Bushfire Hazard Assessment Subdivision 54 Pullen Street, Woolgoolga

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Bushfire Disclaimer

This report in no way suggests or guarantees that a bushfire or grass fire will not occur at the project site and / or impact the proposed development. Furthermore, the measures recommended in this report do not guarantee that loss of life, injury and / or property damage will not occur during a bushfire or grass fire event. The severity and impact of a bushfire or grass fire event can be influenced by matters such as vegetation management, human behaviour and extreme weather conditions.

This report advises on matters published by the NSW Rural Fire Service in the guideline Planning for Bushfire Protection 2019 and other advice available from that organisation. Due consideration has been given to site conditions, the nature of the proposed development and to appropriate legislation and documentation available at the time of writing. The report is therefore current at the time of writing only.

Certification

	Name	Signature	Date
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Reviewed by	Jacqui Lachmann	Jlah-	03/07/2024
UPR	Description	Issued By	Date Issued
4910-1001	Bushfire Hazard Assessment_V1	Paul Creenaune	03/07/2024



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Executive Summary

This Bushfire Hazard Assessment has been prepared to support a Development Application to the City of Coffs Harbour for the proposed subdivision of Lot 12 DP 1059040, 54 Pullen Street, Woolgoolga, NSW. The subdivision will create lots on bushfire prone land with the potential for future residential development and therefore requires a Bushfire Safety Authority in accordance with Section 100B of the *Rural Fires Act 1997*.

The Bushfire Hazard Assessment has taken into consideration the proposed development layout, the vegetation creating a bushfire hazard, the effective slope and Fire Danger Index for the site in accordance with *Planning for Bush Fire Protection 2019*. The proposal includes a performance solution to determine an appropriate asset protection zone distance based on a short fire run assessment. The Bushfire Hazard Assessment demonstrates that the recommended bushfire protection measures are available and can be implemented to facilitate the proposed development in accordance with the requirements of *Planning for Bush Fire Protection 2019*.

The proposed development is regarded as Integrated Development under Section 4.46 of the *Environmental Planning and Assessment Act 1979*.

The following table provides a summary of the recommendations for each bushfire protection measure outlined in Chapter 5 of Planning for Bushfire Protection 2019.

Bushfire Protection Measure	Recommendation
Asset Protection Zones	 Proposed Lots 1 to 20 and the road reserve for Road 1 are to be managed as an Inner Protection Area (IPA) in accordance with Appendix A4.1.1 of Planning for Bushfire Protection 2019.
	 Compensatory planting to the north and west of the perimeter road must consist of species that will not compromise the asset protection zones, including avoiding the introduction of large eucalypt canopy trees that could overhang the perimeter road at maturity.
Landscaping	 Any fencing is to be constructed of non-combustible material.
Access	 Road 1 is to comply with the requirements (General Requirements and Perimeter Roads) of Table 5.3b of Planning for Bushfire Protection 2019, except that secondary access is to be provided by a 4 m wide gravel pavement (emergency access/ cycle path) from the cul-de- sac head to Pullen Street. Any traffic management device (e.g. bollards) constructed along the path are to enable access for emergency services vehicles.
Services - Water, Electricity and Gas	 Water and electricity services are to comply with Table 5.3c of Planning for Bushfire Protection 2019.



1. Introduction

1.1 Scope and Purpose

GeoLINK has been engaged by Precise Planning on behalf of PEAC Property Group Pty Ltd to prepare a Bushfire Hazard Assessment for the proposed subdivision of Lot 12 DP 1059040, 54 Pullen Street, Woolgoolga, referred to herein as 'the site'.

The land on which the proposed development is located is mapped as bushfire prone land.

This Bushfire Hazard Assessment will accompany the Statement of Environmental Effects that informs the development application (DA) lodged under Part 4 of the *Environmental Planning and Assessment Act 1979* to the City of Coffs Harbour.

This report serves to:

- identify the proposed development and site characteristics;
- determine and assess the bushfire threat; and
- recommend appropriate bushfire protection measures in accordance with Planning for Bush Fire Protection 2019 to minimise the impact of bushfire on the development.

1.2 Legislative Framework

The assessment contained in this report has been prepared with regard to:

- Environmental Planning and Assessment Act 1979 (EP&A Act);
- Environmental Planning and Assessment Regulation 2021;
- Rural Fires Act 1997;
- Rural Fires Regulation 2022; and
- Planning for Bushfire Protection (PBP) 2019.

The *Rural Fires Act 1997* and the EP&A Act institute a framework for environmental planning and assessment to consider bushfire hazard issues.

Section 100B of the *Rural Fires Act 1997* establishes that a 'Bush Fire Safety Authority' (BFSA) is required for a subdivision of bush fire prone land that could lawfully be used for residential or rural residential purposes.

This report does not include an assessment of any threatened species or threatened ecological community under the *Biodiversity Conservation Act 2016*, or any Aboriginal object or place within the meaning of the *National Parks and Wildlife Act 1974*. Refer to the Statement of Environmental Effects for further information.

1.3 Bushfire Prone Land

The City of Coffs Harbour bushfire prone land mapping has been prepared as a requirement of Section 10.3 of the EP&A Act and in accordance with the NSW Rural Fire Services (RFS) *Guideline to Bushfire Prone Land Mapping*. The City of Coffs Harbour's bushfire prone land mapping indicates that the site is classified as bushfire prone land containing predominately Category 3 Vegetation. A small area of Category 1 Vegetation is mapped along the northern and western boundaries, and a small area in the south-eastern portion of the site is mapped as Vegetation Buffer.



The surrounding land is also classified as bushfire prone land with riparian vegetation to the north, west and south-west of the site mapped as Category 1 vegetation. The land around the riparian vegetation to the north-west and west is mapped as Category 3 Vegetation. The mapped Vegetation Buffer extends to the north and south. The land to the east and south of the site is predominately cleared and contains existing residential development,

The bush fire prone land mapping for the site and immediate surrounds is shown in **Illustration 1.1**.





517900 517900 Spatial Reference: GDA2020 MGA Zone 56

Cadastre Vegetation category 3 Vegetation buffer

Vegetation category 1

0 40 Metres

Site boundary

LEGEND

Bushfire Hazard Assessment 4910-1002

Bushfire Prone Land - Illustration 1.1

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2. Background

2.1 Location and Description

The site is located at Woolgoolga, in the City of Coffs Harbour local government area. The site is approximately 1.5 km west of the Woolgoolga town centre, on the western periphery of the existing urban area (refer to **Illustration 2.1**).

Table 2.1 provides a quick reference for the location and description details of the site.

Site Details	
Lot / DP	Lot 12 DP 1059040
Street Address	54 Pullen Street
	Woolgoolga
Elevation	10 m AHD
Site Area	2.79 ha
Coffs Harbour Local Environmental Plan 2013	Zone R2 Low Density Residential
Fire Weather District	North Coast
Fire Danger Index (FDI)	80
Fire Control Centre	Coffs Harbour

 Table 2.1
 Site Detail Summary

The site is irregular in shape, with boundaries adjoining Woolgoolga Creek to the north-west, stormwater drainage infrastructure to the north-east, residential development to the east, Pullen Street and two existing dwellings to the south, and a tributary of Woolgoolga Creek to the west. The site is currently vacant, comprising predominately grassland, and sloping down gently from a central high point to the north, east and west (refer to **Illustration 2.2**).

The surrounding land contains a variety of land uses, with riparian vegetation associated with Woolgoolga Creek and its tributary to the north-west and west. Beyond the riparian vegetation is a manufactured home estate to the north-west, meandering riparian vegetation and grassland to the north and rural-residential development to the west. Existing residential development adjoins the east of the site and also continues to the south of Pullen Street.

