



St Anthony of Padua, Austral




Arboricultural Impact Assessment and Bushfire Assessment

Prepared for
Munns Sly Moore Architects

15 August 2018



DOCUMENT TRACKING

Item	Detail
Project Name	Arboricultural Impact Assessment and Bushfire Assessment– St Anthony of Padua
Project Number	17SUT - 7946
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Status	Final
Version Number	V3
Last saved on	15 August 2018

This report should be cited as 'Eco Logical Australia 2017. *St Anthony of Padua, Austral – Arboricultural Impact Assessment and Bushfire Constraints Analysis*. Prepared for Munns Sly Moore Architects.'

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Trees are living organisms. As such, their health and structure may alter, they will grow and their environmental circumstances may change from the time of the site inspection upon which this assessment is based. Trees, as with all living things, pose some level of risk.

Tree risk assessments are valid for 12 months after the date of inspection, unless otherwise stated. Any significant change to the subject tree(s) or surrounding environment, including significant or catastrophic storm/wind events will require the immediate re-inspection and assessment of the tree(s).

Trees fail in ways that the arboricultural community are yet to fully understand. There is no guarantee expressed or implied that failure or deficiencies may not arise of the subject trees in the future. No responsibility is accepted for damage to property or injury/death caused by the nominated trees.

Template 29/9/2015

Contents

1	Introduction	6
1.1	Purpose of this report	6
1.2	Proposal.....	6
1.3	Study area	6
2	Arboricultural impact assessment	7
2.1	Documents and plans referenced	7
2.2	Field investigation	7
2.3	Visual tree assessment	7
2.4	Retention value.....	8
2.5	Protection zones	8
2.5.1	Tree protection zone (TPZ)	8
2.5.2	Structural root zone (SRZ).....	8
2.6	Root investigation	8
2.7	Impacts within the TPZ	8
2.8	Results.....	9
2.9	Recommendations and conclusions.....	10
3	Bushfire Protection Assessment	13
3.1	Method.....	13
3.2	Bushfire Threat Assessment	13
3.3	Asset Protection Zones (APZ)	14
3.4	APZ maintenance plan	15
3.5	Construction standard	15
3.5.1	Access	16
3.5.2	Water supply.....	1
3.6	Electricity Services	1
3.7	Gas Services	1
3.8	Evacuation / Emergency Response Procedures.....	2
3.9	Recommendations and conclusions.....	2
	References	6
	Appendix A Results of the arboricultural assessment	7
	Appendix B Assessment rating system.....	25
	Appendix C AS 4970-2009 mitigation measures	27

Appendix D – BFAA Report	28
Appendix E – Photographs	29

List of figures

Figure 1: Indicative TPZ and SRZ	11
Figure 2: Indicative zones of impact within the TPZ.....	11
Figure 3: Tree impacts	12
Figure 4: Liverpool Council Bush Fire Prone Land Map	3
Figure 5: Austral and Leppington North DCP Bushfire risk and APZ requirements	4
Figure 6: Bushfire Hazard Assessment.....	5

List of tables

Table 1: Threat assessment, APZ and category of bushfire attack	14
Table 2: Performance criteria for reticulated water supplies (PBP page 37)	1
Table 3: Summary of bushfire protection measures assessed	2

Abbreviations

Abbreviation	Description
AQF	Australian Qualifications Framework
AS	Australian Standards
DBH	Diameter at Breast Height
ELA	Eco Logical Australia
m	Metre
mm	Millimetre
NDE	Non-Destructive Excavation
NO	Number
NSW	New South Wales
SP	Species
SRZ	Structural Root Zone
TPZ	Tree Protection Zone
VTA	Visual Tree Assessment

1 Introduction

1.1 Purpose of this report

Eco Logical Australia Pty Ltd (ELA) was commissioned by Munns Sly Moore Architects to prepare an arboricultural impact assessment and bushfire constraints analysis for a proposed development at St Anthony of Padua Catholic School at Austral.

The study area is located on 'biodiversity certified land' according to the *Order to confer biodiversity certification on the State Environmental Planning Policy Sydney Region Growth Centres 2006*. Biocertification negates the requirement to conduct ecological impact assessments under Clause 7.3 of the BC Act and a consent authority is not required to take into consideration the likely impact of the development on biodiversity values (despite any provision of the NSW *Environmental Planning and Assessment Act* (EP&A Act) or any regulation or instrument made under that Act). However, Section 2.3.5 of the Liverpool Growth Centre Precincts DCP contains controls for the retention of native vegetation and protection of ecological values where possible.

The purpose of this arboricultural report is to:

- identify the trees within the study area
- assess the current overall health and condition of the subject trees
- evaluate the retention value of the subject trees
- assess potential impacts and mitigation measures
- identify bushfire constraints that may impact on the design and layout of development.

1.2 Proposal

The key features of the proposed works include:

- school and community meeting space
- a building to incorporate the school entry and administration, resource centre/IT Node, Student Services, Pastoral Care, Staff Study, Staff Commons and cafe
- school hall
- church.

1.3 Study area

St Anthony of Padua Catholic School is bound by Eleventh Avenue to the north, Edmondson Avenue to the east, Tenth Avenue to the south and Fourth Avenue to the west. The suburb of Austral is part of the Liverpool City Council local government area (LGA).

2 Arboricultural impact assessment

2.1 Documents and plans referenced

The conclusions and recommendations of the arboricultural impact assessment are based on the *Australian Standard, AS 4970-2009, Protection of Trees on Development Sites*, the findings from the site inspections and analysis of the following documents/plans:

- *St Anthony of Padua Masterplan, Existing Site Plan, 4032 MP003 1* prepared by Munns Sly Moore Architects dated 23.6.17
- *Plan of Detail and Levels over Lots 809, 812, 841-843 DP2475 known as No.145-165 Tenth Avenue and No.146-170 Eleventh Avenue, Austral Revision E* prepared by LTS Lockley Registered Surveyors NSW, dated 21/6/17
- *Masterplan Aerial Photo Project No.4032, Drawing No. A014* prepared by Munns Sly Moore Architects, no date
- *DA Site Plan – Masterplan – Design Approval – No.4* prepared by Munns Sly Moore Architects dated 29.05.18
- *Overall Landscape Plan St Anthony of Padua, Austral – Landscape Masterplan DA Submission SK 03 Issue D* prepared by Umbacco Landscape Architects dated May 2018

2.2 Field investigation

The subject trees were inspected on 31 October, 7, 10 and 17 November 2017. Data was collected using Trimble Terraflex (GIS mapping) and the location of the trees are accurate to approximately 3 m. Trees of the same species, with similar dimensions growing near each other, have been documented as a group and presented under a single number in **Appendix A**.

2.3 Visual tree assessment

The subject trees were assessed in accordance with a stage one visual tree assessment (VTA) as formulated by Mattheck & Breloer (1994)¹, and practices consistent with modern arboriculture.

The following limitations apply to this methodology:

- Trees were inspected from ground level, without the use of any invasive or diagnostic tools and testing.
- Trees within adjacent properties or restricted areas were not subject to a complete visual inspection (i.e. defects and abnormalities may be present but not recorded).
- No aerial inspections or root mapping was undertaken.
- Tree heights, canopy spread and diameter at breast height (DBH) was estimated, unless otherwise stated.
- Tree identification was based on broad taxonomical features present and visible from ground level at the time of inspection.

¹ VTA is an internationally recognised practice in the visual assessment of trees as prescribed by Mattheck, C. and Breloer, H. 1994. 'Field Guide for Visual Tree Assessment' *Arboricultural Journal*, Vol 18 pp 1-23.

2.4 Retention value

The retention value/importance of a tree or group of trees is determined using a combination of environmental, cultural, physical and social values.

- **High:** These trees are considered important and should be retained and protected. Design modification or re-location of building/s should be considered to accommodate the setbacks as prescribed by Australian Standard AS4970 Protection of trees on development sites.
- **Medium:** These trees are moderately important for retention. Their removal should only be considered if adversely affected by the proposed works and all other alternatives have been considered and exhausted.
- **Low:** These trees are not considered important for retention, nor require special works or design modification to be implemented for their retention.

This tree retention assessment has been undertaken in accordance with the Institute of Australian Consulting Arboriculturists (IACA) Significance of a Tree, Assessment Rating System (STARS). Further details and assessment criteria are in **Appendix B**.

2.5 Protection zones

The protection zones are illustrated in **Figure 1**.

2.5.1 Tree protection zone (TPZ)

The TPZ is the optimal combination of crown and root area (as defined by AS 4970-2009) that requires protection during the construction process. The TPZ is an area that is isolated from the work zone to insure no disturbance or encroachment occurs into this zone. Tree sensitive construction measures must be implemented if works are to proceed within the Tree Protection Zone.

2.5.2 Structural root zone (SRZ)

The SRZ is the area of the root system (as defined by AS 4970-2009) used for stability, mechanical support and anchorage of the tree. It is critical for the support and stability of the tree, and provides the bulk of mechanical support and anchorage. Severance of roots (>50 mmØ) within the SRZ is generally not recommended as it may lead to the destabilisation and/or decline of the tree.

2.6 Root investigation

When assessing the potential impacts of encroachment into the TPZ consideration will need to be given to the location and distribution of the roots, including above or below ground restrictions affecting root growth. Location and distribution of roots may be determined through non-destructive excavation (NDE) methods such as hydro-vacuum excavation (sucker truck), air spade and manual excavation. Root investigation is used to determine the extent and location of roots within the zone of conflict. Root investigation does not guarantee the retention of the tree.

2.7 Impacts within the TPZ

Indicative zones of impact within the TPZ are illustrated in **Figure 2**.

- **No impact (0%):** No likely or foreseeable encroachment within the TPZ.
- **Low impact (<10%):** If the proposed encroachment is less than 10% (total area) of the TPZ, and outside of the SRZ, detailed root investigations should not be required. The area lost to this encroachment should be compensated for elsewhere, and be contiguous with the TPZ.

- **Medium impact (<20%):** If the proposed encroachment is greater than 10% of the TPZ and outside of the SRZ, the project arborist must demonstrate that the tree(s) remain viable. The area lost to this encroachment should be compensated for elsewhere, and be contiguous with the TPZ. All work within the TPZ must be carried out under the supervision of the project arborist.
- **High impact (>20%):** If the proposed encroachment is greater than 20% of the TPZ the SRZ may be impacted. Tree sensitive construction techniques may be used for minor works within this area providing no structural roots are likely to be impacted, and the project arborist can demonstrate that the tree(s) remain viable. Root investigation by non-destructive methods is essential for any proposed works within this area.

2.8 Results

Figure 3 and **Appendix A** shows the results of the arboriculture assessment. Key points are:

- The highest percentage of trees were determined to be of the species most commonly found within the vegetation community of Cumberland Plain Woodland. This is a Critically Endangered Ecological Community and therefore these trees are generally considered to have high retention value in accordance with the STARS rating system (**Appendix B**).
- The canopy trees are generally in poor health, most likely due to psyllid dieback.
- **High Impact (>20%):** **641** trees are wholly within the proposed development footprint. Of these:
 - 469 trees are of **high** retention value
 - 140 trees are of **medium** retention value
 - 32 trees are of **low** retention value
- **Medium impact (<20%):** **14** trees will be subject to a medium impact <20% of the TPZ. Of these:
 - 8 trees are of **high** retention value
 - 6 trees are of **medium** retention value
- **Low impact (<10%):** **16** trees will be subject to a low impact within the TPZ. The anticipated low impact of the proposed development will have negligible impacts to the trees health, vigour or stability. Under the current proposal, these trees can be successfully retained. Of these:
 - 11 trees are of **high** retention value
 - 5 trees are of **medium** retention value
- **No impact:** **95** trees will not be impacted by the proposed development. Under the current proposal, these trees can be successfully retained. Of these:
 - **74** trees are of high retention
 - **15** trees are of medium retention
 - **6** trees are of low retention value

2.9 Recommendations and conclusions

The arborist assessment concluded that 469 trees to be removed from the site have high retention value as a result of being part of the Cumberland Plain Woodland but a large majority of the subject trees have poor vigour as a result of psyllid attack. Biodiversity certification of the site will permit the trees to be removed but will require offsetting in a suitable location. There is also retention of trees located in the north western area of the study area opposite Fourth Avenue as part of the market garden and trees to the southern area of the site within the fitness area (Munns Sly Moore Architects, *DA Site Plan – Masterplan – Design Approval – No.4* dated 29 May 2018)

Recommendations are as follows:

- All tree work must be in accordance with Australian Standard AS 4373-2007, Pruning of Amenity Trees and the NSW WorkCover Code of Practice for the Amenity Tree Industry (1998).
- All tree work is to be carried out by an arborist with a minimum AQF Level 3 qualification in Arboriculture.
- Permission must be granted from the relevant consent authority, prior to removing or pruning of any of the subject trees.

