rain Tree consulting

Arboricultural Management

PO Box 326 AVALON NSW 2107

Mobile 0419 250 248

25 June 2021

53a WARRIEWOOD ROAD

WARRIEWOOD, NSW

DEVELOPMENT PROPOSAL

ARBORICULTURAL IMPACT ASSESSMENT REPORT

Report Ref No- 9521

Prepared for

PVD No. 21 Pty Ltd
C/- Craig & Rhodes Pty Limited
S7.01 / L7, 3 Rider Boulevard
RHODES NSW
P: 9869 1855

Prepared by

Mark A. Kokot

AQF Level 5 Consulting arborist

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INTRODUCTION

This report has been commissioned by PVD No. 21 Pty Ltd C/- Craig & Rhodes Pty Limited to assess the remaining Useful Life Expectancy (ULE) and potential impacts that may occur to significant trees in relation to a new development proposal. The new development proposal consists of constructing twenty one (21) new residential dwellings within Lot 2 of DP1115877 known as 53a Warriewood Road, WARRIEWOOD NSW.

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

Development incursions within tree protection zones (TPZ) and impacts to trees have been outlined within Note 2 of Appendix- A where incursions are described as Minor (<10%) & Major (>10%) TPZ occupancy. Within this report encroachments are discussed as low, moderate to high level impacts within the TPZ. Where site restrictions within notional root zone radiuses exists development impacts or encroachment disturbances are based on author's experience, observations of site conditions, soil type and topography.

Each tree assessed has been accorded a temporary identification number and is referred to by number throughout this report. For additional trees not plotted on provided documentation their location has been estimated by taking offsets from existing trees and structures. The trees, their location, development impact and design requirements may be referenced within the Tree Assessment Schedule and Tree Location Plan of Appendices C & D.

Care has been taken to obtain information from reliable sources. All data has been verified as far as possible, however, I can neither guarantee nor be responsible for the accuracy of information provided by others.

METHODOLOGY

1 In preparation for this report a site and limited ground level Visual Tree Assessment (VTA) was conducted on Monday 21st June 2021 by the author of this report. The principles of VTA were primarily adopted from components of Mattheck *& Breloer* 1994 '*The Body Language of Trees*' with basic risk values determined by criteria explained within the ISA TRAQ manual 2017. The inspection included assessment of the overall health and vigour of trees, tree form, structure and structural condition commencing from near the lower trunk to the upper first order branch division as best as site conditions would allow. On completion of the VTA the retention value of the tree was summarised utilizing the tree assessment Checklist provided within Appendix- B.

2 The inspection was limited to visual assessment from within the subject site where the retention value, condition and diameters of neighbouring trees was estimated. No aerial (climbing) inspections, woody tissue testing or tree root investigation was undertaken as part of this tree assessment. Tree height and canopy spread was estimated and expressed in metres with trunk diameters measured at approximately 1.4 metres above ground level, rounded off to the nearest 50mm and expressed as DBH (Diameter at Breast Height). The height of palms was taken from ground level to the top of the crown shaft only, and excludes the central apical spear projection.

3 This report acknowledges and utilizes the current Australian Standards 'Protection of Trees on Development Sites' AS 4970 – 2009 as explained within Notes of Appendix- A.

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

4 Plans and/or documentation received to assist in preparation of this assessment include: LIMITED PLAN INFORMATION

Saturday Studio project No; 20023

- Site Plan Dwg No. 100:01 rev K, dated 7.6.2021
- Ground Floor Plan Dwg No. 100:02 rev K, dated 7.6.2021

Craig & Rhodes job No. 201921

- Plan / Cut & Fill Plan Dwg No. --, dated --,--,----
- Survey Plan Sheets 2 of 2 ref No. 434-20 dated 2.1.2021

1. SUMMARY OF ASSESSMENT

1.1 General tree assessment

1.1.1 Thirty two (32) trees or groups of have been assessed for the purpose of this report. Of the thirty two trees one (1) tree is located within the front Council verge, nineteen (19) trees are located within adjoining properties and four (4) trees are non-prescribed (exempt) tree species.

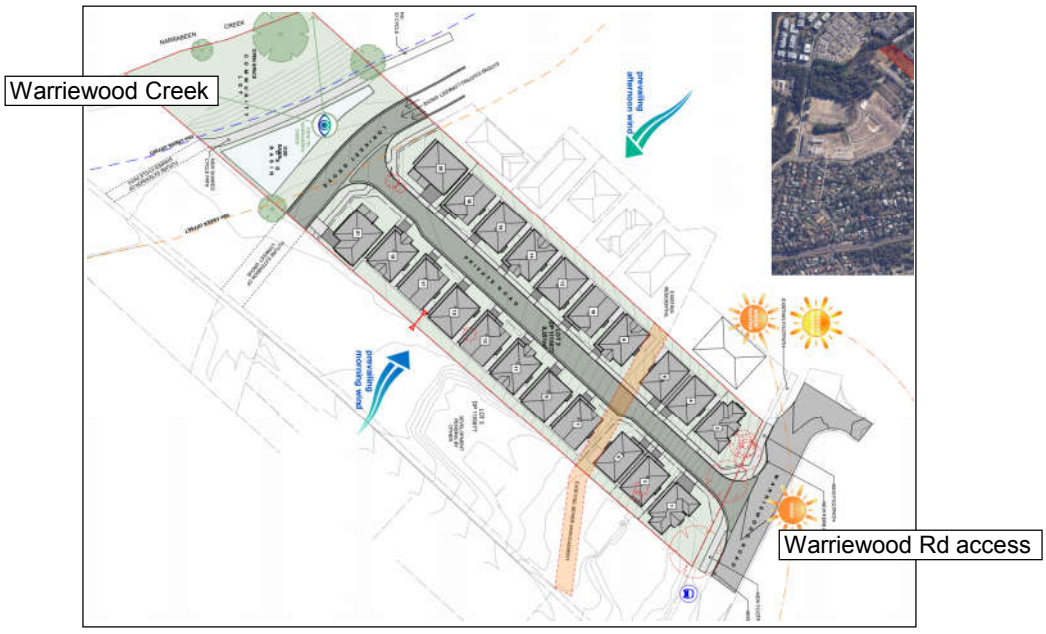
- *Council verge tree*: is identified as a low landscape significant Acacia tree T3a. The tree has been specified for removal to accommodate a proposed pedestrian pathway.
- *Neighbouring trees*: are identified as trees 7, 8, 9, 14G, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28 & 31. The majority of trees are affected by boundary wall proposals to retain fill proposed within the site. Select trees located on the boundary are impacted directly by the wall where wall location necessitates tree removal.
- *Exempt non-prescribed trees*: exempt tree species are identified as trees 3x3, 4, 5 & 10. Being exempt non-prescribed trees the trees are permitted to be managed (pruned, removed or relocated) without Council consent.

