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ARBORICULTURAL IMPACT ASSESSMENT

24 John St Avalon Beach, NSW 2107.

Prepared by:

Graham Brooks dip arb

Arboriculture Australia Consulting Arborist

Tree care and Consultancy

Prepared for:

Anthony & Shannon Ritchie

26/06/2020

Executive Summary

Graham Brooks Arboricultural Tree Services Pty Ltd was commissioned by Anthony Ritchie to undertake an Arboricultural Impact Assessment (AIA) report in regards to the proposed development of 24 John Street Avalon, NSW 2107 (the subject site).

This AIA report will include information relating to 14 trees located within and adjacent to the subject site.

Following an assessment of construction impacts from the proposed development (Section 8) it has been concluded and recommended that;

The appointment of a project arborist (AQF Level 5) for the duration of the project, must be made prior to the commencement of any site works (including demolition), to provide aboricultural management during the construction process. Section 11 of this report details the tree protection process to be followed and specifications for tree protection measures.

The removal of T10 & T11 (subject to approval from Northern Beaches Council) will be required to facilitate the proposed development. Removal must be undertaken by a qualified Arborist (AQF 3) and following the guidelines provided in the Amenity Tree Industry – Work Cover Code of Practice 1998 Safe work Australia’s “Guide to managing risks of tree trimming and removal work” (July 2016). All tree waste is to be removed from site, including timber, mulch and stump grindings.

All remaining trees are to be retained and protected. Tree protection fencing is to be installed prior to the commencement of the project and maintained for its duration in the locations shown in the attached tree protection plan. An example of tree protection fencing can be found in section 11.5 of this report.

Ground protection will be required within the TPZ of T1 and T12 to provide access to the side and rear of the property. The location of ground protection to be installed is shown on the attached tree protection plan. An example of ground protection can be found in section 11.6 of this report.

The project arborist is to supervise demolition and excavation works within the TPZ’s of trees 1,3,7,8,9,13 & 14 and conduct and document root pruning as necessary.

Yours faithfully,
Arboricultural Tree Services Pty Ltd

A handwritten signature in blue ink, appearing to read 'Graham Brooks', is written over a light blue rectangular stamp.

Graham Brooks dip arb
Managing director

Arboriculture Australia Approved Consulting Arborist No: 1983 Member International Society of Arboriculture Mem No: 173140 ISA Tree Risk Assessment Qualified 2014-2019

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1. Introduction

- 1.1 Graham Brooks Arboricultural Tree Services Pty Ltd has been commissioned by Anthony Ritchie to undertake an Arboricultural Impact Assessment (AIA) report in regards to the proposed development of 24 John Street Avalon, NSW 2107 (the subject site).
- 1.2 This AIA report will include information relating to 14 trees located within and adjacent to the subject site.

2. Relevant Legislation and development controls

- 2.1 Lot 3 / DP246147 24 John St Avalon Beach, NSW 2107 is zoned E4 – Environmental Living and is located within the Local Government Area of Northern Beaches Council (Pittwater). (NSW Government, n.d.)
- 2.2 Section A1.9 of the Pittwater 21 Development Control Plan - 2014 (DCP) (Pittwater Council, 2014), defines a tree as;
“tree means a palm or woody perennial plant with a single or multi stem greater than five (5) metres in height.”
- 2.3 Section B4.22 of the Pittwater 21 Development Control Plan - 2014 (DCP) (Pittwater Council, 2014), Preservation of Trees or Bushland Vegetation has also been considered, in particular;
“10. Where trees proposed to be retained may be affected by the construction of new buildings and works of Classes 1 and 10, a Tree Protection Plan as per Appendix 18 (P21DCP) is to be submitted.”
- 2.4 Section 7.6 – Biodiversity, of the Pittwater Local Environmental Plan 2014 (Pittwater Council, 2014)
- 2.5 State Environmental Planning Policy (Vegetation in Non–Rural Areas) 2017 (NSW Government, 2017) has been considered in the preparation of this report. The aims of the policy are to;
 - *“(a) to protect the biodiversity values of trees and other vegetation in non-rural areas of the State, and*
 - *(b) to preserve the amenity of non-rural areas of the State through the preservation of trees and other vegetation.”*

3.The Site

- 3.1 The subject site is the 24 John Street Avalon, NSW 2107. The subject site can be seen below in figure 1 outlined in red.



Figure 1: The subject site, subject trees outlined in red. (SIX Maps, n.d.)

