PEAKE ARBORICULTURE

ARBORICULTURAL IMPACT ASSESSMENT

Lot 1/-/DP398353

1164 Barrenjoey Road, Palm Beach NSW 2108

Prepared on: 15/11/2024

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EXECUTIVE SUMMARY

This Arboricultural Impact Assessment (AIA) was requested by Thomas Martin on the 4th of November 2024. This AIA is to address the potential impacts upon surrounding trees from the proposed development of Lot 1/-/DP398353, 1164 Barrenjoey Road, Palm Beach NSW 2108 (the subject site).

33 trees located within and adjacent to the subject site were assessed during the preparation of this report.

Following a detailed assessment of construction impacts (available in section 6 of this report) it is concluded and recommended that;

The appointment of a site arborist (AQF Level 5) for the duration of the project, should be made prior to the commencement of any site works including demolition, to implement tree protection measures recommended below and in the Tree Protection Specification.

It is recommended that the TPZ's of Trees 4,14,15,16,17,19,20,22,23,24,31 & 32 are protected with Tree protection fencing for the duration of the development. Specifications for signage and fencing are provided in sections 9.5 & 9.6 of this report. The specific location of tree protection fencing is to be determined by the project arborist following a review of all construction drawings.

The project arborist (AQF5) must be present to monitor and certify inground works within the TPZ's of all retained trees. Any root pruning must be in accordance with section 9 of AS4373-2007 Pruning of Amenity Trees (Standards Australia, 2007) as well as being certified and documented by the project arborist.

The following trees will be required to be removed to facilitate the proposed development.

- Trees 1,2,3,8,10 & 11 will be required to be removed (subject to approval from Northern Beaches Council) to facilitate proposed works within the road reserve.
- Prescribed trees 27,29 & 30 will be required to be removed (subject to approval from Northern Beaches Council) to facilitate proposed works within the subject site.
- Exempt trees 5,6,7,9,13,18,21,25,26,28 & 33 will be required to be removed to facilitate proposed works within the subject site.

It is recommended that in the process of tree removal (subject to approval from Northern Beaches Council);

- All work is carried out by a person who is trained in AQF Level 3 in Arboriculture.
- All work is carried out in accordance with the Work Cover, Amenity Tree Industry Code of Practice 1998 and Safe work Australia's "Guide to managing risks of tree trimming and removal work" (July 2016).
- All tree waste is to be removed from site, including timber, mulch and stump grindings.

Proposed replacement planting includes

- Six (6) x *Livistona australis* (Cabbage Tree Palm).
- Seven (7) x *Glochidion ferdinandi* (Cheese Tree)
- Three (3) x *Angophora costata* (Sydney Red Gum), and

- Five (5) x *Banksia robur* (Swamp Banksia)

No additional replacement planting is recommended.

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1 INTRODUCTION & AIMS

1.1 This Arboricultural Impact Assessment (AIA) was requested by Thomas Martin on the 4th of November 2024. This AIA is to address the potential impacts upon surrounding trees from the proposed development of Lot 1/-/DP398353, 1164 Barrenjoey Road, Palm Beach NSW 2108 (the subject site). The subject site can be seen in figure 1 below.

Figure 1: The subject site, site boundary shown in red. (Nearmap, 2023)

1.2 The aim of this report is to:

- Examine Councils policies in regards to application requirements needed for the preparation of an Arboricultural Impact Assessment.
- Visually assess and identify the subject trees & the environment in which they grow.
- Assess construction impacts for each subject tree through the revision of plans for the proposed development.

2 LEGISLATION REQUIREMENTS

2.1 Lot 1/-/DP398353, 1164 Barrenjoey Road, Palm Beach NSW 2108 is zoned C4 – Environmental Living, and is located within the Local Government Area of Northern Beaches Council (NSW Government, n.d.)

2.2 Section A1.9 of the Pittwater 21 Development Control Plan - 2014 (DCP) (Pittwater Council, 2004), defines a tree as;

"tree means a palm or woody perennial plant with a single or multi stem greater than five (5) metres in height."

2.3 Section B4.22 of the Pittwater 21 Development Control Plan - 2014 (DCP) (Pittwater Council, 2004), Preservation of Trees or Bushland Vegetation has also been considered, in particular;

"10. Where trees proposed to be retained may be affected by the construction of new buildings and works of Classes 1 and 10, a Tree Protection Plan as per Appendix 18 (P21DCP) is to be submitted."

2.4 Chapter 2 – Vegetation in non-rural areas of the State Environmental Planning Policy (Biodiversity & Conservation) 2021 (NSW Government, 2021) has been considered in the preparation of this report. The aims of the chapter are to;

- *"(a) to protect the biodiversity values of trees and other vegetation in non-rural areas of the State, and*
- *(b) to preserve the amenity of non-rural areas of the State through the preservation of trees and other vegetation."*

2.5 Section 7.6 – Biodiversity, of the Pittwater Local Envrionmental Plan 2014 (Pittwater Council, 2014)

3 METHOD

3.1 The trees and site were visually assessed from ground level, using methods developed by the Visual Tree Assessment (VTA) process (Claus Mattheck, 2006). No detailed inspections other than root investigation, as described in the VTA process have been undertaken. The genus and species of the trees were recorded[1] as well as the dimensions for diameter at breast height (DBH), diameter above buttress (DAB) and canopy width (when the measurement of a DBH and DAB has not been practical, such as in the case of low branching or mallee trees, a DBH and DAB measurement has been allocated based on tree size). Height and age of the trees were estimated. The tree was given a Health / Vigour rating and signs and symptoms of pests and diseases were looked for. Structural defects and comments were recorded.

3.2 Calculations have been made using guidelines supplied in AS4970-2009 Protection of Trees on Development Sites (Standards Australia, 2009) for the;

- Tree Protection Zone (TPZ),
- Structural Root Zone (SRZ),
- Live Crown Ratio (LCR),
- Live Crown Size (LCS),
- Height/Diameter ratio (H/D).

3.3 The trees have been allocated a landscape significance rating of Low, Medium or High using the *IACA Significance of a Tree, Assessment Rating System* (STARS)© (IACA, 2010). Stars assessment criteria includes:

- Condition and Vigour
- Form, species specific
- Provenance, age and botanical significance
- Heritage and Ecological significance
- Size, shape, and local amenity value
- Restrictions to tree growth

Appendix A contains the assessment criteria in full.

