rain Tree consulting

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23 September 2020

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27 - 29 NORTH AVALON ROAD
AVALON BEACH, NSW 2107

PROPOSED SENIORS LIVING FACILITY

ARBORICULTURAL IMPACT ASSESSMENT REPORT
Report Ref No- RTC-15420 issue A

This report has been commissioned by Armada Avalon Pty Limited C/- Environa Studio for the purpose of providing a summary assessment detailing tree removal and general tree protection requirements for development within 27 – 29 North Avalon Road, AVALON BEACH NSW.
Plans reviewed to assist in preparation of the report include:
Environa studio

- Drawing list provided within job No: 991 issue R dated 18.9.2020

ACOR Consultants P/Limited

- Stormwater Management Plan, Level 1, Dwg No. C3 issue A dated 21.9.2020

John Lock & Associates –job No. 2604

- Existing Tree Plan Dwg No. LP-00 issue H dated 18.9.2020

Hammond Smeallie & Co Pty Limited project No: 14535

- Survey Plan, Sheet 1 rev C dated 7.3.2019

Raintree Consulting

- Arboricultural Impact Assessment (AIA) ref No. RTC-8619 dated 5.10.2019. Within 8619 report T51 & 52 have been corrected to T51 exempt Mulberry tree and T52 prescribed (protected) Cheese tree within this report.

1. PRESCRIBED TREE REMOVAL

The following twenty three (23) prescribed (LGA protected) trees have been identified for removal due to being located within the development footprint, or receive moderate to high levels impacts or disturbance within SRZ & TPZ radiuses.

- T5, 7, 8, 9, 10, 14, 15, 16, 17, 18, 23, 25, 26, 27, 29, 30, 40, 52, 53, 54, 55, 56 & 58, of these trees palm 16 has been specified for relocation.

Design requirements and development disturbances have been identified within Appendix- C p7 with TPZ incursions detailed within Note 2 of appendix A.

2. NON-PRESCRIBED (EXEMPT) TREES

The following twenty six (26) non-prescribed (LGA exempt trees or group of) are permitted to be managed (pruned, removed or relocated) without Council consent.

- T12, 13, 19, 22, 24, 28, 31, 32, 33, 34x5, 35, 36x4, 37, 38, 39, 41, 42, 43, 44, 45, 46, 47, 48, 51, 57 & 59

Should an exempt species require retention further advice from an appointed project arborist is required prior to works commencing within tree protection zone setbacks.

3. General tree protection requirements

1) Prior to demolition works Tree Protection Fencing (TPF) and/or zones as identified within Figure 1 are recommended to be located under the guidance of an appointed site arborist. Unless specified otherwise the location of tree protection fencing is to be positioned to allow for adequate work access and/or be located at the extremity of the TPZ radius, see SRZ & TPZ distance column Appendix- C.

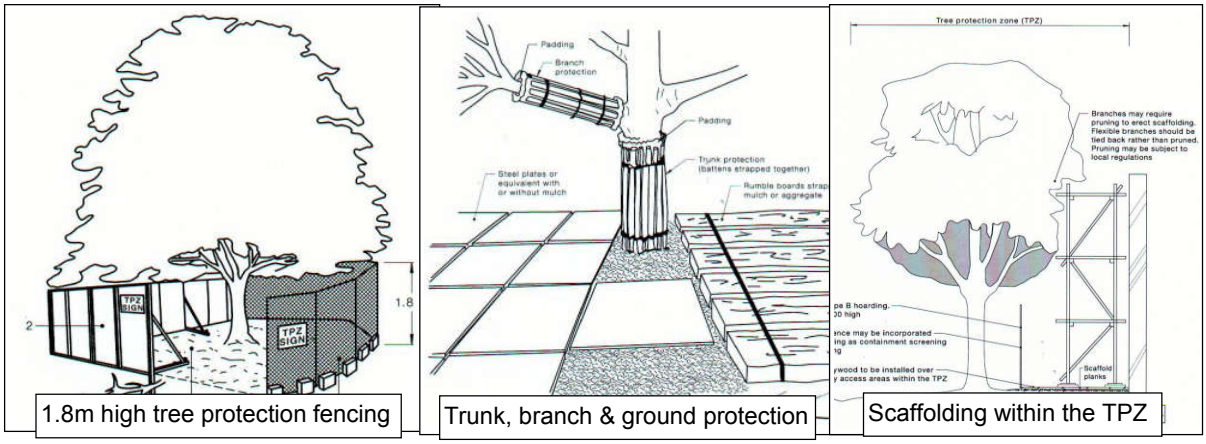
   Where design & construction access may be restrictive timber beam trunk protection is recommended to be installed, with ground protection mats provided to protect underlying tree roots within tree protection zones or areas.

2) In accordance with AS4970 - 2009 (1.4.4) a Project or Site Arborist is to be engaged to monitor, supervise excavation within TPZ setbacks, advise and provide certification of protection works conducted. The project arborist is recommended to hold a minimum Australian Qualification Framework (AQF) Level 4 certification and be competent in methodology of protecting trees on development sites.

