QUEENSLAND BUSHFIRE PLANNING

BUSHFIRE MANAGEMENT PLAN (BMP)

Property

101 Jackson Court Ripley DA1
Lot 359 on S3173

Prepared for: KDL Property Group Pty Ltd
DA1 Jackson Court, Ripley

Sep 2026



www.qldbushfireplanning.com.au

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GLOSSARY OF TERMS AND ABBREVIATIONS

4WD	Four wheel drive
APZ	Asset Protection Zone - An area between an asset and a bushfire hazard where the bushfire fuel hazard has been reduced significantly to reduce the likely intensity of the any bushfire attack so that fire suppression and asset protection activities may be carried out.
AS3959	Australian Standard 3959-2018 - Construction of Buildings in Bushfire-prone Areas
Asset	Anything valued by the community that may be at risk of harm from bushfire, including people, house, crops, heritage buildings and places, infrastructure, the environment, businesses and forest resources.
BAL	Bushfire Attack Level as defined in AS3959 - A means of measuring the severity of a building's potential exposure to ember attack, radiant heat and direct flame contact, using increments of radiant heat expressed in kilowatts per metre squared and the basis for establishing the requirements for construction to improve protection of building elements from attack by bushfire.
Bushfire attack	Attack by burning debris, radiant heat or flame generated by bushfire which might result in ignition and subsequent destruction of the building.
Bushfire catchment	The geographical area surrounding a community which a bushfire ignition is likely to impact on assets valued by the community.
Bushfire hazard area	An area where the combination of fuel load, fuel arrangement and topography under particular climatic and weather conditions has the potential to sustain a bushfire of sufficient severity to pose a risk to people, property or the environment. Bushfire hazards are variable in their severity with severity levels usually measured in terms of fire intensity (kW/m2) arising from the hazard.
Bushfire management	All activities directed to the prevention, detection, damage mitigation and suppression of bushfires and recovery after bushfire events. It includes bushfire policy, administration, law enforcement, community education, training of fire fighters, planning, communication systems, equipment, research, and the multitude of field operations undertaken by land managers and emergency service personnel relating to bushfire control and use of fire to meet land management goals and objectives.

Bushfire-prone area	An area that can support bushfire or is likely to be subject to bushfire attack due to its proximity to a bushfire hazard area.
Ember attack	Attack by smouldering or flaming windborne debris that is capable of entering or accumulating around a building and may ignite the building and other combustible materials and debris (eg garden mulch, pine fencing).
Emergency warning	An emergency warning is a message signalling an imminent hazard, which may include advice on protective measures. Emergency warnings in relation to bushfires are issued by QFES and are used to inform residents of threat to properties, time to impact, the direction and strength of the fire and of the steps residents must to take to survive. There are three National bushfire warning levels defined as follows: • ADVICE: indicates a fire or other emergency has started, however there is no immediate threat. • WATCH AND ACT: there is a heightened level of threat, you need to be aware of your situation and take action to be prepared and protect yourself and your family. • EMERGENCY WARNING: you are in danger.
Environment	The term environment includes: • Ecosystems and their constituent parts, including people and communities. • Natural and physical resources. • The qualities and characteristics of locations, places and areas. • Heritage value of places. • The social, economic and cultural aspects of a thing mentioned above.
FFDI	Forest Fire Danger Index (see also FDR) - A relative number denoting an evaluation if the fire rate of spread, or suppression difficulty for specific combinations of temperature, relative humidity, drought effects and wind speed. The numbers range from 1 to 100.
FDR	Fire Danger Rating - A relative class denoting an evaluation of rate of spread, or suppression difficulty for specific combinations of temperature, relative humidity, drought effects and wind speed indicating the relative evaluation of the fire danger. Ratings are low-moderate (FDI 0-11), high (FDI 12-24), very high (FDI 25-49), severe (FDI 50-74), extreme (FDI 75-99), catastrophic (FDI 100+).
Fine fuel	Fuels such as grass, leaves, bark and twigs (dead plant material less than 6mm and live plant material less than 3mm in diameter) that ignite readily and are burnt readily when dry.

Fire control line	A natural (such as a creek line) or constructed barrier (such as trail or mineral earth break), or treated fire edge used in fire suppression and prescribed burning to limit the spread of the fire.
Fire regime	The history of fire in a particular vegetation type or area including the frequency, intensity and season of burning. It may also include proposals for the use of fire in a given area.
Fuel	Any material such as grass, leaf litter, and live vegetation which can be ignited and sustains a bushfire. Fuel is usually measured in tonnes per hectare.
Fuel layer	The layering of fuels will influence fire behaviour.The five main fuel layers consist of surface fuel, near surface fuel, elevated fuel, bark fuel and canopy fuel.
GIS	Geographic Information System
LGA	Local Government Area
QFES	Queensland Fire and Emergency Services
Regional ecosystem	A grouping of vegetation classes with common ecological requirements for fire and common fire behaviour characteristics.
Residual Risk	The risk of adverse impacts from a bushfire after implementation of risk mitigation/management measures.
Risk	The likelihood of a bushfire igniting and developing to the point that it will threaten an asset and the resultant nature and magnitude of the social, economic and environmental consequences to the community or the assets they value.
Risk mitigation/management	A systematic process that provides a range of treatments which are designed to reduce bushfire risk and thereby contribute to the wellbeing of communities and the environment which may suffer the adverse impacts of bushfire.
ROS	Rate Of Spread
SPP Interactive Mapping System	The State Planning Policy (SPP) Interactive Mapping System, as amended from time to time, published by DLGIP and located at https://spp.dsdip.esriaustraliaonline.com.au/geoviewer/map/planmaking
Unacceptable risk	A situation where people or property are exposed to a predictable hazard event that may result in serious injury to, loss of life, failure of community infrastructure, or property damage that would make a dwelling unfit for habitation.

VHC	Vegetation Hazard Class (VHC) - based on the available bushfire fuel load typically associated with a particular vegetation type.
Water point	Any natural or constructed supply of water that is readily available for fire control operations.
Wildfire	Another term for a bushfire.

EXECUTIVE SUMMARY

Queensland Bushfire Planning has been engaged on behalf of KDL Property Group Pty Ltd to develop a site-based Bushfire Hazard Assessment and Bushfire Management Plan in relation to a Residential Development (DA1) - 162 Lotdevelopment at 101 Jackson Court Ripley DA1, Lot 359 on S3173. The site is captured by the State Planning Policy Natural Hazards and Resilience - *Bushfire Prone Area* mapping and in accordance with the provisions of the Ipswich City Council Planning Scheme 2025 - Bushfire Prone Areas Overlay Code. - Bushfire Hazard Overlay Code, a detailed Bushfire Management Plan has been prepared. This report includes a number of recommendations regarding bushfire risk mitigation in accordance with AS3959-2018 and Ipswich City Council Planning Scheme 2006.

As detailed in Section 5 the bushfire hazard and risk management measures that have been incorporated into the design of the proposed development at 101 Jackson Court Ripley DA1, Lot 359 on S3173, combined with the implementation of the additional recommended measures during the construction and occupational phase of the development should ensure compliance with the Ipswich City Council Planning Scheme 2025 - Bushfire Prone Areas Overlay Code.

In conclusion, the Residential Development (DA1) - 162 Lot development at 101 Jackson Court Ripley DA1, Lot 359 on S3173 is a residential development associated with an acceptable level of risk with regards to people or property being exposed to harm in the event of a bushfire.

Recommendation
1. Ingress and egress for residents and emergency services will be via constructed Roads connecting to Jackson Court.
2. Reticulated water will be provided to the reconfiguration to comply with Urban utilities standards
3. Proposed buildings will be constructed to meet the requirements of the Australian Standard AS3959- 2018 - *Construction of buildings in bushfire prone areas.*
4. The vegetation on 101 Jackson Court Ripley DA1 will be managed to achieve APZ requirements and will be maintained in managed low hazard state.
5. Fencing on 101 Jackson Court Ripley DA1 will be constructed of non – combustible materials.
6. The warning systems now implemented by Emergency Services and Local Authorities provide timely information and advice to occupants. Understanding what to do in the event of bushfire emergency is critical. Prior knowledge as to the steps to take during the lead up to a fire event, during the passage of bushfire, and what to do immediately after the fire front has passed is critical. The Rural Fire Service Queensland (RFSQ) 'Bushfire Survival Plan' provides detailed information on how to prepare for the bushfire season and how to take action to survive in the event of bushfire. A copy of this publication can be obtained from the RFSQ website. https://bushfire-survival-plan.qfes.qld.gov.au

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GLOSSARY OF TERMS AND ABBREVIATIONS

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POTENTIAL BUSHFIRE ATTACK LEVEL

1. INTRODUCTION

This Bushfire Management Plan has been prepared on behalf of KDL Property Group Pty Ltd for a Residential Development (DA1) - 162 Lot development at 101 Jackson Court Ripley DA1, Lot 359 on S3173. The focus of this Report refers to the statutory planning and building requirements as they may apply, pursuant to all relevant policies, standards and regulation, along with end-user consideration. In addition, this report seeks to ensure fire risk and evacuation for adjoining and nearby properties is not inadvertently adversely impacted. This assessment report aims to mitigate the risk to life and property from bushfire threat and the impact of bushfire attack which includes:

- Direct flame contact;
- Ember and firebrand attack;
- Radiant heat; and
- Fire-driven wind.

This Report provides:

- In Section 2 a description of the Residential Development (DA1) - 162 Lot development.
- In Section 3 an assessment of the bushfire hazards and risks that will be present within the Residential Development (DA1) - 162 Lot development pre and post completion.
- In Section 4 details concerning the bushfire hazard and risk management measures that have been incorporated into the Residential Development (DA1) - 162 Lot development and additional measures that are recommended for implementation during the construction and occupational phases of the development.
- In Section 5 assessment of the level of compliance of Residential Development (DA1) - 162 Lot development against the requirements of the Ipswich City Council Planning Scheme 2025 - Bushfire Hazard Overlay Code.

