

Arboricultural Impact Assessment & Tree Protection Plan



Prepared For
Mr. S Duncan
100A Wakehurst Parkway,
ELANORA HEIGHTS NSW 2101

SITE ADDRESS
100A WAKEHURST PARKWAY
ELANORA HEIGHTS NSW 2101

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1 Introduction

1.1 Brief

- 1.1.1 This Arboricultural Impact Assessment (AIA) was prepared by Chantalle Hughes of Treeism Arboricultural Services. This report was commissioned by Mr Rod Worthington of YSCO Geomatics on behalf of the client. The Site is identified as Lot 2 of DP 1177671 and known as 100A Wakehurst Parkway, Elanora Heights, New South Wales.
- 1.1.2 The purpose of this report is to identify the species of each assessed tree, assess their vigour, condition, landscape prominence and ascribe a Retention Value to each tree.
- 1.1.3 The Structural Root Zone (SRZ) and the Tree Protection Zone (TPZ) of each tree is established using the formula provided within the Australian Standard 4970-2009 Protection of trees on development sites (AS4970).
- 1.1.4 This report identifies the 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.
- 1.1.5 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.
- 1.1.6 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.
- 1.1.7 This AIA is not intended as an assessment of any impacts on the trees by any proposed future development of the site.

1.2 Methodology

- 1.2.1 In preparation for this report, ground level, visual tree assessments¹ or limited VTA (e.g. where access was limited), of six (6) trees was completed by the author of this report on 12th August 2020. Inspection details of these trees are provided in Appendix 5 — Schedule of Assessed Trees.
- 1.2.2 The tree heights were visually estimated or measured using a Nikon ForestryPro, unless otherwise noted in Appendix 5, the trunk Diameter at Breast Height were measured at 1.4 metres above ground level (DBH) using a diameter tape unless indicated otherwise. Tree canopy spreads were stepped out with field observations written down, and photographs of the site and trees were taken using an iPhone SE.
- 1.2.3 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 Visual Tree Assessment (VTA) is a procedure of defect analysis developed by Mattheck and Breloer (1994) that uses the growth response and form of trees to detect defects.

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

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

- AS4970-2009 Protection of trees on development sites, Standards Australia;
- Pittwater 21 Development Control Plan (DCP) 2014, Part B Section 22.
- Design of Proposed Inclinator within Lot 2 D.P. 1177671, marked up over Survey Plan, Plan no. 3620/1, authored by YSCO Geomatics (Original survey P.R King & Sons Pty Ltd), dated 29 July 2020.
- Standard Details for Inclinator (generic) Drawing no. 4356 Sheet 1-5, Revision A, authored by Rooney & Bye Consulting Civil and Structural Engineers, dated 28/8/2006.

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 the Pittwater 21 Development Control Plan (DCP) 2014, Part B Section 22.

2 Observations and Discussion

2.1 Threatened Species

2.1.1 One (1) assessed tree (Tree 1) has been tentatively identified as a *Eucalyptus scoparia* (Wallangarra White Gum) which is subject to endangered conservation status under NSW State Government legislation (i.e. NSW Biodiversity Conservation Act 2016) and vulnerable status under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999).

2.1.2 This listing is only pertinent within the species natural regional distribution area of near Tenterfield, NSW and not a planted specimen well outside its natural habitat.

2.2 Assessed Trees

2.2.1 Six (6) trees (prescribed and non-prescribed) were assessed or identified and are included in this report. Details of these are included in the Schedule of Assessed Trees—Appendix 5.

2.2.2 **Tree numbers**—of the 6 assessed trees, the following is noted:

- Two (2) trees located on land adjacent to the subject site trees have been removed by the tree owners—Tree 3 & 4.
- Two (2) trees are prescribed and are located on the subject site—Tree 1 & 2.
- One (1) tree is prescribed and located on land adjacent to the subject site—Tree 5.

2.2.3 **Species origin** — Of the 4 prescribed trees, the following is noted:

- Three (3) prescribed trees are locally native species—Tree 2, 5 & 6.
- One (1) prescribed tree is an introduced native species—Tree 1.

- 2.2.4 The 4 prescribed trees and their respective Retention Value (RV) are identified in Table 1, below. Note: Refer to Appendix 3 for the methodology used to assess the Retention Value of a tree.

Table 1—Tree Identification and Retention Value, where **L** = Low, **M** = Medium, **H** = High. **R** = proposed removal.

Tree No.	Genus & species Common Name	RV	Tree No.	Genus & species Common Name	RV
1	<i>Eucalyptus scoparia</i> Wallangarra White Gum	H	6	<i>Ficus rubiginosa</i> Port Jackson Fig	H
2	<i>Synoum glandulosum</i> Scentless Rosewood	L			
5	<i>Syzygium smithii</i> Lilly Pilly	L			

3 Impact of the Proposed Development

3.1 Potential Required Removal of Prescribed Trees

- 3.1.1 One (1) tree would be required to be removed to allow for the proposed works:

- Tree 2 *Synoum glandulosum* (Scentless Rosewood) – located just over 0.5m from the proposed inclinorail rail this low Retention Value (RV) tree would require excessive pruning for clearance and thus would require removal.

3.2 Proposed Prescribed Tree Retention

- 3.2.1 The following prescribed three (3) trees are proposed to be retained:

- Tree 1 *Eucalyptus scoparia* (Wallangarra White Gum) – located on the subject site.
- Tree 5 *Syzygium smithii* (Lilly Pilly) – located adjacent to the subject site.
- Tree 6 *Ficus rubiginosa* (Port Jackson Fig) – located on the subject site.

- 3.2.2 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 under the consideration set out in Section 3.3.4 of AS4970.

- 3.2.3 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/next page.

