Arboricultural Impact Assessment

TREEISM
Arboricultural Services

Prepared For
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CHURCH POINT NSW 2105

Site Address
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June 2021

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1 Introduction

1.1 Brief

This Arboricultural Impact Assessment (AIA) was prepared by Chantalle Hughes of Treeism Arboricultural Services. This report was commissioned by Isabel McLennan, owner of the subject site. The Site is identified as Lot 51 of DP 1043879 and known as 3 Bakers Road, Church Point, New South Wales.

The purpose of this report is to assess the vigour and condition of one (1) subject site tree, to identify the potential impacts the completed alterations and additions have had on the stability and/or long-term viability of this tree. This report is to provide information to support the Modification to a Development Application - Section 4.55.

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

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

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

1.2 Methodology

In preparation for this report, ground-level, visual tree assessment (VTA), or limited VTA (e.g. where access was limited), were completed by the author of this report on 21st June 2021. Inspection details of this tree is provided in Appendix D —Schedule of Assessed Trees.

The tree height was visually estimated or measured using a Nikon ForestryPro, unless otherwise noted in Appendix D, the trunk Diameter at Breast Height were measured at 1.4 metres above ground level (DBH) using a diameter tape. Tree canopy spread was stepped out with field observations written down, and photographs of the site and tree were taken using an iPhone SE.

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

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

No hydraulic service plan has been reviewed in preparation of this report.

Plans and documents referenced for the preparation of this report include:

- AS4970-2009 Protection of trees on development sites, Standards Australia.
- AS4373-2007 Pruning of Amenity Trees, Standards Australia.
- Part B Section B4.22 Preservation of Trees or Bushland Vegetation, Pittwater 21 Development Control Plan (P21DCP).

- Design Plans, Project no. 1928, Drawing no's. C4.55-1–17, dated 8/4/2021 authored by Northern beaches Designs.
- Survey Plan, Project no. 1019, dated 12/9/2019, authored by Waterview Surveying Services (obtained from Northern Beaches Council on-line DA tracker).

The subject tree is shown as a dot marking and numbered on a marked-up survey plan (see Appendix F—Tree Location Plan).

1.3 Tree Preservation and Management Guidelines

This AIA takes account the State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017 'Vegetation SEPP', and Part B, Section B4.22 Preservation of Trees or Bushland Vegetation, Pittwater 21 Development Control Plan (P21 DCP).

2 Observations and Discussion

2.1 Assessed Tree

One (1) tree impacted by the development was assessed and is discussed within this AIA – Tree 1 *Glochidion ferdinandi* (Cheese Tree). This tree is considered prescribed (protected under P21DCP), located within the subject site and a locally native species. See Appendix D —Schedule of Assessed Trees for further tree details.

2.2 Threatened Species

No assessed tree was found to hold any conservation status under State or Federal Government legislation (i.e. Biodiversity Conservation Act 2016 or Commonwealth Environment Protection and Biodiversity Conservation Act 1999).

2.3 Potential Impacts on Existing Retained Tree

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

This 10% is interpreted as the threshold figure, and the trigger where arboricultural investigations into TPZ encroachments beyond this figure need to be considered.

Disturbance within the Structural Root Zone (SRZ), and extent of encroachments into the TPZ of the prescribed tree retained are summarised in Table 1, below.

Table 1 – Indicates whether encroachment occurs into the SRZ and/or TPZ of trees proposed for retention. Please note site-specific constraints will heavily influence the presence of roots in a particular location.

Tree No.	Tree Common name	Tree located on site	SRZ affected	TPZ area (m^2)	TPZ encroachment (approx. m^2)	TPZ encroachment (approx. %)
1	Cheese Tree	✓	✓	95	82.4	87

<u>Tree 1</u> – **Cheese Tree** – Located within subject site.

<u>Structural Root Zone impacts</u>:

- A concrete slab was laid, and new retaining wall built within the calculated SRZ of this specimen. Both placement of fill and excavation has occurred within this zone.

