

Bushfire Management Plan:  
Development Application: 2 Zodiac Drive, Alkimos

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**FHSI Design Studio PTY Ltd**

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## DOCUMENT TRACKING

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<b>Project Number</b>	23PER5014
<b>Project Manager</b>	Eva Cronin (BPAD Level 2 - 45482)
<b>Prepared by</b>	Maitland Ely
<b>Reviewed by</b>	Eva Cronin (BPAD Level 2 - 45482)
<b>Approved by</b>	Eva Cronin (BPAD Level 2 - 45482)
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Template 2.8.1

### Version control

Version	Purpose
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v1	Draft – Submission to client
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# 1. Introduction

## 1.1 Proposal details

Eco Logical Australia (ELA) was commissioned by FHSI Design Studio PTY Ltd to prepare a Bushfire Management Plan (BMP) to support a development application for 2 Zodiac Drive, Alkimos (hereafter referred to as the subject site, Figure 1). The proposed development will result in an intensification of land use and involves the development of a single multi-storey residential building which includes a basement carpark (Figure 2).

The subject site is within a designated bushfire prone area as per the *Western Australia State Map of Bush Fire Prone Areas* (DFES 2021; Figure 3), which triggers bushfire planning requirements *under State Planning Policy 3.7 Planning in Bushfire Prone Areas* (SPP 3.7; Western Australian Planning Commission (WAPC) 2015) and reporting to accompany submission of the development application in accordance with the associated *Guidelines for Planning in Bushfire Prone Areas v 1.4* (the Guidelines; WAPC 2021).

The subject site is located within the City of Wanneroo along Zodiac Drive, Alkimos and is surrounded by residential infrastructure, cleared areas and classifiable vegetation comprised of regrowth and remnant vegetation. Within the subject site there is unmanaged classifiable vegetation consisting of low open shrubland (Class C Shrubland) that will be cleared for development.

This assessment has been prepared by ELA Bushfire Consultant Maitland Ely with quality assurance undertaken by Senior Bushfire Consultant Eva Cronin (FPAA BPAD Level 2 Certified Practitioner No. BPAD45482).

## 1.2 Purpose and application of the plan

The primary purpose of this BMP is to act as a technical supporting document to inform planning assessment. This BMP is also designed to provide guidance on how to plan for and manage the bushfire risk to the subject site through implementation of a range of bushfire management measures in accordance with the Guidelines.

## 1.3 Environmental considerations

SPP 3.7 policy objective 5.4 recognises the need to consider bushfire risk management measures alongside environmental, biodiversity and conservation values.




No revegetation is proposed within the development and landscaping within the subject site will be maintained in a low-threat state.

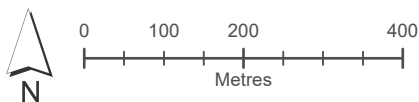
ELA is not aware of any outstanding environmental approvals required for development to proceed.





**Figure 1: Site Overview**

-  Subject site
-  100m site assessment
-  150m site assessment



Datum/Projection:  
GDA 1994 MGA Zone 50  
23PER5014-JP Date: 5/10/2023







**Site/Ground Floor Plan**

**Figure 2: Site Plan (Map 1 of 3)**



**First Floor Plan**

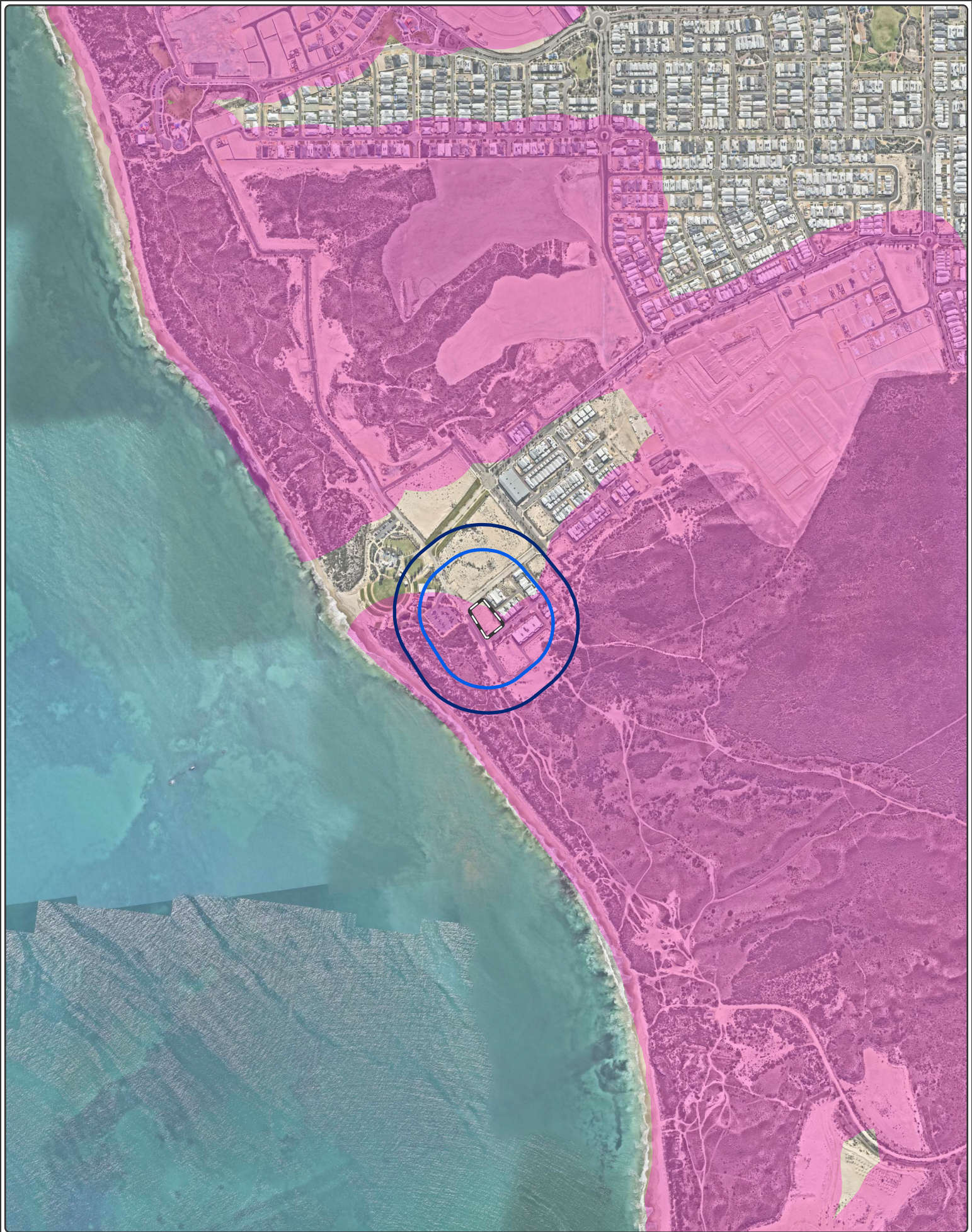
**Figure 2: Site Plan (Map 2 of 3)**







**Second Floor Plan**

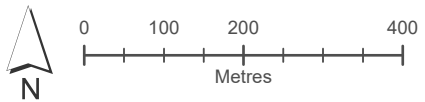
Figure 2: Site Plan (Map 3 of 3)





