



Bushfire Assessment Report

Alterations and Additions to an Existing House - 29 Parni Place Frenchs Forest

Prepared for

Mr David Last



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Document Tracking

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Fire Protection Association of Australia Level 3 BPAD 16373

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Contents

1. Abbreviations	2
2. Glossary	2
3. Property, Proposal & Summary	3
4. Compliance with Planning for Bush Fire Protection 2019	3
5. Introduction	4
6. Site Description & Proposal	6
7. Bush Fire Prone Land	7
8. Infill Development	7
9. Limitations within the System	9
10. Bushfire Assessment Requirements	11
11. Asset Protection Zones	15
12. Bushfire Attack Levels	15
13. Bush Fire Protection Measures for Infill Development	17
14. Access	18
15. Water Supply	18
16. Gas and electrical supplies	18
17. PBP Specific Objectives	19
18. Recommendations	20
19. Conclusion	20
Appendix 1: References	21

1. Abbreviations

APZ	Asset protection zone
AS2419	Australian Standard – Fire hydrant installations
AS3745	Australian Standard – Planning for emergencies in facilities
AS3959	Australian Standard – Construction of buildings in bushfire-prone areas 2018
BAL	Bushfire Attack Level
NCC	National Construction Code
BFSA	Bush Fire safety authority
EP&A Act	Environmental Planning & Assessment Act 1979
EPA Reg	Environmental Planning and Assessment Regulation 2000
GTA	General terms of approval
PBP	Planning for Bush Fire Protection 2019
RF Act	Rural Fires Act 1997
RFS	NSW Rural Fire Service
RFR	Rural Fires Regulation 2013

2. Glossary

AS3959	Australian Standard AS 3959 Construction of buildings in bushfire-prone areas, Standards Australia, 2018, that outlines construction standards applicable to residential developments in bush fire prone areas
Bushfire Prone Area	An area of land that can support a bush fire or is likely to be subject to bush fire attack.
Bush fire safety authority	An approval of the Commissioner of the RFS required for a subdivision for residential or rural residential purpose or for a special fire protection purpose listed under section 100B of the <i>Rural Fires Act 1997</i> .
Infill Development	Refers to the development of land by the erection of or addition to a residential building (or buildings) which does not require the spatial extension of services including public roads, electricity or water and is within an existing allotment.

3. Property, Proposal & Summary

Address:	29 Parni Place Frenchs Forest
Lot/ DP:	Lot 11/-/DP776130
Suburb, town or locality:	Frenchs Forest
Local Government Area:	Northern Beaches
Type of development:	Infill development – Alterations and Additions Residential Dwelling
Existing use	Residential Dwelling
Intended use	Residential Dwelling

4. Compliance with Planning for Bush Fire Protection 2019

Type of Development	Infill
Aim of PBP	Yes
Objectives of PBP	Yes
Specific Objectives for Infill	Yes
BAL	BAL-12.5

5. Introduction

Mr David Last has commissioned Blackash Bushfire Consulting (Blackash) to prepare a bushfire hazard assessment for alterations and additions to the existing dwelling at 29 Parni Place, Frenchs Forest (the site) which is legally known as Lot 24/-/DP29462 (See **Error! Reference source not found.**). The proposal seeks a first floor addition ((Figure 2) to the existing house.

Section 4.14 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) requires compliance with the NSW Rural Fire Service (RFS) document *Planning for Bush Fire Protection 2019* (PBP 2019). The RFS document PBP 2019 applies to all new development on bushfire prone land.