3.4 The trees have been given a Useful Life Expectancy (ULE) rating, categorised as either;

- Long – 40+ years
- Medium – 15-40 years
- Short – 5-15 years
- Consider for removal - <5 years

[1] Identification is based on features visible at the time of assessment. No taxonomical identification has been undertaken.

4 OBSERVATIONS

4.1 Listed in Table 1 below are observations from the subject trees relating to;

- Health and vigour. (Dead, Senescent, Poor, Fair, Good, Excellent)
- Structure / Form. (Poor, Fair, Good, Excellent)
- Any signs/symptoms of pest and disease attack.
- Previous pruning or wounds.
- A landscape significance rating determined using the STARS© (IACA, 2010) matrix.
- A Useful Life Expectancy (ULE) rating of either long, medium, short or consider for removal.

Tree No.	Genus/Species & Common Names	Health Vigour	Structure	Structural Defects/ Comments	Pests/ Disease	Pruning/ Wounds
1	*Strelitzia nicolai* Giant Bird of Paradise	Good	Good	Clump of 3, Located within road reserve	None visible	None visible
2	*Glochidion ferdinandi* Cheese Tree	Good	Poor	Located within road reserve	None visible	Previously lopped
3	*Glochidion ferdinandi* Cheese Tree	Good	Poor	Located within road reserve	None visible	Previously lopped
4	*Jacaranda mimosifolia* Jacaranda	Fair	Poor	Located within road reserve	None visible	Previously lopped
5	*Dypsis leutescens* Golden Cane Palm	Good	Good	Exempt species	None visible	None visible
6	*Plumeria acutifolia* Frangipanni	Good	Good	Exempt <5m	None visible	None visible
7	*Ceratopetalum gummiferum* NSW Christmas Bush	Fair	Poor	Exempt <5m	None visible	Previously lopped
8	*Banksia integrifolia* Coastal Banksia	Fair	Poor	Located within road reserve	None visible	Previously lopped
9	*Banksia spinulosa* Hairpin Banksia	Fair	Poor	Exempt <5m	None visible	None visible

Tree No.	Genus/Species & Common Names	Health Vigour	Structure	Structural Defects/ Comments	Pests/ Disease	Pruning/ Wounds
10	*Melaleuca ericifolia* Swamp Paperbark	Good	Fair	Located within road reserve	None visible	None visible
11	*Glochidion ferdinandi* Cheese Tree	Good	Poor	Located within road reserve	None visible	Previously lopped
12	*Glochidion ferdinandi* Cheese Tree	Good	Poor	Located within road reserve	None visible	Previously lopped
13	*Acacia* sp. Wattle	Fair	Poor	Exempt <5m. Previously windthrown. Trunk growing along the ground.	None visible	None visible
14	*Syagrus romanzoffiana* Cocos Palm	Good	Good	Exempt Species	None visible	None visible
15	*Glochidion ferdinandi* Cheese Tree	Good	Poor	None visible	None visible	Previously lopped
16	*Glochidion ferdinandi* Cheese Tree	Good	Poor	None visible	None visible	Previously lopped
17	*Archontopheonix cunninghamiana* Bangalow Palm	Good	Good	Exempt species	None visible	None visible
18	*Ficus Benjimina* Weeping Fig	Good	Poor	Exempt species. Decay at base. Bark inclusions observed	None visible	None visible
19	*Ficus Benjimina* Weeping Fig	Good	Fair	Neighbouring tree	None visible	None visible
20	*Pheonix canariensis* Date Palm	Good	Fair	Neighbouring tree	None visible	None visible
21	*Acacia saligna* Golden Willow Wattle	Good	Poor	Tree not surveyed. Located as	None visible	None visible

Tree No.	Genus/Species & Common Names	Health Vigour	Structure	Structural Defects/ Comments	Pests/ Disease	Pruning/ Wounds
				accurately as possible using offset measurements. >30° lean		
22	*Grevillea robusta* Silky Oak	Good	Good	Exempt species	None visible	None visible
23	*Jacaranda mimosifolia* Jacaranda	Fair	Poor	Exempt species	None visible	Previously lopped
24	*Ficus rubiginosa* Port Jackson Fig	Fair	Poor	Previously windthrown. Trunk growing along the rock. Exempt <5m	None visible	None visible
25	*Strelitzia nicolai* Giant Bird of Paradise	Good	Good	Exempt species	None visible	None visible
26	*Ligustrum lucidium* Large leaf privet	Good	Good	Exempt species	None visible	None visible
27	*Glochidion ferdinandi* Cheese Tree	Good	Fair	Supressed	None visible	None visible
28	*Ficus Benjimina* Weeping Fig	Good	Fair	None visible	None visible	Lopped for building clearance
29	*Pittosporum undulatum* Sweet Pittosporum	Fair	Fair	None visible	None visible	Previously lopped at 0.5m with new canopy established.
30	*Glochidion ferdinandi* Cheese Tree	Good	Fair	None visible	None visible	Canopy raised over dwelling
31	*Pheonix canariensis* Date Palm	Good	Good	None visible	None visible	None visible

Tree No.	Genus/Species & Common Names	Health Vigour	Structure	Structural Defects/ Comments	Pests/ Disease	Pruning/ Wounds
32	*Glochidion ferdinandi* Cheese Tree	Good	Poor	Decay in central stem and branches	None visible	None visible
33	*Bambusa sp.* Bamboo	Good	Good	Exempt species.	None visible	None visible

Table 1: Tree Observations

4.2 Listed in Table 2 below are measurements[2] from the subject trees relating to;

- Diameter at breast height (DBH).
- Diameter above buttress (DAB).
- Canopy spread – measured to the North, East, South and West (N, E, S, W).
- Tree height.
- Lowest scaffold branch.

