

Bushfire Management Plan Coversheet

This Coversheet and accompanying Bushfire Management Plan has been prepared and issued by a person accredited by Fire Protection Association Australia under the Bushfire Planning and Design (BPAD) Accreditation Scheme.

Bushfire Management Plan and Site Details

Site Address / Plan Reference: 406 (Lot 20) Eleventh Road

Suburb: Hilbert

State: WA

P/code:

Local government area: City of Armadale

Description of the planning proposal: Residential subdivision

BMP Plan / Reference Number: 19018-R01

Version: B

Date of Issue: 26/07/2019

Client / Business Name: Le's Family Developments

Reason for referral to DFES	Yes	No
Has the BAL been calculated by a method other than method 1 as outlined in AS3959 (tick no if AS3959 method 1 has been used to calculate the BAL)?	☐	☒
Have any of the bushfire protection criteria elements been addressed through the use of a performance principle (tick no if only acceptable solutions have been used to address all of the BPC elements)?	☒	☐
Is the proposal any of the following special development types (see SPP 3.7 for definitions)?		
Unavoidable development (in BAL-40 or BAL-FZ)	☐	☒
Strategic planning proposal (including rezoning applications)	☐	☒
Minor development (in BAL-40 or BAL-FZ)	☐	☒
High risk land-use	☐	☒
Vulnerable land-use	☐	☐

If the development is a special development type as listed above, explain why the proposal is considered to be one of the above listed classifications (E.g. considered vulnerable land-use as the development is for accommodation of the elderly, etc.)?

Note: The decision maker (e.g. local government or the WAPC) should only refer the proposal to DFES for comment if one (or more) of the above answers are ticked "Yes".

BPAD Accredited Practitioner Details and Declaration

Name	Accreditation Level	Accreditation No.	Accreditation Expiry
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I declare that the information provided within this bushfire management plan is to the best of my knowledge true and correct

Signature of Practitioner



Date

26/7/2019

Bushfire Management Plan

Subdivision Application

406 Eleventh Road, Hilbert

Prepared for:

Le's Family Developments

July 2019

Report Details	
Project Number	19018-R01
Project Name	Subdivision Bushfire Management Plan
Project Address	406 Eleventh Road, Hilbert
Client	Le's Family Developments
Prepared by	Erika Dawson
Revision	B
Date	26 July 2019

Document Control			
Revision	Date	Purpose	Author Accreditation Details
A	25/7/2019	Draft for client review	Erika Dawson BPAD36371 Level 3 NSW & WA
B	26/7/2019	Final	Erika Dawson BPAD36371 Level 3 NSW & WA



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Disclaimer

This report is prepared solely for Le's Family Developments (the 'client') and any future landowners (or their delegated representatives) of the subject lot(s) and is not for the benefit of any other person and may not be relied upon by any other person.

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1 Introduction

1.1 Purpose

This Bushfire Management Plan (**BMP**) has been prepared to accompany a Development Application (**DA**) for a new residential subdivision. The proposed subdivision is to be site on Lot 20 DP 8081, known as 406 Eleventh Road, Hilbert (**subject site**). The location of the subject site is shown in **Figure 1**.



Source: (City of Armadale n.d.)

Figure 1: Site Location

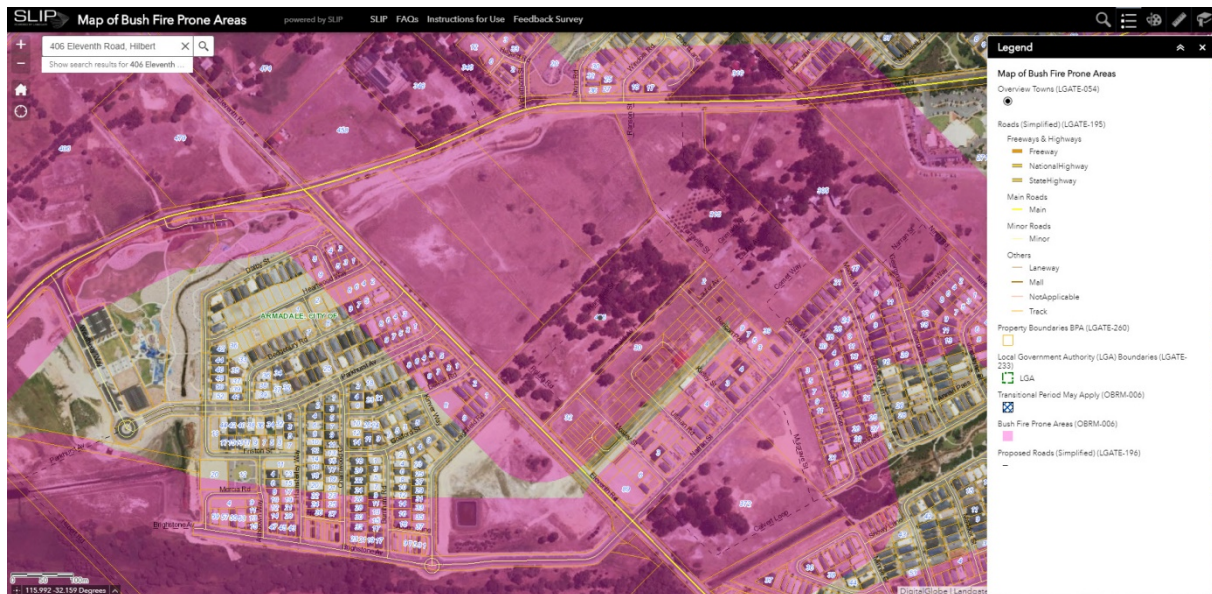
As shown on **Figure 2**, the subject site is mapped as being within a Bush Fire Prone Area on the *Map of Bush Fire Prone Areas* making the site a designated bushfire prone area.

Policy Measure 6.2 of *State Planning Policy No. 3.7 (SPP 3.7)* provides that subdivision applications within designated bushfire prone areas where the Bushfire Attack Level (**BAL**) is, or will be on completion of the development, BAL-12.5 to BAL-29, may be considered for approval providing they are undertaken in accordance with Policy Measure 6.4. To comply with this Policy Measures this BMP has been prepared which includes:

- A BAL Contour Map based on the assessment in Section 2 (Policy Measure 6.4(a));
- Identification of bushfire hazard issues in Section 2.4 (Policy Measure 6.4(b)); and
- An assessment against the bushfire protection criteria in Section 3 (Policy Measure 6.4(c)).

This BMP has been prepared in accordance with:

- SPP 3.7 (Western Australian Planning Commission 2015);
- *Guidelines for Planning in Bushfire Prone Areas* Version 1.3 (**Guidelines**) (Western Australian Planning Commission 2017); and
- the Western Australian Planning Commission (**WAPC**) *Bushfire Management Plan Development Application* (Department of Planning, Lands & Heritage n.d.).



Source: (Department of Fire & Emergency Services n.d.)

Figure 2: Map of Bush Fire Prone Areas

1.2 Proposal Details

Plans of the proposed development are provided in **Figure 5** located in **Appendix A**. The development proposes subdivision of the site to create:

- Residential allotments
- Two (2) Public Open Space (POS) lots; and
- Three (3) new roads.

1.3 Previous Approvals and Planning Framework

The subdivision is consistent with the Structure Plan for the site as shown in **Figure 3**.

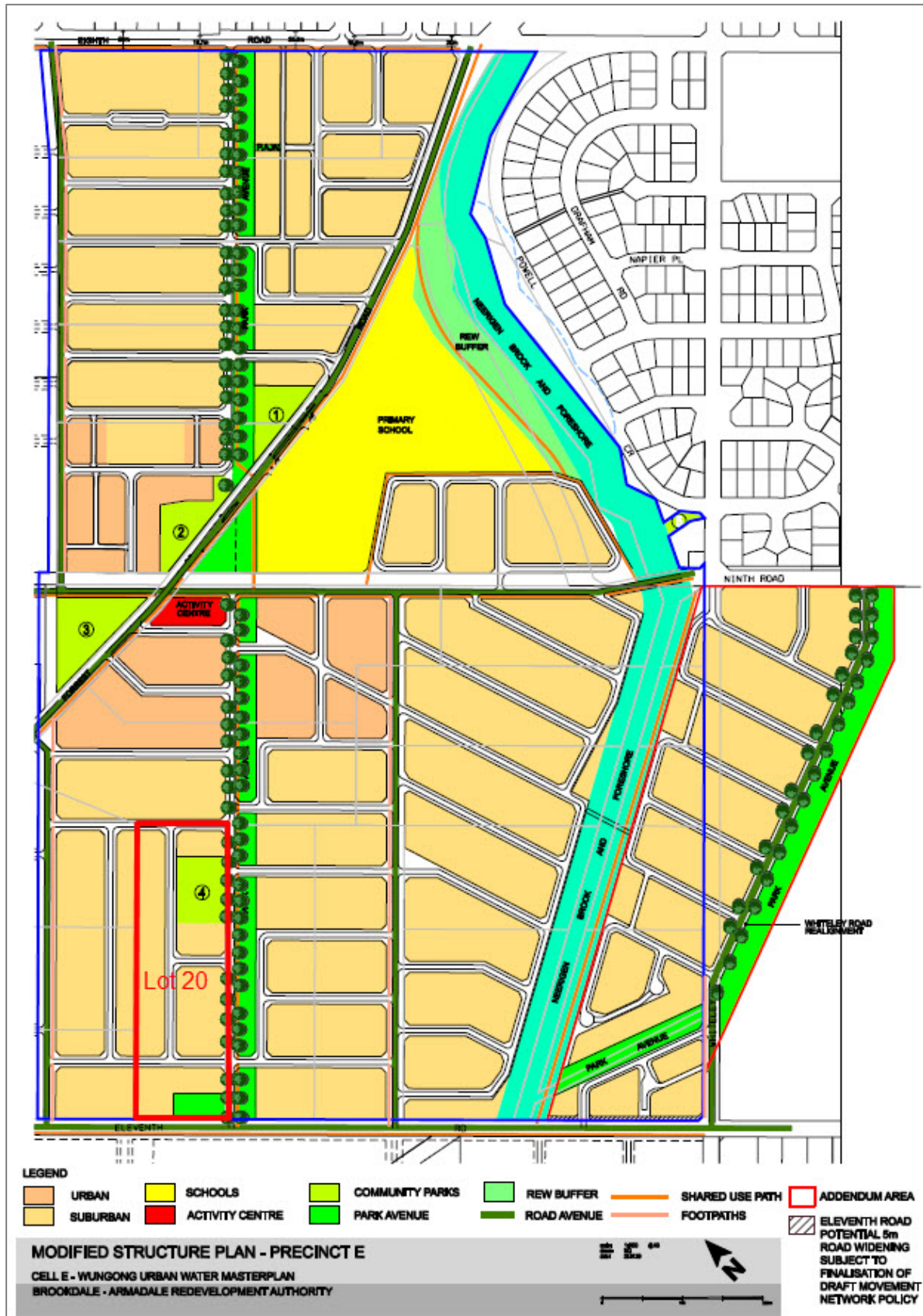
This subdivision was previously approved under Western Australian Planning Commission (**WAPC**) Application No. 152382 dated 15 December 2015. The approval was granted for a period of four (4) years and set to expire on 15 December 2019. Bushfire was not considered as part of this previous subdivision approval.

Recognising the change in approach to bushfire risk, the approved Structure Plan and previous subdivision approvals in the locality, the City of Armadale approved a Vegetation Management BMP over Lots 16-19 Forrest Road and Lot 20 Eleventh Road, Hilbert (refer **Appendix B**). The intent of the approval of the Vegetation Management BMP was to enable management of vegetation to provide enforceable low threat vegetation in the vicinity of the associated subdivisions.

In relation to the proposed subdivision this Vegetation Management BMP included an agreement with the City of Armadale for establishment and on-going management of a 17m wide strip of land on south eastern boundaries of Lot 17, 18 & 19 Forrest Road. This strip is to consist of:

- a 6m wide firebreak directly adjacent to the boundary with Lot 20; and
- an additional 11m wide managed grassland buffer adjacent to the firebreak.

This area is identified as Plot 14 on the Vegetation Management BMP. This land is owned by the City of Armadale and is subject to a Deed of Agreement for on-going maintenance with the developer/owner of the subject site.



Source: (Taylor Burrell Barnett 2009)

Figure 3: Cell E Structure Plan

A BMP has also been approved over Lot 16 Forrest Road Hilbert, which is located directly adjacent to the north east of the site. Stage 1 of the subdivision has been constructed. Stage 2 of the subdivision will convert all the land to low threat vegetation.

1.4 Environmental Considerations

1.4.1 Site Environmental Considerations

A review of the Western Australian Local Government Association's (WALGA) Environmental Planning Tool identifies that the site contains:

- A Multiple Use Geomorphic Wetland of the Swan Coastal Plain
- Banksia Woodlands of the Swan Coastal Plain is a community that may occur within the area.
- Areas relating to the Carnaby's Cockatoo Habitat including:
 - confirmed breeding area buffer
 - possible breeding area buffer
 - confirmed roosting area buffer
- Moderate to Low risk (Class 2) Acid Sulphate Soil Risk

1.4.2 Native Vegetation – Modification & Clearing

All vegetation on site will be permanently removed as part of the subdivision.

1.4.3 Revegetation/Landscape Plan

There are no areas within the subdivision that have been identified as being subject to significant revegetation. The POS areas will be revegetated and maintained to form a low threat vegetation area consistent with AS 3959 clause 2.2.3.2(f). Establishment and management of the POS areas for the first two years will be the responsibility of the developer. The City of Armadale will subsequently take over management of the POS areas in perpetuity.

2 Bushfire Assessment

2.1 Methodology

This BAL assessment has been undertaken in accordance with Method 1 of Australian Standard AS3959:2018 *Construction of buildings in bushfire-prone areas (AS3959)*.

2.2 Assessment Inputs

2.2.1 Fire Danger Index

Pursuant to Table 2.1 of AS3959, the Fire Danger Index (FDI) is 80.

2.2.2 Classified Vegetation

All vegetation within 150m of the building site (**assessment area**) has been assessed and classified in accordance with Table 2.3 and Section 2.2.3.2 of AS3959 and the *Visual Guide for Bushfire Risk Assessment in Western Australia* (Department of Planning 2016). The vegetation within the assessment area has been mapped and is shown in **Figure 6** in **Appendix C**. Photographs of the vegetation from the site inspection carried out on 5 May 2019 are provided in the following plates for each of the assessment plots.

Plot 1	
Vegetation Description	Firebreak and managed grassland enforced through Vegetation Management BMP approved by City of Armadale.
Existing Classification	Exclusion 2.2.3.2 (e) & (f)
Post Development Classification	Exclusion 2.2.3.2 (e) & (f)
	
Photo 1: Plot 1	Photo 2: Plot 1

DIRECTION 332 deg(T) 32.16201°S 115.98612°E ACCURACY 5 m DATUM GDA94  BMP Eleventh Ave f Hilbert 5/5/19, 10:09:00	DIRECTION 235 deg(T) 32.16231°S 115.98577°E ACCURACY 5 m DATUM GDA94  BMP Eleventh Ave f Hilbert 5/5/19, 10:08:24
Photo 3: Plot 1	Photo 4: Plot 1

Plot 2	
Vegetation Description	Unmanaged grassland with scattered trees
Existing Classification	Class G Grassland
Post Development Classification	Class G Grassland
DIRECTION 240 deg(T) 32.16173°S 115.98606°E ACCURACY 5 m DATUM GDA94  BMP Eleventh Ave f Hilbert 5/5/19, 10:09:23	DIRECTION 275 deg(T) 32.16259°S 115.98542°E ACCURACY 5 m DATUM GDA94  BMP Eleventh Ave f Hilbert 5/5/19, 10:11:38
Photo 5: Plot 2	Photo 6: Plot 2

Plot 3	
Vegetation Description	Low threat vegetation. Maintained lawns, orchard
Existing Classification	Exclusion 2.2.3.2 (f)
Post Development Classification	Exclusion 2.2.3.2 (f)
 DIRECTION 68 deg(T) 32.16217°S 115.98641°E ACCURACY 5 m DATUM GDA94 BMP Eleventh Ave e Hilbert 5/5/19, 09:57:55	 DIRECTION 45 deg(T) 32.16255°S 115.98691°E ACCURACY 5 m DATUM GDA94 BMP Eleventh Ave e Hilbert 5/5/19, 09:58:53
Photo 7: Plot 3	Photo 8: Plot 3
 DIRECTION 353 deg(T) 32.16206°S 115.98626°E ACCURACY 5 m DATUM GDA94 BMP Eleventh Ave e Hilbert 5/5/19, 09:57:29	 DIRECTION 60 deg(T) 32.16211°S 115.98631°E ACCURACY 5 m DATUM GDA94 BMP Eleventh Ave e Hilbert 5/5/19, 09:57:40
Photo 9: Plot 3	Photo 10: Plot 3

Plot 4	
Vegetation Description	Non-vegetated areas and managed vegetation within existing subdivision areas and newly establishing subdivision areas.
Existing Classification	Exclusion 2.2.3.2 (e) & (f)
Post Development Classification	Exclusion 2.2.3.2 (e) & (f)
DIRECTION 159 deg(T) 32.16211°S 115.98823°E ACCURACY 5 m DATUM GDA94  BMP Eleventh Ave a Hilbert 5/5/19, 09:37:28	DIRECTION 225 deg(T) 32.16234°S 115.98852°E ACCURACY 10 m DATUM GDA94  BMP Eleventh Ave a Hilbert 5/5/19, 09:38:07
Photo 11: Plot 4	Photo 12: Plot 4
DIRECTION 233 deg(T) 32.16371°S 115.98732°E ACCURACY 5 m DATUM GDA94  BMP Eleventh Ave a Hilbert 5/5/19, 09:44:19	DIRECTION 293 deg(T) 32.16406°S 115.98310°E ACCURACY 5 m DATUM GDA94  BMP Eleventh Ave g Hilbert 5/5/19, 10:18:31
Photo 13: Plot 4	Photo 14: Plot 4

Plot 5	
Vegetation Description	Unmanaged grassland within a future development site
Existing Classification	Class G Grassland
Post Development Classification	Class G Grassland
	
Photo 15: Plot 5	Photo 16: Plot 5

Plot 6	
Vegetation Description	Dense eucalypts with grass understorey
Existing Classification	Class A Forest
Post Development Classification	Exclusion 2.2.3.2 (f) – Low threat vegetation within POS
	
Photo 17: Plot 6	Photo 18: Plot 6

Plot 7	
Vegetation Description	Cleared area of vegetation and dense trees
Existing Classification	Class A Forest & Exclusion 2.3.2.3 (f)
Post Development Classification	Exclusion 2.2.3.2 (f) – Low threat vegetation within POS
	
Photo 19: Plot 7	Photo 20: Plot 7

Plot 8	
Vegetation Description	Pockets of dense eucalypts, transitioning to sparser woodland vegetation and open grasslands. Areas affected by adjacent earthworks.
Existing Classification	Class A Forest, Class B Woodland, Class G Grassland, Exclusion 2.3.2.3 (e)
Post Development Classification	Will be converted to exclusion 2.3.2.3 (f) as part of the development of the site.
	
