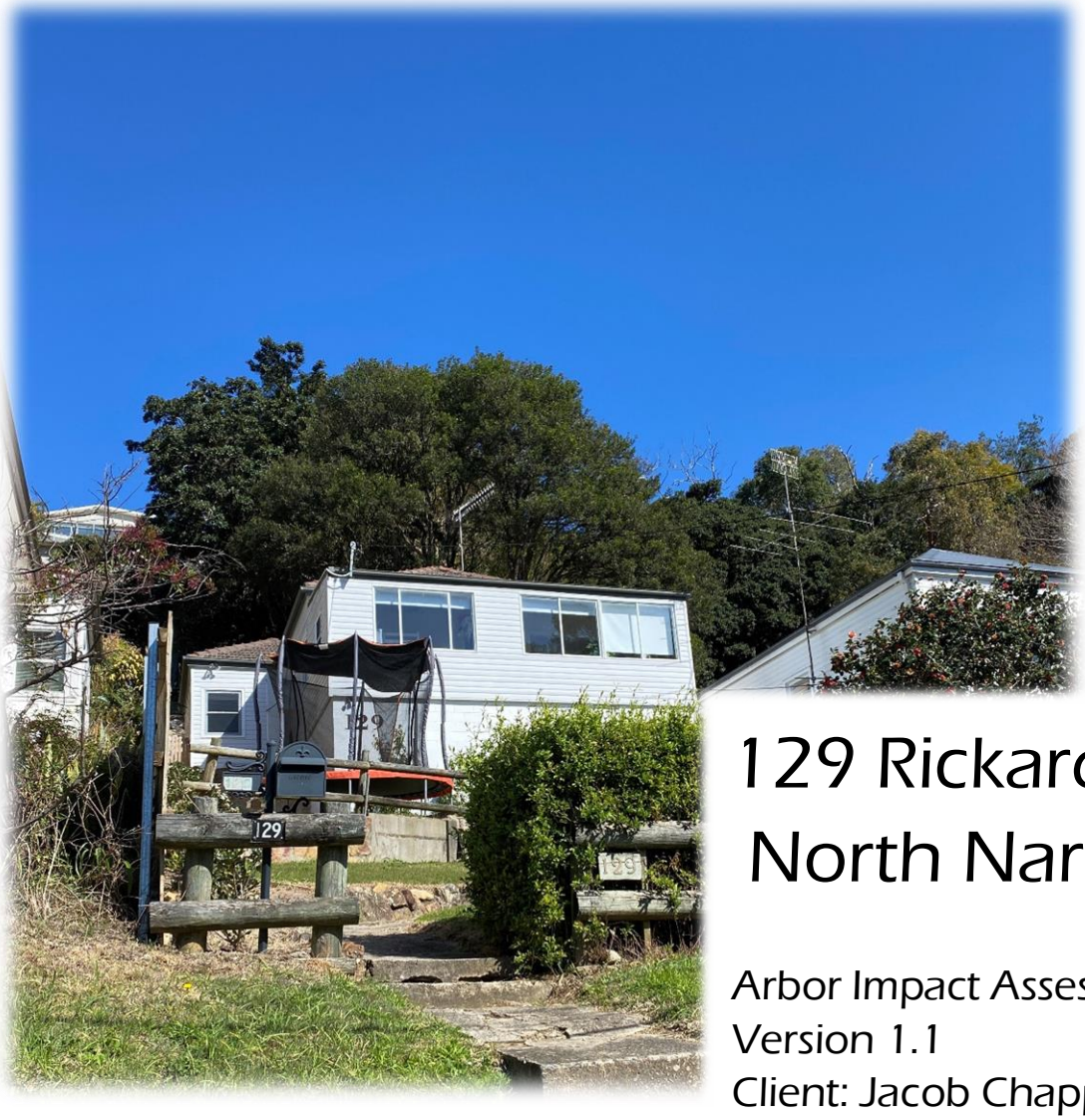
7 September 2021

smart arbor professional CONSULTING



129 Rickard Road, North Narrabeen

Arbor Impact Assessment
Version 1.1
Client: Jacob Chapple

Prepared By

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AQF V Consulting Arborist

Arboriculture Australia™

QTRA Registered User

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Contents

1. DISCLAIMER

The information provided within this report from Smart Arbor Professional Consulting is independently gathered by the author as an unbiased party and represents only the opinions and summations of the consulting arborist; compiled using the data gathered from the site inspection/s and any relevant information provided to the author.

All recommendations and information provided in this report relates to the time and date of the initial, and any following, site assessment/s. In the absence of historical records or information provided to the author, assumptions and findings of the consulting arborist are made based off observations at the time of inspection.

Measurements and locations noted in this report are an approximation and may be based on information found in surveys and further documentation not necessarily completed by the author. Exact locations and measurements of landscape require the assessment of a qualified surveyor.

No part of this report is to be provided or conveyed to any third party or authority until full payment of invoice is received, or a pre-arrangement has been made with the author.

No guarantees are implied for any findings or recommendations made within this report. Deficiencies, defects, climatic impacts, environmental changes, vandalism, mechanical impacts, or any other variable that may change the current state of the tree/s assessed are not covered in this report and will not be relevant to the opinions and findings provided.

2. EXECUTIVE SUMMARY

The report has been commissioned by Jacob Chapple at Graybuilt to provide a qualified assessment for tree specimens on and adjacent to a proposed development site located at 129 Rickard Road, North Narrabeen; a residential property located in the Northern Beaches Council LGA and subject to Local Government Tree Management policies.

The general vegetation on the site is noted to be a combination made up of native and exotic large canopy tree specimens to the rear of the property; exotic small shrub specimens to the front of the property; and a standard exotic turf underlay. The vegetation assessed were 2 x Cheese Trees on the property and 2 x Cheese Trees in a neighbouring property. The approximate location of each tree specimen can be identified on the **TREE LOCATION PLAN** (page 15).

The proposed development that bears an impact to trees on site includes demolition of stairs, retaining walls and external laundry in rear yard; alterations and additions to the existing dwelling including new secondary dwelling and garage, new stairs, sleeper walls, gardens and tank pool in rear yard.

