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PLANS AND DOCUMENTS
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DEVELOPMENT APPROVAL

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Date: 28 July 2021



Queensland
Government

Bushfire management plan

Proposed development | 205-219 Teviot Road | Greenbank | Queensland
Prepared for Everett Property Development Management | 21 August 2020

Land and Environment Consultants Pty Ltd
13 Pedwell Place
Birkdale Queensland 4159
T: 0466 714 833
E: info@landeconsultants.com.au

Bushfire management plan

Final

Report 19099 | Everett Property Development Management | 21 August 2020

Prepared by Robert Janssen

Position Managing principal

Signature



Date 21 August 2020

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Document control

Version	Date	Prepared by	Reviewed by
Draft	31 July 2020	R. Janssen	Everett Property Development Management
Final	21 August 2020	R. Janssen	LEC


Land and environment consultants

T: 0466 714 833 | E: info@landeconsultants.com.au | <http://www.landeconsultants.com.au/>

13 Pedwell Place | Birkdale | Queensland | 4159 | Australia

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Appendix

Appendix 1	Proposed site plan
Appendix 2	Radiant heat exposure calculations
Appendix 3	Bushfire hazard overlay code assessment
Appendix 4	SPP bushfire prone area code assessment

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 mixed use development over 4 stages (**proposed development**) at 205-219 Teviot Road, Greenbank (**the site**), properly described as lot 10/RP184067.

An application for a development permit will be made for the proposed development under the *Greater Flagstone Priority Development Area – Development Scheme*.

The site is affected by the Logan Planning Scheme 2015 *Bushfire hazard overlay map* OM-03.00 (**Bushfire hazard overlay map**) for medium potential bushfire hazard area and potential impact buffer area. Therefore, the application for a development permit is subject to assessment and compliance with bushfire hazard outcomes of the *Greater Flagstone Priority Development Area – Development Scheme* which calls upon the superseded Queensland State Planning Policy (SPP) 1/03 *Guideline Mitigating the Adverse Impacts of Flood, Bushfire and Landslide* (2003) (**SPP 1/03 guideline**) for information and assessment criteria for bushfire.

The SPP 1/03 guideline was repealed in 2013 and the current SPP 2017 came into effect. Therefore, it is considered relevant that this bushfire management plan considers outcomes of the Logan Planning Scheme 2015 *Bushfire hazard overlay code* (**Bushfire hazard overlay code**) and 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**).

The bushfire hazard assessment in this bushfire management plan has been performed 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 which supports the SPP 2017 and SPP 2017 guidance material. It documents the bushfire hazard assessment for the site and identifies strategies that will be implemented to mitigate the potential impacts of bushfire on life, property and the environment, by way of compliance with outcomes of the Bushfire hazard overlay code and 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 Bushfire hazard overlay code and 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 Bushfire hazard overlay map on the Logan City Council online 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 Bushfire hazard overlay code and 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 is shown on Figure 2.1. It is 2 hectares, currently used for a residential purpose and is accessed via Teviot Road and Leanne Court which are dual-lane public roads. Leanne Court and Teviot Road run along the north and east boundaries of the site, respectively.

The land to the north, south and west of the site are large lots used for a residential purpose while land to the east of the site has been cleared in preparation for a residential subdivision.

The site is located within the northern component of the Greater Flagstone Priority Development Area and is zoned within the *Greater Flagstone Priority Development Area – Development Scheme* as an Urban Living Zone.

It is relevant to note that there is a development permit application for a material change of use - child care centre on the lot to the south of the site (Economic Development Queensland application reference DEV2019/1054) which will modify vegetation on the lot. Also, Economic Development Queensland has recently endorsed a context plan over the site and adjoining properties which identifies the area to be future 'residential' development (Economic Development Queensland application reference DEV2019/1059). Future development in accordance with the endorsed context plan would result in extensive modification of vegetation on properties adjoining the site.

2.2 Proposed development

The proposed development involves establishing independent living units, health care services/commercial shops and food and drink outlets over 4 development stages. The proposed plans of development are provided at Appendix 1. A summary of development stages is as follows:

- Stage 1 - health care facilities/commercial precinct, commercial shops, food and drink outlets, 9 residential apartments and a new crossover to Leanne Court.
- Stage 2 - 100 independent living units and assisted living units and two additional crossovers to Leanne Court.
- Stage 3 - 40 independent living units and assisted living units and a 200 bed aged care facility.
- Stage 4 - expansion of the stage 1 development by increasing the health care facilities/commercial precinct and 4 residential apartments.

