Arboricultural Impact Assessment

TREEISM
Arboricultural Services

Prepared For
Graham Bruce
37 Bakers Road
CHURCH POINT NSW 2105

SITE ADDRESS
37 BAKERS ROAD
CHURCH POINT NSW 2105

Prepared by Chantalle Brackenridge Hughes
Consulting Arboriculturist & Horticulturist
Diploma of Arboriculture AQF Level 5

INSTITUTE OF AUSTRALIAN CONSULTING ARBORICULTURISTS
IACA
MANAGING URBAN TREES™

PO Box 36, Church Point, NSW 2105
Mob: 0403 935 419
chantalle@treeism.com.au

OCTOBER 2023

Contents

1 Introduction 2

1.1 Brief 2

1.2 Context 2

1.3 Methodology 2

1.4 Plans and Documents Referenced 3

1.5 Limitations 3

2 Observations and Discussion 4

2.1 Biodiversity Values 4

2.1 Threatened Species 4

2.2 Assessed Trees 4

2.3 Threatened Species 5

3 Impact of the Proposed Development 5

3.1 Prescribed Trees Proposed for Removal 5

3.2 Potential Impacts on Trees Proposed for Retention 5

4 Conclusions 18

5 Recommendations 19

5.1 Trees Proposed for removal 19

5.2 Project Arboriculturist 19

5.3 Minimising Impacts on Trees to be Retained. 19

5.4 General Arboricultural advice 20

6 References 22

7 Appendices 23

Appendix 1 – Terms and Definitions 23

Appendix 2 – STARS – Significance of a Tree Assessment Rating System (IACA 2010)© 24

Appendix 3 – Schedule of Assessed Trees 27

Appendix 4 – Tree Protection Devices 31

Appendix 5 – Photographs 33

Appendix 6 – Tree Location Plan 38

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 Sean Gartner of Gartner and Trovato Architects on behalf of the owner of the subject site. The Site is identified as Lot 2 of DP 222279 and is known as 37 Bakers Road, Church Point, New South Wales. Construction of a secondary dwelling (granny flat), rainwater tank and connecting stairway is 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 protection and maintenance 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 'Narrabeen Group of sediments. Mostly interbedded laminite and shale with quartz to lithic quartz sandstone. Minor red claystones occur north of the Hawkesbury River. Clay pellet sandstone occurs south of the Hawkesbury River (Herbert, 1983)'.

1.2.3 Details of vegetation as per Espade states 'Mostly uncleared, tall eucalypt open-forest (wet sclerophyll) and closed-forest (rainforest). Much of the native vegetation on the Northern Beaches peninsula has been cleared. Tall eucalypt open-forests occur on drier and more exposed slopes and crests. Tree species include *Eucalyptus* (sic) *maculata, E. paniculata, E. saligna, Syncarpia glomulifera, E. botryoides, Angophora floribunda* and *Allocasuarina torulosa*. Rainforest occurs on sheltered slopes. Characteristic tree species include *Acmena* (sic) *smithii, Glochidion ferdinandi, Ceratopetalum apetalum* and *Livistona australis*.

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 twenty-four (24) trees was completed by Chantalle Hughes of Treeism Arboricultural Services on 14th July 2023 (reassessed following updated survey and extra trees collected, 9th October 2023). 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 13.

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)©.

1.4 Plans and Documents Referenced

1.4.1 Architectural Plan, Project no. 2308, Drawing no's. A-00 to A-08, Revision A, dated 12 May 2023, authored by Gartner Trovato Architects.

1.4.2 Survey Plan, Reference E60001-84017, dated 27 September 2023, authored by Burton & Field Surveying and Land Development.

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' and Section B4 Controls relating to the Natural Environment, Pittwater 21 Development Control Plan (P21DCP).

1.5 Limitations

1.5.1 No Landscape or Hydraulic Plans were viewed for 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.

[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.

2 Observations and Discussion

2.1 Biodiversity Values

2.1.1 The site is identified on the Department of Planning and Environments Biodiversity Values Map (BV).

2.1 Threatened Species

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).

2.2 Assessed Trees

2.2.1 Twenty-four (24) 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 location and relevance under the P21DCP** —of the twenty-four (24) assessed trees, the following is noted:

- One (1) subject site tree is considered non-prescribed/exempt under P21 DCP—Tree 23.
- Four (4) trees are located on the boundary of the subject site and neighbouring property—Tree 2, 6, 15 and 16.
- Ten (10) trees are located on an adjoining, neighbouring property—Tree 1, 3, 4, 5, 7, 8, 9, 20, 21 and 22.
- Ten (10) assessed trees are located wholly within the subject site—Tree 10-14, 16A, 17, 18, 19 and 23.

2.2.3 **Species origin** — Of the twenty-three (23) prescribed/neighbouring trees, the following are noted.

- One (1) are introduced native species—Tree 20.
- Twenty-two (22) are locally native species — Tree 1-19, 21 and 22.

2.2.4 The twenty-three (23) assessed, prescribed 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 ID and RV, where L = Low, M = Medium, H = High, R = proposed removal.

Tree No.	*Genus* & *species* **Common Name**	RV	Tree No.	*Genus* & *species* **Common Name**	RV
1	*Ficus rubiginosa* **Port Jackson Fig**	**M**	**13**	*Allocasuarina torulosa* **Forest She-oak**	**H**
2	*Allocasuarina torulosa* **Forest She-oak**	**H**	**14**	*Allocasuarina littoralis* **Black She-oak**	**H**
3	*Glochidion ferdinandi* **Cheese Tree**	**M**	**15**	*Syncarpia glomulifera* **Turpentine**	**H**
4	*Ficus rubiginosa* **Port Jackson Fig**	**H**	**16**	*Syncarpia glomulifera* **Turpentine**	**H**
5	*Allocasuarina torulosa* **Forest She-oak**	**H**	**16A**	*Syncarpia glomulifera* **Turpentine**	**H**

Tree No.	*Genus & species* **Common Name**	RV	Tree No.	*Genus & species* **Common Name**	RV
6	*Allocasuarina torulosa* **Forest She-oak**	**H**	**17**	*Livistona australis* **Cabbage Fan Palm**	**H**
7	*Allocasuarina torulosa* **Forest She-oak**	**H**	**18**	*Syncarpia glomulifera* **Turpentine**	**H**
8	*Allocasuarina torulosa* **Forest She-oak**	**H**	**19**	*Ceratopetalum gummiferum* **NSW Christmas Bush**	**M**
9	*Angophora floribunda* **Rough-barked Apple**	**H**	**20**	*Schefflera actinophylla* **Umbrella Tree**	**L**
10	*Syncarpia glomulifera* **Turpentine**	**H**	**21**	*Syncarpia glomulifera* **Turpentine**	**H**
11	*Syncarpia glomulifera* **Turpentine**	**H**	**22**	*Ficus rubiginosa* **Port Jackson Fig**	**H**
12	*Syncarpia glomulifera* **Turpentine**	**H**			

2.3 Threatened Species

2.3.1 No species of assessed tree is subject to threatened conservation status under Australian and/or State Government legislation (i.e. Chapter 2 of State Environmental Planning (Biodiversity and Conservation) 2021 and the Commonwealth Environment Protection and Biodiversity Conservation Act 1999).

2.3.2 A portion of the site is identified on the Department of Planning and Environment Biodiversity Values Map (BV).

3 Impact of the Proposed Development

3.1 Prescribed Trees Proposed for Removal

3.1.1 One (1) prescribed subject site tree is proposed for removal.

- **Tree 11 Turpentine** – This high RV tree is located within the footprint of the proposed granny flat and 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 2 below.

Table 2: Estimated encroachments of 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.

Tree No.	Tree	Tree located on site	SRZ affected	TPZ area (m^2)	TPZ encroachment (approx. m^2)	TPZ encroachment (approx. %)
1	Port Jackson Fig	**x**	✓	13	*1.13	*8.7
2	Forest She-oak	**x**✓	**x**	34	*1.54	*4.5
3	Cheese Tree?	**x**	**x**	13	0	0
4	Port Jackson Fig	**x**	**x**	49	*1.03	*2.1
5	Forest She-oak	**x**	**x**	13	0	0
6	Forest She-oak	**x**✓	**x**	13	0	0
7	Rough-barked Apple	**x**	**x**	52	0	0
8	Forest She-oak	**x**	**x**	13	0	0
9	Rough-barked Apple	**x**	**x**	104	0	0
10	Turpentine	✓	✓	104	*18.45	*17.7
12	Turpentine	✓	✓	92	*48.48	*52.7
13	Forest She-oak	✓	✓	13	*2.89	*22.2
14	Forest She-oak	✓	**x**	49	*0.49	*1
15	Turpentine	**x**✓	**x**	69	0	0
16	Turpentine	**x**✓	**x**	76	0	0
16A	Turpentine	✓	**x**	13	0	0
17	Cabbage Fan Palm	✓	**N/A**	49	0	0
18	Turpentine	✓	**x**	127	*12.72	*10
19	NSW Christmas Bush	✓	**x**	15	*0.6	*4
20	Umbrella Tree	**x**	✓	43	*15.3	*35.6
21	Turpentine	**x**	**x**	290	39.64	13.7
22	Port Jackson Fig	**x**	**x**	24	0	0

*Denotes the encroachment is an over-estimate given design factors – isolated piers proposed only. See further discussion below.

3.2.4 **Tree 1** Port Jackson Fig – located on neighbouring property.

Structural Root Zone impacts:

- The proposed timber stairs fall within the calculated SRZ of this specimen. Further discussion below.