**Figure 3: Bushfire Prone Areas**

-  Subject site
-  100m site assessment
-  150m site assessment
-  Bushfire Prone Mapping (DFES 2021)



Datum/Projection:  
GDA 1994 MGA Zone 50  
23PER5014-JP Date: 5/10/2023





## 2. Bushfire assessment results

### 2.1 Bushfire assessment inputs

The following section is a consideration of spatial bushfire risk and has been used to inform the bushfire assessment in this report.

#### 2.1.1 Fire Danger Index

A blanket Fire Danger Index (FDI) 80 is adopted for Western Australia, as outlined in Australian Standard AS 3959: 2018 *Construction of Buildings in Bushfire Prone Areas* (SA 2018) and endorsed by Australasian Fire and Emergency Service Authorities Council (AFAC).

#### 2.1.2 Vegetation classification and slope under vegetation

Vegetation and effective slope (i.e. slope under vegetation) within the subject site and surrounding 150 m (the assessment area) were assessed in accordance with the Guidelines and AS 3959: 2018 with regard given to the *Visual guide for bushfire risk assessment in Western Australia* (DoP 2016). Site assessment was undertaken on 31 May 2023.

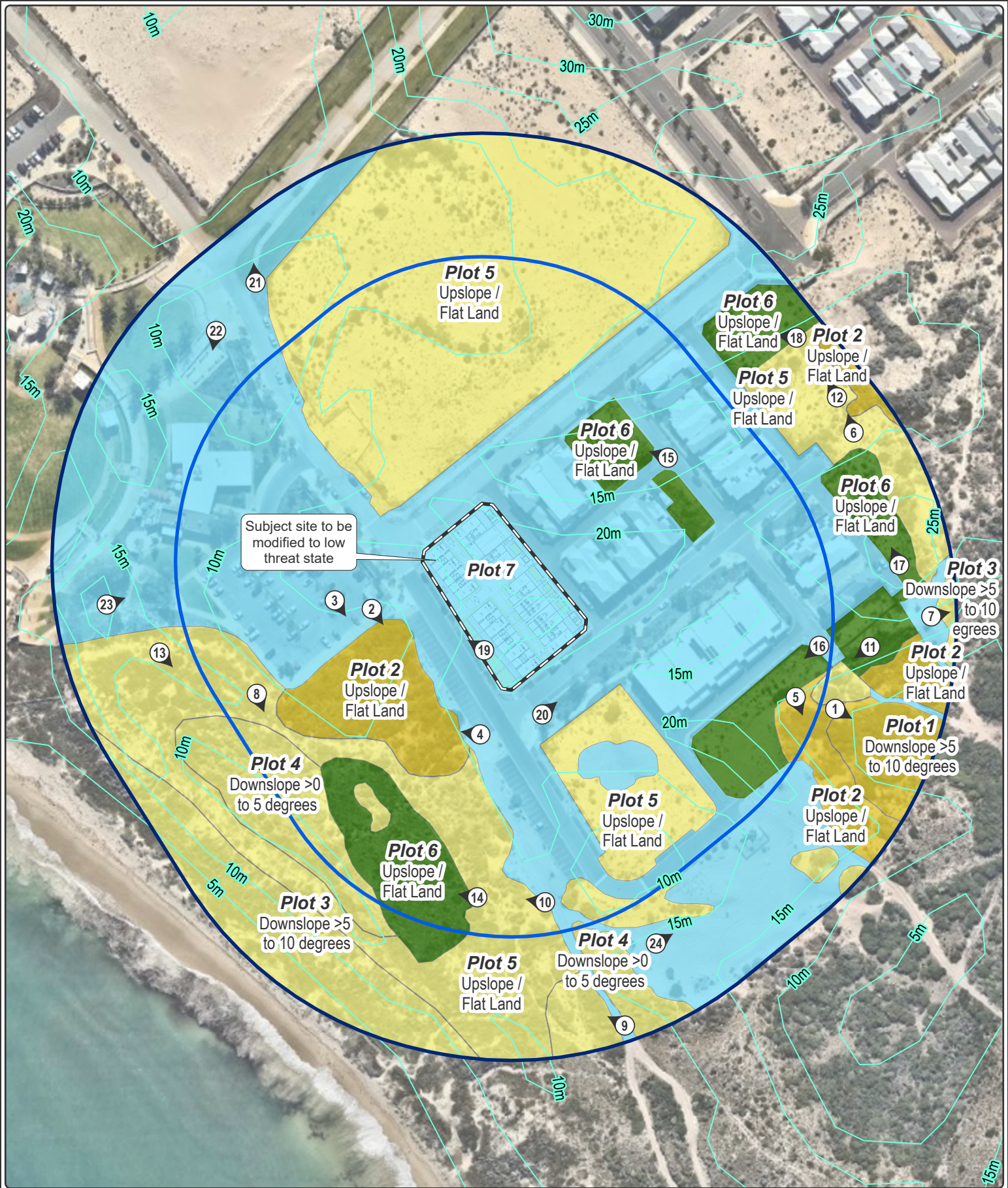
The classified vegetation and effective slope for the proposed development from each of the identified vegetation plots are identified below in Table 1 and Figure 4.

**Table 1: Classified vegetation as per AS 3959: 2018**






Plot	Vegetation Classification	Effective Slope
1	Class D Scrub	Downslope >5 to 10 degrees
2	Class D Scrub	All upslopes and flat land (0 degrees)
3	Class C Shrubland	Downslope >5 to 10 degrees
4	Class C Shrubland	Downslope >0 to 5 degrees
5	Class C Shrubland	All upslopes and flat land (0 degrees)
6	Class G Grassland	All upslopes and flat land (0 degrees)
7	Excluded AS 3959: 2018 2.2.3.2 (e) & (f)	-





Photographs relating to each area and vegetation type are included in Appendix A.

