rain Tree consulting

Arboricultural Management

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14 January 2021

LOT 3, 1110 BARRENJOEY ROAD

PALM BEACH, NSW

DEVELOPMENT PROPOSAL

ARBORICULTURAL IMPACT ASSESSMENT REPORT

Report Ref No- 221

Prepared for

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AQF Level 5 Consulting arborist

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INTRODUCTION

This report has been commissioned by Mr Adam Rytenskild & Mrs Amanda Lee C/- Jorge Hrdina Architects 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 constructing a new dwelling within vacant land identified as Lot 3 in DP 1256016 known as 1110 Barrenjoey Road PALM BEACH 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 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 assessed, their location, development impact and design requirements may be 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 a site consultation and ground level Visual Tree Assessment (VTA) was conducted 16th October 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 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:

Jorge Hrdina Architects project No. 2004 *specific to pre DA*:

- Site Plan Dwg No. DA1001 dated 17.12.2020
- Ground Floor Plan Dwg No. DA2000 dated 17.12.2020
- First Floor Plan Dwg No. DA2002 dated 17.12.2020
- Second Floor Plan Dwg No. DA2003 dated 17.12.2020
- Third Floor Plan Dwg No. DA2004 dated 17.12.2020
- Tree Removal Plan Dwg No. DA2221 dated 15.12.2020
- Tree Impact Plan Dwg No. DA2222 dated 17.12.2020
- North Elevation Dwg No. DA3000 dated 17.12.2020
- South Elevation Dwg No. DA3002 dated 17.12.2020
- Wesdt Elevation Dwg No. DA3003 dated 17.12.2020
- Section 01 & 02 Dwg No. DA3100 & 001 dated 26.11.2020

Adam Clark Surveyors job No. 191257

- Survey Plan ref No: 20688S, dated 23.11.2020

1. SUMMARY OF ASSESSMENT

1.1 General tree assessment

1.1.1 Twenty four (24) trees have been assessed under this development proposal which consist of five (5) neighbouring trees, seven (7) non-prescribed exempt species and one (1) tree within the site containing a low retention value.

Neighbouring trees: Neighbouring trees are identified as trees 20, 21, 22, 23 & 24. Of these trees T22 has been observed as structurally defective and likely containing a low safe site usefulness.

Low retention value tree: is identified as Spotted Gum tree T12 having basal wounds that are likely to become problematic in the future.

Exempt non-prescribed species: noted within Northern Beaches Council Exempt species list trees 5, 6, 7, 10, 15, 17 & 19 are identified as exempt species. Being exempt non-prescribed species with Council notification the trees may be managed without written consent from Council.

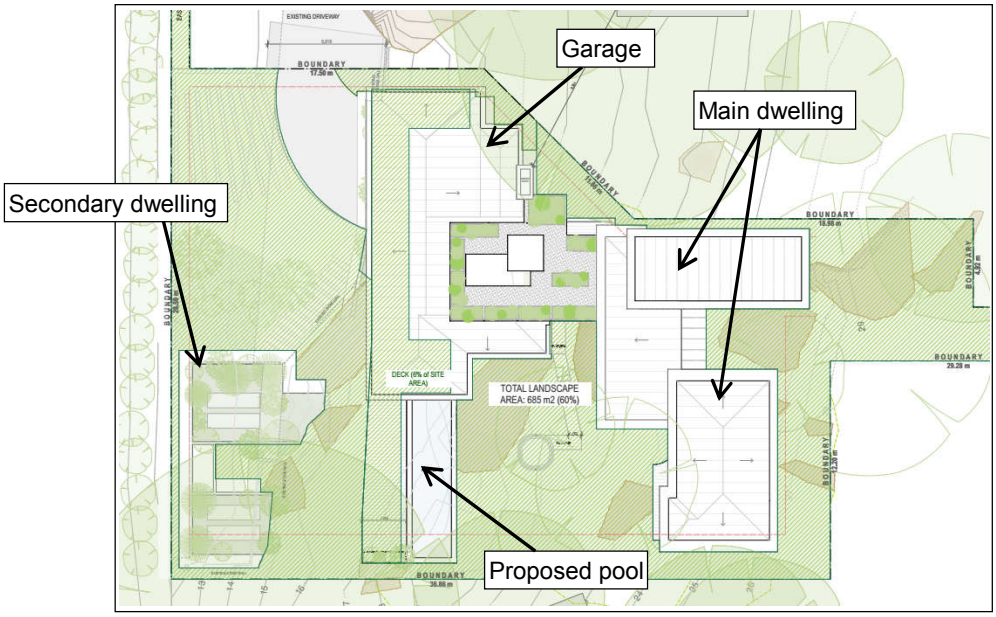
Should an exempt species require retention further arborist advice and protection methodology is required prior to works occurring within Tree Protection Zone (TPZ) setbacks.