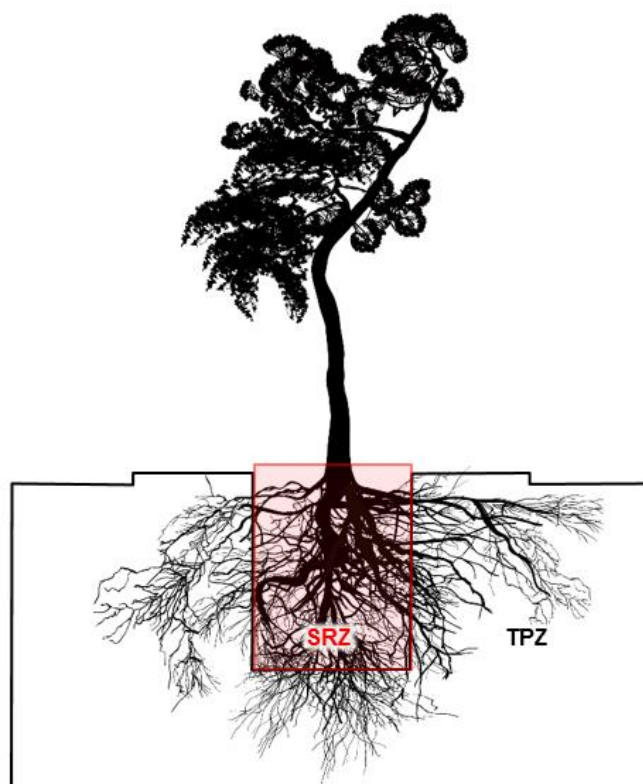


Figure 1: Indicative TPZ and SRZ

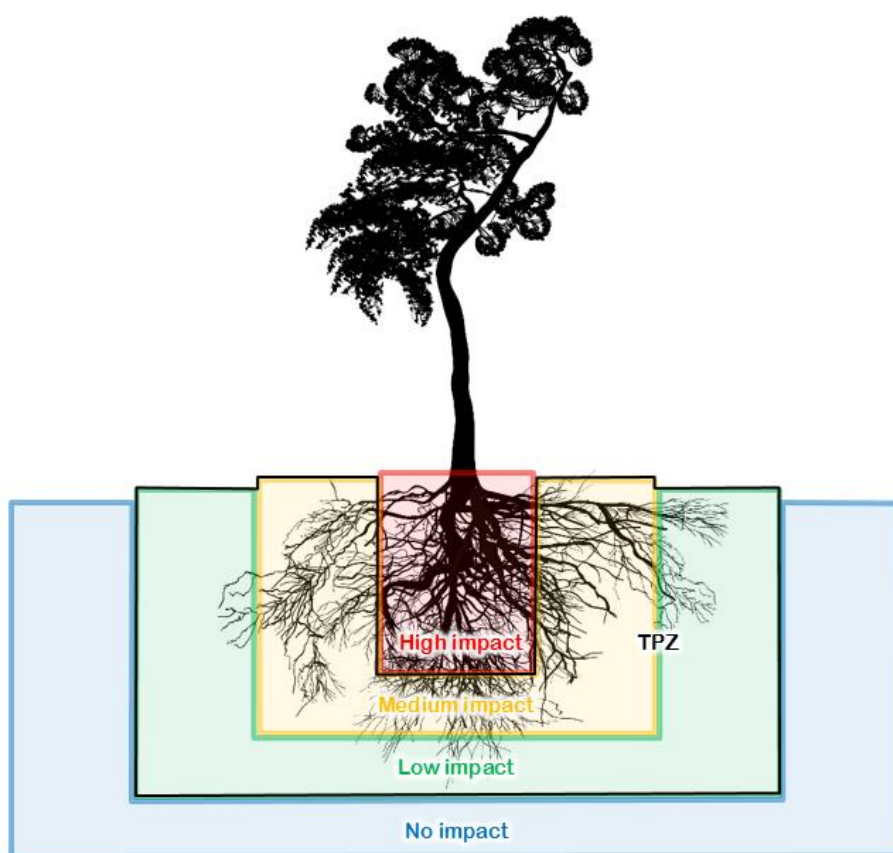


Figure 2: Indicative zones of impact within the TPZ

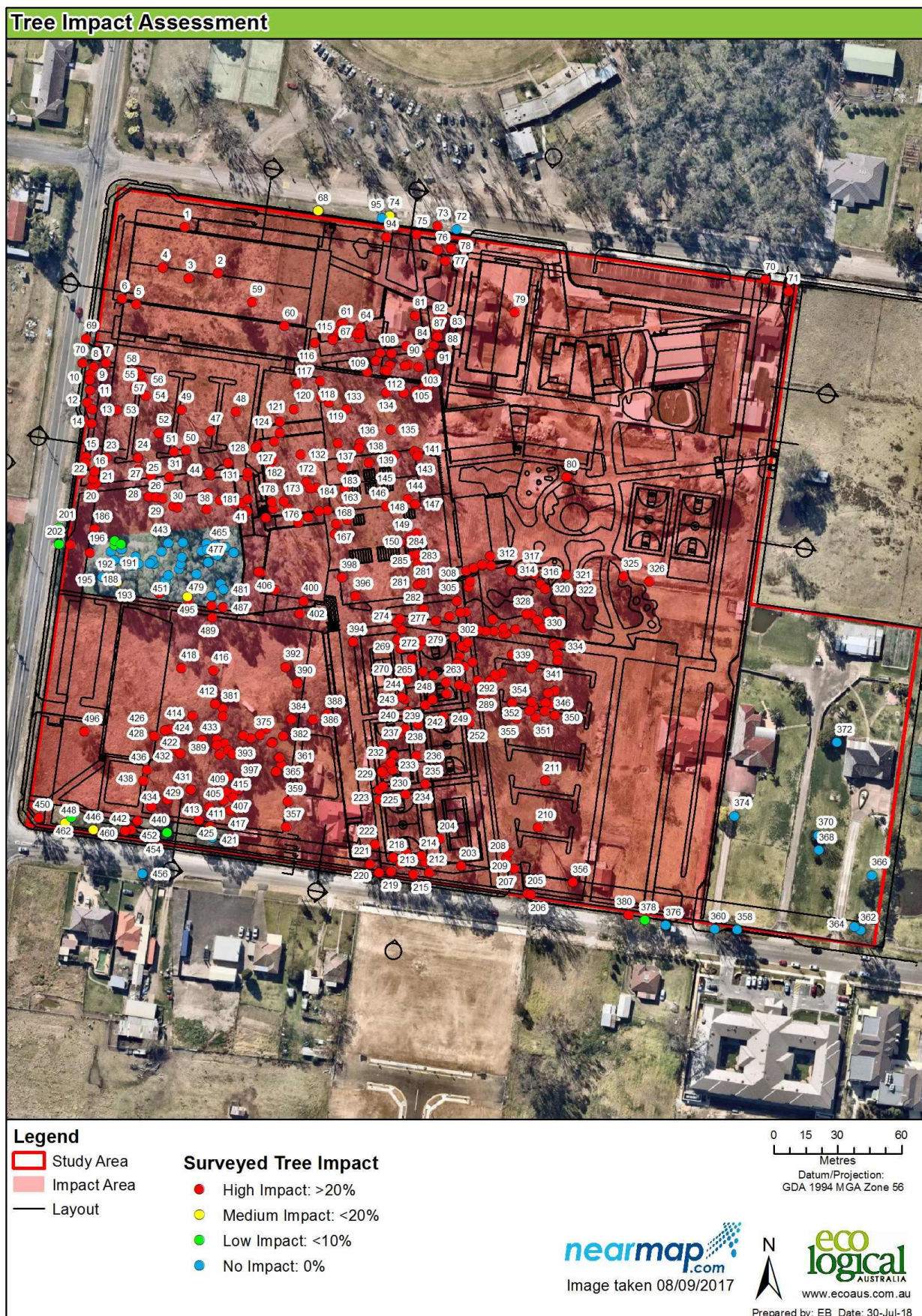


Figure 3: Tree impacts

3 Bushfire Protection Assessment

3.1 Method

Being a Special Fire Protection Purpose (SFPP) development, the concept proposal and proposed Stage 1 works were assessed in accord with Section 100B of the *Rural Fires Act 1997* and '*Planning for Bush Fire Protection 2006*' (RFS 2006), herein referred to as PBP.

Assessment included a review of background documentation, design team consultation, GIS analysis and a site inspection on 20 March 2018.

The relevant controls applicable to the study area are as follows:

- *Schedule 1 – Austral & Leppington North Precincts, part of the Camden Growth Centre Precincts Development Control Plan*
- *State Environmental Planning Policy Sydney Region Growth Centres 2006*

3.2 Bushfire Threat Assessment

The effective slope has been determined from 2 m contour data and revised where required by site assessment. The land is almost flat with a gentle downward slope from the north at 1.5° downslope.

Immediately adjoining the subject land to the north is Eleventh Avenue with an area of Shale Plains Woodland (SPW) further to the north (see **Photo 1-3**). This area is zoned *RE1-Public Recreation* under the Growth Centres SEPP and adjoins an existing sporting field with associated buildings and gravel carpark that is classified as managed land under PBP (**Photo 4-5**). The Indicative Layout Plan (ILP) for the Austral and Leppington North Precinct identifies this use will continue in the future. The ILP shows that the area surrounding the sporting field, including the carpark area to the south, is mapped under the Environmental Protection Overlay. As shown in **Photo 4-5**, this area is highly managed and used as a gravel carpark and assembly hall. Only the area directly to the east of the oval has sufficient CPW to constitute a bushfire hazard under PBP.

SPW is found within the Cumberland Plain Woodland (CPW) community which is listed as an endangered ecological community under the NSW *Biodiversity Conservation Act 2016* and the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999*. CPW is categorised as a Coastal Valley Grassy Woodland by Keith (2004) and 'woodland' in PBP.

Because of development across the Austral and Leppington North Precinct, much of the land surrounding the subject land will be residential development as future stages of the Precinct are completed. The bushfire hazard currently existing within the subject site will be removed during the Stage 1 works associated with the school construction, therefore was not assessed as a hazard to the proposed development.

In all other directions are public roads and well-maintained and managed properties with existing dwellings and ancillary buildings. There is no other vegetation that constitutes a bushfire hazard within 100 m of the site.

The site is located within the Local Government Area (LGA) of Liverpool City Council and has a Fire Danger Index (FDI) of 100.

3.3 Asset Protection Zones (APZ)

Error! Reference source not found. shows the dimensions of the APZ required; and where relevant, information on how the APZ is to be provided is included. The footprint of the required APZ is also shown in Error! Reference source not found..

SFPP developments are required to achieve the APZ performance criteria of '*radiant heat levels not greater than 10kW/m² to be experienced by occupants or emergency services workers entering or exiting the building*'. This has been achieved using a performance solution described further below with the results included in Error! Reference source not found..

As outlined in CB3 of Appendix B of AS 3959-2009 (Standards Australia 2009) the vegetation classification system and associated fuel loads in AS 3959-2009 are based on a national system. Vegetation classification systems specific to the relevant State are accepted as an alternate to the national system. In NSW, a system has been established by Keith (2004) and the fuel loads identified in PBP have been extensively researched. This assessment utilises the fuel loadings for a grassy woodland as described in **Section 3** of this report and in accordance with Table A2.1 of PBP. A refined slope measurement of 1.5 degrees downslope is used within the Method 2 (AS 3959-2009) modelling.

The NBC Bushfire Attack Assessor was used to determine the refined APZ in accordance with Appendix B: Detailed Methodology for Determining the Bushfire Attack Level (BAL) – Method 2 of Australian Standard 3959-2009: '*Construction of buildings in bushfire-prone areas*' (Standards Australia 2009).

This site-specific methodology is used to demonstrate that the development achieves the PBP performance criteria (Section 4.2.7 [p 33]) '*radiant heat levels of greater than 10 kW/m² will not be experienced by occupants or emergency services workers entering or exiting a building.*' The results of this assessment are shown in **Appendix D**.

The APZ assessment is tabulated below in Error! Reference source not found..

Table 1: Threat assessment, APZ and category of bushfire attack

Direction from envelope	Slope ¹	Vegetation ²	PBP required APZ (SFPP) ³	Modelled SFPP APZ (<10 kW/m ²) ⁴	Available APZ	AS 3959-2009 Bushfire Attack Level (BAL) ⁵	Comments
	Church (closest proposed building to bushfire hazard)						
North	1.5° downslope	Woodland	50 m	41 m	45 m	BAL-12.5	Provided by Eleventh Avenue and within property boundaries
	Classrooms (Year 12 classroom closet to bushfire hazard)						
North	1.5° downslope	Woodland	50 m	41 m	95 m	BAL-12.5	Provided by Eleventh Avenue and within property boundaries
	Kindergarten and ELC proposed change of use						

Direction from envelope	Slope ¹	Vegetation ²	PBP required APZ (SFPP) ³	Modelled SFPP APZ (<10 kW/m ²) ⁴	Available APZ	AS 3959-2009 Bushfire Attack Level (BAL) ⁵	Comments
North	1.5° downslope	Woodland	50 m	41 m	50 m	BAL-12.5	Provided by Eleventh Avenue and within property boundaries

¹ Slope most significantly influencing the fire behaviour of the site having regard to vegetation found. Slope classes are according to PBP.

² Predominant vegetation is identified, according to PBP and “Where a mix of vegetation types exist the type providing the greater hazard is said to be predominate”.

³ Assessment according to table A2.6 of PBP (2006).

⁴ Assessment according to Method 2 of Australian Standard 3959: Construction of buildings in bushfire-prone areas’ 2009

⁵ Assessment according to table 2.4.2 of Australian Standard 3959: Construction of buildings in bushfire-prone areas’ 2009

3.4 APZ maintenance plan

The required APZ are provided by Eleventh Avenue to the north, proposed carparks, footpaths and landscaping. Where the APZ is to be established, or any future landscaping is proposed, it is to be managed to Inner Protection Area standards as follows:

- No tree or tree canopy is to occur within 2 m of the future building rooflines;
- The presence of a few shrubs or trees in the APZ is acceptable provided they:
 - Are well spread out and do not form a continuous canopy;
 - Are not species that retain dead material or deposit excessive quantities of ground fuel in a short period or in a danger period; and
 - Are located far enough away from the building so that they will not ignite future buildings by direct flame contact or radiant heat emission.
- Any landscaping or plantings should preferably be local endemic mesic species or other low flammability species;
- A minimal ground fuel is to be maintained to include less than 4 tonnes per hectare of fine fuel (fine fuel means ANY dead or living vegetation of <6 mm in diameter e.g. twigs less than a pencil in thickness. 4 t/ha is equivalent to a 1 cm thick layer of leaf litter); and
- Any structures storing combustible materials such as firewood (e.g. sheds) must be sealed to prevent entry of burning debris.

Further details on APZ implementation and management can be found on the NSW RFS website including:

https://www.rfs.nsw.gov.au/_data/assets/pdf_file/0010/13321/Standards-for-Asset-Protection-Zones.pdf.

3.5 Construction standard

The building construction standard is based on the determination of the Bushfire Attack Level (BAL) in accordance with Method 1 of *Australian Standard AS 3959-2009 ‘Construction of buildings in bushfire-prone areas’* (Standards Australia 2009). The BAL is based on known vegetation type, effective slope, and managed separation distance between the development and the bushfire hazard.

In response to the predicted bushfire attack, the proposed buildings are exposed to **BAL-12.5** as defined in AS 3959-2009.

It is important that the version of AS3959-2009 applicable at the time of construction is consulted. Additionally, the NSW variation to AS 3959-2009 as outlined in PBP 2010 Appendix 3 Addendum is to be applied.

3.5.1 Access

The subject land has frontage and road access to Eleventh Avenue to the north, Fourth Avenue to the west, Tenth Avenue to the South with a driveway/drop area and carpark along the eastern boundary. Car parking is provided at multiple points across the site. It is anticipated that a fire impacting the subject land would be attended to by fire appliances situated within the hardstand surface of Eleventh Avenue or from the driveway/drop off area. If required fire appliances will also be able to traverse the grassed playground areas of the school.

The access arrangements will enable emergency vehicles to access the site in the event of an emergency.

Proposed internal access roads are required to comply with standards contained within section 4.2.7 of PBP for the design and construction of roads within SFPP developments, as listed in **Table 2**.

