Land and environment consultants

PLANS AND DOCUMENTS
referred to in the PDA
DEVELOPMENT APPROVAL

Approval no: DEV2020/1158

Date: 13 APRIL 2021

Queensland Government

Bushfire management plan

Aged care facility | Lot 3, Carseldine Village, 520 Beams Road | Carseldine | Queensland
Prepared for Rockpool RAC (Morayfield) Pty Ltd ATF Rockpool RAC Property Trust No 3
| 27 November 2020

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Bushfire management plan

Final

Report 20073 | Rockpool RAC (Morayfield) Pty Ltd ATF Rockpool RAC Property Trust No 3 | 27 November 2020

Prepared by Robert Janssen

Position Managing principal

Signature 

Date 27 November 2020

Document control

Version	Date	Prepared by	Reviewed by
Draft	7 November 2020	R. Janssen	McNab
Final	27 November 2020	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 one building will withstand bushfire attack on every occasion.

It should be noted that upon lodgement of a development application, 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 undertake a bushfire hazard assessment and prepare a bushfire management plan for the proposed material change of use – aged care facility (**proposed development**) at lot 3, Carseldine Village, 520 Beams Road, Carseldine (**the site**), properly described as part of lot 1/SP311781.

An application for a development permit will be made for the proposed development under the *Fitzgibbon Priority Development Area* (**PDA**) *Development Scheme.* The assessment authority for the development permit application will be Economic Development Queensland (**EDQ**).

The site is affected by the Queensland State Planning Policy (**SPP**) *Bushfire prone area map* (**SPP bushfire prone area map**) for medium and high potential bushfire intensity areas and potential impact buffer area. Therefore, the application for a development permit will be assessed for compliance with bushfire outcomes of the *Fitzgibbon PDA Development Scheme* which defers to outcomes of the SPP *Bushfire prone area code* (**SPP bushfire prone area code**) in the *Natural Hazards, Risk and Resilience – State Planning Policy State Interest guidance material* (DSDMIP 2019) (**SPP 2017 guidance material**).

This bushfire management plan has been prepared in accordance with *Bushfire Resilient Communities Technical Reference Guide for the State Planning Policy State Interest 'Natural Hazards, Risk and Resilience – Bushfire'* (QFES 2019) (**Bushfire resilient communities**) which was prepared by the Queensland Fire and Emergency Services to provide technical guidance for the SPP 2017 guidance material. It documents the bushfire hazard assessment for the site and identifies strategies that will be implemented to achieve compliance with outcomes of the SPP bushfire prone area code.

This bushfire management plan includes:

- an introduction (this section) and description of methods and information resources used for the bushfire hazard assessment;
- description of the site and the proposed development;
- bushfire hazard assessment;
- identification of bushfire hazards associated with the site and the proposed development;
- radiant heat exposure assessment;
- a plan for mitigating bushfire hazards; and
- assessment of the proposed development against the SPP bushfire prone area code.

1.1 Method

To meet the requirements of Bushfire resilient communities the following steps were undertaken:

- review of the SPP bushfire prone area map on the Queensland Governments Development Assessment mapping system and the Queensland regional ecosystem map, vegetation hazard class (**VHC**) map, severe fire weather map and fire history map on the Queensland Fire and Emergency Services online mapping system (**Catalyst**);
- a walk over the site and assessment of land within 100 metres (**m**) of the site for vegetation characteristics, current land management practices, slope, and evidence of previous fires;
- bushfire hazard assessment in accordance with the method in Bushfire resilient communities;
- radiant heat exposure assessment using the Fire Protection Association of Australia *BAL calculator V4.8* (**BAL calculator**) which models the 'method 2' bushfire attack level (**BAL**) assessment procedure in the *Australian Standard for Construction of Buildings in Bushfire Prone Areas* (**AS 3959-2018**); and

- assessment of the proposed development against the SPP bushfire prone area code.

Aerial imagery of the site was accessed online from Google Earth to assist in validating observations and measurements made during the site assessment.

1.2 Suitably qualified person

This bushfire management plan 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 20 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 the proposed development

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

2.1 Site description

The location of the site and proposed development are shown on Figure 2.1. The site is 0.91 hectares (**ha**) (although only the southern part of the site is subject to the development permit application) and is located in Stage 1 of the Carseldine Urban Village which was granted approval on 26 March 2020 (DEV2019/1074).

The approval for Stage 1 of the Carseldine Urban Village includes a reconfiguration of a lot component to create the subject site (lot 3) which was noted in the decision notice as 'aged care/retirement lot.' The preliminary approval for material change of use for the master plan for Carseldine Village (DEV2018/932) also identified lot 3 within mixed use – sub-precinct parkside residential. Residential aged care is identified as suitable/preferred uses within this sub-precinct.

The site has access to mains water and a reticulated hydrant system which is installed in the adjacent road reserves. A new road connection to Beams Road provides vehicle access and egress.

Land to the north, east and west of the site is currently subject to development under the Carseldine Urban Village development approval. Land to the south of the site has a large continuous area of bushland vegetation that is associated with Cabbage Tree Creek and will be retained under the Carseldine Urban Village development approval.

