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21 July 2021

ROYAL FAR WEST - MANLY

14-22 WENTWORTH STREET &

19-21 SOUTH STEYNE, MANLY NSW

SECTION 75W MODIFICATION

ARBORICULTURAL IMPACT ASSESSMENT REPORT

Ref No: 10321

Prepared for
Royal Far West (RFW)
C/- Lighthouse Project Group
PO Box 920 MILSONS POINT, NSW

Prepared by
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INTRODUCTION

This arboricultural report has been commissioned by Royal Far West (RFW) C/- Lighthouse Project Group. The reason this report has been commissioned is to address a S75W Modification in relation to new development within 12 - 22 Wentworth Street and 19 - 21 South Steyne MANLY NSW.

The project sees the implementation of Stages 3 and 4 of the Concept Approval (Application # MP10_0159) and involves the retention of the previously constructed Stages 1 and 2, hospital facility "Centre for Excellence" now known as the 'CCK' building, as well as alterations and additions to Drummond House and the construction of mixed use buildings which incorporate tourist and visitor accommodation, residential apartments and commercial retail uses with basement parking and landscaping.

Within this report the remaining Useful Life Expectancy (ULE) and potential impacts that may occur to significant trees has been addressed.

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

Development incursions within tree protection zones and impacts to trees have been outlined within Note 2 of Appendix- A where incursions are described as low, moderate to high level impacts within tree protection zones. Where site restrictions within notional root zone radiuses exist 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.

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

1. In preparation for this report a limited site and ground level Visual Tree Assessment (VTA) was conducted on Friday 30th 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 very basic risk values determined by criteria explained within the ISA TRAQ manual 2017. The inspection included assessment of the overall health and vigour of the trees, tree form, structure and structural condition commencing from near the lower trunk to the upper first order branch division as best as site conditions would allow. On completion of the VTA the retention value of the tree was summarised utilizing the tree assessment Checklist shown within Appendix- B.
2. 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).
3. This report acknowledges the current Australian Standards 'Protection of Trees on Development Sites' AS4970 – 2009. As explained within Note 1 of Appendix- A. To retain specific trees and ensure their viability development must take into consideration protection of the Tree Protection Zone (TPZ) radius as shown within the *acceptable incursion diagram*. As a guide to determining impacts the Structural Root Zone (SRZ) & Tree Protection Zone (TPZ) setbacks have been provided within Appendix- C the SRZ & TPZ distance column.

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

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

Murcutt Candalepas job No: 5899 drawings *specific to*:

- Site Plan Dwg No: S75W-1060, issue B dated 14.7.2021
- Basement Level 1 Dwg No: 1002, issue B dated 14.7.2021
- Ground Level Envelope Plan Dwg No: 1003, issue B dated 14.7.2021
- Level 1 Envelope Plans Dwg No: 1004, issue B dated 14.7.2021
- Envelope Sections Sheet 1 & 2 Dwg No: 1101 & 1102, issue B dated 14.7.2021
- Envelope Elevations (N&E) Dwg No: 1201, issue B dated 14.7.2021

Veris Australia Pty Limited

- Survey Plan ref No: 202018, Sheet 1 of 15, issue 4 dated 15.4.2020

1. SUMMARY OF ASSESSMENT

1.1 General tree assessment

1.1.1 Thirteen (13) trees or groups of have been assessed under this development proposal. Of the thirteen trees three (3) trees are heritage listed Norfolk Island Pines located along Wentworth Street and one (1) tree is located within an adjoining residential property.

Council verge trees: are identified as trees 1, 2 & 3. Of these trees T3 contains a large open and decaying basal wound with trees 1 & 2 displaying minor basal wounds on the northern side. Given the trees location within the road reserve the radial root spread is unknown with T2 & 3 being located close to proposed excavation for basement design.

Neighbouring tree: T4, visual assessment of the tree has been restricted by site conditions with the tree been subjected to Stage 1 & 2 excavation works within a notional TPZ radius. Site conditions do not allow for accurate assessment of root impact areas where SRZ root encroachment and potential impact is likely by the proposed basement cut.

