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# **rainTree consulting**

## **Arboricultural Management**

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9 January 2020

## **22 OCEAN ROAD**

**PALM BEACH, NSW**

DA2019/1254

## **ADDITIONS & ALTERATIONS**

# **ARBORICULTURAL IMPACT ASSESSMENT & TREE PROTECTION PLAN**

*Ref No- RTC-220*

Prepared for  
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## INTRODUCTION

This report has been commissioned by Mr. Victor Comino 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 primarily consists of additions and alterations for landscaping within the property formally identified as Lot 71 in DP 6746 being known as 22 Ocean Road, PALM BEACH NSW.

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

Within a notional root zone radius development encroachments and occupancy within tree protection zones are referred to as Major (>10%) or Minor (<10%) incursions explained as No impact (0%) incursion, Low impact (<10%) of minor consequence, Medium or moderate impact (<20%) incursion where the project arborist is to demonstrate the tree(s) remain viable by tree sensitive construction techniques, and High level impact (>20%) where design changes or further information is required to manage tree vitality. Where site restrictions within notional root zone radiuses exists development impacts or occupancy disturbances within tree protection zones are determined based on authors experience, observations of site conditions, soil type and topography.

Each tree assessed has been accorded a temporary tree 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 and their location may be referenced within the Tree Assessment Schedule and Tree Location Plan 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.

### DISCLAIMER & LIMITATION ON THE USE OF THIS REPORT

This report is to be utilized in its entirety only. Any written or verbal submission, report or presentation that includes statements taken from the findings, discussions, conclusions or recommendations made in this report, may only be used where the whole of the original report (or copy) is referenced in, and directly to that submission, report or presentation. Unless stated otherwise: Information contained in this report covers only the tree/s that were examined and reflects the condition of the trees at the time of inspection: and the inspection was limited to visual examination of the subject tree without dissection, excavation, probing or coring. There is no warranty or guarantee, expressed or implied, that problems or deficiencies of the subject tree/s may not arise in the future. Arborist cannot guarantee that a tree will be healthy or safe under all circumstances, or for a specific period of time. Trees are a living entity and change continuously, they can be managed but not controlled and to be associated near one involves some degree of risk.

## METHODOLOGY

- i In preparation for this report a limited site and ground level Visual Tree Assessment (VTA) was conducted on Wednesday 11<sup>th</sup> December 2019 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 2013. 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 utilizes the current Australian Standards 'Protection of Trees on Development Sites' AS 4970 – 2009 as explained within Notes 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 identified within Appendix- A Notes: *acceptable incursions*. 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:  
David Katon Studio 4 Track Building Design project No. 63
  - Site Plan Sheet No: 00-A dated Nov 22, 2019
  - Short Section 3, Sheet No: 36-A dated Nov 22, 2019
  - Long Section Front yard, Sheet No: 37-A dated Nov 22, 2019Chadwick cheng Consulting Surveyors
  - Survey Plan ref No. 38117/D1-MGA issue 1) dated 29.1.2019

## 1. SUMMARY OF ASSESSMENT

### 1.1 General tree assessment

1.1.1 Thirty four (34) have been assessed under this development proposal with smaller shrubs at or <4m in height located within the assessment area. Of the trees assessed three (3) are located within the front Council verge, sixteen (16) are non-prescribed palm trees, one (1) contains a low retention value and eleven (11) are located within neighbouring properties.

Council road reserve trees are identified as heritage item Norfolk Island Pines T1, 2 & 3. The trees display no significant defects and are subjected to proposed fill within their tree protection zones.

Exempt non-prescribed palms are identified as trees: 4, 5, 6, 7, 8, 9, 10, 11, 14, 15, 16, 17, 18, 20, 21 & 23. Being non-prescribed species and exempt from protection the trees are permitted to be managed (pruned, removed or relocated) without Council consent. Should an exempt specimen require retention prior to works occurring within specified Tree Protection Zone (TPZ) setbacks further advice from an appointed project arborist is required.