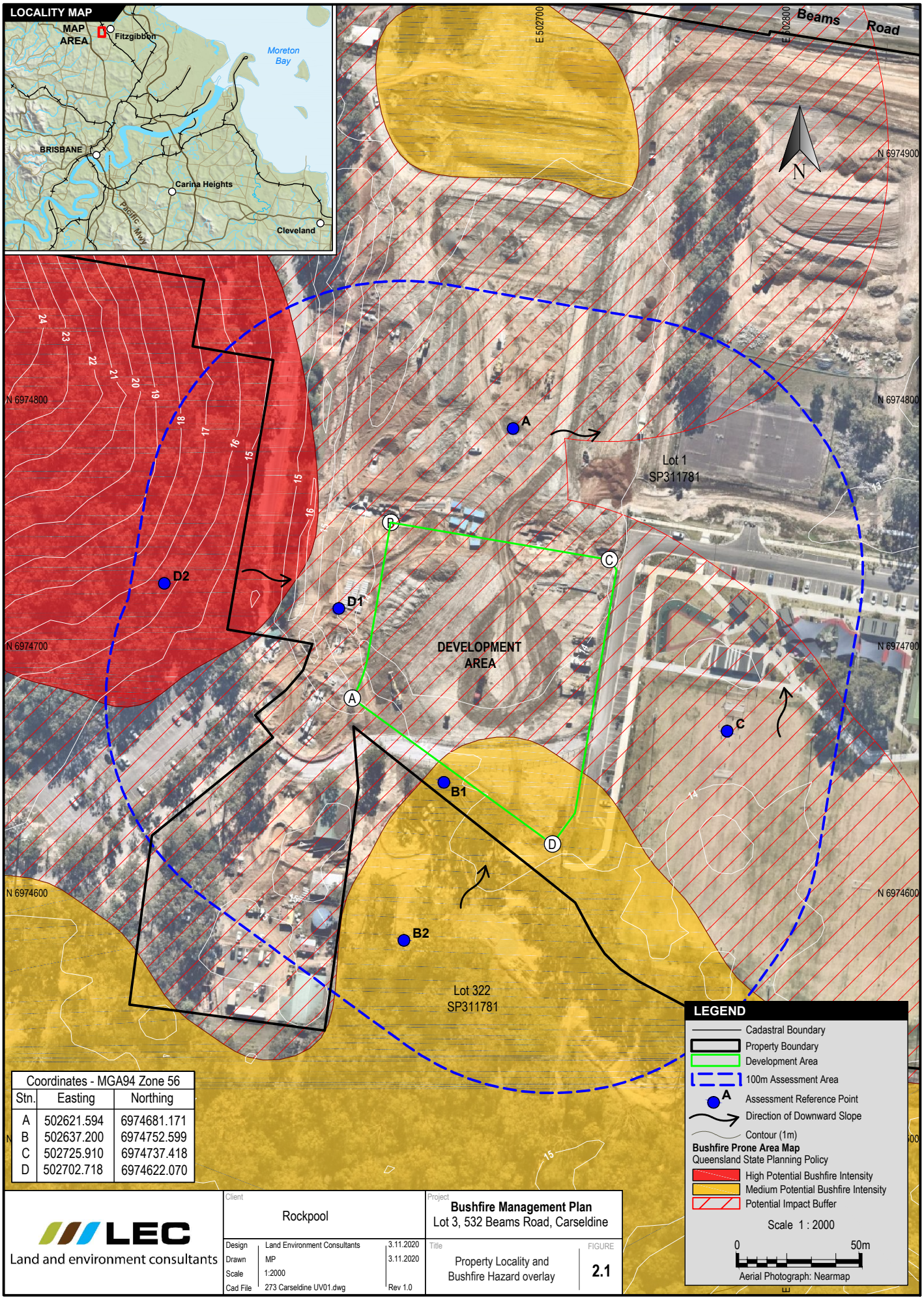
2.2 Proposed development

The proposed development involves establishing an aged care facility in Stage 1 of the Carseldine Urban Village. The approval for Stage 1 of the Carseldine Urban Village includes a reconfiguration of a lot component to create the subject site (lot 3) which was noted in the decision notice as 'aged care/retirement lot.' The preliminary approval for material change of use for the master plan for Carseldine Village (DEV2018/932) also identified lot 3 within mixed use – sub-precinct parkside residential. Residential aged care is identified as suitable/preferred uses within this sub-precinct.

The proposed site plan for the proposed development is provided at Appendix 1.

2.3 SPP bushfire prone area map

The SPP bushfire prone area map for the site is shown on Figure 2.1. Verification of bushfire hazard areas shown on the SPP bushfire prone area map is provided via the bushfire hazard assessment in Section 3.4.



Coordinates - MGA94 Zone 56		
Stn.	Easting	Northing
A	502621.594	6974681.171
B	502637.200	6974752.599
C	502725.910	6974737.418
D	502702.718	6974622.070

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Client: Rockpool

Project: **Bushfire Management Plan**
Lot 3, 532 Beams Road, Carseldine

Design	Land Environment Consultants	3.11.2020
Drawn	MP	3.11.2020
Scale	1:2000	
Cad File	273 Carseldine UV01.dwg	Rev 1.0

Title: Property Locality and Bushfire Hazard overlay

FIGURE: 2.1

3 Bushfire assessment

This chapter provides details of the desktop review, site assessment and bushfire hazard assessment.