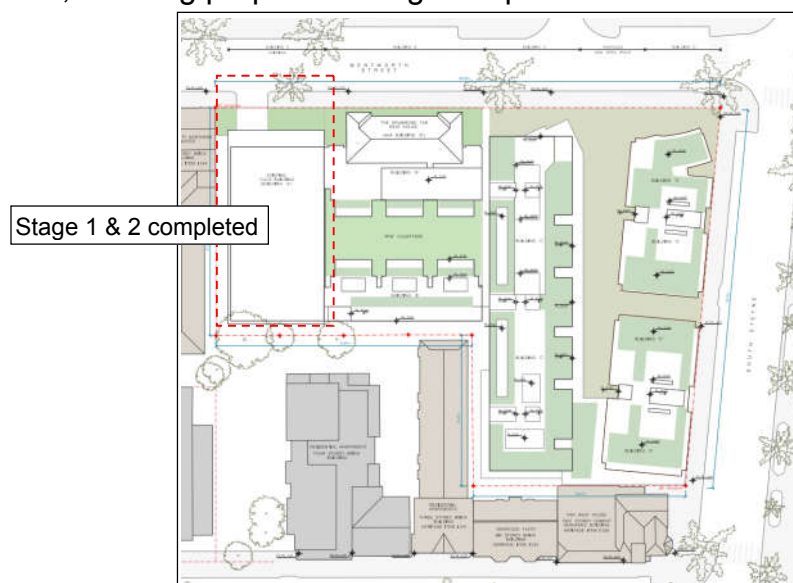
Site trees 5 - 13: are mostly small trees of moderate significance with trees 5 to 7 containing higher landscape amenity values being more visually dominant from Wentworth Street frontage. Remaining trees are somewhat restricted from view with all trees contained within constructed garden bed environments.

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

1.2 The development proposal

1.2.1 The development proposal consists of additions and alterations to Drummond House with deep soil excavation for basement levels to facilitate construction. The works which include upper level multi use facilities are located within notional tree protection zone setbacks.

Figure 1, showing proposed design footprint



1.3 Tree removal to accommodate design

1.3.1 Nine (9) trees or groups of require removal to accommodate the Stage 3 & 4 design proposal. The trees are identified as trees 5 to 13 where T7 consists of four (4) Hibiscus trees located along an adjacent building footprint & T8 consists of a group of five (5) small trees within a tight cluster. Within the following sections development impacts are discussed with summary of the assessment provided within the Tree Assessment Schedule of Appendix- C.

1.4 Discussion of development impacts

1.4.1 Design encroachments, disturbances and landscape modifications by design are summarised as follows:

1.4.2 *Trees which fall within the development footprint*

- All nine (9) trees T5, 6, 7, 8, 9, 10, 11, 12 & 13 fall within the proposed building footprint and require removal to accommodate design.

1.4.3 *Council verge trees*

- Tree 1: receives likely negligible impact by design where root zone management within the TPZ potentially occurred by tree protection methodology outlined within the completed Stage 1 & 2 work program.
- Tree 2: the radial root distribution is unknown and may well have been restricted by adjacent roadside infrastructure and boundary fence foundations. These have likely acted as root barriers minimising root zone encroachment and conflicts within the site. Within a notional 11.4m TPZ basement excavation proposes a Moderate (15-20%) impact having at or near 18% occupancy within the TPZ.
- Tree 3: similar to T2 having a restricted root zone basement occupancy is considered as having a Moderate to Low (10-15%) impact having at or near 11% TPZ incursion.

1.4.4 Determining management requirements for trees T2 & 3 is somewhat difficult due to existing site conditions that may have restricted root encroachment within the site. Tree root investigations or ground penetrating radar (GPR) adjacent the boundary may provide more detail on the distribution of critical roots within the site. Given site constraints the following recommendations are provided as a guide in minimising root zone conflicts.

