862-900 Swan Bay Road, Mannerim, Victoria.

Bushfire Risk Assessment for a proposed development

Report for

St Quentin

June 2026

BeaconEcological

ACKNOWLEDGEMENTS

Beacon Ecological would like to acknowledge the following for their contribution to the project:

- **Deepika Cheran** (Town Planner/Designer, St Quentin) for site and project information.

Beacon Ecological
3 Menczer Lane
Jan Juc Victoria 3228
Email: luke@beaconecological.com.au
Web: www.beaconecological.com.au
ABN: 351 621 669 82

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Field assessment: Luke Hynes

Report: Luke Hynes

Photography: Luke Hynes

Cover Photo: 862-900 Swan Bay Road, Mannerim.

Beacon Ecological acknowledges and pays respect to the past, present and future Traditional Custodians and Elders of this nation, particularly the Wadawurrung people on whose land the field work was completed, and the continuation of cultural, spiritual and educational practices of Aboriginal and Torres Strait Islander peoples.

DISCLAIMER

The author advises that the information presented in this report, including any bushfire management advice, has been prepared with all due diligence and care, and based on the best available knowledge and research.

However the author takes no responsibility for any loss, injury or financial damage resulting from the reliance and/or application of management advice provided in the report. Requirements detailed in this document do not guarantee survival of the buildings or the occupants. The client is strongly encouraged to develop and practice a bushfire survival plan.

Information and assistance including a template for a Bushfire Survival Plan is provided as part of the 'Fire Ready Kit' available through the CFA website at http://www.cfa.vic.gov.au or through your local CFA Regional office.

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SUMMARY

Beacon Ecological was engaged by St Quentin to undertake a Bushfire Attack Level assessment and prepare a Bushfire Risk Assessment for a proposed development at 862-900 Swan Bay Road, Mannerim, Victoria. A dwelling and shed is proposed at the site which is currently vacant.

This document details fire related threats to the proposed development and includes responses to requirements regarding development in areas covered by the Bushfire Prone Area, particularly *Clause 53.02-6 Bushfire Prone Decision Guidelines.*

Bushfire Prone Area Requirements

The proposed development is for a dwelling and shed within the Bushfire Prone Area, and as such the decision guidelines outlined in Clause 53.02-6 must be considered. Development requirements are as follows:

- The proposed dwelling will be constructed to Bushfire Attack Level (BAL) 12.5 construction standards with defendable space of 19 metres.
- Defendable space for the shed is 10 metres to all aspects. There are no construction requirements for the proposed shed.
- A static water supply of 10,000 litres will be provided for fire fighting purposes.
- Access requirements including a turning area and passing bays is required.

1 INTRODUCTION

Beacon Ecological was engaged by St Quentin to undertake a Bushfire Attack Level assessment and prepare a Bushfire Risk Assessment for a proposed development at 862-900 Swan Bay Road, Mannerim, Victoria. A dwelling and shed is proposed at the site which is currently vacant.

This document details fire related threats to the proposed development and includes responses to requirements regarding development in areas covered by the Bushfire Prone Area, particularly *Clause 53.02-6 Bushfire Prone Decision Guidelines.*

1.1 PROPOSAL

A dwelling and shed is proposed at the site which is currently vacant.

2 METHODOLOGY

Methodologies detailed below were used to satisfy the information requirements under the under *Clause 53.02-6 Bushfire Prone Decision Guidelines*:

1. A Bushfire Hazard Landscape Assessment
2. A Bushfire Attack Level Assessment
3. The local bushfire context

2.1 BACKGROUND REVIEW

The following websites were reviewed to obtain background information on the study site:

- **Planning Schemes Online** for information regarding topography and slope, planning provision overlays and zones pertaining to native vegetation and ecological values within the study area (DTP 2026c).
- **Google maps** for aerial photos of the study area and surrounds.

Other relevant literature, including The *Australian Standard. Construction in bushfire prone areas* AS 3959 - 2018 (Australian Standards 2018) and practice notes published by the Department of Transport and Planning (DTP) and Country Fire Authority (CFA) were also reviewed as part of the investigation. These include:

- *Planning Permit Application in a Bushfire Management Overlay or Bushfire Prone Area – Guideline* (DTP 2026a).
- *Bushfire Hazard Assessments – Guideline* (DTP 2026b).
- *Assessing Vegetation in a Bushfire Management Overlay (BMO)* (CFA 2011a).
- *Landscaping for Bushfire. Garden Design and Plant Selection* (CFA 2011b).

2.2 FIELD ASSESSMENT

A field assessment was undertaken on 19 February 2026 to complete the Landscape Type Assessment and Bushfire Attack Level Assessment.

2.3 BUSHFIRE HAZARD LANDSCAPE ASSESSMENT

The bushfire hazard landscape assessment provides information on the bushfire hazard more than 150 metres away from a development site. Landscape characteristics considered as part of this assessment include:

- Vegetation extent in the broader locality;
- The road network;
- Any history of bushfire in the area;
- Likely directions of travel for local bushfires; and,
- Any significant landscape features that are relevant to the considerations set out in Clause 53.02.

The bushfire hazard landscape assessment allocates the proposal into one of four broader landscape types that indicate landscape bushfire risk and allows for recommendations about life safety and development proceeding on the subject site (CFA 2014).

2.4 BUSHFIRE ATTACK LEVEL ASSESSMENT

Land within 100 metres of the proposed development was traversed where possible to determine classifiable vegetation as described in AS 3959 2018 (Australian Standards 2018) and low-threat and modified vegetation as described in *Bushfire Hazard Assessments - Guideline* (DTP 2026b). The distance to classifiable vegetation and the proposed development was calculated as well as the slope under the classifiable vegetation.

This information in conjunction with Table 1 from clause 53.02 was used to determine the appropriate Bushfire Attack Level (BAL), defendable space and dwelling construction requirements. The higher the BAL, the higher the exposure to the effects of flame, radiant heat and ember attack from a bushfire. A lower BAL (i.e. 12.5 or 19) will have a larger defendable space and fewer construction requirements, whilst a BAL-40 will have a smaller defendable space and extensive fire-protection construction requirements.

