



Bushfire Risk Assessment

Infill Development



Proposed Development:	Two (2) 'Class 1a' dwellings – main residence & second dwelling.
Location:	Lot 50 DP1291928 of 27 Tyagarah Road Tyagarah NSW 2481
Client:	Sarah Vial
Our Ref:	2307VIA2166 [2207VIA1898]

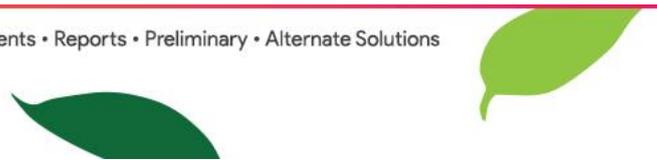


Date of Issue: 20 September 2023

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'Prepare—Act—Survive'

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'000'



Document Distribution Record				
Version	Date	Prepared by	Reviewed by	PDF e-mailed to:
Draft 0.1	29/08/2023	AP	MJ	-
Version 1.0	4/09/2023	MJ	AP	The client
Version 1.1	20/09/2023 (amended plans)	AP	MJ	The client

EXPIRY

The bushfire risk assessment and resulting BAL rating contained in this report should not be relied upon for a period extending 12 months from date of issue. If this report was issued more than 12 months ago, it is recommended that the validity of the determination be confirmed with the Accredited Practitioner and where required an updated report should be issued.

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EXECUTIVE SUMMARY

This Bushfire Risk Assessment relates to a proposed development located at:	Lot 50 DP1291928 27 Tyagarah Road Tyagarah NSW 2481
Client/s:	Sarah Vial
Site inspection date:	22 September 2022
Proposed development:	Two (2) 'Class 1a' dwellings – main residence & second dwelling
Plans:	Plans by Isabelle Menezes, date: 19/09/2023 A full set of plans shall be provided by the applicant to accompany the DA. All design and site plans must ensure compliance with the minimum building setbacks in relation to this development as proposed and the recommendations contained herein.
What is the Bushfire Attack Level (BAL) as per AS3959–2018?	BE1 – Main residence: BAL-19 (entire residence, swimming pool & deck). BE2 – Second dwelling: BAL-19 (entire structure).
Are performance solutions presented herein?	NO
Does this development require referral to the NSW Rural Fire Service?	NO – The consent authority must be satisfied the development conforms to the relevant specifications and requirements prior to granting of consent. If not satisfied, the consent authority should consult with the Commissioner of the NSW Rural Fire Service under s.4.14 EP&A Act.
Does this development satisfy the Aims and Objectives of Planning for Bushfire Protection (PBP 2019)?	YES – The proposed development shall confirm with the relevant specifications and requirements against PBP (2019) subject to compliance with the recommendations and conditions set out herein.
This Bushfire Risk Assessment Report acts as a 'Certificate' under s.4.14(b) Environmental Planning and Assessment Act 1979.	This 'Certificate' has been issued by Melanie Jackson who is recognised by the NSW Rural Fire Service as a qualified consultant in bushfire risk assessment.  Melanie Jackson – BPAD-Level 3 Certified Practitioner FPAA Cert. No: 21977



TABLE OF CONTENTS

Expiry	ii
Copyright Statement	ii
Disclaimer	ii
Executive Summary	iii
Table of Contents	iv
Table of Tables	v
Table of Figures	v
Table of Photos	v
Abbreviations	vi
1 Introduction	1
1.1 Subject Site	1
1.2 Proposed Development	1
1.3 Legislation	2
1.4 Aim and Objectives	3
2 Bushfire Risk Assessment	4
2.1 Methodology	4
2.2 Site Inspection	4
2.3 Site Assessment	4
2.4 Bushfire Protection Measures (BPM)	8
3 Recommendations & Compliance	13
4 Conclusion	23
Bibliography	24
Appendix A – Site & BAL Plans	25
Appendix B – RFS Guidelines & Fast Facts	38



TABLE OF TABLES

Table 1: Vegetation Analysis	5
Table 2: Main Residence (BE1) APZ & BAL Rating Results	8
Table 3: Second Dwelling (BE2) APZ & BAL Rating Results	9
Table 4: BPM compliance against the performance criteria & acceptable solutions – s.7 Residential Infill Development (PBP)	14

TABLE OF FIGURES

Figure 1: Aerial image of the subject site (Source: NSW Government; 2023)	1
Figure 2: BFPL Map (Source: NSW Government; 2023)	2
Figure 3: Vegetation analysis (Source: FireMaps 2023; Nearmap 2023)	7
Figure 4: BAL analysis (Source: FireMaps 2023; Nearmap 2023)	11
Figure 5: APZ & access (Source: FireMaps 2023; Nearmap 2023).....	12

TABLE OF PHOTOS

Photo 1: South managed land	6
Photo 2: North managed land.....	6
Photo 3: West grassland (foreground)	6
Photo 4: Forest in the distance.....	6



ABBREVIATIONS

Abbreviation	Description
APZ	Asset protection zone
AS3959	Australian Standard – Construction of Buildings in Bushfire Prone Areas
BAL	Bush fire attack level
BCA	Building Code of Australia
BE	Building envelope
BFPL	Bush fire prone land
BFPL Map	Bush fire prone land map
BFSA	Bush fire safety authority
BPM	Bush fire protection measure
DA	Development application
DCP	Development control plan
EP&A Act	<i>Environmental Planning & Assessment Act 1979</i>
FFDI	Forest fire danger index
GFDI	Grass fire danger index
IPA	Inner protection area
kW/m ²	Kilowatts per metre squared
LEP	Local environmental protection plan
NSW RFS	NSW Rural Fire Service
OPA	Outer protection area
PBDB	Performance based design brief
PBP	Planning for Bushfire Protection
RF Act	<i>Rural Fires Act 1997</i>
RF Reg	<i>Rural Fires Regulation 2022</i>
SEPP	<i>State Environmental Planning Policy</i>
SFPP	Special fire protection purpose
SFR	Short fire run



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1 INTRODUCTION

Bushfire Risk Pty Ltd was engaged by the client/s to conduct a Bushfire Risk Assessment in support of a Development Application (DA). The purpose of the assessment is to determine category of bushfire attack and construction level for the proposed development on behalf of the client/s.

The development shall be carried out on the lot/s referred to as the 'Subject Site' (Figure 1) and dwelling sites shall be sited within a Building Envelope which shall be referred to as a 'BE' throughout this document.

1.1 Subject Site

Address: Lot 50 DP1291928

27 Tyagarah Road Tyagarah NSW 2481.

1.2 Proposed Development

Two (2) 'Class 1a' dwellings – main residence & second dwelling, swimming pool and deck.



Figure 1: Aerial image of the subject site (Source: NSW Government; 2023)

1.3 Legislation

1.3.1 Bushfire Prone Land

The subject site is mapped as 'Bush Fire Prone Land' (BFPL) under s.10.3 Environmental Planning and Assessment Act 1979 (EPA Act), triggering the legislative requirements for building on bushfire prone land is applicable (Ref. Figure 2).

1.3.2 Building on Bushfire Prone Land

The National Construction Code (NCC) contains Performance Requirements and Deemed-to-Satisfy provisions relating building on Bushfire Prone Land (BFPL). Construction on BFPL must comply with AS3959-2018 – Construction of buildings in bushfire prone areas (AS3959) or the National Association of Steel Framed Housing (2014) Steel Framed Construction in Bush Fire Areas (NASH Standard) as varied in NSW. These requirements are considered Deemed-to-Satisfy solutions, however, do not extend to BAL-FZ or where modified by specific conditions of the relevant development consent.



Figure 2: BFPL Map (Source: NSW Government; 2023)

1.3.3 Infill Development

The proposed development is classified as 'infill' development, which refers to the development of land by the erection of, or alteration or addition to, a dwelling which does not require the spatial extension of services including public roads, electricity, water and sewerage and is within an existing lot. Infill development requires an assessment under s.4.14 EPA Act 1979, requiring an assessment of the bushfire risk to be carried pursuant to section 7 – Residential Infill Development PBP (2019).

1.3.4 Planning for Bushfire Protection

All development on BFPL must satisfy the aim and objectives of Planning for Bush Fire Protection (PBP 2019). This report demonstrates how the requirements can be met by ensuring suitable Bushfire Protection Measures (BPM) are put in place commensurate with the level of risk and characteristics of the occupants.

The aim of PBP is to provide for the protection of human life and minimise impacts on property from the threat of bush fire, while having due regard to development potential, site characteristics and protection of the environment.

1.4 Aim and Objectives

All development on BFPL must satisfy the aim and objectives of Planning for Bush Fire Protection (PBP 2019). This report demonstrates how the requirements can be met by ensuring suitable Bushfire Protection Measures (BPM) are put in place commensurate with the level of risk and characteristics of the occupants.

The aim of PBP is to provide for the protection of human life and minimise impacts on property from the threat of bush fire, while having due regard to development potential, site characteristics and protection of the environment.

2 BUSHFIRE RISK ASSESSMENT

This Bushfire Risk Assessment includes an analysis of the hazard, threat and subsequent risk to the development as proposed and provides recommendations that the proposal satisfies the aim and objectives of PBP, Specific Objectives for Infill Development and Intent of Measures. by demonstrating compliance against the performance criteria or acceptable solutions, thereby providing adequate bushfire protection measures (BPM) to the proposed development commensurate with the level of risk and characteristics of the occupants.

The assessment shall incorporate provisions including appropriate separation distances between the BE and hazard, namely asset protection zone (APZ) and defendable spaces around a building and appropriate BAL rating nominated pursuant to the requirements set out in PBP (2019). The results may incorporate deviations from the acceptable solutions, where performance solutions may be used to demonstrate compliance against the performance criteria.

The recommendations aim to satisfy the requirements of PBP (2019) by addressing the suite of BPM in combination, commensurate with the level of bushfire risk and site and occupant characteristics appropriate to the proposed development.

2.1 Methodology

2.1.1 PBP 2019

The bushfire risk assessment was carried out pursuant to the requirements set out in s.7 – *Residential Infill Development* (PBP 2019). The bushfire risk assessment was carried out pursuant to the site assessment methodology described in Appendix 1 PBP (2019).

2.1.2 Acceptable Methodology – Asset Protection Zones

The APZ was determined pursuant to the requirements set out in PBP (2019), namely *Appendix 1 – Site Assessment Methodology* including the following tables:

- A1.12.3 - Minimum distances for APZs – residential development, FFDDI 80 areas (29kW/m², 1090K).
- A1.12.6 – Determination of BAL, FFDI 80 – residential development.
- A1.2 – Vegetation formation. A split assessment of two vegetation types shall be used to determine the worst-case scenario.

2.2 Site Inspection

An assessment of the subject site was undertaken by Melanie Jackson (BPAD-Level 3 Accredited Practitioner No. 21977) on 22 September 2022.

