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5 May 2021

15 JUBILEE AVENUE

WARRIEWOOD, NSW

DA-202/1039

DEVELOPMENT PROPOSAL

ARBORICULTURAL IMPACT ASSESSMENT REPORT

Report Ref No- 3521

Prepared for
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INTRODUCTION

This arboricultural report has been commissioned by 15 Jubilee Pty Limited for the purpose of determining the remaining Useful Life Expectancy (ULE) and potential impacts that may occur to significant trees in relation to a new development proposal. The new development proposal consists of constructing a multi-use commercial facility within Lot 202 of DP 1019363 being known as 15 Jubilee Avenue WARRIEWOOD, NSW.

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 are outlined 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

- i In preparation for this report a limited site and ground level Visual Tree Assessment (VTA) was conducted on Friday 19th February 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 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.
- ii The inspection was limited to a visual assessment from within the subject site where the retention value, condition and diameters of neighbouring trees was estimated. Tree height and canopy spread was estimated and expressed in metres with trunk diameters measured at approximately 1.4 metres above ground level, rounded off to the nearest 50mm and expressed as DBH (Diameter at Breast Height). The height of palms was taken from ground level to the top of the crown shaft only, and excludes the central apical spear projection.
- iii This report 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.
- iv Plans and documentation received to assist in preparation of this report include:
SBA Architects job No.20259 *specific to*:
 - Site, Roof & Site Analysis Plan Dwg No. DA100 rev A dated 30.4.2021
 - Ground Floor Plan Dwg No. DA200 rev A dated 30.4.2021
 - Ground Floor Plan Areas Dwg No. SK 01 rev -- dated 30.4.2021
 - Elevations Dwg No. DA500 & 501 rev A dated 30.4.2021
 - Sections Dwg No. DA600 rev A dated 30.4.2021Land Surveys job No. 2103458
 - Survey Plan Sheet 1 rev B dated 22.4.2021

1. SUMMARY OF ASSESSMENT

1.1 General tree assessment

1.1.1 Twenty seven (27) trees or groups of have been assessed under this development proposal. Of the twenty seven trees one tree is located on the front Council verge with two partly located on the boundary, eight (8) trees are non-prescribed exempt trees and two (2) trees are located within neighbouring properties of which one is located on the boundary.

Neighbouring trees: Neighbouring trees are identified as tree T1 (Peppermint Gum) and & T27 (Phoenix Palm). Both are identified within Northern Beaches Council exempt species list. With T1 partly located on the boundary design proposes a high level of impact within the SRZ indicating tree removal is required to accommodate vehicle access.

Council verge tree(s): is identified as a significant local native tree T9, with native trees T8 & 10 located partly on the boundary. The trees are specified for retention and require specific and appropriate tree protection prior to works commencing.

Exempt tree species: are identified as trees 4, 5, 6, 7, 11_{x3}, 12, 17 & 26 with smaller trees <3m in height within the rear stormwater easement. Being exempt non-prescribed trees, exempt trees entirely located within the site are permitted to be managed (pruned, removed or relocated) without Council consent. Should an exempt tree require retention further advice and protection methodology is required prior to works occurring within Tree Protection Zone (TPZ) setbacks.

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

1.2 The development proposal

1.2.1 The development proposal consists of constructing a new multi storey commercial facility with excavation for basement levels within tree protection zone setbacks.

1.3 Tree removal to accommodate design

1.3.1 Fifteen (15) prescribed (LGA protected) or part neighbouring trees require removal to accommodate design. The fifteen trees are identified as trees:

- T1, 2, 3, 13, 14, 15, 16, 18, 19, 20, 21, 22, 23, 24 & 25.