A summary of the recommendations in reference to the vegetation assessed and information on the proposed development provided within this report is as follows:

- Tree 3 is suitable for retention due to a low impact encroachment posed to the Tree Protection Zone. Tree sensitive construction techniques must be utilised as prescribed in the **DISCUSSION** section of this report (page 12).
- Tree 4 is suitable for retention due to a moderate, yet sustainable impact encroachment posed to the Tree Protection Zone. Tree sensitive construction techniques must be utilised as prescribed in the **DISCUSSION** section of this report (page 13).
- Tree No.'s 1 & 2 are unsuitable for retention if the proposed development is to proceed in its current form due to being located within the footprint of the proposed tank pool and associated retaining wall. These trees should be removed prior to site establishment.
- All tree removal works must be approved by Council prior to completion. Works should be completed by an experienced Arborist with a minimum AQF III qualification in Arboriculture who holds Public Liability and Workers Compensation insurance.
- An exclusion zone is to be implemented utilising existing fencing on the boundary that is adjacent to the trees in the neighbouring property. This section of fencing should be sign posted with a 'no access' instruction and contact details for the Project Manager and Project Arborist.
- A Project Arborist with a minimum AQF V qualification should be engaged for the duration of the project to supervise excavation works within a measured Tree Protection Zone of a retained tree and certify Tree Protection Measures.

Schedule of Tree Management Processes

Stage	Task	Responsible Parties	Process Timing
1	Engagement of Project Arborist to oversee tree health and management	Principal Contractor	Prior to site establishment
2	Undertake removal of Tree No.'s 1 & 2	Principal Contractor	Prior to site establishment
3	Install Tree Protection signage on the fenceline adjacent to Tree No.'s 3 & 4	Principal Contractor	Prior to site establishment.
4	Certification of Pruning and Tree Protection Measures	Project Arborist	Prior to site establishment.
5	Supervise all excavation works proposed within the TPZ	Principal Contractor Project Arborist	As required prior to the works proceeding adjacent to tree
6	Final Inspection and certification of retained trees	Project Arborist	After completion of all construction and landscaping works.

3. PURPOSE

3.1 - PROPOSAL

The report has been commissioned by Jacob Chapple at Graybuilt to provide a qualified assessment for tree specimens on and adjacent to a proposed development site located at 129 Rickard Road, North Narrabeen; a residential property located in the Northern Beaches Council LGA and subject to Local Government Tree Management policies.

The objective of this report is to complete a Visual Tree Assessment (Mattheck and Breloer 1994 standard)[d] and take data to assess and provide advice on the impacts posed on vegetation protected by Local Government policies and provide recommendations to assist and guide management of tree species with the view of retaining and protecting suitable specimens.

Determinations and conclusions are drawn in this report by identifying key factors such as:

- Significant tree specimens
- Trees protected under the relevant Development Control Plan (Pittwater 21 Development Control Plan 2014; B4.22 – Preservation of Trees and Bushland Vegetation)[c]
- Trees protected under the Threatened Species Conservation Act (NSW 1995) and/or the Environment Protection and Biodiversity Conservation Act (Commonwealth 1999)
- Trees suitable for retention
- Trees unsuitable for retention
- The impacts by proposed structures to currently existing tree specimens

The data collected can be read in summarized table form in **TREE DATA COLLECTION FORM** (page 11).

3.2 - LOCAL GOVERNMENT TREE PROTECTION

The site is located within the Northern Beaches LGA, and is thus governed by their relevant adopted Development Control Plans and Local Environment Plans from former Councils; and their current Tree Management Policies. The Pittwater Development Control Plan[c] requires a Vegetation Clearing Permit for:

a) Removal or cutting down of any tree over five (5) metres in height;
b) Pruning of more than ten percent (10%) of a tree canopy.
c) The removal or cutting down of vegetation in "Bushland".

The trees assessed in this report can be categorized as protected by this policy.

4. METHOD

4.1 – METHODOLOGY

A visual assessment of the trees (VTA[8] - Mattheck and Breloer 1994 standard)[d] was performed on 10th August, 2021. VTA[8] is an industry recognised and standard assessment of an individual tree from ground level to identify tree health and structural symptoms. VTA[8] is limited to view at ground level, and does not observe symptoms below ground level, or up in the canopy not viewable from ground.

In order to view tree conditions below ground level, excavation around the root base would be required. For viewing areas of the canopy not viewable from ground, an aerial inspection would be required. Neither of these methods were completed at the time of assessment.

4.2 - INSPECTION DATA

- Genus and species
- Height (Estimation),
- Canopy Spread (Estimation)
- DBH (Diameter at Breast Height) and DRB (Diameter at Root Base) with Diameter Tape
- Age
  (**J**uvenile, **S**emi-**M**ature, **M**ature, **O**ver-**M**ature, **S**enescent)
- Vigor
  (**G**ood, **AV**erage, **P**oor, **D**ead, **DO**rmant)
- Growth Habit
  (**U**pright, **S**preading, **L**eaning, **O**ver-**E**xtended, **D**ominant, **C**o-**D**ominant, **M**ulti-**S**temmed)
- Crown[1] Form
  (**S**ymmetrical, **AS**ymmetrical, **DE**nse, **SP**arse)
- IACA STARS© Significance value
  (**H**igh, **M**edium, **L**ow)
- Defects
- General Comments

