

Bushfire Management Plan

Proposed Subdivision

Forrest Walk Precinct
Frasers Landing, Coodanup
City of Mandurah



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Prepared For:
Frasers Property Australia
17 November 2020
Version 1.0

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Project Name: Residential Subdivision, Forrest Walk, Frasers Landing
Address: Lot 9006 Wanjeep Street, Coodanup
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Bushfire Safety Consulting Pty Ltd

I hereby declare that I am a BPAD accredited bushfire practitioner.	
Accreditation No.	23160
Signature	
Date	17/11/2020



Document Control

Bushfire Management Plan – Lot 9006 Wanjeep Street, Coodanup			
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Front cover photo: Proposed Subdivision

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EXECUTIVE SUMMARY

This Bushfire Management Plan (BMP) has been prepared to support a proposed 118 lot subdivision application for the south-west corner of Lot 9006 Wanjeep Street, Coodanup. The 'Forrest Walk' development is part of a larger subdivision known as 'Fraser's Landing', with previous stages approved and currently undergoing development, with additional stages planned for development in the future.

The proposed residential lots are exposed to permanent bushfire attack from the east due to an area of Class A Forest vegetation set aside for conservation. An area of remnant native vegetation classified as low threat under Exclusion Clause 2.2.3.2 (b) (less than 1 hectare in size and greater than 100 metres from other classified vegetation) will remain in a Public Open Space to the north. A small adjacent area of Class D Scrub is temporary and will be cleared for residential development prior to development. Lots will only be titled once BAL-29 or lower is achieved.

There will be good vehicular access with the extension of Lakewood Parkway through to Birchley Road providing egress to the north-east and south. All lots will have access to a public road providing egress to two different destinations. The area is reticulated, and hydrants will be established to standards.

A Method 1 BAL assessment has been undertaken to determine predicted radiant heat flux levels on the site and no lots are exposed to predicted radiant heat flux levels exceeding 29kW/m² once conditions have been met. These conditions are that a perimeter APZ be established on the eastern boundary of the site and that vegetation on the site be cleared in stages to 100 metres of lots prior to the creation of titles. Over half (66) of the proposed lots are rated BAL-LOW, with 35 lots rated BAL-12.5, 3 lots rated BAL-19 and 14 lots rated BAL-29.

The proposed subdivision can achieve all of the Acceptable Solutions and Performance Principles in the Guidelines for Planning in Bushfire Prone Areas V1.3 (2017).

The developer is responsible for ensuring requirements for the provision of water and vehicular access are met, as well as establishing and maintaining the Asset Protection Zone until lots are sold. Fuel loads and responsibility for APZ standards are then transferred to the new owners/occupiers of the land.

It is expected that the implementation of this BMP will reduce the threat to residents, the public and fire fighters in the area addressed by this BMP. The proposal complies with the *State Planning Policy No. 3.7: Planning in Bushfire Prone Areas (SPP 3.7)* and the *Guidelines for Planning in Bushfire Prone Areas (WAPC 2017 V1.3)*. This BMP addresses future subdivision conditions by providing responses to the performance criteria in the *Guidelines for Planning in Bushfire Prone Areas V1.3 (WAPC et.al. 2017)*.

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1 PROPOSAL DETAILS

This Bushfire Management Plan (BMP) has been prepared to support a proposed subdivision application for the south-west corner of Lot 9006 Wanjeep Street, Coodanup (herein referred to as 'the site'). The site is located approximately 1.5 kilometres south-east of the Mandurah City centre, and approximately 67 kilometres south of the Perth Central Business District (CBD).

The 7.5 hectare development site is proposed to be subdivided into 118 residential lots and two managed road reserve spaces, with the creation or extension of three new public roads (Figure 1). The lots are to be created on the south side of Stringybark Drive, east of Wanjeep Street and north of Birchley Road. All lots will have direct driveway access onto one of the newly created or extended public roads that feed onto Kalumba Road and Lockha Street to the north or Birchley Road to the south.

The site is zoned 'Urban Development' under the City of Mandurah Town Planning Scheme (TPS). It is surrounded by a previous stage of Fraser's Landing subdivision which is predominately developed, or soon to be developed, into residential lots of a similar size to the north. A small section of remnant vegetation classified as low threat (Exclusion Clause 2.2.3.2 b) is present to the north and will be less than 1 hectare in size and greater than 100 metres from classified vegetation upon completion of development. Vegetation on the remainder of the site will be cleared or modified and maintained in a low threat condition.

Land west of the site contains residential housing, commercial development, vacant land containing low threat vegetation, and a secondary educational college. Existing residential development exists to the south of the site, while land containing permanent Class A Forest in a conservation reserve is present to the east (Figure 2).

The area will be reticulated, and scheme water provided. There will be a number of entry/egress routes using proposed public roads and there will be fire hydrants within regulated access.



SOURCE OF PHOTOGRAPHY: NEARMAP

Location details: Forrest Walk Precinct
Frasers Landing, Coodanup

Assessment date: October 2020

Prepared by: Bushfire Safety Consulting

Accreditation level: Level 3 BPAD Practioner

Accreditation number: BPAD 23160

Accreditation expiry date: 31st January 2021

Date aerial photo: August 2020

**FIGURE 1
SUBDIVISION PLAN**

0 10 20 30 40 50 60m

SCALE 1:1500 @ A3
DATE: NOVEMBER 2020



 SUBJECT LAND



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 Date aerial photo: August 2020

FIGURE 2
SITE LOCATION

SCALE 1:10 000 @ A4
 DATE: OCTOBER 2020



LEGEND:
 SUBJECT LAND

SOURCE OF PHOTOGRAPHY: NEARMAP



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1.1 Policy and Guidelines

1.1.1 Application of SPP 3.7

The *State Planning Policy No. 3.7: Planning in Bushfire Prone Areas (SPP 3.7)* provides the foundation for land use planning to address bushfire risk management in Western Australia. It is used to inform and guide decision makers, referral agencies and land owners/ proponents to help achieve acceptable bushfire protection outcomes.

The policy contains objectives and policy measures as well as reference to the bushfire protection criteria, as outlined in the *Guidelines for Planning in Bushfire Prone Areas (WAPC 2017 V1.3; the 'Guidelines')*. The policy applies to this subdivision proposal because parts of the subdivision application is in a designated bushfire prone area on the WA map of Bushfire Prone Areas (see Figure 3).

