LEC
Land and environment consultants

Bushfire management plan

Proposed development | 10 Honeyeater Circuit | Oxley | Queensland
Prepared for Honeycombes Developments Pty Ltd | 24 August 2024

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Bushfire management plan

Final

Report 24082 | Honeycombes Developments Pty Ltd | 24 August 2024

Approved by Robert Janssen

Position Managing principal

Signature 

Date 24 August 2024

Document control

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Draft	31 July 2024	R. Janssen	LEC
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Disclaimer

Notwithstanding the precautions adopted in this report, it should always be remembered that bushfires burn under a range of conditions. An element of risk, no matter how small always remains, and although AS 3959-2018 is designed to improve the performance of such buildings, there can be no guarantee, because of the variable nature of bushfires, that any building will withstand bushfire attack on every occasion.

It should be noted that upon lodgement of a development proposal, State Government, council and/or the fire service may recommend additional construction requirements.

Although every care has been taken in the preparation of this report, Land and Environment Consultants Pty Ltd accept no responsibility resulting from the use of the information in this report.

1 Introduction

Land and Environment Consultants Pty Ltd (**LEC**) was engaged to prepare a bushfire management plan (**BMP**) for the proposed material change of use – multiple dwellings (**proposed development**) at 10 Honeyeater Circuit, Oxley (**the site**), properly described as lot 302/SP326512.

A priority development area (**PDA**) development application will be made for the proposed development under the *Oxley Priority Development Area Development Scheme* (DSDMIP 2019). Economic Development Queensland (**EDQ**) will be the assessment authority.

The site is identified as a bushfire hazard area by the Queensland State Planning Policy (**SPP**) *Bushfire prone area map* (**Bushfire prone area map**). Therefore, the development application for the proposed development is subject to compliance with the example bushfire overlay code (**Bushfire overlay code**) in the *Natural Hazards, Risk and Resilience – Bushfire, State Planning Policy State Interest guidance material* (DSDMIP 2019) (**SPP guidance material – bushfire**).

This BMP has been prepared in general accordance with *Bushfire Resilient Communities Technical Reference Guide for the State Planning Policy State Interest 'Natural Hazards, Risk and Resilience – Bushfire'* (QFES 2019a) (**BRC guide**) which was prepared by the Queensland Fire and Emergency Services to provide technical guidance for the implementation of SPP guidance material – bushfire.

This BMP documents the bushfire hazard assessment and demonstrates how the proposed development will comply with the Bushfire overlay code. It includes:

- an introduction (this section) and description of methods and information resources used for the preparation of this BMP;
- description of the site and proposed development;
- bushfire hazard assessment;
- identification of bushfire hazards associated with the site and proposed development;
- a plan for mitigating bushfire hazards; and
- assessment of the proposed development against the Bushfire overlay code.

1.1 Method

To meet requirements of the SPP guidance material - bushfire and the BRC guide, the following tasks were undertaken:

- review of the approved bushfire management plans and radiant heat flux modelling for the PDA development applications for the Oxley PDA – EDQ reference DEV2020/1099 and DEV2021/1191, which established the lot where the proposed development will occur;
- bushfire hazard assessment in general accordance with the method in the BRC guide; and
- assessment of the proposed development against the Bushfire overlay code.

Aerial imagery of the site and measuring tools were accessed online from Google Earth and Queensland Globe to assist with validating observations and measurements made during the site assessment.

1.2 Suitably qualified person

This BMP was prepared by Robert Janssen who is a suitably qualified and experienced bushfire management consultant.

Robert is the managing principal at LEC and has over 25 years of experience in bushfire planning and operations. He has prepared bushfire management plans for residential, commercial and industrial property developments, utilities, government facilities and conservation estates.

Robert's formal qualifications as an environmental scientist and consulting experience are coupled with 10 years of experience as a nationally accredited fire-fighter with the national parks and wildlife service in New South Wales and Queensland.

2 Description of the site and proposed development

This chapter provides a description of the site and proposed development.

2.1 Site description

The location of the site is shown in Figure 2.1. The site is 0.97 hectares (**ha**) and is serviced by public roads and mains water.

The site adjoins a drainage reserve to the north, residential subdivision to the south, a drainage reserve and recreation park to the east and a residential care facility to the west.

The bushfire management plan for DEV2020/1099 determined that the source of bushfire hazard in relation to the site comes from the bushland reserve to the north and west of the drainage reserve which adjoins the northern boundary of the site.

2.2 Proposed development

The proposed development involves establishing a townhouse development. The site plan for the proposed development is provided in Appendix 1 and shows the proposed layout of townhouse allotments, community centre, swimming pool, driveways and parking.

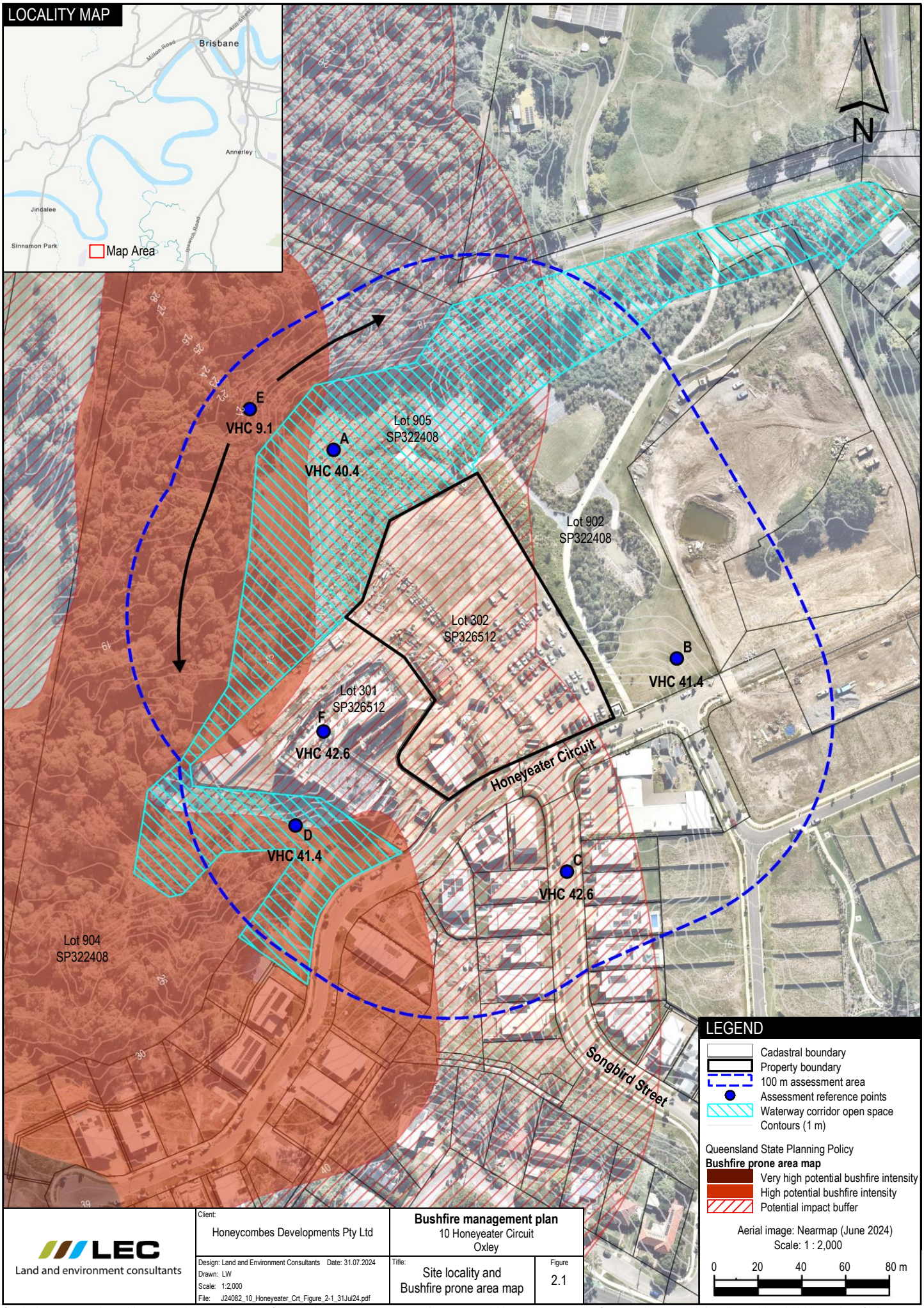
Access and egress for the proposed development will be via a new driveway connection to Honeyeater Circuit.

