



# Bushfire Development Report

for the proposed subdivision of  
6230 and 6280 Great Ocean Road  
Apollo Bay VIC 3233

Prepared for  
Australian Tourism Investments No. 5 Pty Ltd

February 2020

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Terramatrix project: Australian Tourism Investment No5-2020-01 BMO\_BDR-Apollo Bay

Cover image: Looking southwest over the site towards Apollo Bay township.

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### Version Control

Version	Date issued	Comments	Issued by
2.0	2020-02-07	Bushfire Development Report (BDR) to client	Hamish Allan

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## TABLE OF CONTENTS

<b>1</b>	<b>INTRODUCTION.....</b>	<b>3</b>
1.1	SITE SUMMARY .....	4
<b>2</b>	<b>BUSHFIRE PLANNING AND BUILDING CONTROLS.....</b>	<b>6</b>
2.1	CLAUSE 13 ENVIRONMENTAL RISKS AND AMENITY .....	6
2.1.1	<i>Clause 13.01-1S Natural hazards and climate change .....</i>	<i>6</i>
2.1.2	<i>Clause 13.01-2S Coastal inundation and erosion .....</i>	<i>6</i>
2.1.3	<i>Clause 13.02-1S Bushfire planning .....</i>	<i>6</i>
2.2	CLAUSE 21 MUNICIPAL STRATEGIC STATEMENT .....	8
2.2.1	<i>Clause 21.01-2 Land Use Vision.....</i>	<i>8</i>
2.2.2	<i>Clause 21.03-3 Apollo Bay and Marengo .....</i>	<i>8</i>
2.2.3	<i>Clause 21.05-4 Tourism .....</i>	<i>8</i>
2.3	CLAUSE 44.06 BUSHFIRE MANAGEMENT OVERLAY (BMO) .....	8
2.4	CLAUSE 71.02-3 INTEGRATED DECISION MAKING.....	9
2.5	BUSHFIRE PRONE AREA (BPA) .....	9
2.6	OTHER DEVELOPMENT CONTROLS .....	11
2.6.1	<i>Zoning.....</i>	<i>11</i>
2.6.2	<i>Overlays.....</i>	<i>11</i>
<b>3</b>	<b>BUSHFIRE HAZARD SITE ASSESSMENT .....</b>	<b>12</b>
3.1	CLASSIFIED VEGETATION.....	12
3.1.1	<i>Forest.....</i>	<i>12</i>
3.1.2	<i>Grassland.....</i>	<i>12</i>
3.1.3	<i>Modified vegetation .....</i>	<i>13</i>
3.2	EXCLUDED VEGETATION AND NON-VEGETATED AREAS .....	14
3.3	TOPOGRAPHY.....	15
3.4	FIRE WEATHER.....	21
<b>4</b>	<b>BUSHFIRE HAZARD LANDSCAPE ASSESSMENT .....</b>	<b>23</b>
4.1	LOCATION DESCRIPTION .....	23
4.2	LANDSCAPE RISK .....	23
4.3	REGIONAL BUSHFIRE PLANNING ASSESSMENT.....	24
4.4	CREDIBLE BUSHFIRE SCENARIOS .....	25
<b>5</b>	<b>BUSHFIRE MANAGEMENT STATEMENT .....</b>	<b>28</b>

5.1	SUBDIVISION OBJECTIVES.....	28
5.1.1	<i>Approved measure 5.2</i> .....	28
5.1.2	<i>Approved measure 5.3</i> .....	33
5.1.3	<i>Approved measure 5.4</i> .....	34
<b>6</b>	<b>RESPONSE TO CLAUSE 13.02-1S BUSHFIRE PLANNING .....</b>	<b>35</b>
6.1.1	<i>Protection of human life strategies</i> .....	35
6.1.2	<i>Bushfire hazard identification and assessment strategies</i> .....	36
6.1.3	<i>Settlement planning strategies</i> .....	38
6.1.4	<i>Areas of high biodiversity conservation value</i> .....	40
6.1.5	<i>Use and development control in a Bushfire Prone Area</i> .....	40
<b>7</b>	<b>CONCLUSION .....</b>	<b>42</b>
<b>8</b>	<b>APPENDICES.....</b>	<b>43</b>
8.1	APPENDIX A: VEGETATION MANAGEMENT REQUIREMENTS .....	43
8.2	APPENDIX B: WATER SUPPLY REQUIREMENTS .....	44
8.3	APPENDIX C: ACCESS REQUIREMENTS.....	46
<b>9</b>	<b>REFERENCES.....</b>	<b>48</b>



## 1 Introduction

This Bushfire Development Report (BDR) has been prepared on behalf of Australian Tourism Investments No. 5 Pty Ltd, to show how the proposed subdivision of 6230 and 6280 Great Ocean Road, Apollo Bay VIC 3233, can comply with the applicable planning and building controls that relate to bushfire, specifically the requirements of Clause 13.02-1S *Bushfire Planning*, Clause 44.06 *Bushfire Management Overlay (BMO)* and associated Clause 53.02 *Bushfire Planning* in the Colac Otway Planning Scheme.

The proposal is to apply a development plan for future subdivision of the Neighbourhood Residential Zone - Schedule 1 (NRZ1) part of the site, comprising 144 residential lots with associated open space, drainage reserves and a residential road network (Beveridge Williams, 2019). The balance of the site (to the northwest and northeast) will remain as Rural Conservation Zone (RCZ). This report assesses the bushfire risk and demonstrates how the development can respond to the objectives and strategies for bushfire safety at Clause 13.02-1S in the Planning Policy Framework (PPF) (Colac Otway Planning Scheme, 2018a) and the subdivision objectives at Clause 53.02-4 *Bushfire Planning* (Colac Otway Planning Scheme, 2020).

The site is within a declared Bushfire Prone Area and is partially covered by the BMO. This report assesses the bushfire hazard and identifies how development of the site can appropriately mitigate the bushfire risk and respond to, and comply with, the applicable bushfire planning and building controls. It has been prepared in accordance with applicable guidance for the assessment of, and response to bushfire risk, provided in:

- *Bushfire State Planning Policy Amendment VC140*, Planning Advisory Note 68 (DELWP, 2018);
- *AS 3959-2018 Construction of buildings in bushfire prone areas* (Standards Australia, 2019) and;
- *Planning Permit Applications Bushfire Management Overlay Technical Guide* (DELWP, 2017).

In accordance with the application requirements of Clause 44.06 this report also includes:

- *A Bushfire hazard site assessment*, including a plan that describes the bushfire hazard within 150m of the site in accordance with the site assessment methodology of *AS 3959-2009<sup>1</sup> Construction of buildings in bushfire-prone areas* and Clause 44.06;
- *A Bushfire hazard landscape assessment*, including a plan that describes the bushfire hazard of the general locality more than 150m from the site; and
- *A Bushfire Management Statement*, detailing how the development responds to the bushfire risk and the requirements and objectives of Clauses 44.06 and 53.02.

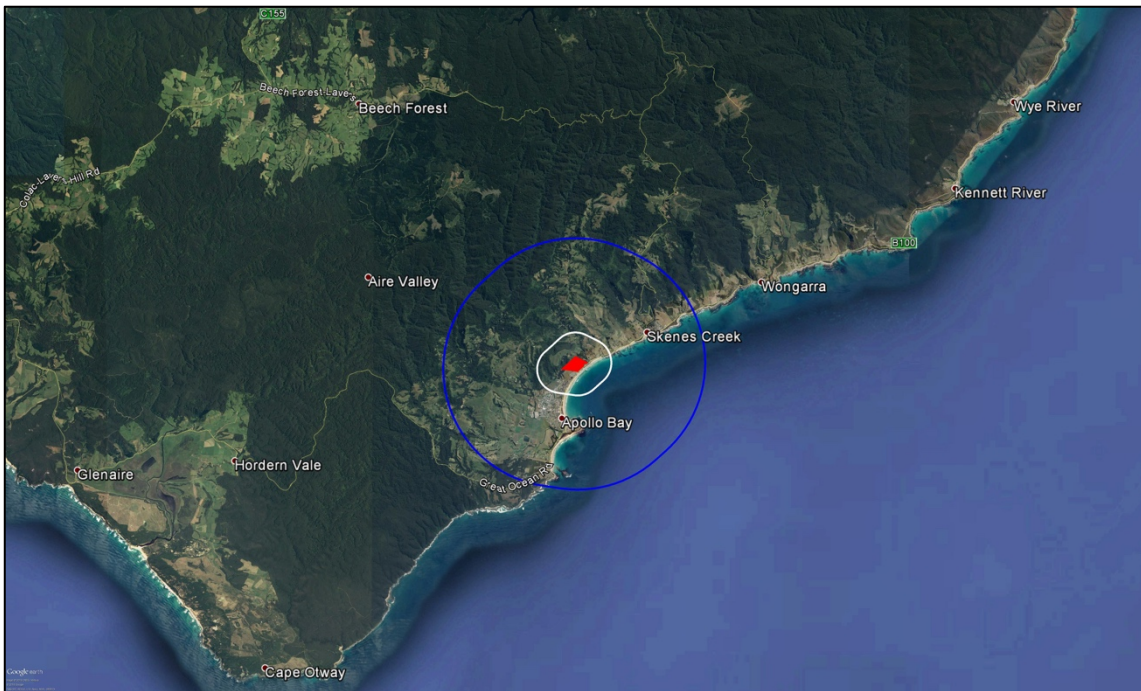
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<sup>1</sup> AS 3959-2009 has been superseded by AS 3959-2018, which was invoked in the National Construction Code (NCC) in May 2019, therefore, all references to AS 3959-2009 should be read as the most recent version of the standard.

This report also includes a Bushfire Management Plan (BMP) consistent with the CFA's standard permit conditions and BMP guidance (CFA, 2017a).

## 1.1 Site summary

<b>Address:</b>	6230 (Lot 1 LP120240) and 6280 (Lot 2 LP120240) Great Ocean Road, Apollo Bay VIC 3233
<b>Property size:</b>	40.7ha
<b>Local Government Area:</b>	Colac Otway Shire Council
<b>Zone/s</b>	Neighbourhood Residential Zone - Schedule 1 (NRZ1) Rural Conservation Zone (RCZ)
<b>Overlay/s</b>	Bushfire Management Overlay (BMO) Design and Development Overlay - Schedule 10 (DDO10) ( <i>partial coverage</i> ) Significant Landscape Overlay - Schedules 3 and 5 (SLO3 and SLO5) ( <i>partial coverage</i> ) Development Plan Overlay - Schedule 5 (DPO5) Erosion Management Overlay – Schedule 1 (EMO1) ( <i>partial coverage</i> )
<b>Directory reference:</b>	Vic Roads 101 C5
<b>Site assessment date:</b>	7/04/2018
<b>Assessed by:</b>	Hamish Allan



**Figure 1 - Site location (site shown in red fill, 1km buffer of site in white outline, 5km buffer in blue outline; Google earth imagery 2016-17).**

## 2 Bushfire planning and building controls

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

### 2.1 Clause 13 Environmental risks and amenity

This clause in the Planning Policy Framework (PPF) has three provisions pertinent to bushfire.