Photo 21: Plot 8	Photo 22: Plot 8

Plot 9	
Vegetation Description	Eucalypts with grassland understorey
Existing Classification	Class B Woodland
Post Development Classification	Class B Woodland
	
Photo 23: Plot 9	Photo 24: Plot 9

Plot 10	
Vegetation Description	Unmanaged grassland
Existing Classification	Class G Grassland
Post Development Classification	Class G Grassland
	
Photo 25: Plot 10	

Plot 11	
Vegetation Description	Managed vegetation within road and POS area
Existing Classification	Exclusion 2.2.3.2 (f)
Post Development Classification	Exclusion 2.2.3.2 (f)
	
Photo 26: Plot 11	Photo 27: Plot 11

2.2.3 Distance to Site

For each of the vegetation plots identified in **Section 2.2.2** the distance from the site (boundary) to the classified vegetation (plot) in horizontal plane has been determined and is outlined in **Table 2** for each of the proposed lots.

2.2.4 Effective Slope

For each of the vegetation plots identified in **Section 2.2.2**, the effective slope has been determined in degrees and whether it is upslope or downslope in relation to the site. Slope data was measured on site and cross referenced with elevation data sourced from the Environmental Planning Tool (Western Australian Local Government Association 2018)

The effective slope determination for each Plot is provided in Table 1.

2.2.5 Summary of Assessment Inputs

The following table provides a summary of the assessment inputs determined in accordance with the methodology outlined above.

Table 1: Summary of Assessment Inputs

Vegetation Plot	Vegetation Classification/Exclusion	Effective Slope
1	Exclusion 2.2.3.2 (e) & (f)	N/A
2	Class G Grassland	Flat/upslope
3	Exclusion 2.2.3.2 (f)	N/A
4	Exclusion 2.2.3.2 (e) & (f)	N/A
5	Class G Grassland	Flat/upslope
6	Exclusion 2.2.3.2 (f)	N/A

Table 1: Summary of Assessment Inputs

Vegetation Plot	Vegetation Classification/Exclusion	Effective Slope
7	Exclusion 2.2.3.2 (f)	N/A
8	Exclusion 2.2.3.2 (e) & (f)	N/A
9	Class B Woodland	Flat/upslope
10	Class G Grassland	Flat/upslope
11	Exclusion 2.2.3.2 (f)	N/A

2.3 Assessment Outputs

Using the inputs in **Section 2.2**, the worst case BAL has been calculated for each of the proposed lots and is provided in **Table 2**. The assessment assumes completion of all subdivision works. The table outlines the highest applicable BAL to each lot as well as an achievable BAL that future development on site could achieve through providing a nominated building envelope on site.

The BAL Contour Maps for the development are provided in **Figure 7**, **Figure 8**, and **Figure 9** located in **Appendix D**.

Table 2: Bushfire Attack Level

Lot	Vegetation Class	Plot	Effective Slope	Separation Distance	Highest BAL	Achievable BAL
601	Class G Grassland	5	Flat/upslope	28m	BAL-12.5	N/A
602	Class G Grassland	2	Flat/upslope	38m	BAL-12.5	N/A
603	Class G Grassland	2	Flat/upslope	28m	BAL-12.5	N/A
604	Class G Grassland	2	Flat/upslope	17m	BAL-12.5	N/A
605	Class G Grassland	2	Flat/upslope	17m	BAL-12.5	N/A
606	Class G Grassland	2	Flat/upslope	17m	BAL-12.5	N/A
607	Class G Grassland	2	Flat/upslope	17m	BAL-12.5	N/A
607	Class G Grassland	2	Flat/upslope	17m	BAL-12.5	N/A
609	Class G Grassland	2	Flat/upslope	17m	BAL-12.5	N/A
610	Class G Grassland	2	Flat/upslope	17m	BAL-12.5	N/A
611	Class G Grassland	2	Flat/upslope	17m	BAL-12.5	N/A
612	Class G Grassland	2	Flat/upslope	17m	BAL-12.5	N/A
613	Class G Grassland	2	Flat/upslope	17m	BAL-12.5	N/A
614	Class G Grassland	2	Flat/upslope	17m	BAL-12.5	N/A
615	Class G Grassland	2	Flat/upslope	17m	BAL-12.5	N/A
616	Class G Grassland	2	Flat/upslope	17m	BAL-12.5	N/A
617	Class G Grassland	2	Flat/upslope	17m	BAL-12.5	N/A
618	Class G Grassland	2	Flat/upslope	17m	BAL-12.5	N/A
619	Class G Grassland	2	Flat/upslope	17m	BAL-12.5	N/A

Table 2: Bushfire Attack Level

Lot	Vegetation Class	Plot	Effective Slope	Separation Distance	Highest BAL	Achievable BAL
620	Class G Grassland	2	Flat/upslope	17m	BAL-12.5	N/A
621	Class G Grassland	2	Flat/upslope	17m	BAL-12.5	N/A
622	Class G Grassland	2	Flat/upslope	17m	BAL-12.5	N/A
623	Class G Grassland	2	Flat/upslope	17m	BAL-12.5	N/A
624	Class G Grassland	2	Flat/upslope	17m	BAL-12.5	N/A
625	Class G Grassland	2	Flat/upslope	17m	BAL-12.5	N/A
626	Class G Grassland	2	Flat/upslope	17m	BAL-12.5	N/A
627	Class G Grassland	2	Flat/upslope	17m	BAL-12.5	N/A
628	Class G Grassland	2	Flat/upslope	17m	BAL-12.5	N/A
629	Class G Grassland	2	Flat/upslope	17m	BAL-12.5	N/A
630	Class G Grassland	2	Flat/upslope	27m	BAL-12.5	N/A
631	Class G Grassland	2	Flat/upslope	37m	BAL-12.5	N/A
632	Class B Woodland	9	Flat/upslope	100m	BAL-LOW	N/A
633	Class B Woodland	9	Flat/upslope	100m	BAL-LOW	N/A
634	Class B Woodland	9	Flat/upslope	100m	BAL-LOW	N/A
635	Class B Woodland	9	Flat/upslope	100m	BAL-LOW	N/A
636	Class B Woodland	9	Flat/upslope	100m	BAL-LOW	N/A
637	Class G Grassland	2	Flat/upslope	110m	BAL-LOW	N/A
638	Class G Grassland	2	Flat/upslope	98m	BAL-LOW	N/A
639	Class G Grassland	2	Flat/upslope	86m	BAL-LOW	N/A
640	Class G Grassland	2	Flat/upslope	74m	BAL-LOW	N/A
641	Class G Grassland	2	Flat/upslope	62m	BAL-LOW	N/A
642	Class G Grassland	2	Flat/upslope	62m	BAL-LOW	N/A
643	Class G Grassland	2	Flat/upslope	74m	BAL-LOW	N/A
644	Class G Grassland	2	Flat/upslope	86m	BAL-LOW	N/A
645	Class G Grassland	2	Flat/upslope	98m	BAL-LOW	N/A
646	Class G Grassland	2	Flat/upslope	110m	BAL-LOW	N/A
647	Class G Grassland	2	Flat/upslope	62m	BAL-LOW	N/A
648	Class G Grassland	2	Flat/upslope	62m	BAL-LOW	N/A
649	Class G Grassland	2	Flat/upslope	62m	BAL-LOW	N/A
650	Class G Grassland	2	Flat/upslope	62m	BAL-LOW	N/A
651	Class G Grassland	2	Flat/upslope	62m	BAL-LOW	N/A
652	Class G Grassland	2	Flat/upslope	62m	BAL-LOW	N/A
653	Class G Grassland	2	Flat/upslope	62m	BAL-LOW	N/A
654	Class G Grassland	2	Flat/upslope	62m	BAL-LOW	N/A

Table 2: Bushfire Attack Level

Lot	Vegetation Class	Plot	Effective Slope	Separation Distance	Highest BAL	Achievable BAL
655	Class G Grassland	5	Flat/upslope	75m	BAL-LOW	N/A
656	Class G Grassland	5	Flat/upslope	75m	BAL-LOW	N/A
657	Class G Grassland	5	Flat/upslope	75m	BAL-LOW	N/A
657	Class G Grassland	5	Flat/upslope	75m	BAL-LOW	N/A
659	Class G Grassland	5	Flat/upslope	75m	BAL-LOW	N/A
660	Class G Grassland	5	Flat/upslope	75m	BAL-LOW	N/A
661	Class G Grassland	2	Flat/upslope	92m	BAL-LOW	N/A
662	Class G Grassland	2	Flat/upslope	92m	BAL-LOW	N/A
663	Class G Grassland	2	Flat/upslope	92m	BAL-LOW	N/A
664	Class G Grassland	2	Flat/upslope	92m	BAL-LOW	N/A
665	Class G Grassland	2	Flat/upslope	92m	BAL-LOW	N/A
666	Class G Grassland	2	Flat/upslope	92m	BAL-LOW	N/A
667	Class G Grassland	2	Flat/upslope	92m	BAL-LOW	N/A
668	Class G Grassland	2	Flat/upslope	92m	BAL-LOW	N/A

2.4 Bushfire Hazard Issues

The following bushfire hazard issues have been identified through examination of the environmental considerations and the bushfire risk assessment:

- If the development is staged, the balance lot will need to be managed as low threat vegetation and two access routes will need to be provided at all times.
- This BMP assumes that the City of Armadale will enforce the Vegetation Management BMP (and associated Deed of Agreement) across Lots 17-19 Forrest Road, Hilbert, to allow for an ongoing enforceable management works order to provide a 17m hazard separation to for the lots along the north western boundary of the site. If this is not achieved, then a revised bushfire assessment will be required.
- This BMP assumes that the POS areas are to be landscaped and maintained as low threat vegetation consistent with AS 3959 Clause 2.2.3.2 (f) and/ or A2.1 (APZ) of the Guidelines. If this is not achieved, then a revised bushfire assessment will be required.
- The BAL ratings provided in the BAL Contour Plans (**Appendix D**) and **Table 2** are indicative only and are for the purposes of demonstrating compliance with the bushfire protection criteria of SPP 3.7. The BAL Contour map is to be updated following the implementation of the bushfire strategies contained within this report. Alternatively, an individual BAL assessment is to be completed prior to the issue of the building permit.
- Future residential BCA Class 1, 2, 3 and associated Class 10a buildings are to be constructed to the applicable construction standard of AS 3959.
- The subdivision contains lots that are subject to a BAL above BAL-LOW, as identified within **Table 2**. The bushfire protection criteria relevant to the development are addressed in **Section 3** of this report.

3 Bushfire Protection Criteria

3.1 Assessment against Bush Fire Protection Criteria

The following table shows how the proposed development complies with the applicable bushfire protection criteria from Appendix 4 of the Guidelines. The proposed Bushfire Protection Measures to be implemented to comply with the criteria are shown on the plan in **Appendix E**. Detailed outlining of the Bushfire Protection Measures are provided in **Appendix F**.

Table 3: Bushfire Protection Criteria

	Acceptable Solution	Performance Solution	N/A	Comment
Element 1 Location				
A1.1 Development Location	☒	☐	☐	Table 2 outlines the worst case BALs for each of the proposed lots within the development. The development, once complete, will be located in an area subject to BAL-29 or less.
Element 2: Siting & Design of Development				
A2.1 Asset Protection Zone	☐	☐	☐	Figure 10 (Appendix E) shows the location and extent of the proposed APZ. An APZ will be provided for the development: - That is required to be established and maintained across the entire site. - The APZ and the approved Vegetation Management BMP in combination will ensure the potential radiant heat impact on the building does not exceed 29kW/m²; - the APZ will be located wholly within the subject site; and - the APZ will be managed in accordance with the requirements of the <i>Standards for APZs</i> (refer Appendix F).
Element 3: Vehicular Access				
A3.1 Two access routes	☒	☐	☐	The site provides for at least two (2) vehicular access routes from the site as shown in Figure 10. A temporary EAW will be provided at the rear of Lots 632-636 to connect into Grimaldi Avenue until such a time as Stage 2 of the adjacent Lot 16 development is complete.
A3.2 Public Road	☒	☐	☐	Public Roads are to be constructed to the standards as detailed in the Vehicular Access Technical Requirements as outlined in Appendix F.
A3.3 Cul-de-sac	☐	☒	☒	No permanent cul-de-sacs are proposed as part of the development. The development contains two roads that until the adjacent development is carried out will be no-through roads. One is located between Lots 631 and 632. Until

Table 3: Bushfire Protection Criteria

	Acceptable Solution	Performance Solution	N/A	Comment
				such a time as the through road is provided into the adjacent Lot 16, a temporary EAW will be provided at the rear of Lots 632-636 to connect into Grimaldi Avenue. The second is located between Lots 604 and 605. A temporary turn around will be provided at the end of this road. As a 17.5m diameter cul-de-sac cannot be provided, a performance solution has been provided to demonstrate compliance with Performance Principle P3 (see Section 3.1.1).
A3.4 Battle-axe	☐	☐	☒	No battle axes proposed
A3.5 Private driveway longer than 50m	☐	☐	☒	No private driveways longer than 50m
A3.6 Emergency access way	☒	☐	☐	A temporary EAW will be provided at the rear of Lots 632-636 to connect into Grimaldi Avenue until such a time as Stage 2 of the adjacent Lot 16 development is complete.
A3.7 Fire service access routes (perimeter roads)	☐	☐	☒	No FSARs are required as public roads or EAWs provide access around habitable lots.
A3.8 Firebreak width	☒	☐	☐	Upon completion of the subdivision works, no lots will exceed 5,000m² and therefore do not require firebreaks to be installed. Any balance lots >5,000m² are required to comply with the Fire Break Notice during staging of subdivision, and will require 3m wide, 4m high firebreaks along the external boundaries and grasses kept slashed below 100mm. The applicable City of Armadale (CoA) Fire Break Notice is provided in Appendix G.
Element 4: Water				
A4.1 Reticulated areas	☒	☐	☐	The subdivision is to be provided with reticulated fire hydrants in accordance with Water Corporation DS63 and DFES requirements. See Figure 10 .
A4.2 Non-reticulated areas	☐	☐	☒	Located within a reticulated water supply area.
A4.3 Individual lots within non-reticulated areas	☐	☐	☒	Located within a reticulated water supply area.

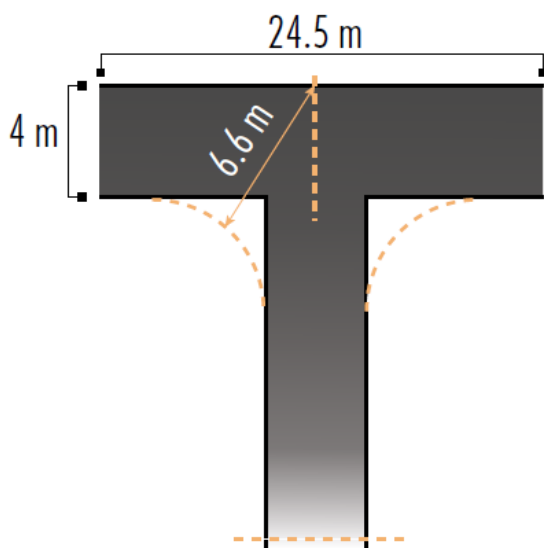
3.1.1 Performance Principle-Based Solution – Cul-de-sac

3.1.1.1 Background

The road between proposed Lots 604 and 605 will be a temporary dead end road until such a time as the land to the west is developed. The road reserve in this location is only 15m wide and hence cannot support a 17.5m diameter cul-de-sac bulb.

3.1.1.2 Performance Solution

Therefore it is proposed to provide a “T” turnaround area in place of the cul-de-sac bulb. The “T” turnaround area is to be provided in accordance with that specified for the Acceptable Solution A3.5 Private Driveway longer than 50m as shown in **Figure 4** below.



Source: (Western Australian Planning Commission 2017)

Figure 4: Design Requirement for a private driveway longer than 50m

The top of the “T” will be centred in road reserve, with the far sides of the top of the “T” extending 4.75m into Lots 604 and 605. With the 15m wide road reserve this will provide for the total 24.5m ($4.75\text{m} \times 2 = 9.5\text{m} + 15\text{m}$).

3.1.1.3 Rationale/Justification

Section 4.5.2.2 of the *Guidelines for Planning in Bushfire Prone Areas* requires Performance Solutions to demonstrate how they:

- achieve or exceed the intent and performance principle of the element; and
- more broadly achieve the objectives of SPP 3.7.

It also requires:

- a statement of the extent to which the proposed principle based solution(s) conforms with, or deviates from the acceptable solution(s)
- evidence including calculations and diagrams to support how the use of a material, form of construction or design achieves the performance principle(s)

- verification methods such as a test, inspection, calculation or other method that determines whether a principle-based solution(s) complies with the relevant performance principle(s). All verification methods must be acceptable to the Department of Fire and Emergency Services.

The following addresses the abovementioned requirements.

The intent of the Element 3 Vehicular Access is:

To ensure that the vehicular access serving a subdivision/development is available and safe during a bushfire event.

Performance Principle P3 states:

The internal layout, design and construction of public and private vehicular access and egress in the subdivision/ development allow emergency and other vehicles to move through it easily and safely at all times.

The Acceptable Solution A3.3 requires that a cul-de-sac comply with the provision as outlined in **Table 4**. It can be seen that the proposed performance solution will comply with all but one provision of A3.3 (i.e. turnaround requirement).