Table 2: Performance criteria for Internal Access Roads (PBP page 35)

Performance Criteria	Acceptable Solutions	Compliance
The intent may be achieved where:		
<ul style="list-style-type: none"> internal road widths and design enable safe access for emergency services and allow crews to work with equipment about the vehicle. 	<ul style="list-style-type: none"> internal roads are two-wheel drive, sealed, all-weather roads; internal perimeter roads are provided with at least two traffic lane widths (carriageway 8 metres minimum kerb to kerb) and shoulders on each side, allowing traffic to pass in opposite directions; roads are through roads. Dead end roads are not more than 100 metres in length from a through road, incorporate a minimum 12 metres outer radius turning circle, and are clearly sign posted as a dead end; traffic management devices are constructed to facilitate access by emergency services vehicles. a minimum vertical clearance of four metres to any overhanging obstructions, including tree branches, is provided. curves have a minimum inner radius of six metres and are minimal in number to allow for rapid access and egress. the minimum distance between inner and outer curves is six metres. maximum grades do not exceed 15 degrees and average grades are not more than 10 degrees. crossfall of the pavement is not more than 10 degrees. roads do not traverse through a wetland or other land potentially subject to periodic inundation (other than flood or storm surge). roads are clearly sign-posted and bridges clearly indicate load ratings. the internal road surfaces and bridges have a capacity to carry fully-loaded firefighting vehicles (15 tonnes). 	<p>Can comply</p> <p>No perimeter road required as not directly adjoining the hazard, and Eleventh Ave separates the hazard and the subject site therefore providing access requirements.</p> <p>Can comply</p> <p>Can comply</p> <p>Can comply</p> <p>Can comply</p> <p>Can comply</p> <p>Can comply</p> <p>Can comply</p> <p>Can comply</p> <p>Can comply</p>

3.5.2 Water supply

The subject land is serviced by reticulated water with hydrants located at regular intervals along Eleventh Avenue. **Table 2** identifies the acceptable solution requirements of Section 4.2.7 of PBP for which the proposal is compliant with, subject to the following specifications:

Table 2: Performance criteria for reticulated water supplies (PBP page 37)

Performance Criteria	Acceptable Solutions	complies
The intent may be achieved where:		
<ul style="list-style-type: none"> water supplies are easily accessible and located at regular intervals 	<ul style="list-style-type: none"> access points for reticulated water supply to SFPP developments incorporate a ring main system for all internal roads. 	Can comply
	<ul style="list-style-type: none"> fire hydrant spacing, sizing and pressures comply with AS 2419.1 – 2005. Where this cannot be met, the RFS will require a test report of the water pressures anticipated by the relevant water supply authority. In such cases, the location, number and sizing of hydrants shall be determined using fire engineering principles. 	Can comply
	<ul style="list-style-type: none"> the provisions of public roads in section 4.1.3 in relation to parking are met. 	Can comply

3.6 Electricity Services

The existing overhead electrical transmission lines are compliant with Section 4.1.3 of PBP, subject to the following specifications:

- Lines with short pole spacing (30 metres) are required, unless crossing gullies, gorges or riparian areas; and
- No part of a tree is closer to a power line than the distance set out in accordance with the specifications in *'Guide for the Management of Vegetation in the Vicinity of Electricity Assets'* issued by the Industry Safety Steering Committee 3 (ISSC3 2016).

3.7 Gas Services

Gas services (reticulated or bottle gas) are compliant with Section 4.2.7 of PBP, subject to the following specifications:

- Any gas services are to be installed and maintained in accordance with Australian Standard AS/NZS 1596 *The storage and handling of LP Gas* (SA 2014). Metal piping is to be used;
- All fixed gas cylinders are kept clear of all flammable materials to a distance of 10 metres and shielded on the hazard side of the installation;
- If gas cylinders need to be kept close to the building, the release valves are directed away from the building and at least 2 metres away from any combustible material, so that they do not act as a catalyst to combustion. Connections to and from gas cylinders are metal; and

Polymer sheathed flexible gas supply lines to gas meters adjacent to buildings are not used

3.8 Evacuation / Emergency Response Procedures

A Bushfire Emergency Response and Evacuation Plan prepared following the NSW RFS (2014) Guide to developing a bush fire emergency and evacuation plan

(https://www.rfs.nsw.gov.au/__data/assets/pdf_file/0020/29270/Form.pdf) is to be prepared prior to occupation and is recommended as a condition of consent.

3.9 Recommendations and conclusions

The proposed development complies with the acceptable solutions within 'Planning for Bush Fire Protection 2006', (see Error! Reference source not found.).

Modelling using Method 2 of AS 3959-2009 (Standards Australia 2009) demonstrates that the proposal is able to achieve the threshold of <10 kW/m² radiant heat exposure.

Table 3: Summary of bushfire protection measures assessed

Bushfire Protection Measures	Complies	Requirements	Acceptable Solution	Performance Solution	Report Section
Asset Protection Zones	<input checked="" type="checkbox"/>	APZ dimensions	<input type="checkbox"/>	<input checked="" type="checkbox"/>	3.3
APZ Maintenance plan	<input checked="" type="checkbox"/>	Identified APZ to be maintained in perpetuity to the detailed specifications in Section 3.4	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3.4
Construction standard	<input checked="" type="checkbox"/>	A maximum of BAL-12.5 is achievable.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3.5
Access	<input checked="" type="checkbox"/>	Internal access to meet PBP acceptable solution specifications for a SFPP development.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3.5
Water supply	<input checked="" type="checkbox"/>	Reticulated water supply to meet PBP acceptable solution specifications for a SFPP development.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3.5.2
Electricity service	<input checked="" type="checkbox"/>	Electricity supply located underground.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3.6
Gas service	<input checked="" type="checkbox"/>	Gas services are to be installed and maintained in accordance with AS/NZS 1596:2014.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3.7
Evacuation / Emergency Response procedures	<input checked="" type="checkbox"/>	A Bushfire Emergency Response and Evacuation Plan is to be prepared prior to occupation	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3.8

