

AUSTRALIS
Tree Management



Arboriculture Impact Assessment

**35 - 47 Stennett Road, Ingleburn
Stage 3, Warehouse Development**

Commissioned By: Stockland Development Pty Limited
Level 25, 133 Castlereagh Street,
Sydney NSW 2000

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24 March 2022

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Summary

Australis Tree Management has been commissioned by Stockland Development Pty Limited to complete an Arboriculture Impact Assessment (AIA). 'TreeAZ' (Version 10.10-ANZ) was used to determine retention values. This report aims to identify the health and condition of the trees, potential impacts from proposed works and to provide recommendations.

The development proposed is for the construction of warehouse facilities, car parking and driveways and associated works.

In total seventy (70) trees were assessed located within the subject site on 25th August 2021.

- One (1) tree is proposed for retention
 - The proposed civil and servicing requirements will cause a major encroachment on the tree.
- Sixty – nine (69) trees on site are proposed for removal
 - Thirty (30) are high quality trees
 - Thirty-nine (39) are poor quality or young trees.

The tree defects and symptoms that were encountered have been discussed and a detailed tree schedule is included in Appendix A.

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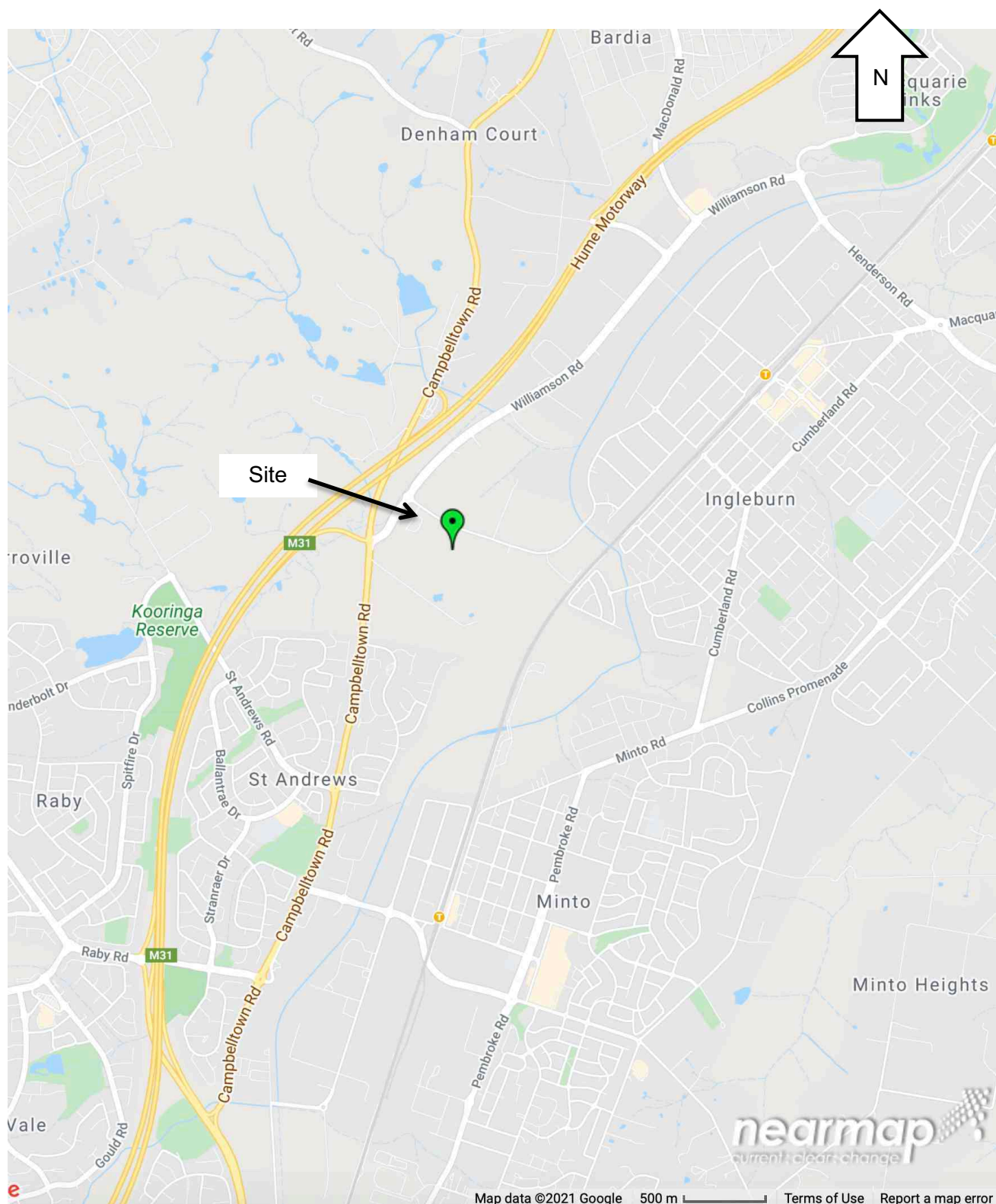
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Acronyms

Abbreviation	Term	Definition
DBH	Diameter at breast height	The diameter of a tree's stem typically measured with a diameter tape at 1.4 metres height (AS4970-2009).
DCP	Development Control Plan	
LEP	Local Environmental Plan	
LGA	Local Government Authority	
VWM	Part 11 Vegetation and Wildlife Management	Tree Protection Council Policy
TPZ	Tree Protection Zone	The tree protection zone (TPZ) is the principal means of protecting trees on development sites. The TPZ is a combination of the root area and crown area requiring protection. It is an area isolated from construction disturbance, so that the tree remains viable (AS4970-2009).

Location Map

35 - 47 Stennett Road, Ingleburn



Source: Near Map 24 September 2021

Figure 1. Location Map

35 - 47 Stennett Road, Ingleburn



1 Introduction

1.1 Project Description

The development proposed is for the construction of warehouse facilities, car parking and driveways and associated works. There are seventy (70) trees onsite with sixty nine (69) trees within the location of the proposed works that will require removal.

1.2 Brief

Mr Chris Demertze from Stockland Development Pty Limited has provided instructions to inspect and assess the health and condition of the trees at 35 - 47 Stennett Road, Ingleburn, including any tree within the vicinity of the proposed works including trees on adjoining properties. I have prepared an Arboriculture Impact Assessment on the proposed impacts of the development works on the subject trees. This report will provide recommendations regarding tree protection during the development process.

1.3 Aims

- Undertake field surveys for tree health and condition.
- Conduct a literature review on the tree defects and symptoms.
- Search databases for relevant tree species information including Council Tree Protection Policies.
- Identify Tree Protection Zones for all trees assessed and assess the likely impacts from the development on the trees.
- Provide preliminary advice and tree protection recommendations for trees proposed for retention and protection.

1.4 Qualifications and Experience

This report has been based upon site observations and the assessment of the subject trees. Conclusions have been reached from experience and follow up research. Qualification details are included in the appendix.

Australis Tree Management (Meredith Gibbs) provides consulting arborist services only and does not provide services such as climbing, pruning, tree removal, root investigations or root pruning. This report is an impartial professional assessment only and does not derive any financial benefit from specifying pruning or other physical services.

1.5 Documents Provided

- Stockland Development Pty Limited
 - 20 September 2021
 - *Ingleburn - 55 Stennett Rd - Feature & Level Survey - Rev A Issued.pdf*
 - 22 March 2022
 - *image002.jpg*
 - *image003.jpg*
 - *image004.jpg*

1.6 Scope

This report is only concerned with the health and condition of the subject trees and the potential impacts from the proposed development. Root mapping, invasive structural strength of the trees, soils assessments or aerial inspections were not performed. This report has been prepared in accordance with Campbelltown City Council. It includes a detailed assessment based on the site visit and the documents provided.

Recommendations may be provided regarding alterations to the proposed design or construction methods to mitigate detrimental impacts on the subject trees. Only trees which qualify as a being protected under Campbelltown City Council's Part 11 Vegetation and Wildlife Management (2016) have been included in the body of this report. All tree species assessed are located in the 'Tree Schedule' in Appendix A.

2 Methodology

2.1 Methods

The following relevant information was compiled for consideration of the proposed works. Further information can be found in the appendices.

- AS 4970- 2009 Protection of trees on development sites
- AS 4373 - 2007 Pruning of amenity trees
- Tree Survey Form (Matheny & Clark, 1994)
- Visual Tree Assessment (Mattheck & Breloer, 1994)

2.2 TreeAZ (Barrell, 2010)

- **TreeAZ 'A'** - Moderate and high-quality trees suitable for retention for more than 10 years, and worthy of being a material constraint
- **TreeAZ 'Z'** - Low quality trees not worthy of being material constraint

2.3 Information Collected

Information collected includes tree species, dimensions, tree health and condition, tree assessment ratings and tree protection zones etc. Trees located on adjoining properties will be inspected from the ground on the subject site or public land only. All relevant information is included in the Tree Schedule (Appendix A). The inspection was of a preliminary nature and did not involve any climbing or detailed investigation beyond what was visible from accessible points at ground level.

2.4 Species Identification

Identification of the subject trees are determined by visible features only at the time of the inspection. Every effort is made to correctly identify the subject trees where time permits. It is not based upon comparison against herbarium specimens. Photographs are compared with varying text listed in 'References'.

2.5 Tree Dimensions

In accordance with AS 4970-2009 tree trunk diameters were measured with a diameter tape at 1.4m high (unless stated). Tree heights are measured with a clinometer and canopy spreads estimated accordingly. Tree Protection Zones (TPZ's) and Structural Root Zones (SRZ's) are measured radially from the trunk.

2.6 Photography

An iPhone or iPad were used. In low light levels photographs maybe altered to improve visual quality, this involves adjustments to exposure, contrast, reduction of shadows and increased sharpness. No adjustments to vibrancy that alter natural colours were applied.

2.7 Australian Standard 4970-2009 Protection of trees on development sites

This document describes the best practices for the planning and protection of trees on development sites. The procedures described are based on plant biology and current best practices as covered in recently published literature.

2.8 Australian Standard 4373 - 2007 Pruning of amenity trees

The objective of this revision is to reflect current arboricultural practices.

The recommendations given in this Standard are intended to apply specifically to urban and amenity trees but exclude pruning for fruit production and silviculture.

2.9 Vegetation

Vegetation types have been determined using a variety of methods depending on the location and LGA. Depending on the sources results can vary and should be used as a guide only.

2.10 Wildlife

Interactions between the tree and possible fauna were examined to the best of my ability through text listed in the references. An expert opinion may be required confirm or deny any fauna activities.

3 Site Visit and Observations

3.1 Field Visit

The unaccompanied site visit was conducted on Wednesday, 25 August 2021. All observations were from ground level without detailed investigations. The weather at the time of the inspection was overcast and dull with poor visibility.

3.2 Brief Site Description

Stennett Road is located in the industrial area of Ingleburn located approximately 52km south- west from Sydney CBD in the Macarthur region. The property is located on the southern side of the road surrounded by commercial developments. The site is zoned as IN1: General Industrial. The property consists of a warehouses and parking areas.

3.3 Climate & Microclimates

The site is exposed to the west with prevailing winds coming from the south-west. The lack of protection from surrounding structures caused stronger winds which may cause branch failures. Available sunlight is adequate to excessive with the bitumen ground surface absorbing heat and creating reflective heat which can be detrimental to nearby trees.

3.4 Location of the Trees

The trees in question are located around the boundaries of the site. The trees have been located on the supplied site plan and numbered accordingly. These plans are illustrative purposes only and should not be used directly for scaling measurements. Trees no. 3 and 6 were not located on the supplied survey plan. The trees have been approximately located therefore inaccuracies may occur.

3.5 On Site Vegetation

The site contains indigenous, planted native and exotic tree species. They are of varying ages and stages of maturity. Tree No. 5 is considered the only remnant tree on site. The subject site has been highly modified with the removal of indigenous under storey and ground cover plants and shrubs. The subject dominant trees together with other indigenous trees in the surrounding residences are lightly connected to the remainder of the ecological communities nearby. The majority of the existing tree plantings are non-indigenous species and have not genetically adapted to the soil type and the local climate.

4 Legislation & Policies

4.1 Vegetation in Non-Rural Areas [NSW] (2017)

The State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017 includes provisions requiring the preservation of trees and bushland within Campbelltown City Council LGA.

Aims of Policy

The aims of this Policy are:

- (a) to protect biodiversity values of trees and vegetation in non-rural areas of the State, and*
- (b) to preserve the amenity of non-rural areas of the State through the preservation of trees and other vegetation.*

4.2 Councils Tree Protection

This report relies on the information contained within Campbelltown City LEP and DCP. This report may include trees on adjoining properties that are likely to be impacted by the proposed development regardless of the definition contained in the LEP and DCP. Council may require a greater setback from proposed structures to ensure the preservation and protection of the tree. A separate permit to prune any trees within or adjacent to the property and/or any pruning of tree roots must be obtained from Council prior to any works being undertaken.

