



# Xylology

Arboricultural Consultancy

## ARBORICULTURAL IMPACT ASSESSMENT

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ISA Tree Risk Assessment Qualification (TRAQ)

Quantified Tree Risk Assessment (QTRA) No. 4816

**LGA:** Northern Beaches

**Date:** 16 December 2024

**Revision:** Rev B





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## 1 Introduction

### 1.1 Context

- 1.1.1 Xylology Arboricultural Consultancy was engaged on 3 December 2024 by Glenn Wightwick, to provide an Arboricultural Impact Assessment (AIA) Report relating to a Jetty Application for a Proposed New Dwelling at Lot 15 DP 875022, 206 McCarrs Creek Rd, Church Point 2105.
- 1.1.2 The geology is classed as Narrabeen Group of sediments. Mostly interbedded laminite and shale with quartz to lithic quartz sandstone. Minor red claystones occur north of the Hawkesbury River. Clay pellet sandstone occurs south of the Hawkesbury River (Herbert, 1983 cited in Department of Planning, Industry and Environment, 2024).
- 1.1.3 Original vegetation is cited as being, tall eucalypt open-forest (wet sclerophyll) and closed-forest (rainforest). Much of the native vegetation on the Northern Beaches peninsula has been cleared. Tall eucalypt open-forests occurred on drier and more exposed slopes and crests. Tree species include Spotted Gum (*Eucalyptus maculata*), Grey Ironbark (*E. paniculata*), Sydney Blue Gum (*E. saligna*), Turpentine (*Syncarpia glomulifera*), Bangalay (*E. botryoides*), Rough-barked Apple (*Angophora floribunda*) and Forest Oak (*Allocasuarina torulosa*). Rainforest occurs on sheltered slopes. Characteristic tree species include Lilly Pilly (*Acmena smithii*), Cheese Tree (*Glochidion ferdinandi*), Coachwood (*Ceratopetalum apetalum*) and Cabbage Tree (*Livistona australis*) [DPIE, 2023].
- 1.1.4 The site is not mapped on the Department of Planning and Environment's Biodiversity Values Map.

### 1.2 Legislation

- 1.2.1 Environmental Planning and Assessment Act 1979.
- 1.2.2 NSW Biodiversity Conservation Act 2016.
- 1.2.3 State Environmental Planning Policy (SEPP) Biodiversity and Conservation 2021 (Chapter 2).
- 1.2.4 SEPP Coastal Management 2018.
- 1.2.5 Pittwater Local Environmental Plan (LEP) 2014.
- 1.2.6 Pittwater 21 Development Control Plan (DCP).

### 1.3 Scope

- 1.3.1 The purpose of this report is to identify potential impacts the proposal will have on the retention or long-term viability of each tree and aims to provide guidelines for tree protection and maintenance during development.
- 1.3.2 This report is not intended to be a comprehensive tree risk assessment; however, the report may make recommendations, where appropriate, for further assessment, treatment or testing of trees where potential structural problems have been identified, or where below ground investigation may be required.
- 1.3.3 This AIA is not intended as an assessment of any impacts on the trees by any proposed future development or unapproved development of the site.

### 1.4 Method

- 1.4.1 In preparation of this report a ground level, Visual Tree Assessments (VTA) or limited VTA (e.g., where access was limited), of three (3) trees was completed by the author of this report on 10 December 2023. Inspection details of these trees are provided in Appendix E - Schedule of Assessed Trees.
- 1.4.2 The tree heights were visually estimated or measured using a Haglof Digital Clinometer, the trunk Diameter at Breast Height were measured at 1.4 metres above ground level (DBH) using a diameter tape unless otherwise noted in Appendix E - Schedule of Assessed Trees. Tree canopy spreads were stepped out, and photographs of the site and trees were taken using a TDC600 and/or iPhone 13.
- 1.4.3 Tree data and field observations were entered into a data dictionary on a Trimble TDC600. Data was managed through Terraflex Trimble Connect.
- 1.4.4 Tree Retention Values (RV) were allocated using Significance of a Tree Assessment Rating System - STARS (IACA 2010) ©.
- 1.4.5 The Structural Root Zone (SRZ) and the Tree Protection Zone (TPZ) of each tree was calculated using the formula provided within the Australian Standard 4970-2009 Protection of trees on development sites (AS4970).

