Attachment 2

BUSHFIRE MANAGEMENT PLAN

Bushfire management plan/Statement addressing the Bushfire Protection Criteria coversheet

Site address: Lot 9 (portion) Toreopango Avenue, Yanchep

Site visit: Yes ☑ No ☐

Date of site visit (if applicable): Day 10 Month January Year 2022

Report author or reviewer: Linden Wears

WA BPAD accreditation level (please circle):

Not accredited ☐ Level 1 BAL assessor ☐ Level 2 practitioner ☐ Level 3 practitioner ☑

If accredited please provide the following.

BPAD accreditation number: 19809 Accreditation expiry: Month June Year 2023

Bushfire management plan version number: Rev 0

Bushfire management plan date: Day 13 Month June Year 2022

Client/business name: Wolfdene Pty Ltd

	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 bushfire protection criteria elements)?		✔

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

	Yes	No
Unavoidable development (in BAL-40 or BAL-FZ)		✔
Strategic planning proposal (including rezoning applications)		✔
High risk land-use		✔
Vulnerable land-use		✔

None of the above ☐

Note: Only if one (or more) of the above answers in the tables is yes should the decision maker (e.g. local government or the WAPC) refer the proposal to DFES for comment.

Why has it been given one of the above listed classifications (E.g. Considered vulnerable land-use as the development is for accommodation of the elderly, etc.)?

The information provided within this bushfire management plan to the best of my knowledge is true and correct:

Signature of report author or reviewer 

Date 13 June 2022

Wolfdene Pty Ltd

Bushfire Management Plan (Subdivision Application)

Portion Lot 9 Toreopango Avenue
Yanchep

13 June 2022

61979/143431 (Rev 0)

JBS&G Australia Pty Ltd T/A Strategen-JBS&G

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1. Proposal details

1.1 Background

Wolfdene Pty Ltd is seeking to lodge a subdivision application to guide future residential and commercial mixed-use development within a portion of Lot 9 Toreopango Avenue (the project area), located in the City of Wanneroo. The subdivision plan (Figure 1) identifies:

- 563 residential lots
- 2 business zone lots
- 3 areas of Public Open Space (POS) and drainage.
- a sewer pump station
- an area for future Toreopango Road widening in the north
- the internal public road layout
- the location of the 24 m wide powerline easement along the eastern project area boundary

1.2 Site description

The project area comprises approximately 38.9 ha within a portion of Lot 9 and is surrounded by (see Figure 2):

- Toreopango Avenue road reserve (for future development), with undeveloped land further to the north
- undeveloped land within Lot 9011 Greenside Drive to the south, with Sun City golf course further to the south
- Mitchell Freeway reserve to the east (for future development), with undeveloped land further east (Crown Reserve 9869)
- a future private school site is located to the west/northwest of the project area, with the undeveloped portion of St Andrews Drive road reserve further west. Further to the west is the Yanchep train station, which is currently under construction as part of the Metronet project.

Public road access to the site is to be from extension of St Andrews Drive from the south, and Toreopango Avenue from the north-west, both of which are expected to be available from the initial stages of the development. Additional public road access will eventually be provided to the development from the future extension of the freeway to Yanchep, which will be connected to Toreopango Avenue, however the timing of this is currently unknown.

The project area is designated as bushfire prone on the *Map of Bush Fire Prone Areas* (DFES 2021; see Plate 1).

1.3 Purpose

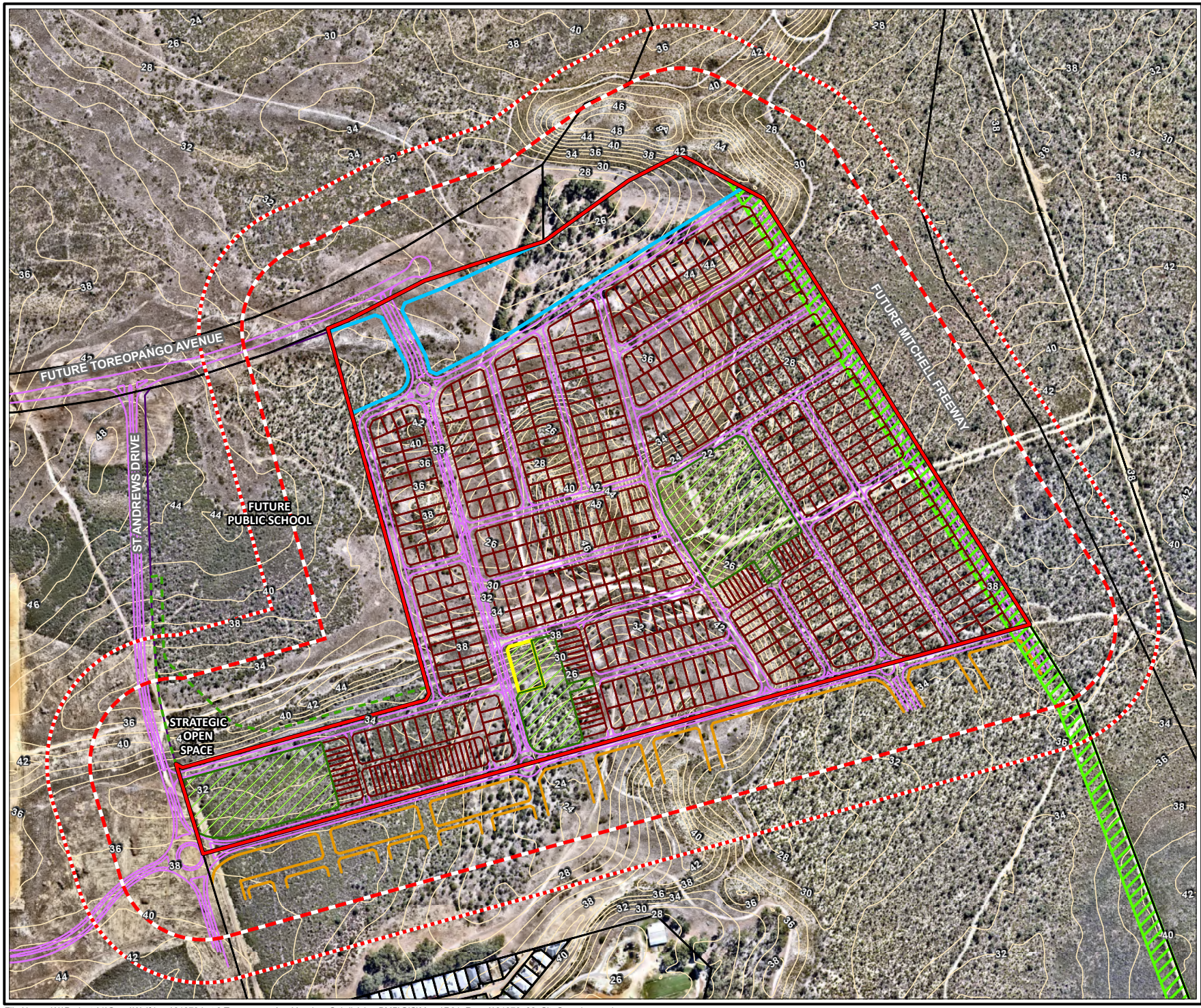
This Bushfire Management Plan (BMP) has been prepared to address requirements under Policy Measures 6.2 and 6.4 of *State Planning Policy 3.7 Planning in Bushfire-Prone Areas* (SPP 3.7; WAPC 2015) and *Guidelines for Planning in Bushfire-Prone Areas Version 1.4* (the Guidelines; WAPC 2021).

1.4 Other plans/reports

There are no known bushfire reports or assessments that have been prepared previously for the project area. An Environmental Assessment Report has been prepared by PGV Environmental, to accompany the development application.

Plate 1: Map of Bush Fire Prone Areas (DFES 2021)

Figure 1: Subdivision Plan



Legend

- Project area
- 100m assessment area
- 150m assessment area
- Cadastral boundary
- Business zone
- Sewer pump station
- POS
- Future public school
- Proposed lots
- Powerline easement
- Strategic open space
- Proposed road layout
- Future adjacent lots
- Topographic contours (mAHD)
- Minor road

strategen JBS&G

Job No: 61979

Client: Wolfdene Pty Ltd

Version: A	Date 11/05/2022
Drawn By: jcrute	Checked By: CT

Scale 1:6,000 at A4

0 100 200
metres

Coor. Sys. GDA 1994 MGA Zone 50

Lot 9, Toreopango Avenue Yanchep, WA

SITE OVERVIEW

FIGURE 2

File Name: W:\Projects\1)Open\Wolfdene\61979 Lot 9 Toreopango Ave Yanchep Subdivision BMP\GIS\Maps\R01_Rev_A\61979_02_SiteOverview.mxd
Image Reference: www.nearmap.com© - Imagery Date: 15. April 2022.

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. Further detail can be found in the project Environmental Assessment Report.

Table 1: Summary of environmental values

Environmental value	Mapped as occurring within or adjacent to the project area		Description
	Within	Adjacent	
Environmentally Sensitive Area	✓	✓	The project area and surrounds are identified as being an environmentally sensitive area.
Swan Bioplan Regionally Significant Natural Area	✘	✘	No part of the project area or adjacent land is identified as being a regionally significant natural area.
Ecological linkages	?	?	This layer is not currently publicly available on mapping services.
Wetlands	✘	✘	No wetlands or RAMSAR site are located within, or adjacent to, the project area. The nearest wetland (Loch McNess) is approximately 1 km to the east of the project area.
Waterways	✘	✘	No waterway are located within, or adjacent to, the project area. The nearest waterway (Loch McNess) is approximately 1 km to the east of the project area.
Threatened Ecological Communities listed under the EPBC Act	✓	✓	This layer is currently publicly available at a coarse level, and identifies the project area and adjacent land as having Threatened Ecological communities. No Tuart woodlands are located within, or adjacent to, the project area, with the nearest being over 850 m to the east.
Threatened and priority flora	✘	✘	This layer is currently publicly available at a coarse level, but doesn't identify any threatened or priority flora occurring near the project area.
Fauna habitat listed under the EPBC Act	✓	✓	The project and assessment areas are mapped as being confirmed and unconfirmed breeding areas, and as requiring further investigation as feeding habitat.
Threatened and priority fauna	✓	✓	This layer is currently publicly available at a coarse level, but identifies the following occurring near the project area. • Threatened (Endangered) birds – outside project area • Priority P4 fauna – within project area
Bush Forever Site	✘	✓	Bush Forever site 288 is located to the east of the freeway reserve (intruding into the assessment area) and the north of the assessment area.
DBCA managed lands and waters (includes legislated lands and waters and lands of interest)	✘	✓	No Lands of Interest are identified within the project or assessment areas. Legislated Land and Water (Yanchep NP; Crown Reserve R 9868) are identified to east (intruding into the assessment area) and to the north.
Conservation covenants	✘	✘	Strategen-JBS&G are not aware of any conservation covenant across the project area.