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 consist of constructing a new dwelling and associated infrastructure within vacant land. The minimising of impacts has been proposed by tree sensitive design suspending the main dwelling structure above ground level with minimal excavation within tree protection zones of significant trees proposed for retention.

Figure 1, showing proposed development footprint

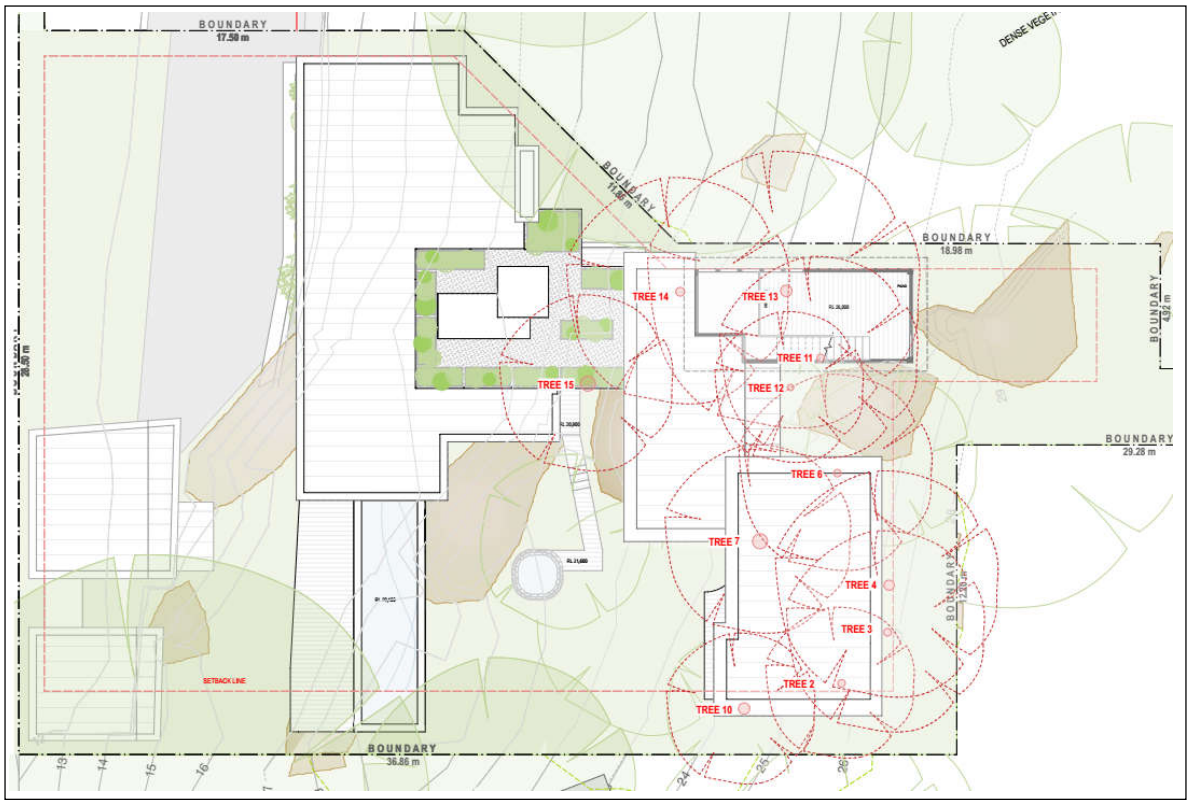


1.3 Tree removal to accommodate design

1.3.1 Trees 2, 3, 4, 11, 12, 13 & 14 are proposed for removal to accommodate design. The removal of exempt or low significant species 6, 7, 10 & 15 also require removal due to high level impacts or being located close to the dwelling structure.