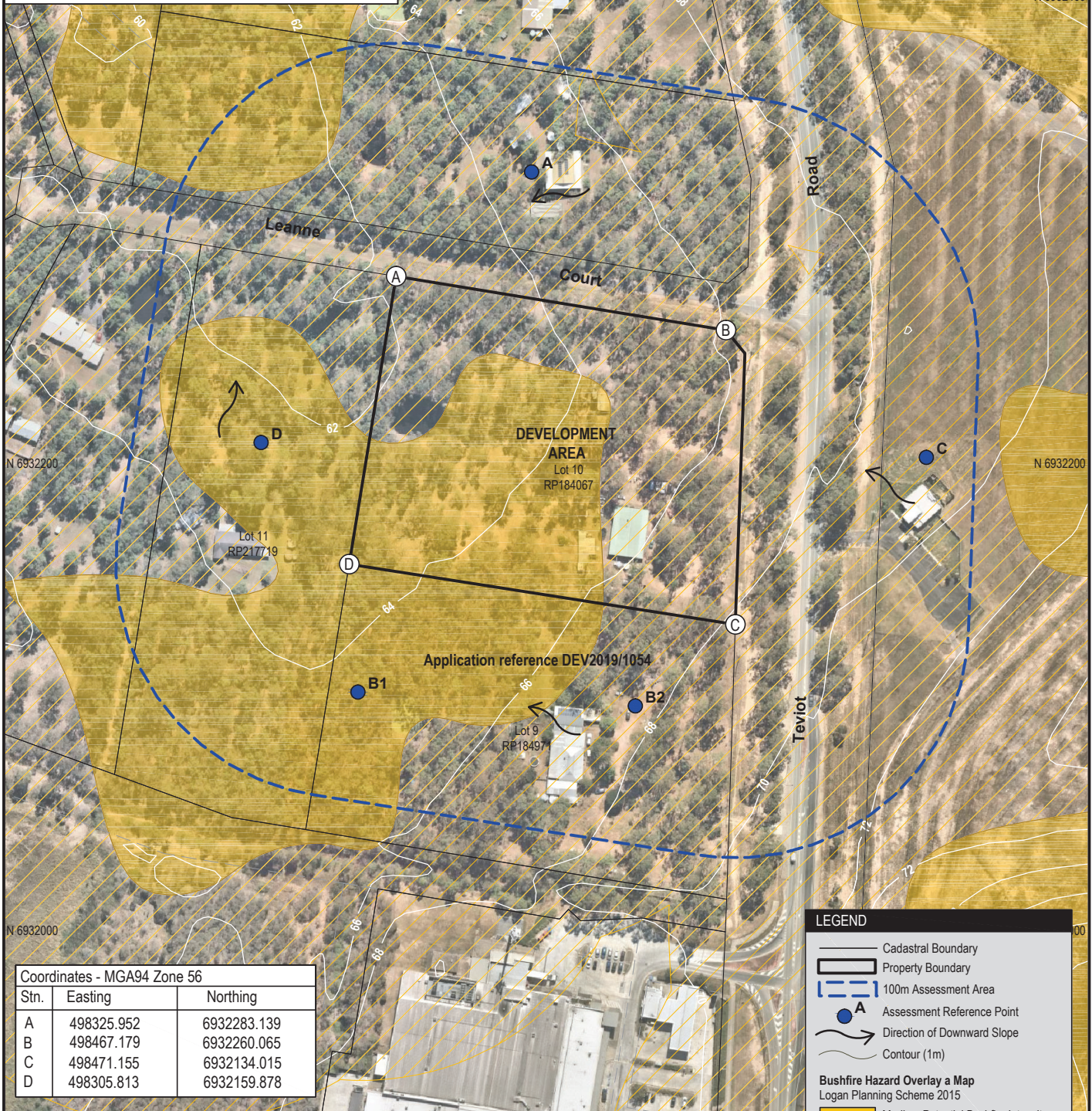
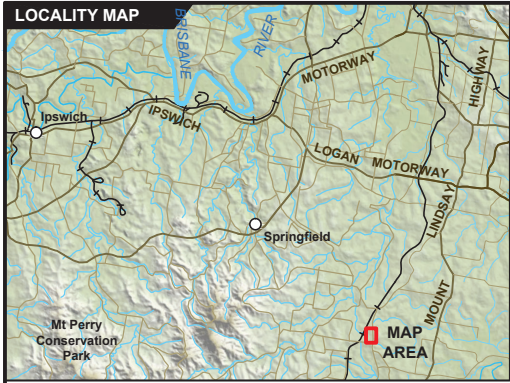
The assisted living units and the aged care facility are defined as 'vulnerable use' development by the SPP 2017 guidance material. These types of uses are considered vulnerable because occupants will require assistance from emergency personnel to respond to an emergency. With regards to a bushfire emergency, planning provisions in the SPP 2017 guidance material focus on providing emergency personnel with a safe working space by way of an increased distance of separation from bushfire hazard. This is because emergency personnel are likely to be exposed to bushfire attack for longer periods of time when providing emergency assistance to a vulnerable use development than other types of development where occupants are self-sufficient.

Access to the proposed development will be via 3 new crossovers to Leanne Court.

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

2.3 Bushfire hazard overlay

The Bushfire hazard overlay map for the site is shown on Figure 2.1. The location of bushfire hazard areas in relation to the proposed development are confirmed by the bushfire hazard assessment in Section 3.4.



Coordinates - MGA94 Zone 56

Stn.	Easting	Northing
A	498325.952	6932283.139
B	498467.179	6932260.065
C	498471.155	6932134.015
D	498305.813	6932159.878

LEGEND

- Cadastral Boundary
- Property Boundary
- 100m Assessment Area
- Assessment Reference Point
- Direction of Downward Slope
- Contour (1m)

Bushfire Hazard Overlay a Map
Logan Planning Scheme 2015

- Medium Potential Bushfire Intensity
- Potential Impact Buffer

Scale 1 : 2500

0 25 50 75m

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Client
Everett Property Development Management

Design
Land Environment Consultants
MP
Scale
1:2500
Cad File
257 205-219 Teviot Rd01.dwg

29.07.2020
29.07.2020
Rev 1.0

Project
Bushfire Management Plan
205-219 Teviot Road, Greenbank

Title
Property Locality and Bushfire Hazard overlay

FIGURE
2.1

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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 5.8.