The following policy measures will need to comply with SPP 3.7:

Table 1. Policy measures

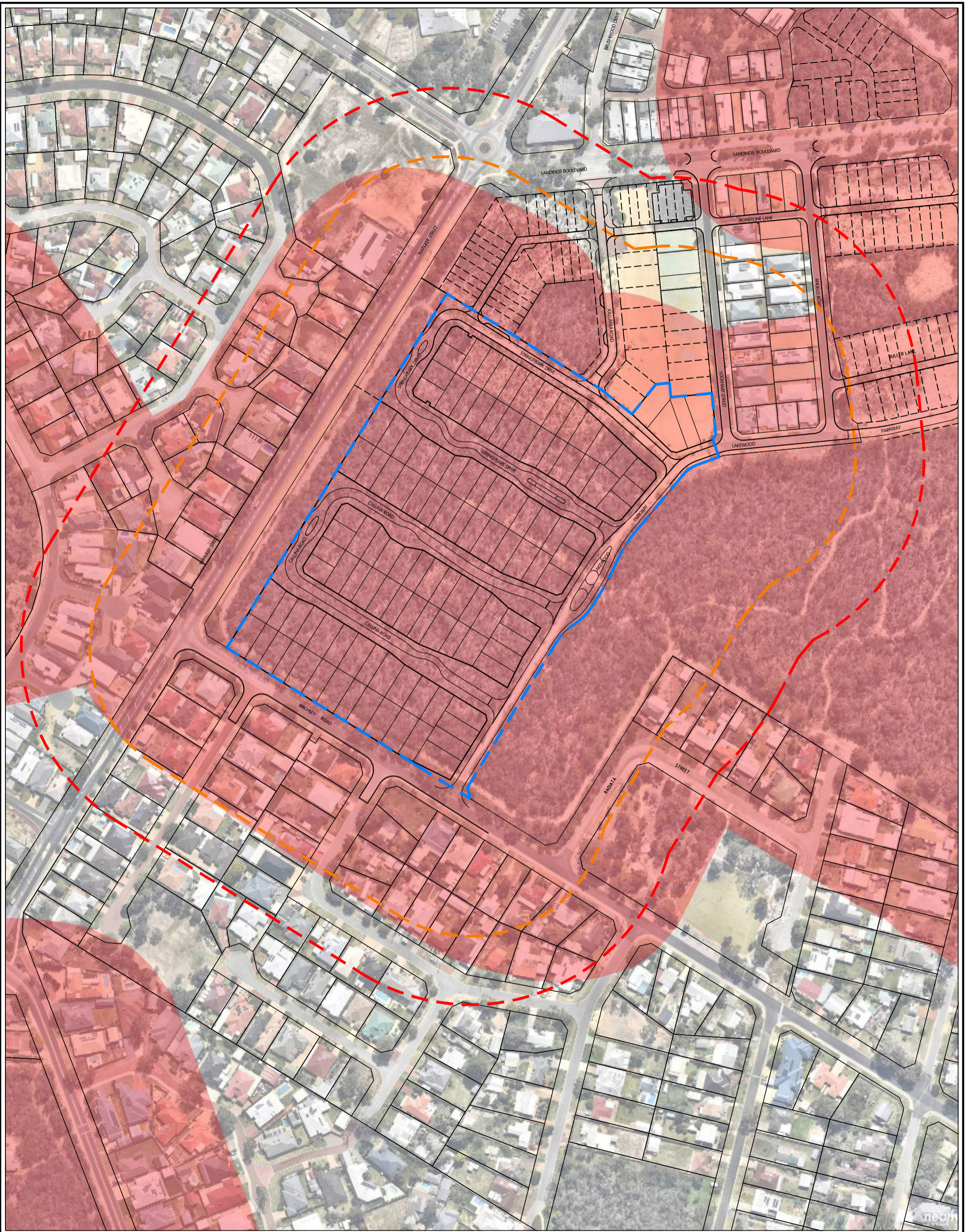
Policy Measure 6.2	The subdivision application is located within a designated bushfire prone area and will have a Bushfire Hazard Level above low and a Bushfire Attack Level rating above BAL-LOW.
Policy Measure 6.4	Policy 6.4 applies meaning the subdivision proposal will be accompanied by: <ul style="list-style-type: none"> - BAL Contour Plan - Lot specific BAL ratings - Identification of relevant issues; and - Demonstration of compliance with the guidelines

The subdivision proposal does not propose vulnerable or high-risk land use and is not considered as minor or unavoidable development under *SPP 3.7*.

1.1.2 Guidelines for Planning in Bushfire Prone Areas V1.3 (2017)

The requirements of The Department of Planning - *Guidelines for Planning in Bushfire Prone Areas V1.3 (2017)* are accommodated within this BMP.

The Guidelines are intended to inform and guide decision makers, referral authorities and proponents to achieve acceptable bushfire protection outcomes, including expectations at the different stages of planning.



Location details: Forrest Walk Precinct
 Frasers Landing, Coodanup

Assessment date: October 2020

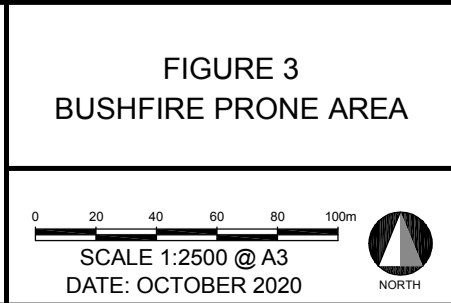
Prepared by: Bushfire Safety Consulting

Accreditation level: Level 3 BPAD Practioner

Accreditation number: BPAD 23160

Accreditation expiry date: 31st January 2021

Date aerial photo: August 2020



SUBJECT LAND

ASSESSMENT AREA (150m) FROM THE EXTERNAL BOUNDARY OF THE SUBJECT SITE

ASSESSMENT AREA (100m) FROM THE EXTERNAL BOUNDARY OF THE SUBJECT SITE

BUSHFIRE PRONE AREA

SOURCE OF PHOTOGRAPHY: NEARMAP

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2 ENVIRONMENTAL CONSIDERATIONS

2.1 Native Vegetation – Modification and Clearing

Some clearing and modification of vegetation and fuel loads is required to achieve the full subdivision. This will occur on the site in stages to ensure lots are only titled once they achieve BAL-29 or lower. Remnant vegetation in the centrally located Public Open Space to the north can be retained in its natural undisturbed condition.

A site meeting was undertaken with the City of Mandurah Environmental Officer to confirm the POS strip adjacent to Wanjeep Road and the second POS strip between the site and the Conservation Reserve to the east can both be modified consistent with the Fuel Treatment Strategies plan in Figure 6. In addition to this, the works will be undertaken under supervision of City of Mandurah and notification to the City of Mandurah Environmental Officers will be provided 48 hours prior to works. A start-up meeting will be arranged to confirm works, standards and methodology. Works are to be undertaken in such a manner to prevent pathogen spread and pruning is to be completed in accordance with AS 4373. The extent of works will be clearly defined on site and checked before work commences. Any mulching machines are to be located to protect retained tree roots and trunks and to ensure the machine does not run back into protected areas.

Vegetation within the site will be progressively cleared with the appropriate clearing approvals process to ensure lots are not encumbered with unnecessary BAL ratings. Once cleared, the area will be maintained in a low threat condition by the developer until such time as development works are undertaken.

2.2 Re-vegetation/ Landscape Plans

There are no revegetation or landscape plans proposed within the site.

3 BUSHFIRE ASSESSMENT RESULTS

Bushfires are common in the City of Mandurah and local brigades respond to numerous bushfires in the district annually. Given the bushfire threat in the area this BMP plays a critical role in ensuring that the development of the land appropriately mitigates the risk from bushfire.

