# BUSHFIRE ASSESSMENT REPORT

# MANFACTURED HOME ESTATE

## 283 & 303 Wollombi Road, Farley

Prepared for Vivacity Property


## Bushfire Planning Australia

**Stuart Greville**
Accredited Bushfire Practitioner
BPAD-26202
✆ 0400 917 792
✉ stuart@bfpa.com.au
BPA Reference: 2319 Farley

Prepared for: Vivacity Property
Attention: Tom Copping
✆ 0421 109 183
✉ tom@vivacityproperty.com.au

## Disclaimer and Limitation

This report is prepared solely for Vivacity Property (the 'Client') for the specific purposes of only for which it is supplied (the 'Purpose'). This report is not for the benefit of any other person; either directly or indirectly and is strictly limited to the purpose and the facts and matters stated in it and will not be used for any other application.

This report is based on the site conditions surveyed at the time the document was prepared. The assessment of the bushfire threat made in this report is made in good faith based on the information available to Bushfire Planning Australia at the time.

The recommendations contained in this report are considered to be minimum standards and they do not guarantee that a building or assets will not be damaged in a bushfire. In the making of these comments and recommendations it should be understood that the focus of this document is to minimise the threat and impact of a bushfire.

Finally, the implementation of the adopted measures and recommendations within this report will contribute to the amelioration of the potential impact of any bushfire upon the development, but they do not and cannot guarantee that the area will not be affected by bushfire at some time.

## Document Status: 2319 - SFPP Manufactured Home Estate

| Version | Status | Purpose | Author | Review Date |
|---|---|---|---|---|
| 1 | Draft | Draft for Review | Katrina Mukevski | 23 August 2023 |
| 2 | Draft | Draft for Client Review | Stuart Greville | 23 August 2023 |
| 3 | Final | Final for Submission | Stuart Greville | 13 September 2023 |

## Certification

As the author of this Bushfire Threat Assessment (BAR), I certify this BAR provides the detailed information required by the NSW Rural Fire Service under Clause 45 of the Rural Fires Regulation 2022 and Appendix 1 of Planning for Bushfire Protection 2019 for the purposes of an application for a bush fire safety authority under section 100B(4) of the Rural Fires Act 1997.

BPAD Bushfire Planning & Design Accredited Practitioner Level 2

**Stuart Greville**

Accredited Bushfire Practitioner

BPAD-26202

Date: 13 September 2023

In signing the above, I declare the report is true and accurate to the best of my knowledge at the time of issue.

# Executive Summary

Bushfire Planning Australia (BPA) has been engaged by Vivacity Property (the 'Proponent') to undertake a Bushfire Assessment Report (BAR) for the proposed manufactured home estate (MHE) located at 283 & 303 Wollombi Road, Farley; legally known as Lot 2 & 4 DP810894. The proposed development includes the construction of 254 manufactured home dwelling sites, a clubhouse and ancillary community facilities. Each dwelling will be used for long-term occupation and constructed to the appropriate construction standard.

A manufactured home estate is defined as a Special Fire Protection Purpose (SFPP) under the NSW Rural Fire Service (RFS) document Planning for Bushfire Protection 2019 (PBP 2019).

This BAR found the site was exposed to a medium to high bushfire hazard located primarily to the south and west of the site which is mapped as Category 1 Vegetation in the Maitland City Council Bush Fire Prone Land Map.

This BAR has been prepared in accordance with the submission requirements detailed in Appendix 2 of PBP 2019 and has demonstrated the proposed expansion satisfies the Aims and Objectives of PBP 2019, including the Specific Objectives for SFPP developments.

The following key recommendations have been designed to enable the proposed development to achieve Performance Criteria for SFPP developments detailed in Section 6.8 of PBP 2019:

1. The areas within the site identified as an Asset Protection Zone in **Figure 14** shall be managed as an Inner Protection Area (IPA) as outlined within Appendix 4 of PBP 2019 and the RFS document *Standards for asset protection zones*;
2. All future buildings to be constructed on the proposed sites shall have due regard to the specific considerations given in the National Construction Code: Building Code of Australia (BCA) which makes specific reference to Australian Standard AS3959-2018 Construction of buildings in bushfire prone areas (AS3959-2018) and the NASH Standard Steel Framed Construction in Bushfire Prone Areas;
3. Where the new dwellings are not required to be comply with the BCA, each dwelling shall be constructed in accordance with the relevant Bushfire Attack Level (BAL) identified on **Figure 14** and shown in **Table 4**. An updated Approval to Operate (issued under Section 68 of the Local Government Act 1993) shall include the BAL Contour Plan and require each new dwelling to be constructed to the nominated BAL rating. Furthermore, a suitably worded instrument(s) must be created pursuant to section 88 of the Conveyancing Act 1917 clearly outlining the require BAL ratings for each dwelling;
4. All new sites are to be connected to a reliable water supply network and that suitable fire hydrants are located throughout the development site that are clearly marked and provided for the purposes of bushfire protection. Fire hydrant spacing, sizing and pressure shall comply with AS2419.1 2005 and section 6.8.3 of PBP 2019;
5. The internal access road is to be designed and constructed in accordance with section 6.8.2 of PBP 2019 **or** as shown in the plans contained in **Appendix A.** An additional 4 passing bays are recommended along the eastern perimeter to increase the road width to 8m wide for a minimum of 20m in length for each passing bay;
6. Consideration should be given to landscaping and fuel loads on site to decrease potential fire hazards on site; and
7. A Bushfire Emergency Management and Evacuation Plan (BEMEP) shall be prepared that is consistent with the RFS Guidelines 'Development Planning – A Guide to Developing a Bush Fire Emergency Management and Evacuation Plan December 2014'.

This assessment has been made based on the bushfire hazards observed in and around the site at the time of inspection and production (September 2023).

Should the above recommendations be implemented, the proposed modification to the approved development will result in a better bushfire outcome as the existing bushfire risk should be suitably mitigated to offer an acceptable level of protection to life and property for those persons and assets occupying the site but they do not and cannot guarantee that the area will not be affected by bushfire at some time.

# Table of Contents

# Figures



# Tables



# Plates

# Appendices

# Terms and Abbreviations

| Abbreviation | Meaning |
|---|---|
| APZ | Asset Protection Zone |
| AS2419-2005 | Australian Standard – Fire Hydrant Installations |
| AS3959-2018 | Australian Standard – Construction of Buildings in Bush Fire Prone Areas |
| BAR | Bushfire Assessment Report |
| BCA | Building Code of Australia |
| BC Act | NSW Biodiversity Act 2016 |
| BDAR | Biodiversity Development Assessment Report |
| BMP | Bush Fire Management Plan |
| BPA | Bush Fire Prone Area (Also Bushfire Prone Land) |
| BPL | Bush Fire Prone Land |
| BPLM | Bush Fire Prone Land Map |
| BPM | Bush Fire Protection Measures |
| DoE | Commonwealth Department of the Environment |
| DPI Water | NSW Department of Primary Industries – Water |
| EPA Act | NSW Environmental Planning and Assessment Act 1979 |
| EPBC Act | Commonwealth Environment Protection and Biodiversity Conservation Act 1999 |
| FDI | Fire Danger Index |
| FMP | Fuel Management Plan |
| ha | hectare |
| IPA | Inner Protection Area |
| LGA | Local Government Area |
| MCC | Maitland City Council |
| NPWS | NSW National Parks and Wildlife Service |
| OPA | Outer Protection Area |
| OEH | NSW Office of Environment and Heritage |
| PBP 2019 | Planning for Bushfire Protection 2019 |
| RF Act | Rural Fires Act 1997 |
| RF Regulation | Rural Fires Regulation |
| RFS | NSW Rural Fire Service |
| TSC Act | NSW Threatened Species Conservation Act 1995 (as repealed) |
| VMP | Vegetation Management Plan |

# 1. Introduction

Bushfire Planning Australia (BPA) has been engaged by Vivacity Property to undertake a Bushfire Assessment Report (BAR) for the proposed manufactured home estate (MHE) at 283 & 303 Wollombi Road, Farley; legally known as Lot 2 & 4 DP810894. The proposed development will create 254 manufactured home sites, a clubhouse and ancillary services.

The assessment aims to consider and assess the bushfire hazard and associated potential bushfire threat relevant to the proposed development, and to outline the minimum mitigative measures which would be required in accordance with the provisions of the New South Wales Rural Fire Service (RFS) publication *Planning for Bushfire Protection 2019* (PBP 2019) that has been released and adopted through the *Environmental Planning and Assessment Amendment* (Planning for Bushfire Protection) *Regulation 2007* and the *Rural Fires Regulation 2013*.

## 2. Site Description

**Table 1: Site Details**

| | |
|---|---|
| **Address** | 283 & 303 Wollombi Road, Farley |
| **Title** | Lot 2 & 4 DP810894 |
| **LGA** | Maitland City Council |
| **Site Area** | 30.37 ha |
| **Land Use Zone** | R1 General Residential and RU2 Rural Landscape (**Figure 1**) |
| **Context** | The site is large and an irregular shape, located on the southern side of Wollombi Road and includes multiple dwellings and dams. Vegetation primarily exists from the mid-section to the southern boundary of the site.<br>There is vegetation located to the east, south and west of the site. There are rural residential properties to the north of the site, north of Wollombi Road. |
| **Fire History** | The site lies within a local government area with a Fire Danger Index (FDI) rating of 100. |

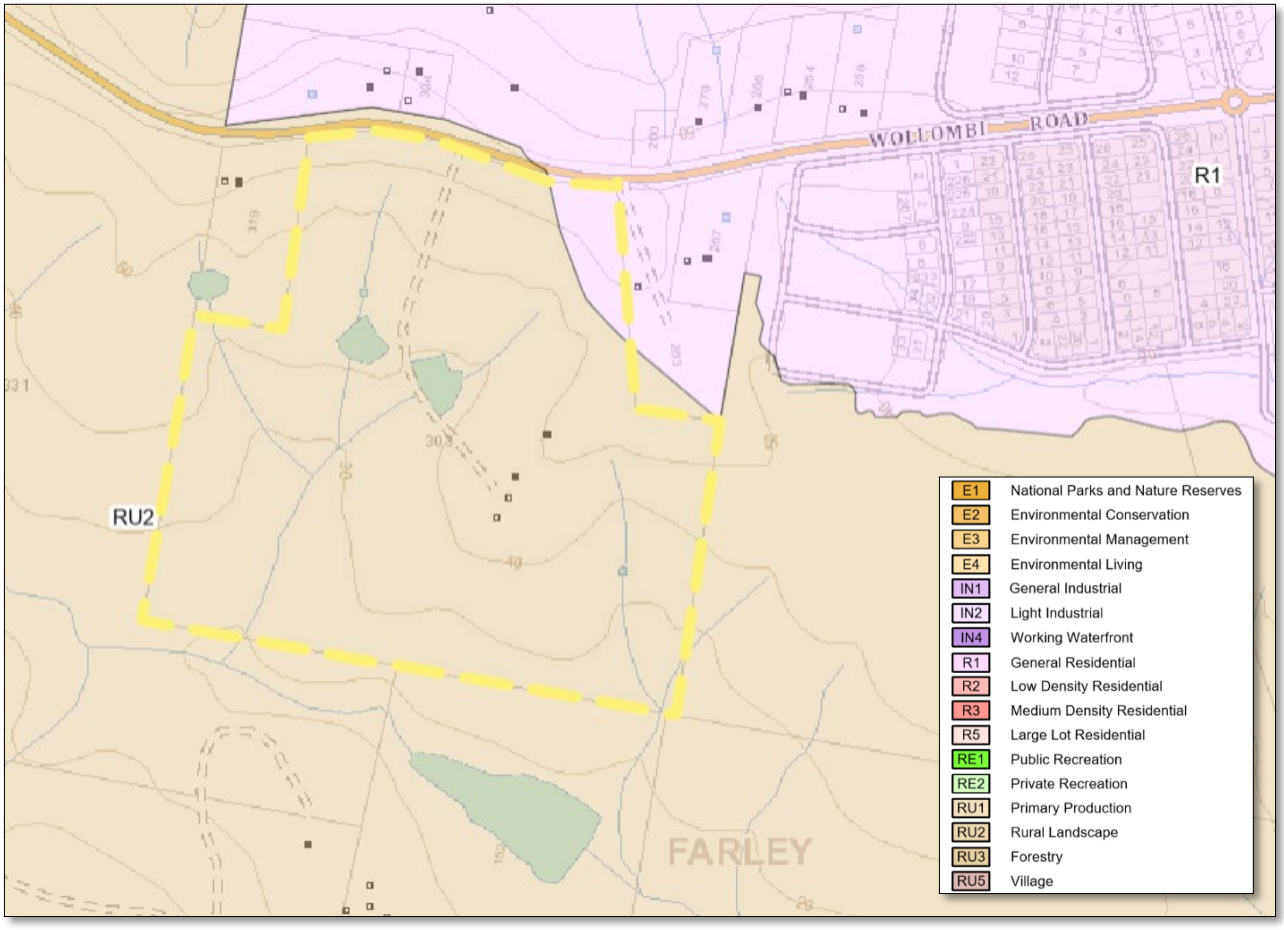


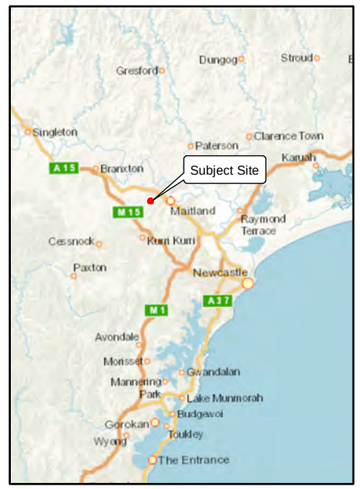

**Figure 1: Maitland Local Environmental Plan 2011 (Land Zoning Map Sheet)**

**Project: 303 Wollombi Rd, Farley: Job No: 2319**

*Figure 2*

# Site Location

BUSHFIRE PLANNING AUSTRALIA




Subject Site

100m Buffer

140m Buffer

SOURCE:
Cadastral Boundary: NSW Department of Finance, Services and Innovation 2023
Basemap: NSW Department of Customer Service 2022

N
W E
S

0 200 400
Meters

A3 Scale: 1:10,000

File:2319-Farley-Fig1-SiteLocation-230328 Date: 28/03/2023



GEOVIEW
GIS & mapping solutions for infrastructure, town planning & environmental management

## 2.1. Bushfire Prone Land

Bushfire activity is prevalent in landscapes that carry fuel and the two predominant bushfire types are grassland and forest fires. Factors such as topographic characteristics and quantity of fuel loads influence the intensity and spread of fire. The scale of a bushfire hazard is tailored to the characteristics of the hazard, the size and characteristics of the affected population, types of land use exposed to bushfire, predicted development growth pressures and other factors affecting bushfire risk.

**Figure 3** demonstrates the site is mapped as Vegetation Category 1 and Vegetation Category 3 bushfire prone land.

Vegetation Category 3 bushfire prone land exists primarily on the northern portion of the site and along the eastern boundary. Vegetation Category 3 bushfire prone land also exists to the north, north-east, north-west, south-east and south-west within and beyond 140m of the site.

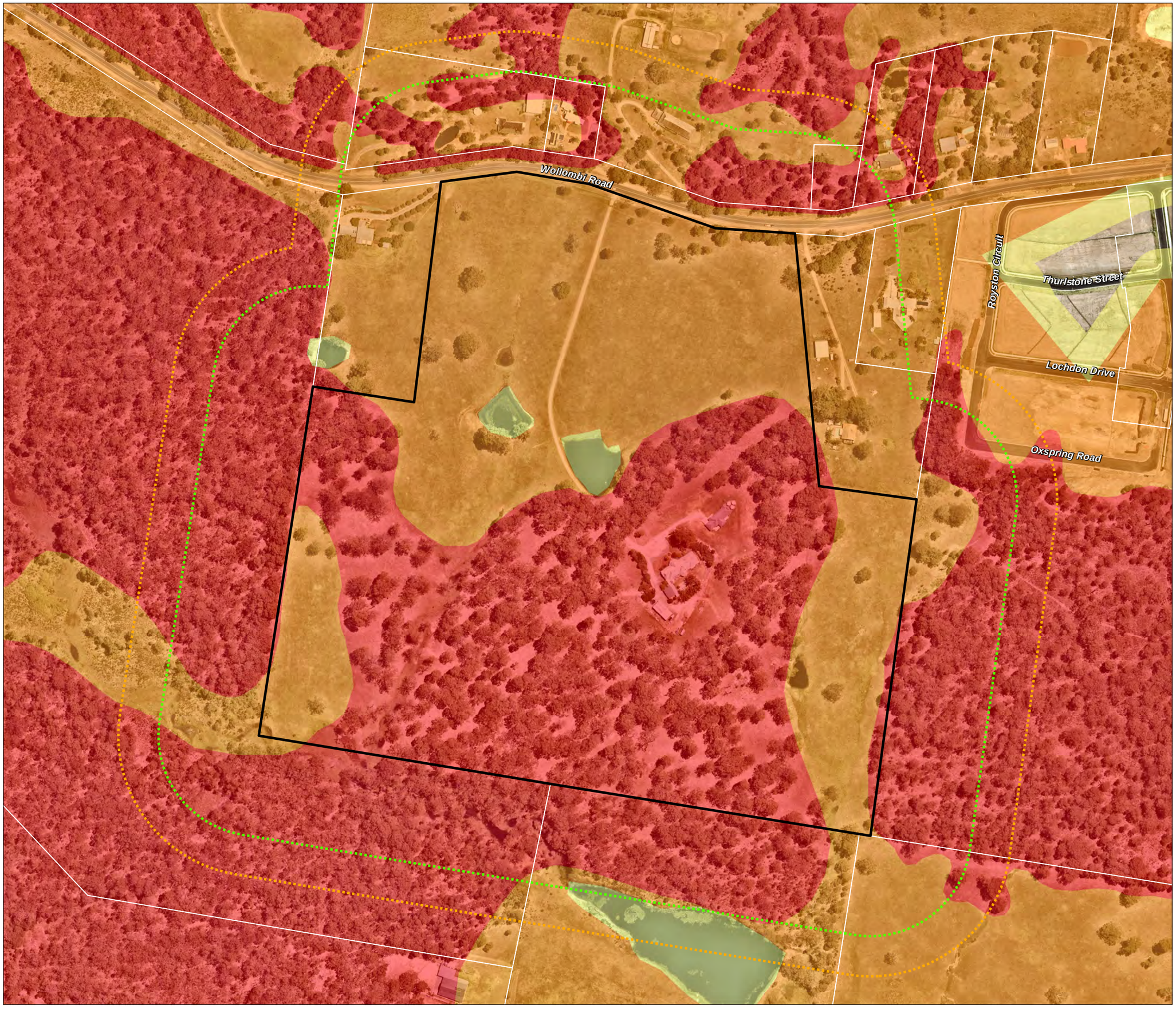
Vegetation Category 1 bushfire prone land is identified from the mid-section of the site extending to the south. This vegetation continues to the south / south-west and expands to the west within and beyond 140m from the site and is identified as the primary bushfire hazard. Vegetation Category 1 bushfire prone land is scattered to the north and also exists immediately along the south-eastern boundary within and beyond 140m of the site.

Project: 303 Wollombi Rd, Farley: Job No: 2319

*Figure 3*

# NSW Bush Fire Prone Land

BUSHFIRE PLANNING AUSTRALIA




- Subject Site
- 100m Buffer
- 140m Buffer

**Bushfire Prone Land**

- Vegetation Category 1
- Vegetation Category 3
- Buffer

SOURCE:
Cadastral Boundary: NSW Department of Finance, Services and Innovation 2022
NSW Bush Fire Prone Land: NSW Rural Fire Service 2022
Aerial Photo: NearMap 03/01/2023

N
W E
S

0 100
Meters

A3 Scale: 1:3,500

File:2319-Farley-Fig2-BFPL-230328 Date: 28/03/2023

## 2.2. Proposed Development

The proposed development seeks to develop a manufactured home estate (MHE) consisting of 254 sites, a clubhouse and associated ancillary services.

The proposed development includes the construction of a new site perimeter road and interconnecting non-perimeter roads to provide safe access and egress for emergency personnel and occupants and direct access to each site.

Plans of the proposed development are contained in **Appendix A** and shown in **Figure 4**.


**Figure 4: Proposed Development**

## 2.3. Aims and Objectives

The assessment aims to consider and assess the bushfire hazard and associated potential bushfire threat relevant to the proposed development, and to outline the minimum mitigative measures which would be required in accordance with the provisions of the New South Wales Rural Fire Service (RFS) publication *Planning for Bushfire Protection 2019* (PBP 2019) and the *Rural Fires Regulation 2013.*

This assessment has been undertaken in accordance with clause 45 of the Rural Fires Regulation 2022. This BAR also addresses the aims and objectives of PBP 2019, being:

- Afford buildings and their occupants protection from exposure to a bushfire;
- Provide a defendable space to be located around buildings;
- Provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent the likely fire spread to buildings;
- Ensure that appropriate operational access and egress for emergency service personnel and occupants is available;
- Provide for ongoing management and maintenance of bushfire protection measures (BPMs); and
- Ensure that utility services are adequate to meet the needs of firefighters.

A compliance table demonstrating compliance with PBP 2019 is provided in **Appendix B**.

## 2.4. Specific Objectives for Special Fire Protection Purposes

The aims and objectives listed in section 1.1 of PBP 2019 remain applicable to Special Fire Protection Purposes (SFPP) developments, however further consideration has been given to SFPP developments due to the nature of these environments and the occupants they accommodate. Occupants of SFPP developments are generally more vulnerable to bushfire attack therefore specific objectives have been put in place to ensure greater protection is provided (section 6.2 PBP 2019). Specific objectives include:

- Minimise levels of radiant heat, localised smoke and ember attack through increased APZ, building design and siting;
- Provide for an appropriate operational environment for emergency service personnel during firefighting and emergency management;
- Ensure the capacity of existing infrastructure (such as roads and utilities) can accommodate the increase in demand during emergencies as a result of the development; and
- Ensure emergency evacuation procedures and management which provides for the special characteristics and needs of occupants.

As a manufactured home estate is classified as a SFPP development, the specific objectives and acceptable solutions for a SFPP development have been considered.

### 2.4.1. Specific Residential-Based SFPP

Whilst manufactured homes can be built to achieve all levels of construction required under the NCC, they are not required to obtain separate development consent for each dwelling. Instead, dwellings must comply with the design, construction and installation requirements of Part 3 of the *Local Government (Manufactured Home Estates, Caravan Parks, Camping Grounds and Moveable Dwellings) Regulation* 2005 ('the Regulation'). A Notice of Completion of Installation is required by Clause 68 of the Regulation and can be used to require evidence of construction standards, including BAL and AS3959-2018.

The acceptable solution for manufactured housing is the provision of an APZ which achieves 10kW/m$^2$; being commensurate with the SFPP development.

However, evidence can be provided with the Notice of Completion of Installation, which confirms that all dwellings have been constructed to the appropriate construction standards under AS3959-2018 or NASH standard, and an APZ has been established which meets 29kW/m$^2$, being for a standard residential dwelling.

# 3. Bushfire Hazard Assessment

## 3.1. Vegetation Assessment

Vegetation classification over the site and surrounding area has been carried out as follows:

- Aerial Photograph Interpretation to map the vegetation classification
- Reference to NSW State Vegetation Type, Department of Planning and Environment 2022 (**Figure 5**); and
- Site inspection completed by Stuart Greville on 1 April 2023 (**Plates 1-12**).

In accordance with PBP 2019, an assessment of the vegetation over a distance of 100m in all directions from the site was undertaken. Vegetation that may be considered a bushfire hazard was identified in all directions from the development footprint. The vegetation classification is based on the revised Table 2.3 in AS3959-2018 and Appendix 1 of PBP 2019. The unmanaged fuel loads detailed in the *RFS Comprehensive Fuel Loads Fact Sheet* (March 2019) have been adopted for the purpose of assessing the bushfire hazard. The findings of the site inspection were compared to the available vegetation mapping. The inconsistencies between the mapping sources and hazardous vegetation mapped on the NSW RFS Bushfire Prone Land maps were quantified during the site inspection.

### 3.1.1. Reliability Assessment

Although the bushfire prone land mapping is intended to be regularly updated, land use and vegetation cover that contribute to bushfire hazards are subject to change. A reliability assessment was undertaken for the subject site and all land within 140m. In this instance the bushfire prone land mapping is not consistent with existing vegetation present within the site.