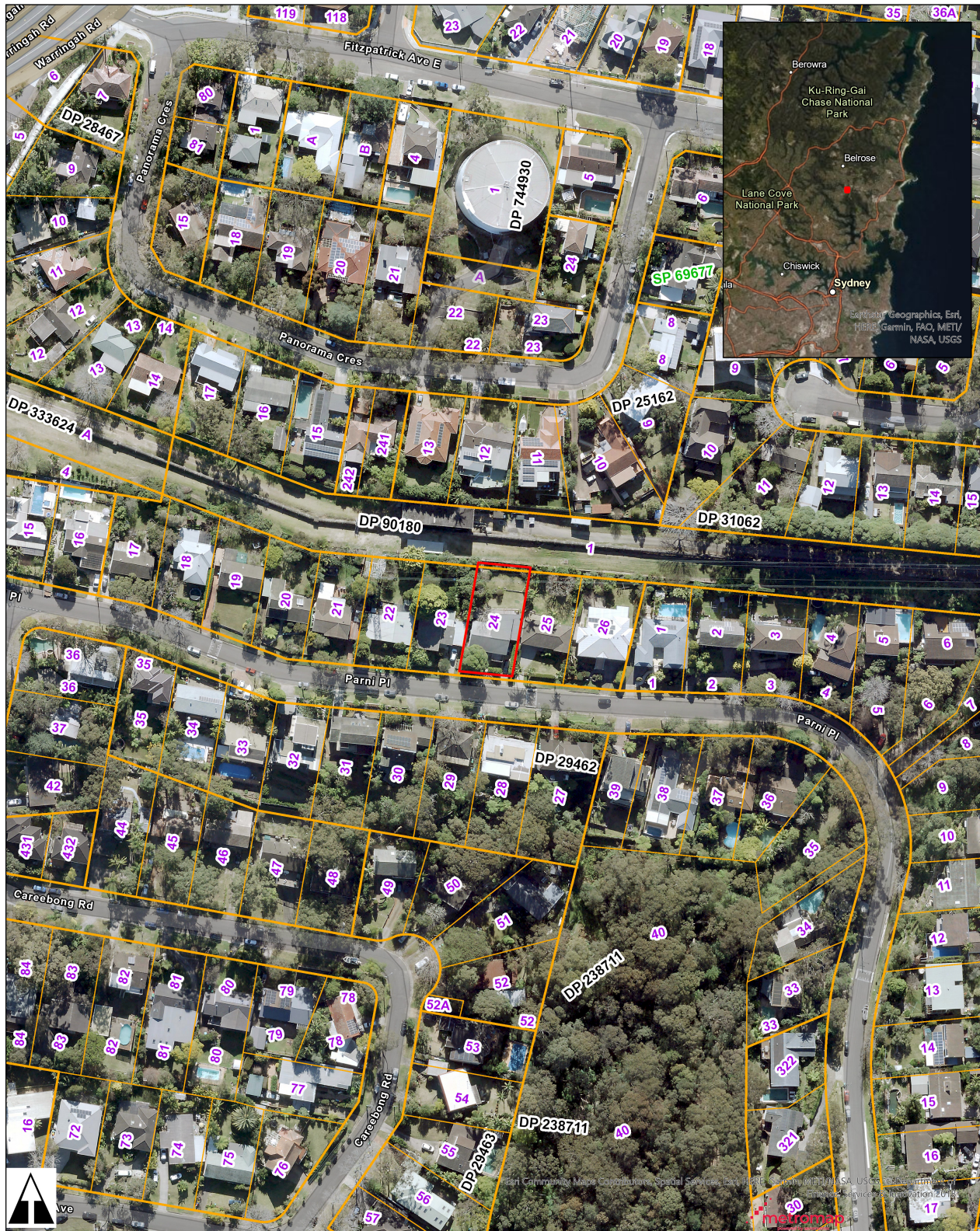
Northern Beaches Council as the consent authority, is required to consult with the RFS under section 4.14 of the EPA Act when proposed alterations and additions (infill development) does not comply with the “acceptable solutions” within section 7 of PBP or is in the Flame Zone. However, a referral to the NSW RFS is not required when Council has been provided with a certificate by a person who is recognised by the NSW RFS as a qualified consultant in bush fire risk assessment stating that the development conforms to the relevant specifications and requirements. We understand that a development application (DA) will be submitted to Council for the proposal.

PBP recognises that infill development proposals will be constrained by existing situations – pre-existing subdivision patterns and existing built forms surrounding the subject site. Consequently, each proposal must be considered on its merits and in accordance with the intent and performance criteria for infill development.

This assessment has been prepared by Lew Short, Principal Blackash Bushfire Consulting (FPAA BPAD-A Certified Practitioner No. BPD-PA-16373) who is recognised by the RFS as qualified in bushfire risk assessment and have been accredited by the Fire Protection Association of Australia as a suitably qualified consultant to undertake alternative solution proposals.

The application meets the acceptable solutions of PBP 2019 and no alternative or performance-based solution have been proposed.

29 Parni Place Frenchs Forest



SITE : 29 Parni Place. Frenchs Forest.NSW

Site Location		Projected Coordinate System	GDA 2020 Zone 56
- Property Boundary - Cadastre (NSW DCDB)		DATE : 21/09/2021	Map Version : 1.0
		NSW Digital Cadastral Database (DCDB) Aerial Imagery: MetroMap - 30/07/2021 Although all care has been taken - WizarDtech accepts no responsibility from the use or inaccuracies of this map and spatial data. Copyright © WizarDtech Spatial Services 2021.	
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Figure 1 Location

6. Site Description & Proposal

The site is located within an existing residential area within the suburb of Frenchs Forest. The subject lot is on the northern side of Parni Place and is separated from the designated Bushfire Prone Land to the south by approximately 71m, including existing residential properties

An existing dwelling on the site and adjoining properties to the north, south, east and west also contain existing residential dwellings.

It is proposed to provide internal and external modifications to the ground floor and to construct a new first floor consisting of three bedrooms, rumpus, bathroom and balcony. The full plans are available with the DA set.