3.1 Severe fire weather

The severe fire weather map on Catalyst indicates the 5 % annual exceedance probability forest fire danger index (**FFDI**) for the site is 55.

This FFDI value has been used for the bushfire hazard assessment in Section 3.4 and the radiant heat exposure assessment in Section 5.7.

3.2 Fire history

Fire history data on Catalyst indicates no fires have occurred within 1 kilometre (**km**) of the site during the past 10 years.

3.3 Site assessment

LEC walked over the site and assessed land within 100 m of the proposed development area on 27 October 2020. Observations were recorded about current land use and management, vegetation characteristics, slope of land and evidence of previous fires.

The locations of site assessment reference points are shown on Figure 2.1. Table 3.1 provides a summary of observations associated with site assessment reference points and the features of bushland areas are shown in Photographs 3.1-3.2

Table 3.1 Site observations

Assessment Point	Catalyst VHC	Ground truthed VHC	Notes
A	VHC 39.2 *Low to moderate tree cover in built-up areas* (**VHC 39.2**)	VHC 42.6 *Nil to very low vegetation cover* (**VHC 42.6**)	This land has been cleared under the Stage 1 development approval for the Carseldine Urban Village.
B1	VHC 16.1 *Eucalyptus dominated forest* (**VHC 161**)	VHC 41.4 *Low grass or tree cover in a built-up area* (**VHC 41.4**)	This land will be developed with a bicycle path and turf under the Stage 1 development approval for the Carseldine Urban Village – see approved landscape plan at Appendix 2.
B2	VHC 16.1	VHC 16.1	This area is contiguous with bushland vegetation along Cabbage Tree Creek. It will be subject to vegetation rehabilitation and will be consistent with VHC 16.1 when it reaches a mature state.
C	VHC 41.4	VHC 41.4	Existing sports fields and recreation park that has landscaped gardens and turf.
D1	VHC 16.1 and VHC 39.2	VHC 42.6	The new road connection to Beams Road and future residential development proposed as Stage 3 of the Carseldine Urban Village.
D2	VHC 9.1 *Moist to dry eucalypt open forest* (**VHC 9.1**)	VHC 9.1	Bushland vegetation

Photograph 3.1 VHC 16.1 at B2

Photograph 3.2 VHC 9.1 at D2

3.4 Bushfire hazard assessment

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 models the bushfire hazard assessment method in Bushfire resilient communities.

Part B of the SPP – *state interest technical manual - Natural Hazards, Risk and Resilience* – A *'fit-for-purpose' approach in undertaking natural hazard studies and risk assessments* (DILGP 2016)(**SPP bushfire hazard assessment manual**) defines bushfire hazard classes as follows:

- very high – potential bushfire intensity > 40,000 kilowatts/m (**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 potential bushfire intensity calculations which determine the bushfire hazard class of assessment reference points shown on Figure 2.1 are presented in Table 3.2.

Table 3.2 Potential bushfire intensity

Assessment reference point	Ground truthed VHC	Potential fuel load (t/ha)[1]	Slope (°)[2]	Potential bushfire intensity (kW/m)	Bushfire hazard class
A	VHC 42.6	2	0	136	Non-bushfire hazard class
B1	VHC 41.4	3	0	307	Non-bushfire hazard class
B2	VHC 16.1	16	0	8,621	Medium
C	VHC 41.4	3	0	307	Non-bushfire hazard class
D1	VHC 42.6	2	0	136	Non-bushfire hazard class
D2	VHC 9.1	24.2	5	27,965	High

Notes 1 potential fuel load taken from Bushfire resilient communities
2 slope default to 0° for VHC's with discontinuous fuels, ie VHC 41.4 and VHC 42.6

3.5 Bushfire hazard areas

Results of potential bushfire intensity calculations determined that medium and high potential bushfire intensity areas occur at assessment reference points B2 and D2.

Development within 100 m of a medium or high potential bushfire intensity area is vulnerable from exposure to radiant heat, ember attack and burning debris. To mitigate these potential impacts, the

SPP bushfire hazard assessment manual identifies these areas as a potential impact buffer and they are treated as a bushfire hazard assessment area for planning purposes.

Therefore, the bushfire hazard assessment in this report has confirmed that the site is a bushfire hazard area and the development permit application for the proposed development is subject to further assessment and compliance with outcomes of the SPP bushfire prone area 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 in South-east Queensland starts in August, peaks in September and begins to fall in November, but will remain elevated until 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 is commensurate with a 'very high' fire danger rating (**FDR**). FDRs provide advice about the level of bushfire threat on a day and a very high FDR will be associated with hot, dry and windy conditions. If a bushfire starts and takes hold during a very high FDR, it will be difficult to control and fast moving in large areas of natural vegetation. Bushfires under these conditions can threaten suddenly and without warning. However, well prepared and constructed buildings that are actively defended can offer safety during a fire (ESA 2009).

4.2 Fire history

As discussed in Section 3.2, fire history data indicates no fires have occurred within 1 km of the site during the past 10 years.