#### 2.1.1 Clause 13.01-1S Natural hazards and climate change

The objective of this Clause is to minimise the impacts of natural hazards and adapt to the impacts of climate change through risk-based planning. Specified strategies to achieve the objective are:

- *‘Consider the risks associated with climate change in planning and management decision making processes.*
- *Identify at risk areas using the best available data and climate change science.*
- *Integrate strategic land use planning with emergency management decision making.*
- *Direct population growth and development to low risk locations.*
- *Develop adaptation response strategies for existing settlements in risk areas to accommodate change over time.*
- *Ensure planning controls allow for risk mitigation or risk adaptation strategies to be implemented.*
- *Site and design development to minimise risk to life, property, the natural environment and community infrastructure from natural hazards’ (Colac Otway Planning Scheme, 2018b).*

#### 2.1.2 Clause 13.01-2S Coastal inundation and erosion

The objective of this Clause is to plan for and manage the potential coastal impacts of climate change. One of the specified strategies is to *‘Avoid development in identified coastal hazard areas susceptible to inundation (both river and coastal), erosion, landslip/landslide, acid sulfate soils, bushfire and geotechnical risk’ (Colac Otway Planning Scheme, 2018c).*

It is noted that especially in southern and eastern Australia, since the 1950’s there has been an increase in the length of the fire weather season and a greater number of higher risk days associated with climate change (CSIRO/BOM, 2018). The Australasian Fire and Emergency Service Authorities Council (AFAC) identify that a failure of building codes and land use planning to adequately adapt to climate change is a significant risk (AFAC, 2018). The implications of climate change in relation to fire weather are discussed further in Section 3.4 of this report.

#### 2.1.3 Clause 13.02-1S Bushfire planning

Clause 13.02-1S has the objective *‘To strengthen the resilience of settlements and communities to*

*bushfire through risk based planning that prioritises the protection of human life'* (Colac Otway Planning Scheme, 2018a). The policy must be applied to all planning and decision making under the Planning and Environment Act 1987, relating to land which is:

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

Priority must be given to the protection of human life by:

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

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

- Subdivisions of more than 10 lots;
- Accommodation;
- Child care centres;
- Education centres;
- Emergency services facilities;
- Hospitals;
- Indoor recreation facilities;
- Major sports and recreation facilities;
- Places of assembly; and
- Any application for development that will result in people congregating in large numbers.

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

This study assesses the hazard and identifies the bushfire protection measures that will be required for future development on the site. It is considered that development can appropriately prioritise the protection of human life, and meet the objectives of Clause 13.02-1S, largely by ensuring future dwellings will not be exposed to RHF above 12.5kW/m<sup>2</sup>, which is commensurate with a BAL-12.5 construction standard.

The maximum 12.5kW/m<sup>2</sup> safety threshold is required in settlement planning as the upper limit



for acceptable risk. Responsible authorities must *'Not approve any strategic planning document, local planning policy, or planning scheme amendment that will result in the introduction or intensification of development in an area that has, or will on completion have, more than a BAL-12.5 rating under AS 3959-2009'*<sup>2</sup> (Colac Otway Planning Scheme, 2018a).

Analysis of how the development can respond to the strategies in Clause 13.02-1S is provided in Section 6.

## 2.2 Clause 21 Municipal Strategic Statement

### 2.2.1 Clause 21.01-2 Land Use Vision

The land use vision in the Colac Otway Municipal Strategic Statement (MSS) states in relation to 'Environmental Features', that *'Development will respond to environmental risks such as bushfire, flooding, landslip, erosion and salinity'* (Colac Otway Planning Scheme, 2014).

### 2.2.2 Clause 21.03-3 Apollo Bay and Marengo

One of the settlement strategies for Apollo Bay and Marengo is to, *'Recognise and protect ecological values and avoid development in areas at risk from the effects of flooding, wildfire, acid sulphate soil disturbance, erosion, landslip and salinity'* (Colac Otway Planning Scheme, 2015a).

### 2.2.3 Clause 21.05-4 Tourism

This clause notes that *'The increase in tourism has the potential to create conflicts through environmental damage, pressure on attractive and sensitive areas for development to meet accommodation demands and potential dangers to residents and visitors in areas sensitive to landslip and bushfires'* (Colac Otway Planning Scheme, 2017).

It is considered that an appropriate development response to the objectives and strategies of Clause 13.02-1S Bushfire Planning, will give effect to the content in the MSS that relates to bushfire (see Section 6).

## 2.3 Clause 44.06 Bushfire Management Overlay (BMO)

The purposes of the BMO, which applies to the northwestern and northeastern parts of the site (see Map 2 and Map 3), are:

- *'To implement the Municipal Planning Strategy and the Planning Policy Framework.'*

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<sup>2</sup> AS 3959-2009 has been superseded by AS 3959-2018, which was invoked in the National Construction Code (NCC) in May 2019, therefore, all references to AS 3959-2009 should be read as the most recent version of the standard.

- *To ensure that the development of land prioritises the protection of human life and strengthens community resilience to bushfire.*
- *To identify areas where the bushfire hazard warrants bushfire protection measures to be implemented.*
- *To ensure development is only permitted where the risk to life and property from bushfire can be reduced to an acceptable level' (Colac Otway Planning Scheme, 2018d).*

The BMO largely applies to patches of treed vegetation greater than 4ha in size, where head fire intensity has been modelled to be 30,000kW/m or more. It also extends over land 150m around those areas, based on research into house loss from bushfires which has found that 92% of house loss occurs within 150m of the bushfire hazard (DTPLI, 2013).

Clause 53.02 *Bushfire Planning* applies to BMO applications and contains:

- **'Objectives:** *An objective describes the outcome that must be achieved in a completed development.*
- **Approved measures (AM):** *An approved measure meets the objective.*
- **Alternative measures (AltM):** *An alternative measure may be considered where the responsible authority is satisfied that the objective can be met. The responsible authority may consider other unspecified alternative measures.*
- **Decision guidelines:** *The decision guidelines set out the matters that the responsible authority must consider before deciding on an application, including whether any proposed alternative measure is appropriate' (Colac Otway Planning Scheme, 2018e).*

Section 5 identifies how the proposed development responds to the BMO and the applicable objectives of Clause 53.02.

## 2.4 Clause 71.02-3 Integrated Decision Making

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

## 2.5 Bushfire Prone Area (BPA)

The site is in a designated Bushfire Prone Area (BPA). BPAs are those areas subject to or likely to be subject to bushfire, as determined by the Minister for Planning. Those areas of highest bushfire risk within the BPA are designated as BMO areas.

In a BPA, the Building Act 1993 and associated Building Regulations 2018, through application of

the National Construction Code (NCC), require bushfire protection standards for class 1, 2 and 3<sup>3</sup> buildings, 'Specific Use Bushfire Protected Buildings'<sup>4</sup> and associated class 10A buildings<sup>5</sup> or decks. The applicable performance requirement in the NCC is:

*'A building that is constructed in a designated bushfire prone area must, to the degree necessary, be designed and constructed to reduce the risk of ignition from a bushfire, appropriate to the —*

- (a) potential for ignition caused by burning embers, radiant heat or flame generated by a bushfire; and*
- (b) intensity of the bushfire attack on the building'* (ABCB, 2019).

Compliance with *AS 3959-2018 Construction of buildings in bushfire prone areas* (Standards Australia, 2019) is 'deemed-to-satisfy' the performance requirement<sup>6</sup>.

Applicable buildings must be constructed to a minimum Bushfire Attack Level (BAL)-12.5, or higher, as determined by a site assessment or planning scheme requirement.

A BAL is a means of measuring the severity of a building's potential exposure to ember attack, radiant heat and direct flame contact. There are six BALs defined in AS 3959-2018, which range from BAL-LOW, which has no bushfire construction requirements to BAL-FZ (Flame Zone) where flame contact with a building is expected.

Larger developments and certain vulnerable uses in a BPA (see Section 2.1.3) are also required by Clause 13.02-1S *Bushfire planning* to:

- *'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'* (Colac Otway Planning Scheme, 2018a).

There are no significant obstacles to future development of the site complying with the applicable strategies at Clause 13.02-1S and the building regulations invoked by the BPA coverage (see Section 6).

DELWP review and excise areas from the BPA approximately every 6 months. Land becomes eligible for excision if it satisfies statewide hazard mapping criteria, including that the land needs

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<sup>3</sup> Class 1, 2 and 3 buildings are defined in the NCC and are generally those used for residential accommodation, including houses and other dwellings, apartments, hotels and other buildings with a similar function or use.

<sup>4</sup> Specific Use Bushfire Protected Buildings are defined in the Victorian *Building Regulations 2018*, they generally comprise 'vulnerable' uses and include schools, kindergartens, childcare facilities, aged care facilities and hospitals.

<sup>5</sup> Class 10a buildings are defined in the NCC as non-habitable buildings including sheds, carports, and private garages.

<sup>6</sup> For Class 1 and associated Class 10a buildings, the *NASH Standard for Steel Framed Construction in Bushfire Areas* is also deemed to satisfy the performance requirement.

to be:

- At least 300m from areas of classified vegetation (except grassland) larger than 4ha in size; and
- At least 150m from areas of classified vegetation (except grassland) 2 to 4ha in size; and
- At least 60m from areas of unmanaged grassland more than 2ha in size (DELWP, 2015).

For isolated areas of vegetation greater than 1ha but less than 2ha, the shape of the area and connectivity to any other hazardous vegetation is a further consideration (DELWP, 2015). Land around the site that is not in the BPA, (i.e. BAL-LOW areas) is shown in Map 2 and Map 3.

## 2.6 Other development controls

### 2.6.1 Zoning

Neither the NRZ or RCZ have significant implications for bushfire safety and compliance. It is noted however, that the BMO provides for single dwelling applications in residential and rural-residential areas such as the NRZ, to have a simplified BMO application and compliance pathway.

### 2.6.2 Overlays

Other than the BMO, the only overlay of relevance to bushfire risk is the Development Plan Overlay Schedule 5 (DPO5). The DPO5 appears to have no significant implications for bushfire safety and compliance but requires a development plan to be supported by:

*'A Bushfire Assessment that includes an assessment of the site risk and how subdivision will respond to this risk, particularly in respect of the revegetation of land above the 40 metre contour'* (Colac Otway Planning Scheme, 2015b).

Maps 1 and 3 show the location of the 40m contour across the site. The future mature state of any areas of revegetation or landscaping on the site, if they are proposed in accordance with the DPO5, may influence the bushfire risk. Any areas of revegetation will need to be appropriately located and responded to, to avoid any increase in bushfire risk (see Section 5 and Map 4).