Tree Number	Species	Maturity	Height (m)	Lowest Scaffold (m)	Spread (m)				DBH / Multi (cm)	DAB (cm)
					N	E	S	W		
1	*Strelitzia nicolai*	Mature	3.5	0.5	2	2	2	2	34	NA
2	*Glochidion ferdinand*	Mature	4.5	3	4	0.5	2	2	28	40
3	*Glochidion ferdinandi*	Mature	3.5	1.5	1	1	1	1	23	35
4	*Jacaranda mimosifolia*	Mature	5.5	1.5	5	4	3	4	47	60
5	*Dypsis leutescens*	Mature	3	0.5	1	1	1	1	12	NA
6	*Plumeria acutifolia*	Mature	2	0.5	1	1	1	1	11	12
7	*Ceratopetalum gummiferum*	Mature	3	1.5	1	1	1	1	8	10
8	*Banksia integrifolia*	Mature	5.5	2	4	1	2	1	26	30
9	*Banksia spinulosa*		1.8	0.5	1	1	1	1	10	12
10	*Melaleuca ericifolia*		6	2	3	1	2	2	28	30
11	*Glochidion ferdinandi*		6	1	1	1	1	1	26	30
12	*Glochidion ferdinandi*		7	1	4	2	4	4	41	50
13	*Acacia* sp.		3.5	2	2	1	5	1	18	35
14	*Syagrus romanzoffiana*		10	7	3	3	3	3	25	NA
15	*Glochidion ferdinandi*		6	2	3	1	2	4	29	36

[2] Measurements of trees located within neighbouring properties have been estimated as accurately as possible.

Tree Number	Species	Maturity	Height (m)	Lowest Scaffold (m)	Spread (m)				DBH / Multi (cm)	DAB (cm)
					N	E	S	W		
16	*Glochidion ferdinandi*		7	2	1	3	2	2	30	38
17	*Archontopheonix cunninghamiana*		6	3	1.5	1.5	1.5	1.5	20	NA
18	*Ficus Benjimina*		14	1	8	4	8	10	62	75
19	*Ficus Benjimina*		8	4	5	1	5	5	41	50
20	*Pheonix canariensis*		5	2.5	3	3	3	3	60	NA
21	*Acacia saligna*		6	4	9	0	0	8	27	34
22	*Grevillea robusta*		9	3.5	5	5	5	5	52	58
23	*Jacaranda mimosifolia*		4	2	3	1	1	3	19	26
24	*Ficus rubiginosa*		4	0.5	8	0	4	4	60	60
25	*Strelitzia nicolai*		7	0.5	4	4	4	4	45	NA
26	*Ligustrum lucidium*		8	4	4	2	4	2	23	32
27	*Glochidion ferdinandi*		6	2	3	3	1	3	33	40
28	*Ficus Benjimina*		6	1	5	3	2	3	38	48
29	*Pittosporum undulatum*		5	1	2	1	1	1	20	22
30	*Glochidion ferdinandi*		6	2	4	1	4	4	34	47
31	*Pheonix canariensis*		4	1.5	3	3	3	3	60	NA
32	*Glochidion ferdinandi*		6	2	5	1	4	4	47	58
33	*Bambusa sp.*		5	0.5	2	2	2	2	7	NA

Table 2: Tree Measurements

4.3 Listed in Table 3 Below are calculations from the subject trees relating to:

- Tree Protection Zone (TPZ)
- Structural Root Zone (SRZ)
- Live Crown Ratio (LCR)
- Live Crown Size (LCS)

Tree Number	Species	TPZ (m)	SRZ (m)	Live Crown Size (m2)	Live Crown Ratio (%)
1	*Strelitzia nicolai*	3	NA	12	86%
2	*Glochidion ferdinand*	3.35	2.25	6	33%
3	*Glochidion ferdinandi*	2.74	2.13	4	57%

Tree Number	Species	TPZ (m)	SRZ (m)	Live Crown Size (m2)	Live Crown Ratio (%)
4	*Jacaranda mimosifolia*	5.59	2.67	32	73%
5	*Dypsis leutescens*	2	NA	5	83%
6	*Plumeria acutifolia*	2	1.5	3	75%
7	*Ceratopetalum gummiferum*	2	1.5	3	50%
8	*Banksia integrifolia*	3.15	2	14	64%
9	*Banksia spinulosa*	2	1.5	3	72%
10	*Melaleuca ericifolia*	3.36	2	16	67%
11	*Glochidion ferdinandi*	3.15	2	10	83%
12	*Glochidion ferdinandi*	4.92	2.47	42	86%
13	*Acacia* sp.	2.16	2.13	7	43%
14	*Syagrus romanzoffiana*	4	NA	18	30%
15	*Glochidion ferdinandi*	3.5	2.15	20	67%
16	*Glochidion ferdinandi*	3.6	2.2	20	71%
17	*Archontopheonix cunninghamiana*	2.5	NA	9	50%
18	*Ficus Benjimina*	7.4	2.93	195	93%
19	*Ficus Benjimina*	4.9	2.47	32	50%
20	*Pheonix canariensis*	4	NA	15	50%
21	*Acacia saligna*	3.24	2.1	17	33%
22	*Grevillea robusta*	6.24	2.63	55	61%
23	*Jacaranda mimosifolia*	2.23	1.88	8	50%
24	*Ficus rubiginosa*	7.2	2.67	28	88%
25	*Strelitzia nicolai*	5	NA	52	93%
26	*Ligustrum lucidium*	2.79	2.05	24	50%
27	*Glochidion ferdinandi*	4.02	2.25	20	67%
28	*Ficus Benjimina*	4.55	2.43	33	83%

Tree Number	Species	TPZ (m)	SRZ (m)	Live Crown Size (m2)	Live Crown Ratio (%)
29	*Pittosporum undulatum*	2.36	1.75	10	80%
30	*Glochidion ferdinandi*	4.07	2.41	26	67%
31	*Pheonix canariensis*	4	NA	15	63%
32	*Glochidion ferdinandi*	5.59	2.63	28	67%
33	*Bambusa sp.*	2	NA	18	90%

Table 3: Calculations from the subject trees

4.4 Preliminary root investigation was undertaken along the boundary of the subject site adjacent to T32. Established gardens prevented extensive root investigation in this area, however, confirmation that existing underground services (150mm diameter PVC) has resulted in root growth being restricted within the subject site. Root investigation was to an average depth of 500mm before rock was encountered. Two roots, 30mm and 35mm in diameter were encountered. All other roots were <20mm in diameter (see figure 2, below).