4.3 Likely direction of bushfire attack

The likely directions of bushfire attack on the proposed development are from the south and west, ie assessment reference points B2 and D2, where large continuous areas of VHC 16.1 and VHC 9.1 occur. These bushfire attack scenarios are further assessed in Section 5.7.

4.4 Topography

The topography of assessment reference points B2 and D2 will not increase the intensity of bushfire attack in relation to the site. VHC 16.1 at assessment reference point B2 is on flat land and VHC 9.1 at assessment reference point D2 is on 5° upslope in relation to the site. Bushfire attack from flat land or upslope land will have a reduced intensity compared to bushfire attack from downslope land.

4.5 Vegetation restoration and retention

Bushland vegetation will be retained in the bushland and open space component of the Carseldine Urban Village and could be subject to prescribed burning for fuel hazard reduction and to maintain the functioning of the ecosystem. Prescribed burns are carefully planned and implemented and except for some temporary nuisance caused by increased traffic and smoke they are unlikely to have any significant impact on the proposed development.

4.6 Potential bushfire hazard from adjacent land use

Based on fire history data discussed in Section 4.2, adjacent land uses are not a bushfire hazard in relation to the proposed development.

4.7 Water and access

The proposed development will be connected to mains water and will have access to a reticulated hydrant system.

The proposed development will be accessible via a public road network which is capable of accommodating emergency vehicles.

5 Bushfire hazards associated with the proposed development

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

5.1 Vulnerable use

The proposed development is a 'vulnerable use' aged care facility as defined under Table 7 of the SPP 2017 guidance material. As mention in Section 2.1, the approval for Stage 1 of the Carseldine Urban Village includes a reconfiguration of a lot component to create the subject site (lot 3) which was noted in the decision notice as 'aged care/retirement lot.' The preliminary approval for material change of use for the master plan for Carseldine Village (DEV2018/932) also identified lot 3 within mixed use – sub-precinct parkside residential. Residential aged care is identified as suitable/preferred uses within this sub-precinct.

Occupants of the proposed development will be elderly and will be more vulnerable to the effects of bushfire attack. This vulnerability can be due to factors including greater potential for health impacts, reduced and dependent mobility, or the need for high levels of care. This type of vulnerable use is often more difficult to evacuate, and occupants may not be able to support themselves during a bushfire event.

Bushfire resilient communities permits vulnerable use development in bushfire hazard areas where site planning can appropriately support disaster management capacity and capability, ie access for emergency services, vegetation management areas which provide opportunities for prescribed burning or backburning operations and an appropriately designed reticulated hydrant system for fire-fighting purposes.

5.2 Essential community infrastructure

The proposed development does not involve community infrastructure for essential services as defined under Table 7 of the SPP 2017 guidance material.

5.3 Hazardous material storage in bulk

The proposed development includes a bulk liquified petroleum gas (**LPG**) storage area. The location of the LPG storage area will be appropriately separated from bushfire hazard areas.

5.4 Landscaping

Landscaping within the site will be appropriately designed to limit the potential for it to catch fire and compromise the building and evacuation routes from the building.

5.5 Emergency access and evacuation

Efficient access for emergency services and the evacuation of the site will be provided via an appropriately designed driveway which includes manoeuvring areas. Planning for the proposed development includes an alternative driveway route through the balance of the site to the north which can be used in an emergency event should the main driveway crossover become compromised.

Upon completion of stage 3 of the Carseldine Urban Village, the new road connection to Beams Road will adjoin developed land and will not be compromised by bushfire attack from bushland vegetation retained in the bushland and open space component of the Carseldine Urban Village.

5.6 Cycle path along south boundary of the site

As shown by the approved landscape plan at Appendix 2, the south boundary of the site will be separated from the bushfire hazard area associated with the bushland and open space component of the Carseldine Urban Village by a turf area which incorporates a concrete bicycle path.

This area of landscaping will be maintained as a low fuel hazard area in perpetuity and will reduce the vulnerability of the site to bushfire attack. It will also support disaster management capacity and capability by providing opportunities for prescribed burning or backburning operations.

5.7 Radiant heat exposure

The radiant heat profile of the bushfire attack scenarios from assessment reference points B2 and D2 were assessed using the BAL calculator. The inputs used in the models, calculations and results are provided at Appendix 3.

Site planning is seeking to locate the building envelope on the site so that it achieves a radiant heat flux level ≤ 29 kW/m^2 and the primary building exits and LPG storage area will be located in a position which is either shielded from bushfire attack or achieves a radiant heat flux level ≤ 10 kW/m^2.

Table 5.1 provides a summary of results at Appendix 3 and indicates the width of setbacks required from bushfire hazard areas to achieve a radiant heat flux level of ≤ 10 kW/m^2 and ≤ 29 kW/m^2.

Table 5.1 Setbacks required to bushfire hazard areas

Assessment reference point	**Setback required to bushfire hazard areas (m)**	
	≤ 10 kW/m^2	≤ 29 kW/m^2
B2 - south	29.1	11.4
D2 - west	32.5	13

6 Bushfire mitigation plan

This chapter identifies mitigation measures that will be implemented as part of the proposed development to comply with the SPP bushfire prone area code.

