

ATTACHMENT 4

BUSHFIRE MANAGEMENT PLAN



ROWE
GROUP

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 154 & 155 Alexander Drive

Suburb: LANDSDALE

State: WA

P/code: 6065

Local government area: City of Wanneroo

Description of the planning proposal: Development Application

BMP Plan / Reference Number: 210216

Version: 1.1

Date of Issue: 2/12/2022

Client /Business Name: Steve Hindley

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 type="checkbox"/>	<input checked="" 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.)?

Tourism Land Use - Short stay accommodation or visitation uses that involve people who are unaware of their surroundings and who may require assistance or direction in the event of a bushfire.

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 Mike Scott	Accreditation Level Level 3	Accreditation No. BPAD 27795	Accreditation Expiry 01/08/2022
Company Bushfire Prone Planning		Contact No. 6477 1144	

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

02/12/2021



Bushfire Management Plan

Lot 154 & 155 Alexander Drive, East Landsdale

City of Wanneroo

Planning Stage: Development Application (Standard BMP)

Planning Development Type: Development Application

Bushfire Policy – Specific Development or Use Type: Centre Zone Development

Job Number: 210216

Assessment Date: 26 March 2021

Report Date: 2 December 2021

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BMP (Standard DA-Non-Tourism) Template v8.5				
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Person/Business: Email:			<input type="checkbox"/>	<input type="checkbox"/>
<p>Limitation of Liability: The measures contained in this Bushfire Management Plan, are considered to be minimum requirements and they do not guarantee that a building will not be damaged in a bushfire, persons injured, or fatalities occur either on the subject site or off the site while evacuating. This is substantially due to the unpredictable nature and behaviour of fire and fire weather conditions. Additionally, the correct implementation of the required bushfire protection measures will depend upon, among other things, the ongoing actions of the landowners and/or operators over which Bushfire Prone Planning has no control.</p> <p>All surveys, forecasts, projections and recommendations made in this report associated with the proposed development are made in good faith based on information available to Bushfire Prone Planning at the time. All maps included herein are indicative in nature and are not to be used for accurate calculations.</p> <p>Notwithstanding anything contained therein, Bushfire Prone Planning will not, except as the law may require, be liable for any loss or other consequences whether or not due to the negligence of their consultants, their servants or agents, arising out of the services provided by their consultants.</p> <p>Copyright ©2020 BPP Group Pty Ltd: All intellectual property rights, including copyright, in format and proprietary content contained in documents created by Bushfire Prone Planning, remain the property of BPP Group Pty Ltd. Any use made of such format or content without the prior written approval of Bushfire Prone Planning, will constitute an infringement on the rights of the Company which reserves all legal rights and remedies in respect of any such infringement.</p>				

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EXECUTIVE SUMMARY

This Bushfire Management Plan is to accompany a Development Application for a proposed centre zone development at Lot 154 & Lot 155 Alexander Drive, Landsdale, in the City of Wanneroo. Future development will consist of supermarkets, restaurants, retail stores, and associated carpark areas.

Contained in this bushfire management plan, contour mapping is utilised to visually show the potential radiant heat impacts (from bushfire prone vegetation), as separate Bushfire Attack Level contours across the site. The BAL's have been derived from the proposed Lots within the accessed areas. The purpose is to inform future development planning by determining or indicating the Bushfire Attack Levels (BAL's) that future buildings, within the development site, are potentially subject to.

Against the Bushfire Protection Criteria, the decision maker's assessment for a future Proposal will be on the basis of it being able to meet the Acceptable Solutions, once construction and landscaping is complete as follows:

- For Element 1 'Location', the development is able to achieve the acceptable solution (by being located in an area that will on competition be subject to BAL-29 or less);
- For Element 2 'Siting and Design' the future Proposal is able to meet the acceptable solutions by the buildings being able to achieve an Asset Protection Zone (APZ) of sufficient size to ensure the radiant heat impact does not exceed BAL-29;
- For Element 3 'Vehicular Access', the location of the development is able to meet the current acceptable solution A3.1 and E3.1 (provision of two access routes to different destinations); and
- For Element 4 'Water', the Location of the development is able to achieve the acceptable solution (it is located in a reticulated water supply area where existing hydrants are available for fire-fighting operations).

The development site will be subdivided at a future stage.

1 PROPOSAL DETAILS

1.1 Description and Associated Plans and Maps

Landowner / Proponent:	Landsdale Unit Trust (Lot 154) Alexander Unit Trust (Lot 155)
Bushfire Prone Planning Commissioned to Produce the Bushfire Management Plan (BMP) By:	Steve Hindley
For Submission To:	City of Wanneroo
Purpose of the BMP:	To satisfy a condition of planning approval
'Development' Site Total Area:	4.2239 hectares
No. of Existing/Proposed Lots:	Existing lot(s) = 2
Description of the Proposed Development/Use:	
Development application for a proposed centre zone with supermarkets, restaurants, retail stores, and carpark areas.	
Staged Development and Management of Potential Bushfire Hazard Issues	
The bushfire management planning for the development stage will address the bushfire risk that considers the future development and subdivision on the site can be undertaken independently on subsequent subdivision stages, ensuring the acceptable solutions for the four key bushfire planning elements are met.	



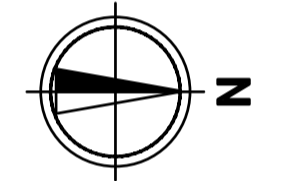
LEGEND

- BUILDING FOOTPRINT GFA
- ANCILLARY STRUCTURE/ USE AREA
- BITUMEN SEALED PAVEMENT, REFER TOP CIVIL DETAILS
- BLACK CONCRETE HARDSTAND, REFER TO CIVIL.
- SELECTED PAVED FOOTPATH.
- SOFT LANDSCAPED AREA.
- COLORLED PAVING ROLL OVER HARDSTAND
- EXISTING LEVELS/ OVERLAY
- NEW 350mm WIDE LIMESTONE BLOCK RETAINING WALL SHOWN INDICATIVELY. REFER TO CIVIL DRAWINGS FOR MORE INFORMATION.
- NEW 200mm WIDE SEMI MOUNTABLE CONCRETE KERBS, TIE INTO EXISTING ROAD KERB AS REQUIRED. REFER TO CIVIL DRAWINGS FOR MORE INFORMATION.
- NEW RAMPS WITH TACTILE STRIPS, CONSTRUCTION TO BE IN ACCORDANCE WITH AS1428.1. REFER TO CIVIL DRAWINGS FOR DETAILS

LANDSCAPING NOTE

ALL LANDSCAPING IS TO BE DESIGNED AND INSTALLED IN ACCORDANCE WITH BUSINESS MANAGEMENT PLAN AS REQUIRED. PLEASE REFER TO LANDSCAPING PLAN BY OTHERS FOR MORE INFORMATION.

LOT 154	LOT 155
TOTAL SITE AREA	20,266m ²
SOFT LANDSCAPING	2,130m ²
LANDSCAPING COVERAGE	10.5%
TOTAL SITE AREA	12,266m ²
SOFT LANDSCAPING	1,85m ²
LANDSCAPING COVERAGE	15.0%



HINDLEY & ASSOCIATES
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DEVELOPMENT APPLICATION

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NO. DATE: REVISION: DRAWN: CHECK:
A 29.11.21 ISSUED FOR DEVELOPMENT APPROVAL JJR SJH

A1 SHEET

PROPOSED SITE PLAN
SCALE 1:400

PROPOSED CENTRE ZONE DEVELOPMENT
LOT 154 & 155 Cnr. ALEXANDER DRIVE & LANDSDALE ROAD, EAST LANDSDALE
for LANDSDALE UNIT TRUST & ALEXANDER UNIT TRUST

Date 24.08.20
Design SJH
Drawn JJR
Checked SJH
Scale 1:400
Job No. 0456
Dwg - DA03
Rev - A

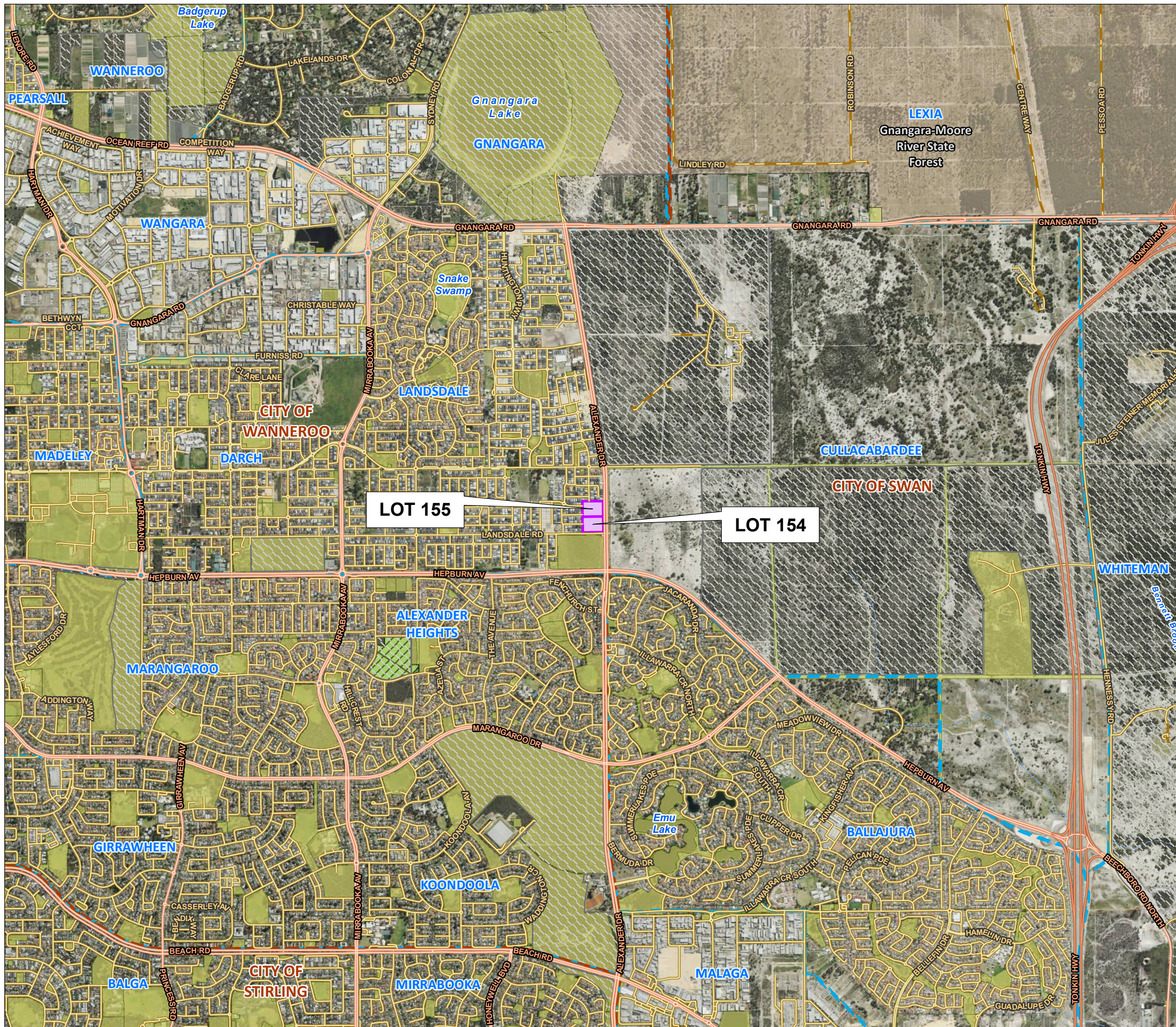


Figure 1.2
Location Plan

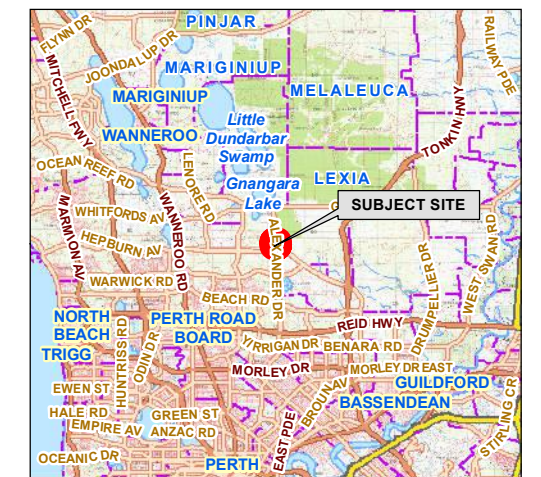
Lot 155 on Diagram 28708, Area : 21,145 sq m
 385 Alexander Drive,
 Lot 154 on Diagram 28708, Area : 21,094 sq m
 365 Landsdale Road,
 LANDSDALE 6065
CITY OF WANNEROO