The proposed development will be connected to mains water and will include an external hydrant system.

2.3 Bushfire prone area map

The Bushfire prone area map for the site is shown in Figure 2.1.Verification of the bushfire hazard areas shown in the Bushfire prone area map is provided via the bushfire hazard assessment in Chapter 3.

Please note, in this BMP the term ‘bushfire prone area’ and ‘bushfire hazard area’ have the same meaning. Both terms mean an area of vegetation that is determined to have a potential bushfire intensity ≥ 4,000 kilowatts/m (**kW/m**) and the land within 100 m of this vegetation.



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Client: Honeycombes Developments Pty Ltd

Bushfire management plan
10 Honeyeater Circuit
Oxley

Design: Land and Environment Consultants Date: 31.07.2024
Drawn: LW
Scale: 1:2,000
File: J24082_10_Honeyeater_Crt_Figure_2-1_31Jul24.pdf

Title: Site locality and Bushfire prone area map

Figure 2.1

3 Bushfire hazard assessment

This chapter provides a bushfire hazard assessment for the proposed development.

3.1 Severe fire weather

The 5 % annual exceedance probability forest fire danger index (**FFDI**) for the site is 55. This FFDI value has been used for the potential bushfire intensity calculations in Section 3.4 and the radiant heat exposure assessment in Section 5.6.

3.2 Fire history

Fire history data indicates there have been no bushfires within 1 kilometre (**km**) of the site during the past 20 years.

3.3 Site inspection

A site inspection was undertaken for the bushfire management plan for DEV2020/1099 (**original site inspection**). Observations were recorded about current land use and management, vegetation characteristics, the slope of land and evidence of previous fires.

The locations of assessment reference points used for the bushfire hazard assessment are shown in Figure 2.1. Table 3.1 provides a summary of observations from the original site inspection and notes about the bushfire hazard assessment of assessment reference points. Features of assessment reference points are shown in Photographs 3.1-3.5.

Table 3.1 Site observations

Assessment reference point	Catalyst VHC	VHC	Notes
A	VHC 39.2 *Low to moderate tree cover in built-up areas* (**VHC 39.2**)	VHC 40.4 *Continuous low grass or tree cover* (**VHC 40.4**)	This assessment reference point is aligned with the drainage reserve adjoining the northern boundary of the site. It is landscaped with turf and a combination of reeds, grasses and lilies. The bushfire management plan for DEV2020/1099 assessed the drainage reserve as VHC 40.4.
B	VHC 39.2	VHC 41.4 *Discontinuous low grass or tree cover* (**VHC 41.4**)	This assessment reference point is aligned with the recreation park adjoining the eastern boundary of the site. It is a maintained landscape which has pathways, gardens and areas of lawn. The bushfire management plan for DEV2020/1099 assessed the recreation park as VHC 41.4.
C	VHC 41.4	VHC 42.6 *Nil to very low vegetation cover* (**VHC 42.6**)	This assessment reference point is aligned with the residential subdivision adjoining the southern boundary of the site. It will have nil to very low vegetation cover and was assessed in the bushfire management plan for DEV2020/1099 as VHC 42.6.
D	VHC 9.1 *Moist to dry eucalypt open forests* (**VHC 9.1**)	VHC 41.4	This assessment reference point is an extension of the drainage reserve identified at assessment reference point A. However, it is landscaped with turf and is maintained as lawn. The bushfire management plan for DEV2020/1099 assessed this part of the drainage reserve as VHC 41.4.

Table 3.1 Site observations

Assessment reference point	Catalyst VHC	VHC	Notes
E	VHC 9.1	VHC 9.1	This assessment reference point is aligned with the bushland vegetation that is retained within the conservation open space area. The pre-clear regional ecosystem structure of the bushland vegetation correlates with VHC 9.1.
F	VHC 9.1, VHC 16.1 *Eucalyptus dominated forest on drainage lines and alluvial plains* and VHC 41.4	VHC 42.6	This assessment reference point is aligned with the residential aged care facility adjoining the western boundary of the site which is under construction. It will have nil to very low vegetation cover and is assessed as VHC 42.6.

Photograph 3.1 Example of VHC 40.4 at A

Photograph 3.2 Example of VHC 41.4 at B

Photograph 3.3 Example of VHC 42.6 at C

Photograph 3.4 Example of VHC 41.4 at D

Photograph 3.5 Example of VHC 9.1 at E

3.4 Potential bushfire intensity calculations

The potential bushfire intensity of assessment reference points was determined using the Queensland Public Safety Business Agency *Potential Bushfire Intensity Calculator* (version November 2014) which is an Excel spreadsheet calculator that models the bushfire hazard assessment method in the BRC guide.

The BRC guide defines bushfire hazard classes as follows:

- very high – potential bushfire intensity > 40,000 kW/m;
- high – potential bushfire intensity 20,000-40,000 kW/m;
- medium – potential bushfire intensity 4,000-20,000 kW/m; and
- non-bushfire hazard – potential bushfire intensity < 4,000 kW/m.

Results of the potential bushfire intensity calculations which determine the bushfire hazard class of assessment reference points shown in Figure 2.1 are presented in Table 3.2.

Table 3.2 Potential bushfire intensity

Assessment reference points	VHC	Potential fuel load tonnes/ha[1]	Slope (°)[2]	Potential bushfire intensity (kW/m)	Bushfire hazard class
A	VHC 40.4	5	0	853	Non-bushfire hazard[3]
B	VHC 41.4	3	0	307	Non-bushfire hazard
C	VHC 42.6	2	0	136	Non-bushfire hazard
D	VHC 41.4	3	0	307	Non-bushfire hazard
E	VHC 9.1	24.2	0	19,806	Medium
F	VHC 42.6	2	0	136	Non-bushfire hazard

Notes
1. Potential fuel load taken from the BRC guide.
2. Slope defaults to 0° for VHC 41.4 and VHC 42.6 which are defined in the BRC guide as a low hazard class with discontinuous bushfire fuel.
3. VHC 40.4 is defined in the BRC guide as grassfire prone.