Understanding that the design has mostly been suspended above ground level utilizing tree sensitive techniques provided within the following sections discussions relating to tree protection, development impacts and/or removal by design are discussed. Design impacts may also be referenced within Appendix- C the Tree Assessment Schedule where root radiuses are expressed as notional areas. Based on ground assessment existing site features such as rock outcrops have likely restricted radial root development indicating the SRZ & TPZ may be greater, and development occupancy may have higher implications on underlying tree roots.

Figure 2, showing proposed tree removal plan



1.4 Discussion of development impacts – *prescribed (protected) trees*

Trees which fall within the development footprint

1.4.1 Excluding non-prescribed (exempt) trees, trees which fall within the development footprint requiring removal to accommodate design are identified as:

- T2, 3, 4, 11, 13 & 14.

Trees receiving moderate to high level TPZ coverage by design

1.4.2 Tree 12 receives a likely moderate to high level impact with excavation within the SRZ and building location likely to become problematic in the future. The adjacent rock outcrop has likely confined roots in or towards the area of excavation indicating a high level of disturbance and likely building line conflict with the tree trunk.

Trees receiving moderate or moderate to low level TPZ coverage by design

1.4.3 Trees 8, 16 & 18 receive between 15 & 20% TPZ coverage where the suspended design reduces the overall impact to trees. Development discussions and recommendations are discussed as follow:

- Tree 8: excavation is proposed within the SRZ and part TPZ indicating tree root investigations are required to determine potential impact to critical underlying tree roots. Plan DA2222 identify the likely impact areas with a greater excavation area is more likely required to accommodate construction primarily to achieve RL24.79.
- Tree 16: Located adjacent rock outcrops has more than likely confined roots between a narrow growing media or rock corridor indicating coverage by the design floor plan would likely contribute to higher levels of disturbance outside of a notional SRZ & TPZ radius. Given that design is suspended above ground level it can be said that tree sensitive construction methodology has been designed to mitigate TPZ disturbances, however, given existing site features within the SRZ & TPZ impacts are considered unknown.
- Tree 18: The proposed spa should be relocated outside of the SRZ radius. Similar to T16 above the root system is confined and restricted indicating development disturbances are likely to be greater primarily by the swimming pool location. Prior to obtaining a Construction Certificate (CC) clearer more detail information is required outlining the pool construction methodology and where any excavation or rock demolition is required to accommodate design.

Trees receiving negligible, low to moderate low level TPZ coverage by design

1.4.4 Trees 1, 9, 20, 21, 22, 23 & 24 receive low and/or manageable (<15%) TPZ occupancy by the design proposal with no works identified within the SRZ. The following summary identifies proposed works within tree protection zones.

- Tree 1: Given that the proposal is suspended above ground level the proposal demonstrates a tree sensitive design approach. Given that root systems may be located between narrow rock corridors root zone impacts may be greater than determined. Where excavation is required within 8m of the tree (at or near two thirds the notional TPZ radius) root investigations are recommended to identify likely impacts to underlying tree roots.
- Tree 9: Likely low level impact with roots restricted in development by an adjacent rock outcrop. Pending on final design for spa, excavation for hydraulics may increase TPZ disturbances.

- Tree 20: receives Minor (<10%) TPZ disturbance by the lower garage proposal. To minimise TPZ encroachment no over excavation should occur beyond the line of cut shown within construction drawings. Should over excavation be required the extent of over excavation is to be detailed within construction drawings for arborist review.
- Tree 21: receives Minor (<10%) TPZ disturbance where additional excavation is required to accommodate the secondary dwelling. Minimising encroachment has been identified where the existing southern retaining wall remains. For additional excavation within the TPZ the extent of cut and/or any over excavation to accommodate the required cut is to be detailed within construction drawings.
- Tree 22: has been identified as a structurally defective tree. Pending on the swimming pool construction methodology the overall encroachment is considered minor.
- Tree 23 & 24 receive negligible to very low level TPZ encroachment by design.

2. CONCLUSIONS & RECOMMENDATIONS

2.1 Tree Removal

2.1.1 Based on the design proposal and with the consent of Council the following seven (7) trees have been identified for removal to accommodate design.

