rain Tree consulting

Arboricultural Management
PO Box 326 AVALON NSW 2107
Mobile 0419 250 248

23 October 2024

140 - 142 OCEAN STREET
NARRABEEN, NSW

DEVELOPMENT PROPOSAL

ARBORICULTURAL IMPACT ASSESSMENT (AIA) REPORT

Ref No- 10824

Prepared for
Trio Industries Pty Limited
C/- PopovBass Architects
PO Box 334 SURRY HILLS, NSW
T: 9955 5604

Prepared by
Mark A. Kokot
AQF Level 5 Consulting arborist

CONTENTS **page**

INTRODUCTION

This report has been commissioned by TRIO Industries Pty Limited C/- PopovBass Architects. The purpose and scope of works is 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 proposed development consists of constructing a new multi-level residential apartment facility within Lot 12 of SEC 47 in DP 111254 & Lot 13 in DP 606591 known as 140 & 142 Ocean Street NARRABEEN NSW.

Recommendations for retention or removal of trees is based on the tree's protection status, being prescribed or non-prescribed trees, tree structural condition, estimated remaining Useful Life Expectancy (U.L.E.) and potential impacts to trees by the design proposal.

Development incursions within tree protection zones (TPZ) are based on percentages of incursion noted within Note 2 of Appendix- A and are described as Negligible (0%), Minor (<10%) & Major (>10%) TPZ occupancy having *Low*, *Moderate* to *High* level impacts within the Tree Protection Zone (TPZ).

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

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

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

1. In preparation for this report an initial site and ground level visual tree inspection was conducted on Friday 23rd April 2021 by the author of this report. An additional inspection from within 140 Ocean Street was conducted on Thursday 17th October 2024.

   The principles of visual tree inspection 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 (tree risk) manual 2017. The inspection included observing the overall health and vigour of trees, tree form, structure and structural condition as best as site conditions would allow. On completion of the inspection the retention value of the tree was summarised utilizing the tree inspection Checklist provided within Appendix- C.

2. The inspection was limited to visual observations where no aerial (climbing) inspections, woody tissue testing, or tree root investigation was undertaken. 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). Where multi stems at or near the base exist the stem group diameter was estimated as a tight clump. The height of palms was taken from ground level to the top of the crown shaft only and excludes the central apical spear projection with palm Tree Protection Zones (TPZ) determined as 1m outside the canopy projection area.

3. This report acknowledges and utilizes the current Australian Standards 'Protection of Trees on Development Sites' AS4970 – 2009 as explained within Notes of Appendix- A.

4. Unless specified otherwise all distances and development offsets within this report are taken from the centre of the tree as indicated within provided survey and/or design documentation.

5. Plans and/or documentation reviewed to assist in preparation of this assessment include:

   PopovBass Architects Job No: 0649, *specific to*:
   - Site Plan Dwg No: DA103, rev A dated 24.9.2024
   - Basement Plan Dwg No: DA104, rev A dated 24.9.2024
   - Basement Plan Large Dwg No: DA119, rev A dated 24.9.2024
   - Ground Floor Plan Dwg No: DA105, rev A dated 24.9.2024
   - Level 1 Plan Dwg No: DA106, rev A dated 24.9.2024
   - Elevations Dwg No: DA109 & 110 rev A dated 24.9.2024
   - Sections AA & BB Dwg No: DA111 & 112 rev A dated 24.9.2024
   - Demolition Plan Dwg No: DA115 rev A dated 24.9.2024

   C & A Surveyors NSW P/L
   - Survey Plan ref No. 16303-21 Rev V3 dated 27.8.24

1. SUMMARY OF ASSESSMENT

1.1 General tree assessment

1.1.1 Twenty-four (24) trees or groups of (hedges or screen tree plantings) have been assessed for the purpose of this development proposal. Of the twenty-four trees two (2) trees are located within the front Council verge and seven (7) trees are neighbouring trees situated within adjoining properties. Within the proposed development area and site boundaries the remaining fifteen (15) trees are exempt non-prescribed trees by way of species type or are exempt being less than 5m in height as noted within Northern Beaches Council tree management guidelines.

1.1.2 *Council verge trees* are identified as:

- T1 & 2.

The trees receive *negligible* or low-level TPZ occupancy or new encroachment by the design proposal.

1.1.3 *Neighbouring trees* are identified as:

- T3, 4, 5*x3*, 6, 7*x6*, 8 & 9*x15*.

Of these trees T3, 5 & 6 receive *high-level* or *Major* (>10%) TPZ occupancy with Structural Root Zone (SRZ) encroachment.