4.3 Councils Exempt Species

The assessed tree species are not listed in the councils' list of exempt species.

4.4 Endangered Ecological Communities (EEC)

The Scientific Committee established by the Threatened Species Conservation Act has made a Final Determination to list Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest as a Critically Endangered Ecological Community on Part 3 of Schedule 1 of the Act.

4.5 Threatened Species

The subject tree species are not listed in the NSW Biodiversity Conservation Act (2016) or The Environment Protection and Biodiversity Conservation Act (1999).

4.6 Biosecurity Act 2015

The assessed tree species are not listed in the Biosecurity Act 2015.

5 Results

A total of seventy (70) trees were assessed on site and within 5m of boundaries. Due to the requirements of the proposed development activities, sixty - nine (69) trees require removal, regardless of their 'TreeAZ' category.

5.1 'Tree AZ' and Tree Type

- **Tree AZ 'A'** - Moderate and high-quality trees suitable for retention for more than 10 years, and worthy of being a material constraint
- **Tree AZ 'Z'** - Low quality trees not worthy of being material constraint

TREE AZ	Exotic	Indigenous	Native	Total
A1	1	4	23	28
A2	0	3	0	3
Z1	1	15	21	37
Z4	0	1	0	1
Z6	0	0	1	1
	2	23	45	70

Table 1. 'Tree AZ' and Tree Type

5.2 Tree Species and Life Expectancy

Life Expectancy	40+yrs	15-40yrs	5-15yrs	<5yrs	Total
Exotic					
<i>Pinus radiata</i> (Monterey Pine)	0	2	0	0	2
Indigenous					
<i>Acacia decurrens</i> (Black Wattle)	0	0	1	0	1
<i>Casuarina glauca</i> (Swamp Oak)	14	3	0	0	17
<i>Eucalyptus moluccana</i> (Grey Box)	2	1	0	0	3
<i>Eucalyptus tereticornis</i> (Forest Red Gum)	0	2	0	1	3
<i>Melaleuca styphelioides</i> (Prickly Paperbark)	1	0	0	0	1
Native					
<i>Eucalyptus microcorys</i> (Tallowwood)	9	6	1	2	18
<i>Eucalyptus punctata</i> (Grey Gum)	5	6	2	1	14
<i>Eucalyptus saligna</i> (Sydney Blue Gum)	4	5	2	0	11
	35	25	6	4	70

Table 2. Species and Life Expectancy

5.3 Tree Proposed for Retention


Tree No.	5	
Species	<i>Eucalyptus moluccana</i> (Grey Box)	
Age	Mature	
Life Expectancy	40+ years	
Crown Class	Dominant	
Crown Condition	Average (3)	
Type	Indigenous	
TPO Protected	Yes	
Health & Condition	Minor previous failures / nest in upper canopy	
Location	On site	
TreeAZ	A2	
Proposed Works Comments	Services and 10m wide driveway	
TPZ	9.6m	
Total TPZ Area	Total TPZ Area	
Distance To Proposed Development	Approximately 8m to proposed road	
Proposed TPZ Encroachment	21%	
Proposed Status	Retain	Figure 3. Tree No. 5

Table 3. Tree No. 5

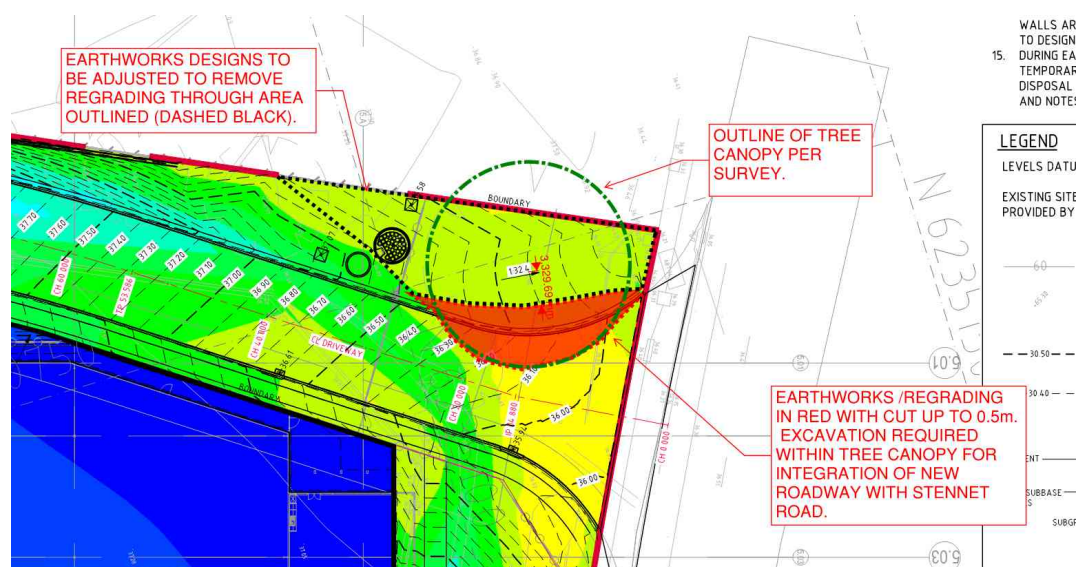


Figure 4. Tree No. 5 Proposed works

6 Discussion

6.1 The Proposed Development

- 6.1.1 The development proposed is for the construction of warehouse facilities, car parking and driveways and associated works. This will involve significant soil disturbances and leveling as well as the installation of storm water works.

6.2 Significant Tree Species

- 6.2.1 *Casuarina glauca* (Swamp Oak) is an indigenous tree species that makes up 24% of all trees assessed. There are six (6) groups of multiple trees included. This species is classed as 'dominant' within the Sydney Basin species (Benson & McDougall, 1995). There are seventeen (17) trees in total with nine (9) trees being semi mature to mature in age. Fourteen (14) trees have a life expectancy of 40+ years.
- 6.2.2 *Eucalyptus moluccana* (Grey Box) is an indigenous tree species of only three (3) trees were assessed and having life expectancies of over 15 years. This species is classed as 'dominant-frequent' within the Sydney Basin species (Benson & McDougall, 1995).
- 6.2.3 *Eucalyptus moluccana* (Grey Box) is an indigenous tree species of only three (3) trees were assessed and having life expectancies of less than 5 years for Trees No. 68 and over 15 years for Trees No. 20 and 65. This species is classed as 'dominant-frequent' within the Sydney Basin species (Benson & McDougall, 1995).
- 6.2.4 *Eucalyptus punctata* (Grey Gum) is a native tree species that makes up 26% of all trees assessed. This species is indigenous to numerous areas of New South Wales outside the Cumberland Plain areas. It is classed as 'frequent' within the Sydney Basin (Benson & McDougall, 1995). There are eighteen (18) trees in total with fourteen (14) trees being semi mature to mature in age. Nine (9) trees have a life expectancy of 40+ years.
- 6.2.5 *Eucalyptus microcorys* (Tallowwood) is a native tree species that makes up 26% of all trees assessed. This species is indigenous to the New South Wales Central Coast, North Coast and Queensland. It is classed as 'abundant' (Benson & McDougall, 1995). There are eighteen (18) trees in total with fourteen (14) trees being semi mature to mature in age. Nine (9) trees have a life expectancy of 40+ years.
- 6.2.6 *Eucalyptus saligna* (Sydney Blue Gum) is a native tree species that makes up 16% of all trees assessed. This species is indigenous to numerous areas of New South Wales outside the Cumberland Plain areas. It is classed as 'dominant-frequent' within the Sydney Basin (Benson & McDougall, 1995). There are eleven (11) trees in total with all being young to semi mature. Four (4) trees have a life expectancy of 40+ years.

6.3 Tree Health and Condition

- 6.3.1 **Tree Wounds:** Trees No. 29, 57, 60 and 65 have varying types of wounds, both on the trunk, within canopies and wounds from the pruning of large branches. Bark protects the cambial layer that transports food. Damage and exposure to this layer will disrupt the flow and cause the cells to die. Fungal and mirco-organism infections can cause decay or canker formation.
- 6.3.2 **Included Bark:** Nineteen (19) trees have severe signs of included unions either between codominant trunks scaffold branch union, primary or secondary branch junctions. The adaptive growth within the included bark branch union enables structural strength to meet the physical pressures applied to the branches.
- 6.3.3 **Epicormic Growth and Water Sprouts:** Many trees also have varying amounts of these shoots. These shoots are generated as a result of stress, failed branches or excessive pruning. They grow vigorously and are weakly attached while young and prone to failure. As the shoots mature the branch of origin will lay new wood over the union and strengthen the hold.
- 6.3.4 **Decline or Die Back:** Seven (7) trees also have varying amounts of twig dieback and decline. Decline and dieback is the reduction in the dynamic mass of a tree as twigs and branches die and are walled off by protection boundaries.

6.4 Tree Proposed for Retention

- 6.4.1 Tree No. 5 *Eucalyptus moluccana* (Grey Box)
 - 6.4.1.1 This indigenous tree is located on site and is protected by council. The tree is mature in age with a dominant trunk and is in fair health with average (3) crown condition and fair structural condition. The tree has a minor level of previously failed branches and a nest was sighted in the in upper canopy. This tree has a 'TreeAZ' rating of 'A2' and an estimated life expectancy of 40+yrs.
 - 6.4.1.2 The proposed driveway and civil works are located approximately 2.5m from the trunk, inside the 3.2m SRZ and 9.6m TPZ with a 21% encroachment. The proposed encroachment is considered major in accordance with AS4970-2009. And likely to cause stress to the tree and potentially cause instability.
 - 6.4.1.3 Excavations to integrate road levels for Stennett Road located approximately 2.5m from the trunk will cause root system disturbances. The proposed excavations must be performed with an air knife or hydraulic soil excavation to locate roots within the 9.6m TPZ. The root system must be protected during the proposed excavations, preventing damaged or severance to any root measuring over 40mm in diameter.

- 6.4.1.4 The proposed storm water line is located outside the TPZ.
- 6.4.1.5 Canopy pruning may be required for clearance for the proposed works. No branch over 5cm in diameter should be pruned and no more than 10% of the canopy. All pruning must be in accordance with AS4373-2009 Pruning of amenity trees.

Tree Protection

6.5 Tree Protection Measures

These specifications are for Tree No. 5 which is selected for retention.

- 6.5.1 **Tree Protection** - All tree parts must be protected - This includes roots, trunks and branches.
- 6.5.2 **Trunk Protection** - If working within TPZ, trunk protection shall consist of hessian or padding wrapped around the trunk, two meter lengths of timber (100 x 50mm) spaced at 100-150mm centres secured together with 2mm galvanised wire. These shall be strapped around the trunk and not fixed to the tree in any way to avoid mechanical injury or damage.
- 6.5.3 **Fencing** - A 1.8m chain wire fence, secured and fastened to prevent movement be installed in accordance with AS4970-2009 and AS 4687-2007. The TPZ distance has been extended to compensate. Woody roots must not be damage during fencing TPZ fencing installation. The installation of all required tree protection fencing must include shade cloth attached to the fencing to reduce transport of dust, particulates and liquids from entering the tree protection zone. No fence relocation is permitted without Arborist permission.
- 6.5.4 **Ground Protection** - Ground surface protection must be installed if construction access is required through any TPZ. Protected with boarding (ie scaffolding board or plywood sheeting or similar material), placed over a layer of mulch to a depth of at least 100mm and geotextile fabric. The protective boarding must be left in place for the duration of the construction and development. The existing concrete driveway is to be left in-situ and forms part of the ground surface protection.
- 6.5.5 **Signage** - "Tree Protection Zone, No Entry". With project arborist contact details to be attached to the protective fencing.
- 6.5.6 **Machinery Movements** - When machinery movements are required within the TPZ then a geotextile permeable membrane to be laid under mulch or crushed rock under rumble boards must be in place.
- 6.5.7 **Foot Traffic** - Raised platforms using scaffolding and boards or similar must be constructed if foot traffic occurs within TPZ. Scaffold with boards is sufficient.
- 6.5.8 **AS4970-2009** - Activities generally excluded from the TPZ include but are not limited to;
- soil cutting or fill including trenching
 - machine excavation including trenching;
 - excavation for silt fencing;

- soil cultivation, disturbance or compaction;
- stockpiling, storage or mixing of materials;
- preparation of chemicals, including preparation of cement products;
- parking of vehicles and plant;
- disposal of liquids and refueling;
- dumping of waste;
- disposal of building materials;
- was placement of fill;
- lighting of fires;
- soil level changes;
- temporary or permanent installation of utilities and signs, and
- physical damage to the tree.
- site offices or shed locations

6.5.9 **Scaffolding** - All construction scaffolding must be erected around all branches not approved for pruning or removal.