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

1.2 The development proposal

1.2.1 The development proposal consist of constructing twenty one (21) residential dwellings with road and associated infrastructure. Design proposes significant fill to accommodate the proposal with retaining walls and fill located within tree protection zone setbacks.

Figure 1, showing proposed 21 dwellings within the site



1.3 Tree removal to accommodate design

1.3.1 Twelve (12) prescribed (LGA protected) trees are identified for removal to accommodate design. The nine trees are identified as trees:

- 1, 2, 3a, 6, 11, 12, 13, part 14G, 26, 29, 30 & 31.

Of the above trees T3a is a Council verge with part 14G, 26 & 31 being located on the boundary or within neighbouring sites.

Exempt tree species within the site permitted to be removed, pruned or relocated are identified as trees:

- 3x3, 4, 5 & 10.

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

1.4 Discussion of development impacts – *prescribed trees*

Proposed tree removal due to high level impacts by design

1.4.1 The following trees are proposed for removal due to being located within the building footprint or receive Major SRZ & TPZ encroachments and impacts by design necessitating tree removal:

- T1: proposed removal die to fill, landscape works and building footprint within SRZ & TPZ.
- T2: located within building footprint for road access.
- T3a: located within proposed pedestrian pathway.
- T6, 11, 12 & 13: within building footprint for road access.
- T14G: part small stand of trees E of group located on boundary affected by retaining wall proposal.
- T26 & 31: located on boundary affected by retaining wall proposal.
- T29 & 30: requested tree removal to accommodate earthworks within SRZ & TPZ.

Trees likely receiving Moderate to High impacts by design

1.4.2 The following trees receive Major (>10%) TPZ encroachments with works located within Structural Root Zone (SRZ) setbacks.

- T7, 8, 9, 15, 16, 17, 18, 19, 20, 21, 23, 24 & 27.

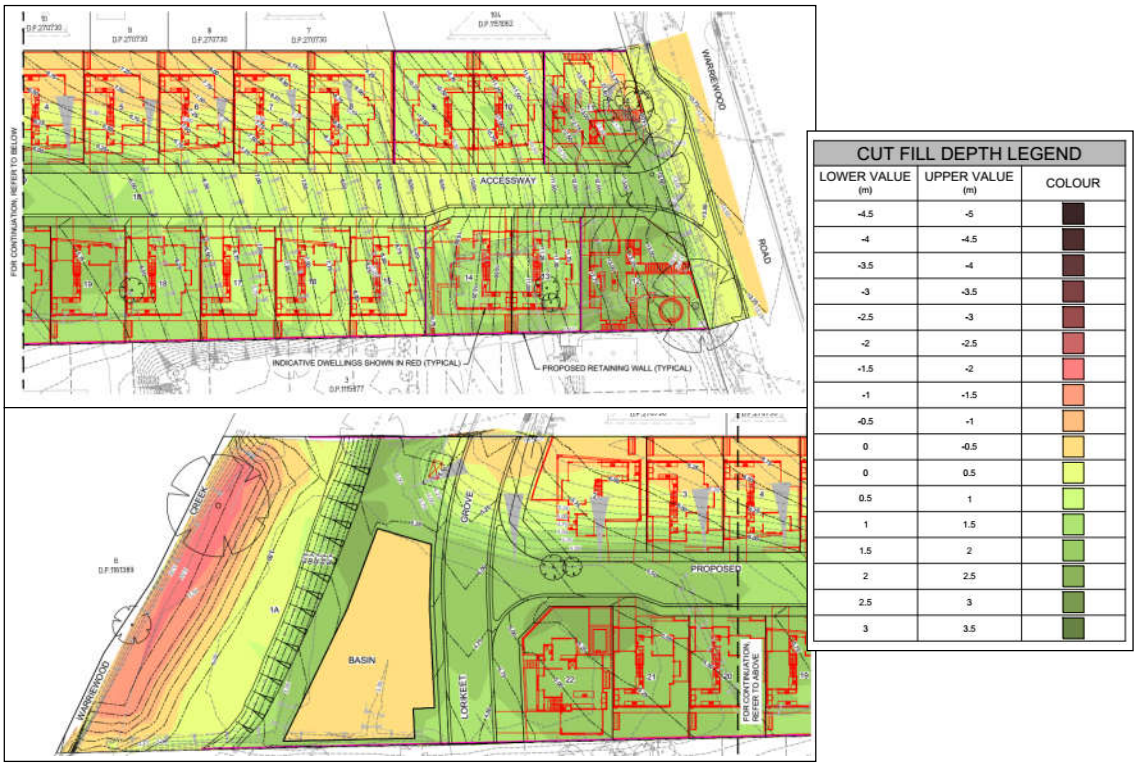
These trees are primarily neighbouring trees where retaining wall construction may affect tree vitality. In accordance with AS4973 undertaking tree root investigations may provide more information on the distribution, location and impact to critical roots.