Given SRZ encroachment tree root investigations or root mapping is recommended to determine the impact by the proposed excavation cut in support of the proposed driveway ramp.

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

- T10 *to* 24 inclusive.

Being exempt non-prescribed specimens, the above trees or palms are permitted to be managed (pruned, removed or relocated) without Council consent. Should an exempt species require retention further arborist advice and protection methodology as indicated within Section 2.3 *General tree protection requirements* is required prior to works occurring within Tree Protection Zone (TPZ) radiuses.

1.1.5 Based on the inspection conducted, apart from low retention value trees, the trees inspected 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 Appendix- D.

1.2 The development proposal

1.2.1 The development proposal consists of constructing a new multi-level residential apartment block known as Trio Narrabeen Apartments.

The proposal consists of deep excavation for lower-level basement carparking, services and facilities with the design footprint located within Structural Root Zone (SRZ) and Tree Protection Zone (TPZ) radiuses of prescribed (protected) and non-prescribed trees.

1.3 Tree removal to accommodate design

1.3.1 To accommodate the design proposal all fifteen (15) non-prescribed trees or groups of within the site require or are recommended for removal to make space for new plantings.

The subject trees are identified as trees:

- T10, 11*x5*, 12*x4*, 13*x5*, 14, 15*x4*, 16, 17, 18, 19, 20, 21, 22*x3*, 23*x6* & 24

1.3.2 The identified impacts by the development proposal have been detailed and require to be reviewed as part of this report within Appendix- D, with the following sections providing discussions of impact assessment by the design proposal on neighbouring trees.

1.4 Details which require further information

Driveway ramp & basement excavation cut

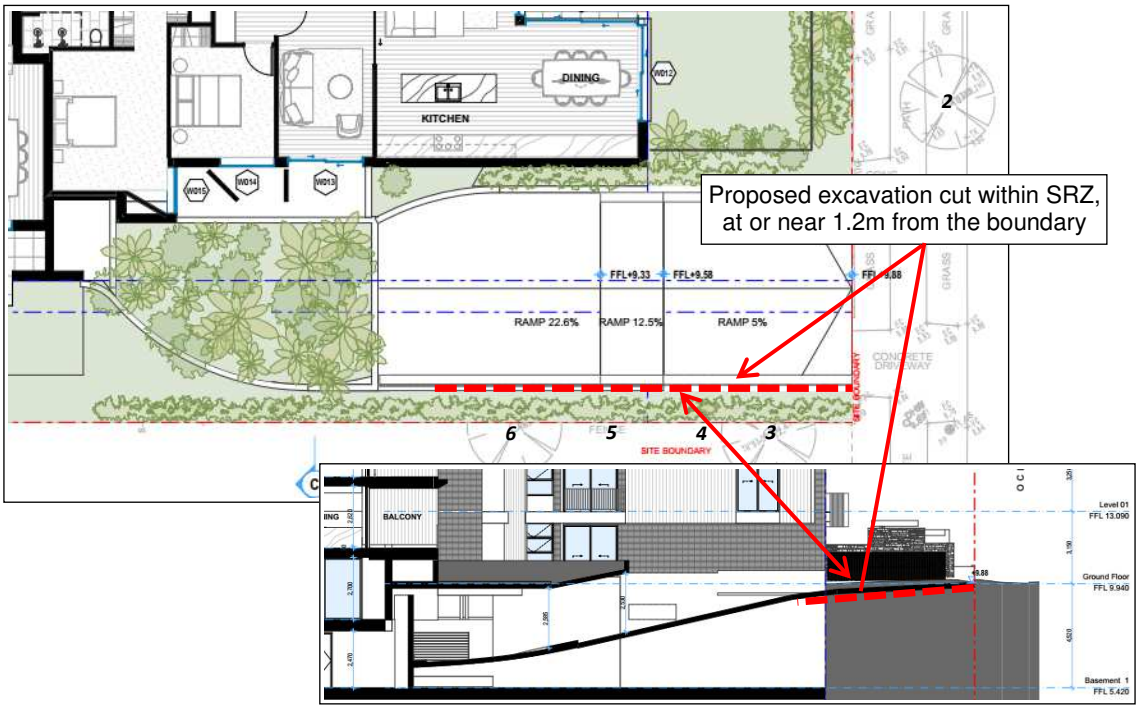
1.4.1 The proposed driveway footprint including excavation cut to accommodate ramp access is located within the Structural Root Zone (SRZ), being *the area required for tree stability* of neighbouring trees: T3, 4, 5 & 6.

Of the above trees young and developing tree T4 is unlikely to be detrimentally affected by the proposed driveway setback.

