PLANS AND DOCUMENTS
referred to in the PDA
DEVELOPMENT APPROVAL

Approval no: DEV2024/1537

Date: 25 November 2024

Queensland Government

LEC
Land and environment consultants

Bushfire management plan

Proposed development | 41 and 49 Plaza Place | Carseldine | Queensland
Prepared for St George Community Housing Limited | 22 August 2024

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Bushfire management plan

Final

Report 24064 | St George Community Housing Limited | 22 August 2024

Approved by Robert Janssen

Position Managing principal

Signature 

Date 22 August 2024

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Draft	15 August 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 41 and 49 Plaza Place, Carseldine (**the site**), properly described as lots 2049 and 2050/SP311913.

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

The site is identified as a bushfire hazard area by the Queensland State Planning Policy *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 former Queensland Fire and Emergency Services, now the Queensland Fire Department to provide technical guidance for the implementation of the 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 plan (LEC 2023) for the development application for Stage V of the Carseldine Village (**Stage V BMP**), which includes the lots 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.

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 0.43 hectares (**ha**) and is serviced by public roads and mains water.

The site adjoins urban development along its northern and eastern boundaries and a stormwater drainage swale and restricted vehicle access track along its southern and western boundaries. The drainage swale manages stormwater run-off from the adjacent bushland area and the restricted vehicle access track provides access to the stormwater drainage swale for maintenance and bushfire management and emergency purposes. The stormwater drainage swale and restricted vehicle access track will be maintained by Brisbane City Council (**Council**) in accordance with the Stage V BMP which will result in a low and discontinuous level of bushfire fuel that will provide separation between the site and the adjacent bushland area in perpetuity.

2.2 Proposed development

The proposed development involves establishing a multi-storey apartment complex. The site plan for the proposed development is provided in Appendix 1 and shows the proposed layout of units, driveways and parking.

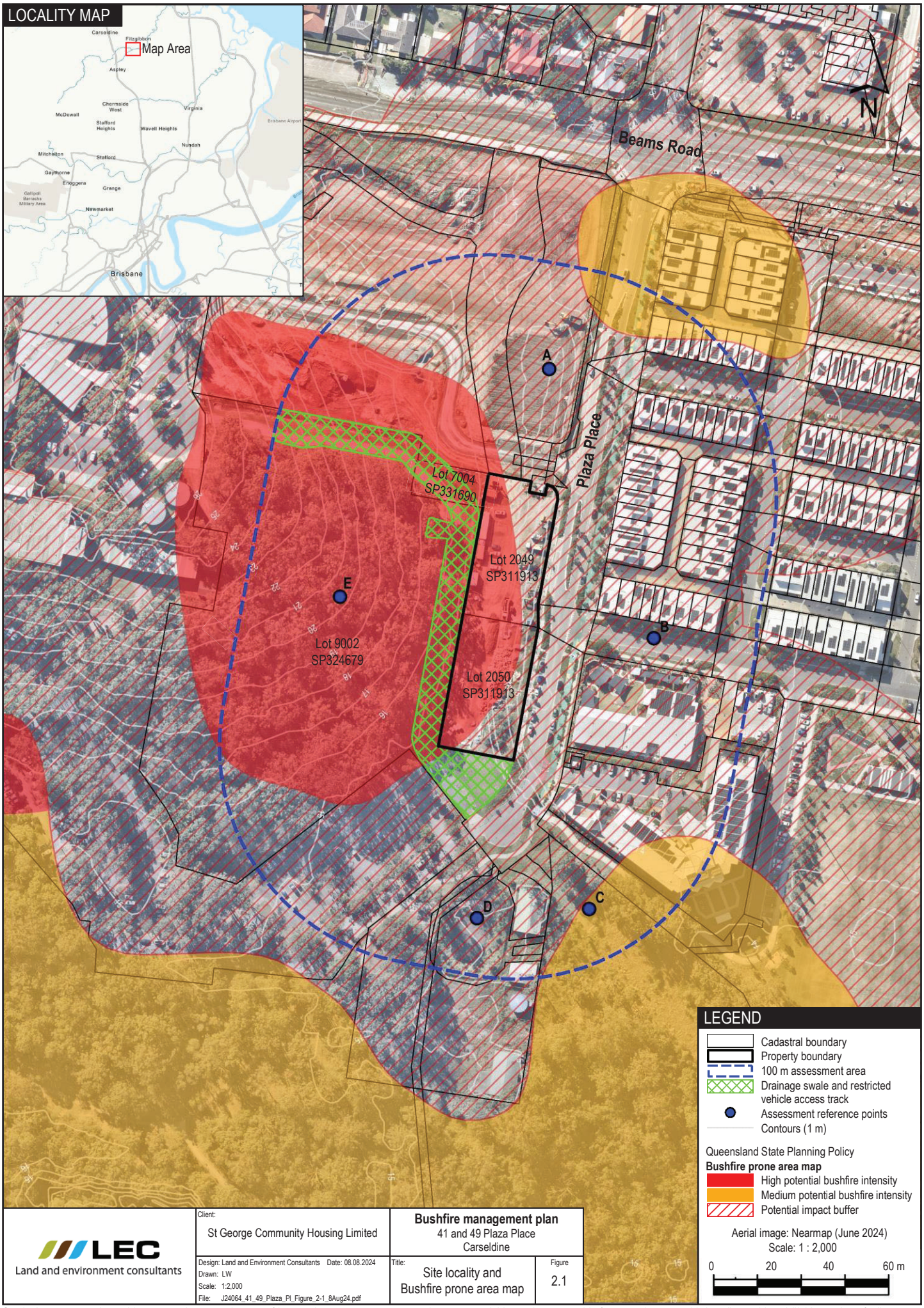
Access and egress for the proposed development will be via a new driveway connection to Meander Street and the broader public road network.