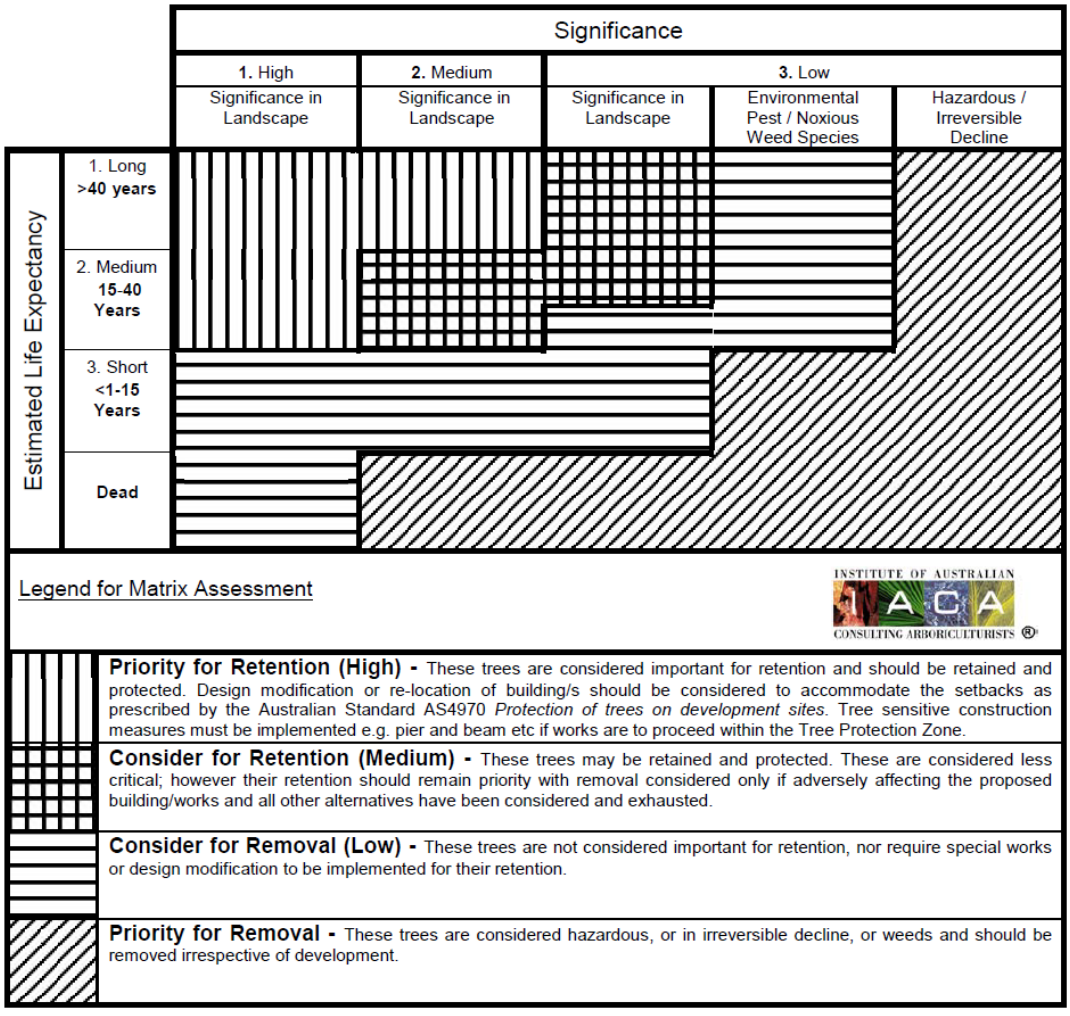
Data collected is then subject to the SULE (© Jeremey Barrell 2001)[e] methodology of assessment, which influences any conclusions drawn and recommendations made.

4.3 - TREE DATA DEFINITIONS

- **Age:** The definitions for tree age refer to the stage of life and maturity the tree is currently in that is relevant to tree species. Juvenile (**J**) is where the tree is in a small or sapling form and has not yet reached a stage where it is producing fruit. This category can often refer to a tree specimen that is under Local Government minimum requirements for classification of a tree, but is not necessarily defined by this parameter. A juvenile specimen can grow at an accelerated rate in comparison to the other categories depending on competing species. Semi-Mature (**SM**) is an age of the tree where it may have reached fruiting ability, however the size and habit does not reflect what would be classified as a fully mature example of its species. This category is governed by tree species and their growth habits. Mature (**M**) is the category where the tree has reached fruiting ability and the size and habit reflect what is expected from a fully mature specimen. A mature tree will continue to have steady annual growth. Over-Mature (**OM**) is a mature tree that has considerably slowed its growth rate and has neared its useful life expectancy. Senescent (**S**) is a stage where the tree is still alive, but no longer capable of putting on new growth. This is the final live stage of a tree.
- **Vigor:** The definitions for vigor correlate with how well the tree is performing in its environment and inclusive of canopy growth, branch growth and habit, and expression of general shape from the species in question. Good (**G**) is signs of new growth both in leaf/canopy and branches. 'Flushing'[4] is a general good indicator. Average (**AV**) is little to no signs of 'Flushing'[4], however growth is stabilizing and there is no significant loss of canopy growth, nor is there excessive presence of deadwood. Poor (**P**) is when the tree shows signs of decline, usually with excessive amounts of deadwood or epicormic[3] growth, along with less canopy leaf presence and little to no progress in branch and trunk growth. Dead (**D**) means no signs of growth, and the tree is irreversible of its condition. Dormant (**DO**) describes the canopy as being non-existent, i.e. no leaves, however this is not necessarily a sign of death or poor vigor as the tree may be deciduous and just during its dormancy stage.
- **Growth Habit:** The definitions for growth habit apply to condition and habit of the tree and the form features that impact its shape and other factors. Upright (**U**) means the tree is generally growing straight up and reaching skyward with little deviation of direction from the point of the root base. Leaning (**L**) means the tree has deviated from the point of the root base and is favoring a direction that is leaning away. Over-extended (**OE**) means the tree has an excessive lean that could over-balance the tree, and extreme weather conditions may pose a threat of uprooting the tree. Co-Dominant (**CD**) means the main leader of the tree has split into two or more main leaders that have started growing their own primary and secondary laterals. Multi-Stemmed (**MS**) means the tree has begun growth of multiple leaders from the root base that have started their own scaffold of primary and secondary branches.
- **Crown Form:** The definitions for crown form describe the shape and habit of the canopy, or crown, and touch upon the vigor or leaf growth habit of the crown also. Symmetrical (**S**)

describes the canopy as being generally even and balanced in all directions, without favoring a direction. Asymmetrical (**AS**) could refer to a lean or unbalanced canopy, generally seen in species inhibited by other species or unevenly pruned. Dense (**DE**) describes the canopy as generally full for its species, with decent or 'Flushing'[4] growth. Sparse (**SP**) describes the canopy as having less decent growth, or open gaps in the canopy.

- **Significance Value:** The definitions for significance value are determined using the IACA Significance of a Tree, Assessment Rating System (STARS)©[(1)]. This rating system assists with tree management in the planning processes for a proposed development that impacts trees protected under Local Government Tree Management Policies. The system defines three categories of significance as **H**igh, **M**edium and **L**ow within the landscape. Once assessment criteria defines the significance of the tree in the landscape, a retention value can then be determined utilising the below Priority Matrix :



Other variations on values defined and attributed to the significance value of a tree is at the discretion of the author utilizing experience and professional opinion. All such results are discussed in a report's recommendations.

