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**Independent
Arboricultural
Services**



Arboricultural Impact Assessment

Prepared For: Cleanaway c/o Planning Insights Pty Ltd

Job Date: 11 May 2026

1825 Old Cleveland Rd
Chandler QLD 4155

IAS20557



Independent Arboricultural Services - Disclaimer

The material contained in this document has been prepared on an independent basis free of any bias and represents the honest opinion of the consulting arborist.

Tissue or soil samples have not been collected nor submitted for testing unless otherwise stated. Excavation is limited to minor earthworks and we submit this assessment on the basis that all data is based on visual inspection of the tree/s and its/their location, species, health and condition at the time of writing unless otherwise stated. Measurements and tree locations noted in this report are approximate and have not been determined by survey unless information and analysis has been provided by the consultant or such information is otherwise noted. Please request a more detailed arborist report if further information and analysis is required. Depending on site requirements, specific alternate specialist advice including engineering consultancy and certification maybe required in combination with this assessment. This assessment contains arborist advice and associated general information only and does not purport to provide other site-specific specialist advice such as engineering certification unless arrangement to source such advice for inclusion in this assessment has been requested and authorised.

This report contains opinions, advice and recommendations based on information and data gathered from site inspections carried out by personnel from Independent Arboricultural Services as well as information provided by the client and/or its representatives, is to be relied on by the client in that context. It is assumed all such information provided to Independent Arboricultural Services is correct. All recommended arboricultural works detailed in this assessment including pruning of tree canopy or roots, tree removal, tree transplantation or other associated works including stump grinding or the application of any prescribed treatment, shall be carried out in accordance with applicable standards including AS 4373-2007 *Pruning of Amenity Trees* and AS 4970-2025 *Protection of Trees on Development Sites*.

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The invoice for this report will be issued to the person or entity as per the address advised at the time of confirmation of appointment. Assessment in this report is based on plans provided at the time of confirmation of engagement and report preparation. Additional time required for re-assessment of report detail due to subsequent re-issue of plans after report preparation will be subject to an additional fee which will be charged at our hourly rate. This report shall not be conveyed to any third party including regulatory authority/s until full payment of this invoice is received by Independent Arboricultural Services and a finalised report has been issued unless agreement to do so has been granted.

Factors including the absence of historical records or local knowledge, recognition of the variability of the integrity of a tree as a naturally living organism as well as the impact of conditions within its surrounds to which it maybe subject including the impacts of mechanical force and the occurrence of weather events, do not allow an arborist to guarantee the age of a tree, or the length of time a tree/s may live or such time as it /they may fail. There is no warranty or guarantee, expressed or implied that the problems or deficiencies of the plants or property in question may not arise in the future.

Executive Summary

Independent Arboricultural Services have been engaged by Cleanaway c/o Planning Insights Pty Ltd (*The Client*) to assess potential impacts to the nominated vegetation (*Subject Trees*) resulting from proposed development at 1825 Old Cleveland Rd, Chandler QLD 4155. Adam Kriedemann (AQF Level 5) attended site on 11 May 2026 to undertake the assessment of the impact of the works.

The assessment of the impacts of proposed development on the identified trees in and around the development envelope, roads and services has been undertaken. Advice on both specific and general tree protection measures and Project Arborist Requirements have been detailed in this report. It is important as the design is refined, further reviews are undertaken by the Project Arborist and protection measures are further specified as required.

As part of the design process and operational works it is recommended that the following is undertaken,

Specific Tree Protection Measures include;

- Trees 1175 and 1190
 - HOLD POINT: Low pressure exploratory water excavation to be undertaken as nominated and supervised by the Project Arborist (AQF Level 5).
 - Removal of trees within the NRZ of retained trees, to be undertaken by an AQF Level 3 Arborist under the supervision of the Project Arborist (AQF level 5).
 - No grubbing of stumps is to occur within NRZ of retained trees. Stumps are to be stump ground.
- Trees 1152, 1154, 1174, 1188, 1192 -
 - Removal of these trees within the NRZ of retained trees is to be undertaken by an AQF Level 3 Arborist under the supervision of the Project Arborist (AQF level 5). No grubbing of stumps is to occur within NRZ of retained trees. Stumps are to be stump ground.

General Tree measures include;

- Ensure all approvals, permits, permissions, consent are in place before works commence.
- Undertake a pre-start meeting with contractors before works commence.
- Tree Protection Fencing (TPZ) is to be erected before works commence and audited by the Project Arborist (Min AQF Level 5).
- Supervision by the appointed Project Arborist and licenced Fauna Spotter/Catcher of the approved tree removals.
- Any works proposed within the NRZ of retained tree/s, requires supervision of a minimum AQF Level 5 Project Arborist.
- Tree Pruning is to be undertaken by a minimum AQF Level 3 Arborist.
- Laydown areas and site shed/office locations are to be identified/finalised and excluded from the TPZ of retained tree/s and minimise public impact.
- Route vehicles and equipment outside of NRZs. If access is required, mulch to a depth of 100mm with tree padding installed, with the option of track mats as determined and signed off by the appointed Project Arborist.
- Construction materials, spoil, stockpiles, tools and equipment are not permitted within the NRZ of retained tree/s.

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Document Tracking & Information

Project Name	Arboricultural Impact Assessment		
Project Arborist	Adam Kriedemann (AQF Level 5)		
Client	Cleanaway c/o Planning Insights Pty Ltd		
Address	1825 Old Cleveland Rd, Chandler QLD 4155		
IAS Reference	IAS20557	Revision	1
Prepared By	Adam Kriedemann (AQF Level 5)		
Checked By	Mick Maher (AQF Level 5)	Date	1 June 2026

All comments and recommendations in this report have been determined in accordance with Australian Standards AS 4373-2007 Pruning of amenity trees and AS 4970-2025 Protection of trees on development sites. All recommended tree work should be carried out in accordance with these standards.



Adam Kriedemann
Consulting Arborist

Abbreviations

BCC	Brisbane City Council	TPP	Tree Protection Plan
DA	Development Application	TPS	Tree Protection Specifications
VPO	Vegetation Protection Order	CMP	Construction Management Plan
BLE	Building Location Envelope	VMP	Vegetation Management Plan
TPZ	Tree Protection Zone	AS	Australian Standard
NRZ	Notional Root Zone	AS 4373: 2007	Pruning of amenity trees
SRZ	Structural Root Zone	AS 4970: 2025	Protection of trees on development sites
RPA	Root Protection Area	DSH	Diameter at Standard Height
PA	Project Arborist	CA	Consulting Arborist

Contact Details

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Consultant Credentials

Andrew Rankine <i>Director</i>	<ul style="list-style-type: none"> • Diploma Arb. (AQF Level 5) • Arboriculture Australia Registered Professional Arborist • QTRA (Qualified) 	<ul style="list-style-type: none"> • TRAQ (Qualified) • ISA Certified Arborist & Municipal Specialist AU-0269AM • QAA Qualified Member
Roger Rankine <i>Managing Director</i>	<ul style="list-style-type: none"> • Diploma Arb. (AQF Level 5) • Grad Cert Arb. (AQF Level 8) • ISA Board Certified Master Arborist (QL-001A) 	<ul style="list-style-type: none"> • QTRA (Qualified) • TRAQ (Qualified) • QAA Qualified Member
Mick Maher <i>Business Manager</i>	<ul style="list-style-type: none"> • Diploma Arb. (AQF Level 5) • TRAQ (Qualified) • QTRA (Qualified) • Cert IV Project Management 	<ul style="list-style-type: none"> • Cert III Conservation and Land Management • Cert II Horticulture (Turf Management) • QAA Qualified Member
Stephen Catchpoole <i>Consulting Arborist</i>	<ul style="list-style-type: none"> • Diploma Arb. (AQF Level 5) • Doctor of Philosophy in Forestry (PhD) • QTRA (Qualified) 	<ul style="list-style-type: none"> • TRAQ (Qualified) • Bachelor of Science Forestry • Bachelor of Science (Hons Botany) • QAA Qualified Member
Sam Gilbey <i>Consulting Arborist</i>	<ul style="list-style-type: none"> • Diploma Arb. (AQF Level 5) • TRAQ (Qualified) • QTRA (Qualified) 	<ul style="list-style-type: none"> • ISA Certified Arborist • Bachelor of Science in Ecology and Conservation Biology
Kieran Pentland <i>Consulting Arborist</i>	<ul style="list-style-type: none"> • Diploma Arb. (AQF Level 5) • Grad Cert Arb. (AQF Level 8) • MSc. Arb. & Urban Forestry (AQF Level 9) • ISA Board Certified Master Arborist 	<ul style="list-style-type: none"> • QAA Qualified Member • QTRA (Qualified) • TRAQ (Qualified) • Bachelor of Arts in Leisure Management • National Cert in Tree Management • National Cert in Horticulture
Justin Darby <i>Consulting Arborist</i>	<ul style="list-style-type: none"> • Diploma Arb. (AQF Level 5) • Certificate III Arboriculture • TRAQ (Qualified) 	<ul style="list-style-type: none"> • QTRA (Qualified) • Certificate II in ESI
Tom Kennedy <i>Consulting Arborist</i>	<ul style="list-style-type: none"> • Certificate III Arboriculture 	<ul style="list-style-type: none"> • Diploma Arb. (AQF Level 5)
Adam Kriedemann <i>Consulting Arborist</i>	<ul style="list-style-type: none"> • Certificate III Arboriculture • TRAQ (Qualified) 	<ul style="list-style-type: none"> • Diploma Arb. (AQF Level 5)
Peter Sproule <i>CAD / GIS Drafting Specialist</i>	<ul style="list-style-type: none"> • Diploma Arb. (AQF Level 5) • VALID (Qualified) 	<ul style="list-style-type: none"> • Bachelor of Design (Landscape Architecture) • QAA Qualified Member
Robert Stoop <i>Trainee Consulting Arborist</i>	<ul style="list-style-type: none"> • Diploma Arb. (AQF Level 5) in progress 	

Map

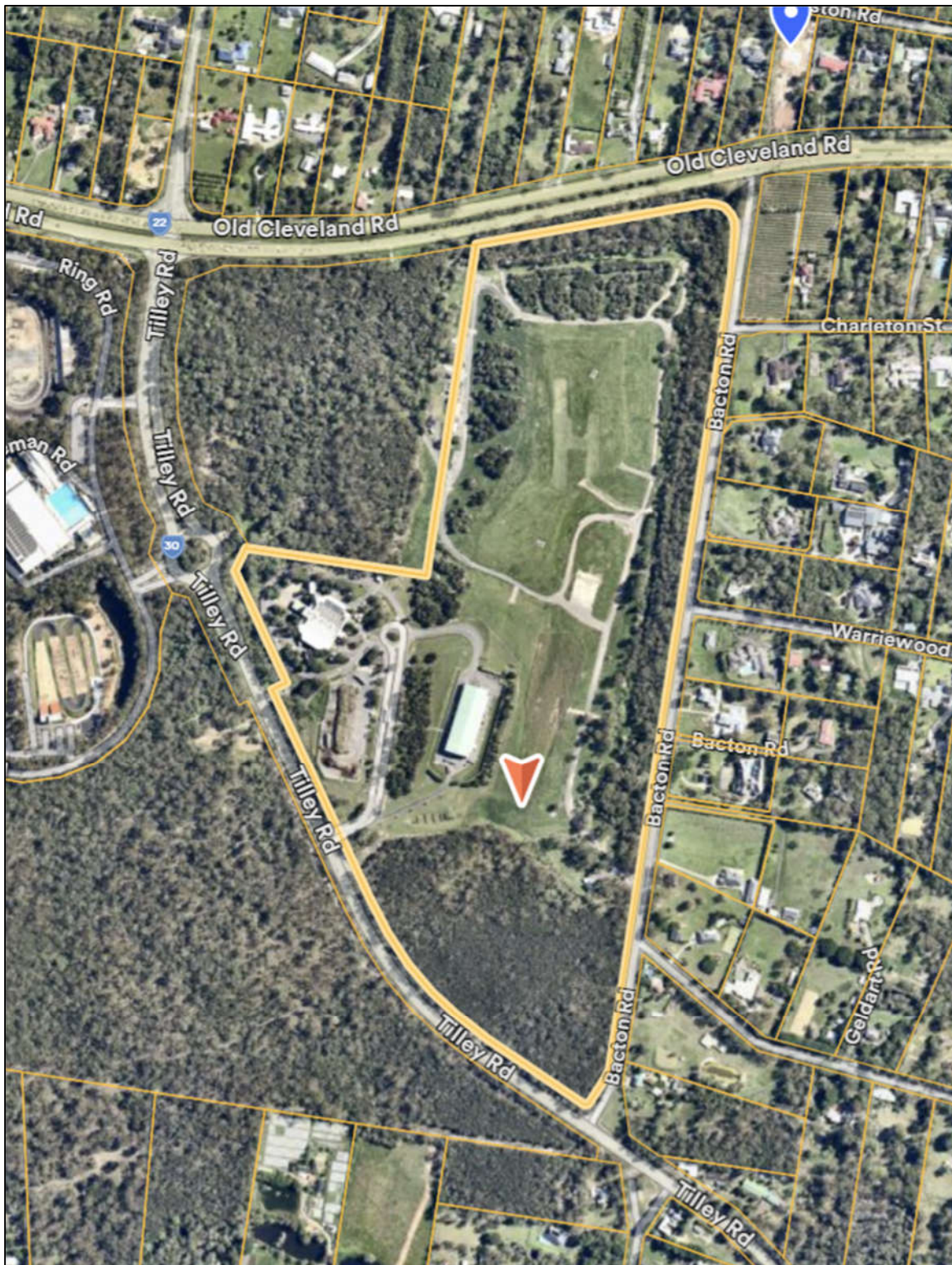


Figure 1: Subject Site (Nearmap® accessed 2026)

Introduction

This report is based on a visual inspection carried out from the ground on 11 May 2026. No soil or tissue sampling has been conducted. Tree assessment and Qualitative Visual Tree Analysis has been carried out in accordance with TRAQ ISA guidelines. Data and information provided to the client by others has been incorporated into this report as appropriate.