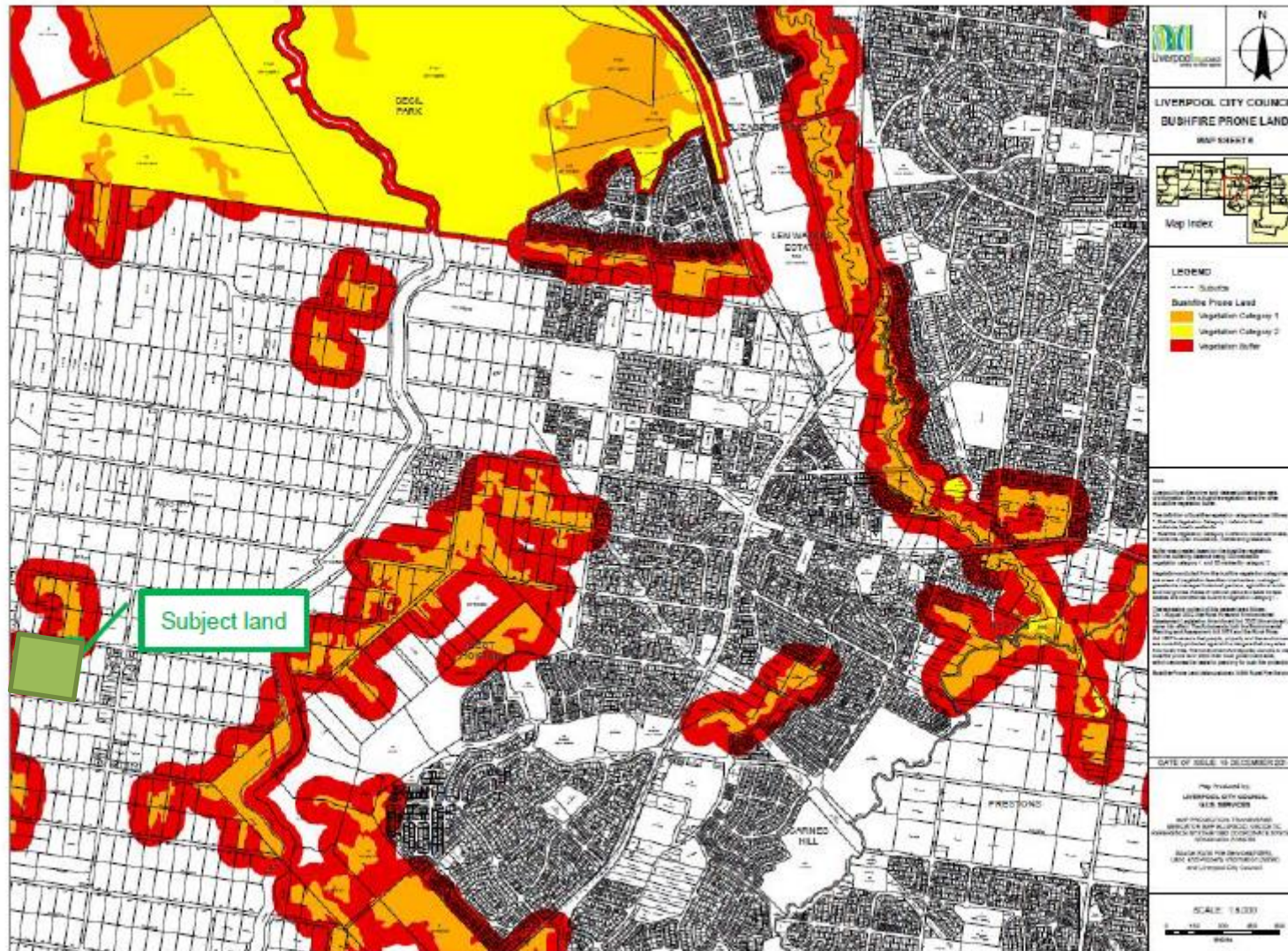


Figure 4: Liverpool Council Bush Fire Prone Land Map

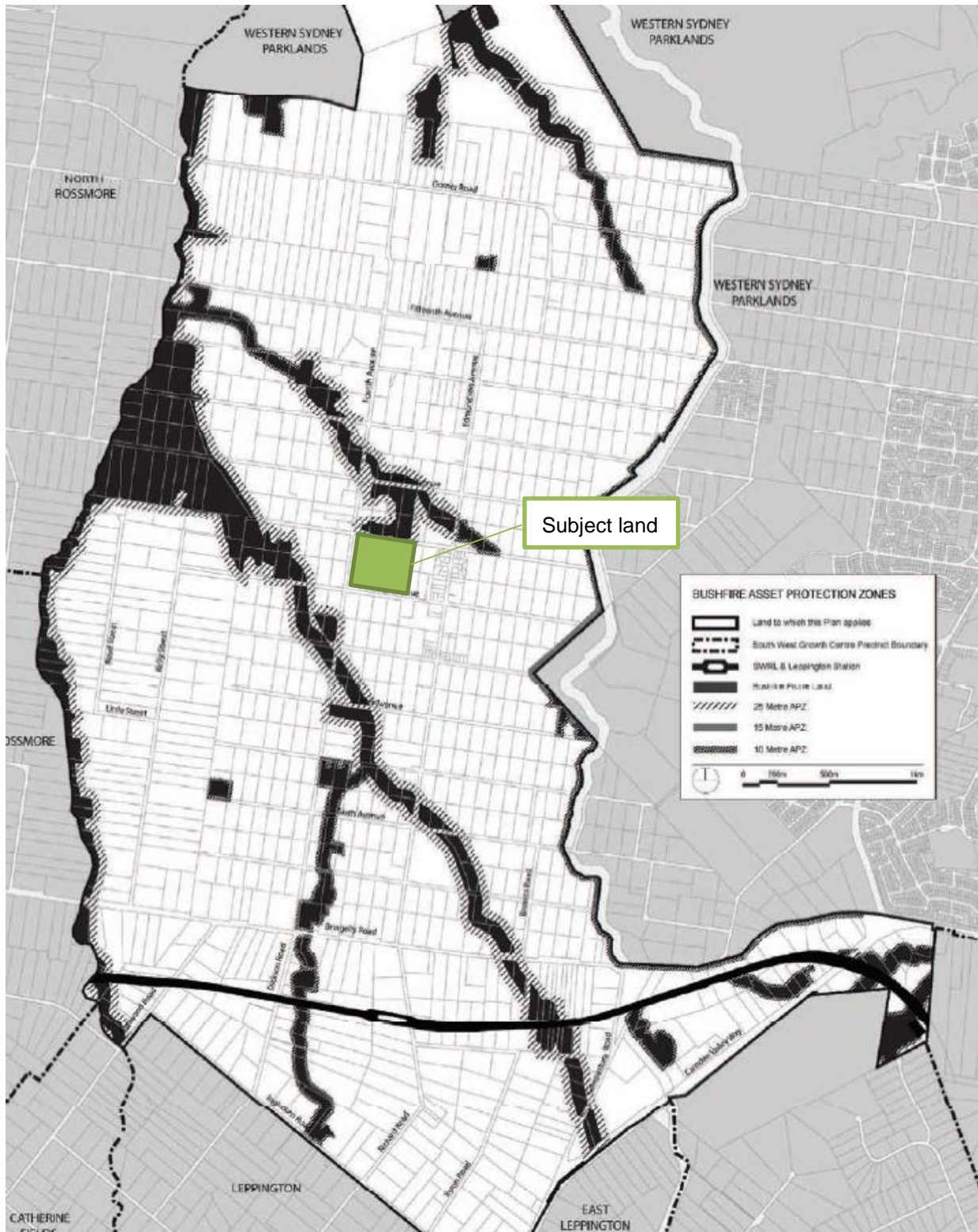


Figure 5: Austral and Leppington North DCP Bushfire risk and APZ requirements

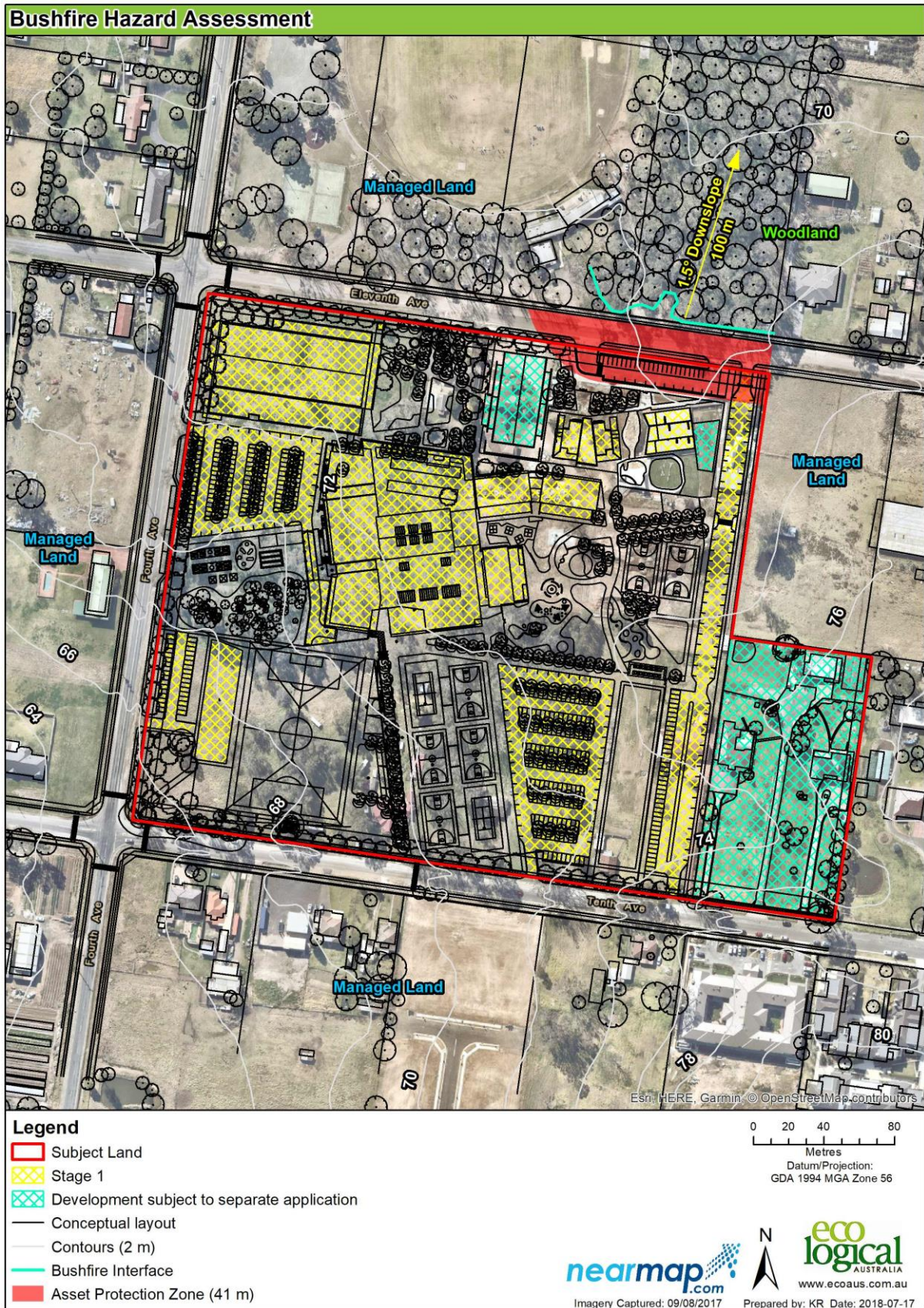


Figure 6: Bushfire Hazard Assessment

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Appendix A Results of the arboricultural assessment

Tree	Botanical name	Trees in Groups	Height (m)	Spread (m)	Health	Structure	Retention value	DBH (mm)	TPZ (mm)	SRZ (mm)	Impact
1	<i>Callistemon sp.</i>	1	5	5	Poor	Poor	Low	500	2500	6000	High Impact: >20%
2	<i>Shinus areira</i>	1	7	14	Poor	Poor	Low	1500	3900	15000	High Impact: >20%
3	<i>Acer negundo</i>	1	7	8	Fair	Fair	Low	600	2700	7200	High Impact: >20%
4	<i>Pyrus sp.</i>	1	6	5	Poor	Fair	Low	450	2400	5400	High Impact: >20%
5	<i>Eucalyptus tereticornis</i>	1	8	6	Poor	Fair	Medium	400	2300	4800	High Impact: >20%
6	<i>Melia azedarach</i>	2	4	3	Good	Fair	Medium	200	1700	2400	High Impact: >20%
7	<i>Eucalyptus moluccana</i>	1	12	8	Poor	Poor	High	500	2500	6000	High Impact: >20%
8	<i>Eucalyptus moluccana</i>	1	14	11	Fair	Fair	High	1000	3300	12000	High Impact: >20%
9	<i>Eucalyptus moluccana</i>	1	6	3	Fair	Poor	High	150	1500	2000	High Impact: >20%
10	<i>Eucalyptus moluccana</i>	1	10	6	Poor	Poor	Medium	600	2700	7200	High Impact: >20%
11	<i>Eucalyptus moluccana</i>	1	18	14	Poor	Fair	High	900	3200	11000	High Impact: >20%
12	<i>Eucalyptus moluccana</i>	1	20	16	Poor	Fair	High	1100	3400	13000	High Impact: >20%
13	<i>Eucalyptus moluccana</i>	1	20	8	Fair	Fair	High	400	2300	4800	High Impact: >20%
14	<i>Eucalyptus tereticornis</i>	1	20	12	Fair	Fair	High	1900	4300	15000	High Impact: >20%
15	<i>Eucalyptus tereticornis</i>	1	8	5	Good	Fair	High	200	1700	2400	High Impact: >20%
16	<i>Eucalyptus tereticornis</i>	1	12	6	Good	Good	High	400	2300	4800	High Impact: >20%
17	<i>Eucalyptus tereticornis</i>	1	12	6	Fair	Fair	High	500	2500	6000	High Impact: >20%
18	<i>Eucalyptus tereticornis</i>	1	14	10	Fair	Fair	High	500	2500	6000	High Impact: >20%
19	<i>Eucalyptus tereticornis</i>	1	16	8	Poor	Fair	High	600	2700	7200	High Impact: >20%
20	<i>Eucalyptus tereticornis</i>	1	16	6	Good	Good	High	300	2000	3600	High Impact: >20%
21	<i>Eucalyptus tereticornis</i>	1	16	6	Good	Good	High	450	2400	5400	High Impact: >20%
22	<i>Eucalyptus tereticornis</i>	4	16	6	Good	Good	High	300	2000	3600	High Impact: >20%
23	<i>Eucalyptus tereticornis</i>	1	16	8	Fair	Good	High	450	2400	5400	High Impact: >20%
24	<i>Brachychiton populneus</i>	1	10	4	Good	Good	High	500	2500	6000	High Impact: >20%
25	<i>Eucalyptus tereticornis</i>	1	14	8	Fair	Fair	High	350	2100	4200	High Impact: >20%

Tree	Botanical name	Trees in Groups	Height (m)	Spread (m)	Health	Structure	Retention value	DBH (mm)	TPZ (mm)	SRZ (mm)	Impact
26	<i>Eucalyptus tereticornis</i>	1	20	10	Fair	Good	High	600	2700	7200	High Impact: >20%
27	<i>Eucalyptus moluccana</i>	1	12	6	Fair	Poor	High	250	1800	3000	High Impact: >20%
28	<i>Eucalyptus tereticornis</i>	1	12	8	Fair	Good	High	300	2000	3600	High Impact: >20%
29	<i>Eucalyptus tereticornis</i>	1	14	5	Fair	Fair	High	250	1800	3000	High Impact: >20%
30	<i>Eucalyptus moluccana</i>	1	14	7	Poor	Fair	High	300	2000	3600	High Impact: >20%
31	<i>Eucalyptus tereticornis</i>	1	16	10	Poor	Poor	High	550	2600	6600	High Impact: >20%
32	<i>Eucalyptus tereticornis</i>	1	18	6	Poor	Fair	High	350	2100	4200	High Impact: >20%
33	<i>Eucalyptus tereticornis</i>	2	18	10	Fair	Good	High	450	2400	5400	High Impact: >20%
34	<i>Eucalyptus tereticornis</i>	1	16	12	Poor	Poor	High	1100	3400	13000	High Impact: >20%
35	<i>Dead Euc teret</i>	1	16	8	Poor	Poor	Medium	400	2300	4800	High Impact: >20%
36	<i>Eucalyptus tereticornis</i>	1	14	8	Fair	Good	High	450	2400	5400	High Impact: >20%
37	<i>Eucalyptus tereticornis</i>	2	12	6	Fair	Fair	High	350	2100	4200	High Impact: >20%
38	<i>Eucalyptus tereticornis</i>	1	15	8	Poor	Good	High	400	2300	4800	High Impact: >20%
40	<i>Eucalyptus tereticornis</i>	2	12	6	Fair	Good	High	300	2000	3600	High Impact: >20%
41	<i>Eucalyptus tereticornis</i>	2	10	7	Fair	Good	High	300	2000	3600	High Impact: >20%
42	<i>Eucalyptus tereticornis</i>	1	10	6	Good	Good	High	500	2500	6000	High Impact: >20%
43	<i>Eucalyptus tereticornis</i>	1	10	5	Poor	Fair	High	250	1800	3000	High Impact: >20%
44	<i>Eucalyptus moluccana</i>	1	14	8	Fair	Good	High	450	2400	5400	High Impact: >20%
45	<i>Eucalyptus tereticornis</i>	1	10	7	Poor	Poor	Medium	550	2600	6600	High Impact: >20%
46	<i>Eucalyptus tereticornis</i>	2	10	4	Fair	Good	High	250	1800	3000	High Impact: >20%
47	<i>Eucalyptus tereticornis</i>	1	10	6	Poor	Fair	High	300	2000	3600	High Impact: >20%
48	<i>Eucalyptus moluccana</i>	1	8	6	Poor	Fair	Medium	250	1800	3000	High Impact: >20%
49	<i>Eucalyptus moluccana</i>	1	16	12	Poor	Fair	High	900	3200	11000	High Impact: >20%
50	<i>Eucalyptus moluccana</i>	1	20	14	Poor	Poor	Medium	600	2700	7200	High Impact: >20%
51	<i>Eucalyptus moluccana</i>	1	18	10	Poor	Fair	High	450	2400	5400	High Impact: >20%
52	<i>Eucalyptus moluccana</i>	1	20	14	Fair	Fair	High	600	2700	7200	High Impact: >20%
53	<i>Eucalyptus moluccana</i>	1	18	8	Fair	Good	High	600	2700	7200	High Impact: >20%

Tree	Botanical name	Trees in Groups	Height (m)	Spread (m)	Health	Structure	Retention value	DBH (mm)	TPZ (mm)	SRZ (mm)	Impact
54	<i>Eucalyptus moluccana</i>	2	17	8	Poor	Fair	Medium	600	2700	7200	High Impact: >20%
55	<i>Eucalyptus moluccana</i>	1	18	10	Fair	Good	High	900	3200	11000	High Impact: >20%
56	<i>Eucalyptus tereticornis</i>	1	18	6	Good	Good	High	400	2300	4800	High Impact: >20%
57	<i>Eucalyptus moluccana</i>	1	18	8	Poor	Fair	High	1250	3600	15000	High Impact: >20%
58	<i>Eucalyptus moluccana</i>	2	8	6	Fair	Good	High	300	2000	3600	High Impact: >20%
59	<i>Eucalyptus tereticornis</i>	1	14	10	Good	Good	High	550	2600	6600	High Impact: >20%
60	<i>Eucalyptus moluccana</i>	1	18	16	Poor	Fair	High	2000	4400	15000	High Impact: >20%
61	Dead	1	16	6	Poor	Poor	Low	500	2500	6000	High Impact: >20%
62	<i>Eucalyptus moluccana</i>	1	16	8	Poor	Poor	High	650	2800	7800	High Impact: >20%
63	<i>Eucalyptus moluccana</i>	5	14	5	Poor	Fair	High	300	2000	3600	High Impact: >20%
64	<i>Eucalyptus moluccana</i>	1	14	6	Poor	Fair	High	350	2100	4200	High Impact: >20%
65	<i>Eucalyptus moluccana</i>	1	18	7	Poor	Good	High	450	2400	5400	High Impact: >20%
66	<i>Eucalyptus moluccana</i>	1	18	10	Poor	Good	High	550	2600	6600	High Impact: >20%
67	<i>Eucalyptus moluccana</i>	2	10	4	Poor	Fair	High	250	1800	3000	High Impact: >20%
68	<i>Eucalyptus moluccana</i>	2	10	5	Fair	Good	High	500	2500	6000	Medium Impact: <20%
69	<i>Eucalyptus tereticornis</i>	1	16	12	Good	Fair	High	1000	3300	12000	High Impact: >20%
70	<i>Phoenix canariensis</i>	2	6	8	Good	Good	High	650	2800	7800	High Impact: >20%
70	<i>Eucalyptus moluccana</i>	1	16	8	Good	Fair	High	400	2300	4800	High Impact: >20%
71	<i>Syagrus romanzoffiana</i>	1	6	4	Good	Good	High	350	2100	4200	High Impact: >20%
72	<i>Callistemon salignus</i>	1	3	3	Good	Good	Medium	100	1300	2000	No Impact: 0%
73	<i>Eucalyptus moluccana</i>	1	14	10	Poor	Fair	High	950	3200	11000	High Impact: >20%
74	<i>Eucalyptus moluccana</i>	1	16	8	Poor	Poor	Medium	600	2700	7200	Medium Impact: <20%
75	<i>Quercus robur</i>	1	6	7	Good	Good	High	300	2000	3600	High Impact: >20%
76	<i>Acer negundo</i>	1	6	5	Good	Good	Medium	400	2300	4800	High Impact: >20%
77	<i>Acer negundo</i>	1	4	4	Fair	Fair	Low	150	1500	2000	High Impact: >20%
78	<i>Callistemon citrinus</i>	1	6	5	Fair	Fair	Medium	200	1700	2400	High Impact: >20%
79	<i>Syagrus romanzoffiana</i>	3	10	4	Good	Good	Medium	300	2000	3600	High Impact: >20%

