BUSHFIRE ASSESSMENT REPORT

The Loxford: Precinct 1B

464 Cessnock Road, Gillieston Heights

Proposed Residential Subdivision

Prepared for Loxford Project Management

Bushfire Planning Australia

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Reference: 2158
Version: FINAL - July 2022

Disclaimer and Limitation

This report is prepared solely for the Loxford Project Management Pty Ltd (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: 2158 - Bushfire Assessment Report

Version	Status	Purpose	Author	Review Date
1	Draft	Draft for Review	Katrina Mukevski	13 July 2022
2	Draft	Draft for Client Review	Stuart Greville	15 July 2022
3	Final	Final for Submission	Stuart Greville	27 July 2022

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 44 of the Rural Fires Regulation 2013 and Appendix 2 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: 27 July 2022

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 Loxford Project Management Pty Ltd (the 'Client') to undertake a Bushfire Assessment Report (BAR) for the proposed residential subdivision known as Precinct 1B of the Regrowth Kurri Kurri at 464 Cessnock Road, Gillieston Heights (the 'subject site'). Precinct 1B is directly west of and connects to Precinct 1A. A development application was lodged with Maitland City Council (MCC) on 9 March 2022 for the subdivision of land (DA/2022/193) referred to as Precinct 1A to create 342 lots. The NSW Rural Fire Service (RFS) issued a Bush Fire Safety Authority for the residential subdivision on 23 June 2022 (RFS Ref: DA202203525006493-Original-1).

An assessment of the existing bushfire hazard was completed in accordance with Appendix 2 of the RFS document Planning for Bushfire Protection 2019 (PBP 2019). The assessment of the landscape, vegetation and topography found that the site is subject to a low to moderate bushfire threat immediately to the south of the site. The hazard is consistent with a *forest* vegetation, namely Hunter Macleay Dry Sclerophyll Forest (DSF) and Sydney Sand Flats DSF, and transitions to Woodland. Additionally, *grassland* is present to the east of the site although will be cleared as a result of a neighbouring development site; and to the west of the site whereby it will be cleared and managed as part of a proposed APZ. The BAR concludes that the hazard identified can be successfully mitigated by applying the requirements of PBP 2019, such as a combination of temporary and permanent Asset Protection Zones (APZs).

Bushfire mitigation measures that are applied to create compliance with PBP 2019 would reduce the vulnerability of the future buildings and occupants. Construction measures can increase the likelihood of assets to withstand most bushfires. A good access and egress strategy can also reduce the vulnerability of the development by enabling occupants to move away from a bushfire as it approaches.

The following recommendations have been designed to enable the proposed development to maintain an acceptable level of protection from the residual risk of a bushfire that may occur in the existing vegetation, in accordance with PBP 2019:

1. The entire site; including all proposed residential lots, Lots 124, 424, 801, 813, 914 and 1419, 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. Access shall satisfy the Performance Criteria outlined in Table 5.3b of PBP 2019 and constructed in accordance with the Detail Sheets of each stage contained in **Appendix A**. This will require the provision of a minimum of two (2) separate road access points provided from the development site to the north and east to ensure safe evacuation for all residents. Access will primarily be provided through Precinct 1A. Accordingly, no lots within Precinct 1B shall be registered prior to the completion of the main collector road connecting the site to Cessnock Road as part of Precinct 1A;
3. Low risk non-perimeter roads shall be 8m wide (including provision for on-street parking);
4. Perimeter roads shall be 10.5m wide with provision for parking on the non-hazard side of the road;
5. Any temporary turning heads shall be constructed in accordance Appendix A3.3 of PBP 2019;
6. Vegetation within road verges (including swales) to be consistent with a grassland vegetation classification with tree canopy less than 10% at maturity (and considered unmanaged);
7. All future dwellings to be constructed on the proposed lots 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;

8. All new lots 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 5.3.3 of PBP 2019; and
9. Consideration should be given to landscaping and fuel loads on site to decrease potential fire hazards on site.

This assessment has been made based on the bushfire hazards observed in and around the site at the time of inspection and production (July 2022) and demonstrates the development has satisfied the aims and objectives of Planning for Bushfire Protection 2019.

Finally, should the above recommendations be implemented, 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 and that property and life damage/loss will not occur.

Table of Contents

Figures

Tables

Plates

Appendices

Appendix A: Plan of Proposed Residential Subdivision

Appendix B: AHIMS Search Results

Appendix C: Traffic Statement, PDC Consultants - May 2022

Appendix D: Rural Fire Service Pre-DA Advice - 2 May 2022

Appendix E: NBC Bushfire Attack Assessor V4.1 Report

Appendix F: Planning for Bushfire Protection 2019 Compliance Table

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
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
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)

1. Introduction

Bushfire Planning Australia (BPA) has been appointed by Loxford Project Management Pty Ltd (the 'Client') to undertake a Bushfire Assessment Report (BAR) for the proposed residential subdivision known as Precinct 1B of The Loxford at 464 Cessnock Road, Gillieston Heights (the 'subject site'). The proposed development will include the completion of bulk earthworks, development of 224 residential Torrens Title allotments and construction of associated ancillary services over 14 stages.

The assessment aims to provide a bushfire risk assessment which considers and assesses the bushfire hazard and associated potential bushfire threat relevant to the proposed development on a landscape scale. The assessment outlines the minimum mitigative measures which would be required in accordance with the BAR, provisions of the New South Wales Rural Fire Service (RFS) publication *Planning for Bushfire Protection 2019* (PBP 2019) and the *Rural Fires Regulation 2022*.

1.1. Aims and Objectives

This BAR aims to assess the bushfire threat and recommends a series of bushfire protection measures that aim to minimise the risk of adverse impact of bush fires on life, property and the environment.

This assessment has been undertaken in accordance with Appendix 2 of *Planning for Bushfire Protection 2019* and clause 45 of the *Rural Fires Regulation 2022*. This assessment also addresses the aim and objectives of PBP 2019, being:

- Afford buildings and their occupants protection from exposure to a bushfire;
- Provide for 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.

2. Site Description

Table 1: Site Description

Address	464 Cessnock Road, Gillieston Heights
Title	Lot 2, 3, 4, 5, 7, 8 and 9 DP456946 Lot 54, 55, 69, 70 and 71 DP975994 Lot 1 DP 1206034
LGA	Maitland City Council
Subject Site/ Study Area	35 ha
Development Site	~20ha
Land Use Zone	R1, Residential and RU2 Rural Landscape (**Figure 1**)
Bushfire Prone Land	Vegetation Category 1 and Vegetation Buffer (**Figure 3**)
Context	The site is located to the west of Cessnock Road, Gillieston Heights. The proposed development site is located to the east of the operational railway line form part of the proposed development. The site has historically been used for grazing and predominantly cleared however some remnant vegetation exists contained to the riparian corridor.
Topography	Undulating, no more than 10m at its deepest point
Fire History	No (recorded) fire history directly impacting site FFDI 100

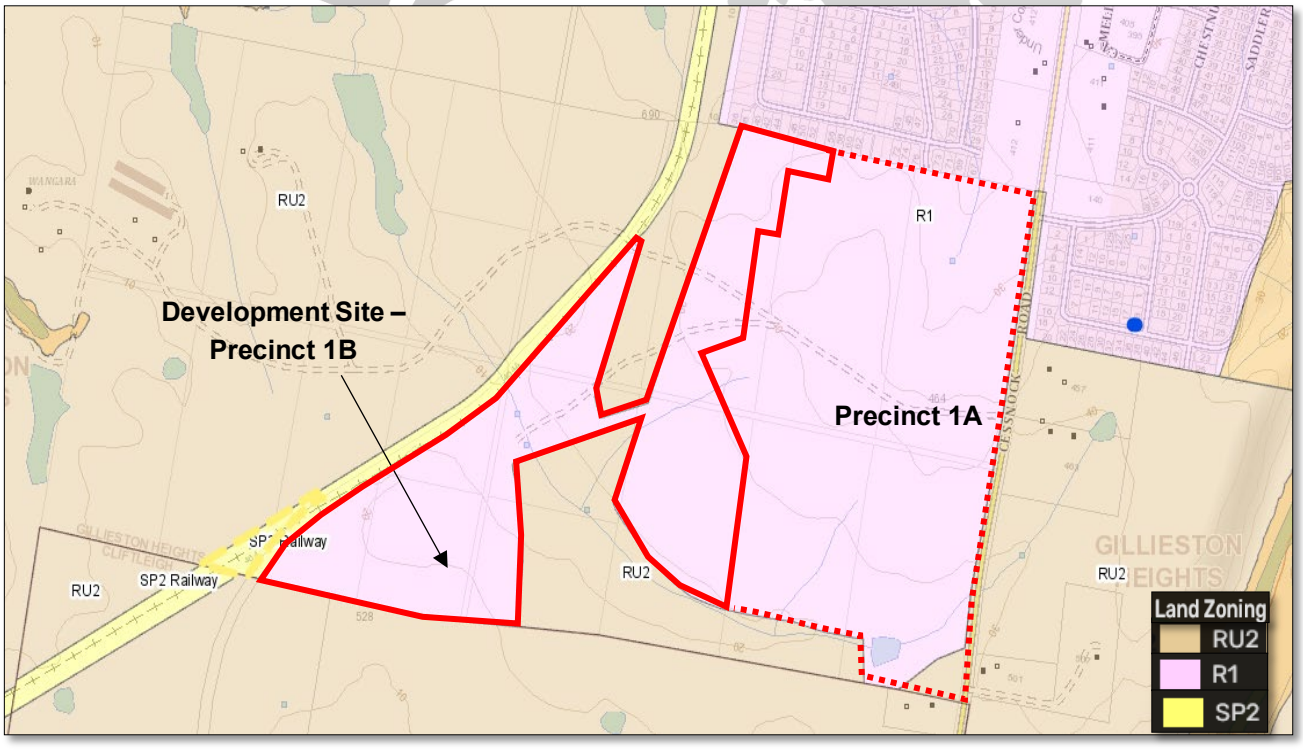

Figure 1: Land Use Zone Map (Maitland Local Environment Plan 2011)

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Job No: 2158

Figure 2

Site Location

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Subject site

2km site buffer

SOURCE:
Base Map © Department of Customer Service 2020

N W E S

0 250 500 750 1,000
Meters

A3 Scale: 1:20,000

File:Gillieston Heights1B-Fig1_SiteLocation_220511 Date: 11/05/2022

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2.1. Background

Precinct 1B of Regrowth, Kurri Kurri represents the residential lands within the Maitland Local Government Area.

These lands are being marketed as 'The Loxford'. This Development Application (DA) for Precinct 1B represents the second DA lodged with Maitland Council for residential subdivision.

Other DAs that have been lodged include an Exhibition Village for 49 display homes and signage that will advertise the land for future sales.

These DAs represent the first residential stages of the Regrowth, Kurri Kurri, which is a masterplanned development for 2,068 residential lots, public recreation, commercial and industrial lands over the former Kurri Kurri Smelter and associated buffer lands.

The landholdings are currently in the ownership of Hydro Aluminium, Kurri Kurri, but will now be incrementally purchased by the McCloy and Stevens Group as a joint venture under the title of Loxford Project Management Kurri Kurri.

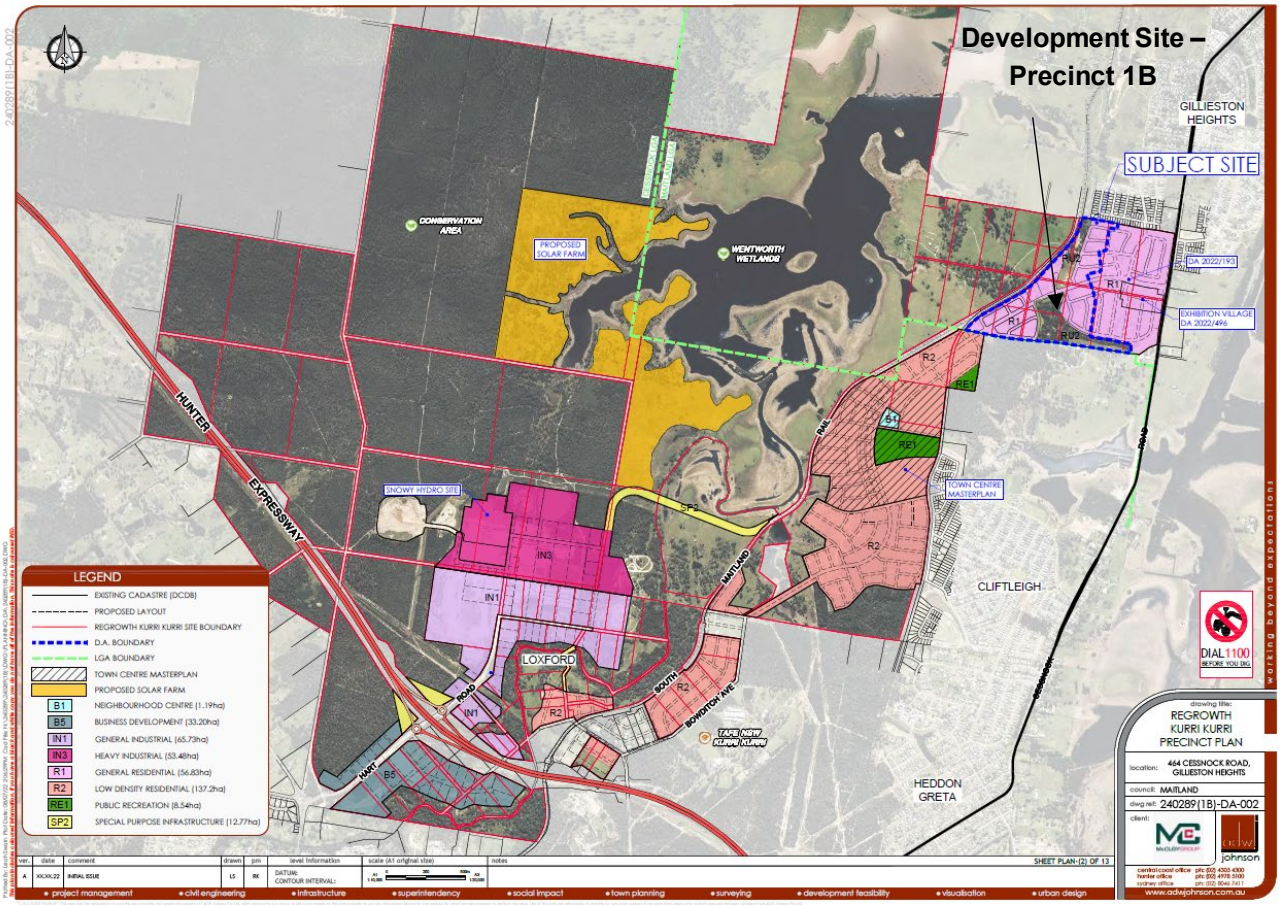

Figure 3: Kurri Regrowth Precinct Plan (Precinct 1B blue-dashed line)

2.2. 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 4 demonstrates the proposed development site contains all Vegetation Categories; being Vegetation Category 1, 2 and 3, and Vegetation Buffer bushfire prone land, whereby the Category 1 bushfire prone land is mostly isolated in nature. The exception being Lot 69 DP975994 whereby the Vegetation Category 1 bushfire prone land contained within the site extends beyond the development site boundary and connects to the primary bushfire hazard located immediately to the south of the site.

There is also bushfire prone land within 140m to the west of the development site although separated by a disused railway line and to the south of the site.

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Job No: 2158

Figure 4

NSW Bush Fire Prone Land

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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 2021
NSW Bush Fire Prone Land: NSW Rural Fire Service 2018
Aerial photo: NearMap 06/08/2021

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0 50 100 150 200 250
Meters

A3 Scale: 1:5,000

File:Gillieston Heights1B-Fig2a_BFPL_220511 Date: 11/05/2022

2.3. Fire History

There have been a number of bushfires recorded within 3km of the site dating back to 2001 although these have varied in size and impact. The closest bushfire occurred in 2019 at Kiah Road, Gillieston Heights, within 2kms from the proposed development site. The largest bushfire recorded occurred in 2002 throughout the Loxford region.

Figure 5 demonstrates the NSW State Fire History within a 2km radius from the development site. The RFS Fire History data does not identify any hazard reduction burns that have been completed.

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Job No: 2158

Figure 5

NSW State Fire History

BUSHFIRE PLANNING AUSTRALIA

- Subject Site
- 2km site buffer
- <all other values>

YearOfFire

- 2001
- 2002
- 2006
- 2011
- 2014
- 2017
- 2018
- 2019

SOURCE:
Cadastral Boundary: NSW Department of Finance, Services and Innovation 2021
NSW State Fire History: NSW Rural Fire Service 2022
Aerial photo: NearMap 06/08/2021

N W E S

0 250 500 750 1,000
Meters

A3 Scale: 1:20,000

File:Gillieston Heights1B-Fig2b_FireHistory-220511 Date: 11/05/2022

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2.4. Proposed Development

The proposed development seeks consent for a residential subdivision that will create 224 residential allotments. The proposed development forms part of The Loxford and is known as Precinct 1B. A development application (DA 2022/193) has been submitted to Council for the subdivision of the land between the subject site and Cessnock Road, known as Precinct 1A.

The proposed development will also include bulk earthworks and benching over the site with retaining walls up to 1.5m in height. Associated pathways and services such as drainage reserves are also included in the proposed residential subdivision.

Further construction of roads including a divided carriageway (MC01) and collector roads are also proposed to manage traffic and access in and around the development. Construction of Precinct 1B and the connection to Cessnock Road, cannot commence until the development of Precinct 1A has been completed.

The plan of subdivision is contained in **Appendix A** and shown in **Figure 6.**

Figure 6: Plan of Proposed Subdivision - Precinct 1B

3. Bushfire Hazard Assessment

The Bushfire Hazard Assessment is conducted on a more localised scale, assessing vegetation categories out to a distance of 140 metres and slope to a distance of 100m, in accordance with the Site Assessment Methodology within Appendix 1 of PBP. This establishes a more localised risk context for the development and specific bush fire protection measures required for the subdivision of the land to occur.

The bushfire hazard assessment involves quantitative and qualitative assessments of the site. The quantitative assessment includes a detailed site inspection to record and review vegetation communities, slope and aspect both within and surrounding the site. The qualitative assessment will be based on the known bushfire behaviour of the subject land.

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 and extent (NearMap historical series);
- Review of NSW State Vegetation Type, NSW Department of Planning, Industry and Environment 2022 (**Figure 7**);
- Review of Biodiversity Development Assessment Report (BDAR) prepared by GHD July 2022; and
- Site Inspection on 3 September 2021 and 16 July 2022 by Stuart Greville (BPA).

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 Appendix 1 of PBP 2019; per Keith (2004). The unmanaged fuel loads detailed in the *Comprehensive Vegetation Fuel Loads* published by the RFS in March 2019 have been adopted for the purpose of assessing the bushfire hazard. The findings of the site inspection were compared to the Keith Vegetation Formations mapping provided by the NSW RFS. The inconsistencies between the mapping sources were quantified during the site inspection.

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Job No: 2158

Figure 7

NSW State Vegetation Type (Class)

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140m Buffer

100m Buffer

Vegetation Class

- Coastal Floodplain Wetlands
- Coastal Freshwater Lagoons
- Hunter-Macleay Dry Sclerophyll Forests
- Not native vegetation
- Sydney Sand Flats Dry Sclerophyll Forests

SOURCE:
Cadastral Boundary: NSW Department of Finance, Services and Innovation 2021
Aerial photo: NearMap17/02/2022
Vegetation: Pre-Release v1.1.0 Eastern NSW Vegetation Type: NSW Department of Planning, Industry and Environment 2021

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0 25 50 75 100 125 150 175 200 225
Meters

A3 Scale: 1:4,263

File:Gillieston Heights1B-FigX-Vegetation-SV-Class-220511 Date: 11/05/2022

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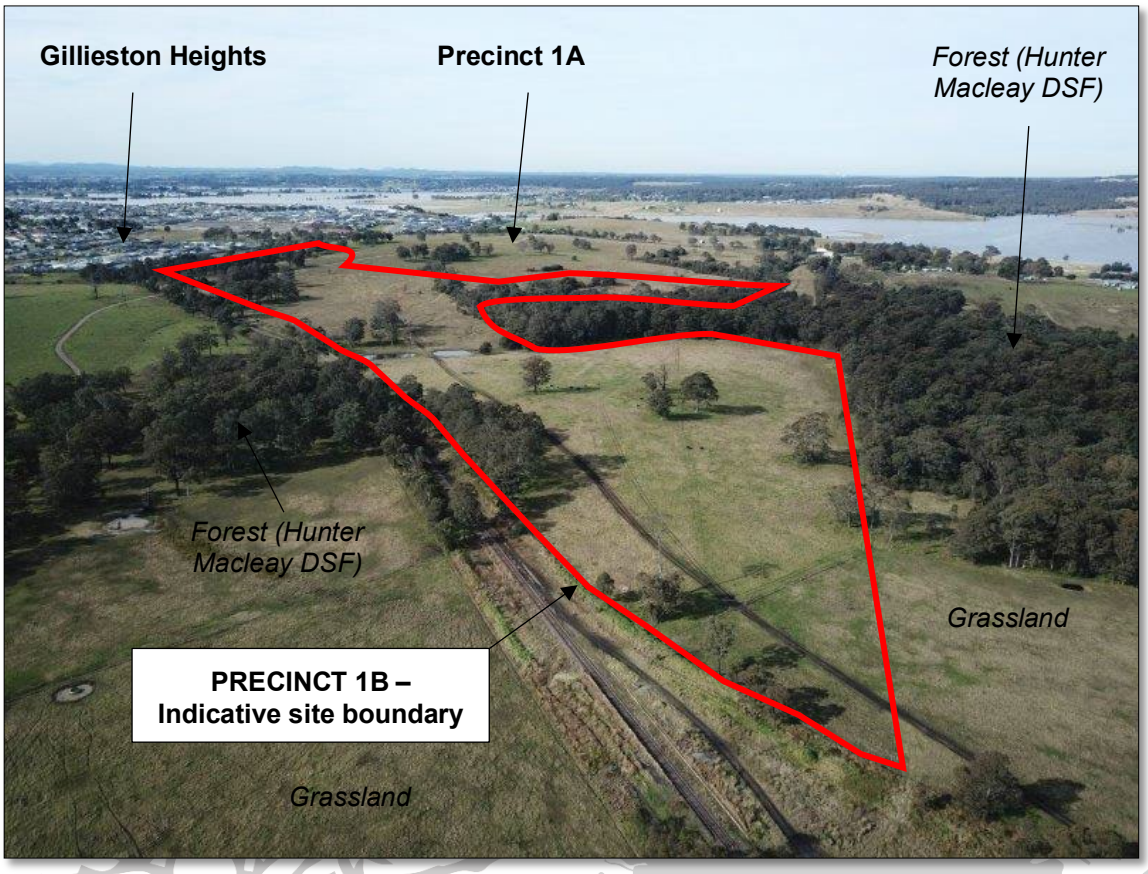