4. Method

- 4.1 The tree and site were visually assessed from ground level. The genus and species of the tree was recorded as well as the dimensions for diameter at breast height (DBH), diameter at root crown and canopy width. Height and age of the tree were estimated as well as the percentage of deadwood, the tree was given a vigour rating and signs and symptoms of pests and diseases were looked for. Comments/Structural defects were also recorded.
- 4.2 Calculations have been made using guidelines supplied in AS4970-2009 Protection of Trees on Development Sites (Standards Australia, 2009) for the;
- Tree Protection Zone (TPZ),
 - Structural Root Zone (SRZ),
 - Live Crown Ratio (LCR),
 - Live Crown Size (LCS),
 - Height/Diameter ratio (H/D).
- 4.3 The subject tree has been allocated a landscape significance rating of Low, Medium or High using the *IACA Significance of a Tree, Assessment Rating System (STARS)©* (IACA, 2010). Stars assessment criteria includes:
- Condition and Vigour
 - Form, species specific
 - Provenance, age and botanical significance
 - Heritage and Ecological significance
 - Size, shape, and local amenity value
 - Restrictions to tree growth

Appendix A contains the assessment criteria in full.

- 4.4 The subject tree has been allocated a Useful Life Expectancy (ULE) rating, categorised as either;
- Long – 40+ years
 - Medium – 15-40 years
 - Short – 5-15 years
 - Consider for removal - <5 years

5. Observations

5.1 Listed in Table 1 below are observations from the subject tree relating to;

- Vigour. Good, Fair or Poor
- Deadwood. An overall % has been estimated.
- Structural defects and comments.
- Any signs/symptoms of pest and disease attack.
- Previous pruning or wounds.

Tree No.	Genus/Species & Common Names	Vigour	Dead wood %	Structural Defects/ Comments	Pests/ Disease	Pruning/ Wounds
1	<i>Melaleuca quinquinervia</i> Broad-leaved paperbark	Good	5-10%	Surface orientated structural roots.	None visible	None visible
2	<i>Syzygium paniculatum</i> Lilly Pilly	Good	5-10%	Previous failure 3.5m AGL, Western stem.	None visible	None visible
3	<i>Melaleuca quinquinervia</i> Broad-leaved paperbark	Fair	5-10%	None visible	None visible	Over-pruned for cable clearance
4	<i>Callistemon viminalis</i> Weeping Bottle brush	Poor	5-10%	None visible	None visible	Lopped for cable clearance
5	<i>Syagrus romanzoffiana</i> Cocos Palm	Good	5%	None visible	None visible	None visible
6	<i>Syagrus romanzoffiana</i> Cocos Palm	Good	5%	None visible	None visible	None visible

Tree No.	Genus/Species & Common Names	Vigour	Dead wood %	Structural Defects/ Comments	Pests/ Disease	Pruning/ Wounds
7	<i>Washingtonia filifera</i> Cotton Palm	Good	5%	None visible	None visible	None visible
8	<i>Glochidion ferdinandi</i> Cheese Tree	Good	5-10%	None visible	None visible	Pruned for building clearance
9	<i>Salix matsudana</i> Tortured Willow	Fair	10-15%	Northern stem previously failed.	None visible	None visible
10	<i>Agonis flexuosa</i> Willow myrtle	Fair	10-15%	None visible	None visible	Repeatedly lopped
11	<i>Melaleuca quinquinervia</i> Broad-leaved paperbark	Fair	5-10%	Main stem previously failed at 6m AGL. 1 st order branch failure at 3.5m AGL	None visible	None visible
12	<i>Archontopheonix cunninghamiana</i> Bangalow Palm	Good	5%	None visible	None visible	None visible
13	<i>Melaleuca quinquinervia</i> Broad-leaved paperbark	Fair	5-10%	Co-dominant stem with partial inclusion	None visible	None visible
14	<i>Glochidion ferdinandi</i> & <i>Banksia Integrifolia</i> Cheese Tree & Coastal Banksia	Good	5-10%	Two trees abutting each other. Shared root zone locations. Treated as one tree for impact assessment. Banksia has previous failure of 1 st order stems.	None visible	None visible

TABLE 1: TREE OBSERVATIONS

5.2 Listed in Table 2 below are measurements from the subject trees relating to;

- Diameter at breast height (DBH).
- Diameter above buttress (DAB).
- Canopy spread – measured to the North, East, South and West (N, E, S, W).
- Tree height.
- Lowest scaffold branch.

Tree Number	Species	Maturity	Height (m)	Lowest Scaffold (m)	Spread (m)				DBH / Multi (cm)	DAB (cm)
					N	S	E	W		
1	<i>Melaleuca quinquinervia</i>	Mature	14	3	6.5	5.8	3.5	6	63	70
2	<i>Syzygium paniculatum</i>	Mature	10	2	2	5	4	4	34	48
3	<i>Melaleuca quinquinervia</i>	Mature	10	1.5	3	2	2	4	38	46
4	<i>Callistemon viminalis</i>	Mature	4	1.5	5	4	3	2	30	35
5	<i>Syagrus romanzoffiana</i>	Mature	12	11	2	2	2	2	22	NA
6	<i>Syagrus romanzoffiana</i>	Mature	11	10	2	2	2	2	27	NA
7	<i>Washingtonia filifera</i>	Mature	12	11	1.5	1.5	1.5	1.5	30	NA
8	<i>Glochidion ferdinandi</i>	Mature	6	1.8	2	4	7	3	28	36
9	<i>Salix matsudana</i>	Mature	6	2	3	3	4	3	43	50
10	<i>Agonis flexuosa</i>	Mature	6.5	2	5	5	5	5	43	85
11	<i>Melaleuca quinquinervia</i>	Mature	7	3	4	3	3	4	32	40
12	<i>Archontopheonix cunninghmiana</i>	Mature	7	6	2	2	2	2	28	NA
13	<i>Melaleuca quinquinervia</i>	Mature	13	5	4	4	4	3	35	45
14	<i>Glochidion ferdinandi</i> & <i>Banksia Integrifolia</i>	Mature	11	2	6	5	5	6	68	100

