
Bushfire management plan

Proposed development of Estate lot 14 of the Flagstone Logistics Estate | 4499-4651 Mount Lindesay
Highway | North Maclean | Queensland
Prepared for CH Hydrangea Pty Ltd | 2 June 2025

PLANS AND DOCUMENTS
referred to in the PDA
DEVELOPMENT APPROVAL

Approval no: DEV-2026-FLA-5515

Date: 13 August 2026



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Bushfire management plan

Final V1

Report 25038 | CH Hydrangea Pty Ltd | 2 June 2025

Approved by Robert Janssen

Position Managing principal

Signature



Date 2 June 2025

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Document control

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Draft	20 May 2025	R. Janssen	LEC
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Disclaimer

Notwithstanding the precautions adopted in this report, it should always be remembered that bushfires burn under a range of conditions. An element of risk, no matter how small always remains, and although AS 3959-2018 is designed to improve the performance of such buildings, there can be no guarantee, because of the variable nature of bushfires, that any building will withstand bushfire attack on every occasion.

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

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

1 Introduction

Land and Environment Consultants Pty Ltd (LEC) was engaged to prepare a bushfire management plan (BMP) for the priority development area (PDA) development permit application (material change of use – warehouse (distribution centre) and low impact industry) (**proposed development**) at part of 4499-4651 Mount Lindesay Highway, North Maclean, properly described as part of lot 39/SP338791(**the site**).

The proposed development will function as distribution centre for the tenant, for the receipt, warehousing, storing and distribution of products, and will include a facility that enables material to be printed for distribution and limited storage of dangerous goods. The proposed development will operate 24 hours a day, 7 days a week and will be located within Stage 2 of the overarching PDA development permit approval for the Flagstone Logistics Estate (Economic Development Queensland (EDQ) reference DEV2018/961/18).

The site is identified as a bushfire hazard area by the *Bushfire prone area map* (**Bushfire prone area map**) in the State Planning Policy interactive mapping system (**SPP IMS**) and the approved bushfire management plan and addendum to the bushfire management plan that was submitted for the overarching PDA development approval for the Flagstone Logistics Estate. Therefore, the PDA development permit application for the proposed development is subject to compliance with the bushfire hazard outcomes of the *Greater Flagstone Priority Development Area – Development Scheme* which calls up the superseded *State Planning Policy 1/03 Guideline – Mitigating the Adverse Impacts of Flood, Bushfire and Landslide* (DLGP, DES 2003) (**SPP 1/03 guideline**) for information and assessment criteria for bushfire. It is also subject to compliance with the bushfire conditions attached to the PDA development approval for the Flagstone Logistics Estate.

The SPP 1/03 guideline was repealed in 2013 and the current SPP 2017 is now in effect. Therefore, it is considered relevant that this BMP considers outcomes sought by the current SPP 2017 by way of compliance with the example bushfire overlay code (**Bushfire overlay code**) in the *Natural Hazards, Risk and Resilience – Bushfire, State Planning Policy State Interest guidance material* (DSDMIP 2019) (**SPP guidance material – bushfire**) which reflects the current assessment benchmarks for development within a bushfire prone area.

This BMP has been prepared in general accordance with *Bushfire Resilient Communities Technical Reference Guide for the State Planning Policy State Interest 'Natural Hazards, Risk and Resilience – Bushfire* (QFES 2019a) (**BRC guide**) which was prepared by the former Queensland Fire and Emergency Services, now Queensland Fire Department, to provide technical guidance for the implementation of the SPP guidance material – bushfire. It documents the bushfire hazard assessment and demonstrates how the proposed development will comply with the Bushfire overlay code. It includes:

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

1.1 Bushfire conditions for the Flagstone Logistics Estate

The overarching PDA development approval for the Flagstone Logistics Estate (EDQ reference DEV2018/961/18) included an endorsed bushfire management plan and addendum to the bushfire management plan, which outlined requirements for future development within the Flagstone Logistics Estate.

Since the endorsed bushfire management plan and addendum to the bushfire management plan were prepared, hazardous vegetation has been cleared from within the Flagstone Logistics Estate and from part of the property adjoining the southern boundary of the site. As a result, some requirements of the endorsed bushfire management plan and addendum to the bushfire management plan are no longer relevant to the site.

This BMP provides a contemporary assessment of bushfire hazards affecting the site, ie based on the recent clearing of hazardous vegetation adjacent to the site, and identifies mitigation measures required for compliance with the Bushfire overlay code and BRC guide which were released after the bushfire management plan and addendum to the bushfire management plan were endorsed for the Flagstone Logistics Estate.

1.2 Method

To meet requirements of the BRC guide, the following tasks were undertaken:

- review of the Bushfire prone area map in the SPP IMS, fire history data in Queensland Globe (DR 2025) and the Queensland regional ecosystem (**RE**) data, vegetation hazard class (**VHC**) data and severe fire weather data referenced in the *Bushfire Resilient Communities Mapviewer user guide* (QFD 2025) (**BRC MV guide**);
- inspection of land adjacent to the proposed development for vegetation characteristics, current land management practices, slope and evidence of previous fires;
- bushfire hazard assessment in general accordance with the method in the BRC guide;
- 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 the proposed development against the Bushfire overlay code.

Aerial imagery of the site and measuring tools were accessed online from Google Earth and Queensland Globe to assist with validating observations and measurements made during the site inspection.

1.3 Suitably qualified person

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

Robert is the managing principal at LEC and has over 25 years of experience in bushfire planning and operations. He has prepared bushfire management plans for residential, commercial and industrial property developments, utilities, government facilities and conservation estates.

Robert's formal qualifications as an environmental scientist and consulting experience are coupled with 10 years of experience as a nationally accredited fire-fighter with the national parks and wildlife service in New South Wales and Queensland.

2 Description of the site and proposed development

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

2.1 Site description

The location of the site is shown in Figure 3.1 and is within stage 2 of the Flagstone logistics estate which is under construction.

The land adjoining the site has been cleared for the Flagstone logistics estate and will be further developed in the future for industrial uses. The exception is the land adjoining the southern boundary of the site which is under development to establish a drainage/open space lot.

The landscaping concept plan for the drainage reserve is provided in Appendix 1 and indicates the basin batters and basin floor will be planted out with a suite of species which dominate the adjoining natural landscape, ie RE 12.3.5 *Melaleuca quinquenervia* open forest on coastal alluvium (**RE 12.3.5**).

The natural landscape to the south of the drainage reserve will be retained within an environmental conservation area that was established under the conditions of approval for PDA development permit application number DEV2022/1315.

Upon completion of the Stage 2 Flagstone Logistics Estate civil works, the site will have frontage to a road and access to services including stormwater, sewer, electricity and communications.

2.2 Proposed development

The site plan for the proposed development is provided in Appendix 2 and shows the proposed layout of the warehouse building, ancillary infrastructure, landscape area, driveways, parking, and truck turning areas.

Of note, the proposed warehouse building and ancillary infrastructure are setback from the rear boundary of the site, which adjoins the landscaped drainage/open space lot, by a hardstand area used for truck manoeuvring and parking.

Dangerous goods are expected to be stored in packets, ie individual cans, as opposed to bulk containers.

Access and egress for the proposed development will be via driveway connections to a new road within the Flagstone logistics estate, ie Connect Way.

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

2.3 Bushfire prone area map

The Bushfire prone area map for the site is provided in Appendix 3. Verification of the bushfire hazard areas shown in the Bushfire prone area map is provided via the bushfire hazard assessment in Chapter 3 which considers clearing which has been completed within the Flagstone Logistics Estate and within part of the adjoining property to the south of the site.

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/metre (**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 data referenced in the BRC MV guide 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 5.5.

3.2 Fire history

Fire history data indicates numerous fires have occurred within 1 kilometre (**km**) of the site during the past 20 years. The data does not indicate the origin of the fires, ie whether they were wildfires or planned burns.

3.3 Site inspection

LEC inspected the site on 1 May 2025. Observations were recorded about current land use and management, vegetation characteristics, the slope of land and evidence of previous fires.

Bushfire assessment units (**BAUs**) have been used to describe the characteristics of vegetation within 100 m of the site and are shown in Figure 3.1. They consider the post development landform of the Flagstone logistic estate and development to the south of the site, ie PDA development permit application number DEV2022/1315, which are under construction.

Table 3.1 provides a summary of the desktop review, observations from the site inspection and notes about the bushfire hazard assessment of BAUs. Features of BAUs are shown in Photographs 3.1-3.2.