There are no watercourses or significant landform features on the property.





Spatial Reference: GDA2020 MGA Zone 56





2.5 km

Information shown is for illustrative purposes only Drawn by: AB Checked by: RE Reviewed by: PTC Source of base data: Open Street Map Date: 17/04/2024



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Bushfire Hazard Assessment 4910-1002

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Exotic vegetation

40 Metres

2.2 Zoning and Land Use

The site is zoned R2 Low Density Residential under the Coffs Harbour Local Environmental Plan 2013

The site is currently vacant, containing predominately grassland vegetation (refer to **Plates 2.1** and **2.2**).



Plate 2.1 View from north-west corner across the site to south-east



Plate 2.2 View from north-west corner across the site to south

2.3 Proposed Development

The proposed development involves subdivision of the site into 20 residential lots, ranging in size from 532m² to 1646m², and a residue lot containing a detention basin and area of potential compensatory planting to be dedicated to the City of Coffs Harbour. A single public road (Road 1) is proposed off Pullen Street in the south-east corner of the site, traversing north towards the northern boundary and then west and south to form a perimeter road adjacent to the riparian area of the site, terminating in a cul-de-sac turning circle at the south-west corner of the site. An emergency (alternative) access/ cycle path is proposed from the cul-de-sac turning circle back onto Pullen Street at the south-western corner of the site. The proposal includes three battle-axe lots (refer to **Appendix A**).

The subdivision will be serviced by an extension to the existing Woolgoolga reticulated water supply and will have underground electricity. Stormwater will be directed to the proposed detention basin in the north-east corner of the site, and then discharged into Woolgoolga Creek. The basin will be planted with reeds and sedges. A gravel access track/ service road is located between the basin and proposed Lot 4.

The proposal will involve the removal of six tress and compensatory revegetation along the edge of the riparian strip between the existing vegetation line and the proposed perimeter road.



3. Bushfire Hazard Assessment

The following subsections were informed by site visits undertaken by GeoLINK on 12 July 2022 and 24 April 2024.

3.1 Vegetation

Vegetation classifications for the purpose of assessing bushfire hazard are based on vegetation formations and fuel loads outlined in PBP 2019.

Vegetation surrounding the proposed subdivision has been assessed in terms of potential bushfire hazard over a distance of 140 m, using the formation classes provided within Figure A1.2 of PBP 2019. The dominant vegetation formation in each relevant direction of the proposed subdivision is outlined in **Table 3.1**.

Direction	Predominant Vegetation Formation
North	Forest
North-east (detention basin)	Grassland
East	Managed Land
South	Managed Land
South (south-west corner)	Forest
West	Forest *

Table 3.1 Vegetation Formation

* includes proposed compensatory plantings

The area containing the proposed lots is predominately grassland, which will be managed following the subdivision.

The existing unmanaged vegetation to the north and north-west of the site consists of narrow strips of riparian forest that follow the meandering path of Woolgoolga Creek. The State Vegetation Type Map (<u>https://geo.seed.nsw.gov.au</u>) identifies the riparian forest vegetation as Mid North Lowland Flooded Gum-Palm Wet Forest. The riparian forest strips are interspersed with areas of weeds, regrowth and grassland (refer to **Plates 3.1, 3.2** and **Illustration 2.2**). The edge of the existing vegetation towards the subdivision will be enhanced with compensatory plantings adjacent to the proposed perimeter road. Due to the fragmented nature of the riparian vegetation, its relatively small area and being surrounded by predominately managed land, a forest classification is considered to be conservative.

The land to the north-west of Woolgoolga Creek contains a manufactured homes estate.

The stormwater detention basin to the north-east of the proposed subdivision will have a gravel service track along its southern side, between the basin and proposed Lot 4. The bed of the basin will contain reeds and sedges and has been assessed as grassland in this assessment.

The unmanaged vegetation to the west of the site also consists of Mid North Lowland Flooded Gum-Palm Wet Forest, which will also be enhanced with a narrow strip of compensatory plantings adjacent to the proposed perimeter road. A tributary of Woolgoolga Creek runs parallel to the western boundary on the adjoining land. The land to the west of this creek line contains a rural-residential property with managed grounds, which include a mown ground layer under the existing trees to the creek bank (refer to **Plates 3.3** and **3.4**).





Plate 3.1 Narrow strip of riparian vegetation along northern boundary



Plate 3.2 Regrowth and grassland to north of riparian vegetation



Plate 3.3 Managed ground layer on adjoining property to west of the site



Plate 3.4 Riparian vegetation between the site and western creek

3.2 Slope

The effective slope is the slope of the land beneath the vegetation assessed as being a hazard that will have the greatest influence on bushfire behaviour in relation to the development. The effective slope for the proposal has been assessed over 100 m in each relevant direction.

The effective slope in relation to the development is outlined in Table 3.2.

Table 3.2	Effective Slope
-----------	-----------------

Aspect	Effective Slope
North	upslope/ flat
North-east (detention basin)	upslope/ flat
East	N/A
South	N/A
South (south-west corner)	upslope/ flat
West	>10-15°



The riparian area to the north of the site is relatively flat, with a short, steep bank from the site down to Woolgoolga Creek and a similar short bank down from the perimeter road to the riparian area. The creek is a permanent waterbody with a variable width of approximately 3 - 4 m. To the north of the site, Woolgoolga Creek wraps around a low mound, with the land rising and falling approximately 1 m over a distance of approximately 60 m to the further creek bank (refer to **Plates 3.5** and **3.6**). Beyond the creek to the north is a paddock of grazed grassland. Over a distance of 100 m from the site, the variation in elevation is minor and includes both slight up and down slopes. For the purpose of this assessment, the slope has been averaged and assessed as upslope/ flat. The creek bank and roadside verge are not likely to significantly affect fire behaviour for a fire travelling from north to south as it has a short lateral length (<10 m) and the fire would need to cross the creek before travelling up the bank.

The riparian vegetation continues along the creek to the north-west on upslope/ flat topography.



Plate 3.5 View to west at north-west corner showing slight upslope towards northern creek bank



Plate 3.6 View to north along western boundary

3.3 Fire Weather District

The City of Coffs Harbour local government area is located within the 'North Coast' fire weather district, with a Fire Danger Index (FDI) of 80.



4. Bushfire Protection Measures

4.1 Asset Protection Zones

Planning for Bush Fire Protection 2019 describes an asset protection zone (APZ) as a fuel reduced area surrounding a built asset or structure which provides a buffer zone between a bushfire hazard and the asset. The APZ provides:

- a buffer zone between a bush fire hazard and an asset;
- an area of reduced bush fire fuel that allows for suppression of fire;
- an area from which backburning or hazard reduction can be conducted; and
- an area which allows emergency services access and provides a relatively safe area for firefighters and home owners to defend their property.

The minimum required APZs for residential subdivision are based on a radiant heat threshold of 29 kW/m^2 and have been determined in accordance with Table A1.12.3 and the methodology outlined in Appendix A1.1 of PBP 2019, using the relevant vegetation formation, effective slope and FDI.

Table 4.1 outlines the site characteristics, minimum required APZ (BAL 29), separation distance between the lots and the relevant vegetation (including compensatory planting) and proposed APZ surrounding the proposed subdivision.

Direction	Vegetation Formation	Effective Slope	Minimum APZ	Separation Distance	Proposed APZ
North	Forest	upslope/ flat	20 m	20 m	20 m
North-east	Grassland	upslope/ flat	10 m	10 m	10 m
East	Managed Land	-	-	-	-
South	Managed Land	-	-	-	-
South (south- west corner)	Forest	upslope/ flat	20 m	20 m	20 m
West	Forest	>10-15° (12°)	39 m	25 m	25 m *

Table 4.1 Proposed Asset Protection Zones

* Refer to the performance solution below

The proposed APZs extend from the edge of the unmanaged vegetation, across the perimeter road and include part of the building setback line. All APZs can be provided within the site (refer to **Illustration 4.1**).

