

Bushfire Management Plan:  
Subdivision Application: Lot 9010 & 9043 (2)  
Bainbridge Avenue, Alkimos

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**PEET Limited**

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## DOCUMENT TRACKING

<b>Project Name</b>	Bushfire Management Plan: Subdivision: Lot 9010 & 9043 (2) Bainbridge Avenue, Alkimos
<b>Project Number</b>	22PER2221
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<b>Status</b>	Draft
<b>Version Number</b>	v1
<b>Last saved on</b>	20 March 2023

This report should be cited as 'Eco Logical Australia 2022. *Bushfire Management Plan: Subdivision: Lot 9010 & 9043 (2) Bainbridge Avenue, Alkimos.* Prepared for PEET Limited.

## ACKNOWLEDGEMENTS

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Template 2.8.1

Version control	
Version	Purpose
v1	Draft – Submission to client
v2	Final

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# 1. Introduction

## 1.1 Proposal details

Eco Logical Australia (ELA) was commissioned by PEET Limited to prepare a Bushfire Management Plan (BMP) to support a subdivision application for Lot 9010 & 9043 (2) Bainbridge Avenue, Alkimos (hereafter referred to as the subject site, Figure 1). The proposed subdivision will result in an intensification of land use and involves the development of 43 residential lots, one Balance Lot and one Rail Reserve area (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, south of Bainbridge Avenue in Alkimos. Within the subject site there are areas of unmanaged classifiable vegetation and cleared areas. Classifiable remnant vegetation is located south of the site and beyond, as well as areas located further than 150 m east and west of the site. Land immediately north, east and west is predominantly comprised of residential development and a primary school.

This assessment has been prepared by ELA Bushfire Consultant Maitland Ely with quality assurance undertaken by Principal Bushfire Consultant Daniel Panickar (FPAA BPAD Level 3 Certified Practitioner No. BPAD37802).

## 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.

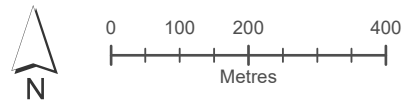
The subject site has been previously cleared, however due to the site not being managed regrowth has occurred with site containing patches of grass and tall shrubs.

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



**Figure 1: Site Overview**

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



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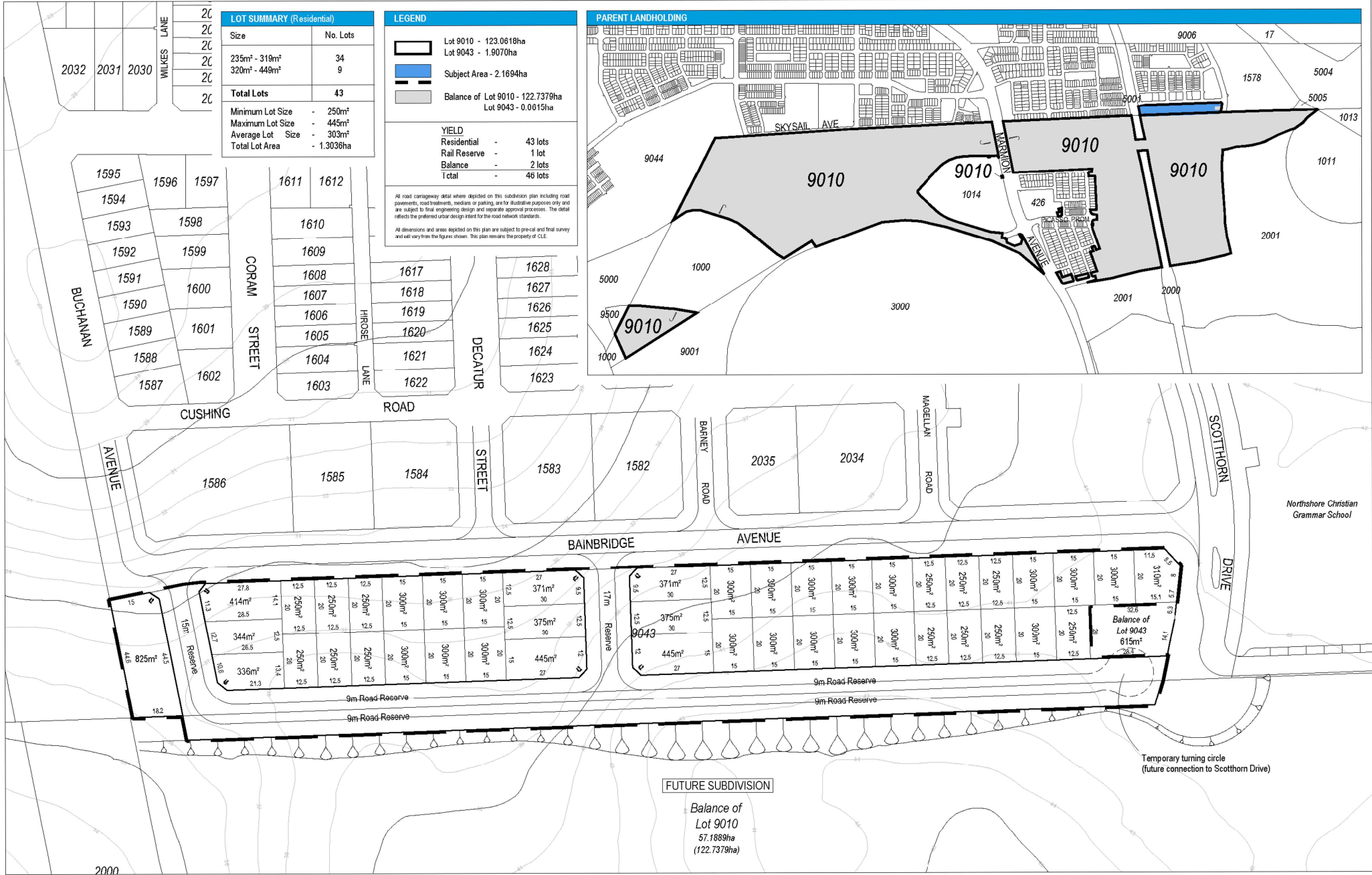




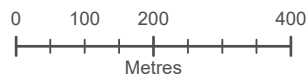


Figure 2: Site Plan



**Figure 3: Bushfire Prone Areas**

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



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## 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