Tree Protection Zone impacts:

- The proposed timber access stairs fall inside the TPZ of this specimen (see Figure 1 below), an 8.7% encroachment has been estimated. Given the timber stair encroachment also falls within the SRZ, this level of encroachment is considered *major* under AS4970 and triggers Clause 3.3.4 - TPZ encroachment considerations under AS4970 - 2009.
- The primary consideration is (b) *The potential loss of root mass resulting from the encroachment: number and size of roots* and (h) *Design Factors*.
- Given the stairs will be on piers only the level of encroachment is greatly reduced. Negative impact to tree health/condition is considered unlikely.

Pruning impacts:

- No pruning is foreseen to accommodate works.

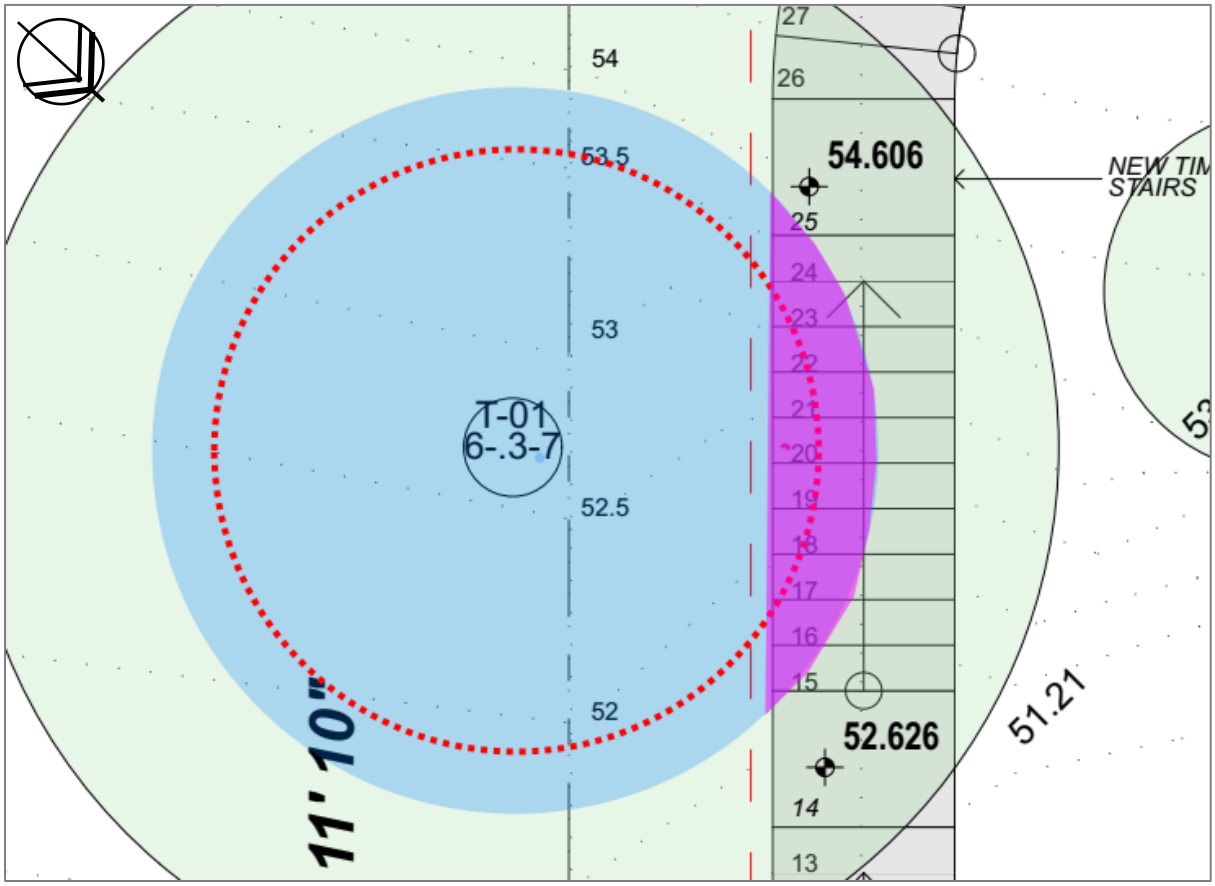


Figure 1 – Tree 1 encroachment – Mark up of Granny Flat Plan, dwg no. A.03, 12/5/23 authored by Gartner Trovato Architects. Red dotted circle notes SRZ, blue shaded circle TPZ, pink shading is encroachment. Marked up by Treeism. NOT TO SCALE.

3.2.1 **Tree 2** Forest She-oak - located partially on subject site and neighbouring property.

Structural Root Zone impacts:

- All works are located outside the SRZ of this specimen.

Tree Protection Zone impacts:

- The proposed Granny Flat falls inside the TPZ of this specimen (see Figure 2 below), an 4.5% encroachment has been estimated. This level of encroachment is considered *minor* under AS4970 and impacts to tree health and condition not foreseen.
- Additionally, this section of the Granny Flat will be located on isolated piers, further reducing any impacts on this specimen.

Pruning impacts:

- The canopy is orientated to the south, no pruning would be required.

3.2.2 **Tree 3** Cheese Tree - located on adjoining property.

Structural Root Zone impacts:

- All works are located outside the SRZ of this specimen.

Tree Protection Zone impacts:

- No works are proposed within the TPZ of this specimen (see Figure 2 below).

Pruning impacts:

- No pruning is foreseen to accommodate works.

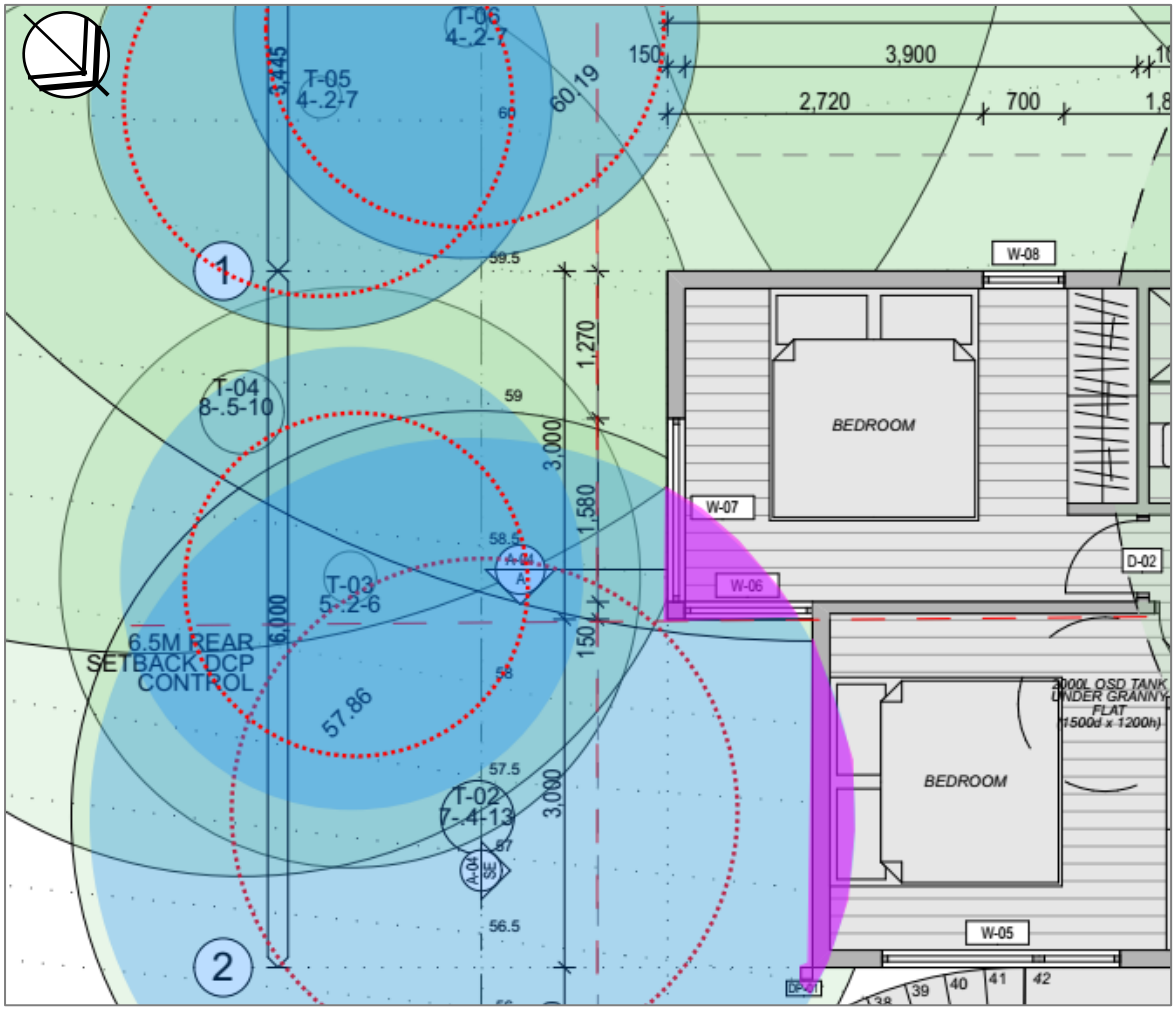


Figure 2 – Tree 2 & 3 encroachment – Mark up of Granny Flat Plan, dwg no. A.03, 12/5/23 authored by Gartner Trovato Architects. Red dotted circle notes SRZ, blue shaded circle TPZ, pink shading is encroachment. Note nil encroachment Tree 5 & 6. Marked up by Treeism. NOT TO SCALE.