High-level impacts may occur to trees 3, 5 & 6, indicating tree root investigations or root mapping along the line of cut is required to identify the location, distribution and impact on critical roots within the SRZ.

Tree management should then be based on the results of the investigation and be incorporated within a final Tree Protection & Management Plan for all neighbouring trees or tree groups adjacent the site.

Figure 1: showing driveway footprint impact area.



1.5 Discussion of development impacts – *neighbouring trees*

Trees receiving Negligible, Minor or manageable (<15%) encroachment impacts.

1.5.1 The following five (5) trees or groups of receive *Low-level* or manageable encroachment impacts by the design footprint indicating the trees are capable of being managed in accordance with Section 2.3 *General tree protection requirements*.

- T1, 2, 7, 8 & 9.

Specific tree management recommendations are recommended to consist of the following:

a) Trees 1 & 2: require timber beam trunk protection prior to demolition activities commencing.

b) Trees 7, 8 & 9: 1.8m high tree protection fencing is recommended to be installed at the edge of the extending canopy dripline at or near a 2.5m boundary setback.

No excavation or deep soil level (RL) change should occur within TPZ setbacks with any excavation beyond the canopy dripline of T8 supervised & certified by an appointed site arborist. Paving within the TPZ should be of a tree sensitive design being of a porous material to protect underlying tree roots.

Trees receiving manageable Moderate-low (10-15%) encroachment impacts.

1.5.2 One (1) neighbouring tree T4 receives a *moderate* and manageable 13.4% occupancy within the SRZ & TPZ.

Being a young tree the TPZ and slight SRZ excavation encroachment should be managed by an appointed site arborist managing and clean cutting any encountered tree roots in accordance with AS4970 – 2009 Section 4.5.4 *Root protection during works within the TPZ*.

Trees receiving Moderate (15-20%) or High-level (25-35%) encroachment impacts

1.5.3 Three (3) neighbouring trees T3, 5 & 6 receive *moderate* or *high-level* driveway excavation encroachment impact within the TPZ and SRZ being *the area required for tree stability*.

Given works within the critical root area further information is required to determine impacts on extending structural roots. Additional information should consist of:

a) Undertake a tree root investigation along the line of driveway cut to identify the location, distribution and impact on any critical underlying tree root.

The investigation should be conducted by experienced personnel with the line of proposed driveway cut clearly pegged or marked on site for arborist review.

b) The management of the trees should then be based on the results of the investigation with a detailed Tree Protection & Management Plan provided for all neighbouring trees.

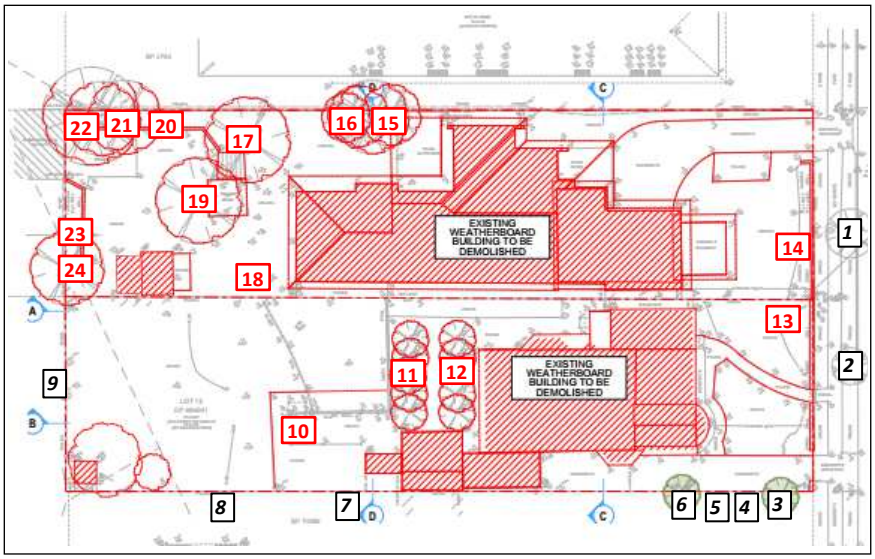
2. CONCLUSIONS & RECOMMENDATIONS

2.1 Tree Removal

2.1.1 With Council review & consent the following exempt fifteen (15) non-prescribed trees or groups of require or are recommended for removal to accommodate the design proposal:

- T10, 11*x5*, 12*x4*, 13*x5*, 14, 15*x4*, 16, 17, 18, 19, 20, 21, 22*x3*, 23*x6* & 24

Figure 2: showing proposed tree removal plan.