Plate 1: Precinct 1B looking north east towards Precinct 1A

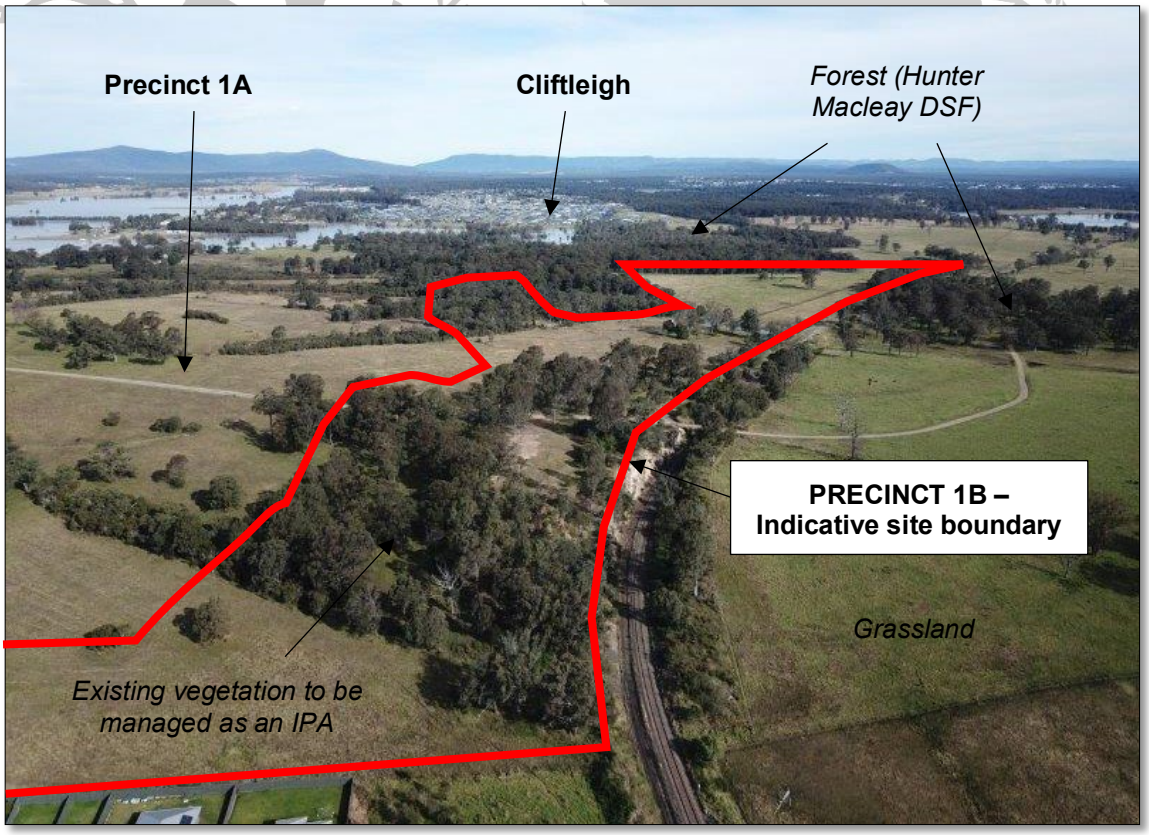

Plate 2: Looking south along western boundary defined by the South Maitland Railway

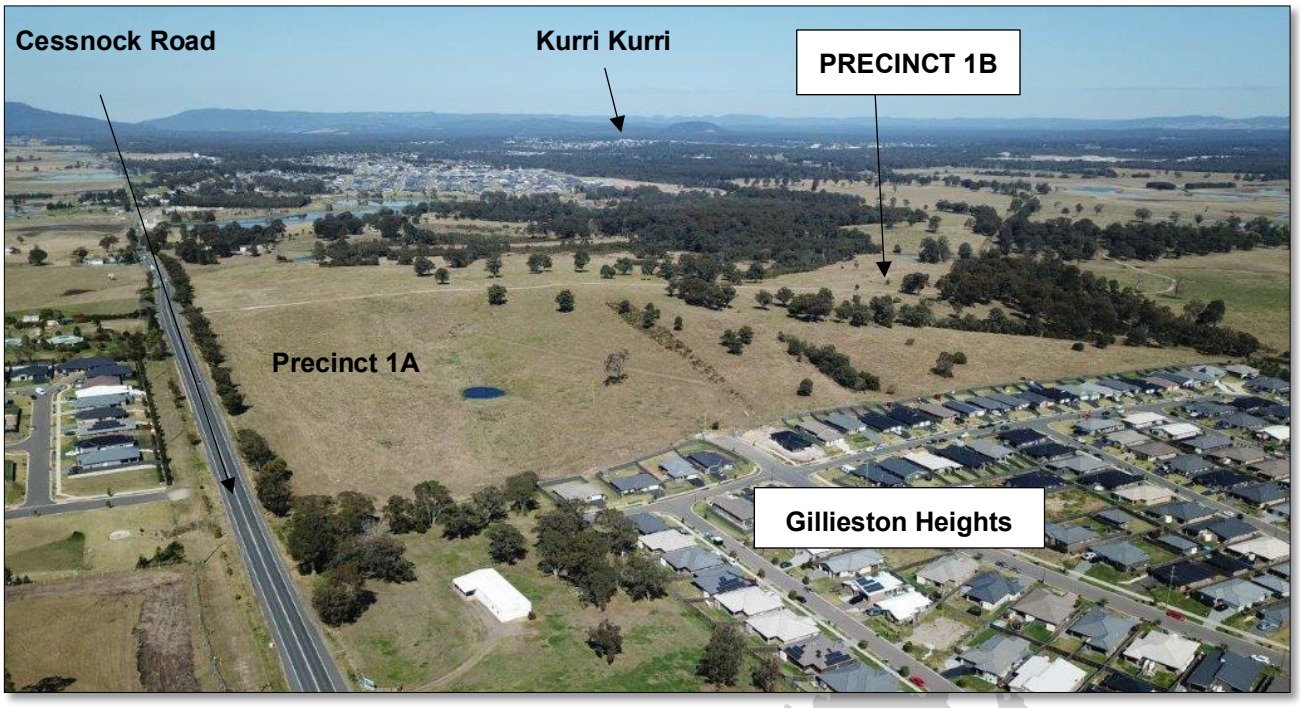

Plate 3: Precincts 1A and 1B; looking south west over Gillieston Heights towards Kurri Kurri

Plate 4: T3 – looking north west across grazed paddock from railway overpass

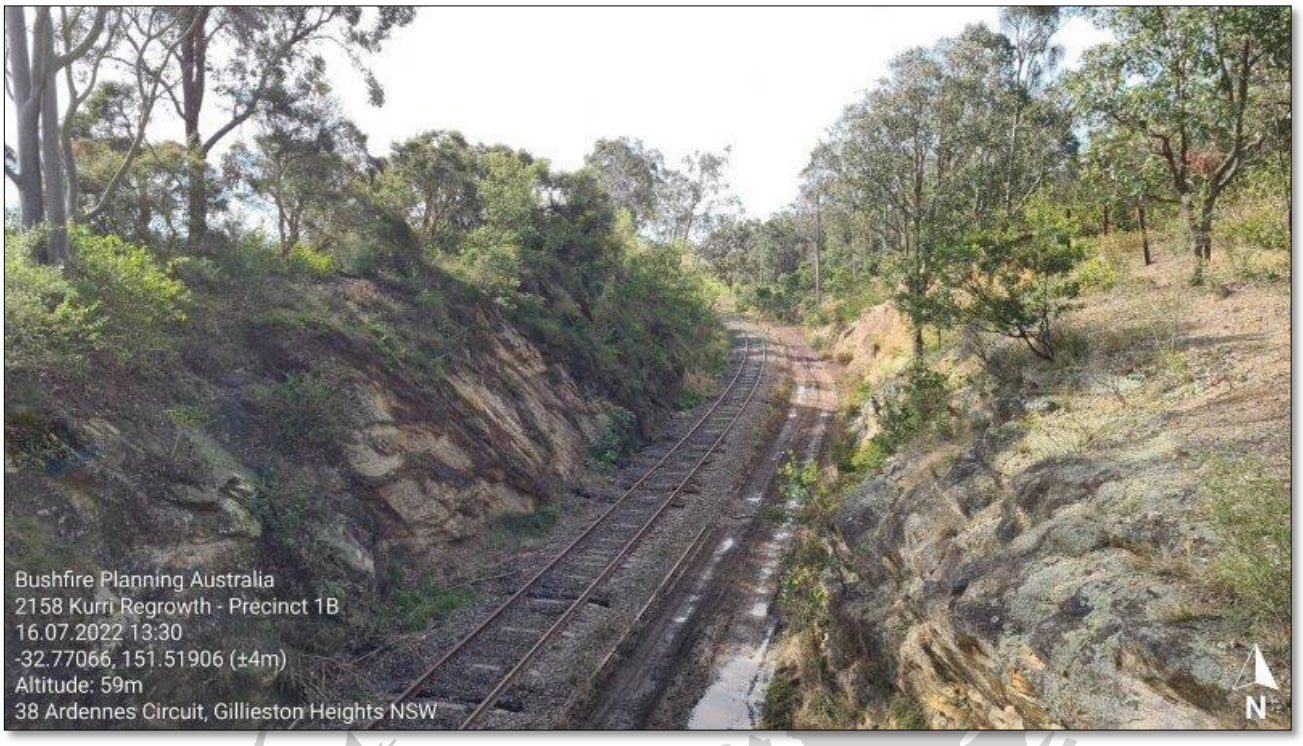

Plate 5: South Maitland Railway looking north from overpass (between T3 and T4)

Plate 6: T4 - Typical open forest vegetation to be managed as an IPA

Plate 7: T5 - Open forest (*Hunter Macleay DSF*) to be managed as an IPA between Precincts 1A and 1B

Plate 8: T9 - looking east into *Hunter Macleay DSF*

Plate 9: Looking over southern boundary across actively grassed paddock (*grassland*)

Plate 10: T15 – looking north over South Maitland Railway into *Hunter Macleay DSF*

3.2. Slope Assessment

Assessment of the effective slope impacting the site was undertaken using LiDAR point cloud data including DEM (NSW LPI) and results from field investigations carried out on the 3 September 2021.

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.

A series of figures were produced that demonstrate the slope within 140m and 2km of the site from the subject site in several formats, including:

- Digital Elevation Model - **Figure 8**; and
- Slope analysis in gradients of 5 degrees - **Figure 9**.

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Job No: 2158

Figure 8

Digital Elevation Model (site)

BUSHFIRE PLANNING AUSTRALIA

Subject Site
100m Buffer
140m Buffer
Contour (10m)
Contour (1m)
Watercourse

Elevation 9AHD)
High : 47m
Low : 0.5m

SOURCE:
Cadastral Boundary: NSW Department of Finance, Services and Innovation 2021
Watercourse: Geoscience Australia 2015
Surface analysis: Derived from LiDAR - Newcastle & Cessnoc 1 metre Resolution Digital Elevation Model

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0 50 100 150 200
Meters

A3 Scale: 1:4,000

File:Gillieston Heights1B-Fig5a-DEM-Site-220511 Date: 11/05/2022

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Job No: 2158

Figure 9

Slope Analysis: LiDAR (site)

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- Subject Site
- 100m Buffer
- 140m Buffer
- Contour (10m)
- Contour (1m)
- Watercourse

Slope

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

SOURCE:
Cadastral Boundary: NSW Department of Finance, Services and Innovation 2021
Watercourse: Geoscience Australia 2015
Surface analysis: Derived from LiDAR - Newcastle & Cessnoc 1 metre Resolution Digital Elevation Model

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0 50 100 150 200
Meters

A3 Scale: 1:4,000

File:Gillieston Heights1B-Fig6a-SlopeLiDAR-Site-220511 Date: 11/05/2022

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3.3. Results

All vegetation identified within the current Bush Fire Prone Land map was confirmed during the site inspection. A large portion of the site is managed land (by way of active and continuous grazing) and therefore excluded for the purposes of PBP 2019.

Vegetation located to the north and south-eastern portion of the site was confirmed as a *forest*, namely *Hunter-Macleay Dry Sclerophyll Forest,* and will be retained as part of the proposed development. A narrow corridor of vegetation located along the western development boundary and dissued railway corridor, was also confirmed as *Hunter-Macleay Dry Sclerophyll Forest*, is isolated in nature and will be cleared as part of the proposed development.

The primary bushfire hazard within and beyond 100m of the site was confirmed along the sites southern boundary and identified as a *forest* vegetation formation; namely Hunter Macleay DSF. This vegetation connects both the development site and the primary bushfire hazard.

Vegetation within 100m of the site located to the east is confirmed as managed *grassland* that forms part of a neighbouring developments either yet to or have commenced construction.

The effective slope on the adjoining lands is almost flat, with minor falls and rises on all elevations. Although there have been no recorded fires within the subject site and on adjoining land, measures must be put in place to afford future occupants protection against flame, radiant heat and ember attack. By employing a combination of bushfire protection measures as listed in PBP 2019 the development will better mitigate against the impact of fire through the inclusion of appropriate Asset Protection Zones, access, water and utilities and emergency response procedures in the design phase.

The results of hazard assessment are detailed in **Table 3** and shown in **Figure 10**.

Table 2: Slope and Vegetation Assessment Results

Transect	Vegetation Description	Vegetation Classification (PBP 2019)	Slope
T1-T3	Actively grazed paddocks (managed land) Ongoing management cannot be guaranteed	*Grassland*	<2.4° Downslope
T4	Forest with a cleared understorey / grazed east of the railway corridor. Within Proposed Lot 801 and managed as an APZ	*Excluded/ APZ*	1.5° Downslope
T5	Forest with a cleared understorey / grazed separating the northern portion of the site. Within Proposed Lot 801 and managed as an APZ.	*Excluded/ APZ*	-3.4° Upslope
T6	Managed land (APZ in lot 801), transitioning from northern forest, which separates the northern portion of the site	*Excluded/ APZ*	-3.4° Upslope
T7	Forest with a cleared understorey / grazed separately the southern portion of the site	*Forest* (Hunter Macleay Dry Sclerophyll Forest)	1.3° Downslope
T8	Forest with a cleared understorey / grazed separately the southern portion of the site	*Forest* (Hunter Macleay Dry Sclerophyll Forest)	3.1° Downslope
T9	Forest with a cleared understorey / grazed separately the southern portion of the site	*Forest* (Hunter Macleay Dry Sclerophyll Forest)	1.8° Downslope

Transect	Vegetation Description	Vegetation Classification (PBP 2019)	Slope
T10	Forest south of the development site identified as the primary bushfire hazard	*Forest* (Hunter Macleay Dry Sclerophyll Forest)	-0.6° Upslope
T11	Forest south of the development site identified as the primary bushfire hazard	*Forest* (Hunter Macleay Dry Sclerophyll Forest)	3.3° Downslope
T12	Forest south of the development site identified as the primary bushfire hazard	*Forest* (Hunter Macleay Dry Sclerophyll Forest)	2.7° Downslope
T13	Forest south of the development site identified as the primary bushfire hazard	*Forest* (Hunter Macleay Dry Sclerophyll Forest)	3.5° Downslope
T14	Actively grazed paddocks (managed land) Ongoing management cannot be guaranteed	*Grassland*	1.8° Downslope
T15	Open grassy forest west of the development site and the railway corridor. Cleared understorey; actively grazed	*Forest* (Hunter Macleay Dry Sclerophyll Forest)	1.9° Downslope
T16-T17	Proposed development site to the edge of the disused railway corridor	*Low threat / excluded*	<4.4° Downslope
T18-T20	Drainage reserve and surrounding planted batters	*Low threat / excluded*	Flat/ level
T21	Forest south of the development site identified as the primary bushfire hazard	*Forest* (Hunter Macleay Dry Sclerophyll Forest)	-0.2° Upslope
T22	Forest south of the development site identified as the primary bushfire hazard	*Forest* (Hunter Macleay Dry Sclerophyll Forest)	0.0° Downslope
T23	Forest south of the development site identified as the primary bushfire hazard	*Forest* (Hunter Macleay Dry Sclerophyll Forest)	3.9° Downslope
T24	Forest south of the development site identified as the primary bushfire hazard	*Forest* (Hunter Macleay Dry Sclerophyll Forest)	-2.3° Upslope

Project: Gillieston Heights 1B
Job No: 2158

Figure 10

Slope & Vegetation Assessment

BUSHFIRE PLANNING AUSTRALIA

- Subject Site
- 100m Buffer
- 140m Buffer
- Contour (10m)
- Contour (1m)
- RL
- Downslope transect
- Upslope transect
- Lots - Proposed 1A
- Lots - Proposed 1B
- Proposed Roads
- Basins
- Residual Lots
- Managed Land (Temporary APZ)
- Forest (Hunter Macleay DSF - cleared understorey/ grazed
- Forest (Hunter Macleay DSF)
- Forest (Sydney Sand Flats DSF)
- Forest (Sydney Sand Flats DSF) to be revegetated
- Woodland
- Grassland
- Managed Land (active open space)
- Managed Land (actively grazed paddocks)
- Managed Land (railway corridor)

SOURCE:
Cadastral Boundary: NSW Department of Finance, Services and Innovation 2021
Watercourse: Geoscience Australia 2015
Surface analysis: Derived from LiDAR - Newcastle & Cessnoc 1 metre Resolution Digital Elevation Model

N W E S

0 50 100 150
Meters

A3 Scale: 1:3,250

File:Gillieston Heights1B-Fig7-SlopeVeg-220715 Date: 15/07/2022

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

T1 100m 2.1°
T2 100m 2.4°
T3 100m 0.4°
T4 100m 1.5°
T5 100m -3.4°
T6 95m -3.4°
T7 100m 1.3°
T8 105m 3.8°
T9 100m 1.7°
T10 100m -0.6°
T11 100m 3.3°
T12 100m 2.7°
T13 100m 3.5°
T14 100m 1.8°
T15 100m 1.9°
T16 46m 4.4°
T17 56m 4.4°
T18 60m 4.4°
T19 109m 1.1°
T20 42m 4.1°

13.2m 16.8m
13.1m 17.3m
24.9m 25.6m
25.4m 28.0m
29.5m 23.5m
27.0m 21.0m
15.4m 18.8m
16.3m 20.6m
17.2m 20.7m
15.4m 13.5m
10.8m 10.8m
13.4m 13.8m
17.0m 14.8m
13.1m 20.1m
21.2m 18.3m
15.3m 16.2m
15.2m 20.7m
22.1m 23.1m
12.1m 10.1m
10.5m 15.0m

RAIL CORRIDOR
RL2 ZONED LAND
DRAINAGE RESERVE
DRAINAGE RESERVE
MAITLAND
SOUTH
ROAD MC01
ROAD MC09
ROAD MC03
ROAD MC15
ROAD MC14
ROAD MC08
MAITLAND LGA
CESSNOCK LGA
22 DP1181574
DP1251

3.4. Significant Environmental Features

The recommended bushfire protection measures have been designed to avoid any unacceptable impacts on a significant environmental feature.

3.5. Threatened Species, populations or ecological communities

The area of the site to be affected by the proposed development has been identified to avoid impact on any threatened species, population or EEC. All bushfire mitigation measures; including APZs will consider the existing and potential biodiversity values to avoid impact where possible.

3.6. Aboriginal Objects

A search of the AHIMS database (results contained in **Appendix B**) 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 avoid disturbing any artefacts if identified.

4. Bushfire Risk and Mitigation

4.1. Asset Protection Zones

An 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 shall be managed as an IPA.

4.1.1. Determining the Appropriate Setbacks

To achieve compliance with the performance criteria for APZs (Table 5.3a), the Acceptable Solutions outlined in Table A1.12.2 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-T20). To ensure the APZs achieve the intent of Section 5.3.1 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 V4.1 report detailing the inputs used is contained in **Appendix C**.

Neighbouring development sites to the east, known as Precinct 1A (DA/2022/193), is pending development approval with Maitland City Council. Any existing vegetation will be cleared when the land is developed, prior to the commencement of this proposed development.

Refer to **Table 4** and **Figure 12** for the recommended APZs.

Table 3: Required and Recommended Asset Protection Zones

Transect	Vegetation Classification (PBP 2019)	Effective Slope	PBP 2019 FDI 100 Table A1.12.2	Recommended APZ (29kW/m^2) Method 2
T1-T3	*Grassland*	<2.4° Downslope	12m	10m
T4-T6	Excluded (APZ - Lot 801)	max. 1.5° Downslope	N/A	>100m
T7	*Forest* (Hunter Macleay Dry Sclerophyll Forest)	1.3° Downslope	29m	18m
T8	*Forest* (Hunter Macleay Dry Sclerophyll Forest)	3.1° Downslope	29m	19m
T9	*Forest* (Hunter Macleay Dry Sclerophyll Forest)	1.8° Downslope	29m	18m
T10	*Forest* (Hunter Macleay Dry Sclerophyll Forest)	-0.6° Upslope	24m	16m
T11	*Forest* (Hunter Macleay Dry Sclerophyll Forest)	3.3° Downslope	29m	19m
T12	*Forest* (Hunter Macleay Dry Sclerophyll Forest)	2.7° Downslope	29m	18m
T13	*Forest* (Hunter Macleay Dry Sclerophyll Forest)	3.5° Downslope	29m	19m
T14	*Grassland*	1.8° Downslope	12m	12m
T15	*Forest* (Hunter Macleay Dry Sclerophyll Forest)	1.9° Downslope	29m	18m
T16-T17	*Low threat / excluded*	2.4° Downslope	N/A	>100m
T18-T20	*Low threat / excluded*	Flat/ level	N/A	>100m
T21	*Forest* (Hunter Macleay Dry Sclerophyll Forest)	-0.2° Upslope	24m	16m
T22	*Forest* (Hunter Macleay Dry Sclerophyll Forest)	0.0° Downslope	24m	16m
T23	*Forest* (Hunter Macleay Dry Sclerophyll Forest)	3.9° Downslope	29m	20m

Transect	Vegetation Classification (PBP 2019)	Effective Slope	PBP 2019 FDI 100 Table A1.12.2	Recommended APZ (29kW/m^2) Method 2
T24	*Forest* (Hunter Macleay Dry Sclerophyll Forest)	-2.3° Upslope	24m	16m

4.2. 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.

Avoiding understorey planting and regular trimming of the lower limbs of trees also assists in reducing fire penetration into the canopy. Rainforests 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.

Specific requirements for the management of vegetation and landscaping around vulnerable developments and within the APZ the following conditions apply:

- Within 10m of a building, flammable objects such as plants, mulches and fences must not be located close to vulnerable parts of the building such as windows, decks and eaves;
- Trees must not overhang the roofline of the building, touch walls or any other elements of a building;
- Grass should be no more than 100mm in height. All leaves and vegetation debris are to be removed at regular intervals (rake leaves and twigs from grass every week during the fire season);

- Establish lawn substitutes including non-flammable ground covers such as decorative stone or gravel;
- Plants greater than 100m in height at maturity must not be placed directly in front of a window or other glass features;
- Tree canopy separation of 2 metres and overall canopy cover no more than 15% at maturity;
- Preference should be given to smooth barked and evergreen trees;
- Shrubs should not be located under trees;
- Shrubs should not form more than 10% ground cover; and
- Provide a reliable and sufficient water supply and installation of sprinkler systems to create a well-watered landscape.

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.

4.3. 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 subdivision layout. All dwellings must have direct access to a public road. Section 5.3.2 of PBP 2019 requires a development to provide safe operational access to structures and water supply for emergency services while residents are seeking to evacuate.

Refer to **Appendix A** for the development plans indicating the proposed access arrangements. Access will be provided from Cessnock Road, via a newly constructed road (MC01) to be constructed as part of the Precinct 1A development.

A 24m wide perimeter road (MC08) will be constructed to the south of the neighbouring development (Precinct 1A), continuing along the southern boundary of the proposed development and act as the APZ against the primary bushfire hazard. There will be several non-perimeter roads constructed that will provide direct access to each lot.

It is noted the road carriageway widths of all proposed roads (perimeter and non-perimeter) exceed the minimum required (10.5m and 8m respectively) by PBP 2019. Independent to the bushfire assessment, the Client has been advised by Council that public on-street parking must be provided on both sides of the non-perimeter roads.