6.5.10 **Pruning** – Clearance of pruning of no more than 10% of the canopy with pruning cuts of 50mm maximum may be proposed. Remove of all dead stubs and failed branches leaving a clean cut with no splinters or pieces of wood that may prevent wound wood closure. This will enable wound wood development and reduce the risk of fungal infection. Any pruning required must be in accordance with AS 4373-2007 Pruning of Amenity Trees, Standards Australia and completed by level 3 qualified arborist or higher. Climbing spikes MUST NOT be used.

6.5.11 **Mulch** - Within the TPZ fencing up to 100mm of COMPOSTED organic mulch must be applied to help retain moisture levels, suppress weed growth and reduce tree stress. Mulch must be in accordance with AS4454-2012 Composts, soil conditioners and mulches.

6.5.12 **Irrigation** - All trees must be thoroughly watered regularly throughout the development process. This is dependent on weather conditions where more water applied during hot and or winding weather. Micro-irrigation lines must be connected to a designated water source that remains connected throughout the development works.

6.5.13 **Tree Damage** - If any tree is damaged the project arborist should be notified, engaged to inspect and provide advice as well as written documentation to be supplied to the certifying authority.

6.5.14 **Fertilisation** - Any tree requiring fertilisation should be performed at the discretion of the site arborist only

6.6 Tree Monitoring Schedule

- During site occupation all TPZ's and trees must be monitored, assessed and recorded by the project arborist according to council's determinations.

- Any work that must occur within a TPZ must be witnessed and directed by the project arborist.
- In the event that any tree is declining in health the project arborist shall be engaged to supply written remedial applications that must be applied immediately.
- Excavation Within Tree Protection Zones
- Any excavation work within a Tree Protection Zone must be monitored by the project arborist.

6.7 Root Pruning

- Where developments are constructed within the TPZ hand excavation must occur to locate structural roots with a diameter of greater than 40mm.
- Root exposure must be applied with hand tools or Air Spade to prevent damage to the root system.
- Roots measuring over 40mm in diameter must not be pruned within the Structural Root Zone unless directed by the project arborist ONLY.
- Roots measuring over 40mm in diameter within the Tree Protection Zone and outside the Structural Root Zone may be pruned at the discretion of the project arborist or by an AQF level 3 arborist or higher.
- All pruning equipment must be sharp and clean. Secateurs, loppers or pruning saws should be used and can be cleaned with methylated spirits to prevent disease and pathogen spread.
- Bolt or wire cutters must not be used for root pruning.

6.8 Root Care

- Any roots exposed must be wrapped or covered with hessian or cloth and kept moist to prevent drying out and sunburn until backfilling occurs.
- Backfill must be watered in and mulched with composted leaf mulch.

6.9 Project Arborist Monitoring

1	Project arborist (level 5) must oversee tree retention
2	All tree related matters must be discussed with the project arborist
3	The builder / site manager is responsible to inform the project arborist of any issues during works
4	Project arborist must maintain a monthly log including site visits, notes and photographs
5	Project arborist must provide feedback the builder, site manager or council

Table 4. Project Arborist Monitoring

6.10 Project Arborist Supervision

An Arborist with minimum qualifications in Arboriculture of Level 5 (under the Australian Qualification Framework) must oversee various stages of work within the Tree Protection Zone of any tree listed for retention. The Arborist must certify compliance with each. Key milestone as detailed below.

1	Site arborist to mark tree protection fencing locations
2	Approve installation of tree protection measures
3	During demolition of any ground surface materials (paving, concrete, grass etc) within the Tree Protection Zone (TPZ) of any tree to be retained
4	During any excavation and trenching which has been approved by Council within the TPZ of any tree to be retained
5	During any Landscape works within the TPZ of any tree to be retained

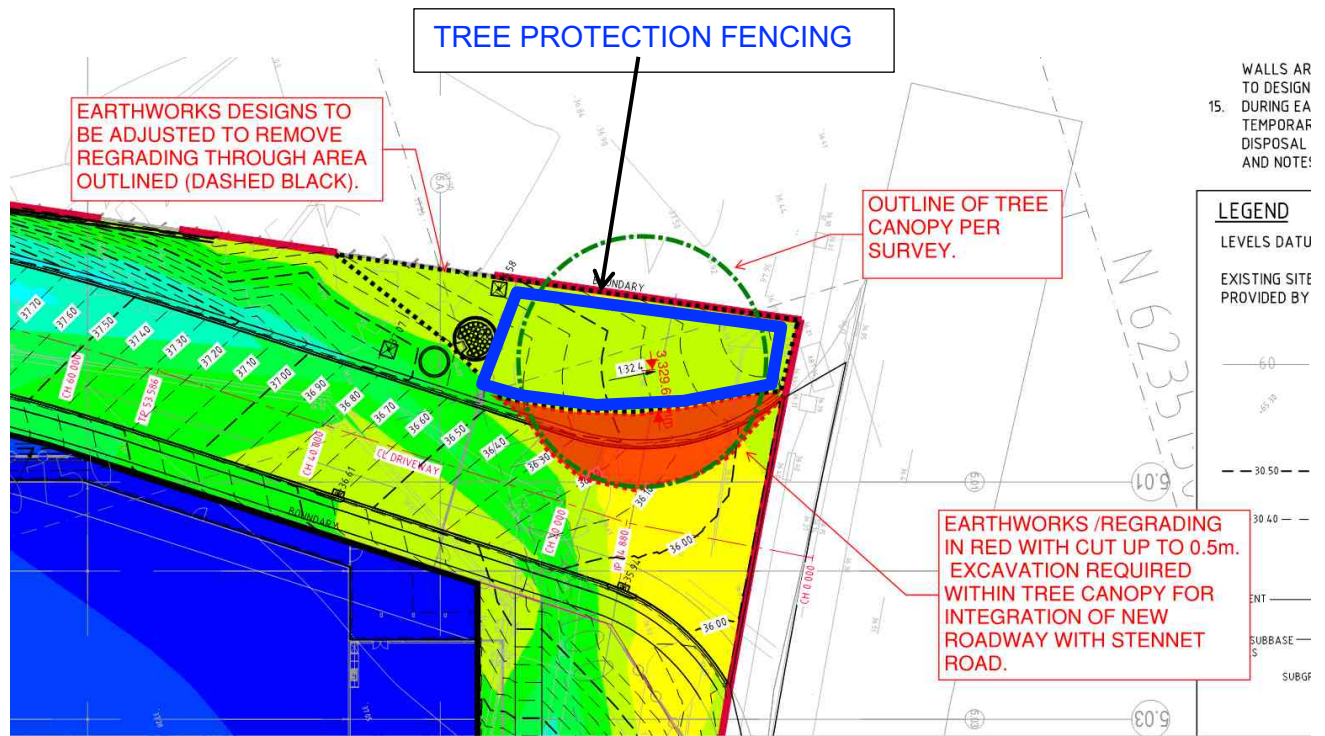
Table 5. Project Arborist Supervision

6.11 Project Arborist Hold Points

Hold Point	Task	Timing	Certification
1	Appoint project arborist to ensure protection of trees	Prior to demolition of structures	Project Arborist
2	Tree Protection Plan be onsite prior to works (AS4970-2009)		
3	Inspect Tree Protection Fencing with signage. (AS4970-2009)	Prior to demolition of structures	
4	Supervise all work within any TPZ's	As required prior to works proceeding	
5	Install Trunk Protection where applicable		
6	Tree Inspection	Bi-monthly during all construction works	
7	Final Tree Inspection	Post construction	

Table 6. Project Arborist Hold Points

7 Tree Protection



Appendix A - Tree Schedule

Tree No.	Species	Location	DBH (cm)	DGL (cm)	Height (m)	Canopy (m) radius	Age Class	Life Expectancy	Crown Class	Tree Condition	Crown Condition	Structure Condition	Deadwood Epicormics	Type	Tree AZ	Council Protected	TPZ (m) SRZ (m)	Proposed Works	Distance (m)	Proposed Encl	Proposed Status
1	Acacia decurrens (Black Wattle)	on site	10	10	4.0	5.0	semi mature	5-15yrs	dominant	poor	average (3)	poor	N/A N/A	native	Z1	yes	2.0 1.3	car park	0.0	100%	Remove
				Health & Condition bulge on trunk																	
2	Casuarina glauca (Swamp Oak)	on site	20	20	8.0	4.0	young	15-40yrs	dominant	fair	average (3)	fair	N/A N/A	indigenous	Z1	yes	2.4 1.7	car park	0.0	100%	Remove
				Health & Condition																	
3	Casuarina glauca (Swamp Oak)	on site	10	10	4.0	2.0	young	15-40yrs	codominant	fair	good (4)	poor	N/A N/A	indigenous	Z1	yes	2.0 1.3	car park	0.0	100%	Remove
				Health & Condition multiple trees / suckers																	
4	Eucalyptus moluccana (Grey Box)	on site	42 30 30	60	10.0	10.0	young	40+yrs	dominant	fair	average (3)	fair	0% <10%	indigenous	A2	yes	5.0 2.7	driveway	0.0	100%	Remove
				Health & Condition minor bark inclusions																	
5	Eucalyptus moluccana (Grey Box)	on site	80	90	18.0	16.0	mature	40+yrs	dominant	fair	average (3)	fair	<10% <10%	indigenous	A2	yes	9.6 3.2	driveway and civil works	2.5	21%	Retain
				Health & Condition minor previous failures / nest in upper canopy																	
6	Casuarina glauca (Swamp Oak) multiple	on site	5	5	4.0	2.0	young	40+yrs	codominant	fair	average (3)	fair	N/A N/A	indigenous	Z1	yes	2.0 0.9	diversion drain	0.0	100%	Remove
				Health & Condition multiple trees																	
7	Eucalyptus punctata (Grey Gum)	on site	45	55	12.0	12.0	semi mature	5-15yrs	dominant	poor	average (3)	poor	10%-25% 10%-25%	native	Z1	yes	5.4 2.6	diversion drain	0.0	100%	Remove
				Health & Condition trunk cankers / twig dieback																	
8	Eucalyptus punctata (Grey Gum)	on site	45	60	10.0	10.0	semi mature	15-40yrs	dominant	poor	low (2-3)	poor	<10% 10%-25%	native	Z1	yes	5.4 2.7	diversion drain	0.0	100%	Remove
				Health & Condition cankers / previous failures																	
9	Eucalyptus punctata (Grey Gum)	on site	45	50	8.0	8.0	young	<5yrs	dominant	poor	severe decline (1)	poor	75%-100% 100%	native	Z1	yes	5.4 2.5	diversion drain	0.0	100%	Remove
				Health & Condition decline +																	
10	Eucalyptus microcorys (Tallowwood)	on site	50	55	8.0	10.0	semi mature	<5yrs	dominant	poor	decline (2)	poor	50%-75% 50%-75%	native	Z1	yes	6.0 2.6	diversion drain	0.0	100%	Remove
				Health & Condition decline																	

Tree No.	Species	Location	DBH (cm)	DGL (cm)	Height (m)	Canopy (m) radius	Age Class	Life Expectancy	Crown Class	Tree Condition	Crown Condition	Structure Condition	Deadwood Epicormics	Type	Tree AZ	Council Protected	TPZ (m) SRZ (m)	Proposed Works	Distance (m)	Proposed Engr	Proposed Status
11	Eucalyptus microcorys (Tallowwood)	on site	50	55	8.0	10.0	semi mature	15-40yrs	dominant	poor	low (2-3)	fair	10%-25% 10%-25%	native	A1	yes	6.0 2.6	diversion drain	0.0	100%	Remove
Health & Condition included bark branch unions + / scaffold inclusions																					
12	Eucalyptus microcorys (Tallowwood)	on site	45	50	12.0	9.0	semi mature	<5yrs	dominant	poor	severe decline (1)	fair	75%-100% 75%-100%	native	Z1	yes	5.4 2.5	diversion drain	0.0	100%	Remove
Health & Condition decline +																					
13	Casuarina glauca (Swamp Oak)	on site	10	15	8.0	3.0	young	40+yrs	dominant	fair	low (2-3)	fair	N/A N/A	indigenous	Z1	yes	2.0 1.5	diversion drain	0.0	100%	Remove
Health & Condition																					
14	Pinus radiata (Monterey Pine)	on site	40	45	13.0	8.0	semi mature	15-40yrs	dominant	fair	average (3)	fair	<10% <10%	exotic	A1	yes	4.8 2.4	diversion drain	0.0	100%	Remove
Health & Condition																					
15	Eucalyptus microcorys (Tallowwood)	on site	50 40 30	60	12.0	9.0	semi mature	15-40yrs	dominant	fair	low (2-3)	fair	<10% <10%	native	A1	yes	6.0 2.7	diversion drain	0.0	100%	Remove
Health & Condition scaffold inclusions / branch inclusions																					
16	Casuarina glauca (Swamp Oak)	on site	10	10	8.0	6.0	young	40+yrs	dominant	fair	average (3)	fair	N/A N/A	indigenous	Z1	yes	2.0 1.3	diversion drain	0.0	100%	Remove
Health & Condition multiple trees																					
17	Eucalyptus punctata (Grey Gum)	on site	40	55	15.0	10.0	semi mature	15-40yrs	dominant	fair	average (3)	fair	<10% <10%	native	A1	yes	4.8 2.6	diversion drain	0.0	100%	Remove
Health & Condition previous failure (20cm diam scaffold with included bark)																					
18	Eucalyptus punctata (Grey Gum)	on site	30	40	12.0	10.0	semi mature	15-40yrs	codominant	fair	low (2-3)	fair	<10% <10%	native	A1	yes	3.6 2.3	diversion drain	0.0	100%	Remove
Health & Condition included bark branch unions / scaffold inclusions																					
19	Eucalyptus microcorys (Tallowwood)	on site	30	40	8.0	10.0	young	40+yrs	dominant	fair	average (3)	fair	<10% <10%	native	Z1	yes	3.6 2.3	diversion drain	0.0	100%	Remove
Health & Condition included bark branch unions																					
20	Eucalyptus microcorys (Tallowwood)	on site	25	30	8.0	8.0	young	40+yrs	codominant	fair	average (3)	fair	<10% <10%	native	Z1	yes	3.0 2.0	diversion drain	0.0	100%	Remove
Health & Condition included bark branch unions																					

