



MONACO
DESIGNS PL

ARBORICULTURAL IMPACT REPORT

For:
Bathla

Site Address:
182 Guntawong Road,
Riverstone

Site Inspection Date:
02nd September 2019

Report Issue Date:
28th January 2021

Job No:
5378

mb: 0409123200

email: paul@monaco.net.au abn: 69078380168

**TREE REPORTS LANDSCAPE PLANS
VEGETATION MANAGEMENT PLANS**

IMPORTANT NOTES – Trees on development sites (and neighbouring properties) can potentially render it undevelopable, or reduce potential yield. Developers and builders should obtain advice from a Consulting Arborist prior to purchasing a site, or engaging a Building Designer. A simple site analysis of significant trees and determining their TPZ's could save all parties involved significant time and money.

Many trees contain internal defects, of which many cannot be determined without dissection. These defects could be from genetic, human or environmentally influenced factors that may be hazardous to persons or property. Although deaths are rare from falling trees, common sense should prevail in extreme weather conditions.

This report was not written with the intention of being used in a court of law.

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DOCUMENT CONTROL

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1. Executive Summary – Key points

- 1.1. Trees to be retained – T22-T25
- 1.2. AS 4970-2009 ‘Protection of Trees on Development Sites’ (here after ‘The Standard’) – Section 2.3.5 – states ‘...*the location of tree protection measures should also be shown on other documents such as demolition, bulk earth works, construction and landscape plans.*’
- 1.3. Appointment of Project Arborist is required to document and log all works in relation to retained trees. This documentation is to be forwarded to Council or PCA at end of construction works.
- 1.4. An 1800mm temporary chain wire fence (with plastic feet – not posts driven into ground) is to be installed to protect trees. It is to be erected prior to demolition / excavation / benching and remain until the end of the construction period. Refer to attached diagram for fence locations and or setback dimensions. (Note: - Dimensions have been set by CAD and should be rounded up.)
- 1.5. Signage is to be placed on fencing, outlining appointed Project Arborist with mobile phone number.
- 1.6. All contractors / consultants on the site should be inducted to the penalties that may apply if the tree protection area is breached.
- 1.7. Contractors to expect that all trenching and excavation within the designated TPZ must be undertaken by hand, under the supervision of the Project Arborist. No changes to NGL’s over site are required.

2. Introduction

- 2.1 This report has been commissioned by Ms Emma Fleming on behalf of Bathla to appease contention 14.
- 2.2 The expert witness code of conduct has been read.

3. Documents Provided

- 3.1 Preliminary Tree Report – undertaken by Monaco Designs on 3rd September 2019.
- 3.2 Proposed Subdivision and RFB Binder – Barker Stewart Ryan – Rev C – 150121
 - 3.2.1 Cover Sheet
 - 3.2.2 General Arrangement Plan – Tree numbering imposed
 - 3.2.3 Engineering Plan Sheet 1 of 2
 - 3.2.4 Engineering Plan Sheet 2 of 2
 - 3.2.5 Lot 1 Engineering Plan
 - 3.2.6 Bulk Earthworks Plan

4. Method and Limits

- 4.1 Information within this report relies upon the finding within the Preliminary Tree Report findings as per Section 3.1.
- 4.2 Observations and recordings of the trees were made using the Visual Tree Assessment (VTA) at ground level during the site inspection as dated. The VTA '*interprets the body language of trees, linking internal defects to the trees own repairs structures....so trees that are apparently dangerous should be distinguished from trees that are really dangerous...*' (Mattheck 2007). No invasive, or explorative tests, ie dissections, excavation, probing, coring or aerial inspections were undertaken.
- 4.3 Access was not completely accessible to the site. However, many trees were noted as endemic Cumberland Plain Woodland regrowth.
- 4.4 As many trees are endemic and typical of a forest setting, their retention value is deemed very high. However, many of the faults would not be tolerated within a residential setting.
- 4.5 As the scope for the report is limited to development impact and retention value, a thorough VTA was not conducted for hazard reduction purposes.
- 4.6 Photographs included within this report were taken at time of initial inspection, unless noted otherwise.
- 4.7 Blacktown City Council's Tree Preservation Order (TPO) states:- "tree" - means a perennial plant not less than one meter high with at least one self-supporting woody stem which is a plant of a species, variety or cultivar, each of the members of which, if permitted to grow to its maturity, would generally have a height in excess of 3 metres
- 4.8 Construction will be concrete slab and brick veneer.
- 4.9 Terminology used in this report is explained in Section 8.
- 4.10 Crown spreads are taken as an average of the radii, unless the crown is severely distorted or the issue requires more accurate dimensioning.
- 4.11 The Australian Standard AS 4970-2009 'Protection of Trees on Development Sites' is utilised where applicable for determining minimum clearances where works encroach the tree protection zone (TPZ). However, distances may be varied by the Consulting Arborist once other factors are taken into consideration, including but not limited to; *individual species tolerance to disturbance, soil geology and topography, meso / microclimate, proposed construction / engineering methods and potential Arboricultural techniques that could be utilised.*