This assessment does not seek to remove the threat of any bushfire risk, but provide detailed siting, layout, building and/or servicing information to assist the ability of the owner(s) to manage the potential threat of this risk. This assessment report is prepared in accordance with best practice industry standards as applicable in Queensland and pursuant to both State and local government bushfire hazard policies and guidelines.

1.1 Bushfire Regulatory Framework

1.1.1 State Planning Policy (SPP)

The SPP identifies the Queensland Government's policies about matters of state interest in land use planning and development (DILGP, July 2017). The SPP is a broad and comprehensive statutory planning instrument. It sits above regional plans, standard planning scheme provisions and local government planning schemes within the hierarchy of planning instruments outlined in the Planning Act 2016.

The SPP is supported by the following guidance material:

- The SPP state interest guidance material - Natural hazards, risk and resilience – Bushfire ('SPP guidance') (DSDMIP, 2019), which provides further context to the SPP and explains how the SPP policies can be applied, in particular for local government when making or amending local planning instruments. The SPP guidance is also intended to assist assessment managers and practitioners in applying the SPP assessment benchmarks when state interests have not been integrated into the local planning scheme (where applicable).
- The 'Bushfire Resilient Communities – Technical Reference Guide for the State Planning Policy State Interest - Natural Hazards, Risk and Resilience – Bushfire ('BRC technical document') (QFES, 2019), which provides technical guidance and policy positions of the Queensland Fire and Emergency Services (QFES). It includes procedures for undertaking a bushfire hazard assessment (BHA), calculating asset protection zones and preparing a Bushfire Management Plan.

1.1.2 Ipswich City Planning Scheme 2025

The purpose of the Bushfire Prone Areas Overlay Code is to ensure that the risk to life, property and the environment as a result of bushfire is either avoided in the first instance, or where risk cannot be avoided, is mitigated to an acceptable or tolerable level.
The purpose of the code will be achieved through the following overall outcomes:

1. Development is sited and located:
    - to avoid intolerable risk;
    - to minimise the exposure and vulnerability of people and property at risk from bushfires;
    - on an existing cleared area of the site and to avoid the removal of existing vegetation for bushfire protection purposes; and
    - to achieve effective and efficient emergency response and recovery capabilities, ensuring that safe self-evacuation from bushfire events can be facilitated;

2. Rehabilitation, revegetation and landscaping does not increase the risk to people or property;
    - development does not, directly or cumulatively, cause or increase adverse impacts on other properties or land from bushfire;
    - hazard vulnerable uses and community infrastructure for essential services are only established or intensified within bushfire prone areas to satisfy community need, where there is no other suitable alternative location, and the development can appropriately mitigate the risk; and
    - development avoids or mitigates the risk to public safety and the environment from the manufacture or storage of hazardous materials in areas of medium, high and very high potential bushfire intensity.

1.1.3 AS3959:2018 Construction of Buildings in Bushfire Prone Area

The Australian Standard AS3959:2018 Construction of Buildings in Bushfire-Prone Areas (Standards Australia, 2009) specifies the requirements for the construction of buildings in bushfire-prone areas in order to improve their resistance to bushfire attack. AS3959:2018 applies to those areas where a regulated map (i.e. a planning scheme overlay map) identifies an area as a bushfire prone area (or similar), requiring calculation of Bushfire Attack Level (BAL) in accordance with a methodology outlined in the standard. AS3959:2018 prescribes the construction details for buildings depending on the calculated BAL. The detailed requirements relating to construction methods and materials are typically dealt with as part of building design and enabled via private certification in accordance with the Building Code of Australia.

2. SITE DESCRIPTION AND DETAILS

2.1 Overview

The site is located at 101 Jackson Court Ripley DA1 and is described as Lot 359 on S3173 within Ipswich City Council (Figure 1).



Figure 1

Lot 359 on S3173 has an area of 14.1640 Hectares and is aligned east-west with a north-easterly aspect (Figure 2).



Figure 2

Lot 359 on S3173 is currently zoned Future Urban (Figure 3).

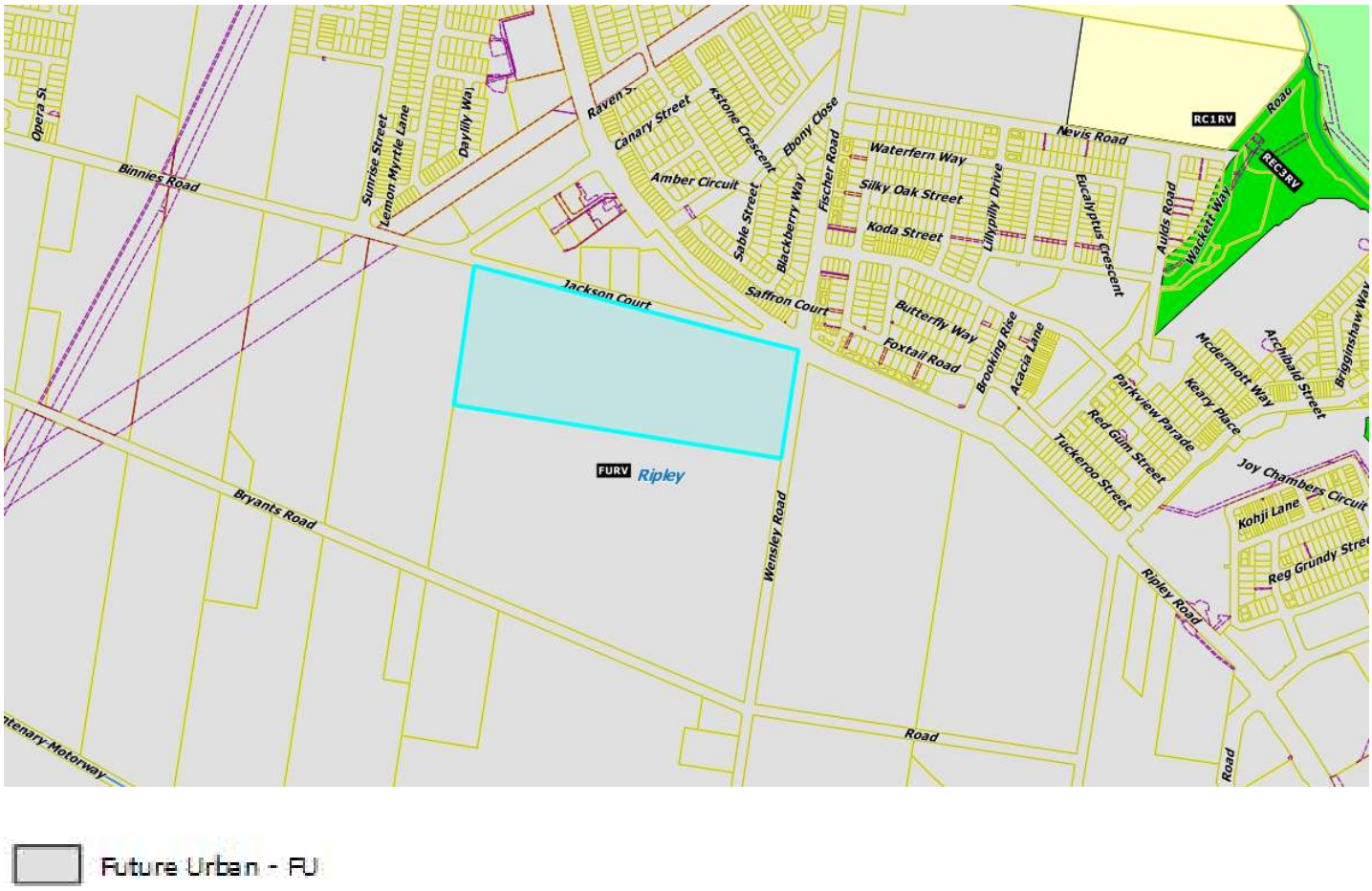
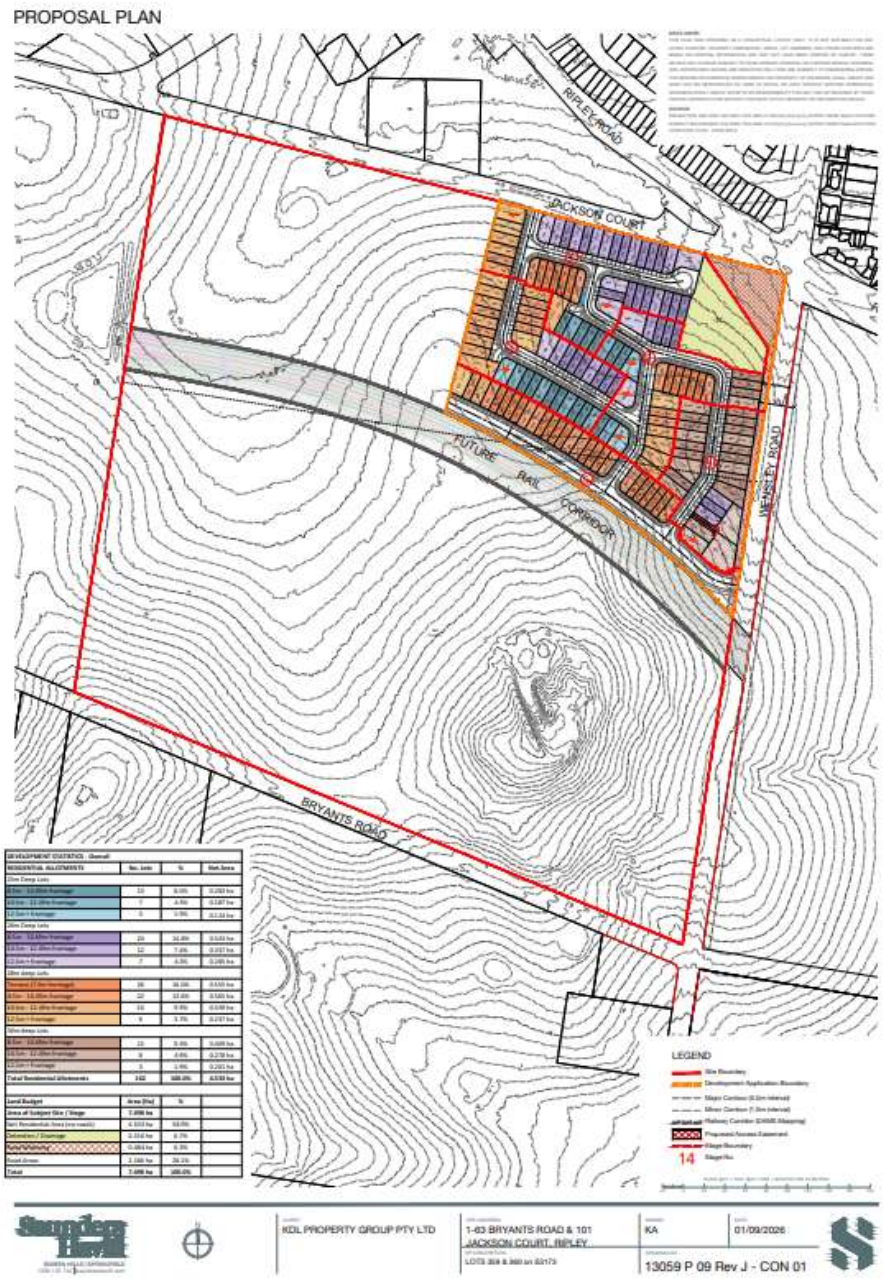