Tree No.	Species	Location	DBH (cm)	DGL (cm)	Height (m)	Canopy (m) radius	Age Class	Life Expectancy	Crown Class	Tree Condition	Crown Condition	Structure Condition	Deadwood Epicormics	Type	Tree AZ	Council Protected	TPZ (m) SRZ (m)	Proposed Works	Distance (m)	Proposed Encl	Proposed Status
21	Eucalyptus microcorys (Tallowwood)	on site	45	50	10.0	12.0	semi mature	40+ yrs	dominant	fair	average (3)	fair	<10% <10%	native	A1	yes	5.4 2.5	diversion drain	0.0	100%	Remove
Health & Condition included bark branch unions																					
22	Casuarina glauca (Swamp Oak)	on site	10	20	10.0	4.0	young	40+ yrs	codominant	fair	average (3)	fair	<10% <10%	indigenous	Z1	yes	2.0 1.7	diversion drain	0.0	100%	Remove
Health & Condition																					
23	Casuarina glauca (Swamp Oak)	on site	10	20	10.0	4.0	young	40+ yrs	codominant	fair	average (3)	fair	<10% <10%	indigenous	Z1	yes	2.0 1.7	diversion drain	0.0	100%	Remove
Health & Condition																					
24	Casuarina glauca (Swamp Oak)	on site	10	20	10.0	4.0	young	40+ yrs	codominant	fair	average (3)	fair	<10% <10%	indigenous	Z1	yes	2.0 1.7	diversion drain	0.0	100%	Remove
Health & Condition																					
25	Eucalyptus microcorys (Tallowwood)	on site	30	35	8.0	8.0	young	5-15 yrs	dominant	fair	low (2-3)	fair	<10% <10%	native	Z1	yes	3.6 2.1	diversion drain	0.0	100%	Remove
Health & Condition included bark branch unions / twig dieback / some yellow foliage																					
26	Eucalyptus microcorys (Tallowwood)	on site	41 10 40	45	10.0	10.0	semi mature	40+ yrs	dominant	fair	average (3)	fair	<10% <10%	native	A1	yes	4.9 2.4	diversion drain	0.0	100%	Remove
Health & Condition included bark branch unions																					
27	Eucalyptus microcorys (Tallowwood)	on site	40	45	12.0	12.0	semi mature	15-40 yrs	dominant	fair	average (3)	fair	<10% <10%	native	A1	yes	4.8 2.4	diversion drain	0.0	100%	Remove
Health & Condition included bark branch unions																					
28	Casuarina glauca (Swamp Oak) multiple	on site	15	20	10.0	6.0	semi mature	40+ yrs	codominant	fair	average (3)	fair	<10% <10%	indigenous	A1	yes	2.0 1.7	driveway	0.0	100%	Remove
Health & Condition multiple trees																					
29	Eucalyptus punctata (Grey Gum)	on site	30	40	13.0	10.0	semi mature	15-40 yrs	codominant	fair	low (2-3)	fair	<10% <10%	native	A1	yes	3.6 2.3	diversion drain	0.0	100%	Remove
Health & Condition scaffold wound																					
30	Eucalyptus punctata (Grey Gum)	on site	30	30	12.0	12.0	semi mature	15-40 yrs	dominant	fair	average (3)	fair	<10% <10%	native	A1	yes	3.6 2.0	diversion drain	0.0	100%	Remove
Health & Condition																					

Tree No.	Species	Location	DBH (cm)	DGL (cm)	Height (m)	Canopy (m) radius	Age Class	Life Expectancy	Crown Class	Tree Condition	Crown Condition	Structure Condition	Deadwood Epicormics	Type	Tree AZ	Council Protected	TPZ (m) SRZ (m)	Proposed Works	Distance (m)	Proposed Encl	Proposed Status
31	Casuarina glauca (Swamp Oak) multiple	on site	20	20	8.0	4.0	semi mature	40+yrs	codominant	fair	average (3)	fair	N/A N/A	indigenous	Z1	yes	2.4 1.7	driveway	0.0	100%	Remove
Health & Condition multiple trees																					
32	Casuarina glauca (Swamp Oak)	on site	20	20	8.0	4.0	semi mature	40+yrs	codominant	fair	average (3)	fair	N/A N/A	indigenous	Z1	yes	2.4 1.7	driveway	0.0	100%	Remove
Health & Condition multiple trees																					
33	Eucalyptus saligna (Sydney Blue Gum)	on site	30	35	8.0	8.0	young	5-15yrs	dominant	fair	low (2-3)	fair	25%-50% 25%-50%	native	Z1	yes	3.6 2.1	driveway	0.0	100%	Remove
Health & Condition twig dieback / decline																					
34	Eucalyptus saligna (Sydney Blue Gum)	on site	40	45	10.0	10.0	young	40+yrs	dominant	fair	average (3)	fair	<10% <10%	native	Z1	yes	4.8 2.4	driveway	0.0	100%	Remove
Health & Condition																					
35	Pinus radiata (Monterey Pine)	on site	30	30	7.0	5.0	young	15-40yrs	dominant	fair	average (3)	fair	<10% <10%	exotic	Z1	yes	3.6 2.0	driveway	0.0	100%	Remove
Health & Condition																					
36	Eucalyptus punctata (Grey Gum)	on site	45	45	10.0	10.0	semi mature	40+yrs	dominant	fair	good (4)	fair	<10% <10%	native	A1	yes	5.4 2.4	driveway	0.0	100%	Remove
Health & Condition																					
37	Eucalyptus punctata (Grey Gum)	on site	40	40	8.0	10.0	semi mature	40+yrs	dominant	fair	average (3)	fair	<10% <10%	native	A1	yes	4.8 2.3	driveway	0.0	100%	Remove
Health & Condition cankers																					
38	Eucalyptus microcorys (Tallowood)	on site	40	45	10.0	10.0	semi mature	40+yrs	dominant	fair	average (3)	fair	10%-25% <10%	native	A1	yes	4.8 2.4	driveway	0.0	100%	Remove
Health & Condition included bark branch unions																					
39	Eucalyptus punctata (Grey Gum)	on site	30	30	9.0	9.0	semi mature	40+yrs	dominant	fair	average (3)	fair	<10% <10%	native	A1	yes	3.6 2.0	driveway	0.0	100%	Remove
Health & Condition scaffold inclusions																					
40	Eucalyptus punctata (Grey Gum)	on site	30	35	8.0	8.0	semi mature	40+yrs	dominant	fair	average (3)	fair	<10% <10%	native	A1	yes	3.6 2.1	driveway	0.0	100%	Remove
Health & Condition																					

Tree No.	Species	Location	DBH (cm)	DGL (cm)	Height (m)	Canopy (m) radius	Age Class	Life Expectancy	Crown Class	Tree Condition	Crown Condition	Structure Condition	Deadwood Epicormics	Type	Tree AZ	Council Protected	TPZ (m) SRZ (m)	Proposed Works	Distance (m)	Proposed Encl	Proposed Status
41	Eucalyptus punctata (Grey Gum)	on site	40	45	12.0	8.0	semi mature	15-40yrs	dominant	fair	average (3)	poor	<10% 10%-25%	native	Z1	yes	4.8 2.4	driveway	0.0	100%	Remove
Health & Condition included bark failures																					
42	Eucalyptus punctata (Grey Gum)	on site	40	45	10.0	10.0	semi mature	40+yrs	dominant	fair	average (3)	fair	<10% <10%	native	A1	yes	4.8 2.4	driveway	0.0	100%	Remove
Health & Condition trunk cankers																					
43	Eucalyptus punctata (Grey Gum)	on site	40	45	8.0	10.0	semi mature	5-15yrs	dominant	poor	low (2-3)	fair	<10% 10%-25%	native	Z1	yes	4.8 2.4	driveway	0.0	100%	Remove
Health & Condition trunk cankers +																					
44	Casuarina glauca (Swamp Oak) multiple	on site	10	10	8.0	4.0	semi mature	40+yrs	codominant	fair	average (3)	fair	N/A N/A	indigenous	Z1	yes	2.0 1.3	driveway	0.0	100%	Remove
Health & Condition																					
45	Casuarina glauca (Swamp Oak)	on site	40	45	10.0	8.0	semi mature	15-40yrs	codominant	fair	average (3)	poor	<10% N/A/3/10/202	indigenous	Z1	yes	4.8 2.4	driveway	0.0	100%	Remove
Health & Condition included bark branch and scaffold unions																					
46	Eucalyptus saligna (Sydney Blue Gum)	on site	55	55	10.0	12.0	semi mature	15-40yrs	dominant	fair	average (3)	poor	<10% <10%	native	Z1	yes	6.6 2.6	driveway	0.0	100%	Remove
Health & Condition scaffold inclusions +																					
47	Eucalyptus saligna (Sydney Blue Gum)	on site	45	50	10.0	10.0	semi mature	15-40yrs	dominant	fair	low (2-3)	fair	<10% 10%-25%	native	A1	yes	5.4 2.5	driveway	0.0	100%	Remove
Health & Condition																					
48	Eucalyptus saligna (Sydney Blue Gum)	on site	30	35	8.0	8.0	semi mature	15-40yrs	dominant	fair	average (3)	poor	<10% <10%	native	Z1	yes	3.6 2.1	driveway	0.0	100%	Remove
Health & Condition included bark branch unions + / scaffold inclusions																					
49	Eucalyptus saligna (Sydney Blue Gum)	on site	35	40	10.0	8.0	semi mature	5-15yrs	dominant	fair	low (2-3)	fair	10%-25% 25%-50%	native	Z1	yes	4.2 2.3	driveway	0.0	100%	Remove
Health & Condition stressed / branch cankers																					
50	Casuarina glauca (Swamp Oak) multiple	on site	10	10	8.0	4.0	semi mature	40+yrs	codominant	fair	average (3)	fair		indigenous	Z1	yes	2.0 1.3	driveway	0.0	100%	Remove
Health & Condition																					