TABLE 2: TREE MEASUREMENTS

5.3 Listed in Table 3 Below are calculations from the subject tree relating to;

- Tree Protection Zone (TPZ)
- Structural Root Zone (SRZ)
- Live Crown Ratio (LCR)
- Live Crown Size (LCS)
- Height/Diameter ratio (H/D)

Tree Number	Species	TPZ (m)	SRZ(m)	H/D Ratio	Live Crown Size (m2)	Live Crown Ratio (%)
1	<i>Melaleuca quinquinervia</i>	7.56	2.85	22	120	79%
2	<i>Syzygium paniculatum</i>	4.1	2.43	29	60	80%
3	<i>Melaleuca quinquinervia</i>	4.5	2.39	26	47	85%
4	<i>Callistemon viminalis</i>	3.58	2.13	13	18	63%
5	<i>Syagrus romanzoffiana</i>	2.64	1.5	55	4	8%
6	<i>Syagrus romanzoffiana</i>	3.24	1.5	41	4	9%
7	<i>Washingtonia filifera</i>	3.6	1.5	40	3	8%
8	<i>Glochidion ferdinandi</i>	3.36	2.15	21	34	70%
9	<i>Salix matsudana</i>	5.16	2.47	14	26	67%
10	<i>Agonis flexuosa</i>	5.13	3.09	15	45	69%
11	<i>Melaleuca quinquinervia</i>	3.84	2.25	22	28	57%
12	<i>Archontopheonix cunninghmiana</i>	3.39	1.5	25	4	14%
13	<i>Melaleuca quinquinervia</i>	4.2	2.37	37	60	62%
14	<i>Glochidion ferdinandi</i> & <i>Banksia Integrifolia</i>	8.16	3.31	16	99	82%

TABLE 3: CALCULATIONS FROM THE SUBJECT TREES

6. Tree Retention Values

6.1 The subject Tree has been allocated a retention value using the priority Matrix in the *IACA Significance of a Tree, Assessment Rating System (STARS)*© (IACA, 2010). The Matrix uses the Landscape Significance rating combined with the Useful Life Expectancy (ULE) to determine a retention value of either;

- Priority for Retention (High) – All measures must be taken to retain and protect these trees. If the guidelines set out in AS4970-2009 Protection of trees on development sites cannot be used to protect the trees, design modification or re-location of the proposed development should be considered.
- Consider for Retention (Medium) – Retention of these trees should remain a priority. If the trees are adversely affecting the proposed development and all protection measures have been considered but are not viable, removal can be considered.
- Consider for Removal (Low) – Retention of these trees is not important. No modification to design should be considered for their retention.
- Priority for Removal – Trees in an irreversible decline, weed species or hazardous trees. These trees should be removed.

Tree Number	Species	Landscape Significance Rating	Useful Life Expectancy	Retention Value
1	<i>Melaleuca quinquinervia</i>	Medium	Long (>40)	High
2	<i>Syzygium paniculatum</i>	Medium	Medium (15-40)	Medium
3	<i>Melaleuca quinquinervia</i>	Medium	Short (5-15)	Low
4	<i>Callistemon viminalis</i>	Low	Short (5-15)	Low
5	<i>Syagrus romanzoffiana</i>	Low	Medium (15-40)	Low (Exempt species)
6	<i>Syagrus romanzoffiana</i>	Low	Medium (15-40)	Low (Exempt species)

Tree Number	Species	Landscape Significance Rating	Useful Life Expectancy	Retention Value
7	<i>Washingtonia filifera</i>	Low	Medium (15-40)	Low (Exempt species)
8	<i>Glochidion ferdinandi</i>	Medium	Medium (15-40)	Medium
9	<i>Salix matsudana</i>	Low	Short (5-15)	Low (Exempt species)
10	<i>Agonis flexuosa</i>	Medium	Short (5-15)	Low
11	<i>Melaleuca quinquinervia</i>	Low	Short (5-15)	Low
12	<i>Archontopheonix cunninghmiana</i>	Low	Medium (15-40)	Low (Exempt species)
13	<i>Melaleuca quinquinervia</i>	Medium	Medium (15-40)	Medium
14	<i>Glochidion ferdinandi</i> & <i>Banksia Integrifolia</i>	Medium	Medium (15-40)	Medium

TABLE 4: TREE RETENTION VALUES

7. Root Investigation

- 7.1 Non-destructive root investigation was undertaken using an airspade and soil vacuum to a depth of 450mm along the boundary of the proposed driveway, adjacent to tree 1 (see figure 2 below).