Low retention value tree is identified as tree 12. The native Fig tree containing basal abnormalities where the condition is likely to become problematic in the future. The tree is considered a tree which should not restrict this development application due to the trees expected short safe retention value. The tree may also be part of tree 13, being a stem potentially rising from the base of T12. The removal and replacement of the trees is required to accommodate the design proposal.

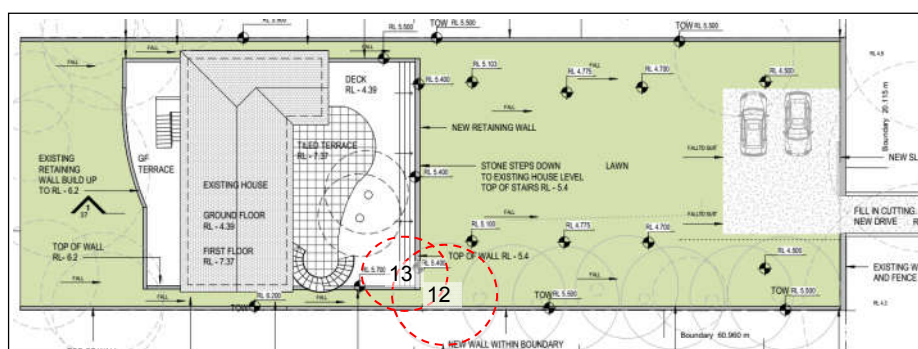
Neighbouring palms are identified as non-prescribed palm trees: 24 to 34. The majority of trees are located along the boundary of 21 Ocean Road where a new retaining wall is proposed to accommodate design.

1.1.2 With exception of T12 the trees assessed are considered viable for retention without change in existing site conditions or modification within their Tree Protection Zone (TPZ) radiuses, refer Appendix- C the SRZ & TPZ distance column.

### 1.2 Prescribed tree removal to accommodate design

1.2.1 Two (2) trees T12 & 13 require or are recommended for removal to accommodate design. The trees are summarised as T12 receiving SRZ impacts and having a low retention value, and T13 being located within or very near to the footprint a retaining wall supporting stair access at RL5.40.

Figure 1, showing proposed development area & tree removal plan



### 1.3 Discussions of development impacts – *prescribed trees*

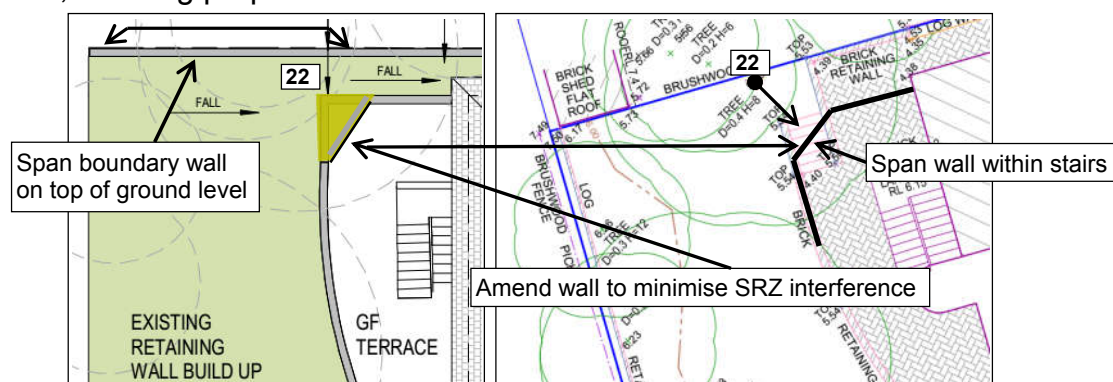
1.3.1 Road reserve trees 1, 2 & 3. Proposed works consist of the placement of fill within Tree Protection Zone (TPZ) radiuses, new retaining walls within the boundary, construction of a new sliding gate with the existing front walls and fence to remain. No excavation is proposed within Structural Root Zone (SRZ) setbacks with alterations or disturbances within notional TPZ's considered as having minor and manageable (10-15%) TPZ occupancy. Given the significance of the trees the following recommendations are provided as a guide to minimise impacts by design:

- i. *Fill within tree protection zones*; within Section 4.2 of AS4970-2009 fill is generally an activity which should be excluded from tree protection zones, and where a greater than 10% occupancy occurs the arborist is to demonstrate the tree(s) will remain viable. In this case the fill material within the tree protection zone (TPZ) is to be of non-contaminated, certified, clean, free draining Sydney sand provided by a reputable supplier. To avoid potential contaminants leaching towards the trees from fill outside of the TPZ all fill material is to be certified as clean non-contaminated fill. Certificates of Sydney sand and clean fill soils are to be retained and provided to the Principal Certifying Authority (PCA) for tree/root protection requirements.
- ii. The placement of fill within tree protection zones or specified protection area is to occur without compaction, with proposed vehicle parking preferably located along the southern boundary.
- iii. The existing road reserve driveway crossover and retaining walls should remain to protect underlying tree roots, allowing for compaction to occur over the existing driveway footprint only.
- iv. *Tree protection fencing*; prior to works commencing tree trunks are to be protected with timber beams no less than 2.4m in height.
- v. The parking of heavy commercial material delivery or construction vehicles is recommended to be excluded from beneath tree canopy driplines, and any designated tree protection area (TPA).
- vi. *Sliding gate proposal*; prior to installation an appointed project arborist is to review and endorse any excavation required to support the construction of the front sliding gate.
- vii. *N & S boundary retaining walls*; given that the proposed method of retaining wall construction is unclear proposed excavations for footing placement is to occur under the supervision of an appointed project arborist. No tree roots at or >30mm(Ø) are to be damaged by works where footing design is to accommodate (bridge over and retain) significant tree roots that may extend from T1 & 3. The retention of non-prescribed palms along the southern boundary may require specific retaining wall footing design as specified within Section 1.3.6.

1.3.2 N & S boundary retaining walls – *general*: based on site observations, unless stated otherwise the existing boundary retaining walls have likely acted as a root barrier restricting neighbouring root encroachment within the site. These existing walls have likely reduce any major root zone impact to neighbouring tree root systems.

- 1.3.3 Trees 12 & 13. Proposed works consist of retaining wall construction along the southern boundary and courtyard stair access walls supporting fill at or near RL5.40. Works are proposed within the SRZ of T12 where a high level of SRZ disturbance occurs, with T13 falling within the footprint of stair design. Given that T12 contains a low retention value the removal of trees 12 & 13 is recommended to make space for new planting of the same or similar tree species.
- 1.3.4 Tree 19. Proposed works within the TPZ consist of increasing the rear retaining wall from RL5.4 to RL6.2 (800mm), with Long Section Plan Sheet 37A indicating no fill to accommodate design within the rear yard. Without disturbance within 7m of the tree, the tree is unlikely to be affected by the increased height of the retaining wall. Tree protection fencing is recommended to be installed forming a tree protection area (TPA) no less than 4m from the face of the tree extending 6m to the N & S sides of the canopy projection.
- 1.3.5 Tree 22. Proposed works within the SRZ, *the area required for tree stability* consist of excavation to accommodate a boundary retaining wall, and landscape retaining wall modification that will likely conflict with critical anchoring tree roots. The encroachment within the SRZ is considered minor given the location of the existing retaining wall and stairs. Modification of the proposed landscape retaining wall design is recommended, with the proposed boundary retaining wall suspended above ground level to avoid conflicts with underlying tree roots. Modification and tree management to retain the tree as a viable asset is recommended to consist of the following guidelines:
- i. As shown within Figure 2 p8 the line of the proposed landscape retaining wall is recommended to span across or be situated in the existing stairs and connect to part of the existing retaining wall to avoid disturbance within the 2.3m SRZ. The area lost by excavation has been compensated by the proposed increased garden and drainage fall area spanning the northern boundary where impacts to the trees root system are likely to be minor given appropriate management.
  - ii. The proposed north corner boundary retaining wall within the upper level should be constructed on top of ground level, supported by pier and beam construction, spanning over the SRZ and across neighbouring palm adventitious root systems.
  - iii. Where footing excavation and/or over excavation is required for retaining wall construction the excavation activity is to be conducted manually, by hand and supervised by an appointed project arborist. All encountered tree roots <30mm(Ø) are to be appropriately managed, clean cut and protected by the arborist to avoid ripping beyond the point of excavation by site machinery. Where larger tree roots have been encountered they are to be referred to an independent arborist for further advice.
  - iv. Timber beam trunk protection is to be installed prior to works commencing, where the appointed supervising arborist may request ground/root protection matting during construction activities.