2.3 Site Assessment

The following sections include an assessment of the subject site, vegetation, slope, setbacks, environmental considerations for the subject site and bushfire protection measures in combination.

2.3.1 Fire Danger District

The fire danger for the Local Council area is set at FFDI-80

2.3.2 Vegetation & Environmental Features

The assessment and classification of the predominant vegetation types on and surrounding the subject site (out to a minimum distance of 140m from the boundaries of the property) was undertaken, using Keith (2006) vegetation classification system as described in PBP (2019) (Table 1).

2.3.3 Slope & Aspect

An assessment of the aspect and effective slope, being the land under the classified vegetation most likely to have the greatest effect on bushfire behaviour within 100m of the site was undertaken and the results presented in the assessment table/s herein (Table 2 and Table 3).

Slope analysis was undertaken using the following assessment methodology:

- A desktop assessment of 2, 5, 10m contours available via the Fire Protection Association (FPAA) *FireMaps NSW* platform (FPAA 2023).
- On-site ground truthing was undertaken, assessing the slope using a Leopold Laser Range Finder and comparison with the desktop assessment to determine the effective slope of the hazard; tabulated in the results table/s herein (Ref. Figure 3).

Table 1: Vegetation Analysis

Vegetation Classification, Direction, Plot, Description & Photos
<p>South – Managed land & low threat vegetation (exclusions)</p> <p>Both onsite and south of the subject site, the vegetation is consistently managed in a low fuel state, south being managed around the curtilage of the dwellings on these properties. Patches of rainforest are considered '<i>low threat vegetation – exclusions</i>' and are excluded from this assessment (PBP 2019).</p>
<p>East – Managed land & low threat vegetation (exclusions)</p> <p>The pacific motorway traverses adjacent to the subject site, strips of roadside vegetation, rainforest patches and managed land occurs to the east. These areas are considered '<i>low threat vegetation – exclusions</i>' and are excluded from this assessment (PBP 2019).</p>
<p>North – Grassland</p> <p>North of the subject site the vegetation is classified as 'Grassland' 'Category 2' vegetation.</p>
<p>West (a) – Grassland</p> <p>West (b) – Forest</p> <p>The land west has two distinct vegetation types within the assessment area. Firstly grassland formation and Coastal Swamp Forest which is consistent with the 'Forest' formation under PBP (2019). The grassland is at least 40m deep between the boundary and forest. Therefore an assessment of the two vegetation types was carried out to determine the worst case scenario relating to the proposed development.</p>

Vegetation Classification, Direction, Plot, Description & Photos



Photo 1: South managed land



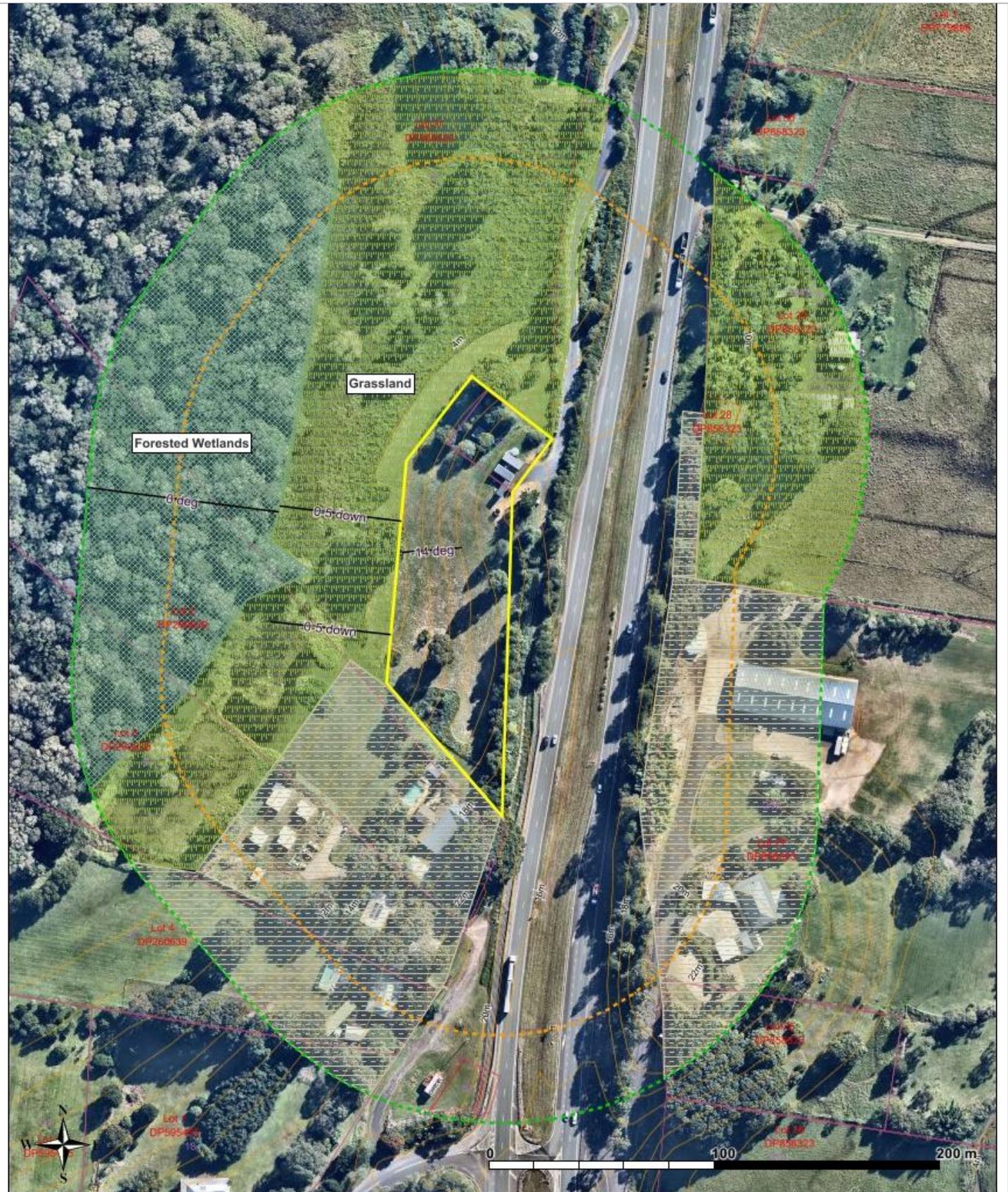
Photo 2: North managed land



Photo 3: West grassland (foreground)



Photo 4: Forest in the distance



Legend

Slope profiles	Property boundary	140m survey	100m survey	VEG	Forest	Property Boundary	Lot Boundary	Contours (2m)
— Slopes	▭ Subject Site	▭ Veg analysis	▭ Slope Analysis	▭ Excluded	▭ Grassland	▭	▭	▭

Map Printed from FireMaps on Mon Sep 04 22:03:50 AEST 2023

Figure 3: Vegetation analysis (Source: FireMaps 2023; Nearmap 2023)

2.4 Bushfire Protection Measures (BPM)

The BPMs are a set of measures to be satisfied which aim to reduce risk from bushfires and enhance occupant survival, property protection and community resilience to bushfire attack. Analysis of the BPMs shall be undertaken commensurate to the level of risk to occupants and the subject site.

Recommendations provided are based on the results. BPMs to be satisfied include the following:

- APZ
- Access
- Construction
- Siting and design
- Landscaping
- Services
- Emergency and evacuation planning

The following section/s describe the vegetation type, slope, access, availability of water supplies and environmental considerations for the subject site and surrounds.

2.4.1 Intent of measures:

'To minimise the risk of bushfire attack and provide protection for emergency services personnel, residents and others assisting firefighting activities' (PBP 2019).

2.4.2 Asset Protection Zones

Setbacks from the hazard are presented in Table 2 and Table 3 below. The setbacks relate to the separation distance between the proposed development site (BE) and the hazard.

The APZ is to be managed within the bounds of the subject site in perpetuity pursuant to *Appendix 4 – Asset Protection Zone Requirements* (PBP 2019). Refer to Figure 4.

Table 2: Main Residence (BE1) APZ & BAL Rating Results

Vegetation & Hazard Analysis & Results Summary			APZ Requirements	
Direction	Vegetation Class / Formation	Veg Slope (°)	Table A1.12.3 Min. APZ (m)	Recommended Min. APZ (m)
North	Grassland	0 level	10	20 (onsite)
East	Low threat vegetation (exclusions)	-	-	20 (onsite)
South	Managed land & low threat vegetation (exclusions)	-	-	20m (or boundary whichever is closest)
West (a)	Grassland (from boundary)	0-5 downslope	11	16m (to boundary) ^
West (b)	Forest (>40m from boundary)	0 level	20	To boundary
Notes:				
^ The proposed BE shall be sited with setbacks as per the site plans provided herein (Ref. Appendix A), i.e. the extent of the dwelling, swimming pool and deck must be at least 16m from the west boundary to comply with BAL-19 construction level.				

Table 3: Second Dwelling (BE2) APZ & BAL Rating Results

Vegetation & Hazard Analysis & Results Summary			APZ Requirements	
Direction	Vegetation Class / Formation	Veg Slope (°)	Table A1.12.3 Min. APZ (m)	Recommended Min. APZ (m)
North	Grassland	0 level	10	20 (onsite)
East	Low threat vegetation (exclusions)	-	-	20 (onsite)
South	Managed land & low threat vegetation (exclusions)	-	-	20m (or boundary whichever is closest)
West (a)	Grassland (from boundary)	0-5 downslope	11	20m (onsite) *
West (b)	Forest (>40m from boundary)	0 level	20	To boundary

Notes:
* The proposed BE shall be sited with setbacks as per the site plans provided herein (Ref. Appendix A), i.e. the extent of the dwelling & dwelling deck must be at least 20m from the west boundary to comply with BAL-19 construction level.

2.4.3 Construction Standard – BAL Rating

Bushfire Attack Levels (BAL) provide increased protection designed to improve a buildings performance and negate the effects of bushfire attack to a building. Albeit there is no guarantee a building will survive a bushfire event however the six BAL ratings set out in *Australian Standard 3959-2018 – Construction of Buildings in Bushfire Prone Areas (AS3959-2018)* aim to reduce the effects of potential exposure of a building to embers, radiant heat flame contact and potential ignition.

The recommended BAL rating/s for the proposed development is as follows:

BE1 – Main residence: BAL-19 (entire residence, swimming pool & deck).

BE2 – Second dwelling: BAL-19 (entire structure).

In addition to the BAL rating, construction shall include the NSW variations to AS3959. Refer to BPM Compliance Table presented herein.

2.4.4 Water Supplies for Fire Fighting Purposes

Water supplies shall comply with the acceptable solutions. A minimum 20,000 litre static water supply shall be installed. The swimming pool may be nominated as a suitable supply provided access to the swimming pool is provided as discussed above (Ref. Figure 4).