3.5 Bushfire hazard areas

Results of the potential bushfire intensity calculations in Table 3.2 confirm the site is within a bushfire hazard area and are consistent with the bushfire analysis in the bushfire management plan for DEV2020/1099. Therefore, the development application for the proposed development is subject to compliance with the Bushfire overlay code.

4 Bushfire hazards associated with the site

This chapter identifies bushfire hazards associated with the site.

4.1 Fire danger season

The fire danger season at the site starts in August, peaks in September and will begin to fall when consistent summer rainfall occurs. Typically, the worst fire weather conditions will be experienced during the fire danger season when the wind direction is from the north or west.

An FFDI of 55 will be associated with hot, dry and windy conditions. If a bushfire starts and takes hold under these conditions, it will be difficult to control and fast moving in large areas of unmanaged vegetation.

4.2 Fire history

As discussed in Section 3.2, fire history data indicates that no fires have occurred within 1 km of the site during the past 20 years.

4.3 Potential directions of bushfire attack

The proposed development could be exposed to bushfire attack from the north to the north-west where hazardous vegetation occurs, ie from assessment reference point E shown in Figure 2.1. Nonetheless, bushfire attack from assessment reference point E is setback from the site by the drainage reserve, ie assessment reference point A, which has a minimum width of 45 m in this area. Therefore, bushfire attack from assessment reference point E does not need to be further considered in this BMP.

The drainage reserve, ie assessment reference point A, was assessed as a grassfire prone area in Section 3.4. Therefore, grassfire attack from assessment reference point A is further analysed in Section 5.6.

4.4 Potential bushfire hazards from adjacent land uses

Given that the fire history data discussed in Section 4.2 indicates there have been no fires within 1 km of the site during the past 20 years, land uses adjacent to the proposed development are not considered to be a potential bushfire hazard.

4.5 Water and access for emergency services

The site has access to mains water and a public road network which will provide access and egress for emergency services and occupants.

5 Bushfire hazards associated with the proposed development

This chapter identifies potential bushfire hazards associated with the proposed development.

5.1 Siting and design

The proposed development will be designed to mitigate the risk of bushfire hazard determined by the bushfire hazard assessment in this BMP.

Townhouse allotments adjacent to the drainage reserve along the northern boundary of the site, ie assessment reference point A shown in Figure 2.1, will be appropriately separated from the grassfire hazard area.

5.2 Land use

The proposed development does not involve uses defined in Table 7 of the SPP guidance material – bushfire as a vulnerable use, essential community infrastructure or hazardous materials in the context of a bushfire hazard area.

5.3 Landscaping

Landscaping within the site will be designed and maintained to provide a low level of discontinuous bushfire fuel.

In the unlikely event of a bushfire, the design and maintenance of landscaping will prevent spot fires from escalating and compromising buildings and routes for access and egress.

5.4 Fire-fighter water supply

The proposed development will be connected to mains water and will have an external hydrant system.

5.5 Access and egress

The new driveway connection to Honeyeater Circuit and driveway will be designed and constructed to provide efficient access and egress for urban fire trucks.

5.6 Radiant heat exposure

The Bushfire overlay code provides guidance about the acceptable level of radiant heat exposure for development within bushfire hazard areas. It requires development to provide allotment boundaries or building envelopes which are separated from hazardous vegetation by a distance which achieves a radiant heat flux level ≤ 29 kW/m^2 at the boundaries or building envelopes.

As discussed in Section 4.3, the proposed development could be exposed to grassfire attack from assessment reference point A, shown in Figure 2.1. The radiant heat profile of this grassfire attack scenario was analysed in the bushfire management plan for DEV2020/1099. The grassfire attack radiant heat flux model from the bushfire management plan for DEV2020/1099 is provided in Appendix 2. It identifies that building envelopes must be separated from the edge of hazardous vegetation along the northern boundary of the site by 7.1 m to achieve a radiant heat flux level ≤ 29 kW/m^2 at the building envelopes.

6 Bushfire mitigation plan

This chapter identifies mitigation measures that must be implemented as part of the proposed development to comply with the Bushfire overlay code.

It is the total of the mitigation measures in this chapter that will reduce the risk of bushfire hazard to a tolerable level. Failure to implement all actions in their entirety could result in an increased level of exposure to bushfire hazards.

6.1 Asset protection zone

A 7.1 m wide asset protection zone (**APZ**) must be established along the northern boundary of the site as shown in Figure 6.1.

Buildings and structures must not be established within the APZ. The exceptions are a driveway, carpark, pathway, swimming pool, water tank, fence or retaining wall which must be constructed with fire-resisting materials.

Fire-fighters must always have access to the interface of the APZ and the drainage reserve from within the site.

Permanent or long-term storage or stockpiling must not occur within the APZ.

6.2 Landscaping

Landscaping within the site must be designed and maintained in accordance with Part 5 of *Bushfire Resilient Building Guidance for Queensland Homes* (QRA 2020) (**Bushfire resilient building**) which is publicly available online. Plant selection must favour the list of plant species in Appendix E of Bushfire resilient building.

Garden waste and vegetation debris must be removed from landscaped areas at regular time intervals during the calendar year. Grass must be maintained as lawn at a nominal height of < 100 millimetres.

6.3 Fire-fighting water supply

The proposed development must be connected to mains water and have an external hydrant system.

The mains water connection must be in accordance with the local water retailer's specifications for supply and pressure.

The external hydrant system must be designed and constructed in accordance with *Fire Hydrant and Vehicle Access Guidelines for Residential, Commercial and Industrial Lots* (QFES 2019b) (**Fire hydrant and vehicle access guidelines**) which defers to the local water retailer's specifications and the *Australian Standard* (**AS 2419.1-2021**) *Fire hydrant installation, system design, installation and commissioning.*

Where there are differences between the local water retailer's specifications and AS 2419.1-2021, the higher level specification should prevail.

