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# **rainTree consulting**

## **Arboricultural Management**

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15 January 2019

## **34 BEATTY STREET**

**BALGOWLAH HEIGHTS, NSW**

# **ARBORICULTURAL ASSESSMENT & DEVELOPMENT IMPACT REPORT**

*Report Ref No- RTC-0119*

Prepared for

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## INTRODUCTION

This report has been commissioned by Carol & Luke Randell C/- CHROFI Architects 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 additions and alterations to the existing dwelling situated within Lot 21A of DP 350345 being known as 34 Beatty Street, BALGOWLAH HEIGHTS, 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.

Each tree 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 assessed trees may be referenced within the Tree Assessment Schedule and Tree Location Plan Appendices C and D.

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 radial, taken from the centre of the tree. To retain specific trees and ensure their viability development must take into consideration protection of the Tree Protection Zone (TPZ) radius as identified within Appendix- A Notes: *acceptable incursions*. As a guide to determining impacts the Structural Root Zone (SRZ) & Tree Protection Zone (TPZ) setbacks have been provided within Appendix- C the SRZ & TPZ distance column.

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

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

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

## METHODOLOGY

- i In preparation for this report a limited site and ground level Visual Tree Assessment (VTA) was conducted on Wednesday 5<sup>th</sup> December 2018 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 risk values determined by criteria explained within the ISA TRAQ manual 2013. The inspection included assessment of the overall health and vigour of the trees, tree form, structure and structural condition commencing from near the lower trunk to the upper first order branch division as best as site conditions would allow. On completion of the VTA the retention value of the tree was summarized utilizing the tree assessment Checklist, 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. 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). Palm heights were estimated by the height of the palm extending from ground level to the top of the crown shaft only.
- iii Development encroachments are referred to as No impact (0%) incursion, Low impact (<10%) of minor consequence, Medium impact (<20%) incursion where the project arborist is to demonstrate the tree/s remain viable by tree sensitive construction techniques, and High level impact (>20%) where design changes or further information is required to manage tree vitality.
- iv Plans and/or documentation received to assist in preparation of this assessment include:  
CHROFI Architects project No: 1816
  - Site Plan Dwg No. DA-002 issue A, dated 14.1.19
  - Ground Floor Plan Dwg No. DA-101 issue A, dated 14.1.19
  - First Floor Plan Dwg No. DA-102 issue A, dated 14.1.19
  - Garage Level Plan Dwg No. DA-105 issue A, dated 14.1.19
  - Elevations Sheets 1 & 2 Dwg No's. DA-201 & 202 issue A, dated 14.1.19
  - Sections Dwg No's. DA-301 & 302 issue A, dated 14.1.19  
VEKTA
  - Survey Plan ref No: 10158Adetail, rev B dated 22/2/2011

## 1. SUMMARY OF ASSESSMENT

### 1.1 General tree assessment

- 1.1.1 Twenty one (21) trees and/or palms have been assessed under this development proposal which consist of seventeen (17) non-prescribed exempt species.

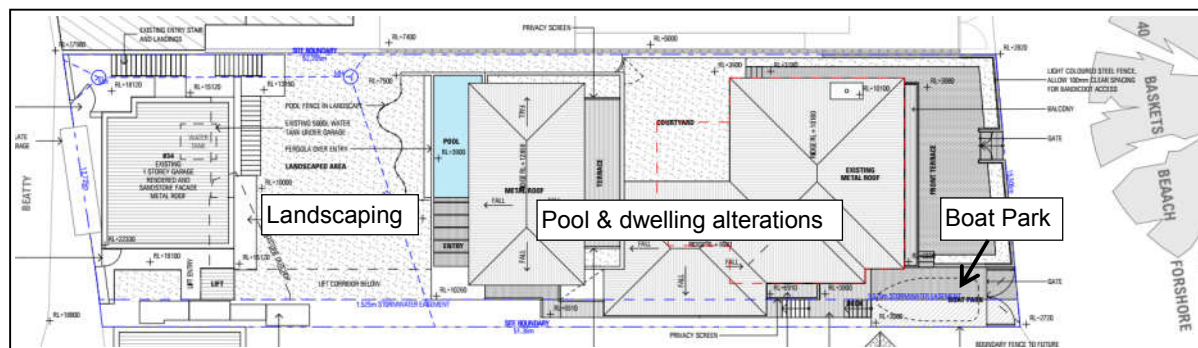
Non-prescribed species being undesirable trees, palms or trees less than 5m in height are identified as trees T1, 2, 3, 4, 7, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 & 20, with several small trees and shrubs scattered throughout the rear yard. Being exempt from protection the non-prescribed species are permitted to be managed (pruned, removed or relocated) without Council consent. Should an exempt specimen require retention prior to works occurring within specified Tree Protection Zone (TPZ) setbacks (identified within Appendix-C) further advice from an appointed project arborist is required.

