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Arborist Impact Assessment

Gosford Waterfront Precinct Revitalisation

Grahame Park, Waterfront Park & 6 Dane Drive, Gosford, NSW 2250

Lot 12/-/DP868080, Lot 7017 DP 1116968, Lot 7018 DP 1116947



Prepared for: ADW Johnson

28 May 2026

AEP Ref: 6061

Revision: 00

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Document Control

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Client Name	ADW Johnson for the Hunter and Central Coast Development Corporation (HCCDC)
AEP Project Team	John Atkins Joe Young

Revision

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00	3/06/2026	John Atkins	Joe Young	Joe Young

Distribution

Revision	Date	Name	Organisation
00	4/06/2026	Belinda Rollison	ADW Johnson

Disclaimer

Direct observations are relevant only to the trees identified within this report. This report utilises a rapid assessment of tree health and condition to inform retention value. This assessment of tree health and condition is based on non-destructive visual observations from ground level. Thus, it is not possible to identify all structural faults at high levels in the tree, internal structural faults or within the root system.

Observations about Tree Health, Structure, and other characteristics have been made at the time of assessment and these characteristics may change over time due to natural growth of the tree as a living organism or due to unforeseen events. As such the observations that are supplied within are relevant for a period of 12 months from the time of assessment, after which re-assessment may be required for the trees assessed within this report.

The recommendations and methodologies for Tree Protection within this report are relevant only to the Trees assessed within this report. The author is not responsible for tree damage related to failure to apply these recommendations or methodologies for Tree Protection in full within this report or for tree damage relating to works conducted by an unaffiliated person. No responsibility for damage to persons or property is accepted for damage by trees referred to within this report.

Executive Summary

At the request of ADW Johnson (the client), Anderson Environment & Planning (AEP) have prepared an Arborist Impact Assessment and Tree Protection Plan to address the potential arboricultural impacts from the proposed Gosford Waterfront Precinct Revitalisation Project (the Proposal) at Grahame Park, Waterfront Park and Sailing Club to Sea Park on recreational land at Dane Drive, Gosford, NSW (the Subject Site).

This report considers the landscape designs proposal for the site prepared by ADW Johnson (2026).

The arborist site survey was undertaken on 1st April 2026. A total of 18 trees were assessed. Tree Assessment was undertaken by the following methodologies (**Section 4**);

- A visual tree assessment as described by Mattheck and Breloer (1994);
- Characteristic features for each tree were recorded;
- Structural Root Zone (SRZ) and Notional Root Zone (NRZ) using methods of calculation as outlined in AS 4970 – 2025; and
- Landscape Significance Rating (LSR) and Retention Values as outlined by Morton (2006).

The following landscape significance ratings (LSRs) have been applied to the assessed trees:

- Two (2) 'Very High' These trees have a very large live crown size exceeding 200m²; and as a visually prominent specimen in good condition;
- 13 'High', due to their canopy size and good health and as representatives of the original vegetation of the area;
- Three (3) 'Moderate' due to their canopy size and higher visibility as exotic or native cultivar status; and

With consideration of the estimated life expectancy for each tree, Retention Values were assigned to each tree within the site. This identified the following;

- 14 'High';
- Four (4) 'Moderate'; and

No hollows or large stick nests were noted in the assessed trees.

One (1) assessed tree is recommended for removal as a hazardous tree. All 18 other trees are recommended for retention, most with protection measures (**Section 6.1, Table 3**), including;

- Two (2) trees located within the development footprint that require no protection fencing;
- Seven (7) trees which will have major encroachment within the NRZ (>20%) and possible SRZ encroachment by the shared user pathway works;
- Seven (7) trees where encroachment within the NRZ is up to 20%
- Two (2) trees where tree protection measures are still recommended with no encroachment of the NRZ.

Details of recommendations have been included in Tree Protection Measures (**Section 6.1, Table 3**).

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1.0 Introduction

1.1 Background

At the request of ADW Johnson (the client), Anderson Environment & Planning (AEP) have prepared an Arborist Impact Assessment and Tree Protection Plan to address the potential arboricultural impacts from the proposed Gosford Waterfront Precinct Revitalisation Project (the Proposal) at Grahame Park, Waterfront Park and Sailing Club to Sea Park on recreational land at Dane Drive, Gosford, NSW (the Subject Site).

This report considers the landscape designs proposal for the site prepared by ADW Johnson (2026).

1.2 Objectives

Further to the above the following objectives for this report have been assigned:

- Tree identification plan and schedule identifying tree species, size, canopy spread and other dimensions;
- Assessment of all trees within the Subject Sites along Gosford Waterfront Precinct including, but not limited to, the health and vigour of the trees, structural integrity, life expectancy, retention value and landscape significance;
- Likely impact the proposed development will have on assessed trees, including NRZ and SRZ encroachments; and
- Tree protection plan and methodologies throughout the development for all impacted trees to be retained.

2.0 Site Description and Locality

Table 1 provide the site details for the Subject Site.

Table 1 – Site Particulars

Detail	Comments
Client	ADW Johnson for Hunter and Central Coast Development Corporation
Address	Grahame Park, Waterfront Park and Sailing Club to Sea Park along Dane Drive Gosford
Title(s)	Lot 12/-/DP868080, Lot 7017 DP 1116968, Lot 7018 DP 1116947
Subject Site	The Subject Site encompasses three sections of Gosford Waterfront Precinct. Area 1 is Grahame Park; Area 2 is Waterfront Park and Area 3 Sailing Club to Sea Park.
LGA	Central Coast Council
Zoning	Under the <i>Central Coast Local Environmental Plan 2022</i> (the LEP), the Subject Site is zoned RE1– Public Recreation
Current Land Use	The Subject Site is a combination of three zones used for public recreation in varying degrees. Grahame Park is largely undeveloped and limited in use due to minimal assets present. Waterfront Park connects with other facilities along the waterfront precinct and periodically allows use for circuses and other events. Area 3 adjoins the Lions Park and playground area, Gosford Pool and the Sailing Club.
Surrounding Land Use	The Subject Site is entirely surrounded by major roads and parkland.

Detail	Comments
Soil	The Subject site is listed as disturbed terrain and is likely to be fill material with possible ash deposits and imported spoil used to create level areas above the tidal zones. Soils are likely to be highly sodic in Grahame Park. (eSpade, 2026).

3.0 Proposed Development

It is proposed to:

1. Modify Grahame Park with a new walkway/cycleway and landscape features, additional car parking and tree planting.
2. Create a new café and outdoor seating area on the northern side of the car park at Gosford Boat Ramp.
3. Completion of the shared path connection between the Gosford Sailing Club and Gosford Lion's Park.

Figure 1 depicts the extent of the Subject Site overlain on an aerial photograph of the locality.

Figure 2 shows a concept plan for the proposed development.

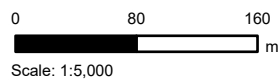


-  Study Area
-  Area 1
-  Area 2
-  Area 3

Figure 1 - Site Location

Address: Gosford Waterfront Precinct
Client: HCCDC c/- ADW Johnson
AEP Ref: 6061 | Date: 03 June 2026

Imagery: Nearmap (19/12/2025)
Spatial Reference: GDA2020 MGA Zone 56



Disclaimer: While reasonable care has been taken to ensure the information on this map is accurate and up-to-date, errors or omissions may still occur. Please verify the accuracy of all information before use. Note that boundaries are not survey accurate and do not scale off this plan.

