

BUSHFIRE ASSESSMENT REPORT

FOR A DETACHED DUAL OCCUPANCY

Lot 4 in DP 241962.
1275 Lismore Rd, Clunes.

PREPARED BY: LANDUSE

A.B.N.: 95 020 786 142

ADDRESS: PO Box 204 The Channon, NSW 2480.

PHONE & FAX: 02) 66886453

MOBILE: 0419 420362

EMAIL: EMAIL: landusebushfire@gmail.com

TECHNICAL STAFF: JJ Bruce B.App.Sc. (Hons.). Grad.Dip. Bushfire Protection

PREPARED FOR: Emma Hansford.

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SUMMARY

- A Detached Dual Occupancy (class 1a building) is proposed on an existing holding which includes Lot 12 DP 241962, Lot 4 DP 241962 and Lot 1 DP 400475. The 2.7ha holding is on land zoned RU2 – Rural Landscape.
- The property on which this development is proposed, is mapped as within category 3 bushfire vegetation.
- Bushfire assessment detailed in Section 2 of this report indicates a Bushfire Attack Level (BAL) of BAL-12.5 with the specified Asset Protection Zone (APZ).
- Bushfire protection measures are addressed in Section 3 of this report and corresponding performance criteria are required to be implemented in accordance with Appendix 1-1 to 1-5.
- Additionally, as addressed in this report, consideration has been given to the following:
 - Clearing will be required to instate the APZ however this can be achieved by removal of exotic species only.
 - APZ non-compliance: As detailed in section 3.1.1 Lot 4-/241962 and Lot 1-/400475 within the existing holding are to be amalgamated, to ensure that the APZ acceptable solution “APZs are wholly within the boundaries of the development site” can be achieved.

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LIST OF ACCRONYMS

AS	Australian Standard
APZ	Asset Protection Zone
BAL	Bushfire Attack Level
BCA	Building Code of Australia
IPA	Inner Protection area (Part of the APZ)
NCC	National Construction Code
NSW	New South Wales
PBP	Planning for Bushfire Protection

1 INTRODUCTION

This Bushfire Assessment Report has been conducted at the behest of E. Hansford and has been prepared to support an application for approval of the developments bushfire protection under Section 4.14 of the Environmental Planning and Assessment Act (EP&A, 1997). Bushfire protection measures are in accordance with Planning for Bushfire Protection (PBP, 2019) and the Building code of Australia (ABCB, 2019) referring Australian Standard 3959 (AS3959, 2018).

1.1 AIMS AND OBJECTIVES

The Aim of this Bushfire Assessment Report is to address planning controls for this development, to provide for the protection of human life and to minimise impacts on property from the threat of bushfire, while having due regard to development potential, on-site amenity and protection of the environment.

General objectives are to:

- afford buildings and their occupants protection from exposure to a bush fire;
- provide for a defendable space to be located around buildings;
- provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent the likely fire spread to buildings;
- ensure that safe operational access and egress for emergency service personnel and occupants is available;
- provide for ongoing management and maintenance of Bushfire Protection Measures; and
- ensure that utility services are adequate to meet the needs of firefighters.

2 BUSHFIRE ASSESSMENT

2.1 DEVELOPMENT AND SITE DESCRIPTION

The development proposal is for a detached dual occupancy (Class 1a Building). There is an existing house (Class 1a) and shed (Class 10a) on the property, which are not part of this assessment as they are greater than 6m from the proposed development. The proposed development is located on an existing 2.7ha holding which includes Lot 12/-/241962, Lot 4/-/241962 and Lot 1/-/400475, accessed from 1275 Lismore Rd, Clunes and is located on land zoned RU2 – Rural Landscape (NSWPP, 2022).

The proposed development constitutes an increased residential density for the allotment and therefore the principles and criteria associated with subdivisions in bush fire prone areas apply in accordance with 8.2.1 of PBP (PBP, 2019).

The subject holding is mapped as being within Category 3 bushfire prone vegetation (NSWPP, 2022) and is characterised by cleared and mown areas on ridge lines where land has a lower slope. Ridge side slopes are vegetated with exotic vegetation with >70% canopy cover, with some natural rainforest recruitment in these areas.

Features of the site and surrounding land which are expected to mitigate the effect of high intensity bushfire on the development include:

- There is a high proportion of cleared (grazing) and intensively managed (macadamia plantation) land use on surrounding land.
- Bushfire prone vegetation is fragmented and disconnected within the surrounding landscape.

2.1.1 Environmental considerations

Desktop study did not find any environmental considerations in or surrounding the property which could be affected by the proposed Bushfire Protection Measures (NSWPP, 2022, NSWBVM, 2022, NSWNVR, 2022).

Vegetation removal will be required to instate the APZ however this can be achieved by removal of exotic species only, and therefore will not have a negative effect on the local environment..

It is outside the scope of this report to conduct detailed assessment of threatened species, populations, endangered ecological communities and critical habitat, or sites of cultural and or heritage significance, or to provide specialist geotechnical advice. Any clearing of native vegetation associated with the formation or maintenance of the APZ is to be done with relevant approvals

2.2 BUSHFIRE ATTACK LEVEL

Bushfire Attack Level (BAL) assessment map is shown in Appendix 2-1(a). Table 1 details BAL assessment which has been determined using the simplified procedure (method 1) in accordance with Section 2 of AS3959 (AS3959, 2018) and Appendix 1 of PBP (PBP, 2019).

2.2.1 Relevant Fire Danger Index (FDI):

The subject site has an assumed 1:50yr FFDI of 80 in accordance with Table 2.1 of AS3959.

2.2.2 Classification of bushfire prone vegetation:

Bushfire prone vegetation has been classified in accordance with Table 2.3 of AS3959 and A1.3 and 7.9 of PBP.

2.2.3 Distance from classified bushfire prone vegetation

Current and proposed APZ distance from classified bushfire prone vegetation have been determined in accordance with 2.2.5 of AS3959.

2.2.4 Effective slope:

Effective slope has been determined in accordance with 2.2.5 of AS3959 and A1.4 & A1.5 of PBP.

2.2.5 Bushfire Attack Level (BAL)

The development is expected to be exposed to a heat flux of no greater than 12.5kW/m² Table 1 details proposed APZ and predicted BAL's for the development.

Table 1. Secondary dwelling BAL assessment

Direction (transect)	Bushfire Veg. Class. (distance)	Effective Slope	Proposed APZ	Bushfire Attack Level (BAL)
N (0°)	Grassland (45m)	Downslope 5-10°	23m To boundary	BAL-12.5*
E (90°)	Rainforest † (65m)	Downslope 5-10°	65m	BAL-12.5
SE (45°)	Rainforest † (5m)	Downslope 0-5°	30m	BAL-12.5
S (180°)	Rainforest † (7m)	Downslope 5-10°	34m	BAL-12.5
SW (215°)	Rainforest † (10m)	Downslope 0-5°	30m	BAL-12.5
W (270°)	Rainforest † (80m)	Downslope 0-5°	25m	BAL-LOW

* The Distance to bushfire prone vegetation, not proposed APZ has been used to determine BAL.