----- **LEGEND** -----

- Subject Site
- Local Government Authority
- Locality / Suburb
- Reserves**
- Reserves
- Legislated Lands and Waters**
- State Forest
- DBCAs Lands of Interest**
- Crown Freehold - Dept Interest
- Bush Forever



----- **LOCALITY** -----



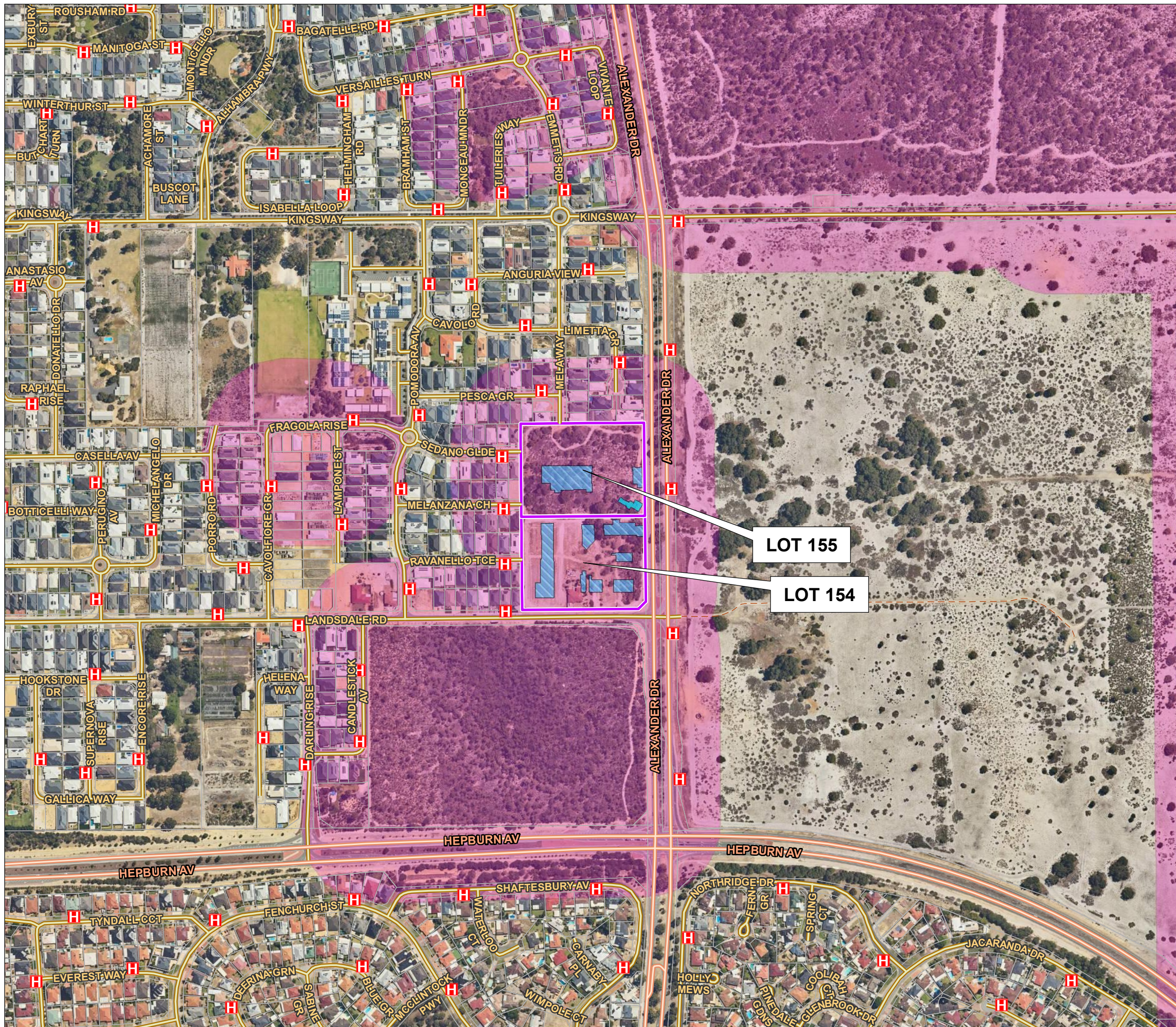
Aerial Imagery : Landgate/SLIP
 Image Date : Aug 2020



Coordinate System: GDA 1994 MGA Zone 50
 Projection: Universal Transverse Mercator Units: Metre
 Map compiled by: Ian Ross 7/04/2021
 Map updated by: Ian Ross 7/04/2021

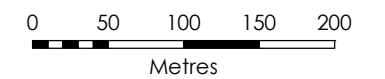
Figure 1.3
Bushfire Prone Area

Lot 155 on Diagram 28708, Area : 21,145 sq m
 385 Alexander Drive,
 Lot 154 on Diagram 28708, Area : 21,094 sq m
 365 Landsdale Road,
 LANDSDALE 6065
CITY OF WANNEROO

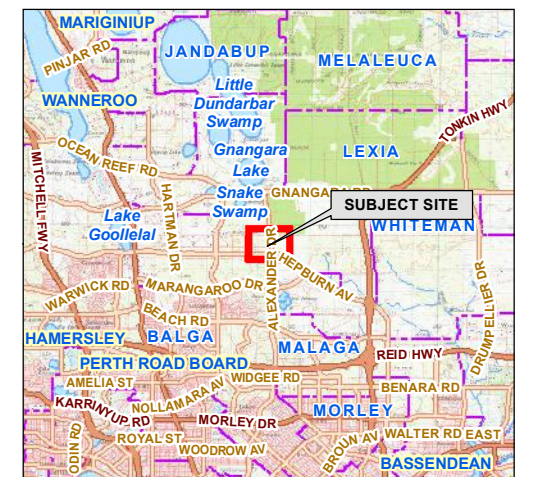


----- LEGEND -----

- Subject Site
- Other Lots
- H Hydrant
- Proposed Building**
- Commercial Buildings
- Plant
- Bushfire Prone Areas (2019)



----- LOCALITY -----



Aerial Imagery : Landgate/SLIP
 Image Date : Feb 2021



Coordinate System: GDA 1994 MGA Zone 50
 Projection: Universal Transverse Mercator Units: Metre
 Map compiled by: Ian Ross 1/12/2021
 Map dated by: Ian Ross 1/12/2021

1.2 Existing Documentation Relevant to the Construction of this Plan

This section acknowledges any known reports or plans that have been prepared for previous planning stages, that refer to the subject area and that may or will impact upon the assessment of bushfire risk and/or the implementation of bushfire protection measures and will be referenced in this Bushfire Management Plan.

Table 2.1: Existing relevant documentation.

RELEVANT EXISTING DOCUMENTS		
Existing Document	Copy Provided by Client	Title
Local Development Plan	Yes	Endorsed Local Development Plan No.18 Lots 154 155 Alexander Drive Landsdale – 16 th July 2020
Environmental Report	-	-
Landscaping (Revegetation) Plan	-	-
Bushfire Risk Assessments	-	-

2 ENVIRONMENTAL CONSIDERATIONS

2.1 Native Vegetation – Restrictions to Modification and/or Clearing

Many bushfire prone areas also have high biodiversity values. SPP 3.7 policy objective 5.4 recognises the need to consider bushfire risk management measures alongside environmental, biodiversity and conservation values (Guidelines s2.3).

There is a requirement to identify any need for onsite modification and/or clearing of native vegetation and whether this may trigger potential environmental impact/referral requirements under State and Federal environmental legislation. Confirmation that any proposed native vegetation modification and/or clearing is acceptable, should be received from the relevant agencies by the proponent and provided to the bushfire consultant for inclusion in the Bushfire Management Plan if it will influence the required bushfire planning assessments and outcomes. The following table details any potential environmental restrictions of which the author of this report is aware.

Table 2.2: Native vegetation and potential environmental considerations and restrictions.

NATIVE VEGETATION MODIFICATION / CLEARING - POTENTIAL ENVIRONMENTAL RESTRICTIONS IDENTIFIED				
Environmental Considerations / Features	Potential Mapping Data Source (SLIP / Local Planning)	Relevant to Proposed Development	Data Applied	Action Required
Onsite clearing of native vegetation is required.		Yes		
Environmental impact/referral requirements under State and Federal environmental legislation may be triggered.		Possible		
National Park / Nature Reserve	DBCA-011	No-Confirmed by Bushfire Consultant	Relevant Database Reviewed by Bushfire Consultant	None
Conservation Covenant	DPIRD-023	Not Known	Data Not Readily Available to Bushfire Consultant	Proponent to Seek Advice
Bush Forever Site	DPLH-019	No-Confirmed by Bushfire Consultant	Relevant Database Reviewed by Bushfire Consultant	None
RAMSAR Wetland	DBCA-010	No-Confirmed by Bushfire Consultant	Relevant Database Reviewed by Bushfire Consultant	None
Geomorphic and Other Wetland	DBCA-011-019, 040, 043, 044	No-Confirmed by Bushfire Consultant	Relevant Database Reviewed by Bushfire Consultant	None
Threatened and Priority Ecological Communities (TECs or PECs)	DBCA-038	Likely	Relevant Database Reviewed by Bushfire Consultant	Proponent to Seek Advice
Threatened and Priority Flora including Declared Rare Flora (DRFs)	DBCA-036	Unlikely	Relevant Database Reviewed by Bushfire Consultant	Proponent to Seek Advice
Land Identified as significant through a Local Biodiversity Strategy	LG - Intramaps	Not Known	Data Not Readily Available to Bushfire Consultant	Proponent to Seek Advice