Trees likely receiving Moderate to low impacts by design

1.4.3 The following trees receive negligible, Minor or manageable TPZ encroachments where trees can be retained utilizing principles outlined within Section 2.3 *General tree protection requirements*.

- T22, 25 & 28.

Figure 2, showing cut & fill proposal, *refer Cut & Fill Plan*



2. CONCLUSIONS & RECOMMENDATIONS

2.1 Tree Removal

2.1.1 Based on the limited information provided, design layout and with the consent of Council twelve (12) trees require or are recommended for removal to accommodate design. The trees are identified as trees:

- 1, 2, 3a, 6, 11, 12, 13, part 14G, 26, 29, 30 & 31.

Exempt tree species permitted to be removed, pruned or relocated are identified as trees: 3x3, 4, 5 & 10.

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) Clearer more detailed plans are required to determine the extent of development where trees are proposed for retention.

b) For neighbouring trees located along the northeastern boundary in accordance with AS4970 tree root investigations are required to identify the location, distribution and impact to critical roots where Major encroachments occur. The management of the trees should be based on the outcome of the investigation.

2.3 General tree protection requirements

a) Prior to demolition works Tree Protection Fencing (TPF) and/or zones as identified within Figure 3 are recommended to be located under the guidance of an appointed site arborist. Unless specified otherwise the location of tree protection fencing is to be positioned to allow for adequate work access and/or be located at the extremity of the TPZ radius, see SRZ & TPZ distance column Appendix- C. Where design & construction access may be restrictive timber beam trunk protection is recommended to be installed, with ground protection mats provided to protect underlying tree roots within tree protection zones or areas.

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

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

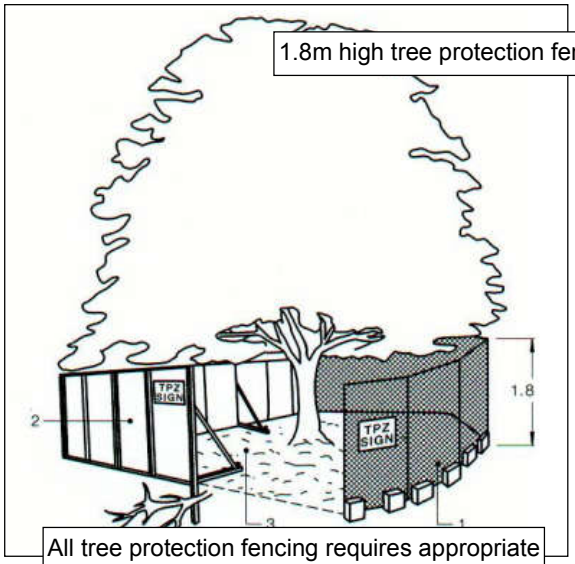
d) The project arborist is to be familiar with protection measures specific to Australian Standard AS4970 'Protection of Trees on Development Sites' – 2009 requirements with any modification in Tree Protection Fencing (TPF) or Zones (Z) to be compliant with AS4970 Section 4.5 *Other Tree Protection Measures.*

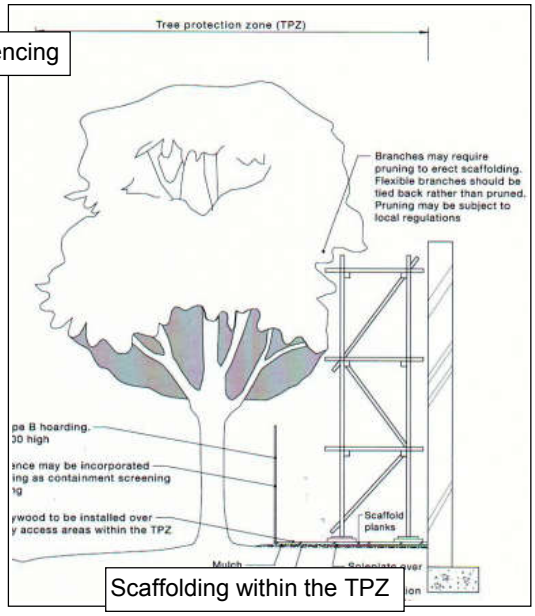
e) During approved excavation within TPZ setbacks there shall be no over excavation beyond the line of cut as shown within construction drawings. Should over excavation be required the extent of excavation should be detailed within approved drawings or a construction management plan for arborist review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

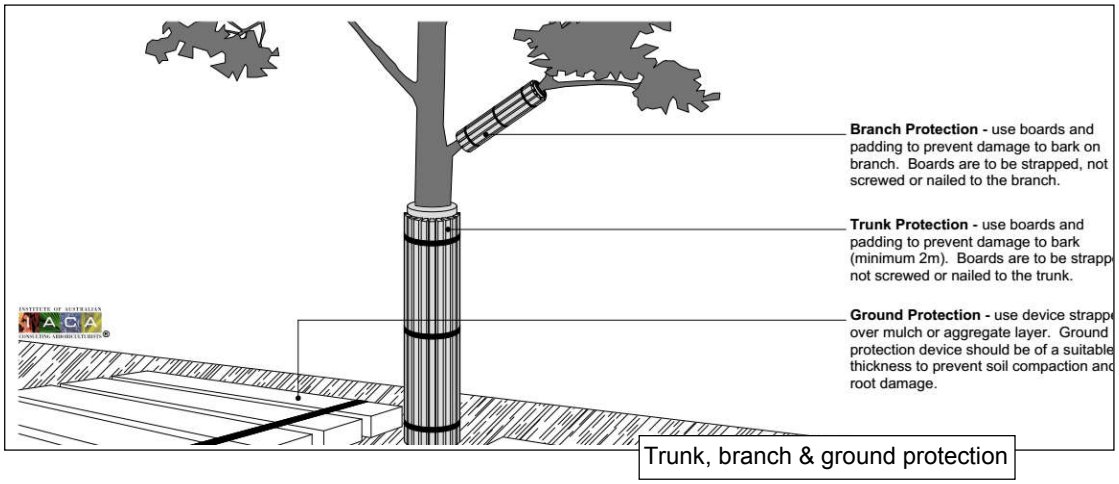
f) Unless specified otherwise during approved excavation within TPZ setbacks excavation is to be conducted manually (by hand) under the supervision of an appointed project arborist. Where approved by the arborist the pruning of roots at or <30mm(Ø) is to be conducted in accordance with AS4970 – 2009 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. 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.

