Bushfire Development Report
as Expert Evidence

for the Kaufland Store Development
at 266-268 Maroondah Highway
Chirnside Park VIC 3116

Prepared for
Kaufland Australia Pty Ltd

November 2018
Terramatrix project: Kaufland Australia Pty Ltd-2018-02 BPA-Chirnside Park

Cover image: Looking west across the property at the development site.

Terramatrix Pty. Ltd.
ACN 129 163 373
ABN 44 129 163 373
PO Box 1391, Collingwood VIC 3066
P: 03 9417 2626
www.terramatrix.com.au

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Preface

Expert Witness Details

Name and address

Name: Hamish Allan
Title: Manager Bushfire Planning and Design
Company: Terramatrix Pty. Ltd.
Address: Suite 5, 166 Wellington Street
         Collingwood VIC 3066
Email: hamish@terramatrix.com.au
Telephone: (03) 9417 2626

Qualifications

• Bachelor of Applied Science in Environmental Assessment and Land Use Policy, 1990, Victoria College.
• Graduate Diploma in Bushfire Protection, 2014, University of Western Sydney.
• Level 3 Accredited Bushfire Practitioner - Bushfire Planning and Design, Fire Protection Association Australia (FPAA) Accreditation Number BPAD29090.

Area of expertise

Bushfire planning and design.

Skills and experience

I have over 25 years experience in land use planning (environmental, strategic and statutory planning), environmental management and bushfire planning including as a Park Ranger and Environmental Planner for State and local governments.

My role at Terramatrix includes managing the Terramatrix Bushfire Planning and Design (BPAD) team. This includes leading and undertaking bushfire risk assessments for strategic planning projects such as precinct structure plans, producing Bushfire Management Statements and other bushfire development reports for residential and commercial developments, subdivisions and planning scheme amendments.

I am a Victorian bushfire practitioner accredited by the Fire Protection Association Australia (FPAA) in association with the Country Fire authority (CFA) and Department of Environment, Land, Water and Planning (DELWP) to provide Level 3 Bushfire Planning and Design (BPAD) services.
I am a guest lecturer in Bushfire Planning and Design for University of Melbourne - Bushfire Urban Planning and have presented on the Victoria University Graduate Certificate in Performance Based Building and Fire Codes. I have also provided sessional training services for a range of clients including the Planning Institute of Australia PLANET course - Preparing and Assessing a Bushfire Management Statement.

I am regularly called upon to provide expert evidence about bushfire safety and compliance for Planning Panels and at VCAT.

**Instructions and scope of this report**

I have been engaged by Kaufland Australia Pty Ltd and instructed by Matthew Hughes of Planning and Property Partners, to provide expert evidence about bushfire safety and compliance, for the proposed retail development at 226-228 Maroondah Highway, Chirnside Park.

The information in this report has been prepared and is provided in accordance with the ‘Guide to Expert Evidence’ published by Planning Panels Victoria (PPV, 2015).

A reference list of documents referred to is provided at the end of the report.

**Client relationship**

I was engaged in October 2018 by Kaufland Australia Pty Ltd, to provide expert bushfire planning advice. My relationship with the client is a standard commercial one and no private, personal or other matter has influenced the content or findings of this statement.

‘I have made all the inquiries that I believe are desirable and appropriate and no matters of significance which I regard as relevant have to my knowledge been withheld from the Panel’.

Hamish Allan
Manager - Bushfire Planning and Design
Terramatrix Pty. Ltd.
5th November 2018.
1 Introduction

Kaufland Australia Pty Ltd proposes to develop a retail store on a portion of land at 266-268 Maroondah Highway, Chirnside Park VIC 3116. The site is currently vacant, undeveloped land. The development proposal is to construct a supermarket and other retail space, with associated car parking, access roads and landscaping.

The site is in the Commercial Zone - Schedule 1 (C1Z). A relatively small portion of the development site, along the southern and eastern boundaries, is within a designated Bushfire Prone Area (BPA). It is noted that no part of the site or surrounding landscape for over 1.5km, is affected by the Bushfire Management Overlay (BMO).

