Land and environment consultants

Bushfire management plan

Future development | 532 Beams Road | Carseldine Village | Queensland
Prepared for Economic Development Queensland | 22 November 2023

PLANS AND DOCUMENTS
referred to in the PDA
DEVELOPMENT APPROVAL

Approval no: DEV2022/1321/9

Date: 9 August 2024

Queensland Government

Land and Environment Consultants Pty Ltd
Suite 5, 66 Bay Terrace
Wynnum Queensland 4178
T: 07 2112 5692
E: info@landeconsultants.com.au

Bushfire management plan

Final V1

Report 23095 | Economic Development Queensland | 22 November 2023

Approved by	Robert Janssen
Position	Managing principal
Signature	
Date	22 November 2023

Document control

Version	Date	Prepared by	Reviewed by
Draft	12 October 2023	R. Janssen	LEC
Final	8 November 2023	R. Janssen	LEC
Final V1	22 November 2023	R. Janssen	LEC

LEC
Land and environment consultants

T: 07 2112 5692 | E: info@landeconsultants.com.au | http://www.landeconsultants.com.au/

Suite 5, 66 Bay Terrace | Wynnum | Queensland | 4178 | Australia

Table of contents

Contents

Table of contents i

1 Introduction 1

1.1 Planning context 1

1.2 Bushfire management plan 1

1.3 Method 2

1.4 Suitably qualified person 2

2 Description of the site and future development 3

2.1 Site description 3

2.2 Future development 3

2.3 State Planning Policy bushfire prone area map 3

3 Bushfire hazard assessment 5

3.1 Severe fire weather 5

3.2 Fire history 5

3.3 Site assessment 5

3.4 Potential bushfire intensity calculations 6

3.5 Bushfire hazard areas 7

4 Bushfire hazards associated with the site 8

4.1 Fire danger season 8

4.2 Fire history 8

4.3 Bushfire attack 8

4.4 Potential bushfire hazards from adjacent land use 8

4.5 Water and access for emergency services 8

5 Bushfire hazards associated with future development 9

5.1 Siting and design 9

5.2 Vulnerable uses 9

5.3 Community infrastructure for essential services 9

5.4 Storage of hazardous materials 9

5.5 Civic plaza in lot 9001 10

5.6 Bushland vegetation retained in lot 9005 10

5.7 Stormwater drainage swale and restricted vehicle access track 10

5.8 Access and egress 10

5.9 Fire-fighter water supply 10
5.10 Radiant heat exposure 10
5.11 Building design and construction 11
6 Bushfire mitigation plan 13
6.1 Vulnerable use development 13
6.2 Community infrastructure for essential services 13
6.3 Storage of hazardous materials 13
6.4 Landscaping 13
6.5 Access and egress 13
6.6 Fire-fighter water supply 13
6.7 Service installation 14
7 Conclusion 15

Figures

Figure 2.1 Site locality and State Planning Policy bushfire prone area map 4
Figure 5.1 Bushfire mitigation plan 12

Tables

Table 3.1 Site observations 5
Table 3.2 Potential bushfire intensity 7

Photographs

Photograph 3.1 VHC 42.6 at B 6
Photograph 3.2 VHC 16.1 at C 6
Photograph 3.3 VHC 9.1 at E 6
Photograph 3.4 VHC 41.4 at F 6

Appendix

Appendix 1 Approved plan of subdivision
Appendix 2 Proposed plan of subdivision
Appendix 3 Stormwater drainage swale and restricted vehicle access track
Appendix 4 Radiant heat exposure assessment
Appendix 5 Radiant heat flux contours over lots 5002, 2049 and 2050

Appendix 6 Bushfire attack level contour plan

Appendix 7 Bushfire overlay 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 building will withstand bushfire attack on every occasion.

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

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

1 Introduction

Land and Environment Consultants Pty Ltd (**LEC**) was engaged to prepare a bushfire management plan (**BMP**) for the future development of Stage V and part of Stage 2 of the Carseldine Village, identified as lots V001, V002, V003, 9001, 9005, 2049 and 2050 (**the site**) in the approved plan of subdivision which is provided in Appendix 1.

Please note, since the plan of subdivision was approved the lot numbers within Stage V have been amended. Previous lots V001, V002 and V003 are now identified as lots 5001, 5002 and 5003. The proposed plan of subdivision with the amended lot numbers is provided in Appendix 2. The amended lot numbers shown in Appendix 2 are used in this BMP.

LEC prepared a bushfire assessment and management plan (LEC 2018) for the Carseldine Village and an addendum to the bushfire assessment and management plan (LEC 2022) (**addendum**) for consideration of a stormwater drainage swale and restricted vehicle access track aligned with the rear boundaries of lots 2049, 2050, 5002 and through lot 9005. The layout plan for the stormwater drainage swale and restricted vehicle access track is provided in Appendix 3.

This BMP consolidates the bushfire assessment and management plan and addendum and can be used and relied on for future priority development area (**PDA**) development applications made over the site under the *Fitzgibbon Urban Development Area Development Scheme*.

1.1 Planning context

The site is identified as a bushfire hazard area by Queensland State Planning Policy (**SPP**) *Bushfire prone area map* (**SPP bushfire prone area map**). Therefore, future development applications made over the site will be subject to compliance with bushfire outcomes of the *Fitzgibbon PDA Development Scheme* which defers to the example bushfire overlay code (**Bushfire overlay code**) in the *Natural Hazards, Risk and Resilience – Bushfire, State Planning Policy State Interest guidance material* (DSDMIP 2019) (**SPP guidance material – bushfire**).

1.2 Bushfire management plan

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

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

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

1.3 Method

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

- review of the SPP bushfire prone area map in the SPP interactive mapping system (DILGP 2023), and the Queensland regional ecosystem map, vegetation hazard class (**VHC**) map, severe fire weather map and fire history map in the QFES online mapping system (QFES 2023) (**Catalyst**);
- inspection 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 V4.9* (**BAL calculator**) which models the 'method 2' bushfire attack level (**BAL**) assessment procedure in the *Australian Standard* (**AS 3959-2018**) *Construction of buildings in bushfire prone areas*; and
- assessment of future development against the Bushfire overlay code.

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

1.4 Suitably qualified person

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

Robert is the managing principal at LEC and has over 25 years of experience in bushfire planning and operations. He has prepared BMPs 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 future development

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

2.1 Site description

The location of the site is shown in Figure 2.1. The site is 2.92 hectares (**ha**), accessed via Beams Road and Plaza Place and is serviced by a mains water supply.

Most of the land adjoining the site is developed or under development and has little vegetation cover or maintained vegetation, ie formal gardens, shade trees, pathways and mown grass. The exception is land to the south of the site where bushland vegetation has been retained and is protected from future development.

2.2 Future development

Future development within the site will include:

- mixed use development – lots 5001, 5002 and 5003;
- open space (civic plaza) – lot 9001;
- bushland vegetation retention and part of the stormwater drainage swale and restricted vehicle access track – lot 9005;
- apartments – lots 2049 and 2050; and
- a new road reserve.

The PDA development applications for future development within the site may involve the following categories of development:

- vulnerable uses, community infrastructure providing essential services and the storage of materials that are hazardous in the context of bushfire;
- reconfiguring a lot;
- material change of use; and
- multiple dwellings.

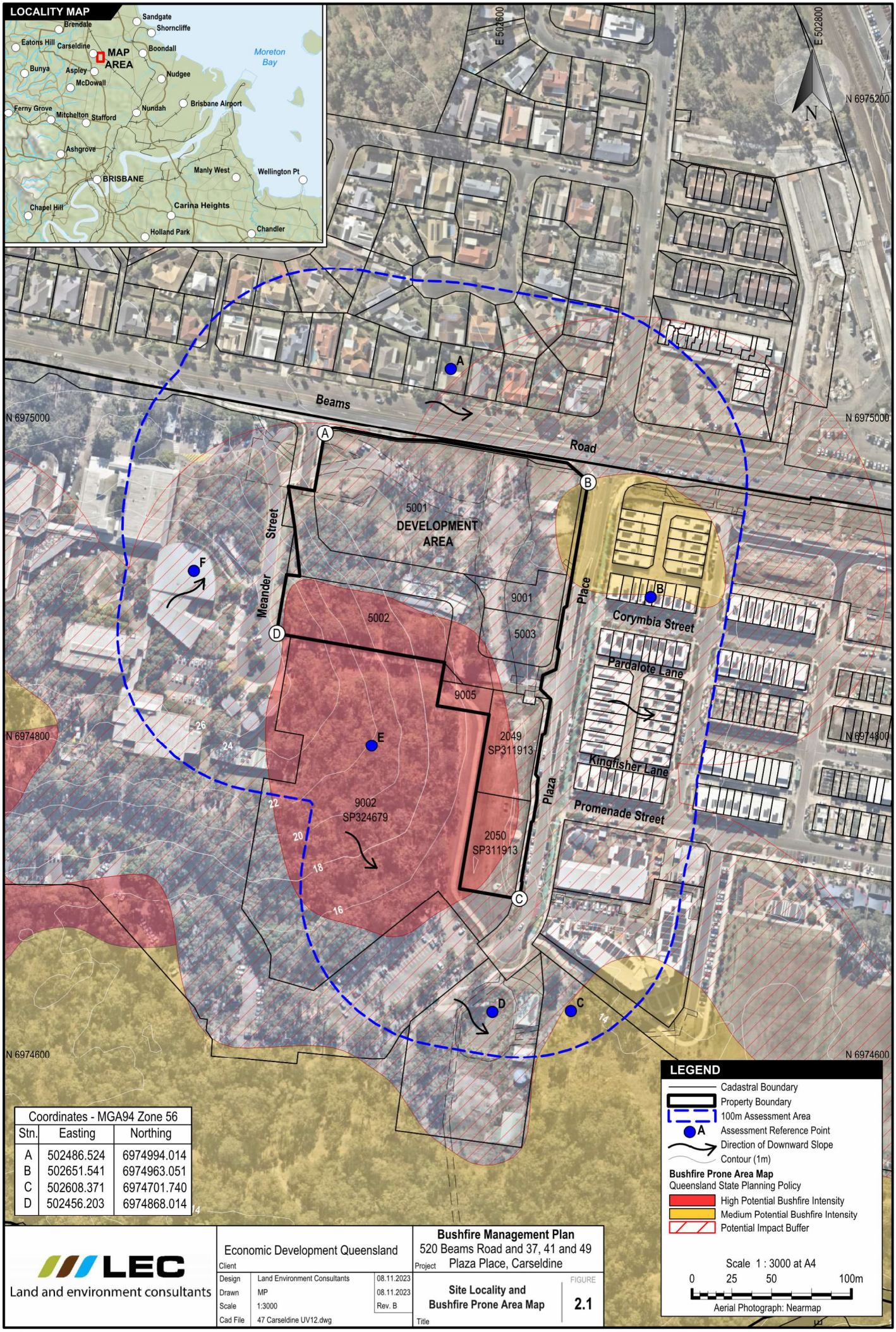
Access and egress to future development within the site will be via Beams Road, Plaza Place and the new road reserve.

Future development will be connected to mains water and will have access to the reticulated hydrant system in the Beams Road and Plaza Place road reserves and the new road reserve within the site.

2.3 State Planning Policy bushfire prone area map

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

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



3 Bushfire hazard assessment

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

3.1 Severe fire weather

The severe fire weather map in 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 potential bushfire intensity calculations in Section 3.4 and the radiant heat exposure assessment in Section 5.10.

3.2 Fire history

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

3.3 Site assessment

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

The locations of assessment reference points used for the bushfire hazard assessment are shown in Figure 2.1. Table 3.1 provides a summary of observations from the site inspection and notes about the bushfire hazard assessment of assessment reference points. Examples of the VHCs at assessment reference points are shown in Photographs 3.1-3.4.

Table 3.1 Site observations

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

Table 3.1 Site observations

Assessment reference point	Catalyst VHC	Ground truthed VHC	Notes
	coastal lowlands and ranges (**VHC 9.1**)		
F	VHC 41.4	VHC 41.4	This area was the former Carseldine Queensland University of Technology campus. It has buildings and maintained vegetation, ie formal gardens, shade trees, pathways and mown grass.

Photograph 3.1 VHC 42.6 at B

Photograph 3.2 VHC 16.1 at C

Photograph 3.3 VHC 9.1 at E

Photograph 3.4 VHC 41.4 at F

3.4 Potential bushfire intensity calculations

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

Bushfire resilient communities define bushfire hazard classes as follows:

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

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

Table 3.2 Potential bushfire intensity

Assessment reference point	VHC	Potential fuel load (tonnes/ha)[1]	Slope (°)[2]	Potential bushfire intensity (kW/m)	Bushfire hazard class
A	VHC 42.6	2	0	136	Non-bushfire hazard class
B	VHC 42.6	2	0	136	Non-bushfire hazard class
C	VHC 16.1	16	0	8,621	Medium[3]
D	VHC 41.4	3	0	307	Non-bushfire hazard class
E	VHC 9.1	24.1	5	27,965	High
F	VHC 41.4	3	0	307	Non-bushfire hazard class

Notes 1 Potential fuel load taken from Bushfire resilient communities.
2 Slope defaults to 0° for VHC 41.4 and VHC 42.6 which have discontinuous bushfire fuels.
3 Vegetation at assessment reference point C has been assessed as though rehabilitation has reached a mature state.

3.5 Bushfire hazard areas

Results of the potential bushfire intensity calculations in Table 3.2 determined the site is within a bushfire hazard area. Therefore, PDA development applications for future development within the site will be subject to compliance with the Bushfire overlay code.