Defendable Space

Defendable space is defined in Clause 72 of the relevant Planning Scheme as an area of land around a building where vegetation is modified and managed to reduce the effects of flame contact and radiant heat associated with a bushfire (DTP 2026a). See Plate 1 for a diagram of defendable space and Appendix 1 for vegetation management requirements.

Plate 1. Defendable space around a proposed construction (Source: DTP 2026a).

Construction Standards

Building construction and design can be used to minimise the impacts of ember attack and radiant heat on a building. Construction requirements for buildings relating to a calculated BAL are prescribed in AS3959-2018 (Australian Standards 2018). The materials and design of a building can be used to prevent the accumulation of debris and entry of embers. Appropriate construction helps the building to withstand the potential exposure from a bushfire as the fire front passes. Different BAL levels can be utilised on different sides of the dwelling construction if required. See Appendix 3 for construction requirements associated with this development.

Construction Standards

Building construction and design can be used to minimise the impacts of ember attack and radiant heat on a building. Construction requirements for buildings relating to a calculated BAL are prescribed in AS3959-2018 (Australian Standards 2018). The materials and design of a building can be used to prevent the accumulation of debris and entry of embers. Appropriate construction helps the building to withstand the potential exposure from a bushfire as the fire front passes. See Appendix 4 for construction requirements associated with this development.

2.5 LIMITATIONS

When determining the bushfire hazards of the site and landscape, access to private property was not always available. In some cases, adjacent threats were determined using aerial photos and viewing over fences.

Classifiable vegetation was assessed based on the current conditions and evidence of vegetation modification. Assumptions have been made as to what ongoing vegetation conditions and successional processes may occur with respect to classifiable vegetation types.

3 BUSHFIRE HAZARD SITE ASSESSMENT

3.1 LOCALITY AND SITE DESCRIPTION

The site is located at 862-900 Swan Bay Road, Mannerim, Victoria (Figure 1).

Property shape, dimensions, size, orientation and contours:

The study area is located at 862-900 Swan Bay Road, Mannerim Victoria (Figure 1) and is an approximately 32.3 hectare irregularly shaped property gently sloping to the north. The study area comprises scattered Drooping Sheoak *Allocasuarina verticillata* over and understorey dominated by introduced pasture with scattered native species providing less than 25% vegetative cover. The surrounding area comprises low density rural areas dominated by pasture.

The property is located within Farming Zone (FZ) and covered by an Environmental Significance Overlay (ESO1 – Areas of Flora and Fauna Habitat and Geological and Natural Interest). A Vegetation Protection Overlay (VPO1 – Significant Roadsides and Linear Reserves) covers Swan Bay Road and Knights Road adjacent to the proposed development (DTP 2026).

Existing vehicle access arrangements: Access exists from Swan Bay Road in the north. Swan Bay Road is a two lane sealed road that meets CFA access requirements.

Any features of the site relevant to bushfire considerations: There are no features of the site relevant to bushfire considerations.

3.2 VEGETATION ASSESSMENT

One classifiable vegetation type, Grassland, was noted within the 150 metre assessment area (Figure 2). Low threat vegetation dominated the assessment area. See below for a description of each vegetation type and how the classification was determined.

Grassland Vegetation

Vegetation that meets the AS3959 classification of Grassland dominates the assessment area (Figure 2). This vegetation type is dominated by pasture grasses with scattered Drooping Sheoak *Allocasuarina verticillata* (Plate 2).

Plate 2. Grassland vegetation within the assessment area.

3.3 BUSHFIRE ATTACK LEVEL FOR THE PROPOSED DEVELOPMENT

Dwelling: The development location allows for defendable space requirements from Column A for Grassland vegetation from Table 1 to Clause 53.02-5. Defendable space is contained wholly within the confines of the property.

See Table 1 and Figure 2 for the highest threat vegetation within 150 metres for four orientations, the slope under the classifiable vegetation and defendable space requirements. Construction requirements to satisfy BAL 12.5 are detailed in Appendix 2.

Table 1. Development BAL and Defendable space requirements.

Orientation	Highest threat vegetation	Slope under classifiable vegetation	Defendable space width	BAL Level
North	Grassland	Flat or upslope	19 metres (Column A)	12.5
East	Grassland	Flat or upslope	19 metres (Column A)	12.5
West	Grassland	Flat or upslope	19 metres (Column A)	12.5
South	Grassland	Flat or upslope	19 metres (Column A)	12.5

Shed: The shed is a non-habitable building located greater than 10 metres from the dwelling. The shed defendable space must be created for a distance of 10 metres around the proposed building or to the property boundary, whichever is the lesser as per *Planning Permit Application in a Bushfire Management Overlay or Bushfire Prone Area – Guideline* (DTP 2026a). There are no construction requirements for the shed.

4 BUSHFIRE HAZARD LANDSCAPE ASSESSMENT

4.1 VEGETATION EXTENT OF THE BROADER LOCALITY

The majority of the surrounding landscape is dominated by managed pasture. Fire runs greater than ten kilometres are possible to the north and west however given the location of the Port Phillip Bay to the north and townships of Portarlington, Leopold and Clifton Springs to the north and west the likelihood of significant grassland fires from these aspects is reduced. Swan Bay is present to the east and Point Lonsdale and the ocean to the south. East and southeast winds do not generally support high bushfire conditions and grassland fires are unlikely from these directions.

4.2 THE ROAD NETWORK

The proposed development is located with direct access to sealed two-lane roads that meet CFA access requirements.

4.3 PROXIMITY OF THE SITE TO LOW THREAT LOCATIONS

The site has access to an extensive sealed road network connecting to nearby townships including Portarlington and Drysdale, which provide opportunities for relocation to lower-risk areas should a bushfire occur.

4.4 BUSHFIRE HISTORY

Historical records indicate that the local area has experienced a relatively low frequency of bushfires.

4.5 LANDSCAPE TYPE

The surrounding landscape characteristics are indicative of **Broader Landscape Type 1** as per *Planning Permit Application in a Bushfire Management Overlay or Bushfire Prone Area – Guideline* (DTP 2026a). The site meets all of the criteria of Landscape Type 1. See justification in Table 2 below.

