



APPENDIX 1

1. BUSHFIRE MANAGEMENT PLAN

Prepared by: RUIC Fire

Reference: 3864

Dated: 23 July 2018

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: Lot 19, Sixty Eight Rd,		
Suburb: Baldivis	State: WA	P/code: 6171
Local government area: City of Rockingham		
Description of the planning proposal: LSP & Subdivision		
BMP Plan / Reference Number: 3864	Version: 2.6	Date of Issue: 23/07/2018
Client / Business Name: The Glow Development (WA) Pty Ltd		

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)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is the proposal any of the following special development types (see SPP 3.7 for definitions)?		
Unavoidable development (in BAL-40 or BAL-FZ)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Strategic planning proposal (including rezoning applications)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Minor development (in BAL-40 or BAL-FZ)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
High risk land-use	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Vulnerable land-use	<input type="checkbox"/>	<input checked="" type="checkbox"/>

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.)?

Local Structure Plan

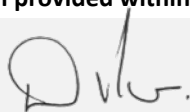
Note: The decision maker (e.g. local government or the WAPC) should only refer the proposal to DFES for comment if one (or more) of the above answers are ticked "Yes".

BPAD Accredited Practitioner Details and Declaration

Name Darrel Krammer	Accreditation Level 3	Accreditation No. 33412	Accreditation Expiry February 2019
Company RUIC Fire		Contact No. 0403916912	

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

23/07/2018

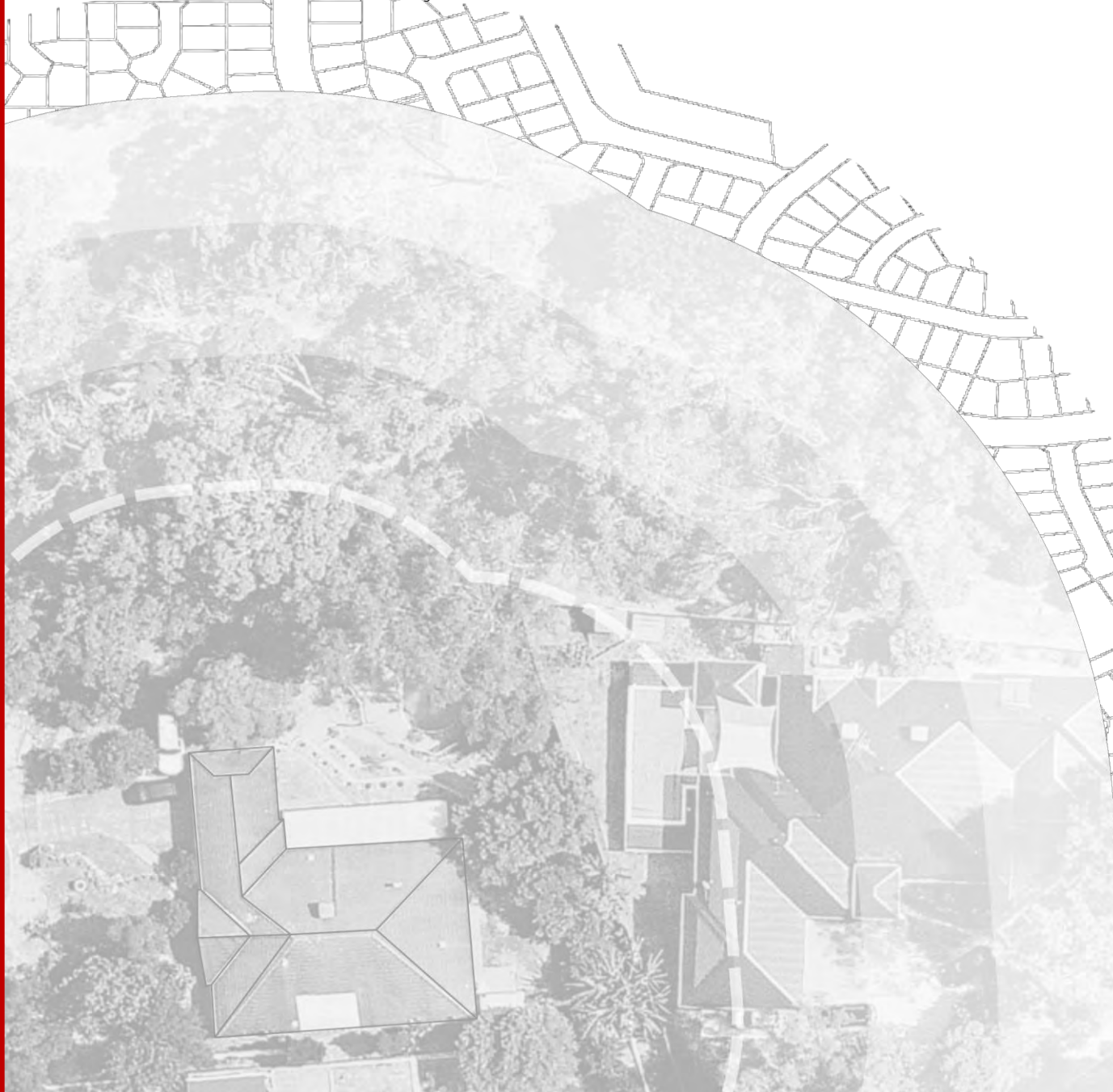


BUSHFIRE MANAGEMENT PLAN

State Planning Policy 3.7
(Subdivision Development)

Lot 19, Sixty Eight Rd, Baldivis

Version: 2.6 Reference: 3864 July 2018



DISCLAIMER AND LIMITATION

This report is prepared solely for The Glow Development (WA) Pty Ltd (the 'proponent') and any future landowners 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

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.

RUIC Fire accepts no liability or responsibility whatsoever for or in respect of any use or reliance upon this report and its supporting material by any third party.

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 Document Details

1.1 Background Information

Project Number: 3864
Project Name: Lot 19 Sixty Eight Rd
Author: Darrel Krammer, Grad. Dip Bushfire Protection, BPAD 33412, Level 3
Version: V2.6
Date of issue: 23rd July 2018

A handwritten signature in black ink, appearing to read "D. Krammer", written over a horizontal line.

Author: Darrel Krammer

Date: 23/07/2018

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 (if applicable).

1.2 Development Description

The development involves the subdivision of Lot 19 Sixty-Eight Rd, Baldivis (the site), within the municipality of the City of Rockingham.