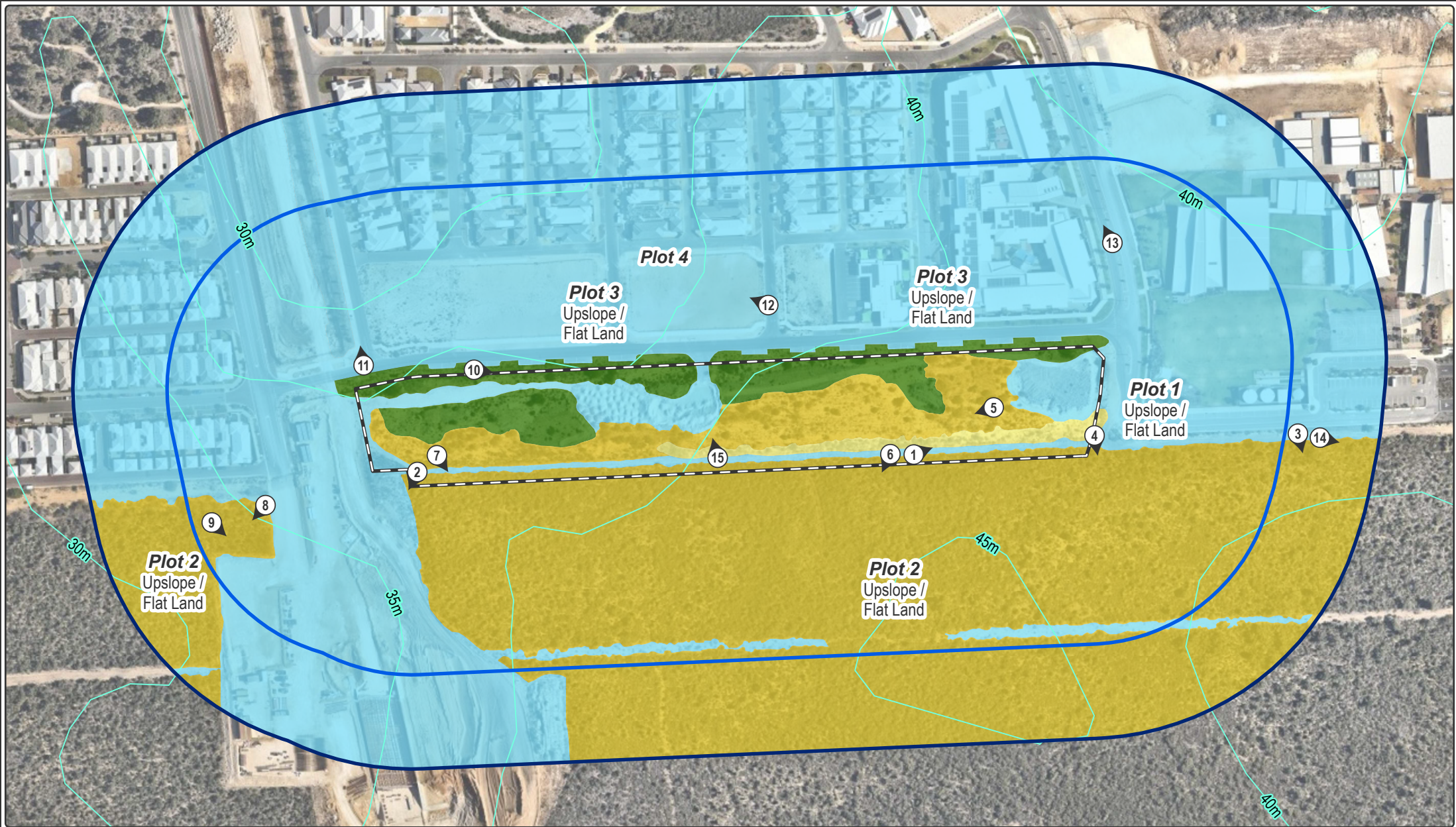
Vegetation and effective slope (i.e. slope under vegetation) within the subject site and surrounding 150 m (the assessment area) were assessed in accordance with the Guidelines and AS 3959: 2018 with regard given to the *Visual guide for bushfire risk assessment in Western Australia* (DoP 2016). Site assessment was undertaken on 24 February 2023.

The classified vegetation and effective slope for the site 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 C Shrubland	All upslopes and flat land (0 degrees)
2	Class D Scrub	All upslopes and flat land (0 degrees)
3	Class G Grassland	All upslopes and flat land (0 degrees)
5	Excluded AS 3959: 2018 2.2.3.2 (e) & (f)	All upslopes and flat land (0 degrees)

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



**Figure 4: Vegetation Classification**

Subject site	Contour (5m)	<b>Vegetation classification</b>
100m site assessment	Photo location	Class C shrubland
150m site assessment		Class D scrub
		Class G grassland
		Excluded as per clause 2.2.3.2 (e) and (f)

0 25 50 100  
Metres

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## 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 proposed buildings 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.