The proposed development will be connected to mains water and will have access to the existing reticulated hydrant system in the adjoining road reserves.

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/metres (**kW/m**) and the land within 100 m of this vegetation.



LEC
Land and environment consultants

Client: St George Community Housing Limited

Bushfire management plan
41 and 49 Plaza Place
Carseldine

Design: Land and Environment Consultants Date: 08.08.2024
Drawn: LW
Scale: 1:2,000
File: J24064_41_49_Plaza_Pl_Figure_2-1_8Aug24.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. It is based on the desktop information, site inspection data and bushfire analysis in the Stage V BMP.

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 5.7.

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

LEC has undertaken numerous assessments of land within 100 m of the site for vegetation characteristics, current land management practises, the slope of land and evidence of previous fires; the most recent being 27 October 2020.

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 site inspection and notes about the bushfire hazard assessment of assessment reference points. Examples of VHCs at assessment reference points are shown in Photographs 3.1-3.2.

Table 3.1 Site observations

Assessment reference point	Catalyst VHC	VHC	Notes
A	VHC 9.1 *Moist to dry eucalypt open forests on coastal lowlands and ranges* (**VHC 9.1**), VHC 16.1 *Eucalyptus dominated forest on drainage lines and alluvial plains* (**VHC 16.1**) and VHC 41.4 *Discontinuous low grass or tree cover* (**VHC 41.4**)	VHC 42.6 *Nil to very low vegetation cover* (**VHC 42.6**)	This area is aligned with future mixed-use development adjoining the northern boundary of the site. The land has been cleared and is under development.
B	VHC 16.1 and VHC 39.2 *Low to moderate tree cover in built-up areas* (**VHC 39.2**)	VHC 42.6	This area is aligned with the mixed-use development adjoining the eastern boundary of the site. It has nil to very low vegetation cover.
C	VHC 16.1 and VHC 41.4	VHC 16.1	This area is contiguous with bushland vegetation along Cabbage Tree Creek. It will be subject to vegetation rehabilitation and will become consistent with VHC 16.1 as the rehabilitation reaches a mature state.
D	VHC 41.4	VHC 41.4	This area is a special purpose lot which has been mostly cleared and developed with stormwater management structures, buildings and a vehicle turnaround area. It will be transferred to Council for ownership and ongoing maintenance.