The development is proposed to consist of 93 residential lots, one grouped housing lot, three areas of Public Open Space (POS), subject to relevant planning approvals. A portion of the southern area of the lot is reserved for the development of a proposed school, which has already started construction through previous planning and development approvals.

The site and overall development plan is illustrated in Figure (i) on page 8 of this report. The site is identified as Bushfire Prone through the State Bushfire Prone Maps triggering the application of AS3959 in accordance with the Building Code of Australia.

The development will be staged as the lots along the east and north boundaries of the site are subjected to BAL ratings >BAL-29, and as such these lots will be excluded from development until permanent vegetation removal occurs within the adjoining lots to the north and east. The lots subject to exclusion from development are proposed lots 39 - 44 and 76 - 93 inclusive.

These lots are to be maintained in a low threat state, as detailed in section 4 of this report, in accordance with AS3959-2009 2.2.3.2 (f) to ensure that the unaffected lots are not subject to a radiant heat impact greater than 29kW/m².

Baldivis South Secondary School is proposed to occupy a portion of the southern portion of the site, and is subject to a BMP developed separately to this development.

This BMP is to be updated, post vegetation works within adjoining lots, which allows development of the affected lots of higher BAL identified within this report.

1.3 Vulnerable / High Risk Land Use

The residential nature of the subdivision does not contain any high risk land uses as defined in SPP3.7.

The proposed high school is classified as an educational facility that is consistent with the definition of Vulnerable Land Use as defined in SPP3.7. A Bushfire Management Plan, specific to the high school development, has been developed as a separate Development Application to this subdivision application. The current Bushfire Management Plan does not address specific compliance of the school site, except for ongoing vegetation maintenance of the site until acquired by the Department of Education.

1.4 Unavoidable Development

The development is not considered unavoidable development as defined in SPP3.7.

1.5 Minor Development

The development is not considered minor development as defined in SPP3.7.

1.6 Environmental Considerations

The proponent has not identified any relevant environmental considerations (wetlands, foreshores, Bush Forever sites, remnant vegetation, threatened species, ecological communities, nature reserves or coastal reserves) within the site or being affected by the development.

1.7 Risk Assessment

Risk assessment was completed in accordance with ISO31000:2009 (Standards Australia, 2009) and COAG's National Inquiry on Bushfire Mitigation and Management (Ellis, Kanowski & Whelan, 2004) (Table 1A). The risk assessment demonstrates that after application of the risk management strategies incorporated into the design of the development, the residual bushfire related risk post subdivision is significantly reduced compared to the current state.

Table 1A: Risk assessment of development

Risk Number	Risk Statement	Impact Category	Pre-development Risk Level	Prevention Controls (Planning Specific)	Post-development Residual Risk Level
1.	There is the potential that a bushfire will impact the proposed development which in turn will cause death or injury to persons.	People	Moderate	<ul style="list-style-type: none">Enhanced construction in accordance with AS 3959 to provide shelter during passage of the fire front.Multiple egress routes for residents	Low

				<p>to evacuate to areas greater than 100m from the vegetation interface.</p> <ul style="list-style-type: none"> • Reticulated firefighting water supply. • Staged development prevents development of Lots 76-93 and 39-44 until adequate vegetation clearing within adjacent lots ensures a maximum radiant heat impact equivalent to BAL-29 to the lot boundaries. 	
2.	There is the potential that a bushfire will impact the proposed development, which in turn will cause destruction of or damage to the proposed dwellings.	Infrastructure	Moderate	<ul style="list-style-type: none"> • Enhanced construction in accordance with AS 3959. • Subdivision design ensures maximum of BAL-29 is not exceeded. • Reticulated firefighting water supply • Staged development prevents development of Lots 76-93 and 39-44 until adequate vegetation clearing within adjacent lots ensures a maximum radiant heat impact equivalent to BAL-29 to the lot boundaries. 	Low
3.	There is the potential that a bushfire will impact the proposed development, which in turn will cause destruction of or damage to environmental assets.	Environment	Low	<ul style="list-style-type: none"> • Development does not include the removal of any environmentally significant vegetation. 	Low

1.8 Bushfire Design Criteria:

All bushfire related design criteria are addressed in Section 4 of this report. The Bushfire Management Plan Strategies Map is illustrated in Figure (ii) on page 9 of this report.

The criteria below specifically exclude Lots 76-93 and 39-44 , which are subject to staged development upon vegetation clearing of vegetation in adjoining lots.

Acceptable Solutions applied: A1.1, A2.1, A2.2, A3.1, A3.2, A4.1

Acceptable Solutions not applicable: A3.3, A3.4, A3.5, A3.6, A3.7, A3.8, A4.2, A4.3

Non-compliances: Nil

1.9 Specific Bushfire Planning requirements:

Required bushfire planning design requirements are summarised as:

- (i) *Future residential buildings (Class 1, 2 or 3 buildings and associated Class 10a buildings and decks) to be constructed in accordance with AS3959;*
- (ii) *Lots 76-93 and 39-44 are to be retained as balance lots until such a time that vegetation within adjoining lots is cleared sufficiently to ensure that the radiant heat impact does not exceed 29kW/m² to the lot boundaries.*
- (iii) *Lots 76-93 and 39-44 are to be maintained in a low threat state in accordance with AS3959:2009 s2.2.3.2(e) and/or (f), as detailed in Section 4, of this report. This management is to be ongoing, by the developer, until such a time that the staged development allows for development of the balance lots;*
- (iv) *POS is to be maintained in a low threat state in accordance with AS3959:2009 s2.2.3.2(f) and is subject to a landscaping plan to which the design complies;*
- (v) *Development of the proposed school is required to be supported by a separate Bushfire Management Plan that specifically addresses the unique design of the school and potential bushfire impacts in the context of an educational facility; and*
- (vi) *This Bushfire Management Plan is to be reviewed and updated upon vegetation clearance within lots allowing future stages.*