- 1.1.2 Remaining trees 5, 6, 8 & 21 are considered viable for retention without change in existing site conditions or modification within the Tree Protection Zone (TPZ) radius.

### 1.2 The development proposal

- 1.2.1 The development proposal consist of additions and alterations to the existing dwelling with provision for new landscaping and rear yard swimming pool.

Figure 1, showing proposed development footprint



### 1.3 Tree removal to accommodate design

- 1.3.1 Based on the provided documentation four (4) prescribed trees T5, 6, 8 & 21 have been proposed for removal. Of these trees T5, 6 & 8 are capable of relocation or retention within landscape design principles.

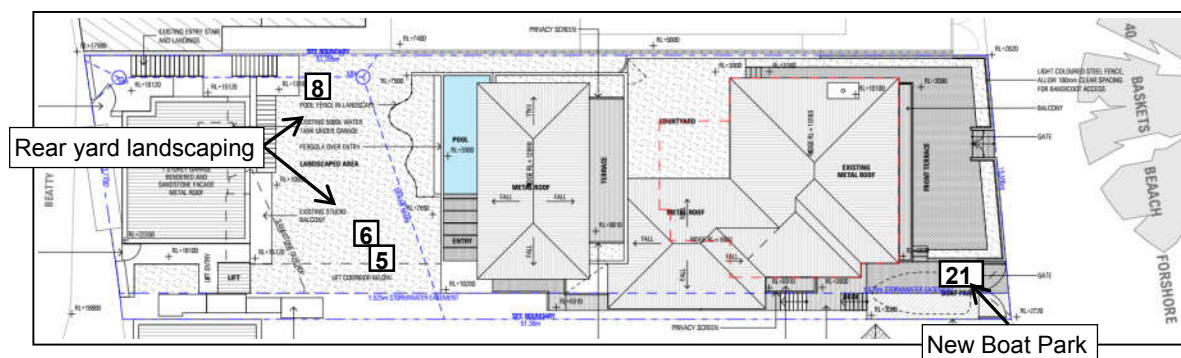
Exempt species permitted to be removed to accommodate design without Local Government Authority (LGA) consent are identified as trees 1, 2, 3, 4, 7, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 & 20.

Provided within the following sections discussions relating to tree protection, development impacts and removal by design are provided.

## 1.4 Discussion of development impacts

- 1.4.1 Palm 1 being an exempt palm tree is proposed for retention with minimal to no change in design adjacent the palm. Being located within a confined and part raised garden bed no works should occur within the 4m Tree Protection Zone (TPZ) without further arborist advice, (refer Garage Level Plan DA-105).
- 1.4.2 Trees 5, 6 & 8.
- Tree ferns 5 & 6. Site Plan DA-002 indicates their removal is likely required to accommodate new rear yard landscape design, with Section Plan DA-301 showing land modification for site leveling. Being tree ferns their relocation is somewhat possible within the design proposal.
  - Tree 8 the Frangipani tree has been proposed for removal. The tree is located at the edge of a steep embankment and displays average form. Although a species that also transplants easily the relocation of the tree may not be viable given the trees location within the environment, average form and branch structure.
- 1.4.3 Tree 21. To accommodate the proposed Boat Park adjacent Forty Baskets Beach the removal of the tree is required. The tree itself displays average branch sutural condition with minor weak stem inclusion development within the upper branch scaffolds. Also reducing the trees retention value is the trees severely bowing lean and canopy mass within Forty Baskets Beach Forshore, where lean may have been a result of past anchoring root failure.