Figure 2: T32 - Preliminary Root Investigation

5 TREE RETENTION VALUES

5.1 Trees have been allocated a retention value using the priority Matrix in the *IACA Significance of a Tree, Assessment Rating System* (STARS)© (IACA, 2010). The Matrix uses the Landscape Significance rating combined with the Useful Life Expectancy (ULE) to determine a retention value of either;

- Priority for Retention (High) – All measures must be taken to retain and protect these trees. If the guidelines set out in AS4970-2009 Protection of trees on development sites cannot be used to protect the trees, design modification or re-location of the proposed development should be considered.
- Consider for Retention (Medium) – Retention of these trees should remain a priority. If the trees are adversely affecting the proposed development and all protection measures have been considered but are not viable, removal can be considered.
- Consider for Removal (Low) – Retention of these trees is not important. No modification to design should be considered for their retention.
- Priority for Removal – Trees in an irreversible decline, weed species or hazardous trees. These trees should be removed.

Tree Number	Species	Landscape Significance Rating	Useful Life Expectancy	Retention Value
1	*Strelitzia nicolai*	Low	Medium (15-40)	Low
2	*Glochidion ferdinand*	Low	Medium (15-40)	Low-Medium
3	*Glochidion ferdinandi*	Low	Medium (15-40)	Low-Medium
4	*Jacaranda mimosifolia*	Low	Medium (15-40)	Low-Medium
5	*Dypsis leutescens*	Low	Medium (15-40)	Low-Exempt
6	*Plumeria acutifolia*	Low	Medium (15-40)	Low-Exempt
7	*Ceratopetalum gummiferum*	Low	Short (5-15)	Low-Exempt
8	*Banksia integrifolia*	Low	Medium (15-40)	Low-Medium
9	*Banksia spinulosa*	Low	Medium (15-40)	Low-Exempt
10	*Melaleuca ericifolia*	Medium	Medium (15-40)	Low-Medium
11	*Glochidion ferdinandi*	Low	Medium (15-40)	Low-Medium
12	*Glochidion ferdinandi*	Medium	Medium (15-40)	Medium
13	*Acacia* sp.	Low	Short (5-15)	Low-Exempt

Tree Number	Species	Landscape Significance Rating	Useful Life Expectancy	Retention Value
14	*Syagrus romanzoffiana*	Low	Medium (15-40)	Low
15	*Glochidion ferdinandi*	Medium	Medium (15-40)	Medium
16	*Glochidion ferdinandi*	Medium	Medium (15-40)	Medium
17	*Archontopheonix cunninghamiana*	Low	Medium (15-40)	Low-Exempt
18	*Ficus Benjimina*	Low	Medium (15-40)	Low-Exempt
19	*Ficus Benjimina*	Low	Medium (15-40)	Low-Medium
20	*Pheonix canariensis*	Medium	Medium (15-40)	Low-Medium
21	*Acacia saligna*	Low	Medium (15-40)	Low-Exempt
22	*Grevillea robusta*	Low	Medium (15-40)	Medium-Exempt
23	*Jacaranda mimosifolia*	Low	Medium (15-40)	Low-Exempt
24	*Ficus rubiginosa*	Low	Medium (15-40)	Low-Exempt
25	*Strelitzia nicolai*	Low	Medium (15-40)	Low-Exempt
26	*Ligustrum lucidium*	Low	Medium (15-40)	Low-Exempt
27	*Glochidion ferdinandi*	Medium	Medium (15-40)	Medium
28	*Ficus Benjimina*	Low	Medium (15-40)	Low-Exempt
29	*Pittosporum undulatum*	Low	Short (5-15)	Low
30	*Glochidion ferdinandi*	Medium	Medium (15-40)	Medium
31	*Pheonix canariensis*	Low	Medium (15-40)	Low
32	*Glochidion ferdinandi*	Medium	Medium (15-40)	Medium
33	*Bambusa sp.*	Low	Medium (15-40)	Low-Exempt

Table 4: Tree Retention Values

6 CONSTRUCTION IMPACTS

All trees discussed below are shown on the attached TPZ/SRZ Plans. Construction Impacts are prepared based upon the plan set provided. Stormwater + civil engineering drawings and/or specifications have not been provided for the purpose of this assessment.

6.1 TREES PROPOSED FOR REMOVAL

6.1.1 Trees 1,2,8 & 10 are located within the footprint of proposed excavation within the road reserve. Their removal will be required to facilitate the proposed development (subject to council approval).

6.1.2 The following trees have major encroachments from proposed excavation within the road reserve.

Tree Number	TPZ encroachment percentage	SRZ encroachment (Y/N)
3	28%	Y
11	29%	Y

Their removal will be required to facilitate the proposed development (subject to council approval).

6.1.3 Exempt trees 6,7,9,13, & 25 are located within the footprint of proposed excavation within the subject site. Their removal will be required to facilitate the proposed development.

6.1.4 The following exempt trees have major encroachments from proposed excavation within the subject site.

Tree Number	TPZ encroachment percentage	SRZ encroachment (Y/N)
18	28%	Y
21	26%	Y
26	43%	Y
28	17%	Y

Their removal will be required to facilitate the proposed development.

6.1.5 Exempt trees 5 & 33 are proposed to be removed as part of the landscape upgrade.

6.1.6 Prescribed trees 27,29 & 30 are located within the footprint of proposed excavation within the subject site (and the location of the proposed dwelling). Their removal will be required (subject to council approval) to facilitate the proposed development.

6.2 TREES PROPOSED FOR RETENTION

6.2.1 The following trees are proposed to be retained.

Tree Number	TPZ encroachment percentage	Comment
4	10%	Road reserve tree located adjacent to the boundary. Tree protection fencing required.

14	13%	Although T14 is subject to a major encroachment, existing tanks within the TPZ are likely to have reduced root growth in the area of proposed works. Tree protection fencing required.
15	11%	Although T15 is subject to a major encroachment, reduced tree size (from previous pruning and competition) suggests that the full TPZ under AS 4970-2009 is not required for successful tree retention. Tree protection fencing required.
16	12%	Although T16 is subject to a major encroachment, reduced tree size (from previous pruning and competition) suggests that the full TPZ under AS 4970-2009 is not required for successful tree retention. Tree protection fencing required.
17	16%	Although T17 is subject to a major encroachment, T17 is a hardy species that with protection, is likely to tolerate a 16% encroachment. Tree protection fencing required.
19	<5%	No long-term detrimental impacts expected. Retain & protect. Tree protection fencing required.
20,22 & 23	No encroachment	Tree protection fencing required.
24	8%	No long-term detrimental impacts expected. Retain & protect. Tree protection fencing required.
31	<5%	No long-term detrimental impacts expected. Retain & protect. Tree protection fencing required.
32	12% + Bordering SRZ	Preliminary root investigation detailed in section 4.4 indicates there is likely to be no detrimental impacts from the proposed encroachment. Retain & protect. Tree protection fencing required.