Tree No.	Species	Location	DBH (cm)	DGL (cm)	Height (m)	Canopy (m) radius	Age Class	Life Expectancy	Crown Class	Tree Condition	Crown Condition	Structure Condition	Deadwood Epicormics	Type	Tree AZ	Council Protected	TPZ (m) SRZ (m)	Proposed Works	Distance (m)	Proposed Encl	Proposed Status
51	Casuarina glauca (Swamp Oak)	on site	32 25 20	65	10.0	8.0	semi mature	40+yrs	codominant	fair	average (3)	fair	<10% N/A	indigenous	A1	yes	3.8 2.8	driveway	0.0	100%	Remove
Health & Condition																					
52	Casuarina glauca (Swamp Oak)	on site	30	40	10.0	8.0	semi mature	40+yrs	codominant	fair	average (3)	fair	<10% N/A	indigenous	A1	yes	3.6 2.3	driveway	0.0	100%	Remove
Health & Condition																					
53	Eucalyptus saligna (Sydney Blue Gum)	on site	55	55	12.0	12.0	semi mature	40+yrs	dominant	fair	average (3)	fair	<10% <10%	native	A1	yes	6.6 2.6	driveway	0.0	100%	Remove
Health & Condition scaffold inclusions / kino on trunk / pruning events / canopy lifted																					
54	Eucalyptus saligna (Sydney Blue Gum)	on site	10	20	6.0	3.0	young	15-40yrs	dominant	fair	low (2-3)	fair	<10% <10%	native	Z1	yes	2.0 1.7	driveway	0.0	100%	Remove
Health & Condition pruning events																					
55	Casuarina glauca (Swamp Oak) multiple	on site	10	10	8.0	4.0	semi mature	40+yrs	codominant	fair	average (3)	fair		indigenous	Z1	yes	2.0 1.3	driveway	0.0	100%	Remove
Health & Condition multiple trees																					
56	Eucalyptus saligna (Sydney Blue Gum)	on site	50	60	12.0	14.0	semi mature	40+yrs	dominant	fair	average (3)	fair	<10% 10%-25%	native	A1	yes	6.0 2.7	driveway	0.0	100%	Remove
Health & Condition pruning events / trunk cankers																					
57	Eucalyptus saligna (Sydney Blue Gum)	on site	55	60	10.0	12.0	semi mature	15-40yrs	dominant	fair	low (2-3)	poor	<10% 10%-25%	native	Z1	yes	6.6 2.7	car park	0.0	100%	Remove
Health & Condition kino on trunk / pruning events / trunk wound																					
58	Eucalyptus saligna (Sydney Blue Gum)	on site	30	35	8.0	6.0	young	40+yrs	dominant	fair	average (3)	fair	<10% <10%	native	Z1	yes	3.6 2.1	building	0.0	100%	Remove
Health & Condition pruning events																					
59	Eucalyptus microcorys (Tallowwood)	on site	50	55	14.0	9.0	mature	15-40yrs	dominant	fair	average (3)	fair	<10% <10%	native	Z6	yes	6.0 2.6	driveway	0.0	100%	Remove
Health & Condition included bark branch union / asymmetric canopy / pruning events / lean																					
60	Eucalyptus tereticornis (Forest Red Gum)	on site	93 50 60 50	90	15.0	12.0	mature	15-40yrs	dominant	fair	average (3)	poor	10%-25% 10%-25%	indigenous	Z4	yes	11.2 3.2	earth works	0.0	100%	Remove
Health & Condition trunk wounds / cankers																					

Tree No.	Species	Location	DBH (cm)	DGL (cm)	Height (m)	Canopy (m) radius	Age Class	Life Expectancy	Crown Class	Tree Condition	Crown Condition	Structure Condition	Deadwood Epicormics	Type	Tree AZ	Council Protected	TPZ (m) SRZ (m)	Proposed Works	Distance (m)	Proposed Encl	Proposed Status
61	Eucalyptus microcorys (Tallowwood)	on site	57 40 40	50	14.0	12.0	semi mature	40+yrs	dominant	fair	average (3)	fair	<10% <10%	native	A1	yes	6.8 2.5	earth works	0.0	100%	Remove
Health & Condition																					
62	Eucalyptus microcorys (Tallowwood)	on site	50	50	10.0	14.0	semi mature	40+yrs	dominant	fair	average (3)	fair	<10% <10%	native	A1	yes	6.0 2.5	earth works	0.0	100%	Remove
Health & Condition included bark branch unions																					
63	Eucalyptus microcorys (Tallowwood)	on site	50	50	14.0	10.0	semi mature	40+yrs	dominant	fair	good (4)	fair	<10% 10%-25%	native	A1	yes	6.0 2.5	earth works	0.0	100%	Remove
Health & Condition included bark branch unions																					
64	Eucalyptus microcorys (Tallowwood)	on site	50	50	12.0	10.0	semi mature	15-40yrs	dominant	fair	average (3)	fair	10%-25% <10%	native	A1	yes	6.0 2.5	earth works	0.0	100%	Remove
Health & Condition included bark branch unions																					
65	Eucalyptus tereticornis (Forest Red Gum)	on site	58 30 30 40	60	13.0	8.0	semi mature	15-40yrs	dominant	fair	average (3)	poor	<10% 10%-25%	indigenous	Z1	yes	7.0 2.7	earth works	0.0	100%	Remove
Health & Condition trunk wounds																					
66	Melaleuca styphelioides (Prickly Paperbark)	on site	54 20 40 30	80	8.0	10.0	mature	40+yrs	dominant	fair	average (3)	fair	<10% <10%	indigenous	A1	yes	6.5 3.0	earth works	0.0	100%	Remove
Health & Condition																					
67	Eucalyptus moluccana (Grey Box)	on site	65 45 25 40	80	12.0	12.0	semi mature	15-40yrs	dominant	fair	decline (2)	fair	25%-50% 25%-50%	indigenous	A2	yes	7.8 3.0	earth works	0.0	100%	Remove
Health & Condition decline																					
68	Eucalyptus tereticornis (Forest Red Gum)	on site	17 10 10	25	5.0	2.0	young	<5yrs	dominant	poor	decline (2)	fair	10%-25% <10%	native	Z1	yes	2.0 1.8	earth works	0.0	100%	Remove
Health & Condition decline																					
69	Eucalyptus microcorys (Tallowwood)	on site	10	10	3.0	2.0	young	15-40yrs	dominant	fair	average (3)	fair	<10% <10%	native	Z1	yes	2.0 1.3	earth works	0.0	100%	Remove
Health & Condition included bark branch unions																					
70	Eucalyptus microcorys (Tallowwood)	on site	60	60	12.0	12.0	semi mature	40+yrs	dominant	fair	average (3)	fair	<10% <10%	native	A1	yes	7.2 2.7	earth works	0.0	100%	Remove
Health & Condition included bark branch unions																					

Appendix B - Tree Schedule Definitions and Information

Location - Adjoining Property / Nature Strip / On Site

Dimensions - Diameter at breast height at 1.4m (DBH) / Diameter at ground level (DGL)

Height - Height measured in meters determined with a clinometer or estimated by eye

Canopy - Canopy spread measured in meters in each direction

Age Class

- Young - Recently planted or seeded
- Semi mature - < 20% of life expectancy
- Mature - 20% - 80% of life expectancy
- Over mature - > 80% of life expectancy

Life Expectancy - >5 years / 5-15 years / 15-40 years / 40+ years

Crown Class

- Dominant - Crown extends above general canopy; not restricted by other trees.
- Co-dominant - Crown forms the bulk of the general canopy but crowded by other trees.
- Intermediate - Crown extends into dominant / co dominant canopy but quite crowded on all sides.
- Emergent - Crown development restricted from surrounding trees.
- Suppressed - Crown development restricted from overgrowing trees.

Tree Condition

- **Good** - The crown is unrestricted. Free of pests, diseases and obvious structural issues. Has adequate vigour, foliage volume, size and colour
- **Fair** - The crown is not significantly restricted. Minor signs of pests and diseases. Some signs of damage or branch failures from storms. Some signs of reduced health or potential decline. They tree may improve in health or deteriorate in health and condition and may improve with remedial works.
- **Poor** - The crown is significantly restricted. Major signs of pests and diseases. Significant signs of damage or branch failures where structural integrity may be compromised or the tree is in decline and unlikely to recover.
- **Senescent** - The tree is overmature and show irreversible decline, dying or nearly dead.
- **Dead** - The tree is no longer capable of photosynthesis, osmosis and turgidity. Any dead tree must be assessed for hollow bearing capabilities and habitat potential.
- **Removed** - No longer present at location.

Crown Condition

- 1 - Severe decline, <20% canopy density; major dead wood
- 2 - Declining, 20-60% canopy density; twig and branch dieback
- 3 - Average / low vigour, 60-90% canopy density; twig dieback
- 4 - Good, 90-100% canopy density; little or no dieback or other problems
- 5 - Excellent, 100% canopy density; no deadwood or other problems

Structural Condition

- Poor - Wounds with fungal fruiting bodies, excessive included bark unions, numerous previous failures, significant wounds.
- Fair - Minor wounds, minor included bark unions, minor deadwood etc.
- Good - No significant issues and good foliage volume

Deadwood

- Low - Less than 10% of the canopy
- Medium - Between 10% and 50% of the canopy
- High - Greater than 50% of the canopy

Epicormic growth

- Low - Less than 10% of the canopy
- Medium - Between 10% and 50% of the canopy
- High - Greater than 50% of the canopy

Tree Type

- Endemic - Species that occur naturally and are restricted to a given area.
- Exotic - An introduced plant from outside Australia.
- Indigenous - Species that occur naturally to a given area but may not be restricted to only that area.
- Native - A general term referring to any plant indigenous to Australia including cultivars.

Root Zone - Compacted / Garden / Grass / Mulched / Natural Bush / Paved / Soil level lowered / Soil level raised

Structures - Fence / Garage / Footpath / Verandah / Dwelling / Road / Driveway / Seat

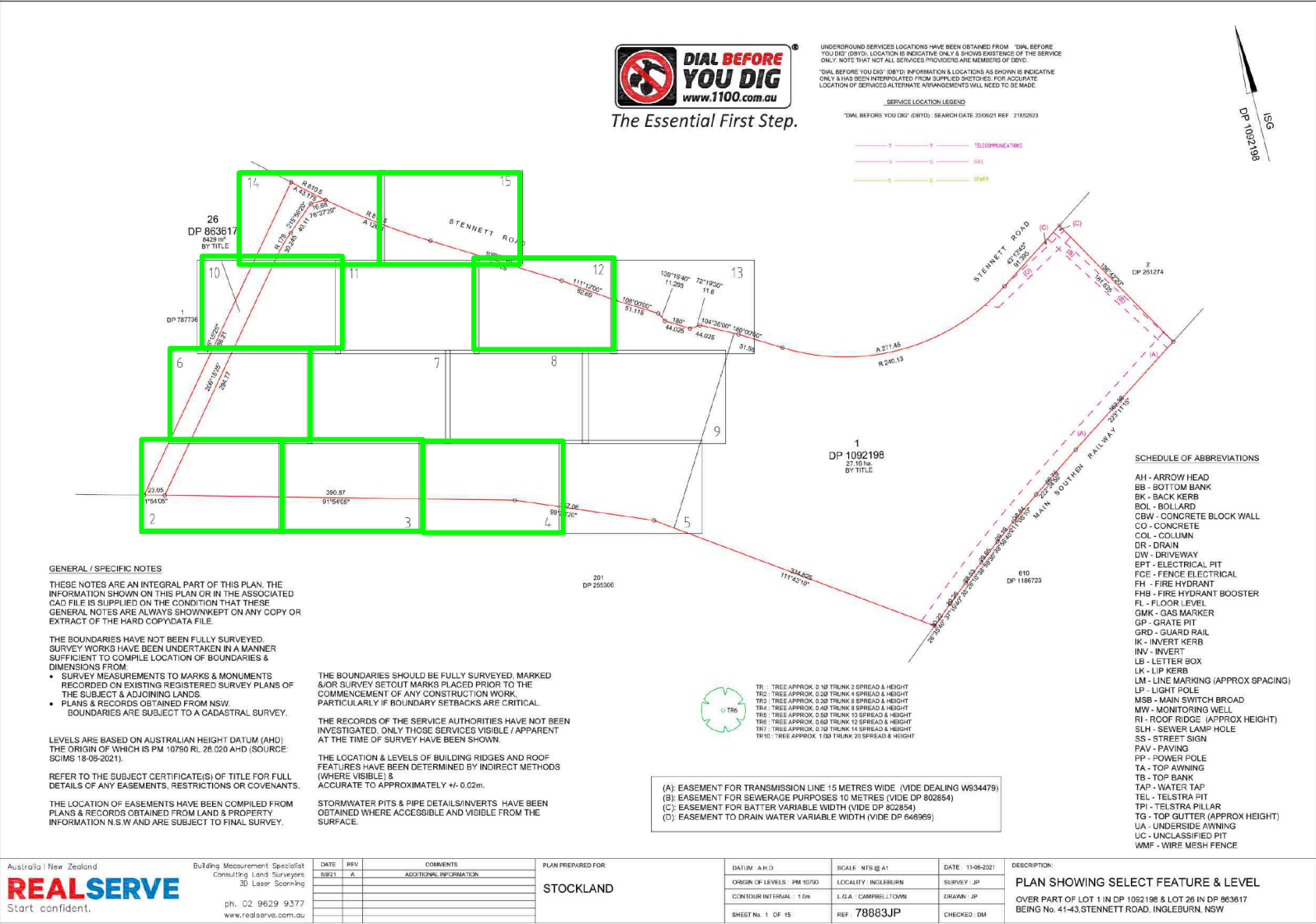
Tree Protection Zone - Tree Protection Zone (TPZ) is the principal means of protecting trees on development sites. The TPZ is a combination of the root area and crown area requiring protection. It is an area isolated from construction disturbance, so that the tree remains viable. If the proposed encroachment is less than 10% of the area of the TPZ and is outside the SRZ, detailed root investigations should not be required. The area lost to this encroachment should be compensated for elsewhere and contiguous with the TPZ.

Structural Root Zone - The SRZ is the area required for tree stability. A larger area is required to maintain a viable tree.