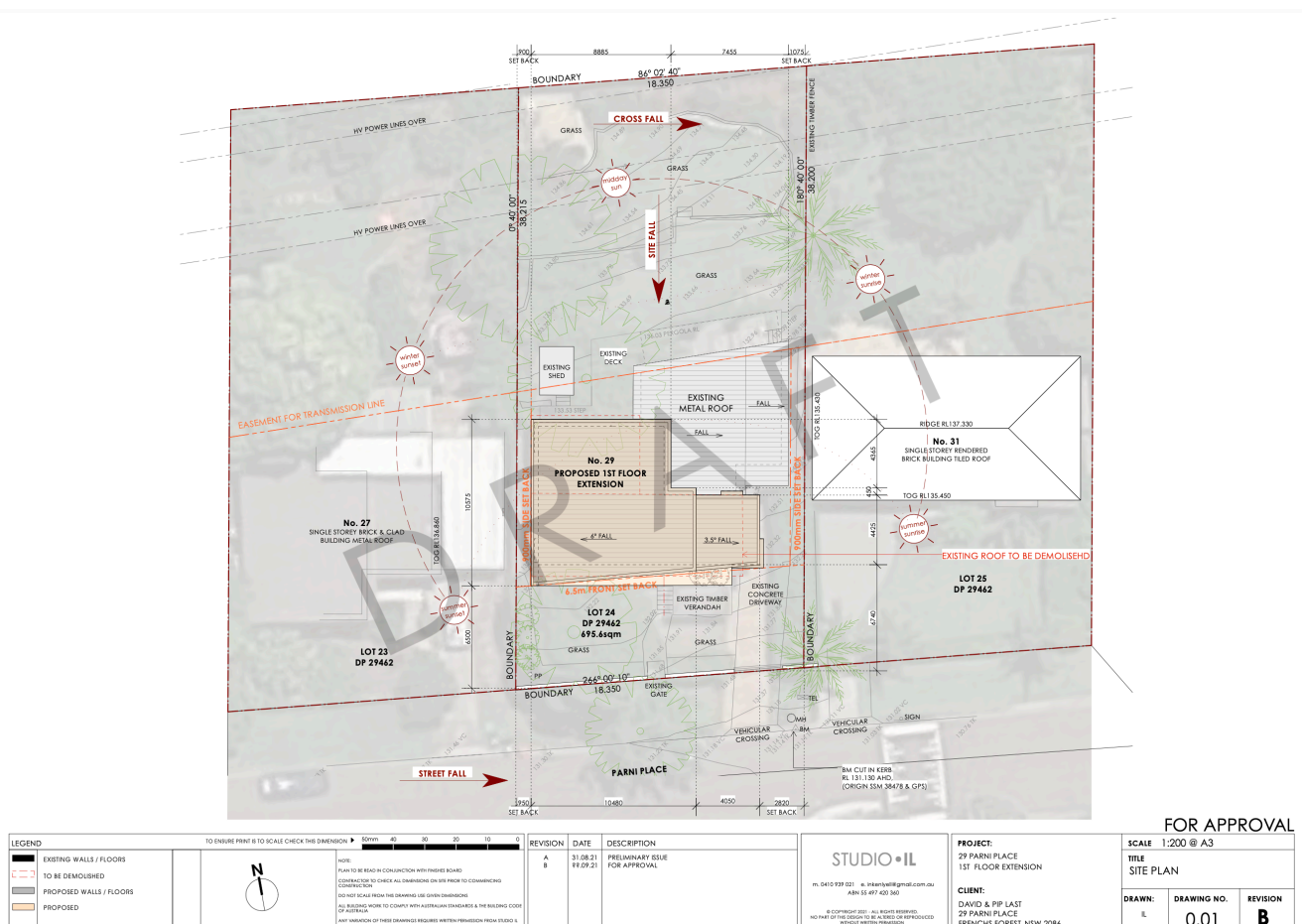


Figure 2: Proposed First Floor Addition

7. Bush Fire Prone Land

The site is within the 100m buffer associated with the Category 1 Bushfire Prone Land to the south of the site. As such, the site is identified as 'bush fire prone land' (see Figure 3) for the purposes of Section 10.3 of the EPA Act and the legislative requirements for building on bush fire prone lands are applicable.

Bush fire prone land maps provide a trigger for the development assessment provisions and consideration of sites that are bushfire prone. Bush Fire prone land (BFPL) is land that has been identified by council, which can support a bushfire or is subject to bushfire attack. Bush fire prone land maps are prepared by local council and certified by the Commissioner of the RFS.

The site is mapped as bushfire prone buffer. The bushland to the south is mapped as Category 1 Bushfire Prone Vegetation. The site therefore is correctly identified as within the bushfire prone buffer.

8. Infill Development

PBP 2019 acknowledges that infill development proposals will be constrained by existing situations – pre-existing subdivision patterns and existing built forms surrounding the subject site. Consequently, each proposal must be considered on its merits and in accordance with the intent and performance criteria for infill development.

PBP 2019 provides an outcome-based approach to infill development which honours the expectation to build on a lawfully created lot with an expectation to build.

Due to the separation between the site and the forest to the east the proposed dwelling can comply with PBP 2019.



Figure 3: Bush Fire Prone Land Map.