3.1 Assessment Inputs



The methodology used to assess the site is outlined in the *Guidelines for Planning in Bushfire Prone Areas V1.3 (2017)*. The lot layout is known, and a strategic level bushfire hazard assessment is not required. A BAL Contour map of existing condition is provided in accordance with Appendix 3 of the guidelines.

Assessing bushfire threat at the site-specific level requires evaluating the predominant class of vegetation on the site and surrounding area for a minimum of 150 m, as shown in the Vegetation Classification Map (Figure 4).



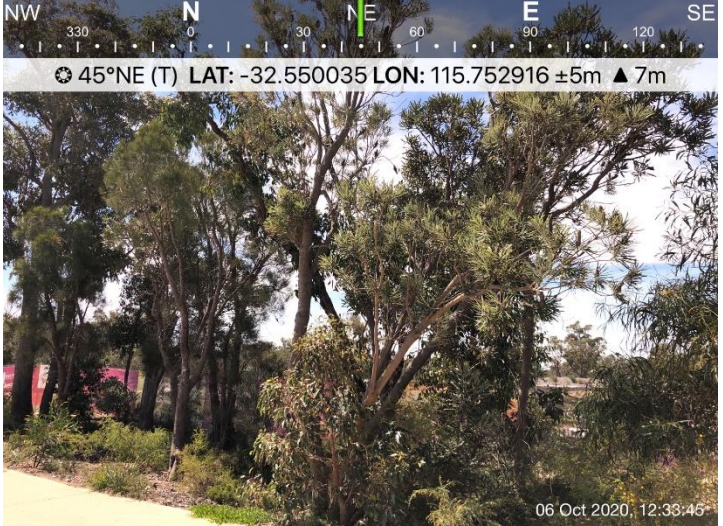
3.1.1 Vegetation Classification

Vegetation within the proposed development site will be cleared or modified to low threat condition prior to development. The site is surrounded by development containing predominately low threat vegetation to the south and west. Permanent Class A Forest vegetation is present to the east in a conservation reserve. Land to the north is contained within the overall Fraser's Landing subdivision and has previously obtained approval for subdivision. It will be cleared for development prior to the development of this stage with the exception of a small area of remnant vegetation classified as low threat (Exclusion Clause 2.2.3.2 b) as it will be less than 1 hectare and greater than 100 metres from classified vegetation prior to development.



The vegetation plots on and surrounding the site and within 150 metres of the site boundary are found in Figure 4 with plot descriptions below.

<p>Photo ID: 1 Plot Number: 1 Vegetation classification or exclusion clause: Class A Forest Description/justification of classification: Thick overstorey canopy of eucalypts, banksia and Casuarina trees over low shrubs, grasses and herbaceous weeds in Roadside Reserve.</p>	
<p>Photo ID: 2 Plot Number: 1 Vegetation classification or exclusion clause: Class A Forest Description/justification of classification: Thick overstorey canopy of eucalypts, banksia and Casuarina trees over low shrubs, grasses and herbaceous weeds in Conservation Reserve.</p>	




Bushfire Management Plan –Fraser's Landing Forrest Walk, Coodanup



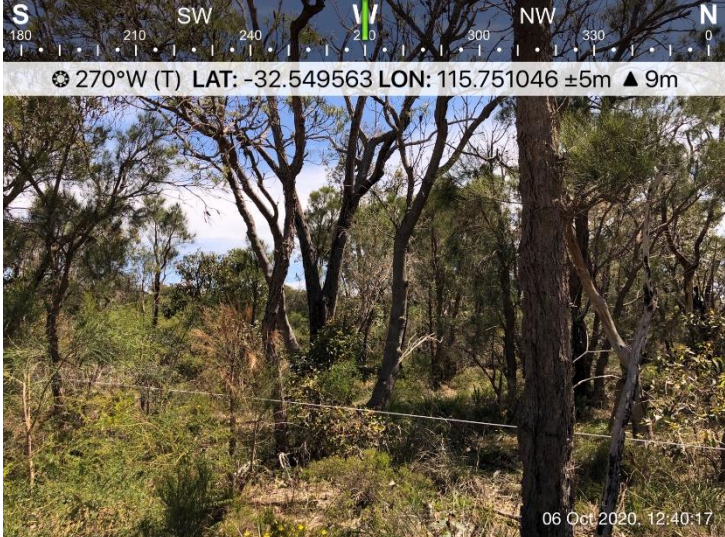
<p>Photo ID: 3 Plot Number: 1 Vegetation classification or exclusion clause: Class A Forest Description/justification of classification: Canopy of Eucalypts to 12 metres tall, with thick layer of Melaleuca shrubs to 6 metres tall over low shrubs, grasses and herbaceous weeds in Conservation Reserve.</p>	
<p>Photo ID: 4 Plot Number: 1 Vegetation classification or exclusion clause: Class A Forest Description/justification of classification: Thick overstorey canopy of Eucalypts, Banksia and Casuarina trees over low shrubs, grasses and herbaceous weeds in Roadside Reserve.</p>	
<p>Photo ID: 5 Plot Number: 2 Vegetation classification or exclusion clause: Class B Woodland Description/justification of classification: Eucalypts, banksia and Casuarina trees with canopy cover 10 – 30%. Understorey consists of low shrubs, groundcovers and grasses in Roadside Reserve.</p>	

Bushfire Management Plan –Fraser's Landing Forrest Walk, Coodanup

<p>Photo ID: 6 Plot Number: 3 Vegetation classification or exclusion clause: Exclusion Clause 2.2.3.2(f) Description/justification of classification: Existing cleared development area maintained in low fuel condition.</p>	
<p>Photo ID: 7 Plot Number: 3 Vegetation classification or exclusion clause: Exclusion Clause 2.2.3.2(f) Description/justification of classification: Area proposed to be cleared and maintained in low fuel condition prior to development.</p>	
<p>Photo ID: 8 Plot Number: 4 Vegetation classification or exclusion clause: Exclusion Clause 2.2.3.2(f) Description/justification of classification: Area proposed for vegetation modification to low fuel condition prior to development as agreed by the City of Mandurah.</p>	

Bushfire Management Plan –Fraser's Landing Forrest Walk, Coodanup

<p>Photo ID: 9 Plot Number: 4 Vegetation classification or exclusion clause: Exclusion Clause 2.2.3.2(f) Description/justification of classification: Area proposed for vegetation modification to low fuel condition prior to development as agreed with City of Mandurah.</p>	
<p>Photo ID: 10 Plot Number: 4 Vegetation classification or exclusion clause: Exclusion Clause 2.2.3.2(f) Description/justification of classification: Strip of vegetation proposed for vegetation modification and management as agreed with City of Mandurah.</p>	
<p>Photo ID: 11 Plot Number: 4 Vegetation classification or exclusion clause: Exclusion Clause 2.2.3.2(f) Description/justification of classification: Strip of vegetation proposed for vegetation modification and management as agreed with City of Mandurah.</p>	

<p>Photo ID: 12 Plot Number: 4 Vegetation classification or exclusion clause: Exclusion Clause 2.2.3.2(f) Description/justification of classification: Strip of vegetation proposed for vegetation modification and management as agreed with City of Mandurah.</p>	
<p>Photo ID: 13 Plot Number: 5 Vegetation classification or exclusion clause: Exclusion Clause 2.2.3.2(b) Description/justification of classification: Area of native vegetation that will post development be less than 1 hectare in size and not within 100 metres of other areas of classified vegetation.</p>	
<p>Photo ID: 14 Plot Number: 5 Vegetation classification or exclusion clause: Exclusion Clause 2.2.3.2(b) Description/justification of classification: Area of native vegetation that will be post development less than 1 hectare in size and not within 100 metres of other areas of classified vegetation.</p>	

Bushfire Management Plan –Fraser's Landing Forrest Walk, Coodanup

Photo ID: 15
Plot Number: 6
Vegetation classification or exclusion clause:
 Exclusion Clause 2.2.3.2(f)
Description/justification of classification:
 Low threat vegetation in Public Open Space, including maintained turf and cultivated garden beds.