Table 4: Cul-de-sac Requirements

Provision	Requirement	Development Provision
Minimum trafficable surface	6m	> 6m
Horizontal clearance	6m	> 6m
Maximum grade < 50m	1 in 10	< 1 in 10
Maximum weight capacity	15 t	> 15t
Maximum crossfall	1 in 33	< 1 in 33
Curves minimum inner radius	8.5m	8.5m
Maximum length	200m	30m approximately
Turnaround requirements	17.5m diameter head	“T” turnaround in accordance with A3.5 Private driveway

The purpose of the turnaround is to enable a fire appliance to be able to turnaround at the end of the road. The Private Driveway provisions in A3.5 provide for an equivalent requirement, which is to facilitate the safe turnaround of a type 3.4 fire appliance. A3.5 provides for a 17.5m diameter turnaround as well as the proposed “T” type and also another “Y” shaped turn around.

The proposed performance solution, being consistent with the Acceptable Solution A3.5 for turnarounds, is considered to be an equivalent outcome to the Acceptable Solution A3.3. Given this, it is considered that the performance solution will provide for:

- an internal layout, design and construction of public vehicular access and egress in the subdivision that will allow emergency and other vehicles to move through it easily and safely at all times. Thus achieving the requirements of the Performance Principle P3; and
- vehicular access serving a subdivision that will be available and safe during a bushfire event. Thus achieving the intent of Element 3.

3.2 Additional Management Strategies

The following items require specific consideration in relation to the subdivision and future planning stages.

- The Fire Control Notice requires that all properties with a BMP approved as part of a subdivision consent requires compliance with the BMP in its entirety.
- A lot specific BAL Assessment will be required at the Development Application stage of planning for future BCA Class 1a, 2, 3 or associated 10a buildings.

3.3 Summary of Bushfire Protection Measures

The Bushfire Protection Measures required as part of the proposed subdivision are illustrated on **Figure 10** and include:

- All POS is to comprise low threat landscaping.
- If the subdivision is staged, the balance lot is to be maintained as low threat vegetation at all times.
- The entirety of the site is to be established and maintained as an APZ at the completion of the subdivision.
- Public roads are to be constructed to the requirements of the Technical Vehicular Access requirements within Appendix F of this BMP.
- Reticulated fire hydrants are to be installed in accordance with Water Corporation DS63 and DFES requirements.
- A Temporary 6m wide EAW is required as identified in **Figure 10**. Construction standards are detailed within **Appendix F** of this BMP. The EAW is to remain in place until such a time as the road becomes a through road.
- A Temporary “T” turnaround area provided adjacent and on Lots 604 and 605 in accordance with **Appendix F** of this BMP. It is to be retained until such a time as the land to the west is developed and provides a through road.
- Two access routes to/from the site are to be maintained at all times, through any staging of the subdivision.

4 Implementation

4.1 Introduction

The assessment of the proposed development carried out in this BMP has assumed the development will be carried out in accordance with a number of bush fire protection measures (BFPM). The location, extent and requirements for the BMP are shown in **Appendix E** and **Appendix F**.

The following provides a summary of the BFMP that must be incorporated into the development to ensure it best protects the development from the effects of bushfire in accordance with the requirements of the Guidelines and other best practice guidelines. The table assigns responsibilities for both initial implementation and ongoing maintenance requirements the BFPMs.

4.2 Responsibilities

Table 5: Implementation Responsibilities

Measure	Implementation Responsibility			
	N/A	Developer	Land Owner	Local Government
Initial Implementation (Prior to Subdivision Clearance)				
1 Establish the APZ across the site, as indicated in Figure 10, and to the standard as stated within this BMP.	☐	☒	☐	☐
2 Establish the POS as low threat vegetation/exclusion	☐	☒	☐	☐
3 Public Roads constructed to the standard as stated within this BMP.	☐	☒	☐	☐
4 Install the temporary EAW through Lots 632-636 to the standard as stated within this BMP if the through road connection has not been provided.	☐	☒	☐	☐
5 Two access routes to be provided at all times (including any staging)	☐	☒	☐	☐
6 Reticulated water supply and fire hydrants provided in accordance with Water Corporation DS63 and DFES requirements.	☐	☒	☐	☐
7 S70A Notice on Title advising landowners that the lots are within a Bushfire Prone Area and the lots are subject to the provisions of SPP3.7 and this BMP.	☐	☒	☐	☐
8 Install a temporary turnaround area on and adjacent to Lots 604 and 605 in accordance with the requirements in this BMP if the through road connection has not been provided.	☐	☒	☐	☐
On-going Maintenance				
9 Maintain the APZ in accordance with the requirements specified within this BMP.	☐	☐	☒	☐

Table 5: Implementation Responsibilities

	Measure	Implementation Responsibility			
		N/A	Developer	Land Owner	Local Government
10	Maintain the POS as low threat vegetation/exclusion	☐	☒	☐	☒
11	Maintain any balance lots as low threat vegetation.	☐	☒	☐	☐
12	Comply with the relevant local government annual firebreak notice issued under s33 of the Bush Fires Act 1954	☐	☐	☒	☐
13	Maintenance of the temporary EAW through Lots 632-636 to the standard as stated within this BMP if the through road connection has not been provided.	☐	☒	☐	☐
14	Maintenance of the temporary turnaround on and adjacent to Lots 604 and 605 to the standard as stated within this BMP if the through road connection has not been provided.	☐	☒	☐	☐

5 Conclusion

The proposed subdivision, on completion, will ensure that all habitable development is located in an area that has a low to moderate bushfire hazard level (i.e. BAL-29 or below). With the implementation of the Bush Fire Protection Measures, as outlined in **Sections 3 and 4** and shown on the figure attached at **Appendix E**, the proposed development is considered to be appropriately protected from bushfire and complies with the requirements of the Guidelines and SPP3.7. The proposed development is not expected to increase the bushfire risk.

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Appendix A

Development Plans



Figure 5: Proposed Subdivision Plan

Appendix B

Vegetation Management BMP



BUSHFIRE MANAGEMENT PLAN

Subdivision Vegetation Management

Lot 16 Forrest Rd & Lot 20 Eleventh Rd,
Hilbert

Version: 1.3 Reference: 8086 Date: September 2018



DOCUMENT DETAILS

Project Number: 8086

Project Address: Lot 16 Forrest Rd & Lot 20 Eleventh Rd, Hilbert

Client Name: Mr Hiep van Le, sole director of H&H Developments (WA) No.2 Pty Ltd (Lot 16 Forrest Rd) and Le's Family Developments Pty Ltd (Lot 20 Eleventh Rd)

Author: Darrel Krammer, Grad Dip Bushfire Protection, BPAD33412 Level 3

Version: 1.3

Date of issue: 24th September 2018



Author: Darrel Krammer
Date: 24/09/2018

In the signing the above, the author declares that this Bushfire Management Plan meets the requirements of State Planning Policy 3.7. This report supersedes all previous Bushfire Management Plans for the site.

Document Control:

Report Version	Purpose	Author/ Reviewer and Accreditation Details	Date Submitted
A1	Draft for client review	D. Krammer (BPAD 33412, Level 3)	04/09/2018
A2	Client updates	D. Krammer (BPAD 33412, Level 3)	12/09/2018
1.0	Final for submission	D. Krammer (BPAD 33412, Level 3)	12/09/2018
1.1	Client updates	D. Krammer (BPAD 33412, Level 3)	17/09/2018
1.2	Minor typos	D. Krammer (BPAD 33412, Level 3)	19/09/2018
1.3	Minor amendments	D. Krammer (BPAD 33412, Level 3)	19/09/2018

DISCLAIMER AND LIMITATION

This report is prepared solely for **Mr Hiep van Le, sole director of H&H Developments (WA) No.2 Pty Ltd (Lot 16 Forrest Rd) and Le's Family Developments Pty Ltd (Lot 20 Eleventh Rd)** (the 'proponent') and any future landowners (or their delegated representatives) of the subject lot(s) and is not for the benefit of any other person and may not be relied upon by any other person.

The mitigation strategies contained in this Bushfire Management Plan are considered to be prudent minimum standards only, based on the writer's experience as well as standards prescribed by relevant authorities. It is expressly stated that RUIC Fire and the writer do not guarantee that if such standards are complied with or if a property owner exercises prudence, that a building or property will not be damaged or that lives will not be lost in a bush fire.

Fire is an extremely unpredictable force of nature. Changing climatic factors (whether predictable or otherwise) either before or at the time of a fire can also significantly affect the nature of a fire and in a bushfire prone area it is not possible to completely guard against bushfire.

Further, the growth, planting or removal of vegetation; poor maintenance of any fire prevention measures; addition of structures not included in this report; or other activity can and will change the bushfire threat to all properties detailed in the report. Further, the achievement of the level of implementation of fire precautions will depend on the actions of the landowner or occupiers of the land, over which RUIC Fire has no control. If the proponent becomes concerned about changing factors then a new Fire Risk Management Plan should be requested.

To the maximum extent permitted by the law, RUIC Fire, its employees, officers, agents and the writer ("RUIC Fire") excludes all liability whatsoever for:

1. claim, damage, loss or injury to any property and any person caused by fire or as a result of fire or indeed howsoever caused;
2. errors or omissions in this report except where grossly negligent; and
3. the proponent expressly acknowledges that they have been made aware of this exclusion and that such exclusion of liability is reasonable in all the circumstances.

If despite the provisions of the above disclaimer RUIC Fire is found liable then RUIC Fire limits its liability to the lesser of the maximum extent permitted by the law and the proceeds paid out by RUIC Fire's professional or public liability insurance following the making of a successful claim against such insurer.

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This report is valid for a period of three years only from the date of its issue. All BAL ratings identified in this report are indicative and are required to be verified at the time of construction of individual buildings to ensure appropriate setbacks identified in the proposed development have been achieved.

RUIC Fire is a trading name of

Rural Fire Risk Consultancy Pty Ltd

ABN: 48 151 451 713

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1.0 Proposal Details

1.1 Subject Site

The site the subject of this Bushfire Management Plan (BMP) is Lot 16 Forrest Road and Lot 20 Eleventh Road, Hilbert (the site). The site is located within the municipality of the City of Armadale. The site and surrounding area is shown on the Location Plan at Figure 1A.

The site is bordered by City of Armadale owned and managed land to the north west of Lot 20, being Lots 17 to 19 Forrest Road, Hilbert.

The site is identified as being Bushfire Prone on the *Map of Bush Fire Prone Areas 2018* (OBRM, 2018) as illustrated in Figure 1B.

1.2 Planning Proposal

The purpose of this BMP is to provide an enforceable mechanism for the low threat management of vegetation within Lot 20 Eleventh Rd and Lot 16 Eleventh Rd Hilbert. The individual lots are owned by the same person in two different entity names. The client has taken a precautionary approach to bushfire management and has requested development of this BMP to minimise the bushfire threat to surrounding development and within the subject lots of this BMP.

The lots the subject to this BMP have been granted conditional subdivisional approval as per below:

- Lot 16 Forrest Rd – Application 151090, dated 13th March 2015
- Lot 20 Eleventh Rd – Application 152382, dated 15th December 2015

Neither application approval was conditional on compliance with the deemed provisions of SPP3.7 and the associated guidelines.

The subdivision of Lot 20 Eleventh Rd and Lot 16 Forrest Rd is to be staged. This BMP applies to Stage 1 (refer to Figure 1A) of the subdivision of the subject lots and is to be updated upon further staging of the subdivision. Stage 1 of the subdivision consists of proposed lots:

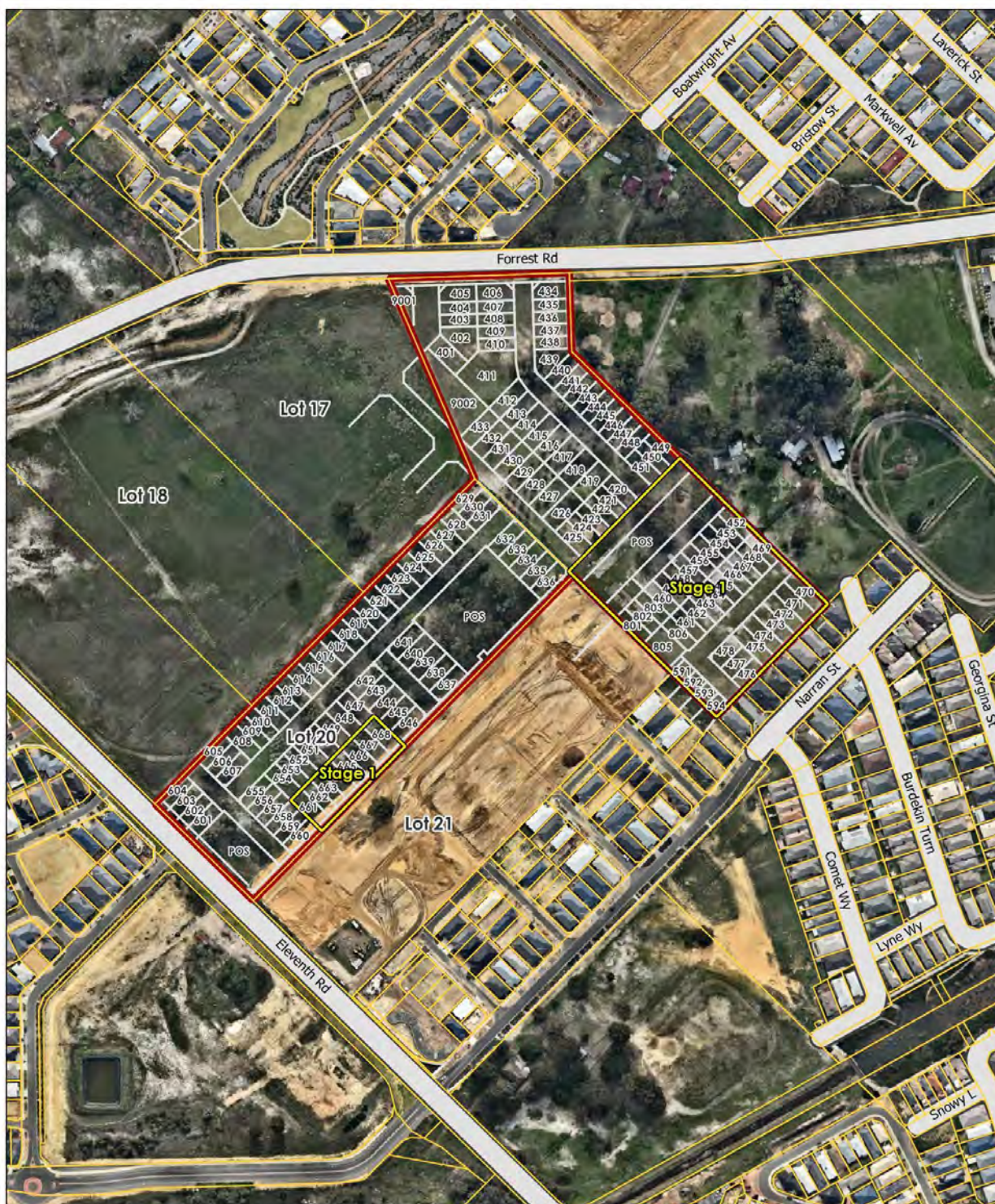
- 661 – 668 within existing Lot 20 Eleventh Rd
- 452 – 476, 591 – 594 and 801 – 806 within existing Lot 16 Forrest Rd

The proposed Subdivision Plan is illustrated in Figure 1C.

This BMP specifically details the vegetation management for Stage 1 and does not address the other Elements of the *Guidelines for planning in bushfire prone areas appendices* as these were not required for the conditional approval.

1.3 Previous Bushfire and Environmental Assessments

No previous bushfire management plans have been completed for either subdivision application.



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Size: A4
 Scale: 1:4,000

LOCATION PLAN

Lot 16 and 20 Eleventh Road, Hilbert
Stage 1



Site Boundary



Proposed
 Lots



Roads



Cadastre

0 20 40 60 80 100 m



Ref: 8086_001_01_Location_20170427
 Projection: GDA94 MGA50
 Author: MVA - RUIC | Date: 2018-08-24
 Data Source: Cadastre - Landgate; Imagery - Neamap;
 Roads, Site Boundary, Veg, BAL, Buffers, BMS - RUIC.

Disclaimer: Although the data within this map is considered accurate at the time of creation, RUIC Fire does not guarantee, and accepts no legal liability whatsoever arising from or connected to, the accuracy, reliability, currency or completeness of any data used within this map.