Figure 3

2.2 Proposed Development



The proposed development (DA 1) is a Residential Development (DA1) - 162 Lot (Figure 4, 4a).

Figure 4

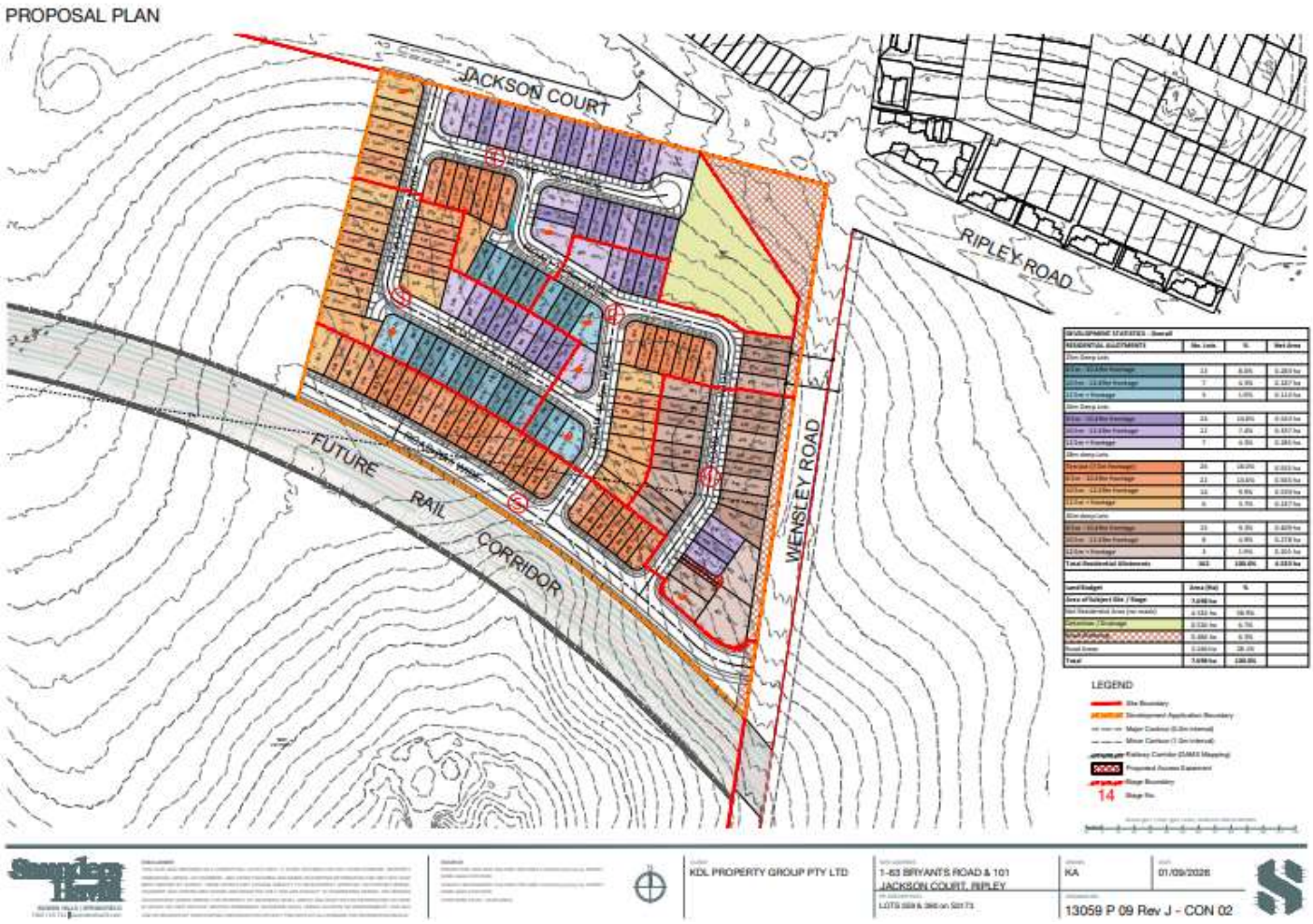

PROPOSAL PLAN
JACKSON COURT
RIPLEY ROAD
WENSLEY ROAD
FUTURE
RAIL
CORRIDOR
LEGEND
KDL PROPERTY GROUP PTY LTD
1-83 BRYANTS ROAD & 101 JACKSON COURT, RIPLEY
KA
01/09/2026
13059 P 09 Rev J - CON 02

Figure 4a

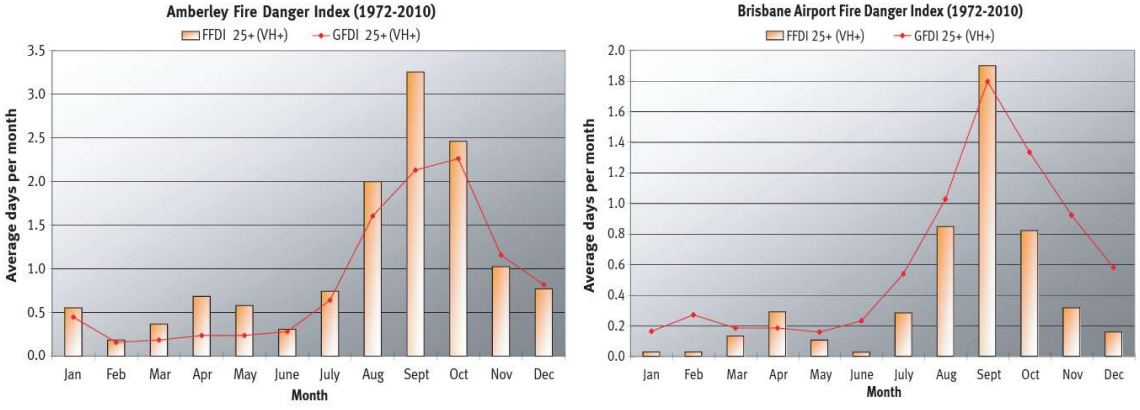
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3. BUSHFIRE HAZARD AND RISK ASSESSMENT

3.1 Overview

Ipwsich City Council is situated in Southeast Queensland, an area characterised by a mild sub-tropical costal climate which does not normally experience extended periods of server fire weather that are frequently experienced in southern Australia. The number of days each year characterised by weather conditions conducive to the ignition and rapid spread of a high intensity bushfire are limited. The Southeast Queensland (SEQ) fire season (when more severe wildfires normally occur) is generally recognised as September to December. In the southern part of SEQ, as indicated by analysis of fire weather data from Brisbane Airport and Amberley, August is also a period of elevated fire risk, and more significant than November which has a lower risk with the commencement of storm rains. September, the peak month for wildfires is characterised by frequent westerly winds, typically low rainfall, low humidity and increasing temperatures.

The graphic below illustrates the average number of days per month that were characterised by Forest Fire Danger Index (FFDI) of 25 or greater using data from the Amberley and Brisbane Airport weather stations for the period 1972 to 2010. FFDI of 25 is the base FFDI value for the Very High Fire Danger rating used in Queensland. This analysis indicates that on average there are less than 14 days per year where an FFDI of 25 or greater can be expected. For the rest of the year the prevailing meteorological conditions mean if a bushfire starts it can most likely be contained without significant risk to human health or property.



Consistent with the relatively low frequency of high risk bushfires in SEQ compared to southern states, the number of lives and houses lost as a result of bushfire is also relatively low. Not withstanding, bushfires still do frequently occur in Southeast Queensland and present a risk that needs to be considered as part of a comprehensive approach to land use planning and development.

3.2 Bushfire Hazard Assessment

3.2.1 Ipswich City Planning Scheme Bushfire Risk Map

Figure 5 shows the bushfire hazard overlay mapping in the Ipswich City Planning Scheme.