Photo ID: 16
Plot Number: 6
Vegetation classification or exclusion clause:
 Exclusion Clause 2.2.3.2(f)
Description/justification of classification:
 Low threat vegetation on existing vacant block consisting predominately of managed grass.



Photo ID: 17
Plot Number: 7
Vegetation classification or exclusion clause:
 Exclusion Clause 2.2.3.2(e)
Description/justification of classification:
 Predominately non-vegetated areas including roads, buildings and footpaths.






Bushfire Management Plan –Fraser's Landing Forrest Walk, Coodanup

<p>Photo ID: 18 Plot Number: 7 Vegetation classification or exclusion clause: Exclusion Clause 2.2.3.2(e) Description/justification of classification: Predominately non-vegetated areas including roads, buildings and footpaths.</p>	 <p>244°SW (T) LAT: -32.551805 LON: 115.748424 ±5m ▲ 7m 06 Oct 2020, 12:55:07</p>
<p>Photo ID: 19 Plot Number: 7 Vegetation classification or exclusion clause: Exclusion Clause 2.2.3.2(e) Description/justification of classification: Predominately non-vegetated areas including roads, buildings and footpaths.</p>	 <p>239°SW (T) LAT: -32.551361 LON: 115.747978 ±5m ▲ 9m 06 Oct 2020, 12:53:36</p>
<p>Photo ID: 20 Plot Number: 7 Vegetation classification or exclusion clause: Exclusion Clause 2.2.3.2(e) Description/justification of classification: Predominately non-vegetated areas including roads, buildings and footpaths.</p>	 <p>284°W (T) LAT: -32.549714 LON: 115.749255 ±5m ▲ 9m 06 Oct 2020, 12:48:49</p>

Bushfire Management Plan –Fraser's Landing Forrest Walk, Coodanup

<p>Photo ID: 21 Plot Number: 7 Vegetation classification or exclusion clause: Exclusion Clause 2.2.3.2(e) Description/justification of classification: Non-vegetated area including cleared mineral earth for previous development stage.</p>	
<p>Photo ID: 22 Plot Number: 7 Vegetation classification or exclusion clause: Exclusion Clause 2.2.3.2(e) Description/justification of classification: Predominately non-vegetated areas including roads, buildings, footpaths and cleared mineral earth.</p>	
<p>Photo ID: 23 Plot Number: 7 Vegetation classification or exclusion clause: Exclusion Clause 2.2.3.2(e) Description/justification of classification: Predominately non-vegetated areas including roads, carparks, buildings and footpaths.</p>	

Bushfire Management Plan –Fraser's Landing Forrest Walk, Coodanup

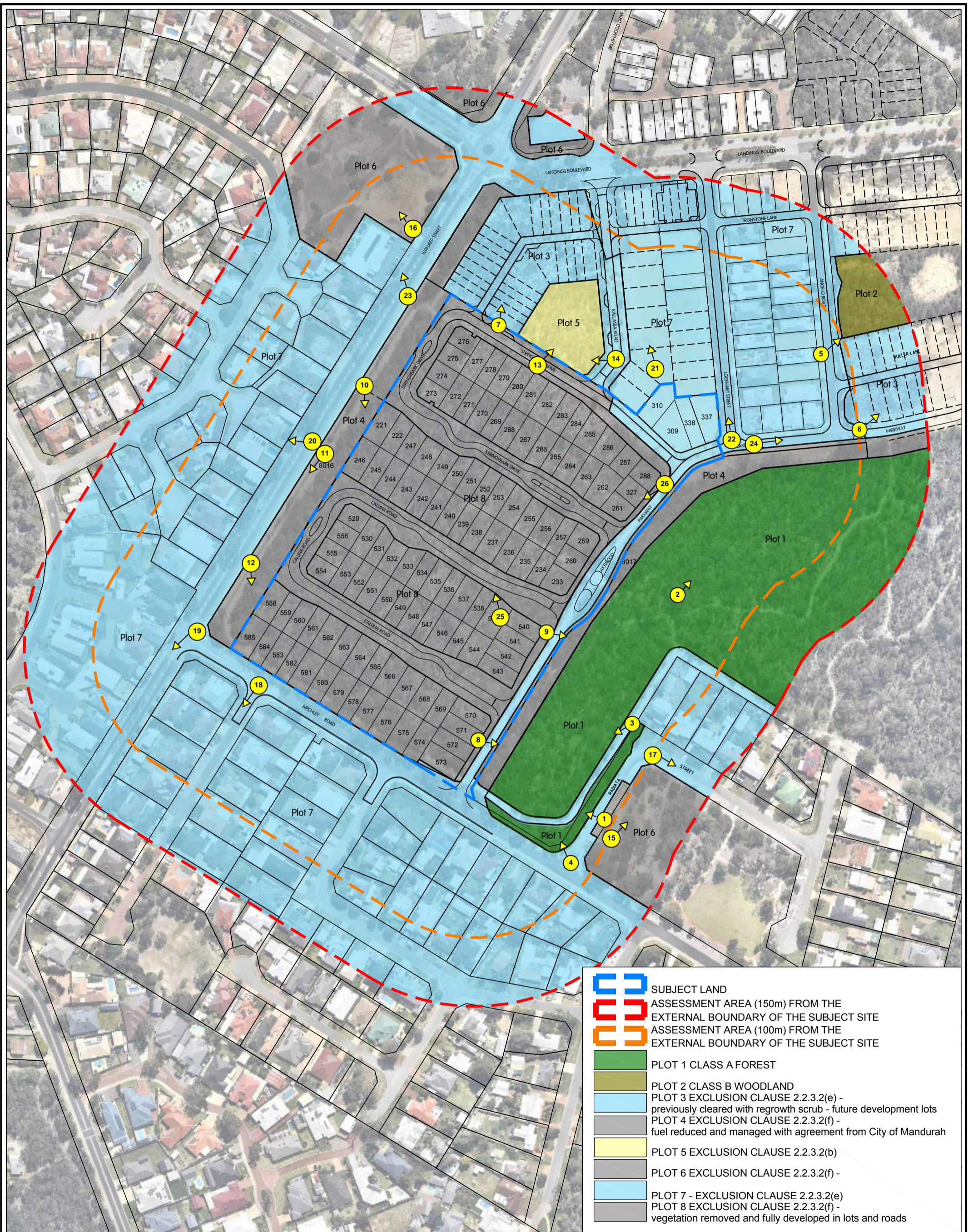
<p>Photo ID: 24 Plot Number: 7 Vegetation classification or exclusion clause: Exclusion Clause 2.2.3.2(e) Description/justification of classification: Predominately non-vegetated areas including roads, buildings and footpaths.</p>	
<p>Photo ID: 25 Plot Number: 8 Vegetation classification or exclusion clause: Exclusion Clause 2.2.3.2(f) Description/justification of classification: Proposed development area with vegetation removed and fully developed into lots and roads prior to occupation.</p>	
<p>Photo ID: 26 Plot Number: 8 Vegetation classification or exclusion clause: Exclusion Clause 2.2.3.2(f) Description/justification of classification: Proposed development area with vegetation removed and fully developed into lots and roads prior to occupation.</p>	