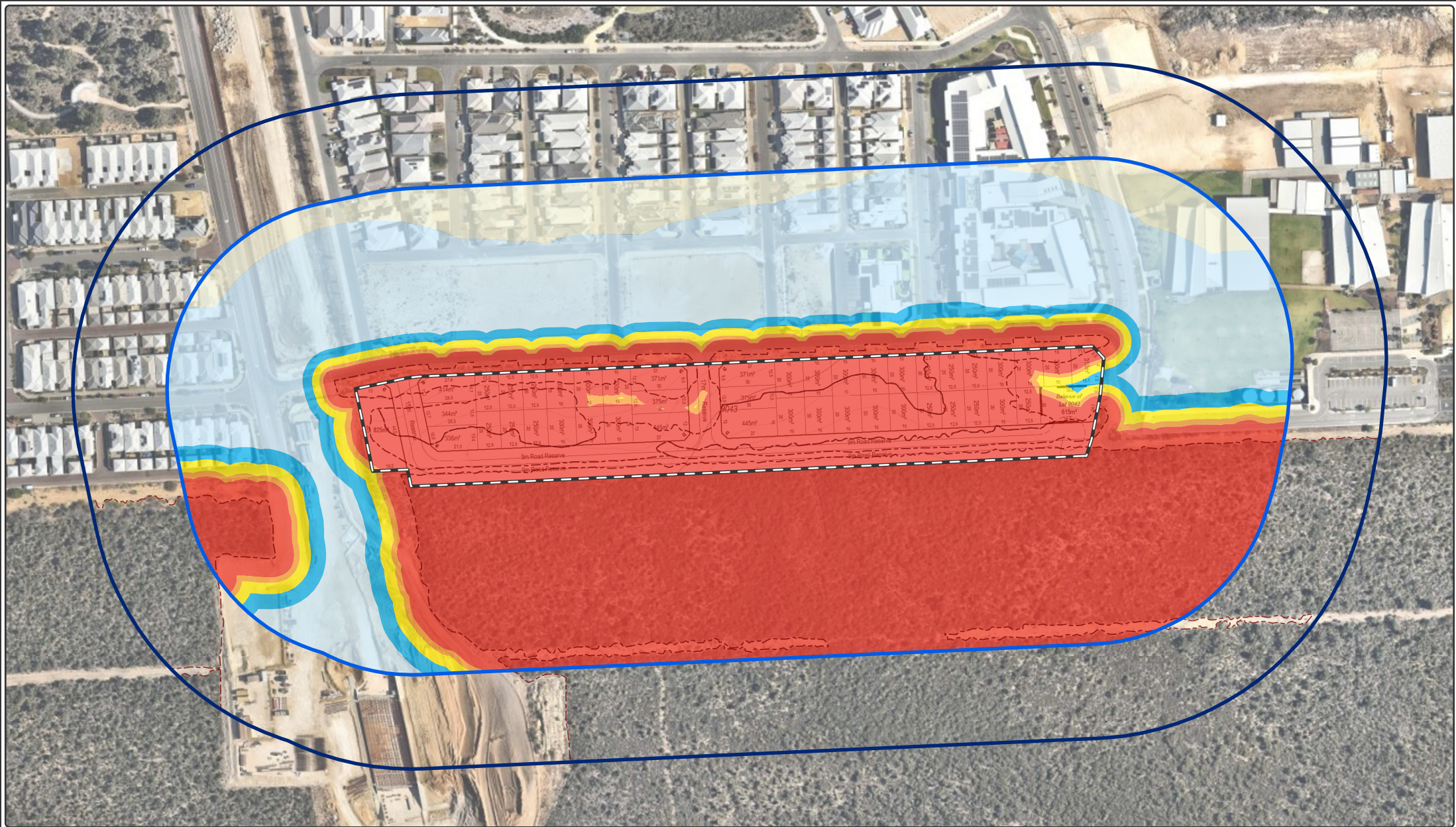
### 2.2.2 Method 1 BAL assessment

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

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

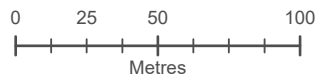
Plot	Vegetation Classification	Effective Slope	Separation distances required				
			BAL-FZ	BAL-40	BAL-29	BAL-19	BAL-12.5
1	Class C Shrubland	All upslopes and flat land (0 degrees)	<7	7-<9	9-<13	13-<19	19-<100
2	Class D Scrub	All upslopes and flat land (0 degrees)	<10	10-<13	13-<19	19-<27	27-<100
3	Class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

The developer has entered into an arrangement with the adjacent landowner to undertake battering works on their land to the south for engineering purposes. This battering will require clearing of vegetation and is shown in Figure 2. This clearing has been factored into post-clearing vegetation and BAL assessments depicted in Figure 6, Table 3 and Figure 7.



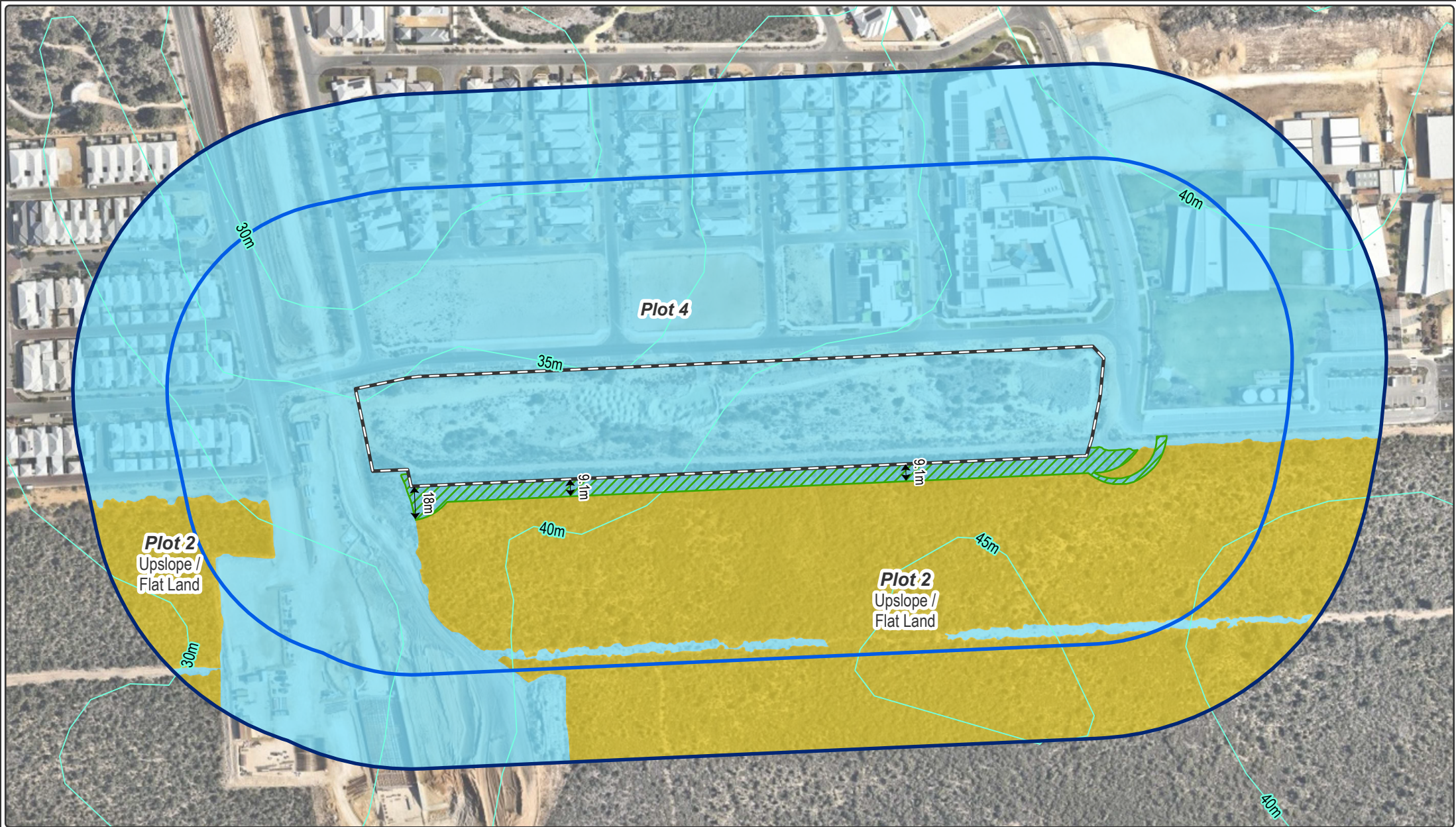
**Figure 5: : Bushfire Attack Level (BAL) Contour**

