Arboricultural Impact Assessment and Tree Protection Plan

Site: 117 Rickard Road, North Narrabeen

Date: 23/04/23

Reference: AIA117Rick/042023





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Assumptions: Care has been taken to obtain information from reliable sources as far as possible. Lisa Durland can neither guarantee nor be responsible for the accuracy of information provided by others.

Unless stated otherwise: The inspection was limited to visual examination of the subject tree/s without dissection, excavation, probing or coring. There is no warranty or guarantee, expressed or implied, that problems or deficiencies of the subject tree/s may not arise in the future.

2 Introduction

Green Spaces Consultancy has been engaged by Ms Sam Ginsburg *(the client)* to undertake an Arboricultural Impact Assessment report in relation to 117 Rickard Road, North Narrabeen *(the site)*.

The report relates to proposed development for alterations to the existing dwelling and additions to the front.

The proposal includes the removal of one (1) tree (Tree 1/ *Plumaria acutifolia* – Frangipani) that is subject to the tree management controls and other vegetation (including the *Camellia sasanqua* at the front of the dwelling) that is not subject to the controls due to dimensions. The tree proposed for removal has been allocated a 'Moderate' retention value.

The development will have a minor (if any) impact on two (2) trees located within 5 metres of the proposed additions. These are Tree 2 (*Dypsis lutescens* - Golden Cane Palm) located on the subject site and Tree 3 (*Plumaria acutifolia* – Frangipani) located on the adjacent site at 115 Rickard Road.

The site was attended by Lisa Durland (the author) on Tuesday 18 April 2023.

3 Documentation

Plan/Document	Prepared by	Dwg No/Ref No	Dated
Survey Plan	Waterview Surveying Services	1678detail 1	07/02/22
Architectural Plans	Studio T	2301-E-00 – 2301-P-06	02/04/23
3D Images	Studio T	-	-

The following documents have been provided -

Figure 1 – Table of supplied plans and documents

The plans/documents as listed above have been relied upon for the information in this report.

The tree locations referenced in this document correspond to the information as supplied on the survey plan provided and the tree numbering is consistent with the numbering used on the tree location plan that can be referenced in Section 6.2 in Figure 2.

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Stormwater/drainage plans have not been provided for assessment.

4 Aims

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- Provide an assessment of the current health, vigour and structural condition of the trees.
- Provide advice relating to the suitability of the retention or removal of the trees on the site in the context of the proposed development.
- To identify existing trees to be retained and removed.
- Identify the Structural Root Zone and Tree Protection Zone (SRZ and TPZ in accordance with AS4970 'Protection of trees on development sites').
- Identify the impact of the proposed development on the trees to be retained.
- Recommend construction methodologies to mitigate the development impact on trees to be retained.
- Identify any additional issues that may require further assessment or ongoing monitoring.
- Specify required tree protection for trees to be retained.

5 The Site

The site is identified as Lot 65 in DP16212 and is located at the address known as 117 Rickard Road, North Narrabeen. The lot is rectangular in shape and rises from the front of the site at RL24.39 to more than RL 35.7 the rear.

The location of the site is shown by the red flag in Figure 1 below.



Image 1 - Site Location (Source: https://maps.six.nsw.gov.au/)

5.1 Land Titles and Planning Controls

The following site details are recorded from the NSW Planning Portal and the Northern Beaches Council website:

- Lot/ Plan No. 65/-/DP16212
- Land Use Zones C4 Environmental Living
- Local Environmental Plan Pittwater LEP 2014
- Development Control Plan Pittwater 21 DCP
- Tree Management Controls Part B4.22 of the DCP Preservation of Trees and Bushland Environment
- Heritage The site is not listed as a Heritage Item and is not located with a Heritage Conservation Area.

6 The Trees

- 6.1 Tree/Vegetation Schedule
- Tree 1 Plumaria acutifolia (Frangipani)
- Tree 2 Dypsis lutescens (Golden Cane Palm)
- Tree 3 Plumaria acutifolia (Frangipani)

6.2 Tree Locations



Figure 2 – Location of Tree 1 from survey plan – trees 2 and 3 were not included on the survey and are estimated only. The trees in green are nominated for retention. The trees in red are nominated for removal – any tree that is not numbered is not a prescribed tree due to dimensions (also for removal).

