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# 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: Amberton Estate - Precincts 3N & 4E

Suburb: Eglinton

State: WA

P/code: 6034

Local government area: City of Wanneroo

Description of the planning proposal: Subdivision Application

BMP Plan / Reference Number: STO18460.01

Version: R001 Rev 0

Date of Issue: 03/10/2018

Client / Business Name: Stockland

## 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)?



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)?



Is the proposal any of the following special development types (see SPP 3.7 for definitions)?

Unavoidable development (in BAL-40 or BAL-FZ)



Strategic planning proposal (including rezoning applications)



Minor development (in BAL-40 or BAL-FZ)



High risk land-use



Vulnerable land-use



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.)?

N/A

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

Zac Cockerill

Accreditation Level

Level 2

Accreditation No.

BPAD 37803

Accreditation Expiry

31/08/2019

Company

Strategen Environmental

Contact No.

9792 4797

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 03/10/2018





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## Amberton P3N & P4E

### Bushfire Management Plan (Subdivision Application)

Prepared for  
Stockland  
by Strategen

October 2018





# **Amberton P3N & P4E**

## **Bushfire Management Plan (Subdivision Application)**

Strategen is a trading name of  
Strategen Environmental Consultants Pty Ltd  
Level 1, 50 Subiaco Square Road Subiaco WA 6008  
ACN: 056 190 419

October 2018

## ***Limitations***

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## ***Document control***

Client: Stockland

Report Version	Revision No.	Purpose	Strategen author	Reviewed by	Submitted to Client	
					Form	Date
Draft Report	Rev A	For review by client	Brodie Mastrangelo (BPAD45985)	Zac Cockerill (BPAD37803)	Electronic (email)	28/09/2018
<b>Final Report</b>	<b>Rev 0</b>	<b>Issued for use: to accompany subdivision application</b>	<b>Zac Cockerill (BPAD37803)</b>	<b>Zac Cockerill (BPAD37803)</b>	<b>Electronic (email)</b>	<b>3/10/2018</b>

Filename: STO18460\_01 R001 Rev 0 - 3 October 2018

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# 1. Proposal details

## 1.1 Background

Stockland is seeking to lodge a subdivision application to facilitate ongoing residential development of Precincts 3N and 4E of Amberton Estate (i.e. P3N and P4E, hereon referred to as the project area), located within a portion of Lot 9023 Marmion Avenue, Eglinton in the City of Wanneroo. The subdivision plan (Figure 1) identifies:

- a total of 430 proposed residential lots
- proposed development layout
- internal road layout
- areas of Public Open Space (POS) and drainage
- numerous balance lots to be retained within Lot 9023.

The project area is zoned 'Residential' as per the City of Wanneroo Town Planning Scheme No.2, which is consistent with existing residential development within broader areas of Amberton Estate.

The project area is located within a designated bushfire prone area (Plate 1), as per the WA Map of Bush Fire Prone Areas (DFES 2018).

## 1.2 Site description

The project area comprises approximately 25.75 ha within Lot 9023 and is surrounded by (see Figure 2):

- remnant vegetation to the north and west in varying degrees of condition
- existing Amberton Estate residential development to the south
- Marmion Avenue and remnant vegetation to the east.

## 1.3 Purpose

This Bushfire Management Plan (BMP) has been prepared to address requirements under Policy Measure 6.4 of *State Planning Policy 3.7 Planning in Bushfire-Prone Areas* (SPP 3.7; WAPC 2015) and *Guidelines for Planning in Bushfire-Prone Areas* (the Guidelines; WAPC 2017).

## 1.4 Other plans/reports

The BAL assessment outlined in this report is the most up to date assessment relating to the project area and therefore supersedes any previous Strategen BAL assessments/contour assessments undertaken within the project area, including those documented in the following Bushfire Management Plans (BMPs)/addendums previously prepared by Strategen:

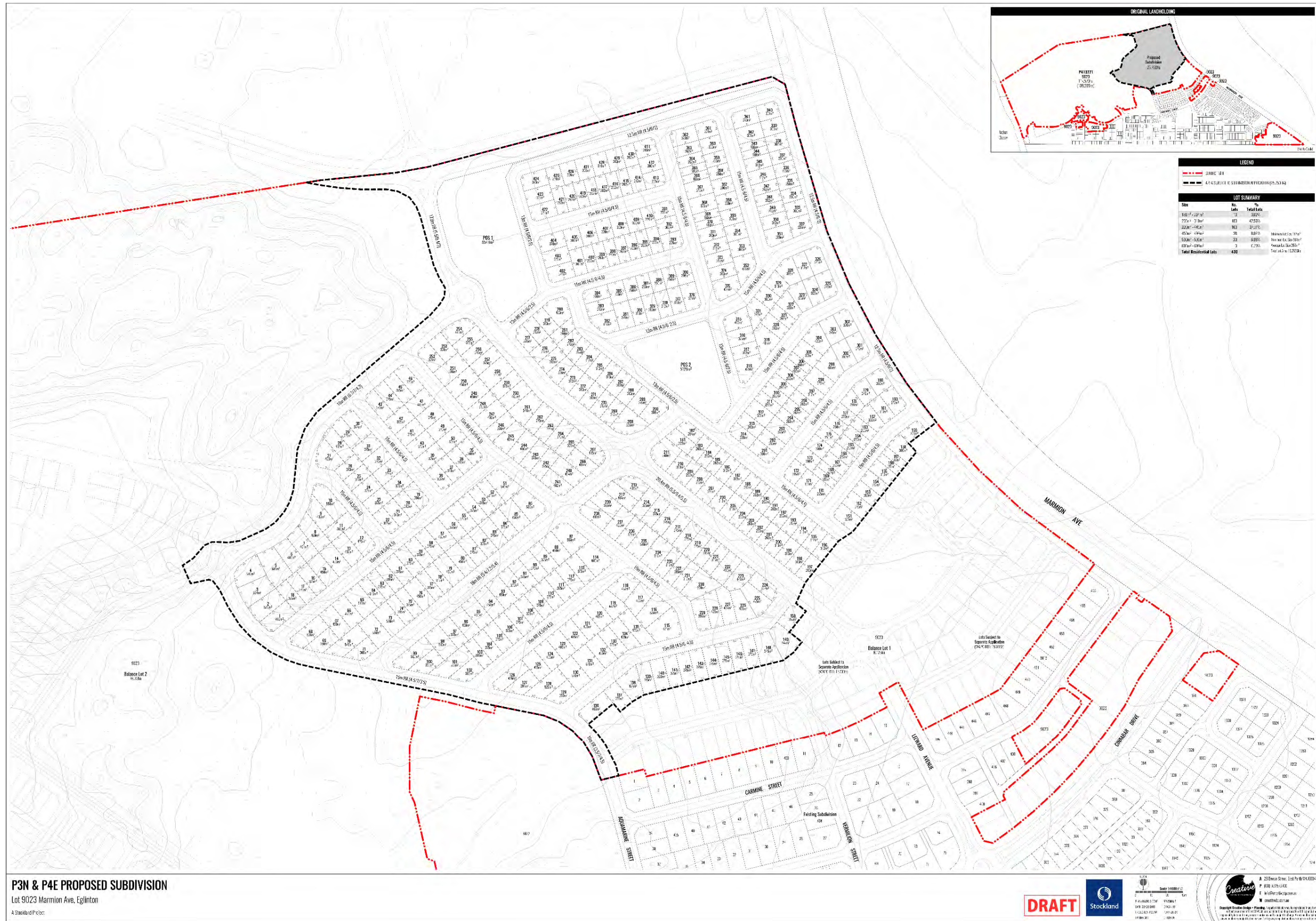
- Amberton Estate Fire Management Plan (Strategen 2016)
- Stages 8 & 9 Amberton Estate BMP (Strategen 2017)
- Portion Stages 8,9,39 & 40 Amberton Estate BMP (Strategen 2018).