- T2, 3, 4, 11, 12, 13 & 14.

Non-prescribed trees permitted to be removed or managed without Council consent are identified as trees: 5, 6, 7, 10, 15, 17 & 19.

Should a non-prescribed tree require retention no works is to occur within TPZ setbacks without prior arborist advice and additional tree protection methodology.

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

a) Prior to obtaining a Construction Certificate (CC) a detailed engineered footing plan is recommended to be provide for arborist review and endorsement. The footing plan should consider spanning over Structural Root Zone (SRZ) radiuses such that critical roots are not damaged by works.

b) Where footings or excavation is proposed within areas that occupy greater than 10% of the TPZ radius tree root investigations are required to identify the location, distribution and impact to critical underlying tree roots. Given the difficulty of the site and likely rock outcrops that have restricted radial root development the management of trees should be based on the outcome of tree root investigations.

c) As the proposal has primarily been constructed to be suspended above ground level the lower floor to ground level is recommended to remain exposed. Maintaining air flow, moisture levels, tree root activity and soil microorganisms will be required to mitigate the impact of TPZ coverage by the suspended design.

2.3 General tree protection requirements

a) Prior to demolition works Tree Protection Fencing (TPF) and/or zones as identified within Figure 3 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.

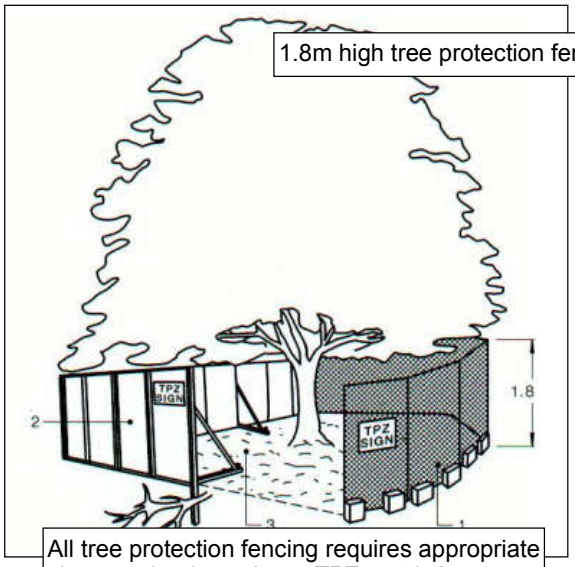
Where design & construction access may be restrictive timber beam trunk protection is recommended to be installed, with ground protection mats provided to protect underlying tree roots within tree protection zones or areas.

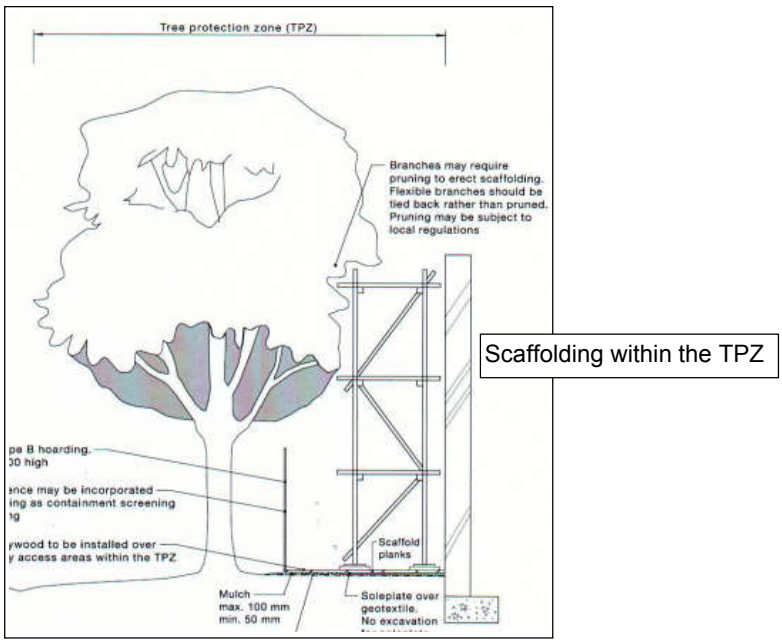
b) In accordance with AS4970 - 2009 (1.4.4) a Project or Site Arborist is to be engaged to monitor, supervise excavation within TPZ setbacks, advise and provide certification of protection works conducted. The project arborist is recommended to hold a minimum Australian Qualification Framework (AQF)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