5. The Site

- 5.1 The site is a rural residential allotment; know as Lot 47 in DP 30186. It supports a single storey residence with numerous kennels / sheds etc., and comprises an area of 2.025ha

6. Tree Assessment Schedule / Impact Schedule for Trees Proposed to be retained

ASSESSMENT													IMPACT (RETAINED TREES ONLY)					
No	Scientific Name	Age Class	Health	Condition	Height (m)	Spread (m)	D BH (mm)	(On / Off Site)	Disease	Retention Value	Proposed to be removed or retained	Construction Tolerance	Pruning Required	TPZ – AS 4970 (rad. m)	SRZ – AS4970 (rad. m)	Encroach TPZ / SRZ	TPZV (TPZ Variation)	Impacts / Recommendations / Reason for Removal
1	<i>Eucalyptus tereticornis</i>	M	A	A	> 20	> 20	>1k Base	Off	Y	Very High	Removed	-						Engineering Plan Sheet 2 of 2 Lot 1 Engineering Plan Bulk Earthworks Plan
2	<i>Eucalyptus tereticornis</i>	M	a/p	a/p	18	10	>1k Base	Off	Y	Mod	Removed	-						Engineering Plan Sheet 2 of 2 Lot 1 Engineering Plan Bulk Earthworks Plan
3	<i>Eucalyptus crebra</i> *	M	G	G	15	10	300	Off	-	Very High	Removed	-						Engineering Plan Sheet 2 of 2 Lot 1 Engineering Plan Bulk Earthworks Plan
4	<i>Eucalyptus tereticornis</i>	M	G	G	> 20	> 20	800	Off	-	Very High	Removed	-						Engineering Plan Sheet 2 of 2 Lot 1 Engineering Plan Bulk Earthworks Plan
5	<i>Eucalyptus tereticornis</i>	M	G	G	15	15	400	Off	-	Very High	Removed	-						Engineering Plan Sheet 2 of 2 Lot 1 Engineering Plan Bulk Earthworks Plan
6	<i>Eucalyptus tereticornis</i>	M	G	G	> 20	> 20	450	Off	-	Very High	Removed	-						Engineering Plan Sheet 2 of 2 Lot 1 Engineering Plan Bulk Earthworks Plan
7	<i>Eucalyptus tereticornis</i>	M	P	P	12	12	350	Off	Y	Low	Removed	-						Road 1
8	<i>Eucalyptus tereticornis</i>	M	G	G	> 20	> 20	>1k Base	Off	-	Very High	Removed	-						Road 1
9	<i>Eucalyptus crebra</i> *	S	P	P	6	6	250 Base	Off	Y	Low	Removed	-						Road 1
10	<i>Eucalyptus tereticornis</i>	S	G	A	8	4	300 Base	Off	Y	Low	Removed	-						Road 1
11	<i>Ulmus parvifolia</i>	M	G	G	7	10	400 Multi	On	-	Mod/ Low	Removed	-						Road 1

ASSESSMENT													IMPACT (RETAINED TREES ONLY)					
No	Scientific Name	Age Class	Health	Condition	Height (m)	Spread (m)	D BH (mm)	(On / Off Site)	Disease	Retention Value	Proposed to be removed or retained	Construction Tolerance	Pruning Required	TPZ – AS 4970 (rad. m)	SRZ – AS4970 (rad. m)	Encroach TPZ / SRZ	TPZV (TPZ Variation)	Impacts / Recommendations / Reason for Removal
12	<i>Eucalyptus tereticornis</i>	M	G	G	> 20	> 20	>1k	On	-	Very High	Removed	-						Road 1
13	<i>Ulmus parvifolia</i>	M	G	G	7	10	300 Base	On	-	Mod	Removed	-						Road 1
14	<i>Jacaranda mimosifolia</i>	M	G	G	8	10	Multi	On	-	Mod	Removed	-						Road 1
15	<i>Eucalyptus tereticornis</i>	M	A	g/a	> 20	18	700 Av	On	Y	Mod/High	Removed	-						Road 1
16	<i>Grevillea robusta</i>	M	G	A	15	10	400	On	Y	Mod	Removed	-						Road 1
17	<i>Thuja species</i>	M	G	G	5	4	150	On	Y	Low	Removed	-						N/a
18	<i>Eucalyptus crebra</i> *	M	G	G	10	8	250	On	-	Very High	Removed	-						Lot 1 Engineering Plan (Basement Outline)
19	<i>Eucalyptus crebra</i> *	M	G	G	10	8	250	On	-	Very High	Removed	-						Lot 1 Engineering Plan (Basement outline)
20	<i>Eucalyptus tereticornis</i>	M	G	G	9	6	250	On	-	Very High	Removed	-						Road 4
21	<i>Eucalyptus crebra</i> *	M	G	G	10	6	250	On	-	Very High	Removed	-						Road 4
22	<i>Eucalyptus crebra</i> *	M	G	G	18	10	500 surv	Bdy	-	Very High	Retained	Av	-	6	2.47	Yes	No	Refer to Section 7
23	<i>Ulmus parvifolia</i>	M	G	G	10	20	500 App.	On	-	Mod	Retained	Av	-	6	2.47	No	No	Refer to Section 7
24	<i>Eucalyptus crebra</i> *	M	G	?	15	-	500 surv	Bdy	-	Very High	Retained	Av	-	6	2.47	?	No	Refer to Section 7
25	<i>Eucalyptus tereticornis</i>	Dominant species - Not assessed								Very High	Retained	Av	-	Wholesale tree protection		No		Refer to Section 7