5. OBSERVATIONS

5.1 - SITE DESCRIPTION

The trees are located on a steep residential block with a north-easterly aspect that composes of a two-storey residence, a separate carport at the property frontage, paved paths and stairways, and landscaped tiered gardens supporting the steep slope of the block.

The proposed development that bears an impact to trees on site includes demolition of stairs, retaining walls and external laundry in rear yard; alterations and additions to the existing dwelling including new secondary dwelling and garage, new stairs, sleeper walls, gardens and tank pool in rear yard.

The general vegetation on the site is noted to be a combination made up of native and exotic large canopy tree specimens to the rear of the property; exotic small shrub specimens to the front of the property; and a standard exotic turf underlay. The vegetation assessed were 2 x Cheese Trees on the property and 2 x Cheese Trees in a neighbouring property. The approximate location of each tree specimen can be identified on the **TREE LOCATION PLAN** (page 15).

5.2 - VEGETATION COMMUNITY

The mapped vegetation community[g] for this site was made up by the Sydney Coastal Dry Sclerophyll Forest, which is an open eucalypt forest and woodland with prominent and diverse sclerophyll shrub understorey and open groundcover of sclerophyll sedges.

The dominant tree species across the topography of this ecological community includes Angophora costata (Smooth-barked Apple) and Corymbia gummifera (Red Bloodwood). In gullies Eucalyptus piperita (Sydney Peppermint) is frequent, while ridges house canopy species consisting of Eucalyptus capitellata (Brown Stringybark), Eucalyptus haemastoma (Broad-leaved Scribbly Gum), Eucalyptus oblonga, Eucalyptus racemosa (Narrow-leaved Scribbly Gum) and Eucalyptus sieberi (Silvertop Ash). Banksia serrata (Old Man Banksia) and Ceratopetalum gummiferum (NSW Christmas Bush) make up a tree mid-canopy in gullies. There does not appear to be a representative of this community on site.

5.3 - REFERENCE MATERIAL

- **Alterations & Additions inc. Secondary Dwelling** completed by Network Design; July 2021
- NSW Government; **The SEED Initiative**; 2021
- Pittwater Council (adopted by Northern Beaches Council); **Pittwater 21 Development Control Plan**; 2014

ADDRESS: 129 Rickard Rd, Narrabeen INSPECTION: 10/08/21

NO#	Genus	Species	Common Name	Age	Vigor	Growth Habit	Crown Form	Height (m)	Canopy Spread (m)	DBH 1	DBH 2	DBH	DRB	SRZ	TPZ	Amenity Value	Eco Value	Sig. Rating	DW %	Defects	General Comments	Encroachment
1	*Glochidion*	*ferdinandi*	Cheese Tree	M	F-AV	L	AS	12	4	410		410	490	2453	4920			M		Phototropic lean away from T2, suppressed to W from Ficus. Growing on edge of steep tiered garden. Epicormic shoots on main trunk and FOB.		Within Development Footprint
2	*Glochidion*	*ferdinandi*	Cheese Tree	M	AV	CD, U	AS	12	5	500		500	590	2652	6000			M		Rubbing branches @ 7m. Recent heavy crownlifting.	Most dominant canopy of the 4 trees.	Within Development Footprint
3	*Glochidion*	*ferdinandi*	Cheese Tree	M	AV	CD, L	AS	13	4.5	420		420	480	2431	5040			M		Entwined canopy with T4, and suppressed by T2. Included juntion @ 5m. Rubbing leaders @ 6m.	Tree located in neighbouring property. DBH and DRB estimated due to access.	Located 3m from proposed new stairs to the south and 3.3m from proposed new stairs to south-west posing a combined 9% cut/fill encroachment within the TPZ
4	*Glochidion*	*ferdinandi*	Cheese Tree	M	AV	CD, U	AS	13	6	480	460	665	650	2762	7980			M		Codominamt @ 1m with associated included bark and litter buildup.	Tree located in neighbouring property. DBH and DRB estimated due to access.	Located 2.8m from proposed new stairs to the south and 3.5m from proposed new stairs to south-west posing a combined 16% cut/fill encroachment within the TPZ

7. DISCUSSION

All of the tree species assessed on this site can be categorized as native, yet not endemic to the nearest mapped local vegetation community. The proposed development appears to be taking an approach in order to retain all trees on the neighbouring property by maintaining existing levels directly adjacent to these trees.

The extent of impacts to trees on development sites can be broadly rated using the following scale of impact to the tree's health and structure (Guy Parossien):

0% of encroachment into the Tree Protection Zone –	No Impact
0 to 10% of encroachment into the Tree Protection Zone –	Low Impact
10 to 15% of encroachment into the Tree Protection Zone –	Low to Moderate Impact
15 to 20% of encroachment into the Tree Protection Zone –	Moderate Impact
20 to 25% of encroachment into the Tree Protection Zone –	Moderate to High impact
25 to 35% of encroachment into the Tree Protection Zone –	High Impact
>35% of encroachment into the Tree Protection Zone –	Significant Impact

7.1 – Trees with a Low Impact (>10%)

- Tree 3 is a Cheese Tree (*Glochidion ferdinandi*) located in a neighbouring property to the north-west of the site and is 3m from a proposed stairwell and retaining wall, providing a 9% encroachment within the Tree Protection Zone. This tree is considered as having a Medium STARS© Significance rating and must be retained and protected as it is not located on the client's property.

  While the construction of the stairs and wall is a low impact to the tree's root system, this would be deemed as sustainable by the tree if tree sensitive construction techniques are utilised when working within the TPZ as prescribed by the Australian Standard AS4970-2009 - Protection of trees on development sites. Specifically, excavation for the stairs and retained area at the line of cut should be completed under the supervision of a Project Arborist with a minimum AQF5 level qualification. If roots greater than 40mm diameter are identified, they should be clean cut with a pruning saw or chainsaw under the direction of the Project Arborist.

  All care should also be taken during the demolition of the existing detached laundry adjacent to the tree, and no excavation should occur below ground level during this process.

