7 Ryrie Street, Healesville, Victoria.

Bushfire Management Statement for a proposed development

Report for

Meenks Ink Design

May 2024

BeaconEcological

ACKNOWLEDGEMENTS

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

- **Paul Meenks** (Meenks Ink Design) for site and project information

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Cover Photo: Existing dwelling at 7 Ryrie Street, Healesville.

Beacon Ecological acknowledges and pays respect to the past, present and future Traditional Custodians and Elders of this nation, particularly the Wurundjeri People on whose land the field visit took place, 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 Meenks Ink Design to undertake a Bushfire Attack Level assessment and prepare a Bushfire Management Statement for a proposed development at 7 Ryrie Street, Healesville, Victoria. A second dwelling is proposed at the site which supports an existing dwelling.

This document details fire related threats to the proposed development and includes responses to legislative requirements regarding development in areas covered by the Bushfire Management Overlay.

Bushfire Management Statement Requirements

The proposed development is for a second dwelling within Neighbourhood Residential Zone (NRZ2), and as such Clause 53.02-4 applies. Development requirements are as follows:

- The proposed dwelling will be built to Bushfire Attack Level (BAL) 12.5 with defendable space to the property boundary to all aspects.
- A static water supply of 10,000 litres for CFA use is required with CFA access and fittings required.
- Access that meets minimum CFA requirements will be provided.

Additional details of requirements under the BMO objectives and measures are provided in Section 5 of this report.

1 INTRODUCTION

Beacon Ecological was engaged by Meenks Ink Design to undertake a Bushfire Attack Level assessment and prepare a Bushfire Management Statement for a proposed development at 7 Ryrie Street, Healesville, Victoria. A second dwelling is proposed at the site which supports an existing dwelling.

This assessment is required as the property is located within a Bushfire Management Overlay (BMO) under the Yarra Ranges Shire Council Planning Scheme (DEECA 2023a). This document details fire related threats to the proposed development and includes responses to legislative requirements regarding development in areas covered by the BMO.

1.1 PROPOSAL

A second dwelling is proposed at the site which supports an existing dwelling.

2 METHODOLOGY

Methodologies detailed below were used to satisfy the following application requirements under the BMO under Clause 53.02-4:

1. A Bushfire Hazard Site Assessment
2. A bushfire Hazard Landscape Assessment
3. A Bushfire Management Statement.

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 (DEECA 2023a).
- **Nature Kit** for bushfire history of the local area (DEECA 2023b).
- **Google maps** for aerial photos of the study area and surrounds.

Other relevant literature, including planning provisions in clauses 44.06 and 53.02 relating to the Bushfire Management Overlay, The *Australian Standard. Construction in bushfire prone areas AS 3959 -2018* (Australian Standards 2018) and practice notes published by the Country Fire Authority (CFA) were also reviewed as part of the investigation. These include:

- *Planning Permit Applications. Bushfire Management Overlay. Technical Guide. Planning For Bushfire* (DELWP 2017a).
- *Planning For Bushfire. Guidelines for meeting Victoria's bushfire planning requirements* (CFA 2012).
- *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 14 August 2023 to complete the Bushfire Hazard Site Assessment and Bushfire Hazard Landscape Assessment.

2.3 BUSHFIRE HAZARD SITE ASSESSMENT

Land within 150 metres of 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 *Practice Note 65 Preparing and Assessing a Planning Application Under the Bushfire Provisions in Planning Schemes* (DELWP 2017a). 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 Tables 2 or 3 from clause 53.02was 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 (Plate 1), (DELWP 2017a). 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.

In some instances where the slope under vegetation is greater than 20°, Method 2 calculations were used to determine the BAL and defendable space. Fuel loads of the vegetation were determined in accordance with *Overall fuel hazard assessment guide* (DSE 2010) and the *CSIRO BAL Method 2 calculator* used to calculate defendable space distances

Plate 1. Bushfire Attack Levels (BAL) and hazards associated with bushfire threats (Source: DELWP 2017a)

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 (DELWP 2017a). See Plate 2 for a diagram of defendable space and Appendix 1 for vegetation management requirements.

Plate 2. Defendable space around a proposed construction (Source: DELWP 2017a).

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 4 for construction requirements associated with this development.

2.4 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).

