1.0 Purpose Statement

This position statement establishes FPA Australia’s position on the recently amended provisions to Australian Standard AS 3959-2009 Construction of buildings in bushfire prone areas regarding the design and selection of roof systems for Flame Zone construction. It also provides advice to FPA Australia members and other stakeholders on the background and issues that support the establishment of FPA Australia’s position.

Amendment No. 3 to AS 3959-2009 included changes to the provisions for roof systems for Flame Zone construction. FPA Australia (the Association) did not support these changes and subsequently voted “No” to the amendment. This position statement outlines the reasons for voting negative but also provides clear guidance to industry on the Association’s preferred approach to the design and installation of roofing systems for Flame Zone construction.

2.0 Audience

This Position Statement is intended for:

(i) FPA Australia members

(ii) Key stakeholders in

(a) the Bushfire Planning and Design Industry; and

(b) the Building and Construction Industry; and

(iii) The general public.

3.0 Introduction

Australian Standard AS 3959-2009 Construction of buildings in bushfire prone areas (the standard) was first published in March 2009 in response to the Black Saturday bushfires which occurred in Victoria on February 7, 2009.

The standard replaced the 1999 edition which had last been amended in 2001. The 2009 edition of the standard specifies the construction requirements for buildings in bushfire prone areas to reduce the risk of ignition from a bushfire while the fire front passes. Construction requirements in the standard vary depending on the Bushfire Attack Level (BAL). There are five levels of BAL requiring specific construction requirements as detailed in the following table.
Roof systems for Flame Zone construction in bushfire prone areas

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<table>
<thead>
<tr>
<th>BAL</th>
<th>Risk Level</th>
<th>Risk Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BAL–12.5</td>
<td>Low Risk</td>
<td>Risk of ember attack</td>
</tr>
<tr>
<td>BAL–19</td>
<td>Moderate Risk</td>
<td>Risk of ember attack and burning debris ignited by wind borne embers and a likelihood of exposure to radiant heat.</td>
</tr>
<tr>
<td>BAL–29</td>
<td>High Risk</td>
<td>Increased risk of ember attack and burning debris ignited by wind borne embers and a likelihood of exposure to an increased level of radiant heat.</td>
</tr>
<tr>
<td>BAL–40</td>
<td>Very High Risk</td>
<td>Much increased risk of ember attack and burning debris ignited by wind borne embers, a likelihood of exposure to a high level of radiant heat and some likelihood of direct exposure to flames from the fire front.</td>
</tr>
<tr>
<td>BAL–FZ (Flame Zone)</td>
<td>Extreme Risk</td>
<td>Extremely high risk of ember attack and burning debris ignited by wind borne embers, a likelihood of exposure to an extreme level of radiant heat and direct exposure to flames from the fire front.</td>
</tr>
</tbody>
</table>

It is widely acknowledged that the 2009 edition of the standard was a vast improvement on the 1999 edition. Amongst other improvements, the 2009 edition included significant changes to the site assessment methodology and the construction requirements. Despite these improvements it was acknowledged that the standard was published on the basis that some issues were unresolved and required further work. The preface listed a number of issues requiring further consideration as well as acknowledging that unanimity was not achieved in relation to construction requirements for BAL-FZ (flame zone).

Since publication of the standard in March 2009 there have been three amendments proposed and implemented. Amendment No. 1 dealt primarily with a number of editorial and non-technical corrections, while Amendment No. 2 included a response to some, but not all of the issues listed in the preface to the standard that were resolved by the Standards Australia FP-020 Committee.

In June 2011 Standards Australia FP-020 committee developed draft Amendment No. 3 to the standard. FPA Australia’s Technical Advisory Committee TAC/20 considered the proposed changes to the standard and determined that a negative (No) vote should be recorded due to significant concerns with certain aspects included in the amendments, in particular the inclusion of prescribed generic roofing systems for BAL-FZ applications.

4.0 Background

Amendment No. 3 to AS 3959-2009 introduced two prescribed roof construction solutions (detailed in Appendix I of the standard) for BAL-FZ construction. In addition, changes made to clause 9.6.1 make it less clear that a roofing system complying with the relevant test standard (AS 1530.8.2-2007) when tested from the outside, is equally a satisfactory method for achieving compliance with the construction requirements for BAL-FZ.

The prescribed roof construction solutions introduced in Appendix I of the standard detailed two generic roof systems, one for tiled roof construction and one for sheet roof construction both applicable for traditional skillion, hipped and gabled roofs.