<u>Tree Protection Zone impacts</u>:

- An estimated TPZ encroachment of 82.4m^2 or 87% has been calculated in relation to the new works, this falls well within the *major* level of encroachment under AS4970 (see Figure 1 below/next page).
- Evidence of root severance has occurred for the concrete slab construction (see Plates 2 & 4) with one (1) 190mm diameter exposed root severed cleanly at the root crown to the south-west of the tree stem. Tension side roots on a steep slope are generally known to be more important for tree stability.
- It is unknown if further roots have been severed for the concrete slab construction. The concrete slab appears to have large piers placed supporting it so further excavation for construction is unlikely but this cannot be known without further excavation. Tree body language lends itself to the likelihood of further deeper roots on the tension side of the tree however this cannot be known without root mapping.
- Root mapping along the line of the concrete slab may provide further information on whether adequate additional structural root remain intact within this area, however, should roots dive deep within this area root mapping will be unable to inform us of such as root mapping with an air spade (the most common and accessible method) is limited to around a 500mm depth.
- One exposed 60mm diameter was noted as intact heading under the new deck extension. Mechanical wounding was noted but on the whole the root remains viable.
- Fill has been placed and a new sandstone block retaining wall constructed to the north-and north-east of the tree stem. A timber retaining wall was previously insitu to the north-west of the stem and the ground above this and to the east of the stem sloped dramatically. It is possible areas have been filled and others levelled. Fill high in organic matter will pose the highest issue to roots below, given the tendency for this to lead to anaerobic conditions. Soil testing was not carried out with this assessment.
- Root severance on the tension side of the tree poses the most immediate level of risk of tree failure at present, if root mapping can determine that adequate deeper intact roots on the tension side have been retained, then the fill on the compression roots could be potentially monitored via tree health and condition. However, the long term risk of root death of compression roots (roots on lower side of slope in this instance) due to compaction is high.
- Put simply there is no guarantee of tree ongoing stability but determining the level of root severance may allow a more informed decision.

<u>Pruning impacts</u>:

- Significant pruning has been carried out on this specimen, works contrary to the standards set within AS4373 -2007 Pruning of Amenity Tree were completed. Large diameter stubs were noted during assessment for pruning carried out to provide clearances for the new decking/storage structure. An estimated 15-20% is likely to have been removed but without prior knowledge or photography of the tree it is hard to determine, a higher percentage may have been removed.
- However, despite the previous pruning the remaining foliage is likely to be sufficient to fuel the tree in the medium term. Epicormic growth was noted at the time of assessment and tree vigor appeared adequate.