Table 2. Broader Landscape type

Broader Landscape Type 1 Descriptor	Response	Description met
There is little vegetation beyond 150 metres of the site (except grasslands and low threat vegetation).	Vegetation beyond 150 metres of the site is generally restricted to grasslands (pasture).	✓
Extreme bushfire behaviour is not possible.	While grassland fuels can support rapidly spreading fires under adverse weather conditions, the coastal setting of the Bellarine Peninsula and the predominance of agricultural land uses generally reduce the likelihood of sustained extreme bushfire behaviour compared to heavily forested inland regions.	✓

The type and extent of vegetation is unlikely to result in neighbourhood-scale destruction of property.	Although grassland fuels are present within the broader landscape, the absence of extensive forested vegetation and the predominantly agricultural character of the area reduce the likelihood of bushfire behaviour resulting in neighbourhood-scale destruction of property.	✓
Immediate access is available to a place that provides shelter from bushfire.	While a formal place of shelter is not located immediately adjacent to the site, the property has direct access to the surrounding sealed road network and nearby townships.	✓

5 BUSHFIRE PRONE AREA DECISION GUIDELINES

See below for responses to the Bushfire Prone Area decision guidelines as detailed in Clause 53.02-6:

5.1 GENERAL

Decision Guideline	Response
The impact of any State, regional or local bushfire management and prevention actions occurring around the site and in the wider area on the bushfire hazard and the level of risk to the proposed development.	There are no relevant management actions occurring around the site as the majority of the local area supports pasture (grasslands).
The risk of bushfire to people, property and community infrastructure.	The risk of bushfire to people, property and community infrastructure is considered low. Although grassfires may occur within the broader agricultural landscape, the predominance of managed pasture, limited extent of forested vegetation, coastal setting and relatively low historical incidence of significant bushfire events reduce the likelihood of widespread impacts.
Whether the risk arising from the broader landscape can be mitigated to an acceptable level.	The risk from the broader landscape is considered low (Landscape Type 1) and the proposed defendable space, construction standard, access and static water supply is considered appropriate for the landscape risk.
Whether bushfire protection measures to address the identified bushfire risk are required and can be practically implemented, including any measure set out in clause 53.02-4.	Defendable space, construction, access and static water requirements from Clause 53.02-4 have been implemented.
Whether bushfire protection measures can be implemented without unacceptable biodiversity impacts.	The development has been designed to avoid and minimise impacts to biodiversity values.

5.2 PROPOSED VEGETATION

Decision Guideline	Response
If vegetation is proposed, whether it will cause or contribute to the bushfire hazard or increase the risk to life, property, or community infrastructure.	No revegetation is proposed as part of the development.

5.3 DWELLINGS AND SMALL SECOND DWELLINGS

Decision Guideline	Response
Whether a static water supply for bushfire firefighting is required having regard to the size of the lot, proximity to a hydrant and connection to reticulated water.	A static water supply of 10,000 litres for fire fighting purposes will be provided.
If a vehicle accessway is greater than 30 metres in length or the relevant fire authority requires access to the static water supply on the land, whether the access design and construction requirements set out in Table 3 to clause 53.02-5 should be met.	The following access requirements of Table 3 to Clause 53.02-5 will be applied: • 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 a 1 in 8 (12.5%) (7.1°) entry and exit angle. • As the access is greater than 100 metres the following will be provided: o A turning circle with a minimum radius of eight metres. o A driveway encircling the dwelling. o The provision of other vehicle turning heads – such as a T or Y head – which meet the specification of Austroads Design for an 8.8 metre Service Vehicle. • As the access is greater than 200 metres the following will be provided: o 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.

5.4 VULNERABLE PEOPLE

Decision Guideline	Response
For a building used for accommodation (other than a dwelling or small second dwelling), education centre, hospital, indoor recreation facility, major sports and recreation facility or place of assembly the responsible authority must also consider: • The capacity for vulnerable occupants to evacuate. • Whether emergency management arrangements are provided and are sufficient for the site. • Whether the risk to vulnerable occupants warrants the closure of the use or development on days of elevated fire danger. • Whether measures to shelter in place are warranted and whether the measures will protect human life. • The net benefit provided to any existing vulnerable people.	The proposed development is for a dwelling only. This guideline is not applicable.

5.5 SUBDIVISION

Decision Guideline	Response
Whether each lot can achieve the setback from the bushfire hazard in accordance with the vegetation type and slope set out in Table 1 to clause 53.02-5 for the corresponding distance specified in Column C of that Table.	The development is not for a subdivision. These guidelines are not applicable.
Whether a staged subdivision manages interim bushfire hazard during the construction or staging.	

