

Submission to the NSW Independent Bushfire Inquiry

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1 Introduction

I am a BPAD certified (FPA) Bushfire Planning Consultant who has been practicing for over 8 years in the Local Government Areas (LGAs) of Wingecarribee, Wollondilly, Wollongong, Hawkesbury, Blue Mountains, Shoalhaven, Eurobodalla. I am therefore familiar with the bushfire risk and associated bushfire planning issues of many of the places which burnt in the December 2019 and January 2020 fires.

My objective for this submission is to provide understanding into the role of BPAD bushfire planning consultants in relation to both strengths and weaknesses of the current planning system.

I also offer insight gained with the process of recovery after the recent bushfire event. A summary of considerations and detailed explanations for some terms are provided at the end of this submission.

Since the event, I have volunteered to the Conjola Recovery Centre (an community led initiative), the Shoalhaven Council Bushfire Building Damage survey of Conjola Park and also provided Bushfire Attack Level (BAL) assessments to the owners of burnt homes.

I am also interested in how landscapes within an APZ can be assessed for improved bushfire protection of the buildings while also serving other functions such as garden, family living space, aesthetics and biodiversity. I am concerned the *Planning for Bushfire Protection* (PBP) does not provide specific APZ management guidance, nor ensure the APZ is maintained into perpetuity. To further this, I am currently conducting a research project on APZ management standards as part of a Masters of Bushfire Protection (WSU), and have collected survey data from the 2019/2020 fires to assess the effectiveness of APZs in relation to the PBP APZ standard conditions of management.

This submission to the NSW Independent Bushfire Inquiry has been made to the following parts of the terms of reference:

- The preparation and planning by agencies, government, other entities and the community for bushfires in NSW, including current laws, practices and strategies, and building standards and their application and effect
- Land use planning and management and building standards,
- Appropriate action to adapt to future bushfire risks to communities and ecosystems.
- Coordination and collaboration by the NSW Government with the Australian Government and local governments.

2 Bushfire Risk Assessment

2.1 BPADS Consultant's Role with Bushfire Risk Assessments

BPAD Consultants provide advice and assessments for anyone who requires planning consent for a proposal that is located on land identified as Bushfire Prone. There are 66 BPAD certified consultants in NSW and a large number of us who would work on a regular basis in the geographic areas of the recent fire events. Our clients can include homeowners seeking additions and amendments or to build a new house, architects who are project managing a development and developers who are subdividing or proposing to rezone.

A proportion of assessments also include Class 2, 3, 4 and 9 of the Building Code. These types of developments are considered more vulnerable to the bushfire risk and under the *Rural Fires Act* are identified as *Special Fire Protection Purpose Development* (SFPP). I have undertaken SFPP assessments for private hospitals, retirement villages, schools, Places of Worship's including Catholic Convents, Buddhist Retreats, Hindu Temples and Moslem Cemeteries and a wide range of tourist accommodation facilities.

The most basic part of any bushfire assessment involves identification of the Bushfire Attack Level (BAL). BALs are the measuring tool used to measure the severity of a building's potential exposure to ember attack, radiant heat and direct flame contact (2).

To determine the BAL, the PBP provides two methodologies (3). The process required involves variable inputs which to be identified correctly, need skill and knowledge of fire behaviour, fuel loads and landscape assessment.

Depending on the proposal and location, the PBP also requires compliance with APZ, access, landscaping, water supply, building design and construction and emergency management arrangements.

There are several types of development which will not be granted DA consent if located in an area that meets BAL 40 or Flame Zone. This includes subdivisions, secondary dwellings (including granny flats) and holiday lets, farm stay accommodation and bed and breakfasts. Furthermore, SFPP's are required to meet 10kW m² which many locations cannot provide as the setback involves large buffer distances.

Due to the complexities, I and many of my BPAD colleagues would usually spend at least 3 to 5 hours a week helping to clarify confusion. Often the first stage is determining the type of development and the landscape in which it is proposed. Once this is understood, the type of bushfire assessment can be explained so that the correct bushfire assessment can be prepared.

My experience is that applicants in bushfire prone land need help to understand the process required for DA consent. The strategic role in the early planning phases of a project is usually underestimated.