All arboricultural recommendations contained in this report have been determined in accordance with AS 4373-2007 *Pruning of Amenity Trees* and AS 4970-2025 *Protection of Trees on Development Sites*.

For the purposes of this report, reference to a Consulting or Project Arborist is held to mean an arboricultural specialist who holds minimum arboricultural qualifications of Diploma of Arboriculture/AQF Level 5, appropriate professional insurances, and has appropriate experience in the protection of trees on construction sites. Where tree work is specified, all recommended tree work is to be carried out in accordance with the above mentioned standards by an appropriately trained and AQF qualified arborist practitioner/s with an up to date record of training and membership of a recognised Australian arboricultural association, e.g. Queensland Arboricultural Association (QAA), Arboriculture Australia (AA), or a recognised international arboricultural association. No climbing spikes are to be used if pruning is to be carried out on live trees, except in the instance of an emergency.

Qualifications of the report authors include Diploma of Arboriculture/AQF Level 5 and International Society of Arboriculture (ISA) Certified Arborist accreditation. Report authors hold current insurances and memberships, including qualified memberships of Queensland Arboricultural Association (QAA), and Arboriculture Australia (AA) as well as current accreditation and membership of ISA.

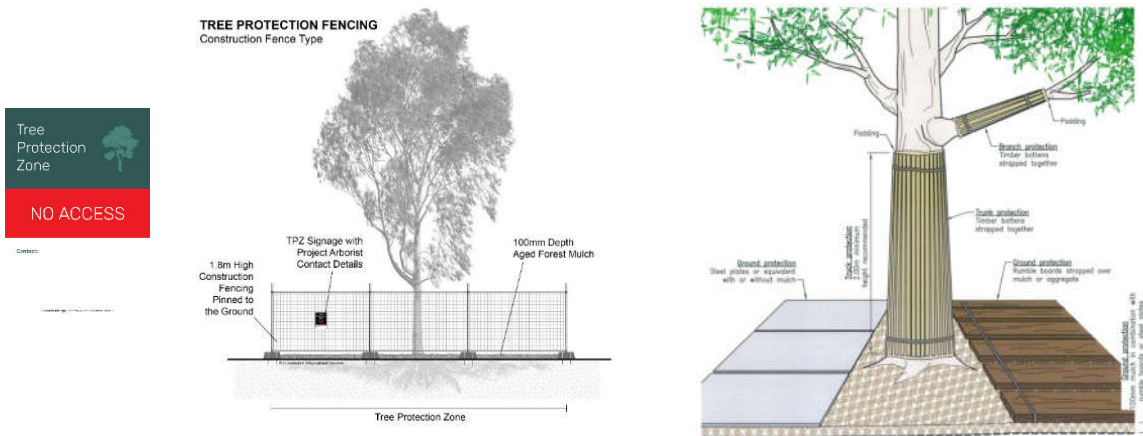
Independent Arboricultural Services is a qualified registrant on the QAA Register of Consulting Arborists.

Tree Protection Guidelines

- **Protection of retained trees during construction works**

Protection of Retained Trees During Construction Works

An exclusion zone is to be established along the perimeters of retained trees and cordoned off with a physical barrier of wire mesh fence, 1.8m in height, which is securely anchored. The role of these fences is to prevent any damage to the complete tree including root system (SRZ & TPZ/NRZ), stem and branch structure as well as the crown or canopy. Alternatively, and on approval of a minimum AQF Level 5 Project Arborist, plastic mesh fencing, 1.2m in height, secured with star pickets and caps with straining wire can be utilised. All TPZ fencing will require appropriate signage to signify the relevant protection zones. This will require audit and sign off prior to operational works onsite.



Tree protection fencing to be utilised. Where works will be undertaken close to and within Tree Protection Zones specific tree protection measures to be utilised a directed by the project Arborist.

Project Hold Points

Engage a minimum AQF Level 5 Project Arborist during the project life;

- Once tree protection fencing and signage has been established and finalised, Project Arborist (minimum AQF Level 5) to audit and sign off.
- Any works within the Notional Root Zone (NRZ) of retained tree/s is required.
- If tree roots are encountered over 50mm in diameter outside of TPZs of retained tree/s.
- Changes to the plans occur.
- On completion of the project to conduct a final audit and summary.

(Site audits/summary reports will be conducted at each hold point interval by the Project Arborist)

Project Arborist Requirements	
1.	Pre-Start Inspection and audit of tree protection fencing before works commence.
2.	Any required tree works to be undertaken by a minimum AQF Level 3 Arborist under the supervision of the Project Arborist (Min AQF Level 5). Tree services company to be a member of Queensland Arboricultural Association or Arboriculture Australia.
3.	All works within the NRZ of the retained vegetation to be supervised by the Project Arborist (Min AQF Level 5). Audit reports to be completed and submitted by the Project Arborist. Any below ground incursion to be water excavated under low pressure, under the supervision of the Project Arborist.
4.	All works to be excluded from the Structural Root Zone (SRZ) and supervised if located within TPZ.
5.	The Project Arborist to be consulted if changes to plans are made that affect any retained vegetation.
6.	At the completion of works, Project Arborist to undertake a site assessment and an audit report compiled of any further remedial actions required.

Conclusion

For all retained trees, with due care, implementation of appropriate work methodology as noted in this report and isolation of all TPZs of retained trees from construction works, the potential for ill-effect to retained/affected trees can be minimised in accordance with guidelines of AS 4970-2025 *Protection of Trees on Development Sites*.

The following must occur:

All required regulatory approvals must be in place prior to the commencement of any tree work for future construction work. Approvals are required should the Project Arborist prescribe pruning such as crown clean, canopy lift and/or directional pruning.

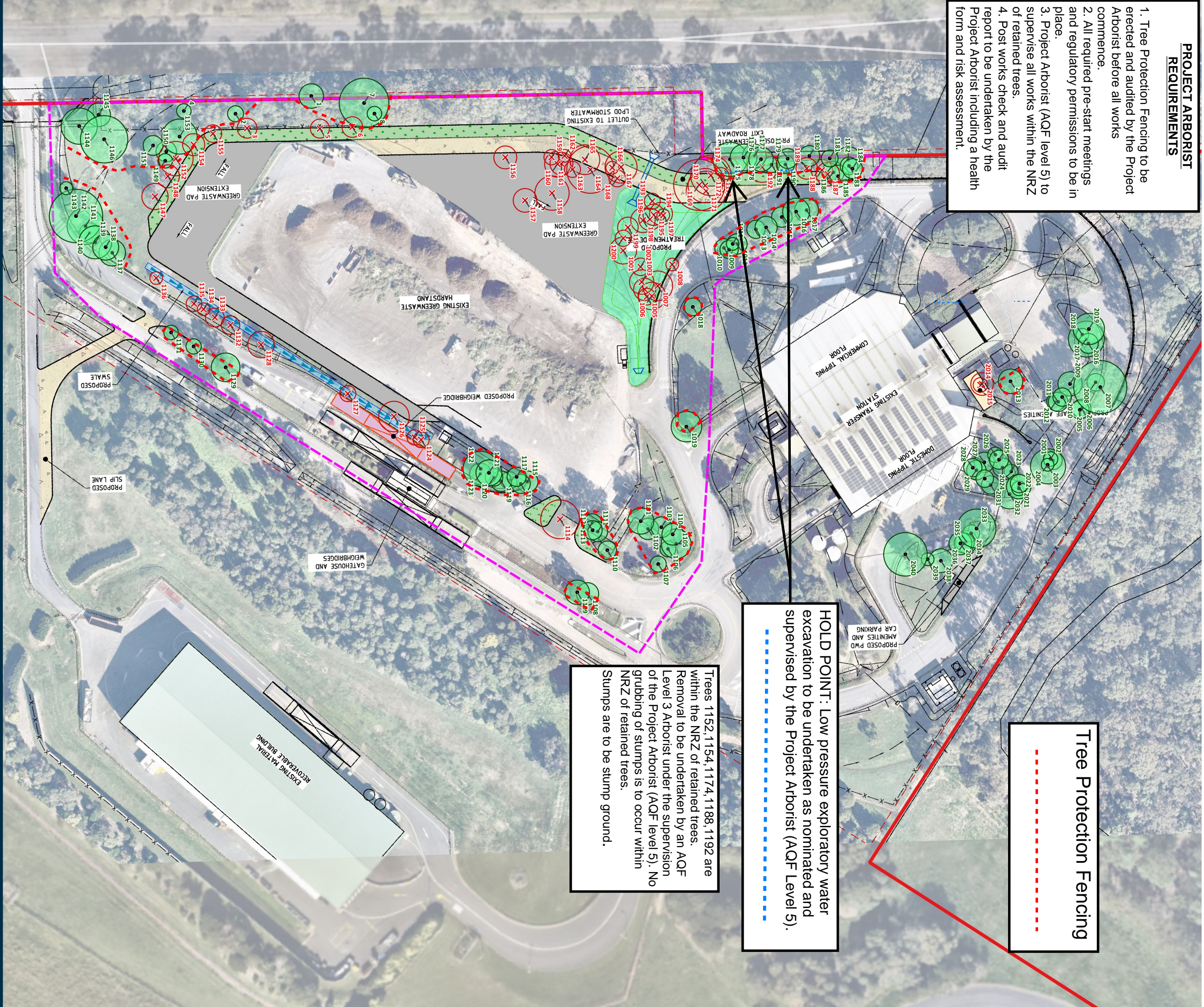
- Project Arborist must be appointed and engaged to guide the protection of protected tree/s from project commencement, i.e. during design planning and during the construction period until its completion.
- **All Arboricultural reports, TPP, TPS, VMPs & approvals must be included in the CMP.**
- Exploratory low pressure water excavation is to be undertaken as specified.
- Arborist briefing of all engaged persons on their commencement as well as diligent work practices must occur during all approved future construction work.
- Root disturbance must be minimised to prevent accidental injury, compression, and the creation of exposure points which may allow entry of pests and pathogens.
- **All work within any NRZ must be supervised by the Project Arborist.**

All work within NRZs must be carried out with due care to avoid mechanical impact to retained tree/s during the construction phase. Sleeving should be installed to provide an impervious barrier between exposed TPZ perimeter/s and any proposed new concreted areas to prevent chemical leaching into surrounding soil of retained tree/s.

Reactionary processes, such as the emergence of deadwood, dieback etc. may be likely to occur as a result of disturbance and/or injury to any retained tree/s on a construction site. Amended design plans and construction methodology can serve to avoid or minimise the likely emergence of such issues, and therefore their associated future OH&S issues to the future occupants of the new dwellings and/or pedestrian/vehicular traffic within the vicinity of retained tree/s. Any required pruning is to be undertaken by a minimum AQF Level 3 arborist, under the supervision of the appointed Project Arborist (AQF Level 5).

PROJECT ARBORIST REQUIREMENTS

1. Tree Protection Fencing to be erected and audited by the Project Arborist before all works commence.
2. All required pre-start meetings and regulatory permissions to be in place.
3. Project Arborist (AQF level 5) to supervise all works within the NRZ of retained trees.
4. Post works check and audit report to be undertaken by the Project Arborist including a health form and risk assessment.



Tree Protection Fencing

HOLD POINT: Low pressure exploratory water excavation to be undertaken as nominated and supervised by the Project Arborist (AQF Level 5).

Trees 1152, 1154, 1174, 1188, 1192 are within the NRZ of retained trees. Removal to be undertaken by an AQF Level 3 Arborist under the supervision of the Project Arborist (AQF level 5). No grubbing of stumps is to occur within NRZ of retained trees. Stumps are to be stump ground.

1825 Old Cleveland Road

Legend

- Site Boundary
- Survey Area
- Property Boundaries
- Road
- Tree Impacts [167]
- Tree to be retained [107]
- Tree to be removed [60]

Figure 2 - Tree Retention Plan

28 South Project Ref: 2026 - 029

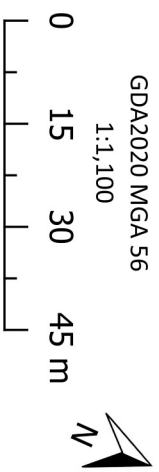
Source: C:\Users\luanna\Dropbox\28 South\Projects\28South\28South_1825-Old-Cleveland-Rd-Chandler\03_Working\01_GIS\28South\1825 Old Cleveland Road.dwg

The spatial data referenced within this map has been obtained from a variety of verified and licensed sources, as follows: Relevant local government data portals, DoR's QSpatial data catalogue, 28 South Environmental, clients and associates. Aerial imagery is sourced from Nearmap, Google Satellite and the DoR repositories QImagery and Qdclde.