The development requires a planning scheme amendment for the proposed introduction of an incorporated document, via a proposed ministerial amendment to apply the Specific Controls Overlay at Clause 45.12, and as such, is proceeding to a planning advisory committee. Also, the development may result in people congregating in large numbers. Accordingly, Clause 13.02 Bushfire requires that bushfire risk be considered in the planning decision (Yarra Ranges Planning Scheme, 2018a).

This report assesses the bushfire hazard and identifies how the proposed development can appropriately mitigate any bushfire risk, and, respond to and comply with the applicable bushfire planning and building controls. It has been prepared in accordance with guidance for the assessment of, and response to, bushfire risk, provided in:

- Bushfire State Planning Policy Amendment VC140, Planning Advisory Note 68 (DELWP, 2018); and
- Local planning for bushfire protection, Planning Practice Note 64 (DELWP, 2015).
2 Overview of the site

Figure 1 – Site location (site in red fill, 1km buffer in blue outline and 5km buffer in white outline (Google Earth imagery date 2017-10-18).

<table>
<thead>
<tr>
<th>Address</th>
<th>266-268 Maroondah Highway, Chirnside Park VIC 3116</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site size</td>
<td>approx. 3.9ha development site within the property.</td>
</tr>
<tr>
<td>Municipality</td>
<td>Yarra Ranges Shire Council</td>
</tr>
<tr>
<td>Zone/s:</td>
<td>Commercial Zone - Schedule 1 (C1Z) (development site)</td>
</tr>
<tr>
<td>Overlay/s:</td>
<td>Development Contributions Plan Overlay - Schedule 1 (DCP01)</td>
</tr>
<tr>
<td>Directory reference:</td>
<td>Melway 37 G6</td>
</tr>
<tr>
<td>Assessed by:</td>
<td>Hamish Allan</td>
</tr>
<tr>
<td>Date of assessment:</td>
<td>27th October 2018</td>
</tr>
</tbody>
</table>
3 Bushfire planning and building controls

This section summarises the applicable planning and building controls that relate to bushfire.

3.1 Clause 71.02-3 Integrated Decision Making

Clause 71.02-3 states that planning and responsible authorities should endeavour to integrate policies and balance conflicting objectives in favour of net community benefit and sustainable development. However, in bushfire affected areas, the protection of human life must be prioritised over all other policy considerations (Yarra Ranges Planning Scheme, 2018b).

3.2 Clause 13.02 Bushfire

Clause 13.02 has the objective ‘To strengthen the resilience of settlements and communities to bushfire through risk based planning that prioritises the protection of human life’ (Yarra Ranges Planning Scheme, 2018a). The policy must be applied to all planning and decision making under the Planning and Environment Act 1987, relating to land which is:

• Within a designated Bushfire Prone Area;
• Subject to a Bushfire Management Overlay; or
• Proposed to be used or developed in a way that may create a bushfire hazard.

Clause 13.02 requires priority to be given to the protection of human life by:

• ‘Prioritising the protection of human life over all other policy considerations.’
• ‘Directing population growth and development to low risk locations and ensuring the availability of, and safe access to, areas where human life can be better protected from the effects of bushfire.’
• ‘Reducing the vulnerability of communities to bushfire through consideration of bushfire risk in decision-making at all stages of the planning process’ (Yarra Ranges Planning Scheme, 2018a).

Key strategies are stipulated in Clause 13.02, which require that strategic planning documents, planning scheme amendments and development plan approvals properly assess bushfire risk and include appropriate bushfire protection measures. This also applies to planning permit applications for:

• Subdivisions of more than 10 lots;
• Accommodation;
• Child care centre;
• Education centre;
• Emergency services facility;
• Hospital;
• Indoor recreation facility;
• Major sports and recreation facility;
• Place of assembly; and
• Any application for development that will result in people congregating in large numbers.

Development should not be approved where ‘...a landowner or proponent has not satisfactorily demonstrated that the relevant policies have been addressed, performance measures satisfied or bushfire protection measures can be adequately implemented’ (Yarra Ranges Planning Scheme, 2018a).