Tree	Botanical name	Trees in Groups	Height (m)	Spread (m)	Health	Structure	Retention value	DBH (mm)	TPZ (mm)	SRZ (mm)	Impact
80	<i>Eucalyptus moluccana</i>	1	16	12	Poor	Fair	High	650	2800	7800	High Impact: >20%
81	<i>Pyrus sp.</i>	1	6	9	Good	Good	Medium	400	2300	4800	High Impact: >20%
82	<i>Callistemon salignus</i>	1	5	5	Good	Fair	Medium	200	1700	2400	High Impact: >20%
83	<i>Pittosporum undulatum</i>	1	6	4	Good	Good	Medium	200	1700	2400	High Impact: >20%
84	<i>Delonix regia</i>	1	10	4	Fair	Fair	Medium	200	1700	2400	High Impact: >20%
85	<i>Melia azedarach</i>	1	8	6	Good	Fair	High	700	2800	8400	High Impact: >20%
86	<i>Cinnamomum camphora</i>	1	12	6	Good	Good	Low	450	2400	5400	High Impact: >20%
87	<i>Lophostemon confertus</i>	1	12	4	Good	Good	Medium	150	1500	2000	High Impact: >20%
88	<i>Melaleuca linariifolia</i>	1	10	6	Good	Fair	High	450	2400	5400	High Impact: >20%
89	<i>Callistemon salignus</i>	1	6	5	Fair	Fair	Medium	200	1700	2400	High Impact: >20%
90	<i>Delonix regia</i>	1	6	5	Fair	Fair	Low	150	1500	2000	High Impact: >20%
91	<i>Ficus sp.</i>	1	10	10	Good	Good	High	550	2600	6600	High Impact: >20%
92	<i>Corymbia maculata</i>	1	12	8	Good	Good	High	350	2100	4200	High Impact: >20%
93	<i>Erythrina x sykesii</i>	1	9	9	Fair	Good	Low	550	2600	6600	High Impact: >20%
94	<i>Eucalyptus crebra</i>	1	10	5	Fair	Good	High	350	2100	4200	High Impact: >20%
95	<i>Eucalyptus sp.</i>	1	5	4	Good	Good	Medium	200	1700	2400	No Impact: 0%
96	<i>Corymbia maculata</i>	1	8	6	Good	Good	High	200	1700	2400	High Impact: >20%
97	<i>Corymbia maculata</i>	1	8	5	Good	Good	High	200	1700	2400	High Impact: >20%
98	<i>Ficus elastica</i>	1	7	8	Good	Fair	Medium	450	2400	5400	High Impact: >20%
99	<i>Erythrina x sykesii</i>	1	6	10	Good	Fair	Low	340	2100	4100	High Impact: >20%
100	<i>Araucaria bidwillii</i>	2	4	3	Good	Good	Medium	160	1500	2000	High Impact: >20%
101	<i>Erythrina x sykesii</i>	1	6	10	Good	Good	Low	1000	3300	12000	High Impact: >20%
102	<i>Pinus radiata</i>	1	10	4	Fair	Good	Low	200	1700	2400	High Impact: >20%
103	<i>Leptospermum sp.</i>	1	4	4	Fair	Poor	Medium	400	2300	4800	High Impact: >20%
104	<i>Erythrina x sykesii</i>	1	10	12	Good	Fair	Low	550	2600	6600	High Impact: >20%
105	<i>Grevillea robusta</i>	1	10	4	Good	Good	Medium	150	1500	2000	High Impact: >20%
106	<i>Ficus sp.</i>	1	8	5	Good	Good	Medium	200	1700	2400	High Impact: >20%

Tree	Botanical name	Trees in Groups	Height (m)	Spread (m)	Health	Structure	Retention value	DBH (mm)	TPZ (mm)	SRZ (mm)	Impact
107	<i>Eucalyptus moluccana</i>	1	16	8	Poor	Poor	High	500	2500	6000	High Impact: >20%
108	<i>Erythrina x sykesii</i>	1	7	6	Good	Fair	Low	250	1800	3000	High Impact: >20%
109	<i>Eucalyptus moluccana</i>	1	16	4	Poor	Fair	High	300	2000	3600	High Impact: >20%
110	<i>Syagrus romanzoffiana</i>	2	15	6	Good	Good	Medium	250	1800	3000	High Impact: >20%
111	<i>Erythrina x sykesii</i>	1	6	7	Good	Fair	Low	750	2900	9000	High Impact: >20%
112	<i>Eucalyptus moluccana</i>	1	16	8	Poor	Good	High	500	2500	6000	High Impact: >20%
113	<i>Dead eucalyptus</i>	4	18	0	Poor	Poor	Low	200	1700	2400	High Impact: >20%
114	<i>Eucalyptus moluccana</i>	1	15	2	Poor	Poor	High	200	1700	2400	High Impact: >20%
115	<i>Eucalyptus moluccana</i>	1	7	3	Poor	Poor	High	150	1500	2000	High Impact: >20%
116	<i>Eucalyptus moluccana</i>	1	16	0	Poor	Poor	Medium	450	2400	5400	High Impact: >20%
117	<i>Eucalyptus moluccana</i>	1	10	4	Poor	Fair	High	250	1800	3000	High Impact: >20%
118	<i>Eucalyptus moluccana</i>	1	20	13	Poor	Fair	High	750	2900	9000	High Impact: >20%
119	<i>Dead eucalyptus</i>	1	20	8	Poor	Poor	Medium	650	2800	7800	High Impact: >20%
120	<i>Eucalyptus moluccana</i>	1	18	10	Poor	Good	High	500	2500	6000	High Impact: >20%
121	<i>Eucalyptus moluccana</i>	4	5	3	Poor	Fair	High	150	1500	2000	High Impact: >20%
123	<i>Eucalyptus moluccana</i>	1	10	6	Poor	Poor	High	400	2300	4800	High Impact: >20%
124	<i>Eucalyptus moluccana</i>	1	12	4	Poor	Poor	High	250	1800	3000	High Impact: >20%
125	<i>Eucalyptus moluccana</i>	1	16	6	Poor	Fair	High	300	2000	3600	High Impact: >20%
126	<i>Eucalyptus moluccana</i>	2	4	2	Poor	Fair	High	150	1500	2000	High Impact: >20%
127	<i>Eucalyptus moluccana</i>	1	16	7	Poor	Fair	High	400	2300	4800	High Impact: >20%
128	<i>Eucalyptus moluccana</i>	1	8	3	Fair	Fair	High	150	1500	2000	High Impact: >20%
129	<i>Eucalyptus moluccana</i>	1	14	8	Poor	Good	High	350	2100	4200	High Impact: >20%
130	<i>Eucalyptus tereticornis</i>	1	14	3	Fair	Fair	High	300	2000	3600	High Impact: >20%
131	<i>Eucalyptus tereticornis</i>	1	14	4	Fair	Good	High	300	2000	3600	High Impact: >20%
132	<i>Eucalyptus moluccana</i>	2	7	3	Poor	Fair	High	200	1700	2400	High Impact: >20%
133	<i>Eucalyptus moluccana</i>	1	14	12	Poor	Poor	High	650	2800	7800	High Impact: >20%
134	<i>Eucalyptus moluccana</i>	1	12	3	Poor	Good	High	250	1800	3000	High Impact: >20%

Tree	Botanical name	Trees in Groups	Height (m)	Spread (m)	Health	Structure	Retention value	DBH (mm)	TPZ (mm)	SRZ (mm)	Impact
135	<i>Eucalyptus moluccana</i>	1	18	15	Fair	Fair	High	850	3100	10000	High Impact: >20%
136	<i>Eucalyptus moluccana</i>	1	10	4	Poor	Fair	High	200	1700	2400	High Impact: >20%
137	<i>Eucalyptus moluccana</i>	2	7	3	Poor	Fair	High	150	1500	2000	High Impact: >20%
138	Dead tree	2	16	4	Poor	Poor	Medium	400	2300	4800	High Impact: >20%
139	<i>Eucalyptus moluccana</i>	1	10	3	Fair	Good	High	200	1700	2400	High Impact: >20%
140	<i>Eucalyptus moluccana</i>	1	20	10	Poor	Fair	High	550	2600	6600	High Impact: >20%
141	<i>Eucalyptus moluccana</i>	3	8	3	Poor	Fair	High	200	1700	2400	High Impact: >20%
142	<i>Eucalyptus moluccana</i>	1	18	8	Poor	Poor	Medium	400	2300	4800	High Impact: >20%
143	<i>Eucalyptus moluccana</i>	1	18	8	Poor	Good	High	400	2300	4800	High Impact: >20%
144	<i>Eucalyptus moluccana</i>	1	16	10	Poor	Good	High	500	2500	6000	High Impact: >20%
145	<i>Eucalyptus moluccana</i>	1	18	7	Poor	Good	High	500	2500	6000	High Impact: >20%
146	Dead tree	1	18	0	Poor	Poor	Medium	500	2500	6000	High Impact: >20%
147	<i>Eucalyptus moluccana</i>	1	16	0	Poor	Poor	Medium	400	2300	4800	High Impact: >20%
148	<i>Eucalyptus moluccana</i>	1	18	0	Poor	Poor	Medium	600	2700	7200	High Impact: >20%
149	<i>Eucalyptus moluccana</i>	3	16	0	Poor	Poor	Medium	350	2100	4200	High Impact: >20%
150	<i>Eucalyptus moluccana</i>	1	18	10	Poor	Fair	High	500	2500	6000	High Impact: >20%
151	<i>Eucalyptus moluccana</i>	1	18	8	Poor	Fair	High	400	2300	4800	High Impact: >20%
162	<i>Eucalyptus moluccana</i>	1	16	8	Poor	Poor	High	500	2500	6000	High Impact: >20%
163	<i>Eucalyptus moluccana</i>	1	16	0	Poor	Poor	Medium	350	2100	4200	High Impact: >20%
164	Dead euc	1	6	0	Poor	Poor	Medium	200	1700	2400	High Impact: >20%
165	<i>Eucalyptus moluccana</i>	1	5	3	Fair	Good	High	150	1500	2000	High Impact: >20%
166	<i>Eucalyptus moluccana</i>	3	10	5	Poor	Good	High	200	1700	2400	High Impact: >20%
167	<i>Eucalyptus moluccana</i>	1	6	2	Poor	Fair	High	150	1500	2000	High Impact: >20%
168	<i>Eucalyptus tereticornis</i>	1	6	4	Fair	Fair	High	200	1700	2400	High Impact: >20%
169	<i>Eucalyptus moluccana</i>	2	10	4	Poor	Poor	High	250	1800	3000	High Impact: >20%
170	<i>Eucalyptus moluccana</i>	1	5	2	Poor	Fair	High	150	1500	2000	High Impact: >20%
171	Dead euc	1	8	0	Poor	Poor	Medium	250	1800	3000	High Impact: >20%

Tree	Botanical name	Trees in Groups	Height (m)	Spread (m)	Health	Structure	Retention value	DBH (mm)	TPZ (mm)	SRZ (mm)	Impact
172	<i>Eucalyptus moluccana</i>	1	12	2	Poor	Fair	High	250	1800	3000	High Impact: >20%
173	<i>Eucalyptus moluccana</i>	2	8	2	Poor	Fair	High	150	1500	2000	High Impact: >20%
174	<i>Eucalyptus moluccana</i>	2	16	8	Poor	Good	High	350	2100	4200	High Impact: >20%
175	<i>Eucalyptus moluccana</i>	1	14	3	Poor	Poor	High	200	1700	2400	High Impact: >20%
176	<i>Eucalyptus moluccana</i>	1	5	3	Poor	Fair	High	150	1500	2000	High Impact: >20%
177	<i>Eucalyptus tereticornis</i>	1	12	4	Poor	Fair	High	350	2100	4200	High Impact: >20%
178	<i>Eucalyptus tereticornis</i>	1	5	2	Poor	Fair	High	150	1500	2000	High Impact: >20%
179	<i>Eucalyptus tereticornis</i>	1	6	3	Fair	Fair	High	150	1500	2000	High Impact: >20%
180	<i>Eucalyptus tereticornis</i>	1	6	4	Fair	Fair	High	250	1800	3000	High Impact: >20%
181	<i>Eucalyptus tereticornis</i>	6	6	3	Fair	Good	High	150	1500	2000	High Impact: >20%
182	<i>Eucalyptus tereticornis</i>	1	6	2	Fair	Fair	High	200	1700	2400	High Impact: >20%
183	<i>Eucalyptus moluccana</i>	1	16	7	Poor	Fair	High	300	2000	3600	High Impact: >20%
184	<i>Eucalyptus moluccana</i>	1	8	3	Poor	Poor	High	300	2000	3600	High Impact: >20%
185	<i>Pinus radiata</i>	6	10	6	Good	Good	Low	350	2100	4200	High Impact: >20%
186	<i>Callistemon sp.</i>	1	4	4	Fair	Fair	Low	160	1500	2000	High Impact: >20%
187	<i>Eucalyptus tereticornis</i>	1	14	6	Fair	Fair	High	400	2300	4800	High Impact: >20%
188	<i>Acacia binervia</i>	1	6	8	Good	Good	High	400	2300	4800	No Impact: 0%
189	<i>Eucalyptus tereticornis</i>	1	12	4	Poor	Fair	High	400	2300	4800	No Impact: 0%
190	<i>Eucalyptus tereticornis</i>	1	16	8	Fair	Fair	High	400	2300	4800	Low Impact: <10%
191	<i>Eucalyptus tereticornis</i>	1	12	3	Poor	Fair	High	300	2000	3600	No Impact: 0%
192	<i>Eucalyptus tereticornis</i>	1	6	3	Good	Good	High	150	1500	2000	No Impact: 0%
193	<i>Eucalyptus tereticornis</i>	1	16	6	Good	Fair	High	900	3200	11000	Medium Impact: <20%
194	<i>Eucalyptus tereticornis</i>	1	8	4	Fair	Good	High	150	1500	2000	No Impact: 0%
195	<i>Eucalyptus tereticornis</i>	1	14	3	Good	Fair	High	250	1800	3000	No Impact: 0%
196	<i>Eucalyptus tereticornis</i>	5	14	3	Fair	Fair	High	200	1700	2400	Low Impact: <10%
197	<i>Eucalyptus tereticornis</i>	1	12	7	Good	Good	High	400	2300	4800	Low Impact: <10%
198	<i>Eucalyptus tereticornis</i>	2	6	2	Poor	Fair	High	150	1500	2000	No Impact: 0%

Tree	Botanical name	Trees in Groups	Height (m)	Spread (m)	Health	Structure	Retention value	DBH (mm)	TPZ (mm)	SRZ (mm)	Impact
199	<i>Eucalyptus tereticornis</i>	6	14	4	Good	Fair	High	300	2000	3600	No Impact: 0%
200	<i>Eucalyptus tereticornis</i>	1	14	6	Good	Good	High	450	2400	5400	No Impact: 0%
201	<i>Eucalyptus tereticornis</i>	1	10	6	Good	Good	High	500	2500	6000	Low Impact: <10%
202	<i>Eucalyptus tereticornis</i>	1	8	4	Poor	Fair	High	300	2000	3600	Low Impact: <10%
203	<i>Eucalyptus tereticornis</i>	1	22	16	Good	Good	High	950	3200	11000	High Impact: >20%
204	<i>Eucalyptus tereticornis</i>	1	14	6	Fair	Good	High	750	2900	9000	High Impact: >20%
205	<i>Eucalyptus moluccana</i>	1	20	14	Poor	Good	High	1100	3400	13000	High Impact: >20%
206	<i>Eucalyptus moluccana</i>	1	10	8	Poor	Fair	High	350	2100	4200	High Impact: >20%
207	<i>Eucalyptus moluccana</i>	1	18	12	Poor	Good	High	500	2500	6000	High Impact: >20%
208	<i>Eucalyptus moluccana</i>	1	18	15	Poor	Poor	High	700	2800	8400	High Impact: >20%
209	<i>Eucalyptus moluccana</i>	1	20	12	Poor	Fair	High	900	3200	11000	High Impact: >20%
210	<i>Eucalyptus tereticornis</i>	1	30	6	Fair	Good	High	600	2700	7200	High Impact: >20%
211	<i>Eucalyptus tereticornis</i>	1	16	12	Good	Good	High	1000	3300	12000	High Impact: >20%
212	<i>Eucalyptus moluccana</i>	1	18	10	Poor	Fair	High	1000	3300	12000	High Impact: >20%
213	<i>Eucalyptus moluccana</i>	1	10	6	Fair	Good	High	250	1800	3000	High Impact: >20%
214	<i>Eucalyptus tereticornis</i>	1	16	8	Good	Fair	High	650	2800	7800	High Impact: >20%
215	<i>Eucalyptus moluccana</i>	1	7	4	Fair	Fair	High	300	2000	3600	High Impact: >20%
216	<i>Eucalyptus moluccana</i>	8	14	3	Poor	Fair	High	200	1700	2400	High Impact: >20%
217	<i>Eucalyptus moluccana</i>	2	8	5	Poor	Fair	High	200	1700	2400	High Impact: >20%
218	<i>Eucalyptus moluccana</i>	2	12	5	Poor	Fair	High	550	2600	6600	High Impact: >20%
219	<i>Eucalyptus moluccana</i>	1	8	6	Poor	Fair	High	500	2500	6000	High Impact: >20%
220	<i>Eucalyptus moluccana</i>	1	14	6	Poor	Fair	High	750	2900	9000	High Impact: >20%
221	<i>Eucalyptus moluccana</i>	1	12	10	Poor	Fair	High	1150	3500	14000	High Impact: >20%
222	<i>Eucalyptus tereticornis</i>	1	14	8	Fair	Fair	High	550	2600	6600	High Impact: >20%
223	<i>Eucalyptus moluccana</i>	1	16	8	Fair	Good	High	400	2300	4800	High Impact: >20%
224	<i>Eucalyptus moluccana</i>	1	13	6	Poor	Fair	High	500	2500	6000	High Impact: >20%
225	<i>Eucalyptus moluccana</i>	1	14	4	Poor	Poor	High	300	2000	3600	High Impact: >20%