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 site on 11 November 2019. 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 their features are shown in Photographs 3.1-3.5.

Table 3.1 Site observations

Assessment Point	Catalyst VHC	Ground truthed VHC	Notes
A	VHC 10.1 <i>Spotted gum dominated open forests (VHC 10.1)</i> and VHC 41.4 <i>Low grass or tree cover in a built-up area (VHC 41.4)</i>	VHC 39.2 <i>Low to moderate tree cover in built-up areas (VHC 39.2)</i>	Large residential lot with clearings around residential buildings and regrowth vegetation. The understorey mainly consisted of grass and there was evidence of slashing.
B1	VHC 9.2 <i>Moist to dry woodland (VHC 9.2)</i>	VHC 9.2	Large residential lot with a patch of bushland vegetation that is shown to be retained on the proposal plan for DEV2019/1054. The patch of bushland vegetation adjoins land with vegetation that has continuous fuel.
B2	VHC 10.1 and VHC 41.4	VHC 40.4 <i>Low grass or tree cover in rural areas (VHC 40.4)</i>	Vegetation management area around building. The proposal plan for DEV2019/1054 shows that this area will be subject to maintained landscaping with a narrow strip of vegetation restoration along the common boundary with the site.
C	VHC 40.4	VHC 41.4	This land has a sales office and has been cleared in preparation for civil earthworks.
D	VHC 9.2	VHC 39.2	Large residential lot with clearings around residential buildings and regrowth vegetation. The understorey mainly consisted of grass and there was evidence of slashing.



Photograph 3.1 VHC 39.2 at A



Photograph 3.2 VHC 9.2 at B1



Photograph 3.3 VHC 40.4 at B2



Photograph 3.4 VHC 41.4 at C



Photograph 3.5 VHC 39.2 at D

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) 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 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 (°)	Potential bushfire intensity (kW/m)	Bushfire hazard class
A	VHC 39.2	8	0	2,182	Non-bushfire hazard class
B1	VHC 9.2	17.8	0	10,088	Medium
B2	VHC 40.4	5	0	853	Non-bushfire hazard class
C	VHC 41.4	3	3	377	Non-bushfire hazard class
D	VHC 39.2	8	0	2,182	Non-bushfire hazard class

Notes 1 potential fuel load taken from Bushfire resilient communities

3.5 Bushfire hazard areas

Results of potential bushfire intensity calculations determined that the land at assessment reference point B1 is a medium potential bushfire intensity area and they agree with the Bushfire hazard overlay map.

The site is within 100 m of the medium potential bushfire intensity area, is vulnerable from exposure to radiant heat, ember attack and burning debris and is deemed to be a bushfire hazard area for planning purposes.

Therefore, the bushfire hazard assessment has confirmed that the site is a bushfire hazard area, ie potential impact buffer, and the proposed development is subject to compliance with outcomes of the Bushfire hazard overlay code and 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.

An FFDI value represents the chance of a fire starting, its rate of spread, its intensity and the difficulty of its suppression, according to various combinations of air temperature, relative humidity, wind speed and both the long and short-term drought effects. The severe fire weather map accessed on Catalyst indicates the 5% annual exceedance probability FFDI for the site is 55.

Fire danger ratings (**FDR**) are based on the forecast weather conditions, ie FFDI, and gives advice about the level of bushfire threat on a day. An FFDI of 55 is commensurate with a very high FDR and will be associated with hot, dry and windy conditions. If a fire starts and takes hold under these conditions, it will be difficult to control in large areas of natural vegetation.

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 north, south and west where there is vegetation with a continuous horizontal fuel profile, ie VHC 39.2 at assessment reference points A and D and VHC 9.2 at assessment reference point B1. These bushfire attack scenarios are further assessed in Section 5.8.

4.4 Potential bushfire hazard from adjacent land use

The site adjoins large residential lots. Based on the fire history data discussed in Section 4.2, the adjacent residential land use is not a bushfire hazard in relation to the proposed development.

4.5 Water and access

The proposed development will be connected to mains water and is 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 Site activities and usage patterns

The proposed development is for a mixed use development and does not involve activities or design features, eg hazardous material storage, vegetation restoration etc, that will increase the risk of bushfire hazard on adjacent properties.

5.2 Population

The site is located within the northern component of the Greater Flagstone Priority Development Area and is subject to an endorsed context plan (Economic Development Queensland application reference DEV2019/1059) which identifies the site and adjoining properties as future 'residential' development.

Future development of properties around the site in accordance with the endorsed context plan (Economic Development Queensland application reference DEV2019/1059) will reduce the extent and connectivity of bushland vegetation around the site and will remove the bushfire hazard areas currently shown on the Bushfire hazard overlay map.

Therefore, in the long term the proposed development will not materially increase the number of people or buildings exposed to bushfire hazard. Furthermore, it will be designed to mitigate the risk of bushfire hazard to a tolerable level by way of complying with outcomes of the Bushfire hazard overlay code and the SPP bushfire prone area code.

5.3 Storage or handling of hazardous materials in bulk

The proposed development does not involve the storage or handling of hazardous materials in bulk as defined in the SPP 2017 guidance material.

5.4 Vulnerable uses and essential community infrastructure

The proposed development includes vulnerable uses, ie assisted living units and aged care facility, as defined as under the SPP 2017 guidance material.