2.2 Specific tree management recommendations

2.2.1 In addition to the recommendations provided within this report the following summary or additional recommendations are provided as a guide for tree management due to the design proposal:

a) Trees 3, 5 & 6 requires further investigations by tree root investigations to determine the impact on critical structural roots by proposed driveway excavation adjacent the boundary.

The management of the trees should then be based on the results of the investigation.

b) Council verge trees T1 & 2 require timber beam trunk protection prior to demolition works commencing.

c) Neighbouring trees 7, 8 & 9 require tree protection fencing installed at the extremity of the extending canopy dripline or setback as indicated within Appendix- D.

No work access or excavation is to occur within Structural Root Zone (SRZ) radiuses, being *the area required for tree stability* (AS4970).

Should access or excavation be required within the SRZ prior project arborist advice & certification is required.

2.3 General tree protection requirements

a) Prior to site works, including demolition, Tree Protection Fencing (TPF) and/or zones as identified within this report or Appendix- B 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 as indicated within the SRZ & TPZ distance column Appendix- D. Where design & construction access may be restrictive by tree protection fencing timber beam trunk protection is recommended to be installed with ground protection mats provided to protect underlying tree roots within tree protection zones or designated tree protection areas (TPA).

b) Unless approved otherwise activities to be excluded within TPZ radius or specified tree protection areas (TPA's) include:

- Machine access & excavation.
- Minor works including trenching & installation of utility services.
- Storage & work preparation including wash down areas.
- Soil level change and physical damage to trees.

Activities that minimize the impact of TPZ disturbances include:

- Within the TPZ radius, TPA or extending 2m outside the canopy dripline installation of native leaf mulch not greater than 80mm in depth with routine irrigation based on arborist advice is recommended.

c) In accordance with AS4970 - 2009 (1.4.4) during works 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.

d) 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*).

e) 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.*

f) Approved excavation within TPZ setbacks; there shall be no over excavation beyond the line of cut as shown within construction drawings without arborist advice. Should over excavation be required the extent of excavation should be detailed within approved drawings or a construction management plan for arborist review and endorsement.

g) Unless specified otherwise during approved excavation within TPZ setbacks excavation is to be conducted manually (by hand) under the supervision of an appointed site 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.

h) *Additional inground services* which may include landscape works, fencing, sewer, stormwater, water and electrical services, final design and impact to trees shall be reviewed and endorsed by the project arborist prior to installation. Where landscaping (excavation) is required within the SRZ further advice from an appointed project arborist is recommended.

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

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

j) *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).

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

1) Prior to works arboricultural certification is to be provided ensuring that all trees have been adequately protected in accordance with this report, or as indicated within Australian Standard AS 4970 Protection of Trees on Development Sites– 2009.
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 tree protection zones without prior project arborist notification and/or site supervision.
4) No access, work activity or storage is permitted within fenced or designated tree protection areas (TPA's) or Tree Protection Zone (TPZ) radiuses without arborist advice and certification.

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.

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

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

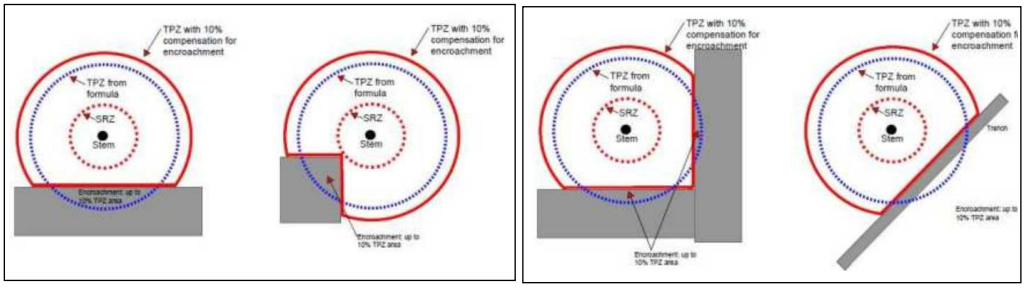
APPENDICES

APPENDIX- A: Terminology, 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. **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**:

Low impact 0 - 10% of minor consequence. *Low to Moderate* 10 – 15% incursion where the project arborist is to demonstrate the tree(s) remain viable. *Moderate* 15 – 20% incursion where the project arborist is to demonstrate the tree(s) remain viable by tree sensitive construction techniques. *Moderate to high* 20 – 25% incursion requiring specific protection methodology to retain. *High impact* 25 – 35% incursion where design changes or further information is required to manage tree vitality which includes *Significant* >35% incursion.
WBF = located within design or building footprint where design necessitates tree removal.