6 FIGURES

Figure 1: Study area location

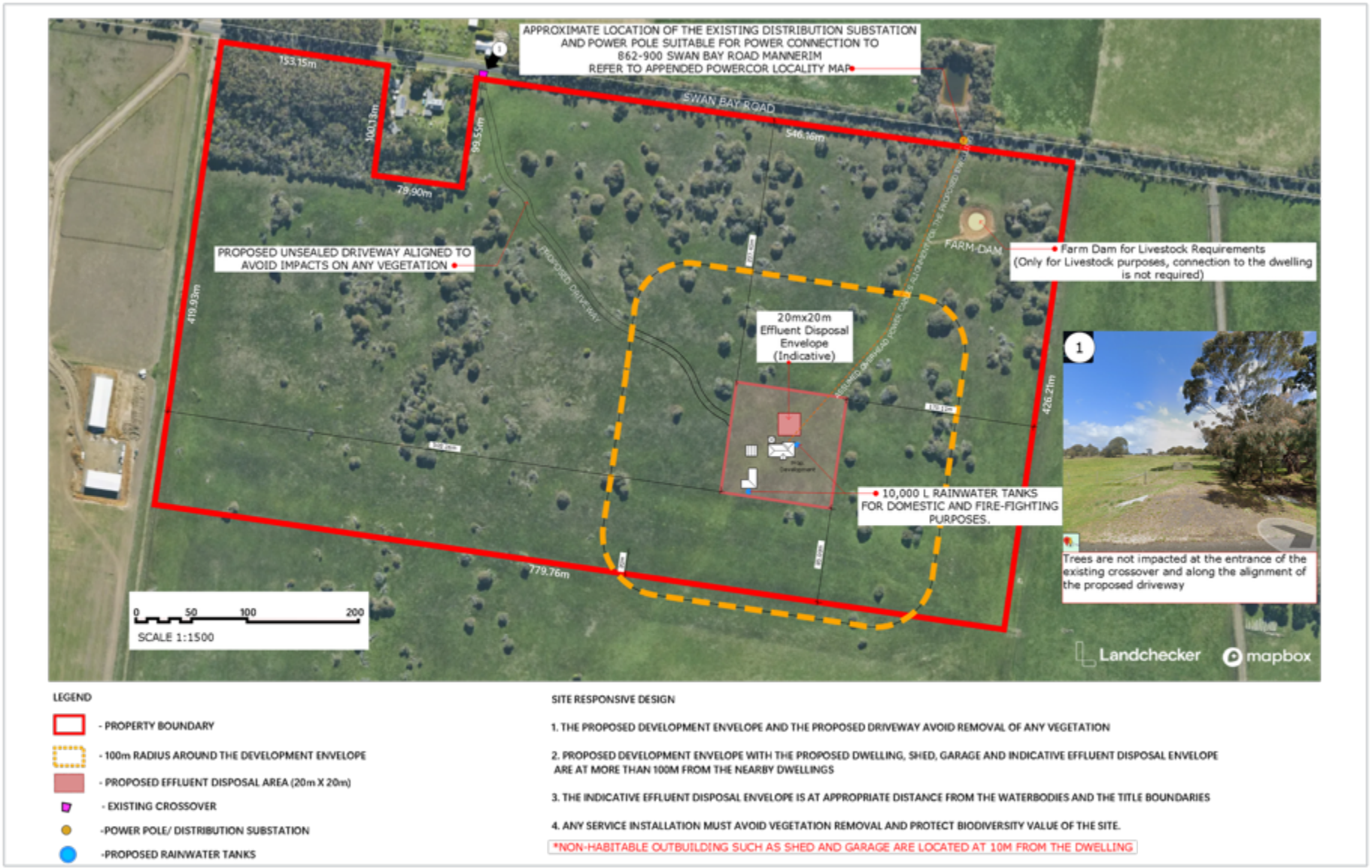
Study area

N

0 1 2km

Beacon Ecological

FIGURE 2. BUSHFIRE SITE HAZARD AND REASONABLE SITING PLAN



LEGEND

- PROPERTY BOUNDARY
- 100m RADIUS AROUND THE DEVELOPMENT ENVELOPE
- PROPOSED EFFLUENT DISPOSAL AREA (20m X 20m)
- EXISTING CROSSOVER
- POWER POLE/ DISTRIBUTION SUBSTATION
- PROPOSED RAINWATER TANKS

SITE RESPONSIVE DESIGN

1. THE PROPOSED DEVELOPMENT ENVELOPE AND THE PROPOSED DRIVEWAY AVOID REMOVAL OF ANY VEGETATION
2. PROPOSED DEVELOPMENT ENVELOPE WITH THE PROPOSED DWELLING, SHED, GARAGE AND INDICATIVE EFFLUENT DISPOSAL ENVELOPE ARE AT MORE THAN 100M FROM THE NEARBY DWELLINGS
3. THE INDICATIVE EFFLUENT DISPOSAL ENVELOPE IS AT APPROPRIATE DISTANCE FROM THE WATERBODIES AND THE TITLE BOUNDARIES
4. ANY SERVICE INSTALLATION MUST AVOID VEGETATION REMOVAL AND PROTECT BIODIVERSITY VALUE OF THE SITE.

*NON-HABITABLE OUTBUILDING SUCH AS SHED AND GARAGE ARE LOCATED AT 10M FROM THE DWELLING

St. Quentin
TOWN PLANNING I SURVEYING I GEOTECHNICAL
39 MCKILLOP STREET GEELONG VIC 3220
P: (03)5201 1811 E: admin@stqc.com.au

Project	CONSTRUCTION OF A DWELLING UNDER ESO - 1
Dwg no.	TP03 - SERVICES/INFRASTRUCTURE PLAN I Ver. 03
Address	862-900 SWAN BAY RD MANNERIM
Job No.	19668
Date	03 JUNE 2026
Title	LOT 1 ON PS844909M VOL. 12402 FOL. 076

Notes

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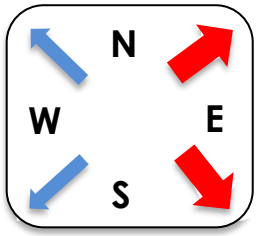
REVISION TABLE

VER	DD/MM/YY	REMARKS
02	25/04/26	RE-ALIGN POWER CABLES LOCATION TO AVOID TREES
03	01/06/26	RELOCATE SHED & GARAGE AT 10M FROM THE PROPOSED DWELLING

03
TP

FIGURE 3. BUSHFIRE HAZARD LANDSCAPE ASSESSMENT



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DTP 2026a. *Planning Permit Application in a Bushfire Management Overlay or Bushfire Prone Area – Guideline*. Published by the Victorian Department of Transport and Planning.

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DTP 2026c. Department of Transport and Planning website www.land.vic.gov.au

Standards Australia 2018. *Australian Standard. Construction of buildings in bushfire-prone areas. AS 3959 – 2018*. Published by Standards Australia Sydney NSW.