4 Bushfire hazards associated with the site

This chapter identifies bushfire hazards associated with the site.

4.1 Fire danger season

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

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

4.2 Fire history

As discussed in Section 3.2, fire history data indicates that no fires have occurred within 1 km of the site during the past 10 years. Notwithstanding, given the site adjoins a large area of bushland vegetation, it is considered possible that the site could be exposed to bushfire attack in the future.

4.3 Bushfire attack

Future development could be exposed to bushfire attack from assessment reference points C and E, shown in Figure 2.1, where hazardous vegetation occurs. These bushfire attack scenarios are analysed in Section 5.10.

4.4 Potential bushfire hazards from adjacent land use

Existing development adjoining the site is not considered a bushfire hazard to the future development within the site given that it has little vegetation cover or maintained vegetation with discontinuous bushfire fuels.

The bushland vegetation being rehabilitated at assessment reference point C and retained at assessment reference point E is a bushfire hazard to future development given that it was assessed as a bushfire hazard area in Section 3.4.

4.5 Water and access for emergency services

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

5 Bushfire hazards associated with future development

This chapter identifies potential bushfire hazards associated with future development.

5.1 Siting and design

Future development will be sited and designed to achieve the following outcomes:

- layout and location will minimise the exposure and vulnerability of people and property to bushfires;
- contribute to effective and efficient emergency response and recovery capabilities;
- rehabilitation, revegetation and landscaping does not increase the risk of people and property to bushfires;
- only establishes or intensifies vulnerable uses and community infrastructure providing essential services within a bushfire hazard area where no other options exists to provide the necessary level of service;
- avoids or mitigates the risk from the storage of material that are hazardous in the context of bushfire.

5.2 Vulnerable uses

Future development may involve vulnerable uses identified in Table 7 of the SPP guidance material – bushfire, ie a childcare centre, community housing, etc.

Vulnerable uses should not be located within 100 m of the hazardous vegetation at assessment reference points C and E shown in Figure 2.1. The exception is where there is no suitable alternative location, site planning can appropriately mitigate the risk of bushfire hazard and the infrastructure can function effectively during and immediately after a bushfire event. In this situation, Bushfire resilient communities requires buildings or building envelopes involving the vulnerable use to be separated from hazardous vegetation by a distance which achieves a radiant heat flux level ≤ 10 kW/m^2 at the buildings or building envelopes.

5.3 Community infrastructure for essential services

Future development may involve community infrastructure for essential services identified in Table 7 of the SPP guidance material – bushfire, ie emergency services, utility installations, etc.

The bushfire mitigation measures for vulnerable use development, which are outlined in Section 5.2, are also applicable to community infrastructure for essential services.

5.4 Storage of hazardous materials

Future development may involve the storage of hazardous materials identified in Table 7 of the SPP guidance material – bushfire, ie a retail service station.

The bushfire mitigation measures for vulnerable use development, which are outlined in Section 5.2, are also applicable to the storage of hazardous materials. In addition, future development involving the storage of hazardous materials would be operated in accordance with requirements of the Queensland *Work Health and Safety Act 2011* (**WHS Act**) and the associated regulation and guidelines, the Queensland *Environmental Protection Act 1994* (**EP Act**) and the *Australian Standard* (**AS 1940-2017**) *The storage and handling of flammable and combustible liquids.*

5.5 Civic plaza in lot 9001

Landscaping associated with the future development of the civic plaza will consist of lawn, shade trees, landscaped gardens, pathways and park furniture. It will be regularly maintained and will not be a bushfire hazard to future development.

5.6 Bushland vegetation retained in lot 9005

The patch of bushland vegetation retained in lot 9005 adjoining the rear boundary of lot 2049 will not be a bushfire hazard to future development. It is a small area and will be separated from the hazardous vegetation at assessment reference point E, shown in Figure 2.1, by the stormwater drainage swale and restricted vehicle access track.

5.7 Stormwater drainage swale and restricted vehicle access track

The stormwater drainage swale and restricted vehicle access track shown in the layout plan in Appendix 3 will be designed and maintained to provide a low bushfire fuel hazard area and a setback between the future development within lots 5002, 2049 and 2050 and the hazardous vegetation at assessment reference point E, shown in Figure 2.1.

The stormwater drainage swale and restricted vehicle access track will be transferred to Council for ownership and maintenance.

5.8 Access and egress

Access and egress to future development within the site will be via Beams Road, Plaza Place and the new road reserve.

The new road will provide connections to Beams Road and Plaza Place and will be designed and constructed to accommodate an urban fire truck.

5.9 Fire-fighter water supply

Future development will be connected to mains water and will have access to the reticulated hydrant system in road reserves for Beams Road and Plaza Place.

A reticulated hydrant system will be installed in the new road reserve within the site.

5.10 Radiant heat exposure

The Bushfire overlay code provides guidance about radiant heat exposure for a reconfiguration of a lot development application. It states:

> 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:
>
> b. a distance that achieves a radiant heat flux level of 29 kW/m^2 or less:
> i. at the building envelope, if identified at RaL stage; or
> ii. where a building envelope is not identified, at all lot boundaries.

The Bushfire overlay code defers to guidance in Bushfire resilient communities about radiant heat exposure for land uses identified in Table 7 of the SPP guidance material – bushfire as vulnerable uses, community infrastructure for essential services and the storage of hazardous materials in the context of bushfire hazard. Bushfire resilient communities requires these land uses to be separated from hazardous vegetation by a distance which achieves a radiant heat flux level ≤ 10 kW/m^2 at the buildings, building envelopes or storage area.

As discussed in Section 4.3, future development could be exposed to bushfire attack from assessment reference points C and E, shown in Figure 2.1, where hazardous vegetation occurs. The radiant heat profile of these bushfire attack scenarios was analysed using the BAL calculator. Inputs used in the BAL calculator and results are provided in Appendix 4.

The 10 kW/m^2 and 29 kW/m^2 radiant heat flux contour measured from assessment reference points C and E are shown in Figure 5.1. The 10 kW/m^2 and 29 kW/m^2 radiant heat flux contour measured from assessment reference point C does not affect the site and is not considered further in this BMP.

Figure 5.1 demonstrates future development within lots 5001, 5002, 5003, 9001, 2049 and 2050 is not constrained by the setback required to achieve a radiant heat flux level ≤ 29 kW/m^2 at buildings or building envelopes. It also demonstrates lots 5002, 2049 and 2050 are constrained by the setback required to achieve a radiant heat flux level ≤ 10 kW/m^2 at buildings, building envelopes or storage areas (including vents), which may be relevant to future development if it involves vulnerable uses, community infrastructure for essential services or the storage of hazardous materials in the context of bushfire hazard.

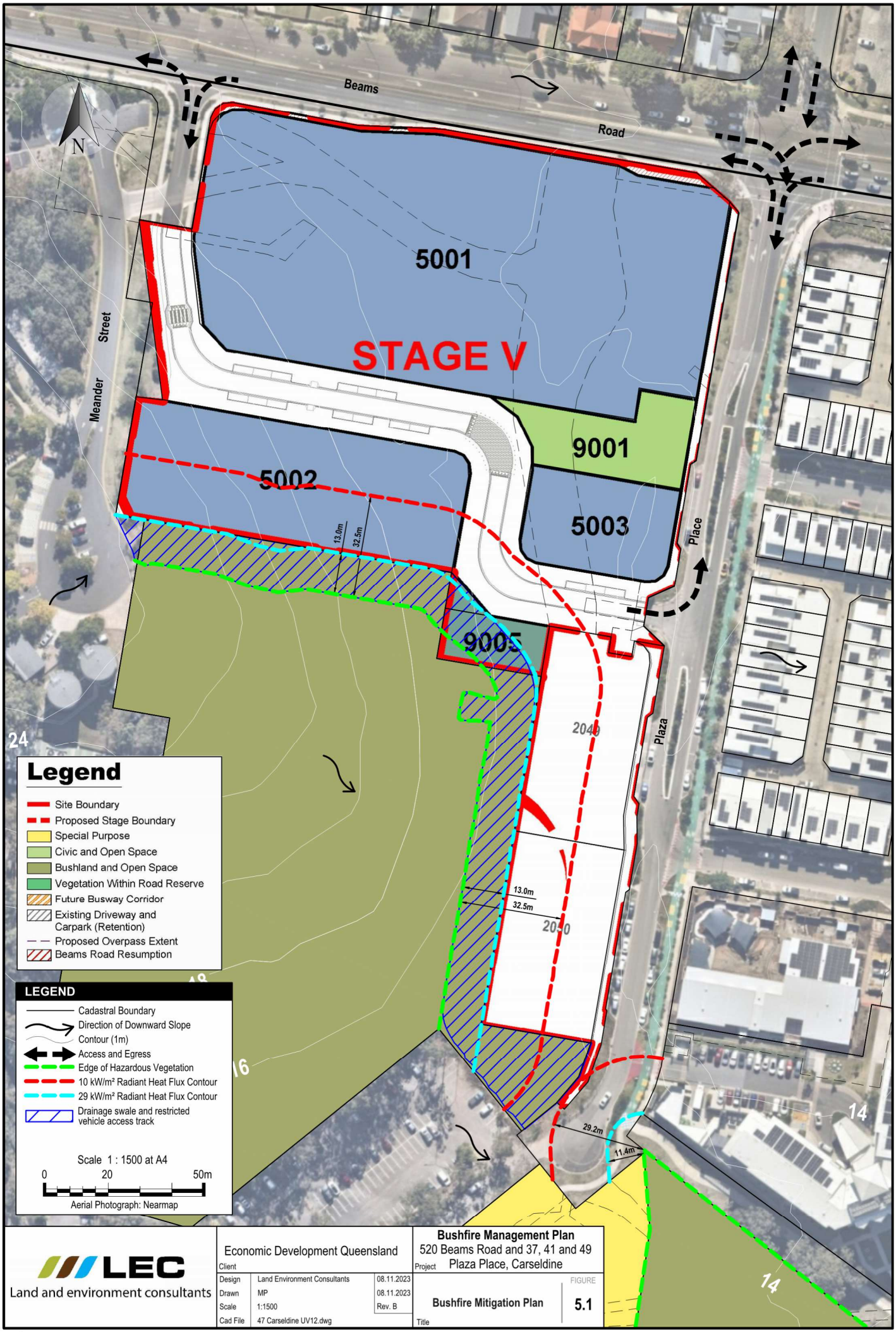
Higher resolution figures showing the 10 kW/m^2 and 29 kW/m^2 radiant heat flux contours over lots 5002, 2049 and 2050 are provided in Appendix 5.

5.11 Building design and construction

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

Notwithstanding, compliance with the *Building Code of Australia* (ABCB 2022) (**BCA**) and *Queensland Development Code* (QG 2021) requires certain BCA classifications of building which are located within a bushfire prone area, to be designed and constructed in accordance with BAL construction standards in AS 3959-2018.

To assist with future building development applications, a BAL contour plan over the site is provided in Appendix 6.



LEC Land and environment consultants

Client	Economic Development Queensland	
Design	Land Environment Consultants	08.11.2023
Drawn	MP	08.11.2023
Scale	1:1500	Rev. B
Cad File	47 Carseldine UV12.dwg	

Bushfire Management Plan
520 Beams Road and 37, 41 and 49 Plaza Place, Carseldine
Project

Bushfire Mitigation Plan
Title

FIGURE 5.1

6 Bushfire mitigation plan

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

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

6.1 Vulnerable use development

Future development within the site involving vulnerable uses must identify buildings or building envelopes which are setback from hazardous vegetation by a distance which achieves a radiant heat flux level ≤ 10 kW/m^2 at the buildings or building envelopes.

6.2 Community infrastructure for essential services

Future development within the site involving community infrastructure for essential services must identify buildings or building envelopes which are setback from hazardous vegetation by a distance which achieves a radiant heat flux level ≤ 10 kW/m^2 at the buildings or building envelopes.

6.3 Storage of hazardous materials

Future development involving the storage of hazardous materials in the context of bushfire hazard must be setback from hazardous vegetation by a distance which achieves a radiant heat flux level ≤ 10 kW/m^2 at the storage area. It must also be operated in accordance with requirements of the WHS Act and the associated regulation and guidelines, EP Act and AS 1940-2017.

6.4 Landscaping

Future development within the site must have landscaping which is designed in accordance with Part 5 of *Bushfire Resilient Building Guidance for Queensland Homes* (QRA 2020) (**Bushfire resilient building**).

Plant species used in garden beds should favour the list of species in Appendix E of Bushfire resilient building.

Landscaped areas must be maintained. Weeds, vegetation debris and rubbish must be removed from landscaped areas at regular time intervals during the calendar year. Turf must be maintained as lawn at a nominal height of 10 centimetres.

6.5 Access and egress

The new road within the site must be designed and constructed to accommodate an urban fire truck in accordance with *Fire Hydrant and Vehicle Access Guidelines for Residential, Commercial and Industrial Lots* (QFES 2019b) (**Fire hydrant and vehicle access guidelines**) which defers to the *Road Planning and Design Manual – 2nd Edition* (DTMR 2013) for load bearing capacity, geometry and turning radii.

Site access and egress is shown in Figure 5.1.

6.6 Fire-fighter water supply

Future development within the site must be connected to mains water. The mains water connection must be tested (and if required, augmented) to ensure that it has sufficient flow and pressure

characteristics for fire-fighting purposes at all times, ie minimum flow and pressure of 10 litres/second at 200 kilopascals.