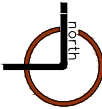
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HOMETOWN AUSTRALIA
LANDSCAPE DESIGN DEVELOPMENT (50%)

SHEET NO	SHEET NAME	REVISION	DATE
LDD 001	LANDSCAPE COVER SHEET	A	30.04.26
LDD 002	LANDSCAPE LEGEND	A	30.04.26
LDD 100	LANDSCAPE GENERAL ARRANGEMENT PLAN	A	30.04.26
LDD 200	EXISTING CONDITIONS AND DEMOLITION PLAN 1	A	30.04.26
LDD 201	LANDSCAPE PLAN 1	A	30.04.26
LDD 300	EXISTING CONDITIONS AND DEMOLITION PLAN 2	A	30.04.26
LDD 301	LANDSCAPE PLAN 2	A	30.04.26
LDD 400	EXISTING CONDITIONS AND DEMOLITION PLAN 3	A	30.04.26
LDD 401	LANDSCAPE PLAN 3	A	30.04.26
LDD 500	LANDSCAPE PLANT SCHEDULES	A	30.04.26
LDD 501	LANDSCAPE PLANT SCHEDULES	A	30.04.26
LDD 502	LANDSCAPE MATERIALS AND FINISHES SCHEDULES	A	30.04.26
LDD 600	LANDSCAPE TREE RETENTION PLAN 1	A	30.04.26
LDD 601	LANDSCAPE TREE RETENTION PLAN 2	A	30.04.26
LDD 602	LANDSCAPE TREE RETENTION PLAN 3	A	30.04.26
LDD 603	LANDSCAPE TREE RETENTION SCHEDULE	A	30.04.26
LDD 604	LANDSCAPE TREE RETENTION DETAILS	A	30.04.26
LDD 700	LANDSCAPE DETAILS	A	30.04.26
LDD 800	LANDSCAPE SPECIFICATION	A	30.04.26
LDD 801	LANDSCAPE SPECIFICATION	A	30.04.26
LDD 802	LANDSCAPE SPECIFICATION	A	30.04.26

NOT FOR CONSTRUCTION

	CLIENT HCCDC	REV.	DATE	AMENDMENT	DRAWN	CHECKED	PROJECT No.	DISCIPLINE	PREFIX	NUMBER	SCALES
	PROJECT GOSFORD, NSW	A	30.04.26	50% Issue Detailed Design	AKU	BRO	191143	LA		LDD 001	1:5000
							PLAN TITLE LANDSCAPE COVER SHEET				

4.0 Methodology

The arborist site survey was undertaken on 1st April 2026. Each tree observed within the Subject Site was assigned a unique tree number. Tree species were identified based on guidance, descriptions and records provided by the Royal Botanic Gardens (Plantnet 2022).

4.1 Visual Tree Assessment

A visual tree assessment to evaluate the health and condition of these trees in relation to the impacts of the proposed development was undertaken from ground level following the methodology described by Mattheck and Breloer (1994). Tree height was estimated following the guidance outlined in the Private Native Forestry Code of Practice (DECC 2007) and confirmed with a laser range finder. The Diameter at Standard Height (DSH) and Diameter Above Buttress (DAB) was determined using a DSH tape and methods of calculation for the Structural Root Zone (SRZ) and Notional Root Zone (NRZ) applied as outlined in Australian Standard 4970-2025 *Protection of trees on development Sites* (AS 4970 – 2025) (Standards Australia 2025). Tree Total Canopy Area was estimated from the formula πx (average canopy spread)². Tree data and photos were recorded with a mobile phone.

4.2 Tree Location Mapping and Data

Tree locations were recorded using ESRI Field Maps in conjunction with a handheld GPS device. These coordinates were projected into GIS mapping software to visualise tree positions spatially. As handheld GPS units can be subject to minor positional inaccuracies, the plotted locations may not reflect absolute location.

To improve location accuracy, trees were positioned based on landscape plans provided by ADW Johnson derived from survey plans.

Client supplied plans (**Figure 2**) were geo-referenced within GIS software. These plans served as a framework against which tree impact determinations were made. Tree protection and development-related constraints were assessed relative to the site layout.

4.3 Tree Retention Value

To determine tree Retention Value a Landscape Significance Rating (LSR) was assigned to each tree. The LSR value provides consideration of the tree's amenity, environmental and heritage values (refer **Appendix B**). Trees are then assigned one of the following LSR categories:

- Significant (1);
- Very High (2);
- High (3);
- Moderate (4);
- Low (5);
- Very Low (6); and
- Insignificant (7).

Once the landscape significance value has been determined the following assessment matrix that utilises estimated life expectancy and landscape significance (**Table 2**) was applied to each tree.

Table 2 – Tree Retention Status Matrix Assessment matrix adopted from Morton (2006)

Landscape significance rating							
Estimated Life Expectancy	1	2	3	4	5	6	7
Greater than 40 Years	High						
15 to 40 Years				Moderate			
5 to 15 Years				Low			
Less than 5 Years					Very low		
Dead or Hazardous							

4.4 Limitations

This report utilises a rapid assessment of tree health and condition to inform retention value. Should a detailed assessment of tree structural health and condition be required a tree risk assessment report should be commissioned.

This assessment of tree health and condition is based on non-destructive visual observations from ground level. Thus, it is not possible to identify all structural faults at high levels in the tree, internal structural faults or within the root system. Should a detailed assessment for structural faults be required a tree risk assessment report should be commissioned.

Weather conditions such as extreme wind, storm activity, lightning as well as other events or disturbances independent of the proposed activities are unpredictable. Unforeseeable damage to trees may occur as a result of unpredictable or unplanned weather events or disturbances.

Tree identifications are based on identifying features (fruit, inflorescence, etc.) found during April and made at ground level from within the Subject Site.

The total canopy area for each tree utilised within this report is an estimation based on field observation of canopy spread and the true amount of canopy area may differ.

Tree identified within by this plan are located to GPS accuracy and there may be some minor discrepancy in the true location.

Impact assessment was based on plans provided by the client (**Figure 2**) at the time of preparation of this report. Any changes to the design footprint will alter some of the recommendations and this report should be updated to reflect these changes.

5.0 Tree Assessment Results

A total of 18 trees identified within the site and neighbouring properties were assessed. Observations were made for each assessed tree (**Appendix A**). Tree locations are shown in **Figure 3**.

5.1 Summary of Tree Condition and Characteristics

All 18 trees assessed are located within the Subject Site areas.

The assessed trees were of both native and exotic species. There is some likelihood that trees may have some historical links to the waterfront development, but this is not clearly known.

The condition of the assessed trees includes 11 in fair condition and eight (8) in good condition.

Notable Trees within this grouping are:

- Trees 5 and 6 (*Ficus microcarpa* var. 'Hillii' & *Ficus rubiginosa* respectively) are two semi-mature trees with canopy areas that exceed 200 m². They are visually prominent in the area and both have a High retention value.
- Tree 9 (*Araucaria heterophylla* – Norfolk Island Pine) with poor canopy condition. This tall, old tree (measured at 31.5 m in height) has a very sparse canopy with stunted growth and very limited crown spread. The cause of the tree's condition is not known, possibly caused by bird damage or severe drought and storm effect. The root zone appears to have been compacted on east side and root crown has signs of a previous slab restriction over the roots.
- Trees 10 – 18 (*Lophostemon confertus* – Brush Box) these trees have extensive damage to surface roots and, in some cases, mechanical damage to the base of the trunks from parking vehicles. The shaded area under the tree provides cooler parking for users of the site, particularly the Sailing Club users. The soil about these trees is heavily compacted.