Table 2 – Indicates whether encroachment occurs into the SRZ and/or TPZ of trees proposed for retention. 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 (m2)	TPZ encroachment (approx. m2)	TPZ encroachment (approx. %)
1	Wallangarra White Gum	✓	*see 3.2.4	241	6.4	2.7
5	Lilly Pilly	✗	✓	18	2.1	11.7
6	Port Jackson Fig	✓	✗	255	3.8	1.5

3.2.4 Tree 1 – Wallangarra White Gum – located on subject site.

Structural Root Zone impacts:

- The proposed top deck/landing is located within the calculated SRZ of this specimen. However, this landing is proposed beyond a previous cut for the existing retaining wall, the level of the proposed landing deck is significantly lower than the base of the tree.
- No root activity was noted beyond the retaining wall during assessment, no cracking of the retaining wall or uplift in the existing pavers was noted. It is highly unlikely roots will be encountered during works.

Tree Protection Zone impacts:

- A landing deck, one (1) 'anchor' block footing and one (1) intermediate column/footing (see Appendix 7) will be located within the TPZ of this specimen. Reviewing the specifications within the Engineer drawings, (using the largest potential pier size to ensure an overestimate rather than an under estimation of impacts), and allowing for a likely 200mm over excavation on each side for the footing, an total encroachment of 6.4m² or 2.7% has been calculated. This is a minimal encroachment however given works area proposed within the SRZ, so this places works in the *major* encroachment category under AS4970.
- As discussed within the SRZ, it is unlikely roots would be encountered during works given the existing retaining wall limiting root ingress, but flexible pier/footing placement would be required should roots be encountered.

Pruning impacts: No pruning is foreseen, as works are located well below the canopy of the tree.

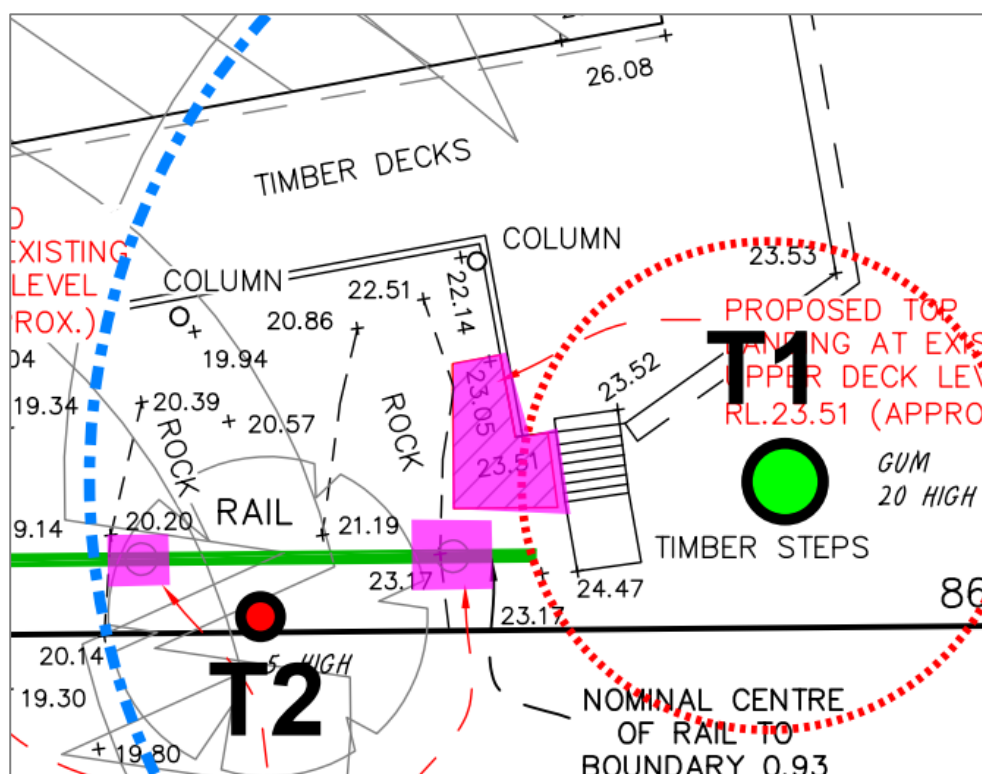


Figure 1 – Tree 1 – Proposed encroachment- red dotted circle SRZ, blue dashed TPZ. Pink shading represents encroachment. (excerpt of YSCO Geomatics Design).
Not to scale. Marked up by C. Hughes.

3.2.5 Tree 5 – Lilly Pilly – located on adjacent site.

Structural Root Zone impacts:

- One (1) 'intermediate' column/footing (see Appendix 7) will be located within the SRZ. Preferably this would be relocated outside the SRZ of this tree to reduce possible impacts on this tree.

Tree Protection Zone impacts:

- One (1) intermediate column/footing and realignment of the existing path and steps is proposed within the TPZ of this specimen. As previously discussed, ideally the proposed pier placement would be located outside the calculated SRZ of this tree, an encroachment of 2.1m² or 11.7% has been calculated. This places works in the major encroachment under AS4970.
- Should the pier be relocated this would significantly reduce the impacts on this tree. Given the path is currently in place no new loss of available resources would occur.

Pruning impacts:

- Some very minor pruning may be required to accommodate access for the proposed inclinor, however given the canopy is mainly clear on the subject site side (see Plate 7) this would equate to one small branch to be pruned.
- Given the narrow canopy of the tree, the pruning required will be within acceptable standards under the AS4373 Pruning of Amenity Trees.