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

6.1 Radiant heat exposure

The 10 kW/m^2 and 29 kW/m^2 radiant heat flux contours over the site are shown on Figure 6.1. Radiant heat flux contours are measured from the Precinct boundary, unless adjoining land is of a tenure which ensures that it will remain cleared in perpetuity, ie road reserve.

The building envelope on the site will achieve a radiant heat flux level ≤ 29 kW/m^2 and the primary building exits and LPG storage area will be located in a position which is either shielded from bushfire attack or achieves a radiant heat flux level ≤ 10 kW/m^2.

6.2 Landscaping

Landscaping within the site will be designed to minimise the potential for it to catch fire and compromise the building and evacuation routes from the building.

Landscape design will be based on The Victorian Country Fire Authority guideline *Landscaping for Bushfire – Garden design and plant selection* (CFA 2011) which is publicly available online.

Plant selection will favour species which have characteristics that reduce their likelihood of ignition. These characteristics include well suited to local growing conditions, high moisture content, open and loose branching with sparse leaves, course texture, wide, flat and thick leaves, smooth bark and low levels of oils, waxes and resins.

Landscaped areas will be irrigated and regularly maintained.

6.3 Vehicle access

The driveway cross over and driveway will be designed and constructed in accordance with *Fire Hydrant and Vehicle Access Guidelines for Residential, Commercial and Industrial Lots* (QFES 2015) (**Fire hydrant and vehicle access guidelines**) for load bearing capacity, geometry and turning radii and will provide efficient access/egress for emergency services.

Please note, Fire hydrant and vehicle access guidelines defers to the *Road Planning and Design Manual – 2nd Edition* (DTMR 2013).

The driveway will incorporate manoeuvring areas which enable emergency vehicles to turnaround within the site. An alternative access/egress route will be provided through the balance of the site to the north. Site access and egress is shown on Figure 6.1.

6.4 Fire-fighting water supply

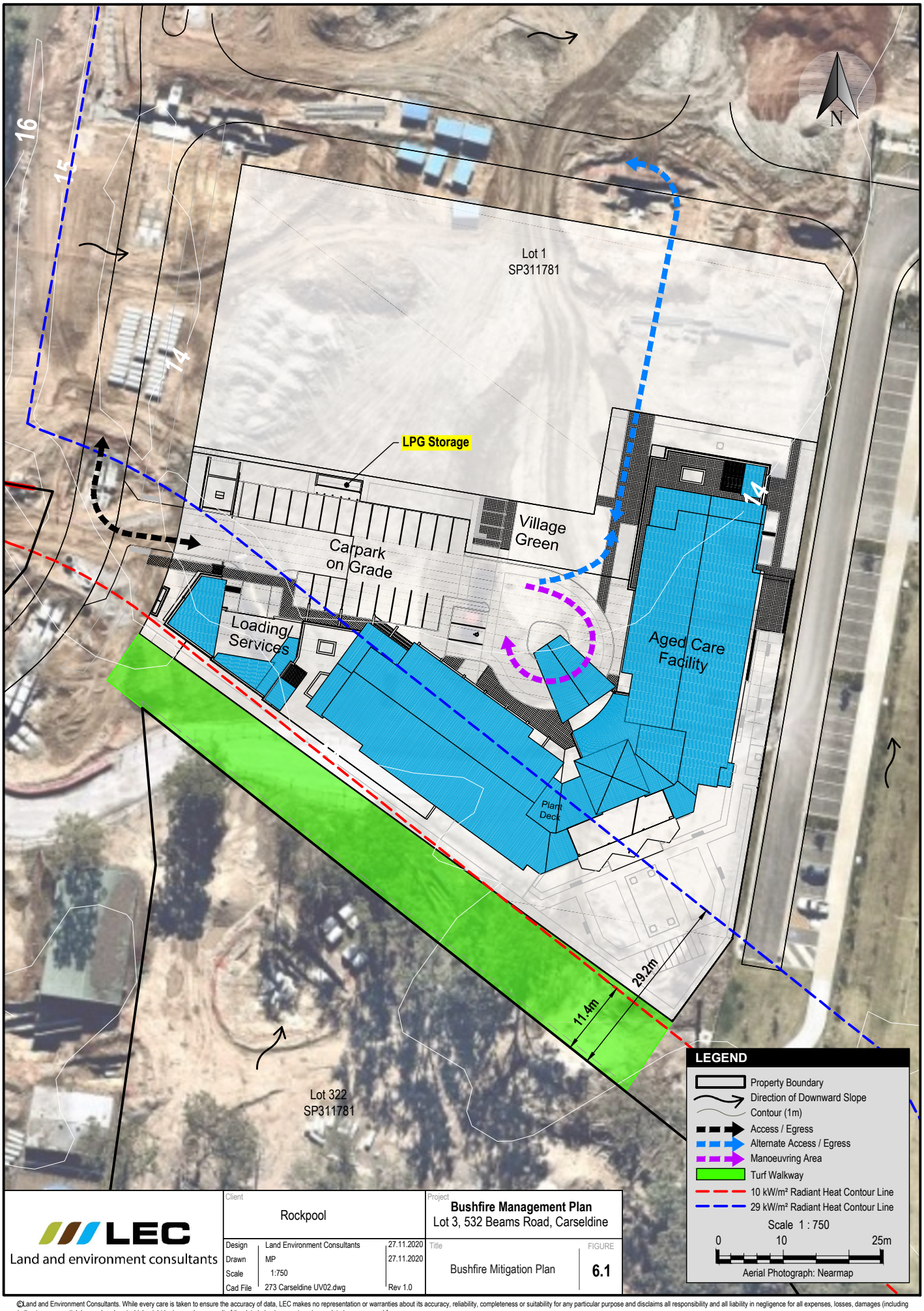
The proposed development will be connected to mains water and will have access to an appropriately designed reticulated hydrant system that will be constructed as part of Stage 1 of the Carseldine Urban Village.