5.5 Landscaping

Landscaping on the site will be appropriately designed to minimise the potential for it to catch fire and compromise buildings and the evacuation route from buildings.

5.6 Access and evacuation

Efficient access for emergency services and the orderly evacuation of occupants will be provided via 3 new road connections to Leanne Court.

Driveways within the site will be used to separate buildings from hazardous vegetation at assessment reference points B1 and D and will be designed to provide the necessary width and height clearance required for urban fire-fighter appliances.

5.7 Fire-fighting water supply

The proposed development will be connected to mains water and will have an appropriately designed reticulated hydrant system.

During the detailed design phase, water supply and pressure will be tested (and if required augmented) to ensure that it has sufficient flow and pressure characteristics for fire-fighting purposes at all times.

5.8 Radiant heat exposure

The Bushfire overlay code and the SPP bushfire prone area code seeks to provide building locations which are separated from hazardous vegetation by a distance which 'achieves an acceptable or tolerable level of risk to people and property'. The acceptable outcome for vulnerable use development, ie assisted living units and aged care facility, is a separation distance from hazardous vegetation which achieves a radiant heat flux $\leq 10 \text{ kW/m}^2$ and for other development, eg health care facilities/commercial precinct, commercial shops, food and drink outlets and independent living units, a separation distance from hazardous vegetation which achieves a radiant heat flux $\leq 29 \text{ kW/m}^2$.

Liquified petroleum gas (LPG) storage will be located so that it has a separation distance from hazardous vegetation which achieves a radiant heat flux $\leq 10 \text{ kW/m}^2$.

The radiant heat profile of bushfire attack scenarios discussed in Section 4.3, ie assessment reference points A, B1 and D, were assessed using the BAL calculator. The inputs used in the models, calculations and results are provided at Appendix 2.

The separation distance required to achieve a radiant heat flux $\leq 10 \text{ kW/m}^2$ is as follows:

- 14 m from assessment reference points A and D; and
- 26.7 m from assessment reference point B1.

The separation distance required to achieve a radiant heat flux $\leq 29 \text{ kW/m}^2$ is as follows:

- 5.1 m from assessment reference points A and D; and
- 10.2 m from assessment reference point B1.

6 Bushfire mitigation plan

This chapter identifies mitigation measures that will be implemented as part of the proposed development to comply with the Bushfire hazard overlay code and 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 Setbacks from hazardous vegetation

The 10 kW/m² and 29 kW/m² radiant heat flux contours over the site are shown on Figure 6.1. The radiant heat flux contours are measured from the boundaries of the site, unless adjoining land is of a tenure which ensures that it will remain cleared in perpetuity, ie road reserve.

Vulnerable use buildings, ie assisted living units and aged care facility, and LPG storage will not be located between the south and west boundaries of the site and the 10 kW/m² radiant heat flux contour.

Other development, ie health care facilities/commercial precinct, commercial shops, food and drink outlets and independent living units will not be located between the south and west boundaries of the site and the 29 kW/m² radiant heat flux contour.

Development permissible between the south and west boundaries of the site and the 10 kW/m² and 29 kW/m² radiant heat flux contours includes driveways, carpark spaces and landscaped areas.

Given that future development of adjacent properties under the endorsed context plan (Economic Development Queensland application reference DEV2019/1059) will reduce the extent and connectivity of bushland vegetation adjoining the site, the location of the 10 kW/m² and 29 kW/m² radiant heat flux contours is likely to change. Therefore, the 10 kW/m² and 29 kW/m² radiant heat flux contours over the stage 2 and 3 development areas will be reviewed prior to detailed site planning for the stage 2 and 3 development.

6.2 Landscaping

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

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 should 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, coarse 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

Cross overs and driveways associated with the proposed development 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 for emergency services.

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

Evacuation of the site will be via Leanne Court and Teviot Road as shown on Figure 6.1.

6.4 Fire-fighting water supply

The proposed development will be connected to mains water and will have an appropriately designed reticulated hydrant system constructed in accordance with Fire hydrant and vehicle access guidelines.

6.5 Utilities

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



LEGEND

- Cadastral Boundary
- Property Boundary
- Direction of Downward Slope
- Contour (1m)
- Evacuation
- Indicative Radiant Heat Exposure Contour
 - 10 kW/m²
 - 29 kW/m²

Scale 1 : 1250

0 20 50m

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Client Everett Property Development Management			Project Bushfire Management Plan 205-219 Teviot Road, Greenbank	
Design Drawn Scale Cad File	Land Environment Consultants MP 1:1250 257 205-219 Teviot Rd02.dwg	20.08.2020 20.08.2020 Rev 1.0	Title Bushfire Mitigation Plan	FIGURE 6.1

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7 Conclusion

This bushfire management plan has been prepared in accordance with Bushfire resilient communities as considered relevant to the context of the site and the proposed development.

A bushfire hazard assessment confirmed that the site is affected by bushfire hazard and the proposed development is subject to compliance with outcomes of the Bushfire hazard overlay code and the SPP bushfire prone area code.

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 outcomes of the Bushfire hazard overlay code and the SPP bushfire prone area code as demonstrated at Appendix 3 and Appendix 4 respectively.