## 1.5 Plans and documents referenced

- 1.5.1 Site Plan, titled Jetty Application for Proposed Development, Lot 15 DP 875022 206 McCarrs Creek Road Church Point, Dwg 1, authored by Lionel Curtin - Design & Documentation, December 2024.
- 1.5.2 Plan, titled Jetty Application for Proposed Development, Lot 15 DP 875022 206 McCarrs Creek Road Church Point, Dwg 2, authored by Lionel Curtin - Design & Documentation., December 2024.
- 1.5.3 South West Elevation, titled Jetty Application for Proposed Development, Lot 15 DP 875022 206 McCarrs Creek Road Church Point, Dwg 2, authored by Lionel Curtin - Design & Documentation, December 2024.
- 1.5.4 Site Plan titled Jetty Application for Proposed Development, Lot 15 DP 875022 206 McCarrs Creek Road Church Point, Dwg 1, authored by Lionel Curtin - Design & Documentation, December 2024.
- 1.5.5 Pittwater Local Environmental Plan 2014.
- 1.5.6 Pittwater 21 Development Control Plan.
- 1.5.7 AS4970-2009 Protection of trees on development sites, Standards Australia.

## 1.6 Limitations

- 1.6.1 Trees were assessed from the ground only, no below ground (soil or geotech) investigation was conducted, no internal diagnostics or tissue sampling were conducted.
- 1.6.2 Information contained in this report only reflects the condition of the trees at the time of inspection. Trees are dynamic, living things which can be subject to change without notice in certain circumstances.
- 1.6.3 Care has been taken to obtain all information from reliable sources. All data has been verified as far as possible; however, Xylology can neither guarantee nor be responsible for the accuracy of information provided by others.

## 2 Observations and Discussion

### 2.1 Assessed Trees

2.1.1 Images of the site and trees can be found in Appendix G - Photographs.

2.1.2 Three (3) trees within five (5) metres of the proposed works were assessed or identified and are included in this report. Details of these are included in Appendix E - Schedule of Assessed Trees

2.1.3 Tree numbers - of the three (3) assessed trees, the following is noted:

- Two (2) trees (T2 & T3) are located on the subject property.
- One (1) tree (T1) is located on the neighbouring property, No. 208 McCarrs Creek Rd, Church Point 2105.
- The three (3) trees and their respective Retention Value (RV) are identified in Table 1, below.

**Note:** Refer to Appendix C - STARS: Significance of a Tree Assessment Rating System (IACA 2010) © for the methodology used to assess the Retention Value of a tree.

**Table 1**—Tree Identification and RV, where **L = Low**, **M = Medium**, **H = High**, **R = Removal Proposed**.

Tree No.	Genus & species Common Name	RV
1	<i>Syagrus romanzoffiana</i> <b>Cocos Palm - Exempt Species (Neighbours Tree)</b>	M
2	<i>Casuarina glauca</i> <b>Swamp She-oak</b>	M
3	<i>Archontophoenix cunninghamiana</i> <b>Bangalow Palm - Exempt Species</b>	M

### 3 Impact of the Proposed Development

#### 3.1 The Proposal

- 3.1.1 The proposal for is for a new timber jetty and associated sea wall for a new dwelling.
- 3.1.2 The current retention system along the shoreline is dilapidated (**Image 4**) and therefore requires the construction a new sea wall.
- 3.1.3 The new sea wall is to be constructed of sandstone blocks (2000 x 500 x 500) and will require appropriate footings and drainage (Appendix I).
- 3.1.4 The chosen material is aligned with the Pittwater 21 Development Control Plan, Section D Locality Specific Development Controls, D15 Waterways Locality, D15.18 Seawalls. Specifically point iii which states *“constructed of or faced in rectangular shaped sandstone, being either dressed or rough-cut in order to promote a uniform treatment along the foreshore”*.

#### 3.2 Trees Proposed for Removal

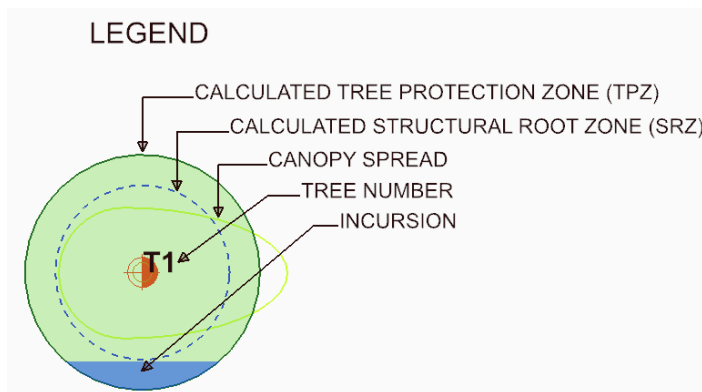
- 3.2.1 One (1) non-prescribed/exempt tree and one (1) prescribed tree are proposed for removal.
- 3.2.2 Based on the proposed design, the following trees will need to be removed as they either sit within the building/landscape footprint or are heavily impacted by the proposal.