2.4.5 Access

An access road to the dwelling is proposed. The property access road shall be constructed as per the acceptable solutions of PBP, namely allow for a 4m wide carriageway, provide a turning area or loop road i.e. multi-head turning area as depicted in Appendix 3 PBP (2019).

Should the swimming pool be nominated as a firefighting water supply, access and a hardstand area suitable for fire fighting vehicles shall be installed within 4m of the pool (Ref. Figure 5).

2.4.6 Electricity & Gas Services

Any modifications to the existing services shall be conducted in accordance with the acceptable solutions.

2.4.7 Landscaping

Comply with the acceptable solutions by undertaking landscaping and APZ management as per the NSW Appendix 4 (PBP) and the RFS document '*Standards for Asset Protection Zones*' (RFS 2005).

2.4.8 Emergency Planning

It is recommended occupants of the site prepare a bushfire survival plan and practice it annually. A guide to preparing a 'Bushfire Survival Plan' is available for download on the NSW RFS website: www.rfs.nsw.gov.au.

2.4.9 Likely Environmental Impacts

The scope of this report does not include an environmental assessment and should be read in conjunction with the Statement of Environmental Effects (SEE) and any supporting assessments and reports submitted in support of the DA.

The following was considered during the assessment process:

- There is a single tree within the proposed BE that is proposed for removal. The APZ does not require removal and/or modification of any significant vegetation to create the APZ.
- The client must seek further advice from Council prior to undertaking tree removal.
- The APZ shall be managed in perpetuity as an Inner Protection Area (IPA).

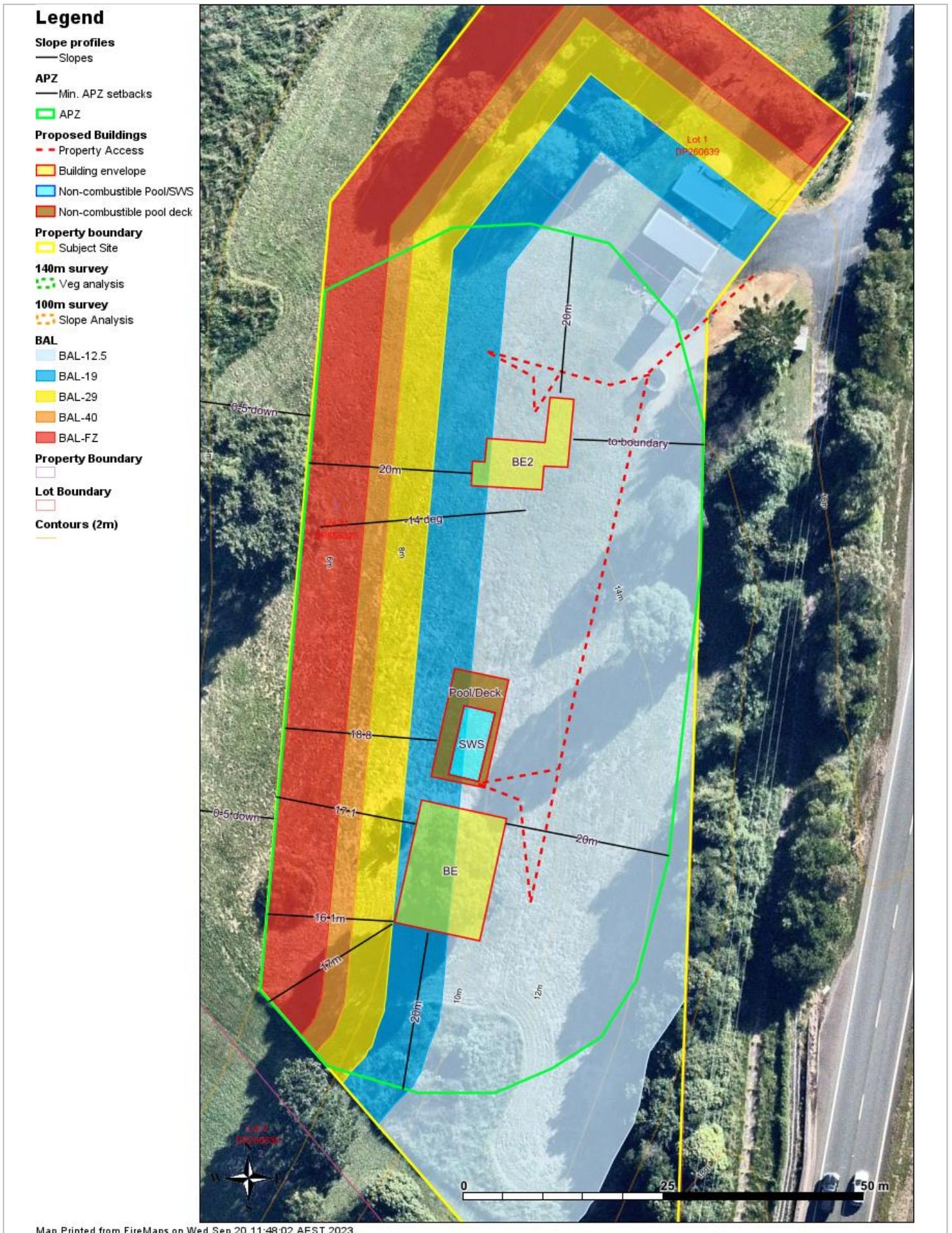


Figure 4: BAL analysis (Source: FireMaps 2023; Nearmap 2023)

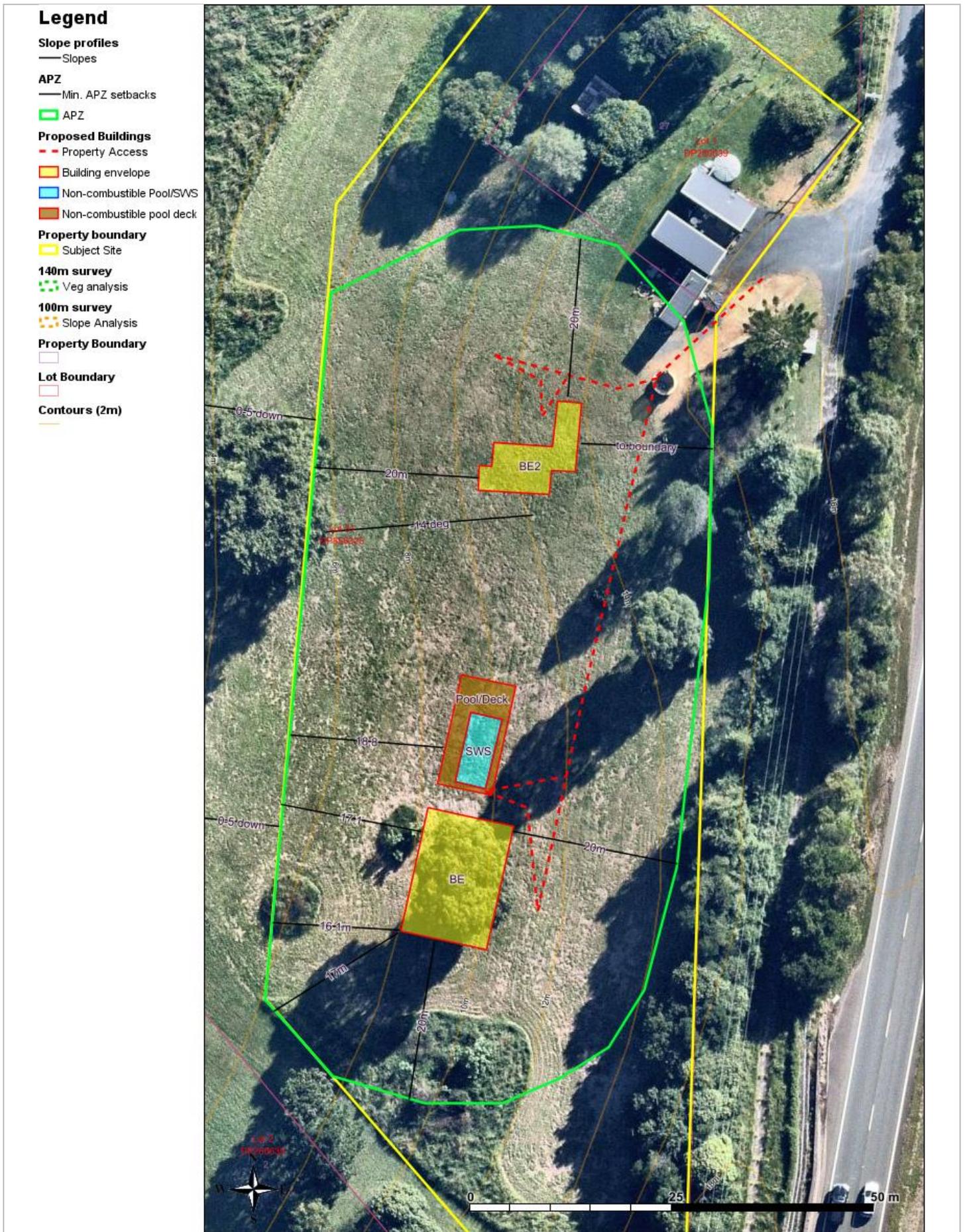


Figure 5: APZ & access (Source: FireMaps 2023; Nearmap 2023)

3 RECOMMENDATIONS & COMPLIANCE

The following table/s indicate the extent to which the proposed development conforms with or deviates from the standards, specific objectives, performance criteria and acceptable solutions set out in s.7 – *Residential Infill Development* (PBP).

The results and recommendations herein are commensurate with the level of bushfire risk and characteristics of the occupants for the proposed development, by applying the suite of BPM in combination, being the site-specific requirements that must be satisfied to comply.

The table below specifies the level of compliance and any deviations from the acceptable solution against the BPMs, providing recommendations ensuring the intent of each BPM shall be met (Table 4).

NB: the following terms indicate the level of compliance referred to in Table 4 below.

Acceptable Solution – complies with the Acceptable Solution/s; some work may be required to meet the requirements.

Performance Criteria – performance solution/s used to demonstrate compliance against the Performance Criteria; some additional work may be required to meet the requirements.

Assumed (previous approval/s) – it is assumed this requirement has been met under existing approval/s i.e., existing infrastructure/DA approval/s.

N/A – not applicable; this solution is not relevant to this proposal.