6.5 Utilities

The reticulation of services, ie water, electricity, communications and gas, will be installed underground.

6.6 Building design and construction

The building will be appropriately designed and constructed in accordance with specifications in the *National Construction Code Series, Building Code of Australia Class 2 to Class 9 Buildings, Volume 1* (ABCB 2019).



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Client	Rockpool	
Project	**Bushfire Management Plan** Lot 3, 532 Beams Road, Carseldine	
Design	Land Environment Consultants	27.11.2020
Drawn	MP	27.11.2020
Scale	1:750	
Cad File	273 Carseldine UV02.dwg	Rev 1.0
Title	Bushfire Mitigation Plan	FIGURE 6.1

7 Conclusion

This bushfire management plan has been prepared in accordance with Bushfire resilient communities.

A bushfire hazard assessment confirmed that the site is a bushfire hazard area and that the proposed development is subject to compliance with outcomes of the SPP bushfire prone area code. Notwithstanding, condition 2 of the development approval for Stage 1 of the Carseldine Urban Village permits the development of an aged care facility on the site.

Mitigation measures that will 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 development approval for Stage 1 of the Carseldine Urban Village and outcomes of the SPP bushfire prone area code as demonstrated at Appendix 4.

References

Australian Capital Territory Emergency Services Agency (ESA) 2009, *Fire Danger Ratings – An early indicator to you about the potential danger is a bushfire starts,* 2009

Australian Building Codes Board (ABCB) 2019, *National Construction Code Series, Building Code of Australia Class 2 to Class 9 Buildings, Volume 1,* Australian Government and States and Territories of Australia, February 2019

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Queensland Fire and Emergency Service (QFES) 2015, *Fire Hydrant and Vehicle Access Guidelines for Residential, Commercial and Industrial Lots*, November 2015

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

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

Victorian Country Fire Authority (CFA) 2011, *Landscaping for bushfire – garden design and plant selection*, November 2011

Appendix 1 Proposed site plan

Aged Care Facility

Residents	150
Carparks	25
GFA	8485
Proposed Site Area	5569 Shared + ACF
Plot Ratio	1.52
Approx. Site Cover	2200 40%

GJG Architects

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Project
Carseldine CUV- Scheme 23

Client
Rockpool

Issue	Date	Amendment
10	26.11.20	DA Issue
9	9.11.20	Second Prelodge Issue
8	30.10.20	Prelim Issue 2
7	22.10.20	Client Inst Minor Adjustments
6	20.10.20	GF Layout Change and Effects
4	22.9.20	Int Client Req. Layout Changes

Drawing Title	Drawing Number
Site Plan Scale 1 : 500 @ A3 original	20-15-DA-1.1

Appendix 2 Approved landscape plan for assessment reference point B1

JOINS 203-FI

FOOTPATH TO CIVIL ENGINEERS DETAIL

BIKE PATH TO CIVIL ENGINEERS DETAIL

RAMP TO CIVIL ENGINEERS DETAIL

LOT 3

EXTENT OF WORKS

JOIN INTO EXISTING FOOTPATH

THIS IS TO CERTIFY THAT THESE DRAWINGS HAVE BEEN DESIGNED AND DOCUMENTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE RELEVANT DEVELOPMENT APPROVAL FOR THIS SITE.

30.06.2020 1689

SIGNED DATE AILA MEMBERSHIP NO.

PLOT STYLE: URBIS_A1.CTB

PAGE SETUP: _PDF_A1L_MM

PLOTTED BY: CINDY PESTER

PLOT DATE: 29.10.2020

PATH: J:\Client\EEconomic Development Queensland\ND1901 - Carseldine Urban Village\05 Construction Docs\5.1 CADS.14 Layouts\STAGE 1\CUV_51-200-FI.dwg

URBIS

PROJECT

CARSELDINE URBAN VILLAGE

STAGE 1

532 BEAMS ROAD

CARSELDINE QUEENSLAND 4034

Level 32, 300 George Street | Brisbane QLD 4000 Australia | +61 7 3007 3800 | URBIS Pty Ltd | ABN 50 105 256 228

KEY PLAN

REV	DESCRIPTION	DWN	CHK	DATE
02	FOR CONSTRUCTION	CP	CP	29.10.2020
01	FOR CONSTRUCTION	CP	JD	22.10.2020
E	FOR TENDER	CP	JD	08.07.2020
D	FOR APPROVAL	CP	JD	02.07.2020
C	FOR TENDER	CP	JD	21.05.2020
B	FOR APPROVAL	CP	JD	15.05.2020
A	FOR INFORMATION	CP	JD	07.05.2020

PROJECT DIRECTOR: PH

CLIENT

ECONOMIC DEVELOPMENT QUEENSLAND

.