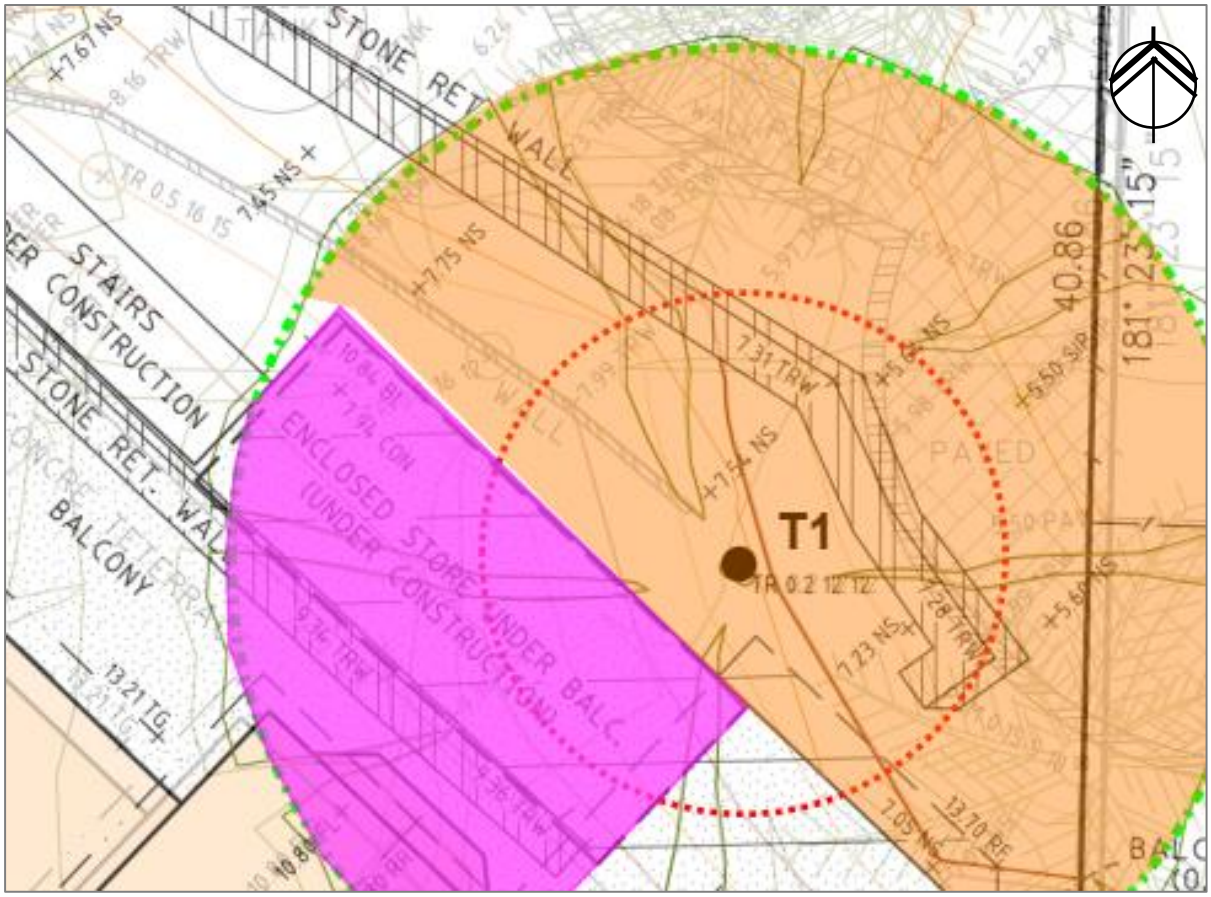


Figure 1 – Tree 1 – Survey Plan dated 12/9/2019 by Waterview Surveying Services overlaid with Design Plan by Northern beaches Designs Drawing no. C4.55-2. Red dotted circle indicates SRZ whilst TPZ is denoted by green hashing. Pink shading indicates area of potential excavation whilst orange shading notes likely fill within the TPZ.
Marked up by C.Hughes. NOT TO SCALE.

3 Conclusions

One (1) *Glochidion ferdinandi* (Cheese Tree) was assessed for this Arboricultural Impact Assessment. Recent works have occurred around this tree within the SRZ and TPZ representing a *major* encroachment under AS4790-2009.

One (1) severed large diameter root was noted during site inspection. This was severed cleanly and is displaying very early signs of wound tissue starting to grow over the wound site. It is unknown if further roots were severed for the concrete slab construction.

Fill was placed and a new retaining wall constructed down slope of the tree. It is possible deeper roots within this area have been significantly buried in this area. In the long term compaction may lead to death of these deeper roots, it is possible the tree will establish new roots in this area but this cannot be known and multiple factors will alter the likelihood of this occurring.

Tree stability has been compromised but to what extend it is not clear at this time. Root mapping would help discover if further roots were severed along the concrete slab, use of an auger/soil probe would help determine levels and type of fill within the area behind the retaining wall.

4 Recommendations

4.1 OPTION 1 - Further Investigation

Root mapping along the slab has been recommended. This will hopefully determine if further roots were severed and what roots remain.

Following the results of root mapping a more informed decision may be able to be made on tree stability. Root mapping should be carried out with non-destructive digging methods such as an air-spade, hand digging or possibly a dry vac by an experienced operator, ideally with Arboricultural qualifications.

Further investigation into the type of fill and depth of fill behind the new sandstone block retaining wall will also provide further necessary information on the long-term viability of the subject tree.

4.2 OPTION 2 –Tree Removal

Given the root severance and ground level changes around the subject tree, stability is likely to have been compromised. Tree removal would remove the risk to surrounding property and residents.

Tree removal is at the discretion of Council approving such, no work should be carried out prior to approval.

Tree removal works are to be carried out by an AQF Level 3 Arborist.

Tree removals are to be undertaken in accordance with the NSW WorkCover Code of Practice for the Amenity Tree Industry (1998) and Safe Work Guide to Managing Risks of Tree Trimming and Removal Work 2016.

Tree removals shall be in accordance with the Work Health and Safety Act 2011 and the Work Health and Safety (WHS) Regulations 2011.

5 References

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

Hadlington, P. & Johnston, J. (1988) Australian Trees: Their Care & Repair. University of NSW Press, Kensington.

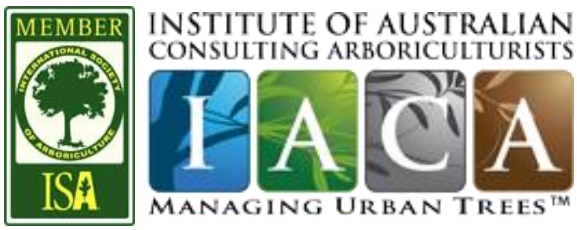
Mattheck, C. & Breloer, H. (1994) The Body Language of Trees: A handbook for failure analysis. Research for Amenity Trees No. 4, The Stationery Office, London.

