rain Tree consulting

Arboricultural Management

PO Box 326 AVALON NSW 2107

Mobile 0419 250 248

17 September 2020

4 PARK AVENUE

AVALON BEACH, NSW

DEVELOPMENT PROPOSAL

ARBORICULTURAL IMPACT ASSESSMENT REPORT

Report Ref No- RTC-15320

Prepared for
Eliza & Greg Viney
C/- CM Studio architects
409 / 19A Boundary Street
RUSHCUTTERS BAY NSW
T: 9380 5791

Prepared by
Mark A. Kokot
AQF Level 5 Consulting arborist

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INTRODUCTION

This arboricultural report has been commissioned by Eliza & Greg Viney C/- CM Studio architects for the purpose of determining the remaining Useful Life Expectancy (ULE) and potential impacts that may occur to significant trees in relation to a new development proposal. The new development proposal consists of additions and alterations to the existing dwelling situated within Lot 32 in DP 133325 known as 4 Park Avenue AVALON BEACH, NSW.

Recommendations for retention or removal of trees is based on tree condition, accorded ULE category and potential impacts to trees under this development proposal.

Development incursions within tree protection zones and impacts to trees have been outlined within Note 2 of Appendix- A where incursions are expressed as low, moderate to high level impacts within tree protection zones. Where site restrictions within notional root zone radiuses exists development impacts or encroachment disturbances are based on author's experience, observations of site conditions, soil type and topography.

Each tree assessed has been accorded a temporary identification number and is referred to by number throughout this report. For additional trees not plotted on provided documentation their location has been estimated by taking offsets from existing trees and structures.

The trees assessed, their location, development impact and design requirements have been referenced within the Tree Assessment Schedule and Tree Location Plan of Appendices C and D.

Care has been taken to obtain information from reliable sources. All data has been verified as far as possible, however, I can neither guarantee nor be responsible for the accuracy of information provided by others.

METHODOLOGY

i In preparation for this report detailed planning & consultation works were conducted with an initial limited site and ground level Visual Tree Assessment (VTA) was conducted on the 8th April 2020 by the author of this report. The principles of VTA were primarily adopted from components of Mattheck *& Breloer* 1994 '*The Body Language of Trees*' with very basic risk values determined by criteria explained within the ISA TRAQ manual 2017. The inspection included assessment of the overall health and vigour of the trees, tree form, structure and structural condition commencing from near the lower trunk to the upper first order branch division as best as site conditions would allow. On completion of the VTA the retention value of the tree was summarised utilizing the tree assessment Checklist shown within Appendix-B.

ii The inspection was limited to a visual assessment from within the subject site where the retention value, condition and diameters of neighbouring trees was estimated. Tree height and canopy spread was estimated and expressed in metres with trunk diameters measured at approximately 1.4 metres above ground level, rounded off to the nearest 50mm and expressed as DBH (Diameter at Breast Height). The height of palms was taken from ground level to the top of the crown shaft only, and excludes the central apical spear projection.

iii This report acknowledges the current Australian Standards 'Protection of Trees on Development Sites' AS4970 – 2009. As explained within Note 1 of Appendix- A. To retain specific trees and ensure their viability development must take into consideration protection of the Tree Protection Zone (TPZ) radius as shown within the *acceptable incursion diagram.* As a guide to determining impacts the Structural Root Zone (SRZ) & Tree Protection Zone (TPZ) setbacks have been provided within Appendix- C the SRZ & TPZ distance column.

Unless specified otherwise all distances and development offsets within this report are taken from the centre of the tree.

iv Plans and documentation received to assist in preparation of this report include:

CM Studio architects Job No: 2020_107, *specific to*:

- Site Plan Dwg No: DA101 issue A dated 24.8.2020
- Lower Ground Floor Dwg No: DA102 issue A dated 24.8.2020
- Ground Floor Demolition Plan Dwg No: DA103 issue A dated 24.8.20
- Proposed Lower Floor Dwg No: DA104 issue A dated 24.8.2020
- Proposed Ground Floor Dwg No: DA105 issue A dated 24.8.2020
- Street & Rear Elevations Dwg No: DA201 issue A dated 24.8.2020
- Side Elevations Dwg No: DA202 issue A dated 24.8.2020
- Sections Dwg No: DA301 issue A dated 24.8.2020
- Landscape Plan Dwg No: DA401 issue A dated 24.8.2020