9. Limitations within the System

Bushfire is a normal part of Australia's natural environment, particularly in eucalypt forests and grasslands. However, the frequency and intensity of bushfires varies throughout the landscape and the seasons. Bushfires are a common occurrence during the drier periods of the year in most places. Climate change is expected to bring longer bushfire seasons to parts of Australia, an increasing number of extreme fire weather days, and increasing fire intensity.

Bushfires of low or moderate intensity often pose little threat to life, property and community assets, but the potential for changes in wind direction can be a significant hazard. However, bushfires that burn in heavy fuels, steep terrain or on hot, dry and windy days often spread rapidly, crown in forests, produce powerful convection columns and create extensive spot fires ahead of the fire front, often making their control impossible until weather conditions moderate.

As the Fire Danger Rating reaches 'Extreme', bushfires are often described as 'firestorms' and become impossible to control. When the Fire Danger Rating approaches 'Catastrophic', the risk of serious injury or death to people in the path of a bushfire increases significantly, and many properties and other community infrastructure can become difficult or impossible to defend¹. Isolated developments will be at higher risk under lower Fire Danger Ratings.

The safety of people may be improved if they have prepared a bushfire survival plan, including contingency plans in the event their primary plan fails or cannot be carried out, and have taken adequate steps to prepare for bushfire.

In line with the national fire services position, the safest action to protect life is for people to be away from the bushfire or threat of bushfire as early as possible. Leaving a high-risk bushfire location is the safest action and leaving before a bushfire threatens is always safer than remaining until a bushfire starts. Leaving becomes increasingly appropriate with higher Fire Danger Ratings.

When bushfires are burning on days where circumstances such as weather conditions, topography or fuel loads may create intense fire behaviour, typically when 'Extreme' or 'Catastrophic' fire danger conditions are expected, or where circumstances such as weather conditions, topography or fuel loads may create intense fire behaviour, leaving early may be the only safe action, even for people who are prepared to defend well-prepared buildings.

¹ AFAC Position Paper on Community Safety p. 4

Limitations of Planning for Bush Fire Protection 2019 (p. 11)

Due to certain limitations, the measures contained in this document do not guarantee that loss of life, injury and/or property damage will not occur during a bush fire event. Limitations of this document include, but are not limited to uncertainties in the following areas:

- *Fire Danger Index;*
- *fuel loads;*
- *existing developments;*
- *human behavior; and*
- *maintenance.*

It is possible that days of higher Fire Danger Index (FDI) may be experienced than the FDI levels assumed within this document. The performance of buildings constructed in accordance with this document and the National Construction Code of Australia may be inadequate due to excessive levels of radiant heat exposure, flame contact, embers travelling further than expected and excessive winds.

Limitations of AS3959

The measure contained in AS 3959 cannot guarantee that a building will survive a bushfire event on every occasion. This is substantially due to the degree of vegetation management, the unpredictable nature and behaviour of fire, and extreme weather conditions.

The Standard is primarily concerned with improving the ability of buildings in designated bushfire prone areas to better withstand attack from bushfire thus giving a measure of protection to the building occupants (until the fire front passes) as well as to the building itself. As such, the Standard seeks to construct a house to survive the passage of the fire and not necessarily to absolutely survive the fire. AS3959 notes that:

It should be borne in mind that the measures contained in this Standard cannot guarantee that a building will survive a bushfire event on every occasion. This is substantially due to the degree of vegetation management, the unpredictable nature and behaviour of fire, and extreme weather conditions (AS3959 p. 5).

Importantly, AS3959 is not applicable for fires burning under weather conditions above Fire Danger Index of 100. Under this scenario, it is anticipated that houses will ignite during the passage of the fire and will not provide any refuge for occupants.

10. Bushfire Assessment Requirements

The subject land is identified as being bushfire prone land on the Northern Beaches Bushfire Prone Land Map. As infill development, the proposed development is to be assessed by Council under the provision of Section 4.14 of the EP&A Act, which includes the consideration of the PBP 2019. The following detailed assessment is based on the methodology and requirements of PBP 2019 and supporting RFS policy.

PBP 2019 recognises the unique attributes of infill development and promotes detailed site analysis and the application of a combination of bushfire protection measures (BPMs) to achieve an acceptable outcome.

The BPMs work in combination to provide a suite of measures that meet the aim and objective and Section 4.3 of PBP 2019. The BPMs are shown in Figure 4.

Appropriate combinations depend upon geographic location and site circumstances.