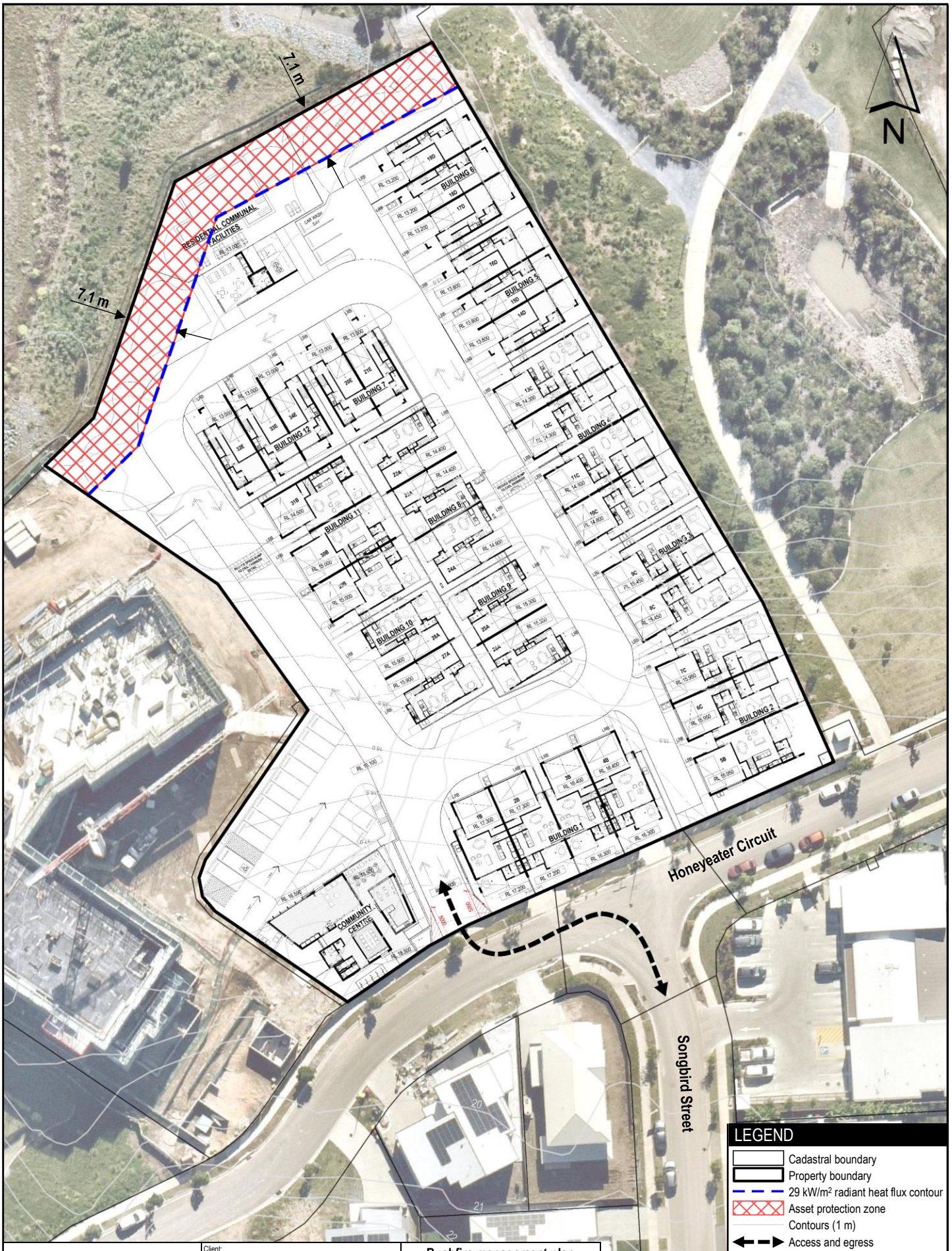
6.4 Access and egress

The new driveway connection to Honeyeater Circuit and driveways must be designed and constructed to provide efficient access and egress for an urban fire truck in accordance with Fire hydrant and vehicle access guidelines which defers to *Road Planning and Design Manual – 2nd Edition* (DTMR 2013) for load bearing capacity, geometry and turning radii.

Access and egress for the proposed development is shown in Figure 6.1

6.5 Service installation

Reticulated services, ie water, electricity, gas and communications, must be installed underground.



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Client:
Honeycombes Developments Pty Ltd

Bushfire management plan
10 Honeyeater Circuit
Oxley

Design: Land and Environment Consultants Date: 23.08.2024
Drawn: LW
Scale: 1:700
File: J24082_10_Honeyeater_Crt_Figure_6-1_23Aug24.pdf

Title: Bushfire mitigation plan

Figure 6.1

7 Conclusion

This BMP was prepared by a suitably qualified person and is in general accordance with the SPP guidance material – bushfire and the BRC guide.

A bushfire hazard assessment determined the site is within a bushfire hazard area and the proposed development is subject to compliance with the Bushfire overlay code.

Mitigation measures that must be implemented as part of the proposed development are specified in Chapter 6. With the implementation of these mitigation measures the proposed development complies with the Bushfire overlay code as demonstrated in Appendix 3.

References

Land and Environment Consultants Pty Ltd (LEC) 2021, *Bushfire management plan – Oxley Parkside, 53 Seventeen Mile Rocks Road, Oxley,* Prepared for Economic Development Queensland, Final V4 August 2022

Queensland Department of Transport and Main Roads (DTMR) 2013, *Road Planning and Design Manual – 2nd Edition*, 2013

Queensland Department of State Development, Manufacturing, Infrastructure and Planning (DSDMIP) 2019, *Natural Hazards, Risk and Resilience – Bushfire, State Planning Policy – state interest guidance material*, December 2019

Queensland Fire and Emergency Service (QFES) 2019a, *Bushfire Resilient Communities Technical Reference Guide for the State Planning Policy State Interest 'Natural Hazards, Risk and Resilience – Bushfire'*, October 2019

Queensland Fire and Emergency Service (QFES) 2019b *Fire Hydrant and Vehicle Access Guidelines for Residential, Commercial and Industrial Lots*, March 2019

Queensland Reconstruction Authority (QRA) 2020, *Bushfire Resilient Building Guidance for Queensland Homes*, July 2020

Standards Australia Limited (Standards Australia) 2021, *Australian Standard 2419.1-2021 – Fire hydrant installation, system design, installation and commissioning*, Sixth edition, September 2021

Standards Australia Limited (Standards Australia) 2018, *Australian Standard 3959-2018 Construction of buildings in bushfire prone areas*, Fourth edition, November 2018

Appendix 1 Proposed site plan

1 SITE PLAN- GFA GROUND FLOOR
1 : 250

NOTES:
REFER REFERENCED DRAWINGS BELOW FOR THE RELEVANT CONSULTANT INFORMATION FOR CIVIL INFRASTRUCTURE, LOT BOUNDARIES, LANDSCAPE DETAILS, LEVELS AND FALLS.
VERIFY ALL REFERENCED INFORMATION ON THIS PLAN WITH THE RELEVANT CONSULTANT DRAWINGS AND NOTIFY OF NEW INFORMATION MADE AVAILABLE OR OF ANY DISCREPANCIES.

REFERENCED DRAWINGS:

LANDPARTNERS- BUILT ENVIRONMENT CONSULTANTS
DETAIL SURVEY
PLAN REFERENCE BRSS8271-000-3-1

RPS GROUP
OXLEY LANDSCAPE BASE- SKETCH
PLAN REFERENCE 004868

ABBREVIATIONS

CODE	DESCRIPTION
LRB	LETTER BOX

Arqus DESIGN

Integrated perspective

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ABN 68 135 616 303

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PO Box 2455
New Farm Qld 4005

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Nominated Architect: Scott Peabody
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Arqus Design acknowledges the Traditional Owners of Country on which we live, work and design and pay our respects to their Elders, past and present.

NOTES

Contractors are to verify all dimensions on site before commencing any work or producing shop drawings.