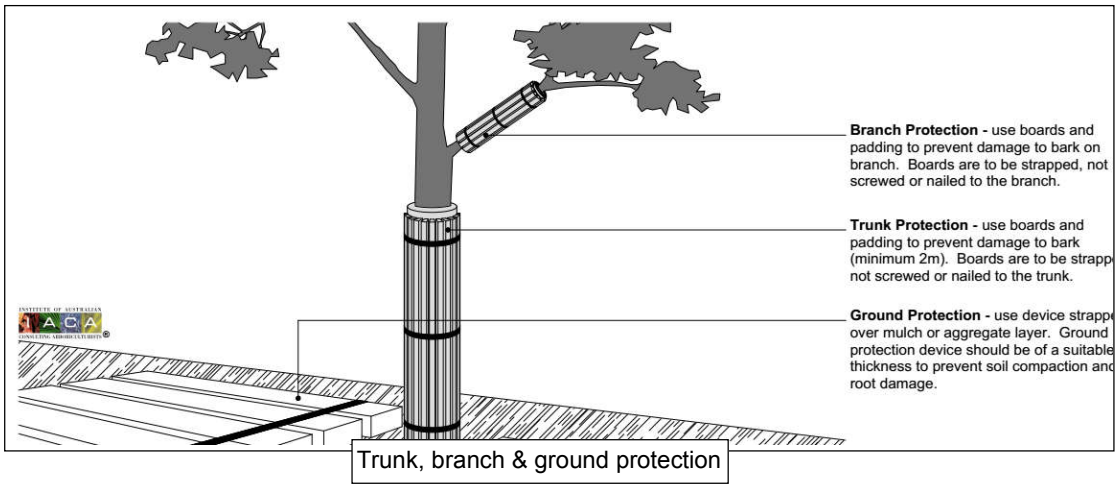
c) The project arborist is to provide final certification outlining tree protection measures with photographic evidence of ongoing works retained for certification purposes (AS4970 S/5.5.2 *Final certification*).

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.*

Figure 3: tree protection fencing, ground and trunk protection detail







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

1) No works 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.
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 below.

Table 1, certification requirements & hold points

1	Pre-construction	Undertake tree root investigations to determine potential root zone conflicts
		Engineer to provide detailed footing plan for arborist review
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

g) *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).

h) *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.

i) 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

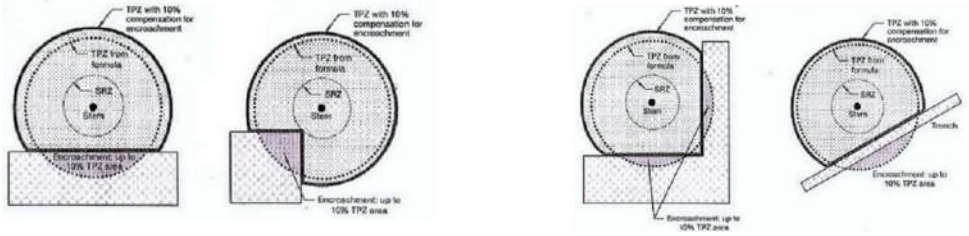
Mark A Kokot
AQF Level 5 consulting arborist
Diploma of Hort/Arboriculture (AQF5), Associate Diploma Parks Management (AQF4)
Certified Arborist / Tree Surgeon (AQF3), ISA Tree Risk Assessment Qualified 6/2024
Member: ISA, Arboriculture Australia & IACA, Working With Children No: WWC0144637E