The APZ should be established and managed as an Inner Protection Area (IPA) in accordance with Appendix A4.1.1 of PBP 2019 and should consist of open areas with minimal fuel at ground level that could be set alight by bushfire. Some trees and shrubs are permissible within the APZ, provided crown separation can be achieved and vegetation does not overhang buildings. No combustible materials should be stored in the APZ. The standards for an IPA, as outlined in Appendix A4.1.1 of PBP 2019, are contained in **Appendix B**.

Compensatory planting proposed to the north and west of the perimeter road must consist of species that will not compromise the APZs, including avoiding the introduction of large eucalypt canopy trees that could overhang the perimeter road at maturity.



4.1.1 APZ Performance Solution

Performance based solutions allow for flexibility in responding to site specific conditions and constraints while still meeting the relevant performance criteria.

The bushfire hazard to the west of the proposed subdivision contains a strip of forest vegetation with an average width of 50 m from the creek to the proposed road / edge of proposed compensatory planting. The land to the west of the creek bank has been assessed as managed as it comprises a managed rural residential property with a narrow strip of remnant canopy eucalypts with a managed understorey down to the creek bank (refer to **Plate 3.3**). The managed rural residential property extends for approximately 70m to the west of the creek before transitioning to predominately grassland.

Due to the narrow width of the riparian vegetation (including compensatory planting), a performance solution is proposed to determine the relevant APZ distance to the west of the proposed lots with the verification method based on a site specific calculation using the short fire run methodology outlined in the NSW RFS publication *Short Fire Run – Methodology for assessing bush fire risk for low risk vegetation*.

The relevant performance criteria from PBP 2019 - Table 5.3a is that:

Potential building footprints must not be exposed to radiant heat levels exceeding 29 kW/m² on each proposed lot.

The short fire run calculation has been performed using the Newcastle Bushfire Consulting Bushfire Attack Assessor V4.1 software and includes the following variable inputs:

- vegetation classification Forest (fuel loads in accordance with PBP 2019 Table A1.12.8)
- FDI of 80
- maximum effective slope 12° downslope

The calculation results are outlined in **Figure 4.1** and demonstrate that a separation distance of 25 m from the edge of the vegetation to the building setback line is sufficient to ensure that the radiant heat exposure to any new dwelling will not exceed 29 kW/m².



Asses	C Bush 59 (2018) App t Date:	fire Attack Ass pendix B - Detailed Metho 30/04/2024	essment Report d 2 Assessment Da	te:	30/04/2024
Site Street Address	54 Pu	llen Street Woolgook	19		
Accessory	Deul	Cool INK	-		
Assessor:	Caffe	Lieenaune, Geolink	Section de		
Local Government Area	Cons	Harbour	Alpine Area:		NO
Transmissivity: Fuss and Flame Length: RFS PBP, Rate of Fire Spread: Nob Radiant Heat: Drysdale, Peak Elevation of Receiv Peak Flame Angle: Tan e Short Fire Run - Methodo	Hammins, 2001/Ves le et al., 19 1985; Sulli er: Tan et a t al., 2005 logy for As	, 2002 ta/Catchpole 980 ivan et al., 2003; Tan al., 2005 ssessing Bush Fire Ri	et al., 2005 sk for Low Risk Vegetati	on May	2019; NSW R
Run Description:	west				
Vegetation Informatio	n	2.2.40240			
Vegetation Type:	Forest (i	including Coastal Swa	amp Forest)		
Vegetation Group:	Forest a	nd Woodland			
Vegetation Slope:	12 Degre	ees N	Vegetation Slope Type	Downs	slope
Surface Fuel Load(t/ha):	d(t/ha): 22 Overall Fuel Load(t/ha): 36.1				
Vegetation Height(m):	2		Only Applicable to Shrub/Scrub and Vesta		
Site Information			in the second second		1.1
Site Slope:	12 Degr	rees	Site Slope Type:	Down	slope
Elevation of Receiver(m): Default		APZ/Separation(m):	25	
Fire Inputs					
Veg./Flame Width(m):	18.3		Flame Temp(K):	1090	-
Calculation Paramete	rs				
Flame Emissivity:	95	1	Relative Humidity(%):	25	
Heat of Combustion(kJ/	kg 18600		Ambient Temp(K):	308	
Moisture Factor:	5		FDI:	80	
Program Outputs			7. Ca. 199		1.5-
Level of Construction:			Peak Elevation of Rece	iver(m)	: 5.94
Radiant Heat(kW/m2):	28.37		Flame Angle (degrees)		39
Flame Length(m):			Maximum View Factor:		0.434
Rate Of Spread (km/h):	4.83		Inner Protection Area(I	n):	25
Transmissivity:	0.86		Outer Protection Area(m):	0
Fire Intensity(kW/m):	90159				
Short Fire Run Calcula	ations				
Fire Run(m): 50			Length to Breadth Ratio:		2.82
Fire Run(m):	50		Lengui to Dreauti Rati		
Fire Run(m): Full Ellipse Length(m):	50 161.91		Headfire Backfire Ratio		29.85

Figure 4.1 Short Fire Run calculation to west







Bushfire Hazard Assessment 4910-1002

Asset Protection Zone - Illustration 4.1

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Table 4.2 outlines the extent to which the proposed APZs comply with the performance criteria and acceptable solution requirements of Table 5.3a of PBP 2019.

Table 4.2 APZ Compliance with PBP 2019

Performance Criteria	Acceptable Solution	Application
Potential building footprints must not be exposed to radiant heat levels exceeding 29 kW/m ² on each proposed lot.	An APZ is provided in accordance with Table A1.12.2 or A1.12.3 Based on the FFDI.	The proposed APZs comply with Table A1.12.3, except to the west (refer to Section 4.1.1).
APZs are managed and maintained to prevent the spread of a fire towards the building.	APZs are managed in accordance with the requirements of Appendix 4 of PBP.	APZ are to be managed in accordance with PBP 2019 – Appendix A4.1.1.
The APZ is provided in perpetuity.	APZs are wholly within the boundaries of the development site.	Complies
APZ maintenance is practical, soil stability is not compromised and the potential for crown fires is minimised.	APZ are located on lands with a slope less than 18 degrees.	Complies

4.2 Landscaping

The area of compensatory planting is outside the proposed APZs. Compensatory planting proposed to the north and west of the perimeter road must consist of species that will not compromise the APZs, including avoiding the introduction of large eucalypt canopy trees that could overhang the perimeter road at maturity.

No other specific landscaping is proposed as part of the subdivision. The proposed lots will be managed as an APZ as outlined in **Table 4.2**.

Section 7.6 of PBP 2019 outlines requirements for fencing in bushfire prone areas and states that where the fence is within 6 m of a building or in areas of BAL 29 or greater, they should be made of non-combustible material only.

Table 4.3 assesses compliance with the acceptable solutions of PBP 2019 relating to landscaping.

Table 4.3 Landscaping Compliance with PBP 2019

Performance Criteria	Acceptable Solution	Application
Landscaping is designed and managed to minimise flame	Landscaping is in accordance with Appendix 4.	N/A
contact and radiant heat to buildings, and the potential for wind-driven embers to cause ignitions.	Fencing is constructed in accordance with Section 7.6 of PBP 2019.	Any fencing is to be constructed of non- combustible material.