**Project: 303 Wollombi Rd, Farley: Job No: 2319**

*Figure 5*

# NSW State Vegetation Type (Class)

BUSHFIRE PLANNING AUSTRALIA

Subject Site

100m Buffer

140m Buffer

**Vegetation Class**

Coastal Floodplain Wetlands

Hunter-Macleay Dry Sclerophyll Forests

Not native vegetation

SOURCE:
Cadastral Boundary: NSW Department of Finance, Services and Innovation 2023
NSW Vegetation Type: NSW Department of Planning, Industry and Environment 2022
Aerial photo: NearMap 03/01/2023

N
W E
S

0 25 50 75 100 125 150 175
Meters

A3 Scale: 1:3,500

File:2319-Farley-Fig3-Vegetation-NSW-SVT-230328

Date: 28/03/2023



GEOVIEW
GIS & mapping solutions for infrastructure, town planning & environmental management

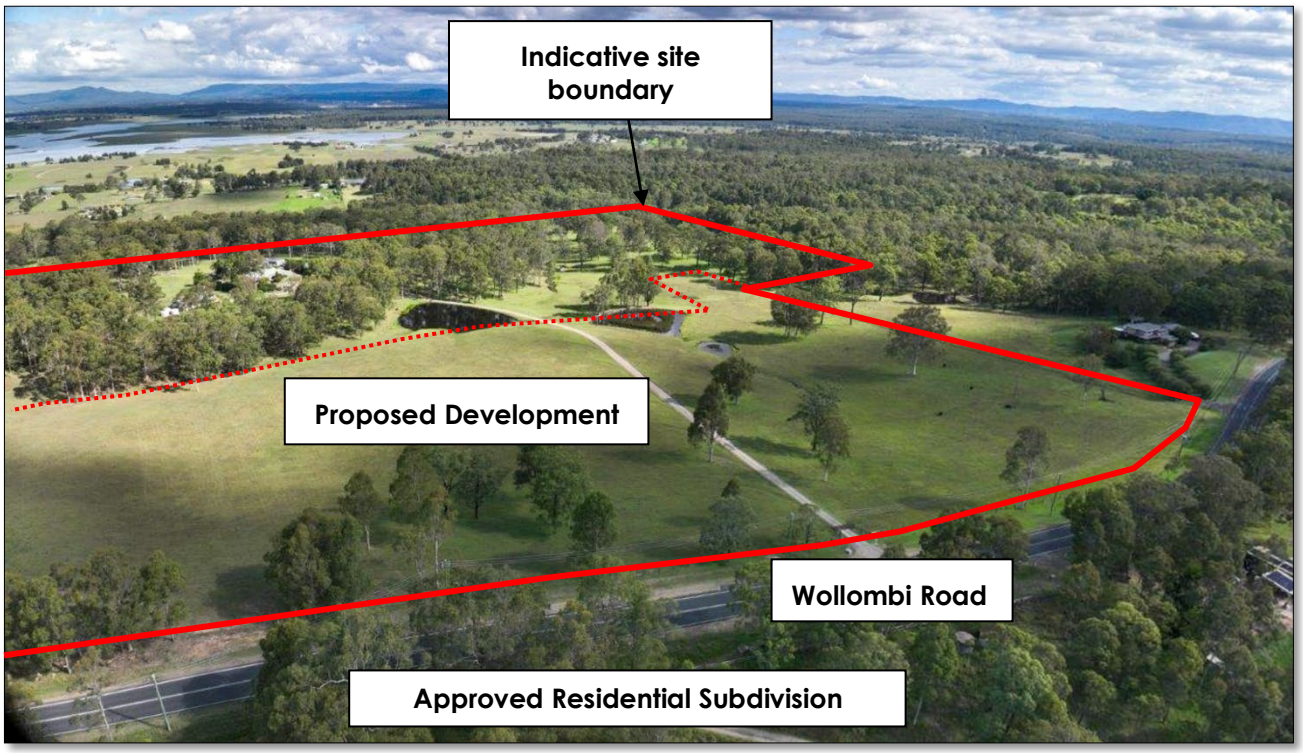



**Plate 1: Open pasture across northern portion of the site adjoining Wollombi Road to be developed**

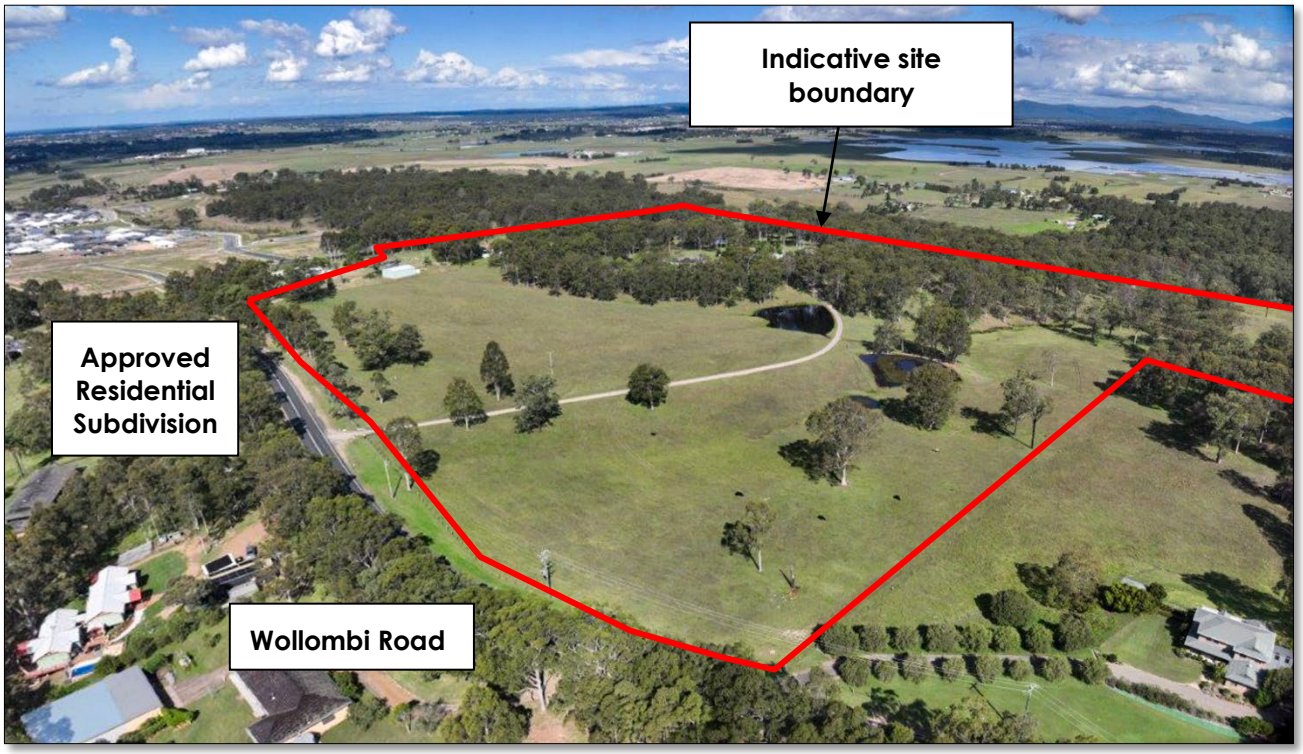



**Plate 2: Northern portion of the site currently cleared**


**Plate 3: Eastern boundary looking south down towards T10 – *Hunter Macleay DSF* (forest)**


**Plate 4: *Hunter Macleay Dry Sclerophyll Forest* adjacent to eastern boundary (T13)**


**Plate 5: Development footprint along eastern boundary cleared of mature vegetation**


**Plate 6: Southern boundary between T14 and T15 ecotone between forested wetland, forest and grassland**


**Plate 7: South western corner of site to remain clear of vegetation – continue historical land management (grazing)**


**Plate 8: The majority of surface fuel throughout the site removed and replace with pasture grasses (T26)**


**Plate 9: Western perimeter road adjacent to managed grassland (exotic) T29, T30 & T31**


**Plate 10: Development will not extend beyond open paddocks and grassland to be managed as an APZ**


**Plate 11: Majority of development contained to northern side of existing farm dam**

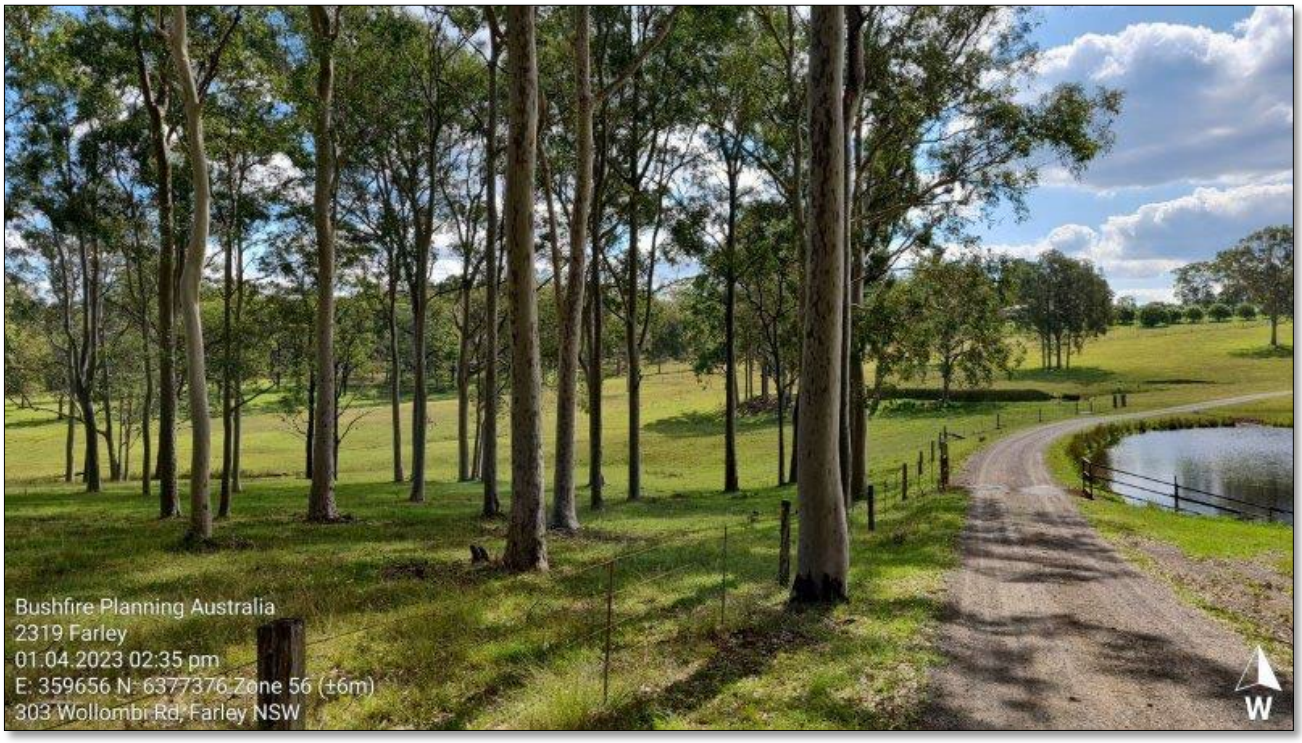



**Plate 12: Minor works required to maintain APZ around the interface of development due to low fuel understorey**

## 3.2. Slope Assessment

The slope assessment was undertaken as follows:

- Review of LiDAR point cloud data – including DEM (NSW LPI);
- Detail survey of existing and design contours; and
- Site inspection completed on 1 April 2023.

An assessment of the slope over a distance of 140m in the hazard direction from the site boundary was undertaken. The effective slope was then calculated under the classified vegetation where there was a fire run greater than 50m. The topography of the site has been evaluated to identify both the average slope and by identifying the maximum slope present. These values help determine the level of gradient which will most significantly influence the fire behaviour of the site.

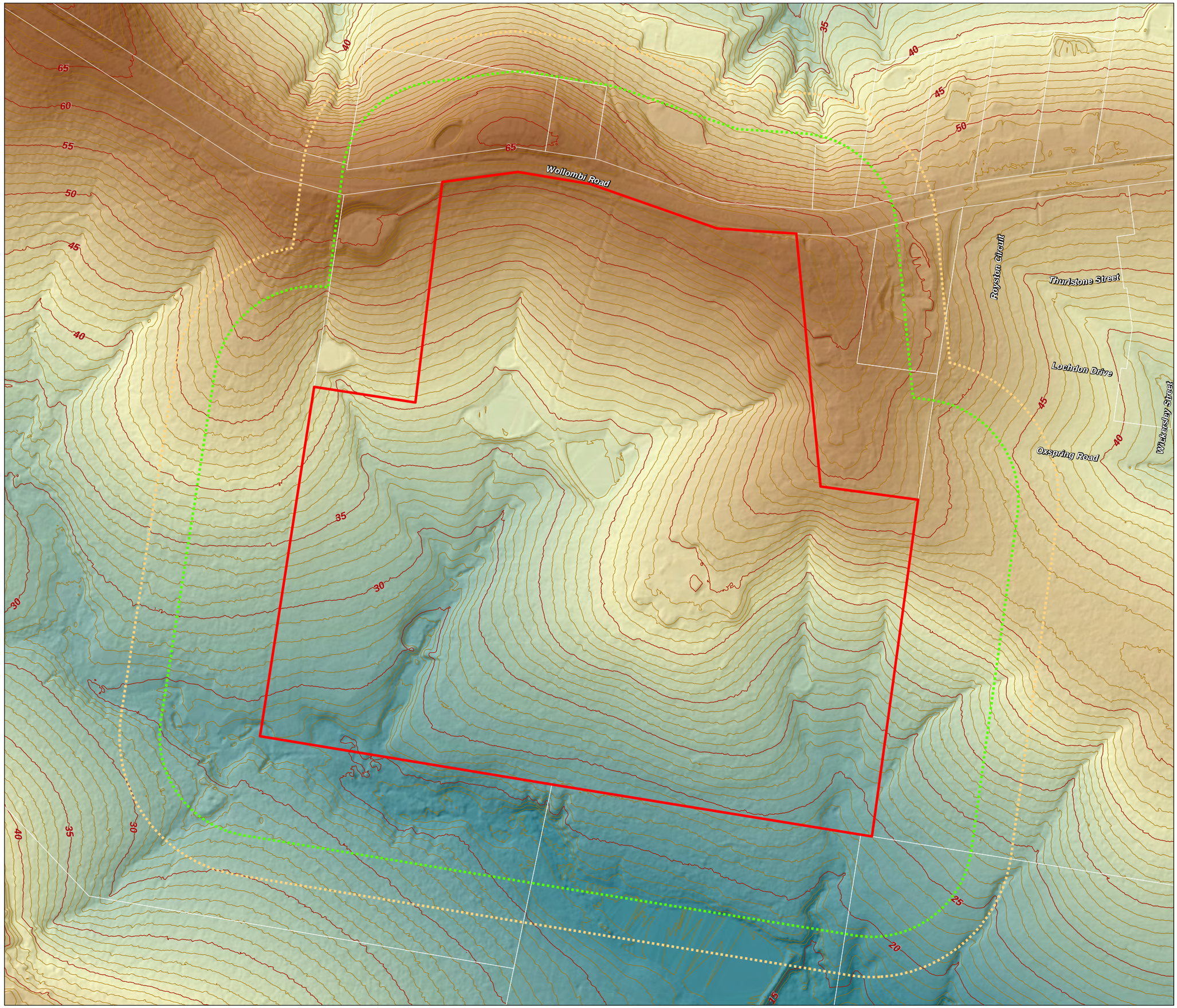
The effective slope in all directions is shown in **Figure 6, Figure 7** and **Table 2.**

The final bushfire hazard assessment defining vegetation classifications and effective slope is shown in **Figure 8.**

Project: 303 Wollombi Rd, Farley: Job No: 2319

*Figure 6*

# Digital Elevation Model




BUSHFIRE PLANNING AUSTRALIA

- Subject Site
- 100m Buffer
- 140m Buffer
- Contour (5m)
- Contour (1m)

**Elevation (AHD)**

High : 71m

Low : 12m

SOURCE:
Cadastral Boundary: NSW Department of Finance, Services and Innovation 2023
Surface analysis: Derived from Newcastle & Cassnock 1m resolution LiDAR: © Department Finance, Services and Innovation 2014

N W E S

0 25 50 75 100 125 150 175
Meters

A3 Scale: 1:3,500

File:2319-Farley-Fig4-DEM-230328 Date: 28/03/2023



GEOVIEW
GIS & mapping solutions for infrastructure, town planning & environmental management

**Project: 303 Wollombi Rd, Farley: Job No: 2319**

*Figure 7*

# Slope Analysis: LiDAR

BUSHFIRE PLANNING AUSTRALIA

Subject Site
100m Buffer
140m Buffer
Contour (5m)
Contour (1m)

**Slope**

0° - 5°
5° - 10°
10° - 15°
15°- 20°
>20°

SOURCE:
Cadastral Boundary: NSW Department of Finance, Services and Innovation 2022
Surface analysis: Derived from Newcastle & Cassnock 1m resolution LiDAR: © Department Finance, Services and Innovation 2014
Aerial photo: NearMap 03/01/2023

N
W E
S

0 25 50 75 100 125 150 175
Meters

A3 Scale: 1:3,500

File:2319-Farley-Fig5-SlopeLiDAR-230328 Date: 28/03/2023

## 3.3. Significant Environmental Features

The recommended bushfire protection measures have been designed to minimise any unacceptable impacts on a significant environmental feature. The recommended APZs are located within cleared land that has historically been used for intensive agricultural.

## 3.4. Threatened Species, populations or ecological communities

The area of the site to be affected by the proposed development has been identified to minimise impact on any threatened species, population or EEC. All bushfire mitigation measures; including APZs will consider the existing and potential biodiversity values to minimise impact where possible. Firebird ecoSultants has completed an ecological assessment (dated 19 April 2023).

## 3.5. Aboriginal Objects

A search of the AHIMS database (results contained in **Appendix C**) revealed there are no Aboriginal sites or places recorded near the site. All bushfire mitigation measures, such as APZs have considered this and been designed to minimise disturbing any artefacts if identified.

## 3.6. Results

All vegetation identified within the current Bush Fire Prone Land map was confirmed during the site inspection and in this instance is not consistent.

All vegetation within the site, primarily located from the mid-section to the southern boundary, was confirmed as a forest formation, namely *Hunter Macleay Dry Sclerophyll Forests*. This vegetation also exists immediately along the eastern and western site boundaries extending within and beyond 140m of the site and is identified as the primary bushfire hazard.

Additionally, a forested wetland, namely *Coastal Floodplain Wetlands*, exists within the south-west corner of the site and extends along the southern boundary before spreading to the west within and beyond 140m of the site.

The remainder of the site within the development footprint and isolated sections along the eastern and western boundaries were confirmed managed and therefore not required to be considered for the purposes of Planning for Bushfire Protection (PBP 2019).

The results of hazard assessment are detailed in **Table 2** and shown in **Figure 8**.

**Table 2: Slope and Vegetation Assessment Results**

| Transect | Vegetation or Other Infrastructure | Vegetation Classification (PBP 2019) | Slope |
|---|---|---|---|
| T1 North | Forest vegetation north of site separated by Wollombi Road | *Forest* (Hunter Macleay Dry Sclerophyll Forest) | 8.1° Downslope |
| T2 North | Forest vegetation north of site separated by Wollombi Road and rural properties | *Forest* (Hunter Macleay Dry Sclerophyll Forest) | 10.7° Downslope |
| T3 North | From northern site boundary to forest vegetation separated by Wollombi Road | *Excluded* (Managed land) | -5.7° Upslope |
| T4 North | Narrow corridor (17m) of forest vegetation on the northern side of Wollombi Road | *Excluded* (Low Threat vegetation) | -6.4° Upslope |
| T5 North | Forest vegetation within rural properties north of site separated by Wollombi Road | *Forest* (Hunter Macleay Dry Sclerophyll Forest) | 8.0° Downslope |
| T6 North | Forest vegetation north of site separated by Wollombi Road | *Forest* (Hunter Macleay Dry Sclerophyll Forest) | 9.9° Downslope |
| T7 North | Forest vegetation north of site separated by Wollombi Road | *Forest* (Hunter Macleay Dry Sclerophyll Forest) | 11.3° Downslope |
| T8 North-east | Managed land on rural properties identified as proposed future development | *Excluded* (Managed land) | 2.7° Downslope |
| T9 East | Forest vegetation east of the site on neighbouring lot | *Forest* (Hunter Macleay Dry Sclerophyll Forest) | 3.5° Downslope |
| T10 East | Forest vegetation east of the site on neighbouring lot | *Forest* (Hunter Macleay Dry Sclerophyll Forest) | 2.1° Downslope |
| T11 East | Forest vegetation from the subject sites eastern boundary on the neighbouring lot | *Forest* (Hunter Macleay Dry Sclerophyll Forest) | -0.5° Upslope |
| T12 East | Forest vegetation from the subject sites eastern boundary on the neighbouring lot | *Forest* (Hunter Macleay Dry Sclerophyll Forest) | -5.4° Upslope |
| T13 East | Forest vegetation from the subject sites eastern boundary on the neighbouring lot | *Forest* (Hunter Macleay Dry Sclerophyll Forest) | 0.7° Downslope |
| T14 East | Forest vegetation from the subject sites eastern boundary on the neighbouring lot | *Forest* (Hunter Macleay Dry Sclerophyll Forest) | 0.5° Downslope |
| T15 On-site | Forest vegetation within the subject sites south-eastern corner extending beyond the sites southern boundary | *Forest* (Hunter Macleay Dry Sclerophyll Forest) | 2.6° Downslope |
| T16 On-site | Forest vegetation within the subject sites south-eastern corner | *Forest* (Hunter Macleay Dry Sclerophyll Forest) | 1.5° Downslope |

| | | | |
|---|---|---|---|
| T17<br>On-site | Forest vegetation within the subject site | *Forest*<br>(Hunter Macleay Dry Sclerophyll Forest) | 0.2°<br>Downslope |
| T18<br>On-site | Replanted gully transitioning to forest vegetation within the subject site | *Forest*<br>(Hunter Macleay Dry Sclerophyll Forest) | 5.9°<br>Downslope |
| T19<br>On-site | Forest vegetation from the proposed road to existing and retained managed land within the subject site | *Forest*<br>(Hunter Macleay Dry Sclerophyll Forest) | 3.8°<br>Downslope |
| T20<br>On-site | Forest vegetation from the proposed road within the subject site | *Forest*<br>(Hunter Macleay Dry Sclerophyll Forest) | 4.9°<br>Downslope |
| T21<br>On-site | Forest vegetation south of the proposed development site within the subject site | *Forest*<br>(Hunter Macleay Dry Sclerophyll Forest) | 6.2°<br>Downslope |
| T22<br>On-site | Forest vegetation south of the proposed development site within the subject site | *Forest*<br>(Hunter Macleay Dry Sclerophyll Forest) | 1.1°<br>Downslope |
| T23<br>On-site | Replanted vegetation along the gully transitioning to managed land | *Forest*<br>(Hunter Macleay Dry Sclerophyll Forest) | -3.2°<br>Upslope |
| T24<br>On-site | Grassland transitioning to replanted vegetation along the gully | *Grassland* | 3.2°<br>Downslope |
| T25<br>On-site | Grassland transitioning to replanted vegetation along the gully | *Grassland* | 4.7°<br>Downslope |
| T26<br>On-site | Forest vegetation along both sides of the gully within the subject site towards the western site boundary | *Forest*<br>(Hunter Macleay Dry Sclerophyll Forest) | -0.7°<br>Upslope |
| T27<br>North-west | Grassland from the north-western subject site boundary to the replanted gully | *Grassland* | 3.0°<br>Downslope |
| T28<br>North-west | Grassland from the north-western subject site boundary | *Grassland* | 0.1°<br>Downslope |
| T29<br>North-west | Grassland from the north-western subject site boundary | *Grassland* | 2.2°<br>Downslope |
| T30<br>North-west | Wollombi Road separately the subject site and forest vegetation | *Excluded* | -4.1°<br>Upslope |
| T31<br>North-west | Subject site to the northern rural residential property, separated by Wollombi Road | *Excluded* | -1.0°<br>Upslope |
| T32<br>North-west | Subject site to the northern rural residential property, separated by Wollombi Road | *Excluded* | -0.7°<br>Upslope |
| T33<br>North-west | Subject site to the northern rural residential property, separated by Wollombi Road | *Excluded* | Flat |
| T34 and all gullies<br>North-west | Forest vegetation along the proposed replanted forested wetland | *Forested Wetland*<br>(Coastal Floodplain Wetland) | ~2.0°<br>Downslope |

Project: 303 Wollombi Rd, Farley: Job No: 2319

*Figure 8*

# Slope & Vegetation Assessment

BUSHFIRE PLANNING AUSTRALIA

Approved Development - 245 lot subdivision (DA/2020/1425)

Wollombi Road

Royston Circuit

Thurlstone Street

Wickersley Street

Lochdon Drive

Oxspring Road

Lot 6 DP634525 | Lot 5 DP585160 | Lot 91 DP774537 | Lot 92 DP774537 | Lot 4 DP535667 | Lot 3 DP535667 | Lot 2 DP535667 | Lot 1 DP513480 | Lot 100 DP1267906 | Lot 3 DP810894 | Lot 1 DP810894 | Lot 2 DP810894 | Lot 4 DP810894 | Lot 216 DP1270566 | Lot 217 DP1270586 | Lot 151 DP1189168 | Lot 101 DP629692 | Lot 1 DP1077519 | Lot 152 DP1189168

T1 100m 8.1° | T2 100m 10.7° | T3 75m -1.0° | T4 17m -4.4° | T5 100m 8.0° | T6 100m 9.9° | T7 100m 11.3° | T8 100m 4.5° | T9 100m 3.5° | T10 100m 2.1° | T11 100m -0.5° | T12 100m -3.4° | T13 100m 0.7° | T14 100m 0.5° | T15 100m 2.6° | T16 100m 1.5° | T17 100m 0.2° | T18 100m -5.6° | T19 65m 3.8° | T20 100m 4.9° | T21 100m 6.2° | T22 100m 1.1° | T23 55m -3.2° | T24 38m 3.2° | T25 50m 4.7° | T26 100m -0.7° | T27 100m 3.0° | T28 100m 0.1° | T29 100m 2.2° | T30 29m -4.1° | T31 75m -1.0° | T32 33m -0.6° | T33 27m 0.0° | T34 100m 2.8°

Subject Site
Lot Boundary
100m Buffer
140m Buffer
Contour (5m)
Contour (1m)
RL
Downslope transect
Upslope transect
Approved Development - 245 lot subdivision (DA / 2020 / 1425)
Gully
Proposed Development
Proposed Roads
Proposed Fire trail
Detention Basin

**Vegetation Class**

Grassland
Coastal Floodplain Wetlands
Hunter - Macleay Dry Sclerophyll Forests
Managed Land
Not native vegetation

SOURCE:
Cadastral Boundary: NSW Department of Finance, Services and Innovation 2022
Surface analysis: Derived from Newcastle & Cassnock 1m resolution LiDAR: © Department Finance, Services and Innovation 2014
Vegetation: Bushfire Planning Australia 2023
Aerial photo: Site = BPA Drone August 2023, surrounds = NearMap 03/01/2023

N W E S

0 25 50 75 100 125 150 175
Meters

A3 Scale: 1:3,500

File:2319-Farley-Fig6-SlopeVeg-230905 Date: 5/09/2023

# 4. Bushfire Protection Measures

This Bushfire Assessment Report (BAR) has adopted the methodology to determine the appropriate Bushfire Protection Measures (BPMs) detailed in PBP 2019. As part of the BAR, the recommended BPMs demonstrate the aims and objectives of PBP 2019 have been satisified; includinig the matters considered by the RFS necessary to protect persons, property and the environment from the danger that may arise from a bushfire.