DRAWING TITLE

FINISHES PLAN

ISSUE

FOR CONSTRUCTION

PROJECT NO.

ND1901

SCALE

SET DRAWING SCALE

NORTH

DRAWING NO.

204-FI

REVISION

02

Appendix 3 Radiant heat exposure calculations

B2 VHC 16.1

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

D2 VHC 9.1

- 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

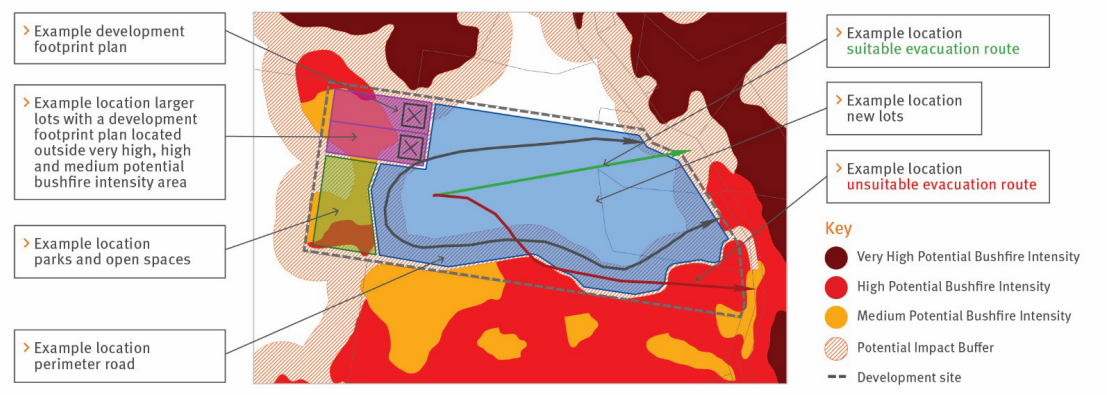
Flame angle - Douglas & Tan, 2005

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

Appendix 4 SPP bushfire prone area 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 reconfiguring 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 a lot.

Performance outcomes	Acceptable outcomes	Compliance assessment
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 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.	**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 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)	**Not applicable** The proposed development does not involve the reconfiguring a lot.

Performance outcomes	Acceptable outcomes	Compliance assessment
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 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 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.	**Not applicable** The proposed development does not involve the reconfiguring a lot.
		

Performance outcomes	Acceptable outcomes	Compliance assessment
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. **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. **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.	**Not applicable** The proposed development does not involve the reconfiguring a lot.
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	**Not applicable** The proposed development does not involve the reconfiguring a lot.

Performance outcomes	Acceptable outcomes	Compliance assessment
	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.	
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). **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 otherwise specified by the relevant water entity; and (b) the *Road Planning and Design Manual 2nd edition*, Department of Transport and Main Roads, 2013	**Not applicable** The proposed development does not involve the reconfiguring a lot.
Section D		
Reconfiguring a lot (RaL) – where creating additional lots for the purpose of residential development and a reticulated water supply is not provided.		

Performance outcomes	Acceptable outcomes	Compliance assessment
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.	**Not applicable** The proposed development does not involve the reconfiguring a lot.

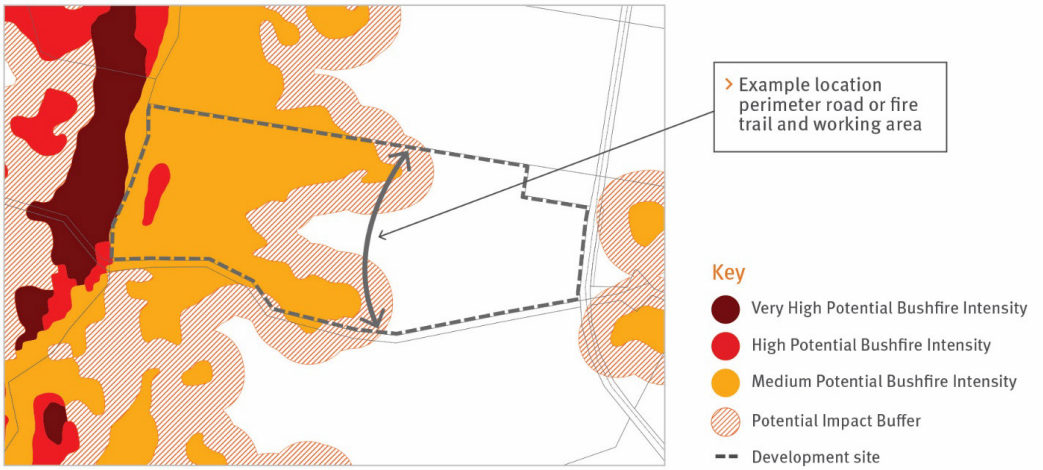



Figure 6 – Siting of fire trail and working area		
Section E		
Material change of use		
PO10 Site layout achieve an acceptable or tolerable risk to people. Landscape or open space provided as part of the development: (a) acts as a buffer between hazardous vegetation and development; and	**AO10.1** Site layout places the landscape and open spaces within the site between premises and adjacent mapped medium, high or very high potential bushfire intensity areas. Refer Figure 7.	✓ **Complies with AO10.1 and AO10.2** As shown by the approved landscape plan at Appendix 2 of the bushfire management plan, the south boundary of the site will be separated from the bushfire hazard area associated with the bushland and open space component of the Carseldine Urban Village by a turf