Environmental value	Mapped as occurring within or adjacent to the project area		Description
	Within	Adjacent	
Aboriginal Heritage	✘	✘	Aboriginal Register site (ID 24673) is located 600 m east of the project area.
Crown Reserves	✘	✘	Crown Reserve R 9868 is the nearest crown reserve, and is identified as being just outside the eastern assessment area boundary, and also wraps around to the north of the assessment area.

Regional vegetation surveys and mapping of the Swan Coastal Plain indicates the project area and adjacent land is contained within the following vegetation complexes:

- Cottesloe Complex-North (eastern part of the project and assessment areas)
    - Predominantly low open forest and low woodland of Banksia attenuata (Slender Banksia) - Banksia menziesii (Firewood Banksia) - Eucalyptus todtiana (Pricklybark); closed heath on the Limestone outcrops.
- Quindalup Complex (western part of the project and assessment areas)
    - Coastal dune complex consisting mainly of two alliances - the strand and fore-dune alliance and the mobile and stable dune alliance. Local variations include the low closed forest of Melaleuca lanceolata (Rottnest Teatree) - Callitris preissii (Rottnest Island Pine), the closed scrub of Acacia rostellifera (Summer-scented Wattle) and the low closed Agonis flexuosa (Peppermint) forest of Geographe Bay.

Environmental impacts resulting from implementation of the proposal will need to be addressed under standard State and Federal environmental assessment and referral requirements under the Environmental Protection Act 1986 and Environment Protection and Biodiversity Conservation Act 1999.

Strategen-JBS&G assumes that all relevant environmental studies and all required environmental approvals will be obtained prior to commencing any on-site vegetation modification or clearing required to construct the development or implement the onsite Asset Protection Zones.

2.2 Revegetation / Landscape Plans

No revegetation is proposed as part of the proposal.

All nominated Asset Protection Zones (APZs) are to comply with the APZ standards from the Guidelines as detailed in Schedule 1 of the Guidelines (refer to Appendix B).

All other onsite landscaping, outside of nominated APZs, will consist of low threat and managed gardens and streetscaping in accordance with AS 3959 Clause 2.2.3.2 (f) and Schedule 1 of the Guidelines (refer to Appendix B), or vegetation otherwise excludable in accordance with AS 3959 Clause 2.2.3.2 provisions for isolating unmanaged vegetation.

3. Bushfire assessment results

3.1 Assessment inputs

3.1.1 Vegetation classification

Strategen-JBS&G assessed classified vegetation and exclusions within the project area and adjoining 150 m (the assessment area) through on-ground verification on 10 January 2022 in accordance with *AS 3959-2018 Construction of Buildings in Bushfire-Prone Areas* (AS 3959; SA 2018) and the *Visual Guide for Bushfire Risk Assessment in Western Australia* (DoP 2016). Georeferenced site photos and a description of the vegetation classifications and exclusions are contained in Appendix A.

Given the potential for future development adjacent to the project area (Freeway extension to the east, Toreopango Avenue extension to freeway, residential development to the south and the public school to the west) but with unknown timing and designs, two scenarios have been mapped to depict the BAL outcomes following implementation of this development, and anticipated BAL outcomes if adjacent development is also constructed:

- Post development (refer Figure 3) reflecting full implementation of the proposal without surrounding development (other that portion of Toreopango Avenue)
    - All land within the project area is cleared or modified to low threat vegetation as part of proposed development
    - Toreopango Avenue is extended east of the first public road connection created as part of the proposed development, as this road connection will be required to ensure two public access routes are provided to the development.
    - The timing of the freeway extension, the Toreopango Avenue extension to the freeway and the southern residential development is unknown
    - While the school will likely be constructed during this development, the extent of the public school development and managed landscaping within that lot is unknown, so it is conservatively assumed that it will remain as observed during the site inspection
    - The proposed Strategic Open Space located within the school lot, is also assumed to remain as observed during the site inspection (i.e. it will not be modified to non-vegetated or low threat vegetation).
    - Outside the project area and portions of the assessment areas addressed above, the post-development vegetation classifications and effective slope observed at the time of inspection
- Indicative surrounding development (refer Figure 4) reflecting adjacent developments being completed including:
    - All land within the project area is cleared or modified to low threat vegetation as part of proposed development
    - Assumes the freeway has been extended past the project area (at least to Toreopango Avenue) including associated civil works, landscaping and revegetation. Given the exact freeway design is unknown at this stage, it is assumed to contain Class D scrub with a downslope 0° - 5° effective slope along the freeway verges adjacent to the project area boundary noise wall. ***Note: while the Freeway is shown as entirely Class D scrub, upon completion, it is expected much of this will be non-vegetated roads.***

- Assumes that Toreopango Avenue is extended to the freeway, and the road reserve will be modified to non-vegetated elements or low threat vegetation consistent with AS 3959 Clause 2.2.3.2 (e) and (f).
- Assumes that the southern residential development is also modified to non-vegetated elements or low threat vegetation consistent with AS 3959 Clause 2.2.3.2.
- Given the level of vegetation modification associated with the school development is unknown, as schools can often have retained vegetation around their perimeters, it is assumed that the post-development vegetation classifications and effective slope in these areas are as observed at the time of inspection. It is noted that most of the internal part of the school would be modified to non-vegetated elements or low threat vegetation consistent with AS 3959 Clause 2.2.3.2 but this is not reflected on the mapping.
- Given the level of vegetation modification permitted in the Strategic Open Space is unknown, it is likely to be limited if any and as such, it is assumed that the post-development vegetation classifications and effective slope in these areas are as observed at the time of inspection.
- Outside the project area and portions of the assessment areas addressed above, the post-development vegetation classifications and effective slope observed at the time of inspection

3.1.2 Effective slope

Strategen-JBS&G assessed effective slope under classified vegetation within the assessment area through on-ground verification on 10 January 2022 in accordance with AS 3959. Results were cross-referenced with Landgate 5m contour data and are depicted in Figure 3.

Site observations indicate that land within the project and assessment areas are predominately undulating dunes, with various local high and low points creating flat/upslope and downslope effective slopes.

3.1.3 Summary of inputs

Figure 3 and Figure 4 depict the anticipated vegetation classifications and exclusions following completion of subdivision works and implementation of low threat landscaping throughout the project area and adjacent 150 m, for the two scenarios outlined in Section 3.1.1. The post-development vegetation classifications/exclusions and effective slope associated with Figure 3 are summarised in Table 2, with those in Figure 4 summarised in Table 3.

Table 2: Summary of vegetation classifications, exclusions and effective slope (post-development)

Vegetation plot	Vegetation classification	Effective slope	Comments
1	Class C Shrubland	Flat/upslope (0°)	Shrub vegetation <2 m height
2	Class C Shrubland	Downslope >0–5°	Shrub vegetation <2 m height
3	Class C Shrubland	Downslope >5–10°	Shrub vegetation <2 m height
4	Class C Shrubland	Downslope >10–15°	Shrub vegetation <2 m height associated with steep dune slopes in the north-east
5	Class C Shrubland	Downslope >15–20°	Shrub vegetation <2 m height associated with steep dune slopes in the north-east
6	Class D Scrub	Flat/upslope (0°)	Scrub vegetation between 2-6 m high
7	Class D Scrub	Downslope >0–5°	Scrub vegetation between 2-6 m high
8	Class D Scrub	Downslope >5–10°	Scrub vegetation between 2-6 m high associated with steep dune slopes in the north-east

Vegetation plot	Vegetation classification	Effective slope	Comments
9	Class D Scrub	Downslope >10–15°	Scrub vegetation between 2-6 m high associated with steep dune slopes in the north-east and south-west
10	Class A Forest	Flat/upslope (0°)	Small plot of forest vegetation along the northern project area boundary
11	Class A Forest	Downslope >0–5°	Small plot of forest vegetation along the northern project area boundary
12	Modified to non-vegetated and/or low threat (Clauses 2.2.3.2 [e] and/or [f])	N/A	Existing vegetation to be modified to non-vegetated elements (buildings, roads, paths) or low threat vegetation (gardens, managed POS, road verges etc)

Table 3: Summary of vegetation classifications, exclusions and effective slope (indicative surrounding development

Vegetation plot	Vegetation classification	Effective slope	Comments
1	Class C Shrubland	Flat/upslope (0°)	Shrub vegetation <2 m height
2	Class C Shrubland	Downslope >0–5°	Shrub vegetation <2 m height
4	Class C Shrubland	Downslope >10–15°	Shrub vegetation <2 m height associated with steep dune slopes in the north-east
6	Class D Scrub	Flat/upslope (0°)	Scrub vegetation between 2-6 m high
7	Class D Scrub	Downslope >0–5°	Scrub vegetation between 2-6 m high
9	Class D Scrub	Downslope >10–15°	Scrub vegetation between 2-6 m high associated with steep dune slopes in the south-west
12	Modified to non-vegetated and/or low threat (Clauses 2.2.3.2 [e] and/or [f])	N/A	Existing vegetation to be modified to non-vegetated elements (buildings, roads, paths) or low threat vegetation (gardens, managed POS, road verges etc)
20	Modified to non-vegetated and/or low threat (Clauses 2.2.3.2 [e] and/or [f])	N/A	Existing vegetation to be modified to non-vegetated elements (buildings, roads, paths) or low threat vegetation (gardens, managed POS, road verges etc), as part of future southern residential development
21	Modified to non-vegetated and/or low threat (Clauses 2.2.3.2 [e] and/or [f])	N/A	Existing vegetation to be modified to non-vegetated elements (roads, paths) or low threat vegetation (managed road verges) as part of extension of Toreopango Avenue to the freeway
22	Class D Scrub	Downslope >0–5°	Assumed vegetation classification along the project area boundary noise wall, following completion of civil works, landscaping and revegetation for Freeway extension north to Toreopango Avenue