A Traffic Statement prepared by PDC Consultants (contained in **Appendix C**) was provided to Council and is currently under consideration by the RFS as part of the assessment of the BAR supporting the development application for Precinct 1A. The Traffic Statement concluded that the proposed road network; being 8m and 10.5m wide roads permits on-street parking on both sides of the non-perimeter roads, and parking on the non-hazard side of the perimeter roads, would rarely result in evacuating vehicles conflicting with firefighting vehicles.

A Pre-DA Advice application was submitted to the RFS on 14 February 2022 seeking RFS agreement that an 8m wide non-perimeter road achieved the Performance Criteria for non- perimeter roads. The advice received from the RFS on 3 May 2022 (contained in **Appendix D**) confirmed that a minimum 4m carriageway free of parking is an acceptable Performance Solution for internal roads (non-perimeter roads) where the roads are not located along the hazard interface.

By demonstrating on-street parking is able to be accommodated on both sides of the road and adopting the RFS endorsed Performance Solution of a 4m wide carriageway, the proposed development; including the access road network, satisfies the Performance Criteria for Access detailed in Table 5.3b of PBP 2019.

In summary, it is considered the proposed road network provides safe, all-weather two-way through roads and safe operational access for emergency service personnel and evacuation purposes; complying with the relevant provisions contained in Section 5.3.2 of PBP. Accordingly, it is requested the RFS endorse the proposed layout for Precinct 1B as a Performance Solution.

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

4.4.2. Electricity

All electricity services will be 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 1592-2002. 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 must satisfy the Performance Requirements of the National Construction Code: Building Code of Australia (BCA). Part 2.3 of Volume 2 of the BCA applies to dwellings located within designated bushfire areas, which are defined as:

> *Land which has been designated under a power in legislation as being subject, or likely to be subject to, bushfires.*

Accordingly, all forthcoming habitable buildings must 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 = *varied*;
- Vegetation classification = *Forest*; and
- Building location.

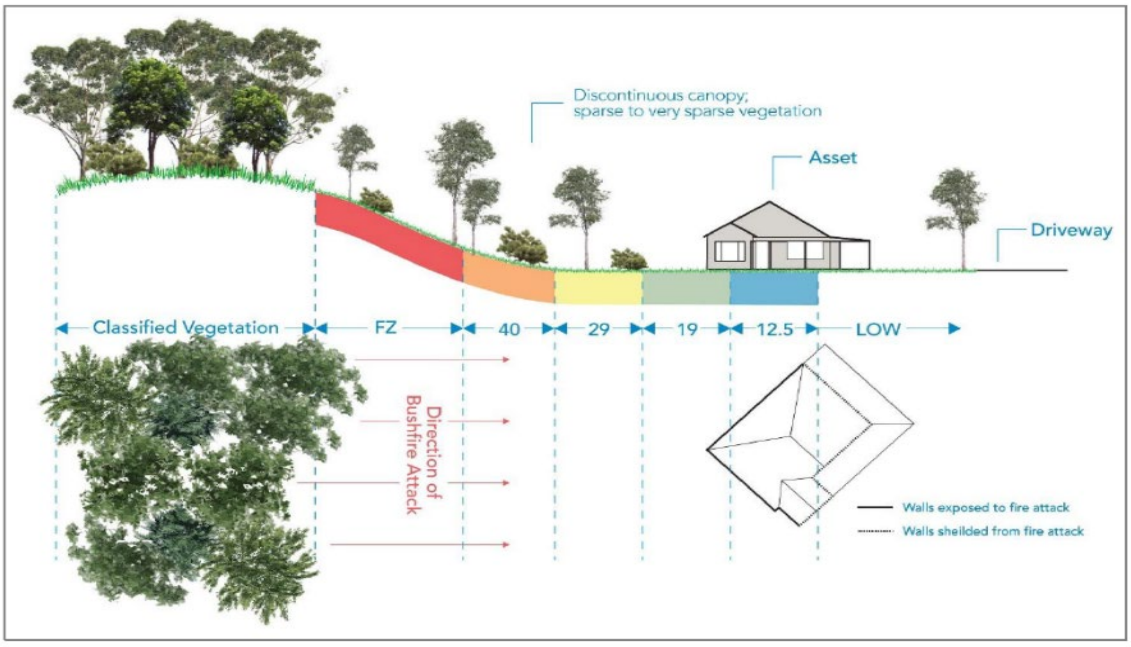


Figure 11: Bushfire Attack Level

The BALs for each transect have been calculated and provided in **Table 5**. To demonstrate the BAL ratings, **Figure 12** has been prepared in accordance with the methodology to prepare a Subdivision BAL Plan outlined in the RFS User Guide for Subdivision of Urban Release Areas on Bush Fire Prone land to represent the BALs required.

Table 4: Required BALs

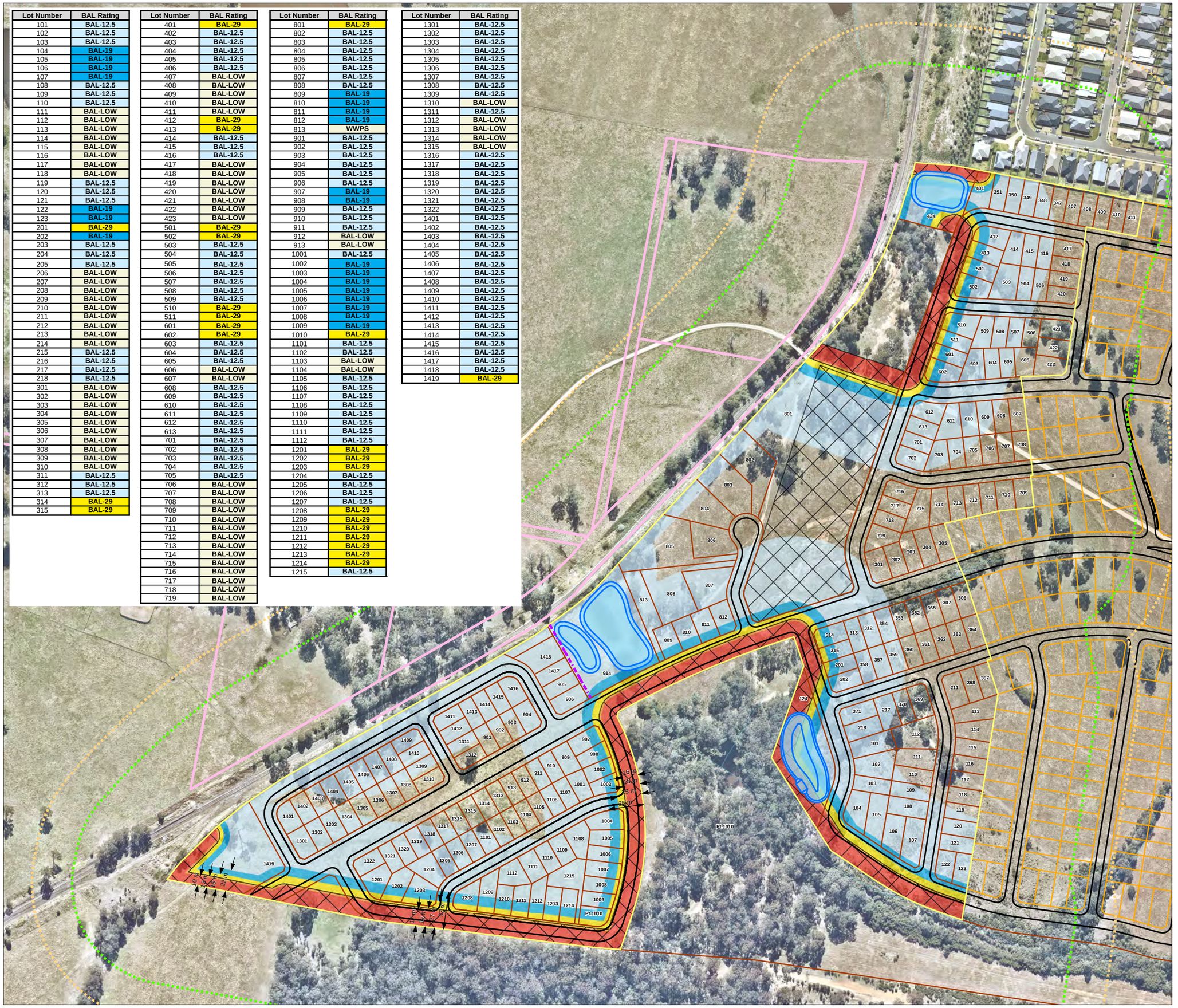
Transect	Vegetation Classification (PBP 2019)	Slope	APZ ($29kW/m^2$)	Distance from Hazard	Bushfire Attack Level (BAL)
T1- T3	*Grassland*	<2.4° Downslope	**12m**	0m-<10m	BAL-FZ
				10m-<12m	BAL-40
				12m-<16m	BAL-29
				16m-<22m	BAL-19
				22m-<50m	BAL-12.5
T7	*Forest (Hunter Macleay DSF)*	2.0° (1.3°) Downslope	**18m**	0m-<16m	BAL-FZ
				16m-<18m	BAL-40
				18m-<25m	BAL-29
				25m-<35m	BAL-19
				35m-<100m	BAL-12.5
T8 & T9	*Forest (Hunter Macleay DSF)*	3.0° Downslope	**18m**	0m-<17m	BAL-FZ
				17m-<20m	BAL-40
				20m-<27m	BAL-29
				27m-<37m	BAL-19
				37m-<100m	BAL-12.5
T11 – T13	*Forest (Hunter Macleay DSF)*	3.5° Downslope	**19m**	0m-<17m	BAL-FZ
				17m-<19m	BAL-40
				19m-<27m	BAL-29
				27m-<37m	BAL-19
				37m-<100m	BAL-12.5
T14	*Grassland*	1.4° Downslope	**12m**	0m-<10m	BAL-FZ
				10m-<12m	BAL-40
				12m-<16m	BAL-29
				16m-<22m	BAL-19
				22m-<50m	BAL-12.5
T15	*Forest (Sydney Sand Flats DSF)*	2.0° Downslope	**18m**	0m-<16m	BAL-FZ
				16m-<18m	BAL-40
				18m-<25m	BAL-29
				25m-<35m	BAL-19
				35m-<100m	BAL-12.5
T21-T24	*Forest (Sydney Sand Flats DSF)*	~2.0° Downslope	**18m**	0m-<16m	BAL-FZ
				16m-<18m	BAL-40
				18m-<25m	BAL-29
				25m-<35m	BAL-19
				35m-<100m	BAL-12.5

Lot Number	BAL Rating
101	BAL-12.5
102	BAL-12.5
103	BAL-12.5
104	BAL-19
105	BAL-19
106	BAL-19
107	BAL-19
108	BAL-12.5
109	BAL-12.5
110	BAL-12.5
111	BAL-LOW
112	BAL-LOW
113	BAL-LOW
114	BAL-LOW
115	BAL-LOW
116	BAL-LOW
117	BAL-LOW
118	BAL-LOW
119	BAL-12.5
120	BAL-12.5
121	BAL-12.5
122	BAL-19
123	BAL-19
201	BAL-29
202	BAL-19
203	BAL-12.5
204	BAL-12.5
205	BAL-12.5
206	BAL-LOW
207	BAL-LOW
208	BAL-LOW
209	BAL-LOW
210	BAL-LOW
211	BAL-LOW
212	BAL-LOW
213	BAL-LOW
214	BAL-LOW
215	BAL-12.5
216	BAL-12.5
217	BAL-12.5
218	BAL-12.5
301	BAL-LOW
302	BAL-LOW
303	BAL-LOW
304	BAL-LOW
305	BAL-LOW
306	BAL-LOW
307	BAL-LOW
308	BAL-LOW
309	BAL-LOW
310	BAL-LOW
311	BAL-12.5
312	BAL-12.5
313	BAL-12.5
314	BAL-29
315	BAL-29

Lot Number	BAL Rating
401	BAL-29
402	BAL-12.5
403	BAL-12.5
404	BAL-12.5
405	BAL-12.5
406	BAL-12.5
407	BAL-LOW
408	BAL-LOW
409	BAL-LOW
410	BAL-LOW
411	BAL-LOW
412	BAL-29
413	BAL-29
414	BAL-12.5
415	BAL-12.5
416	BAL-12.5
417	BAL-LOW
418	BAL-LOW
419	BAL-LOW
420	BAL-LOW
421	BAL-LOW
422	BAL-LOW
423	BAL-LOW
501	BAL-29
502	BAL-29
503	BAL-12.5
504	BAL-12.5
505	BAL-12.5
506	BAL-12.5
507	BAL-12.5
508	BAL-12.5
509	BAL-12.5
510	BAL-29
511	BAL-29
601	BAL-29
602	BAL-29
603	BAL-12.5
604	BAL-12.5
605	BAL-12.5
606	BAL-LOW
607	BAL-LOW
608	BAL-12.5
609	BAL-12.5
610	BAL-12.5
611	BAL-12.5
612	BAL-12.5
613	BAL-12.5
701	BAL-12.5
702	BAL-12.5
703	BAL-12.5
704	BAL-12.5
705	BAL-12.5
706	BAL-LOW
707	BAL-LOW
708	BAL-LOW
709	BAL-LOW
710	BAL-LOW
711	BAL-LOW
712	BAL-LOW
713	BAL-LOW
714	BAL-LOW
715	BAL-LOW
716	BAL-LOW
717	BAL-LOW
718	BAL-LOW
719	BAL-LOW

Lot Number	BAL Rating
801	BAL-29
802	BAL-12.5
803	BAL-12.5
804	BAL-12.5
805	BAL-12.5
806	BAL-12.5
807	BAL-12.5
808	BAL-12.5
809	BAL-19
810	BAL-19
811	BAL-19
812	BAL-19
813	WWPS
901	BAL-12.5
902	BAL-12.5
903	BAL-12.5
904	BAL-12.5
905	BAL-12.5
906	BAL-12.5
907	BAL-19
908	BAL-19
909	BAL-12.5
910	BAL-12.5
911	BAL-12.5
912	BAL-LOW
913	BAL-LOW
1001	BAL-12.5
1002	BAL-19
1003	BAL-19
1004	BAL-19
1005	BAL-19
1006	BAL-19
1007	BAL-19
1008	BAL-19
1009	BAL-19
1010	BAL-29
1101	BAL-12.5
1102	BAL-12.5
1103	BAL-LOW
1104	BAL-LOW
1105	BAL-12.5
1106	BAL-12.5
1107	BAL-12.5
1108	BAL-12.5
1109	BAL-12.5
1110	BAL-12.5
1111	BAL-12.5
1112	BAL-12.5
1201	BAL-29
1202	BAL-29
1203	BAL-29
1204	BAL-12.5
1205	BAL-12.5
1206	BAL-12.5
1207	BAL-12.5
1208	BAL-29
1209	BAL-29
1210	BAL-29
1211	BAL-29
1212	BAL-29
1213	BAL-29
1214	BAL-29
1215	BAL-12.5

Lot Number	BAL Rating
1301	BAL-12.5
1302	BAL-12.5
1303	BAL-12.5
1304	BAL-12.5
1305	BAL-12.5
1306	BAL-12.5
1307	BAL-12.5
1308	BAL-12.5
1309	BAL-12.5
1310	BAL-LOW
1311	BAL-12.5
1312	BAL-LOW
1313	BAL-LOW
1314	BAL-LOW
1315	BAL-LOW
1316	BAL-12.5
1317	BAL-12.5
1318	BAL-12.5
1319	BAL-12.5
1320	BAL-12.5
1321	BAL-12.5
1322	BAL-12.5
1401	BAL-12.5
1402	BAL-12.5
1403	BAL-12.5
1404	BAL-12.5
1405	BAL-12.5
1406	BAL-12.5
1407	BAL-12.5
1408	BAL-12.5
1409	BAL-12.5
1410	BAL-12.5
1411	BAL-12.5
1412	BAL-12.5
1413	BAL-12.5
1414	BAL-12.5
1415	BAL-12.5
1416	BAL-12.5
1417	BAL-12.5
1418	BAL-12.5
1419	BAL-29



Project: Gillieston Heights 1B
Job No: 2158

Figure 12

Subdivision BAL Plan

BUSHFIRE PLANNING AUSTRALIA

Subject Site
100m Buffer
140m Buffer
1.8m radiant heat shield
Lots - Proposed 1A
Lots - Proposed 1B
Proposed Roads
Basins
Residual Lots

Asset Protection Zone

Required Bushfire Attack Levels (PBP 2019 Table A1.12.5)

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

SOURCE:
Cadastral Boundary: NSW Department of Finance, Services and Innovation 2021
Watercourse: Geoscience Australia 2015

N
W E
S

0 50 100 150
Meters

A3 Scale: 1:3,500

File:Gillieston Heights1B-Fig8-BALs-220726 Date: 26/07/2022

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4.6. Emergency Services

There is a NSW Fire & Rescue Station located at 14 Church Street, Maitland, approximately 5.5km or 8 minutes drive away from the site (**Figure 15**). This station would likely be first responders with support from a second Fire & Rescue Station located in East Maitland (12kms) if required.

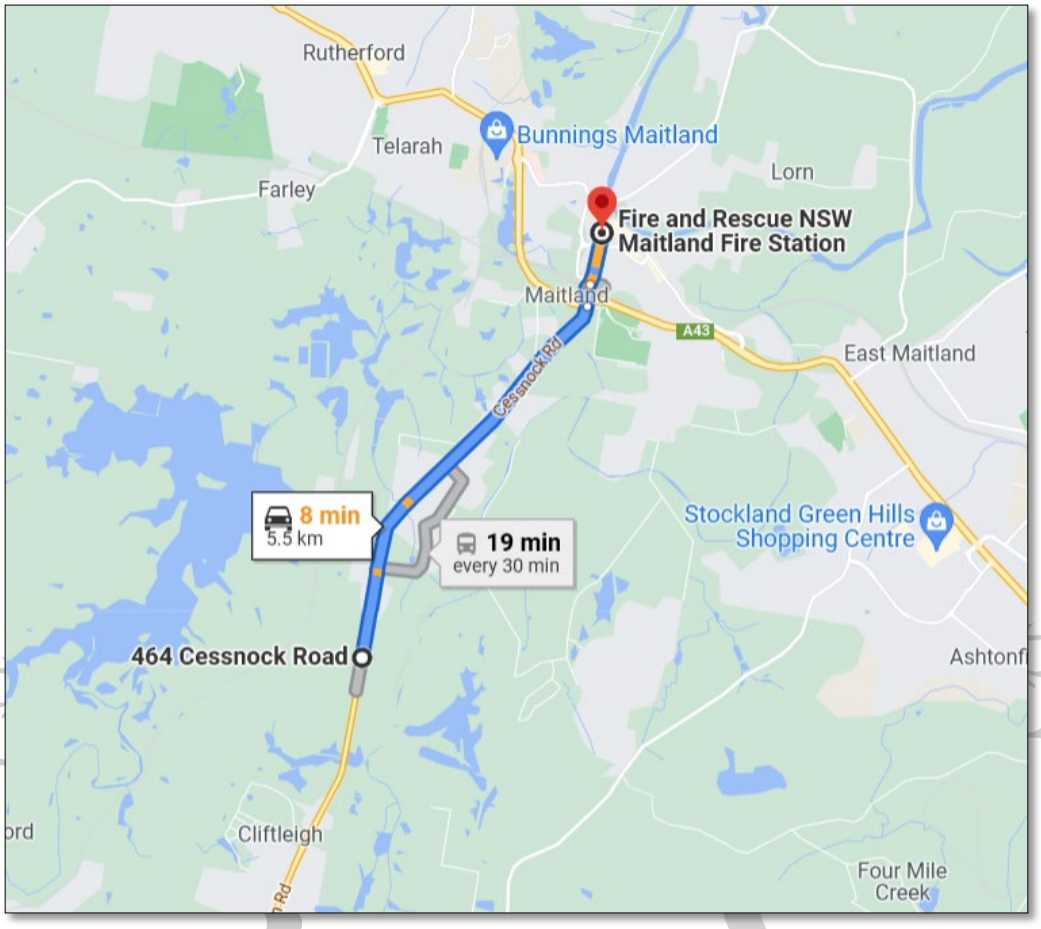


Figure 13: NSW Fire & Rescue - Maitland

5. Conclusion and Recommendations

Bushfire Planning Australia has been engaged by Loxford Project Management to undertake a Bushfire Assessment Report for the proposed residential subdivision known as Precinct 1B of the Regrowth Kurri Kurri located at Cessnock Road, Gillieston Heights.

This BAR found that the site is currently exposed to a low to medium bushfire hazard immediately to the south of the site. The hazard is consistent with a *forest* vegetation, namely Hunter Macleay Dry Sclerophyll Forest (DSF) and Sydney Sand Flats DSF, and transitions to a w*oodland* as described in PBP 2019. Additionally, *grassland* is present to the east of the site although will be cleared as a result of a neighbouring development site; and to the west of the site whereby it will be cleared and managed as part of a proposed APZ. The BAR concludes that the hazard identified can be successfully mitigated by applying the requirements of PBP 2019, such as a combination of temporary and permanent Asset Protection Zones.

In summary, the following recommendations have been designed to enable the proposed residential development to achieve the aims and objectives of PBP 2019:

1. The entire site; including all proposed residential lots, Lots 124, 424, 801 (part), 813, 914 and 1419, 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. Access shall satisfy the Performance Criteria outlined in Table 5.3b of PBP 2019 and constructed in accordance with the Detail Sheets of each stage contained in **Appendix A**. This will require the provision of a minimum of two (2) separate road access points provided from the development site to the north and east to ensure safe evacuation for all residents. Access will primarily be provided through Precinct 1A. Accordingly, no lots within Precinct 1B shall be registered prior to the completion of the main collector road connecting the site to Cessnock Road as part of Precinct 1A;
3. Low risk non-perimeter roads shall be 8m wide (including provision for on-street parking);
4. Perimeter roads shall be 10.5m wide with provision for parking on the non-hazard side of the road;
5. Any temporary turning heads shall be constructed in accordance Appendix A3.3 of PBP 2019;
6. Vegetation within road verges (including swales) to be consistent with a grassland vegetation classification with tree canopy less than 10% at maturity (and considered unmanaged);
7. All future dwellings to be constructed on the proposed lots 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;
8. All new lots 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 5.3.3 of PBP 2019; and
9. Consideration should be given to landscaping and fuel loads on site to decrease potential fire hazards on site.

This assessment has been made based on the bushfire hazards observed in and around the site at the time of inspection and production (July 2022) and demonstrates the development has satisfied the aims and objectives of Planning for Bushfire Protection 2019.

Finally, should the above recommendations be implemented, 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 and that property and life damage/loss will not occur.