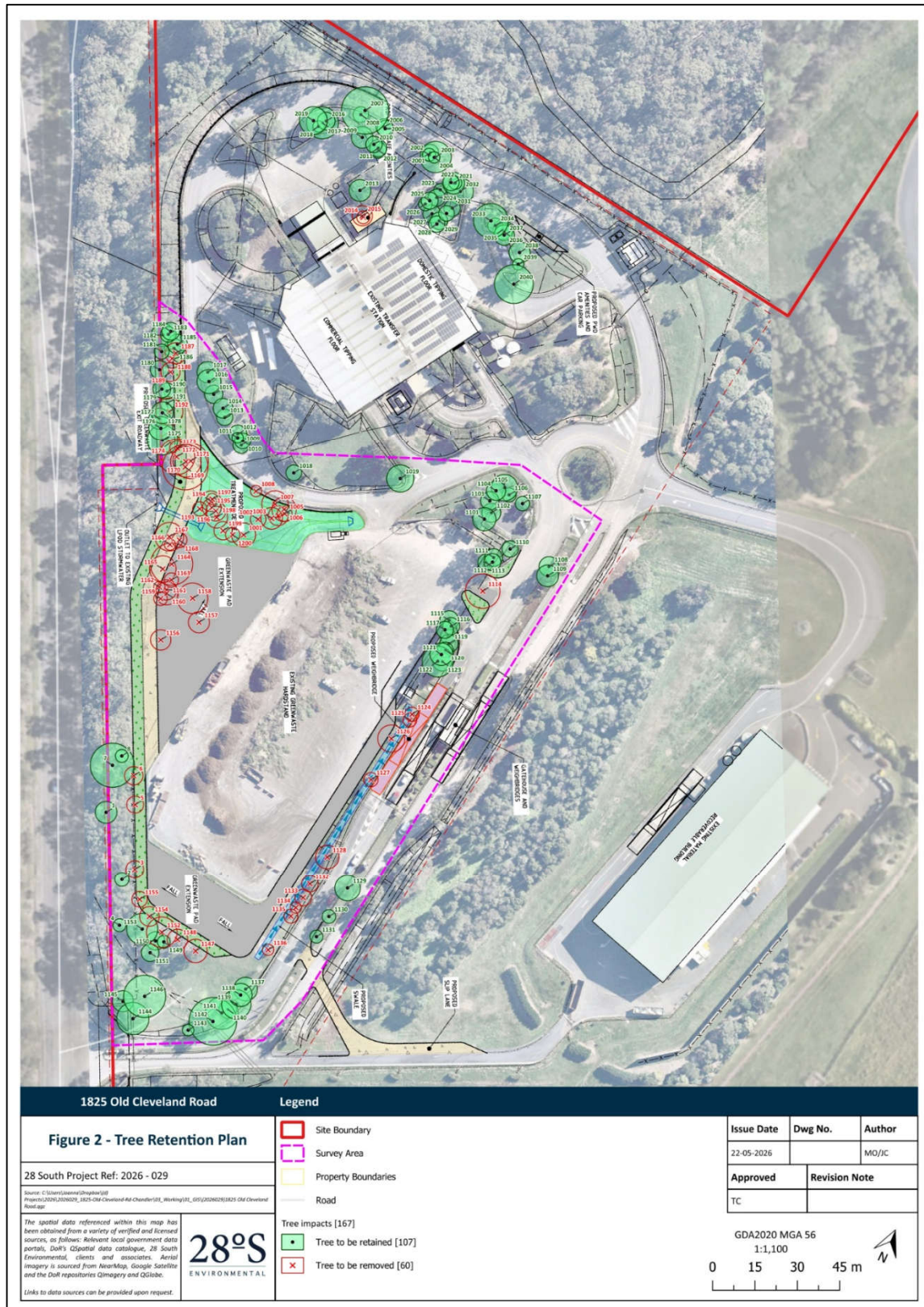


Links to data sources can be provided upon request.

Issue Date	Dwg No.	Author
22-05-2026		MO/JC
Approved	Revision Note	
TC		



Tree Locations



Please Note: Tree Locations have been supplied by 28 South. Circles indicate Notional Root Zones as defined under AS4970-2025 Protection of Trees on Development Sites.

Tree Detail

Tree No.	Botanical Name	DSH (cm)	SRZ (m)	NRZ (m)	Height (m)	Spread (m)	Health	Form	Comment
1	<i>Corymbia intermedia</i>	32	2.1	3.8	17	6	Fair	Typical	
2	<i>Eucalyptus seeana</i>	21	1.7	2.5	15	6	Fair	Typical	
3	<i>Eucalyptus seeana</i>	26	1.9	3.1	14	7	Fair	Typical	
4	<i>Eucalyptus siderophloia</i>	19	1.6	2.3	14	3	Fair	Typical	
5	<i>Eucalyptus acmenoides</i>	25	1.8	3	10	4	Fair	Typical	
6	<i>Angophora leiocarpa</i>	27	1.9	3.2	16	4	Fair	Typical	
7	<i>Blakella citriodora</i>	65	2.8	7.8	19	13	Fair	Typical	
8	<i>Blakella citriodora</i>	19	1.6	2.3	14	5	Fair	Typical	
1001	<i>Allocasuarina littoralis</i>	35	2.1	4.2	12	4	Fair	Typical	
1002	<i>Allocasuarina littoralis</i>	23	1.8	2.8	6	2	Fair	Typical	
1003	<i>Eucalyptus crebra</i>	32	2.1	3.8	16	7	Fair	Typical	
1004	<i>Eucalyptus crebra</i>	29	2	3.5	16	6	Fair	Typical	
1005	<i>Eucalyptus crebra</i>	22	1.8	2.6	10	4	Fair	Typical	
1006	<i>Eucalyptus crebra</i>	36	2.2	4.3	17	5	Fair	Typical	
1007	<i>Eucalyptus crebra</i>	39	2.2	4.7	18	8	Fair	Typical	
1008	<i>Eucalyptus crebra</i>	9	1.2	2	4	2	Fair	Typical	
1009	<i>Syzygium luehmannii</i>	24	1.8	2.9	6	3	Fair	Typical	
1010	<i>Syzygium luehmannii</i>	24	1.8	2.9	7	3	Fair	Typical	

Tree No.	Botanical Name	DSH (cm)	SRZ (m)	NRZ (m)	Height (m)	Spread (m)	Health	Form	Comment
1011	<i>Syzygium luehmannii</i>	16	1.5	2	6	2	Fair	Typical	
1012	<i>Syzygium luehmannii</i>	27	1.9	3.2	7	4	Fair	Typical	
1013	<i>Macaranga tanarius</i>	24	1.8	2.9	6	6	Fair	Typical	
1014	<i>Syzygium sp.</i>	29	2	3.5	7	3	Fair	Typical	
1015	<i>Macaranga tanarius</i>	27	1.9	3.2	7	7	Fair	Typical	
1016	<i>Syzygium sp.</i>	35	2.1	4.2	8	6	Fair	Typical	
1017	<i>Syzygium luehmannii</i>	31	2	3.7	6	6	Fair	Typical	
1018	<i>Macaranga tanarius</i>	23	1.8	2.8	6	3	Fair	Typical	
1019	<i>Allocasuarina littoralis</i>	40	2.3	4.8	12	4	Fair	Typical	
1101	<i>Allocasuarina littoralis</i>	34	2.1	4.1	9	3	Fair	Typical	
1102	<i>Allocasuarina littoralis</i>	28	1.9	3.3	9	3	Fair	Typical	
1103	<i>Allocasuarina littoralis</i>	27	1.9	3.3	8	5	Fair	Typical	Vine in canopy
1104	<i>Cupaniopsis anacardioides</i>	28	1.9	3.4	6	4	Fair	Typical	
1105	<i>Eucalyptus grandis</i>	39	2.2	4.7	10	9	Fair	Typical	
1106	<i>Allocasuarina littoralis</i>	21	1.7	2.5	9	3	Fair	Typical	
1107	<i>Flindersia sp.</i>	21	1.7	2.5	6	4	Fair	Typical	
1108	<i>Corymbia intermedia</i>	29	2	3.5	5	3	Fair	Typical	
1109	<i>Allocasuarina littoralis</i>	32	2.1	3.8	8	3	Fair	Typical	
1110	<i>Macaranga tanarius</i>	24	1.8	2.9	3	4	Fair	Typical	
1111	<i>Allocasuarina littoralis</i>	26	1.9	3.1	9	3	Fair	Typical	

Tree No.	Botanical Name	DSH (cm)	SRZ (m)	NRZ (m)	Height (m)	Spread (m)	Health	Form	Comment
1112	<i>Melaleuca leucadendra</i>	25	1.8	3	9	3	Fair	Typical	
1113	<i>Allocasuarina littoralis</i>	24	1.8	2.9	7	3	Fair	Typical	
1114	<i>Acacia disparrima</i>	51	2.5	6.1	8	8	Fair	Typical	
1115	<i>Allocasuarina littoralis</i>	28	1.9	3.4	9	3	Fair	Typical	
1116	<i>Allocasuarina littoralis</i>	25	1.8	3	9	4	Fair	Typical	
1117	<i>Allocasuarina littoralis</i>	25	1.8	3	9	3	Fair	Typical	
1118	<i>Allocasuarina littoralis</i>	23	1.8	2.8	9	3	Fair	Typical	
1119	<i>Allocasuarina littoralis</i>	27	1.9	3.2	9	3	Fair	Typical	
1120	<i>Allocasuarina littoralis</i>	23	1.8	2.8	6	4	Fair	Typical	
1121	<i>Allocasuarina littoralis</i>	34	2.1	4.1	12	4	Fair	Typical	
1122	<i>Allocasuarina littoralis</i>	46	2.4	5.5	14	6	Fair	Typical	
1123	<i>Allocasuarina littoralis</i>	28	1.9	3.4	8	4	Fair	Typical	
1124	<i>Allocasuarina littoralis</i>	21	1.7	2.5	4	3	Fair	Typical	
1125	<i>Allocasuarina littoralis</i>	20	1.7	2.4	5	3	Poor	Typical	
1126	<i>Allocasuarina littoralis</i>	40	2.3	4.8	6	6	Fair	Typical	
1127	<i>Allocasuarina littoralis</i>	21	1.7	2.5	7	3	Dead	Typical	
1128	<i>Allocasuarina littoralis</i>	35	2.1	4.2	6	4	Fair	Typical	
1129	<i>Eucalyptus propinqua</i>	38	2.2	4.5	12	6	Fair	Typical	
1130	<i>Corymbia intermedia</i>	20	1.7	2.4	5	4	Fair	Typical	
1131	<i>Corymbia intermedia</i>	19	1.6	2.3	6	3	Fair	Typical	

Tree No.	Botanical Name	DSH (cm)	SRZ (m)	NRZ (m)	Height (m)	Spread (m)	Health	Form	Comment
1132	<i>Melaleuca salicina</i>	24	1.8	2.9	3	3	Fair	Typical	
1133	<i>Melaleuca Viminalis</i>	25	1.8	3	3	2	Fair	Typical	
1134	<i>Melaleuca salicina</i>	9	1.2	2	2	2	Poor	Typical	
1135	<i>Melaleuca Viminalis</i>	21	1.7	2.5	3	3	Fair	Typical	
1136	<i>Melaleuca quinquenervia</i>	9	1.2	2	3	2	Fair	Typical	
1137	<i>Melaleuca leucadendra</i>	35	2.1	4.2	13	6	Fair	Typical	
1138	<i>Melaleuca leucadendra</i>	34	2.1	4.1	12	5	Fair	Typical	
1139	<i>Melaleuca leucadendra</i>	43	2.3	5.2	11	4	Fair	Typical	
1140	<i>Melaleuca leucadendra</i>	26	1.9	3.1	14	6	Fair	Typical	
1141	<i>Melaleuca leucadendra</i>	48	2.4	5.8	10	6	Fair	Typical	
1142	<i>Melaleuca leucadendra</i>	70	2.8	8.4	14	7	Fair	Typical	
1143	<i>Lophostemon confertus</i>	17	1.6	2	3	2	Fair	Typical	
1144	<i>Allocasuarina littoralis</i>	47	2.4	5.7	14	5	Fair	Typical	
1145	<i>Allocasuarina littoralis</i>	31	2	3.7	9	3	Fair	Typical	
1146	<i>Eucalyptus seeana</i>	62	2.7	7.4	18	12	Fair	Typical	
1147	<i>Eucalyptus acmenoides</i>	35	2.1	4.1	5	7	Fair	Typical	
1148	<i>Eucalyptus acmenoides</i>	30	2	3.6	15	6	Fair	Typical	
1149	<i>Eucalyptus seeana</i>	19	1.6	2.3	9	3	Fair	Typical	
1150	<i>Eucalyptus acmenoides</i>	27	1.9	3.2	16	8	Fair	Typical	
1151	<i>Corymbia ptychocarpa x ficifolia</i>	26	1.9	3.1	13	6	Fair	Typical	

Tree No.	Botanical Name	DSH (cm)	SRZ (m)	NRZ (m)	Height (m)	Spread (m)	Health	Form	Comment
1152	<i>Angophora leiocarpa</i>	45	2.4	5.4	19	7	Fair	Typical	
1153	<i>Angophora leiocarpa</i>	46	2.4	5.5	18	7	Fair	Typical	
1154	<i>Eucalyptus acmenoides</i>	29	2	3.5	10	7	Fair	Typical	
1155	<i>Eucalyptus seeana</i>	23	1.8	2.8	13	6	Fair	Typical	
1156	<i>Eucalyptus seeana</i>	30	2	3.6	5	5	Fair	Typical	
1157	<i>Allocasuarina littoralis</i>	31	2	3.7	5	3	Poor	Typical	
1158	<i>Allocasuarina littoralis</i>	44.9	2.4	5.4	10	4	Fair	Typical	Basal Hollow
1159	<i>Allocasuarina littoralis</i>	20	1.7	2.4	9	3	Fair	Typical	
1160	<i>Allocasuarina littoralis</i>	34	2.1	4.1	13	5	Fair	Typical	
1161	<i>Allocasuarina littoralis</i>	30	2	3.6	13	4	Fair	Typical	
1162	<i>Corymbia intermedia</i>	13	1.4	2	4	3	Fair	Typical	
1163	<i>Allocasuarina littoralis</i>	21	1.7	2.5	10	4	Fair	Typical	
1164	<i>Allocasuarina littoralis</i>	62	2.7	7.4	10	8	Fair	Typical	
1165	<i>Allocasuarina littoralis</i>	39	2.2	4.7	10	5	Fair	Typical	Vine in canopy
1166	<i>Melaleuca quinquenervia</i>	12	1.4	2	5	2	Fair	Typical	
1167	<i>Eucalyptus propinqua</i>	42	2.3	5	15	8	Fair	Typical	
1168	<i>Allocasuarina littoralis</i>	22	1.8	2.6	9	3	Fair	Typical	
1169	<i>Allocasuarina littoralis</i>	67	2.8	8	16	6	Fair	Typical	
1170	<i>Allocasuarina littoralis</i>	45	2.4	5.4	14	6	Fair	Typical	
1171	<i>Allocasuarina littoralis</i>	52	2.5	6.2	18	6	Fair	Typical	