Legend

- Project area
- 100m assessment area
- 150m assessment area
- Cadastral boundary
- Business zone
- Sewer pump station
- POS
- Future public school
- Proposed lots
- Powerline easement

Vegetation classification

- Class A Forest
- Class C Shrubland
- Class D Scrub
- Area to be modified to non-vegetated and low threat state
- Proposed road layout
- Future adjacent lots
- Strategic open space
- Topographic contours (mAHD)
- Photo point directions
- Minor road

strategen JBS&G

Job No: 61979

Client: Wolfdene Pty Ltd

Version: A	Date 11/05/2022
Drawn By: jcrute	Checked By: LW

Scale 1:6,000 at A4

0 100 200
metres

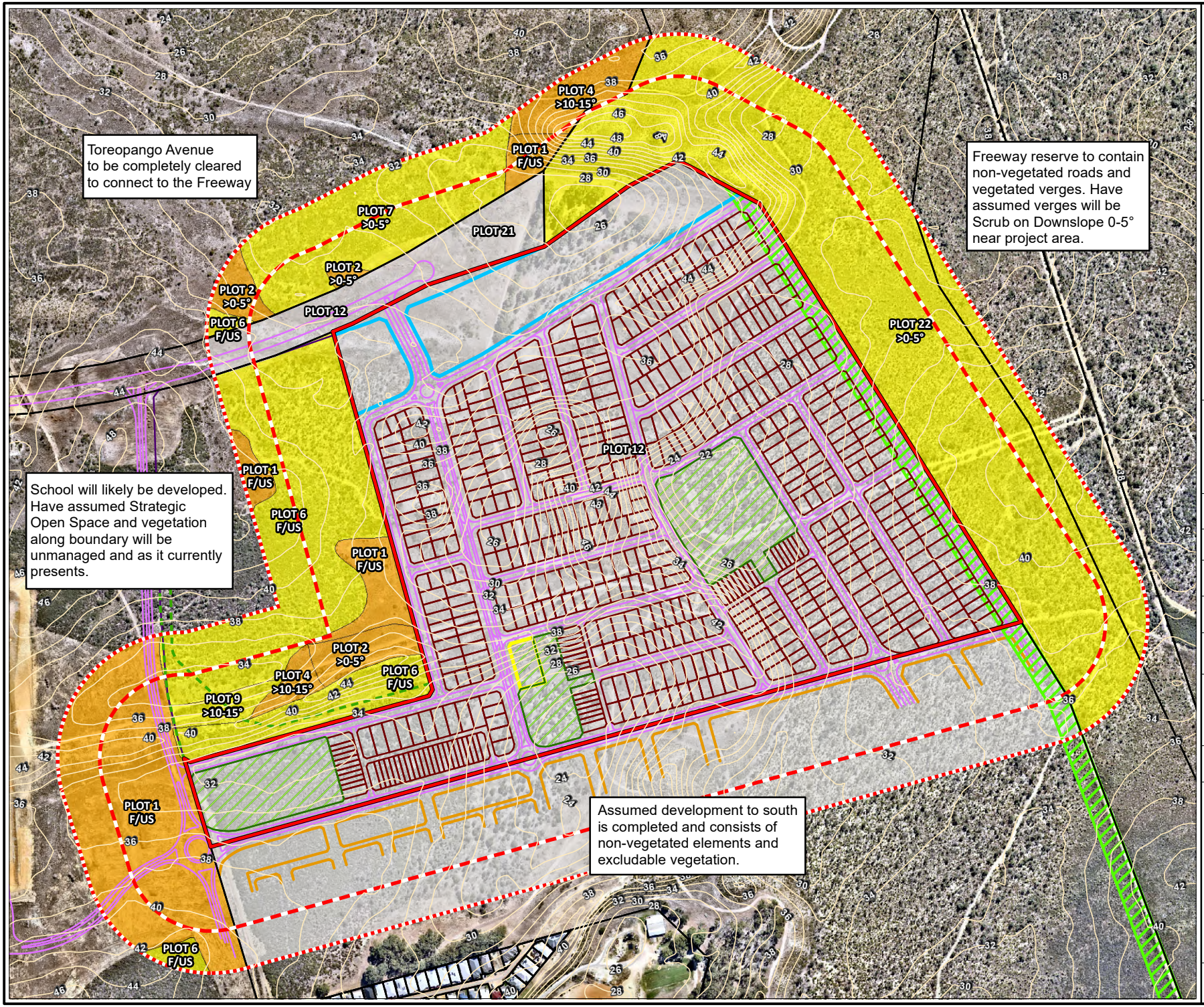
Coor. Sys. GDA 1994 MGA Zone 50

Lot 9, Toreopango Avenue Yanchep, WA

VEGETATION CLASSIFICATION AND EFFECTIVE SLOPE (POST-DEVELOPMENT)

FIGURE 3

File Name: W:\Projects\1)Open\Wolfdene\61979 Lot 9 Toreopango Ave Yanchep Subdivision BMP\GIS\Maps\R01_Rev_A\61979_03_VegClassPostDev.mxd
Image Reference: www.nearmap.com© - Imagery Date: 15. April 2022.



Legend

- Project area
- 100m assessment area
- 150m assessment area
- Cadastral boundary
- Business zone
- Sewer pump station
- POS
- Future public school
- Proposed lots
- Powerline easement

Vegetation classification

- Class C Shrubland
- Class D Scrub
- Area to be modified to non-vegetated and low threat state
- Strategic open space
- Proposed road layout
- Future adjacent lots
- Topographic contours (mAHD)
- Minor road

strategen JBS&G

Job No: 61979

Client: Wolfdene Pty Ltd

Version: A	Date 11/05/2022
Drawn By: jcrute	Checked By: LW

Scale 1:6,000 at A4

0 100 200
metres

Coor. Sys. GDA 1994 MGA Zone 50

Lot 9, Toreopango Avenue Yanchep, WA

VEGETATION CLASSIFICATION AND EFFECTIVE SLOPE (INDICATIVE SURROUNDING DEVELOPMENT)

FIGURE 4

File Name: W:\Projects\1)Open\Wolfdene\61979 Lot 9 Toreopango Ave Yanchep Subdivision BMP\GIS\Maps\R01_Rev_A\61979_04_VegClass_SurroundDev.mxd
Image Reference: www.nearmap.com© - Imagery Date: 15. April 2022.

3.2 Assessment outputs

3.2.1 Bushfire Attack Level (BAL) contour assessment

Strategen-JBS&G has undertaken a BAL contour assessment in accordance with Method 1 of AS 3959 for the project area for each of the two scenarios detailed in Section 3.1.1. The Method 1 procedure incorporates the following factors:

- state-adopted FDI 80 rating
- vegetation classification
- 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 future development and subsequently informs the standard of building construction and/or setbacks required for proposed habitable development to potentially withstand such impacts and/or deliver compliance with bushfire protection criteria of the Guidelines.

The BAL contours are based on:

- the post-development vegetation classifications and effective slope observed at the time of inspection
- consideration of the proposed on-site clearing extent and resultant vegetation exclusions, including proposed Asset Protection Zones (APZs) and onsite low threat vegetation
- separation distances between future habitable development and classified vegetation achieved in line with the Development Plan
- the other assumptions detailed in Section 3.1.1.

The results of the BAL contour assessment for the post-development scenario are detailed in Table 4 and illustrated in Figure 5, with that for the scenario including indicative surrounding development shown on Table 5 and Figure 6: BAL contour map (indicative surrounding development). The highest BAL applicable to the external boundary of the proposed lots is BAL–FZ within the 2 business zone lots, however following the implementation of internal APZs, there remains sufficient areas of BAL-29 or lower for future habitable development. The residential lots with BAL-40/FZ in the south of the project area (Lots 310, 335, 337, 362, 517-519 and 546-549) are to be temporarily quarantined until adjacent development permanently modifies or removes the bushfire hazard. Implementation of building setbacks at the building stage may result in BAL reductions for various lots.