## 3 Bushfire hazard site assessment

### 3.1 Classified vegetation

Vegetation within the 150m BMO assessment zone around the subdivision boundary has been classified in accordance with the BMO/AS 3959 methodology. Classified vegetation is vegetation that is deemed hazardous from a bushfire perspective.

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

#### 3.1.1 Forest

Treed vegetation to the west and northwest best accords with the Open or Low Open Forest vegetation types of AS 3959-2018. The AS 3959 description is *'Trees 30 m high; 30%–70% foliage cover (may include understorey of sclerophyllous low trees or shrubs). Typically dominated by eucalypts, melaleuca or callistemon (may include riverine and wetland environments) and callitris. Includes eucalypt plantations'* (Standards Australia, 2019).

Most of this vegetation is on private land to the north and west of the site and comprises forest regrowth on what appears to have been previously cleared land (see Figure 7 and Figure 8). Some areas of forest extend down into the site along drainage lines.

#### 3.1.2 Grassland

Non-treed vegetation in the Rural Conservation Zone parts of the site (northwest of the proposed residential subdivision) and to the southwest, in an area also proposed to be subdivided for residential development (the Mariners View Estate), matches the AS 3959-2018 classification of Grassland, which is defined as *'All forms (except tussock moorlands), including situations with shrubs and trees, if the overstorey foliage cover is less than 10%. Includes pasture and cropland'* (Standards Australia, 2019). Grassland vegetation is considered hazardous and therefore classifiable, when it is not managed in a minimal fuel condition i.e. when it is >100mm tall (Standards Australia, 2019).

In the BMO and BPA, Grassland areas are assumed to be unmanaged and classifiable unless there is 'reasonable assurance' that they will be managed in perpetuity, in a low threat state, no more than 100mm high.



### 3.1.3 Modified vegetation

Several patches of tree and scrub/shrub vegetation to the southeast and northwest of the site (see Map 1) are best described as modified vegetation due to their size and orientation in relation to the site, their vegetative structure and likely credible fire behaviour they may generate.

*‘Modified vegetation is vegetation that doesn’t fit into the vegetation classifications in AS3959:2009 Construction of buildings in bushfire prone areas (the standard) because it:*

- *has been modified, altered or is managed due to urban development, or gardening,*
- *has different fuel loads from those assumed in the standard,*
- *has limited or no understorey vegetation, or*
- *is not low-threat or low-risk vegetation as defined in the standard’* (Colac Otway Planning Scheme, 2018e).

Modified vegetation may occur where fuel loads are higher than typical residential gardens and therefore the vegetation cannot be excluded as low-threat. However, because of the amount of disturbance and modification that has occurred and/or the pattern and configuration of the vegetation (e.g. small, fragmented patches and/or reduced or no understorey/surface vegetation), the fuel load and anticipated fire behaviour is likely to be different from that presumed in the BMO/AS 3959-2009 methodology.

This type of vegetation may not produce a 100m wide fire front moving at a quasi-steady state rate of forward spread, as presumed in the BMO/AS 3959-2009 methodology, but may generate radiant heat and localised flame contact that needs to be fully considered (DELWP, 2017).

The modified vegetation within the 150m assessment zone includes:

- A patch of modified forest to the northeast of the site, immediately north of the neighbouring dwelling. This vegetation is not managed in a condition that could be described as low threat, however, as it occurs around the domestic living space and access associated with the neighbouring dwelling, it is substantially modified with a lower fuel hazard than that presumed for Forest vegetation.
- Shrub/Scrub and wetland vegetation either side of Wild Dog Road to the northeast and associated with the creek flats and abutting land (see Figure 1). Some of this vegetation may be inundated during floods or tidal flows and therefore be low threat<sup>7</sup>. Other areas, however, comprise denser, taller scrub, with or without tree cover, and are not in a low threat state. As they are small, localised patches, not contiguous to larger areas of classified vegetation they are best described as ‘modified’.
- Coastal shrubland and grassland, with or without remnant or planted exotic trees, occurs between the beach and the Great Ocean Road to the southeast (see Figure 3). The

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<sup>7</sup> Vegetation supported by a permanent water body or with a high moisture and/or salt content may be considered non-hazardous and low threat (Douglas et al., 2014).

narrow width of this vegetation means that it would not likely support a fully developed fire with a 100m wide fire front moving directly towards the site, and according it is best described as modified.

All of the patches of modified vegetation are small enough, isolated enough from the site or other classified patches, or modified to a such extent that they are unlikely to carry a fire of the size and intensity presumed in the BMO/AS 3959 model, i.e. AS 3959 presumes a 100m wide fire front moving directly at a site/buildings at a quasi-steady state rate of forward spread. Whilst these patches are unlikely to sustain such a fire, they cannot be deemed low threat and need an appropriate BAL response and vegetation setback (defendable space).

### 3.2 Excluded vegetation and non-vegetated areas

Areas of low threat vegetation and non-vegetated areas can be excluded from classification in accordance with Section 2.2.3.2 of AS 3959-2018, if they meet one or more of the following criteria:

- (a) *'Vegetation of any type that is more than 100m<sup>8</sup> from the site.*
- (b) *Single areas of vegetation less than 1 ha in area and not within 100m of other areas of vegetation being classified vegetation.*
- (c) *Multiple areas of vegetation less than 0.25ha in area and not within 20m of the site, or each other, or of other areas of vegetation being classified vegetation.*
- (d) *Strips of vegetation less than 20m in width (measured perpendicular to the elevation exposed to the strip of vegetation) regardless of length and not within 20m of the site or each other, or other areas of vegetation being classified vegetation.*
- (e) *Non-vegetated areas, that is, areas permanently cleared of vegetation, including waterways, exposed beaches, roads, footpaths, buildings and rocky outcrops.*
- (f) *Vegetation regarded as low threat due to factors such as flammability, moisture content or fuel load. This includes grassland managed in a minimal fuel condition, mangroves and other saline wetlands, maintained lawns, golf courses (such as playing areas and fairways), maintained public reserves and parklands, sporting fields, vineyards, orchards, banana plantations, market gardens (and other non-curing crops), cultivated gardens, commercial nurseries, nature strips and windbreaks' (Standards Australia, 2019).*

Low-threat areas excluded from classification include the managed gardens and domestic living areas of the surrounding properties. Non-vegetated areas include the roads, driveways and structures within the 150m site assessment zone (see Map 1).

It is reasonable to assume that most, if not all parts of the subdivision, will become low threat and excludable as the development is completed. This should include any revegetation in the RCZ and all of the proposed open space areas and drainage reserves, unless they are

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<sup>8</sup> In a BMO area the applicable distance is 150m.

appropriately setback from future buildings (see Section 5).

Note that currently, vegetation in the proposed open space/drainage reserve area at the northeast corner of the site is not in a low threat state, and comprises Scrub or Modified vegetation (Figure 9).

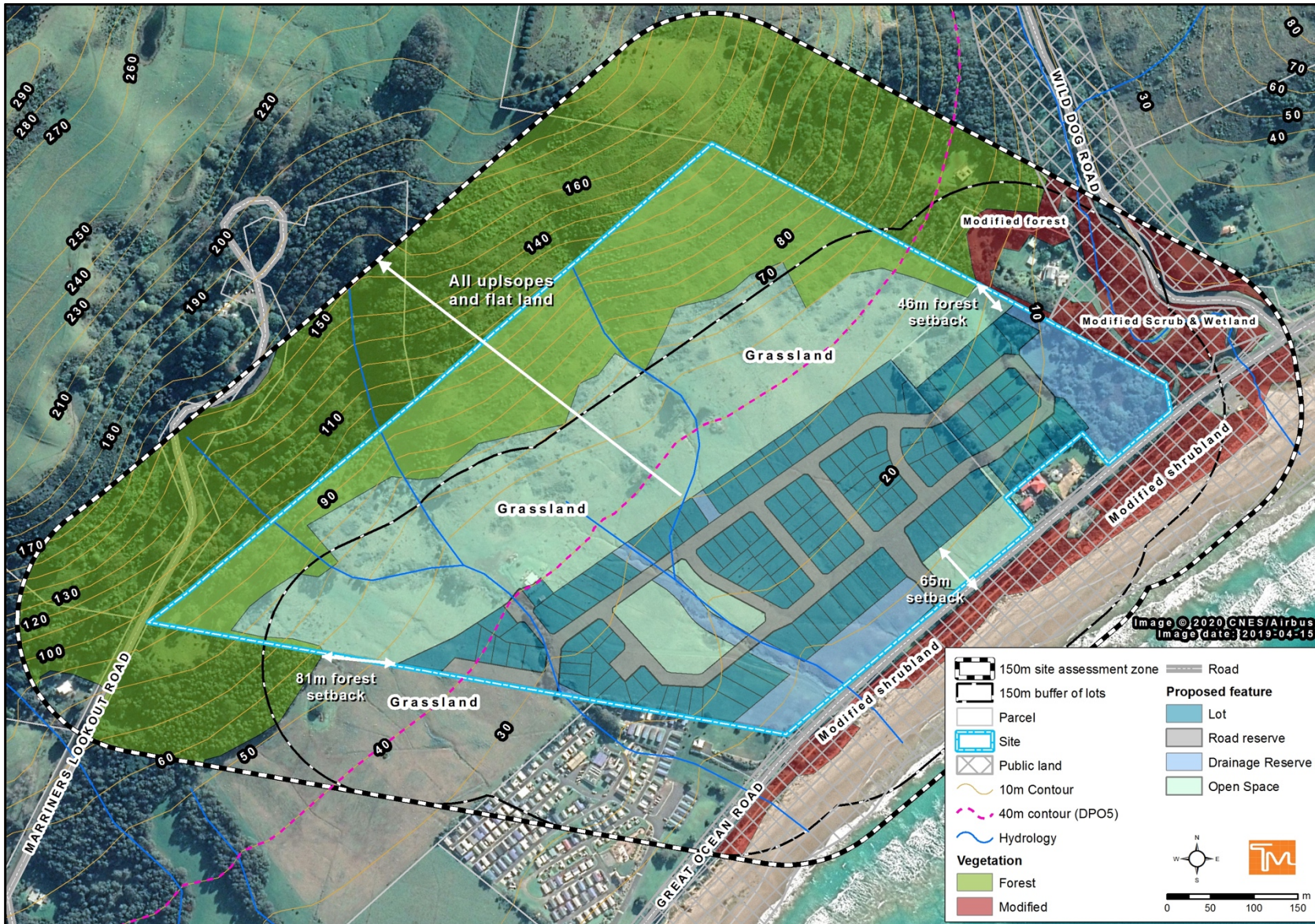
### 3.3 Topography

The BMO/AS 3959 methodology requires that the 'effective slope' be identified to determine the BAL and applicable defendable space or vegetation setback distances. This is the slope of land under the classified vegetation that will most significantly influence the bushfire attack on a building. Two broad types apply:

- Flat and/or Upslope - land that is flat or on which a bushfire will be burning downhill in relation to the development. Fires burning downhill (i.e. on an upslope) will generally be moving more slowly with a reduced intensity.
- Downslope - land under the classified vegetation on which a bushfire will be burning uphill in relation to the development. As the rate of spread of a bushfire burning on a downslope (i.e. burning uphill towards a development) is significantly influenced by increases in slope, downslopes are grouped into five classes in 5° increments from 0° up to 20°.