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

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

Treetec Website – accessed 3 & 16/12/2020 - https://www.treetec.net.au/tpz_srz_dbh_calculator/

Report prepared by Chantalle Hughes – June, 2021



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6 Appendices

Appendix A - Terms and Definitions

Age classes

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

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

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

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

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

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

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

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

Scaffold branch/root: a primary structural branch of the crown or primary structural root of the tree.

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

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

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

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

Appendix B - ULE Guide

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

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

1. Long ULE - tree appeared retainable at the time of assessment for over 40 years with an acceptable degree of risk, assuming reasonable maintenance:

    a) Structurally sound trees located in positions that can accommodate future growth
    b) Trees which could be made suitable for long term retention by remedial care
    c) Trees of special significance which would warrant extraordinary efforts to secure their long term retention

2. Medium ULE - tree appeared to be retainable at the time of assessment for 15 to 40 years with an acceptable degree of risk, assuming reasonable maintenance:

    a) Trees which may only live from 15 to 40 years
    b) Trees which may live for more than 40 years but would be removed for safety or nuisance reasons
    c) Trees which may live for more than 15 years but would be removed to prevent interference with more suitable individuals or to provide space for new planting
    d) Trees which could be made suitable for retention in the medium term by remedial care

3. Short ULE - tree appeared to be retainable at the time of assessment for 5 to 15 years with an acceptable degree of risk, assuming reasonable maintenance:

    a) Trees which may only live from 5 to 15 years
    b) Trees which may live for more than 15 years but would be removed for safety or nuisance reasons
    c) Trees which may live for more than 15 years but would be removed to prevent interference with more suitable individuals or to provide space for new planting
    d) Trees which require substantial remediation and are only suitable for retention in the short term.

4. Removal - trees which should be removed within the next 5 years:

    a) Dead, dying, suppressed or declining trees because of disease or inhospitable conditions
    b) dangerous trees through instability or recent loss of adjacent trees
    c) Dangerous trees because of structural defects including cavities, decay, included bark, wounds or poor form
    d) Damaged trees that are clearly not safe to retain
    e) Trees which may live for more than 5 years but would be removed to prevent interference with more suitable individuals or to provide space for new planting
    f) Trees which are damaging or may cause damage to existing structures within the next 5 years
    g) Trees that will become dangerous after removal of other trees for the reasons given in (a) to (f)
    h) Trees in categories (a) to (g) that have a high wildlife habitat value and, with appropriate treatment, could be retained subject to regular review

5. Small, young or regularly pruned - Trees that can be reliably moved or replaced:

    a) small trees less than 5m in height
    b) young trees less than 15 years old but over 5m in height
    c) formal hedges and trees intended for regular pruning to artificially control growth

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

The landscape significance of a tree is an essential criterion for establishing the importance that a particular tree may have on a site. However, rating the significance of a tree becomes subjective and difficult to ascertain in a consistent and repetitive fashion due to assessor bias. It is therefore necessary to have a rating system utilising structured qualitative criteria to assist in determining the retention value for a tree.
This rating system will assist in the planning processes for proposed works, above and below ground where trees are to be retained on or adjacent a development site. The system uses a scale of *High*, *Medium* and *Low* significance in the landscape. Once the landscape significance and *Useful Life Expectancy* of an individual tree has been defined, the retention value can be determined.

Tree Significance - Assessment Criteria

1. High Significance in landscape.

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

2. Medium Significance in landscape.

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

3. Low Significance in landscape.

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

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

Environmental Pest / Noxious Weed Species:

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

Hazardous/Irreversible Decline:

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

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

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

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

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

Legend for Matrix Assessment

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

Table 1 - Tree Retention Value - Priority Matrix.

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

Appendix D – Schedule of Assessed Trees – Site inspection 21/6/2021. 3 Bakers Street, Church Point.

Tree No.	*Genus & species* **Common Name**	Ht (m)	Sp (m)	DBH (mm)	AB (mm)	Age	V	C	Comments	ULE	TSR	RV	SRZ (m)	TPZ (m)	TPZ (area)
1	*Glochidion ferdinandi* **Cheese Tree**	12	14	280/ 250/ 260/ (460)	680	M	G	F-P?	Locally native species. Epicormic growth in upper canopy noted. Trifurcate at 0.6m AGL. Mechanical damage noted to base of stem and on one exposed root. Soil up to 350mm in depth removed to south-west of stem. 190mm diameter root severed, starting to occlude. Poor pruning with large stubs left, one 200mm in diameter, rest between 20-80mm in diameter.	*2A	H	H	2.8	5.5	95

KEY

Trees to be retained.