2.5 BUSHFIRE MANAGEMENT STATEMENT

The Bushfire Management Statement describes how the proposed development responds to the requirements of clauses 44.06 and 53.02 of the BMO. The planning provisions related to the BMO are contained in clause 44.06 – Bushfire Management Overlay of the planning scheme. Specific objectives approved measures, alternative measures and decision guidelines are set out in clause 53.02 of the planning scheme and these inform decisions under the BMO (DELWP 2017a).

Clause 53.02-3 provides a streamlined process for preparing and assessing planning applications and relates to proposals with only one dwelling located within land zoned Neighbourhood Residential Zone, General Residential Zone, Residential Growth Zone, Urban Growth Zone, Low Density Residential Zone, Township Zone or Rural Living Zone. This clause provides one objective *Dwellings in existing settlements – Bushfire protection objective* that has approved measures that must be met.

Clause 53.02-4 applies to all other applications including an application that does not meet all the approved measures to be assessed under 53.02.1. This clause includes three objectives:

1. *53.02-4.1 Landscape, siting and design objectives;*
2. *53.02-4.2 Defendable space and construction objective; and,*
3. *53.02-4.3 Water supply and access objectives.*

These objectives contain approved and alternative measures required to meet the objectives. Approved measures are those that are considered to meet the objective. Alternative measures may be considered where the responsible authority is satisfied that the objective can be met. The responsible authority may consider other unspecified alternative measures (DELWP 2017a).

2.6 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 7 Ryrie Street, Healesville, Victoria (Figure 1).

Property shape, dimensions, size, orientation and contours:

The property is an approximately 1,032 square metre rectangular shaped block, supporting a dwelling and garden areas. The property and 150 metre assessment area slopes gently to the northwest.

The property is located within Neighbourhood Residential Zone (NRZ2) of the Yarra Ranges Shire Council planning scheme and is covered by the Bushfire Management Overlay (BMO1), Significant Landscape Overlay (SLO22) and Design and Development Overlay (DDO6), (DEECA 2023a).

Existing vehicle access arrangements: Access exists from Ryrie Street in the south of the site. Ryrie Street 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

No classifiable vegetation types were noted within the 150 metre assessment area (Figure 2). The 150 metre assessment area is dominated by Low threat vegetation. See below for a description of this vegetation type and how the classification was determined.

Excludable vegetation: The entire assessment area comprises managed vegetation and is considered excludable, low threat vegetation (Figure 2, Plate 5). These areas are excluded from classification in accordance with section 2.2.3.2 of AS 3959-2018 as they are:

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

2. Low threat vegetation, including grassland managed in a minimal fuel condition, maintained lawns, golf courses, maintained public reserves and parklands, vineyards, orchards, cultivated gardens, commercial nurseries, nature strips and windbreaks (Standards Australia, 2018).

Plate 3. Low threat vegetation within the assessment area.

3.3 BUSHFIRE ATTACK LEVEL FOR THE PROPOSED DEVELOPMENT

The dwelling location allows for Low Threat Vegetation defendable space. The dwelling will be constructed to a BAL 12.5.

Defendable space requirements have been taken from Low Threat Vegetation from Table 2 to Clause 53.02-5 and is contained wholly to the property boundary.

See Table 2 below 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 3.

Table 2. Development BAL and Defendable space requirements.

Orientation	Highest threat vegetation	Slope under classifiable vegetation	Defendable space width	Defendable Space from Table 2 to Clause 53.02-5	Construction BAL
Northwest	Low Threat Vegetation	Flat/upslope	Property boundary*	Low Threat Vegetation (Property boundary)	12.5
Southwest	Low Threat Vegetation	Downslope 0°-5°	Property boundary*	Low Threat Vegetation (Property boundary)	12.5
Southeast	Low Threat Vegetation	Flat/upslope	Property boundary*	Low Threat Vegetation (Property boundary)	12.5
Northeast	Low Threat Vegetation	Flat/upslope	Property boundary*	Low Threat Vegetation (Property boundary)	12.5

Notes:

*For low threat vegetation, defendable space is to be provided for a distance of 50 metres, or the property boundary whichever is the lesser, for buildings constructed to all bushfire attack levels. The minimum construction standard is BAL 12.5.