#### 3.3 Tree 2 - Swamp She-oak & Tree 3 - Bangalow Palm (Exempt Species)

##### **Structural Root Zone & Tree Protection Zone Impacts:**

- 3.3.1 The construction of a proposed sandstone sea wall, including associated footing and drainage works, impacts the trunk (TPZ & SRZ) of both Tree 2 & 3 (Figure 1).
- 3.3.2 This resulting incursion into the SRZ and TPZ of these trees is considered to be 100%. As such, under this proposal, Trees 2 and 3 would require removal.

### 3.4 Plan interpretation



### 3.5 Potential Impacts on Trees Proposed for Retention

- 3.5.1 Under the Australian Standard 4970-2009 Protection of trees on development sites (AS4970), encroachments less than 10% of the Tree Protection Zone (TPZ) are considered to be minor.
- 3.5.2 If the proposed encroachment is greater than 10% of the TPZ or inside the SRZ, the project arborist must demonstrate that the tree(s) would remain viable.
- 3.5.3 When determining the potential impacts of encroachment into the TPZ, the project arborist should consider the following items listed under clause 3.3.4 of AS4970-2009:
- (a) Location and distribution of the roots to be determined through non-destructive investigation methods (pneumatic, hydraulic, hand digging or ground penetrating radar). Photographs should be taken, and a root zone map prepared.
  - (b) The potential loss of root mass resulting from the encroachment: number and size of roots.
  - (c) Tree species and tolerance to root disturbance.
  - (d) Age, vigour and size of the tree.
  - (e) Lean and stability of the tree. NOTE: Roots on the tension side are likely to be most important for supporting the tree and are likely to extend for a greater distance.
  - (f) Soil characteristics and volume, topography and drainage.
  - (g) The presence of existing or past structures or obstacles affecting root growth.
  - (h) Design factors.
- 3.5.4 Disturbance within the Structural Root Zone (SRZ), and extent of encroachments into the TPZ's of prescribed trees to be retained are summarised in **Table 2** below.

**Table 2: Estimated encroachments into the SRZ and TPZ of trees proposed for retention.** **Note:** These figures are based on the SRZ and TPZ offsets as calculated under AS4970 and do not necessarily reflect the actual root zones of the trees. Existing at or below ground structures, site topography and soil hydrology will influence the presence, spread and direction of tree root growth.

Tree No.	Tree	Tree located on site	SRZ affected	TPZ encroachment (approx. %)
1	<i>Syagrus romanzoffiana</i> (Cocos Palm) Exempt Species & Neighbours Tree	X	NA	14.5%



### 3.6 Tree 1 - Cocos Palm (Neighbours Tree & Exempt Species)

#### Structural Root Zone Impacts:

- 3.6.1 The AS4970 formula for calculating the SRZ of a tree does not apply to palms, other monocots, cycads, and tree ferns.
- 3.6.2 **Tree Protection Zone Impacts:**
- 3.6.3 The proposed sandstone sea wall, including associated footing and drainage works, impacts the TPZ of Tree 1 (Figure 1) resulting in a theoretical incursion of 14.5%.
- 3.6.4 The primary considerations under part 3.3.4 of AS4970-2009 are (b) "The potential loss of root mass resulting from the encroachment: number and size of roots", (c) "Tree species and tolerance to root disturbance", affecting root growth & (d) Age, vigour and size of the tree.
- 3.6.5 Cocos Palms have a high tolerance of root disturbance and transplant readily with small root plates. Additionally, the subject tree has good vigour. As such, the impact of the proposed construction would be considered negligible, and the long-term viability of this tree is considered high.