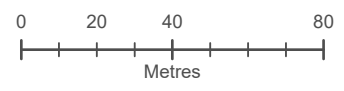




**Figure 4: Vegetation Classification Post Clearance**

-  Subject site
-  100m site assessment
-  150m site assessment
-  Contour (5m)
-  Photo location

- Vegetation classification**
-  Class C Shrubland
  -  Class D Scrub
  -  Class G Grassland
  -  Excluded as per clause 2.2.3.2 (e) and (f)



Datum/Projection:  
GDA 1994 MGA Zone 50  
23PER5014-JP Date: 14/11/2023





## 2.2 Bushfire assessment outputs

A Bushfire Attack Level (BAL) assessment has been undertaken in accordance with SPP 3.7, the Guidelines, AS 3959: 2018 and the bushfire assessment inputs in Section 2.1.

### 2.2.1 BAL assessment

All land located within 100 m of the classified vegetation depicted in Figure 4 is considered bushfire prone and is subject to a BAL assessment in accordance with AS 3959: 2018.

A Method 1 BAL assessment (as outlined in AS 3959: 2018) has been completed for the proposed development and incorporates the following factors:

- Fire Danger Index (FDI) rating;
- Vegetation class;
- Slope under classified vegetation; and
- Distance between proposed development area and the classified vegetation.

Based on the identified BAL, construction requirements for the proposed building can then be assigned. The BAL rating gives an indication of the expected level of bushfire attack (i.e. radiant heat flux, flame contact and ember penetration) that may be received by proposed buildings and subsequently informs the standard of construction required to increase building survivability.

### 2.2.2 Method 1 BAL assessment

Table 2 and Figure 5 display the Method 1 BAL assessment (in the form of BAL contours) that has been completed for the proposed development in accordance with AS 3959: 2018 methodology.

**Table 2: Method 1 BAL calculation (BAL contours)**

Plot	Vegetation Classification	Effective Slope	Separation distances required				
			BAL-FZ	BAL-40	BAL-29	BAL-19	BAL-12.5
1	Class D Scrub	Downslope >5 to 10 degrees	<12	12-<17	17-<24	24-<35	35-<100
2	Class D Scrub	All upslopes and flat land (0 degrees)	<10	10-<13	13-<19	19-<27	27-<100
3	Class C Shrubland	Downslope >5 to 10 degrees	<8	8-<11	11-<17	17-<25	25-<100
4	Class C Shrubland	Downslope >0 to 5 degrees	<7	7-<10	10-<15	15-<22	22-<100
5	Class C Shrubland	All upslopes and flat land (0 degrees)	<7	7-<9	9-<13	13-<19	19-<100
6	Class G Grassland	All upslopes and flat land (0 degrees)	<6	6-<8	8-<12	12-<17	17-<50
7	Excluded AS 3959: 2018 2.2.3.2 (e) & (f)	-	No separation distances required – BAL-LOW				

Based on the site assessment inputs and BAL assessment, the proposed building within the subject site will be exposed to a BAL rating of BAL-19 as depicted in Figure 5. A summary of the BAL rating for the proposed building is also provided in Table 3.

Under Volume Two of the National construction Code (NCC) Class 1, 2 or 3 buildings and/or Class 10a buildings or decks associated with a Class 1, 2 or 3 building in designated bushfire prone areas are required to comply with AS 3959: 2018.

The class of building applicable to the various components of the building (and subsequent requirement to comply with bushfire construction requirements in AS 39595 under the National Construction Code) will be determined by the building surveyor at the building permit application stage, however, ELA's understanding is the building is likely to be considered a Class 2 building (residential component) and Class 7a building (basement carpark) under the National Construction Code (NCC).

This BAL assessment is based on the assumption that there are no exposed external elements of the basement carpark and that the carpark will be suitably fire separated from the above floors under provisions within the NCC and AS 3959 (this must be confirmed with the building surveyor).

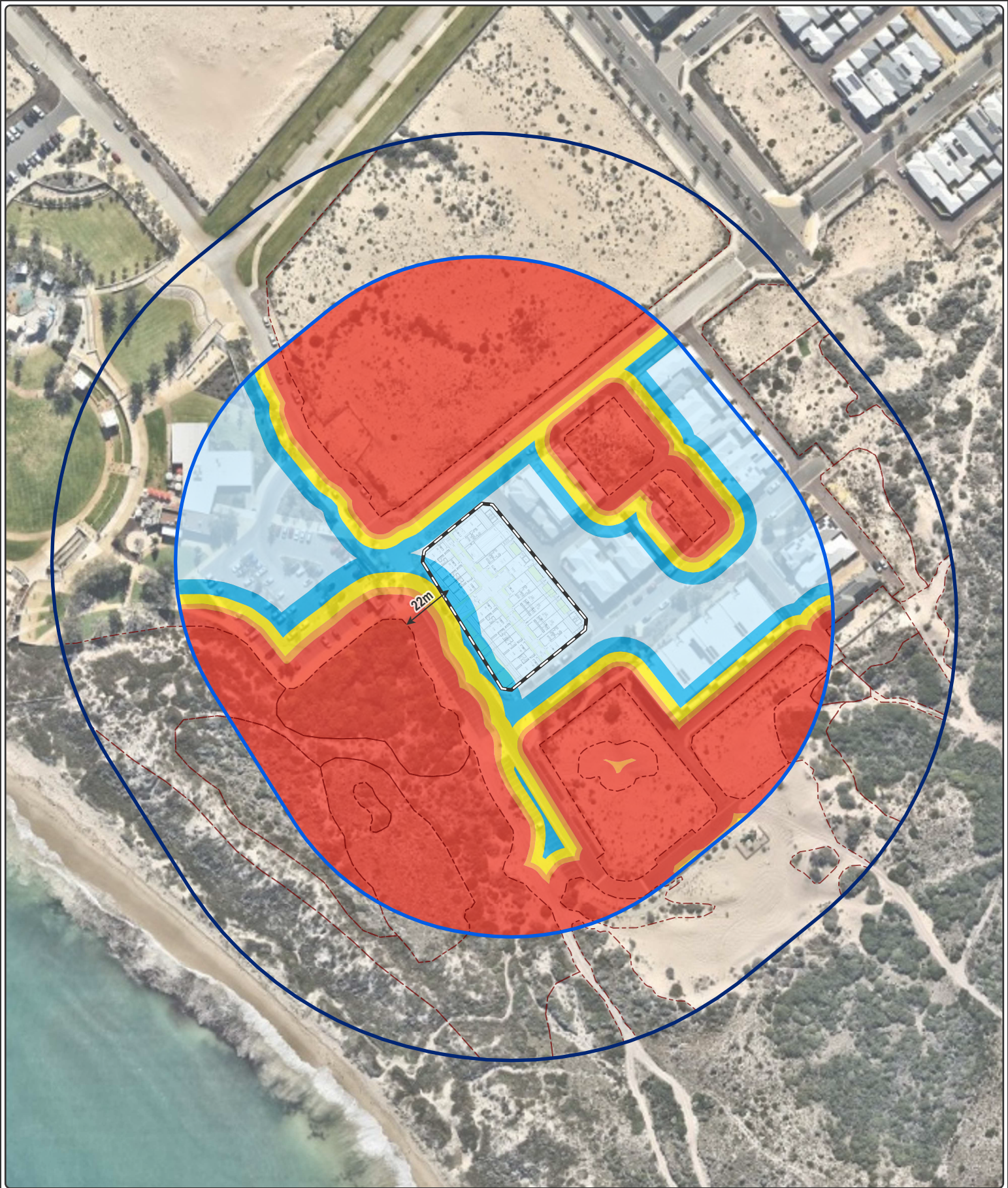
**Table 3: BAL rating for proposed building within the subject site**