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

Trees proposed to be removed.

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

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

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

* Provided ample remaining root growth is found, tree may be found to be a 4D (works severed large diameter root) should it be found to be destabilised.

AB – above *buttress roots*. AGL - above ground level.

** Determined by the largest number found (i.e. broadest branch spread or highest DBH) within a tree group to ensure ample tree protection zone.

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

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

DBH refers to the approximate diameter of tree stem at breast height i.e. 1.4 metres above ground (unless otherwise noted) and expressed in millimetres.

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

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

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

ULE refers to the estimated *Useful Life Expectancy* of a tree. Refer to Appendices A and B for details.

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

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

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

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

Appendix E - Photographs

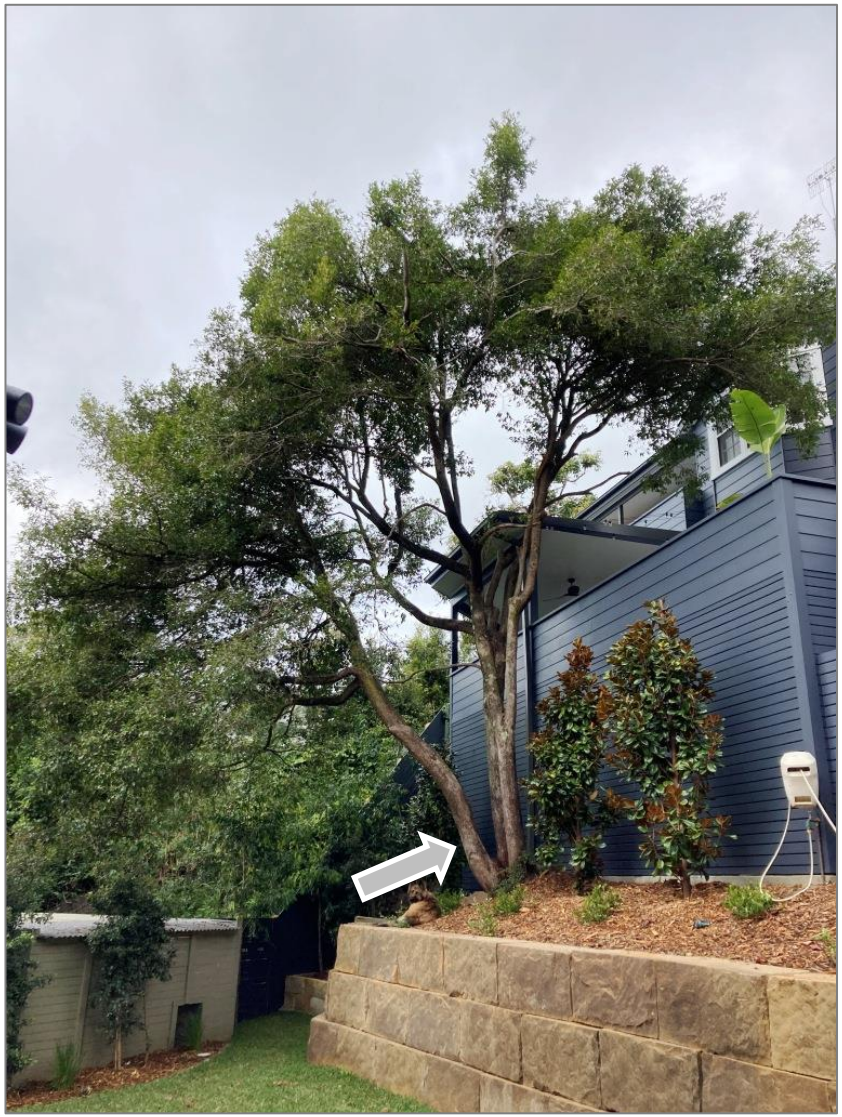

Plate 1 – Tree 1. Arrow notes subject tree.

