



# Bushfire Safety Solutions



**BAL Risk Assessment Report**

**Proposed New Second Dwelling  
232 – 259 Llandilo Road  
Berkshire Park NSW 2747**

**Date: August 2012**

**Report No: 2012/152B**

**Client:**

**Mr. & Mrs. Zammit  
232 – 259 Llandilo Road  
Berkshire Park NSW 2747**

*Bushfire Safety Solutions is a Corporate Member of the Fire Protection Association of Australia*



***Bushfire Assessment Specialists***

## BAL RISK ASSESSMENT REPORT

Prepared in accordance with  
AS 3959 – 2009  
&  
Planning for Bushfire Protection 2006 Chapter 4.

**Applicant Details:** Mr. & Mrs. Zammit  
**Applicant Address:** 232 - 252 Llandilo Road Berkshire Park NSW  
2747  
**Date of Final BAL Risk Assessment:** 11 August 2012  
**BAL Risk Assessment Property Address:** Lot 4 D.P. 510842 No 232 – 252 Cnr Llandilo  
Road and Sixth Avenue Berkshire Park NSW  
2747

### BAL Risk Levels

**Eastern Elevation**  $\leq 2.27\text{kW/m}^2$  BAL LOW as per design fire site modeling.  
**Southern Elevation**  $\leq 2.27\text{kW/m}^2$  BAL LOW as per design fire site modeling.  
**Northern Elevation**  $\leq 2.27\text{kW/m}^2$  BAL LOW as per design fire site modeling.  
**Western Elevation**  $\leq 2.27\text{kW/m}^2$  BAL LOW as per design fire site modeling.

**Issued by:** Steve Parrott  
FPA Accredited BPAD – A  
Bushfire Design No 16761  
Dated 11 August 2012

**Signed:**  STEVE PARROTT

**Dated:** 11 August 2012



# BAL Risk Assessment Report

## No. 232 – 252 Llandilo Road Berkshire Park

### Bushfire Risk Assessment Method

Assessment Method 2 as per the requirements of AS 3959 – 2009 has been used in this BAL assessment.

Assessment Method 2 provides for a site specific and accurate determination of the hypothetical radiant heat flux levels a bushfire could be expected to generate under certain environmental conditions.

***Please note that Assessment Method 2 is an approved methodology for bushfire risk assessment as per AS3959 – 2009.***

### BAL Risk Assessment - Discussion

An application was received for a BAL risk assessment for proposed new second dwelling at Lot4 DP 510842 No. 232 - 252 Cnr Llandilo Road and Sixth Avenue Berkshire Park. The assessment examined the compliance provisions in Planning for Bushfire Protection 2006 regarding asset protection zones and general bushfire protection to enable a Bushfire Authority to be issued by the NSW Rural Fire Service in accordance with s79BA of the Environmental Planning and Assessment Act 1979 for the proposed second dwelling.

The BAL risk assessment of the site has been determined using information provided by the Client, an assessment of local bushfire hazards that are in proximity to the proposed development and bushfire prone land mapping compiled by Penrith City Council.

### Documents Referenced

- Architectural Plans prepared by Branvel Developments Pty Ltd dated 15/06/2012;
- Detailed site inspection dated 1 August 2012;
- Penrith City Council Bushfire Prone Land Maps;
- Planning for Bushfire Protection (NSW RFS) 2006;
- NBC Bushfire Attack Computer Modeling Program (V2.1) 2011.

## **Dwelling Design**

The proposed second dwelling is to be located on the eastern side of an existing dwelling within a rural residential locality.

Vehicle entrance to the second dwelling is directly off Sixth Avenue.

The lot is currently managed to comply with the requirements of the Planning for Bushfire Protection 2006 for asset protection zones to an “Inner Protection Zone” standard.

Combustible fuel level are not to exceed 5t/ha within the landscaped areas of the property.

The maximum BAL level determined for the dwelling will be recommended to be applied to all elevations.

## **Design Fire Methodology – Assessment Method 2 (AS3959 – 2009)**

The Council Bushfire Prone Land Map indicates that the bushfire threat exposure is to the western aspect within the Castlereagh Nature Reserve.

The orientation of the proposed new dwelling is such that the bushfire threat exposure to the new dwelling is considered to be low. The overall separation distance will exceed the maximum distance to warrant a credible bushfire threat to the proposed dwelling.

The subject lot is located within an area that is predominantly rural land use to the west, south and east, whilst to the north, the predominant development category is residential.