Minor Encroachment - If the proposed encroachment is less than 10% of the area of the TPZ and is outside the SRZ, detailed root investigations should not be required. The area lost to this encroachment should be compensated for elsewhere and contiguous with the TPZ. Variations must be made by the project arborist considering relevant factors.

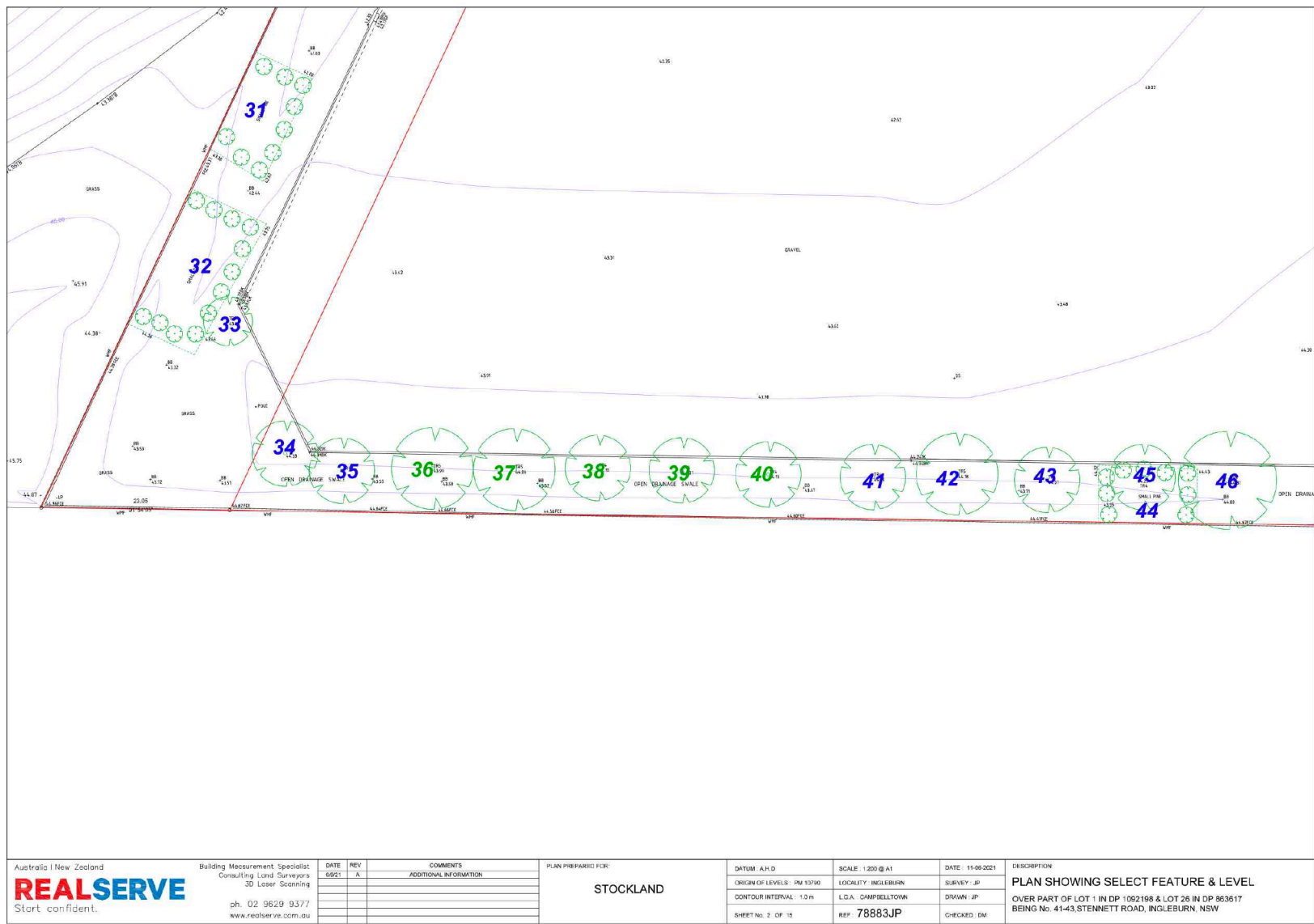
Major Encroachment - If the proposed encroachment is greater than 10% of the TPZ or inside the SRZ, the project arborist must demonstrate that the tree(s) would remain viable. The area lost to this encroachment should be compensated for elsewhere and contiguous with the TPZ. This may require root investigation by non-destructive methods and consideration of relevant factors

Appendix C - TPZ Numbering

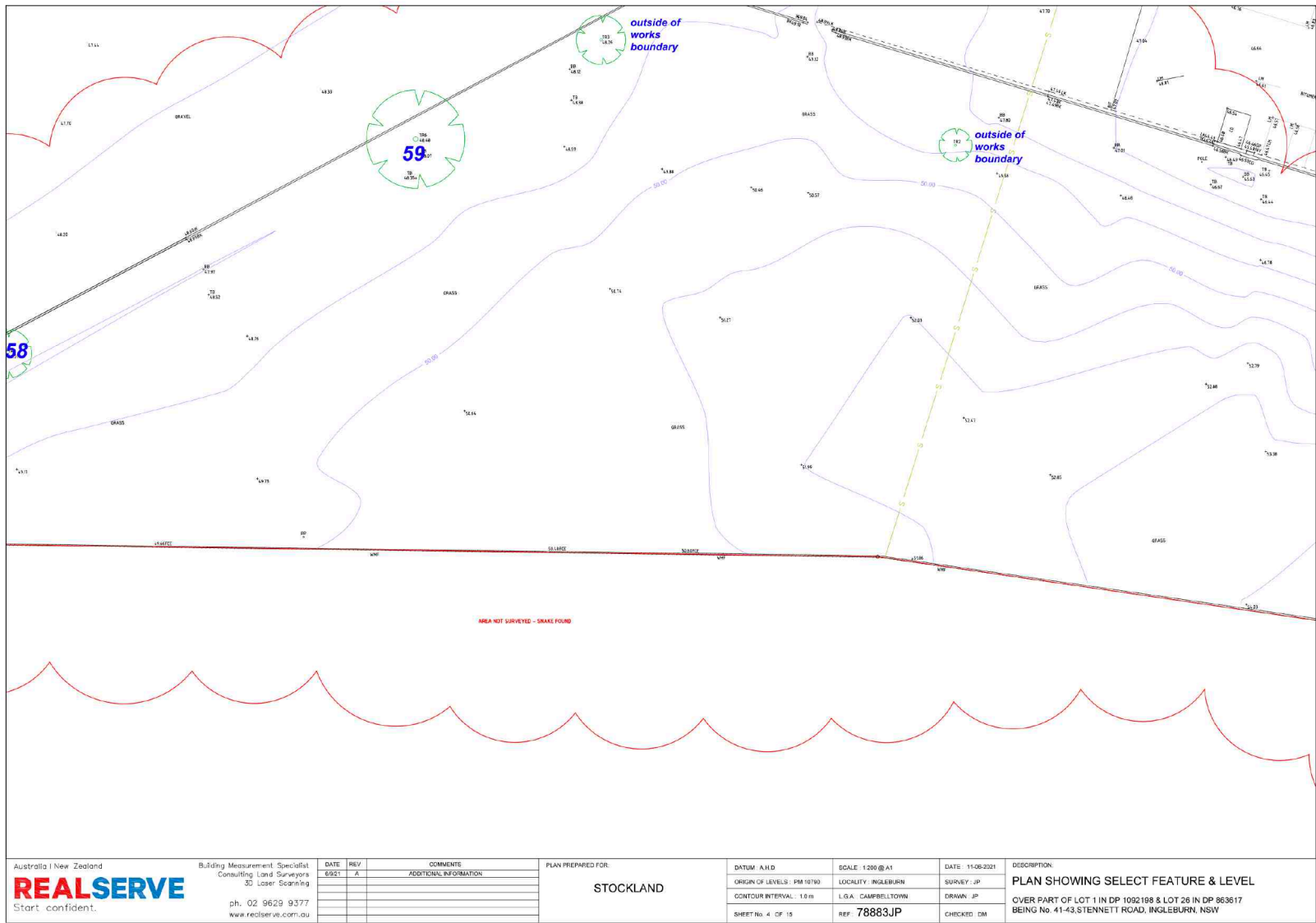


Australis New Zealand	Building Measurement Specialist Consulting Land Surveyors 3D Laser Scanning	DATE: 2021 REV: A	COMMENTS: ADDITIONAL INFORMATION	PLAN PREPARED FOR: STOCKLAND	DATUM: AHD ORIGIN OF LEVELS: PM 10750 CONTOUR INTERVAL: 1.0m SHEET No. 1 OF 15	SCALE: NTS @ A1 LOCALITY: INGLEBURN L.G.A.: CAMPBELLTOWN REF: 78883JP	DATE: 13-06-2021 SURVEY: JP DRAWN: JP CHECKED: DM	DESCRIPTION: PLAN SHOWING SELECT FEATURE & LEVEL
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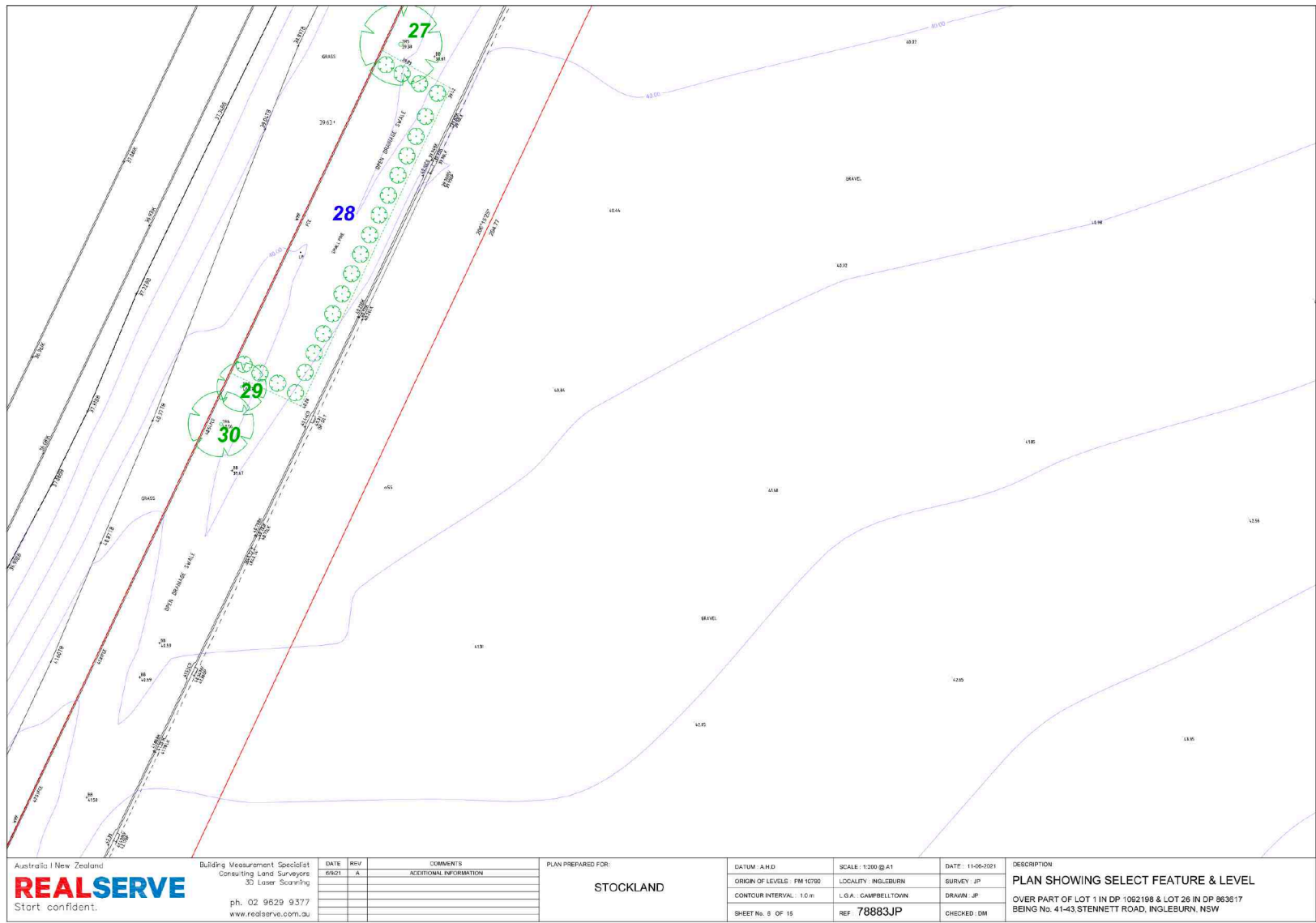
Survey 2