Detail applicable to the scale of the drawing published.

DATE	REVISION	ISSUE
29/05/24	FOR INFORMATION	A
30/05/24	FOR INFORMATION	B
04/07/24	FOR INFORMATION	C
18/07/24	SITE PLAN- UPDATE	D
19/07/24	PRELIMINARY DA PACKAGE	E
23/07/24	PRELIMINARY DA PACKAGE-UPDATED	F
31/07/24	SITE PLAN-UPDATE	G
20/08/24	SITE PLAN- UPDATE	H
21/08/24	PRELIMINARY DA PACKAGE	I

CLIENT

HONEYCOMBES PROPERTY GROUP

PROJECT

OXLEY RESIDENTIAL DEVELOPMENT

10 HONEYEATER CIRCUIT, OXLEY
LOT 302 ON SP326512

Country: Yugara & Yugarabul

DRAWING

SITE PLAN -GROUND FLOOR

JOB NUMBER	DESIGN	DRAWN	CHECKED
23-0069	SP	ZC	SP

SCALE	DATE CREATED	NORTH
1 : 250 @A1 @A3	29/02/24	

DRAWING NUMBER **A1-1-01** ISSUE **I**

ISSUED FOR 21/08/2024 4:39:26 PM

PRELIMINARY

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Appendix 2 Radiant heat exposure assessment

Grassfire attack through assessment reference point A

- Forest fire danger index - 55
- Grassland fire danger index – 78 (conversion based on Table B2 of AS 3959-2018)
- Vegetation - VHC 40.4 *Low tree or grass cover in built up areas*
- Overall fuel load – 5 t/ha
- Surface fuel load – 5 t/ha
- Slope – 0° slope
- Site slope – 0° slope
- Flame width – 100 m

Minimum Distance Calculator - AS3959-2009 (Method 2)			
Inputs		Outputs	
Grassland Fire Danger Index	78	Rate of spread	10.14 km/h
Vegetation classification	Grassland	Flame length	6.1 m
Surface fuel load	5 t/ha	Flame angle	54 °, 64 °, 73 °, 78 °, 80 ° & 85 °
Overall fuel load	5 t/ha	Elevation of receiver	2.46 m, 2.74 m, 2.91 m, 2.98 m, 3 m & 3.03 m
Vegetation height	n/a	Fire intensity	26,195 kW/m
Effective slope	0 °	Transmissivity	0.889, 0.88, 0.865, 0.846, 0.835 & 0.76
Site slope	0 °	Viewfactor	0.5865, 0.4293, 0.2868, 0.1934, 0.1566 & 0.0431
Flame width	100 m	Minimum distance to < 40 kW/m²	5.199999999999998 m
Windspeed	n/a	Minimum distance to < 29 kW/m²	7.099999999999991 m
Heat of combustion	18,600 kJ/kg	Minimum distance to < 19 kW/m²	10.59999999999998 m
Flame temperature	1,090 K	Minimum distance to < 12.5 kW/m²	15.59999999999996 m
		Minimum distance to < 10 kW/m²	19.1 m

Rate of Spread - Noble et al. 1980

Flame length - Purton, 1982

Elevation of receiver - Douglas & Tan, 2005

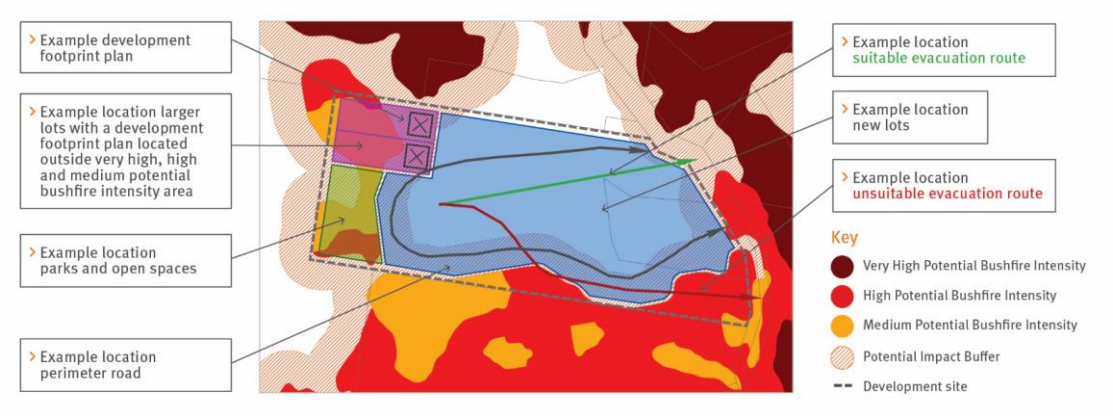
Flame angle - Douglas & Tan, 2005

Radiant heat flux - Drysdale, 1999, Sullivan et al., 2003, Douglas & Tan, 2005

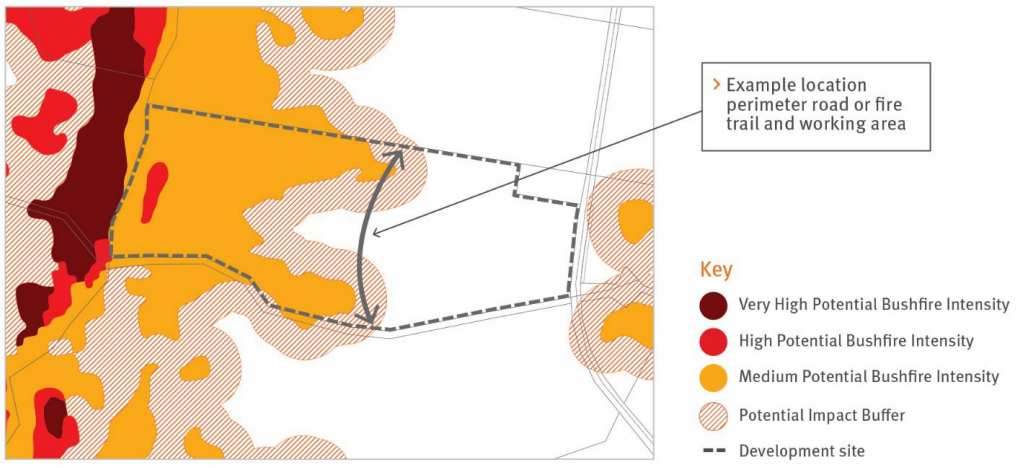
Appendix 3 Bushfire overlay code assessment