A reticulated hydrant system must be installed in the new road reserve. It must be designed and constructed in accordance with specifications in Fire hydrant and vehicle access guidelines which defers to the local water retailer's specifications and the *Australian Standard* (**AS 2419.1-2021**) *Fire hydrant installation, system design, installation and commissioning*. Where there are differences between the local water retailer's specifications and AS 2419.1-2021, the higher level standard should prevail.

6.7 Service installation

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

7 Conclusion

This BMP was prepared by a suitably qualified person and is in general accordance with Bushfire resilient communities.

A bushfire hazard assessment determined the site is within a bushfire hazard area and PDA development applications for future development within the site will be subject to compliance with the Bushfire overlay code.

Mitigation measures that must be implemented as part of future development within the site are specified in Chapter 6. With the implementation of these mitigation measures the future development will comply with the Bushfire overlay code as demonstrated in Appendix 7.

References

Australian Building Codes Board (ABCB) 2022, *National Construction Code Series, Building Code of Australia, Volumes 1 and 2*, Australian Government and States and Territories of Australia, May 2023

Land and Environment Consultants Pty Ltd (LEC) 2018, *Bushfire assessment and mitigation plan, Carseldine Urban Village, 532 Beams Road, Carseldine, Queensland*, Final V1, prepared for Economic Development Queensland, 1 May 2018

Land and Environment Consultants Pty Ltd (LEC) 2022, *Addendum to the bushfire assessment for Carseldine Village,* prepared for Economic Development Queensland, 19 September 2022

Queensland Department of State Development, Infrastructure, Local Government and Planning (DSDILGP 2023) *State Planning Policy Interactive Mapping System*, accessed online at https://spp.dsdip.esriaustraliaonline.com.au/geoviewer/map/planmaking, September 2023

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

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

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

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

Queensland Fire and Emergency Services (QFES) 2023, *Catalyst – Sustainable development mapping system*, QFES Sustainable Development Unit, accessed online at https://catalyst.qfes.qld.gov.au/sdu/ via user login, August 2023

Queensland Government (QG) 2021, *Queensland Development Code*, accessed online at https://www.business.qld.gov.au/industries/building-property-development/building-construction/laws-codes-standards/queensland-development-code, last updated March 2021

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

Standards Australia Limited (Standards Australia) 2017, *Australian Standard 1940–2017 The storage and handling of flammable and combustible liquids*, August 2017

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

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

Appendix 1 Approved plan of subdivision

Legend

- Site Boundary
- Proposed Stage Boundary
- Existing Easements
- Proposed Access Easement
- Beams Road Resumption

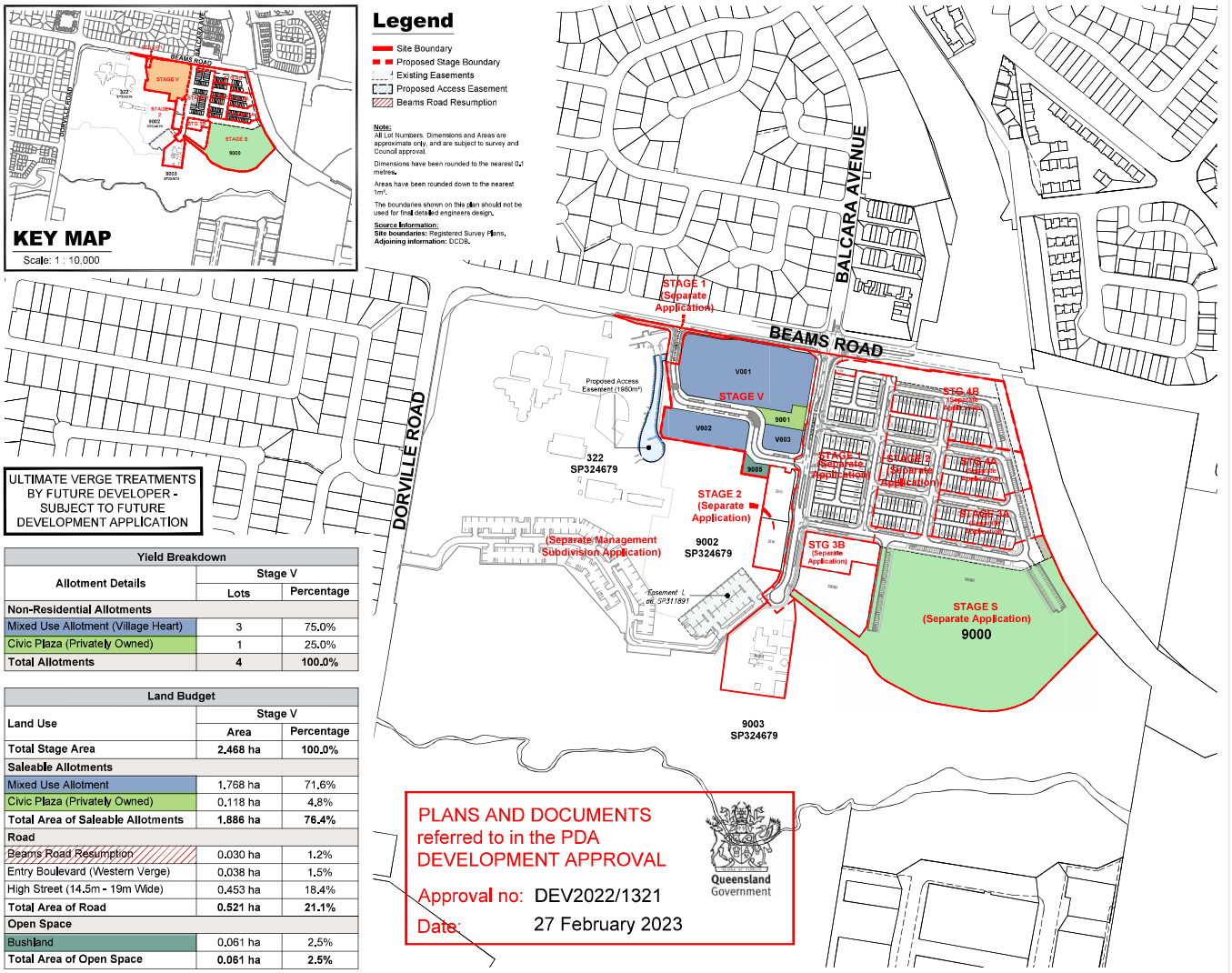
Note:
All Lot Numbers, Dimensions and Areas are approximate only, and are subject to survey and Council approval.

Dimensions have been rounded to the nearest 0.1 metres.

Areas have been rounded down to the nearest 1m².

The boundaries shown on this plan should not be used for final detailed engineers design.

Source Information:
Site boundaries: Registered Survey Plans.
Adjoining information: DCDB.



ULTIMATE VERGE TREATMENTS BY FUTURE DEVELOPER - SUBJECT TO FUTURE DEVELOPMENT APPLICATION

Yield Breakdown		
Allotment Details	Stage V	
	Lots	Percentage
Non-Residential Allotments		
Mixed Use Allotment (Village Heart)	3	75.0%
Civic Plaza (Privately Owned)	1	25.0%
Total Allotments	**4**	**100.0%**

Land Budget		
Land Use	Stage V	
	Area	Percentage
Total Stage Area	**2.468 ha**	**100.0%**
Saleable Allotments		
Mixed Use Allotment	1.768 ha	71.6%
Civic Plaza (Privately Owned)	0.118 ha	4.8%
Total Area of Saleable Allotments	**1.886 ha**	**76.4%**
Road		
Beams Road Resumption	0.030 ha	1.2%
Entry Boulevard (Western Verge)	0.038 ha	1.5%
High Street (14.5m - 19m Wide)	0.453 ha	18.4%
Total Area of Road	**0.521 ha**	**21.1%**
Open Space		
Bushland	0.061 ha	2.5%
Total Area of Open Space	**0.061 ha**	**2.5%**

PLANS AND DOCUMENTS referred to in the PDA DEVELOPMENT APPROVAL

Approval no: DEV2022/1321

Date: 27 February 2023

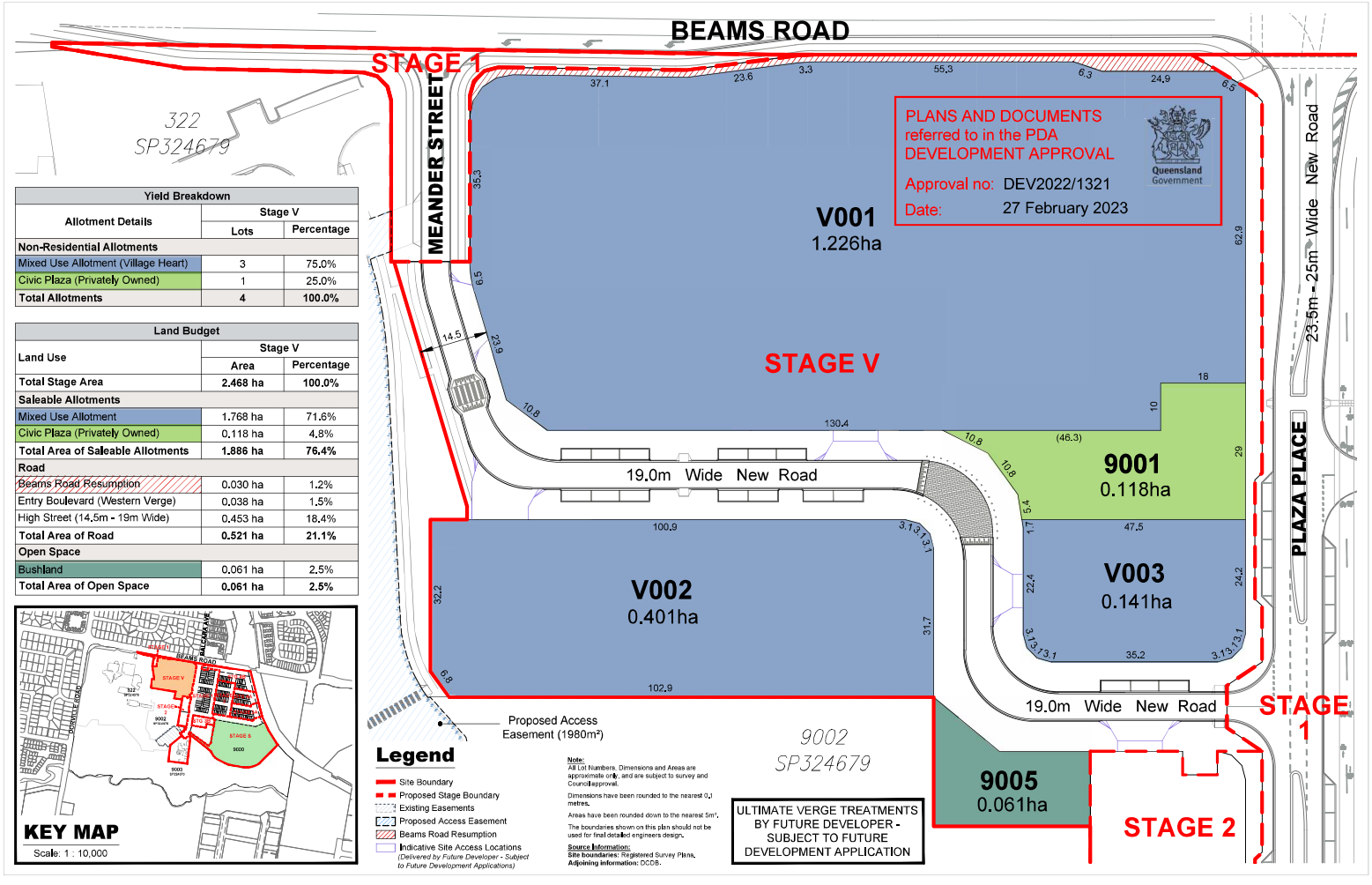
Queensland Government

CARSELDINE URBAN VILLAGE

PLAN OF SUBDIVISON STAGE V - OVERALL

PLAN REF: 128180 – 123
Rev No: I
DATE: 26 JULY 2022
CLIENT: EDQ
DRAWN BY: MD
CHECKED BY: MD / DG

URBAN DESIGN
Level 4 HQ South
520 Wickham Street
PO Box 1559
Fortitude Valley QLD 4006
T +61 7 3539 8500
W rpsgroup.com



Yield Breakdown		
Allotment Details	Stage V	
	Lots	Percentage
Non-Residential Allotments		
Mixed Use Allotment (Village Heart)	3	75.0%
Civic Plaza (Privately Owned)	1	25.0%
Total Allotments	**4**	**100.0%**

Land Budget		
Land Use	Stage V	
	Area	Percentage
Total Stage Area	**2.468 ha**	**100.0%**
Saleable Allotments		
Mixed Use Allotment	1.768 ha	71.6%
Civic Plaza (Privately Owned)	0.118 ha	4.8%
Total Area of Saleable Allotments	**1.886 ha**	**76.4%**
Road		
Beams Road Resumption	0.030 ha	1.2%
Entry Boulevard (Western Verge)	0.038 ha	1.5%
High Street (14.5m - 19m Wide)	0.453 ha	18.4%
Total Area of Road	**0.521 ha**	**21.1%**
Open Space		
Bushland	0.061 ha	2.5%
Total Area of Open Space	**0.061 ha**	**2.5%**

Legend

- Site Boundary
- Proposed Stage Boundary
- Existing Easements
- Proposed Access Easement
- Beams Road Resumption
- Indicative Site Access Locations *(Delivered by Future Developer - Subject to Future Development Applications)*

Note:
All Lot Numbers, Dimensions and Areas are approximate only, and are subject to survey and Council approval.