Cibar Surveying Pty Limited

- Survey Plan Dwg No: 20022_LD dated 2.3.2020

1. SUMMARY OF ASSESSMENT

1.1 General tree assessment

1.1.1 Nineteen (19) trees or groups of have been assessed under this development proposal. Of the nineteen trees three (3) trees are located within neighbouring properties with two (2) of these located on the boundary, seven (7) trees are exempt non-prescribed species and four (4) trees within the site contains a low retention values.

Low retention value tree(s): are identified as trees 14, 15, 16 & 17. The trees contain faults or decline reducing their remaining site usefulness where the trees condition should not restrict this development proposal due to containing short retention values.

Neighbouring trees: Neighbouring trees are identified as Phoenix palm T1, and Angophora tree T2 both being located on or near the boundary and exempt Coco's palm T8. Design has suspended the rear extension to minimise encroachment impacts adjacent T2 with palm trees unlikely to be affected by works.

Exempt non-prescribed trees: Trees noted as non-prescribed (exempt) tree species are identified as trees:

- Group A, T3x2, 5, 9. 11, 12 x2 & 13.

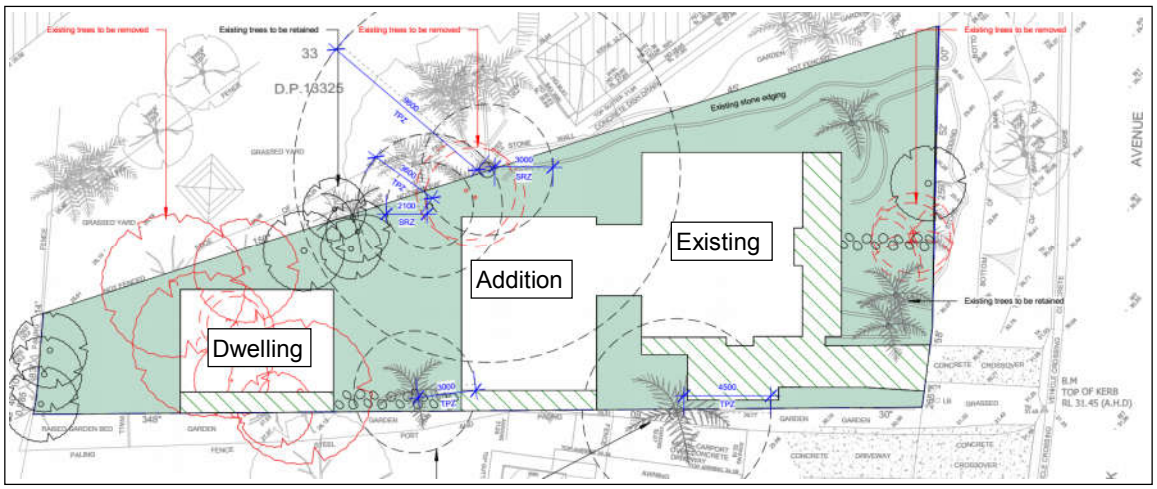
Being exempt non-prescribed species the trees are permitted to be managed (pruned, removed or relocated) without Council consent. Should an exempt species require retention further advice from an appointed project arborist is required prior to works within Tree Protection Zone (TPZ) setbacks.

1.1.2 Remaining trees are considered viable for retention without change in existing site conditions or modification within their Tree Protection Zone (TPZ) radiuses as indicated within the SRZ & TPZ distance column of Appendix- C.

1.2 The development proposal

1.2.1 The development proposal consists additions and alterations to the existing dwelling with provisions for a rear yard two storey addition and secondary dwelling.

Figure 1, showing proposed design footprint



1.3 Tree removal to accommodate design

1.3.1 Four (4) prescribed trees require or are recommended for removal to accommodate design. The four trees are identified as trees:

- 14, 15, 16 & 17.