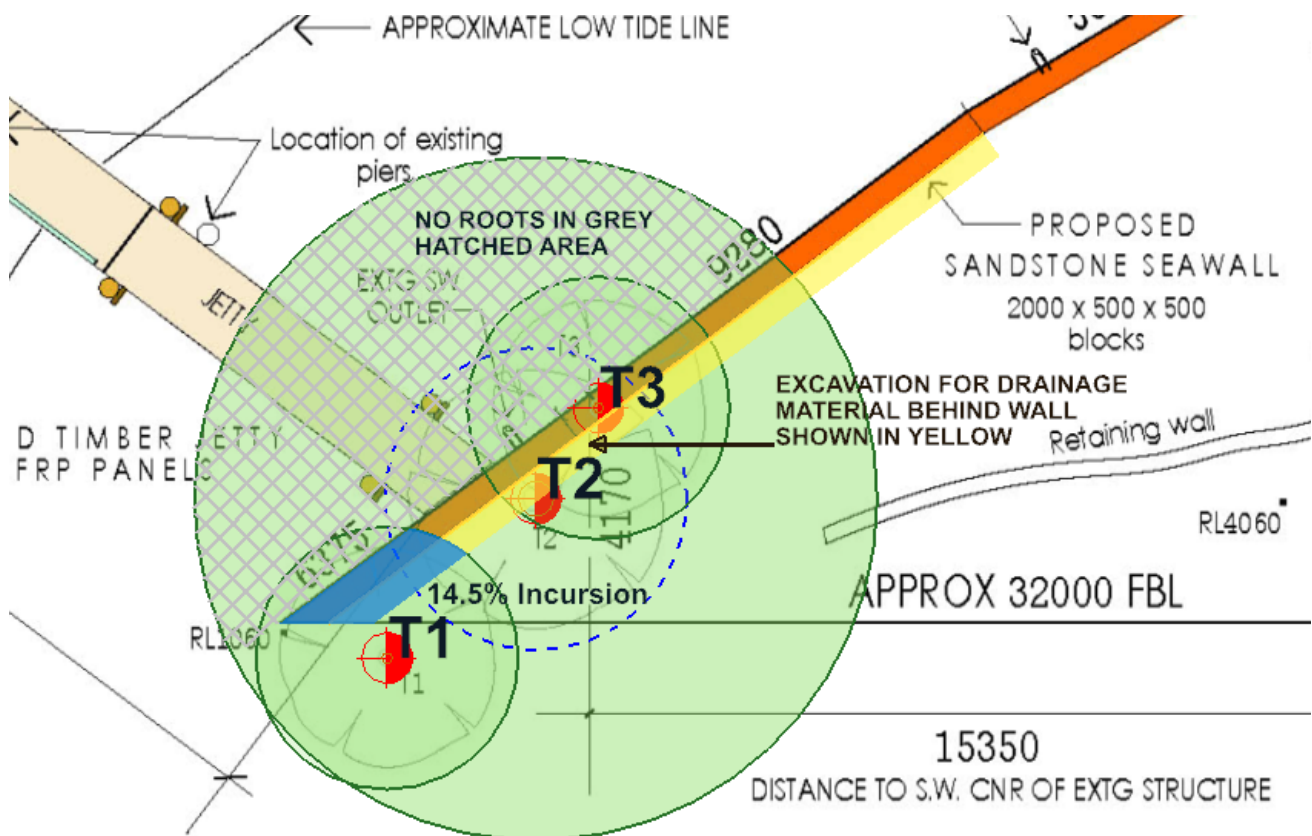


Figure 1. Encroachments to Trees 1, 2 & 3

## 4 Conclusions

- 4.1.1 A total of three (3) trees are included in this Arboricultural Impact Assessment.
- 4.1.2 Two (2) trees (T2, & T3) are located on the subject property and will require removal under this proposal.
- 4.1.3 One (1) tree (T1) is located on the neighbouring property, No. 208 McCarrs Creek Rd. This tree can be effectively retained if the recommendations made within this report are followed.

## 5 Recommendations

### 5.1 Project Arboriculturist

- 5.1.1 A Project Arboriculturist (PA) shall be engaged prior to works commencing on the site.
- 5.1.2 The PA must have a minimum Australian Qualification Framework Level 5 (AQF5) or above in Arboriculture.
- 5.1.3 Duties of the PA shall include, but not be limited to:
  - i) Liaising with the Project Manager/Head Contractor/Site Manager to confirm the tree protection and other specific tree protection requirements prior to site works commencing.
  - ii) Inspection of Tree Protection Devices and supervision of works as recommended in this report or as specified in any Conditions of Consent associated with an approved development application.
  - iii) Provision of Compliance Certification if, and when, required.

### 5.2 Minimising Impacts on Trees to be Retained

- 5.2.1 No unapproved excavation or ground level changes outside the active work zones are to occur within the TPZ of trees to be retained.

### 5.3 Tree Proposed for Removal

- 5.3.1 Works shall be performed by a minimum AQF Level 3 arborist and shall 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.
- 5.3.2 Tree removal of prescribed trees is subject to permit from the relevant consent authority.

### 5.4 Other

- 5.4.1 No washing or rinsing of tools or other equipment, preparation of any mortars, cement mixing, or brick cutting is to occur within 8m upslope of any palms or trees to be retained.
- 5.4.2 Regular monitoring of the trees during development works for unforeseen changes or decline will help maintain the trees in a healthy state.