Dimensions have been rounded to the nearest 0.1 metres.

Areas have been rounded down to the nearest 5m².

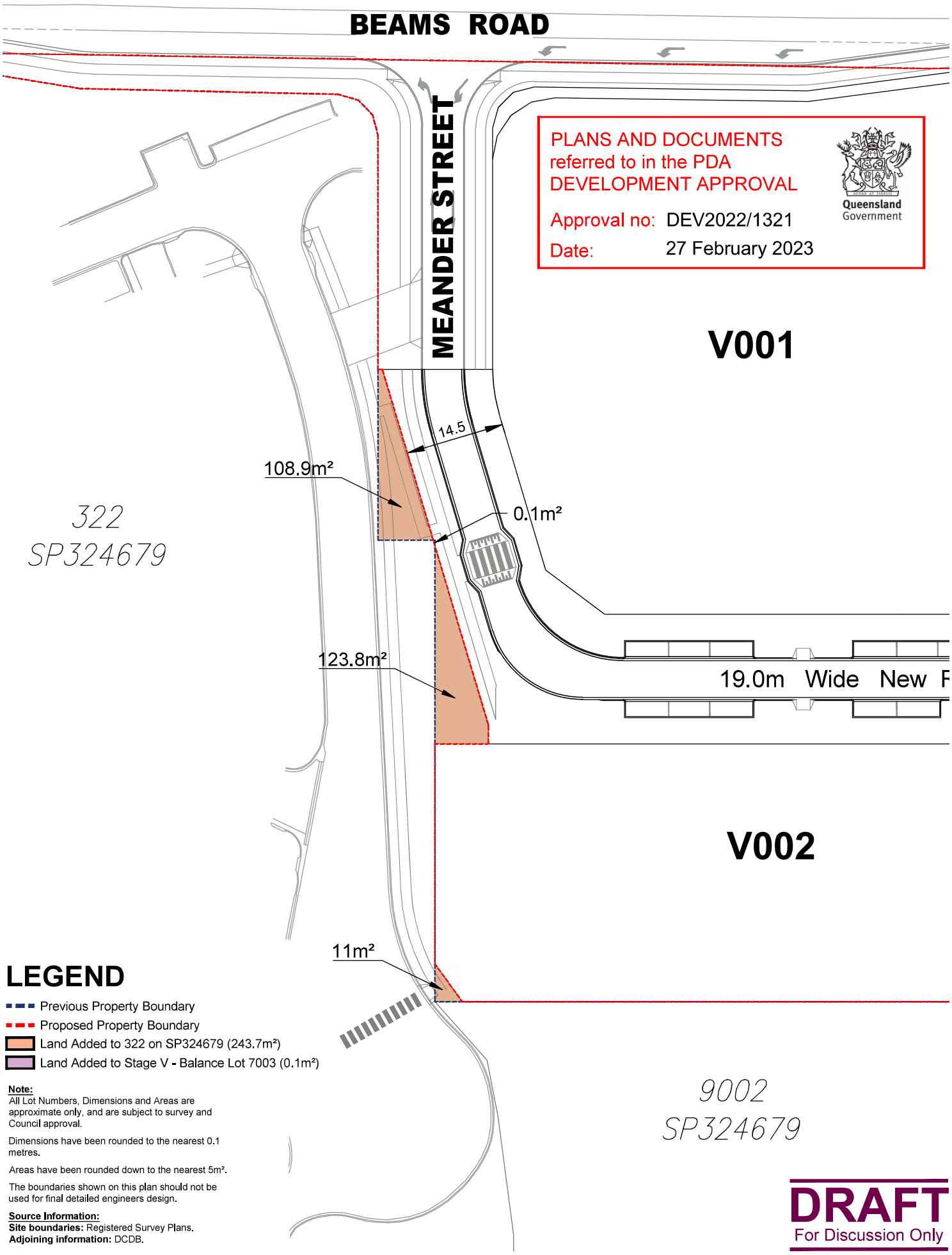
The boundaries shown on this plan should not be used for final detailed engineers design.

Source Information:
Site boundaries: Registered Survey Plans.
Adjoining information: DCDB.

PLAN REF: 128180 – 124
Rev No: I
DATE: 26 JULY 2022
CLIENT: EDQ
DRAWN BY: MD
CHECKED BY: MD / DG
0 5 10 15 20 25 1 : 500 @ A2

CARSELDINE URBAN VILLAGE
PLAN OF SUBDIVISION
STAGE V - VILLAGE HEART SUBDIVISION

URBAN DESIGN
Level 4 HQ South
520 Wickham Street
PO Box 1559
Fortitude Valley QLD 4006
T +61 7 3539 9500
W rpsgroup.com



LEGEND

- Previous Property Boundary
- Proposed Property Boundary
- Land Added to 322 on SP324679 (243.7m²)
- Land Added to Stage V - Balance Lot 7003 (0.1m²)

Note:
All Lot Numbers, Dimensions and Areas are approximate only, and are subject to survey and Council approval.

Dimensions have been rounded to the nearest 0.1 metres.

Areas have been rounded down to the nearest 5m².

The boundaries shown on this plan should not be used for final detailed engineers design.

Source Information:
Site boundaries: Registered Survey Plans.
Adjoining information: DCDB.

DRAFT
For Discussion Only

PLAN REF: 128180 – 150
Rev No: C
DATE: 26 JULY 2022
CLIENT: EDQ
DRAWN BY: MD
CHECKED BY: MD/DG

0 5 10 15 20 25 1 : 500 @ A3

CARSELDINE URBAN VILLAGE
STAGE V - VILLAGE HEART
BOUNDARY REALIGNMENT

URBAN DESIGN
Level 4 HQ South
520 Wickham Street
PO Box 1559
Fortitude Valley QLD 4006
T +61 7 3539 9500
W rpsgroup.com

Appendix 2 Proposed plan of subdivision

KEY MAP

Scale: 1 : 10,000

Legend

- Site Boundary
- Proposed Stage Boundary
- Existing Easements
- Proposed Access Easement
- Beams Road Resumption

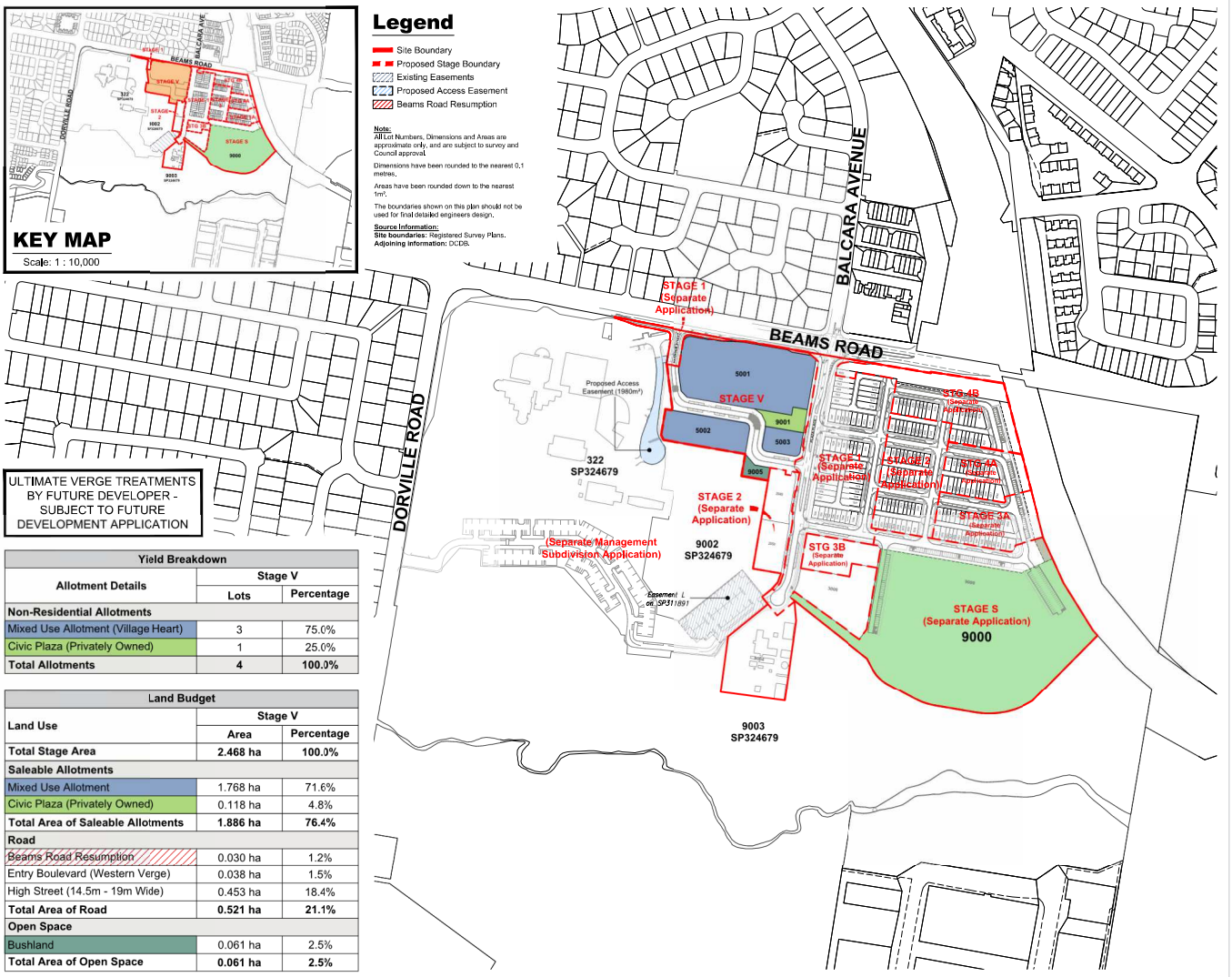
Note:
All Lot Numbers, Dimensions and Areas are approximate only, and are subject to survey and Council approval.

Dimensions have been rounded to the nearest 0.1 metres.

Areas have been rounded down to the nearest 1m².

The boundaries shown on this plan should not be used for final detailed engineers design.

Source Information:
Site boundaries: Registered Survey Plans.
Adjoining information: DCDB.



ULTIMATE VERGE TREATMENTS BY FUTURE DEVELOPER - SUBJECT TO FUTURE DEVELOPMENT APPLICATION

Yield Breakdown		
Allotment Details	**Stage V**	
	Lots	**Percentage**
Non-Residential Allotments		
Mixed Use Allotment (Village Heart)	3	75.0%
Civic Plaza (Privately Owned)	1	25.0%
Total Allotments	**4**	**100.0%**

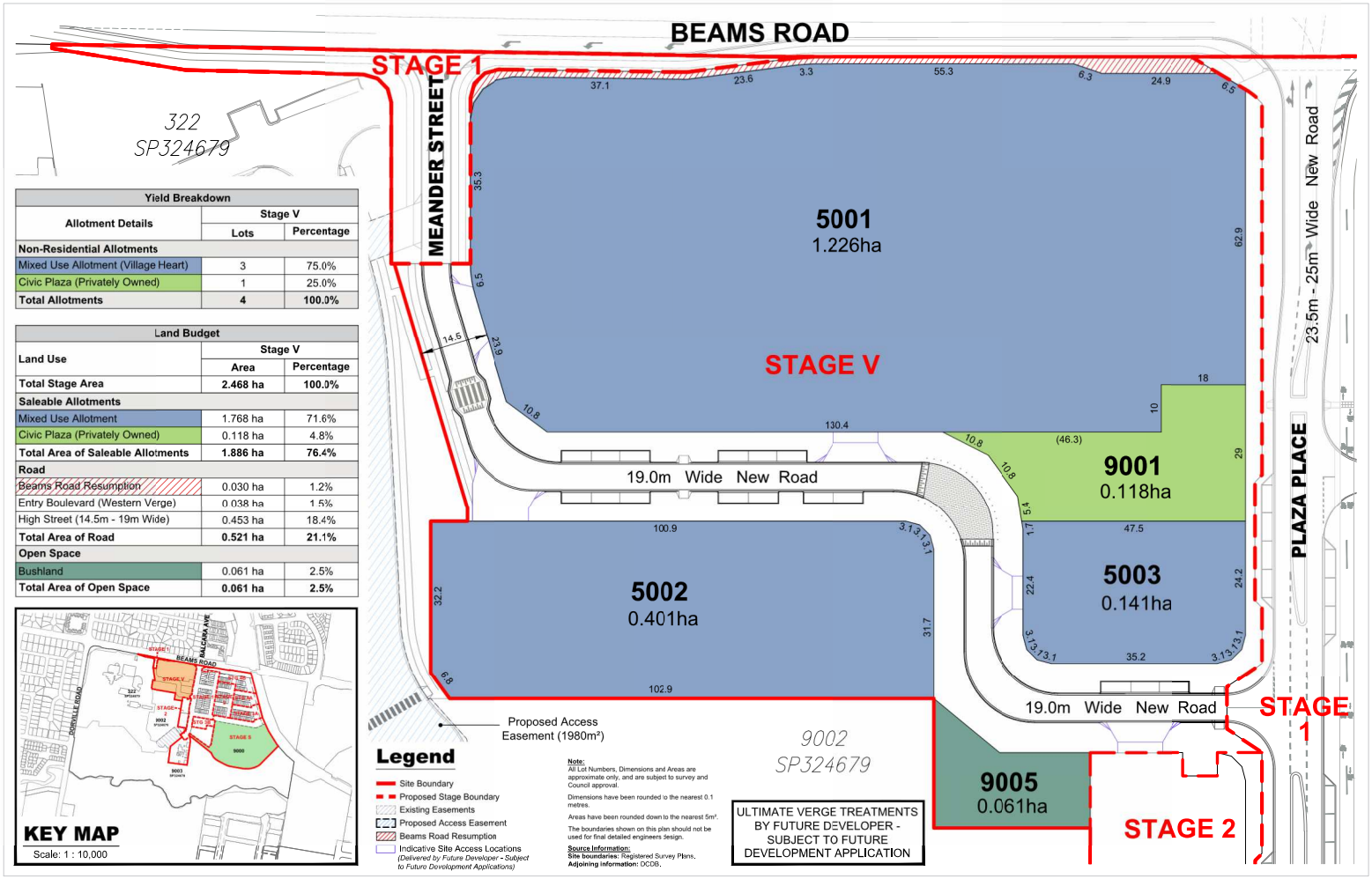
Land Budget		
Land Use	**Stage V**	
	Area	**Percentage**
Total Stage Area	**2.468 ha**	**100.0%**
Saleable Allotments		
Mixed Use Allotment	1.768 ha	71.6%
Civic Plaza (Privately Owned)	0.118 ha	4.8%
Total Area of Saleable Allotments	**1.886 ha**	**76.4%**
Road		
Beams Road Resumption	0.030 ha	1.2%
Entry Boulevard (Western Verge)	0.038 ha	1.5%
High Street (14.5m - 19m Wide)	0.453 ha	18.4%
Total Area of Road	**0.521 ha**	**21.1%**
Open Space		
Bushland	0.061 ha	2.5%
Total Area of Open Space	**0.061 ha**	**2.5%**