Table 3.1 Site observations

Assessment reference point	Catalyst VHC	VHC	Notes
E	VHC 9.1	VHC 9.1	Bushland vegetation.

Photograph 3.1 Example of VHC 16.1 at C

Photograph 3.2 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 42.6	2	0	136	Non-bushfire hazard
B	VHC 42.6	2	0	136	Non-bushfire hazard
C	VHC 16.1	16	0	8,621	Medium[3]
D	VHC 41.4	3	0	307	Non-bushfire hazard
E	VHC 9.1	24.2	5	27,965	High

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. Vegetation at assessment reference point C has been assessed as though rehabilitation has reached a mature state.

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. 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 assessment reference points C and E shown in Figure 2.1, where hazardous vegetation occurs. These bushfire attack scenarios are further analysed in Section 5.7.

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, the land uses adjacent to the site are not considered to be a potential bushfire hazard.

4.5 Water and access for emergency services

The site has access to mains water, a reticulated hydrant system 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.

5.2 Land use

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

5.3 Stormwater drainage swale and restricted vehicle access track

The stormwater drainage swale and restricted vehicle access track shown in Figure 2.1 is designed to provide a low level of discontinuous bushfire fuel and will be maintained by Council in perpetuity. As a result, it can be relied upon to provide a setback between hazardous vegetation at assessment reference point E and the proposed development.

5.4 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.

5.5 Fire-fighter water supply

The proposed development will be connected to mains water and will have access to the reticulated hydrant system in the adjoining road reserves.

5.6 Access and egress

The new driveway connection to Meander Street and driveways within the site will be designed and constructed to provide efficient access and egress for an urban fire truck.

5.7 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 a building envelope which is separated from hazardous vegetation by a distance which achieves a radiant heat flux level ≤ 29 kW/m^2 at the building envelope.

As discussed in Section 4.3, the proposed development could be exposed to bushfire attack from assessment reference points C and E, shown in Figure 2.1, where hazardous vegetation occurs. The radiant heat profile of these bushfire attack scenarios was analysed using the BAL calculator. Inputs used in the BAL calculator and results are provided in Appendix 2.

Results of the radiant heat exposure assessment, which are presented in Figure 5.1, demonstrates the building envelope for the proposed development is separated from hazardous vegetation by a distance

which achieves a radiant heat flux level ≤ 29 kW/m^2 at the building envelope and complies with the radiant heat exposure outcome of the Bushfire overlay code.

LEC
Land and environment consultants

Client:
St George Community Housing Limited

Bushfire management plan
41 and 49 Plaza Place
Carseldine

Design: Land and Environment Consultants Date: 12.08.2024
Drawn: LW
Scale: 1:900
File: J24064_41_49_Plaza_Pl_Figure_6-1_12Aug24.pdf

Title:
Bushfire mitigation plan

Figure
5.1

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 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.

6.2 Fire-fighting water supply

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

Any requirement for an external hydrant system to be installed within the site must be determined by a fire services engineer and based on compliance with the *Building Code of Australia* (ABCB 2022) (**BCA**).

If required, 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.

6.3 Access and egress

The new driveway connection to Meander Street and driveways within the site 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 5.1.

6.4 Building design and construction

Building design and construction requirements are a matter for the building development application and are not dealt with by a PDA development application or by this BMP.

The site is identified as a bushfire prone area. As a result, provisions of the BCA and the *Queensland Development Code* (QG 2021) (**QDC**) that apply to a bushfire prone area apply to any building assessment work within the site. Where compliance with the BCA or QDC requires compliance with the bushfire attack level (**BAL**) construction requirements in the *Australian Standard* (AS 3959-2018)

Construction of buildings in bushfire prone areas, the building envelope for the proposed development must be assessed with a BAL rating of BAL-29.