3.2.3 **Tree 4** Port Jackson Fig - located on adjoining property.

Structural Root Zone impacts:

- All works are located outside the SRZ of this specimen.

Tree Protection Zone impacts:

- The proposed Granny Flat falls inside the TPZ of this specimen (see Figure 3 below), an 2.1% encroachment has been estimated. This level of encroachment is considered *minor* under AS4970.
- Additionally, the northern portion of this encroachment will be located on isolated piers, further reducing any potential impacts to tree health and condition.

Pruning impacts:

- Potential minor pruning may be required to allow clearances for the proposed Granny Flat.

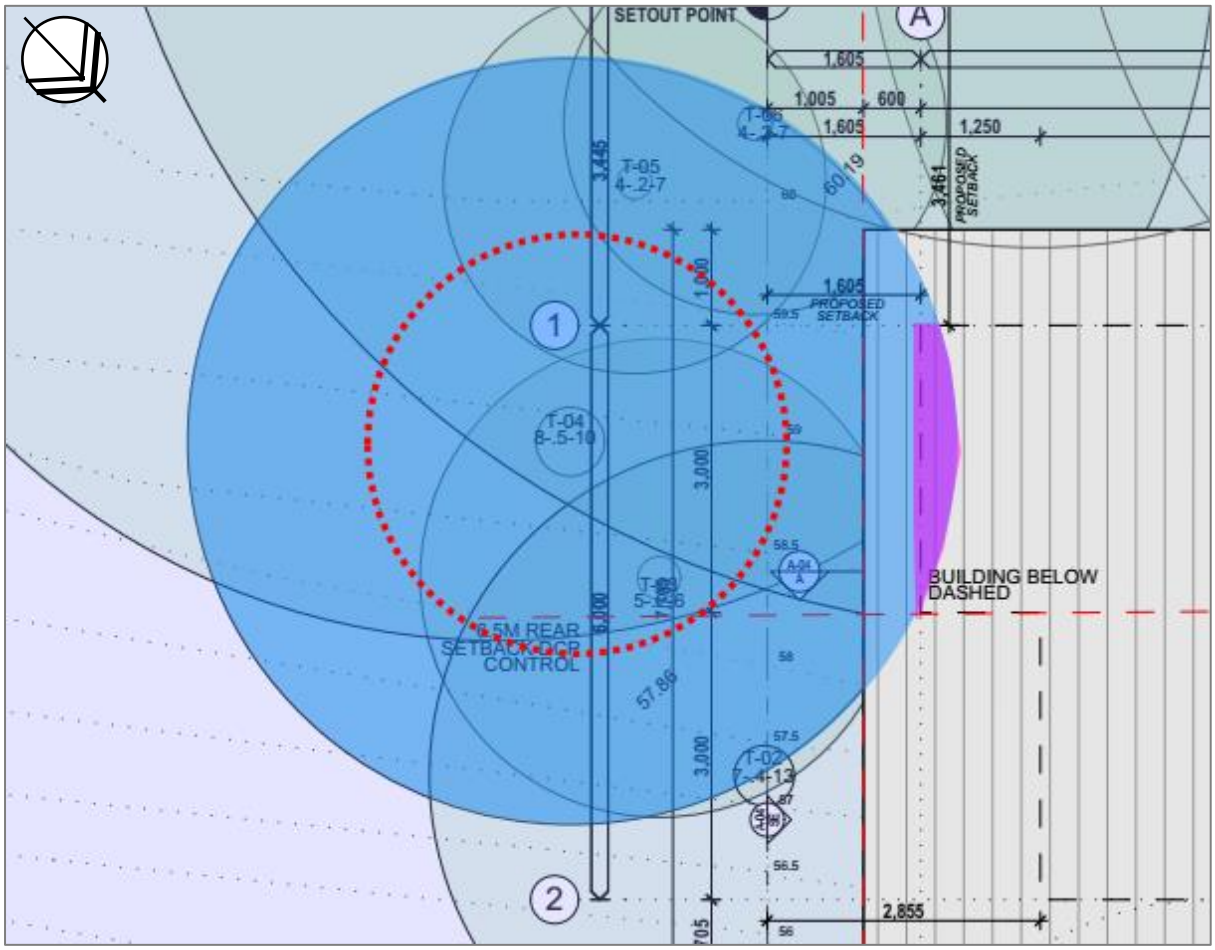


Figure 3 – Tree 4 encroachment – Mark up of Site Plan & Site Analysis, dwg no. A.01, 12/5/23 authored by Gartner Trovato Architects. Red dotted circle notes SRZ, blue shaded circle TPZ, pink shading is encroachment. Marked up by Treeism. NOT TO SCALE.

3.2.4 **Tree 5** Forest She-oak - located on neighbouring site.

Structural Root Zone impacts:

- All works are located outside the SRZ of this specimen.

Tree Protection Zone impacts:

- No works are proposed within the TPZ of this specimen (see Figure 2 page 8 above).

Pruning impacts:

- No pruning is foreseen to accommodate works as the canopy is orientated to the south.

3.2.5 **Tree 6** Forest She-oak - located on neighbouring site.

Structural Root Zone impacts:

- All works are located outside the SRZ of this specimen.

Tree Protection Zone impacts:

- No works are proposed within the TPZ of this specimen (see Figure 2 page 8 above).

Pruning impacts:

- No pruning is foreseen to accommodate works as the canopy does not extend over the subject site.

3.2.6 **Tree 7** Rough-barked Apple - located on neighbouring site.

Structural Root Zone impacts:

- All works are located outside the SRZ of this specimen.

Tree Protection Zone impacts:

- No works are proposed within the TPZ of this specimen.

Pruning impacts:

- No pruning is foreseen to accommodate works as the canopy is orientated to the south.

3.2.7 **Tree 8** Forest She-oak - located on neighbouring site.

Structural Root Zone impacts:

- All works are located outside the SRZ of this specimen.

Tree Protection Zone impacts:

- No works are proposed within the TPZ of this specimen.

Pruning impacts:

- No pruning is foreseen to accommodate works.

3.2.8 **Tree 9** Rough-barked Apple - located on neighbouring site.

Structural Root Zone impacts:

- All works are located outside the SRZ of this specimen.

Tree Protection Zone impacts:

- No works are proposed within the TPZ of this specimen.

Pruning impacts:

- No pruning is foreseen to accommodate works.

3.2.9 **Tree 10** Turpentine - located on subject site.

Structural Root Zone impacts:

- The proposed deck for the Granny Flat falls within the SRZ of this specimen. It will be on isolated piers thus reducing impacts.

Tree Protection Zone impacts:

- A theoretical encroachment of 17.7% has been estimated (see Figure 4 below). This is considered a *major* encroachment under AS4970 and triggers Clause 3.3.4 - TPZ encroachment considerations under AS4970 - 2009. The primary consideration is (b) *The potential loss of root mass resulting from the encroachment: number and size of roots* and (h) *Design Factors*.
- The pink shading in Figure 4 denotes the section on isolated piers, the orange section is an excavation into the bank on the south-west side only. This 'permanent' encroachment has been calculated at 6% encroachment. Pier placement could be a little flexible to avoid woody root disturbance, long term negative impact on tree health is unlikely.

Pruning impacts:

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

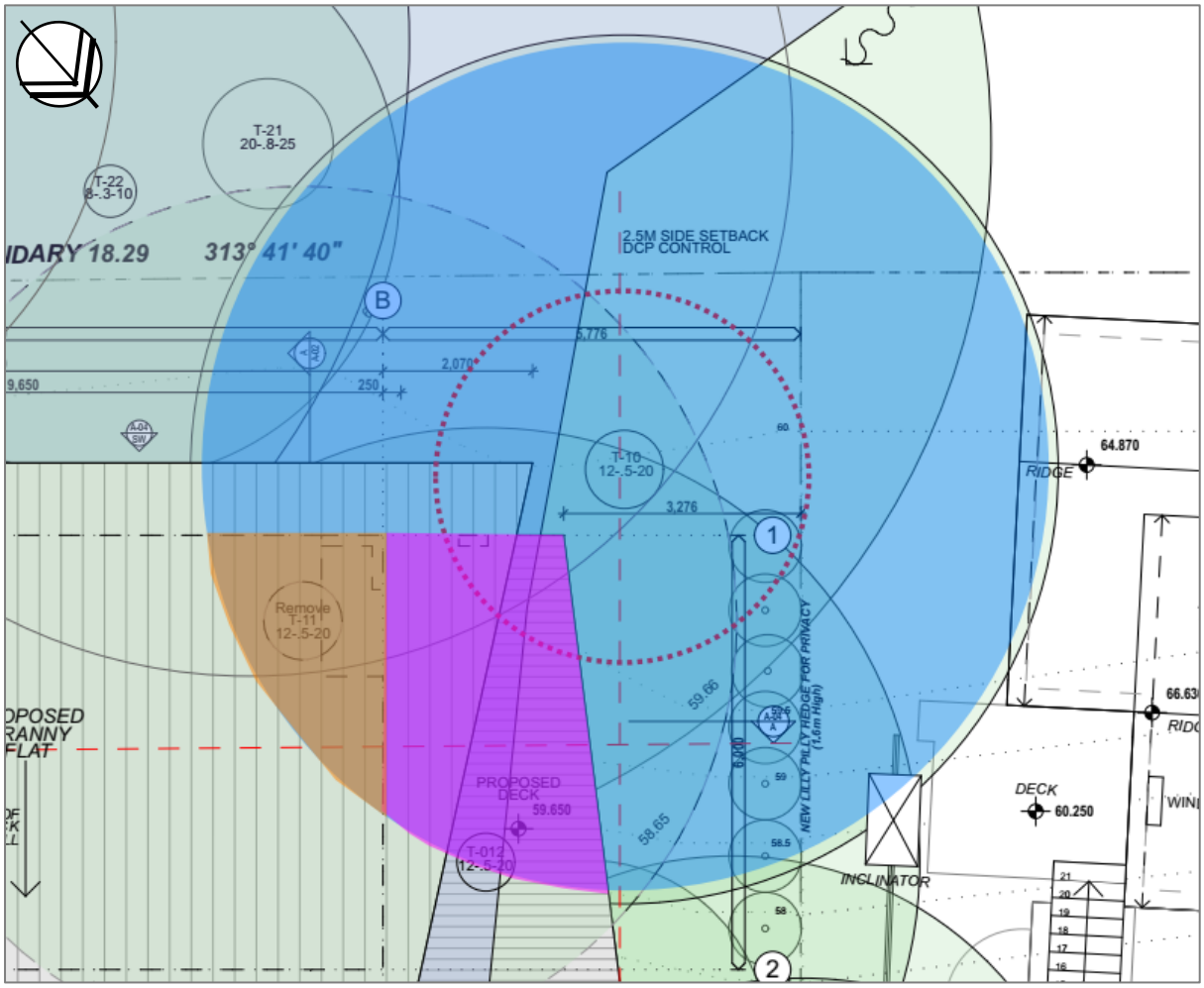


Figure 4 – Tree 10 – Mark up of Site Plan & Site Analysis, dwg no. A.01, 12/5/23 authored by Gartner Trovato Architects. Red dotted circle notes SRZ, blue shaded circle TPZ, pink shading is encroachment – piers only, orange shading permanent encroachment. Marked up by Treeism. NOT TO SCALE.

3.2.10 **Tree 12** Turpentine - located on subject site.

Structural Root Zone impacts:

- The proposed deck for the Granny Flat falls within the SRZ of this specimen. It will be on isolated piers thus reducing impacts.

Tree Protection Zone impacts:

- A theoretical encroachment of 52.7% has been estimated (see Figure 5 below). This is well within *major* encroachment under AS4970 and triggers Clause 3.3.4 - TPZ encroachment considerations under AS4970 - 2009. Again, the primary considerations are (b) *The potential loss of root mass resulting from the encroachment: number and size of roots* and (h) *Design Factors*.
- The pink shading in Figure 4 denotes the section on isolated piers, the orange section is an excavation into the bank on the south side. This 'permanent' encroachment has been calculated at 5.8% encroachment. Pier placement would need to be flexible to avoid woody root disturbance. Adequate space around the tree stem will be required to accommodate stem/trunk expansion.
- Minor to moderate impacts in the short to medium term are likely but will depend on the potential disturbance of woody roots and any offset watering in the short term to ameliorate the rain-shadow.

Pruning impacts:

- No pruning will be required, canopy held high.

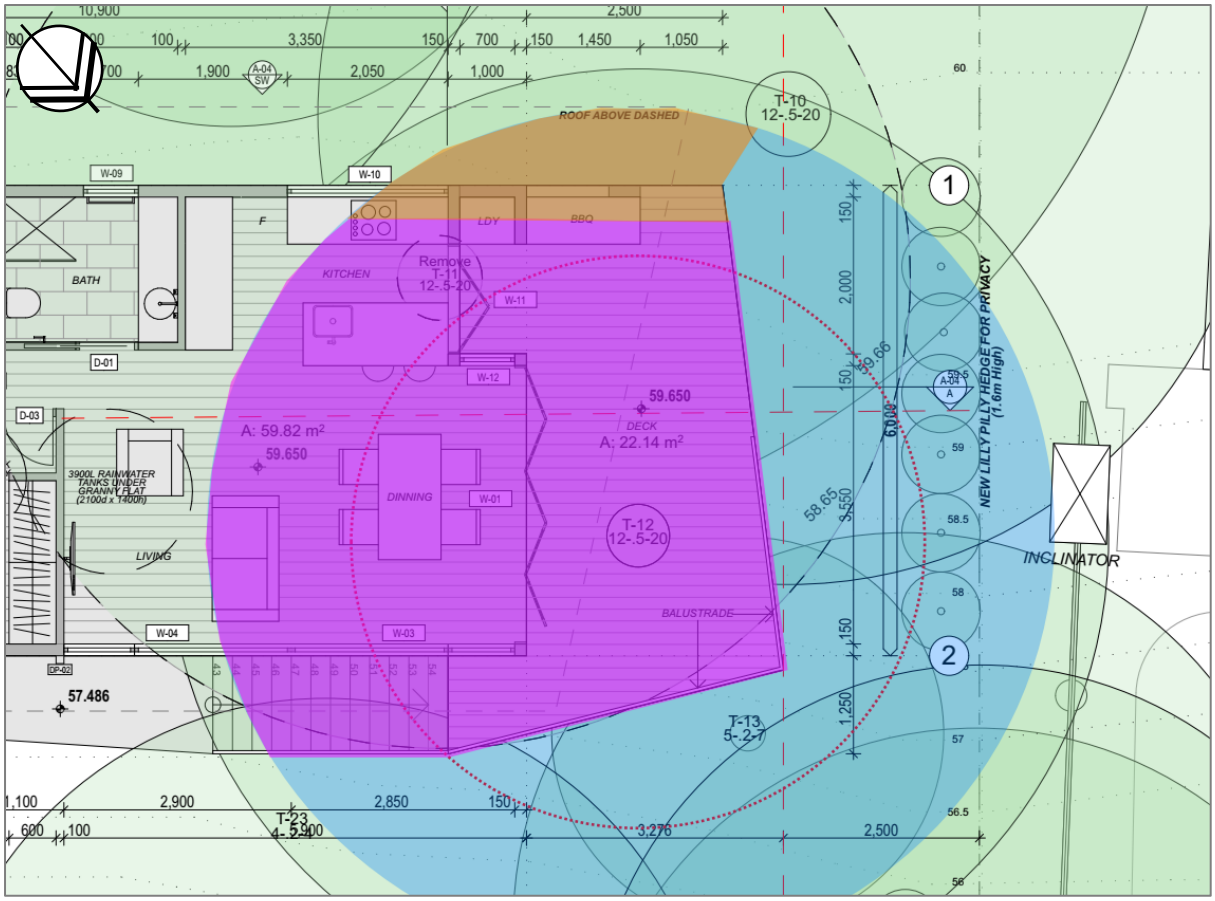


Figure 5 – Tree 12 encroachment – Mark up of Granny Flat Plan, dwg no. A.03, 12/5/23 authored by Gartner Trovato Architects. Red dotted circle notes SRZ, blue shaded circle TPZ, pink shading is encroachment – piers only, orange shading permanent encroachment. Marked up by Treeism. NOT TO SCALE.

3.2.11 **Tree 13** Forest She-oak - located on subject site.

Structural Root Zone impacts:

- The proposed deck for the Granny Flat falls within the SRZ of this specimen. It will be on isolated piers thus reducing impacts.

Tree Protection Zone impacts:

- A theoretical encroachment of 22.2% has been estimated (see Figure 6 page 15). This is considered *major* encroachment under AS4970 and triggers Clause 3.3.4 - TPZ encroachment considerations under AS4970 - 2009. Again, the primary considerations are (b) *The potential loss of root mass resulting from the encroachment: number and size of roots* and (h) *Design Factors*.
- The pink shading in Figure 4 denotes the deck encroachment, this is proposed to be on isolated piers. Provided pier placement is flexible to avoid woody root disturbance impact to tree health should be minimal.

Pruning impacts:

- Nil to minor pruning may be required to accommodate the proposed works.

3.2.12 **Tree 14** Black She-oak - located on subject site.

Structural Root Zone impacts:

- No works will occur within the SRZ of this specimen.

Tree Protection Zone impacts:

- The proposed deck for the Granny Flat falls inside the TPZ of this specimen (see Figure 6 page 15), an 1% encroachment has been estimated. This level of encroachment is considered *minor* under AS4970.
- Additionally, this encroachment will be located on isolated piers, further reducing any potential impacts to tree health and condition.

Pruning impacts:

- No pruning is foreseen to be required to accommodate the works.

3.2.13 **Tree 15** Turpentine - located partially on subject site and neighbouring property.

Structural Root Zone impacts:

- No works will occur within the SRZ of this specimen.

Tree Protection Zone impacts:

- All works fall outside the calculated TPZ.

Pruning impacts:

- No pruning is foreseen to be required to accommodate the works.

3.2.14 **Tree 16** Turpentine - located partially on subject site and neighbouring property.

Structural Root Zone impacts:

- No works will occur within the SRZ of this specimen.

Tree Protection Zone impacts:

- All works fall outside the calculated TPZ.

Pruning impacts:

- No pruning is foreseen to be required to accommodate the works.

3.2.15 **Tree 16A** Turpentine - located on the subject site.

Structural Root Zone impacts:

- No works will occur within the SRZ of this specimen.

Tree Protection Zone impacts:

- All works fall outside the calculated TPZ.

Pruning impacts:

- No pruning is foreseen to be required to accommodate the works.

3.2.16 **Tree 17** Cabbage Tree Palm - located on subject site.

