"Commercial in Confidence"

Bushfire Development Report

Including

Bushfire Management Statement

Pathway 2

Bushfire Hazard Site Assessment

Bushfire Attack Level Assessment - Determination

Bushfire Hazard Landscape Assessment

Bushfire Management Plan

Response to Clause 13.02-1S Bushfire Planning

Relating to proposed new dwelling at 325 Pinnacle Lane Steels Creek 3775 Victoria

[redacted]

28 April 2021
V8.1

Prepared by:

SBAFire

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Document Set ID: 6585840
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"Commercial in Confidence"

Bushfire Development Report

Including

Bushfire Management Statement
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Executive Summary

This bushfire development report (BDR) relates to the proposed new dwelling at 325 Pinnacle Lane Steels Creek 3775 Victoria. The subject site is in a Designated Bushfire Prone Area and is also covered by a Bushfire Management Overlay, therefore requiring a Bushfire Management Statement (BMS) (Pathway 2) and bushfire attack level (BAL) assessment as Clause 53.02-4 applies, under Clause 53.02. The Bushfire Development Report has been prepared by SBAFire Bushfire Advisory for the property owners and should be read in conjunction with the planning and building application for the property.

The bushfire development report outlines how the proposed construction development of a new dwelling on the site responds to the purpose and objectives of Clause 53.02-4: – Bushfire Planning, Bushfire protection objectives, including the decision guidelines of Clause 44.06 – Bushfire Management Overlay.

The subject site is also subject to specific planning and building controls that relate to bushfire, including Clause 71.02-3 Integrated Decision Making, that states that planning and responsible authorities should endeavour to integrate policies and balance conflicting objectives in favour of net community benefit and sustainable development. In bushfire affected areas the protection of human life must be priorities over all other policy considerations. Clause 13.02-1S Bushfire Planning will be considered with the objective "To strengthen the resilience of settlements and communities to bushfire through risk based planning that prioritises the protection of human life over all other policy considerations"

We have provided a detailed bushfire development report, including a bushfire management statement, bushfire landscape hazard assessment, bushfire management plan, bushfire hazard site assessment and bushfire attack level (BAL) assessment and a response to clause 13.02-1S Bushfire Planning, in order to ensure a clear understanding of the nature of the bushfire risk the property is responding to, and includes some requirements and recommended measures that would improve the overall bushfire preparedness and resilience of the property and people at the site.

The proposal involves construction of proposed new dwelling at 325 Pinnacle Lane Steels Creek 3775 Victoria, which is located in a Bushfire Management Overlay, requiring a BMS and BAL report.

The report includes the following:

1. *A **Bushfire Hazard Site Assessment** including a plan that describes the bushfire hazard within 150 metres of the proposed development*
2. *A **Bushfire Management Statement** describing how the proposed development responds to the requirements of Clause 53:02 and Clause 44.06*
3. *A **Bushfire Attack Level Assessment** – Detailed procedure (Method 2) AS3959-2018*
4. *A **Bushfire Hazard Landscape Assessment Outline** including a plan that describes the bushfire hazard of the general locality more than 150 metres from the site*
5. *A **Bushfire Management Plan***
6. *A **Response to Clause 13.02-1S Bushfire Planning***

The current property owners manage the vegetation around and across the subject property to a high standard. It will be important for the property owners to continues to maintain a high level of property vegetation management and maintenance, in order to ensure minimal fuel loading on the property, particularly within the defined defendable space area. The nature of the vegetation on and adjoining the site, combined with the grassland, woodland and forest vegetation beyond the site will present a very high to extreme bushfire risk, particularly on days of extreme to catastrophic fire weather conditions.

The proposed development appropriately prioritises the protection of human life, and strengthens community resilience to bushfire, through strategic siting, design and construction measures that reduce the bushfire risk to human life and property to an acceptable level. In terms of vegetation and topography surrounding the site, the site is exposed to extensive very high to extreme bushfire risk vegetation to the north, west, east and south.

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The consultant is of the opinion that the vegetation across the area around the subject new dwelling site is essentially managed. With extensive grassland, woodland and forest areas in the immediate and wider bushfire landscape, that is largely unmanaged, with high levels of ground/surface fuel loads, mid-level and canopy fuel and overall fuel loads, that are at or above the standard fuels loads of AS3959-2018.

The vegetation on and directly adjoining the site, is directly linked to the very high to extreme risk woodland and forest areas surrounding the site to the north, northwest, northeast, west, east and south/southeast.

The subject site is potentially exposed to high impact major bushfires that can approach the site from more than one aspect. The consultant has deemed the subject site Landscape Risk Typology as Broader Landscape Type 3 as referred to within Practice Note 65:

- *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.*
- *Bushfire can approach from more than one aspect.*
- *The site is located in an area that is not managed in a minimum fuel condition.*
- *Access to an appropriate place that provides shelter from bushfire is not certain.*

The subject site is exposed to a very high to extreme bushfire landscape risk, with the potential for long run bushfires from more than 40 km away and from more than one direction, in addition there is extensive very high to extreme bushfire risk vegetation that impinges on and adjoining the main egress road and the road network available to people on the subject site. The main egress roads also have extensive road verge vegetation that also elevates the risk to people seeking to egress the site, making it potentially very difficult to safely egress the site during a major bushfire impacting the site, Steels Creek and the wider area. In order to provide the ability for people on the site to have the ability to shelter in place and have access to a place of last resort on the site, a bushfire shelter has been required on the site. Which would ensure that people on the site will be able to shelter in place and have a place of last resort within close proximity to the dwelling.

This report demonstrates that the bushfire management, mitigation and planning measures set out in this report, will strengthen community resilience and provide a strong level of protection to people and property on the site and reduce the overall bushfire risk on and adjoining site.

The bushfire management, planning and mitigation requirements for the proposed new dwelling at 325 Pinnacle Lane Steels Creek 3775 Victoria (Subject site), include:

- *Dwelling to be constructed to a minimum of BAL 29*
- *Defendable Space of 35 metres in all directions around the dwelling*
- *Establish a 5 metres managed vegetation buffer/fire break to the property boundary to the west, south and east and 60 metres to the north*
- *Ensure that the new accessway to the new dwelling site complies with the BMO assess and egress construction requirements, including passing bays (20m x 6m) at least every 200 metres*
- *Provide a 40,000 firefighting water supply tank on the site, in the location set out in the BMP*
- *Provide a bushfire shelter on the site near the dwelling and the firefighting water supply tank.*

The proposed new dwelling development takes into account site constraints, the closest vegetation threat and incorporates measures to mitigate bushfire risk. When considering factors of aspect, vegetation threat, slope and vegetation character, this report demonstrates that: *BAL 29 Construction level will be achieved for the proposed new dwelling on the site.*

The proposal is appropriate for CFA/FRV and Council approval and support.

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Document Control

DOCUMENT CONTROL:	
Project Number:	1912433
Project Name:	325 Pinnacle Lane Steels Creek 3775 Victoria
Document Reference:	BMS/BAL Report 325 Pinnacle Lane Steels Creek

PREPARED FOR:	
Client name	[redacted]
Address	C/ 325 Pinnacle Lane Steels Creek 3775 Victoria

PREPARED BY:	
Consultant	Geoffrey Stone *MBA, FAIM, CFO, MIFireE, AdvDipEmergMgt, CertIVFireSup, CertFireOps* Principal Consultant SBAFire – Bushfire Advisory
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VERSION CONTROL:		
Version	Details	Date
Original V8.1	Final Document	28/04/2021
Revised version		

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DISCLAIMER

This report is prepared on the basis the subject site and land that is identified to be 'at risk' of bushfire. Any buildings or structures located on such land subsequently inherit this risk. This report does not seek to remove this risk but provides a bushfire management and assessment report outline of issues relating to bushfire management and planning to assist the ability of the landowner to manage the threat of this risk.

This assessment is prepared based upon local, State and Federal legislative provisions relating to bushfire protection, as relevant at the time of production. SBAFire maintains relevant knowledge with regard to planning and development in bushfire prone areas. However, it is important to note that whilst bushfires generally maintain certain scientific attributes, bushfire events vary in intensity, duration, location and 'typical' behavioural characteristics. Bushfires do not always conform to scientific and widely understood predictabilities and remain subject to variation across fire seasons by virtue of changes in ground fuel loads and vegetation, prevailing weather and wind conditions and topography.

It remains the landowner's responsibility to understand and prepare for the event of bushfire, which requires year-round property maintenance, a proficient understanding of local bushfire knowledge and what do in the event of a bushfire. A personal bushfire safety plan is recommended, and decisions regarding what to do in an event should be made well in advance of any particular bushfire threat. Regular contact with your local fire authority is advised.

Whilst every care has been taken in the preparation of this report to advise upon the bushfire risk of the property, it forms no guarantee with respect to the safeguard of life and property. SBAFire accepts no responsibility for any damage or loss of life or property as a result of bushfire or any other cause which may in any way be taken to be the subject of this report. This report and the information within it are provided on the understanding that reasonable care will be taken when using it. If there remains any uncertainty regarding the application of the information within the report in a specified circumstance, further professional advice should be sought. SBAFire does not accept responsibility for how the information within this report is applied or relied upon.

Further comment: We reiterate that this report has been prepared to assist you in determining the nature of bushfire management requirements set out in the approved documentation for this property that is stated in this report. We have given careful consideration to the statutory requirements and specific requirements of various authorities. We SBAFire have made our recommendations on the basis of the information made available to us and our understanding of the requirements and using our best endeavors. The information may be of assistance to you. Before relying on information in this report, users should carefully evaluate the accuracy, completeness and relevance of the information provided for their purposes. SBAFire, its directors and employees do not guarantee that it is without flaw or omission of any kind or is wholly appropriate for your particular purposes and therefore disclaim all liability for any error, loss or other consequence that may arise from you relying on any information in this report.

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W: www.sbafire.com E: info@sbafire.com

Qualifications

- *Chief Fire Officer (CFO) Designation CPSE/Commission on Professional Credentialing USA*
- *Member of The Institution of Fire Engineers UK - MIFireE*
- *Advanced Diploma of Public Safety - Emergency Management*
- *Major Incident Controller/Commander AIIMS - Australasian Inter-service Incident Management System*
- *Certificate IV in Training and Assessment*
- *Certificate IV in Public Safety (Firefighting Supervision)*
- *Certificate III in Public Safety (Firefighting Operations)*
- *Certificate II in Public Safety (Firefighting Operations)*
- *Senior Executive Fire Officer Assessment V – CFA*
- *Operations Management - CFA*
- *Operations Officer – CFA*
- *Fire Officer III Assessment - CFA*
- *Brigade Officer - QFES*
- *Crew Leader - CFA & QFES*
- *Leading Firefighter/Fire Officer I – CFA*
- *Forest Fire Management – Former DCFL - Forests Commission Victoria*
- *Master of Business Administration - The University of Melbourne Victoria*
- *Graduate Diploma in Business Administration - The University of Ballarat Victoria*
- *Diploma of Leadership and Management*
- *Fellow of Australian Institute of Management – FAIM*
- *Certified Professional Manager – CPMgr current*

Area of Expertise

Bushfire management, planning, design and operations. Large scale bushfire incident command and operations. Fire and Emergency Services delivery, operations, policy, management, corporate, strategic and operational planning. Leadership and management of large-scale complex public, private and non-profit organisations.

Experience

Geoffrey Stone has more than 35 years' experience, knowledge, skills and qualifications as a Senior Fire and Emergency Services Officer with the Country Fire Authority Victoria (CFA), Queensland Fire and Emergency Services (QFES), Queensland Fire and Rescue Service (QFRS) and Rural Fire Service Queensland (RFSQ), and recognised industry wide as one of the top experts in the field. He has previously served as CFA Director Strategic and Operational Planning, State Fire Commander, Assistant Chief Officer in various departments and locations, and in other senior state, regional command, group and brigade level positions.

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Introduction and scope

SBAFire has been engaged by the property owners to undertake a Bushfire Development Report (BDR), including a Bushfire Management Statement (BMS), Bushfire Hazard Landscape Assessment (BHLA), Bushfire Hazard Site Assessment (BHSA), Bushfire Attack Level (BAL) assessment and a Bushfire Management Plan (BMP), relating to the proposed new dwelling at 325 Pinnacle Lane Steels Creek 3775 Victoria (subject site).

The current dwelling at 325 Pinnacle Lane Steels Creek 3775 Victoria will be demolished and a new dwelling will be constructed near the southern property boundary of the site and not on the current dwelling site. The subject site is within the Bushfire Prone Area and is also covered by the Bushfire management Overlay (BMO) and therefore a very high to extreme bushfire risk environment. The site has extensive bushfire hazard landscape risk, and the area is a very high to extreme bushfire risk environment. The BDR, considers aspects of Planning Scheme relating to bushfire and protection of human life, and applies AS3959-2018 Construction of buildings in bushfire prone areas to establish the construction BAL level for the new dwelling on the site. The BDR considers and applies Clause 53.02 Bushfire Planning, Clause 44.06 Bushfire Management Overlay, Clause 71.02-3 and 13.02-1S as further outlined in the following.

The subject site is subject to specific planning and building controls that relate to bushfire, including Clause 71.02-3 Integrated Decision Making, that states that planning and responsible authorities should endeavour to integrate policies and balance conflicting objectives in favour of net community benefit and sustainable development. In bushfire affected areas the protection of human life must be priorities over all other policy considerations. Clause 13.02-1S Bushfire Planning will be considered with the objective “To strengthen the resilience of settlements and communities to bushfire through risk based planning that prioritises the protection of human life over all other policy considerations”

In bushfire affected areas planning and responsible authorities must prioritise the protection of human life over all other policy considerations. Clause 13.02-1S Bushfire Planning will be considered with the objective “To strengthen the resilience of settlements and communities to bushfire through risk based planning that prioritises the protection of human life over all other policy considerations”

The BDR, bushfire management statement, bushfire management plan, bushfire hazard site and landscape assessments and bushfire attack level assessment aim to mitigate the risk to life and property from bushfire threat and the impact of bushfire attack.

This bushfire development report (BDR) does not seek to remove the bushfire risk, but provides detailed siting, building and general bushfire hazard related information to assist in the ability of the landowner to manage the risk associated with living in a bushfire environment. The BDR has been prepared in accordance with AS3959-2018, and considered bushfire related planning scheme Clauses including, 71.02-3 Integrated Decision Making, Clause 13.02-1S Bushfire Planning, 53.02 Bushfire Planning and Clause 44.06 Bushfire Management Overlay, best practice standards as applied in Victoria and in accordance with Local and State Government bushfire planning, guidelines and policies.

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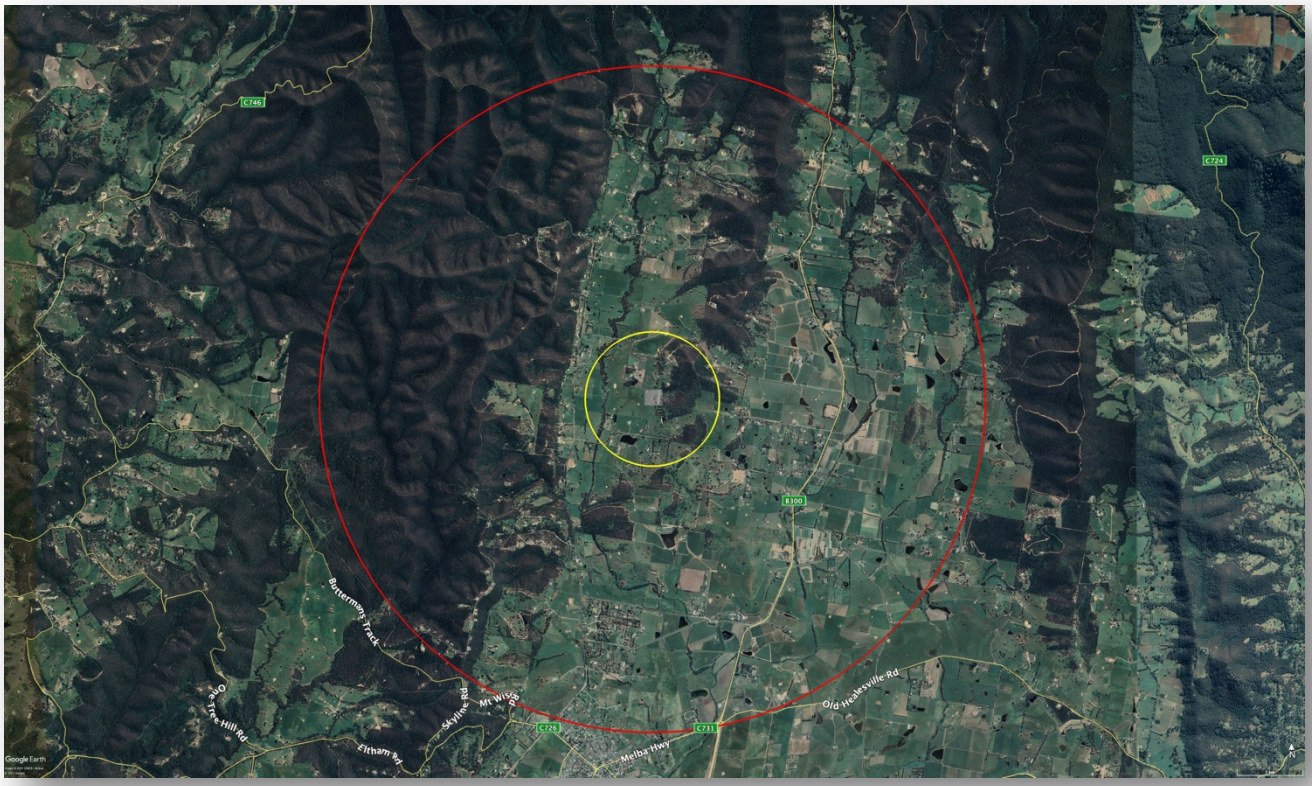
Location and Site Overview

The subject site is located at 325 Pinnacle Lane Steels Creek 3775 Victoria, surrounding properties and existing land use and the landscape context will be considered as part of this report.



Aerial Image Site location and surrounding areas, 1 km buffer (Yellow) 5 km buffer (Red)
(Image Source: Google Earth Pro 1 Dec 2018)

The subject site details:

Address: 325 Pinnacle Lane Steels Creek 3775 Victoria

Site size: 191,233 sqm (19.1 ha)

Council: Lot 2\LP117799 Yarra Ranges Council Current Property No. 202146

Planning Zone: Green Wedge Zone (GWZ5)

Overlays: Bushfire Management Overlay (BMO)

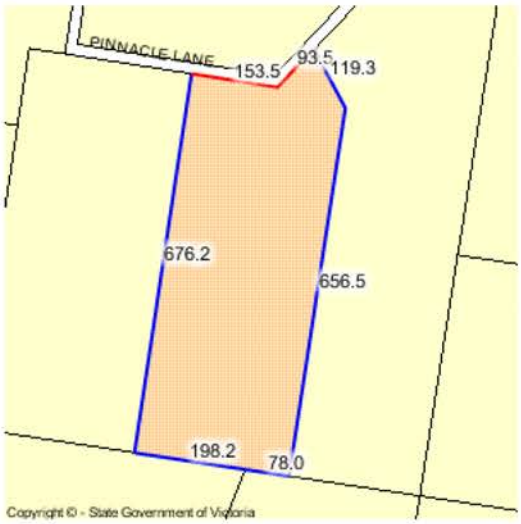
Primary Planning Scheme Clauses: Clause 71.02-3 Integrated Decision Making, Clause 13.02-1S Bushfire Planning, Clause 53.02 Bushfire Planning and Clause 44.06 Bushfire Management Overlay.

Bushfire Area: Bushfire Prone Area (BPA) and Bushfire Management Overlay (BMO)

Summary of Bushfire Risk: The site is in a green wedge zone at the rural bushfire interface. The subject site and the surrounding areas are located in a very high to extreme bushfire risk environment. The subject site bushfire risk is elevated by the extensive grassland, woodland and forest vegetation adjoining and beyond the subject site. It is important to highlight that the combination the extensive grassland, woodland and forest across the wider landscape and the potential for short and long fire runs into the site, elevates the bushfire risk the site and people face. *It is important to highlight that the subject site vegetation across the site and directly adjoining the current and the new dwelling is managed through grazing by the current site owners. Thus, the overlay bushfire risk on the site is partly reduced within the immediate area of the new dwelling. Steels Creek was impacted by the Kilmore East bushfire of Black Saturday 2009, 10 people lost their lives in the Steels Creek area on Black Saturday.*

Site Plan Image

All dimensions and areas are approximate. They may not agree with the values shown on a title or plan.



Area: 191233 sq. m
(19.1 ha)
Perimeter: 1975 m

For this parcel:
Site boundaries
Road frontages

Dimensions for individual parcels require a separate search, but dimensions for individual units are generally not available.

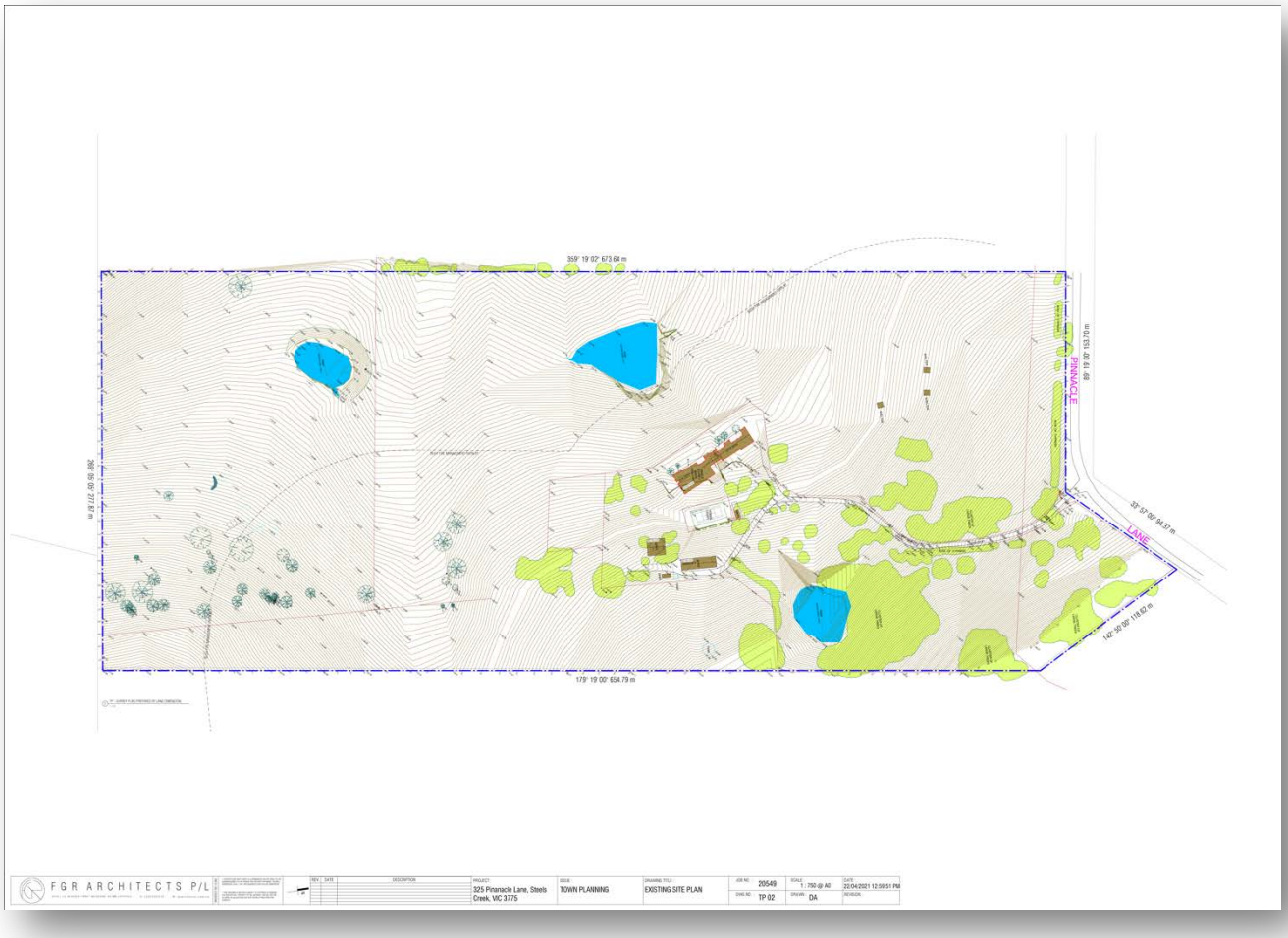
For more accurate dimensions get copy of plan at
Title and Property Certificates

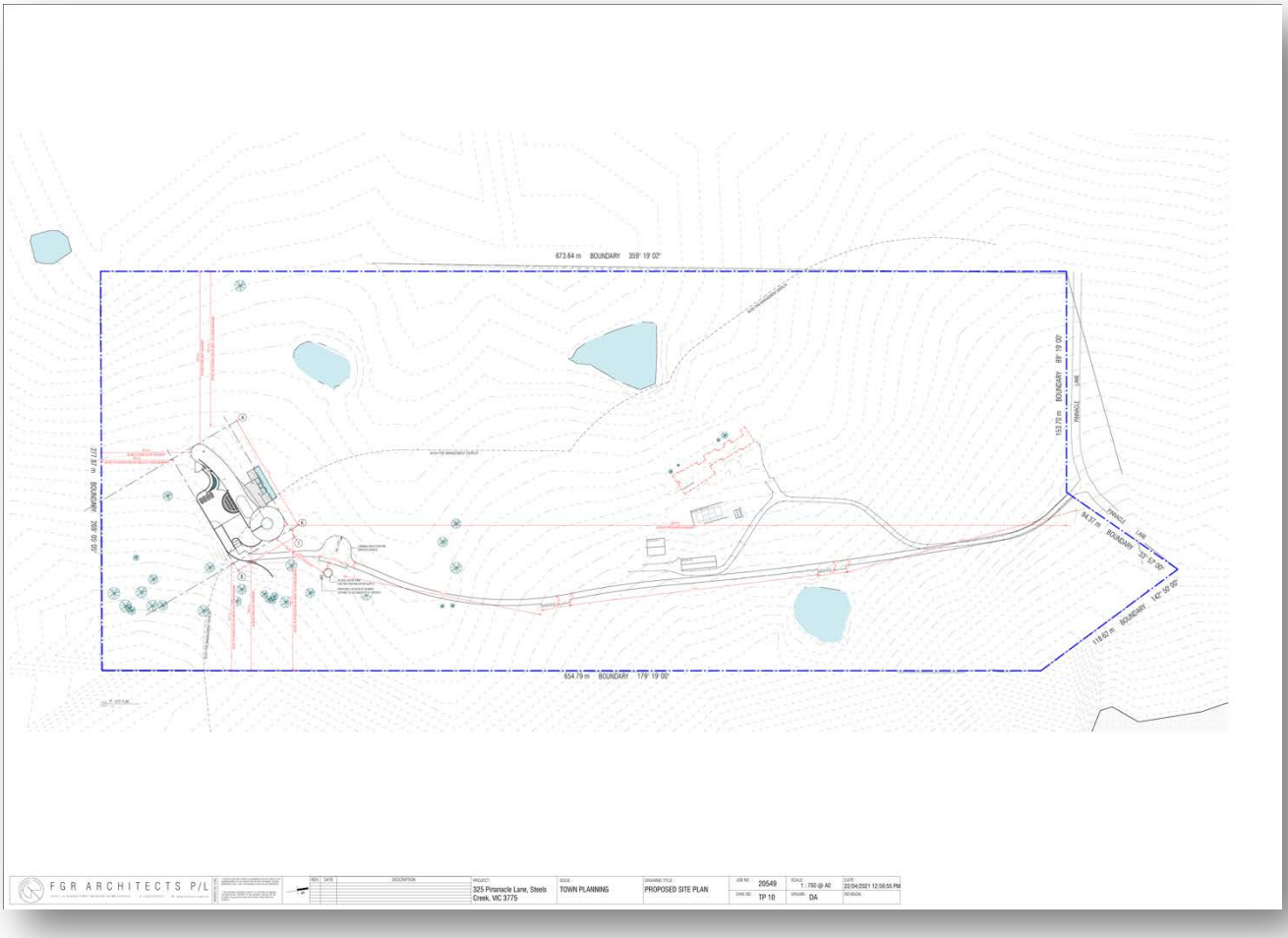
Aerial Image of Subject Site 325 Pinnacle Lane Steels Creek

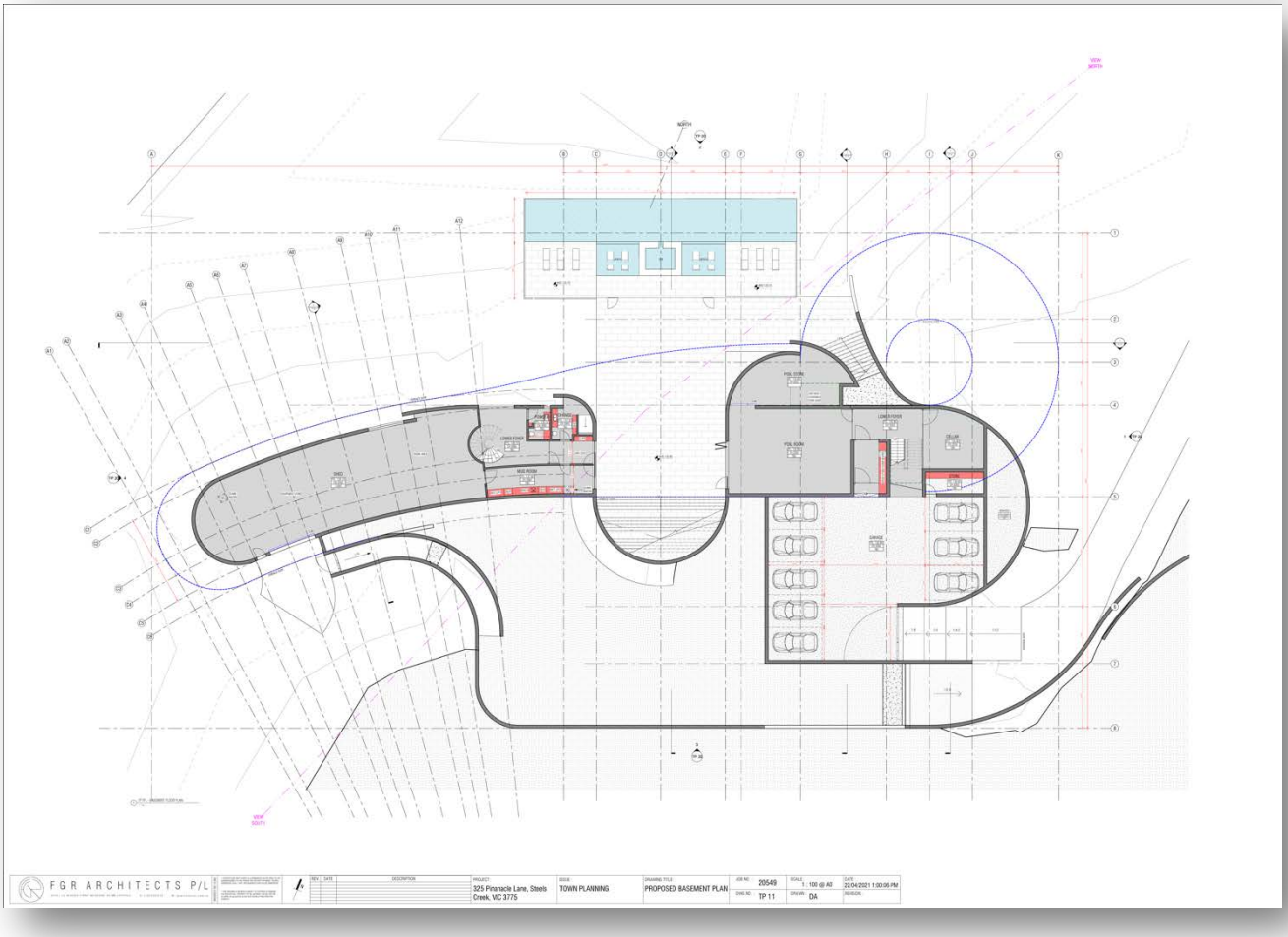
Aerial Image of Current Dwelling & Proposed New Dwelling Envelope & Surrounds