CARSELDINE URBAN VILLAGE

PLAN OF SUBDIVISON STAGE V - OVERALL

PLAN REF: 128180 – 123
Rev No: J
DATE: 21 AUGUST 2023
CLIENT: EDQ
DRAWN BY: MD
CHECKED BY: MD / DG

URBAN DESIGN
Level 4 HQ South
520 Wickham Street
PO Box 1559
Fortitude Valley QLD 4006
T +61 7 3539 9500
W rpsgroup.com



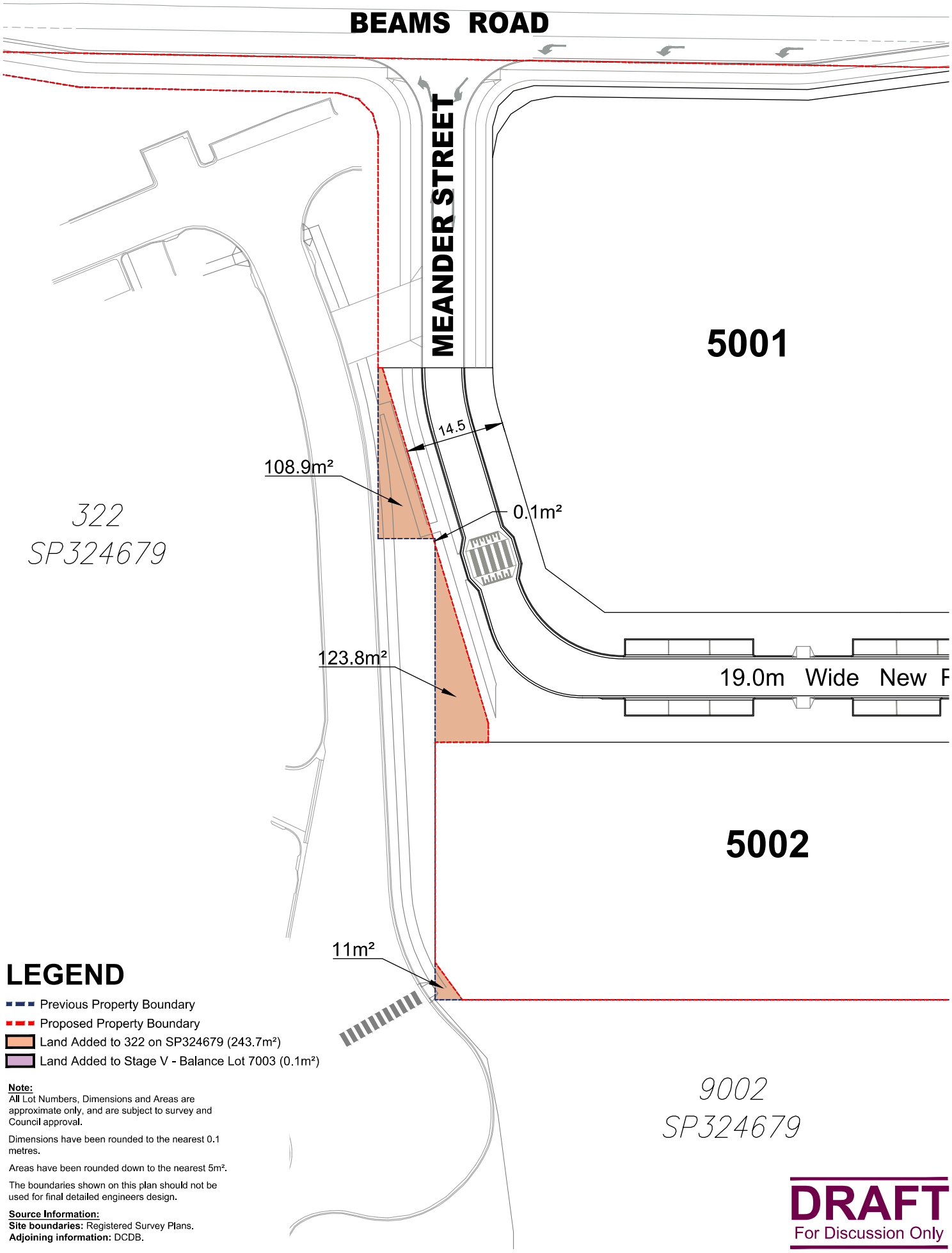
Yield Breakdown		
Allotment Details	Stage V	
	Lots	Percentage
Non-Residential Allotments		
Mixed Use Allotment (Village Heart)	3	75.0%
Civic Plaza (Privately Owned)	1	25.0%
Total Allotments	**4**	**100.0%**

Land Budget		
Land Use	Stage V	
	Area	Percentage
Total Stage Area	**2.468 ha**	**100.0%**
Saleable Allotments		
Mixed Use Allotment	1.768 ha	71.6%
Civic Plaza (Privately Owned)	0.118 ha	4.8%
Total Area of Saleable Allotments	**1.886 ha**	**76.4%**
Road		
Beams Road Resumption	0.030 ha	1.2%
Entry Boulevard (Western Verge)	0.038 ha	1.5%
High Street (14.5m - 19m Wide)	0.453 ha	18.4%
Total Area of Road	**0.521 ha**	**21.1%**
Open Space		
Bushland	0.061 ha	2.5%
Total Area of Open Space	**0.061 ha**	**2.5%**

PLAN REF: 128180 – 124
Rev No: J
DATE: 21 AUGUST 2023
CLIENT: EDQ
DRAWN BY: MD
CHECKED BY: MD / DG
1 : 500 @ A2

CARSELDINE URBAN VILLAGE
PLAN OF SUBDIVISION
STAGE V - VILLAGE HEART SUBDIVISION

URBAN DESIGN
Level 4 HQ South
520 Wickham Street
PO Box 1559
Fortitude Valley QLD 4006
T +61 7 3539 9500
W rpsgroup.com



LEGEND

- Previous Property Boundary
- Proposed Property Boundary
- Land Added to 322 on SP324679 (243.7m²)
- Land Added to Stage V - Balance Lot 7003 (0.1m²)

Note:
All Lot Numbers, Dimensions and Areas are approximate only, and are subject to survey and Council approval.

Dimensions have been rounded to the nearest 0.1 metres.

Areas have been rounded down to the nearest 5m².

The boundaries shown on this plan should not be used for final detailed engineers design.

Source Information:
Site boundaries: Registered Survey Plans.
Adjoining information: DCDB.

DRAFT
For Discussion Only

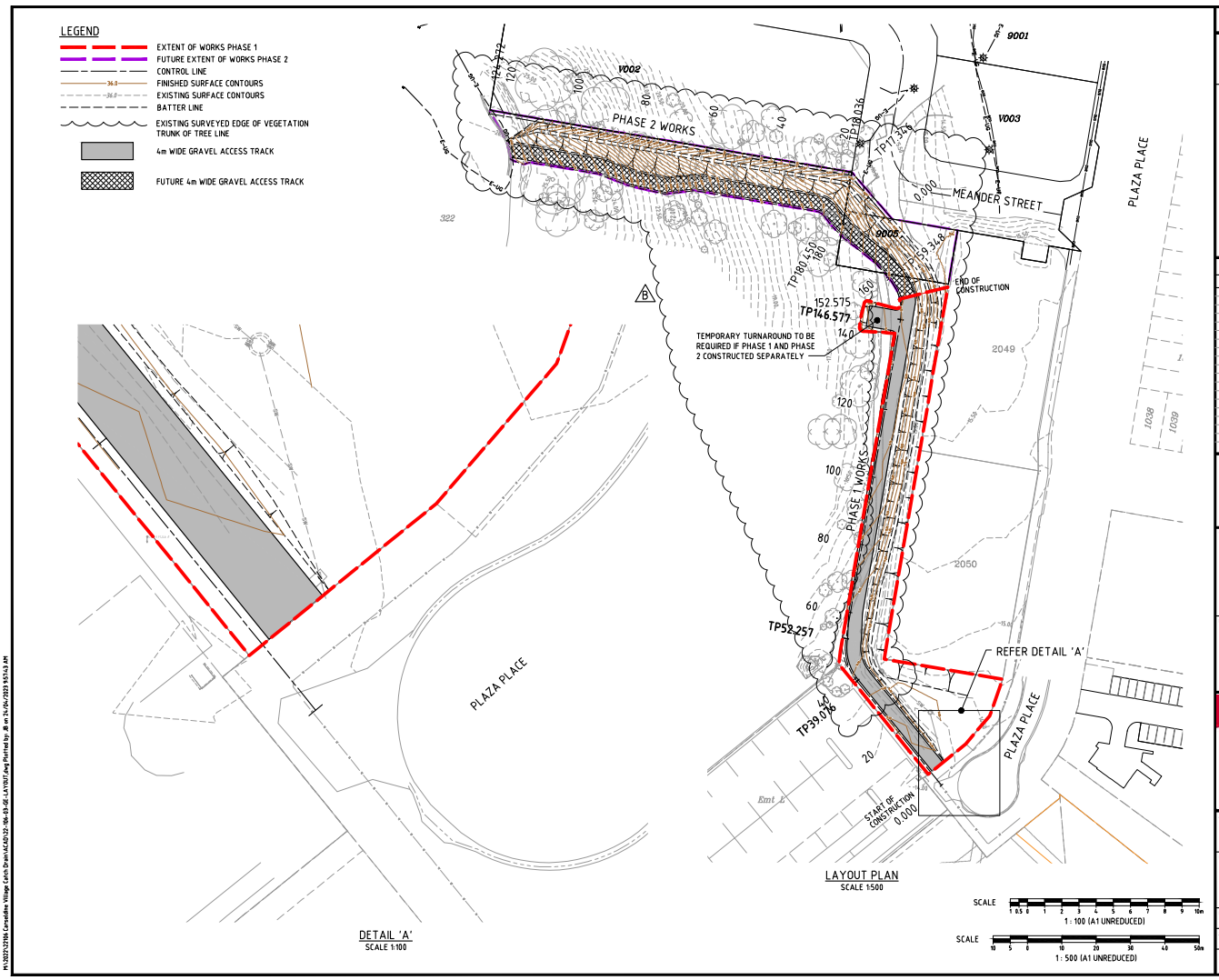
PLAN REF: 128180 – 150
Rev No: D
DATE: 21 AUGUST 2023
CLIENT: EDQ
DRAWN BY: MD
CHECKED BY: MD/DG

0 5 10 15 20 25 1 : 500 @ A3

CARSELDINE URBAN VILLAGE
STAGE V - VILLAGE HEART
BOUNDARY REALIGNMENT

URBAN DESIGN
Level 4 HQ South
520 Wickham Street
PO Box 1559
Fortitude Valley QLD 4006
T +61 7 3539 9500
W rpsgroup.com

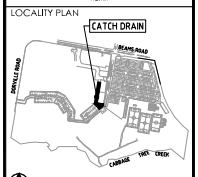
Appendix 3 Stormwater drainage swale and restricted vehicle access track



DO NOT SCALE THIS DRAWING
IF IN DOUBT - ASK!