Figure 2, showing proposed T22 wall modification area



### Non-prescribed palms

1.3.6 Non-prescribed palm trees are permitted to be managed by the owner without Council consent. Should relocation be proposed the location of palms is to be clearly identified within a detailed landscape plan. Those palms identified as exempt species are palms 4, 5, 6, 7, 8, 9, 10, 11, 14, 15, 16, 17, 18, 20, 21 & 23. For the purpose of palm retention and assessment of potential development impacts the following discussions and recommendations are provided:

- i. *Fill within palm/tree protection zones*; the placement of extensive fill within tree protection zones may likely compromise palm vitality. Where palms are required to be maintained within their existing position an acceptable risk is required that fill may reduce palm vigour. The minimising of impacts may occur by placing certified, non-contaminated, clean, free draining Sydney sand within the TPZ. There should be no soil compaction within tree protection zones with garden irrigation provided to encourage new adventitious root growth.
- ii. Palms 14 & 15; no soil disturbance should occur within the 3.5m palm protection zones without prior arborist advice.
- iii. The most appropriate palm management should ideally consist of professional palm relocation, placed on top of non-contaminated free draining sandy soils being subjected to a professional routine management program.
- iv. *Retaining wall construction*; given that the proposed method of retaining wall construction is unclear final engineered drawings are recommended to be reviewed and endorsed by an appointed project arborist. Based on design plans the location of the new wall is to be situated within the boundary, against the existing wall to avoid neighbouring property conflicts. Should selected palms require to be retained in their existing location the construction of the wall requires to bridge across and on top of the palm root ball base, with footings positioned each side of the palm root ball, located well outside of the palms main congested adventitious root systems. The location of footings is to be determined on site by an appointed project arborist where root investigations may be required to identify the appropriate span that can accommodate footings and the palms root ball.



## 1.4 Neighbouring palm discussions

1.4.1 Neighbouring palms located adjacent the northern boundary are all non-prescribed palms, not protected by the Local Government Authority (LGA). Being neighbouring palms, the palms require protection to ensure they are not compromised by development activities. Based on the documentation provided the new wall is to be constructed within the boundary, and likely against the existing retaining wall to minimise conflicts with palm root systems indicating a negligible RL change impact or disturbance by design. The following discussions and recommendations are provided as a guide for the minimising of impacts by proposed works.

- i. Palms 24 & 25; as discussed within Section 1.3.5 (iv) the proposed retaining wall is to be constructed on top of ground level, bridging over adventitious root systems as determined by the site arborist.
- ii. Palms 26 to 34; to avoid conflicts with neighbouring palms the new retaining wall is to be constructed on top of or against the existing wall, primarily to ensure the anchorage of the palms located against the boundary is not disrupted by removing the existing wall.
- iii. Prior to the walls construction final engineered design palms are recommended to be reviewed and endorsed by an appointed project arborist.