4.3 Access

Access to the proposed subdivision will be provided by a single public road off Pullen Street in the south-east corner of the site, traversing north to the northern boundary and then west and south to form a perimeter road adjacent to the riparian vegetation and terminating in a cul-de-sac turning circle. An emergency (alternative) access/ cycle path is proposed from the cul-de-sac turning circle back onto Pullen Street at the south-western corner of the site. The proposal includes three battle-axe lots (refer to **Appendix A**).

The proposed road is designed to have sufficient capacity for the volume of traffic likely to be generated by the development and links to Pullen Street, which is a two lane public road providing alternative access/ egress routes for the site. There are no registered fire trails on the site or in the immediate vicinity.

Table 4.4 outlines the extent to which the proposed subdivision access complies with the relevant acceptable solution requirements of Table 5.3b of PBP 2019.

	Ferrormance Criteria	Application			
	Access (General Requi	rements)			
Firefighting vehicle are provided with s all-weather access structures	Firefighting vehicles are provided with safe,	Property access roads are two- wheel drive, all-weather roads.	All lots have direct access to proposed Road 1.		
	structures	Perimeter roads are provided for residential subdivisions of three or more allotments.	A perimeter road is provided adjacent to the bushfire hazard along the northern and western boundaries.		
		Subdivisions of three or more allotments have more than one access in and out of the development.	A 4 m wide emergency access/ cycle path is provided from the cul-de-sac turning circle to Pullen Street to create an alternative emergency access for the subdivision.		
		Traffic management devices are constructed to not prohibit access by emergency services vehicles.	Removable bollards are proposed along the emergency access/ cycle path to allow for pedestrian and bicycle use and to restrict regular vehicle use. A key for the bollard locks would be provided to the City of Coffs Harbour, NSW Rural Fire Service and Fire and Rescue NSW.		
		Maximum grades for sealed roads do not exceed 15 degrees and an average grade of not more than 10 degrees or other gradient specified by road design standards, whichever is the lesser gradient.	Complies		
		All roads are through roads.	A 4 m wide emergency access/ cycle path is provided from the cul-de-sac turning circle to Pullen Street to create a through road		

Table 4.4 Access Compliance with PBP 2019



Performance Criteria	Acceptable Solution	Application			
		emergency access for the subdivision.			
	Dead end roads are not recommended, but if unavoidable, are not more than 200m in length, incorporate a minimum 12m outer radius turning circle, and are clearly sign posted as a dead end.	The proposed cul-de-sac is approximately 320 m to its termination, which includes a 12 m outer radius turning circle.			
	Where kerb and guttering is provided on perimeter roads, roll top kerbing should be used to the hazard side of the road.	Roll top kerb is to be provided on the perimeter road.			
	Where access / egress can only be achieved through forest, woodland and heath vegetation, secondary access shall be provided to an alternate point on the existing public road system.	A 4 m wide emergency access/ cycle path is provided from the cul-de-sac turning circle to Pullen Street to create an alternative emergency access for the subdivision.			
	One way only public access roads are no less than 3.5 m wide and have designated parking bays with hydrants located outside of these areas to ensure accessibility to reticulated water for fire suppression.	N/A			
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),	Road 1 is to be designed to cater for vehicle loads up to 23 tonnes.			
	Bridges and causeways are to clearly indicate load rating.	N/A			
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.	Hydrants are to be located outside of parking reserves and road carriageways.			
	Hydrants are provided in accordance with the relevant clauses of AS 2419.1:2021.	Hydrants are to be provided in accordance with the relevant clauses of AS 2419.1:2021.			
	There is suitable access for a Category 1 fire appliances to within 4m of the static water supply where no reticulated supply is available.	N/A			
Perimeter Roads					
Access roads are	Are two-way sealed roads.	Complies			
access and egress for firefighting vehicles	Minimum 8 m carriageway width kerb to kerb.	The perimeter road (Road 1) is to have a minimum 8 m carriageway			



width.

Performance Criteria	Acceptable Solution	Application		
while residents are evacuating as well as providing a safe	Parking is provided outside of the carriageway width.	Complies		
operational environment for emergency service personnel during firefighting and emergency management on the interface.	Hydrants are located clear of parking areas.	Hydrants are to be located outside of parking areas		
	Are through roads, and these are linked to the internal road system at an interval of no greater than 500 m.	A 4 m wide emergency access/ cycle path is provided from the cul-de-sac turning circle to Pullen Street to create a through road emergency access for the subdivision.		
	Curves of roads have a minimum inner radius of 6m.	Complies		
	The maximum grade road is 15 degrees and average grade of not more than 10 degrees.	Complies		
	The road crossfall does not exceed 3 degrees.	Complies		
	A minimum vertical clearance of 4 m to any overhanging obstructions, including tree branches, is provided.	A minimum 4 m vertical clearance is to be maintained over the proposed road.		
Non-perimeter Roads				
Access roads are designed to allow safe	Minimum 5.5 m carriageway width kerb to kerb.	N/A Pronosed Road 1 is consistent in		
access and egress for firefighting vehicles while residents are	Parking is provided outside of the carriageway width.	its design and complies with perimeter road standards.		
evacuating.	Hydrants are located clear of parking areas.			
	Roads are through roads, and these are linked to the internal road system at an interval of no greater than 500 m.			
	Curves of roads have a minimum inner radius of six metres.			
	The road crossfall does not exceed 3 degrees.			
	A minimum vertical clearance of 4 m to any overhanging obstructions, including tree branches, is provided.			
Property Access				
Firefighting vehicles can access the dwelling and exit the property safely.	There are no specific access requirements in an urban area where an unobstructed path (no greater than 70 m) is provided between the most distant external part of the proposed dwelling and the nearest part of the public access road (where the road	All lots have direct access to proposed Road 1. The following proposed lots are battle-axe shaped lots with the		



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Performance Criteria	Acceptable Solution	Application
	speed limit is not greater than 70 kph) that supports the operational use of emergency firefighting vehicles. In circumstances where this cannot occur, the following requirements apply:	length of the access handle indicated: Lot 7 – 29 m Lot 8 – 50 m Lot 13 – 35 m
	Minimum 4 m carriageway width;	It is likely that a future dwelling on
	In forest, woodland and heath situations, rural property access roads have passing bays every 200m that are 20m long by 2m wide, making a minimum trafficable width of 6m, at the passing bay;	each lot would be within 70 m of the public road. In the event that the furthest part of a dwelling was greater than 70 m from the road, the size and shape of the lots are such that the dwelling location would not be greater than 90 m from the
	A minimum vertical clearance of 4m to any overhanging obstructions, including tree branches;	carriageway, in accordance with the Fire & Rescue NSW <i>Fire</i> <i>Safety Guideline – Fire hydrants</i> for minor residential
	Provide a suitable turning area in accordance with Appendix 3;	development.
	Curves have a minimum inner radius of 6 m and are minimal in number to allow for rapid access and egress;	
	The minimum distance between inner and outer curves is 6m;	
	The crossfall is not more than 10 degrees;	
	Maximum grades for sealed roads do not exceed 15 degrees and not more than 10 degrees for unsealed roads; and	
	A development comprising more than three dwellings has formalised access by dedication of a road and not by right of way	
	Note: Some short constrictions in the access may be accepted where they are not less than 3.5 m wide, extend for no more than 30 m and where the obstruction cannot be reasonably avoided or removed.	



4.4 Services – Water, Electricity and Gas

The site has access to the reticulated water supply with a 100mm main running along the southern side of Pullen Street. The reticulated water supply will be extended to service the proposed residential lots.

Electricity supply is available to the site from existing overhead lines along the northern side of Pullen Street. The proposed internal electricity supply will be underground.