Table 4: BAL contour assessment results (post-development)

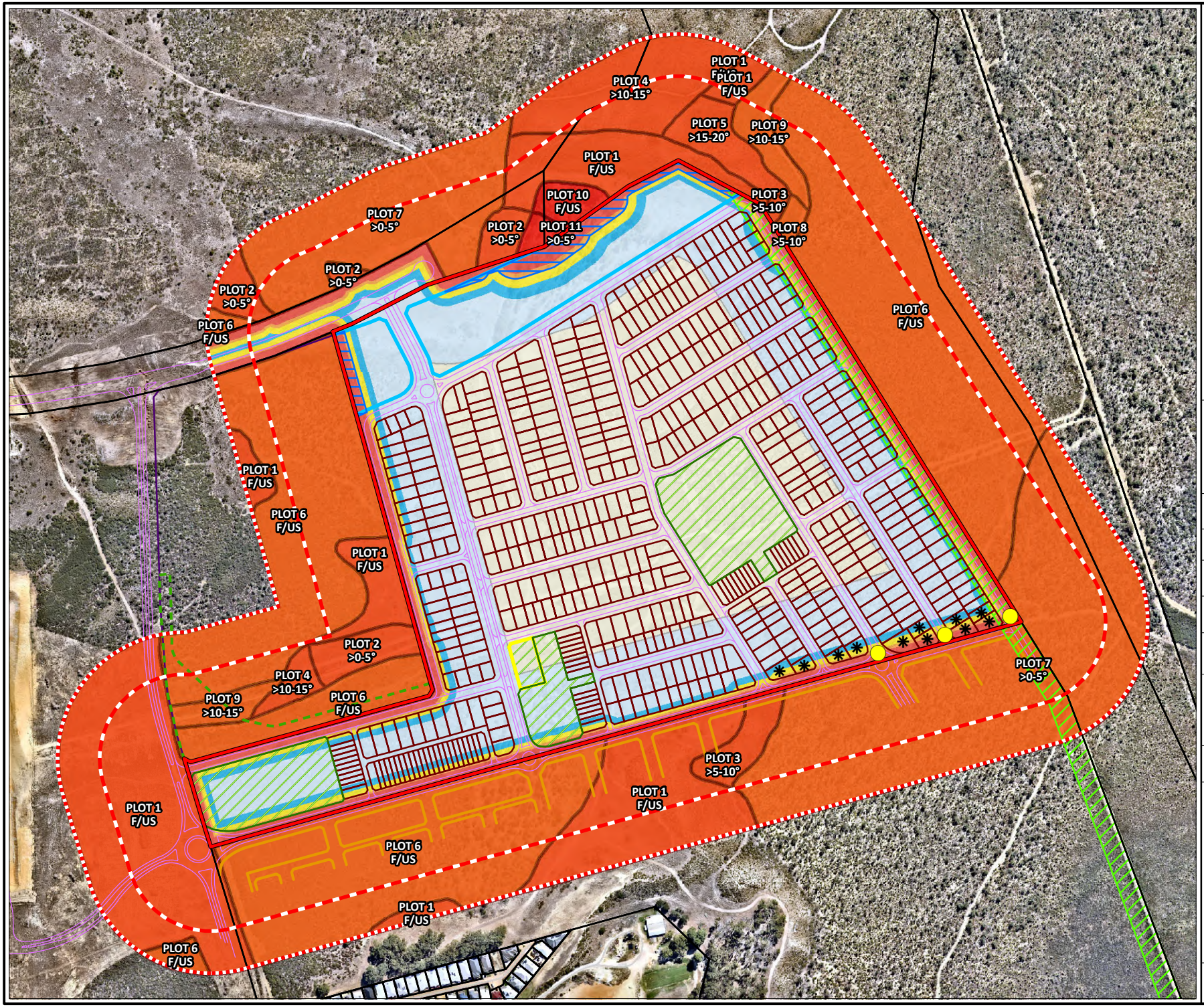
Method 1 BAL determination					
Plot	**Vegetation classification**	**Effective slope**	**Separation distance (to nearest lot boundary)**	**Highest BAL (to lot boundary)**	**Modified BAL (with building setbacks)**
1	Class C Shrubland	Flat/upslope (0°)	0 m	BAL–FZ	BAL–29
2	Class C Shrubland	Downslope >0–5°	4 m	BAL–FZ	BAL–29
3	Class C Shrubland	Downslope >5–10°	0 m	BAL–FZ	BAL–29
4	Class C Shrubland	Downslope >10–15°	35 m	BAL–12.5	BAL–12.5
5	Class C Shrubland	Downslope >15–20°	9 m	BAL–FZ	BAL–29
6	Class D Scrub	Flat/upslope (0°)	0 m	BAL–FZ	BAL–29
7	Class D Scrub	Downslope >0–5°	0 m	BAL–FZ	BAL–29
8	Class D Scrub	Downslope >5–10°	0 m	BAL–FZ	BAL–29
9	Class D Scrub	Downslope >10–15°	38 m	BAL–19	BAL–19

Method 1 BAL determination					
10	Class A Forest	Flat/upslope (0°)	0 m	BAL–FZ	BAL–29
11	Class A Forest	Downslope >0–5°	0 m	BAL–FZ	BAL–29
12	Modified to non-vegetated and/or low threat (Clauses 2.2.3.2 [e] and/or [f])	N/A	N/A	N/A	N/A

Table 5: BAL contour assessment results (indicative surrounding development)

Method 1 BAL determination					
Plot	**Vegetation classification**	**Effective slope**	**Separation distance (to nearest lot boundary)**	**Highest BAL (to lot boundary)**	**Modified BAL (with building setbacks)**
1	Class C Shrubland	Flat/upslope (0°)	16 m	BAL–19	BAL–19
2	Class C Shrubland	Downslope >0–5°	16 m	BAL–19	BAL–19
4	Class C Shrubland	Downslope >10–15°	45 m	BAL–12.5	BAL–12.5
6	Class D Scrub	Flat/upslope (0°)	0 m	BAL–FZ	BAL–29
7	Class D Scrub	Downslope >0–5°	44 m	BAL–12.5	BAL–12.5
9	Class D Scrub	Downslope >10–15°	45 m	BAL–12.5	BAL–12.5
12	Modified to non-vegetated and/or low threat (Clauses 2.2.3.2 [e] and/or [f])	N/A	N/A	N/A	N/A
20	Modified to non-vegetated and/or low threat (Clauses 2.2.3.2 [e] and/or [f])	N/A	N/A	N/A	N/A
21	Modified to non-vegetated and/or low threat (Clauses 2.2.3.2 [e] and/or [f])	N/A	N/A	N/A	N/A
22	Class D Scrub	Downslope >0–5°	0 m	BAL–FZ	BAL–29

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.



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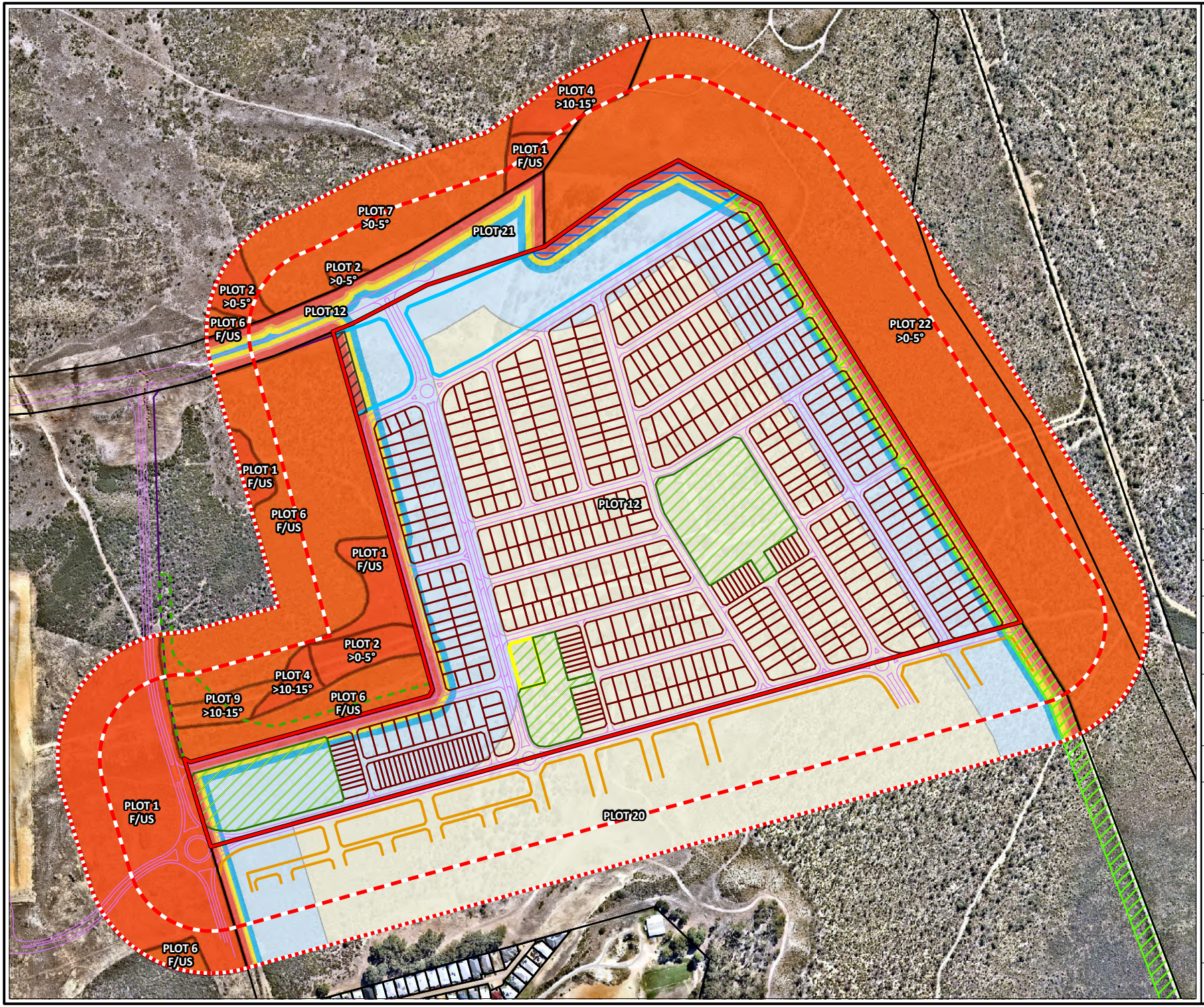

Legend

- Project area
- 100m assessment area
- 150m assessment area
- Cadastral boundary
- Business zone
- Sewer pump station
- POS
- Future public school
- Proposed lots
- Powerline easement
- APZ (based on current vegetation)
- APZ (based on future freeway)
- Classified vegetation

BAL contours

- BAL FZ
- BAL 40
- BAL 29
- BAL 19
- BAL 12.5
- BAL Low
- Strategic open space
- Proposed road layout
- Future adjacent lots
- Minor road

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Job No: 61979

Client: Wolfdene Pty Ltd

Version: A	Date 12/05/2022
Drawn By: jcrute	Checked By: LW

Scale 1:6,000 at A4

0 100 200
metres

Coor. Sys. GDA 1994 MGA Zone 50

Lot 9, Toreopango Avenue Yanchep, WA

BAL CONTOUR PLAN (INDICATIVE SURROUNDING DEVELOPMENT)

FIGURE 6

File Name: W:\Projects\1)Open\Wolfdene\61979 Lot 9 Toreopango Ave Yanchep Subdivision BMP\GIS\Maps\R01_Rev_A\61979_06_BALs_SurroundDev.mxd
Image Reference: www.nearmap.com© - Imagery Date: 15. April 2022.