Structural Root Zone impacts:

- Under AS4970, the formula for calculating the SRZ of a tree does not apply to palms, other monocots, cycads, or tree ferns.

Tree Protection Zone impacts:

- All works fall outside the calculated TPZ.

Pruning impacts:

- No pruning is foreseen to be required to accommodate the works.

3.2.17 **Tree 18** Turpentine - located on subject site.

Structural Root Zone impacts:

- No works will occur within the SRZ of this specimen.

Tree Protection Zone impacts:

- A theoretical encroachment of 10% has been estimated (see Figure 6 below/next page). This places it just within what is considered *major* encroachment under AS4970 and triggers Clause 3.3.4 - TPZ encroachment considerations under AS4970 - 2009. However, as discussed previously, the primary considerations are (b) *The potential loss of root mass resulting from the encroachment: number and size of roots* and (h) *Design Factors*.
- The pink shading in Figure 6 below denotes the deck and stair encroachment, these are both proposed to be on isolated piers. Provided pier placement is flexible to avoid woody root disturbance, impact to tree health should be minimal.

Pruning impacts:

- Nil to minor pruning is likely to be required to accommodate the proposal.

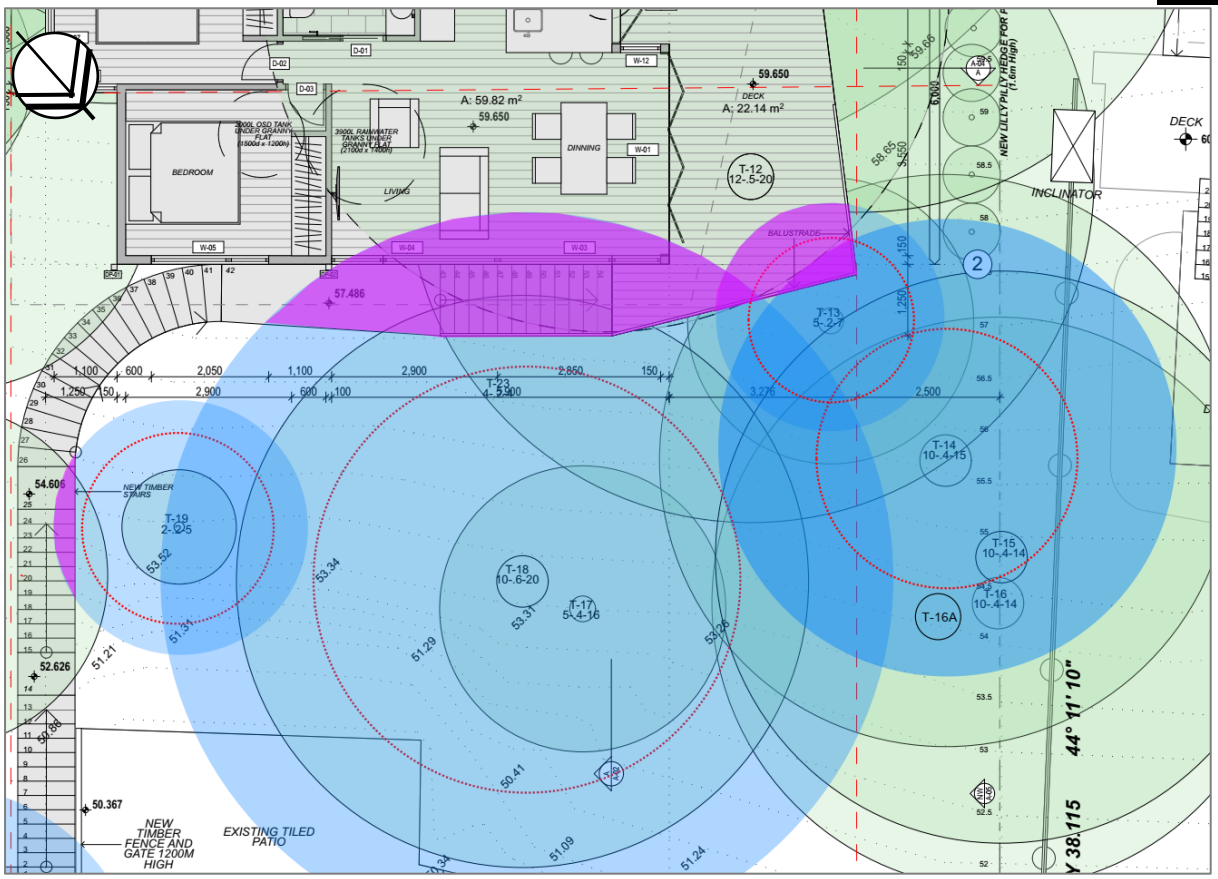


Figure 6 – Tree 13, 14, 18 & 19 – Mark up of Granny Flat Plan, dwg no. A.03, 12/5/23 authored by Gartner Trovato Architects. Red dotted circle notes SRZ, blue shaded circle TPZ, pink shading is encroachment. Marked up by Treeism. NOT TO SCALE.

3.2.18 **Tree 19** NSW Christmas Bush - located on subject site.

Structural Root Zone impacts:

- No works will occur within the SRZ of this specimen.

Tree Protection Zone impacts:

- An encroachment of 4% has been estimated (see Figure 6 above). This is considered a *minor* encroachment under AS4970.
- Additionally, the stairs are proposed as light-weight timber stairs on isolated piers.

Pruning impacts:

- No pruning will be required to accommodate the proposed stairs.

3.2.19 **Tree 20** Umbrella Tree – Located on neighbouring property.

Structural Root Zone impacts:

- The proposed access stairs for the Granny Flat falls within the SRZ of this specimen. They are proposed as light-weight timber stairs on isolated piers, thus reducing impacts.
- Existing stone flagging is also located within this area (see Inset of Figure 6 below/next page).

Tree Protection Zone impacts:

- A theoretical encroachment of 35.6% has been estimated (see Figure 6 page 15). This is considered *major* encroachment under AS4970 and triggers Clause 3.3.4 - TPZ encroachment considerations under AS4970 - 2009. Again, the primary considerations are (b) *The potential loss of root mass resulting from the encroachment: number and size of roots* and (h) *Design Factors*.
- The pink shading in Figure 4 denotes the deck encroachment, this is proposed to be on isolated piers. Provided pier placement is flexible to avoid woody root disturbance impact to tree health should be minimal.

Pruning impacts:

- No pruning will be required to accommodate the proposal.

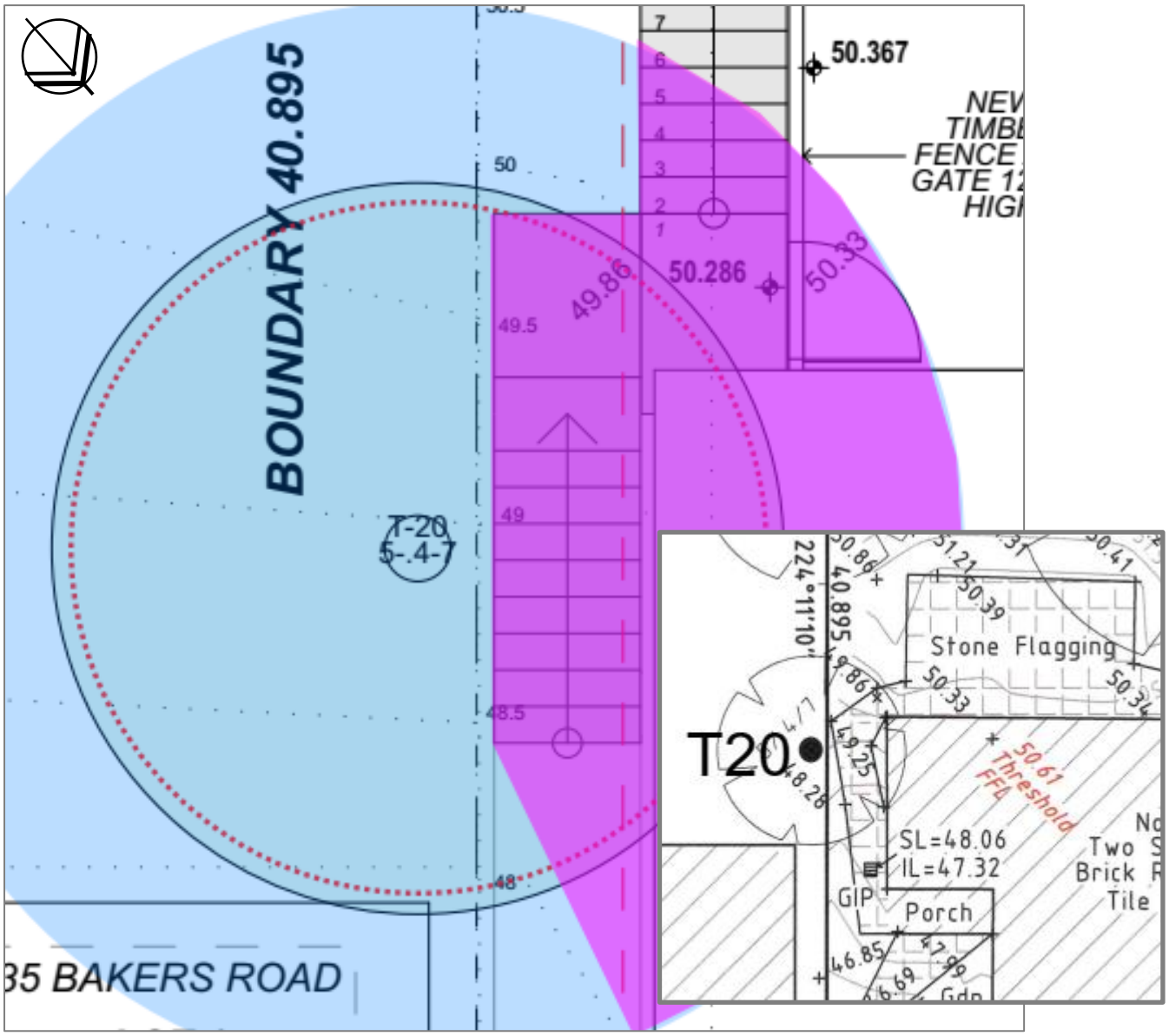


Figure 6 – Tree 20 – Mark up of Granny Flat Plan, dwg no. A.03, 12/5/23 authored by Gartner Trovato Architects. Red dotted circle notes SRZ, blue shaded circle TPZ, pink shading is encroachment. Inset – Survey Plan Ref E60001-84017, 27/9/23 by Burton & Field Surveying and Land Development Marked up by Treeism. NOT TO SCALE.