Bottled gas is not proposed at this stage and will be assessed at dwelling construction stage for the respective lots.

Table 4.5 outlines the extent to which the water, electricity and gas services comply with the relevant acceptable solution requirements of Table 5.3c of PBP 2019.

Performance Criteria	Acceptable Solution	Application			
Water Supplies					
An adequate water supply is provided for firefighting purposes.	Reticulated water is to be provided to the development, where available.	The subdivision will be serviced by a reticulated water supply.			
	A static water and hydrant supply is provided for non-reticulated developments or where reticulated water supply cannot be guaranteed.	N/A			
	Static water supplies shall comply with Table 5.3d.	N/A			
Water supplies are located at regular intervals; and the water supply is	Fire hydrant spacing, design and sizing comply with the relevant clauses of AS 2419.1:2021.	Fire hydrant spacing, design and sizing is to comply with the relevant clauses of AS 2419.1:2021.			
accessible and reliable for firefighting operations.	Hydrants are not located within any road carriageway.	Hydrants are not to be located within any road carriageway.			
	Reticulated water supply to urban subdivisions uses a ring main system for areas with perimeter roads.	A ring main will be installed along the perimeter road, linking back to the existing main on Pullen Street.			
Flows and pressure are appropriate.	Fire hydrant flows and pressures comply with the relevant clauses of AS 2419.1:2021.	Hydrant flow and pressure to be confirmed following installation.			
The integrity of the water supply is maintained.	All above-ground water service pipes external to the building are metal, including and up to any taps.	N/A until dwelling construction stage.			
	Above ground water storage tanks shall be of concrete or metal.	N/A			

 Table 4.5
 Water, Electricity and Gas Compliance with PBP 2019



Performance Criteria	Application	
Electricity Services		
Location of electricity services limits the possibility of ignition of	Where practicable, electrical transmission lines are underground.	Electricity services will be installed underground.
surrounding bush land or the fabric of buildings.	Where overhead, electrical transmission lines are proposed as follows:	N/A
	Lines are installed with short pole spacing (30 m), 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.	
Gas Services		
Location and design 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/NZS 1596:2014, the requirements of relevant authorities, and metal piping is used;	N/A until dwelling construction stage.
	All fixed gas cylinders are kept clear of all flammable materials to a distance of 10m and shielded on the hazard side;	
	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.	

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5. Recommendations and Conclusion

5.1 Recommendations

It is recommended that the following bushfire protection measures are applied to the proposed development and be included in the consent by the City of Coffs Harbour:

- Proposed Lots 1 to 20 and the road reserve for Road 1 are to be managed as an Inner Protection Area (IPA) in accordance with Appendix A4.1.1 of Planning for Bushfire Protection 2019.
- Compensatory planting to the north and west of the perimeter road must consist of species that will not compromise the asset protection zones, including avoiding the introduction of large eucalypt canopy trees that could overhang the perimeter road at maturity.
- Any fencing is to be constructed of non-combustible material.
- Road 1 is to comply with the requirements (General Requirements and Perimeter Roads) of Table 5.3b of Planning for Bushfire Protection 2019, except that secondary access is to be provided by a 4 m wide gravel pavement (emergency access/ cycle path) from the cul-de-sac head to Pullen Street. Any traffic management device (e.g. bollards) constructed along the path are to enable access for emergency services vehicles.
- Water and electricity services are to comply with Table 5.3c of Planning for Bushfire Protection 2019.

5.2 Conclusion

This Bushfire Hazard Assessment has taken into consideration the proposed development, existing vegetation, effective slope and FDI detailed within Planning for Bush Fire Protection 2019. Adequate and appropriate bushfire protection measures are available and can be implemented to facilitate the proposed subdivision of Lot 12 DP 1059040, 54 Pullen Street, Woolgoolga. The proposal conforms with the standards, performance criteria and intent of measures outlined in Planning for Bush Fire Protection 2019 and complies with Section 100B of the *Rural Fires Act 1997*.

It is therefore recommended that the proposed development is approved and conditioned in accordance with the recommendations provided within this assessment.

Paul Creenaune Senior Bushfire Consultant

B. Urb & Reg Planning Grad Dip (Bushfire Protection) BPAD – Level 3 (58899)



References

Fire & Rescue NSW (2016). *Fire Safety Guideline – Fire hydrants for minor residential development.* Fire Safety Branch, Community Safety Directorate, Greenacre NSW.

Keith, D., (2004). *Ocean Shores to Desert Dunes*, Department of Environment and Conservation, Hurstville.

NSW Government (2024). SEED – Sharing and Enabling Environmental Data. https://geo.seed.nsw.gov.au/

NSW Rural Fire Service [RFS] (2019). *Planning for Bush Fire Protection.* NSW Rural Fire Service and Department of Planning, Sydney.

NSW Rural Fire Service [RFS] (2019) Short Fire Run – Methodology for assessing bush fire risk for low risk vegetation. NSW Rural Fire Service and Department of Planning, Sydney.



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Appendix A

Proposed Subdivision Plan





de Groot & Benson **Consulting Engineers & Planners**



LOCALITY SKETCH

	A	08-05-2024	FOR DA APPROVAL	CSR	G'I
R	REV.	DATE	REVISION	DR.BY	AP.E

PROPOSED SUBDIVISION 54 PULLEN STREET WOOLGOOLGA

DRAWING INDEX							
DRAWING No.	DESCRIPTION						
22157-DA-01	COVER SHEET						
22157-DA-02	LOT LAYOUT						
22157-DA-03	GENERAL LAY-OUT PLAN						
22157-DA-04	BULK EARTHWORKS & SEDIMENT EROSION C						
22157-DA-05	SEDIMENT EROSION DETAILS						
22157-DA-06	SERVICES PLAN						
22157-DA-07	BIORETENTION BASIN PLAN						
22157-DA-08	BIO BASIN TYPICAL SECTION						
22157-DA-09	RIPARIAN PLANTING PLAN						

de Groot &	A.C.N. 052 300 571 236 Harbour Drive,	Scale	AS	SHOWN	Cad File N	VO . 22157 DA Opt	2a.dwg	Project: 54 PULLEN STREET
Benson	CONS Harbour NSW 2430	Surveyed		-	Datum		AHD	WOOLGOOLGA
Consulting	Bhana (02) 6652 1700	Drawn	CSR	Designed	CSR	Approved	GJK	
Engineers & Planners	Findle (02) 0052 1700 Fax (02) 6652 7418 Email: email@dgb.com.au	Checked	GJK	Date	JUNE	No. of dwgs		

CONTROL PLAN

COVER SHEET	Project No. 2215	7
	Drawing No.	1
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	Drawn	CSR	Designed	CSR	Approved	GJK	
Phone (02) 6652 1700 Fax (02) 6652 7418 Email: email@dgb.com.au	Checked	GJK	Date	JUNE	No. of dwgs		Client: PEAC INVESTMENTS

Surface Analys is : Elevation Ranges								
Number	Color	Minimum Elevation (m)	Maximum Elevation (m)					
1		-5.000	-3.000					
2		-3.000	-2.000					
3		-2.000	- 1.000					
4		- 1.000	0.000					
5		0.000	0.500					
6		0.500	1.000					
7		1.000	2.000					
8		2.000	4.000					

Title:	Project No.	22157
BULK EARTHWORKS &		22157
SEDIMENT EROSION CONTROL	Drawing No.	
PLAN		DA04
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A 08-05-2024