Figure 1A: Location Plan

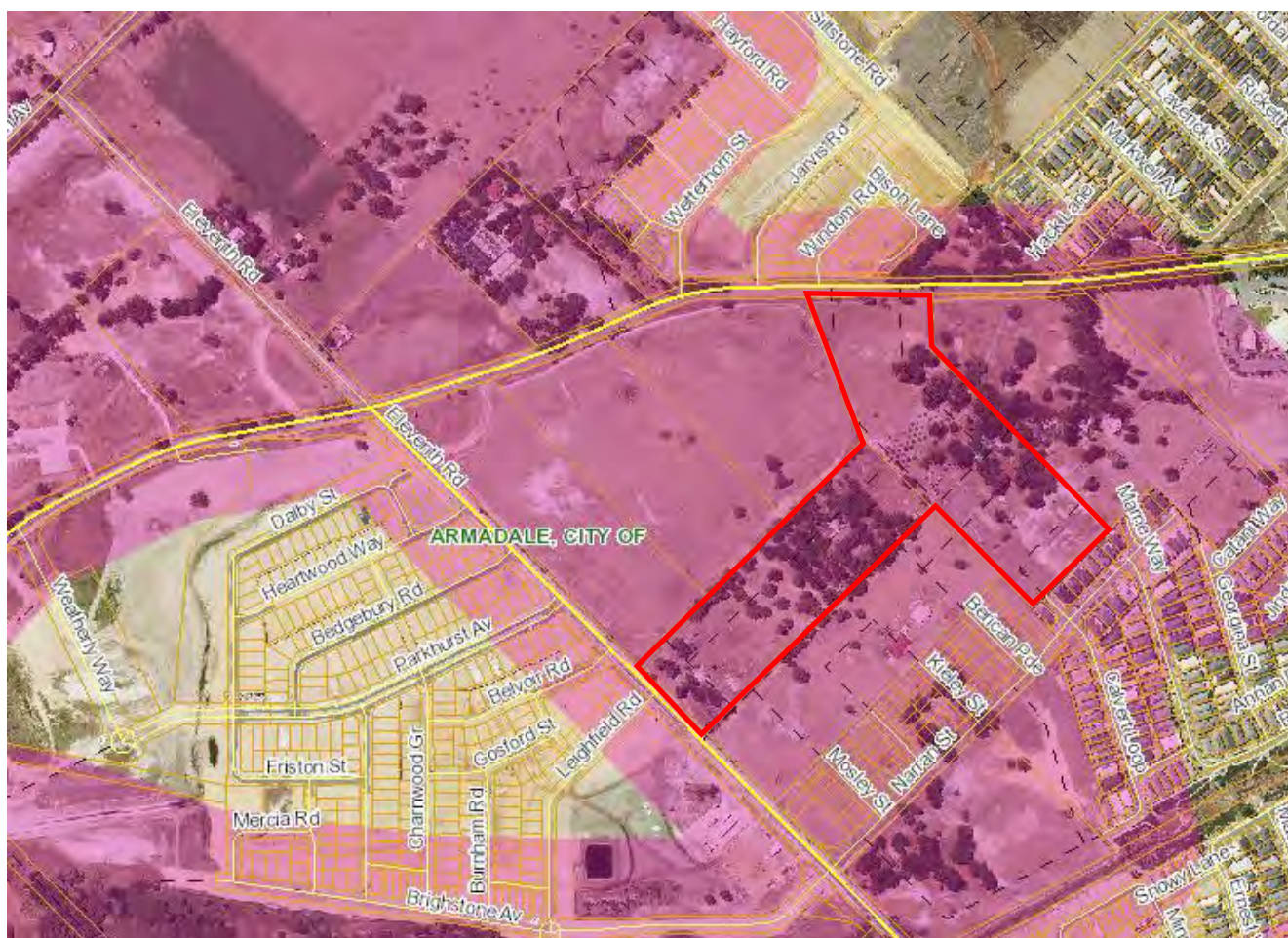


Figure 1B: Map of Bushfire Prone Areas 2018 (sourced September 2018)



Figure 1C: Plan of Subdivision for Lots 20 & 21 Eleventh Rd and Lot 16 Forrest Rd, Hilbert

2.0 Environmental Considerations

2.1 Native Vegetation – Modification and Clearing

Ultimately, the entirety of Lot 20 Eleventh and Lot 16 Forrest Roads will be permanently cleared for residential development, except for the retained and landscaped POS areas as follows:

- Proposed Lot 669 (5138m²)
- Proposed Lot 670 (2079m²)
- Proposed Lot 491 (3312m²)

For stage 1 of the subdivision, all vegetation within Lot 20 Eleventh Road will be established and managed as low threat, meeting the AS3959 Low Threat Exclusion 2.2.3.2 (f), and A2.1 of the *Guidelines for planning in bushfire prone areas appendices*.

Low threat vegetation and establishment will also extend for at least 100m towards Plot 9 Woodland vegetation and 50m towards Plots 10 and 12 grassland vegetation, from the Lot 669 POS area.

The single row of trees along the north west boundary of Lot 20 Eleventh Road may be retained when managed in accordance with A2.1 of the guidelines for the understorey management requirements of <2t/ha. This retained vegetation will ultimately be removed as part of future stages of subdivision earthworks.

2.2 Grassland Vegetation – Modification and Clearing

Lots 17 to 19 Forrest Road consists of unmanaged grassland, within the lots owned by the City of Armadale. Whilst a timeframe is unknown, future subdivision and residential development within these lots will occur in the future. This future development will remove all of the grassland and lower the BAL impacts from the north west side of this BMP's subdivision application to BAL-LOW.

In order to reduce the BAL ratings to an acceptable level, cognisant of the fact that the BAL ratings will, in the future reduce to BAL-LOW, the developer has accepted a BAL-12.5 rating on the lots abutting Lots 17 – 19 Forrest Road.

In order to achieve a BAL-12.5 equivalent radiant heat impact, a 17m hazard separation is required from the lot boundaries to the edge of grassland that is >100mm in height. To achieve this 17m separation, the client has agreed to recompense the City for the establishment and ongoing maintenance of a 6m wide firebreak immediately abutting the lot boundaries, and an 11m low threat buffer slashing regime, extending from the 6m wide firebreak.

This is to be via an agreed management order placed on the developer that is legally binding until such a time that development within Lots 17-19 Forrest Road permanently removes or manages the vegetation to a low threat state.

2.3 Re-Vegetation/ Landscape Management Plans

There are no areas within the subdivision site that are identified as being subject to revegetation.

The proposed Lot 669 POS area will be established and maintained as a low threat area, consistent with AS 3959 Clause 2.2.3.2 (f) in later stages of subdivision.

The future management of Lot 669 and 670 POS areas are subject to the approval of a Landscape Management Plan as illustrated in the draft contained at Appendix 2. This is to be implemented in future subdivision stages.

A drainage swale, identified as Plot 5 on the Vegetation Class map (Figure 3A) in Lot 21 Eleventh Rd, and extending into Lot 16 Forrest Rd, shall be planted with nutrient stripping species within the centre drainage route, and have grassland edges, managed in a low threat state of <100mm. Appendix 4 details the drainage basin earthworks.

3.0 Bushfire Assessment Results

3.1 Assessment Inputs

3.1.1 Effective Slope

Effective slope under each vegetation plot was determined in accordance with the methodology detailed in *AS 3959-2009 Construction of buildings in bushfire prone areas* (AS 3959) (Standards Australia, 2009).

Slope data was measured on site and cross referenced with elevation data sourced from the Environmental Planning Tool (EPT) (WALGA, 2018).

3.1.2 Vegetation Classification

Vegetation classification was determined in accordance with the methodology detailed in *AS 3959 and the Visual Guide for Bushfire Risk Assessment in Western Australia*, First Edition (Department of Planning, 2016).

All bushfire structures and fuel loads are assessed in their mature states (including revegetation and rehabilitation areas) unless otherwise identified.

3.1.3 Summary of Assessment Inputs

Table 3A summarises the vegetation classification and effective slope of each Vegetation Plot. Figure 3A illustrates the location and classification of each vegetation plot as well as the elevation contours for the assessment area.

Table 3A: Summary of Assessment Inputs

Vegetation Plot	Vegetation Classification or Exclusion Clause	Effective Slope under the vegetation (degrees)
1	Class B Woodland	Flat/ Upslope
2	Class G Grassland	Flat/ Upslope
3	Exclusion 2.2.3.2 (e) & (f)	N/A
4	Exclusion 2.2.3.2 (e) & (f)	N/A
5	Exclusion 2.2.3.2 (f)	N/A
6	Exclusion 2.2.3.2 (f)	N/A
7	Exclusion 2.2.3.2 (f)	N/A
8	Exclusion 2.2.3.2 (f)	N/A
9	Class B Woodland	Flat/ Upslope
10	Class G Grassland	Flat/ Upslope
11	Exclusion 2.2.3.2 (e) & (f)	N/A
12	Class G Grassland	Flat/ Upslope
13	Exclusion 2.2.3.2 (e) & (f)	N/A
14	Exclusion 2.2.3.2 (e) & (f)	N/A
15	Exclusion 2.2.3.2 (f)	N/A

Vegetation Plot	Vegetation Classification or Exclusion Clause	Effective Slope under the vegetation (degrees)
16	Exclusion 2.2.3.2 (e) & (f)	N/A
17	Class G Grassland	Flat/ Upslope

3.1.4 Vegetation Plot Details

The location and classification of each Vegetation Plot within 150 metres of the site are mapped in Figure 3A. Photos and a description of each Plot are provided in the tables below.

Plot 1	
Existing	Class B Woodland
Post Development	Class B Woodland
Effective Slope	Flat/ Upslope
Plot 1 comprises the treed vegetation located within Lot 2029 Forrest Road to the north of the subject lot. Canopy cover is <30%, trees to approximately 20m and a grassland (managed) understorey.	
 Photo ID: 1a  Photo ID: 1b	

Plot 2

Existing	Class G Grassland
Post Development	Class G Grassland
Effective Slope	Flat Upslope

Plot 2 comprises the grassland vegetation located within Lot 2029 Forrest Road to the north of the subject lot. The City of Armadale 2017/18 Firebreak Notice (Appendix 3) only requires a 3m wide firebreak for all land >5000m². Whilst primarily managed at time of inspection, there is no enforceable instrument to require low threat management.



Photo ID: 2a



Photo ID: 2b



Photo ID: 2c

Plot 3

Existing	Class G Grassland (Open Woodland)
Post Development	Exclusion 2.2.3.2 (e) & (f)
Effective Slope	N/A

Plot 3 comprises the grassland vegetation within the south east portion of Lot 16 Forrest Rd. This vegetation will be removed for residential development, public roads and managed POS drainage reserve as part of Stage 1 subdivision works.



Photo ID: 3a

Plot 4

Existing	Class G Grassland (Open Woodland)
Post Development	Exclusion 2.2.3.2 (e) & (f)
Effective Slope	N/A

Plot 4 comprises the vegetation located within proposed Lots 661 to 668, being the Stage 1 subdivision works within Lot 20 Eleventh Rd.

This vegetation will be removed for residential development, public roads and managed POS drainage reserve as part of Stage 1 subdivision works.



Photo ID: 4a



Photo ID: 4b



Photo ID: 4c

Plot 5

Existing	Exclusion 2.2.3.2 (e)
Post Development	Exclusion 2.2.3.2 (e) & (f)
Effective Slope	N/A

Plot 5 comprises the POS drainage area within Lot 21 Eleventh Rd Hilbert.

At the time of inspection, the site was devoid of vegetation. Future landscaping will consist of a narrow drainage basin with nutrient stripping species and with managed grassland edges.



Photo ID: 5a



Photo ID: 5b

Plot 6

Existing	Class B Woodland
Post Development	Exclusion 2.2.3.2 (f)
Effective Slope	N/A

Plot 6 comprises low threat managed vegetation located within proposed Lot 669 POS area. The area measures <1 ha and is not within 50m of grassland vegetation or 100m of other classified vegetation, also meeting AS3959 exclusion 2.2.3.2 (b).

Appendix 2 contains the draft Landscape Management Plan for the POS for implementation during future subdivision stages.



Photo ID: 6a



Photo ID: 6b



Photo ID: 6c



Photo ID: 6d

Plot 7

Existing	Class B Woodland
Post Development	Exclusion 2.2.3.2 (f)
Effective Slope	N/A

Plot 7 comprises vegetation located within the drainage POS area in the south east corner of Lot 20 Eleventh Rd.

Future landscaping will consist of a narrow drainage basin with nutrient stripping species and with managed grassland edges.



Photo ID: 7a



Photo ID: 7b

Plot 8

Existing	Class B Woodland
Post Development	Exclusion 2.2.3.2 (f)
Effective Slope	N/A

Plot 8 comprises the low threat managed areas identified within Lot 16 Forrest Rd and Lot 20 Eleventh Rd, excluding the POS areas of Plots 6 & 7. The low threat management is required to reduce the bushfire risk to the surrounding residential development and Stage 1 of this BMP, as detailed within Section 2 of this BMP.

Vegetation management is to be established and maintained in accordance with AS3959 Exclusion 2.2.3.2 (f) and A2.1 of the guidelines.



Photo ID: 8a



Photo ID: 8b



Photo ID: 8c



Photo ID: 8d

Plot 8



Photo ID: 8e



Photo ID: 8f

Plot 9

Existing	Class B Woodland
Post Development	Class B Woodland
Effective Slope	Flat/ Upslope

Plot 9 comprises the treed vegetation to be retained within Lot 16 Forrest Road. Trees are to approximately 20m with a managed grazed understorey. Management of the understorey is to continue until tree removal is required and approved for later subdivision stages.



Photo ID: 9a



Photo ID: 9b

Plot 10

Existing	Class G Grassland
Post Development	Class G Grassland
Effective Slope	Flat Upslope

Plot 10 comprises the grassland vegetation within the northern portion of Lot 16 Forrest Rd.



Photo ID: 10a

Plot 11

Existing	Exclusion 2.2.3.2 (e) non-vegetated areas Exclusion 2.2.3.2 (f) low threat vegetation
Post Development	Exclusion 2.2.3.2 (e) non-vegetated areas Exclusion 2.2.3.2 (f) low threat vegetation
Effective Slope	N/A

Plot 11 consists residential development located on the north side of Forrest RD



Photo ID: 11a



Photo ID: 11b



Photo ID: 11c

Plot 12

Existing	Class G Grassland
Post Development	Class G Grassland
Effective Slope	Flat/Upslope

Plot 12 consists of the grassland vegetation located within Lots 17 to 19 Forrest Rd. The land is owned by the City of Armadale.



Photo ID: 12a



Photo ID: 12b



Photo ID: 12c



Photo ID: 12d

Plot 13	
Existing	Exclusion 2.2.3.2 (e) non-vegetated areas Exclusion 2.2.3.2 (f) low threat vegetation
Post Development	Exclusion 2.2.3.2 (e) non-vegetated areas Exclusion 2.2.3.2 (f) low threat vegetation
Effective Slope	N/A

Plot 13 comprises existing residential developed areas to the south and east of the Lot 21 Eleventh and Lot 16 Forrest roads, as highlighted within the orange shaded area in the image below.



Photo ID: N/A (Nearmap imagery)

Plot 14	
Existing	Class G Grassland
Post Development	Exclusion 2.2.3.2 (e) non-vegetated areas Exclusion 2.2.3.2 (f) low threat vegetation
Effective Slope	N/A
Plot 14 consists of the grassland vegetation located within Lots 17 to 19 Forrest Rd. The land is owned by the City of Armadale, that is to be established as a 6m wide firebreak and 11m managed area as detailed within Section 2 of this report. Photos are consistent of those for Plot 12	

Plot 15

Existing	Exclusion 2.2.3.2 (e) non-vegetated areas Exclusion 2.2.3.2 (f) low threat vegetation
Post Development	Exclusion 2.2.3.2 (e) non-vegetated areas Exclusion 2.2.3.2 (f) low threat vegetation
Effective Slope	N/A

Plot 15 consists of the managed vegetation located within the school site to the south west of Eleventh Road.



Photo ID: 15a



Photo ID: 15b



Photo ID: 15c

Plot 16	
Existing	Exclusion 2.2.3.2 (e) non-vegetated areas
Post Development	Exclusion 2.2.3.2 (e) non-vegetated areas Exclusion 2.2.3.2 (f) low threat vegetation
Effective Slope	N/A

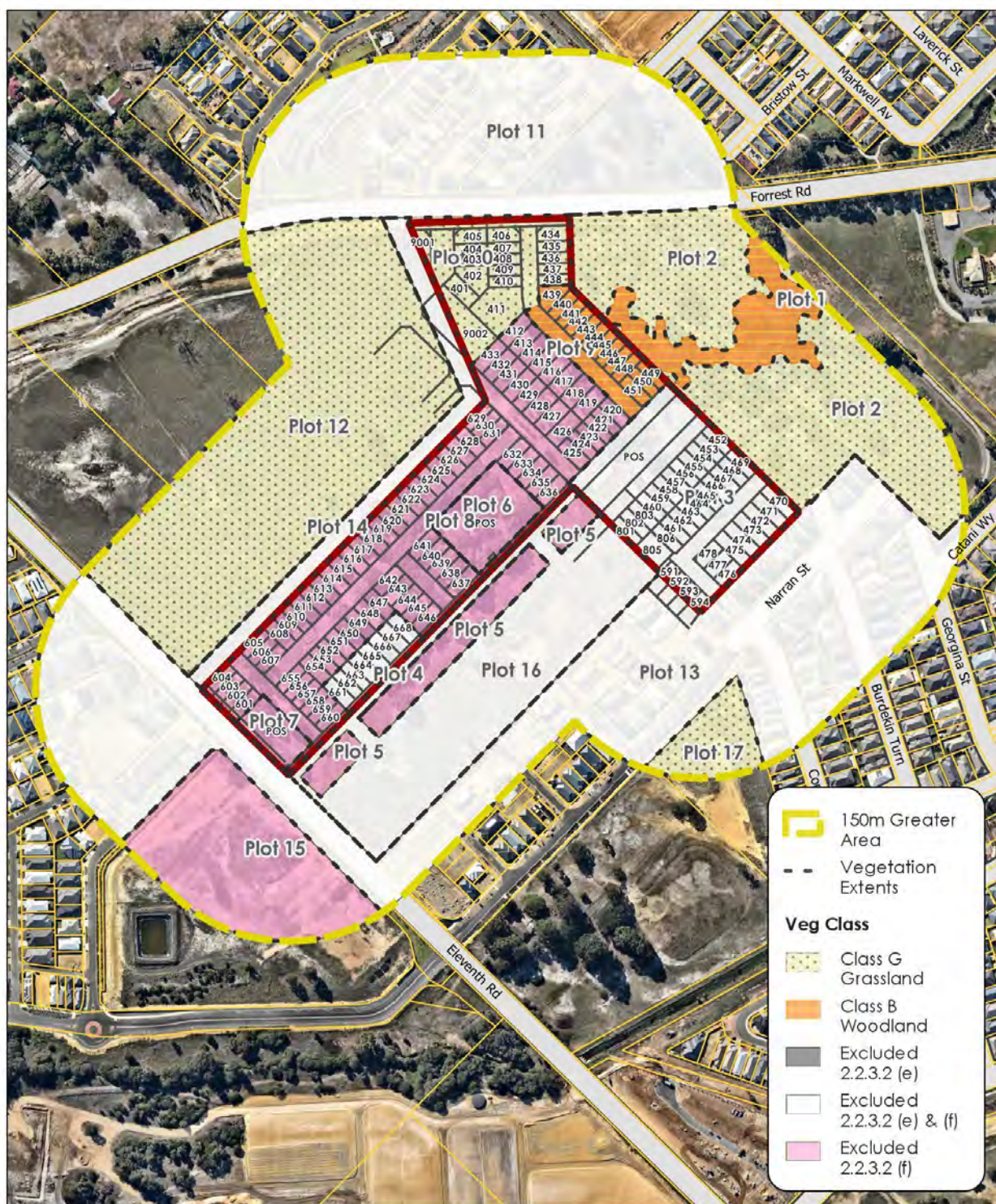
Plot 16 consists of Lot 21 Eleventh Rd that has been cleared of all vegetation for subdivisional earthworks. Refer to Plot 5 for photos.

Plot 17	
Existing	Exclusion 2.2.3.2 (e) non-vegetated areas Exclusion 2.2.3.2 (f) low threat vegetation
Post Development	Exclusion 2.2.3.2 (e) non-vegetated areas Exclusion 2.2.3.2 (f) low threat vegetation
Effective Slope	N/A

Plot 17 comprises vacant land to the south and east of the Lot 21 Eleventh and Lot 16 Forrest roads, as highlighted within the orange shaded area in the image below.