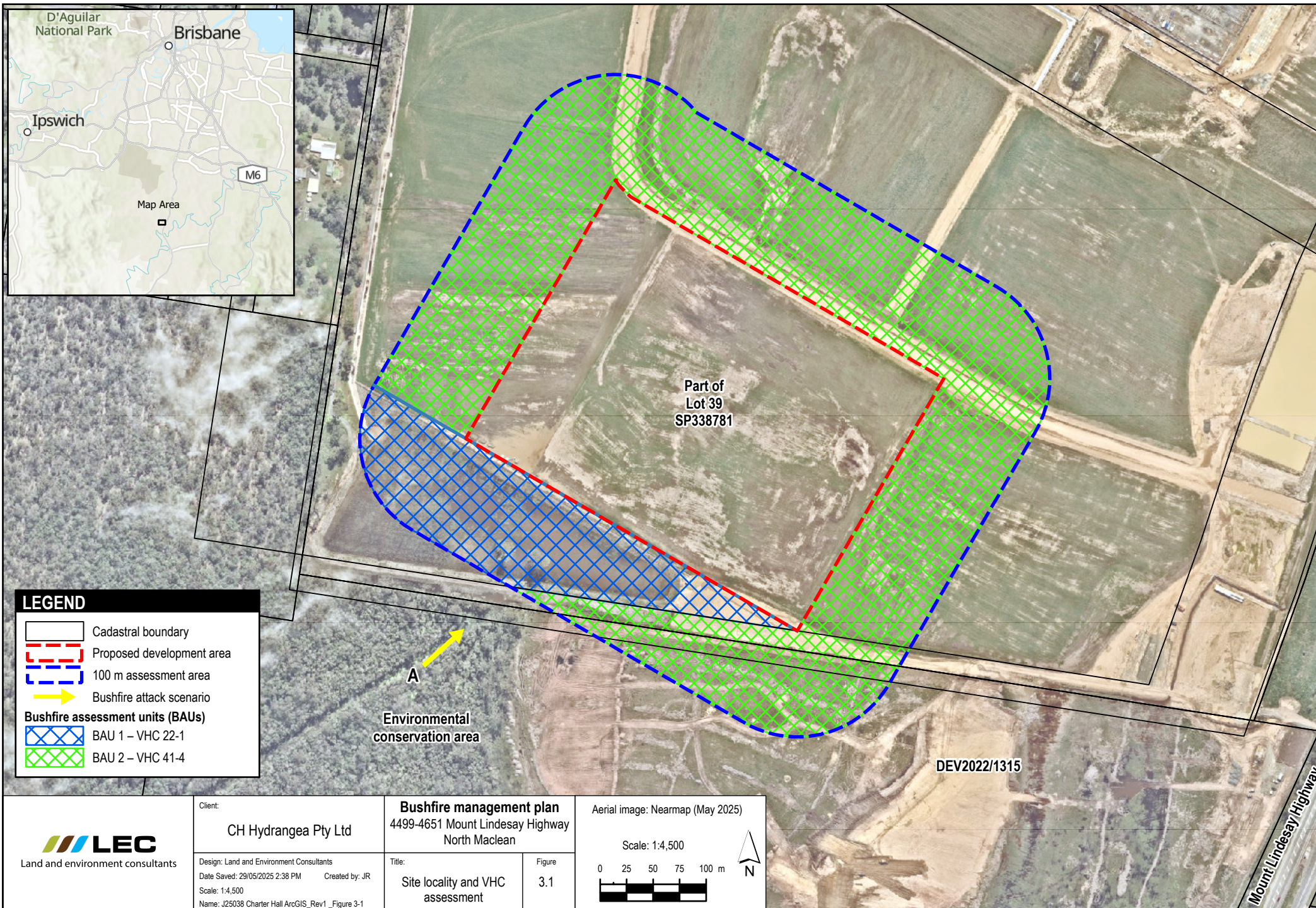


Table 3.1 Site observations

BAU	State mapped VHC	VHC	Notes
BAU 1	VHC 10.1 <i>Spotted gum dominated open forests (VHC 10.1)</i> , VHC 13.1 <i>Dry to moist eucalypt open forests on undulating metamorphics and granite (VHC 13.1)</i> , VHC 40.4 <i>Continuous low grass or tree cover (VHC 40.4)</i> and VHC 41.4 <i>Discontinuous low grass or tree cover (VHC 41.4)</i> and VHC 43.6 <i>Waterbodies or very low vegetation cover (VHC 43.6)</i>	VHC 22.1	BAU 1 is aligned the drainage/open space lot adjoining the southern boundary of the site. The landscaping concept plan for the drainage/open space lot indicates the basin batters and basin floor will be planted out with a suite of species from RE 12.3.5. This BMP assesses the drainage/open space lot as though the landscaping has reached a mature state in accordance with the species and structure of RE 12.3.5 which correlates with VHC 22.1. When the landscaping matures, BAU 1 will have continuous bushfire fuel.
BAU 2	VHC 9.2 <i>Moist to dry eucalypt woodland on coastal lowlands and ranges (VHC 9.2)</i> , VHC 10.1, VHC 13.1, VHC 40.4, VHC 41.4 and VHC 43.6.	VHC 41.4	BAU 2 is aligned with the Flagstone logistic estate and the industrial land use area within the approved development adjoining the southern boundary of the site (EDQ reference DEV2022/1315). In the post development landform, BAU 2 will have a low level of vegetation and discontinuous bushfire fuel.



Photograph 3.1 VHC 22.1 landscaping within BAU 1



Photograph 3.2 Example of VHC 41.4 within BAU 2

3.4 Potential bushfire intensity calculations

The potential bushfire intensity of BAUs 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 Section 4.2.4 of the BRC guide.

Section 3.1 of the BRC guide defines bushfire hazard classes as follows:

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

Results of the potential bushfire intensity calculations which determine the bushfire hazard class of BAUs shown in Figure 3.1 are presented in Table 3.2.

Table 3.2 Potential bushfire intensity

BAU	VHC	Potential fuel load tonnes/ha ¹	Slope (°) ²	Potential bushfire intensity (kW/m)	Bushfire hazard class
BAU 1	VHC 22.1	28.4	1	29,468	High
BAU 2	VHC 41.4	3	0	307	Non-bushfire hazard

Notes 1 Potential fuel load taken from the BRC guide.

2 Slope defaults to 0° for VHC 41.4 which is defined in the BRC guide as a low hazard class with discontinuous bushfire fuel.

3.5 Bushfire hazard areas

Results of the potential bushfire intensity calculations in Table 3.2 confirm the proposed development is affected by a high potential bushfire intensity area and the 100 m potential impact buffer which is applied to this area. Therefore, the proposed development is within a bushfire hazard area and the PDA development permit application is subject to compliance with the Bushfire overlay code.

4 Bushfire hazards associated with the site

This chapter identifies bushfire hazards associated with the site.

4.1 Fire danger season

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

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

4.2 Fire history

As discussed in Section 3.2, fire history data indicates numerous fires have occurred within 1 km of the site during the past 20 years. Based on this fire history and the large continuous area of bushland vegetation adjoining the site, it is considered possible the proposed development could be exposed to bushfire attack, planned or otherwise, in the future.

4.3 Bushfire attack scenarios

The proposed development could be exposed to bushfire attack from BAU 1 shown in Figure 3.1 where a high potential bushfire intensity area occurs. This bushfire attack scenario is further analysed in Section 5.5.

4.4 Potential bushfire hazard from adjacent land use

The bushland vegetation that will be established within the drainage/open space lot and retained within the environmental conservation area established under PDA development permit application number DEV2022/1315 is a potential bushfire hazard to the proposed development. This is confirmed by the potential bushfire intensity calculations in Section 3.4, which determined BAU 1 is a high potential bushfire intensity area.

4.5 Water and access for emergency services

Upon completion of the stage 2 Flagstone Logistics Estate civil works, the site will have frontage to a road and access to services including stormwater, sewer, water, electricity and communications.

5 Bushfire hazards associated with the proposed development

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

5.1 Siting and design

The proposed development will be designed to mitigate the risk of bushfire hazard determined by the bushfire hazard assessment in this BMP.

The proposed warehouse building and ancillary infrastructure are setback from the rear boundary of the site which adjoins the high potential bushfire intensity area associated with the drainage/open space lot. In the event of a bushfire ignition, the setback will reduce the level of radiant heat exposure at the warehouse building and ancillary infrastructure and the hardstand area within the setback will provide an operational space for firefighters to undertake bushfire management activities.

5.2 Land use

The proposed development does not involve a vulnerable use or community infrastructure for essential services as defined in the SPP guidance material – bushfire.

The proposed development will involve limited storage of dangerous goods. However, the dangerous goods would be stored in packets, as opposed to in bulk containers, and it is not considered to be consistent with the storage or manufacture of hazardous materials in the context of bushfire hazard as defined in the SPP guidance material -bushfire. Notwithstanding, the dangerous goods store will be in the northern part of the building and not directly exposed to potential elements of bushfire attack.

Further details and analysis of dangerous goods storage is provided in the *Preliminary Dangerous Goods Report* (AC 2025).

5.3 Fire-fighter water supply

The proposed development will be connected to mains water and will have an appropriately designed external hydrant system. In addition, the new roads within the Flagstone logistics estate will accommodate a hydrant system.

5.4 Access and egress

Access and egress for the proposed development will be via driveway connections to a new road within the Flagstone logistics estate as shown in Figure 5.1.

The proposed driveways, truck turning areas and hardstand areas within the site will be designed for articulated trucks and will provide efficient access and egress for urban fire trucks.

5.5 Radiant heat exposure

The Bushfire overlay code provides guidance about the acceptable level of radiant heat exposure for development within a bushfire hazard area. It requires the development footprint of buildings and structures to be separated from hazardous vegetation by a distance which achieves a radiant heat flux level $\leq 29 \text{ kW/m}^2$ at the buildings or structures.

As discussed in Section 4.3, the proposed development could be exposed to bushfire attack from BAU 1 shown in Figure 3.1. The radiant heat profile of this bushfire attack scenario was analysed with the BAL calculator. Inputs used in the BAL calculator and results are provided in Appendix 4.

Figure 5.1 demonstrates the proposed warehouse building and ancillary infrastructure are separated from hazardous vegetation by a distance which achieves a radiant heat flux level $\leq 29 \text{ kW/m}^2$ and complies with the Bushfire overlay code.



LEGEND

- Cadastral boundary
- Proposed development area
- 29 kW/m² radiant heat flux contour
- Access & egress

 Land and environment consultants	Client: CH Hydrangea Pty Ltd		Bushfire management plan 4499-4651 Mount Lindesay Highway North Maclean		Aerial image: Nearmap (May 2025)
	Design: Land and Environment Consultants Date Saved: 29/05/2025 2:36 PM Created by: JR Scale: 1:2,500 Name: J25038 Charter Hall ArcGIS_Rev1_Figure 5-1		Title: Radiant heat flux contour	Figure 5.1	Scale: 1:2,500 0 10 20 30 40 m  

6 Bushfire mitigation plan

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

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

6.1 Landscaping

Landscaping within the site must be designed and maintained in accordance with Part 5 of *Bushfire Resilient Building Guidance for Queensland Homes* (QRA 2020) (**Bushfire resilient building**) which is publicly available online. Plant selection must favour the list of plant species in Appendix E of Bushfire resilient building.

Landscaped areas must be maintained at regular time intervals during calendar year. Weeds and vegetation debris must be removed from garden beds and turf must be maintained as lawn at a nominal height ≤ 100 millimetres.

6.2 Fire-fighting water supply

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

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

If required, the external hydrant system must be designed and constructed in accordance with *Fire hydrant and Vehicle Access Guidelines for Residential, Commercial and Industrial lots* (QFES 2019b) (**Fire hydrant and vehicle access guidelines**) which defers to the local water retailer's specifications and the *Australian Standard (AS 2419.1-2021) Fire hydrant installations, 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.