† Bushfire vegetation class determined in accordance with exotic vegetation conversion Table A1.9 of AS3959.

3 BUSHFIRE PROTECTION MEASURES

Bushfire Protection Measures (BPM's) are addressed in this section of the report.

3.1 ASSET PROTECTION ZONE

Asset protection zone performance criteria are to be achieved by implementing acceptable solutions detailed in Appendix 1-1.

Note: Clearing will be required to instate the APZ however this can be achieved by removal of exotic species only and it is recommended that native rainforest vegetation is maintained as part of the 15% canopy cover allowed within the APZ.

The APZ, shown in Appendix 2-1(b), is to be maintained for the life of the development in accordance with Appendix 2.2 and the monitoring and fuel management program in Table 2.

Table 2. Monitoring and fuel management program.		
Area	Management Method	Timing
APZ	Minimise fine ground fuels. By mowing, slashing, brush cutting, raking and picking up sticks.	Monthly in spring and summer.
	Remove all branches within 2m of ground. And maintain 2-5m canopy separation	Annual inspection in August with work to be conducted by 1 st October
	Selective planning and maintenance of vegetation to achieve overall canopy cover of 15%.	

3.1.1 APZ Non-compliance

The nominated APZ extends over the boundary of Lot 4/-/DP241962 and Lot 1/-/DP400475 which could be seen to conflict with the performance criteria “The APZs is provided in perpetuity”, as it prevents the acceptable solution “APZs are wholly within the boundaries of the development site”, from being implemented. It is recommended that these 2 allotments, are amalgamated to achieve APZ performance criteria.

3.2 CONSRUCTION

3.2.1 Detached Dual Occupancy

Construction performance criteria are to be achieved by implementing acceptable solutions detailed in Appendix 1-2. The proposed Detached Dual Occupancy is a relocated house which is required to be sited and retrofitted to conform to BAL-12.5 construction, which is detailed in Appendix 1-6.

3.2.2 Existing House

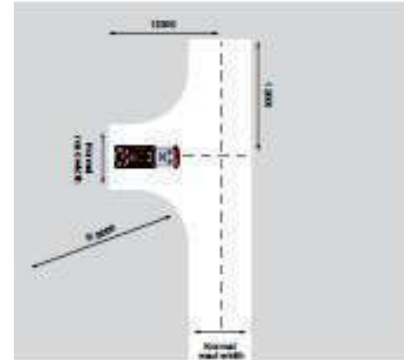
Alterations and additions were made to the existing house with final occupancy certificate issued 20/1/2017 (Byron council DA tracker). It is assumed that bushfire conditions were implemented as part of this development application. The house was not assessed as part of this bushfire assessment.

3.2.3 Existing Shed

The existing shed is >6m from the proposed detached dual occupancy and therefore has no bushfire construction requirements.

3.3 ACCESS

Access performance criteria are to be achieved by implementing acceptable solutions detailed in Appendix 1-3. A Type C vehicle turning head, shown here, is to be instated, in the location shown in Appendix 2-1(b).



3.4 WATER SUPPLY AND UTILITIES

3.4.1 Water supply

Water supply performance criteria are to be achieved by implementing acceptable solutions, detailed in Appendix 1-4. A 20kl firefighting reserve is required. A riser with storz outlet is to be installed within 4m of hardened driveway surface so it is accessible by trucks. Appendix 2-1(b) shows the location of the nominated firefighting reserve and Storz outlet.

3.4.2 Electricity services

Electricity services performance criteria are to be achieved by acceptable solutions detailed in Appendix 1-4.

3.4.3 Gas services

Gas services performance criteria are to be achieved by acceptable solutions detailed in Appendix 1-4.

3.5 LANDSCAPING

Landscaping performance criteria are to be achieved by implementing acceptable solutions detailed in Appendix 1-5. Refer to Appendix 2-1(b) for APZ specifications and Table 2 for monitoring and fuel management program.

3.6 EMERGENCY MANAGEMENT / BUSHFIRE SURVIVAL PLAN

Occupants of this residence are to develop a bushfire survival plan in accordance with NSW RFS guidelines <https://www.rfs.nsw.gov.au/resources/bush-fire-survival-plan>. using the following four simple steps.

STEP 1: DISCUSS WHAT TO DO IF A BUSH FIRE THREATENS YOUR HOME.

Many households find that having a discussion over dinner works best as everybody is together and focussed.

STEP 2: PREPARE YOUR HOME AND GET IT READY FOR BUSH FIRE SEASON.

There are simple things you can do around your home to prepare it for a bush fire, like keeping the grass low and having a cleared area around your home.

STEP 3: KNOW THE BUSH FIRE ALERT LEVELS.

If there is a fire in your area you will find its alert level on the NSW RFS website and in the 'Fires Near Me' app. You need to keep track of the alert level so you know what you should do.

STEP 4: KEEP ALL THE BUSH FIRE INFORMATION NUMBERS, WEBSITES AND THE SMARTPHONE APP.

In a bush fire, it's important that you stay up to date on conditions in your area.

4 CONCLUSIONS

The proposed development is capable of complying with approval considerations under Section 4.14 of the Environmental Planning and Assessment Act (EP&A, 1997) and is therefore eligible for approval with conditions that Performance Criteria are implemented as prescribed in accordance with this report and with the following special consideration:

- Lot 4/-/241962 and Lot 1/-/400475 within the existing holding are to be amalgamated, to ensure that the APZ acceptable solution “APZs are wholly within the boundaries of the development site” is achieved.

5 REFERENCES

ABCB. (2019) National Construction Code, Building Code Of Australia. Volume 2; Class 1 and 10 Buildings. Amendment 1. Australian Building Codes Board. Canberra, ACT.

AS3959. (2018) AS 3959:2018. Construction of buildings in bushfire-prone areas. Standards Australia International Ltd. Sydney. NSW.

EP&A. (1997) Environmental Protection and Assessment Act 1979 No 203. NSW Consolidated Acts. NSW.

NSWBVM. (2022) Biodiversity Values Map and Threshold Tool. NSW Government.
<https://www.lmbc.nsw.gov.au/Maps/index.html?viewer=BOSETMap>.

NSWNVR. (2022) The Native Vegetation Regulatory (NVR) Map. NSW Government.
<https://www.lmbc.nsw.gov.au/Maps/index.html?viewer=NVRMap>.

NSWPP. (2022) New South Wales Government Planning Portal.
<https://www.planningportal.nsw.gov.au>.

PBP. (2019) Planning for Bushfire Protection 2019. NSW Rural Fire Service.

APPENDIX 1-1. ASSET PROTECTION ZONES (APZ) PERFORMANCE CRITERIA AND ACCEPTABLE SOLUTIONS

APZ Performance Criteria (Table 5.3a – PBP 2019)	Acceptable solutions	Note C = Compliance required. NC = Not compliant NA = Not applicable
Potential building footprints must not be exposed to radiant heat levels exceeding 29 kW/m ² on each proposed lot.	APZs are provided in accordance with Tables A1.12.2 and A1.12.3 based on the FFDI.	C. Nominated APZ complies, See Table 1 and Appendix 2-1.
APZs are managed and maintained to prevent the spread of a fire towards the building.	APZs are managed in accordance with the requirements of Appendix 4 of PBP.	C. Appendix 4 of PBP is attached as Appendix 2-2 of this report.
The APZs is provided in perpetuity.	APZs are wholly within the boundaries of the development site.	NC. Nominated APZ extends over Lot boundary within the holding – refer to 3.1.1. of report.
APZ maintenance is practical, soil stability is not compromised and the potential for crown fires is minimised.	APZ are located on lands with a slope less than 18 degrees.	C. Nominated APZ complies.