A response to the applicable strategies of Clause 13.02 is provided in Section 5.2 of this report.

### 3.3 Bushfire Prone Area (BPA)

More than half of the property, affecting a small area along the southern and eastern part of the development site within the property, is in the Bushfire Prone Area (BPA) (see Map 2). BPAs are those areas subject to or likely to be subject to bushfire, as determined by the Minister for Planning. Those areas of highest bushfire risk within the BPA are designated as BMO areas.

In a BPA, the Building Act 1993 and associated Building Regulations 2018, through application of the National Construction Code (NCC), require bushfire protection standards for class 1, 2 and 3 buildings, ‘Specific Use Bushfire Protected Buildings’ and associated class 10A buildings or decks. The applicable performance requirement in the NCC is:

‘A 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 —

(a) potential for ignition caused by burning embers, radiant heat or flame generated by a bushfire; and

(b) intensity of the bushfire attack on the building’ (ABCB, 2016).

Compliance with AS 3959-2009 *Construction of buildings in bushfire prone areas* (Standards Australia, 2011) is ‘deemed-to-satisfy’ the performance requirement.

In a BPA, applicable buildings must be constructed to a minimum Bushfire Attack Level (BAL)-12.5, or higher, as determined by a site assessment or planning scheme requirement. A BAL is a means of measuring the severity of a building’s potential exposure to ember attack, radiant heat and direct flame contact. There are six BALs defined in AS 3959-2009, which range from BAL-
LOW, which has no bushfire construction requirements to BAL-FZ (Flame Zone) where flame contact with a building is expected (see Appendix 1).

The proposed building does not require a BAL construction standard to comply with the building regulations that relate to bushfire. It is considered that this is acceptable and no specific bushfire protection measures are required, due to the:

- Very low bushfire risk at the site due to its location in a largely urban-residential landscape.
- The only bushfire hazard is from long grass (and a small area of scrub) on the vacant land to the east and south. These directions are not typically associated with severe fire weather and grassfires, whilst they can be fast moving, are of a lesser intensity than forest and scrub fires, and do not generate significant levels of ember attack.
- It is likely (by prudent property management and/or compliance with the local government process of checking properties and issuing fire prevention notices where a hazard exists) that most or all of the grass will be slashed to manage the hazard during the fire danger period.
- The hazard posed by the long grass on the vacant parts of the property is likely to be relatively temporary, as in the long term it is reasonable to assume it will be removed by development or management of the vegetation in a low threat state.
- The location of the site means that in the event of a fire, the emergency response can be expected to be quick and well resourced.
4 **Bushfire hazard assessment**

One of the bushfire hazard identification and assessment strategies in Clause 13.02 is to use the best available science to identify the hazard posed by vegetation, topographic and climatic conditions. The basis for the hazard assessment should be:

- *Landscape conditions - meaning the conditions in the landscape within 20 kilometres and potentially up to 75 kilometres from a site;*
- *Local conditions - meaning conditions in the area within approximately 1 kilometre from a site;*
- *Neighbourhood conditions - meaning conditions in the area within 400 metres of a site; and,*
- *The site for the development* (Yarra Ranges Planning Scheme, 2018b).

This section identifies the landscape context including landscape hazard assessment and description and fire history.

This section also includes a site assessment as required for determining a BAL construction standard by AS 3959-2009 *Construction of buildings in bushfire prone areas*, which requires an assessment of the vegetation and topography up to 100m around a building (Standards Australia, 2011). However, as noted in Section 3.3, a BAL construction standard is not applicable to the proposed type of building.

### 4.1 Landscape considerations

#### 4.1.1 Location description and context

The development site comprises a portion of land within 266-268 Maroondah Highway, Chirnside Park VIC 3116. Commercial development occurs immediately to the north, northeast and west-southwest of the site. Vacant land, comprising grassland, abuts to the south and east, and the Maroondah Highway abuts the site to the northwest. Beyond the commercial developments and vacant land surrounding the site, are the urban residential suburbs of Chirnside Park, Croydon North and Mooroolbark (see Figure 1 and Map 1).