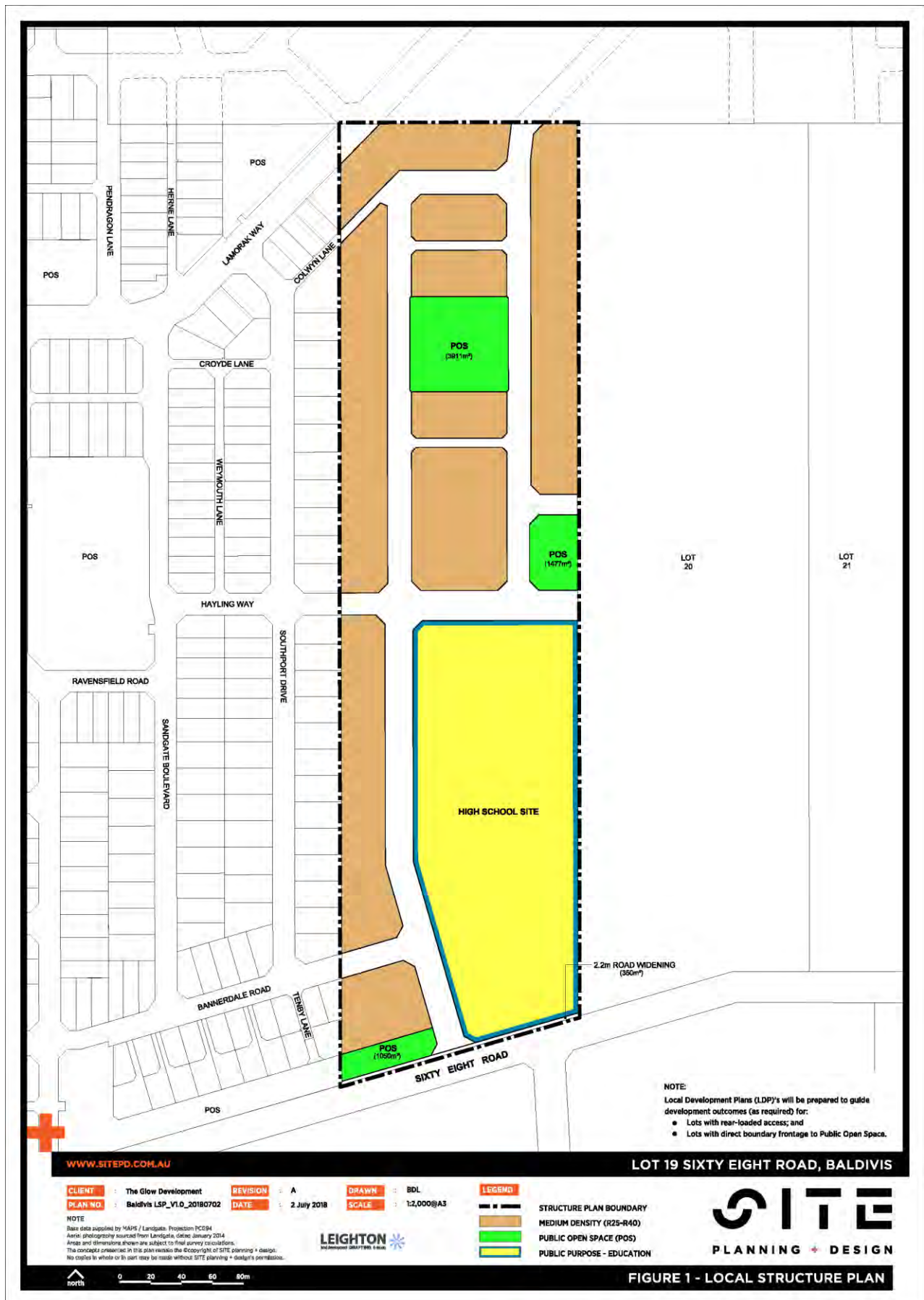


Figure i: Site Map (Client, 2018)