APPENDIX 1-2. CONSTRUCTION PERFORMANCE CRITERIA AND ACCEPTABLE SOLUTIONS

Buildings in bushfire prone areas Performance Criteria (P2.7.5 - NCC volume 2 2019)	Acceptable solutions (P3.10.5 – NCC volume 2 2019)	Note C = Compliance required. NC = Not compliant NA = Not applicable
<p>A Class 1 building or a Class 10a building or deck associated with a Class 1 building that is constructed in a designated bushfire prone area must, to the degree necessary, be designed and constructed to reduce the risk of ignition from a bushfire, appropriate to the:</p> <p>(a) potential for ignition caused by burning embers, radiant heat or flame generated by a bushfire; and</p> <p>(b) intensity of the bushfire attack on the building.</p>	<p>Performance Requirement P2.7.5 is satisfied, for:</p> <p>(a) a Class 1 building; or</p> <p>(b) a Class 10a building or deck associated with a Class 1 building located in a designated bushfire prone area, if it is constructed in accordance with the following:</p> <p>(c) AS 3959 except:</p> <p>(i) as amended by Planning for Bush Fire Protection; and</p> <p>(ii) for Section 9 for Bushfire Attack Level FZ (BAL-FZ).</p> <p>(d) NASH Standard – Steel Framed Construction in Bushfire Areas except:</p> <p>(i) as amended by Planning for Bush Fire Protection; and</p> <p>(ii) for buildings subject to Bushfire Attack Level FZ (BAL-FZ).</p> <p>(e) the requirements of (c), or (d) above as modified by the development consent following consultation with the NSW Rural Fire Service under section 4.14 of the Environmental Planning and Assessment Act 1979 if required; or</p> <p>(f) the requirements of (c), or (d) above as modified by development consent with a bushfire safety authority issued under section 100B of the Rural Fires Act 1997 for the purposes of integrated development</p>	C.
CONSTRUCTION Performance Criteria (Table 7.4a – PBP 2019)	Acceptable solutions	
The proposed building can withstand bush fire attack in the form of embers, radiant heat and flame contact.	<p>- BAL is determined in accordance with Tables A1.12.5 to A1.12.7; and</p> <p>- Construction provided in accordance with the NCC and as modified by section 7.5 or PBP (please see advice on construction in the flame zone).</p>	C. BAL12.5.
Proposed fences and gates are designed to minimise the spread of bush fire.	Fencing and gates are constructed in accordance with section 7.6 of PBP.	C. To comply if constructed.
Proposed Class 10a buildings are designed to minimise the spread of bush fire.	Class 10a buildings are constructed in accordance with section 8.3.2 or PBP.	NA. Existing shed >6m.

Appendix 1-3. ACCESS STANDARDS PERFORMANCE CRITERIA AND ACCEPTABLE SOLUTIONS

ACCESS Performance Criteria (Table 7.4a – PBP 2019)	Acceptable Solutions	Note C = Compliance required. NC = Not compliant NA = Not applicable
Firefighting vehicles are provided with safe, all-weather access to structures and hazard vegetation.	Property access roads are two-wheel drive, all-weather roads.	C.
The capacity of access roads is adequate for firefighting vehicles.	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..	C.
There is appropriate access to water supply.	Hydrants are provided in accordance with the relevant clauses of AS 2419.1:2021.	NA
	There is suitable access for a Category 1 fire appliance to within 4m of the static water supply where no reticulated supply is available.	C.
Firefighting vehicles can access the dwelling and exit the property safely.	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.	NA. 140m from public through road.
	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. In circumstances where this cannot occur, the following requirements apply;	NA See below
	Minimum 4m carriageway width.	C.
	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.	NA.
	A minimum vertical clearance of 4m to any overhanging obstructions, including tree branches.	C.
	Property access must provide a suitable turning area in accordance with Appendix 3 of PBP.	C. See Appendix 2-1(b) for location of turning bay
	Curves have a minimum inner radius of 6m and are minimal in number to allow for rapid access and egress.	C.
	The minimum distance between inner and outer curves is 6m.	C.
	The crossfall is not more than 10 degrees.	C.
	Maximum grades for sealed roads do not exceed 15 degrees and not more than 10 degrees for unsealed roads.	C.
	A development comprising more than three dwellings has formalised access by dedication of a road and not by right of way.	NA.
	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.	

Appendix 1-4. WATER AND UTILITIES PERFORMANCE CRITERIA AND ACCEPTABLE SOLUTIONS

WATER SUPPLIES Performance Criteria (Table 7.4a – PBP 2019)	Acceptable Solutions	Note C = Compliance required. NC = Not compliant NA = Not applicable
An adequate water supply is provided for firefighting purposes.	Reticulated water is to be provided to the development, where available; and A static water supply is provided where no reticulated water is available.	NA. C.
Water supplies are located at regular intervals; and The water supply is accessible and reliable for firefighting operations.	Fire hydrant spacing, design and sizing comply with the relevant clauses of AS 2419.1:2005;	NA.
	Hydrants are not located within any road carriageway; and	NA.
	Reticulated water supply to urban subdivisions uses a ring main system for areas with perimeter roads.	NA.
Flows and pressure are appropriate	Fire hydrant flows and pressures comply with the relevant clauses of AS 2419.1:2005.	NA.
The integrity of the water supply is maintained.	All above-ground water service pipes external to the building are metal, including and up to any taps.	C.
A static water supply is provided for firefighting purposes in areas where reticulated water is not available.	Where no reticulated water supply is available, water for firefighting purposes is provided in accordance with Table 5.3d of PBP.	C. 20kl shown in Appendix 2-1(b).
	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.	C. Shown in Appendix 2-1(b).
	Ball valve and pipes are adequate for water flow and are metal.	C.
	Supply pipes from tank to ball valve have the same bore size to ensure flow volume.	C.
	Underground tanks have an access hole of 200mm to allow tankers to refill direct from the tank.	NA.
	A hardened ground surface for truck access is supplied within 4m.	C.
	Above-ground tanks are manufactured from concrete or metal.	C.
	Raised tanks have their stands constructed from non-combustible material or bush fire-resisting timber (see Appendix F of AS 3959).	NA.
	Unobstructed access can be provided at all times.	C.
	Underground tanks are clearly marked.	NA.
	Tanks on the hazard side of a building are provided with adequate shielding for the protection of firefighters.	C. – Storz outlet next to shed.
	All exposed water pipes external to the building are metal, including any fittings.	C.
	Where pumps are provided, they are a minimum 5hp or 3kW petrol or diesel-powered pump, and are shielded against bush fire attack.	C.
	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.	C.