Other plans/reports relating to this development include:

- MRS Amendment 1284/57
- Commonwealth EPBC Approval 2010/5777
- EPBC Approval 2013/7068
- EPBC Approval 2014/7137.



Plate 1: Bush Fire Prone Areas map



Source: CDP 2018

Figure 1: Plan of subdivision



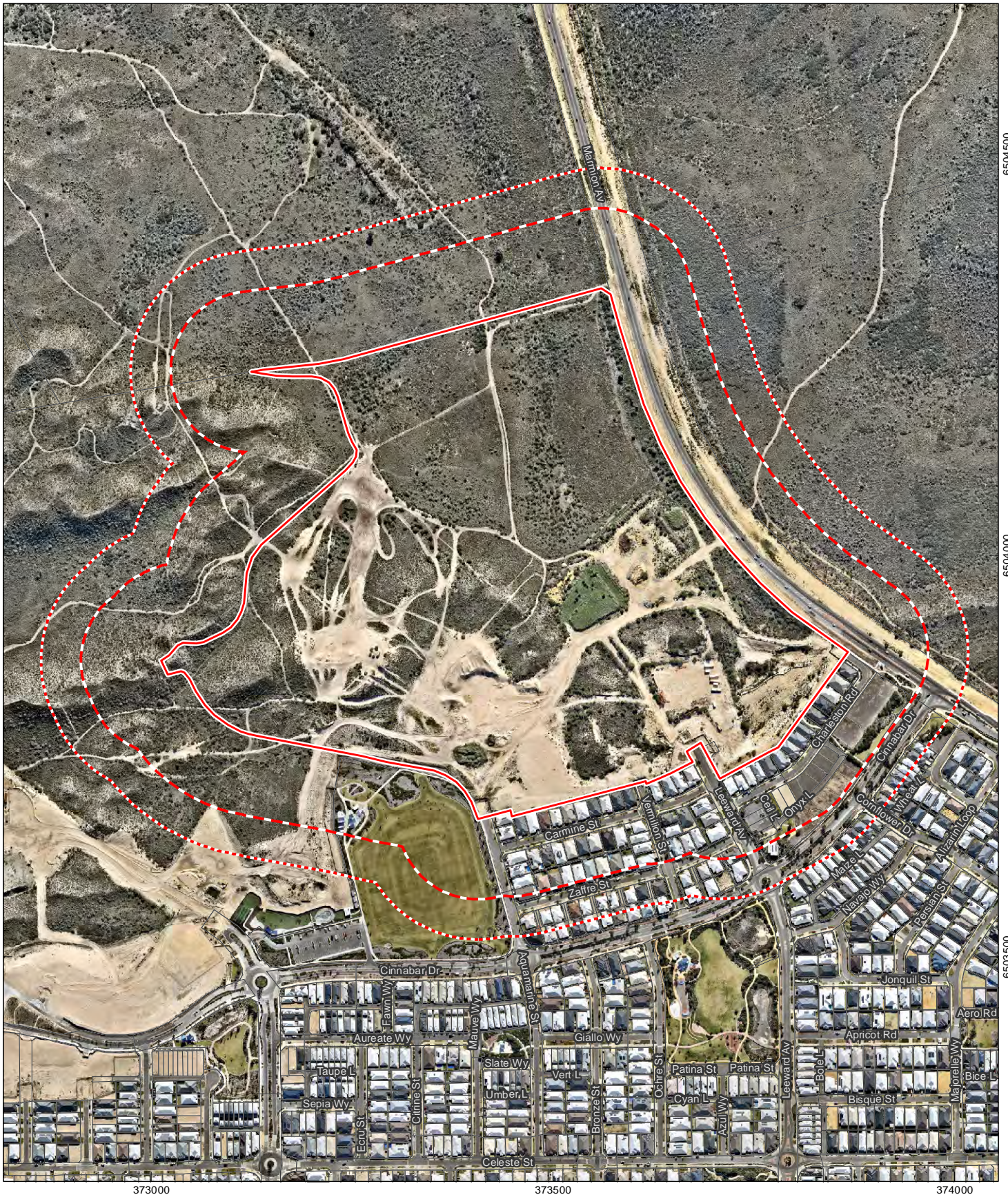


Figure 2: Site overview



Scale 1:6,500 at A4



Coordinate System: GDA 1994 MGA Zone 50

Date: 7/09/2018

**Legend**

- Project area
- 100m assessment area
- 150m assessment area
- Cadastre



info@strategen.com.au | www.strategen.com.au

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Data source: Nearmap: Aerial image, flown 06/2018. Client: Stockland. Development layout, 08/2018. Created by: jcrute

## 2. Environmental considerations

### 2.1 Native vegetation – modification and clearing

The majority of the project area contains remnant vegetation, which will be cleared as part of the proposal. Table 1 provides a summary of a search of publicly available environmental data.

Table 1: Summary of environmental values

Environmental value	Present within or adjacent to project area (Y/N)	Description
Environmentally Sensitive Area	Y	The project area is mapped as an ESA as a result of occurrences of threatened ecological communities (TECs) in the broader area. ESAs are only relevant in the context of exemptions for the requirement of a clearing permit under Part V of the EP Act. Clearing within the project area will be assessed through the subdivision process, which provides a valid exemption regardless of the presence of an ESA.
Wetlands	N	N/A
Waterways	N	N/A
Potential Threatened Ecological Communities listed under the EPBC Act	Unconfirmed	Regional mapping shows the buffer of conservation significant ecological communities occurring within the project area.
Potential habitat for threatened fauna species	Y	The project area may contain potential habitat for the Threatened Carnaby's Black Cockatoo.
DBCA legislated lands and water (includes National Park, Conservation Park, Nature Reserve, marine reserves, State forest and timber reserve)	N	There are no DBCA legislated lands or waters within the project area.
DBCA land of interest (includes some areas of UCL, freehold purchased by State and some unvested Crown reserves)	N	There are no DBCA land of interest within the project area.
Vegetation associations or complexes with <30% of Pre-European extent remaining outside of constrained areas	N	N/A

Native vegetation occurs across a large portion of the project area, with the exception of cleared tracks, firebreaks and disturbed areas in the southern portion of the project area. Regional vegetation mapping identifies the pre-European Beard vegetation association within the project area as being Guilderton 1007: shrublands; *Acacia lasiocarpa* and *Melaleuca acerosa* heath/shrublands; *Acacia rostelifera* and *Acacia cyclops* thicket.

The proposed development will necessitate clearing of native vegetation within the project area and adjacent staging buffer, with the possible exception of vegetation retained/introduced within the four proposed POS areas. Any retained or introduced vegetation in these POS areas will be designed in accordance with landscape plans to be excludable under one or a combination of Clauses 2.2.3.2 (b), (e) and (f) of AS3959 (a discussed in Section 2.2).