#### 4.1.2 Landscape risk

To assist in assessing landscape risk, four 'broader landscape types', representing different landscape risk levels, are described in the DELWP technical guide *Planning Applications Bushfire Management Overlay*. These are intended to streamline decision-making and support more consistent decisions based on the landscape risk (DELWP, 2017).

The four types range from low risk landscapes where there is little hazardous vegetation beyond 150m of the site and extreme bushfire behaviour is not credible, to extreme risk landscapes with
limited or no evacuation options, and where fire behaviour could exceed BMO/AS 3959-2009 presumptions about fire weather, the fuel hazard and bushfire behaviour (see Table 1).

Table 1 - Landscape risk typologies (from DELWP, 2017).

<table>
<thead>
<tr>
<th>Broader Landscape Type 1</th>
<th>Broader Landscape Type 2</th>
<th>Broader Landscape Type 3</th>
<th>Broader Landscape Type 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>• There is little vegetation beyond 150 metres of the site (except grasslands and low-threat vegetation).</td>
<td>• The type and extent of vegetation located more than 150 metres from the site may result in neighbourhood-scale destruction as it interacts with the bushfire hazard on and close to a site.</td>
<td>• The type and extent of vegetation located more than 150 metres from the site may result in neighbourhood-scale destruction as it interacts with the bushfire hazard on and close to a site.</td>
<td>• The broader landscape presents an extreme risk.</td>
</tr>
<tr>
<td></td>
<td>• Bushfire can only approach from one aspect and the site is located in a suburban, township or urban area managed in a minimum fuel condition.</td>
<td>• Bushfire can approach from more than one aspect.</td>
<td>• Fires have hours or days to grow and develop before impacting.</td>
</tr>
<tr>
<td></td>
<td>• Immediate access is available to a place that provides shelter from bushfire.</td>
<td>• Access is readily available to a place that provides shelter from bushfire. This will often be the surrounding developed area.</td>
<td>• Access to an appropriate place that provides shelter from bushfire is not certain.</td>
</tr>
</tbody>
</table>

The landscape corresponds with the description of the lowest risk Landscape Type 1. The hazard is restricted to the grassland to the south and east, which is likely to be managed during the fire season and, in the longer term, removed as the vacant land is developed.

4.1.3 Fire history

There is no recent (post-1970) recorded history of bushfire in the surrounding landscape (see Map 1).

4.1.4 Regional Bushfire Planning Assessment (RBPA) Melbourne Metropolitan Region

As part of the response to the 2009 Victorian Bushfires Royal Commission, Regional Bushfire Planning Assessments (RBPAs) were undertaken across six regions that covered the whole of Victoria. The RBPAs provide information about ‘identified areas’ where a range of land use planning matters intersect with a bushfire hazard to influence the level of risk to life and property
from bushfire. The RBPAs state that ‘This information should be addressed as part of strategic land use and settlement planning at the regional, municipal and local levels’ (DPCD, 2012).

The Regional Bushfire Planning Assessment – Melbourne Metropolitan Region covers the Yarra Ranges Shire Council LGA. Whilst the RBPA notes the site is in a ‘Bushfire landscape of consideration’ no specific matters are identified, and the suburbs of Chirnside Park and Mooroolbark are identified as suburban residential areas (DPCD, 2012).
Map 1 - Bushfire hazard landscape assessment map.

No recorded history of bushfire since 1970, in view extent
4.2 Neighbourhood and site considerations

Vegetation and topography within the 100m BAL assessment zone around the building, and a 400m assessment zone around the development site, has been assessed. Classified vegetation is vegetation that is deemed hazardous from a bushfire perspective and is classified in accordance with the AS 3959-2009 methodology.

The classification system is not directly analogous to Ecological Vegetation Classes (EVCs) but uses a generalised description of vegetation based on the AUSLIG (Australian Natural Resources Atlas: No. 7 - Native Vegetation) classification system. The classification is based on the structure of the vegetation in its mature state and the likely fire behaviour that it will generate.

The assessment is based on site assessment and analysis of aerial imagery available on Google Earth.