3.2.20 **Tree 21** Turpentine – Located on neighbouring property.

Structural Root Zone impacts:

- No works will occur within the SRZ of this specimen.

Tree Protection Zone impacts:

- An encroachment of 13.7% has been estimated (see Figure 7 below). This is considered *major* encroachment under AS4970 and triggers Clause 3.3.4 - TPZ encroachment considerations under AS4970 - 2009. Again, the primary considerations are (b) *The potential loss of root mass resulting from the encroachment: number and size of roots* and (h) *Design Factors*.
- The pink shading in Figure 7 denotes the deck encroachment, this is proposed to be on isolated piers. The orange shading the more 'permanent' encroachment from the Granny Flat given the rear/southern section is an excavation. This 'permanent' encroachment equates to only 10.4% encroachment, just in the *major* encroachment category under AS4970.
- Minor to moderate impacts in the short to medium term are likely but will depend on the potential disturbance of woody roots. Access to or the restriction of moisture to this tree will remain unchanged as all works are downhill.

Pruning impacts:

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

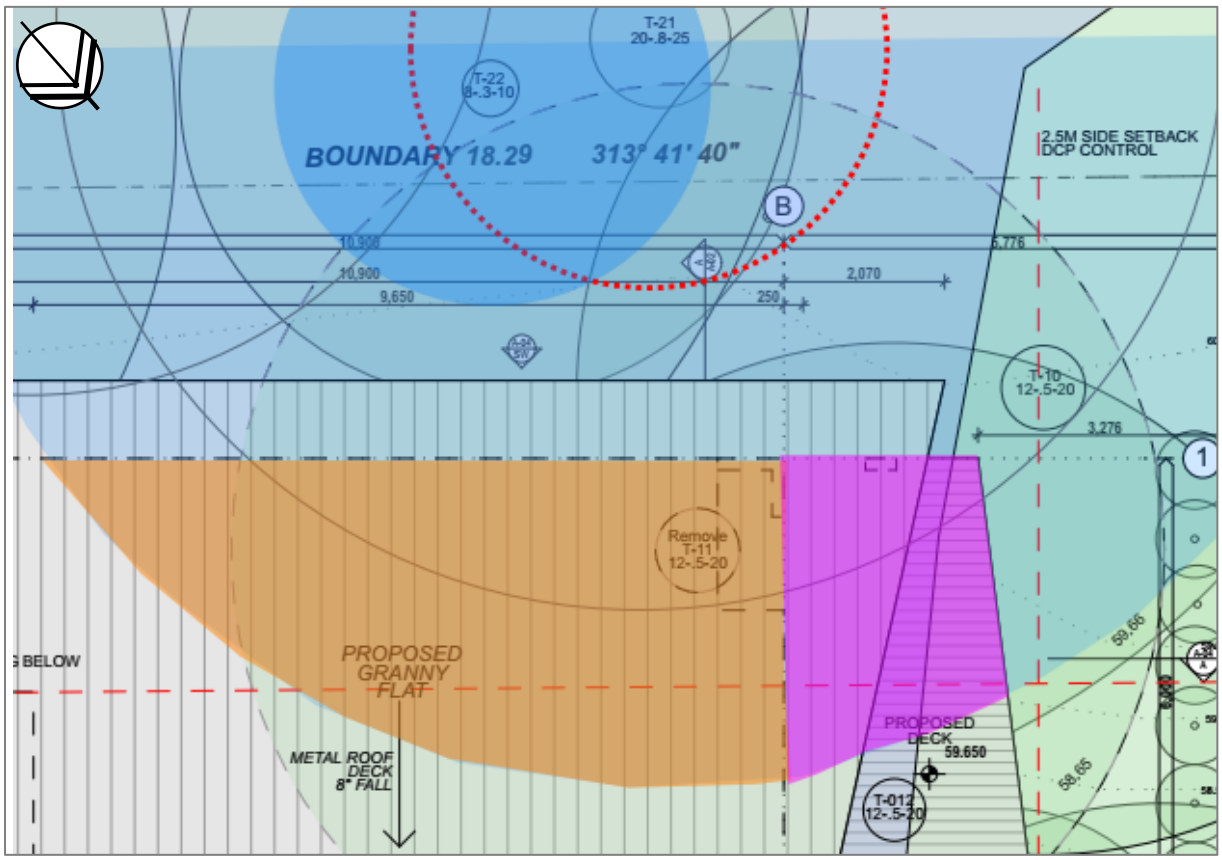


Figure 7 – Tree 21 and 22 – Mark up of Site Plan & Site Analysis, dwg no. A.01, 12/5/23 authored by Gartner Trovato Architects. Red dotted circle notes SRZ, blue shaded circle TPZ, pink shading is encroachment – piers only, orange shading permanent encroachment. Marked up by Treeism. NOT TO SCALE.

3.2.21 **Tree 22** Port Jackson Fig – Located on neighbouring property.

Structural Root Zone impacts:

- No works will occur within the SRZ of this specimen.

Tree Protection Zone impacts:

- All works are located outside the calculated TPZ of this specimen (see Figure 7, above/page 17).

Pruning impacts:

- The tree is located higher than the proposed Granny Flat, only minor pruning may be required to accommodate the proposal.

4 Conclusions

4.1.1 A total of twenty-four trees (24) 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.

4.1.3 The site is identified on the Department of Planning and Environments Biodiversity Values Map (BV).

4.1.4 One (1) *high* RV tree (Tree 11) will be required to be removed to facilitate the proposed works.

4.1.5 Eleven (11) assessed trees (Tree 3, 5-9, 15, 16, 16A, 17 and 22) will incur no/nil encroachment into the calculated TPZ, impacts to tree health and condition are unlikely.

4.1.6 Five (5) assessed trees (Tree 1, 2, 4, 14, and 19) will incur minor encroachment into the calculated TPZ, impacts to tree health and condition are not foreseen.

4.1.7 Six (6) trees (Tree 10, 12, 13, 18, 20 and 21) will incur technically *major* encroachment as the works fall within the SRZ or over the 10% TPZ threshold. The design methods have been considered, tree retention and viability are considered achievable in the long term provided pier locations are flexible to avoid woody root severance in excess off 40mm in diametre (or as deemed achievable for tree retention and viability by the Project Arborist/Council).

4.1.8 Provided the recommendations of this report are adhered to, all trees proposed for retention shall remain viable.

5 Recommendations

5.1 Trees Proposed for removal

5.1.1 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 is subject to permit from the relevant consent authority.

5.2 Project Arboriculturist

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

5.2.2 A specific Tree Protection Plan, once Councils Conditions of Consent are issued, shall be established to ensure compliance with the relevant Notice of Determination.

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 Certification if, and when required.

5.3 Minimising Impacts on Trees to be Retained.

5.3.1 TREE PROTECTION – Tree 1-6, 10, 12-16, 16A, 17-19.

- No storage of materials/equipment is to occur within the identified TPZ's and no ground level changes is to occur within the identified TPZ outside the active work zones.
- 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.
- All works shall comply with the Tree Protection Plan.
- Stem protection as per Appendix 4 – Figure 3 (and compliant with AS4970) is to be in place. Ground protection is to be placed within identified TPZ's of trees to be retained, outside of active work zones.
- Pruning of branches must be undertaken by a minimum AQF Level 3 arborist in accordance with Clause 7.3.4 of the Australian Standard AS4373-2007 Pruning of amenity trees as assessed and directed by the Project Arborist.
- Refer to Section 5.4 for further information on tree protection measures.

5.3.2 TREE PROTECTION – Tree 7-9, 21 and 22.

- Tree protection fencing (as per Appendix 4 &/or AS4970) is to be installed along the property boundary (as surveyed) to protect tree stems. Ground protection is to be placed within identified TPZ's of trees to be retained, outside of active work zones.

- Pruning of branches must be undertaken by a minimum AQF Level 3 arborist in accordance with Clause 7.3.4 of the Australian Standard AS4373-2007 Pruning of amenity trees as assessed and directed by the Project Arborist.
- Refer to Section 5.4 for further information on tree protection measures.
- Non-destructive excavation is to be used when working within the TPZ of trees to be retained (including Tree 20) and must be supervised by an AQF level 5 consulting arborist.
- All works shall comply with the Tree Protection Plan.