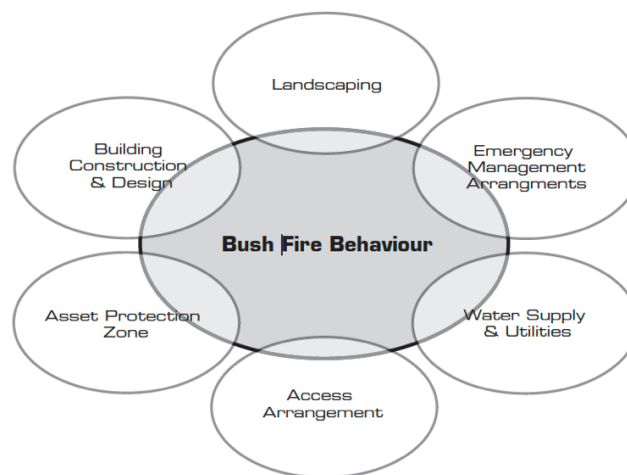


Figure 4: Bushfire Protection Measures in Combination (source PBP 2019 p. 26)

Methodology

PBP 2019 provides a methodology to determine the bushfire threat posed to a site and Australian Standards for the *Construction of Buildings in Bushfire Prone Areas* (AS3959) is used to determine the construction requirement to reduce potential bushfire attack.

The following assessment is prepared in accordance with PBP 2019 and Method 1 from AS3959. This assessment is based on a site inspection and desktop assessment of the site assessment utilising the following resources:

- *Planning for Bush Fire Protection* (NSW RFS, 2019);
- Aerial mapping; and
- Site assessment and GIS analysis.

Bushfire Hazard

An assessment of the bushfire hazard is necessary to determine the application of bushfire protection measures such as Asset Protection Zone (APZ) locations and dimensions and future building construction requirements in accordance with AS3959. The vegetation formations (bushfire fuels) and the topography (effective slope) combine to create the bushfire threat that may affect bushfire behaviour at the site, and which determine the building response of PBP 2019.

Fire weather

The fire weather is dictated by PBP and assumes a credible worst-case scenario and an absence of any other mitigating factors relating to aspect or prevailing winds. The site has a Fire Danger Index (FDI) of 100 as per PBP 2019.

Vegetation

Predominant Vegetation is classified by structure or formation using the system adopted by Keith (2004) and by the general description using PBP 2019.

Vegetation types give rise to radiant heat and fire behaviour characteristics. There are 12 vegetation formations (with sub-formations) identified in PBP. The predominant vegetation has been determined over a distance of at least 140 metres in all directions from the proposed property boundary or building footprint on the site. Where a mix of vegetation types exist, the type providing the greater hazard is said to predominate.

The 'predominant vegetation' to the south is classified as Coastal Sandstone Gully Forest for the purposes of PBP 2019 (see Figure 5). The remainder of the area surrounding the site is managed residential land.

Slopes influencing bushfire

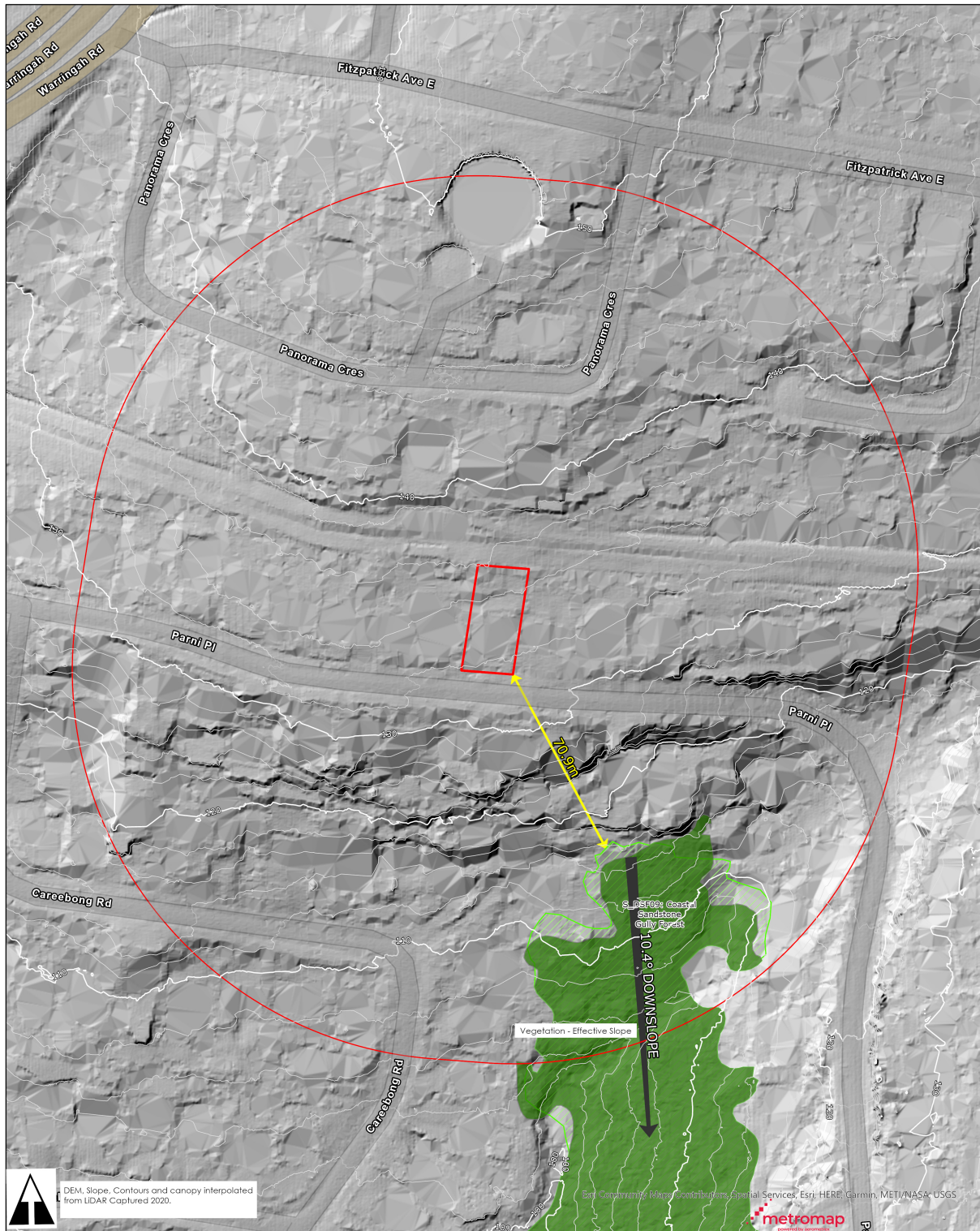
The 'effective slope' influencing fire behaviour approaching the sites has been assessed in accordance with the methodology specified within PBP. This is conducted by measuring the worst-case scenario slope where the vegetation occurs over a 100 metre transect measured outwards from the development boundary.