Proposed building	Plot most affecting BAL rating	Separation Distance (m)	BAL Rating
Single multi-storey building	Plot 2	22	BAL-19

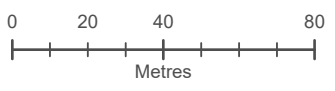
### 2.3 Identification of issues arising from the BAL assessment

Should there be any changes in development design or vegetation/hazard extent that requires a modified bushfire management response, then the above BAL ratings will need to be reassessed for the affected areas and documented in a brief addendum to this BMP.





**Figure 5: Bushfire Attack Level (BAL) Contour Post Clearance**

 Subject site	<b>Bushfire Attack Level (BAL)</b>	 <p>Datum/Projection: GDA 1994 MGA Zone 50</p> <p>23PER5014-JP Date: 16/11/2023</p>
 100m site assessment	 BAL - FZ	
 150m site assessment	 BAL - 40	
 Bushfire hazard interface	 BAL - 29	
	 BAL - 19	
	 BAL - 12.5	
	 BAL - LOW	 



## 3. Assessment against the Bushfire Protection Criteria

### 3.1 Compliance

The proposed development is required to comply with policy measures 6.2 and 6.5 of SPP 3.7 and the Guidelines. Implementation of this BMP is expected to meet objectives 5.1-5.4 of SPP 3.7.

In response to the above requirements of SPP 3.7 and the Guidelines, bushfire risk management measures, as outlined, have been devised for the proposed development in accordance with Guideline acceptable solutions to meet compliance with bushfire protection criteria.

Table 4 outlines the Acceptable Solutions (AS) that are relevant to the proposal and summarises how the intent of each Bushfire Protection Criteria has been achieved. No Performance Solutions (PS) have been proposed for this proposal. These management measures are depicted in Figure 6 where relevant.

**Table 4: Summary of solutions used to achieve bushfire protection criteria**

Bushfire Protection Criteria	AS	PS	N/A	Comment
<b>Element 1: Location</b>				
A1.1 Development location	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<p>The proposed building within the subject site will be located in an area subject to BAL ratings of <math>\leq</math>BAL-29 (Figure 5; Figure 6).</p> <p>The proposed development is considered to be compliant with A1.1.</p>
<b>Element 2: Siting and design of development</b>				
A2.1 Asset Protection Zone (APZ)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<p>The proposed development has an APZ sufficient for the potential radiant heat flux to not exceed <math>29\text{kW/m}^2</math> and will be managed in accordance with the requirements of 'Standards for Asset Protection Zones' (WAPC 2021; Appendix B).</p> <p>The APZ can be contained within the boundaries of the lot or managed in perpetuity in a low fuel state.</p> <p>The proposed development is considered to be compliant with A2.1.</p>
<b>Element 3: Vehicular access</b>				
A3.1 Public Roads	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<p>No internal roads are proposed as a part of the development.</p> <p>The subject site is bound by Zodiac Drive to the north, Portside Promenade to the west, Cardinal Approach to the south and Spray Lane to the east. Access to the building carpark (basement) will be via Spray Lane. The Guidelines do not prescribe values for the trafficable (carriageway/pavement) width of public roads as they should be in accordance with the class of road as specified in the IPWEA Subdivision Guidelines, Liveable Neighbourhoods, Austroad Standards and/or any applicable standard in the local government area. ELA are not traffic/civil engineers so cannot comment on whether these existing roads comply with Local Government Guidelines for Subdivisional Development (IPWEA Subdivision Guidelines), Liveable Neighbourhoods, Austroad standards and/or any applicable standards for the local government area. ELAs assessment, however, has identified that the roads</p>

Bushfire Protection Criteria	AS	PS	N/A	Comment
				<p>surrounding the development (with the exception of Spray Lane) are bitumen with estimated width of the sealed surface achieving a minimum width of 6 m and therefore consider the existing road network would provide suitable access and egress for the community and emergency services personnel in the event of a bushfire. ELA assumes the width of Spray Lane meets the relevant requirements under IPWEA Subdivisional Guidelines that apply to this road classification, however, this should be confirmed with the City of Wanneroo.</p> <p>Vehicular access technical requirements in accordance with the Guidelines are detailed in Appendix C.</p> <p>The proposed development is considered to be compliant with A3.1.</p>
A3.2a Multiple access routes	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<p>Two access routes to/from the subject site are available (Figure 6). Refer to A3.1 above for details regarding vehicular access technical requirements for public roads.</p> <p>The proposed development is considered to be compliant with A3.2a.</p>
A3.2b Emergency Access way	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No emergency access ways are required or proposed.
A3.3 Through-roads	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<p>Acceptable Solution A3.3 applies to the strategic planning proposal, structure plan or subdivision application stage of the planning process</p> <p>A3.3 is not applicable to this proposed development.</p>
A3.4a Perimeter roads	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<p>Acceptable Solution A3.4a applies to the strategic planning proposal, structure plan or subdivision application stage of the planning process.</p> <p>A3.4a is not applicable to this proposed development.</p>
A3.4b Fire service access route	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<p>Acceptable Solution A3.4b applies to the strategic planning proposal, structure plan or subdivision application stage of the planning process.</p> <p>A3.4b is not applicable to this proposed development.</p>
A3.5 Battle-axe access legs	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<p>Acceptable Solution A3.5 applies to the strategic planning proposal, structure plan or subdivision application stage of the planning process.</p> <p>A3.5 is not applicable to this proposed development.</p>
A3.6 Private driveways	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<p>The subject site is serviced by reticulated water, the most distant external part of all the subject buildings are within 70 m of a public road (measured as a hose lay) and the subject site is accessed by a public road where speed limit is not greater than 70 km/hr.</p> <p>A3.6 is not applicable to this proposed development.</p>
A4.2 Provision of water for firefighting purposes	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<p>Existing reticulated water is present within the area and the subject site will be connected to this water supply.</p> <p>The nearest existing hydrant is located outside the southwest corner of the subject site along Portside</p>