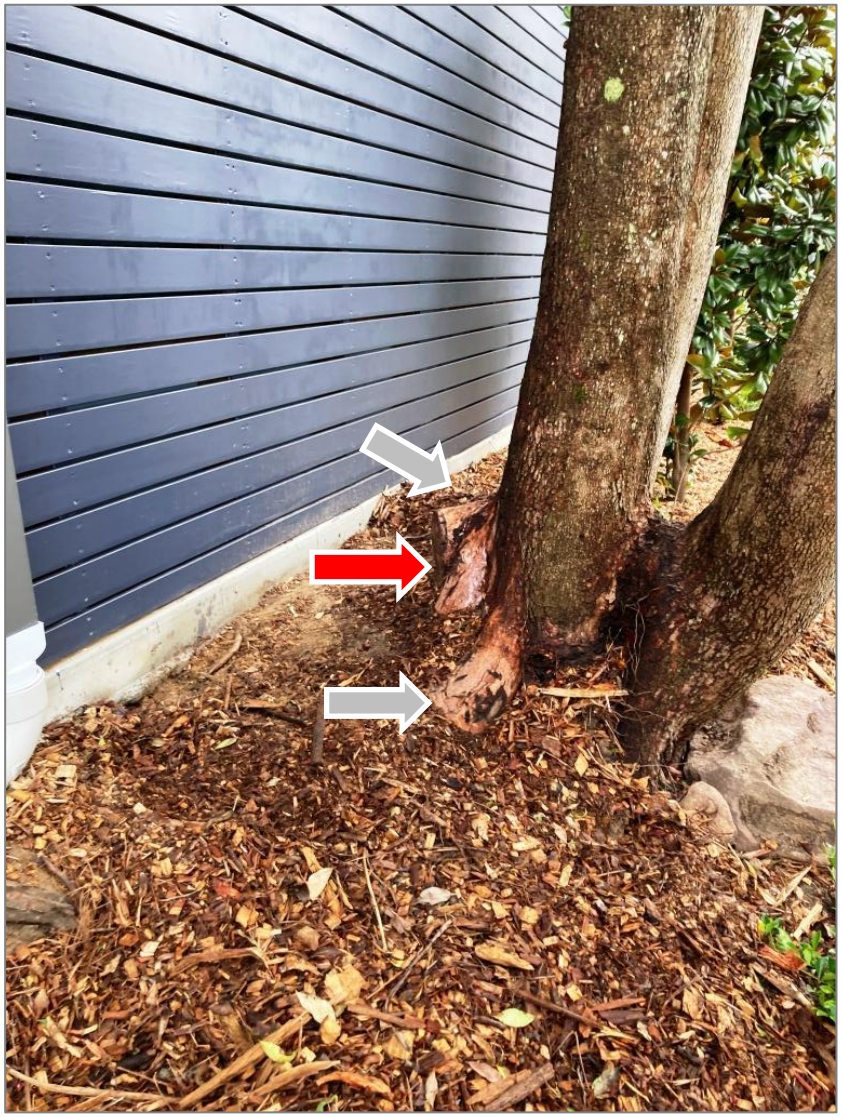

Plate 2 – Tree 1 – Photo notes location of new slab in relation to base of stem Pinkish areas at base of stem (noted with grey arrow) are indicators of soil removal against stem. Red arrow notes severed large diameter root.