- |                           |                                    |            |
|---------------------------|------------------------------------|------------|
| Subject site              | <b>Bushfire Attack Level (BAL)</b> | BAL - 12.5 |
| 100m site assessment      | BAL - FZ                           | BAL - 29   |
| 150m site assessment      | BAL - 40                           | BAL - 19   |
| Bushfire hazard interface |                                    | BAL - LOW  |





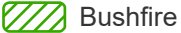
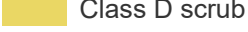
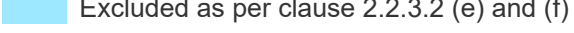


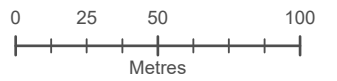
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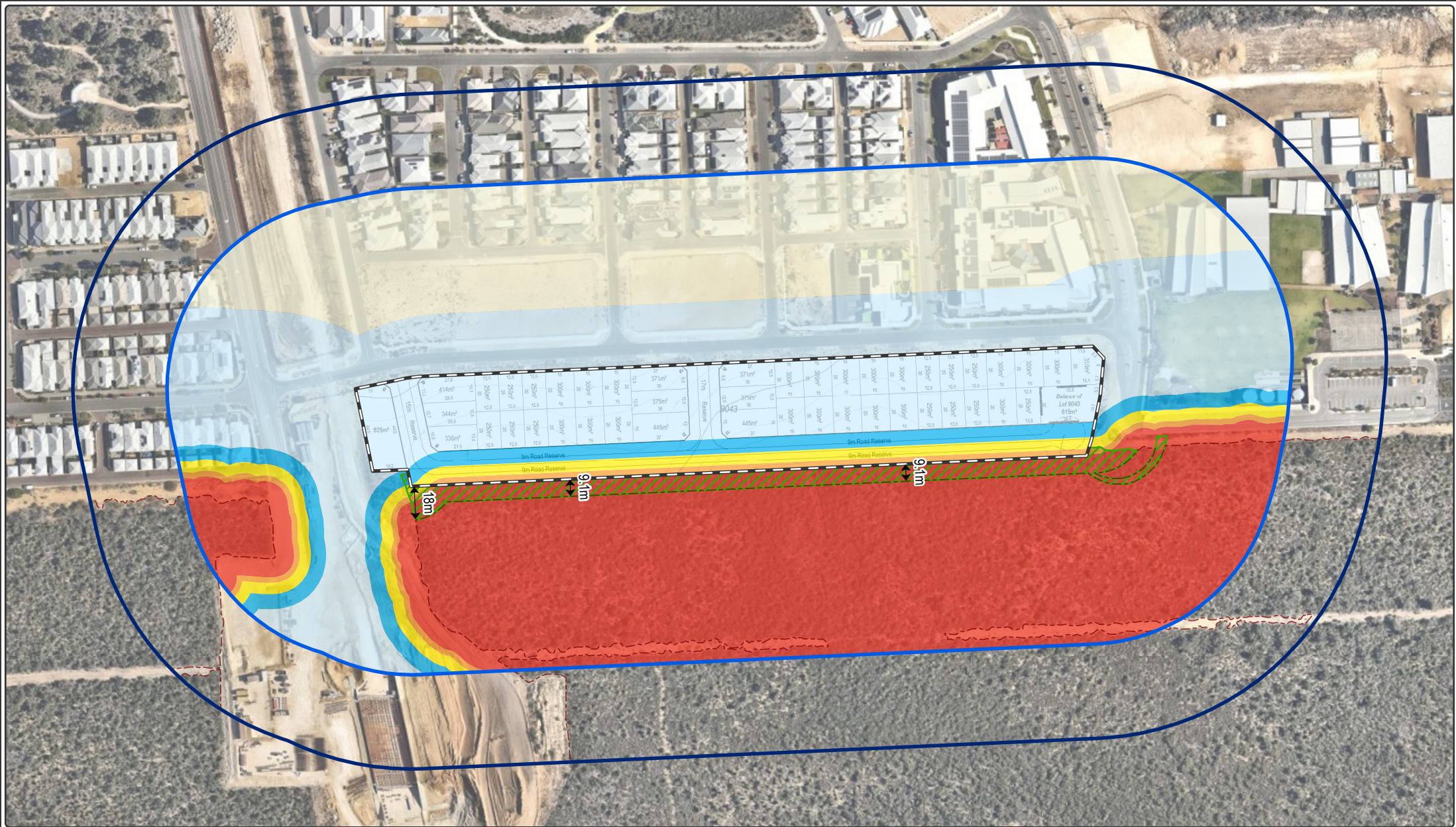
**Figure 6: Vegetation Classification Post-Clearing**

-  Subject site
-  100m site assessment
-  150m site assessment
-  Contour (5m)
-  Bushfire Mitigation Measure – Hazard Separation Vegetation Clearing
- Vegetation classification**
-  Class D scrub
-  Excluded as per clause 2.2.3.2 (e) and (f)



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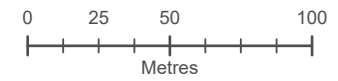




**Figure 7: Bushfire Attack Level (BAL) Contour Post-Clearing**

- Subject site
- 100m site assessment
- 150m site assessment
- Bushfire hazard interface
- Bushfire Mitigation Measure – Hazard Separation Vegetation Clearing

Bushfire Attack Level (BAL)	
	BAL - FZ
	BAL - 40
	BAL - 29
	BAL - 19
	BAL - 12.5
	BAL - LOW



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

Proposed building	Plot most affecting BAL rating	Separation Distance (m)	BAL Rating
All proposed residential lots	Plot 2	28	BAL-12.5
Balance Lot	Plot 2	28	BAL-12.5
Rail Reserve Area	Plot 2	28	BAL-12.5

### 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.

The proposed development has areas of natural vegetation onsite that have not been managed for a number of years. In future, management of fuel loads and onsite vegetation may reduce the potential bushfire risk and reduction of radiant heat affecting the development.