* Refer to section 10 for explanation of terminology – Age Class – I=Immature - S=Semi Mature - M=Mature - O=Over mature
Health / Condition / Construction Tolerance – G=Good – A=Average – P=Poor. General - Y=Yes – N=No. (as)=assumed

7. Discussion / Recommendations

7.1 Preamble:-

- 7.1.1 The General Arrangement Plan (Appendix) shows diagrammatic locations of required tree protection barriers (double red lines).
 - 7.1.2 The Project Arborist is to supervise and direct the installation of the tree protection barriers as per TPZ radial setbacks outlined in Section 6.
 - 7.1.3 Tree protection measures to be installed PRIOR TO ANY works commencing on site.
- 7.2 Tree 22 is a Chinese Elm located close to the boundary. Bulk Earthworks Plan shows some fill potentially within TPZ. Project Arborist to determine any potential impacts on site.
- 7.3 Tree 23 will not be impacted upon.
- 7.4 Tree 24 may be within proposed access road to bio-retention basin. Location of road can easily be redirected by tree protection barrier location for specimen.
- 7.5 Tree group 25 are located within the existing dam to the north west of the site. All trees not affected by proposed roadworks can be retained. It is assumed the trees would be protected within installation of site fencing around the dam, however Project Arborist to direct installation to ensure the maximum number of trees are retained.

8. Tree Protection / Management Requirements

8.1 PRE CONSTRUCTION - DEMOLITION AND TREE REMOVAL

- 8.1.1 Trees that must be retained and not adversely impacted upon – T22-T25
- 8.1.2 AS 4970-2009 ‘Protection of Trees on Development Sites’ (here after ‘The Standard’) – Section 2.3.5 – states ‘...*the location of tree protection measures should also be shown on other documents such as demolition, bulk earth works, construction and landscape plans.*
- 8.1.3 Appointment of a Project Arborist is required. They must document and log all works in relation to retained trees. This documentation is to be forwarded to Council or PCA at end of construction works (a template log is provided in the Section 13).
- 8.1.4 **NOTE:-** Project Arborist to ensure Councils Conditions of Consent / Notice of Determination are cited prior to works commencing. Council may require additional tree protection measures or specific documentation that may need to be addressed to appease the PCA.
- 8.1.5 An 1800mm temporary chain wire fence (with plastic feet – not posts driven into ground) must be installed to protect retained trees. It is to be erected prior to demolition / excavation / benching and remain until the end of the construction period. Refer to attached diagram for fence locations and or setback dimensions. (Note:- Dimensions have been set by CAD and should be rounded up.) Refer to AS 4970-2009 – Figure 3 and AS 4687-2007 ‘Temporary Fencings and Hoardings’.

- 8.1.6 Signage is to be placed on fencing, outlining appointed Project Arborist with mobile phone number. All contractors / consultants on the site should be inducted to the penalties that may apply if the tree protection area is breached. Refer to AS 4970-2009 – Figure C1 and AS 1319-1994 ‘Safety Signs’.
- 8.1.7 Tree removal must be undertaken by qualified Arborist (AQF 3/5), in accordance with applicable codes and standards for the Tree Industry. Mulch is to be stockpiled on site where appropriate for reuse in TPZ’s (weed free). Ensure retained trees are not damaged, by segmentally removing adjacent trees as opposed to felling where applicable.
- 8.1.8 No lopping, topping or spiking of trees proposed to be retained. Any pruning is to be undertaken in accordance with AS 4373 ‘Pruning of Amenity Trees’. Remove major deadwood / diseased material as a matter of course and is only to be undertaken by AQF 3 Arborist. Stumps are to be ground and not pulled by machines. Retained existing trees are not to be used as anchorages points.
- 8.1.9 TPZ for T22-T24 must be mulched with 100mm recycled leaf litter mulch, preferably recycled from any trees removed from site (no weed seeds) to reduce soil compaction, stimulate microbial activity and retain moisture.
- 8.1.10 No siting of sheds, stockpiling of materials etc permitted within TPZV.
- 8.1.11 TPZ must not to be entered unless under direction of Project Arborist.
- 8.1.12 Trunk protection not deemed necessary. However if required, place 100mm x 50mm x 2000mm battens (as a minimum or practical) vertically at 100mm intervals around trunk. Battens are to be secured by metal strapping and buffered from direct contact with tree geo-tech fabric / hessian or similar. Double layer, 100 mm wide top and bottom should be adequate. *Battens are not to be fixed directly to tree with screws / nails etc.*