Non-prescribed trees permitted to be removed without Council consent are identified as trees:

- Group A, 3x2, 5, 9, 11, 12 x2 & 13.

1.4 Discussion of development impacts

1.4.1 Prescribed trees which fall within the proposed footprint of the secondary dwelling or receive high level encroachments within Structural(S) & Tree Protection Zones (TPZ) radiuses requiring removal to accommodate design are identified as trees: 14, 15, 16 & 17.

The four trees have been accorded low retention values with T15 located directly adjacent the secondary dwelling footprint.

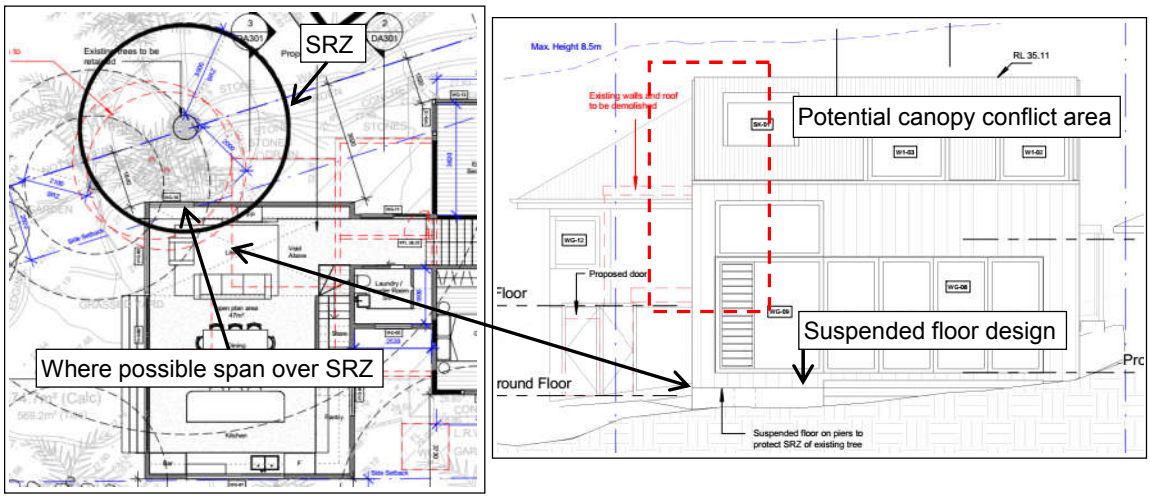
1.4.2 Group A; consist of several non-prescribed trees or palms <5m in height. The removal of select palms has been proposed with retention of remaining trees to be conducted in accordance with Section 2.3 General tree protection requirements.

1.4.3 Palm 1 located on the boundary, should excavation be proposed within the 4.5m tree protection zone further arborist advice is recommended prior to works commencing.

1.4.4 Tree 2; the addition is suspended above ground level and located on top of existing building or landscape area footprints where tree protection zone impacts are considered of moderate to low disturbance. Minimising impacts during works should consist of the following recommendations:

- The addition should clearly identify by use of height poles the location of the eastern elevation to extending branch overhang.
- At no stage should main structural branches be removed, with pruning of lower branch scaffold stems not greater than 110mm(Ø) to clear the addition likely.
- The pruning of the tree should be made clear in a detailed pruning plan showing height poles along the east elevation & potential roofline conflict areas.
- Pier footings in support of the suspended floor are to be manually (hand) excavated to a depth of 0.4m (400mm) with tree roots at or >30mm(Ø) retained.
- Where possible the design should span over the SRZ to minimise conflicts to critical underlying tree roots as shown within Figure 2 p7.
- The trunk of the tree is to be protected with timber beam trunk protection to a height no less than 3m to mitigate potential impact and injury during second level construction activities.
- At no stage should continuous trench excavation be conducted within the tree protection zone.
- All hydraulics are recommended to be placed beneath the suspended floor exiting towards the west of the tree as shown within Figure 2 p7.