4.2.1 Grassland

Areas of grassy vegetation with an overstorey foliage cover of less than 10%, and grass more than 100mm high, are classifiable in the Grassland group of AS 3959-2009, which is defined as ‘All forms (of vegetation) including areas with shrubs and trees, if overstorey foliage cover is less than 10%’ (Standards Australia, 2011).

The grassland areas on the property and the development site itself, were hazardous (i.e. greater than 100mm high), and therefore classifiable, at the time of the site assessment (see Figure 2). However, hazardous grassland areas such as this are required to be maintained (usually by slashing, mowing or grazing) in a low threat, or at least reduced hazard state, during the fire danger period. It is considered likely that this would be the case at this site and, if not undertaken by prudent management by the property owner, is likely to be assured through the annual program of fire hazard inspections and, if required, issuing of fire prevention notices by the Shire. It should be noted that this is not required to achieve the development, but is rather a factor likely to contribute to the low risk.

Most, if not all, of the small area of shrubs on and around the development site will be removed to achieve the development (see Figure 3).

The area of vacant land and vegetation to the northwest, across the Maroondah Highway, is not considered a bushfire hazard to the site.

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4 Under the BMO, the long-term mature state of the vegetation is considered, however for determining a BAL using AS 3959-2009, the assessment is at a ‘point in time’, which does not necessarily take into account future changes in the vegetation.
4.2.2 Excluded vegetation and non-vegetated areas

Areas of low threat vegetation and non-vegetated areas can be excluded from classification in accordance with Section 2.2.3.2 of AS 3959-2009, if they meet one or more of the following criteria:

i. ‘Vegetation of any type that is more than 100m\(^5\) from the site.

ii. Single areas of vegetation less than 1 ha in area and not within 100m of other areas of vegetation being classified.

iii. Multiple areas of vegetation less than 0.25 ha in area and not within 20 m of the site, or each other.

iv. Strips of vegetation less than 20 m in width (measured perpendicular to the elevation exposed to the strip of vegetation) regardless of length and not within 20 m of the site or each other, or other areas of vegetation being classified.

v. Non-vegetated areas, including waterways, roads, footpaths, buildings and rocky outcrops.

vi. Low threat vegetation, including grassland managed in a minimal fuel condition\(^6\), maintained lawns, golf courses, maintained public reserves and parklands, vineyards, orchards, cultivated gardens, commercial nurseries, nature strips and windbreaks\(^1\) (Standards Australia, 2011).

Apart from the grassland on the property, all other land extending at least 400m around the site, comprises either excludable and low threat vegetation, or non-vegetated areas.

4.2.3 Topography

The 'effective slope' is assessed for determining the BAL and applicable vegetation setback/defendable space distances. This is the slope of land under the classified vegetation that will most significantly influence the bushfire attack on a building. Two broad types apply:

- Flat and/or Upslope - land that is flat or on which a bushfire will be burning downhill in relation to the development. Fires burning downhill (i.e. on an upslope) will generally be moving more slowly with a reduced intensity.

- Downslope - land under the classified vegetation on which a bushfire will be burning uphill in relation to the development. As the rate of spread of a bushfire burning on a downslope (i.e. burning uphill towards a development) is significantly influenced by increases in slope, downslopes are grouped into five classes in 5° increments from 0° up to 20°.

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5 150m in BMO areas.

6 Minimal fuel condition means there is insufficient fuel available to significantly increase the severity of the bushfire attack, recognisable as short-cropped grass for example, to a nominal height of 100mm (Standards Australia, 2011).
As the land under the grassland to the south and east, rises up and away from the development site, it is in the lesser risk ‘All upslopes and flat land’ slope class. Therefore, the topography is not a factor contributing to any bushfire risk.

Figure 2 - Looking west towards the development site, showing grassland to the south and east.

Figure 3 - Looking southwest across the development site.
Map 2 - Bushfire hazard neighbourhood assessment map.
Map 3 - Bushfire hazard site (BAL) assessment map.
5 Planning and development response

5.1 Bushfire protection measures

As identified in Section 3.3, the type of building proposed does not require a BAL construction standard by the building regulations, and this is also justified by the low bushfire risk at the site and landscape scale. It is noted however, that this type of building, due to its commercial and public use and requirement to comply with other aspects of the building regulations and construction code (which typically require robust construction and materials); means it is possible that it may reach, or even exceed, the minimum BAL-12.5 standard for at least some aspects of the building e.g. use of non-combustible materials and thicker glazing.