3) The project arborist is to provide final certification outlining tree protection measures with photographic evidence of ongoing works retained for certification purposes (AS4970 S/5.5.2 *Final certification*).

4) The project arborist is to be familiar with protection measures specific to Australian Standard AS4970 'Protection of Trees on Development Sites' – 2009 requirements with any modification in Tree Protection Fencing (TPF) or Zones (Z) to be compliant with AS4970 Section 4.5 *Other Tree Protection Measures.*

Figure 1: tree protection fencing, ground and trunk protection detail



1.8m high tree protection fencing | Trunk, branch & ground protection | Scaffolding within the TPZ

All tree protection fencing requires appropriate signage clearly stating *a TPZ restriction area* being a designated Tree Protection Zone.

5) Unless specified otherwise during approved excavation within TPZ setbacks excavation is to be conducted manually (by hand) under the supervision of an appointed project arborist.

Where approved by the arborist the pruning of roots at or <30mm(Ø) is to be conducted in accordance with AS4970 – 2009 Section 4.5.4 *Root protection during works within the TPZ*, such that tree roots are not damaged or ripped beyond the point of excavation by site machinery. Where larger roots have been encountered they are to be referred to an independent Level 5 arborist for further advice.

For deep excavations exposed roots at the excavated cut face are to be protected with jute mesh, geotextile fabric or similar being secured in place to avoid drying of roots and the exposed soil profile.

6) ***Hold points***: Hold points specific to *no works are to commence without arborist advice, inspections & certifications*:

1) No works shall occur within the SRZ without prior arborist advice and certification.

The project arborist shall be notified in advance before works commence, with all plans and documentation provided to the arborist for review prior to attending site, which includes minor Civil & landscape works.

2) No excavation shall occur within the TPZ without prior project arborist notification and/or site supervision.

The project arborist shall be given adequate notice to schedule in supervision works.

3) It is the responsibility of the principle contractor to manage tree protection zones and complete each task identified within Table 1.

The development site superintendent is responsible for informing all site contractors of tree protection requirements which includes minor civil works and landscape construction.

Table 1, certification requirements & hold points

1	Pre-construction	Prior to works clearly mark all trees for removal & retention
		Install tree protection fencing & zones as specified or as directed by the site arborist
2	During construction	Project arborist to supervise & certify approved works within tree protection zones throughout the course of development
		Project arborist to undertake routine (monthly) site & tree inspections
3	Post construction	Prior to handover project arborist to provide final inspection & certification of tree health & vitality

7) *Canopy pruning / tree removal:* where required tree removal and canopy reductions are to be approved by the Local Government Authority.

Works are to be conducted by a suitably qualified AQF Level 3 certified arborist in accordance with AS4373 Pruning Standards, and specifically be conducted in accordance with Safe Work Australia – Guide to managing risks of tree trimming and removal works 2016 (www.swa.gov.au).

8) *Additional inground services* which may include landscape works, sewer, stormwater, water and electrical services, final design and impact to trees shall be reviewed and endorsed by the project arborist prior to their installment. Where landscaping (excavation) is required within the SRZ further advice from an appointed project arborist is recommended.

9) To ensure tree(s) are appropriately protected the development site superintendent is recommended to be familiar with all tree protection and ongoing certification requirements. The superintendent is responsible for informing all subcontractors of the responsibilities and requirements of tree protection prior to their engagement.

Should you require further liaisons in this matter please contact me direct on 0419 250 248

Yours sincerely

Mark A Kokot

AQF Level 5 consulting arborist

Diploma of Hort/Arboriculture (AQF5), Associate Diploma Parks Management (AQF4)
Certified Arborist / Tree Surgeon (AQF3), ISA Tree Risk Assessment Qualified 2024
Member: ISA, Arboriculture Australia & IACA, Working With Children No: WWC0144637E

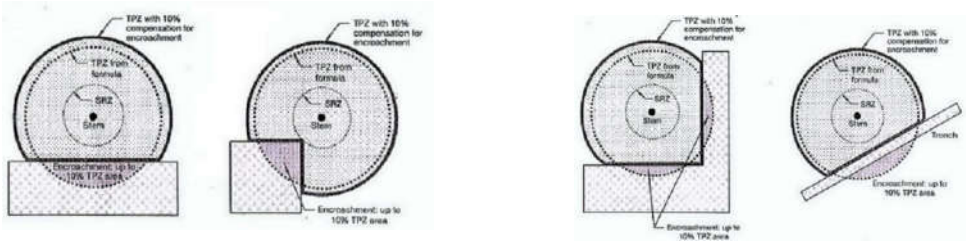
APPENDIX- A: Terminology, notes & references