References

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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

PROPERTY DESCRIPTION
LOT 10 on RP084067
PARISH: PERRY
COUNTY: STANLEY

COUNCIL: LOGAN CITY COUNCIL
DEVELOPMENT ASSESSMENT

TOTAL SITE AREA - 2.001 ha

STAGE 1 & 4 - BUILDINGS (3 STOREY)

DEVELOPMENT SITE AREA - 6,332m²
(INCLUDES STAGE 4 SITE AREA)

LANDSCAPE/OPEN SPACE - 1,240m² (19.6%)

BUILDING AREAS - NLA

GROUND LEVEL	
T1 - DENTIST	- 100m ²
T2 - OPTOMETRIST	- 97m ²
T3 - PATHOLOGY	- 44m ²
T4 - CAFE/HEALTH FOODS	- 100m ²
T5 - CHEMIST INCLUDES EXCLUSIVE AMENITIES	- 44.8m ²
T6 - MEDICAL CONSULT	- 417m ²
PUBLIC AMENITIES	- 14m ²
T11 - MEDICAL/COMMERCIAL	- 443m ²

TOTAL GROUND LEVEL NLA - 1,663m²

OVERALL BLDG FOOTPRINT - 1,840m²
(INCLUDES STAIRS/LIFTS AND STAGE 1 BUILDINGS)
(EXCLUDES OPEN AIR BREEZEWAYS, REFUSE AND MECHANICAL SERVICES ENCLOSURES)

CAR PARKING

- PARKING REQUIRED - TB.A
- PARKING PROVIDED - 152

LEGEND

BR BICYCLE RACK 4 OFF. 5 BIKES MAX. EACH





VERVE
BUILDING DESIGN CO.
BUILDING DESIGN REFERENCE NO. 100221 - PROJECT NO. 205-219
DESIGNED BY: JAMES WILSON
DRAWN BY: JAMES WILSON
DATE: 10/10/2020

Commercial / Industrial / retail
fast food restaurant design
travel centre / service stations
Project concept to completion

VERVE BUILDING DESIGN CO.
100221 - PROJECT NO. 205-219
DESIGNED BY: JAMES WILSON
DRAWN BY: JAMES WILSON
DATE: 10/10/2020

Project Description

PROPOSED MIXED USE DEVELOPMENT
205-219 TEVIOT ROAD, GREENBANK

Proposed Development

Site Area: 2.001 ha / 1,663 m²

Scale: 1:500

Drawn by: JAMES WILSON

Checked by: JAMES WILSON

Approved by: JAMES WILSON

Drawn by: JAMES WILSON

Checked by: JAMES WILSON

Approved by: JAMES WILSON

Project Title

CONCEPT PLAN - GROUND FLOOR
STAGE 1 & STAGE 4

Project Number

19021-DA06

Revision

C

Appendix 2 Radiant heat exposure calculations

B1 VHC 9.2

- Forest fire danger index – 55
- Vegetation – VHC 9.2 *Moist to dry eucalypt woodland on coastal lowlands and ranges*
- Overall fuel load – 17.2 t/ha¹
- Surface fuel – 16.2 t/ha¹
- Slope – 0° slope
- Site slope – 0° slope
- Flame width – 100 m

Note 1 overall and surface fuel loads are based on guidance by the QFES in Bushfire resilient communities



Calculated July 28, 2020, 9:26 am (MDC v.4.8)

J19099

Minimum Distance Calculator - AS3959-2018 (Method 2)			
Inputs		Outputs	
Fire Danger Index	55	Rate of spread	1.06 km/h
Vegetation classification	Woodland	Flame length	9.01 m
Surface fuel load	16.2 t/ha	Flame angle	54 °, 64 °, 72 °, 77 °, 79 ° & 84 °
Overall fuel load	17.2 t/ha	Elevation of receiver	3.64 m, 4.05 m, 4.28 m, 4.39 m, 4.42 m & 4.48 m
Vegetation height	n/a	Fire intensity	9,501 kW/m
Effective slope	0 °	Transmissivity	0.883, 0.87, 0.85, 0.827, 0.8149999999999999 & 0.744
Site slope	0 °	Viewfactor	0.5927, 0.4366, 0.2919, 0.1984, 0.1612 & 0.0441
Flame width	100 m	Minimum distance to < 40 kW/m²	7.5 m
Windspeed	n/a	Minimum distance to < 29 kW/m²	10.2 m
Heat of combustion	18,600 kJ/kg	Minimum distance to < 19 kW/m²	15.2 m
Flame temperature	1,090 K	Minimum distance to < 12.5 kW/m²	22.1 m
		Minimum distance to < 10 kW/m²	26.7 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

A and D VHC 39.2

- Forest fire danger index – 55
- Vegetation – VHC 39.2 *Low to moderate tree cover*
- Overall fuel load – 8 t/ha¹
- Surface fuel – 8 t/ha¹
- Slope – 0° slope
- Site slope – 0° slope
- Flame width – 100 m

Note 1 overall and surface fuel loads are based on guidance by the QFES in Bushfire resilient communities



Calculated July 28, 2020, 9:27 am (MDC v.4.8)