7.2 - Moderately Impacted Trees (>10%; <20%)

- Tree 4 is a Cheese Tree (*Glochidion ferdinandi*) located in a neighbouring property to the north-west of the site and is 2.8m from a proposed stairwell and retaining wall, providing a

16% encroachment within the Tree Protection Zone. This tree is considered as having a Medium STARS© Significance rating and must be retained and protected as it is not located on the client's property.

The area calculated as the Tree Protection Zone may be inflated as a realistic existing root zone for this tree specimen due to a significant falloff of existing levels associated with the steep aspect of the block. With this in consideration, the actual encroachment calculation may be less than measured. However, this may also indicate a greater congregation of roots in a more confined area, so the calculation provided is deemed as the relevant percentage for this report.

While the construction of the stairs and wall is a moderate impact to the tree's root system, this would be deemed as sustainable by the tree if tree sensitive construction techniques are utilised when working within the TPZ as prescribed by the Australian Standard AS4970-2009 - Protection of trees on development sites. Specifically, excavation for the stairs and retained area at the line of cut should be completed under the supervision of a Project Arborist with a minimum AQF5 level qualification. If roots greater than 40mm diameter are identified, they should be clean cut with a pruning saw or chainsaw under the direction of the Project Arborist.

All care should also be taken during the demolition of the existing detached laundry adjacent to the tree, and no excavation should occur below ground level during this process.

7.3 - Trees within the development footprint

- Tree No.'s 1 & 2 are Cheese Trees (*Glochidion ferdinandi*) located within the footprint of the proposed tank pool. These trees have been categorized as having Medium STARS© Significance ratings and are suitable for retention; however extensive redesign of the pool and retained areas would be required in order to retain these trees. The trees are unable to be retained if the proposed development is approved in its current form.

7.4 - Other Trees Assessed and General Notes

- A Port Jackson Fig (*Ficus rubiginosa*) was noted to be located in the land behind the rear boundary of the property, however no fencing was in place to delineate the property boundary. No works are indicated on the plan (Alterations & Additions inc. Secondary Dwelling completed by Network Design; July 2021) to the area that would be calculated as the Tree Protection Zone for this tree. However, care should be taken when transporting equipment, machinery and goods in and around this tree if such should occur.
- Existing fencing on the boundary that is adjacent to the trees in the neighbouring property is an appropriate height that it can be utilised as tree protection fencing. This section of fencing should be sign posted with a 'no access' instruction and contact details for the Project Manager and Project Arborist.

8. RECOMMENDATIONS

8.1 - TREES SUITABLE FOR RETENTION

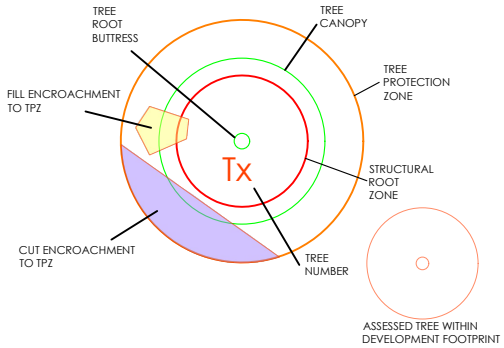
- Tree 3 is suitable for retention due to a low impact encroachment posed to the Tree Protection Zone. Tree sensitive construction techniques must be utilised as prescribed in the **DISCUSSION** section of this report (page 12).
- Tree 4 is suitable for retention due to a moderate, yet sustainable impact encroachment posed to the Tree Protection Zone. Tree sensitive construction techniques must be utilised as prescribed in the **DISCUSSION** section of this report (page 13).