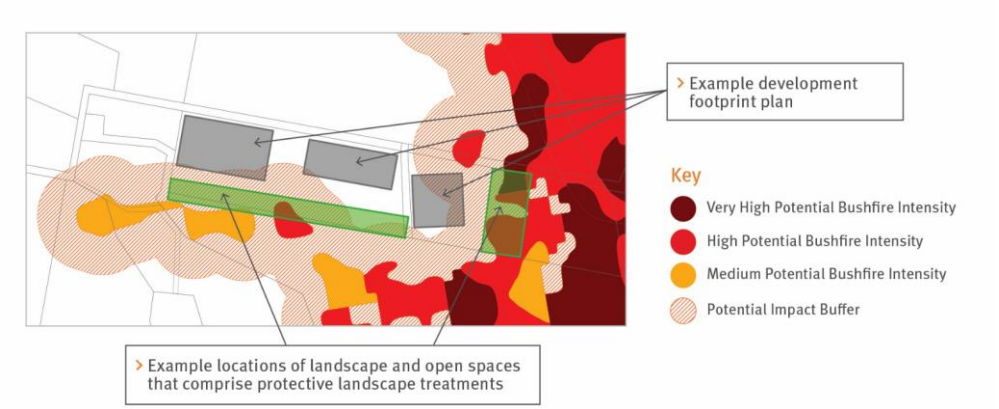
Performance outcomes	Acceptable outcomes	Compliance assessment
Section A **Reconfiguring a lot (RaL) – where creating lots of more than 2,000 square metres**		
PO1 The subdivision layout: (a) enables future buildings to be located away from slopes and land forms that expose people or property to an intolerable risk to life or property; and (b) facilitates emergency access and operational space for firefighters in a reduced fuel area between future buildings and structures and hazardous vegetation, that reduce risk to an acceptable or tolerable level. Note – An applicant may seek to undertake a site-level verification of the location and nature of hazardous vegetation and resulting potential bushfire intensity levels, for example where changes in foliage have occurred (e.g. as a consequence of adjoining permanent urban development) or where an applicant seeks to verify the regional ecosystem map inputs. This verification should form part of a bushfire hazard assessment in accordance with the methodology in the QFES *Bushfire resilient communities* document. The outcomes of this assessment can demonstrate how an alternate solution to the acceptable outcome can deliver an acceptable or tolerable level of risk.	**AO1.1** A development footprint plan is identified for each lot that avoids ridgelines, saddles and crests where slopes exceed 15 per cent. **AO1.2** A development footprint plan is identified for each lot that is separated from the closest edge to the adjacent mapped medium, high or very high potential bushfire intensity area by: (a) a distance that is no closer than the distances specified in Table 5 at all development footprint plan boundaries; or (b) a distance that achieves a radiant heat flux level of 29 kW/m2 or less at all development footprint plan boundaries. Note – This separation area is often termed an asset protection zone. Note – The radiant heat flux levels can be established by undertaking a bushfire hazard assessment in accordance with the methodology in the QFES Bushfire resilient communities document.	**Not applicable** The proposed development does not involve the reconfiguration of a lot.
PO2 The subdivision layout enables: (a) future buildings to be located as close as possible to property entrances to facilitate safe evacuation during a bushfire event; and (b) future site access to be located and designed to allow safe evacuation of the site by occupants and maintain access by emergency services under critical event conditions.	**AO2** A development footprint plan is identified for each lot that: (a) is located within 60 metres of the street frontage; and (b) sited to enable a route between the development footprint plan and the street frontage with a gradient that does not exceed of 12.5 per cent.	**Not applicable** The proposed development does not involve the reconfiguring of a lot.
Section B		
Reconfiguring a lot (RaL) – where creating lots of 2,000 square metres or less		
PO3 The subdivision layout: (a) avoids creating lots on slopes and land forms that expose people or property to an intolerable risk to life or property; and (b) facilitates emergency access and operational space for	**AO3.1** The subdivision layout results in lots that are sited so that they are separated from the closest edge to the adjacent mapped medium, high or very high potential bushfire intensity area by: (a) a distance that is no closer than the distances specified	**Not applicable** The proposed development does not involve the reconfiguring of a lot.

Performance outcomes	Acceptable outcomes	Compliance assessment
firefighters in a reduced fuel area between future buildings and structures and hazardous vegetation, that reduce risk to an acceptable or tolerable level. Note – An applicant may seek to undertake a site-level verification of the location and nature of hazardous vegetation and resulting potential bushfire intensity levels, for example where changes in foliage have occurred (e.g. as a consequence of adjoining permanent urban development) or where an applicant seeks to verify the regional ecosystem map inputs. This verification should form part of a bushfire hazard assessment, in accordance with the methodology in the QFES *Bushfire resilient communities* document. The outcomes of this assessment can demonstrate how an alternate solution to the acceptable outcome can deliver an acceptable or tolerable level of risk.	in Table 5 at all lot boundaries; or : (b) a distance that achieves a radiant heat flux level of 29 kW/m^2 or less: (i) at the building envelope, if identified at RaL stage; or (ii) where a building envelope is not identified, at all lot boundaries. Note – This separation area is often termed an asset protection zone. Note – The radiant heat flux levels can be established by undertaking a bushfire hazard assessment in accordance with the methodology in the QFES *Bushfire resilient communities* document. Note – For staged developments, temporary separation areas may be absorbed as part of subsequent stages. Note - Existing cleared areas external to the site may only be used in calculating necessary separation where tenure ensures that the land will remain cleared of hazardous vegetation (for example the land is a road, watercourse or highly managed park in public ownership).	
	AO3.2 The subdivision layout does not create lots that are within bushfire prone areas and on ridgelines, saddles and crests where slopes exceed 15 per cent (roads and parks may be located in these areas).	
Section C		
Reconfiguring a lot (RaL) – where creating more than 20 lots		
PO4 The subdivision layout is designed to minimise the length of the development perimeter and number of lots exposed to hazardous vegetation. Note – For example, avoid finger-like subdivision patterns or substantive vegetated corridors between lots.	**AO4** No acceptable outcome is prescribed	**Not applicable** The proposed development does not involve the reconfiguring of a lot.
PO5 The subdivision layout provides for adequate access and egress and safe evacuation routes, to achieve an acceptable or tolerable risk to people.	**AO5.1** The subdivision layout: (a) avoids the creation of bottle-neck points in the movement network within the development (for example, avoids	**Not applicable** The proposed development does not involve the reconfiguring of a lot.

Performance outcomes	Acceptable outcomes	Compliance assessment
	hourglass patterns); and (b) ensures the road network has sufficient capacity for the evacuating population.	
	AO5.2 The subdivision layout ensures evacuation routes: (a) direct occupants away from rather than towards or through areas with a greater potential bushfire intensity; and (b) minimise the length of route through bushfire prone areas. Refer Figure 5.	
 *Figure 5 – Subdivision layout and evacuation routes*		
PO6 The subdivision layout provides adequate buffers between hazardous vegetation and development. Note – An applicant may seek to undertake a site-level verification of the location and nature of hazardous vegetation and resulting potential bushfire intensity levels, for example where changes in foliage have occurred (e.g. as a consequence of adjoining permanent urban development) or where an applicant seeks to verify the regional ecosystem map inputs. This verification should form part of a bushfire hazard assessment, in accordance with the methodology in the QFES *Bushfire resilient communities* document. The outcomes of this assessment can demonstrate how an alternate solution to the acceptable outcome can deliver an acceptable or tolerable level of risk.	**AO6.1** The subdivision layout results in an asset protection zone being located to create a separation area from adjacent mapped medium, high or very high potential bushfire intensity areas.	**Not applicable** The proposed development does not involve the reconfiguring of a lot.
	AO6.2 The asset protection zone is comprised of: (a) parks and open spaces; and/or (b) lots greater than 2000 square metres; and/or (c) public roads (termed perimeter roads). Note – Parks and open space may be located within the mapped medium, high and very high potential bushfire intensity areas to create a separation between the development and the balance of the bushfire prone area. Note – Portions of lots greater than 2000 square metres may be located within the mapped medium, high and very high potential bushfire intensity areas. Refer Figure 5.	