8.2 DURING CONSTRUCTION

- 8.2.1 Contractor is to expect that all trenching / excavation within the designated TPZV will be undertaken by hand, under the supervision of Project Arborist.
- 8.2.2 Should heavy machinery be required to access TPZ, Project Arborist is to determine appropriate method. Options include; a designated path / track could be constructed using 150 x 75 mm sleepers OR 150 mm mulch layer OR 50 mm layer of washed river sand beneath rumble boards – discuss with Arborist.
- 8.2.3 No changes to natural ground level (NGL) are permitted within TPZV unless approved on Council stamped plans, or by the Project Arborist.
- 8.2.4 Cranes must be located where no damage to canopy will occur (onsite and neighbouring). For sites with tight aerial access, the Project Arborist to be present for advice on possible canopy reduction and / or remedial pruning.
- 8.2.5 Underground services should use common trenches as far as practical from trunk and TPZ of tree. If large diameter roots are encountered (>40 mm), the contractor is to tunnel beneath. Developer to ensure Project Arborist is present if Utility companies

need to access the TPZ (within property boundaries). Naivety is not accepted and heavy fines could be applicable.

- 8.2.6 Roots greater than 10 mm in diameter must be cleanly cut rather than torn by machinery.
- 8.2.7 Any vegetation or weed removal within TPZV to be undertaken by hand. Herbicides must be used in accordance with the label and applied on a calm day. Herbicide damage to existing vegetation is not acceptable and fines may apply.
- 8.2.8 Underground Boring - Although currently not deemed necessary, if underground boring is required, an open trench is to be excavated 90 degrees to the trunk at either end of the TPZ, to an approximate depth of 1000mm, unless altered by Project Arborist in respect to particular species and its current vitality. Excavator can be used until 20mm roots are encountered. Once 20mm roots are encountered, all excavation there after must be undertaken by hand.

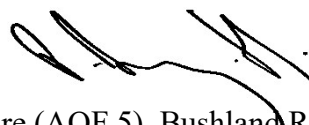
8.3 POST CONSTRUCTION - GENERAL

- 8.3.1 Only approved changes to NGL will be accepted. That includes Landscape works. Project Arborist and Landscape Consultant to ensure final works comply prior to issue of Certification.
- 8.3.2 Proposed hard surfacing within TPZ should preferably utilise permeable materials, ie dry jointed paving layed on a granular base with screeded sharp sand.
- 8.3.3 Retaining wall construction should give preference to gravity masonry wall or timber that reduces the need for concrete footings and increases permeability and movement. Backfill with an inert granular material ie washed river sand. Use of root deflection barriers may be appropriate.
- 8.3.4 Any irrigation methods proposed should mimic site conditions pre development; in respect to tree species.

9. Conclusion

- 9.1 Most trees on site are required to be removed to allow proposed road widening.
- 9.2 It is recommended that it be conditioned that a Project Arborist be appointed prior to demolition and that they 'register' with the PCA before any works commence so that the builder can be inducted as to important times when Arborist will be required on site.

Regards
Paul Monaco



Paul Monaco, Bach. Hort. Sc. (AQF 7), Arboriculture (AQF 5), Bushland Regeneration (AQF 3).
Landscape and Horticultural Consultant, Consulting Arborist.
Quantified Tree Risk Assessment (QTRA) – No. 3923

Limitation of liability

This report has been prepared by the arborist and must be accepted on the basis that all reasonable attempts have been made to identify factors and features relevant to the tree(s) specified. Unless otherwise stated, observations have been made by eye from ground level (VTA).

It must be noted that any opinions given by the arborist relating to the health, desirability, or significance of any tree will not necessarily coincide with the opinions of the relevant council authorities or their Tree Management Officers.

Surveys are not undertaken by Monaco Designs Pty Ltd, therefore we cannot confirm their accuracy.

Tree related hazards should be kept in perspective with manmade hazards. Roof materials, advertising material, general rubbish etc can cause serious harm if they fall in extreme weather conditions. Trees should be seen in perspective with other essentials / desirables of life, which are not hazard free.

10. Qualifications and Experience of Author

Bachelor of Horticultural Science (Landscape)

Arboriculture techniques

Bushland Regeneration

Diploma of Arboriculture

QTRA Registration

UWS Hawkesbury 1996.

Ryde Tafe 1995

Western Sydney TAFE 1995

Western Sydney TAFE 2015

June 2014

Director of Monaco Designs since 1997

Monaco Designs has provided services in the following areas since its inception:-

Landscape / Arboriculture / Horticulture / Nursery Industries / Vegetation Management Plans and Building Design.