Aerial Image of New Dwelling Site and Surrounding Area

New Dwelling and Site Outline Plans (supplied by owner)







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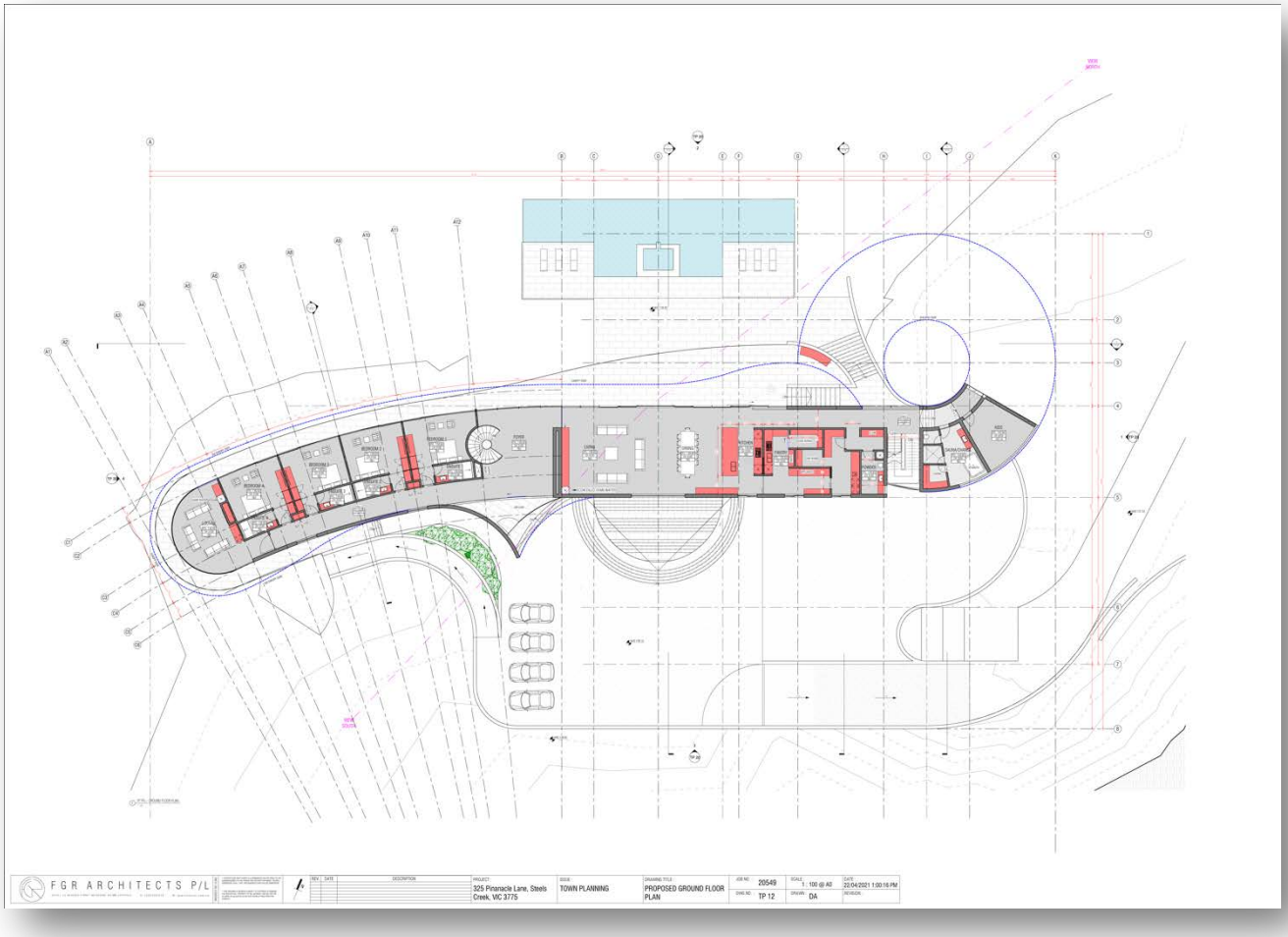

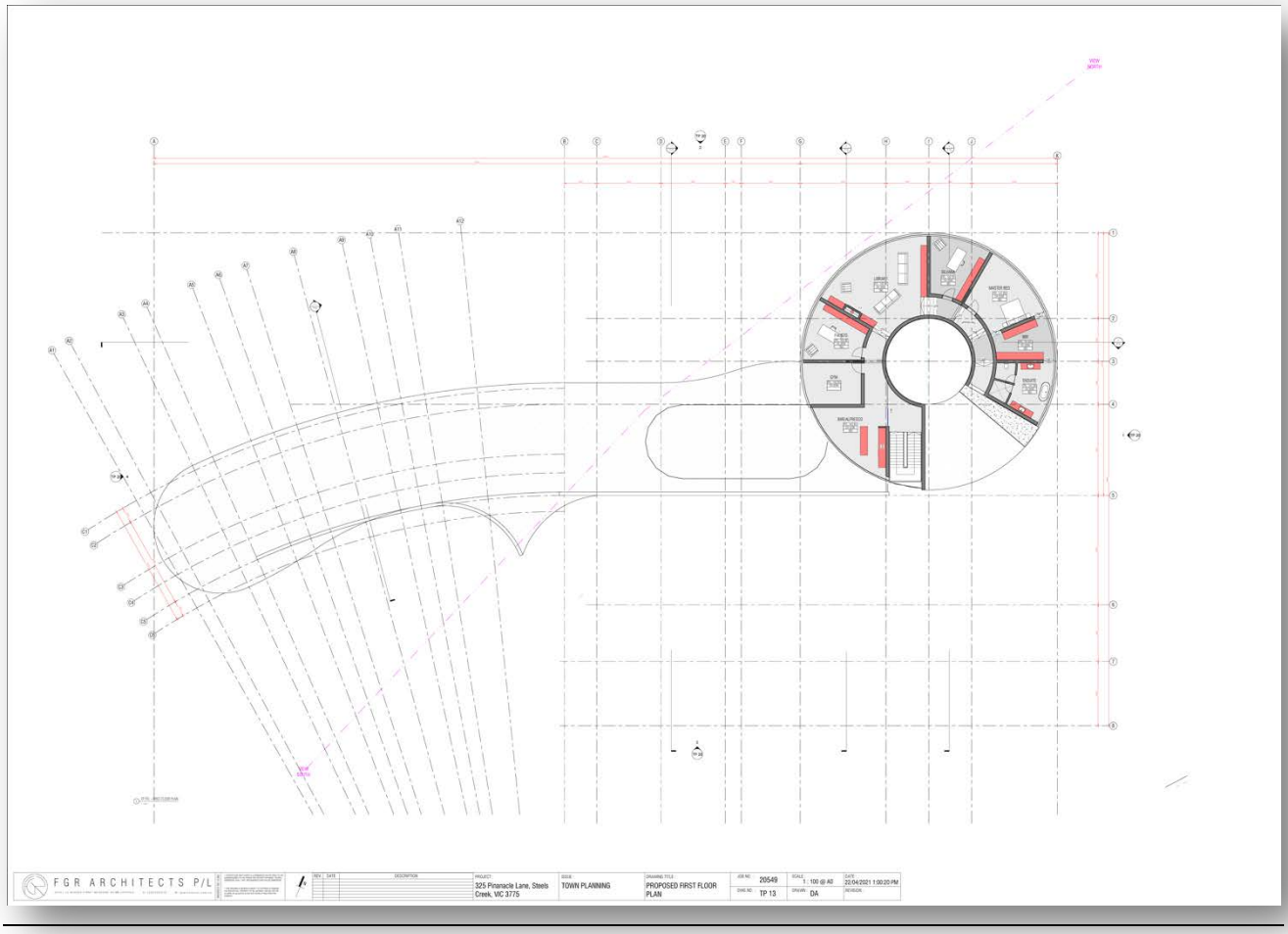

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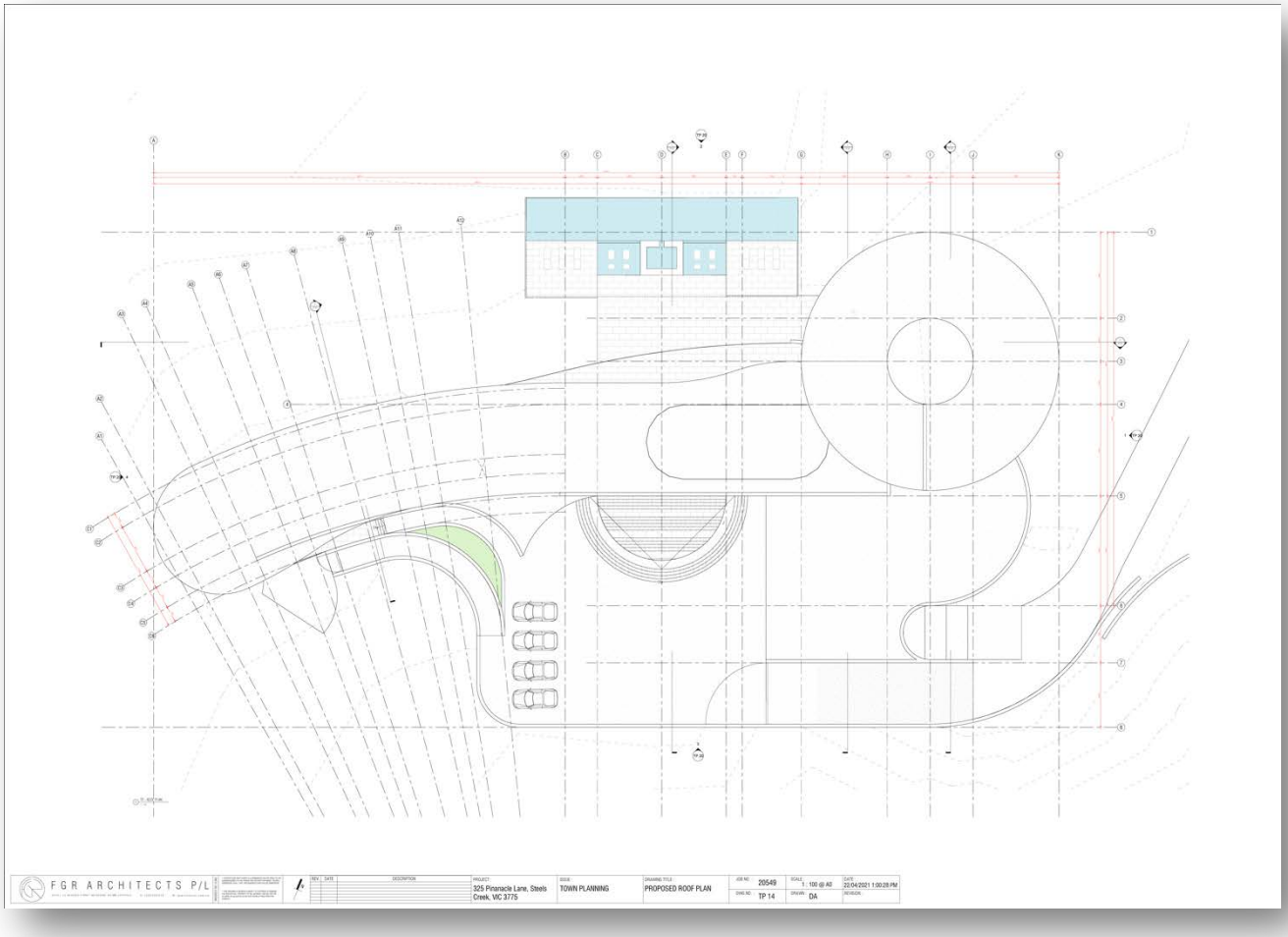

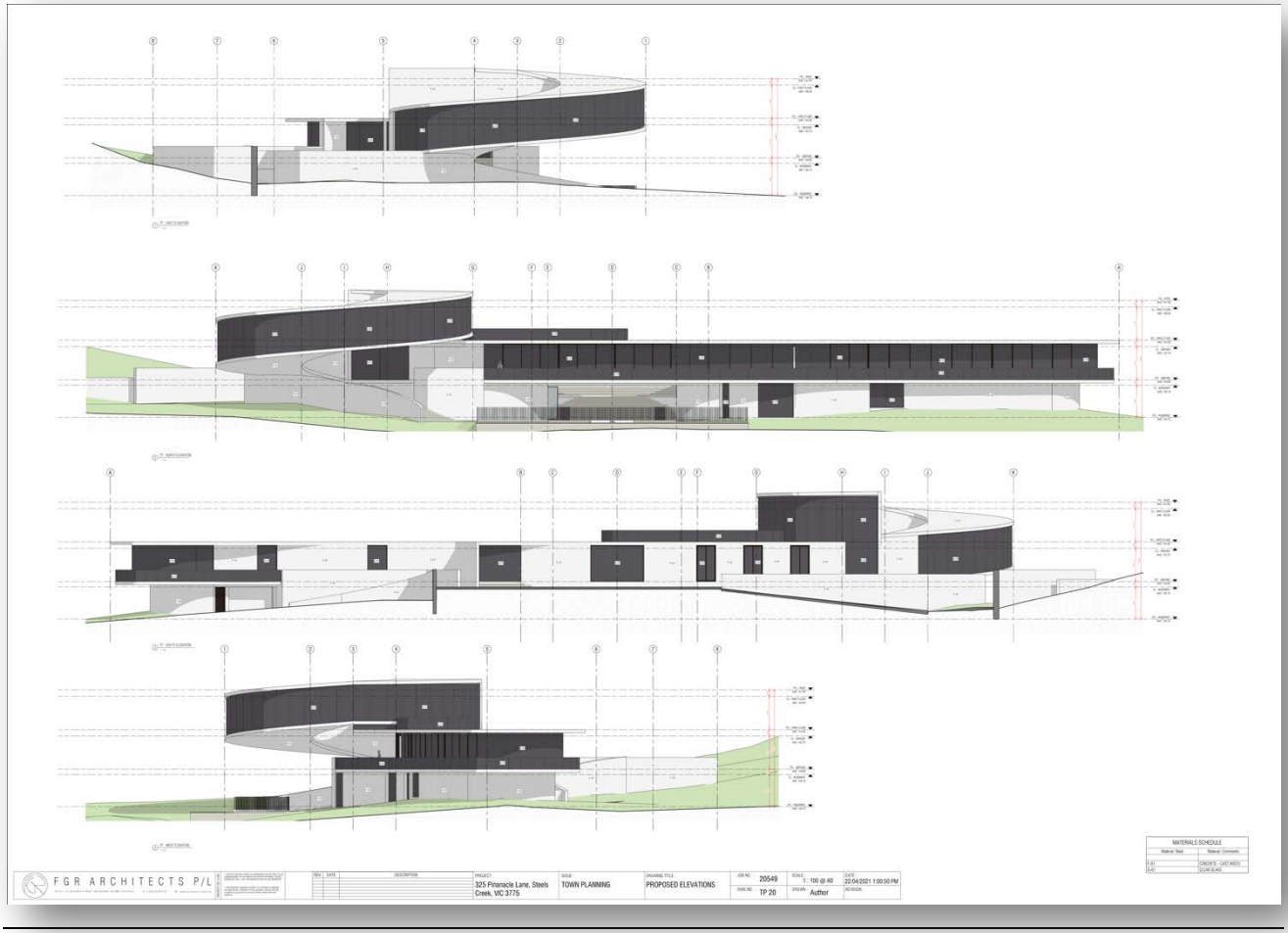

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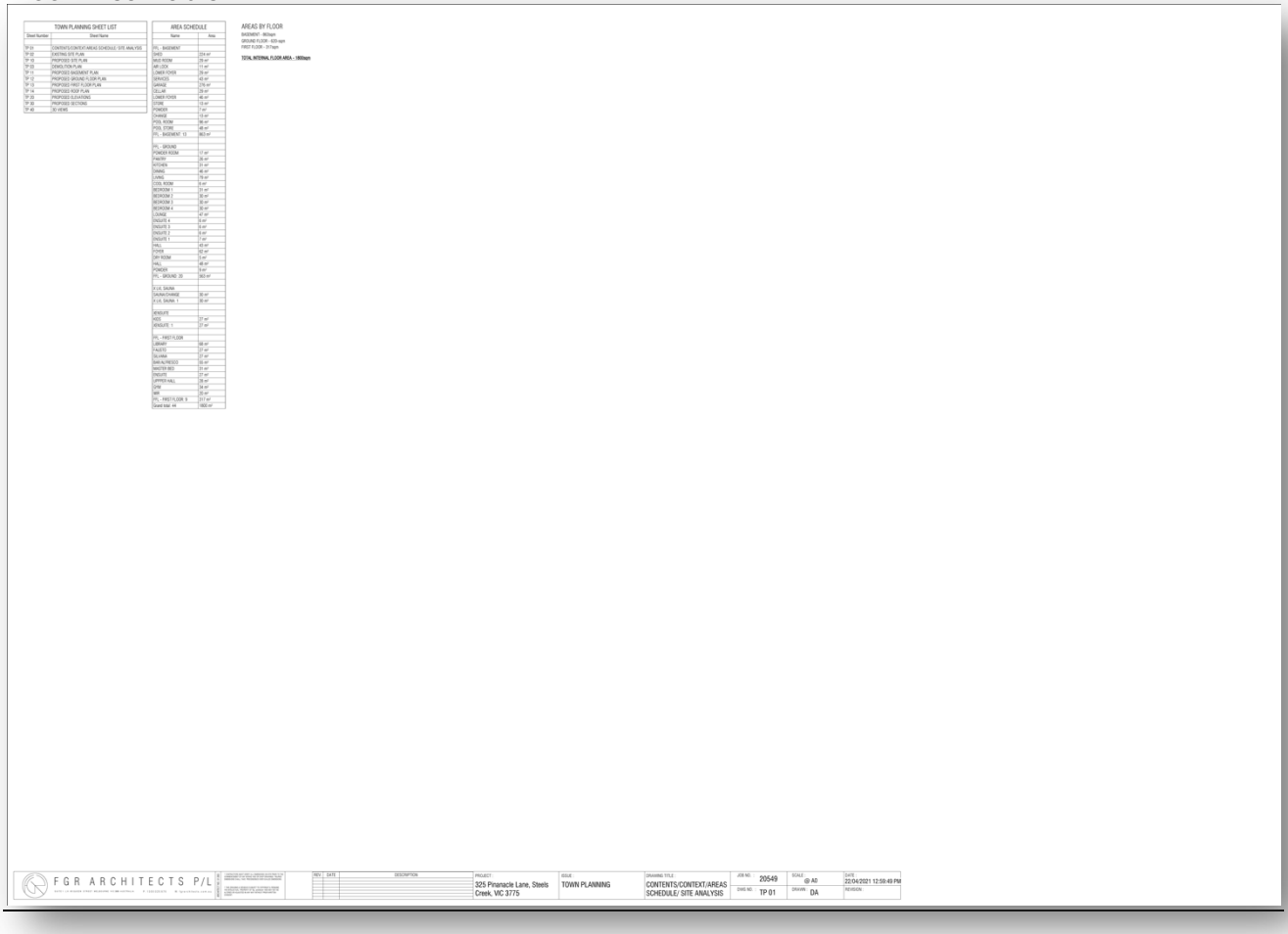
Floor Area Table



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SBAFire Drone Aerial Images of Site and Surrounds


View Northwest
© SBAFire Drone Aerial
SBAFire Drone Aerial Image 19 April 2021


View West
© SBAFire Drone Aerial
SBAFire Drone Aerial Image 19 April 2021


View Southwest
© SBAFire Drone Aerial
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View South
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View East
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SBAFire Drone Aerial Image 19 April 2021


View Northeast
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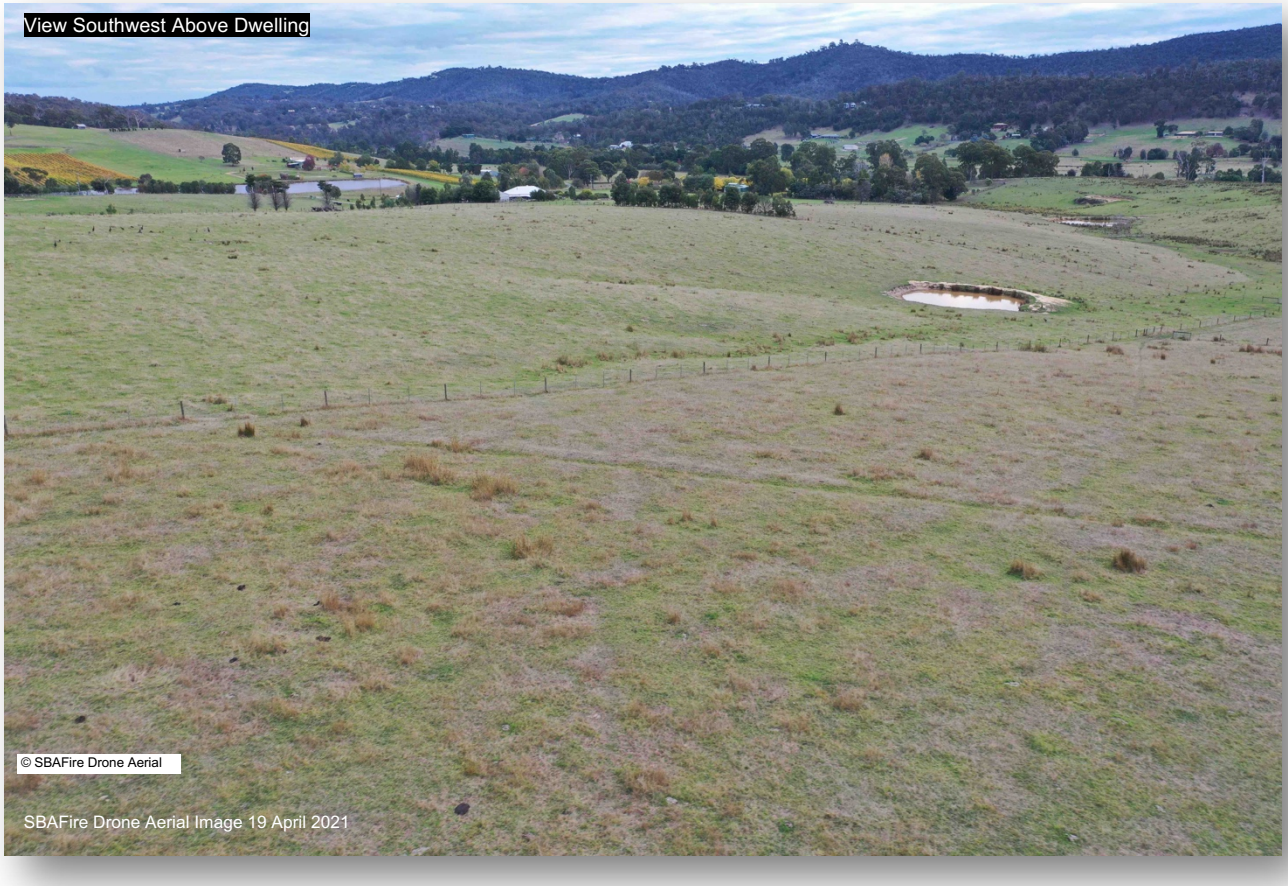
SBAFire Low Height Drone Run Images


View Southwest Above Dwelling
© SBAFire Drone Aerial
SBAFire Drone Aerial Image 19 April 2021


View South/Southeast Above Dwelling
© SBAFire Drone Aerial
SBAFire Drone Aerial Image 19 April 2021


View East Above Dwelling
© SBAFire Drone Aerial
SBAFire Drone Aerial Image 19 April 2021


View Northeast Above Dwelling
© SBAFire Drone Aerial
SBAFire Drone Aerial Image 19 April 2021

Bushfire planning and policy

This section identifies the existing planning, policy and building controls that apply to the site, which have bushfire related implications for the subject site.

Planning Policy Framework

In preparing our Bushfire Development Report, we will consider aspects of Planning Scheme Clause 53.02 Bushfire Planning and Clause 44.06 Bushfire Management Overlay (BMO), and required to consider specifically Clause 71.02-3 and 13.02-1S and must apply AS3959-2018 Construction of buildings in bushfire prone areas.

Clause 71.02-3 Integrated Decision Making

The subject site is subject to specific planning and building controls that relate to bushfire, including Clause 71.02-3 Integrated Decision Making, states that planning and responsible authorities should endeavour to integrate policies and balance conflicting objectives in favour of net community benefit and sustainable development. In bushfire affected areas, the protection of human life must be priorities over all other policy considerations.

Clause 13.02 Bushfire

Clause 13.02 Bushfire, through Clause 13.02-1S Bushfire Planning, has the objective *"To strengthen the resilience of settlements and communities to bushfire through risk based planning that prioritises the protection of human life over all other policy considerations"*

In bushfire affected areas the protection of human life must be priorities over all other policy considerations. Clause 13.02-1S Bushfire Planning will be considered with the objective "To strengthen the resilience of settlements and communities to bushfire through risk based planning that prioritises the protection of human life over all other policy considerations"

Clause 13.02-1S Bushfire Planning

The overarching strategies prioritise the protection of human life over other policy considerations in planning and decision-making in areas at risk from bushfire. This policy must be applied to all planning and decision making under the *Planning and Environment Act 1987* relating to land that 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.

Objective

To Strengthen the resilience of settlements and communities to bushfire through risk-based planning that prioritises the protection of human life.

Strategies

Protection of human life

Give priority 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 the consideration of bushfire risk in decision making at all stages of the planning process.

Bushfire hazard identification and assessment

Identify bushfire hazard and undertake appropriate risk assessment by:

- Applying the best available science to identify vegetation, topographic and climate conditions that create a bushfire hazard.
- 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.
- Applying the Bushfire Management Overlay to areas where the extent of vegetation can create an extreme bushfire hazard.
- Considering and assessing the bushfire hazard on the basis of:
  - Landscape conditions – meaning conditions in the landscape within 20 kilometres (and potentially up to 75 kilometres) of a site.
  - Local conditions – meaning conditions in the area within approximately 1 kilometres of a site.
  - Neighbourhood conditions – meaning conditions in the area within 400 metres of a site; and
  - The site for the development.
- Consulting with emergency management agencies and the relevant fire authority early in the process to receive their recommendations and implement appropriate bushfire protection measures.
- 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.
- 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.

Settlement planning

Plan to strengthen the resilience of settlements and communities and prioritise protection of human life by:

- 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 AS3959-2018 Construction of buildings in Bushfire-prone Areas (Standards Australia, 2018).
- Ensuring the availability of, and safe access to, areas assessed as BAL-LOW rating under AS3959-2018 Construction of buildings in Bushfire-prone Areas (Standards Australia, 2018) 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 reducing 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 and 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 AS3959-2018 Construction of buildings in Bushfire-prone Areas (Standards Australia, 2018).

Area of 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 important areas of biodiversity.

Use and development control in a Bushfire Prone Area

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
- Childcare centre
- Education Centre
- Emergency service 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.

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.

Policy guidelines

Consider as relevant:

- Any applicable approved state, regional and municipal fire prevention plan.

Policy documents

Consider as relevant:

- AS 3959-2018 Construction of buildings in Bushfire-prone Areas (Standards Australia, 2018)
- Building in bushfire-prone areas – CSORO & Standards Australia (SAA HB36-1993, 1993)
- Any bushfire-prone area map prepared under the Building Act 1993 or regulations made under that Act.

Bushfire Management Overlay (BMO)

The BMO currently covers the subject site.

The BMO is a planning scheme provision used to guide the development of land in areas of high bushfire hazard. The location, design and construction of any development and the implementation of bushfire protection measures must be considered under a BMO[1].

The BMO applies to areas where there is potential for extreme bushfire behaviour, such as a crown fire and extreme ember attack and radiant heat.

The BMO deals with bushfire hazard and risk in the following ways:

1. The BMO is applied to areas based on the bushfire hazard following the methodology and criteria outlined in advisory note 46.

2. When a planning permit application is required under the BMO a site-based assessment of the bushfire hazard is undertaken and submitted as part of the application. This localised assessment considers vegetation types and slope to give an accurate picture of the bushfire hazard as it relates to a specific site.

3. A risk assessment of a proposal is undertaken as part of a planning permit application. This involves considering a proposal against the objectives, standards and decision guidelines of the BMO and Clause 53.02 and 44.06 of the planning scheme.

The ways that a bushfire can impact a structure informs the criteria used to define the areas where the BMO will apply.

The three main ways a bushfire can impact a structure are ember attack, radiant heat and direct flame contact. Each of these elements can impact a structure at different distances beyond vegetation itself. The BMO mapping takes this variable distance into account.

Matters to be considered in the BMO include:

- Location, layout and siting.
- Building construction and defendable space.
- Water supply and access; and
- Implementation of bushfire protection measures.

The BMO site assessment process is used to determine how far away from unmanaged vegetation a building would need to be to receive less than a certain level of radiant heat e.g., a building constructed Bushfire Attack Level (BAL) to BAL-29 has been designed to withstand a radiant heat flux of 29 kW/m2. This analysis is used to determine the best combination of Defendable Space and BAL construction standard for a proposed development.

[1] Advisory Note 46 | Bushfire Management Overlay Mapping Methodology and Criteria

Bushfire Prone Area (BPA)

The whole of the subject site and adjoining properties are within a designated Bushfire Prone Area (BPA). BPA are those areas subject to or likely to be subject to bushfires, as determined by the Minister for Planning. Those areas of highest bushfire risk within the BPA are designated as Bushfire Management Overlay (BMO) areas.