From a bushfire perspective, the topography on and around the site within the 150m assessment zone is relatively benign, and would not exacerbate the bushfire attack. To the north the land is very steep, but it is all upslope of the site. Therefore, for the purposes of determining BALs and defendable space, the applicable slope class is 'All upslopes and flat land' under the Forest and Grassland to the northeast (see Map 1). The terrain under the modified vegetation to the northeast and south is largely flat and not a significant influence on bushfire behaviour.





Map 1 - Bushfire hazard site assessment plan.





**Figure 2 – Looking south at Modified vegetation along Wild Dog Creek to the northeast of the site.**



**Figure 3 – Scrub and Shrubland classified as Modified vegetation, southeast of the site between the beach and the Great Ocean Road.**





**Figure 4 – Looking south at Modified vegetation on the property abutting the site to the north.**



**Figure 5 – Looking northwest across the site.**





**Figure 6 – Modified forest to the north-northeast.**



**Figure 7 – Regenerating Forest to the north-northwest.**





**Figure 8 – Looking southeast at Forest to the northwest of site.**



**Figure 9 – Looking west across the Great Ocean Road at Scrub classified as Modified vegetation in the proposed open space/drainage reserve area in the eastern corner of the site.**

### 3.4 Fire weather

The Forest Fire Danger Index (FFDI) and the Grassland Fire Danger Index (GFDI) represent the level of bushfire threat based on weather (and fuel) conditions. An FFDI 100/GFDI 130 is applied in non-alpine areas of Victoria by the building system, to establish building setback distances from classified vegetation in accordance with AS 3959-2018.

The indices are also used for predicting fire behaviour including the difficulty of suppression, forecasting Fire Danger Ratings (FDRs) and determining an appropriate level of preparedness for emergency services. Table 1 displays the FDRs, their FFDI range<sup>9</sup> and the description of conditions for each FDR.

Note that the benchmark of an FFDI 100 represents a 'one size fits all' model of extreme fire weather conditions for the state, but which has been exceeded during some significant fire events, including at some locations in Victoria on 'Black Saturday' 2009. Therefore, it is important to note that this is not necessarily the *worst-case* conditions for any particular location, including the development site.

It should be noted that, especially in eastern and southern Australia, since the 1950s there has been an increase in the length of the fire weather season and a greater number of higher risk days (CSIRO/BOM, 2018). There is a 'high confidence' that climate change will result in a harsher fire weather climate for the Southern Slopes Victoria West sub-region that the study area is in; with a 'low confidence' in the magnitude of the expected change (CSIRO/BOM, 2019).

However, currently the CFA and DELWP have no published policy on FFDI recurrence intervals. There is, therefore, no compelling rationale for applying a different FFDI/GFDI from the 'default' FFDI 100/GFDI 130 threshold used throughout non-Alpine areas of Victoria in the planning and building system<sup>10</sup>.

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<sup>9</sup> The GFDI ranges for each FDR in Table 1 may vary in some jurisdictions.

<sup>10</sup> In alpine areas of Victoria an FFDI 50 applies for determining BALs using Method 1 of AS 3959-2018.

**Table 1 - Fire Danger Ratings (Source: AFAC, 2017; CFA 2017b).**

Forest Fire Danger Index	Grassland Fire Danger Index	Fire Danger Rating (FDR)	Description of conditions
100+	150+	Code Red	The worst conditions for a bush or grass fire. Homes are not designed or constructed to withstand fires in these conditions. The safest place to be is away from high risk bushfire areas.
75-99	100-149	Extreme	Expect extremely hot, dry and windy conditions. Fires will be uncontrollable, unpredictable and fast moving. Spot fires will start, move quickly and will come from many directions. Homes that are situated and constructed or modified to withstand a bushfire, that are well prepared and actively defended, may provide safety. You must be physically and mentally prepared to defend in these conditions.
50-74	50-99	Severe	Expect hot, dry and possibly windy conditions. If a fire starts and takes hold, it may be uncontrollable. Well prepared homes that are actively defended can provide safety. You must be physically and mentally prepared to defend in these conditions.
	25-49	Very High	If a fire starts, it can most likely be controlled in these conditions and homes can provide safety. Be aware of how fires can start and minimise the risk. Controlled burning off may occur in these conditions if it is safe – check to see if permits apply.
	12-24	High	
	0-11	Low – Moderate	



## 4 Bushfire hazard landscape assessment

One of the bushfire hazard identification and assessment strategies in Clause 13.02-1S is to use the best available science to identify the hazard posed by vegetation, topographic and climatic conditions. The basis for the hazard assessment should be:

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

This section considers the hazard beyond the site level. BMO applications under Clause 53-02-4, must also have regard to the nature of the bushfire risk arising from the surrounding landscape (Colac Otway Planning Scheme, 2020).

### 4.1 Location description

The site abuts the Great Ocean Road where it hugs the coastline, along the northeastern outskirts of Apollo Bay, approximately 1km from the central Apollo Bay township area.

The heavily forested and rugged landscape associated with the Great Otway National Park is approximately 2.5km to the northwest. The surrounding landscape is generally agricultural or rural living, comprising pasture interspersed with patches of regrowth scrub and forest, or remnant forest generally associated with waterways and drainage lines (see Maps 2 and 3).

Further inland (i.e. from >2.5km to >5km from the site), the landscape is dominated by large areas of forest on complex and often steep topography. The general area around Apollo Bay was affected by bushfire in both 1939 and 1967.


### 4.2 Landscape risk

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

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

The wider landscape beyond 2.5 to 5km best accords with landscape types 3 and 4, however, within approximately 2.5km of the site the hazard moderates due to the flatter terrain and the occurrence of pasture and cleared or partially cleared land. This landscape immediately around the site has elements of landscape type 2 due to the flatter or upslope terrain, pasture around the site and the location of the site on the coast, abutting the lower threat Apollo Bay township area.

**Table 2 - Landscape risk typologies (from DELWP, 2017).**

Broader Landscape Type 1	Broader Landscape Type 2	Broader Landscape Type 3	Broader Landscape Type 4
<ul style="list-style-type: none"> <li>• There is little vegetation beyond 150 metres of the site (except grasslands and low-threat vegetation).</li> <li>• Extreme bushfire behaviour is not possible.</li> <li>• The type and extent of vegetation is unlikely to result in neighbourhood- scale destruction of property.</li> <li>• Immediate access is available to a place that provides shelter from bushfire.</li> </ul>	<ul style="list-style-type: none"> <li>• 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.</li> <li>• Bushfire can only approach from one aspect and the site is located in a suburban, township or urban area managed in a minimum fuel condition.</li> <li>• Access is readily available to a place that provides shelter from bushfire. This will often be the surrounding developed area.</li> </ul>	<ul style="list-style-type: none"> <li>• 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.</li> <li>• Bushfire can approach from more than one aspect.</li> <li>• The site is located in an area that is not managed in a minimum fuel condition.</li> <li>• Access to an appropriate place that provides shelter from bushfire is not certain.</li> </ul>	<ul style="list-style-type: none"> <li>• The broader landscape presents an extreme risk.</li> <li>• Fires have hours or days to grow and develop before impacting</li> <li>• Evacuation options are limited or not available.</li> </ul>
			

### 4.3 Regional Bushfire Planning Assessment

As part of the response to the 2009 Victorian Bushfires Royal Commission, Regional Bushfire Planning Assessments (RBPAs) were undertaken across six regions that covered the whole of Victoria. The RBPAs provide information about ‘identified areas’ where a range of land use planning matters intersect with a bushfire hazard to influence the level of risk to life and property

from bushfire. The RBPAs state that *'This information should be addressed as part of strategic land use and settlement planning at the regional, municipal and local levels'* (DPCD, 2012).

The *Regional Bushfire Planning Assessment – Barwon South West Region* covers the Colac Otway Shire Council area. It describes Apollo Bay as a settlement surrounded by vegetation adjacent to the Great Otway National Park, resulting in an 'urban bushfire hazard interface' occurring to the north of Apollo Bay at the foothills to Great Otway National Park. It identifies *'Grassland environments located at the interface between forested environments and the established urban settlement of Apollo Bay'* and notes the *'Presence of medium size lots in excess of 0.4 hectares in proximity to bushfire hazard associated with riparian vegetation located in Wild Dog Creek environs and the Great Otway National Park to the north-west'* (DPCD, 2012).

#### **4.4 Credible bushfire scenarios**

The most likely bushfire scenarios are as for a large landscape fire in Victoria, being an approach from those directions typically associated with the direction of the wind on severe or higher, fire danger days i.e. from the north, northwest, west or southwest (Long, 2006).

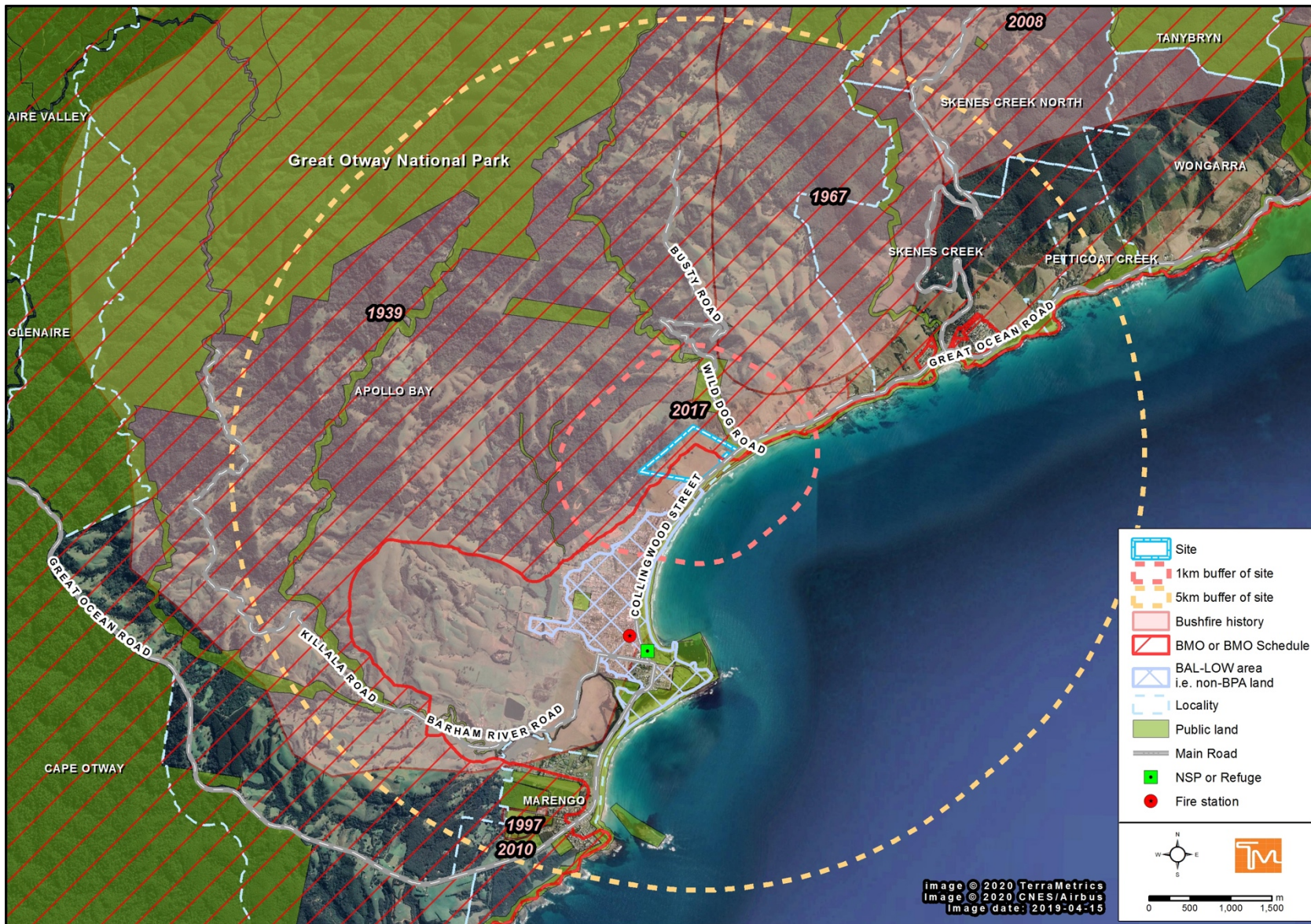
A large fire could approach the site from the north–southwest arc through the rural-semi rural landscape around the site, or beyond it, the Great Otway National Park to the northwest.