6.5 Service installation

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

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. It is based on the desktop information, site inspection data and bushfire analysis in the Stage V BMP which was prepared for Stage V of the Carseldine Village.

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.

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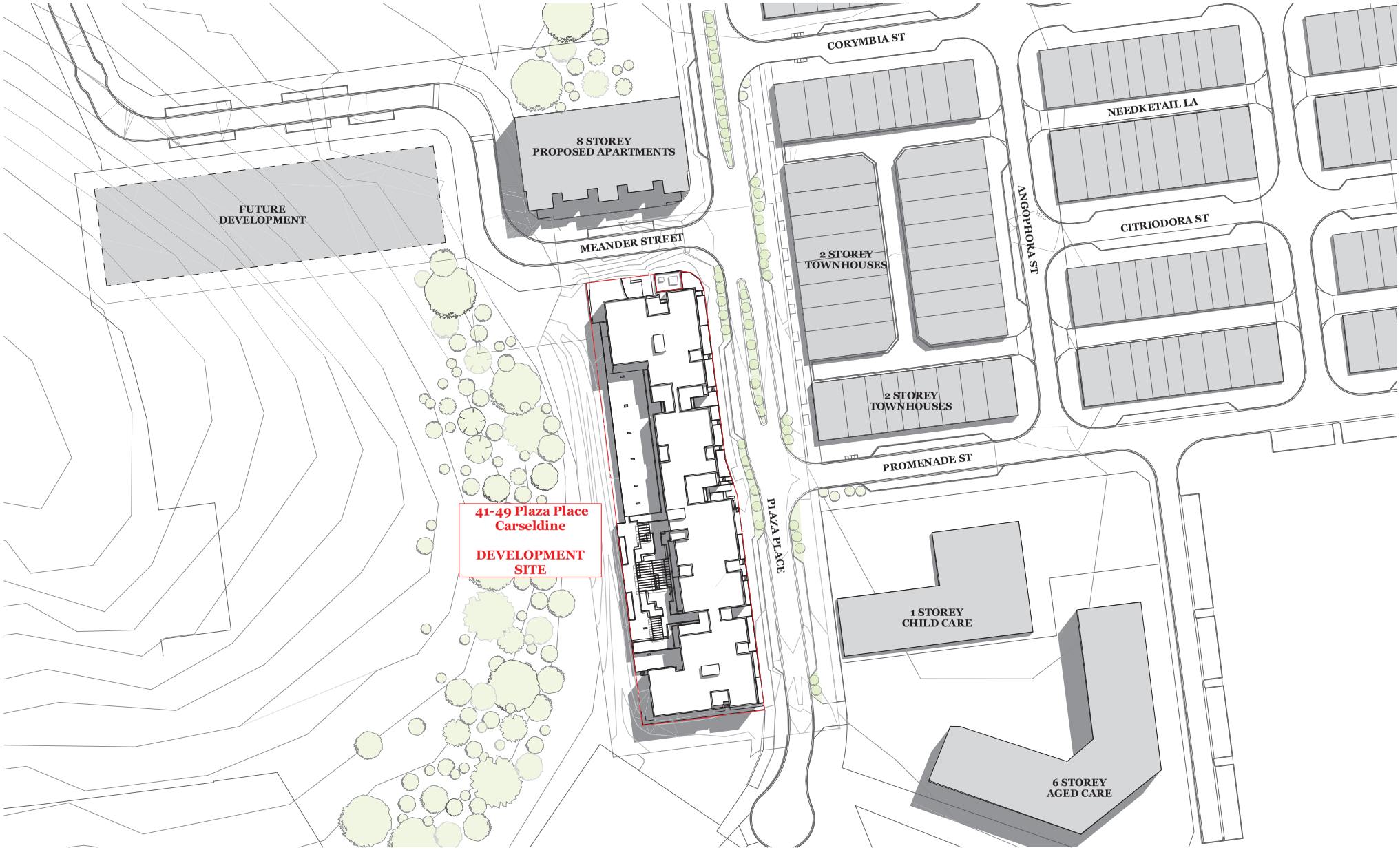
Standards Australia Limited (Standards Australia) 2018, *Australian Standard 3959-2018 Construction of buildings in bushfire prone areas*, Fourth edition, November 2018