## 2. CONCLUSIONS & RECOMMENDATIONS

### 2.1 Tree Removal

2.1.1 Under the current proposal and with the consent of Council two (2) trees T12 & 13 require or are recommended for removal to accommodate design. Exempt non-prescribed trees permitted to be managed (pruned, removed or relocated) without the consent of Council are trees 4, 5, 6, 7, 8, 9, 10, 11, 14, 15, 16, 17, 18, 20, 21 & 23. Where an exempt specimen requires retention the palm(s) are recommended to be managed in accordance with this report with further advice from an appointed project arborist obtained prior to works occurring within TPZ setbacks.

### 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*

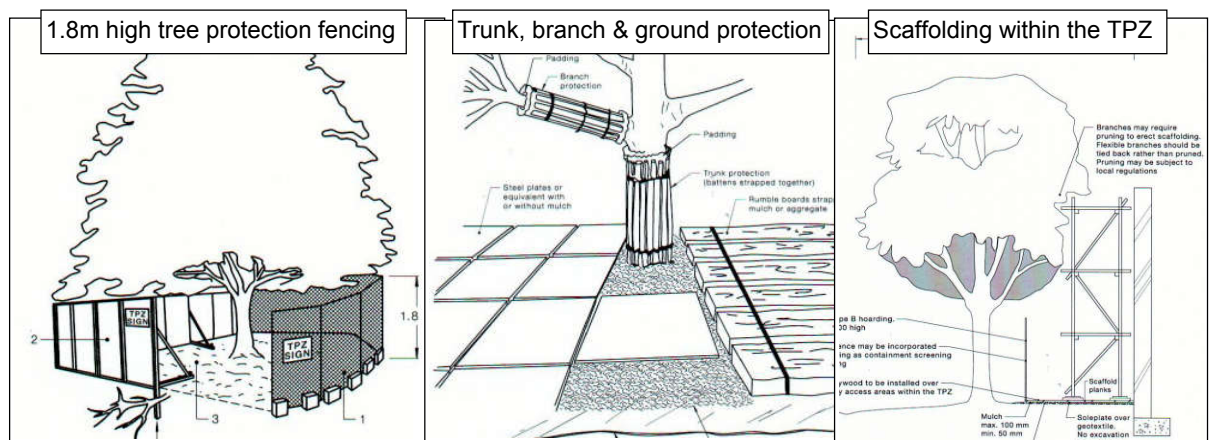
1. A guideline for tree management has been provided within Appendix- E the Tree Management Plan with specific requirements outlined below:
  - Trees 1, 2 & 3: fill within the TPZ is to be certified, clean, non-contaminated free draining Sydney sand. No soil compaction is to occur within tree protection zones where the existing driveway crossover should remain allowing for compaction of fill within the driveway footprint only.

- Tree 22: modification in the wall design is recommended such that the wall corner angles across the existing stairs to avoid conflicts with the trees structural root system. The boundary retaining wall should also be constructed on top of ground level, supported by pier and beam construction, bridging over the SRZ and neighbouring palm root systems.

## 2.2.2 General requirements & guidelines

1. 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 specified tree protection areas (TPA).
2. In accordance with AS4970 - 2009 (1.4.4) a Project 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 be suitably qualified having 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 3: tree protection fencing, ground and trunk protection detail



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

5. **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.

It is the responsibility of the principle contractor to complete each task identified within Table 1 to ensure trees are appropriately managed in accordance with Australian Standard AS 4970 – 2009 Protection of Trees on Development Sites.

Table 1, certification requirements & hold points

1	Pre-construction	Clearly tag and number all trees for removal & retention
		Prior to works install tree protection fencing & zones as specified or directed & certified by the site arborist
2	During construction	Project arborist to supervise & certify approved works within the tree protection zones
		Engage project arborist to undertake routine site inspections at six (6) week intervals
3	Post construction	Prior to handover project arborist to provide final inspection & certification of tree health & vitality

6. 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.
7. The storage of materials and fill within tree protection zones is to be avoided. Should storage be required further advice and certification from the appointed project arborist is recommended.
8. *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 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](http://www.swa.gov.au)).
9. *Boundary fence and minor retaining wall construction*: to avoid disturbance to underlying tree roots boundary fences and landscape retaining walls should span across the SRZ being suspended above ground level supported by pier and beam construction within the TPZ.