Figure 2, showing proposed works adjacent T5, 6, 8 & 21



- 1.4.4 Neighbouring *Livistona australis* Cabbage Palms located south of the site have root zones protected by default given the adjacent stormwater culvert. No impacts to these palms is likely by the development proposal.
- 1.4.5 Forty Baskets Beach Forshore is of local, district and regional significance. Those trees located adjacent the property are not affected by site works, however, should access for construction activities be required the *Casuarina glauca* She Oak trees are to be protected from construction activity disturbances. Further advice for an appointed project arborist should be obtained prior to vehicle and/or construction access occurring which may disrupt or damage underlying tree roots.

## 2. CONCLUSIONS & RECOMMENDATION

### 2.1 Tree Removal

2.1.1 Based on the documents provided and with the consent of Council the removal of four (4) prescribed trees, T5, 6, 8 & 21 is required to accommodate design principles.

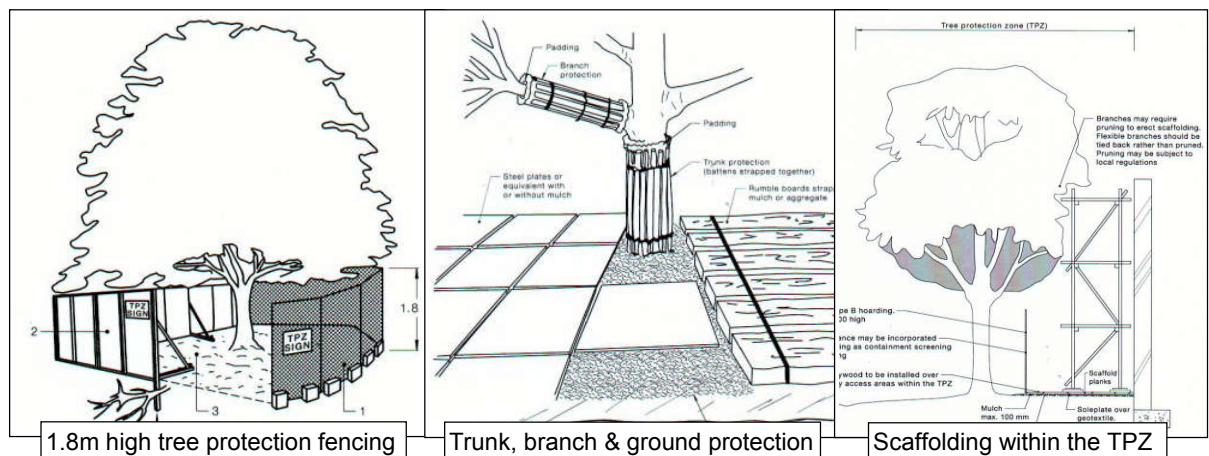
*Non-prescribed exempt tree removal* – those trees or palms permitted to be managed (pruned, removed or relocated) without Council consent are identified as non-prescribed species T1, 2, 3, 4, 7, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 & 20. Should an exempt specimen require retention prior to works occurring within specified Tree Protection Zone (TPZ) setbacks identified within Appendix-C further advice from an appointed project arborist is required.

### 2.2 Recommended tree management & protection principles

2.2.1 In addition to the recommendations provided within this report the following summary and/or additional recommendations are provided as a guide to tree protection during works:

1. *Specific* – Forty Baskets Beach Forshore trees. Should access for construction activities be required along the forshore further advice from an appointed project arborist is required. Tree protection zones are recommended to be put in place complying with timber beam trunk and ground (root) protection as indicated within Figure 3 below.
2. Tree / Palm 1. Should the non-prescribed palm tree be considered for retention no works, demolition or excavation should occur within the palms 4m tree protection zone. Excavation or demolition may destabilize the palm where further arborist advice is required to ensure the anchorage of the palm is not disrupted.

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



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

3. *Additional inground services within TPZ's* (Forshore specific) which may include 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.
  4. *Canopy pruning / tree removal:* where required tree removal and canopy reductions are to be approved by the Local Government Authority. Works are to be conducted by a suitably qualified AQF Level 3 arborist in accordance with AS4373 Pruning Standards, and specifically be conducted in accordance with Safe Work Australia – Guide to managing risks of tree trimming and removal works 2016 ([www.swa.gov.au](http://www.swa.gov.au)).
  5. Should there be any uncertainty in tree protection requirements the appointed arborist is to be consulted prior to work activities commencing.
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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 6/2014  
Member: Arboriculture Australia No.1292, Working With Children No: WWC01446



## APPENDICES

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## APPENDIX- A: Terminology, notes & references

**Acceptable Risk:** Exposure to or reject risk of varying degrees. The acceptable risk is defined as 'The person who accepts some degree of risk in return for a benefit being exposed to some risk of varying degree.'