Table 4: BPM compliance against the performance criteria & acceptable solutions – s.7 Residential Infill Development (PBP)

BPM	Performance Criteria	Acceptable Solutions	Compliance & Recommendations
<p>s.7.4 Intent of measures: To minimise the risk of bushfire attack and provide protection for emergency services personnel, residents and others assisting firefighting activities.</p>			
<p>The intent may be achieved where:</p>			
APZ	<ul style="list-style-type: none"> APZs are provided commensurate with the construction of the building; and A defensible space is provided. 	<ul style="list-style-type: none"> An APZ is provided in accordance with Table A1.12.2 or A1.12.3 in Appendix 1.6 	<p>Complies with the Acceptable Solutions</p> <ul style="list-style-type: none"> The APZ satisfies the minimum distances for APZs as per Table A1.12.3.
APZ	<ul style="list-style-type: none"> APZs are managed and maintained to prevent the spread of a fire to the building. 	<ul style="list-style-type: none"> APZs are managed in accordance with the requirements of Appendix 4 of PBP. 	<p>Comply with the Acceptable Solutions</p> <p>The APZ shall be:</p> <ul style="list-style-type: none"> Managed in perpetuity as an IPA.
APZ	<ul style="list-style-type: none"> The APZ is provided in perpetuity. APZ maintenance is practical, soil stability is not compromised and the potential for crown fires is minimised. 	<ul style="list-style-type: none"> APZs are wholly within the boundaries of the development site. APZ are located on lands with a slope less than 18 degrees. 	<p>Complies with the Acceptable Solutions</p>
Access	<ul style="list-style-type: none"> Firefighting vehicles are provided with safe, all-weather access to structures 	<ul style="list-style-type: none"> Property access roads are two-wheel drive, all-weather roads. 	<p>Comply with the Acceptable Solutions</p>

BPM	Performance Criteria	Acceptable Solutions	Compliance & Recommendations
	and hazard vegetation.		
Access	<ul style="list-style-type: none"> The capacity of access roads is adequate for firefighting vehicles. 	<ul style="list-style-type: none"> The capacity of road surfaces and any bridges/causeways is sufficient to carry fully loaded firefighting vehicles (up to 23 tonnes), bridges and causeways are to clearly indicate load rating. 	<p>Comply with the Acceptable Solutions</p>
Access	<ul style="list-style-type: none"> There is appropriate access to water supply. 	<ul style="list-style-type: none"> Hydrants are provided in accordance with the relevant clauses of AS 2419.1:2005. There is suitable access for a Category 1 fire appliance to within 4m of the static water supply where no reticulated supply is available. 	<p>Comply with the Acceptable Solutions</p> <ul style="list-style-type: none"> The swimming pool may be nominated as the firefighting water supply, therefore ensure suitable access for a Category 1 fire appliance to within 4m of the static water supply is provided.
Access	<ul style="list-style-type: none"> Firefighting vehicles can access the dwelling and exit the property safely. 	<ul style="list-style-type: none"> At least one alternative property access road is provided for individual dwellings or groups of dwellings that are located more than 200 metres from a public through road. <p>Note: There are no specific access requirements in an urban area where an unobstructed path (no greater than 70m) is provided between the most distant external part of the proposed dwelling and the nearest part of the public access road (where the road speed limit is not greater than 70kph) that supports the operational use of emergency firefighting vehicles.</p> <p>In circumstances where this cannot occur, the following requirements apply:</p> <ul style="list-style-type: none"> Minimum 4m carriageway width. 	<p>Comply with the Acceptable Solutions</p>

BPM	Performance Criteria	Acceptable Solutions	Compliance & Recommendations
		<ul style="list-style-type: none"> • In forest, woodland and heath situations, rural property roads have passing bays every 200m that are 20m long by 2m wide, making a minimum trafficable width of 6m, at the passing bay. • A minimum vertical clearance of 4m to any overhanging obstructions, including tree branches. • Property access must provide a suitable turning area in accordance with Appendix 3. • Curves have a minimum inner radius of 6m and are minimal in number to allow for rapid access and egress. • The minimum distance between inner and outer curves is 6m. • The crossfall is not more than 10 degrees. • Maximum grades for sealed roads do not exceed 15 degrees and not more than 10 degrees for unsealed roads; and • A development comprising more than three dwellings has formalised access by dedication of a road and not by right of way. <p>Note: Some short constrictions in the access may be accepted where they are not less than 3.5m wide, extend for no more than 30m and where the obstruction cannot be reasonably avoided or removed. The gradients applicable to public roads also apply to community style development property access roads in addition to the above.</p>	

BPM	Performance Criteria	Acceptable Solutions	Compliance & Recommendations
Water Supplies	<ul style="list-style-type: none"> An adequate water supply is provided for firefighting purposes. 	<ul style="list-style-type: none"> Reticulated water is to be provided to the development where available. A static water supply is provided where no reticulated water supply is available. 	<p>Comply with the Acceptable Solutions</p>
Water Supplies	<ul style="list-style-type: none"> The integrity of the water supply is maintained. 	<ul style="list-style-type: none"> All above-ground water service pipes external to the building are metal, including and up to any taps. 	<p>Comply with the Acceptable Solutions</p>
Water Supplies	<ul style="list-style-type: none"> A static water supply is provided for firefighting purposes in areas where reticulated water is not available. 	<ul style="list-style-type: none"> Where no reticulated water supply is available, water for firefighting purposes is provided in accordance with Table 5.3d. A connection for firefighting purposes is located within the IPA or non-hazard side and away from the structure; 65mm Storz outlet with a ball valve is fitted to the outlet. Ball valve and pipes are adequate for water flow and are metal. Supply pipes from tank to ball valve have the same bore size to ensure flow volume. Underground tanks have an access hole of 200mm to allow tankers to refill direct from the tank. A hardened ground surface for truck access is supplied within 4m. Above-ground tanks are manufactured from concrete or metal. 	<p>Acceptable Solutions</p> <ul style="list-style-type: none"> Ensure a min. 20,000 litre water supply is made available for firefighting purposes at all times. The water source shall be made available or located within the APZ and away from the structure (e.g. 20m of the dwelling). The swimming pool may be nominated provided suitable access up to the water source as per the acceptable solutions is installed.

BPM	Performance Criteria	Acceptable Solutions	Compliance & Recommendations
		<ul style="list-style-type: none"> • Raised tanks have their stands constructed from non-combustible material or bush fire-resisting timber (see Appendix F of AS 3959). • Unobstructed access can be provided at all times; underground tanks are clearly marked. • Tanks on the hazard side of a building are provided with adequate shielding for the protection of firefighters. • All exposed water pipes external to the building are metal, including any fittings. • Where pumps are provided, they are a minimum 5hp or 3kW petrol or diesel-powered pump and are shielded against bush fire attack. • Any hose and reel for firefighting connected to the pump shall be 19mm internal diameter; and • Fire hose reels are constructed in accordance with AS/NZS 1221:1997 and installed in accordance with the relevant clauses of AS 2441:2005. 	
Electricity Services	<ul style="list-style-type: none"> • Location of electricity services limits the possibility of ignition of surrounding bush land or the fabric of buildings. 	<ul style="list-style-type: none"> • Where practicable, electrical transmission lines are underground; and • Where overhead, electrical transmission lines are proposed as follows: <ul style="list-style-type: none"> • Lines are installed with short pole spacing of 30m, unless crossing gullies, gorges, or riparian areas; and 	<p>Comply with the Acceptable Solutions</p> <ul style="list-style-type: none"> • Where applicable, any new or upgrades to the electricity supply services shall be carried out in accordance with the acceptable solution.

BPM	Performance Criteria	Acceptable Solutions	Compliance & Recommendations
		<ul style="list-style-type: none"> No part of a tree is closer to a power line than the distance set out in ISSC3 <i>Guideline for Managing Vegetation Near Power Lines</i>. 	
Gas Services	<ul style="list-style-type: none"> Location and design of gas services will not lead to ignition of surrounding Bushland or the fabric of buildings. 	<ul style="list-style-type: none"> Reticulated or bottled gas is installed and maintained in accordance with AS/NZS 1596:2014 - The storage and handling of LP Gas, and the requirements of relevant authorities, and metal piping is used. All fixed gas cylinders are kept clear of all flammable materials to a distance of 10m and shielded on the hazard side. Connections to and from gas cylinders are metal. Polymer-sheathed flexible gas supply lines are not used; and Above-ground gas service pipes are metal, including and up to any outlets. 	<p>Comply with the Acceptable Solutions</p> <ul style="list-style-type: none"> Where provided, gas supplies shall be installed in accordance with the acceptable solution.
Construction Standards	<ul style="list-style-type: none"> The proposed building can withstand bush fire attack in the form of embers, radiant heat, and flame contact. 	<ul style="list-style-type: none"> BAL is determined in accordance with Tables A1.12.5 to A1.12.7; and Construction provided in accordance with the NCC and as modified by section 7.5 (please see advice on construction in the flame zone). 	<p>Comply with the Acceptable Solutions</p> <ul style="list-style-type: none"> The min. recommended BAL rating is: <ul style="list-style-type: none"> BE1 – Main residence: BAL-19 (entire residence, swimming pool & deck). BE2 – Second dwelling: BAL-19 (entire structure). Construction shall be undertaken pursuant to the following sections of AS3959-2018: <ul style="list-style-type: none"> s.6 – Construction for BAL-19; and s.3 – Construction General; and <p>The following NSW variations for construction must be applied:</p>

BPM	Performance Criteria	Acceptable Solutions	Compliance & Recommendations
			<ul style="list-style-type: none"> Clause 3.10 of AS3959 is deleted and any sarking used for BAL-12.5, BAL-19, BAL-29 or BAL-40 shall: <ul style="list-style-type: none"> Be non-combustible; or Comply with AS/NZS 4200.1, be installed on the outside of the frame, and have a flammability index of not more than 5 as determined by AS1530.2; and Clause 5.2 ad 6.2 of AS3959 is replaced by Clause 7.2 of AS3959, except that any wall enclosing the subfloor space need only comply with the wall requirements for the respective BAL; and Clause 5.7 and 6.7 of AS3959 is replaced by clause 7.7 of AS3959, except that any wall enclosing the subfloor space need only comply with the wall requirements for the respective BAL.
Construction Standards	<ul style="list-style-type: none"> Proposed fences and gates are designed to minimise the spread of bush fire. 	<ul style="list-style-type: none"> Fencing and gates are constructed in accordance with section 7.6. 	<p>Comply with the Acceptable Solutions</p> <p>All fences in bushfire prone areas should be made of either hardwood or non-combustible material.</p> <ul style="list-style-type: none"> In circumstances where the fence is within 6m of a building or in areas of BAL-29 or greater, they should be made of non-combustible material only.
Construction Standards	<ul style="list-style-type: none"> Proposed Class 10a buildings are designed to minimise the spread of bush fire. 	<ul style="list-style-type: none"> Class 10a buildings are constructed in accordance with section 8.3.2. 	<p>Comply with the Acceptable Solutions</p> <p>The NCC defines a class 10 building as a non-habitable building or structure such as a:</p> <ul style="list-style-type: none"> Class 10a – a non-habitable building being a private garage, carport, shed or the like; or