- a) Given basement cut at or near the boundary ideally tree root investigations should be conducted to identify the location, distribution and impact to underlying tree roots within the TPZ. The management of the trees should then be based on the results of the investigation.
- b) In the absence of tree root investigations immediately after demolition or removal of existing surfaces manual trench excavation under the supervision of an appointed site arborist should be conducted along the line of cut to a depth of 0.7m (700mm). Encountered tree root are to be management in accordance with AS4970 Section 4.5.4 *Root protection during works within the TPZ*, ensuring that tree roots are not damaged or ripped beyond the point of excavation by site machinery.

- c) Encountered tree roots should also be managed in accordance with Section 2.3 e) of this report where AS4373-2007 states *the effects of root pruning are not always predictable*.

1.4.5 Neighbouring tree T4

Similar to Council verge tree T1 root zone management within the TPZ likely occurred by protection methodology outlined within previous Stage 1 & 2 works. Based on the existing footprint within the TPZ the proposed new occupancy and basement cut within the 6m TPZ may have a high level of impact due to proposed cut within the SRZ as shown within Basement Plan 1002. As TPZ occupancy or disruption has likely already occurred by the location of Stage 1 development the effects or percentage of new encroachment impact is difficult to determine. As the tree is located within a confined garden bed having restricted ability for root distribution the effects of the basement cut may be greater than estimated where tree root investigations may provide information on the location, distribution and impacts to critical underlying tree roots. The minimising of development impacts is recommended to occur in accordance with Australian Standard AS4970 – 2009 Protection of Trees on Development Sites being specific to the following guidelines:

- a) Where Major (>10%) encroachment or excavation is to occur within the 2.6m Structural Root Zone (SRZ) *being the area required for tree stability*, tree root investigations and root mapping is required to determine impacts to underlying tree roots. The root investigation should occur within 4m of the tree, be located along the line of proposed cut and be conducted utilizing non tree root destructive techniques. Given site constraints manual hand root investigations may not be able to be conducted efficiently to provide appropriate information where ground penetrating radar (GPR) may be required in this location. The management of the tree should be based on the results of the investigation with arborist certification ensuring root pruning will not compromise tree anchorage or tree vitality.
- b) Pending results of the root investigation general management should consist of the following:
- Immediately after demolition and prior to construction manual (hand) trench excavation under the supervision of an appointed site arborist is to be conducted along the line of cut to a depth of 0.7m (700mm). Any encountered tree root(s) that will not compromise tree anchorage are to be managed in accordance with AS4970 Section 4.5.4 *Root protection during works within the TPZ*, ensuring that tree roots are not damaged or ripped beyond the point of excavation by site machinery.
 - Encountered tree roots should also be managed in accordance with Section 2.3 e) of this report where AS4373 2007 states *the effects of root pruning are not always predictable*.
 - There should be no over excavation beyond the line of cut shown within construction drawings to minimise encroachment and impact within the SRZ.

2. CONCLUSIONS & RECOMMENDATIONS

2.1 Tree Removal

2.1.1 Based on the development proposal and with the consent of Council nine (9) trees or groups of require removal to accommodate design. The nine trees are identified as trees:

- 5, 6, 7_{x4}, 8_{x5}, 9, 10, 11, 12 & 13

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:

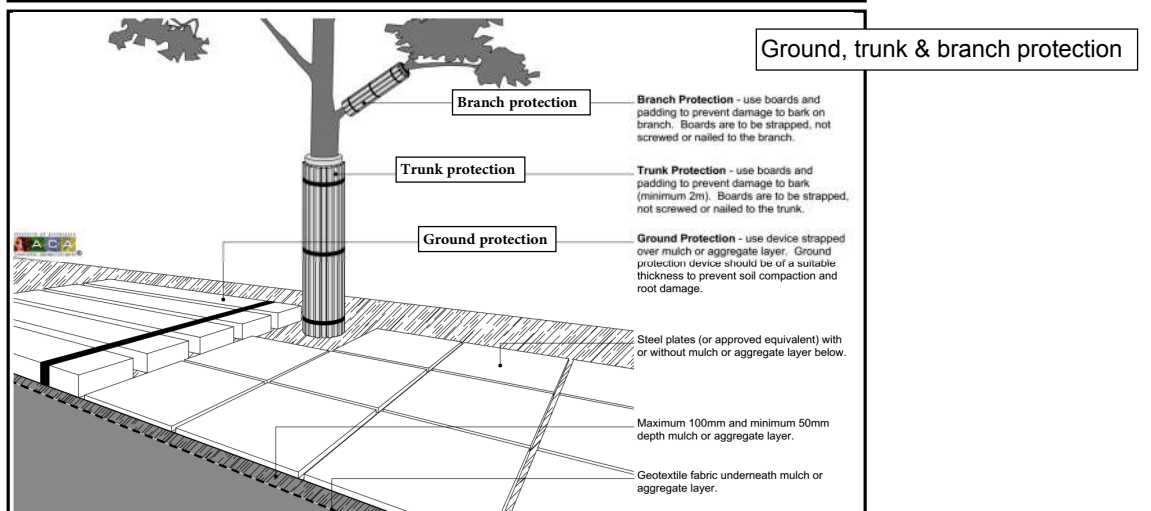
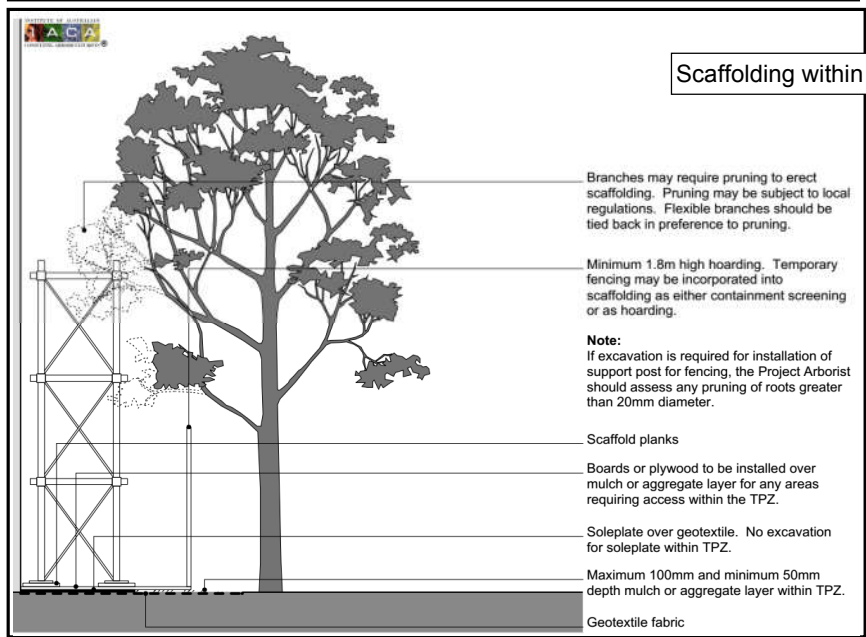
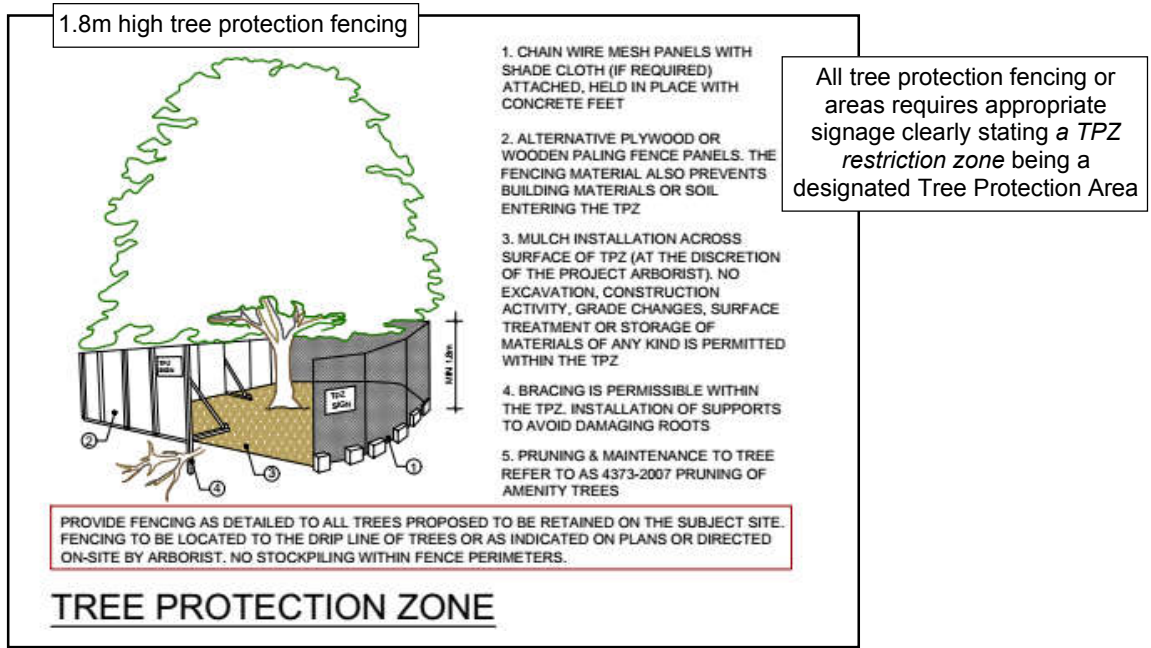
Specific recommendations