6.3 Access and egress

The proposed driveways must be designed and constructed to provide efficient access and egress for an urban fire truck in accordance with Fire hydrant and vehicle access guidelines which defers to the *Road Planning and Design Manual – 2nd Edition* (DTMR 2013) for load bearing capacity, geometry and turning radii.

6.4 Service installation

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

7 Conclusion

This BMP was prepared by a suitably qualified person and in general accordance with the BRC guide.

A bushfire hazard assessment determined the proposed development area is within a bushfire hazard area and the PDA development permit application is subject to compliance with the Bushfire overlay code.

Mitigation measures that must be implemented as part of the proposed development are specified in Chapter 6. With the implementation of these mitigation measures the proposed development complies with the Bushfire overlay code as demonstrated in Appendix 5.

References

ACOR Consultants (AC) 2025, *Preliminary Dangerous Goods Report*, prepared for CH Hydrangea Pty Ltd, 30 May 2025

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

Queensland Department of Resources (DR) 2024, *Queensland Globe*, accessed online at <https://qldglobe.information.qld.gov.au/> May 2025

Queensland Department of State Development, Infrastructure, Local Government and Planning (DSDILGP) 2024) *State Planning Policy Interactive Mapping System*, accessed online at <https://spp.dsdip.esriaustraliaonline.com.au/geoviewer/map/planmaking>, May 2025

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

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

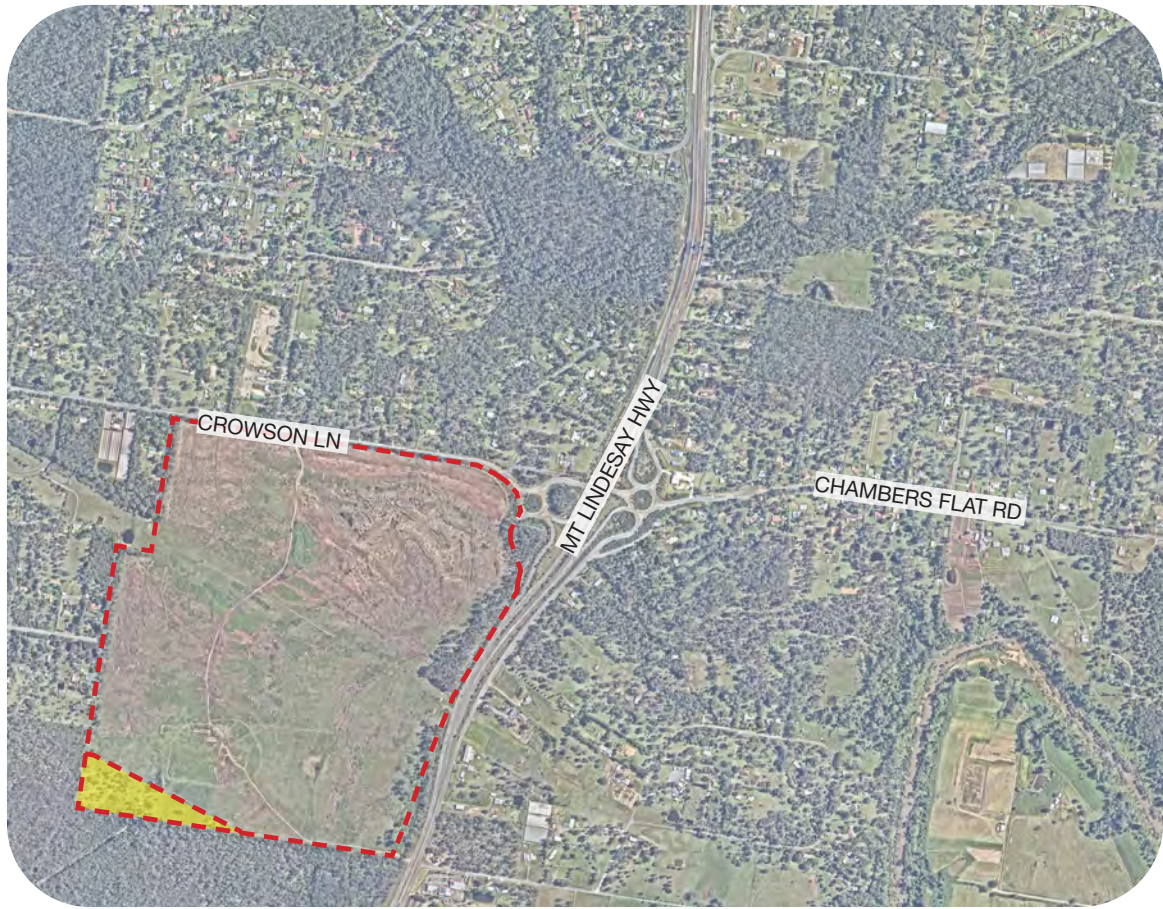
Standards Australia Limited (Standards Australia) 2018, *Australian Standard 3959-2018 Construction of buildings in bushfire prone areas*, Fourth edition, November 2018

Appendix 1 Landscape concept plan for the drainage reserve

NORTH MACLEAN - OPEN SPACE

4499-4651 MOUNT LINDESAY HIGHWAY,
NORTH MACLEAN, QLD 4280

LANDSCAPE CONCEPT PLAN
COMPENSATORY PLANTING PLAN FOR CONDITION 32(a)
19.06.2023
ISSUE G



DRAWING LIST:

- L-01 Coversheet
- L-02 Design Precedent Images
- L-03 Vegetation Typologies 01
- L-04 Vegetation Typologies 02
- L-05 Landscape Concept Masterplan
- L-06 Landscape Section A-A
- L-07 Indicative Plant Schedule
- L-08 Landscape Details (Typical)

CLIENTS:



LANDSCAPE ARCHITECT:



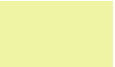
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DESIGN PRECEDENT IMAGES



VEGETATION TYPOLOGIES 01

KEY:



BASIN BATTER LANDSCAPE

Zone A will be treated as an ecotone between adjoining upper and lower slope regional ecosystems. Given the expected frequency of ponding, species tolerant of root zone inundation will be selected. Canopy species will comprise Queensland blue gum (*Eucalyptus tereticornis*), Swamp mahogany (*Eucalyptus robusta*), Swamp turpentine (*Lophostemon suaveolens*) and Broad-leaved paperbark (*Melaleuca quinquenervia*). The slightly elevated position of the planting zone will also be suited to establishing Swamp tea tree (*Melaleuca irbyana*) in the subcanopy layer. Other subcanopy species will include Red ash (*Alphitonia excelsa*), Pink Euodia (*Melicope elleryana*) and Umbrella cheese tree (*Glochidion sumatranum*). To establish quick domination of the groundcover layer and resist establishment of groundcover weeds present elsewhere in the adjoining wetland, the groundcover layer will be heavily planted with Matrush (*Lomandra longifolia*).



BASIN FLOOR LANDSCAPE

Zone B (the floor of the basin) will be planted out with Broad-leaved paperbark, a species dominating the adjoining natural wetland. Patches of Snow in summer (*Melaleuca linarifolia*) will also be established to increase floristic diversity. Queensland blue gum and Swamp turpentine can be established on the slightly elevated transition zones to Zone A. The midstorey of such vegetation is naturally sparse, but the groundcover reasonably diverse. Detailed design should ensure the establishment of species present in the adjoining wetland, including Frogsmouth (*Philydrum lanuginosum*), Swamp rice grass (*Lersia hexandra*), Sag rush (*Elaeocarpus philippinensis*), *Nymphoides exiliflora*, *Damasonium minus*, *Triglochin multifructum* and *Eclipta platyglossa*.



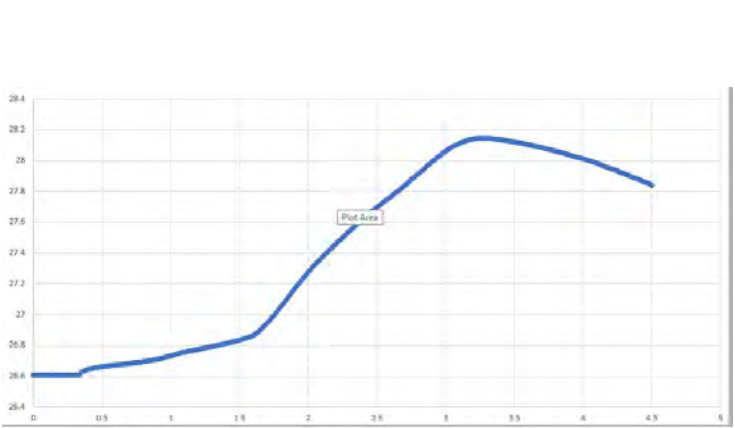
BASIN EDGE LANDSCAPE



The Water By Design Technical Guideline identifies opportunities to establish naturalistic vegetation communities in bioretention basins (refer following examples). The intent is to establish a similar well-vegetated system in the proposed detention basin (an easier task without the need for maintenance of filter media).



The plot data below indicates that the trees currently occupying the basin floor will die from inundation. It is recommended that the basin floor be planted out with a Broad-leaved paperbark community very similar to what occurs in the adjoining parts of the Maclean Estates site (i.e., Regional Ecosystem 12.3.5) This is a floristically simple community dominated by Broad-leaved paperbark (*Melaleuca quinquenervia*), with secondary (minor) occurrence of Swamp turpentine (*Lophostemon suaveolens*) and Queensland blue gum (*Eucalyptus tereticornis*) on the slightly elevated edges. Generally, the midstorey is sparse and comprised of Broad-leaved paperbark. The groundcover is comprised of a diversity of sedges and wetland species that are unlikely to be commercially available. Instead, it is acceptable to use the commercially available Swamp water fern (*Blechnum indicum*) and Grey sedge (*Lepironia articulata*), which are both commonly found in RE 12.3.5. The image below illustrates the nature of vegetation to be established. The planting palette is provided as Schedule 1. An extended establishment phase is required to allow plants to reach a height where they will tolerate the ponding. Plants need to be installed at least 6 months (and ideally 12 months) before deep ponding is expected to occur.