11. Terminology used in this Report

- 11.1 **AGE CLASSES:** - (I) Immature refers to a juvenile tree. (S) Semi-mature, refers to a tree between growth stages immature and mature. (M) Refers to a tree at full size with some opportunity for further growth. (O) Over-mature, refers to a tree past its peak growth or health and is either in, or about to enter decline.
- 11.2 **HEALTH CLASS:** - Exhibited by crown density, leaf colour, presence of epicormic shoots, ability to withstand disease invasion and degree of dieback.
Good (G) / Average (A) / Poor (P) / Deciduous at time of inspection (D).
- 11.3 **CONDITION CLASS:** - Refers to the trees form and growth habit as a result of its environment (aspect, suppression by other trees and soils). Also takes into consideration potential structural defects such as cavities and weak trunk / branch unions. Good (G)/ Average (A) / Poor (P).
- 11.4 **DIAMETER AT BREAST HEIGHT:** - Expressed in millimetres, this is the average radius measured at 1400mm from the ground for single trunk specimens. For multiple trunked specimens, the measurement is taken below the flange of the branch collar. Where a tree is trunkless, an average diameter is determined by taking an average of the radius and noted at ground level.
- 11.5 **DISEASE:** - Includes a range of factors biotic and abiotic in nature that could affect the long term vitality of the specimen, ie pests, pathogens, cankers, soil compaction etc.
- 11.6 **RETENTION VALUE:** - Has been generally determined based on (but not limited to) the following criteria:-
- Zero – Tree is a noxious / environmental weed, diseased or damaged beyond remediation and removal required or exempt from Local Council’s TPO.
 - Low – An immature specimen that could be replaced with new tree planting, or a poor representation of the species, negative impact on amenity, or visual significance within the landscape.
 - Moderate – Tree has a fair contribution to visual character, good representation of species, semi-mature / mature specimen, potential habitat relevance.
 - High – Excellent visual character / amenity, representation of species, mature specimen, indigenous / endemic species. Neighbouring property.
 - Very High - Endangered or threatened species, heritage / historical or cultural significance, endemic species / remnant vegetation, habitat for endangered or threatened fauna, commemorative planting. Tree on neighbouring properties or Council Land.
- 11.7 **CONSTRUCTION TOLERANCE:** - Provides an indication of the trees potential longevity after being exposed to many of the issues within a construction zone, ie; soil compaction, reduction in root zone and soil volume, changes in soil pH, canopy reduction, changes in overland flow / water table.
Good (G) – Average (A) – Poor (P). Based on experience as opposed to scientific data.
- 11.8 **TREE PROTECTION ZONE (TPZ):-** As defined by AS 4970-2009 – ‘A specified area above and below ground and at a given distance from the trunk set aside for the protection of a trees roots and crown to provide for the viability and stability of a tree to be retained

where it is potentially subject to damage by development'. TPZ = DBH x 12 (represented as radius). Generally speaking, AS4970-2009 states:-

- Minor encroachment is <10%
- Major encroachment is >10%

11.9 Structural Root Zone (SRZ):- As defined by AS 4970-2009 – *'The area around the base of a tree required for the trees stability in the ground'*.

11.10 VTA – Visual Tree Assessment – described by Dr Clause Mattheck in *'The Body Language of Trees'*. This assessment process is supported by The International Society of Arboriculture, as a system to inspect trees for indicators of structural defects that may pose a risk of failure.