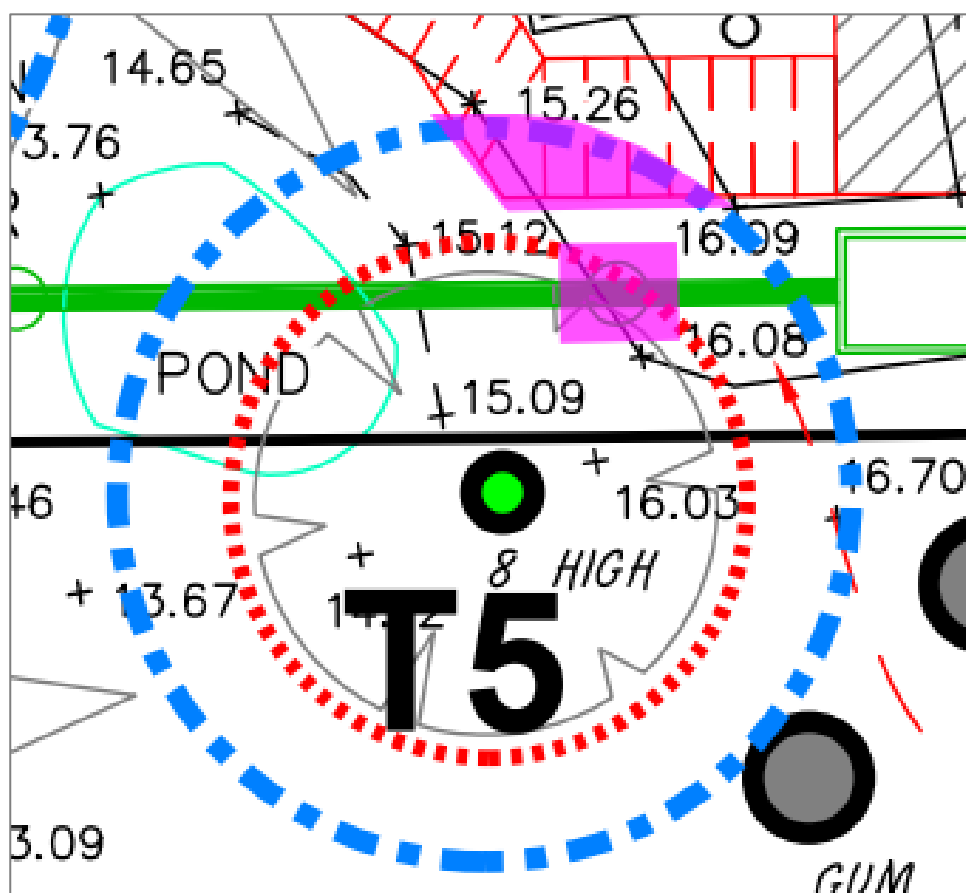


Figure 2 – Tree 5 – Proposed encroachment, red dotted circle SRZ, blue dashed TPZ. Pink shading represents encroachment. (excerpt of YSCO Geomatics Design). Not to scale. Marked up by C. Hughes.

3.2.6 Tree 6 – Port Jackson Fig – located on subject site.

Structural Root Zone impacts:

- All proposed works are located outside the SRZ.

Tree Protection Zone impacts:

- Two (2) intermediate column/footings, one (1) 'anchor' block footing, realignment of the existing path and steps and landing platform is proposed within the TPZ of this specimen.
- A total encroachment of 3.8m² or 1.5% has been calculated within the TPZ placing it in the minor category under AS4970. Additionally this specimen is lithophytic with a mass of roots cascading down the existing rock outcrop, usual TPZ calculations do not really suit this specimens current growth habit. No root activity was noted to the east of the existing path/stairs.
- I do not believe the proposed works will affect the long term survival of this specimen.
- Pruning impacts: Pruning will be required to accommodate the access for the inclinometer (see Plate 8). Pruning required will be under 10% of the total live canopy of the tree and compliant AS4373 Pruning of Amenity Trees.

4 Conclusions

- 4.1.1 A total of six (6) trees are included in this Arboricultural Impact Assessment.
- 4.1.2 Two (2) trees located on neighbouring property have been completely or partially removed by the tree owners since the survey plan was undertaken.
- 4.1.3 One (1) assessed tree (Tree 1) has been identified as endangered and vulnerable under State and Federal Government legislation, however the tree is planted and well outside its regional distribution. This tree is being retained and not adversely affected as a result of the proposed works, provided the recommendations of this report are adopted.
- 4.1.4 One (1) tree ascribed a low Retention Value tree (Tree 2) will require removal to accommodate the proposal.
- 4.1.5 One (1) neighbouring tree will have the SRZ impacted should works not be relocated. Once the pier is relocated outside the SRZ, works are supportable from an Arboricultural prospective.
- 4.1.6 Provided the recommendations of this report are adopted, adverse impacts on the vitality and condition of the trees to be retained are unlikely.

5 Recommendations

5.1 Tree Removal

- 5.1.1 One (1) ascribed low Retention Value tree (Tree 2) will require removal to accommodate the proposal.
- 5.1.2 Tree removal is at the discretion of Council approving such, no work should be carried out prior to approval.
- 5.1.3 Tree removal works are to be carried out by an AQF Level 3 Arborist.
- 5.1.4 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.
- 5.1.5 Tree removals shall be in accordance with the Work Health and Safety Act 2011 and the Work Health and Safety (WHS) Regulations 2011.

5.2 Project Arboriculturist

- 5.2.1 A Project Arboriculturist (PA) shall be engaged prior to further works commencing on the site.
- 5.2.2 The PA must have a minimum Australian Qualification Framework Level 5 (AQF5) or above in Arboriculture.
- 5.2.3 Duties of the PA shall include, but not be limited to:
 - Liaising with the Project Manager/Head Contractor/Site Manager to confirm the tree protection fencing locations, construction access, and other specific tree protection requirements prior to site works commencing.