- APZs
- Access
- Water Supply and Utilities
- Building Construction and Design
- Landscaping
- Emergency Management Arrangements

## 4.1. Asset Protection Zones

An Asset Protection Zone (APZ) is an area surrounding a development that is managed to reduce the bushfire hazard to an acceptable level to mitigate the risk to life and property. The required width of the APZ varies with slope and the type of hazard. An APZ can consist of both an inner protection area (IPA) and an outer protection area (OPA). In this instance the entire APZ and the balance of the development site; excluding the residue lot, shall be managed as an IPA.

An APZ can include the following:

- Lawns;
- Discontinuous gardens;
- Swimming pools;
- Roads, driveways and managed verges;
- Unattached non-combustible garages with suitable separation from the dwelling;
- Open space / parkland; and
- Car parking.

The presence of a few shrubs or trees in the APZ is acceptable provided that they:

- Do not touch or overhang any buildings;
- Are well spread out and do not form a continuous canopy;
- Are not species that retain dead material or deposit excessive quantities of ground fuel in a short period or in a danger period; and
- Are located far enough away from any dwelling so that they will not ignite the dwelling by direct flame contact or radiant heat emission.

Woodpiles, wooden sheds, combustible material storage areas, large areas / quantities of garden mulch, stacked flammable building materials etc. are not recommended in the APZ.

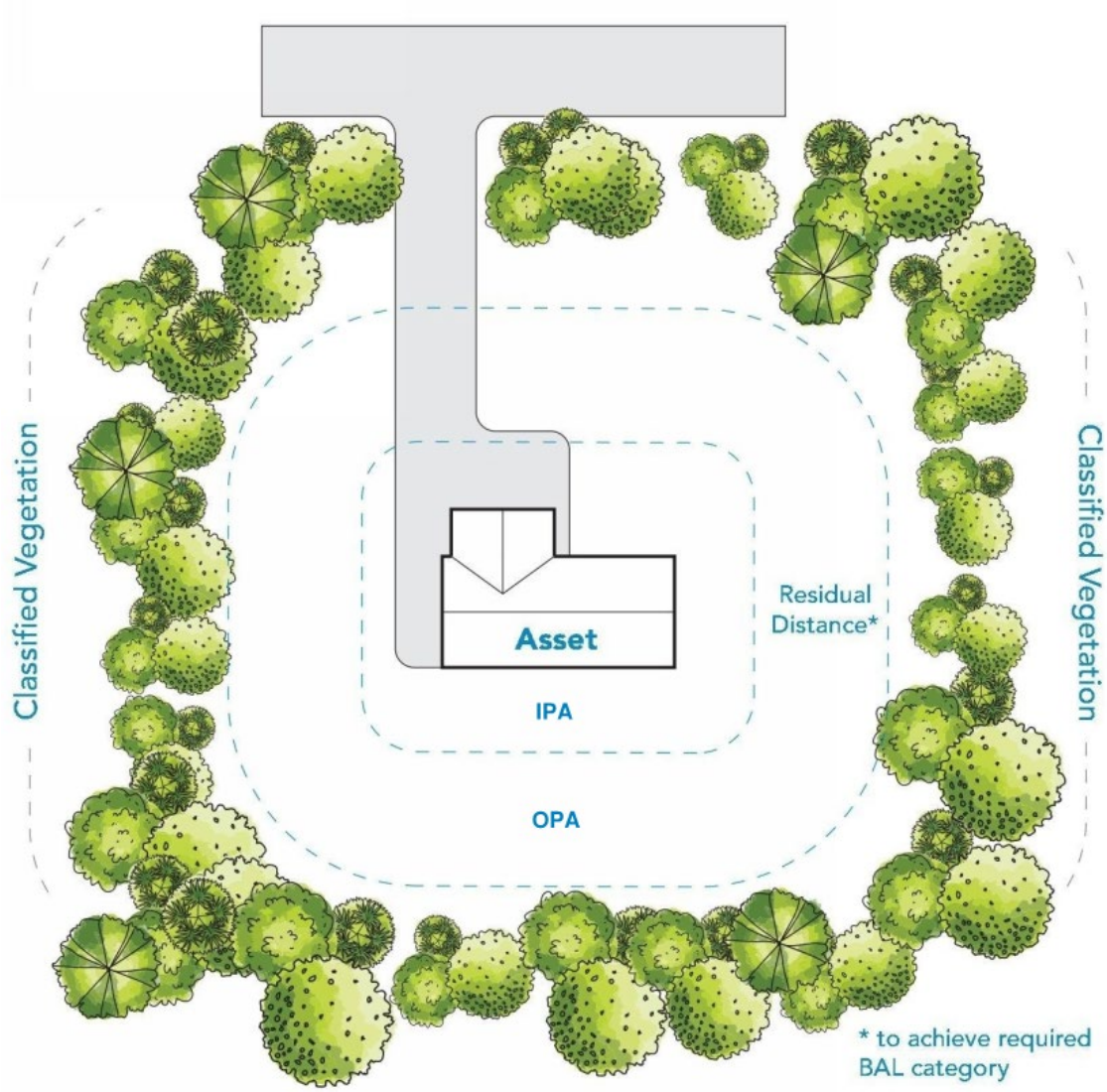



**Figure 9: Inner and Outer Asset Protection Zones**

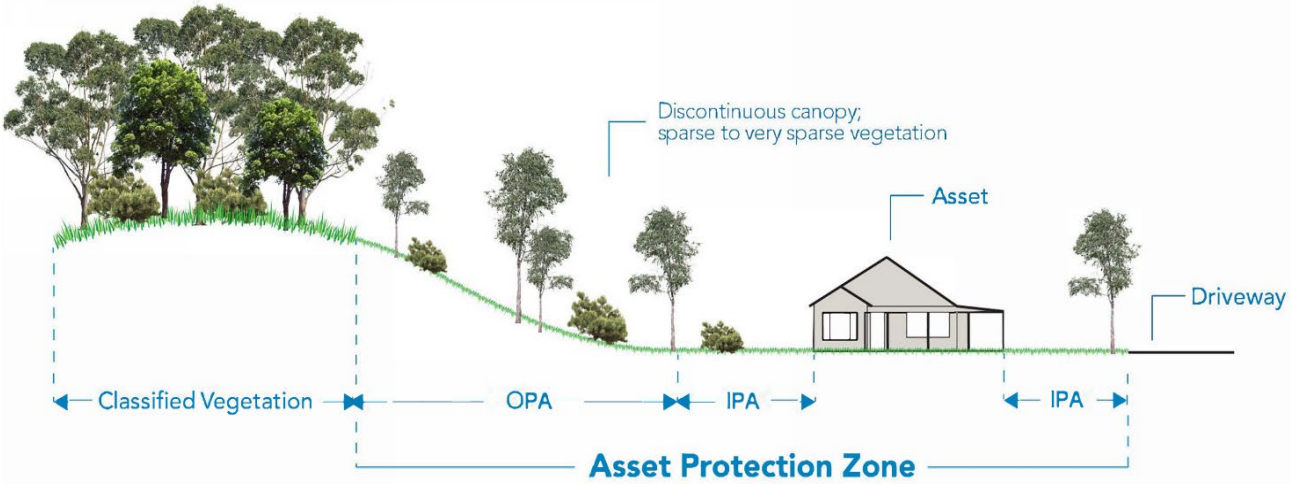



**Figure 10: Example of the APZ profile**

### 4.1.1. Special Fire Protection Purposes

Special Fire Protection Purposes (SFPP) developments mean the occupants of the proposed development may be more vulnerable to bush fire attack and therefore may require greater protection from such threats as well as assisted evacuation. SFPPs include schools, seniors housing, child care centres, hospitals and tourist accommodation.

Section 6.8 of PBP 2019 provides protection measures for SFPP developments. In comparison to a standard residential development where radiant heat levels of no greater than 29kW/m$^2$ are acceptable, radiant heat levels of greater than 10kW/m$^2$ must not be experienced by on any part of the buildings. To achieve radiant heat levels of less than 10kW/m$^2$, APZs of 67m or greater are typically required (based on Table A1.12.1 of PBP 2019) for a *forest* vegetation formation.

Objectives for SFPP developments place emphasis on the space surrounding buildings (as defendable space and APZs) and less reliance on construction standards. SFPP developments are highly dependent on suitable emergency evacuation arrangements, which require greater separation from bush fire threats.

### 4.1.2. Determining the Appropriate Setbacks

To achieve compliance with the performance criteria for APZs (Table 6.3a), the Acceptable Solutions outlined in Table A1.12.1 of PBP 2019 may be adopted as a deemed-to-satisify solution.

Alternatively, the appropriate APZ setback may be determined to achieve the Performance Criteria by adopting a performance-based solution. Based on the unique site characteristics identified by the BAR, the intensity of a bushfire event presented as the radiant heat exposure was calculated at several locations throughout the development site using the NBC Bushfire Attack Assessor V4.1. The nominated fuel loads for the respective vegetation classifications as published by the RFS in March 2019 have been used to determine the APZs and the effective slope obtained from the Digital Elevation Model (DEM) for each transect.

As the site lies within the Maitland City Council LGA, it is assessed under a FDI rating of 100. The Detailed Method (Method 2) outlined in Australian Standard *AS3959-2018 Construction of buildings in bushfire prone areas* was used to calculate the potential level of radiant heat flux generated at the nominated locations (see transects T1-T34). To ensure the APZs achieve the intent of Section 6.3 of PBP 2019, the APZs have been determined to ensure all lots are able to accomomodate a dwelling that will not be exposed to radiant heat levels exceeding 29kW/m$^2$. The NBC Bushfire Attack Assessor report detailing the inputs used is contained in **Appendix D**.

#### 4.1.2.1. Specific Residential-based SFPP: Manufactured Home Estates

Although the proposed development does not include the construction of any dwellings, each future dwelling shall be constructed in accordance with the relevant Bushfire Attack Level (BAL) identified on **Figure 14** and shown in **Table 4**. The Approval to Operate shall include the BAL Contour Plan and require each dwelling to be constructed to the nominated BAL rating (maximum BAL-29). Furthermore, a suitably worded instrument(s) will be created pursuant to section 88B of the *Conveyancing Act 1917* clearly outlining the require BAL ratings for each dwelling. In this regard, each new dwelling will be sited to ensure radiant heat levels do not exceed 29kW/m$^2$.

Refer to **Table 3** and **Figure 14** for the required APZs.

**Table 3: Required APZ setbacks**

| Transect | Vegetation Classification (PBP 2019) | Slope | APZ Table A1.12.1 | APZ Table A1.12.2 | Recommended APZ (29kW/m²) |
|---|---|---|---|---|---|
| T1 North | *Forest* (Hunter Macleay Dry Sclerophyll Forest) | 8.1° Downslope | 93m | 36m | **25m** |
| T2 North | *Forest* (Hunter Macleay Dry Sclerophyll Forest) | 10.7° Downslope | 100m | 45m | **28m** |
| T3 North | *Excluded* (Managed land) | -5.7° Upslope | N/A | N/A | **N/A** |
| T4 North | *Excluded* (Low Threat vegetation) | -6.4° Upslope | N/A | N/A | **N/A** |
| T5 North | *Forest* (Hunter Macleay Dry Sclerophyll Forest) | 8.0° Downslope | 93m | 36m | **24m** |
| T6 North | *Forest* (Hunter Macleay Dry Sclerophyll Forest) | 9.9° Downslope | 93m | 36m | **27m** |
| T7 North | *Forest* (Hunter Macleay Dry Sclerophyll Forest) | 11.3° Downslope | 100m | 45m | **28m** |
| T8 North-east | *Excluded* (Managed land) | 2.7° Downslope | N/A | N/A | **N/A** |
| T9 East | *Forest* (Hunter Macleay Dry Sclerophyll Forest) | 3.5° Downslope | 79m | 29m | **20m** |
| T10 East | *Forest* (Hunter Macleay Dry Sclerophyll Forest) | 2.1° Downslope | 79m | 29m | **20m** |
| T11 East | *Forest* (Hunter Macleay Dry Sclerophyll Forest) | -0.5° Upslope | 67m | 24m | **20m** |
| T12 East | *Forest* (Hunter Macleay Dry Sclerophyll Forest) | -5.4° Upslope | 67m | 24m | **13m** |
| T13 East | *Forest* (Hunter Macleay Dry Sclerophyll Forest) | Flat* (0.7° Downslope) | 67m | 24m | **17m** |
| T14 East | *Forest* (Hunter Macleay Dry Sclerophyll Forest) | Flat* (0.5° Downslope) | 67m | 24m | **17m** |
| T15 On-site | *Forest* (Hunter Macleay Dry Sclerophyll Forest) | 2.6° Downslope | 79m | 29m | **18m** |
| T16 On-site | *Forest* (Hunter Macleay Dry Sclerophyll Forest) | 1.5° Downslope | 79m | 29m | **17m** |
| T17 On-site | *Forest* (Hunter Macleay Dry Sclerophyll Forest) | Flat* (0.2° Downslope) | 67m | 24m | **16m** |
| T18 On-site | *Forest* (Hunter Macleay Dry Sclerophyll Forest) | 5.9° Downslope | 93m | 36m | **22m** |

| | | | | | |
|---|---|---|---|---|---|
| T19 On-site | *Forest* (Hunter Macleay Dry Sclerophyll Forest) | 3.8° Downslope | 79m | 29m | **19m** |
| T20 On-site | *Forest* (Hunter Macleay Dry Sclerophyll Forest) | 4.9° Downslope | 79m | 29m | **20m** |
| T21 On-site | *Forest* (Hunter Macleay Dry Sclerophyll Forest) | 6.2° Downslope | 93m | 36m | **22m** |
| T22 On-site | *Forest* (Hunter Macleay Dry Sclerophyll Forest) | 1.1° Downslope | 79m | 29m | **17m** |
| T23 On-site | *Forest* (Hunter Macleay Dry Sclerophyll Forest) | -3.2° Upslope | 67m | 24m | **14m** |
| T24 On-site | *Grassland* | 3.2° Downslope | 40m | 12m | **11m** |
| T25 On-site | *Grassland* | 4.7° Downslope | 40m | 12m | **11m** |
| T26 On-site | *Forest* (Hunter Macleay Dry Sclerophyll Forest) | -0.7° Upslope | 67m | 24m | **16m** |
| T27 North-west | *Grassland* | 3.0° Downslope | 40m | 12m | **12m** |
| T28 North-west | *Grassland* | Flat* (0.1° Downslope) | 36m | 10m | **12m** |
| T29 North-west | *Grassland* | 2.2° Downslope | 40m | 12m | **12m** |
| T30 North-west | *Excluded* | -4.1° Upslope | N/A | N/A | **N/A** |
| T31 North-west | *Excluded* | -1.0° Upslope | N/A | N/A | **N/A** |
| T32 North-west | *Excluded* | -0.7° Upslope | N/A | N/A | **N/A** |
| T33 North-west | *Excluded* | Flat | N/A | N/A | **N/A** |
| T34 & revegetated gullies North-west | *Forested Wetland* (Coastal Floodplain Wetland) | ~2.0° Downslope | 79m | 29m | **11m** |

* Slopes less than 1 degree are considered ineligible and have been assessed as 'Flat'.

## 4.2. Access

In the unlikely event of a serious bushfire, it will be essential to ensure that adequate ingress / egress and the provision of defendable space are afforded in the layout. The following design specifications detailed in PBP 2019 are relevant to the proposed development:

- Internal roads are two-wheel drive all weather roads;
- internal perimeter roads are provided with a minimum carriageway width of up to 8m;
- be through roads, but if unavoidable then dead ends should be not more than 100 metres in length, incorporate a minimum 12 metres turning circle (either in cul-de-sac or T-head formation) and should be clearly sign posted as dead ends;
- the capacity of road surfaces is sufficient to carry fully loaded fire fighting vehicles (15 tonnes);
- curves of roads (other than perimeter roads) are a minimum inner radius of 6 metres and minimal in number, to allow for rapid access and egress;
- maximum grade for sealed roads do not exceed 12.5$^{o}$;
- have a minimum vertical clearance to a height of four metres at all times;

The proposed development provides a network of internal non-perimeter roads and two (2) perimeter roads along the eastern and western boundaries. The new perimeter roads are connected by a perimeter fire trail extending along the southern boundary to provide defendable space between the site and the adjoining hazard, but also to provide access for maintenance and hazard management throughout the property.

The 2 new perimeter roads will be widened at several sections to ensure an unobstructed carriageway suitable for use by firefighting appliances is available along the entire length of the boundary. This will require several passing bays which will widen the carriageway to 8m wide in several areas.

In this instance the proposed access arrangements are considered to be acceptable and complies with the relevant Performance Criteria.

Refer to **Appendix A** for proposed development showing access.

## 4.3. Emergency Services

There is a NSW Rural Fire Station located at 2 Mustang Drive, Rutherford, approximately 6km (9mins) drive away from the site (**Figure 11**). A second NSW Fire & Rescue station is located at 14 Church Street, Maitland, approximately 6.7km (10mins) from the site (**Figure 12**). In an emergency, either or both of these services could attend the site.

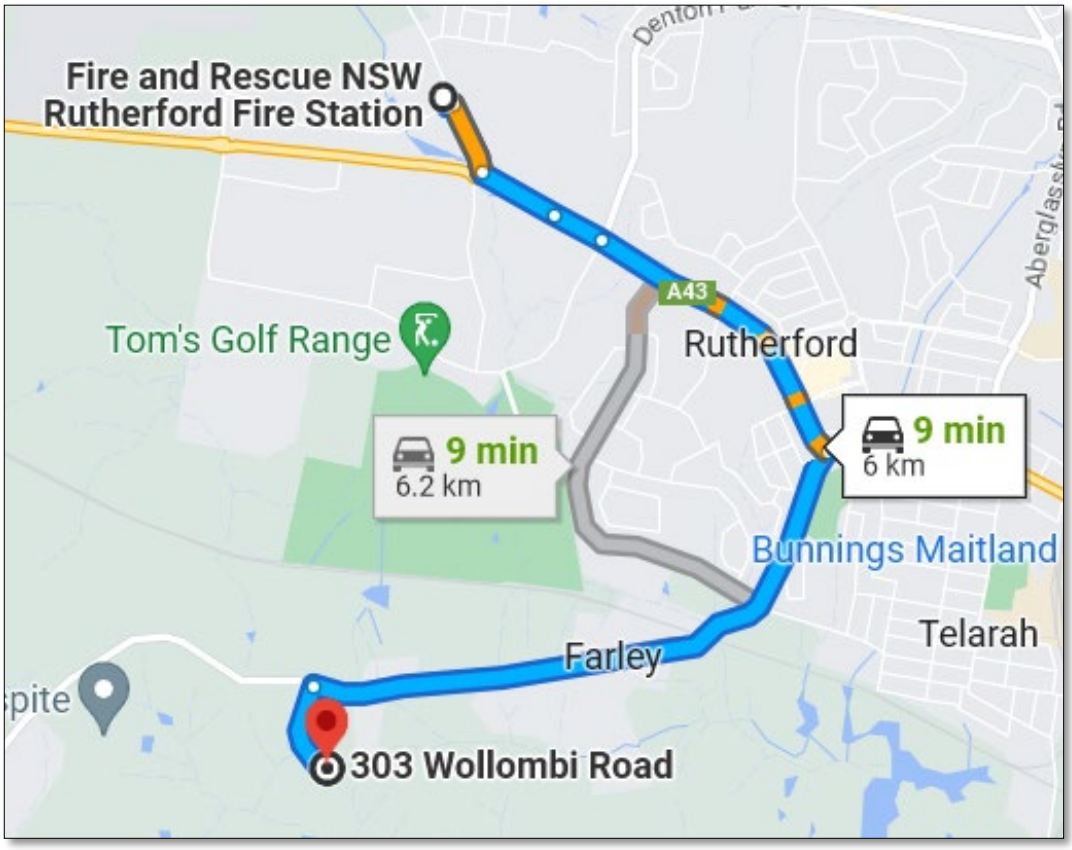



**Figure 11: NSW Fire & Rescue - Rutherford**

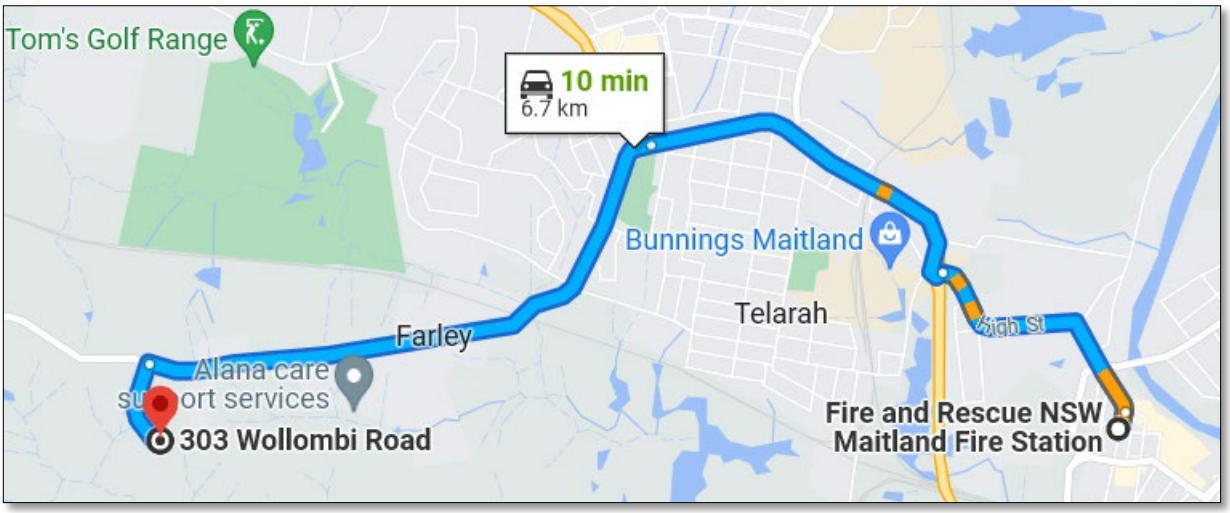



**Figure 12: NSW Fire & Rescue - Maitland**

## 4.4. Services - water, electricity and gas

### 4.4.1. Water

Fire hydrant spacing, sizing and pressure should comply with AS 2419.1-2005. Hydrants are not to be located within any road carriageway.

All lots within the proposed development will be connected to the internal reticulated water supply.

### 4.4.2. Electricity

All new electricity services are located underground.

### 4.4.3. Gas

Any reticulated or bottled gas should be installed and maintained according to the requirements of the relevant authorities and AS 159-2002. It is expected that the location of gas services will not lead to ignition of surrounding bushland or the fabric of buildings.

## 4.5. Construction Standards - Bushfire Attack Level

All buildings, including single dwellings (Class 1a buildings), constructed within the site are recommended to satisfy the Performance Requirements of the National Construction Code: Building Code of Australia (BCA).

Accordingly, all forthcoming habitable buildings shall satisfy the requirements of Part 3.7.4 of the BCA. The *Deemed-to-Satisfy* (DTS) provision of the BCA can only be achieved if dwellings in bushfire prone areas are constructed in accordance with Australian Standard *AS3959-2018 Construction of buildings in bushfire prone areas*. Alternatively, the DTS provisions can also be achieved if the habitable building is constructed in accordance with the NASH Standard 'Steel Framed Construction in Bushfire Areas'.

Building design and the materials used for construction of future dwellings should be chosen based on the information contained within AS3959-2018, and accordingly the designer/architect should be made aware of this recommendation.

The determinations of the appropriate bushfire attack level (BAL) is based on the maximum potential radiant heat exposure. BALs are based upon parameters such as weather modelling, fire-line intensity, flame length calculations, as well as vegetation and fuel load analysis. The determination of the BAL is derived by assessing the:

- Relevant FDI = *100*;
- Flame temperature = *1090K*;
- Slope = variable;
- Vegetation classification = *forest* and *forested wetland*; and
- Building location.

The Detailed Method (Method 2) outlined in AS3959-2018 was used to calculate the Bushfire Attack Level (BAL) for the development. The NBC Bushfire Attack Assessor V4.1 was used to model the bushfire radiant heat exposure which determined the applicable BAL. All sites with the development layout are exposed to BAL-29 or less.

The greatest bushfire hazard was found to the west of the site being a *forest*.

