rain Tree consulting

Arboricultural Management

PO Box 326 AVALON NSW 2107

Mobile 0419 250 248

31 August 2021

7 CROWN ROAD

QUEENSCLIFF, NSW

DEVELOPMENT PROPOSAL

ARBORICULTURAL IMPACT ASSESSMENT REPORT

Report Ref No- 13721

Prepared for
DORN Design
C/- Brad Dorn
T: 0422 986 372

Prepared by
Mark A. Kokot
AQF Level 5 Consulting arborist

CONTENTS **page**

INTRODUCTION

This report has been commissioned by DORN Design C/- Brad Dorn to assess 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 alteration to the existing dwelling located within Lot 2 of DP 514296 known as 7 Crown Road QUEENSCLIFF NSW.

Recommendations for retention or removal of trees is based on the trees condition, accorded ULE category, current design and potential impacts to trees under this development application.

Development incursions within tree protection zones (TPZ) and impacts to trees have been outlined within Note 2 of Appendix- A where incursions are described as Minor (<10%) & Major (>10%) TPZ occupancy having low, moderate to high level impacts within the TPZ. 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, their location, development impact and design requirements may be referenced within the Tree Assessment Schedule and Tree Location Plan of Appendices C & 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 a site consultation & ground level Visual Tree Assessment (VTA) was conducted on Friday 25th June 2021 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 basic risk values determined by criteria explained within the ISA TRAQ manual 2017. The inspection included assessment of the overall health and vigour of 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 provided within Appendix- B.

ii The inspection was limited to visual assessment from within the subject site where the retention value, condition and diameters of neighbouring trees was estimated. No aerial (climbing) inspections, woody tissue testing, or tree root investigation was undertaken as part of this tree assessment. 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 and utilizes the current Australian Standards 'Protection of Trees on Development Sites' AS 4970 – 2009 as explained within Notes of Appendix- A.

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

iv Plans and/or documentation received to assist in preparation of this assessment include:

DORN Design project No: 10037

- Site Plan Dwg No. DA 1.10 issue B dated 23.8.2021
- Garage Level Plan Dwg No. DA 2.03 issue B dated 23.8.2021
- Office Level Plan Dwg No. DA 2.02 issue B dated 23.8.2021
- Level 1 Plan Dwg No. DA 2.01 issue B dated 23.8.2021
- Level 00 Plan Dwg No. DA 2.00 issue B dated 23.8.2021
- Pool Level Dwg No. DA 2.001 issue B dated 23.8.2021
- Lower Garden Level Dwg No. DA 2.003 issue B dated 23.8.2021
- East Elevations Dwg No. DA 5.00, 5.01 & 5.02 issue B dated 23.8.2021
- Section Dwg No. DA 6.00 issue B dated 23.8.2021

The Garden Social

- Landscape Plans Dwg No: DA02, 03 & 04 rev B dated 20.8.2021

CMS Surveyors Pty Limited

- Survey Plan Dwg No: 17393 issue 2 dated 8.2.2018

1. SUMMARY OF ASSESSMENT

1.1 General tree assessment

1.1.1 Twenty five (25) trees have been assessed under this development proposal. Of the twenty-five trees nine (9) trees are located within adjoining properties of which one palm T16 has been identified with a low retention value. Within the site eleven (11) trees are exempt non-prescribed trees noted within Northern Beaches Council exemptions E1 Preservation of Trees or Bushland Vegetation DCP / Warringah LEP 2011.

Neighboring trees are identified as trees:

- 1, 2x2, 3, 10, 11, 12, 16, 17 & 25.

Of these trees T1, 2x2, 3, 10, 11, 12 & 17 are non-prescribed trees being exempt species however, require to be managed and protected in accordance with Australian Standard AS 4970 – 2009 Protection of Trees on Development Site principles. To accommodate design Council verge exempt species T1, 2 & 3 are proposed for removal requiring consent to be managed by the tree owner or Councils managing department.

Low retention value tree T16 located within a neighboring site displays a moderate to significant lean towards the existing dwelling. Proximity to the structural building and constant dwelling contact indicates palm management would eventually necessitate palm removal.

Exempt non-prescribed trees within the site are identified as trees:

- T4, 5x2, 6x2, 7, 8, 9, 13, 14, 15, 18 & 19.

Being exempt non-prescribed trees, the trees or palms are permitted to be managed (pruned, removed, or relocated) without Council consent. Should an exempt species require retention further advice and protection methodology is required prior to works occurring 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 Tree Protection Zone (TPZ) radiuses as indicated within the SRZ & TPZ distance column of Appendix- C.