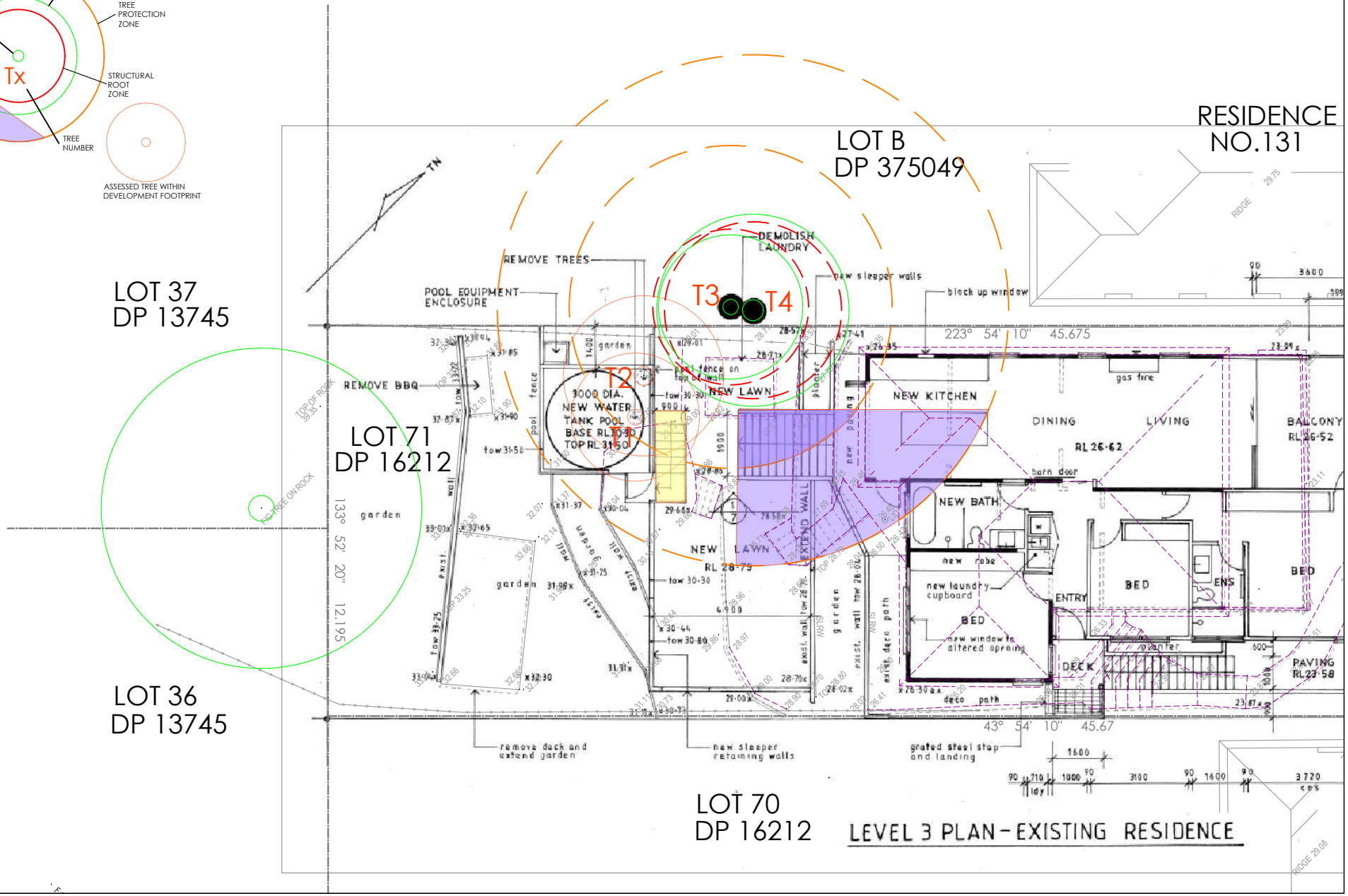
8.2 - TREES UNSUITABLE FOR RETENTION

- Tree No.'s 1 & 2 are unsuitable for retention if the proposed development is to proceed in its current form due to being located within the footprint of the proposed tank pool and associated retaining wall. These trees should be removed prior to site establishment.
- All tree removal works must be approved by Council prior to completion. Works should be completed by an experienced Arborist with a minimum AQF III qualification in Arboriculture who holds Public Liability and Workers Compensation insurance.

8.3 – SITE SPECIFIC TREE PROTECTION MEASURES

- An exclusion zone is to be implemented utlising existing fencing on the boundary that is adjacent to the trees in the neighbouring property. This section of fencing should be sign posted with a 'no access' instruction and contact details for the Project Manager and Project Arborist.
- A Project Arborist with a minimum AQF V qualification should be engaged for the duration of the project to supervise excavation works within a measured Tree Protection Zone of a retained tree and certify Tree Protection Measures.





REV.	TITLE	BY	DATE
A	TREE LOCATION PLAN	LS	30.08.21

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ADDRESS: **129 RICKARD ROAD, NORTH NARRABEEN**

CLIENT: **JACOB CHAPPLE**

PROJECT	ALTERATIONS & ADDITIONS		
DRAWING	TREE LOCATION PLAN		
SCALE: NTS @ A4	ISSUE: V1.0	DRAWN BY: LS	
SHEET NUMBER: TLP-S1	DATE: 30.08.21	REVISION: A	

NORTH

10. TREE PROTECTION PLANNING

10.1 – Engagement of A Project Arborist

The engagement of a Project Arborist is required to oversee and certify tree protection measures implemented prior to any site establishment works and maintained for the duration of the construction process. The Project Arborist is to perform additional site inspections as required at each stage of the development that may impact tree health including supervision of construction works with a tree's measure TPZ, pruning of trees away from construction activities, etc. The Project Arborist should also be notified in the event the protected trees are damaged or are showing signs of decline which may require further management recommendations.

10.2 - Tree Protection Fencing

When required as part of an approved Development Application, tree protection fencing shall be installed prior to site establishment to establish the TPZ for trees to be retained. Tree protection fencing shall be maintained for the duration of the development schedule. The Tree Protection Fencing should enclose as much of the TPZ as can reasonably be fenced off, allowing for pedestrian access and a minimum 1m offset around construction footprint and scaffolding. The fencing should be made up of steel with a chain mesh or fence palings with plywood panels that is lockable and a minimum 1.8m in height. All Tree Protection Fencing should be sign posted with a 'no access' instruction and contact details for the Project Manager and Project Arborist. This should all be certified by the Project Arborist.

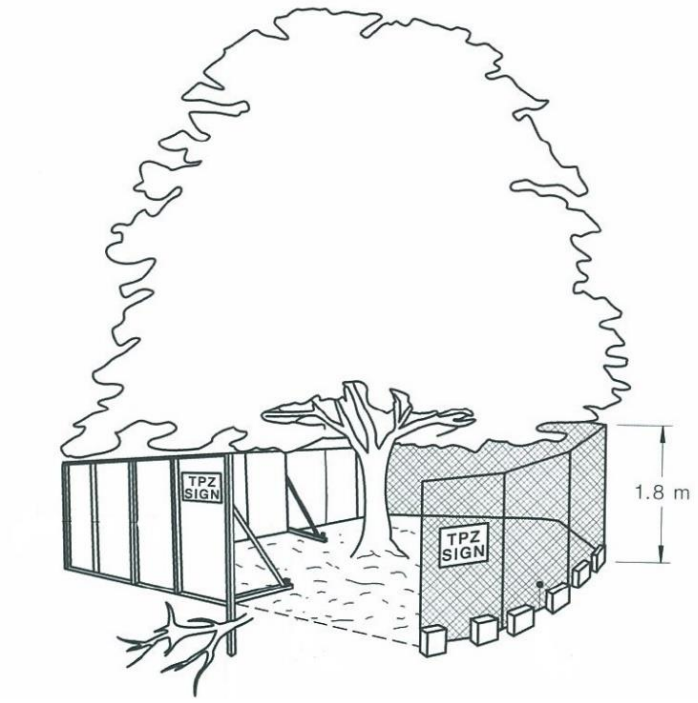


Image from AS 4970 'Protection of Trees on Development Sites'; Standards Australia, 2009

10.3 - Other Tree Protection Measures

Other measures that can assist with the protection of the canopy, trunk, branches, or roots from the risk of damage can include:

- A 100mm layer of approved mulch to be installed to the TPZ.
- A temporary drip irrigation system to be installed to the TPZ.
- Ground protection matting for staff, equipment and machinery access over tree roots.
- Trunk and branch battens and/or wrapping.