REV. DATE

FOR DA APPROVAL

REVISION

CSR GJK

DR.BY AP.B

SEDIMENT AND EROSION CONTROL NOTES

GENERAL

- 1. ALL WORK IS TO BE IN ACCORDANCE WITH THE PLAN AND CONSISTENT WITH NSW LANDCOM PUBLICATION "MANAGING STORMWATER: SOILS & CONSTRUCTION" (THE "BLUE BOOK" 4th EDITION 2004)
- 2. THE NOMINATED PROJECT MANAGER (OR EARTHWORKS CONTRACTOR) SHALL BE RESPONSIBLE FOR THE IMPLEMENTATION OF THE EROSION AND SEDIMENT CONTROL PLAN
- 3. THE PROJECT MANAGER SHALL INFORM ALL CONTRACTORS AND SUB CONTRACTORS OF THEIR OBLIGATIONS UNDER THE ESCP 4. THE PROJECT MANAGER SHALL PROVIDE APPROPRIATE ENVIRONMENTAL INDUCTION TO ALL
- STAFF 5. THE PROJECT MANAGER SHALL PROVIDE APPROPRIATE ENVIRONMENTAL TRAINING TO ALL
- STAFF 6. THE PLAN SHALL INCLUDE A WORKS PROGRAM (E.G GANTT CHART) INCLUDING
- ACCOUNTABILITY FOR EACH ACTION (I.E RESPONSIBILITY / SIGN OFF)
- 7. CONTROL MEASURES SHALL BE IN PLACE PRIOR TO EACH SITE DISTURBANCE
- 8. SITE DISTURBANCE SHALL BE STAGED WHERE POSSIBLE 9. WORK SHALL BE RESTRICTED TO THE WELL DEFINED WORKS ZONES
- 10. ALL WORKS ARE TO BE INSPECTED, AND MAINTAINED WHERE NECESSARY, ON A WEEKLY BASIS AND AFTER EACH RUNOFF EVENT
- 11. FAILURE TO IMPLEMENT ANY PART OF THE PLAN WILL CONSTITUTE A HOLD POINT (THIS WOULD ALSO CONSTITUTE A BREACH OF THE PROTECTION OF THE ENVIRONMENT OPERATIONS ACT).

SITE INFRASTRUCTURE

- 12. THE SITE SUPERVISOR SHALL ENSURE ALL MATERIALS REQUIRED FOR EROSION AND SEDIMENT CONTROL, INCLUDING REHABILITATION WORKS, SHALL BE ON-SITE PRIOR TO IMPLEMENTATION DATES
- 13. ALL PROJECT MATERIALS SHALL BE CORRECTLY LOCATED AND PROTECTED TO AVOID ANY ADVERSE ENVIRONMENTAL IMPACT
- 14. ALL WEATHER AND SAFE SITE ACCESS SHALL BE IDENTIFIED 15. A SOIL RETENTION SYSTEM (E.G., GRAVEL SHAKEDOWN ZONE) SHALL BE PROVIDED AT ALL SITE ACCESSES
- 16. ANY SOIL MATERIAL TRACKED OFF-SITE ONTO ROADWAYS SHALL BE IMMEDIATELY REMOVED 17. ALL CHEMICAL STORAGE SHALL BE MANAGED (E.G BUNDED) IN ACCORDANCE WITH WORKCOVER OR EPA GUIDELINES

CLEARING

- 18. NO-GO AREAS SHALL BE CLEARLY MARKED BY MEANS OF APPROPRIATE MARKINGS. 19. VEGETATION TO BE CLEARED SHALL BE CLEARLY MARKED USING APPROPRIATE MARKINGS
- 20. MACHINERY CUTTING EDGES SHALL NOT CONTACT THE SOIL (GRASS, SMALLER SHRUBS, AND ROOTS ETC. WILL BE INCORPORATED INTO THE TOPSOIL WHEN STRIPPED)
- 21. MINIMUM FORWARD CLEARING SHALL BE ADOPTED. CLEARING OF WATERCOURSES WILL NOT BE CARRIED OUT UNTIL THE ASSOCIATED WORK COMMENCES
- 22. LOGS SHALL BE SALVAGED OR REPLACED AS HABITAT. REMAINING VEGETATION SHALL BE USED AS MULCH, REMOVED TO AN AUTHORISED WASTE STATION OR BURNED IN PITS UNDER A LICENCE FROM THE EPA
- 23. VEGETATION WINDROWS SHALL BE LOCATED OUT OF FLOW LINES AND AWAY FROM UNDISTURBED VEGETATION
- 24. TEMPORARY OR PERMANENT STABILISATION (E.G., SOWING OF COVERCROP) SHALL BE IMPLEMENTED WITHIN 1 WEEK ON SECTIONS OF CLEARED ZONES NOT FURTHER SUBJECT TO WORKS.

TOPSOIL STRIPPING

- 25. TOPSOIL SHALL INCLUDE A MINIMUM OF THE FIRST 100-150 MM OF THE SOIL SURFACE. 26. ALL TOPSOIL SHALL BE STRIPPED FROM ALL AREAS THAT ARE TO BE CUT OR FILLED AND STOCKPILED IN AREAS INDICATED ON THE PLAN. AWAY FROM DRAINAGE FLOWPATHS OR
- STORMWATER INLETS 27. TOPSOIL STOCKPILES SHALL BE LIMITED TO 1.5M IN HEIGHT, TRACK ROLLED AND WHERE STOCKPILED FOR PERIODS GREATER THAN 6 WEEKS FURTHER STABILISED (E.G.. EROSION PROTECTION BLANKET. VEGETATIVE COVER CROP (SEE BELOW) OR MULCHED).

EROSION CONTROL

- 28. THE EXTENT OF CUT AND FILLS SHALL BE MINIMISED
- 29. CUT AND FILL BATTER GRADES SHALL IDEALLY BE AT 1:3
- 30. OVER FILLING OF BATTERS SHALL BE AVOIDED 1. BARRIER OR SIMILAR FENCING SHALL BE USED TO PROTECT NO-GO AREAS
- 32. DISTURBED SOIL AREAS SHALL BE EFFECTIVELY MANAGED BY STAGING, MINIMISING AREA
- EXPOSED AT ANY ONE TIME AND MINIMISING THE EXPOSURE TIMEFRAME OF EACH 33. CATCHMENTS SHALL BE BROKEN INTO SMALLER SUB-CATCHMENTS THEREBY REDUCING
- RUNOFF VOLUMES E.G.: - DIVERTING CLEAN 'RUN-ON' WATER SAFELY AROUND THE SITE USING CATCH DRAINS OR BANKS (GRADES GENERALLY 1-2%, TO STABLE OUTLET AREAS), OR THROUGH THE DISTURBED WORK SITE TEMPORARILY LINING DESIGNATED FLOW PATHS
- REDUCING SLOPE LENGTHS USING DIVERSION DRAINS (GRADES GENERALLY 3-4%) AT REGULAR INTERVALS ACROSS THE SLOPE) GENERALLY LOCATED AT EVERY LM FALL IN LONG GROUNDSLOPE) TO SUITABLE SEDIMENT TRAPS / ENERGY DISSIPATERS - MINIMISING THE STEEPNESS OF DISTURBED SLOPES
- 34. SOIL MATERIAL STOCKPILES (EXCAVATED AND IMPORTED) SHALL BE LOCATED OUT OF
- FLOW LINES 35. TEMPORARY OR PERMANENT SOIL COVERING SHALL BE PROVIDED WHERE APPROPRIATE TO
- REDUCE EROSION
- 36. ALL CONTROL MEASURES SHALL BE APPROPRIATELY DESIGNED, SIZED, LOCATED AND INSTALLED
- 37. ALL PERMANENT EROSION CONTROL MEASURES SHALL BE INSTALLED AS EARLY AND AS SOON AS THEIR EARTHWORKS ARE COMPLETED.