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 diameter, 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 a coarse, gap graded material such as 20 — 50mm crushed basalt or equivalent to provide some aeration to the root zone. Note that roadbase or crushed sandstone or other material containing a high percentage of fines is unacceptable for this purpose.
- The fill material should be consolidated with a non-vibrating roller 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

6.1.1 Barrell, J (1995) Pre-development Tree Assessment from Trees and Building Sites, Eds. Watson & Neely, International Society of Arboriculture, Illinois.

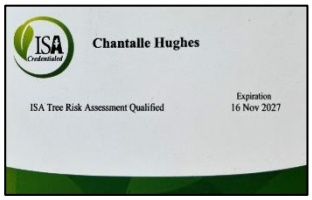
Mattheck, C. & Breloer, H. (1994) The Body Language of Trees: A handbook for failure analysis. Research for Amenity Trees No. 4, The Stationery Office, London.

Standards Australia AS4373-2007: Pruning of Amenity Trees, Standards Australia, Sydney.

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

www.treetec.net.au/tpz_srz_dbh_calculator - accessed 23/7/2023.

Report prepared by Chantalle Hughes –July-October 2023



Chantalle Brackenridge Hughes
Consulting arboriculturist and horticulturist
Tree Surgery Certificate
Advanced Certificate Urban Horticulture
Diploma of Horticulture (Arboriculture) *Credit*
ISA Tree Risk Assessment Qualification (TRAQ) updated 2022
Accredited Member of Institute of Australian Consulting Arboriculturists (IACA)
Affiliate Member of the Local Government Tree Resources of Australia (LGTRA)
Member of the International Society of Arboriculture (ISA)

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.

		Significance				
		1. High	**2.** Medium	**3.** Low		
		Significance in Landscape	Significance in Landscape	Significance in Landscape	Environmental Pest / Noxious Weed Species	Hazardous / Irreversible Decline
Estimated Life Expectancy	1. Long **>40 years**					
	2. Medium **15-40 Years**					
	3. Short **<1-15 Years**					
	Dead					

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 14/7/2023 and 9/10/2023, 37 Bakers Road, Church Point.

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)
1	*Ficus rubiginosa* **Port Jackson Fig**	10	6	*120/60 (134)	200	SM	G	G-F	Located on neighbouring property. Locally native species. Twiggy deadwood, dead tree entwined with it.	2A	H	**H**	1.7	2.0	13
2	*Allocasuarina torulosa* **Forest She-oak**	9	6	275	360	M	G	G	Located partially on neighbouring property and the subject site. Locally native species. Canopy orientated all to south. Hanger in canopy.	2A	H	**H**	2.2	3.3	34
3	*Glochidion ferdinandi / Syzygium sp.* **Cheese Tree/Lilly Pilly**	9	4	110	150	SM	G	F-P	Located on neighbouring property. Locally native species? No lower branches, canopy all oriented to east very hard to identify, unsure of species.	2D	M	**M**	1.5	2.0	13
4	*Ficus rubiginosa* **Port Jackson Fig**	18	16	330	380	EM	G	G	Located on neighbouring property. Locally native species. Surrounded by rock outcrops, young Cheese tree to south of it.	2A	H	**H**	2.2	4.0	49
5	*Allocasuarina torulosa* **Forest She-oak**	8	3	120	200	EM	G	G-F	Located on neighbouring property. Locally native species. Canopy all to south.	2A	H	**H**	1.7	2.0	13
6	*Allocasuarina torulosa* **Forest She-oak**	14	6	160	220	M	G	G-F	Located partially on neighbouring property and the subject site. Locally native species. No lower branches over site.	2A	H	**H**	1.8	2.0	13
7	*Angophora floribunda?* **Rough-barked Apple**	18	10	340	400	M	G	G-F	Located on neighbouring property. Locally native species? Canopy all to south thus hard to assess, high percentage of epicormic growth.	2A	H	**H**	2.3	4.1	52
8	*Allocasuarina torulosa* **Forest She-oak**	13	6	190	240	M	G	G	Located on neighbouring property. Locally native species.	2A	H	**H**	1.8	2.0	13

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)
9	*Angophora floribunda?* **Rough-barked Apple**	22	18	480	560	M	G	G	Located on neighbouring property. Locally native species.	2A	H	**H**	2.6	5.8	104
10	*Syncarpia glomulifera* **Turpentine**	24	16	480	580	M	G	G	Located on subject site. Locally native species. Canopy held high, right beside neighbour's children play equipment.	2A	H	**H**	2.6	5.8	104
11	*Syncarpia glomulifera* **Turpentine**	24	18	430	540	M	G	G	Located on subject site. Locally native species. Canopy held high, deadwood to 30mm	2A	H	**H**	2.6	5.2	84
12	*Syncarpia glomulifera* **Turpentine**	23	8	450	540	M	G	G	Located on subject site. Locally native species. Canopy all to north north-west. Deadwood to 50mm.	2A	H	**H**	2.6	5.4	92
13	*Allocasuarina torulosa* **Forest She-oak**	8	5	150	200	M	G	G	Located on subject site. Locally native species.	2A	H	**H**	1.5	2.0	13
14	*Allocasuarina torulosa* **Forest She-oak**	26	12	330	420	M	G	G	Located on subject site. Locally native species. Canopy to west and held high over site.	2A	H	**H**	2.3	4.0	49
15	*Syncarpia glomulifera* **Turpentine**	22	10	390	470	M	G	G	Located partially on neighbouring property. Locally native species.	2A	H	**H**	2.4	4.7	69
16	*Syncarpia glomulifera* **Turpentine**	20	7	410	510	M	G	G	Located partially on neighbouring property. Locally native species. Suppressed by tree beside it canopy all to northwest.	2A	H	**H**	2.5	4.9	76
16A	*Syncarpia glomulifera* **Turpentine**	10	8	*100/ 140 (172)	*180	M	G	G-F	Located on subject site. Locally native species. Dog-legged stem. Not on survey.	2A	H	**H**	1.6	2.1	13
17	*Livistona australis* **Cabbage Fan Palm**	12	6	*280	N/A	M	G	G	Located on neighbouring property. Locally native species. Estimate stem details as limited access.	1A	H	**H**	N/A	4.0	49

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)
18	*Syncarpia glomulifera* **Turpentine**	26	16	*530	*600	M	G	G	Located on subject site. Locally native species. Estimated stem details as limited access.	2A	H	**H**	2.7	6.4	127
19	*Ceratopetalum gummiferum* **NSW Christmas Bush**	8	3	180	210	EM	G	F	Located on subject site. Locally native species. Either lopped or more likely storm damaged, head snapped out. 100% epicormic growth. Stem estimated due to access.	2D	M	**M**	1.7	2.2	15
20	*Schefflera actinophylla* **Umbrella Tree**	15	8	190/ 220/ 100 (307)	460	M	G	G	Located on neighbouring property. Introduced native species. Leans to east, included stems at base.	2A	L	**L**	2.4	3.7	43
21	*Syncarpia glomulifera* **Turpentine**	22	18	800	900	M	G	G	Located on neighbouring property. Locally native species.	2A	H	**H**	3.2	9.6	290
22	*Ficus rubiginosa* **Port Jackson Fig**	18	12	230	270	M	G	G	Located on neighbouring property. Locally native species.	2A	H	**H**	1.9	2.8	24
23	*Howea forsteriana* **Kentia Palm**	-	-	-	-	-	-	-	Located on subject site. Introduced exotic species. Exempt under P21 DCP.	2A	L	**L**	-	-	-

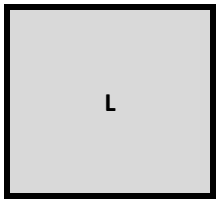
KEY

Trees to be retained.

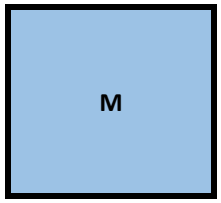
Dead/non-prescribed tree or palm on site that may be removed or retained without Development Consent or Tree Management Permit.

Trees proposed for removal.

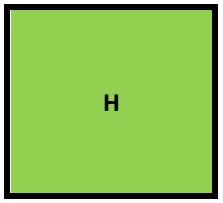
Trees proposed for relocation.



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



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



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

* DBH is visually estimated (usually adjoining trees or 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 approximate diameter of tree stem at breast height i.e. 1.4 metres above ground (unless otherwise noted) and expressed in metres. 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 Appendices 2 and 3 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 3 – 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 3 – 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. 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. 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.