Based on the assessment, the effective slope of the forest to the east ranges from is 10.4 degrees downslope in relation to the site (see Figure 5 and Figure 6).



Vegetation and Slope Analysis		Projected Coordinate System	GDA 2020 Zone 56
- Property Location +140m - 100m Slope Lines - Distance Lines - 2m Contours		DATE : 21/09/2021	Map Version : 1.0
- Sydney Sandstone Gully Forest - Bushfire Effective Vegetation		Vegetation: The Native Vegetation of the Sydney Metropolitan Area - Version 3.1 (OEH, 2016) VIS ID 4489 Aerial Imagery: MetroMap - 30/07/2021 Although all care has been taken - WiZarDTech accepts no responsibility from the use or inaccuracies of this map and spatial data. Copyright © WiZarDTech Spatial Services 2021.	

Figure 5: Vegetation and Slope



Vegetation and Slope Analysis		Projected Coordinate System	GDA 2020 Zone 56
- Property Location +140m - 100m Slope Lines - Distance Lines - 2m Contours - Sydney Sandstone Gully Forest - Bushfire Effective Vegetation		DATE : 21/09/2021	Map Version : 1.0
		Vegetation: The Native Vegetation of the Sydney Metropolitan Area - Version 3.1 (OEH, 2016) VLS ID 4489 Aerial Imagery: MetroMap - 30/07/2021 Although all care has been taken - WizarTech accepts no responsibility from the use or inaccuracies of this map and spatial data. Copyright © WizarTech Spatial Services 2021.	
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Figure 6 Site Separation

11. Asset Protection Zones

An essential component of infill developments is the provision of a defensible space. This is a space to ensure the safety of fire fighters and residents following the passage of a fire front and will reduce radiant heat loads onto the structures.

The site is separated from the narrow band of forest vegetation by 70.9m (Figure 6). The surrounding residential properties are managed land in accordance with PBP 2019 and provide an APZ.

12. Bushfire Attack Levels

The Bushfire Attack Levels (BAL) is a means of measuring the ability of a building to withstand attack from bushfire. The form of bushfire attack and the severity will vary according to the conditions (FDI, vegetation, slope and setback) on the site.

The BAL assesses the severity of a building's potential exposure to ember attack, radiant heat and direct flame contact, using increments of radiant heat expressed in kilowatts per square metre, which is the basis for establishing the requirements for construction to improve protection of a building from potential attack by a bushfire, as defined in *Australian Standard AS 3959-2009 Construction of buildings in bushfire-prone areas* (AS 3959-2018).

The BAL ratings are used as the basis for establishing the requirements for construction to improve protection of a building from potential bushfire attack. The BAL assessment is shown in Figure 6 depicts the BALs across the site as the acceptable solution.