5.2 Summary of Landscape Significance and Retention Value

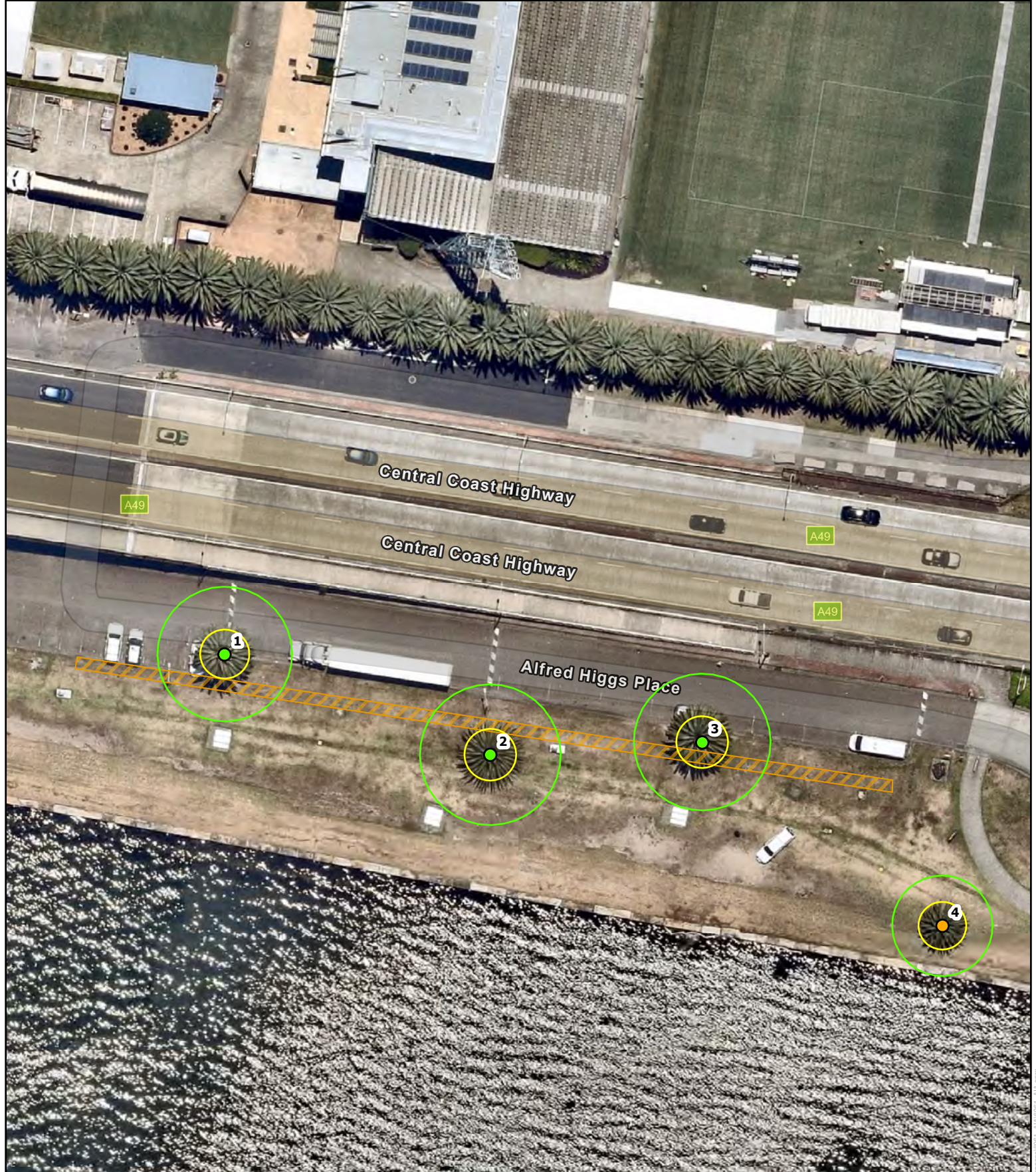
The following landscape significance ratings (LSRs) have been applied to the assessed trees:

- Two (2) 'Very High' These trees have a very large live crown size exceeding 200m²; and as a visually prominent specimen in good condition;
- 13 'High', due to their canopy size and good health and as representatives of the original vegetation of the area;
- Three (3) 'Moderate' due to their canopy size and higher visibility as exotic or native cultivar status; and

With consideration of the estimated life expectancy for each tree, Retention Values were assigned to each tree within the site. This identified the following;

- 14 'High';
- Four (4) 'Moderate'; and

No hollows or large stick nests were noted in the assessed trees.



Impact Area

NRZ

SRZ

Retention Value

High

Low

Moderate

Very Low

Figure 3 - Tree Retention - Area 1



Scale: 1:600





 Impact Area

Retention Value

-  High
-  Low
-  Moderate
-  Very Low

Figure 4 - Tree Retention Area 2

0 10 20
m
Scale: 1:600



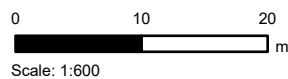


Impact Area

Retention Value

- High
- Low
- Moderate
- Very Low

Figure 5 - Tree Retention Area 3



6.0 Tree Impact Assessment

The Notional Root Zone (NRZ) and Structural Root Zone (SRZ) are indicative areas critical for maintaining a tree's viability and stability respectively, holding the majority of the roots necessary for each function. Any ground works within these zones are likely to impact the viability or stability of the tree by injuring the root system. Trees were assessed against plans provided by the client. Consideration is also given to the tree's tolerance to disturbance, health, structure condition and long-term viability within the site.

6.1 Proposal Impacts

6.1.1 Retained Trees

Eighteen trees are proposed for retention. The following relates to tree protection for these trees:

Trees with predicted minor encroachment into their NRZ (<10%);

- Trees 2, 6, 7 & 8 have minor encroachment less than 10%
- These trees have predicted minor encroachment (<10%) by the development, however the NRZ of these trees can be feasibly offset into unimpacted areas and these trees should be retained with tree protection measures;

Trees with a predicted moderate encroachment into their NRZ (10 – 20%);

- Trees 4, 5, 11, 13 and 18 have encroachment of between 10 – 20%.
- Tree 4 will require protection measures and ongoing management during and after construction to compensate for root loss as this palm is already in fair to poor health. The pathway can be moved slightly to reduce any risks.
- The encroachment within the NRZ of Tree 5 is not critical as the site inspection showed that the root system has already been restricted by a previous structure and the proposed new café will not impact this tree. Protection measures are still required.
- Trees 13 and 18 have moderate encroachment that, combined with current compaction and basal damage by cars, compounds this impact. Protection measures and a suitable medium for the walkway encroachment that allows good gaseous exchange is vital.

Trees with a predicted major encroachment into their NRZ (>20%);

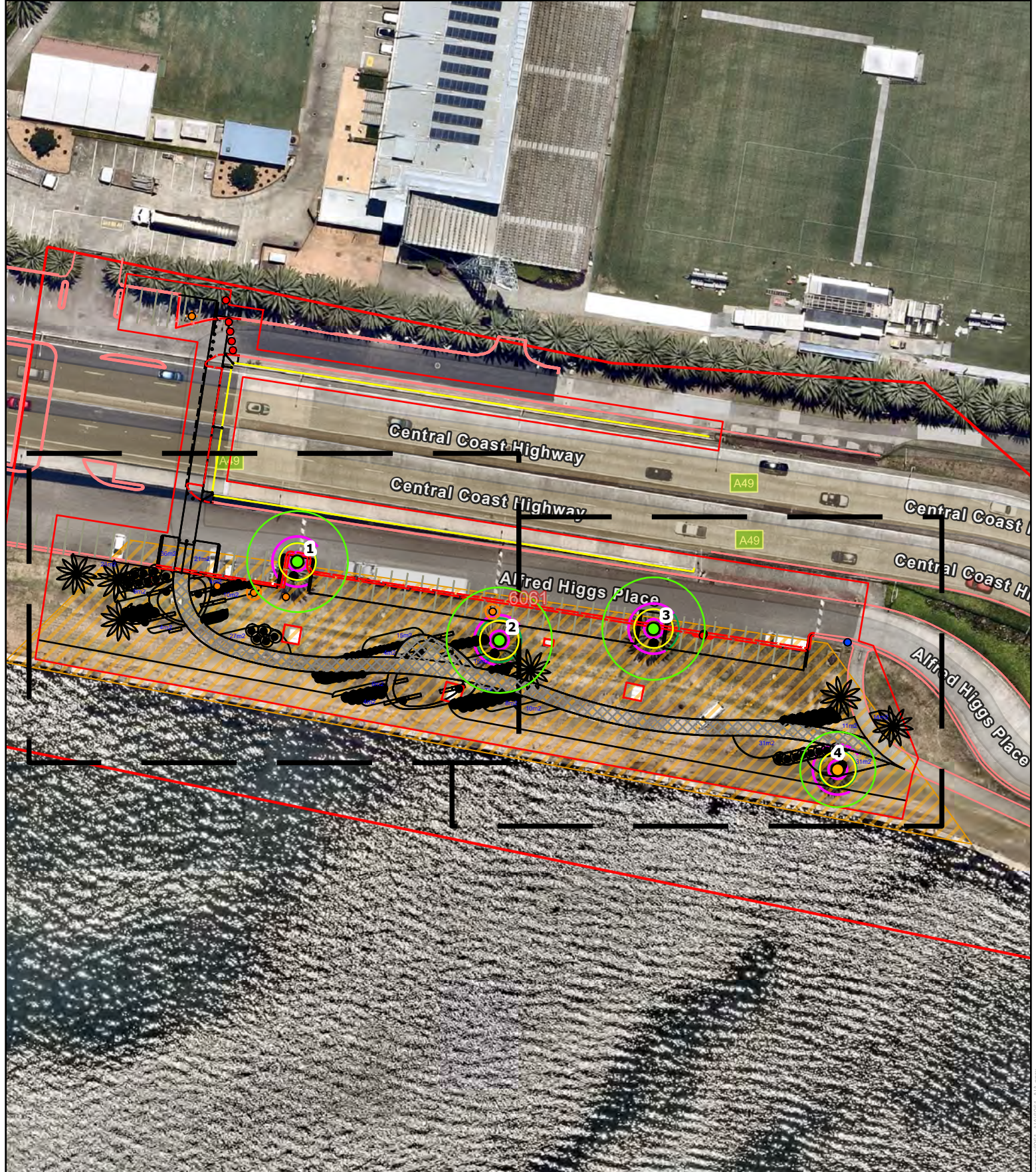
- Trees 9, 10, 12, 14, 15, 16 & 17 have encroachment within the NRZ of greater than 20%.
- Tree 9 is a large tree with a substantial Notional Root Zone and Structural Root Zone. The proposed walkway/cycleway encroaches more than 20 % of the NRZ and encroaches within the SRZ distance. As this tree is currently in only Fair condition, the tree will be adversely impacted if conventional construction methods of a reinforced concrete pathway. The use of an elevated walkway, or a permeable pavement system would reduce the impacts of the encroachments. The tree also requires pruning to remove a large amount of deadwood that would be over the walkway and management of the remaining NRZ area to improve tree health.
- Trees 10 – 7 already suffer the impacts of compaction and physical damage to roots and the trunk. The proposed walkway/cycleway will encroach within the NRZ areas of these trees likely to exceed 20%. As in Tree 9 above, alternative methods of construction will significantly reduce the extent of root damage and allow retention of the trees. Additionally, improving the growing conditions about trees 9, 10 – 18 by the use of mulch, nutrients and good water during dry periods will enhance the areas of roots unaffected by development.