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7 Development Impact Discussion

Tree 1 – Plumaria acutifolia (Frangipani)

Should the application be supported Tree 1 will require removal as it is located within the building footprint. This tree has been allocated a moderate retention value.

It is noted that the site supports a significant percentage of canopy cover excluding Tree 1 and that the lost canopy can be replaced in the front setback within 5 -10 years using a locally occurring species.



Image 2 - Tree 1



Image 3 – Tree 1 canopy



Image 3 – Showing the substantial canopy cover the site supports to the rear of the dwelling.

<u>Tree 2</u> – *Dypsis lutescens* (Golden Cane Palm)

Tree 2 can be viably retained in conjunction with the proposed development. The existing concrete stairs within the nominated TPZ are to be retained.



Image 4 – Tree 2

The excavation required for a pier at point A as indicated in Image 6 is approx. 2.3 metres from the outer edge of the clump of palms and at point B is approx. 3.5 m.

The proposed works will have little, if any, impact on Tree 2.

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Tree protection fencing should be erected as indicated in Appendix 2 and clause 8.2. Works must be undertaken as recommended in section 8.

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<u>Tree 3</u> – *Plumaria acutifolia* (Frangipani)

Tree 3 can be viably retained in conjunction with the proposed development. Some of the existing concrete stairs within the estimated SRZ are to be retained and it is considered highly unlikely that there will be roots from this tree where any excavation may be required for piers (marked A and B) to support the landing/steps as shown in Image 6. Should roots that cannot be severed be encountered, the location of supporting piers/pads can be adjusted accordingly or an alternative solution such as a cantilever can be used.



Image 5 – Tree 3

The proposed works will have little, if any, impact on Tree 3 provided any excavation within the TPZ is limited to small, isolated areas and/or for isolated piers/pads if tree roots are encountered during excavation.

Tree protection fencing should be erected as indicated in Appendix 2 and clause 8.2. Works must be undertaken as recommended in section 8.



Image 6 – Excavation can be limited to isolated piers/pads to avoid roots from Tree 3 if encountered.

8 Recommendations

It is recommended that -

- Trees 2 and 3 are protected during demolition and construction.
- If approved by the Northern Beaches Council, Tree 1 be removed.
- All excavation within 3.5 m (beyond this would be impacting less than 10% of the estimated TPZ area and therefore considered minor) of Tree 3 (*Plumaria acutifolia* Frangipani) and within 2.5 m of the outer edge of the clump that forms Tree 2 (*Dypsis lutescens* Golden Cane Palm) must be undertaken as directed by, and under the supervision of, the Project Arborist. Should roots be encountered that are not approved for removal the design must be modified to accommodate the retention of such roots. Appropriately located piers or pads and or cantilevered structures will be suitable.
- Tree protection be installed in accordance with the Tree Protection Plan in Appendix 2 and works to be undertaken in accordance with section 8.
- Replacement canopy trees are planted in accordance with any condition placed on a consent for the works.

8.1 Tree Protection Zones

As defined in *AS 4970-2009 'Protection of trees on development sites'* (AS4970) the Tree Protection Zone (TPZ) is the principal means of protecting trees on development sites. The TPZ is a combination of root area and crown area requiring protection.