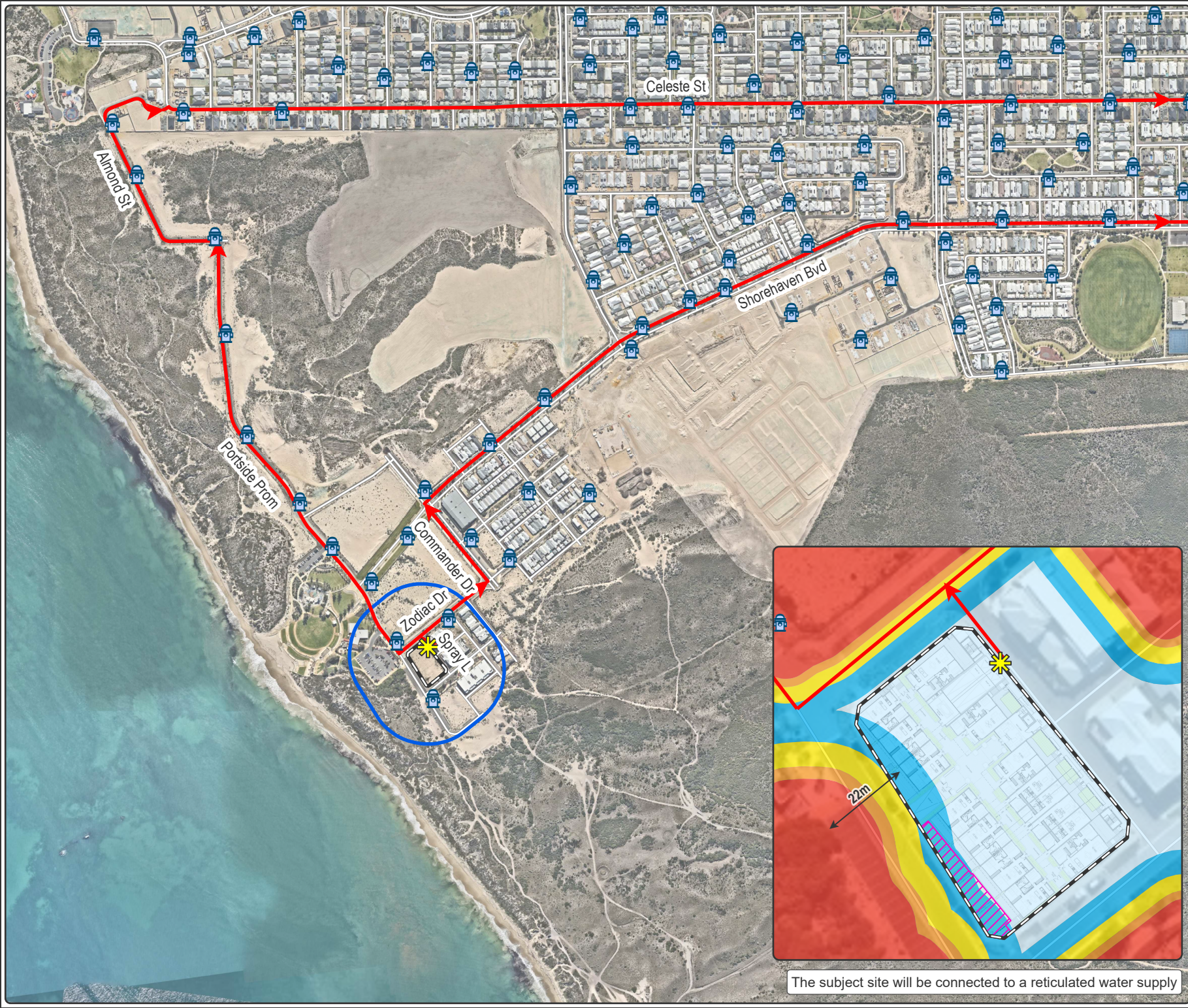
Bushfire Protection Criteria	AS	PS	N/A	Comment
				<p>Promenade (Figure 6). ELA assumes the surrounding network of hydrants meet Water Corporation specifications given they are established and within the Perth metropolitan area.</p> <p>Note: this development may require a hydrant system within the subject site that complies with the FES Commissioner’s operational requirements as per regulation 18B of the Building Regulations 2012, however, this will be determined by the building surveyor and decision maker(s).</p> <p>The proposed development is considered to be compliant with A4.2.</p>
<b>Element 5: Vulnerable tourism land uses</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<p>This development application is not considered vulnerable tourism land use. Element 5 is not applicable to this proposed development.</p>

NOTE – AS- ACCEPTABLE SOLUTION, PS- PERFORMANCE SOLUTION, N/A- NOT APPLICABLE

### 3.2 Additional Bushfire Requirements

All landscaping areas within the subject site will be maintained in accordance with Standards for Asset Protection Zones (Appendix B) or to low threat status as per 2.2.3.2 in AS 3959: 2018.





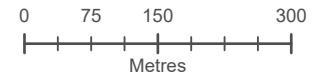
**Legend**

- Subject site
- 100m site assessment
- Asset Protection Zone (APZ)
- Hydrant
- Access point
- Access / egress route

**Bushfire Attack Level (BAL)**

- BAL - FZ
- BAL - 40
- BAL - 29
- BAL - 19
- BAL - 12.5
- BAL - LOW

**Figure 6: Spatial representation of the bushfire management strategies**



Datum/Projection:  
GDA 1994 MGA Zone 50  
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The subject site will be connected to a reticulated water supply



## 4. Implementation and enforcement

Implementation of the BMP applies to the developer, future owners within the subject site and the local government to ensure bushfire management measures are adopted and implemented on an ongoing basis. A summary of the bushfire management measures described in Section 3, as well as a works program, is provided in Table 5. These measures will be implemented to ensure the ongoing protection of life and property assets is achieved. Timing and responsibilities are also defined to assist with implementation of each measure.