J19099

Minimum Distance Calculator - AS3959-2018 (Method 2)			
Inputs		Outputs	
Fire Danger Index	55	Rate of spread	0.52 km/h
Vegetation classification	Woodland	Flame length	4.39 m
Surface fuel load	8 t/ha	Flame angle	55 °, 65 °, 73 °, 79 °, 81 ° & 86 °
Overall fuel load	8 t/ha	Elevation of receiver	1.79 m, 1.99 m, 2.1 m, 2.15 m, 2.16 m & 2.19 m
Vegetation height	n/a	Fire intensity	2,182 kW/m
Effective slope	0 °	Transmissivity	0.893, 0.886, 0.875, 0.86, 0.85 & 0.776
Site slope	0 °	Viewfactor	0.5778, 0.4221, 0.2848, 0.1901, 0.1544 & 0.0422
Flame width	100 m	Minimum distance to < 40 kW/m ²	3.8 m
Windspeed	n/a	Minimum distance to < 29 kW/m ²	5.1 m
Heat of combustion	18,600 kJ/kg	Minimum distance to < 19 kW/m ²	7.6 m
Flame temperature	1,090 K	Minimum distance to < 12.5 kW/m ²	11.4 m
		Minimum distance to < 10 kW/m ²	14 m

Rate of Spread - Mearthur, 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 hazard overlay code assessment

Performance outcomes	Acceptable outcomes	Comments
For accepted development (subject to requirements) and assessable development		
Location, design and siting of development		
PO1 Development is designed to: (a) minimise risk of bushfire hazard; (b) provide safe premises; (c) create efficient emergency access for fire-fighting and other emergency vehicles. Note—Planning scheme policy 6—Management of bushfire hazard provides guidelines on how to achieve this outcome.	AO1 Development: (a) does not increase the number of persons living in, or lots in, the Bushfire hazard area identified on Bushfire hazard overlay map—OM—03.00; or (b) is on a site that a bushfire hazard assessment prepared in accordance with the methodology in planning scheme policy 6—Management of bushfire hazard determines is of low bushfire hazard.	✓ Complies with PO1 A site-specific bushfire hazard assessment was performed on the site in accordance with the method in <i>Bushfire Resilient Communities Technical Reference Guide for the State Planning Policy State Interest 'Natural Hazards, Risk and Resilience – Bushfire (QFES 2019)</i> and determined that the proposed development is affected by bushfire hazard. A bushfire management plan has been prepared (this report) and provides mitigation measures for potential impacts of bushfire hazard on the proposed development. Future development of properties around the site in accordance with the endorsed context plan (Economic Development Queensland application reference DEV2019/1059) will reduce the extent and connectivity of bushland vegetation around the site and will remove the bushfire hazard areas currently shown on the Bushfire hazard overlay map. Therefore, in the long term the proposed development will not materially increase the number of people or buildings exposed to bushfire hazard. Furthermore, it will be designed to mitigate the risk of bushfire hazard to a tolerable level by way of complying with outcomes of the Bushfire hazard overlay code and the SPP bushfire prone area code.
PO2 Development is sited and constructed to minimise the bushfire hazard and maximise the protection of life and property from bushfire. Editor's note – Planning scheme policy 6-Management of bushfire hazard contains guidance on the preparation of bushfire management plans.	AO2 Development is located and constructed: (a) where there is no bushfire management plan approved by an existing development approval: (i) such that the bushfire attack level is less than or equal to BAL-29; (ii) away from the most likely direction of a fire front;	✓ Complies with PO2 The site is flat and will be cleared in preparation for civil works. As specified in Section 6.1 and Figure 6.1 of the Bushfire management plan: • Vulnerable use buildings, ie assisted living units and aged care facility, and LPG storage will not

Performance outcomes	Acceptable outcomes	Comments
	(iii) so that elements of the development least susceptible to fire are sited closest to the bushfire hazard; (iv) such that asset protection zones are sited on land with a slope less than 18 degrees; (v) such that asset protection zones are entirely within the boundaries of the private property of the development site; or (b) where an approved bushfire management plan directs development to be located. Note—BAL = Bushfire attack level is the radiant heat flux a building will experience during a bushfire and is a measure of heat energy impacting on a surface expressed as kW/m². BAL is calculated from the following factors; vegetation type, fuel loads, distance to vegetation, Forest Fire danger Index (FDI), flame length, fire behaviour/intensity and slope. BAL is used to determine the required construction level of a building and the size of asset protection zones (inner and outer radiation zones). Further information on calculating the BAL can be obtained from AS3959–2009. Editor's note—Asset protection zones are not located on slopes greater than 18 degrees to ensure maintenance is practical, soil stability is not compromised and the potential for crown/canopy fires is reduced.	be located between the south and west boundaries of the site and the 10 kW/m² radiant heat flux contour. Other development, ie health care facilities/commercial precinct, commercial shops, food and drink outlets and independent living units will not be located between the south and west boundaries of the site and the 29 kW/m² radiant heat flux contour. The setbacks required to achieve radiant heat flux outcomes are fully contained within the boundary of the site, except from the northern boundary where it is contained in the Leanne Court road reserve. Development permissible within the 10 kW/m² and 29 kW/m² radiant heat flux contours includes driveways, carpark spaces and landscaped areas. Access and evacuation of the site is via existing public roads which are capable of accommodating emergency services vehicles. In the vicinity of the site, these roads are not affected by bushfire hazard areas shown on the Bushfire hazard overlay map
PO3 Reconfiguring a lot ensures that lots are designed to minimise bushfire hazard and provide safe sites for people, property and buildings.	AO3 Lots: (a) are suitable for people, property and buildings by: (i) having a bushfire attack level less than or equal to BAL–29; or (ii) containing a development envelope area that has a bushfire attack level less than or equal to BAL–29; (b) provide asset protection zones that: (i) are located on land with a slope less than 18 degrees; (ii) are located on the same lot.	Not applicable The proposed development does not involve the reconfiguration of a lot.