SEDIMENT CONTROL

- 38. THE NEED FOR SEDIMENT CONTROL MEANS THAT EROSION CONTROL HAS NOT BEEN
- ACHIEVED. 39. SEDIMENT FILTERS (E.G., SEDIMENT FENCE) SHALL BE USED TO FILTER ALL 'SHEET FLOW' RUNOFF FROM DISTURBED AREAS. SEDIMENT FENCING SHALL BE INSTALLED TO THE MANUFACTURERS SPECIFICATIONS AND:
- BE SPACED SUCCESSIVELY SPACED DOWNSLOPE NO GREATER THAN 50 M APART AND APPROXIMATELY AT EVERY 1 M FALL IN GROUNDSLOPE - BE INSTALLED TO THE CONTOUR
- HAVE THE ENDS TURNED UPSLOPE 500 MM WHERE APPROPRIATE TO CREATE STORAGE - WHERE SEDIMENT FENCING CANNOT BE PLACED ON THE CONTOUR, SMALL CHECK DAMS OR FENCE RETURNS SHALL BE INCORPORATED AT REGULAR INTERVALS ALONG THE FENCE LINE TO SLOW RUNOFF

de Groot &	A.C.N. 052 300 571 236 Harbour Drive,	Scale	AS	SHOWN	Cad File N	VO . 22157 DA Or	ot 2a.dwg	Project: 54 PULLEN STREET
Benson	Coffs Harbour NSW 2450	Surveyed			Datum		AHD	WOOLGOOLGA
Consulting	Phone (02) 6652 1700	Drawn	CSR	Designed	CSR	Approved	GJK	Oliante
Engineers & Planners	Filone (02) 6652 1700 Fax (02) 6652 7418 Email: email@dgb.com.au	Checked	GJK	Date	JUNE	No. of dwgs		

SEDIMENT CONTROL (Cont)

- 40. SEDIMENT TRAPS (E.G EXCAVATIONS, BARRIERS) SHALL BE USED TO POND
- 'CONCENTRATED' RUNOFF THEREBY ALLOWING SETTLEMENT AND RETENTION OF SEDIMENT. SEDIMENT TRAPS SHALL BE INSTALLED IN ACCORDANCE WITH PLAN DETAILS OR NOTE 1. THEY
- BE AS LARGE AS PRACTICAL
- BE CONSTRUCTED TO SUIT EXPECTED FLOW CONDITIONS - BE LOCATED APPROXIMATELY EVERY 1 M FALL IN GROUNDSLOPE
- PROVIDE FOR SAFE OVERFLOW
- 41. SEDIMENT CONTROLS SHALL BE LOCATED AS CLOSE TO DISTURBED AREAS AS PRACTICAL
- 42. TRAPPED SEDIMENT SHALL BE REMOVED TO AN APPROPRIATE NOMINATED LOCATION 43. TEMPORARY CONTROL MEASURES SHALL REMAIN IN PLACE UNTIL THE CATCHMENT THEY
- ARE SERVICING IS STABILISED (FOR GRASS THIS WILL MEAN 70% GROUNDCOVER).

DUST CONTROL

- 44. ALL SOIL LOADED TRUCKS LEAVING OR ENTERING THE SITE SHALL BE TARPED
- 45. A WATER CART SHALL BE CONTINUALLY PROVIDED TO AVOID DUST GENERATION 46. WATERING, WIND FENCING, MANUFACTURED COVERINGS AND/OR MULCH SHALL BE PROVIDED
- WHERE COVERCROP STRIKE IS INHIBITED

TOPSOIL REPLACEMENT

- 47. TOPSOIL SHALL BE RE-SPREAD OVER ALL EXPOSED SOIL SURFACES WHERE VEGETATION IS REQUIRED. A MAXIMUM DEPTH OF 50 MM SHALL BE PLACED ON SLOPES STEEPER THAN 1:3 AND A MINIMUM DEPTH OF 100 MM SHALL BE PLACED ON SLOPES LESS THAN 1:3
- 48. WHERE CUT BATTERS ARE TO BE SEEDED, SLOPES EXCEEDING 1:2.5 (H: V) SHALL BE ROUGHENED HORIZONTALLY TO ENHANCE THE RETENTION OF TOPSOIL
- 49. SOIL AMELIORANTS SHALL BE PROVIDED WHERE REQUIRED AS DETERMINED BY THE PROJECT MANAGER
- 50. SEEDBED PREPARATION SHALL BE PROVIDED WHERE TOPSOIL HAS BEEN OVERLY COMPACTED.

REVEGETATION

- 51. REVEGETATION SHALL BE ON-GOING AND PROGRESSIVE
- 52. WHERE ANY BREAK IN OPERATIONS, OR WHERE WORK IS CEASED IN AN AREA FOR LONGER THAN 4 WEEKS, THE EXPOSED AREAS SHALL BE STABILISED (E.G.. TEMPORARY TOPSOILING AND SEEDING WITH AN APPROPRIATE COVERCROP, MULCHES, BLANKETS / MATTINGS) 53. TOPSOILED AREAS SHALL BE SEEDED WITH THE FOLLOWING COVERCROP SPECIES:
- SEPTEMBER TO FEBRUARY JAPANESE MILLET (15 KG/HA) - MARCH TO AUGUST ANNUAL RYEGRASS OR CEREAL RYE OR OATS (15 KG/HA)
- 54. FROM LATE FEBRUARY TO EARLY MARCH AND LATE AUGUST TO EARLY SEPTEMBER A COMBINATION OF SPECIES CAN BE USED
- 55. PERMANENT GRASS SPECIES SHALL COMPRISE:
- PRE CONSTRUCTION OR NOMINATED SPECIES. 56. PERMANENT SHRUB AND TREE SPECIES SHALL COMPRISE: - AS PER LANDSCAPE PLAN: - IN ABSENCE OF LANDSCAPE PLAN, LOCAL NATIVE SPECIES, NOMINATE PLANT SPECIES, ITS FORM (SEED OR SEEDLING). PLANTING RATES, REGIMES, MATRICES, 57. AN NPK 11-34-11 FERTILISER OR SIMILAR AS APPROPRIATE SHALL BE APPLIED AT A RATE
- OF 200-400 KG/HA. CARE IS TO BE TAKEN TO AVOID ANY FERTILISER DIRECTLY ENTERING WATERCOURSES.
- 58. SCARIFYING OR DIRECT DRILLING SHOULD BE USED TO IMPROVE SEED STRIKE RATES 59. REVEGETATION WORKS SHALL BE MAINTAINED / ENHANCE (E.G., RESEEDING, FERTILISING, WATERING) UNTIL A MINIMUM OF 70% GROUND COVER IS ESTABLISHED.
- 60. ADDITIONAL PROTECTION MEASURES (E.G ORGANIC MATTING / BLANKETS) SHALL BE PROVIDED (NOMINATE)
- 61. A STRIP OF TURF SHALL BE PROVIDED AND MAINTAINED IMMEDIATELY BEHIND KERB WHERE FOOTPATH AND SITE DISTURBANCE HAS OCCURRED AND COMPLIMENTED BY ADDITIONAL STRIPS ACROSS THE FOOTPATH AT REGULAR INTERVALS WHERE RUNOFF IS EXPECTED TO FLOW ALONG THE SAID FOOTPATH.
- 62. STOCKPILE SITES, BORROW PITS ETC. SHALL BE REVEGETATED IMMEDIATELY UPON DECOMMISSION.