**Table 5: Proposed work program**

No	Bushfire management measure	Responsibility
<b>Prior to occupancy</b>		
1	Ensure proposed building is located outside of areas subject to BAL-FZ and BAL-40 as per the design in Figure 6.	Developer
2	Ensure all APZs are implemented as per Figure 6.	Developer
3	Ensure all remaining internal landscaping is managed and maintained to low threat as per 2.2.3.2 in AS 3959: 2018.	Developer
4	Place Section 165 Notification on Title advising the site is located within a Bushfire Prone Area and subject to the BMP.	Developer
5	Connect subject site to reticulated water supply.	Developer
6	Construct proposed building to relevant construction standard in AS 3959-2018.	Builder
<b>Ongoing management</b>		
7	Ensure all APZs are maintained.	Landowner
8	Maintain all remaining internal landscaping to low threat as per 2.2.3.2 in AS 3959: 2018.	Landowner



## 5. Conclusion

In the author's professional opinion, the bushfire protection requirements listed in this assessment provide an adequate standard of bushfire protection for the proposed development. As such, the proposed development is consistent with the aim and objectives of SPP 3.7 and associated guidelines and is recommended for approval.

## 6. References

City of Wanneroo (CoW), 2023, Firebreaks, [Online], available from: [Firebreaks - City of Wanneroo](#)

Department of Fire and Emergency Services (DFES), 2021, *Map of Bush Fire Prone Areas*, [Online], Government of Western Australia, available from: <http://www.dfes.wa.gov.au/regulationandcompliance/bushfireproneareas/Pages/default.aspx>

Department of Planning (DoP), 2016, *Visual guide for bushfire risk assessment in Western Australia*. DoP, Perth.


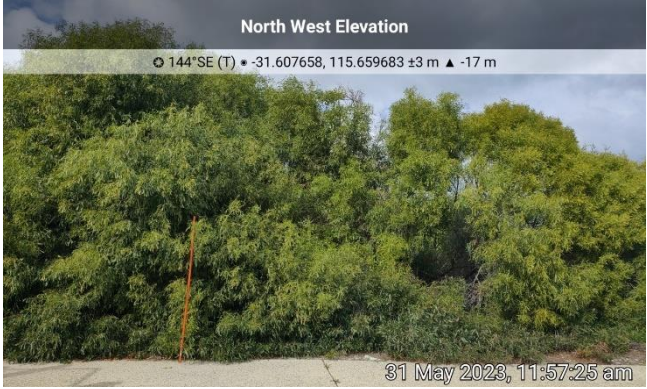

Standards Australia (SA), 2018, *Construction of buildings in bushfire-prone areas, AS 3959-2018*. SAI Global, Sydney.

Western Australian Planning Commission (WAPC), 2015, *State Planning Policy 3.7 Planning in Bushfire Prone Areas*. WAPC, Perth.

Western Australian Planning Commission (WAPC), 2021, *Guidelines for Planning in Bushfire Prone Areas Version 1.4 (including appendices)*, WAPC, Perth.

Western Australian Planning Commission (WAPC), 2019, *A guide to developing a Bushfire Emergency Evacuation Plan, October 2019*.

## Appendix A – Classified Vegetation Photos

Plot	Classification or Exclusion Clause	Class D Scrub
1	<p><b>Photo Point 1</b></p> <p>Classified vegetation within this plot is comprised of shrubs greater than 2 m high with &gt;30% foliage cover. Slope under this plot was assessed as downslope&gt;5 to 10 degrees.</p>	
2	<p><b>Photo Point 2</b></p> <p>Classified vegetation within this plot is comprised of shrubs greater than 2 m high with &gt;30% foliage cover. 2 m height pole present within the associated photo. Slope under this plot was assessed as upslope/flat land.</p>	
2	<p><b>Photo Point 3</b></p> <p>Classified vegetation within this plot is comprised of shrubs greater than 2 m high with &gt;30% foliage cover. 2 m height pole present within the associated photo. Slope under this plot was assessed as upslope/flat land.</p>	

**Plot 2 Classification or Exclusion Clause Class D Scrub**

**Photo Point 4**

Classified vegetation within this plot is comprised of shrubs greater than 2 m high with >30% foliage cover. 2 m height pole present within the associated photo. Slope under this plot was assessed as upslope/flat land.



**Plot 2 Classification or Exclusion Clause Class D Scrub**

**Photo Point 5**

Classified vegetation within this plot is comprised of shrubs greater than 2 m high with >30% foliage cover. 2 m height pole present within the associated photo. Slope under this plot was assessed as upslope/flat land.



**Plot 2 Classification or Exclusion Clause Class D Scrub**

**Photo Point 6**

Classified vegetation within this plot is comprised of shrubs greater than 2 m high with >30% foliage cover. 2 m height pole present within the associated photo. Slope under this plot was assessed as upslope/flat land.





**Plot 3      Classification or Exclusion Clause      Class C Shrubland**

**Photo Point 7**

Classified vegetation within this plot is comprised of shrubs <2 m high with >30% foliage cover.  
2 m height pole present within the associated photo.  
Slope under this plot was assessed as downslope >5 to 10 degrees.



**Plot 4      Classification or Exclusion Clause      Class C Shrubland**

**Photo Point 8**

Classified vegetation within this plot is comprised of shrubs <2 m high with >30% foliage cover.  
Slope under this plot was assessed as downslope >0 to 5 degrees.



**Plot 4      Classification or Exclusion Clause      Class C Shrubland**

**Photo Point 9**

Classified vegetation within this plot is comprised of shrubs <2 m high with >30% foliage cover.  
2 m height pole present within the associated photo.  
Slope under this plot was assessed as downslope >0 to 5 degrees.



**Plot 5 Classification or Exclusion Clause Class C Shrubland**

**Photo Point 10**

Classified vegetation within this plot is comprised of shrubs <2 m high with >30% foliage cover.  
2 m height pole present within the associated photo.  
Slope under this plot was assessed as upslope/flat land.