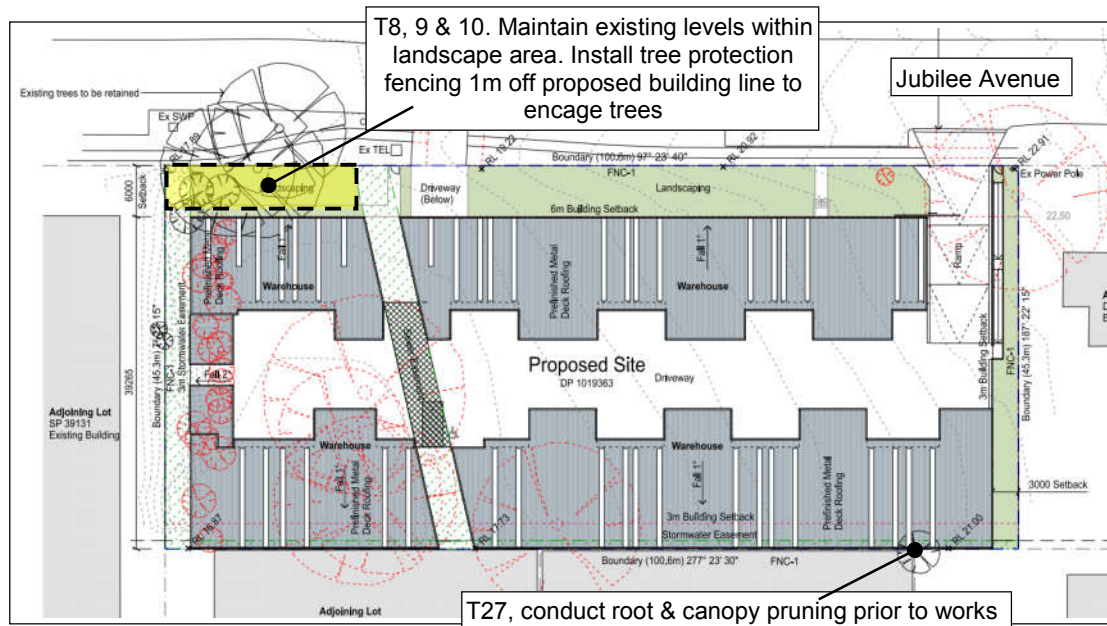
The removal of eight (8) non-prescribed exempt trees located entirely within the site is permitted without Council consent. The eight non-prescribed trees are identified as tree:

- T4, 5, 6, 7, 11_{x3}, 12, 17 & 26.

Of the above trees two (2) trees from group T11_{x3} appear capable of retention given appropriate arborist advice and protection prior to works.

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

Figure 1, showing tree removal & protection areas



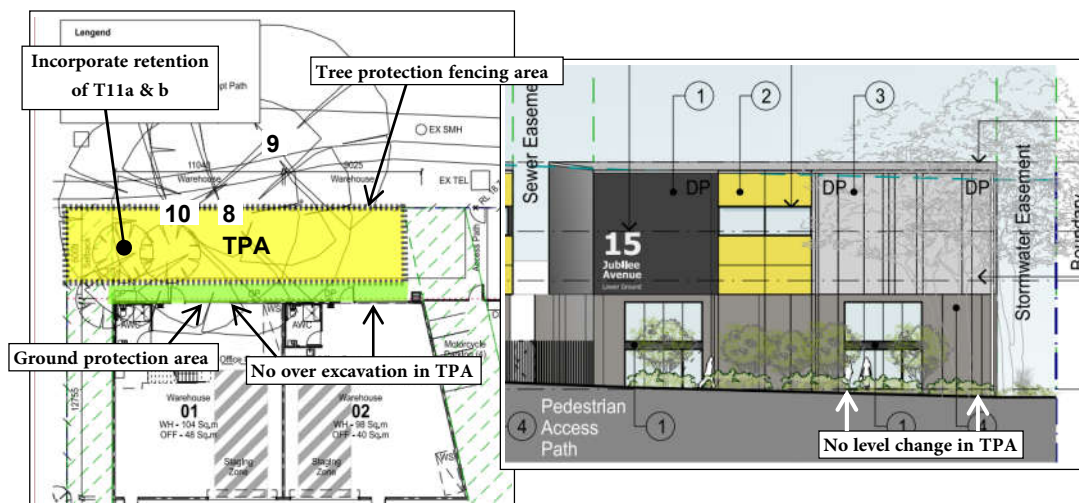
1.4 Discussion of development impacts – prescribed trees

Council verge trees

1.4.1 Tree 9 & part T8 & 10 located on the boundary. Given the building setback T9 receives minor to negligible impact by the design footprint provided landscape levels are maintained without excavation cut to at or near the building line. Tree 8 & 10 receiver higher TPZ encroachments with the following recommendations provided to mitigate impacts by design:

- There is to be no level change or excavation within SRZ radiuses at or near 3m from the trees. The Structural Root Zone (SRZ) being the area required for tree stability is to remain a development (excavation) exclusion zone. Where excavations are required within the SRZ tree root investigations are to be conducted to identify potential conflicts to critical underlying tree roots.
- There is to be no over excavation or fill (batter) beyond the building footprint to mitigate further encroachment and impacts within the Tree Protection Zone (TPZ). The proposed construction methodology shall be reviewed and endorsed by an appointed arborist prior to works.
- As shown within Figure 2 the building setback to the boundary is to be retained as a Tree Protection Area (TPA) and be protected with tree protection fencing located 1m off the building line, or as directed by an appointed arborist utilising ground & root protection mats.
- Civil work (pathway) plans shall be reviewed and endorsed by an appointed arborist prior to works with footpath constructed utilizing tree sensitive design as not to disrupt underlying tree roots.
- Canopy reduction pruning shall be conducted in accordance with Australian Standards AS 4373 Pruning of Amenity Trees 2007, and/or Section 2.3 g) of this report.