NOTE-3: Showing acceptable 10% incursion within TPZ radiuses (AS4970)

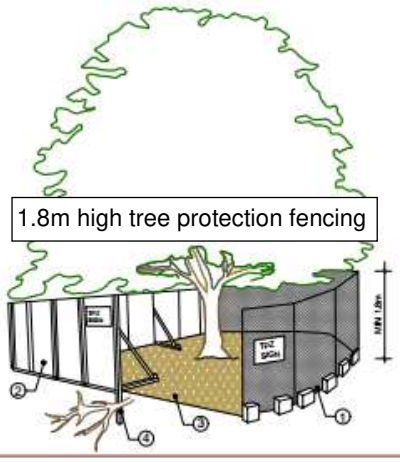


SELECTED REFERENCES:

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 protection fencing, ground and trunk protection detail

A



1. CHAIN WIRE MESH PANELS WITH SHADE CLOTH (IF REQUIRED) ATTACHED, HELD IN PLACE WITH CONCRETE FEET

2. ALTERNATIVE PLYWOOD OR WOODEN PALING FENCE PANELS. THE FENCING MATERIAL ALSO PREVENTS BUILDING MATERIALS OR SOIL ENTERING THE TPZ

3. MULCH INSTALLATION ACROSS SURFACE OF TPZ (AT THE DISCRETION OF THE PROJECT ARBORIST). NO EXCAVATION, CONSTRUCTION ACTIVITY, GRADE CHANGES, SURFACE TREATMENT OR STORAGE OF MATERIALS OF ANY KIND IS PERMITTED WITHIN THE TPZ

4. BRACING IS PERMISSIBLE WITHIN THE TPZ. INSTALLATION OF SUPPORTS TO AVOID DAMAGING ROOTS

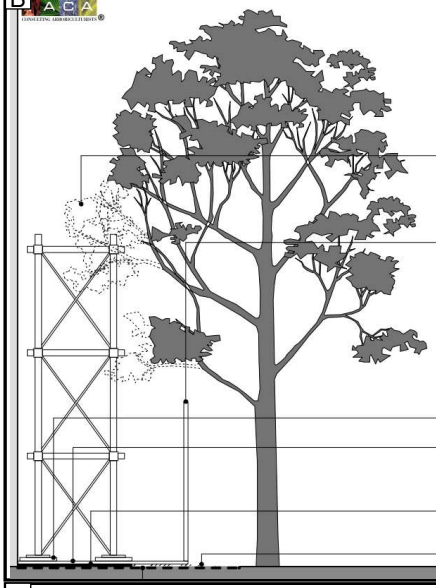
5. PRUNING & MAINTENANCE TO TREE REFER TO AS 4373-2007 PRUNING OF AMENITY TREES

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

PROVIDE FENCING AS DETAILED TO ALL TREES PROPOSED TO BE RETAINED ON THE SUBJECT SITE. FENCING TO BE LOCATED TO THE DRIP LINE OF TREES OR AS INDICATED ON PLANS OR DIRECTED ON-SITE BY ARBORIST. NO STOCKPILING WITHIN FENCE PERIMETERS.

TREE PROTECTION ZONE

B



Scaffolding within the Tree Protection Zone

Branches may require pruning to erect scaffolding. Pruning may be subject to local regulations. Flexible branches should be tied back in preference to pruning.

Minimum 1.8m high hoarding. Temporary fencing may be incorporated into scaffolding as either containment screening or as hoarding.

Note:
If excavation is required for installation of support post for fencing, the Project Arborist should assess any pruning of roots greater than 20mm diameter.

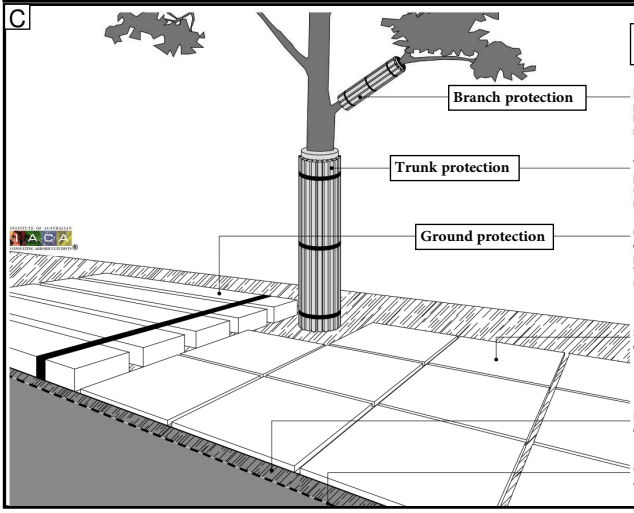
Scaffold planks

Boards or plywood to be installed over mulch or aggregate layer for any areas requiring access within the TPZ.