Site slope is approximately 2<sup>0</sup> up slope to the south east at the side of the lot.

Ground slope is approximately 2<sup>0</sup> under the bushfire prone vegetation to the south western aspect.

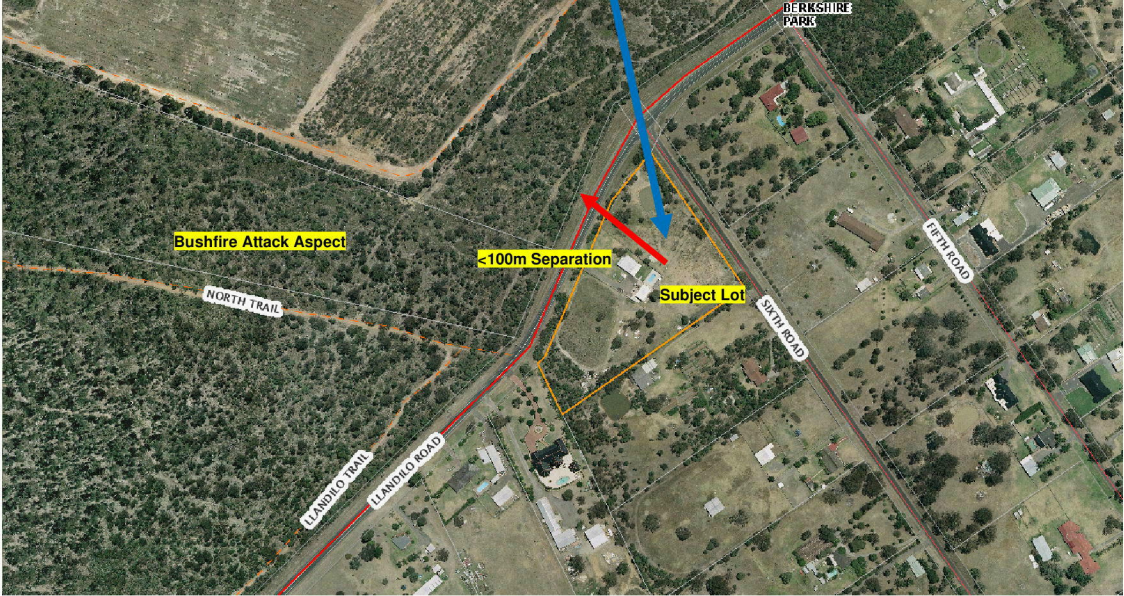
Fuel source is deemed “Woodland” within the Castlereagh Nature Reserve.

Adjoining land holdings are managed rural properties, with a low bushfire threat level to the proposed development.

The overall separation distance of the proposed dwelling to the closest bushfire prone vegetation is greater than 100m to the western aspects.

The separation distance is generally with that portion of the subject lot that falls outside of the designated bushfire buffer zone.

Bushfire Prone Land Map of General Area



Subject Site – 232 – 252 Cnr Llandilo Road & Sixth Avenue

The existing Bushfire Prone Land Map indicates the subject development site to be within the designated “Bushfire Buffer Zone” however the siting of the proposed dwelling is approximately 105m beyond the mapped remnant bushfire prone vegetation interface to the west within the Castlereagh Nature Reserve.



Proposed Building Location –Lot 4 No 232 – 252 Cnr Llandilo Rd & Sixth Ave

Design Fire 1 – South Western Run 1



**NBC Bushfire Attack Assessment Report V2.1**

AS3959 (2009) Appendix B - Detailed Method 2

Print Date: 11/08/2012 Assessment Date: 11/08/2012

Site Street Address: 232 Llandilo Road, Berkshire Park  
 Assessor: Steve Parrott, Bushfire Safety Solutions  
 Local Government Area: Penrith 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: Western Run 1

Vegetation Information

Vegetation Type:	Woodland	Vegetation Group:	Forest and Woodland
Vegetation Slope:	2 Degrees	Vegetation Slope Type:	Downslope
Surface Fuel Load(t/ha):	15	Overall Fuel Load(t/ha):	25

Site Information

Site Slope	2 Degrees	Site Slope Type:	Downslope
Elevation of Receiver(m)	Default	APZ/Separation(m):	105

Fire Inputs

Veg./Flame Width(m):	100	Flame Temp(K)	1090
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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:	VERY LOW	Peak Elevation of Receiver(m):	4.5
Level of Construction:	BAL LOW	Fire Intensity(kW/m):	26690
Radiant Heat(kW/m2):	2.27	Flame Angle (degrees):	84
Flame Length(m):	16.43	Maximum View Factor:	0.042
Rate Of Spread (km/h):	2.07	Inner Protection Area(m):	105
Transmissivity:	0.72	Outer Protection Area(m):	0

Design fire aspects, contours and proposed dwelling location are highlighted in relation to the proposed bushfire threats and subsequent radiant heat flux exposure levels.