Tree No.	Botanical Name	DSH (cm)	SRZ (m)	NRZ (m)	Height (m)	Spread (m)	Health	Form	Comment
1172	<i>Allocasuarina littoralis</i>	53	2.5	6.4	16	7	Fair	Typical	
1173	<i>Allocasuarina littoralis</i>	22	1.8	2.6	10	3	Fair	Typical	
1174	<i>Allocasuarina littoralis</i>	30	2	3.6	12	4	Fair	Typical	
1175	<i>Allocasuarina littoralis</i>	45	2.4	5.4	17	6	Fair	Typical	
1176	<i>Allocasuarina littoralis</i>	35	2.1	4.2	14	5	Fair	Typical	
1177	<i>Allocasuarina littoralis</i>	31	2	3.7	12	5	Fair	Typical	
1178	<i>Allocasuarina littoralis</i>	32	2.1	3.8	14	6	Fair	Typical	
1179	<i>Allocasuarina littoralis</i>	26	1.9	3.1	10	3	Fair	Typical	
1180	<i>Allocasuarina littoralis</i>	27	1.9	3.2	11	3	Fair	Typical	
1181	<i>Allocasuarina littoralis</i>	22	1.8	2.6	12	5	Fair	Typical	
1182	<i>Allocasuarina littoralis</i>	34	2.1	4.1	16	7	Fair	Typical	
1183	<i>Allocasuarina littoralis</i>	23	1.8	2.8	13	4	Fair	Typical	
1184	<i>Allocasuarina littoralis</i>	26	1.9	3.1	14	4	Fair	Typical	
1185	<i>Allocasuarina littoralis</i>	29	2	3.5	13	4	Fair	Typical	
1186	<i>Allocasuarina littoralis</i>	29	2	3.5	14	5	Fair	Typical	
1187	<i>Allocasuarina littoralis</i>	31	2	3.7	13	4	Fair	Typical	Vine in canopy
1188	<i>Allocasuarina littoralis</i>	28	1.9	3.4	10	4	Fair	Typical	Vine in canopy
1189	<i>Allocasuarina littoralis</i>	28	1.9	3.4	12	5	Fair	Typical	
1190	<i>Allocasuarina littoralis</i>	24	1.8	2.9	13	4	Fair	Typical	
1191	<i>Allocasuarina littoralis</i>	21	1.7	2.5	10	4	Fair	Typical	

Tree No.	Botanical Name	DSH (cm)	SRZ (m)	NRZ (m)	Height (m)	Spread (m)	Health	Form	Comment
1192	<i>Allocasuarina littoralis</i>	40	2.3	4.8	15	6	Fair	Typical	
1193	<i>Allocasuarina littoralis</i>	21	1.7	2.5	10	3	Fair	Typical	
1194	<i>Eucalyptus propinqua</i>	30	2	3.6	15	6	Fair	Typical	
1195	<i>Allocasuarina littoralis</i>	28	1.9	3.4	15	5	Fair	Typical	
1196	<i>Allocasuarina littoralis</i>	29	2	3.5	10	3	Fair	Typical	
1197	<i>Corymbia intermedia</i>	15	1.5	2	5	2	Fair	Typical	
1198	<i>Allocasuarina littoralis</i>	32	2.1	3.8	15	4	Fair	Typical	
1199	<i>Corymbia intermedia</i>	27	1.9	3.2	7	4	Fair	Typical	
1200	<i>Allocasuarina littoralis</i>	21.3	1.7	2.6	9	2	Fair	Typical	
2001	<i>Melaleuca quinquenervia</i>	24	1.8	2.9	6	5	Fair	Typical	
2002	<i>Melaleuca quinquenervia</i>	19	1.6	2.3	7	4	Fair	Typical	
2003	<i>Allocasuarina littoralis</i>	46	2.4	5.5	11	10	Fair	Typical	
2004	<i>Melaleuca quinquenervia</i>	15	1.5	2	7	4	Fair	Typical	
2005	<i>Macaranga tanarius</i>	24	1.8	2.9	6	9	Fair	Typical	
2006	<i>Macaranga tanarius</i>	25	1.8	3	5	6	Fair	Typical	
2007	<i>Eucalyptus tereticornis</i>	70	2.8	8.4	11	10	Fair	Typical	
2008	<i>Corymbia intermedia</i>	23	1.8	2.8	8	8	Fair	Typical	
2009	<i>Syzygium luehmannii</i>	32	2	3.8	9	7	Fair	Typical	
2010	<i>Syzygium luehmannii</i>	24	1.8	2.9	8	6	Fair	Typical	
2011	<i>Syzygium luehmannii</i>	26	1.9	3.1	6	5	Fair	Typical	
2012	<i>Syzygium luehmannii</i>	24	1.8	2.9	8	5	Fair	Typical	
2013	<i>Acmena smithii</i>	32	2.1	3.8	8	6	Fair	Typical	
2014	<i>Acmena smithii</i>	19	1.6	2.3	7	5	Fair	Typical	Crown Decline
2015	<i>Acmena smithii</i>	30	2	3.5	9	6	Fair	Typical	
2016	<i>Lophostemon confertus</i>	26	1.9	3.1	7	6	Fair	Typical	

Tree No.	Botanical Name	DSH (cm)	SRZ (m)	NRZ (m)	Height (m)	Spread (m)	Health	Form	Comment
2017	<i>Melaleuca leucadendra</i>	47	2.4	5.6	10	7	Fair	Typical	
2018	<i>Melaleuca linariifolia</i>	16	1.5	2	2	3	Fair	Typical	
2019	<i>Delonix regia</i>	41	2.3	4.9	6	10	Fair	Typical	
2020	<i>Melaleuca quinquenervia</i>	19	1.6	2.3	7	4	Fair	Typical	
2021	<i>Allocasuarina littoralis</i>	32	2.1	3.8	9	6	Fair	Typical	
2022	<i>Allocasuarina littoralis</i>	24	1.8	2.9	10	5	Fair	Typical	
2023	<i>Syzygium luehmannii</i>	18	1.6	2.2	5	3	Fair	Typical	
2024	<i>Syzygium luehmannii</i>	25	1.8	3	8	6	Fair	Typical	
2025	<i>Syzygium luehmannii</i>	25	1.8	3	7	6	Fair	Typical	
2026	<i>carica papaya</i>	20	1.7	2.4	4	2	Fair	Typical	
2027	<i>Acmena smithii</i>	26	1.9	3.2	8	7	Fair	Typical	
2028	<i>Acmena smithii</i>	24	1.8	2.9	4	2	Fair	Poor	
2029	<i>Acmena smithii</i>	26	1.9	3.1	6	6	Fair	Typical	
2030	<i>Ficus lyrata</i>	23	1.8	2.8	5	7	Fair	Typical	
2031	<i>Allocasuarina littoralis</i>	24	1.8	2.9	11	6	Fair	Typical	
2032	<i>Eucalyptus siderophloia</i>	39	2.2	4.7	12	10	Fair	Typical	
2033	<i>Ficus benjamina</i>	51	2.5	6.1	8	12	Fair	Typical	
2034	<i>Lophostemon confertus</i>	22	1.8	2.6	6	4	Fair	Typical	
2035	<i>Acmena smithii</i>	29	2	3.5	6	7	Fair	Typical	
2036	<i>Lophostemon confertus</i>	26	1.9	3.1	6	7	Fair	Typical	
2037	<i>Lophostemon confertus</i>	30	2	3.6	8	7	Fair	Typical	
2038	<i>Corymbia intermedia</i>	31	2	3.7	10	7	Fair	Typical	
2039	<i>Lophostemon confertus</i>	16	1.5	2	5	3	Fair	Typical	
2040	<i>Ficus benjamina</i>	57	2.6	6.8	9	10	Fair	Typical	

Table Legend (where relevant):			
Health	Form	Aged Class	Further Detail
Good: Trees foliage is in exceptional condition and can be considered an excellent specimen of its species. No pests or diseases are present.	Good: Trees structure is exceptional and can be considered an excellent specimen of its species. No visible defects are present.	Juvenile: Tree will generally grow rapidly in this phase of its life cycle.	Diameter at Standard Height (DSH) measured at 1.4m above ground level. Diameter at Root Flare (DRF) measured at the base of the tree, at the trunk / root system transition zone. Diameter = circumference divided by π
Fair: Trees foliar condition is satisfactory but may be exhibiting some signs of stress such as tip dieback or chlorosis, pests or diseases may be present but not adversely affecting the tree.	Typical: Trees structure is normal for the species; some minor structural constraints may be present.	Mature: Tree has reached maturity and is producing flowers, fruits and seeds. Tree continues to grow.	Notional Root Zone (NRZ) defined as metres radius. Calculated being $DSH \times 12$ (minimum 2.0m and no greater than 15m).
Poor: Foliage density is sparse or largely discoloured, tree health is at or approaching a critical value which may be irreversible, pests or diseases are highly prevalent throughout the crown.	Poor: Structure is a poor example of its species and exhibits a combination of structural issues.	Full to Late Maturity: Tree has reached the maximum height for its species, elongation has stopped but the trunk continues to thicken, overall growth rate is starting to slow, foliar density may be starting to thin.	Structural Root Zone (SRZ) displaced as metres radius. Calculation being $(DRF \times 50)^{0.42} \times 0.64$ (never less than 1.5m or greater than 15m).
Dead: Tree is in advanced decline or completely dead.	Dead: Tree is in advanced decline or completely dead.	Senescent: Tree has / is starting to retract in size through dieback and shedding of limbs. Trees in this age class may be ecologically valuable, as their structure contains habitat necessary for native fauna.	TPZ / NRZ – unless otherwise specified the Tree Protection Zone and the Notional Root Zone will be the same dimension.

Tree Recommendations

Tree No.	Botanical Name	DSH (cm)	SRZ (m)	NRZ (m)	Impact	Retention Status	Recommendation
1	<i>Corymbia intermedia</i>	32	2.1	3.8	MINOR	RETAIN	Retain and Protect <ul style="list-style-type: none"> Tree Protection Fencing to be erected and audited by the Project Arborist before all works
2	<i>Eucalyptus seeana</i>	21	1.7	2.5	MINOR	RETAIN	Retain and Protect <ul style="list-style-type: none"> Tree Protection Fencing to be erected and audited by the Project Arborist before all works
3	<i>Eucalyptus seeana</i>	26	1.9	3.1	MAJOR	REMOVE	Remove and Replace
4	<i>Eucalyptus siderophloia</i>	19	1.6	2.3	MINOR	RETAIN	Retain and Protect <ul style="list-style-type: none"> Tree Protection Fencing to be erected and audited by the Project Arborist before all works
5	<i>Eucalyptus acmenoides</i>	25	1.8	3	MAJOR	REMOVE	Remove and Replace
6	<i>Angophora leiocarpa</i>	27	1.9	3.2	MAJOR	REMOVE	Remove and Replace
7	<i>Blakella citriodora</i>	65	2.8	7.8	MINOR	RETAIN	Retain and Protect <ul style="list-style-type: none"> Tree Protection Fencing to be erected and audited by the Project Arborist before all works
8	<i>Blakella citriodora</i>	19	1.6	2.3	MINOR	RETAIN	Retain and Protect <ul style="list-style-type: none"> Tree Protection Fencing to be erected and audited by the Project Arborist before all works
1001	<i>Allocasuarina littoralis</i>	35	2.1	4.2	MAJOR	REMOVE	Remove and Replace
1002	<i>Allocasuarina littoralis</i>	23	1.8	2.8	MAJOR	REMOVE	Remove and Replace
1003	<i>Eucalyptus crebra</i>	32	2.1	3.8	MAJOR	REMOVE	Remove and Replace
1004	<i>Eucalyptus crebra</i>	29	2	3.5	MAJOR	REMOVE	Remove and Replace
1005	<i>Eucalyptus crebra</i>	22	1.8	2.6	MAJOR	REMOVE	Remove and Replace
1006	<i>Eucalyptus crebra</i>	36	2.2	4.3	MAJOR	REMOVE	Remove and Replace