NORTH

LOCALITY PLAN



REVISIONS

No	Description	Date	By
A	FOR APPROVAL	27.07.2022	AA
B	EXTENT OF WORKS AMENDED	14.04.2023	AA

Client
ECONOMIC DEVELOPMENT QUEENSLAND (EDQ)

Project
CARSELDINE VILLAGE CATCH DRAIN

kn group
ABN 35 112 53 611
L1, 62 Astor Tce
Spring Hill Q 4000
07 3017 1900
www.kngroup.com.au

Approved

Drawing Title
GENERAL LAYOUT PLAN

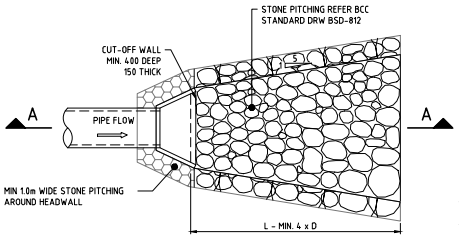
Drawn	Designed	Checked	Date
RW	JB	MS	JUL '22

Scale: AS SHOWN
Sheet: 03 of 12

Size	Drawing No	Revision
A1	22-106-03	B

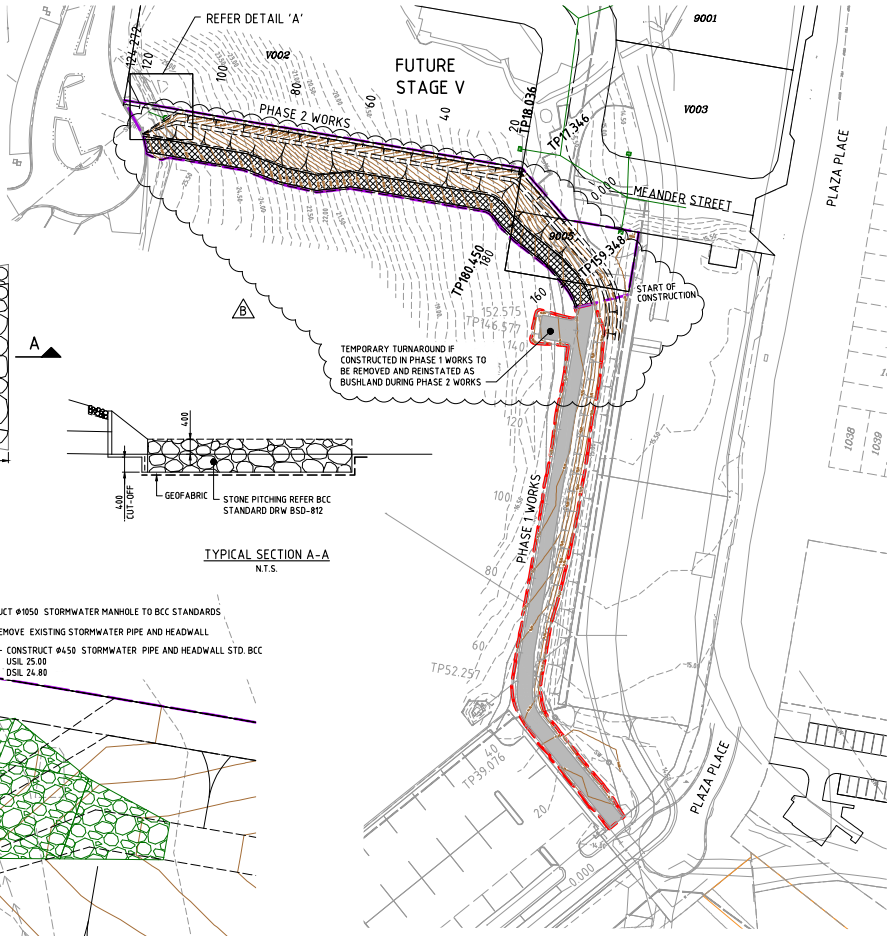
LEGEND

- EXISTING EXTENT OF WORKS PHASE 1
- EXTENT OF WORKS PHASE 2
- CONTROL LINE
- FINISHED SURFACE CONTOURS
- EXISTING SURFACE CONTOURS
- BATTER LINE
- EXISTING SURVEYED EDGE OF VEGETATION TRUNK OF TREE LINE
- EXISTING PHASE 1 4m WIDE GRAVEL ACCESS TRACK
- 4m WIDE GRAVEL ACCESS TRACK

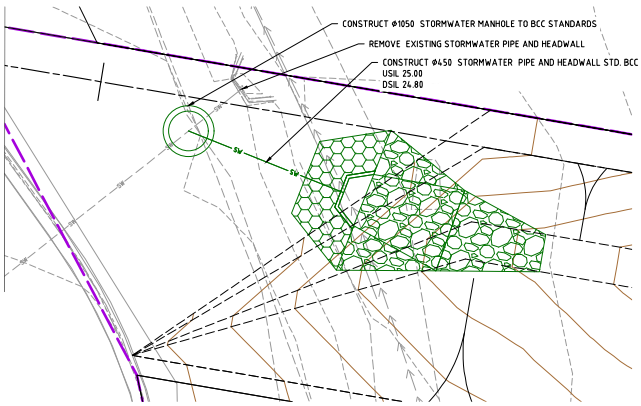


STORMWATER OUTLET STONE PITCHING
N.T.S.

TYPICAL SECTION A-A
N.T.S.



LAYOUT PLAN
SCALE 1:500



DETAIL 'A'
SCALE 1:50

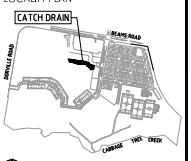
SCALE 1:50 (A1 UNREDUCED)

SCALE 1:500 (A1 UNREDUCED)

DO NOT SCALE THIS DRAWING
IF IN DOUBT - ASK!

NORTH

LOCALITY PLAN



REVISIONS

No	Description	Date	By
A	FOR APPROVAL	27.07.22	AA
B	EXTENT OF WORKS AMENDED	14.04.23	AA

Client
ECONOMIC DEVELOPMENT QUEENSLAND (EDQ)

Project
CARSELDINE VILLAGE CATCH DRAIN PHASE 2

kn group
ABN 35 112 53 611
L1, 62 Astor Tce
Spring Hill Q 4000
07 3017 1900
www.kngroup.com.au

Approved

Drawing Title
GENERAL LAYOUT PLAN

Drawn	Designed	Checked	Date
DES	JB	MS	JUL '22

Scale	Sheet
AS SHOWN	03 of 10

Size	Drawing No	Revision
A1	22-106-103	B

Appendix 4 Radiant heat exposure assessment

Bushfire attack from assessment reference point C

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

FPA AUSTRALIA | FLAMESOL

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

J17037 (S2)

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

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

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

Elevation of receiver - Douglas & Tan, 2005

Flame angle - Douglas & Tan, 2005

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

Bushfire attack from assessment reference point E

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

FPA AUSTRALIA | FLAMESOL

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

J17037 (S1)

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

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

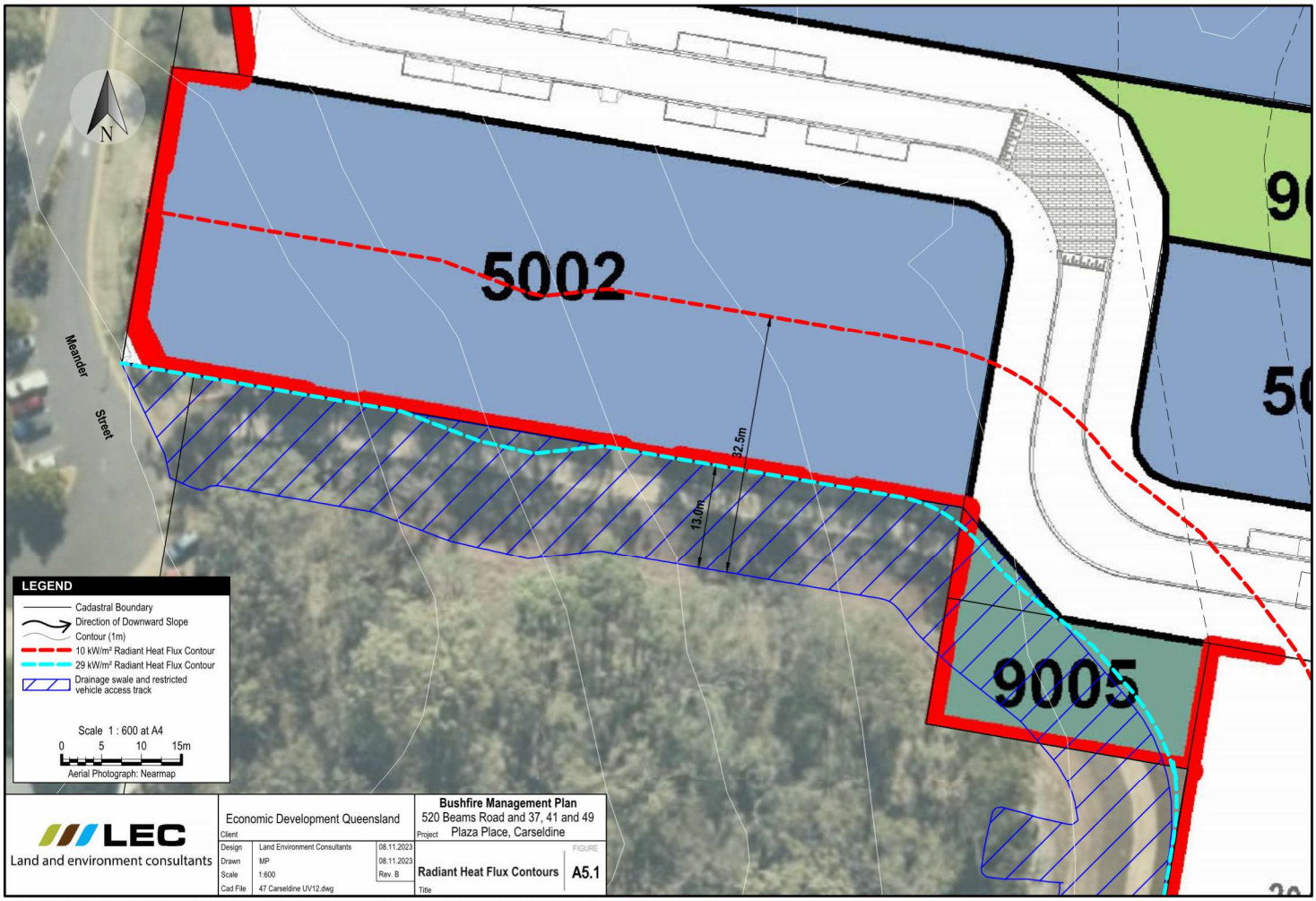
Flame length - NSW Rural Fire Service, 2001 & Noble et al., 1980

Elevation of receiver - Douglas & Tan, 2005

Flame angle - Douglas & Tan, 2005

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

Appendix 5 Radiant heat flux contours over lots 5002, 2049 and 2050



LEC
Land and environment consultants

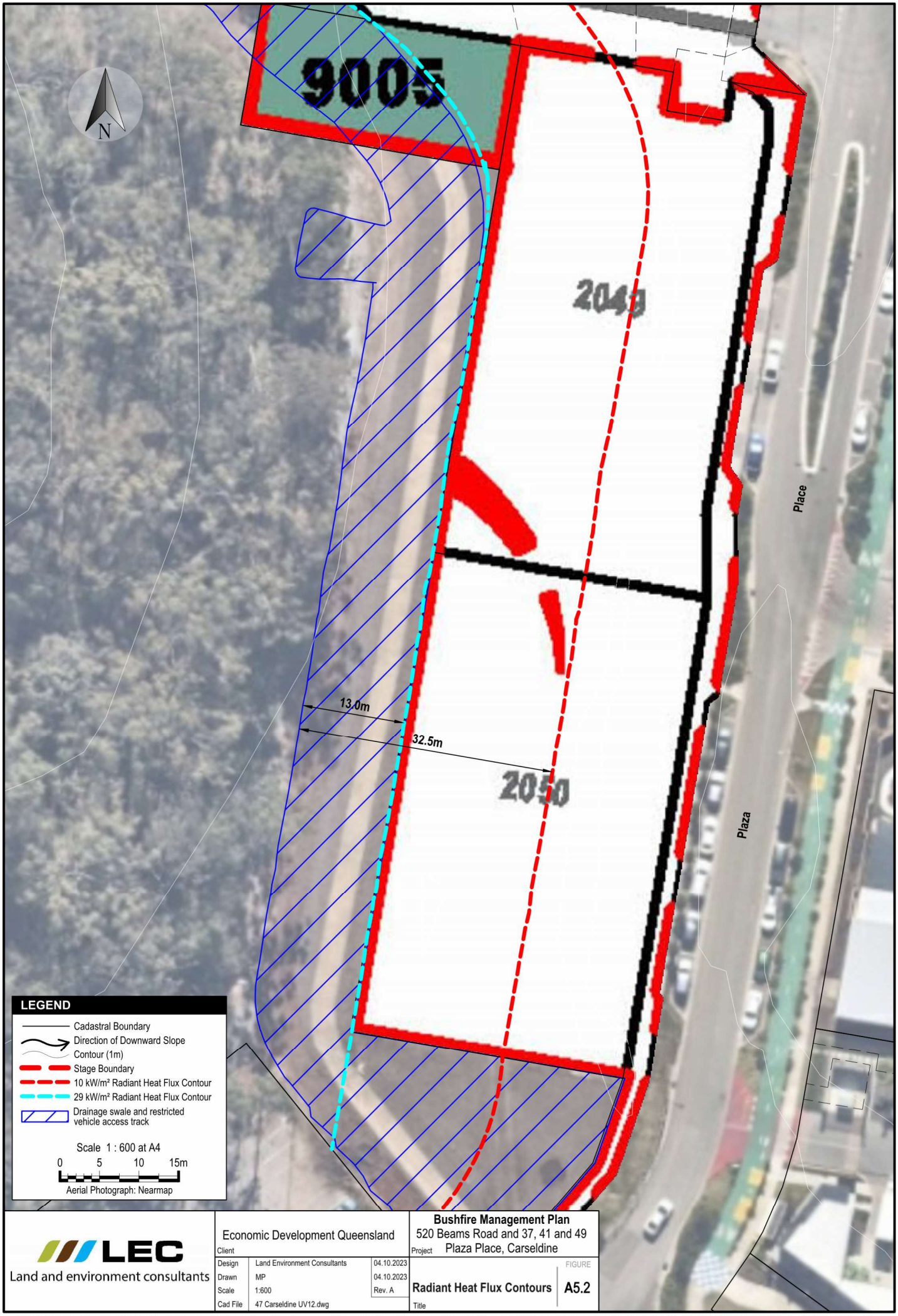
Client: Economic Development Queensland

Project: **Bushfire Management Plan**
520 Beams Road and 37, 41 and 49 Plaza Place, Carseldine