Long fire runs are possible in through the rugged, forested terrain of the Otway Ranges. Fire behaviour in this broader landscape may even be beyond the default assumptions in the BMO, with the possibility of severe fire winds and extreme fire behaviour associated with convective plumes. This type of fire behaviour was documented for the 1983 'Ash Wednesday' fire that impacted the Great Ocean Road townships of Lorne, Aireys Inlet and Anglesea further to the north (Billing, 1983).

The landscape for more than 2km surrounding the site, however, is not extreme risk, as it includes large areas of cleared land and pasture interspersed with patches of remnant native vegetation and rural/semi-rural development. The topography is undulating, but with a generally flat or upslope run for any large fire that may approach the site. It is considered that if the development can achieve BMO and BPA compliance this will provide acceptable safety commensurate with the risk.

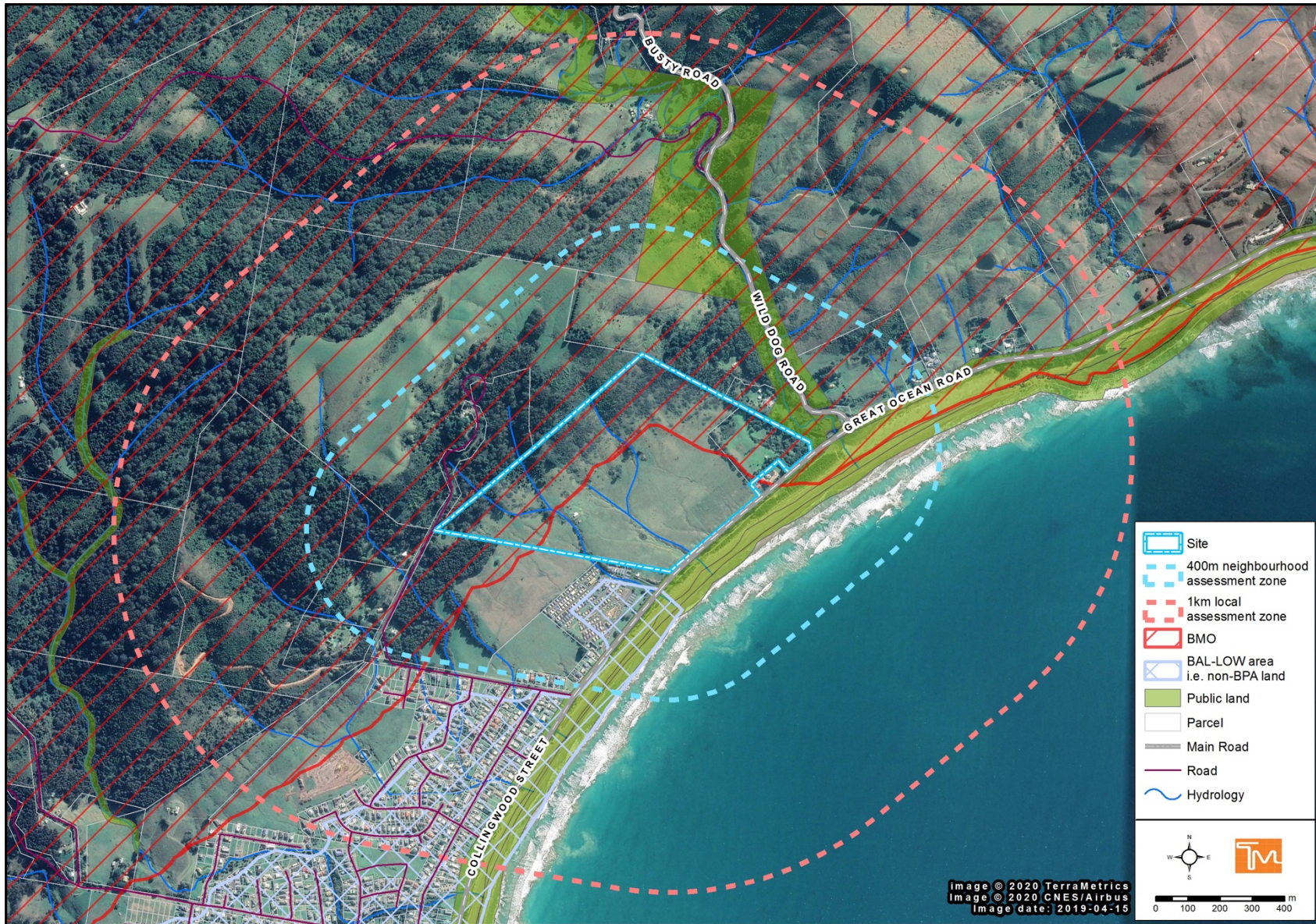
The occupants of the site can reasonably be expected to have advance warning of the approach of a large landscape scale bushfire as envisaged in the BMO, and be in a position to evacuate to Apollo Bay, which provides a large, low threat urban area. It should be noted however, that ember attack might cause local ignitions on and/or around the site, well in advance of any discernible main fire front.





Map 2 - Bushfire hazard landscape assessment plan.





Map 3 - Bushfire hazard local and neighbourhood landscape assessment.



## 5 Bushfire Management Statement

This section comprises a Bushfire Management Statement in accordance with the application requirements of Clause 44.06 and associated Clause 53.02 in the Colac Otway Planning Scheme. The assessment is based on the *Overall Development Plan V36* (Beveridge Williams, 2019).

### 5.1 Subdivision objectives

The BMO subdivision objectives are:

*'To provide lots that are capable of being developed in accordance with the objectives of Clause 53.02.*

*To specify at the subdivision stage bushfire protection measures to develop a lot with a single dwelling on land zoned for residential or rural residential purposes' (Colac Otway Planning Scheme, 2020).*

As the subdivision is in the Neighbourhood Residential Zone (NRZ1) part of the site, compliance with approved measure (AM) 5.2 applies, which is deemed to meet the objectives.

#### 5.1.1 Approved measure 5.2

*'An application to subdivide land zoned for residential or rural residential purposes must be accompanied by a plan that shows:*

- *Each lot satisfies the approved measure in AM 2.1.*
- *A building envelope for a single dwelling on each lot that complies with AM 2.2 and provides defensible space in accordance with:*
  - *Columns A or B of Table 2 to Clause 53.02-5 for a subdivision that creates 10 or more lots; or*
  - *Columns A, B or C of Table 2 to Clause 53.02-5 for a subdivision that creates less than 10 lots.*

*The bushfire attack level that corresponds to the defensible space provided in accordance with Table 2 to Clause 53.02-5 must be noted on the building envelope.*

- *Defensible space wholly contained within the boundaries of the proposed subdivision.*
- *Defensible space may be shared between lots within the subdivision. Defensible space for a lot may utilise communal areas, such as roads, where that land can meet the requirements for defensible space.*
- *Vegetation management requirements in accordance with Table 6 to implement and maintain the defensible space required under this approved measure.*
- *Water supply and vehicle access that complies with AM 4.1' (Colac Otway Planning Scheme, 2020).*



### **AM 2.1 – Landscape**

*'The bushfire risk to the development from the landscape beyond the site can be mitigated to an acceptable level'* (Colac Otway Planning Scheme, 2020).

As identified in Section 4, the landscape is not one of extreme bushfire risk, and it is considered that the risk can be mitigated to an acceptable level by applying approved or specified alternative measures to meet the BMO objectives.

### **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 building is in close proximity to a public road.*
- *Access can be provided to the building for emergency service vehicles'* (Colac Otway Planning Scheme, 2020).

The siting and layout maximises the setback from the hazard (i.e. unmanaged vegetation) as far as practicable by locating lots towards the south and southeast of the site. All lots, with the possible exception of the northeastern-most lot (see Maps 1 and 4), achieve compliance with the BMO setback requirement for BAL-12.5 defensible space in response to Forest in the 'All upslopes and flat land' slope class i.e.  $\geq 48\text{m}$  setback (see Map 4). Lots abutting the Great Ocean Road will have at least a 65m setback from the modified Scrub/Shrubland vegetation between the beach and the road.

The proposed lots are all reasonably close to the Great Ocean Road and access and egress via the proposed residential road network can comply with the requirements for emergency vehicles.

### **Defendable space and construction**

As the subdivision comprises 10 or more lots, defendable space in the BMO parts of the site is required to be in accordance with Columns A or B of Table 2 to Clause 53.02-5, which equates to a BAL-12.5 or BAL-19 construction standard.

However, a key Clause 13.02-1S settlement planning strategy, is that no strategic planning document, local planning policy or planning scheme amendment should be approved if it will result in future development exceeding BAL-12.5 (Colac Otway Planning Scheme, 2018a). This creates the arguably illogical situation whereby subdivision of more than 10 lots in a lesser risk BPA, cannot create lots above BAL-12.5, whereas in a higher risk environment in the BMO, a subdivision could create BAL-19 lots, or in certain circumstances BAL-29 lots (as long as the development didn't require a planning scheme amendment).