Figure 2, showing T8, 9 & 10 protection area



Neighbouring tree discussions

1.4.2 T1: located partly on the boundary proposed excavation for driveway access & pedestrian ramp will adversely impact the structural root zone where the design footprint necessitates tree removal [Plan DA100]. The tree visually displays signs of termite activity at the base and central canopy decline indicating the tree may be in the slow mortality spiral of decline due to age and environmental stress.

1.4.3 T27: it's likely a majority of adventitious roots are located within the site with the palms location to infrastructure likely to become problematic to the neighbouring building in the future. Visually it appears the trunk of the palm is located within 1.2m of the boundary where the following recommendations are provided to manage roots extending within the site.

- a) Prior to works arboricultural root pruning is to occur to the boundary 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, additionally see Section 2.3 e) root management requirements.
- b) Canopy reduction pruning shall be conducted by a suitably qualified Australian Qualification Framework (AQF) Level 3 certified arborist.

Site tree discussions – prescribed trees

1.4.4 Trees which fall within the building footprint and require removal to accommodate design are identified as trees: 3, 13, 14, 15, 16, 18, 19, 20, 21, 22, 23, 24 & 25 as shown within Plan DA100.

1.4.5 Remaining tree T2 requires removal to accommodate level grading or excavation cut within the structural root zone.

1.4.6 Within the site exempt T11a & b being local native Cheese trees appear to be retainable given appropriate management as indicated within Section 2.3 *General tree protection requirements*.

2. CONCLUSIONS & RECOMMENDATIONS

2.1 Tree Removal

- 2.1.1 Based on the design proposal and with the consent of Council fifteen (15) prescribed trees T1, 2, 3, 13, 14, 15, 16, 18, 19, 20, 21, 22, 23, 24 & 25 require removal to accommodate design.
- 2.1.2 Non-prescribed trees T4, 5, 6, 7, 11x3, 12, 17 & 26 being exempt from protection unless native trees grow greater than 5m in height prior to DA lodgment are permitted to be managed (pruned, removed or relocated) without Council consent.