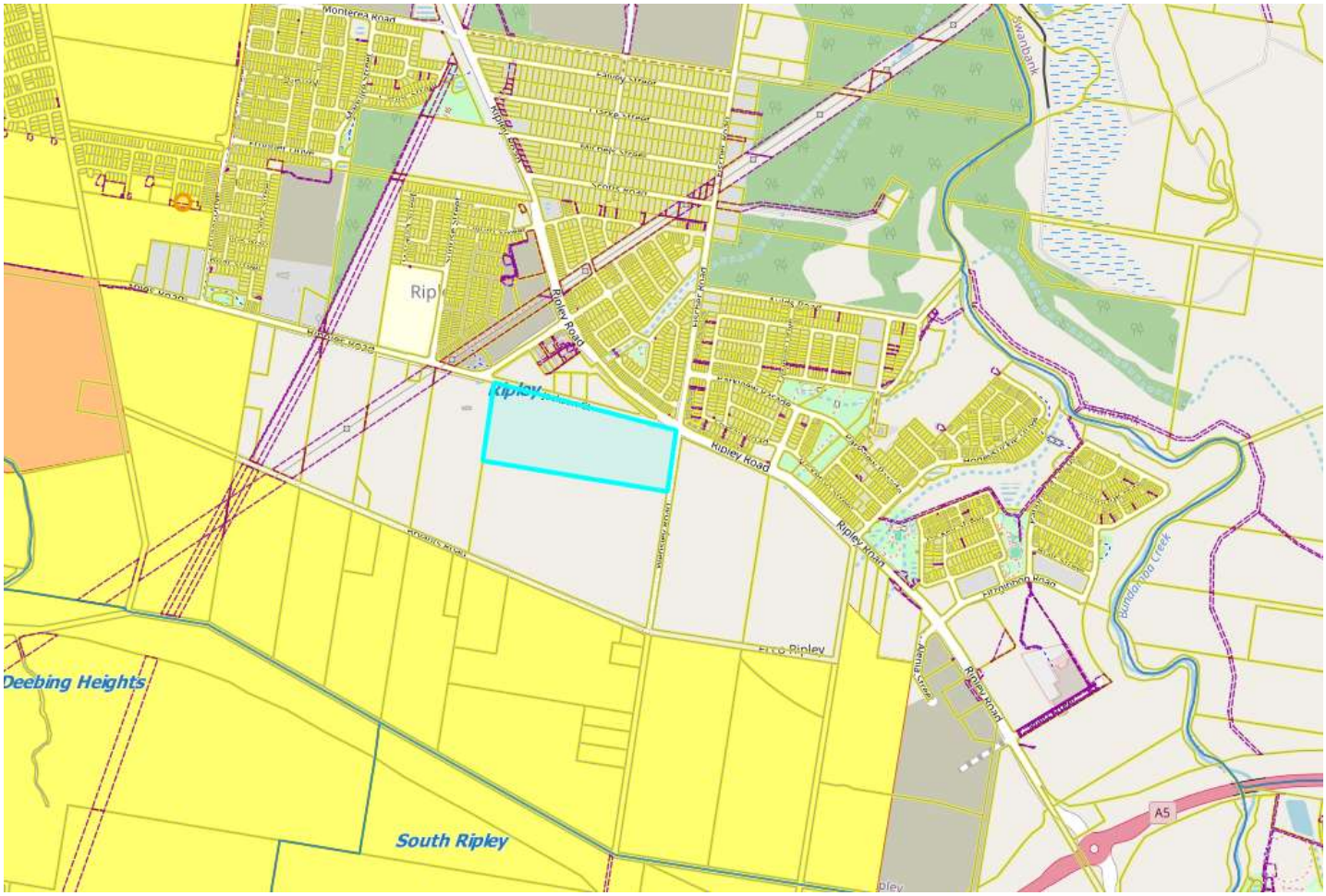


Figure 5

3.2.2 SPP Natural Hazard Mapping

The State Government Single State Planning Policy (SPP) released in 2017, includes mapping that is an outcome of the new bushfire hazard mapping methodology developed by the CSIRO and the Queensland Government. The new Bushfire Prone Area mapping was found to have an average reliability of 85%. The new methodology provides a major improvement in Bushfire hazard mapping. The new modified approach calculates potential fire line intensity using total fuel loads, landscape slope and fire weather severity. A default 100-metre buffer was determined from analysis of heat and radiation decay curves and research that indicates 80% of housing loss and 80% of life loss occurred within 100 metres of bushland.

The subject site is identified on the State Planning Policy Natural Hazards Risk and Resilience mapping as being within potential bushfire impact zone, requiring the bushfire hazard impacts be addressed (Figure 6).

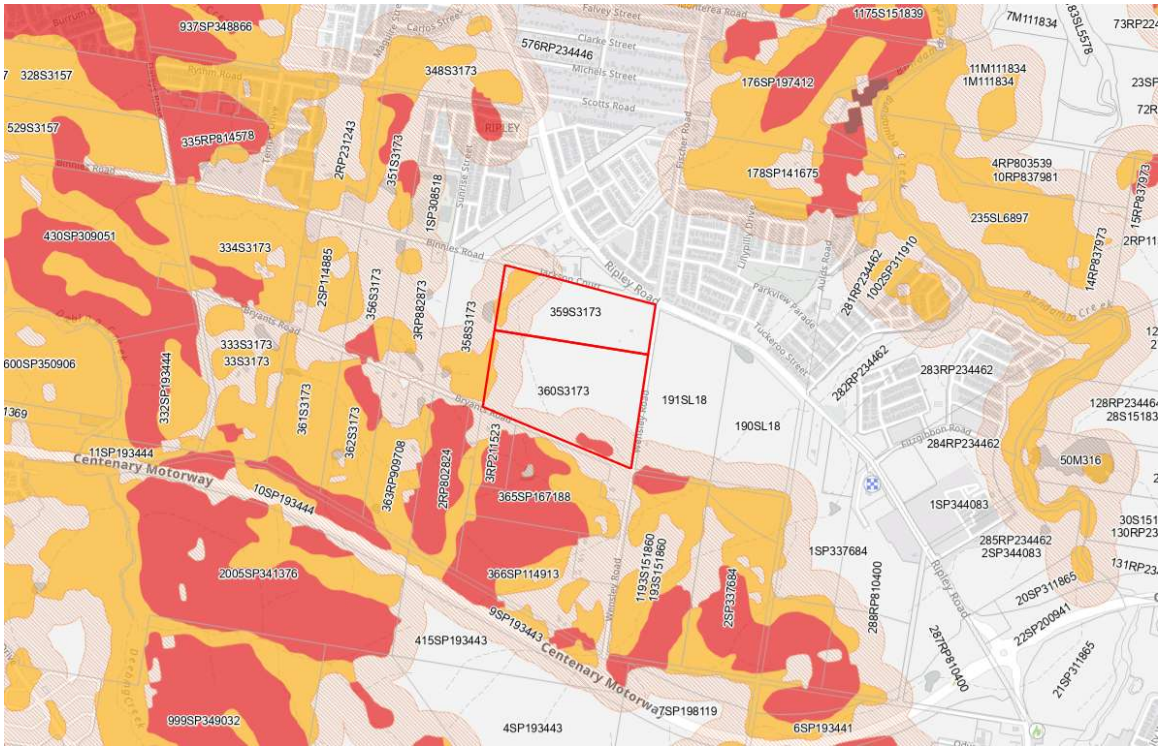


Figure 6

Very High Potential Bushfire Intensity
High Potential Bushfire Intensity
Medium Potential Bushfire Intensity
Potential Impact Buffer

3.3 Site Assessment

The site specific assessment of the bushfire hazard classification for the development at 101 Jackson Court Ripley DA1, Lot 359 on S3173 and immediate locality has been completed based on a review of aerial imagery, topographic data, available vegetation mapping and a physical site inspection conducted on July 2026. The site inspection was conducted to confirm and record the relevant information to determine the bushfire hazard in accordance with the requirements of the Ipswich City Planning Scheme 2006. These assessments account for changes that will occur to the extent and nature of the vegetation types as a result of the proposed development at 101 Jackson Court Ripley DA1. The site specific assessments were based on the methodology specified in Australian Standard AS3959:2018 - Construction of Building in Bushfire Prone Areas.

The classification of an area's Potential Bushfire Intensity takes into account three key variables:

- Total Fuel Load - primarily a function of the vegetation type(s) in an area.
- McArthur Forest Fire Danger Index (FFDI) - an index that considers variability in fire intensity associated with a range of weather variable including recent precipitation, current wind speed, relative humidity and temperature.
- Slope - an important variable controlling the rate of fire spread and fuel consumption.

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3.3.1 Pre Development Vegetation

Table 1 shows the original vegetation on and about the site identified using the *Public Safety Business Agency (PSBA) State-wide Bushfire Hazard (Bushfire Prone Area)* mapping.

VHC Description	Regional Ecosystem (RE)	Site Specific Assessment of Presence	Potential Fuel Load (t/Ha) Surface	Potential Fuel Load (t/Ha) Total
1. VHC: 10.1 (Photo 1)	12.9 - 10.2 Corymbia citriodora subsp. variegata Â± Eucalyptus crebra open forest on sedimentary rocks	Original vegetation Spotted gum dominated open forests	19.3	20.8
2. VHC: 13.2 (Photo 2)	12.9 - 10.7 Eucalyptus crebra Â± E. tereticornis, Corymbia tessellaris, Angophora spp., E. melanophloia woodland on sedimentary rocks	Secondary vegetation type Dry to moist eucalypt woodlands on undulating metamorphics and granite	12.8	14.4

Table 1



Photo 1



Photo 2

3.3.2 Classified Vegetation

Australian Standard, *Construction of Buildings in Bushfire Prone Areas* (AS 3959–2018*)* requires any classified vegetation within 100 metres of the proposed works must be assessed. Table 2 shows the vegetation on and about the site identified using the *Public Safety Business Agency (PSBA) State-wide Bushfire Hazard (Bushfire Prone Area)* mapping.