TPZ fencing as displayed in **Figure 5** will be required for the duration of works to protect all trees in close proximity to works.

Table 3 provides a summary of impact assessment.

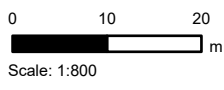
Table 3 – Summary of Impact Assessment

Tree Assessment	Retention Value (Tree No)			Total
	High	Moderate	Low	
Retain (No fencing)	Tree 2	Tree 4		2
Retain (Protection fencing)	Tree 1, 3, 5, 6, 7, 8, 10, 12, 13, 14, 16, 17, 18	Trees 9, 11, 15		16
Total Tree Retention	14	4	0	18



- Legend**
- Impact Area
 - Retention Value High
 - Retention Value Low
 - Retention Value Moderate
 - Retention Value Very Low

Figure 6 - Tree Assessment Area 1

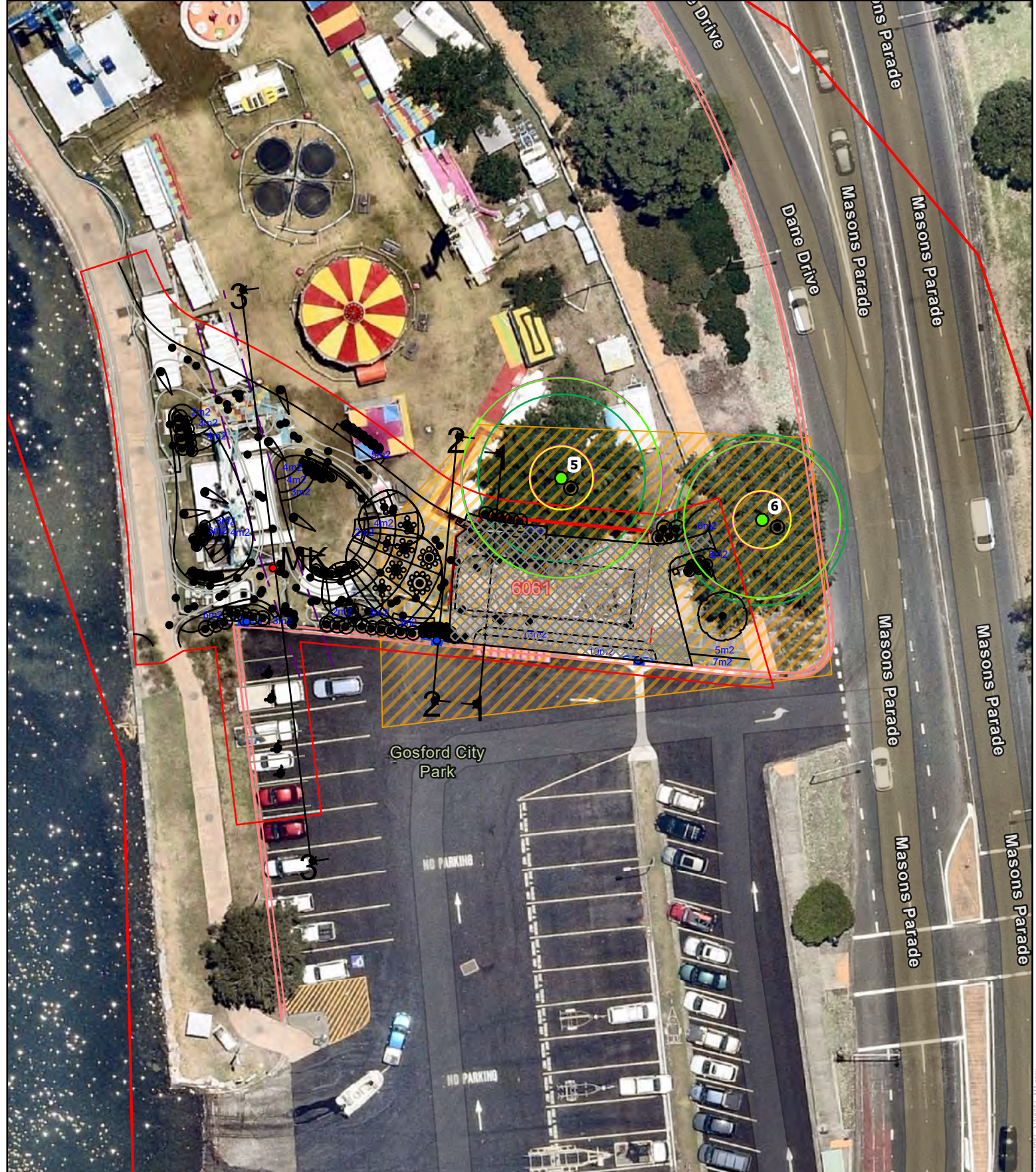


Address: Gosford Waterfront Precinct
 Client: HCCDC c/- ADW Johnson
 AEP Ref: 6061 | Date: 03 June 2026

Imagery: Nearmap (19/12/2025)
 Spatial Reference: GDA2020 MGA Zone 56

Disclaimer: While reasonable care has been taken to ensure the information on this map is accurate and up-to-date, errors or omissions may still occur. Please verify the accuracy of all information before use. Note that boundaries are not survey accurate and do not scale off this plan.

Path: G:\Shared drives\6061 - Gosford Waterfront Tender - AEP\Mapping\Workspaces\6061_AEA\6061_AEA.aprx



Legend

- Impact Area
- NRZ
- SRZ

Retention Value

- High
- Low
- Moderate
- Very Low



Legend

- Impact Area
- SRZ
- NRZ

Retention Value

- High
- Low
- Moderate
- Very Low

7.0 Recommendations

7.1 Tree Retention and Removal

- Trees designated for retention within this report as outlined in **Section 6** to the development footprint should be retained with Tree Protection Measures.

7.2 Project Arborist

- At the commencement of the development a Project Arborist shall be appointed, holding a minimum of AQF level 5 in Arboriculture and with experience on site clearance work of trees.
- The Project Arborist (PA) shall communicate with the project manager and site supervisor prior to commencement of construction.
- The PA shall identify the trees to be retained and set out on ground the positions of tree protection fence panels to be installed.
- Prior to commencement of earthworks, the PA shall inspect the fences and ensure the trees are adequately protected, then issue an email stating compliance with tree protection fence placements has occurred.
- Trees will be inspected at the final stage of earthworks. The inspection will identify any changes in tree health due to impacts from the development or environmental factors. A compliance certificate will be issued.