## 6 References

- Barrell, J (1995) Pre-development Tree Assessment from Trees and Building Sites, Eds. Watson & Neely, International Society of Arboriculture, Illinois.
- IACA, 2010, IAVA Significance of a Tree, Assessment Rating System (STARS), Institute of Australian Consulting Arboriculturists, Australia.
- 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.
- Northern Beaches Mapping, <https://nb-icongis.azurewebsites.net/>, accessed 14 December 2024.
- Pittwater 21 Development Control Plan,  
<https://eservices.northernbeaches.nsw.gov.au/ePlanning/live/pages/plan/Book.aspx?exhibit=PDGP&hid=12334>, accessed 14 December 2024.
- Pittwater Local Environmental Plan 2014, [Pittwater Local Environmental Plan 2014 | Planning Portal - Department of Planning and Environment](#), accessed 14 December 2024.
- Standards Australia AS4373-2007: Pruning of Amenity Trees, Standards Australia, Sydney.
- Standards Australia AS4970-2009 Protection of trees on development sites, Standards Australia, Sydney.

## Appendix A - Terms and Definitions

### Age classes

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

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

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

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

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

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

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

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

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

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

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

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

## Appendix 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, 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 D - 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 						
	<b>Priority for Retention (High)</b> -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 <i>Protection of trees on development sites</i> . Tree sensitive construction measures must be implemented e.g., pier and beam etc if works are to proceed within the Tree Protection Zone.					
	<b>Consider for Retention (Medium)</b> -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.					
	<b>Consider for Removal (Low)</b> -These trees are not considered important for retention, nor require special works or design modification to be implemented for their retention.					
	<b>Priority for Removal</b> -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](http://www.iaca.org.au)

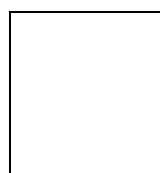




## Appendix E - Schedule of Assessed Trees

Tree No.	Species	Ht (m)	Sp (m)	DBH (m)	AB (m)	Age	V	C	Comments	ULE	TSR	RV	SRZ (m)	TPZ (m)
1	<i>Syagrus romanzoffiana</i> <b>Cocos Palm</b>	16	5	.26	.30	M	G	G	Exempt Species. All Palms other than <i>Livistona australis</i> are Exempt.	2a	M	M	NA	6
2	<i>Casuarina glauca</i> <b>Swamp She-oak</b>	17	6	.52	.65	M	G-F	F-P	Previously Lopped. Included Bark throughout canopy.	2a	M	M	2.76	6.24
3	<i>Archontophoenix cunninghamiana</i> <b>Bangalow Palm</b>	9	3	.20	.24	M	G-F	G-F	Exempt Species. All Palms other than <i>Livistona australis</i> are Exempt.	2a	M	M	NA	4

### KEY



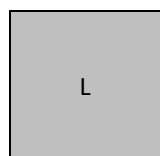
Trees to be retained.



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



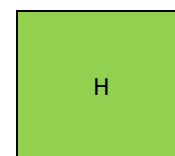
Trees proposed to be removed.



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



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



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

## KEY continued.

\* **DBH/AB** is visually estimated (usually adjoining trees or those that are hard to access). **AB** – above *buttress roots*. **AGL** – above ground level.

Figures in brackets indicate the determined DBH and TPZ for a multi-stemmed tree based on the formula shown in Appendix A of AS4970-2009.

**NOTE:** According to AS4970, the TPZ of palms, other monocots, cycads, and tree ferns should not be less than 1m outside the crown projection. The AS4970 formula for calculating the SRZ of a tree does not apply to palms, other monocots, cycads, and tree ferns.

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

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

**DBH** refers to the approximate diameter of tree stem at breast height i.e., 1.4 metres above ground (unless otherwise noted) and expressed in millimetres. Figures in brackets indicate the minimum TPZ allowable as per Section 3.2 Determining the TPZ with AS4970-2009.

**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.

## The following abbreviations are used in relation to Vigour and Condition:

<b>G</b>	Good
<b>G-F</b>	Good-Fair
<b>F</b>	Fair
<b>F-P</b>	Fair-Poor
<b>P</b>	Poor