Acceptable Risk: Exposure to or reject risk of varying degrees. The acceptable risk is defined as '*The person who accepts some degree of risk in return for a benefit being exposed to some risk of varying degree*.
Age classes: (I) Immature refers to a well established but juvenile tree. (ESM) refers to an early semi mature tree not of juvenile appearance. (SM) Semi-mature refers to a tree at growth stages advancing into maturity and full size. (LSM) Late Semi- Mature, refers to a tree between semi-mature and close to mature. (EM) refers to a tree at the first stages of maturity. (M) Mature refers to a full size tree with some capacity for future growth. (LM) Late mature refers to a tree entering into over maturity (OM) and likely first stages of senescence. **Health:** Refers to a trees vigor exhibited by the crown density, leaf colour, presence of epicormic shoots, ability to withstand disease invasion and the degree of dieback.
Condition: 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 week trunk / branch junctions. These are not directly connected with health and it is possible for a tree to be healthy but in poor condition. **Decay:** (*N*) – an area of wood that is undergoing decomposition. (*V*) – decomposition of an area of wood by fungi or bacteria. **Decline:** Is the response of a tree to a reduction of energy levels resulting from stress. Recovery from decline is difficult and slow; is usually irreversible. **Defect:** A identifiable fault in a tree. **Epicormic Shoots**: Shoots that arise from latent or adventitious buds that occur on stems and branches and on suckers produced from the base of the tree. A symptom / result of stress related factors. **Footprint:** The area occupied by site structures, including the dwelling driveways and hard surfaces. **Included Bark**: (Inclusion) a genetic weak fault, pattern of development at branch junctions where the bark is turned inwards rather than pushed out, can pose a potential hazard. **Order of branches:** First order being those that are the first to extend from the main trunk or codominant limbs, second order branches extend from the first order and third order branches extend from the second order. **Probability:** The likelihood of some event happening. **Risk:** Is the probability of something adverse happening. **Suppression:** Restrained growth pattern from competition of other trees or structures. **Wound:** Damage inflicted upon a tree through injury to its living cells, may continue to develop further weakening of the structure compromising structural integrity.

NOTE 1: This report acknowledges the current **Australian Standards 'Protection of Trees on Development Sites'** AS 4970 – 2009 with reference to the Tree Protection Zone (TPZ): being a combination of the root and crown area requiring protection. The TPZ takes into consideration the Structural Root Zone (SRZ): The area required for tree stability. Determined by AS4970 - 2009 Figure 1, Table of determining the SRZ, section 3.3.5 of the standards. The standard states where a greater than 10% encroachment occurs the arborist is to take into consideration the schedule of determining impacts as set within AS4970 s. 3.3.4. Encroachments are referred to within this report as major or minor encroachments (AS4970 s. 3.3.2 & 3.3.3). Below is the terminology used for estimated percentage of development incursion used within this report. To retain specific trees and ensure their viability development must take into consideration protection of the TPZ radius.

NOTE 2: The extent of inclusion within the TPZ radius has been categorised as follows:
No impact 0% incursion
Low impact 0 - 10% of minor consequence
Low to Moderate 10 – 15% incursion where the project arborist is to demonstrate the tree(s) remain viable
Moderate 15 – 20% incursion where the project arborist is to demonstrate the tree(s) remain viable by tree sensitive construction techniques
Moderate to high 20 – 25% incursion requiring specific protection methodology to retain
High impact 25 – 30% incursion where design changes or further information is required to manage tree vitality which includes Significant impact >35% incursion.

Showing acceptable incursion within the TPZ (AS4970)



SELECTED REFERENCES:
Barrell J. 1993, 'Preplanning Tree Surveys: Safe useful Life expectancy (SULE) is the Natural Progression", Arboricultural Journal 17: 1, February 1993, pp. 33-46.
International Society of Arboriculture (ISA) 2013, Tree Risk Assessment Manual, Martin Graphics, Champaign Illinois U.S.
Mattheck, C. & Breloer, H.(1994) *The Body Language of Trees.* Research for Amenity Trees No.4 the Stationary Office, London.
Matheny N. & Clark J. 1998, Trees & Development *'A Technical Guide to Preservation of Trees During Land Development'* International Society of Arboriculture, Champaign USA.
Standards Australia 2009, *Australian Standards 4970 Protection of Trees on Development Sites* - Standards Australia, Sydney, Australia.
Northern Beaches Council DCP https://www.northernbeaches.nsw.gov.au/planning-and-development/building-and-renovations/planning-controls

APPENDIX- B: Tree Retention Value *Checklist* ©rainTree consulting

VTA i) Landscape Significance (LS): The significance of a tree in the landscape is a combination of its amenity, environmental and heritage values.

Values may be subjective however, are based after IACA Sustainable Retention Index Value (SRVI) which offer a visual understanding of the relative importance of the tree to the environment. The Landscape Significance for this assessment is described in seven categories to assist in determining the retention value of trees.