Appendix 1-4 cont. WATER AND UTILITIES PERFORMANCE CRITERIA AND ACCEPTABLE SOLUTIONS

ELECTRICITY SERVICES Performance Criteria (Table 7.4a – PBP 2019)	Acceptable Solutions	Note C = Compliance required. NC = Not compliant NA = Not applicable
Location of electricity services limits the possibility of ignition of surrounding bush land or the fabric of buildings.	Where practicable, electrical transmission lines are underground.	C.
	Where overhead, electrical transmission lines are proposed as follows:	C.
	Lines are installed with short pole spacing (30m), unless crossing gullies, gorges or riparian areas; and	C.
	No part of a tree is closer to a power line than the distance set out in accordance with the specifications in ISSC3 Guideline for Managing Vegetation Near Power Lines.	C.

GAS SERVICES Performance Criteria (Table 7.4a – PBP 2019)	Acceptable Solutions	Note C = Compliance required. NC = Not compliant NA = Not applicable
Location and design of gas services will not lead to ignition of surrounding bushland or the fabric of buildings.	Reticulated or bottled gas is installed and maintained in accordance with AS/NZS 1596:2014 and the requirements of relevant authorities, and metal piping is used.	C.
	All fixed gas cylinders are kept clear of all flammable materials to a distance of 10m and shielded on the hazard side.	C.
	Connections to and from gas cylinders are metal.	C.
	Polymer-sheathed flexible gas supply lines are not used; and	C.
	Above-ground gas service pipes are metal, including and up to any outlets.	C.

Appendix 1-5. LANDSCAPING PERFORMANCE CRITERIA AND ACCEPTABLE SOLUTIONS

LANDSCAPING Performance Criteria (Table 7.4a – PBP 2019)	Acceptable Solutions	Note C = Compliance required. NC = Not compliant NA = Not applicable
Landscaping is designed and managed to minimise flame contact and radiant heat to buildings, and the potential for wind-driven embers to cause ignitions.	Compliance with the NSW RFS ‘Asset protection zone standards’ (see Appendix 4 - PBP).	C. Appendix 4 of PBP is attached as Appendix 2-2 of this report.
	A clear area of low-cut lawn or pavement is maintained adjacent to the house.	C.
	Fencing is constructed in accordance with section 7.6.	C. If constructed.
	Trees and shrubs are located so that:	
	The branches will not overhang the roof.	C.
	The tree canopy is not continuous.	C.
	Any proposed windbreak is located on the elevation from which fires are likely to approach	C.

Appendix 1-6 BAL-12.5 Construction requirements

AS 3959 clause	BAL 12.5 requirements including PBP 2019 amendments
Intent	BAL 12.5 is primarily concerned with protection from ember attack and radiant heat up to and including 12.5 kW/m ² where the site is less than 100m from the source of bushfire attack.
AS 3959 Appendix F: Bushfire resistant timber species	<ul style="list-style-type: none"> • Silver top Ash - <i>Eucalyptus sieberi</i> • Blackbutt - <i>Eucalyptus pilularis</i> • River redgum - <i>Eucalyptus camaldulensis</i> • Spotted gum - <i>Corymbia maculate</i> • Red ironbark - <i>Eucalyptus sideroxylon</i> • Turpentine - <i>Syncarpia glomulifera</i> • Kwila (Merbau) - <i>Intsia bijuga</i>
Sub-floor supports 7.2 now replaces 5.2 as amended by 7.5.2 of PBP 2019.	<p>No special construction requirements where enclosed with:</p> <ul style="list-style-type: none"> (a) A wall that conforms with clause 5.4; or (b) A mesh or perforated sheet with a maximum aperture of 2mm, made of corrosive resistant steel, bronze or aluminium; or (c) A combination of (a) and (b) <p>Where unenclosed: The support posts, columns, stumps, piers and poles shall be—</p> <ul style="list-style-type: none"> (a) of non-combustible material; or (b) of bushfire-resisting timber (see Appendix 1); or (c) a combination of Items (i) and (ii) above
Floors 5.3	<p>Elevated floors</p> <p>No special construction requirements where enclosed with:</p> <ul style="list-style-type: none"> (a) A wall that conforms with clause 5.4; or (b) A mesh or perforated sheet with a maximum aperture of 2mm, made of corrosive resistant steel, bronze or aluminium; or (c) A combination of (a) and (b) <p>Unenclosed</p>
	<p>Unenclosed Subfloor Space – Bearers, Joists & Flooring</p> <p>Where the sub-floor is unenclosed the Bearers, Joists & Flooring shall be:</p> <ul style="list-style-type: none"> (a) bearers, joists & flooring greater than 400mm above finished ground level or <p>Bearers, joists & flooring less than 400mm above finished ground level shall be one of the following:</p> <ul style="list-style-type: none"> (A) non-combustible; or (B) bushfire-resisting timber (see Appendix 1); or (C) a combination of any of Items (a), (b);
	<p>(b) Flooring shall be—</p> <ul style="list-style-type: none"> (i) non-combustible; or (ii) bushfire-resisting timber (see Appendix 1); or

AS 3959 clause	BAL 12.5 requirements including PBP 2019 amendments
	<p>(iii) timber (other than bushfire-resisting timber), particleboard or plywood flooring where the underside is lined with sarking-type material or mineral wool insulation; or</p> <p>(iv) a combination of any of Items (a), (b) or (c) above; or</p> <p>(v) A system complying with AS 1530.8.1 or provide enclosed subfloor space.</p>
External walls 5.4	<p>Less than 400 mm from the ground or less than 400 mm above decks, carport roofs, awnings and similar elements or fittings having an angle less than 18 degrees to the horizontal and extending more than 110 mm in width from the wall (see Figure D3) shall be of—</p> <p>(a) non-combustible material including full masonry or masonry veneer walls with an outer leaf of clay, concrete, calcium silicate or natural stone or precast or in situ walls of concrete or aerated concrete or earth wall including mud brick all with a minimum of 90 mm in thickness; or</p>
Timber log	(b) Timber logs of a species with a density of 680kg/m ³ or greater at 12% moisture content; of a minimum nominal overall thickness of 90mm and a minimum thickness of 70mm and gauge planed or; (e)
Cladding	<p>(c) Externally fixed cladding that is:</p> <p>(i) non-combustible; or</p> <p>(ii) fibre-cement external cladding, a minimum of 6 mm in thickness; or</p> <p>(iii) bushfire-resisting timber (see Appendix F); or</p> <p>(iv) a timber species as specified in paragraph E1, Appendix E; or</p> <p>(v) a combination of any of Items (i), (ii), (iii) or (iv); or</p> <p>(d) a combination of any of Items (a), (b) or (c).</p> <p>No requirement for the portion of wall 400mm above decks, carport roofs, awnings and similar elements or fittings having an angle less than 18 degrees to the horizontal and extending more than 110 mm in width from the wall (see Figure D3).</p>
Joints.	<p>All joints in the external surface material of walls shall be covered, sealed, overlapped, backed or butt-jointed to prevent gaps greater than 3 mm or</p> <p>Alternatively, sarking-type material may be applied over the outer face of the frame prior to fixing any external cladding.</p>
Vents and weepholes	Vents and weepholes in external walls shall be screened with a mesh with a maximum aperture of 2 mm, made of corrosion-resistant steel, bronze or aluminium, except where the vents and weepholes are less than 3 mm.
External glazed elements and assemblies and external Doors 5.5	<p>Bushfire shutters</p> <p>Where fitted, bushfire shutters shall:</p> <p>(a) be fixed to the building and be non-removable;</p> <p>(b) when in the closed position, have no gap greater than 3 mm between the shutter and the wall, the sill or the head;</p> <p>(c) be readily manually operable from either inside or outside;</p> <p>(d) protect the entire window assembly or door assembly;</p> <p>(e) consist of materials being either non-combustible material; or</p> <p>(i) Bushfire-resisting timber (see Appendix F); or</p>