VHC Description	Regional Ecosystem (RE)	Site Specific Assessment of Presence	Potential Fuel Load (t/Ha) Surface	Potential Fuel Load (t/Ha) Total
1. VHC: 40.4 (Photo 1)	Continuous low grass or tree cover	Non - Remnant Vegetation now present on Lot 359 on S3173	4.5	5.0

Table 2



Based on the above, the Potential Fuel Loads available within and adjacent to Lot 359 on S3173 range from:

- a minimum of 4.5 tonnes/Ha associated with existing and proposed fuel load: to
- a maximum of 5.0 tonnes/Ha associated with ares of remnant vegetation located within 100m of the development.

3.3.3 Forest Fire Danger Index

For land use planning purposes in Queensland the 1:20 year Forest Fire Danger Index, adjusted to reflect the expected climate in the year 2050, has been adopted as the design fire weather conditions. The FFDI for a 1:20 year is equivalent to a 5% annual exceedance probability (ie. 5% chance of occurring in any given year) and integrates the combined effect of a range of weather variables including long term dryness, recent precipitation, current wind speed, relative humidity and temperature.

The QFES Redi-Map Portal provides more refined mapping of FFDI (1 in 20 years) index values. Utilising this mapping the applicable FFDI for the development at 101 Jackson Court Ripley DA1 has resulted in an FFDI for the development of 58. An FFDI of 58 falls within the severe Fire Danger Rating (FDR) according to the FDR system developed by Australasian Fire Authorities Council (AFAC) and summarised in Table 3.

Fire Danger Rating	AFAC Description of Likely Fire Behaviour and Consequence
Catastrophic FFDI > 100	Fires will be uncontrollable, unpredictable and fast moving. These are the worst conditions for a bush or grass fire. If a fire starts and takes hold, it will be extremely difficult to control. It will take significant fire fighting resources and cooler conditions to bring it under control. Spot fires will start well ahead of the main fire and cause rapid spread of the fire. Embers will come from many directions. Homes are not designed or constructed to withstand fires in these conditions. The safest place to be is away from bushfire prone areas.
Extreme **FFDI 75-99**	Fires will be uncontrollable, unpredictable and fast moving. These are very hot, dry and windy conditions for a bush or grass fire. If a fire starts and takes hold, it will be unpredictable, move very fast. It will be very difficult for fire fighters to bring under control. Spot fires will start and move quickly. Embers may come from many directions. Homes that are prepared to the highest level, have been constructed to bushfire protection levels and are actively defended, may provide safety. You must be prepared physically and mentally to defend in these conditions. The safest place to be is away from bushfire prone areas.

Fire Danger Rating	AFAC Description of Likely Fire Behaviour and Consequence
Severe **FFDI 50-74**	Fires will be uncontrollable and move quickly .These are hot, dry and possibly windy conditions for a bush or grass fire. If a fire starts and takes hold, it will be hard for fire fighters to bring under control. Well-prepared homes that are actively defended can provide safety. You must be prepared physically and mentally to defend in these conditions.
Very High **FFDI 25-49**	Fires Can be difficult to control. Flames may burn into the tree tops. Theres is a chance people may die or be injured. Some homes and businesses may be damaged or destroyed. Well prepared and actively defended house can offer safety during a fire. Embers may be blown ahead of a fire. Spot fires may occur up to 2km ahead of the fire. Leaving is the safest option for your survival. Your home will only offer safety if it and you are well prepared and you can actively defend during a fire.
High **FFDI 12-24**	Fires can be controlled. Loss of life is highly unlikely and damage to property will be limited. Well prepared and actively defended houses can offer safety during a fire. Embers may be blown ahead of the fire. Spot fires can occur close to the main fire. Know where to get more information and monitor the situation for any changes.
Low-Moderate **FFDI <12**	Fires can be easily controlled. Little or no risk to life and property. Know where to get more information and monitor the situation for any changes

Table 3

Note: An FFDI of 58 specified for use in the SPP for land use planning purpose is higher than the FFDI of 40 specified in AS3959-2018 for all of Queensland for building design and approval purposes.

3.3.4 Slope Assessment

From a bushfire hazard perspective slope of the land under the bushfire prone vegetation can greatly influence fire behaviour. This slope is referred to as the **effective slope**. If the potentially hazardous vegetation is located upslope of the asset(s) the contribution that slope makes towards the intensity and rate of spread of the fire is negligible. **Site slope** is the gradient of the land between retained vegetation and adjoining assets. The site slope influences the 'view factor' of the flame geometries in Bushfire Attack Level models.

Where potentially hazardous vegetation is located downslope of the asset(s) the effective slope gradient of the vegetated land will have significant influence on bushfire intensity and rate of spread. Typically, for each 18-20% (or 10 degrees) increase in slope gradient the rate of forward spread and intensity of a bushfire will double for a fire moving up the slope towards an asset. Similarly if the fire is moving down the slope the rate of spread will decrease by approximately double for each 18-20% (or 10 degrees) increase in slope gradient. As the rate of spread of a bushfire increase so does its intensity.

The effective and site slope for the proposed development at 101 Jackson Court Ripley DA1 4 degrees site slope.

NOTE: As fire travels slower down a hill, all classified vegetation that is upslope will assume a value of 0 degrees (i.e. flat land) *(AS3959:2018)*.

3.4 Bushfire Risk Assessment

3.4.1 Risk Classification

With reference to AS/NZS ISO 31000 Risk Management - Principles and Guidelines, The bushfire risk profile of an asset may be defined as "*the chance of something happening that will have an impact on objectives*" and can be qualified in terms of:

- **Likelihood:** the frequency with which it is expected a bushfire of a particular level of intensity will threaten an asset via smoke, embers, radiant heat or flame attack. This can be influenced by local environmental factors, fuel biomass and structure, density of potential ignition sources, fire management and intervention capability etc. , all of which can vary over time due to the influence of resource availability, weather and climate variability.
- **Consequences:** The nature and significance of the potential adverse outcomes for an asset exposed to a certain intensity of bushfire attack (eg. health effects, damage to structures, economic loss, interference with ecosystem processes, loss of biodiversity). This can be influenced by the vulnerability and resilience of the asset to bushfire exposure, the social, economic and environmental values of the asset, post fire recovery and prospects, costs and timeframes.

Assessing the risks to people and property posed by bushfires requires an understanding of the tolerances of people and property to different levels of bushfire attack, in particular attack by flames and radiant heat. For people there is generally no safe level of direct flame exposure and radiant heat is recognised as the biggest killer in a bushfire. Radiant heat levels increase with the increase in the proximity and intensity of bushfire.

The vulnerability of buildings and structures to bushfire attack is largely determined by:

- The material used in their construction.
- The severity and duration of the exposure to radiant heat or flame attack.

For land use planning purposes a maximum radiant heat flux exposure of 29 kW/m2 for residential dwellings on newly created lots is increasingly being recognised as the benchmark for an acceptable level of risk exposure. In this respect the building setback distance needed to achieve a 29 kW/m2 heat flux exposure:

- Reduces potential exposure to bushfire attack, particularly direct flame contact.
- Reduces the likelihood of piloted ignition due to radiant heat exposure.
- Provides opportunities for emergency access and operational space for firefighters before the arrival of a bushfire,
- Improves consistency between planning and building outcomes, thereby reducing the potential for conflicts between planning and building approvals.
- Avoids duplication and regulatory burden on home owners.

3.4.2 Bushfire Behaviour and Risk Exposure Modelling

For land use planning purposes, an important element of a "fit for purpose" method of assessing whether or not a proposed development provides a tolerable or acceptable level of bushfire risk is to consider likely bushfire behaviour and consequences for future residents, QFES personnel and built infrastructure under a design bushfire event. One method for assessing bushfire risk exposure levels examining the likely levels of flame, radiant heat and ember attack that people and property would be exposed to under a design fire event using the Australian Standard AS3959-2018: Construction of buildings in Bushfire Prone Areas - Bushfire Attack Level Method 2. This approach involves:

- **Step 1**: Determine the relevant FDI.
- **Step 2:** Determine the vegetation classification, fuel loads.
- **Step 3**: Determine the effective slope in degrees under the classified vegetation.
- **Step 4**: Determine the slope in degrees of the land between the site and the classified vegetation.
- **Step 5**: Determine the distance of the site from classified vegetation.
- **Step 6**: Determine the BAL rating using Method 2.

For the purposes of this assessment the relevant FFDI, classified vegetation types and slope characteristics used in this assessment are detailed in Section 3.3.2 and 3.3.4 of this Report.

3.4.3 Assessment of Bushfire Hazard

Australian Standard - *Construction of Buildings in Bushfire Prone Areas (AS 3959–2018)* requires that any classified vegetation within 100 metres of the proposed works must be assessed. Figure 9 indicates the extent of the 100-metre separation zone (BAL Impact Zone).