PLANT SCHEDULE: BASIN FLOOR

STRATA AND DENSITY	CODE	COMMON NAME	BOTANICAL NAME	% CONTRIBUTION TO OVERALL PLANTING DENSITY IN STRATA	COMMENT
CANOPY (3m SPACING)	MEL QUI	Broad-leaved paperbark	<i>Melaleuca quinquenervia</i>	85	
	LOP SUA	Swamp turpentine	<i>Lophostemon suaveolens</i>	10	Restricted to slightly drier edges
	EUC TER	Queensland blue gum	<i>Eucalyptus tereticornis</i>	5	Restricted to slightly drier edges
MIDSTOREY (SCATTERED SPECIMEN - 1 PLANT / 500m2)	MEL LIN	Flax-leaved paperbark	<i>Melaleuca linarifolia</i>	50	
	GLO SUM	Umbrella cheese tree	<i>Glochidion sumatranum</i>	20	
	MEL ELL	Pink euodia	<i>Melliope elleryana</i>	20	
GROUNDCOVER (INTERPLANTED AT 0.5m CENTRES IN THE REMAINING AREAS)	BLE IND	Swamp water fern	<i>Blechnum indicum</i>	85	
	LEP ART	Grey sedge	<i>Lepironia articulata</i>	15	Final grading to create slightly deeper water retaining 'dishes' for the establishment of this species

The basin walls should be planted with species typically found on footslopes adjoining paperbark swamps. Again, useful information can be derived from vegetation survey on the adjoining Maclean Estates site. Here, Swamp turpentine and Queensland blue gum are the dominant species in this setting, with secondary occurrence of Narrow-leaved red ironbark (*Eucalyptus crebra*) and Coastal grey box (*Eucalyptus moluccana*). The midstorey should include *Acacia* spp. Red ash (*Alphitonia excelsa*) and Foambark (*Jagera pseudorhus*). The groundcover can be planted out with densely spaced Matrush (*Lomandra longifolia*). The bushland planting style image provided above illustrates such vegetation at a developmental stage. The planting palette is provided as below.

PLANT SCHEDULE: BASIN BATTER

STRATA AND DENSITY	CODE	COMMON NAME	BOTANICAL NAME	% CONTRIBUTION TO OVERALL PLANTING DENSITY IN STRATA
CANOPY (4m SPACING)	EUC TER	Queensland blue gum	<i>Eucalyptus tereticornis</i>	45
	LOP SUA	Swamp turpentine	<i>Lophostemon suaveolens</i>	35
	EUC CRE	Narrow-leaved red ironbark	<i>Eucalyptus crebra</i>	10
	EUC MOL	Coastal grey box	<i>Eucalyptus moluccana</i>	10
MIDSTOREY (ALTERNATE / INTERPLANTED AT 4m CENTRES WITH THE CANOPY TREES)	ACA AUL	Brush Ironbark Wattle	<i>Acacia aulacocarpa</i>	60
	ALP EXC	Red ash	<i>Alphitonia excelsa</i>	20
	JAG PSU	Foambark	<i>Jagera pseudorhus</i>	20
GROUNDCOVER (INTERPLANTED AT 0.5m CENTRES IN THE REMAINING AREAS)	LOM LON	Mat rush	<i>Lomandra longifolia</i>	100

LANDSCAPE MASTERPLAN

KEY:

- SITE BOUNDARY
- FAUNA EXCLUSION FENCE
REFER TO ARCHITECT'S DETAILS
- PROPOSED TREE PLANTING
REFER TO PLANT SCHEDULE

- MAINTENANCE ACCESS / GRAVEL SURFACE
- BASIN EDGE LANDSCAPE
- BASIN BATTER LANDSCAPE
- BASIN FLOOR LANDSCAPE

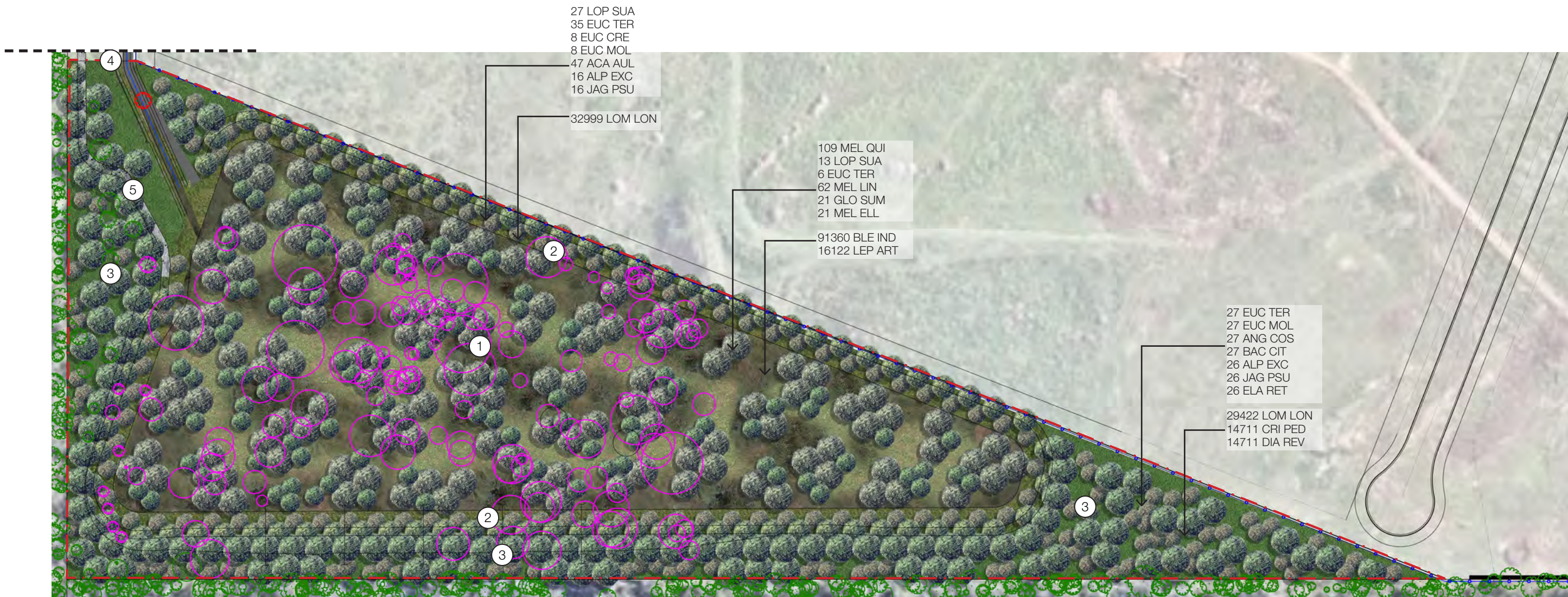
- EXISTING TREE TO BE REMOVED - APPROVED CONCEPT
- EXISTING TREE TO BE REMOVED - ARCADIS DESIGN
- EXISTING TREE TO BE RETAINED - TO ARBORIST'S ASSESSMENT
- EXISTING TREE TO BE RETAINED
- SCARRED TREE TO BE RETAINED

DESIGN NOTES

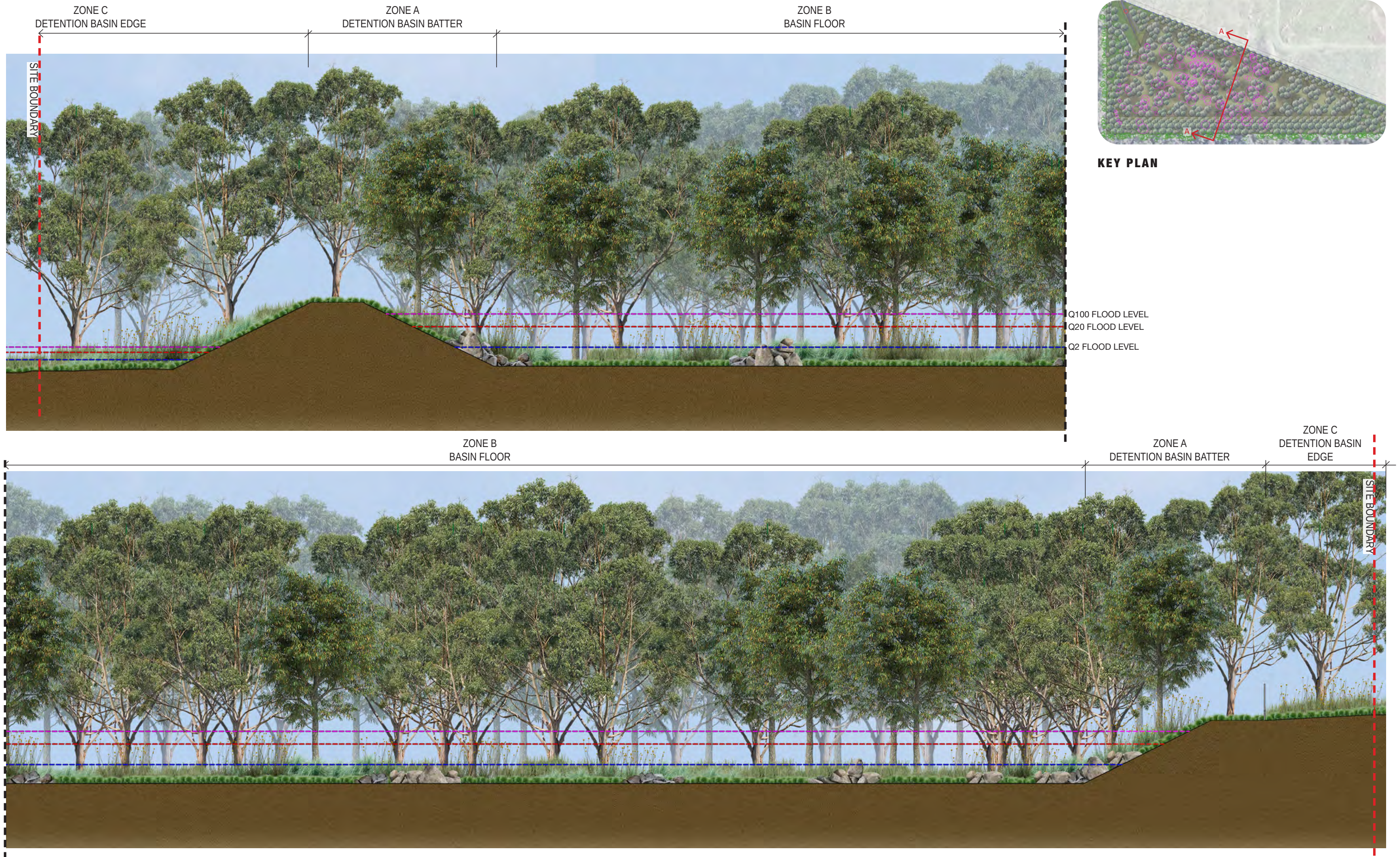
- BASIN FLOOR LANDSCAPE
- BASIN BATTER LANDSCAPE
- BASIN EDGE LANDSCAPE
- SWALE
- MAINTENANCE ACCESS TRACK