Photo ID: N/A (Nearmap imagery)



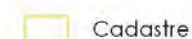
1300 797 607
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VEGETATION CLASSIFICATION

**Lot 16 and 20 Eleventh Road, Hilbert
 Stage 1**



Proposed Lots



Roads



Size: A4
 Scale: 1:4,500

0 50 100 150 200 m

Ref: 8086_002_01_VegClass_20170427
 Projection: GDA94 MGA50
 Author: MMA - RUIC | Date: 2018-08-24
 Data Source: Cadastre - Landgate; Imagery - Neamap;
 Roads, Site Boundary, Veg, BAL, Buffers, BMS - RUIC.

Disclaimer: Although the data within this map is considered accurate at the time of creation, RUIC Fire does not guarantee, and accepts no legal liability whatsoever arising from or connected to, the accuracy, reliability, currency or completeness of any data used within this map.

Figure 3A: Post Development Vegetation Classifications

3.2 Assessment Outputs

Potential bushfire impact analysis was undertaken in accordance with AS 3959 Methodology 1 to determine the potential worst case scenario radiant heat impact on each of the lots in the proposed development.

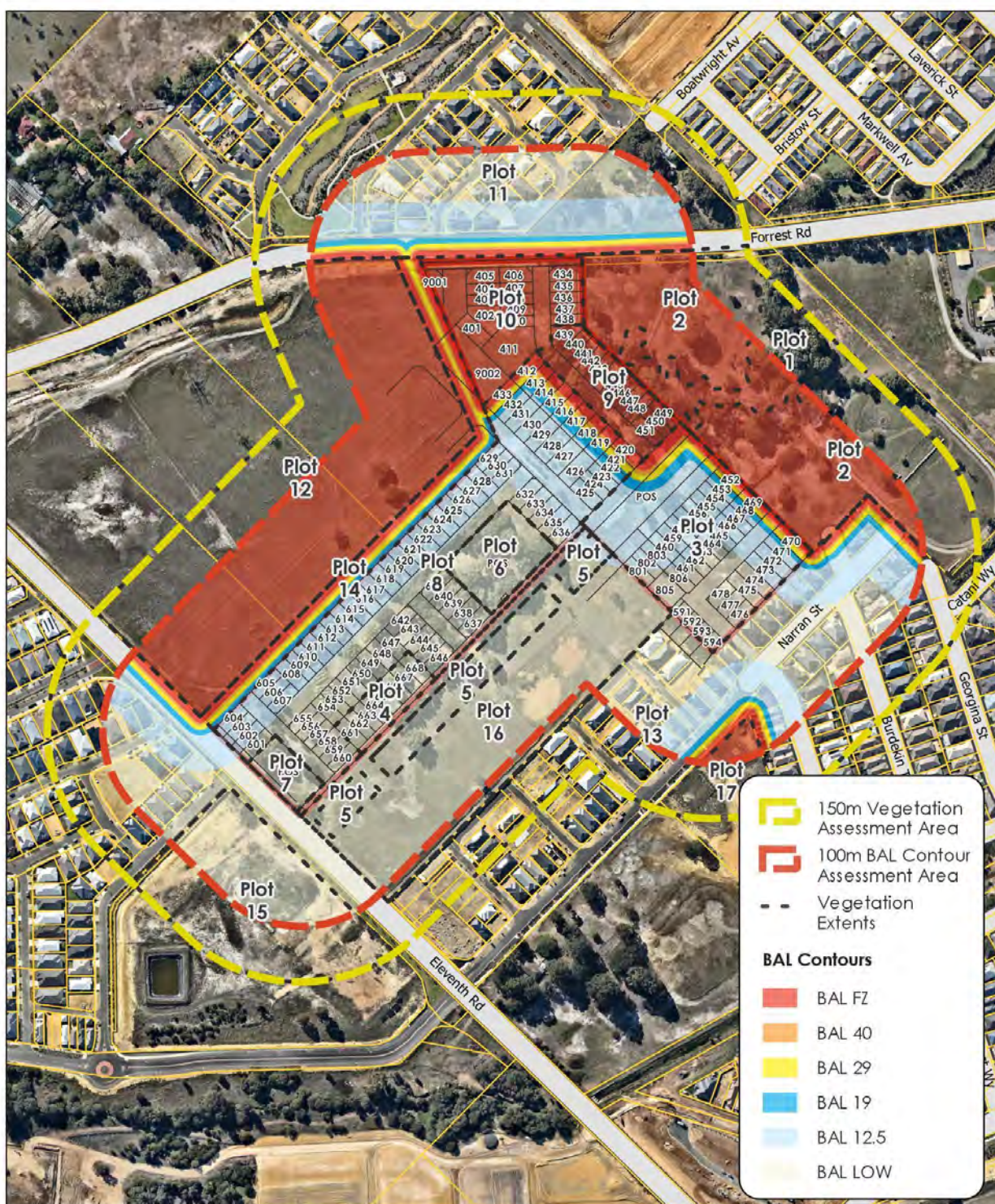
Table 3B and Figure 3B provides a summary of the indicative BALs applicable to each proposed Stage 1 lot on completion of the subdivision civil works and establishment of the POS areas as low threat. The table lists the highest BAL applicable to each lot as well as an achievable BAL that future habitable development could attain through strategic siting of the building within the lot.

Table 3B: Methodology 1 Bushfire Attack Level Assessment Results

AS 3959 Methodology 1 BAL Assessment for Stage 1 lots						
Lot	Vegetation Classification	Vegetation Plot	Effective Slope (degrees)	Separation Distance (m)	Highest BAL	Achievable BAL
452	Class G Grassland	Plot 2	Flat/ Upslope	3	BAL-FZ	
453	Class G Grassland	Plot 2	Flat/ Upslope	13.5	BAL-19	
454	Class G Grassland	Plot 2	Flat/ Upslope	24	BAL-12.5	
455	Class G Grassland	Plot 2	Flat/ Upslope	35	BAL-12.5	
456	Class B Woodland	Plot 2	Flat/ Upslope	45	BAL-12.5	
457	Class B Woodland	Plot 2	Flat/ Upslope	53	BAL-12.5	
458	Class B Woodland	Plot 2	Flat/ Upslope	55	BAL-12.5	
459	Class B Woodland	Plot 2	Flat/ Upslope	59	BAL-12.5	
460	Class B Woodland	Plot 2	Flat/ Upslope	65	BAL-12.5	
803	Class B Woodland	Plot 2	Flat/ Upslope	83	BAL-12.5	
802	Class B Woodland	Plot 2	Flat/ Upslope	79	BAL-12.5	
801	Class B Woodland	Plot 2	Flat/ Upslope	87	BAL-12.5	
469	Class G Grassland	Plot 2	Flat/ Upslope	3	BAL-FZ	
468	Class G Grassland	Plot 2	Flat/ Upslope	13.5	BAL-19	
467	Class G Grassland	Plot 2	Flat/ Upslope	24	BAL-12.5	
466	Class G Grassland	Plot 2	Flat/ Upslope	35	BAL-12.5	
465	Class G Grassland	Plot 2	Flat/ Upslope	45	BAL-12.5	
464	Class B Woodland	Plot 2	Flat/ Upslope	83	BAL-12.5	
463	Class B Woodland	Plot 2	Flat/ Upslope	85	BAL-12.5	
462	Class B Woodland	Plot 2	Flat/ Upslope	87	BAL-12.5	BAL-LOW
461	Class B Woodland	Plot 2	Flat/ Upslope	91	BAL-12.5	BAL-LOW
806	Class B Woodland	Plot 2	Flat/ Upslope	96	BAL-12.5	BAL-LOW
805	Class B Woodland	Plot 2	Flat/ Upslope	>100	BAL-low	
470	Class G Grassland	Plot 2	Flat/ Upslope	3	BAL-FZ	

AS 3959 Methodology 1 BAL Assessment for Stage 1 lots

Lot	Vegetation Classification	Vegetation Plot	Effective Slope (degrees)	Separation Distance (m)	Highest BAL	Achievable BAL
471	Class G Grassland	Plot 2	Flat/ Upslope	15	BAL-19	
472	Class G Grassland	Plot 2	Flat/ Upslope	27	BAL-12.5	
473	Class G Grassland	Plot 2	Flat/ Upslope	39	BAL-12.5	
474	Class G Grassland	Plot 2	Flat/ Upslope	>50	BAL-LOW	
475	Class G Grassland	Plot 2	Flat/ Upslope	>50	BAL-LOW	
476	Class G Grassland	Plot 2	Flat/ Upslope	>50	BAL-LOW	
477	Class G Grassland	Plot 2	Flat/ Upslope	>50	BAL-LOW	
478	Class G Grassland	Plot 2	Flat/ Upslope	>50	BAL-LOW	
591	Class G Grassland	Plot 2	Flat/ Upslope	>50	BAL-LOW	
592	Class G Grassland	Plot 2	Flat/ Upslope	>50	BAL-LOW	
593	Class G Grassland	Plot 2	Flat/ Upslope	>50	BAL-LOW	
594	Class G Grassland	Plot 2	Flat/ Upslope	>50	BAL-LOW	
661	Class G Grassland	Plot 12	Flat/ Upslope	>50	BAL-LOW	
662	Class G Grassland	Plot 12	Flat/ Upslope	>50	BAL-LOW	
663	Class G Grassland	Plot 12	Flat/ Upslope	>50	BAL-LOW	
664	Class G Grassland	Plot 12	Flat/ Upslope	>50	BAL-LOW	
665	Class G Grassland	Plot 12	Flat/ Upslope	>50	BAL-LOW	
666	Class G Grassland	Plot 12	Flat/ Upslope	>50	BAL-LOW	
667	Class G Grassland	Plot 12	Flat/ Upslope	>50	BAL-LOW	
668	Class G Grassland	Plot 12	Flat/ Upslope	>50	BAL-LOW	



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BAL CONTOURS

Lot 16 and 20 Eleventh Road, Hilbert Stage 1

Site Boundary

Proposed Lots

Cadastre

Roads



Size: A4
 Scale: 1:4,500

0 50 100 150 200 m

Ref: 8086_003_01_BALContours_20170427
 Projection: GDA94 MGA50
 Author: MVA - RUIC | Date: 2018-08-24
 Data Source: Cadastre - Landgate; Imagery - Neamap;
 Roads, Site Boundary, Veg, BAL, Buffers, BMS - RUIC.

Disclaimer: Although the data within this map is considered accurate at the time of creation, RUIC Fire does not guarantee, and accepts no legal liability whatsoever arising from or connected to, the accuracy, reliability, currency or completeness of any data used within this map.

Figure 3B: BAL Contour Map

4.0 Identification of Bushfire Hazard Issues

4.1 Bushfire Hazard Issues

Through the examination of the environmental considerations and the bushfire risk assessment, the following bushfire hazard issues have been identified.

- Lots 452, 469 and 470 are currently unable to achieve a BAL less than BAL-29 due to vegetation located within Lot 2029 Forrest Road. These lots are to be excluded from habitable development until permanent vegetation removal and/or management, external to the site, occurs to allow for a permanent reduction in the BALs. An updated BAL Contour map or individual BAL assessment will be required post the permanent vegetation works.
- This BMP assumes that the POS areas are to be established and maintained as low threat vegetation consistent with AS 3959 Clause 2.2.3.2 (f) and/ or A2.1 (APZ) of the Guidelines. An approved Landscape Plan (draft at Appendix 2) is required to guide the POS establishment and ongoing management during future subdivision stages.
- The developers and the City of Armadale are to enter into an agreement for the establishment and ongoing low threat vegetation management of a 6 metre wide firebreak plus an additional 11m managed grassland buffer along the northern boundary of Lot 20 Eleventh Road and south western boundary of Lot 16 Forrest Road, as indicated by Plot 14.
- The BAL ratings provided in the BAL Contour map (Figure 3B) and Table 3B are indicative only and are for the purposes of demonstrating compliance with the bushfire protection criteria of SPP 3.7. The BAL Contour map is to be updated following the implementation of the bushfire strategies contained within this report. Alternatively, an individual BAL assessment is to be completed prior to the issue of the building permit.
- Future residential BCA Class 1, 2, 3 and associated Class 10a buildings are to be constructed to the applicable construction standard of AS 3959.
- The subdivision contains lots that are subject to a BAL above BAL-LOW, as identified within Table 3B. The bushfire protection criteria relevant to the development are addressed in Section 5 of this report.

4.2 Additional Management Strategies

The following items require specific consideration in relation to the subdivision and future planning stages.

4.2.1 Landscape Management Plan

An approved Landscape Management Plan (draft at Appendix 2) is required to demonstrate low threat vegetation implementation and ongoing management in perpetuity to maintain the low threat status during future subdivision stages. As part of this BMP, the POS areas are to be established and maintained as low threat meeting AS3959 c2.2.3.2 (f).

4.2.2 Local Government Firebreak Notice

The 2018/19 City of Armadale Firebreak Notice, is located in Appendix 3 and detailed below;

- **Does your property have a Fire Management Plan?**
 - o *All properties with a Fire Management Plan as part of a subdivision consent shall comply with the plan in its entirety.*
- **All Areas of Land over 5000m²**
 - o *Install bare mineral earth trafficable firebreaks clear of all flammable material to a minimum of three (3) metres wide immediately inside all external boundaries of the land. All overhanging branches, trees, limbs etc. to be trimmed back to a four (4) metre high clear vertical axis over the firebreak area. Install bare mineral earth trafficable firebreaks to a minimum of three (3) metres wide immediately surrounding all buildings, sheds and haystacks or groups of buildings situated on the land, with all overhanging branches, trees, limbs etc. to be trimmed back to three (3) metres high with a clear vertical axis over the firebreak area. This includes driveways and access to all buildings on the land.*
 - o *If the requirements of this notice are carried out by burning, such burning must be in accordance with the relevant provisions of the Bush Fires Act 1954.*
 - o **MOWED FIREBREAKS ARE NOT PERMITTED**

4.2.3 Lot specific BAL assessments

A lot specific BAL Assessment is required at the Development Application stage of planning for future BCA Class 1a, 2, 3 or associated 10a buildings.

4.2.4 Future Bushfire Management Plans

This BMP is to be updated for future stages of subdivision

5.0 Responsibilities for Implementation and Management

This section sets out the responsibilities of the developer/s, landowner/s and the local government with regards to the initial implementation and ongoing maintenance of the required bushfire management strategies in perpetuity.

Tables 6A to 6C outline the Bushfire Risk Management Measures included as part of the subdivision and assigns responsibilities and timing for implementation and maintenance. *Implementation of the BMP applies to the developer, prospective landowners and the City of Armadale.*

Table 6A: Developer Responsibilities prior to issue of titles

DEVELOPER – PRIOR TO ISSUE OF TITLES		
No.	Implementation Action	Subdivision Clearance
1	Establish low threat vegetation (APZ standard) as detailed within this BMP for Plots 3, 4, 6, 7, 8 and 14 of Figure 3A	☐
2	The developer and the City of Armadale are to enter into an agreement for the establishment and ongoing low threat vegetation management of a 6 metre wide firebreak plus an additional 11m managed grassland buffer along the northern boundary of Lot 20 Eleventh Road and south western boundary of Lot 16 Forrest Road, as indicated by Plot 14.	☐

Certification by Bushfire Consultant

I _____ certify that at the time of inspection, the BAL ratings contained within this BMP are correct/have been updated to reflect final site conditions (delete as applicable); and implementation actions 1 – 2 have been undertaken in accordance with the BMP.

Clearance is recommended by a Bushfire Consultant.

Signature: _____ Date: _____

BPAD No. _____ Accreditation Level: _____

Table 6B: Landowner/ Developer Responsibilities prior settlement or issue of titles

LANDOWNER/ DEVELOPER – PRIOR TO SETTLEMENT OR ISSUE OF TITLES	
No.	Implementation Action
1	Maintain the low threat vegetation (APZ standard) as detailed within this BMP for Plots 3, 4, 6, 7, 8 and 14 of Figure 3A
2	Comply with the relevant local government annual firebreak notice issued under s33 of the Bush Fires Act 1954.

Table 6C: Landowner/ Occupier/ Local Government ongoing Responsibilities

LANDOWNER/ OCCUPIER – ONGOING MANAGEMENT	
No.	Management Action
1	Maintain the Asset Protection Zone (APZ) across individual lot.
2	Comply with the relevant local government annual firebreak notice issued under s33 of the Bush Fires Act 1954.

LOCAL GOVERNMENT – ONGOING MANAGEMENT	
No.	Management Action
1	Maintain the 6m wide firebreak and 11m low threat buffer as per the vegetation management agreement for Lots 17 to 19 Forrest Road.
2	Maintain POS to low threat standard as detailed within the approved Landscape Management Plan, after handover period of two summers from the agreed handover date.
3	Ensure ongoing compliance with the bushfire risk management measures as detailed within this BMP

6.0 References

- Department of Planning. (2016). Visual Guide for Bushfire Risk Assessment in Western Australia First Edition. Western Australian Department of Planning. Perth, WA.
- OBRM. (2018). Map of Bush Fire Prone Areas 2018. Office of Bushfire Risk Management. Perth, WA.
- City of Armadale. (2018). Firebreak Notice. Effective from 30 November of each unless otherwise varied. City of Armadale, WA.
- Standards Australia. (2009). AS 3959-2009 Construction of buildings in bushfire prone areas. SAI Global.
- WALGA. (2018). Environmental Planning Tool. Western Australian Local Governments Association, WA.
- WAPC. (2015). State Planning Policy 3.7 Planning in Bushfire Prone Areas. Western Australian Planning Commission & Department of Planning.
- WAPC. (2016). Planning Bulletin 111/2016 Planning in Bushfire Prone Areas. Western Australian Planning Commission.
- WAPC. (2017a). Guidelines for Planning in Bushfire Prone Areas Version 1.3. Western Australian Planning Commission, Department of Planning & Department of Fire and Emergency Services.
- WAPC. (2017b). Guidelines for Planning in Bushfire Prone Areas Appendices Version 1.3. Western Australian Planning Commission, Department of Planning & Department of Fire and Emergency Services.