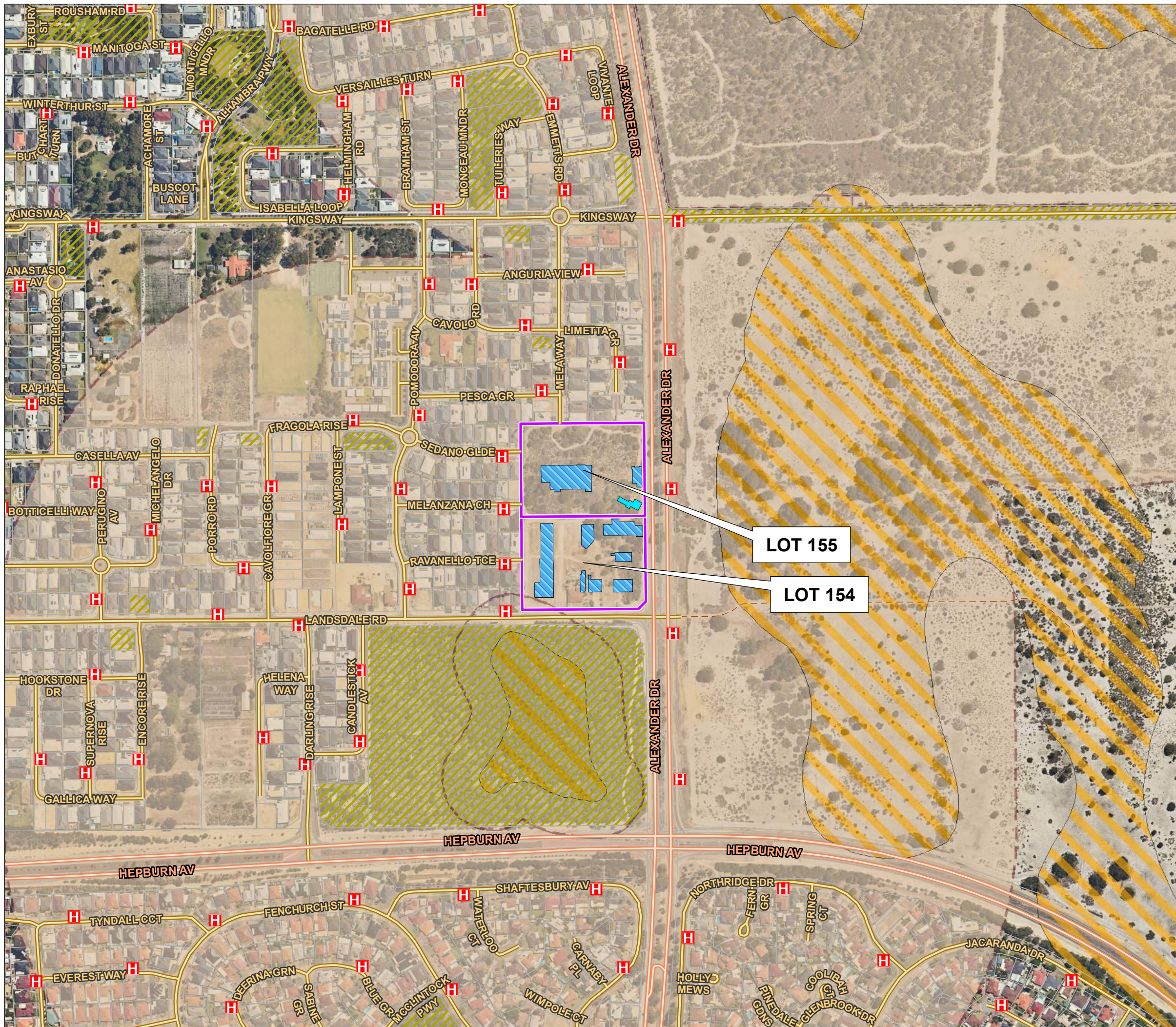
Statement of how the identified environmental feature(s) is dealt with in this Bushfire Management Plan (and the location of relevant information):

The assessments and bushfire protection measures detailed the BMP, assume that environmental approval will be achieved or clearing permit exemptions will apply.

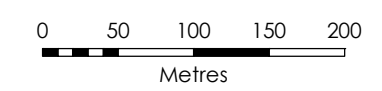
It is advised that the proponent seek further advice from an Environmental Consultant or the WA Department of Biodiversity Conservation and Attractions for further information on the condition and species contained within the proposed development area and the requirement for referral of the proposal.

Figure 2.1
Environmental Considerations Map

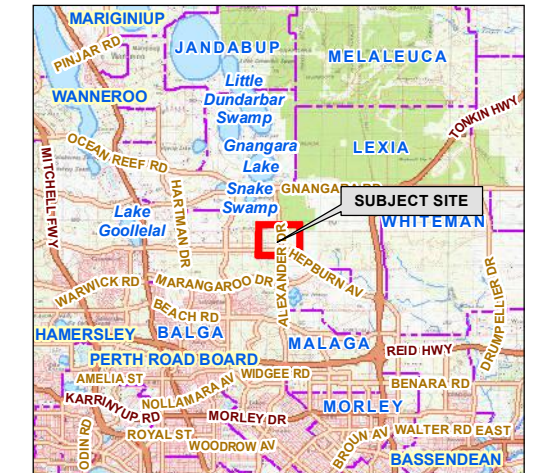
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CITY OF WANNEROO



- LEGEND -----
- Subject Site
 - Other Lots
 - H Hydrant
 - Proposed Building**
 - Commercial Buildings
 - Plant
 - Reserves**
 - Reserves
 - Geomorphic Wetlands**
 - Dampland
 - Clearing Regulations**
 - Clearing Regulations



----- LOCALITY -----



Aerial Imagery : Landgate/SLIP
 Image Date : Feb 2021

Coordinate System: GDA 1994 MGA Zone 50
 Projection: Universal Transverse Mercator Units: Metre
 Map compiled by: Ian Ross 1/12/2021
 Map dated by: Ian Ross 1/12/2021

Disclaimer and Limitation: This map has been prepared for bushfire management planning purposes only. All depicted areas, contours and any dimensions shown are subject to survey. Bushfire Prone Planning does not guarantee that this map is without flaw of any kind and disclaims all liability for any errors, loss or other consequence arising from relying on any information depicted.
 Map Document Path / Name: K:\Projects\Jobs 2021\210216 - Lot 154 & 155 Alexander Drive Landsdale (BMP SD)\210216 - BMP - Apr 2021\Mapping\MXD\210216_Fig2-1_ENV_Alexander Drive Landsdale.mxd

Development Design Considerations

Establishing development in bushfire prone areas can adversely affect the retention of native vegetation through clearing associated with the creation of lots and/or asset protection zones. Where loss of vegetation is not acceptable or causes conflict with landscape or environmental objectives, it will be necessary to consider available design options to minimise the removal of native vegetation.

Table 2.3: Development design.

MINIMISE THE REMOVAL OF NATIVE VEGETATION	
Design Option	Assessment / Action
Reduction of lot yield	N/A
Cluster development	N/A
Construct building to a standard corresponding to a higher BAL as per BCA (AS 3959:2018 and/or NASH Standard)	N/A
Modify the development location	N/A
The development proposal considers the ability to locate new buildings in an area on the site that can achieve bushfire attack level ratings, to a maximum of BAL-29.	
IMPACT ON ADJOINING LAND	
Is this planning proposal able to implement the required bushfire protection measures within the boundaries of the land being developed so as not to impact on the bushfire and environmental management of neighbouring reserves, properties or conservation covenants?	Yes
The development proposal, with future buildings, considers achievable asset protection zones within the boundaries of the subject land. Clearing vegetation outside of the land is not required for development works.	

2.2 Retained Vegetation / Re-vegetation / Landscape Plans (including POS)

Riparian zones, wetland/foreshore buffers, road verges and public open space may have plans to re-vegetate or retain vegetation as part of the proposed development. Vegetation corridors may be created between offsite and onsite vegetation and provide a route for fire to enter a development area.

All retained/planned vegetation and its management will be considered in the development of this Bushfire Management Plan.

Is re-vegetation of riparian zones and/or wetland or foreshore buffers and/or public open space a part of this Proposal?	No
N/A	
Is the requirement for ongoing maintenance of existing vegetation in riparian zones and/or wetland or foreshore buffers and/or public open space a part of this Proposal?	No
N/A	
Has a landscape plan been developed for the proposed development?	No
N/A	

3 POTENTIAL BUSHFIRE IMPACT ASSESSMENT

3.1 Assessment Input

3.1.1 Fire Danger Index (FDI) Applied

AS 3959:2018 Table 2.1 specifies the fire danger index values to apply for different regions. The values used in the model calculations are for the Forest Fire Danger Index (FFDI) and for which equivalent representative values of the Grassland Fire Danger Index (GFDI) are applied as per Appendix B. The values can be modified if appropriately justified.

Table 3.1: Applied FDI Value

FDI VALUE			
Vegetation Areas	As per AS 3959:2018 Table 2.1	As per DFES for the Location	Value Applied
1-9	80	N/A	80

3.1.2 Vegetation Classification and Effective Slope

Classification: Bushfire prone vegetation identification and classification has been conducted in accordance with AS 3959:2018 s2.2.3 and the Visual Guide for Bushfire Risk Assessment in WA (DoP February 2016).

When more than one vegetation type is present, each type is identified separately, and the applied classification considers the potential bushfire intensity and behaviour from the vegetation types present and ensures the worst case scenario is accounted for – this may not be from the predominant vegetation type.

The vegetation structure has been assessed as it will be in its mature state (rather than what might be observed on the day). Areas of modified vegetation are assessed as they will be in their natural unmodified state (unless maintained in a permanently low threat, minimal fuel condition, satisfying AS 3959:2018 s2.2.3.2(f) and asset protection zone standards). Vegetation destroyed or damaged by a bushfire or other natural disaster has been assessed on its revegetated mature state.

Effective Slope: Refers to the ground slope under each area of classified vegetation and is described in the direction relative to the view from the building or proposed development site. Effective slope is not the same as 'average slope', rather it is the slope which most significantly influences fire behaviour. This slope has a direct and significant influence on a bushfire's rate of spread and intensity.

Where there is a significant change in effective slope under an area of classified vegetation, that will cause a change in fire behaviour, separate vegetation areas will be identified to enable the correct assessment.

When the effective slope, under a given area of bushfire prone vegetation, will be different relative to multiple proposed development sites, then the effective slopes corresponding to the different locations, are separately identified.

Planned Re-vegetation/Landscaping Considerations/Public Open Space Management

Vegetation is classified at its present condition. However, onsite classified vegetation will be considered low-threat and or non-vegetated post-development. Such vegetation will be excluded from classification after removal, due to proposed management, with the landowners holding the obligation to manage onsite vegetation to a minimal fuel, low threat state, in perpetuity.

Excluded Bushfire Prone Vegetation

The landowner can manage all onsite vegetation to a minimal fuel, low threat state once the existing classified vegetation is removed for development. Consequently, the potential bushfire impact is determined by bushfire prone vegetation offsite over which the existing/future landowner has no control.

Table 3.2: Vegetation classification and effective slope.

ALL VEGETATION WITHIN 150 METRES OF THE PROPOSED DEVELOPMENT				
Vegetation Area	Identified Vegetation Types ¹ or Description if 'Excluded'	Applied Vegetation Classification ¹	Effective Slope (degrees) ² (AS 3959:2018 Method 1)	
			Assessed	Applied Range
1	Closed scrub D-13	Class D Scrub	0	upslope or flat
2	Sown pasture G-26, Open tussock G-23	Class G Grassland	0	upslope or flat
3	Open scrub D-14	Class D Scrub	Upslope 2	upslope or flat
4	Low open woodland B-08	Class G Grassland	Upslope 2	upslope or flat
5	Open heath C-11	Class C Shrubland	0	upslope or flat
6	Open tussock G-23 , Open woodland B-06 , Sparse open herbfield G-28	Class G Grassland	0	upslope or flat
7	Low Threat Vegetation	Excluded as per Section 2.2.3.2 (f)	N/A	N/A
8	Low Threat Vegetation	Excluded as per Section 2.2.3.2 (f)	N/A	N/A
9	Non-vegetated Area, Low Threat Vegetation	Excluded as per Section 2.2.3.2 (e)(f)	N/A	N/A
Representative photos of each vegetation area, descriptions and classification justification, are presented on the following pages. The areas of classified vegetation are defined, and the photo locations identified on Figure 3.1, the vegetation and topography map.				
Note ¹ : Described and classified as per AS 3959:2018 Table 2.3 and Figures 2.3 and 2.4 (A)-(H)				
Note ² : Effective slope measured as per AS 3959:2018 Section 2.2.5 and Appendix B Part B4				

VEGETATION AREA 1

AS 3959:2018 Vegetation Classification Applied:	Class D Scrub
Vegetation Types Present:	Closed scrub D-13
Description/Justification:	Mixed species trees, dominated by banksia <6 m tall, with foliage cover 30-50%. Tiered structure with the understorey comprised of grasstrees <2m tall, mixed species shrubs, and tall grass.
Post Dev. Assumptions:	Vegetation is onsite and will be removed prior to or during development.



Photo ID: 1



Photo ID: 2



Photo ID: 3



Photo ID: 4



Photo ID: 5



Photo ID: 6

VEGETATION AREA 2

AS 3959:2018 Vegetation Classification Applied:	Class G Grassland
Vegetation Types Present:	Sown pasture G-26 Open tussock G-23
Description/Justification:	Unmanaged sparse grass.
Post Dev. Assumptions:	Vegetation is onsite and will be removed prior to or during development.



Photo ID: 7



Photo ID: 8



Photo ID: 9

VEGETATION AREA 3

AS 3959:2018 Vegetation Classification Applied:	Class D Scrub
Vegetation Types Present:	Open scrub D-14
Description/Justification:	Mixed species trees, dominated by banksia <6 m tall, with foliage cover <30%. Clearly tiered structure with the understorey comprised of grasstrees <2m tall, mixed species shrubs, and tall grass.
Post Dev. Assumptions:	Vegetation is on an offsite reserve. Vegetation cannot be removed or managed and is classified as worst-case scenario.