7.3 Design of landscaped areas

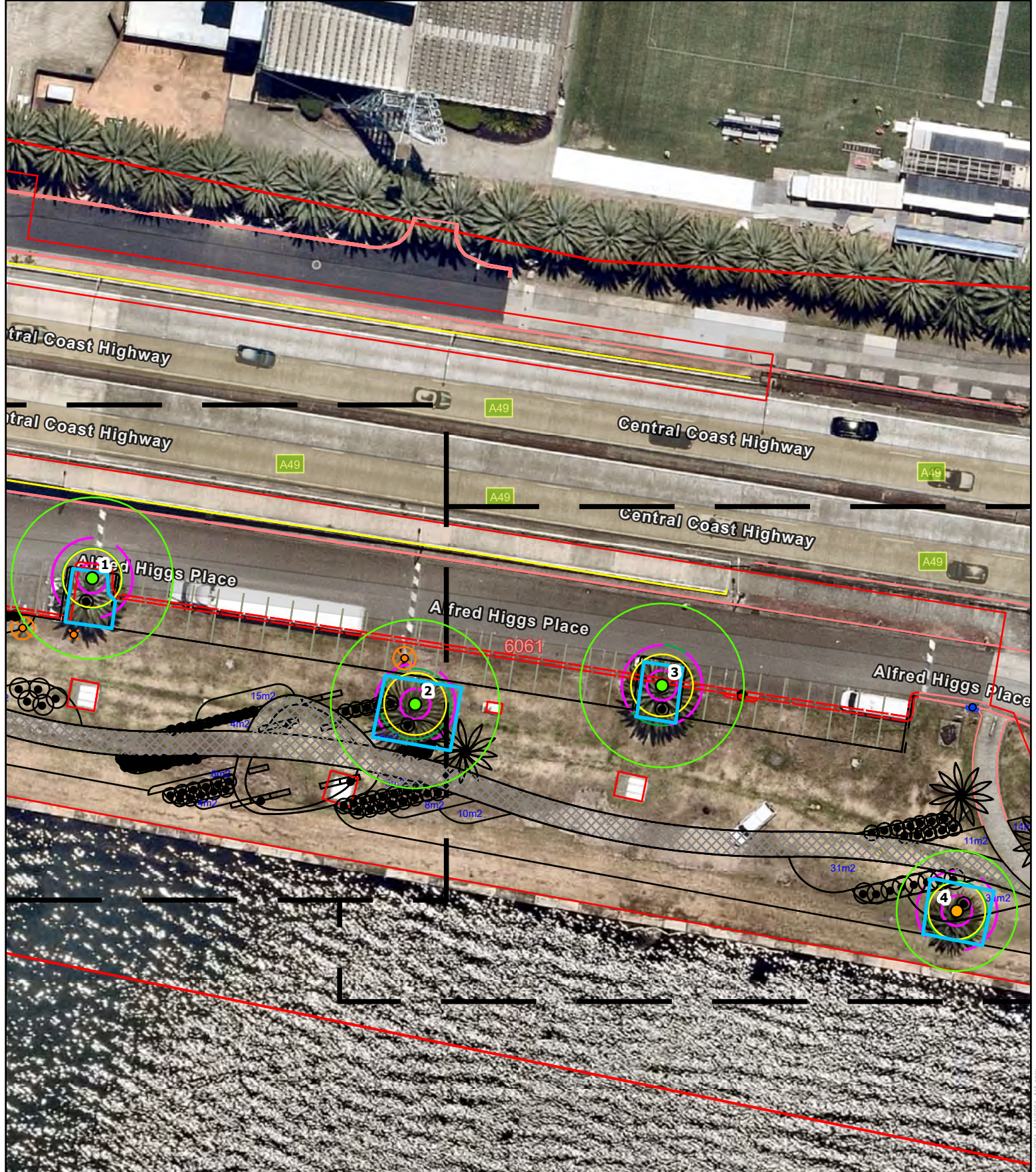
- The draft landscape design provided for Area 1 indicates additional tree planting will occur and that the design enhances the existing open landscape of the site. The key impact and design aspect here is the retention of Tree 3 a mature palm with a restricted root zone and a proposed design that restricts this root zone even further. The design does not state that Tree 3 will require tree management practices to be put in place such as mulching, additional fertilising and possible planting under or about the NRZ area.
- Area 2 shows landscape works that will likely compliment the existing trees with additional plantings. Work that is recommended in addition to the new building and landscaping is to address the current damage to the existing pathway. Tree 6 has a substantial; NRZ area with a radius of 11m and the current pathway is well within this zone. It was observed that the roots of Tree 6 are already causing lifting of the concrete sections and trip hazards have been previously addressed. The landscape works could address this problem that is likely to worsen by identifying a strategy to elevate a short section of the current walkway over tree roots and stop ongoing problems of maintenance and risk management.
- Trees 9 – 18 have the most critical design requirements. In reviewing the landscape design, the method of construction is not specified at this date. It is recommended that the construction method does not involve excavation deeper than 100 mm of the current levels. A light scrape to obtain suitable levels is critical. The pavement material recommended is [Porous Lane Pavement system](#) that is purposely designed for shared user pathways.
- Pruning to remove dead branches in Tree 9 that will be directly above the pathway should be included in landscape works as part of the tree protection measures. Tree 6 requires pruning to raise the canopy and remove branches likely to cover the adjacent traffic sign.
- The current vehicle damage and compaction about trees 10 – 18 is not addressed. This may be beyond the scope of the project but could be considered as this is critical to the retention of these trees in the long term.

7.4 Tree Protection Measures

- All tree maintenance and pruning works should be carried out by a qualified tree worker in accordance with AS4373 –2007 Pruning of Amenity Trees.
- The TPZ of the tree should be offset by the same percentage as the proposed encroachment where possible.
- The TPZ should be mulched with an organic mulch and the rootzone should be watered during dry periods.
- No herbicides should be used within the TPZ of trees and any grass removal should be conducted by hand or mini excavator under the direct supervision of the project arborist.
- A continuous TPZ fence should be installed for retained trees as displayed in **Figure 5**. The TPZ shall be delineated by a 1.8m interlocking chain wire fence located around trees designated to be retained within close proximity to the Works, in accordance with AS 4687. **Appendix D** details tree protection fencing that should be implemented.
- TPZ fencing must be installed before the commencement of any Works. The fencing should not be removed or altered until after the completion of works.
- All Contractors working in close proximity to the TPZ of Trees to be retained should be briefed as to the requirements of the Tree Protection Zone.
- The TPZ fencing and zone should be certified by the project arborist before construction commences.
- Tree health and condition should be monitored by the project arborist at regular stages during construction, at practical completion of construction, and after completion.
- The following activities should be avoided within the TPZ of trees to be retained where practicable:
 - o Machine excavation of soil including trenching;
 - o Operation of heavy equipment;
 - o Stockpiling of soils;
 - o Storage of heavy or other equipment;
 - o Parking of vehicles;
 - o Wash down and cleaning of equipment;
 - o Excavation for silt fencing;
 - o Dumping of waste;
 - o Change of soil level or gradient; and
 - o Covering with concrete, impermeable, or compacted surfaces.
- Where works are required that encroach into TPZ of trees to be retained, additional protection measures, which include trunk and low branch guards, and ground protection measures should be implemented following guidance in Australian standard AS 4970 – 2025 *Protection of trees on development Sites* (**Appendix D**). These works should only be conducted under supervision of the project arborist. The use of “soft” construction methods including manual and vacuum removal of soils is recommended for works conducted within the TPZ of Trees to be retained.

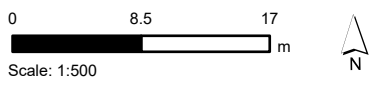
7.5 Other Recommendations

- Clothing, equipment and boots should be clean and sanitised prior to each site visit to prevent onsite introduction of plant pests and diseases such as Myrtle rust.
- Vehicles and construction equipment should utilise designated entry and egress points to avoid potential of impacts on Trees to be retained.