Performance outcomes	Acceptable outcomes	Compliance assessment
	AO6.3 Where the asset protection zone includes lots greater than 2000 square metres a development footprint plan is identified for each lot that is located in accordance with AO1.2.	
PO7 Parks or open space provided as part of the asset protection zone do not create additional bushfire prone areas. Note –The undertaking of a bushfire hazard assessment, in accordance with the methodology in the QFES *Bushfire resilient communities* document may assist in demonstrating compliance with this performance outcome.	**AO7** Where the asset protection zone includes parks or open spaces, they: (a) comprise only low threat vegetation, including grassland managed in a minimal fuel condition, maintained lawns, golf courses, maintained public reserves and parklands, cultivated gardens and nature strips; or (b) are designed to ensure a potential available fuel load is maintained at less than eight tonnes/hectare in aggregate and with a fuel structure that remains discontinuous. Note – Minimal fuel condition means there is insufficient fuel available to significantly increase the severity of the bushfire attack, for example short-cropped grass to a nominal height of 10 centimetres.	**Not applicable** The proposed development does not involve the reconfiguring of a lot.
PO8 Perimeter roads are accessible for fire-fighting vehicles, to facilitate emergency access and operational space for fire- fighting, maintenance works and hazard reduction activities.	**AO8.1** Where the asset protection zone includes a perimeter road it: (a) has a two-lane sealed carriageway clear of hazardous vegetation; and (b) is connected to the wider public road network at both ends and at intervals of no more than 200 metres; and (c) does not include design elements that may impede access for fire-fighting and maintenance for fire- fighting purposes (for example traffic calming involving chicanes).	**Not applicable** The proposed development does not involve the reconfiguring of a lot.
	AO8.2 Where the subdivision contains a reticulated water supply, the road network and fire hydrants are designed and installed in accordance with: (a) *Fire Hydrant and Vehicle Access Guidelines for residential, commercial and industrial lots*, Queensland Fire and Emergency Services, 2015, unless	

Performance outcomes	Acceptable outcomes	Compliance assessment
	otherwise specified by the relevant water entity; and (b) the *Road Planning and Design Manual 2nd edition*, Department of Transport and Main Roads, 2013.	
Section D		
Reconfiguring a lot (RaL) – where creating additional lots for the purpose of residential development and a reticulated water supply is not provided.		
PO9 The subdivision layout provides for perimeter roads or fire trail and working areas that are accessible by the type of fire-fighting vehicles servicing the area, to facilitate emergency access and operational space for fire-fighting, maintenance works and hazard reduction activities.	**AO9.1** The subdivision layout includes: (a) a fire trail and working area designed and constructed in accordance with the design parameters in Table 6 that separates the residential lot or development footprint plan from adjacent mapped medium, high or very high potential bushfire intensity areas; or (b) a perimeter road designed and constructed in accordance with AO8.1. Refer Figure 6.	**Not applicable** The proposed development does not involve the reconfiguring of a lot.
 *Figure 6 – Siting of fire trail and working area*		
Section E		
Material change of use		
PO10 Site layout achieve an acceptable or tolerable risk to people. Landscape or open space provided as part of the development: (a) acts as a buffer between hazardous	**AO10.1** Site layout places the landscape and open spaces within the site between premises and adjacent mapped medium, high or very high potential bushfire intensity areas.	**Complies with AO10.1** Buildings and structures will be setback from hazardous vegetation adjoining the northern boundary of the site by an asset protection zone (**APZ**).

Performance outcomes	Acceptable outcomes	Compliance assessment
vegetation and development; and (b) does not create additional bushfire prone areas. Note – An applicant may seek to undertake a site-level verification of the location and nature of hazardous vegetation and resulting potential bushfire intensity levels, for example where changes in foliage have occurred (e.g. as a consequence of adjoining permanent urban development) or where an applicant seeks to verify the regional ecosystem map inputs. This verification should form part of a bushfire hazard assessment in accordance with the methodology in the QFES *Bushfire resilient communities* document. The outcomes of this assessment can demonstrate how an alternate solution to the acceptable outcome can deliver an acceptable or tolerable level of risk.	Refer Figure 7.	
	AO10.2 This landscaping and open space comprises protective landscape treatments that: (a) comprise only low threat vegetation, including grassland managed in a minimal fuel condition, maintained lawns, golf courses and cultivated gardens; or (b) are designed to ensure a potential available fuel load is maintained at less than 8 tonnes/hectare in aggregate and that fuel structure remains discontinuous. Note – Minimal fuel condition means there is insufficient fuel available to significantly increase the severity of the bushfire attack, for example short-cropped grass to a nominal height of 10 centimetres.	**Complies with AO10.2** Landscaping within the APZ and the balance of the site will be designed and maintained in accordance with Part 5 of *Bushfire Resilient Building Guidance for Queensland Homes 2020*. These design principals will minimise the potential for landscaping to catch fire and compromise buildings and routes for access and egress. Specifications for landscaping are provided in Section 6.2 of the bushfire management plan (**BMP**).
 *Figure 7 – Siting of protective landscape treatments*		
PO11 The development establishes evacuation areas, to achieve an acceptable or tolerable risk to people.	**AO11** If in an isolated location, development establishes direct access to a safe assembly/evacuation area. Note – Guidance on identifying safe evacuation areas is contained in the QFES *Bushfire resilient communities* document.	**Complies with PO11** The proposed development is in suburban Brisbane and not an isolated location.
PO12 If on a lot of over 2,000 m^2, where involving a new premises or an existing premises with an increase in development footprint, development:	**AO12** No acceptable outcome is prescribed.	**Complies with PO12** Driveways will provide access and egress for the townhouse allotments. The driveways will be designed and constructed to provide efficient access and egress for an urban fire