If the correct BAL and other related bushfire planning constraints are not identified in the early planning phase, the result can be a protracted process. Clients are often surprised and angry that the bushfire protection requirements for consent was the deal breaker. It is a costly venture to develop a DA proposal from both applicant and consent authority's perspective. Therefore, accurate advice relating to bushfire assessment from a BPAD consultant circumvents wasted money and time.

In many cases applicants are under prepared for the required cost of bushfire protection. This is especially the case with the higher BALs. For example, a Flame Zone construction can cost an additional \$200,000 due to windows and roof requirements. Some clients have initially agreed to a Flame Zone dwelling but much later in the process discovered the true cost of construction and subsequently abandoned the project. If a BPAD consultant is involved, all aspects of the bushfire requirements are identified from the beginning.

Flame Zone as an alteration and addition development is also challenging because the RFS policy is that only the proposed new works should meet the Flame Zone Standard. The applicant is then required to spend a proportionally large sum on Flame Zone construction which is tacked onto an existing combustible structure with no bushfire protection apart from the condition to screen all openable spaces.

After the bushfire event of 2019/20, BPAD consultants have played a constructive role in helping people understand the planning regulations for bushfire protection. Over the last few months, I would speak to several people a week who are seeking to understand how to build again. As a consultant who usually works with clients who have planned a project, it is a different situation to work with people who have suddenly lost everything and sometimes cannot afford to build because of the cost of Flame Zone construction. These people have had no choice in now navigating the complex bushfire planning regulations which can even bring a hardened developer to their knees in despair.

Last February, I assisted in a rebuilding recovery workshop in Conjola. There was a strong attendance and interest in how to navigate the bushfire planning rules. The most challenging aspect in helping as a BPAD is that across the region which burnt, many locations of dwellings is in Flame Zone according to BAL assessment criteria. Explaining this can be difficult as despite the bushfire event. Many of these dwellings were built long before any bushfire protection requirements. Quite a few have had DAs in the recent past however the associated bushfire assessments were not identified correctly. Also, the bushfire risk may have changed since the DA because of circumstances such as the management of the APZ buffers, properties have changed hands or the vegetation on adjacent land has changed. In some cases, such as Conjola Park, the land was not mapped bushfire prone.

2.2 Value of Accurate BAL Assessment

The importance of identifying the correct BAL as early as possible in the planning process cannot be understated. Nor can the skill required to identify the correct BAL, or the other constraints. As a BPAD consultant I take approximately 10 hours of

analysis to provide an accurate bushfire risk assessment. This involves examining recent and historic aerial images, identifying and preparing GIS layers of information regarding vegetation maps, planning layers such as biodiversity, LEP land Zones, 1 and 2 m contours.

The location of the proposal is then considered in relation to the site and scaled onto an aerial with cadastre and analysed bushfire vegetation formations (according to fuel loads) and effective slope in relation to the bushfire behaviour. During this process, a site visit is made involving assessment of the current APZ on site, bushfire construction standards of existing dwellings, slope measurements and on-the ground and sometimes drone images taken. The site visit involves engagement with the applicant to better define the nature of the proposal and identify the potential constraints

In addition I provide the benefit of being familiar with similar types of projects to the one being proposed, in comparable landscapes. The professional support network of other BPADS consultants also ensures a consistent application of the PBP standards. Frequently I will consult the consent authorities (Council and RFS) on behalf of my clients so that the final submission for DA can be designed to meet bushfire protection compliance. The role of intermediary between the applicant and the consent authority is one of the BPADS most vital roles. The BPADS can take the time to explain to the applicants the reasons for the bushfire protection measures required at consent, and also explain the applicant's proposal and any issues in an efficient conversation to stakeholders.

As part of the assessment, I frequently discuss the planning issues with the RFS Development Assessment Planning Officers (DAPOs). These officers are helpful, and their advice plays a key role in shaping the direction of the proposal.

A major issue when dealing with the DAPOs is that the system is understaffed and under pressure to process DAs. Where the DAPO disagrees with the BPAD assessment there can sometimes be no consultation before the GTAs are issued. . In respect to BPADS and the applicants who have paid for a professional report, the DAPOs should have a formal procedure to acknowledge that where BPAD certified assessments differ from DAPOS, some form of communication is required. Usually, there is a solution and the important aspect of the process is the shared objective of both the BPAD and the DAPO in the delivery of the PBP intent.