11.11 VIGOUR: - Genetic feature of tree to resist strain. (Shigo)

11.12 VITALITY: - General ability of a tree to grow in its current location.

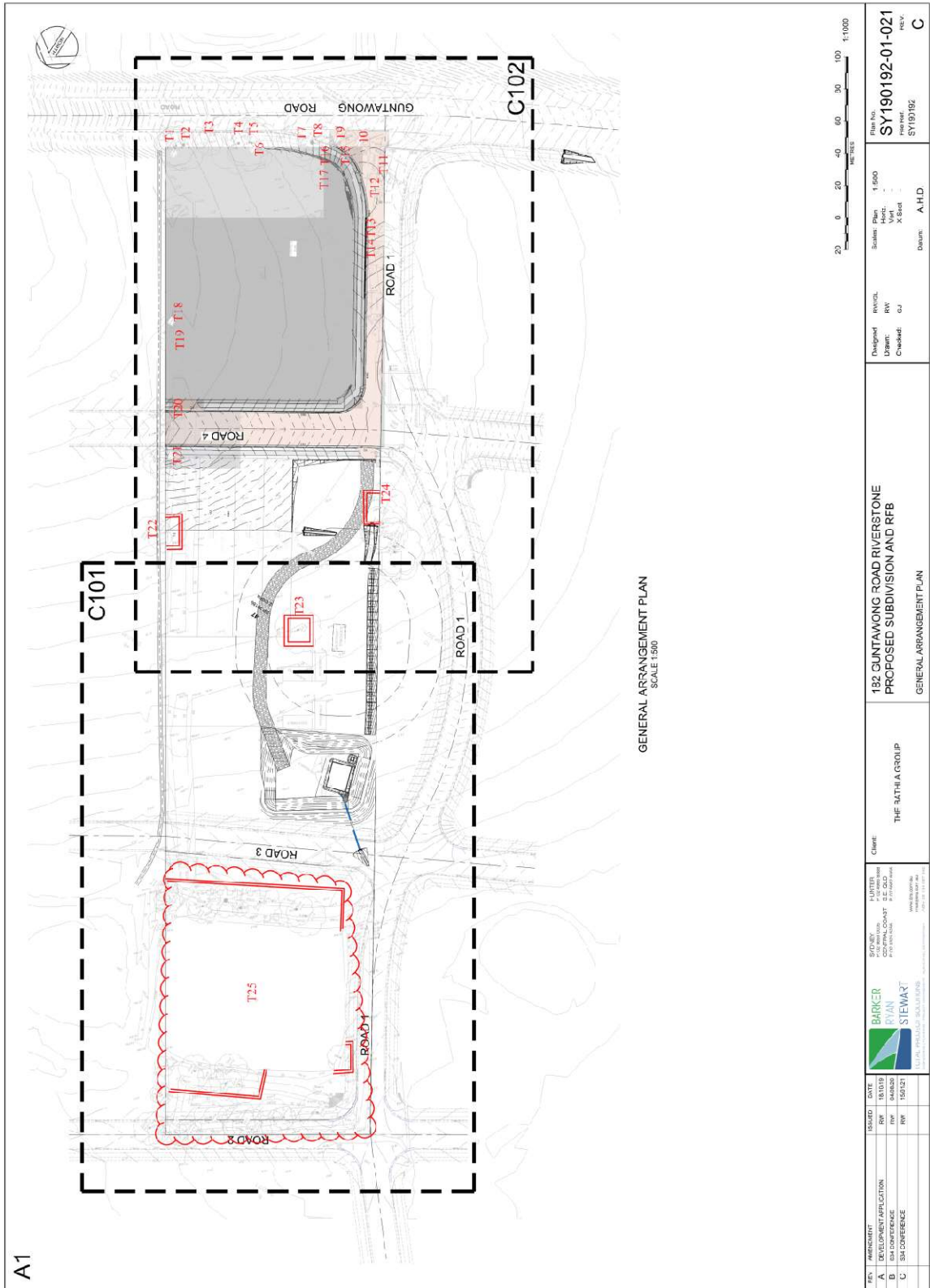
11.13 VTA – Visual Tree Assessment – described by Dr Clause Mattheck in *'The Body Language of Trees'*. This assessment process is supported by The International Society of Arboriculture, as a system to inspect trees for indicators of structural defects that may pose a risk of failure.

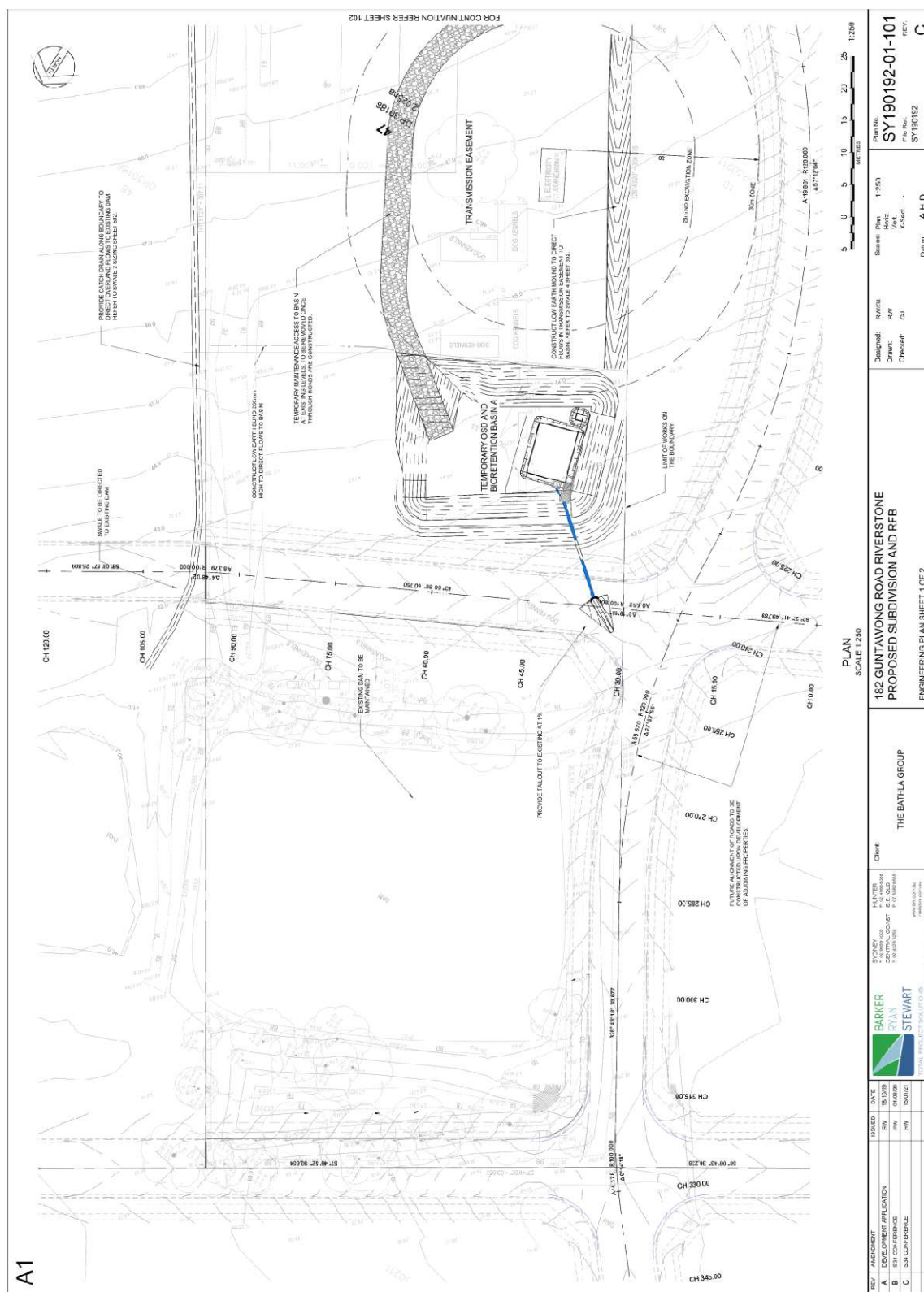
11.14(as): - Assumed species, dbh etc.