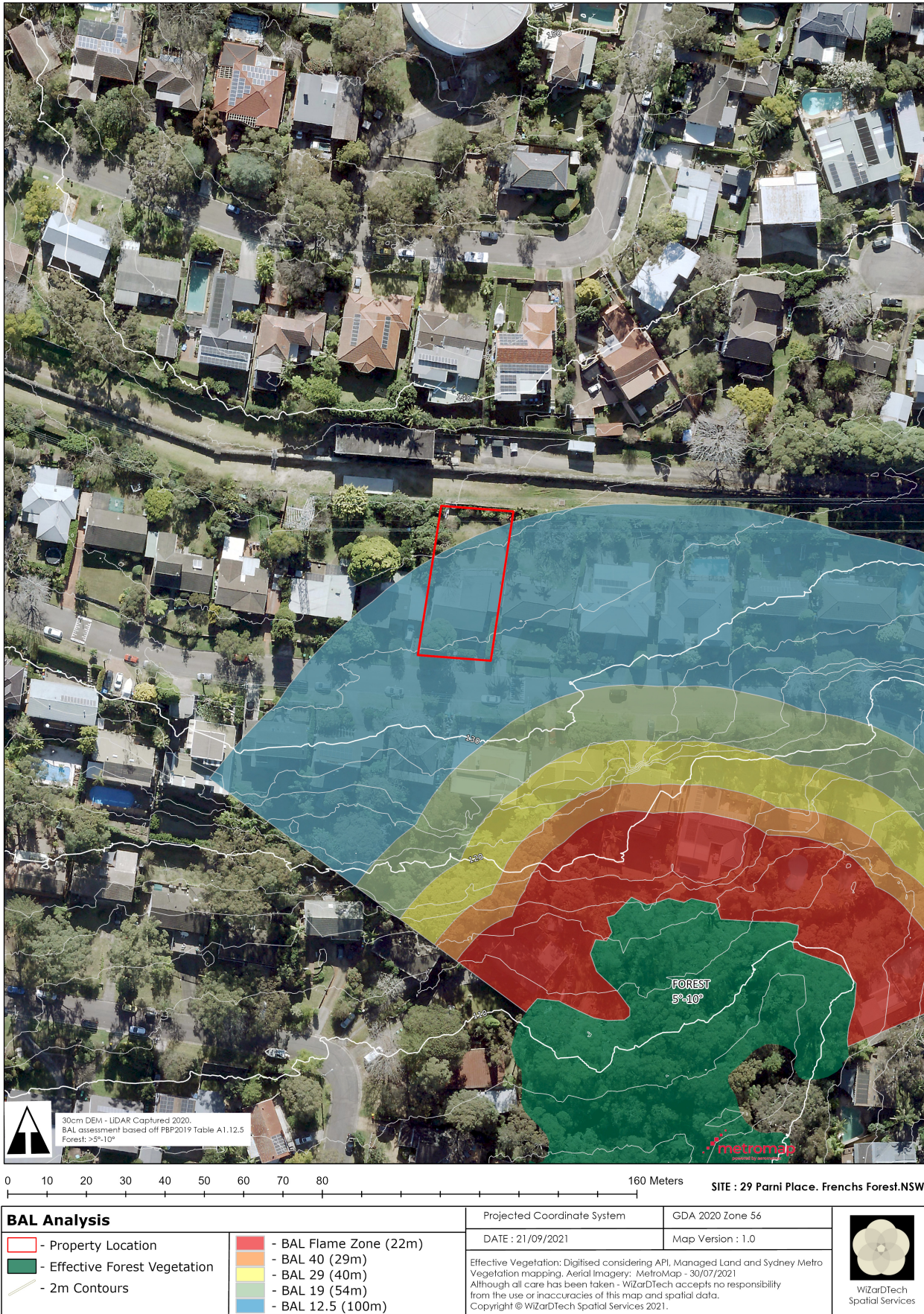


Figure 7 Bushfire Attack Levels

13. Bush Fire Protection Measures for Infill Development

The specifications and requirements for Bush Fire Protection Measures for Infill Development are to:

minimise the risk of bush fire attack and provide protection for emergency services personnel, residents and others assisting firefighting activities.

The performance requirements and solutions are provided in Table 3.

Table 3: Performance Criteria and compliance.

	Performance Criteria	Evidence	Complies
Asset Protection Zones	APZs are provided commensurate with the construction of the building.	APZ are provided in accordance with A1.12.5 (BAL-12.5)	YES
	A defensible space is provided.	Provided as part of APZ	YES
	APZs are managed and maintained to prevent the spread of a fire to the building.	Entire site will be an IPA in accordance with Appendix 4 of PBP 2019	YES
	the APZ is provided in perpetuity.	APZ are provided through adjoining development	YES
	APZ maintenance is practical, soil stability is not compromised and the potential for crown fires is minimised.	APZ are on slopes less than 18 Degrees	YES
Access	Firefighting vehicles are provided with safe, all-weather access to structures and hazard vegetation.	Direct public road access via Parni Place	YES
	The capacity of access roads is adequate for firefighting vehicles.	Parni Place is a sealed Public Road	YES
	There is appropriate access to water supply.	Hydrants are within the street and will not be altered as part of the application.	YES
	Firefighting vehicles can access the dwelling and exit the property safely.	Urban area with clear path between all external part of the dwelling and the nearest part of the public road	YES
Water Supplies	An adequate water supply is provided for firefighting purposes.	Existing reticulated water supply	YES
	Water supplies are located at regular intervals.	Existing reticulated water supply	YES
	The water supply is accessible and reliable for firefighting operations.	Existing reticulated water supply	YES
	Flows and pressure are appropriate.	Existing reticulated water supply	YES
	The integrity of the water supply is maintained.	Existing reticulated water supply	YES