KEYPLAN

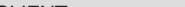


LANDSCAPE SECTION A-A



SECTION A-A

Scale 1:200@A3 / 1:100@A1

PROJECT	DRAWING TITLE	PROJECT NO.	PURPOSE	SCALE	REVISION	DATE	DRAWN	CHECKED	PAGE	CLIENT
NORTH MACLEAN OPEN SPACE + WESTERN BUFFER 4499-4651 MOUNT LINDESAY HIGHWAY, NORTH MACLEAN, QLD 4280	LANDSCAPE SECTION A-A	H8-23006	COMPENSATORY PLANTING PLAN FOR CONDITION 32(A)	1:200@A3	G	19.06.2023	KM/DG	DV	L0 6	



PLANT SCHEDULE

PLANT SCHEDULE: BASIN FLOOR

CODE	BOTANICAL NAME	POT SIZE	DENSITY	NOS
	TREES			
MEL QUI	Melaleuca quinquenervia	Tubestock	As Shown	109
EUC TER	Eucalyptus tereticornis	Tubestock	As Shown	6
LOP SUA	Lophostemon suaveolens	Tubestock	As Shown	13
MEL LIN	Melaleuca linarifolia	Tubestock	As Shown	62
GLO SUM	Glochidion sumatranum	Tubestock	As Shown	21
MEL ELL	Melliope elleryana	Tubestock	As Shown	21
	GROUNDCOVERS + GRASS			
BLE IND	Blechnum indicum	Tubestock	4/m²	91360
LEP ART	Lepironia articulata	Tubestock	4/m²	16122



MEL LIN



MEL QUI



EUC TER



LOP SUA

PLANT SCHEDULE: BASIN BATTER

CODE	BOTANICAL NAME	POT SIZE	DENSITY	NOS
	TREES			
EUC TER	Eucalyptus tereticornis	200mm	As Shown	35
LOP SUA	Lophostemon suaveolens	200mm	As Shown	27
EUC CRE	Eucalyptus crebra	200mm	As Shown	8
EUC MOL	Eucalyptus moluccana	200mm	As Shown	8
ACA AUL	Acacia aulacocarpa	200mm	As Shown	47
ALP EXC	Alphitonia excelsa	200mm	As Shown	16
JAG PSU	Jagera pseudorhus	200mm	As Shown	16
	GROUNDCOVERS + GRASS			
LOM LON	Lomandra longifolia	Tubestock	4/m²	32999



ALP EXC



MEL ELL



ACA AUL



JAG PSU

PLANT SCHEDULE: BASIN EDGE

CODE	BOTANICAL NAME	POT SIZE	DENSITY	NOS
	TREES			
EUC TER	Eucalyptus tereticornis	200mm	As Shown	27
EUC MOL	Eucalyptus moluccana	200mm	As Shown	27
ANG COS	Angophora costata	200mm	As Shown	27
BAC CIT	Backhousia citriodora	200mm	As Shown	27
ELA RET	Elaeocarpus reticulatis	200mm	As Shown	26
ALP EXC	Alphitonia excelsa	200mm	As Shown	26
JAG PSU	Jagera pseudorhus	200mm	As Shown	26
	GROUNDCOVERS + GRASS			
LOM LON	Lomandra longifolia	Tubestock	4/m²	29422
CRI PED	Crinum pedunculatum	Tubestock	4/m²	14711
DIA REV	Dianella sp	Tubestock	4/m²	14711



BAC CIT



LEP ART



BLE IND



CRI PED



DIA REV

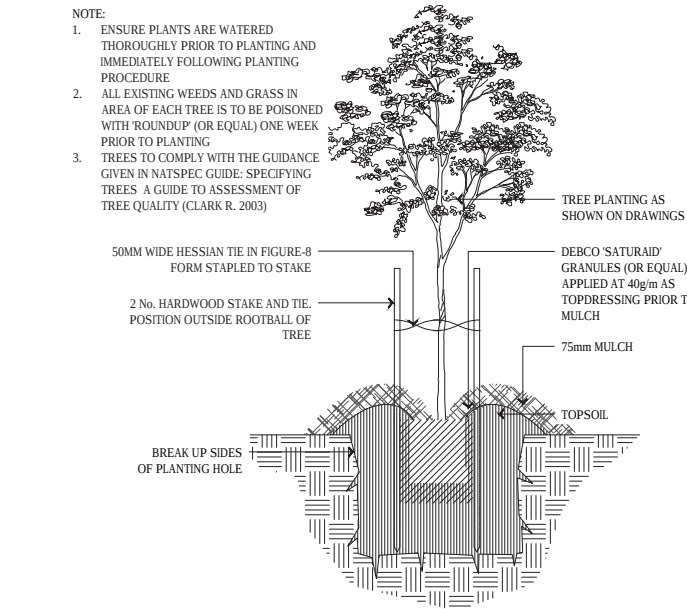


LOM LON

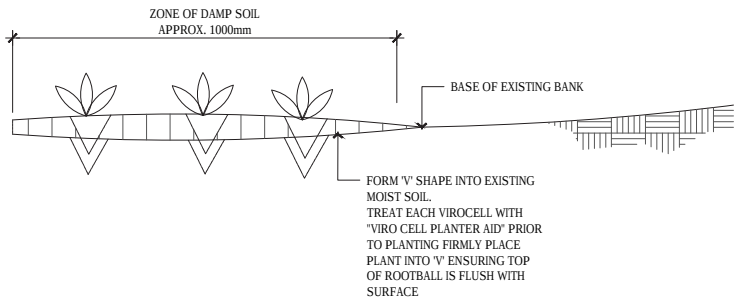
NOTES:

Basin edge planting sourced from City Of Logan Landscape Development Manual

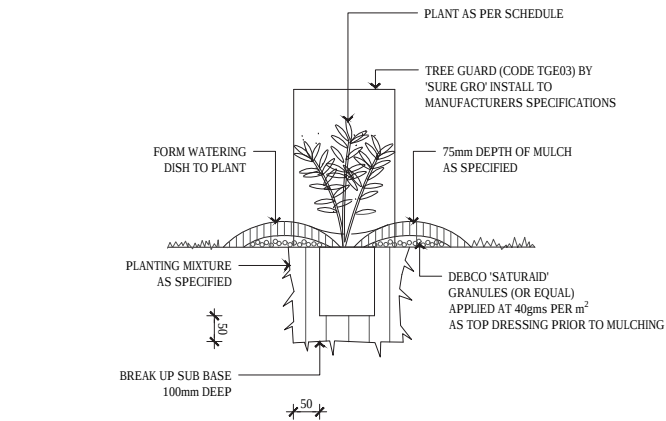
LANDSCAPE DETAILS (TYPICAL)



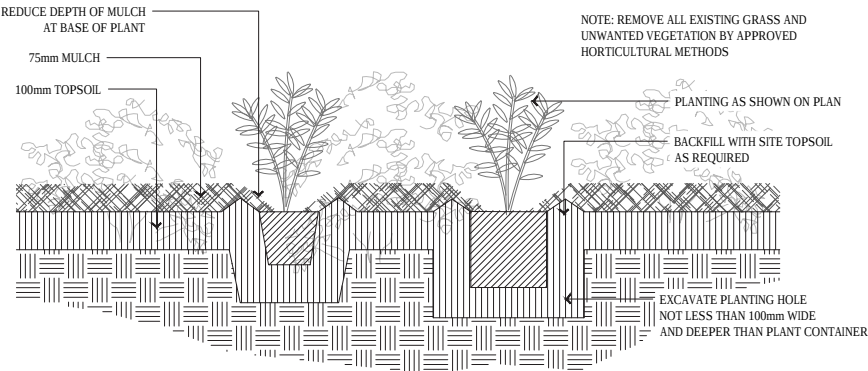
01 TYPICAL TREE PLANTING DETAIL UNDER 75L
1:20 @ A1 / 1:40 @ A3