An EPBC referral (Ref: 2010/5777) was submitted for the proposed development (including adjacent development areas) in 2010, for potential impacts to Carnaby's Black Cockatoo. Department of Environment and Energy (DoEE) approved the proposal with conditions including the creation of Carnaby's cockatoo habitat within POS areas within the project area. This process was outlined in Amendment No.1 to Eglinton LSP No.82 submitted by Creative design and Planning (2016), as per the below extract:

- "Development of the eastern half of the Eglinton LSP No.82 area was assessed under the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) due to the impact of clearing on Carnaby's Black Cockatoo foraging habitat. The determination on the referral was deemed a 'Controlled Action' and a formal assessment (EPBC 2010/5777) was undertaken. The Eglinton LSP No.82 was approved by the Commonwealth Minister for Environment on 30 April 2013, modified on 17 July 2013 and 20 October 2015. The western section of the Eglinton LSP No.82 area was referred under two separate proposals both of which were determined as 'Not a Controlled Action'."

Based on the above information, Strategen understands that all relevant environmental approvals have been sought up to this point in time. Subdivision approval will provide a valid clearing exemption to undertake the necessary subdivisional and clearing works required.

## 2.2 Revegetation / Landscape Plans

Landscaping within the project area will be limited to the proposed POS areas and street scaping. As previously mentioned, any landscaping proposed will consist of vegetation excludable under Clauses 2.2.3.2 (b), (e) and (f) of AS3959. Final determination of the applicable exclusion clauses will be confirmed as part of detailed landscape design once final size, location, density and species selection are known. Detailed landscape planning and design will need to be consistent with the provisions of this BMP with regards to any exclusions/managed land proposed.

Based on conceptual landscape information available, proposed POS will constitute the following:

- POS 2 (exclusion clauses 2.2.3.2 (b), (e) and (f) – vegetated components less than 1 ha and greater than 100 m from classified vegetation, with additional areas of non-vegetated land and low threat managed vegetation): passive open space comprising rest stops along the pedestrian and cycle network consisting of low threat tree planting along the periphery, seating and informal pathways
- POS 3 (exclusion clauses 2.2.3.2 (b), (e) and (f) – vegetated components less than 1 ha and greater than 100 m from classified vegetation, with additional areas of non-vegetated land and low threat managed vegetation): passive open space and drainage to provide amenities for passive recreation such as walking and resting, linkages to the greater cycle and pedestrian network, open space for infiltration and wetlands for detention, with the key features being low threat tree planting along the periphery, seating, grassed areas for the 5 and 100 year infiltration requirements, native wetlands areas for the 1:1 ARI drainage requirements and informal pathways
- POS 1 and 4 (exclusion clauses 2.2.3.2 (e) and (f) – combination of non-vegetated land and low threat managed vegetation): passive open space buffers to conservation POS to the west comprising low threat tree planting, seating and pedestrian paths.

### 3. Bushfire assessment results

#### 3.1 Assessment inputs

##### 3.1.1 Classified vegetation and effective slope

Strategen assessed classified vegetation, exclusions and effective slope within 150 m of proposed development through on-ground verification on 23 August 2018 in accordance with AS 3959—2009 *Construction of Buildings in Bushfire-Prone Areas* (AS 3959; SA 2009). Results are depicted in Figure 3 and georeferenced site photos are contained in Appendix 1.

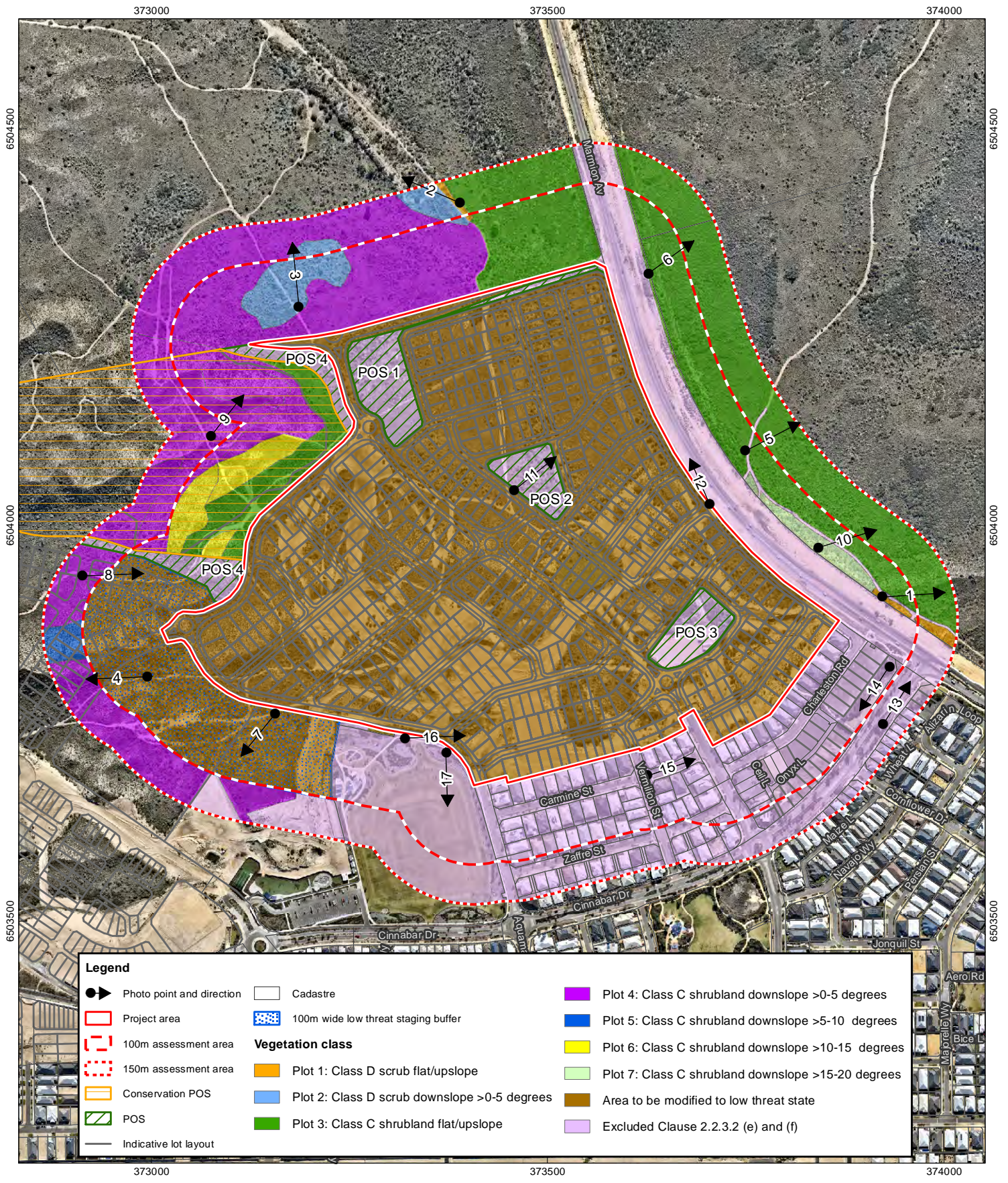
A summary of the assessed classified vegetation, effective slope and exclusions are provided in Table 2.

As previously discussed, all POS will be excluded from classification under a combination of Clauses 2.2.3.2 (b), (e) and (f) of AS 3959. Detailed landscape planning and design will need to be consistent with the provisions of this BMP with regards to any exclusions/managed land proposed.

Classified vegetation currently situated within 100 m of the project area to the southwest is under control of the proponent and is temporary, subject to future clearing, earthworks and development as part of staged subdivision in accordance with LSP 82. This vegetation is to be modified as part of this subdivision application and associated subdivisional works to form a 100 m wide low threat staging buffer within the balance land along the southwest boundary. This will mitigate the impact of temporary vegetation and will ensure there is no unnecessary BAL impact on proposed development. The staging buffer will not impact any proposed vegetation retention/habitat creation within the large conservation POS area to the west of the project area.