1	Significant	2	Very High	3	High	4	Moderate	5	Low	6	Very Low	7	Insignificant

ii) Visual Tree Assessment (VTA)

0	If appropriate to VTA - **exempt* trees from Local Government Authority (LGA) Tree Management or Preservation Orders (TPO)	2E	Trees location likely to be affected by infrastructure restricting root growth potential, or tree has potential to cause infrastructure damage where risk mitigation or rectification works may likely compromise tree
0A	Noxious or invasive species located within heritage conservation area		
1	Trees that are dead, significantly declining >75% volume or obviously hazardous	3	This rating incorporates trees that may require further investigation of defects such as cavities or symptoms indicating internal decay to an extent that cannot be quantified under visual examination. Further inspections may be in the way of arborist climbing inspection within the canopy, root crown investigation and/or drill penetrating or Picus Sonic Tomograph ultrasound testing procedures to determine percentage of internal decay.
2	Trees that are structurally damaged. Have poor structure or weak & detrimental large stem inclusions capable or failure opposed to 2B. Tree also may be affected by extensive borer damage, fungal pathogens (wood rot) or viruses. Some symptoms may be reversible, remediated or controlled give appropriate management.		
2A	Tree damage specific to basal and/or root plate damage, very shallow soils or steep topography resulting in poor anchorage where condition may become problematic in near future / may include trees with included bark splits to ground level	4	Trees which appear specifically environmentally stressed by drought, poor soil or site conditions. Symptoms may be reversible given appropriate management
2B	Defect specific to stem inclusions development (weak branch attachments) where the condition may not be immediately detrimental however, require annual to biannual monitoring with control to prevent stem failure by installing slings, cable or bracing. Tree may also contain multi stems or codominant twin stems	5	Trees that would benefit from crown maintenance pruning as identified within the Australian Standards AS 4373 – 2007 Pruning of Amenity Trees
		5A	Trees that require little or no maintenance at time of inspection other than close monitoring
2C	Tree may contain minor wounds, pest or minor pathogen activity, altered from storm damaged to an extent that is not considered immediately detrimental - may also display average form. Likely to require close annual monitoring or minor corrective pruning	6	Trees may be typical for species type, of good form and visual condition for age class May have suppressed one sided canopies or are low risk trees
2D	Trees significantly altered by recent storm or over pruning events which may reduce retention values due to average form- or tree extensively pruned for power line clearance	7	VTA restricted by canopy or plant material vine or ivy covering tree parts, or site conditions which do not allow access- e.g. fences to neighbouring sites

iii) Retention Value (RV): y [1] High, tree viable for retention, [2] Medium, viable for retention with minor faults which may reduce ULE, [3] Low, trees which should not restrict development applications containing faults that are likely to become problematic in the short term, [4] Remove, trees to be considered for removal due to average condition.

1	High retention	2	Medium retention	3	Low retention	4	Consider removal

iv) U.L.E. categories Useful Life Expectancy (after *Barrell* 1996, modified by the author). A trees U.L.E. category is the life expectancy of the tree modified first by its age, health, condition, safety and location. U.L.E. assessments are not static but may be modified as dictated by changes in trees health and environment.

1. Long U.L.E. - Appear retainable at the time of assessment for over 40 years with an acceptable degree of risk assuming reasonable maintenance.
2. Medium U.L.E. - Appear to be retainable at the time of assessment for 15 to 40 years with an acceptable degree of risk assuming reasonable maintenance.
3. Short U.L.E. - Trees appear to be retainable at the time of assessment for 5 to15 years with an acceptable degree of risk assuming reasonable maintenance.
4. Very short - Removal- Trees which should be scheduled for removal within the very short term or as specified within this report.
5. Small, young or regularly pruned – Trees under 5m in height that can be easily moved or replaced, includes screen plantings or hedge lines.

APPENDIX- C: Tree Assessment Schedule

	Trees requiring removal due to hazardous or dead condition - subject to Local Government Authority notification		Trees with low retention values: senescence, developing defects or being *exempt trees from the LGA Tree Preservation Order (TPO)

Tree No	***Botanical Name*** **COMMON NAME**	**Height x spread (m)**	**DBH (mm)**	**SRZ** / **TPZ**	**Age**	**Health**	**Condition**	**Signifi-cance**	**VTA**	**RV**	**U. L.E.**	**Comments** CV = Council verge tree NT= Neighbouring tree
1 CV	*Casuarina glauca* She Oak	16 x 11	650	2.8m / 7.8	SM	Good	Fair / Poor	3	2	3	<3	Twin stems at 1.4m with stem inclusion development capable of failure
Design & impact summary	*Retain & protect; Low level building footprint occupancy, no works within SRZ to occur, no excavation within TPZ recommended which includes inground services (hydraulics) and landscape features*											
2 CV	*Casuarina glauca* She Oak	20 x 13	550	2.7 / 6.6	SM	Good	Good	3	6/7	1	2	Tree with no significant defects noted
Design & impact summary	*Retain & protect; Low level building footprint occupancy, no works within SRZ to occur, no excavation within TPZ recommended which includes inground services (hydraulics) and landscape features*											
3 CV	*Casuarina glauca* She Oak	6 x 2	100	1.5 / 2	I	Good	Good	3	6	1	2	Tree with no significant defects noted
Design & impact summary	*Retain & protect; negligible building footprint occupancy, no works within SRZ to occur, no excavation within TPZ recommended without arborist advice*											
4 CV	*Jacaranda mimosifolia* Jacaranda	9 x 7	300at base	2 / 3.6	ESM	Good	Good	4	2C	2	2	Minor lower trunk wounds – appear not immediately detrimental
Design & impact summary	*Retain & protect; negligible building footprint occupancy, no works within SRZ to occur, no excavation within TPZ recommended without arborist advice*											
5 CV	*Eucalyptus Botryoides* Southern Mahogany	6 x 4	200	1.8 / 2.4	ESM	Good	Fair / Good	3	6	1	2	Suppressed canopy form biomass NE – no significant visual faults
Design & impact summary	*Remove to accommodate footpath design*											
6 x3 CV	*Casuarina glauca* She Oak	av 5 x 3	av 100	1.5 / 2	ESM	Good	Fair	3	2C	2	2	Three small trees of average form
Design & impact summary	*Retain & protect; negligible building footprint occupancy, no works within SRZ to occur, no excavation within TPZ recommended without arborist advice, likely footpath impact*											
7 CV	*Bauhinia sp* Bauhinia	9 x 11	450at base	2.4 / 5.4	SM	Good	Fair / Good	4	2C	2	2	Minor wounds at multi stems 0.5m + stub end cuts N sides
Design & impact summary	*Remove to accommodate footpath design*											
8 CV	*Hibiscus sp* Hibiscus	3 x 6	150at base	1.5 / 2	ESM	Good	Fair / Good	4	2B	2	3	Multi stemmed at base, typical for species type
Design & impact summary	*Remove to accommodate footpath design*											