The Building Regulations, through application of the Building Code of Australia, apply bushfire protection standards for building works in designated BPA. A minimum construction standard applies to all new buildings in a BPA. Buildings must be constructed to a minimum 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 that form part of *AS 3959 -2018* (Standards Australia). The level of risk and expected fire outcomes at each BAL are explained in Table below.

Bushfire Attack Levels and Corresponding Sections of AS3959-2018

The Bushfire Attack Level for the property has been assessed. The following table outlines the key elements of the BAL risk level and potential radiation exposure during a major bushfire.

BUSHFIRE ATTACK LEVELS AND CORRESPONDING SECTIONS FOR SPECIFIC CONSTRUCTION REQUIREMENTS

Bushfire Attack Level (BAL)	Classified vegetation within 100 m of the site and heat flux exposure thresholds	Description of predicted bushfire attack and levels of exposure	Construction Section
BAL—LOW	See Clause 2.2.3.2	There is insufficient risk to warrant specific construction requirements	4
BAL—12.5	″12.5 kW/m^2	Ember attack	3 and 5
BAL—19	>12.5 kW/m^2 ″19 kW/m^2	Increasing levels of ember attack and burning debris ignited by windborne embers together with increasing heat flux	3 and 6
BAL—29	>19 kW/m^2 ″29 kW/m^2	Increasing levels of ember attack and burning debris ignited by windborne embers together with increasing heat flux	3 and 7
BAL—40	>29 kW/m^2 ″40 kW/m^2	Increasing levels of ember attack and burning debris ignited by windborne embers together with increasing heat flux with the increased likelihood of exposure to flames	3 and 8
BAL—FZ	>40 kW/m^2	Direct exposure to flames from fire front in addition to heat flux and ember attack	3 and 9

Table: Source Table 3.1 AS3959-2009

Bushfire Hazard Characteristics

Australia has a long history of bushfires going back more than 150 years. There are a number of key factors that are involved in major bushfires, including the presence of fuel, oxygen and an ignition source. More specifically, fire intensity and the speed at which a bushfire spreads will depend on ambient temperature, fuel load, fuel moisture, wind speed and slope angle.

Understanding how bushfire behaves and destroys houses is important when planning, designing, sitting a dwelling and selecting suitable plants for a garden. There are three major factors that influence bushfire behaviour: topography, weather conditions and vegetation.

Bushfire Attack Methods

There are a number of ways in which bushfires attack vegetation and structures, including.

- Direct flame contact
- Ember attack
- Radiant heat

During major bushfires dwellings and structures are impacted firstly by one of these attack methods, most often ember attack causes structures to ignite well ahead of the main bushfire front.

Mechanisms of bushfire attack

The mechanisms of bushfire attack on a building can be a combination of sparks and embers and or direct flame contact and or radiant heat. Strong winds may also cause structural damage to a building and increase the chances of ignition by embers, radiant heat or flame. These mechanisms and their possible implications for the subject site area are briefly discussed in this section.

Direct Flame contact and radiant heat

Radiant heat is the heat generated by burning materials. It can cause combustible surfaces to ignite without direct flame or ember contact, crack and break windows and dry out materials ahead of an advancing bushfire, making them more readily combustible.

It is flame contact or radiant heat that poses the greatest threat to human survival. These mechanisms can result in rapid involvement of the entire building and cause the building to ignite during the passage of the fire front when in most cases there is no option for people present, other than to shelter within the building. Radiant heat is the most common cause of death in bushfires.

Flame contact and radiant heat

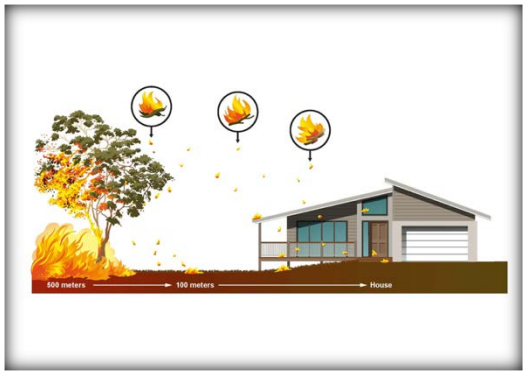
Ember attack

Ember attack is the most common cause of house loss during bushfires. Ember attack occurs when small burning twigs, leaves and bark are carried by the wind, and land on and around the building. If they land on combustible surfaces, they can cause an ignition that can spread to the whole building. Embers can enter gaps as small as 1.8mm[2].

Typically, ember attack can be expected to commence well before a fire front arrives, peak with the passage of the fire front and then continue for a number of hours after the fire front has passed, as nearby trees continue to smoulder and shed burning bark. Many buildings are lost to ember attack in the period after the fire front has passed.

Where there are rough and loose barked, stringybark eucalypts in the woodland and forest vegetation on and around a site, severe ember attack is possible, especially in a large, landscape scale bushfire. Eucalypt species can also generate burning materials and firebrands that can be lofted hundreds of meters and at times many km in advance of the fire. Under unpredictable and variable bushfire wind conditions, such ember attack may be possible from all directions. One of the purposes of the AS 3959-2018 BAL construction standards is to provide sufficient protection from embers.

Ember attack on a structure



Wind

Wind has the potential to increase a building's vulnerability to other mechanisms of bushfire attack. Severe winds can accompany severe bushfires and cause failure of the building structure, allowing ember entry onto combustible surfaces. It can also cause trees and branches to fall, breaking windows, and other damage to the structure.

The winds associated with Black Saturday Bushfires on 7 February 2009 at times exceeded more than 100 km per hour combined with temperatures exceeding 46 degrees C. During the Ash Wednesday Bushfires of 1983 winds exceeding 110 km per hour were recorded.

Vegetation Elements

This section outlines the vegetation within and adjacent to a site area and classifies it pursuant to AS 3959-2018 *Construction of buildings in bushfire prone area*[3], vegetation classification scheme. The bushfire attack level (BAL) site assessment requires the identification of classified vegetation within 150m radius of the site due to the bushfire risk of a site and surrounding vegetation. The bushfire hazard site assessment documents the bushfire hazard on or near the site.

The assessment provides factual information, on the bushfire hazard (vegetation type and slope), informs defendable space, bushfire attack level and building construction requirements, which is informed by the methodology contained in AS3959:2018.

2 CFA Vegetation Classes Victorian Bushfire Management Overlay

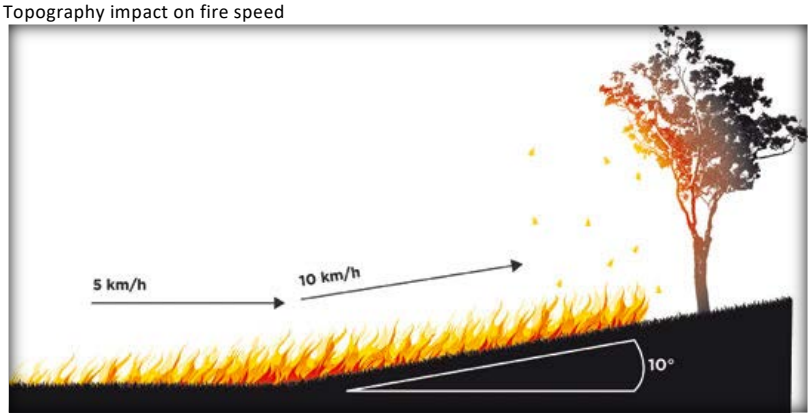
3 Australian Standard Construction of building in bushfire prone areas AS3959-2018

The BAL relies on a generalised description of vegetation based on the AUSLIG (Australian Natural Resources Atlas: - Native Vegetation) classification system. If more than one vegetation type is present, the 'worst case scenario' is applied - the predominant vegetation type present is not necessarily the worst-case scenario applied (AS3959:2018 2.2.3.1).

Topography

Topography can significantly influence the rate of spread and intensity of a bushfire. Fire burns faster uphill – as the slope increases so does the speed of the fire and its intensity. For every 10° slope, the fire will double its speed. Fires move more slowly down-hill because the flames reach less fuel, and less radiant heat preheats the vegetation in front of the fire. For every 10° of downhill slope, the fire will halve its speed[3]. When winds are light the slope will be the dominant influence on the direction of fire spread.

Topography impact on fire speed



Fire Weather

Hot, dry and windy days provide ideal conditions for a bushfire. In summer, these are common weather conditions that increase the flammability of vegetation. Low humidity and high temperatures, which are fueled by hot winds, dry out vegetation, allowing it to readily ignite.

Fire weather is a significant part of bushfire hazard. Vegetation types, fuel loads, effective slope and a range of other factors can be assessed, fire weather can vary greatly across days and seasons, and can have a significant impact on the potential for bushfire threat and bushfire behaviour and intensity.

The Fire Danger Index (FDI) was developed in the 1960's by Scientist A. G. McArthur to measure the degree of danger of fire in Australian forests. The index combines a record of dryness, based on rainfall and evaporation, with meteorological variables for wind speed, temperature and humidity. The FDI is a key component for calculating the Bushfire Attack Level (BAL) combined with vegetation type, distance to classified vegetation and slope.

The FDI is the primary method used to communicate the level of fire danger at a point in time and the likely ability of fire suppression agencies being able to suppress a fire.

Bushfire Hazard Site Assessment

The Bushfire Hazard Site Assessment describes the subject site and bushfire hazard within 150m of the proposed development.

We acknowledge that, pursuant to Clause 53.02, "the description of the hazard must be prepared in accordance with Sections 2.2.3 to 2.2.5 of AS3959:2018 Construction of buildings in bushfire prone areas (Standards Australia) excluding paragraph (a) of section 2.2.3.2".

This assessment:

- *Provides factual information on the bushfire hazard (vegetation type and slope);*
- *Informs defendable space and building construction requirements; and*
- *Utilises the methodology contained in Australian Standard AS3959:2018 Construction of buildings in bushfire prone areas (AS3959) to provide contextual information on a site.*

The following summarises the characteristics which are present within the site and surrounding environs:

Assessment area and analysis of the site

Assessment area and analysis of the site	Assessment area and analysis of the site The irregular polygon shaped allotment at 325 Pinnacle Lane Steels Creek 3775 Victoria, occupies an area of 191,233 sqm (19.1 ha) and contains managed and modified vegetation, grassland, woodland and forest vegetation on and adjoining the site. With extensive grassland, woodland and forest areas to the north, west, east and south of the site within and beyond 150 metres radius of the dwelling façade. The Black Saturday fires of 2009 began with the Kilmore East fire when fallen power-lines started a blaze in farmland at 11.47 am. The fire spread quickly through a pine plantation and crossed the Hume Freeway at 1.58 pm. The fire burnt through Wandong and reached Mount Disappointment at approximately 3 pm. Strong westerly winds blew the fire towards Humevale and Kinglake with embers causing spot fires up to 20 - 40 kilometres away. Between 3.30 – 7 pm, the fire entered Kinglake National Park and continued onto Strathewen, St Andrews, Kinglake, Kinglake West, Chum Creek, Steels Creek, Arthurs Creek, Flowerdale, Broadford, Healesville and Toolangi. In this fire, 119 people died, 232 were injured and 1242 homes were lost. Steels Creek and surrounding areas were impacted at around 5.45 pm on Saturday 7 February 2009, with the loss of 10 lives in the Steels Creek area. The forest and woodland areas near and adjoining the subject site to the north, northwest, east, northeast and south/southwest were impacted by the Kilmore East bushfire, which travelled more than 45 km from Kilmore East to Steels Creek. The subject site is set amongst rural properties in an established setting of Steels Creek, featuring rural properties and housing at the bushfire interface on various large lot sizes and configurations. With managed vegetation near the new dwelling and grassland, woodland and forest vegetation to the north, northwest, northeast, east, west and south.

	The vegetation on the site is currently managed, but the wider grassland, woodland and forest vegetation on and adjoining the site is largely unmanaged and will require ongoing vegetation management of the modified vegetation, grassland, woodland and forest areas on the subject site and where possible adjoining the site. The vegetation on the site and near the new dwelling envelope is to some extent managed through grazing and will need to be managed to achieve the required ongoing defendable space. In addition, the current accessway to the new dwelling, will need to comply with the BMO access requirements as fire authority access is required to the firefighting water supply tank. The accessway will need to comply with all of the required BMO access and egress requirements, including achieving the required accessway construction requirements as the accessway is longer than 200 metres (750 metres approx.) to the rear of the new dwelling. Firefighting vehicles will be able to access the dwelling and the firefighting water supply tank from the accessway. There are no fire hydrants in the area within 120 metres of the rear of the dwelling. A 40,000 litre firefighting water supply tank will be required on the site as set out in this report and specifically the bushfire management plan (BMP).
Vegetation classification *This is Section 2.2. 3 in AS3959*	Vegetation classification When considering vegetation within the assessable area (150 metre radius) the vegetation includes managed vegetation, grassland and scattered woodland and forest vegetation. Beyond the site the primary risk is the grassland, woodland and forest vegetation areas to the north, northwest, northeast west, east and south. There are extensive very high to extreme risk forest and woodland areas to the north, northwest, northeast, west/southwest and east/southeast associated with road verge vegetation and public and private woodland and the forest areas that are essentially, unmanaged. It is important to highlight that under dry fuel and extreme fire weather conditions, the current vegetation on the site and adjoining and beyond the site presents a very high to extreme bushfire risk to the site and people on the site, should the site and area be impacted by a major bushfire. Also, the extensive largely unmanaged road verge vegetation along the road network, main roads and other roads and access tracks across the area present a very high bushfire risk. The level of ground fuel management and the separation between the vegetation combined with the overall treed canopy across and near the new dwelling, is such that it is not fully linked near the new dwelling and therefore does not provide an overall linkage of the canopy across and adjoining the site from the heavily forested areas to the north, northeast, east, southeast and north. The managed vegetation, grassland, woodland and forest vegetation areas within 150 metres of the proposed new dwelling, is set out in the Bushfire Hazard Site Assessment Plan and beyond 150 metres in the Bushfire Hazard Landscape Assessment and plan.

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Exclusions – low-threat vegetation and non-vegetated areas *This is Section 2.2.3.2 in AS3959*	Exclusions low threat area The vegetation and properties adjoining the subject site are such that there are no areas that the consultant is prepared to class as excludable, due to the overall bushfire landscape risk and the extensive road verge vegetation across the area. On and adjoining the subject site there are no areas that are excludable and in a state of 'low threat' and therefore excludable pursuant to AS3959-2018 2.2.3.2 (f). Whilst some areas are managed vegetation on and adjoining the site, it is such that it is not considered excludable, as there is potential under extreme fire weather and dry fuel conditions that some of the managed areas may be capable of carrying a bushfire.
Distance to classifiable Vegetation *This is Section 2.2.4 AS3959*	Distance to classified vegetation The subject site new dwelling building site vegetation is located within 12 metres from the grassland vegetation to the north, west and east, and 25 metres from the scattered woodland to the east, south and southeast.
Slope under the classifiable vegetation *This is Section 2.2.5 in AS3959*	Slope under classified vegetation The effective slope under the classified vegetation is as follows: *North: Downslope/0-5° (Short run) Upslope on long run* *East: Upslope* *South: Downslope/0-5°* *West: Downslope/0-5°* *Note: where the vegetation classification is "Low Threat" the prevailing slope has no bearing on the BAL rating.*
Reticulated Water Supply, Fire Hydrant	There is are no fire hydrants within 120 metres of the subject dwelling site. *Note: Measurements are to the rear of the proposed dwelling.*

Classified Vegetation Table:

Classified vegetation within 150 metres of the proposed development in accordance with AS3959-2018 Construction of buildings in bushfire prone areas.

	Direction (Aspect)			
	Northern	**Southern/SE**	**Eastern**	**Western**
Vegetation (within 150 metres of proposed building / works)	Excludable / Low Threat ☐ Modified/Managed ✓ Forest ✓ Woodland ✓ Scrub (tall) ☐ Shrubland (short) ☐ Mallee ☐ Rainforest ☐ Grassland ✓	Excludable / Low Threat ☐ Modified/Managed ✓ Forest ☐ Woodland ✓ Scrub (tall) ☐ Shrubland (short) ☐ Mallee ☐ Rainforest ☐ Grassland ✓	Excludable / Low Threat ☐ Modified/Managed ✓ Forest ✓ Woodland ✓ Scrub (tall) ☐ Shrubland (short) ☐ Mallee ☐ Rainforest ☐ Grassland ✓	Excludable / Low Threat ☐ Modified/Managed ✓ Forest ☐ Woodland ☐ Scrub (tall) ☐ Shrubland (short) ☐ Mallee ☐ Rainforest ☐ Grassland ✓
Effective Slope (under the classifiable vegetation within 150 metres)	Upslope / Flat ☐ **DOWNSLOPE** >0 to 5 ° ✓ >5 to 10° ☐ >10° to 15° ☐ >15 to 20° ☐ >20° ☐	Upslope / Flat ☐ **DOWNSLOPE** >0 to 5 ° ✓ >5 to 10° ☐ >10° to 15° ☐ >15 to 20° ☐ >20° ☐	Upslope / Flat ✓ **DOWNSLOPE** >0 to 5 ° ☐ >5 to 10° ☐ >10° to 15° ☐ >15 to 20° ☐ >20° ☐	Upslope / Flat ☐ **DOWNSLOPE** >0 to 5 ° ✓ >5 to 10° ☐ >10° to 15° ☐ >15 to 20° ☐ >20° ☐
Distance (m) to Classifiable Vegetation	12	25	25	12
Primary vegetation	Grassland	Woodland	Woodland	Grassland
BAL rating	29	29	19	29
Defendable Space in metres Dwelling	35 metres	35 metres	35 metres	35 metres

Managed Vegetation Buffer/Fire Break

Managed Vegetation Fire Break Buffer in metres	60 metres	Property boundary	Property boundary	Property boundary

Bushfire Attack Level (BAL) Assessment

Property Details:

Lot and Plan Number: SPI: 2\LP117799 Yarra Ranges Council Current Property No. 202146

Address: 325 Pinnacle Lane Steels Creek 3775 Victoria

Description of building work:

This report has been prepared to provide an understanding of the Bushfire Attack Level and the construction requirements flowing from the BAL, as set out in Australian Standard AS3959-2018 and BCA measures required as part of any construction of proposed new dwelling at the subject site as outlined above.

Bushfire Attack Level Analysis and modelling

The development of the site assessment has used the detailed procedure to determine the BAL for the subject site.

The fire danger index (FDI) for Victoria has been applied at FDI 100.

The Bushfire Attack Level (BAL) shall be determined by using either;

1. (a) simplified procedure described in Clause 2.2 (Method 1); or
2. (b) detailed procedure described in Appendix B (Method 2).

BALs are based on levels of exposure defined in Table 3.1. of AS3959-2018

There are two methods for determining BALs as outlined above:

Method 1 - a simplified procedure that involves five procedural steps to determine BALs,
and is subject to limitations on the circumstances in which it can be used (see Appendix C) of AS3959-2018.

Method 2 - a detailed procedure using calculations to determine BALs where a more specific result is sought or where the site conditions are outside of the scope of the simplified procedure (Method 1) (see Appendix B) ASS3959-2018.

BALs are used to determine which, if any, construction requirements contained in Sections 3 to 9 of AS3959-2018 Construction of buildings in bushfire prone areas, are appropriate for a particular site.

The table of calculations on page 40 sets out the Method 2 modelling of BALs for the subject site.

Bushfire Attack Level Assessment – Method 2 – Modelling

Bushfire Attack Level Calculations for Subject Site

Bushfire Attack level (BAL) Method 2	**North**	**East**	**West**	**South/SE**
Inputs	1	2	3	4
Fire Danger Index	130	100	130	100
Vegetation Type	Grassland	Woodland	Grassland	Woodland
Surface fuel Load (t/ha)	4.5	15	4.5	15
Overall fuel Load (t/ha)	4.5	25	4.5	25
Effective Slope (°)	5	0	5	5
Site Slope (°)	0	0	0	0
Distance to Vegetation	12 m	25 m	12 m	25 m
Flame width (m)	100	100	100	100
Windspeed km/h	45	45	45	45
Heat of Combustion (kj/kg)	18,600	18,600	18,600	18,600
Flame Temperature (K)	1090	1090	1090	1090
Outputs				
Rate of Spread (km/h)	23.86 km/h	1.79 km/h	23.86 km/h	2.54 km/h
Flame Length (m)	8.86 m	14.7 m	8.86 m	19.52 m
Flame Angle	68°	71°	68°	65°
Elevation of Receiver	4.11 m	6.94 m	4.11 m	8.84 m
Fire Intensity	55,480 kW/m	23,249 kW/m	55,480 kW/m	32,828 kW/m
Transmissivity	0.862	0.823	0.862	0.828
Viewfactor	0.3685	0.2842	0.3685	0.3794
Radiant Heat Flux	24.17 kW/m2	17.8 kW/m2	24.17 kW/m2	23.9 kW/m2
Bushfire Attack Level	**BAL – 29**	**BAL – 19**	**BAL – 29**	**BAL – 29**

References: Rate of Spread – Noble et al. 1980, Flame length – Purton 1982, Elevation of receiver – Douglas & Tan 2005, Flame angle – Douglas & Tan 2005, Radiant heat flux – Drysdale 1999, Sullivan et al. 2003, Douglas & Tan 2005

Determination of Bushfire Attack Level (BAL)

Bushfire attack level (BAL) assessment Method 2 modelling of potential BAL's has been undertake.

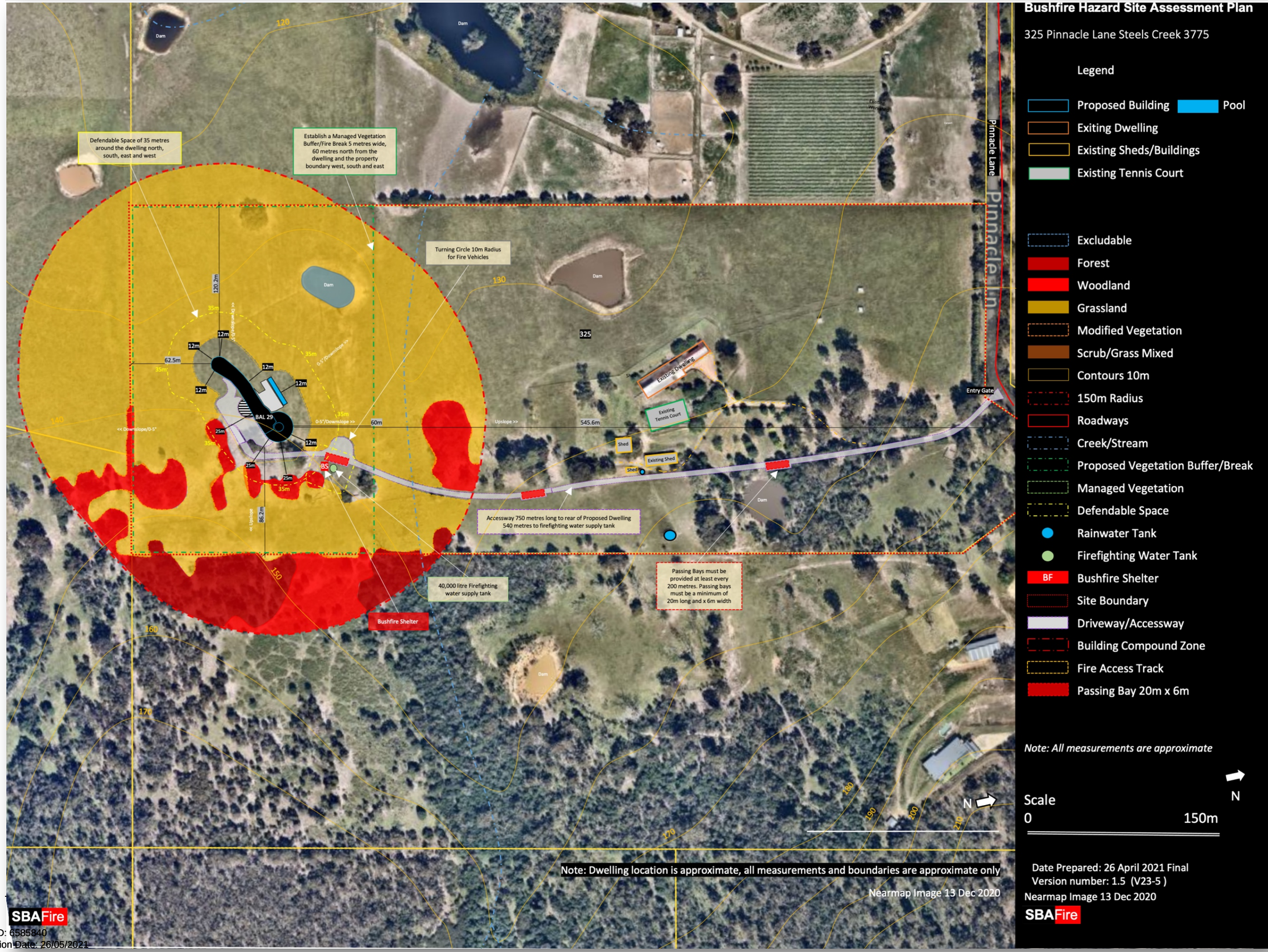
The subject property is in a designated bushfire prone area and is required to comply with the planning scheme and AS3959-2018 Construction of buildings in bushfire prone areas, ***thus the works associated with the construction of new dwelling at 325 Pinnacle Lane Steels Creek 3775 Victoria is subject to a minimum construction level of BAL 29.***

Statement:
I have taken all reasonable steps to ensure that the information provided in this assessment is accurate and reflects the conditions on and around the site and allotment on the date of this assessment.

I have undertaken a great deal of work on this report, well beyond the normal scope for such a report. I am sure you will find it helpful in considering your bushfire risk planning and mitigation strategies for the property.

Signed: *Geoffrey Stone*

Geoffrey Stone *MBA, FAIM, CFO, MIFireE, AdvDipEmergMgt, CertIVFireSup, CertFireOps*
Principal | **SBA**Fire – Bushfire Advisory



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SBAFire Drone Aerial Images & Ground Site and Surrounds Images

The following photographs illustrate the subject site and surrounding vegetation characteristics:

1 View south on Pinnacle Lane to entry of 325 Pinnacle Lane

2 View northeast on Pinnacle Lane site entry on right

3 View west on Pinnacle Lane from site entry

4 View south to site accessway

5 View west on accessway near entry gate

6 View north on accessway near current dwelling

7 View west on accessway current dwelling

8 View southeast on accessway current dwelling on right

9 View southeast on accessway to sheds

10 View north on accessway to sheds

11 View northwest on accessway to current dwelling and sheds

12 View southwest on accessway near sheds and current dwelling

13 View north at new dwelling site

14 View northeast at new dwelling site

15 View east at new dwelling site

16 View southeast at new dwelling site

17 View south at new dwelling site

18 View west at new dwelling site

Bushfire Hazard Landscape Assessment

The bushfire hazard landscape assessment (the 'landscape assessment') provides information on the bushfire hazard more than 150 metres away from a development site. Considering bushfire from this broader landscape perspective is important as it affects the level of bushfire risk a development and its future occupants may be exposed to.

This landscape assessment:

- *Provides factual information on the bushfire hazard (vegetation extent and slope)*
- *Provides information on key features of the general locality that are relevant to better understanding the protection provided by the location*
- *Provides contextual information on a site.*

The landscape assessment does not assess a specific development proposal and is only required where Clause 53.02-4 requires consideration of the bushfire risk from the landscape beyond the site. Clause 13.02 of the Planning Policy Framework prioritises the protection of human life over all other policy considerations. Clause 13.02-1S stipulates that developments must identify bushfire hazard and undertake appropriate risk assessment, including considering and assessing the bushfire hazard on the basis of landscape conditions within 20 km and up to 75 km of the site, local conditions within 1 km of site and neighbourhood conditions within 400 metres of the site. There are four 'broader landscape types', representing different landscape risk levels, as described in the DELWP technical guide Planning Permit Applications Bushfire Management Overlay (DELWP, Sept 2017) and Planning Practice Note 65 Preparing and Assessing a Planning Application under the Bushfire Provisions in Planning Schemes.

Bushfire landscape risk: The subject site surrounding landscape accords with Broader Landscape Type 3, due to the surrounding vegetation and distance from the site at 325 Pinnacle Lane to the main egress road (Steels Creek Road) and the fact that the site is essentially a managed vegetation environment and surrounded by grassland, woodland and forest across the wider landscape. It is important to recognise that moving south to Yarra Glen Township during a bushfire impacting the area could be very high risk, also, Steels Creek Lane is a dead-end road to the north, moving north on Steels Creek Road or on Melba Highway is potentially very high risk, as bushfires are likely to approach from the north, northeast and northwest.