1.2 The development proposal

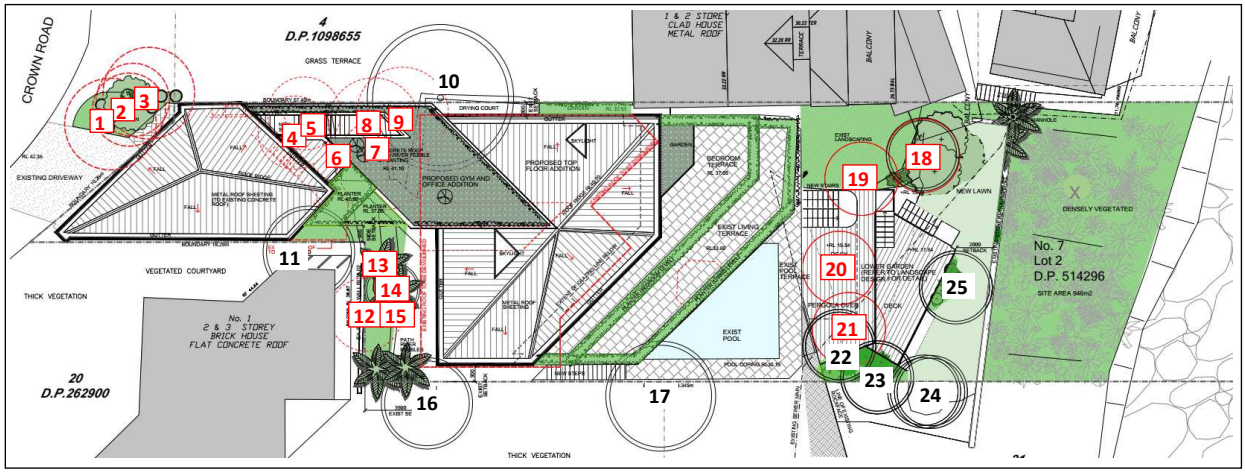
1.2.1 The development proposal consists of additions and alterations to the existing dwelling with provisions for new lower garden and decking located within Tree Protection Zone (TPZ) radiuses.

1.3 Tree removal to accommodate design – *prescribed (protected) trees*

1.3.1 Within the site two (2) prescribed trees T20 & 21 are proposed for removal to accommodate design with Council verge trees T1, 2x2 & 3 proposed for removal to allow for new landscape design.

The identified development impacts and design requirements have been detailed within Appendix- C and summarized within the following sections.

Figure 1, showing design footprint & tree removal plan



1.4 Discussion of development impacts – *prescribed & neighbouring trees*

Proposed tree removal due to high level impacts or design request

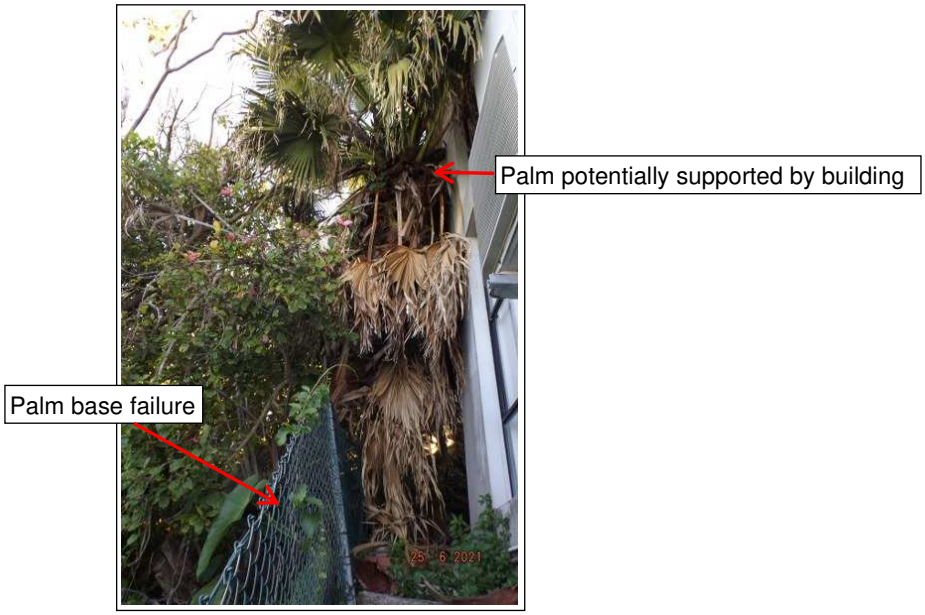
1.4.1 Prescribed (protected) trees located within the building or excavation footprints of design or requested for removal to accommodate design are identified as:

Council verge trees T1, 2 & 3. The exempt species are proposed for removal allow for redevelopment of the property entry with replacement of native tree in compensation for the amenity lost.

Trees within the site T20 & 21. Proposed removal to construct the lower decking & garden area where the trees fall within the footprint of design.

1.4.2 Neighboring Palm T16 should be considered for removal due to past root ball failure, lean & contact with the dwelling. The removal of the palm would likely require consent from the tree owner. Should the palm be retained excessive frond removal will be required to clear the building line.