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

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

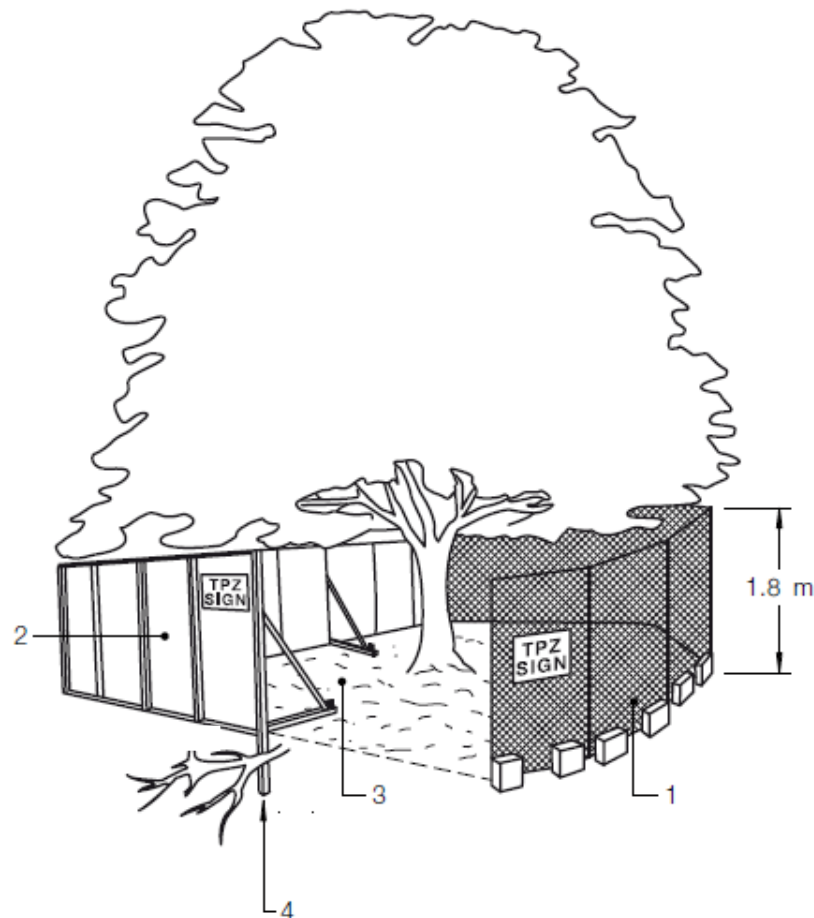
**RV** Refers to the retention value of a tree, based on the tree’s ULE *and* Tree Significance. Refer to Appendix C – Significance of a Tree Assessment Rating for more detail.