The pre-da service which the RFS offers for clients is an invaluable tool to have some form of agreement on issues early during the strategic phase. During the recent bush fire event the DAPO Officers were seconded to provide the rapid assessments of burnt buildings and the pre-da service was closed for almost 4 months. The fires were a valid excuse and it was relevant for DAPO officers to undertake this role. However, the volume of burnt properties requiring assessment meant there were not enough DAPO officers available for assessing DAs. This is another case for increasing funding and officers.

I and other BPAD consultants were also confused why BPAD level 3s were not asked to help on a volunteer basis in the rapid assessments. Several BPADS did volunteer our services to the UWS and Shoalhaven Council assessment survey and personally I felt that it was a valuable experience and will help provide a better BPAD service.

2.3 Out of Date FDI input for BAL assessments

It is a matter of urgency that the RFS update the outdated FDI tables on the RFS website. Evidence from the Bureau of Meteorology and research from Western Sydney University show that the FDI input used in the PBP to calculate BALS are out of date and do not reflect the current fire weather data. The deemed to satisfy BAL is calculated through Methodology 1 in the PBP 2019. Research published by Dr Grahame Douglas show that the FDI for many of these LGAS should be set higher.

The implications of the outdated FDI inputs are leading to BALs and APZ setbacks not accurately reflecting the bushfire risk of the location. This research resonates with the scale of damage from the recent fires.

BPAD consultants can adjust FDI in performance-based models to accurately identify the bushfire risk. However, it is unlikely a consultant would provide a higher BAL than the one that is required by regulations.

2.4 Incorrect Bushfire Prone Land Maps

Some areas burnt were not identified as Bushfire prone. For example, Conjola Park and Milton. The bushfire maps are out of date and the public use these maps as a reference point to determine whether a bushfire risk exists. Likewise, areas which no longer pose a bushfire risk due to development can require an assessment. This is a further financial burden to an applicants.

2.5 Who Should Provide a Bushfire Hazard Risk Assessment?

I can provide this Commission with numerous self-assessments where the applicant has incorrectly identified the BAL due to misunderstanding of vegetation and slope. Some of these self-assessments are “knocked back” by council however some incorrect self-assessments are approved. Why is bushfire risk assessment in NSW left to chance? An applicant of a development proposal cannot provide a self-assessment for an engineering footing, biodiversity study, archaeological or an on-site domestic wastewater.

The credibility of the PBP is undermined when for example a street with similar bushfire risk can have several dwellings built to different BALS determined through self-assessment. This leads to disregard of planning for bushfire protection when applicants using a consultant discover adjacent lots have used a self-assessment and given themselves a lower BAL, which was approved by either exempt or complying development or s4.14.

Exempt and complying development requires either a council or a person who is recognised by the RFS as a suitably qualified consultant in bushfire fire risk assessment to certify that a development is not in BAL 40 or Flame Zone. A system should be put in place to ensure only qualified bushfire fire assessors within councils issue these BAL certificates. Wollongong Council is a good example of this as one of the senior planners is BPAD qualified.

In LGAs where the recent fire events occurred, future bushfire protection could be better addressed at a local level through a bushfire policy in the Local Environment Plan (LEP). Some councils have identified bushfire policy through the DCPs which should be commended.

2.6 Recognition of BPAD Professional Qualifications

BPADS currently provide accurate bushfire hazard risk and ensure new development address this risk with adequate control. Recently there is debate on how qualified a BPAD needs to be.

I am typical of the 66 BPAD professional consultants currently working in NSW. I have an undergraduate degree, a post graduate degree in bushfire protection and another also in environmental risk assessment. I belong to a professional body, the Fire Protection Association of Australia (FPA), am committed to ongoing professional development as well as a code of ethics and maintain professional indemnity insurance. I have worked in the past in all three Australian tiers of government in environmental land management.

At the most recent professional body meeting for BPADs in September 2019, it was explained that the BPAD scheme is not financially viable. A proposal to provide short courses at VET levels was discussed. Short technical skills based courses would allow for more BPADS and more fees to allow the scheme to become financially viable.