Figure 2: showing neighbouring palm T16 in contact with dwelling



Discussions of remaining tree impacts

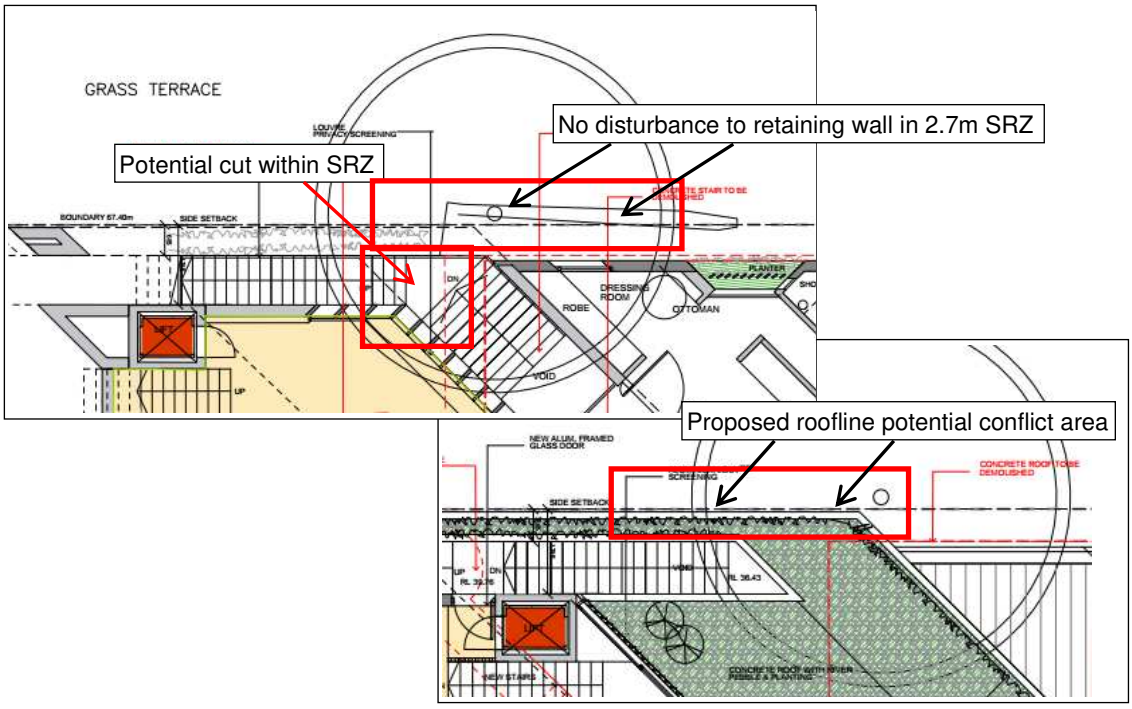
1.4.3 Tree 10. Determining Tree Protection Zone (TPZ) impacts or incursions by design is somewhat difficult as the tree is located on the edge of a loose and degrading sandstone retaining wall. The extent of root encroachment within the site is unclear where tree roots may or may not have accessed the adjacent terraced garden bed. Modification of site features include provisions for new stair access and proposed roof at RL41.10 being above ground level and spanning the notional TPZ radius. With existing dwelling wall to be retained the new stair access to upper levels requires mitigating impacts which are recommended to consist of the following guidelines:

a) Maintaining tree stability requires ensuring the existing boundary retaining wall remains stable and no excavation or disruption of site features within the terraced garden bed area occur within the 2.7m Structural Root Zone (SRZ) without prior arborist advice. Should new footings or excavation within the SRZ be required arboricultural tree root investigations are recommended to be conducted to identify the impact to critical anchoring roots.

b) Generally the 2.7m SRZ spanning the boundary line and retaining wall shall remain a development activity exclusion zone. No works shall occur within this setback without prior arborist advice.

c) Foundations that support the Office Level roof plan shown within Plan DA 2.02 shall be constructed in a manner that does not compromise tree anchorage. Clearer more detailed construction drawings primarily footing locations, with a proposed cut & fill plan within the 7.2m tree protection zone is recommended to be provided for arborist review and endorsement prior to works commencing.

Figure 3: Showing tree 10 design impact area



1.4.4 Tree 11. Tree is contained within a steep garden bed, has exposed surface roots towards proposed garden beds and site alterations where root zone radiuses have been restricted by existing site features. Proposed works consist of new garden bed & retaining walls at RL46.50 to lower wall at RL37.05 located within the SRZ. Excavation for footings in support of planter bed design may likely disrupt tree anchorage, with fill within the SRZ & TPZ being an activity that should be restricted within the tree protection zone (AS4970). It is likely the location of the tree to the neighbouring dwelling will become a nuisance where maintaining tree vitality may be difficult due to changes within the garden bed environment. Mitigating impacts by design may not suffice in ensuring tree vitality will not be disrupted with the following guidelines provided to manage impacts by design:

a) A detailed cut & fill plan should be provided that clearly shows proposed site modifications within the 3.6m tree protection zone.
b) Generally, the 2.1m SRZ should remain a development activity exclusion zone. No excavation should occur within the 2.1m SRZ without tree root investigations being conducted to determine the impact on tree stability (critical anchoring roots) or impact on tree health.
c) Clear and detailed civil retaining wall design plans and construction method statement should also be provided for arborist review and endorsement. Civil landscape design plans should also identify any area of over excavation that may be required to accommodate works within the SRZ & TPZ.