g) *Canopy pruning / tree removal:* where required tree removal and canopy reductions are to be approved by the Local Government Authority. Works are to be conducted by a suitably qualified AQF Level 3 certified arborist in accordance with AS4373 Pruning Standards, and specifically be conducted in accordance with Safe Work Australia – Guide to managing risks of tree trimming and removal works 2016 (www.swa.gov.au).

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







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

i) *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).

j) Hold points: specific to no works are to commence without arborist advice, inspections & certifications:
   1) No works shall commence until all trees specified for retention have been adequately protected with tree protection fencing or similar being certified by an appointed project arborist.
   2) No works shall occur within the SRZ of any tree without prior arborist advice and certification. Where excavation may be required prior exploratory tree root investigation are to identify the location, distribution and impact to underlying tree roots.
   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	Install tree protection fencing & zones as specified within this report or as directed by the site arborist for certification purposes
2	During construction	Project arborist to supervise & certify approved excavation works within tree protection zones.
		Engage arborist to undertake monthly tree inspections
3	Post construction	Prior to handover project arborist to provide final inspection & certification of tree health & vitality

k) To ensure tree(s) are appropriately protected the development site superintendent is recommended to be familiar with all tree protection and ongoing certification requirements. The superintendent is responsible for informing all subcontractors of the responsibilities and requirements of tree protection prior to their engagement.

Should you require further liaisons in this matter please contact me direct on 0419 250 248
Yours sincerely

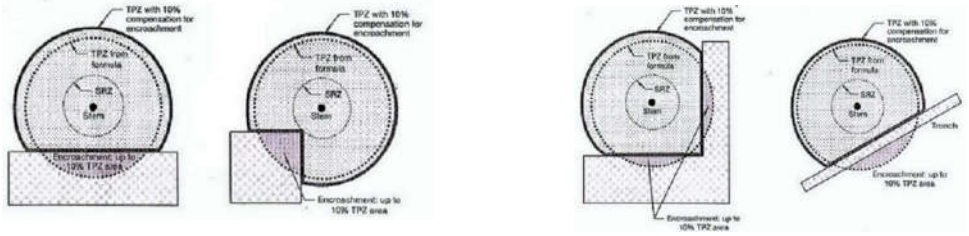
Mark A Kokot
AQF Level 5 consulting arborist
Diploma of Hort/Arboriculture (AQF5), Associate Diploma Parks Management (AQF4)
Certified Arborist / Tree Surgeon (AQF3), ISA Tree Risk Assessment Qualified 6/2024
Member: ISA, Arboriculture Australia & IACA, Working With Children No: WWC0144637E

APPENDICES

APPENDIX- A: Terminology & references

Acceptable Risk: Exposure to or reject risk of varying degrees. The acceptable risk is defined as '*The person who accepts some degree of risk in return for a benefit being exposed to some risk of varying degree*. **Age classes:** (I) Immature refers to a well established but juvenile tree. (ESM) refers to an early semi mature tree not of juvenile appearance. (SM) Semi-mature refers to a tree at growth stages advancing into maturity and full size. (LSM) Late Semi-Mature, refers to a tree between semi-mature and close to mature. (EM) refers to a tree at the first stages of maturity. (M) Mature refers to a full size tree with some capacity for future growth. **Health:** Refers to a trees vigor exhibited by the crown density, leaf colour, presence of epicormic shoots, ability to withstand disease invasion and the degree of dieback. **Condition:** Refers to the tree's form and growth habit, as modified by its environment (aspect, suppression by other trees, soils) and the state of the scaffold (i.e. Trunk and major branches), including structural defects such as cavities, crooked trunks or week trunk / branch junctions. These are not directly connected with health and it is possible for a tree to be healthy but in poor condition. **Decay:** (*N*) – an area of wood that is undergoing decomposition. (*V*) – decomposition of an area of wood by fungi or bacteria. **Decline:** Is the response of a tree to a reduction of energy levels resulting from stress. Recovery from decline is difficult and slow; is usually irreversible. **Defect:** A identifiable fault in a tree. **Epicormic Shoots**: Shoots that arise from latent or adventitious buds that occur on stems and branches and on suckers produced from the base of the tree. A symptom / result of stress related factors. **Footprint:** The area occupied by site structures, including the dwelling driveways and hard surfaces. **Included Bark**: (Inclusion) a genetic weak fault, pattern of development at branch junctions where the bark is turned inwards rather than pushed out, can pose a potential hazard. **Order of branches:** First order being those that are the first to extend from the main trunk or codominant limbs, second order branches extend from the first order and third order branches extend from the second order. **Probability:** The likelihood of some event happening. **Risk:** Is the probability of something adverse happening. **Suppression:** Restrained growth pattern from competition of other trees or structures. **Wound:** Damage inflicted upon a tree through injury to its living cells, may continue to develop further weakening of the structure compromising structural integrity.
NOTE 1: This report acknowledges the current **Australian Standards 'Protection of Trees on Development Sites'** AS 4970 – 2009 with reference to the Tree Protection Zone (TPZ): being a combination of the root and crown area requiring protection. The TPZ takes into consideration the Structural Root Zone (SRZ): The area required for tree stability. Determined by AS4970 - 2009 Figure 1, Table of determining the SRZ, section 3.3.5 of the standards. The standard states where a greater than 10% encroachment occurs the arborist is to take into consideration the schedule of determining impacts as set within AS4970 s. 3.3.4. Encroachments are referred to within this report as major or minor encroachments (AS4970 s. 3.3.2 & 3.3.3). Below is the terminology used for estimated percentage of development incursion used within this report. To retain specific trees and ensure their viability development must take into consideration protection of the TPZ radius.