Photo ID: 10





Photo ID: 11









Photo ID: 12







Photo ID: 13

VEGETATION AREA 4	
AS 3959:2018 Vegetation Classification Applied:	Class G Grassland
Vegetation Types Present:	Low open woodland B-08
Description/Justification:	Eucalyptus trees to be >10m tall in mature state, with <10% foliage cover. Sparse grassy understory.
Post Dev. Assumptions:	Vegetation is offsite, and taking a cautionary approach is classified as worst-case scenario. Vegetation can be managed by the City of Wanneroo.
	
Photo ID: 14	Photo ID: 15

VEGETATION AREA 5	
AS 3959:2018 Vegetation Classification Applied:	Class C Shrubland
Vegetation Types Present:	Open heath C-11
Description/Justification:	Tall grass and mixed shrub species <2 m with sparse trees growing to ~10 m once mature.
Post Dev. Assumptions:	Vegetation is offsite and classified as worst-case scenario. It cannot be managed or removed, as it is a designated drainage area.
	
Photo ID: 16	Photo ID: 17

VEGETATION AREA 6	
AS 3959:2018 Vegetation Classification Applied:	Class G Grassland
Vegetation Types Present:	Open tussock G-23 Open woodland B-06 Sparse open herbfield G-28
Description/Justification:	Foliage cover <10% with trees > 10 m in height, surrounded by succulents, sparse tussock grass and sand.
Post Dev. Assumptions:	Vegetation is offsite and, taking a cautionary approach, is classified as worst-case scenario. It cannot be managed or removed as it is under clearing regulations and is classified as a geomorphic wetland area.
	
Photo ID: 18	Photo ID: 19
	
Photo ID: 20	Photo ID: 21

VEGETATION AREA 7	
AS 3959:2018 Vegetation Classification Applied:	Excluded as per Section 2.2.3.2 (f)
Vegetation Types Present:	Low Threat Vegetation
Description/Justification:	Maintained median strip consisting of low shrubs and eucalyptus trees with no understorey (on sand and mulch).
Post Dev. Assumptions:	Low threat vegetation is expected to remain in this state in perpetuity.
	
Photo ID: 22	Photo ID: 23

VEGETATION AREA 8	
AS 3959:2018 Vegetation Classification Applied:	Excluded as per Section 2.2.3.2 (f)
Vegetation Types Present:	Low Threat Vegetation
Description/Justification:	Sandy area with patchy succulent ground covers. Low threat area with a history of management.
Post Dev. Assumptions:	Low threat vegetation is expected to remain in this state in perpetuity.
	
Photo ID: 24	Photo ID: 25

VEGETATION AREA 8



Photo ID: 26



Photo ID: 27

VEGETATION AREA 9

AS 3959:2018 Vegetation Classification Applied:	Excluded as per Section 2.2.3.2 (e)(f)
Vegetation Types Present:	Non-vegetated Areas Low Threat Vegetation
Description/Justification:	Residential areas comprised of housing, roads and pathways, and managed and reticulated gardens.
Post Dev. Assumptions:	Low-threat and non-vegetated areas area expected to remain at a low-threat state in perpetuity.



Photo ID: 28



Photo ID: 29



Photo ID: 30



Photo ID: 31



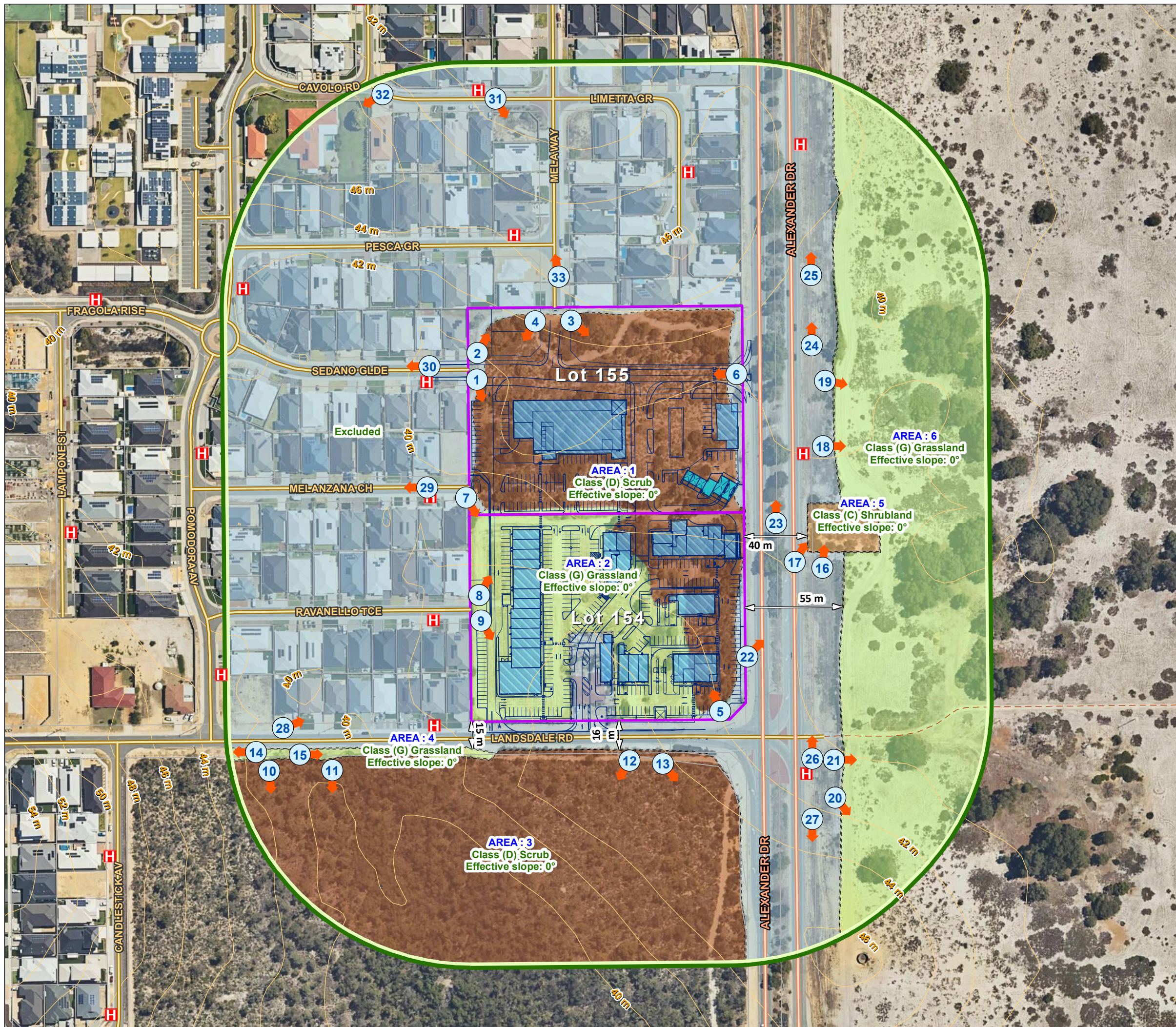
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Photo ID: 33

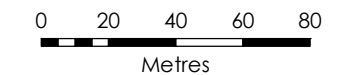
Figure 3.1
Topography & Classified Vegetation

Lot 155 on Diagram 28708, Area : 21,145 sq m
 385 Alexander Drive,
 Lot 154 on Diagram 28708, Area : 21,094 sq m
 365 Landsdale Road,
 LANDSDALE 6065
CITY OF WANNEROO

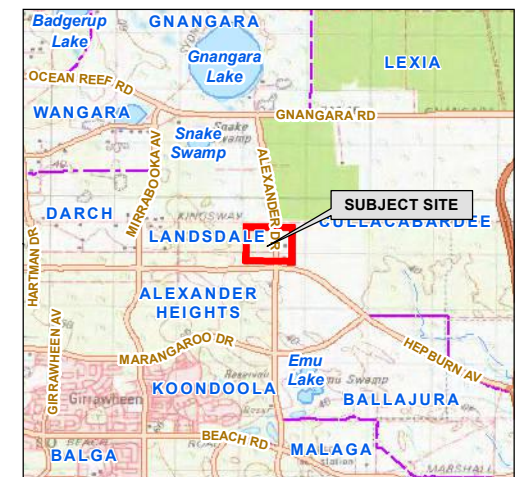


----- LEGEND -----

- Subject Site
- Other Lots
- ← Photo & Direction
- H Hydrant
- Proposed Building**
- Commercial Buildings
- Plant
- Vegetation Assessment Area**
- 150m from Subject Site
- Classified Vegetation**
- Class (C) Shrubland
- Class (D) Scrub
- Class (G) Grassland
- Exclusion 2.2.3.2
- ↔ Vegetation Distance



----- LOCALITY -----



Aerial Imagery : Landgate/SLIP
 Image Date : Feb 2021

Coordinate System: GDA 1994 MGA Zone 50
 Projection: Universal Transverse Mercator Units: Metre
 Map compiled by: Ian Ross 1/12/2021
 Map updated by: Ian Ross 1/12/2021

Disclaimer and Limitation: This map has been prepared for bushfire management planning purposes only. All depicted areas, contours and any dimensions shown are subject to survey. Bushfire Prone Planning does not guarantee that this map is without flaw of any kind and disclaims all liability for any errors, loss or other consequence arising from relying on any information depicted.
 Map Document Path / Name: K:\Projects\Jobs 2021\210216 - Lot 154 & 155 Alexander Drive Landsdale (BMP SD)\210216 - BMP - Apr 2021\Mapping\MXD\210216_Fig3-1_VEG_Alexander Drive Landsdale.mxd

3.1.3 Vegetation Separation Distance

The vegetation separation distance is the horizontal distance measured from the relevant parts of an existing building or a future building's planned location (within a lot), to the determined edge of an area of classified vegetation.

This separation distance applied to determining a Bushfire Attack Level (BAL) can be either:

- The measured distance – for which the location of the building relative to the edge of classified vegetation must be known. This will result in single determined BAL that will apply to a building. (The measured distance is a required calculation input); or
- A calculated minimum and maximum distance (range) that will correspond to each individual BAL. The calculated distances provide an indicative (or achievable) BAL for which the determined BAL will be dependent on the known location of the building relative to the edge of classified vegetation.

The calculated range of distances corresponding to each BAL can be presented in different formats (tables or a BAL contour map), dependent on the form of information that is most appropriate for the proposed development/use. These distance ranges corresponding to BAL(s) will be presented in Section 3.2: 'Assessment Output'.

For the proposed development/use, the applicable vegetation separation distances will be presented within the Bushfire Management Plan in this location:

In Section 3.2 'Assessment Output' as a table containing the calculated ranges of distance corresponding to each BAL and illustrated as a BAL Contour Map.

A BAL Contour Map indicating the BAL ratings across the site area of Lots 154 & 155 is provided to indicate the environment based on the current bushfire conditions. The future development of asset protection zones to achieve a maximum BAL-29 for proposed building and associated infrastructure will be constructed at the development stage, which will require the removal of all onsite vegetation.

3.2 Assessment Output

UNDERSTANDING THE RESULTS OF THE BUSHFIRE IMPACT ASSESSMENT

Bushfire Attack Levels (BALs) – Their Application in the Building Environment is Different to the Planning Environment

In the building environment, a **determined BAL** is required for the proposed construction at the building application stage. This is to inform approval considerations and establish the bushfire construction standards that are to apply. An indicative BAL is not acceptable for a building application.

In the planning environment, through the application of SPP 3.7 and associated Guidelines, the deemed to satisfy requirement for a proposed 'development site' or sites (defined by the LPS Amendment Regulations 2015 as "that part of a lot on which a building that is the subject of development stands or is to be constructed"), is that a BAL-29 or lower rating can be achieved once all works associated with the proposal are completed. For planning approval purposes, an **indicative BAL** can provide the required information.

Determined Bushfire Attack Level

A determined BAL is to apply to an existing building or the 'development site' on which the building is to be constructed and not to a lot or building envelope. Its purpose is to state the potential radiant heat flux to which the building will be exposed, thereby determining the construction standard to be applied.