1.4.5 Tree 17. Negligible building encroachment within tree protection zone. Canopy extension within the site requires to be managed in accordance with Australian Standards AS 4373 Pruning of Amenity Trees 2007.

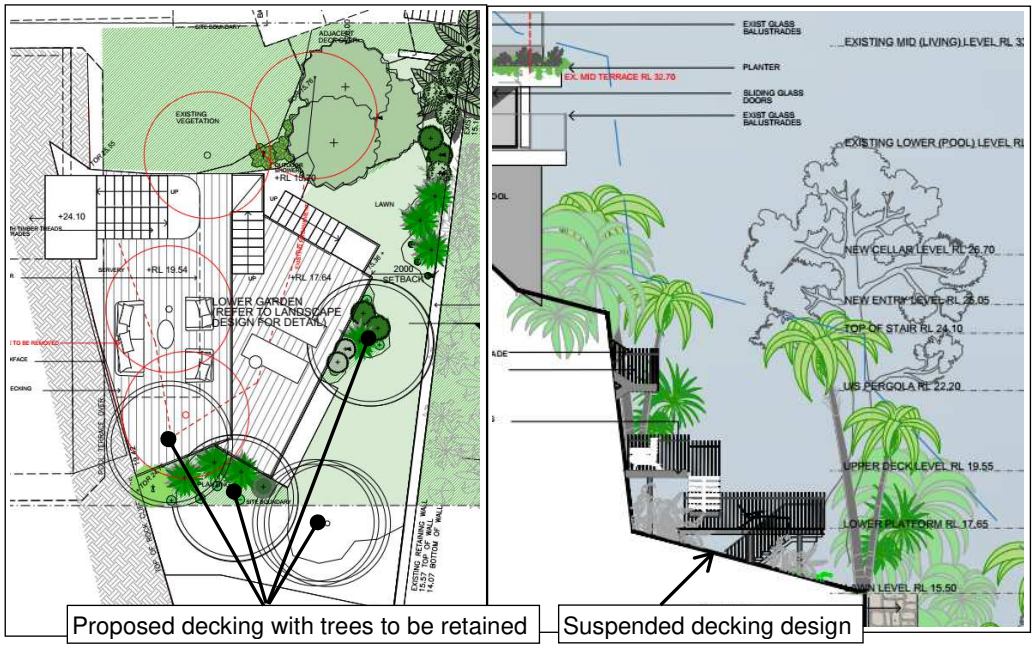
1.4.6 Trees 22 - 25. New works consist of suspended decking with deck structures supported by single post footings. The design is consistent with tree sensitive design that mitigates encroachment impacts within both the SRZ & TPZ. Shown within East Elevation Plan DA 5.00 and Figure 4 the structures are well above ground level where root zone impacts or occupancy at or below ground level is considered minor to low level impact. Coverage over the SRZ & TPZ is greater for tree 22 where decking requires to allow for future tree growth. To help mitigate impacts by design and for maintaining tree vitality the following recommendations should be adopted:

a) No soil disturbance shall occur within tree protection zone setbacks with the SRZ considered an excavation exclusion zone.
b) Prior to construction a detailed footing plan shall be provided for arborist review and endorsement. The plan shall show post hole footing location within TPZ setbacks only. The footing plan shall clearly detail the requirement of no excavation or footings to be positioned within the SRZ of any tree requiring retention.
c) The propose decking shall allow for water or precipitation to drain freely between boards contacting the lower natural ground level.

d) Tree 22 specific: the proposed decking surrounding the tree shall be constructed in a manner that allows for future growth of tree parts, upper branch scaffolds and affected area of the lower trunk.

e) All trees shall be protected with timber beam trunk protection, ground & root mat protection within the SRZ prior to works commencing.

Figure 4: Showing trees 22 - 25 design impact area



2. CONCLUSIONS & RECOMMENDATIONS

2.1 Tree Removal

2.1.1 With the consent of Council the following five (5) protected trees require removal to accommodate the design proposal:

- T1, 2, 3, 20 & 21.

2.1.2 Given the location of neighbouring palm T16 to or on the building the palm should be considered for removal as the palm may be reliant on the building structure for support.

2.1.3 Exempt trees permitted to be managed (pruned, removed or relocated) to accommodate design without the consent of Council are identified as:

- T4, 5, 6, 7, 8, 9, 12, 13, 14, 15, 18 & 19.