BPM	Performance Criteria	Acceptable Solutions	Compliance & Recommendations
			<ul style="list-style-type: none"> Class 10b – a structure being a fence, mast, antenna, retaining or free-standing wall, swimming pool, or the like; or Class 10c – a private bushfire shelter. <p>There are no bushfire protection requirements for Class 10a buildings located more than 6m from a dwelling in bushfire prone areas. Where a Class 10a building is located within 6m of a dwelling it must be constructed in accordance with the NCC.</p>
*Upgrades for Ember Protection	*The existing residence and associated buildings remain predominantly unchanged in relation to the bushfire threat. Refer to the attached NSW RFS document: 'Development Assessment and Planning Introduction – Upgrading of existing buildings' (RFS 2014; Appendix B).		
Landscaping	<ul style="list-style-type: none"> Landscaping is designed and managed to minimise flame contact and radiant heat to buildings, and the potential for wind-driven embers to cause ignitions. 	<ul style="list-style-type: none"> Compliance with the NSW RFS 'Asset protection zone standards' (see Appendix 4). A clear area of low-cut lawn or pavement is maintained adjacent to the house; fencing is constructed in accordance with section 7.6; and Trees and shrubs are located so that: <ul style="list-style-type: none"> The branches will not overhang the roof. The tree canopy is not continuous; and Any proposed windbreak is located on the elevation from which fires are likely to approach. 	<p>Acceptable Solutions</p> <ul style="list-style-type: none"> Landscaping is to be managed in accordance with Appendix 4 (PBP) (Ref. Appendix B herein) and the NSW RFS document 'Guidelines for Asset Protection Zones'. <p>When creating and maintaining gardens within an APZ, key landscaping features may include the following (list not exhaustive):</p> <ul style="list-style-type: none"> Ensure that vegetation does not provide a continuous path to the house. Plant vegetation in clumps rather than continuous rows. Tree canopy cover should be less than 15% at maturity. Trees at maturity do not overhang or touch the building. Tree canopies should be separated by 2-5m. Prune low branches min. two metres above the ground.

BPM	Performance Criteria	Acceptable Solutions	Compliance & Recommendations
			<ul style="list-style-type: none"> • Shrubs should not be planted under trees. • Clumps of shrubs and other plants should be separated from the dwelling and plant away from windows and doors by a distance of at least twice the height of the vegetation. • Use low-flammability plant species i.e., rainforest species, succulents etc. • Use non-flammable ground cover/mulch such as pebbles or crush tile etc.
Emergency Management	<ul style="list-style-type: none"> • It is recommended the occupants formulate a bushfire survival plan and practice it on a regular basis. • A guide to preparing a 'Bushfire Survival Plan' is available for download on the NSW RFS website: www.rfs.nsw.gov.au (RFS 2019). 		

4 CONCLUSION

This bushfire report provides the consent authority with a detailed bushfire risk assessment to enable the consent authority to make an informed decision in granting consent for the proposed development referred to herein.

As a BPAD Level 3 accredited practitioner, recognised by the NSW Rural Fire Service, all elements of bushfire attack and BPMs in combination have been considered commensurate with the level or risk in relation to the proposed development.

In conclusion, provided the proposed development is carried out in accordance with the recommendations contained herein, the proposed development, in my professional opinion, satisfies the aim, objectives and performance criteria set out in *s.7 Residential Infill Development* (PBP).

BIBLIOGRAPHY

Australian Building Codes Board, 2022, *NCC–National Construction Code Series, Building Code of Australia Class 1 and Class 10 Buildings*, Vol 2. Canberra, Act.

Couch, P., 2021, *NBC Bushfire Attack Assessor*, Newcastle Bushfire Consultants, Warners Bay NSW 2282.

Fire Protection Association Australia (FPAA), 2023, *FireMaps NSW*, <www.firemaps.com.au>, Blackburn, North VIC 3128.

Nearmap, 2023, *Nearmap*, <<http://maps.au.nearmap.com/>>.

NSW Government, 2023, *ePlanning Spatial Viewer*, <<https://www.planningportal.nsw.gov.au/spatialviewer>>.

NSW Rural Fire Service, 2005, *Standards for Asset Protection Zones*, NSW Rural Fire Service, Sydney NSW.

NSW Rural Fire Service, 2019, *Bushfire Survival Plan*, 2019, <<http://www.rfs.nsw.gov.au>>.

NSW Rural Fire Service, 2019, *Development Assessment & Planning – Upgrading of Existing Buildings* 0914, <<http://www.rfs.nsw.gov.au>>.

NSW Rural Fire Service, 2019, *Planning for Bush Fire Protection, A Guide for Councils, Planners, Fire Authorities and Developers*, NSW Rural Fire Service, Sydney NSW.

NSW Rural Fire Service, 2022, *Planning for Bush Fire Protection, A Guide for Councils, Planners, Fire Authorities and Developers Addendum November 2022*, NSW Rural Fire Service, Sydney NSW.

Standards Australia / New Zealand Standards, 2008, *AS/NZS 1596–2008 The Storage and Handling of LP Gas*, Sydney, Standards Australia International Ltd.

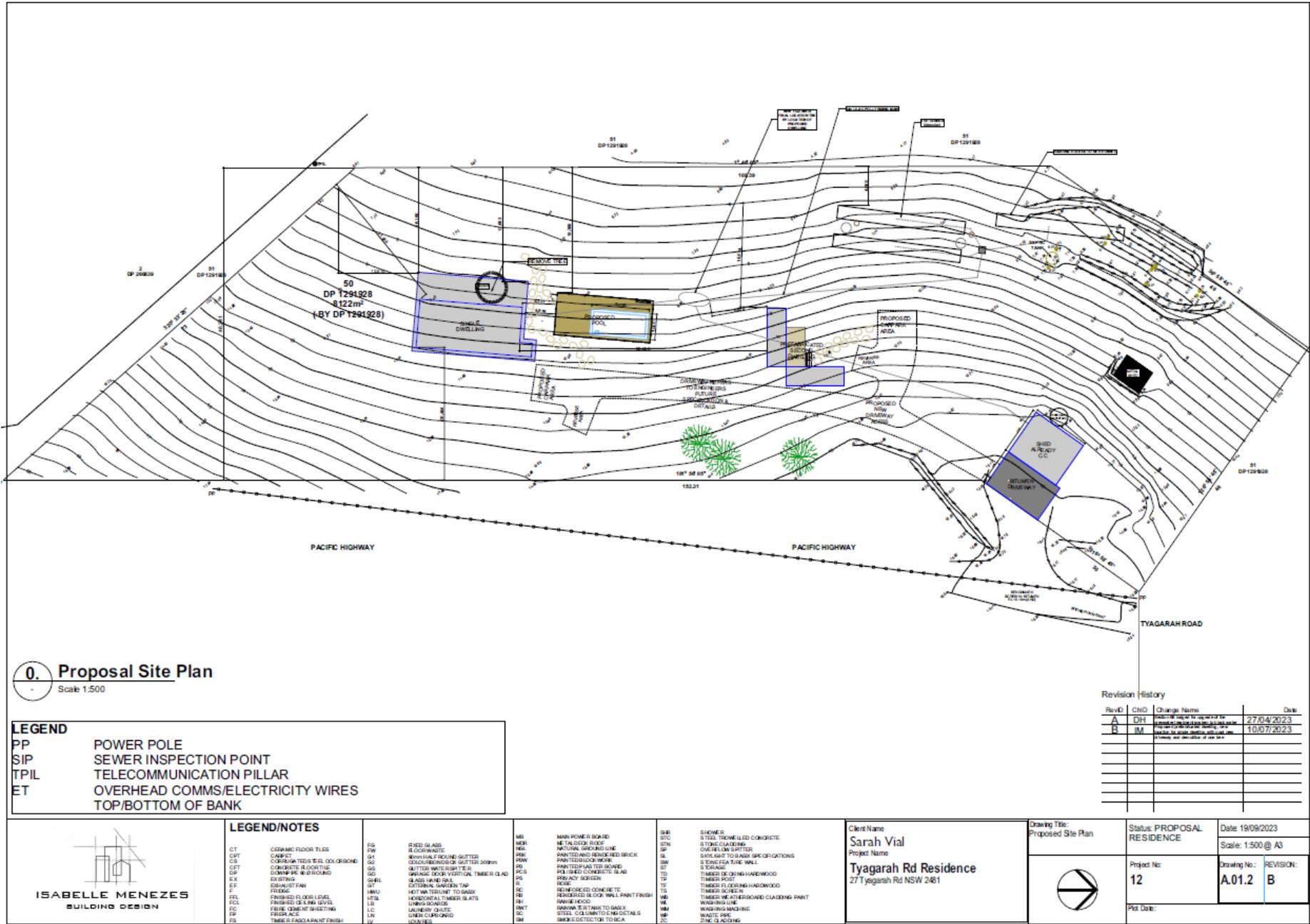
Standards Australia, 2018, *AS 3959–2018 Construction of Buildings in Bushfire Prone Areas*, Sydney, Standards Australia International Ltd.

APPENDIX A – SITE & BAL PLANS

Plans by: Isabelle Menezes, date: 19/09/2023.

The following figure indicates the proposed BLE referred to herein. Relocating the proposed BLE will render these results invalid and a reassessment and/or rewrite of this report may be required as a result.

A full set of plans shall be provided by the applicant to accompany the DA. All design and site plans must ensure compliance with the minimum building setbacks in relation to this development as proposed and the recommendations contained herein.