Performance outcomes	Acceptable outcomes	Compliance assessment
(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.	**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.	area which incorporates a concrete bicycle path. This area of landscaping will be maintained as a low fuel hazard area in perpetuity and will reduce the vulnerability of the site to bushfire attack. It will also support disaster management capacity and capability by providing opportunities for prescribed burning or backburning operations. Landscaping within the site will be designed to minimise the potential for it to catch fire and compromise the building and evacuation routes from the building. Specifications for landscape design are provided in Section 6.2 of the Bushfire management plan.

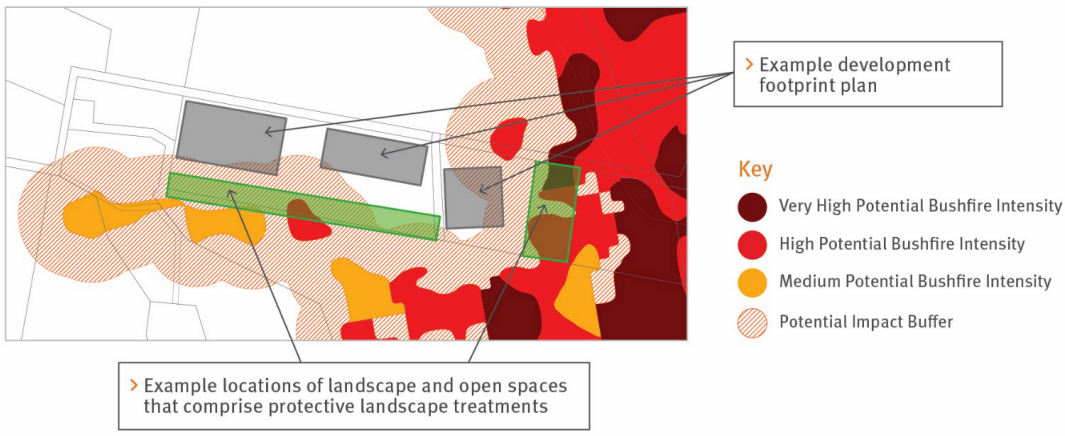


Figure 7 – Siting of protective landscape treatments

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 an isolated location.

Performance outcomes	Acceptable outcomes	Compliance assessment
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: (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	**AO12** No acceptable outcome is prescribed.	✓ **complies with PO12** The driveway crossover and driveway will be designed to provide sufficient width and height clearance and turning geometrics for urban fire-fighter appliances, ie in accordance with *Fire Hydrant and Vehicle Access Guidelines for Residential, Commercial and Industrial Lots* (QFES 2015). The driveway will incorporate manoeuvring areas which enable emergency vehicles to turnaround within the site. An alternative access/egress route will be provided through the balance of the site to the north.
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 will have access to a reticulated hydrant system in the adjoining road reserves.
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	**AO14.1** No acceptable outcome is prescribed.	**An alternate solution is proposed** The building envelope on the site will achieve a radiant heat flux level ≤ 29 kW/m^2 and the primary building exits and LPG storage area will be located in a position which is either shielded from bushfire attack or achieves a radiant heat flux level ≤ 10 kW/m^2. The approval for Stage 1 of the Carseldine Urban Village includes a reconfiguration of a lot component to create the subject site (lot 3)

Performance outcomes	Acceptable outcomes	Compliance assessment
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		which was noted in the decision notice as 'aged care/retirement lot.' The preliminary approval for material change of use for the master plan for Carseldine Village (DEV2018/932) also identified lot 3 within mixed use – sub-precinct parkside residential. Residential aged care is identified as suitable/preferred uses within this sub-precinct. The combination of mitigation measures in the bushfire management plan appropriately supports disaster management capacity and capability, ie access for emergency services, vegetation management areas which provide opportunities for prescribed burning or backburning operations and appropriately design reticulated hydrant system for fire-fighting purposes.
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. (i)	**Not applicable** The proposed development does not involve community infrastructure.
PO16 Development avoids or mitigates the risks to public safety and the	**AO16** No acceptable outcome is prescribed.	✓ **complies with PO16**

Performance outcomes	Acceptable outcomes	Compliance assessment
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.		The LPG storage area will be located in a position which is either shielded from bushfire attack or achieves a radiant heat flux level ≤ 10 kW/m^2.
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 **AO17.2** Landscaping management within any asset protection zone maintains a: (a) potential available fuel load which is less than eight	**Not applicable** Asset protection zones are not proposed within the site.

Performance outcomes	Acceptable outcomes	Compliance assessment
	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). **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 any areas of bushland vegetation restoration.

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 that 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 an easement that is to be maintained by the grantor.
Egress	Contains trafficable vehicle routes in to low hazard areas, every 200 metres

Table 6 – Fire trail and working area design parameters

Group	Uses
Vulnerable uses	childcare centre, community care centre, detention facility, education 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 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

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