Landscape Risk Typologies Table

Broader Landscape Type 1	Broader Landscape Type 2	Broader Landscape Type 3	Broader Landscape Type 4
There is little vegetation beyond 150 metres of the site (except grasslands and low-threat vegetation). *Extreme bushfire behaviour is not possible.* *The type and extent of vegetation is unlikely to result in neighbourhood- scale destruction of property.* *Immediate access is available to a place that provides shelter from bushfire.*	*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.* *Bushfires can only approach from one aspect and the site is located in a suburban, township or urban area managed in a minimum fuel condition.* *Access is readily available to a place that provides shelter from bushfire. This will often be the surrounding developed area.*	*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.* *Bushfire can approach from more than one aspect.* *The site is located in an area that is not managed in a minimum fuel condition.* *Access to an appropriate place that provides shelter from bushfire is not certain.*	*The broader landscape presents an extreme risk.* *Fires have hours or days to grow and develop before impacting.* *Evacuation options are limited or not available.*

Increasing Bushfire Risk

Overview

Overview	***Victoria is one of the most fire-prone areas in the world,*** *with a history of catastrophic bushfires. The history of major bushfires goes back more than 150 years. Some of the past major bushfires include: Black Thursday 6 February 1851 12 lives lost, 1926 Warburton 31 lives lost, Black Friday 13 January 1939 71 lives lost, 1942 1 life lost, 1943 10 lives lost, 1944 14 January 32 lives lost, 1952 several lives lost, 1962 The Basin, Dandenong Ranges, Christmas Hills, Hurstbridge, Warrandyte 8 lives lost, 1965 Gippsland, 1968 Dandenong Ranges, The Basin, Upwey and Upper Ferntree Gully 64 houses lost, 1969 Lara, Daylesford and Darraweit 22 lives and 230 houses lost, 1972 Mount Buffalo, 1977 Western District 4 lives and 108 houses lost, 1978 Gippsland 2 lives lost, 1983 1 February Mount Macedon 50 houses lost, Ash Wednesday 16 February 1983 47 lives and more than 2,000 buildings lost, 1985 various areas of Victoria 3 lives and 182 houses lost, 1991 1 life and 17 houses lost, 1997 Dandenong Ranges, Arthurs Seat, Gippsland and Creswick 3 lives and 41 houses lost, 1998 5 lives lost, 2003 Alpine Fires 1 life and 41 house and 213 structures lost, 2005-6 Grampians, Kinglake, Murrindindi and western district 2 lives and 41 houses and 359 buildings lost, 2006-7 Great Divide Complex 33 houses 255 buildings and 1.2 million ha lost, 2009 January Delburn 44 houses lost, 2009 7 February Black Saturday Bushfires 173 lives, 2,056 houses and 1,600 buildings lost. There have been many other major bushfires in the past. Recent major bushfires have included Wye River bushfires 2015, Bunyip State Forest 2019 and the Black Summer Bushfires of 2019/20, along with many other bushfires. The Kilmore East bushfire of Black Saturday 2009, impacted Steels Creek and resulted in 10 lives being lost in Steels Creek.* There are a variety of bushfire causes, that can ignite a bushfire. Some examples including lightning strikes are natural and cannot be prevented while others result from human activity. The high bushfire risk in Victoria is the consequence of a combination of factors including: • *Large areas of highly flammable dry eucalypt forest, woodland and expanses of highly flammable grassland* • *A climate pattern of mild, moist winters followed by hot dry summers and protracted droughts* • *Agricultural practices that include the use of fire* • *Increasing population density in bushfire-prone areas, such as in the rural/urban interface (fringe)* The subject site and vegetation extent in the broader area landscape, including all of the surrounding properties adjoining the subject site are located in the Steels Creek green wedge zone, set amongst rural residential and farming type properties in an established setting, featuring properties and housing on various large lot sizes and configurations. The vegetation within the immediate and wider area includes primarily managed vegetation on the site and surrounding the new dwelling, with grassland, woodland and forest within 150 metres radius of the proposed new dwelling. Beyond the site, there are extensive very high to extreme threat woodland and forest vegetation areas. The vegetation across the area is largely unmanaged to the north, south, east and west. The majority of the vegetation beyond 150 metres of the subject site to the north, northwest, northeast, west, east/southeast and south/southwest is very high-risk to extreme threat woodland and forest vegetation, which is associated with private and public land including reserves, national parks and forests to the north, northwest, northeast,

east, west and south/southwest. These areas are essentially very high to extreme threat unmanaged vegetation.

The primary threat to the subject site is from the north, northwest, northeast, west/southwest and east/southeast, with extensive very high to extreme threat woodland and forest vegetation beyond the site. In addition, the area well beyond the site has extensive very high to extreme threat forest and woodland vegetation, that can potentially carry a bushfire from a few km's away to more than 40 km away, deep into Steels Creek Road and the wider Steels Creek area. The area surrounding the subject site and the wider area and region has a long history of major bushfires.

Road networks. The primary road serving the site is Steels Creek Road a sealed public road that is a dead-end road to the north and provides access to the south and east to Melba Highway which provides access to the north and south. Steels Creek Road provides access to Yarra Glen to the south.

The main roads and tracks in the area have extensive road verge vegetation, including scrub, grassland, scattered woodland and forest. Other roads and tracks in the subject site area are generally narrow unsealed roads with extensive road verge vegetation, with a mix of scrub, grassland and scattered woodland and forest vegetation. There are areas of road verge and other strips and areas of vegetation, that directly link to the very high-risk woodland and forest areas, and therefore can act like candle wicks driving bushfires deep into the Steels Creek Road area and the wider Steels Creek area.

Bushfire history. The Steels Creek, Yarra Glen and the wider surrounding areas to the north, west, east and south of the site, has a history of major bushfires. There have been many major bushfires impact the wider area and region, including, Black Friday Bushfires of 1939, Ash Wednesday Bushfires 1983, the Black Saturday Bushfires of 2009, with the Kilmore East bushfire of 2009 which had a fire run of more than 73 km stopping just north of Healesville.

The Black Saturday fires of 2009 began with the Kilmore East fire when fallen power-lines started a blaze in farmland at 11.47 am. The fire spread quickly through a pine plantation and crossed the Hume Freeway at 1.58 pm. The fire burnt through Wandong and reached Mount Disappointment at approximately 3 pm. Strong westerly winds blew the fire towards Humevale and Kinglake with embers causing spot fires up to 20 - 40 kilometres away. Between 3.30 – 7 pm, the fire entered Kinglake National Park and continued onto Strathewen, St Andrews, Kinglake, Kinglake West, Chum Creek, Steels Creek, Arthurs Creek, Flowerdale, Broadford, Healesville and Toolangi. In this fire, 119 people died, 232 were injured and 1242 homes were lost.

Steels Creek and surrounding areas were impacted at around 5.45 pm on Saturday 7 February 2009, with the loss of 10 lives in the Steels Creek area. The forest and woodland areas near and adjoining the subject site to the north, northwest, east, northeast and south/southwest were impacted by the Kilmore East bushfire, which travelled more than 45 km from Kilmore East to Steels Creek.

Bushfire direction of travel. Bushfires will primarily approach the subject site and Steels Creek from the north, northwest, northeast and west/southwest. There is also the potential for bushfires to approach from the east, and south/southeast due to the vegetation types, including grassland, scrub, woodland and forest areas surrounding the wider area beyond the site.

Fire runs into site. The most likely bushfire runs into the subject site, include short fire runs of less than 1 to 5 km from the north, east, south/southeast and west/southwest. There is potential for long fire runs of more than 40 km from north and northwest, more than 50 km from the northeast, and more than 10 km from the west and more than 10 km from the southwest and east/southeast.

The nearest Township/Urban area is Yarra Glen to the south. *Yarra Glen Township/Urban Area: The subject site 325 Pinnacle Lane Steels Creek has access to the Yarra Glen urban area and shopping precinct*, which is approximately 10 km to the south of the subject site via Steels Creek Road, with a travel time in a motor vehicle of approximately 11 minutes under normal road traffic conditions. Moving south to Yarra Glen during a bushfire impacting the Steels Creek area, could be very high risk, due to the extensive road verge vegetation across the road network.

Yarra Glen as an urban/rural area, near the subject site to the south, is such that the fringe areas of Yarra Glen could be impacted by a bushfire penetrating deep into the urban area of Yarra Glen under extreme to catastrophic fire weather conditions. Thus, the urban/rural township area immediately to the south of the subject site in Yarra Glen, may not be a suitable place to safely shelter in place, subject to the fire weather conditions.

Yarra Glen shopping precinct is in the urban area and may potentially provide potential protection from the impact of extreme bushfire behaviour, where fuel is managed in a minimum fuel condition and there is sufficient distance or shielding to protect people from direct flame contact or harmful levels of radiant heat, and with potentially suitable short travel distances. *There is some significant potential for bushfire risks to arise on the travel journey from the subject site to a place of greater protection, the risk issues related to high risk roadside vegetation or road traffic congestion, that may make it impossible to reach a nearby Township or urban area.*

Neighbourhood Safer Place (NSP) – Bushfire Place of Last Resort, there is no NSP in Steels Creek, the nearest NSP is located at: Dixons Creek Recreation Reserve, Melba Highway (between Pinnacle Lane and Lorimers Lane) Dixons Creek. (1659 Melba Highway) With a travel distance from 325 Pinnacle Lane Steels Creek of approx. 3.8 km via Pinnacle Lane then south on Melba Highway and a travel time of approx. 5 minutes under normal road traffic conditions

Likely bushfire scenarios. The most likely bushfire scenarios that could impact the subject site, will be from the north, northwest, northeast, west/southwest and under some weather situations from the east/south/southeast, whereby there is extensive very high threat grassland, woodland and forest vegetation both adjoining and beyond 150 metres radius of the site. Also, within and beyond 1 to 5 km of the

subject site there is extensive very high to extreme risk grassland, woodland and forest vegetation. In addition, the area well beyond the site has extensive very high to extreme threat, woodland and forest vegetation, associated with state forests, national parks and reserves and private land areas. The grassland, woodland and forest areas surrounding the subject site and the Steels Creek area, can potentially carry a bushfire from more than 40 km away, deep into Steels Creek Road and the wider surrounding area and the Steels Creek area.

Bushfire management and prevention within the wider area. There has been limited bushfire mitigation planning and action, in the very high to extreme bushfire risk areas to the northwest, northeast, north, east, south and west beyond, adjoining and surrounding the site. There are essentially no current planned burning or significant bushfire mitigation works within Steels Creek and wider area, and the area surrounding and adjoining 325 Pinnacle Lane.

Essentially it is fair to suggest the overall bushfire risk faced by the subject site and the outer areas of Yarra Glen and Steels Creek and other nearby communities, is significantly elevated by the lack of any evidence of any planned bushfire mitigation activities.

The subject site is a managed site, with cattle grazing on the site and highly managed gardens and landscape surrounding the current dwelling site and thus provides a significant level of protection to the subject site and proposed new dwelling. It will be critical that the vegetation and ground fuel near and across the subject site continue to be managed in a similar way to that of the defendable space area. *The area surrounding and beyond the subject site is a very high to extreme risk bushfire landscape environment, capable of producing Catastrophic bushfires, that can cause heavy life and property losses.*

Subject site, landscape and bushfire protection measures. The subject site proposed new dwelling on the site at 325 Pinnacle Lane, is located in the most suitable locations on the subject site. It is important to highlight that the proposed new dwelling site has greater separation from the primary woodland and forest areas to the east of the new dwelling site.

The proposed new dwelling will be constructed to BAL 29 and provided with defendable space of 35 metres around the dwelling, in addition to defendable space, there will a 40,000 firefighting water supply tank located on the new dwelling site, and a bushfire shelter is required near the new dwelling and adjoining the firefighting water supply, as set out in the bushfire management plan (BMP) and the bushfire hazard site assessment plan. In addition, a managed vegetation buffer/fire break of 5 metres is to be established along the property boundary to the west, south and east and 60 metres from the new dwelling to the north.

Landscape typology and conclusions	Landscape typology It is deemed the subject site and broader landscape type can be described as type 3 as referred to within Practice Note 65: • *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.* • *Bushfire can approach from more than one aspect.* • *The site is located in an area that is not managed in a minimum fuel condition.* • *Access to an appropriate place that provides shelter from bushfire is not certain.*

Neighbourhood Safer Place (NSP) – Bushfire Place of Last Resort

Neighbourhood Safer Place (NSP) – Bushfire Place of Last Resort, there is no NSP in Steels Creek, the nearest NSP is located at: Dixons Creek Recreation Reserve, Melba Highway (between Pinnacle Lane and Lorimers Lane) Dixons Creek. (1659 Melba Highway) With a travel distance from 325 Pinnacle Lane Steels Creek of approx. 3.8 km via Pinnacle Lane then south on Melba Highway and a travel time of approximately 5 minutes under normal road traffic conditions

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Possible Bushfire Run Scenarios

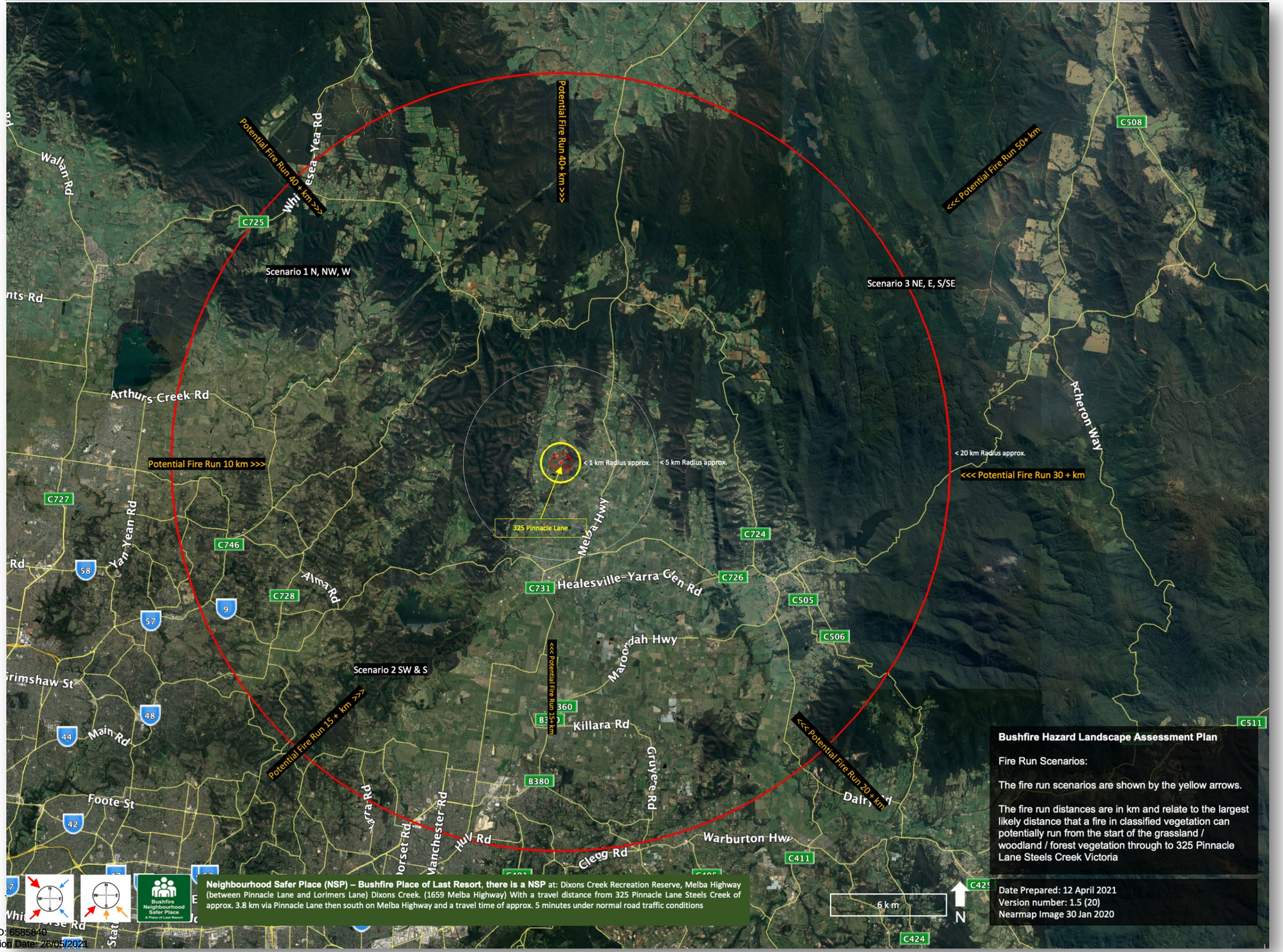
The potential impact of a bushfire on the proposed development has been assessed in relation to likely bushfire run scenarios. These scenarios define credible directions of approach of a bushfire, given the nature of the site, the surrounding vegetation and topography. The following descriptions refers to the image on page 53 showing bushfire run direction scenarios.

It is important to highlight that the grassland, woodland and forest vegetation surrounding the site in all directions, has inter linking woodland/forest canopy over long distances surrounding the site. The nature of the woodland and forest areas are such that there is extensive ground fuel and middle level fuel loads, with heavy upper tree canopy across the bushfire landscape that are at or above the levels in AS3959-2018.

The overall fuel loads across the area are capable of carrying a major bushfire, as the vegetation surrounding and beyond the subject site is such that the ground cover and middle level fuels combined with the current level of canopy development, are potentially at or above the normal fuel loads for forest under AS3959-2018.

Possible Bushfire Run Scenarios for 325 Pinnacle Lane (as set out on page 53)

Fire Approach Scenario	Description
1 Approach from North, northwest and west	A bushfire is most likely to be a long run bushfire that will approach from the north, northwest or west due to the prevailing winds primarily from these directions on days of extreme fire weather conditions. Bushfires from these directions are likely to be long run fires from more than 40 km from the north, more than 40 km from the northwest, and more than 50 km from the northeast and more than 10 km from the west. Also, there is potential from short run fires from within 400 metres to 5 km from the north, northwest and west. Ember attack is likely, with elevated firebrands likely to travel long distances and potentially cause spot fires well ahead of the main fire front. In the case of the subject site spot fires are likely to cause fires to start on the northern aspect of the subject site to the north, northwest and west, also close to the site from the north, northwest and west of the site. There is a high level of likelihood, and it is important to recognise that sport fires could cause a situation where the subject site could be under direct bushfire attack from all directions and well ahead of the main bushfire reaching the site.
2 Approach from southwest and south	A long or short run bushfire approaching from the southwest or south would generally be associated with a significant wind change. Also, due to the topography of the area, with deep downslopes and complex terrain beyond the site, the site could face a complex mix of wind directions, caused by both the southwest/west change and the nature of the fire behaviour, including fire storms and fire generated wind which will be unpredictable and highly variable wind direction. Bushfires from the south and southwest are likely to approach from the southwest, with potentiall fire runs of approximately 10 km to more than 15 km from the southwest/south, through road verge woodland, scrub and forest, and moving through heavy forest and woodland areas.
3 Approach from northeast, east and southeast	A short or long run bushfire approaching from the northeast, east and southeast could potentially be associated with the prevailing fire weather conditions on a day of extreme fire weather. In addition, there is the potential for a wind change in the afternoon on a day of extreme fire weather conditions. Bushfires from the northeast, east and southeast are likely to have potential fire runs of more than 50 km away from the northeast to more than 30 km from the east, short run fires of 1 km to more than 5 km from the northeast, east and southeast are likely, under the right mix of fuel dryness and fire weather conditions. A bushfire approaching from the northeast, east and southeast will run primarily run through grassland and heavy forest and woodland areas.



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Response Statement to Clause 13.02 Bushfire – 13.02-1S

The subject site is subject to specific planning and building controls that relate to bushfire, including Clause 71.02-3 Integrated Decision Making, that states that planning and responsible authorities should endeavour to integrate policies and balance conflicting objectives in favour of net community benefit and sustainable development. In bushfire affected areas the protection of human life must be priorities over all other policy considerations. Clause 13.02-1S Bushfire Planning will be considered with the objective "To strengthen the resilience of settlements and communities to bushfire through risk based planning that prioritises the protection of human life over all other policy considerations"

This statement that provides a response to Clause 13.02 (Bushfire), 13.02-1S Bushfire Planning of the Council Planning Scheme given the site is located within the Bushfire Prone Area and is also covered by the bushfire management overlay.

SBAFire has been engaged by the property owners of the subject site to prepare a response relating to the proposed new dwelling at 325 Pinnacle Lane Steels Creek 3775 Victoria (subject site). Due to the nature of the subject site location in a bushfire prone area and subject to a bushfire management overlay, a response to the Planning Policy Framework at Clause 13.02 Bushfire has been prepared, which includes the need to consider the bushfire risk associated with the protection of human life in areas designated as 'bushfire prone' under the Building Act 1993. The site is in a designated bushfire prone area and is covered by the bushfire management overlay.

The objective of Clause 13.02 is to strengthen the resilience of settlements and communities to bushfire risk through risk-based planning that prioritises the protection of human life. Clause 13.02 requires the planning permit application to:

- *Reduce the vulnerability of communities to bushfire through the consideration of bushfire risk in decision making at all stages of the planning process.*
- *Consider the risk of bushfire to people, property and the community infrastructure.*
- *Require implementation of appropriate bushfire protection measures to address the identified bushfire risk.*
- *Ensure that new development can implement bushfire protection measures without unacceptable biodiversity impacts.*

This report demonstrates that bushfire protection and mitigation objectives for water supply, access, building design, siting and separation, landscape design, vegetation management relevant matters relating to bushfire hazard and the protection of human life have been considered and incorporated in the proposal.

The site is located in a designated bushfire prone area and the bushfire management overlay, which are identified as an area where people and property are particularly venerable to bushfire. Bushfire Development Report has considered the risk of bushfire to people, property and community infrastructure, and provided detail on the implementation of appropriate bushfire protection measures to address the identified bushfire risk consistent with the proposed use in accordance with Clause 13.02 Bushfire, of the Planning Scheme.

This report clearly responds to the proposed development of a new dwelling at 325 Pinnacle Lane Steels Creek, addresses the requirements of Clause 13.02 and specifically Clause 13.02-1S and presents highly developed Bushfire Development Report, that includes a Bushfire Management Statement (BMS) and Bushfire Attack Level (BAL) Assessment report, relating to the proposed construction of a new dwelling at 325 Pinnacle Lane Steels Creek.

This bushfire development report does not seek to remove the bushfire risk, but provides detailed siting, building and general bushfire hazard related information to assist in the ability of the landowner to manage the risk associated with living and operating in a bushfire environment. The bushfire management statement has been prepared in accordance with AS3959-2018 Construction of buildings in bushfire prone areas, Planning Scheme Clauses 53.02, Clause 44.06 and Clause 13.02 and best practice standards as applied in Victoria and in accordance with Local and State Government bushfire planning, guidelines and policies.

The objective of Clause 13.02 is to strengthen the resilience of settlements and communities to bushfire risk through risk-based planning that prioritises the protection of human life. Clause 13.02 requires the planning permit application to:

- *Reduce the vulnerability of communities to bushfire through the consideration of bushfire risk in decision making at all stages of the planning process.*
- *Consider the risk of bushfire to people, property and the community infrastructure.*
- *Require implementation of appropriate bushfire protection measures to address the identified bushfire risk.*
- *Ensure that new development can implement bushfire protection measures without unacceptable biodiversity impacts.*

Statement Response to Clause 13.02-1S

Reduce the vulnerability of communities to bushfire through the consideration of bushfire risk in decision making at all stages of the planning process.	Reduce the vulnerability of communities The proposed development of a new dwelling on the subject site at 325 Pinnacle Lane Steels Creek Victoria, is consistent with the application of the planning policy in the subject site area. The proposed development of the new dwelling will potentially reduce the bushfire risk to the local communities through the consideration of bushfire risk and the application of appropriate measures to reduce the bushfire risk on the subject site, which in turn will reduce the bushfire risk to the surrounding communities. As set out in the following a range of measures have been applied to reduce the vulnerability of communities of bushfire through consideration and application of mitigation measures, that will significantly reduce the bushfire risk on the subject site.
Consideration of the risk of bushfire to people, property and the community infrastructure	Consideration of the risk of bushfire to people, property and community infrastructure *When considering the risk of bushfire to people, property and the community infrastructure. It is clear that the subject site is a very high bushfire risk site in the general context of bushfire within the immediate area and with a very high to extreme level of risk beyond 150 metres of the site and the wider area beyond the site.* When considering access and egress for people on the subject site and adjoining the site, there is good access for firefighting vehicles and egress from the site and area for people, through movement to places that provide the potential to shelter in place and place of last resort, and of the urban areas to the south of the site in Yarra Glen. The ability of people on the site being able to move to Yarra Glen to shelter in place and have a place of last resort, may be compromised due to the vegetation across the landscape, combined with the extensive road verge vegetation across the road network. The site ability to provide shelter in place and place of last resort is strengthened by the provision of a bushfire shelter on site new dwelling site near the firefighting water supply tank and the new dwelling, as set out in the bushfire hazard site assessment and bushfire management plan (BMP). ***Required that a Bushfire Shelter be established on the subject Site:*** A bushfire shelter has been required on the site, that would be located close to the dwelling and therefore the bushfire shelter would provide for people on the site to shelter in place and have a place of last resort on the site.

The subject site and vegetation extent in the broader area, including all of the surrounding properties adjoining the subject site are located in the Steels Creek area, set amongst rural farming and residential type properties in an established setting, featuring properties and housing on various large lot sizes and configurations. The vegetation within the immediate and wider area beyond 150 metres radius of the subject site, includes primarily managed vegetation and grassland, woodland and forest vegetation.

In addition, in the wider bushfire landscape there is extensive very high risk grassland, woodland and forest vegetation areas to the north, northwest, northeast, west, east and south, that is essentially manage near the new dwelling on the site and largely unmanaged adjoining the site and in the wider area. There are also extensive very high risk forest and woodland areas within 1 km to 5 km km of the site and more than 40 km away to the north, northwest, northeast, and more than 10 km to the south, west and east, that are essentially unmanaged and associated with private land and state/local nature reserves, and national parks and forests .

The nearest Township/Urban area is Yarra Glen to the south. *The subject site 325 Pinnacle Lane Steels Creek has access to the Yarra Glen urban area and shopping precinct*, which is approximately 10 km to the south of the subject site via Steels Creek Road, with a travel time in a motor vehicle of approximately 11 minutes under normal road traffic conditions. Moving south to Yarra Glen during a bushfire impacting the Steels Creek area, could be very high risk, due to the extensive road verge vegetation across the road network.

Yarra Glen as an urban/rural area, near the subject site to the south, is such that the fringe areas of Yarra Glen could be impacted by a bushfire penetrating deep into the urban area of Yarra Glen under extreme to catastrophic fire weather conditions. Thus, the urban/rural township area immediately to the south of the subject site in Yarra Glen, may not be a suitable place to safely shelter in place, subject to the fire weather conditions.

Yarra Glen shopping precinct is in the urban area and may potentially provide potential protection from the impact of extreme bushfire behaviour, where fuel is managed in a minimum fuel condition and there is sufficient distance or shielding to protect people from direct flame contact or harmful levels of radiant heat, and with potentially suitable short travel distances. *There is some significant potential for bushfire risks to arise on the travel journey from the subject site to a place of greater protection, the risk issues related to high risk roadside vegetation or road traffic congestion, that may make it impossible to reach a nearby Township or urban area.*

Neighbourhood Safer Place (NSP) – Bushfire Place of Last Resort, there is no NSP in Steels Creek, the nearest NSP is located at: Dixons Creek Recreation Reserve, Melba Highway (between Pinnacle Lane and Lorimers Lane) Dixons Creek. (1659 Melba Highway) With a travel distance from 325 Pinnacle Lane Steels Creek of approx. 3.8 km via Pinnacle Lane then south on Melba Highway and a travel time of approx. 5 minutes under normal road traffic conditions

	A Bushfire Shelter is required on the site *as set out in the bushfire hazard site assessment and the outline BMP image,* the Bushfire shelter will provide the ability to shelter in place and a Place of Last Resort on the site and close to the new dwelling on the site.
The implementation of appropriate bushfire protection measures to address the identified bushfire risk	The implementation of appropriate bushfire protection measures ***Dwelling sitting, landscape and bushfire protection measures***. The proposed new dwelling is located in essentially the same location as the current dwelling is generally located in suitable location on the site at 325 Pinnacle Lane Steels Creek, the subject site. The new dwelling will be constructed to BAL 29 and provided with defendable space of 35 metres around the dwelling. In addition, to defendable space, there will be a 40,000 firefighting water supply tank located on the site. *A Bushfire Shelter is required on the site as set out in the BMP,* the Bushfire shelter will provide the ability to Shelter in Place and a Place of Last Resort on the site and close to the new dwelling and the 40,000-litre firefighting water supply tank on the site. The proposed bushfire protection measures above address the identified bushfire risk to an acceptable level. It is the opinion of the consultant that the implementation of the outlined bushfire protection measures above, are appropriate bushfire protection measures that will address the identified bushfire risk.
How the development can implement bushfire protection measures without unacceptable biodiversity impacts.	How the development can implement bushfire protection measures It is the opinion of the consultant that the subject site is such that the bushfire protection measures will be able to be implemented without any unacceptable biodiversity impacts. This is largely due to the bushfire protection measures being sensitive to the lot and the size of the lot and the distance between the subject site and the wider landscape. It is the opinion of the Consultant that the bushfire protection measures will not have unacceptable biodiversity impacts.

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Bushfire Impact on Urban Areas at Urban/Rural Interface

The following seeks to highlight the very high bushfire risk nature of living at the urban/rural interface. Recent bushfire examples have been used to show bushfire behavior under extreme fire weather bushfire conditions at the interface, including:

Black Saturday Bushfires 2009, in particular Marysville.

Also, a dramatic example is the recent Northern California bushfires in which more than 8,000 homes were destroyed and significant loss of life. See Image 2 Coffee Park subdivision Santa Rosa California.

The following images are aimed at emphasising the before and after impact of bushfires on essentially urban areas under extreme fire weather conditions.