AS 3959 clause	BAL 12.5 requirements including PBP 2019 amendments
	<p>(ii) A timber species as specified in paragraph E1, Appendix E; or</p> <p>(iii) a combination of any of the above and where perforated, have—</p> <p>(A) uniformly distributed perforations with a maximum aperture of 3 mm when the shutter is providing radiant heat protection or 2 mm when the shutter is also providing ember protection; and</p> <p>(B) a perforated area no greater than 20% of the shutter and</p> <p>if bushfire shutters are fitted to all external doors then at least one of those shutters shall be operable from the inside to facilitate safe egress from the building.</p>
Screens for windows and doors	<p>Screens</p> <p>Where fitted, screens for windows and doors shall have a mesh or perforated sheet with a maximum aperture of 2 mm, made of corrosion-resistant steel, bronze or aluminium. Gaps between the perimeter of the screen assembly and the building element to which it is fitted shall not exceed 3 mm.</p> <p>The frame supporting the mesh or perforated sheet shall be made from—</p> <ul style="list-style-type: none"> (a) metal; or (b) bushfire-resisting timber (see Appendix 1); or (c) a timber species as specified in table 2, Appendix 2.
Windows and sidelights	<p>Window assemblies shall comply with one of the following:</p> <ul style="list-style-type: none"> (a) Completely protected by a bushfire shutter that complies with clause 5.5.1; or (b) Completely protected externally by screens that comply with clause 5.5.2; or (c) Where glazing is less than 400 mm from the ground or less than 400 mm above decks, carport roofs, awnings and similar elements or fittings having an angle less than 18 degrees to the horizontal and extending more than 110 mm in width from the window frame (see Figure D3), Window frames and window joinery shall be made from one of the following: <ul style="list-style-type: none"> (i) Bushfire-resisting timber (see Appendix F); or (ii) A timber species as specified in paragraph E1, Appendix E; or (iii) Metal, or (iv) Metal-reinforced PVC-U. The reinforcing members shall be made from aluminium, stainless steel, or corrosion-resistant steel and the frame and sash shall satisfy the design load, performance and structural strength of the member. (d) Where glazing is less than 400 mm from the ground or less than 400 mm above decks, carport roofs, awnings and similar elements or fittings having an angle less than 18 degrees to the horizontal and extending more than 110 mm in width from the window frame (see Figure D3), the glazing shall be Grade A safety glass minimum 4 mm, or glass blocks with no restriction on glazing methods. (e) Where glazing is other than that specified in Item (d) above, annealed glass may be used In accordance with AS1288. (f) The opening portions of windows shall be screened internally or externally with screens that comply with clause 3.6 and 5.5.2.
Side hung external doors	<p>Side-hung external doors, including French doors, panel fold and bi-fold doors, shall comply with one of the following:</p> <ul style="list-style-type: none"> (a) They shall be protected by a bushfire shutter that complies with 3.7. and 5.5.1 or (b) They shall be completely protected externally by screens that comply with Clause 3.6 and 5.5.2. or (c) shall be: <ul style="list-style-type: none"> (i) non-combustible; or (ii) a solid timber door, having a minimum thickness of 35 mm for the first

AS 3959 clause	BAL 12.5 requirements including PBP 2019 amendments
	<p>400 mm above the threshold; or</p> <p>(iii) a door, including a hollow core door, with a non-combustible kickplate on the outside for the first 400 mm above the threshold; or</p> <p>(iv) a door, including a hollow core door, protected externally by a screen that conforms with clause 5.5.2</p> <p>(d) a fully framed glazed door, where the framing is made from:</p> <p>(i) Bushfire-resisting timber (see Appendix F); or</p> <p>(ii) A timber species as specified in paragraph E1, Appendix E; or</p> <p>(iii) Metal, or</p> <p>(iv) Metal-reinforced PVC-U.</p> <p>(e) Where doors incorporate glazing, the glazing shall comply with the glazing requirements for windows and</p> <p>(f) Doors shall be tight-fitting to the door frame and to an abutting door, if applicable and</p> <p>(g) Where any part of the door frame is less than 400 mm from the ground or less than 400 mm above decks, carport roofs, awnings and similar elements or fittings having an angle less than 18 degrees to the horizontal and extending more than 110 mm in width from the door (see Figure D3), that part of the door frame shall be made from one of the following:</p> <p>(i) Bushfire-resisting timber (see Appendix F); or</p> <p>(ii) A timber species as specified in paragraph E1, Appendix E; or</p> <p>(iii) Metal, or</p> <p>(iv) Metal-reinforced PVC-U. The reinforcing members shall be made from aluminium, stainless steel, or corrosion-resistant steel; and,</p> <p>(v) Weather strips, draught excluders or draught seals shall be installed at the base of side-hung external doors.</p>
Sliding doors	<p>Sliding doors shall comply with one of the following: (a) They shall be protected by a bushfire shutter that complies with Clause 3.7 and 5.5.2; or</p> <p>(b) They shall be completely protected externally by screens that comply with Clause 3.6 and 5.5.2; or</p> <p>(c) They shall comply with the following:</p> <p>(i) Bushfire-resisting timber (see Appendix F); or</p> <p>(ii) A timber species as specified in paragraph E1, Appendix E; or</p> <p>(iii) Metal, or</p> <p>(iv) Metal-reinforced PVC-U. The reinforcing members shall be made from aluminium, stainless steel, or corrosion-resistant steel.</p> <p>(d) Any glazing incorporated in sliding doors shall be Grade A safety glass with a minimum 4mm thickness, complying with AS 1288.</p> <p>(e) Sliding doors shall be tight-fitting in the frames.</p>
Vehicle access doors (garage doors)	<p>(a) The lower portion of a vehicle access door that is within 400 mm of the ground when the door is closed (AS3959 Figure D4) shall be made from—</p> <p>(i) non-combustible material; or</p> <p>(ii) fibre-cement sheet, a minimum of 6 mm in thickness; or</p> <p>(iii) Bushfire-resisting timber (see Appendix F); or</p> <p>(iv) A timber species as specified in paragraph E1, Appendix E; or</p> <p>(v) a combination of any of Items (i), (ii), (iii) or (iv) above.</p> <p>(b) Panel lift, tilt doors or side-hung doors shall be fitted with suitable weather strips, draught excluders, draught seals or guide tracks, as appropriate to the door type, with a maximum gap no greater than 3 mm.</p> <p>(c) Roller doors shall have guide tracks with a maximum gap no greater than 3 mm and shall be fitted with a nylon brush that is in contact with the door.</p>