As listed in AS4970, the following activities must be excluded from the TPZ's whether the area is fenced or not:

- machine excavation
- excavation for silt fencing
- cultivation
- storage
- preparation of chemicals (including cement products)
- parking of vehicles and plant
- refueling
- dumping of waste
- wash down and cleaning of equipment
- placement of fill
- lighting of fires

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- soil level changes
- temporary or permanent installation of utilities and signs, and
- physical damage to the tree

8.2 Project Arborist

It is recommended that the person acting on this consent engages a Project Arborist (min AQF Level 5 qualification) to certify the following HOLDPOINTS –

Stage of arboricultural inspection HOLDPOINT	Compliance documentation - photos shall be included
Installation of tree protection fencing/measures prior to any work commencing on site. Brief contractors in relation to approved works within TPZs and when supervision is required. Regular inspection to ensure tree protection is remaining in place as approved.	Compliance with tree protection measures as approved – fencing location shown in Appendix 2.
Excavation within the TPZ of Trees 2 and 3.	Compliance with clause 8.3, 8.4.
Root pruning	Compliance with clause 8.3, 8.4.
Prior to the issue of a Final Occupation Certificate	Compliance that all works have been undertaken as conditioned by Council and/or in accordance with this report.

8.2 Fencing

The tree protection fencing shall be erected prior to any works (other than tree removal and pruning) commencing on the site. The fencing shall be installed in the location as shown by the blue lines on the plan in Appendix 2. Given the slope of the site the fencing can be constructed from star pickets and Parawebbing - refer to Image 7 below as an example. Alternately 1.8-metre-high steel frame panels with chain mesh infill fencing can be used. The fencing should remain in situ until the completion of all construction.



Image 7 - Example of fencing materials

All tree protection fencing shall be prominently sign posted indicating that the area is not to be accessed. The sign shall include contact details for the builder/project manager and project arborist and can also include information about activities that are not allowed within the Tree Protection Area.

8.3 Excavation

Excavation for the footings of the approved structure within the TPZ of Tree 2 and 3 must be undertaken under the supervision of the Project Arborist. The excavation must be undertaken carefully using tree sensitive techniques such as handheld implements, air pressure (Airspade/Airknife ®) or water pressure avoiding damage to tree roots that are not approved for removal.

Piling, piers, pads and footings to be designed and located accordingly.

Any spoil from the excavations must not be left within the TPZ.

8.4 Exposed Roots

Exposed roots to be retained shall be protected from direct sunlight, drying out and extremes of temperature by covering them with a geotextile fabric or similar that is to be kept damp at all times until the root can be covered with soil.

8.5 Stormwater

All proposed stormwater lines and subterranean services shall be located outside the TPZ of trees to be retained unless approved in writing by the Project Arborist prior to installation. Where installation outside the TPZ is not possible an alternate measure to excavation may be utilized. Measures such as suspending pipes under slabs, decking and other structures are likely to be appropriate. Small incursions into the TPZ (but clear of the SRZ) may be approved by the Project Arborist with conditions relating to excavation / installation methodologies to mitigate the impact to tree roots.

Allar

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9 Bibliography/References

Australian Standards Association 2007, AS 4373 – 2007 'Pruning of Amenity Trees'.

Australian Standards Association 2009, AS 4970 'Protection of trees on development sites.

Barrell, J 1996, Pre-planning Tree Surveys: SULE is the Natural Progression. Arboricultural Journal 17, 33-46.

- Harris, R, Clark, J, & Matheny, N 2004, *Arboriculture Integrated Management of Landscape Trees, Shrubs, and Vines*, 4th Edition, Prentice Hall, New Jersey.
- Rowell, R 1991, *Ornamental Flowering Trees in Australia*, Revised edition, New South Wales University Press, Australia.

Shigo, AL 2008, A New Tree Biology, 2nd Edn, Sherwin Dodge Printers, Littleton USA

ttps:// https://www.planningportal.nsw.gov.au/spatialviewer/#/find-a-property/address - accessed 18 April 2023

https://www.northernbeaches.nsw.gov.au/planning-development/tree-management/privateland - accessed 18 April 2023