Design	Land Environment Consultants	08.11.2023
Drawn	MP	08.11.2023
Scale	1:600	Rev. B
Cad File	47 Carseldine UV12.dwg	

Title: **Radiant Heat Flux Contours**

FIGURE **A5.1**



LEC
Land and environment consultants

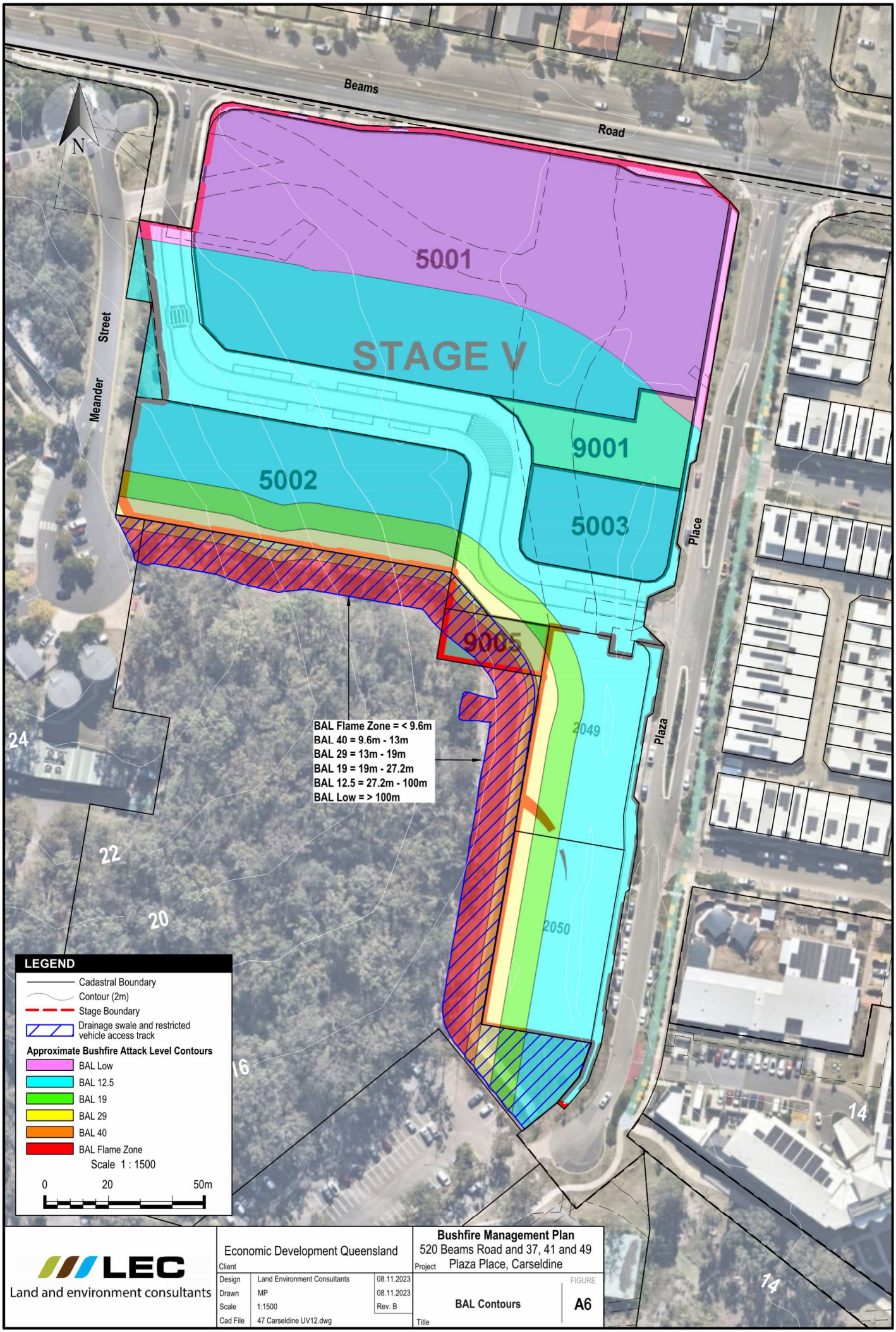
Client	Economic Development Queensland	
Design	Land Environment Consultants	04.10.2023
Drawn	MP	04.10.2023
Scale	1:600	Rev. A
Cad File	47 Carseldine UV12.dwg	

Bushfire Management Plan
520 Beams Road and 37, 41 and 49 Plaza Place, Carseldine
Project

Radiant Heat Flux Contours
Title

FIGURE A5.2

Appendix 6 Bushfire attack level contour plan



LEC Land and environment consultants

Client	Economic Development Queensland	
Design	Land Environment Consultants	08.11.2023
Drawn	MP	08.11.2023
Scale	1:1500	Rev. B
Cad File	47 Carseldine UV12.dwg	

Bushfire Management Plan
520 Beams Road and 37, 41 and 49 Plaza Place, Carseldine

Project

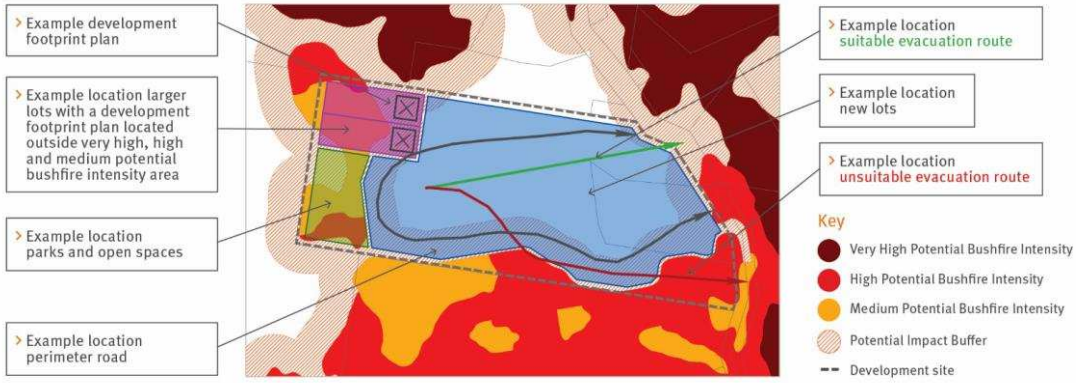
Title: **BAL Contours**

FIGURE **A6**

Appendix 7 Bushfire overlay code assessment

Performance outcomes	Acceptable outcomes	Compliance assessment
Section A **Reconfiguring a lot (RaL) – where creating lots of more than 2,000 square metres**		
PO1 The subdivision layout: (a) enables future buildings to be located away from slopes and land forms that expose people or property to an intolerable risk to life or property; and (b) facilitates emergency access and operational space for firefighters in a reduced fuel area between future buildings and structures and hazardous vegetation, that reduce risk to an acceptable or tolerable level. Note – An applicant may seek to undertake a site-level verification of the location and nature of hazardous vegetation and resulting potential bushfire intensity levels, for example where changes in foliage have occurred (e.g. as a consequence of adjoining permanent urban development) or where an applicant seeks to verify the regional ecosystem map inputs. This verification should form part of a bushfire hazard assessment in accordance with the methodology in the QFES *Bushfire resilient communities* document. The outcomes of this assessment can demonstrate how an alternate solution to the acceptable outcome can deliver an acceptable or tolerable level of risk.	**AO1.1** A development footprint plan is identified for each lot that avoids ridgelines, saddles and crests where slopes exceed 15 per cent.	**Complies with AO1.1** The site has slope < 15 %.
	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.	**Complies with AO1.2** Figure 5.1 of the bushfire management plan (**BMP**) demonstrates future development within lots 5001, 5002, 5003, 9001, 2049 and 2050 is not constrained by the setback required to achieve a radiant heat flux level ≤ 29 kilowatts/ square metre (**kW/m²**) at buildings or building envelopes.
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.	**Complies with AO2** Future development within the site will be located within 60 m of street frontage and will have gently sloping driveways.
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	**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,	**Complies with AO3.1** Figure 5.1 of the BMP demonstrates future development within lots 5001, 5002, 5003, 9001, 2049 and 2050 is not constrained by the setback

Performance outcomes	Acceptable outcomes	Compliance assessment
to an intolerable risk to life or property; and (b) facilitates emergency access and operational space for firefighters in a reduced fuel area between future buildings and structures and hazardous vegetation, that reduce risk to an acceptable or tolerable level. Note – An applicant may seek to undertake a site-level verification of the location and nature of hazardous vegetation and resulting potential bushfire intensity levels, for example where changes in foliage have occurred (e.g. as a consequence of adjoining permanent urban development) or where an applicant seeks to verify the regional ecosystem map inputs. This verification should form part of a bushfire hazard assessment, in accordance with the methodology in the QFES *Bushfire resilient communities* document. The outcomes of this assessment can demonstrate how an alternate solution to the acceptable outcome can deliver an acceptable or tolerable level of risk.	high or very high potential bushfire intensity area by: (a) a distance that is no closer than the distances specified in Table 5 at all lot boundaries; or : (b) a distance that achieves a radiant heat flux level of 29 kW/m^2 or less: (i) at the building envelope, if identified at RaL stage; or (ii) where a building envelope is not identified, at all lot boundaries. Note – This separation area is often termed an asset protection zone. Note – The radiant heat flux levels can be established by undertaking a bushfire hazard assessment in accordance with the methodology in the QFES *Bushfire resilient communities* document. Note – For staged developments, temporary separation areas may be absorbed as part of subsequent stages. Note - Existing cleared areas external to the site may only be used in calculating necessary separation where tenure ensures that the land will remain cleared of hazardous vegetation (for example the land is a road, watercourse or highly managed park in public ownership).	required to achieve a radiant heat flux level ≤ 29 kW/m^2 at buildings or building envelopes.
	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).	**Complies with AO3.2** The site has slope < 15 %.
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	**Complies with PO4** The Plaza Place road reserve and the stormwater drainage swale and restricted vehicle access track are used to separate future development within the site from hazardous vegetation.

Performance outcomes	Acceptable outcomes	Compliance assessment
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.	**Complies with AO5.1** Access and egress to future development within the site will be via Beams Road, Plaza Place and the new road reserve. The new road will provide connections to Beams Road and Plaza Place and will be designed and constructed to accommodate an urban fire truck.
	AO5.2 The subdivision layout ensures evacuation routes: (a) direct occupants away from rather than towards or through areas with a greater potential bushfire intensity; and (b) minimise the length of route through bushfire prone areas. Refer Figure 5.	**Complies with AO5.2** Future development within the site is located in a suburban context and has access to existing public roads which provide numerous access and egress routes for emergency services and future occupants.
 *Figure 5 – Subdivision layout and evacuation routes*		
PO6 The subdivision layout provides adequate buffers between hazardous vegetation and development. Note – An applicant may seek to undertake a site-level verification of the location and nature of hazardous vegetation and resulting potential bushfire intensity levels, for example where changes in foliage have occurred (e.g. as a consequence of adjoining permanent urban development) or where an applicant seeks to verify the regional ecosystem map inputs. This verification should form part of a bushfire hazard assessment, in accordance with the methodology in the QFES *Bushfire resilient*	**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.	**Complies with AO6.1** The Plaza Place road reserve and the stormwater drainage swale and restricted vehicle access track are used to separate future development within the site from hazardous vegetation.
	AO6.2 The asset protection zone is comprised of: (a) parks and open spaces; and/or (b) lots greater than 2000 square metres; and/or (c) public roads (termed perimeter roads). Note – Parks and open space may be	**Complies with AO6.2** The stormwater drainage swale and restricted vehicle access track will be transferred to Brisbane City Council for ownership and maintenance.