Tree	Botanical name	Trees in Groups	Height (m)	Spread (m)	Health	Structure	Retention value	DBH (mm)	TPZ (mm)	SRZ (mm)	Impact
226	<i>Eucalyptus moluccana</i>	1	18	7	Fair	Good	High	400	2300	4800	High Impact: >20%
227	<i>Eucalyptus tereticornis</i>	1	6	6	Good	Fair	High	250	1800	3000	High Impact: >20%
228	<i>Eucalyptus moluccana</i>	1	6	4	Fair	Fair	High	250	1800	3000	High Impact: >20%
229	<i>Eucalyptus moluccana</i>	1	8	5	Fair	Fair	High	200	1700	2400	High Impact: >20%
230	<i>Eucalyptus moluccana</i>	2	15	6	Poor	Fair	High	400	2300	4800	High Impact: >20%
231	<i>Eucalyptus moluccana</i>	1	6	3	Poor	Poor	High	200	1700	2400	High Impact: >20%
232	<i>Eucalyptus moluccana</i>	1	10	5	Poor	Poor	High	450	2400	5400	High Impact: >20%
233	<i>Eucalyptus moluccana</i>	2	10	6	Poor	Fair	High	300	2000	3600	High Impact: >20%
234	<i>Eucalyptus tereticornis</i>	1	18	10	Poor	Poor	High	450	2400	5400	High Impact: >20%
235	<i>Eucalyptus moluccana</i>	1	18	12	Poor	Good	High	750	2900	9000	High Impact: >20%
236	<i>Eucalyptus moluccana</i>	1	25	16	Poor	Good	High	1550	4000	15000	High Impact: >20%
237	<i>Eucalyptus moluccana</i>	1	6	4	Fair	Poor	High	200	1700	2400	High Impact: >20%
238	<i>Eucalyptus tereticornis</i>	1	16	8	Good	Good	High	650	2800	7800	High Impact: >20%
239	<i>Eucalyptus moluccana</i>	1	17	10	Poor	Fair	High	500	2500	6000	High Impact: >20%
240	<i>Eucalyptus tereticornis</i>	1	16	6	Good	Good	High	350	2100	4200	High Impact: >20%
241	<i>Eucalyptus tereticornis</i>	2	12	6	Good	Good	High	200	1700	2400	High Impact: >20%
242	<i>Eucalyptus tereticornis</i>	2	16	6	Good	Good	High	400	2300	4800	High Impact: >20%
243	<i>Eucalyptus moluccana</i>	2	10	4	Fair	Good	High	200	1700	2400	High Impact: >20%
244	<i>Eucalyptus moluccana</i>	1	12	5	Fair	Good	High	300	2000	3600	High Impact: >20%
245	<i>Eucalyptus tereticornis</i>	1	10	6	Fair	Fair	High	550	2600	6600	High Impact: >20%
246	<i>Eucalyptus moluccana</i>	1	18	8	Poor	Poor	High	400	2300	4800	High Impact: >20%
247	<i>Eucalyptus tereticornis</i>	1	14	6	Good	Fair	High	600	2700	7200	High Impact: >20%
248	<i>Eucalyptus tereticornis</i>	1	8	5	Fair	Good	High	350	2100	4200	High Impact: >20%
249	<i>Eucalyptus tereticornis</i>	1	8	3	Good	Good	High	250	1800	3000	High Impact: >20%
250	<i>Eucalyptus moluccana</i>	2	8	2	Fair	Good	High	250	1800	3000	High Impact: >20%
251	<i>Eucalyptus moluccana</i>	1	20	16	Poor	Fair	High	700	2800	8400	High Impact: >20%
252	<i>Eucalyptus moluccana</i>	2	18	12	Poor	Poor	High	550	2600	6600	High Impact: >20%

Tree	Botanical name	Trees in Groups	Height (m)	Spread (m)	Health	Structure	Retention value	DBH (mm)	TPZ (mm)	SRZ (mm)	Impact
253	<i>Eucalyptus moluccana</i>	3	10	3	Poor	Fair	High	150	1500	2000	High Impact: >20%
254	<i>Eucalyptus moluccana</i>	4	17	3	Poor	Good	High	250	1800	3000	High Impact: >20%
255	<i>Eucalyptus tereticornis</i>	1	16	3	Fair	Fair	High	250	1800	3000	High Impact: >20%
256	<i>Eucalyptus tereticornis</i>	1	6	2	Poor	Poor	High	400	2300	4800	High Impact: >20%
257	<i>Eucalyptus moluccana</i>	1	8	6	Fair	Poor	High	350	2100	4200	High Impact: >20%
258	<i>Eucalyptus tereticornis</i>	1	22	8	Good	Fair	High	500	2500	6000	High Impact: >20%
259	<i>Eucalyptus tereticornis</i>	1	20	6	Poor	Fair	High	400	2300	4800	High Impact: >20%
260	<i>Eucalyptus moluccana</i>	1	16	7	Poor	Fair	High	400	2300	4800	High Impact: >20%
261	<i>Eucalyptus tereticornis</i>	1	10	4	Good	Good	High	200	1700	2400	High Impact: >20%
262	<i>Eucalyptus moluccana</i>	1	14	4	Good	Good	High	250	1800	3000	High Impact: >20%
263	<i>Eucalyptus tereticornis</i>	3	12	4	Fair	Good	High	200	1700	2400	High Impact: >20%
264	<i>Eucalyptus moluccana</i>	1	18	6	Poor	Poor	High	400	2300	4800	High Impact: >20%
265	<i>Eucalyptus moluccana</i>	1	8	6	Fair	Fair	High	200	1700	2400	High Impact: >20%
266	<i>Eucalyptus moluccana</i>	1	22	14	Poor	Good	High	1050	3400	13000	High Impact: >20%
267	<i>Eucalyptus moluccana</i>	1	6	4	Fair	Fair	High	300	2000	3600	High Impact: >20%
268	<i>Eucalyptus moluccana</i>	1	8	4	Poor	Fair	High	300	2000	3600	High Impact: >20%
269	<i>Eucalyptus tereticornis</i>	1	8	5	Good	Fair	High	300	2000	3600	High Impact: >20%
270	<i>Eucalyptus moluccana</i>	1	7	4	Fair	Fair	High	250	1800	3000	High Impact: >20%
271	<i>Eucalyptus moluccana</i>	1	10	0	Poor	Poor	Medium	300	2000	3600	High Impact: >20%
272	<i>Eucalyptus tereticornis</i>	1	10	4	Fair	Fair	High	250	1800	3000	High Impact: >20%
273	<i>Eucalyptus moluccana</i>	1	10	5	Poor	Poor	High	350	2100	4200	High Impact: >20%
274	<i>Eucalyptus moluccana</i>	4	10	3	Poor	Fair	High	200	1700	2400	High Impact: >20%
275	<i>Eucalyptus moluccana</i>	1	12	3	Poor	Fair	High	250	1800	3000	High Impact: >20%
276	<i>Eucalyptus tereticornis</i>	1	7	4	Poor	Fair	High	250	1800	3000	High Impact: >20%
277	<i>Eucalyptus moluccana</i>	1	18	8	Poor	Fair	High	450	2400	5400	High Impact: >20%
278	<i>Eucalyptus moluccana</i>	1	8	4	Fair	Fair	High	200	1700	2400	High Impact: >20%
279	<i>Eucalyptus moluccana</i>	1	8	3	Poor	Fair	High	250	1800	3000	High Impact: >20%

Tree	Botanical name	Trees in Groups	Height (m)	Spread (m)	Health	Structure	Retention value	DBH (mm)	TPZ (mm)	SRZ (mm)	Impact
280	<i>Corymbia maculata</i>	1	18	6	Good	Good	High	250	1800	3000	High Impact: >20%
281	<i>Eucalyptus tereticornis</i>	2	8	3	Fair	Fair	High	200	1700	2400	High Impact: >20%
281	<i>Eucalyptus moluccana</i>	1	16	6	Poor	Good	High	400	2300	4800	High Impact: >20%
282	<i>Eucalyptus moluccana</i>	2	10	4	Poor	Fair	High	250	1800	3000	High Impact: >20%
283	<i>Eucalyptus tereticornis</i>	1	14	3	Poor	Poor	Medium	350	2100	4200	High Impact: >20%
284	<i>Eucalyptus moluccana</i>	1	18	10	Poor	Fair	High	450	2400	5400	High Impact: >20%
285	<i>Eucalyptus moluccana</i>	1	20	15	Poor	Good	High	500	2500	6000	High Impact: >20%
286	<i>Corymbia maculata</i>	1	18	6	Good	Good	High	500	2500	6000	High Impact: >20%
287	<i>Eucalyptus moluccana</i>	3	14	3	Poor	Good	High	250	1800	3000	High Impact: >20%
288	<i>Eucalyptus moluccana</i>	1	6	4	Fair	Fair	High	250	1800	3000	High Impact: >20%
289	<i>Eucalyptus moluccana</i>	1	15	4	Poor	Fair	High	300	2000	3600	High Impact: >20%
290	<i>Eucalyptus moluccana</i>	2	16	5	Poor	Good	High	250	1800	3000	High Impact: >20%
291	<i>Eucalyptus tereticornis</i>	2	15	3	Fair	Good	High	250	1800	3000	High Impact: >20%
292	<i>Eucalyptus moluccana</i>	1	14	5	Poor	Fair	High	250	1800	3000	High Impact: >20%
293	<i>Eucalyptus tereticornis</i>	1	20	10	Good	Good	High	700	2800	8400	High Impact: >20%
294	<i>Eucalyptus moluccana</i>	3	16	4	Poor	Good	High	200	1700	2400	High Impact: >20%
295	<i>Eucalyptus tereticornis</i>	1	16	3	Fair	Good	High	250	1800	3000	High Impact: >20%
296	<i>Eucalyptus moluccana</i>	2	14	3	Poor	Fair	High	200	1700	2400	High Impact: >20%
297	<i>Eucalyptus tereticornis</i>	5	12	2	Poor	Fair	High	150	1500	2000	High Impact: >20%
298	<i>Eucalyptus moluccana</i>	3	14	4	Poor	Fair	High	200	1700	2400	High Impact: >20%
299	<i>Eucalyptus moluccana</i>	2	6	2	Poor	Fair	High	150	1500	2000	High Impact: >20%
300	<i>Eucalyptus tereticornis</i>	5	6	2	Poor	Fair	High	150	1500	2000	High Impact: >20%
301	<i>Eucalyptus moluccana</i>	1	15	5	Poor	Good	High	300	2000	3600	High Impact: >20%
302	<i>Eucalyptus moluccana</i>	2	10	3	Poor	Fair	High	200	1700	2400	High Impact: >20%
303	<i>Melaleuca decora</i>	1	10	4	Good	Good	High	550	2600	6600	High Impact: >20%
304	<i>Corymbia maculata</i>	1	18	17	Good	Good	High	700	2800	8400	High Impact: >20%
305	<i>Eucalyptus fibrosa</i>	1	14	6	Good	Fair	High	400	2300	4800	High Impact: >20%

Tree	Botanical name	Trees in Groups	Height (m)	Spread (m)	Health	Structure	Retention value	DBH (mm)	TPZ (mm)	SRZ (mm)	Impact
306	<i>Eucalyptus moluccana</i>	1	16	6	Poor	Good	High	650	2800	7800	High Impact: >20%
307	<i>Eucalyptus moluccana</i>	1	6	4	Fair	Fair	High	150	1500	2000	High Impact: >20%
308	<i>Eucalyptus tereticornis</i>	1	18	4	Fair	Good	High	400	2300	4800	High Impact: >20%
309	<i>Eucalyptus moluccana</i>	1	14	6	Poor	Poor	High	300	2000	3600	High Impact: >20%
310	<i>Eucalyptus moluccana</i>	2	18	12	Poor	Fair	High	400	2300	4800	High Impact: >20%
311	<i>Eucalyptus moluccana</i>	1	10	5	Fair	Fair	High	350	2100	4200	High Impact: >20%
312	<i>Eucalyptus tereticornis</i>	1	18	8	Good	Good	High	550	2600	6600	High Impact: >20%
313	<i>Eucalyptus moluccana</i>	1	18	5	Poor	Fair	High	800	3000	9600	High Impact: >20%
314	<i>Corymbia maculata</i>	1	16	8	Good	Good	High	300	2000	3600	High Impact: >20%
315	<i>Eucalyptus tereticornis</i>	1	16	2	Good	Good	High	200	1700	2400	High Impact: >20%
316	<i>Eucalyptus moluccana</i>	3	12	3	Poor	Fair	High	150	1500	2000	High Impact: >20%
317	<i>Eucalyptus tereticornis</i>	2	12	4	Good	Good	High	250	1800	3000	High Impact: >20%
318	<i>Corymbia maculata</i>	1	10	6	Good	Fair	High	200	1700	2400	High Impact: >20%
319	<i>Eucalyptus tereticornis</i>	3	16	8	Good	Good	High	400	2300	4800	High Impact: >20%
320	<i>Eucalyptus moluccana</i>	2	7	3	Poor	Fair	High	250	1800	3000	High Impact: >20%
321	<i>Eucalyptus tereticornis</i>	10	8	3	Fair	Fair	High	200	1700	2400	High Impact: >20%
322	<i>Eucalyptus tereticornis</i>	10	6	2	Fair	Good	High	150	1500	2000	High Impact: >20%
323	<i>Eucalyptus moluccana</i>	1	15	10	Poor	Fair	High	300	2000	3600	High Impact: >20%
324	<i>Eucalyptus moluccana</i>	4	8	3	Good	Good	High	150	1500	2000	High Impact: >20%
325	<i>Eucalyptus tereticornis</i>	1	18	10	Good	Good	High	900	3200	11000	High Impact: >20%
326	<i>Melaleuca decora</i>	1	12	6	Good	Good	High	450	2400	5400	High Impact: >20%
327	<i>Eucalyptus moluccana</i>	1	16	8	Poor	Good	High	500	2500	6000	High Impact: >20%
328	<i>Eucalyptus tereticornis</i>	1	16	8	Good	Fair	High	650	2800	7800	High Impact: >20%
329	<i>Eucalyptus tereticornis</i>	1	5	3	Fair	Fair	High	150	1500	2000	High Impact: >20%
330	<i>Eucalyptus tereticornis</i>	2	14	3	Poor	Fair	High	150	1500	2000	High Impact: >20%
331	<i>Eucalyptus moluccana</i>	2	8	3	Poor	Fair	High	200	1700	2400	High Impact: >20%
332	<i>Eucalyptus moluccana</i>	1	18	8	Good	Good	High	700	2800	8400	High Impact: >20%