Marysville Black Saturday Bushfires 2009

Coffee Park subdivision Santa Rosa California Bushfire October 2017

Black Saturday Bushfire 2009 Marysville Impact

Image 1:
Marysville Murchison St and Lyell St intersection Before and After Black Saturday Bushfire 2009

Northern California Bushfires October 2017 Coffee Park Santa Rosa Impact

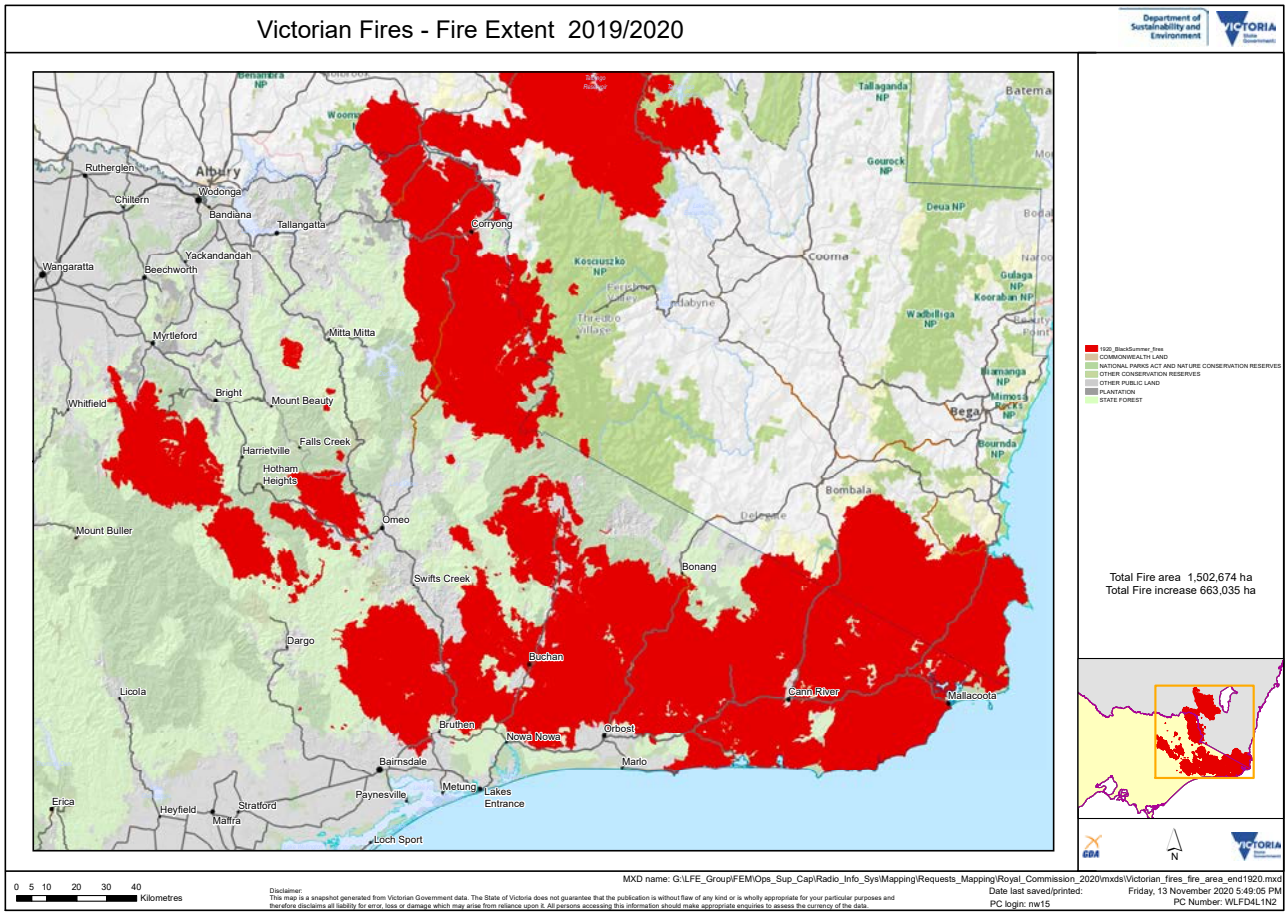
Image 2:
Before and After images Coffee Park subdivision in Santa Rosa California USA

Source: New York Times

Bushfire Fire History Summary - Major Bushfires Since 1851

Year	Location	Size (ha)	Losses
1851	Dandenong Ranges (Black Thursday)	Unknown	12 people
1898	South Gippsland	260,000	12 people, 2000 buildings
1926	Warburton, Noojee, Kinglake, Erica, Dandenong Ranges	Unknown	31 people
1939	Noojee, Warrandyte, Yarra Glen, Warburton, Erica (Black Friday)	2,000,000	71 people, 650 houses
1942	South Gippsland	Unknown	1 person, 20 houses
1944	Beaumaris	Unknown	63 houses
1944	Yallourn, Morwell, Traralgon	Unknown	9 people, 136 houses
1962	The Basin, Christmas Hills, Kinglake, St Andrews, Hurstbridge, Warrandyte, Mitcham	30,321	32 people, 450 houses
1968	The Basin, Upwey	1920	53 houses, 10 other buildings
1983	Belgrave South, Cockatoo, Beaconsfield Upper (Ash Wednesday)	93,500	47 people, 2000 houses or other buildings
1997	Dandenong Ranges, Arthurs Seat	569	3 people, 41 houses
2005-06	Yea, Moondarra, Kinglake	25,000	4 people
2006-07*	Walhalla (Great Divide bushfire)	1,048,238	1 person, 51 houses
2009	Kilmore East, Churchill, Kinglake, Marysville, Yarra Valley, Dandenong Ranges, Narre Warren, Upper Ferntree Gully, Wilsons Promontory, Bunyip State Park, Delburn (Black Saturday)	232,300	173 people, 2007 houses
2014	Warrandyte, Darraweit Guim, Hernes Oak	41,000 +	40+ houses

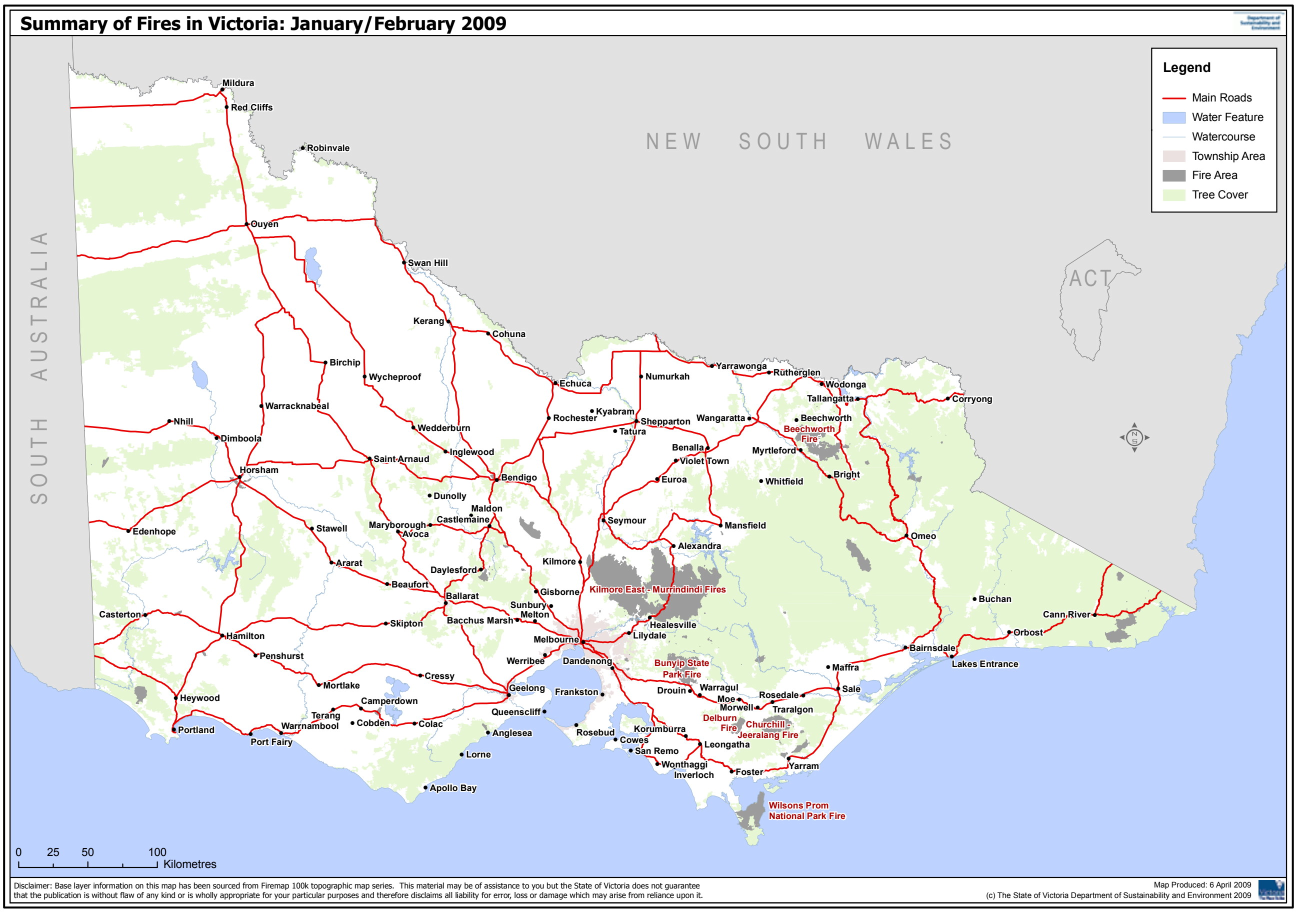
Victoria Bushfires 2019/2020

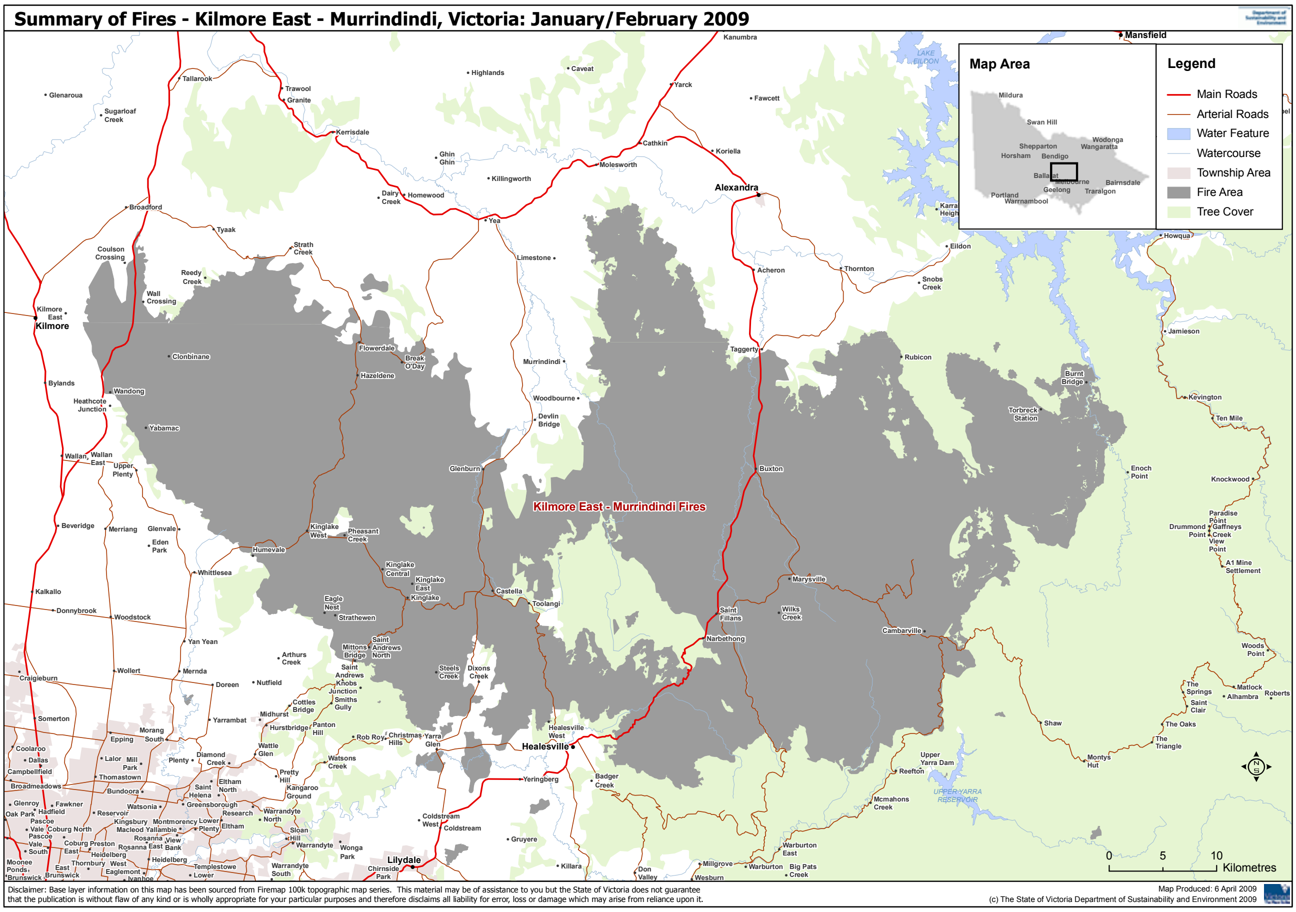


Mallacoota Bushfire 2019

Bushfire North of Bairnsdale 2019

Black Saturday Bushfires 2009

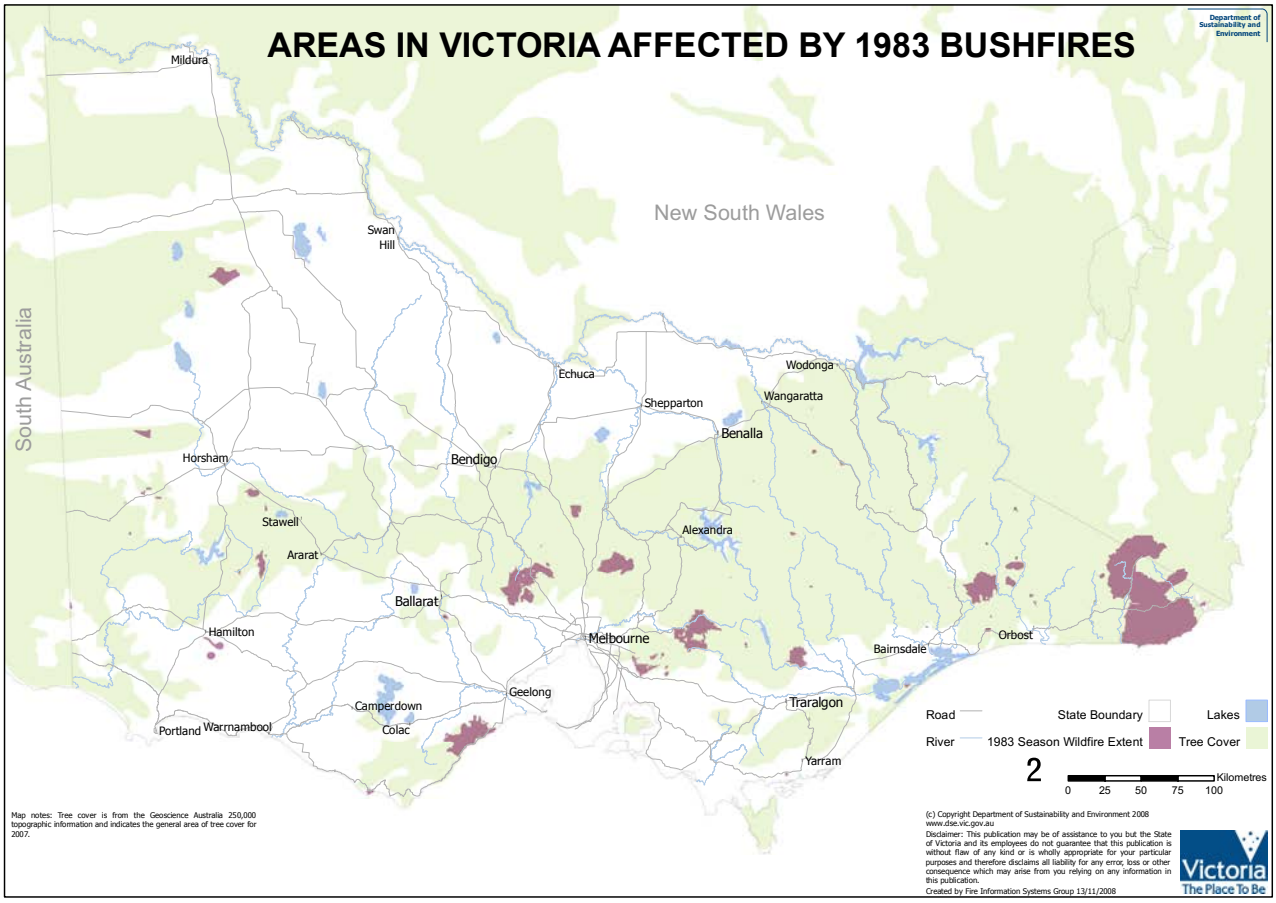




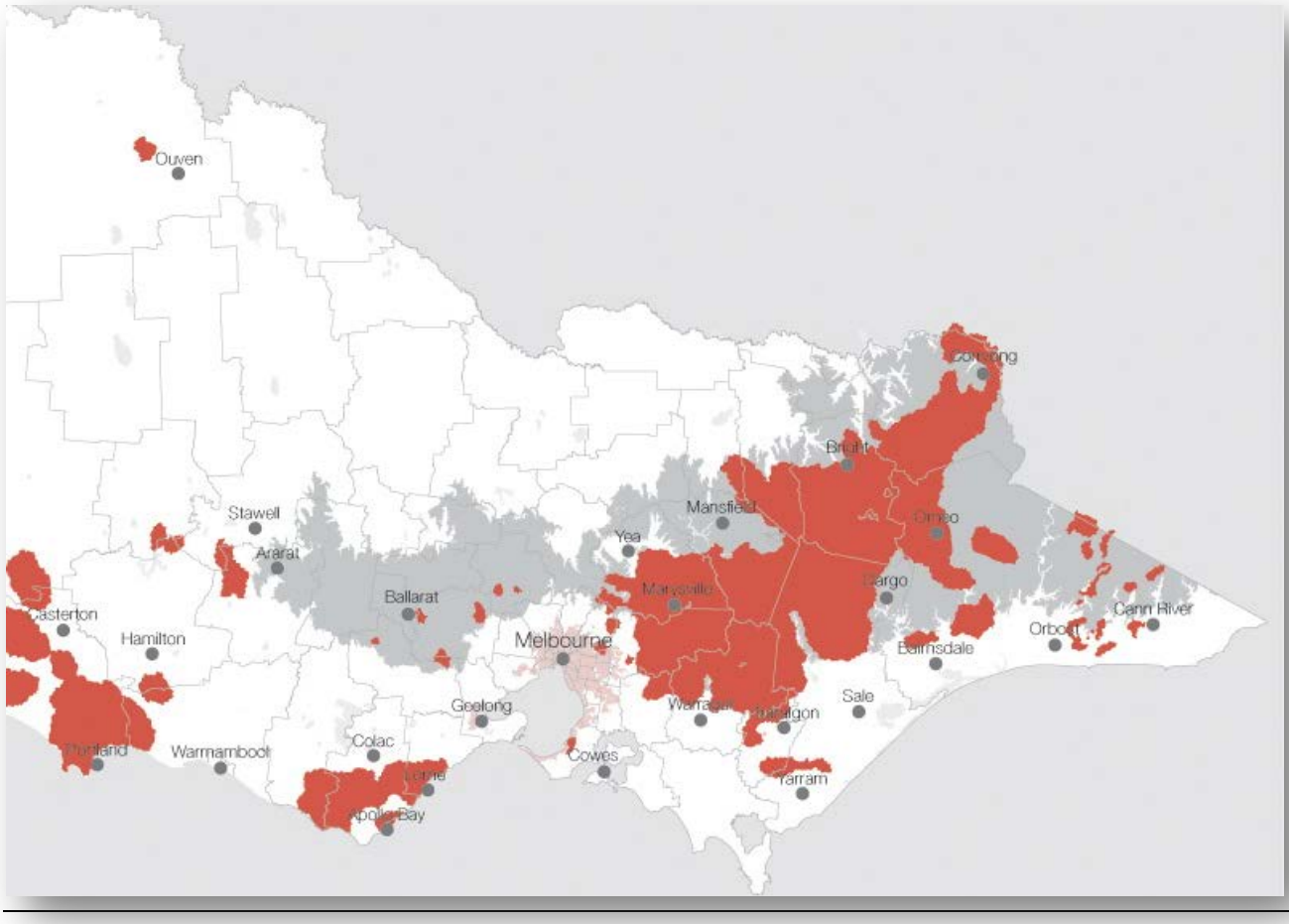
Pine plantation fire adjacent to Hume Highway at Wandong Victoria Black Saturday 7 February 2009

Black Saturday 7 February 2009

Ash Wednesday Bushfires 1983



Black Friday Bushfires – 13th January 1939



Context of Bushfire Risk and Wider Area

The bushfire images below, have been included with the aimed of illustrating an example of the likely real view of a bushfire in vegetation similar to that adjoining and near 325 Pinnacle Lane Steels Creek 3775 Victoria. The vegetation type and fuel loads in the images are similar to Steels Creek and the surrounding areas. *It should be noted that the images primarily depict essentially woodland type vegetation. The subject site is primarily surrounded by grassland, woodland and forest vegetation.*

Bushfire Management Statement

This Bushfire Management Statement Pathway 2 has been developed in response to Clause 53.02-4 Bushfire Protection Objectives.

53.02-4.1 Landscape, Siting and design objectives

- *Development is appropriate having regard to the nature of the bushfire risk arising from the surrounding landscape.*
- *Development is sited to minimise the risk from bushfire.*
- *Development is sited to provide safe access for vehicles, including emergency vehicles.*
- *Building design minimises vulnerability to bushfire attack.*

Approved Measure AM 2.1 - Landscape

The bushfire risk to the development from the landscape beyond the site can be mitigated to an acceptable level.

The property landscape will be managed and planned to ensure suitable effective vegetation design, planning and management to support the defendable space requirements, on the property and where possible adjoining properties.

The primary threat within 150 metres radius of the dwelling façade is from the grassland, woodland and forest vegetation on and adjoining the site. To the north of the site is Pinnacle Lane that provides some minimal bushfire mitigation to the northwest, north and northeast, as Pinnacle Lane is a narrow road, its potential to provide a significant break between the subject site and a bushfire approaching from the north, northeast and northwest is limited. In addition, as Pinnacle Lane has extensive road verge vegetation, it does essentially increase the potential issues that may impact the ability for vehicles to use the road during a bushfire impacting Pinnacle Lane, Steels Creek Road to the west and Melba Highway to the east. A fire approaching from the north, northwest and northeast, may make it difficult to egress the site via Steels Creek Road or Melba Highway as both road would potentially being impacted by an approaching bushfire. The accessway to 325 Pinnacle Lane, will provide good access capability for firefighting vehicles to access the new dwelling and firefighting water supply tank. To some extent the design of the accessway does act like and bushfire buffer and fire break to the northeast of the new dwelling. The managed vegetation, grassland and mid-level fuels on the site are essentially managed near the new dwelling, primarily through grazing, there are areas of unmanaged vegetation on the site, but it is important to recognise that under conditions of dry fuel combined with extreme fire weather conditions could create a situation whereby the managed vegetation on the site could be capable of carry a bushfire that could impact the site new dwelling on the site.

The primary threat to the subject site is from the north, northwest, northeast, west and south/southwest, and also east/southeast with extensive very high to extreme threat forest and woodland vegetation near and beyond the site. In addition, the area well beyond the site has extensive very high to extreme threat forest and woodland vegetation, that can potentially carry a bushfire from a few hundred metres away to more than 40 km away, deep into Pinnacle Lane and the Steels Creek area. The area surrounding the subject site and Steels Creek and beyond in the wider region has a long history of major bushfires. The Black Saturday Bushfires of 2009, Kilmore East bushfire travelled more than 45 km from Kilmore East to Steels Creek, that resulted in 10 deaths in the Steels Creek area.

The subject site bushfire landscape risk can be mitigated to an acceptable level, through a combination of the ongoing management of the site vegetation ground and mid-level fuels on the site. The accessway will be suitable for firefighting vehicles access providing it is designed and complies with BMO accessway design and construction requirements. The defendable space of 35 metres around the new dwelling. In addition, there will also be a 40,000-litre firefighting water supply tank on the site and located near the new dwelling on the accessway and a bushfire shelter is to be installed near the new dwelling and firefighting water supply tank.

Approved Measure AM 2.1 has been met	Yes	✓	No	☐

Approved Measure AM 2.2 - Siting

A building is sited to ensure the site best achieves the following:

- *The maximum separation distance between the building and the bushfire hazard*

The subject site new dwelling building is located 12 metres from the classified grassland vegetation in all directions and scattered woodland is within 25 metres from the northeast, east and south/southeast.

The construction level for the new dwelling will be BAL 29

The proposed new dwelling is to be located in a suitable location on the site as demonstrated in the bushfire hazard site assessment. Pinnacle Lane is a narrow unsealed public road, that provides a minimal level of a fire break capability to the northeast, north and northwest, which is supported by the new accessway for 325 Pinnacle Lane to the northeast of the subject new dwelling site, which provides a level fire break capability to the new dwelling. The defendable space of 35 metres around the new dwelling provides a suitable level of risk reduction on the site, combined with the establishment of a 5 metres fire break to the property boundary to the west, south and east and 60 metres to the north of the new dwelling. Also, subject site accessway will comply with the BMO required 3.5 metre width and the standard BMO accessway construction requirements, combined with passing bays of 20m by 6 m.

- *The building is in close proximity to a public road*

The rear of the new dwelling building is located approximately 750 metres off the public road, Pinnacle Lane an unsealed public road. Pinnacle Lane provides access to the urban areas of Yarra Glen to the south via Steels Creek Road to the west and then south to Yarra Glen, and Melba Highway to the east of the site provides access to Yarra Glen to the south. Also, the neighbourhood safe place is located in Dixons Creek on Melba Highway.

Neighbourhood Safer Place (NSP) – Bushfire Place of Last Resort, there is no NSP in Steels Creek, the nearest NSP is located at: Dixons Creek Recreation Reserve, Melba Highway (between Pinnacle Lane and Lorimers Lane) Dixons Creek. (1659 Melba Highway) With a travel distance from 325 Pinnacle Lane Steels Creek of approx. 3.8 km via Pinnacle Lane then south on Melba Highway and a travel time of approx. 5 minutes under normal road traffic conditions

The nearest Township/Urban area is Yarra Glen to the south. *The subject site 325 Pinnacle Lane Steels Creek has access to the Yarra Glen urban area and shopping precinct*, which is approximately 10 km to the south of the subject site via Steels Creek Road, with a travel time in a motor vehicle of approximately 11 minutes under normal road traffic conditions. Moving south to Yarra Glen during a bushfire impacting the Steels Creek area, could be very high risk, due to the extensive road verge vegetation across the road network.

Yarra Glen as an urban/rural area, near the subject site to the south, is such that the fringe areas of Yarra Glen could be impacted by a bushfire penetrating deep into the urban area of Yarra Glen under extreme to catastrophic fire weather conditions. Thus, the urban/rural township area immediately to the south of the subject site in Yarra Glen, may not be a suitable place to safely shelter in place, subject to the fire weather conditions.

Yarra Glen shopping precinct is in the urban area and may potentially provide potential protection from the impact of extreme bushfire behaviour, where fuel is managed in a minimum fuel condition and there is sufficient distance or shielding to protect people from direct flame contact or harmful levels of radiant heat, and with potentially suitable short travel distances. *There is some significant potential for bushfire risks to arise on the travel journey from the subject site to a place of greater protection, the risk issues related to high-risk roadside vegetation or road traffic congestion, that may make it impossible to reach a nearby Township or urban area.*

- *Access can be provided to the building for emergency service vehicles*

As the proposed new dwelling building is greater than 200 metres (750m) to rear of the new dwelling off Pinnacle Lane, an unsealed public road, there is a requirement for firefighting vehicles to enter the site via the site accessway off Pinnacle Lane. There will be a 40,000-litre firefighting water supply tank on the site located near the new dwelling on the accessway, which will be able to be accessed by firefighting vehicles. There will also be a bushfire shelter located near the dwelling and next to the firefighting water supply tank.

Approved Measure AM 2.2 has been met	Yes	✓	No	☐

Approved Measure 2.3 – Building Design

A building is designed to be responsive to the landscape risk and reduce the impact of bushfire on the building.

The proposed new dwelling has been designed so as to reduce the accumulation of debris and entry of embers. The ground cover in the grassland and vegetation areas surrounding the dwelling and shed will be managed in order to reduce the protentional for ember attack from the ground cover fuel.

Approved Measure AM 2.3 has been met	Yes	✓	No	☐

53.02-4.2 – Defendable Space and Construction Objective

- Defendable space and building construction mitigate the effect of flame contact, radiant heat and embers on the buildings.

Approved Measure AM 3.1 – Bushfire Construction and Defendable Space

A building provides the defendable space in accordance with Column A, B, C of Table 2 and is managed in accordance with Table 6 of Clause 53.02-5 wholly within the title boundaries of the land.

The dwelling building will be provided with defendable space in accordance with Table 2 to Clause 53.02-5

Defendable space has been established using Table 2. ***The construction standard for the new dwelling, building is to be a minimum of BAL 29.***

Defendable space for the dwelling building is provided for a distance of 35 metres in all directions around the dwelling, where the vegetation will be managed in accordance with Table 6 of Clause 53.02-5 below.

Table 6 of Clause 53.02-5 – Defendable space management requirements:

Defendable space is provided and is managed in accordance with the following requirements:

- Grass must be short cropped and maintained during the declared fire danger period.
- All leaves and vegetation debris must be removed at regular intervals during the declared fire danger period.
- Within 10 metres of a building, flammable objects must not be located close to the vulnerable parts of the building.
- Plants greater than 10 centimetres in height must not be placed within 3 metres of a window or glass feature of the building.
- Shrubs must not be located under the canopy of trees.
- Individual and clumps of shrubs must not exceed 5 square metres in area and must be separated by at least 5 metres.
- Trees must not overhang or touch any elements of the building.
- The canopy of trees must be separated by at least 5 metres.
- There must be a clearance of at least 2 metres between the lowest tree branches and ground level.

Unless specified in a schedule or otherwise agreed in writing to the satisfaction of the relevant fire authority.

✓ Acceptance confirmed of Table 6 Vegetation Management Requirements

There are no significant siting constraints that would allow Column D of Table 2 to Clause 53.02-5

Yes ☐ No ☐ Not Applicable ✓

A building is constructed to the bushfire attack level:
That corresponds to the defendable space provided in accordance with Table 2 to Clause 53.02-5

The new dwelling to be constructed to a minimum Bushfire Attack Level of BAL 29

The defendable space is wholly contained within the boundaries of the property

Yes ✓ No ☐ if no, see Alternative Measure 3.3

Approved Measure AM 3.1 has been met	Yes	✓	No	☐

53.02-4.3 – Water Supply and Access Objectives

- *A static water supply is provided to assist in protecting property.*
- *Vehicle access is designed and constructed to enhance safety in the event of a bushfire.*

Approved Measure AM 4.1 – Water Supply and Access

Water Supply Requirement

A building used for a dwelling (including an extension or alteration to a dwelling), a dependant person's unit, industry, office or retail premises service station or warehouse is provided with:

- *A static water supply for firefighting and property protection purposes as specified in Table 4 to Clause 53.02-5.*

The water supply may be in the same tank as other water supplies provided that a separate outlet is reserved for firefighting water supplies.

Lot Size (m^2)	**Hydrant Available**	**Capacity (litres)**	**Fire Authority Fittings & Access Required**	**Requirement**
Less than 500	Not Applicable	2,500	No	☐
500 – 1000	Yes	5,000	No	☐
500 – 1000	No	10,000	Yes	☐
1001 and above	Not Applicable	10,000	Yes	☐
	Not Applicable	40,000	Yes	✓
Note: A hydrant is available if it is located within 120 metres of the rear of the building				

Confirm Static Water Supply meets the following requirements	✓	Is stored in an above ground water tank constructed of concrete or metal
	✓	All fixed above ground water pipes and fittings for firefighting purposes must be made of corrosive resistant metal.
	✓	Include a separate outlet for the occupant use
	✓	Be readily identifiable from the building or appropriate identification signage to the satisfaction of CFA must be provided.
	✓	Be located within 60 metres of the outer edge of the approved building
	✓	The outlet/s of the water tank must be within 4 metres of the access-way and unobstructed
	✓	Incorporate a ball or gate valve (British Standard Pipe (BSP 65mm) and coupling (64mm CFA 3 thread per inch male fitting)
	✓	Any pipework and fittings must be a minimum of 65mm (excluding the CFA coupling)

Additional Information:

A 40,000-litre static water supply tank is to be provided and maintained solely for firefighting purposes. The tank location is marked on the bushfire management plan and the bushfire hazard site assessment plan.

Approved Measure AM 4.1 (Water Supply) Has been met	Yes	✓	No	☐

Access requirement

Table 5 Vehicle Access Design and Construction Requirements:

A building used for a dwelling (including an extension or alteration to a dwelling), a dependant person's unit, industry, office or retail premises service station or warehouse is provided with is provided with vehicle access is designed and constructed as specified in Table 5 to Clause 53.02-5.