## 3. Assessment against the Bushfire Protection Criteria

### 3.1 Compliance

The proposed subdivision is required to comply with policy measures 6.2 and 6.4 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 subdivision 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 8 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>All proposed lots within the subject site will be located in an area subject to BAL ratings of <math>\leq</math>BAL-29 (Figure 7 and Figure 8).</p> <p>The proposed subdivision 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 29kW/m<sup>2</sup> 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 subdivision 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>The subject site is accessed via Bluewater Drive and Maroon Avenue. 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 surrounding the development 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</p>



Bushfire Protection Criteria	AS	PS	N/A	Comment
				<p>suitable access and egress for the community and emergency services personnel in the event of a bushfire. Vehicular access technical requirements in accordance with the Guidelines are detailed in Appendix C.</p> <p>The proposed subdivision is considered to be compliant with A3.1.</p>
A3.2a Multiple access routes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<p>Not compliant – Single access route to/from the subject site is available (Figure 8). Refer to A3.1 above for details regarding vehicular access technical requirements for public roads. Discretionary decision-making request as per Section 2.7 of the Guidelines.</p> <p>Refer to section 3.2 below.</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 checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<p>One no-through road is proposed as a part of this subdivision. One temporary cul-de-sac will be created as part of this subdivision, for the no-through road. This cul-de-sac will eventually connect up with Scotthorn Drive, however until this through road is connected, the cul-de-sac will contain a minimum 18m diameter turning circle at the head</p> <p>The proposed subdivision is considered to be compliant with A3.3.</p>
A3.4a Perimeter roads	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<p>Current roads present alongside proposed roads within subject site formulate a perimeter road.</p> <p>The proposed subdivision is considered to be compliant with A3.4.</p>
A3.4b Fire service access route	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<p>No fire service access route is required as all classified vegetation can be accessed through the existing/proposed road network.</p> <p>A3.4b is not applicable to this proposed subdivision.</p>
A3.5 Battle-axe access legs	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<p>No battle-axe properties are proposed as a part of this subdivision.</p> <p>A3.5 is not applicable to this proposed subdivision.</p>
A3.6 Private driveways	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	This acceptable solution is not applicable to subdivision applications.
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. There are three nearby existing hydrants that are located adjacent to the subject site along the northern boundary running along Bainbridge Avenue (Figure 8). ELA assumes the surrounding network of hydrants meet Water Corporation specifications given they are established and within the Perth metropolitan area.</p> <p>The proposed subdivision is considered to be compliant with A4.2.</p>

Bushfire Protection Criteria	AS	PS	N/A	Comment
<b>Element 5: Vulnerable tourism land uses</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	This development application is not considered vulnerable tourism land use. Element 5 is not applicable to this proposed subdivision.

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

### 3.2 Element A3.2a Multiple access routes: Non-compliance – discretionary decision making

Due to legacy approvals and development, the proposed subject site is only accessible via one available route. This route provides access to/from the subject site to the west, over the Yanchep rail corridor, through the broader Shorehaven Estate and out onto Marmion Avenue (Figure 8). The surrounding area was developed under older bushfire regulations and as such only a single access was installed. As this single access route is existing and previously approved, ELA believe that discretion being exercised under section 2.7 of the Guidelines (*Legacy approvals and discretionary decision making*) is warranted.

Section 2.7 of the Guidelines states that legacy sites should demonstrate compliance with SPP 3.7 and these Guidelines and where necessary, the design should be modified to achieve compliance with the bushfire protection criteria. Where a performance principle solution or a re-design is not possible due to demonstrated site constraints, the BMP must address a number of criteria to seek to lessen the existing level of bushfire risk exposure.

There is no possible way of developing a secondary access route given the rail corridor constraints. However, future connections will be provided with the Public Transport Authority currently constructing a permanent crossing over the rail corridor as shown in Appendix D. Proposed secondary access being constructed by Public Transport Authority will be built to meet all bushfire risk obligations.

The criteria in section 2.7 of the Guidelines are addressed below.

#### IDENTIFY NON-COMPLIANCE

A single access route to the proposed subject site is available via the existing road network, therefore compliance with Element 3 Vehicular Access: A3.2a of the Guidelines cannot be achieved.

#### ADDRESS THE BUSHFIRE PROTECTION CRITERIA TO THE GREATEST EXTENT POSSIBLE

Whilst it is impossible for multiple access routes to be created at the current time due to constraints associated with the Yanchep rail corridor, there are plans for a future secondary access route to be installed as a permanent crossing over the rail corridor, thereby increasing the number of access routes to two (Appendix D).

Additional bushfire management measures have been incorporated into subdivision design to reduce the risk associated with this non-compliance (detailed below).

#### DETAIL HOW THE DESIGN CONSIDERS BUSHFIRE RISK MANAGEMENT AND WHERE ADDITIONAL BUSHFIRE MITIGATION MEASURES HAVE BEEN INCLUDED TO MINIMISE THE RISK

Due to single access route to/from subject site, an additional bushfire mitigation measure has been incorporated into subdivision design. In addition to the perimeter road between proposed lots and the

adjacent bushfire hazard, removal of a portion of vegetation located south of the site (on the adjacent property) is proposed for battering purposes. This vegetation removal will increase the hazard separation from the site and assist in reducing the BAL rating for proposed lots, as well as overall bushfire risk for the subject site. Decreasing the risk exposure to the subject site through this measure, will provide additional time for residents/visitors to evacuate the site through the existing access route should a bushfire emergency eventuate. It will also result in the internal areas of the subject site (and surrounding estate) being safer, should the evacuation route be compromised and shelter-in-place be required.

In addition, as detailed earlier, there are plans for a future secondary access route to be installed as a permanent crossing over the rail corridor, thereby increasing the number of access routes to two (Appendix D).

### OUTLINE HOW THE OBJECTIVES OF SPP 3.7 HAVE BEEN ACHIEVED

The objectives of SPP 3.7 are:

- 5.1 Avoid any increase in the threat of bushfire to people, property and infrastructure. The preservation of life and the management of bushfire impact are paramount;
- 5.2 reduce vulnerability to bushfire through the identification and consideration of bushfire risks in decision-making at all stages of the planning and development process;
- 5.3 Ensure the higher order strategic planning documents, strategic planning proposals, subdivision and development application take into account bushfire protection measures; and
- 5.4 Achieve an appropriate balance between bushfire risk management measures and, biodiversity conservation values, environmental protection and biodiversity management and landscape amenity, with consideration of the potential impacts of climate change.

In ELA's professional opinion, the subdivision does take into account bushfire protection requirements and includes specified bushfire protection measures, with management of adjacent classifiable vegetation to the south occurring alongside plans in the future for the development of a secondary access route through development of permanent crossing over the rail corridor (Appendix D).