NOTE 2: The extent of inclusion within the TPZ radius has been categorised as follows:
No impact (0%) incursion, Low to negligible impact (<10%) of minor consequence, 10 - <15% incursion of moderate to low impact, 15 - <20% Medium to moderate level of impact and incursion where the project arborist is to demonstrate the tree/s remain viable by tree sensitive construction techniques, 20 - <25% incursion of Medium to high level of impact, 25 – <35% of High level impact to significant >35% incursion where moderate to high level impacts may require design changes or further information to manage tree vitality. **WBF** = located within the building footprint where design necessitates tree removal.
Showing acceptable incursion within the TPZ (AS4970)



SELECTED REFERENCES:

Barrell J. 1993, 'Preplanning Tree Surveys: Safe useful Life expectancy (SULE) is the Natural Progression", Arboricultural Journal 17: 1, February 1993, pp. 33-46.
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Mattheck, C. & Breloer, H.(1994) *The Body Language of Trees.* Research for Amenity Trees No.4 the Stationary Office, London.
Matheny N. & Clark J. 1998, Trees & Development *'A Technical Guide to Preservation of Trees During Land Development'* International Society of Arboriculture, Champaign USA.
ProSafe: TPZ encroachment calculator https://proofsafe.com.au/tpz_incursion_calculator.htmlStandards Australia 2009, *Australian Standards 4970 Protection of Trees on Development Sites* - Standards Australia, Sydney, Australia.
Standards Australia 2007, *Australian Standards 4373 Pruning of Amenity Trees* - Standards Australia, Sydney, Australia.
Northern Beaches Council DCP https://www.northernbeaches.nsw.gov.au/planning-and-development/building-and-renovations/planning-controls

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

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

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

1	Significant	2	Very High	3	High	4	Moderate	5	Low	6	Very Low	7	Insignificant

ii) Visual Tree Assessment (VTA)

0	If appropriate to VTA - **exempt* trees from Local Government Authority (LGA) Tree Management or Preservation Orders (TPO)	2E	Trees location likely to be affected by infrastructure restricting root growth potential, or tree has potential to cause infrastructure damage &/or risk mitigation or rectification works may compromise tree anchorage. Tree(s) may be contained within a vault have restricted anchoring root potential
0A	Noxious or invasive species located within heritage conservation area		
1	Trees that are dead, significantly declining >75% volume or obviously hazardous	3	This rating incorporates trees that may require further investigation of defects such as cavities or symptoms indicating internal decay to an extent that cannot be quantified under visual examination. Further inspections may be in the way of arborist climbing inspection within the canopy, root crown investigation and/or drill penetrating or Picus Sonic Tomograph ultrasound testing procedures to determine percentage of internal decay.
2	Trees that are structurally damaged. Have poor structure or weak & detrimental large stem inclusions capable or failure opposed to 2B. Tree also may be affected by extensive borer damage, fungal pathogens (wood rot) or viruses. Some symptoms may be reversible, remediated or controlled give appropriate management.		
2A	Tree damage specific to basal and/or root plate damage, very shallow soils or steep topography resulting in poor anchorage where condition may become problematic in near future / may include trees with included bark splits to ground level	4	Trees which appear specifically environmentally stressed by drought, poor soil or site conditions. Symptoms may be reversible given appropriate management
2B	Defect specific to stem inclusions development (weak branch attachments) where the condition may not be immediately detrimental however, require annual to biannual monitoring with control to prevent stem failure by installing slings, cable or bracing. Tree may also contain multi stems or codominant twin stems	5	Trees that would benefit from crown maintenance pruning as identified within the Australian Standards AS 4373 – 2007 Pruning of Amenity Trees
		5A	Trees that require little or no maintenance at time of inspection other than close monitoring
2C	Tree may contain minor wounds, pest or minor pathogen activity, altered from storm damaged to an extent that is not considered immediately detrimental - may also display average form. Likely to require close annual monitoring or minor corrective pruning	6	Trees may be typical for species type, of good form and visual condition for age class May have suppressed one sided canopies or are low risk trees
2D	Trees significantly altered by recent storm or over pruning events which may reduce retention values due to average form- or tree extensively pruned for power line clearance	7	VTA restricted by canopy or plant material vine or ivy covering tree parts, or site conditions which do not allow access- fences to neighbouring sites

iii) Retention Value (RV): Determined by [1] tree fee of visual defects and viable for retention, [2] viable for retention with minor faults which may reduce ULE, [3] trees which should not restrict development applications containing faults that are likely to become problematic in the short term, [4] trees to be considered for removal due to average condition.

1	High retention	2	Medium retention	3	Low retention	4	Consider removal

iv) U.L.E. categories Useful Life Expectancy (after *Barrell* 1996, modified by the author). A trees U.L.E. category is the life expectancy of the tree modified first by its age, health, condition, safety and location. U.L.E. assessments are not static but may be modified as dictated by changes in trees health and environment.

1. Long U.L.E. - Appear retainable at the time of assessment for over 40 years with an acceptable degree of risk assuming reasonable maintenance.
2. Medium U.L.E. - Appear to be retainable at the time of assessment for 15 to 40 years with an acceptable degree of risk assuming reasonable maintenance.
3. Short U.L.E. - Trees appear to be retainable at the time of assessment for 5 to15 years with an acceptable degree of risk assuming reasonable maintenance.
4. Very short - Removal- Trees which should be scheduled for removal within the very short term or as specified within this report.
5. Small, young or regularly pruned – Trees under 5m in height that can be easily moved or replaced, includes screen plantings or hedge lines.