Tree	Botanical name	Trees in Groups	Height (m)	Spread (m)	Health	Structure	Retention value	DBH (mm)	TPZ (mm)	SRZ (mm)	Impact
333	<i>Eucalyptus tereticornis</i>	3	6	3	Poor	Poor	High	150	1500	2000	High Impact: >20%
334	<i>Eucalyptus moluccana</i>	1	10	6	Fair	Fair	High	400	2300	4800	High Impact: >20%
335	<i>Eucalyptus moluccana</i>	1	6	4	Good	Fair	High	200	1700	2400	High Impact: >20%
336	<i>Eucalyptus tereticornis</i>	1	18	8	Good	Good	High	400	2300	4800	High Impact: >20%
337	<i>Eucalyptus tereticornis</i>	3	8	3	Poor	Fair	High	150	1500	2000	High Impact: >20%
338	<i>Eucalyptus moluccana</i>	1	18	8	Fair	Good	High	600	2700	7200	High Impact: >20%
339	<i>Eucalyptus tereticornis</i>	6	14	4	Good	Good	High	200	1700	2400	High Impact: >20%
340	<i>Eucalyptus moluccana</i>	2	16	4	Good	Good	High	200	1700	2400	High Impact: >20%
341	<i>Eucalyptus tereticornis</i>	2	18	6	Good	Good	High	450	2400	5400	High Impact: >20%
342	<i>Eucalyptus tereticornis</i>	1	6	4	Poor	Poor	High	400	2300	4800	High Impact: >20%
343	<i>Eucalyptus moluccana</i>	1	16	5	Good	Good	High	250	1800	3000	High Impact: >20%
344	<i>Eucalyptus moluccana</i>	5	8	3	Fair	Fair	High	200	1700	2400	High Impact: >20%
346	<i>Eucalyptus tereticornis</i>	1	18	6	Good	Good	High	700	2800	8400	High Impact: >20%
347	<i>Eucalyptus tereticornis</i>	2	18	6	Good	Good	High	350	2100	4200	High Impact: >20%
349	<i>Eucalyptus tereticornis</i>	1	18	10	Good	Good	High	350	2100	4200	High Impact: >20%
350	<i>Eucalyptus moluccana</i>	1	18	10	Good	Good	High	500	2500	6000	High Impact: >20%
351	<i>Eucalyptus moluccana</i>	2	5	3	Good	Good	High	150	1500	2000	High Impact: >20%
352	<i>Eucalyptus tereticornis</i>	1	18	5	Good	Fair	High	300	2000	3600	High Impact: >20%
353	<i>Eucalyptus moluccana</i>	3	18	3	Poor	Fair	High	300	2000	3600	High Impact: >20%
354	<i>Eucalyptus moluccana</i>	3	14	3	Poor	Fair	High	200	1700	2400	High Impact: >20%
355	<i>Eucalyptus moluccana</i>	1	14	6	Poor	Fair	High	500	2500	6000	High Impact: >20%
356	<i>Pyrus sp.</i>	1	5	5	Good	Fair	Low	200	1700	2400	High Impact: >20%
357	<i>Eucalyptus tereticornis</i>	1	20	16	Good	Good	High	750	2900	9000	High Impact: >20%
358	<i>Eucalyptus moluccana</i>	1	10	5	Fair	Fair	High	450	2400	5400	No Impact: 0%
359	<i>Eucalyptus tereticornis</i>	1	20	14	Good	Good	High	600	2700	7200	High Impact: >20%
360	<i>Eucalyptus moluccana</i>	1	10	4	Poor	Poor	High	450	2400	5400	No Impact: 0%
361	<i>Casuarina glauca</i>	2	10	6	Good	Good	High	300	2000	3600	High Impact: >20%

Tree	Botanical name	Trees in Groups	Height (m)	Spread (m)	Health	Structure	Retention value	DBH (mm)	TPZ (mm)	SRZ (mm)	Impact
362	<i>Eucalyptus tereticornis</i>	4	15	5	Fair	Fair	Medium	400	2300	4800	No Impact: 0%
363	<i>Casuarina glauca</i>	2	7	3	Good	Good	High	200	1700	2400	High Impact: >20%
364	<i>Phoenix canariensis</i>	1	4	3	Fair	Fair	Low	350	2100	4200	No Impact: 0%
365	<i>Casuarina glauca</i>	1	4	2	Good	Good	High	150	1500	2000	High Impact: >20%
366	<i>Shinus areira</i>	1	6	3	Good	Fair	Low	400	2300	4800	No Impact: 0%
367	<i>Eucalyptus moluccana</i>	1	14	5	Fair	Good	High	300	2000	3600	High Impact: >20%
368	<i>Fraxinus excelsior</i>	1	5	4	Poor	Poor	Low	300	2000	3600	No Impact: 0%
369	<i>Eucalyptus tereticornis</i>	3	16	5	Fair	Good	High	400	2300	4800	High Impact: >20%
370	<i>Cupressus x leylandii</i>	1	4	2	Good	Fair	Low	400	2300	4800	No Impact: 0%
371	<i>Eucalyptus tereticornis</i>	3	12	1	Fair	Good	High	200	1700	2400	High Impact: >20%
372	<i>Callistemon viminalis</i>	1	6	3	Fair	Fair	Low	300	2000	3600	No Impact: 0%
373	<i>Eucalyptus tereticornis</i>	2	10	4	Fair	Fair	High	200	1700	2400	High Impact: >20%
374	<i>Jacaranda mimosifolia</i>	1	6	5	Good	Fair	Low	250	1800	3000	No Impact: 0%
375	<i>Eucalyptus tereticornis</i>	1	16	6	Good	Good	High	550	2600	6600	High Impact: >20%
376	<i>Eucalyptus moluccana</i>	1	9	4	Good	Good	High	400	2300	4800	No Impact: 0%
377	<i>Eucalyptus tereticornis</i>	4	14	3	Fair	Good	High	200	1700	2400	High Impact: >20%
378	<i>Eucalyptus moluccana</i>	1	7	4	Good	Fair	High	450	2400	5400	Low Impact: <10%
379	<i>Eucalyptus tereticornis</i>	4	16	5	Good	Good	High	350	2100	4200	High Impact: >20%
380	<i>Eucalyptus moluccana</i>	1	10	5	Fair	Fair	High	600	2700	7200	High Impact: >20%
381	<i>Eucalyptus tereticornis</i>	1	10	4	Fair	Fair	High	550	2600	6600	High Impact: >20%
382	<i>Fraxinus excelsior</i>	1	4	2	Good	Good	Low	200	1700	2400	High Impact: >20%
383	<i>Eucalyptus tereticornis</i>	1	16	4	Good	Good	High	350	2100	4200	High Impact: >20%
384	<i>Callistemon salignus</i>	1	5	3	Fair	Fair	Low	200	1700	2400	High Impact: >20%
385	<i>Eucalyptus tereticornis</i>	1	6	3	Fair	Fair	High	300	2000	3600	High Impact: >20%
386	<i>Eucalyptus tereticornis</i>	1	11	4	Poor	Fair	Low	400	2300	4800	High Impact: >20%
387	<i>Eucalyptus tereticornis</i>	1	15	4	Poor	Good	High	300	2000	3600	High Impact: >20%
388	<i>Eucalyptus saligna</i>	1	10	6	Fair	Fair	Medium	500	2500	6000	High Impact: >20%

Tree	Botanical name	Trees in Groups	Height (m)	Spread (m)	Health	Structure	Retention value	DBH (mm)	TPZ (mm)	SRZ (mm)	Impact
389	<i>Eucalyptus tereticornis</i>	1	18	10	Good	Good	High	450	2400	5400	High Impact: >20%
390	<i>Callistemon salignus</i>	1	5	3	Good	Poor	Low	400	2300	4800	High Impact: >20%
391	<i>Eucalyptus tereticornis</i>	1	15	10	Good	Fair	High	600	2700	7200	High Impact: >20%
392	<i>Fraxinus griffithii</i>	1	5	4	Good	Poor	Low	400	2300	4800	High Impact: >20%
393	<i>Eucalyptus tereticornis</i>	1	16	5	Good	Good	High	300	2000	3600	High Impact: >20%
394	<i>Eucalyptus moluccana</i>	15	6	3	Poor	Fair	Medium	300	2000	3600	High Impact: >20%
395	<i>Eucalyptus tereticornis</i>	1	14	4	Good	Good	High	250	1800	3000	High Impact: >20%
396	<i>Eucalyptus tereticornis</i>	3	7	3	Poor	Fair	Medium	400	2300	4800	High Impact: >20%
397	<i>Melaleuca armillaris</i>	1	5	4	Good	Fair	Medium	550	2600	6600	High Impact: >20%
398	<i>Eucalyptus tereticornis</i>	1	5	3	Poor	Fair	Medium	400	2300	4800	High Impact: >20%
399	<i>Melaleuca sp.</i>	1	5	4	Fair	Fair	Medium	250	1800	3000	High Impact: >20%
400	<i>Eucalyptus tereticornis</i>	6	6	2	Poor	Fair	Medium	200	1700	2400	High Impact: >20%
401	<i>Eucalyptus tereticornis</i>	1	18	6	Good	Good	High	400	2300	4800	High Impact: >20%
402	<i>Eucalyptus tereticornis</i>	12	7	3	Poor	Fair	Medium	350	2100	4200	High Impact: >20%
403	<i>Eucalyptus tereticornis</i>	1	16	7	Fair	Good	High	350	2100	4200	High Impact: >20%
404	<i>Eucalyptus tereticornis</i>	5	7	3	Poor	Fair	Medium	350	2100	4200	High Impact: >20%
405	<i>Melaleuca sp.</i>	1	6	4	Good	Fair	Medium	200	1700	2400	High Impact: >20%
406	<i>Eucalyptus tereticornis</i>	17	7	3	Poor	Fair	Medium	300	2000	3600	High Impact: >20%
407	<i>Eucalyptus moluccana</i>	1	12	6	Fair	Good	High	400	2300	4800	High Impact: >20%
408	<i>Eucalyptus tereticornis</i>	11	8	3	Poor	Fair	Medium	400	2300	4800	High Impact: >20%
409	<i>Melaleuca decora</i>	1	6	6	Good	Fair	High	400	2300	4800	High Impact: >20%
410	<i>Eucalyptus tereticornis</i>	8	10	3	Fair	Poor	Medium	400	2300	4800	No Impact: 0%
411	<i>Melaleuca sp.</i>	1	6	6	Good	Fair	Medium	250	1800	3000	High Impact: >20%
412	<i>Eucalyptus tereticornis</i>	1	9	4	Fair	Good	Medium	400	2300	4800	High Impact: >20%
413	<i>Eucalyptus tereticornis</i>	1	16	8	Poor	Good	High	400	2300	4800	High Impact: >20%
414	<i>Eucalyptus tereticornis</i>	1	11	5	Poor	Fair	Medium	550	2600	6600	High Impact: >20%
415	<i>Eucalyptus moluccana</i>	1	14	4	Fair	Good	High	400	2300	4800	High Impact: >20%

Tree	Botanical name	Trees in Groups	Height (m)	Spread (m)	Health	Structure	Retention value	DBH (mm)	TPZ (mm)	SRZ (mm)	Impact
416	<i>Eucalyptus tereticornis</i>	1	9	4	Fair	Fair	Medium	500	2500	6000	High Impact: >20%
417	<i>Eucalyptus tereticornis</i>	3	16	6	Fair	Good	High	450	2400	5400	High Impact: >20%
418	<i>Eucalyptus tereticornis</i>	1	8	4	Fair	Fair	Medium	550	2600	6600	High Impact: >20%
419	<i>Eucalyptus tereticornis</i>	6	16	6	Good	Good	High	400	2300	4800	High Impact: >20%
420	<i>Eucalyptus tereticornis</i>	1	7	4	Fair	Poor	Medium	350	2100	4200	High Impact: >20%
421	<i>Eucalyptus tereticornis</i>	2	14	5	Fair	Fair	High	300	2000	3600	No Impact: 0%
422	<i>Eucalyptus tereticornis</i>	1	7	5	Fair	Fair	Medium	400	2300	4800	High Impact: >20%
423	<i>Eucalyptus tereticornis</i>	2	6	4	Poor	Fair	High	200	1700	2400	Medium Impact: <20%
424	<i>Eucalyptus tereticornis</i>	1	8	3	Poor	Fair	Medium	450	2400	5400	High Impact: >20%
425	<i>Eucalyptus tereticornis</i>	1	14	6	Good	Good	High	300	2000	3600	High Impact: >20%
426	<i>Eucalyptus tereticornis</i>	1	6	3	Poor	Poor	Medium	350	2100	4200	High Impact: >20%
427	<i>Eucalyptus tereticornis</i>	1	16	8	Good	Good	High	400	2300	4800	Medium Impact: <20%
428	<i>Eucalyptus tereticornis</i>	1	6	4	Poor	Poor	Medium	400	2300	4800	High Impact: >20%
429	<i>Eucalyptus tereticornis</i>	1	16	6	Fair	Good	High	400	2300	4800	High Impact: >20%
430	<i>Eucalyptus tereticornis</i>	1	9	5	Fair	Poor	Medium	500	2500	6000	High Impact: >20%
431	<i>Eucalyptus tereticornis</i>	1	20	10	Good	Good	High	1000	3300	12000	High Impact: >20%
432	<i>Eucalyptus tereticornis</i>	1	6	4	Poor	Fair	Medium	400	2300	4800	High Impact: >20%
433	<i>Eucalyptus tereticornis</i>	1	16	7	Good	Good	High	450	2400	5400	High Impact: >20%
434	<i>Eucalyptus tereticornis</i>	1	9	6	Poor	Fair	Medium	700	2800	8400	High Impact: >20%
435	<i>Eucalyptus tereticornis</i>	2	16	8	Good	Good	High	300	2000	3600	No Impact: 0%
436	<i>Eucalyptus tereticornis</i>	1	10	6	Poor	Fair	Medium	450	2400	5400	High Impact: >20%
437	<i>Eucalyptus tereticornis</i>	4	10	5	Good	Good	High	200	1700	2400	No Impact: 0%
438	<i>Eucalyptus tereticornis</i>	1	10	6	Poor	Fair	Medium	500	2500	6000	High Impact: >20%
439	<i>Eucalyptus tereticornis</i>	2	17	5	Good	Good	High	250	1800	3000	No Impact: 0%
440	<i>Eucalyptus tereticornis</i>	1	8	3	Fair	Fair	Medium	400	2300	4800	High Impact: >20%
441	<i>Eucalyptus tereticornis</i>	3	15	4	Good	Good	High	200	1700	2400	No Impact: 0%
442	<i>Eucalyptus tereticornis</i>	3	7	3	Fair	Fair	Medium	350	2100	4200	High Impact: >20%