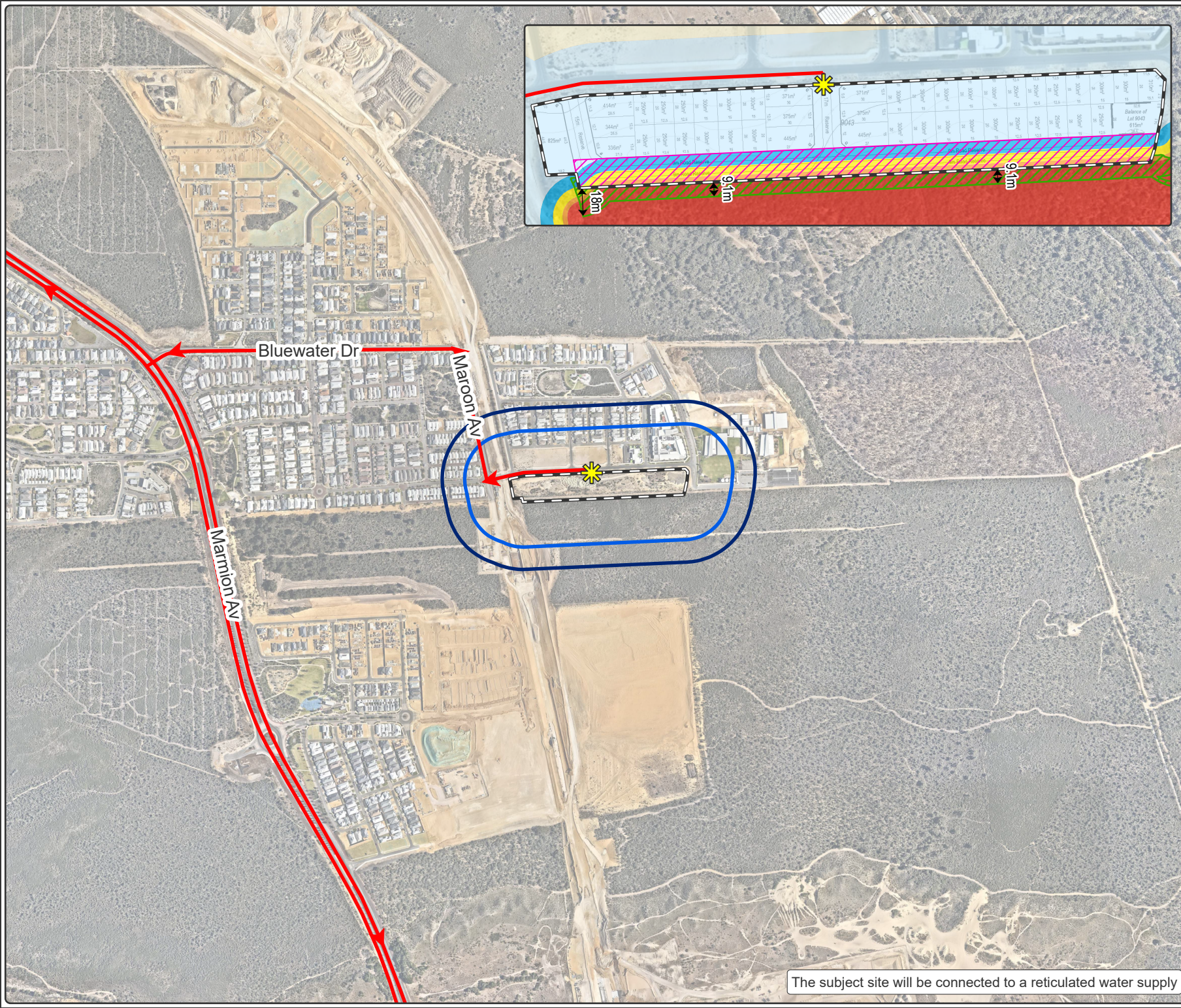
In addition to the above, the proposed subdivision satisfies the acceptable solutions for the remainder of Element 3 and Elements 1, 2 and 4 in the Guidelines and therefore ELA consider the proposed subdivision to meet objectives of SPP 3.7.

### OUTLINE WHY DISCRETION IS WARRANTED BY THE DECISION-MAKER IN THIS INSTANCE

Given the constraints detailed above, the fact that the proposed subdivision has made effort to reduce overall bushfire risk exposure through proposed management of neighbouring classifiable vegetation, increasing the hazard and site separation and with future plans of a secondary access route being proposed further south, ELA consider that discretion can be applied by the decision-maker.

### 3.3 Additional Bushfire Requirements

All landscaping areas within the subject site will be maintained in accordance with Standards for Asset Protection Zones (Appendix B).



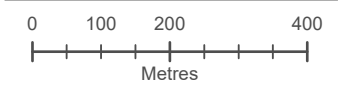
**Legend**

- Subject site
- 100m site assessment
- 150m site assessment
- Lot boundary
- Bushfire Mitigation Measure – Hazard Separation Vegetation Clearing
- 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 8: Spatial representation of the bushfire management strategies**



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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 issue of Titles</b>		
1	Ensure proposed building is located outside of areas subject to BAL-FZ and BAL-40 as per the design in Figure 8.	Developer
2	Ensure that APZs are cleared around each stage of subdivision if the entirety of the development depicted in Figure 8 is not developed in a single stage	Developer
3	Ensure all APZs are implemented and maintained	Developer
4	Place Section 165 Notification on Title for all lots within Bushfire Prone Areas.	Developer
5	Construct road network (including temporary cul-de-sac) as per plan in Figure 8	Developer
6	Provide reticulated water supply to all lots and hydrants in accordance with Figure 8	Developer
<b>Prior to occupancy</b>		
7	Ensure all APZs are implemented and maintained.	Developer
8	Construct proposed building to relevant construction standard in AS 3959-2018.	Developer
<b>Ongoing management</b>		
9	Maintain APZs to the standard in the Guidelines	Owners / City of Wanneroo (in public reserves)

## 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 subdivision. As such, the proposed subdivision 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 C Shrubland
Plot 1	<p><b>Photo Point 1</b></p> <p>Classified vegetation within this plot is comprised of shrubs &lt;2 m high with &gt;30% foliage cover.</p> <p>Slope under this plot was assessed as upslope/flat land.</p>	
Plot 1	<p><b>Photo Point 2</b></p> <p>Classified vegetation within this plot is comprised of shrubs &lt;2 m high with &gt;30% foliage cover.</p> <p>Slope under this plot was assessed as upslope/flat land.</p>	
Plot 2	<p><b>Photo Point 3</b></p> <p>Classified vegetation within this plot is comprised of shrubs with the dominate height being greater than 2 m high with &gt;30% foliage cover.</p> <p>2 m height pole present within the associated photo.</p> <p>Slope under this vegetation 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 with the dominate height being greater than 2 m high with >30% foliage cover.

2 m height pole present within the associated photo.

Slope under this vegetation 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 10%-30% foliage cover.

2 m height pole present within the associated photo.

Slope under this vegetation 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 with the dominate height being greater than 2 m high with >30% foliage cover.