APPENDIX- C: Tree Assessment Schedule

	Trees requiring removal due to hazardous or dead condition - subject to Local Government Authority notification		Trees with low retention values: senescence, developing defects or being low significant *exempt trees from the LGA tree management orders

Tree No	*Botanical Name* COMMON NAME	Height x spread (m)	DBH (mm)	SRZ / TPZ	Age	Vigour	Condition	Signifi-cance	VTA	RV	U. L.E.	Comments CV = Council verge tree NT= Neighbouring tree
1	*Corymbia maculata* Spotted Gum	18 x 14	1000	3.4m / 12	M	Fair	Fair	3	2C/2A /4	2	2	Past lower trunk wounds at base S & W sides likely to become problematic in the future, appears slightly environmentally stressed with decline in canopy, past pruning cuts with minor upper branch scaffolds wounds
Design & impact summary		*Remove; Likely High (25-35%) TPZ occupancy with design plans indicate tree removal to accommodate Unit 1 fill, landscape & proposed boundary retaining wall supporting fill within TPZ, having landscape works within SRZ*										
2	*Eucalyptus saligna* Sydney Blue Gum	15 x 12	650	2.8 / 7.8	ESM	Good	Fair	3	2C	2	2	One sided canopy biomass - W, past pruning cuts with exposed surface roots W side
Design & impact summary		*Remove; within building or excavation footprint for road access*										
*3x3	*Acacia saligna* WA Golden Wattle	av 7 x 4	av 300at base	2 / 3.6	SM	Fair	Fair / Poor	4	0/2/4	3	<3	Exempt tree species. Group of trees in declining vigour, select trees (centre) with basal decay = low retention value tree group
Design & impact summary		*Remove; Design plans indicate tree removal to accommodate Unit 2 fill, landscape & proposed retaining wall for stir access*										
3a CV	*Acacia saligna* WA Golden Wattle	7 x 2.5	250at base	1.8 / 2.43	SM	Fair	Fair / Poor	4	0/4	3	<3	Trees in significant declining vigour = low retention value tree group
Design & impact summary		*Remove; Design plans show tree removal to accommodate pedestrian footpath*										
*4	*Citrus sp* Citrus tree	3 x 2.5	200at base	1.6 / 2.4	SM	Poor	Poor	5	0/4	3	3	Exempt tree species fruit tree class
Design & impact summary		*Remove; Exempt tree species*										
*5	*Prunus sp* Fruit tree	5.5 x 5	300	2.1 / 3.6	ESM	Good	Good	5	0	2	2	Exempt tree species fruit tree class deciduous at time of inspection
Design & impact summary		*Remove; Exempt tree species*										
6	*Casuarina glauca* She Oak	9 x 3	200	1.8 / 2.4	ESM	Good	Fair / Good	4/3	2C	2	2	Contains minor basal wound S side
Design & impact summary		*Remove; Located within private road access proposal*										

	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 low significant *exempt trees from the LGA tree management orders

Tree No	*Botanical Name* COMMON NAME	Height x spread (m)	DBH (mm)	SRZ / TPZ	Age	Vigour	Condition	Signifi-cance	VTA	RV	U. L.E.	Comments CV = Council verge tree NT= Neighbouring tree
7 NT	*Hibiscus sp* Hibiscus	5 x 7	400at base	2.3m / 4.8	M	Good	Fair / Good	4	2B	2	2	Multi stemmed at base, with stem inclusion development, located on edge of upper level embankment, canopy 2.5m in at 2m above ground level
Design & impact summary		*Retain; Likely high level (25-35%) TPZ occupancy with SRZ cut impact by proposed boundary retaining wall, potential minor canopy pruning required*										
8 NT	*Hibiscus tiliaceus* Sea Hibiscus	4 x 6	500at base	2.5 / 6	SM	Good	Fair / Good	4/3	2B	2	2	Low suppressed canopy form biomass N, canopy 4m in at 2m above ground level with majority of canopy within site
Design & impact summary		*Retain; Likely high level (25-35%) TPZ occupancy with SRZ cut impact by proposed boundary retaining wall, likely significant canopy reduction required*										
9 NT	*Ficus benjamina* Weeping Fig	10 x 10	750at base	2.8 / 9	ESM	Good	Fair / Good	4/3	2B	2	2	Multi stemmed at base, with minor stem inclusion development, located on raised section of embankment, canopy 4m in at 2m above ground level
Design & impact summary		*Retain; Likely high level (25-35%) TPZ occupancy with SRZ cut impact by proposed boundary retaining wall, moderate canopy lift required*										
*10	*Morus sp* Mulberry	6 x 5	150, 200	2.1 / 4.2	ESM	Good	Fair / Good	5	0/2C	2	2	Exempt tree species fruit tree class
Design & impact summary		*Remove; Exempt tree species*										
11 NT	*Casuarina glauca* She Oak	8 x 3	250	2 / 3	ESM	Good	Fair / Good	4/3	2C	2	2	Multi stems at 3m with minor stem inclusion development, bowing lower trunk from ground level
Design & impact summary		*Remove; Located within private road access proposal*										
12 NT	*Casuarina glauca* She Oak	10 x 3	250	2 / 3	ESM	Good	Good	4/3	6	1	1	Tree with no significant visual faults
Design & impact summary		*Remove; Located within private road access proposal*										
13 NT	*Casuarina glauca* She Oak	10 x 4	250	2 / 3	ESM	Good	Good	4/3	6	1	1	Tree with no significant visual faults
Design & impact summary		*Remove; Located within private road access proposal*										

	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 low significant *exempt trees from the LGA tree management orders