A determined BAL cannot be given for a future building whose design and position on the lot are unknown or the vegetation separation distance has not been established. It is not until these variables have been fixed that a determined BAL can be stated, and a BAL Certificate can be issued.

The one exception is when a building **of any dimension** can be **positioned anywhere** on a proposed lot (within R-Code building setbacks) or within a defined building envelope, and always remain subject to the same BAL, regardless of the retention of any existing classified vegetation either onsite or offsite.

Indicative Bushfire Attack Level

If a BAL is not able to achieve 'determined' status it will be an indicative BAL. It indicates the BAL that can be achieved by the proposed development/use. However, it is conditional upon an assessment variable(s) being confirmed at a later stage (e.g. the building location is established/changed, or vegetation is modified/removed to establish the vegetation separation distance).

A BAL certificate cannot be issued for an indicative BAL – unless that BAL cannot vary (refer to 'Determined BAL' above).

In table form, a single or a range of indicative BAL(s) may be presented. If a single indicative BAL is stated for a defined area (i.e. the lot or building envelope), this will be the highest indicative BAL impacting the defined area.

In BAL contour map form (refer to Section 3.2.2), the illustrated BAL contours visually identify areas of land for which if any part of an existing or proposed building is located on that land and within the BAL contours, then the highest BAL affecting that building (or part of the land on which the building will be constructed), will be the indicative BAL that is to apply.

The BAL can only become a determined BAL once the actual location of that building on the land is known and/or the required minimum vegetation separation distance corresponding to the relevant BAL contour is established (refer to Table 3.x).

3.2.1 Bushfire Attack Level Results - BAL Contour Map Format

INTERPRETATION OF THE BUSHFIRE ATTACK LEVEL (BAL) CONTOUR MAP

The contour map will present different coloured contour intervals extending from the areas of classified bushfire prone vegetation. These represent the different bushfire attack levels that will exist at varying distances away from the classified vegetation in the event of a bushfire in that vegetation.

The areas of classified vegetation to be considered in developing the BAL contours, are those that will remain as the intended end state of the subject development once earthworks, clearing and/or landscaping and re-vegetation have been completed (or each stage completed).

Each bushfire attack level corresponds to a set range of radiant heat flux that is generated by a bushfire. That range is defined by the AS 3959:2018 BAL determination methodology.

The width of each shaded BAL contour is a diagrammatic representation of the separation distances from the classified vegetation that correspond to each BAL for each separately identified area of classified vegetation. They have been calculated by the application of the unique site variables including vegetation types and structure, ground slope and applied fire weather.

(Refer to Section 3.2 'Understanding the Results of the Bushfire Impact Assessment' for the explanation of how BAL(s) for buildings will be assessed from the BAL Contour Map).

Construction of the BAL Contours

VEGETATION AREAS APPLIED TO THE DEVELOPMENT OF THE BAL CONTOUR MAP

All identified areas of classified vegetation have been applied with the following exceptions:

1. For Figure 3.2, all classified vegetation within proposed Lot 154 & Lot 155 is excluded and the BAL contours are constructed into the Lots from any classified vegetation outside the boundaries of proposed Lot 154 & Lot 155.

This approach is applied to indicate the achievable bushfire attack levels within the specified lots and the resultant area of developable land (i.e. subject to BAL-29 or less). It is based on the following assumptions:

1. Any classified vegetation within each lot will be removed for development and or can potentially be managed by the landowner to meet asset protection zone standards and dimensions corresponding to an indicated BAL; and
2. Each lot must be considered independent of what development may or may not take place on the adjoining lot.

VEGETATION SEPARATION DISTANCES APPLIED

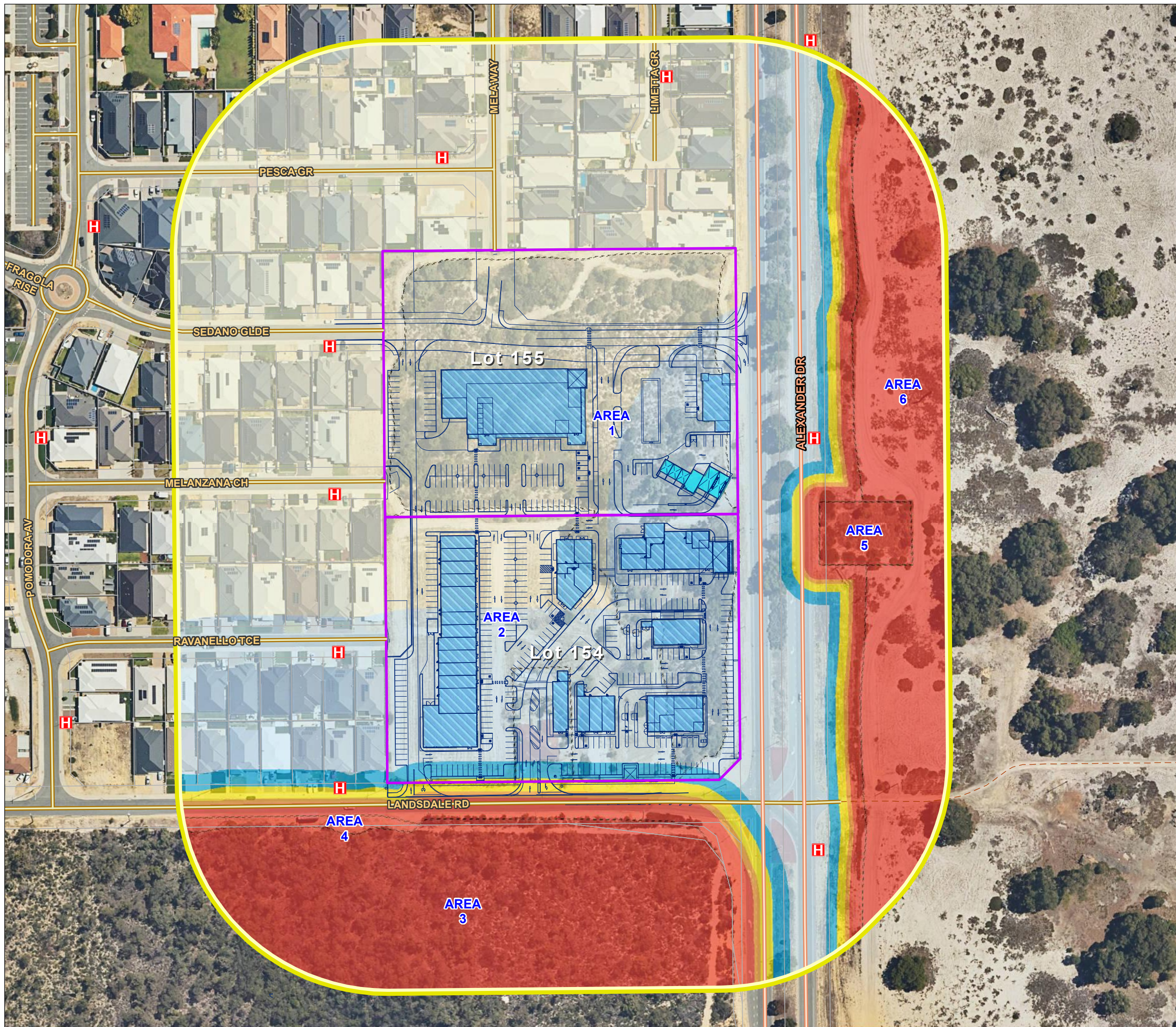
The distances that have been applied to illustrating the width of each BAL contour shown in Figure 3.2 are stated in Table 3.3. These correspond to each Bushfire Attack Level and are specific to the proposed development site.

Table 3.3: Vegetation separation distances applied to construct the BAL contours.

BAL CONTOUR MAP – APPLIED VEGETATION SEPARATION DISTANCES								
Derived from the Application of Method 1 BAL Determination Methodology (AS 3959:2018 Section 2, Table 2.5) ¹								
Vegetation Area	Vegetation Classification	Effective Slope (degree range)	BAL and Corresponding Separation Distance (m)					
			BAL-FZ	BAL-40	BAL-29	BAL-19	BAL12.5	BAL-LOW
1	Class D Scrub	upslope or flat	<10	10-<13	13-<19	19-<27	27-<100	>100
2	Class G Grassland	upslope or flat	<6	6-<8	8-<12	12-<17	17-<100	>100
3	Class D Scrub	upslope or flat	<10	10-<13	13-<19	19-<27	27-<100	>100
4	Class G Grassland	upslope or flat	<6	6-<8	8-<12	12-<17	17-<100	>100
5	Class C Shrubland	upslope or flat	<7	7-<9	9-<13	13-<19	19-<100	>100
6	Class G Grassland	upslope or flat	<6	6-<8	8-<12	12-<17	17-<50	>50
7	Excluded AS3959:2018 2.2.3.2 (f)	N/A	-	-	-	-	-	-
8	Excluded AS3959:2018 2.2.3.2 (f)	N/A	-	-	-	-	-	-
9	Excluded AS3959:2018 2.2.3.2 (e)(f)	N/A	-	-	-	-	-	-

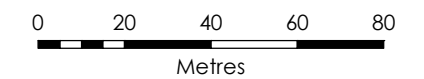
Figure 3.2
**BAL Contour Map
 (Post Development)**

Lot 155 on Diagram 28708, Area : 21,145 sq m
 385 Alexander Drive,
 Lot 154 on Diagram 28708, Area : 21,094 sq m
 365 Landsdale Road,
 LANDSDALE 6065
CITY OF WANNEROO

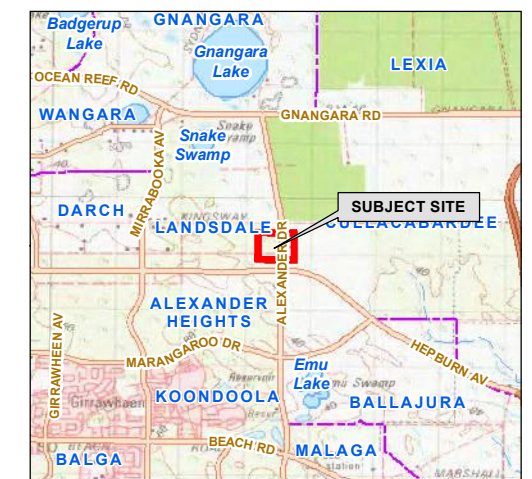


----- LEGEND -----

- Subject Site
- Other Lots
- H Hydrant
- Proposed Building**
- Commercial Buildings
- Plant
- Vegetation Assessment Area**
- 100m from Subject Site
- Classified Vegetation Boundary
- Indicative Bushfire Attack Levels**
- BAL FZ
- BAL 40
- BAL 29
- BAL 19
- BAL 12.5
- BAL LOW



----- LOCALITY -----



Aerial Imagery : Landgate/SLIP
 Image Date : Feb 2021



Coordinate System: GDA 1994 MGA Zone 50
 Projection: Universal Transverse Mercator Units: Metre
 Map compiled by: Ian Ross 1/12/2021
 Map updated by: Ian Ross 1/12/2021

3.2.2 Bushfire Attack Level Results - Derived from The BAL Contour Map

Table 3.4: Indicative and determined BAL(s) for proposed building works.

BUSHFIRE ATTACK LEVEL FOR PLANNED BUILDINGS/STRUCTURE	
BAL Determination Methodology Applied ¹	Method 1 as per AS 3959:2018 s2.2.6 and Table 2.5.
Building/Structure Description (planned)	Indicative BAL (refer to start of s3.2)
Medical Centre (440 m ²)	BAL-12.5
Restaurant (200 m ²)	BAL-12.5
Proposed Retail (1248 m ²)	BAL-12.5
Proposed Office (447 m ²)	BAL-12.5
Proposed Supermarket	BAL-LOW
Drive through food outlet 1	BAL-12.5
Drive through food outlet 2	BAL-12.5
Liquor store/ proposed retail	BAL-12.5
Convenience Store	BAL-12.5
Car wash building	BAL-12.5
Drive Through Food Outlet	BAL-12.5
Takeaway 1 – 3	BAL-12.5
<i>Note¹ Assessment inputs applied are presented in Section 3.1.</i>	
<i>Building structures have been grouped together. Individual retail shops may be subject to lower BAL rating (BAL-LOW)</i>	

4 IDENTIFICATION OF BUSHFIRE HAZARD ISSUES

In response to the Bushfire Management Plan requirements established by Appendix 5 of the Guidelines for Planning in Bushfire Prone Areas (WAPC 2017 v1.3), the following statements are made to assist in the understanding of whether the proposal is likely to be able to comply with the bushfire protection criteria now or in subsequent planning stages.