- Legend**
- SRZ
 - NRZ
 - Tree Protection Zone
- Retention Value**
- High
 - Low
 - Moderate
 - Very Low

Figure 9 - Tree Protection Area 1



Address: Gosford Waterfront Precinct
 Client: HCCDC c/- ADW Johnson
 AEP Ref: 6061 | Date: 03 June 2026

Imagery: Nearmap (19/12/2025)
 Spatial Reference: GDA2020 MGA Zone 56

Disclaimer: While reasonable care has been taken to ensure the information on this map is accurate and up-to-date, errors or omissions may still occur. Please verify the accuracy of all information before use. Note that boundaries are not survey accurate and do not scale off this plan.

Path: G:\Shared drives\6061-6559\6061 - Gosford Waterfront Tender - AEP\Mapping\Workspaces\6061_AEA\6061_AEA.aprx



Legend

- SRZ
- NRZ
- Tree Protection Zone

Retention Value

- High
- Low
- Moderate
- Very Low

Figure 10 - Tree Protection Area 2

0 8.5 17
m
Scale: 1:500





Legend

SRZ
NRZ

Retention Value

High
Low
Moderate
Very Low

Figure 11 - Tree Protection Area 3

0 8.5 17
m
Scale: 1:500



8.0 Conclusion

The recommendations for tree retention and removal have been made with consideration of minimising negative impacts on the existing trees and palms and consideration of public risk factors.

Based on the tree assessment 18 assessed trees can be retained within the site, 16 requiring Tree Protection Measures including tree protection fencing.

Please note that assessment of tree removal and retention has been made by overlaying plans supplied by ADW Johnson. These recommendations may be subject to change once further design and engineering detail has been prepared and this report will require updating in accordance with these changes if any.

To ensure successful tree retention the implementation of a detailed Tree Protection Plan and Tree Protection measures will be an essential part of the Construction Environment Management Plan to avoid further loss of trees in close proximity to the construction footprint.

We trust this meets your requirements. Should you require further details or clarification, please do not hesitate to contact the undersigned on 0407 019 076 or Joe Young, Lead Arborist (0411 446 203).

Yours faithfully,

A handwritten signature in black ink, appearing to read 'John Atkins', with a stylized flourish extending from the end.

John Atkins

Senior Arborist

Dip. Arb. (AQF 5)

Grad. Cert. Arb. (AQF 8)

Anderson Environment & Planning

9.0 References

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Appendix A – Tree Schedule

Appendix A – Assessed Tree Schedule

Tree ID	Scientific Name	Common Name	DSH (m)	DAB (m)	Canopy Spread (m)				Canopy Spread Average	Estimated Total Canopy Area	Height (m)	Age Class	Health	Structure	Landscape significance rating	Estimated life expectancy	Retention Value	NRZ (m)	SRZ (m)	Remove / Retain	NRZ %
					N	E	S	W	(m)	(m ²)											
1	<i>Phoenix canariensis</i>	Canary Island Date Palm	0.67	0.75	3	3	3	3	3	28	11	Mature	Good	Good	High	40+	high	8.0	2.9	Retain (Protection)	0.0
2	<i>Phoenix canariensis</i>	Canary Island Date Palm	0.70	0.85	3.5	3.5	3.5	3.5	3.5	38	6	Mature	Good	Good	High	40+	high	8.4	3.1	Retain	4.5
3	<i>Phoenix canariensis</i>	Canary Island Date Palm	0.68	0.85	4	4	4	4	4	50	14	Mature	Good	Good	High	40+	high	8.2	3.1	Retain (Protection)	0.0
4	<i>Phoenix canariensis</i>	Canary Island Date Palm	0.50	0.70	3	3	3	3	3	28	6	Mature	Fair	Fair	Moderate	40+	moderate	6.0	2.9	Retain	15.0
5	<i>Ficus microcarpa</i> var. 'Hillii'	Hills Weeping Fig	0.83	0.89	8	8.5	8	9	8.38	221	14.5	Mature	Good	Fair	Very High	40+	high	10.0	3.2	Retain (Protection)	16.0
6	<i>Ficus rubiginosa</i>	Port Jackson Fig	0.65	0.71	9	7	9	9	8.5	227	10.4	Semi-Mature	Good	Good	Very High	40+	high	7.8	2.9	Retain (Protection)	2.0
7	<i>Lophostemon confertus</i>	Brush Box	0.64	0.73	6	8	8	8	7.5	177	14	Mature	Good	Good	High	40+	high	7.7	2.9	Retain (Protection)	1.8
8	<i>Lophostemon confertus</i>	Brush Box	0.78	0.93	7	7	8	8	7.5	177	14	Mature	Fair	Good	High	40+	high	9.4	3.2	Retain (Protection)	8.1
9	<i>Araucaria heterophylla</i>	Norfolk Island Pine	0.93	1.09	4	3	5	5	4.25	57	31.5	Mature	Fair	Fair	High	15-40	moderate	11.2	3.4	Retain (Protection)	37.3
10	<i>Lophostemon confertus</i>	Brush Box	0.71	0.83	8	6	6	6	6.5	133	12	Mature	Good	Fair	High	40+	high	8.5	3.1	Retain (Protection)	21.0
11	<i>Lophostemon confertus</i>	Brush Box	0.41	0.53	5	5	4	5	4.75	71	14	Mature	Fair	Good	Moderate	40+	moderate	4.9	2.5	Retain (Protection)	14.0
12	<i>Lophostemon confertus</i>	Brush Box	0.64	0.71	7	5	6	6	6	113	14	Mature	Good	Good	High	40+	high	7.7	2.9	Retain (Protection)	24.8
13	<i>Lophostemon confertus</i>	Brush Box	0.43	0.51	6	5	6	6	5.75	104	12	Mature	Fair	Good	High	40+	high	5.2	2.5	Retain (Protection)	13.5
14	<i>Lophostemon confertus</i>	Brush Box	0.63	0.74	6	5	6	6	5.75	104	14.5	Mature	Good	Fair	High	40+	high	7.6	2.9	Retain (Protection)	24.8
15	<i>Lophostemon confertus</i>	Brush Box	0.57	0.69	4	4	4	5	4.25	57	12	Mature	Fair	Fair	Moderate	15-40	moderate	6.8	2.8	Retain (Protection)	26.8

Tree ID	Scientific Name	Common Name	DSH (m)	DAB (m)	Canopy Spread (m)				Canopy Spread Average	Estimated Total Canopy Area	Height (m)	Age Class	Health	Structure	Landscape significance rating	Estimated life expectancy	Retention Value	NRZ (m)	SRZ (m)	Remove / Retain	NRZ %
					N	E	S	W	(m)	(m²)											
16	<i>Lophostemon confertus</i>	Brush Box	0.59	0.69	6	5	6	7	6	113	16	Mature	Good	Good	High	40+	high	7.1	2.8	Retain (Protection)	30.5
17	<i>Lophostemon confertus</i>	Brush Box	0.68	0.81	5	4	6	7	5.5	95	12	Mature	Good	Good	High	40+	high	8.2	3.0	Retain (Protection)	29.2
18	<i>Lophostemon confertus</i>	Brush Box	0.68	0.81	5	5	5	7	5.5	95	14	Mature	Good	Fair	High	40+	high	8.2	3.0	Retain (Protection)	16.0

Appendix B – Glossary

GLOSSARY AND DEFINITIONS

Age Classes:

- Juvenile refers to an immature tree;
- Semi-mature refers to a tree between immaturity and full size;
- Mature refers to a full-sized tree with some capacity for further growth; and
- Over-mature refers to a tree already in decline.

Diameter at standard height (DSH): Tree stem diameter at 1.4 metres above ground level.

Diameter at buttress (DAB): Tree stem diameter as measured above the root buttress at ground level.

Notional Root Zone (NRZ):

An indicative measure of the area necessary to protect for tree viability, as calculated by the formula $NRZ = DSH \times 12$

Tree Protection Zone (TPZ):

The specified zone both above and below ground encompassing the area necessary to protect both the crown and woody roots of trees during development.