MONITORING

63. THE WORKS SUPERVISOR SHALL BE RESPONSIBLE FOR:

- AUDIT OF THE ESCP - MONITORING OF ESCs
- MAINTENANCE OF ESCs
- MANAGEMENT OF ANY NON-CONFORMANCES

MAINTENANCE

- 64. THE WORKS SUPERVISOR SHALL BE RESPONSIBLE FOR ENSURING CONTROL MEASURES ARE CHECKED WEEKLY AND AFTER EACH RAINFALL EVENT INSPECTION AND MAINTENANCE PROVIDED WHERE REQUIRED.
- 65. TEMPORARY CONTROL MEASURES SHALL BE MAINTAINED UNTIL A MINIMUM OF 70% GROUND COVER IS ACHIEVED
- 66. WATER QUALITY ASSESSMENT SHALL BE PROVIDED PRIOR TO DISCHARGE OF ANY
- CONTAMINATED SITE STORMWATER INTO EITHER SURFACE OR GROUND WATERS 67. REHABILITATED AREAS SHALL BE MONITORED PERIODICALLY TO CHECK FOR THE POSSIBLE ONSET OF SOIL EROSION AND/OR WEED PROBLEMS.

AT COMPLETION

68. THE WORKS SUPERVISOR SHALL ENSURE THAT: - ALL PERMANENT ESC WORKS ARE CORRECTLY INSTALLED - ALL TEMPORARY CONTROL MEASURES ARE REMOVED, BUT ONLY WHEN AT LEAST 70% GROUND COVER HAS BEEN ACHIEVED

EVALUATION

69. THE WORKS SUPERVISOR SHALL ENSURE THE PLAN IS CONTINUALLY EVALUATED AND AMENDMED WHERE REQUIRED.

Title: SEDIMENT & EROSION CONTROL DETAILS	Project No. Drawing No.	22157 DA05
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SCALE OF METRES 1:400 (A1) 1:800(A3)	A	08-05-2024	FOR DA APPROVAL	CSR	G
	REV.	DATE	REVISION	DR.BY	AP

BIO-RETENTION BASIN (MINIMUM 150sq.m BED WITH ADDITIONAL 40sq.m FOREBAY), COMBINED WITH DETENTION STORAGE.

> -THE WATER FROM 44 PULLEN STREET AND REAR OF LOTS 3 AND 4 TO DISCHARGE INTO BIO BASIN

-LOTS 3 & 4 STORMWATER FROM ROOFS AND PADS TO DRAIN TO STREET

LOT 15 DP 1302111

-INTERALOTMENT SW PIT INSTALLED IN REAR YARD OF No.44. REAR YARDS OF LOTS 3 AND 4 GRADED TO PROVIDE AN OVERLAND FLOW PATH. 1101

CONNECT TO EXISTING SEWER

Title:

<u>LEGEND</u> STORMWATER

SEWER

NEAR LEVEL PAD

FINISHED SURFACE CONTOUR SPOT HEIGHT SLOPE

RETAINING WALLS								
0.0 – 0.8 m								
0.8 – 1.3 m								
1.3 – 1.8 m								
1.8 – 2.3 m								
2.3 – 2.8 m								
2.8 – 3.3 m								
3.3 – 4.3 m								

×17.416	
-9.3%	

Project No. 22157 Drawing No. DA06 Amendment No.

Α

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SERVICES



<u>LEGEND</u>

A

EXISTING CONTOURS	
FINISHED CONTOURS MAJOR	
FINISHED CONTOUR MINOR	
FINISHED SPOT HEIGHTS	×17.416
FINISHED SLOPE	-9.3 <u>%</u>
APZ (BAL29)	
PROPOSED STORMWATER	8
PROPOSED SEWER	O
PROPOSED RETAINING WALL	
BASIN FLOOR PLANTING	\vee \vee \vee
BASIN BANK PLANTING	
	Project No. 22157
	Drawing No. DA07
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Appendix B

APZ Standards (PBP 2019 Extract)





APPENDIX 4 ASSET PROTECTION ZONE REQUIREMENTS

In combination with other BPMs, a bush fire hazard can be reduced by implementing simple steps to reduce vegetation levels. This can be done by designing and managing landscaping to implement an APZ around the property.

Careful attention should be paid to species selection, their location relative to their flammability, minimising continuity of vegetation (horizontally and vertically), and ongoing maintenance to remove flammable fuels (leaf litter, twigs and debris).

This Appendix sets the standards which need to be met within an APZ.

A4.1 Asset Protection Zones

An APZ is a fuel-reduced area surrounding a building or structure. It is located between the building or structure and the bush fire hazard.

For a complete guide to APZs and landscaping, download the NSW RFS document *Standards for Asset Protection Zones* at the NSW RFS Website www.rfs.nsw.gov.au.

An APZ provides:

- a buffer zone between a bush fire hazard and an asset;
- an area of reduced bush fire fuel that allows for suppression of fire;
- an area from which backburning or hazard reduction can be conducted; and
- an area which allows emergency services access and provides a relatively safe area for firefighters and home owners to defend their property.

Bush fire fuels should be minimised within an APZ. This is so that the vegetation within the zone does not provide a path for the spread of fire to the building, either from the ground level or through the tree canopy.

An APZ, if designed correctly and maintained regularly, will reduce the risk of:

- direct flame contact on the building;
- damage to the building asset from intense radiant heat; and
- > ember attack.

The methodology for calculating the required APZ distance is contained within Appendix 1. The width of the APZ required will depend upon the development type and bush fire threat. APZs for new development are set out within Chapters 5, 6 and 7 of this document.

In forest vegetation, the APZ can be made up of an Inner Protection Area (IPA) and an Outer Protection Area (OPA).

A4.1.1 Inner Protection Areas (IPAs)

The IPA is the area closest to the building and creates a fuel-managed area which can minimise the impact of direct flame contact and radiant heat on the development and act as a defendable space. Vegetation within the IPA should be kept to a minimum level. Litter fuels within the IPA should be kept below 1cm in height and be discontinuous.

In practical terms the IPA is typically the curtilage around the building, consisting of a mown lawn and well maintained gardens.

When establishing and maintaining an IPA the following requirements apply:

Trees

- tree canopy cover should be less than 15% at maturity;
- trees at maturity should not touch or overhang the building;
- Iower limbs should be removed up to a height of 2m above the ground;
- tree canopies should be separated by 2 to 5m; and
- > preference should be given to smooth barked and evergreen trees.

Shrubs

- create large discontinuities or gaps in the vegetation to slow down or break the progress of fire towards buildings should be provided;
- shrubs should not be located under trees;
- shrubs should not form more than 10% ground cover; and
- clumps of shrubs should be separated from exposed windows and doors by a distance of at least twice the height of the vegetation.

Grass

- grass should be kept mown (as a guide grass should be kept to no more than 100mm in height); and
- > leaves and vegetation debris should be removed.

A4.1.2 Outer Protection Areas (OPAs)

An OPA is located between the IPA and the unmanaged vegetation. It is an area where there is maintenance of the understorey and some separation in the canopy. The reduction of fuel in this area aims to decrease the intensity of an approaching fire and restricts the potential for fire spread from crowns; reducing the level of direct flame, radiant heat and ember attack on the IPA.

Because of the nature of an OPA, they are only applicable in forest vegetation.

When establishing and maintaining an OPA the following requirements apply:

Trees

- tree canopy cover should be less than 30%; and
- > canopies should be separated by 2 to 5m.

Shrubs

- > shrubs should not form a continuous canopy; and
- shrubs should form no more than 20% of ground cover.

Grass

- grass should be kept mown to a height of less than 100mm; and
- > leaf and other debris should be removed.

An APZ should be maintained in perpetuity to ensure ongoing protection from the impact of bush fires. Maintenance of the IPA and OPA as described above should be undertaken regularly, particularly in advance of the bush fire season.



Figure A4.1

Typlical Inner and Outer Protection Areas.