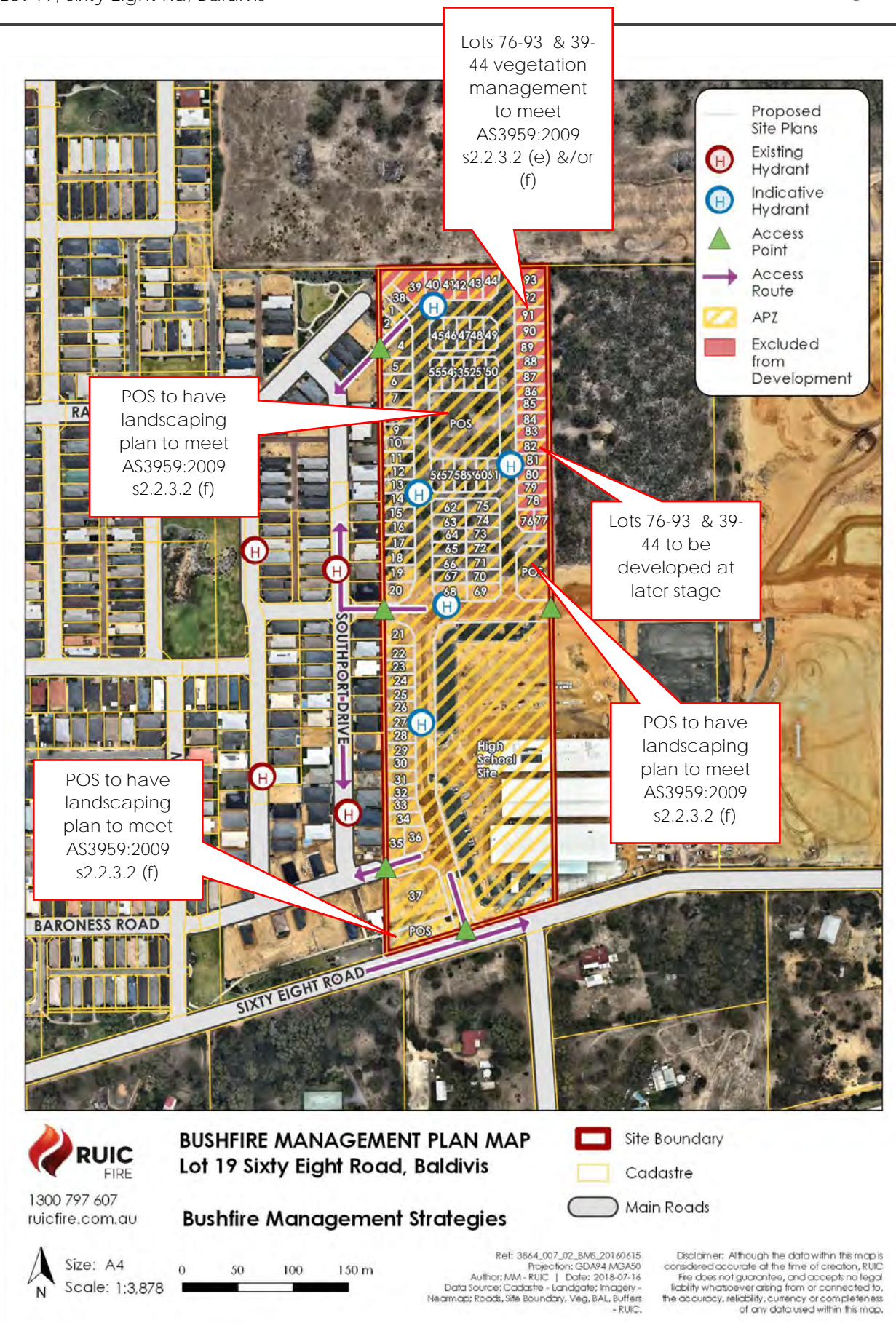


Figure ii: Bushfire Management Strategies Map

2.0 Spatial consideration of bushfire threat

2.1 Bushfire Fuels and Potential Bushfire Impact

The location and extent of AS 3959 vegetation structures, including low fuel areas, within 150m of the site are mapped in Figures 2A-2C and illustrated in the associated plates. Bushfire fuel loads are identified as consistent with AS 3959 Table B2 for radiant heat flux modelling purposes. All bushfire structures and fuel loads are assessed in their mature states (including revegetation and rehabilitation areas) unless otherwise identified.

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 lot boundary in the proposed development in the event of bushfire within vegetation classifiable in accordance with AS3959.

The BAL Contour Map (Figures 2A-2C, Table 2A) identifies that through the implementation of the required Asset Protection Zones and separation afforded by structures satisfying AS 3959 c2.2.3.2, the maximum potential radiant heat impact for each lot boundary (excluding Lots 76-93 and 39-44) in the proposed development is BAL-19. This satisfies Guidelines for Planning in Bushfire Prone Areas (GPBPA) Element 1: Location, A1.1.

Table 2A: Maximum BAL rating that applies to each lot boundary

Lot/s	Vegetation Classification	Effective Slope	Separation (m)	BAL Rating Achievable
Lots 1-2,	Class G Grassland	Downslope >0 to 5°	20 to less than 50m	BAL-12.5
Lots 3 - 36	Class G Grassland	Downslope >0 to 5°	> 50m	BAL-LOW
Lot 37	Class B Woodland	Downslope >0 to 5°	35 to less than 100m	BAL-12.5
Lot 38	Class G Grassland	Downslope >0 to 5°	14 to less than 20m	BAL-19
Lot 39 - 44	Class G Grassland	Downslope >0 to 5°	3m	BAL-FZ ¹
Lots 45 - 75	Class B Woodland	Downslope >0 to 5°	35 to less than 100m	BAL-12.5
Lots 76 -93	Class B Woodland	Downslope >0 to 5°	3m	BAL-FZ ¹

¹ Lots 76-93 and 39-44 will be retained as balance lots until permanent vegetation clearing within adjoining lots is achieved and enables the radiant heat impact to these lots to be 29kW/m² or less.

2.2 Bushfire Hazard Issues

From the BAL Contour Map, the following bushfire hazard issues have been identified.

- Lots 76-93 and 39-44 have a radiant heat impact >29kW/m². These lots are to be retained as balance lots until such a time that vegetation within adjoining lots to the east and north are permanently modified to have a potential radiant heat impact of BAL-29 or less.

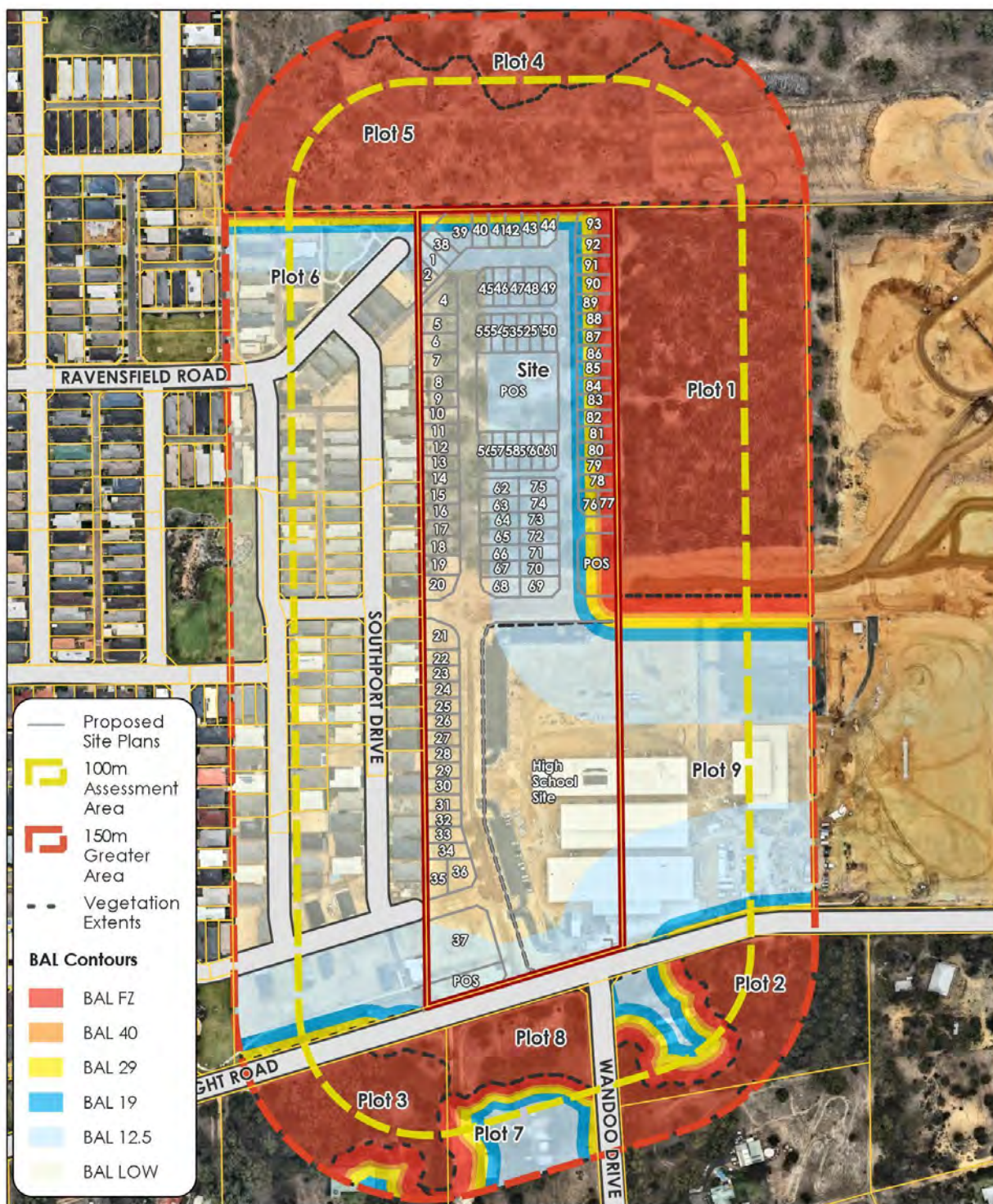
- Numerous lots have a BAL rating above BAL-LOW and as such future residential buildings (Class 1, 2 or 3 buildings and associated Class 10a buildings and decks) to be constructed in accordance with AS3959;
- Lots 76-93 and 39-44 are to be established and maintained in accordance with AS3959-2009 c2.2.3.2 (e) and/or (f), until development within adjoin landholdings allows for development of these lots. The lots are to be managed in a low threat state, by the developer, prior to any development occurring in other lots and until such a time the lots are able to be developed. Refer to Section 4.1 for details on maintenance.