6. References

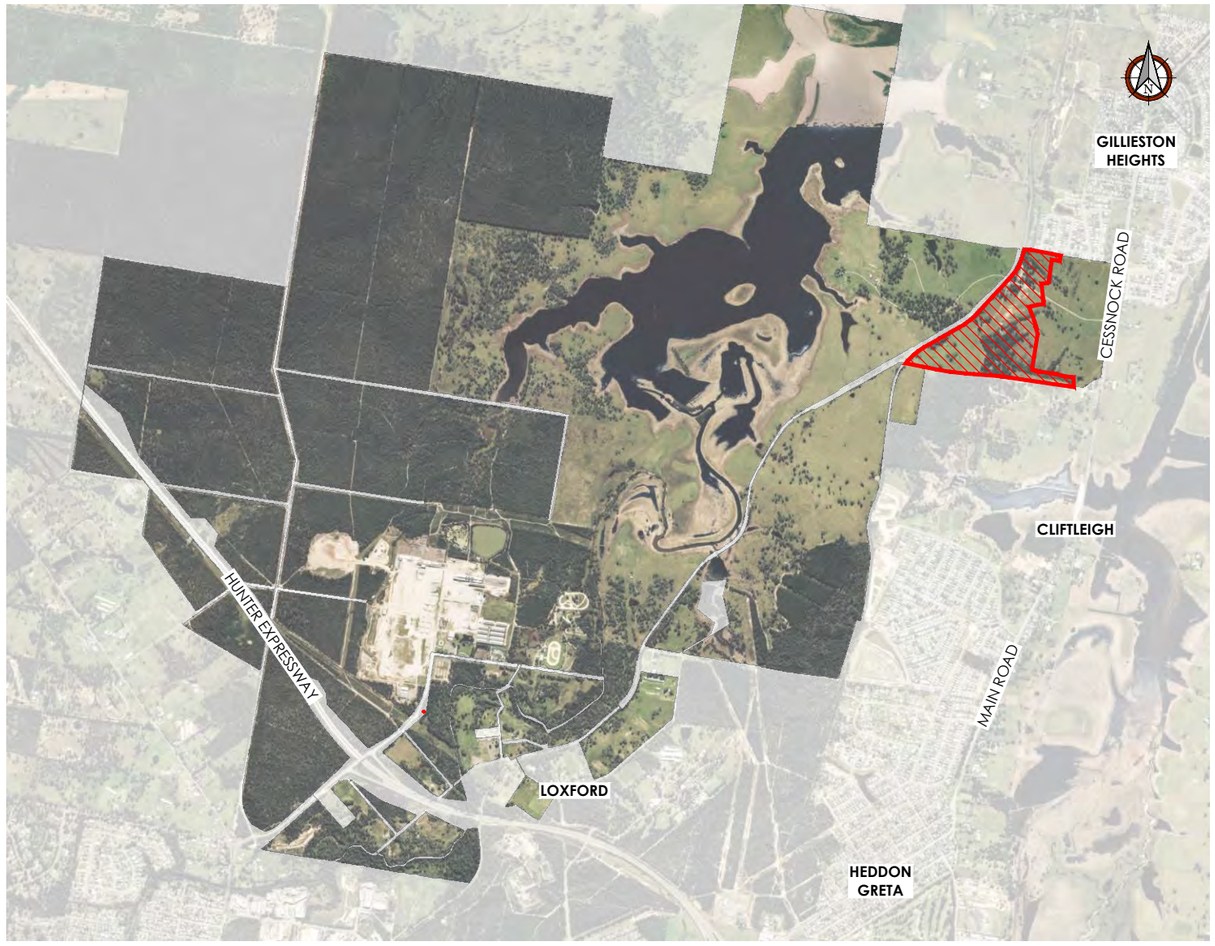
- NSW Rural Fire Service (2005). *Standards for Asset Protection Zones*. NSW Rural Fire Service.
- NSW Rural Fire Service (2019). Planning for Bushfire Protection – A Guide for Councils, Planners, Fire Authorities, Developers and Home Owners.
- Ramsay, GC and Dawkins, D (1993). *Building in Bushfire-prone 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: Plan of Proposed Residential Subdivision

240289(1B)-DA-001

DEVELOPMENT APPLICATION

LOTS 2, 3, 4, 5, 7, 8 & 9 D.P. 456946,
LOTS 54, 55, 69, 70 & 71 D.P. 975994, LOT 1 D.P. 1206034
FRONTING CESSNOCK ROAD, GILLIESTON HEIGHTS



INDEX OF DRAWINGS

DIAL1100 BEFORE YOU DIG

working beyond expectations

drawing title:

COVER SHEET AND DRAWING INDEX

location: 464 CESSNOCK ROAD, GILLIESTON HEIGHTS

council: MAITLAND

dwg ref: 240289(1B)-DA-001

client:

ver.	date	comment	drawn	pm	level information	scale (A1 original size)	notes
A	XX.XX.22	INITIAL ISSUE	LS	RK	DATUM: N/A CONTOUR INTERVAL: N/A		

SHEET PLAN-(1) OF 13

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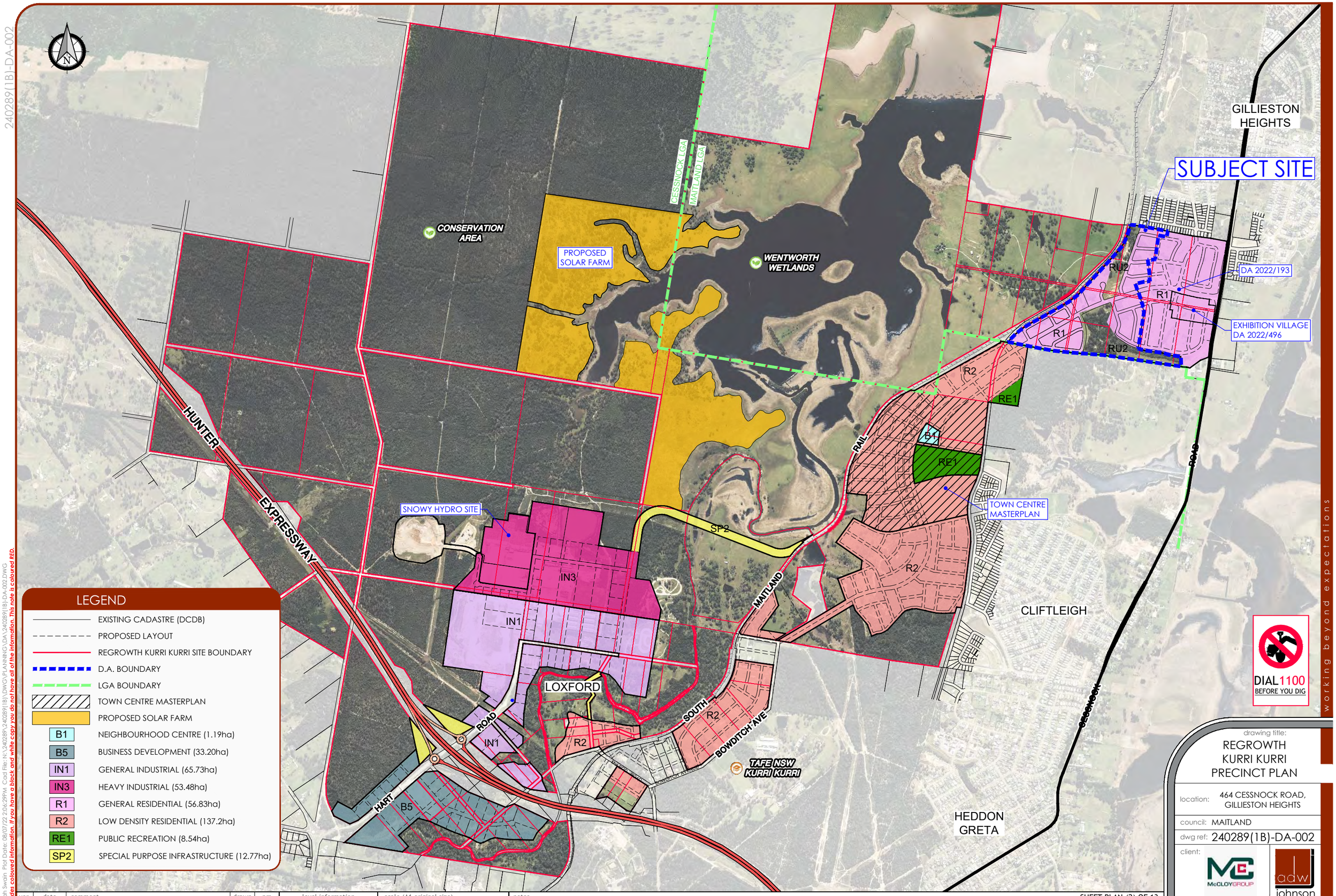
240289(1B)-DA-002



LEGEND

- EXISTING CADASTRE (DCDB)
- PROPOSED LAYOUT
- REGROWTH KURRI KURRI SITE BOUNDARY
- D.A. BOUNDARY
- LGA BOUNDARY
- TOWN CENTRE MASTERPLAN
- PROPOSED SOLAR FARM
- B1 NEIGHBOURHOOD CENTRE (1.19ha)
- B5 BUSINESS DEVELOPMENT (33.20ha)
- IN1 GENERAL INDUSTRIAL (65.73ha)
- IN3 HEAVY INDUSTRIAL (53.48ha)
- R1 GENERAL RESIDENTIAL (56.83ha)
- R2 LOW DENSITY RESIDENTIAL (137.2ha)
- RE1 PUBLIC RECREATION (8.54ha)
- SP2 SPECIAL PURPOSE INFRASTRUCTURE (12.77ha)

DIAL1100 BEFORE YOU DIG

working beyond expectations

ver.	date	comment	drawn	pm	level information	scale (A1 original size)	notes
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SHEET PLAN-(2) OF 13

drawing title:
REGROWTH KURRI KURRI PRECINCT PLAN

location: 464 CESSNOCK ROAD, GILLIESTON HEIGHTS
council: MAITLAND
dwg ref: 240289(1B)-DA-002
client: McCLOY GROUP

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Plotted By: Leah Swain Plot Date: 08/07/22 2:06:29PM Cad File: N:\240289\240289(1B)\DWG\PLANNING\DA\240289(1B)-DA-002.DWG

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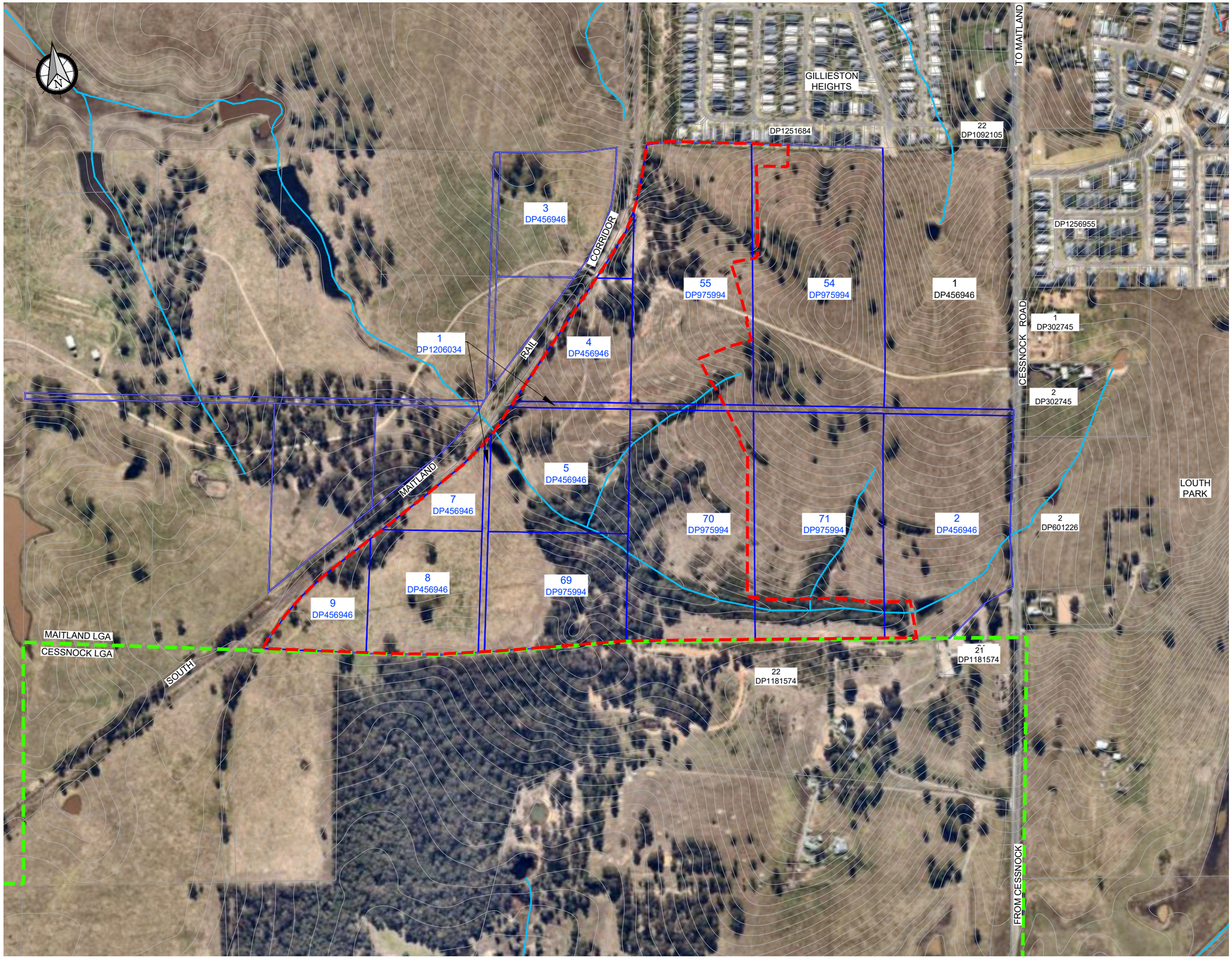
240289(1B)-DA-003



LEGEND

- SUBJECT DEVELOPMENT LOTS
- PROPOSED RESIDENTIAL DEVELOPMENT
- EXISTING BOUNDARY
- LGA BOUNDARY
- 1 DP302745 — EXISTING ADJACENT LOT NUMBER AND TITLE
- 1 DP456946 — SUBJECT DEVELOPMENT LOT NUMBER AND TITLE

NOTES:-

1. BOUNDARIES HAVE BEEN DETERMINED BY PLAN DIMENSIONS ONLY, AND HAVE NOT BEEN SURVEYED. ALL DIMENSIONS, AREAS AND EASEMENTS ARE SUBJECT TO FINAL SURVEY.
2. CONTOURS SHOWN HEREON ARE DERIVED FROM LIDAR DATA FOR DESIGN PURPOSES ONLY AND ARE TO BE CONFIRMED ON SITE PRIOR TO ANY EXCAVATION OR CONSTRUCTION.
3. THIS PLAN HAS BEEN PREPARED FOR THE PURPOSE OF D.A. AND SHOULD NOT BE USED FOR ANYTHING OTHER THAN THAT PURPOSE.

DETAIL PLAN
SCALE 1:3000

ver.	date	comment	drawn	pm	level information	scale (A1 original size)	notes
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• project management • civil engineering • infrastructure • superintendency • social impact • town planning • surveying • development feasibility • visualisation • urban design

DIAL 1100 BEFORE YOU DIG

drawing title:
EXISTING SITE NATURAL SURFACE PLAN

location: 464 CESSNOCK ROAD, GILLIESTON HEIGHTS
council: MAITLAND
dwg ref: 240289(1B)-DA-003
client:

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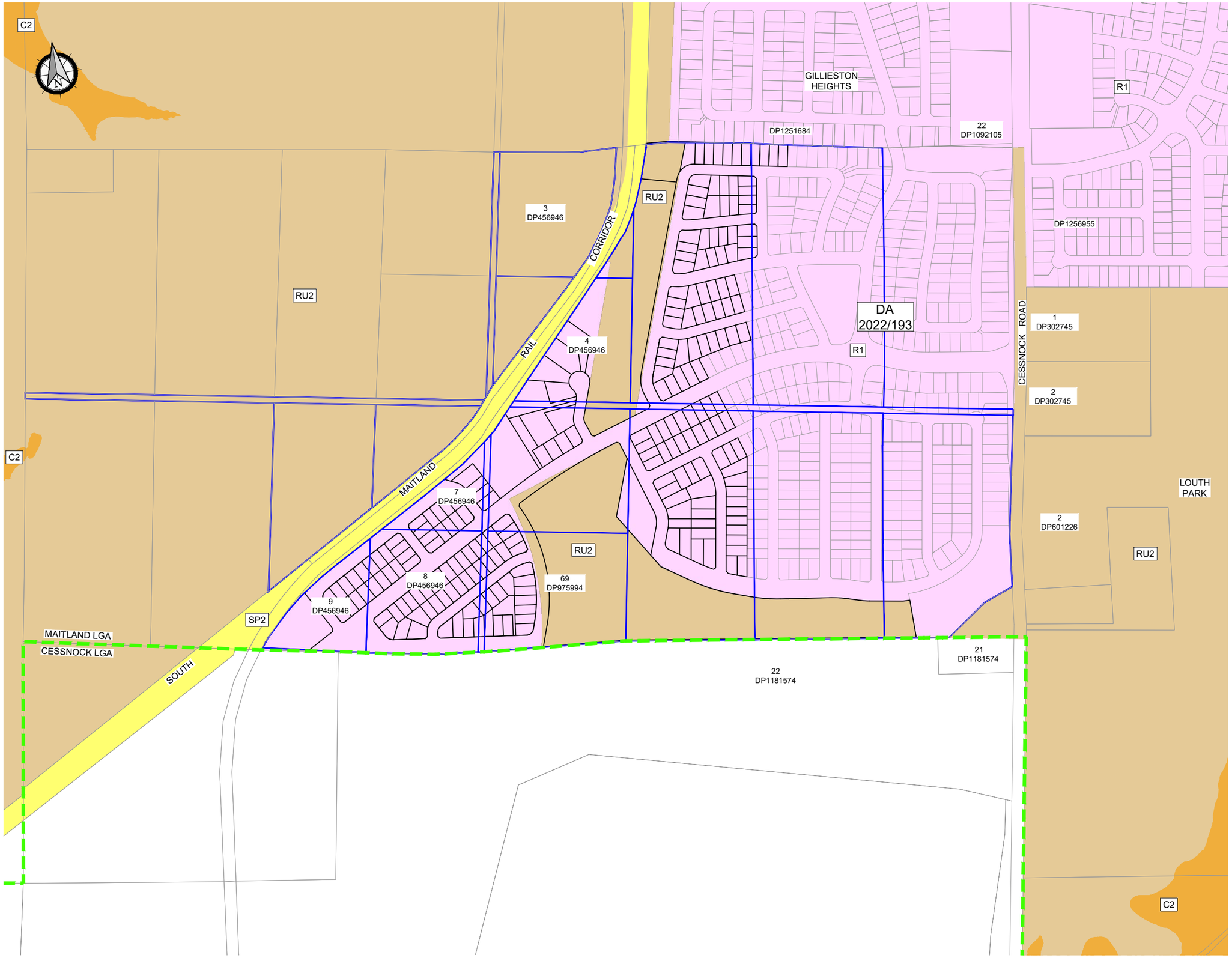
working beyond expectations



LEGEND

- SUBJECT DEVELOPMENT LOTS
- EXISTING BOUNDARY
- PROPOSED BOUNDARY
- LGA BOUNDARY
- R1 GENERAL RESIDENTIAL
- RU2 RURAL LANDSCAPE
- C2 ENVIRONMENTAL CONSERVATION
- SP2 INFRASTRUCTURE

DETAIL PLAN

SCALE 1:3000

ver.	date	comment	drawn	pm	level information	scale (A1 original size)	notes
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• project management • civil engineering • infrastructure • superintendency • social impact • town planning • surveying • development feasibility • visualisation • urban design

DIAL1100 BEFORE YOU DIG

working beyond expectations

drawing title: LEP ZONING

location: 464 CESSNOCK ROAD, GILLIESTON HEIGHTS

council: MAITLAND

dwg ref: 240289(1B)-DA-004

client: McCLOY GROUP

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hunter office ph: (02) 4978 5100
sydney office ph: (02) 8046 7411
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240289(1B)-DA-006

LEGEND

- PROPOSED RESIDENTIAL DEVELOPMENT
- EXISTING BOUNDARY
- PROPOSED BOUNDARY
- LGA BOUNDARY
- STAGE BOUNDARY (TBC)
- 2 STAGE NUMBER (TBC)
- STORMWATER BASIN
- PROPOSED RESIDENTIAL
- PROPOSED RESIDUE LOT
- PROPOSED COUNCIL DEDICATED RESERVE

LOT SCHEDULE

STAGE	RESIDENTIAL LOTS	PUBLIC RESERVE LOTS
STAGE 1	23	1
STAGE 2	18	–
STAGE 3	15	–
STAGE 4	23	1
STAGE 5	11	–
STAGE 6	13	–
STAGE 7	19	–
STAGE 8	12	1 (WWPS)
STAGE 9	13	–
STAGE 10	10	–
STAGE 11	12	–
STAGE 12	15	–
STAGE 13	22	–
STAGE 14	18	1
TOTAL LOTS	224	4
RESIDUE LOTS	1	

DETAIL PLAN
SCALE 1:3000

DIAL1100 BEFORE YOU DIG

working beyond expectations

drawing title:
OVERALL STAGE MASTER PLAN

location: 464 CESSNOCK ROAD, GILLIESTON HEIGHTS
council: MAITLAND
dwg ref: 240289(1B)-DA-006
client: McCLOY GROUP

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ver.	date	comment	drawn	pm	level information	scale (A1 original size)	notes
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• project management • civil engineering • infrastructure • superintendency • social impact • town planning • surveying • development feasibility • visualisation • urban design

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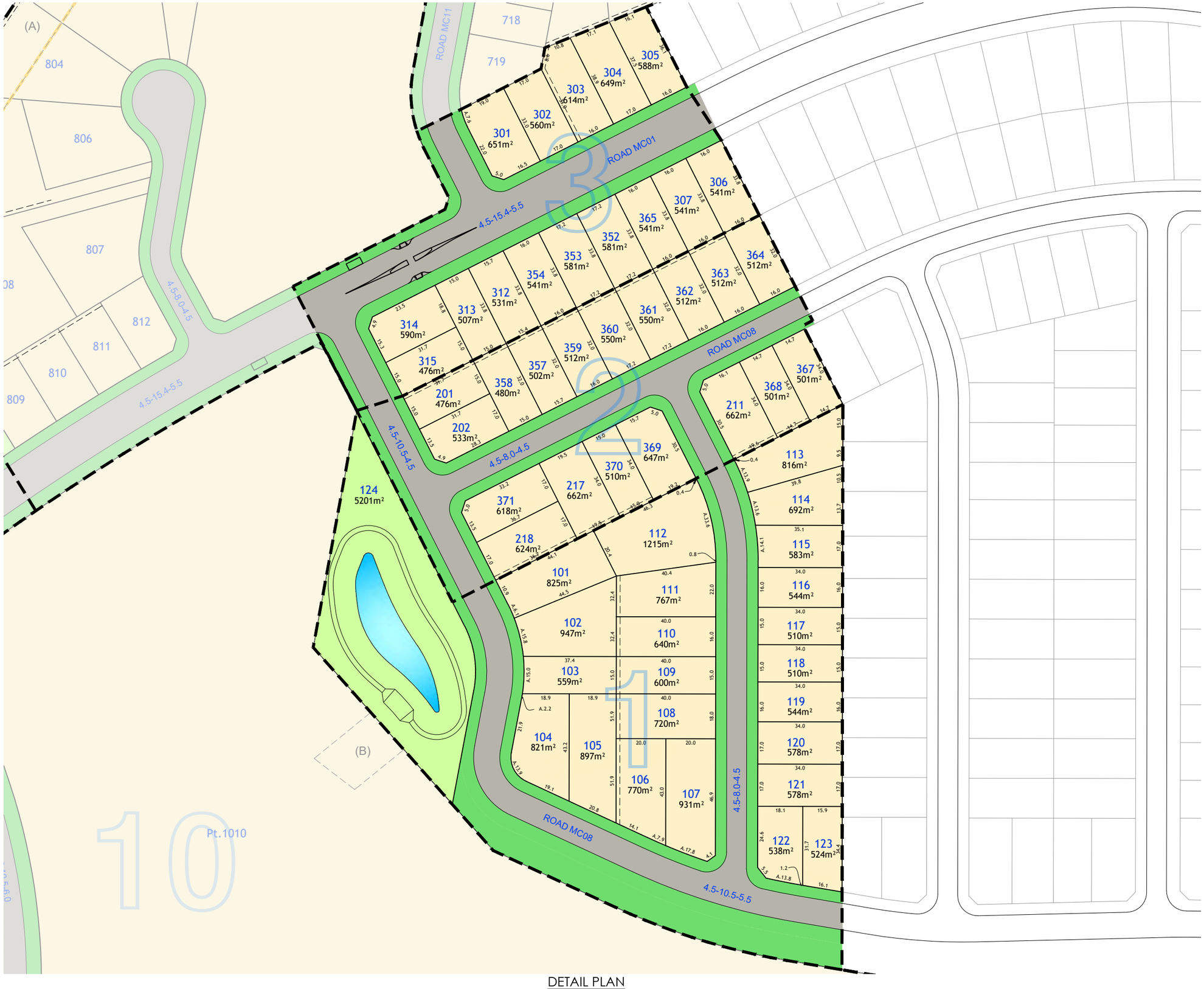