**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.



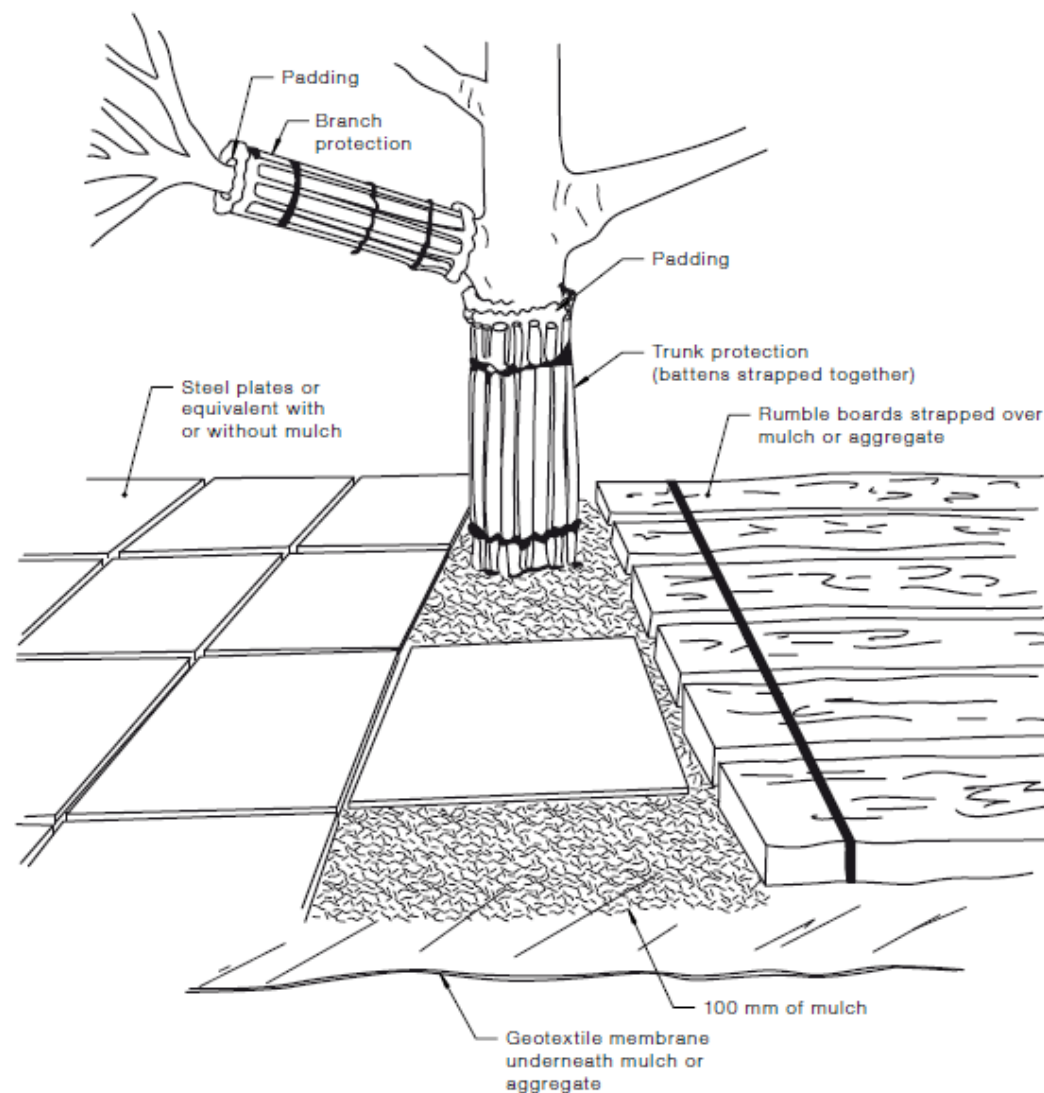
## Appendix F - Tree Protection Devices



### LEGEND:

1. Chain wire mesh panels with shade cloth (if required) attached, held in place with concrete feet.
2. Alternative plywood or wooden paling fence panels. This fencing material also prevents building materials or soil entering the TPZ.
3. Mulch installation across surface of TPZ (at the discretion of the project arborist). No excavation, construction activity, grade changes, surface treatment or storage of materials of any kind is permitted within the TPZ.
4. Bracing is permissible within the TPZ. Installation of supports should avoid damaging roots.





**NOTES:**

1. For trunk and branch protection use boards and padding that will prevent damage to bark. Boards are to be strapped to trees, not nailed, or screwed.
2. Rumble boards should be of a suitable thickness to prevent soil compaction and root damage.