4 BUSHFIRE HAZARD LANDSCAPE ASSESSMENT

4.1 VEGETATION EXTENT OF THE BROADER LOCALITY

The local landscape is dominated by managed vegetation within residential areas of Healesville. The broader landscape comprises relatively intact native vegetation within the Yarra Ranges National Park approximately 4.5 kilometre to the west and various State Forests approximately five kilometres to the north. Grazed pasture is beyond the Healesville township to the west and south and a mix of pasture and remnant vegetation within private property beyond the Healesville township to the north (Figure 3).

4.2 THE ROAD NETWORK

The proposed development is located with direct access to a sealed two-lane road that meets CFA access requirements.

4.3 PROXIMITY OF THE SITE TO LOW THREAT LOCATIONS

The nearest neighbourhood safer place is the Healesville Safer Neighbourhood Place at Queens Park, Bounded by Don Road, Maroondah Highway and Badger Creek Road, approximately 1.9 kilometres to the west (Four minutes by vehicle) . However, in case of a bushfire event the property could be used as a place of shelter considering the managed nature of the neighbourhood.

4.4 BUSHFIRE HISTORY

The local area has been subject to moderate bushfire activity since 1970 with the exception of the extreme Black Saturday fires in 2009 which came to within approximately three kilometres of the property to the north within the Yarra Ranges and also included several large grass fires approximately five kilometres to the west (DEECA 2023b). See Figure 4 for a map of previous bushfires.

The local area, particularly to the north, and east have been subject to numerous prescribed burns within the Yarra Ranges National Park (DEECA 2023b).

The nature of the landscape topography, vegetation and land uses provides different potential bushfire approaches to the site. These are outlined below and in Figure 3.

Scenario 1. Northerly winds are often associated with high threat fire conditions. There is potential for large fires to build up from the northwest or northeast of the site through intact areas of native vegetation in state forests and the Yarra Ranges National Park. These areas support large areas of high fuel load forest vegetation and steep topography with potential for extreme fire conditions. Significant ember attack and spotting may be expected from this direction in the case of a large fire front. The bushfire threat from this aspect is moderated through modified landscapes closer to the subject site supporting mixed fuel loads dominated by pasture and then the Healesville township.

Scenario 2. In some instances northerly winds can change to the west or southwest on hot, high fire threat days. This can create a large fire front if a fire has had a long run during northerly winds. The long eastern edge of the fire becomes the new fire front if the wind changes to the west or southwest creating a large

established fire. Significant ember attack and spotting may be expected from these directions in the case of a large fire front. The bushfire threat from this aspect is moderated through modified landscapes closer to the subject site supporting mixed fuel loads dominated by pasture and then the Healesville township.

4.5 LANDSCAPE TYPE

The surrounding landscape characteristics are indicative of **Broader Landscape Type Two** as per *Planning Permit Applications. Bushfire Management Overlay. Technical Guide* (DELWP 2017a). The site meets all of the criteria of Landscape Type 2. See justification in Table 2 below.

Table 3. Broader Landscape type

Broader Landscape Type 2 Descriptor	Response	Description met
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.	Areas close to the relatively intact native vegetation within the Yarra Ranges and State Forests may result in neighbourhood scale destruction.	✓
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.	While bushfire can approach from the north and west, the site is located in a suburban, township or urban area managed in a minimum fuel condition.	✓
Access is readily available to a place that provides shelter from bushfire. This will often be the surrounding developed area.	The surrounding developed area can provide shelter from bushfire.	✓

5 BUSHFIRE MANAGEMENT STATEMENT

Clause 53.02 contains a range of sub clauses with objectives, approved measures, alternative measures and decisions guidelines. Table 3 below details which clauses are relevant to this application. The following section demonstrates how the requirements have been met for the relevant standards.

Table 3. Relevant clauses and measures applicable to the proposed development

Clause	Measure	Achieved	Justification
Clause 53.02-1 Dwellings in existing settlements – Bushfire protection objective	AM 1.1	Not Applicable	The proposed development is not within land zoned Neighbourhood Residential Zone, General Residential Zone, Residential Growth Zone, Urban Growth Zone, Low Density Residential Zone, Township Zone or Rural Living Zone
	AM 1.2	Not Applicable	
	AM 1.3	Not Applicable	
Clause 53.02-4.1 Landscape, siting and design objectives	AM 2.1	Achieved	This development must address this clause.
	AM 2.2	Achieved	
	AM 2.3	Achieved	
Clause 53.02-4.2 Defendable space and construction objectives	AM 3.1	Achieved	The proposed development meets this clause
	AM 3.2	Not applicable	The proposed development is for a dwelling
	AltM 3.3	Not Applicable	Approved measure 3.1 can be achieved. These alternative measures are not required.
	AltM 3.4	Not Applicable	
	AltM 3.5	Not Applicable	
	AltM 3.6	Not Applicable	
Clause 53.02-4.3 Water supply and access objectives	AM 4.1	Achieved	This development must address this clause.
	AM 4.2	Not Applicable	The proposed development is for a dwelling
Clause 53.02-4.4 Subdivision objectives	AM 5.1	Not Applicable	This application is not a subdivision.
	AM 5.2	Not Applicable	
	AM 5.3	Not Applicable	
	AM 5.4	Not Applicable	
	AltM 5.5	Not Applicable	