DETAIL PLAN

SCALE 1:750

LEGEND		
STAGE	RESIDENTIAL LOTS	PUBLIC RESERVE LOTS
STAGE 1	23	1
STAGE 2	18	0
STAGE 3	15	0

BUS STOP

20m ACOUSTIC BUFFER

EASEMENT TO DRAIN WATER

(B) EASEMENT TO DRAIN WATER

DIAL 1100 BEFORE YOU DIG

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ver.	date	comment	drawn	pm	level information	scale (A1 original size)	notes
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drawing title:

DETAIL SHEET OF STAGES 1, 2 & 3

location: 464 CESSNOCK ROAD, GILLIESTON HEIGHTS

council: MAITLAND

dwg ref: 240289(1B)-DA-007

client:

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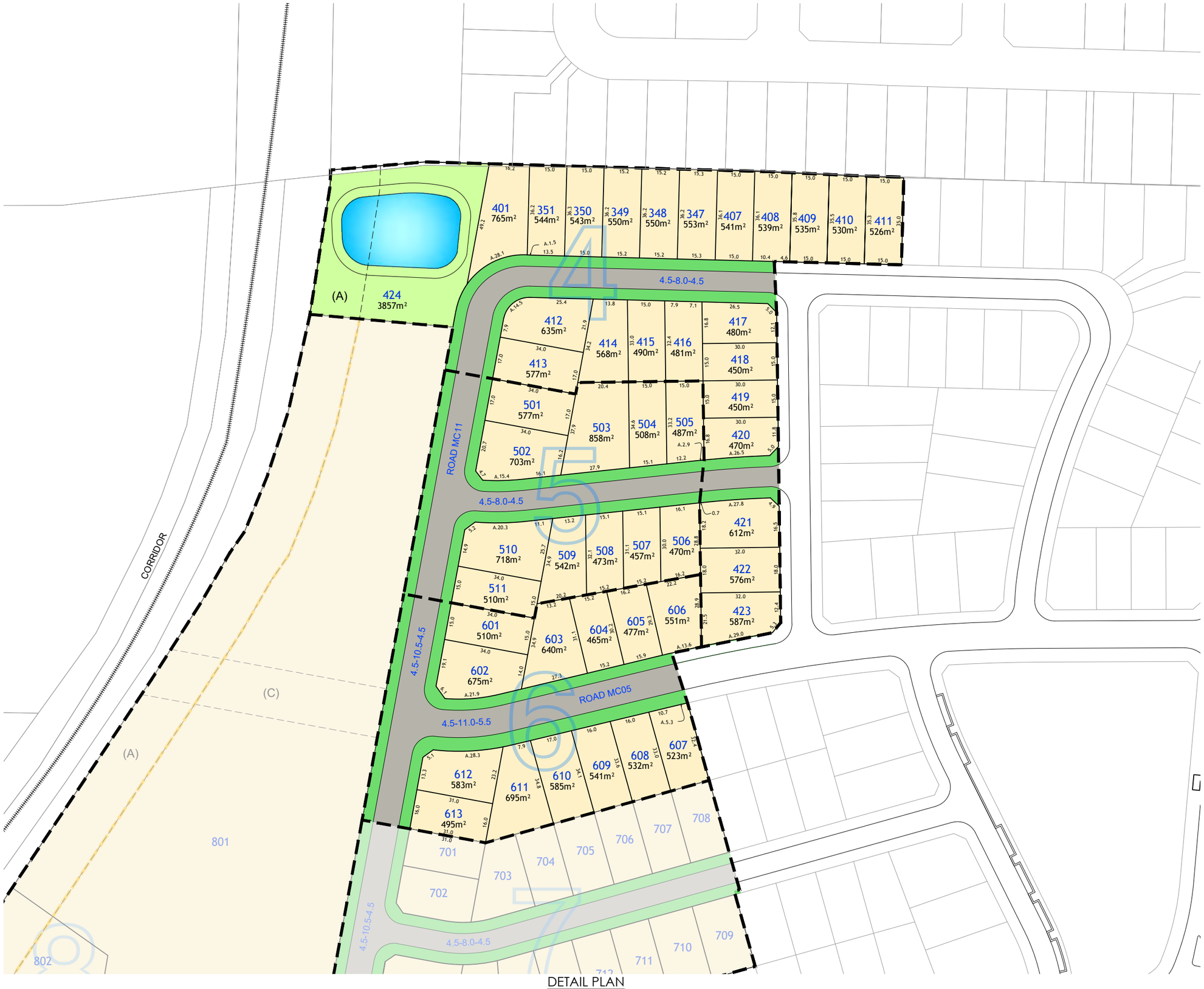
240289(1B)-DA-008



DETAIL PLAN
SCALE 1:750

LEGEND		
STAGE	RESIDENTIAL LOTS	PUBLIC RESERVE LOTS
STAGE 4	23	1
STAGE 5	11	0
STAGE 6	13	0

20m ACOUSTIC BUFFER

EASEMENT TO DRAIN WATER

(A) EXISTING EASEMENT FOR ELECTRICITY AND OTHER PURPOSES (20 WIDE - TO BE EXTINGUISHED)

(C) EASEMENT FOR ACCESS AND SERVICES (20 WIDE)

DIAL1100 BEFORE YOU DIG

working beyond expectations

drawing title:
DETAIL SHEET OF STAGES 4, 5 & 6

location: 464 CESSNOCK ROAD, GILLIESTON HEIGHTS

council: MAITLAND

dwg ref: 240289(1B)-DA-008

client: McCLOYGROUP

ver.	date	comment	drawn	pm	level information	scale (A1 original size)	notes
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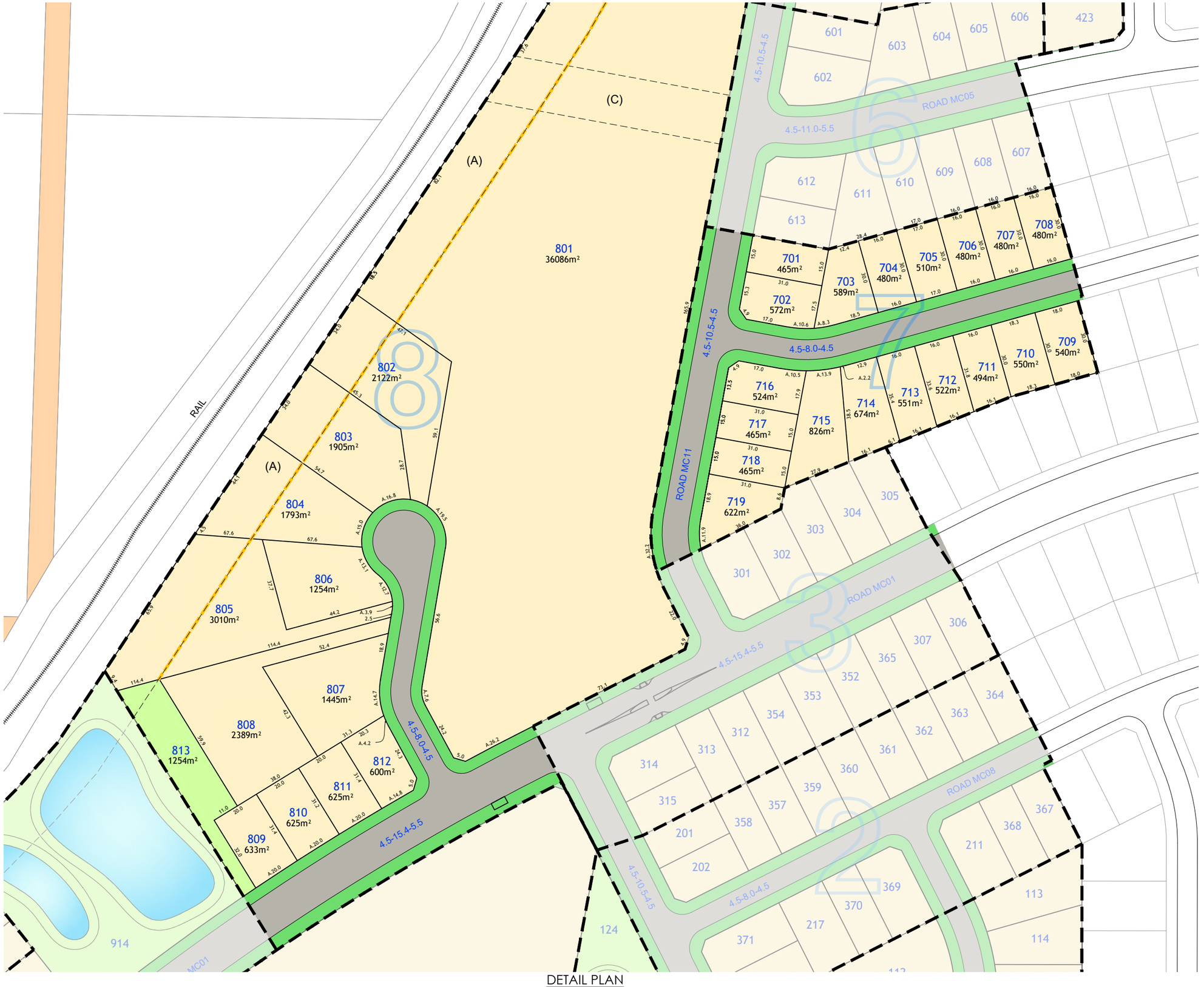

DETAIL PLAN
SCALE 1:750

STAGE	RESIDENTIAL LOTS	PUBLIC RESERVE LOTS
STAGE 7	19	0
STAGE 8	12	1 (WWPS)

BUS STOP
20m ACOUSTIC BUFFER
EASEMENT TO DRAIN WATER

(A) EXISTING EASEMENT FOR ELECTRICITY AND OTHER PURPOSES (20 WIDE - TO BE EXTINGUISHED)

(C) EASEMENT FOR ACCESS AND SERVICES (20 WIDE)

DIAL1100 BEFORE YOU DIG

working beyond expectations

drawing title:
DETAIL SHEET OF STAGES 7 & 8

location: 464 CESSNOCK ROAD, GILLIESTON HEIGHTS
council: MAITLAND
dwg ref: 240289(1B)-DA-009
client:

ver.	date	comment	drawn	pm	level information	scale (A1 original size)	notes
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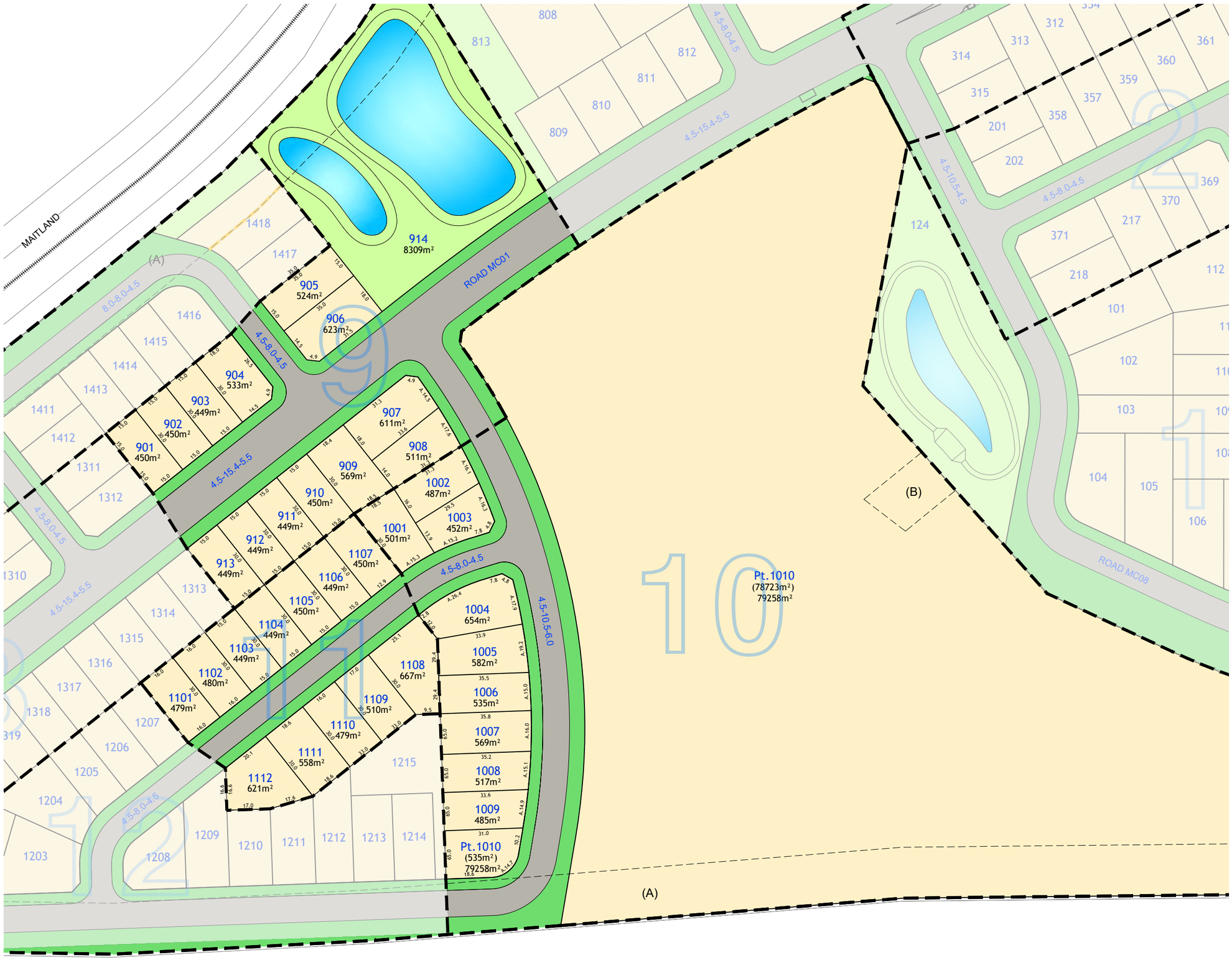
240289(1B)-DA-010



LEGEND		
STAGE	RESIDENTIAL LOTS	PUBLIC RESERVE LOTS
STAGE 9	13	0
STAGE 10	10	0
STAGE 11	12	0

BUS STOP

20m ACOUSTIC BUFFER

EASEMENT TO DRAIN WATER

(A) EXISTING EASEMENT FOR ELECTRICITY AND OTHER PURPOSES (20 WIDE - TO BE EXTINGUISHED)

(B) EASEMENT TO DRAIN WATER (BENEFITTING MCC AND TERMINATING AT THE WATERCOURSE)

DIAL1100 BEFORE YOU DIG

working beyond expectations

DETAIL PLAN

SCALE 1:750

ver.	date	comment	drawn	pm	level information	scale (A1 original size)	notes
A	XX.XX.22	INITIAL ISSUE	LS	RK	DATUM: N/A CONTOUR INTERVAL: N/A	A1 1:750 (0, 15.0, 30.0, 37.5m) A3 1:1500	SHEET PLAN-(10) OF 13

drawing title:

DETAIL SHEET OF STAGES 9, 10 & 11

location: 464 CESSNOCK ROAD, GILLIESTON HEIGHTS

council: MAITLAND

dwg ref: 240289(1B)-DA-010

client: McCLOYGROUP

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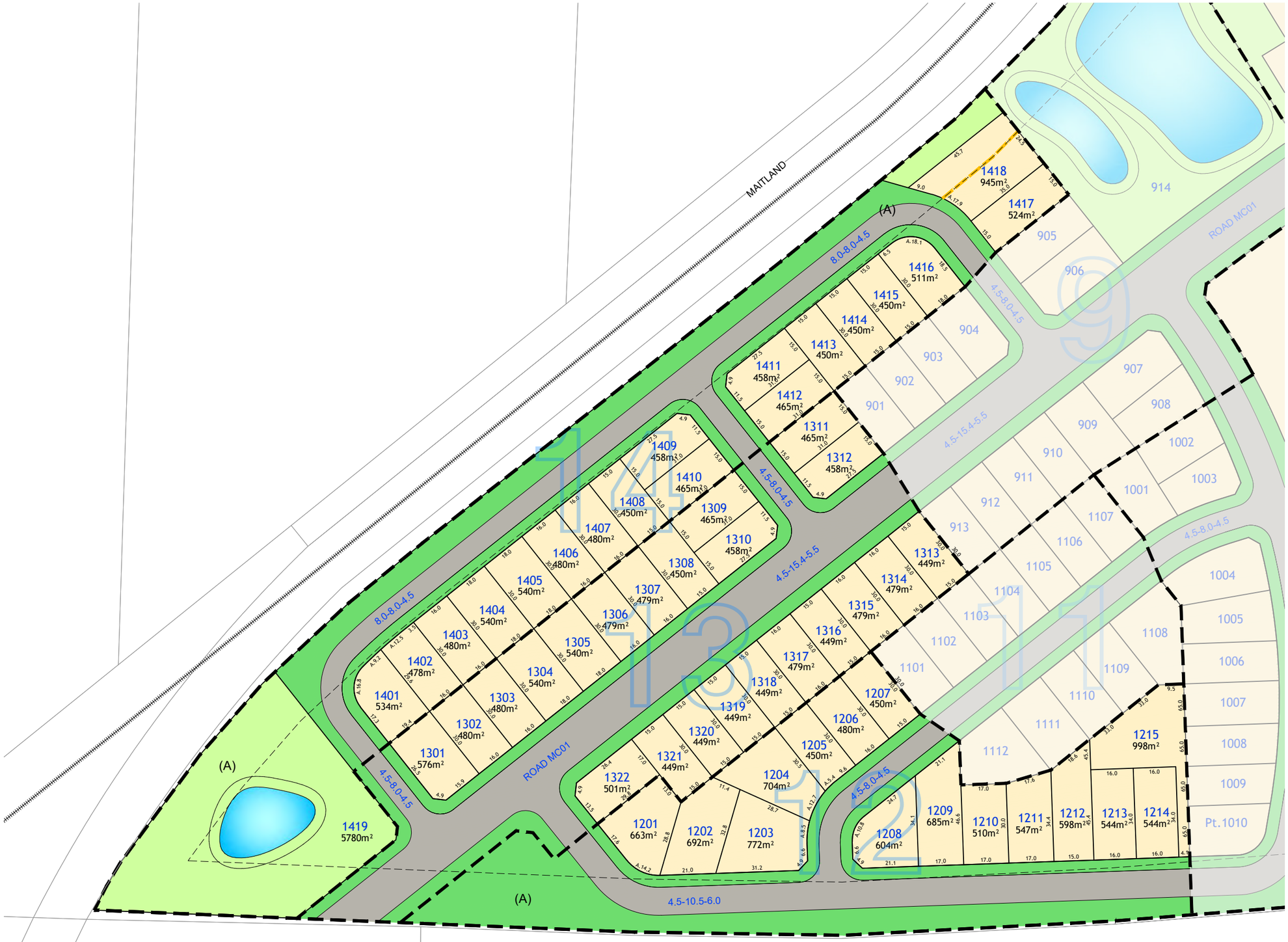

DETAIL PLAN
SCALE 1:750

STAGE	RESIDENTIAL LOTS	PUBLIC RESERVE LOTS
STAGE 12	15	0
STAGE 13	22	0
STAGE 14	18	1

20m ACOUSTIC BUFFER
EASEMENT TO DRAIN WATER

(A) EXISTING EASEMENT FOR ELECTRICITY AND OTHER PURPOSES (20 WIDE - TO BE EXTINGUISHED)

DIAL1100 BEFORE YOU DIG

working beyond expectations

drawing title:
DETAIL SHEET OF STAGES 12, 13 & 14

location: 464 CESSNOCK ROAD, GILLIESTON HEIGHTS
council: MAITLAND
dwg ref: 240289(1B)-DA-011
client: McCLOY GROUP

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ver.	date	comment	drawn	pm	level information	scale (A1 original size)	notes
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Appendix B: AHIMS Search Results

AHIMS Web Services (AWS)
Search Result

Your Ref/PO Number : 2158 Kurri McCloy

Client Service ID : 646214

Katrina Greville

Date: 09 December 2021

21 Costata Crescent
Adamstown New South Wales 2289

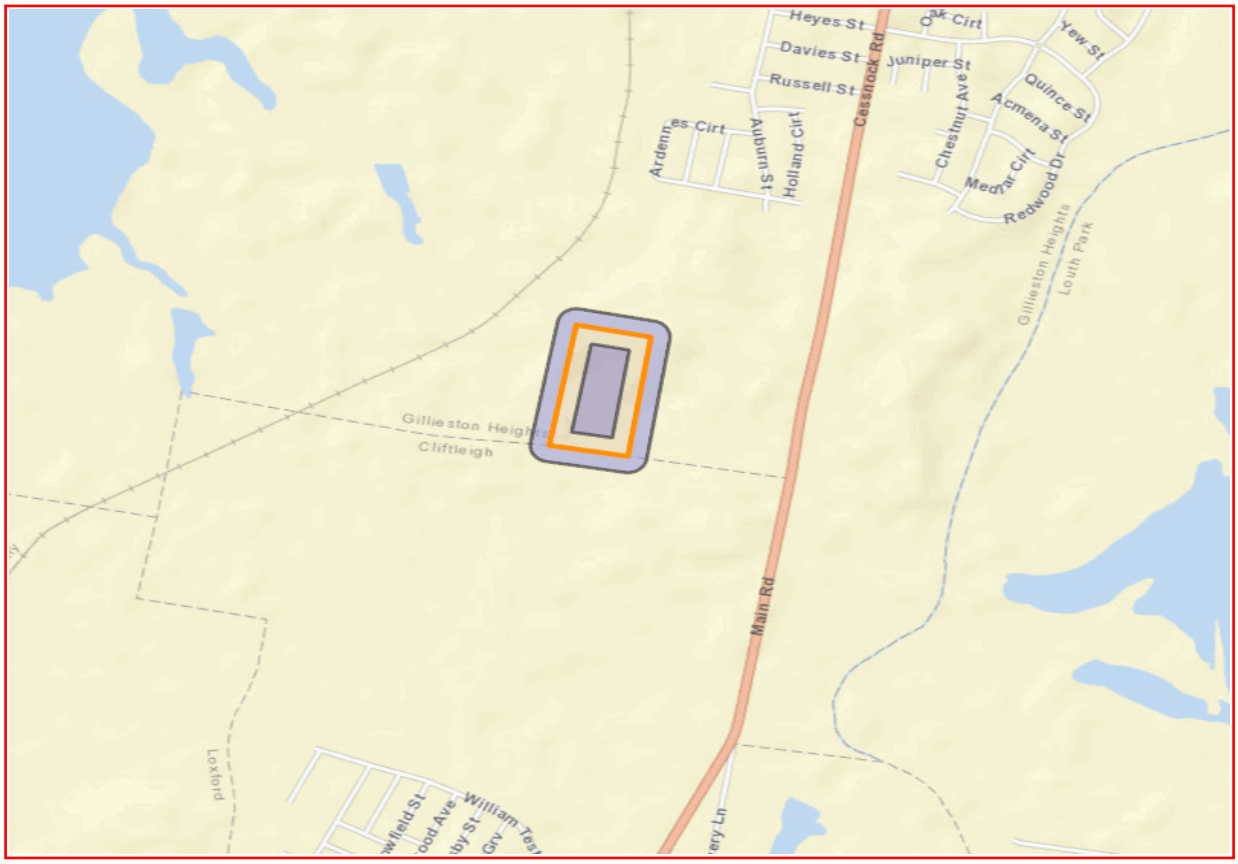
Attention: Katrina Greville

Email: klmukevski@bigpond.com

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lot : 70, DP:DP975994, Section : - with a Buffer of 50 meters, conducted by Katrina Greville on 09 December 2021.