1007	<i>Eucalyptus crebra</i>	39	2.2	4.7	MAJOR	REMOVE	Remove and Replace
1008	<i>Eucalyptus crebra</i>	9	1.2	2	MAJOR	REMOVE	Remove and Replace
1009	<i>Syzygium luehmannii</i>	24	1.8	2.9	MINOR	RETAIN	Retain and Protect <ul style="list-style-type: none"> Tree Protection Fencing to be erected and audited by the Project Arborist before all works
1010	<i>Syzygium luehmannii</i>	24	1.8	2.9	MINOR	RETAIN	Retain and Protect <ul style="list-style-type: none"> Tree Protection Fencing to be erected and audited by the Project Arborist before all works
1011	<i>Syzygium luehmannii</i>	16	1.5	2	MINOR	RETAIN	Retain and Protect <ul style="list-style-type: none"> Tree Protection Fencing to be erected and audited by the Project Arborist before all works
1012	<i>Syzygium luehmannii</i>	27	1.9	3.2	MINOR	RETAIN	Retain and Protect <ul style="list-style-type: none"> Tree Protection Fencing to be erected and audited by the Project Arborist before all works
1013	<i>Macaranga tanarius</i>	24	1.8	2.9	MINOR	RETAIN	Retain and Protect <ul style="list-style-type: none"> Tree Protection Fencing to be erected and audited by the Project Arborist before all works
1014	<i>Syzygium sp.</i>	29	2	3.5	MINOR	RETAIN	Retain and Protect <ul style="list-style-type: none"> Tree Protection Fencing to be erected and audited by the Project Arborist before all works
1015	<i>Macaranga tanarius</i>	27	1.9	3.2	MINOR	RETAIN	Retain and Protect <ul style="list-style-type: none"> Tree Protection Fencing to be erected and audited by the Project Arborist before all works
1016	<i>Syzygium sp.</i>	35	2.1	4.2	MINOR	RETAIN	Retain and Protect <ul style="list-style-type: none"> Tree Protection Fencing to be erected and audited by the Project Arborist before all works
1017	<i>Syzygium luehmannii</i>	31	2	3.7	MINOR	RETAIN	Retain and Protect <ul style="list-style-type: none"> Tree Protection Fencing to be erected and audited by the Project Arborist before all works
1018	<i>Macaranga tanarius</i>	23	1.8	2.8	MINOR	RETAIN	Retain and Protect <ul style="list-style-type: none"> Tree Protection Fencing to be erected and audited by the Project Arborist before all works
1019	<i>Allocasuarina littoralis</i>	40	2.3	4.8	MINOR	RETAIN	Retain and Protect

							<ul style="list-style-type: none"> Tree Protection Fencing to be erected and audited by the Project Arborist before all works
1101	<i>Allocasuarina littoralis</i>	34	2.1	4.1	MINOR	RETAIN	Retain and Protect <ul style="list-style-type: none"> Tree Protection Fencing to be erected and audited by the Project Arborist before all works
1102	<i>Allocasuarina littoralis</i>	28	1.9	3.3	MINOR	RETAIN	Retain and Protect <ul style="list-style-type: none"> Tree Protection Fencing to be erected and audited by the Project Arborist before all works
1103	<i>Allocasuarina littoralis</i>	27	1.9	3.3	MINOR	RETAIN	Retain and Protect <ul style="list-style-type: none"> Tree Protection Fencing to be erected and audited by the Project Arborist before all works
1104	<i>Cupaniopsis anacardioides</i>	28	1.9	3.4	MINOR	RETAIN	Retain and Protect <ul style="list-style-type: none"> Tree Protection Fencing to be erected and audited by the Project Arborist before all works
1105	<i>Eucalyptus grandis</i>	39	2.2	4.7	MINOR	RETAIN	Retain and Protect <ul style="list-style-type: none"> Tree Protection Fencing to be erected and audited by the Project Arborist before all works
1106	<i>Allocasuarina littoralis</i>	21	1.7	2.5	MINOR	RETAIN	Retain and Protect <ul style="list-style-type: none"> Tree Protection Fencing to be erected and audited by the Project Arborist before all works
1107	<i>Flindersia sp.</i>	21	1.7	2.5	MINOR	RETAIN	Retain and Protect <ul style="list-style-type: none"> Tree Protection Fencing to be erected and audited by the Project Arborist before all works
1108	<i>Corymbia intermedia</i>	29	2	3.5	MINOR	RETAIN	Retain and Protect <ul style="list-style-type: none"> Tree Protection Fencing to be erected and audited by the Project Arborist before all works
1109	<i>Allocasuarina littoralis</i>	32	2.1	3.8	MINOR	RETAIN	Retain and Protect <ul style="list-style-type: none"> Tree Protection Fencing to be erected and audited by the Project Arborist before all works
1110	<i>Macaranga tanarius</i>	24	1.8	2.9	MINOR	RETAIN	Retain and Protect <ul style="list-style-type: none"> Tree Protection Fencing to be erected and audited by the Project Arborist before all works
1111	<i>Allocasuarina littoralis</i>	26	1.9	3.1	MINOR	RETAIN	Retain and Protect <ul style="list-style-type: none"> Tree Protection Fencing to be erected and audited by the Project Arborist before all works

1112	<i>Melaleuca leucadendra</i>	25	1.8	3	MINOR	RETAIN	Retain and Protect <ul style="list-style-type: none"> Tree Protection Fencing to be erected and audited by the Project Arborist before all works
1113	<i>Allocasuarina littoralis</i>	24	1.8	2.9	MINOR	RETAIN	Retain and Protect <ul style="list-style-type: none"> Tree Protection Fencing to be erected and audited by the Project Arborist before all works
1114	<i>Acacia disparrima</i>	51	2.5	6.1	MAJOR	REMOVE	Remove and Replace
1115	<i>Allocasuarina littoralis</i>	28	1.9	3.4	MINOR	RETAIN	Retain and Protect <ul style="list-style-type: none"> Tree Protection Fencing to be erected and audited by the Project Arborist before all works
1116	<i>Allocasuarina littoralis</i>	25	1.8	3	MINOR	RETAIN	Retain and Protect <ul style="list-style-type: none"> Tree Protection Fencing to be erected and audited by the Project Arborist before all works
1117	<i>Allocasuarina littoralis</i>	25	1.8	3	MINOR	RETAIN	Retain and Protect <ul style="list-style-type: none"> Tree Protection Fencing to be erected and audited by the Project Arborist before all works
1118	<i>Allocasuarina littoralis</i>	23	1.8	2.8	MINOR	RETAIN	Retain and Protect <ul style="list-style-type: none"> Tree Protection Fencing to be erected and audited by the Project Arborist before all works
1119	<i>Allocasuarina littoralis</i>	27	1.9	3.2	MINOR	RETAIN	Retain and Protect <ul style="list-style-type: none"> Tree Protection Fencing to be erected and audited by the Project Arborist before all works
1120	<i>Allocasuarina littoralis</i>	23	1.8	2.8	MINOR	RETAIN	Retain and Protect <ul style="list-style-type: none"> Tree Protection Fencing to be erected and audited by the Project Arborist before all works
1121	<i>Allocasuarina littoralis</i>	34	2.1	4.1	MINOR	RETAIN	Retain and Protect <ul style="list-style-type: none"> Tree Protection Fencing to be erected and audited by the Project Arborist before all works
1122	<i>Allocasuarina littoralis</i>	46	2.4	5.5	MINOR	RETAIN	Retain and Protect <ul style="list-style-type: none"> Tree Protection Fencing to be erected and audited by the Project Arborist before all works
1123	<i>Allocasuarina littoralis</i>	28	1.9	3.4	MINOR	RETAIN	Retain and Protect <ul style="list-style-type: none"> Tree Protection Fencing to be erected and audited by the Project Arborist before all works

1124	<i>Allocasuarina littoralis</i>	21	1.7	2.5	MAJOR	REMOVE	Remove and Replace
1125	<i>Allocasuarina littoralis</i>	20	1.7	2.4	MAJOR	REMOVE	Remove and Replace
1126	<i>Allocasuarina littoralis</i>	40	2.3	4.8	MAJOR	REMOVE	Remove and Replace
1127	<i>Allocasuarina littoralis</i>	21	1.7	2.5	MAJOR	REMOVE	Remove and Replace
1128	<i>Allocasuarina littoralis</i>	35	2.1	4.2	MAJOR	REMOVE	Remove and Replace
1129	<i>Eucalyptus propinqua</i>	38	2.2	4.5	MINOR	RETAIN	Retain and Protect <ul style="list-style-type: none"> • Tree Protection Fencing to be erected and audited by the Project Arborist before all works
1130	<i>Corymbia intermedia</i>	20	1.7	2.4	MINOR	RETAIN	Retain and Protect <ul style="list-style-type: none"> • Tree Protection Fencing to be erected and audited by the Project Arborist before all works
1131	<i>Corymbia intermedia</i>	19	1.6	2.3	MINOR	RETAIN	Retain and Protect <ul style="list-style-type: none"> • Tree Protection Fencing to be erected and audited by the Project Arborist before all works
1132	<i>Melaleuca salicina</i>	24	1.8	2.9	MAJOR	REMOVE	Remove and Replace
1133	<i>Melaleuca Viminalis</i>	25	1.8	3	MAJOR	REMOVE	Remove and Replace
1134	<i>Melaleuca salicina</i>	9	1.2	2	MAJOR	REMOVE	Remove and Replace
1135	<i>Melaleuca Viminalis</i>	21	1.7	2.5	MAJOR	REMOVE	Remove and Replace
1136	<i>Melaleuca quinquenervia</i>	9	1.2	2	MAJOR	REMOVE	Remove and Replace
1137	<i>Melaleuca leucadendra</i>	35	2.1	4.2	MINOR	RETAIN	Retain and Protect <ul style="list-style-type: none"> • Tree Protection Fencing to be erected and audited by the Project Arborist before all works
1138	<i>Melaleuca leucadendra</i>	34	2.1	4.1	MINOR	RETAIN	Retain and Protect <ul style="list-style-type: none"> • Tree Protection Fencing to be erected and audited by the Project Arborist before all works
1139	<i>Melaleuca leucadendra</i>	43	2.3	5.2	MINOR	RETAIN	Retain and Protect <ul style="list-style-type: none"> • Tree Protection Fencing to be erected and audited by the Project Arborist before all works

1140	<i>Melaleuca leucadendra</i>	26	1.9	3.1	MINOR	RETAIN	Retain and Protect <ul style="list-style-type: none"> Tree Protection Fencing to be erected and audited by the Project Arborist before all works
1141	<i>Melaleuca leucadendra</i>	48	2.4	5.8	MINOR	RETAIN	Retain and Protect <ul style="list-style-type: none"> Tree Protection Fencing to be erected and audited by the Project Arborist before all works
1142	<i>Melaleuca leucadendra</i>	70	2.8	8.4	MINOR	RETAIN	Retain and Protect <ul style="list-style-type: none"> Tree Protection Fencing to be erected and audited by the Project Arborist before all works
1143	<i>Lophostemon confertus</i>	17	1.6	2	MINOR	RETAIN	Retain and Protect <ul style="list-style-type: none"> Tree Protection Fencing to be erected and audited by the Project Arborist before all works
1144	<i>Allocasuarina littoralis</i>	47	2.4	5.7	MINOR	RETAIN	Retain and Protect <ul style="list-style-type: none"> Tree Protection Fencing to be erected and audited by the Project Arborist before all works
1145	<i>Allocasuarina littoralis</i>	31	2	3.7	MINOR	RETAIN	Retain and Protect <ul style="list-style-type: none"> Tree Protection Fencing to be erected and audited by the Project Arborist before all works
1146	<i>Eucalyptus seeana</i>	62	2.7	7.4	MINOR	RETAIN	Retain and Protect <ul style="list-style-type: none"> Tree Protection Fencing to be erected and audited by the Project Arborist before all works
1147	<i>Eucalyptus acmenoides</i>	35	2.1	4.1	MAJOR	REMOVE	Remove and Replace
1148	<i>Eucalyptus acmenoides</i>	30	2	3.6	MAJOR	REMOVE	Remove and Replace
1149	<i>Eucalyptus seeana</i>	19	1.6	2.3	MINOR	RETAIN	Retain and Protect <ul style="list-style-type: none"> Tree Protection Fencing to be erected and audited by the Project Arborist before all works
1150	<i>Eucalyptus acmenoides</i>	27	1.9	3.2	MINOR	RETAIN	Retain and Protect <ul style="list-style-type: none"> Tree Protection Fencing to be erected and audited by the Project Arborist before all works
1151	<i>Corymbia ptychocarpa x ficifolia</i>	26	1.9	3.1	MINOR	RETAIN	Retain and Protect <ul style="list-style-type: none"> Tree Protection Fencing to be erected and audited by the Project Arborist before all works

1152	<i>Angophora leiocarpa</i>	45	2.4	5.4	MAJOR	REMOVE	<p>Remove and Replace</p> <ul style="list-style-type: none"> Removal of trees within the NRZ of retained trees to be undertaken by an AQF Level 3 Arborist, under the supervision of the Project Arborist (AQF level 5). No grubbing of stumps is to occur within NRZ of retained trees. Stumps are to be stump ground.
1153	<i>Angophora leiocarpa</i>	46	2.4	5.5	MINOR	RETAIN	<p>Retain and Protect</p> <ul style="list-style-type: none"> Tree Protection Fencing to be erected and audited by the Project Arborist before all works
1154	<i>Eucalyptus acmenoides</i>	29	2	3.5	MAJOR	REMOVE	<p>Remove and Replace</p> <ul style="list-style-type: none"> Removal of trees within the NRZ of retained trees to be undertaken by an AQF Level 3 Arborist, under the supervision of the Project Arborist (AQF level 5). No grubbing of stumps is to occur within NRZ of retained trees. Stumps are to be stump ground.
1155	<i>Eucalyptus seeana</i>	23	1.8	2.8	MAJOR	REMOVE	Remove and Replace
1156	<i>Eucalyptus seeana</i>	30	2	3.6	MAJOR	REMOVE	Remove and Replace
1157	<i>Allocasuarina littoralis</i>	31	2	3.7	MAJOR	REMOVE	Remove and Replace
1158	<i>Allocasuarina littoralis</i>	44.9	2.4	5.4	MAJOR	REMOVE	Remove and Replace
1159	<i>Allocasuarina littoralis</i>	20	1.7	2.4	MAJOR	REMOVE	Remove and Replace
1160	<i>Allocasuarina littoralis</i>	34	2.1	4.1	MAJOR	REMOVE	Remove and Replace
1161	<i>Allocasuarina littoralis</i>	30	2	3.6	MAJOR	REMOVE	Remove and Replace
1162	<i>Corymbia intermedia</i>	13	1.4	2	MAJOR	REMOVE	Remove and Replace
1163	<i>Allocasuarina littoralis</i>	21	1.7	2.5	MAJOR	REMOVE	Remove and Replace
1164	<i>Allocasuarina littoralis</i>	62	2.7	7.4	MAJOR	REMOVE	Remove and Replace
1165	<i>Allocasuarina littoralis</i>	39	2.2	4.7	MAJOR	REMOVE	Remove and Replace