4. Identification of bushfire hazard issues

4.1 Bushfire context

The project area is predominantly surrounded by currently undeveloped and uncleared land, with existing Sun City golf course and residential development located 200 m to the south, and the construction of Yanchep railway and train station 400 m to the west.

Until land to the south and west is fully developed, there is still a bushfire threat from these directions, however the greatest threat to the proposed development is from Yanchep National Park to the north and east, with undisturbed native vegetation further to the north and east of the park. Fire runs from the north, east and south-east could be ten's of kilometres long through primarily scrub, woodland and forest vegetation, which would result in elevated bushfire behaviour impacting the development. Future construction of the freeway and Toreopango Avenue along the northern and eastern interfaces (noting that Toreopango Avenue will be extended along the north-western project area interface) will provide significant separation from the majority of this bushfire impact, however the timing of this road construction is currently unknown.

Bushfires approaching from the west could still have fire run of over 1 km, however the new railway does fragment this run, with the undisturbed fire run from the railway being 200-500 m wide. Fire runs from the south are between 200-700 m long, limited by existing residential and recreational development. While fire runs in both directions are significantly lesser than the north, east and south-east, there is currently continuous vegetation (primarily shrubland and scrub) along these runs which would be sufficient to result in elevated bushfire behaviour.

4.2 Bushfire hazard issues

The following bushfire hazard issues have been identified for the proposed development:

1. The project area is located within a bushfire prone area and subject to a BAL above BAL-Low due to the surrounding bushfire prone vegetation hazards and therefore requires an assessment against the bushfire protection criteria of the Guidelines in accordance with Policy Measure 6.4 of SPP 3.7.
2. The BAL Contour assessment identifies that future habitable development within most proposed lots has capacity to achieve BAL-29 or lower, with the majority of lots being able to achieve BAL-12.5 or BAL-Low. However, a number of lots along the southern and northern interfaces will are subject to BAL-40/FZ impacts from existing vegetation, which will either be removed or altered as part of future development, or remain as currently presents. A combination of temporary quarantining and/or reduction of the developable areas (as determined by the internal APZ setbacks within lots) will be applied to ensure that no habitable development occurs within these areas. Additionally, vegetation modification and management in adjacent lots may also be considered, provided a suitable enforceable mechanism can be arranged with the adjacent landowner or land manager.
3. On completion of development within the project area, there will be a reduced bushfire risk to future assets as a result of vegetation clearing that will be undertaken to facilitate development. Vegetation clearing throughout development staging will play an important role in managing the bushfire risk posed by on-site temporary vegetation during roll out of individual development stages.
4. Future habitable development within a designated bushfire prone area requires a bushfire construction response in accordance with the National Construction Code (using AS 3959 or the NASH standards) if located within an area of BAL-12.5 or higher. BAL ratings and bushfire construction response will be determined at BMP compliance stage prior to clearance of subdivision.

5. The project area will be accessed by two public road access routes, from the north-west and the south-west, which achieves compliance with Acceptable Solutions of the Guidelines and allows resident and public egress while facilitating emergency services access to the site. If development is staged, vehicular access arrangements will also need to ensure that that all occupiers and visitors are provided with a compliant access network (from Stage 1 onwards).
6. The project area is currently located in a non-reticulated area, however reticulated water supply is to be extended to the site, any will provide the bushfire fighting water supply.

Strategen-JBS&G considers the bushfire hazards within and adjacent to project area and the associated bushfire risks are manageable through standard management responses outlined in the Guidelines and AS 3959. These responses have been factored in to proposed development as early as possible at all stages of the planning process to ensure a suitable, compliant and effective bushfire management outcome is achieved for protection of future life, property and environmental assets.

Bushfire mitigation measures designed to address the abovementioned bushfire hazard issues and achieve compliance with the bushfire protection criteria of the Guidelines are described in Section 5 of this BMP.

5. Assessment against the bushfire protection criteria

5.1.1 Compliance with Elements 1 – 4

Compliance with Elements 1 – 4 of the bushfire protection criteria of the Guidelines (Version 1.4) is demonstrated by meeting the acceptable solutions, as detailed in Table 6.

Table 6: Compliance with the bushfire protection criteria of the Guidelines (Elements 1 – 4)

Bushfire protection criteria			**Development response**	
Performance Principle	**Acceptable solutions**	**Planning Stage**	**Method of compliance**	**Proposed bushfire management measures**
Element 1: Location *Intent: To ensure that strategic planning proposals, subdivision and development applications are located in areas with the least possible risk of bushfire to facilitate the protection of people, property and infrastructure*				
Performance Principle P1 The strategic planning proposal, subdivision and development application is located in an area where the bushfire hazard assessment is or will, on completion, be moderate or low, or a BAL–29 or below, and the risk can be managed. For unavoidable development in areas where BAL–40 or BAL–FZ applies, demonstrating that the risk can be managed to the satisfaction of the decision-maker.	A1.1 Development location The strategic planning proposal, subdivision and development application is located in an area that is or will, on completion, be subject to either a moderate or low bushfire hazard level, or BAL–29 or below.	**All**	**Acceptable Solution**	The BAL contour assessment for the scenario without extension of the freeway (and Toreopango Avenue to the freeway) or construction of development south (see Figure 5 and Table 4) indicates that: • all proposed residential lots can achieve BAL-29 or lower, other than 11 lots (Lots 310, 335, 337, 362, 517-519 and 546-549) along the southern boundary. These 11 lots are to be temporarily quarantined until future development to the south of the project area permanently modifies or removes the bushfire hazard to enable these lots to be created in BAL-29 or lower (see Figure 6), or a suitable management agreement is negotiated with the Lot 9011 landowner. • the 2 business zone lots along the northern interface will have some BAL-40/FZ incursion into the lots. ○ The BAL-40/FZ impact on the north-western business zone lot is from the school site, and given it is unknown whether the school will clear the vegetation adjacent to this lot or not, an APZ will be implemented over the BAL-40/FZ area to prevent any habitable development along this eastern interface. The APZ will be able to contain internal driveways, carparking and managed gardens, with sufficient developable area within the remainder of the lot for habitable development. The APZ width is expected to be 13 m wide, however this can be reviewed as part of the development application for the business zone lot. ○ The north/north-eastern business zone lot has BAL-40/FZ incursion from classified vegetation within Toreopango Avenue and Freeway reserves, that will likely be developed as part of the freeway extension. This is BAL-40/FZ area within the lot, is expected to be significantly reduced following the freeway extension (see Figure 5 and Figure 6 for comparison). An APZ setback is proposed over the BAL-40/FZ contours within this lot (as per Figure 5) to prevent habitable development in areas BAL-40/FZ. The current APZ setback is variable from 9 m to 27 m wide (see Figure 5), however future landscaping and revegetation along Toreopango Avenue and the Freeway verges could produce a 15 m setback assuming Class D scrub on downslope 0°-5° (see Figure 6). Both scenarios ensure sufficient land remains in areas of BAL-29 or less within the business zone lot for habitable development, with the exact APZ widths being able to be reviewed as part of the development application for this lot. ○ Given the timing of future development of the school and Freeway extension adjacent to the business zones is unknown, and as such so is the final nature of bushfire hazard in these adjacent areas (i.e. vegetation classification, effective slope, entirely cleared), it is difficult to prescribe the exact APZ width required within the business zone lots to excluded BAL-40/FZ incursions at this stage. On that basis, it is proposed that the APZ implemented in the business zone lots is sized based on the post-development bushfire hazard as per current vegetation and effective slope (i.e. as per Figure 3 producing BAL's depicted on Figure 5), and that if the hazard in adjacent land changes prior to development (e.g. Figure 4 resulting in BALs as per Figure 6), the APZ is adjusted as part of BMPs accompanying future planning applications associated with development in the business zone lots. Based on the above, a combination of temporary quarantining and internal APZ setbacks will be employed to ensure all habitable development is located in areas of BAL-29 or lower. There also exists an option to seek management agreements with adjacent landowners or land managers (especially to the south and west), however this has not currently been pursued at this stage.
Element 2: Siting and design of development *Intent: To ensure that the siting and design of development minimises the level of bushfire impact.*				
Performance Principle P2 The siting and design of the strategic planning proposal, subdivision or development application, including roads, paths and	A2.1 Asset Protection Zone (APZ) Every habitable building is surrounded by, and every proposed lot can achieve, an APZ depicted on submitted plans, which meets the following requirements: **Width**: Measured from any external wall or supporting post or column of the proposed	**All**	**Acceptable Solution**	The BAL contour assessment identifies all development as having the capacity to achieve APZs within lot boundaries and surrounding permanent low fuel roads to achieve a BAL-29 or lower rating. The APZs are as depicted on Figure 5, with the APZ extent within the 2 business zone lots able to be amended as part of the future planning applications for those lots, informed by the understanding of proposed vegetation modification