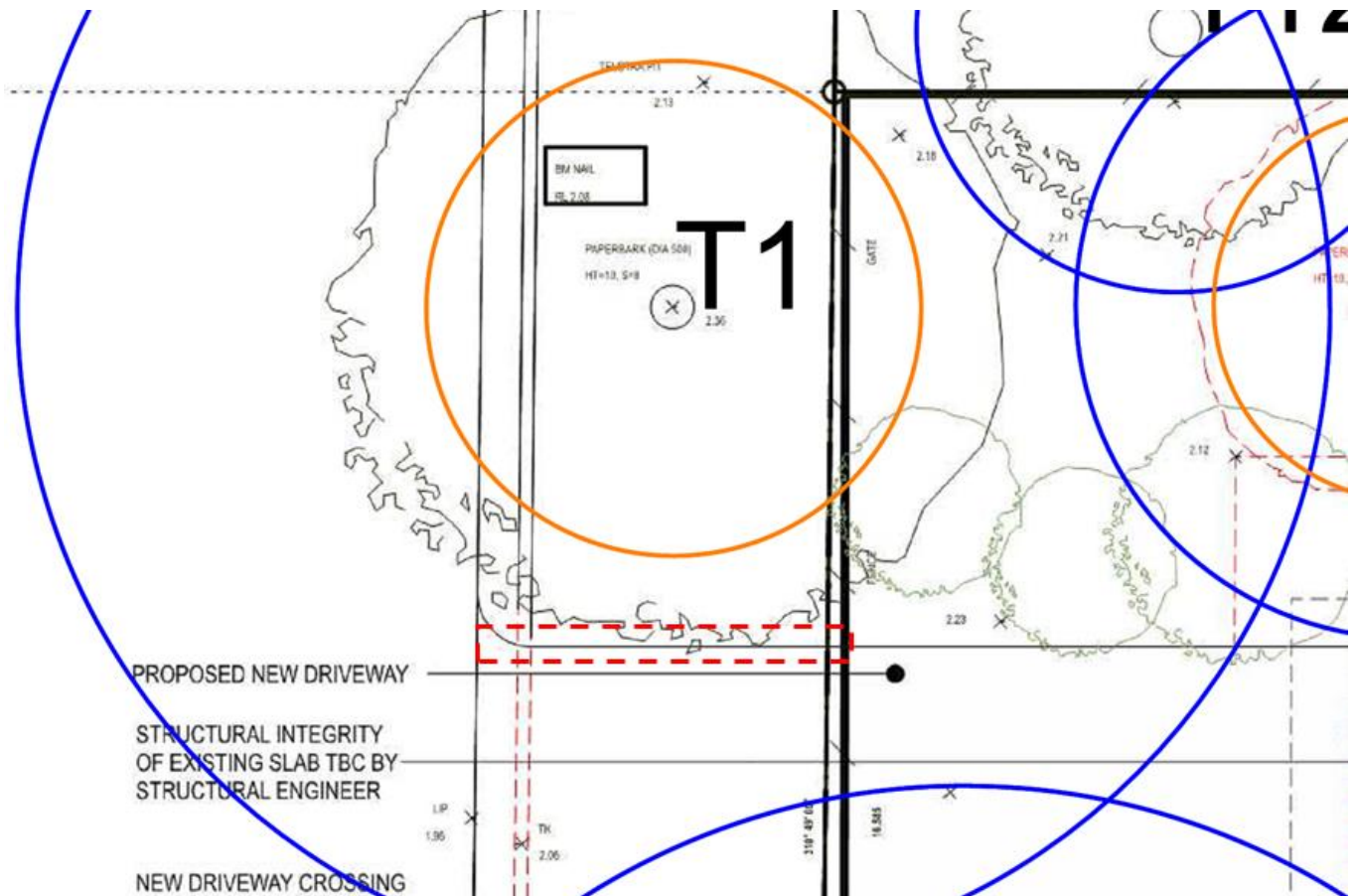


FIGURE 2: LOCATION OF ROOT INVESTIGATION TRENCH SHOWN OUTLINED IN RED
ON AN EXCERPT OF THE PROPOSED GROUND FLOOR PLAN

7.2 Woody and non woody roots encountered during the investigation were <40mm in diameter.



FIGURE 3: ROOT DIAMETERS.