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

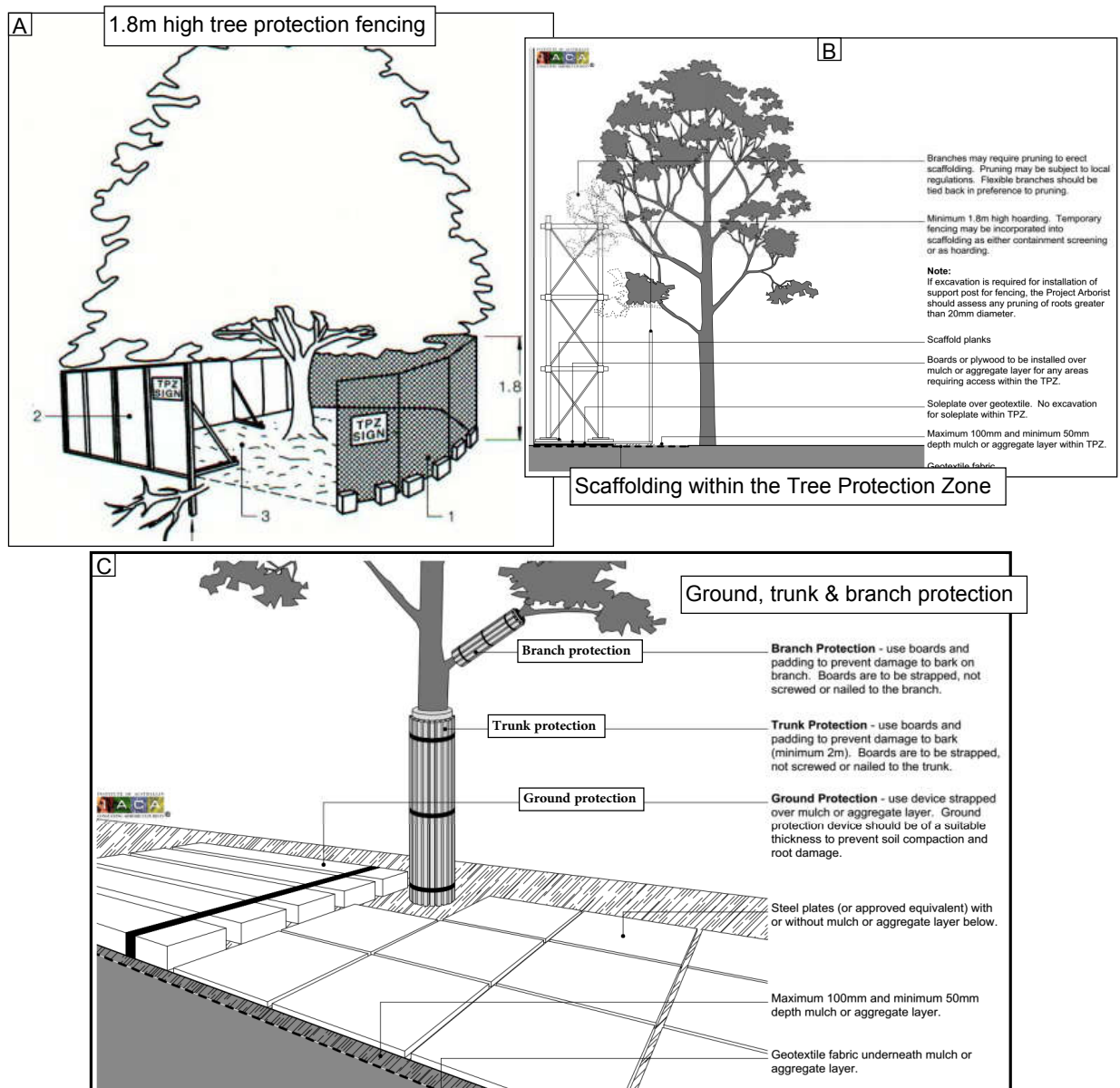
- a) Council verge tree T9: as shown within Section 2.3 Figure 3 c) the tree requires timber beam trunk protection to be installed prior to works commencing.
- b) Site trees T8 & 10: a designated fenced tree protection area (TPA) shall be installed acting as a tree protection zone. Within the TPA extending from the building footprint to the boundary there is to be no over excavation, batter of level change that would disrupt tree vitality. The TPA is to remain a designated development access exclusion zone where no excavation shall occur within the 3m SRZ setbacks. The fenced TPA shall be mulched and drip irrigated to manage tree vitality due to TPZ loss by the design proposal.
- c) Neighbouring palm T27: prior to works appropriate arboricultural pruning of roots shall occur to avoid ripping of roots at the boundary by site machinery.
- d) The appointed Principal Certifying Authority (PCA) is recommended to obtain certification of specific tree management works as indicated above for the purpose of protecting trees on development sites.

2.3 General tree protection requirements

- a) Prior to demolition works Tree Protection Fencing (TPF) and/or zones as identified within Figure 4 are recommended to be located under the guidance of an appointed site arborist. Unless specified otherwise the location of tree protection fencing is to be positioned to allow for adequate work access and/or be located at the extremity of the TPZ radius, see SRZ & TPZ distance column Appendix- C.
Where design & construction access may be restrictive timber beam trunk protection is recommended to be installed, with ground protection mats provided to protect underlying tree roots within tree protection zones or areas.

- b) In accordance with AS4970 - 2009 (1.4.4) a Project or Site Arborist is to be engaged to monitor, supervise excavation within TPZ setbacks, advise and provide certification of protection works conducted. The project arborist is recommended to hold a minimum Australian Qualification Framework (AQF) Level 4 certification and be competent in methodology of protecting trees on development sites.
- c) The project arborist is to provide final certification outlining tree protection measures with photographic evidence of ongoing works retained for certification purposes (AS4970 S/5.5.2 *Final certification*).
- d) The project arborist is to be familiar with protection measures specific to Australian Standard AS4970 'Protection of Trees on Development Sites' – 2009 requirements with any modification in Tree Protection Fencing (TPF) or Zones (Z) to be compliant with AS4970 Section 4.5 *Other Tree Protection Measures*.

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



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

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. Root pruning should also be conducted in accordance with Section 9 of Australian Standards AS 4373 Pruning of Amenity Trees 2007 specific to all cuts shall be clean cuts made with sharp tools such as secateurs, pruners, handsaws, chainsaws or specialized root pruning equipment.