Bushfire protection criteria			Development response	
Performance Principle	**Acceptable solutions**	**Planning Stage**	**Method of compliance**	**Proposed bushfire management measures**
landscaping, is appropriate to the level of bushfire threat that applies to the site. The proposal incorporates a defendable space and significantly reduces the heat intensities at the building surface thereby minimising the bushfire risk to people, property and infrastructure, including compliance with AS 3959 if appropriate.	building, and of sufficient size to ensure the potential radiant heat impact of a bushfire does not exceed 29kW/m² (BAL–29) in all circumstances. **Location:** 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 (see explanatory notes) **Management:** the APZ is managed in accordance with the requirements of 'Standards for Asset Protection Zones' (see Guidelines Schedule 1).			associated with the Freeway and Toreopango Avenue extensions and the school development at that time. All APZs to comply with the standards outlined in the Guidelines (see Appendix B), and are to be to subject to ongoing management to ensure this standard is maintained in perpetuity.
Element 3: Vehicular access *Intent: To ensure that the vehicular access serving a subdivision/ development is available and safe*				
Performance Principle P3i The design and capacity of vehicular access and egress is to provide for the community to evacuate to a suitable destination before a bushfire arrives at the site, allowing emergency services personnel to attend the site and/or hazard vegetation.	A3.1 Public Roads *The minimum requirements under this acceptable solution are applicable to all proposed and existing public roads.* Public roads are to meet the minimum technical requirements in Table 6, Column 1. The trafficable (carriageway/pavement) width is to be in accordance with the relevant class of road in the Local Government Guidelines for Subdivisional Development (IPWEA Subdivision Guidelines), Liveable Neighbourhoods, Austroad standards and/or any applicable standards for the local government area.	**SP, Sb, Do**	**Acceptable Solution**	All public roads will be constructed to relevant technical requirements under the Guidelines (see Appendix C)
	A3.2a Multiple access routes Public road access is to be provided in two different directions to at least two different suitable destinations with an all-weather surface (two-way access). If the public road access to the subject site is via a no-through road which cannot be avoided due to demonstrated site constraints, the road access is to be a maximum of 200 metres from the subject lot(s) boundary to an intersection where two-way access is provided. The no-through road may exceed 200 metres if it is demonstrated that an alternative access, including an emergency access way, cannot be provided due to site constraints and the following requirements are met: • the no-through road travels towards a suitable destination; and • the balance of the no-through road, that is greater than 200 metres from the subject site, is wholly within BAL-LOW, or is within a residential built-out area – Figure 23.	**SP, Sb, Do**	**Acceptable Solution**	A combination of the public roads being extended to the project area (St Andrews Drive and Toreopango Avenue) and the proposed internal vehicle access network, will provide all occupants with the option of travelling to more than two different destinations: • connection to St Andrews Drive providing the option of travelling south into existing residential development, where travel is possible east and west at the intersection with Yanchep Beach Road • connection to Toreopango Avenue which eventually connects to Two Rocks Road, which provides the option of travelling further north or south. The future extension of the freeway to Yanchep will also provide additional access and egress routes to the site. All internal roads will be through roads, however the timing of adjacent development to the south and the extension of Toreopango Avenue to the freeway, create temporary no-through roads that will be resolved with temporary turning heads until the future road connections are made.
	A3.2b Emergency access way *Where it is demonstrated that A3.2a cannot be achieved due to site constraints, or where an alternative design option does not exist, an emergency access way can be considered as an acceptable solution.* An emergency access way is to meet all the following requirements: • requirements in Table 6, Column 2; • provides a through connection to a public road; • be no more than 500 metres in length; and • must be signposted and if gated, gates must open the whole trafficable width and remain unlocked.	**SP, Sb, Do**	**Not Applicable** **(Compliant with Acceptable Solutions if required to address temporary staging)**	No permanent emergency access ways (EAW) are proposed. It is noted that if development and vehicular access construction is to be staged, any proposed temporary EAWs required to address temporary access non-compliances, must be constructed to the relevant technical requirements of the Guidelines (see Appendix C).
	A3.3 Through roads All public roads should be through-roads. No-through roads should be avoided and should only be considered as an acceptable solution where: • it is demonstrated that no alternative road layout exists due to site constraints; and • the no-through road is a maximum length of 200 metres to an intersection providing two-way access, unless it satisfies the exempt ion provisions in A3.2a of this table. A no-through road is to meet all the following requirements:	**SP, Sb**	**Not Applicable** **(Compliant with Acceptable Solutions if required to address temporary**	The project area could potentially be serviced by two proposed no-through roads, St Andrews Drive and Toreopango Avenue, however the proposal will essentially connect these two roads to create a through road network. No permanent no-through roads are proposed as part of the subdivision. Given the unknown timing of development to the south and the extension of Toreopango Avenue to the freeway, several temporary no-through roads could potentially be created (see Figure 5), and must be

Bushfire protection criteria			Development response	
Performance Principle	**Acceptable solutions**	**Planning Stage**	**Method of compliance**	**Proposed bushfire management measures**
	• requirements of a public road (Table 6, Column 1); and • turn-around area as shown in Figure 24		**staging)**	constructed to the relevant technical requirements of the Guidelines (see Appendix C). All of these no-through roads are expected to be removed once the future road network adjacent to the project area is constructed, creating a through road network. All proposed temporary no-through roads are less than 200 m length, with the roads in the south to be shortened to reflect the temporary quarantining of lots along the southern boundary. It is noted that if development and vehicular access construction is to be staged, any other proposed temporary no-through roads required to address temporary access non-compliances, must be constructed to the relevant technical requirements of the Guidelines (see Appendix C). t
Performance Principle P3ii The internal layout, design and construction of public and private vehicular access and egress in the subdivision / development allow emergency and other vehicles to move through it safely and easily. The design of vehicular access and egress provides: • access and egress for emergency service vehicles while allowing the community to evacuate; • a defendable space for emergency services personnel on the interface between classified vegetation and development site; and hazard separation between classified vegetation and the subject site to reduce the potential radiant heat that may impact a lot(s).	A3.4a Perimeter Roads Two different vehicular access routes are provided, both of which connect to the public road network, provide safe access and egress to two different destinations and are available to all residents/the public at all times and under all weather conditions. A perimeter road is a public road and should be provided for greenfield or infill development where 10 or more lots are being proposed (including as part of a staged subdivision) with the aim of: • separating areas of classified vegetation under AS3959, which adjoin the subject site, from the proposed lot(s); and • removing the need for battle-axe lots that back onto areas of classified vegetation. A perimeter road is to meet the requirements contained in Table 6, Column 1. A perimeter road may not be required where: • the adjoining classified vegetation is Class G Grassland; • lots are zoned for rural living or equivalent; • it is demonstrated that it cannot be provided due to site constraints; or • all lots have frontage to an existing public road	**SP, Sb**	**Acceptable Solution**	Upon completion, the proposed development will have perimeter public roads at all interfaces with classified vegetation, with the only exceptions being: • around the north/north-eastern business zone lot, along the interface with the freeway • along the north-western business zone lot, along the western interface with the school site • temporarily along the south-eastern interface, where the future road is located in the adjacent residential subdivision The perimeter interface will with the north/north-eastern business lot will eventually be provided by the Freeway, and Toreopango Avenue interchange, with defendable space provided within the lot to be provided by the APZ over the BAL-40/FZ areas within that lot. The north-western business zone lot will not be able to construct habitable buildings over the BAL-40/FZ areas within the lot, creating defendable space along this western interface. Given the layout and design of the school is unknown at this stage, it isn't yet known whether there will actually be classified vegetation retained along this interface, however once the school and business zone lots are developed, this interface is would at worst be a relatively small plot of unmanaged vegetation and not considered necessary for a perimeter road. The south-eastern interface will eventually connect to future roads to the south, with the temporarily quarantined lots providing separation from the bushfire hazard to the south in the interim.
Performance Principle P3iii Vehicular access is provided which allows: • access and egress for emergency service vehicles; • defendable space for emergency services personnel on the interface • between classified vegetation and development; and • hazard separation between classified vegetation and the site to reduce the potential radiant heat that may impact a lot(s).	A3.4b Fire service access route *Where proposed lots adjoin classified vegetation under AS3959, and a perimeter road is not required in accordance with A3.4a, a fire service access route can be considered as an acceptable solution to provide firefighter access, where access is not available, to the classified vegetation.* A fire service access route is to meet all the following requirements: • requirements in Table 6, Column 3; • be through-routes with no dead-ends; • linked to the internal road system at regular intervals, every 500 metres; • must be signposted; • no further than 500 metres from a public road; • if gated, gates must open the required horizontal clearance and can be locked by the local government and/or emergency services, if keys are provided for each gate; and • turn-around areas designed to accommodate type 3.4 fire appliances and to enable them to turn around safely every 500 metres.	**SP, Sb**	**Not Applicable**	The proposed subdivision design does not require fire service access routes (FSARs) to achieve access within and around the perimeter of the project area.
Performance Principle P3iv Vehicular access is provided which allows emergency service vehicles to directly access all habitable buildings and water supplies and exit the lot without entrapment	A3.5 Battle-axe access legs *Where it is demonstrated that a battle-axe cannot be avoided due to site constraints, it can be considered as an acceptable solution.* There are no battle-axe technical requirements where the point the battle-axe access leg joins the effective area of the lot, is less than 50 metres from a public road in a reticulated area. In circumstances where the above condition is not met, or the battle-axe is in a non-reticulated water area, the battle-axe is to meet all the following requirements:	**Sb**	**Not applicable**	No battle-axe legs are proposed as part of the development and the project area is not serviced by an existing battle-axe.