10. *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.
  11. To ensure tree(s) are appropriately protected the development site superintendent is recommended to be familiar with all tree protection requirements as outlined within this report. The superintendent is responsible for informing all subcontractors of the responsibilities and requirements of tree protection prior to their engagement.
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Should you require further liaisons in this matter please contact me direct on 0419 250 248

Yours sincerely



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Diploma of Hort/Arboriculture (AQF5), Associate Diploma Parks Management (AQF4)  
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Member: ISA, Arboriculture Australia & IACA, Working With Children No: WWC0144637E



## APPENDICES

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## 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.'

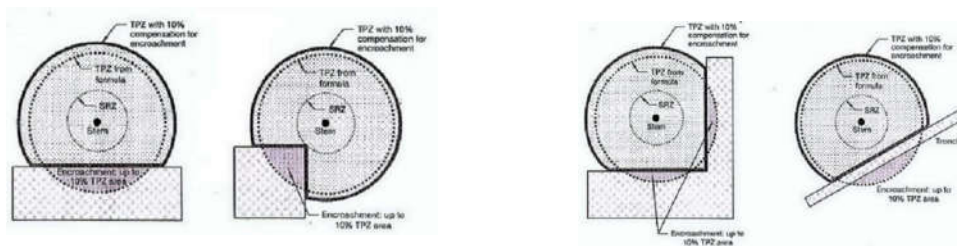
**Age classes:** (I) Immature refers to a well established but juvenile tree. (ESM) refers to an early semi mature tree not of juvenile appearance. (SM) Semi-mature refers to a tree at growth stages advancing into maturity and full size. (LSM) Late Semi-Mature, refers to a tree between semi-mature and 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 tree's 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 weak 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:**

Development encroachments are referred to as No impact (0%) incursion, Low impact (<10%) of minor consequence, Medium impact (<20%) incursion where the project arborist is to demonstrate the tree/s remain viable by tree sensitive construction techniques, and High level impact (>20%) where design changes or further information is required to manage tree vitality.

Showing acceptable incursion within the TPZ (AS4970)



### SELECTED REFERENCES:

- Barrell J. 1993, 'Preplanning Tree Surveys: Safe useful Life expectancy (SULE) is the Natural Progression', *Arboricultural Journal* 17: 1, February 1993, pp. 33-46.
- International Society of Arboriculture (ISA) 2013, *Tree Risk Assessment Manual*, Martin Graphics, Champaign Illinois U.S.
- Mattheck, C. & Breloer, H.(1994) *The Body Language of Trees*. Research for Amenity Trees No.4 the Stationary Office, London.
- Matheny N. & Clark J. 1998, *Trees & Development 'A Technical Guide to Preservation of Trees During Land Development'* International Society of Arboriculture, Champaign USA.
- Standards Australia 2009, *Australian Standards 4970 Protection of Trees on Development Sites* - Standards Australia, Sydney, Australia.
- Hornsby Council DCP 2013 – General / Revision 22 dated February 2018