	Trees requiring removal due to hazardous or dead condition - subject to Local Government Authority notification		Trees with low retention values: senescence, developing defects or being *exempt trees from the LGA Tree Preservation Order (TPO)

Tree No	*Botanical Name* COMMON NAME	Height x spread (m)	DBH (mm)	SRZ / TPZ	Age	Health	Condition	Signifi-cance	VTA	RV	U. L.E.	Comments CV = Council verge tree NT= Neighbouring tree
9 CV	*Casuarina glauca* She Oak	23 x 14	550, 350	3.1 10.8	ESM	Good	Fair / Good	3	2A	2	3	Twin stems at ground level, NW stem with stem inclusion development at ground level = likely to become problematic in the future
Design & impact summary		*Remove to accommodate footpath design*										
10 CV	*Eucalyptus robusta* Swamp Mahogany	16 x 11	350	2.3 4.2	ESM	Fair / Good	Fair	3	2E	2	3	Shallow root plate with surface roots, slight lean N + suppressed canopy form biomass - N
Design & impact summary		*Remove to accommodate footpath construction, likely high level SRZ interference*										
11 CV	*Corymbia citriodora* Lemon Scented Gum	23 x 18	700	2.8 8.4	ESM	Good	Good	4/3	2C	2	2	Minor lower trunk wound W side – appears not immediately detrimental
Design & impact summary		*Retain & protect, likely high level SRZ impact by footpath, Moderate level occupancy & disturbance within TPZ*										
*12	*Phoenix canariensis* Phoenix Palm	4 x 8	1000	- 5	ESM	Good	Good	4	0/6	1	2	Exempt palm species
Design & impact summary		*Exempt species, manage in accordance with design requirement, likely Medium level TPZ occupancy by pathway, minor excavation impact for hydraulics*										
*13	*Cupressus leylandii* Leyland Green Cypress	7 x 4	150, 200	2.1 4.2	ESM	Fair / Good	Fair	4	0/2B	2	2	Exempt tree species, twin at ground level with minor stem inclusion development
Design & impact summary		*Exempt species, manage in accordance with design requirement*										
14	*Casuarina glauca* She Oak	15 x 5	300	2.1m 3.6	ESM	Good	Fair / Good	3	2C	2	2	Skewed trunk, of tall forest form, slight lean W, suppressed canopy = likely to become problematic if exposed
Design & impact summary		*Remove; design requirement, hydraulic impact within SRZ & basement cut = likely Moderate to high level impact*										
15	*Casuarina glauca* She Oak	24 x 11	350	2.3 4.2	SM	Good	Good	3	6	1	2	Tree with no significant defects noted SRZ & TPZ likely to be greater
Design & impact summary		*Remove within building or construction footprint*										
16	*Livistona australis* Cabbage Palm	4 x 5	400	- 3.5	ESM	Fair / Good	Good	3	2C/6	1	2/5	Slight pest / pathogen affected foliage – appears not immediately detrimental
Design & impact summary		*Remove within building or construction footprint, proposed palm relocation, see landscape plan for further detail*										

	Trees requiring removal due to hazardous or dead condition - subject to Local Government Authority notification		Trees with low retention values: senescence, developing defects or being *exempt trees from the LGA Tree Preservation Order (TPO)