Performance Criteria		Evidence	Complies
	A static water supply is provided for firefighting purposes in areas where reticulated water is not available.	Existing reticulated water supply	YES
Services	Location of electricity services limits the possibility of ignition of surrounding bush land or the fabric of buildings.	The existing electrical supply limits the possibility of ignition	YES
	Location and design of gas services will not lead to ignition of surrounding bushland or the fabric of buildings.	Any new gas services are to be installed and maintained in accordance with AS/NZS 1596:2008.	YES
Construction	The proposed building can withstand bush fire attack in the form of embers, radiant heat and flame contact.	BAL is determined in accordance with Tables A1.12.5 (BAL-12.5)	YES
	Proposed fences and gates are designed to minimise the spread of bush fire.	No fences or gates are proposed	YES
	Proposed Class 10a buildings are designed to minimise the spread of bush fire.	NA	YES
Landscaping	Landscaping is designed and managed to minimise flame contact and radiant heat to buildings, and the potential for wind-driven embers to cause ignitions.	Will comply with the NSW RFS "Asset protection zone standards"	YES

14. Access

The site is located within an existing residential area which has adequate access through the public road network. The site has direct access to Parni Place and occupants to leave the area in a direction away from the Bushfire Prone Land to the south of the site. Access complies with PBP 2019.

15. Water Supply

The subject land is serviced by a reticulated water supply and has hydrants located within Parni Place. Water supplies comply with PBP 2019.

16. Gas and electrical supplies

The site is serviced by an existing electrical supply which does not provide an ignition issue for the surrounding bushland or the fabric of building.

Any new gas services are to be installed and maintained in accordance with AS/NZS 1596:2008 *The storage and handling of LP gas* (Standards Australia, 2008).

17. PBP Specific Objectives

PBP provides Specific Objectives for Infill development (Section 4.3.2). Table 3 is an assurance approach using expert judgement.

Table 3: Specific Objectives for Infill Development.

Specific Objective for Infill	Compliance	Comment
Provide a defensible space to enable unimpeded access for firefighting around the building.		The risk to adjoining lands is not increased.
Provide better bush fire outcomes on a redevelopment site than currently exists, commensurate with the scale of works proposed.		The new dwelling will comply with AS3959.
Design and construct buildings commensurate with the bush fire risk.		The new dwelling will be built in accordance with AS3959 BAL-12.5.
Provide access, services and landscaping to aid firefighting operations.		Direct access provided through existing public road network.
Not impose an increased bush fire management and maintenance responsibility on adjoining landowners.		APZ are provided within the site and by existing residential development.
Increase the level of bush fire protection to existing dwellings based on the scale of the proposed work and level of bush fire risk.		The new dwelling will comply with AS3959 and the requirements of PBP 2019.

18. Recommendations

The following recommendation has been made within this report to ensure the proposed alterations and additions are compliant with Section 4.14 of the EPA Act and *Planning for Bush Fire Protection 2019*:

Recommendation 1 – The entire site is to be maintained as an Inner Protection Area (IPA) in accordance with Appendix 4 of PBP 2019 and the NSW RFS “Asset protection zone standards”.

Recommendation 2 – The alterations and additions are to be constructed in accordance with BAL-12.5 of Australian Standard AS 3959-2009 *Construction of buildings in bushfire-prone areas* (AS 3959-2018).

19. Conclusion

This assessment has demonstrated that the proposed dwelling can comply with *Planning for Bush Fire Protection 2019*. The recommendations have been provided to ensure compliance with *Planning for Bush Fire Protection 2019*.

Given the assessment and recommendations, the development conforms to the relevant specifications and requirements of PBP 2019 and this report constitutes a certificate by a person who is recognised by the NSW RFS as a qualified consultant in bush fire risk assessment. A referral to the NSW RFS is therefore not required.



Lew Short | Principal

Blackash Bushfire Consulting

B.A., Grad. Dip. (Design for Bushfires), Grad. Cert. of Management (Macq), Grad. Cert. (Applied Management), BA (Resource & Environmental Management)

Fire Protection Association of Australia Level 3 BPAD 16373



Appendix 1: References

NSW Rural Fire Service (RFS). 2019. *Planning for Bush Fire Protection: A Guide for Councils, Planners, Fire Authorities and Developers*.

Standards Australia. 2005. *Fire hydrant installations - System design, installation and commissioning*, AS 2419.1, Fourth edition 2005, SAI Global, Sydney.

Standards Australia. 2008. *The storage and handling of LP Gas*, AS/NZS 1596:2008, Fourth edition 2005, SAI Global, Sydney.

Standards Australia. 2018. *Construction of buildings in bushfire-prone areas*, AS 3959-2018. SAI Global, Sydney.