Spatial Context - Broader Landscape Considerations	
Wider road network and access constraints	<p>The surrounding area has an extensive public road network at the larger scale associated with the residential zoning and corresponding large lot sizes. At a more local level access options can be limited to a single road in two directions for some distance before other options are available.</p> <p>There is no access constraint for the subject site with regard to what is considered acceptable from a planning perspective, however, where development opportunities can increase local access options within the surrounding area, this would have merit that should be considered as benefiting a greater number of residents.</p> <p>The proposed new roads for the development site will connect existing dead-end roads, providing greater access for residents and the general public.</p>
Proximity of settlements and emergency services	<p>The subject site is part of a large area of urban settlement. It is surrounded by the built-up residential and commercial suburbs of Landsdale, Darch, and Alexander Heights. Emergency services are located in Malaga and in Wangara (9 mins, 5.9 km and 9 mins, 8.4 km travel).</p>
Bushfire prone vegetation types and extent (including conserved vegetation)	<p>Significant extents of bushfire prone vegetation exist across the broader landscape as retained native vegetation (banksia forest) and asset protection zones around existing dwellings.</p> <p>Hepburn Park, a 10-ha conservation reserve, is adjacent to the subject lot. The vegetation will produce significant embers and firebrands in a bushfire event primarily due to the type of bark.</p>
Topography and fire behaviour interactions.	<p>The topography is undulating rather than rugged. Some areas of flat land but most areas have slopes of zero to five degrees present over significant areas. Bushfire rates of spread can double for every ten degrees of upslope while downslopes will slow the rate of spread.</p>
Potential for extreme fire behaviour and pyro convective events.	<p>Possible but limited likelihood due to the fragmentation of areas of bushfire prone vegetation due to cleared areas, fuel load management by landowners and the availability of emergency services (including being a part of the greater Perth metropolitan area).</p>
Environmental Considerations	
Constraints to implementing required and/or additional bushfire protection measures	<p>The environment considerations have not identified any issues primary bushfire hazard identified.</p>
Provision of Access Within the Subject Site	
Potential constraints	<p>No constraints to establishing the required access will exist.</p>
Potential Bushfire Impacts	
Flame and radiant heat and ability to establish an APZ	<p>The proposed lot sizes and development locations will allow a BAL-29 dimensioned APZ to be established within each lot and around the proposed buildings. This will prevent flame contact from the classified vegetation. Application of the BAL-29 bushfire construction standard will mitigate the risks from radiant heat impact to what is considered an acceptable level.</p>

Embers/firebrands, smoke and fire-driven wind	These will be the major impacts to the subject site. The appropriate protection measures of building construction and strict management of the APZ will mitigate the risk to what is considered an acceptable level.
Issues to be Considered at Subsequent Planning Stages (additional assessments/documents)	
Specific land uses to be addressed	N/A
Additional assessments	N/A
Additional documents	N/A
Discretionary Decision Making and the Precautionary Principle (SPP 3.7 and Guidelines)	
Does the bushfire consultant consider there are issues that need to be addressed in this space?	No.

5 ASSESSMENT AGAINST THE BUSHFIRE PROTECTION CRITERIA ESTABLISHED BY THE GUIDELINES

For a development application that is not a 'Tourism Land Use' to be considered compliant with SPP 3.7, it must satisfy (achieve) the intent of each of the four elements of the bushfire protection criteria. These criteria are established by the *Guidelines for Planning in Bushfire Prone Areas WAPC 2017 v1.3*). Compliance can be achieved by either:

- Meeting all applicable acceptable solutions corresponding to each element (i.e. the minimum bushfire protection measures that are deemed to satisfy planning requirements); or
- Where an acceptable solution cannot be met, by developing a performance solution that satisfies the established requirements.

5.1 Local Government Variations to Apply

Local governments may add to or modify the acceptable solutions of the Bushfire Protection Criteria (BPC) and/or apply technical requirements that vary from those specified in the *Guidelines for Planning in Bushfire Prone Areas (WAPC)*. In such instances, this Proposal will be assessed against these variations and/or any specific local government technical requirements for emergency access and water. Refer to Appendices 2 and 3 for relevant technical requirements.

Will local or regional variations (endorsed by WAPC / DFES) to the applicable acceptable solutions established by the <i>Guidelines</i> or the <i>Position Statement: Tourism land uses in bushfire prone areas WAPC October 2019</i> , apply to this Proposal?	N/A
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Specific Local Government technical requirements where required to be applied will be addressed at the subsequent development clearance stage/s where requested by the local government.

5.2 Summary of Assessment Against the Bushfire Protection Criteria

SUMMARISED OUTCOME OF THE ASSESSMENT AGAINST THE BUSHFIRE PROTECTION CRITERIA					
Element of the Bushfire Protection Criteria	Basis for the Proposal Achieving Full Compliance with SPP 3.7			The Proposal Cannot Achieve Full Compliance with SPP 3.7	
	Acceptable Solutions Met	Achieves the Intent of the Element		Bushfire planning development type that may not require full compliance is applied	An improvement in bushfire performance compared to the existing development is detailed (refer Note 4)
	All applicable solutions are fully met	All applicable solutions are not fully met. A merit based assessment and/or a bushfire performance comparison of the proposals residual risk with that of the residual risk of the acceptable solution is conducted (refer Note 4)	A performance principle-based solution is applied		
1. Location	✓			N/A	
2. Siting and Design of Development	✓				
3. Vehicular Access	✓				
4. Water	✓				
<p>Note: The development proposal has been assessed:</p> <ol style="list-style-type: none"> Against the requirements established in Appendix 4 of the <i>Guidelines for Planning in Bushfire Prone Areas, WAPC 2017 v1.3 (Guidelines)</i>. The Guidelines are found at https://www.planning.wa.gov.au/8194.aspx; and Applying the interpretation guidance provided in <i>Position Statement: Planning in bushfire prone areas – Demonstrating Element 1: Location and Element 2: Siting and design (WAPC Nov 2019)</i>. Applying any endorsed variations to the Guideline's acceptable solutions and associated technical requirements that have been established by the local government. If known and applicable these have been stated in Section 5.1 with the detail included as an appendix if required by the local government. When non-compliant with SPP 3.7 and when appropriate, by utilising additional compliance pathways that include the application of merit based assessment and comparative bushfire performance. The validity of this approach is derived from relevant decisions made by the responsible authorities (refer Appendix 2). 					

5.3 Assessment Detail

Element 1: Location	
<p>Intent: To ensure that strategic planning proposals, subdivision and development applications are located in areas with the least possible risk of bushfire to facilitate the protection of people, property and infrastructure.</p>	
<p>Compliance: How the proposed development achieves the intent of Element 1:</p>	<p>By fully meeting all applicable acceptable solutions established by the bushfire protection criteria (Guidelines v1.3 WAPC 2017)</p>
<p>ASSESSMENT (COMPLIANCE) STATEMENTS</p>	
<p>For each applicable acceptable solution, the following statements present the results of the assessment of the proposed development/use against the requirements established by the <i>Guidelines (WAPC 2017 v1.3)</i> and apply the interpretation guidance established by the <i>Position Statement: Planning in bushfire prone areas – Demonstrating Element 1: Location and Element 2: Siting and design (WAPC Nov 2019)</i>.</p>	
<p>Acceptable Solution: A1.1: Development Location</p>	
<p>ASSESSMENT AGAINST THE REQUIREMENTS ESTABLISHED BY THE GUIDELINES</p>	
<p>The proposed development will provide an area of land within each lot that can be considered suitable for development as BAL-40 or BAL-FZ construction standards will not be required to be applied. This meets the requirements established by Acceptable Solution A1.1 and its associated explanatory note.</p>	
<p>ASSESSMENT AGAINST THE REQUIREMENTS ESTABLISHED BY THE POSITION STATEMENT</p>	
<p>The position statement establishes that:</p> <ul style="list-style-type: none"> • The source of risk (the hazard) to be considered in Element 1 is the “level of bushfire exposure” from the type and extent of bushfire prone vegetation and the topography of the land on which it exists; and • “Consideration should be given to the site context” which includes the land both “within and adjoining the subject site”. The “hazards remaining within the site should not be considered in isolation of the hazards adjoining the site, as the potential impact of a bushfire will be dependent on the wider risk context.” <p>The position statement also recognises:</p> <ul style="list-style-type: none"> • That the proposed development site and its surrounding land may be part of an area “identified for development or intensification of land use prior to the release of SPP 3.7”; consequently • Consideration by decision-makers “should also be given to improving bushfire management of the site and surrounding area, thereby reducing the vulnerability of people property and infrastructure to bushfire”; and • The application of mitigation measures to lessen the risk to the broader area would include improvements to the local road network (including emergency access ways), improvements/additions to firefighting water supply and increasing separation distance from the hazard. 	
<p>The Hazard Within the Subject Site</p> <p>The existing lot is entirely vegetated with native vegetation classified as Class D Scrub and Class G Grassland, except for the existing dwelling. The impact of the slopes under the vegetation will be dependent on a bushfire’s direction of travel, however, the subject site is flat decreasing the impact of slopes on the risk of bushfire.</p> <p>However, the ability to establish a BAL-29 dimensioned APZ within each lot’s boundaries removes the threat of greater levels of radiant heat or flame contact upon a future dwelling. Once the vegetation is cleared, all proposed buildings will be subject to maximum BAL-12.5.</p>	

Element 1: Location

The primary bushfire threat from bushfire prone vegetation remaining within the proposed lot will be embers. This threat will be mitigated by the ongoing maintenance of the APZ to ensure the buildings will not be impacted by consequential fire within combustible materials used, stored or accumulated within the APZ. The Classes of buildings within this development are not required to be constructed to AS3959 Standards, however it is a recommendation that they are constructed the BAL-12.5 Standards to protect against ember attack.

The Hazard Adjoining the Subject Site

Bushfire prone vegetation within the residential locality exists as native vegetation classified as Class C Scrub and Class G Grassland. A 10-ha conservation reserve (Hepburn Park) that adjoins the southern boundary of the existing lot and which presents the single most significant extent of bushfire prone vegetation.

The impact of the slope under the vegetation will be dependent on a bushfire's direction of travel, but slopes in the range of zero to five degrees downslope from the proposed lots do exist. Bushfire travelling upslope will have increased intensity and rate of spread. However, the adjoining land cannot be considered as rugged (which would present the potential for more extreme and variable fire behaviour).

Consequently, the potential exists for intense bushfire behaviour to occur within these areas of bushfire prone vegetation. The potential bushfire impact on persons and property within the proposed lots will be to increase the level of ember attack in the event of a bushfire.

This ember threat will be mitigated by the application of appropriate building design, bushfire construction standards and the ongoing maintenance of the BAL-29 dimensioned APZ, to ensure the buildings will not be impacted by consequential fire within combustible materials used, stored or accumulated within the APZ.

The development site, within the context of its location in the broader landscape, cannot be considered as being at high risk from the impacts of bushfire.

Element 2: Siting and Design of Development

Intent: To ensure that the siting and design of development (note: not building/construction design) minimises the level of bushfire impact.

Compliance: How the proposed development achieves the intent of Element 2:	By fully meeting all applicable acceptable solutions established by the bushfire protection criteria (Guidelines v1.3 WAPC 2017)
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ASSESSMENT (COMPLIANCE) STATEMENTS

For each applicable acceptable solution, the following statements present the results of the assessment of the proposed development/use against the requirements established by the *Guidelines (WAPC 2017 v1.3)* and apply the interpretation guidance established by the *Position Statement: Planning in bushfire prone areas – Demonstrating Element 1: Location and Element 2: Siting and design (WAPC Nov 2019)*.