Based on the topography of the subject site, the BAL LOW rating is deemed to be applicable to the each elevation.

## Bushfire Compliance Table – No. 232 – 252 Cnr Llandilo Road & Sixth Ave Berkshire Park

PBP 2006 Performance Criterion	Performance Solution
<b>In relation to asset protection zones:</b>	
<ul style="list-style-type: none"><li>A defensible space is provided on site.</li></ul>	Minimum APZ located within lot – to IPA standard. Site conditions allow for minimal APZ. A defensible space is available to the front and rear portions of the dwelling.
<ul style="list-style-type: none"><li>An asset protection zone is provided and maintained for the life of the development.</li></ul>	APZ within lot is fully cleared and landscaped. Exposed building elements to be screened to prevent ember entry to building.
<b>In relation to siting and design:</b>	
<ul style="list-style-type: none"><li>Buildings are sited and designed to minimize the risk of bush fire attack</li></ul>	<p>Proposed dwelling sited to a hypothetical BAL radiant heat flux (RHF) exposure level of 2.27kW/m<sup>2</sup> for the western building elevation.</p> <p>Windows and doors are recommended to be screened to protect against ember attack from each aspect.</p>
<b>In relation to construction standards:</b>	
<ul style="list-style-type: none"><li>It is demonstrated that the proposed building can withstand bush fire attack in the form of wind, smoke, embers, radiant heat and flame contact.</li></ul>	<p>The proposed dwelling is to be constructed to equivalent BAL LOW construction standards to AS3959 – 2009. BAL LOW does not have any building requirements for bushfire protection.</p> <p>Embers and radiant heat will be managed by the installation of steel screens to all exposed windows and doors.</p>
<b>In relation to access requirements:</b>	
<ul style="list-style-type: none"><li>Safe, operational access is provided (and maintained) for emergency services personnel in suppressing a bush fire while residents are seeking to relocate, in advance of a bush fire.</li></ul>	<p>Site access is on the northern side adjacent to the bushfire hazard aspect.</p> <p>Main access located on the northern elevation of dwelling away from the bushfire prone vegetation aspect.</p> <p>The property has direct street access off Sixth Ave.</p>
<b>In relation to water and utility services:</b>	
<ul style="list-style-type: none"><li>Adequate water and electricity services are provided for firefighting operations.</li></ul>	<p>A reticulated water supply is connected to the property.</p>
<ul style="list-style-type: none"><li>Gas and electricity services are located so as not to contribute to the risk of fire to a building.</li></ul>	<p>Electricity utility services are existing services provided to the general locality.</p>
<b>In relation to landscaping:</b>	
<ul style="list-style-type: none"><li>It is designed and managed to minimize flame contact and radiant heat to buildings, and the potential for wind driven embers to cause ignitions.</li></ul>	<p>All landscaping will be kept to an IPA standard of construction and external garden beds to be located off the external curtilage of the second dwelling.</p>

## Recommended Conditions for BAL Risk Assessment

1. Asset protection zone to be an inner protection zone for the whole of the open space surrounding the proposed second dwelling;
2. The APZ is to be constructed to an “Inner Protection Zone” standard of construction and achieve a maximum of 5t/ha of residual combustible fuel loading at any one time.
3. New second dwelling to be constructed to a **BAL LOW** construction standards (AS3959 – 2009). It is noted that BAL LOW does not have any bushfire construction requirements.

## Summary

The proposed development is located within an area that is designated as being bushfire prone. The proposed second dwelling is capable of being protected against local bushfire impacts in accordance with the requirements of Chapter 4, Clause 4.3 as outlined in Planning for Bushfire Protection 2006.

## Conclusion

In accordance with the requirements of the *deem to satisfy* construction requirements of AS3959 – 2009, and *Planning for Bushfire Protection 2006*, I certify that the proposed development, if constructed in accordance with the BAL rating for this lot will generally comply with BAL LOW risk assessment with a maximum radiant heat flux emission level of 2.27kW/m<sup>2</sup> to each aspect.