0. Proposal Site Plan
Scale 1:500

LEGEND

PP	POWER POLE
SIP	SEWER INSPECTION POINT
TPIL	TELECOMMUNICATION PILLAR
ET	OVERHEAD COMMS/ELECTRICITY WIRES
	TOP/BOTTOM OF BANK

Revision History

RevID	ChD	Change Name	Date
A	DH	PROPOSAL SITE PLAN	27/04/2023
B	IM	REVISION TO PROPOSAL SITE PLAN	10/07/2023

ISABELLE MENEZES
BUILDING DESIGN

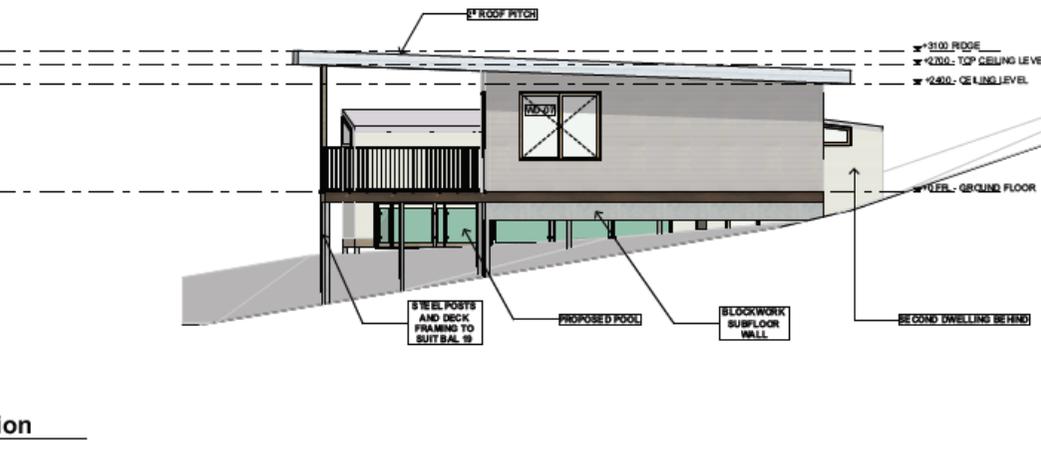
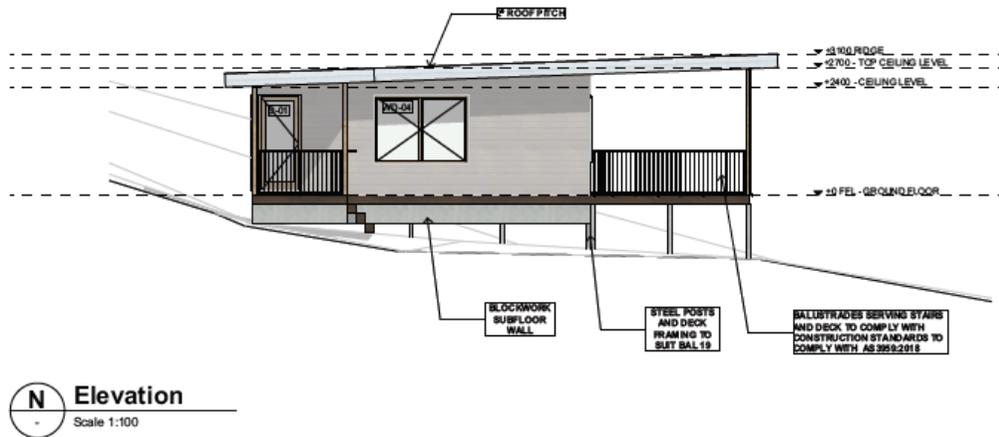
LEGEND/NOTES

C/T	CERAMIC FLOOR TILES	FG	SHED GLASS	MB	MAIN POWER BOARD	SHR	SHOWER
C/P	CARPET	FW	R/OORWASTE	MR	METAL ROOF	STC	STEEL TRIMMELED CONCRETE
C/S	CONCRETE SLAB	GA	WATER/RAIN GUTTER	NR	NATURAL SKRINKING LINE	STN	STONE CLADDING
C/ST	CONCRETE BLOCK/STONE	GS	COLOR/BONDING OF GUTTER 300mm	PK	PARTICULAR RENDERED BRICK	SP	SPRINKLER TO BASE SPECIFICATIONS
CP	CONCRETE PAVING	GG	MULTI WATER/SIG TILES	PRW	PARTICULAR RENDERED WOOD	SW	5 DEGREE TURE WALL
CPK	CONCRETE KICK	GG	WINDAGE DOOR VERTICAL TIMBER CLAD	PCS	POLISHED CONCRETE SLAB	ST	5 DEGREE TURE WALL
EP	EQUALIST FAN	GH	GLASS W/INE WALL	R	ROOF	TD	TIMBER DECKING HARDWOOD
F	FLOORING	GI	CURTAINAL GARDEN TAP	RC	REINFORCED CONCRETE	TS	TIMBER FLOORING HARDWOOD
F/L	FINISHED FLOOR LEVEL	HMV	HOT WATER UNIT TO BASE	RI	RENDERED BRICK WALL PAINT FINISH	TT	TIMBER SCREEN
F/L	FINISHED SUB FLOOR LEVEL	HTL	HORIZONTAL TIMBER SLATS	RM	RENDERED BRICK WALL PAINT FINISH	UM	UNDER FLOOR BOARDING CLADDING PAINT
FC	FLOOR COVERING	LC	LINEAR CHANNEL	RM	RENDERED BRICK WALL PAINT FINISH	VM	WASHING MACHINE
FC	FLOOR COVERING	LN	LINEN CUPBOARD	SC	SMOKE DETECTOR TO BICA	WM	WASHING MACHINE
FS	FLOOR FINISH	LV	LANDSCAPE	SM	SMOKE DETECTOR TO BICA	ZC	ZINC CLADDING

Client Name
Sarah Vial
Project Name
Tyagarah Rd Residence
27 Tyagarah Rd NSW 2481

Drawing Title:
Proposed Site Plan

Status: PROPOSAL RESIDENCE	Date: 19/09/2023
Project No: 12	Scale: 1:500 @ A3
Drawing No: A.01.2	Revision: B
Plot Title:	



FINISHES

ROOF:
EXTERNAL WALL CLADDING:
MAIN FLOOR:

TRIMDEK 'SURFMIST' AT 2° PITCH
FC SHEET 'BASALT' COLORBOND
TIMBER WITH BLOCK SUBFLOOR
PERIMETER WALL

DECK:
DOORS AND WINDOWS:

HARDI DECK FIBRE CEMENT
ALUMINIUM 'CLEAR ANODIZED'

- ** ALL CONSTRUCTION TO COMPLY WITH BAL 12.5
- *** EG: STEEL SCREENED WINDOWS AND DOORS, 2MM MAX APERTURE
- *** NO EXTERNAL TIMBER
- *** MASONRY SUBFLOOR PERIMETER WALL WITH SCREENED VENTS
- *** REFER DESIGN MANUAL FOR DETAILS FOR WALLS AND ROOFS

ALL TAPS, TOILETS, INSULATION AND WINDOW GLASS AS PER COMMITMENTS IN BASIX CERTIFICATE

ALL LIGHTING LED

Revision History

RevID	CHD	Change Name	Date
A	DH	Program development	
B	DH	Program development	04/08/2017
C	IM	Program development	10/07/2023

S Elevation
Scale 1:100



LEGEND/NOTES

CT	CERAMIC FLOORTILES	FG	FIXED GLASS	MB	MAIN POWER BOARD	SR	SHOWER
CPT	CABINET	FW	FLOORWASTE	MR	ME TAILOR ROOF	STC	STEEL TROMBOLLED CONCRETE
CS	CORUGATED GALV. COLORBOND	G1	ROUND HALF ROUND GUTTER	NGL	NATURAL GROUND LINE	STN	STONE CLADDING
CFT	CONCRETE FLOOR TILE	GG	COLORBOND GUTTER 300mm	PK	PARTIALLY REVERSED BRICK	SP	OVERFLOW SPITTER
CP	CONCRETE W/ BOUND	GG	GUTTER WASTE SPITTER	PKM	PARTIALLY REVERSED BRICK	SV	STONE VENTURE WALL
EX	EXISTING	GD	GARDEN GULLY VERTICAL TIMBER CLAD	PK	PARTIALLY REVERSED BRICK	ST	STONE FEATURE WALL
FF	FINISHED FLOOR	GL	GLASS HAND RAIL	PCS	POLISHED CONCRETE SLAB	TD	TIMBER DECKING HARDWOOD
FL	FINISHED FLOOR LEVEL	GR	EXTERNAL GARDEN TAP	PI	FRYFRY BOSHEN	TP	TIMBER POST
FCL	FINISHED CEILING LEVEL	HTL	HOT WATER TAP TO BASE	PL	REINFORCED CONCRETE	TS	TIMBER SCREEN
FC	FIBRE CONCRETE SHEETING	HTL	HORIZONTAL TIMBER SLATS	RF	RENDERED BLOCK WALL PAINT FINISH	TM	TIMBER MEATHARD CLADDING PAINT
FP	FIRE PLACE	LB	LIVING BOARD	RH	RANK HOOD	WL	WASHING LINE
FS	FIBRE REINFORCED CONCRETE	LD	LAUNDRY GULLY	RNT	RAINWATER TANK TO BASE	WM	WASHING MACHINE
		LN	LINEN CUPBOARD	SC	STEEL COLUMN TO GROUND DETAIL	WP	WASTE PIPE
		LV	LAUNDRY	SM	SMOKE DETECTOR TO BICA	ZC	ZINC CLADDING

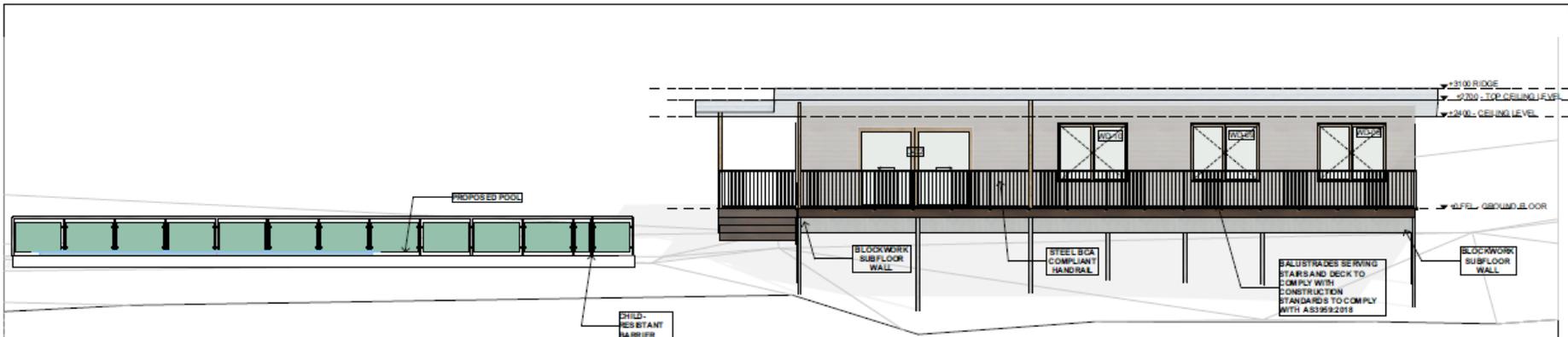
Client Name
Sarah Vial
Project Name
Tyagarah Rd Residence
27 Tyagarah Rd NSW 2481

Drawing Title:
Proposed Elevation - Single Dwelling

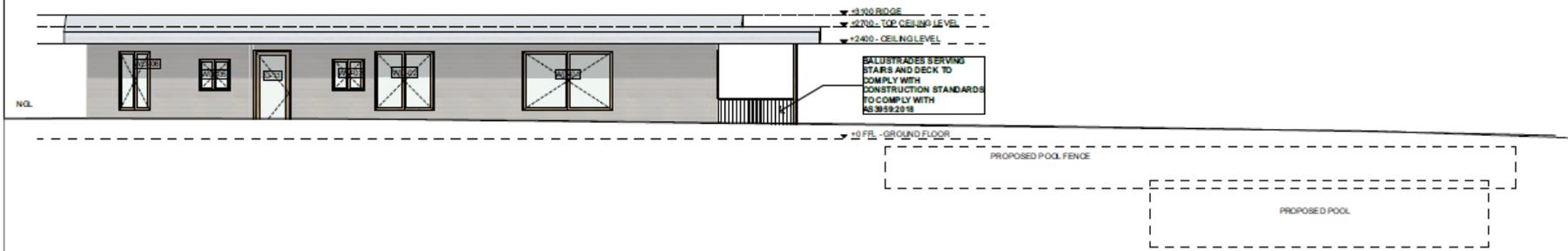
Status: PROPOSAL
RESIDENCE

Date: 19/09/2023
Scale: 1:100 @ A3
Project No:
12
Drawing No.: **A.01.6**
REVISION: **B**
Ptd Date:





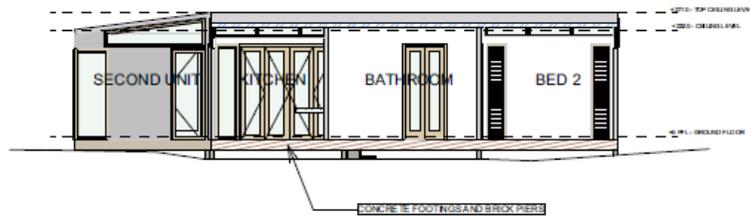
E Elevation
Scale 1:100



W Elevation
Scale 1:100

RevID	CHD	Change Name	Date
A	DH	Preparation of drawing	
B	DH	Preparation of drawing	04/08/2017
C	IM	Preparation of drawing	10/07/2023

	LEGEND/NOTES CT CERAMIC FLOOR TILES CPT CARPET C/S CORRUGATED STEEL COLORBOND CPT CONCRETE BLOCKTILE C/P DOWN PIPE WITH BRACING CK EXISTING C/P EXHAUST FAN FROGGING FLS FINISHED FLOOR LEVEL FCL FINISHED CEILING LEVEL FC FRISE COGNIT SURTING FP FRIDGE PLACE FS TIMBER FASCIA PAINT FINISH FG GLASS FW BLOCKWASTE G1 60mm HALF ROUND GUTTER GG COLORBOND/BLK GUTTER 300mm GPT GUTTER WATER TIGHTER GS GROUND COVER VERTICAL TIMBER CLAD GFL GLASS LINED RAIL G/T EXTERNAL GARDEN TAP FROGGING H/MU HOT WATER UNIT TO BASK H/TAL HORIZONTAL TIMBER SLATS L/B LINING BOARD L/C LAMINARY GAUGE LN UNDER CLIPBOARD LV LAMINAR MB MAIN POWER BOARD MER METAL ROD RISER NGL NATURAL GROUND LINE PWB PAINTED/UNPAINTED BRICK P/W PAINTED/UNPAINTED WOOD P/L PAINTED LANTERNS P/LA POLISHED CONCRETE SLAB P/S PROXY SCREEN R/R REINFORCED CONCRETE R/B RENOVATED BLOCK WALL PAINT FINISH R/W RANVISED R/WB RENOVATED BLOCK WALL PAINT FINISH RNT RAINWATER NUT TO BASK SC STEEL COLUMN TO BASK SMD SMOKE DETECTOR TO BASK SMC STEEL TRIMMELED CONCRETE STN STONE CLADDING SP OVER BASK GUTTER SW SKYLIGHT TO BASK SPECIFICATIONS SW S/T STONE CLADDING WALL ST STORAGE T/T TIMBER DECKING HARDWOOD TP TIMBER POST T/T TIMBER DECKING HARDWOOD T/T TIMBER SCREED T/T TIMBER WEATHERBOARD CLADDING PAINT W/L WASHING LINE W/M WASHING MACHINE WP WASTE PIPE ZC ZONE CLADDING	Client Name Sarah Vial Project Name Tyagarah Rd Residence 27 Tyagarah Rd NSW 2461	Drawing Title: Proposed Elevation - Single Dwelling	Status: PROPOSAL RESIDENCE	Date: 19/09/2023 Scale: 1:100 @ A3
		Project No: 12	Drawing No.: A.01.7	REVISION: B	Plot Date:



S-01 SECOND DWELLING SECTION 1
Scale 1:100



S-02 SECOND DWELLING SECTION 2
Scale 1:100

Revision History

RevID	CHD	Change Name	Date
A	IM	Prepared for the DA and council meeting	10/07/2023

<p>ISABELLE MENEZES BUILDING DESIGN</p>	<p>LEGEND/NOTES</p> <p>CT CERAMIC FLOOR TILES CPT CARPET C/S CONCRETE TO S/SL COLORBOND CPT CONCRETE BLOCKTILE C/P DOWN PIPE WITH RAINING CK EXISTING C/P EXHAUST FAN F/ EXISTING FEL FINISHED FLOOR LEVEL FCL FINISHED CEILING LEVEL FCL FINISH CONCRETE GUTTERING FP FIREPLACE FS TIMBER FASCIA PAINT FINISH</p>	<p>FG IRON GLASS FW BLOCKWASTE G1 60mm HALF ROUND GUTTER GG COLORBOND/SLATE GUTTER DOWN GUTTER WATER TIGHTENER GG GRASSY COVER VERTICAL TIMBER CLAD GREL GLASS LINED RAIL GT EXTERNAL GARDEN TAP HMU HOT WATER UNIT TO BASIN HTL HORIZONTAL TIMBER SLATS LUB LIVING BOARDER L.C LAMINARY SHEET LN UNDER CLIPBOARD LV UNDER</p>	<p>MB MAIN POWER BOARD MER METAL LUGS BRICK MGL NATURAL GROUND LINE MSE PAINTED/ENAMEL BRICK MSE PAINTED/ENAMEL MSE PAINTED/LAS TER BOARD MGL MASONRY CONCRETE SLAB MSE PROXY SCREEN MSE ROOF MSE REINFORCED CONCRETE MSE REINFORCED BLOCK WALL PAINT FINISH MSE RANKWOOD MSE RAINWATER TO BASIN MSE STEEL COLUMN TO END DETAIL MSE SMOKE DETECTOR TO BGA</p>	<p>MSE SHOWER MSE STEEL TRIMMELED CONCRETE MSE STONE CLADDING MSE STN OVER BELL GUTTER MSE SWY SAFE TO BASIN SPECIFICATIONS MSE S/S STAINLESS STEEL WALL MSE S/TORANGE MSE TIMBER BRACING HARDWOOD MSE TIMBER POST MSE TIMBER BRACING HARDWOOD MSE TIMBER SECTION MSE TIMBER MEATHORSEBOARD CLADDING PAINT MSE WASHING LINE MSE WASHING MACHINE MSE WASTE PIPE MSE ZONE CLADDING</p>	<p>Client Name Sarah Vial Project Name Tyagarah Rd Residence 27 Tyagarah Rd NSW 2481</p>	<p>Drawing Title: Second Dwelling Sections</p>	<p>Status: PROPOSAL RESIDENCE</p>	<p>Date: 19/09/2023 Scale: 1:100 @ A3</p>
					<p>Project No: 12</p> <p>Plot Date:</p>	<p>Drawing No.: A.01.12</p> <p>REVISION: B</p>		

APPENDIX B – RFS GUIDELINES & FAST FACTS

APPENDIX 3

ACCESS

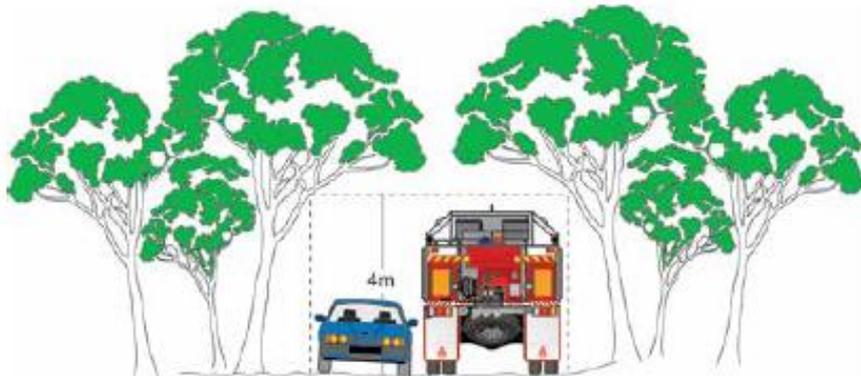
This appendix provides design principles for emergency service vehicle access.

A3.1 Vertical clearance

An unobstructed clearance height of 4 metres should be maintained above all access ways including clearance from building construction, archways, gateways and overhanging structures (e.g. ducts, pipes, sprinklers, walkways, signs and beams). This also applies to vegetation overhanging roads.

Figure A3.1

Vertical clearance.



A3.2 Vehicle turning requirements

Curved carriageways should be constructed using the minimum swept path as outlined in Table A3.2.

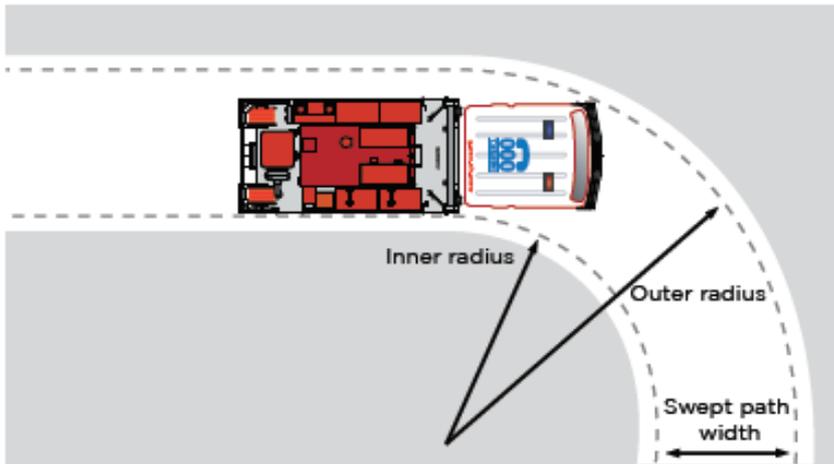
Table A3.2

Minimum curve radius for turning vehicles.

Curve radius (inside edge in metres)	Swept path (metres width)
< 40	4.0
40 - 69	3.0
70 - 100	2.7
> 100	2.5

Figure A3.2a

Swept path width for turning vehicles.



The radius dimensions given are for wall to wall clearance where body overhangs travel a wider arc than the wheel tracks (vehicle swept path). The swept path shall include an additional 500mm clearance either side of the vehicle.

Figure A3.2b

Roundabout swept path.



Example of a swept path as applied to a roundabout. The distance between inner and outer turning arcs allows for expected vehicle body swing of front and rear overhanging sections (the swept path).