- a) *Council verge trees*: Prior to works commencing the three trees T1, 2 & 3 shall be protected with 2.4m high timber beam trunk protection as identified within Figure 2 p9. The timber beam trunk protection is to be wrapped with high visibility mesh material at a minimum 2m height acting as a visual aid where commercial vehicle access is required within 6m of the trees. Identifying the likelihood of root zone conflicts by basement cut adjacent trees 2 & 3 requires tree root investigations to provide more information on the location, distribution and impact to underlying tree roots. In the absence of tree root investigations manual (hand) excavation is to be conducted along the line of cut under the supervision of an appointed site arborist. All encountered tree roots are to be managed in accordance with Section 2.3 e) of this report. At no stage is scaffolding or hording to be placed in a manner that compromises the extending canopy of trees.
- b) *Neighbouring tree T4*: Similar to Council verge trees 2 & 3 the likelihood of root zone conflicts requires tree root investigations to identify the location, distribution and impact to underlying tree roots. Given site constraints this may not be able to be efficiently conducted where ground penetrating radar may be required in this situation. Mitigating impacts by design requires identifying excavation impacts within 4m of the tree, with no over excavation beyond the line of basement cut as detailed within construction drawings recommended. Based on results of the tree root investigation and should no significant root impact be identified, immediately after demolition manual (hand) excavation under the supervision of an appointed site arborist to a depth of 0.7m (700mm) is recommended. All encountered tree roots are to be treated in accordance with Section 2.3 e) of this report.
At no stage should scaffolding conflict with the extending canopy with flexible limbs tied back to avoid damage. Where minor pruning is required pruning is to be conducted in accordance with Australian Standards AS 4373 Pruning of Amenity Trees 2007 and as indicated within Section 2.3 i) of this report.

2.3 General tree protection requirements

- a) Prior to demolition works Tree Protection Fencing (TPF) and/or zones as identified within Figure 2 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 5 certification and be competent in methodology of protecting trees on development sites.
- c) 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*.
- d) Monthly inspections are recommended to be conducted by the appointed arborist ensuring that all tree protection measures are adhered to.
- 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 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. It should be noted that AS4373-2007 states *the effects of root pruning are not always predictable*.
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) To ensure minimal encroachment within the TPZ 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.

Figure 2: Tree protection fencing, ground and trunk protection detail



- g) *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.