Figure 2, showing design footprint adjacent T2

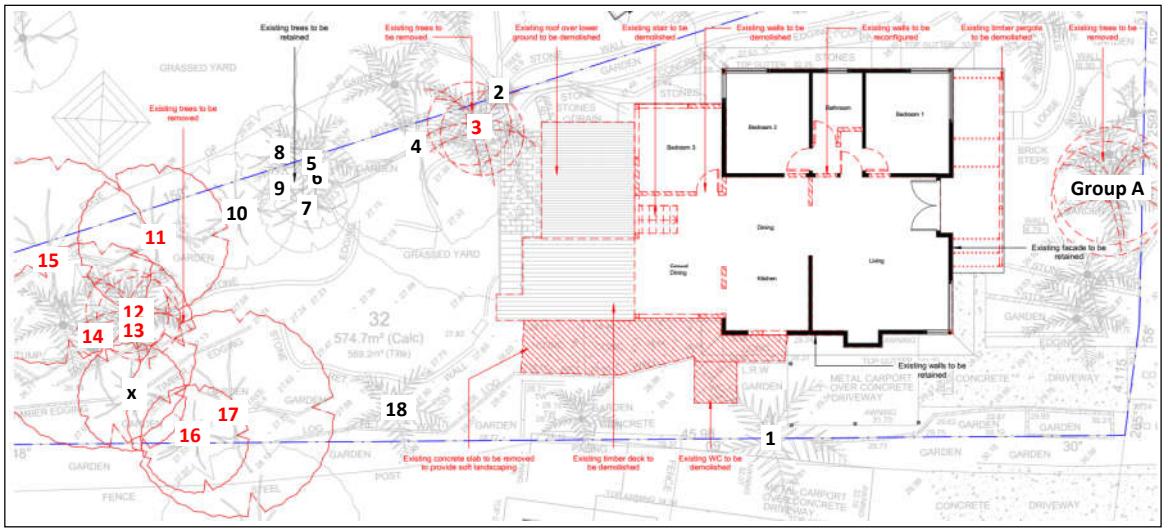


1.4.5 Non-prescribed species permitted to be removed to accommodate design are trees 3x2, 5, 9, 11, 12 x2 & 13. Retention of an exempt species requires further arborist advice with protection conducted in accordance with Section 2.3 General tree protection requirements.

1.4.6 Prescribed trees receiving low or negligible TPZ disturbance and impact by design requiring protection in accordance with Section 2.3 are identified as trees 6, 7, 8 & 18.

1.4.7 Tree 10; the design footprint of the secondary dwelling is suspended above ground level having moderate to low level (<15%) TPZ occupancy with very minor SRZ encroachment. The design appears to span over the SRZ minimising underlying root conflicts with pier footings to be manually excavated retaining tree roots at or >30mm(Ø). The trunk of the tree is recommended to be protected with timber beam trunk protection no less than 2m in height.

Figure 3, showing proposed tree removal plan



2. CONCLUSIONS & RECOMMENDATIONS

2.1 Tree Removal

2.1.1 Under the current proposal and with the consent of Council four (4) prescribed trees require or are recommended for removal to accommodate design. The four trees are identified as trees: 14, 15, 16 & 17.

Exempt non-prescribed species Group A, 3x2, 5, 9, 11, 12 x2 & 13 are permitted to be managed (pruned, removed or relocated) without the consent of Council. Should an exempt tree require retention further advice from an appointed project arborist is required.

2.2 Recommended tree management & protection principles

2.2.1 In addition to the recommendations provided within this report and Australian Standard AS4970 – 2009 Protection of Trees on Development Sites the following summary and/or additional recommendations are provided as a guide for tree protection during works:

Specific recommendations

1) Tree 2; pier footing locations should be clearly marked on site and where possible be placed to span the structure over the SRZ. Manual hand excavation is required within the TPZ, and specifically the 3m SRZ radius with tree roots at or >30mm(Ø) retained. Should larger woody roots be encountered further advice from the project arborist is required. Canopy reduction pruning to clear the roofline and eastern elevation should be made clear within a detailed pruning plan, ensuring that the main forked stems supporting the upper branch scaffolds are not in conflict with the design. An appointed project arborist shall supervise and certify excavation works within the TPZ ensuring no critical root damage occurs during works. All hydraulics are recommended to be located to the west of the addition, placed beneath the dwelling floor level to avoid continuous trench excavation within the TPZ.
2) Similar tree protection is required for tree 10, ensuring critical roots are not damaged by works, with on site arborist supervision conducted for excavation within the TPZ of palm tree T18.