2.2 Recommended tree management & protection principles

2.2.1 In addition to tree management requirements provided within this report and those identified within 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

a) Prior to obtaining a Construction Certificate (CC) a detailed colour coded cut & fill plan, including intended over excavation areas within the SRZ & TPZ of trees 10 & 11 is recommended for arborist review. Specific areas of concern are excavation for stair access within the SRZ of T10, retaining wall and garden bed construction adjacent T11.

b) Tree 10. Given the tree is located on a failing part boundary sandstone retaining wall there should be no disturbance within the trees 2.7m structural root zone (SRZ) *being the area required for tree stability*. Where excavation is required within the SRZ tree root investigations are recommended to provide further information on the location, distribution and impact to critical underlying tree roots. Detailing areas of over excavation to accommodate stair access and suspended roof line foundations parallel to the boundary should also be made clear within construction drawings for arborist review.

c) Tree 11. As the tree is located on very steep topography there should be no excavation within the trees SRZ. Where excavation is proposed detailed tree root investigations are to be conducted to ensure the trees anchorage is not disrupted by works.

d) Trees 22 - 25. Prior to works a detailed deck footing plan is to be provided for arborist review and endorsement. The location of footings are to be positioned outside of SRZ radiuses to minimize critical root zone conflicts. Deck construction is a to allow for future growth of T22 and be constructed in a manner that permits water / precipitation to drain freely to the lower natural ground level.

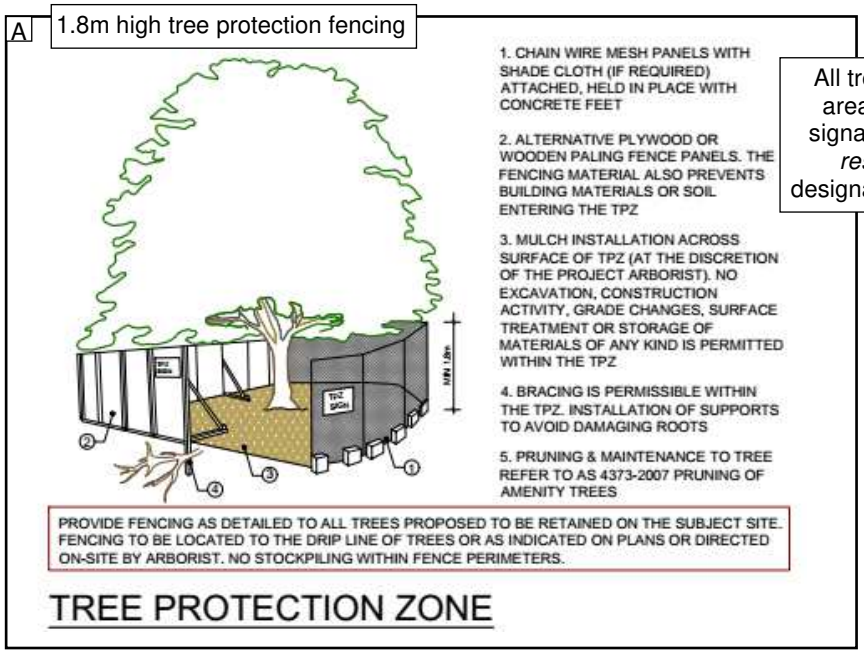
2.3 General tree protection requirements

a) Prior to demolition works Tree Protection Fencing (TPF) and/or zones as identified within Figure 5 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.

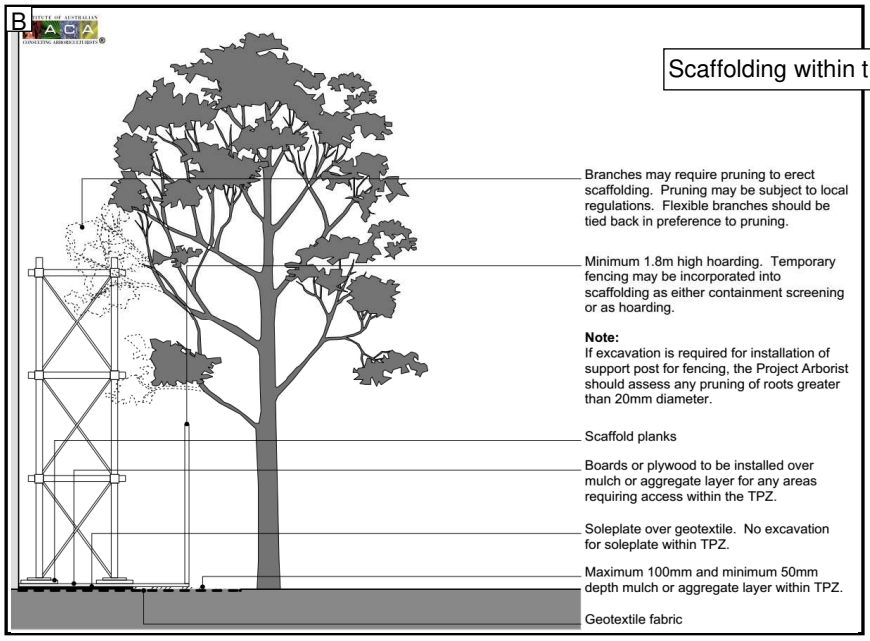
Where design & construction access may be restrictive timber beam trunk protection is recommended to be installed, with ground protection mats provided to protect underlying tree roots within tree protection zones or areas.

Should there be any uncertainty with all recommended tree protection requirements the site superintendent shall contact the appointed project or site arborist for advice prior to works occurring within tree protection zones (TPZ).