For deep excavations exposed roots at the excavated cut face are to be protected with jute mesh, geotextile fabric or similar being secured in place to avoid drying of roots and the exposed soil profile.

- f) *Hold points*: specific to no works are to commence without arborist advice, inspections & certifications:
- 1) No works (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.
 - 2) No excavation shall occur within the TPZ without prior project arborist notification and/or site supervision to ensure underlying tree roots are appropriately managed.
 - 3) No access or work activity is permitted within any recommended fenced or designated tree protection area (TPA) as indicated within this report without arborist advice.

Table 1, certification requirements & hold points

1	Pre-construction	Prior to works install tree protection fencing & zones as specified within this report or as directed and approved by the site arborist.
		T27: conduct appropriate root pruning prior to any excavation occurring along the rear boundary
2	During construction	Project arborist to supervise & certify approved excavation works within TPA of T8, 9 & 10.
3	Post construction	Prior to handover project arborist to provide final inspection & certification of tree health & vitality

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

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

i) To ensure tree(s) are appropriately protected the development site superintendent is recommended to be familiar with all tree protection and ongoing certification requirements.

The superintendent is responsible for informing all subcontractors of the responsibilities and requirements of tree protection prior to their engagement.

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

Yours sincerely



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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



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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.'

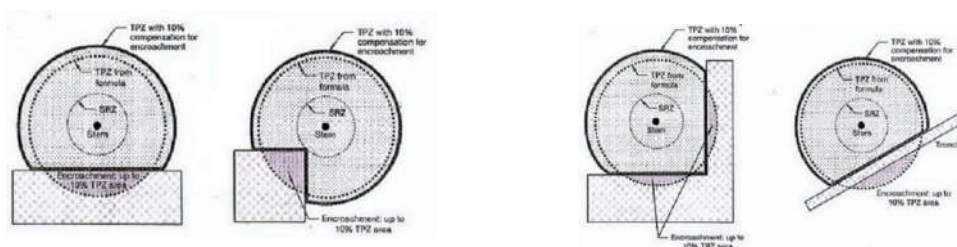
Age classes: (I) Immature refers to a well established but juvenile tree. (ESM) refers to an early semi mature tree not of juvenile appearance. (SM) Semi-mature refers to a tree at growth stages advancing into maturity and full size. (LSM) Late Semi-Mature, refers to a tree between semi-mature and close 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** = located within the building footprint where design necessitates tree removal.

Showing acceptable incursion within the TPZ (AS4970)



SELECTED REFERENCES:

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

International Society of Arboriculture (ISA) 2017, *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, are based after IACA Sustainable Retention Index Value (SRVI) which offer a visual understanding of the relative importance of the tree to the environment. The Landscape Significance for this assessment is described in seven categories to assist in determining the retention value of trees.

1	Significant	2	Very High	3	High	4	Moderate	5	Low	6	Very Low	7	Insignificant
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ii) Visual Tree Assessment (VTA)