Tree No	*Botanical Name* COMMON NAME	Height x spread (m)	DBH (mm)	SRZ / TPZ	Age	Vigour	Condition	Signifi-cance	VTA	RV	U. L.E.	Comments CV = Council verge tree NT= Neighbouring tree
14G NT	*Casuarina glauca* She Oak	6 x 2	200at base	1.6 / 2.4	ESM	Good	Fair / Good	4/3	2B	2	2	Clump of self-seeded or epicormic stems from low stumps, select trees on fence line
Design & impact summary		*Removal of section located along boundary where boundary retaining wall is proposed, retain smaller trees well within boundary limits*										
15 NT	*Casuarina glauca* She Oak	17 x 8	450	2.5 / 5.4	ESM	Good	Good	3	6/7	1	2	Tree with no significant visual faults
Design & impact summary		*Retain; Likely Moderate to high (20-25%) TPZ occupancy with excavation for retaining wall supporting fill within the SRZ. May require tree root investigations to determine impacts on underlying tree roots.*										
16 NT	*Casuarina glauca* She Oak	17 x 7	300	2.1 / 3.6	ESM	Good	Fair	3	2B	2	2	Twin stems at 1.4m with stem inclusion development, lower trunk bowing form
Design & impact summary		*Retain; Moderate (15-20%) TPZ occupancy with excavation for retaining wall supporting fill within the SRZ. May require tree root investigations to determine impacts on underlying tree roots.*										
17 NT	*Casuarina glauca* She Oak	18 x 8	250, 300	2.6 / 6.6	ESM	Good	Fair / Good	3	2B	2	2	Suppressed canopy form located >2m from boundary
Design & impact summary		*Retain; Likely Moderate to high (20-25%) TPZ occupancy with excavation for retaining wall supporting fill within the SRZ. May require tree root investigations to determine impacts on underlying tree roots.*										
18 NT	*Casuarina glauca* She Oak	18 x 11	450	2.5 / 5.4	ESM	Good	Fair / Good	3	2B	2	2	Suppressed canopy form, twin stems at 1.1m with stem inclusion development
Design & impact summary		*Retain; Likely Moderate to high (20-25%) TPZ occupancy with excavation for retaining wall supporting fill within the SRZ. May require tree root investigations to determine impacts on underlying tree roots.*										
19 NT	*Casuarina glauca* She Oak	19 x 8	400	2.4 / 4.8	ESM	Good	Good	3	6	1	1	Tree with no significant visual faults
Design & impact summary		*Retain; Likely Moderate to low (20-25%) TPZ occupancy with excavation for retaining wall supporting fill within the SRZ. May require tree root investigations to determine impacts on underlying tree roots.*										
20 NT	*Casuarina glauca* She Oak	20 x 9	500	2.6 / 6	ESM	Good	Fair / Good	3	2B	2	2	Co-dominant twin stems at 1.8m no significant visual faults
Design & impact summary		*Retain; Likely Moderate to high (20-25%) TPZ occupancy with excavation for retaining wall supporting fill within the SRZ. May require tree root investigations to determine impacts on underlying tree roots.*										

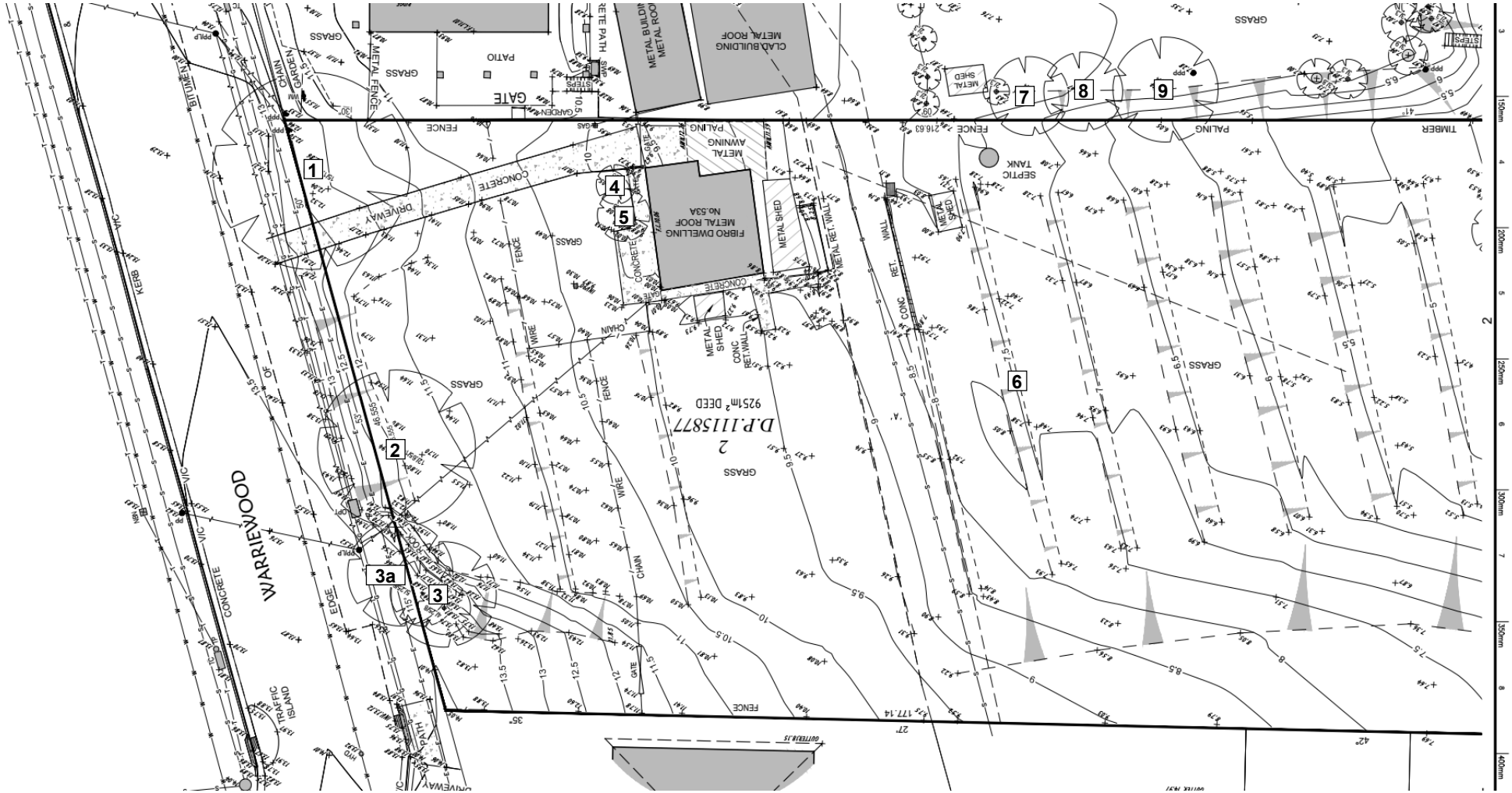
	Trees requiring removal due to hazardous or dead condition - subject to Local Government Authority notification		Trees with low retention values: senescence, developing defects or being low significant *exempt trees from the LGA tree management orders