8. Construction Impacts

8.1 Listed in table 5 below are likely impacts from the proposed construction upon the trees.

Tree No.	Proposed encroachments into TPZ and/or canopy	Likely Impacts from proposed construction (Discussion)	Conclusion
1	T1 has a major encroachment of approximately 17% to the TPZ from the proposed driveway	Due to no significant woody roots being encountered in the root investigation detailed in section 7, no detrimental impacts are expected from the proposed construction.	T1 is to be retained and protected. Protective fencing and ground protection will be required during construction.
2,4,5,6 & 12	There are no proposed encroachments to the TPZ's of Trees 2,4,5,6 & 12	No detrimental impacts to Trees 2,4,5,6 & 12 are expected from the proposed development.	Trees 2,4,5,6 & 12 are to be retained and protected. Protective fencing will be required during construction.
3,7,8 & 9	Existing structures are to be demolished within the TPZ's of trees 3,7,8 & 9	No detrimental impacts to trees 3,7,8 & 9 are expected from the proposed development.	Trees 3,7,8 & 9 are to be retained and protected. Arborist supervision will be required during demolition.
10	Tree 10 is located within the development footprint	The removal of T10 will be required to facilitate the proposed development.	Remove and replace T10 subject to approval from Northern Beaches Council.
11	Tree 11 has a major encroachment of approximately 24% to the TPZ and an encroachment to the SRZ from the proposed Dwelling extension.	The removal of T11 will be required to facilitate the proposed development.	Remove and replace T11 subject to approval from Northern Beaches Council.

Tree No.	Proposed encroachments into TPZ and/or canopy	Likely Impacts from proposed construction (Discussion)	Conclusion
T13 & 14	T13 & 14 have a minor encroachment of <10% to the TPZ from the proposed driveway. Demolition of existing paving will also be undertaken within the TPZ.	No detrimental impacts to trees 13 & 14 are expected from the proposed development. All works within the dwelling are within the existing footprint.	Trees 11 & 12 are to be retained and protected. Arborist supervision will be required during demolition.

TABLE 5: CONSTRUCTION IMPACTS

9. Documents used in the Preparation of this report

- 9.1 Listed in table 6 below are documents used in the preparation of this report. Any plan overlays referenced in table 6 below are available as attachments at the end of this report.

Document type	Source/ Author	Title	Date
Plan	Chenchow Little Pty Ltd	Existing Floor Plan	04/05/2020
Plan	Chenchow Little Pty Ltd	Proposed Ground Floor Plan	04/05/2020
Plan	Chenchow Little Pty Ltd	North Elevation	04/05/2020
Plan	Chenchow Little Pty Ltd	South Elevation	04/05/2020
Plan	Chenchow Little Pty Ltd	Section A-A	04/05/2020
Plan	Chenchow Little Pty Ltd	Section B-B	04/05/2020
Plan Overlay	Graham Brooks Arboricultural Tree Services	Tree Location, TPZ & SRZ Plan	26/06/2020
Plan Overlay	Graham Brooks Arboricultural Tree Services	Tree Protection Plan	26/06/2020
Australian Standard	Standards Australia Limited	AS 4970-2009 Protection of trees on development sites.	2009

TABLE 6: DOCUMENTS USED IN THE PREPARATION OF THIS REPORT

10. Conclusion & Recommendations

- 10.1 The appointment of a project arborist (AQF Level 5) for the duration of the project, must be made prior to the commencement of any site works (including demolition), to provide arboricultural management during the construction process. Section 11 of this report details the tree protection process to be followed and specifications for tree protection measures.
- 10.2 The removal of T10 & T11 (subject to approval from Northern Beaches Council) will be required to facilitate the proposed development. Removal must be undertaken by a qualified Arborist (AQF 3) and following the guidelines provided in the Amenity Tree Industry – Work Cover Code of Practice 1998 Safe work Australia’s “Guide to managing risks of tree trimming and removal work” (July 2016). All tree waste is to be removed from site, including timber, mulch and stump grindings.
- 10.3 All remaining trees are to be retained and protected. Tree protection fencing is to be installed prior to the commencement of the project and maintained for its duration, in the locations shown in the attached tree protection plan. An example of tree protection fencing can be found in section 11.5 of this report.
- 10.4 Ground protection will be required within the TPZ of T1 and T12 to provide access to the side and rear of the property. The location of ground protection to be installed is shown on the attached tree protection plan. An example of ground protection can be found in section 11.6 of this report.
- 10.5 The project arborist is to supervise demolition and excavation works within the TPZ’s of trees 1,3,7,8,9,13 & 14 and conduct and document root pruning as necessary.

Yours faithfully,
Arboricultural Tree Services Pty Ltd



Graham Brooks dip arb

Managing director

Arboriculture Australia Approved Consulting Arborist No: 1983 Member International Society of Arboriculture Mem No: 173140 ISA Tree Risk Assessment Qualified 2014-2019

11. Tree Protection Specification – As Per AS4970 – 2009

Tree Protection will be undertaken in the three stages listed below.

11.1 Pre - Development

11.1.1 Prior to any tree removal an AQF level 5 arborist must be engaged as site arborist to oversee all arboricultural aspects of the project including identifying trees for removal.

11.1.2 Tree protection should be installed by a minimum AQF level 3 arborist and be supervised by an AQF level 5 arborist in accordance with the guidelines from AS4970-2009 Protection of trees on development sites (Standards Australia, 2009), and the information provided in sections 10.4, 10.5 and 10.6 of this report.

11.1.3 All trees on site should be visually assessed and their current health and condition recorded. Tree protection measures should be inspected.