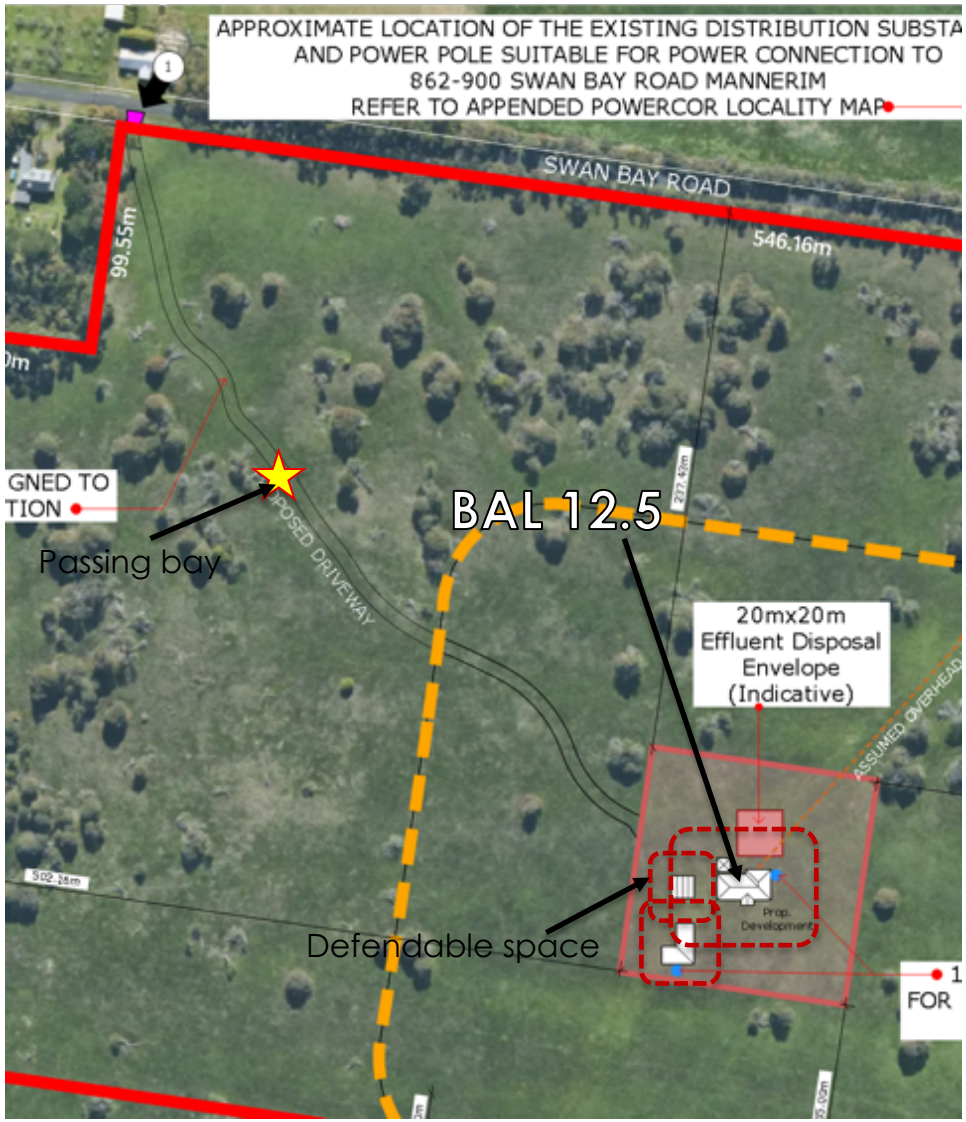
APPENDICES

APPENDIX 1. MANAGEMENT REQUIREMENTS FOR DEFENDABLE SPACE ZONES

The following vegetation management measures apply to the defendable space:

- 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 m 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.
- The canopy of trees must be separated by at least 5 metres. For a non-habitable outbuilding ancillary to a dwelling, the canopy of trees must be separated by at least 2 metres.
- Trees must not overhang or touch any elements of the building.
- There must be a clearance of at least 2 metres between the lowest tree branches and ground level.

APPENDIX 2. BUSHFIRE MANAGEMENT PLAN FOR A PROPOSED DEVELOPMENT AT 862-900 SWAN BAY ROAD, MANNERIM



Bushfire Prone Area Requirements

Construction Requirements

The dwelling will be built to Bushfire Attack Level (BAL) construction standards of 12.5.

The shed has no construction requirements.

Defendable Space Management

Defendable space for the dwelling is 19 metres and 10 metres for the shed.

Defendable Space Vegetation Management

Vegetation within the defendable space area must be managed to 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 m 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.
- There must be a clearance of at least 2 metres between the lowest tree branches and ground level.

Access Requirements for CFA access

The following design and construction requirements apply to the access:

- 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 a 1 in 8 (12.5 per cent) (7.1 degrees) entry and exit angle.
- As the access is greater than 100 metres the following will be provided:
  - 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 Austroads Design for an 8.8 metre Service Vehicle.
- As the access is greater than 200 metres the following will be provided:
  - 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 4 metres.

APPENDIX 3. CONSTRUCTION REQUIREMENTS

SECTION 5 CONSTRUCTION REQUIREMENTS FOR BAL—12.5

5.1 GENERAL

A building assessed in Section 2 as being BAL—12.5 shall conform with Section 3 and Clauses 5.2 to 5.8.

Any element of construction or system that satisfies the test criteria of AS 1530.8.1 may be used in lieu of the applicable requirements contained in Clauses 5.2 to 5.8 (see Clause 3.8).

NOTE: BAL—12.5 is primarily concerned with protection from ember attack and radiant heat up to and including 12.5 kW/m^2 where the site is less than 100 m from the source of bushfire attack.

5.2 SUB-FLOOR SUPPORTS

This Standard does not provide construction requirements for subfloor support where the subfloor space is enclosed with—

(a) a wall that conforms with Clause 5.4; or

(b) a mesh or perforated sheet with a maximum aperture of 2 mm, made of corrosion-resistant steel, bronze or aluminium; or

(c) a combination of Items (a) and (b).

NOTE: This requirement applies to the subject building only and not to verandas, decks, steps, ramps and landings (see Clause 5.7).

C5.2 Combustible materials stored in the subfloor space may be ignited by embers and cause an impact to the building.

5.3 FLOORS

5.3.1 General

This Standard does not provide construction requirements for concrete slabs on the ground.

5.3.2 Elevated floors

5.3.2.1 *Enclosed subfloor space*

This Standard does not provide construction requirements for elevated floors, including bearers, joists and flooring, where the subfloor space is enclosed with—

(a) a wall that conforms with Clause 5.4; or

(b) a mesh or perforated sheet with a maximum aperture of 2 mm, made of corrosion-resistant steel, bronze or aluminium; or

(c) a combination of Items (a) and (b) above.

5.3.2.2 *Unenclosed subfloor space*

Where the subfloor space is unenclosed, the bearers, joists and flooring, less than 400 mm above finished ground level, shall be one of the following:

(a) Materials that conform with the following:

(i) Bearers and joists shall be—

(A) non-combustible; or

(B) bushfire-resisting timber (see Appendix F);or

(C) a combination of Items (A) and (B).

BAL—12.5

(ii) Flooring shall be—

(A) non-combustible; or

(B) bushfire-resisting timber (see Appendix F); or

(C) timber (other than bushfire-resisting timber), particleboard or plywood flooring where the underside is lined with sarking-type material or mineral wool insulation; or

(D) a combination of any of Items (A), (B) or (C);

or

(b) A system conforming with AS 1530.8.1.