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 C: Traffic Statement, PDC Consultants May 2022

Ref: 0563r01v02

31/05/2022

Loxford Project Management Pty Ltd
Suite 2, Ground Floor, 316 Hunter Street
Newcastle NSW 2300

Attention: Jeffrey Bretag

RE: CESSNOCK ROAD RESIDENTIAL SUBDIVISION, GILLIESTON HEIGHTS
RESPONSE TO COUNCIL REQUEST FOR INFORMATION
TRAFFIC STATEMENT

Dear Jeffrey,

PDC Consultants has been commissioned to prepare a Traffic Statement responding to a request for additional information made by Maitland City Council (Council RFI), dated 23/03/2022, on Development Application (DA) 2022 / 193, which seeks consent for Torrens Title subdivision to create 342 residential lots, three residue lots and seven public reserve lots for the site fronting Cessnock Road, Gillieston Heights.

COUNCIL RFI

Part 4 of the Council RFI noted a perceived non-compliance of the proposed subdivision road layout and cross sections when assessed against *NSW Rural Fire Service (RFS) Planning for Bushfire Protection 2019* (PBP 2019) and *Council's Development Control Plan* (MDCP), with the full comment provided below, for reference:

> *4. Bushfire Perimeter Roads*
>
> *The Planning for Bush Fire Protection (PBP) Guidelines includes the following requirements:*
>
> *Perimeter Roads – 8.0m travel corridor (clear of parking), linked to internal road network every 500m maximum*
> *Non-perimeter roads – 5.5m travel corridor (clear of parking)*
>
> *It is evident that the proposed bushfire solution for the subdivision will require parking restrictions in front of residential lots to achieve the bushfire report. Maitland City Council's development standards (DCP, MOES, etc) require on-street parking on all road types including on both sides of an 8.0m street. These are minimum standards and subject to increases where circumstances may require. Council is not supportive of providing parking restrictions against lots on all perimeter and non-perimeter residential linkages.*
>
> *It is noted that PBP uses a Performance based approach which can be achieved by providing either the acceptable solutions option or a performance-based solution.*

This Traffic Statement has been prepared to assess the proposal's suitability for emergency evacuation in consideration of the requirements of PBP 2019 and MDCP, with our findings contained herein.

POLICY CONTEXT

Planning for Bushfire Protection 2019

PBP 2019 notes the design of access road "*shall enable safe access and egress for residents attempting to leave the area at the same time that emergency service personnel are arriving to undertake firefighting operations*" and sets out performance criteria and acceptable solutions for access for residential subdivisions in Table 5.3b.

Performance criteria are defined as the outcomes that need to be achieved to satisfy the intent of PBP 2019. These can be achieved by satisfying the stated acceptable solutions, adopting a performance based solution, or a combination of the two. As such, acceptable solutions are desirable but strict adherence is not necessary to achieve the intent and satisfy the performance criteria of PBP 2019.

Pertinent to Council's RFI is the performance criteria for perimeter and non-perimeter roads that "*access roads are designed to allow safe access and egress for firefighting vehicles while residents are evacuating*". Acceptable solutions regarding carriageway widths are identified as set out in **Table 1**.

Table 1: Acceptable Solutions for Carriageway Widths *(Source: PBP 2019 Table 5.3b)*

PERIMETER ROADS	NON-PERIMETER ROADS
• Minimum 8m carriageway width kerb to kerb. • Parking is provided outside of the carriageway width.	• Minimum 5.5m carriageway width kerb to kerb. • Parking is provided outside of the carriageway width.

Compliance to PBP 2019 is discussed more thoroughly in the Bushfire Assessment Report prepared for the DA by Bushfire Planning Australia, dated 09/02/2022.

Pre-DA Advice dated 02/05/2022 was provided by NSW RFS, which notes "*Given the low risk posed by the bush fire hazard as shown in the submitted Figure 19 Subdivision BAL Plan, a bush fire report can be prepared which assesses the proposal against the performance criteria of Table 5.3b of PBP. The minimum acceptable width for any performance solution for internal roads needs to consider a minimum of 4m carriageway free of parking for appropriate firefighting access to proposed lots*".

This advice therefore confirms that whilst PBP 2019 states an acceptable solution of 5.5 metre carriageway widths kerb to kerb for non-perimeter roads, NSW RFS is willing to accept a minimum of 4.0 metres in this instance, given the low risk posed by bushfire hazard.

Maitland Development Control Plan

Part C of MDCP contains specific design guidelines for built development, with Part C.10 providing design advice applicable to the design and construction of new subdivisions. Controls are stated which are pertinent to the Council RFI as follows:

EC.3 Hazards

i) Assessment of threat from bushfire must examine impacts of the proposal both within and external to the site, including the capacity of the existing road network serving the site to accommodate traffic in emergency situations.

o) The subdivision design must provide adequate emergency vehicle access to those parts of the site fronting a potential bushfires source.

DC.6 Roads & Access, Pedestrian & Cycleways

Section DC.6 of Part 3.10 provides design guidance on roads, accesses, pedestrians, and cycleways within subdivisions, with a stated objective pertinent to Council's RFI being "*To provide access for emergency and service vehicles to all lots*", and performance criterion as follows:

d) Road widths and geometry in all urban subdivisions must accommodate necessary service and emergency vehicles.

e) Road and access to public roads shall be designed and constructed in accordance with Council's *Manual of Engineering Standards* (MOES).

MDCP and MOES provide tables identifying road types and dimensions, including carriageway reserve widths, for residential subdivisions. These are provided as guides to the minimum dimensions, with MDCP noting that road widths can be provided outside of the criteria contained in MOES under certain circumstances, subject to Council's approval.

The Road Types and Dimensions table provided in Section 2.1 of MOES is provided as **Table 2** below, for reference.

Table 2: Road Types and Dimensions *(Source: MOES Section 2.1)*

ROAD TYPE	MAX NO. LOTS	RESERVE WIDTH (m) [a]	CARRIAGEWAY / KERB-KERB (m) [b]	ON-ROAD BICYCLE FACILITY	FOOTWAY VERGE (m) [c]	KERB [d]	FOOTPATH (1.5m WIDE) [e]	DESIGN ESA [f]
Local – Place [i]	10	17	8	Mixed	4.5	Rolled	As Required	1×10^5
Local – Access [i]	20	17	8	Mixed	4.5	Rolled	One side	1×10^5
Local – Secondary [i]	50	17	8	Mixed	4.5	Rolled	One side	2×10^5
Local - Primary [i]	100	17	8	Mixed	4.5	Rolled	One side	5×10^5
Collector - Secondary [i]	200	17	8	Mixed (Parking)	4.5	Upright	One side	1×10^6
Collector - Primary [iv]	300	20	11	Mixed (Parking) [p]	4.5	Upright	One side	1.5×10^6
Distributor –Secondary [v]	400	23	14	Mixed (Parking) [p]	4.5	Upright	Both sides	2×10^6
Distributor - Primary [m v]	500	24	15 [q]	1.5m Lane	4.5	Upright	Both sides	5×10^6
Sub-Arterial [n]	3500	24.4	15.4 [r]	1.7m Lane [s]	4.5	Upright	Both sides	1×10^7 min

Table 2 demonstrates that all local streets are required to provide kerb to kerb carriageway widths of 8.0 metres, as is a secondary collector road. Primary collector roads require a kerb to kerb width of 11.0 metres.

Neither MDCP nor MOES specify that on-street parking is necessary along both sides of the carriageway. **Table 2** alludes to on-street parking as being present on collector roads in describing on-road bicycle facility requirements as 'Mixed (Parking)'; however, no such description or designation is made for local streets.

As such, Table 2 suggests that on-street parking is not mandatory on local streets serving fewer than 100 lots but may be required along at least one side of collector roads.

PROPOSED DEVELOPMENT

Introduction

The proposed subdivision contains a total of 15 internal streets, labelled MC01 to MC15, as illustrated by **Figure 1**. Typical cross sections of all internal roads have been developed as part of the engineering plans by ADW Johnson and are provided as **Attachment 1**.

In summary, three road types have been adopted throughout the subdivision in accordance with **Table 2**:

1. **Sub-Arterial** (MC01).
2. **Collector – Primary** (MC04 (partial), MC05, MC06 and MC08 (partial)).
3. **Local – Place, Access, Secondary or Primary** (MC02, MC03, MC07, MC08 (partial), MC09, MC10, MC11, MC12, MC13, MC14 and MC15).

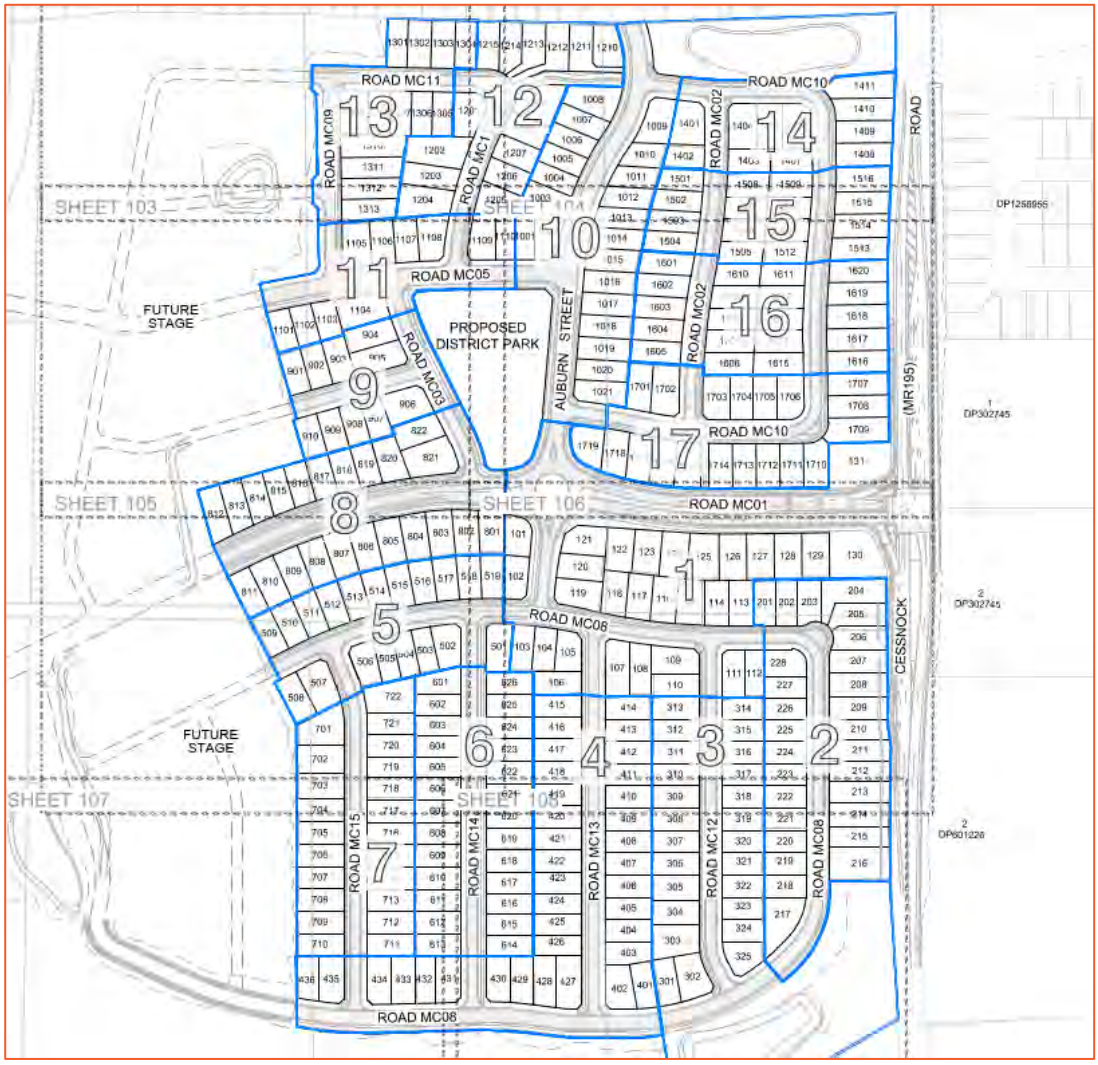


Figure 1: Proposed Subdivision Road Network

Compliance to MDCP and MOEs

In accordance with MDCP and MOES road dimensions (**Table 2**), the **sub-arterial** MC01 has a road has a minimum kerb to kerb width of 15.4 metres, with on-street parking provided along both sides west of the roundabout with Auburn Place, and a central median and no on-street parking provided between said roundabout and the intersection with Cessnock Road to the east.

The **primary collector** roads of MC04, MC05, MC06, and the perimeter road of MC08, are all designed with minimum kerb to kerb carriageway widths of 10.5 – 11.0 metres, in accordance with the requirements of MDCP and MOES.

All remaining **local roads** are designed with kerb to kerb carriageway widths of a minimum 8.0 metres.

All proposed roads therefore satisfy the dimensions identified in MOES (**Table 2**) and therefore are compliant to Council's controls and design standards.

Compliance to PBP 2019

The need for this Traffic Statement is driven by a concern Council has that the proposed kerb to kerb carriageway widths only satisfy PBP 2019 if on-street car parking is only provided along one side of the respective subdivision road network. This perception is discussed in terms of the two types of subdivision road classifications defined in PBP 2019, perimeter and non-perimeter roads, below:

Perimeter roads are proposed as 10.5 metres wide, with PBP 2019 requiring an 8.0 metre kerb to kerb carriageway width clear of on-street parking. Australian Standard (AS) 2890 Part 5: On-Street Parking (AS 2890.5) requires on-street car parking spaces have a total width of 2.0 – 2.3 metres for streets with posted speed limit 50 km/h or less.

MC08 to the south of the subdivision is the only perimeter road. As such, the proposal satisfies the acceptable solutions of PBP 2019 should on-street car parking be provided along one side of the MC08 perimeter road; however, only 6.5 metres clear width would be available if parking were provided along both sides. The proposed development is however considered to form a performance based solution given two-way vehicle movements can pass along MC08 without conflict, as is discussed later in this study.

Non-perimeter roads comprise all other roads within the subdivision having varying widths with a minimum of 8.0 metres, with PBP 2019 identifying a 5.5 metre kerb to kerb carriageway width clear of on-street parking as an acceptable solution.

As such, the proposal satisfies PBP 2019 should on-street car parking be provided along one side of the perimeter road; however, only 4.0 metres clear width would be available if parking were provided along both sides.

Whilst not meeting the acceptable solution, this 8.0 metre clear kerb to kerb width does however meet the performance solution criteria offered by NSW RFS in its Pre-DA Advice, which notes a clear width free of parking of 4.0 metres would be acceptable at this site given the low risk posed by bushfire.

As such, all 8.0 metre non-perimeter roads proposed within the subdivision meet the performance solution criteria agreed with NSW RFS, whilst providing on-street car parking along both sides, and therefore also satisfy Council's on-street parking requirement.

All non-perimeter roads wider than 8.0 metres also therefore satisfy the performance solution, with the wider non-perimeter roads of MC04 (partial), MC05, MC06 and MC08 (partial) also meeting acceptable solution criteria.

Figure 2 illustrates which subdivision roads are wholly compliant to the clear width acceptable solutions or performance solutions of PBP 2019 agreed with NSW RFS, should on-street parking be provided along both sides.

MC08 is the only road which does not meet the acceptable solutions or a performance based solution agreed with NSW RFS; however, the proposal is considered satisfactory given justification provided later in this study.

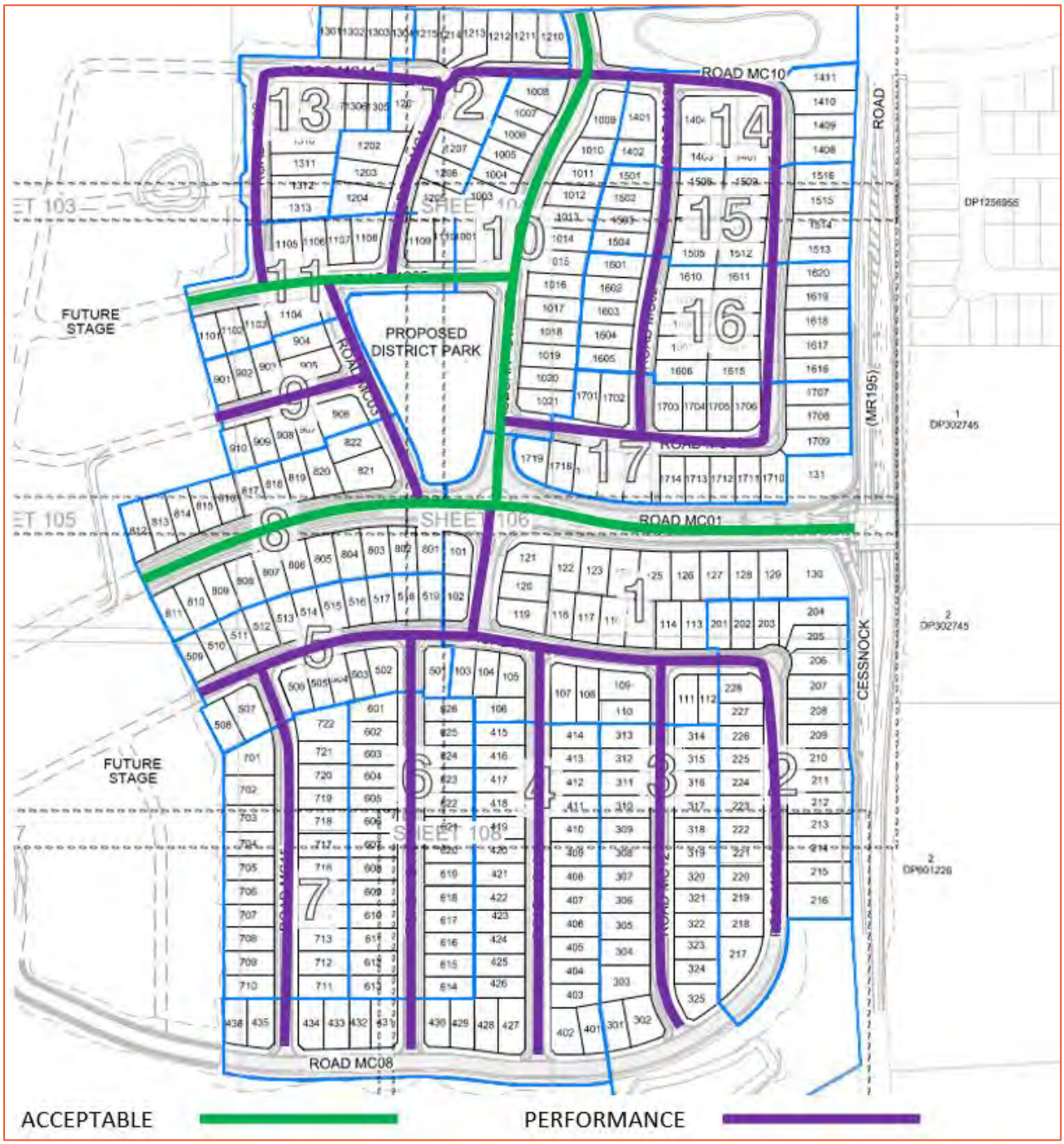


Figure 2: Compliant Roads to PBP 2019

Figure 2 illustrates that the key roads for evacuation and connection to the existing road network, being MC01 and Auburn Street, are proposed with kerb to kerb widths which comply to the acceptable solutions of PBP 2019 even if on-street parking were provided along both sides, as is MC05.

All other internal roads comply with the performance solution of PBP 2019 if on-street parking is provided along both sides, or the acceptable solution criteria if on-street parking is provided along one side only.

PARKING ASSESSMENT

Given the non-perimeter road of MC08 does not meet the acceptable solution criteria of PBP 2019, an assessment has been carried out to determine whether the road could be considered to satisfy a performance-based solution, which considers the likely demand for on-street car parking within the residential subdivision.

Maitland Demographics

To estimate the anticipated car ownership of residents of the proposed subdivision, an analysis of demographic characteristics of surrounding suburbs and the broader local government area (LGA) has been undertaken, with findings presented in Table 3.

Table 3: Car Ownership Statistics *(Source: ABS)*

AREA	AVERAGE MOTOR VEHICLES PER DWELLING
MAITLAND (LGA)	1.9
Maitland (State Suburb)	1.4
Gillieston Heights (State Suburb)	2.0
Cliftleigh (State Suburb)	2.1
Heddon Greta (State Suburb)	2.1

Table 3 demonstrates that average car ownership near the proposed subdivision varies from a low of 1.4 vehicles per dwelling in the Maitland state suburb (given proximity to public transport) to highs of 2.1 vehicles per dwelling in the more remote suburbs of Cliftleigh and Heddon Greta.

The overall average car ownership across the Maitland LGA is 1.9 motor vehicles per dwelling.

On-Site Parking Provision

The proposal is for 342 low density residential lots, each of which will provide a total of two on-site car parking spaces within an enclosed double garage, thereby exceeding the minimum requirement for a dwelling house of MDCP of one on-site car space. There are no other land uses, such as retail or commercial development, proposed.

Furthermore, garages will be setback a minimum of 5.5 metres from the property boundary, thereby allowing a potential further two cars to park on the vehicle driveway, thus providing for up to four vehicles on-site per lot.

It is evident therefore that the proposed on-site car parking provision significantly exceeds the minimum requirements of MDCP and the average car ownership of nearby suburbs similar in nature to the proposed subdivision. Whilst it is acknowledged that there will be some degree of on-street parking demand, driven by resident

and visitor preference over demand and availability, there is nevertheless expected to be little reliance upon on-street car parking, with all demands generated by residents of the dwellings largely catered for on-site.

Conclusion

The abundant on-site car parking provision on lots within the proposed subdivision will exceed the anticipated car parking demand expected via consideration of MDCP and ABS data. As such, demand for on-street car parking is expected to be very low, and will be sporadic in comprising vehicles of users who simply prefer to park on-street even where on-site availability exists. This sporadic demand will ensure plentiful passing opportunities throughout the internal road network.

TRAFFIC ASSESSMENT

Introduction

The Parking Assessment above demonstrates that provision of on-street car parking internal to the proposed subdivision is likely to result in minimal demand for on-street car parking and plentiful passing opportunities.

The Council RFI suggests on-street car parking is necessary along both sides of all roads internal the subdivision.

It is therefore important to consider traffic conditions in the event of an emergency evacuation, to identify the likelihood of conflict between departing members of the public and firefighting vehicles. This assessment is provided herein.

Evacuation Traffic Demand

Key to determining the ability of residents of the proposed subdivision to evacuate in the event of an emergency is determining the number of vehicles, or traffic demand, that would use the road network in such an event. Conventional means of estimating traffic generation, such as the use of trip rates presented in the *RMS Guide to Traffic Generating Developments 2002*, are not valid in consideration of an evacuation, as the number of vehicles accessing the road network is inherently atypical and not reflective of 'typical' peak period traffic demands.