Soleplate over geotextile. No excavation for soleplate within TPZ.

Maximum 100mm and minimum 50mm depth mulch or aggregate layer within TPZ.

C



Ground, trunk & branch protection

Branch protection

Branch Protection - use boards and padding to prevent damage to bark on branch. Boards are to be strapped, not screwed or nailed to the branch.

Trunk protection

Trunk Protection - use boards and padding to prevent damage to bark (minimum 2m). Boards are to be strapped, not screwed or nailed to the trunk.

Ground protection

Ground Protection - use device strapped over mulch or aggregate layer. Ground protection device should be of a suitable thickness to prevent soil compaction and root damage.

Steel plates (or approved equivalent) with or without mulch or aggregate layer below.

Maximum 100mm and minimum 50mm depth mulch or aggregate layer.

Geotextile fabric underneath mulch or aggregate layer.

APPENDIX- C: Tree Retention Value *Check list* ©rainTree consulting

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	Tree 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 compromise tree anchorage. Tree(s) may be contained by sloid structures with restricted anchoring root(s)
0A	Noxious or invasive weed species located within heritage conservation areas		
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, or 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 have become exposed or are subject to wind loading, or have tall forest form where exposure may result in windthrow or limb snap
		5A	Screen trees, trees or shrubs, that are routinely hedged, pruned or managed for height control
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 canopy, 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 containing faults that are likely to become problematic in the future, [4] trees to be considered for removal due to poor or 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- D: Tree Assessment Schedule

Refer Appendix- C Tree retention value Checklist

	Consider tree removal due to dead or high-risk condition - subject to Local Government Authority notification		Trees with low retention values: senescence, are significantly environmentally stressed, have developing defects or being *exempt non-prescribed trees within the LGA

Tree No	*Botanical Name* COMMON NAME	Height x spread (m)	DBH (mm)	SRZ / TPZ (m)	Age	Vigour (health)	Condition (structure)	LS	VTA	RV	ULE	Comments CV = Council verge tree NT = Neighbouring tree
1 *CV*	*Lagunaria patersonii* Norfolk Island Hibiscus	5 x 3	350	2.1 4.2	SM	Good	Fair	4-3	2C	2	2	Minor pruning cuts throughout modifying tree form
Design impact summary: Retain & protect with Negligible (0%) TPZ encroachment indicating tree is capable of being managed in accordance with Section 2.3 General tree protection requirements, specific to: no access or excavation within the SRZ & installed tree protection fencing												
2 *CV*	*Lagunaria patersonii* Norfolk Island Hibiscus	5 x 3	250at base	1.8 3	SM	Good	Fair / Good	4-3	2C	2	2	Lower trunk wounds with minor pruning cuts throughout modifying tree form
Design impact summary: Retain & protect, proposed new driveway ramp at or near 4.2m from tree, outside of the TPZ with no new crossover shown. Potential crossover at or near 3m likely to be at the extremity of the TPZ indicating Minor (<10%) TPZ occupancy. Given minor TPZ encroachment tree is capable of being managed in accordance with Section 2.3 General tree protection requirements, specific to: no excavation within the SRZ & installed tree protection fencing												
3 *NT*	*Banksia integrifolia* Costal Banksia	8 x 5.5	250	2 3	ESM	Good	Good	3	6	1	1	Tree with no significant visual faults, canopy 2m> at 1.8m^ in site
Design impact summary: Retain & protect. Proposed driveway cut for ramp located within the SRZ, at or near 1.2m from tree have a High (25-35%) TPZ incursion at or near 24.5%. Being within the SRZ impacts are likely to be high-level indicating impact requires further investigations by tree root mapping or root investigations to determine impact on critical structural roots.												
4 *NT*	*Syzygium paniculatum* Magenta Lilli Pilli	3 x 2	150	1.6 2	ESM	Good	Good	3	7-2C	2	1	Past pruning cuts N side, canopy 1.5m> at 1.6m^ in site
Design impact summary: Retain & protect. Proposed driveway cut having a manageable Moderate to Low (10-15%) TPZ incursion at or near 13.4% being just within the SRZ. Given manageable encroachment tree is capable of being managed in accordance with Section 2.3 General tree protection requirements, specific to: direct on-site arborist supervision & certification during excavations for root management & pruning at the at or near 1.3m driveway cut setback.												
5*x3* *NT*	*Banksia integrifolia* Costal Banksia	9 x 4	200	1.8 2.4	ESM	Good	Good	3	7-2C	2	1	Three screen trees, above visual parts appear in good order, leaning form N, 70-80% canopy overhang, canopy at 3.5m> at 1.4m^ in site
Design impact summary: Retain & protect. Proposed driveway cut within the SRZ & TPZ having a Moderate (15-20%) TPZ incursion at or near 18.7% encroachment. Given height of tree and tree lean SRZ impacts may potentially be high-level indicating impact requires further investigations by tree root mapping or root investigations to determine impact on critical structural roots.												