2.3 General tree protection requirements

1) Prior to demolition works Tree Protection Fencing (TPF) and/or zones as identified within Figure 4 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.

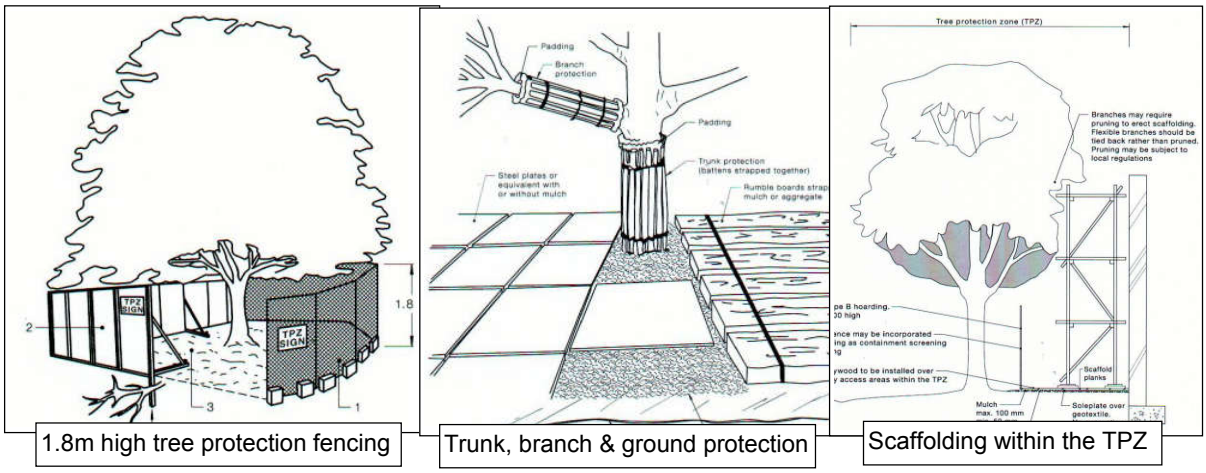
   Where design & construction access may be restrictive timber beam trunk protection is recommended to be installed, with ground protection mats provided to protect underlying tree roots within tree protection zones or areas.

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 4: 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.

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

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

Table 1, certification requirements & hold points

1	Pre-construction	Prior to works 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. All civil work plans to be reviewed and endorsed by the arborist. Arborist to certify free draining sandy soils within the TPZ
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.

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

APPENDICES

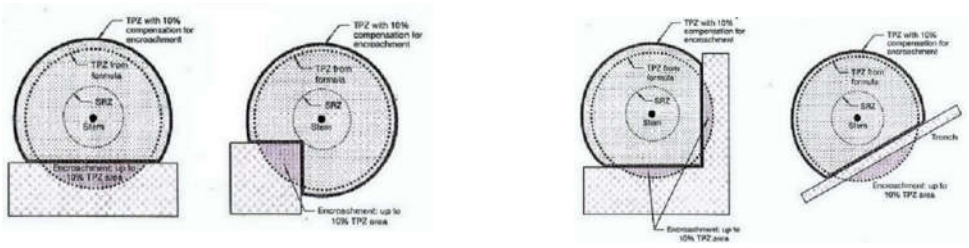
APPENDIX- A: Terminology, notes & references

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 to negligible impact (<10%) of minor consequence, 10 - <15% incursion of moderate to low impact, 15 - <20% Medium to moderate level of impact and incursion where the project arborist is to demonstrate the tree/s remain viable by tree sensitive construction techniques, 20 - <25% incursion of Medium to high level of impact, 25 – <35% of High level impact to significant >35% incursion where moderate to high level impacts may require design changes or further information to manage tree vitality. **WBF** = 100% within building footprint.