- 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.
- Provision of Compliance Certification if, and when required.

5.3 Minimising Impacts on Trees to be Retained

5.3.1 Tree 1 – Wallangarra White Gum – located on subject site.

- Protect Tree 1 by placing temporary fencing and signage as per Figure 1 & 2 and Appendix 9 direction.
- Any ground level changes within the calculated TPZ the subject tree are to be supervised by the Project Arborist/Council.
- No canopy pruning is considered to be required.
- Refer to Section 6 & 7 of this report for further tree protection measures.

5.3.2 Tree 5 – Lilly Pilly– located on adjacent site.

- Protect Tree 5 by providing stem protection as per Appendix 9 and Figure 3 (Key 2) direction.
- Any ground level changes within the calculated TPZ the subject tree are to be supervised by the Project Arborist/Council.
- Canopy pruning shall be carried out by an AQF Level 3 Arborist and to a maximum 5% of the total live canopy and maximum branch diameter of 50mm.
- Refer to Section 6 & 7 of this report for further tree protection measures.

5.3.3 Tree 6 – Port Jackson Fig– located on subject site.

- Given the tree location on top of a rock outcrop, well out of the works zone, stem protection or ground protection is not deemed necessary in this instance.
- Any ground level changes within the calculated TPZ are to be supervised by the Project Arborist/Council.
- Canopy pruning shall be carried out by an AQF Level 3 Arborist and to a maximum 10% of the total live canopy.
- Refer to Section 6 & 7 of this report for further tree protection measures.

6 General Tree Protection Measures

6.1 Stockpiling

- 6.1.1 Any ground identified for proposed stockpiling that is within the TPZ of trees to be retained shall be covered with thick, coarse mulch, placement of wooden pallets over the mulch, covering of the pallets with a tarpaulin (or similar), and the placement of materials on top of this device to prevent loose or potentially contaminating materials from moving into the soil profile.

6.2 Fill Material

- 6.2.1 Placement of fill material within the TPZ of trees to be retained should be avoided where possible. Where placement of fill cannot be avoided, the material should be a coarse, gap graded material such as 20 — 50mm crushed basalt or equivalent to provide some aeration to the root zone. Note that roadbase or crushed sandstone or other material containing a high percentage of fines is unacceptable for this purpose.
- 6.2.2 The fill material should be consolidated with a non-vibrating roller to minimise compaction of the underlying soil.
- 6.2.3 A permeable geotextile may be used beneath the sub-base to prevent migration of the stone into the sub-grade. No fill material should be placed in direct contact with the trunk.

6.3 Hygiene Practices

- 6.3.1 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/trees to be retained.

7 Post Construction Tree Care Measures

7.1 Mulching

- 7.1.1 The removal of mulch after construction to remove any contaminants and its replacement with a good quality mulch and addition of 10% organic matter will improve beneficial soil micro-organisms, retain moisture and improve aeration and water infiltration.

7.2 Irrigation

- 7.2.1 An arboriculturist should determine whether irrigation should be carried out during extended periods of drought.

7.3 Pest Management

- 7.3.1 Monitoring is required, as trees under stress are more prone to insect attack.

8 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.

https://www.treetec.net.au/tpz_srz_dbh_calculator-2/ - Accessed 27 August 2020.

9 Acknowledgements

Credit to Catriona Mackenzie of Urban Forestry Australia Pty Ltd for large areas of text and general layout.

Report prepared by Chantalle Hughes – August, 2020



Chantalle Brackenridge Hughes

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Tree Surgery Certificate

Advanced Certificate Urban Horticulture

Diploma of Horticulture (Arboriculture) *Credit* – AQF Level 5

ISA Tree Risk Assessment Qualification (TRAQ) 2016

Accredited Member of Institute of Australian Consulting Arboriculturists (IACA)

Affiliate Member of the Local Government Tree Resources of Australia (LGTRA)

Member of the International Society of Arboriculture (ISA)

10 Appendices

Appendix 1 – 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.

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 2 – 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 3 – 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 3 – 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 Tree Pty Ltd and Andrew Morton in June 2001.