03 BASIN PLANTING
1:20 @ A1 / 1:40 @ A3



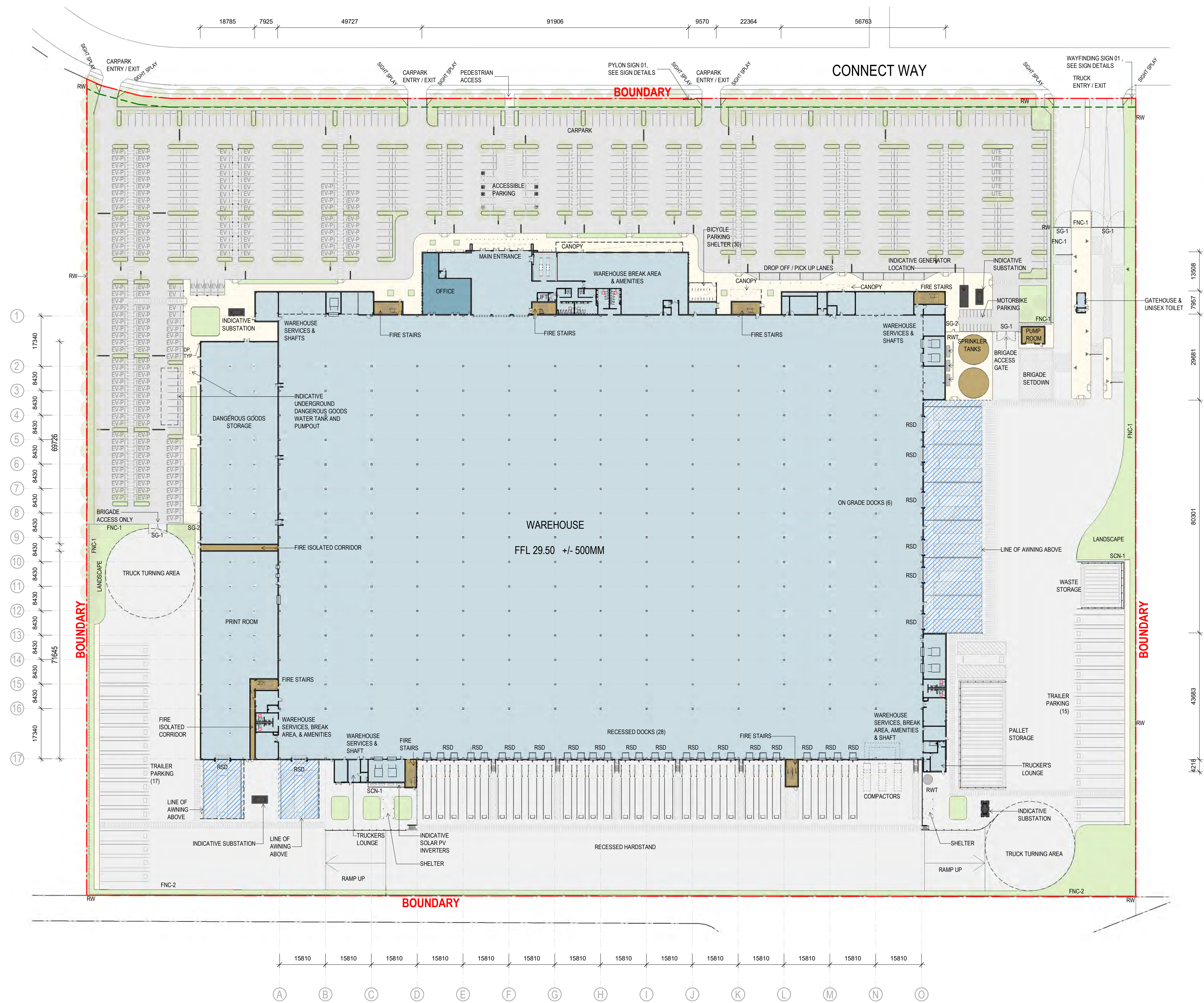
02 TUBESTOCK PLANTING DETAIL
1:20 @ A1 / 1:40 @ A3



04 MASS PLANTING DETAIL
1:10 @ A1 / 1:20 @ A3

Appendix 2 Proposed site plan

REVISIONS		
REV	DESCRIPTION	DATE
1	FOR INFORMATION	23.04.2025
2	WORK IN PROGRESS	30.04.2025
3	WORK IN PROGRESS	14.05.2025
4	DRAFT	19.05.2025
5	DRAFT	23.05.2025
A	ISSUE FOR DA	28.05.2025



GENERAL NOTES

ALL CAR DRIVE AISLES, PARKING SPACES, AND DISABLED PARKING SPACES IN ACCORDANCE WITH CITY OF LOGAN, LOGAN PLANNING SCHEME 2015 AND AUSTRALIAN STANDARDS AS 2890.

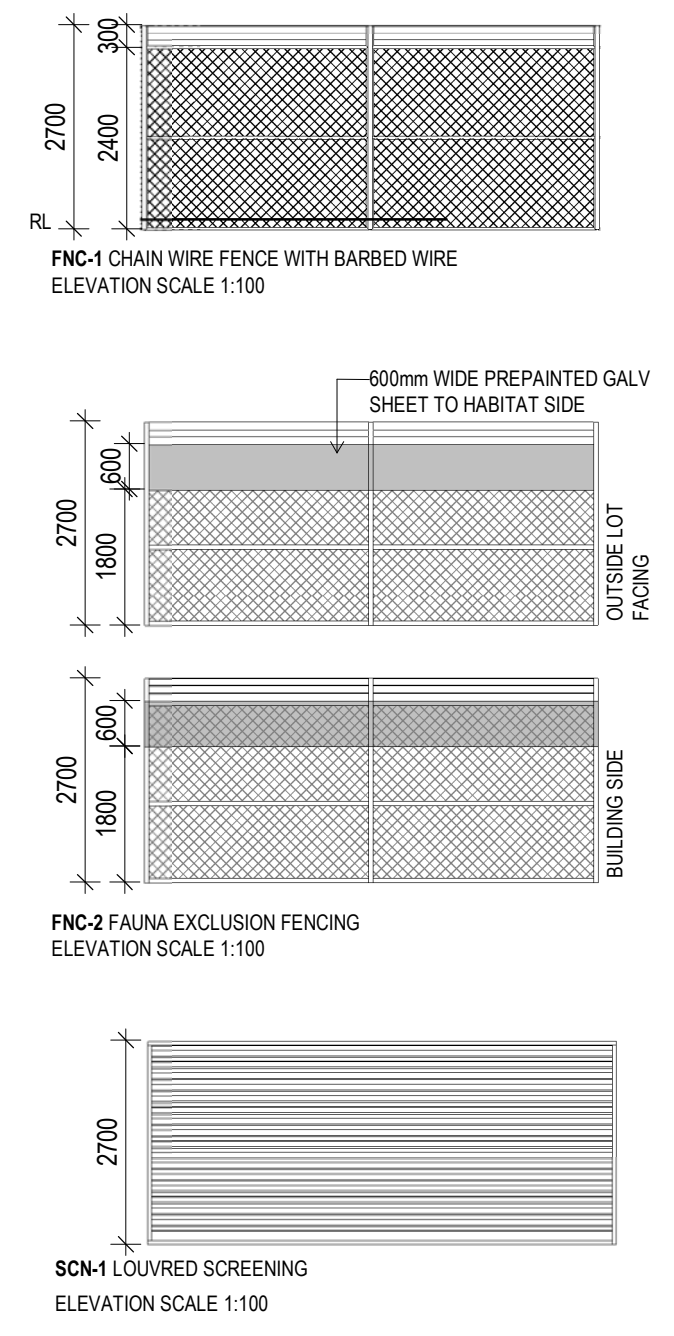
ALL NEW DRIVEWAYS AND CROSS OVERS SHALL BE IN ACCORDANCE WITH LOCAL COUNCIL AND AUSTRALIAN STANDARDS REQUIREMENTS .

SITE STORMWATER DRAINAGE IN ACCORDANCE WITH LOCAL AUTHORITY & COUNCIL REQUIREMENTS.

BICYCLE PARKING AND END OF TRIP FACILITIES TO MEET QUEENSLAND DEVELOPMENT CODE AND AUSTRALIAN STANDARDS REQUIREMENTS

DEVELOPMENT SCHEDULE	
SITE AREA	99,592 m ²
TOTAL GFA	141,056 m ²
SITE COVERAGE	44.77%
SITE STORMWATER DRAINAGE IN ACCORDANCE WITH LOCAL AUTHORITY & COUNCIL REQUIREMENTS.	
BICYCLE PARKING AND END OF TRIP FACILITIES TO MEET QUEENSLAND DEVELOPMENT CODE AND AUSTRALIAN STANDARDS REQUIREMENTS	
TOTAL CAR PARKING SPACES	644
INCLUDES: - ACCESSIBLE PARKING (7) - UTE (7) - ELECTRICAL VEHICLE PARKING (38) - ELECTRICAL VEHICLE PARKING - FUTURE PROVISION (128)	
MOTORBIKE PARKING	18
BICYCLE PARKING	30
TRAILER PARKING	32

- LEGEND**
- SITE BOUNDARY
 - LANDSCAPE SETBACK
 - FNC-1
 - FNC-2
 - LANDSCAPE AREA
 - OFFICE AREA
 - WAREHOUSE AREA
 - FIRE SERVICES & EGRESS
 - HEAVY DUTY PAVEMENT
 - LIGHT DUTY PAVEMENT
 - PEDESTRIAN PAVEMENT
 - AWNING ABOVE
 - INDICATIVE LANDSCAPE
- RSD - ROLLER SHUTTER DOOR
DP - DOWNPIPES
RW - RETAINING WALL
TYP - (TYPICAL)
SG1 - SWING GATE
SG2 - SWING GATE - PEDESTRIAN
SCN - SCREEN
RWT - RAINWATER TANK
EV - ELECTRIC VEHICLE PARKING
EV-P - ELECTRIC VEHICLE PARKING (FUTURE PROVISION)
UTE - UTILITY OR LONG WHEEL LIGHT VEHICLE



1 SITE PLAN 1:750

ISSUE FOR DA



WAREHOUSE & LOW IMPACT INDUSTRY DEVELOPMENT
QUEENSLAND



SITE PLAN

Date 28.05.2025

Scale As indicated@A1

Project No 25133

DA03

A

Appendix 3 Bushfire prone area map



 Cadastre (25k)

Bushfire prone area

CLASS

 High Potential Bushfire Intensity

 Medium Potential Bushfire Intensity

 Potential Impact Buffer

State Planning Policy IMS - Export Map

Making or amending a local planning instrument and designing land for local infrastructure

Disclaimer This map has been prepared with due care based on the best available information at the time of publication. However, the State of Queensland (acting through the department) makes no representations, either express or implied, that the map is free from errors, inconsistencies or omissions. Reliance on information contained in this map is the sole responsibility of the user. The State disclaims responsibility for any loss, damage or inconvenience caused as a result of reliance on information or data contained in this map.