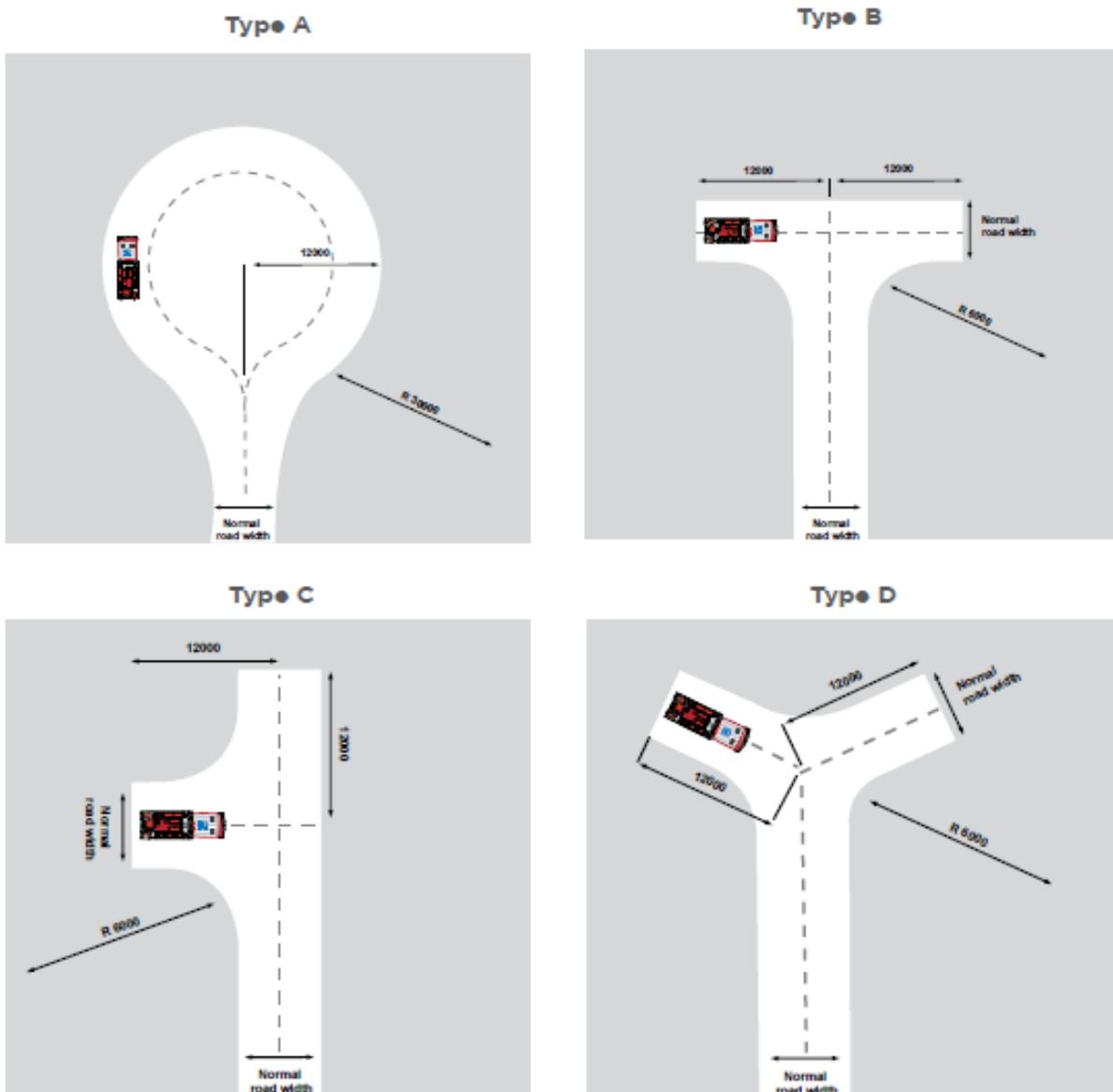
A3.3 Vehicle turning head requirements

Dead ends that are longer than 200m must be provided with a turning head area that avoids multipoint turns. "No parking" signs are to be erected within the turning head.

The minimum turning radius shall be in accordance with Table A3.2. Where multipoint turning is proposed the NSW RFS will consider the following options:

Figure A3.3

Multipoint turning options.



A3.4 Passing bays

The construction of passing bays, where required, shall be 20m in length and provide a minimum trafficable width at the passing point of 6m.

Figure A3.4

Passing bays can provide advantages when designed correctly. Poor design can and does severely impede access.



A3.5 Parking

Parking can create a pinch point in required access. The location of parking should be carefully considered to ensure fire appliance access is unimpeded. Hydrants shall be located outside of access ways and any parking areas to ensure that access is available at all times.

Figure A3.5

Hydrants and parking bays.

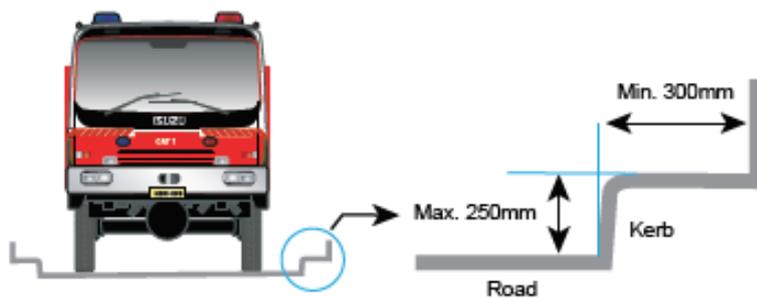


A3.6 Kerb dimensions

All kerbs constructed around access roads should be no higher than 250mm and free of vertical obstructions at least 300mm back from the kerb face to allow clearance for front and rear body overhang.

Figure A3.6

Carriageway kerb clearance dimensions.



A3.7 Services

Hydrant services should be located outside the carriageway and parking bays to permit traffic flow and access. Setup of standpipes within the carriageway may stop traffic flow. Hydrant services shall be located on the side of the road away from the bush fire threat where possible.

A3.8 Local Area Traffic Management (LATM)

The objective of LATM is to regulate traffic an acceptable level of speed and traffic volume within a local area.

Traffic engineers and planners should consider LATM devices when planning for local traffic control and their likely impact on emergency services. LATM devices by their nature are designed to restrict and impede the movement of traffic, especially large vehicles.

Where LATM devices are provided they are to be designed so that they do not impede fire vehicle access.

A3.9 Road types

A3.9.1 Perimeter Roads

Perimeter roads are to be provided with a minimum clear width of 8m. Parking and hydrants are to be provided outside of carriageways. Hydrants are to be located outside of carriageways and parking areas.

Figure A3.9a

Perimeter road widths.



A3.9.2 Non-perimeter Roads

Non-perimeter roads shall be provided with a minimum clear width of 5.5m. Parking is to be provided outside of the carriageway and hydrants are not to be located in carriageways or parking areas.

Figure A3.9b

Non-perimeter road widths.



A3.9.3 Property access

Property access roads are to be a minimum of 4m wide.

Figure A3.9c

Property access road widths.



APPENDIX 4

ASSET PROTECTION ZONE REQUIREMENTS

In combination with other BPMs, a bush fire hazard can be reduced by implementing simple steps to reduce vegetation levels. This can be done by designing and managing landscaping to implement an APZ around the property.

Careful attention should be paid to species selection, their location relative to their flammability, minimising continuity of vegetation (horizontally and vertically), and ongoing maintenance to remove flammable fuels (leaf litter, twigs and debris).

This Appendix sets the standards which need to be met within an APZ.

A4.1 Asset Protection Zones

An APZ is a fuel-reduced area surrounding a building or structure. It is located between the building or structure and the bush fire hazard.

For a complete guide to APZs and landscaping, download the NSW RFS document *Standards for Asset Protection Zones* at the NSW RFS Website www.rfs.nsw.gov.au.

An APZ provides:

- a buffer zone between a bush fire hazard and an asset;
- an area of reduced bush fire fuel that allows for suppression of fire;
- an area from which backburning or hazard reduction can be conducted; and
- an area which allows emergency services access and provides a relatively safe area for firefighters and home owners to defend their property.

Bush fire fuels should be minimised within an APZ. This is so that the vegetation within the zone does not provide a path for the spread of fire to the building, either from the ground level or through the tree canopy.

An APZ, if designed correctly and maintained regularly, will reduce the risk of:

- direct flame contact on the building;
- damage to the building asset from intense radiant heat; and
- ember attack.

The methodology for calculating the required APZ distance is contained within Appendix 1. The width of the APZ required will depend upon the development type and bush fire threat. APZs for new development are set out within Chapters 5, 6 and 7 of this document.

In forest vegetation, the APZ can be made up of an Inner Protection Area (IPA) and an Outer Protection Area (OPA).

A4.1.1 Inner Protection Areas (IPAs)

The IPA is the area closest to the building and creates a fuel-managed area which can minimise the impact of direct flame contact and radiant heat on the development and act as a defensible space. Vegetation within the IPA should be kept to a minimum level. Litter fuels within the IPA should be kept below 1cm in height and be discontinuous.

In practical terms the IPA is typically the curtilage around the building, consisting of a mown lawn and well maintained gardens.

When establishing and maintaining an IPA the following requirements apply:

Trees

- tree canopy cover should be less than 15% at maturity;
- trees at maturity should not touch or overhang the building;
- lower limbs should be removed up to a height of 2m above the ground;
- tree canopies should be separated by 2 to 5m; and
- preference should be given to smooth barked and evergreen trees.

Shrubs

- create large discontinuities or gaps in the vegetation to slow down or break the progress of fire towards buildings should be provided;
- shrubs should not be located under trees;
- shrubs should not form more than 10% ground cover; and
- clumps of shrubs should be separated from exposed windows and doors by a distance of at least twice the height of the vegetation.

Grass

- grass should be kept mown (as a guide grass should be kept to no more than 100mm in height); and
- leaves and vegetation debris should be removed.

A4.1.2 Outer Protection Areas (OPAs)

An OPA is located between the IPA and the unmanaged vegetation. It is an area where there is maintenance of the understorey and some separation in the canopy. The reduction of fuel in this area aims to decrease the intensity of an approaching fire and restricts the potential for fire spread from crowns; reducing the level of direct flame, radiant heat and ember attack on the IPA.

Because of the nature of an OPA, they are only applicable in forest vegetation.

When establishing and maintaining an OPA the following requirements apply:

Trees

- tree canopy cover should be less than 30%; and
- canopies should be separated by 2 to 5m.

Shrubs

- shrubs should not form a continuous canopy; and
- shrubs should form no more than 20% of ground cover.

Grass

- grass should be kept mown to a height of less than 100mm; and
- leaf and other debris should be removed.

An APZ should be maintained in perpetuity to ensure ongoing protection from the impact of bush fires. Maintenance of the IPA and OPA as described above should be undertaken regularly, particularly in advance of the bush fire season.



Figure A4.1

Typical Inner and Outer Protection Areas.