Table 2: Summary of classified vegetation and exclusions

Vegetation plot	Applied vegetation classification/exclusion	Effective slope under the classified vegetation (degrees)
1	Class D scrub	0
2	Class D scrub	>0-5
3	Class C shrubland	0
4	Class C shrubland	>0-5
5	Class C shrubland	>5-10
6	Class C shrubland	>10-15
7	Class C shrubland	>15-20
N/A	Excluded under Clause 2.2.3.2 (e) and (f)	N/A



**Figure 3: Vegetation classification and effective slope**

Scale 1:6,400 at A4
   
  
 Coordinate System: GDA 1994 MGA Zone 50
   
 Date: 21/09/2018



## 3.2 Assessment outputs

Any proposed habitable buildings that cannot achieve a full 100 m wide low fuel separation distance from post development classified vegetation will require application of AS 3959 to determine appropriate siting of development and potential increased building construction standards in response to the assessed BAL. Strategen has undertaken a BAL contour assessment for the project area in accordance with Method 1 of AS 3959 and Appendix 3 of the Guidelines (Figure 4). The Method 1 procedure for calculating the BAL (as outlined in AS 3959) incorporates the following factors:

- state-adopted FDI 80 rating
- vegetation class
- effective slope
- distance maintained between proposed development areas and the classified vegetation.

The BAL rating gives an indication of the level of bushfire attack (i.e. the radiant heat flux) that may be received by proposed future development and subsequently informs the standard of building construction and/or setbacks required for proposed habitable development to potentially withstand such impacts. Strategen recognises that mandatory compliance of proposed buildings with the AS 3959 building construction standards is required for this development as proposed buildings will be a Class 1, 2, 3 or associated Class 10a building under the National Construction Code.

The assessed BAL contours are depicted in Figure 4. The width of each BAL contour in Figure 4 is set in accordance with AS 3959 and reflects the relevant BAL rating applicable to the respective Class D scrub or Class C shrubland vegetation types situated on the assessed slopes (refer to Table 3). Where BAL contours differ based on the different BAL application distances associated with the vegetation classifications, the highest (worst case) BAL has been applied.

The BAL contours are based on the vegetation class and effective slope assessed at the time of inspection and take into consideration the vegetation exclusions and separation distances achieved in line with the subdivision plan following development works, including the proposed 100 m wide low threat staging buffer to the southwest of the project area, as depicted in Figure 3. Should there be any changes in development design or classified vegetation extent that results in a modified BAL outcome, then the BAL contours will need to be reassessed for the affected areas and documented in a brief addendum to this BMP prepared to accompany a future planning/building application.

Table 3: Method 1 BAL calculation

Classified vegetation	Effective slope	BAL contour width	BAL contour	Comment
Plot 1 Class D scrub	All up-slopes and flat land (0 degrees)	<10 m	BAL-FZ	No development is proposed in this area
		10-<13	BAL-40	No development is proposed in this area
		13-<19	BAL-29	No development is proposed in this area
		19-<27	BAL-19	No development is proposed in this area
		27-<100	BAL-12.5	Development will occur in this area
Plot 2 Class D scrub	Down-slope (>0-5 degrees)	<11 m	BAL-FZ	No development is proposed in this area
		11-<15	BAL-40	No development is proposed in this area
		15-<22	BAL-29	No development is proposed in this area
		22-<31	BAL-19	No development is proposed in this area
		31-<100	BAL-12.5	No development is proposed in this area
Plot 3 Class C shrubland	All up-slopes and flat land (0 degrees)	<7 m	BAL-FZ	No development is proposed in this area
		7-<9	BAL-40	No development is proposed in this area
		9-<13	BAL-29	No development is proposed in this area
		13-<19	BAL-19	Development may occur in this area
		19-<100	BAL-12.5	Development will occur in this area
Plot 4 Class C shrubland	Down-slope (>0-5 degrees)	<7 m	BAL-FZ	No development is proposed in this area
		7-<10	BAL-40	No development is proposed in this area
		10-<15	BAL-29	No development is proposed in this area
		15-<22	BAL-19	No development is proposed in this area
		22-<100	BAL-12.5	Development will occur in this area
Plot 5 Class C shrubland	Down-slope (>5-10 degrees)	<8 m	BAL-FZ	No development is proposed in this area
		8-<11	BAL-40	No development is proposed in this area
		11-<17	BAL-29	No development is proposed in this area
		17-<25	BAL-19	No development is proposed in this area
		25-<100	BAL-12.5	No development is proposed in this area
Plot 6 Class C shrubland	Down-slope (>10-15 degrees)	<9 m	BAL-FZ	No development is proposed in this area
		9-<13	BAL-40	No development is proposed in this area
		13-<19	BAL-29	No development is proposed in this area
		19-<28	BAL-19	No development is proposed in this area
		28-<100	BAL-12.5	Development will occur in this area
Plot 7 Class C shrubland	Down-slope (>15-20 degrees)	<10 m	BAL-FZ	No development is proposed in this area
		10-<15	BAL-40	No development is proposed in this area
		15-<22	BAL-29	No development is proposed in this area
		22-<31	BAL-19	No development is proposed in this area
		31-<100	BAL-12.5	Development will occur in this area

## 4. Identification of bushfire hazard issues

### 4.1 Bushfire context

The project area comprises a combination of cleared and degraded land in the southern portion and intact remnant vegetation in the northern portion. Intact remnant vegetation is also contained on surrounding land to the west and north. The ability of this vegetation to support long fire runs of over 1 km significantly increases the potential bushfire risk to proposed development. However, this risk is temporary given the broad extent of urban development proposed in these areas. Land to the south comprises existing residential development in the form of roads, houses and low threat managed landscaping that do not pose a significant bushfire threat.

Bushfire behaviour may also occur to the east throughout intact vegetation beyond the 50 m wide Marmion Avenue road reserve. However, this bushfire scenario will have limited radiant heat impact on proposed development since Marmion Avenue provides significant defensible space. Vegetation to the east is also temporary given proposed urban development as part of Eglinton Hill.

It is considered that the bushfire risk to the proposed development posed by these hazards can be managed through standard application of acceptable solutions under the Guidelines (see Table 4), as well as through a direct bushfire suppression response if required. On this basis, Strategen considers the bushfire hazards adjacent to the project area and the associated bushfire risks are readily manageable.

### 4.2 Bushfire hazard issues

The greatest permanent bushfire threat to the proposed development is from remnant vegetation to be retained within conservation POS to the northwest. Separation from this shrubland vegetation is provided by interfacing road reserves and a managed POS buffer (i.e. POS 4), which form permanent and substantial buffers between proposed development and classified vegetation.

The intact vegetation within the project area is proposed to be cleared, including provision of a staging buffer to the southwest, which will eliminate bushfire threat in these areas.

If subdivisional works are to be staged internal to the project area, the following staging provisions may need to be implemented as required and in advance of lot creation within each development stage to negate any unnecessary bushfire risk from future development stages:

- internal 100 m wide low threat staging buffers
- provision of temporary compliant cul-de-sacs and turn-around points (if staged road construction is to be less than 200 m long), until such time that through access can be achieved onto adjacent development stages
- provision of temporary compliant Emergency Access Ways (EAWs) to achieve through access for each internal development stage if the access route is longer than 200 m and cannot be dealt with via a compliant cul-de-sac.

These provisions will not apply for internal stages that are subject to BAL-Low.