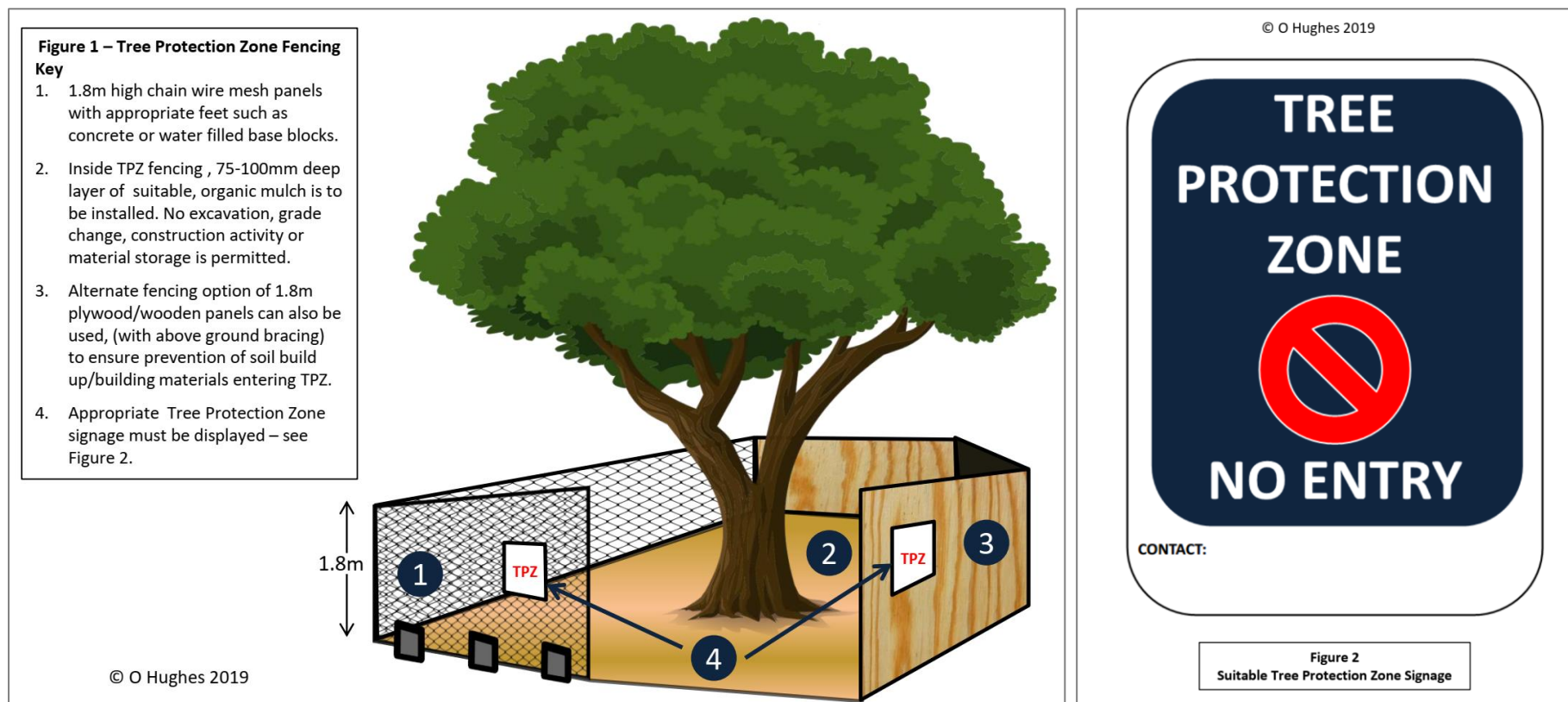
		Significance				
		1. High	2. Medium	3. Low		
		Significance in Landscape	Significance in Landscape	Significance in Landscape	Environmental Pest / Noxious Weed Species	Hazardous / Irreversible Decline
Estimated Life Expectancy	1. Long >40 years					
	2. Medium 15-40 Years					
	3. Short <1-15 Years	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

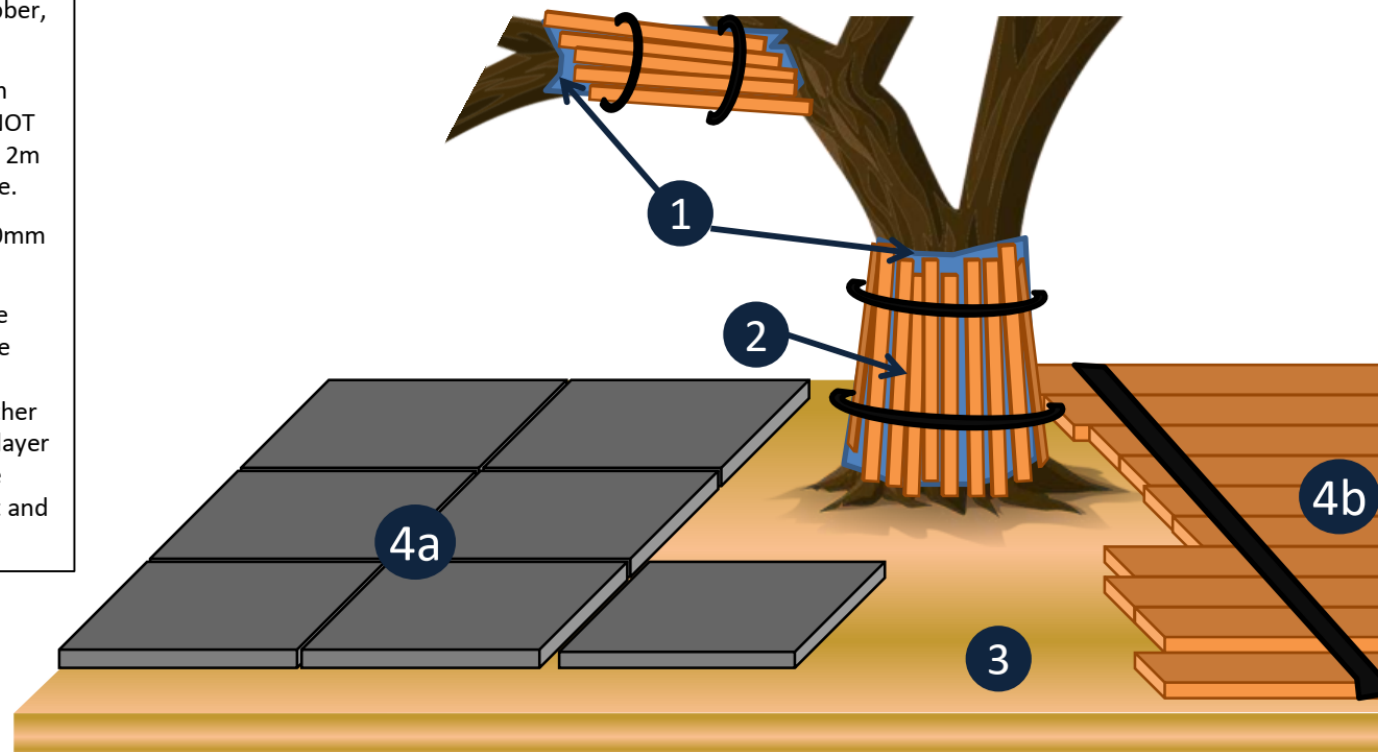


Figures 1 & 2 – Tree Protection Fencing and appropriate signage.