## Appendix G - Photographs



Image 1. Tree 1, 2 & 3 in Situ



Image 2. Tree Showing Included Bark





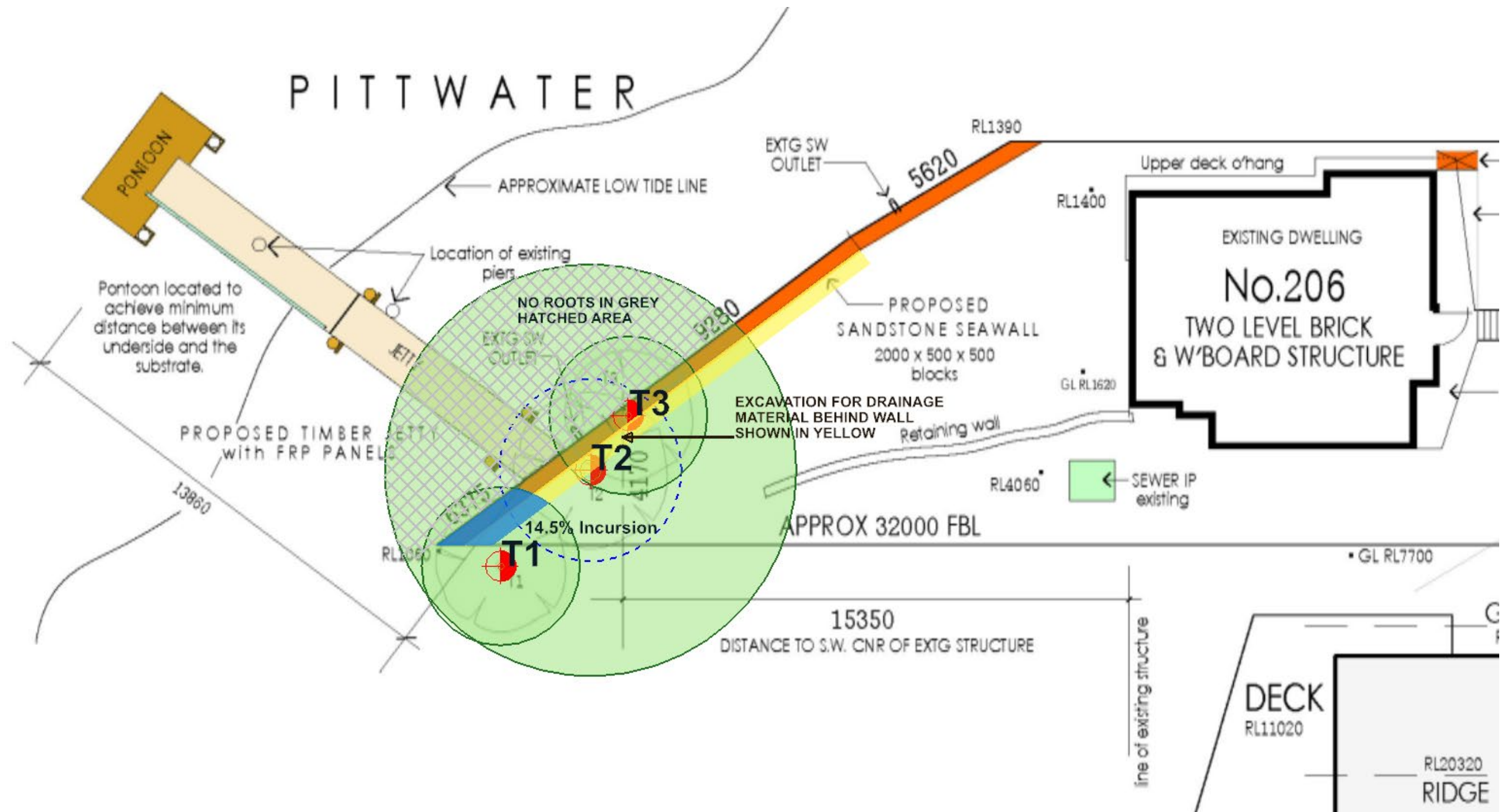
Image 3. Tree 2 Showing Included Bark



Image 4. Dilapidated Seawall showing casuarina roots along top edge

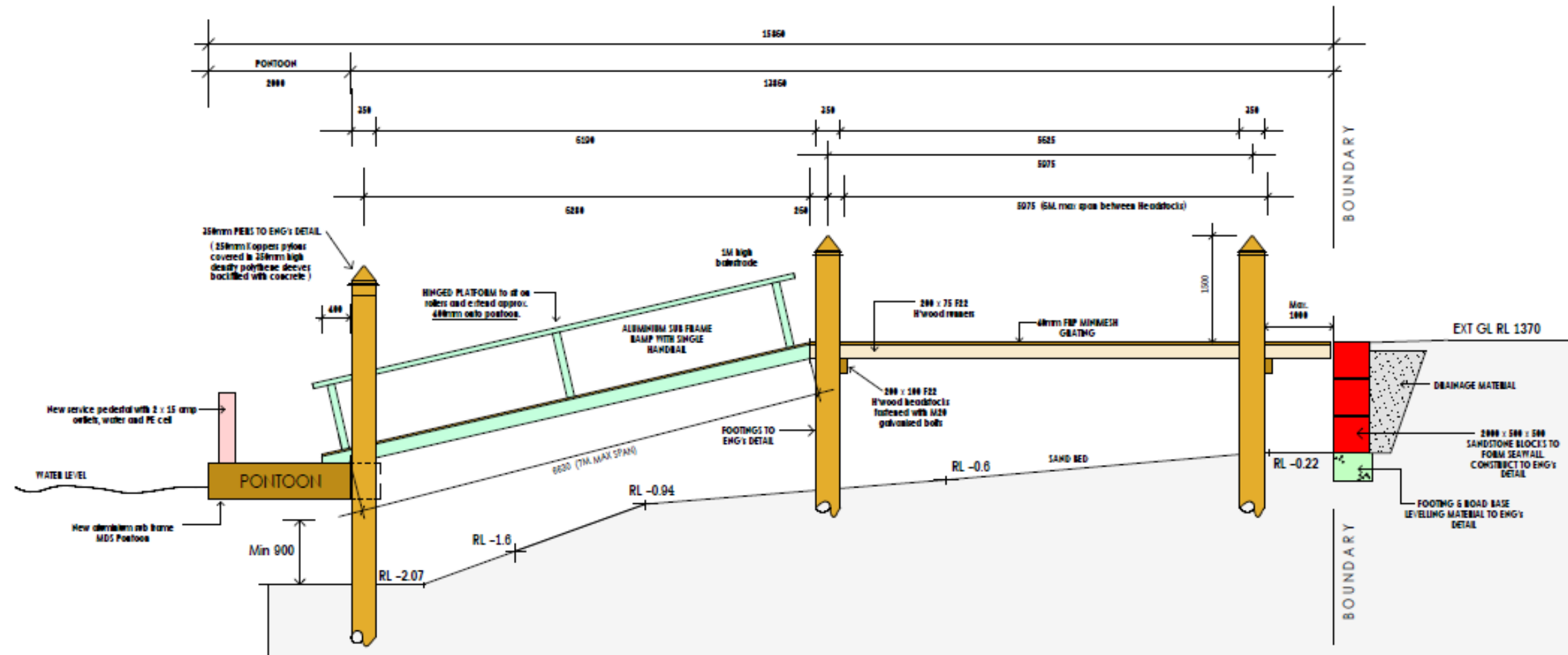


Appendix H - Incursion Plan



Marked up – G. Nugent (Not to Scale)

Appendix I – South West-Elevation



SOUTH WEST ELEVATION

JETTY APPLICATION  
FOR  
PROPOSED NEW DWELLING