## 5. Assessment against the bushfire protection criteria

### 5.1 Compliance table

An acceptable solutions assessment against the bushfire protection criteria is provided in Table 4.

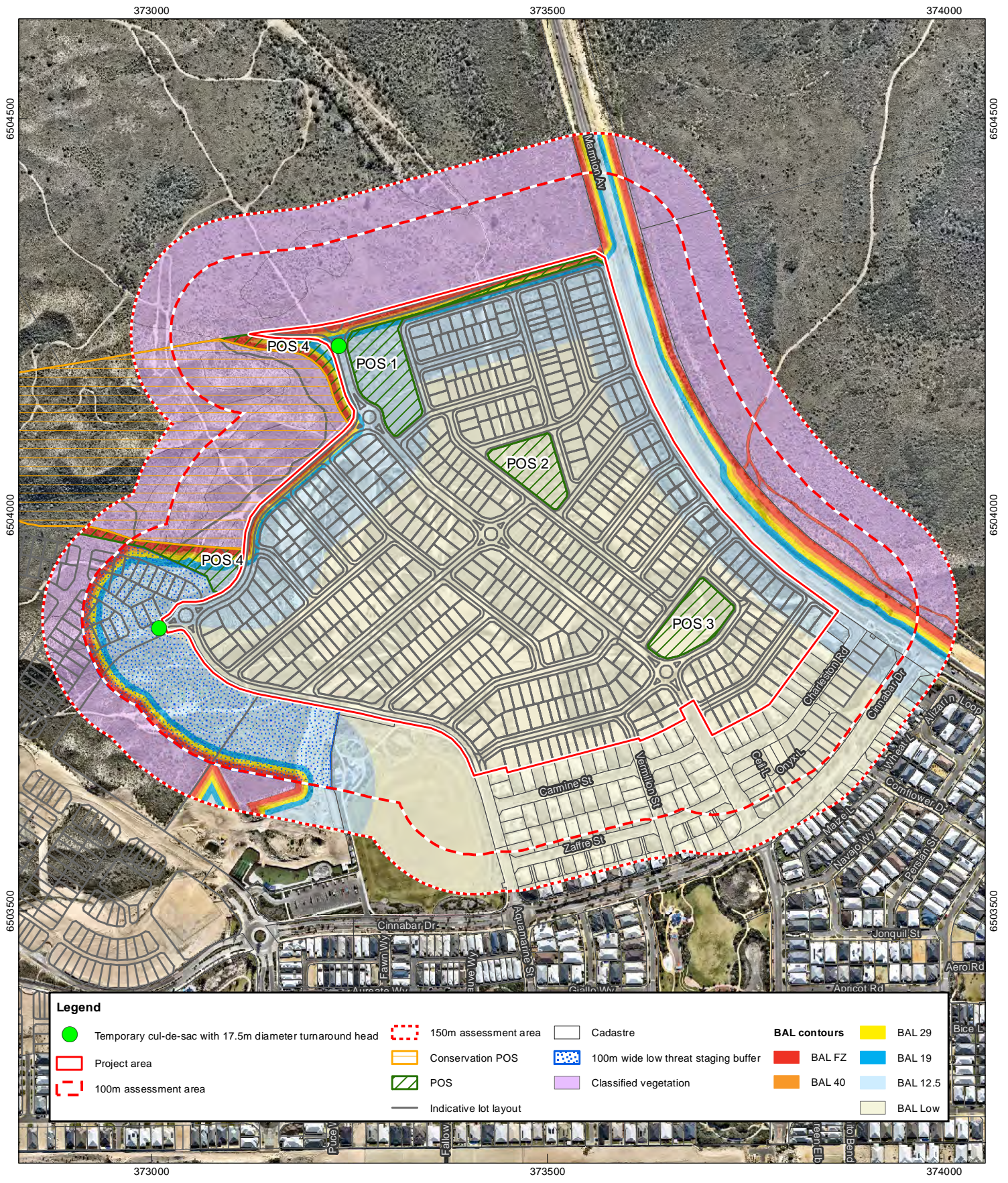
Table 4: Bushfire protection criteria

Bushfire protection criteria	Method of compliance	Proposed bushfire management strategies
	Acceptable solutions	
Element 1: Location	A1.1 Development location	The BAL contour assessment (see Figure 4 and Table 3) identifies all lots as having capacity to achieve BAL-29 or lower.
Element 2: Siting and design	A2.1 Asset Protection Zone	The BAL contour assessment identifies all development as having the capacity to achieve APZs within surrounding permanent low fuel roads and POS buffers to ensure BAL-29 or lower is achieved (see Figure 4). APZs are to be subject to ongoing management in accordance with standards outlined in the Guidelines (see Appendix 2).
Element 3: Vehicular access	A3.1 Two access routes.	The proposed internal vehicular access network will provide all occupants with the option of travelling to two different destinations via a connection to Marmion Avenue along Cinnabar Drive to the east and a connection to Shorehaven Boulevard along Leeward Avenue to the south. Temporary EAWs may be required to provide through access during internal staging of development.
	A3.2 Public road	All public roads will be constructed to the relevant technical requirements of the Guidelines (see Appendix 3)
	A3.3 Cul-de-sac (including a dead-end-road)	Two temporary cul-de-sacs are proposed within the project area, which will eventually be extended to link to future development stages to the north and west. Additional temporary cul-de-sacs may be required during internal staging of development. All cul-de-sacs will be less than 200 m in length, will include minimum 17.5 m diameter turn-around heads and will be constructed to relevant technical requirements under the Guidelines (see Appendix 3).
	A3.4 Battle-axe	N/A. No battle-axes are proposed.
	A3.5 Private driveway longer than 50 m	N/A. No private driveways longer than 50 m are proposed.
	A3.6 Emergency access way	Temporary EAWs may be required to provide through access during internal staging of development.
	A3.7 Fire service access routes (perimeter roads)	N/A. No fire access routes are proposed or required.
	A3.8 Firebreak width	Firebreaks will be implemented as required to comply with the City of Wanneroo Fire Hazard Reduction Notice (refer to Appendix 4).
	Element 4: Water	A4.1 Reticulated areas
A4.2 Non-reticulated areas		N/A. Proposed development will be reticulated.
A4.3 Individual lots within non-reticulated areas (Only for use if creating 1 additional lot and cannot be applied cumulatively)		N/A. Proposed development will be reticulated.

## 5.2 Additional management strategies

Strategen makes the following additional recommendations to inform ongoing planning stages of the development and increase the level of bushfire risk mitigation across the site:

1. **On-site staging buffers:** if development (and therefore clearing) is to occur on a staged basis, clearing in advance will need to occur to ensure building construction is not inhibited by a temporary vegetation extent located within adjacent development stages yet to be cleared. This can be achieved by ensuring that each approved stage subject to construction is surrounded by a 100 m wide, on-site cleared or low threat buffer prior to development (not including vegetation proposed to be retained). Once the buffers are created, they will need to be maintained on a regular and ongoing basis at a fuel load less than 2 t/ha to achieve a low threat minimal fuel condition all year round until such time that the buffer area is developed as part of the next development stage. This will assist in managing the current on-site temporary vegetation hazards.  
A proposed staging buffer has been identified adjacent west of the project area (see Figure 4). Additional staging buffers may be required to address internal staging of development.
2. **Fuel management within cleared vacant lots and POS:** cleared lots and POS will be managed on a regular and ongoing basis by the developer until sale of lots after which time landowners and the City will be responsible for ongoing management respectively. Management will involve slashing/mowing of grassland and weeds to height of less than 10 cm in accordance with the APZ standards in the Guidelines (see Appendix 2).
3. **Provision of temporary vehicular access provisions:** temporary cul-de-sacs and/or EAWs may be required in advance of lot creation within each relevant stage to achieve vehicular access compliance for each internal stage of development. Where staged road construction is less than 200 m long, temporary compliant cul-de-sacs could be adopted with suitable turn-around heads until such time that through access is provided onto adjacent development stages. If staged dead-ends are longer than 200 m, then temporary compliant EAWs will be required to provide connections through to constructed public roads, thereby achieving through access. These provisions will not apply for internal stages that are subject to BAL-Low.
4. **Road verge fuel management:** surrounding road verges that have been excluded as low threat will need to continue to be managed to ensure the understorey and surface fuels remain in a low threat, minimal fuel condition in accordance with Clause 2.2.3.2 (f) of AS 3959. Ongoing road verge management is the responsibility of the City.
5. **Notification on title:** notification is to be placed on the Title of proposed lots subject to BAL-12.5 or higher (either through condition of subdivision or other head of power) to ensure landowners/proponents and prospective purchasers are aware that their lot is subject to an approved BMP and BAL assessment, however, since the lot is situated within a designated bushfire prone area (at creation of title), the BAL for proposed buildings may, at the discretion of the City of Wanneroo, need to be confirmed at the development application or building permit stage.
6. **Building construction standards:** development will include Class 1, 2, 3 and associated Class 10a buildings. Therefore, there is a statutory requirement for proposed buildings to meet the construction requirements of AS 3959 in accordance with the assessed BAL.
7. **BAL compliance and/or individual lot BAL assessment at future stages:** a BAL compliance report and/or individual lot BAL assessment may be prepared at the discretion of the City/WAPC following completion of subdivisional works and prior to lot title to validate and confirm the accuracy of BAL assessments depicted in the BMP or demonstrate any change in the assessed BAL or other management measures documented in this BMP, which may occur as a result of changes in building location, vegetation class or bushfire management approach.
8. **Compliance with annual firebreak notice:** the developer/land manager and prospective land purchasers are to comply with the current City of Wanneroo annual firebreak notice (refer to Appendix 4).
9. **POS landscape plans:** the developer will be required to prepare detailed landscape plans for proposed POS areas 1–4 to demonstrate that these areas will be excluded from classification in accordance with the provisions of this BMP and to inform the BAL compliance process.



**Legend**

Temporary cul-de-sac with 17.5m diameter turnaround head	150m assessment area	Cadastre	<b>BAL contours</b>	BAL 29
Project area	Conservation POS	100m wide low threat staging buffer	BAL FZ	BAL 19
100m assessment area	POS	Classified vegetation	BAL 40	BAL 12.5
	Indicative lot layout			BAL Low

**Figure 4: BAL contour map and spatial representation of bushfire management measures**

Scale 1:6,400 at A4

Coordinate System: GDA 1994 MGA Zone 50

Date: 21/09/2018

Q:\Consult\2018\STO\STO18460\1\_GIS\_documents\ArcMap\_documents\STO18460\_G003\_RevD.mxd info@strategen.com.au | www.strategen.com.au

© 2017. Whilst every care has been taken to prepare this map, Strategen & Stockland makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.

Data source: Nearmap: Aerial image, flown 06/2018. Client: Stockland, Development layout, 08/2018, Conservation POS: 13/09/2018. Created by: jcrute

## 6. Responsibilities for implementation and management of the bushfire measures

This section is to set out the responsibilities of the developer/s, landowner/s and local government with regards to the initial implementation and ongoing maintenance of the required actions.

Table 5: Responsibilities for implementation of the bushfire measures by the developer

Developer – prior to issue of titles		
No.	Implementation action	Subdivision clearance
1	Construct public roads, temporary cul-de-sacs and temporary EAWs as required to achieve vehicular access compliance and to the standards stated in this BMP	<input type="checkbox"/>
2	Establish 100 m low threat staging buffers as required to the standards stated in this BMP	<input type="checkbox"/>
3	Establish and maintain all created lots in a low threat state to achieve exclusion Clause 2.2.3.2 (f) of AS 3959, including slashing/mowing of grassland and weeds to height of less than 10 cm	<input type="checkbox"/>
4	Establish and maintain road reserves, verges and POS to be excluded as low threat vegetation under the relevant exclusion clauses of AS 3959, including slashing/mowing of grassland and weeds to height of less than 10 cm and engineering of POS exclusions through detailed landscape design	<input type="checkbox"/>
5	Place notification on the Certificates of Title of all proposed lots with a BAL rating of 12.5 or above	<input type="checkbox"/>
6	BAL compliance to demonstrate reassessment of the management measures documented in this BMP (such as the APZ and/or BALs)	<input type="checkbox"/>
7	Provision of reticulated water supply	<input type="checkbox"/>
8	Provision of detailed POS landscape plans demonstrating exclusion from classification for POS areas 1–4	<input type="checkbox"/>

### Certification by Bushfire Consultant

I \_\_\_\_\_ certify that at the time of inspection, the BAL ratings contained within this BMP are correct; and implementation actions 1 – 3 have been undertaken in accordance with the BMP.

Clearance is recommended.

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Table 6: Responsibility for implementation and management of the bushfire measures

Developer – prior to sale or occupancy	
No.	Management action
1	Maintain staging buffers, POS areas, road verges and titled lots to meet the exclusion clauses outlined in this BMP
2	Maintain vehicular access routes and reticulated water supply to the required technical standards as per this BMP
Developer/Landowner/occupier – ongoing management	
No.	Management action
1	Maintain the 100 m wide low threat staging buffer to the dimensions and standard stated in the BMP
2	Comply with the City of Wanneroo annual firebreak notice issued under s33 of the Bush Fires Act 1954
3	Maintain vehicular access routes and reticulated water supply to the required technical standards
Local government – ongoing management	
No.	Management action
1	Maintain POS and road reserves to a low threat vegetation standard in accordance with the exclusion clauses outlined in this BMP



**Appendix 1**  
**Site photographs**





Photo ID: 1

<b>Plot number</b>		Plot 1
<b>Vegetation classification or exclusion clause</b>	<b>Existing</b>	Class D scrub
	<b>Post-development</b>	Class D scrub
<b>Description / justification for classification</b>		Shrubs greater than 2 m in height with a continuous fuel profile.



Photo ID: 2

<b>Plot number</b>		Plot 1
<b>Vegetation classification or exclusion clause</b>	<b>Existing</b>	Class D scrub
	<b>Post-development</b>	Class D scrub
<b>Description / justification for classification</b>		Shrubs greater than 2 m in height with a continuous fuel profile.