Tree No	*Botanical Name* COMMON NAME	Height x spread (m)	DBH (mm)	SRZ / TPZ	Age	Vigour	Condition	Signifi-cance	VTA	RV	U. L.E.	Comments CV = Council verge tree NT= Neighbouring tree
21 NT	*Casuarina glauca* She Oak	18 x 9	500	2.6 6	ESM	Good	Good	3	2B	2	2	Narrow suppressed canopy form, with twin stems at 1.2m with minor stem inclusion development
Design & impact summary		*Retain; Likely Moderate to high (20-25%) TPZ occupancy with excavation for retaining wall supporting fill within the SRZ. May require tree root investigations to determine impacts on underlying tree roots.*										
22 NT	*Casuarina glauca* She Oak	18 x 6	300	2.1 3.6	ESM	Good	Fair / Good	3	2B	2	2	Narrow suppressed canopy form, codominant at 3m with minor stem inclusion development
Design & impact summary		*Retain; Likely Moderate to low (10-15%) TPZ occupancy with excavation for retaining wall supporting fill within TPZ*										
23 NT	*Casuarina glauca* She Oak	18 x 10	500	2.6 6	ESM	Good	Good	3	6	1	1	Tree with no significant visual faults
Design & impact summary		*Retain; Moderate (20-25% TPZ occupancy with excavation for retaining wall supporting fill just within the SRZ. May require tree root investigations to determine impacts on underlying tree roots.*										
24 NT	*Casuarina glauca* She Oak	18 x 13	600	2.7 7.2	ESM	Good	Good	3	6	1	1	Tree with no significant visual faults
Design & impact summary		*Retain; Likely High (25-35%) TPZ occupancy with excavation for retaining wall supporting fill within the SRZ. May require tree root investigations to determine impacts on underlying tree roots.*										
25 NT	*Casuarina glauca* She Oak	16 x 7	250	2 3	ESM	Good	Good	3	6	1	1	Tree with no significant visual faults
Design & impact summary		*Retain; Likely Moderate to low (10-15%) TPZ occupancy with excavation for retaining wall supporting fill within TPZ*										
26 NT	*Casuarina glauca* She Oak	8 x 4	150	1.6 2	ESM	Good	Good	4/3	6	1	1	Part neighbouring tree located on fence line, potential codominant stems at ground level
Design & impact summary		*Remove; within building or excavation footprint for boundary wall supporting fill*										
27 NT	*Casuarina glauca* She Oak	18 x 10	550	2.7 6.6	ESM	Good	Good	3	6	1	1	Tree with no significant visual faults, may have SRZ disturbance from adjacent property works
Design & impact summary		*Retain; Likely High (25-35%) TPZ occupancy with excavation for retaining wall supporting fill within the SRZ. May require tree root investigations to determine impacts on underlying tree roots.*										
28 NT	*Howea forsteriana* Kentia Palm	6 x 3	200	- 2.5	ESM	Good	Good	5	6	1	1	Palm no significant visual faults
Design & impact summary		*Retain; Likely Moderate to low (10-15%) TPZ occupancy with excavation for retaining wall supporting fill within TPZ*										

	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 low significant *exempt trees from the LGA tree management orders

Tree No	*Botanical Name* COMMON NAME	Height x spread (m)	DBH (mm)	SRZ / TPZ	Age	Vigour	Condition	Signifi-cance	VTA	RV	U. L.E.	Comments CV = Council verge tree NT= Neighbouring tree
29	*Casuarina glauca* She Oak	10 x 4	200	1.8 / 2.4	ESM	Good	Good	3	6	1	1	Located at edge of embankment to creek edge with no significant visual faults
Design & impact summary		*Design request to remove tree; no building footprint impact, tree located in earth works area requested for removal*										
30	*Eucalyptus robusta* Swamp Mahogany	19 x 16	950	3.3 / 11.4	M	Good	Fair / Good	3	4	2	2	Slight lean N, at creek edge, slightly environmentally stressed with minor decline in canopy
Design & impact summary		*Design request to remove tree; no building footprint impact, tree located in earth works area requested for removal*										
31 NT	*Erythrina criistagalli* Cooks Comb Coral Tree	7 x 8	450	2.5 / 5.4	EM	Good	Good	5	4/7	2	2	Appears slightly environmentally stressed with minor decline in canopy, Restricted VTA by vegetation
Design & impact summary		*Remove; within building or excavation footprint for boundary wall supporting fill*										

APPENDIX- D: *Sheet 1 of 2*, Tree Location Plan



Sheet 2 of 2 Tree Location Plan