11.1.4 Certifying of Pre-Construction Tree Protection by the site arborist will conclude the pre-construction phase of development. It is recommended that Construction does not commence until Pre-Construction tree protection has been certified by the site arborist.

11.2 Development Stage

11.2.1 Tree protection measures must remain in place during this stage. They cannot be removed intermittently for access and any modifications to Tree Protection Fencing Location must be authorised, recorded and carried out by the site arborist.

11.2.2 The site arborist will conduct regular visits in accordance to visually assess and record the health and condition of the trees being retained for the duration of the development.

11.2.3 Tree protection measures will also be assessed regularly to ensure they are functioning correctly. Any maintenance required for Tree Protection measures will also be performed.

11.2.4 A stop work notice will be issued to the compliance officer if any Tree Protection Measures are not found to be complying with the Tree Protection Plan.

11.2.5 Any incidents relating to retained trees must be reported immediately to the site arborist to be documented and a plan for remediation put in place.

11.3 Conclusion of Development

11.3.1 Final visit from the site arborist to report on the health and condition of the trees that have been retained and the removal of tree protection. Incidents documented during the development stage will be included in this report.

11.3.2 Any remedial work necessary upon the completion of development will be recommended in the final report.

11.4 Tree Protection zone requirements

Tree Protection Zones (TPZs), will be set out before the commencement of construction works.

According to AS 4970-2009, activities excluded from the TPZ include but are not limited to:-

- (a) machine excavation including trenching
- (b) excavation for silt fencing
- (c) cultivation
- (d) storage
- (e) preparation of chemicals, including preparation of cement products
- (f) parking of vehicles and plant
- (g) refuelling
- (h) dumping of waste
- (i) wash down and cleaning of equipment
- (j) placement of fill
- (k) lighting of fires
- (l) soil level changes
- (m) temporary or permanent installation of utilities and signs
- (n) physical damage to the tree.

Source Australian Standard AS 4970-2009 *Protection of trees on development sites*.

A TPZ sign with contact details of the site arborist must be fixed to the TPZ fencing, see example below.



An Example of a TPZ sign.

Source, Australian Standard AS 4970-2009 *Protection of trees on development sites*

11.5 Tree Protection Fencing Requirements

11.5.1 Tree protection Fencing must be a minimum of 1.8 metres in height and be held in place with locking clamps and concrete feet between each panel, see Figure 2 below. All temporary fencing should also comply with AS 4687-2007 Temporary fencing and hoardings.



An Example of Temporary Fencing

11.6 Ground Protection Requirements

11.6.1 Wherever ground Protection is required within a TPZ. It is recommended that the ground surface is covered with hessian or geotextile fabric, a thick layer of leaf mulch (minimum 75mm) is applied and timber boards are placed on top of the mulch and strapped together. Track mats (or another suitable commercial product) may also be used in place of timber boards. An example of ground protection is shown below.



An example of completed ground protection

12. References

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13. Glossary of Terms

Common name/genus - the common name and genus/ species of the tree.

Age Class- assessment of the trees current age.

Immature (IM) - refers to a tree at growth stages between immaturity and full size.

Semi-mature (SM) - refers to a full sized tree with some capacity for further growth.

Mature (M)-refers to a full sized tree with some capacity for further growth.

Over-mature (OM) - a mature tree has reached a near stable size (biomass) above and below the ground .Trees can have a Mature Age Class for > 90% of their life span. Over-mature (OM) trees show symptoms of irreversible decline and decreasing biomass.

Height -estimated overall height of the tree.

Tree Protection Zone (TPZ) - is a “No Go Zone” surrounding a tree to aid in its ability to cope with disturbances associated with construction works. Tree protection involves minimising root damage that is caused by activities such as construction. Tree protection also reduces the chance of a tree’s decline in health or death & the possibly damage to structural stability of the tree from root damage.

Diameter at Breast Height (DBH) - the trunk diameter at breast height (in metres) of the tree, 1.4 meters above ground level.

Diameter above the Buttress (DAB) - refers to the tree trunk diameter measured above the root buttress and is used to calculate the radius of the SRZ.

Structural root zone (SRZ) – the structural root zone is the area required for the trees stability. A larger area is required to maintain a viable tree. The SRZ is only needed to be calculated when a major encroachment into the TPZ is proposed. There are many factors that affect the size of the SRZ (e.g. tree height, crown area, soil type, soil moisture).The SRZ may also be influenced by natural or built structures, such as rock and footings.

Vigour - Good (G), Fair (F) or Poor (P) - the general appearance of the canopy of the tree at the time of inspection. Vigour can vary with the season and rainfall frequency

Health – Excellent (E), Very Good (VG), Good (G), Fair (F), Declining (D), Poor (P),Very Poor (VP).this refers to the tree’s form & growth habit, as modified by its environment (aspect suppression by other tree/s, soils,) & the state of the scaffold (i.e. trunk & major branches),including structural defects such as cavities, crooked trunks or weak trunk/branch junctions. These are not directly connected with health & it is possible for a tree to be healthy but in poor condition/vigour.