Notes: AM – Approved Measure, AltM – Alternative measure

CLAUSE 53.02-4.1 LANDSCAPE, SITING AND DESIGN OBJECTIVES

Development is appropriate having regard to the nature of the bushfire risk arising from the surrounding landscape.

Development is sited to minimise the risk from bushfire.

Development is sited to provide safe access for vehicles, including emergency vehicles.

Building design minimises vulnerability to bushfire attack.

APPROVED MEASURES

Measure	Requirement
AM 2.1	**The bushfire risk to the development from the landscape beyond the site can be mitigated to an acceptable level.** ***Response:*** While the development is located within a lower bushfire threat area (Landscape Type Two), the bushfire risk is further reduced to an acceptable level as the development is: • Able to meet all Bushfire Management Overlay approved measures. • In a location dominated by Low Threat vegetation and able to provide BAL 12.5 construction requirements. • In a location where access to the site is provided via a trafficable road that meets CFA access requirements.
AM 2.2	**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.** ***Response:*** The siting of the dwelling has considered bushfire risk by: • While there are no bushfire risks in the immediate vicinity, the proposed development is within close proximity of a public road with a driveway of approximately 30 metres. The driveway provides adequate access for CFA emergency vehicles.
AM 2.3	**A building is designed to reduce the accumulation of debris and entry of embers.** ***Response:***

Measure	Requirement
	• The building is simple in design and the design minimises the use of re-entrant corners, complex roof lines, gaps between building materials (walls and roof) and unenclosed underfloor space to reduce vulnerability to ember attack. • Any landscaping will follow *Landscaping for Bushfire. Garden Design and Plant Selection* (CFA 2011).

CLAUSE 53.02-4.2 DEFENDABLE SPACE AND CONSTRUCTION OBJECTIVE

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

APPROVED MEASURES

Measure	Requirement
AM 3.1	**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 defendable space in accordance with:** • **Table 2 Columns A, B or C and Table 6 to Clause 53.02-5 wholly within the title boundaries of the land; or** • **If there are significant siting constraints, Table 2 Column D and Table 6 to Clause 53.02-5.** **The building is constructed to the bushfire attack level that corresponds to the defendable space provided in accordance with Table 2 to Clause 53.02-5.** ***Response:*** **Dwelling:** The dwelling location allows for a defendable space for property boundary as per Low Threat Vegetation from Table 2 to Clause 53.02-5. The dwelling will be constructed to BAL 12.5

CLAUSE 53.02-4.3 WATER SUPPLY AND ACCESS OBJECTIVES

A static water supply is provided to assist in protecting property.

Vehicle access is designed and constructed to enhance safety in the event of a bushfire.

APPROVED MEASURES

Measure	Requirement
AM 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 fire fighting 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 fire fighting water supplies.** ***Response:*** **Static Water Supply:** A static water supply of 10,000 litres must be provided for CFA use to the following specifications: • Be stored in an above ground water tank constructed of concrete or metal. • Have all fixed above ground water pipes and fittings required for firefighting purposes made of corrosive resistant metal. • Include a separate outlet for occupant use. • Be readily identifiable from the building or appropriate identification signs 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). **Access:** The following design and construction requirements apply: • All-weather construction. • A load limit of at least 15 tonnes. • Provide a minimum trafficable width of 3.5 metres. • Be clear of encroachments for at least 0.5 metres on each side and at least 4 metres vertically.

	• Curves must have a minimum inner radius of 10 metres. • The average grade must be no more than 1 in 7 (14.4%) (8.1°) with a maximum grade of no more than 1 in 5 (20%) (11.3°) for no more than 50 metres. • Dips must have no more than a 1 in 8 (12.5 per cent) (7.1 degrees) entry and exit angle.