2.3 Access Considerations

Two different vehicular access routes are provided to the development from Sixty Eight Road via Baldivis Road and Eighty Road, both of which connect to the greater public road network, providing safe access and egress to two different destinations and are available to all residents/the public at all times and under all weather conditions (Figure 2D). Additional access to areas greater than 100m from the vegetation threats are available into established low threat urban areas.

2.4 Water Supply

The site is to be serviced by reticulated scheme water and firefighting hydrants that satisfy Acceptable Solution A4.1.



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BUSHFIRE MANAGEMENT PLAN MAP Lot 19 Sixty Eight Road, Baldvis

BAL Contours

- Site Boundary
- Cadastre
- Main Roads



Size: A4
Scale: 1:3,878

0 50 100 150 m

Ref: 3864_004_02_BALContours_20160614
Projection: GDA94 MGA50
Author: MM - RUIC | Date: 2018-07-16
Data Source: Cadastre - Landgate; Imagery -
Nearmap; Roads, Site Boundary, Veg, BAL, Buffers
- 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 2A: BAL Contour Map

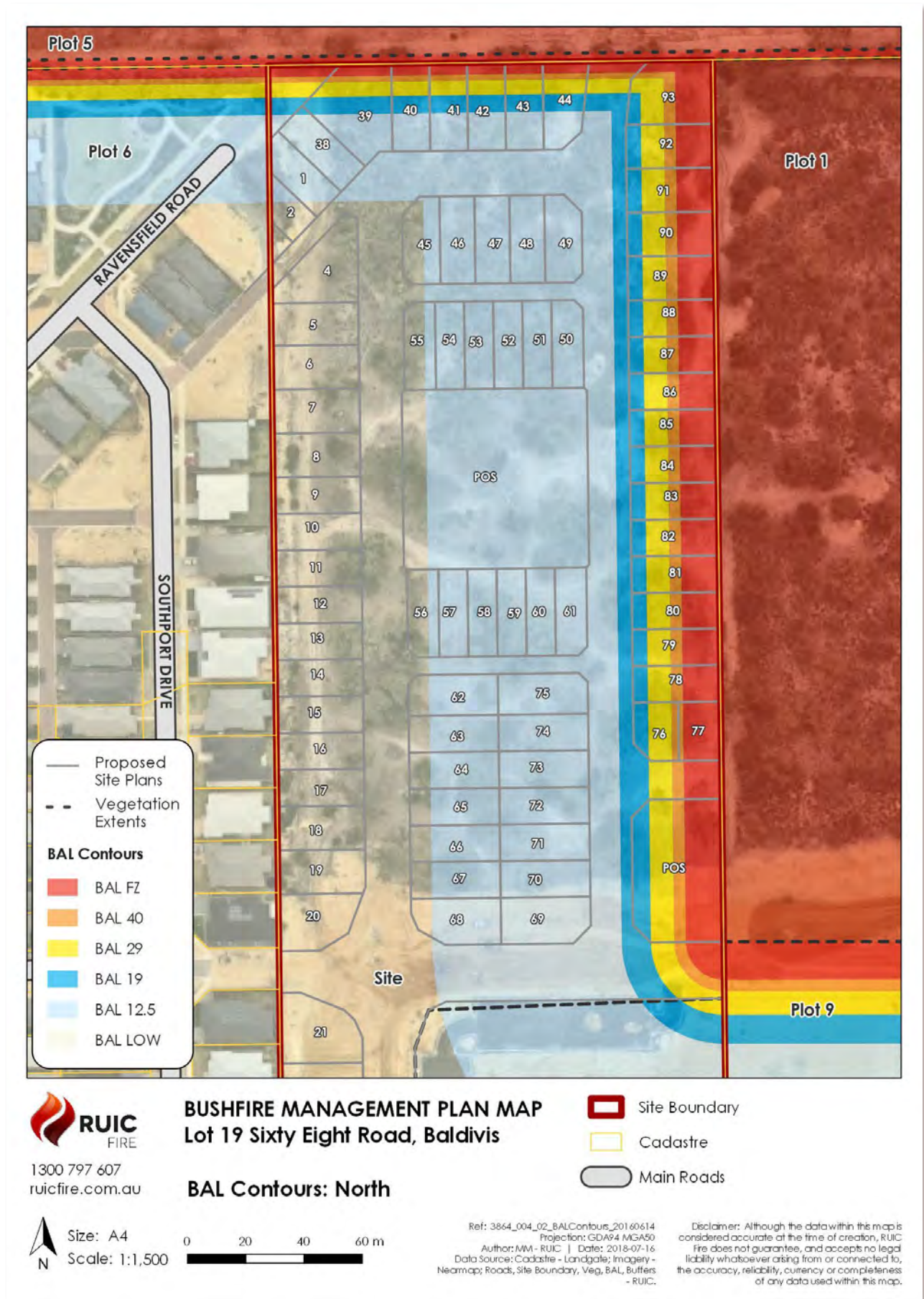
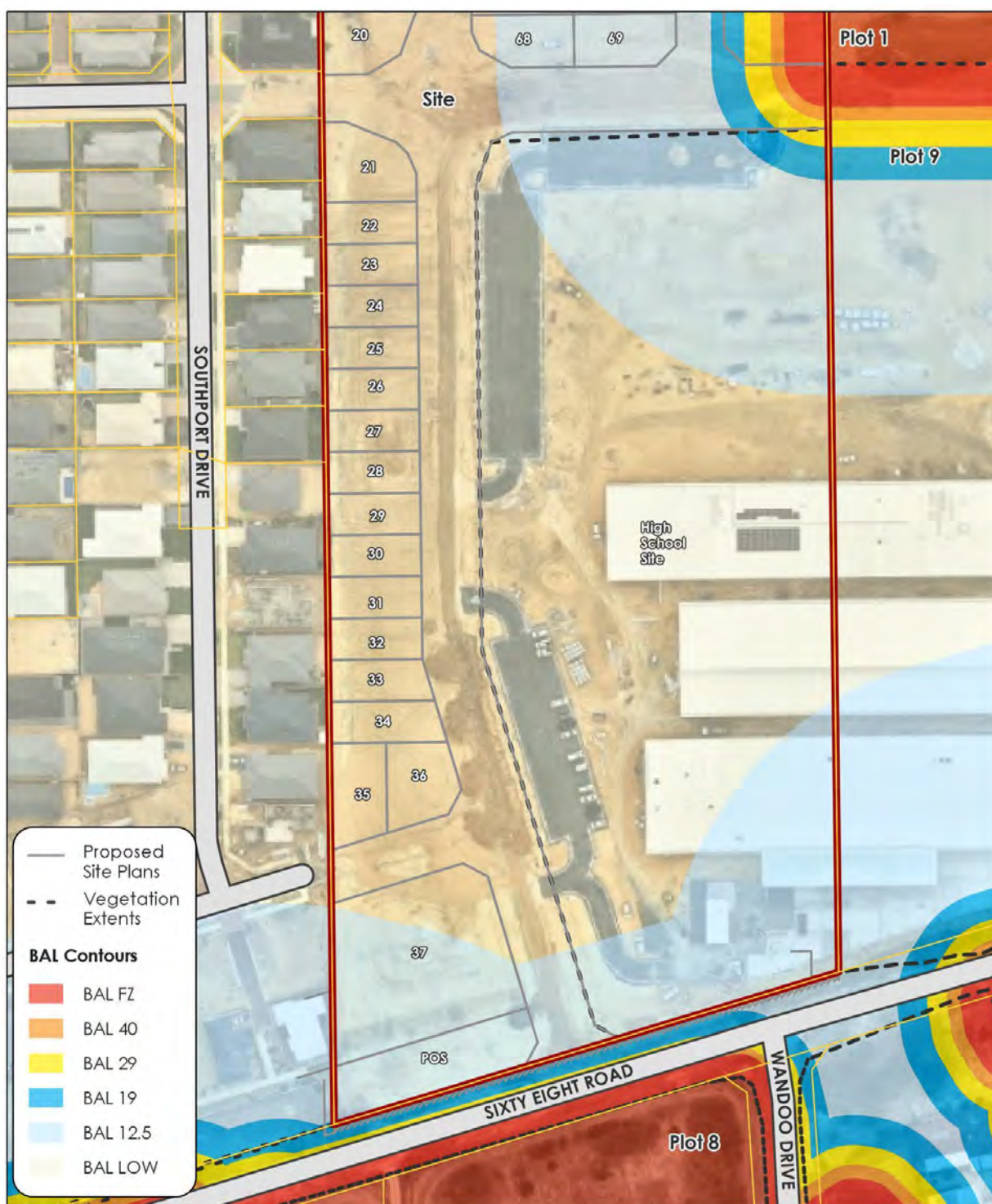