Deadwood – this refers to any whole limb that no longer contains living issues (i.e. living leaves & /or bark).Some dead wood is common in a number of species.

Crown Spread - the greatest width from drip line to drip line of a branch across the trees crown.

Crown Form -the density of foliage (expressed as a percentage), that would be expected to be displayed in a tree of its genus/species. Many factors such as the presence of pests and/or diseases, drought and other associated environmental conditions contribute to crown form.

Epicormic Growth - these are advantageous shoots that grow from secondary bud development. They are an indicator that the tree has/or is under stress.

Live Crown Ratio (LCR) -the height of a trees crown, relative to the total height of the tree. Often used as an indicator of overall stability.

Live Crown Size (LCS) - the area of the crown as viewed from one aspect.

Australian Height Datum (AHD) – A Geodetic measurement for altitude in Australia.

AGL – Above Ground level.

14. Relevant Appendices

Appendix 1 - STARS© Rating System

Significance of a Tree, Assessment Rating System* (IACA 2010) – S.T.A.R.S. ©

The landscape significance of a tree is an essential criterion to establish 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. To assist this process all definitions for terms used in the *Tree Significance - Assessment Criteria* and *Tree Retention Value - Priority Matrix*, are taken from the IACA Dictionary for Managing Trees in Urban Environments 2009.

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 of an individual tree has been defined, the retention value can be determined. An example of its use in an Arboricultural report is shown as Appendix A.

Tree Significance - Assessment Criteria



High Significance in landscape

- The tree is in *Good condition* and *Good vigor*;
- 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.

Medium Significance in landscape

- The tree is in *Fair-Good condition* and *Good or Low vigor*;
- 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*.

Low Significance in landscape

- The tree is in fair-poor condition and good or low vigor;
- 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.

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 for individual trees only, however, can be applied to a monocultural stand in its entirety e.g. hedge.

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

Table 1.0 Tree Retention Value - Priority Matrix.

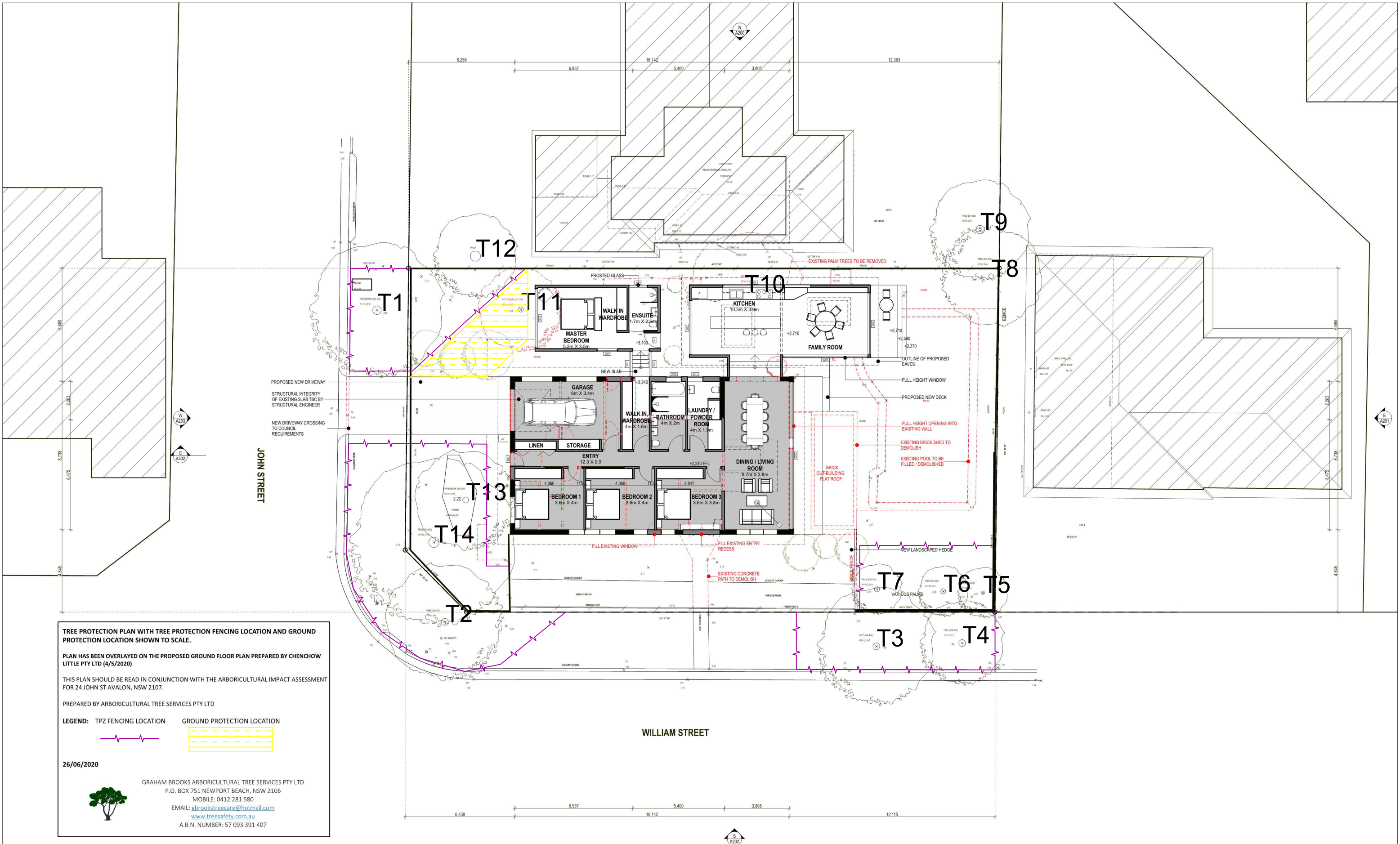
		Significance				
		1. High	2. Medium	3. Low		
		Significance in Landscape	Significance in Landscape	Significance in Landscape	Environmental Pest / Noxious Weed Species	Hazardous / Irreversible Decline
Estimated Life Expectancy	1. Long >40 years					
	2. Medium 15-40 Years					
	3. Short <1-15 Years	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