3.1.2 Effective Slope

The effective slope is flat in the Class A Forest vegetation to the south, north-east and north, as well as in the Class B Woodland to the east. The topography and effective slope is outlined in Figure 4.

Table 2. Summary of vegetation type and effective slope

Vegetation Area/ Plot	Applied Vegetation Classification	Effective Slope under the Classified Vegetation (degrees)
1	Class A Forest	Flat
2	Class B Woodland	Flat
3	Exclusion Clause 2.2.3.2 (f)	N/A
4	Exclusion Clause 2.2.3.2 (f)	N/A
5	Exclusion Clause 2.2.3.2 (b)	N/A
6	Exclusion Clause 2.2.3.2 (f)	N/A
7	Exclusion Clause 2.2.3.2 (e)	N/A
8	Exclusion Clause 2.2.3.2 (f)	N/A



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Frasers Landing, Coodanup

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Date aerial photo: August 2020

FIGURE 4 - VEGETATION CLASSIFICATION MAP (BAL CONTOUR MAP)

0 20 40 60 80 100m

SCALE 1:2500 @ A3
DATE: NOVEMBER 2020



PHOTO LOCATION & DIRECTION

SOURCE OF PHOTOGRAPHY: NEARMAP



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3.2 Assessment Outputs

A post development BAL contour assessment was undertaken according to Appendix 3 of the Guidelines and the results are found in the BAL Contour Map at Figure 5.

The Method 1 BAL Assessment was undertaken to determine the BAL contours impacting the site once development is complete, as outlined in Table 3.

Lots will not be titled until sufficient clearing has been undertaken for each lot to achieve a minimum BAL rating of BAL-29.

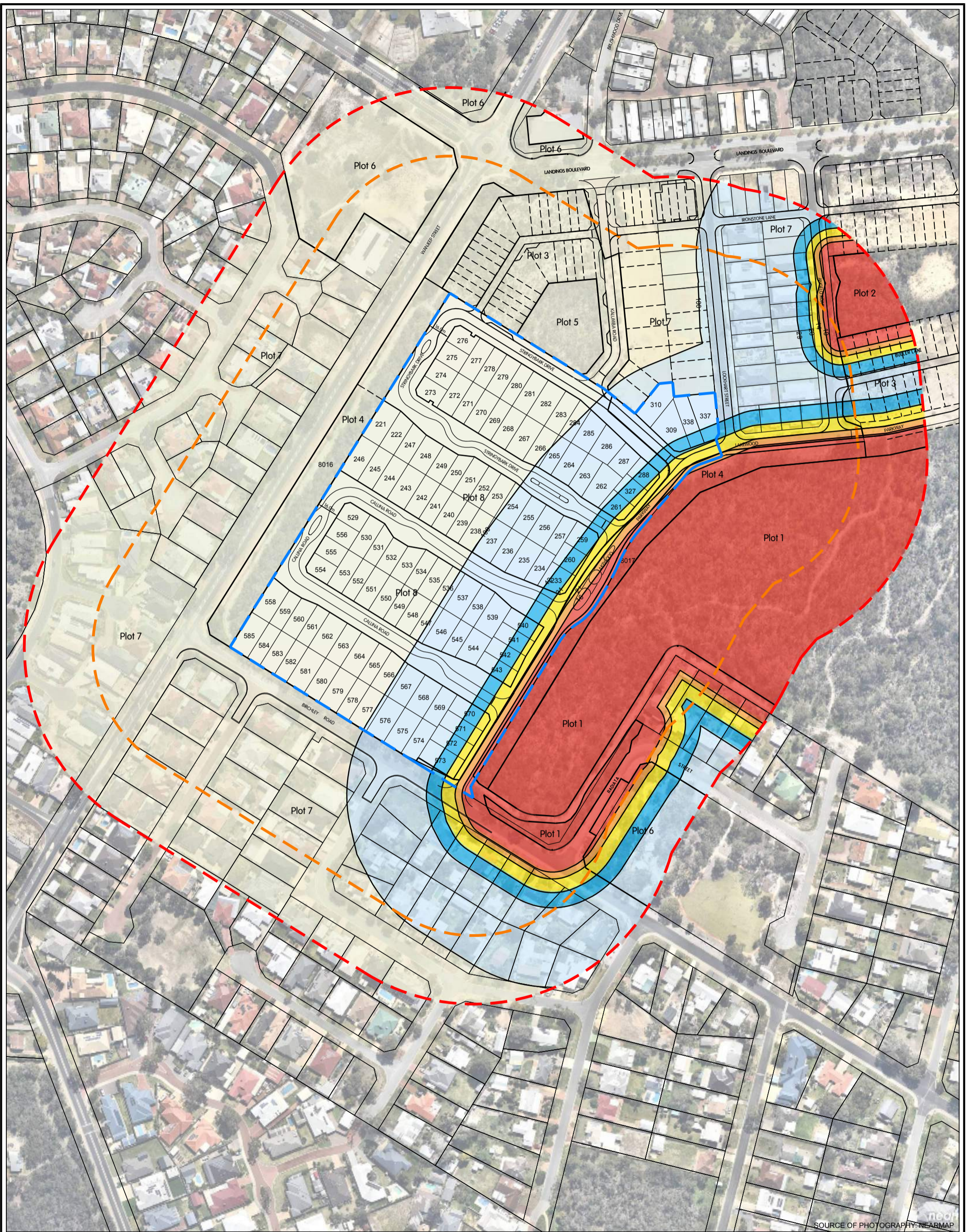
Table 3. Summary of assessment outputs

Lot	Plot & Applied Vegetation Classification	Effective Slope	Separation Distance to Classified Vegetation (metres)	Highest BAL Contour
233, 259-261, 288, 327, 540-543, 570-573	Plot 1 – Class A Forest (East)	Flat	21 - <31	BAL - 29
309, 337, 338	Plot 1 – Class A Forest (East)	Flat	31 - <42	BAL – 19
234-238, 254-257, 262-266, 284-287, 310, 536-539, 544-547, 566-569, 574-577	Plot 1 – Class A Forest (East)	Flat	42 - <100	BAL – 12.5
221, 222, 239-253, 267-283, 529-535, 548-556, 558-565, 578-585	Plot 1 – Class A Forest (East)	Flat	>100	BAL – LOW

The final developed scenario is outlined in Figure 6 as a spatial representation of the bushfire management strategies.