7 DOCUMENTS USED IN THE PREPARATION OF THIS REPORT

7.1 Listed in table 5 below are documents used in the preparation of this report.

Document type	Source/ Author	Title	Date
Plan	C&A Surveyors	Detail & Boundary Identification Survey	09/10/2024
Plan	Rama Architects	DA-001 Site Plan DA-100 Garage Floor DA-101 Services Floor DA-102 Ground Floor DA-103 First Floor DA-104 Second Floor DA-105 Roof Plan DA-300 Elevations DA-301 Elevations DA-302 Elevations DA-303 Elevations DA-400 Section 01 DA-401 Section 02 DA-500 Landscape Concept Plan DA-502 Waste Management, Erosion & Sediment Control Plan DA-503 Hard & Soft Landscaping	05/11/2024
Plan Overlay	Peake Arboriculture	Tree Location, TPZ & SRZ Plans.	15/11/2024

Table 5: Documents used in the preparation of this report.

8 CONCLUSION & RECOMMENDATIONS

8.1 The appointment of a site arborist (AQF Level 5) for the duration of the project, should be made prior to the commencement of any site works including demolition, to implement tree protection measures recommended below and in the Tree Protection Specification.

8.2 It is recommended that the TPZ's of Trees 4,14,15,16,17,19,20,22,23,24,31 & 32 are protected with Tree protection fencing for the duration of the development. Specifications for signage and fencing are provided in sections 9.5 & 9.6 of this report. The specific location of tree protection fencing is to be determined by the project arborist following a review of all construction drawings.

8.3 The project arborist (AQF5) must be present to monitor and certify inground works within the TPZ's of all retained trees. Any root pruning must be in accordance with section 9 of AS4373-2007 Pruning of Amenity Trees (Standards Australia, 2007) as well as being certified and documented by the project arborist.

8.4 The following trees will be required to be removed to facilitate the proposed development.

- Trees 1,2,3,8,10 & 11 will be required to be removed (subject to approval from Northern Beaches Council) to facilitate proposed works within the road reserve.
- Prescribed trees 27,29 & 30 will be required to be removed (subject to approval from Northern Beaches Council) to facilitate proposed works within the subject site.
- Exempt trees 5,6,7,9,13,18,21,25,26,28 & 33 will be required to be removed to facilitate proposed works within the subject site.

It is recommended that in the process of tree removal (subject to approval from Northern Beaches Council);

- All work is carried out by a person who is trained in AQF Level 3 in Arboriculture.
- All work is carried out in accordance with the Work Cover, Amenity Tree Industry Code of Practice 1998 and Safe work Australia's "Guide to managing risks of tree trimming and removal work" (July 2016).
- All tree waste is to be removed from site, including timber, mulch and stump grindings.

8.4 Proposed replacement planting includes

- Six (6) x *Livistona australis* (Cabbage Tree Palm).
- Seven (7) x *Glochidion ferdinandi* (Cheese Tree)
- Three (3) x *Angophora costata* (Sydney Red Gum), and
- Five (5) x *Banksia robur* (Swamp Banksia)

No additional replacement planting is recommended.

9 TREE PROTECTION SPECIFICATION – AS PER AS4970 – 2009

Tree Protection will be undertaken in the three stages listed below. Certification from the project arborist is required at/during each stage.

9.1 PRE – DEVELOPMENT STAGE

- Prior to any tree removal an AQF level 5 arborist must be engaged as site arborist to oversee all arboricultural aspects of the project, including tagging all trees and identifying trees for removal.
- Tree protection should be installed by a minimum AQF level 3 arborist and be supervised by an AQF level 5 arborist in accordance with the guidelines from AS4970-2009 Protection of trees on development sites (Standards Australia, 2009), and the information provided in this report.
- All trees to be retained must be visually assessed and their current health and condition recorded. The minimum assessment categories are provided below.

  Visual assessment benchmark
  - Health and Vitality (Good/Fair/Poor/Dead)
  - Leaf Damage
  - Pests and Diseases
  - Deadwood percentage
  - Dieback Percentage.
  - Mechanical Damage
  - Recent Pruning
- Certifying of Pre-Construction Tree Protection by the site arborist will conclude the pre-construction phase of development. Construction must not commence until Pre-Construction tree protection has been certified by the site arborist.
- The project manager is to be made aware of Tree Protection requirements for the duration of the project.

Pre-development Arboricultural Certification

	Pre-Development requirement met. (Y/N)	Project Arborist Signature	Date
All trees tagged. Trees for removal identified by project arborist.			
All tree protection measures have been correctly installed.			
A pre-development visual inspection of all trees to be retained has been undertaken by the project arborist			
The project manager has been made aware of all tree protection measures required for the duration of the project.			

9.2 DEVELOPMENT STAGE

- Tree protection measures must remain in place during this stage. They cannot be removed intermittently for access and any modifications to Tree Protection Fencing Locations as shown in the tree protection plan, must be authorised, recorded and carried out by the site arborist.
- The project arborist is to be present for all arboricultural supervision within TPZ's of retained trees, as recommended by the arboricultural impact assessment(AIA) and tree protection plan.
- The site arborist will conduct regular visits (every two months) in accordance with AS4970-2009 to visually assess and record the health and condition of the trees being retained.
- Tree protection measures will also be assessed regularly to ensure they are functioning correctly. Any maintenance required for Tree Protection measures will be performed.
- A stop work notice will be issued to the project manager if any Tree Protection Measures are not found to be complying with the Tree Protection Plan.
- Any incidents relating to retained trees must be reported immediately to the site arborist to be documented and a plan for remediation put in place.

Development Stage Arboricultural Certification.