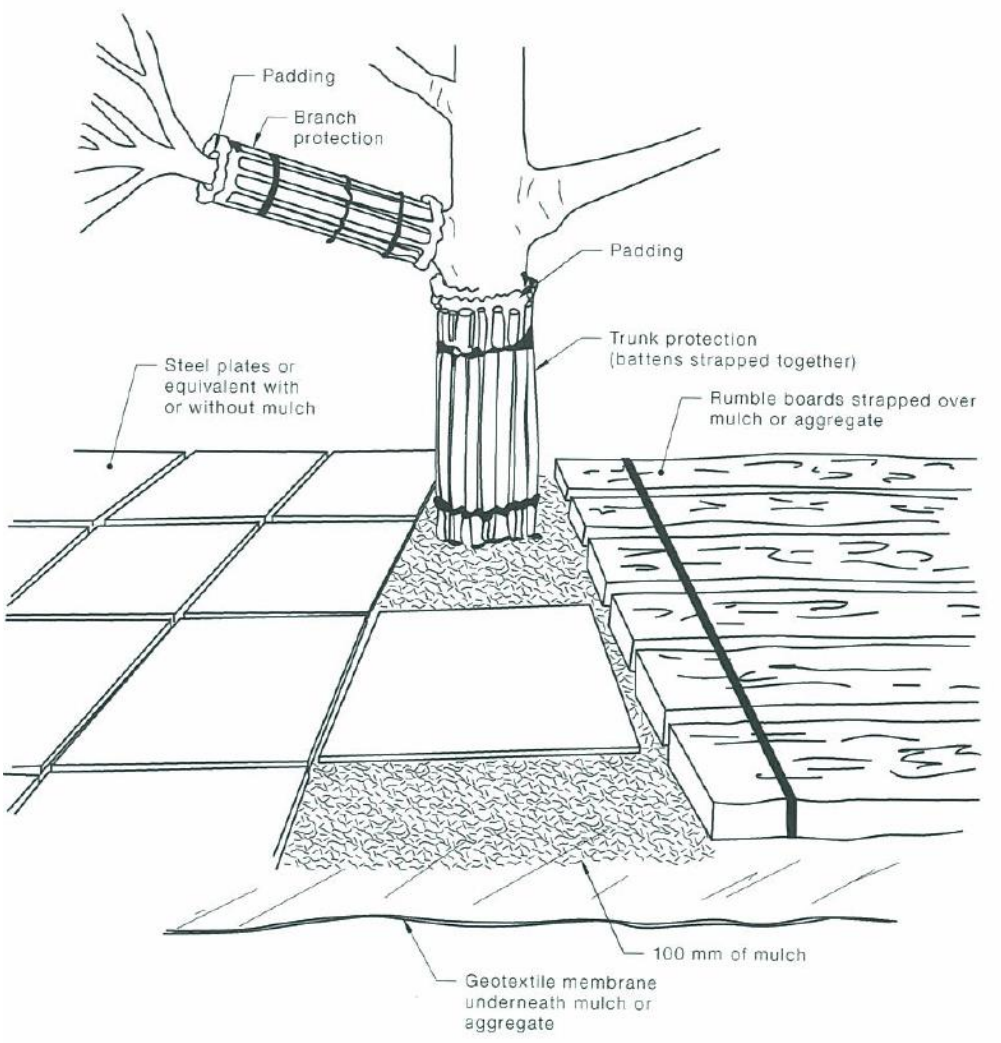


Image from AS 4970 'Protection of Trees on Development Sites'; Standards Australia; 2009

10.4 - Excavation within the TPZ

Excavation within the TPZ should be avoided, however this is not always realistically the case during a development. All efforts to preserve tree root systems should be taken including:

- Supervision from the Project Arborist during excavation.
- Excavation to be completed by hand when reasonable to avoid damage to roots.
- Root mapping may be required prior to excavation and should be completed with the use of either ground penetrating radar, air spade, water laser or by hand excavation; and should be certified by the Project Arborist.
- Where roots >50mm diameter are encountered, alternative construction methods should be considered to ensure roots are not damaged. Allowance should also be made for future root growth.
- Under-boring for services proposed below the root ball of the tree should be considered and certified by the Project Arborist.

10.5 - Fill

All fill material to be placed within the TPZ should be approved prior by the Project Arborist and be interfaced with a large diameter gravel or pebble to provide aeration and percolation to the root zone.

10.6 - Paving

Proposed paved areas within the TPZ should be placed on or above grade to minimise excavation and avoid root severance and/or damage. Pavements should be permeable or porous.

10.7 - Pruning

All recommended pruning works (including root pruning) should be in accordance with Australian Standard for Pruning of amenity trees (AS4373 - 2007)[a]. If required, roots should be severed with clean sharp implement flush with the face of the excavation and maintained in a moist condition. Root pruning shall be performed under the supervision of the Project Arborist.

10.8 - Tree Removal

Tree removal work shall be carried out by an experienced Arborist in accordance with the NSW Work Cover Code of Practice for the Amenity Tree Industry (1998) and holds Public Liability and Workers Compensation insurance. Care shall be taken to avoid damage to trees during the felling

operation. Stumps shall be grinded using a mechanical stump grinder to a minimum depth of 300mm without damage to other retained root systems.

10.9 - Tree Damage

In the event of damage to a tree or the TPZ of a tree to be retained, the Project Arborist should be advised in order to provide advice on remedial action. This should be implemented as soon as practicable and certified by the Project Arborist.

10.10 - Post Construction Tree Management

Tree protection fencing with additional trunk and root protection shall be removed following completion of the development schedule. Any mulch layer installed for root protection should be reduced to a 75mm layer and retained on site. In the event of any tree deteriorating in health after the development schedule is complete, the Project Arborist should be engaged to provide advice on any remedial action.

11. APPENDIX

1. Crown: The canopy of the tree from the starting point of the tree's first primary lateral.

2. Deadwood: Leaves and branches that have died back and are of an irreversible condition.

3. Epicormic: The growth that occurs at the point of the epicormic bud that become active shoots when reacting to damage or stress in the tree.

4. Flushing: Fast green leaf growth occurring in reaction to ideal or high nutrient conditions for the tree.

5. Tree Protection Zone (TPZ): The area calculated (DBH x 12) as a protective buffer to isolate a tree from construction and excavation disturbance so the tree may remain viable.

6. Structural Root Zone (SRZ): The area calculated ($(DRB \times 50)^{0.42} \times 0.64$) that estimates root growth requiring to be retained for stability of the tree.

7. Encroachment: An activity or disturbance that takes place within proximity to the tree and inside the Tree Protection Zone.