Acceptable Solution: A2.1: Asset Protection Zone

THE APZ - DEVELOPMENT SITING AND DESIGN PLANNING REQUIREMENTS

The necessary outcome of bushfire planning for development siting and design, is to ensure that a building can be located within the developable portion of any lot (i.e. outside those parts of the lot that form the required R-Code building setbacks, or any other excluded area), and be subject to potential radiant heat from a bushfire not exceeding 29 kW/m² (i.e. a maximum BAL of BAL-29).

This will be achieved when the size of the “low fuel area immediately surrounding a building”, the asset protection zone (APZ), is large enough. This requires a certain separation distance to exist between the building and areas of classified vegetation. These are the BAL-29 APZ dimensions and they will vary dependent on site specific parameters.

The APZ should be contained solely within the boundaries of each lot, except in instances where the neighbouring lot(s) or adjacent public land will be managed in a low-fuel state on an ongoing basis, in perpetuity.

Where possible, planning for siting and design should incorporate elements that include non-vegetated areas (e.g. roads/parking/drainage) and/or formally managed areas of vegetation (public open space/recreation areas/services installed in a common section of land), as either part of the required APZ dimensions or to additionally increase separation distances to provide greater protection. These elements create robust and easier managed asset protection zones.

THE ASSESSMENT

Future buildings on the lots of the proposed development subdivision can be surrounded by an APZ that will ensure the potential radiant heat impact of a bushfire does not exceed 29 kW/m² (BAL-29). The required APZ specifications of width, location and management can be achieved.

APZ Width: The required APZ dimensions to ensure buildings are subject to a maximum BAL of BAL-29 (measured from any external wall or supporting post or column to the edge of the classified vegetation), has been determined in Section 3.2 of this BMP and are:

BAL-29 APZ Dimensions		
Applicable to Following Lot(s): Lots 154 and Lot155	Building to Area 1 – Scrub	Minimum 13 metres
	Building to Area 2 - Grassland	Minimum 8 metres
	Building to Area 3 – Scrub	Minimum 13 metres
	Building to Area 4 – Grassland	Minimum 8 metres
	Building to Area 5 – Shrubland	Minimum 9 metres
	Building to Area 6 – Grassland	Minimum 8 metres

Once appropriate approvals from local government and relevant authorities are granted, onsite vegetation can be cleared for development. The removal of onsite vegetation currently classified at Class-D Scrub and Class-G

Element 2: Siting and Design of Development

Grassland will reduce the potential radiant heat impact to the surrounding lots, reducing current BAL-FZ to BAL-29 and below.

APZ Location: Asset protection zones of the widths stated above can be contained solely within the boundaries of each lot. Onsite vegetation will be required to be modified/removed, the authority for which will need to be received from the local government.

APZ Management: All vegetation that will require modification/removal and future management is onsite and therefore under the control of the landowner.

Retained vegetation will be managed in accordance with the technical requirements established by the Schedule 1: 'Standards for Asset Protection Zones (Guidelines)'. The APZ specifications are also detailed in Appendix 1 and the City of Wanneroo may have additional requirements established by their Firebreak Notice.

THE APZ – REQUIRED DIMENSIONS TO SATISFY FUTURE BUILDING (AND ONGOING MANAGEMENT)

It is important for the landowner to be aware that the APZ dimensions that will be required to be physically established and maintained on each lot surrounding relevant future buildings, may be different to those stated above for the BAL-29 APZ - which is the minimum dimension a planning proposal needs to show can be established to comply with SPP 3.7.

The actual APZ dimensions to be physically established and maintained, will be based on which of the following establishes the larger APZ dimension:

- The dimensions corresponding to the determined BAL of a building (refer to Section 3.2 for explanation of the 'planning' versus 'building' requirements and 'indicative' versus 'determined' BAL); or
- The APZ dimensions established by the local government's Firebreak Notice.

If the dimensions of the APZ that are to be established are known at this time, they will be stated below.

For the proposed development subdivision, there is no potential to reduce future construction BAL's for future buildings unless there are significant changes made to offsite classified vegetation as the result of future management on those lands.

Element 3: Vehicular Access

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

Compliance: How the proposed development achieves the intent of Element 3:

By fully meeting all applicable acceptable solutions established by the bushfire protection criteria (Guidelines v1.3 WAPC 2017)

ASSESSMENT (COMPLIANCE) STATEMENTS

For each applicable acceptable solution, the following statements present the results of the assessment of the proposed development/use against the requirements established by the *Guidelines* (WAPC 2017 v1.3).

Acceptable Solution: A3.1: Two Access Routes

There are two different vehicular access routes provided via Alexander Drive and Landsdale Road, both of which connected to the public road network, provide safe access and egress to two different destinations and are available to the public at all times and under all weather conditions.

Acceptable Solution: A3.2: Public Road

The construction technical requirements established by the Guidelines and/or the local government can and will be complied with.

Acceptable Solution: A3.3: Cul-de-sacs (including a dead-end road)

N/A

Acceptable Solution: A3.4: Battle-axe

N/A

Acceptable Solution: A3.5: Private Driveways

The construction technical requirements established by the Guidelines and/or the local government can and will be complied with. These requirements are set out in Appendix 2.

Acceptable Solution: A3.6: Emergency Access Way

N/A

Acceptable Solution: A3.7: Fire Service Access Routes

N/A

Acceptable Solution: A3.8: Firebreak Width

N/A

Element 4: Water

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

Compliance: How the proposed development achieves the intent of Element 4:

By fully meeting all applicable acceptable solutions established by the bushfire protection criteria (Guidelines v1.3 WAPC 2017)

ASSESSMENT (COMPLIANCE) STATEMENTS

For each applicable acceptable solution, the following statements present the results of the assessment of the proposed development/use against the requirements established by the *Guidelines (WAPC 2017 v1.3)*.

Acceptable Solution: A4.1: Reticulated Areas

A reticulated water supply is available to the subject site A hydrant is located on Landsdale Road 20 m from the lot boundary as indicated on Figure 3.1 and at 200m intervals along Alexander Road (30 m away from lot boundary). Three more hydrants are located 24 m away from the lot on Sedano Glade, Melanzana Chase, and Revanello Terrace.

Required hydrant separation distances – 100m commercial, 200m residential, 400m rural residential >1 ha

Acceptable Solution: A4.2: Non-Reticulated Areas

N/A

Acceptable Solution: A4.3: Non-Reticulated Areas – Individual Lots

N/A

6 RESPONSIBILITIES FOR IMPLEMENTATION AND MANAGEMENT OF THE BUSHFIRE PROTECTION MEASURES

Table 6.1: BMP Implementation responsibilities prior to occupancy or building.

Landowner (Developer) - Prior to Occupancy or Building	
No.	Implementation Actions
1	<p>The local government may condition a development application approval with a requirement for the landowner/proponent to register a notification onto the certificate of title and deposited plan.</p> <p>This will be done pursuant to Section 70A <i>Transfer of Land Act 1893</i> as amended ('Factors affecting use and enjoyment of land, notification on title'). This is to give notice of the bushfire hazard and any restrictions and/or protective measures required to be maintained at the owner's cost.</p> <p>This condition ensures that:</p> <ol style="list-style-type: none"> 1. Landowners/proponents are aware their lot is in a designated bushfire prone area and of their obligations to apply the stated bushfire risk management measures; and 2. Potential purchasers are alerted to the Bushfire Management Plan so that future landowners/proponents can continue to apply the bushfire risk management measures that have been established in the Plan.
	<p>Prior to post planning approval, the entity responsible for having the BMP prepared should ensure that anyone listed as having responsibility under the Plan has endorsed it and is provided with a copy for their information and informed that it contains their responsibilities. This includes the landowners/proponents (including future landowners where the Plan was prepared as part of a subdivision approval), local government and any other authorities or referral agencies ('Guidelines' s4.6.3).</p>
	<p>Prior to any building work, inform the builder of the existence of this Bushfire Management Plan and the responsibilities it contains, regarding the required construction standards. This will be:</p> <ul style="list-style-type: none"> • The standard corresponding to the determined BAL, as per the bushfire provisions of the Building Code of Australia (BCA); and/or • A higher standard because the BMP establishes that the construction standard is to correspond to a higher BAL as an additional bushfire protection measure.

Table 6.3: Ongoing management responsibilities for the Landowner/Occupier.

Landowner/Occupier - Ongoing	
No.	Ongoing Management Actions
1	<p>Maintain the Asset Protection Zone (APZ) surrounding proposed buildings to the largest dimension as determined by either:</p> <ul style="list-style-type: none"> The dimensions corresponding to the determined BAL of a building (refer to Section 3.2 for explanation of the 'planning' versus 'building' requirements and 'indicative' versus 'determined' BAL); or The dimensions corresponding to the City of Wanneroo's Firebreak Notice. <p>Maintain the APZ to the above dimensions and to the standards established by the Guidelines (refer to Appendix 1) or as varied by the local government through their Firebreak Notice (refer to the following responsibility).</p>
2	<p>Comply with the City of Wanneroo's Firebreak Notice issued under s33 of the Bush Fires Act 1954.</p> <p>This may include specifications for asset protection zones that differ from the Guideline's APZ Standards, with the intent to better satisfy local conditions. When these are more stringent than those created by the Guidelines, or less stringent and endorsed by the WAPC and DFES, they must be complied with. Refer to Appendix 1.</p>
3	<p>Maintain vehicular access routes within the lot to the required surface condition and clearances as stated in the BMP.</p>
4	<p>Ensure that any builders (of future structures on the lot) are aware of the existence of this Bushfire Management Plan and the responsibilities it contains regarding the application of construction standards corresponding to a determined BAL.</p>
5	<p>Ensure all future buildings the landowner has responsibility for, are designed and constructed in full compliance with:</p> <ol style="list-style-type: none"> the requirements of the WA Building Act 2011 and the bushfire provisions of the Building Code of Australia (BCA); and with any identified additional requirements established by this BMP or the local government.

Table 6.4: Ongoing management responsibilities for the Local Government.

Local Government - Ongoing	
No.	Ongoing Management Actions
1	<p>Monitor landowner compliance with the Bushfire Management Plan and the annual Firebreak notice.</p>

APPENDIX 1: TECHNICAL REQUIREMENTS FOR ONSITE VEGETATION MANAGEMENT

A1.1 Requirements Established by the Guidelines – Standards for Asset Protection Zones

(Source: Guidelines for Planning in Bushfire Prone Areas - WAPC 2017 v1.3 Appendix 4, Element 2, Schedule 1 and Explanatory Note E2.1)

DEFINING THE ASSET PROTECTION ZONE (APZ)

Description: An APZ is an area surrounding a building that is managed to reduce the bushfire hazard to an acceptable level (by reducing fuel loads). The width of the required APZ varies with slope and vegetation and varies corresponding to the BAL rating determined for a building (lower BAL = greater dimensioned APZ).

For planning applications, the minimum sized acceptable APZ is that which is of sufficient size to ensure the potential radiant heat impact of a fire does not exceed 29kW/m² (BAL-29). It will be site specific.

For subdivision planning, design elements and excluded/low threat vegetation adjacent to the lot(s) can be utilised to achieve the required vegetation separation distances and therefore reduce the required dimensions of the APZ within the lot(s).

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

Establishment: 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.

[Note: Regardless of whether an Asset Protection Zone exists in accordance with the acceptable solutions and is appropriately maintained, fire fighters are not obliged to protect an asset if they think the separation distance between the dwelling and vegetation that can be involved in a bushfire, is unsafe.]

Schedule 1: Standards for APZ

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 mm in thickness reduced to and maintained at an average of two tonnes per hectare (example below).

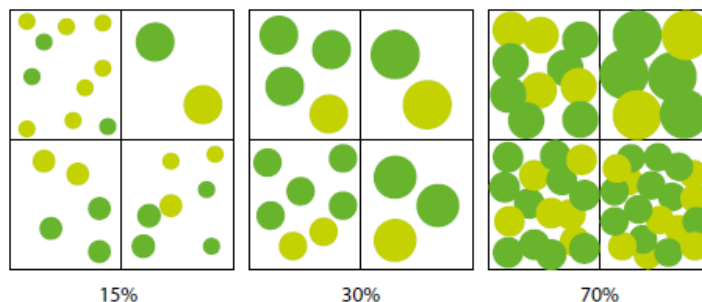


Example: Fine fuel load of 2 t/ha

(Image source: Shire of Augusta Margaret River's Firebreak and Fuel Reduction Hazard Notice)

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. Diagram below represents tree canopy cover at maturity.