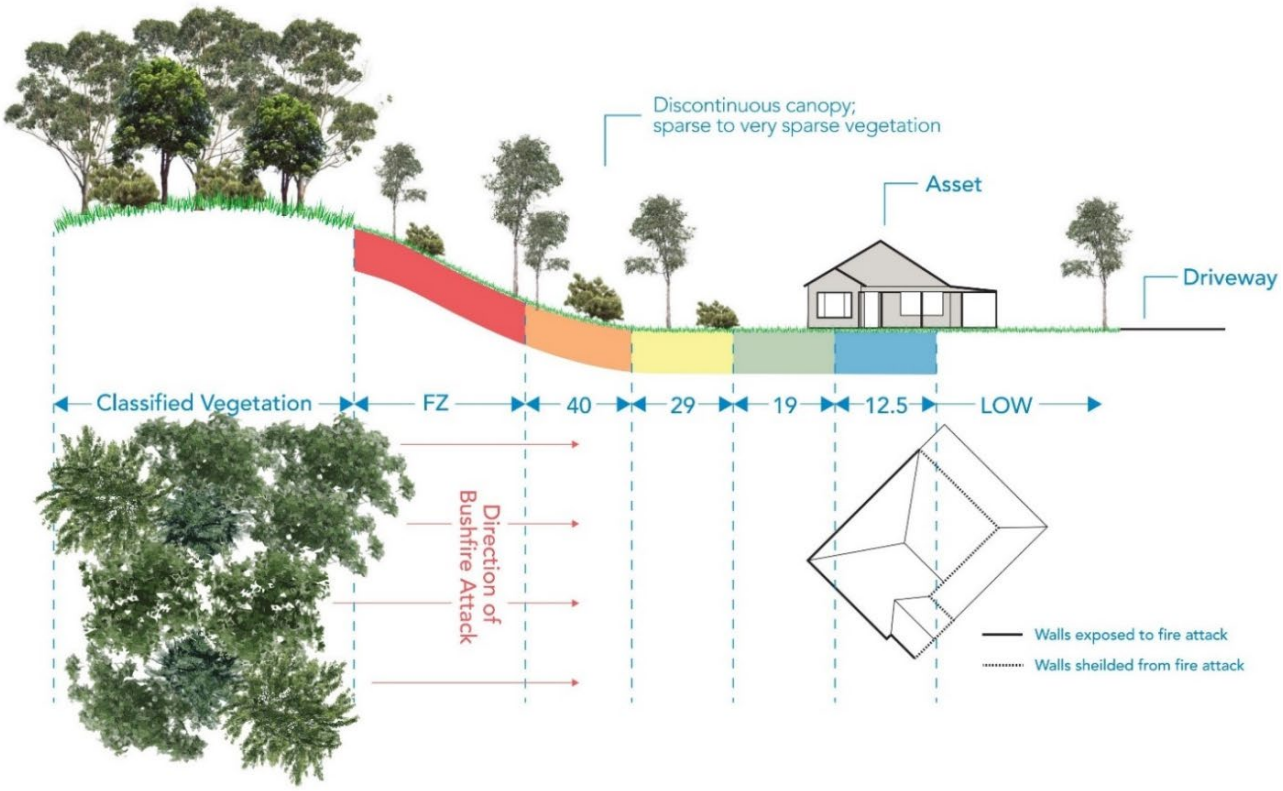



**Figure 13: BAL example**

**Table 4: Bushfire Attack Levels**

| Transect | Vegetation Classification (PBP 2019) | Slope | APZ Provided | Distance from Hazard | Bushfire Attack Level (BAL) |
|---|---|---|---|---|---|
| T1 North | *Forest* (Hunter Macleay DSF) | 8.1° Downslope | **25m** | 0m-<23m | BAL-FZ |
| | | | | 23m-<25m | BAL-40 |
| | | | | 25m-<34m | BAL-29 |
| | | | | 34m-<46m | BAL-19 |
| | | | | 46m-<100m | BAL-12.5 |
| | | | | 69m | 10kW/m$^2$ |
| T2 North | *Forest* (Hunter Macleay DSF) | 10.7° Downslope | **28m** | 0m-<27m | BAL-FZ |
| | | | | 27m-<28m | BAL-40 |
| | | | | 28m-<38m | BAL-29 |
| | | | | 38m-<51m | BAL-19 |
| | | | | 51m-<100m | BAL-12.5 |
| | | | | 75m | 10kW/m$^2$ |
| T3 & T4 North | Excluded | -6.4° Upslope | **N/A** | N/A | BAL-LOW |
| T5 North | *Forest* (Hunter Macleay DSF) | 8.0° Downslope | **24m** | 0m-<22m | BAL-FZ |
| | | | | 22m-<24m | BAL-40 |
| | | | | 24m-<33m | BAL-29 |
| | | | | 33m-<45m | BAL-19 |
| | | | | 45m-<100m | BAL-12.5 |
| | | | | 67m | 10kW/m$^2$ |
| T6 North | *Forest* (Hunter Macleay DSF) | 9.9° Downslope | **27m** | 0m-<25m | BAL-FZ |
| | | | | 25m-<27m | BAL-40 |
| | | | | 27m-<36m | BAL-29 |
| | | | | 36m-<49m | BAL-19 |
| | | | | 49m-<100m | BAL-12.5 |
| | | | | 73m | 10kW/m$^2$ |
| T7 North | *Forest* (Hunter Macleay DSF) | 11.3° Downslope | **28m** | 0m-<27m | BAL-FZ |
| | | | | 27m-<28m | BAL-40 |
| | | | | 28m-<39m | BAL-29 |
| | | | | 39m-<52m | BAL-19 |
| | | | | 52m-<100m | BAL-12.5 |
| | | | | 75m | 10kW/m$^2$ |
| T8 North | Excluded (Managed Land) | 2.7° Downslope | **N/A** | N/A | BAL-LOW |

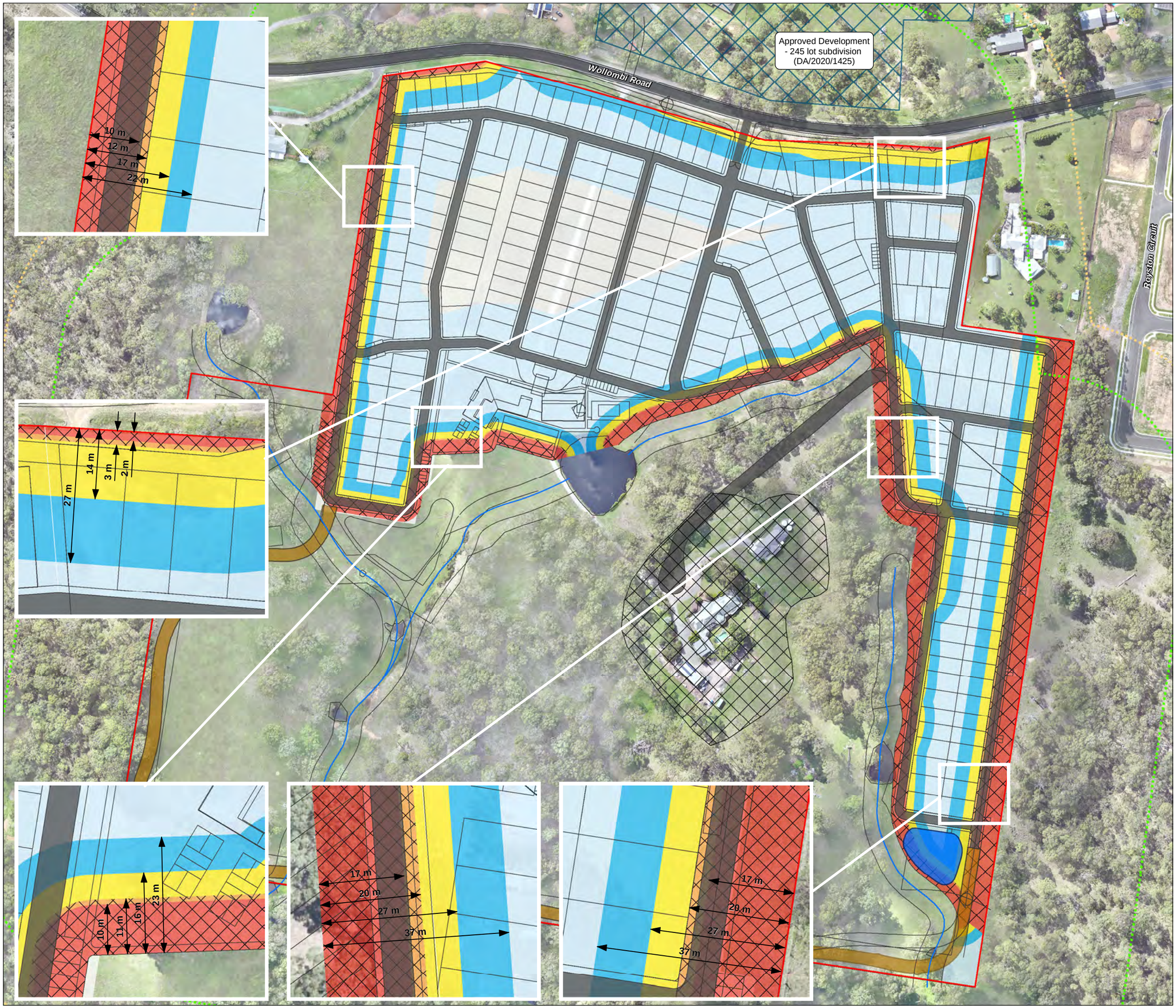
| Transect | Vegetation Classification (PBP 2019) | Slope | APZ Provided | Distance from Hazard | Bushfire Attack Level (BAL) |
|---|---|---|---|---|---|
| T9 East | *Forest* (Hunter Macleay DSF) | 3.5° Downslope | **20m** | 0m-<17m | BAL-FZ |
| | | | | 17m-<20m | BAL-40 |
| | | | | 20m-<27m | BAL-29 |
| | | | | 27m-<37m | BAL-19 |
| | | | | 37m-<100m | BAL-12.5 |
| | | | | 57m | 10kW/m$^2$ |
| T10 East | *Forest* (Hunter Macleay DSF) | 2.1° Downslope | **20m** | 0m-<16m | BAL-FZ |
| | | | | 16m-<20m | BAL-40 |
| | | | | 20m-<26m | BAL-29 |
| | | | | 26m-<36m | BAL-19 |
| | | | | 36m-<100m | BAL-12.5 |
| | | | | 55m | 10kW/m$^2$ |
| T11 East | *Forest* (Hunter Macleay DSF) | -0.5° Upslope | **20m** | 0m-<14m | BAL-FZ |
| | | | | 14m-<20m | BAL-40 |
| | | | | 20m-<23m | BAL-29 |
| | | | | 23m-<32m | BAL-19 |
| | | | | 32m-<100m | BAL-12.5 |
| | | | | 50m | 10kW/m$^2$ |
| T12 East | *Forest* (Hunter Macleay DSF) | -5.4° Upslope | **13m** | 0m-<11m | BAL-FZ |
| | | | | 11m-<13m | BAL-40 |
| | | | | 13m-<18m | BAL-29 |
| | | | | 18m-<26m | BAL-19 |
| | | | | 26m-<100m | BAL-12.5 |
| | | | | 42m | 10kW/m$^2$ |
| T13 East | *Forest* (Hunter Macleay DSF) | Flat* (0.7° Downslope) | **17m** | 0m-<15m | BAL-FZ |
| | | | | 15m-<17m | BAL-40 |
| | | | | 17m-<24m | BAL-29 |
| | | | | 24m-<34m | BAL-19 |
| | | | | 34m-<100m | BAL-12.5 |
| | | | | 52m | 10kW/m$^2$ |
| T14 East | *Forest* (Hunter Macleay DSF) | Flat* (0.5° Downslope) | **17m** | 0m-<15m | BAL-FZ |
| | | | | 15m-<17m | BAL-40 |
| | | | | 17m-<24m | BAL-29 |
| | | | | 24m-<34m | BAL-19 |
| | | | | 34m-<100m | BAL-12.5 |
| | | | | 52m | 10kW/m$^2$ |

| Transect | Vegetation Classification (PBP 2019) | Slope | APZ Provided | Distance from Hazard | Bushfire Attack Level (BAL) |
|---|---|---|---|---|---|
| T15 On-site | *Forest* (Hunter Macleay DSF) | 2.6° Downslope | **18m** | 0m-<17m | BAL-FZ |
| | | | | 17m-<18m | BAL-40 |
| | | | | 18m-<26m | BAL-29 |
| | | | | 26m-<36m | BAL-19 |
| | | | | 36m-<100m | BAL-12.5 |
| | | | | 56m | 10kW/m$^2$ |
| T16 On-site | *Forest* (Hunter Macleay DSF) | 1.5° Downslope | **17m** | 0m-<16m | BAL-FZ |
| | | | | 16m-<17m | BAL-40 |
| | | | | 17m-<25m | BAL-29 |
| | | | | 25m-<34m | BAL-19 |
| | | | | 34m-<100m | BAL-12.5 |
| | | | | 53m | 10kW/m$^2$ |
| T17 On-site | *Forest* (Hunter Macleay DSF) | Flat* (0.2° Downslope) | **16m** | 0m-<15m | BAL-FZ |
| | | | | 15m-<16m | BAL-40 |
| | | | | 16m-<24m | BAL-29 |
| | | | | 24m-<33m | BAL-19 |
| | | | | 33m-<100m | BAL-12.5 |
| | | | | 51m | 10kW/m$^2$ |
| T18 On-site | *Forest* (Hunter Macleay DSF) | 5.9° Downslope | **22m** | 0m-<20m | BAL-FZ |
| | | | | 20m-<22m | BAL-40 |
| | | | | 22m-<30m | BAL-29 |
| | | | | 30m-<42m | BAL-19 |
| | | | | 42m-<100m | BAL-12.5 |
| | | | | 63m | 10kW/m$^2$ |
| T19 On-site | *Forest* (Hunter Macleay DSF) | 3.8° Downslope | **19m** | 0m-<18m | BAL-FZ |
| | | | | 18m-<19m | BAL-40 |
| | | | | 19m-<27m | BAL-29 |
| | | | | 27m-<38m | BAL-19 |
| | | | | 38m-<100m | BAL-12.5 |
| | | | | 58m | 10kW/m$^2$ |
| T20 On-site | *Forest* (Hunter Macleay DSF) | 4.9° Downslope | **20m** | 0m-<19m | BAL-FZ |
| | | | | 19m-<20m | BAL-40 |
| | | | | 20m-<29m | BAL-29 |
| | | | | 29m-<40m | BAL-19 |
| | | | | 40m-<100m | BAL-12.5 |
| | | | | 60m | 10kW/m$^2$ |

| Transect | Vegetation Classification (PBP 2019) | Slope | APZ Provided | Distance from Hazard | Bushfire Attack Level (BAL) |
|---|---|---|---|---|---|
| T21 On-site | *Forest* (Hunter Macleay DSF) | 6.2° Downslope | **22m** | 0m-<20m | BAL-FZ |
| | | | | 20m-<22m | BAL-40 |
| | | | | 22m-<40m | BAL-29 |
| | | | | 40m-<42m | BAL-19 |
| | | | | 42m-<100m | BAL-12.5 |
| | | | | 63m | 10kW/m$^2$ |
| T22 On-site | *Forest* (Hunter Macleay DSF) | 1.1° Downslope | **17m** | 0m-<15m | BAL-FZ |
| | | | | 15m-<17m | BAL-40 |
| | | | | 17m-<24m | BAL-29 |
| | | | | 24m-<34m | BAL-19 |
| | | | | 34m-<100m | BAL-12.5 |
| | | | | 53m | 10kW/m$^2$ |
| T23 On-site | *Forest* (Hunter Macleay DSF) | -3.2° Upslope | **14m** | 0m-<12m | BAL-FZ |
| | | | | 12m-<14m | BAL-40 |
| | | | | 14m-<20m | BAL-29 |
| | | | | 20m-<28m | BAL-19 |
| | | | | 28m-<100m | BAL-12.5 |
| | | | | 45m | 10kW/m$^2$ |
| T24 & T25 On-site | *Grassland* | <4.7° Downslope | **11m** | 0m-<9m | BAL-FZ |
| | | | | 9m-<12m | BAL-40 |
| | | | | 12m-<17m | BAL-29 |
| | | | | 17m-<25m | BAL-19 |
| | | | | 25m-<50m | BAL-12.5 |
| | | | | 40m | 10kW/m$^2$ |
| T26 On-site | *Forest* (Hunter Macleay DSF) | -0.7° Upslope | **16m** | 0m-<14m | BAL-FZ |
| | | | | 14m-<16m | BAL-40 |
| | | | | 16m-<23m | BAL-29 |
| | | | | 23m-<32m | BAL-19 |
| | | | | 32m-<100m | BAL-12.5 |
| | | | | 50m | 10kW/m$^2$ |
| T27, T28 & T29 North-west | *Grassland* | 2.5° Downslope | **12m** | 0m-<9m | BAL-FZ |
| | | | | 9m-<12m | BAL-40 |
| | | | | 12m-<17m | BAL-29 |
| | | | | 17m-<25m | BAL-19 |
| | | | | 25m-<50m | BAL-12.5 |
| | | | | 40m | 10kW/m$^2$ |

| Transect | Vegetation Classification (PBP 2019) | Slope | APZ Provided | Distance from Hazard | Bushfire Attack Level (BAL) |
|---|---|---|---|---|---|
| T30 to T33 North-west | *Excluded* | Upslope | **N/A** | N/A | BAL-LOW |
| T34 North-west | *Forested Wetland* (Coastal Floodplain Wetland) | ~2.0° Downslope | **11m** | 0m-<10m | BAL-FZ |
| | | | | 10m-<11m | BAL-40 |
| | | | | 11m-<16m | BAL-29 |
| | | | | 16m-<23m | BAL-19 |
| | | | | 23m-<100m | BAL-12.5 |
| | | | | 37m | 10kW/m$^2$ |

* Slopes less than 1 degree are considered ineligible and have been assessed as 'Flat'.




**Project: 303 Wollombi Rd, Farley: Job No: 2319**

*Figure 14*

# Subdivision BAL Plan

BUSHFIRE PLANNING AUSTRALIA

- Subject Site
- 100m Buffer
- 140m Buffer
- Approved Development - 245 lot subdivision (DA / 2020 / 1425)
- Gully
- Proposed Development
- Proposed Roads
- Proposed Fire trail
- Detention Basin
- Hunter - Macleay Dry Sclerophyll Forests
- Asset Protection Zone

**Required Bushfire Attack Levels (AS3959-2018)**

- BAL - FZ
- BAL - 40
- BAL - 29
- BAL - 19
- BAL - 12.5

SOURCE:
Cadastral Boundary: NSW Department of Finance, Services and Innovation 2022
Aerial photo: Site = BPA Drone August 2023, surrounds = NearMap 03/01/2023

N W E S

0 25 50 75 100 125
Meters

A3 Scale: 1:2,500

File:2319-Farley-Fig7-BALs-230905 Date: 5/09/2023



GEOVIEW
GIS & mapping solutions for infrastructure, town planning & environmental management

## 4.6. Landscaping and Vegetation Management

In APZs and IPAs, the design and management of the landscaped areas in the vicinity of buildings have the potential to improve the chances of survival of people and buildings. Reduction of fuel does not require the removal of all vegetation. Trees and plants can provide some bushfire protection from strong winds, intense heat and flying embers (by filtering embers) and changing wind patterns.

Generally landscaping in and around a bushfire hazard should consider the following:

- Priority given to retaining species that have a low flammability;
- Priority given to retaining species which do not drop much litter in the bushfire season and which do not drop litter that persists as ground fuel in the bush fire season;
- Priority given to retaining smooth barked species over stringy bark; and
- Create discontinuous or gaps in the vegetation to slow down or break the progress of fire towards the dwellings.

Landscaping within APZs and IPAs should give due regard to fire retardant plants and ensure that fuel loads do not accumulate as a result of the selected plant varieties.

The principles of landscaping for bushfire protection aim to:

- Prevent flame impingement on dwellings;
- Provide a defendable space for property protection;
- Reduce fire spread;
- Deflect and filter embers;
- Provide shelter from radiant heat; and
- Reduce wind speed.

Plants that are less flammable have the following features;

- High moisture content;
- High levels of salt;
- Low volatile oil content of leaves;
- Smooth barks without ‘ribbons’ hanging from branches or trunks; and
- Dense crown and elevated branches.

Avoiding understorey planting and regular trimming of the lower limbs of trees also assists in reducing fire penetration into the canopy. Rainforest species such as Syzygium and figs are preferred to species with high fine fuel and/or oil content.

Trees with loose, fibrous or stringy bark should be avoided. These trees can easily ignite and encourage ground fire to spread up to, and then through the crown of trees.

Consideration should be given to vegetation fuel loads present on site with particular attention to APZs.

Careful thought must be given to the type and physical location of any proposed site landscaping. Inappropriately selected and positioned vegetation has the potential to ‘replace’ any previously removed fuel load.

Bearing in mind the desired aesthetic and environment sought by site landscaping, some basic principles have been recommended to help minimise the chance of such works contributing to the potential hazard on site.

Whilst it is recognised that fire-retardant plant species are not always the most aesthetically pleasing choice for site landscaping, the need for adequate protection of life and property requires that a suitable balance between visual and safety concerns be considered.

It is reiterated again that it is essential that any landscaped areas and surrounds are subject to ongoing fuel management and reduction to ensure that fine fuels do not build up.

# 5. Conclusion and Recommendations

Bushfire Planning Australia (BPA) has been engaged by Vivacity Property (the 'Proponent') to undertake a Bushfire Assessment Report (BAR) for the proposed manufactured home estate (MHE) located at 283 & 303 Wollombi Road, Farley; legally known as Lot 2 & 4 DP810894. The proposed development includes the construction of 254 manufactured home dwelling sites, a clubhouse and ancillary community facilities. Each dwelling will be used for long-term occupation and constructed to the appropriate construction standard.

A manufactured home estate is defined as a Special Fire Protection Purpose (SFPP) under the NSW Rural Fire Service (RFS) document Planning for Bushfire Protection 2019 (PBP 2019).

This BAR found the site was exposed to a medium to high bushfire hazard located primarily to the south and west of the site which is mapped as Category 1 Vegetation in the Maitland City Council Bush Fire Prone Land Map.

This BAR has been prepared in accordance with the submission requirements detailed in Appendix 2 of PBP 2019 and has demonstrated the proposed expansion satisfies the Aims and Objectives of PBP 2019, including the Specific Objectives for SFPP developments.

The following key recommendations have been designed to enable the proposed development to achieve Performance Criteria for SFPP developments detailed in Section 6.8 of PBP 2019:

1. The areas within the site identified as an Asset Protection Zone in **Figure 14** shall be managed as an Inner Protection Area (IPA) as outlined within Appendix 4 of PBP 2019 and the RFS document *Standards for asset protection zones*;
2. All future buildings to be constructed on the proposed sites shall have due regard to the specific considerations given in the National Construction Code: Building Code of Australia (BCA) which makes specific reference to Australian Standard AS3959-2018 Construction of buildings in bushfire prone areas (AS3959-2018) and the NASH Standard Steel Framed Construction in Bushfire Prone Areas;
3. Where the new dwellings are not required to be comply with the BCA, each dwelling shall be constructed in accordance with the relevant Bushfire Attack Level (BAL) identified on **Figure 14** and shown in **Table 4**. An updated Approval to Operate (issued under Section 68 of the Local Government Act 1993) shall include the BAL Contour Plan and require each new dwelling to be constructed to the nominated BAL rating. Furthermore, a suitably worded instrument(s) must be created pursuant to section 88 of the Conveyancing Act 1917 clearly outlining the require BAL ratings for each dwelling;
4. All new sites are to be connected to a reliable water supply network and that suitable fire hydrants are located throughout the development site that are clearly marked and provided for the purposes of bushfire protection. Fire hydrant spacing, sizing and pressure shall comply with AS2419.1 2005 and section 6.8.3 of PBP 2019;
5. The internal access road is to be designed and constructed in accordance with section 6.8.2 of PBP 2019 **or** as shown in the plans contained in **Appendix A.** An additional 4 passing bays are recommended along the eastern perimeter to increase the road width to 8m wide for a minimum of 20m in length for each passing bay;
6. Consideration should be given to landscaping and fuel loads on site to decrease potential fire hazards on site; and
7. A Bushfire Emergency Management and Evacuation Plan (BEMEP) shall be prepared that is consistent with the RFS Guidelines 'Development Planning – A Guide to Developing a Bush Fire Emergency Management and Evacuation Plan December 2014'.

This assessment has been made based on the bushfire hazards observed in and around the site at the time of inspection and production (September 2023).

Should the above recommendations be implemented, the proposed modification to the approved development will result in a better bushfire outcome as the existing bushfire risk should be suitably mitigated to offer an acceptable level of protection to life and property for those persons and assets occupying the site but they do not and cannot guarantee that the area will not be affected by bushfire at some time.

# 6. References


- NSW Rural Fire Service (2005). Standards for Asset Protection Zones. NSW Rural Fire Service.
- NSW Rural Fire Service (2019). Planning for Bushfire Protection – A Guide for Councils, Planners, Fire Authorities, Developers and Home Owners.
- Ramsay, GC and Dawkins, D (1993). Building in Bushfire-prone Areas – Information and Advice. CSIRO and Standards Australia.
- Rural Fires and Environmental Assessment Legislation Amendment Act 2002.
- Standards Australia (2018). AS 3959 – 2018: Construction of Buildings in Bushfire-prone Areas.