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 development control plans
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	*Araucaria heterphylla* Norfolk Island Pine	30 x 16	950	3.3m / 11.4	SM	Good	Good	3	7	2	2	Restricted VTA above ground visual parts appear in good order, confined in rock escarpment, SRZ & TPZ likely to be greater
Design & impact summary		*Retain & protect; Low to Moderate (10-15%) TPZ coverage & impact by suspended design footprint having at or near 12% coverage, no encroachment identified within notional SRZ, requires footing plan and details of any excavation within TPZ for arborist review. Where excavation is required within 8m of the tree, tree root investigations are recommended to identify root zone conflicts*										
2	*Glochidion ferdinandi* Cheese Tree	11 x 7	250	2 / 3	ESM	Fair / Good	Good	3	6	1	2	Tree with no significant visual faults
Design & impact summary		*Remove; located within building footprint*										
3	*Corymbia maculata* Spotted Gum	17 x 8	300	2.1 / 3.6	ESM	Good	Good	3	7/4	2	2	Restricted VTA, Suppressed canopy form biomass – W, above ground visual parts appear in good order
Design & impact summary		*Remove; High level impact (<35%) with excavation within SRZ & TPZ to accommodate RL24.7*										
4	*Corymbia maculata* Spotted Gum	16 x 9	400	2.4 / 4.8	ESM	Good	Good	3	4	2	2	slightly environmentally stressed with minor suppressed canopy form biomass – E, NE
Design & impact summary		*Remove; High level impact (<35%) with excavation within SRZ & TPZ to accommodate RL24.7*										
*5	*Phoenix canariensis* Phoenix Palm	9 x 7	700	- / 4.5	SM	Good	Good	4	0	1	1	Exempt palm species
Design & impact summary		*Exempt species. Manage in accordance with design requirement, recommend removal due to location to dwelling*										
*6	*Cinnamomum camphora* Camphor Laurel	10 x 8	350	2.3 / 4.2	ESM	Good	Good	5	0	1	1	Non-prescribed exempt tree species
Design & impact summary		*Remove: exempt species located within building footprint (WBF)*										
*7	*Phoenix canariensis* Phoenix Palm	6 x 6	500	- / 4	ESM	Good	Good	4	0	1	1	Exempt palm species
Design & impact summary		*Remove: exempt species located within building footprint (WBF)*										

	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
8	*Corymbia maculata* Spotted Gum	26 x 18	1050	3.5 / 13.8	M	Good	Fair / Good	3	2C	2	2	Typical for species type in age class, upper branch scaffolds failures evident, Large diameter deadwood, large surface roots W = SRZ & TPZ likely to be greater
Design & impact summary		*Retain; moderate (15-20%) coverage over SRZ & TPZ, with excavation to accommodate RL24.7. Existing RL's vary from near 24.8+ indicating likely excavation impact within SRZ & TPZ requires further information to determine impacts within a notional TPZ by tree root investigations*										
9	*Corymbia maculata* Spotted Gum	20 x 10	450	2.5 / 5.4	ESM	Good	Good	3	6	1	2	Narrow suppressed canopy form biomass E, NW, with no significant visual faults
Design & impact summary		*Retain; Minor impact of moderate to low (10-15%) coverage within TPZ with proposed suspended dwelling at RL24.7. Adjacent spa requires more detail in construction / excavation for hydraulic plan with access path to be suspended within the TPZ*										
*10	*Pittosporum undulatum* Native Daphne	7 x 6	450at base	2.3 / 5.4	M	Fair / Good	Fair	4	0/2A	2	3	Exempt tree species height class <8m tall, Multi stemmed at base, with stub end decline & decay NW side
Design & impact summary		*Remove: located directly adjacent building footprint*										
11	*Corymbia maculata* Spotted Gum	15 x 8	300	2.1 / 3.6	ESM	Good	Good	3	6/7	1	2	Restricted VTA above ground visual parts appear in good order
Design & impact summary		*Remove: located within building footprint (WBF)*										
12	*Corymbia maculata* Spotted Gum	14 x 5	250	2 / 3	ESM	Good	Fair / Poor	3	2A	3	3	Structurally defective tree at base W side = low retention value
Design & impact summary		*Remove. Likely high level impact with excavation within SRZ, rock at base restricting radial root spread indicates likely tree decline or failure by proposed cut & RL at 23.6, building elevation likely to conflict with tree trunk indicating removal to accommodate design.*										
13	*Glochidion ferdinandi* Cheese Tree	12 x 11	450	2.5 / 5.4	EM	Good	Good	3	6	1	2	Located at edge of embankment, exposed surface roots NW, located on rock
Design & impact summary		*Remove: located within building footprint (WBF)*										
14	*Glochidion ferdinandi* Cheese Tree	10 x 9	350	2.3 / 4.2	SM	Good	Good	3	6	1	2	Located at edge of embankment / steep slope, with Suppressed canopy form biomass W, NW
Design & impact summary		*Remove: located within building footprint (WBF)*										
*15	*Phoenix canariensis* Phoenix Palm	6 x 7	600	- / 4.5	ESM	Good	Good	4	0/6	1	2	Exempt palm species located at edge of embankment