AS 3959 clause	BAL 12.5 requirements including PBP 2019 amendments
	(d) Vehicle access doors with ventilation slots shall be protected in accordance with requirements for <i>Vents and weepholes in external walls</i> and shall be screened with a mesh with a maximum aperture of 2 mm, made of corrosion-resistant steel, bronze or aluminium, except where the vents and weepholes are less than 3 mm.
Rooves 5.6 (including verandahs and attached carport roofs, Penetrations, eaves, fascias, gables, gutters and downpipes)	<p>(a) Roof tiles, roof sheets and roof-covering accessories shall be non-combustible.</p> <p>(b) The roof/wall junction shall be sealed, to prevent openings greater than 3 mm, either by the use of fascia and eaves linings or sealing between the top of the wall and the underside of the roof and between the rafters at the line of the wall.</p> <p>(c) Roof ventilation openings, such as gable and roof vents, shall be fitted with ember guards made of non-combustible material or a mesh or perforated sheet with a maximum aperture of 2 mm, made of corrosion-resistant steel, bronze or aluminium.</p> <p>(d) Only evaporative coolers manufactured in accordance with AS60335.2.98 shall be used.</p> <p>Evaporative coolers with an internal damper to prevent the entry of embers into the roof space need to be screened externally.</p>
Tiled roofs	<p>Tiled roofs shall be fully sarked. The sarking shall be</p> <p>(a) Non-combustible; or</p> <p>(b) Breather-type sarking complying with AS/ NZ S 4 200.1 and with a flammability index of not more than 5 (see AS15 30.2) and sarked on the outside of the frame; or</p> <p>(c) An insulation material conforming to the appropriate Australian Standard for that material and:</p> <p>(i) be located directly below the roof battens;</p> <p>(ii) cover the entire roof area including the ridges and hips; and</p> <p>(iii) be installed so that there are no gaps that would allow the entry of embers where the sarking meets fascias, gutters, valleys and the like, and into gutter.</p>
Sheet roofs	<p>Sheet roofs shall—</p> <p>(a) be fully sarked in accordance with Clause 5.6.2, except that foil-backed insulation blankets may be installed over the battens; or</p> <p>(b) have any gaps greater than 3 mm, under corrugations or ribs of sheet roofing and between roof components, sealed at the fascia or wall line and at valleys, hips and ridges by—</p> <p>(i) a mesh or perforated sheet with a maximum aperture of 2 mm, made of corrosion-resistant steel, bronze or aluminium; or</p> <p>(ii) mineral wool; or</p> <p>(iii) other non-combustible material; or</p> <p>(iv) a combination of any of Items (i), (ii) or (iii) above.</p>
Verandah, carport and awning roofs	<p>The following apply to verandah, carport and awning roofs:</p> <p>(a) A verandah, carport or awning roof forming part of the main roof space [see Figure D1(a), Appendix D] shall meet all the requirements for the main roof, as specified in Clause 5.6</p>

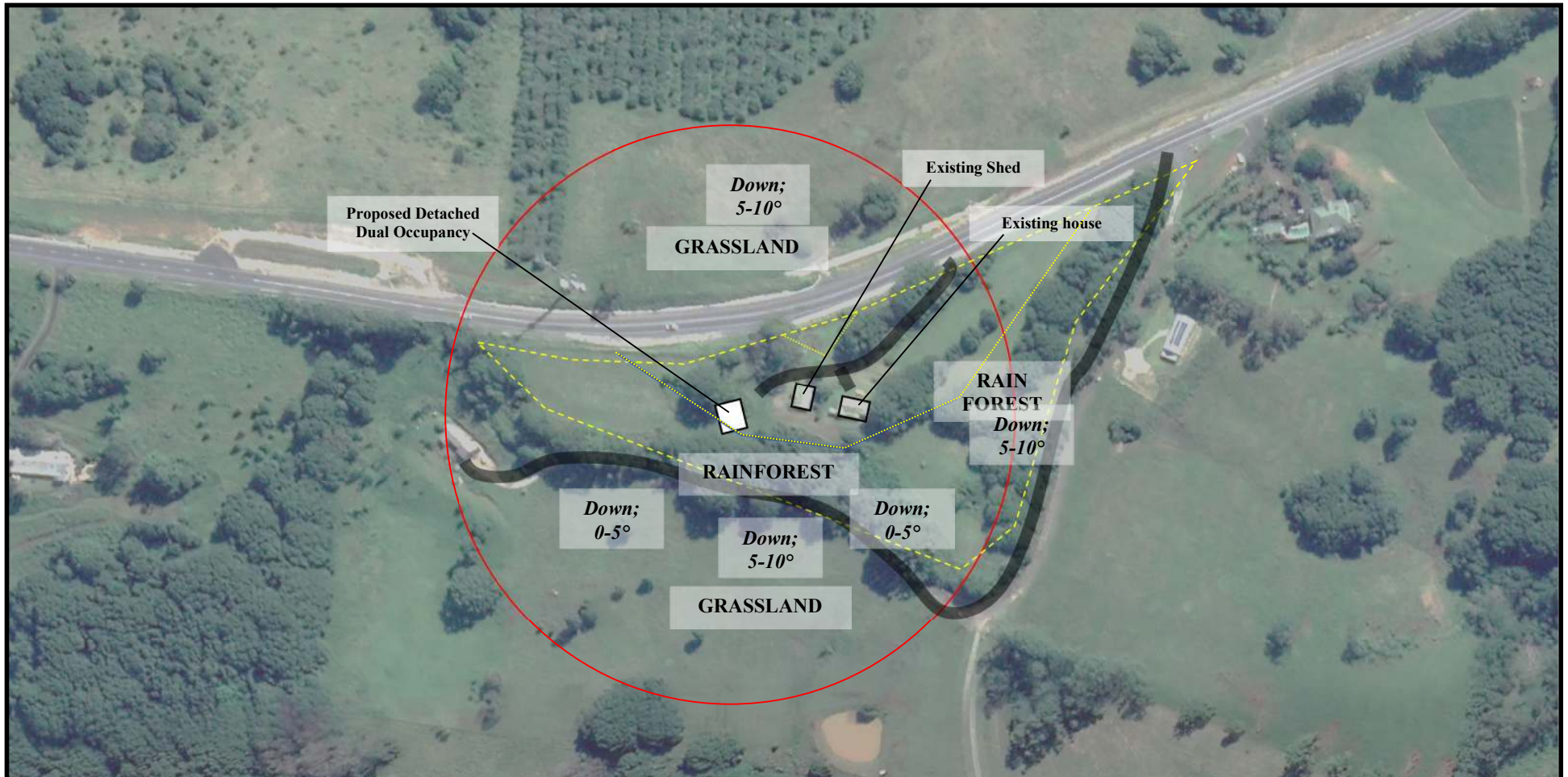
AS 3959 clause	BAL 12.5 requirements including PBP 2019 amendments
	(b) A verandah, carport or awning roof separated from the main roof space by an external wall [see Figures D1(b) and D1(c)] complying with Clause 5.4 shall have a non-combustible roof covering.
Roof penetrations	<p>The following apply to roof penetrations:</p> <p>(a) Roof penetrations, including roof lights, roof ventilators, roof-mounted evaporative cooling units, aerials, vent pipes and supports for solar collectors, shall be adequately sealed at the roof to prevent gaps greater than 3 mm. The material used to seal the penetration shall be non-combustible.</p> <p>(b) Openings in vented roof lights, roof ventilators or vent pipes shall be fitted with ember guards made from a mesh or perforated sheet with a maximum aperture of 2 mm, made of corrosion-resistant steel, bronze or aluminium except for gas appliance flues.</p> <p>(c) All overhead glazing shall be Grade A safety glass complying with AS 1288.</p> <p>(d) Glazed elements in roof lights and skylights may be of polymer provided a Grade A safety glass diffuser, complying with AS 1288, is installed under the glazing. Where glazing is an insulating glazing unit (IGU), Grade A toughened safety glass minimum 4 mm, shall be used in the outer pane of the IGU.</p> <p>(e) Flashing elements of tubular skylights may be of a fire-retardant material, provided the roof integrity is maintained by an under-flashing of a material having a flammability index no greater than 5.</p> <p>(f) Evaporative cooling units shall be fitted with butterfly closers at or near the ceiling level or, the unit shall be fitted with non-combustible covers with a mesh or perforated sheet with a maximum aperture of 2 mm, made of corrosion-resistant steel, bronze or aluminium.</p> <p>(g) Eaves lighting shall be adequately sealed and not compromise the performance of the element</p>
Eaves linings, fascias and gables	<p>The following apply to eaves linings, fascias and gables:</p> <p>(a) Gables shall comply with Clause 5.4.</p> <p>(b) Eaves penetrations shall be protected the same as for roof penetrations, as specified in Clause 5.6.5.</p> <p>(c) Eaves ventilation openings greater than 3 mm shall be fitted with ember guards made of non-combustible material or a mesh or perforated sheet with a maximum aperture of 2 mm, made of corrosion-resistant steel, bronze or aluminium.</p> <p>(d) Joints in eaves linings, fascias and gables may be sealed with plastic joining strips or timber storm moulds</p> <p>Linings to be non-combustible?</p>
Eaves linings, fascias and gables Sarking As per PBP 2019	<p>The following apply to eaves linings, fascias and gables:</p> <p>(a) Gables shall comply with Clause 5.4.</p> <p>(b) Eaves penetrations shall be protected the same as for roof penetrations, as specified in Clause 5.6.5.</p> <p>(c) Eaves ventilation openings greater than 3 mm shall be fitted with ember guards made of non-combustible material or a mesh or perforated sheet with a maximum aperture of 2 mm, made of corrosion-resistant steel, bronze or aluminium.</p> <p>(d) Joints in eaves linings, fascias and gables may be sealed with plastic joining strips or timber storm moulds</p> <p>Linings to be non-combustible? Any sarking used shall be:</p> <p>(a) Non-combustible; or</p>