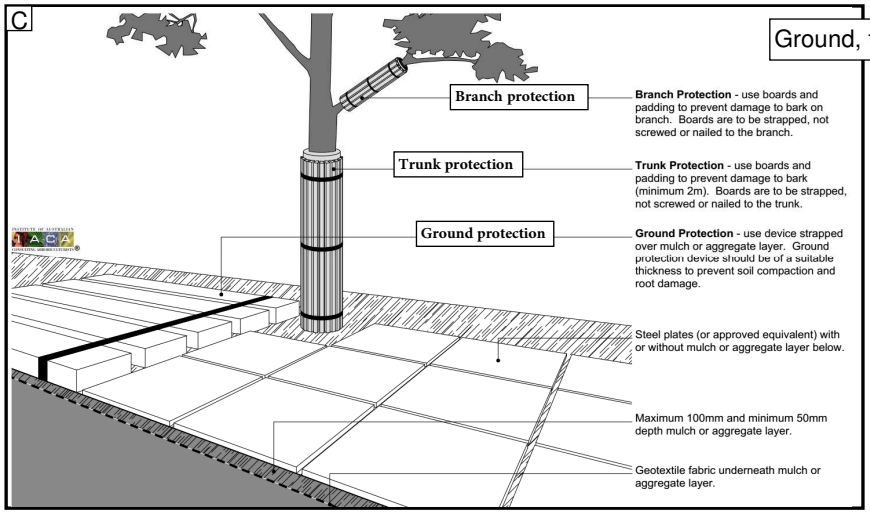
Figure 5: Tree protection fencing, ground and trunk protection detail



All tree protection fencing or areas requires appropriate signage clearly stating *a TPZ restriction zone* being a designated Tree Protection Area



Scaffolding within the Tree Protection Zone



Ground, trunk & branch protection

b) 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.

c) 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*).

d) 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.*

e) 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.

f) During approved excavation within TPZ setbacks there shall be no over excavation beyond the line of cut as shown within construction drawings. Should over excavation be required the extent of excavation should be detailed within approved drawings or a construction management plan for arborist review and certification.

g) *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.

h) *Tree sensitive construction measures* such as pier and beam bridging over critical roots, suspended slabs, cantilevered building sections, screw piles and contiguous piling can minimise the impact of encroachment (AS4970).

Where Bushfire BAL construction conflicts exist with tree management advice the appointed project arborist shall be consulted to advise on appropriate design outcomes.

i) *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).

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

1) Prior to construction arboricultural certification is required ensuring that all trees have been adequately protected in accordance with this report.
2) No works (including landscaping) shall occur within the SRZ of any tree without prior arborist advice and certification. Where excavation may be required prior exploratory tree root investigation are to identify the location, distribution and impact to underlying tree roots.
3) No excavation shall occur within the TPZ without prior project arborist notification and/or site supervision.
4) No access or work activity is permitted within fenced or designated tree protection areas (TPA's) without arborist advice.

Table 1, certification requirements & hold points

1	Pre-construction	Prior to works install tree protection fencing & zones as specified within this report or as directed by the site arborist.
2	During construction	Project arborist to supervise & certify approved excavation works within tree protection areas.
3	Post construction	Prior to handover project arborist to provide final inspection & certification of tree health & vitality

k) 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

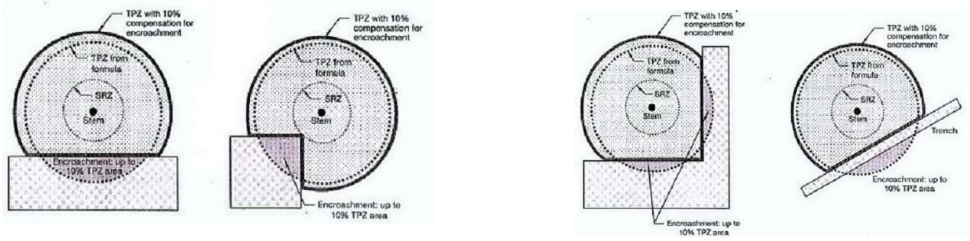
Mark A Kokot
AQF Level 5 consulting arborist
Diploma of Hort/Arboriculture (AQF5), Associate Diploma Parks Management (AQF4)
Certified Arborist / Tree Surgeon (AQF3), ISA Tree Risk Assessment Qualified 6/2024
Member: ISA, Arboriculture Australia & IACA, Working With Children No: WWC0144637E