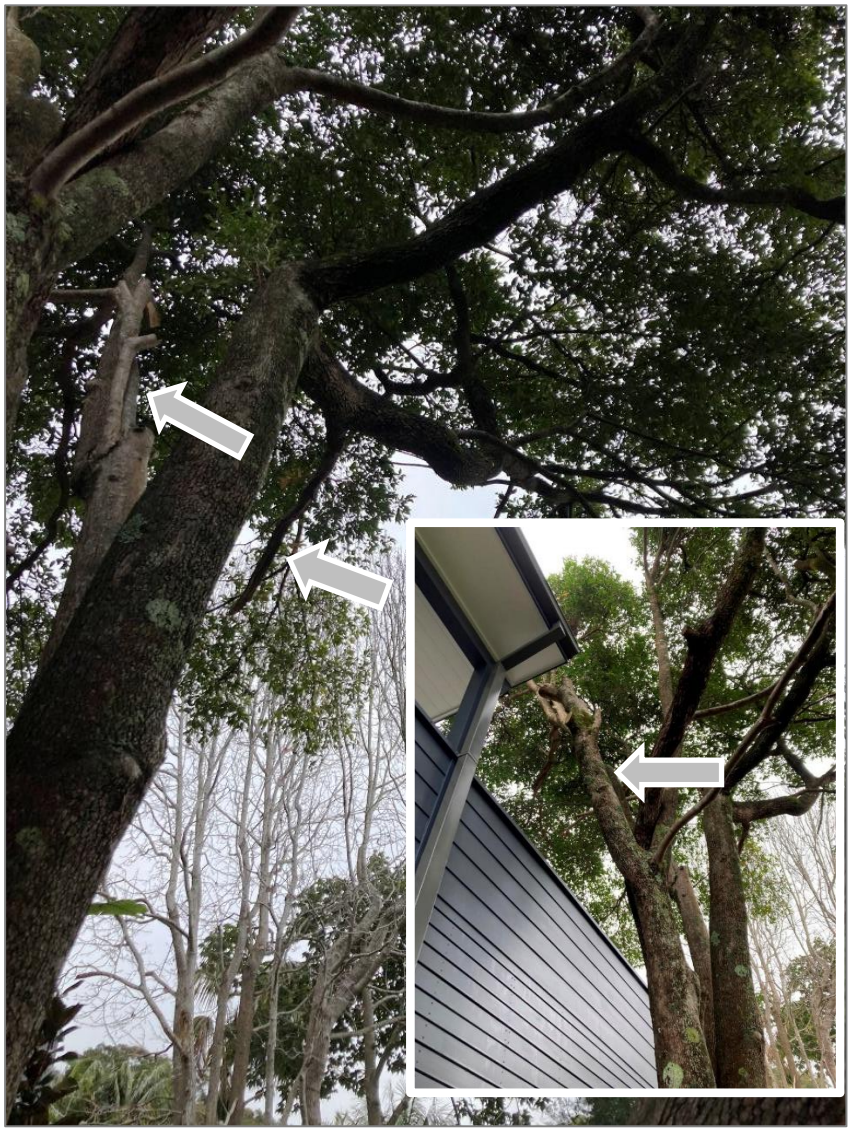

Plate 3 – Tree 1 – Arrow note smaller diameter stubs requiring clean up should tree be found stable.

Inset Plate – Arrow notes 200mm diameter stub.

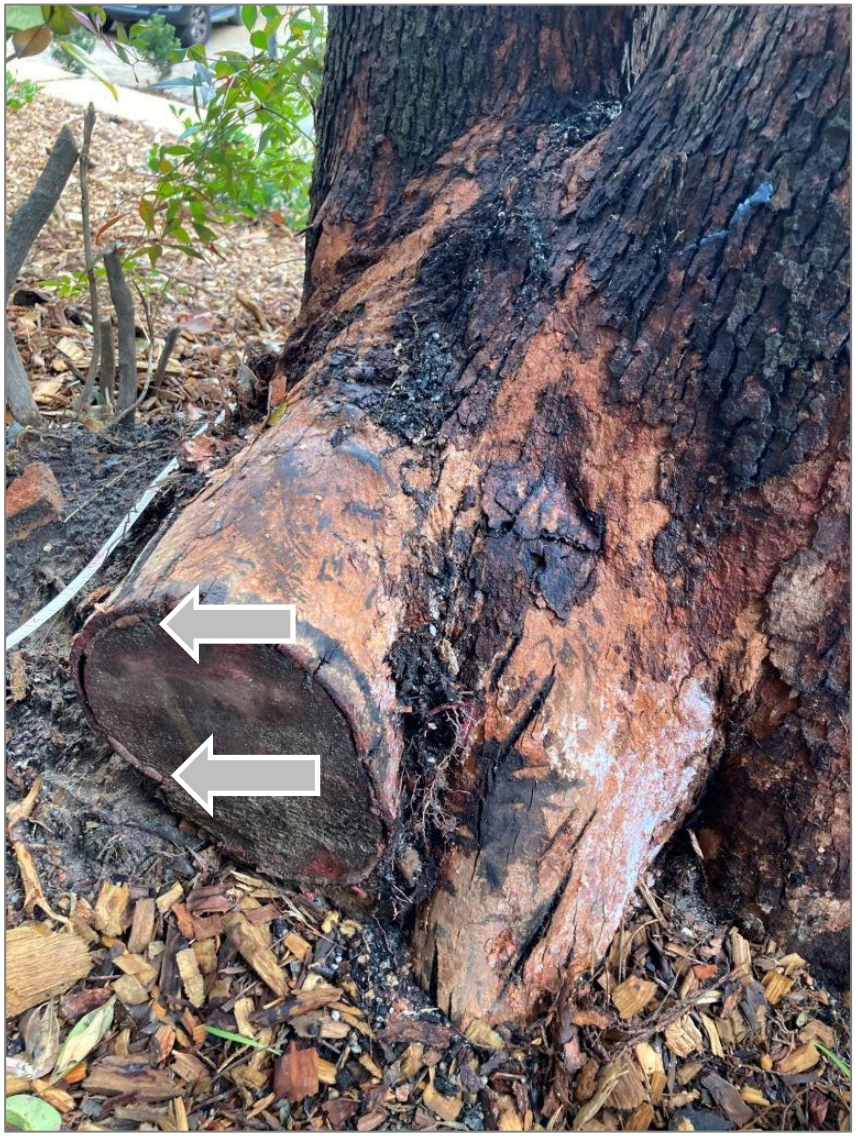

Plate 4 – Tree 1 – Close up of severed root. Arrows note where root starting to try and occlude.