Performance outcomes	Acceptable outcomes	Compliance assessment
communities document. The outcomes of this assessment can demonstrate how an alternate solution to the acceptable outcome can deliver an acceptable or tolerable level of risk.	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.	**Complies with AO6.3** Figure 5.1 of the BMP demonstrates future development within lots 5001, 5002, 5003, 9001, 2049 and 2050 is not constrained by the setback required to achieve a radiant heat flux level ≤ 29 kW/m^2 at buildings or building envelopes.
PO7 Parks or open space provided as part of the asset protection zone do not create additional bushfire prone areas. Note –The undertaking of a bushfire hazard assessment, in accordance with the methodology in the QFES *Bushfire resilient communities* document may assist in demonstrating compliance with this performance outcome.	**AO7** Where the asset protection zone includes parks or open spaces, they: (a) comprise only low threat vegetation, including grassland managed in a minimal fuel condition, maintained lawns, golf courses, maintained public reserves and parklands, cultivated gardens and nature strips; or (b) are designed to ensure a potential available fuel load is maintained at less than eight tonnes/hectare in aggregate and with a fuel structure that remains discontinuous. Note – Minimal fuel condition means there is insufficient fuel available to significantly increase the severity of the bushfire attack, for example short-cropped grass to a nominal height of 10 centimetres.	**Not applicable** The Plaza Place road reserve and the stormwater drainage swale and restricted vehicle access track are used to separate future development within the site from hazardous vegetation.
PO8 Perimeter roads are accessible for fire-fighting vehicles, to facilitate emergency access and operational space for fire- fighting, maintenance works and hazard reduction activities.	**AO8.1** Where the asset protection zone includes a perimeter road it: (a) has a two-lane sealed carriageway clear of hazardous vegetation; and (b) is connected to the wider public road network at both ends and at intervals of no more than 200 metres; and (c) does not include design	**Complies with AO8.1** The restricted vehicle access track has been designed in the accordance with minimum requirements for emergency service vehicles including: • a minimum formed width of 4 m; • minimum vertical clearance of 4 m to any overhanging obstructions including tree branches and 5 m to overhead powerlines;

Performance outcomes	Acceptable outcomes	Compliance assessment
	elements that may impede access for fire-fighting and maintenance for fire- fighting purposes (for example traffic calming involving chicanes).	• formed vehicle surface is located within a vegetation clearing with a minimum width of 6 m; • a maximum gradient of 12.5 % with adequate drainage to prevent soil erosion and minimise ongoing track maintenance; • minimum 6 tonne rated surface; and • access at each end.
	AO8.2 Where the subdivision contains a reticulated water supply, the road network and fire hydrants are designed and installed in accordance with: (a) *Fire Hydrant and Vehicle Access Guidelines for residential, commercial and industrial lots*, Queensland Fire and Emergency Services, 2015, unless otherwise specified by the relevant water entity; and (b) the *Road Planning and Design Manual 2nd edition*, Department of Transport and Main Roads, 2013.	**Complies with AO8.2** A reticulated hydrant system will be installed in the new road reserve. It will be designed and constructed in accordance with specifications in *Fire Hydrant and Vehicle Access Guidelines for Residential, Commercial and Industrial Lots 2019* which defers to the local water retailer's specifications and the *Australian Standard* (**AS 2419.1-2021**) *Fire hydrant installation, system design, installation and commissioning*.
Section D		
Reconfiguring a lot (RaL) – where creating additional lots for the purpose of residential development and a reticulated water supply is not provided.		
PO9 The subdivision layout provides for perimeter roads or fire trail and working areas that are accessible by the type of fire-fighting vehicles servicing the area, to facilitate emergency access and operational space for fire-fighting, maintenance works and hazard reduction activities.	**AO9.1** The subdivision layout includes: (a) a fire trail and working area designed and constructed in accordance with the design parameters in Table 6 that separates the residential lot or development footprint plan from adjacent mapped medium, high or very high potential bushfire intensity areas; or (b) a perimeter road designed and constructed in accordance with AO8.1. Refer Figure 6.	**Not applicable**

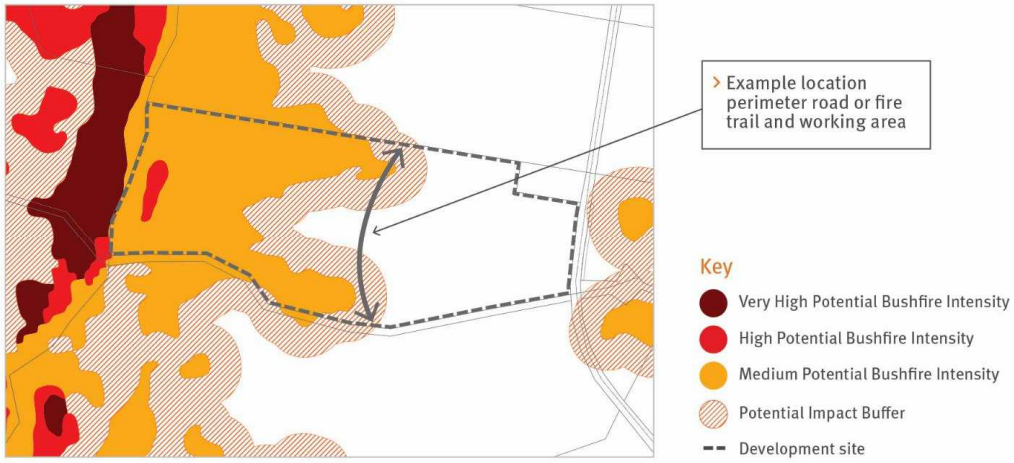
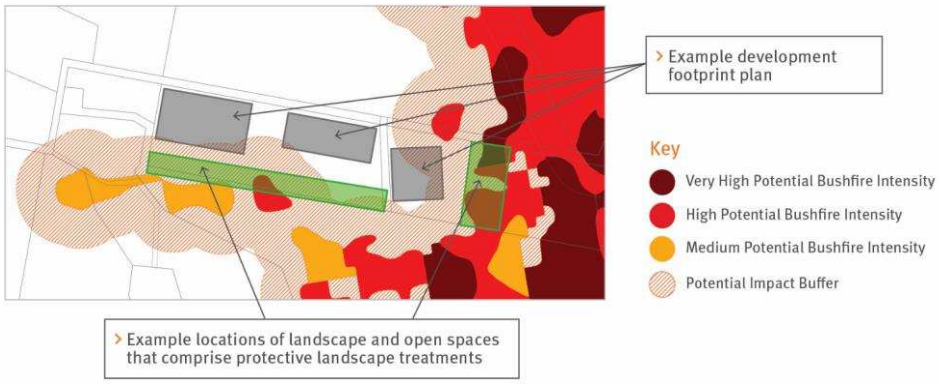
<table>
<tr><th>Performance outcomes</th><th>Acceptable outcomes</th><th>Compliance assessment</th></tr>
<tr><td colspan="3"> 

Figure 6 – Siting of fire trail and working area</td></tr>
<tr><td colspan="3">Section E</td></tr>
<tr><td colspan="3">Material change of use</td></tr>
<tr><td rowspan="2">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 Bushfire resilient communities document. The outcomes of this assessment can demonstrate how an alternate solution to the acceptable outcome can deliver an acceptable or tolerable level of risk.</td><td>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.</td><td>Complies with AO10.1
The Plaza Place road reserve and the stormwater drainage swale and restricted vehicle access track are used to separate future development within the site from hazardous vegetation.</td></tr>
<tr><td>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.</td><td>Complies with AO10.2
Rehabilitation of the stormwater drainage swale and restricted vehicle access track will be designed to provide a low fuel hazard area with discontinuous bushfire fuels that will prevent isolated fires from developing to a size that could threaten the rear boundaries of lots 5002, 2049 and 2050.</td></tr>
</table>

Performance outcomes	Acceptable outcomes	Compliance assessment
 *Figure 7 – Siting of protective landscape treatments*		
PO11 The development establishes evacuation areas, to achieve an acceptable or tolerable risk to people.	**AO11** If in an isolated location, development establishes direct access to a safe assembly/evacuation area. Note – Guidance on identifying safe evacuation areas is contained in the QFES *Bushfire resilient communities* document.	**Not applicable**
PO12 If on a lot of over 2,000 m^2, where involving a new premises or an existing premises with an increase in development footprint, development: (a) locates occupied areas as close as possible to property entrances to facilitate safe evacuation during a bushfire event; and (b) ensures vehicular access is located and designed to allow safe evacuation of the site by occupants and maintain access by emergency services under critical event conditions	**AO12** No acceptable outcome is prescribed.	**Complies with PO12** Figure 5.1 of the BMP demonstrates future development within lots 5001, 5002, 5003, 9001, 2049 and 2050 is not constrained by the setback required to achieve a radiant heat flux level ≤ 29 kW/m^2 at buildings or building envelopes.
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	**AO13** No acceptable outcome is prescribed	**Complies with PO13** Future development within the site will be connected to mains water.

Performance outcomes	Acceptable outcomes	Compliance assessment
water supply, may form a condition of a development approval. For further information on preferred solutions refer to the QFES *Bushfire resilient communities* 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 *Bushfire resilient communities* document may assist in demonstrating compliance with this performance outcome	**AO14.1** No acceptable outcome is prescribed.	**Complies with PO14** Section 6.1 of the BMP requires future development within the site involving vulnerable uses to be setback from hazardous vegetation by a distance which achieves a radiant heat flux level ≤ 10 kW/m^2 at the buildings or building envelopes.
PO15 Community infrastructure providing essential services listed in Table 7 are not established within a bushfire prone area unless: (a) there is an overriding need in the public interest for the new or expanded service the development provides (for example, there are no other suitable alternative locations that can deliver the required level of service or meet emergency service response times during and immediately after a bushfire event); and (b) the infrastructure can function effectively during and immediately after a bushfire event. Note – The preparation of a bushfire management plan in accordance with the methodology in the QFES *Bushfire resilient communities* document may assist in demonstrating compliance with this performance outcome.	**AO15** No acceptable outcome is prescribed.	**Complies with PO15** Section 6.2 of the BMP requires future development within the site involving community infrastructure providing essential services to be setback from hazardous vegetation by a distance which achieves a radiant heat flux level ≤ 10 kW/m^2 at the buildings or building envelopes.

Performance outcomes	Acceptable outcomes	Compliance assessment
PO16 Development avoids or mitigates the risks to public safety and the environment from the manufacture or storage of materials listed in Table 7 that are hazardous in the context of bushfire to an acceptable or tolerable level. Note – The preparation of a bushfire management plan in accordance with the methodology in the QFES *Bushfire resilient communities* document may assist in demonstrating compliance with this acceptable outcome. Editor's note – In addition to the requirements of this code the *Work Health and Safety Act 2011* and associated Regulation and Guidelines, the *Environmental Protection Act 1994* and the relevant building assessment provisions under the *Building Act 1975* contain requirements for the manufacture and storage of hazardous substances. Information is provided by Business Queensland on the requirements for storing and transporting hazardous chemicals, available at: www.business.qld.gov.au/running-business/protecting-business/risk-management/hazardous-chemicals/storing-transporting.	**AO16** No acceptable outcome is prescribed.	**Complies with PO16** Section 6.3 of the BMP requires future development within the site involving storage of hazardous materials in the context of bushfire hazard to be setback from hazardous vegetation by a distance which achieves a radiant heat flux level ≤ 10 kW/m^2 at the storage area. In addition, it will be operated in accordance with requirements of the *Queensland Work Health and Safety Act* 2011 and the associated regulation and guidelines, the Queensland *Environmental Protection Act 1994* and the *Australian Standard* (AS 1940-2017) *The storage and handling of flammable and combustible liquids*.
Section F		
Where involving an asset protection zone		
PO17 Asset protection zones are designed and managed to ensure they do not increase the potential for bushfire hazard. Note – The preparation of a landscape management plan undertaken in accordance with the methodology in the QFES *Bushfire resilient communities* document may assist in demonstrating compliance with this performance outcome.	**AO17.1** Landscaping treatments within any asset protection zone comprise only low threat vegetation, including grassland managed in a minimal fuel condition, maintained lawns, golf courses, maintained public reserves and parklands, vineyards, orchards, cultivated gardens, commercial nurseries, nature strips and windbreaks. Note – Minimal fuel condition means there is insufficient fuel available to significantly increase the severity of the bushfire attack, for example short-cropped grass to a nominal height of 10 centimetres. OR	**Complies with AO17.1** Rehabilitation of the stormwater drainage swale and restricted vehicle access track will be designed to provide a low fuel hazard area with discontinuous bushfire fuels that will prevent isolated fires from developing to a size that could threaten the rear boundaries of lots 5002, 2049 and 2050.
	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;	**Complies with AO17.2** The stormwater drainage swale and restricted vehicle access track will be transferred to Brisbane City Council for ownership and maintenance.

Performance outcomes	Acceptable outcomes	Compliance assessment
	and (b) fuel structure which is discontinuous. Note – The preparation of a landscape management plan undertaken in accordance with the methodology in the QFES *Bushfire resilient communities* document may assist in demonstrating compliance with this acceptable outcome.	At least 70 % of the stormwater drainage swale will be rehabilitated with turf and maintained as lawn at a nominal height of 10 centimetres.
Section G		
Where planning provisions or conditions of approval require revegetation or rehabilitation		
PO18 Revegetation or rehabilitation areas are designed and managed to ensure they do not result in an unacceptable level of risk or an increase in bushfire intensity level. Note – The undertaking of a bushfire hazard assessment in accordance with the methodology in the QFES *Bushfire resilient communities* document may assist in demonstrating compliance with this performance outcome.	**AO18.1** Required revegetation or rehabilitation: (a) is located outside of any asset protection zone; or (b) maintains a potential available fuel load which is less than eight tonnes/hectare in aggregate and fuel structure which is discontinuous. Note – The preparation of a landscape management plan undertaken in accordance with the methodology in the QFES *Bushfire resilient communities* document may assist in demonstrating compliance with acceptable outcome (b).	**Not applicable**
	AO18.2 Revegetation or rehabilitation of areas located within mapped medium, high or very high potential bushfire intensity areas, revegetate and rehabilitate in a manner that maintains or reduces the existing fuel load. OR Revegetation or rehabilitation of areas located within the mapped potential impact buffer area, revegetate and rehabilitate in a manner that maintains or reduces the existing fuel load. Note – The preparation of a vegetation management plan undertaken in accordance with the methodology in the QFES *Bushfire resilient communities* document may assist in demonstrating compliance with this acceptable outcome.	**Not applicable**

Table 6 – Fire trail and working area design parameters

Parameter	Provisions
Width	Contains a width of at least 20 metres including: 1. A trafficable area (cleared and formed); a. with a minimum width of 4 metres than can accommodate a rural firefighting vehicle b. with no less than 4.8 metres vertical clearance from canopy vegetation

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

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

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