4 IDENTIFICATION OF BUSHFIRE HAZARD ISSUES

The area of Class A Forest vegetation in the conservation reserve to the east poses the greatest long term bushfire threat to the future residential development. Predicted ember attack and radiant heat could impact the site as evident in the BAL Contour plan (Figure 5).



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FIGURE 5
BAL CONTOUR MAP







0 20 40 60 80 100m

SCALE 1:2500 @ A3

DATE: NOVEMBER 2020



INDICATIVE BUSHFIRE ATTACK LEVELS

-  BAL LOW
-  BAL 12.5
-  BAL 19
-  BAL 29
-  BAL 40
-  BAL FLAME ZONE



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5 ASSESSMENT AGAINST THE BUSHFIRE PROTECTION CRITERIA

This report adopts an acceptable solution and performance-based system of control for each bushfire protection criteria. This methodology is consistent with Appendix 4 of the *Guidelines for Planning in Bushfire Prone Areas, Version 1.3 (2017)*. The management issues are:

- Location of the Development.
- Siting and Design of Development.
- Vehicular access.
- Water.

Acceptable solutions are proposed for all of the bushfire protection criteria and each illustrates a means of satisfactorily meeting the corresponding performance criteria.

5.1 Compliance Table

Land use planning bushfire risk mitigation strategies are comprehensively detailed in the following sections by providing responses to the performance criteria that fulfil the intent of the bushfire hazard management issues outlined in the *Guidelines for Planning in Bushfire Prone Areas V1.3 (2017)*. The compliance checklist is attached as Table 4.

Table 4: Compliance Table

Bushfire Protection Criteria	Method of compliance	Proposed bushfire management strategies
	Acceptable Solutions	
Element 1: Location	AQ1.1 Development Location	The Method 1 BAL Assessment in this report demonstrates that classified vegetation in the area surrounding the site does impact some of the proposed lots as outlined in Table 3, however all lots can achieve a rating of BAL-29 or lower. Long term, the majority of the lots on the site achieve a rating of BAL-12.5 or BAL-LOW. No lots will be titled until appropriate clearing has been achieved to ensure full compliance with SPP 3.7
Element 2: siting and Design	A2.1 Asset Protection Zone (APZ)	The Asset Protection Zone (APZ) will occupy all residential lots and road reserves within 100 metres of classified vegetation (ie with rating of BAL-12.5 or higher, see Figure 6). Vegetation in the POS strip along Wanjeep Street to the west and Lakewood Parkway will be modified and maintained as per standards in the Spatial plan (Figure 6) as agreed with the City of Mandurah. A specific perimeter APZ is sited on the eastern interface and includes the Lakewood Parkway road reserve. Buildings are excluded from being constructed in the perimeter APZ. All lots will be exposed to BAL-29 or lower as confirmed by Method 1 BAL assessments. The APZ will be managed in accordance with the requirements of the standards in Appendix 1.

Bushfire Management Plan –Fraser's Landing Forrest Walk, Coodanup

Element 3: Vehicular Access	A3.1 Two access routes	All the lots will have access to the extension of Lakewood Parkway to the east, Stringybark Drive to the north, or the newly created Callina Road. These roads will provide access to Lockhart Street, Kalumba Road and a third currently unnamed public road, all of which lead to Landings Boulevard to the north. In addition, Lakewood Parkway provides access to Birchley Road to the south. Therefore, there will be provision for a minimum of two access routes.
	A3.2 Public Road	The public roads to be created or extended, as well as surrounding existing roads, comply with minimum public road standards outlined in Appendix 2.
	A3.3 Cul-de-sac	There are no cul-de-sacs proposed.
	A3.4 Battle-axe	There are no battle-axes proposed.
	A3.5 Private drive-way longer than 50 metres	There are no private driveways longer than 50m proposed.
	A3.6 Emergency access way	There are no emergency access ways proposed or required in this subdivision.
	A3.7 Fire Emergency access routes	There are no fire emergency access ways proposed or required.
	A3.8 Firebreak width	Compliance is achieved with the current City of Mandurah Fire Control Notice (Appendix 3).
Element 4: Water	A4.1 Reticulated areas	The development has access to a reticulated water supply. Hydrants will be spaced according to the Water Corporation's No. 63 Water Reticulation Standard.
	A4.2 Non-reticulated areas	Not applicable
	A4.3 Individual lots within non-reticulated areas	Not applicable

5.2 Additional Management Strategies

APZ standards will be established within the site and will be maintained by the developer prior to the creation of titles until the sale of lots. The area of Class A Forest vegetation in the conservation reserve to the south-east poses the greatest long term bushfire threat to the future residential development, however all lots can achieve BAL-29 or lower.

The site will be cleared in stages to 100 metres of current stage as per the clearing permit process and any regrowth vegetation will be maintained in a low threat condition prior to the issuing of titles to ensure lots are established and maintained at BAL ratings of BAL-29 or lower. A staged approach to BAL assessments will be undertaken following clearing to provide certainty to the developer and purchaser. All lots will be exposed to BAL-29 or lower as the staged clearing occurs and will be confirmed in stages with Method 1 BAL assessments.

The proposed works in the two strips of POS will be undertaken under supervision of the City of Mandurah and notification to the City of Mandurah Environmental Officers will be provided 48 hours prior to works. A start-up meeting will be arranged to confirm works, standards and methodology. Works are to be undertaken in such a manner to prevent pathogen spread and pruning is to be completed in accordance with AS 4373. The extent of works will be clearly defined on site and checked before work commences. Any mulching machines are to be located to protect retained tree roots and trunks and to ensure the machine does not run back into protected areas. A summary of management strategies is outlined in Figure 6.

There are no specific Vulnerable or High-Risk Land Uses proposed at the site. Any specific applications will trigger the necessary requirements under State Planning Policy 3.7.



REQUIREMENTS

1. The subdivision is separated from bushfire hazard by a road reserve which functions as an Asst Protection Zone and fuel reduced area in the adjacent reserve. This combined area of management results in no lots exceeding BAL-29.
2. The site is connected to the existing public road network in multiple locations providing multiple access options to multiple destinations.
3. The area is provided with a reticulated water supply. The provision of scheme water together with fire hydrants will meet the specifications of Water Corporation Design Standard DS63 and DFES requirements. The Water Corporation is responsible for all hydrant repairs.
4. Treatment Zone 1 is immediately adjacent to lots and to ensure BAL-29 compliance the following works are required:

- Trees to be protected and under-pruned include (overstorey eucalypts, casuarina and banksia genus).