Appendix 1 Site plan

Plans
Site Plan



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Project Name	CARSELDINE COMMUNITY HOUSING
Project Number	00013408
Date	9/08/2024
Scale	1:1000@A3
Drawing Name	Site Plan
Drawing Number	**DA301**
Revision	**A**

Appendix 2 Radiant heat exposure assessment

Bushfire attack from assessment reference point C

- Forest fire danger index - 55
- Vegetation - VHC 16.1 *Eucalyptus dominated forest on drainage lines and alluvial plains*
- Overall fuel load – 26 tonnes/hectare (**t/ha**)
- Surface fuel load – 16 t/ha
- Slope – 0° slope
- Site slope – 0° slope
- Flame width – 100 metre (**m**)

FPA AUSTRALIA | FLAMESOL

Calculated December 2, 2019, 12:35 pm (MDc v.4.8)

J17037 (S2)

Minimum Distance Calculator - AS3959-2009 (Method 2)			
Inputs		Outputs	
Fire Danger Index	55	Rate of spread	1.05 km/h
Vegetation classification	Forest	Flame length	9.98 m
Surface fuel load	16 t/ha	Flame angle	53 °, 64 °, 72 °, 77 °, 79 ° & 84 °
Overall fuel load	26 t/ha	Elevation of receiver	3.98 m, 4.48 m, 4.74 m, 4.86 m, 4.9 m & 4.96 m
Vegetation height	n/a	Fire intensity	14,185 kW/m
Effective slope	0 °	Transmissivity	0.881, 0.866, 0.845, 0.822, 0.8090000000000001 & 0.74
Site slope	0 °	Viewfactor	0.5938, 0.4366, 0.2937, 0.1992, 0.162 & 0.0443
Flame width	100 m	Minimum distance to < 40 kW/m²	8.399999999999986 m
Windspeed	n/a	Minimum distance to < 29 kW/m²	11.39999999999998 m
Heat of combustion	18,600 kJ/kg	Minimum distance to < 19 kW/m²	16.79999999999997 m
Flame temperature	1,090 K	Minimum distance to < 12.5 kW/m²	24.20000000000007 m
		Minimum distance to < 10 kW/m²	29.10000000000014 m

Rate of Spread - Mcarthur, 1973 & Noble et al., 1980

Flame length - NSW Rural Fire Service, 2001 & Noble et al., 1980

Elevation of receiver - Douglas & Tan, 2005

Flame angle - Douglas & Tan, 2005

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

Bushfire attack from assessment reference point E

- Forest fire danger index - 55
- Vegetation - VHC 9.1 *Moist to dry eucalypt open forests on coastal lowlands and ranges*
- Overall fuel load – 34.2 t/ha
- Surface fuel load – 24.2 t/ha
- Slope – 5° upslope slope
- Site slope – 0° slope
- Flame width – 100 m

FPA AUSTRALIA | FLAMESOL

Calculated December 2, 2019, 12:33 pm (MDc v.4.8)

J17037 (S1)