Figure 3 - Stem, Branch & Ground protection measures

Key

1. Padding (such as geotextile membrane, natural hessian, rubber, or carpet to protect bark).
2. Battens/boards for branch/stem protection, strapped together NOT nailed into bark/tree. Minimum 2m in height on stem where feasible.
3. Ground protection base 75-100mm of fit for purpose mulch.
4. If machinery is required to move within the TPZ then steel rumble boards (4a) or wide, timber sheeting/boards thrashed together (4b) is to be placed over mulch layer (preferably with geotextile base layer), this to spread the weight and minimise soil compaction



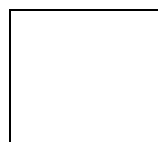
© O Hughes 2019

Figure 3 – Stem and ground protection measures.

Appendix 5 – Schedule of Assessed Trees – Site inspection 12/8/2020, 100A Wakehurst Parkway, Elanora Heights.

Tree No.	Genus & species Common Name	Ht (m)	Sp (m)	DBH (mm)	Age	V	C	Comments	ULE	TSR	RV	SRZ (m)	TPZ (m)	TPZ (area)
1	<i>Eucalyptus scoparia?</i> Wallangarra White Gum?	8	4	725	M	G	G	Introduced native species. Deadwood to 80mm Ø noted. High percentage of epicormic growth noted but suspect recovery from recent drought.	2A	H	H	3.1	8.8	241
2	<i>Synoum glandulosum</i> Scentless Rosewood	9	5	100 / 150	M	G	F-P	Locally native species. Covered in vine, limited assessment. Appears to be reshoot/suckers from a stump.	3A	L	L	1.7	2.2	15
3	Recently removed Gum	-	-	-	-	-	-	Located on neighbouring property. Removed by neighbour recently.	-	L	L	-	-	-
4	Recently removed Gum – bole still insitu during site inspection	-	-	-	-	-	-	Located on neighbouring property. In process of being removed by neighbour.	-	L	L	-	-	-
5	<i>Syzygium smithii</i> Lilly Pilly	7	4	*200 AB	EM	G	F-P	Located on neighbouring property. Locally native species. Poor form, twisted codominant stems @ 2.5m AGL. Limited assessment.	3A	M	L	1.7	2.4	18
6	<i>Ficus rubiginosa</i> Port Jackson Fig	10	20	* 300 X 5 200 X 3	M	G	G	Locally native species. Limited assessment as access difficult as tree located on rock outcrop. Tree has been lopped/topped previously.	1A	H	H	3.1	9.0	255

KEY



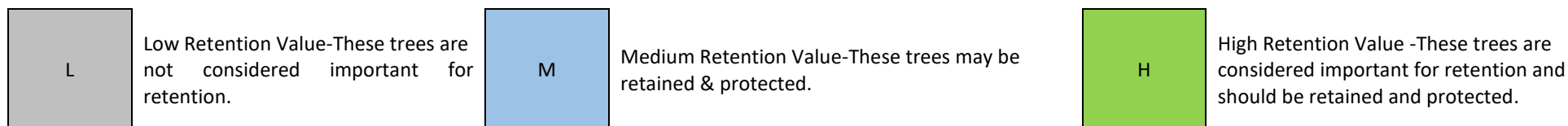
Trees to be retained.



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.



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

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

SRZ & TPZ in groups of trees taken from the largest stem diameter of the group.

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 1 -Terms and Definitions for more detail.

V refers to the tree’s vigour (health) Refer to Appendix 1 -Terms and Definitions for more detail.

C refers to the tree’s structural condition. Refer to Appendix 1 -Terms and Definitions for more detail.

ULE refers to the estimated *Useful Life Expectancy* of a tree. Refer to Appendix 2 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 3 – 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 3 – 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 1 -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 1 -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 6 – Photographs



Plate 1 – Tree 1– Arrow notes retaining wall currently within the SRZ of this specimen. Landing/deck for inclinator will extend off existing deck on the other side of the timber stairs.



Plate 2 – Tree 1 – Canopy of tree has deadwood and epicormics but is vigorous.



Plate 3 – Tree 2 – tree requires removal to accommodate the proposal as canopy in location of rain for inclinor.



Plate 4 – Tree 2 – Arrow notes that tree is regrowth from old stump.



Plate 5 – Tree 4 – Arrow notes bole of partially removed neighbours tree, as found during site inspection.



Plate 6 – Tree 5 – Arrow notes twisted codominant branches of neighbours Lilly Pilly.



Plate 7 – Tree 5 – Arrow notes location of tree, note lack of canopy on site and location of inclinor



Plate 8 – Tree 6 – Arrow notes low limbs that will require pruning to accommodate inclinor access.