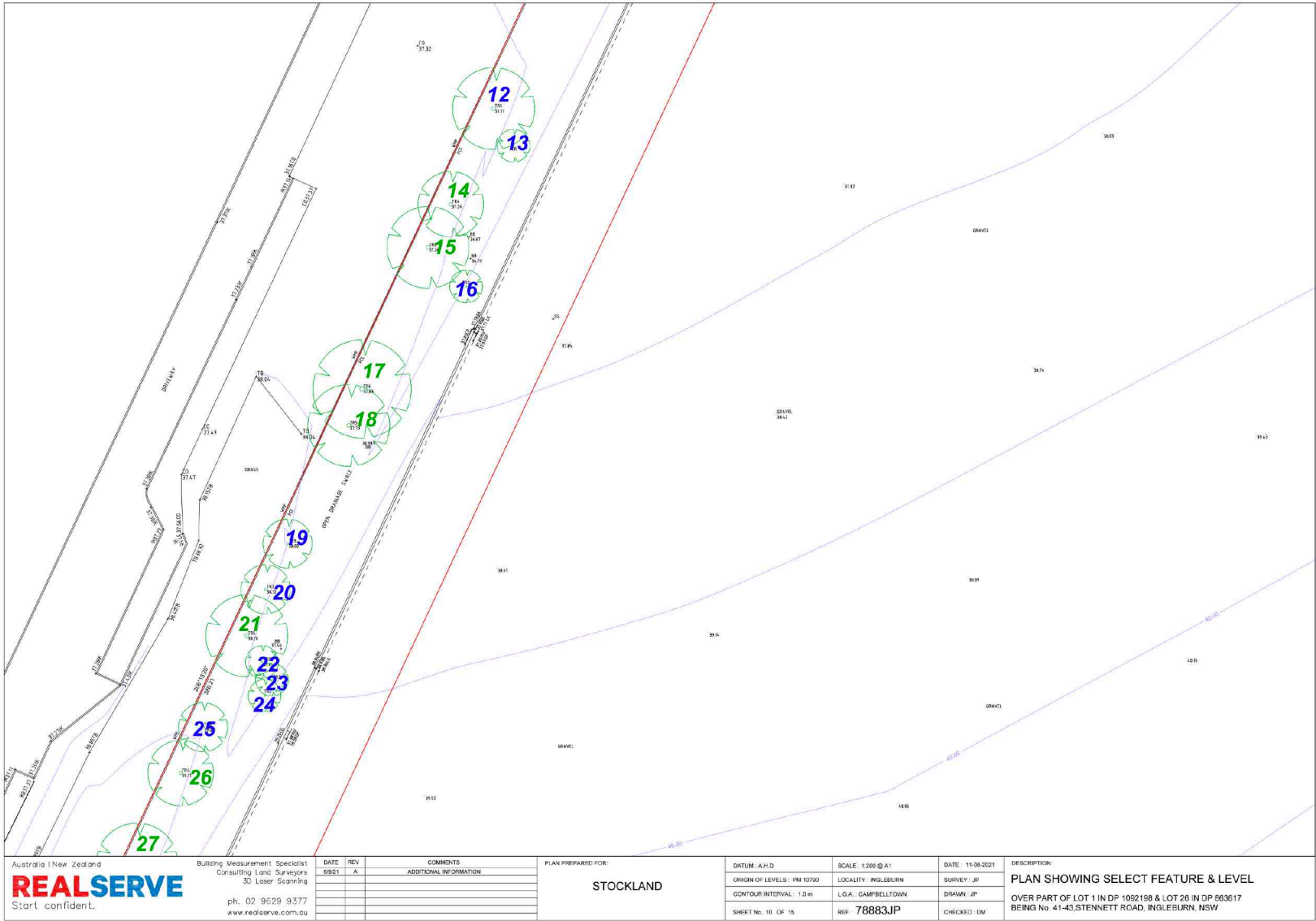
Survey 4



Survey 6



Survey 10



PLAN SHOWING SELECT FEATURE & LEVEL

OVER PART OF LOT 1 IN DP 1092198 & LOT 26 IN DP 86317
BEING No. 41-43, STENNETT ROAD, INGLEBURN, NSW

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DATE	REV	COMMENTS
9/02/21	A	ADDITIONAL INFORMATION

PLAN PREPARED FOR
STOCKLAND

DATUM	SCALE	DATE	DESCRIPTION
A.M.D.	1:200 @ A1	11-06-2021	PLAN SHOWING SELECT FEATURE & LEVEL

ORIGIN OF LEVELS	LOCALITY	SURVEY
PM 10790	INGLEBURN	JP

CONTOUR INTERVAL	L.G.A.	DRAWN
1.0 m	CAMPBELLTOWN	JP

SHEET	REF	CHECKED
No. 14 OF 15	78883JP	DM

24 March 2022

Reference 20221869.1

Appendix D - Thumbnail Photographs



1



2



3



4



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**17****18****19****20****21****22****23****24****25****26****27****28****29****30****31****32**

**33****34****35****36****37****38****39****40****41****42****43****44****45****46****47****48**

**49****50****51****52****53****54****55****56****57****58****59****60****61****62****63****64**



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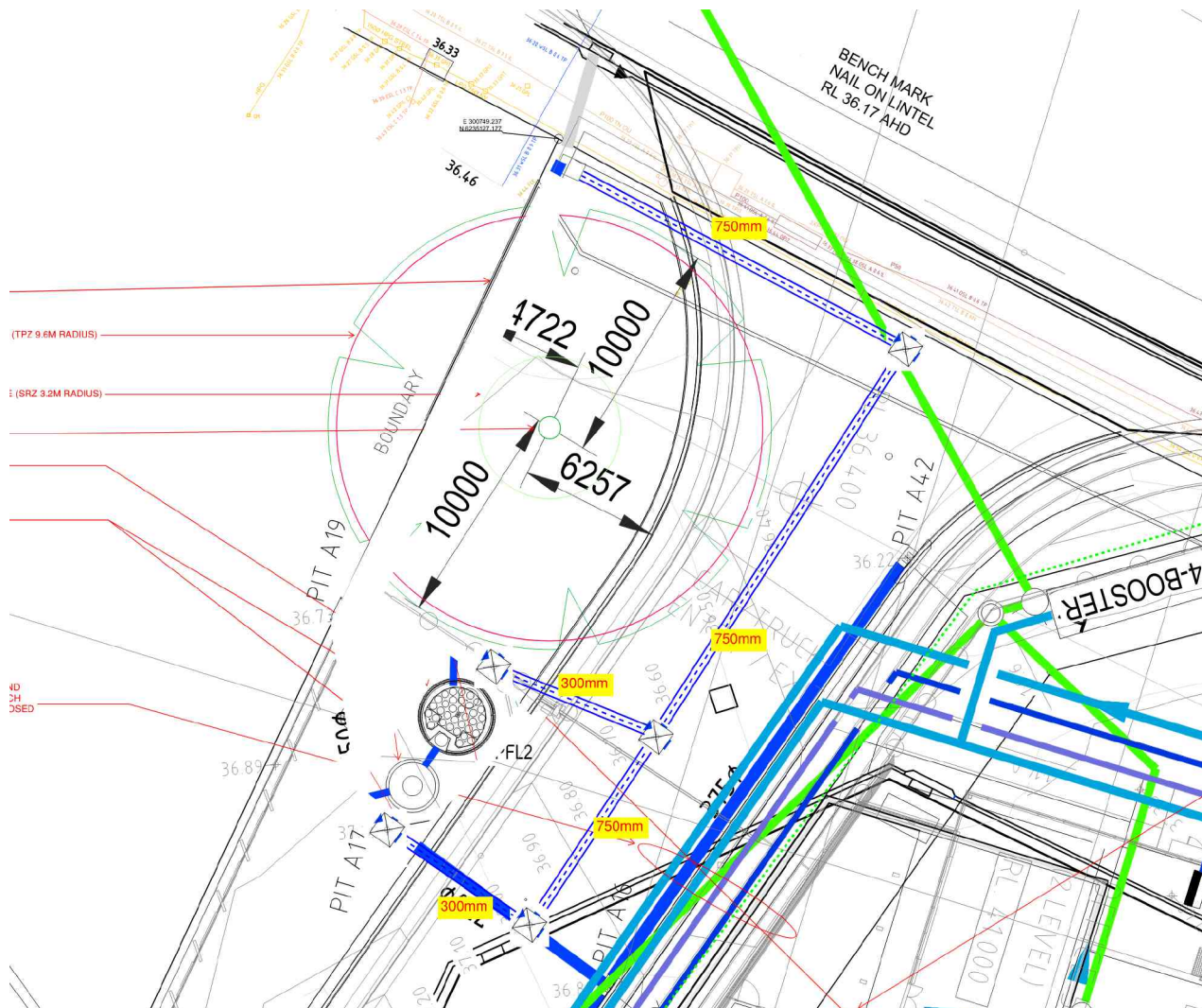


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Image003.jpg (plan not supplied)



Appendix G - Glossary

Shigo, A.L. (1986) A New Tree Biology Dictionary.

*Docktor, D (2001) City of Palo Alto, Tree Technical Manual.

Bark* - All tissue outside the vascular cambium. Bark is usually divided into inner bark active phloem and aging and dead crushed phloem.

Basal - Lower trunk area of the tree.

Branch* - Organ which supports leaves, flowers and fruit.

Branch collar* - Trunk tissue that forms around the base of a branch between the main stem and the branch wood and trunk wood to meet. Formed by compaction or expansion as the girth of the branch and trunk increase.

Canopy - The part of the crown composed of the leaves and small twigs.

Cavity - An open wound, characterized by the presence of decay and resulting in a hollow (Matheny & Clarke, 1994).

Codominant stems* - Stems or trunks of about the same size originating from the same position from the main stem.

Compaction - Compaction of soils causes roots to die due to lack of oxygen and water.

Compartmentalization* - Dynamic tree defence process involving protection features that resist the spread of pathogens.

Crown* - Portion of the tree consisting of branches and leaves and any part of the trunk from which branches arise.

Crown Projection - Area within the dripline or beneath the lateral extent of the crown (Geiger, 2004)

Decay* - Degeneration and delignification of plant tissue, including wood, by pathogens or microorganisms.

Dieback - Dieback is the reduction in the dynamic mass of a tree as twigs and branches die and are walled off by protection boundaries.

Epicormic shoots* - Shoots produced by dormant buds within the bark or stems of a tree as a result of stress, lopping or increase light. Epicormic shoots usually have a weaker form of branch attachment.

Included bark* - Inwardly formed bark at the junction of branches or codominant stems.

Kino - A dark red to brown resin-like substance produced by the trees in the genera Eucalyptus and other related genera. Kino forms when living cells are injured and infected.

Lopping* - Random cutting of branches or stems between branch union or at internodes on young trees.

Mycorrhiza - A symbiotic, non pathogenic, or weakly pathogenic association of fungi and non woody, absorbing roots of plants. The common belief is that the mycorrhiza help the tree with mineral absorption, especially phosphorus.

Microorganisms - An organism of microscopic size. Bacteria, the tree pathogens, may be as small as 3 microns wide by 5 microns long.

Pathogen - Any agent that causes disease.

Photosynthesis - A process where chlorophyll in plants traps the energy of the sun in a molecule of carbon dioxide and water that is called sugar.

Roots - An organ of a tree that serves to maintain mechanical support, to provide water and essential elements from the soil through absorption, and to store energy reserves.

Stem* - Organ which supports branches, leaves flowers and fruit.

Tree* - Long lived woody perennial plant greater than (or potentially greater than) 3m in height with one or relatively few stems.

Trunk* - The main stem.

Wound* - An opening that is created when the bark is cut, removed or injured.