AS 3959 clause	BAL 12.5 requirements including PBP 2019 amendments
	(b) comply with AS/ NZ S 4 200.1, with a flammability index of not more than 5 as determined by AS 1530.2 and sarked on the outside of the frame.
Gutters and downpipes	If installed, all gutter and valley leaf guards shall be non-combustible
	Box Gutters Box gutters shall be non-combustible and flashed at the junction with the roof with non-combustible material.
verandas, decks, steps, ramps and landings 7.7 (as amended by 7.5.2 of PBP 2019)	Enclosed Subfloor Spaces There are not construction requirements for supports, bearers and joists when the subfloor is enclosed. The subfloor space of verandas, decks, steps, ramps and landings is are deemed enclosed when (a) any wall enclosing the subfloor space complies with clause 5.4, <i>Externally fixed cladding that is within 400mm of the ground or :</i> <i>(i) non-combustible; or</i> <i>(ii) fibre-cement external cladding, a minimum of 6 mm in thickness; or</i> <i>(iii) bushfire-resisting timber (see Appendix F); or</i> <i>(iv) a timber species as specified in paragraph E1, Appendix E; or</i> <i>(v) a combination of any of Items (i), (ii), (iii) or (iv); or</i> <i>(d) a combination of any of Items (a), (b) or (c).; and,</i> (b) all openings are protected in accordance with clause 3.6 made of corrosion resistant steel, bronze or aluminium.
Unenclosed Subfloor Spaces	Where subfloor spaces are unenclosed: support posts, columns, stumps, stringers, piers and poles shall be— (a) of non-combustible material; or (b) of bushfire-resisting timber (see Appendix F); or (c) a combination of Items (a) and (b) above.
	Bearers and Joists shall be— (a) of non-combustible material; or (b) of bushfire-resisting timber (see Appendix F); or (c) a combination of Items (a) and (b) above.
Veranda posts	Veranda posts shall be made from - (i) of non-combustible material; or (ii) of bushfire-resisting timber (see Appendix F); or (iii) a combination of Items (a) and (b) above.
Veranda posts Decking	Veranda posts shall be made from - (i) of non-combustible material; or (ii) of bushfire-resisting timber (see Appendix F); or (iii) a combination of Items (a) and (b) above.

AS 3959 clause	BAL 12.5 requirements including PBP 2019 amendments
	<p>Decking, stair treads and the trafficable surfaces of ramps and landings shall be—</p> <ul style="list-style-type: none"> (a) of non-combustible material; or (b) of bushfire-resisting timber (see Appendix F); or (c) a combination of Items (a) and (b) above or be an enclosed subfloor. (d) the decking gaps between 3mm and 10mm should be avoided.
Balustrades, handrails or other barriers	<p>Those parts of the handrails and balustrades less than 125 mm from any glazing or any combustible wall shall be:</p> <ul style="list-style-type: none"> (a) of non-combustible material; or (b) bushfire-resisting timber (see Appendix F); or (c) a combination of Items (i) and (ii) above.
Balustrades, handrails or other barriers Attached Structures	<p>Those parts of the handrails and balustrades less than 125 mm from any glazing or any combustible wall shall be:</p> <ul style="list-style-type: none"> (a) of non-combustible material; or (b) bushfire-resisting timber (see Appendix F); or (c) a combination of Items (i) and (ii) above. <p>(a) any part of a garage, carport, verandah or similar roofed structure that is attached to, or shares a common roof space with the dwelling, the entire garage, carport, verandah or similar roofed structure shall comply with the construction requirements of BAL 12.5; or</p> <p>(b) the structure shall be separated from the dwelling by a wall that extends to the underside of a non-combustible roof covering, and that complies with the following:</p> <p>The wall shall be of masonry, earth wall or masonry-veneer construction with the masonry leaf of not less than 90 mm in thickness or have an FRL of not less than 60/60/60 for loadbearing walls and –/60/60 for non-loadbearing walls when tested from the attached structure side and shall have openings protected as follows:</p> <ul style="list-style-type: none"> (i) Doorways—by FRL –/60/30 self-closing fire doors. (ii) Windows—by FRL –/60/– fire windows permanently fixed in the closed position. (iii) Other openings—by construction with an FRL not less than –/60/–. <p>Control and construction joints, subfloor vents, weepholes and penetrations for pipes and conduits need not comply with the above [Item (iii)].</p>
Attached Structures Garages and carports below a dwelling	<ul style="list-style-type: none"> (a) any part of a garage, carport, verandah or similar roofed structure that is attached to, or shares a common roof space with the dwelling, the entire garage, carport, verandah or similar roofed structure shall comply with the construction requirements of BAL 12.5; or (b) the structure shall be separated from the dwelling by a wall that extends to the underside of a non-combustible roof covering, and that complies with the following: <p>The wall shall be of masonry, earth wall or masonry-veneer construction with the masonry leaf of not less than 90 mm in thickness or have an FRL of not less than 60/60/60 for loadbearing walls and –/60/60 for non-loadbearing walls when tested from the attached structure side and shall have openings protected as follows:</p> <ul style="list-style-type: none"> (i) Doorways—by FRL –/60/30 self-closing fire doors. (ii) Windows—by FRL –/60/– fire windows permanently fixed in the closed