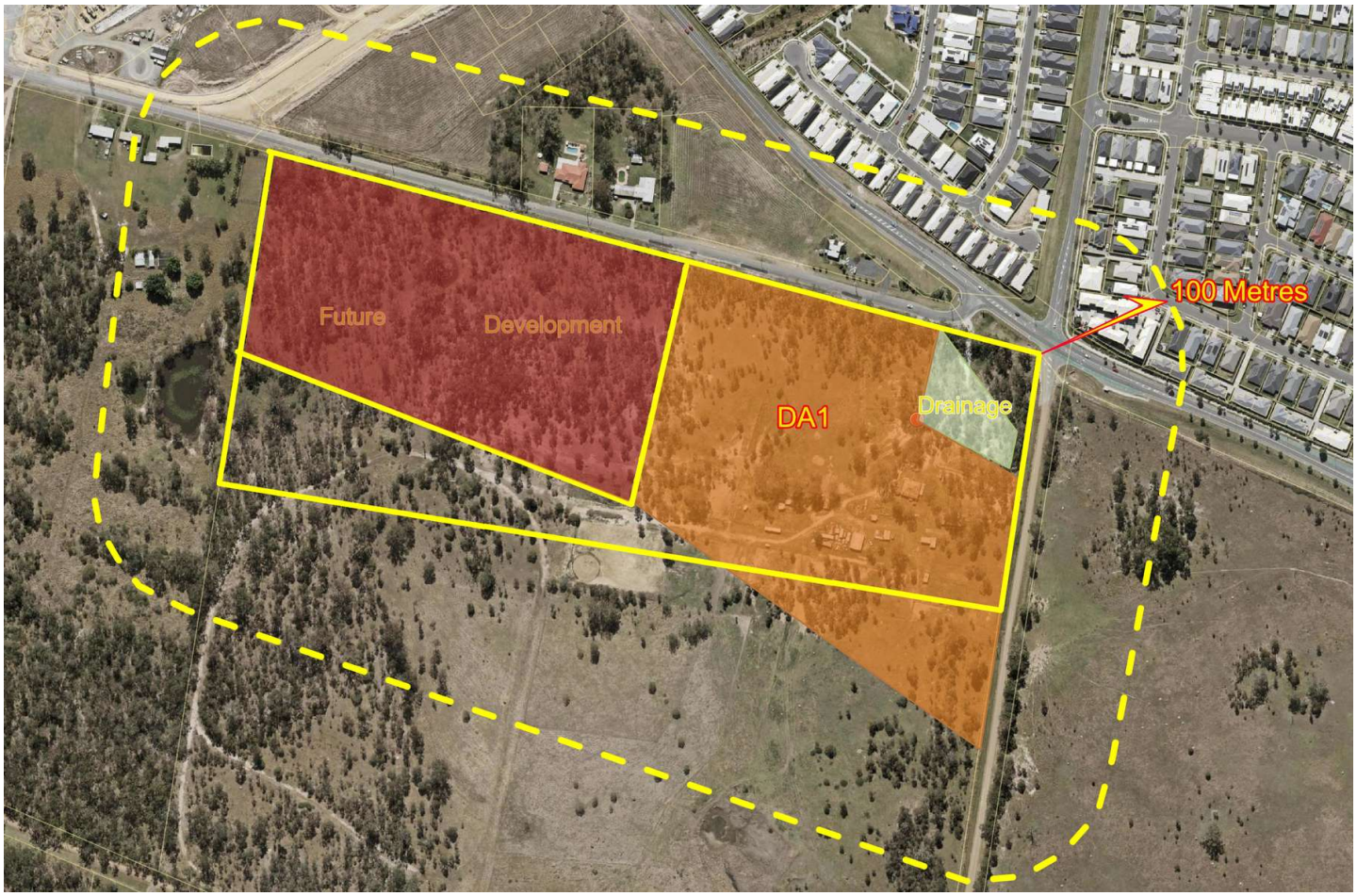


Figure 9

Calculations using AS 3959-2018, in accordance with Appendix B - *Detailed Method for Determining the Bushfire Attack Level (BAL) – Method 2 (Normative)*, indicate that at a separation distance of greater than 150 metres buildings located on the proposed site will be exposed to a radiant heat flux of Low kW/m2 equating to a Bushfire Attack Level (BAL) of LOW * (Figure 10). Table 4 describes the six (6) Bushfire Attack Levels.

SPP Bushfire Separation Distance Calculator			
VARIABLE DESCRIPTION	**VARIABLE**	**UNITS**	**VALUE**
Input Values			
FIRE WEATHER SEVERITY	**FDI**		54.00
VEGETATION HAZARD CLASS	**VHC**	-	40.4 Continuous low grass or tree cover
REMNANT STATUS	**-**	-	Remnant
SLOPE TYPE (UPSLOPE OR DOWNSLOPE)	**ST**	-	Upslope
EFFECTIVE SLOPE UNDER THE HAZARDOUS VEGETATION	**eSlope**	degrees	4.00
SLOPE BETWEEN SITE AND HAZARDOUS VEGETATION	**θ**	degrees	4.00
DISTANCE OF THE SITE FROM HAZARDOUS VEGETATION	**d**	m	150.00
Output Values			
SURFACE FUEL LOAD	**-**	t/ha	~~0.50~~
NEAR SURFACE FUEL LOAD	**-**	t/ha	~~4.00~~
BARK FUEL LOAD	**-**	t/ha	~~0.50~~
ELEVATED FUEL LOAD	**-**	t/ha	~~0.00~~
TOTAL OVERALL FUEL LOAD	**W**	t/ha	~~5.00~~
TOTAL SURFACE FUEL LOAD	**w**	t/ha	~~4.50~~
POTENTIAL FIRE LINE INTENSITY	**I**	kW/m	~~0~~
RADIANT HEAT FLUX	**q**	kW/m^2	~~0.00~~
BUSHFIRE ATTACK LEVEL (AS 3959-2009)	**BAL**	-	~~BAL-LOW~~

Figure 10

Bushfire Attack Level (BAL)	Radiant Heat Exposure (AS3959)	Description of Predicted Bushfire Attack and Levels of Exposure
BAL - Low	Insignificant	The risk is very low, radiant heat on the building is insignificant to warrant specific construction requirements. However, ember attack may still occur.
BAL 12.5	0 to 12.5kW/m2	Primarily risk of ember attack. Risk of radiant heat is considered low.
BAL 19	12.5 to 19kW/m2	Risk is considered moderate with increasing levels of ember attack and burning debris ignited by wind borne embers. Increasing likelihood of exposure to radiant heat.
BAL 29	19 to 29kW/m2	Risk is considered to be high. Increasing levels of ember attack and burning debris ignited by wind borne embers. Increasing likelihood of exposure to radiant heat.
BAL 40	29 to 40kW/m2	Risk is considered to be very high. Increasing levels of ember attack and burning debris ignited by wind borne embers. Increasing likelihood of exposure to radiant heat and some direct exposure to flames possible.
BAL FZ	40kW/m2 plus (flame contact)	Risk is considered to be extreme. Direct exposure to flame from the fire front is likely in addition to high levels of radiant heat exposure and ember attack.

Table 4

4. BUSHFIRE HAZARD AND RISK MITIGATION

Figure 11 illustrates that effective protection against bushfire can only be achieved by the integration of multiple measures. Removing the bushland (hazard) will remove the risk but this option is neither necessarily possible nor desirable. An acceptable level of protection of life and property can be achieved while still retaining and protecting biodiversity and the natural values of the bushland.



Figure 11

The appropriate mitigation and management of bushfire hazards and risks involves the integration of a combination of bushfire hazard mitigation measures during the design, construction and operational phase of any development, including:

- Ensuring development design, including the layout of roads and driveways and the location, size and orientation of residential lots and buildings, is responsive to bushfire hazards;
- Appropriate firefighting and management infrastructure is provided, including an adequate and accessible water supply, fire breaks and maintenance/access trails;
- Specifications and materials for building design and construction are in accordance with AS3959-2018 Construction of Buildings in Bushfire Prone Areas;
- Management of potentially hazardous vegetation taking into account the conservation values of that vegetation and the important role fire plays in the functioning of many Australian ecosystems;
- Landscape design and property maintenance requirements;
- Community awareness, education and training; and
- Identification of parties to be responsible for specific bushfire management tasks and actions.

The design of the Residential Development (DA1) - 162 Lot development at 101 Jackson Court Ripley DA1 has been informed by the above. The following sections provide detail concerning some of the key design elements which have been incorporated into the design of the development to ensure an acceptable level of risk to human safety and property is maintained in the event of a bushfire occurring in the general locality. Where appropriate, details concerning measures that need to be taken during construction and occupational phases of the development are also provided.

4.1 Access and Evacuation

The intent of design requirements for roads is to provide safe egress for residents and access for attending firefighting vehicles. A road system that is compliant with guideline measures provides fire services with easier access to buildings, a safe retreat for firefighters and residents, and can provide a fire control line where hazard reduction and back burning can take place. In determining safe access to a site, consideration is given to the fire brigade vehicles which are required to access public and private roads. Given the size of these vehicles and the poor visibility in which they often operate, roads need to be designed to specific requirements, including road width, grade, cross-fall, weight capacity, passing bays and turnaround areas, all of which may vary depending on whether it is a perimeter, access, cul-de-sac or battle-axe road type.

Ultimately egress and ingress to the Residential Development (DA1) - 162 Lot development will be via constructed Roads connecting to Jackson Court. There is likely to be substantial warning of a major bushfire front approaching the development allowing site occupants sufficient time to implement their bushfire emergency plans.

4.2 Water Supply

Providing a sufficient water supply provides firefighters and residents with the appropriate levels of water to undertake building defense. There are two options in which a house site can be supplied with a sufficient water supply; from either reticulated water accessible via a hydrant, or a dedicated static water supply. Reticulated water will be supplied to the development meeting the required statutory standards.

4.3 Building Design and Construction

Buildings within the Residential Development (DA1) - 162 Lot development at 101 Jackson Court Ripley DA1 situated within 100 metres of areas of hazardous vegetation (ie. bushfire prone vegetation with the capacity to support bushfires with an intensity of 4000kW/m2 or greater under design fire weather conditions) need to be designed and constructed in accordance with AS3959-2018: *Construction of Buildings in Bushfire Prone Areas.*

4.4 Vegetation Management

The bushfire severity potential of an area can be substantially reduced by managing vegetation in a manner that reduces or removes potential bushfire fuel loads. This includes management of areas that are intended to provide a conservation function. The failure to manage vegetation fuel loads in conservation reserves can result in high intensity wildfires that have adverse ecological impacts for the reserve as well as creating an unnecessary hazard for adjacent urban areas.