*AS1530.8.2. Methods for fire tests on building materials, components and structures Part 8.2: Tests on elements of construction for buildings exposed to simulated bushfire attack – Large flaming sources
5.0 Issues

Prior to Amendment No. 3 of AS 3959-2009 (the standard) being integrated into the standard, the roof of a building subject to a Bushfire Attack Level (BAL) of BAL-FZ (Flame Zone) was required to comply with AS 1530.8.2-2007 when tested from the outside. This requirement meant that to comply with the standard, all roofs and roofing systems used in BAL-FZ applications had to be constructed using the same specific materials and employ the same construction techniques as roof products and systems that were originally evaluated by the Registered Testing Authority.

FPA Australia (the Association) understands that in the course of preparing Amendment No. 3, the Standards Australia committee responsible for AS 3959-2009 commissioned testing of a prototype roofing system. It is understood that the prescribed generic roofing systems introduced in the standard were based on the prototype system and were evaluated against the performance criteria in AS 1530.8.2-2007.

In contrast to a fully tested and certified roofing system, the prescribed generic roof systems do not allow for any control over the type of materials used or the method of installation. FPA Australia considers that this makes a generic roof system far less reliable than a tested or certified system.

FPA Australia is concerned that the generic roofing systems specified in Appendix I of the standard are likely to be inconsistently applied. This concern stems from the fact that there is no guarantee that the types of materials ultimately used on site will match those that were used in the testing and evaluation commissioned by the Standards Committee.

FPA Australia considers that a roofing system that uses different materials, or applies different construction techniques to those used in the testing and evaluation of the prototype system may not pass the AS 1530.8.2-2007 test, if the modified roofing system was submitted for testing.

The selection of plywood installed as part of a generic system is an example of where different materials could be used. Plywood is a manufactured wood panel made from thin sheets of wood veneer. In Australia, plywood is widely available in many varying forms from numerous product manufacturers and importers. Plywood can be manufactured from softwood, hardwood and tropical timbers and the thin sheets of wood veneer can be bonded together using a variety of different glue products. Such variations in plywood production make it most unlikely that all brands of plywood will perform the same when tested under fire conditions. This is just one example of where product selection could influence the performance of a generic roofing system.

Roof systems that have been certified by a Registered Testing Authority are required to comprehensively detail the materials and components to be used in the certified system. To ensure a system tested in a laboratory can be accurately replicated in the field; manufacturers of certified systems provide detailed manuals that document the specific products to be used and provide details on the method of installation to be followed in accordance with the certified system. In contrast the generic systems included in Appendix I of the standard provide little guidance in relation to the method of installation.
The table below provides a comparison between the detail specified by a typical sheet roof system that has been tested and certified to comply with AS 1530.8.2-2007 and the ability for the generic roofing system contained in Appendix I of the standard to vary the materials ultimately used in construction.

This issue is fundamental to FPA Australia’s concerns regarding the use of generic roof solutions for the highest risk category of bushfire attack (BAL-FZ). While it may be reasonable to argue that such solutions are an accepted and appropriate mechanism for controlling building work and deliver consistency and efficiency for the building industry; the risk associated with BAL-FZ construction as discussed earlier warrants a more scientific, evidence-based response. The requirements adopted in earlier versions of the standard followed this approach by requiring roofs and roof systems to comply with AS 1530.8.2-2007. This is a position that was also supported by the findings and recommendations of the 2009 Victorian Bushfires Royal Commission (VBRC) which raised concerns over the requirements for flame zone construction.