8. Visual Tree Assessment (VTA): a non-invasive biomechanically based system of Tree Assessment developed by Claus Mattheck and Helge Breloer, examining the health and structural condition of individual trees.

9. Canker: A symptom of an infectious fungal pathogen that has entered between the bark cambium and heartwood that can display as a discolouration, a depression in the bark, or a wound that continues to attempt to heal but is continuously expanding.

12. REFERENCES

a) Standards Australia; **AS 4373 Pruning of amenity trees;** 2007

b) Standards Australia; **AS 4970 Protection of trees on development sites;** 2009

c) Pittwater Council (adopted by Northern Beaches Council); **Pittwater 21 Development Control Plan**; 2014

d) Claus Mattheck; Helge Breloer; **The body language of trees : a handbook for failure analysis**; 1994

e) Jeremy Barrell; **SULE: Its use and status into the New Millennium**; modified paper, 2001

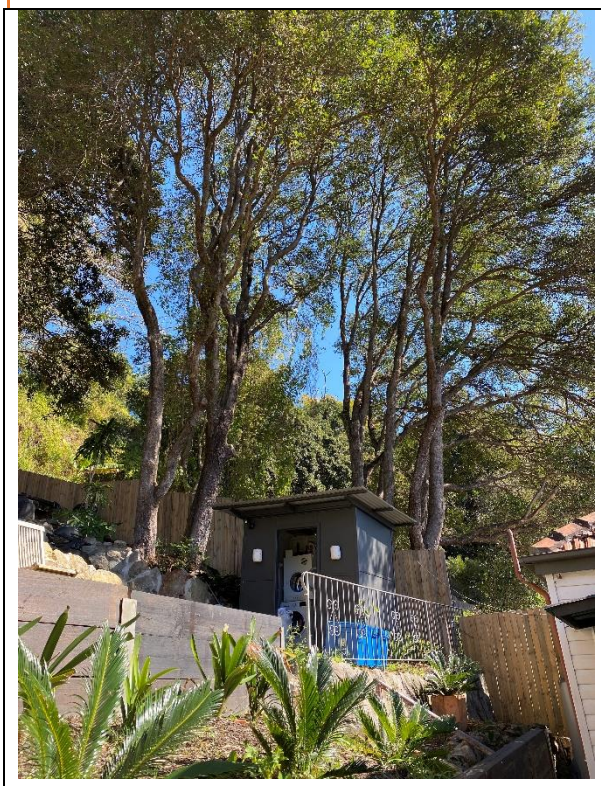
f) Institute of Australian Consulting Arboriculturalists; **IACA Significance of a Tree, Assessment Rating System (STARS)©;** 2010

g) NSW Government; **The SEED Initiative;** 2021

h) Benson, D., & Howell, J.; **Natural Vegetation of the Sydney Area – Detailed Descriptions;** Cunninghamia Volume 3, Royal Botanic Gardens Sydney, 1994.

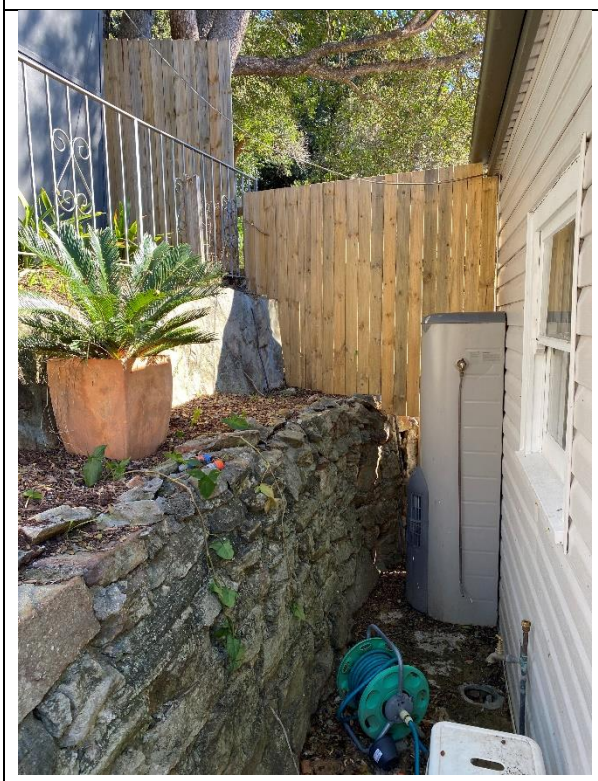
i) Richard W. Harris; James R. Clark; Nelda P. Matheny; **Arboriculture: Integrated Management of Landscape Trees, Shrubs , and Vines**; 4th Edition 2004

13. PHOTO REFERENCE

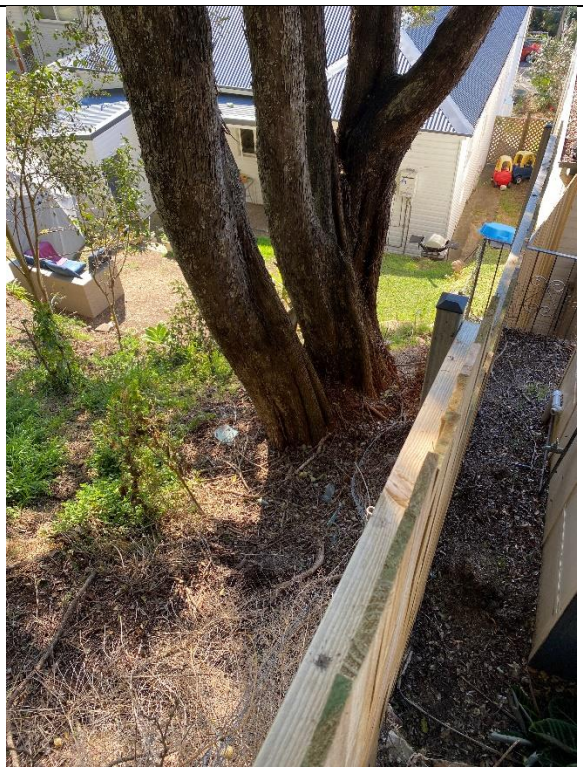


All trees assessed

Tree No.'s 1 & 2



Retaining walls to keep existing levels



Tree No.'s 3 & 4

Port Jackson Fig behind rear boundary