0	If appropriate to VTA - *exempt or low significant 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

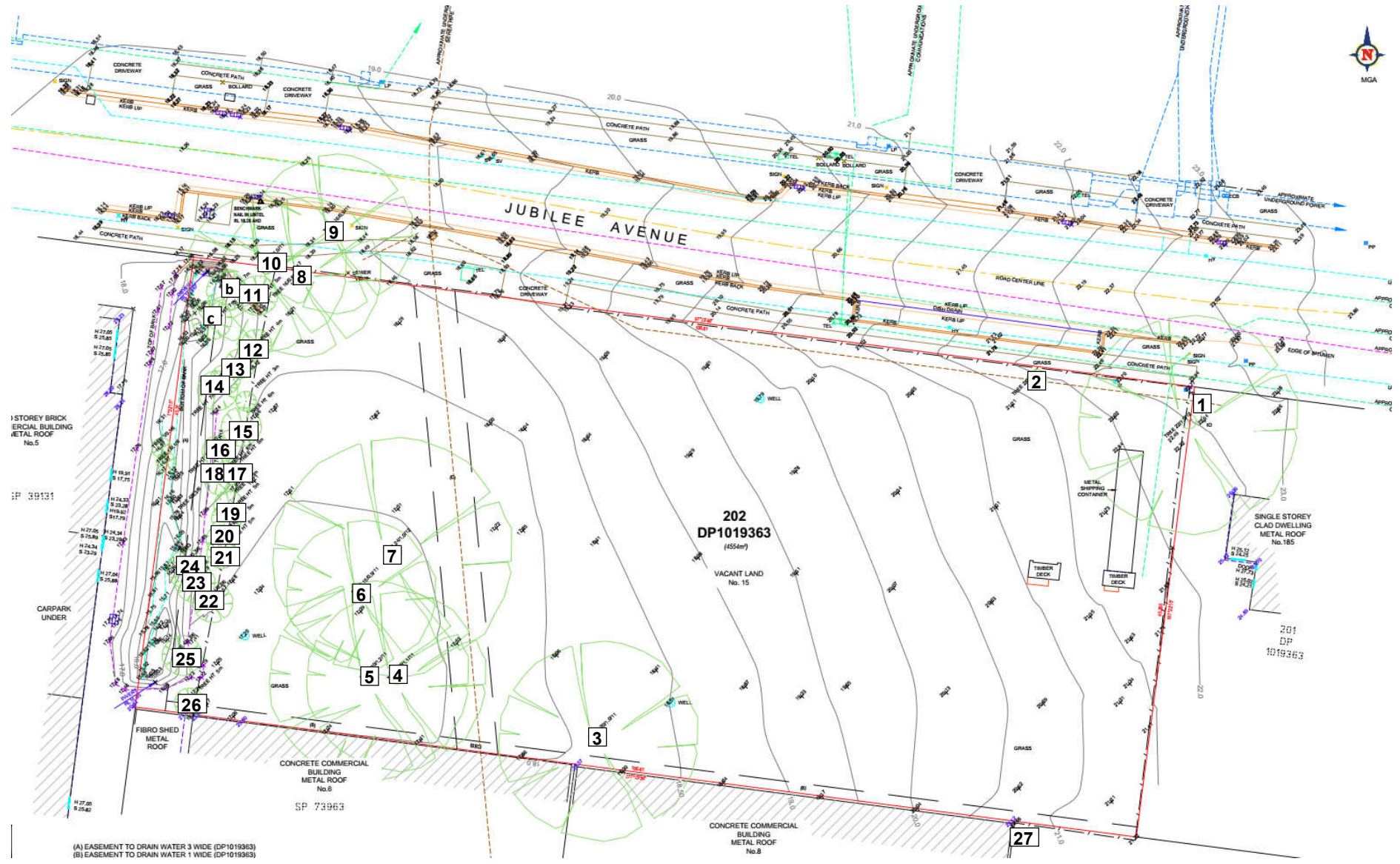
Trees requiring removal due to hazardous or dead condition - subject to Local Government Authority notification							Trees with low retention values: senescence, developing defects or being low significant *exempt trees from the LGA tree management orders					
Tree No	Botanical Name COMMON NAME	Height 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 part NT	<i>Eucalyptus nicholii</i> Black Peppermint	16 x 18	1100	3.5m 13.2	LM	Fair	Fair / Good?	3	4/7	2	2	Part neighbouring tree. Visual evidence of termite mound at base N side, appears slightly environmentally stressed with epicormic shoot development throughout lower branch scaffolds & decline in central canopy, likely senescing tree
<i>Design & impact summary</i>		<i>Remove: driveway crossover, vehicle access ramp & excavation cut having High level (<35%) TPZ incursion at or near 28.7% occupancy within SRZ & TPZ. Design impact indicates tree removal to accommodate design</i>										
2	<i>Banksia integrifolia</i> Costal Banksia	5 x 2	150at base	1.5 2	ESM	Good	Good	4/3	6	1	1	Tree with no significant visual faults
<i>Design & impact summary</i>		<i>Remove: design identifies tree removal to accommodate landscape area with cut to RL20.92 within TPZ indicating Significant cut impact (>35%) within the SRZ & TPZ</i>										
3	<i>Eucalyptus grandis</i> Flooded Gum	16 x 15	400, 750	3.5 13.8	EM	Good	Good	3	2C	2	2	Twin stemmed tree at 1.2m, minor wounds throughout upper branch scaffolds, Suppressed canopy form biomass N due to adjacent building footprint, likely restricting radial root development
<i>Design & impact summary</i>		<i>Remove: Located within building footprint</i>										
*4	<i>Populus deltoides</i> Cottonwood	23 x 15	900	3.2 10.8	M	Good	Fair / Good	4/3	0/2A	2	2	Exempt tree species, Suppressed canopy form biomass NNE + slight lean, minor basal decay area E side
<i>Design & impact summary</i>		<i>Remove: Located within building footprint</i>										
*5	<i>Populus deltoides</i> Cottonwood	24 x 17	1050, 700	4.1 15	M	Good	Fair / Good	4/3	2B	2	2	Exempt tree species. Twin stems at base with minor stem inclusion development, Suppressed canopy form biomass W, 700mm(Ø) stem lopped at 12m
<i>Design & impact summary</i>		<i>Remove: Located within building footprint</i>										
*6	<i>Populus deltoides</i> Cottonwood	24 x 18	900	3.2 10.8	M	Good	Fair / Good	4/3	0/2	2	2	Exempt tree species, Past central stem failure modifying form, main bowing stem at 10+m with biomass W
<i>Design & impact summary</i>		<i>Remove: Located within building footprint</i>										