APPENDICES

APPENDIX- A: Terminology & 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. **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** = located within the building footprint where design necessitates tree removal.
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.
ProSafe: TPZ encroachment calculator https://proofsafe.com.au/tpz_incursion_calculator.htmlStandards Australia 2009, *Australian Standards 4970 Protection of Trees on Development Sites* - Standards Australia, Sydney, Australia.
Standards Australia 2007, *Australian Standards 4373 Pruning of Amenity Trees* - 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 *Check list* ©*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 &/or risk mitigation or rectification works may compromise tree anchorage. Tree(s) may be contained within a vault have restricted anchoring root potential
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
1 CV	*Lagunaria patersonii* Norfolk Island Hibiscus	7 x 5	300	2.1m / 3.6	SM	Good	Fair / Good	4	0/2C	2	2	Council verge exempt species with minor wounds evident
Design & impact summary	*Proposed Council verge exempt species tree removal to accommodate new landscape plantings & redevelopment of property entry*											
2x2 CV	*Syagrus romanzoffiana* Cocos Palm	5 x 2.5	200	- / 2.25	ESM	Good	Good	5	0/6	2	2	Council verge exempt palm with no significant visual faults
Design & impact summary	*Proposed Council verge exempt species tree removal to accommodate new landscape plantings & redevelopment of property entry*											
3 CV	*Lagunaria patersonii* Norfolk Island Hibiscus	6 x 5	250	2 / 3	ESM	Fair / Good	Good	4	0/4	2	2	Council verge exempt tree, slightly environmentally stressed with minor decline in canopy
Design & impact summary	*Proposed Council verge exempt species tree removal to accommodate new landscape plantings & redevelopment of property entry*											
*4	*Archontophoenix cunninghamiana* Bangalow Palm	8 x 2.5	200	- / 2.25	ESM	Good	Good	4	0/6	1	1	Exempt non-prescribed palm with no significant visual faults
Design & impact summary	*Remove exempt species to accommodate design*											
*5x2	*Archontophoenix cunninghamiana* Bangalow Palm	8 x 2.5	150	- / 2.25	ESM	Good	Good	4	0/6	1	1	Exempt non-prescribed palm with no significant visual faults
Design & impact summary	*Remove exempt species to accommodate design*											
*6x2	*Archontophoenix cunninghamiana* Bangalow Palm	5 x 2.5	100	- / 2.25	ESM	Good	Good	4	0/6	1	1	Exempt non-prescribed palm with no significant visual faults, several smaller palms in garden bed
Design & impact summary	*Remove exempt species to accommodate design*											
*7	*Howea forsteriana* Kentia Palm	4 x 3	150	- / 2.5	SM	Good	Fair / Good	4	0/2E	2	2	Exempt non-prescribed palm, retaining wall at base where location to infrastructure likely to become problematic in the future
Design & impact summary	*Remove exempt species to accommodate design*											
*8	*Lagunaria patersonii* Norfolk Island Hibiscus	8 x 4	250	2 / 3	ESM	Good	Good	4	0/2B/ 2E	2	2	Exempt, twin stems at 2m, located in garden bed with retaining wall at base = location to infrastructure may become problematic in the future
Design & impact summary	*Remove exempt species to accommodate 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	Vigour	Condition	Signifi-cance	VTA	RV	U. L.E.	Comments CV = Council verge tree NT= Neighbouring tree
*9	*Lagunaria patersonii* Norfolk Island Hibiscus	10 x 6	250	2m / 3	ESM	Good	Good	4	0/2E	2	2	Exempt non-prescribed tree, twin stems at 2m, located in garden bed with retaining wall at base = location to infrastructure may become problematic in the future
Design & impact summary		*Remove exempt species to accommodate design*										
10 NT	*Olea europaea susp cuspidate* African Olive	8 x 11	400, 200	2.7 / 7.2	SM	Good	Fair	4	0/2B/ 2E	2	3	Located at edge of embankment / retaining wall of loose sandstone, Multi stemmed at 1.4m (4x), narrow suppressed canopy form N-S, location on infrastructure likely to become problematic = likely low retention value
Design & impact summary		*Retain & protect. Tree located on wall edge with restricted radial root development. TPZ encroachment difficult to determine due to trees location with likely cut for stair access within the SRZ. Recommend colored Cut & Fill plan to be provided showing extent of excavation required to accommodate works with details on above suspended roofline footings along boundary to be provided for arborist review. Overall TPZ occupancy or impact is likely to be moderate to low (10-15%) encroachment with works proposed within the SRZ requiring further information on critical anchoring root locations in likely excavation areas. Canopy reduction pruning to AS4373 standards may be required back to boundary.*										
11 NT	*Lagunaria patersonii* Norfolk Island Hibiscus	11 x 7	300	2.1 / 3.6	ESM	Fair / Good	Fair / Good	4	0/2A/ 2E	2	2	Located at edge of steep embankment, confined in garden bed, exposed surface roots evident, within 2m to dwelling
Design & impact summary		*Retain & protect. Tree located on very steep topography with exposed surface roots extending within the site. Both SRZ & TPZ are restricted in development where determining percentage of encroachment is difficult. With proposed raised level in garden bed(s) design encroachment impacts are likely to be high given the restricted root growing area. Mitigating impacts requires no excavation within the SRZ with a clear colour coded cut & fill plan provided for arborist review. Landscape civil design plans should also be provided showing construction detail & construction methodology, and where any over excavation may be required to accommodate works (foundations) within the TPZ.*										
12	DEAD TREE	7 x 3	200	1.6 / -	-	-	-	5	1	4	4	Dead tree, appears partly located on or directly adjacent boundary line
Design & impact summary		*Remove exempt species to accommodate design*										
*13	*Pittosporum undulatum* Native Daphne	5 x 3	100	1.5 / 2	ESM	Fair / Good	Good	4	2E	2	3	Exempt tree species height class, in garden bed with retaining wall at base
Design & impact summary		*Remove exempt species to accommodate design*										
*14	*Archontophoenix cunninghamiana* Bangalow Palm	8 x 4	200	- / 3	ESM	Good	Good	4	0/2E	2	3	Exempt non-prescribed palm, in garden bed with retaining wall at base
Design & impact summary		*Remove exempt species to accommodate 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	Vigour	Condition	Signifi-cance	VTA	RV	U. L.E.	Comments CV = Council verge tree NT= Neighbouring tree
*15	*Pittosporum undulatum* Native Daphne	4 x 3	150at base	1.5m / 2	ESM	Fair	Fair / Good	4	0/4/ 2E	2	3	Exempt tree species height class, in garden bed, retaining wall at base, slightly environmentally stressed with slight decline in canopy
Design & impact summary		*Remove exempt species to accommodate design*										
16 NT	*Livistona australis* Cabbage Palm	6 x 4	400	- / 3	SM	Good	Fair?	3	2A	2	3	Likely root plate failure, in contact with dwelling wall having moderate lean W = likely low retention value
Design & impact summary		*Recommended palm removal due to past root ball failure, lean towards & on dwelling where palm contact to dwelling will always be problematic. Dwelling contact may also be contributing factor in supporting the palm. Requires palm owner consent for removal.*										
17 NT	*Olea europaea susp cuspidate* African Olive	10 x 9	300, 250	2.6 / 6.6	M	Fair / Poor	Fair	4	2/4	3	3	Environmentally stressed, decline in canopy, lopped W side for pool clearances, located at edge of embankment with Phoenix palm N side
Design & impact summary		*Retain & protect; negligible new building occupancy within TPZ. Canopy reduction pruning back to boundary requires to be conducted in accordance with Australian Standards AS 4373 Pruning of Amenity Trees 2007*										
*18	*Syagrus romanzoffiana* Cocos Palm	6 x 4	200	- / 3	ESM	Fair / Good	Good	4	0/4	2	2	Exempt non-prescribed palm appears slightly environmentally stressed
Design & impact summary		*Remove exempt species to accommodate design*										
*19	*Phoenix canariensis* Phoenix Palm	4 x 5	650	- / 3.5	ESM	Good	Good	4	0/6	1	1	Exempt non-prescribed palm with no significant visual faults
Design & impact summary		*Remove exempt species to accommodate design*										
20	*Banksia integrifolia* Costal Banksia	6 x 4	200	1.8 / 2.4	ESM	Good	Good	4/3	4	2	2	Restricted VTA vegetation, tree on rock outcrop with likely restricted root development
Design & impact summary		*Proposed tree removal to accommodate new decking.*										
21	*Banksia integrifolia* Costal Banksia	6 x 4	300	2.1 / 3.6	ESM	Good	Good	4/3	2A	2	2	Located at edge of embankment, located on rock with likely restricted root development, contains slight lean & bowing habit E.
Design & impact summary		*Proposed tree removal to accommodate new decking.*										