6 FIGURES

FIGURE 1. LOCATION OF THE PROPERTY

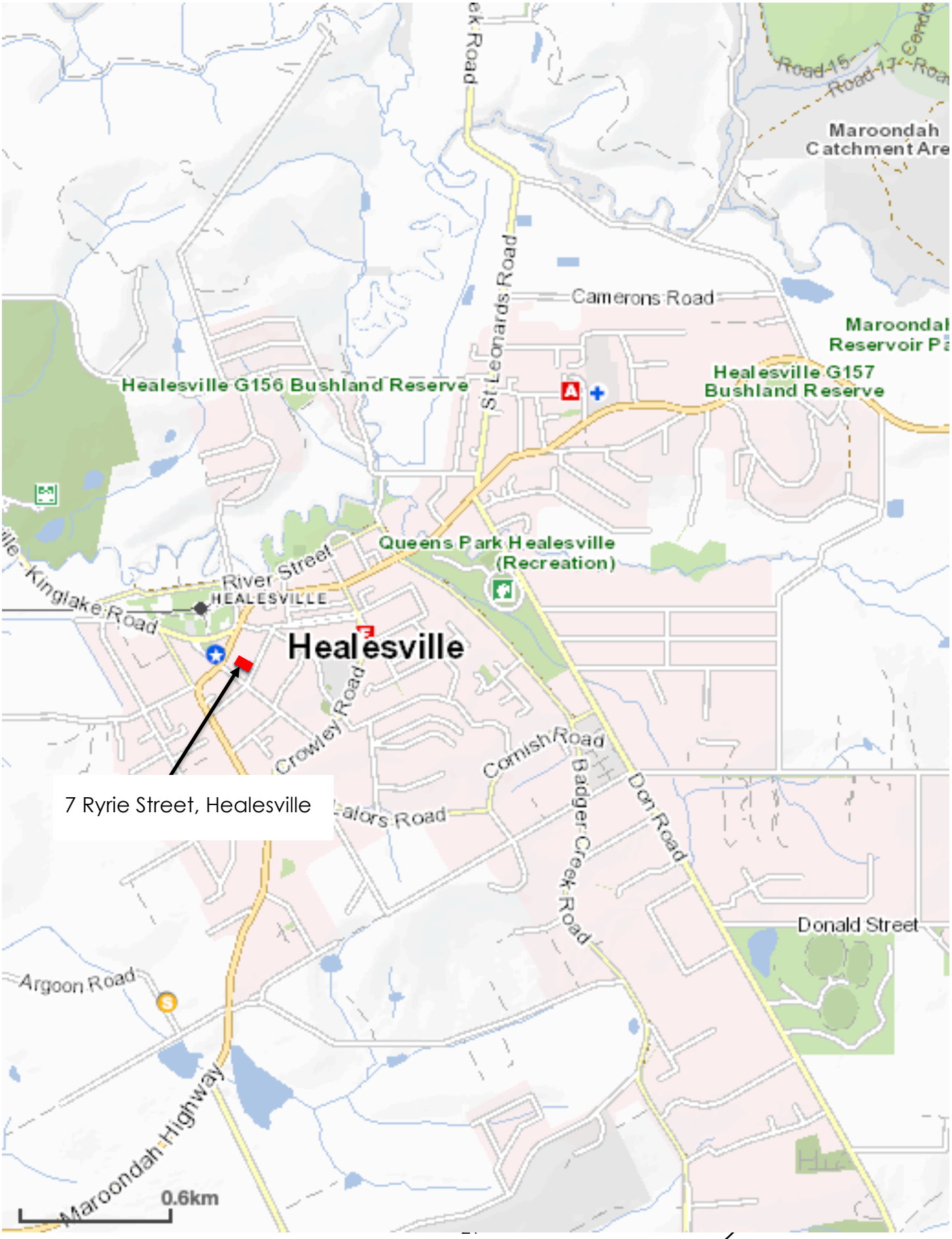


FIGURE 2. BUSHFIRE SITE HAZARD