Performance outcomes	Acceptable outcomes	Comments
Vehicular access and fire maintenance trails		
PO4 Access for fire management and evacuation is provided by access that: (a) separates premises from adjoining vegetation; (b) is safely accessible by fire fighting vehicles; (c) has regular vehicular access points for bushfire management, response and evacuation; (d) has regular vehicle passing and turning areas for bushfire management, response and evacuation; (e) allows access at all times for fire fighting vehicles; (f) allows for maintenance, burning off and bushfire response; (g) has vehicular links to an alternative through road; (h) is readily maintained. Editor's note—Planning scheme policy 6— Management of bushfire hazard provides details on alternative solutions for providing fire management access and evacuation	AO4 Access for fire management and evacuation is provided by vehicular access in the form of a perimeter road: (a) with a minimum reserve width of 20 metres; (b) located between the premises and adjoining vegetation; (c) with a maximum gradient of 12.5 percent; (d) constructed to otherwise comply with section 3.4—Movement infrastructure standards of planning scheme policy 5— Infrastructure; (e) that has a layout that does not include a cul-de-sac.	✓ Complies with PO4 Access for emergency services and the evacuation of occupants is via Leanne Court and Teviot Road which are existing public roads. The new crossovers and driveways within the site will be designed to provide sufficient width and height clearance and turning geometrics for urban fire-fighter appliances, ie in accordance with <i>Fire Hydrant and Vehicle Access Guidelines for Residential, Commercial and Industrial Lots</i> (QFES 2015).

Performance outcomes	Acceptable outcomes	Comments
Water supply		
PO5 Development has access to adequate water supply for fire fighting purposes.	AO5 Development: (a) is connected to a reticulated water supply scheme that has sufficient flow and pressure characteristics for fire fighting purposes at all times with a minimum pressure and flow of 10 litres per second at 200kPa; or (b) has an on-site water storage in accordance with Table 8.2.3.3.2, dedicated or retained for fire fighting purposes that is made of fire resistant materials and is: (i) a separate tank; or (ii) a reserve section in the bottom part of the main water supply tank. Editor's note—The requirement in AO5 is: – in addition to the requirement for potable water supply/storage in AO2 in Table 9.4.3.3.2—Infrastructure code: self-assessable and assessable development.; – reflected in AO5 in Table 9.4.3.3.2—Infrastructure code: self-assessable and assessable development.	✓ Complies with PO5 The proposed development will be connected to mains water and will have a reticulated hydrant system which complies with <i>Fire Hydrant and Vehicle Access Guidelines for Residential, Commercial and Industrial Lots</i> (QFES 2015).

Performance outcomes	Acceptable outcomes	Comments
For assessable development		
Community infrastructure		
PO6 Community infrastructure is not located in a bushfire hazard area or is able to function effectively during and immediately after a bushfire event.	AO6 Community infrastructure is: (a) not located in a Bushfire hazard area identified on Bushfire hazard overlay map—OM—03.00; or (b) located to ensure that: (i) the core services provided by the community infrastructure is able to function effectively during bushfire events; (ii) access to the community infrastructure is not compromised by bushfire events; (iii) the safe storage of valuable records, public records and items of cultural or historic significance is able to be maintained during a bushfire event.	Not applicable The proposed development does not include community infrastructure.
Hazardous materials		
PO7 Public safety and the environment are not adversely affected by the adverse impacts of bushfire on hazardous materials including fuels, explosives and flammable chemicals manufactured or stored in bulk on premises.	AO7 Hazardous materials: (a) storage is in compliance with AS1940—The storage and handling of flammable and combustible liquids; (b) manufacturing does not occur in a Bushfire hazard area on Bushfire hazard overlay map—OM—03.00.	Not applicable The proposed development does not involve the manufacture or storage and handling of hazardous materials in bulk Notwithstanding, the LPG storage area will be located so that it achieves a radiant heat flux $\leq 10 \text{ kW/m}^2$.

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 <i>Bushfire resilient communities</i> 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 <i>Bushfire resilient communities</i> 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/m² 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 <i>Bushfire resilient communities</i> 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.
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	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	Not applicable The proposed development does not involve the reconfiguring a lot.

Performance outcomes	Acceptable outcomes	Compliance assessment
should form part of a bushfire hazard assessment, in accordance with the methodology in the QFES <i>Bushfire resilient communities</i> 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.	(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.	
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 <i>Bushfire resilient communities</i> 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 a lot.
PO8 Perimeter roads are accessible for fire-fighting vehicles, to facilitate emergency access and operational	AO8.1 Where the asset protection zone includes a perimeter road it: (a) has a two-lane sealed carriageway	Not applicable The proposed development does not involve the reconfiguring a lot.

Performance outcomes	Acceptable outcomes	Compliance assessment
space for fire- fighting, maintenance works and hazard reduction activities.	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). A08.2 Where the subdivision contains a reticulated water supply, the road network and fire hydrants are designed and installed in accordance with: (a) <i>Fire Hydrant and Vehicle Access Guidelines for residential, commercial and industrial lots</i>, Queensland Fire and Emergency Services, 2015, unless otherwise specified by the relevant water entity; and (b) <i>the Road Planning and Design Manual 2nd edition</i>, 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.	A09.1 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	Not applicable The proposed development does not involve the reconfiguring a lot.