Notwithstanding, BAL-12.5 defensible space for all lots in accordance with Clause 13.02-1S (or a combination of BAL-12.5 and BAL-19 defensible space in accordance with the BMO), is achievable for future subdivision of the site as stipulated in Table 2 below.

**Table 3 – Potentially applicable BAL defensible space distances from Table 2 to Clause 53.02-5.**

Vegetation	BAL	Slope class	Defendable space (m)
Forest	BAL-12.5	All upslopes and flat land	48
Scrub			27
Shrubland			19
Grassland			19
Modified	BAL-29	All slopes	50m or to the property boundary

Map 4 shows the extent of the 48m defensible space setback required in response to Forest. For most lots that do not have any forest within 150m of them (see the 150m buffer of lots shown in Maps 1 and 4), the lesser Grassland defensible space area of 19m is applicable, as shown in Map 4. An appropriate response to the combined Forest and Grassland hazard, is to ensure that no Forest within 48m (or Scrub within 27m) of a dwelling<sup>11</sup>, is allowed to occur or regenerate; and, that a minimum 19m defensible space area is maintained between dwellings and unmanaged Grassland along the northwest boundary, where the grass is managed in a low threat state (i.e. slashed or mown not less than 100mm high).

In response to Modified vegetation, Table 2 to clause 53.02-5 stipulates a minimum BAL-29 standard with defensible space extending for 50m or to the property boundary (whichever is the lesser distance). It is considered however, that the more conservative and precautionary classification of Scrub could be applied to the modified vegetation to the north and east, for which, BAL-12.5 dwellings would require a minimum 27m of defensible space. As shown in Map 5 the actual setback is over 65m to the south, more than enough for BAL-12.5.

All of the lots can achieve BAL-12.5, with the possible exception of the northern/north-easternmost lot, which is setback only 15m from the northern site boundary, and is approximately 46m from Forest. This lot could be removed or reconfigured, or if retained, have a higher BAL-29 (or possibly BAL-19) construction standard applied for a future dwelling, in response to the exposure to Scrub, Modified and Forest vegetation.

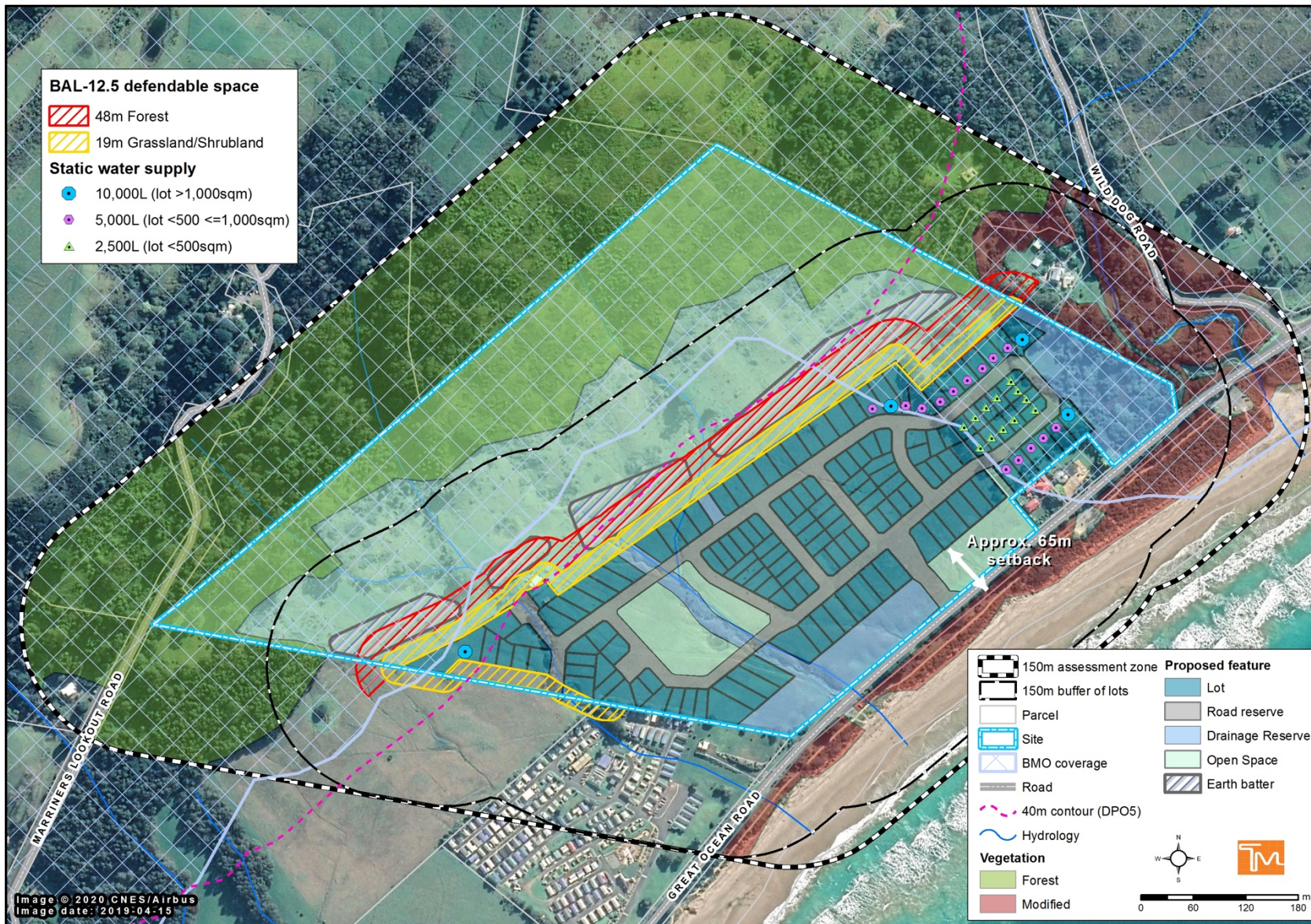
The defensible space arrangement in Map 4 shares defensible space amongst lots and uses communal areas such as roads. The defensible space and all proposed landscaping and open space, including drainage reserves, and to the north, at least within the defensible space perimeter around the lots, must meet the vegetation management requirements stipulated in Table 6 at Clause 53.02-5, as detailed in Appendix A of this report; or, meet one or more of the exclusion criteria for low hazard vegetation in AS 3959-2018 (see Section 3.2).

<sup>11</sup> Ideally, to minimise the hazard, no further Forest or Scrub (re)vegetation should occur within 150m of the lots.

There are some minor areas of defensible space shown in Map 4, which are beyond the site boundaries to the northeast, east and southwest of the site. However, except for some of the defensible space around the north-easternmost lot discussed above, all of these are over land that is currently, and it can reasonably be assured will continue to be, maintained in a low threat state consistent with the objective of defensible space. These include the two properties between the site and the Great Ocean Road near the northeast corner of the site, and the Big 4 Holiday Park to the south-southwest.

Ongoing management of land in a low threat state, in the proposed Mariners View Estate to the south of the site, for at least 19m between dwellings and any unmanaged grass, and at least 48m from existing and any future Forest areas to the north, will also need to be assured. This includes ensuring the proposed earthen batters meet defensible space standards.





Map 4 – Analysis map.



### **Approved measure 4.1**

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

- *A static water supply for firefighting and property protection purposes specified in Table 4 to Clause 53.02-5.*
- *Vehicle access that is designed and constructed as specified in Table 5 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' (Colac Otway Planning Scheme, 2020).*

Table 4 to Clause 53.02-5 requires that a static water supply be provided, based on the property size and the proximity of the building/envelope to a hydrant, as detailed in Table 3 of this report.

**Table 4 - Water supply requirements from Table 4 to Clause 53.02-5.**

Property size (m <sup>2</sup> )	Hydrant within 120m of the rear of the building	Tank capacity (litres)	CFA fittings and access required
Less than 500	Not applicable	2,500	No
500 - 1000	Yes	5,000	No
500 – 1000	No	10,000	Yes
1,001 and above	Not applicable	10,000	Yes

Map 4 shows the applicable static water compliance requirements for lots in the BMO parts of the site. It assumes that all lots would have a hydrant within 120m of the rear of the lot or a building envelope in the lot, in accordance with the fire hydrants objective at Clause 56-09-3.

There appear to be no obstacles to driveways and roads complying with Table 5 to Clause 53.02-5 as detailed in Appendix C to this report.

### **5.1.2 Approved measure 5.3**

*'An application to subdivide land to create 10 or more lots provides a perimeter road adjoining the hazardous vegetation to support fire fighting' (Colac Otway Planning Scheme, 2020).*

The development plan does not show a perimeter road separating lots from the grassland and forest to the north in accordance with this measure. However, if the defendable space setbacks can be otherwise achieved, and maintained in perpetuity by an appropriately enforceable mechanism, this is not considered significant, because the hazard largely comprises lesser risk grassland or modified vegetation, and the local landscape risk is not extreme.

### 5.1.3 Approved measure 5.4

*'A subdivision manages the bushfire risk to future development from existing or proposed landscaping, public open space and communal areas.'* (Colac Otway Planning Scheme, 2020).

The DPO5 that applies to the site requires that a development plan must be supported by an 'Open Space and Landscape Masterplan' that includes:

- *'Open space adjacent to linear drainage reserves that contains walking and cycling paths and a children's playground. The playground design shall comply with Council's Playground Strategy.*
- *A landscaped open space reserve adjacent to Wild Dog Creek.*
- *A linear open space reserve located along the clay mounds adjacent to the Great Ocean Road.*
- *Any areas of proposed revegetation including the steep slopes above the 40 metre contour.*
- *The extensive use, where appropriate, of local indigenous plant species throughout the development site. Exotic trees can be considered for street tree plantings.*
- *Proposed street planting in accordance with Council's street planting guide' (Colac Otway Planning Scheme, 2015b).*

As identified above, all proposed landscaping, drainage reserves and other open space, at least within the subdivision and the defendable space around the lots, must meet the vegetation management requirements stipulated in Table 6 at Clause 53.02-5, as detailed in Appendix A of this report; or, meet one or more of the exclusion criteria for low hazard vegetation in AS 3959-2018 (See Section 3.2).

It is not clear what, if any, revegetation may occur above the 40m contour, or elsewhere on the balance of the land to the north of the subdivision, shown as Open Space in Map 4. However, as long as future vegetation in this area comprises no more of a hazard than classified Grassland (i.e. grass >100mm long with less than 10% overstorey tree or shrub cover) or Shrubland (shrubs with an average height of no more than 1.5m) then the 19m defendable space area will be appropriate – assuming Forest will not occur within a minimum 48m of any lot.

The future state of vegetation in the proposed drainage reserves will need to be confirmed. For example, the north-easternmost drainage reserve currently comprises modified Scrub (see Figure 9), from which future dwellings would need a defendable space setback of 27m for BAL-12.5 construction.

The required defendable space setbacks and vegetation management standards will need to be achieved, and be able to be maintained in perpetuity, by an appropriately enforceable mechanism.