Bushfire protection criteria			Development response	
Performance Principle	**Acceptable solutions**	**Planning Stage**	**Method of compliance**	**Proposed bushfire management measures**
	• requirements in Table 6, Column 4; and • passing bays every 200 metres with a minimum length of 20 metres and a minimum additional trafficable width of two metres (i.e. the combined trafficable width of the passing bay and constructed private driveway to be a minimum six metres)			
	A3.6 Private driveways There are no private driveway technical requirements where the private driveway is: • within a lot serviced by reticulated water; • no greater than 70 metres in length between the most distant external part of the development site and the public road measured as a hose lay; and • accessed by a public road where the road speed limit is not greater than 70 km/h. In circumstances where all of the above conditions are not met, or the private driveway is in a non-reticulated water area, the private driveway is to meet all the following requirements: • requirements in Table 6, Column 4; • passing bays every 200 metres with a minimum length of 20 metres and a minimum additional trafficable width of two metres (i.e. the combined trafficable width of the passing bay and constructed private driveway to be a minimum six metres); and • turn-around area as shown in Figure 28 and within 30 metres of the habitable building.	**Dd, Do**	**Not Applicable**	The proposed residential lots will be serviced by a reticulated water supply, in an area where road speeds will be less than 70 km/hr and be of size where all future habitable development will be located within 70 m of a public road (for hose lay). On this basis, it is not expected the residential lots will need to comply with the private driveway requirements. The three (2) business zone lots are larger than the residential lots, and future habitable development on these commercial lots may be located further than 70 m of a public road (for hose lay). As such, the internal roads within these lots may need to comply with the private driveway standards (see Appendix C), however this will be resolved by the future development applications required for development on each of these lots.
Element 4: Water *Intent: To ensure that water is available to enable people, property and infrastructure to be defended from bushfire*				
No Performance Principle Applies	A4.1 Identification of future water supply	**SP**	**Not applicable**	Not applicable to this planning stage

Performance Principle P4
The subdivision, development or land use is provided with a permanent and secure water supply that is sufficient for firefighting purposes.
Provide a permanent water supply that is:
• sufficient and available for firefighting purposes;
• constructed from non-combustible materials (e.g. steel), or able to
• maintain its integrity throughout a bushfire; and
accessible, with legal access for maintenance and re-filling by tankers and emergency service vehicles
	A4.2 Provision of water for firefighting purposes
	Where a reticulated water supply is existing or proposed, hydrant connection(s) should be provided in accordance with the specifications of the relevant water supply authority. Where these specifications cannot be met, then the following applies:
	• The provision of a water tank(s), in accordance with the requirements of Schedule 2; and
	• Where the provision of a strategic water tank(s) is applicable, then the following requirements apply:
	  ○ land to be ceded free of cost to the local government for the placement of the tank(s);
	  ○ the lot or road reserve where the tank is to be located is identified on the plan of subdivision;
	  ○ tank capacity, construction, and fittings, provided in accordance with the requirements of Schedule 2; and
	  ○ a strategic water tank is to be located no more than 10 minutes from the subject site (at legal road speeds).
	Where a subdivision includes an existing habitable building(s) that is to be retained, a water supply should be provided to this existing habitable building(s), in accordance with the requirements listed above.
		Sb, Dd, Do	**Acceptable Solution**	The proposed development will be connected to reticulated water supply, via surrounding development, in accordance with Water Corporations Design Standard 63 requirements including the provision of street fire hydrants.

*** *Applicable Planning Stages* (SP** - Strategic planning and structure plan where lot layout is unknown; **Sb** - Structure plan where lot layout is known and subdivision application; **Dd** – Development application for a single dwelling, ancillary dwelling or minor development; **Do** – Development application for any other development)

5.1.2 Compliance with Element 5

Element 5 relates specifically to vulnerable tourism land uses and is therefore not applicable to the proposed subdivision.

5.2 Specific and additional management measures

Strategen-JBS&G advises the following specific and additional bushfire management measures to increase the level of bushfire risk mitigation across the site as part of the current subdivision application and to inform ongoing planning stages of the development.

5.2.1 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 suitably sized on-site cleared or low threat buffer 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 in accordance with AS 3959 Clause 2.2.3.2 (f) (including the management of grassland at 100 mm or lower) 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.

5.2.2 Onsite landscaping

The BAL contour assessment is reliant on all landscaping within the project area being established and maintained as low threat vegetation in accordance with AS 3959 Clause 2.2.3.2. Responsibility for establishment and maintenance of low threat landscaping is discussed in Section 6.

5.2.3 Staging of access

If development (and therefore construction of vehicular access) is to occur on a staged basis, vehicular access arrangements will need to ensure that all occupiers and visitors are provided with at least two access routes at all stages. This can be achieved via construction of access in advance of stages or through provision of temporary emergency access ways until two formal access roads are available.

5.2.4 Fuel management within cleared vacant lots

Cleared vacant lots are to be managed on a regular and ongoing basis by the developer until sale of lots after which time landowners will be responsible for ongoing management. Maintenance is to be in accordance with Clause 2.2.3.2 (f) of AS 3959 and Schedule 1 of the Guidelines (refer to Appendix B) and will involve slashing/mowing of grassland and weeds to height of less than 100 mm.

5.2.5 Road verge fuel management

Existing and proposed road verges that have been excluded as low threat are 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 developer until handover to the City, and then the City thereafter.

5.2.6 Temporary Quarantining of Residential Lots in areas of BAL-40/FZ

Proposed residential lots on the southern boundary with a BAL impact of BAL-40/FZ from existing vegetation within the Lot 9011 to the south, namely Lots 310, 335, 337, 362, 517-519 and 546-549, are to be temporarily quarantined until future development permanently modifies or removes the bushfire hazard to enable these lots to be created in BAL-29 or lower. Quarantining of the 11 lots from the subdivision approval is to be Western Australian Planning Commission, which will be subject to a condition of subdivision stating the following (or similar wording):

Proposed Lots 310, 335, 337, 362, 517-519 and 546-549 *are not to be titled until it can be adequately demonstrated, via a suitably qualified bushfire consultant, that the lots can be developed to a rating of BAL-29 or lower. (Western Australian Planning Commission).*

Whilst the temporary land quarantining and associated condition of subdivision precludes the titling of lots, it does not preclude the land from be subject to subdivisional works (e.g. clearing, earthworks, installation of services, noise attenuation, etc).

Alternatively, should a suitable management agreement be obtained with the Lot 9011 landowners to manage the vegetation in a low threat condition in perpetuity, or until future development permanently removes the bushfire hazard.

5.2.7 APZ setbacks on Business Zone lots with areas of BAL-40/FZ

Given the timing of future development of the school and Freeway extension adjacent to the business zones is unknown, and as such so is the final nature of bushfire hazard in these adjacent areas (i.e. vegetation classification, effective slope, entirely cleared), it is difficult to prescribe the exact APZ width required within the business zone lots to excluded BAL-40/FZ incursions at this stage.

Based on the above, the APZ implemented in the business zone lots is to be sufficiently sized to exclude all BAL-40/FZ incursion within the lots based on the post-development bushfire hazard as per current vegetation and effective slope (see Figure 5), and that if the hazard in adjacent land changes prior to development (potentially such as Figure 6), the APZ is adjusted as part of BMPs accompanying future planning applications associated with development in the business zone lots.

5.2.8 Notification on title

A notification, pursuant to Section 165 of the Planning and Development Act 2005, is to be placed on the certificates of title of the proposed lots subject to BAL-12.5 or higher to ensure landowners/proponents and prospective purchasers are aware that the lot is located within a bushfire prone area and is subject to an approved BMP. The notification is to state as follows:

This land is within a bushfire prone area as designated by an Order made by the Fire and Emergency Services Commissioner and is subject to a Bushfire Management Plan. Additional planning and building requirements may apply to development on this land (Western Australian Planning Commission).

5.2.9 BMP compliance and/or individual lot BAL assessment at future stages

A BMP compliance report is to be prepared prior to issue of title to validate and confirm that relevant management measures of this BMP have been implemented appropriately to achieve the intended bushfire management outcomes and compliance with bushfire protection criteria.

5.2.10 Building construction standards

Future Class 1, 2, 3 and associated 10a buildings in areas subject to BAL-12.5 or higher are required to comply with National Construction Code, in particular the bushfire specific building construction requirements of AS 3959 or the NASH standards.

Future development that is not Class 1, 2 and 3 residential buildings or associated Class 10a structures, has no statutory requirement for proposed buildings to meet the bushfire construction requirements detailed in the National Construction Code. Notwithstanding, it is recommended that where practical, non-residential habitable buildings also adopt bushfire construction measures relevant to the assessed BAL, or at least those of the BAL-12.5 standard to provide resilience against ember attack.

5.2.11 Vulnerable land uses

Vulnerable land uses are those where persons may be less able to respond in a bushfire emergency. The Guidelines specify that vulnerable land uses include:

- land uses designed to accommodate people who are less physically or mentally able and are likely to present evacuation challenges. Examples may include the elderly, children (under 18 years of age), and the sick or injured, in dedicated facilities such as aged or assisted care, nursing homes, education centres, education establishments, schools, childcare centres, hospitals and rehabilitation centres.
- facilities that, due to the building design or use, or the number of people accommodated, are likely to present evacuation challenges. Examples include corrective institutions (prisons), large community purpose centres or large places of worship.
- tourism or recreational land uses which involve visitors who are unfamiliar with the surroundings and/or where they present evacuation challenges.

No vulnerable land uses are specifically nominated as part of this subdivision application, however should any of the business zone developments include a use that is considered to constitute a vulnerable land use, they would be subject to the requirements of Policy Measure 6.6.1 of SPP 3.7 which requires vulnerable land uses located in areas of BAL-12.5 to BAL-29 to be accompanied by a Bushfire Emergency Evacuation Plan (BEEP) at development application stage.

5.2.12 High risk land uses

High-risk land uses are certain land uses that have potential to ignite a bushfire, prolong the duration of a bushfire or increase the intensity of a bushfire and included uses that also have potential to expose the community, fire fighters and the environment to dangerous, uncontrolled substances during a bushfire event.

High risk land uses may include, but are not limited to, service stations, bulk storage of hazardous materials, fuel depots and certain heavy industries as well as power generating land uses.

Proposed industrial development in the business zone lots has the potential to establish high risk land uses within the project area. Where high risk land uses cannot be avoided, Policy Measure 6.6.1 of SPP 3.7 requires high risk land uses located in areas of BAL-12.5 to BAL-29 to be accompanied by a Bushfire Risk Management Plan (BRMP) at development application stage.

5.2.13 Compliance with annual firebreak notice

The developer and prospective land purchasers are to comply with the current City of Wanneroo annual firebreak notice as amended (refer to Appendix D).

The City of Wanneroo Firebreak Notice specifies that lots <4000 m^2 must have grasses and inflammable material maintained to a height of <50 mm or have a 3 m trafficable firebreak within the lot boundaries. Lots that are >4000 m^2 must have a 3 m trafficable firebreak within the lot boundaries.

The City of Wanneroo Firebreak Notice also requires that any property with an approved BMP, must comply with the firebreak notice and any additional requirements detailed in the BMP.