Date: 24/03/2025

Queensland
Government

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Appendix 4 Radiant heat exposure assessment

Bushfire attack scenario from BAU 1

- Forest fire danger index - 55
- Vegetation - VHC 22.1 *Melaleuca open forests on seasonally inundated lowland coastal swamps*
- Understorey fuel load – 23.4 tonnes/hectare (t/ha)
- Total fuel load – 28.4 t/ha
- Effective slope – 1° slope
- Site slope – 0.29° slope
- Flame width – 100 metres
- Flame temperature – 1,090 Kelvin



Calculated June 3, 2024, 10:37 am (MDC v.4.9)

J24041

Minimum Distance Calculator - AS3959-2018 (Method 2)			
Inputs		Outputs	
Fire Danger Index	55	Rate of spread	1.65 km/h
Vegetation classification	Forest	Flame length	14.16 m
Understorey fuel load	23.4 t/ha	Flame angle	53.29 °, 63.29 °, 71.28999999999999 °, 75.28999999999999 °, 77.28999999999999 ° & 83.28999999999999 °
Total fuel load	28.4 t/ha	Elevation of receiver	5.61 m, 6.24 m, 6.59 m, 6.68 m, 6.71 m & 6.56 m
Vegetation height	n/a	Fire intensity	24,280 kW/m
Effective slope	1 °	Transmissivity	0.873, 0.854, 0.829, 0.803, 0.79 & 0.728
Site slope	0.29 °	Viewfactor	0.5976, 0.4441, 0.3007, 0.2041, 0.1659 & 0.045
Flame width	100 m	Minimum distance to < 40 kW/m²	11.7 m
Windspeed	n/a	Minimum distance to < 29 kW/m²	15.7 m
Heat of combustion	18,600 kJ/kg	Minimum distance to < 19 kW/m²	22.9 m
Flame temperature	1,090 K	Minimum distance to < 12.5 kW/m²	32.3 m
		Minimum distance to < 10 kW/m²	38.3 m

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

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

Elevation of receiver - Douglas & Tan, 2005

Flame angle - Douglas & Tan, 2005

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

Appendix 5 Bushfire overlay code assessment

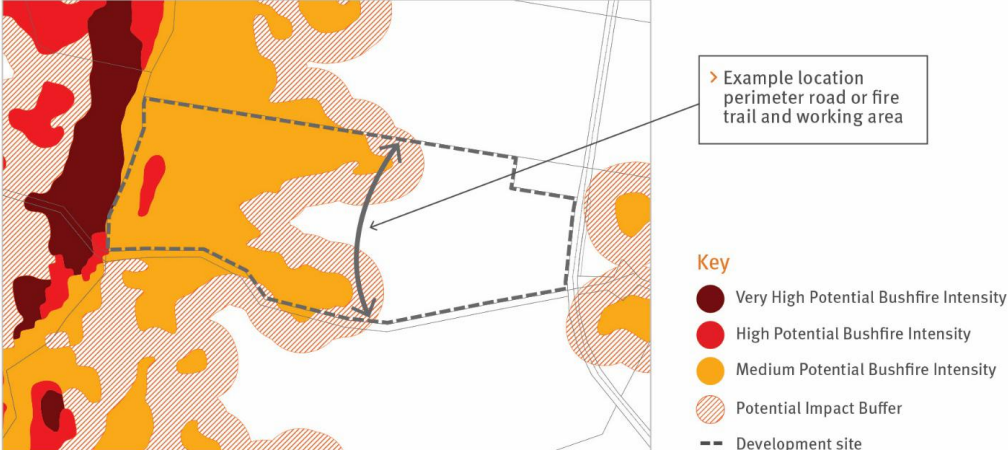
Performance outcomes	Acceptable outcomes	Compliance assessment
Section A		
Reconfiguring a lot (RaL) – where creating lots of more than 2,000 square metres		
PO1 The subdivision layout: (a) enables future buildings to be located away from slopes and land forms that expose people or property to an intolerable 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 <i>Bushfire resilient communities</i> document. The outcomes of this assessment can demonstrate how an alternate solution to the acceptable outcome can deliver an acceptable or tolerable level of risk.	AO1.1 A development footprint plan is identified for each lot that avoids ridgelines, saddles and crests where slopes exceed 15 per cent. AO1.2 A development footprint plan is identified for each lot that is separated from the closest edge to the adjacent mapped medium, high or very high potential bushfire intensity area by: (a) a distance that is no closer than the distances specified in Table 5 at all development footprint plan boundaries; or (b) a distance that achieves a radiant heat flux level of 29 kW/m² or less at all development footprint plan boundaries. Note – This separation area is often termed an asset protection zone. Note – The radiant heat flux levels can be established by undertaking a bushfire hazard assessment in accordance with the methodology in the QFES <i>Bushfire resilient communities</i> document.	Not applicable
PO2 The subdivision layout enables: (a) future buildings to be located as close as possible to property entrances to facilitate safe evacuation during a bushfire event; and (b) future site access to be located and designed to allow safe evacuation of the site by occupants and maintain access by emergency services under critical event conditions.	AO2 A development footprint plan is identified for each lot that: (a) is located within 60 metres of the street frontage; and (b) sited to enable a route between the development footprint plan and the street frontage with a gradient that does not exceed of 12.5 per cent.	Not applicable
Section B		
Reconfiguring a lot (RaL) – where creating lots of 2,000 square metres or less		
PO3 The subdivision layout: (a) avoids creating lots on slopes and land forms that expose people or property to an intolerable risk to life or property; and (b) facilitates emergency access and operational space for	AO3.1 The subdivision layout results in lots that are sited so that they are separated from the closest edge to the adjacent mapped medium, high or very high potential bushfire intensity area by: (a) a distance that is no closer than the distances specified	Not applicable

Performance outcomes	Acceptable outcomes	Compliance assessment
firefighters in a reduced fuel area between future buildings and structures and hazardous vegetation, that reduce risk to an acceptable or tolerable level. Note – An applicant may seek to undertake a site-level verification of the location and nature of hazardous vegetation and resulting potential bushfire intensity levels, for example where changes in foliage have occurred (e.g. as a consequence of adjoining permanent urban development) or where an applicant seeks to verify the regional ecosystem map inputs. This verification should form part of a bushfire hazard assessment, in accordance with the methodology in the QFES <i>Bushfire resilient communities</i> document. The outcomes of this assessment can demonstrate how an alternate solution to the acceptable outcome can deliver an acceptable or tolerable level of risk.	in Table 5 at all lot boundaries; or : (b) a distance that achieves a radiant heat flux level of 29 kW/m² or less: (i) at the building envelope, if identified at RaL stage; or (ii) where a building envelope is not identified, at all lot boundaries. Note – This separation area is often termed an asset protection zone. Note – The radiant heat flux levels can be established by undertaking a bushfire hazard assessment in accordance with the methodology in the QFES <i>Bushfire resilient communities</i> document. Note – For staged developments, temporary separation areas may be absorbed as part of subsequent stages. Note - Existing cleared areas external to the site may only be used in calculating necessary separation where tenure ensures that the land will remain cleared of hazardous vegetation (for example the land is a road, watercourse or highly managed park in public ownership).	
	A03.2 The subdivision layout does not create lots that are within bushfire prone areas and on ridgelines, saddles and crests where slopes exceed 15 per cent (roads and parks may be located in these areas).	Not applicable
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.	A04 No acceptable outcome is prescribed	Not applicable
PO5 The subdivision layout provides for adequate access and egress and safe evacuation routes, to achieve an acceptable or tolerable risk to people.	A05.1 The subdivision layout: (a) avoids the creation of bottle-neck points in the movement network within the development (for example, avoids	Not applicable

Performance outcomes	Acceptable outcomes	Compliance assessment
	hourglass patterns); and (b) ensures the road network has sufficient capacity for the evacuating population.	
	A05.2 The subdivision layout ensures evacuation routes: (a) direct occupants away from rather than towards or through areas with a greater potential bushfire intensity; and (b) minimise the length of route through bushfire prone areas. Refer Figure 5.	
Figure 5 is a map illustrating a subdivision layout and evacuation routes. The map shows a development site (dashed line) with various bushfire intensity zones (Very High, High, Medium Potential) and evacuation routes (suitable and unsuitable). Callouts point to specific features like development footprint, parks, perimeter roads, and lot locations. Key: - Very High Potential Bushfire Intensity - High Potential Bushfire Intensity - Medium Potential Bushfire Intensity - Potential Impact Buffer - Development site Example development footprint plan Example location larger lots with a development footprint plan located outside very high, high and medium potential bushfire intensity area Example location parks and open spaces Example location perimeter road Example location suitable evacuation route Example location new lots Example location unsuitable evacuation route		
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 <i>Bushfire resilient communities</i> document. The outcomes of this assessment can demonstrate how an alternate solution to the acceptable outcome can deliver an acceptable or tolerable level of risk.	A06.1 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. A06.2 The asset protection zone is comprised of: (a) parks and open spaces; and/or (b) lots greater than 2000 square metres; and/or (c) public roads (termed perimeter roads). Note – Parks and open space may be located within the mapped medium, high and very high potential bushfire intensity areas to create a separation between the development and the balance of the bushfire prone area. Note – Portions of lots greater than 2000 square metres may be located within the mapped medium, high and very high potential bushfire intensity areas. Refer Figure 5.	Not applicable

Natural hazards, risk and resilience - Bushfire

Performance outcomes	Acceptable outcomes	Compliance assessment
	AO6.3 Where the asset protection zone includes lots greater than 2000 square metres a development footprint plan is identified for each lot that is located in accordance with AO1.2.	
PO7 Parks or open space provided as part of the asset protection zone do not create additional bushfire prone areas. Note –The undertaking of a bushfire hazard assessment, in accordance with the methodology in the QFES <i>Bushfire resilient communities</i> document may assist in demonstrating compliance with this performance outcome.	AO7 Where the asset protection zone includes parks or open spaces, they: (a) comprise only low threat vegetation, including grassland managed in a minimal fuel condition, maintained lawns, golf courses, maintained public reserves and parklands, cultivated gardens and nature strips; or (b) are designed to ensure a potential available fuel load is maintained at less than eight tonnes/hectare in aggregate and with a fuel structure that remains discontinuous. Note – Minimal fuel condition means there is insufficient fuel available to significantly increase the severity of the bushfire attack, for example short-cropped grass to a nominal height of 10 centimetres.	Not applicable
PO8 Perimeter roads are accessible for fire-fighting vehicles, to facilitate emergency access and operational space for fire- fighting, maintenance works and hazard reduction activities.	AO8.1 Where the asset protection zone includes a perimeter road it: (a) has a two-lane sealed carriageway clear of hazardous vegetation; and (b) is connected to the wider public road network at both ends and at intervals of no more than 200 metres; and (c) does not include design elements that may impede access for fire-fighting and maintenance for fire- fighting purposes (for example traffic calming involving chicanes).	Not applicable
	AO8.2 Where the subdivision contains a reticulated water supply, the road network and fire hydrants are designed and installed in accordance with: (a) <i>Fire Hydrant and Vehicle Access Guidelines for residential, commercial and industrial lots</i>, Queensland Fire and Emergency Services, 2015, unless	Not applicable