# Appendix A: Plans of Proposed MHE




BIMcloud: SDASERVER02 - BIMcloud Basic for Archicad 25/2023-029 _Farley Lifestyle Resort_SK

**NOTES**

1. REFER TO CIVIL ENGINEERS DRAWINGS FOR ALL SITE LEVELS
2. REFER TO LANDSCAPE ARCHITECTS PLANS FOR PLANTING AND LANDSCAPE DETAILS

**P** +61 2 4969 3631
**E** HELLO@SDARCH.COM.AU
**A** SUITE 1, LEVEL 1, 187 UNION ST, THE JUNCTION NSW 2291
SDARCH.COM.AU

| ISSUE | DESCRIPTION | BY | CHK | DATE |
|---|---|---|---|---|
| E | FOR INFORMATION | DF | DF | 19/07/2023 |
| F | FOR INFORMATION | DF | DF | 25/07/2023 |
| G | FOR INFORMATION | DF | DF | 31/07/2023 |
| H | FOR DA | SB | SB | 14/08/2023 |
| I | FOR DA | SB | SB | 17/08/2023 |

PROJECT
FARLEY LIFESTYLE RESORT

LOCATION
283 & 303 Wollombi Rd, FARLEY NSW 2320 Australia

CLIENT
VIVACITY

DRAWING
MASTERPLAN 1:2000

PROJECT NO.
2023-029

SCALE
1:1500@A1

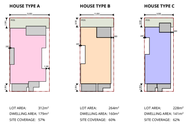
DRAWING NO.
DD100

ISSUE NO.
I

SPACE·DESIGN·ARCHITECTURE

## MOVEABLE DWELLING TYPE | TYPICAL SITE COVERAGE


## MOVEABLE DWELLING TYPE | TYPICAL PRIVATE OPEN SPACE SUMMARY




## KEY

- COMMUNITY FACILITIES & SHOP
- EXISTING DAM
- CAR PARKS
- APZ
- LAND SET ASIDE FOR NEIGHBOURING DWELLING AND RETAINED VEGETATION

## NOTES

1. REFER TO CIVIL ENGINEERS DRAWINGS FOR ALL SITE LEVELS






## GRAPHIC LEGEND + YIELD SUMMARY

| MOVEABLE DWELLING LOTS - MANUF HOME | QTY | % OF YIELD |
|---|---|---|
| LARGE LOT (HOUSE TYPE A) | 92 | 44.4% |
| MEDIUM LOT (HOUSE TYPE B) | 91 | 44% |
| SMALL LOT (HOUSE TYPE C) | 13 | 6.3% |
| CUSTOM LOT | 11 | 5.3% |
| **TOTAL** | **207 LOTS** | |
| **MOVEABLE DWELLING LOTS - MUTLI DWELLING** | | |
| LARGE LOT (HOUSE TYPE A) | 14 | 30% |
| MEDIUM LOT (HOUSE TYPE B) | 23 | 49% |
| SMALL LOT (HOUSE TYPE C) | 10 | 21% |
| **TOTAL** | **47 LOTS** | |
| **SITE TOTAL** | **254 LOTS** | |

## TABLE OF SITE AREAS

| LOCATION | AREAS | % OF SITE |
|---|---|---|
| TOTAL SITE AREA | 328,065 m² | 100% |
| MANUFACTURED HOUSING AREA (RU2) | 301,570 m² | 91% |
| MULTI DWELLING HOUSING AREA (R1) | 26,495 m² | 9% |

## TOTAL AREA OF GREEN SPACE

| LOCATION | AREAS |
|---|---|
| SOUTHERN GREENSPACE (RU2) | 24,995 m² |
| TOTAL GREENSPACE (RU2) | 41,065 m² |
| TOTAL GREENSPACE (R1) | 3,027 m² |
| **TOTAL** | **44,092m²** |

**P** +61 2 4969 3631
**E** HELLO@SDARCH.COM.AU
**A** SUITE 1, LEVEL 1, 187 UNION ST, THE JUNCTION NSW 2291
**SDARCH.COM.AU**

| ISSUE | DESCRIPTION | BY | CHK | DATE |
|---|---|---|---|---|
| G | FOR CLIENT REVIEW | DF | DF | 13/07/2023 |
| H | FOR INFORMATION | DF | DF | 25/07/2023 |
| I | FOR INFORMATION | DF | DF | 31/07/2023 |
| J | FOR DA | SB | SB | 14/08/2023 |
| K | FOR DA | SB | SB | 17/08/2023 |

PROJECT
FARLEY LIFESTYLE RESORT

LOCATION
283 & 303 Wollombi Rd, FARLEY
NSW 2320 Australia

CLIENT
VIVACITY

DRAWING
MASTERPLAN 1:1000

PROJECT NO.
2023-029

SCALE
1:1000, 1:625.01, 1:200@A1

DRAWING NO.
DD101

ISSUE NO.
K

SPACE·DESIGN·ARCHITECTURE




## KEY

- PROPOSED ROAD LAYOUT
- PROPOSED ROAD RESERVE
- GENERAL CAR PARKING
- ACCESSIBLE CAR PARKING
- CARAVAN PARKING

**NOTE:** FOOTPATHS ARE INDICATIVE AND WILL REQUIRE CONFIRMATION BY CIVIL AND LANDSCAPE CONSULTANTS

## PARKING NUMBERS

| | MHE (RU2) | MDH (R1) |
|---|---|---|
| STANDARD | 42 | 11 |
| ACCESSIBLE | 3 | 0 |
| CARAVAN | 12 | 0 |
| **TOTAL** | 57 | 11 |

## NOTES

1. REFER TO CIVIL ENGINEERS DRAWINGS FOR ALL SITE LEVELS

**P** +61 2 4969 3631
**E** HELLO@SDARCH.COM.AU
**A** SUITE 1, LEVEL 1, 187 UNION ST, THE JUNCTION NSW 2291
**SDARCH.COM.AU**

| ISSUE | DESCRIPTION | BY | CHK | DATE |
|---|---|---|---|---|
| D | FOR CLIENT REVIEW | DF | DF | 13/07/2023 |
| E | FOR INFORMATION | DF | DF | 25/07/2023 |
| F | FOR INFORMATION | DF | DF | 31/07/2023 |
| G | FOR DA | SB | SB | 14/08/2023 |
| H | FOR DA | SB | SB | 17/08/2023 |

PROJECT
FARLEY LIFESTYLE RESORT

LOCATION
283 & 303 Wollombi Rd, FARLEY NSW 2320 Australia

CLIENT
VIVACITY

DRAWING
MASTERPLAN - ROAD LAYOUT AND PARKING

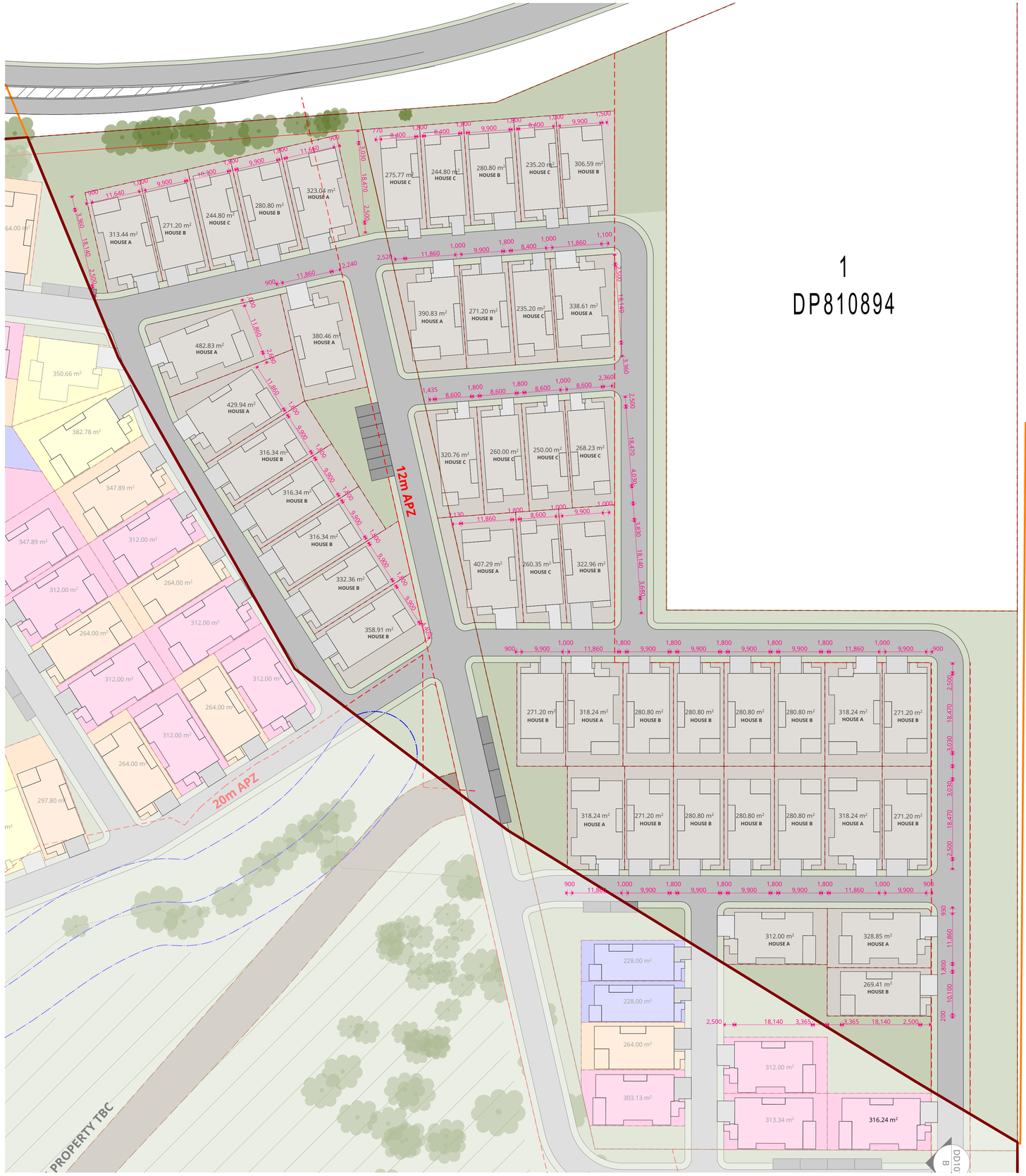
PROJECT NO.
2023-029

SCALE
1:1000, 1:200 @A1

DRAWING NO.
DD103

ISSUE NO.
H

SPACE·DESIGN·ARCHITECTURE






BIMcloud: SDASERVER02 - BIMcloud Basic for Archicad 25/2023-029 _Farley Lifestyle Resort_SK

**NOTES**

1. REFER TO CIVIL ENGINEERS DRAWINGS FOR ALL SITE LEVELS

2. REFER TO LANDSCAPE ARCHITECTS PLANS FOR PLANTING AND LANDSCAPE DETAILS

**P** +61 2 4969 3631
**E** HELLO@SDARCH.COM.AU
**A** SUITE 1, LEVEL 1, 187 UNION ST, THE JUNCTION NSW 2291
**SDARCH.COM.AU**

| ISSUE | DESCRIPTION | BY | CHK | DATE |
|---|---|---|---|---|
| A | FOR INFORMATION | DF | DF | 25/07/2023 |
| B | FOR INFORMATION | DF | DF | 31/07/2023 |
| C | FOR DA | SB | SB | 14/08/2023 |
| D | FOR DA | SB | SB | 17/08/2023 |
| E | FOR DA | DF | DF | 23/08/2023 |

PROJECT
FARLEY LIFESTYLE RESORT

LOCATION
283 & 303 Wollombi Rd, FARLEY
NSW 2320 Australia

CLIENT
VIVACITY

DRAWING
MASTERPLAN - MULTI DWELLING HOUSING SITE PLAN

PROJECT NO.
2023-029

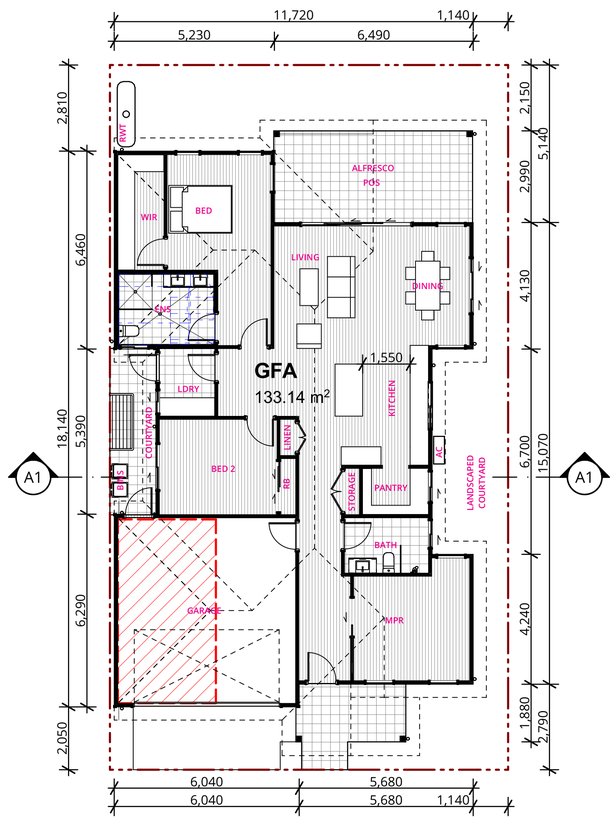
SCALE
1:500@A1

DRAWING NO.
DD108

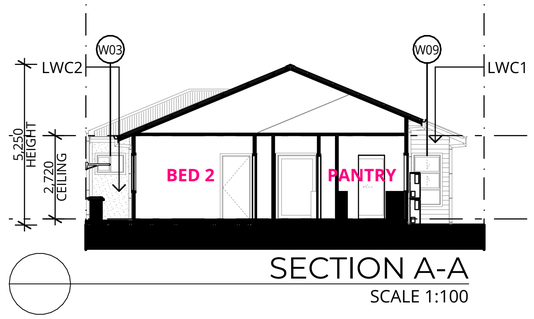
ISSUE NO.
E

SPACE·DESIGN·ARCHITECTURE

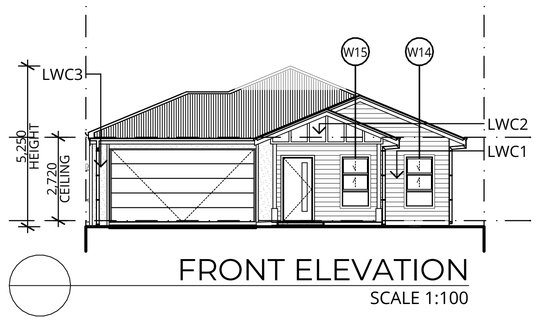
NOMINATED ARCHITECTS Leigh Richardson NSW 8340 NT AR1209 QLD 4955, Daniel Bush NSW 9694, James Clarence NSW 7927 TAS 933



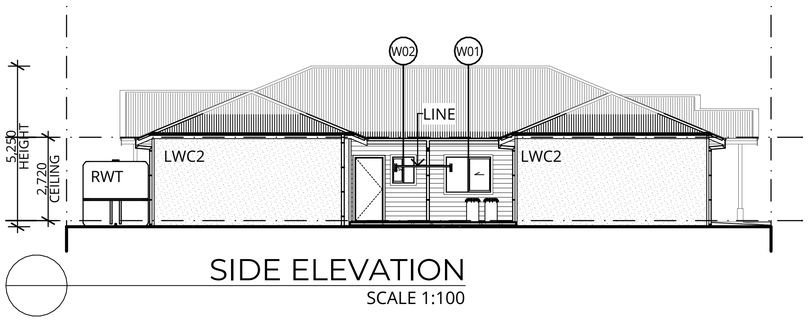

## GROUND FLOOR PLAN
SCALE 1:100



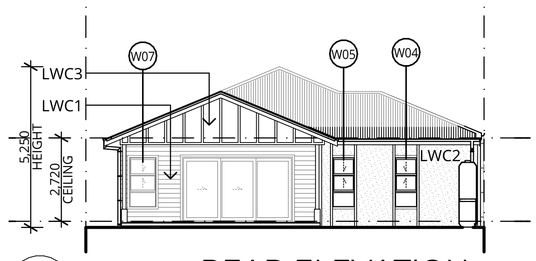

## SECTION A-A
SCALE 1:100



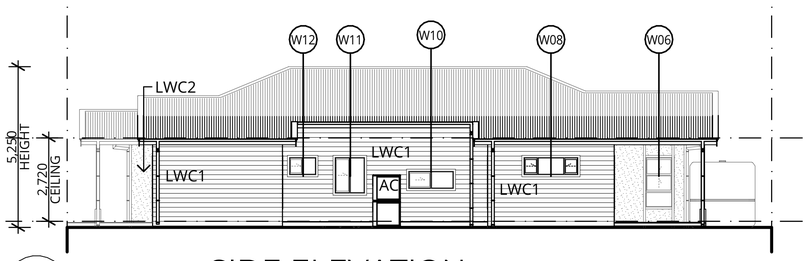

## FRONT ELEVATION
SCALE 1:100




## SIDE ELEVATION
SCALE 1:100




## REAR ELEVATION
SCALE 1:100




## SIDE ELEVATION
SCALE 1:100

| WINDOW SCHEDULE | |
|---|---|
| **ID** | **W x H** |
| W01 | 1,500×1,200 |
| W02 | 750×900 |
| W03 | 900×600 |
| W04 | 750×1,650 |
| W05 | 750×1,650 |
| W06 | 900×1,650 |
| W07 | 900×1,650 |
| W08 | 1,800×600 |
| W09 | 900×1,650 |
| W10 | 1,500×600 |
| W11 | 1,000×1,200 |
| W12 | 900×600 |
| W13 | 900×1,650 |
| W14 | 900×1,650 |
| W15 | 900×1,650 |

| AREAS | |
|---|---|
| GFA | 133.14 |
| ALFRESCO | 19.41 |
| GARAGE | 35.09 |
| PATIO | 6.67 |
| | **194.31 m²** |

NOTE: REFER TO LANDSCAPE DRAWINGS FOR PLANTING AND FENCING DETAILS

LEGEND

| | |
|---|---|
| AC | AIR CONDITIONING |
| BIN1 | RUBBISH BIN -TYPE 1 |
| LINE | CLOTHES LINE |
| LWC1 | LIGHTWEIGHT CLADDING - TYPE 1 |
| LWC2 | LIGHTWEIGHT CLADDING - TYPE 2 |
| LWC3 | LIGHTWEIGHT CLADDING - TYPE 3 |
| MRS1 | METAL ROOF SHEETING - TYPE 1 |



**P** +61 2 4969 3631
**E** HELLO@SDARCH.COM.AU
**A** SUITE 1, LEVEL 1, 187 UNION ST, THE JUNCTION NSW 2291
**SDARCH.COM.AU**

| ISSUE | DESCRIPTION | BY | CHK | DATE |
|---|---|---|---|---|
| A | FOR INFORMATION | DF | DF | 28/06/2023 |
| B | FOR CLIENT REVIEW | DF | DF | 13/07/2023 |
| C | FOR DA | SB | SB | 14/08/2023 |
| D | FOR DA | SB | SB | 17/08/2023 |

PROJECT
FARLEY LIFESTYLE RESORT

LOCATION
283 & 303 Wollombi Rd, FARLEY
NSW 2320 Australia

CLIENT
VIVACITY

DRAWING
HOUSE - TYPE A

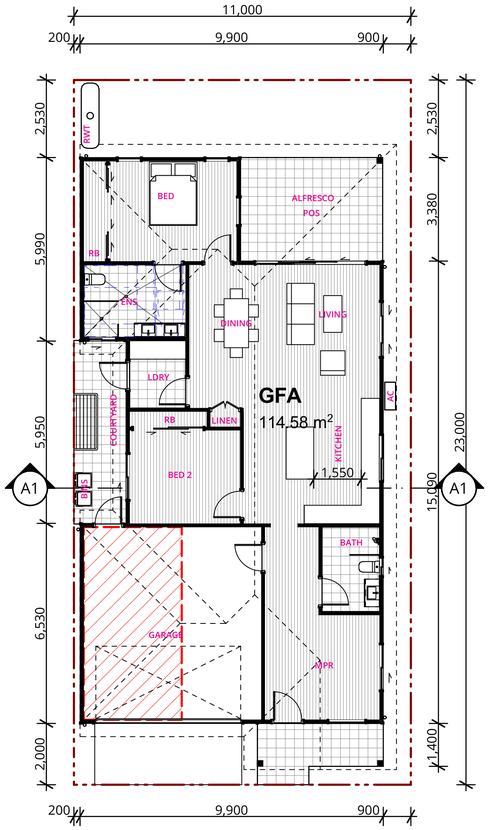
PROJECT NO.
2023-029

SCALE
@A1

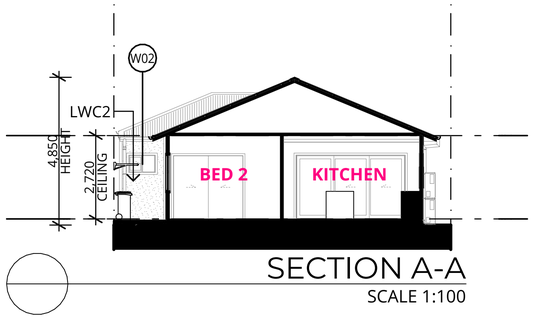
DRAWING NO.
DD120

ISSUE NO.
D

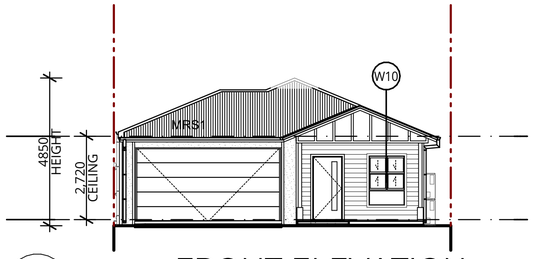
SPACE·DESIGN·ARCHITECTURE



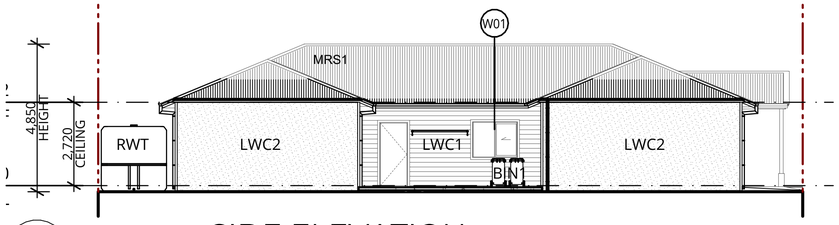

## GROUND FLOOR PLAN
SCALE 1:100



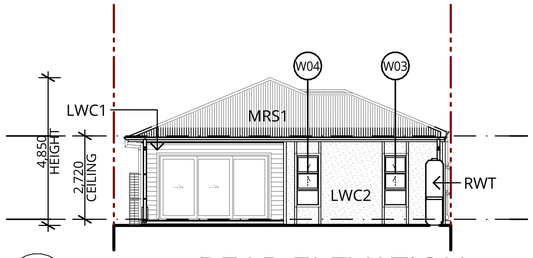

## SECTION A-A
SCALE 1:100



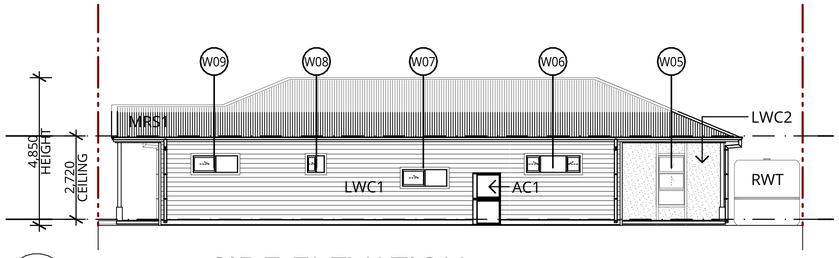

## FRONT ELEVATION
SCALE 1:100




## SIDE ELEVATION
SCALE 1:100




## REAR ELEVATION
SCALE 1:100




## SIDE ELEVATION
SCALE 1:100

| WINDOW SCHEDULE | |
|---|---|
| **ID** | **W x H** |
| W01 | 1,500×1,200 |
| W02 | 900×600 |
| W03 | 750×1,650 |
| W04 | 750×1,650 |
| W05 | 900×1,650 |
| W06 | 1,800×600 |
| W07 | 1,500×600 |
| W08 | 600×600 |
| W09 | 1,500×600 |
| W10 | 1,200×1,650 |

| AREAS | |
|---|---|
| GFA | 114.58 |
| GARAGE | 36.48 |
| PATIO | 5.77 |
| ALFRESCO | 15.68 |
| | **172.51 m²** |

NOTE: REFER TO LANDSCAPE DRAWINGS FOR PLANTING AND FENCING DETAILS

LEGEND

| | |
|---|---|
| AC | AIR CONDITIONING |
| BIN1 | RUBBISH BIN -TYPE 1 |
| LINE | CLOTHES LINE |
| LWC1 | LIGHTWEIGHT CLADDING - TYPE 1 |
| LWC2 | LIGHTWEIGHT CLADDING - TYPE 2 |
| LWC3 | LIGHTWEIGHT CLADDING - TYPE 3 |
| MRS1 | METAL ROOF SHEETING - TYPE 1 |



**P** +61 2 4969 3631
**E** HELLO@SDARCH.COM.AU
**A** SUITE 1, LEVEL 1, 187 UNION ST, THE JUNCTION NSW 2291
**SDARCH.COM.AU**

| ISSUE | DESCRIPTION | BY | CHK | DATE |
|---|---|---|---|---|
| A | FOR INFORMATION | DF | DF | 28/06/2023 |
| B | FOR CLIENT REVIEW | DF | DF | 13/07/2023 |
| C | FOR DA | SB | SB | 14/08/2023 |
| D | FOR DA | SB | SB | 17/08/2023 |