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								
*7	<i>Populus deltoides</i> Cottonwood	18 x 14	800	3m 9.6	M	Good	Good	4/3	0/2C	2	2	Exempt tree species, Suppressed canopy form biomass NNE + light lean, stem wound at 8m N
<i>Design & impact summary</i>		<i>Remove: Located within building footprint</i>										
8	<i>Eucalyptus robusta</i> Swamp Mahogany	17 x 13	750	3 9	SM	Fair / Good	Fair / Good	3	4	2	2	Environmentally stressed with decline in canopy, large diameter deadwood & low foliage volume
<i>Design & impact summary</i>		<i>Retain: TPZ encroachment with footpath is likely Moderate to High (20-25%) impact at or near 20.3%, with building footprint identifying Moderate Low (10-15%) TPZ encroachment at 12.4% TPZ occupancy. Root system likely asymmetrical restricted by adjacent trees, kerb & guttering. Management to mitigate impact by design requires no over excavation or change in levels within 5m of tree, pathway on ground level with specific tree & ground protection, mulch & irrigation. Estimated <15% reduction pruning likely required to clear building line</i>										
9 CV	<i>Eucalyptus robusta</i> Swamp Mahogany	15 x 13	800	3 9.6	M	Good	Good	3	2C	2	2	Minor trunk indent seams N side to 1.5m, Suppressed canopy form biomass NNE
<i>Design & impact summary</i>		<i>Retain & protect: Negligible to Minor (<10%) TPZ occupancy by design footprint. Levels to remain as existing adjacent Warehouse 1 & 2 to Sewer easement with footpath constructed on or above ground level</i>										
10	<i>Eucalyptus robusta</i> Swamp Mahogany	15 x 13	850	3.1 10.2	M	Fair / Good	Fair / Good	3	4	2	2	Environmentally stressed, low foliage volume, decline in canopy + large diameter deadwood, suppressed canopy form ESE side
<i>Design & impact summary</i>		<i>Retain: TPZ encroachment with footpath is likely Moderate (20-25%) impact at or near 20.5%, with building footprint identifying Moderate Low (10-15%) TPZ encroachment at 13.5% TPZ occupancy. Root system likely asymmetrical restricted by adjacent trees, kerb & guttering. Management to mitigate impact by design requires no over excavation or change in levels within Warehouse 1 setback, pathway on ground level with specific tree & ground protection, mulch & irrigation. Estimated <10% reduction pruning likely required to clear building line</i>										
*11 x3	<i>Glochidion ferdinandi</i> Cheese Tree	4.5 x 4	200at base	1.6 2.4	ESM	Good	Fair / Good	4/3	0/2B	2	2	Group of three small exempt tree species <5m tall. Multi stemmed at base with minor stem inclusion development
<i>Design & impact summary</i>		<i>Retain select trees with onsite arborist advice & tree protection fencing prior to works. 1x small tree in corner (11c) likely requiring removal due to building footprint location, with retained level for management of T8 & 10 sufficing in mitigating impacts</i>										
*12	<i>Eucalyptus robusta</i> Swamp Mahogany	4 x 2	100at base	1.5 2	I	Good	Good	4/3	0/6/7	1	1	Tree with no significant visual faults
<i>Design & impact summary</i>		<i>Remove: Located within building footprint</i>										