Table 1, certification requirements & hold points

1	Pre-construction	Prior to works install tree protection fencing (trunk or ground protection) and/or zones as specified within this report or as directed by the site arborist.
		Trees 2, 3 & 4, where required undertake tree root investigations along the line of proposed basement cut to determine impacts to underlying tree roots.
2	During construction	Project arborist to supervise & certify approved excavation works within tree protection zones.
		The appointed site arborist shall conduct routine (monthly) inspections of trees and tree protection for the purpose of complying with guidelines as indicated within AS 4970 – 2009 ‘Protection of Trees on Development Sites.
3	Post construction	Prior to handover project arborist to provide final inspection & certification of tree health & vitality

- h) 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*).
- 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) *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.

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

l) 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

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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

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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.

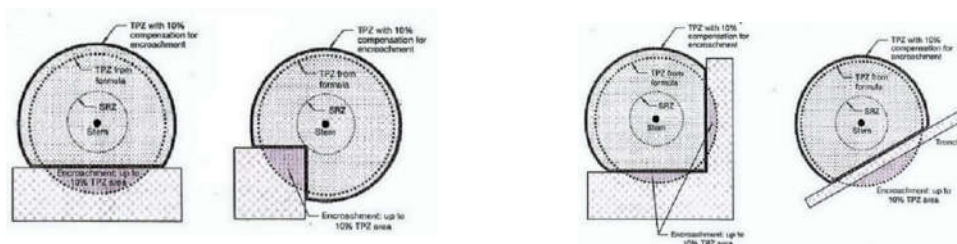
Age classes: (I) Immature refers to a well established but juvenile tree. (ESM) refers to an early semi mature tree not of juvenile appearance. (SM) Semi-mature refers to a tree at growth stages advancing into maturity and full size. (LSM) Late Semi- Mature, refers to a tree between semi-mature and close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

No impact (0%) incursion, Low to negligible impact (<10%) of minor consequence, 10 - <15% incursion of moderate to low impact, 15 - <20% Medium to moderate level of impact and incursion where the project arborist is to demonstrate the tree/s remain viable by tree sensitive construction techniques, 20 - <25% incursion of Medium to high level of impact, 25 – <35% of High level impact to significant >35% incursion where moderate to high level impacts may require design changes or further information to manage tree vitality. **WBF** = 100% within building footprint.

Showing acceptable incursion within the TPZ (AS4970)



SELECTED REFERENCES:

Barrell J. 1993, 'Preplanning Tree Surveys: Safe useful Life expectancy (SULE) is the Natural Progression', *Arboricultural Journal* 17: 1, February 1993, pp. 33-46.

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.html

Standards Australia 2009, *Australian Standards 4970 Protection of Trees on Development Sites* - Standards Australia, Sydney, Australia.

Northern Beaches Council DCP <https://www.northernbeaches.nsw.gov.au/planning-and-development/building-and-renovations/planning-controls>

APPENDIX- B: Tree Retention Value Checklist ©rainTree consulting

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

Values may be subjective however, offer a visual understanding of the relative importance of the tree to the environment. The Landscape Significance of a tree is described in seven categories to assist in determining the retention value of trees.