10 Appendix 1 – Tree Assessment Data

Tree #	Botanical Name (Common Name)	Estimated Height (m)	Crown spread (m)	DBH (mm)	TPZ rad (m)	DARF (mm)	SRZ rad (m)	Health	Condition	ULE (years)	Landscape Significance	Retention Value	Comments
1	Plumaria acutifolia (Frangipani)	6	7	410	4.9	**	**	Med/Good	Medium	Medium 15-40	Moderate	Moderate	Looks to be co-dominant from base – thick vegetation making base inspection not possible. Minor decay at past pruning points. Condition typical for a mature tree of this species. Coming into the time when foliage is yellowing and falling so an assessment of health is difficult. Constrained rooting area on compression side – located in raised bed.
2	Dypsis lutescens (Golden Cane Palm)	Several trunks with clear height >5m.	4	-	2.5*	-	-	Good	Good	Medium 15-20	Low/Moderate	Moderate	Forms a clump.
3	Plumaria acutifolia (Frangipani)	5	6	**420	5	**450	2.3	Med/Good	Medium	Medium 15-40	Low/Moderate	-	The retention value in this circumstance is 'high' as the tree is located on an adjacent site. Coming into the time when foliage is yellowing and falling so an assessment of health is difficult.

*Note – AS4970 'Protection of trees on development sites' nominates that the TPZ of a palm should not be less than 1 m outside the crown projection however in this case a 2 m radius is considered adequate for a

TPZ.

**Note – Access not available to measure so dimension has been estimated.

11 Appendix 2 – Protective fencing plan for Trees 2 and 3



12 Appendix 3 – Tree Assessment Methodologies

The assessment of the trees is based on a visual inspection of the trees from ground level using relevant aspects of the Visual Tree Assessment (VTA) method as outlined by Mattheck & Breloer (1994). The inspection included notation of the dimensions of the trees, the density and health of the foliage in conjunction with an examination of the form and structure of the trunks, branches and crown and an assessment of the health and soundness of these elements of the trees.

The inspection was limited to visual inspection of each tree without dissection or coring. The inspection did not include aerial inspection and no testing of woody tissue or substantial subterranean root investigation was undertaken.

The tree heights were estimated using comparison with adjacent structures where heights and dimensions were known. The canopy spread was measured with a metal 25mm blade Craftwright® tape measure and the trunk diameter at breast height (DBH) and trunk diameter above the root flare (DARF) was measured using a Yamayo® diameter tape at 1.4 above ground and is expressed in millimeters.

All measurements from the trees are taken as if measured from the centre of the tree trunk and are expressed in meters unless otherwise stated.

The criteria for assessing health included assessing density of the canopy, new extension growth, impact of pests and or diseases, amount and dimensions of deadwood/dieback, size and colour of foliage and presence or absence of epicormic growth. Each tree was rated as having Good (G), Medium (M), Poor (P) or Dead (D) health.

The criteria for assessing condition included assessing the soundness of the branch unions, presence of cavities and or decay, branching structure including co-dominant trunks and rubbing branches, leaning trunks, root girdling or root damage/removal, branch failures and general structural integrity. Each tree was rated as having Good (G), Medium (M), Poor (P) or Remove (R) condition.

No soil sampling or testing has been undertaken.

The Structural Root Zones (SRZ) and Tree Protection Zones (TPZ) have been calculated using the formula as nominated in AS 4970 'Protection of trees on development sites. The assessment of encroachment from previous development uses AS 4970 'Protection of trees on development sites' – Section 3.3.2 and 3.3.3 as a point of reference.

The results of the visual tree assessment for the three (3) trees have been summarized in a table in Appendix 1.

13 Appendix 4 - Tree Retention Value Assessment Methodology

The process as detailed below was used to determine a retention value for each tree on the site. The retention value assists in determining the constraint value of each tree in the context of designing the proposed development.

A retention value for each tree has been determined and is included in Appendix 1.

The process for determining the retention values involved a considered methodology detailed as follows, in order of undertaking -

13.1 ULE

Each tree has been assigned a ULE (Useful Life Expectancy) value modified by a process developed by Barrell (1996). The objective of a ULE assessment is to assign a relative value to individual trees within a group for the purpose of informing future management options. In summary, ULE is the life expectancy of each tree modified by economic considerations, impacts on trees with a longer ULE and the retention of the amenity of the wider landscape. ULE values for each tree are included in the table in Appendix 1 and details of the ULE categories (from which the ULE values were derived) are provided in Appendix 6.