2 m height pole present within the associated photo.

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



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

**Photo Point 7**

Classified vegetation within this plot is comprised of shrubs with the dominate height being greater than 2 m high with >30% foliage cover.

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



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

**Photo Point 8**

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 vegetation was assessed as upslope/flat land.



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

**Photo Point 9**

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 vegetation was assessed as upslope/flat land.



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

**Photo Point 10**

Classified vegetation within this plot is comprised of shrubs greater than 2 m high with 10%-30% foliage cover.

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



**Plot 3      Classification or Exclusion Clause      Class G Grassland**

**Photo Point 11**

Classified vegetation within this plot is comprised of grasses with isolated shrubs scattered throughout.

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



**Plot 4      Classification or Exclusion Clause      Excluded AS 3959: 2018 2.2.3.2 (e)**

**Photo Point 12**

Non-vegetated area that has been excluded under 2.2.3.2 (e) of AS 3959: 2018. The area comprises of cleared areas for future residential development.



**Plot 4 Classification or Exclusion Clause Excluded AS 3959: 2018 2.2.3.2 (e) & (f)**

**Photo Point 13**

This area has been excluded under 2.2.3.2 (e) and (f) of AS 3959: 2018. The area comprises of non-vegetated areas such as footpaths, aged care living and residential development as well as surrounding low threat remanent vegetation that is comprised of landscaping and gardens.



**Plot 4 Classification or Exclusion Clause Excluded AS 3959: 2018 2.2.3.2 (e)**

**Photo Point 14**

Non-vegetated area that has been excluded under 2.2.3.2 (e) of AS 3959: 2018. The area is comprised of a firebreak track.



**Plot 4 Classification or Exclusion Clause Excluded AS 3959: 2018 2.2.3.2 (e)**

**Photo Point 15**

Non-vegetated area that has been excluded under 2.2.3.2 (e) of AS 3959: 2018. The area is comprised of a cleared area.



## 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.

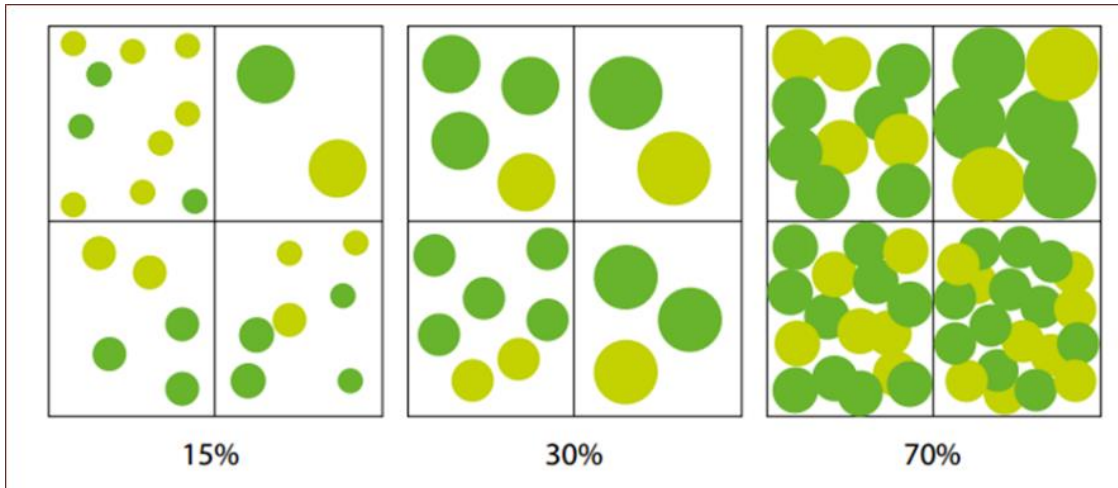


Figure 9: Illustrated tree canopy cover projection (WAPC 2021)