This Standard does not provide construction requirements for elements of elevated floors, including bearers, joists and flooring, if the underside of the element is 400 mm or more above finished ground level.

5.4 WALLS

5.4.1 General

The exposed components of an external wall that are less than 400 mm from the ground or less than 400 mm above decks, carport roofs, awnings and similar elements or fittings having an angle of less than 18 degrees to the horizontal and extending more than 110 mm in width from the wall (see Figure D3, Appendix D) shall be one of the following:

(a) Non-combustible material including the following provided the minimum thickness is 90 mm:

(i) Full masonry or masonry veneer walls with an outer leaf of clay, concrete, calcium silicate or natural stone.

(ii) Precast or in situ walls of concrete or aerated concrete.

(iii) Earth wall including mud brick; or

(b) Timber logs of a species with a density of 680 kg/m^3 or greater at a 12% moisture content; of a minimum nominal overall thickness of 90 mm and a minimum thickness of 70 mm (see Clause 3.11); and gauge planed; or

(c) Cladding that is fixed externally to a timber-framed or a steel-framed wall and is—

(i) non-combustible material; or

(ii) fibre-cement a minimum of 6 mm in thickness; or

(iii) bushfire-resisting timber (see Appendix F); or

(iv) a timber species as specified in Paragraph E1, Appendix E; or

(v) a combination of any of Items (i), (ii), (iii) or (iv); or

(d) A combination of any of Items (a), (b) or (c).

This Standard does not provide construction requirements for the exposed components of an external wall that are 400 mm or more from the ground or 400 mm or more above decks, carport roofs, awnings and similar elements or fittings having an angle less than 18 degrees to the horizontal and extending more than 110 mm in width from the wall (see Figure D3, Appendix D).

BAL—12.5

5.4.2 Joints

All joints in the external surface material of walls shall be covered, sealed, overlapped, backed or butt-jointed.

5.4.3 Vents and weepholes

Except for exclusions provided in Clause 3.6, vents and weepholes in external walls shall be screened with a mesh made of corrosion-resistant steel, bronze or aluminium.

5.5 EXTERNAL GLAZED ELEMENTS, ASSEMBLIES AND DOORS

5.5.1 Bushfire shutters

Where fitted, bushfire shutters shall conform with Clause 3.7 and be made from—

(a) non-combustible material; or

(b) a timber species as specified in Paragraph E1, Appendix E; or

(c) bushfire-resisting timber (see Appendix F); or

(d) a combination of any of Items (a), (b) or (c).

5.5.2 Screens for windows and doors

Where fitted, screens for windows and doors shall have a mesh or perforated sheet made of corrosion-resistant steel, bronze or aluminium.

The frame supporting the mesh or perforated sheet shall be made from—

(a) metal; or

(b) bushfire-resisting timber (see Appendix F); or

(c) a timber species as specified in Paragraph E2, Appendix E.

5.5.3 Windows and sidelights

Window assemblies shall:

(a) Be completely protected by a bushfire shutter that conforms with Clause 3.7 and Clause 5.5.1; or

(b) Be completely protected externally by screens that conform with Clause 3.6 and Clause 5.5.2.

C5.5.3 For Clause 5.5.3(b), the screening needs to be applied to cover the entire assembly, that is including framing, glazing, sash, sill and hardware.

or

(c) Conform with the following:

(i) *Frame material* For window assemblies less than 400 mm from the ground or less than 400 mm above decks, carport roofs, awnings and similar elements or fittings having an angle less than 18 degrees to the horizontal and extending more than 110 mm in width from the window frame (see Figure D3, Appendix D),window frames and window joinery shall be made from one of the following:

(A) Bushfire-resisting timber (see Appendix F); or

(B) A timber species as specified in Paragraph E2, Appendix E; or

(C) Metal; or

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(D) Metal-reinforced uPVC. The reinforcing members shall be made from aluminium, stainless steel, or corrosion-resistant steel.

There are no specific restrictions on frame material for all other windows.

(ii) *Hardware* There are no specific restrictions on hardware for windows.

(iii) *Glazing* Where glazing is less than 400 mm from the ground or less than 400 mm above decks, carport roofs, awnings and similar elements or fittings having an angle less than 18 degrees to the horizontal and extending more than 110 mm in width from the window frame (see Figure D3, Appendix D), this glazing shall be Grade A safety glass a minimum of 4 mm in thickness or glass blocks with no restriction on glazing methods.

NOTE: Where double-glazed assemblies are used above, the requirements apply to the external pane of the glazed assembly only. For all other glazing, annealed glass may be used in accordance with AS 1288.

(iv) *Seals and weather strips* There are no specific requirements for seals and weather strips at this BAL level.

(v) *Screens* The openable portions of windows shall be screened internally or externally with screens that conform with Clause 3.6 and Clause 5.5.2.

C5.5.3 For Clause 5.5.3(c), screening to openable portions of all windows is required in all BALs to prevent the entry of embers to the building when the window is open.

For Clause 5.5.3(c)(v), screening of the openable and fixed portions of some windows is required to reduce the effects of radiant heat on annealed glass and has to be externally fixed.

For Clause 5.5.3(c)(v), if the screening is required only to prevent the entry of embers, the screening may be fitted externally or internally.

5.5.4 Doors—Side-hung external doors (including French doors, panel fold and bi-fold doors)

Side-hung external doors, including French doors, panel fold and bi-fold doors, shall—

(a) be completely protected by bushfire shutters that conform with Clause 3.7 and Clause 5.5.1;

or

(b) be completely protected externally by screens that conform with Clause 3.6 and Clause 5.5.2;

or

(c) conform with the following:

(i) *Door panel material* Materials shall be—

(A) non-combustible; or

(B) solid timber, laminated timber or reconstituted timber, having a minimum thickness of 35 mm for the first 400 mm above the threshold; or

(C) hollow core, solid timber, laminated timber or reconstituted timber with a non-combustible kickplate on the outside for the first 400 mm above the threshold; or

(D) hollow core, solid timber, laminated timber or reconstituted timber protected externally by a screen that conforms with Clause 5.5.2; or

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(E) for fully framed glazed door panels, the framing shall be made from metal or bushfire resisting timber (see Appendix F) or a timber species as specified in Paragraph E2, Appendix E or uPVC.