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.
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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.
ProSafe: TPZ encroachment calculator https://proofsafe.com.au/tpz_incursion_calculator.html
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, offer a visual understanding of the relative importance of the tree to the environment. The Landscape Significance of a tree 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, trees may be contained within a vault having restricted root development / anchorage
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- fences to neighbouring sites

iii) Retention Value (RV): Determined by [1] tree fee of visual defects and viable for retention, [2] viable for retention with minor faults which may reduce ULE, [3] trees which should not restrict development applications containing faults that are likely to become problematic in the short term, [4] 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	Vigour	Condition	Signifi-cance	VTA	RV	U. L.E.	Comments CV = Council verge tree NT= Neighbouring tree
group *A	Mixed species in front yard – all exempt	Small trees <5m tall & palm trees in front yard, all non-prescribed exempt vegetation Can be managed without consent. No works within 2m of any tree or palm without arborist advice										
Action & TPZ occupancy		*Remove exempt palms within front yard, retain smaller trees <5m tall*										
1 NT	*Phoenix canariensis* Phoenix Palm	8 x 7	750	- / 4.5m	SM	Good	Good	4	0/6	1	2	Neighbouring exempt palm, lower trunk sweep N with no significant visual faults
Action & TPZ occupancy		*Retain; low level (<10%) TPZ disturbance due to existing features in TPZ, with addition located at extremity of TPZ*										
2 NT	*Angophora costata* Angophora	16 x 18	800	3 / 9.6	SM	Good	Fair / Good	3	2C	2	2	Part neighbouring tree. Minor wound S side at 3.5m with no significant visual faults. Reduction pruning required for upper level. 1x stem 120(Ø) at 5m W side
Action & TPZ occupancy		*Retain & protect with timber beam trunk protection; likely moderate to low level (10-15% disturbance) & occupancy within SRZ & TPZ due to existing structures. Plan DA201 shows suspended design over SRZ with minor excavation at extremity of TPZ. Lower branch scaffold reduction pruning required to accommodate elevation roofline, pier footing excavation to retain roots at or >30mm(Ø), excavation under arborist supervision.*										
3 x2	*Archontophoenix cunninghamiana* Bangalow Palm	4 x 3	150	- / 2.5	ESM	Good	Good	4	6	1	2	Exempt palm species, part vegetation covered
Action & TPZ occupancy		*Exempt palm species remove to accommodate design*										
4	*Radermachera sinica* China Doll Tree	11 x 6	300	2.1 / 3.6	ESM	Good	Good	5	6	1	2	Tree with no significant visual faults, suppressed canopy form
Action & TPZ occupancy		*Retain & protect with timber beam trunk protection; likely moderate to low level (10-15% disturbance) & occupancy within SRZ & TPZ due to existing structures. Plan DA201 shows suspended design over SRZ, pier footing excavation to retain roots at or >30mm(Ø)*										
*5	*Livistona australis* Cabbage Palm	2 x 4	350	- / 3	I	Good	Good	3	0/6	1	1/5	Exempt palm species <5m tall, with no significant visual faults
Action & TPZ occupancy		*Exempt tree species height class, manage in accordance with design requirement under arborist advice*										
6	*Callistmon salignus* Willow Bottlebrush	11 x 6	300	2.1 / 3.6	ESM	Good	Good	4/3	6	1	2	Suppressed canopy form biomass W with no significant visual faults
Action & TPZ occupancy		*Retain & protect; negligible (<10%) TPZ encroachment by secondary dwelling within TPZ*										