PROJECT
FARLEY LIFESTYLE RESORT

LOCATION
283 & 303 Wollombi Rd, FARLEY
NSW 2320 Australia

CLIENT
VIVACITY

DRAWING
HOUSE - TYPE B

PROJECT NO.
2023-029

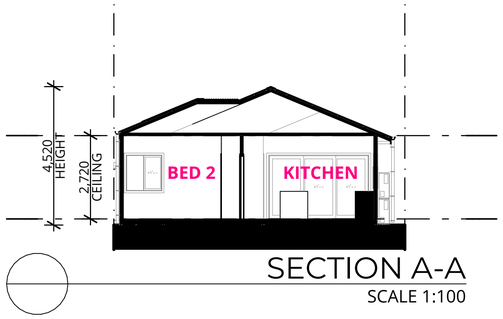
SCALE
@A1

DRAWING NO.
DD121

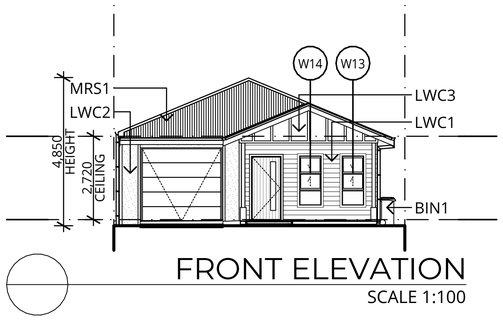
ISSUE NO.
D

SPACE·DESIGN·ARCHITECTURE

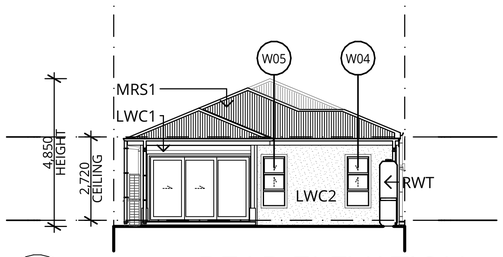

## GROUND FLOOR PLAN
SCALE 1:100



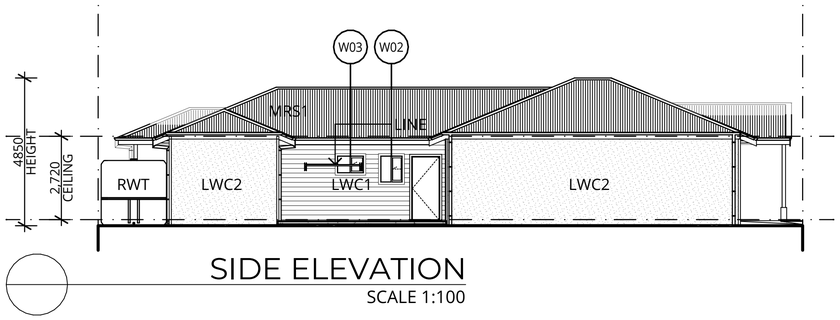

## SECTION A-A
SCALE 1:100



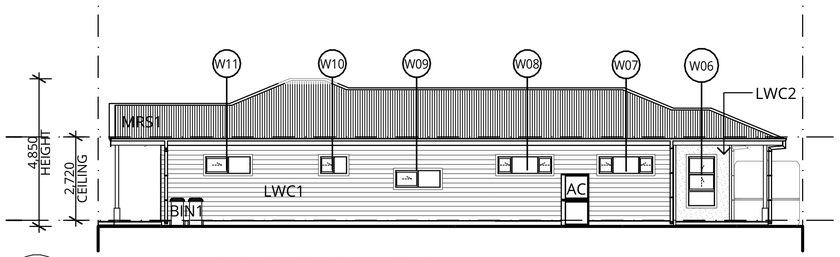

## FRONT ELEVATION
SCALE 1:100




## REAR ELEVATION
SCALE 1:100




## SIDE ELEVATION
SCALE 1:100




## SIDE ELEVATION
SCALE 1:100

| WINDOW SCHEDULE | |
|---|---|
| **ID** | **W x H** |
| W01 | 1,200×1,200 |
| W02 | 750×900 |
| W03 | 900×600 |
| W04 | 750×1,650 |
| W05 | 750×1,650 |
| W06 | 900×1,650 |
| W07 | 1,800×600 |
| W08 | 1,800×600 |
| W09 | 1,500×600 |
| W10 | 900×600 |
| W11 | 1,500×600 |
| W13 | 750×1,650 |
| W14 | 750×1,650 |

| AREAS | |
|---|---|
| GFA | 111.88 |
| ALFRESCO | 11.28 |
| GARAGE | 22.99 |
| PATIO | 6.90 |
| | **153.05 m²** |

NOTE: REFER TO LANDSCAPE DRAWINGS FOR PLANTING AND FENCING DETAILS

LEGEND

| | |
|---|---|
| AC | AIR CONDITIONING |
| BIN1 | RUBBISH BIN -TYPE 1 |
| LINE | CLOTHES LINE |
| LWC1 | LIGHTWEIGHT CLADDING - TYPE 1 |
| LWC2 | LIGHTWEIGHT CLADDING - TYPE 2 |
| LWC3 | LIGHTWEIGHT CLADDING - TYPE 3 |
| MRS1 | METAL ROOF SHEETING - TYPE 1 |



**P** +61 2 4969 3631
**E** HELLO@SDARCH.COM.AU
**A** SUITE 1, LEVEL 1, 187 UNION ST, THE JUNCTION NSW 2291
**SDARCH.COM.AU**

| ISSUE | DESCRIPTION | BY | CHK | DATE |
|---|---|---|---|---|
| A | FOR INFORMATION | DF | DF | 28/06/2023 |
| B | FOR CLIENT REVIEW | DF | DF | 13/07/2023 |
| C | FOR DA | SB | SB | 14/08/2023 |
| D | FOR DA | SB | SB | 17/08/2023 |

PROJECT
FARLEY LIFESTYLE RESORT

LOCATION
283 & 303 Wollombi Rd, FARLEY
NSW 2320 Australia

CLIENT
VIVACITY

DRAWING
HOUSE - TYPE C

PROJECT NO.
2023-029

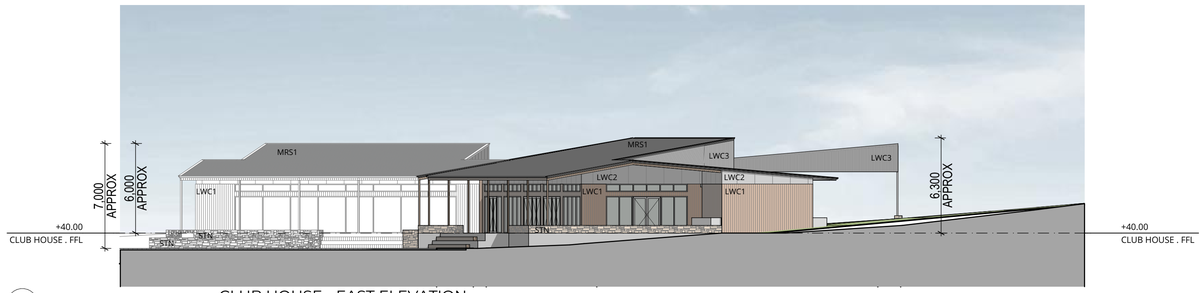
SCALE
@A1

DRAWING NO.
DD122

ISSUE NO.
D

SPACE·DESIGN·ARCHITECTURE


CLUB HOUSE - SOUTH ELEVATION
SCALE 1:200




CLUB HOUSE - EAST ELEVATION
SCALE 1:200


CLUB HOUSE - NORTH ELEVATION
SCALE 1:200


CLUB HOUSE - WEST ELEVATION
SCALE 1:200



P:\2023\2023-029 Farley Lifestyle Resort\02 Drawings\02_b Working Files\2023-029_Farley Lifestyle Resort_Club House_DD.pln

LEGEND
LWC1 = LIGHTWEIGHT CLADDING - TYPE 1
LWC2 = LIGHTWEIGHT CLADDING - TYPE 2
LWC3 = LIGHTWEIGHT CLADDING - TYPE 3
MRS1 = METAL ROOF SHEETING - TYPE 1
STN = STONE

**P** +61 2 4969 3631
**E** HELLO@SDARCH.COM.AU
**A** SUITE 1, LEVEL 1, 187 UNION ST, THE JUNCTION NSW 2291
**SDARCH.COM.AU**

| ISSUE | DESCRIPTION | BY | CHK | DATE |
|---|---|---|---|---|
| A | FOR INFORMATION | DF | DF | 31/05/2023 |
| B | FOR CLIENT REVIEW | DF | DF | 13/07/2023 |
| C | FOR DA | SB | SB | 14/08/2023 |
| D | FOR DA | SB | SB | 17/08/2023 |

PROJECT
FARLEY LIFESTYLE RESORT

LOCATION
303 Wollombi Rd, FARLEY NSW 2320 Australia

CLIENT
VIVACITY

DRAWING
CLUB HOUSE - ELEVATIONS

PROJECT NO.
2023-029

SCALE
1:200@A1

DRAWING NO.
DD202

ISSUE NO.
D

SPACE·DESIGN·ARCHITECTURE

# Appendix B: Planning for Bushfire Protection 2019 Compliance Tables

**Table 1: Aims and Objectives of Planning for Bushfire Protection 2019**

| Objectives | Satisfied | Comment |
|---|---|---|
| ➢ Afford buildings and their occupants protection from exposure to a bush fire | ✓ | APZs along the interface with the vegetation within the site is provided by perimeter roads that separate the sites from the primary threat and adequate setbacks provide defendable space from areas of reduced vegetation. The APZs extend beyond the perimeter roads to the south. Furthermore, the APZ will be extended along the eastern and western boundaries to provide additional protection for the new dwellings.<br>Consequently there will be no dwellings (long-term occupation) exposed to radiant heat levels greater than 29kW/$m^2$. |
| ➢ Provide for a defendable space to be located around buildings | ✓ | Where required, each site is provided with an APZ that accommodates a building footprint that will not be exposed to radiant heat levels exceeding 29kW/$m^2$. The APZ and road network provides a defendable space that is capable of providing an environment in which a person can undertake property protection after the passage of bushfire with some level of safety. An APZ will also be provided to ensure all existing dwellings within the site; including a fire trail along the southern boundary, have sufficient defendable space. |
| ➢ Provide appropriate separation between a hazard and buildings, which, in combination with other measures, prevent the likely fire spread to buildings | ✓ | The APZs have been calculated to provide a suitable buffer between any future dwellings and the bushfire hazard; commensurate with the vegetation formation and slope. |
| ➢ Ensure that safe operational access and egress for emergency service personnel and residents is available | ✓ | All residents have direct access to multiple internal roads that provide several options to evacuate from the development site. Due to the proposed road widths and road layout within the development site, emergency service personnel will continue to have unobstructed access to the site whilst residents are evacuating in the opposite direction. |
| ➢ Provide for ongoing management and maintenance of BPMs | ✓ | All APZs are contained with common property and will be maintained by the operator of the MHE in accordance with Appendix 4 of the PBP 2019 and Standards for APZs. |
| ➢ Ensure that utility services are adequate to meet the needs of firefighters | ✓ | The development includes all essential utility services to meet the needs of firefighters; including a reliable water supply. |

**Table 2: Performance Criteria and Acceptable Solutions for SFPP Developments (Chapter 6 PBP 2019)**

| Intent of Measure | Performance Criteria | Acceptable Solution | Complies | Comment |
|---|---|---|---|---|
| **6.8.1 ASSET PROTECTION ZONES**<br><br>Table 6.8a<br>To provide suitable building design, construction and sufficient space to ensure that radiant heat levels at buildings does not exceed critical limits for firefighters and other emergency services personnel undertaking operations, including supporting or evacuating occupants. | Radiant heat levels of greater than 10kW/m$^2$ (1200K) are not experienced at any part of the building. | The building is provided with an APZ in accordance with Table A1.12.1. in Appendix 1. | PS | The proposed MHE has been designed to ensure APZs are provided to achieve the Performance Criteria for residential infill development. |
| | APZ maintenance is practical, soil stability is not compromised and the potential for crown fires is negated. | The APZ is not located on lands with a slope exceeding 18° | ✓ | All APZs are located on land with slopes 10° or less. |
| | APZs are managed and maintained to prevent the spread of a fire towards the building.<br><br>The APZ is provided in perpetuity. | The APZ is managed in accordance with the requirements of Appendix 4 of PBP 2019 and is wholly within the boundaries of the development site. | ✓ | The APZ will be required to be maintained in accordance with Appendix 4 of the PBP 2019 and Standards for APZs by the operator of the MHE. |
| | | Mechanisms are in place to provide for the maintenance of the APZ over the life of the development. | ✓ | |
| | | Other structures located within the APZ need to be located further than 6m from the refuge building. | ✓ | Any ancillary structures will be greater than 6m from the primary structure. |
| | **VARIATIONS: Manufactured Home Estates** | An APZ in accordance with Table A1.12.1 in Appendix 1 of this document is provided to all new dwellings; or | ✓ | The site layout has been designed to ensure all sites are provided with sufficient area to provide a dwelling exposed to 29kW/m$^2$ or less.<br>Whilst the proposed development does not seek consent for the construction of any new dwellings, the Community Management Statement shall include the BAL Contour Plan (**Figure 15**) and require each dwelling to be constructed to the nominated BAL rating. Furthermore, a suitably worded instrument(s) must be created pursuant to section 88 of the Conveyancing Act 1917 clearly outlining the require BAL ratings for each dwelling. |
| | | An APZ in accordance with Table A1.12.2 in Appendix 1 of this document is provided where it is demonstrated that all new dwellings will be constructed in accordance with BAL-29. | | |
| **LANDSCAPING** | Landscaping is designed and managed to minimise flame contact and radiant heat to buildings, and the potential for wind-driven embers to cause ignitions. | Landscaping is in accordance with APZ standards (see Appendix 4).<br>Fencing is constructed in accordance with section 7.6. | ✓ | All new landscaping will be designed and planted in accordance with the guidelines relevant at the time of planting. |

| Intent of Measure | Performance Criteria | Acceptable Solution | Complies | Comment |
|---|---|---|---|---|
| **CONSTRUCTION** | The proposed building can withstand bush fire attack in the form of wind, smoke, embers, radiant heat and flame contact. | A construction level of BAL-12.5 under AS3959 or NASH and Table 6.8a is applied | ✓ | Whilst the proposed development does not seek consent for the construction of any new dwellings, the Community Management Statement shall include the BAL Contour Plan (**Figure 15**) and require each dwelling to be constructed to the nominated BAL rating. Furthermore, a suitably worded instrument(s) must be created pursuant to section 88 of the Conveyancing Act 1917 clearly outlining the require BAL ratings for each dwelling. |
| | **VARIATIONS: Manufactured Home Estates** | Where an APZ in accordance with Table A1.12.1 in Appendix 1 of this document the construction standards for BAL-12.5 shall apply; or | | |
| | | Where an APZ in accordance with Table A1.12.2 in Appendix 1 of this document the construction standards for BAL-29 shall apply. | | |
| **6.8.2 ACCESS Table 6.8b** To provide safe operational access for emergency services personnel in suppressing a bush fire, while residents are accessing or egressing an area. **FIREFIGHTING VEHICLES** | Firefighting vehicles are provided with safe all weather access to structures and hazard vegetation. | SFPP access roads are two-wheel drive, all-weather roads | ✓ | All roads are all-weather, sealed roads allowing safe and direct access for fire fighting vehicles to all lots. |
| | | Access is provided to all structures and hazard vegetation. | ✓ | |
| | | Traffic management devices are constructed to not prohibit access by emergency services vehicles. | ✓ | |
| | | Access roads must provide suitable turning areas in accordance with Appendix 3. | ✓ | |
| **ACCESS ROAD CAPACITY** | The capacity of access roads is adequate for firefighting vehicles. | The capacity of road surfaces and any bridges/ causeways is sufficient to carry fully loaded firefighting vehicles (up to 23 tonnes); bridges and causeways are to clearly indicate load rating. | ✓ | All new roads will have sufficient capacity to carry fully loaded fire fighting vehicles. |
| **ACCESS TO WATER** | There is appropriate access to water supply. | Hydrants are located outside of parking reserves and road carriageways to ensure accessibility to reticulated water for fire suppression. | ✓ | All new sites will be connected to a new water supply main. |
| | | Hydrants are provided in accordance with AS2419.1:2005. | ✓ | |
| | | There is suitable access for Category 1 fire appliance to within 4m of the static water supply where no reticulated supply is available. | ✓ | |

| Intent of Measure | Performance Criteria | Acceptable Solution | Complies | Comment |
|---|---|---|---|---|
| PERIMETER ROADS | Perimeter access roads are designed to allow safe access and egress for medium rigid firefighting vehicles while occupants are evacuating as well as providing a safe operational environment for emergency service personnel during firefighting and emergency management on the interface. | There are two-way sealed roads. | ✓ | The proposed internal road network provides perimeter roads and a secondary egress to Wollombi Road. |
| | | 8m carriageway width kerb to kerb. | ✓ | |
| | | Hydrants are to be located clear of parking areas. | ✓ | |
| | | There are through roads, and these are linked to the internal road system at an interval of no greater than 500m. | ✓ | |
| | | Curves of roads have a minimum inner radius of 6m. | ✓ | |
| | | The maximum grade road is 15° and average grade is 10°. | ✓ | |
| | | The road crossfall does not exceed 3°. | ✓ | |
| | | A minimum vertical clearance of 4m to any overhanging obstructions, including tree branches. | ✓ | |
| NON-PERIMETER ROADS | Non-perimeter access roads are designed to allow safe access and egress for medium rigid firefighting vehicles while occupants are evacuating. | Minimum 5.5m width kerb to kerb. | ✓ | The proposed new internal roads provide safe circulation throughout the MHE offering multiple egress routes from every site. |
| | | Parking is provided outside of the carriageway. | ✓ | |
| | | Hydrants are to be located clear of parking areas. | ✓ | |
| | | There are through roads, and these are linked to the internal road system at an interval of no greater than 500m. | ✓ | |
| | | Curves of roads have a minimum inner radius of 6m. | ✓ | |
| | | The maximum grade road is 15° and average grade is 10°. | ✓ | |
| | | The road crossfall does not exceed 3°. | ✓ | |
| | | A minimum vertical clearance of 4m to any overhanging obstructions, including tree branches. | ✓ | |

| Intent of Measure | Performance Criteria | Acceptable Solution | Complies | Comment |
|---|---|---|---|---|
| **6.8.3 SERVICES Table 6.8c**<br><br>To provide adequate services for water for the protection of buildings during and after the passage of a bushfire, and not to locate gas and electricity so as not to contribute to the risk of fire to a building.<br><br>**WATER** | A water supply is provided for firefighting purposes | Reticulated water is to be provided to the development, where available | ✓ | A reticulated water supply is provided. |
| | | A static water supply is provided where no reticulated water is available | **N/A** | |
| | Water supplies are located at regular intervals<br><br>The water supply is accessible and reliable for firefighting operations | Fire hydrant spacing, design and sizing comply with AS2419.1:2005; | ✓ | A series of fire hydrants will be located throughout the MHE. |
| | | Hydrants are not located within any road carriageway; | ✓ | |
| | | Reticulated water supply to SFPPs uses a ring main system for areas with perimeter roads. | ✓ | A new water supply ring main will be provided throughout the new component of the MHE. |
| | Flows and pressures are appropriate | Fire hydrant flows and pressures comply with AS2419.1:2005. | ✓ | |
| | The integrity of the water supply is maintained | All above ground water service pipes are metal, including and up to any taps. | **N/A** | |
| **ELECTRICITY** | Location of electricity services limits the possibility of ignition of surrounding bushland or the fabric of buildings. | Where practicable, electrical transmission lines are underground. | ✓ | All transmission lines will be located underground. |
| | | Where overhead electrical transmission lines are proposed as follows:<br>- lines are installed with short pole spacing (30 metres), unless crossing gullies, gorges or riparian areas; and<br>- no part of a tree is closer to a power line than the distance set out in accordance with the specifications in ISSC3 Guideline for Managing Vegetation Near Power Lines | **N/A** | |

| Intent of Measure | Performance Criteria | Acceptable Solution | Complies | Comment |
|---|---|---|---|---|
| **GAS** | Location of gas services will not lead to ignition of surrounding bushland or the fabric of buildings. | Reticulated or bottled gas is installed and maintained in accordance with AS 1596:2014 and the requirements of relevant authorities, metal piping is to be used. | ✓ **Able to comply** | |
| | | All fixed gas cylinders are kept clear of all flammable materials to a distance of 10 metres and shielded on the hazard side; | ✓ | All tanked gas stored on site will be sited and secured with appropriate shielded from the bushfire hazard. |
| | | Connections to and from gas cylinders are metal: | ✓ | |
| | | Polymer-sheathed flexible gas supply lines are not used; and | ✓ | |
| | | Above-ground gas service pipes are metal, including and up to any outlets. | ✓ | |
| **6.8.4 EMERGENCY MANAGEMENT PLANNING**<br>**Table 6.8d**<br>To provide suitable emergency and evacuation arrangements for occupants of SFPP developments | A bush fire emergency and evacuation management plan is prepared. | Bush fire emergency management and evacuation plan is prepared consistent with the:<br>❑ the NSW RFS document: A Guide to Developing a Bush Fire Emergency Management and Evacuation Plan; and<br>❑ AS3745:2010 Planning for emergencies in facilities. | ✓ **Able to comply** | A Bushfire Management Plan is recommended to be prepared for the MHE. |
| | | The emergency and evacuation management plan should include a mechanism for the early relocation of occupants. | ✓ **Able to comply** | |
| | Appropriate and adequate management arrangements are established for consultation and implementation of the bush fire emergency and evacuation management plan. | An Emergency Planning Committee is established to consult with residents and staff in developing and implementing an Emergency Procedures Manual. | ✓ **Able to comply** | Where required, consultation with staff and residents will be undertaken during the preparation of the Bushfire Management Plan. |
| | | Detailed plans of all emergency assembly areas including 'on-site' and 'off-site' arrangements as started in AS3745 are clearly displayed, and an annual (as a minimum) trial emergency evacuation is conducted. | ✓ **Able to comply** | |

# Appendix C: AHIMS Report

# AHIMS Web Services (AWS)
## Search Result

Your Ref/PO Number : 2319 Farley

Client Service ID : 784506

Katrina Greville

21 Costata Crescent
Adamstown  New South Wales  2289

Attention: Katrina  Greville

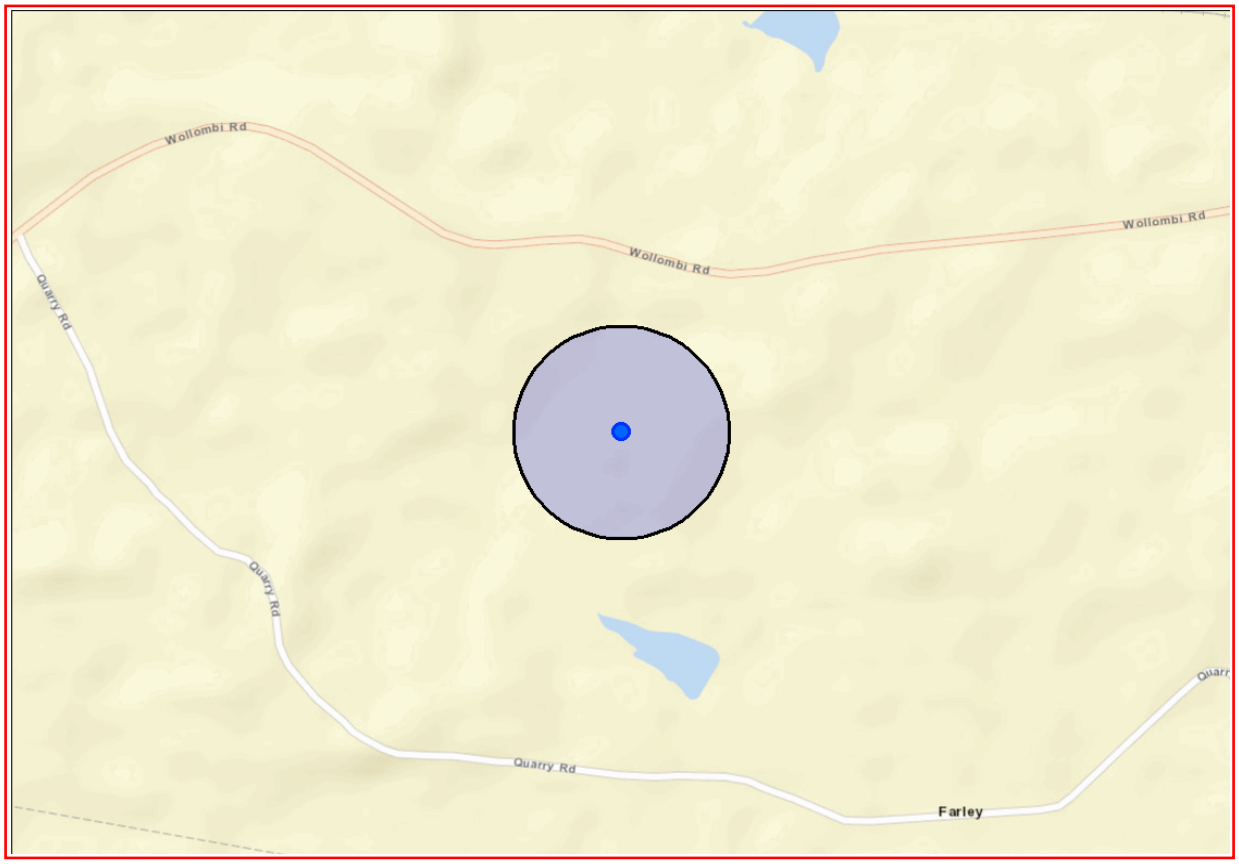
Email: klmukevski@bigpond.com

Date: 23 May 2023

Dear Sir or Madam:

**AHIMS Web Service search for the following area at Address : 303 WOLLOMBI ROAD FARLEY 2320 with a Buffer of 200 meters, conducted by Katrina Greville on 23 May 2023.**

**The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.**




A search of Heritage NSW AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

| | |
|---|---|
| 0 | Aboriginal sites are recorded in or near the above location. |
| 0 | Aboriginal places have been declared in or near the above location. * |

**If your search shows Aboriginal sites or places what should you do?**

- You must do an extensive search if AHIMS has shown that there are Aboriginal sites or places recorded in the search area.
- If you are checking AHIMS as a part of your due diligence, refer to the next steps of the Due Diligence Code of practice.
- You can get further information about Aboriginal places by looking at the gazettal notice that declared it. Aboriginal places gazetted after 2001 are available on the NSW Government Gazette (https://www.legislation.nsw.gov.au/gazette) website. Gazettal notices published prior to 2001 can be obtained from Heritage NSW upon request

**Important information about your AHIMS search**

- The information derived from the AHIMS search is only to be used for the purpose for which it was requested. It is not be made available to the public.
- AHIMS records information about Aboriginal sites that have been provided to Heritage NSW and Aboriginal places that have been declared by the Minister;
- Information recorded on AHIMS may vary in its accuracy and may not be up to date. Location details are recorded as grid references and it is important to note that there may be errors or omissions in these recordings,
- Some parts of New South Wales have not been investigated in detail and there may be fewer records of Aboriginal sites in those areas. These areas may contain Aboriginal sites which are not recorded on AHIMS.
- Aboriginal objects are protected under the National Parks and Wildlife Act 1974 even if they are not recorded as a site on AHIMS.
- This search can form part of your due diligence and remains valid for 12 months.