Tree No	*Botanical Name* COMMON NAME	Height x spread (m)	DBH (mm)	SRZ / TPZ	Age	Health	Condition	Signifi-cance	VTA	RV	U. L.E.	Comments CV = Council verge tree NT= Neighbouring tree
17	*Corymbia maculata* Spotted Gum	20 x 22	750	2.8 / 9	SM	Fair / Good	Fair / Poor	2	2	3	3	Structurally defective tree, large wound S side ground level to 5m – wound wood face sound, wound margins increasing with decline in canopy = likely pathogen affected = low retention value
Design & impact summary		*Remove within building or construction footprint*										
18	*Melaleuca quinquenervia* Paperbark	5 x 3	100, 100	1.6 / 2.4	ESM	Good	Fair / Good	4/3	2B	2	2	Twin stems at ground level with minor stem inclusion development
Design & impact summary		*Remove within building or construction footprint*										
*19	*Melaleuca quinquenervia* Paperbark	4 x 2.5	100	1.5 / 2	ESM	Good	Good	4/3	6	1	2/5	Exempt tree species height class <5m
Design & impact summary		*Exempt species, manage in accordance with design requirement*										
20	*Angophora costata* Angophora	6 x 5	150	1.6 / 2	I	Good	Good	3	6	1	1	Tree with no significant defects noted
Design & impact summary		*Retain & protect, no excavation within TPZ, exclude or suspend landscape walls within TPZ*										
21	*Eucalyptus sp* Eucalypt	6 x 4	150at base	1.5 / 2	I	Good	Good	4/3	6/7	1	1	Small juvenile tree, requires flower & fruit for ID – no significant visual faults noted
Design & impact summary		*Retain & protect, no excavation within TPZ, exclude landscape walls & features within TPZ*										
*22	*Gordonia axillaris* Gordonia	4 x 6	300at base	2 / 3.6	SM	Fair	Fair / Good	4/5	4/2C	2	2	Exempt tree species height class <5m, Environmentally stressed with reduction pruning evident
Design & impact summary		*Exempt species, manage in accordance with design requirement, likely moderate to high impact for minor civil landscape works in SRZ*										
23	*Leptospermun petersonii* Lemon Scented Tea Tree	5 x 4	250at base	1.8 / 3	SM	Good	Fair	4	2C/4	2	<3	Very Slight decline in canopy, of average form by lopping / reduction pruning = low retention value
Design & impact summary		*Retain with Moderate to high level SRZ conflicts, landscape civil works in SRZ, removal recommended*										
*24	*Grevillea sp* Grevillea Moonlight	4 x 5	300at base	2 / 3.6	M	Fair / Poor	Fair / Poor	5	0/4	3	<3	Exempt tree species height class <5m, with significant decline throughout
Design & impact summary		*Exempt species, manage in accordance with design requirement, likely Moderate to high excavation impact for landscape civil works in SRZ*										

	Trees requiring removal due to hazardous or dead condition - subject to Local Government Authority notification		Trees with low retention values: senescence, developing defects or being *exempt trees from the LGA Tree Preservation Order (TPO)

Tree No	*Botanical Name* COMMON NAME	Height x spread (m)	DBH (mm)	SRZ / TPZ	Age	Health	Condition	Signifi-cance	VTA	RV	U. L.E.	Comments CV = Council verge tree NT= Neighbouring tree
25	*Eucalyptus robusta* Swamp Mahogany	17 x 15	650	2.8 / 7.8	SM	Good	Fair / Poor	2	2/3	2	3?	Large open lower trunk wound at 1m W side with decay evident, wound wood seam increasing to 2.4m = low retention value - benefit from further investigations with very shallow surface roots evident
Design & impact summary		*Remove; within building footprint*										
26	*Macadamia integrifolia* Macadamia	6 x 5	250at base	1.8 / 3	ESM	Good	Good	4	6	1	2	Tree with no significant defects noted
Design & impact summary		*Remove; within building footprint*										
27	*Melaleuca quinquenervia* Paperbark	13 x 3	250	2 / 3	ESM	Fair / Good	Fair / Good	4/3	2B	2	2	Minor stem inclusion development at 7m twin stem bifurcation – likely to become problematic if exposed
Design & impact summary		*Remove; within building footprint*										
*28	*Grevillea robusta* Silky Oak	24 x 8	400	2.4 / 4.8	ESM	Good	Good	4/3	6	1	2	Exempt tree species, tall forest form – likely to become problematic if exposed
Design & impact summary		*Exempt species, manage in accordance with design requirement*										
29	*Casuarina glauca* She Oak	22 x 15	450, 450	3.1 / 10.8	SM	Good	Fair	3	2A	3	3	Main twin stems at ground level with stem inclusion development – likely to become problematic in the future, shallow and extensive root plate = low retention value
Design & impact summary		*Remove; within building or construction footprint*										
30	*Syzygium* smithii Lilly pilly	5 x 7	200	1.8 / 2.4	ESM	Good	Good	3	6	1	2	Suppressed canopy form biomass E with no significant defects noted
Design & impact summary		*Remove; within building or construction footprint*										
*31	*Nerium oleander* Oleander	11 x 11	multi 1200at base	3.6 / 14.4	M	Fair / Good	Fair / Good	5	0	2	2	Exempt tree species
Design & impact summary		*Exempt species, manage in accordance with design requirement*										
*32	*Lagerstromia indica* Crepe Myrtle	9 x 10	multi 850at base	3 / 10.2	M	Good	Fair / Good	4/3	0/2B	2	2	Exempt tree species
Design & impact summary		*Exempt species, manage in accordance with design requirement*										