	Development requirement met. (Y/N)	Project Arborist Signature	Date
Tree protection measures have remained in place for the duration of the development.			
Tree Health and vitality has not deteriorated during the development.			
Arboricultural supervision has been undertaken as required by the AIA and Tree Protection Plan			
Incidents relating to retained trees have been reported to the project arborist.			
Remediation has been implemented as necessary for the successful retention of retained trees.			

9.3 CONCLUSION OF DEVELOPMENT

- Final visit from the site arborist to report on the health and condition of the trees that have been retained and the removal of tree protection. Incidents documented during the development stage will be included in this report.
- Any remedial work necessary upon the completion of development will be recommended in the final report.
- Replacement trees are to be planted before the project arborists final inspection.

Conclusion of Development Arboricultural Certification.

	Development requirement met. (Y/N)	Project Arborist Signature	Date
Tree protection measures have remained in place for the duration of the development.			
Tree Health and vitality has not deteriorated during the development.			
All documentation from site inspections/supervision has been compiled.			
Remediation has been implemented as necessary for the successful retention of retained trees. Any remediation to be continued has been recommended in the final report.			
Replacement tree planting has been undertaken and all replacement trees have been planted correctly.			

9.4 TREE PROTECTION ZONE REQUIREMENTS

Tree Protection Zones (TPZs), will be set out before the commencement of construction works.

According to AS 4970-2009, activities excluded from the TPZ include but are not limited to-:

(a) machine excavation including trenching
(b) excavation for silt fencing
(c) cultivation
(d) storage
(e) preparation of chemicals, including preparation of cement products
(f) parking of vehicles and plant
(g) refuelling
(h) dumping of waste
(i) wash down and cleaning of equipment
(j) placement of fill
(k) lighting of fires
(l) soil level changes
(m) temporary or permanent installation of utilities and signs
(n) physical damage to the tree.

Source Australian Standard *AS 4970-2009 Protection of trees on development sites*.

9.5 Tree Protection Zone Signage

A tree protection zone sign must be affixed to all Fenced Tree Protection Zones. (Example Below)

9.6 Tree Protection Fencing Requirements

Tree protection Fencing must be a minimum of 1.8 metres in height and be held in place with locking clamps and concrete feet between each panel, see Figure 2 below.

An Example of Temporary Fencing

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11 GLOSSARY OF TERMS

Age class:

Young – planted recently.
Semi Mature – Reached less than 20% of expected life span.
Mature – Between 20-80% of expected life span.
Over Mature – Past 80% of expected life span.

Health and Vigour:

0 – Dead tree.
1 – Advanced state of decline. Significant deadwood visible. <20% live foliage cover.
2 – Declining. Dieback and deadwood visible. 20-60% live foliage cover.
3 – Low to average vigour. Dieback or visible. 60-90% live foliage cover.
4 – Good vigour. Small amount of dieback visible. 90-100% live foliage cover.
5 – Excellent vigour. No dieback or deadwood visible. 100% live foliage cover.

Crown:

Measured from the top of the tree to the lowest branch, comprising of leaves and branches.

Deadwood:

Dead branches found in a trees crown. An entirely dead branch or stem.

Dieback:

The death of portions of the crown. The death of branches or shoots from the tips inward.

Defect:

A feature of a tree that affects the health or structure in an adverse manner.

Decay:

The process of micro-organisms breaking down woody tissue.

Cavity:

A void in a woody stem, usually created by decay. This can be open or closed.

Soil Texture:

The amounts of sand, silt and clay in a soil.

Soil pH:

A figure expressing the acidity or alkalinity of a soil.

DBH:

Diameter at Breast Height refers to the tree trunk diameter measured at breast height or 1.4 metres above ground level.

DAB:

Diameter Above the Buttress refers to the tree trunk diameter measured above the root buttress and is used to calculate the radius of the SRZ.

TPZ:

Tree Protection Zone The radius of the TPZ is calculated for each tree by multiplying the DBH x 12. To establish the TPZ this radius is measured from the centre of the stem at ground level and it is an area that is to be isolated from construction disturbance. Any encroachment into the TPZ of more than 10% is considered to be a major encroachment.

SRZ:

Structural Root Zone The radius of the SRZ is calculated using the following formula:

r (SRZ) = $(Dx50)^{0.42}$ x 0.64 where D is the DAB measured in metres. It is the area around a tree that is required for tree stability and is usually applied on constructions sites after there has been a major encroachment of the TPZ.

LCR:

Live Crown Ratio. The height of a trees crown, relative to the total height of the tree. Often used as an indicator of overall stability.

LCS:

Live Crown Size. The area of the crown as viewed from one aspect.

H/D:

Height over Diameter ratio. An indicator of failure due to slenderness. 30 is the optimum ratio. Greater than 50 is considered hazardous

12 RELEVANT APPENDICES

12.1 APPENDIX 1 – S.T.A.R.S.© (IACA 2010)

Significance of a Tree, Assessment Rating System* (IACA 2010) – S.T.A.R.S. ©

The landscape significance of a tree is an essential criterion to establish 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. To assist this process all definitions for terms used in the *Tree Significance - Assessment Criteria* and *Tree Retention Value - Priority Matrix*, are taken from the IACA Dictionary for Managing Trees in Urban Environments 2009.

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 of an individual tree has been defined, the retention value can be determined. An example of its use in an Arboricultural report is shown as Appendix A.

Tree Significance - Assessment Criteria

High Significance in landscape

- The tree is in *Good condition* and *Good vigor*;
- The tree has a form typical for the species;
- The tree is a remnant or is a planted locally indigenous specimen and/or is rare or uncommon in the local area or of botanical interest or of substantial age;
- The tree is listed as a Heritage Item, Threatened Species or part of an Endangered ecological community or listed on Councils significant Tree Register;
- The tree is visually prominent and visible from a considerable distance when viewed from most directions within the landscape due to its size and scale and makes a positive contribution to the local amenity;
- The tree supports social and cultural sentiments or spiritual associations, reflected by the broader population or community group or has commemorative values;
- The tree's growth is unrestricted by above and below ground influences, supporting its ability to reach dimensions typical for the taxa *in situ* - tree is appropriate to the site conditions.