Appendix 1 – Technical Information for Developers and Landowners

A1.1 Asset Protection Zone Technical Requirements (Element 2)

ELEMENT 2: SITING AND DESIGN OF DEVELOPMENT

Acceptable Solution

A2.1 Asset Protection Zone (APZ)

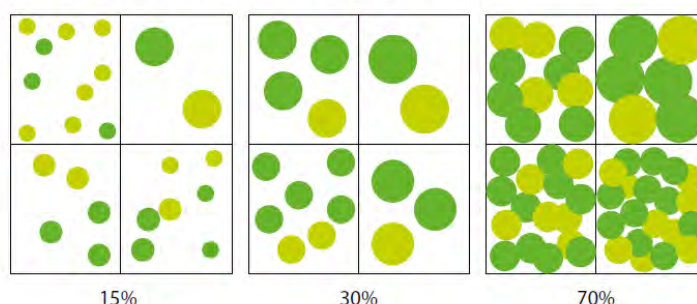
Every building is surrounded by, and every proposed lot can achieve, an APZ depicted on submitted plans, which meets the following requirements:

- **Width:** Measured from any external wall or supporting post or column of the proposed building, and of sufficient size to ensure the potential radiant heat impact of a fire does not exceed 29kW/m² (BAL-29) in all circumstances.
- **Location:** the APZ should be contained solely within the boundaries of the lot on which a building is situated, except in instances where the neighbouring lot or lots will be managed in a low-fuel state on an ongoing basis, in perpetuity (see explanatory notes).
- **Management:** the APZ is managed in accordance with the requirements of 'Standards for Asset Protection Zones' (see Schedule 1).

SCHEDULE 1: STANDARD FOR ASSET PROTECTION ZONES

- **Fences:** within the APZ are constructed from non-combustible materials (e.g. iron, brick, limestone, metal post and wire). It is recommended that solid or slatted non-combustible perimeter fences are used.
- **Objects:** within 10 metres of a building, combustible objects must not be located close to the vulnerable parts of the building i.e. windows and doors.
- **Fine Fuel load:** combustible dead vegetation matter less than 6 millimetres in thickness reduced to and maintained at an average of two tonnes per hectare.
- **Trees (> 5 metres in height):** trunks at maturity should be a minimum distance of 6 metres from all elevations of the building, branches at maturity should not touch or overhang the building, lower branches should be removed to a height of 2 metres above the ground and or surface vegetation, canopy cover should be less than 15% with tree canopies at maturity well spread to at least 5 metres apart as to not form a continuous canopy.

Figure 18: Tree canopy cover – ranging from 15 to 70 per cent at maturity



- **Shrubs (0.5 metres to 5 metres in height):** should not be located under trees or within 3 metres of buildings, should not be planted in clumps greater than 5m² in area, clumps of shrubs should be separated from each other and any exposed window or door by at least 10 metres. Shrubs greater than 5 metres in height are to be treated as trees.
- **Ground covers (<0.5 metres in height):** can be planted under trees but must be properly maintained to remove dead plant material and any parts within 2 metres of a structure, but 3 metres from windows or doors if greater than 100 millimetres in height. Ground covers greater than 0.5 metres in height are to be treated as shrubs.
- **Grass:** should be managed to maintain a height of 100 millimetres or less.

A1.2 Vehicular Access Technical Requirements (Element 3)

ELEMENT 3: VEHICULAR ACCESS

A3.8 Firebreak width

Lots greater than 0.5 hectares must have an internal perimeter firebreak of a minimum width of three metres or to the level as prescribed in the local firebreak notice issued by the local government.

Refer to the Local Government Firebreak Notice at Appendix 3 for firebreak requirements.

Appendix 2 – Draft Landscaping Plan

REV	DATE	ISSUE
A	11/05/2024	11/05/2024
B	11/05/2024	11/05/2024
C	11/05/2024	11/05/2024
D	11/05/2024	11/05/2024
E	11/05/2024	11/05/2024



LOCATION PLAN



LEGEND

NOTES

1. ALL WORKS TO BE COMPLETED BY 11/05/2024.

2. ALL WORKS TO BE COMPLETED BY 11/05/2024.

3. ALL WORKS TO BE COMPLETED BY 11/05/2024.

4. ALL WORKS TO BE COMPLETED BY 11/05/2024.

5. ALL WORKS TO BE COMPLETED BY 11/05/2024.

6. ALL WORKS TO BE COMPLETED BY 11/05/2024.

7. ALL WORKS TO BE COMPLETED BY 11/05/2024.

8. ALL WORKS TO BE COMPLETED BY 11/05/2024.

9. ALL WORKS TO BE COMPLETED BY 11/05/2024.

10. ALL WORKS TO BE COMPLETED BY 11/05/2024.



ecoscope

AUTHOR: TK
CHECKED: PJ
PROJECT NO: 3036-16
LOT 20 ELEVENTH ROAD
CLIENT: BLOCK PROPERTY AUSTRALIA

COVER SHEET

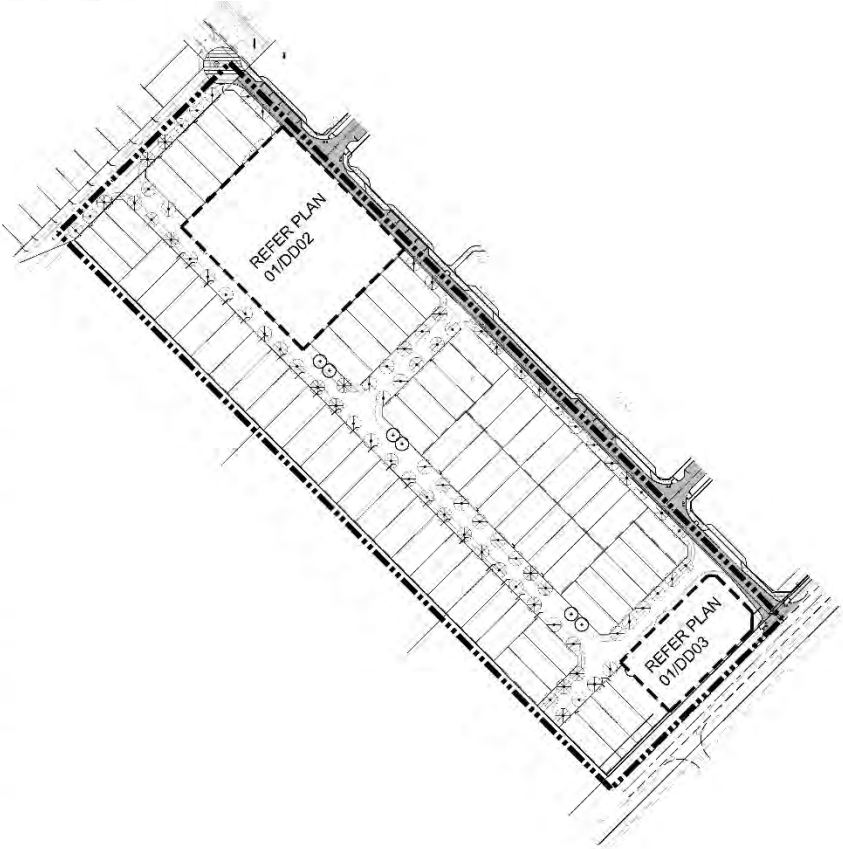
DD00 - E

SCALE 1:1000 @ A1

0 10 20 30 40 50 100m

DESIGN DEVELOPMENT			
DWG NO.	DWG NAME	SCALE @ A1	REV
DD00	COVER SHEET	1:1000	E
DD01	STREETSCAPE PLAN	1:750	E
DD02	PUBLIC OPEN SPACE PLAN	1:200	E
DD03	RAIN GARDEN PLANS	AS SHOWN	E

LOT 20 ELEVENTH ROAD
LANDSCAPE ARCHITECTURAL DRAWINGS



REV	DATE	ISSUE
1	01/04/20	ISSUE FOR APPROVAL
2	02/04/20	REVISIONS APPROVED
3	02/04/20	REVISIONS APPROVED
4	02/04/20	REVISIONS APPROVED
5	02/04/20	REVISIONS APPROVED



LOCATION PLAN



LEGEND

Symbol	Botanical Name	Pot Size
	<i>Allocasuarina fraseriana</i>	45L
	<i>Corymbia calophylla</i>	45L
	<i>Eucalyptus viminalis</i>	45L

NOTE: ALL TREES TO BE PLANTED WITHIN 100M OF THE BUSHFIRE HAZARD ZONE.

NOTES

1. ALL TREES TO BE PLANTED WITHIN 100M OF THE BUSHFIRE HAZARD ZONE.

2. ALL TREES TO BE PLANTED WITHIN 100M OF THE BUSHFIRE HAZARD ZONE.

3. ALL TREES TO BE PLANTED WITHIN 100M OF THE BUSHFIRE HAZARD ZONE.

4. ALL TREES TO BE PLANTED WITHIN 100M OF THE BUSHFIRE HAZARD ZONE.

5. ALL TREES TO BE PLANTED WITHIN 100M OF THE BUSHFIRE HAZARD ZONE.

6. ALL TREES TO BE PLANTED WITHIN 100M OF THE BUSHFIRE HAZARD ZONE.

7. ALL TREES TO BE PLANTED WITHIN 100M OF THE BUSHFIRE HAZARD ZONE.

8. ALL TREES TO BE PLANTED WITHIN 100M OF THE BUSHFIRE HAZARD ZONE.

9. ALL TREES TO BE PLANTED WITHIN 100M OF THE BUSHFIRE HAZARD ZONE.

10. ALL TREES TO BE PLANTED WITHIN 100M OF THE BUSHFIRE HAZARD ZONE.

ecoscape

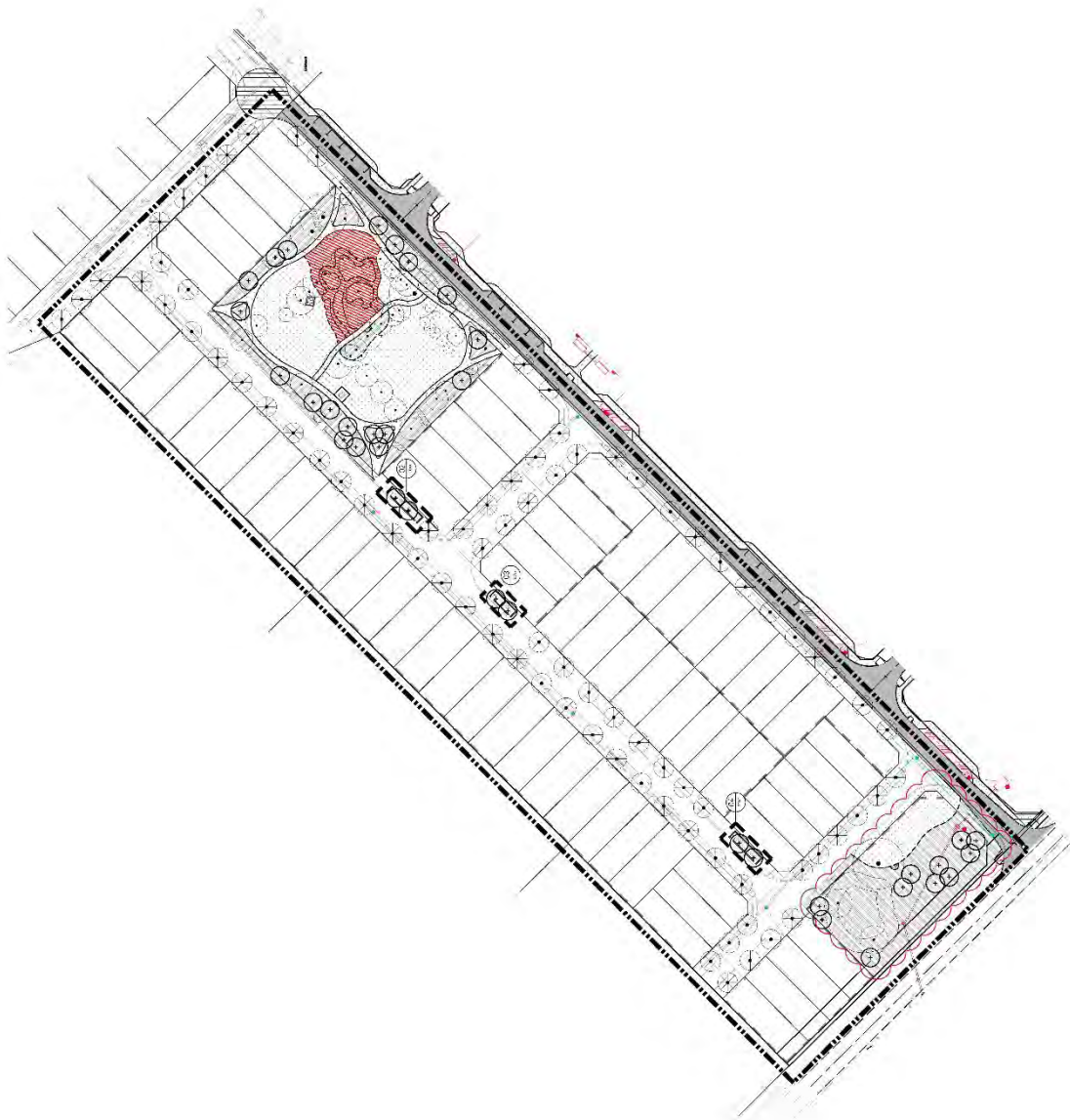
10 YEARS 10% DISCOUNT ON ALL PLANTING COSTS

AUTHOR TK CHECKED PJ PROJECT NO 3858-16

LOT 20 ELEVENTH ROAD
CLIENT: BLOKK PROPERTY AUSTRALIA

STREETSCAPE PLAN
DD01-E
SCALE 1:750 @ A1

0 7.5 15 22.5 30 37.5 75m



Lot 16 Forrest Rd & Lot 20 Eleventh Rd, Hilbert



REV

DATE

ISSUE

1

15/06/20

1.0

2

15/06/20

2.0

3

15/06/20

3.0

4

15/06/20

4.0

5

15/06/20

5.0

LOCATION PLAN



LEGEND

Public Open Space

Rain Garden

Medium Shrub

Low Shrub

Tree

Boundary

Footpath

Road

Kerb

Gutter

Drainage

Stormwater

Sewerage

Gas

Water

Electricity

Telecommunications

Other

NOTES

1. ALL PLANTING IS TO BE DONE IN ACCORDANCE WITH THE LOCAL GOVERNMENT'S PLANTING GUIDELINES.

2. ALL PLANTING IS TO BE DONE IN ACCORDANCE WITH THE LOCAL GOVERNMENT'S PLANTING GUIDELINES.

3. ALL PLANTING IS TO BE DONE IN ACCORDANCE WITH THE LOCAL GOVERNMENT'S PLANTING GUIDELINES.

4. ALL PLANTING IS TO BE DONE IN ACCORDANCE WITH THE LOCAL GOVERNMENT'S PLANTING GUIDELINES.

5. ALL PLANTING IS TO BE DONE IN ACCORDANCE WITH THE LOCAL GOVERNMENT'S PLANTING GUIDELINES.

ecoscope

AUTHOR: TK

CHECKED: PJ

PROJECT NO: 2654-16

LOT 20 ELEVENTH ROAD

CLIENT: BUNK PROPERTY AUSTRALIA

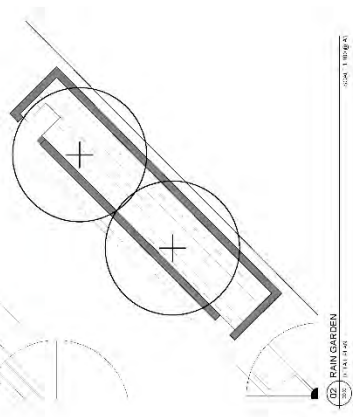
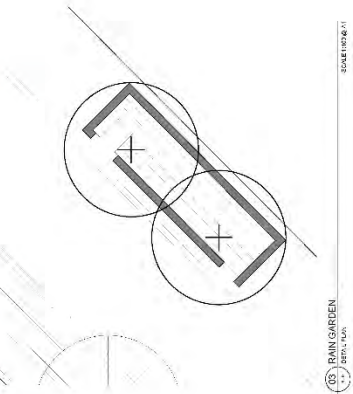
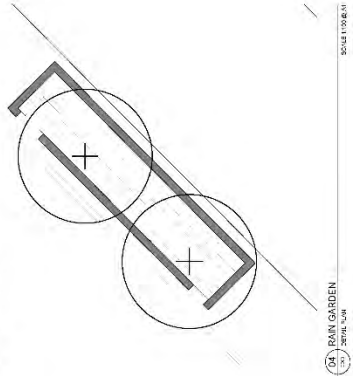
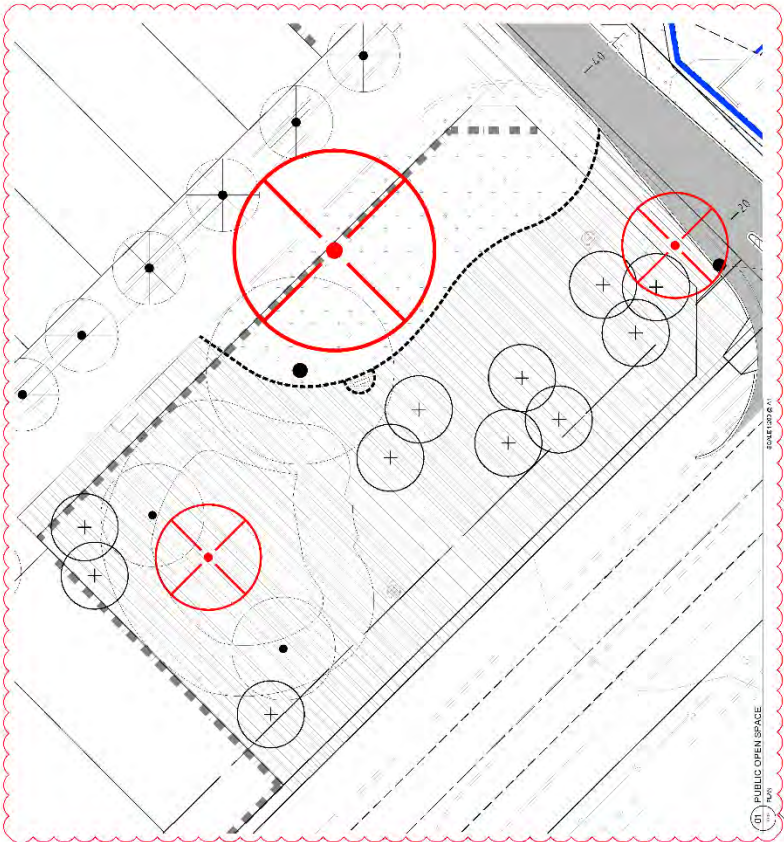
RAIN GARDEN