As well as not requiring a BAL construction standard, it is considered that no other measures specifically for bushfire safety are warranted. This opinion is based on:

- The plans appear to show, and it is assumed, that vehicle access will be available to the building for emergency services; and
- A static water supply for structural fire safety will be provided that will also suffice for any bushfire risk, and the area has a reliable reticulated water supply.

It is suggested though, that a useful feature to enhance safety, would be to construct a 1.8m high non-combustible (e.g. colourbond steel) fence along the southern and eastern boundary where the site abuts grassland. This would provide some barrier to flame, radiant heat and embers if an ignition and fire in the grassland were to occur, and, would help to protect vehicles and landscaping (and the building) on the site.

Map 3 shows that if a BAL-12.5 construction standard were to be applied to the building, the current siting can, or can almost, achieve the 19m setback from unmanaged grassland that would be required (shown as a 19m orange buffer in the map).

5.2 Response to Clause 13.02

The following sub-sections provide a summary of how the proposal responds to the applicable strategies for bushfire safety in the PPF at Clause 13.02.

5.2.1 Protection of human life strategies

Clause 13.02 requires that the priority be given to protection of human life.

Prioritising the protection of human life over all other policy considerations

It is considered that the proposal prioritises the protection of human life over all other considerations by:
• Assessing and responding to the bushfire risk through the assessment and findings of this report;
• Complying with the building regulations that relate to bushfire, which do not in fact require any specific bushfire protection measures, due to the type of building and the low bushfire risk; and
• Ensuring that the requirements for structural fire safety are complied with, including typical site emergency management arrangements and procedures, access to the building for emergency management vehicles and a static water supply, which are considered to also be a sufficient response to the low bushfire risk.

Directing population growth and development to low risk locations and ensuring the availability of, and safe access to, areas where human life can be better protected from the effects of bushfire.

As identified in Section 4 of this report, there is a low bushfire risk at the site and landscape level, and easy pedestrian or vehicle access is available to acceptably safe non-vegetated areas or areas with low threat vegetation, away from the grassland hazard to the south and east.

Reducing the vulnerability of communities to bushfire through consideration of bushfire risk in decision-making at all stages of the planning process

This report appropriately identifies and considers to the bushfire risk.

5.2.2 Bushfire hazard identification and assessment strategies

Clause 13.02-1 requires that the bushfire hazard be identified, and appropriate risk assessment be undertaken.

Applying the best available science to identify vegetation, topographic and climatic conditions that create a bushfire hazard.

The bushfire hazard assessment in Section 4, identifies the hazard posed by vegetation and topography, at the site, neighbourhood and landscape scale. Climatic conditions are not a significant factor that needs to be specifically considered for assessing the bushfire hazard at this site.

Considering the best available information about bushfire hazard including the map of designated bushfire prone areas prepared under the Building Act 1993 or regulations made under that Act.

Map 1 and Map 2 show the current extent of BPA coverage of the site and surrounding landscape, based on the most recent BPA mapping for the state, which was gazetted 16th October 2018. Most of the development site is outside the BPA.
Applying the Bushfire Management Overlay in planning schemes to areas where the extent of vegetation can create an extreme bushfire hazard.

Current BMO coverage reflects relatively recent BMO mapping introduced into the Yarra Ranges Planning Scheme by Amendment GC13, which was gazetted on 3rd October 2017 (see Map 1). There is no BMO affected land within 1.5km of the site.

Considering and assessing the bushfire hazard on the basis of:

- **Landscape conditions** - meaning the conditions in the landscape within 20 kilometres and potentially up to 75 kilometres from a site;
- **Local conditions** - meaning conditions in the area within approximately 1 kilometre from a site;
- **Neighbourhood conditions** - meaning conditions in the area within 400 metres of a site; and
- **The site for the development.**

Section 4 of this report provides a bushfire hazard assessment at the landscape, neighbourhood and site scales.