AS 3959 clause	BAL 12.5 requirements including PBP 2019 amendments
	<p>position.</p> <p>(iii) Other openings—by construction with an FRL not less than –/60/–.</p> <p>Control and construction joints, subfloor vents, weepholes and penetrations for pipes and conduits need not comply with the above [Item (iii)].</p> <p>Garages and carports below a dwelling</p> <p>(a) Shall comply with the construction requirements of this BAL or</p> <p>(b) any construction separating the garage or carport (including walls and flooring systems) from the remainder of the dwelling shall comply with the following:</p> <p>have an FRL of not less than 60/60/60 for loadbearing construction and –/60/60 for non-loadbearing construction when tested from the garage or carport side or if a wall be of masonry, earth wall or masonry-veneer construction with the masonry leaf of not less than 90 mm in thickness and shall have openings protected in accordance with the following:</p> <p>(i) Doorways—by –/60/30 self-closing fire doors.</p> <p>(ii) Windows—by –/60/– fire windows permanently fixed in the closed position.</p> <p>(iii) Other openings—by construction with an FRL not less than –/60/–.</p> <p>NOTE: Control and construction joints, subfloor vents, weepholes and penetrations for pipes and conduits need not comply with the above [Item (iii)].</p> <p>or</p> <p>(d) if separating construction is a wall, be of masonry, earth wall or masonry-veneer construction with the masonry leaf of not less than 90 mm in thickness</p>

APPENDIX 2-1(a). BAL ASSESSMENT MAP



LEGEND

Note: This map has been produced by LandUse using a GPS system with +/- 3m accuracy, and aerial base map (Maxar Technologies 2022)
 Author: JJ Bruce 0419420362
 Date: 21/11/22.

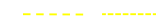


0 60m
 Scale 1:3000

BAL Assessment boundary (140m)

Driveway

Property; Lot boundary



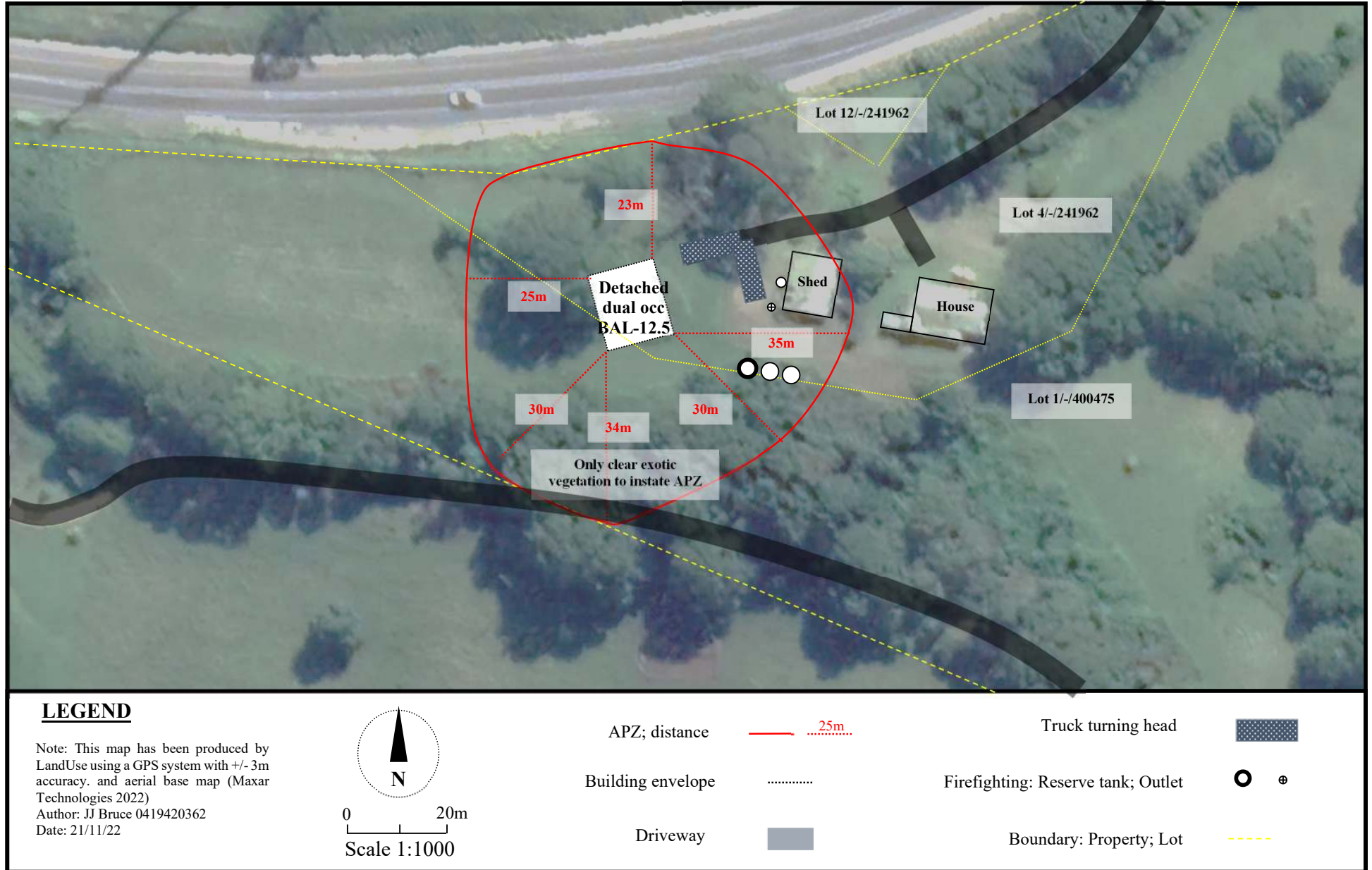
Bushfire vegetation class.

Effective slope

RAINFOREST

Down; 5-10°

APPENDIX 2-1(b). ASSET PROTECTION ZONE PLAN



APPENDIX 2-2. ASSET PROTECTION ZONE REQUIREMENTS (Source: Appendix 4 of PBP:2019)

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.