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

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

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

1	Significant	2	Very High	3	High	4	Moderate	5	Low	6	Very Low	7	Insignificant
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**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 Pcus 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 of 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 free 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
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**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 to 15 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	Age	Health	Condition	Significance	VTA	RV	U. L.E.	Comments CV = Council verge tree NT= Neighbouring tree
				TPZ								
1 CV	<i>Araucaria heterophylla</i> Norfolk Island Pine	33 x 15	1500	4m 15	M	Good	Good	1	2C	2	2	Minor surface root damage S side
2 CV	<i>Araucaria heterophylla</i> Norfolk Island Pine	28 x 12	850	3.1 10.2	M	Good	Good	1	2C	2	2	Minor lower trunk wound SE side near ground level
3 CV	<i>Araucaria heterophylla</i> Norfolk Island Pine	32 x 15	1250	3.7 15	M	Good	Good	1	2C	2	2	Minor surface root damage SW side
*4	<i>Phoenix canariensis</i> Phoenix Palm	11 x 6	650	- 4	M	Good	Good	4/3	0/6	1	2	Exempt palm species, raised root ball above ground level at base
*5	<i>Phoenix canariensis</i> Phoenix Palm	2 x 6	600	- 4	I	Good	Good	4	0/6/ 2E	1	1/5	Exempt palm species, with very minor foliage tip decline from coastal environment
*6	<i>Phoenix canariensis</i> Phoenix Palm	9 x 6	650	- 4	M	Good	Good	4/3	0/6 2E	1	2	Exempt palm species, raised root ball above ground level at base
*7	<i>Syagrus romanzoffiana</i> Cocos Palm	16 x 5	300	- 3.5	M	Good	Good	4/3	0/6/ 2E	1	2	Exempt palm species, location to infrastructure likely to become problematic in the future
*8	<i>Phoenix canariensis</i> Phoenix Palm	4 x 6	550	- 4	SM	Good	Good	4/3	0/4/ 2E	1	2	Lower trunk sweep N, bowing sweep on lower trunk where location to infrastructure likely to become problematic in the future
*9	<i>Phoenix canariensis</i> Phoenix Palm	7 x 7	700	- 4.5	M	Good	Good	4/3	0/6	1	2	Exempt palm species, slight bowing lean from ground level, raised root ball above ground level at base
*10	<i>Phoenix canariensis</i> Phoenix Palm	11 x 7	700	- 4.5	M	Good	Good	4/3	0/6/ 2E	1	2	Exempt palm species, raised root ball above ground level at base
*11	<i>Phoenix canariensis</i> Phoenix Palm	10 x 6	700	- 4	M	Good	Good	4/3	0/6/ 2E	1	2	Exempt palm species, raised root ball above ground level at base



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	Age	Health	Condition	Significance	VTA	RV	U. L.E.	Comments CV = Council verge tree NT= Neighbouring tree
				TPZ								
12	<i>Ficus rubiginosa</i> Port Jackson Fig	9 x 6	200, 250	2.4m 5.4	ESM	Good	Fair / Poor	3	2A	3	<3	Twin stems at ground level with stem inclusion development, poor root development S side to fence, past damage & pruning cut wounds at base, cut surface root at 2.5m N = basal conduction likely to become problematic in the future = low retention value
13	<i>Ficus rubiginosa</i> Port Jackson Fig	7 x 5	200	1.8 2.4	ESM	Good	Fair	4/3	2C	2	2	Likely stem of T12, moderate lean SW, epicormic shoots on lower trunk with suppressed canopy form bio mass SSW
*14	<i>Archontophoenix cunninghamiana</i> Bangalow Palm	11 x 5	250	- 3.5	M	Good	Good	4/3	0/6	1	2	Exempt palm species with no significant defects noted
*15	<i>Archontophoenix cunninghamiana</i> Bangalow Palm	11 x 5	250	- 3.5	M	Good	Good	4/3	0/6	1	2	Exempt palm species with no significant defects noted
*16	<i>Phoenix canariensis</i> Phoenix Palm	9 x 7	700	- 4.5	M	Good	Fair / Good	4/3	0/2E	2	2	Exempt palm species, fused at base with T17, location to infrastructure likely to become problematic in the future
*17	<i>Phoenix canariensis</i> Phoenix Palm	9 x 7	700	- 4.5	M	Good	Fair / Good	4	0	2	2	Exempt palm species, slight trunk sweep N, fused at base with T16
*18	<i>Phoenix canariensis</i> Phoenix Palm	8 x 7	650	- 4.5	M	Good	Good	4	0	1	2	Exempt palm species with no significant defects noted
19	<i>Melaleuca quinquenervia</i> Paperbark	14 x 12	900	3.2 10.8	M	Good	Fair	3	2	2	3	Main twin stems with stem inclusion development and wound seam N side, adventitious roots within and external of included junction descending S side
*20	<i>Syagrus romanzoffiana</i> Cocos Palm	17 x 5	200	- 3.5	M	Fair / Good	Good	4	0	1	2	Exempt palm species with no significant defects noted
*21	<i>Syagrus romanzoffiana</i> Cocos Palm	17 x 5	250	- 3.5	M	Good	Good	4	0	1	2	Exempt palm species with no significant defects noted
22	<i>Glochidion ferdinandi</i> Cheese Tree	8 x 8	350	2.3 4.2	ESM	Good	Good	3	6	1	1	Endemic tree with no significant defects noted