1166	<i>Melaleuca quinquenervia</i>	12	1.4	2	MAJOR	REMOVE	Remove and Replace
1167	<i>Eucalyptus propinqua</i>	42	2.3	5	MAJOR	REMOVE	Remove and Replace
1168	<i>Allocasuarina littoralis</i>	22	1.8	2.6	MAJOR	REMOVE	Remove and Replace
1169	<i>Allocasuarina littoralis</i>	67	2.8	8	MAJOR	REMOVE	Remove and Replace
1170	<i>Allocasuarina littoralis</i>	45	2.4	5.4	MAJOR	REMOVE	Remove and Replace
1171	<i>Allocasuarina littoralis</i>	52	2.5	6.2	MAJOR	REMOVE	Remove and Replace
1172	<i>Allocasuarina littoralis</i>	53	2.5	6.4	MAJOR	REMOVE	Remove and Replace
1173	<i>Allocasuarina littoralis</i>	22	1.8	2.6	MAJOR	REMOVE	Remove and Replace
1174	<i>Allocasuarina littoralis</i>	30	2	3.6	MAJOR	REMOVE	Remove and Replace <ul style="list-style-type: none"> Removal of trees within the NRZ of retained trees to be undertaken by an AQF Level 3 Arborist, under the supervision of the Project Arborist (AQF level 5). No grubbing of stumps is to occur within NRZ of retained trees. Stumps are to be stump ground.
1175	<i>Allocasuarina littoralis</i>	45	2.4	5.4	MINOR	RETAIN	Retain and Protect <ul style="list-style-type: none"> Tree Protection Fencing to be erected and audited by the Project Arborist before all works HOLD POINT: Low pressure exploratory water excavation to be undertaken as nominated and supervised by the Project Arborist (AQF Level 5). Removal of trees within the NRZ of retained trees to be undertaken by an AQF Level 3 Arborist, under the supervision of the Project Arborist (AQF level 5). No grubbing of stumps is to occur within NRZ of retained trees. Stumps are to be stump ground.
1176	<i>Allocasuarina littoralis</i>	35	2.1	4.2	MINOR	RETAIN	Retain and Protect

							<ul style="list-style-type: none"> Tree Protection Fencing to be erected and audited by the Project Arborist before all works
1177	<i>Allocasuarina littoralis</i>	31	2	3.7	MINOR	RETAIN	Retain and Protect <ul style="list-style-type: none"> Tree Protection Fencing to be erected and audited by the Project Arborist before all works
1178	<i>Allocasuarina littoralis</i>	32	2.1	3.8	MINOR	RETAIN	Retain and Protect <ul style="list-style-type: none"> Tree Protection Fencing to be erected and audited by the Project Arborist before all works
1179	<i>Allocasuarina littoralis</i>	26	1.9	3.1	MINOR	RETAIN	Retain and Protect <ul style="list-style-type: none"> Tree Protection Fencing to be erected and audited by the Project Arborist before all works
1180	<i>Allocasuarina littoralis</i>	27	1.9	3.2	MINOR	RETAIN	Retain and Protect <ul style="list-style-type: none"> Tree Protection Fencing to be erected and audited by the Project Arborist before all works
1181	<i>Allocasuarina littoralis</i>	22	1.8	2.6	MINOR	RETAIN	Retain and Protect <ul style="list-style-type: none"> Tree Protection Fencing to be erected and audited by the Project Arborist before all works
1182	<i>Allocasuarina littoralis</i>	34	2.1	4.1	MINOR	RETAIN	Retain and Protect <ul style="list-style-type: none"> Tree Protection Fencing to be erected and audited by the Project Arborist before all works
1183	<i>Allocasuarina littoralis</i>	23	1.8	2.8	MINOR	RETAIN	Retain and Protect <ul style="list-style-type: none"> Tree Protection Fencing to be erected and audited by the Project Arborist before all works
1184	<i>Allocasuarina littoralis</i>	26	1.9	3.1	MINOR	RETAIN	Retain and Protect <ul style="list-style-type: none"> Tree Protection Fencing to be erected and audited by the Project Arborist before all works
1185	<i>Allocasuarina littoralis</i>	29	2	3.5	MINOR	RETAIN	Retain and Protect <ul style="list-style-type: none"> Tree Protection Fencing to be erected and audited by the Project Arborist before all works
1186	<i>Allocasuarina littoralis</i>	29	2	3.5	MINOR	RETAIN	Retain and Protect <ul style="list-style-type: none"> Tree Protection Fencing to be erected and audited by the Project Arborist before all works
1187	<i>Allocasuarina littoralis</i>	31	2	3.7	MAJOR	REMOVE	Remove and Replace

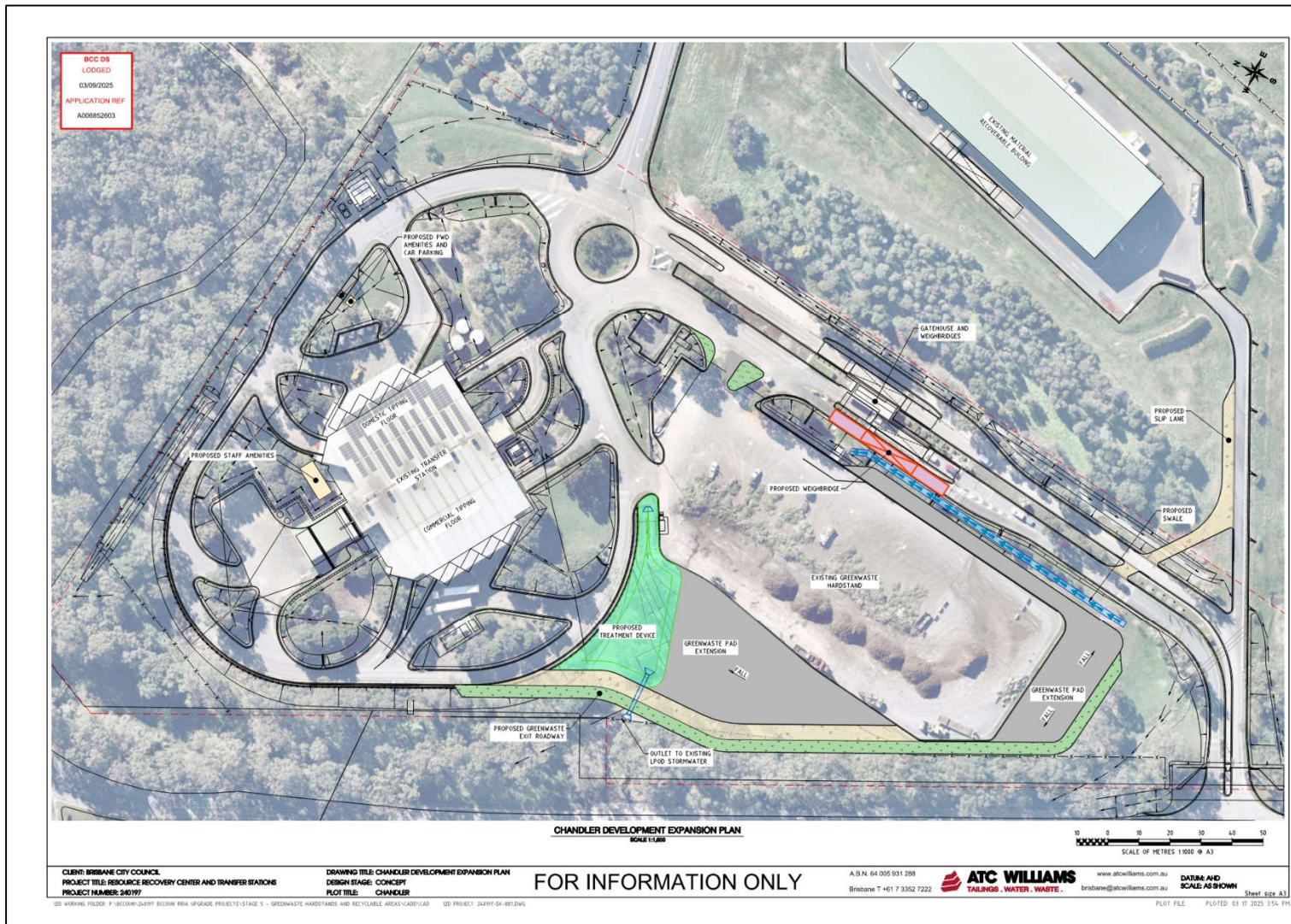
1188	<i>Allocasuarina littoralis</i>	28	1.9	3.4	MAJOR	REMOVE	<p>Remove and Replace</p> <ul style="list-style-type: none"> Removal of trees within the NRZ of retained trees to be undertaken by an AQF Level 3 Arborist, under the supervision of the Project Arborist (AQF level 5). No grubbing of stumps is to occur within NRZ of retained trees. Stumps are to be stump ground.
1189	<i>Allocasuarina littoralis</i>	28	1.9	3.4	MAJOR	REMOVE	Remove and Replace
1190	<i>Allocasuarina littoralis</i>	24	1.8	2.9	MINOR	RETAIN	<p>Retain and Protect</p> <ul style="list-style-type: none"> Tree Protection Fencing to be erected and audited by the Project Arborist before all work. HOLD POINT: Low pressure exploratory water excavation to be undertaken as nominated and supervised by the Project Arborist (AQF Level 5). Removal of trees within the NRZ of retained trees, to be undertaken by an AQF Level 3 Arborist under the supervision of the Project Arborist (AQF level 5). No grubbing of stumps is to occur within NRZ of retained trees. Stumps are to be stump ground.
1191	<i>Allocasuarina littoralis</i>	21	1.7	2.5	MINOR	RETAIN	<p>Retain and Protect</p> <ul style="list-style-type: none"> Tree Protection Fencing to be erected and audited by the Project Arborist before all works
1192	<i>Allocasuarina littoralis</i>	40	2.3	4.8	MAJOR	REMOVE	<ul style="list-style-type: none"> Remove and Replace Removal of trees within the NRZ of retained trees to be undertaken by an AQF Level 3 Arborist, under the supervision of the Project Arborist (AQF level 5). No grubbing of stumps is to occur within NRZ of retained trees. Stumps are to be stump ground.
1193	<i>Allocasuarina littoralis</i>	21	1.7	2.5	MAJOR	REMOVE	Remove and Replace
1194	<i>Eucalyptus propinqua</i>	30	2	3.6	MAJOR	REMOVE	Remove and Replace
1195	<i>Allocasuarina littoralis</i>	28	1.9	3.4	MAJOR	REMOVE	Remove and Replace