Refer Appendix- C Tree retention value Checklist

	Consider tree removal due to dead or high-risk condition - subject to Local Government Authority notification		Trees with low retention values: senescence, are significantly environmentally stressed, have developing defects or being *exempt non-prescribed trees within the LGA

Tree No	*Botanical Name* COMMON NAME	Height x spread (m)	DBH (mm)	SRZ / TPZ (m)	Age	Vigour (health)	Condition (structure)	LS	VTA	RV	ULE	Comments CV = Council verge tree NT = Neighbouring tree
6 *NT*	*Pittosporum undulatum* Native Daphne	6 x 4	200	1.8 2.4	ESM	Fair / Good	Fair / Good	4-3	7-4	2	<2	Canopy slightly environmentally stressed S side, past pruning cuts + sub end decline at 2m
Design impact summary: Retain & protect. Proposed driveway cut within the SRZ & TPZ having a Moderate (15-20%) TPZ incursion at or near 18.7% encroachment. Given average vitality to may not tolerate design encroachment impact. Tree root mapping or root investigations could be conducted to determine impact on critical structural roots or deep soil loss.												
7*x6* *NT*	*Elaeocarpus reticulatus* Blueberry Ash	4.5 x 3.5	150	1.6 2	ESM	Good	Fair / Good	4-3	4-2D	2	2	Screen trees, slightly environmentally stressed, topped for height control, canopy 2.5m. at 2m^
Design impact summary: Retain & protect receiving Negligible (0%) SRZ & TPZ encroachment by basement cut & GF Plan indicating tree stand is capable of being managed in accordance with Section 2.3 General tree protection requirements, specific to: no access or excavation within the SRZ with installed tree protection fencing at the 2m TPZ.												
8 *NT*	*Acmena smithii* Lilly Pilly	4 x 5	600at base	2.7 7.2	SM	Good	Fair	3	5A	2	2	multi stems at 0.6m, Restricted visual inspection above visual parts appear in good order, hedged for height control, canopy 2.5m> at 1.2m^
Design impact summary: Retain & protect, appears located within raised soil garden bed where neighbouring impacts are unknown. Proposed basement cut estimated at Minor (<10%) TPZ occupancy (8.6%) with slight additional GF Plan occupancy & pavers within the TPZ. Given Minor (<10%) & manageable TPZ encroachment tree is capable of being managed in accordance with Section 2.3 General tree protection requirements, specific to: no access or excavation within the SRZ, no cut / site leveling within 3m with retention of existing RL within the 3m setback and installed tree protection fencing at the 2.5m edge of the extending canopy dripline within the site.												
9*x6* *NT*	*Marraya paniculata* Marraya	4 x 2.5	200at base	1.6 2.4	SM	Good	Fair / Good	4-3	7-5A	2	2	Screen planting, hedged for height control, canopy 2m> at 1.7m^
Design impact summary: Retain & protect. Proposed basement cut & building footprint located outside the TPZ having Negligible (0%) encroachment indicating tree is capable of being managed in accordance with Section 2.3 General tree protection requirements, specific to: no access or excavation within the SRZ with installed tree protection fencing at the 2m boundary setback / at edge of extending canopy dripline within the site.												
*10	*Plumeria sp* Frangipani	2.5 x 2.5	100, 100	1.6 2.4	SM	Good*	Good	4	0-2C	2	2-5	Exempt tree species height class <5m, part deciduous* at time of inspection
Design impact summary: Proposed removal of exempt tree species to accommodate design												
*11*x5*	*Syagrus romanzoffiana* Cocos Palm	8 x 5	300	- 3.5	SM	Good	Good	4	0-2C	2	2	Exempt palm species, minor lower trunk wounds evident
Design impact summary: Proposed removal of exempt tree species to accommodate design												

Refer Appendix- C Tree retention value Checklist

	Consider tree removal due to dead or high-risk condition - subject to Local Government Authority notification		Trees with low retention values: senescence, are significantly environmentally stressed, have developing defects or being *exempt non-prescribed trees within the LGA