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

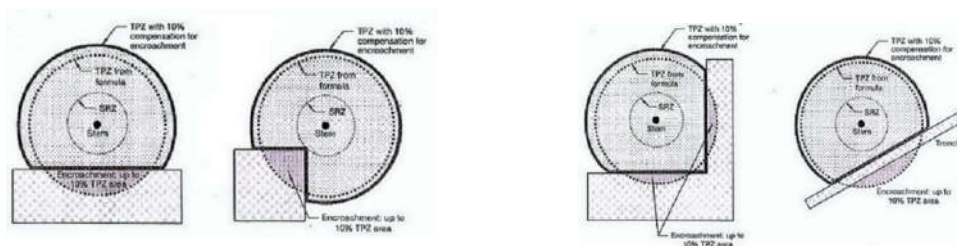
### NOTES:

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.

**The extent of inclusion within the TPZ radius has been categorized as follows:**

<10% = negligible incursion / >10 - <15% = low to moderate level of incursion / >15 - <20% = moderate level of incursion / >20 - <25% = moderate to high level of incursion / >25 - <35% = high level of incursion, >35% = significant inclusion within the TPZ

Showing acceptable incursion within the TPZ (AS4970)



### SELECTED REFERENCES:

- Barrell J. 1993, 'Preplanning Tree Surveys: Safe useful Life expectancy (SULE) is the Natural Progression', Arboricultural Journal 17: 1, February 1993, pp. 33-46.
- International Society of Arboriculture (ISA) 2013, Tree Risk Assessment Manual, Martin Graphics, Champaign Illinois U.S.
- Mattheck, C. & Breloer, H.(1994) *The Body Language of Trees*. Research for Amenity Trees No.4 the Stationary Office, London.
- Matheny N. & Clark J. 1998, *Trees & Development 'A Technical Guide to Preservation of Trees During Land Development'* International Society of Arboriculture, Champaign USA.
- Manly Development Control Plan (DCP) 2013 Amendment 11 dated 28 August 2017
- Standards 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.

**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
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**ii) Visual Tree Assessment (VTA)**

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

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

1	High retention	2	Medium retention	3	Low retention	4	Consider removal
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**iv) U.L.E. categories** Useful Life Expectancy (after *Barrell* 1996, modified by the author). A trees U.L.E. category is the life expectancy of the tree modified first by its age, health, condition, safety and location. U.L.E. assessments are not static but may be modified as dictated by changes in trees health and environment.