Figure 2B: BAL Contour Map – North



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BUSHFIRE MANAGEMENT PLAN MAP Lot 19 Sixty Eight Road, Baldivis

BAL Contours: South



Size: A4
Scale: 1:1,500

0 20 40 60 m

Ref: 3864_004_02_BALContours_20160614
Projection: GDA94 MGA50
Author: MWI - RUIC | Date: 2018-07-16
Data Source: Cadastre - Landgate; Imagery -
Nearmap; Roads, Site Boundary, Veg, BAL, Buffers
- 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 2C: BAL Contour Map - South



Plate i: Plot 1 Class B Woodland



Plate ii: Plot 1 Class B Woodland



Plate iii: Plot 2 Class B Woodland



Plate iv: Plot 2 Class B Woodland



Plate v: Plot 3 Class B Woodland



Plate vi: Plot 3 Class B Woodland



Plate vii: Plot 4 Class B Woodland
(background)



Plate viii: Plot 4 Class B Woodland
(background)



*Plate vii: Plot 5 Class G Grassland
(foreground)*



*Plate viii: Plot 5 Class G Grassland
(foreground)*



Plate vii: Plot 8 Class G Grassland



Plate viii: Plot 8 Class G Grassland



Figure 2D: Site Access

3.0 Proposal compliance and justification

3.1 Compliance with the objectives of SPP3.7

Objective 1: Avoid increasing the threat of bushfire to people, property, and infrastructure. The preservation of life and management of bushfire impact is paramount.

Objective 1 is satisfied through the compliance of the proposed development with all required Policy Principles as detailed in Table 3A and all PBPA Performance Principles as detailed in section 4 of this report.

Objective 2: Reduce vulnerability of bushfire through the identification and assessment of bushfire hazards in decision-making at all of stages of the planning and development process.

Objective 2 is satisfied through the appropriate identification and assessment of all relevant bushfire hazards as detailed in section 2 of this report, specifically the BAL Contour Mapping.

Objective 3: Ensure that planning proposals and development applications take into account bushfire protection requirements and include specified bushfire protection measures where land has or will have a moderate or extreme bushfire hazard level, and or where a rating higher than Bushfire Attack Level (BAL)- LOW applies.

Objective 3 is satisfied through the compliance of the proposed development with all required Policy Principles as detailed in Table 3A and all GPBPA Performance Principles as detailed in section 4 of this report.

Objective 4: Achieve a responsible approach between bushfire management measures and landscape amenity and biodiversity conservation values, with consideration of the potential impacts of climate change.

Objective 4 is satisfied through the appropriate consideration of all biodiversity and environmental assets as detailed in section 1 of this report in the development of bushfire related risk mitigation strategies detailed in section 4 of this report.