Level 6, 10 Valentine Ave, Parramatta 2150
Locked Bag 5020 Parramatta NSW 2124
Tel: (02) 9585 6345

ABN 34 945 244 274
Email: ahims@environment.nsw.gov.au
Web: www.heritage.nsw.gov.au

# Appendix D: NBC Bushfire Attack Assessor V4.1 Report

# NBC Bushfire Attack Assessment Report V4.1

**AS3959 (2018) Appendix B - Detailed Method 2**

**Print Date:** 5/09/2023 **Assessment Date:** 26/03/2023

**Site Street Address:** 2319 307 Wollombi Road, Farley

**Assessor:** Stuart Greville; Bushfire Planning Australia

**Local Government Area:** Maitland **Alpine Area:** No

**Equations Used**

Transmissivity: Fuss and Hammins, 2002
Flame Length: RFS PBP, 2001/Vesta/Catchpole
Rate of Fire Spread: Noble et al., 1980
Radiant Heat: Drysdale, 1985; Sullivan et al., 2003; Tan et al., 2005
Peak Elevation of Receiver: Tan et al., 2005
Peak Flame Angle: Tan et al., 2005

**Run Description:** Replanted gullies

## Vegetation Information

**Vegetation Type:** Coastal Floodplain Wetlands

**Vegetation Group:** Forested Wetlands

**Vegetation Slope:** 2 Degrees **Vegetation Slope Type:** Downslope

**Surface Fuel Load(t/ha):** 8.2 **Overall Fuel Load(t/ha):** 15.1

**Vegetation Height(m):** 0.9 Only Applicable to Shrub/Scrub and Vesta

## Site Information

**Site Slope:** 0 Degrees **Site Slope Type:** Downslope

**Elevation of Receiver(m):** Default **APZ/Separation(m):** 11

## Fire Inputs

**Veg./Flame Width(m):** 100 **Flame Temp(K):** 1090

## Calculation Parameters

**Flame Emissivity:** 95 **Relative Humidity(%):** 25

**Heat of Combustion(kJ/kg)** 18600 **Ambient Temp(K):** 308

**Moisture Factor:** 5 **FDI:** 100

## Program Outputs

**Level of Construction:** BAL 29 **Peak Elevation of Receiver(m):** 4.15

**Radiant Heat(kW/m2):** 27.37 **Flame Angle (degrees):** 65

**Flame Length(m):** 9.15 **Maximum View Factor:** 0.415

**Rate Of Spread (km/h):** 1.13 **Inner Protection Area(m):** 11

**Transmissivity:** 0.867 **Outer Protection Area(m):** 0

**Fire Intensity(kW/m):** 8813

## BAL Thresholds

| | BAL-40: | BAL-29: | BAL-19: | BAL-12.5: | 10 kw/m2: | Elevation of Receiver: |
|---|---|---|---|---|---|---|
| **Asset Protection Zone(m):** | 7 | 10 | 16 | 23 | 37 | 6 |

| | |
|---|---|
| **Run Description:** | T1 (Lot 8 north of road) SFR |

## Vegetation Information

| | | | |
|---|---|---|---|
| **Vegetation Type:** | Hunter Macleay DSF | | |
| **Vegetation Group:** | Dry Sclerophyll Forests (Shrub/Grass) | | |
| **Vegetation Slope:** | 8.5 Degrees | **Vegetation Slope Type:** | Downslope |
| **Surface Fuel Load(t/ha):** | 14 | **Overall Fuel Load(t/ha):** | 24.6 |
| **Vegetation Height(m):** | 0.9 | Only Applicable to Shrub/Scrub and Vesta | |

## Site Information

| | | | |
|---|---|---|---|
| **Site Slope:** | 0 Degrees | **Site Slope Type:** | Downslope |
| **Elevation of Receiver(m):** | Default | **APZ/Separation(m):** | 25 |

## Fire Inputs

| | | | |
|---|---|---|---|
| **Veg./Flame Width(m):** | 100 | **Flame Temp(K):** | 1090 |

## Calculation Parameters

| | | | |
|---|---|---|---|
| **Flame Emissivity:** | 95 | **Relative Humidity(%):** | 25 |
| **Heat of Combustion(kJ/kg)** | 18600 | **Ambient Temp(K):** | 308 |
| **Moisture Factor:** | 5 | **FDI:** | 100 |

## Program Outputs

| | | | |
|---|---|---|---|
| **Level of Construction:** | BAL 29 | **Peak Elevation of Receiver(m):** | 9.88 |
| **Radiant Heat(kW/m2):** | 27.89 | **Flame Angle (degrees):** | 61 |
| **Flame Length(m):** | 22.58 | **Maximum View Factor:** | 0.441 |
| **Rate Of Spread (km/h):** | 3.02 | **Inner Protection Area(m):** | 19 |
| **Transmissivity:** | 0.832 | **Outer Protection Area(m):** | 6 |
| **Fire Intensity(kW/m):** | 38386 | | |

## BAL Thresholds

| | BAL-40: | BAL-29: | BAL-19: | BAL-12.5: | 10 kw/m2: | Elevation of Receiver: |
|---|---|---|---|---|---|---|
| **Asset Protection Zone(m):** | 18 | 24 | 34 | 46 | 69 | 6 |

**Run Description:** T10 east

## Vegetation Information

**Vegetation Type:** Hunter Macleay DSF

**Vegetation Group:** Dry Sclerophyll Forests (Shrub/Grass)

**Vegetation Slope:** 2.5 Degrees

**Vegetation Slope Type:** Downslope

**Surface Fuel Load(t/ha):** 14

**Overall Fuel Load(t/ha):** 24.6

**Vegetation Height(m):** 0.9

Only Applicable to Shrub/Scrub and Vesta

## Site Information

**Site Slope:** 0 Degrees

**Site Slope Type:** Downslope

**Elevation of Receiver(m):** Default

**APZ/Separation(m):** 20

## Fire Inputs

**Veg./Flame Width(m):** 100

**Flame Temp(K):** 1090

## Calculation Parameters

**Flame Emissivity:** 95

**Relative Humidity(%):** 25

**Heat of Combustion(kJ/kg)** 18600

**Ambient Temp(K):** 308

**Moisture Factor:** 5

**FDI:** 100

## Program Outputs

**Level of Construction:** BAL 29

**Peak Elevation of Receiver(m):** 7.28

**Radiant Heat(kW/m2):** 25.07

**Flame Angle (degrees):** 66

**Flame Length(m):** 15.93

**Maximum View Factor:** 0.392

**Rate Of Spread (km/h):** 2

**Inner Protection Area(m):** 16

**Transmissivity:** 0.841

**Outer Protection Area(m):** 4

**Fire Intensity(kW/m):** 25373

## BAL Thresholds

| | BAL-40: | BAL-29: | BAL-19: | BAL-12.5: | 10 kw/m2: | Elevation of Receiver: |
|---|---|---|---|---|---|---|
| **Asset Protection Zone(m):** | 14 | 18 | 26 | 36 | 55 | 6 |

**Run Description:** T11 east

## Vegetation Information

**Vegetation Type:** Hunter Macleay DSF

**Vegetation Group:** Dry Sclerophyll Forests (Shrub/Grass)

**Vegetation Slope:** 0 Degrees

**Vegetation Slope Type:** Upslope

**Surface Fuel Load(t/ha):** 14

**Overall Fuel Load(t/ha):** 24.6

**Vegetation Height(m):** 0.9

Only Applicable to Shrub/Scrub and Vesta

## Site Information

**Site Slope:** 0 Degrees

**Site Slope Type:** Downslope

**Elevation of Receiver(m):** Default

**APZ/Separation(m):** 20

## Fire Inputs

**Veg./Flame Width(m):** 100

**Flame Temp(K):** 1090

## Calculation Parameters

**Flame Emissivity:** 95

**Relative Humidity(%):** 25

**Heat of Combustion(kJ/kg)** 18600

**Ambient Temp(K):** 308

**Moisture Factor:** 5

**FDI:** 100

## Program Outputs

**Level of Construction:** BAL 29

**Peak Elevation of Receiver(m):** 6.48

**Radiant Heat(kW/m2):** 21.74

**Flame Angle (degrees):** 69

**Flame Length(m):** 13.87

**Maximum View Factor:** 0.341

**Rate Of Spread (km/h):** 1.68

**Inner Protection Area(m):** 16

**Transmissivity:** 0.839

**Outer Protection Area(m):** 4

**Fire Intensity(kW/m):** 21353

## BAL Thresholds

| | BAL-40: | BAL-29: | BAL-19: | BAL-12.5: | 10 kw/m2: | Elevation of Receiver: |
|---|---|---|---|---|---|---|
| **Asset Protection Zone(m):** | 12 | 16 | 23 | 32 | 50 | 6 |

**Run Description:** T12 east - upslope

## Vegetation Information

**Vegetation Type:** Hunter Macleay DSF

**Vegetation Group:** Dry Sclerophyll Forests (Shrub/Grass)

**Vegetation Slope:** 5 Degrees

**Vegetation Slope Type:** Upslope

**Surface Fuel Load(t/ha):** 14

**Overall Fuel Load(t/ha):** 24.6

**Vegetation Height(m):** 0.9

Only Applicable to Shrub/Scrub and Vesta

## Site Information

**Site Slope:** 0 Degrees

**Site Slope Type:** Downslope

**Elevation of Receiver(m):** Default

**APZ/Separation(m):** 13

## Fire Inputs

**Veg./Flame Width(m):** 100

**Flame Temp(K):** 1090

## Calculation Parameters

**Flame Emissivity:** 95

**Relative Humidity(%):** 25

**Heat of Combustion(kJ/kg)** 18600

**Ambient Temp(K):** 308

**Moisture Factor:** 5

**FDI:** 100

## Program Outputs

**Level of Construction:** BAL 29

**Peak Elevation of Receiver(m):** 4.84

**Radiant Heat(kW/m2):** 26.79

**Flame Angle (degrees):** 65

**Flame Length(m):** 10.69

**Maximum View Factor:** 0.409

**Rate Of Spread (km/h):** 1.19

**Inner Protection Area(m):** 10

**Transmissivity:** 0.861

**Outer Protection Area(m):** 3

**Fire Intensity(kW/m):** 15122

## BAL Thresholds

| | BAL-40: | BAL-29: | BAL-19: | BAL-12.5: | 10 kw/m2: | Elevation of Receiver: |
|---|---|---|---|---|---|---|
| **Asset Protection Zone(m):** | 9 | 12 | 18 | 26 | 42 | 6 |

**Run Description:** T13 east across small gully

## Vegetation Information

**Vegetation Type:** Hunter Macleay DSF

**Vegetation Group:** Dry Sclerophyll Forests (Shrub/Grass)

**Vegetation Slope:** 1 Degrees

**Vegetation Slope Type:** Downslope

**Surface Fuel Load(t/ha):** 14

**Overall Fuel Load(t/ha):** 24.6

**Vegetation Height(m):** 0.9

Only Applicable to Shrub/Scrub and Vesta

## Site Information

**Site Slope:** 0 Degrees

**Site Slope Type:** Downslope

**Elevation of Receiver(m):** Default

**APZ/Separation(m):** 17

## Fire Inputs

**Veg./Flame Width(m):** 100

**Flame Temp(K):** 1090

## Calculation Parameters

**Flame Emissivity:** 95

**Relative Humidity(%):** 25

**Heat of Combustion(kJ/kg)** 18600

**Ambient Temp(K):** 308

**Moisture Factor:** 5

**FDI:** 100

## Program Outputs

**Level of Construction:** BAL 29

**Peak Elevation of Receiver(m):** 6.58

**Radiant Heat(kW/m2):** 27.62

**Flame Angle (degrees):** 64

**Flame Length(m):** 14.65

**Maximum View Factor:** 0.427

**Rate Of Spread (km/h):** 1.8

**Inner Protection Area(m):** 13

**Transmissivity:** 0.851

**Outer Protection Area(m):** 4

**Fire Intensity(kW/m):** 22878

## BAL Thresholds

| | BAL-40: | BAL-29: | BAL-19: | BAL-12.5: | 10 kw/m2: | Elevation of Receiver: |
|---|---|---|---|---|---|---|
| **Asset Protection Zone(m):** | 13 | 17 | 24 | 34 | 52 | 6 |

**Run Description:** T14 south east corner

## Vegetation Information

**Vegetation Type:** Hunter Macleay DSF

**Vegetation Group:** Dry Sclerophyll Forests (Shrub/Grass)

**Vegetation Slope:** 1 Degrees

**Vegetation Slope Type:** Downslope

**Surface Fuel Load(t/ha):** 14

**Overall Fuel Load(t/ha):** 24.6

**Vegetation Height(m):** 0.9

Only Applicable to Shrub/Scrub and Vesta

## Site Information

**Site Slope:** 0 Degrees

**Site Slope Type:** Downslope

**Elevation of Receiver(m):** Default

**APZ/Separation(m):** 17

## Fire Inputs

**Veg./Flame Width(m):** 100

**Flame Temp(K):** 1090

## Calculation Parameters

**Flame Emissivity:** 95

**Relative Humidity(%):** 25

**Heat of Combustion(kJ/kg)** 18600

**Ambient Temp(K):** 308

**Moisture Factor:** 5

**FDI:** 100

## Program Outputs

**Level of Construction:** BAL 29

**Peak Elevation of Receiver(m):** 6.58

**Radiant Heat(kW/m2):** 27.62

**Flame Angle (degrees):** 64

**Flame Length(m):** 14.65

**Maximum View Factor:** 0.427

**Rate Of Spread (km/h):** 1.8

**Inner Protection Area(m):** 13

**Transmissivity:** 0.851

**Outer Protection Area(m):** 4

**Fire Intensity(kW/m):** 22878

## BAL Thresholds

| | BAL-40: | BAL-29: | BAL-19: | BAL-12.5: | 10 kw/m2: | Elevation of Receiver: |
|---|---|---|---|---|---|---|
| **Asset Protection Zone(m):** | 13 | 17 | 24 | 34 | 52 | 6 |

**Run Description:** T15 south

## Vegetation Information

**Vegetation Type:** Hunter Macleay DSF

**Vegetation Group:** Dry Sclerophyll Forests (Shrub/Grass)

**Vegetation Slope:** 3 Degrees

**Vegetation Slope Type:** Downslope

**Surface Fuel Load(t/ha):** 14

**Overall Fuel Load(t/ha):** 24.6

**Vegetation Height(m):** 0.9

Only Applicable to Shrub/Scrub and Vesta

## Site Information

**Site Slope:** 0 Degrees

**Site Slope Type:** Downslope

**Elevation of Receiver(m):** Default

**APZ/Separation(m):** 18

## Fire Inputs

**Veg./Flame Width(m):** 100

**Flame Temp(K):** 1090

## Calculation Parameters

**Flame Emissivity:** 95

**Relative Humidity(%):** 25

**Heat of Combustion(kJ/kg)** 18600

**Ambient Temp(K):** 308

**Moisture Factor:** 5

**FDI:** 100

## Program Outputs

**Level of Construction:** BAL 40

**Peak Elevation of Receiver(m):** 7.23

**Radiant Heat(kW/m2):** 29.1

**Flame Angle (degrees):** 62

**Flame Length(m):** 16.38

**Maximum View Factor:** 0.451

**Rate Of Spread (km/h):** 2.07

**Inner Protection Area(m):** 14

**Transmissivity:** 0.849

**Outer Protection Area(m):** 4

**Fire Intensity(kW/m):** 26264

## BAL Thresholds

| | BAL-40: | BAL-29: | BAL-19: | BAL-12.5: | 10 kw/m2: | Elevation of Receiver: |
|---|---|---|---|---|---|---|
| **Asset Protection Zone(m):** | 14 | 18 | 26 | 36 | 56 | 6 |

**Run Description:** T16 across southern dry gully

## Vegetation Information

**Vegetation Type:** Hunter Macleay DSF

**Vegetation Group:** Dry Sclerophyll Forests (Shrub/Grass)

**Vegetation Slope:** 1.5 Degrees

**Vegetation Slope Type:** Downslope

**Surface Fuel Load(t/ha):** 14

**Overall Fuel Load(t/ha):** 24.6

**Vegetation Height(m):** 0.9

Only Applicable to Shrub/Scrub and Vesta

## Site Information

**Site Slope:** 0 Degrees

**Site Slope Type:** Downslope

**Elevation of Receiver(m):** Default

**APZ/Separation(m):** 17

## Fire Inputs

**Veg./Flame Width(m):** 100

**Flame Temp(K):** 1090

## Calculation Parameters

**Flame Emissivity:** 95

**Relative Humidity(%):** 25

**Heat of Combustion(kJ/kg)** 18600

**Ambient Temp(K):** 308

**Moisture Factor:** 5

**FDI:** 100

## Program Outputs

**Level of Construction:** BAL 29

**Peak Elevation of Receiver(m):** 6.71

**Radiant Heat(kW/m2):** 28.43

**Flame Angle (degrees):** 63

**Flame Length(m):** 15.06

**Maximum View Factor:** 0.439

**Rate Of Spread (km/h):** 1.86

**Inner Protection Area(m):** 13

**Transmissivity:** 0.851

**Outer Protection Area(m):** 4

**Fire Intensity(kW/m):** 23681

## BAL Thresholds

| | BAL-40: | BAL-29: | BAL-19: | BAL-12.5: | 10 kw/m2: | Elevation of Receiver: |
|---|---|---|---|---|---|---|
| **Asset Protection Zone(m):** | 13 | 17 | 25 | 34 | 53 | 6 |

**Run Description:** T17 across dry gully (first order stream)

## Vegetation Information

**Vegetation Type:** Hunter Macleay DSF

**Vegetation Group:** Dry Sclerophyll Forests (Shrub/Grass)

**Vegetation Slope:** 0.5 Degrees

**Vegetation Slope Type:** Downslope

**Surface Fuel Load(t/ha):** 14

**Overall Fuel Load(t/ha):** 24.6

**Vegetation Height(m):** 0.9

Only Applicable to Shrub/Scrub and Vesta

## Site Information

**Site Slope:** 0 Degrees

**Site Slope Type:** Downslope

**Elevation of Receiver(m):** Default

**APZ/Separation(m):** 16

## Fire Inputs

**Veg./Flame Width(m):** 100

**Flame Temp(K):** 1090

## Calculation Parameters

**Flame Emissivity:** 95

**Relative Humidity(%):** 25

**Heat of Combustion(kJ/kg)** 18600

**Ambient Temp(K):** 308

**Moisture Factor:** 5

**FDI:** 100

## Program Outputs

**Level of Construction:** BAL 29

**Peak Elevation of Receiver(m):** 6.35

**Radiant Heat(kW/m2):** 28.72

**Flame Angle (degrees):** 63

**Flame Length(m):** 14.26

**Maximum View Factor:** 0.442

**Rate Of Spread (km/h):** 1.74

**Inner Protection Area(m):** 12

**Transmissivity:** 0.854

**Outer Protection Area(m):** 4

**Fire Intensity(kW/m):** 22102

## BAL Thresholds

| | BAL-40: | BAL-29: | BAL-19: | BAL-12.5: | 10 kw/m2: | Elevation of Receiver: |
|---|---|---|---|---|---|---|
| **Asset Protection Zone(m):** | 12 | 16 | 24 | 33 | 51 | 6 |

**Run Description:** T18

## Vegetation Information

**Vegetation Type:** Hunter Macleay DSF

**Vegetation Group:** Dry Sclerophyll Forests (Shrub/Grass)

**Vegetation Slope:** 6 Degrees

**Vegetation Slope Type:** Downslope

**Surface Fuel Load(t/ha):** 14

**Overall Fuel Load(t/ha):** 24.6

**Vegetation Height(m):** 0.9

Only Applicable to Shrub/Scrub and Vesta

## Site Information

**Site Slope:** 0 Degrees

**Site Slope Type:** Downslope

**Elevation of Receiver(m):** Default

**APZ/Separation(m):** 22

## Fire Inputs

**Veg./Flame Width(m):** 100

**Flame Temp(K):** 1090

## Calculation Parameters

**Flame Emissivity:** 95

**Relative Humidity(%):** 25

**Heat of Combustion(kJ/kg)** 18600

**Ambient Temp(K):** 308

**Moisture Factor:** 5

**FDI:** 100

## Program Outputs

**Level of Construction:** BAL 29

**Peak Elevation of Receiver(m):** 8.6

**Radiant Heat(kW/m2):** 27.72

**Flame Angle (degrees):** 62

**Flame Length(m):** 19.47

**Maximum View Factor:** 0.435

**Rate Of Spread (km/h):** 2.54

**Inner Protection Area(m):** 17

**Transmissivity:** 0.839

**Outer Protection Area(m):** 5

**Fire Intensity(kW/m):** 32304

## BAL Thresholds

| | BAL-40: | BAL-29: | BAL-19: | BAL-12.5: | 10 kw/m2: | Elevation of Receiver: |
|---|---|---|---|---|---|---|
| **Asset Protection Zone(m):** | 16 | 21 | 30 | 42 | 63 | 6 |

**Run Description:** T19

## Vegetation Information

**Vegetation Type:** Hunter Macleay DSF

**Vegetation Group:** Dry Sclerophyll Forests (Shrub/Grass)

**Vegetation Slope:** 3.8 Degrees

**Vegetation Slope Type:** Downslope

**Surface Fuel Load(t/ha):** 14

**Overall Fuel Load(t/ha):** 24.6

**Vegetation Height(m):** 0.9

Only Applicable to Shrub/Scrub and Vesta

## Site Information

**Site Slope:** 0 Degrees

**Site Slope Type:** Downslope

**Elevation of Receiver(m):** Default

**APZ/Separation(m):** 19

## Fire Inputs

**Veg./Flame Width(m):** 100

**Flame Temp(K):** 1090

## Calculation Parameters

**Flame Emissivity:** 95

**Relative Humidity(%):** 25

**Heat of Combustion(kJ/kg)** 18600

**Ambient Temp(K):** 308

**Moisture Factor:** 5

**FDI:** 100

## Program Outputs

**Level of Construction:** BAL 29

**Peak Elevation of Receiver(m):** 7.56

**Radiant Heat(kW/m2):** 29

**Flame Angle (degrees):** 62

**Flame Length(m):** 17.12

**Maximum View Factor:** 0.45

**Rate Of Spread (km/h):** 2.18

**Inner Protection Area(m):** 15

**Transmissivity:** 0.847

**Outer Protection Area(m):** 4

**Fire Intensity(kW/m):** 27754

## BAL Thresholds

| | BAL-40: | BAL-29: | BAL-19: | BAL-12.5: | 10 kw/m2: | Elevation of Receiver: |
|---|---|---|---|---|---|---|
| **Asset Protection Zone(m):** | 15 | 19 | 27 | 38 | 58 | 6 |

**Run Description:** T2 - Development site north of road

## Vegetation Information

**Vegetation Type:** Hunter Macleay DSF

**Vegetation Group:** Dry Sclerophyll Forests (Shrub/Grass)

**Vegetation Slope:** 11 Degrees

**Vegetation Slope Type:** Downslope

**Surface Fuel Load(t/ha):** 14

**Overall Fuel Load(t/ha):** 24.6

**Vegetation Height(m):** 0.9

Only Applicable to Shrub/Scrub and Vesta

## Site Information

**Site Slope:** 0 Degrees

**Site Slope Type:** Downslope

**Elevation of Receiver(m):** Default

**APZ/Separation(m):** 28

## Fire Inputs

**Veg./Flame Width(m):** 100

**Flame Temp(K):** 1090

## Calculation Parameters

**Flame Emissivity:** 95

**Relative Humidity(%):** 25

**Heat of Combustion(kJ/kg)** 18600

**Ambient Temp(K):** 308

**Moisture Factor:** 5

**FDI:** 100

## Program Outputs

**Level of Construction:** BAL 29

**Peak Elevation of Receiver(m):** 11.38

**Radiant Heat(kW/m2):** 28.59

**Flame Angle (degrees):** 60

**Flame Length(m):** 26.28

**Maximum View Factor:** 0.455

**Rate Of Spread (km/h):** 3.59

**Inner Protection Area(m):** 22

**Transmissivity:** 0.827

**Outer Protection Area(m):** 6

**Fire Intensity(kW/m):** 45613

## BAL Thresholds

| | BAL-40: | BAL-29: | BAL-19: | BAL-12.5: | 10 kw/m2: | Elevation of Receiver: |
|---|---|---|---|---|---|---|
| **Asset Protection Zone(m):** | 21 | 27 | 38 | 51 | 75 | 6 |

| | | | |
|---|---|---|---|
| **Run Description:** | T20 | | |
| **Vegetation Information** | | | |
| **Vegetation Type:** | Hunter Macleay DSF | | |
| **Vegetation Group:** | Dry Sclerophyll Forests (Shrub/Grass) | | |
| **Vegetation Slope:** | 4.9 Degrees | **Vegetation Slope Type:** | Downslope |
| **Surface Fuel Load(t/ha):** | 14 | **Overall Fuel Load(t/ha):** | 24.6 |
| **Vegetation Height(m):** | 0.9 | Only Applicable to Shrub/Scrub and Vesta | |
| **Site Information** | | | |
| **Site Slope:** | 0 Degrees | **Site Slope Type:** | Downslope |
| **Elevation of Receiver(m):** | Default | **APZ/Separation(m):** | 20 |
| **Fire Inputs** | | | |
| **Veg./Flame Width(m):** | 100 | **Flame Temp(K):** | 1090 |
| **Calculation Parameters** | | | |
| **Flame Emissivity:** | 95 | **Relative Humidity(%):** | 25 |
| **Heat of Combustion(kJ/kg)** | 18600 | **Ambient Temp(K):** | 308 |
| **Moisture Factor:** | 5 | **FDI:** | 100 |
| **Program Outputs** | | | |
| **Level of Construction:** | BAL 29 | **Peak Elevation of Receiver(m):** | 8.08 |
| **Radiant Heat(kW/m2):** | 29 | **Flame Angle (degrees):** | 62 |
| **Flame Length(m):** | 18.29 | **Maximum View Factor:** | 0.452 |
| **Rate Of Spread (km/h):** | 2.36 | **Inner Protection Area(m):** | 15 |
| **Transmissivity:** | 0.844 | **Outer Protection Area(m):** | 5 |
| **Fire Intensity(kW/m):** | 29943 | | |