	Trees requiring removal due to hazardous or dead condition - subject to Local Government Authority notification		Trees with low retention values: senescence, developing defects or being *exempt trees from the LGA Tree Preservation Order (TPO)

Tree No	*Botanical Name* COMMON NAME	Height x spread (m)	DBH (mm)	SRZ / TPZ	Age	Health	Condition	Signifi-cance	VTA	RV	U. L.E.	Comments CV = Council verge tree NT= Neighbouring tree
*33	*Schefflera actinophylla* Umbrella Tree	12 x 10	multi 700at base	2.8 / 7.8	M	Good	Fair / Good	5	0/2B	2	2	Exempt tree species
Design & impact summary		*Exempt species, manage in accordance with design requirement*										
*34 x5	*Howea forsteriana* Kentia Palm (clump)	2 x 1.5	100	- / 2	ESM	Good	Good	5	0/6	1	3/5	Exempt palm species
Design & impact summary		*Exempt species, manage in accordance with design requirement*										
*35	*Olea europaea susp cuspidate* African Olive	7 x 5	200	1.8 / 2.4	ESM	Good	Good	5	0/6	1	2	Exempt tree species
Design & impact summary		*Exempt species, manage in accordance with design requirement*										
*36 x4	*Archontophoenix cunninghamiana* Bangalow Palm	av 7 x 3	av 200	- / 2.5m	ESM	Good	Good	4	0/6	1	2	Exempt palm species
Design & impact summary		*Exempt species, manage in accordance with design requirement*										
*37	*Liquidambar styraciflua* Liquidambar	21 x 23	1000	3.3 / 12	M	Good	Fair / Poor	4/3	0/2B/ D	2	3	Exempt tree species, large past structural failure evident within upper branch scaffolds
Design & impact summary		*Exempt species, manage in accordance with design requirement*										
*38	*Ficus lyrata* Cabbage / Fiddle Leaf Fig	6 x 4	200	1.8 / 2.4	ESM	Good	Fair / Good	4	0/2C	2	2	Exempt tree species, past pruned for building line clearance
Design & impact summary		*Exempt species, manage in accordance with design requirement, likely high level impact by landscape civil works & RL change*										
*39	*Callistemon viminalis* Bottle Brush	3 x 2	100at base	1.5 / 2	ESM	Good	Fair / Good	4	0/2C	2	3/5	Exempt tree species height class <5m, past pruning resulting in average form
Design & impact summary		*Exempt species, manage in accordance with design requirement*										
40	*Eucalyptus Botryoides* Southern Mahogany	14 x 12	450	2.5 / 5.4	ESM	Good	Fair	3	2D	3	3	Large stem failure NW side modifying tree form – may become problematic in the future = low retention value
Design & impact summary		*Remove; within building or construction footprint*										
*41	*Musa sp.* Banana Trees	av 4 x 3	av 150	- / 2	ESM	Good	Good	5	0/6	1	2/5	Exempt tree / palm species
Design & impact summary		*Exempt species, manage in accordance with design requirement*										

	Trees requiring removal due to hazardous or dead condition - subject to Local Government Authority notification		Trees with low retention values: senescence, developing defects or being *exempt trees from the LGA Tree Preservation Order (TPO)

Tree No	***Botanical Name*** **COMMON NAME**	Height x spread (m)	DBH (mm)	SRZ / TPZ	Age	Health	Condition	Signifi-cance	VTA	RV	U. L.E.	Comments CV = Council verge tree NT= Neighbouring tree
*42	*Hibiscus sp* Hibiscus	5 x 5	multi 550at base	2.6 6.6	ESM	Fair / Good	Fair / Good	5	0/2B	2	2/5	Exempt tree species height class <5m
Design & impact summary		*Exempt species, manage in accordance with design requirement*										
*43	*Lagerstromia indica* Crepe Myrtle	8 x 6	multi 550at base	2.6 6.6	SM	Good	Fair / Good	4	2C	2	2	Exempt tree species, past reduction pruning & stub end cuts evident
Design & impact summary		*Exempt species, manage in accordance with design requirement*										
*44	*Lagerstromia indica* Crepe Myrtle	8 x 6	multi 550at base	2.6 6.6	SM	Good	Fair / Good	4	2C	2	2	Exempt tree species, past reduction pruning & stub end cuts evident
Design & impact summary		*Exempt species, manage in accordance with design requirement*										
*45	*Lagerstromia indica* Crepe Myrtle	7 x 7	multi 550at base	2.6 6.6	SM	Good	Fair / Good	4	2C	2	2	Exempt tree species, past reduction pruning & stub end cuts evident
Design & impact summary		*Exempt species, manage in accordance with design requirement*										
*46	DEAD TREE	9 x 2	200	1.6 -	-	-	-	6	1	4	4	Dead tree
Design & impact summary		*Exempt species, manage in accordance with design requirement*										
*47	*Morus sp* Mulberry	7 x 7	400	2.4 4.8	ESM	Fair	Fair / Poor	4	0/2	3	<3	Exempt tree species, decay at base N side
Design & impact summary		*Exempt species, manage in accordance with design requirement*										
*48	DEAD TREE	5 x 0	200	1.6 -	-	-	-	6	1	4	4	Dead tree
Design & impact summary		*Exempt species, manage in accordance with design requirement*										
49	*Glochidion ferdinandi* Cheese Tree	14 x 14	800	3m 9.6	OM	Fair / Good	Fair	2	2/3	3	3?	Likely remnant tree, aging specimen, one sided canopy biomass NTH by 8+m, torsion twisted lower trunk with trunk folds and evidenced of potential internal fault – benefit from further investigations
Design & impact summary		*Retain; likely Moderate level TPZ incursion (<20% - at or near 15.5%), with moderate to high level (>25%) canopy reduction prune required, tree age, development disturbance & occupancy potentially unfavorable for maintaining tree vigour*										