Management Clearing approved includes:

- a - remove shrubs including Kunzea, Geraldton Wax, Acacia Jacksonia species using forestry mulcher to not disturb the soil.
- b- remove all dead woody material and fine elevated fuels,

5. Treatment Zone 2 - red areas separated from lots by road. Trees to be protected and under-pruned include (overstorey eucalypts, casuarina and banksia genus).

Management Clearing approved includes:

- a - hand removal using hand tools of all dead fine fuels ensuring to not disturb the soil.

6. Permanent classified vegetation occurs south-east of the site in the Conservation Reserve and is separated from the site by a public road.

7. Some remnant trees will be retained in the road reserve but will have managed understoreys to ensure bushfire threat is mitigated


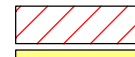




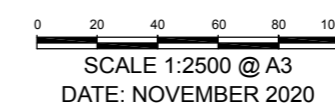
-  SUBJECT LAND
-  PERIMETER ASSET PROTECTION ZONE
-  TREATMENT ZONE 1
-  TREATMENT ZONE 2
-  PUBLIC OPEN SPACE
-  ROAD RESERVES

FIGURE 6 - SPATIAL REPRESENTATION OF BUSHFIRE MITIGATION STRATEGIES



Location details:	Forrest Walk Precinct Fraser's Landing, Coodanup
Assessment date:	October 2020
Prepared by:	Bushfire Safety Consulting
Accreditation level:	Level 3 BPAD Practitioner
Accreditation number:	BPAD 23160
Accreditation expiry date:	31st January 2021
Date aerial photo:	August 2020

6 RESPONSIBILITIES FOR IMPLEMENTATION AND MANAGEMENT OF THE BUSHFIRE MEASURES

Table 5 outlines the initial and ongoing responsibilities, actions and associated works that need to be undertaken by the Developer, future landowners and the City of Mandurah. The check boxes for implementation actions will be used for subdivision clearance. A Bushfire Planning Practitioner will certify the BAL ratings are correct and necessary implementation actions have been completed.

Table 5. Responsibility for bushfire measures

DEVELOPER – PRIOR TO ISSUE OF TITLES		
No.	Implementation Action	Subdivision Clearance
1	Re-assess BAL ratings on lots prior to the creation of titles in stages after clearing of the site and develop a BAL report and Certificates for the building license process.	<input type="checkbox"/>
2	Establish Fuel Treatment Zones as outlined in Figure 6 to the satisfaction of the City of Mandurah.	<input type="checkbox"/>
3	Install the public roads to standards outlined in this report.	
4	Install hydrants to the Water Corporation's No. 63 Water Reticulation Standard.	
5	A notification, pursuant to Section 70A of the Transfer of Land Act 1893 is to be placed on the certificate(s) of title of the lots within the Bushfire Prone Area. Notice of this notification is to be included on the diagram or plan of survey (deposited plan). The notification is to state as follows: 'The lot(s) is/are subject to a Bushfire Management Plan.' (Local Government)".	
DEVELOPER – AT SALE OF LOTS		
6	Make a copy of this BMP available to each lot along with the <i>Homeowners Bush Fire Survival Manual, Prepare, Act, Survive</i> (or similar suitable documentation) and the City of Mandurah's Fire Control Notice.	
LANDOWNER/OCCUPIER – ONGOING MANAGEMENT		
7	Maintain the Asset Protection Zone (APZ) to standards stated in this BMP.	
8	As part of the building license application stage, have the dwelling(s) assessed for the BAL rating by a qualified consultant with BAL rating submitted to the City of Mandurah.	
9	Ensure construction of buildings complies with AS 3959:2018.	
10	If buildings are subject to additional construction in the future, AS 3959:2018 compliance is required.	

CITY OF MANDURAH – ONGOING MANAGEMENT

11	Maintain public roads to appropriate standards and ensure compliance with the City of Mandurah's Fire Control Notice.
12	Maintain weed control works in the Fuel Treatment Zones to reduce annual grass fuel loads
13	Provide fire prevention and preparedness advice to landowners upon request, including the <i>Homeowners Bush Fire Survival Manual, Prepare, Act, Survive</i> (or similar suitable documentation) and the City of Mandurah Fire Control Notice.

Certification by Bushfire Consultant

I _____ certify that at the time of inspection, the BAL ratings contained within this BMP are correct; and implementation actions 1-2 have been undertaken in accordance with the BMP.

Clearance is recommended.

Signature: _____

Date: _____

7 CONCLUSION

This Plan provides acceptable solutions and responses to the performance criteria that fulfil the intent of the bushfire hazard management issues outlined in the Guidelines for Planning in Bushfire Prone Areas (WAPC 2017 V1.3). However, community bushfire safety is a shared responsibility between governments, fire agencies, communities and individuals.

The subdivision is located in the bushfire prone area (i.e. within 100 m of classified vegetation) and risk is reduced via compliance with *AS 3959:2018* standards. BAL-29 will not be exceeded as lots will only be titled once clearing has been undertaken on the balance lot and BAL-29 or lower is achieved for all lots. A perimeter APZ will be established and maintained along the south-east boundary and a minimum of two access options are provided. Fire hydrants will be established to minimum standards and the proposed development will fall within the acceptable level of risk.

REFERENCES

Department of Fire and Emergency Services (DFES), 2014, *The Home Owner's Bushfire Survival Manual*, https://www.dfes.wa.gov.au/safetyinformation/fire/bushfire/BushfireManualsandGuides/DFES_Bushfire-Homeowners_Survival_Manual.pdf, Department of Fire and Emergency Services, Government of Western Australia.

Standards Australia, 2018, *Construction of buildings in bushfire-prone areas (Amendments 1-3)*, AS 3959-2018, Standards Australia International Ltd, Sydney.

Western Australian Planning Commission (WAPC), 2015, *State Planning Policy No. 3.7: Planning in Bushfire Prone Areas (SPP3.7)*, December 2015, Western Australian Planning Commission and Department of Planning WA, Government of Western Australia.

Western Australian Planning Commission (WAPC), 2017, *Guidelines for Planning in Bushfire Prone Areas*, December 2017 V1.3, Western Australian Planning Commission and Department of Planning WA, Government of Western Australia.