- 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



## Appendix D – Future Secondary Access and Crossing over Rail Corridor



LOCALITY PLAN

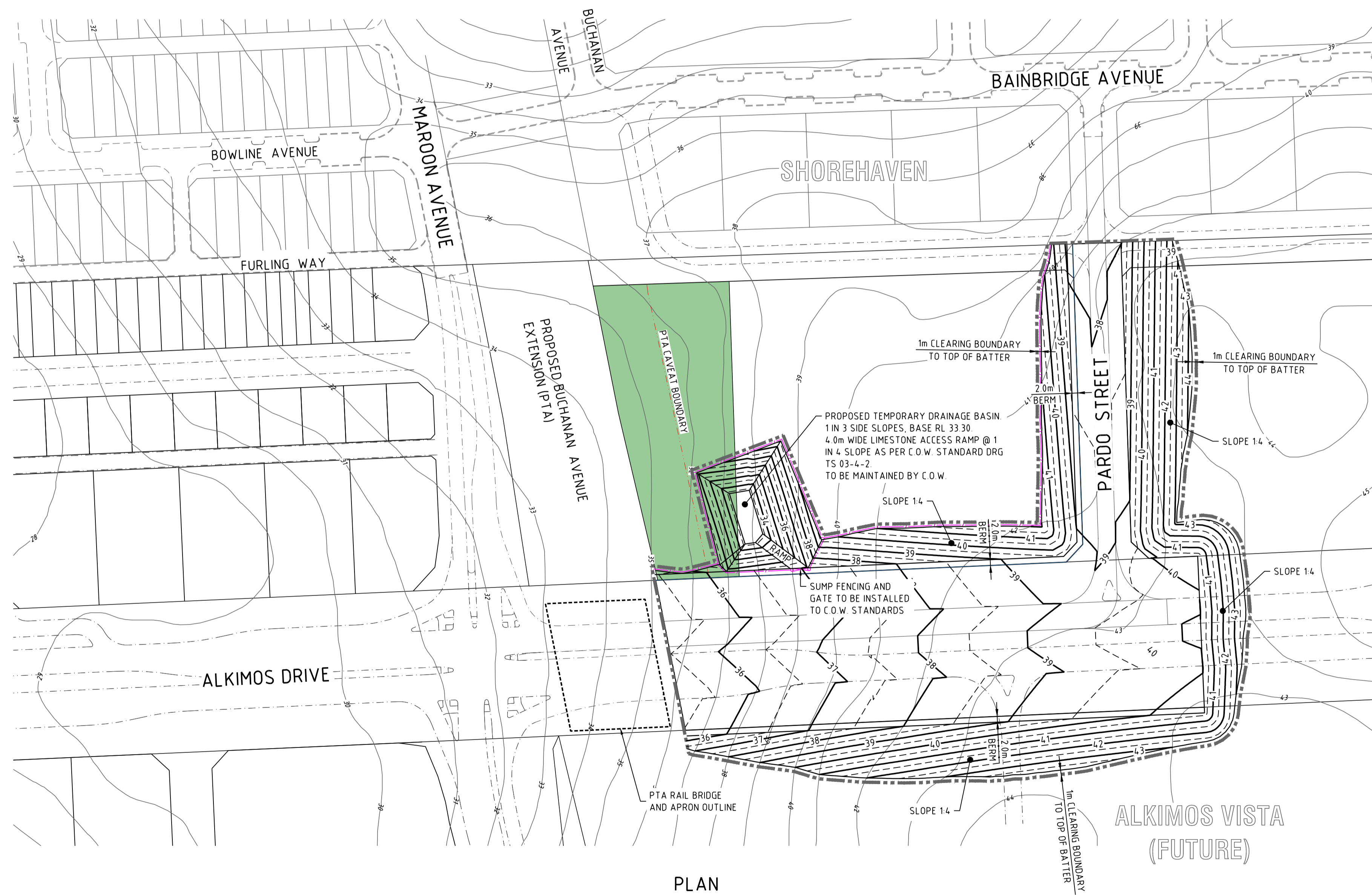
SCALE 1:5000

**GENERAL NOTES**

1. ALL LEVELS IN METRES TO AHD. EXISTING SURVEY BY MNG SURVEYORS.
2. BATTERS TO EXISTING SURFACE AT 1:3 (CUT) 1:4 (FILL) UNLESS NOTED OTHERWISE.
3. ALL UNSUITABLE MATERIAL TO BE REMOVED BY THE CONTRACTOR TO APPROVED TIPPING SITE PRIOR TO COMMENCEMENT OF CONSTRUCTION. ALL FEES TO BE PAID BY CONTRACTOR.
4. EXTENT OF EARTHWORKS TO BE LIMITED TO THE EARTHWORKS STAGE BOUNDARY UNLESS AGREED WITH THE SUPERINTENDENT.
5. ALL CLEARED MATERIAL TO BE MULCHED AND STOCKPILED. LOCATION TO BE CONFIRMED ON SITE BY SUPERINTENDENT.
6. CONTRACTOR TO LOCATE ALL EXISTING SERVICES PRIOR TO COMMENCEMENT OF WORKS ON SITE.
7. CONTRACTOR TO GRADE EVENLY BETWEEN DESIGN CONTOURS AND MATCH INTO EXISTING SURFACE AT LIMIT OF EARTHWORKS BOUNDARY WHERE APPROPRIATE.
8. DESIGN LEVELS SHOWN SHALL BE ON THE FINISHED SURFACE INCLUDING TOPSOIL WHERE SPECIFIED. TOPSOIL TO BE RESPREAD OVER LOTS & VERGES. NO TOPSOIL RESPREAD WITHIN BROOK OR RIVER RESERVE.
9. THE CONTRACTOR SHALL LIMIT THE MOVEMENT OF EQUIPMENT AND MANPOWER TO THE MINIMUM AREA NECESSARY AND PROTECT ALL VEGETATION AND EXISTING SERVICES ON SITE.
10. ALL EARTHWORKED AREAS TO BE HYDROMULCHED UPON COMPLETION OF THE WORKS AND PRIOR TO HANDOVER TO THE CITY OF WANNEROO.

**LEGEND**

- NATURAL SURFACE CONTOUR (1.0m)
- DESIGN CONTOUR (1.0m)
- DESIGN CONTOUR (0.5m)
- EXTENT OF CLEARING & EARTHWORKS BOUNDARY
- PROPOSED ROAD
- EXISTING ROAD
- FUTURE ROAD
- FENCING TO BE 1.8m CHAIRMESH, DIRECT BURIED (NO CONCRETE FOOTINGS REQUIRED)
- PUBLIC OPEN SPACE



PLAN

SCALE 1:1000

**WARNING TO CONTRACTOR UXO**

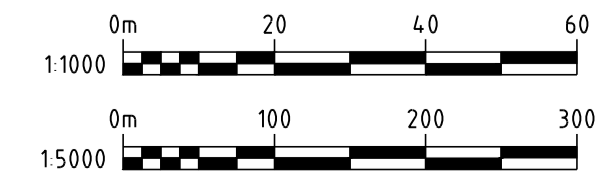
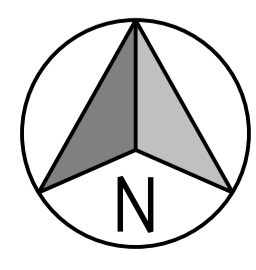
THE SITE IS IDENTIFIED AS POTENTIALLY HAVING UNEXPLODED ORDNANCE.  
 "NO EXCAVATION OR OTHER DISTURBANCE OF THE SOIL ON THIS SITE SHOULD BE CARRIED OUT WITHOUT FIRST OBTAINING CLEARANCE FROM THE UNEXPLODED ORDNANCE BRANCH OF THE FIRE AND EMERGENCY SERVICES AUTHORITY."

**NOTICE TO CONTRACTOR**

IT IS THE CONTRACTORS RESPONSIBILITY TO INVESTIGATE THE NATURE AND LOCATION OF ALL SERVICES WHICH MAY BE ENCOUNTERED AND TO CONSULT WITH THE RELEVANT SERVICE AUTHORITIES PRIOR TO COMMENCEMENT OF EXCAVATIONS. FAILURE TO DO SO OR TO TAKE DUE CARE SHALL NOT LIMIT THE CONTRACTORS LIABILITY FOR REPAIR OF ANY DAMAGED AS A RESULT OF CONSTRUCTION WORKS. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY FOR THE PROTECTION OF ALL EXISTING SERVICES.

P:\6270 Alkimos Central\6270-Plan\6270-P2-120.dwg, 14/02/2023 2:48:47 PM, rbnw\_Digital Signing PDF (ps), 1:1, - CVI Reference

REV	DATE	DRN	CKD	APP	AMENDMENT
D	14.02.23	RJW	-		POS ADDED
C	24.01.23	RJW	A. THOMSON		RE-ISSUED FOR APPROVAL
B	20.01.23	RJW	A. THOMSON		RE-ISSUED FOR APPROVAL
A	25.11.22	DP	A. THOMSON		ISSUED FOR APPROVAL



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CLIENT

APPROVED

DESIGNED  
 MTW

SCALE  
 1:1000 1:5000

PROJECT	TITLE	WAPC No.	DRAWING No.	REVISION
ALKIMOS VISTA - PRECINT 2	CLEARING AND BULK EARTHWORKS PLAN	158376	6270-P2-120	D

ORIGINAL SIZE A1