### An example of the typical differences in the requirements for a tested roof system and a generic roof system

<table>
<thead>
<tr>
<th>Item</th>
<th>Tested and Certified System</th>
<th>Generic System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Membrane attached to rafters or trusses</td>
<td>• Proprietary tested and certified product - 10mm thick.</td>
<td>• 15mm tongue and groove plywood. Any plywood product meeting these specifications may be used.</td>
</tr>
<tr>
<td></td>
<td>• Individual membrane sheets must overlap adjacent sheets by 50mm.</td>
<td>• Plywood fixed at 150mm and 300mm centres using 40mm nails or self-drilled countersunk screws.</td>
</tr>
<tr>
<td></td>
<td>• Joins between membrane sheets secured using 25mm wide steel straps secured by screws at 100mm centres.</td>
<td></td>
</tr>
<tr>
<td>Roof battens</td>
<td>• Steel battens required</td>
<td>• Steel or timber battens allowed</td>
</tr>
<tr>
<td>Insulating material and sarking</td>
<td>• Proprietary tested and certified product - 80mm thick.</td>
<td>• 75mm glasswool with a minimum R-value of R1.8. Any glasswool product meeting these specifications may be used.</td>
</tr>
<tr>
<td>Roof sheets</td>
<td>• Choice of two proprietary roof sheets may be used</td>
<td>• Any roof sheet with a base metal thickness between 0.42mm and 0.6mm may be used.</td>
</tr>
</tbody>
</table>
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FPA Australia contends that maintaining the requirement to install a system certified to comply with *AS 1530.8.2-2007* and obtaining the documentation that proves this, results in a level of quality assurance associated with roof installation that is commensurate with the risk associated with BAL-FZ.

The Association is concerned that the inclusion of generic roof construction options is likely to significantly dilute the use of other roofs or roofing systems developed by industry to pass *AS 1530.8.2 2007*. This may lead to a reduction of investment in the development of alternative roofing systems that would provide additional options to respond to the BAL-FZ risk and comply with the standard.

The changes included in Amendment No. 3 may result in the majority of new buildings taking advantage of the path of least resistance; that is applying the prescribed generic solution rather than designing and testing each system for BAL-FZ sites where the risk is the highest. This would result in a less stringent standard and lower the level of protection offered to the community.

FPA Australia acknowledges that the initial application of *AS 3959–2009* throughout Australia was troublesome for owners of property assessed as being subjected to a BAL-FZ rating. This was in part due to the unexpected adoption of *AS 3959–2009* shortly after the Black Saturday fires. The rapid publication of the standard which included referencing of the newly developed *AS 1530.8.2-2007*, unfortunately meant that there was little opportunity for products to be developed and tested to comply with the new test standard.

Despite the problems associated with the initial publication of the standard, industry has responded by investing considerable funds to design and test systems to meet the new requirements. In fact the rapid release of the standard not only encouraged innovation, but defined an expected level of performance and an even playing field. This has resulted in an increased, yet appropriate level of protection for the community.

It is understandable that in an environment where systems tested to *AS 1530.8.2-2007* were not available, the convenience of being able to turn to a prescribed generic construction requirement was considered desirable to meet consumer demands. However, this is no longer the case and indeed, referencing *AS 1530.8.2-2007* as a benchmark requirement has created a demand for tested product that industry has responded to and continues to innovate towards. Multiple products that have been tested to and found to comply with *AS 1530.8.2-2007* are now available in the marketplace and the Association considers that the changes included in Amendment No. 3 are likely to compromise this healthy competition without delivering any increase in safety.

Home owners have a right to expect that design and construction to a particular assessed BAL level means just that. Any change to *AS 3959-2009* that creates opportunity for a reduction in performance, inadvertently or otherwise, is unlikely to be supported by FPA Australia. This is especially the case if the basis for the proposal is only to reconcile consumer demand that can now be met without changing the current requirements. Consumer and community safety must be respected as the priority.
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6.0 Position Statement

Based on the background and issues outlined above, FPA Australia’s position is that roof construction in BAL-FZ applications should either:

(i) Comprise a roof system that when tested by a Registered Testing Authority in accordance with AS 1530.8.2-2007 achieves a BAL-FZ performance level; or

(ii) Comprise a roof system that is assessed by a Registered Testing Authority based on testing in accordance with AS 1530.8.2-2007 which confirms that the construction will achieve a BAL FZ performance level if tested in accordance with AS 1530.8.2-2007.

7.0 Associated Actions

1. FPA Australia supports further review and development of AS 3959-2009 to address the matters raised in this Position Statement as well as additional matters identified through the Association’s Technical Advisory Committee for Bushfire (TAC/20).

2. FPA Australia encourages continuation of the development of a new edition of AS 3959 that fully considers the findings, and responds to the recommendations of the 2009 Victorian Bushfires Royal Commission and the research outcomes achieved by the Bushfire Cooperative Research Centre.

8.0 References


2. Amendment No. 3 to AS 3959-2009 Construction of buildings in bushfire-prone areas, Published by Standards Australia, November 2011.


4. FPA Australia Technical Advisory Committee for Bushfire Safety (TAC/20).
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9.0 Disclaimer

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