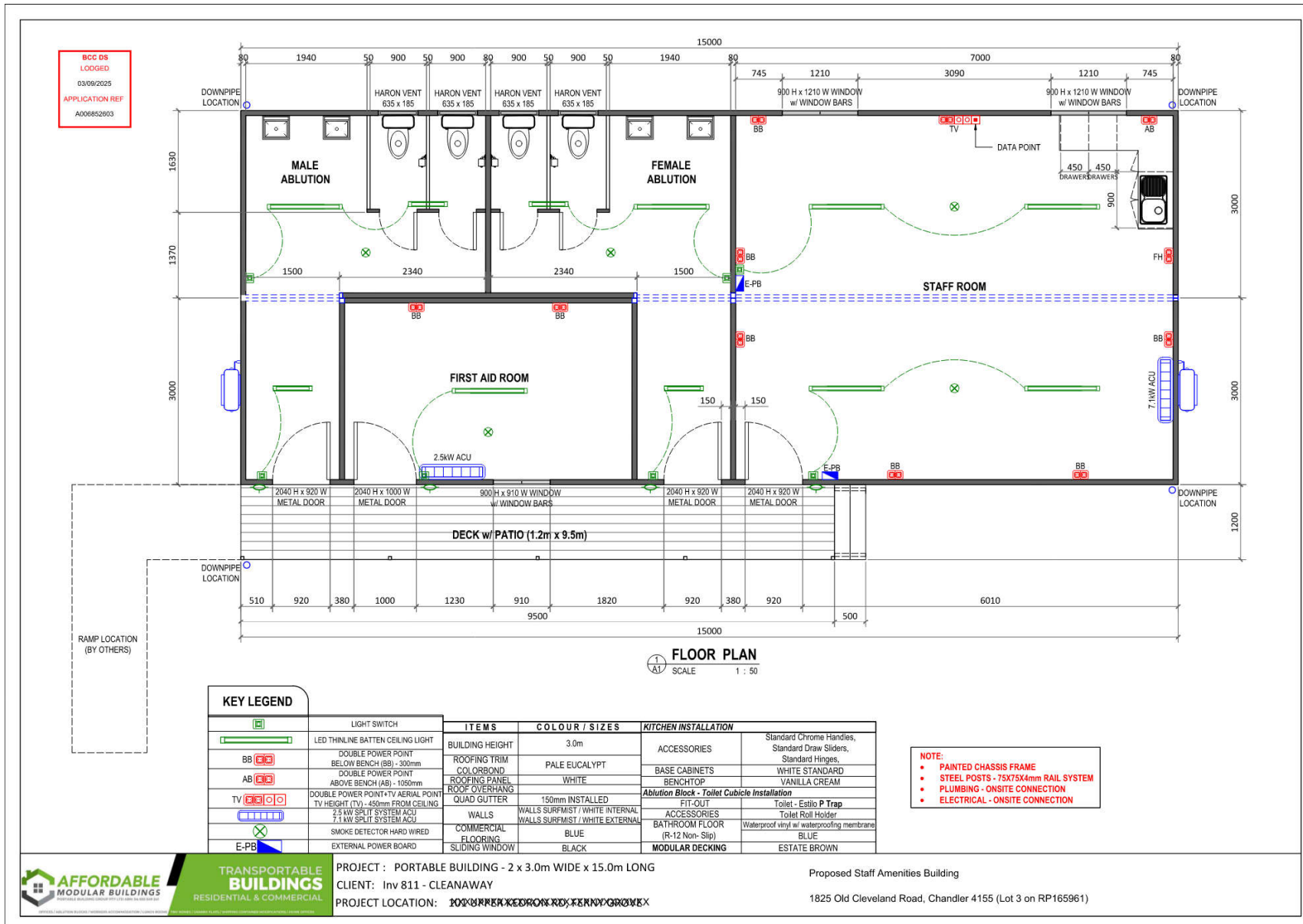
1196	<i>Allocasuarina littoralis</i>	29	2	3.5	MAJOR	REMOVE	Remove and Replace
1197	<i>Corymbia intermedia</i>	15	1.5	2	MAJOR	REMOVE	Remove and Replace
1198	<i>Allocasuarina littoralis</i>	32	2.1	3.8	MAJOR	REMOVE	Remove and Replace
1199	<i>Corymbia intermedia</i>	27	1.9	3.2	MAJOR	REMOVE	Remove and Replace
1200	<i>Allocasuarina littoralis</i>	21.3	1.7	2.6	MAJOR	REMOVE	Remove and Replace
2001	<i>Melaleuca quinquenervia</i>	24	1.8	2.9	NIL	RETAIN	Retain and Protect
2002	<i>Melaleuca quinquenervia</i>	19	1.6	2.3	NIL	RETAIN	Retain and Protect
2003	<i>Allocasuarina littoralis</i>	46	2.4	5.5	NIL	RETAIN	Retain and Protect
2004	<i>Melaleuca quinquenervia</i>	15	1.5	2	NIL	RETAIN	Retain and Protect
2005	<i>Macaranga tanarius</i>	24	1.8	2.9	NIL	RETAIN	Retain and Protect
2006	<i>Macaranga tanarius</i>	25	1.8	3	NIL	RETAIN	Retain and Protect
2007	<i>Eucalyptus tereticornis</i>	70	2.8	8.4	NIL	RETAIN	Retain and Protect
2008	<i>Corymbia intermedia</i>	23	1.8	2.8	NIL	RETAIN	Retain and Protect
2009	<i>Syzygium luehmannii</i>	32	2	3.8	NIL	RETAIN	Retain and Protect
2010	<i>Syzygium luehmannii</i>	24	1.8	2.9	NIL	RETAIN	Retain and Protect
2011	<i>Syzygium luehmannii</i>	26	1.9	3.1	NIL	RETAIN	Retain and Protect
2012	<i>Syzygium luehmannii</i>	24	1.8	2.9	NIL	RETAIN	Retain and Protect
2013	<i>Acmena smithii</i>	32	2.1	3.8	MINOR	RETAIN	Retain and Protect <ul style="list-style-type: none"> Tree Protection Fencing to be erected and audited by the Project Arborist before all works
2014	<i>Acmena smithii</i>	19	1.6	2.3	MAJOR	REMOVE	Remove and Replace
2015	<i>Acmena smithii</i>	30	2	3.5	MAJOR	REMOVE	Remove and Replace

2016	<i>Lophostemon confertus</i>	26	1.9	3.1	NIL	RETAIN	Retain and Protect
2017	<i>Melaleuca leucadendra</i>	47	2.4	5.6	NIL	RETAIN	Retain and Protect
2018	<i>Melaleuca linariifolia</i>	16	1.5	2	NIL	RETAIN	Retain and Protect
2019	<i>Delonix regia</i>	41	2.3	4.9	NIL	RETAIN	Retain and Protect
2020	<i>Melaleuca quinquenervia</i>	19	1.6	2.3	NIL	RETAIN	Retain and Protect
2021	<i>Allocasuarina littoralis</i>	32	2.1	3.8	NIL	RETAIN	Retain and Protect
2022	<i>Allocasuarina littoralis</i>	24	1.8	2.9	NIL	RETAIN	Retain and Protect
2023	<i>Syzygium luehmannii</i>	18	1.6	2.2	NIL	RETAIN	Retain and Protect
2024	<i>Syzygium luehmannii</i>	25	1.8	3	NIL	RETAIN	Retain and Protect
2025	<i>Syzygium luehmannii</i>	25	1.8	3	NIL	RETAIN	Retain and Protect
2026	<i>carica papaya</i>	20	1.7	2.4	NIL	RETAIN	Retain and Protect
2027	<i>Acmena smithii</i>	26	1.9	3.2	NIL	RETAIN	Retain and Protect
2028	<i>Acmena smithii</i>	24	1.8	2.9	NIL	RETAIN	Retain and Protect
2029	<i>Acmena smithii</i>	26	1.9	3.1	NIL	RETAIN	Retain and Protect
2030	<i>Ficus lyrata</i>	23	1.8	2.8	NIL	RETAIN	Retain and Protect
2031	<i>Allocasuarina littoralis</i>	24	1.8	2.9	NIL	RETAIN	Retain and Protect
2032	<i>Eucalyptus siderophloia</i>	39	2.2	4.7	NIL	RETAIN	Retain and Protect
2033	<i>Ficus benjamina</i>	51	2.5	6.1	NIL	RETAIN	Retain and Protect
2034	<i>Lophostemon confertus</i>	22	1.8	2.6	NIL	RETAIN	Retain and Protect
2035	<i>Acmena smithii</i>	29	2	3.5	NIL	RETAIN	Retain and Protect
2036	<i>Lophostemon confertus</i>	26	1.9	3.1	NIL	RETAIN	Retain and Protect

2037	<i>Lophostemon confertus</i>	30	2	3.6	NIL	RETAIN	Retain and Protect
2038	<i>Corymbia intermedia</i>	31	2	3.7	NIL	RETAIN	Retain and Protect
2039	<i>Lophostemon confertus</i>	16	1.5	2	NIL	RETAIN	Retain and Protect
2040	<i>Ficus benjamina</i>	57	2.6	6.8	NIL	RETAIN	Retain and Protect

Plans






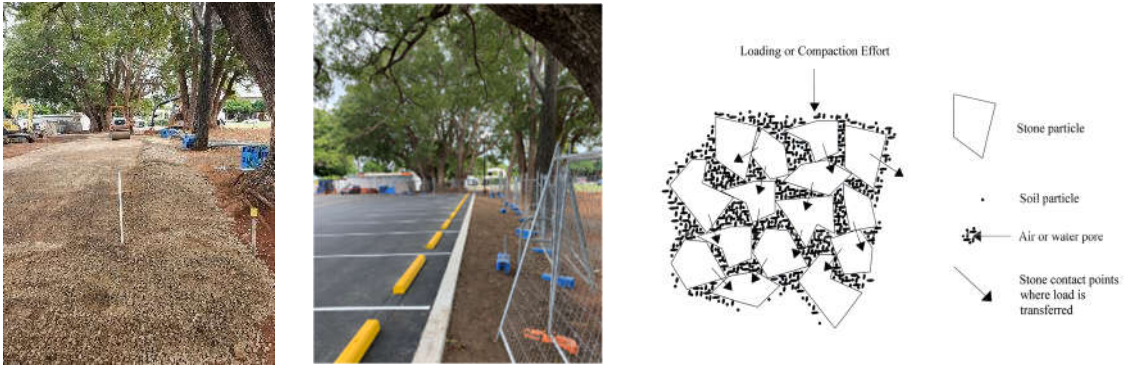








Photos



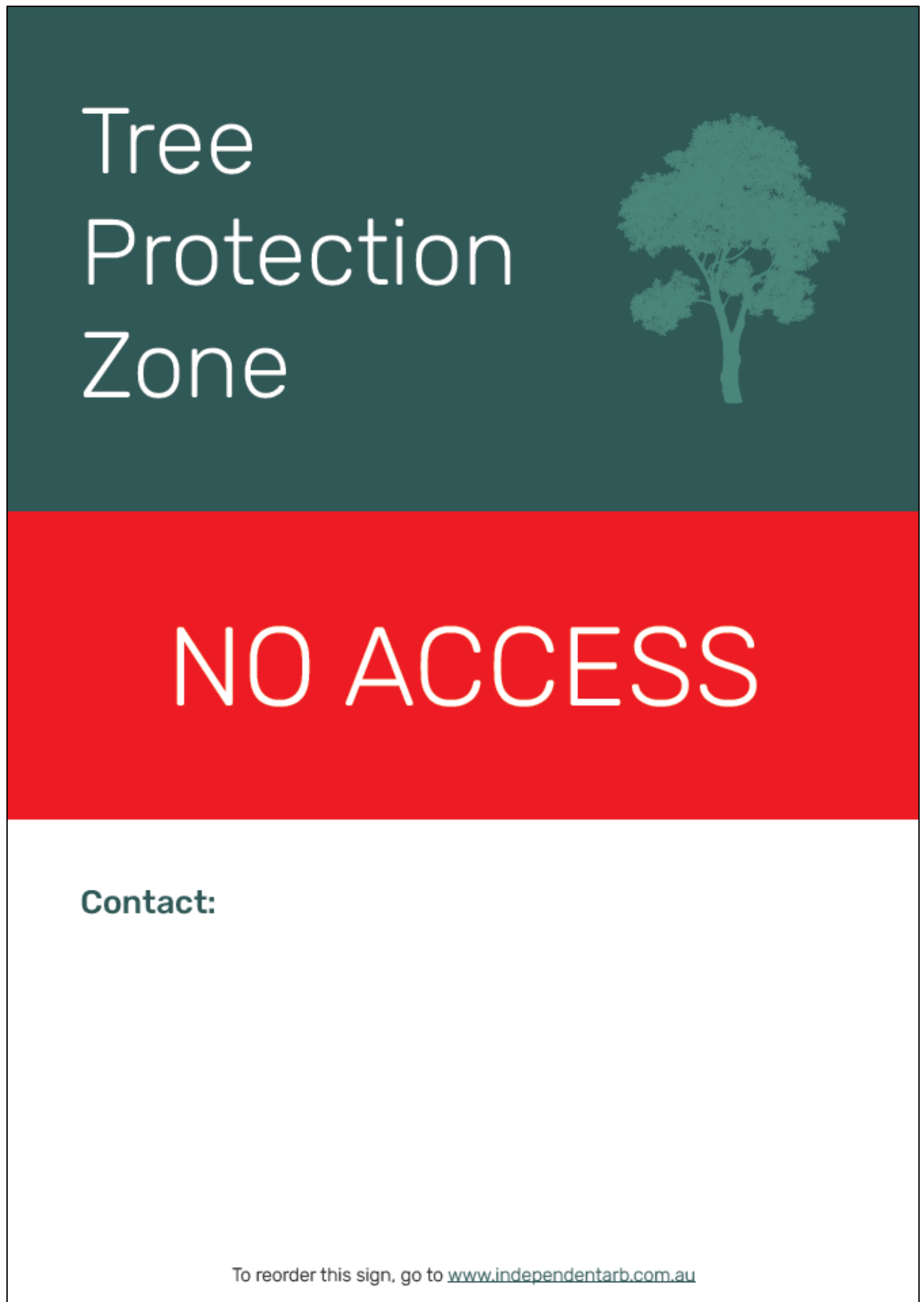
Appendix 1: Examples of Protection Measures

Examples	Photos
<p>The use low pressure water excavation for the installation of conduits</p>	
<p>The use of black plastic to line pier holes</p>	
<p>The use of black plastic to line concrete</p>	
<p>The use of Structural Soil. Structural Soils – (Source: Cornell University)</p>	 <p style="text-align: center;">Loading or Compaction Effort</p> <ul style="list-style-type: none">  Stone particle  Soil particle  Air or water pore  Stone contact points where load is transferred

Appendix 2: Tree Management Plan (TMP) – Works Progress: Development Phase

Stage	Tasks	Specific Outcomes
Pre-construction Phase		
Prepare and finalise Arboricultural Impact Assessments (AIA) for submission to Council	Project Arborist to be appointed. Review tree details in all approved arboricultural reports following any new issue of plans.	Submit Arboricultural reports including Arboricultural Impact Assessment for final Council Approval
Project Arborist to conduct Prestart Meeting with all representatives involved in construction	Prior to meeting: TPZ temporary protection/fencing installed <u>Arboricultural Report, TPP (including TPS) & Council approval copies to be included in Construction Management Plan (CMP) and made available to onsite crews.</u>	Prestart Certification and approvals in place & available onsite with Construction Management Plan (CMP).
Commencement - Construction Phase		
Initial Site Preparation	Project Arborist to supervise all tree work. Construction crew or others are not to remove any part of a tree prior to arborist prestart site inspection.	Compliance Certification of Arboricultural works for lodgement to Council Arborist certification of TPZ measures.
Prestart Toolbox Meeting	All relevant onsite crews to be briefed by Project Arborist prior to commencement of <u>each</u> work phase. Project Arborist <u>must</u> be notified and onsite at all times when construction works are within or close to NRZ. Note: Onsite attendance of Project Arborist is a condition for issue of Arboricultural Site Audit Statement/s.	Arborist Site Audit Reporting system to be in place. Copies of Arboricultural Report to be retained onsite. <u>Arboricultural Site Audit Statement/s will not be issued retrospectively</u>
Construction Phase		
Site Establishment	Project Arborist to monitor tree health during establishment phase, including bulk earthworks, changes in hydrology etc.	Instigate remedial tree care measures if required
Construction work	Site Manager to liaise with and ensure Project Arborist is advised in time, to allow them to be present for all work carried out within NRZ area including any work likely to affect identified tree/s. Any deviation/s from approved plans is to be approved by Project Arborist. Project Arborist to provide ongoing Site Audit Certification of all work within NRZ.	Any remedial tree works to be carried out by qualified arborists under supervision of Project Arborist. Project Arborist is responsible for issue of Arborist Site Audit Reports.
Practical Completion	Project Arborist to carry out review of tree health and vigour and TPZ fencing.	On Project Arborist approval, carryout removal of remaining temporary tree protection measures
Post Construction Phase		
Final Arborist inspection	Carryout tree health review and provide recommendations for required tree care.	Issue of final Arborist Site Audit Compliance Statement for inclusion in final DA documentation and sealing.