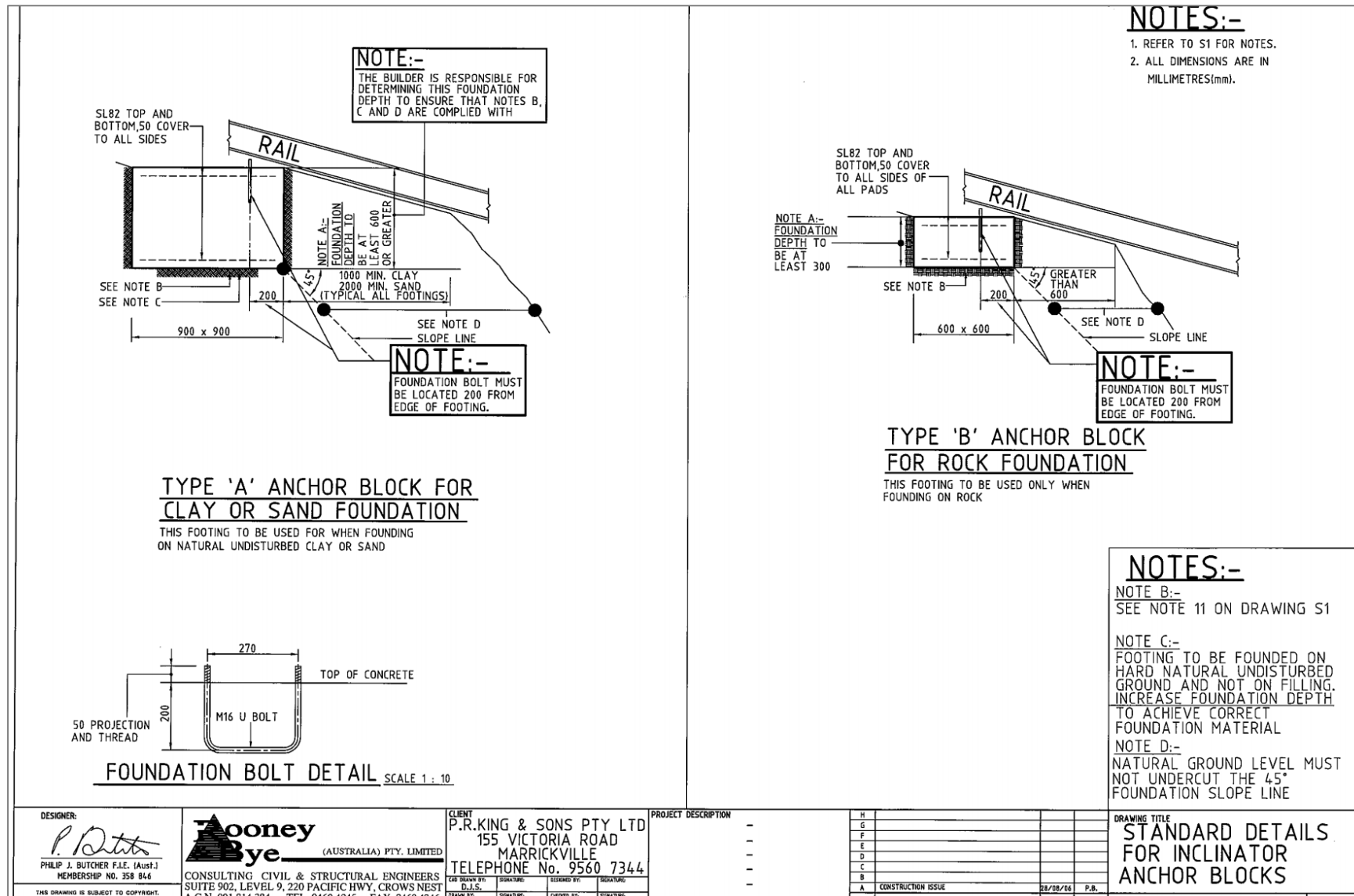


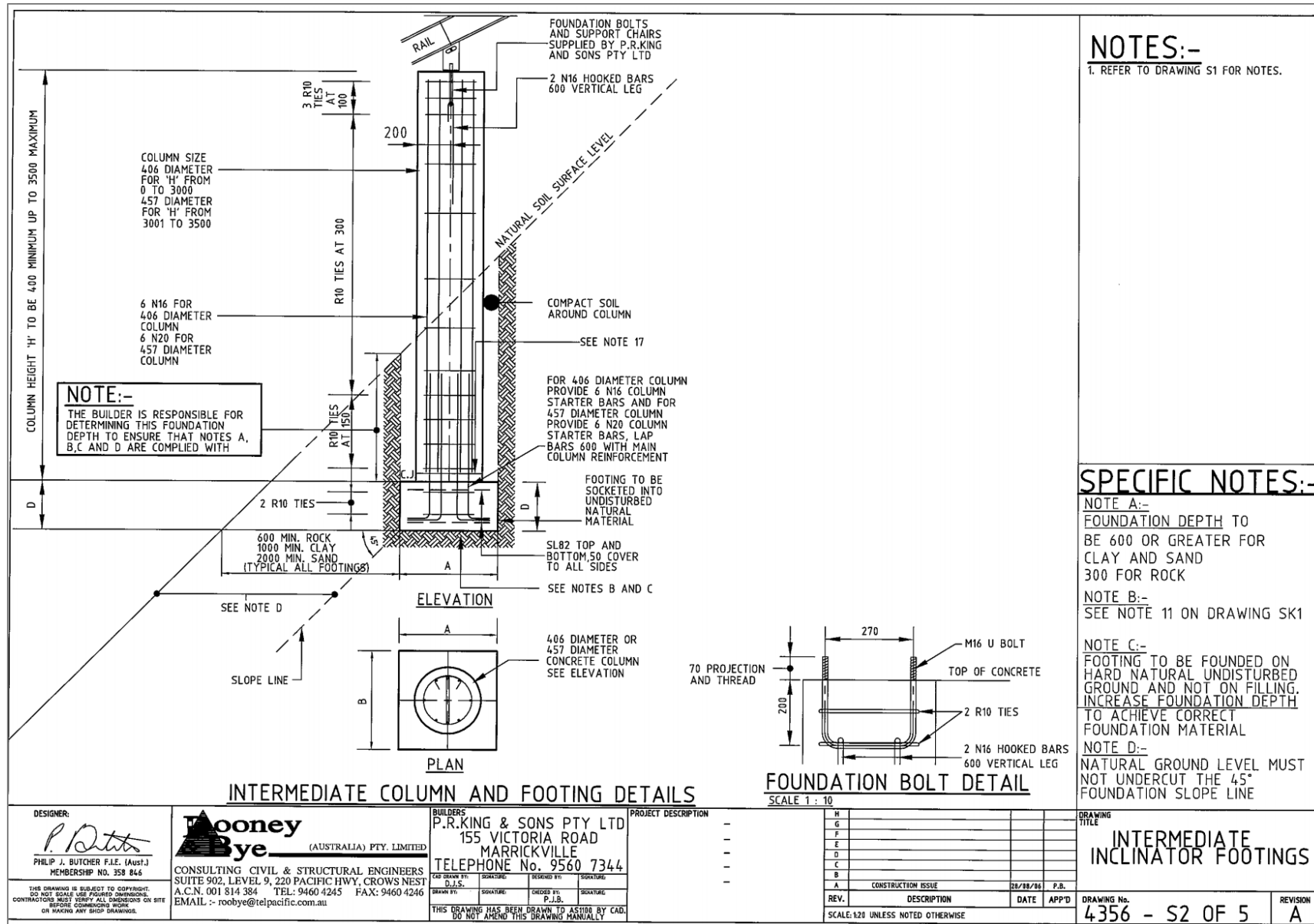
Plate 9 – Tree 6 – Tree is located on top of rock outcrop.