Performance outcomes	Acceptable outcomes	Compliance assessment
	AO8.1.	
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 (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 <i>Bushfire resilient communities</i> 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.	AO10.1 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. 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 AO10.1 and AO10.2 Refer to proposal plan at Appendix 1 of the bushfire management plan and specifications for the design and maintenance of landscaping in Section 6.2 of the Bushfire management plan.
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 <i>Bushfire resilient communities</i> document.	✓ complies with PO11 The radiant heat flux contours demonstrate that most of the site achieves a radiant heat flux ≤ 10 kW/m² and can accommodate a suitable evacuation area.
PO12 If on a lot of over 2,000 m², where involving a new premises or an existing premises with an	AO12 No acceptable outcome is prescribed.	✓ complies with PO12

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		As specified in Section 6.1 and Figure 6.1 of the Bushfire management plan: - Vulnerable use buildings, ie assisted living units and aged care facility, and LPG storage will not be located between the south and west boundaries of the site and the 10 kW/m² radiant heat flux contour. - Other development, ie health care facilities/commercial precinct, commercial shops, food and drink outlets and independent living units will not be located between the south and west boundaries of the site and the 29 kW/m² radiant heat flux contour. The new crossovers and driveways within the site will be designed to provide sufficient width and height clearance and turning geometrics for urban fire-fighter appliances, ie in accordance with <i>Fire Hydrant and Vehicle Access Guidelines for Residential, Commercial and Industrial Lots</i> (QFES 2015). Access for emergency services and the evacuation of occupants is via Leanne Court and Teviot Road which are existing public roads.
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	AO13 No acceptable outcome is prescribed	✓ complies with PO13 The proposed development will be connected to mains water and will have a reticulated hydrant system which complies with <i>Fire Hydrant and Vehicle Access Guidelines for Residential, Commercial and Industrial Lots</i> (QFES 2015).

Performance outcomes	Acceptable outcomes	Compliance assessment
to the QFES <i>Bushfire resilient communities</i> document.]		
PO14 Vulnerable uses listed in Table 7 are not established or intensified within a bushfire prone area unless: (a) there is an overriding need in the public interest for the new or expanded service the development provides; and (b) there are no other suitable alternative locations within the required catchment; and (c) site planning can appropriately mitigate the risk (for example, siting ovals for an educational establishment between the hazardous vegetation and structures. Note – The preparation of a bushfire management plan in accordance with the methodology in the QFES <i>Bushfire resilient communities</i> document may assist in demonstrating compliance with this performance outcome	AO14.1 No acceptable outcome is prescribed.	✓ A performance outcome is proposed Vulnerable use buildings, ie assisted living units and aged care facility, and LPG storage will not be located between the south and west boundaries of the site and the 10 kW/m² radiant heat flux contour. This outcomes is consistent with the performance outcome for vulnerable use development specified in Bushfire Resilient Communities Technical Reference Guide for the State Planning Policy State Interest ‘Natural Hazards, Risk and Resilience – Bushfire’ (QFES 2019). In addition, the Bushfire management plan provides mitigation measures to ensure emergency vehicle access, appropriate fire-fighter water supply and that landscaping is designed and maintained appropriately for a bushfire hazard area. Notwithstanding the mitigation measures described above, future development of adjacent properties under the endorsed context plan (Economic Development Queensland application reference DEV2019/1059) will reduce the extent and connectivity of bushland vegetation adjoining the site and the area of bushfire hazard shown on the Bushfire hazard overlay map.
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	AO15 No acceptable outcome is prescribed. (i)	✓ A performance outcome is proposed Refer to response PO14.

Performance outcomes	Acceptable outcomes	Compliance assessment
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 <i>Bushfire resilient communities</i> document may assist in demonstrating compliance with this performance outcome		
PO16 Development avoids or mitigates the risks to public safety and the environment from the manufacture or storage of materials listed in Table 7 that are hazardous in the context of bushfire to an acceptable or tolerable level. Note – The preparation of a bushfire management plan in accordance with the methodology in the QFES <i>Bushfire resilient communities</i> document may assist in demonstrating compliance with this acceptable outcome. Editor's note – In addition to the requirements of this code the <i>Work Health and Safety Act 2011</i> and associated Regulation and Guidelines, the <i>Environmental Protection Act 1994</i> and the relevant building assessment provisions under the <i>Building Act 1975</i> 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 the storage of hazardous materials in bulk containers.
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.	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,	✓ complies with PO17 As specified in Section 6.2 of the Bushfire management plan, landscaping on the site will be designed to minimise the potential for it to catch and compromise

Performance outcomes	Acceptable outcomes	Compliance assessment
Note – The preparation of a landscape management plan undertaken in accordance with the methodology in the QFES <i>Bushfire resilient communities</i> document may assist in demonstrating compliance with this performance outcome.	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 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 <i>Bushfire resilient communities</i> document may assist in demonstrating compliance with this acceptable outcome.	buildings and evacuation routes from buildings.
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 <i>Bushfire resilient communities</i> 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 <i>Bushfire resilient communities</i> 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	Not applicable The proposed development does not involve any areas of bushland vegetation restoration.

Performance outcomes	Acceptable outcomes	Compliance assessment
	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 <i>QFES Bushfire resilient communities</i> document may assist in demonstrating compliance with this acceptable outcome.	