	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	Vigour	Condition	Signifi-cance	VTA	RV	U. L.E.	Comments CV = Council verge tree NT= Neighbouring tree
7	*Callistemon viminalis* Bottle Brush	5 x 7	200	1.8 / 2.4	SM	Good	Fair / Good	4/3	6	1	2	Low bowing form W with no significant visual faults, low form may become problematic in the future
Action & TPZ occupancy		*Retain & protect; negligible (<10%) TPZ encroachment by secondary dwelling within TPZ*										
8 NT	*Syagrus romanzoffiana* Cocos Palm	5 x 5	200	- / 3	ESM	Good	Good	5	0	1	2	Neighbouring palm, exempt species, with no significant visual faults
Action & TPZ occupancy		*Retain; negligible (0%) TPZ encroachment by design*										
*9	*Eucalyptus scoparia* Wallangatta White Gum	17 x 14	700	2.8 / 8.4	SM	Good	Good?	4/3	0/7	1	2	Exempt tree species. Restricted VTA vegetation, appears in good vigour
Action & TPZ occupancy		*Exempt tree species permitted to be removed, retain under advice from appointed project arborist*										
10	*Glochidion ferdinandi* Cheese Tree	9 x 5	250	2 / 3	ESM	Good	Fair / Good	3	2B	2	2	minor stem inclusion development at 1.5m with suppressed canopy form biomass NNW
Action & TPZ occupancy		*Retain & protect; moderate to low level (<15%) occupancy over SRZ & TPZ, dwelling suspended above ground level minimising impacts with no pier footing excavation within SRZ recommended*										
*11	*Jacaranda mimosifolia* Jacaranda	14 x 14	400, 200	2.7 / 7.2	ESM	Good	Good	4	0/7	1	2	Exempt tree species. Suppressed canopy form biomass & slight lean NE
Action & TPZ occupancy		*Remove exempt tree species to accommodate design*										
*12 x2	*Archontophoenix cunninghamiana* Bangalow Palm	8 x 3	200	- / 2.5	SM	Good	Good	4	0/6	1	2	Exempt palm species, with no significant visual faults
Action & TPZ occupancy		*Remove exempt palm species to accommodate design*										
*13	*Olea europaea susp cuspidate* African Olive	5 x 3	100	1.5 / 2	ESM	Good	Good	6	0	1	2	Exempt tree species, suppressed canopy form E side
Action & TPZ occupancy		*Remove exempt tree species to accommodate design*										
14	*Melaleuca quinquenervia* Paperbark	15 x 12	800at base	3 / 9.6	SM	Good	Fair	3	2/2A	3	3	Three (3) main stems to ground level all with stem inclusion development to ground level on S side – likely to become problematic in the future = low retention value
Action & TPZ occupancy		*Remove; within building footprint (WBF), tree of low retention value*										

	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	Vigour	Condition	Signifi-cance	VTA	RV	U. L.E.	Comments CV = Council verge tree NT= Neighbouring tree
15	*Casuarina glauca* She Oak	20 x 13	450	2.5 / 5.4	SM	Good	Fair	3	2C/3	3	3	Minor lower trunk wound to ground level E side, mid trunk wound wood seam at 3.6m N – likely to become problematic in the future = likely low retention value, structural testing may be required
Action & TPZ occupancy		*Remove; Moderate to high (20%) incursion & coverage over SRZ & TPZ, low retention value tree due to structural wound*										
16	*Pittosporum undulatum* Native Daphne	8 x 4	250	2 / 3	ESM	Fair / Poor	Fair / Poor	4	4	3	<3	Environmentally stressed, decline in canopy + very low vigor and chlorotic foliage = low retention value
Action & TPZ occupancy		*Remove; within building footprint (WBF)*										
17	*Callistmon salignus* Willow Bottlebrush	12 x 5	300	2.1 / 3.6	ESM	Fair	Poor	4/3	2	3	3	Twin stems at 2.1m with stem inclusion development, wound wood seam & defined inclusion fault W side = low retention value if suddenly exposed
Action & TPZ occupancy		*Remove; within building footprint (WBF)*										
18	*Livistona australis* Cabbage Palm	11 x 4	300	- / 3	M	Good	Good	3	6	1	1	Palm with no significant visual faults
Action & TPZ occupancy		*Retain & protect; negligible (<10%) TPZ occupancy by design footprint, excavation to accommodate footprint to be supervised by site arborist*										

APPENDIX- D: Tree Location Plan