(ii) *Door frame material* Door frame materials shall be—

(A) bushfire resisting timber (see Appendix F); or

(B) a timber species as specified in Paragraph E2 of Appendix E; or

(C) metal; or

(D) metal-reinforced uPVC. The reinforcing members shall be made from aluminium, stainless steel, or corrosion-resistant steel.

(iii) *Hardware* There are no specific requirements for hardware at this BAL level.

(iv) *Glazing* the glazing shall be Grade A safety glass a minimum of 4 mm in thickness, or glass blocks with no restriction on glazing methods.

NOTE: Where double glazed units are used the above requirements apply to the external face of the window assembly only.

(v) *Seals and weather strips* Weather strips, draft excluders or draft seals shall be installed.

(vi) *Screens* There are no requirements to screen the openable part of the door at this BAL level.

(vii) Doors shall be tight-fitting to the door frame and to an abutting door, if applicable.

5.5.5 Doors—Sliding doors

Sliding doors shall—

(a) be completely protected by a bushfire shutter that conforms with Clause 3.7 and Clause 5.5.1;

or

(b) be completely protected externally by screens that conform with Clause 3.6 and Clause 5.5.2; or

(c) conform with the following:

(i) *Frame material* The material for door frames, including fully framed glazed doors, shall be—

(A) bushfire-resisting timber (see Appendix F); or

(B) a timber species as specified in Paragraph E2, Appendix E; or

(C) metal; or

(D) metal-reinforced uPVC and the reinforcing members shall be made from aluminium, stainless steel, or corrosion-resistant steel.

(ii) *Hardware* There are no specific requirements for hardware at this BAL level.

(iii) *Glazing* Where doors incorporate glazing, the glazing shall be grade A safety glass a minimum of 4 mm in thickness.

(iv) *Seals and weather strips* There are no specific requirements for seals and weather strips at this BAL level.

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(v) *Screens* There is no requirement to screen the openable part of the sliding door at this BAL level.

(vi) *Sliding panels* Sliding panels shall be tight-fitting in the frames.

5.5.6 Doors—Vehicle access doors (garage doors)

The following applies to vehicle access doors:

(a) The lower portion of a vehicle access door that is within 400 mm of the ground when the door is closed (see Figure D4, Appendix D) shall be made from—

(i) non-combustible material; or

(ii) bushfire-resisting timber (see Appendix F); or

(iii) fibre-cement sheet a minimum of 6 mm in thickness; or

(iv) a timber species as specified in Paragraph E1, Appendix E; or

(v) a combination of any of Items (i), (ii), (iii) or (iv).

(b) All vehicle access doors shall be protected with suitable weather strips, draught excluders, draught seals or brushes. Door assemblies fitted with guide tracks do not need edge gap protection.

NOTES:

1 Refer to AS/NZS 4505 for door types.

2 Gaps of door edges or building elements should be protected as per Section 3.

C5.5.6(b) These guide tracks do not provide a direct passage for embers into the building.

(c) Vehicle access doors with ventilation slots shall be protected in accordance with Clause 3.6.

5.6 ROOFS (INCLUDING PENETRATIONS, EAVES, FASCIAS AND GABLES, AND GUTTERS AND DOWNPIPES)

5.6.1 General

The following applies to all types of roofs and roofing systems:

(a) Roof tiles, roof sheets and roof-covering accessories shall be non-combustible.

(b) The roof/wall and roof/roof junction shall be sealed or otherwise protected in accordance with Clause 3.6.

(c) Roof ventilation openings, such as gable and roof vents, shall be fitted with ember guards made of non-combustible material or a mesh or perforated sheet conforming with Clause 3.6 and, made of corrosion-resistant steel, bronze or aluminium.

(d) Only evaporative coolers manufactured in accordance with AS/NZS 60335.2.98 shall be used. Evaporative coolers with an internal damper to prevent the entry of embers into the roof space need not be screened externally.

5.6.2 Tiled roofs

Tiled roofs shall be fully sarked. The sarking shall—

(a) be located on top of the roof framing, except that the roof battens may be fixed above the sarking;

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(b) cover the entire roof area including ridges and hips; and

(c) extend into gutters and valleys.

5.6.3 Sheet roofs

Sheet roofs shall—

(a) be fully sarked in accordance with Clause 5.6.2, except that foil-backed insulation blankets may be installed over the battens; or

(b) have any gaps sealed at the fascia or wall line, hips and ridges by—

(i) a mesh or perforated sheet that conforms with Clause 3.6 and that is made of corrosion-resistant steel, bronze or aluminium; or

(ii) mineral wool; or

(iii) other non-combustible material; or

(iv) a combination of any of Items (i), (ii) or (iii).

C5.6.3 Sarking is used as a secondary form of ember protection for the roof space to account for minor gaps that may develop in sheet roofing.

5.6.4 Veranda, carport and awning roof

The following applies to veranda, carport and awning roofs:

(a) A veranda, carport or awning roof forming part of the main roof space [see Figure D1(a), Appendix D] shall meet all the requirements for the main roof, as specified in Clauses 5.6.1 to 5.6.6.

(b) A veranda, carport or awning roof separated from the main roof space by an external wall [see Figures D1(b) and D1(c), Appendix D] conforming with Clause 5.4 shall have a non-combustible roof covering, except where the roof covering is a translucent or transparent material.

NOTE: There is no requirement to line the underside of a veranda, carport or awning roof that is separated from the main roof space.

5.6.5 Roof penetrations

The following applies to roof penetrations:

(a) Roof penetrations, including roof lights, roof ventilators, roof-mounted evaporative cooling units, aerials, vent pipes and supports for solar collectors or the like, shall be sealed. The material used to seal the penetration shall be non-combustible.

(b) Openings in vented roof lights, roof ventilators or vent pipes shall conform with Clause 3.6 and be made of corrosion-resistant steel, bronze or aluminium.

This requirement does not apply to a room sealed gas appliance.

NOTE: A gas appliance designed such that air for combustion does not enter from, or combustion products enter into, the room in which the appliance is located.

In the case of gas appliance flues, ember guards shall not be fitted.