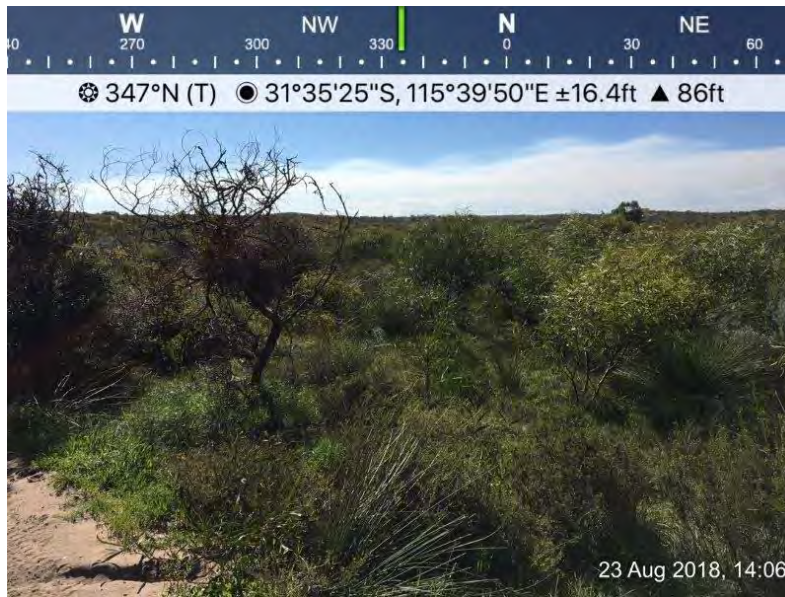


Photo ID: 3

<b>Plot number</b>		Plot 2
<b>Vegetation classification or exclusion clause</b>	<b>Existing</b>	Class D scrub
	<b>Post-development</b>	Class D scrub
<b>Description / justification for classification</b>		Shrubs greater than 2 m in height with a continuous fuel profile.



Photo ID: 4

<b>Plot number</b>		N/A
<b>Vegetation classification or exclusion clause</b>	<b>Existing</b>	Class C shrubland
	<b>Post-development</b>	Excluded under Clause 2.2.3.2 (e) and (f)
<b>Description / justification for classification</b>		To be modified to a low threat state through implementation of 100 m wide low threat staging buffer.



Photo ID: 5

<b>Plot number</b>		Plot 3
<b>Vegetation classification or exclusion clause</b>	<b>Existing</b>	Class C shrubland
	<b>Post-development</b>	Class C shrubland
<b>Description / justification for classification</b>		Shrubs less than 2 m in height along Marmion Avenue.



Photo ID: 6

<b>Plot number</b>		Plot 3
<b>Vegetation classification or exclusion clause</b>	<b>Existing</b>	Class C shrubland
	<b>Post-development</b>	Class C shrubland
<b>Description / justification for classification</b>		Shrubs less than 2 m in height along Marmion Avenue.



Photo ID: 7

<b>Plot number</b>		N/A
<b>Vegetation classification or exclusion clause</b>	<b>Existing</b>	Class C shrubland
	<b>Post-development</b>	Excluded under Clause 2.2.3.2 (e) and (f)
<b>Description / justification for classification</b>		To be modified to a low threat state through implementation of 100 m wide low threat staging buffer.



Photo ID: 8

<b>Plot number</b>		Plot 4
<b>Vegetation classification or exclusion clause</b>	<b>Existing</b>	Class C shrubland
	<b>Post-development</b>	Class C shrubland
<b>Description / justification for classification</b>		Shrubs less than 2 m in height throughout undulating dune terrain.



Photo ID: 9

<b>Plot number</b>		Plot 4
<b>Vegetation classification or exclusion clause</b>	<b>Existing</b>	Class C shrubland
	<b>Post-development</b>	Class C shrubland
<b>Description / justification for classification</b>		Shrubs less than 2 m in height within proposed conservation POS area to the west of site.



Photo ID: 10

<b>Plot number</b>		Plot 7
<b>Vegetation classification or exclusion clause</b>	<b>Existing</b>	Class C shrubland
	<b>Post-development</b>	Class C shrubland
<b>Description / justification for classification</b>		Shrubs less than 2 m in height abutting Marmion Avenue.



Photo ID: 11

<b>Plot number</b>		N/A
<b>Vegetation classification or exclusion clause</b>	<b>Existing</b>	Class C shrubland
	<b>Post-development</b>	Excluded under Clause 2.2.3.2 (e) and (f)
<b>Description / justification for classification</b>		Area to be modified to a low threat state as part of POS 2



Photo ID: 12

<b>Plot number</b>		N/A
<b>Vegetation classification or exclusion clause</b>		Exclusion under Clause 2.2.3.2 (e) and (f)
<b>Description / justification for classification</b>		Low threat managed road verge along Marmion Avenue.





Photo ID: 13

<b>Plot number</b>	N/A
<b>Vegetation classification or exclusion clause</b>	Excluded under Clause 2.2.3.2 (e) and (f)
<b>Description / justification for classification</b>	Low threat POS with manicured lawns and managed gardens.



Photo ID: 14

<b>Plot number</b>	N/A
<b>Vegetation classification or exclusion clause</b>	Excluded under Clause 2.2.3.2 (e) and (f)
<b>Description / justification for classification</b>	Low threat mulched area adjacent to existing low threat residential development.



Photo ID: 15

<b>Plot number</b>	N/A
<b>Vegetation classification or exclusion clause</b>	Excluded under Clause 2.2.3.2 (e) and (f)
<b>Description / justification for classification</b>	Existing low threat residential development with non-vegetated built form and low threat gardens.



Photo ID: 16

<b>Plot number</b>	N/A
<b>Vegetation classification or exclusion clause</b>	Excluded under Clause 2.2.3.2 (e) and (f)
<b>Description / justification for classification</b>	Low threat POS with manicured lawns and managed gardens.



Photo ID: 17

<b>Plot number</b>	N/A
<b>Vegetation classification or exclusion clause</b>	Exclusion under Clause 2.2.3.2 (e) and (f)
<b>Description / justification for classification</b>	Low threat POS with manicured lawns and managed gardens.



Photo ID: 18

<b>Plot number</b>	N/A
<b>Vegetation classification or exclusion clause</b>	Exclusion under Clause 2.2.3.2 (e) and (f)
<b>Description / justification for classification</b>	Low threat managed road verge along Marmion Avenue.



**Appendix 2**  
**Asset Protection Zone Standards**  
**(Schedule 1, the Guidelines)**

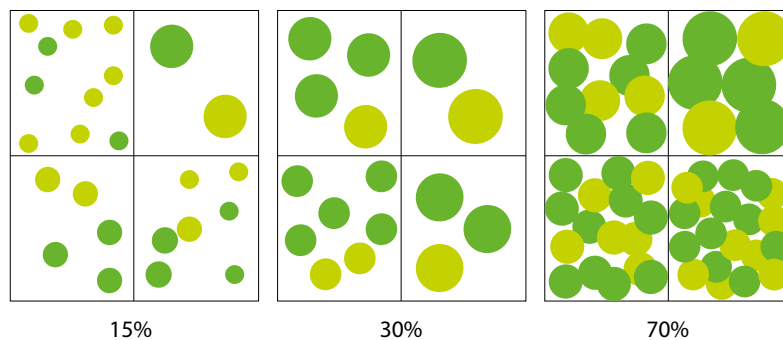


## ELEMENT 2: SITING AND DESIGN OF DEVELOPMENT

### SCHEDULE 1: STANDARDS FOR ASSET PROTECTION ZONES

- **Fences:** within the APZ are constructed from non-combustible materials (e.g. iron, brick, limestone, metal post and wire). It is recommended that solid or slatted non-combustible perimeter fences are used.
- **Objects:** within 10 metres of a building, combustible objects must not be located close to the vulnerable parts of the building i.e. windows and doors.
- **Fine Fuel load:** combustible dead vegetation matter less than 6 millimetres in thickness reduced to and maintained at an average of two tonnes per hectare.
- **Trees (> 5 metres in height):** trunks at maturity should be a minimum distance of 6 metres from all elevations of the building, branches at maturity should not touch or overhang the building, lower branches should be removed to a height of 2 metres above the ground and or surface vegetation, canopy cover should be less than 15% with tree canopies at maturity well spread to at least 5 metres apart as to not form a continuous canopy.