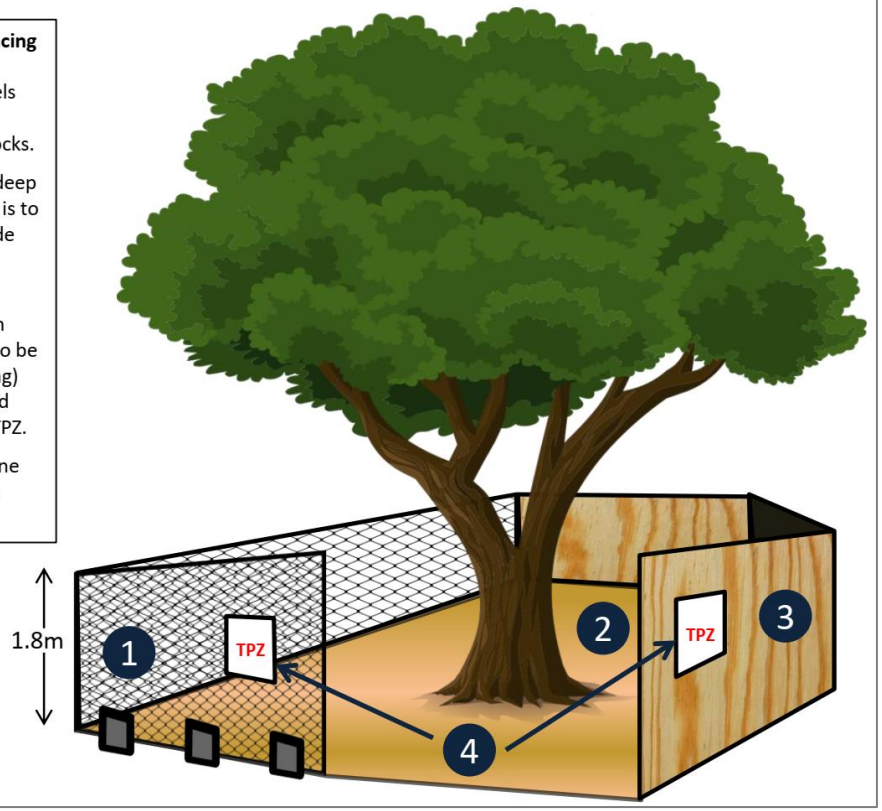


Figure 2
Suitable Tree Protection Zone Signage

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

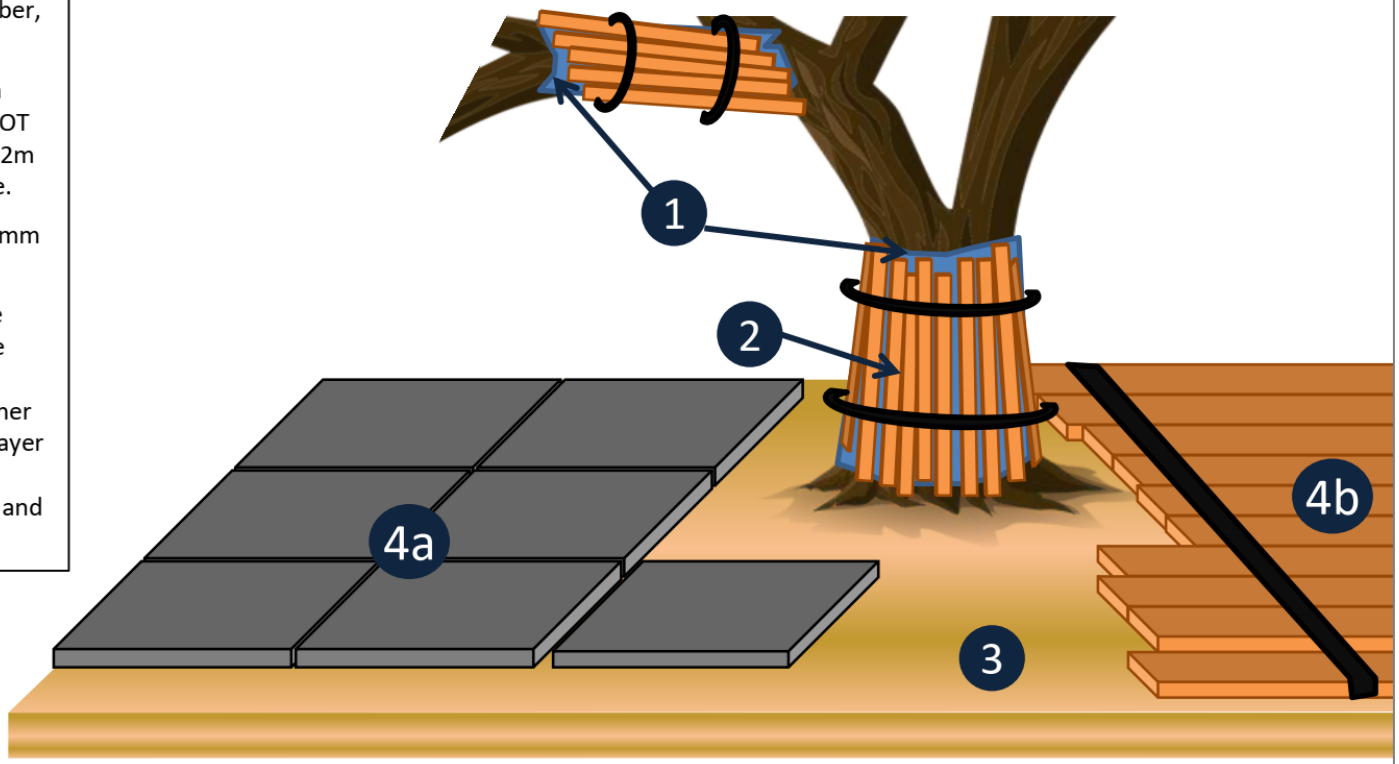


Figure 3 – Stem and ground protection measures.

Appendix 5 – Photographs

Plate 1 – Tree 1, 2 and 19 – Site on steep slope.

Plate 2 – Tree 12-16A – Arrow notes Tree 15, rest of trees are labelled. Area for proposed Granny Flat mostly clear. Trees 12-14 & 16A on subject site. Trees 15 and 16 are partially on neighbouring property.

Plate 3 – Tree 10, 11 (Subject site trees) and Tree 21 and 22 (neighbours trees).

Plate 4– Tree 2 – Located on neighbours site, canopy all to south, suspect large tree onsite (now dead/fallen) previously deflected canopy as several surrounding trees have canopy away from build around – suggesting Phototropism. Allows build to be carried out without much pruning required.

Plate 5 – Tree 14, 17 and 18 – subject site, Tree 15 and 16 – Note canopies held high.

Appendix 6 – Tree Location Plan

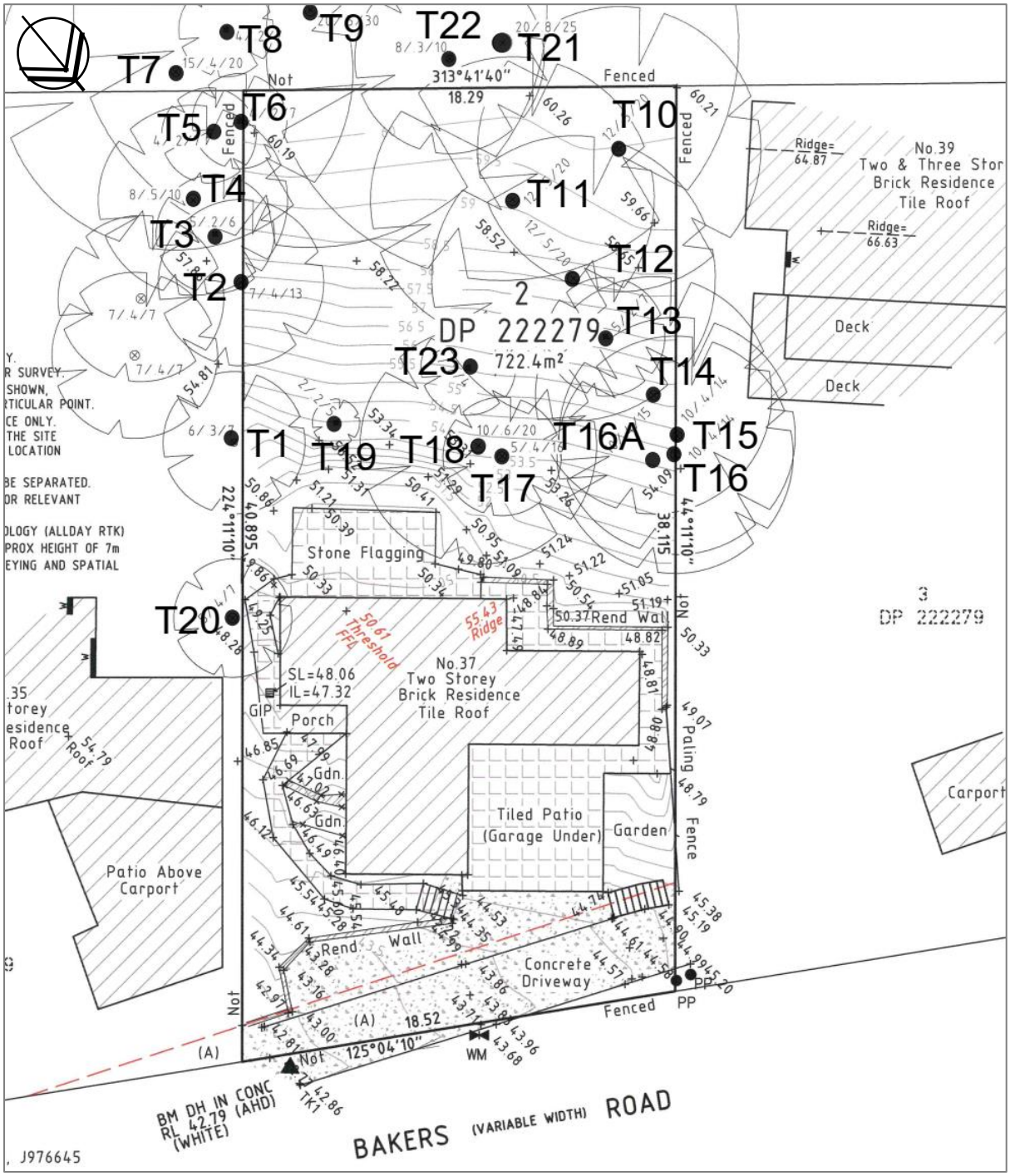


Figure 4 –Excerpt of Survey Plan, Reference E60001-84017, dated 27/9/23 authored by Burton & Field Surveying and Land Development. Marked up by C Hughes (NOT TO SCALE).