Trees requiring removal due to hazardous or dead condition - subject to Local Government Authority notification							Trees with low retention values: senescence, developing defects or being *exempt trees from the LGA Tree Preservation Order (TPO)					
Tree No	Botanical Name COMMON NAME	Height x spread (m)	DBH (mm)	SRZ TPZ	Age	Health	Condition	Significance	VTA	RV	U. L.E.	Comments CV = Council verge tree NT= Neighbouring tree
*23	<i>Archontophoenix cunninghamiana</i> Bangalow Palm	3 x 2.5	150	- 2.5m	I	Good	Good	4	0/6	1	2/5	Exempt palm species with no significant defects noted
Neighbouring tree schedule		All non-prescribed palm trees requiring protection during development works										
24	<i>Syagrus romanzoffiana</i> Cocos Palm	10 x 6	300	- 4	M	Good	Fair / Good	4	2C	2	2	Non-prescribed palm species, minor wounds on main trunk S side
25 x2	<i>Archontophoenix cunninghamiana</i> Bangalow Palm	5 x 3	200	- 2.5	ESM	Good	Good	4	6	1	1	Non-prescribed palm species with no significant defects noted
26	<i>Archontophoenix cunninghamiana</i> Bangalow Palm	9 x 5	200	- 3.5	M	Good	Good	4	7	1	2	Non-prescribed palm species with no significant defects noted
27	<i>Howea forsteriana</i> Kentia Palm	6 x 4	150	- 3	M	Good	Good	4	7	1	2	Non-prescribed palm species with no significant defects noted
28	<i>Syagrus romanzoffiana</i> Cocos Palm	8 x 4	250	- 3	M	Good	Fair / Good	4	2C/7	1	2	Non-prescribed palm species, minor wounds on main trunk S side
29 x2	<i>Archontophoenix cunninghamiana</i> Bangalow Palm	8 x 4	250	- 3	M	Good	Good	4	7	1	2	Non-prescribed palm species with no significant defects noted
30	<i>Syagrus romanzoffiana</i> Cocos Palm	9 x 4	250	- 3	M	Good	Fair / Good	4/3	2C/7	2	2	Non-prescribed palm species, minor wounds on main trunk S side
31	<i>Syagrus romanzoffiana</i> Cocos Palm	6 x 4	300	- 3	EM	Fair / Good	Fair / Good	4	2C/7	2	2	Non-prescribed palm species, minor wounds on main trunk S side
32	<i>Syagrus romanzoffiana</i> Cocos Palm	7 x 6	300	- 4	SM	Good	Fair / Good	4/3	2C/7	2	2	Non-prescribed palm species, minor wounds on main trunk S side
33	<i>Syagrus romanzoffiana</i> Cocos Palm	8 x 6	300	- 4	SM	Good	Fair / Good	4/3	2C/7	2	2	Non-prescribed palm species, minor wounds on main trunk S side
34	<i>Syagrus romanzoffiana</i> Cocos Palm	8 x 5	300	- 3.5	SM	Good	Fair / Good	4/3	2C/7	2	2	Non-prescribed palm species, minor wounds on main trunk S side



## APPENDIX- E: Tree Removal & Protection Plan