Figure 16: Tree canopy cover – ranging from 15 to 70 per cent at maturity



- **Shrubs (0.5 metres to 5 metres in height):** should not be located under trees or within 3 metres of buildings, should not be planted in clumps greater than 5m<sup>2</sup> in area, clumps of shrubs should be separated from each other and any exposed window or door by at least 10 metres. Shrubs greater than 5 metres in height are to be treated as trees.
- **Ground covers (<0.5 metres in height):** can be planted under trees but must be properly maintained to remove dead plant material and any parts within 2 metres of a structure, but 3 metres from windows or doors if greater than 100 millimetres in height. Ground covers greater than 0.5 metres in height are to be treated as shrubs.
- **Grass:** should be managed to maintain a height of 100 millimetres or less.





**Appendix 3**  
**Guidelines vehicular access technical**  
**requirements**



**Table 6:** Vehicular access technical requirements

<b>TECHNICAL REQUIREMENTS</b>	<b>1 Public road</b>	<b>2 Cul-de-sac</b>	<b>3 Private driveway</b>	<b>4 Emergency access way</b>	<b>5 Fire service access routes</b>
Minimum trafficable surface (m)	6*	6	4	6*	6*
Horizontal clearance (m)	6	6	6	6	6
Vertical clearance (m)	4.5	N/A	4.5	4.5	4.5
Maximum grade <50 metres	1 in 10	1 in 10	1 in 10	1 in 10	1 in 10
Minimum weight capacity (t)	15	15	15	15	15
Maximum crossfall	1 in 33	1 in 33	1 in 33	1 in 33	1 in 33
Curves minimum inner radius (m)	8.5	8.5	8.5	8.5	8.5

\*Refer to E3.2 Public roads: Trafficable surface

## EXPLANATORY NOTES

### E3.2 Public road

#### Trafficable surface

Widths quoted for access routes refer to the width of the trafficable surface. A six metre trafficable surface does not necessarily mean paving width. It could, for example, include four metre wide paving one metre wide constructed road shoulders.

In special circumstances, where eight lots or less are being serviced, a public road with a minimum trafficable surface of four metres for a maximum distance of 90 metres may be provided subject to the approval of both the local government and Department of Fire and Emergency Services.

#### Public road design

All roads should allow for two-way traffic to allow conventional two-wheel drive vehicles and fire appliances to travel safely on them.



**Figure 19:** Minimum design requirements for a public road



**Appendix 4**  
**City of Wanneroo Firebreak Notice**



Under the Bushfires Act (1954), all owners and occupiers of land in Western Australia must establish and maintain fire breaks.

Fire breaks and protection measures are vital in assisting the prevention of fires spreading and to allow safer access for bushfire fighters and vehicles.

**Land with an area of less than 4,000m<sup>2</sup>**

- A fire break, not less than three (3) metres wide must be cleared immediately inside (or as close as possible) around all external boundaries of the land.
- All tree branches that over-hang a fire break must be trimmed back to a minimum height of three and a half (3.5) metres above ground level and the growth on the fire break cannot exceed fifty (50) millimetres high.

**Land with an area of 4,000m<sup>2</sup> or more**

- A fire break, not less than three (3) metres wide, must be cleared immediately inside (or as close as possible) around all external boundaries of the land.
- All tree branches that over-hang a fire break must be trimmed back to a minimum height of three and a half (3.5) metres above ground level and the growth on the fire break cannot exceed fifty (50) millimetres high.

**Buildings**

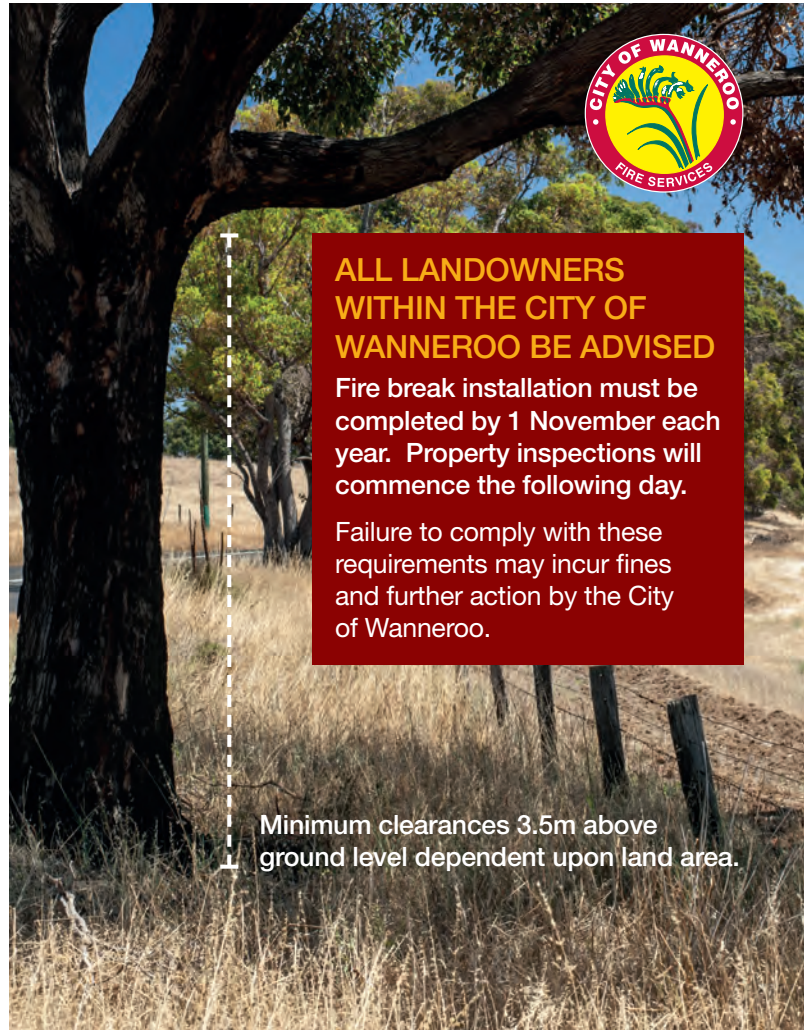
- Install and maintain a twenty (20) metre building protection zone surrounding all buildings, large hay stacks and fuel storage areas. A building protection zone includes undertaking measures such as pruning all lower tree branches to prevent fire entering the trees, ensuring three (3) metre spacing between tree canopies to prevent treetop fires spreading between trees, keeping all grasses to a height of not more than fifty (50) millimetres and storing all firewood piles more than twenty (20) metres away from the buildings.

**APPLICATION TO VARY THE ABOVE REQUIREMENTS**

If it is considered impracticable for any reason to implement any of the requirements of this Notice, application may be made not later than the 18th of October annually to the Council or its authorised officer for permission to provide alternative fire protection measures. If permission is not granted the requirements of this Notice must be complied with.

**ADDITIONAL WORKS**

In addition to the requirements of this Notice, you may be required to carry out further works which are considered necessary by an Authorised Officer and specified by way of a separate written notice forwarded to the address of the owner/s as shown on the City of Wanneroo rates record for the relevant land.



Minimum clearances 3.5m above ground level dependent upon land area.



Non-compliant: no fire break installed inside boundary fence



Compliant: grass slashed to ground level



Non-compliant: mineral earth fire break showing grass/weed regrowth



Compliant: mineral earth fire break



Non-compliant: thick scrub creates a fire hazard around power poles



Compliant: cleared buffer zone around power poles