DD03-E

SCALE 1:200 @ A1

0 2 4 6 8 10 20m

Symbol	Botanical Name	Pot Size
Cal	Corymbia calophylla	45L
Eu	Eucalyptus victrix	45L
Mth	Mealeuca maphrophylla	100L
Rain Garden Planting Mix (3 per sqm)		
Fno	Ficinia nodosa	Tubestock
Ice	Isolepis cernua	Tubestock
Jkr	Juncus kraussii	Tubestock
Mla	Mealeuca lateralis	Tubestock
Bash Planting Mix (3 per sqm)		
Bca	Bolboschoenus caldwellii	Tubestock
Cte	Carex tetraclaus	Tubestock
Cap	Carex appressa	Tubestock
Eac	Eleocharis acuta	Tubestock
Fno	Ficinia nodosa	Tubestock
Ice	Isolepis cernua	Tubestock
Jpa	Juncus pallidus	Tubestock
Jkr	Juncus kraussii	Tubestock
Lto	Lomandra longifolia	Tubestock
Mla	Mealeuca lateralis	Tubestock
Mic	Mealeuca incana	Tubestock
Low Shrubs (2 per sqm)		
Ana	Anigozanthos manglesii	Tubestock
Cca	Conostylis canalicans	Tubestock
Cse	Conostylis setigera	Tubestock
Bca	Babingtonia camphorosmae	Tubestock
Bni	Banksia nivea	Tubestock
Hpr	Hakea prostrata	Tubestock
Kpr	Kennedia prostrata	Tubestock
Mtr	Mealeuca trichophylla	Tubestock
Medium Shrubs (2 per sqm)		
Cpa	Calectanthus quadrifidus	Tubestock
Cpr	Callitris preissii	Tubestock
Hva	Hakea varia	Tubestock
Kgl	Kunzea glabrescens	Tubestock
Mvi	Mealeuca viminea	Tubestock
Rci	Regelia chilata	Tubestock
Vju	Viminaria juncea	Tubestock



Appendix 3 – City of Armadale Firebreak Notice 2018/19

FIREBREAK NOTICE



7 Orchard Avenue, Armadale
Western Australia 6112
Locked Bag No 2, Armadale
Western Australia 6992
www.armadale.wa.gov.au
ABN: 79 863 269 538

For updated information on alerts and
warnings about fires, floods, storms,
earthquakes, cyclones, hazardous
material incidents and more visit
www.emergency.wa.gov.au
DFES 1300 657 209
www.dfes.wa.gov.au

**Western Australian
Bureau of Meteorology** 1196
City of Armadale Rangers
9394 5000
After Hours 1300 886 885
To obtain a fire permit
9394 5000

NOTICE TO ALL OWNERS AND OCCUPIERS OF LAND WITHIN THE CITY OF ARMADALE

IN ALL EMERGENCIES CALL 000
FIRE AMBULANCE POLICE

Date: 6 August 2018

BUSH FIRES ACT 1954

Pursuant to the powers contained in Section 33 of the *Bush Fires Act 1954*, you are hereby required on or before the 30th day of November 2018 or within fourteen days of you becoming the owner or occupier of land should this be after the 30th day of November 2018 to clear firebreaks and remove flammable materials from the land owned or occupied by you as specified hereunder and to maintain the specified land and firebreaks clear of all flammable materials up to and including the 14th day of March 2019.

Definitions

FIREBREAK means a strip of land that has been cleared of all trees, bushes, grasses and any other object or thing or flammable material, leaving clear bare mineral earth. This includes the trimming back of all overhanging trees, bushes, shrubs and any other object or thing over the firebreak area.

FLAMMABLE means any bush, plant, tree, grass, mineral, vegetable, substance, object thing or material that may, or is likely to, catch fire and burn.

TRAFFICABLE means to be able to travel from one point to another in a 4x4 fire vehicle on a firm and stable surface, unhindered without any obstruction or getting bogged or trapped.

VERTICAL AXIS means a continuous vertical uninterrupted line at a right angle to the horizontal line of the firebreak.

All Areas of Land less than 5000m²

Have the entire land clear of all flammable material by mowing, slashing or other means. All grasses are to be maintained below five (5) centimetres in height and all trees, bushes, shrubs are to be trimmed back over driveways and access ways to all buildings to three (3) metres wide with a clear vertical axis over it to four (4) metres high to afford access for emergency services to all structures and points of the property.

All Areas of Land over 5000m²

Install bare mineral earth trafficable firebreaks clear of all flammable material to a minimum of three (3) metres wide immediately inside all external boundaries of the land. All overhanging branches, trees, limbs etc. to be trimmed back to a four (4) metre high clear vertical axis over the firebreak area. Install bare mineral earth trafficable firebreaks to a minimum of three (3) metres wide immediately surrounding all buildings, sheds and haystacks or groups of buildings situated on the land, with all overhanging branches, trees, limbs etc. to be trimmed back to three (3) metres high with a clear vertical axis over the firebreak area. This includes driveways and access to all buildings on the land.

If the requirements of this notice are carried out by burning, such burning must be in accordance with the relevant provisions of the *Bush Fires Act 1954*.

MOWED FIREBREAKS ARE NOT PERMITTED

Hazard Reduction

In addition to the provisions of this notice you may be required to carry out further works which are considered necessary by Council or an Authorised Officer of the City and specified by way of a separate written notice forwarded to the address as shown on the City of Armadale rates record for the relevant land.

Application to Vary Firebreak Requirements

If it is considered impracticable for any reason whatsoever to clear firebreaks or establish other arrangements as required by this notice, you may apply in writing to the City of Armadale, or its duly Authorised Officers, **no later than the 1st day of November 2018** for permission to provide firebreaks in alternative positions on the land. If permission is not granted by the City or its duly Authorised Officers you must comply with the requirements of this notice.

In some instances naturally occurring features such as rocky outcrops, natural watercourses or landscaping such as reticulated gardens, lawns or driveways may be an acceptable substitute for cleared firebreaks.

All firebreaks and other alternative arrangements allowed by the preceding parts of this notice must be established on or before the 30th day of November 2018 (or within 14 days of you becoming the owner or occupier should this occur after that date) and remain clear of flammable material up to and including the 14th day of March 2019.

All approved firebreak variations must be installed as close to the property boundary as practicable.

Note: No firebreak exemptions will be given. Please apply for a firebreak variation if an alternative location for firebreak installation is required.

Does your property have a Fire Management Plan?

All properties with a Fire Management Plan approved as part of a subdivision consent shall comply with the plan in its entirety.

PENALTY: \$5000

Fuel Storage

On all land where fuel drum ramps are located and where fuel dumps, whether contained fuel or not, are stored, clear maintained firebreaks three (3) metres wide with a clear vertical axis over it of four (4) metres in height, around any drum, ramp or stack of drums.

No Burning on Sundays or Public Holidays

An owner or occupier of land shall not set fire to, or cause or allow to be set on fire, any bush, rubbish or refuse whatsoever on a Sunday or a day that is a Public Holiday except when specifically authorised to do so for the purpose of fuel reduction by a Bush Fire Control Officer (BFCO) appointed by Council under the provisions of the *Bush Fires Act 1954*.

Penalties

The penalty for failing to comply with this notice is a fine not exceeding \$5000 and a person in default is also liable whether prosecuted or not to pay the costs of performing the work directed by this notice if it is not carried out by the owner and/or occupier by the date required by this notice.