## 6 Response to Clause 13.02-1S Bushfire planning

The applicable strategies stipulated in Clause 13.02-1S are detailed in the following sub-sections, and a summary is provided about how the proposed development responds to the strategies.

### 6.1.1 Protection of human life strategies

Priority must be given to the protection of human life.

#### ***Prioritising the protection of human life over all other policy considerations***

As identified in Section 4, the site is not in an extreme risk location. Accordingly, the protection of human life can be prioritised by adopting the measures recommended in this report and through application of the existing planning and building regulations for BMO compliance and construction in a BPA, including ensuring future dwellings and other buildings are located where a BAL-12.5 construction standard can be achieved (i.e. achieving setbacks for future buildings from unmanaged vegetation, such that radiant heat can be expected to be below 12.5kW/m<sup>2</sup>).

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

As identified in Section 4, the site is not in an extreme risk landscape and reasonable access to the low threat parts of Apollo Bay can be provided.

The nearest *lowest* risk locations are considered to be the urban-residential and township areas of Apollo Bay that are not in the BPA and are therefore, BAL-LOW areas (see Map 2 and Map 3).

Once development has occurred, reliably low threat urban areas within the site will become eligible for excision from the BPA if they satisfy the exclusion criteria (see Section 2.5).

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

This report provides the basis for incorporating bushfire risk into decision-making associated with development of the site.

The CFA consider that community resilience to bushfire will be strengthened (and hence, presumably, vulnerability to bushfire will be reduced) when a strategic planning proposal demonstrates that Clause 13.02-1S strategies have been applied, and where a proposal takes advantage of existing settlement patterns so that new development will not expose the community to increased risk from bushfire.

The CFA provide principles to respond to Clause 13.02-1S including that settlement planning decisions should:

- *‘Direct development to locations of lower bushfire risk.*
- *Carefully consider development in locations where there is significant bushfire risk that cannot be avoided.*
- *Avoid development in locations of extreme bushfire risk.*
- *Avoid development in areas where planned bushfire protection measures may be incompatible with other environmental objectives’ (CFA, 2015).*

It is considered that the development can appropriately implement the strategies in Clause 13.02-1S that aim to prioritise protection of human life and will, therefore, meet the CFA strategic planning principles for bushfire. The site is not in an extreme risk landscape, is only partially affected by the BMO and abuts an existing lower threat township area where BAL-LOW applies. Some of the site will become eligible for excision from the BPA when development occurs.

### **6.1.2 Bushfire hazard identification and assessment strategies**

The bushfire hazard must be identified, and an appropriate risk assessment be undertaken.

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

This report identifies the hazard in accordance with the commonly accepted methodologies of the BMO and AS 3959-2018 and, as appropriate, additional guidance provided in and *Planning Advisory Note 68 Bushfire State Planning Policy Amendment VC140* (DEWLP, 2018).

The type and extent of (hazardous) vegetation within, and up to 150m around the site, has been identified and classified into the BMO/AS 3959 vegetation groups. Classification was based on the anticipated long-term state of the vegetation, EVC mapping, aerial imagery, site assessment, published guidance on vegetation assessment for bushfire purposes and experience with the fuel hazard posed by the vegetation types that occur within the region.

Geographic Information Systems analysis of publicly available contour data for the area was undertaken and effective slopes determined.

In relation to climatic conditions and fire weather, the BMO/AS 3959 default FFDI 100/GFDI 130 benchmark used in the Victorian planning and building system, has been applied as discussed in Section 3.4.

***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.***

The extent of BPA coverage has been considered (see Section **Error! Reference source not found.**) and is shown in Map 2 and Map 3. This is based on the most recent BPA mapping for the area, which was published 11<sup>th</sup> September 2019.

***Applying the Bushfire Management Overlay in planning schemes to areas where the extent of vegetation can create an extreme bushfire hazard.***

As identified in Section 2.3, only the northwest and northeast portions of the site are covered by the BMO (see Map 2 and Map 3). This is considered appropriate and reflects statewide BMO mapping introduced into the Colac Otway Planning Scheme on 3<sup>rd</sup> October 2017.

***Considering and assessing the bushfire hazard on the basis of:***

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

The hazard has been assessed and described at the a range of scales (see Sections **Error! Reference source not found.** and 4, and Maps 1-3).

At the site scale, the assessment follows the BMO methodology of classifying vegetation and topography within 150m of a site and subdivision.

At the neighbourhood, local and broader landscape scale, the risk has been considered within 1km of the site and extending out beyond 20km in accordance with guidance provided in Planning Advisory Note 68 (DELWP, 2018) and the BMO Technical Guide (DELWP, 2017).

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

It is anticipated the Colac Otway Shire Council will refer this current Bushfire Development Report to the CFA. The CFA have reviewed and commented on a previous version of the report as part of a VCAT hearing into development of the site and at that stage, had no significant issues with the analysis and findings.

***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.***

DELWP advisory and practice notes, Clause 13.02-1S, and the building regulations invoked by the BPA coverage, specify the general requirements and standards for assessing the risk. These have been used in this report as appropriate and bushfire protection measures have been identified commensurate with the risk.

***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.***

It is considered that if the BMO provisions are complied with and the objectives and strategies of Clause 13.02-1S are successfully implemented, as discussed in this report, then the risk can be deemed to be acceptably mitigated such that development can proceed.

The CFA specify that areas where development should not proceed could include:

- *‘Isolated settlements where the size and/or configuration of the settlements will be insufficient to modify fire behaviour and provide protection from a bushfire.*
- *Where bushfire protection measures will not reduce the risk to an acceptable level.*
- *Where evacuation (access) is severely restricted.*
- *Where the extent and potential impact of required bushfire protection measures may be incompatible with other environmental objectives or issues, e.g. vegetation protection, land subject to erosion or landslip’ (CFA, 2015).*

These criteria or characteristics are not applicable to the site.

### ***6.1.3 Settlement planning strategies***

Settlement planning must strengthen the resilience of settlements and communities and prioritise protection of human life.

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

The applicable distances for dwellings or other buildings to be setback from classifiable vegetation, such that RHF is calculated to not exceed 12.5kW/m<sup>2</sup> and BAL 12.5 dwellings could potentially be sited, have been determined (see Section 5.1.1 and Map 4).



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

The nearest *lowest* risk locations are considered to be those areas in the surrounding landscape which are not in a designated Bushfire Prone Area (BPA). These comprise the areas of Apollo Bay and adjacent land to the southwest (see Map 2 and Map 3).

As identified in Section 2.5, once development has occurred, reliably low threat urban areas within the site will become eligible for excision from the BPA if they satisfy the exclusion criteria.

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

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

There will be no increase in risk to existing residents or community infrastructure if:

- Development achieves vegetation setbacks from hazardous vegetation to enable BAL-12.5 construction, provides an appropriate water supply for fire fighting via a conventional reticulated hydrant system, enhanced with static water for BMO affected lots, and appropriate access/egress for emergency vehicles and residents via a conventional residential road network.
- It is ensured that any hazardous vegetation retained or re-established, does not create an increase in the hazard exposure for existing residents.

The risk to existing residents will be reduced by the development of additional urban residential areas and associated low threat or non-vegetated land. As identified above, this will eventually create BAL-LOW areas with the potential to be excised from the BPA, if they are sufficiently distant from any hazardous vegetation.

***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.***

This report appropriately assesses and addresses the risk at a range of scales.

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

No alternative low risk development locations have been identified or assessed as part of this study.

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

If the setback distances from any hazardous vegetation, as identified in this report are implemented, then construction can achieve a BAL not exceeding BAL-12.5. Future development and excision from the BPA of some parts of the site, would enable BAL-LOW.

#### **6.1.4 Areas of high biodiversity conservation value**

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

Terramatrix is not aware of any biodiversity impacts associated with the proposal.

#### **6.1.5 Use and development control in a Bushfire Prone Area**

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

- *Subdivisions of more than 10 lots.*
- *Accommodation.*
- *Child care centres.*
- *Education centres.*
- *Emergency services facilities.*
- *Hospitals.*
- *Indoor recreation facilities.*
- *Major sports and recreation facilities.*
- *Places of assembly.*
- *Any application for development that will result in people congregating in large numbers’ (Colac Otway Planning Scheme, 2018a).*

It further states that:

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

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

Future development applications should be able to achieve acceptable safety if:

- Appropriate setbacks for future development from classified vegetation are achieved to enable BAL-12.5 construction in the BPA;
- Adequate access and egress for emergency management vehicles is provided by a residential road network to assist property defence and fire fighting; and
- A reliable water supply for fire fighting is provided, via a conventional reticulated hydrant system, in accordance with the hydrant objective for residential subdivision at Clause 56.09-3. BMO affected lots will also have a static water supply in compliance with the requirements of Clause 53.02-4 (see Map 4).



## 7 Conclusion

The proposed development plan for a 144 lot subdivision at 6230 and 6280 Great Ocean Road, Apollo Bay VIC 3233 was assessed for compliance with Clause 13.02-13, 44.06 and 53.02 of the Colac Otway Planning Scheme. This report also comprises a bushfire assessment as required by the DPO5 that applies to the site.

The site is within a Bushfire Prone Area (BPA) and is partially covered by the Bushfire Management Overlay (BMO). It is considered that the proposed development plan and future subdivision, can comply with the requirements of Clause 13.02-1S *Bushfire Planning* in the Planning Policy Framework, and meet the applicable BMO development objectives, subject to:

- Surety about how a minimum 19m of defendable space management will be created and maintained in perpetuity along the northwest site boundary.
- Clarification of the location and nature of any revegetation, or natural regeneration, that may occur in the Rural Conservation Zone part of the site to the northwest of future lots; including preventing Forest regenerating or occurring within 48m, or Scrub regenerating or occurring within 27m, of future dwellings.
- Confirmation about the standard of vegetation management that will occur within other proposed open space areas and drainage reserves on the site.
- The nature and timing of the proposed Mariners View Estate development to the southwest of the site.

It is considered that if these matters can all be resolved via the conditional consent process then all the proposed bushfire protection measures detailed in this report can be deemed to appropriately prioritise the protection of human life and achieve acceptable safety.