13.2 Landscape Significance rating

Each tree has been assigned a Landscape Significance rating using the criteria developed by Morton (2011). The trees have been rated using criteria relating to heritage, ecological and amenity values. Landscape Significance ratings for each tree are included in Appendix 1 and the table detailing the criteria for assigning significance ratings is provided in Appendix 7.

13.3 Retention Value

As required by Clause 2.3.2 of AS4970 '*Protection of trees on development sites*' a Retention Value has been assigned to each tree on the site.

Using the ULE and the Landscape Significance rating the Tree Retention Value Matrix has been applied to determine a retention value for each tree. The matrix is included in Appendix 8.

A retention value for each tree has been determined and is included in Appendix 1.

The Retention Value does not include a consideration of the proposed development work and is not a schedule for tree retention or tree removal, however is one, of several, considerations when designing works on a development site.

14 Appendix 5 - Development Impact Assessment Methodology

The following methodology was used in relation to determine the impacts of the proposed development on trees to be retained.

As defined in *AS 4970-2009 'Protection of trees on development sites'* (AS4970) the Tree Protection Zone (TPZ) is the principal means of protecting trees on development sites. The TPZ is a combination of root area and crown area requiring protection. It is ideally an area isolated from construction disturbance (i.e., excavation or fill, trenching, ripping, grading, compaction etc.) so that the tree remains viable.

The TPZ is a radial distance measured from the centre of the tree trunk.

The TPZ and Structural Root Zones (SRZ) dimensions for the trees where recorded are in the table in Appendix 1 (unless lack of access did not allow for measuring).

14.1 Determining Tree Protection Zones

As defined in AS 4970 Section 1.4.7 the TPZ is 'a specified area above and below ground and at a given distance from the trunk set aside for the protection of a tree's roots and crown (canopy) to provide for the viability and stability of a tree to be retained where it is potentially subject to damage by development'. The TPZ is the root zone/canopy area required for vigour and long-term viability. The TPZ area has been calculated as specified in Section 3.2 of AS 4970.

14.2 Determining Structural Root Zones

As defined in AS 4970 Section 1.4.5 the SRZ is 'the area around the base of a tree required for the tree's stability in the ground. The woody root growth and soil cohesion in this area are necessary to hold the tree upright.' The SRZ area has been calculated as specified in Section 3.3.5 of AS 4970.

14.3 Variation to the TPZ - Major

Should major encroachments (> 10%) of the TPZ be proposed it must be demonstrated by The Project Arborist that the tree will remain viable into the long term. Demonstration of viability may include non-destructive methods of root investigation and should be made in consideration of the following factors as listed in Section 3.3.4 of AS 4970:

Location and distribution of the roots

• Potential loss of root mass

- Tree species and tolerance to root disturbance
- Age, vigour and size of the tree
- Lean and stability of the tree
- Soil characteristics
- Existence of past or existing structures affecting root growth
- Design factors

14.4 General Comment - Encroachments into the TPZ

Calculating the percentage of the encroachment is the initial step in the process of assessing any impact. The nature of any major encroachment (>10%) must also be considered in the context of Section 3.3.4 of AS 4970.

15 Appendix 6 - Useful Life Expectancy (ULE) Categories

Each tree has been allocated a ULE rating that aligns with one of the categories below -

- I. 40 years or more
- II. 15 40 years
- III. 5 -15 years
- IV. Less than 5 years

The methodology has been modified from Barrell (1996) and is based on an estimate of the longevity of each tree in consideration of the growing environment. Further consideration is given to the tree health, structural condition and the site suitability and the ULE is modified if required.

16 Appendix 7 – Landscape Significance Table

Ref: Andrew Morton - Earthscape Horticultural, Berowra, NSW (December 2011) – modified by Green Spaces Consultancy 2019.