This direction will be detrimental to the current high standard of bushfire assessments provided by BPADS. A higher degree must be considered the threshold entrance for BPADS. Higher degrees demonstrate a demonstration of commitment and discipline. A short technical course cannot provide anything but a skills-based approach that does not address the complex multi-disciplinary requirements of a bushfire assessment.

A scheme based on a VET course would open the BPAD membership to profit driven opportunists rather than people dedicated to a profession i.e. other industries just tacking on the bushfire planning considerations on by being able to churn employees through a short course.

The confusion of whether the qualifications for BPADS could be undermined to a VET level is creating a self-defeating loop in decreasing the number of enrolments of future candidates into the BPAD program. For example, one of my bushfire trainees has chosen not to enrol in the bushfire protection diploma as it may be a waste of time and money when he may be able to achieve the same qualification soon with a VET course.

It is my understanding that the RFS in the past has approached the NSW Buildings Professionals Board Accreditation Scheme for all BPAD Consultants to be accredited. Currently this accreditation scheme under the NSW Fair trading covers a range of professionals relating to building, construction and developing. This includes building surveying, engineering, subdivision and strata certification. If the FPA cannot afford the BPAD consultants, then this may be an excellent alternative.

Due to the high cost of taking one BPAD to court we were told that the FPA will never take any other BPADS to court due to the prohibitive costs. Ultimately the door is now open for BPADs to not adhere to the FPAs professional conduct.

The key to ensuring professional integrity of BPADS is to ensure a high quality of work. The NSW Buildings Professionals Board Accreditation Scheme audits its members as part of the scheme.

3 Standards for Bushfire Management

3.1 Current requirement for APZ Standards

Development Consent requires the APZ standard to comply with Appendix 4, PBP 2019 and *Standards for Asset Protection Zones* (NSW, RFS).

If councils are not confident of how an APZ should be conditioned for management in s4.14 applications, the proposal is referred to the RFS for recommendations.

The following RFS referral example demonstrates how general the APZ management objectives are:

"The IPA must comprise of

- minimal fine fuel at ground level;*
- Grass mowed or grazed;*
- Trees and shrubs retained as clumps or islands and do not take up more than 20 % of areas;*
- Trees and shrubs located far enough from building so that they will not ignite the building;*
- Minimal plant species that keep dead material or drop large quantities of ground fuel, tree canopy not more than 15 %; tree canopies not located within two metres of the building,*
- Trees separate by 2-5 metres and do not provide a continuous canopy from the hazard to the building;*
- Lower limbs of tree removed up to a height of 2 metres above ground.*
- in relation to the proposal and that the APZ should be managed" ref: DA20191104000842-Original-1)*

The general and open nature for APZ management leads to unresolved issues of how a landscape within the APZ can provide an adequate role as a protective buffer.

For example:

- What is 20 % tree canopy cover?
- How large can a cluster of trees and shrubs be before becoming a hazard,
- Should clusters of vegetation be disconnected from the main bushfire hazard outside the APZ?
- If a APZ is measured from a drip line or a trunk.

Furthermore, the landscape within an APZ is not only plants. This space is also where people live. Many other items in this space also pose a risk to an effective APZ. This includes plastic tanks for BASIX, dog kennels, garden furniture and childrens play equipment. The PBP 2019 does not provide any guidance for the management of such items.

In the quest for demonstrating compliance with the PBP, the consent authority can request a qualified bushfire consultant verification that the APZ standards as prescribed either by the RFS referral or in general with Appendix 4 and the NSW document can comply. This leaves the BPAD consultant certifying an opinion and not specifications.

Recently, achieving the APZ standards became more complex with the introduction of the NSW *Biodiversity Conservation Act* 2016. Depending on the size of the

development, the threshold can trigger biodiversity offsets whereby the number of trees proposed to be kept with the APZ represent a substantial sum of money per tree. To minimise cost, arborists are used to justify which trees can remain based on health.

3.2 Managing Bushfire Protection Measures for Perpetuity

APZ and other bushfire protection conditions are to be provided for perpetuity and not to achieve just consent and then lapse. It is concerning that once the bushfire requirements are signed off at Construction Certificate stage there is no follow up to ensure the bushfire protection measures are maintained. After approval, metal fly screens from the openable windows can be removed, combustible material added to external walls and pine mulch gardens established under windows. Without ongoing active awareness of the bushfire protection measures in place, a development can rapidly lose the attributes which contribute to bushfire protection.