Vehicle access (or part thereof) of a length specified in Column A implements the design and construction requirements specified in Column B.

Column A	Column B
Length of access is less than 30 metres	☐ There are no design and construction requirements if fire authority access to water supply is not required under AM 4.1
Length of access is less than 30 metres	☐ Where fire authority access to the water supply is required under AM 4.1 fire authority vehicles should be able to get within 4 metres of the water supply outlet
Length of access is greater than 30 metres	The following design and construction requirements apply: ✓ All weather construction ✓ A load limit of at least 15 tonnes ✓ Provide a minimum trafficable width of 3.5 metres ✓ Be clear of encroachments for at least 0.5 metres on each side and at least 4 metres vertically ✓ Curves must have a minimum inner radius of 10 metres ✓ The average grade must be no more than 1 in 7 (14.4%) (8.1°) with a maximum grade of no more than 1 in 5 (20%) (11.3°) for no more than 50 metres ✓ Dips must have no more than 1 in 8 (12.5 per cent) (7.1 degrees) entry and exit angle
Length of access is greater than 100 metres	A turning area for fire fighting vehicles must be provided close to the building by one of the following: ✓ A turning circle with a minimum radius of eight metres ✓ A driveway encircling the dwelling ✓ The provision of other vehicle turning heads such as a T head or Y Head – which meet the specification of Austroad Design for an 8.8 metre service vehicle.
Length of access is greater than 200 metres	✓ Passing bays must be provided at least every 200 metres. ✓ Passing bays must be a minimum of 20 metres long with a minimum trafficable width of 6 metres.
Note	*The length of access should be measured from a public road to either the building or the water supply outlet, whichever is longer.*

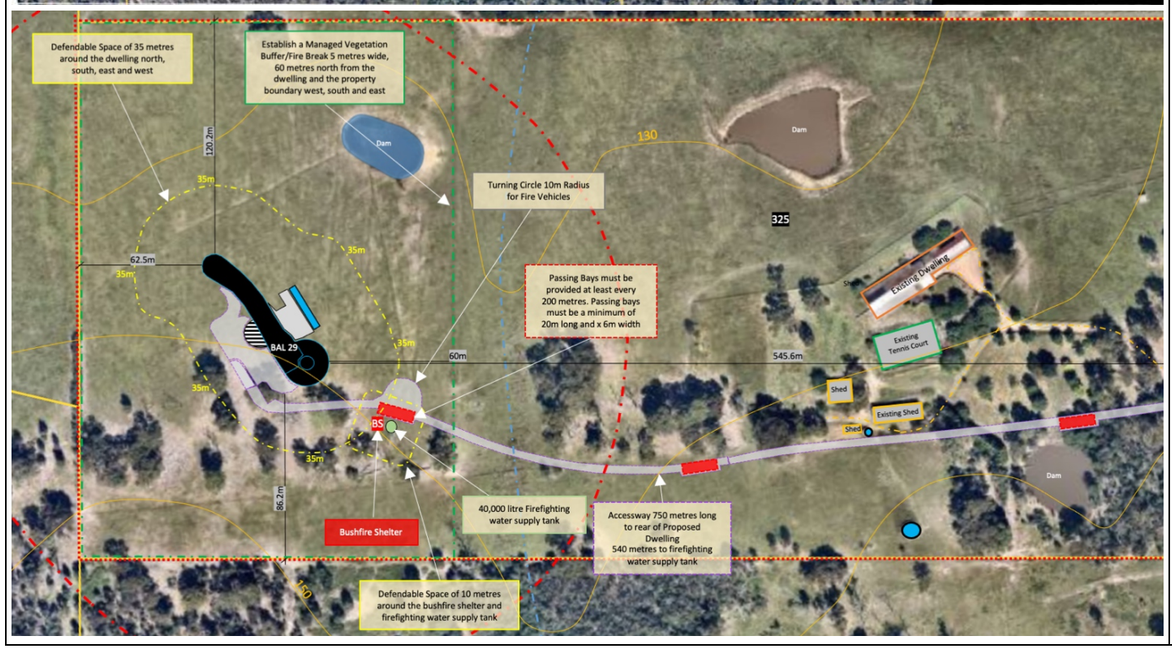
Additional Information:

Firefighting vehicle access and design:

The length of access via the accessway is greater than 200 metres from Pinnacle Lane (750m approx.) to the rear of the dwelling and 540 metres to the firefighting water supply tank, therefore fire authority access to the water supply tank is required under clause AM4.1 fire authority vehicle should be able to get within 4 metres of the water supply outlet.

Approved Measure AM 4.1 (Access) Has been met	Yes	✓	No	☐

Bushfire Management Plan – 325 Pinnacle Lane Steels Creek 3775 Victoria



Bushfire Protection Measures

a) Defendable Space

Defendable space is provided for a distance of 35 metres north, south, east and west around the dwelling, where vegetation (and other flammable materials) will be modified and managed in accordance with the following requirements:

- Grass must be short cropped and maintained during the declared fire danger period.
- All leaves and vegetation debris must be removed at regular intervals during the declared fire danger period.
- Within 10 metres of a building, flammable objects must not be located close to the vulnerable parts of the building.
- Plants greater than 10 centimetres in height must not be placed within 3m of a window or glass feature of the building.
- Shrubs must not be located under the canopy of trees.
- Individual and clumps of shrubs must not exceed 5 sq. metres in area and must be separated by at least 5 metres.
- Trees must not overhang or touch any elements of the building.
- The canopy of trees must be separated by at least 5 metres.
- There must be a clearance of at least 2 metres between the lowest tree branches and ground level.

b) Managed Vegetation Buffer

The managed vegetation buffer to be 5 metres in width and provided to the property boundary west, south and east and 60 metres north, where vegetation will be modified and managed in accordance with the following requirements:

- Grass must be short cropper and maintained during the declared fire danger period.
- All leaves and vegetation debris must be removed at regular intervals during the declared fire danger period

c) Construction Standard

- Proposed New Dwelling to be designed and constructed to a minimum Bushfire Attack Level of BAL 29

d) Water Supply

- Show a water supply tank with 40,000 litres of effective water supply for firefighting purposes which meets the following requirements:
- Be stored in an above ground water tank constructed of concrete or metal.
- Have all fixed above ground water pipes and fittings required for firefighting purposes made of corrosive resistant metal.
- Include a separate outlet for occupant use.
- Be readily identifiable from the building or appropriate identification signage to the satisfaction of the relevant fire authority.
- Be located within 60 metres of the outer edge of the approved building.
- The outlet/s of the water tank must be within 4 metres of the accessway and unobstructed.
- Incorporate a separate ball valve (British Standard Pipe (BSP 65 millimetre) and coupling (64millimetre CFA 3 threads per inch male fitting).
- Any pipework and fittings must be a minimum of 65 millimetres (excluding the CFA coupling)

e) Access for Site Accessway and Fire Access Track

- Show the access for firefighting purposes which meets the following requirements:
- All-weather construction.
- A load limit of at least 15 tonnes
- Provide a minimum trafficable width of 3.5 metres
- Be clear of encroachments for at least 0.5 metres on each side and at least 4 metres vertically
- Curves must have a minimum inner radius of 10 metres
- The average grade must be no more than 1 in 7 (14.4 Per cent) (8.1 degrees) with a maximum grade of no more than 1 in 5 (2 per cent) (11.3 degrees) for no more than 50 metres.
- Dips must have no more than a 1 in 8 (12. Per cent) (7.1 degrees) entry and exit angle.
- Incorporate a turning area for firefighting vehicles close to the building
- Incorporate a passing bay at least every 200 metres that are a minimum 20 metres long and a minimum trafficable width of 6 metres

f) Bushfire Shelter

- Prior to occupation of the dwelling a private bushfire shelter is to be provided (a Class 10c building within the meaning of the Building Regulations 2018) is:
  - Constructed in the location shown on this plan and in accordance with the Building Regulations 2018 and the National Construction Code (NCC) performance requirements.
  - Available for use by the occupants of the dwelling at all times.
  - Maintained in accordance with the requirements of the building permit issued for that private bushfire shelter.

Mandatory Condition

The bushfire protection measures forming part of this permit or shown on the endorsed plans, including those relating to construction standards, defendable space, water supply, and access, must be maintained to the satisfaction of the responsible authority on a continuing basis. This condition continues to have force and effect after the development authorised by this building permit has been completed.

Prepared By: Geoffrey Stone – SBAFire Version: V1.21-10 Final Date: 26 April 2021

SBAFire

Document Set ID: 6585840
Version: 2, Version Date: 26/05/2021

Bushfire Management Requirements - Owner Obligations

The following is a summary of the planning requirements that form part of the construction of a new dwelling at 325 Pinnacle Lane Steels Creek 3775 Victoria, based on the BAL rating and BMO requirements for the property.

Bushfire Management Plan Endorsed
Before the development starts, the Bushfire Management Plan forming part of the Bushfire Management Statement, must be submitted to and endorsed by the Responsible Authority. The plan must not be altered unless otherwise agreed in writing by CFA and the Responsible Authority.

Bushfire Management Plan
Before the development starts, the bushfire management plan which is generally in accordance with the bushfire management plan submitted to and endorsed by the Responsible Authority. The plan must show the following bushfire mitigation measures, unless otherwise agreed in writing by the CFA and the Responsible Authority.

Building Permit Conditions Relevant to the Bushfire Planning Requirements

A permit to construct a building or construct or carry out works must include the following condition:

"The bushfire protection measures forming part of this permit or shown on the endorsed plans, including those relating to construction standards, defendable space, water supply, and access, must be maintained to the satisfaction of the responsible authority on a continuing basis. This condition continues to have force and effect after the development authorised by this building permit has been completed."

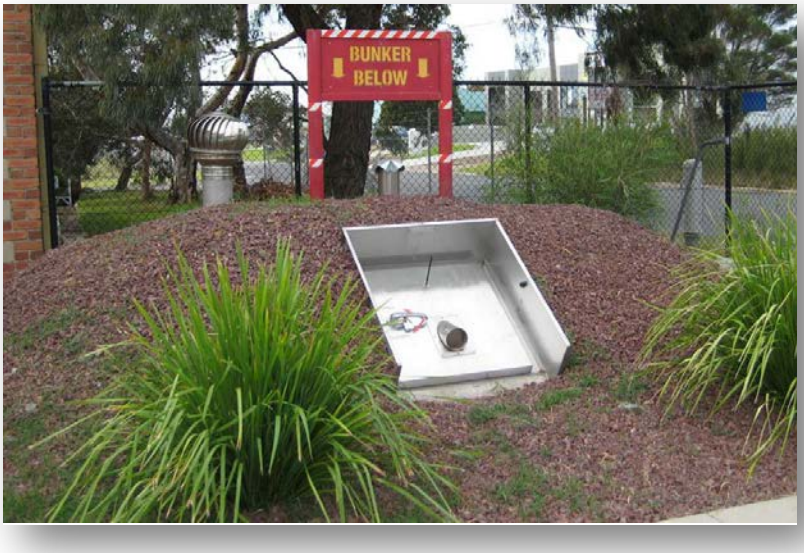
Bushfire protection measures and defendable space
The following is a summary of the building permit requirements for the property, covering all of the key parts of the building permit that relate to the Bushfire Management and Planning, firefighting water supply, access, fire protection and defendable space requirements.

Required Construction Standards

*The proposed new dwelling at 325 Pinnacle Lane Steels Creek 3775 Victoria, must be designed and constructed to a **minimum Bushfire Attack Level of BAL 29** in accordance with the relevant sections of AS3959-2018 Construction of buildings in bushfire prone areas.*

Bushfire Shelter/Bunker is required

A *bushfire shelter/bunker (Private bushfire shelter) is **required** to be installed on the site, in the location shown on the BMP.* The bushfire shelter should be located in line with the location and construction requirements under the building code and AS3959-2018 and Victorian Building Regulations and CFA Private bushfire shelters in Victoria, A Guide for siting, landscape and use. *See CFA link* https://www.cfa.vic.gov.au/plan-prepare/private-bushfire-shelters-or-bunkers



Bushfire Shelter Requirements:
Prior to occupation of the dwelling a private bushfire shelter (a Class 10c building within the meaning of the Building Regulations 2018) is:

- Constructed in the location shown on this plan and in accordance with the Building Regulations 2018 and the National Construction Code (NCC) performance requirements.
- Available for use by the occupants of the dwelling at all times.
- Maintained in accordance with the requirements of the building permit issued for that private bushfire shelter.

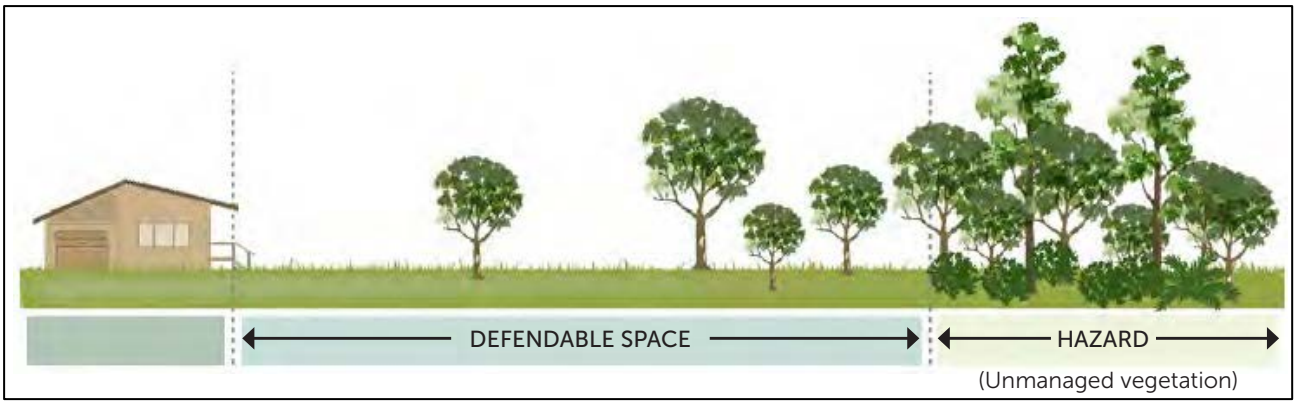
Defendable space and BMO vegetation management standard

New Dwelling Defendable Space
Defendable space is provided for a distance of 35 metres in all directions around the dwelling, where vegetation (and other flammable materials) will be modified and managed in accordance with the following requirements:

Clause 53.02-5 Table 6 Vegetation management requirements

- Grass must be short cropped and maintained during the declared fire danger period.
- All leaves and vegetation debris must be removed at regular intervals during the declared fire danger period.
- Within 10 metres of a building, flammable objects must not be located close to the vulnerable parts of the building.
- Plants greater than 10 centimetres in height must not be placed within 3m of a window or glass feature of the building.
- Shrubs must not be located under the canopy of trees.
- Individual and clumps of shrubs must not exceed 5 sq. metres in area and must be separated by at least 5 metres.
- Trees must not overhang or touch any elements of the building.
- The canopy of trees must be separated by at least 5 metres.
- There must be a clearance of at least 2 metres between the lowest tree branches and ground level.

Defendable Space Outline



Access requirements required and recommended

Before the occupation of the development starts, emergency vehicle access to the static water supply dedicated for firefighting purposes must be provided. The minimum design requirements (including gates, bridges and culverts) that must be complied with are:

The length of access is greater than 200 metres off Pinnacle Lane (750 m approx.) to the rear of the new dwelling and 540 metres to the firefighting water supply tank, fire authority access to the water supply is required under clause AM4.1 fire authority vehicle should be able to get within 4 metres of the water supply outlet.

Clause 53.02-5 Table 5 Vehicle access design and construction
Vehicle access (or part thereof) of a length specified in Column A implements the design and construction requirements specified in Column B.

Column A	Column B	Applies
Length of access is less than 30 metres	There are no design and construction requirements if fire authority access to the water supply is not required under **AM4.1**	☐
Length of access is less than 30 metres	Where fire authority access to the water supply is required under **AM4.1** fire authority vehicles should be able to get within 4 metres of the water supply outlet.	☐
Length of access is greater than 30 metres	The following design and construction requirements apply: • All weather construction • A load limit of at least 15 tonnes • Provide a minimum trafficable width of 3.5m • Be clear of encroachments for at least 0.5 metres on each side and at least 4 metres vertically • Curves must have a minimum inner radius of 10m. • The average grade must be no more than 1 in 7 (14.4 per cent) (8.1 degrees) with a maximum of no more than 1 in 5 (20 per cent) (11.3 degrees) for no more than 50m. • Dips must have no more than a 1 in 8 (12.5%) (7.1° degrees) entry and exit angle.	✓
Length of access is greater than 100 metres	A turning area for fire fighting vehicles must be provided close to the building by one of the following: • A turning circle with a minimum radius of eight metres. • A driveway encircling the dwelling. • The provision of other vehicle turning heads – such as a T or Y head – which meet the specification of Austroad Design for an 8.8 metres Service Vehicle.	✓
Length of access is greater than 200 metres	• Passing bays must be provided at least every 200 metres. • Passing bays must be a minimum of 20 metres long with a minimum trafficable width of 6 metres.	✓

Note: The length of access should be measured from a public road to either the building or the water supply outlet, whichever is the longer.

Static water supply requirements

Clause 53.02-5 Table 4 Water supply requirements

Capacity, fittings and access

Lot sizes (sq. m)	Hydrant available	Capacity (litres)	Fire authority fittings and access required	Applies
Less than 500	Not applicable	2,500	No	☐
500-1,000	Yes	5,000	No	☐
500-1,000	No	10,000	Yes	☐
1,001 and above	Not applicable	10,000	Yes	☐
	Not applicable	40,000	Yes	✓

Note 1: A hydrant is available if it is located within 120 metres of the rear of the building

Before the occupation of the development site starts. Show a 40,000-litre tank with 40,000 litres of effective water supply for firefighting purposes which meets the following requirements:

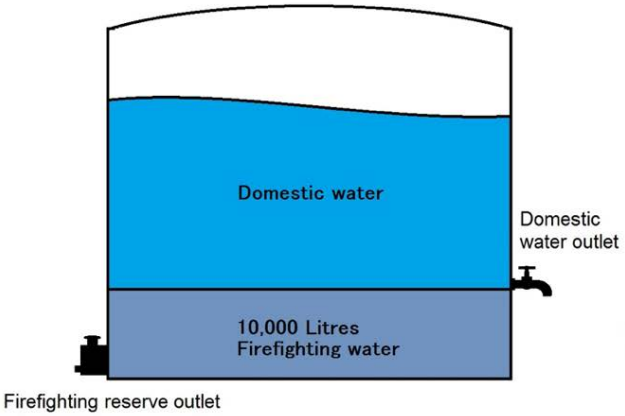
Fire Authority requirements

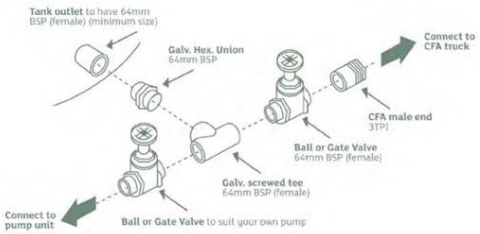
Unless otherwise agreed in writing by the relevant fire authority, the water supply must:

- Be stored in an above ground water tank constructed of concrete or metal
- Have all fixed above–ground water pipes and fittings required for firefighting purposes must be made of corrosive resistant metal.
- Include a separate outlet for occupant use.
- Be readily identifiable from the building or appropriate identification signage to the satisfaction of the relevant fire authority
- Be located within 60 metres of the outer edge of the approved building.
- The outlet/s of the water tank must be within 4 metres of the accessway and unobstructed.
- Incorporate a separate ball valve (British Standard Pipe (BSP 65 millimetre) and coupling (64 millimetre CFA 3 threads per inch male fitting).
- Any pipework and fittings must be a minimum of 65 millimetres (excluding the CFA coupling)

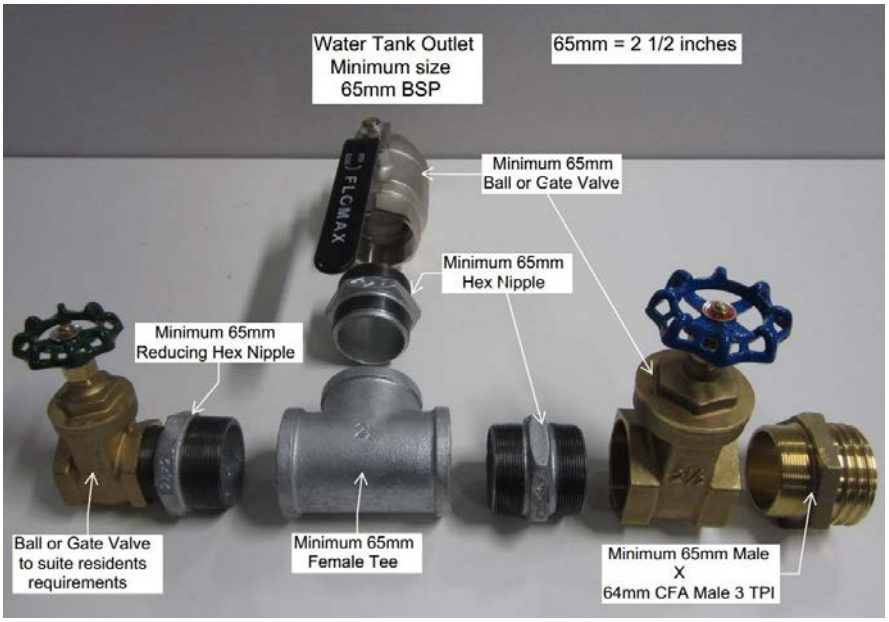
Static Water Supply Fittings/Requirements & Access Requirements

CFA Water Supply Requirements:

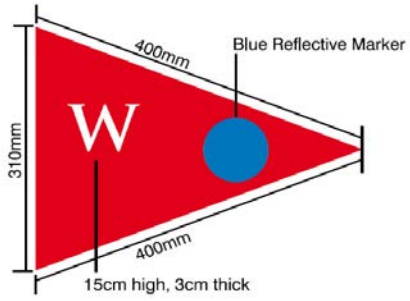




CFA 65mm to 64mm male 3 TPI outlet

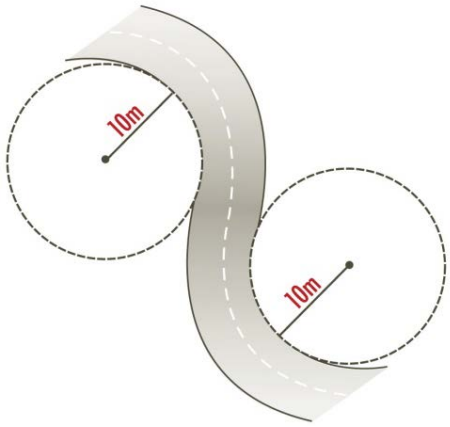


CFA Water supply signage is required as set out below

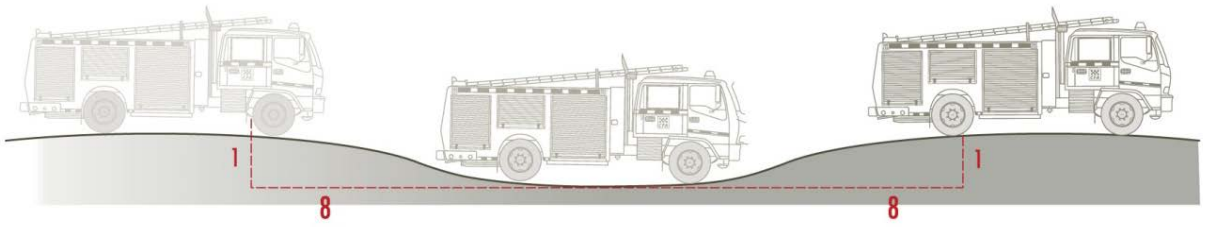


Access Requirements Diagrams for BMO

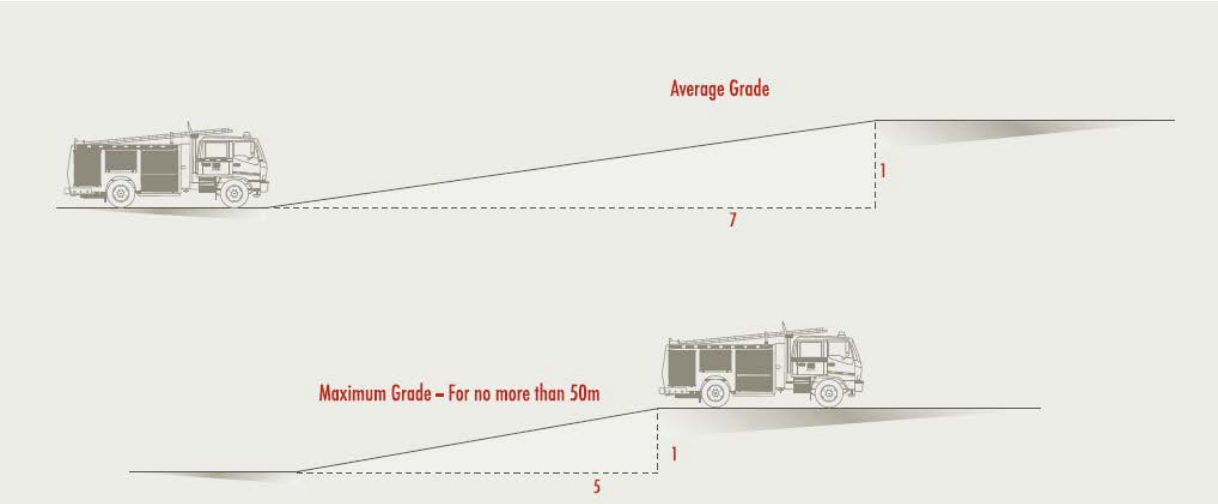
Curves in the accessway - a minimum inner radius of 10m.



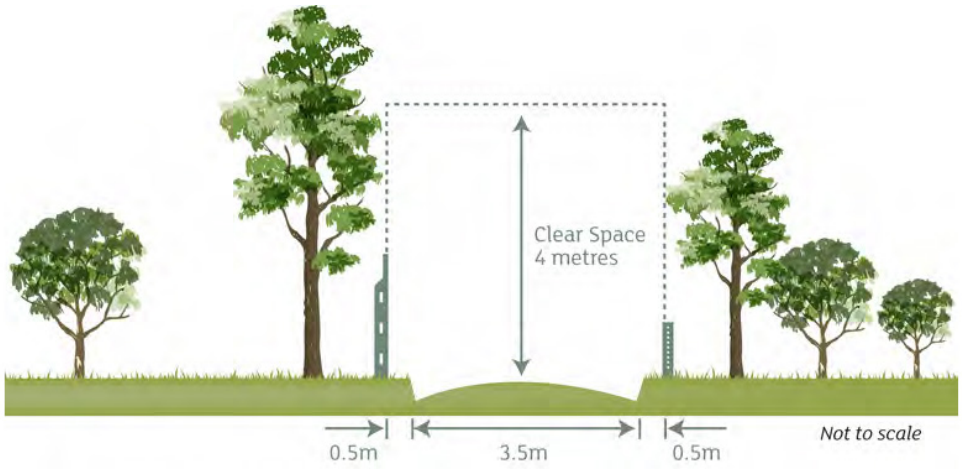
Dips in the accessway - no more than a 1 in 8 (12.5 per cent) (7.1 degrees) entry and exit angle.



Average grade - no more than 1 in 7 (14.4 per cent) (8.1 degrees)



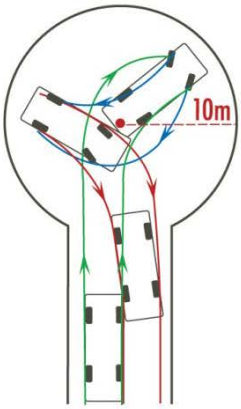
Widths and clearances around the accessway - minimum trafficable width of 3.5m and be substantially clear of encroachments for at least 0.5m on each side and clear of encroachments at least 4m vertically.

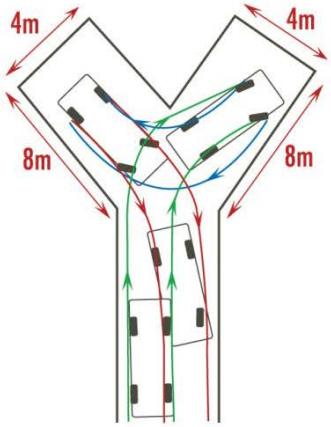


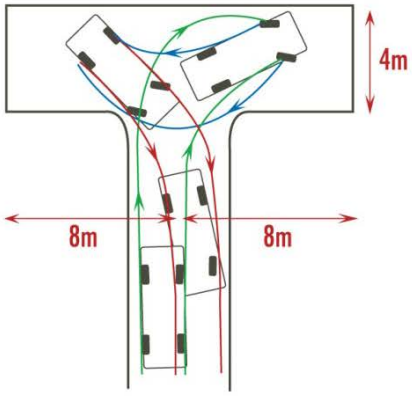
Construction of an all-weather surface

Accessway should be constructed of an all-weather surface (e.g. 150mm depth concrete).