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

**APPENDIX- C: Tree Assessment Schedule**

Trees requiring removal due to hazardous or dead condition - subject to Local Government Authority notification							Trees with low retention values: senescence, developing defects or being *exempt trees from the LGA Tree Preservation Order (TPO)					
Tree No	Botanical Name COMMON NAME	Height x spread (m)	DBH (mm)	SRZ	Age	Health	Condition	Significance	VTA	RV	U. L.E.	Comments CV = Council verge tree NT= Neighbouring tree
				TPZ								
*1	<i>Phoenix canariensis</i> Phoenix Palm	8 x 6	650	- 4m	SM	Good	Good	4/3	0/ 2C/E	2	3	Exempt palm species, location to infrastructure may become problematic in future with minor wound at base EST
*2	<i>Dicksonia antarctica</i> Soft Tree Fern	<5 x 3	200	- 3	SM	Good	Good	4/3	0/6	1	2/5	Exempt fern height class
*3	<i>Camellia japonica</i> Camellia	2.5 x 2.5	200at base	1.6 2.4	ESM	Fair / Good	Fair / Good	4	0/4	3	3	Exempt tree species height class with significant decline WST side
*4	<i>Strelitzia reginae</i> Giant Bird of Paradise	av 12 x 4	av 200	- 3	M	Good	Good	4/3	0/6	1	2	Not classified as a tree = exempt palm species
5	<i>Dicksonia antarctica</i> Soft Tree Fern	6 x 4	200	- 3	M	Good	Good	4/3	6	1	2	Fern with no significant defects noted
6	<i>Dicksonia antarctica</i> Soft Tree Fern	6 x 4	200	- 3	M	Good	Good	4/3	6	1	2	Fern with no significant defects noted
*7	<i>Dicksonia antarctica</i> Soft Tree Fern	2.5 x 3	200	- 2.5	ESM	Good	Good	4/3	0/6	1	2/5	Exempt species height class
8	<i>Plumeria sp</i> Frangipani	5 x 4	200at base	1.6 2.4	ESM	Good	Fair	4/3	2E	2	2	Slight lean EST & located at edge of embankment = likely to become problematic in future, average form with limited lower scaffolds
*9	<i>Hibiscus sp</i> Hibiscus	4 x 3	300at base	2 3.6	ESM	Good	Fair / Good	4/3	0/2B	2	2	Exempt tree species height class, multi stemmed at base, with minor stem inclusion development
*10	<i>Archontophoenix cunninghamiana</i> Bangalow Palm	15 x 4	300	- 3	M	Good	Good	4/3	0/6	1	2	Exempt palm species with no significant defects noted
*11	<i>Strelitzia reginae</i> Giant Bird of Paradise	av 7 x 3	av 150	- 2.5	SM	Good	Good	4/3	0/6	1	2	Not classified as a tree = exempt palm species

Trees requiring removal due to hazardous or dead condition - subject to Local Government Authority notification						Trees with low retention values: senescence, developing defects or being *exempt trees from the LGA Tree Preservation Order (TPO)						
Tree No	Botanical Name COMMON NAME	Height x spread (m)	DBH (mm)	SRZ	Age	Health	Condition	Significance	VTA	RV	U. L.E.	Comments CV = Council verge tree NT= Neighbouring tree
				TPZ								
*12	Archontophoenix cunninghamiana Bangalow Palm	9 x 5	250	- 3.5	SM	Good	Good	4/3	0/6	1	2	Exempt palm species with no significant defects noted
*13	Strelitzia reginae Giant Bird of Paradise	av 9 x 3	av 150	- 2.5	SM	Good	Good	4/3	0/6	1	2	Not classified as a tree = exempt palm species
*14	Strelitzia reginae Giant Bird of Paradise	av 8 x 3	av 150	- 2.5	SM	Good	Good	4/3	0/6	1	2	Not classified as a tree = exempt palm species
*15	Strelitzia reginae Giant Bird of Paradise	av 3 x 3	av 150	- 2.5	ESM	Good	Good	4/3	0/6	1	2	Not classified as a tree = exempt palm species
*16	Archontophoenix cunninghamiana Bangalow Palm	10 x 6	250	- 4	SM	Good	Good	4/3	0/6	1	2	Exempt palm species with no significant defects noted
*17	Strelitzia reginae Giant Bird of Paradise	av 3 x 3	av 200	- 2.5	ESM	Good	Good	4/3	0/6	1	2	Not classified as a tree = exempt palm species
*18	Strelitzia reginae Giant Bird of Paradise	av 3 x 3	av 200	- 2.5	ESM	Good	Good	4/3	0/6	1	2	Not classified as a tree = exempt palm species
*19	Strelitzia reginae Giant Bird of Paradise	av 3 x 3	av 200	- 2.5	ESM	Good	Good	4/3	0/6	1	2	Not classified as a tree = exempt palm species
*20	Datura sp Datura	av 4.5 x 3	av 200at base	1.6 2.4	SM	Fair	Fair / Good	4	0/2C/B	3	3	Exempt species height class with minor wounds & stem inclusion development at base of multi stems
21	Arbutus unedo Strawberry tree	6 x 5	200	1.8 2.4	EM	Good	Fair	4/3	7/2B	2	3	Significant lean EST from potential past root failure with Restricted VTA due to vegetation at base. Contains minor stem inclusion development in upper branch scaffolds
NOTE		Neighbouring Livistona australis Cabbage Palm trees to the south are protected by default – where the adjacent stormwater culver has restricted root encroachment within the site.										

## APPENDIX- D: Tree Location Plan