Structural Root Zone (SRZ):

An indicative measure of the spread of the primary woody and structural roots necessary for tree stability, as calculated by the formula $SRZ = (DAB \times 50)^{0.42} \times 0.64$

Visual Tree Assessment (VTA):

Visual inspection of tree only.

Co-dominant leaders

A tree where two or more stems are of similar diameter.

Included Bark Junctions

A junction where the angle of the union creates an area of ingrown bark. This can create a structural weakness, and is often found on co-dominant stems.

Crown

The portion of the tree consisting of branches and leaves and any part of the trunk from which branches arise.

Stem

The position of the tree consisting of branches and leaves and any part of the trunk from which branches arise. An organ which supports branches, leaves, flowers and fruits.

Epicormic Growth

Refers to shoots produced by dormant buds within the bark or stem of a tree as a result of stress, incorrect pruning or increased light.

Health Condition

Exceptional

- Visually complete crown with dense foliage throughout that indicates strong health and vigour.

- Leaf size and colour that is true to type for the species and free from pest (insect) and disease (pathogen) damage.
- Expected levels of primary growth or seasonal extension and internodal growth evident for the species.
- No evidence of colonising saprophytes and no deadwood evident.

Good

- Visually complete crown, varying in foliage density throughout.
- Leaf size and colour that is true to type for the species with none or minor levels of pest (insect) and/or disease (pathogen) damage evident.
- Expected levels of primary growth or seasonal extension and internodal growth evident for the species.
- No evidence of colonising saprophytes and low levels of deadwood present and approximately 10mm or less in size.

Fair

- Sparse crown, varying in foliage density throughout.
- Reduced leaf size and atypical in colour for the species.
- Low to medium levels of pest (insect) and/or disease (pathogen) damage.
- Reduced, seasonal extension and internodal growth.
- Deadwood easily visible and less than approximately 30mm in size.
- Epicormic growth may be evident.

Poor

- Obvious signs of crown decline, exhibiting significant reduction in live crown volume and foliage density with reduced leaf size and atypical in colour for the species.
- Evidence of defoliation and/or dieback of branch tips.
- Medium to high levels of pest (insect) and disease (pathogen) damage.
- Presence of exudates (kino and resins) from wounds (open and/or weeping).
- Significant reduction in seasonal extension and internodal growth, with significant levels of epicormic growth evident.
- Deadwood easily visible, approximately 30mm to 100mm in size.

Dead

- No evidence of live foliage observed throughout the crown.
- Obvious signs of cracking and shrinking wood.
- Visible evidence of delaminating bark to stems and branches.

Structure Condition**Very Good**

- Strong branch unions at attachment points with no acute angles (compression and tension forks) and good branch taper at unions.

- No visibly, defective tree parts or structural defects.
- No wounds to stems and branches, no crossing and rubbing of branches and no wounds to exposed roots.
- No fungal fruiting bodies present to stems, branches and roots indicating, a presence of fungal pathogens.

Good to Fair

- Developing inclusions at unions of leading, codominant stems and branches.
- Evidence of defective tree parts (low levels) including branch and stem inclusions and crossing and rubbing of branches.
- Evidence of mechanical damage to periderm of stems, branches and roots, exposing vascular tissues.
- Exposed wounds for surface, colonising pathogens and entry points for developing decay.
- Presence of fungal fruiting bodies.
- Some evidence of cavities or hollows. (Fair only)
- No evidence of soil upheaval surrounding base of tree.

Poor

- Obvious signs and evidence of included bark to basal unions of codominant, leading stems and branches.
- Advanced, structural defects evident with failure of tree parts determined within 5 years from time of inspection and assessment.
- Evidence of decay from open wounds with presence of exudates (kino and resins) and exposed and degraded woody tissues.
- Presence of fungal fruiting bodies.
- Presence of cavities and hollows.
- Evidence of mechanical damage with advanced degradation of exposed roots.

a) Hazardous Tree

b) Immediate Removal

- Advanced, structural defects evident. Open cracks to codominant stem and branch unions evident.
- Previous branch and stem failures evident. Failure of remaining tree parts determined within 3 months 6 months, from time of inspection and assessment. Arboricultural works to be scheduled immediately to mitigate associated hazard and risk.
- Severed roots and soil upheaval evident indicating failure of root zone.
- Tree failure imminent within 12 months from time of inspection and assessment

Landscape Significance

Assesses a tree within the landscape and rates according to criteria taken from Morton (2006):

1. Significant

- The subject tree is listed as a Heritage Item under the Local Environment Plan (LEP) with a local, state or national level of significance; or
- The subject tree forms part of the curtilage of a Heritage Item (building / structure /artifact as defined under the LEP) and has a known or documented association with that item; or
- The subject tree is a Commemorative Planting having been planted by an important historical person (s) or to commemorate an important historical event; or
- The subject tree is scheduled as a Threatened Species or is a key indicator species of an Endangered Ecological Community as defined under the or Biodiversity Conservation Act 2016 (NSW) or The Environmental Protection and Biodiversity Conservation Act 1999 (Federal); or
- The tree is a locally indigenous species, representative of the original vegetation of the area and is known as an important food, shelter or nesting tree for endangered or threatened fauna species; or
- The subject tree is a Remnant Tree, being a tree in existence prior to development of the area; or
- The subject tree has a very large live crown size exceeding 300m² with normal to dense foliage cover, is located in a visually prominent in the landscape, exhibits very good form and habit typical of the species and makes a significant contribution to the amenity and visual character of the area by creating a sense of place or creating a sense of identity; or
- The tree is visually prominent in view from surrounding areas, being a landmark or visible from a considerable distance.

2. Very high

- The tree has a strong historical association with a heritage item (building/structure/artifact/garden etc.) within or adjacent the property and/or
- Exemplifies a particular era or style of landscape design associated with the original development of the site; or
- The subject tree is listed on Council's Significant Tree Register; or
- The tree is a locally-indigenous species and representative of the original vegetation of the area and the tree is located within a defined Vegetation Link/ Wildlife Corridor or has known wildlife habitat value;
- The subject tree has a very large live crown size exceeding 200m²; a crown density exceeding 70% Crown Cover (normal-dense), is a very good representative of the species in terms of its form and branching habit or is aesthetically distinctive and makes a positive contribution to the visual character and the amenity of the area.

3. High

- The tree has a suspected historical association with a heritage item or landscape supported by anecdotal or visual evidence; or
- The tree is a locally-indigenous species and representative of the original vegetation of the area; or
- The subject tree has a large live crown size exceeding 100m²; and

- The tree is a good representative of the species in terms of its form and branching habit with minor deviations from normal (e.g. crown distortion/suppression) with a crown density of at least 70% Crown Cover (normal); and the subject tree is visible from the street and surrounding properties and makes a positive contribution to the visual character and the amenity of the area.

4. Moderate

- The subject tree has a medium live crown size exceeding 40m²; and
- The tree is a fair representative of the species, exhibiting moderate deviations from typical form (distortion/suppression etc.) with a crown density of more than 50% Crown Cover (thinning to normal); and
- The tree makes a fair contribution to the visual character and amenity of the area; and
- The tree is visible from surrounding properties, but is not visually prominent – view may be partially obscured by other vegetation or built forms.
- The tree has no known or suspected historical association

5. Low

- The subject tree has a small live crown size of less than 40m² and can be replaced within the short term with new tree planting; or
- The tree is a poor representative of the species, showing significant deviations from the typical form and branching habit with a crown density of less than 50% Crown Cover (sparse); and
- The subject tree is not visible from surrounding properties (visibility obscured) and makes a negligible contribution or has a negative impact on the amenity and visual character of the area.

6. Very low

- The subject tree is listed as an Environment Weed Species in the relevant Local Government Area, being invasive, or a nuisance species.
- The subject tree is scheduled as exempt (not protected) under the provisions of the local Council's Tree Preservation Order due to its species, nuisance or position relative to buildings or other structures.

7. Insignificant

- The tree is a declared Noxious Weed under the Biosecurity Act (NSW) 2015 or identified as a priority weed within the local region.

Appendix C – Site Photographs



Plate 1 - Tree 3. The current parking arrangement is to be modified and will encroach this palm significantly.



Plate 2 - Tree 6 on the left and the proximity of the roots to the current path. Grinding and ramping are already used to manage risks. landscape design should address this problem.