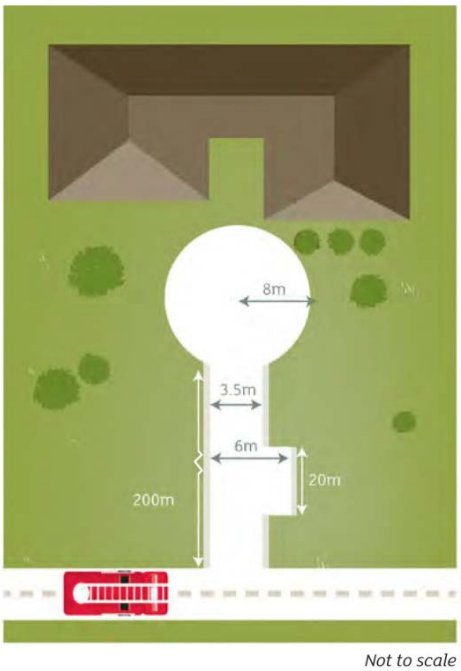
Turning circles – required where accessway **is in excess of 100m**







Passing bays – required where an access way **is in excess of 200m**



Not to scale

0.5m required to open firetruck door

Attachment 1: Your Guide to Bushfire Survival

Your Guide to Survival

CFA

Version 3

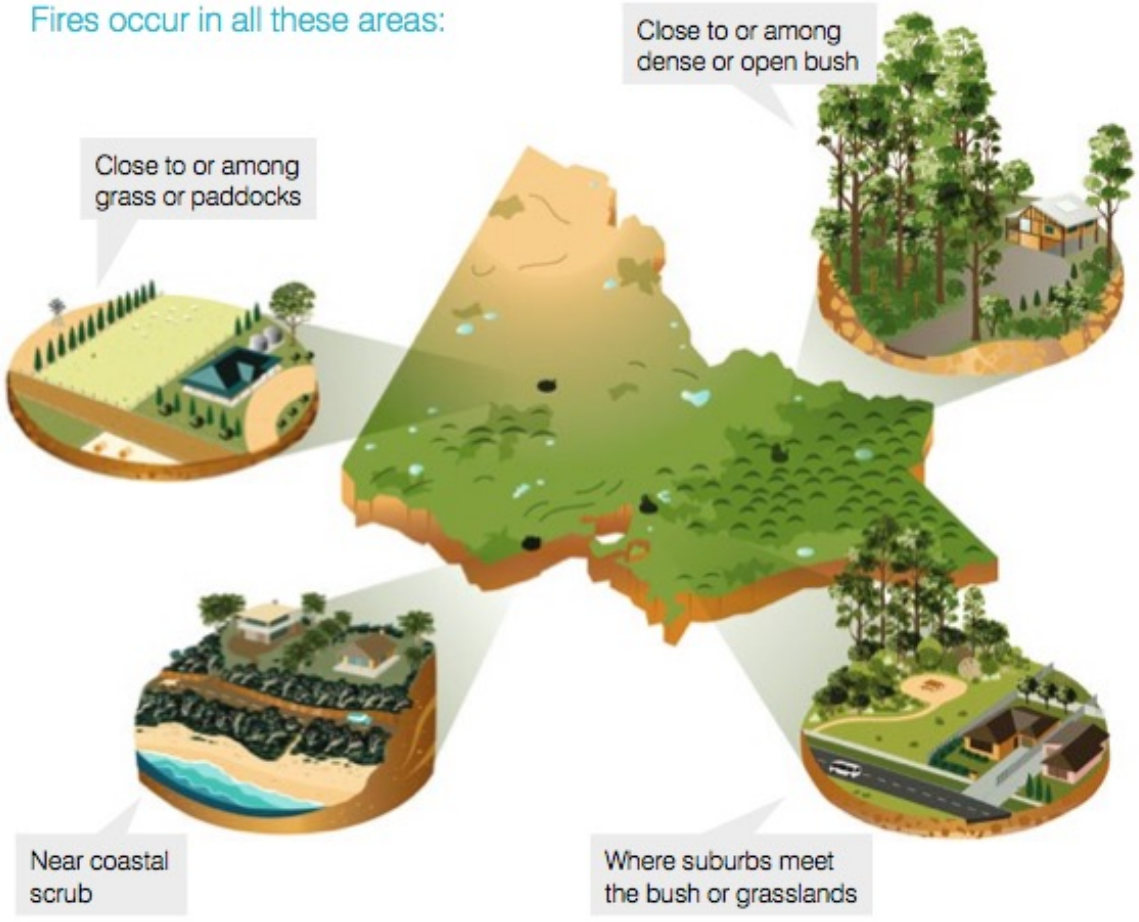
cfa.vic.gov.au

Am I at risk of fire?

You don't have to live in the country to be at risk.

Fires can occur where the suburbs meet the bush or in urban areas where houses have grass, bushland or parkland around them.

Fires occur in all these areas:



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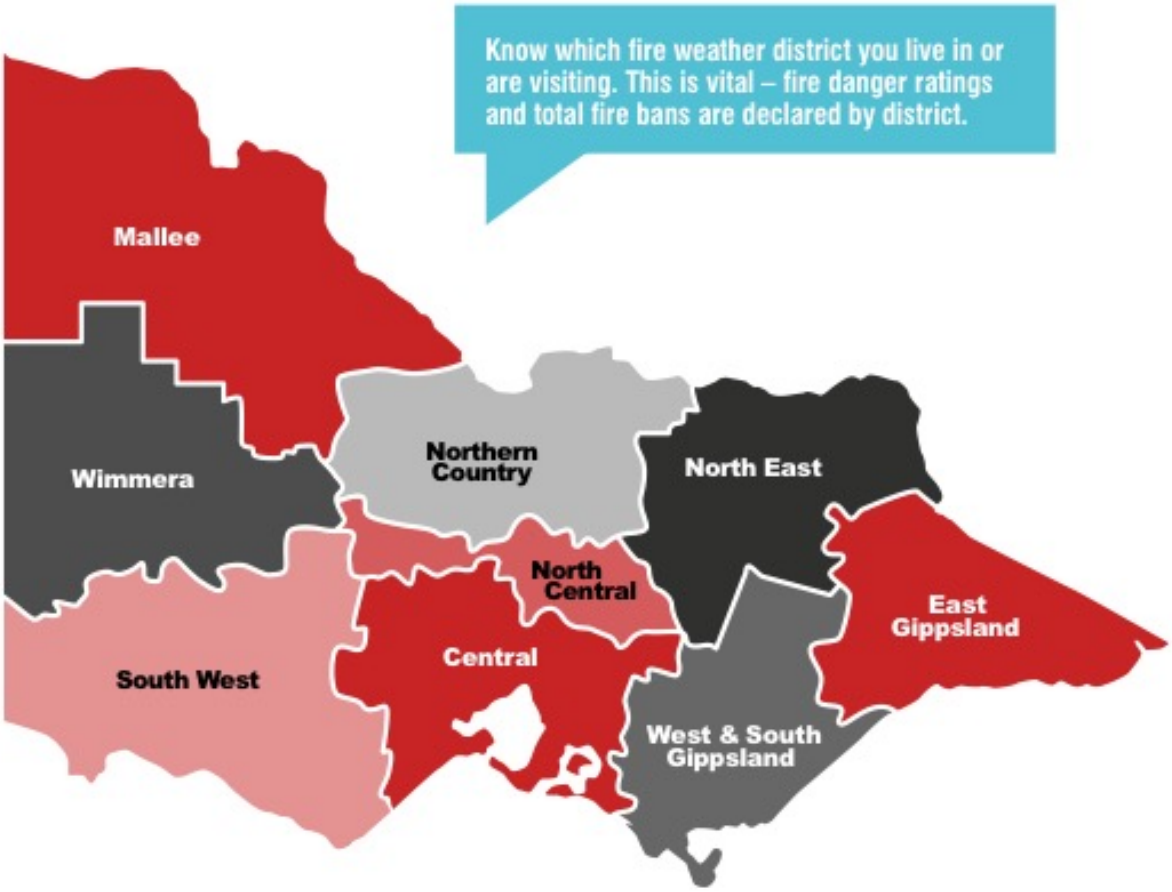
How bad is the risk today?



KNOW YOUR DAILY FIRE DANGER RATING

FIRE DANGER RATING

Fire Danger Ratings (FDR)
tell you how dangerous a fire would be if one started – the higher the rating, the more dangerous the conditions.

KNOW YOUR RESTRICTIONS

TOTAL FIRE BAN

Total Fire Bans
tell you what you can and can't do and what activities are banned on certain days during high fire risk months.

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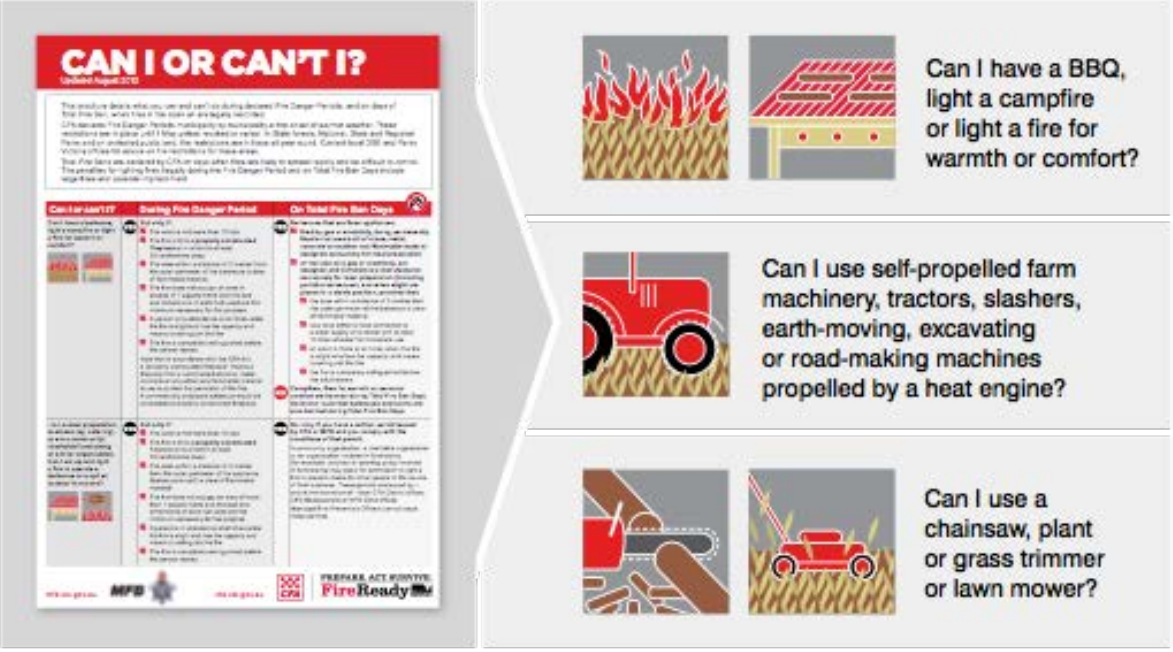
Can I or can't I?

There are legal restrictions in place during the **Fire Danger Period** and on **Total Fire Ban** days. The ***Can I or Can't I*** brochure (pictured below) details what you can or can't do when fires in the open air are restricted. Go to **cfa.vic.gov.au/can** to view this important brochure.



Burning off

Once fire restrictions come into force for your shire or council (known as the Fire Danger Period*), you cannot light a fire in the open air unless you have a permit or comply with certain restrictions.

You need a permit to burn off during the Fire Danger Period.

You can apply for a permit by contacting your local shire or council. You must also notify Emergency Services Telecommunications Authority – or ESTA – of your burn off by calling 1800 668 511.

You will need to tell them:

- the location
- the date
- expected start and finish times
- what you intend to burn
- the estimated size of the burn off.

* The Fire Danger Period begins in the lead up to summer and is declared by CFA for each shire or council. Go to **cfa.vic.gov.au** or your local shire or council for up-to-date information.

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Big decisions

At the very least, here are ten things you should discuss and decide with your family before summer even starts.

10 important decisions to make with your family

- [ ] Which Fire Danger Rating is your trigger to leave?
- [ ] Will you leave early that morning or the night before?
- [ ] Where will you go?
- [ ] What route will you take – and what is your back up route if a fire is already in the area?
- [ ] What will you take with you?
- [ ] What are you going to do with your pets or livestock?
- [ ] Who else do you need to talk to about where you are going?
- [ ] Is there anyone outside your neighbourhood that you need to help or check up on?
- [ ] How will you stay informed about warnings and updates?
- [ ] What will you do if there is a fire in the area and you cannot leave?

Leaving early – what does it mean?

'Leaving early' means being away from high risk areas before there are any signs of fire. It does not mean waiting for a warning or a siren. It does not mean waiting to see or smell smoke. And it certainly does not mean waiting for a knock on the door.

Fires can start and spread very quickly. Leaving early is the safest option for anyone in a high risk bushfire area. Many people have died trying to leave at the last minute.

When you decide to leave is the most important decision you will make.

Driving in a bushfire is extremely dangerous and can be fatal. A drive that would normally take five minutes could take two hours with road closures, traffic jams, crashes, smoke, fallen trees and embers getting in the way.

Plan ahead so you know how you will leave. Know different routes to get out of the area – some may be closed if a fire is already burning nearby.

It's up to you to decide where you will go on a fire risk day. Don't wait and see.

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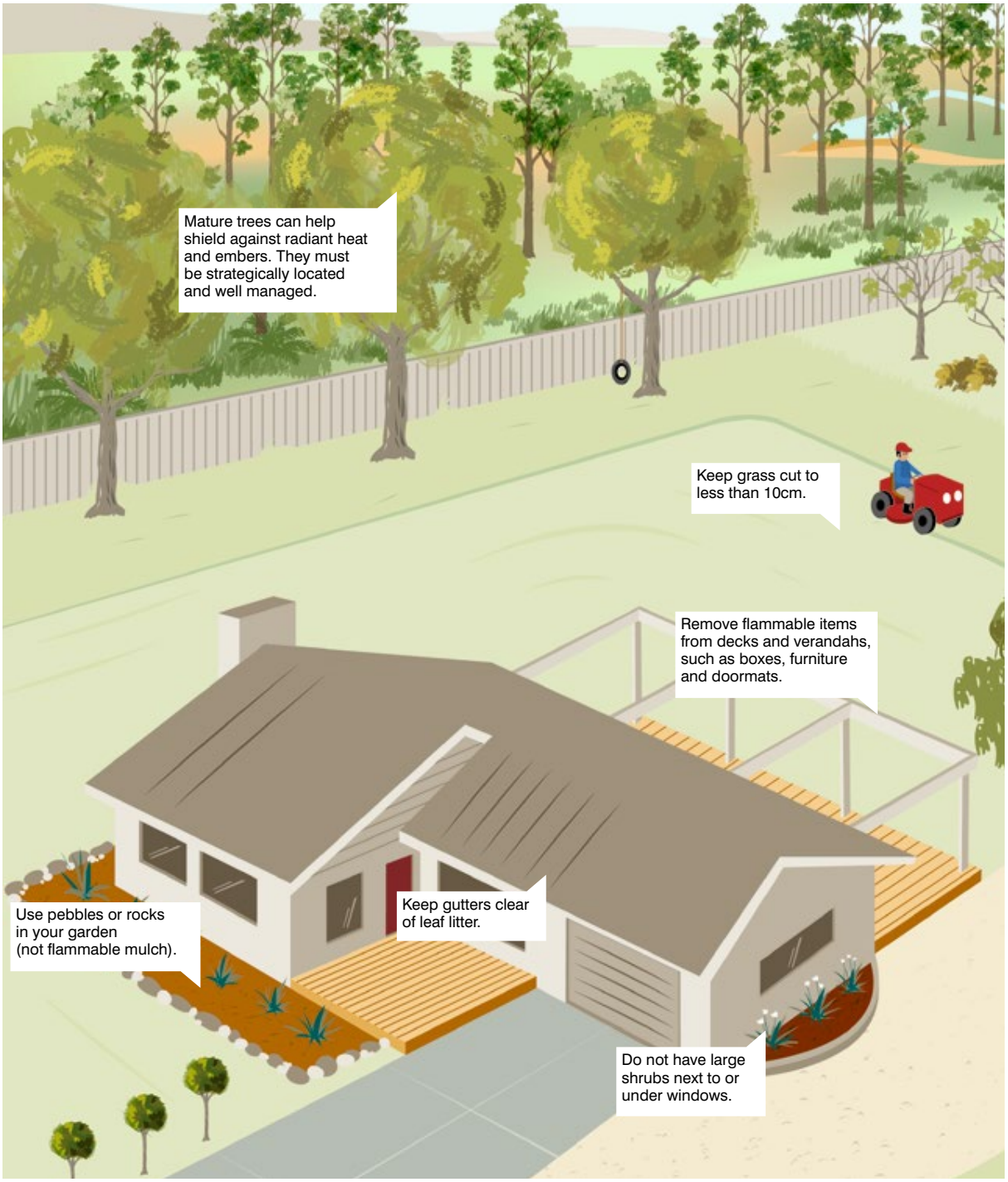
Well-prepared property



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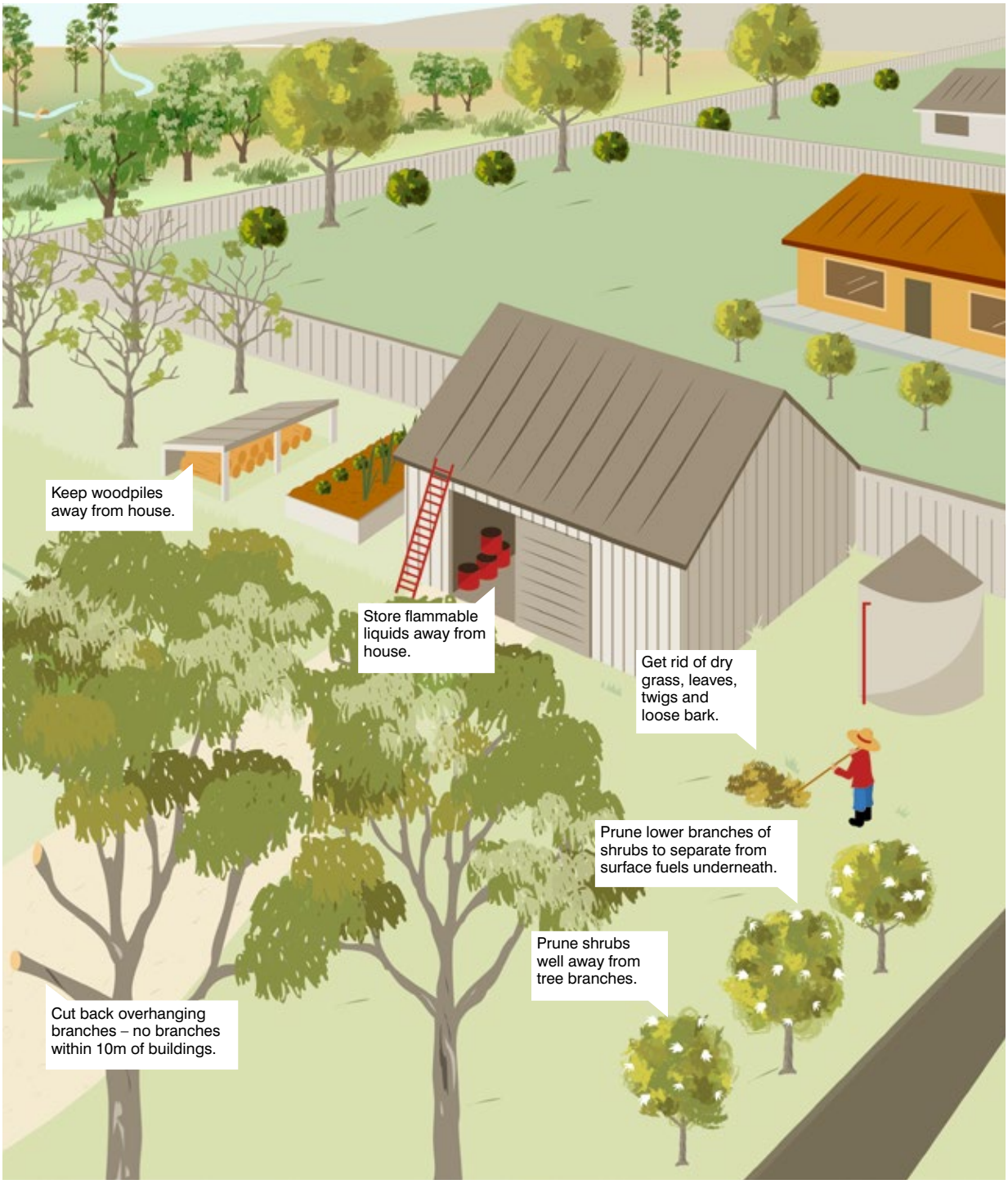
You can reduce the impact of fire on your home by preparing your property before summer.



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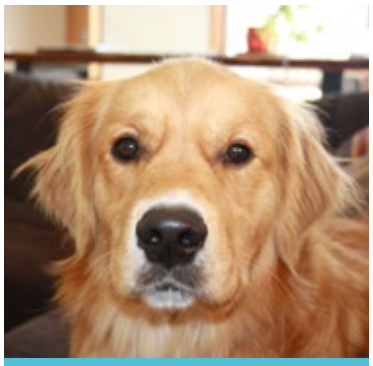
Before summer

- [ ] Pack an Emergency Kit with essential items and keep it in a handy place.
- [ ] Scan important documents and photos onto a memory stick.
- [ ] Buy a battery-operated radio, powerful torch and extra batteries.
- [ ] Save important contact numbers in your mobile phone. Include family, friends and the Victorian Bushfire Information Line. Have a spare mobile phone that you keep fully charged for emergencies. Save the FireReady app if you have a smartphone.
- [ ] Set aside protective clothing (long-sleeved, made from natural material such as cotton, sturdy footwear such as leather boots) for each member of the family.
- [ ] Put woollen blankets in your car for protection in case you get caught on the road.
- [ ] Practise packing your car so you know how long it will take.
- [ ] Mark your main routes, including back up routes and petrol stations on hard copy maps. Check **cfa.vic.gov.au** to see if your town or suburb has a Community Information Guide map.
- [ ] Make arrangements with anyone you plan to visit or stay with when you leave early.
- [ ] Talk to neighbours or nearby friends about ways you can help each other.
- [ ] Don't forget pets. Make sure pet containers are in your Emergency Kit or packed in the car. If you have horses, make sure you can move them somewhere else if they won't be safe on your property.



Remember to prepare for your pets as well. Make sure your pet is wearing an identification tag and add the following items to your Emergency Kit:

- **suitable transport carriers or leash**
- **any medications**
- **dietary supplements**
- **food and drinking water**
- **a familiar item (toy, bed, treats) to help reduce stress.**

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Your Emergency Kit

Overnight bag with change of clothes, toiletries and sanitary supplies

Important items
- photo ID
- passport
- photos
- will
- jewellery
- insurance papers
- medical prescriptions
- USB stick containing important files

Adequate amount of water and food

Woollen blankets

Medicines and first-aid kit

Contact information
- doctor
- council
- power company

Mobile phone and charger

Battery-powered radio, torch and spare batteries

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On fire risk days

- [ ] Stay updated by using more than one source of information so you will know if a fire has started near you.
- [ ] Move livestock to a safe area and put your pets in a safe place ready for loading in the car.
- [ ] Pack personal items such as a change of clothing for each person and toys for children and pets and put them in the car.
- [ ] If your car is behind an electric garage door or gate, take it out and position it in the driveway facing out or on the side of the road.
- [ ] Remove any materials that could burn easily from around your house, on decks, verandahs and pergola areas. This includes mats, outdoor furniture and wood piles.

Last things to do before you leave:

- [ ] Add final items to your Emergency Kit such as medications, prescriptions, mobile phone chargers, pet food and water for everyone.
- [ ] Pack the car, remembering your most important items such as wallet, cards, keys, banking, medical and insurance documents (these should be easily accessible on a USB stick or in an expanding file).
- [ ] Turn off the gas supply.
- [ ] Block the downpipes and partially fill the gutters with water, only if you have time.
- [ ] Make sure everyone is wearing or has access to protective clothing – long pants, long-sleeved shirts and sturdy shoes such as leather boots. Clothes should be loose fitting and made from natural fibres like pure wool, heavy cotton drill or denim. Do not wear synthetics.
- [ ] Tell people you are leaving.
- [ ] Close all doors and windows and lock doors.
- [ ] Leave the front or access gate open.

Don't wait and see.

You should never wait and see what happens during a bushfire.

Leaving late means you will be on the road when conditions are at their most dangerous or you may not be able to get out at all.

The longer you wait to leave, the greater the risk to your life.

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Staying informed

During summer, it's up to you to stay informed

Make it your habit to:

- check your FDR every day during summer
- know if it is a TFB day
- check for warnings, especially on hot, dry, windy days.

WHAT'S THE DIFFERENCE?

FIRE DANGER RATINGS tell you how dangerous a fire would be if one started.

TOTAL FIRE BANS tell you what you can or can't do on days where fire will spread rapidly and be out of control.

WARNINGS tell you that a fire has already started.

Check the FireReady App for up-to-date Fire Danger Rating and Total Fire Ban, as well as information, warnings and the locations of current fires.

Download the App free for Apple and Android devices.

Fire Ready

WARNINGS AND UPDATES

Levels of warnings

There are three different levels of warnings – Advice, Watch and Act and Emergency Warning. Don't expect warnings to be issued in any particular order. The first warning you hear about could even be an Emergency Warning.

ADVICE General information to keep you up to date with developments.

WATCH AND ACT An emergency threatens you. Conditions are changing and you need to start taking action now to protect your health, life and your family.

EMERGENCY WARNING You are in imminent danger and need to take action immediately. You will be impacted by the emergency.

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Where to find warnings and updates

Local News

Listen to ABC Local Radio, commercial and designated community radio stations and watch Sky News TV.

1800 240 667

The Victorian Bushfire Information Line (VBIL) is a freecall.

Online

VicEmergency website: **emergency.vic.gov.au**

Social Media

Twitter **@CFA_Updates** and **facebook.com/cfavic**

1800 555 677

Callers who are deaf, hard of hearing, or have a speech/ communication impairment can contact VBIL via the National Relay Service.

131 450

If you do not speak English, call the Translating and Interpreting Service for translated information.

IN SOME CIRCUMSTANCES

You may receive an SMS to your mobile phone.

You may receive a call to your landline phone.

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Know your local emergency broadcaster

These include:

- ABC local radio
- SKY NEWS TV
- UGFM – Radio Murrindindi
- Stereo 974
- Plenty Valley FM
- Radio Eastern FM 98.1
- Radio KLFM
- Various commercial stations across Victoria.

You can find a complete list at **emv.vic.gov.au**

Emergency Alert is a system used by emergency services to send voice messages to landlines and text messages to mobile phones about emergencies. For more information, go to emergencyalert.gov.au

When to look for warnings

There are different situations when you might need to monitor and check for fire warnings and updates.

WHEN	WHAT TO DO
It's a hot, dry, windy day	During summer, check regularly for updates. Fires can start suddenly at any time.
It's a fire risk day. You have left early, or are preparing to do so.	Ensure the route you have planned is safe. Stay up to date about fires in your area. Know when it is safe to return.
I can see or smell smoke in the air and I want to check what is going on.	Check the VicEmergency website or the FireReady App to see if there are signs of a fire in your area.
I'm staying to defend on a fire risk day.	It is important that you know at the earliest possible stage if a fire is in your area so that you can implement your plan. Once you are aware of a fire, continue to monitor updates.

Do not rely on an official warning to leave. Bushfires can start quickly and threaten homes and lives within minutes. If you receive a warning, you must take it seriously. Failure to act can be fatal.

Keep an eye on conditions outside – you may be aware of a fire before the emergency services.

If you see flames or a column of smoke, always call 000 immediately.

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During a fire

Bushfires are scary and stressful. Understanding what to expect and having a plan about what you will do can help you cope.

What to expect

- Embers and spot fires moving ahead of the main fire
- Smoke, heat, noise and darkness
- Lack of visibility, making it hard to know where the fire is. Travel will be dangerous
- Fires approaching from any direction (or two directions at once)
- Burning embers landing around your property for many hours before or after the main fire front has passed
- Roads blocked by fallen branches, powerlines and emergency vehicles.

How you might feel

- Confused
- Disorientated (don't know where you are)
- Unable to breathe properly
- Scared
- Thirsty and hungry
- Tired.

Expect disruptions to services

Disruptions to telephone service, internet and mains power and water are common during a fire or on a fire risk day.

Don't rely on having mains power and water. If the power goes out, you will not be able to use:

- Cordless phones
- Remote control garage doors, electric gates or similar devices
- Computer and the internet
- Air conditioners and coolers
- Electric pumps.

The best way to prepare yourself mentally is to have a written and practised plan that everyone in your household understands and has agreed to. This helps reduce confusion and time wasting.

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Radiant heat

Radiant heat is the intense heat that radiates from a bushfire. It is like the heat you feel from a campfire, but can be up to 50,000 times stronger. Radiant heat can cause surfaces to catch alight, crack or break windows.

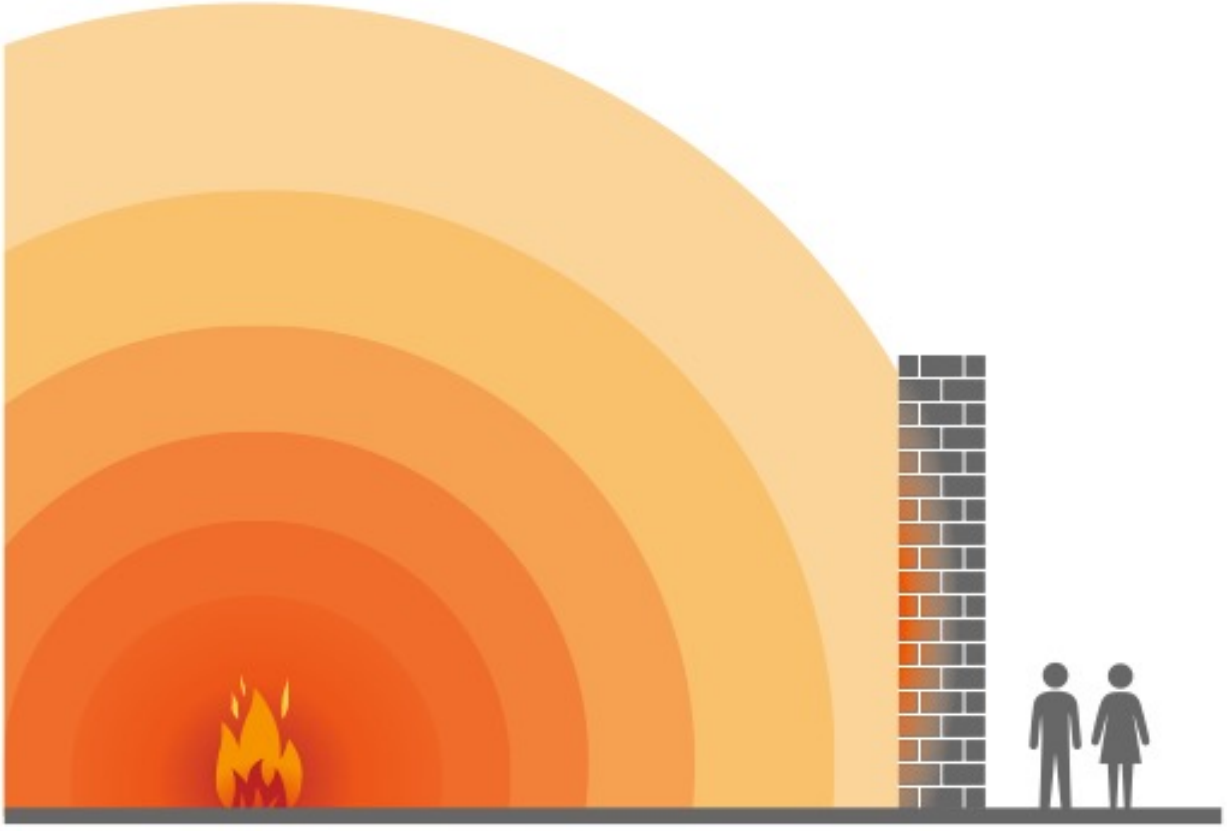
Radiant heat is the biggest killer in a fire. The human body simply cannot absorb large amounts of radiant heat.

Radiant heat can be blocked by a solid object such as a concrete wall or building.