## 8 Appendices

### 8.1 Appendix A: Vegetation management requirements

**As per Table 6 to Clause 53.02-5:**

*'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 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*

*Unless specified in a schedule or otherwise agreed in writing to the satisfaction of the relevant fire authority' (Colac Otway Planning Scheme, 2018e).*

## 8.2 Appendix B: Water supply requirements

**Table 4 from Clause 53.02-5 - Capacity, fittings and access** (Colac Otway Planning Scheme, 2018e)

<b>Capacity, fittings and access</b>			
<b>Lot sizes (square meters)</b>	<b>Hydrant available</b>	<b>Capacity (litres)</b>	<b>Fire authority fittings and access required</b>
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

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

### **Fire Authority Requirements**

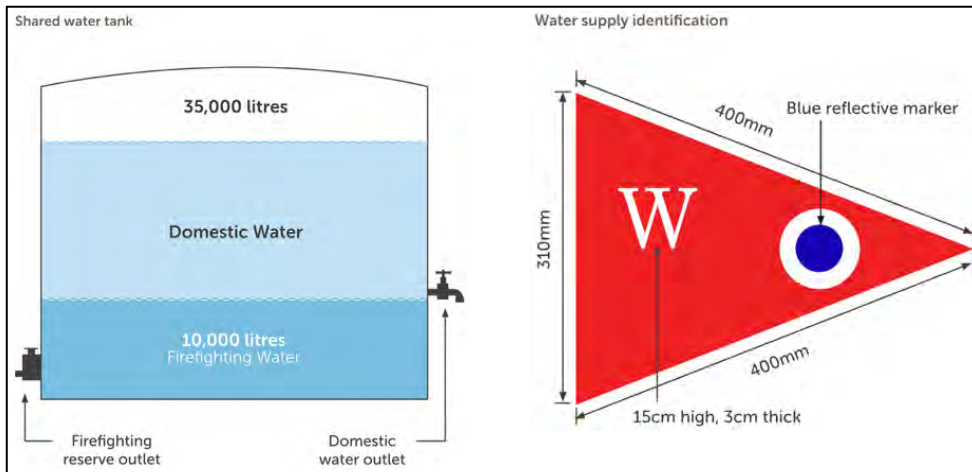
*'Unless otherwise agreed in writing by the relevant fire authority, the water supply must:*

- 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 made of corrosive resistant metal.*
- Include a separate outlet for occupant use.*

*Where a 10,000 litre water supply is required, fire authority fittings and access must be provided as follows:*

- 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 or gate valve (British Standard Pipe (BSP 65 millimetre) and coupling (64 millimetre CFA 3 thread per inch male fitting).*
- Any pipework and fittings must be a minimum of 65 millimetres (excluding the CFA coupling)' (Colac Otway Planning Scheme, 2018e).*

The water supply may be provided in the same water tank as other water supplies provided they are separated with different outlets. See figure below illustrating signage and an example of outlets where fire fighting water will be in the same tank as water for other use.



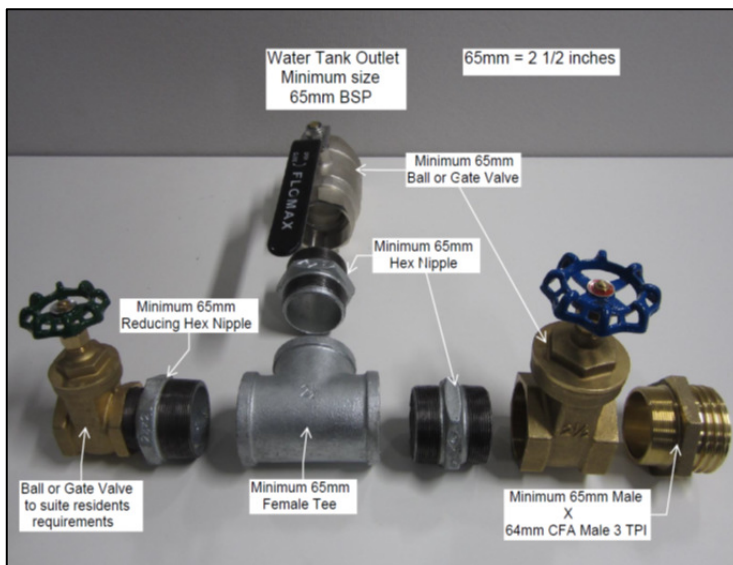
(DELWP, 2017)

**CFA Fittings** (CFA, 2014)

*'If specified within Table 4 to Clause 53.02-5 (if fire brigade access to your water supply is required), CFA's standard BMO permit conditions require the pipe work, fittings and tank outlet to be a minimum size of 64 mm.*

*65 mm BSP (British Standard Pipe) is the most common size available. A 65 mm fitting is equivalent to the old 2 1/2 inch. A 65 mm BSP (2 1/2 inch) fitting exceeds CFA's requirements and will therefore comply with CFA's standard permit conditions for the BMO.*

*The diagram below shows some common tank fittings available at most plumbing suppliers which meet the connection requirements. It includes a 65 mm tank outlet, two 65 mm ball or gate valves with a 65 mm male to 64 mm CFA 3 threads per inch male coupling. This is a special fitting which allows the CFA fire truck to connect to the water supply. An additional ball or gate valve will provide access to the water supply for the resident of the dwelling'.*





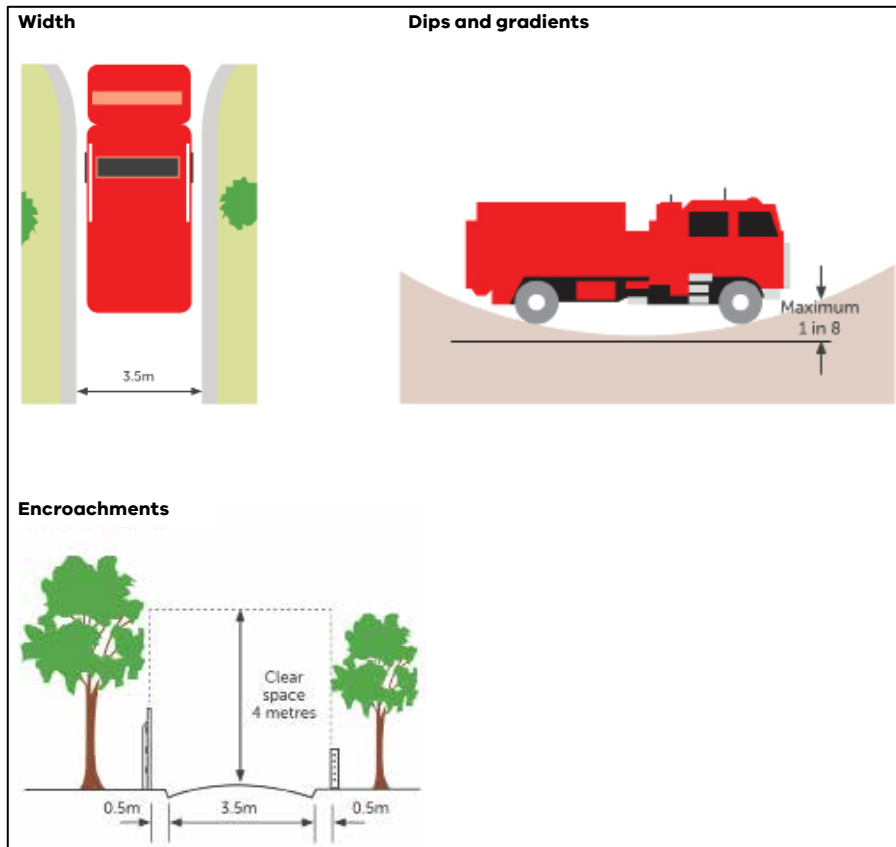
### 8.3 Appendix C: Access requirements

**Driveways less than 30m long have no specific requirements unless access to the water supply outlet is required, in which case the following apply as appropriate.**

#### **Access between 30m and 100m in length**

Where the length of access is greater than 30 metres the following design and construction requirements apply (*the length of access should be measured from a public road to either the building or the water supply outlet, whichever is longer* (Colac Otway Planning Scheme, 2018e)):

- 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 of no more than 1 in 5 (20%) (11.3°) for no more than 50 metres.
- Dips must have no more than a 1 in 8 (12.5%) (7.1°) entry and exit angle.
- A load limit of at least 15 tonnes and be of all-weather construction.
- 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.
- A cleared area of 0.5 metres is required to allow for the opening of vehicle doors along driveways.
- Dips must have no more than a 1 in 8 (12.5 per cent) (7.1 degrees) entry and exit angle.

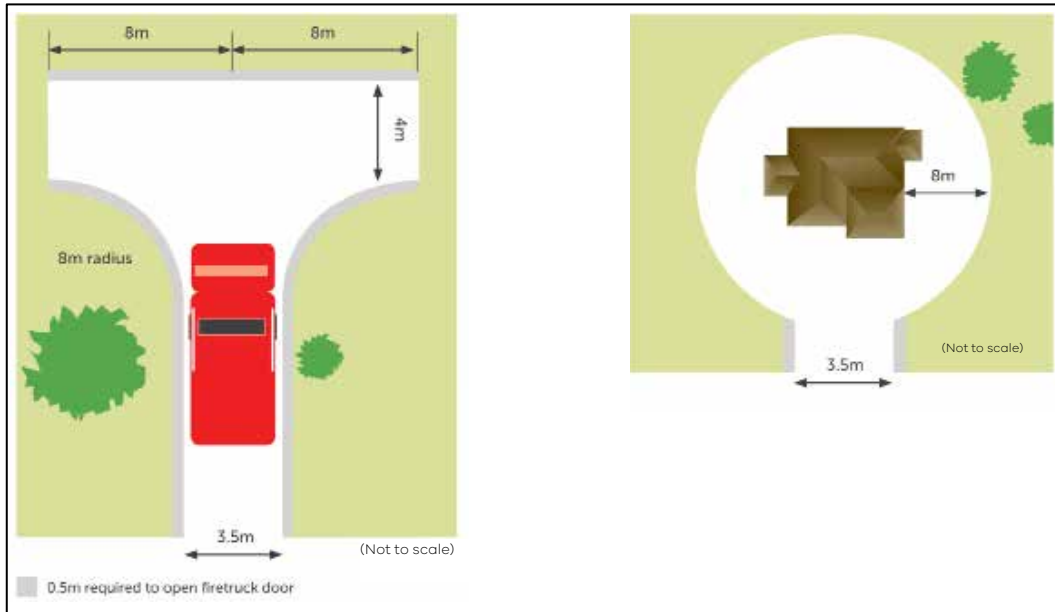


(DELWP, 2017)

### **Access between 100m and 200m in length**

In addition to the 30m-100m requirements above, 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 8 metres
- a driveway encircling the dwelling
- other vehicle turning heads such as a T or Y head which meet the specification of Austroad Design for an 8.8 metre service vehicle.

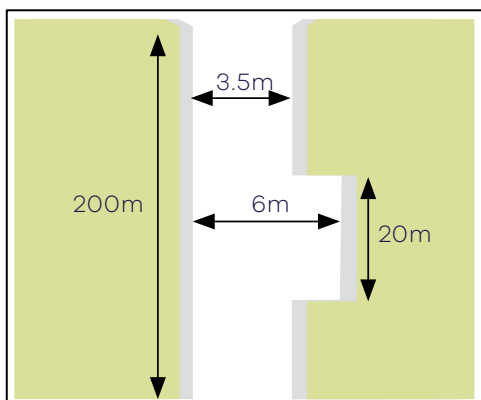


(DELWP, 2017)

### **Access greater than 200m in length**

In addition to the requirements above, passing bays are required at least every 200 metres that are:

- a minimum of 20 metres long
- with a minimum trafficable width of 6 metres.



(DELWP, 2017)

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