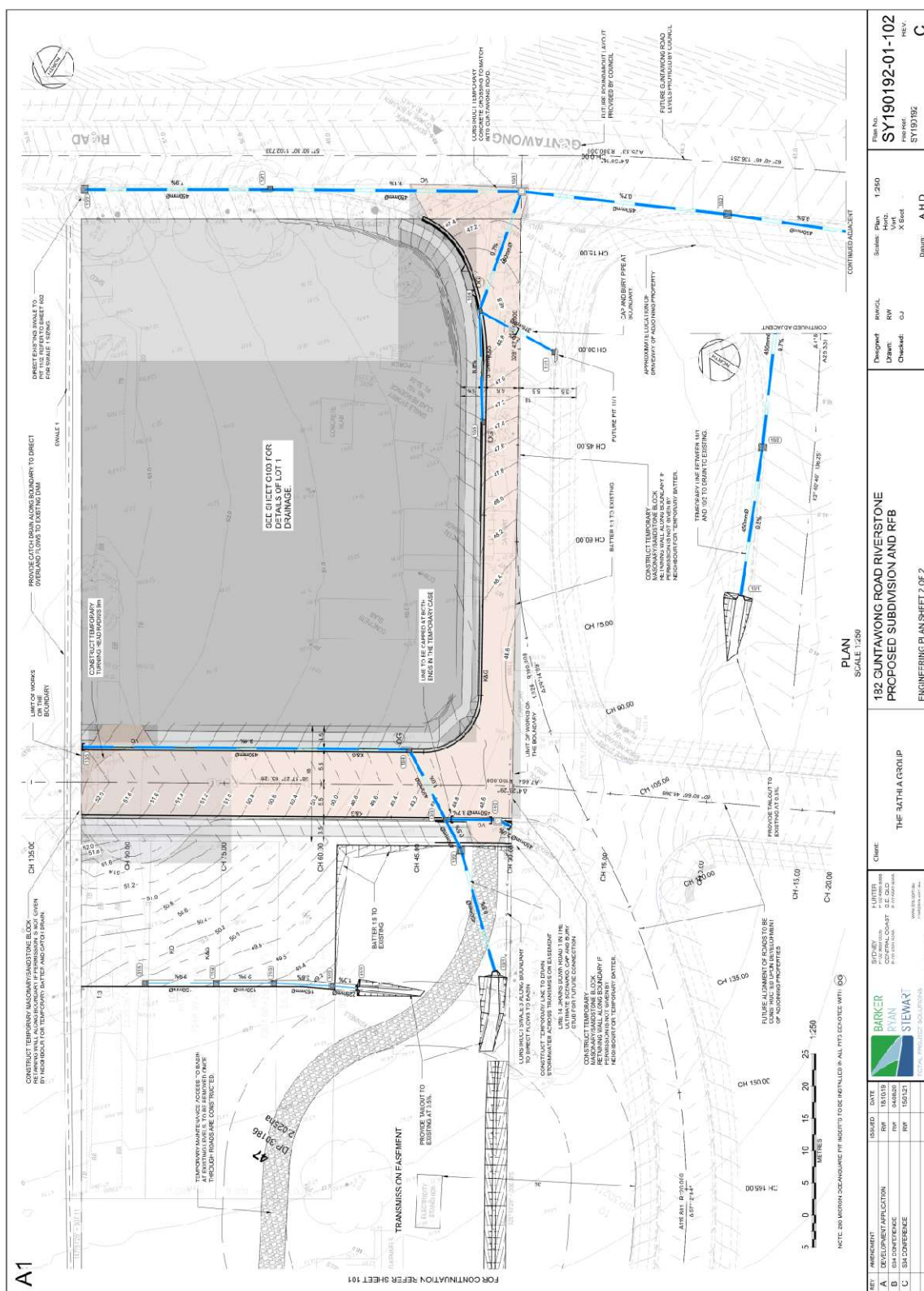
12. Reference / Bibliography

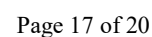
- 12.1 Australian Standard AS 4970-2009 'Protection of Trees on Development Sites'.
- 12.2 AS 1319-1994 'Safety Signs'.
- 12.3 AS 4373-1996 'Pruning of Amenity Trees'.
- 12.4 AS 4687-2007 'Temporary Fencings and Hoardings'.
- 12.5 Trees Dispute Between Neighbours) Act 2006 No. 126
- 12.6 Tree (Disputes Between Neighbours) Amendment Act 2010 No. 27
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- 12.15 Shigo, A. (1997) 'A New Tree Biology', Shigo and Trees Associates.
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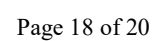
13. Appendix
General Arrangement Plan



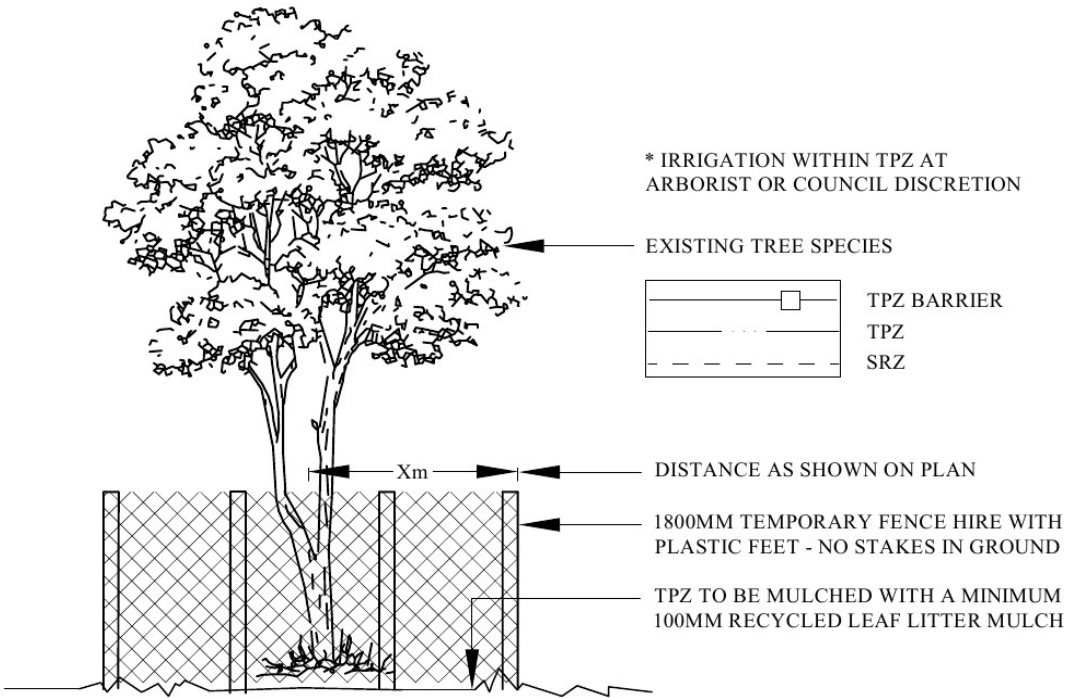








Typical Tree Protection Detail



**TYPICAL TREE PROTECTION
DETAIL - (NTS)**
(IF NO ARBORIST REPORT REQUIRED)

14. Tree Protection Compliance Log

TREE PROTECTION COMPLIANCE LOG							
Project Arborist			Company Name			Mobile	
Date Engaged		PCA		Contact		Mobile	
Pre Construction - Demolition / Tree Removal							
Hold Point	Required Action	Responsibility for notification	Certification Authority	Time of Document /Inspection	Date Inspected	Compliance (Yes or No)	Comments (further sheets attached if required)
1	Project Arborist to register with PCA prior to issue of CC – Project Arborist to acknowledge approved Arboricultural Impact Report and any additional conditions of consent.	PCA / Owner	PCA / Project Arborist	Prior to issue of CC			
2	Establishment of TPZ as detailed and any additional trunk / branch protection. Sign installed.	Principle Contractor	Project Arborist	Prior to demolition / site works			
3	Removal of site vegetation / canopy pruning / reduction works.	Principle Contractor	Cert 3 Arborist for any pruning	In conjunction with demolition			
During Construction							
4	Supervision of any benching / trenching / piercing or footing excavation works within TPZ.	Principle Contractor	Project Arborist				
5	Inspection cycle of trees	-	Project Arborist	Quarterly			
Post Construction							
6	Final inspection of trees	Principle Contractor	Project Arborist	Prior to issue of Occ. Cert.			