Determining the evacuation traffic demand therefore requires a bespoke approach based on the number of dwellings in the study area and several geographic and behavioural influences. The number of dwellings in the proposed subdivision is 342 lots, with geographic and behavioural influences discussed herein.

Vehicle Ownership Rate

The number of vehicles owned by each household will have a direct impact on the number of vehicles departing the proposed subdivision in the event of an emergency. Vehicle ownership has been documented in **Table 3**, with the highest value of 2.1 motor vehicles per dwelling adopted in assessing the potential traffic generation during an emergency to ensure a robust assessment.

Dwelling Occupancy

The dwelling occupancy is a reference to the number of dwellings within the proposed subdivision that are expected to be occupied when an emergency event occurs.

ABS Quick Stats confirms that the number of private unoccupied private dwellings in the Maitland LGA during the 2016 census was 7.1%. This compares to rates of 10.9% in Cliftleigh and 7.0% in Heddon Greta.

The most conservative assessment of an evacuation event is to assume that residents of all remaining occupied private dwellings in the subdivision will be at home during a bush fire event; an assumption that is highly conservative as many residents are typically away from their dwelling, at places of work or leisure, during typical daytimes during which a bush fire emergency evacuation is likely to occur. The Australian Institute of Criminology notes a peak for non-deliberate bushfires of 1 – 4pm when conditions are typically hottest, coinciding with times a majority of residents are likely to be out of their house.

For this reason, a 93% dwelling occupancy is adopted in determining evacuation traffic demand.

Stay and Defend

This assumption considers the proportion of residents who will stay at home to defend their property in the event of a bush fire, as opposed to using their private vehicles to evacuate.

The policy position attached to the national Fire Danger Rating system advocates for individuals to leave early in Catastrophic conditions and recommends it in Extreme conditions. However, there is strong evidence that suggests that despite messaging, the reality of community action is very different from that which fire agencies would like.

A study entitled *Community Preparedness and Response to the 2017 New South Wales Bushfires, Whittaker and Taylor 2018*, documents research undertaken into prospective responses to a bush fire event, that being the proportion who would attempt to stay and defend their property in the event of a bush fire as opposed to departing.

The study found that of survey respondents who were threatened or impacted by bush fire in 2017, 46.7 % stayed or returned to defend their property, although some were not impacted, and 6.5 % began defending and then left. A separate survey asked what respondents would do if a Catastrophic Fire Danger warning were issued next summer, with 27 % indicating they would get ready to stay and defend.

To ensure conservative assessment of road network conditions, a stay and defend proportion of 25 % was adopted for this analysis.

Private Vehicle Use

In the event of an emergency, household occupants are likely to evacuate together as a collective. ABS data identifies that 75.8% of households in the Maitland LGA are family households, with 21.7% single person households. Of the families in the Maitland LGA, 44.9% were couple families with children, a further 35.6% were couples without children, and 18.1% were one parent families.

Given this composition, it is unlikely that every household would evacuate the area using all privately owned vehicles, an assumed average ownership of 2.1 motor vehicles per dwelling, with a proportion of family households likelier to depart as a family unit in one motor vehicle.

Nevertheless, to ensure a conservative assessment, it is assumed that residents will use a total of 80% of all privately owned vehicles within the subdivision when departing in the event of an evacuation, or in other words, each residential dwelling would generate an evacuation traffic demand of 1.6 motor vehicles per household.

Evacuation Traffic Demand Summary

The assumptions presented within this Section are summarised in **Table 4**.

Table 4: Evacuation Traffic Demand Assumptions Summary

ASSUMPTION DESCRIPTION	VALUE
Vehicle ownership rate	2.1 vehicles per dwelling
Dwelling occupancy	93%
Stay and defend	25% stay and defend | 75% evacuate
Private vehicle usage	80%

The resultant evacuation traffic demand generated by each stage of the development is presented in **Table 5**.

Table 5: Evacuation Traffic Demand by Stage

STAGE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Total
DWELLINGS	29	28	25	36	19	26	22	22	10	21	10	15	13	11	16	20	19	342
DEMAND (VEH)	34	33	29	42	22	30	26	26	12	25	12	18	15	13	19	23	22	401

Table 5 confirms that a total of 401 vehicles would be expected to access the road network to evacuate the proposed subdivision in the event of a bush fire, should the above assumptions be adopted.

Evacuation Traffic Distribution

Evacuation in the event of a bush fire involves residents of at-risk properties departing to an area of perceived safety. Such an area is typically urbanised, with a minimum of approximately 100 metres of separation to surrounding bushland frontage.

Within the proposed subdivision, evacuating residents may either travel to an area of low risk within the subdivision that is separated by an asset protection zone (a buffer between a bush fire hazard and buildings) or depart the subdivision entirely.

For this study, all traffic generated by the subdivision is assumed as needing to depart the subdivision altogether. It can do so via two key evacuation routes:

1. Using proposed internal road MC01 to access the existing road network at Cessnock Road.
2. Using the proposed internal extension to Auburn Street to access the existing road network to the north.

A trip distribution exercise has been undertaken which identifies the most likely of these two evacuation routes residents of each of the 17 stages of subdivision would take in the event of an emergency. The assumptions adopted are summarised in **Table 6**.

Table 6: Trip Distribution

EVACUATION ROUTE	SUBDIVISION STAGES USING ROUTE
MC01 to access Cessnock Road to the east	Stages 1 – 8, 17
Auburn Street to exit the subdivision via the north	Stages 12 – 15
Combination of the two evacuation routes	Stages 9 – 11, 16

Applying the assumptions documented in **Table 6** to the trip generation determined in **Table 5** results in the trip distribution by route presented in **Table 7**.

Table 7: Evacuation Traffic Demand by Evacuation Route

STAGE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Total
DEMAND (VEH)	34	33	29	42	22	30	26	26	12	25	12	18	15	13	19	23	22	401
NORTH	-	-	-	-	-	-	-	-	6	12	9	18	15	13	19	11	-	103
EAST	34	33	29	42	22	30	26	26	6	13	3	-	-	-	-	12	22	298

Traffic Assessment of Critical Internal Subdivision Roads

As illustrated by **Figure 2**, MC01 and Auburn Street, being the critical roads which will be used by traffic evacuating the subdivision, are fully compliant to the acceptable solutions of PBP 2019, even with on-street parking provided along both sides. Discussion below focuses therefore on the potential traffic impacts on other streets in the event of an evacuation.

Auburn Street

The most critical non-perimeter road is expected to be the short section of Auburn Street between MC01 to the north and MC08 to the south. Unlike the remainder of Auburn Street north of MC01, this road is proposed as an 8.0 metre kerb to kerb carriageway and would be required to accommodate all evacuating traffic from stages to the south, being Stages 2 – 7 and some of Stage 1. Conservatively assuming all of Stage 1 is required to use this connection would result in a total estimated demand for this section of road of 217 vehicles during an emergency evacuation.

If on-street parking were to be provided along both sides, this short section of road would not be compliant to the acceptable solution of PBP 2019 and would be required to serve approximately 217 vehicles over the course of an emergency evacuation.

NSW RFS has however demonstrated willingness to adopt a performance solution clear-width requirement of 4.0 metres, which would therefore permit on-street car parking to be provided along both sides whilst satisfactory enabling access by firefighting vehicles.

MC08

MC08 forms the southern perimeter road and proposed as a 10.5 metre kerb to kerb width. Should on-street parking be provided along one side only, this perimeter road would meet the requirements of PBP 2019 and no further traffic assessment would be necessary.

Should car parking along both sides of the road be mandated, the clear effective width would fall below the 8.0 metres required by PBP 2019.

The total number of estimated evacuation trips from Stages 2 – 4, 6 & 7 is 161 vehicles; however, the vast majority of these would travel northwards along respective internal north-south roads (MC08, MC12, MC13, MC14 and MC15) given this forms the most direct departure route from the subdivision. Very few would be expected to travel southwards and therefore potentially come into conflict with a fire truck travelling in the opposite direction, which is likely the direction of travel of said fire truck, towards the higher risk bushland area.

Further, despite the PBP 2019 acceptable solution of providing an 8.0 metre kerb to kerb clear width for perimeter roads, it is noted that most passenger cars do not exceed 1.85 metres in width (*Australian Standard (AS) 2890 Part 1: Off-street car parking, Appendix B*) and most fire trucks do not exceed 3.0 metres in width (*Access for Fire Brigade Vehicles and Firefighters, NSW Government 2019*).

As such, a passenger car and fire truck travelling in opposite directions would still be able to pass satisfactorily along the perimeter road, even if parking were fully occupied on both sides of the street.

Conclusion

This Traffic Assessment has identified the likely evacuation traffic demand which would be generated by the subdivision in the event of an emergency, as a means of considering the likelihood of evacuating vehicles meeting and conflicting with a firefighting vehicle on roads internal to the subdivision.

The Traffic Assessment concludes that the key roads catering for evacuating traffic of MC01 and Auburn Street would be compliant to the acceptable solutions of PBP 2019 with parking provided along both sides of the road, and as such no further traffic assessment of these roads is necessary.

Of roads on which the acceptable solution recommended by PBP 2019 would not be achieved if parking were provided along both sides, this Traffic Assessment has demonstrated that:

- A performance solution has been agreed with NSW RFS which renders almost all roads within the subdivision compliant to PBP 2019, except for perimeter road MC08.
- On the perimeter road of MC08, a fire truck would still be able to pass a passenger vehicle if travelling in opposing directions, given the available clear width exceeds the combined width of the vehicle chassis plus vehicle clearances. As such, this is considered a suitable performance based solution which would comply with PBP 2019.

As such, the current proposal is considered supportable on traffic planning grounds.

DESIGN ASSESSMENT

To demonstrate satisfactory access and passing along MC08, the one perimeter road within the subdivision which does not meet acceptable solutions criteria of PBP 2019 should on-street parking be provided along both sides, vehicle swept path analysis has been undertaken and is provided as **Attachment 2**.

The NSW RFS Fire Trail Standards contain firefighting vehicle specifications of vehicles used by NSW RFS, which has formed the basis for swept path analysis. The largest of these vehicles, being a Category 1 firefighting vehicle, is 8.2 metres in length, 2.4 metres wide, has two axles, and a turning circle of 22 metres.

These specifications are all smaller than or equal to those of an 8.8-metre medium rigid vehicle (MRV) as defined by AS 2890 Part 2: Off-Street Commercial Vehicle Facilities (AS 2890.2), which has therefore been adopted for use in swept path analysis as a conservative test case.

Swept path analysis demonstrates that an 8.8-metre MRV can pass a B99 Design Vehicle when travelling in opposite directions along MC08 when both kerbsides are fully occupied by vehicles parked on-street.

As such, the proposed layout of MC08 is considered to satisfactorily achieve the intent of PBP 2019, comprising a performance based solution, and has been designed in accordance with Table 5.3b.

The proposed development is therefore supportable on traffic planning grounds. Please contact the undersigned should you have any queries or require any further information.

Yours sincerely,

Ben Midgley
Principal Traffic Engineer, PDC Consultants

Email: bmidgley@pdcconsultants.com.au

Attachments:
1) *Engineering Plans*
2) *Vehicle Swept Paths*

Attachment 1

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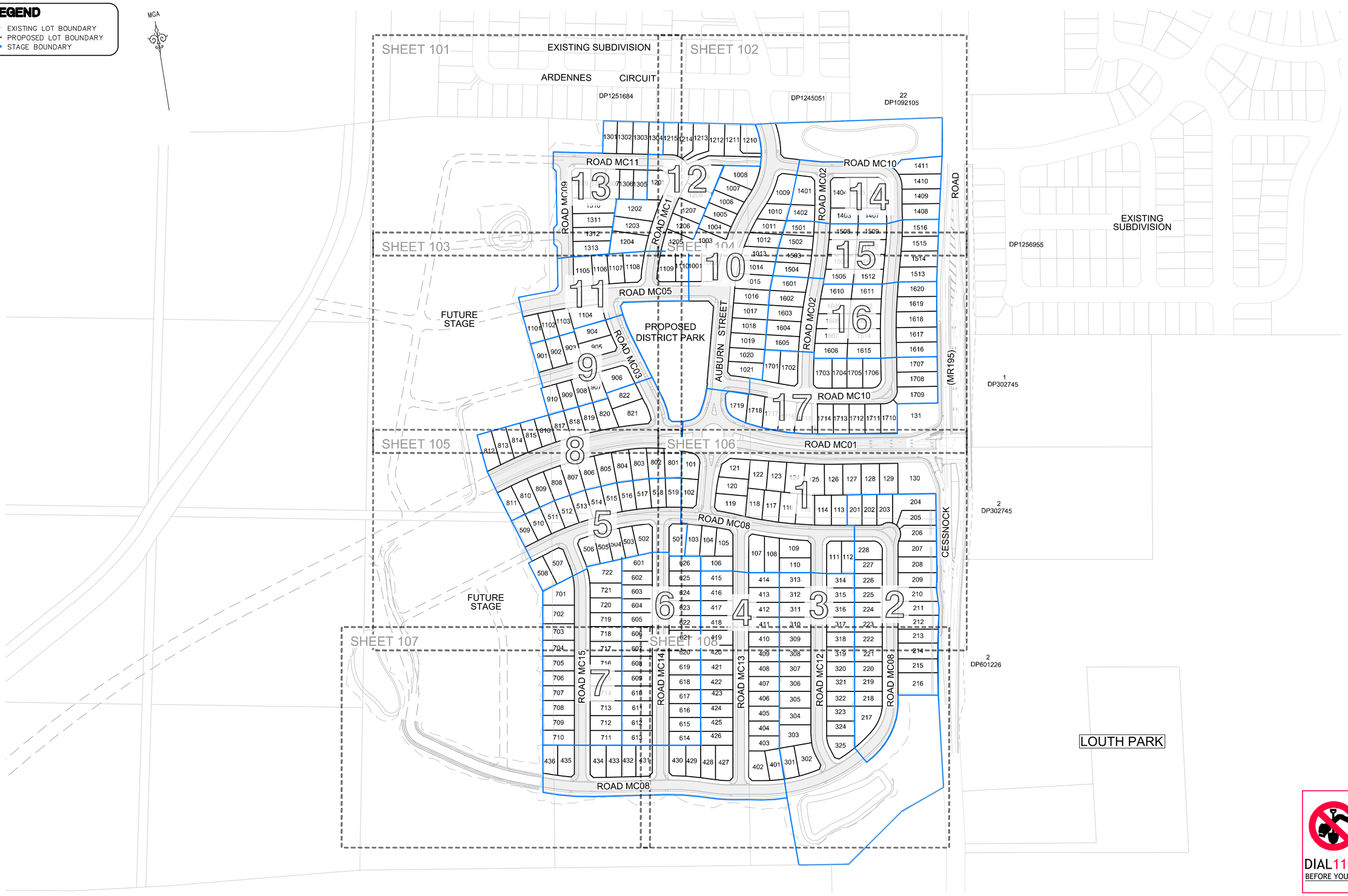
LEGEND

- EXISTING LOT BOUNDARY
- PROPOSED LOT BOUNDARY
- STAGE BOUNDARY

MGA



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CLIENT: McCLOYGROUP

PROPERTY DESCRIPTION
REGROWTH KURRI KURRI
PRECINCT A STAGE 1
464 CESSNOCK ROAD, GILLIESTON HEIGHTS

SURVEYED: ADW Johnson
DATUM: GDA2020 M.G.A. ZONE 56 A.H.D.

PROJECT: PROPOSED SUBDIVISION
PLAN TITLE: OVERALL SITE PLAN

PROJECT No.	DISCIPLINE	NUMBER	REV.
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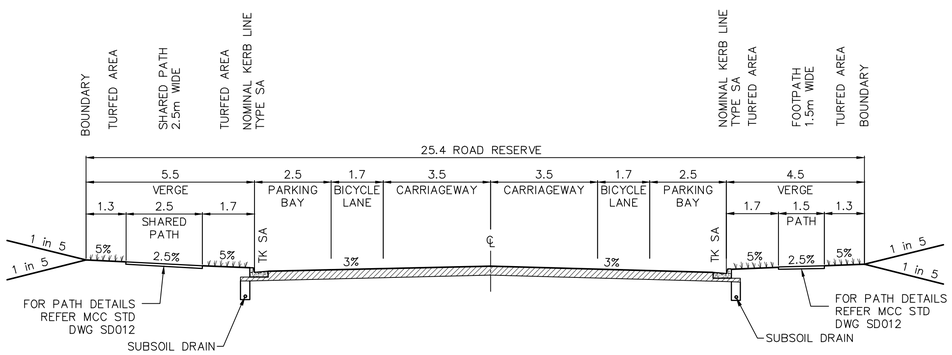

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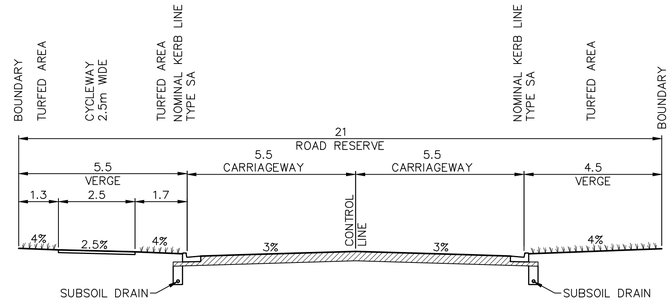

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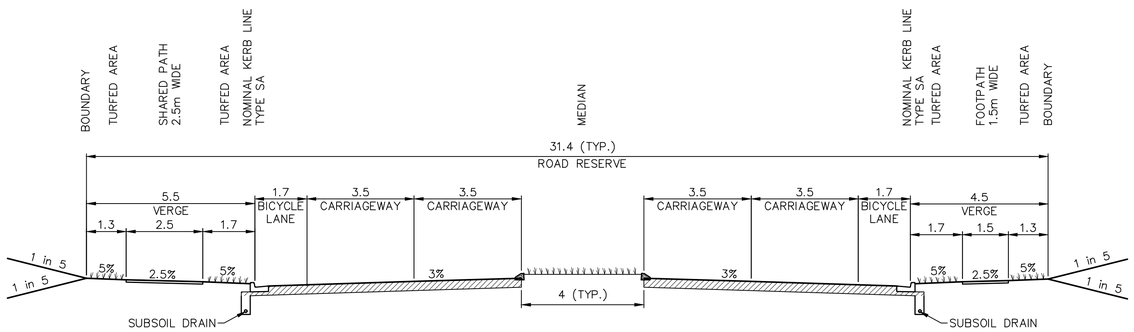

TYPICAL CROSS SECTION: MC01
CESSNOCK ROAD TO AUBURN ST RAB
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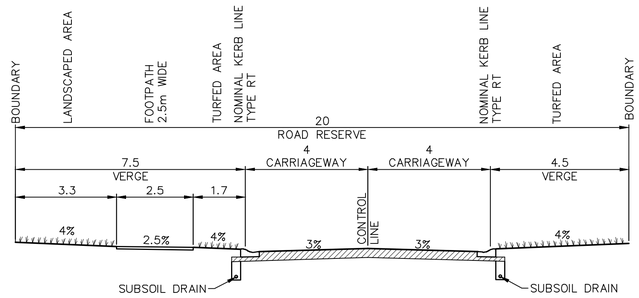

TYPICAL CROSS SECTION: MC04
(CH0 – CH75)
SCALE 1:100 NATURAL

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DATUM: GDA2020 M.G.A. ZONE 56 A.H.D.

PROJECT: PROPOSED SUBDIVISION
PLAN TITLE: TYPICAL ROAD CROSS SECTIONS: SHEET 1

PROJECT No.	DISCIPLINE	NUMBER	REV.
240289(1)	CENG	250	A

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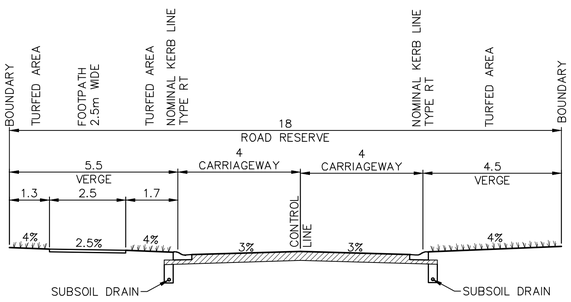

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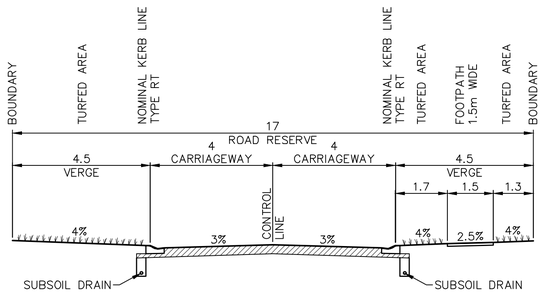
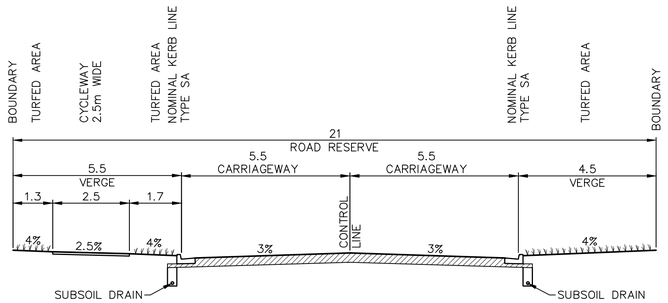


TYPICAL CROSS SECTION: MC06
(CH795 TO L.O.W.)

SCALE 1:100 NATURAL



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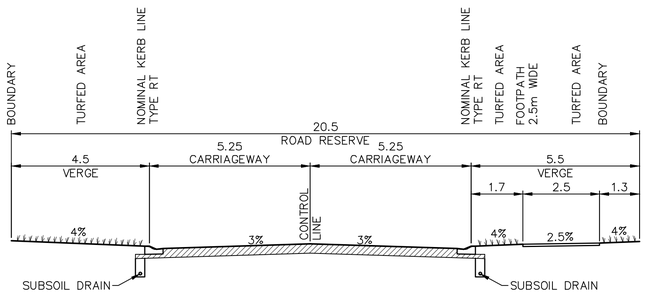
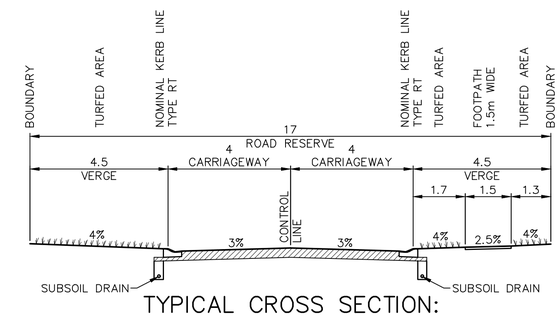


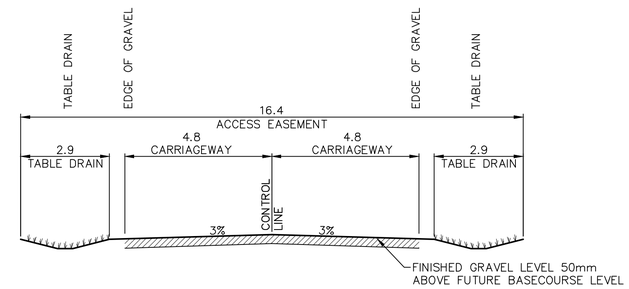
TYPICAL CROSS SECTION: MC06
(L.O.W. TO CH720)

SCALE 1:100 NATURAL



TYPICAL CROSS SECTION:
MC02, MC03, MC07, MC08, MC09, MC10, MC11, MC12 MC13, MC15

SCALE 1:100 NATURAL



TYPICAL CROSS SECTION: MC06
(TEMPORARY BASIN ACCESS)

SCALE 1:100 NATURAL

NOT FOR CONSTRUCTION

REV.	DATE	AMENDMENT	DRAWN	CHECK	DESIGN	VERIFY
A	18.02.2022	INITIAL ISSUE	I.B.	R.B.	R.B.	R.K.