Tree No	*Botanical Name* COMMON NAME	Height x spread (m)	DBH (mm)	SRZ / TPZ (m)	Age	Vigour (health)	Condition (structure)	LS	VTA	RV	ULE	Comments CV = Council verge tree NT = Neighbouring tree
*12*x4*	*Syagrus romanzoffiana* Cocos Palm	8 x 5	250	- / 3.5	SM	Fair / Good	Good	4	0-4	2	2	Exempt palm species, foliage slightly environmentally stressed
Design impact summary: Proposed removal of exempt tree species to accommodate design												
*13*x5*	*Plumeria sp* Frangipani	2.5 x 2	200at base	1.6 / 2.4	SM	Good*	Fair / Good	4	0-2C	2	2-5	Exempt tree species height class <5m, part deciduous* at time of inspection
Design impact summary: Proposed removal of exempt tree species to accommodate design												
*14	*Strelitzia reginae* Giant Bird of Paradise	av 2.5 x 2	av 150	- / 2	ESM	Good	Good	5	0	1	1	Non-prescribed (exempt) palm like species
Design impact summary: Proposed removal of exempt tree species to accommodate design												
*15*x4*	*Syagrus romanzoffiana* Cocos Palm	av 8 x 4	av 250	- / 3	ESM	Good	Good	4	0	1	1	Non-prescribed (exempt) palm species
Design impact summary: Proposed removal of exempt tree species to accommodate design												
*16	*Strelitzia reginae* Giant Bird of Paradise	av 4 x 3	av 150	- / 2.5	ESM	Good	Good	4	0	1	1	Non-prescribed (exempt) palm like species
Design impact summary: Proposed removal of exempt tree species to accommodate design												
*17	*Strelitzia reginae* Giant Bird of Paradise	av 6 x 4	av 150	- / 3	ESM	Good	Good	4	0	1	1	Non-prescribed (exempt) palm like species
Design impact summary: Proposed removal of exempt tree species to accommodate design												
*18	*Nerium oleander* Oleander	2.5 x 6	400at base	2.3 / 4.8	SM	Good	Fair / Good	4	0-2B	2	2	Non-prescribed (exempt) tree, multi stemmed at base
Design impact summary: Proposed removal of exempt tree species to accommodate design												
*19	*Schinus areira* Peppercorn	4 x 5	400, 250	2.7 / 7.8	M	Fair	Fair / Poor	4	0-4	3	3	Exempt tree species height class, lower trunk pruning cuts with decay sections, significant decline in canopy
Design impact summary: Proposed removal of exempt tree species to accommodate design												
*20	*Persea americana* Avocado	6 x 4	100, 100	1.6 / 2.4	ESM	Good	Fair	4	0-2A	3	3	Non-prescribed (exempt) tree, twin stems at ground level with minor stem junction damage
Design impact summary: Proposed removal of exempt tree species to accommodate design												

Refer Appendix- C Tree retention value Checklist

	Consider tree removal due to dead or high-risk condition - subject to Local Government Authority notification		Trees with low retention values: senescence, are significantly environmentally stressed, have developing defects or being *exempt non-prescribed trees within the LGA

Tree No	*Botanical Name* COMMON NAME	Height x spread (m)	DBH (mm)	SRZ / TPZ (m)	Age	Vigour (health)	Condition (structure)	LS	VTA	RV	ULE	Comments CV = Council verge tree NT = Neighbouring tree
*21	*Plumeria sp* Frangipani	3 x 3	200at base	1.6 / 2.4	ESM	Good	Good	4	0	1	1-5	Exempt tree species height class, suppressed canopy form , lean WSW, located in garden bed
Design impact summary: Proposed removal of exempt tree species to accommodate design												
*22*x3*	*Syagrus romanzoffiana* Cocos Palm	av 6 x 5	av 300	- / 3.5	ESM	Good	Good	4	0	2E	2	Exempt palm species located in raised garden bed
Design impact summary: Proposed removal of exempt tree species to accommodate design												
*23*x6*	*Syagrus romanzoffiana* Cocos Palm	av 5 x 3	av 200	- / 2.5	ESM	Good	Good	4	0	2E	2	Exempt palm species, stand of palms consisting of additional *Bangalo* & *Stelitzia* mix in raised garden bed
Design impact summary: Proposed removal of exempt tree species to accommodate design												
*24	*Morus sp* Mulberry	2.5 x 4	200at base	1.6 / 2.4	ESM	Good	Fair / Good	4	0/2C	2	2	Exempt tree species, multi stemmed at base, with decaying stub end evident
Design impact summary: Proposed removal of exempt tree species to accommodate design												

APPENDIX- E: Tree Location Plan