	Trees requiring removal due to hazardous or dead condition - subject to Local Government Authority notification		Trees with low retention values: senescence, developing defects or being *exempt trees from the LGA Tree Preservation Order (TPO)

Tree No	*Botanical Name* COMMON NAME	Height x spread (m)	DBH (mm)	SRZ / TPZ	Age	Health	Condition	Signifi-cance	VTA	RV	U. L.E.	Comments CV = Council verge tree NT= Neighbouring tree
50	*Eucalyptus robusta* Swamp Mahogany	23 x 17	750	3 / 9	SM	Good	Fair	2	2B	2	2	Twin stems at 5m with stem inclusion development – likely to become problematic in the future
Design & impact summary		*Retain; likely Moderate level TPZ incursion (<20% - at or near 15%)*										
*51	*Morus sp* Mulberry	8 x 11	550at base	2.6 / 6.6	SM	Fair / Good	Fair	5	0/2	3	<3	Exempt tree species with decay on lower trunk S side
Design & impact summary		*Exempt species, manage in accordance with design requirement*										
52	*Glochidion ferdinandi* Cheese Tree	6 x 5	150, 200	2.1 / 4.2	ESM	Good	Fair	2	2B	3	3	Twin stems at near ground level with stem inclusion development – likely to become problematic in the future due to one sided weight loaded canopy lean = low retention value
Design & impact summary		*Remove; Significant SRZ & TPZ incursion (>40%) located close to construction footprint*										
53	*Eucalyptus robusta* Swamp Mahogany	12 x 11	350	2.3 / 4.2	ESM	Good	Good	2	6	1	2	Average anchoring root development STH side with minor suppressed canopy form biomass W
Design & impact summary		*Remove; within building or construction footprint*										
54	*Corymbia maculata* Spotted Gum	9 x 8	450	2.5 / 5.4	ESM	Fair / Poor	Fair / Poor	2	2	3	3	Lower trunk wounds NW at 1m - appears pathogen affected resulting in decline in canopy = low retention value
Design & impact summary		*Remove; within building footprint*										
55	*Eucalyptus Botryoides* Southern Mahogany	15 x 11	350	2.3 / 4.2	ESM	Good	Fair / Good	2	2C	2	2	Bowing lower trunk, upper branch scaffolds with no significant visual faults
Design & impact summary		*Remove; Significant SRZ & TPZ incursion (>40%) located close to construction footprint*										
56	*Lophostemon confertus* Qld Brush Box	16 x 8	300	2.1 / 3.6	ESM	Good	Good	4/3	2C	2	2	Minor past stem failure at 9m modifying form – appears not immediately detrimental
Design & impact summary		*Remove; Significant SRZ & TPZ incursion (>40%) located close to construction footprint*										
*57	*Brachychiton acerifolius* Illawarra Flame Tree	8 x 6	350	2.3 / 4.2	ESM	Good	Good	4/3	0/6	1	2	Exempt tree species – no significant visual faults
Design & impact summary		*Exempt species, manage in accordance with design requirement*										

	Trees requiring removal due to hazardous or dead condition - subject to Local Government Authority notification		Trees with low retention values: senescence, developing defects or being *exempt trees from the LGA Tree Preservation Order (TPO)

Tree No	*Botanical Name* COMMON NAME	Height x spread (m)	DBH (mm)	SRZ / TPZ	Age	Health	Condition	Signifi-cance	VTA	RV	U. L.E.	Comments CV = Council verge tree NT= Neighbouring tree
58	*Eucalyptus microcorys* Tallowwood	18 x 16	600	2.7 / 7.2	ESM	Fair / Good	Fair	4/3	2B	2	2	Multi stemmed at 4m, minor stem inclusion development at lower junction(s) – condition may become problematic in the future
Design & impact summary		*Remove; Significant SRZ & TPZ incursion (>40% - at or near 36.4%)*										
*59	*Schefflera actinophylla* Umbrella Tree	10 x 9	multi 550	2.6 / 6.6	SM	Good	Fair / Good	5	0/2B	2	2	Exempt tree species, multi stemmed at base
Design & impact summary		*Exempt species, manage in accordance with design requirement*										

APPENDIX- D: Tree Location Plan