USE OF THIS DOCUMENT AND REFERENCING The IACA Significance of a Tree, Assessment Rating System (STARS) is free to use, but only in its entirety and must be cited as follows:

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

REFERENCES Australia ICOMOS Inc. 1999, *The Burra Charter – The Australian ICOMOS Charter for Places of Cultural Significance*, International Council of Monuments and Sites, www.icomos.org/australia Draper BD and Richards PA 2009, *Dictionary for Managing Trees in Urban Environments*, Institute of Australian Consulting Arboriculturists (IACA), CSIRO Publishing, Collingwood, Victoria, Australia. Footprint Green Pty Ltd 2001, *Footprint Green Tree Significance & Retention Value Matrix*, Avalon, NSW Australia, www.footprintgreen.com.au

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



TREE PROTECTION PLAN WITH TREE PROTECTION FENCING LOCATION AND GROUND PROTECTION LOCATION SHOWN TO SCALE.

PLAN HAS BEEN OVERLAYED ON THE PROPOSED GROUND FLOOR PLAN PREPARED BY CHENCHOW LITTLE PTY LTD (4/5/2020)

THIS PLAN SHOULD BE READ IN CONJUNCTION WITH THE ARBORICULTURAL IMPACT ASSESSMENT FOR 24 JOHN ST AVALON, NSW 2107.

PREPARED BY ARBORICULTURAL TREE SERVICES PTY LTD

LEGEND: TPZ FENCING LOCATION GROUND PROTECTION LOCATION

26/06/2020

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ABBREVIATIONS:	PCB	PRECAST CONCRETE STAIR	DEMOLITION
AC CONCRETE	PCB	REINFORCED CONCRETE BLOCK	EXISTING
CON CHECK ON SITE	RCB	REINFORCED DOUBLE BRICK	PROPOSED
CT CERAMIC TILE	RL	RENDERED MASONRY	
D DOOR	RM	RETRACTABLE VERTICAL BATTEN	
DT DOWNPIPE	RWS	SHUTTERS (HANG AND LOCKED)	
EL EXISTING	SB	ALUMINUM SHS	
FL FINISHED FLOOR LEVEL	SE	RAIN WATER OUTLET	
GB GLASS BALUSTRADE	SL	SOLID BALUSTRADE	
GL GLASS GLAZING	SD	SKYLIGHT	
GU GLASS GLAZING DOOR	SS	SLOTTED DOOR	
HD HAND RAIL	TBC	STEEL DOOR	
J JOINERY UNIT	TDK	TO BE CONFIRMED	
LA FIXED ADJUSTABLE LOUVRES	TPW	TIMBER DECK	
MB METAL BALUSTRADE	TPF	TIMBER PAVEMENT	
MD METAL DECK ROOF	TM	TRANSLUCENT FIXED GLAZING	
MS METAL SILL	VBS	VERTICAL BATTEN PRIVACY SCREEN	
PE PLASTERBOARD, PAINT FINISH	ZN	(HANG AND LOCKED) ALUMINUM SHS	
PCF POLISHED CONCRETE FLOOR		ZINC CLADDING	

SURVEY CONSULTANT:	TRAFFIC ENGINEER:	ARBORESCULE CONSULTANT:	ISSUE	Issue Name	DATE
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			03	Issue For Client Revision	13/03/2020
			02	Issue For Consultants Coordination	26/02/2020
			01	Issue For Client	10/02/2020

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JOB TITLE:	ALTERATIONS AND ADDITIONS FOR ANTHONY & SHANNON RITCHIE
	24 JOHN STREET AVALON BEACH NSW 2107
DRAWING TITLE:	PROPOSED GROUND FLOOR PLAN

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DATE:	MAY 2020
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CHECKED BY:	TCC
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JOB NO:	1527
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FULL SIZE ON ORIGINAL	