1	Significant	2	Very High	3	High	4	Moderate	5	Low	6	Very Low	7	Insignificant
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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 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 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	Vigour	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	22 x 8	1000	3.4m 12	M	Fair / Good	Fair / Good	2	2C	2	2	Open wound at base N side, restricted in road reserve, root zone radius unknown
<i>Design & impact summary</i>		<i>Retain; root zone radius restricted by site conditions, root spread unknown, likely negligible impact given Stage 1 & 2 works being completed adjacent tree. Requires timber beam trunk protection installed prior to works, no excavation within TPZ without prior arborist advice</i>										
2 CV	<i>Araucaria heterophylla</i> Norfolk Island Pine	20 x 9	950	3.3 11.4	M	Fair / Good	Fair / Good	2	4/2C	2	2	Appears slightly environmentally stressed, slight decline in canopy, with minor wounds at ground level N side, restricted in road reserve, root zone radius unknown
<i>Design & impact summary</i>		<i>Retain; root zone radius restricted by site conditions, root spread unknown, notionally basement cut proposes a Moderate (15-<20%) at or near 18% occupancy within the TPZ of likely medium impact, may require tree root investigations of specific root management during works</i>										
3 CV	<i>Araucaria heterophylla</i> Norfolk Island Pine	24 x 10	1000	3.4 12	M	Fair / Good	Fair	2	4/3	2	2	Large open wound at base N side, decaying wound wood face, tree slightly environmentally stressed
<i>Design & impact summary</i>		<i>Retain; root zone radius restricted by site conditions, root spread unknown, notionally basement cut proposes a Moderate to Low (10-15%) at or near 11% occupancy within the TPZ having a manageable and low level impact</i>										
4 NT	<i>Araucaria columnaris</i> Cooks Pine	26 x 6	500	2.6 6	SM	Fair	Fair / Good	3	7/4	2	2	Restricted VTA. Twin apical stems with potential average junction, slightly environmentally stressed potentially from previous works, located in garden bed with restricted root development, canopy in near contact with adjacent build.
<i>Design & impact summary</i>		<i>Retain; root zone radius restricted by site conditions, tree contained in garden bed, root radius or previous Stage 1 & 2 disturbance unknown where tree became stressed before reinstatement of vigour due to works. Percentage of encroachment or impact is difficult to determine due to previous works within the TPZ. Stage 3 & 4 basement cut identifies a potential high level of impact with excavation cut within the SRZ. Tree root investigation may provide further information of impact to underlying tree roots providing specific root management recommendations. No over excavation beyond the line of the proposed basement footprint is recommend where the effect of the encroachment & works is unknown.</i>										
5	<i>Coprosma repens</i> Mirror Bush	4 x 4	150, 100	1.8 3	M	Fair / Good	Fair	4	2C	2	3/5	Minor wounds & pruning cut stub end decline evident, aging specimen
<i>Design & impact summary</i>		<i>Remove; within building footprint</i>										
6	<i>Coprosma repens</i> Mirror Bush	4 x 5	150	1.6 2	M	Good	Fair / Good	4	2C	2	3/5	Minor pruning cut stub end decline evident, aging specimen
<i>Design & impact summary</i>		<i>Remove; within building footprint</i>										

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7 x4	<i>Hibiscus sp</i> Hibiscus	av 6 x 7	av 100	1.5 2	SM	Good	Good	4/3	2E	2	3/5	Located in garden bed against building wall within no significant visual faults
Design & impact summary		Remove; within building footprint										
8 x5	<i>Coprosma repens</i> Mirror Bush	av 4 x 3	av 150	1.6 2	M	Good	Good	4	6	2	3/5	Five (5) mixed species with Marraya shrubs, in confined garden bed, appear slightly environmentally stressed, some with pruning cut stub end decline, most with no significant visual faults
Design & impact summary		Remove; within building footprint										
9	<i>Callistemon viminalis</i> Bottle Brush	6 x 5	150, 100	1.8 3	ESM	Good	Fair / Good	4	2B	2	2	Narrow suppressed canopy form, located in garden bed with minor stem inclusion development at base
Design & impact summary		Remove; within building footprint										
10	<i>Callistemon viminalis</i> Bottle Brush	6 x 5	250	2 3	ESM	Good	Good	4	6	1	2	Located in garden bed with no significant visual faults
Design & impact summary		Remove; within building footprint										
11	<i>Callistemon viminalis</i> Bottle Brush	6 x 4	200	1.8 2.4	ESM	Good	Good	4	6	1	2	Located in garden bed with no significant visual faults
Design & impact summary		Remove; within building footprint										
12	<i>Coprosma repens</i> Mirror Bush	4 x 2.5	100	1.5 2	M	Good	Fair	4	2C	2	2/5	Minor pruning cut stub end decline evident with no significant visual faults
Design & impact summary		Remove; within building footprint										
13	<i>Callistemon viminalis</i> Bottle Brush	5 x 3	150	1.6 2	ESM	Good	Good	4	6	1	2/5	Located in garden bed with suppressed canopy form
Design & impact summary		Remove; within building footprint										