Minimum Distance Calculator - AS3959-2009 (Method 2)			
Inputs		Outputs	
Fire Danger Index	55	Rate of spread	1.13 km/h
Vegetation classification	Forest	Flame length	11.45 m
Surface fuel load	24.2 t/ha	Flame angle	53 °, 64 °, 72 °, 76 °, 78 ° & 83 °
Overall fuel load	34.2 t/ha	Elevation of receiver	4.57 m, 5.14 m, 5.44 m, 5.55 m, 5.6 m & 5.68 m
Vegetation height	n/a	Fire intensity	19,987 kW/m
Effective slope	-5 °	Transmissivity	0.878, 0.862, 0.839, 0.8149999999999999, 0.801 & 0.735
Site slope	0 °	Viewfactor	0.5961, 0.4388, 0.2967, 0.201, 0.1637 & 0.0446
Flame width	100 m	Minimum distance to < 40 kW/m²	9.599999999999982 m
Windspeed	n/a	Minimum distance to < 29 kW/m²	12.99999999999997 m
Heat of combustion	18,600 kJ/kg	Minimum distance to < 19 kW/m²	19 m
Flame temperature	1,090 K	Minimum distance to < 12.5 kW/m²	27.20000000000012 m
		Minimum distance to < 10 kW/m²	32.50000000000019 m

Rate of Spread - Mcarthur, 1973 & Noble et al., 1980

Flame length - NSW Rural Fire Service, 2001 & Noble et al., 1980

Elevation of receiver - Douglas & Tan, 2005

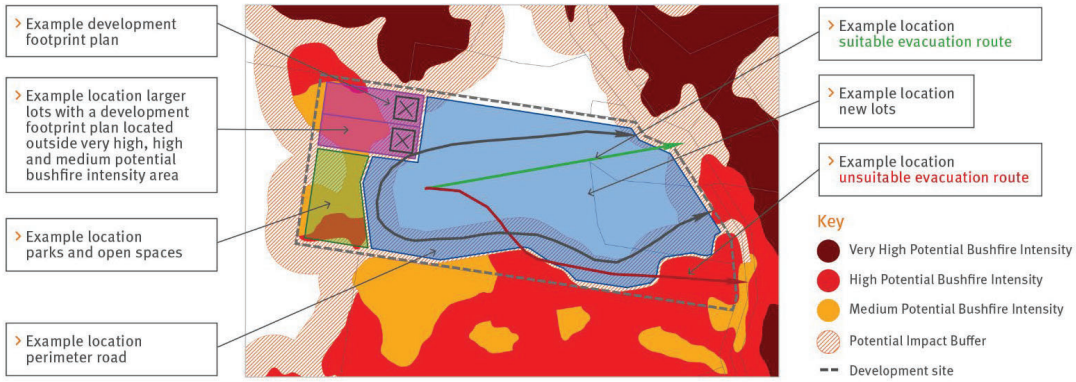
Flame angle - Douglas & Tan, 2005

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

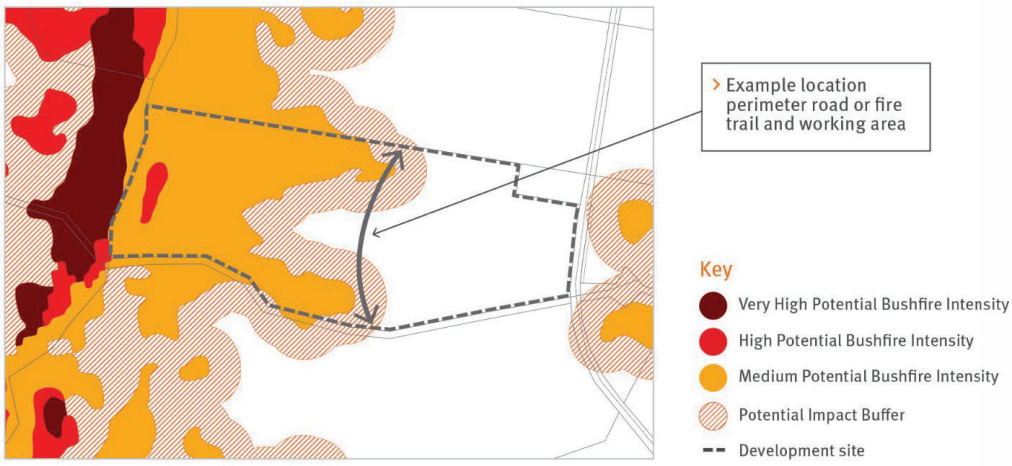
Appendix 3 Bushfire overlay code assessment