AND REASONABLE SITING OPTION PLAN

Legend

- 150 Assessment area
- Property Boundary
- Proposed dwelling

FIGURE 3. BUSHFIRE HAZARD LANDSCAPE ASSESSMENT

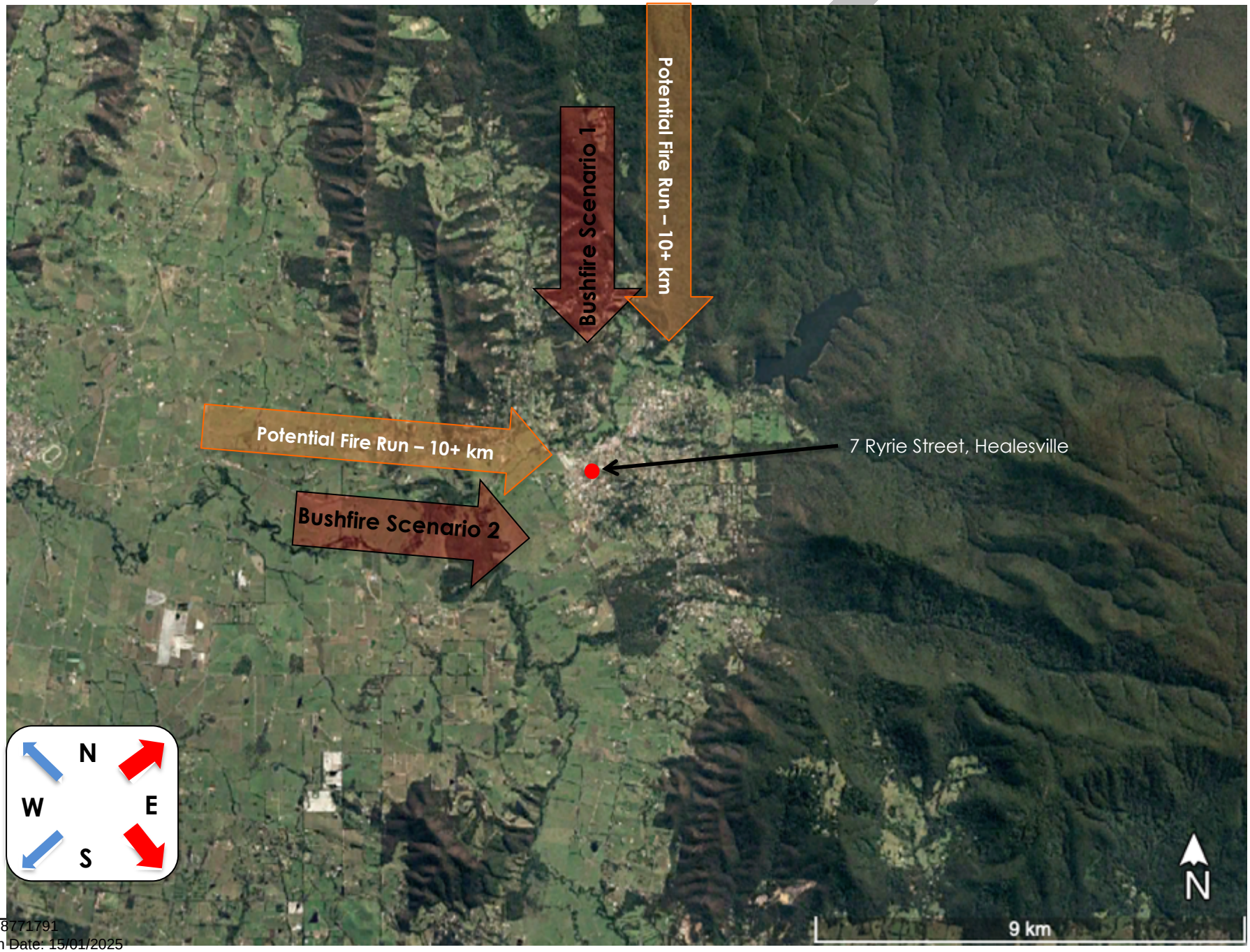
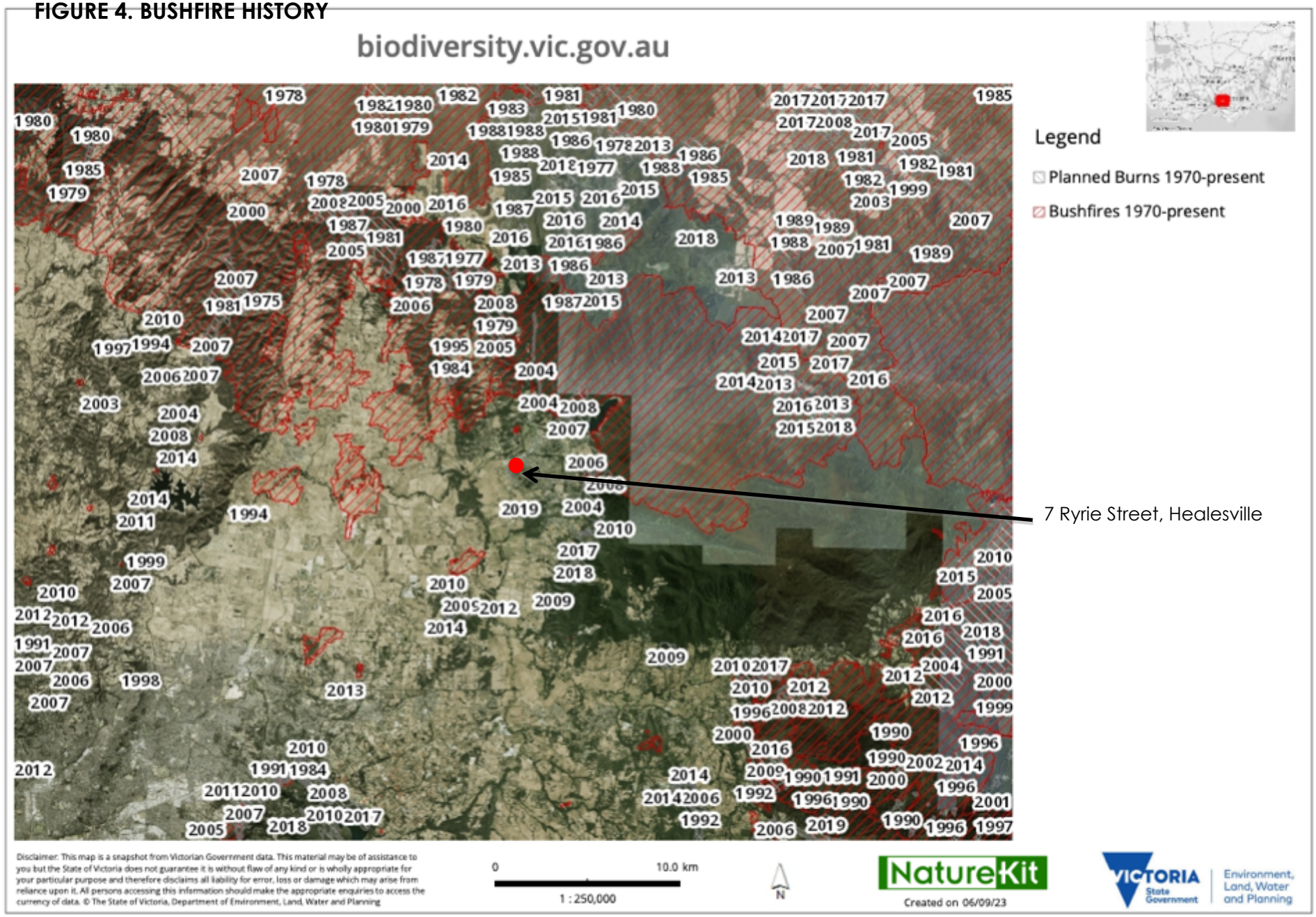