Appendix 3: Tree Protection Signage



Appendix 4: Explanation of Terminology

Definition	Process Description
Removal	Complete tree removal leaving stump as close as possible to ground level. Recommended process will include chipping of all foliage limbs and timber and reinstatement of work site. Recommendation typically based on tree being assessed as representing a health and safety concern [dead, dying, structurally unsound, unstable, poor form].
Remove and Grind	Complete tree removal to include grinding of stump to a depth of 75 millimetres, unless otherwise specified. Recommended process will include chipping of all foliage limbs and timber and reinstatement of work site. Stump site will be cleaned of all grinding debris and sawdust and backfilled with premium topsoil free from weeds.
Crown Clean (Deadwood)	Removal of all major/significant deadwood and dead branches up to [and including] 30 millimetres in diameter in trees overhanging pedestrian or vehicular areas or removal of dead branches > 50mm diameter in canopy of trees located in parkland or similar area unless otherwise specified.
Crown Clean (General pruning)	Recommended pruning process will include removal of broken, crossing, rubbing, diseased, stressed or dying branches or limbs with poor attachment. Additional work process may include pruning to define leaders, balance the crown, reduce weight load, or clear the tree from obstructions. In summary, to rectify, as far as is possible, any structural defects and eliminate undesirable growth or deadwood.
Crown Reduction (Canopy reduction)	Recommended pruning process may include light and general pruning typically to encompass removal of up to 15% but no more than 20% of the leaf-bearing crown. By definition the unique shape and form of the tree will not be altered or compromised by the pruning process. Typically, the consulting arborist will nominate the reduction percentage [%] appropriate to species, condition and assessment.
Crown Raising (Canopy lift)	Pruning processes maybe involve the raising of the tree's lower canopy to a height specified in metres. Typically, the process is performed to provide for pedestrian and or vehicular clearance and unless otherwise specified the default parameters will be to provide 2 metres clearance from ground level or as specified by Local or State Government regulation. From time to time pruning requirements may be altered to accommodate various site-specific requirements as advised by the consulting arborist.
Crown Restoration	Pruning process will encompass crown restoration and remedial works where the tree has been previously lopped or otherwise damaged. Crown restoration is not feasible when a tree has extensive decay and should only be considered when there is evidence of healthy regrowth. When performed correctly the process of remedial pruning will most likely take several years to complete.
Hanger Limb / Unattached Branch	Pruning process may be restricted to the removal of any hanger/s or dangerous/dead/dying limbs and will typically involve the removal of a single limb. In some instances, removal of an individual limb may be necessary to accommodate an obstruction and the consulting arborist will advise accordingly.
Directional Pruning	Pruning process will be restricted to pruning canopy away from buildings/service wires/property boundary and will typically be performed to avoid future growth in these areas. Where appropriate, future growth will be directed away from any obstacles through select pruning, to encourage the development of the growth of new leaders.
Habitat Pruning	When pruning deadwood from trees, simple techniques and methods can be employed to achieve hazard reduction whilst leaving food and habitat for tree dwelling fauna. Long pieces of deadwood can be reduced in length to limit potential hazard but still retain food for the insects and microorganisms. Stubs that have been left by old pruning or

	<p>previous branch failure can be retained, and with the use of a hole-saw or chainsaw they may also be bored out to create a nesting hollow for native birds or small mammals. <i>Source: Mosman Council</i></p>
Deadwood	<p>Deadwood is a naturally occurring feature of most tree species and comprises dead or decaying branches within the canopy of a tree. Deadwood may have habitat value and require removal only when target and occupancy risk is unacceptable i.e. high use pedestrian area or damage to adjacent infrastructure.</p>
Decay	<p>The biological process of degradation of woody tissues by micro-organisms.</p>
Compaction	<p>Results from loads or stress forces applied to the soil as well as shear forces. Both foot traffic and vehicle traffic exert both forces on soils. Vehicle traffic may cause significant compaction at depths of 150–200 mm (the area in which most absorbing roots are located). The degree of compaction will depend on weight of vehicles, number of movements, soil moisture levels and clay content. Soil handling, stockpiling and transporting also tend to lead to the breakdown of soil structure and create compaction. Vibration resulting from frequent traffic or adjacent construction activities may also compact soil.</p>
Codominant Structure:	<p>Stems or trunks on or about the same size and originating from the same position of the main stem. When the stem bark ridge turns upward the union is strong; when the ridge turns inward the union is weak, a likely point of failure in storm or windy weather conditions, or where increased load causes undue stress on the defective union.</p>

Source: AS4373-2007 Pruning of Amenity Trees & AS 4970-2025 Protection of Trees on Development Sites.

Appendix 5: Normal Function of a Tree

Background Note: The following diagrams and explanatory notes are useful to illustrate the structure of a tree in a normal growing environment. This information is taken from AS4970-2025 *Protection of Trees on Development Sites* which has been released subsequently to AS4373-2007 *Pruning of Amenity Trees*.

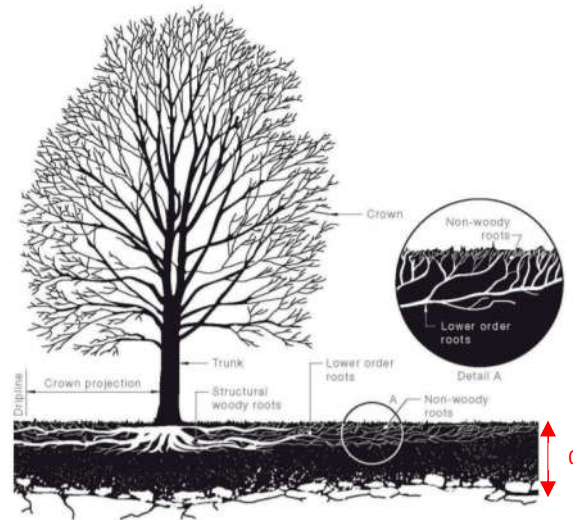


Figure 2: Structure of a tree in a normal growing environment

Leaves

The main function of leaves is photosynthesis, that is, the production of sugars. The sugars produced by the leaves (and any other green tissue) are the source of chemical energy for all living cells in the entire plant and as such are essential for the normal functioning and survival of the tree. Anything that directly or indirectly damages the leaves will interfere with photosynthesis.

Trunks and branches

Branches and trunks are composed of many tissues with specialized functions including the bark (protection), phloem (transport of sugars from the leaves), vascular cambium (growth of new transport tissues), sapwood (transport of water and nutrients from the roots), heartwood (strength and structural support) and rays (internal transport and storage of sugars). Damage to branches or trunks may allow infection by plant pathogens (disease causing organisms), disrupt the movement of vital materials and structurally weaken the tree.

Roots

The main functions of roots include the uptake of water and nutrients, anchorage, storage of sugar reserves and the production of some plant hormones required by the shoots. For roots to function, they must be supplied with oxygen from the soil. The root system of trees consists of several 'types' of roots found in different parts of the soil and is generally much more extensive than commonly thought. The importance of roots is easily overlooked because they are not visible, that is 'out of sight, out of mind'. Damage to the root system is a common cause of tree decline and death and is the most common form of damage associated with development sites.

Root systems consist of three main parts:

1. The structural woody roots (anchorage, storage and transport);
2. Lower order roots (anchorage, storage and transport); and
3. Non-woody roots (absorption of water and nutrients, extension, synthesis of amino acids and growth regulators) (see Figure).

In addition to lateral root spread being underestimated, root depth in trees has also been grossly exaggerated. Deep root systems or taproots are the exception rather than the rule. Most roots of most trees are found in the very top of the soil. The vast majority of these roots are small non-woody absorbing roots which grow upward into the very surface layers of the soil and leaf litter. This delicate, non-woody system, because of its proximity to the surface, is very vulnerable to injury.”

Explanatory Note: The importance of gas exchange in soils

The fact that tree roots require oxygen to function is often misunderstood. Accessibility to available oxygen and water within the soil structure is dependent on the integrity of soil structure within their surrounds; when soils are compacted there is little space between soil aggregates with soil volume and total pore space, especially macropore space diminished. In turn, good soil oxygenation and gas exchange (Lonsdale) levels allow for successful function of tree roots. Oxygen levels in soils will typically decrease as soil depth increases and /or soils are heavily compacted.

Macropore is the term used to describe the relatively large space between soil particles that is usually air filled and allows for water movement and root penetration. Micropore is the term used to describe the space between soil particles that is relatively small and likely to be water filled.

Compaction results from loads or stress forces applied to the soil as well as shear forces. When soil within the root zone of a plant, including a tree, is compacted through either pedestrian or vehicular traffic, or by the heavy weight of stored materials or machinery, the ability of water and oxygen to penetrate the soil around the roots of living plants is compromised. Whilst tree roots are typically found in the top 600mm of the soil horizon, vehicle traffic, in particular may cause significant compaction at depths of 150–200 mm (the area in which most absorbing roots are located). (Refer Tree Function Note above).

The degree of soil compaction will depend on weight of vehicles, number of movements, soil moisture levels and clay content. Soil handling, stockpiling and transporting also tend to lead to the breakdown of soil structure and thus to soil compaction. Vibration, as a result of frequent traffic or adjacent construction activities, will also cause compaction of soil.

Contrary to the commonly held myth that all trees have tap roots, tree roots are typically located within the top 600mm of soil. Just as leaves perform the vital function of photosynthesis, tree roots are vital for the primary functions of anchorage, storage, absorption and conduction. Larger tree roots fulfil the main functions of anchorage, storage and conduction and smaller more fibrous tree roots, which grow primarily at the end of the main woody roots, fulfil a vital role in absorbing oxygen, essential mineral elements and moisture from the soil, often through a symbiotic relationship with soil borne fungi referred to as Mycorrhizae; the extent of root loss has the potential to jeopardise any or all of these main functions and most importantly may compromise the structural integrity of an established tree and its associated potential OH&S risk of failure occurring; any OH&S risk of potential failure in a high use area such as public roads, is noteworthy for all the wrong reasons and should be of major concern and avoided at all times. (Refer Appendix 2, Tree Function Note).

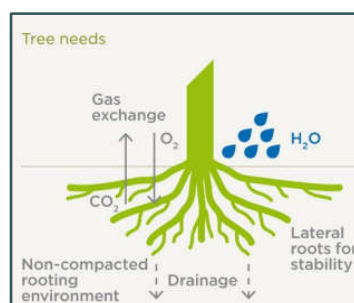


Figure 3: Gas exchange in woody tissues: the diffusion of gases into and out of a particular region (Jaluzot)

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Company Details

Independent Arboricultural Services

Independent Arboricultural Services, incorporated in May 2007, offers a completely independent arborist consulting and reporting service. Its directors and associated consultants bring extensive arboricultural knowledge gained over many years to this company. All consulting staff hold a minimum AQF Level 5 (Diploma of Arboriculture). Specialised advice when required, such as provision of survey mapping or engineering advice and certification is sourced from reputable professional providers according to site requirements as per AS 4970-2025 *Protection of Trees on Development Sites*.

Statement of Goal

To deliver continual improvement through the use of world's best arboricultural practices, supported by ongoing education and exposure to leading industry experts and research throughout the world.

Mission Statement

To provide timely, relevant and actionable consulting advice and practice based on the latest available and best scientific arboricultural knowledge.

Environmental Statement

Independent Arboricultural Services supports long term environmental sustainability sustainable sourced paper and ensuring all inks cartridges are recycled where possible.

Independent Arboricultural Services actively seeks to maintain a positive carbon footprint status and to that end is committed to protecting and preserving the environment, continuing to carry out tree planting, transplanting and replacement planting where practical, having planted in excess of 4000 trees in the first 2 years after its inception in May 2007 alone. Arboricultural recommendations, involving the removal of tree/s, will include replanting at a minimum ratio of 2 trees for any tree removed where possible. All arboricultural recommendations are made in accordance with world's best arboricultural practice and AS 4373-2007 *Pruning of Amenity Trees* and AS 4970-2025 *Protection of Trees on Development Sites* so as to ensure optimal outcomes for all living trees.

Independent Arboricultural Services acknowledges the benefits of healthy trees with good vigour and vitality and actively promotes better understanding in the general community of the contribution that trees make to reducing greenhouse gasses, the contribution of trees to better water retention, prevention of soil erosion, the ability of trees to provide protection to infrastructure by diffusing strong winds in weather events, and the contribution of trees to general liveability within the urban environment.

It is an acknowledged fact that air temperature beneath a tree canopy can be in excess of 7° Celsius lower than the surrounding ambient air temperature thereby reducing reliance on greenhouse gas producing air conditioners and coal fired power sources.