APPENDICES

- Appendix 1: Asset Protection Zone Standards
- Appendix 2: Vehicular Access Technical Requirements
- Appendix 3: City of Mandurah Fire Control Notice

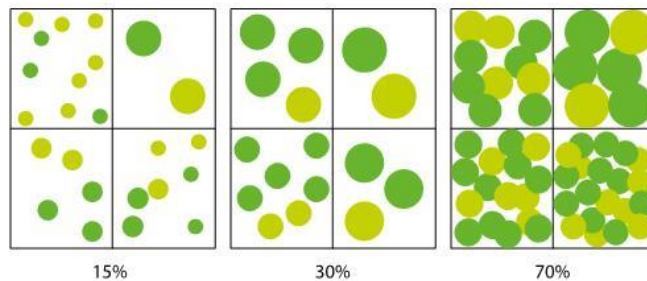
Appendix 1: Asset Protection Zone Standards

ELEMENT 2: SITING AND DESIGN OF DEVELOPMENT

SCHEDULE 1: STANDARDS 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

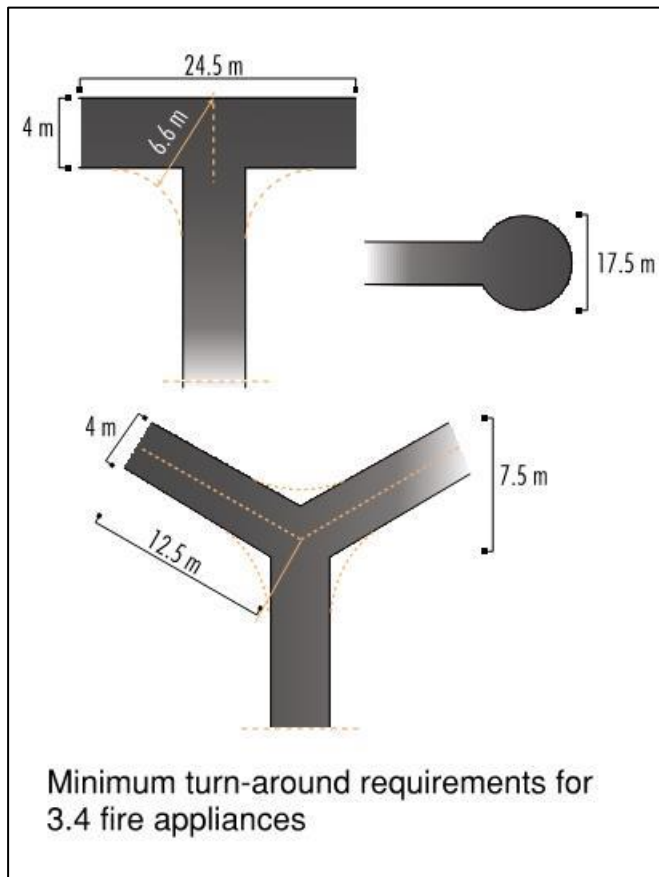


- **Shrubs (0.5 metres to 5 metres in height):** should not be located under trees or within 3 metres of buildings, should not be planted in clumps greater than 5m² in area, clumps of shrubs should be separated from each other and any exposed window or door by at least 10 metres. Shrubs greater than 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.

Appendix 2: Vehicle Access Technical Requirements

TECHNICAL REQUIREMENTS	1 Public road	2 Cul-de-sac	3 Private driveway	4 Emergency access way	5 Fire service access routes
Minimum trafficable surface (m)	6*	6	4	6*	6*
Horizontal clearance (m)	6	6	6	6	6
Vertical clearance (m)	4.5	N/A	4.5	4.5	4.5
Maximum grade <50 metres	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

*Refer to E3.2 Public roads: Trafficable surface



Appendix 3: City of Mandurah Fire Control Notice

What do I need to do?

Preparing for fire is a shared responsibility

The City of Mandurah has a role in setting the requirements for fire preparation on properties within its boundaries. Owners are encouraged to contact Ranger Services to discuss fire management measures in the lead up to fire season or seek further information from the City's website.

What is required?

According to Section 33 of the *Bush Fires Act 1954* you are required to carry out fire prevention work on land you own.

Work must be carried out by 17 November 2019 or within 14 days of becoming the owner, and maintained until 31 May 2020.

Firebreak variations

If impractical to clear firebreaks or if natural features make firebreaks unnecessary, you may apply to the City by 1 November 2019 for an alternative solution.

Fire Management Plans

Where an approved Fire Management Plan relates to a property, owners are required to fully comply with the requirements of that plan.

It can happen to you

ALL properties within Mandurah are subject to ember attacks from nearby fires. Preparing your property can help to prevent damage, loss and significant trauma.

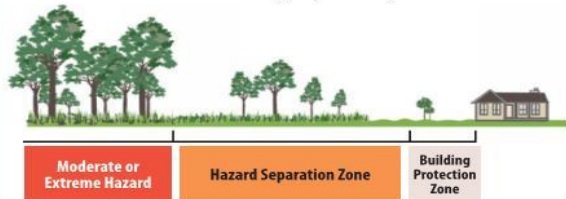
Who can enter my property?

Under section 14 of the *Bush Fires Act 1954* a Bush Fire Control Officer is appointed in accordance with the provisions of the Act and can enter your property to inspect firebreaks and/or anything he considers to be a fire hazard.

If you do not meet your responsibilities as a property owner, you could be liable for a maximum penalty of \$10,000 plus costs. The City may access a property and undertake required work at the expense of the owner.

Asset Protection Zones (APZ) Properties zoned rural residential and on all land 4000m² and over, south of William Street, Davesville are required to:

- Maintain a minimum 2 metre gap between trees, shrubs and any building or infrastructure
- Ensure that no trees overhang any building or infrastructure.



mandurah.wa.gov.au



Fire Compliance Notice

Requirements for properties



Larger Blocks

Occupied or Unoccupied Land 4000m² and Over

When the area of land is 4000m² and over, provide a trafficable mineral earth firebreak of 4 metres wide, with a height clearance of 4.2 metres:

- Inside all external boundaries on the property
- Surrounding all outbuildings erected on the property
- Surrounding haystacks, fuel storage or other flammable materials.

Smaller Blocks

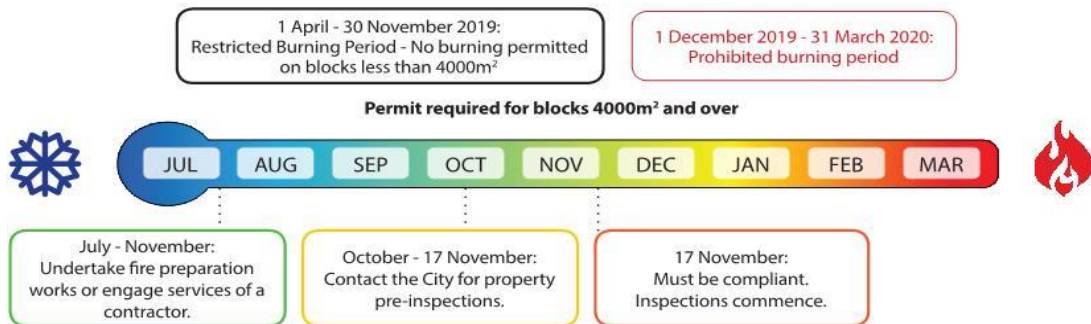
Occupied or Unoccupied Land less than 4000m²

- Have the entire property clear of all flammable materials except for living standing trees
- Mowing, slashing, whipper snipping to a height of no more than 4 cm
- Ploughing, cultivating, scarifying or chemical spraying, followed by slashing to 4cm or other approved method by the City.

NOTE: A 4 metre firebreak may not be sufficient on properties with dense vegetation. Owners may be required to thin vegetation out to the satisfaction of the City to reduce any significant fire risk.

Fire Preparedness Timeline

Ongoing maintenance is required throughout the fire season, this is the owners responsibility.



All enquiries to Ranger Services 9550 3777
Mon-Fri 8.30am - 4.30pm or email
ranger.admin@mandurah.wa.gov.au.