By order of the City of Armadale
R S Tame - Chief Executive Officer

Appendix 4 – Drainage Swale Details



Appendix C

Vegetation Classification Plan

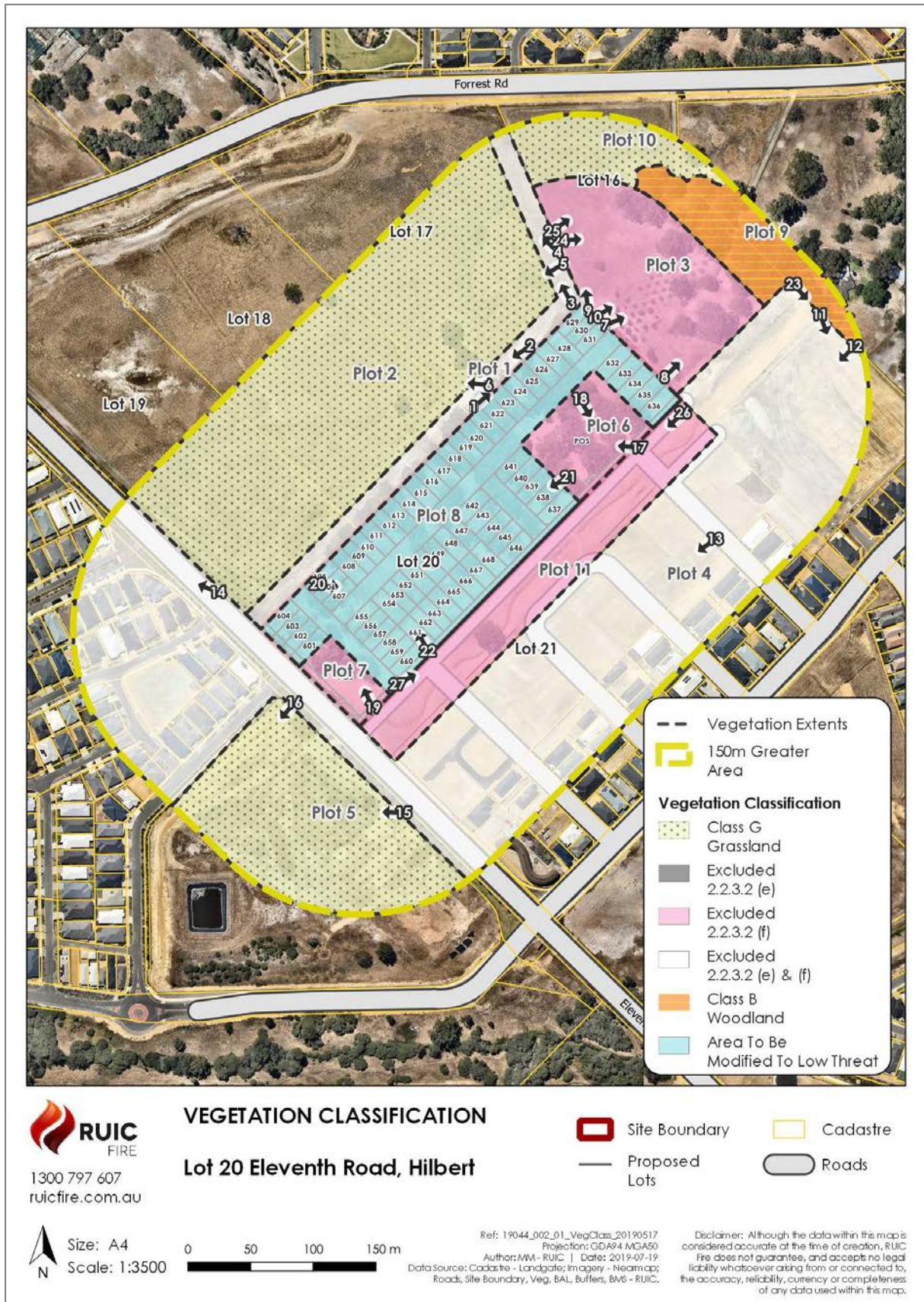


Figure 6: Vegetation Classification Plan

Appendix D

BAL Contour Plans

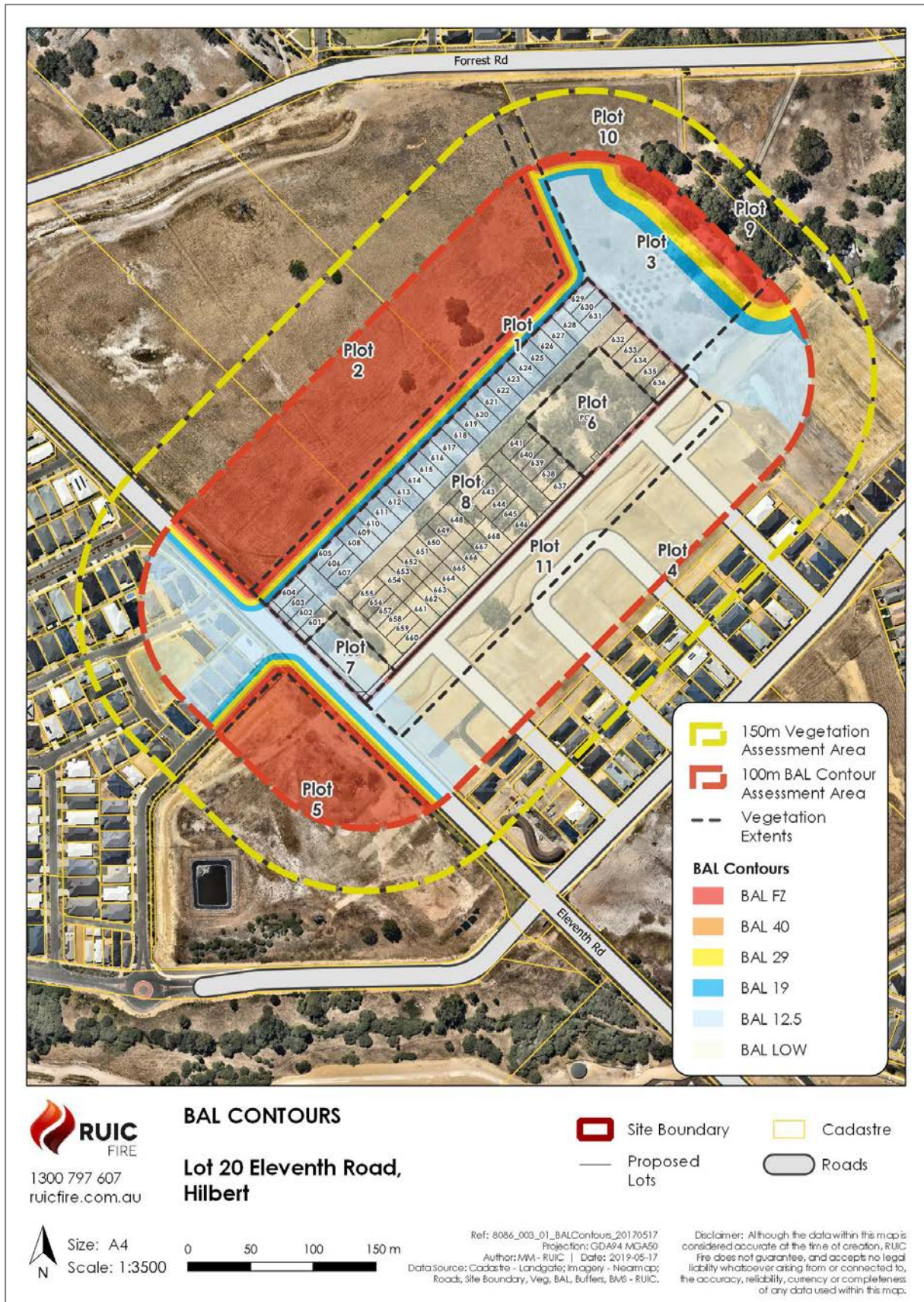


Figure 7: BAL Contour Plan - Overall

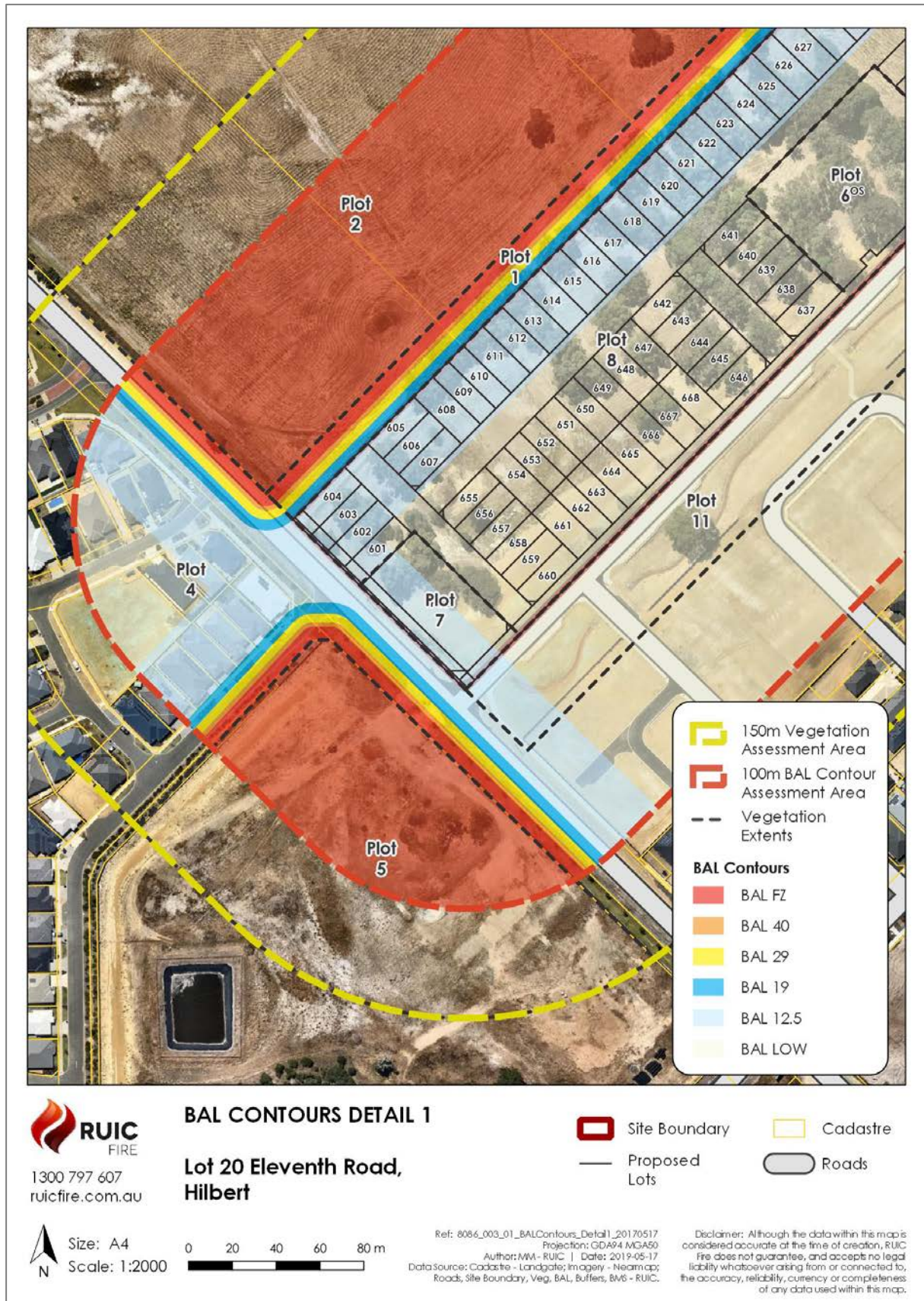


Figure 8: BAL Contour Plan – Detail South

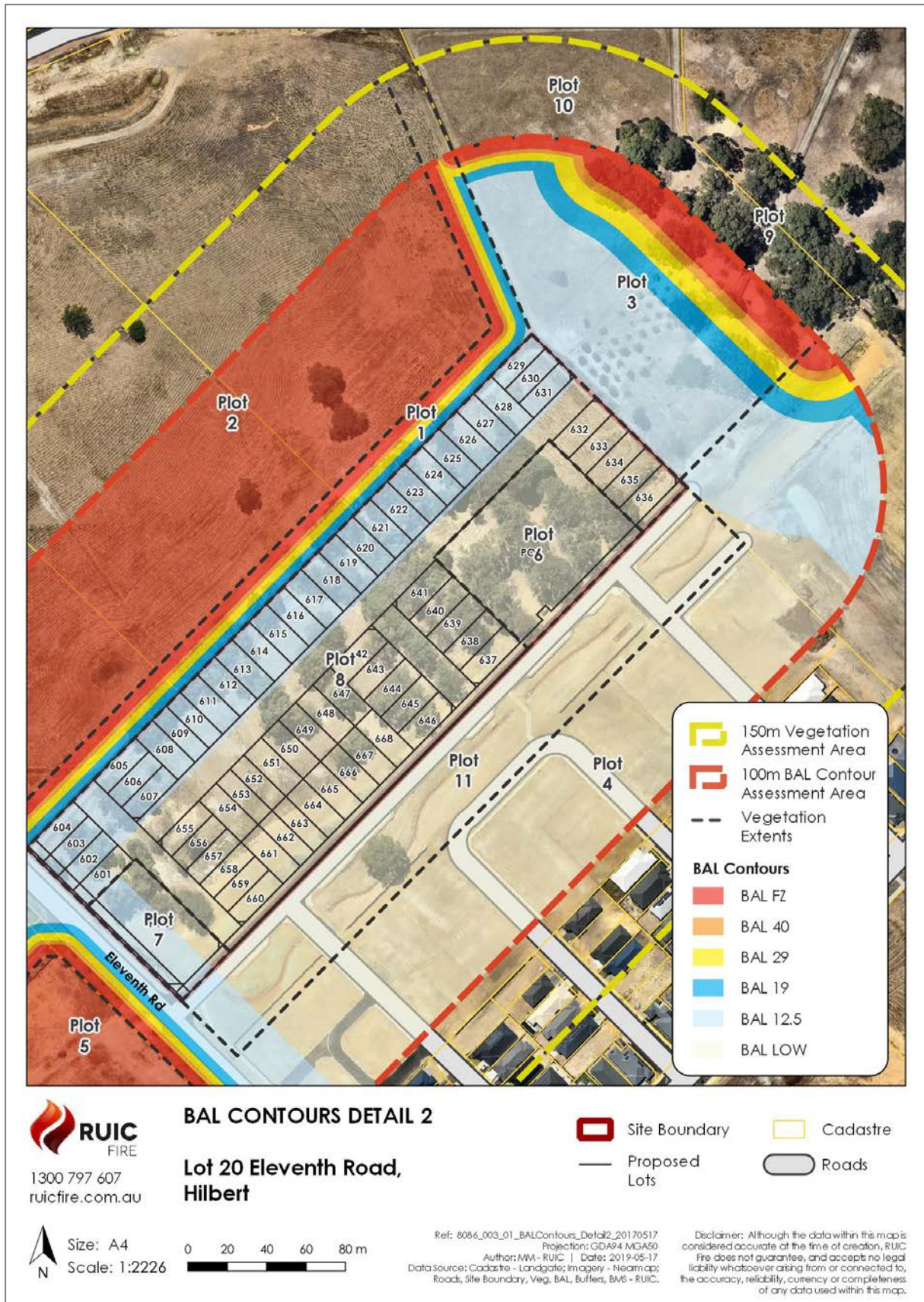


Figure 9: BAL Contour Plan- Detail North

Appendix E

Bushfire Protection Measures

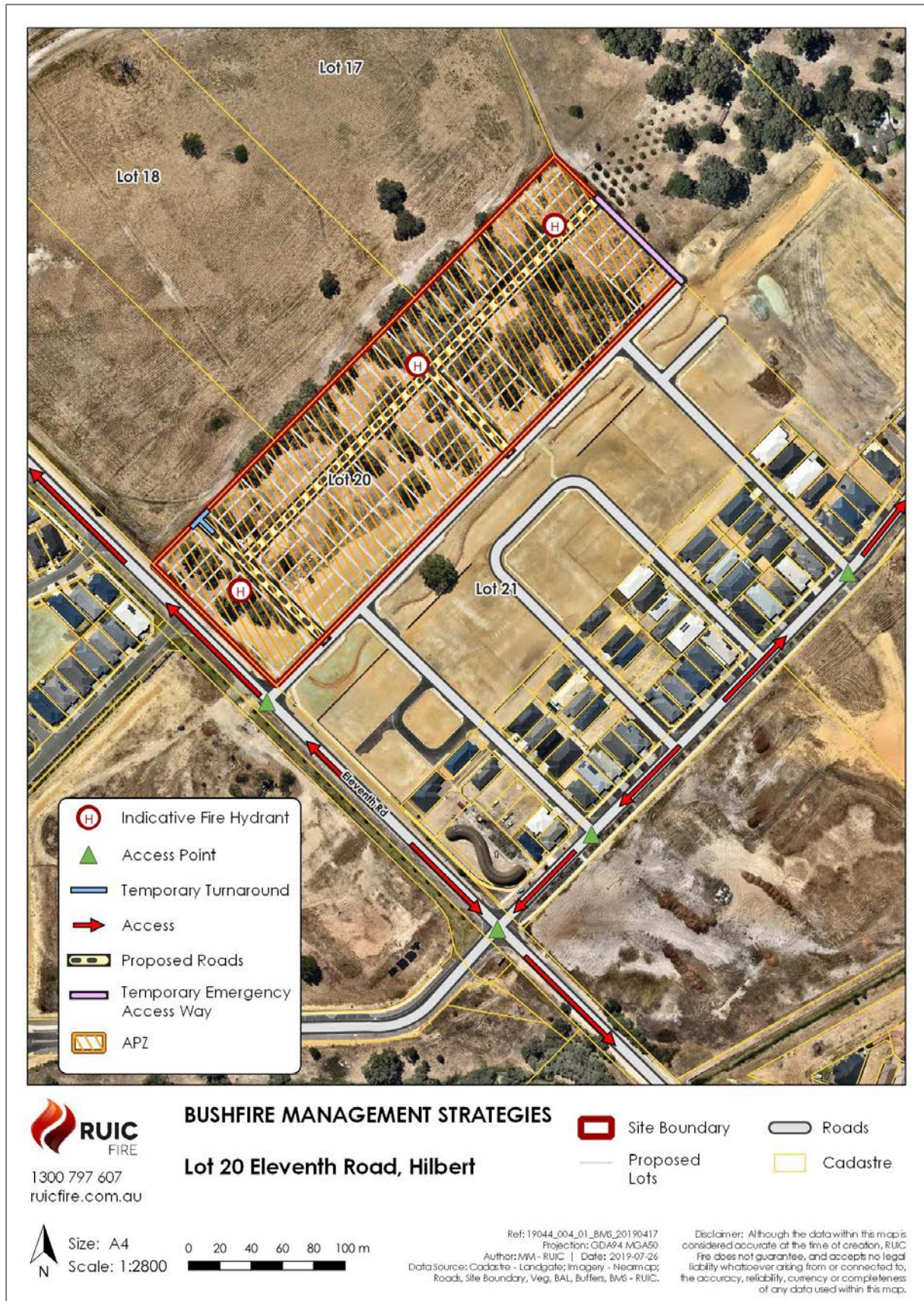


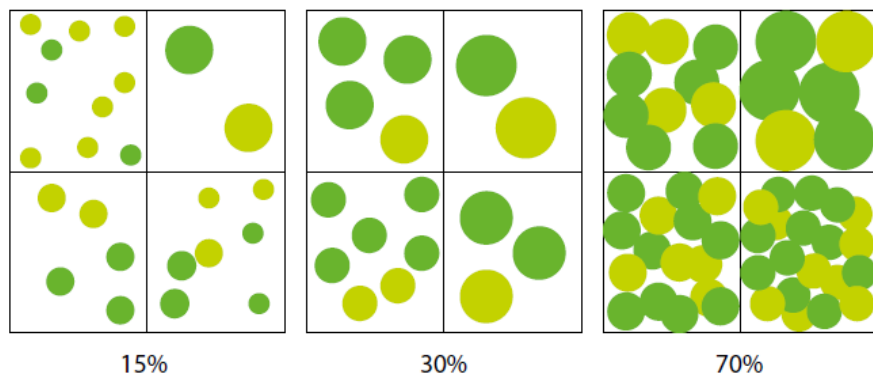
Figure 10: Bushfire Protection Measures

Appendix F

Bushfire Protection Criteria Standards

A2.1 Asset Protection Zone (APZ)

- Width**
- Measured from any external wall or supporting post or column of the proposed building.
 - Sized as outlined in **Figure 10**.
- Location**
- As shown on **Figure 10**.
- Management**
- Fences**
- Within the APZ are constructed from non-combustible materials (e.g. iron, brick, limestone, metal post and wire).
 - It is recommended that solid or slatted non-combustible perimeter fences are used.
- Objects**
- Within 10 metres of a building, combustible objects must not be located close to the vulnerable parts of the building i.e. windows and doors.
- Fine Fuel load**
- Combustible dead vegetation matter less than 6 millimetres in thickness reduced to and maintained at an average of two tonnes per hectare.
- Trees (> 5 metres in height)**
- Trunks at maturity should be a minimum distance of 6 metres from all elevations of the building.
 - Branches at maturity should not touch or overhang the building.
 - Lower branches should be removed to a height of 2 metres above the ground and or surface vegetation.
 - Canopy cover should be less than 15% with tree canopies at maturity well spread to at least 5 metres apart as to not form a continuous canopy.



Shrubs (0.5 metres to 5 metres in height)

- Should not be located under trees or within 3 metres of buildings.
- Should not be planted in clumps greater than 5m² in area.
- Clumps of shrubs should be separated from each other and any exposed window or door by at least 10 metres.
- Shrubs greater than 5 metres in height are to be treated as trees.

Ground covers (<0.5 metres in height)

- Can be planted under trees but must be properly maintained to remove dead plant material and any parts within 2 metres of a structure, but 3 metres from windows or doors if greater than 100 millimetres in height.
- Ground covers greater than 0.5 metres in height are to be treated as shrubs.

Grass

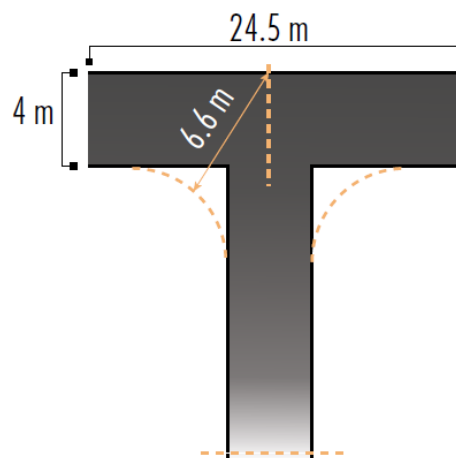
- Should be managed to maintain a height of 100 millimetres or less.

A3.2 Public Roads

Trafficable Surface	6 metres minimum width
Horizontal Clearance	6 metres minimum width
Vertical Clearance	4.5 metres minimum clearance above horizontal clearance area
Maximum Grade	1 in 10 for < 50m
Minimum weight capacity	15 tonnes
Maximum Crossfall	1 in 33
Curves	8.5 metres minimum inner radius

A3.3 Cul-de-sac

Trafficable Surface	6 metres minimum width
Horizontal Clearance	6 metres minimum width
Maximum Grade	1 in 10 for < 50m
Minimum weight capacity	15 tonnes
Maximum Crossfall	1 in 33
Curves	8.5 metres minimum inner radius
Turnaround requirements	“T” head turnaround in accordance with A3.5 and as shown below.



A3.6 Emergency access way

Trafficable Surface	6 metres minimum width
Horizontal Clearance	6 metres minimum width
Vertical Clearance	4.5 metres minimum clearance above horizontal clearance area
Maximum Grade	1 in 10 for < 50m
Minimum weight capacity	15 tonnes
Maximum Crossfall	1 in 33
Curves	8.5 metres minimum inner radius

Appendix G

Fire Control Notice

FIREBREAK NOTICE



7 Orchard Avenue, Armadale
Western Australia 6112
Locked Bag No 2, Armadale
Western Australia 6992
www.armadale.wa.gov.au
ABN: 79 863 269 538

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Western Australian
Bureau of Meteorology 1196
City of Armadale Rangers
9394 5000
After Hours 1300 886 885
To obtain a fire permit
9394 5000

NOTICE TO ALL OWNERS AND OCCUPIERS OF LAND WITHIN THE CITY OF ARMADALE

IN ALL EMERGENCIES CALL 000
FIRE AMBULANCE POLICE

Date: 5 August 2019

BUSH FIRES ACT 1954

Pursuant to the powers contained in Section 33 of the *Bush Fires Act 1954*, you are hereby required on or before the 30th day of November 2019 or within fourteen days of you becoming the owner or occupier of land should this be after the 30th day of November 2019 to clear firebreaks and remove flammable materials from the land owned or occupied by you as specified hereunder and to maintain the specified land and firebreaks clear of all flammable materials up to and including the 31st day of March 2020.

Definitions

FIREBREAK means plough, cultivate, scarify, burn or otherwise clear upon the land firebreaks in such manner, at such places, of such dimensions, and to such number, and whether in parallel or otherwise, as the local government may and is hereby empowered to determine and as are specified in the notice, and thereafter to maintain the firebreaks clear of inflammable matter – Section 33(a) of the *Bush Fires Act 1954*.

FLAMMABLE means any bush, plant, tree, grass, mineral, vegetable, substance, object, thing or material that may, or is likely to, catch fire and burn.

TRAFFICABLE means to be able to travel from one point to another in a 4x4 fire vehicle on a firm and stable surface, unhindered without any obstruction or getting stuck, bogged or trapped.

VERTICAL AXIS means a continuous vertical uninterrupted line at a right angle to the horizontal line of the firebreak.

All Areas of Land over 5000m²

Install and maintain a minimum three (3) metres wide by four (4) metres high clearance, bare mineral earth, trafficable (refer to definition) firebreak no more than 10 metres from the property boundary for the entire perimeter of that property. A reticulated and maintained green lawn may be accepted in lieu of a firebreak.

The firebreak must be a minimum of three (3) metres wide to accommodate for the width of emergency vehicles and have a minimum height clearance of four (4) metres to allow for the height of emergency vehicles.

Bare, mineral earth is essential for the safety and effectiveness of all firebreaks and is considered a safe passage for emergency vehicles to travel along. If a firebreak contains combustible material, it could potentially set vehicles alight and facilitate the growth of a fire.

Install bare mineral earth trafficable firebreaks to a minimum of three (3) metres wide immediately surrounding all buildings, sheds and haystacks or groups of buildings situated on that land, with all overhanging branches, trees, limbs etc. to be trimmed back to three (3) metres high with a clear vertical axis over firebreak area. This includes driveways and access to all buildings on the land.

All Areas of Land less than 5000m²

Have all flammable matter except living trees, shrubs and plants under cultivation, slashed, moved or trimmed down by other means to a height no greater than five (5)cms across the entire property. This includes slashing between parkland, includes weeds, all grasses and hay.

Shrubs are to be trimmed back over driveways and access ways to all buildings to three (3) metres wide with a clear vertical axis over it four (4) metres high to afford access for emergency vehicles to all structures and points of the property.

Hazard Reduction

In addition to the provisions of this notice you may be required to carry out further works which are considered necessary by Council or an Authorised Officer of the City and specified by way of a separate written notice forwarded to the address as shown on the City of Armadale rates record for the relevant land.

Application to Vary Firebreak Requirements

Note: No firebreak exemptions will be given. Please apply for a firebreak variation if an alternative location for firebreak installation is required.

If it is considered impracticable for any reason whatsoever to clear firebreaks or establish other arrangements as required by this notice, you may apply in writing to the City of Armadale, or its duly Authorised Officers, **no later than the 1st day of October 2019** for permission to provide firebreaks in alternative positions on the land. If permission is not granted by the City or its duly Authorised Officers you must comply with the requirements of this notice.

In some instances naturally occurring features such as rocky outcrops, natural watercourses or landscaping such as reticulated gardens, lawns or driveways may be an acceptable substitute for cleared firebreaks.

All firebreaks and other alternative arrangements allowed by the preceding parts of this notice must be established on or before the 30th day of November 2019 (or within 14 days of you becoming the owner or occupier should this occur after that date) and remain clear of flammable material up to and including the 31st day of March 2020.

All approved firebreak variations must be installed as close to the property boundary as practicable.

Fuel Storage

On all land where fuel drum ramps are located and where fuel dumps, whether containing fuel or not, are stored, clear maintained firebreaks three (3) metres wide with a clear vertical axis over it of four (4) metres in height, around any drum, ramp or stack of drums.

Penalties

The penalty for failing to comply with this notice is a fine not exceeding \$5000 and a person in default is also liable whether prosecuted or not to pay the costs of performing the work directed by this notice if it is not carried out by the owner and/or occupier by the date required by this notice.

By order of the City of Armadale
Cliff Frewing - Chief Executive Officer