If conditions of consent relating to bushfire are required to be in place for perpetuity, the conditions should be included on the final building plans as part of the development and not just in the DA GTAs. Currently it is not always possible to identify the bushfire conditions of an existing or neighbouring lot without a GIPA. GIPAs can sometimes take more than 2 weeks to process. Shoalhaven and Wingecarribee Council should be commended for providing a transparent DA register online where the DA and all associated documentation can be found electronically. Bushfire assessments in these LGAs are transparent. Other councils, such as Kiama and Wollongong councils do not transparent development registers due to their interpretation of copyright law. In some cases, there are several iterations of bushfire protection requirements before the development consent is granted. This can be misleading when the applicant is given an original bushfire assessment with the wrong bushfire conditions.

There is merit in applying a similar system as the regulation of onsite domestic wastewater systems in NSW to the regulation of bushfire protection for perpetuity. Under provisions of Local Government (General) Regulation 2005, the owners (including new owners if a property is sold) provide formal consent that inspections can be undertaken by council officers. The property owner then is required to renew their licence to operate following a satisfactory inspection. Approvals to operate are granted for either a period of two, three or five years depending on the risk. In a similar system, the bushfire protection of a development could be checked.

The Victorian Royal Commission for the fires made the following relevant recommendation that all high risk bushfire prone properties require a BAL. The recommendation was

“The State amend s. 32 of the Sale of Land Act 1962 to require that a vendor’s statement include whether the land is in a designated Bushfire-prone Area, a statement about the standard (if any) to which the dwelling was constructed, the bushfire attack level assessment

at the time of construction (where relevant) and a current bushfire attack level assessment of the site of the dwelling'. (VRBC 2009 RECOMMENDATION 53)

I am asked on a regular basis to provide a pre-sale BAL inspection of a lot as part of a buyer's due diligence. I have been told that my BAL report can influence the final price of a property. On the other hand been asked to provide assessments on recently purchased properties where the new owners were oblivious to the high BAL or unauthorised addition which does not meet AS 3959 construction standard. Several times I have been involved in unauthorised secondary dwellings that cannot meet the BAL 29 or less APZ and are required to be removed.

3.3 Bushfire Sprinkler and Sprayers

The VRC recommendation 50 was that: *"Standards Australia move expeditiously to develop a standard for bushfire sprinklers and sprayers"*.

Numerous anecdotal accounts of houses being saved by their bushfire sprinkler systems are told. Also have many clients request information regarding installing bush fire sprinklers and sprayers. Often people will install a sprinkler system in addition to the suite regardless of the bushfire protection measures used in the DA consent. The PBP is completely silent on sprinkler systems and as consequence is a vast array of homemade sprinkler systems which could be improved on.

I recommend that as a minimum, research is undertaken on how to best install a system.

3.4 Bush Fire Emergency Management Plan

Bushfire protection of occupants in SFPP development has a reliance on appropriate emergency evacuation procedures (EEP). The PBP 2019 is specific in how the EEP should be provided however the RFS and councils do not usually approve the EEP and in some cases ask for a BPAD to provide the certification.

The knowledge and skill required to develop an effective EEP is specialised and should be provided by people trained in emergency management.

4 Summary of Considerations

Bushfire Planning benefits from BPAD Consultants because:

- Qualification and training which is formalised through the FPA certification scheme to provide a holistic approach to planning and building in a bushfire prone area.
- Breadth of experience, knowledge and professional insight into bushfire protection which facilitates better understanding of planning requirements associated with bushfire protection for people who have either lost their home from bushfire or are applying for a DA in a bushfire prone area.
- Training and experience to undertake an accurate bushfire risk assessment and identify the most correct BAL, assess APZs and other bushfire planning constraints involving access, emergency management and water supply

Bushfire Planning could be improved if: the role of BPAD consultants is:

- Upheld through the recognition of the role as a professional by maintaining a minimum entry level of a post graduate qualification in bushfire protection.
- Registered with the Buildings Professional Board Accreditation scheme.
- Formalised with DAPO so that if a DA assessment prepared by a BPAD does not result in the same outcome, the DAPO staff will contact the BPAD consultant first to discuss, before issuing the GTA.
- Offered an opportunity to participate as volunteers in the rapid building assessment survey post bushfire event;
- Provide the bushfire assessments for Section 14.4, subdivisions and also SFPP. The significance of bushfire protection should be seen as important any other aspect of building and construction and therefore should be provided by a certified professional and not undertaken through a dumbed down BAL self-assessment.
- Deliver APZ and BAL certification on a 2- or 5-year basis depending on the risk at the home owners expense in a similar model to onsite domestic waste water management;
- Provide pre-sale BAL inspections to accompany a vendors statement for all properties listed for sale in bushfire prone land;

The PBP assessment process can be improved if:

- Specific and consistent APZ standards are developed and endorsed by the consent authorities. In particular the document Standards for Asset Protection Zones should be rewritten to provide quantifiable standards which can be used to identify if the managed landscape provides an adequate buffer to protect from bushfire.
- The bushfire prone maps are updated to reflect more accurately the bushfire risk;
- The FDI input used in the BAL assessment in Methodology 1 is updated to reflect more accurately the research published by Dr Grahame Douglas.
- The local councils adopt a bushfire policy in their LEP which recognises that a bushfire risk assessment should only be provided through the BPAD program;
- A standard for bushfire sprinklers be provided...
- Bushfire Emergency Management Plans should be provided by trained emergency risk assessors.

5 Explanations of the terms

5.1 PBP 2019 APZ requirements

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

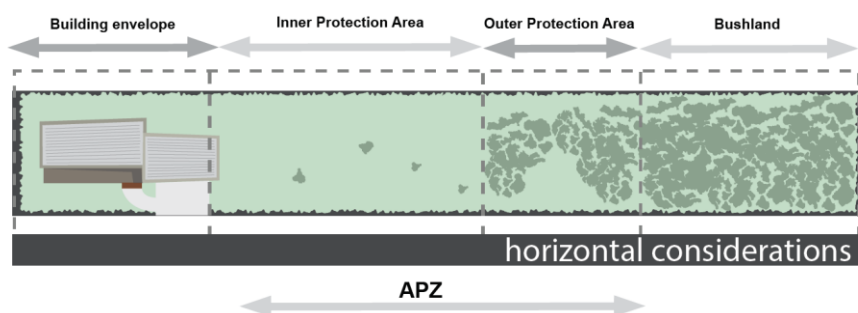
- shrubs should not form a continuous canopy; and
- shrubs should form no more than 20% of ground cover.

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.

Typical Inner and Outer Protection Areas.



5.2 BALS

The BALS are defined in the *Australian Standard AS3959 Construction of buildings in bushfire prone areas* (AS3959). There are 5 BALs ranging from BAL LOW to Flame Zone. Each BAL is determined through the risk of radiant heat to the building being assessed. For example, BAL LOW requires no bushfire protection construction measures because there is insufficient risk. BAL 12.5 requires ember protection such as metal fly screens on openable windows and no external soft timber finishing because the risk of radiant heat from the bushfire hazard would be 12.5 kilowatts per metre squared. Bal 19 (risk of 19 kilowatts per metre squared) requires increased construction protection involving requirements such as thicker 5mm glass. BAL 29 is considered an increasing level of risk for ember attack and burning debris together with increasing heat flux involving at least 29 kWm² of radiant heat. The construction standards for BAL 29 reflect the bushfire risk and can include thicker cladding requirements, less choice of external timber products (based on timber density) and window choice. Lastly, BAL 40 and Flame Zone are considered BALS where the risk of experiencing a fire front is likely and the construction standard is therefore required to be non-combustible or be able to provide protection from flame contact.

5.3 Methodologies for determining BALS

There are two BAL methodologies. The first is an acceptable solution assessment which is based on identifying the vegetation formations for 140 m from the proposal in terms of fuel loads, determine the FFDI for the area and the effective slope for 100 m. These variables can then be matched using the tables provided in the PBP to determine the appropriate BAL. The second methodology is based on a performance-based solution and the development of a bushfire design brief. In this assessment the assessment must be able to demonstrate how the proposal can meet the performance criteria of the PBP. As BPAD Level 3 Consultants many of the performance-based solutions involve using various models to demonstrate radiant heat instead of the deemed to satisfy tables. We also can use short fire runs and radiant heat models.