**Plot 5 Classification or Exclusion Clause Class C Shrubland**

**Photo Point 11**

Classified vegetation within this plot is comprised of shrub <2 m high with >30% foliage cover.  
2 m height pole present within the associated photo.  
Slope under this plot was assessed as upslope/flat land.



**Plot 5 Classification or Exclusion Clause Class C Shrubland**

**Photo Point 12**

Classified vegetation within this plot is comprised of shrubs <2 m high with >30% foliage cover.  
2 m height pole present within the associated photo.  
Slope under this plot was assessed as upslope/flat land.





**Plot 5**      **Classification or Exclusion Clause**      **Class C Shrubland**

**Photo Point 13**

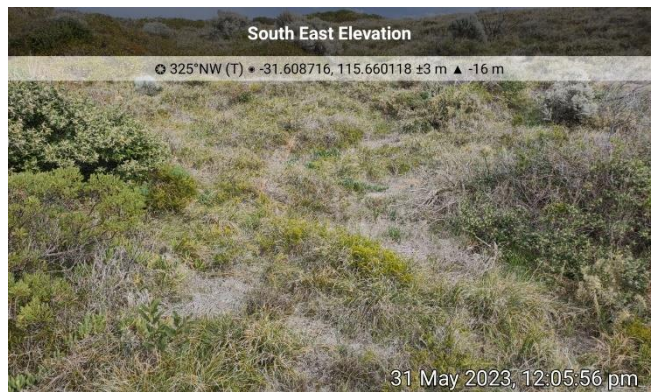
Classified vegetation within this plot is comprised of shrubs <2 m high with >30% foliage cover.  
2 m height pole present within the associated photo.  
Slope under this plot was assessed as upslope/flat land.



**Plot 6**      **Classification or Exclusion Clause**      **Class G Grassland**

**Photo Point 14**

Classified vegetation within this plot is comprised of grasses. Isolated shrubs are present within this plot with a foliage cover of <10%.  
Slope under this plot was assessed as upslope/flat land.



**Plot 6**      **Classification or Exclusion Clause**      **Class G Grassland**

**Photo Point 15**

Classified vegetation within this plot is comprised of unmanaged grasses on vacant land.  
Slope under this plot was assessed as upslope/flat land.



**Plot 6**      **Classification or Exclusion Clause**      **Class G Grassland**

**Photo Point 16**

Classified vegetation within this plot is comprised of grasses. Isolated shrubs are present within this plot with a foliage cover of <10%.

Slope under this plot was assessed as upslope/flat land.

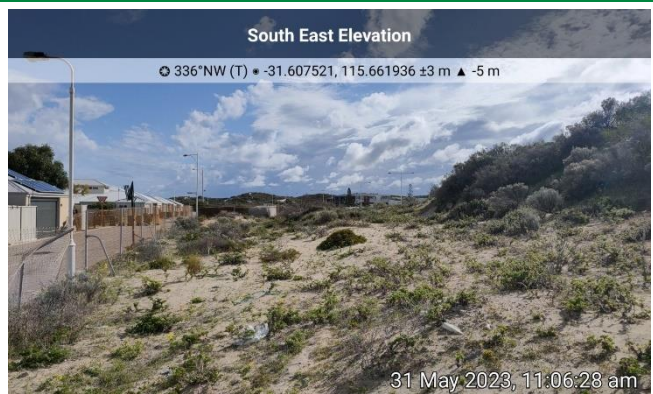


**Plot 6**      **Classification or Exclusion Clause**      **Class G Grassland**

**Photo Point 17**

Classified vegetation within this plot is comprised of grasses.

Slope under this plot was assessed as upslope/flat land.



**Plot 6**      **Classification or Exclusion Clause**      **Class G Grassland**

**Photo Point 18**

Classified vegetation within this plot is comprised of grasses.

Slope under this plot was assessed as upslope/flat land.





**Plot 7 Classification or Exclusion Clause Excluded AS 3959: 2018 2.2.3.2 (e) & (f)**

**Photo Point 19**

Non-vegetated area that is permanently cleared of vegetation (i.e., footpaths and roads).

Vegetation within this plot is regarded as low threat due to factors such as flammability, moisture content and fuel load as it is managed landscaping.



**Plot 7 Classification or Exclusion Clause Excluded AS 3959: 2018 2.2.3.2 (e) & (f)**

**Photo Point 20**

Non-vegetated area that is permanently cleared of vegetation (i.e., footpaths, roads and residential housing).

Vegetation within this plot is regarded as low threat due to factors such as flammability, moisture content and fuel load as it is managed landscaping.



**Plot 7 Classification or Exclusion Clause Excluded AS 3959: 2018 2.2.3.2 (e) & (f)**

**Photo Point 21**

Non-vegetated area that is permanently cleared of vegetation (i.e., footpaths and roads).

Vegetation within this plot is regarded as low threat due to factors such as flammability, moisture content and fuel load as it is managed landscaping.



**Plot 7 Classification or Exclusion Clause Excluded AS 3959: 2018 2.2.3.2 (e) & (f)**

**Photo Point 22**

Non-vegetated area that is permanently cleared of vegetation (i.e., footpaths and buildings).

Vegetation within this plot is regarded as low threat due to factors such as flammability, moisture content and fuel load as it managed landscaping.



**Plot 7 Classification or Exclusion Clause Excluded AS 3959: 2018 2.2.3.2 (e) & (f)**

**Photo Point 23**

Non-vegetated area that is permanently cleared of vegetation (i.e., footpaths and buildings).

Vegetation within this plot is regarded as low threat due to factors such as flammability, moisture content and fuel load as it managed landscaping.



**Plot 7 Classification or Exclusion Clause Excluded AS 3959: 2018 2.2.3.2 (e)**

**Photo Point 24**

Non-vegetated area that is permanently cleared of classifiable vegetation (i.e., cleared areas comprised of sandy dunes).



## Appendix B – Standards for Asset Protection Zones

The following standards have been extracted from the *Guidelines for Planning in Bushfire Prone Areas v 1.4* (WAPC 2021).

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

**a. Width:** Measured from any external wall or supporting post or column of the proposed building, and of sufficient size to ensure the potential radiant heat impact of a fire does not exceed 29kW/m<sup>2</sup> (BAL-29) in all circumstances.

**b. Location:** the APZ should be contained solely within the boundaries of the lot on which a building is situated, except in instances where the neighbouring lot or lots will be managed in a low-fuel state on an ongoing basis, in perpetuity (see explanatory notes).