Medium Significance in landscape

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

Low Significance in landscape

- The tree is in fair-poor condition and good or low vigor;
- The tree has form atypical of the species;
- The tree is not visible or is partly visible from surrounding properties as obstructed by other vegetation or buildings,
- The tree provides a minor contribution or has a negative impact on the visual character and amenity of the local area,
- The tree is a young specimen which may or may not have reached dimension to be protected by local Tree Preservation orders or similar protection mechanisms and can easily be replaced with a suitable specimen,
- The tree's growth is severely restricted by above or below ground influences, unlikely to reach dimensions typical for the 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

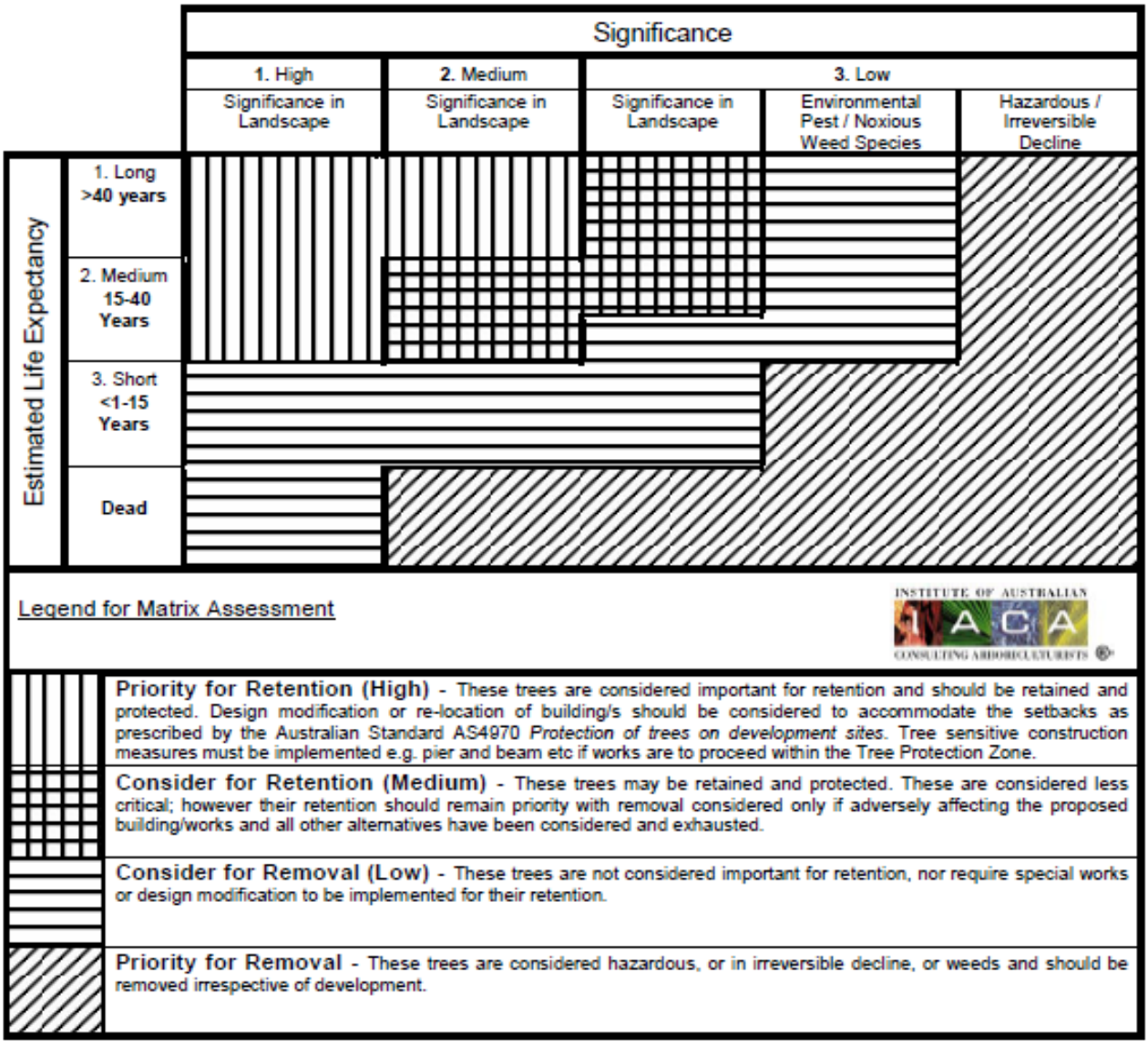
- The tree is structurally unsound and/or unstable and is considered potentially dangerous,
- The tree is dead, or is in irreversible decline, or has the potential to fail or collapse in full or part in the immediate to short term.

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 for individual trees only, however, can be applied to a monocultural stand in its entirety e.g. hedge.

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

Table 1.0 Tree Retention Value - Priority Matrix.



USE OF THIS DOCUMENTAND REFERENCING The IACA Significance of a Tree, Assessment Rating System (STARS) is free to use, but only in its entirety and must be cited as follows:

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

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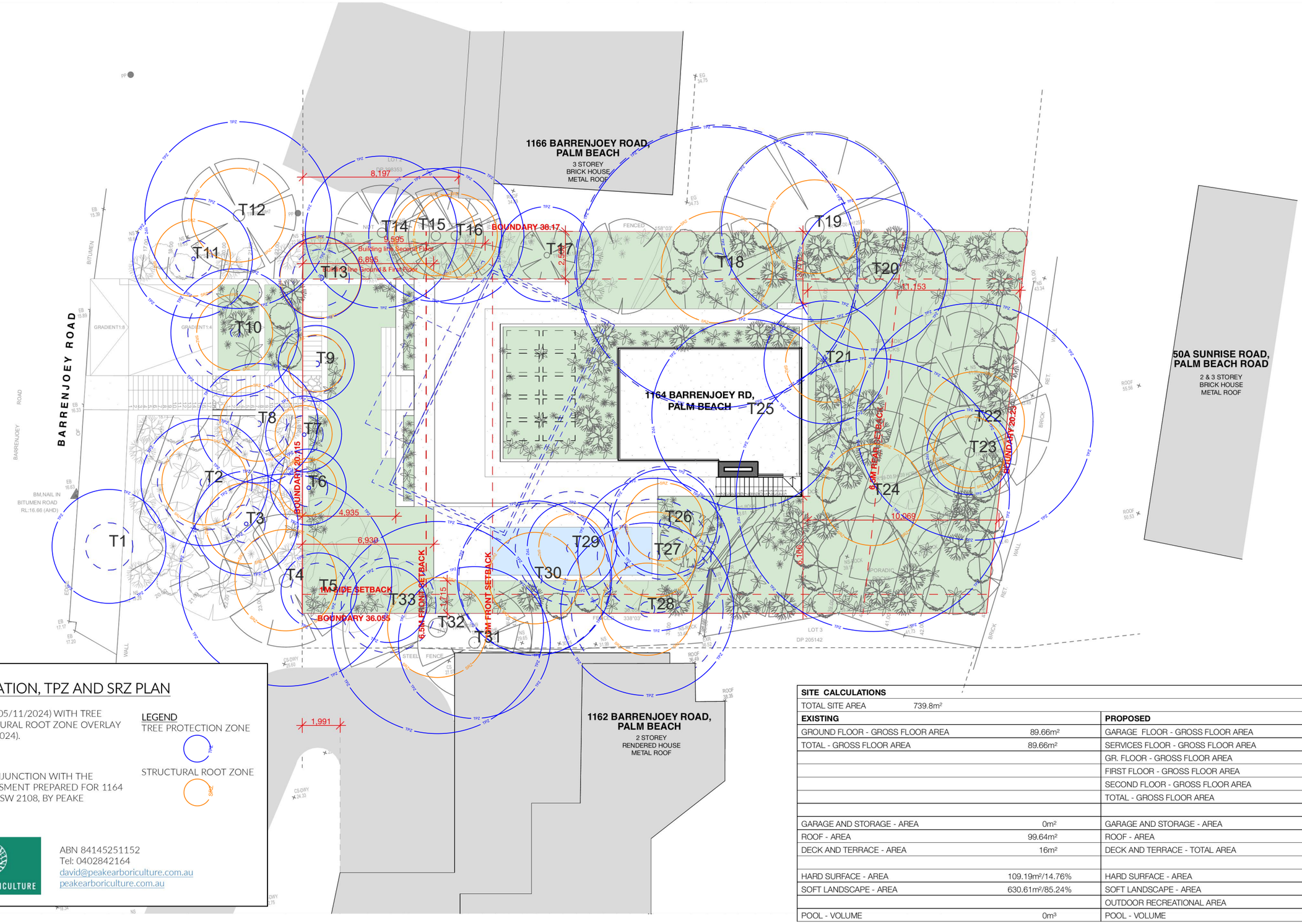

TREE LOCATION, TPZ AND SRZ PLAN

SITE PLAN (RAMA ARCHITECTS – 05/11/2024) WITH TREE PROTECTION ZONE AND STRUCTURAL ROOT ZONE OVERLAY (PEAKE ARBORICULTURE 15/11/2024).

THIS PLAN IS TO BE READ IN CONJUNCTION WITH THE ARBORICULTURAL IMPACT ASSESSMENT PREPARED FOR 1164 BARRENJOEY RD, PALM BEACH NSW 2108, BY PEAKE ARBORICULTURE (15/11/2024).

LEGEND
TREE PROTECTION ZONE
STRUCTURAL ROOT ZONE

PEAKE ARBORICULTURE
ABN 84145251152
Tel: 0402842164
david@peakearboriculture.com.au
peakearboriculture.com.au

SITE PLAN **A1 @1:200**

SITE CALCULATIONS			
TOTAL SITE AREA	739.8m²		
EXISTING		**PROPOSED**	
GROUND FLOOR - GROSS FLOOR AREA	89.66m²	GARAGE FLOOR - GROSS FLOOR AREA	23.63m²
TOTAL - GROSS FLOOR AREA	89.66m²	SERVICES FLOOR - GROSS FLOOR AREA	58.37m²
		GR. FLOOR - GROSS FLOOR AREA	139.16m²
		FIRST FLOOR - GROSS FLOOR AREA	126.48m²
		SECOND FLOOR - GROSS FLOOR AREA	117.36m²
		TOTAL - GROSS FLOOR AREA	465m²
GARAGE AND STORAGE - AREA	0m²	GARAGE AND STORAGE - AREA	124.72m²
ROOF - AREA	99.64m²	ROOF - AREA	199.38m²
DECK AND TERRACE - AREA	16m²	DECK AND TERRACE - TOTAL AREA	124.7m²
HARD SURFACE - AREA	109.19m²/14.76%	HARD SURFACE - AREA	286.3m²/38.7%
SOFT LANDSCAPE - AREA	630.61m²/85.24%	SOFT LANDSCAPE - AREA	405.4m²/54.8%
		OUTDOOR RECREATIONAL AREA	48.1m²/6.5%
POOL - VOLUME	0m³	POOL - VOLUME	46.82m³

NORTH

NOTE: THESE DRAWINGS ARE NOT FOR CONSTRUCTION. FOR DA APPROVAL ONLY
NOTE: DO NOT SCALE OFF THIS DRAWING
NOTE: ALL WORKS TO BE IN ACCORDANCE WITH THE N.C.C. 2022
NOTE: ALL WORKS TO BE IN ACCORDANCE WITH THE RELEVANT AUSTRALIAN STANDARDS
NOTE: ALL WORKS TO BE IN ACCORDANCE WITH THE BASIX REQUIREMENTS
NOTE: ALL WORKS TO BE IN ACCORDANCE WITH CONSULTANTS REQUIREMENTS

KEY:
- DENOTES EXISTING STRUCTURE TO BE RETAINED
- DENOTES PROPOSED NEW STRUCTURE
- DENOTES AREA OF SOFT LANDSCAPING
- DENOTES AREA OF SWIMMING POOL
- DENOTES EXISTING STRUCTURE TO BE DEMOLISHED

PROJECT:
NEW RESIDENTIAL DWELLING

CLIENT:
JOHNSON & THOMSON

LOCATION:
1164 BARRENJOEY ROAD,
PALM BEACH, NSW

PROJECT STAGE:
DEVELOPMENT APPLICATION

DRAWING TITLE:
COVER & SITE INFORMATION: SITE PLAN

SCALE:
1:200 @ A3

DATE OF ISSUE:
5/11/24

DRAWING NO.
DA-001

REVISION:
01

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