Appendix H - TreeAZ (Barrell 2010)

TreeAZ Categories (Version 10.10-ANZ)

Category Z: Unimportant trees not worthy of being material constraint

Z	Local policy exemptions: Trees that are unsuitable for legal protection for local policy reasons including size, proximity and species	
	1	Young or insignificant small trees, i.e. below the local size threshold for legal protection, etc
	2	Too close to a building i.e exempt from legal protection because of proximity etc
	3	Species that cannot be protected for other reasons, i.e. scheduled noxious weeds, out of character in a setting of acknowledged importance, etc
	High risk of death or failure: Trees that are likely to be removed within 10 years because of acute health issues or severe structural failure	
	4	Dead, dying, diseased or declining
	5	Severe damage and/or structural defects where a high risk of failure cannot be satisfactorily reduced by reasonable remedial care, i.e. cavities, decay, included bark, wounds, excessive imbalance, overgrown and vulnerable to adverse weather conditions, etc
	6	Instability, i.e. poor anchorage, increased exposure, etc
	Excessive nuisance: Trees that are likely to be removed within 10 years because of unacceptable impact on people	
	7	Excessive, severe and intolerable inconvenience to the extent that a locally recognized court or tribunal would be likely to authorize removal, i.e. dominance, debris, interference, etc
	8	Excessive, severe and intolerable damage to property to the extent that a locally recognized court or tribunal would be likely to authorize removal, i.e. severe structural damage to surfacing and buildings, etc
	Good management: Trees that are likely to be removed within 10 years through responsible management of the tree population	
	9	Severe damage and/or structural defects where a high risk of failure can be temporarily reduced by reasonable remedial care, i.e. cavities, decay, included bark, wounds, excessive imbalance, vulnerable to adverse weather conditions, etc
	10	Poor condition or location with a low potential for recovery or improvement, i.e. dominated by adjacent trees or buildings, poor architectural framework, etc
	11	Removal would benefit better adjacent trees, i.e. relieve physical interference, suppression, etc
	12	Unacceptably expensive to retain, i.e. severe defects requiring excessive levels of maintenance, etc

NOTE: Z trees with a high risk of death/failure (Z4, Z5 & Z6) or causing severe inconvenience (Z7 & Z8) at the time of assessment and need an urgent risk assessment can be designated as ZZ. ZZ trees are likely to be unsuitable for retention and at the bottom of the categorization hierarchy. In contrast, although Z trees are not worthy of influencing new designs, urgent removal is not essential and they could be retained in the short term, if appropriate

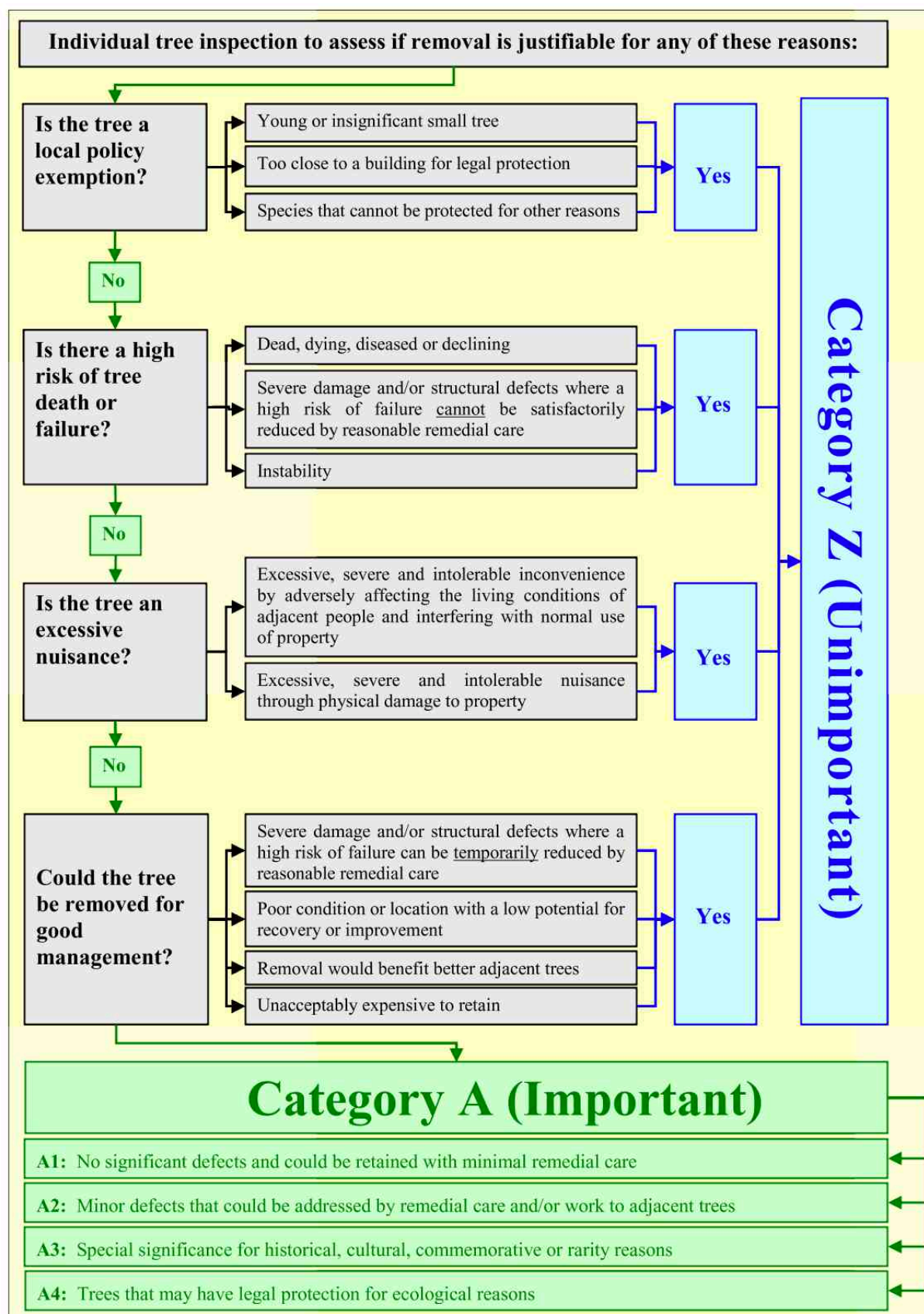
Category A Important trees suitable for retention for more than 10 years and worthy of being a material constraint

A1	No significant defects and could be retained with minimal remedial care
A2	Minor defects that could be addressed by remedial care and/or work to adjacent trees
A3	Special significance for historical, cultural, commemorative or rarity reasons that would warrant extraordinary efforts to retain for more than 10 years
A4	Trees that may be worthy of legal protection for ecological reasons (Advisory requiring specialist assessment)

NOTE: Category A1 trees that are already large and exceptional, or have the potential to become so with minimal maintenance, can be designated as AA at the discretion of the assessor. Although all A and AA trees are sufficiently important to be material constraints, AA trees are at the top of the categorization hierarchy and should be given the most weight in any selection process.

TreeAZ is designed by Barrell Tree Consultancy (www.barrelltreecare.co.uk) and is reproduced with their permission

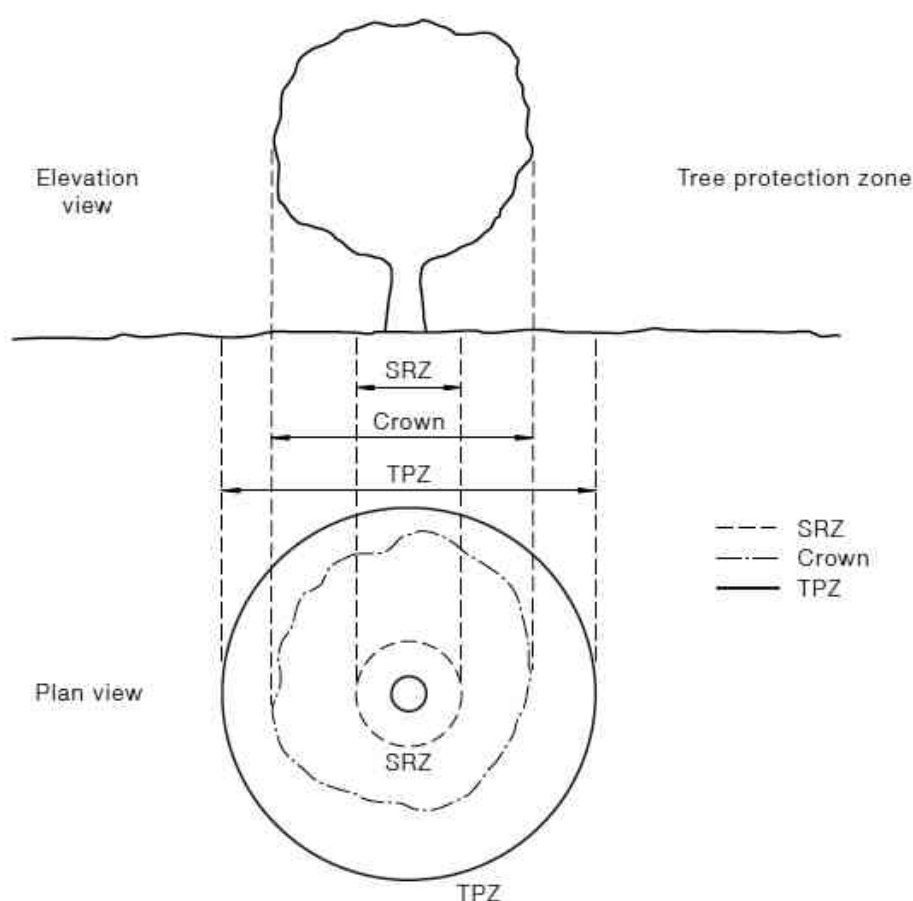
TreeAZ Flow Chart



Appendix I - Tree Protection Zones AS4970-2009

Tree Protection Zone

The tree protection zone (TPZ) is the principal means of protecting trees on development sites. The TPZ is a combination of the root area and crown area requiring protection. It is an area isolated from construction disturbance, so that the tree remains viable.



Determining the TPZ

The **radius** of the TPZ is calculated for each tree by multiplying its DBH \times 12.
 $TPZ = DBH \times 12$
 Where DBH = trunk diameter measured at 1.4 m above ground

Radius is measured from the centre of the stem at ground level.

A TPZ should not be less than 2m nor greater than 15m (except where crown protection is required). Clause 3.3 covers variations to the TPZ.

The TPZ of palms, other monocots, cycads and tree ferns should not be less than 1 m outside the crown projection.

TPZ is measured radially from the trunk

Appendix J - Qualifications & Experience



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ABN: 71 324 020 793

Meredith Gibbs (January 2020)

Qualifications:

- 1999 Advanced Certificate in Urban Horticulture
- 2002 Horticulture Diploma (Arboriculture) Level 5
- 2002 Occupational Health & Safety course
- 2002 Risk Management course
- 2002 Smart Train 008397
- 2010 Collecting Catchment Data
- 2011 Quantified Tree Risk Assessment
- 2014 Quantified Tree Risk Assessment
- 2015 Horticulture Diploma (Arboriculture), Level 5
- 2018 White Card Number 2234996

Practical experience:

- 1996 - 1998 Nursery Hand - Horticulturist
- 1988 - 2001 Garden Maintenance - Horticulturist
- 1997 - 2004 Silver Springs Nursery (Owner/Operator)
- 2000 - Australis Tree Management (Owner/Operator)

Memberships and affiliations:

- Arboriculture Australia
- Australian Institute of Horticulture
- Australian Plant Society of NSW
- Burrendong Botanic Garden & Arboretum
- International Society of Arboriculture
- Quantified Tree Risk Assessment Registered User
- Society of Municipal Arborists
- Women in Arboriculture

Insurance:

- Professional Indemnity Insurance
- Liberty International Underwriters
- \$5,000,000.00
- Policy No. HC-ME-SPC-01-104260
- Public Liability Insurance
- Liberty International Underwriters
- \$20,000,000.00
- Policy No. 463763

Pro Bono Work:

- Middle Dural Public School

Continuing Professional Development:

- NAAA Conference, Mature Trees, 2001
- Claus Mattheck Seminar 2001
- ISAAC Conference - Parramatta 2004
- AILA Tree Management Forum 2005
- Jeremy Barrell Tree AZ & Report Writing Workshop 2006
- A Practitioner's Guide to Visual Tree Assessment – Mike Ellison 2007
- Quantified Tree Risk Assessment Workshop – Mike Ellison 2007
- ISAAC Conference - Brisbane 2008
- ISAAC Conference Workshop Dr. David Lonsdale 2008
- ISAAC Conference Workshop Dr. Phillip Gibbons 2008
- ISAAC Conference - Newcastle 2009
- ISAAC Conference - Adelaide 2010
- ISA International Conference Parramatta 2011
- ISA International Conference Workshop Dr. Ken James 2011
- Arboriculture Australia Annual Conference - Sunshine Coast 2014
- Arboriculture Australia Annual Conference - Adelaide 2015
- Arboriculture Australia Annual Conference - Canberra 2017
- Jeremy Barrell Arboriculture Australia Workshop 2017
- Arboriculture Australia Annual Conference - Hobart 2018
- Arboriculture Australia Annual Conference - Alice Springs 2019

Past Projects

- Pennant Street Castle Hill (Castle Towers) 2006
- Fairway Drive, Kellyville 2012
- Summit Care, Baulkham Hills 2013
- 105-115 Portman Street, Zetland 2016
- 114 Tallawong Road, Rouse Hill 2016
- 2 Lexington Dr Bella Vista 2016
- The Hermitage - Gledswood Hills 2010-2019
- 105 Cudgegong Rd Rouse Hill Development 2018
- 33 Greenwich Road, Greenwich Redevelopment 2017-2019
- Gosford Park Redevelopment 2019
- Blacktown Workers Sports Club Redevelopment 2016-2019
- Gregory Hills Industrial Estate 2019



Appendix K - References

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- State Environmental Planning Policy No 19 - Bushland in Urban Areas :(pub1986-10-24)
- State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017: Subject Land :(pub2017-08-25)
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