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



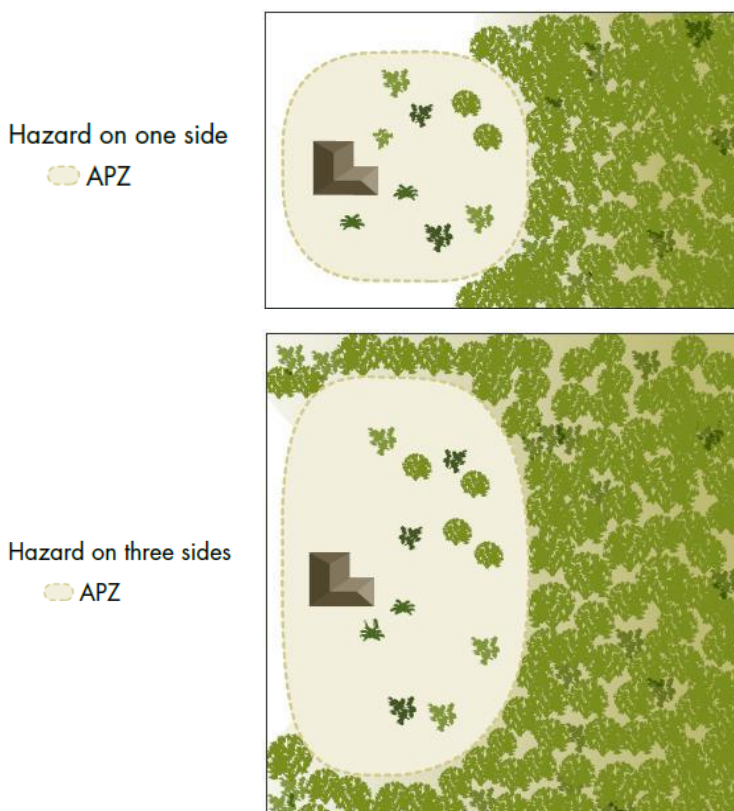
(Source: Guidelines for Planning in Bushfire Prone Areas 2017, Appendix 4)

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 mm 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 mm or less.

The following example diagrams illustrate how the required dimensions of the APZ will be determined by the type and location of the vegetation.



A1.2 Requirements Established by the Local Government – the Firebreak Notice

The local government's current Firebreak Notice is available on their website, at their offices and is distributed as ratepayer's information. It must be complied with.

These requirements are established by the local government's Firebreak Notice created under s33 of the Bushfires Act 1954 and issued annually (potentially with revisions). The Firebreak Notice may include additional components directed at managing fuel loads, accessibility and general property management with respect to limiting potential bushfire impact.

If Asset Protection Zone (APZ) specifications are defined in the Firebreak Notice, these may differ from the Standards established by the Guidelines, with the intent to better satisfy local conditions. When these are more stringent than those created by the Guidelines, or less stringent and endorsed by the WAPC and DFES, they must be complied with.

The APZ dimensions to be physically established and maintained, will be based on which of the following establishes the larger APZ dimension:

- The dimensions corresponding to the determined BAL of a building (refer to Section 3.2 explanation of the 'planning' versus 'building' requirements and 'indicative' versus 'determined' BAL(s)); or
- The APZ dimensions established by the local government's Firebreak Notice.

A1.3 Requirements Recommended by DFES – Property Protection Checklists

Further guidance regarding ongoing/lasting property protection (from potential bushfire impact) is presented in the publication 'DFES – Fire Chat – Your Bushfire Protection Toolkit'. It is available from the Department of Fire and Emergency Services (DFES) website.

A1.4 Requirements Established by AS 3959:2018 – 'Minimal Fuel Condition'

This information is provided for reference purposes. This knowledge will assist the landowner to comply with Management Requirement No. 3 set out in the Guidance Panel at the start of this Appendix. It identifies what is required for an area of land to be excluded from classification as a potential bushfire threat.

"Australian Standard - AS 3959:2018 Section 2.2.3.2: Exclusions - Low threat vegetation and non-vegetated areas:

The Bushfire Attack Level shall be classified BAL-LOW where the vegetation is one or a combination of the following:

- a) Vegetation of any type that is more than 100m from the site.*
- b) Single areas of vegetation less than 1ha in area and not within 100m of other areas of vegetation being classified vegetation.*
- c) Multiple area of vegetation less than 0.25ha in area and not within 20m of the site or each other or other areas of vegetation being classified vegetation.*
- d) Strips of vegetation less than 20m in width (measured perpendicular to the elevation exposed to the strip of vegetation) regardless of length and not within 20m of the site or each other, or other areas of vegetation being classified vegetation.*
- e) Non-vegetated areas, that is, areas permanently cleared of vegetation, including waterways, exposed beaches, roads, footpaths, buildings and rocky outcrops.*
- f) Vegetation regarded as low threat due to factors such as flammability, moisture content or fuel load. This includes grassland managed in a **minimal fuel condition**, (means insufficient fuel available to significantly increase the severity of a bushfire attack – for example, recognisable as short cropped grass to a nominal height of 100mm), mangroves and other saline wetlands, maintained lawns, golf courses (such as playing areas and fairways), maintained public reserves and parklands, sporting fields, vineyards, orchards, banana plantations, market gardens (and other non-curing crops), cultivated gardens, commercial nurseries, nature strips and windbreaks (single row of trees)."*

APPENDIX 2: TECHNICAL REQUIREMENTS FOR VEHICULAR ACCESS

Each local government may have their own standard technical requirements for emergency vehicular access, and they may vary from those stated in the Guidelines.

When required, these are stated in Section 5.1 of this bushfire management plan.

Requirements Established by the Guidelines – The Acceptable Solutions

(Source: Guidelines for Planning in Bushfire Prone Areas WAPC 2017 v1.3, Appendix 4)

VEHICULAR ACCESS TECHNICAL REQUIREMENTS - PART 1

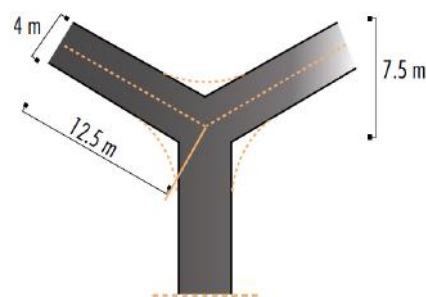
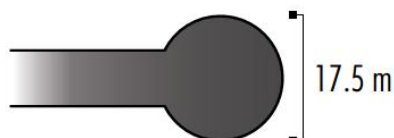
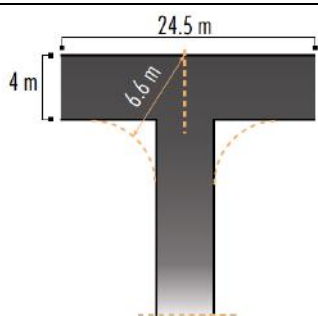
Acceptable Solution 3.5: Private Driveways

The following requirements are to be achieved:

- The design requirements set out in Part 2 of this appendix; and

Where the house site is more than 50 metres from a public road:

- Passing bays every 200 metres with a minimum length of 20 metres and a minimum width of two metres (ie combined width of the passing bay and constructed private driveway to be a minimum six metres);
- Turn-around areas every 500 metres and within 50 metres of a house, designed to accommodate type 3.4 fire appliances to turn around safely (ie kerb to kerb 17.5 metres);
- Any bridges or culverts are able to support a minimum weight capacity of 15 tonnes; and
- All weather surface (i.e. compacted gravel, limestone or sealed).



Acceptable Solution 3.8: Firebreak Width

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

VEHICULAR ACCESS TECHNICAL REQUIREMENTS - PART 2

Technical Component	Vehicular Access Types				
	Public Roads	Cul-de-sacs	Private Driveways	Emergency Access Ways	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	4.5	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 cross-fall	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

VEHICULAR ACCESS TECHNICAL REQUIREMENTS - PART 1

* A six metre trafficable surface does not necessarily mean paving width. It could, for example, include four metres of paving and one metre of constructed road shoulders. In special circumstances, where 8 lots or less are being serviced, a public road with a minimum trafficable surface of four metres for a maximum distance of ninety metres may be provided subject to the approval of both the local government and DFES.

APPENDIX 3: TECHNICAL REQUIREMENTS FOR FIREFIGHTING WATER

Reticulated Areas

[Source: Guidelines for Planning in Bushfire Prone Areas WAPC 2017 v1.3, Appendix 4, Element 4]

The Water Corporation's 'No 63 Water Reticulation Standard' is deemed to be the baseline criteria for developments and should be applied unless local water supply authority's conditions apply.

The requirement is to supply a reticulated water supply and fire hydrants, in accordance with the technical requirements of the relevant water supply authority and DFES.

Key specifications in the most recent version/revision of the design standard include:

- **Residential Standard** – hydrants are to be located so that the maximum distance between the hydrants shall be no more than 200 metres.
- **Commercial Standard** – hydrants are to be located with a maximum of 100 metre spacing in Industrial and Commercial areas.
- **Rural Residential Standard** – where minimum site areas per dwelling is 10,000 m² (1ha), hydrants are to be located with a maximum 400m spacing. If the area is further subdivided to land parcels less than 1ha, then the residential standard (200m) is to be applied.

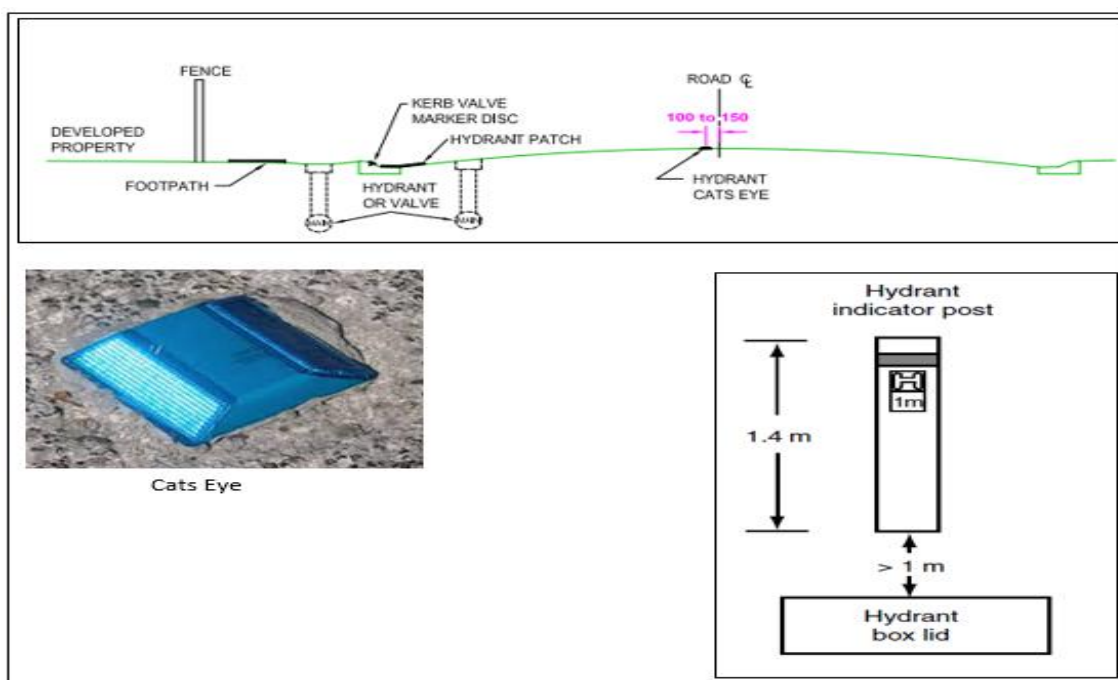


Figure A4.1: Hydrant Location and Identification Specifications