SCALES: 0 1 2 3 4 — A1 / A3 1:100 / 1:200

DESIGN FILE N:\240289(1)\Design\12D\RESI PRECINCT 1 STAGE 1 DA DESIGN\RESI_PRECINCT_1_STAGE_1_DA_DESIGN.project

ALL DIMENSIONS ARE IN METRES U.N.O. DO NOT SCALE

adw johnson
Hunter Office
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Phone: (02) 4978 5100
Fax: (02) 4978 5199
email: hunter@adwjohnson.com.au
www.adwjohnson.com.au
ABN 62 129 445 398

CLIENT: McCLOY GROUP

PROPERTY DESCRIPTION
REGROWTH KURRI KURRI
PRECINCT A STAGE 1
464 CESSNOCK ROAD, GILLIESTON HEIGHTS

SURVEYED: ADW Johnson

DATUM: GDA2020 M.G.A. ZONE 56 A.H.D.

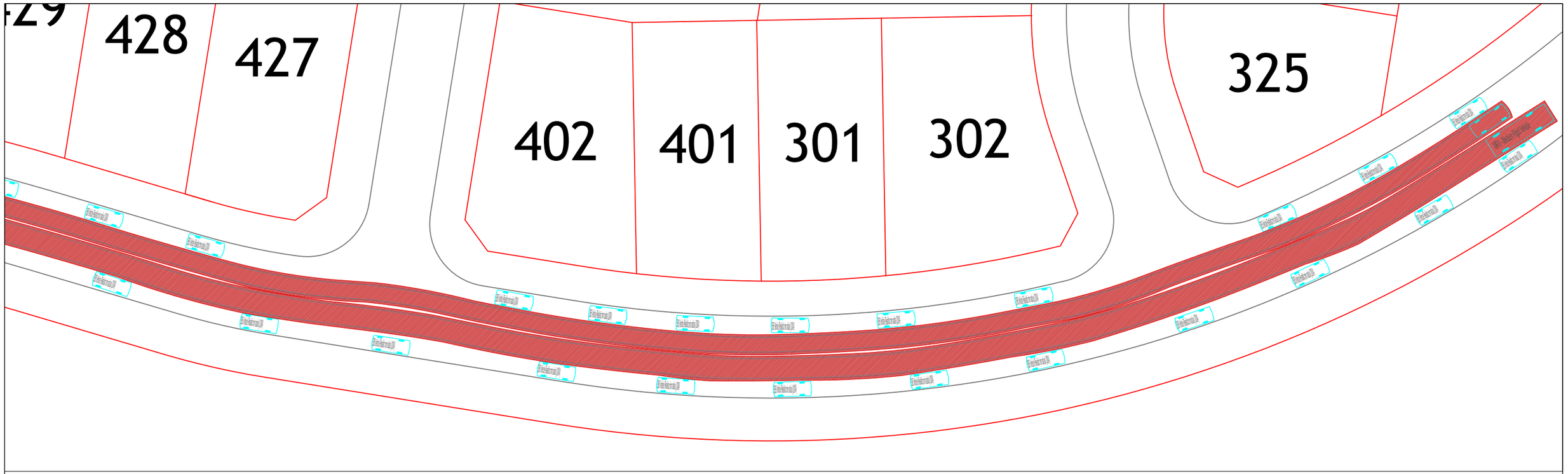
PROJECT: PROPOSED SUBDIVISION

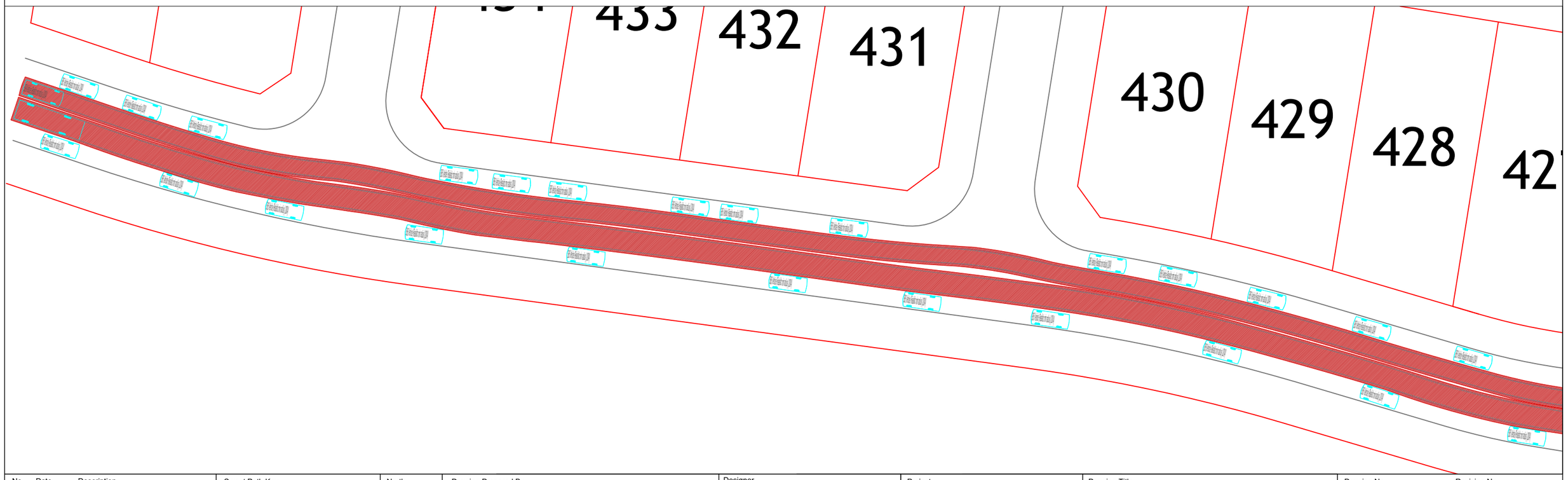
PLAN TITLE: TYPICAL ROAD CROSS SECTIONS: SHEET 2

PROJECT No.	DISCIPLINE	NUMBER	REV.
240289(1)	CENG	251	A

Plotted By: Iain Baker Plot Date: 18/02/22 3:30:06PM Cad File: \\JPSERVER10\ADW-DATA\240289\240289(1)\DWG\ENGINEERING\CENG\240289(1)-CENG-251(A).DWG

Attachment 2





No.	Date	Description

Swept Path Key
- Vehicle Wheel Path
- Vehicle Body Envelope
- 300mm Vehicle Clearance

North: N

Drawing Prepared By

PDC Consultants
Level 14, 100 William Street
Woolloomooloo NSW 2011
t: +61 2 7900 6514
w: www.pdcconsultants.com.au
ABN: 70 615 064 670

Designer	ADW Johnson
Client	McCloy Group
Project	Cessnook Road, Gillieston Heights
Project No	0563
Drawing Title	Swept Path Analysis MC08 Perimeter Road Fire Truck Passing B99 Design Vehicle
Sheet Status	NOT FOR CONSTRUCTION
Drawing No.	001
Revision No.	-
Drawn By	BM
Date	04/05/2022
Scale	1:500 @ A3

0m 5 10 15 20

Appendix D: Rural Fire Service Pre-DA Advice - 2 May 2022

NSW RURAL FIRE SERVICE

PRE-DA ADVICE SUMMARY

Applicant:	Stuart Greville – McCloy Group c/- Bushfire Planning Australia
Subject:	345 lot residential subdivision at 464 Cessnock Road Gillieston Heights PRE-DA20220217000022

Details of the proposal

☐ SFPP	
☑ Residential subdivision	345 lot residential subdivision
☐ Other	

Bush fire protection issues discussed

☐ Hazard Assessment	
☐ Asset Protection Zones	
☑ Access	Road widths and parking outside carriageway. Development proposed 8 metre(m) wide roads (kerb to kerb), allowing for 5.5m trafficable path and 2.5m for on-street parallel parking.
☐ Construction Standards	
☐ Services	
☐ Emergency and Evacuation Planning	

Documentation / plans referenced

DA Subdivision Plans
Slope and Vegetation Assessment (BPA)
Fire 19 Subdivision BAL Plan (BPA)
Series of site photos

Advice Provided

The New South Wales Rural Fire Service (NSW RFS) has reviewed the documentation provided and advises the following:

- The acceptable solutions for subdivision access listed in Table 5.3b of *Planning for Bush Fire Protection* (PBP) *2019* are clear that there must be a 5.5m carriageway free of parking for internal roads. Where the acceptable solution requirements of Table 5.3b are recommended as part of the conditions for an 8 m wide road, it would be expected that the certifier would require no parking signs or other means to ensure compliance with the requirement.

- Given the low risk posed by the bush fire hazard as shown in the submitted Figure 19 Subdivision BAL Plan, a bush fire report can be prepared which assesses the proposal against the performance criteria of Table 5.3b of PBP. The minimum acceptable width for any performance solution for internal roads needs to consider a minimum of 4m carriageway free of parking for appropriate firefighting access to proposed lots along the hazard interface.

- Please note that the pre DA advice issued is preliminary in nature and that no detailed assessment of the site or development is undertaken nor is it intended for the purpose of submitting revised information/bush fire engineering brief for further review of the original advice. The aim of the service is to identify any potential issues before the formal DA is lodged.

Disclaimer

RFS advice is based on information provided and policy and legislative requirements applicable at the time. The advice should be copied into, or referenced in, any subsequent development application.

All efforts are made to identify issues of relevance and likely concern with the preliminary proposal. However, the comments and views in this document are based only on the plans and information submitted for preliminary assessment and discussion at the pre-DA meeting. You are advised that: -

- The views expressed may vary once detailed plans and information are submitted and formally assessed in the development application process, or as a result of issues contained in submissions by interested parties;
- Given the complexity of issues often involved and the limited time for full assessment, no guarantee is given that every issue of relevance will be identified;
- Amending one aspect of the proposal could result in changes which would create a different set of impacts from the original plans and therefore require further assessment and advice; and,
- The Pre-DA advice given does not bind Council officers, the elected Council members, or other parties to the DA process.

Submitted by:

Alastair Patton
Supervisor, Development Assessment and Planning
Planning and Environment Services (East)
Built and Natural Environment

Approved by:

Kalpana Varghese
Supervisor, Development Assessment and Planning
Planning and Environment Services (East)
Built and Natural Environment

Date: 02 May 2022

Appendix E: NBC Bushfire Attack Assessor V4.1 Report

NBC Bushfire Attack Assessment Report V4.1

AS3959 (2018) Appendix B - Detailed Method 2

Print Date: 22/07/2022 **Assessment Date:** 23/05/2022

Site Street Address: 2158 The Loxford Precinct 1B, Gillieston Heights

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: T10, T11, T12, T13 - south across boundary

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: 1 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):** 7.24

Radiant Heat(kW/m2): 27.98 **Flame Angle (degrees):** 64

Flame Length(m): 16.85 **Maximum View Factor:** 0.435

Rate Of Spread (km/h): 2.14 **Inner Protection Area(m):** 15

Transmissivity: 0.846 **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

Run Description:	T14 - paddock south of Precinct 1B		

Vegetation Information

Vegetation Type:	Grassland		
Vegetation Group:	Grassland		
Vegetation Slope:	1.8 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:	1 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:**	130

Program Outputs

Level of Construction:	BAL 29	**Peak Elevation of Receiver(m):**	3.98
Radiant Heat(kW/m2):	29	**Flame Angle (degrees):**	65
Flame Length(m):	9.18	**Maximum View Factor:**	0.438
Rate Of Spread (km/h):	19.13	**Inner Protection Area(m):**	0
Transmissivity:	0.87	**Outer Protection Area(m):**	0
Fire Intensity(kW/m):	59318		

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:	T15 - HMDSF north west of railway

Vegetation Information

Vegetation Type:	Hunter Macleay DSF		
Vegetation Group:	Dry Sclerophyll Forests (Shrub/Grass)		
Vegetation Slope:	1.9 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:	0.6 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):**	6.66
Radiant Heat(kW/m2):	28.96	**Flame Angle (degrees):**	63
Flame Length(m):	15.4	**Maximum View Factor:**	0.447
Rate Of Spread (km/h):	1.92	**Inner Protection Area(m):**	13
Transmissivity:	0.852	**Outer Protection Area(m):**	4
Fire Intensity(kW/m):	24344		

BAL Thresholds

	BAL-40:	BAL-29:	BAL-19:	BAL-12.5:	10 kw/m2:	Elevation of Receiver:
Asset Protection Zone(m):	13	17	25	35	54	6

Run Description:	T16 & T17 land adjoining railway between and site		
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:	1 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):**	4.41
Radiant Heat(kW/m2):	29	**Flame Angle (degrees):**	64
Flame Length(m):	10.25	**Maximum View Factor:**	0.44
Rate Of Spread (km/h):	23.86	**Inner Protection Area(m):**	0
Transmissivity:	0.867	**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: T18 north east into gull (>60m fire run)

Vegetation Information

Vegetation Type: Hunter Macleay DSF

Vegetation Group: Dry Sclerophyll Forests (Shrub/Grass)

Vegetation Slope:	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:	1 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):**	7.76
Radiant Heat(kW/m2):	29	**Flame Angle (degrees):**	62
Flame Length(m):	18.36	**Maximum View Factor:**	0.452
Rate Of Spread (km/h):	2.37	**Inner Protection Area(m):**	0
Transmissivity:	0.845	**Outer Protection Area(m):**	0
Fire Intensity(kW/m):	30150		

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	61	6

Run Description: T19 - across gully

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: 1 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 29

Peak Elevation of Receiver(m): 6.61

Radiant Heat(kW/m2): 29

Flame Angle (degrees): 63

Flame Length(m): 15.5

Maximum View Factor: 0.448

Rate Of Spread (km/h): 1.93

Inner Protection Area(m): 0

Transmissivity: 0.852

Outer Protection Area(m): 0

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:	T1-T3 - Actively grazed paddock west of railway

Vegetation Information

Vegetation Type:	Grassland		
Vegetation Group:	Grassland		
Vegetation Slope:	3 Degrees	**Vegetation Slope Type:**	Downslope
Surface Fuel Load(t/ha):	4.5	**Overall Fuel Load(t/ha):**	4.5
Vegetation Height(m):	0	Only Applicable to Shrub/Scrub and Vesta	

Site Information

Site Slope:	1 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:**	130

Program Outputs

Level of Construction:	BAL 19	**Peak Elevation of Receiver(m):**	3.74
Radiant Heat(kW/m2):	16.42	**Flame Angle (degrees):**	76
Flame Length(m):	8.29	**Maximum View Factor:**	0.255
Rate Of Spread (km/h):	20.79	**Inner Protection Area(m):**	16
Transmissivity:	0.847	**Outer Protection Area(m):**	0
Fire Intensity(kW/m):	48329		

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:	T20 south west into gully		
Vegetation Information			
Vegetation Type:	Hunter Macleay DSF		
Vegetation Group:	Dry Sclerophyll Forests (Shrub/Grass)		
Vegetation Slope:	4.1 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:	1 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):**	7.44
Radiant Heat(kW/m2):	29	**Flame Angle (degrees):**	63
Flame Length(m):	17.45	**Maximum View Factor:**	0.451
Rate Of Spread (km/h):	2.23	**Inner Protection Area(m):**	15
Transmissivity:	0.846	**Outer Protection Area(m):**	4
Fire Intensity(kW/m):	28335		

BAL Thresholds

	BAL-40:	BAL-29:	BAL-19:	BAL-12.5:	10 kw/m2:	Elevation of Receiver:
Asset Protection Zone(m):	15	19	28	38	57	6

Run Description: T21 - T24

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): 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 29

Peak Elevation of Receiver(m): 6.96

Radiant Heat(kW/m2): 27.44

Flame Angle (degrees): 64

Flame Length(m): 15.49

Maximum View Factor: 0.426

Rate Of Spread (km/h): 1.93

Inner Protection Area(m): 14

Transmissivity: 0.848

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:	T4 - north into 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:	1 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):**	6.41
Radiant Heat(kW/m2):	29	**Flame Angle (degrees):**	63
Flame Length(m):	15.04	**Maximum View Factor:**	0.447
Rate Of Spread (km/h):	1.86	**Inner Protection Area(m):**	0
Transmissivity:	0.853	**Outer Protection Area(m):**	0
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	23	34	53	6

Run Description:	T5 & T6 - north east across gully to Precinct 1A

Vegetation Information

Vegetation Type:	Hunter Macleay DSF		
Vegetation Group:	Dry Sclerophyll Forests (Shrub/Grass)		
Vegetation Slope:	3.4 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):**	5.17
Radiant Heat(kW/m2):	29	**Flame Angle (degrees):**	63
Flame Length(m):	11.6	**Maximum View Factor:**	0.442
Rate Of Spread (km/h):	1.33	**Inner Protection Area(m):**	10
Transmissivity:	0.862	**Outer Protection Area(m):**	3
Fire Intensity(kW/m):	16888		

BAL Thresholds

	BAL-40:	BAL-29:	BAL-19:	BAL-12.5:	10 kw/m2:	Elevation of Receiver:
Asset Protection Zone(m):	10	13	20	28	43	6

Run Description: T7 - south into gully separating Precinct 1A

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: 1 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 29

Peak Elevation of Receiver(m): 6.7

Radiant Heat(kW/m2): 27.24

Flame Angle (degrees): 65

Flame Length(m): 15.49

Maximum View Factor: 0.423

Rate Of Spread (km/h): 1.93

Inner Protection Area(m): 14

Transmissivity: 0.847

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: T8 & T9 - east into gully

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:	1 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 29	**Peak Elevation of Receiver(m):**	6.98
Radiant Heat(kW/m2):	28.88	**Flame Angle (degrees):**	63
Flame Length(m):	16.38	**Maximum View Factor:**	0.447
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	37	56	6

Appendix F: Planning for Bushfire Protection 2019 Compliance Table

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	✓	All lots within the proposed development are provided with sufficient separation from the nearest bushfire hazard by public roads.
➢ Provide for a defendable space to be located around buildings	✓	Defendable space by way of an APZ is provided between all new lots and the bushfire hazard to ensure radiant heat levels are below critical limits (29kW/m^2).
➢ Provide appropriate separation between a hazard and buildings, which, in combination with other measures, prevent the likely fire spread to buildings	✓	Appropriate APZs are provided between the proposed lots and the hazard, which in addition to other mitigation measures such as suitable construction, will provide an acceptable level of protection to the buildings, and prevent the spread of fire to the buildings and onto adjoining buildings.
➢ Ensure that safe operational access and egress for emergency service personnel and residents is available	✓	Public road access will be provided from Cessnock Road through Precinct 1A. A secondary access also through Precinct 1A is provided to the existing adjoining development to the north of the site via Auburn Street. As part of the future development to the south, the main collector road will continue further south and ultimately re-connect to the existing public road network.
➢ Provide for ongoing management and maintenance of BPMs	✓	All owners will be responsible for the management and maintenance of the private property.
➢ 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 residential subdivisions (Chapter 5 PBP 2019)

Intent of Measure	Performance Criteria	Acceptable Solution	Complies	Comment
			✓ - Acceptable Solution AS - Alternative Solution	
5.3.1 ASSET PROTECTION ZONES Table 5.3a To provide sufficient space and maintain reduced fuel loads, so as to ensure radiant heat levels at buildings are below critical limits and to prevent direct flame contact with a building.	Potential building footprints must not be exposed to radiant heat levels exceeding 29kW/m^2 on each proposed lot.	APZs are provided in accordance with Tables A1.12.2 and A1.12.3 based on the FFDI.	✓/AS	All proposed lots may be exposed to a maximum potential radiant heat level no greater than 29kW/m^2. A maximum APZ of 25m was calculated using methodology outlined in Appendix B of AS3959-2018 (Method 2 modelling).
	APZs are managed and maintained to prevent the spread of a fire towards the building.	The APZ is managed in accordance with the requirements of Appendix 4	✓	All new landowners will be required to manage their respective lot as an IPA.
	The APZ is provided in perpetuity.	APZs are wholly within the boundaries of the development site.	✓	There are no exceptional circumstances that would require an APZ to be located external to the development site.
	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°	✓	The maximum slope of the site is 5° or less.
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). Fencing is constructed in accordance with section 7.6.	✓	All new landscaping has considered the requirements of APZs per Appendix 4. All new fencing will be colorbond or similar non-combustible material.
5.3.2 ACCESS (General Requirements) **Table 5.3b** To provide safe operational access for emergency services personnel in suppressing a bush fire, while residents are accessing or egressing an area.	Fire fighters are provided with safe all weather access to structures	Property access roads are two-wheel drive, all-weather roads	✓	Public road access will be provided to Cessnock Road via the road network to be constructed as part of Precinct 1A. A 24m perimeter road will be constructed to the south of the development and several non-perimeter roads constructed that will provide direct access to each lot.
		Perimeter roads are provided for residential subdivisions of three or more allotments	✓	
		Subdivisions of three or more allotments have more than one access in and out of the development		
		Traffic management devices are constructed to not prohibit access by	✓	

Intent of Measure	Performance Criteria	Acceptable Solution	Complies	Comment
			✓ - Acceptable Solution AS - Alternative Solution	
		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.	✓	
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 proposed lots are able to be connected to a reticulated water supply.
		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.	✓	
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.	✓	A 24m perimeter road will be constructed to the south of the development and several on-perimeter roads constructed that will provide direct access to each lot. A 10m wide paved carriageway will be provided allowing for an 8m wide unobstructed path of travel and on-street parking outside the carriageway.
		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°.	✓	

Intent of Measure	Performance Criteria	Acceptable Solution	Complies	Comment
			✓ - Acceptable Solution AS - Alternative Solution	
		A minimum vertical clearance of 4m to any overhanging obstructions, including tree branches; and	✓	
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 road network is required to connect with the approved subdivision layout. A 8m wide paved carriageway will be provided allowing for an 5.5m wide unobstructed path of travel and on-street parking outside the carriageway. All roads; including non-perimeter roads will be constructed in accordance with PBP 2019.
		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; and	✓	
5.3.3 SERVICES Table 5.3c 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. **WATER**	Adequate water supplies 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**	
		Static water supplies shall comply with Table 5.3d	**N/A**	
	Water supplies are located at regular intervals	Fire hydrant spacing, design and sizing comply with AS2419.1:2005;	✓	A reticulated water supply is provided.
		Hydrants are not located within any road carriageway;	✓	

Intent of Measure	Performance Criteria	Acceptable Solution	Complies	Comment
			✓ - Acceptable Solution AS - Alternative Solution	
	The water supply is accessible and reliable for firefighting operations	Reticulated water supply to urban subdivisions uses a ring main system for areas with perimeter roads.	✓	A reticulated water supply is provided.
	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.	**Able to comply**	
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.	✓	The proposed new lots will be connected to the existing underground electricity service.
		Where overhead electrical transmission lines are proposed as follows: → lines are installed with short pole spacing (30 metres), unless crossing gullies, gorges or riparian areas; and → 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**	
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.	✓	Any new gas connections will be underground and will be unlikely to create an additional hazard risk to surrounding bushland.
		All fixed gas cylinders are kept clear of all flammable materials to a distance of 10 metres and shielded on the hazard side;		

Intent of Measure	Performance Criteria	Acceptable Solution	Complies	Comment
			✓ - Acceptable Solution AS - Alternative Solution	
		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.		