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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
Design & impact summary		*Remove: located within building footprint (WBF)*										
16	*Corymbia maculata* Spotted Gum	24 x 21	950	3.3 11.4	M	Good	Good	3	6/7	1	2	Restricted VTA above ground visual parts appear in good order. Large rock at base W side = SRZ & TPZ likely to be greater
Design & impact summary		*Proposed retention; potential moderate level impact (<20%) with likely part excavation within TPZ to accommodate design. Rots likely confined between rocks indicating impacts may be greater than determined.*										
*17	*Phoenix canariensis* Phoenix Palm	5 x 7	550	- 4.5	ESM	Good	Good	4	0	1	2	Exempt palm species
Design & impact summary		*Exempt species; manage in accordance with design requirement*										
18	*Corymbia maculata* Spotted Gum	22 x 20	700	2.8 8.4	M	Good	Good	3	6	1	2	Suppressed canopy form biomass NW. Located at edge of embankment / steep slope
Design & impact summary		*Proposed retention; requires further information of proposed swimming pool construction methodology at proposed RL20.1, extent of excavation to accommodate design to be clearly detailed within construction drawings which may require rock demolition within TPZ, spa should be excluded from SRZ with SRZ & TPZ disruption likely to be of a moderate (<20%) impact by design.*										
*19	*Phoenix canariensis* Phoenix Palm	7 x 5	650	- 3.5	ESM	Good	Good	3	0/2E	2	2	Located at edge of embankment where location likely to become problematic in the future
Design & impact summary		*Exempt species; manage in accordance with design requirement*										
20 NT	*Corymbia maculata* Spotted Gum	22 x 24	950	3.3 11.4	M	Good	Good	3	6	1	2	Located at edge of minor sloping embankment, with no significant visual faults
Design & impact summary		*Protect; Minor (10%) incursion within TPZ, to minimise TPZ incursion minimal over excavation to accommodate garage level excavation recommended, arborist supervision to manage any encountered tree roots during works*										
21 NT	*Corymbia maculata* Spotted Gum	26 x 22	700, 650	3.5 15	M	Good	Good	3	6	1	2	Restricted VTA above ground visual parts appear in good order
Design & impact summary		*Protect; Likely low level to Minor (<10%) incursion within TPZ due to existing retaining wall at or near boundary, extent of wall demolition to accommodate secondary dwelling and any additional excavation to be clearly detailed within construction drawings, no over excavation beyond the southern part boundary wall recommended, arborist supervision to manage any encountered tree roots during works*										

	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 NT	*Corymbia maculata* Spotted Gum	18 x 11	800	3 / 9.6	M	Good	Poor	3	2	3	3	Structurally defective tree with open wounds & fungal conks (brackets) throughout lower trunk and branch scaffolds
Design & impact summary		*Protect; tree noted as structurally defective having short ULE. Location of swimming pool outside of SRZ with over all TPZ occupancy considered Minor (10%) of low impact*										
23 NT	*Corymbia maculata* Spotted Gum	17 x 12	450	2.5 / 5.4	ESM	Good?	Good	3	7	1	2	Restricted VTA vegetation, above ground visual parts appear in good order
Design & impact summary		*Protect; likely Minor (<10%) TPZ incursion having low level impact within TPZ with design suspended above ground level at RL.24.7*										
24 NT	*Cinnamomum camphora* Camphor Laurel	13 x 11	450at base	2.3 / 5.4	ESM	Good	Fair / Good	5	2B	2	2	Narrow suppressed canopy form biomass N-E, twin stems at 1m with minor stem inclusion development
Design & impact summary		*Protect; Negligible TPZ occupancy by design*										

APPENDIX- D: Tree Location Plan