Onsite vegetation and landscape management are important to maintaining low hazard conditions by:

- Limiting fuel accumulation;
- Reducing connectivity of fuels;
- Establishing and maintaining defendable space;
- Appropriate landscaping; and
- The proposed lot size of the development will constrain the development of any additional bushfire hazard.

4.5 Residential Landscape Design

Inappropriate landscape design in bushfire prone areas (ie. any land within 100m of bushfire prone vegetation) may expose a dwelling to increased levels of ember attack, radiant heat and flame contact. Well designed and maintained landscaping with appropriate plant species can actually help protect houses by:

- Reducing the amount of radiant heat received by a house;
- Reducing the chance of direct flame contact with the house;
- Deflecting and filtering embers; and
- Reducing flammable landscaping materials within the defendable space.

All vegetation material can burn under the influence of a bushfire, therefore landscape designs in bushfire prone areas should give careful consideration to:

- Species selection;
- Species planting proximity to assets and access paths relative to their flammability.
- Avoidance of both horizontal and vertical continuity of vegetation.

In general "mesic" plant species that have a higher leaf moisture content, less bark and a lower rate of leaf drop will assist with reducing available bushfire fuel loads thereby assisting in reducing the likelihood and severity of bushfire attack. The use of mesic plant species in combination with the following guidelines form the basis for a low risk landscape design in bushfire prone areas:

- Establish and maintain lawn or paved areas such as paths and/or pebble garden with herbs near to the house.
- Maintain cleared areas around all driveways, pathways, fire trails and roadways that may be need to used as access/egress route during a bushfire.
- Plant trees at least 5m from any dwelling house to allow clear access and minimise canopy overhang of roofs and associated accumulation of leaf litter.
- Space trees and shrubs to avoid the creation of continuous canopy that may carry fire.
- Prune lower limbs of trees to height of 2m above ground level.
- Avoid using confers, paperbarks (ie. Melaleuca species), stringy bark and ribbon bark eucalyptus in landscape planting.
- Avoid using organic mulch with preference given to non-flammable mulches such as scoria (light weight volcanic stone), pebbles, recycled crushed bricks.
- Regularly water landscape plantings to maintain plant health and moisture levels.

4.5 Fencing

Fencing materials have the capacity to contribute to fire spread and intensity. It is recommended that non-combustible fencing materials should be used where adjacent to identified classified vegetation

4.6 Community Awareness

Property owners are responsible for developing their own knowledge and understanding of the level of bushfire risk specific to their respective properties. A household bushfire plan is required and must take account of matters such as where occupants are during the day (at home, work or school), if any occupants require special assistance (i.e. infants, the elderly or the ill), evacuation routes available, evacuation destinations, property maintenance and preparation and arrangements for pets. Planning ahead of any perceived bushfire event is essential.

The warning systems now implemented by Emergency Services and Local Authorities provide timely information and advice to occupants. Understanding what to do in the event of bushfire emergency is critical. Prior knowledge as to the steps to take during the lead up to a fire event, during the passage of bushfire, and what to do immediately after the fire front has passed is critical. The Rural Fire Service Queensland (RFSQ) ‘Bushfire Survival Plan’ provides detailed information on how to prepare for the bushfire season and how to take action to survive in the event of bushfire. A copy of this publication can be obtained from the RFSQ website. https://bushfire-survival-plan.qfes.qld.gov.au/

QUEENSLAND BUSHFIRE PLANNING

5. COMPLIANCE ASSESSMENT

Bushfire Hazard Overlay Code - Ipswich City Planning Scheme 2025 - Section 8.2.8

Performance Outcomes	Acceptable Outcomes	Compliance
PO1.1 Site layout achieves an acceptable or tolerable risk to people and property through the use of an asset protection zone to buffer development from hazardous vegetation.	**AO1.1.1** A bushfire management plan is undertaken in accordance with SC6.11 Bushfire Planning Scheme Policy. **AO1.1.2** Development other than a hazard vulnerable use or community infrastructure for essential services, is sited such that an asset protection zone provides a distance that achieves a maximum radiant heat flux level of 29 kW/m² or less between the development footprint and the bushfire hazard. **AO1.1.3** The asset protection zone separates buildings from bushfire hazard by placing maintained landscaped areas, carparks, internal roads/driveways or private open space between premises and mapped medium, high or very high potential intensity areas. **AO1.1.4** Landscaping treatments within any asset protection zone: a. comprise only low threat vegetation with discontinuous fuel structure and maximum potential fuel load not exceeding 8 tonnes per hectare; and b. does not create additional bushfire prone areas.	A Bushfire management plan (BMP) has been prepared by Queensland bushfire planning (QBP) in accordance with SC6.11 The BMP prepared by QBP has determined that there is no Bushfire impact on proposed DA1 The BMP prepared by QBP has determined that there is no Bushfire impact on proposed DA1 There will be no significant areas of vegetation within the proposed DA1 The established vegetation will comprise only low threat vegetation with discontinuous fuel structure and maximum potential fuel load not exceeding 8 tonnes per hectare; and will not not create additional bushfire prone areas.

Performance Outcomes	Acceptable Outcomes	Compliance
	AO1.1.5 Development siting and layout: a. avoids ridgelines, saddles, crests and slopes exceeding 15 percent; b. avoids bushfire prone areas, and avoids or minimises clearing of vegetation (for an asset protection zone) to the extent possible; or c. where avoidance of bushfire prone areas is not possible, development is located in areas of lowest hazard; d. incorporates fencing, including side returns, and retaining walls that are constructed of fire resistant materials; and e. provides for access 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.	The BMP prepared by QBP has determined that there is no Bushfire impact on proposed DA1
PO2.1 Development: a. has access which, having regard to bushfire hazard, is safe for vehicles and emergency services; b. establishes evacuation areas and procedures, to achieve an acceptable or tolerable risk to people;	**AO2.1** Development is: a. located within 60 metres of the road frontage; and b. provided with a minimum four metre wide access driveway to the road frontage with a gradient that does not exceed 12.5 per cent; and	The proposed access will comply with The BMP prepared by QBP has determined that there is no Bushfire impact on proposed DA1

Performance Outcomes	Acceptable Outcomes	Compliance
c. does not worsen evacuation capability of other premises; and d. does not result in significant additional burden on emergency services personnel.	1. allows a medium rigid vehicle safe and clear access including: 2. vertical clearance of 4.5m, including to powerlines; and 3. horizontal clearance of 5m; c. sited to avoid bushfire prone areas, and avoids or minimises clearing of vegetation (for an Asset Protection Zone (APZ)) to that extent possible; or d. where avoidance of bushfire prone areas is not possible, development locates in areas of lowest hazard.	
PO2.2 On sites over 2,000m2, development achieves an acceptable or tolerable risk to people by providing on-site access for evacuation and firefighting vehicles by: a. locating buildings as close as possible to property entrances to facilitate safe evacuation during a bushfire event; and b. ensuring 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.	**AO2.2** Development on sites over 2,000m2 is: a. located within 60 metres of the road frontage; and b. provided with a minimum four metre wide access driveway to the road frontage with a gradient that does not exceed 12.5 per cent.	The proposed access will comply with QFS Fire hydrant and vehicle access guidelines for residential, commercial and industrial lots

Performance Outcomes	Acceptable Outcomes	Compliance
PO3.1 Development is designed to enhance resilience to bushfire.	**AO3.1.1** Development provides simple roof forms which limit valleys and minimise ridges and ability for ember entrapment. **AO3.1.2** Development is designed to avoid re-entrant corners at the building facade, limiting the potential entrapment of embers. **AO3.1.3** Development involving on-site gas supply or storage, regardless of use type or scale, provides safe storage. This includes avoiding the use of heat sensitive or plastic gas fittings, locating gas storage on the side of the building furthest from the potential bushfire hazard. Where gas storage and supplies cannot be sited outside the bushfire prone area, radiant heat shields should be installed, constructed of non-flammable materials.	Will Comply
PO3.2 Development is: a. located within a reticulated water supply area; or b. where reticulated water supply is not available, includes a dedicated static water supply that is appropriately located and available solely for fire-fighting purposes and can be accessed by fire-fighting vehicles.	**AO3.2.1** The development is serviced by a reticulated water supply of a pressure that satisfies utility provider requirements. **AO3.2.2** Where development is not provided with reticulated water supply, it provides a static water supply (tank/s) that: a. is for the sole purpose of firefighting; b. is not less than the volumes outlined in Table 8.2.8.3.3; c. is below ground or constructed of or protected by non-combustible materials;	The proposed development will be connected to the existing reticulated water supply and will comply with Urban Utilities requirements for pressure and volume.