Plate 3 - Tree 5 looking east. The current temporary fence is sufficient to protect this tree and the previous excavation on the site. The tree has a large NRZ area however no further encroachment to that present will occur.



Plate 4 - Trees 9 - 17. The current informal pathway between existing trees is proposed to be upgraded. Tree 9 (on the right) has major encroachment within the NRZ and SRZ of this tree. Designs should not cause further damage and decline.



Plate 5 - Tree 9. The tree has declined in health and the canopy is sparse for such a large, mature tree. the shared user pathway proposed under this tree should be combined with practical maintenance works that improve the condition of the tree's health.

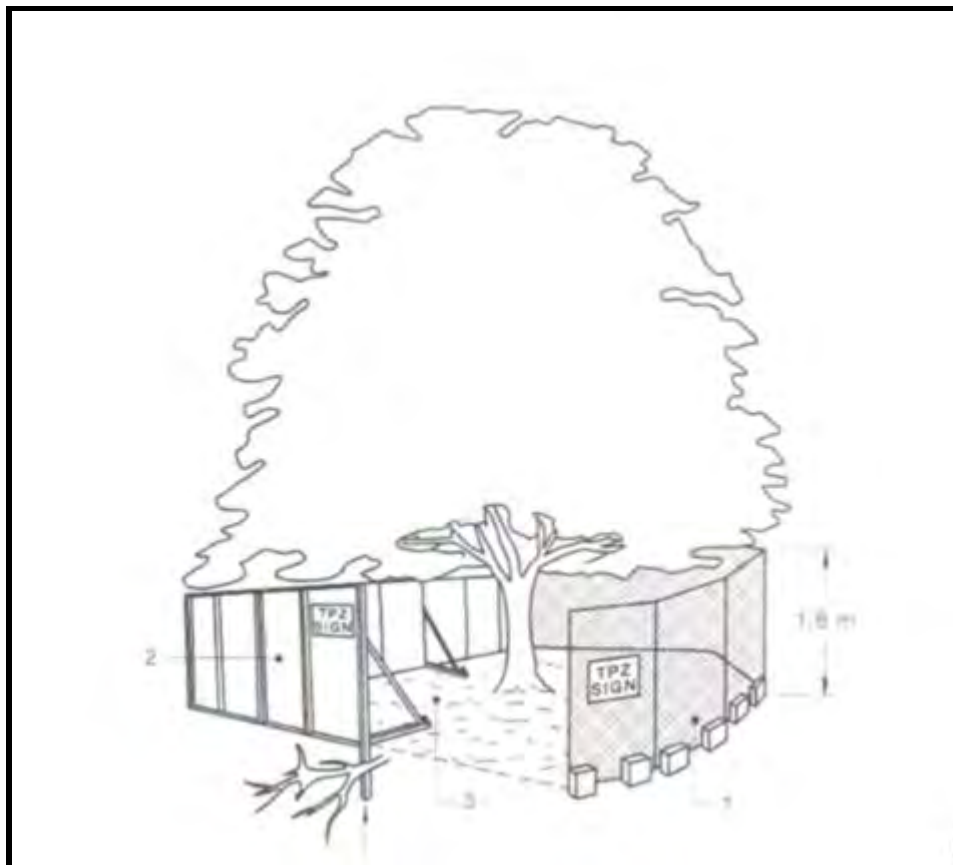
Appendix D –Tree Protection Fencing and Ground Protection

Example of tree protection fencing:

Fence off all trees noted for retention with 1.8m steel mesh fencing at the perimeter of the designated protection zone. Attach signs relating to the importance of tree protection and penalties for breaching tree protection orders to the fencing. If the area is large, install multiple signs.

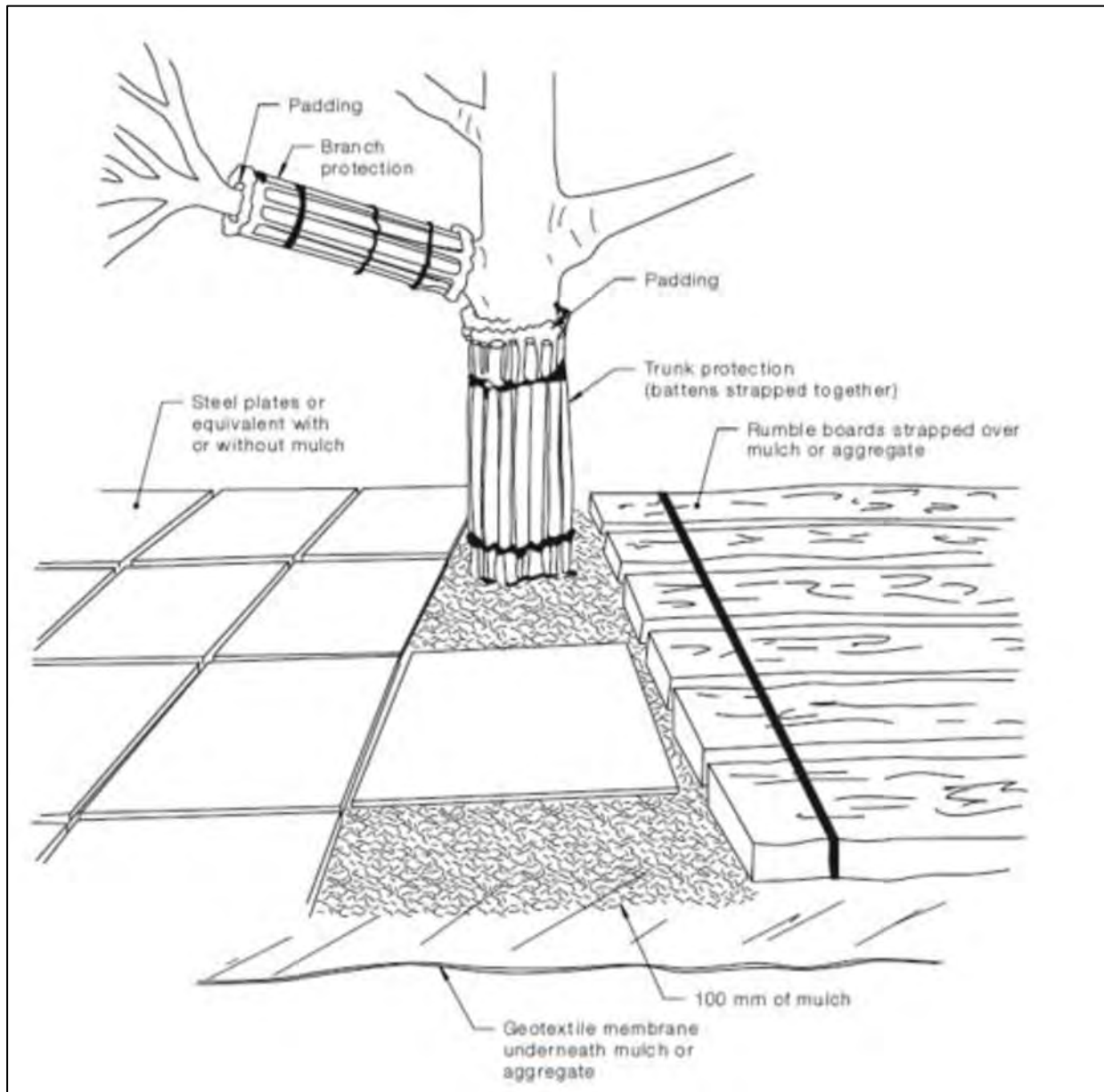
Signs should state that this is a restricted area, no entry unless in the company of the arborist. Authorised access to the protected zone could be through a locked gate or via ladders.

Mulching and semi-regular watering for established protection zones.



Ground Protection

If temporary access for machinery is required within the TPZ ground protection measures will be required. The purpose is to prevent root damage and soil compaction within the TPZ. Measures may include a permeable membrane such as geotextile beneath a layer a mulch or crushed rock below rumble boards as per the below diagram.



Notes:

For trunk and branch protection use boards and padding that will prevent damage to bark. Boards are to be strapped to the trees, not nailed or screwed.

Rumble boards should be of suitable thickness to prevent compaction and root damage.