FIGURE 4. BUSHFIRE HISTORY



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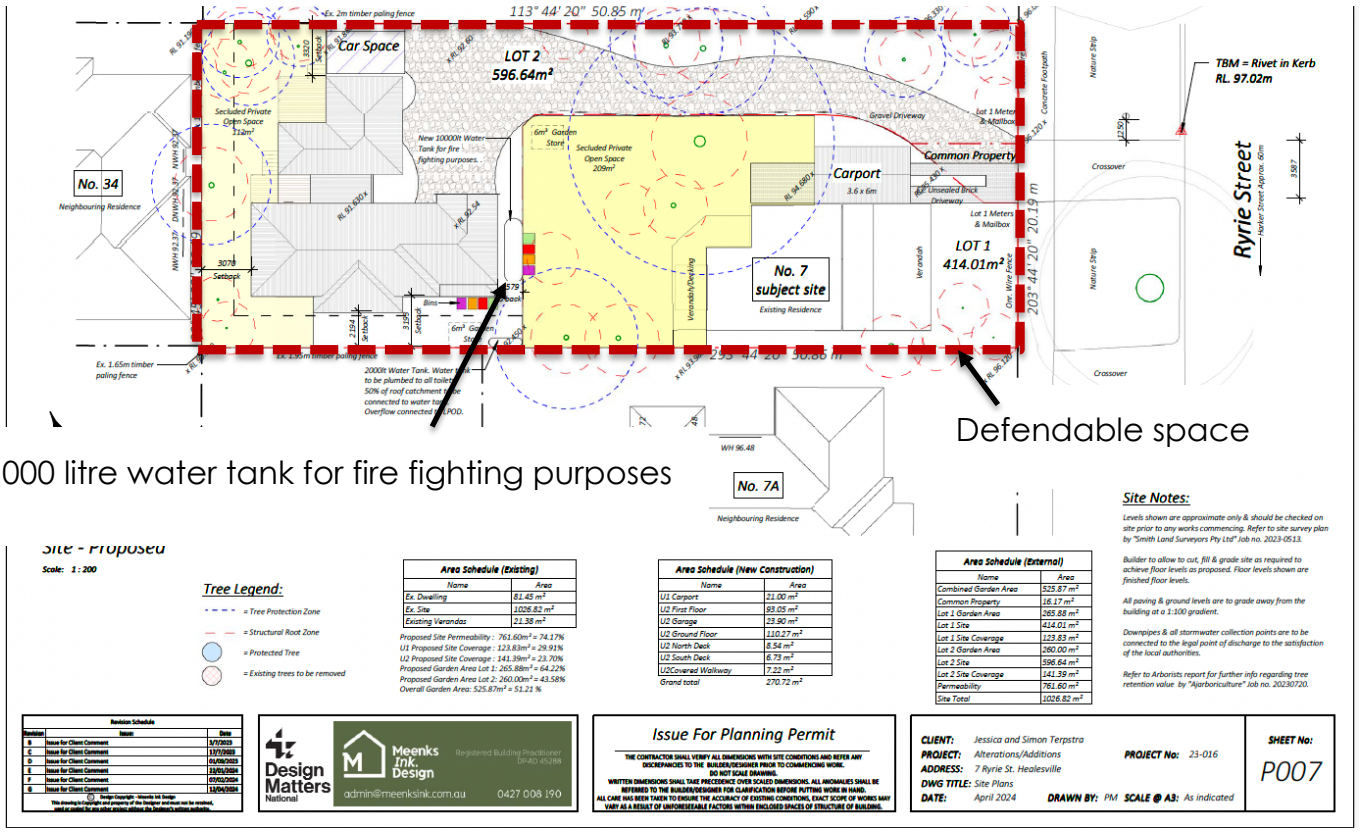
APPENDICES

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.
- Trees must not overhang or touch any elements of the building.
- The canopy of trees must be separated by at least 2 metres.
- 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 7 RYRIE STREET, HEALESVILLE



Bushfire Management Overlay Requirements

Construction Requirements

The proposed dwelling will be built to Bushfire Attack Level (BAL) 12.5.

Defendable Space Management:
Defendable space is to be provided to the property boundary to all aspects.
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 metres of a window or glass feature of the building.
- Shrubs must not be located under the canopy of trees.
- Individual and clumps of shrubs must not exceed 5 square metres in area and must be separated by at least 5 metres.
- Trees must have a canopy separation of at least two (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.

Access: The following design and construction requirements apply:

- All-weather construction.
- A load limit of at least 15 tonnes.
- Provide a minimum trafficable width of 3.5 metres.
- Be clear of encroachments for at least 0.5 metres on each side and at least 4 metres vertically.
- Curves must have a minimum inner radius of 10 metres.
- The average grade must be no more than 1 in 7 (14.4%) (8.1°) with a maximum grade of no more than 1 in 5 (20%) (11.3°) for no more than 50 metres.
- Dips must have no more than a 1 in 8 (12.5 per cent) (7.1 degrees) entry and exit angle.

Water Supply For Fire Fighting Purposes

A static water supply of 10,000 litres must be provided for CFA use to the following specifications:

- Be stored in an above ground water tank constructed of concrete or metal.
- Have all fixed above ground water pipes and fittings required for firefighting purposes made of corrosive resistant metal.
- Include a separate outlet for occupant use.
- Be readily identifiable from the building or appropriate identification signs 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).

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).

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(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).

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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.