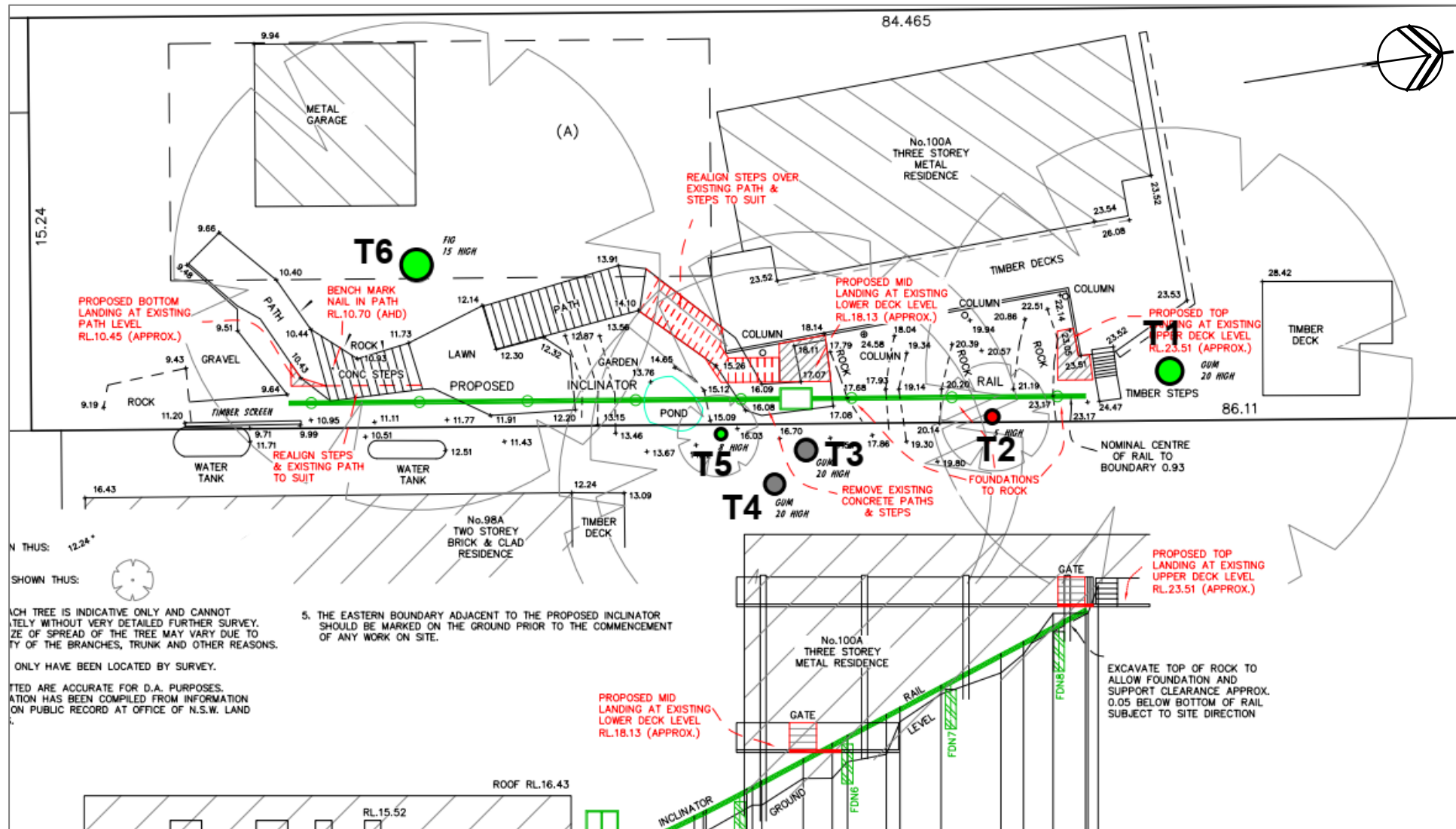
Plate 10 – Tree 6 – Concrete steps are located between proposed inclinator location and Tree 6. No obvious root activity was noted however can will be required if removing existing steps within the TPZ of this tree.

Appendix 7 – Inclinator Detail (Guide only) – Excerpt of Rooney & Bye - Civil & Structural Engineers Drawing no. 4356.





Appendix 8 – Tree Location Plan – Marked up excerpt of YSCO Geomatics – Design of Proposed Inclinator Within Lot 2 D.P. 1177671.



Appendix 9 – Tree Protection Plan – Marked up excerpt of YSCO Geomatics – Design of Proposed Inclinator Within Lot 2 D.P. 1177671.