3.2 SPP 3.7 Policy Measures applicable to the proposal

Table 3A details how the proposed development complies with the Policy Measures of SPP3.7.

Table 3A: SPP3.7 Policy Measures

Policy Measure	Description	Compliance	
6.1	Higher order strategic planning	<input checked="" type="checkbox"/>	Site has been identified as being subject to potential bushfire impact. This Bushfire Management Plan demonstrates compliance of the development with all bushfire related planning requirements
6.2	Application of Policy Measures	<input checked="" type="checkbox"/>	Site has a BAL rating above BAL-LOW. Policy Measures 6.4 and 6.5 apply.
6.3	Supporting information for Strategic Planning Proposals	N/A	Development is at a subdivision level
6.4	Supporting information for Subdivision Applications	<input checked="" type="checkbox"/>	This BMP supports the proposed development. BAL Contour Map is provided in Section 2.1, and Section 2.2. identifies bushfire hazard issues. Compliance against PBPA detailed in section 3.3 of this report.
6.5	Supporting information for Development Applications	<input checked="" type="checkbox"/>	This BMP supports the proposed development. BAL Contour Map is provided in Section 2.1, and Section 2.2. identifies bushfire hazard issues. Compliance against PBPA detailed in section 3.3 of this report.
6.6	Vulnerable / High Risk Land Use	N/A	N/A for this development. Department of Education to complete separate Bushfire Management Plan for high school development (classified as Vulnerable Land Use)
6.7	Minor / Unavoidable Development in BAL-40 and BAL-FZ areas	N/A	
6.8	Advice of State/relevant Authorities for Emergency Services to be sought where Policy Measures are not achieved or where development includes Unavoidable, Vulnerable or High Risk Land Use	N/A	
6.9	Advice of State/relevant Authorities for Environmental Protection sought	N/A	

6.10	Bushfire conditions may be imposed	<input checked="" type="checkbox"/>	An s70A notification on the title is to advise all future owners that this Bushfire Management Plan is applicable to the site and may be enforced through the Local Government Firebreak Notice or other statutory avenue. All additional bushfire conditions imposed by the relevant authorities have been addressed in section 1.4 of this report.
6.11	Precautionary Principle	<input checked="" type="checkbox"/>	Precautionary principles have been adopted throughout this report. The relevant decision maker is encouraged to adopt an informed precautionary approach in accordance with SPP3.7

3.3 Guidelines for Planning in Bushfire Prone Areas Compliance

Table 3B details how the proposed development complies with the Guidelines for Planning in Bushfire Prone Areas (V1.3).

Element	BMP section	Acceptable Solution (A) or Performance Based (PBS) Solution	Compliance	Notes
1. Location	4.1	AS1 Development location	<input checked="" type="checkbox"/>	Staged development precludes development Lots 76-93 and 39-44 until such a time that permeant vegetation clearing has occurred in adjoining lots to ensure that the radiant heat impact to the lot does not exceed BAL-29
2. Siting of Development	4.2	A2.1 Asset Protection Zone	<input checked="" type="checkbox"/>	All lots, excluding Lots 76-93 and 39-44 are to be maintained as an APZ across the entire lot.
3. Vehicular Access	4.3	A3.1 Two access routes	<input checked="" type="checkbox"/>	
		A3.2 Public road	<input checked="" type="checkbox"/>	
		A3.3 Cul-de-sac	N/A	

		A3.4 Battle-axe	N/A	
		A3.5 Private driveway longer than 50m	N/A	
		A3.6 Emergency access way	N/A	
		A3.7 Fire service access routes	N/A	
		A3.8 Firebreak widths	N/A	Lots <0.5ha
4. Water	4.4	A4.1 Reticulated areas	<input checked="" type="checkbox"/>	
		A4.2 Non-reticulated areas	N/A	
		A4.3 Individual lots within non-reticulated areas	N/A	

3.4 Areas of non-compliance with other relevant documents

This report has also been developed in order to comply with the requirements all referenced and applicable documents. No non-compliances have been identified.

4.0 Bushfire Risk Management Measures

The bush fire risk mitigation strategies detailed in this report are designed to comply with the Bushfire Protection Criteria detailed in Guidelines for Planning in Bushfire Prone Areas (GPBPA), V1.3, Appendix 4 (2017).

- i. The notation (P3) refers to Performance Principle 3 of GPBPA Appendix 4. Where a Performance Based Solution is offered detailed justification is provided in Appendix 1 of this report.
- ii. The notation (A3.1) refers to Acceptable Solution 3.1 of GPBPA Appendix 4.
- iii. The notation (E3.1) refers to Explanatory Note 3.1 of GPBPA Appendix 4.
- iv. Where discrepancy occurs between State and Local bushfire planning provisions the higher standard of mitigation has been selected.

4.1 Element 1 - Location

Intent: To ensure that the subdivision, development or land use is located in areas with the least possible risk of bushfire, to facilitate the protection of people, property and infrastructure.

Performance Principle (P1): The strategic planning proposal, subdivision and development application is located in an area where the bushfire hazard assessment is or will, on completion, be moderate or low, or a BAL-29 or below, and the risk can be managed. For minor or unavoidable development in areas where BAL-40 or BAL-FZ applies, demonstrating that the risk can be managed to the satisfaction of the Department of Fire and Emergency Services and the decision-maker.

Acceptable Solution 1 Development Location

All proposed lots, excluding Lots 76-93 and 39-44 inclusive, are located with adequate separation distance from classified vegetation to ensure that the radiant heat impact does not exceed 29kW/m². The maximum BAL rating for these lots is BAL-12.5, thereby complying with A1.1.

Lots 76-93 and 39-44 abut undeveloped lots containing native woodland vegetation and unmanaged grassland threats capable of supporting a bushfire. These lots would be subject to an unacceptable level of risk to life and property with BAL ratings in excess of BAL-29. As such these lots are to be excluded from development until such a time that the classified vegetation within the adjoining lots is permanently removed or managed to a low threat state to reduce the radiant heat impacts on the lot boundaries to 29kW/m² or less.

Lots 76-93 and 39-44 will be cleared of all vegetation as part of the civil works program to carry out site levelling and retaining. These lots are to be maintained in a low threat state in accordance with AS3959-2009 2.2.3.2 (e) &/or (f) to ensure that they do not increase the bushfire threat to other lots within the development over that identified within the BAL Contour Map (Figure 2A). The lots are to either be;

- maintained free of vegetation and treated with Hydro-mulch or Dustex type products, or
- have a cover of organic mulch >6mm in thickness, or
- be established with maintained lawn to a height of less than 50mm, or
- a combination of the above options.