Performance Outcomes	Acceptable Outcomes	Compliance
	d. includes a 50mm male camlock tank fitting that allows access by firefighters; e. is located in an area that is level and within 10 metres to buildings and structures; and f. allows a medium rigid vehicle safe and clear access within 6 metres of the tank.	
PO4.1 Hazard vulnerable uses are only established or intensified within a bushfire prone area if: 1. there is an overriding need in the public interest for the new or expanded service the development provides; 2. no other options exist to service the necessity and there are no other suitable alternative locations within the required catchment; or 3. site planning can appropriately mitigate the risk such that exposure to a radiant heat flux level of less than 10kW/m² is achieved, measured at the outermost projection of the building or structure.	**AO4.1** No accepted outcome provided.	No vulnerable uses proposed

Performance Outcomes	Acceptable Outcomes	Compliance
PO4.2 Short term accommodation uses, nature-based tourism, relocatable home parks, resort complexes, tourist attractions and tourist parks are only established or intensified within a bushfire prone area if: a. no practical alternatives exist to service the need; or b. site planning can appropriately mitigate the risk to life and property to a tolerable level and it is compatible with the extent of the hazard.	**AO4.2** No accepted outcome provided.	Not Applicable
PO4.3 Community infrastructure providing essential services are only established within a bushfire prone area if: a. there is an overriding need in the public interest for the new or expanded service the development provides; b. no other options exist to service the necessity and there are no other suitable alternative locations; c. the infrastructure can function effectively during and immediately after a bushfire event; and d. site planning can appropriately mitigate the risk such that exposure to a radiant heat flux level of less than 10kW/m² is achieved, measured at the outermost projection of the building or structure, or alternative mitigation measures can reduce risk to a tolerable level.	**AO4.3** No accepted outcome provided.	No community infrastructure proposed

Performance Outcomes	Acceptable Outcomes	Compliance
PO4.4 Development avoids or mitigates the risks to public safety and the environment from Medium and High Impact and Special Industry uses involving the manufacture or storage of hazardous or combustible materials to an acceptable or tolerable bushfire risk level.	**AO4.2** No accepted outcome provided.	Not Applicable
PO5.1 Infrastructure such as water supply, electricity, gas and telecommunications are located underground within the site with the exception of above ground components required for operation.	**AO5.1** No accepted outcome provided.	Utility infrastruture will comply with ICC requirements
PO6.1 Development avoids cumulative risk in bushfire prone areas where within or in proximity to areas affected, or suspected of being affected, by Unexploded Ordnance (UXO).	**AO6.1** Development is sufficiently separated or buffered from the potential risk of areas affected, or suspected of being affected, by UXO where also in the bushfire prone area.	No UXO impact
PO6.2 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.	**AO6.2** Required revegetation or rehabilitation is: a. located outside of any asset protection zone; and b. does not increase the potential radiant heat exposure to existing surrounding development.	The BMP prepared by QBP has determined that there is no Bushfire impact on proposed DA1

QUEENSLAND BUSHFIRE PLANNING

Performance Outcomes	Acceptable Outcomes	Compliance
Reconfiguring a Lot		
PO7.1 Development: a. enables future buildings to be located away from slopes, ridgelines, crests and saddles, or other land forms that expose people or property to an intolerable risk to life or property; b. provides adequate separation from potentially hazardous vegetation; c. is designed and located to allow safe self-evacuation of the site by future occupants and users; and d. facilitates emergency access and operational space for emergency services under critical event conditions.	**AO7.1.1** Prepare a bushfire management plan for the development adopting a 5 per cent AEP (1 in 20 year ARI) Forest Fire Danger Index (FFDI) of 65 or as otherwise identified in current CSIRO climate modelling for the region. **AO7.1.2** Reconfigured lots: a. avoid ridgelines, saddles and crests or where slopes exceed 15 per cent; b. maximise frontage to road reserves; and c. avoid the creation of hatchet lots. **AO7.1.3** Allotments and development envelope areas are separated via an asset protection zone from the nearest extent of bushfire hazard by a distance that achieves a radiant heat flux level of 29 kW/m2 or less: a. for all development envelope areas for allotments greater than 2,000m²; or b. at all allotment boundaries for allotments of 2,000m2 or less. **AO7.1.4** For allotments that exceed 2,000m2, a development envelope area is identified that: a. is located within 60 metres of the road frontage; and b. sited to enable a driveway route with a gradient that does not exceed of 12.5 per cent.	The BMP prepared by QBP has determined that there is no Bushfire impact on proposed DA1

Performance Outcomes	Acceptable Outcomes	Compliance
PO8.1 The reconfigured lot layout is designed to minimise the length of the development perimeter and number of lots exposed to hazardous vegetation.	**AO8.1** No accepted outcome provided.	The BMP prepared by QBP has determined that there is no Bushfire impact on proposed DA1
PO8.2 The reconfigured lot layout provides for adequate access and egress and safe evacuation routes, to achieve an acceptable or tolerable risk to people.	**AO8.2.1** The reconfigured lot layout: a. does not result in the potential for bottle-neck points in the movement network within the development (for example, avoids hourglass patterns that are constrained by pinch points in the road network); b. ensures the road network has sufficient capacity for the evacuating population; and c. avoids cul-de-sacs and no-through roads. **AO8.2.2** Reconfiguration for residential purposes provides multiple access and egress options and avoids a single point of access and egress. This is achieved through the provision of sufficient exit points to the connecting road network, relative to the number of allotments proposed, in accordance with Table 8.2.8.3.4. **AO8.2.3** The reconfigured lot 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.	Designed access to Jackson Court will comply with The BMP prepared by QBP has determined that there is no Bushfire impact on proposed DA1

Performance Outcomes	Acceptable Outcomes	Compliance
PO8.3 Development provides public roads that: a. are accessible for fire-fighting vehicles and provide operational space for firefighting, maintenance works and hazard reduction activities; b. facilitate emergency access; c. provide access and connections to reticulated water supply (where available) and fire hydrants; and d. separate created lots from bushfire prone areas and limit the number of properties adjoining bushfire prone areas.	**AO8.3.1** A perimeter road is provided that separates development from hazardous vegetation that: a. has a two-lane carriageway of a minimum 20 metre wide road reserve; b. forms connections with the broader road network with intervals of no more than 250 metres; c. enables access to reticulated water supply for firefighting by locating hydrants outside of parking areas; d. does not include design elements that may impede access for firefighting and maintenance for firefighting purposes (for example traffic calming involving chicanes); e. incorporates mountable kerbing, where kerbing is provided; and f. has a maximum gradient of 12.5 per cent. **AO8.3.2** Where development has access to reticulated water supply, the supply pressure complies with the requirements of Urban Utilities and the road network and fire hydrants are designed and installed in accordance with the *Fire Hydrant and Vehicle Access Guidelines* for residential, commercial and industrial lots (QFES), unless otherwise specified by the relevant water entity.	The BMP prepared by QBP has determined that there is no Bushfire impact on proposed DA1

Performance Outcomes	Acceptable Outcomes	Compliance
PO9.1 In areas where reticulated water supply is not provided, the reconfigured lot layout: a. provides lots of a size and dimension capable of accommodating a static water supply on site to the development envelope area; and b. provides for access and working areas that are accessible by the type of fire-fighting vehicles servicing the area to facilitate emergency access and operational space for firefighting, maintenance works and hazard reduction activities.	**AO9.1** Where the reconfigured lot layout is not serviced by a reticulated water supply it provides: a. a fire trail or working area (which may form part of the APZ) designed and constructed in accordance with the design parameters in SC6.11 Bushfire Planning Scheme Policy that separates the residential lot or development envelope area from adjacent bushfire hazard; or b. a perimeter road; and c. provides space for a static water supply on site and safe and clear access for a medium rigid vehicle to manoeuvre.	Reticulated water supply will be connected
PO10.1 Infrastructure such as water supply, electricity, gas and telecommunications are located underground, with the exception of aboveground components required for operation.	**AO10.1** No accepted outcome provided.	Utility Infrastructure wiil comply with ICC City Plan requirements
PO10.2 Reconfiguration within 100 metres of mapped Very High Potential Bushfire Intensity (unless otherwise determined via a site-level verification as part of a Bushfire Management Plan) achieves a radiant heat flux level of 19 kW/m2 or less measured at the perimeter of the development envelope area.	**AO10.2** No accepted outcome provided.	The BMP prepared by QBP has determined that there is no Bushfire impact on proposed DA1

QUEENSLAND BUSHFIRE PLANNING

Appendices

QUEENSLAND BUSHFIRE PLANNING

APPENDIX 1

POTENTIAL BUSHFIRE ATTACK LEVEL

The Australian Standard, Construction of Buildings in Bushfire Prone Areas (AS 3959-2018) provides a suitable methodology for identifying assessable vegetation and determining the requirements for the construction of buildings in order to improve their resistance to bushfire attack from burning embers, radiant heat, flame contact and a combination of the three attack forms.

Determination of BAL

Step 1. Relevant Fire Danger Index

The PSBA bushfire hazard mapping identifies the FFDI as 58.

Step 2. Vegetation Classification - Fuel Loads

The vegetation type was classified as Continuous low grass or tree cover . Available fuel weights were derived from *PSBA State – Wide Bushfire Hazard (Bushfire Prone Area) Mapping. Fuel weight was determined as: 5.0 tonne/hectare.*

Fuel weights were determined as:

- 0.5 tonne/hectare surface fuels
- 4.0 tonne/hectare near surface fuels
- 0.0 tonne/hectare elevated fuels
- 0.5 tonne/hectare bark fuels
- Total fuel weight = *5.0 tonne/hectare.*

Step 3. Determine the effective slope in degrees under the classified vegetation

The classified vegetation is upslope at 4 degrees, calculated using the LiDAR contour information from the Bushfire Resilient Communities (BRC)

Step 4. Determine the slope in degrees of the land between the site and the classified vegetation

The slope between the site and the classified vegetation is with an average slope of 4 degrees.

Step 5. Determine the distance of the site from classified vegetation

Distance is calculated from the closest edge of the classified vegetation. Classified vegetation under AS 3959-2018 does not include low threat vegetation. The distance to the classified vegetation was calculated using a Nikon Forestry Pro Range Finder and Inclinometer at < 150 metres.

Step 6. Calculations

Effective slope (°) - 4

Site slope (°) - 4

Distance (m) - < 150

Vegetation classification — continuous low grass or tree cover

Forest Fire Danger Index (FFDI) – 58

Surface fuel load (t/ha) – 0.5

Overall fuel load (t/ha) – *5.0*

Heat of combustion (kj/kg) – 18 600

Flame temperature (K) – 1200

Outcomes

Intensity (kW/m2) – 0.0

Radiant heat flux (kW/m2) – Low

Bushfire Attack Level (BAL) - LOW *

*REF: Qld Govt State Planning Policy (SPP) Bushfire Resilient Communities technical guide (Oct 2019)