	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
22	*Banksia integrifolia* Costal Banksia	6 x 4	250	2m 3	ESM	Good	Good	4/3	6	1	1	Tree with moderate lean E, not on survey, near 3m from T23, tree with no significant visual faults
Design & impact summary		*Retain & protect with timber beam trunk protection. Decking proposal of suspended design mitigating root zone impacts. Given suspended design impacts are likely to be low with the SRZ & TPZ. All footings to be located outside of SRZ radiuses with footing excavation conducted manually (by hand) with TPZ setbacks.*										
23	*Banksia integrifolia* Costal Banksia	6 x 5	300	2.1 3.6	ESM	Good	Good	4/3	6	1	1	Suppressed canopy form by T22, biomass & lower trunk bowing lean NNE, with no significant visual faults
Design & impact summary		*Retain & protect with timber beam trunk protection. Design & impact and management discussions as per tree no. 22 above.*										
24 NT	*Banksia integrifolia* Costal Banksia	6 x 4	250	2 3	ESM	Good	Good	4/3	6	1	1	Suppressed canopy form by T23, biomass N, with no significant visual faults
Design & impact summary		*Retain & protect with timber beam trunk protection. Design & impact and management discussions as per tree no. 22*										
25	*Banksia integrifolia* Costal Banksia	7 x 3.5	250	2 3	ESM	Fair	Fair / Good	4/3	4/2B	2	2	Codominant twin stems at 1m, slightly environmentally stressed with slight decline in canopy, located at edge of embankment = position likely to become problematic in the future
Design & impact summary		*Retain & protect with timber beam trunk protection. Design & impact and management discussions as per tree no. 22*										

APPENDIX- D: Tree Location Plan