NOTE: AS/NZS 5601 contains requirements for gas appliance flue systems and cowls. Advice can be obtained from manufacturers and State and Territory gas technical regulators.

(c) All overhead glazing shall be Grade A safety glass conforming with AS 1288.

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(d) Glazed elements in roof lights and skylights may be of polymer provided a Grade A safety glass diffuser, conforming with AS 1288, is installed under the glazing. Where glazing is an insulating glazing unit (IGU), Grade A toughened safety glass of minimum 4 mm in thickness shall be used in the outer pane of the IGU.

(e) Flashing elements of tubular skylights may be of a fire-retardant material, provided the roof integrity is maintained by an under-flashing of a material having a flammability index not exceeding five.

(f) Evaporative cooling units shall be fitted with non-combustible butterfly closers as close as practicable to the roof level or the unit shall be fitted with non-combustible covers with a mesh or perforated sheet with a maximum aperture of 2 mm, made of corrosion-resistant steel, bronze or aluminium.

(g) Vent pipes made from PVC are permitted.

(h) Eaves lighting shall be adequately sealed and not compromise the performance of the element.

5.6.6 Eaves linings, fascias and gables

The following applies to eaves linings, fascias and gables:

(a) Gables shall conform with Clause 5.4.

(b) Eaves penetrations shall be protected in the same way as roof penetrations, as specified in Clause 5.6.5.

(c) Eaves ventilation openings shall be fitted with ember guards in accordance with Clause 3.6 and made of corrosion-resistant steel, bronze or aluminium.

Joints in eaves linings, fascias and gables may be sealed with plastic joining strips or timber storm moulds.

This Standard does not provide construction requirements for fascias, bargeboards and eaves linings.

5.6.7 Gutters and downpipes

This Standard does not provide material requirements for—

(a) gutters, with the exception of box gutters; and

(b) downpipes.

If installed, gutter and valley leaf guards shall be non-combustible.

Box gutters shall be non-combustible and flashed at the junction with the roof with non-combustible material.

5.7 VERANDAS, DECKS, STEPS AND LANDINGS

5.7.1 General

Decking may be spaced.

There is no requirement to enclose the subfloor spaces of verandas, decks, steps, ramps or landings.

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C5.7.7 Spaced decking is nominally spaced at 3 mm (in accordance with standard industry practice); however, due to the nature of timber decking with seasonal changes in moisture content, that spacing may range from 0 mm–5 mm during service. It should be noted that recent research studies have shown that gaps at 5 mm spacing afford opportunity for embers to become lodged in between timbers, which may contribute to a fire. Larger gap spacing of 10 mm may preclude this from happening but such a spacing regime may not be practical for a timber deck.

5.7.2 Enclosed subfloor spaces of verandas, decks, steps, ramps and landings

5.7.2.1 *Materials to enclose a subfloor space*

This Standard does not provide construction requirements for the materials used to enclose a subfloor space except where those materials are less than 400 mm from the ground.

Where the materials used to enclose a subfloor space are less than 400 mm from the ground, they shall conform with Clause 5.4.

5.7.2.2 *Supports*

This Standard does not provide construction requirements for support posts, columns, stumps, stringers, piers and poles.

5.7.2.3 *Framing*

This Standard does not provide construction requirements for the framing of verandas, pergolas, decks, ramps or landings (i.e. bearers and joists).

5.7.2.4 *Decking, stair treads and the trafficable surfaces of ramps and landings*

This Standard does not provide construction requirements for decking, stair treads and the trafficable surfaces of ramps and landings that are more than 300 mm from a glazed element.

Decking, stair treads and the trafficable surfaces of ramps and landings less than 300 mm (measured horizontally at deck level) from glazed elements that are less than 400 mm (measured vertically) from the surface of the deck (see Figure D2, Appendix D) shall be made from—

(a) non-combustible material; or

(b) bushfire-resisting timber (see Appendix F); or

(c) a timber species as specified in Paragraph E1, Appendix E; or

(d) uPVC; or

(e) a combination of any of Items (a), (b), (c) or (d).

5.7.3 Unenclosed subfloor spaces of verandas, decks, steps, ramps and landings

5.7.3.1 *Supports*

This Standard does not provide construction requirements for support posts, columns, stumps, stringers, piers and poles.

5.7.3.2 *Framing*

This Standard does not provide construction requirements for the framing of verandas, decks, ramps or landings (i.e. bearers and joists).

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5.7.3.3 *Decking, stair treads and the trafficable surfaces of ramps and landings*

This Standard does not provide construction requirements for decking, stair treads and the trafficable surfaces of ramps and landings that are more than 300 mm from a glazed element.

Decking, stair treads and the trafficable surfaces of ramps and landings less than 300 mm (measured horizontally at deck level) from glazed elements that are less than 400 mm (measured vertically) from the surface of the deck (see Figure D2, Appendix D) shall be made from—

(a) non-combustible material; or

(b) bushfire-resisting timber (see Appendix F); or

(c) a timber species as specified in Paragraph E1, Appendix E; or

(d) a combination of any of Items (a), (b) or (c) above.

5.7.4 Balustrades, handrails or other barriers

This Standard does not provide construction requirements for balustrades, handrails and other barriers.

5.7.5 Veranda posts

Veranda posts—

(a) shall be timber mounted on galvanized mounted shoes or stirrups with a clearance of not less than 75 mm above the adjacent finished ground level; or

(b) less than 400 mm (measured vertically) from the surface of the deck or ground (see Figure D2, Appendix D) shall be made from—

(i) non-combustible material; or

(ii) bushfire-resisting timber (see Appendix F); or

(iii) a timber species as specified in Paragraph E1, Appendix E; or

(iv) a combination of any of Items (a) or (b).

5.8 WATER AND GAS SUPPLY PIPES

Above-ground, exposed water supply pipes shall be metal.

External gas pipes and fittings above ground shall be of steel or copper construction having a minimum wall thickness in accordance with gas regulations or 0.9 mm whichever is the greater. The metal pipe shall extend a minimum of 400 mm within the building and 100 mm below ground.

NOTE: Refer to State and Territory gas regulations, AS/NZS 5601.1 and AS/NZS 4645.1.

C5.8 Concern is raised for the protection of bottled gas installations. Location, shielding and venting of the gas bottles needs to be considered.