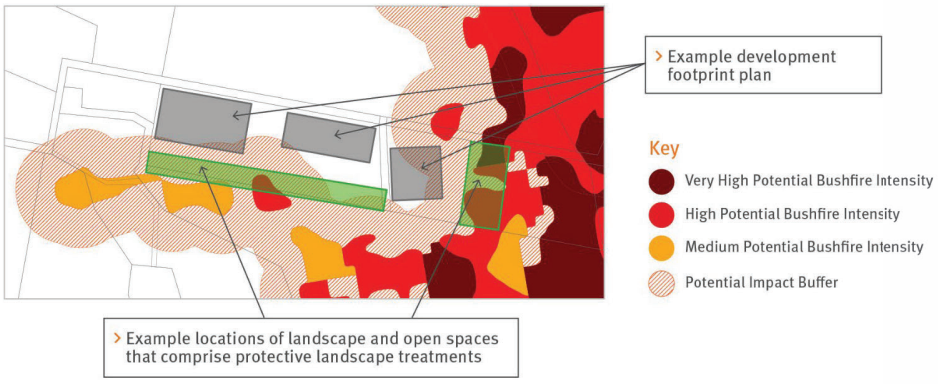
Performance outcomes	Acceptable outcomes	Compliance assessment
Section A **Reconfiguring a lot (RaL) – where creating lots of more than 2,000 square metres**		
PO1 The subdivision layout: (a) enables future buildings to be located away from slopes and land forms that expose people or property to an intolerable 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** The building envelope will be setback from hazardous vegetation adjoining the western boundary of the site by the stormwater drainage swale and restricted vehicle access track which is designed to provide a low level of

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.	discontinuous bushfire fuel and will be maintained by Brisbane City Council (**Council**) in perpetuity. The Plaza Place road reserve provides a setback from the hazardous vegetation to the south-east of the site.
	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 stormwater drainage swale and restricted vehicle access track is designed to provide a low level of discontinuous bushfire fuel and will be maintained by Council in perpetuity. Landscaping within 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 6.1 of the bushfire management plan.
 *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 in 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	**AO12** No acceptable outcome is prescribed.	**Complies with PO12** Access and egress for the proposed development will be provided by a driveway connection to Meander

Performance outcomes	Acceptable outcomes	Compliance assessment
increase in development footprint, development: (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		Street and the broader public road network. The new driveway connection to Meander Street and driveways within the site will be constructed to provide efficient access and egress for an urban fire 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. The mains water connection will be in accordance with the local water retailer's specifications for supply and pressure. Any requirement for an external hydrant system to be installed within the site will be determined by a fire services engineer and based on compliance with the *Building Code of Australia 2022*. If required, 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	**AO14.1** No acceptable outcome is prescribed.	**Not applicable** The proposed development does not involve a vulnerable use.

Performance outcomes	Acceptable outcomes	Compliance assessment
management plan in accordance with the methodology in the QFES *Bushfire resilient communities* document may assist in demonstrating compliance with this performance outcome		
PO15 Community infrastructure providing essential services listed in Table 7 are not established 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 (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.	**AO15** No acceptable outcome is prescribed.	**Not applicable** The proposed development does not involve community infrastructure for essential services.
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.

Performance outcomes	Acceptable outcomes	Compliance assessment
Section F		
Where involving an asset protection zone		
PO17 Asset protection zones are designed and managed to 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.	**AO17.1** Landscaping treatments within any asset protection zone comprise 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	**Not applicable** The proposed development does not involve an asset protection zone.
	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.	
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.

Performance outcomes	Acceptable outcomes	Compliance assessment
	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 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.	**Not applicable** The proposed development does not involve revegetation or rehabilitation.

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