Consulting with emergency management agencies and the relevant fire authority early in the process to receive their recommendations and implement appropriate bushfire protection measures.

The author is not aware of any consultation with the relevant fire authority.

Ensuring that strategic planning documents, planning scheme amendments, planning permit applications and development plan approvals properly assess bushfire risk and include appropriate bushfire protection measures.

The building regulations for construction in a bushfire prone area, DELWP advisory and practice notes and Clause 13.02, specify the general requirements and standards for assessing and responding to bushfire risk. It is considered that compliance with the building and planning regulations is an appropriate response at this low risk site. There is no requirement for specific bushfire protection measures above and beyond those that would be required for structural fire safety and emergency management arrangements for buildings of a public nature.

Not approving development where a landowner or proponent has not satisfactorily demonstrated that the relevant policies have been addressed, performance measures satisfied or bushfire protection measures can be adequately implemented.

The applicable requirements of the building and planning system that relate to bushfire, have been identified in this report, and they demonstrate that the development will be able to provide a compliant and sufficient response to the low risk.
5.2.3 Settlement planning strategies

The development does not comprise settlement planning and therefore, as these strategies are not considered applicable, they are listed below but no specific response is provided.

Directing population growth and development to low risk locations, being those locations assessed as having a radiant heat flux of less than 12.5 kilowatts/square metre under AS 3959-2009 Construction of Buildings in Bushfire-prone Areas (Standards Australia, 2009).

Ensuring the availability of, and safe access to, areas assessed as a BAL-LOW rating under AS 3959-2009 Construction of Buildings in Bushfire-prone Areas (Standards Australia, 2009) where human life can be better protected from the effects of bushfire.

Ensuring the bushfire risk to existing and future residents, property and community infrastructure will not increase as a result of future land use and development.

Achieving no net increase in risk to existing and future residents, property and community infrastructure, through the implementation of bushfire protection measures and where possible reduce bushfire risk overall.

Assessing and addressing the bushfire hazard posed to the settlement and the likely bushfire behaviour it will produce at a landscape, settlement, local, neighbourhood and site scale, including the potential for neighbourhood-scale destruction.

Assessing alternative low risk locations for settlement growth on a regional, municipal, settlement, local and neighbourhood basis.

Not approving any strategic planning document, local planning policy, or planning scheme amendment that will result in the introduction or intensification of development in an area that has, or will on completion have, more than a BAL-12.5 rating under AS 3959-2009.

5.2.4 Areas of high biodiversity conservation value

Ensure settlement growth and development approvals can implement bushfire protection measures without unacceptable biodiversity impacts by discouraging settlement growth and development in bushfire affected areas that are of high biodiversity conservation value

The author is not aware of any apparent biodiversity impacts associated with the development proposal.
5.2.5 Use and development control in a Bushfire Prone Area

Clause 13.02 requires that ‘In a bushfire prone area designated in accordance with regulations made under the Building Act 1993, bushfire risk should be considered when assessing planning applications for the following uses and development:

- Subdivisions of more than 10 lots.
- Accommodation.
- Child care centre.
- Education centre.
- Emergency services facility.
- Hospital.
- Indoor recreation facility.
- Major sports and recreation facility.
- Place of assembly.
- Any application for development that will result in people congregating in large numbers’ (Yarra Ranges Planning Scheme, 2018a).

It further states that:

‘When assessing a planning permit application for the above uses and development:

- Consider the risk of bushfire to people, property and community infrastructure.
- Require the implementation of appropriate bushfire protection measures to address the identified bushfire risk.
- Ensure new development can implement bushfire protection measures without unacceptable biodiversity impacts’ (Yarra Ranges Planning Scheme, 2018a).

The development will result in public use of the site. However, only a small portion is within a bushfire prone area and the bushfire risk is very low. The development will provide acceptable bushfire safety by compliance with the building regulations, which do not require specific protection measures above those that will be needed for structural fire safety and public use of a large retail facility.