Performance outcomes	Acceptable outcomes	Compliance assessment
(a) locates occupied areas as close as possible to property entrances to facilitate safe evacuation during a bushfire event; and (b) ensures vehicular access is located and designed to allow safe evacuation of the site by occupants and maintain access by emergency services under critical event conditions		truck in accordance with *Fire Hydrant and Vehicle Access Guidelines for Residential, Commercial and Industrial Lots 2019* (**Fire hydrant and vehicle access guidelines**) which defers to *Road Planning and Design Manual – 2nd Edition 2013* for load bearing capacity, geometry and turning radii.
PO13 Development is located within a reticulated water supply area or includes a dedicated static water supply that is available solely for fire-fighting purposes and can be accessed by fire-fighting vehicles. Note – Swimming pools, farm ponds and dams are not considered reliable sources of static water supply in Queensland due to regular drought events. Note for Local Government – Information on how to provide an appropriate static water supply, may form a condition of a development approval. For further information on preferred solutions refer to the QFES *Bushfire resilient communities* document.	**AO13** No acceptable outcome is prescribed	**Complies with PO13** The proposed development will be connected to mains water and have an external hydrant system. The mains water connection will be in accordance with the local water retailer's specifications for supply and pressure. The external hydrant system will be designed and constructed in accordance with Fire hydrant and vehicle access guidelines which defers to the local water retailer's specifications and the *Australian Standard* (**AS 2419.1-2021**) *Fire hydrant installation, system design, installation and commissioning*.
PO14 Vulnerable uses listed in Table 7 are not established or intensified within a bushfire prone area unless: (a) there is an overriding need in the public interest for the new or expanded service the development provides; and (b) there are no other suitable alternative locations within the required catchment; and (c) site planning can appropriately mitigate the risk (for example, siting ovals for an educational establishment between the hazardous vegetation and structures. Note – The preparation of a bushfire management plan in accordance with the methodology in the QFES *Bushfire resilient communities* document may assist in demonstrating compliance with this performance outcome	**AO14.1** No acceptable outcome is prescribed.	**Not applicable** The proposed development does not involve a vulnerable use.
PO15 Community infrastructure providing essential services listed in Table 7 are not established within a bushfire prone area unless:	**AO15** No acceptable outcome is prescribed.	**Not applicable** The proposed development does not involve community infrastructure for essential services.

Performance outcomes	Acceptable outcomes	Compliance assessment
(a) there is an overriding need in the public interest for the new or expanded service the development provides (for example, there are no other suitable alternative locations that can deliver the required level of service or meet emergency service response times during and immediately after a bushfire event); and (b) the infrastructure can function effectively during and immediately after a bushfire event. Note – The preparation of a bushfire management plan in accordance with the methodology in the QFES *Bushfire resilient communities* document may assist in demonstrating compliance with this performance outcome.		
PO16 Development avoids or mitigates the risks to public safety and the environment from the manufacture or storage of materials listed in Table 7 that are hazardous in the context of bushfire to an acceptable or tolerable level. Note – The preparation of a bushfire management plan in accordance with the methodology in the QFES *Bushfire resilient communities* document may assist in demonstrating compliance with this acceptable outcome. Editor's note – In addition to the requirements of this code the *Work Health and Safety Act 2011* and associated Regulation and Guidelines, the *Environmental Protection Act 1994* and the relevant building assessment provisions under the *Building Act 1975* contain requirements for the manufacture and storage of hazardous substances. Information is provided by Business Queensland on the requirements for storing and transporting hazardous chemicals, available at: www.business.qld.gov.au/running-business/protecting-business/risk-management/hazardous-chemicals/storing-transporting.	**AO16** No acceptable outcome is prescribed.	**Not applicable** The proposed development does not involve hazardous materials in the context of bushfire hazard.
Section F		
Where involving an asset protection zone		
PO17 Asset protection zones are designed and managed to	**AO17.1** Landscaping treatments within any asset protection zone comprise	**Complies with AO17.1**

Performance outcomes	Acceptable outcomes	Compliance assessment
ensure they do not increase the potential for bushfire hazard. Note – The preparation of a landscape management plan undertaken in accordance with the methodology in the QFES *Bushfire resilient communities* document may assist in demonstrating compliance with this performance outcome.	only 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. Note – Minimal fuel condition means there is insufficient fuel available to significantly increase the severity of the bushfire attack, for example short-cropped grass to a nominal height of 10 centimetres. OR	Specifications for the APZ are provided in Sections 6.1 and 6.2 of the BMP and comply with AO17.1.
	AO17.2 Landscaping management within any asset protection zone maintains a: (a) potential available fuel load which is less than eight tonnes/hectare in aggregate; and (b) fuel structure which is discontinuous. Note – The preparation of a landscape management plan undertaken in accordance with the methodology in the QFES *Bushfire resilient communities* document may assist in demonstrating compliance with this acceptable outcome.	**Complies with AO17.1** Specifications for the APZ are provided in Sections 6.1 and 6.2 of the BMP and comply with AO17.2.
Section G		
Where planning provisions or conditions of approval require revegetation or rehabilitation		
PO18 Revegetation or rehabilitation areas are designed and managed to ensure they do not result in an unacceptable level of risk or an increase in bushfire intensity level. Note – The undertaking of a bushfire hazard assessment in accordance with the methodology in the QFES *Bushfire resilient communities* document may assist in demonstrating compliance with this performance outcome.	**AO18.1** Required revegetation or rehabilitation: (a) is located outside of any asset protection zone; or (b) maintains a potential available fuel load which is less than eight tonnes/hectare in aggregate and fuel structure which is discontinuous. Note – The preparation of a landscape management plan undertaken in accordance with the methodology in the QFES *Bushfire resilient communities* document may assist in demonstrating compliance with acceptable outcome (b).	**Not applicable** The proposed development does not involve revegetation or rehabilitation.
	AO18.2 Revegetation or rehabilitation of areas located within mapped medium, high or very high potential bushfire intensity areas, revegetate and rehabilitate in a manner that maintains or reduces the existing fuel load. OR Revegetation or rehabilitation of	**Not applicable** The proposed development does not involve revegetation or rehabilitation.

Performance outcomes	Acceptable outcomes	Compliance assessment
	areas located within the mapped potential impact buffer area, revegetate and rehabilitate in a manner that maintains or reduces the existing fuel load. Note – The preparation of a vegetation management plan undertaken in accordance with the methodology in the QFES *Bushfire resilient communities* document may assist in demonstrating compliance with this acceptable outcome.	

Table 6 – Fire trail and working area design parameters

Parameter	Provisions
Width	Contains a width of at least 20 metres including: 1. A trafficable area (cleared and formed); a. with a minimum width of 4 metres than can accommodate a rural firefighting vehicle b. with no less than 4.8 metres vertical clearance from canopy vegetation c. with no adjacent inhibiting embankments or retaining walls 2. A working area each side of the trafficable area: a. with a minimum width of 3 metres each side b. cleared of all flammable vegetation greater than 10 centimetres in height 3. The balance (i.e. 10 metre width) managed vegetation area: a. sited to separate the trafficable area from adjacent mapped medium, high or very high potential bushfire intensity areas managed vegetation b. comprising managed vegetation clear of major surface hazards.
Access	Access is granted in favour of the local government and Queensland Fire and Emergency Services Note – this access is commonly granted in the form of a easement that is to be maintained by the grantor.
Egress	Contains trafficable vehicle routes in to low hazard areas, every 200 metres

Table 7 – Vulnerable uses, community infrastructure for essential services and materials that are hazardous in the context of bushfire hazard

Group	Uses
Vulnerable uses	*childcare centre, community care centre, detention facility, educational establishment, hospital, nature-based tourism, relocatable home park, rooming accommodation, residential care facility, resort complex, retirement facility, tourist park*
Community infrastructure for essential services	*educational establishment, emergency services, hospital*
Hazardous materials in the context of bushfire hazard	Hazardous chemicals that are present at the levels or in the quantities that would constitute the use being a hazardous chemical facility Hazardous materials that are present in the quantities in the Work Health and Safety Regulation, schedule 15