RATING	HERITAGE VALUE	ECOLOGICAL VALUE	AMENITY VALUE		
	The subject tree is listed as a Heritage Item under the Local Environment Plan (LEP) with a local, state or national level of significance or is listed on Council's Significant Tree Register	The subject tree is scheduled as a Threatened Species as defined under the Threatened Species Conservation Act 1995 (NSW) or the Environmental Protection and Biodiversity Conservation Act 1999	The subject tree has a very large live crown size exceeding 300m ² with normal to dense foliage cover, is in a visually prominent position in the landscape, exhibits very good form and habit typical of the species		
1. SIGNIFICANT	The subject tree forms part of the curtilage of a Heritage Item (building /structure /artefact as defined under the LEP) and has a known or documented association with that item	The tree is a locally indigenous species, representative of the original vegetation of the area and is known as an important food, shelter or nesting tree for endangered or threatened fauna species	The subject tree makes a significant contribution to the amenity and visual character of the area by creating a sense of place or creating a sense of identity		
	The subject tree is a Commemorative Planting having been planted by an important historical person (s) or to commemorate an important historical event	The subject tree is a Remnant Tree, being a tree in existence prior to development of the area	The tree is visually prominent in view from surrounding areas, being a landmark or visible from a considerable distance.		
2. VERY HIGH	The tree has a strong historical association with a heritage item (building/structure/artefact/garden etc.) within or adjacent the property and/or exemplifies a particular era or style of landscape design associated with the original development of the site.	The tree is a locally indigenous species, representative of the original vegetation of the area and is a dominant or associated canopy species of an Endangered Ecological Community (EEC) formerly occurring in the area occupied by the site.	The subject tree has a very large live crown size exceeding 200m ² ; a crown density exceeding 70% (normal-dense), is a very good representative of the species in terms of its form and branching habit or is aesthetically distinctive and makes a positive contribution to the visual character and the amenity of the area		
3. НІ G Н	The tree has a suspected historical association with a heritage item or landscape supported by anecdotal or visual evidence	The tree is a locally indigenous species and representative of the original vegetation of the area and the tree is located within a defined Vegetation Link / Wildlife Corridor or has known wildlife habitat value	The subject tree has a large live crown size exceeding 100m ² ; The tree is a good representative of the species in terms of its form and branching habit with minor deviations from normal (e.g., crown distortion/suppression) with a crown density of at least 70% (normal); The subject tree is visible from the street and surrounding properties and makes a positive contribution to the visual character and the amenity of the area		
4.	The tree has no known or suspected historical association but	The subject tree is a non-local native or exotic species that is	The subject tree has a medium live crown size exceeding 40m ² ; The tree is a fair representative of the species, exhibiting moderate deviations from typical form (distortion/suppression etc.) with a crown density of more than 50% (thinning to normal); and		
MODERATE	does not detract or diminish the value of the item and is sympathetic to the original era of planting.	protected under the provisions of this DCP.	The tree is visible from surrounding properties but is not visually prominent – view may be partially obscured by other vegetation or built forms. The tree makes a fair contribution to the visual character and amenity of the area.		
5. LOW	The subject tree detracts from heritage values or diminishes the value of a heritage item	The subject tree is scheduled as exempt (not protected) under the provisions of this DCP due to its species, nuisance or position relative to buildings or other structures.	The subject tree has a small live crown size of less than 40m ² and can be replaced within the short term (5-10 years) with new tree planting		
6. VERY LOW	The subject tree is causing significant damage to a heritage Item.	The subject tree is listed as an Exempt Species in the relevant Local Government Area, being invasive, or is a known nuisance species.	The subject tree is not visible from surrounding properties (visibility obscured) and makes a negligible contribution or has a negative impact on the amenity and visual character of the area. The tree is a poor representative of the species, showing significant deviations from the typical form and branching habit with a crown density of less than 50% (sparse).		
7. INSIGNIFICANT	The tree is completely dead and has no visible habitat value	The tree is an invasive weed under the Biosecurity Act (2015) within the relevant Local Government Area.	The tree is completely dead and represents a potential hazard.		

17 Appendix 8 – Tree Retention Values Matrix



Ref: - Modified from Couston, Mark & Howden, Melanie (2001) **Tree Retention Values Table** Footprint Green Pty Ltd, Sydney Australia