Consideration should be given to constructing a 1.8m high non-combustible (e.g. colourbond steel) fence along the southern and eastern site boundary to provide additional safety from a fire in the adjacent grassland.
6 Conclusion

This report has assessed the bushfire hazard to the proposed retail development at 226-228 Maroondah Highway, in accordance with AS 3959-2009 Construction of buildings in bushfire prone areas and the hazard identification strategies at Clause 13.02 Bushfire.

The proposed building is exposed to a relatively small patch of grassland in a low risk urban setting. The building does not require a BAL construction standard to comply with the building regulations that relate to bushfire. It is considered that this is acceptable and no specific bushfire protection measures are required, due to the:

- Very low bushfire risk at the site due to its location in a largely urban-residential landscape.
- The only bushfire hazard being the long grass (and a small area of scrub) on the vacant land to the east, and south. These directions are not typically associated with severe fire weather and grassfires, whilst they can be fast moving, are of a lesser intensity than forest and scrub fires, and do not generate significant levels of ember attack.
- It is likely (by prudent property management and/or compliance with the local government process of checking properties and issuing fire prevention notices where a hazard exists) that most, or all, of the grass will be slashed to manage the hazard during the fire danger period.
- The hazard posed by the grass on the vacant parts of the property is likely to be relatively temporary, as in the long term it is reasonable to assume the hazard will be removed by development or management of the vegetation in a low threat state.
- The location of the site means that in the event of a fire, the emergency response can be expected to be quick and well resourced.

However, it is suggested that a useful, though not required, feature to enhance safety, would be to construct a 1.8m high non-combustible (e.g. colourbond steel) fence along the southern and eastern boundary where the site abuts grassland. This would provide a useful barrier to flame, radiant heat and embers if an ignition and fire in the grassland were to occur.
# Appendix 1  BAL construction standards

<table>
<thead>
<tr>
<th>Bushfire Attack Level (BAL)</th>
<th>Risk Level</th>
<th>Construction elements are expected to be exposed to...</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>VERY LOW: There is insufficient risk to warrant any specific construction requirements but there is still some risk.</td>
<td>No specification.</td>
<td>At 4kW/m² pain to humans after 10 to 20 seconds exposure. Critical conditions at 10kW/m² and pain to humans after 3 seconds. Considered to be life threatening within 1 minute exposure in protective equipment.</td>
</tr>
<tr>
<td>BAL-Low</td>
<td>LOW: There is risk of ember attack.</td>
<td>A radiant heat flux not greater than 12.5 kW/m²</td>
<td>At 12.5kW/m² standard float glass could fail and some timbers can ignite with prolonged exposure and piloted ignition.</td>
</tr>
<tr>
<td>BAL-12.5</td>
<td>MODERATE: There is a risk of ember attack and burning debris ignited by windborne embers and a likelihood of exposure to radiant heat.</td>
<td>A radiant heat flux not greater than 19 kW/m²</td>
<td>At 19kW/m² screened float glass could fail.</td>
</tr>
<tr>
<td>BAL-19</td>
<td>HIGH: There is an increased risk of ember attack and burning debris ignited by windborne embers and a likelihood of exposure to an increased level of radiant heat.</td>
<td>A radiant heat flux not greater than 29 kW/m²</td>
<td>At 29kW/m² ignition of most timbers without piloted ignition after 3 minutes exposure. Toughened glass could fail.</td>
</tr>
<tr>
<td></td>
<td>VERY HIGH: There is a much increased risk of ember attack and burning debris ignited by windborne 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>
<td>A radiant heat flux not greater than 40 kW/m²</td>
<td>At 42kW/m² ignition of cotton fabric after 5 seconds exposure (without piloted ignition).</td>
</tr>
<tr>
<td>BAL-40</td>
<td>EXTREME: There is an extremely high risk of ember attack and a likelihood of exposure to an extreme level of radiant heat and direct exposure to flames from the fire front.</td>
<td>A radiant heat flux greater than 40 kW/m²</td>
<td>At 45kW/m² ignition of timber in 20 seconds (without piloted ignition).</td>
</tr>
<tr>
<td>BAL-FZ (Flame Zone)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Adapted from Standards Australia (2011).
8 References