**BAL Thresholds**

| | BAL-40: | BAL-29: | BAL-19: | BAL-12.5: | 10 kw/m2: | Elevation of Receiver: |
|---|---|---|---|---|---|---|
| **Asset Protection Zone(m):** | 15 | 20 | 29 | 40 | 60 | 6 |

**Run Description:** T21

## Vegetation Information

**Vegetation Type:** Hunter Macleay DSF

**Vegetation Group:** Dry Sclerophyll Forests (Shrub/Grass)

**Vegetation Slope:** 6.2 Degrees

**Vegetation Slope Type:** Downslope

**Surface Fuel Load(t/ha):** 14

**Overall Fuel Load(t/ha):** 24.6

**Vegetation Height(m):** 0.9

Only Applicable to Shrub/Scrub and Vesta

## Site Information

**Site Slope:** 0 Degrees

**Site Slope Type:** Downslope

**Elevation of Receiver(m):** Default

**APZ/Separation(m):** 22

## Fire Inputs

**Veg./Flame Width(m):** 100

**Flame Temp(K):** 1090

## Calculation Parameters

**Flame Emissivity:** 95

**Relative Humidity(%):** 25

**Heat of Combustion(kJ/kg)** 18600

**Ambient Temp(K):** 308

**Moisture Factor:** 5

**FDI:** 100

## Program Outputs

**Level of Construction:** BAL 29

**Peak Elevation of Receiver(m):** 8.62

**Radiant Heat(kW/m2):** 29

**Flame Angle (degrees):** 61

**Flame Length(m):** 19.72

**Maximum View Factor:** 0.453

**Rate Of Spread (km/h):** 2.58

**Inner Protection Area(m):** 0

**Transmissivity:** 0.841

**Outer Protection Area(m):** 0

**Fire Intensity(kW/m):** 32753

## BAL Thresholds

| | BAL-40: | BAL-29: | BAL-19: | BAL-12.5: | 10 kw/m2: | Elevation of Receiver: |
|---|---|---|---|---|---|---|
| **Asset Protection Zone(m):** | 16 | 22 | 40 | 42 | 63 | 6 |

**Run Description:** T22

## Vegetation Information

**Vegetation Type:** Hunter Macleay DSF

**Vegetation Group:** Dry Sclerophyll Forests (Shrub/Grass)

**Vegetation Slope:** 1.1 Degrees

**Vegetation Slope Type:** Downslope

**Surface Fuel Load(t/ha):** 14

**Overall Fuel Load(t/ha):** 24.6

**Vegetation Height(m):** 0.9

Only Applicable to Shrub/Scrub and Vesta

## Site Information

**Site Slope:** 0 Degrees

**Site Slope Type:** Downslope

**Elevation of Receiver(m):** Default

**APZ/Separation(m):** 17

## Fire Inputs

**Veg./Flame Width(m):** 100

**Flame Temp(K):** 1090

## Calculation Parameters

**Flame Emissivity:** 95

**Relative Humidity(%):** 25

**Heat of Combustion(kJ/kg)** 18600

**Ambient Temp(K):** 308

**Moisture Factor:** 5

**FDI:** 100

## Program Outputs

**Level of Construction:** BAL 29

**Peak Elevation of Receiver(m):** 6.56

**Radiant Heat(kW/m2):** 29

**Flame Angle (degrees):** 63

**Flame Length(m):** 14.72

**Maximum View Factor:** 0.447

**Rate Of Spread (km/h):** 1.81

**Inner Protection Area(m):** 13

**Transmissivity:** 0.853

**Outer Protection Area(m):** 3

**Fire Intensity(kW/m):** 23037

## BAL Thresholds

| | BAL-40: | BAL-29: | BAL-19: | BAL-12.5: | 10 kw/m2: | Elevation of Receiver: |
|---|---|---|---|---|---|---|
| **Asset Protection Zone(m):** | 13 | 17 | 24 | 34 | 53 | 6 |

**Run Description:** T23

## Vegetation Information

**Vegetation Type:** Hunter Macleay DSF

**Vegetation Group:** Dry Sclerophyll Forests (Shrub/Grass)

**Vegetation Slope:** 3.2 Degrees

**Vegetation Slope Type:** Upslope

**Surface Fuel Load(t/ha):** 14

**Overall Fuel Load(t/ha):** 24.6

**Vegetation Height(m):** 0.9

Only Applicable to Shrub/Scrub and Vesta

## Site Information

**Site Slope:** 0 Degrees

**Site Slope Type:** Downslope

**Elevation of Receiver(m):** Default

**APZ/Separation(m):** 14

## Fire Inputs

**Veg./Flame Width(m):** 100

**Flame Temp(K):** 1090

## Calculation Parameters

**Flame Emissivity:** 95

**Relative Humidity(%):** 25

**Heat of Combustion(kJ/kg)** 18600

**Ambient Temp(K):** 308

**Moisture Factor:** 5

**FDI:** 100

## Program Outputs

**Level of Construction:** BAL 29

**Peak Elevation of Receiver(m):** 5.31

**Radiant Heat(kW/m2):** 27.15

**Flame Angle (degrees):** 65

**Flame Length(m):** 11.71

**Maximum View Factor:** 0.416

**Rate Of Spread (km/h):** 1.35

**Inner Protection Area(m):** 11

**Transmissivity:** 0.858

**Outer Protection Area(m):** 3

**Fire Intensity(kW/m):** 17122

## BAL Thresholds

| | BAL-40: | BAL-29: | BAL-19: | BAL-12.5: | 10 kw/m2: | Elevation of Receiver: |
|---|---|---|---|---|---|---|
| **Asset Protection Zone(m):** | 10 | 14 | 20 | 28 | 45 | 6 |

**Run Description:** T24 opposite riparian corridor

## Vegetation Information

**Vegetation Type:** Hunter Macleay DSF

**Vegetation Group:** Dry Sclerophyll Forests (Shrub/Grass)

**Vegetation Slope:** 2 Degrees

**Vegetation Slope Type:** Downslope

**Surface Fuel Load(t/ha):** 14

**Overall Fuel Load(t/ha):** 24.6

**Vegetation Height(m):** 0.9

Only Applicable to Shrub/Scrub and Vesta

## Site Information

**Site Slope:** 0 Degrees

**Site Slope Type:** Downslope

**Elevation of Receiver(m):** Default

**APZ/Separation(m):** 20

## Fire Inputs

**Veg./Flame Width(m):** 100

**Flame Temp(K):** 1090

## Calculation Parameters

**Flame Emissivity:** 95

**Relative Humidity(%):** 25

**Heat of Combustion(kJ/kg)** 18600

**Ambient Temp(K):** 308

**Moisture Factor:** 5

**FDI:** 100

## Program Outputs

**Level of Construction:** BAL 29

**Peak Elevation of Receiver(m):** 7.07

**Radiant Heat(kW/m2):** 24.36

**Flame Angle (degrees):** 66

**Flame Length(m):** 15.49

**Maximum View Factor:** 0.381

**Rate Of Spread (km/h):** 1.93

**Inner Protection Area(m):** 16

**Transmissivity:** 0.841

**Outer Protection Area(m):** 4

**Fire Intensity(kW/m):** 24512

## BAL Thresholds

| | BAL-40: | BAL-29: | BAL-19: | BAL-12.5: | 10 kw/m2: | Elevation of Receiver: |
|---|---|---|---|---|---|---|
| **Asset Protection Zone(m):** | 13 | 18 | 25 | 35 | 54 | 6 |

**Run Description:** T25

## Vegetation Information

**Vegetation Type:** Grassland

**Vegetation Group:** Grassland

**Vegetation Slope:** 5 Degrees

**Vegetation Slope Type:** Downslope

**Surface Fuel Load(t/ha):** 6

**Overall Fuel Load(t/ha):** 6

**Vegetation Height(m):** 0

Only Applicable to Shrub/Scrub and Vesta

## Site Information

**Site Slope:** 0 Degrees

**Site Slope Type:** Downslope

**Elevation of Receiver(m):** Default

**APZ/Separation(m):** 12

## Fire Inputs

**Veg./Flame Width(m):** 100

**Flame Temp(K):** 1090

## Calculation Parameters

**Flame Emissivity:** 95

**Relative Humidity(%):** 25

**Heat of Combustion(kJ/kg)** 18600

**Ambient Temp(K):** 308

**Moisture Factor:** 5

**FDI:** 130

## Program Outputs

**Level of Construction:** BAL 29

**Peak Elevation of Receiver(m):** 4.61

**Radiant Heat(kW/m2):** 28

**Flame Angle (degrees):** 64

**Flame Length(m):** 10.25

**Maximum View Factor:** 0.426

**Rate Of Spread (km/h):** 23.86

**Inner Protection Area(m):** 12

**Transmissivity:** 0.865

**Outer Protection Area(m):** 0

**Fire Intensity(kW/m):** 73974

## BAL Thresholds

| | BAL-40: | BAL-29: | BAL-19: | BAL-12.5: | 10 kw/m2: | Elevation of Receiver: |
|---|---|---|---|---|---|---|
| **Asset Protection Zone(m):** | 0 | 0 | 0 | 0 | 0 | 0 |

**Run Description:** T26 -managed land >30% canopy cover

## Vegetation Information

**Vegetation Type:** Hunter Macleay DSF

**Vegetation Group:** Dry Sclerophyll Forests (Shrub/Grass)

**Vegetation Slope:** 0 Degrees

**Vegetation Slope Type:** Downslope

**Surface Fuel Load(t/ha):** 14

**Overall Fuel Load(t/ha):** 24.6

**Vegetation Height(m):** 0.9

Only Applicable to Shrub/Scrub and Vesta

## Site Information

**Site Slope:** 0 Degrees

**Site Slope Type:** Downslope

**Elevation of Receiver(m):** Default

**APZ/Separation(m):** 16

## Fire Inputs

**Veg./Flame Width(m):** 100

**Flame Temp(K):** 1090

## Calculation Parameters

**Flame Emissivity:** 95

**Relative Humidity(%):** 25

**Heat of Combustion(kJ/kg)** 18600

**Ambient Temp(K):** 308

**Moisture Factor:** 5

**FDI:** 100

## Program Outputs

**Level of Construction:** BAL 29

**Peak Elevation of Receiver(m):** 6.23

**Radiant Heat(kW/m2):** 27.92

**Flame Angle (degrees):** 64

**Flame Length(m):** 13.87

**Maximum View Factor:** 0.43

**Rate Of Spread (km/h):** 1.68

**Inner Protection Area(m):** 12

**Transmissivity:** 0.853

**Outer Protection Area(m):** 4

**Fire Intensity(kW/m):** 21353

## BAL Thresholds

| | BAL-40: | BAL-29: | BAL-19: | BAL-12.5: | 10 kw/m2: | Elevation of Receiver: |
|---|---|---|---|---|---|---|
| **Asset Protection Zone(m):** | 12 | 16 | 23 | 32 | 50 | 6 |

**Run Description:** T27 ,T28 & T29 adjoining paddock - grazed

## Vegetation Information

**Vegetation Type:** Grassland

**Vegetation Group:** Grassland

**Vegetation Slope:** 3 Degrees

**Vegetation Slope Type:** Downslope

**Surface Fuel Load(t/ha):** 6

**Overall Fuel Load(t/ha):** 6

**Vegetation Height(m):** 0

Only Applicable to Shrub/Scrub and Vesta

## Site Information

**Site Slope:** 0 Degrees

**Site Slope Type:** Downslope

**Elevation of Receiver(m):** Default

**APZ/Separation(m):** 12

## Fire Inputs

**Veg./Flame Width(m):** 100

**Flame Temp(K):** 1090

## Calculation Parameters

**Flame Emissivity:** 95

**Relative Humidity(%):** 25

**Heat of Combustion(kJ/kg)** 18600

**Ambient Temp(K):** 308

**Moisture Factor:** 5

**FDI:** 130

## Program Outputs

**Level of Construction:** BAL 29

**Peak Elevation of Receiver(m):** 4.37

**Radiant Heat(kW/m2):** 26.09

**Flame Angle (degrees):** 66

**Flame Length(m):** 9.57

**Maximum View Factor:** 0.397

**Rate Of Spread (km/h):** 20.79

**Inner Protection Area(m):** 12

**Transmissivity:** 0.864

**Outer Protection Area(m):** 0

**Fire Intensity(kW/m):** 64439

## BAL Thresholds

| | BAL-40: | BAL-29: | BAL-19: | BAL-12.5: | 10 kw/m2: | Elevation of Receiver: |
|---|---|---|---|---|---|---|
| **Asset Protection Zone(m):** | 0 | 0 | 0 | 0 | 0 | 0 |

**Run Description:** T3 + T4 Wollombi Road

## Vegetation Information

**Vegetation Type:** Non-Hazard

**Vegetation Group:** Non-Hazard

**Vegetation Slope:** 0 Degrees

**Vegetation Slope Type:** Level

**Surface Fuel Load(t/ha):** 0

**Overall Fuel Load(t/ha):** 0

**Vegetation Height(m):** 0

Only Applicable to Shrub/Scrub and Vesta

## Site Information

**Site Slope:** 0 Degrees

**Site Slope Type:** Downslope

**Elevation of Receiver(m):** Default

**APZ/Separation(m):** 101

## Fire Inputs

**Veg./Flame Width(m):** 100

**Flame Temp(K):** 1090

## Calculation Parameters

**Flame Emissivity:** 95

**Relative Humidity(%):** 25

**Heat of Combustion(kJ/kg)** 18600

**Ambient Temp(K):** 308

**Moisture Factor:** 5

**FDI:** 100

## Program Outputs

**Level of Construction:** BAL LOW

**Peak Elevation of Receiver(m):** 0

**Radiant Heat(kW/m2):** 0

**Flame Angle (degrees):** 0

**Flame Length(m):** 0

**Maximum View Factor:** 0

**Rate Of Spread (km/h):** 0

**Inner Protection Area(m):** 101

**Transmissivity:** 0.722

**Outer Protection Area(m):** 0

**Fire Intensity(kW/m):** 0

## BAL Thresholds

| | BAL-40: | BAL-29: | BAL-19: | BAL-12.5: | 10 kw/m2: | Elevation of Receiver: |
|---|---|---|---|---|---|---|
| **Asset Protection Zone(m):** | 0 | 0 | 0 | 0 | 0 | 6 |

**Run Description:** T34 - gullies

## Vegetation Information

**Vegetation Type:** Coastal Floodplain Wetlands

**Vegetation Group:** Forested Wetlands

**Vegetation Slope:** 2 Degrees

**Vegetation Slope Type:** Downslope

**Surface Fuel Load(t/ha):** 8.2

**Overall Fuel Load(t/ha):** 15.1

**Vegetation Height(m):** 0.9

Only Applicable to Shrub/Scrub and Vesta

## Site Information

**Site Slope:** 0 Degrees

**Site Slope Type:** Downslope

**Elevation of Receiver(m):** Default

**APZ/Separation(m):** 11

## Fire Inputs

**Veg./Flame Width(m):** 100

**Flame Temp(K):** 1090

## Calculation Parameters

**Flame Emissivity:** 95

**Relative Humidity(%):** 25

**Heat of Combustion(kJ/kg)** 18600

**Ambient Temp(K):** 308

**Moisture Factor:** 5

**FDI:** 100

## Program Outputs

**Level of Construction:** BAL 29

**Peak Elevation of Receiver(m):** 4.15

**Radiant Heat(kW/m2):** 27.37

**Flame Angle (degrees):** 65

**Flame Length(m):** 9.15

**Maximum View Factor:** 0.415

**Rate Of Spread (km/h):** 1.13

**Inner Protection Area(m):** 11

**Transmissivity:** 0.867

**Outer Protection Area(m):** 0

**Fire Intensity(kW/m):** 8813

## BAL Thresholds

| | BAL-40: | BAL-29: | BAL-19: | BAL-12.5: | 10 kw/m2: | Elevation of Receiver: |
|---|---|---|---|---|---|---|
| **Asset Protection Zone(m):** | 7 | 10 | 16 | 23 | 37 | 6 |

**Run Description:** T5 - north across road to development site

## Vegetation Information

**Vegetation Type:** Hunter Macleay DSF

**Vegetation Group:** Dry Sclerophyll Forests (Shrub/Grass)

**Vegetation Slope:** 8 Degrees

**Vegetation Slope Type:** Downslope

**Surface Fuel Load(t/ha):** 14

**Overall Fuel Load(t/ha):** 24.6

**Vegetation Height(m):** 0.9

Only Applicable to Shrub/Scrub and Vesta

## Site Information

**Site Slope:** 2 Degrees

**Site Slope Type:** Downslope

**Elevation of Receiver(m):** Default

**APZ/Separation(m):** 24

## Fire Inputs

**Veg./Flame Width(m):** 100

**Flame Temp(K):** 1090

## Calculation Parameters

**Flame Emissivity:** 95

**Relative Humidity(%):** 25

**Heat of Combustion(kJ/kg)** 18600

**Ambient Temp(K):** 308

**Moisture Factor:** 5

**FDI:** 100

## Program Outputs

**Level of Construction:** BAL 29

**Peak Elevation of Receiver(m):** 8.93

**Radiant Heat(kW/m2):** 27.92

**Flame Angle (degrees):** 63

**Flame Length(m):** 21.92

**Maximum View Factor:** 0.44

**Rate Of Spread (km/h):** 2.92

**Inner Protection Area(m):** 19

**Transmissivity:** 0.834

**Outer Protection Area(m):** 5

**Fire Intensity(kW/m):** 37084

## BAL Thresholds

| | BAL-40: | BAL-29: | BAL-19: | BAL-12.5: | 10 kw/m2: | Elevation of Receiver: |
|---|---|---|---|---|---|---|
| **Asset Protection Zone(m):** | 18 | 23 | 33 | 45 | 67 | 6 |

**Run Description:** T6 across road- vacant lot near development site

## Vegetation Information

**Vegetation Type:** Hunter Macleay DSF

**Vegetation Group:** Dry Sclerophyll Forests (Shrub/Grass)

**Vegetation Slope:** 10 Degrees

**Vegetation Slope Type:** Downslope

**Surface Fuel Load(t/ha):** 14

**Overall Fuel Load(t/ha):** 24.6

**Vegetation Height(m):** 0.9

Only Applicable to Shrub/Scrub and Vesta

## Site Information

**Site Slope:** 0 Degrees

**Site Slope Type:** Downslope

**Elevation of Receiver(m):** Default

**APZ/Separation(m):** 27

## Fire Inputs

**Veg./Flame Width(m):** 100

**Flame Temp(K):** 1090

## Calculation Parameters

**Flame Emissivity:** 95

**Relative Humidity(%):** 25

**Heat of Combustion(kJ/kg)** 18600

**Ambient Temp(K):** 308

**Moisture Factor:** 5

**FDI:** 100

## Program Outputs

**Level of Construction:** BAL 29

**Peak Elevation of Receiver(m):** 10.81

**Radiant Heat(kW/m2):** 27.99

**Flame Angle (degrees):** 61

**Flame Length(m):** 24.72

**Maximum View Factor:** 0.445

**Rate Of Spread (km/h):** 3.35

**Inner Protection Area(m):** 21

**Transmissivity:** 0.828

**Outer Protection Area(m):** 6

**Fire Intensity(kW/m):** 42571

## BAL Thresholds

| | BAL-40: | BAL-29: | BAL-19: | BAL-12.5: | 10 kw/m2: | Elevation of Receiver: |
|---|---|---|---|---|---|---|
| **Asset Protection Zone(m):** | 20 | 26 | 36 | 49 | 73 | 6 |

**Run Description:** T7 across road sloping down to development site

## Vegetation Information

**Vegetation Type:** Hunter Macleay DSF

**Vegetation Group:** Dry Sclerophyll Forests (Shrub/Grass)

**Vegetation Slope:** 11.5 Degrees

**Vegetation Slope Type:** Downslope

**Surface Fuel Load(t/ha):** 14

**Overall Fuel Load(t/ha):** 24.6

**Vegetation Height(m):** 0.9

Only Applicable to Shrub/Scrub and Vesta

## Site Information

**Site Slope:** 3 Degrees

**Site Slope Type:** Downslope

**Elevation of Receiver(m):** Default

**APZ/Separation(m):** 28

## Fire Inputs

**Veg./Flame Width(m):** 100

**Flame Temp(K):** 1090

## Calculation Parameters

**Flame Emissivity:** 95

**Relative Humidity(%):** 25

**Heat of Combustion(kJ/kg)** 18600

**Ambient Temp(K):** 308

**Moisture Factor:** 5

**FDI:** 100

## Program Outputs

**Level of Construction:** BAL 29

**Peak Elevation of Receiver(m):** 10.5

**Radiant Heat(kW/m2):** 28.81

**Flame Angle (degrees):** 62

**Flame Length(m):** 27.1

**Maximum View Factor:** 0.459

**Rate Of Spread (km/h):** 3.71

**Inner Protection Area(m):** 22

**Transmissivity:** 0.826

**Outer Protection Area(m):** 6

**Fire Intensity(kW/m):** 47214

## BAL Thresholds

| | BAL-40: | BAL-29: | BAL-19: | BAL-12.5: | 10 kw/m2: | Elevation of Receiver: |
|---|---|---|---|---|---|---|
| **Asset Protection Zone(m):** | 21 | 28 | 39 | 52 | 75 | 6 |

**Run Description:** T8 east Lot 1 DP810894

## Vegetation Information

**Vegetation Type:** Non-Hazard

**Vegetation Group:** Non-Hazard

**Vegetation Slope:** 5 Degrees

**Vegetation Slope Type:** Downslope

**Surface Fuel Load(t/ha):** 0

**Overall Fuel Load(t/ha):** 0

**Vegetation Height(m):** 0

Only Applicable to Shrub/Scrub and Vesta

## Site Information

**Site Slope:** 0 Degrees

**Site Slope Type:** Downslope

**Elevation of Receiver(m):** Default

**APZ/Separation(m):** 12

## Fire Inputs

**Veg./Flame Width(m):** 100

**Flame Temp(K):** 1090

## Calculation Parameters

**Flame Emissivity:** 95

**Relative Humidity(%):** 25

**Heat of Combustion(kJ/kg)** 18600

**Ambient Temp(K):** 308

**Moisture Factor:** 5

**FDI:** 100

## Program Outputs

**Level of Construction:** BAL 12.5

**Peak Elevation of Receiver(m):** 0

**Radiant Heat(kW/m2):** 0

**Flame Angle (degrees):** 0

**Flame Length(m):** 0

**Maximum View Factor:** 0

**Rate Of Spread (km/h):** 0

**Inner Protection Area(m):** 12

**Transmissivity:** 0.857

**Outer Protection Area(m):** 0

**Fire Intensity(kW/m):** 0

## BAL Thresholds

| | BAL-40: | BAL-29: | BAL-19: | BAL-12.5: | 10 kw/m2: | Elevation of Receiver: |
|---|---|---|---|---|---|---|
| **Asset Protection Zone(m):** | 0 | 0 | 0 | 0 | 0 | 6 |

| | |
|---|---|
| **Run Description:** | T9 east across Oxspring Road |

## Vegetation Information

| | | | |
|---|---|---|---|
| **Vegetation Type:** | Hunter Macleay DSF | | |
| **Vegetation Group:** | Dry Sclerophyll Forests (Shrub/Grass) | | |
| **Vegetation Slope:** | 3.5 Degrees | **Vegetation Slope Type:** | Downslope |
| **Surface Fuel Load(t/ha):** | 14 | **Overall Fuel Load(t/ha):** | 24.6 |
| **Vegetation Height(m):** | 0.9 | Only Applicable to Shrub/Scrub and Vesta | |

## Site Information

| | | | |
|---|---|---|---|
| **Site Slope:** | 0 Degrees | **Site Slope Type:** | Downslope |
| **Elevation of Receiver(m):** | Default | **APZ/Separation(m):** | 20 |

## Fire Inputs

| | | | |
|---|---|---|---|
| **Veg./Flame Width(m):** | 100 | **Flame Temp(K):** | 1090 |

## Calculation Parameters

| | | | |
|---|---|---|---|
| **Flame Emissivity:** | 95 | **Relative Humidity(%):** | 25 |
| **Heat of Combustion(kJ/kg)** | 18600 | **Ambient Temp(K):** | 308 |
| **Moisture Factor:** | 5 | **FDI:** | 100 |

## Program Outputs

| | | | |
|---|---|---|---|
| **Level of Construction:** | BAL 29 | **Peak Elevation of Receiver(m):** | 7.57 |
| **Radiant Heat(kW/m2):** | 26.6 | **Flame Angle (degrees):** | 64 |
| **Flame Length(m):** | 16.85 | **Maximum View Factor:** | 0.415 |
| **Rate Of Spread (km/h):** | 2.14 | **Inner Protection Area(m):** | 16 |
| **Transmissivity:** | 0.842 | **Outer Protection Area(m):** | 4 |
| **Fire Intensity(kW/m):** | 27185 | | |

## BAL Thresholds

| | BAL-40: | BAL-29: | BAL-19: | BAL-12.5: | 10 kw/m2: | Elevation of Receiver: |
|---|---|---|---|---|---|---|
| **Asset Protection Zone(m):** | 14 | 19 | 27 | 37 | 57 | 6 |