Signed:  Dated: 11 August 2012  
Steve Parrott – FPA Accredited Practitioner – A  
No. 16761

## Bushfire Safety Solutions



View to the East of Subject Development



**BAL LOW Elevations**





**BAL LOW Elevations**



**BUSHFIRE RISK ASSESSMENT CERTIFICATE**

THIS FORM HAS BEEN COMPLETED BY A RECOGNISED CONSULTANT IN BUSHFIRE RISK ASSESSMENT IN ACCORDANCE WITH SECTION 79BA 1(b) OF THE ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979 NO 203.

**PROPERTY ADDRESS:** Lot 4 DP 510842 No. 232 – 252 Cnr Llandilo Road & Sixth Avenue Berkshire Park

**DESCRIPTION OF PROPOSAL:** Proposed New Second Dwelling

**TYPE OF APPLICATION:** DA/CC Application

**PLAN REFERENCES:** Branvel Developments Pty Ltd Drawings 1 – 6 Revision B dated 15/06/2012.

**BAL RATING:** BAL LOW

**DOES THE PROPOSAL RELY ON ALTERNATE SOLUTIONS:** YES **NO**

I **Steve Parrott** of **Bushfire Safety Solutions** have carried out a bushfire risk assessment on the above mentioned proposal and property. A detailed Bushfire Assessment Report is attached which includes the submission requirements set out in Appendix 4 of Planning for Bushfire Protection 2006 together with recommendations as to how the relevant specifications and requirements are to be achieved.

**REPORT REFERENCE:** 2012/152B

**REPORT DATE:** 11 August 2012

**CERTIFICATION NO/ACCREDITED SCHEME:** Fire Protection Association Aust BPAD – A No. 16761

I hereby certify, in accordance with 79BA of the Environmental Planning and Assessment Act 1979 No 203:

1. That I am a person recognised by the NSW Rural Fire Service as a qualified consultant in bushfire risk assessment;
2. That subject to the recommendations contained in the attached Bushfire Risk Assessment Report the proposed development generally complies with the relevant specifications and requirements as outlined below;
3. I am aware that this Bushfire Assessment Report, prepared for the above mentioned site is to be submitted in support of a Development Application/Complying Development Certificate for this site and will be relied upon as the basis for ensuring that the bushfire compliance requirements of the proposed development have been addressed in accordance with Planning for Bushfire Protection 2006, the Building Code of Australia (as applicable) and the construction requirements of AS3959 – 2006; and,
4. Where the assessment is described as a “Complying Development Certificate” application, the Report has been prepared in accordance with State Environmental Planning Policy (Exempt and Complying Development Codes) 2008, Division 1, Subdivision 9, Clause 3.36B.

**SIGNATURE:**



**DATE:** 11 August 2012

Note: This certificate has been completed and signed by a person recognised by the NSW Rural Fire Service as a qualified consultant in bush fire risk assessment in accordance with 79BA of the EP&A Act 1979 No 203.

**This form has been prepared by Bushfire Safety Solutions for attachment to Bushfire Assessment Report No. 2012/152B**

## **Conditions of Use**

This BAL assessment is copyright protected and can only be utilised by the Client for the purposes of this development proposal and is not available for use or to be copied in any form by others not authorised by **Bushfire Safety Solutions**.

This BAL assessment has been prepared in accordance with the Deemed to Satisfy (DTS) compliance provisions of each relevant NSW regulatory requirement.

**It is a condition that the use of this Report is only vested in the Client upon final payment of the Certificate fee.**

The recommendations provided in the assessment respond to the requirements of Planning for Bushfire Protection 2006. The recommendations provide a guideline to both the relevant consent authority and the New South Wales Rural Fire Service as to how the proposed development can comply with the provisions of AS 3959 – 2009 and Planning for Bushfire Protection 2006.

## **Disclaimer**

This BAL assessment is provided in good faith and is based on information supplied for the development by the Client.

Bushfire behaviour is an unpredictable phenomenon and is often erratic under extreme weather conditions.

All care has been taken in the preparation of this BAL assessment and recommendations provided therein. Site conditions, vegetation regrowth and maintenance of asset protection zones are not regulated and therefore may not be maintained in perpetuity to ensure adequate separation between the assets and the bushfire prone vegetation.

**Bushfire Safety Solutions** accepts **no** liability for any ongoing bushfire threat to the property or maintenance of the bushfire protection measures provided to the development.

It is the responsibility of the owner of the property to maintain bushfire protection of the property at all times.

Active and passive bushfire protection measures require ongoing maintenance and diligence to ensure adequate bushfire protection.