If you are caught outside in a fire try to protect yourself by:

- Covering up exposed skin
- Being as far away as you can – distance is the best protection from radiant heat
- Getting behind a solid object
- Staying away from windows as radiant heat can pass through glass.

The only sure way to survive a bushfire and avoid radiant heat is to leave early and be away from the threat.



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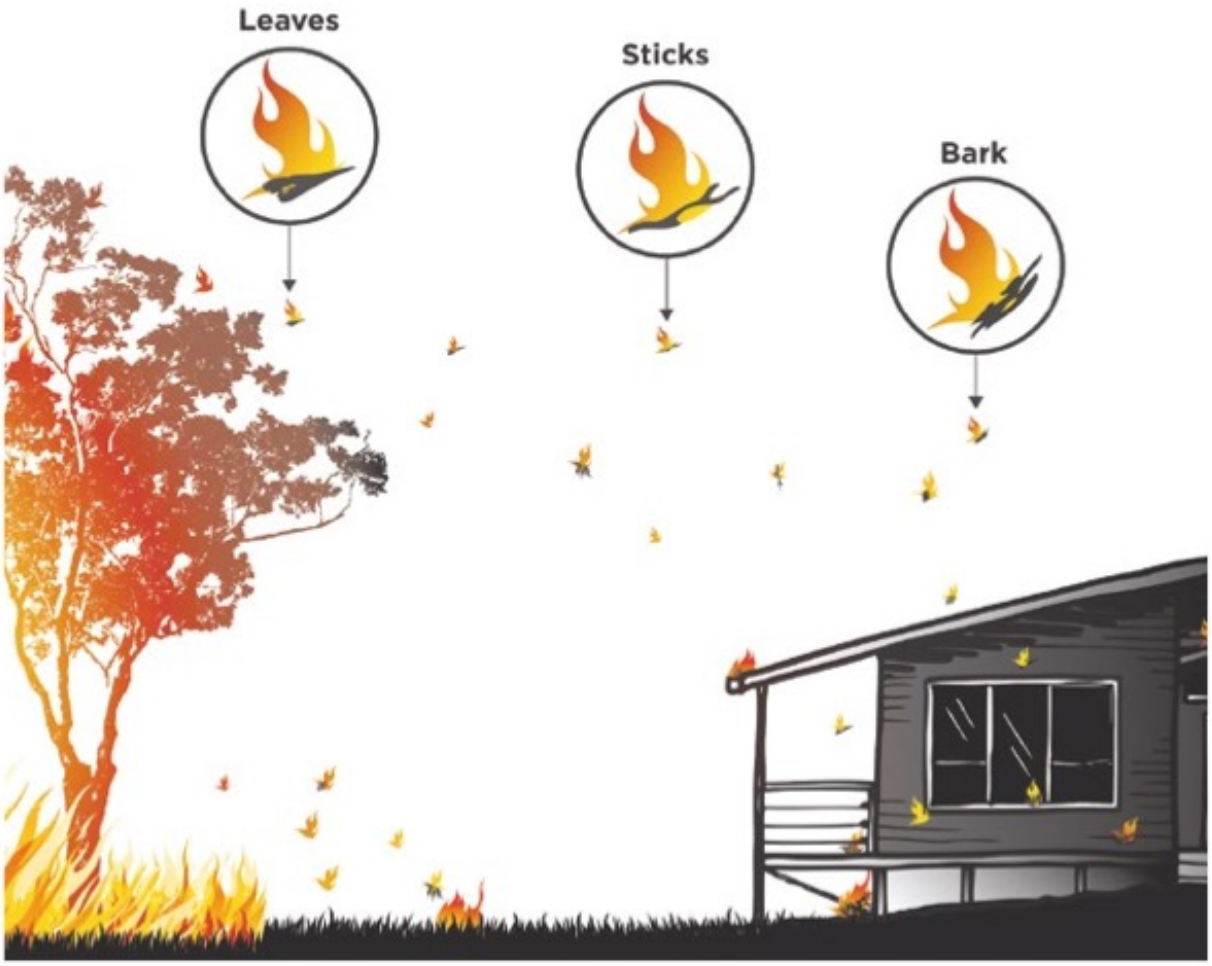
Embers

- Embers are burning twigs, leaves and pieces of debris.
- Embers are carried by the wind and land ahead or away from the main fire in unburnt areas and can start new fires – these are called spot fires.
- Ember attack occurs when twigs and leaves are carried by the wind and land on or around a building.
- Embers can land on top of debris in your gutters and set fire to your house.
- Ember attack is the most common way houses catch fire during bushfires.
- Ember attack can happen before, during and after the bushfire.



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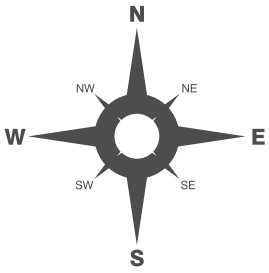
Wind

Wind has a significant influence on the:

- Speed that a fire spreads
- Direction that a fire travels and the size of the fire front
- Intensity of a fire, by providing more oxygen
- Likelihood of spotting. Burning pieces of leaves, twigs and bark (embers) are carried ahead of the fire by winds, causing new fires to start. These are known as spot fires.



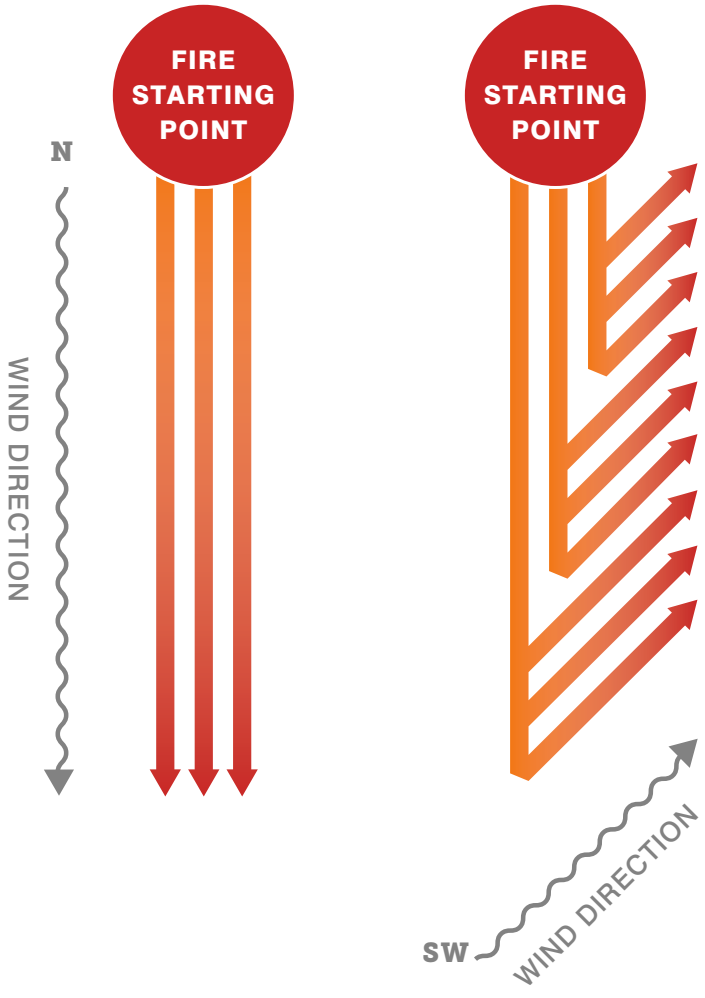
Wind change

A change in wind direction is one of the most dangerous influences on how a fire behaves.

Many people who die in bushfires get caught during or after the wind change.

In Victoria, hot, dry winds typically come from the north and north-west and are often followed by a south-west wind change.

A change in wind direction can change the size of the fire front. This makes wind a very dangerous factor in a bushfire.



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Survival options

If caught in a building

If sheltering in a building during a bushfire, make sure you have two points of exit – including one direct exit to the outside of the house – in every room used as a shelter. Most bathrooms are unsuitable to shelter in. They typically have only one door which can make escape impossible if that exit is blocked by flames and heat.

Most bathrooms also have frosted windows that do not let you see outside – during a bushfire it is important that you can to look outside and know what is happening.

You and others with you in the building must be wearing protective clothing, long pants, long-sleeved shirts and sturdy shoes such as leather boots (not sandals or runners). Clothes should be loose fitting and made from natural fibres like pure wool, heavy cotton drill or denim.

If your house catches fire while you are inside, you will need to act quickly.

- Close the door to the room that is on fire.
- Keep down low to minimise breathing in toxic smoke from the house fire.
- Move away from the areas of house on fire, closing all the doors behind you.
- Do not get trapped in a room with only one exit.
- Move outside to burnt ground as soon as you can. Staying inside a burning house will almost certainly end in death
- Wherever possible, try to put a solid object between you and the radiant heat from the fire.
- Drink water to prevent dehydration.

If you are caught in a car

Take the following actions if you come across smoke or flames and are not able to turn around and drive to safety.

1) Position the car to minimise exposure to radiant heat:

- Park away from dense bush and long grass – try to find a clearing.
- If possible, park behind a barrier such as a wall or rocky outcrop.
- The car should ideally face towards the oncoming fire front.
- Park off the roadway and turn hazard lights on. Car crashes are common in bushfires due to not being able to see the road clearly.

Only shelter in a room that has a direct exit to the outside of the house. If your house is on fire, you will need to leave the house and move outside to burnt ground if possible.

2) To increase your chances of survival:

- Stay in the car and tightly close windows and doors.
- Cover up with woollen blankets and get down below window level – you need to protect yourself from radiant heat which will pass through glass.
- Drink water to prevent dehydration.

3) As soon as you become aware that the fire front is close by:

- Shut all vents and turn off the air conditioning.
- Turn off the engine.

Sheltering in a car is extremely dangerous and can result in serious injury or death. Always plan to leave early to avoid this situation.

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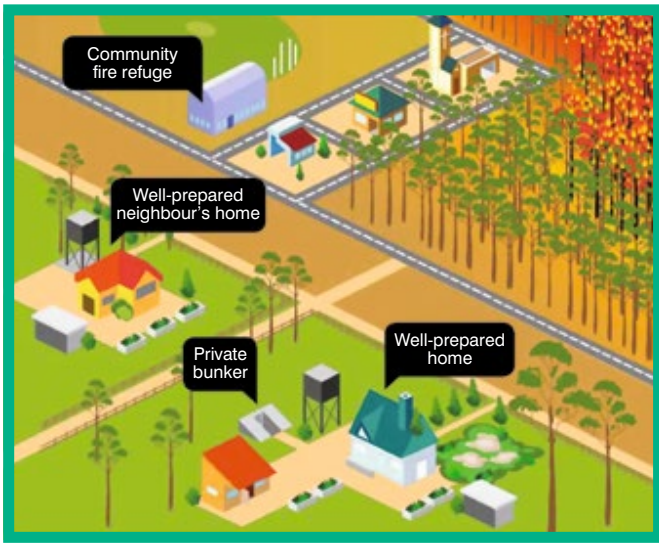
Leave Early

- When the Fire Danger Rating is **Code Red**, leaving early is always the safest option.
- Leave early destinations could include homes of family and friends who live outside the risk area, a nearby town or other built-up area.

Always the safest option



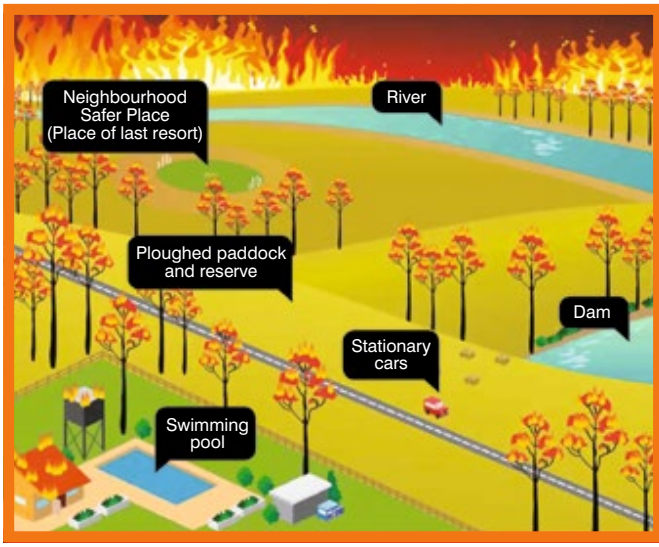
Well Prepared

If leaving the high risk area is no longer an option, there may be options close to where you are that could protect you.

These include:

- a well-prepared home (yours or your neighbour's) that you can actively defend on **Severe** and **Extreme** Fire Danger Rating days only
- private bushfire shelter (bunker) that meets current regulations
- designated community fire refuge.

Your safety is not guaranteed



Last Resort

In situations where no other options are available, taking shelter in one of the below may protect you from radiant heat:

- Neighbourhood Safer Place (Place of Last Resort)
- stationary car in a clear area
- ploughed paddock or reserve
- body of water (i.e. beach, swimming pool, dam, river etc).

High risk of trauma, injury or death.

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Attachment 2: Private Bushfire Shelters in Victoria

Private bushfire shelters in Victoria
A guide for siting, landscaping and use

CFA

On hot, dry, windy days, especially on Code Red Fire Danger Rating days, leaving the area early is always the safest option. It is best to leave before there is any chance of fire in your area, including along your travel path.

CFA recognises that people may decide to install a private bushfire shelter on their property for their family's safety or as part of their decision to build a new home in a high bushfire risk area. This guide has been developed for those who are considering installing a private bushfire shelter, to help you with planning and preparation around this shelter option for improved bushfire safety.

Using a private bushfire shelter is not without risk; there is no guarantee it will save your life. It is not an alternative to leaving early and it should never be a stand-alone solution. It needs to be part of an overall bushfire plan. A private bushfire shelter may form part of a household's backup plan. For example, when it is too late to safely leave the area or it is unlikely that you will be able to safely protect your home from a bushfire.

A private bushfire shelter (commonly referred to as a bushfire bunker) that meets the *Building Regulations 2006* (Regulations) may provide a temporary place of refuge from the life-threatening effects of a bushfire. However, the inappropriate siting, landscaping, or use of a private bushfire shelter can lead to serious injury or death.

If you are considering a private bushfire shelter, you must ensure that:

- the shelter is built to meet the Regulations and performance requirements referenced in this guide
- a building permit is obtained prior to construction
- the shelter is sited (installation location) appropriately
- the surrounding space is managed to provide appropriate separation distance from fire hazards to improve safety when entering and exiting the shelter, before and after the passage of a fire front
- the shelter is properly equipped and maintained to ensure it is in optimal condition
- you are physically and mentally prepared to use a shelter during a fire event.

Use this as a general guide for siting, landscaping and using a private bushfire shelter.

Once you have chosen an accredited shelter product, refer to the shelter provider's product manual for specific siting requirements. If you choose to construct a non-accredited shelter you must seek professional advice from a registered fire safety engineer and source approval of the design according to the Regulations.

Read CFA's *Fire Ready Kit* to help you understand your risk and prepare your household's bushfire plan.

PREPARE. ACT. SURVIVE.
FireReady Victoria

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Victorian Building Regulations, performance standards and permit requirements you need to know before constructing a private bushfire shelter

In Victoria there are design, siting and construction regulations for private bushfire shelters:

- They must comply with the Victorian *Building Regulations 2006* (Regulations) and the National Construction Code (NCC) performance requirements.
  - The Australian Building Codes Board (ABCB) *Performance Standard for Private Bushfire Shelters* provides guidance for shelter designers and builders to meet the NCC performance requirements. The Performance Standard can be viewed on the ABCB website abcb.gov.au.
    - The Performance Standard provides objectives around what needs to be considered and achieved when designing a shelter, but is not a guide for how to build one.
    - If planning to construct a non-accredited shelter, do not rely solely on information within the Performance Standard. You must seek professional advice from a registered building practitioner, such as a fire safety engineer or a structural engineer.
- You must obtain a building permit prior to construction as a part of the Regulations. Installation of a shelter without a valid building permit is illegal. Building permits can be obtained from your local council building department or from a private building surveyor.
- To comply with building permit requirements, the homeowner must either:
  - buy a shelter which has been accredited by the Building Regulations Advisory Committee (BRAC) as meeting the Regulations. Accredited products include both in-ground and above-ground shelters
  - apply to the Building Appeals Board (BAB) for a determination that the design of a non-accredited shelter complies with the Regulations, or
  - obtain a certificate of compliance from a registered fire safety engineer who did not design the shelter, to satisfy a building surveyor that the non-accredited shelter meets the Regulations.

  See the Victorian Building Authority (VBA) website vba.vic.gov.au for a list of BRAC accredited products, information about the BAB process, and to find a registered fire safety engineer.
- In some instances, councils may also require a planning permit. It is important to check with your local council for permit requirements. Find your local council contact details at dtpli.vic.gov.au.
- In high bushfire risk areas, you may not need a permit to clear vegetation and trees from around your home. However, it is important to check with your local council. Different rules apply in different council areas and tough penalties can apply.
- **Warning**:

- Products used as bushfire shelters that are not built to the Regulations and building permit requirements (eg shipping containers, storage units, etc.) can be potential death traps.
  - A shelter made of fireproof materials is only one level of protection. Bushfire shelters built to meet the Regulations and performance requirements include other safety elements such as:
    - constructed to withstand conditions that can be experienced during extreme bushfire events
    - airtight when sealed (vents and door closed) to stop smoke entering and to maintain breathable air for a specified period of time
    - designed so that the inside temperature can be kept at survivable levels for a specified period of time.
- The VBA warns Victorians against buying non-accredited private bushfire shelters or using storage units as shelter in the event of a bushfire. This includes models by companies that have not been approved by the BRAC. Bushfire shelters that are not accredited must be thoroughly assessed for compliance with the NCC as part of obtaining a building permit (VBA Media Release, 3 February 2016).

- **Note:**

- CFA does not test or endorse private bushfire shelters as complying with the Regulations and NCC performance requirements.
- CFA recommends that you request a copy of the shelter certificate of compliance from the shelter designer or manufacturer. Either a certificate of accreditation from the BRAC, a determination from the BAB, or a certification of compliance from an independent fire safety engineer who did not design the shelter.

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Key steps when siting and landscaping a private bushfire shelter

❶ Recognise the fire hazards

- A fire hazard is any fuel that may present a risk to you while entering or exiting a shelter.

  There are two types of fuels – fine and heavy.

FINE FUELS such as leaves, twigs, unmaintained lawn, grassland (pastures, crops and areas of undisturbed natural grassland), loose bark and plant foliage can:

- ignite quickly and burn easily
- support large fast-moving flames, radiant heat and embers.

HEAVY FUELS such as trees, branches, logs, vehicles, farm machinery, fencing, garden furniture, outdoor spas, wood piles, timber retaining walls, garden mulch, and adjacent buildings (such as sheds, carports, houses) can:

- burn for many hours after the bushfire arrival
- provide a heat load that persists longer than a passing bushfire front.

❷ Distance to fine fuels

- Remove fine ground fuels from within your property boundary or to a minimum of 30 metres from your shelter and home. This will reduce the bushfire intensity and the likelihood of new fires starting near your home or shelter.
- Create a clear space, an area of low fuel surrounding your shelter using mown grass to less than 10cm in height or a non-combustible surface (eg clay, concrete, pebbles or gravel).
  - Do not plant on or around your shelter. This will add fuel and threaten your safety when entering or exiting the shelter.
- No plant is completely fire resistant. Given the right conditions all plants will burn. Some are more flammable than others. The CFA 'Landscaping for Bushfire: Garden Design and Plant Selection' can be used to create new or modify existing gardens. Use the online 'Plant Selection Key' when choosing plants for areas beyond the clear space surrounding the shelter. By choosing plants with low flammability you can lower the chance of fires starting in the garden during an ember attack. It can also help reduce the effects of radiant heat.
- Consider what is growing under your trees. Fire might be able to spread easily from the ground into the tree tops.
  - Remove or trim shrubs so their branches are well away from tree branches and ground fuels.
  - Clear space between plants and trees.
  - Remove loose tree bark and remove lower tree branches to a distance of at least 2 metres above the ground.

❸ Distance to heavy fuels

- Accredited shelters will come with a product manual. It will have a set of separation distances for the shelter from heavy fuels and property boundaries. The minimum distance is usually greater than 6 metres.
- Trees, tree branches and building elements near a shelter can be extremely dangerous. They can fall and damage the shelter; block the door or pathway; bring fire risk (flames, heat) closer to your shelter; and raise your risks when exiting.
  - Buildings and the mature height of surrounding trees should be no less than 6 metres or 1.5 times their height away from the shelter, whichever is greater. For example, if a mature tree height is 8 metres, the shelter should be located at a minimum of 8 metres x 1.5 = 12 metres away.
- Before you decide to remove vegetation, particularly trees, you should contact your local council.
- The separation distance from the shelter to the heavy fuel is critical to improve safety when exiting the shelter.
  - Find a site well away from all fuels, greater than the minimum recommendations where possible.
- Locate farm machinery and vehicles well away from the shelter as they too may become fuel in a bushfire.
- Do not use treated pine products (eg posts, sleepers or decking bearers) in garden design, or wood chip mulch within 10 metres of your shelter or house. These materials are quick to ignite, produce toxic ash and smoke, and are difficult to put out.
- Build landscaping features to provide barriers to wind, radiant heat and embers such as stone walls or non-combustible fences, earth mounds or cut-and-fill terracing. Use materials such as brick, earth, stone, and concrete.

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❹ Distance to other hazards

- Store gas bottles and flammable liquids well away from your shelter and exit area. Incorrect storage can make these an explosion risk. An explosion may threaten the structure of the shelter or may increase the danger when exiting the shelter.

❺ Placement

- Read your accredited shelter product manual for specifications.
- Place the shelter:
  - using the specified distances from heavy fuel sources as a minimum. The greater the separation distance between the bushfire hazard and the shelter, the lower the bushfire risk
  - using the specified distances between the shelter and the house exit (eg front door, back door, laundry door). All buildings including your home should be no less than 6 metres or 1.5 times their height away from the shelter, whichever is greater
  - no further away from the house exit than what is specified in the shelter product manual. This will typically be around 20 metres. Where a site provides for a range of possible locations, the preferred distance is between 10 and 15 metres.
  - where a direct, clear and flat pathway can be created from the shelter to the house
  - where you can avoid dangers such as stored combustible items or where future development on a neighbour's land may occur.
- Consider the broader landscape such as hills, ridges and gullies. Placement of the shelter in relation to these features may be used to limit the exposure of the shelter to bushfire and fire induced winds. Seek professional advice through a qualified and experienced bushfire safety consultant.
- Other site issues such as erosion, landslip, flooding, slope, and specific requirements for the accredited shelter installation will affect shelter location.

❻ Orientation

- It is critical that the shelter door faces away from major heavy fuel sources. Heavy fuels can burn long after the fire front has passed. It should face towards a clear area, an area of low fuel, for safer exit. There should be adequate separation from potential residual fire risk (flames, heat, smoke) and dangerous trees (falling hazard).
- Consider the most likely wind direction and locate the shelter door to best avoid direct impact from radiant heat sources when exiting.

❼ Pathway from house to shelter

- The pathway must be direct, clear from obstruction and as flat as possible. Use a non-combustible surface (eg clay, concrete, gravel and pebbles) and a hard edge.
- This is your passage from the house to the shelter. Spot fires from embers can occur on your property before the arrival of the fire front. It is critical to protect yourself from the flames and radiant heat created by burning plants and other fuel sources.
  - Maximise the separation distance between the pathway(s) and any fuel sources or flammable objects.
- Create a clear space, an area of low fuel surrounding pathways using mown grass to less than 10cm in height.
- Build landscaping features such as a retaining wall or other heat shield along the length of the pathway. Use non-combustible materials. This can provide protection from wind, radiant heat and embers.
- Install a metal (pipe/fittings) sprinkler system along the length of the pathway.
- Fires can happen at any time during the day or night. It is critical that your pathway is clearly identifiable in dark conditions. Installing a chain link along the length of the pathway between the house exit and shelter door can assist this.
- Create a flat concrete apron immediately in front of the shelter door. This will provide a clear and stable entry surface.

Using your private bushfire shelter

Your shelter will come with a product manual. It will include specifications around siting, operation, and maintenance. These specifications may vary between products because of unique designs. The following is general good practice advice relevant to all shelters.

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① Maintain your shelter and surrounds

You may not need to use your shelter until many years after its installation, but you must ensure it is in the best condition, properly equipped and ready for use before and during each fire season.

- You will need to check, test, maintain and clean equipment. Restock the shelter at least annually before each fire season. This will make sure that it continues to operate according to the manufacturer's specifications.
- The only materials stored in the shelter should be essential or emergency equipment. Include items such as a battery-powered radio and torch; first-aid kit and medicines; sanitary supplies and portable sanitary facilities; clock; fresh drinking water; non-perishable foods; woollen blankets; protective clothing including smoke face masks, goggles and leather gloves; and pet supplies.
  - If you have pets, your shelter equipment should include a carrier, cage or other means of restraint as well as food, drinking water and any medications. It is always safest to relocate pets early where possible, well before fire threat arrives.
- For a certain period of time, while it is sealed, the shelter contains a volume of breathable air. Non-essential items will reduce the amount of air available and how long you can stay in the shelter.
- It is critical that all fire hazards (fine fuels, heavy fuels and other combustible products) near your shelter, access pathway and exit area are managed well before the bushfire season. See the shelter product manual for recommended distances from your shelter to heavy fuel sources. Also, see the 'Key steps' listed in this guide, for distancing fire hazards and landscaping advice for improved bushfire safety.

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② Practise fire drills

It is not possible to practise fire drills using a shelter under bushfire conditions. But before each bushfire season, it is critical that you and your family practise fire drills using the shelter.

- Discuss your fire plan including the conditions that would allow for safe entry into the shelter and situations where it would no longer be safe to move from the house to the shelter.
- Practise shelter fire drills during daylight hours and at night.
- Practise shelter fire drills on at least one very hot day, with the recommended protective clothing.
- Drills should involve all family members (including pets). Practise staying in the sealed bunker for one hour.
- All capable family members should be familiar with how the shelter works.

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③ Using your shelter

To avoid getting caught in a bushfire on high-risk days, you should plan to leave the area well before there is any fire activity. However, you must also carefully plan how you will use your shelter (and other shelter or last resort options) for situations where it may be too late to safely leave the area or your planned and prepared choice is to stay and defend your home.

- Visit the CFA website for information on other shelter or last resort options - back up plans.
- Be aware of the fire situation in your area. Listen to the radio (ABC local, commercial and designated community stations) or Sky News TV; download the Vic Emergency mobile app or follow CFA updates on social media (Facebook and Twitter); visit the Vic Emergency website at emergency.vic.gov.au for the latest warnings and advice; or call the Vic Emergency Hotline on 1800 226 226 (for hearing or speech impaired via the National Relay Service on 1800 555 677).
  - Go outside; look for smoke or any indication of fire approaching.
  - Keep your mobile phone with you but be aware that communications such as mobile phones and internet may be down during a fire.
- When fire is in your area put on protective clothing. This is very important when moving in and out of the shelter.
  - Protective clothing includes; long pants, long-sleeved shirts, sturdy shoes (such as leather boots, not sandals or runners), leather gloves, smoke goggles, smoke face mask and a wide brimmed hat.
  - Clothes should be loose fitting and made from natural fibres like pure wool, heavy cotton drill or denim.
  - Survival in a shelter is not dependent on this clothing but essential when exiting the shelter into a fire affected environment.
- Approved private bushfire shelters built and sited to meet the Regulations, can provide a higher level of shelter reliability than a house.
- Read your shelter product manual for entering and exiting procedures. These will be specific to its unique design.

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- Plan to be in your shelter before the fire and smoke arrives.
  - As soon as fire is near your property you must get into your shelter.
  - Your physical safety and life must be your highest priority, even if your plan is to defend your home. Your home may be at risk while you shelter, but it is critical that you allow enough time to enter your shelter and stay inside until the fire front has passed.
  - Ensure the shelter vents are closed. If safe to do so, leave the main door open until the approaching fire threat is confirmed (eg fire in the immediate landscape).
  - Close the shelter and monitor outside activity through the viewing window so you can confirm when the fire has passed and external conditions improve. You can then exit to resume your home defence.
  - Close the shelter on exiting to minimise smoke entering shelter. Fire is unpredictable, conditions may change where you may need to re-enter your shelter, if it is safe to do so.
- Do not make a last-minute dash to your private shelter if you have left it too late and the fire has arrived. Being exposed to the effects of the fire outside (eg radiant heat) may be life threatening at this time. In this circumstance a (well prepared) house is likely to provide a safer temporary shelter while the fire passes.
  - Visit the CFA website for information on how to prepare your property and house for bushfire – home improvements. Seek professional advice before undertaking any upgrades or retrofits to your home.

  When sheltering in your home, you must:
  - Actively monitor and defend your house while inside during this time. Check for embers in the roof space and elsewhere in your home
  - NOT shelter in a room with no access to the outside (eg bathroom or toilet)
  - Maintain visibility with the outside to know what is happening with the fire
  - Keep hydrated, drink water even if you don't feel thirsty
  - If your house catches fire, move through the house away from the rooms on fire, closing doors behind you.
  - Plan an exit strategy for when the fire front has passed or it is no longer safe to shelter in the house.
    - Move outside to burnt ground as soon as you can.
    - If it is no longer safe to shelter in the house but still too hot out in the open, seek another shelter option.
  - Assess if it is safe to go to your private bushfire shelter at this time or choose another option. You need to check whether:
    - the path to the shelter is safe to travel compared to the paths to other options
    - the shelter has been left in a sealed state (vents and door closed) so that it has not already filled with smoke
    - there is significant smoke passing over the shelter that may be drawn into it when entering.
- When sealed (vents and door closed) a private shelter only has enough air for a certain number of people, for a certain length of time. Refer to the shelter manufacturer's product specifications for this detail.
  - The experience while in the shelter and length of time to safely shelter may vary depending on the:
    - number of people. More or fewer people than the shelter's maximum can change air time and quality
    - type of occupants (pets and people)
    - internal starting temperature of the shelter when sealed and the increasing temperature during the bushfire event. The starting temperature inside the shelter may be elevated following hot days
    - air quality of shelter when sealed. Smoke inside the shelter can reduce air time and quality.
  - Your personal experience when using a shelter may also vary from others or during different fire events due to differences in your levels of:
    - health, fitness, stress and
    - psychological preparedness.
  - Expect conditions to become hot, humid and stuffy. Keep hydrated, drink water.
  - Occupants will experience an elevated heart rate and shortness of breath.
  - Where possible, children, the elderly, people with respiratory or cardiovascular illness or those with special needs should be well away from the threat early. Leaving the area early on high-risk days is always the safest option.

People should not plan to defend a property on Code Red Fire Danger Rating days.

Most homes are not designed or constructed to withstand fire in Code Red conditions, and such days may make even well-prepared and resourced properties undefendable.

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