**c. Management:** the APZ is managed in accordance with the requirements of 'Standards for Asset Protection Zones' (below):

- Fences within the APZ:
  - Should be constructed from non-combustible materials or bushfire-resisting timber referenced in Appendix F of AS 3959.
- Fine fuel load (Combustible, dead vegetation matter <6 millimetres in thickness):
  - Should be managed and removed on a regular basis to maintain a low threat state;
  - Should be maintained at <2 tonnes per hectare (on average); and
  - Mulches should be non-combustible (e.g. stone, gravel or crushed mineral earth) or wood mulch >6 millimetres in thickness.
- Trees (>6 metres in height):
  - Trunks at maturity should be a minimum distance of six metres from all elevations of the building;
  - Branches at maturity should not touch or overhand a building or powerline;
  - Lower branches and loose bark should be removed to a height of two metres above the ground and/or surface vegetation;
  - Canopy cover within the APZ should be <15 per cent of the total APZ area; and
  - Tree canopies at maturity should be at least five metres apart to avoid forming a continuous canopy. Stands of existing mature trees with interlocking canopies may be treated as an individual canopy provided that the total canopy cover within the APZ will not exceed 15 per cent and are not connected to the tree canopy outside the APZ.

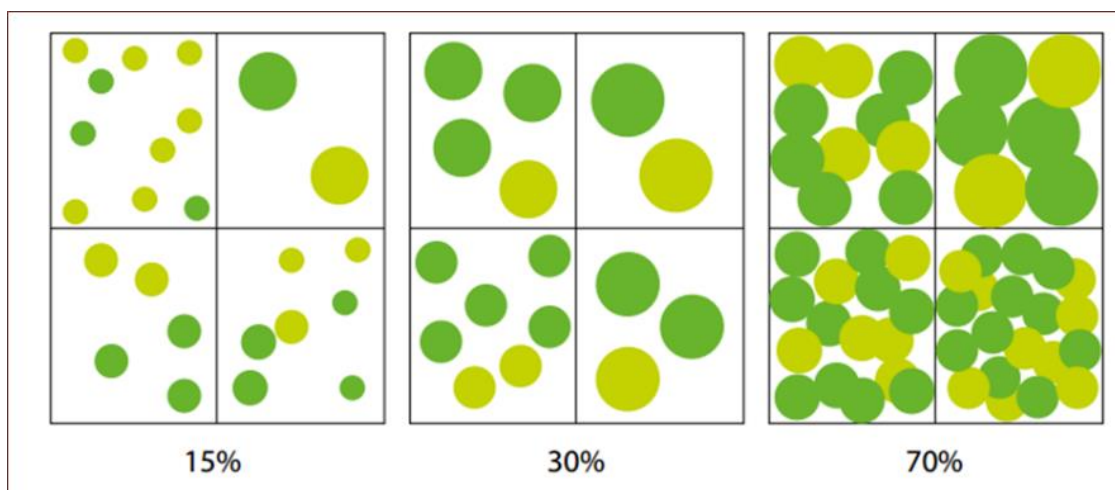


Figure 7: Illustrated tree canopy cover projection (WAPC 2021)

- Shrub and scrub 0.5 metres to six metres in height (shrub or scrub >6 metres in height are to be treated as trees):
  - Should not be located under trees or within three metres of buildings;
  - Should not be planted in clumps >5 square metres in area; and
  - Clumps should be separated from each other and any exposed window or door by at least 10 metres.
- Ground covers <0.5 metres in height (ground covers >0.5 metres in height are to be treated as shrubs):
  - Can be planted under trees but must be maintained to remove dead plant material, as prescribed in 'Fine fuel load' above; and
  - Can be located within two metres of a structure, but three metres from windows or doors if >100 millimetres in height.
- Grass:
  - Grass should be maintained at a height of 100 millimetres or less, at all times; and
  - Wherever possible, perennial grasses should be used and well-hydrated with regular application of wetting agents and efficient irrigation.
- Defendable space:
  - Within three metres of each wall or supporting post of a habitable building, the area is kept free from vegetation, but can include ground covers, grass and non-combustible mulches as prescribed above.
- LP Gas Cylinders:
  - Should be located on the side of a building furthest from the likely direction of a bushfire or on the side of a building where surrounding classified vegetation is upslope, at least one metre from vulnerable parts of a building;
  - The pressure relief valve should point away from the house;
  - No flammable material within six metres from the front of the valve; and
  - Must site on a firm, level and non-combustible base and be secured to a solid structure.

## **Additional notes**

The Asset Protection Zone (APZ) is an area surrounding a building that is managed to reduce the bushfire hazard to an acceptable level. Hazard separation in the form of using subdivision design elements or excluded and low threat vegetation adjacent to the lot may be used to reduce the dimensions of the APZ within the lot.

The APZ 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.

Plant flammability, landscaping design and maintenance should also be considered for trees, shrub, scrub and ground covers within the APZ. Please refer to explanatory notes 'E2 Managing an Asset Protection Zone (APZ) to a low threat state,' 'E2 Landscaping and design of an asset protection zone,' and 'E2 Plant flammability' in the Guidelines for further information relating to APZ standards.



## Appendix C - Vehicular access technical requirements (WAPC 2021)

Technical requirements	Public road	Emergency access way <sup>1</sup>	Fire service access route <sup>1</sup>	Battle-axe and private driveways <sup>2</sup>
Minimum trafficable surface (m)	In accordance with A3.1	6	6	4
Minimum horizontal clearance (m)	N/A	6	6	6
Minimum vertical clearance (m)		4.5		
Minimum weight capacity (t)		15		
Maximum grade unsealed road <sup>3</sup>	As outlined in the IPWEA Subdivision Guidelines		1:10 (10%)	
Maximum grade sealed road <sup>3</sup>	As outlined in the IPWEA Subdivision Guidelines		1:7 (14.3%)	
Maximum average grade sealed road	As outlined in the IPWEA Subdivision Guidelines		1:10 (10%)	
Minimum inner radius of road curves (m)	As outlined in the IPWEA Subdivision Guidelines		8.5	

<sup>1</sup> To have crossfalls between 3 and 6 %.

<sup>2</sup> Where driveways and battle-axe legs are not required to comply with the widths in A3.5 or A3.6, they are to comply with the Residential Design Codes and Development Control Policy 2.2 Residential Subdivision.

<sup>3</sup> Dips must have no more than a 1 in 8 (12.5% -7.1 degree) entry and exit angle