Tree	Botanical name	Trees in Groups	Height (m)	Spread (m)	Health	Structure	Retention value	DBH (mm)	TPZ (mm)	SRZ (mm)	Impact
443	<i>Eucalyptus tereticornis</i>	1	16	8	Fair	Fair	High	400	2300	4800	No Impact: 0%
445	<i>Eucalyptus tereticornis</i>	2	18	6	Good	Good	High	350	2100	4200	No Impact: 0%
446	<i>Eucalyptus tereticornis</i>	5	6	3	Fair	Fair	Medium	300	2000	3600	Medium Impact: <20%
447	<i>Eucalyptus tereticornis</i>	4	16	4	Good	Good	High	200	1700	2400	No Impact: 0%
448	<i>Eucalyptus moluccana</i>	1	7	3	Poor	Fair	High	300	2000	3600	Medium Impact: <20%
449	<i>Eucalyptus tereticornis</i>	1	20	12	Good	Good	High	600	2700	7200	High Impact: >20%
450	<i>Eucalyptus moluccana</i>	1	10	6	Fair	Good	High	600	2700	7200	High Impact: >20%
451	<i>Eucalyptus tereticornis</i>	1	18	6	Good	Good	High	500	2500	6000	No Impact: 0%
452	<i>Eucalyptus moluccana</i>	1	8	3	Fair	Poor	High	400	2300	4800	Low Impact: <10%
453	<i>Eucalyptus fibrosa</i>	1	12	2	Fair	Good	High	150	1500	2000	No Impact: 0%
454	<i>Eucalyptus tereticornis</i>	1	10	5	Fair	Fair	Medium	500	2500	6000	High Impact: >20%
455	<i>Eucalyptus tereticornis</i>	5	16	3	Good	Good	High	200	1700	2400	No Impact: 0%
456	<i>Eucalyptus tereticornis</i>	1	7	3	Poor	Poor	Medium	300	2000	3600	No Impact: 0%
457	<i>Eucalyptus tereticornis</i>	1	7	3	Good	Good	High	150	1500	2000	No Impact: 0%
458	<i>Eucalyptus tereticornis</i>	1	8	3	Fair	Fair	Medium	450	2400	5400	High Impact: >20%
459	<i>Eucalyptus tereticornis</i>	4	8	3	Fair	Fair	High	200	1700	2400	No Impact: 0%
460	<i>Eucalyptus moluccana</i>	1	7	3	Fair	Fair	High	400	2300	4800	High Impact: >20%
461	<i>Eucalyptus tereticornis</i>	2	16	4	Good	Good	High	350	2100	4200	No Impact: 0%
462	<i>Eucalyptus tereticornis</i>	5	9	3	Fair	Fair	Medium	450	2400	5400	Low Impact: <10%
463	<i>Eucalyptus tereticornis</i>	1	18	8	Good	Good	High	350	2100	4200	No Impact: 0%
465	<i>Eucalyptus tereticornis</i>	3	10	4	Good	Good	High	150	1500	2000	No Impact: 0%
467	<i>Eucalyptus tereticornis</i>	2	16	5	Good	Good	High	250	1800	3000	No Impact: 0%
469	<i>Eucalyptus tereticornis</i>	1	16	4	Good	Good	High	300	2000	3600	No Impact: 0%
471	<i>Eucalyptus tereticornis</i>	1	6	2	Good	Good	High	150	1500	2000	No Impact: 0%
473	<i>Eucalyptus tereticornis</i>	3	16	6	Good	Good	High	200	1700	2400	No Impact: 0%
475	<i>Eucalyptus tereticornis</i>	3	14	3	Good	Good	High	150	1500	2000	No Impact: 0%
477	<i>Eucalyptus tereticornis</i>	2	16	6	Good	Good	High	250	1800	3000	No Impact: 0%

Tree	Botanical name	Trees in Groups	Height (m)	Spread (m)	Health	Structure	Retention value	DBH (mm)	TPZ (mm)	SRZ (mm)	Impact
479	<i>Eucalyptus tereticornis</i>	1	16	5	Poor	Good	High	250	1800	3000	No Impact: 0%
481	<i>Eucalyptus tereticornis</i>	3	15	3	Fair	Good	High	200	1700	2400	No Impact: 0%
483	<i>Eucalyptus tereticornis</i>	1	16	5	Fair	Good	High	300	2000	3600	High Impact: >20%
485	<i>Eucalyptus tereticornis</i>	2	17	3	Good	Good	High	250	1800	3000	No Impact: 0%
487	<i>Eucalyptus tereticornis</i>	1	18	8	Good	Good	High	450	2400	5400	High Impact: >20%
489	<i>Eucalyptus tereticornis</i>	1	18	8	Good	Fair	High	950	3200	11000	High Impact: >20%
491	<i>Eucalyptus tereticornis</i>	2	18	8	Good	Good	High	350	2100	4200	High Impact: >20%
493	<i>Eucalyptus tereticornis</i>	6	16	5	Good	Good	High	250	1800	3000	High Impact: >20%
495	<i>Eucalyptus tereticornis</i>	1	18	10	Good	Good	High	450	2400	5400	Medium Impact: <20%
496	<i>Eucalyptus tereticornis</i>	1	0	0			High	0	1500	2000	High Impact: >20%

Appendix B Assessment rating system

Tree Significance - Assessment Criteria - STARS®		
Low	Medium	High
<p>The tree is in fair-poor condition and good or low vigour.</p> <p>The tree has form atypical of the species</p> <p>The tree is not visible or is partly visible from the surrounding properties or obstructed by other vegetation or buildings</p> <p>The tree provides a minor contribution or has a negative impact on the visual character and amenity of the local area</p> <p>The tree is a young specimen which may or may not have reached dimensions to be protected by local Tree Preservation Orders or similar protection mechanisms and can easily be replaced with a suitable specimen</p> <p>The tree's growth is severely restricted by above or below ground influences, unlikely to reach dimensions typical for the taxa in situ – tree is inappropriate to the site conditions</p> <p>The tree is listed as exempt under the provisions of the local Council Tree Preservation Order or similar protection mechanisms</p> <p>The tree has a wound or defect that has the potential to become structurally unsound.</p> <p>The tree is an environmental pest species due to its invasiveness or</p>	<p>The tree is in fair to good condition</p> <p>The tree has form typical or atypical of the species</p> <p>The tree is a planted locally indigenous or a common species with its taxa commonly planted in the local area</p> <p>The tree is visible from surrounding properties, although not visually prominent as partially obstructed by other vegetation or buildings when viewed from the street</p> <p>The tree provides a fair contribution to the visual character and amenity of the local area</p> <p>The tree's growth is moderately restricted by above or below ground influences, reducing its ability to reach dimensions typical for the taxa in situ</p>	<p>The tree is in good condition and good vigour</p> <p>The tree has a form typical for the species</p> <p>The tree is a remnant or is a planted locally indigenous specimen and/or is rare or uncommon in the local area or of botanical interest or of substantial age.</p> <p>The tree is listed as a heritage item, threatened species or part of an endangered ecological community or listed on Councils significant tree register</p> <p>The tree is visually prominent and visible from a considerable distance when viewed from most directions within the landscape due to its size and scale and makes a positive contribution to the local amenity.</p> <p>The tree supports social and cultural sentiments or spiritual associations, reflected by the broader population or community group or has commemorative values.</p> <p>The tree's growth is unrestricted by above and below ground influences, supporting its ability to reach dimensions typical for the taxa in situ – tree is appropriate to the site conditions.</p>

Tree Significance					
Useful Life Expectancy		High	Medium	Low	
	Long >40 years				
	Medium 15-40 years				
	Short <1-15 years				
	Dead				

Legend for Matrix Assessment	
	Priority for retention (High): These trees are considered important for retention and should be retained and protected. Design modification or re-location of building/s should be considered to accommodate the setbacks as prescribed by the Australian Standard AS4970 Protection of trees on development sites. Tree sensitive construction measures must be implemented if works are to proceed within the Tree Protection Zone.
	Consider for retention (Medium): These trees may be retained and protected. These are considered less critical; however their retention should remain priority with the removal considered only if adversely affecting the proposed building/works and all other alternatives have been considered and exhausted.
	Consider for removal (Low): These tree are not considered important for retention, nor require special works or design modification to be implemented for their retention.
	Consider for removal (Low): These tree are not considered important for retention, nor require special works or design modification to be implemented for their retention.

Appendix C AS 4970-2009 mitigation measures

Impact	Requirements under AS 4970-2009	Mitigation (design phase)	Mitigation (construction phase)
Low impact (<10%)	<ul style="list-style-type: none"> The area lost to this encroachment should be compensated for elsewhere, contiguous with the TPZ. Detailed root investigations should not be required. 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> The area lost to this encroachment should be compensated for elsewhere, contiguous with the TPZ. Tree protection must be installed.
Medium impact (<20%)	<ul style="list-style-type: none"> The project arborist must demonstrate the tree(s) would remain viable. Root investigation by non-destructive methods may be required. Consideration of relevant factors including: Root location and distribution, tree species, condition, site constraints and design factors. 	<p>The following design changes should be considered to retain trees where practicable, considering the retention value of the tree and the complexity and cost of the change.</p> <ul style="list-style-type: none"> Relocate services/pathways outside of tree protection zones Design services to be installed at a minimum depth of 1200mm below ground to avoid impact to the root zones of trees. Design pathways to be installed on or above grade, minimising/eliminating excavation within tree protection zones. Design pathways using porous materials (eco-paving, porous asphalt, decomposed granite) to allow water and oxygen to reach the root zone. Design pathways using tree sensitive techniques (pier and beam, suspended slabs). The area lost to encroachment should be compensated for elsewhere, contiguous with the TPZ. 	<ul style="list-style-type: none"> The area lost to this encroachment should be compensated for elsewhere, contiguous with the TPZ. The project arborist would be consulted for any works within the TPZ. Tree protection must be installed. Tree sensitive techniques can be used to install services within the TPZ. Horizontal directional drilling (HDD), boring, non-destructive excavation (NDE). Location and distribution of roots may be determined through non-destructive excavation (NDE) methods such as hydro-vacuum excavation (sucker truck), air spade and manual excavation.
High impact (>20%)	<ul style="list-style-type: none"> The area lost to this encroachment should be compensated for elsewhere, contiguous with the TPZ. 	<ul style="list-style-type: none"> Relocate services/pathways outside of tree protection zones Design services to be installed at a minimum depth of 1200 mm below ground to avoid impact to the root zones of trees. Design pathways to be installed on or above grade, minimising/eliminating excavation within tree protection zones. Design pathways using porous materials (eco-paving, porous asphalt, decomposed granite) to allow water and oxygen to reach the root zone. The area lost to encroachment can be compensated for elsewhere, contiguous with the TPZ. 	<ul style="list-style-type: none"> As above Removal of existing hard surfaces should be undertaken manually to avoid root damage. Tree sensitive techniques can be used to install the services: Horizontal directional drilling (HDD), boring, non-destructive excavation (NDE).

Appendix D – BFAA Report

NBC Bushfire Attack Assessment Report V2.1

AS3959 (2009) Appendix B - Detailed Method 2

Printed: 26/06/2018 Assessment Date: 26/06/2018



Site Street Address: 140-170 Eleventh Avenue [St Anthony of Padua Catholic School], Austral

Assessor: Bruce Horkings; Ecological Australia

Local Government Area: Liverpool Alpine Area: No

Equations Used

Transmissivity: Fuss and Hammins, 2002

Flame Length: RFS PBP, 2001

Rate of Fire Spread: Noble et al., 1980

Radiant Heat: Drysdale, 1985; Sullivan et al., 2003; Tan et al., 2005

Peak Elevation of Receiver: Tan et al., 2005

Peak Flame Angle: Tan et al., 2005

Run Description: T1 - North

Vegetation Information

Vegetation Type:	Woodland	Vegetation Group:	Forest and Woodland
Vegetation Slope:	1.5 Degrees	Vegetation Slope Type:	Downslope
Surface Fuel Load(t/ha):	10	Overall Fuel Load(t/ha):	15

Site Information

Site Slope	0 Degrees	Site Slope Type:	Level
Elevation of Receiver(m)	Default	APZ/Separation(m):	41

Fire Inputs

Veg./Flame Width(m):	100	Flame Temp(K)	1200
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Calculation Parameters

Flame Emissivity:	95	Relative Humidity(%):	25
Heat of Combustion(kJ/kg)	18600	Ambient Temp(K):	308
Moisture Factor:	5	FDI:	100

Program Outputs

Category of Attack:	LOW	Peak Elevation of Receiver(m):	5.16
Level of Construction:	BAL 12.5	Fire Intensity(kW/m):	10314
Radiant Heat(kW/m2):	9.93	Flame Angle (degrees):	81
Flame Length(m):	10.45	Maximum View Factor:	0.112
Rate Of Spread (km/h):	1.33	Inner Protection Area(m):	41
Transmissivity:	0.794	Outer Protection Area(m):	0

Appendix E – Photographs

Photo 1: Woodland vegetation to north adjacent to the oval



Photo 2: Woodland vegetation to the north-east



Photo 3: Looking towards Woodland vegetation from newly constructed carpark.



Photo 4: Bushfire interface setback from Eleventh Avenue



Photo 5: Looking north-west from development at managed land for oval carpark.



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