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								
13	<i>Casuarina glauca</i> She Oak	5 x 2	100at base	1.5m 2	I	Good	Good	4/3	6/7	1	1	Tree with no significant visual faults
<i>Design & impact summary</i>		<i>Remove: Located within building footprint</i>										
14	<i>Eucalyptus robusta</i> Swamp Mahogany	7 x 3	150	1.6 2	I	Good	Good	3	6/7	1	1	Tree with no significant visual faults
<i>Design & impact summary</i>		<i>Remove: Located within building footprint</i>										
15	<i>Eucalyptus piperita</i> Sydney Peppermint	7 x 5	150, 100	1.8 3	ESM	Fair / Good	Fair	4/3	4/7	1	1	Slightly environmentally stressed with no significant visual faults
<i>Design & impact summary</i>		<i>Remove: Located within building footprint</i>										
16	<i>Eucalyptus robusta</i> Swamp Mahogany	8 x 3	200	1.8 2.4	ESM	Good	Good	3	6/7	1	2	Tree with no significant visual faults
<i>Design & impact summary</i>		<i>Remove: Located within building footprint</i>										
*17	<i>Glochidion ferdinandi</i> Cheese Tree	4 x 4	200at base	1.6 2.4	ESM	Good	Good	4/3	0/2B	2	2	Twin stems at 3m with minor stem inclusion development
<i>Design & impact summary</i>		<i>Remove: Located within building footprint</i>										
18	<i>Casuarina glauca</i> She Oak	10 x 3	200	1.8 2.4	ESM	Good	Good	4/3	6/7	1	1	Tree with no significant visual faults
<i>Design & impact summary</i>		<i>Remove: Located within building footprint</i>										
19	<i>Glochidion ferdinandi</i> Cheese Tree	6 x 4	150	1.5 2	ESM	Good	Good	4/3	6	1	1	Tree with no significant visual faults
<i>Design & impact summary</i>		<i>Remove: Located within building footprint</i>										
20	<i>Eucalyptus piperita</i> Sydney Peppermint	5 x 2	100	1.5 2	I	Good	Fair / Good	4/3	2C	2	2	Minor lower trunk sweep potentially from past root plate failure
<i>Design & impact summary</i>		<i>Remove: Located within building footprint</i>										
21	<i>Eucalyptus punctata</i> Grey Gum	6 x 2.5	100	1.5 2	I	Good	Good	3	6	1	1	Tree with no significant visual faults
<i>Design & impact summary</i>		<i>Remove: Located within building footprint</i>										
22	<i>Eucalyptus piperita</i> Sydney Peppermint	7 x 3	150	1.6 2	ESM	Good	Fair / Good	4/3	2B	2	2	Minor stem inclusion development at base evident
<i>Design & impact summary</i>		<i>Remove: Located within building footprint</i>										

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								
23	<i>Eucalyptus piperita</i> Sydney Peppermint	9 x 4	250	2m 3	ESM	Good	Fair / Good	4/3	2C	2	2	Tree with lower trunk bow & minor or superficial wounds evident
<i>Design & impact summary</i>		<i>Remove: Located within building footprint</i>										
24	<i>Eucalyptus piperita</i> Sydney Peppermint	15 x 5	250	2 3	ESM	Good	Good	3	6	1	1	Tree with no significant visual faults
<i>Design & impact summary</i>		<i>Remove: Located within building footprint</i>										
25	<i>Eucalyptus piperita</i> Sydney Peppermint	12 x 5	250	2 3	ESM	Good	Good	3	6	1	1	Tree with no significant visual faults
<i>Design & impact summary</i>		<i>Remove: Located within building footprint</i>										
*26	<i>Eucalyptus piperita?</i> Sydney Peppermint	6 x 4	100	1.5 2	I	Good	Good	4	0/7/2 E	2	2	Exempt tree species within 2m to building foundation. Vine covered to lower branch scaffolds, average form where location to infrastructure likely to become problematic in the future
<i>Design & impact summary</i>		<i>Remove: Located within building footprint</i>										
27 NT	<i>Phoenix canariensis</i> Phoenix Palm	6 x 5	600	- 3.5	ESM	Good	Fair / Good	4	0/7/ 2E	2	2	Palm located against neighbouring building where location to infrastructure likely to become problematic in the future
<i>Design & impact summary</i>		<i>Retain: likely asymmetrical root system restricted by adjacent building where location to infrastructure likely to become problematic in the future. Trunk appears 1.2m from boundary, requires arborist root pruning prior to excavation and construction along boundary with canopy reduction pruning to clear building like. Notional root zone impact & occupancy at or near 33% indicating Moderate to High level TPZ encroachment.</i>										

APPENDIX- D: Tree Location Plan



(A) EASEMENT TO DRAIN WATER 3 WIDE (DP1019363)
 (B) EASEMENT TO DRAIN WATER 1 WIDE (DP1019363)