This treatment is to be established and maintained by the developer, until such a time that the lots are able to be developed.

4.2 Element 2 - Siting and design of Development

Intent: To ensure that the siting of development minimises the level of bushfire impact.

Performance Principle (P2): The siting and design of the strategic planning proposal, subdivision or development application, including roads, paths and landscaping, is appropriate to the level of bushfire threat that applies to the site. That it incorporates a defendable space and significantly reduces the heat intensities at the building surface thereby minimising the bushfire risk to people, property and infrastructure, including compliance with AS 3959 if appropriate.

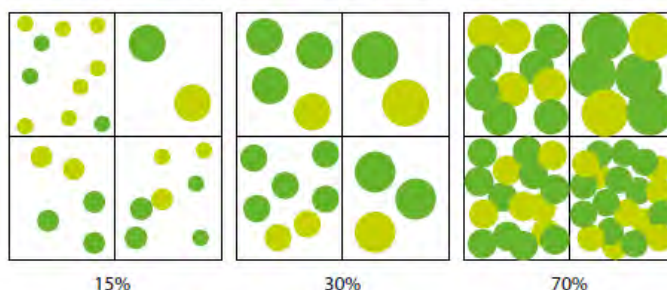
Acceptable Solution 2

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:

- a) 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.
- b) 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).
- c) Management: the APZ is managed in accordance with the requirements of '*Standards for Asset Protection Zones*' (below):
 - o 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.
 - o 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.
 - o 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.
 - o 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 16: Tree canopy cover – ranging from 15 to 70 per cent at maturity



Source: The Guidelines (WAPC, 2017)

- o 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.
- o 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.

- o Grass: should be managed to maintain a height of 100 millimetres or less.

Explanatory Notes:

An APZ is an area surrounding a building that is managed to reduce the bushfire hazard to an acceptable level. The width of the required APZ varies with slope and vegetation. The APZ should at a minimum be of sufficient size to ensure the potential radiant heat impact of a fire does not exceed 29kW/m² (BAL-29). It should be lot specific. Hazard separation in the form of using subdivision design elements (refer to E2) or excluded and low threat vegetation adjacent to the lot may be used to reduce the dimensions of the APZ within the lot.

The APZ includes a defensible space which is an area adjoining the asset within which firefighting operations can be undertaken to defend the structure. Vegetation within the defensible space should be kept at an absolute minimum and the area should be free from combustible items and obstructions. The width of the defensible space is dependent on the space which is available on the property, but as a minimum should be 3 metres.

The APZ should be contained solely within the boundaries of the lot on which the 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. The APZ may include public roads, waterways, footpaths, buildings, rocky outcrops, golf courses, maintained parkland as well as cultivated gardens in an urban context, but does not include grassland or vegetation on a neighbouring rural lot, farmland, wetland reserves and unmanaged public reserves.

Specific considerations

- i. To be implemented prior to habitation of any new dwellings.
- ii. It is the responsibility of the developer to ensure the APZ standard is established.
- iii. It is the responsibility of individual landowners to ensure the APZ standard continues to be achieved post completion of the dwelling construction.

4.3 Element 3 - Vehicular Access

Intent: To ensure that the vehicular access serving a subdivision/ development is safe in the event of a bush fire occurring.

Performance Principle (P3): The internal layout, design and construction of public and private vehicular access in the subdivision/development allows emergency and other vehicles to move through it easily and safely at all times.

Acceptable Solution 3

A3.1 Two access routes

As detailed in Figure 2B, two different vehicular access routes are provided, both of which connect to the public road network, provide safe access and egress to two different destinations and are available to all residents/the public at all times and under all weather conditions.

Acceptable Solution 4

A3.2 Public roads

All new public roads meet the minimum requirements of Acceptable Solution A3.2 as detailed in Table 4A Column 1.

Table 4A: Vehicular access technical requirements

Technical Requirement	Public road	Cul-de-sac (N/A)	Private driveway (N/A)	Emergency access way (N/A)	Fire service access routes (N/A)
Minimum trafficable surface (m)	6	6	4	6	6
Horizontal clearance (m)	6	6	6	6	6
Vertical clearance (m)	4	N/A	4.5	4.5	4.5
Maximum grade over <50m	1 in 10	1 in 10	1 in 10	1 in 10	1 in 10
Minimum weight capacity (t)	15	15	15	15	15
Maximum crossfall	1 in 33	1 in 33	1 in 33	1 in 33	1 in 33
Curves minimum inner radius (m)	8.5	8.5	8.5	8.5	8.5

4.4 Element 4 – Water

Intent: To ensure that water is available to the subdivision, development or land use to enable people, property and infrastructure to be defended from bushfire.

Performance Principle (P4): The subdivision, development or land use is provided with a permanent and secure water supply that is sufficient for firefighting purposes.

Acceptable Solution 5

A4.1 Reticulated areas

The site is to be serviced by reticulated scheme water and firefighting hydrants, satisfying Acceptable Solution A4.1.

5.0 Implementation and Enforcement

Table 5A summarises the responsible party for each mitigation strategy and the time frame in which it must be completed.

Table 5A: Developer Schedule of Works

Strategy	Implementation		Maintenance	
	Responsible	Time Frame	Responsible	Time Frame
Amendments to BMP	Any amendments to this BMP shall be approved by the relevant Jurisdiction Having Authority.			
Asset Protection Zone	Developer	Prior to subdivision clearance	Individual Land Owners	Ongoing
Construction to AS3959	Individual Land Owners & Local Government	On construction of all dwellings	Individual Land Owners	Ongoing
Cul-de-sacs	NA	NA	NA	NA
Battle Axes	NA	NA	NA	NA
Private Driveways	NA	NA	NA	NA
Emergency Access Ways	NA	NA	NA	NA
Firebreaks	NA	NA	NA	NA
Firefighting Water (hydrants)	Developer	Prior to subdivision clearance	Water Corporation	Ongoing
Firefighting Services & Response	DFES and Local Government	Ongoing	DFES and Local Government	Ongoing
Fuel Load Reduction and Fire Break Notice	Local Government	Annually	Local Government	Annually
Inspection and Issue of Works Orders or Fines.	Local Government	Ongoing	Local Government	Ongoing

6.0 References

City of Rockingham Town Planning Scheme No.2.

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