Appendix F – Tree Location Plan

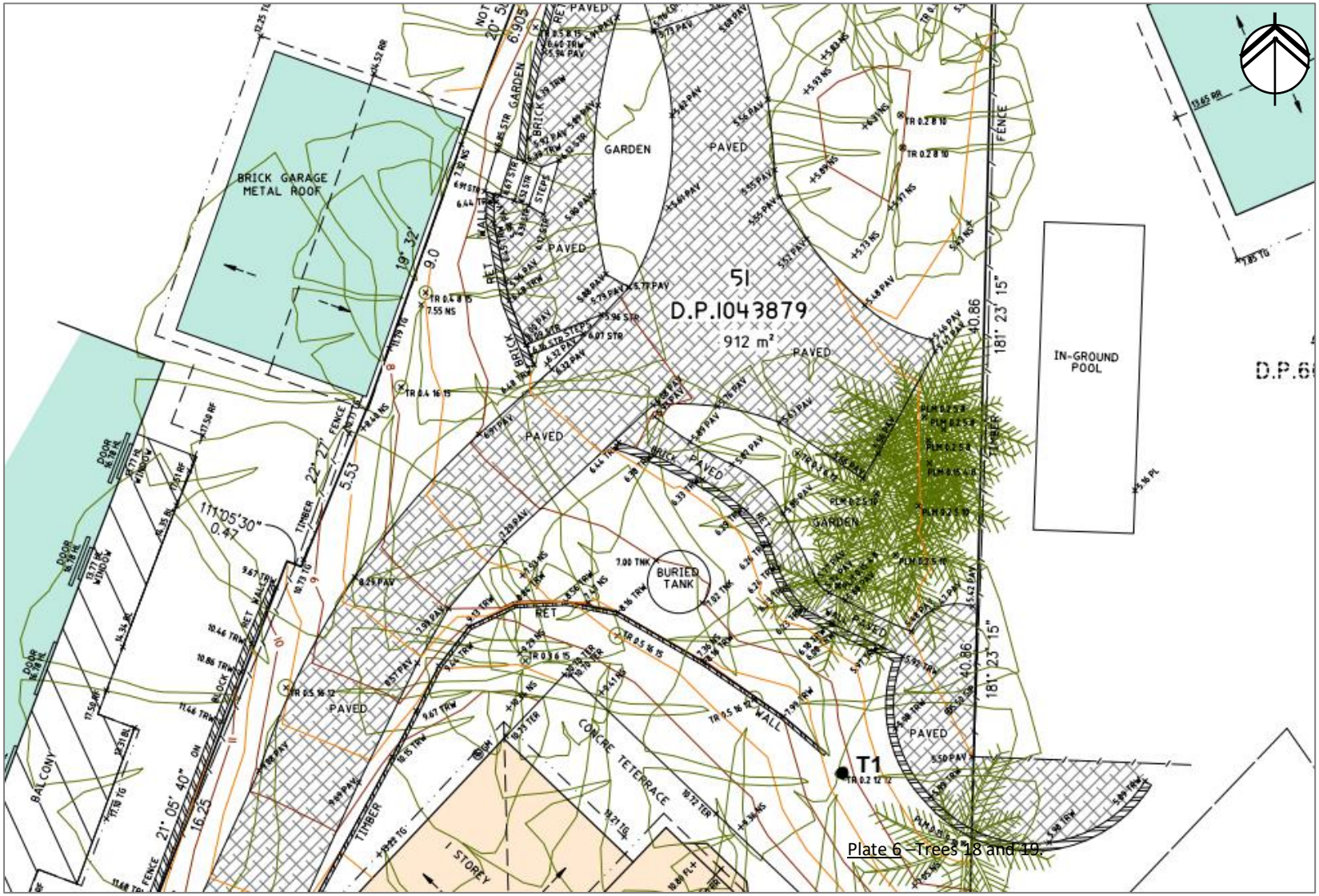

Plate 6 –Trees 18 and 19.

Figure 1 – Marked up Survey, dated 12/9/2019, Waterview Surveying Services, page 1/2. (NOT TO SCALE) – Marked up by C Hughes 28/6/2021.