Performance outcomes	Acceptable outcomes	Compliance assessment
	otherwise specified by the relevant water entity; and (b) the <i>Road Planning and Design Manual 2nd edition</i> , Department of Transport and Main Roads, 2013.	
Section D		
Reconfiguring a lot (RaL) – where creating additional lots for the purpose of residential development and a reticulated water supply is not provided.		
PO9 The subdivision layout provides for perimeter roads or fire trail and working areas that are accessible by the type of fire-fighting vehicles servicing the area, to facilitate emergency access and operational space for fire-fighting, maintenance works and hazard reduction activities.	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
 Figure 6 – Siting of fire trail and working area		
Section E		
Material change of use		
PO10 Site layout achieve an acceptable or tolerable risk to people. Landscape or open space provided as part of the development: (a) acts as a buffer between hazardous	AO10.1 Site layout places the landscape and open spaces within the site between premises and adjacent mapped medium, high or very high potential bushfire intensity areas.	Complies with AO10.1 The proposed warehouse building and ancillary infrastructure are setback from the rear boundary of the site which adjoins the high potential bushfire intensity area associated with the drainage/open

Performance outcomes	Acceptable outcomes	Compliance assessment
vegetation and development; and (b) does not create additional bushfire prone areas. Note – An applicant may seek to undertake a site-level verification of the location and nature of hazardous vegetation and resulting potential bushfire intensity levels, for example where changes in foliage have occurred (e.g. as a consequence of adjoining permanent urban development) or where an applicant seeks to verify the regional ecosystem map inputs. This verification should form part of a bushfire hazard assessment in accordance with the methodology in the QFES <i>Bushfire resilient communities</i> document. The outcomes of this assessment can demonstrate how an alternate solution to the acceptable outcome can deliver an acceptable or tolerable level of risk.	Refer Figure 7.	space lot. In the event of a bushfire ignition, the setback will reduce the level of radiant heat exposure at the warehouse building and ancillary infrastructure and also provide an operational space for firefighters to undertake bushfire management activities. Figure 5.1 of the bushfire management plan (BMP) demonstrates the proposed warehouse building and ancillary infrastructure are separated from hazardous vegetation by a distance which achieves a radiant heat flux level ≤ 29 kilowatt/metre square (kW/m^2).
	AO10.2 This landscaping and open space comprises protective landscape treatments that: (a) comprise only low threat vegetation, including grassland managed in a minimal fuel condition, maintained lawns, golf courses and cultivated gardens; or (b) are designed to ensure a potential available fuel load is maintained at less than 8 tonnes/hectare in aggregate and that fuel structure remains discontinuous. Note – Minimal fuel condition means there is insufficient fuel available to significantly increase the severity of the bushfire attack, for example short-cropped grass to a nominal height of 10 centimetres.	Complies with AO10.2 Specifications for landscaping within the site are provided in Section 6.1 of the BMP and comply with AO10.2 (a) and (b).

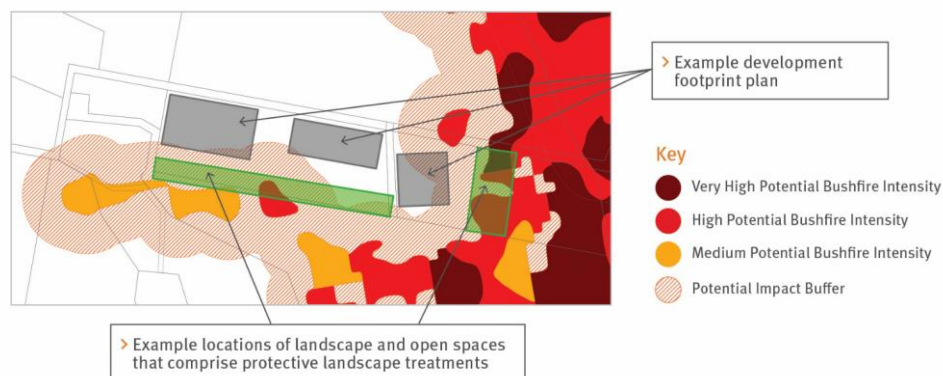


Figure 7 – Siting of protective landscape treatments

Performance outcomes	Acceptable outcomes	Compliance assessment
PO11 The development establishes evacuation areas, to achieve an acceptable or tolerable risk to people.	AO11 If in an isolated location, development establishes direct access to a safe assembly/evacuation area. Note – Guidance on identifying safe evacuation areas is contained in the QFES <i>Bushfire resilient communities</i> document.	Complies with AO11 The proposed development is not in an isolated location and does not require evacuation areas.
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 Section 6.3 of the BMP requires the proposed driveways to be designed and constructed to provide efficient access and egress for an urban fire truck in accordance with <i>Fire hydrant and Vehicle Access Guidelines for Residential, Commercial and Industrial lots 2019 (Fire hydrant and vehicle access guidelines)</i> which defers to the <i>Road Planning and Design Manual – 2nd Edition 2013</i> for load bearing capacity, geometry and turning radii.
PO13 Development is located within a reticulated water supply area or includes a dedicated static water supply that is available solely for fire-fighting purposes and can be accessed by fire-fighting vehicles. Note – Swimming pools, farm ponds and dams are not considered reliable sources of static water supply in Queensland due to regular drought events. Note for Local Government – Information on how to provide an appropriate static water supply, may form a condition of a development approval. For further information on preferred solutions refer to the QFES <i>Bushfire resilient communities</i> document.	AO13 No acceptable outcome is prescribed	Complies with PO13 The proposed development will be connected to mains water. The mains water connection will be in accordance with the local water retailer's specifications for supply and pressure. Any requirement for an external hydrant system to be installed within the site will be determined by a fire services engineer and based on compliance with the <i>National Construction Code 2022</i> . If required, the external hydrant system will be designed and constructed in accordance with Fire hydrant and vehicle access guidelines which defers to the local water retailer's specifications and the <i>Australian Standard (AS 2419.1-2021) Fire hydrant installations, System design, installation and commissioning</i> . Where there are differences between the local water retailer's specifications and AS 2419.1-2021, the higher-level standard should prevail.
PO14 Vulnerable uses listed in Table 7 are not established or intensified within a bushfire prone area unless:	AO14.1 No acceptable outcome is prescribed.	Compliance with PO14 The proposed development does not involve a vulnerable use as defined in Table 7 of this bushfire overlay code.

Performance outcomes	Acceptable outcomes	Compliance assessment
(a) there is an overriding need in the public interest for the new or expanded service the development provides; and (b) there are no other suitable alternative locations within the required catchment; and (c) site planning can appropriately mitigate the risk (for example, siting ovals for an educational establishment between the hazardous vegetation and structures. Note – The preparation of a bushfire management plan in accordance with the methodology in the QFES <i>Bushfire resilient communities</i> document may assist in demonstrating compliance with this performance outcome		
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 <i>Bushfire resilient communities</i> document may assist in demonstrating compliance with this performance outcome.	AO15 No acceptable outcome is prescribed.	Complies with PO15 The proposed development does not involve community infrastructure for essential services as defined in Table 7 of this bushfire overlay code.
PO16 Development avoids or mitigates the risks to public safety and the environment from the manufacture or storage of materials listed in Table 7 that are hazardous in the context of bushfire to an acceptable or tolerable level. Note – The preparation of a bushfire management plan in accordance with the methodology in the QFES <i>Bushfire resilient communities</i> document may assist in demonstrating compliance with this acceptable outcome.	AO16 No acceptable outcome is prescribed.	Complies with PO16 The proposed development does not involve the storage of hazardous materials in the context of bushfire hazard as defined in Table 7 of this bushfire overlay code.

Performance outcomes	Acceptable outcomes	Compliance assessment
Editor's note – In addition to the requirements of this code the <i>Work Health and Safety Act 2011</i> and associated Regulation and Guidelines, the <i>Environmental Protection Act 1994</i> and the relevant building assessment provisions under the <i>Building Act 1975</i> contain requirements for the manufacture and storage of hazardous substances. Information is provided by Business Queensland on the requirements for storing and transporting hazardous chemicals, available at: www.business.qld.gov.au/running-business/protecting-business/risk-management/hazardous-chemicals/storing-transporting.		
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 <i>Bushfire resilient communities</i> document may assist in demonstrating compliance with this performance outcome.	AO17.1 Landscaping treatments within any asset protection zone comprise only low threat vegetation, including grassland managed in a minimal fuel condition, maintained lawns, golf courses, maintained public reserves and parklands, vineyards, orchards, cultivated gardens, commercial nurseries, nature strips and windbreaks. Note – Minimal fuel condition means there is insufficient fuel available to significantly increase the severity of the bushfire attack, for example short-cropped grass to a nominal height of 10 centimetres. OR	Not applicable With the exception of a very small area of landscaping, the setback from the high potential bushfire intensity area adjoining the southern boundary of the site consists of a hardstand area for vehicle manoeuvring. As a result, no APZ is required.
	AO17.2 Landscaping management within any asset protection zone maintains a: (a) potential available fuel load which is less than eight tonnes/hectare in aggregate; and (b) fuel structure which is discontinuous. Note – The preparation of a landscape management plan undertaken in accordance with the methodology in the QFES <i>Bushfire resilient communities</i> document may assist in demonstrating compliance with this acceptable outcome.	Not applicable With the exception of a very small area of landscaping, the setback from the high potential bushfire intensity area adjoining the southern boundary of the site consists of a hardstand area for vehicle manoeuvring. As a result, no APZ is required.
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.	AO18.1 Required revegetation or rehabilitation: (a) is located outside of any asset protection zone; or (b) maintains a potential available fuel load which	Not applicable

Performance outcomes	Acceptable outcomes	Compliance assessment
Note – The undertaking of a bushfire hazard assessment in accordance with the methodology in the QFES <i>Bushfire resilient communities</i> document may assist in demonstrating compliance with this performance outcome.	is less than eight tonnes/hectare in aggregate and fuel structure which is discontinuous. Note – The preparation of a landscape management plan undertaken in accordance with the methodology in the QFES <i>Bushfire resilient communities</i> document may assist in demonstrating compliance with acceptable outcome (b).	
	AO18.2 Revegetation or rehabilitation of areas located within mapped medium, high or very high potential bushfire intensity areas, revegetate and rehabilitate in a 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 <i>Bushfire resilient communities</i> 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 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	<i>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</i>
Community infrastructure for essential services	<i>educational establishment, emergency services, hospital</i>

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Group	Uses
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