5.2.14 Household bushfire survival plan

Due to the extent of bushfire prone hazards within the surrounding area, every household should have their own Bushfire Survival Plan.

DFES has published a Bushfire Preparation Toolkit that provides useful information on developing a Bushfire Survival Plan and can be accessed here:

https://www.dfes.wa.gov.au/safetyinformation/fire/bushfire/BushfireManualsandGuides/DFES-Fire-Chat-Bushfire-Preparedness-Toolkit.pdf

It is recommended that early evacuation of this site is adopted as the first priority, however, strategies and preparations to enable safe sheltering in place (as a last resort) should also be considered and documents within the Plan.

6. Responsibilities for implementation and management of the bushfire measures

Implementation of the BMP applies to the developer, prospective landowners and the City to ensure bushfire management measures are adopted and implemented on an ongoing basis. A bushfire responsibilities table is provided in Table 7 to drive implementation of all bushfire management works associated with this BMP.

Table 7: Responsibilities for implementation and management of the bushfire measures

Implementation/management table	
Developer – prior to issue of titles	
No.	***Implementation action***
1a	Establish the Asset Protection Zone (APZ) within the following parts of the project area to the dimensions and standard stated in the BMP: • Within the 2 business zones as depicted on Figure 5 (unless amended as part of a BMP supporting the relevant development application/s)
1b	Establish all parts of the project area (not nominated as APZs) in a low threat minimal fuel condition, including slashing/mowing of grassland and weeds to height of less than 100 mm, to enable exclusion under AS 3959 Clause 2.2.3.2.
1c	Ensure lots to be temporarily quarantined is done so in accordance with condition of subdivision
1d	If lot creation is staged, establish any required on-site staging buffers to limit temporary BAL impacts, to achieve exclusion Clause 2.2.3.2 (f) of AS 3959, including slashing/mowing of grassland and weeds to height of less than 100 mm.
1e	Construct the public roads to the standards stated in this BMP.
1f	If required on the business zone lots, construct any private driveways to the standards stated in this BMP.
1g	Construct any temporary no-through roads to the standards stated in this BMP.
1h	If required due to staging, ensure all stages are provided with compliant vehicular access arrangements, and if required, construct any temporary emergency access ways and associated signs and gates, to the standards stated in this BMP.
1i	Extend reticulated water supply, from surrounding development, throughout the project area, in accordance with Water Corporations Design Standard 63 requirements including provision of all required street hydrants.
1j	Undertake BMP compliance assessment prior to issue of title to validate and confirm that relevant management measures of this BMP
Developer – until ceded to the City (City thereafter)	
No.	***Implementation action***
3a	Maintain road reserves and verges, onsite POS in a low threat minimal fuel condition under Clause 2.2.3.2 (f) of AS 3959, including slashing/mowing of grassland and weeds to height of less than 100 mm. The management of these road reserves, POS is to be by the developer until ceded to the City (the City thereafter).
Developer – until sale/transfer of lots	
No.	***Implementation action***
4a	If lot creation is staged, maintain on-site staging buffers to achieve exclusion Clause 2.2.3.2 (f) of AS 3959, including slashing/mowing of grassland and weeds to height of less than 100 mm.

Implementation/management table	
4b	Establish maintain all 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 100 mm.
4c	Maintain road verges and POS in a low threat minimal fuel condition as per Clause 2.2.3.2 (f) of AS 3959.
4d	Comply with the relevant local government annual firebreak notice issued under s33 of the Bush Fires Act 1954, including establishment and maintenance of boundary firebreaks.
Landowner/occupier – at future planning stages	
No.	***Implementation action***
5a	For any proposed vulnerable land uses, prepare a Bushfire Emergency Evacuation Plan to accompany the Bushfire Management Plan at the development application stage.
5b	For any proposed high risk land uses, prepare a Bushfire Risk Management Plan to accompany the Bushfire Management Plan at the development application stage.
Landowner/occupier – prior to building construction and ongoing	
No.	***Implementation action***
6a	If required by the City or Building Certifier, obtain individual lot BAL assessment prior to issuing of building permit.
6b	Construct Class 1 ,2, 3 or associated buildings in accordance with National Construction Code (AS 3959 or NASH bushfire construction requirements) as applicable
6c	Prepare a Bushfire Survival Plan using the information recommended in this BMP, or the latest DFES publications. Review each year prior to bushfire season and amend as required.
6d	Maintain any APZs within lots to the standards stated in the BMP.
6e	Maintain cleared/vacant 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 100 mm, until developed to a permanent low fuel state.
6f	Any internal roads in the business zone lots required to comply with the private driveway standards, are to be maintained to the relevant technical requirements stated in this BMP.
Local government – ongoing management	
No.	***Implementation action***
7a	Following handover from the developer, maintain road verges and onsite POS in a low threat minimal fuel condition as per Clause 2.2.3.2 (f) of AS 3959.

7. References

Department of Fire and Emergency Services (DFES) 2021, *Map of Bush Fire Prone Areas*, [Online], Government of Western Australia, available from: https://maps.slip.wa.gov.au/landgate/bushfireprone/,

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

Standards Australia (SA) 2018, *Australian Standard AS 3959–2018 Construction of Buildings in Bushfire-prone Areas*, Standards Australia, Sydney.

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

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

8. Limitations

Scope of services

This report ("the report") has been prepared by Strategen-JBS&G in accordance with the scope of services set out in the contract, or as otherwise agreed, between the Client and Strategen-JBS&G. In some circumstances, a range of factors such as time, budget, access and/or site disturbance constraints may have limited the scope of services. This report is strictly limited to the matters stated in it and is not to be read as extending, by implication, to any other matter in connection with the matters addressed in it.

Reliance on data

In preparing the report, Strategen-JBS&G has relied upon data and other information provided by the Client and other individuals and organisations, most of which are referred to in the report ("the data"). Except as otherwise expressly stated in the report, Strategen-JBS&G has not verified the accuracy or completeness of the data. To the extent that the statements, opinions, facts, information, conclusions and/or recommendations in the report ("conclusions") are based in whole or part on the data, those conclusions are contingent upon the accuracy and completeness of the data. Strategen-JBS&G has also not attempted to determine whether any material matter has been omitted from the data. Strategen-JBS&G will not be liable in relation to incorrect conclusions should any data, information or condition be incorrect or have been concealed, withheld, misrepresented or otherwise not fully disclosed to Strategen-JBS&G. The making of any assumption does not imply that Strategen-JBS&G has made any enquiry to verify the correctness of that assumption.

The report is based on conditions encountered and information received at the time of preparation of this report or the time that site investigations were carried out. Strategen-JBS&G disclaims responsibility for any changes that may have occurred after this time. This report and any legal issues arising from it are governed by and construed in accordance with the law of Western Australia as at the date of this report.

Environmental conclusions

Within the limitations imposed by the scope of services, the preparation of this report has been undertaken and performed in a professional manner, in accordance with generally accepted environmental consulting practices. No other warranty, whether express or implied, is made.

The advice herein relates only to this project and all results conclusions and recommendations made should be reviewed by a competent person with experience in environmental investigations, before being used for any other purpose.

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Appendix A Vegetation plots – photographs and descriptions

Photo ID: 1a

Photo ID: 1b

Plot number		Plot 1
Vegetation classification	**Pre-development**	Class C Shrubland
	Post-development	Class C Shrubland
Description / justification		Shrub vegetation less than 2 m high at maturity

Photo ID: 1c

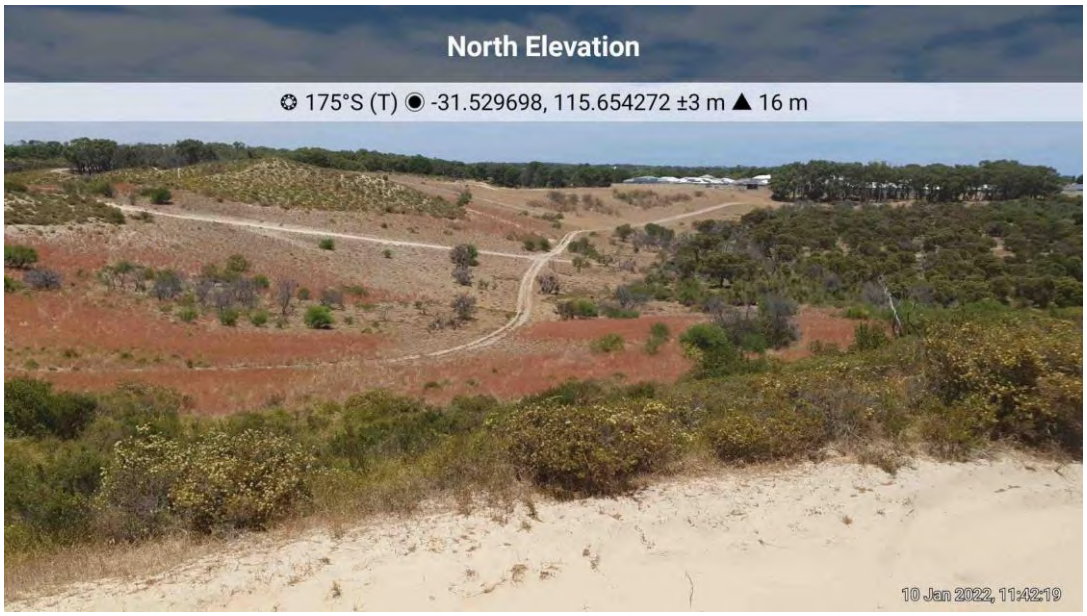


Photo ID: 1d

Plot number		Plot 1
Vegetation classification	**Pre-development**	Class C Shrubland
	Post-development	Class C Shrubland
Description / justification		Shrub vegetation less than 2 m high at maturity

Photo ID: 2a

Photo ID: 2b

Photo ID: 2c

Plot number		Plot 2
Vegetation classification	**Pre-development**	Class C Shrubland
	Post-development	Class C Shrubland
Description / justification		Shrub vegetation less than 2 m high at maturity

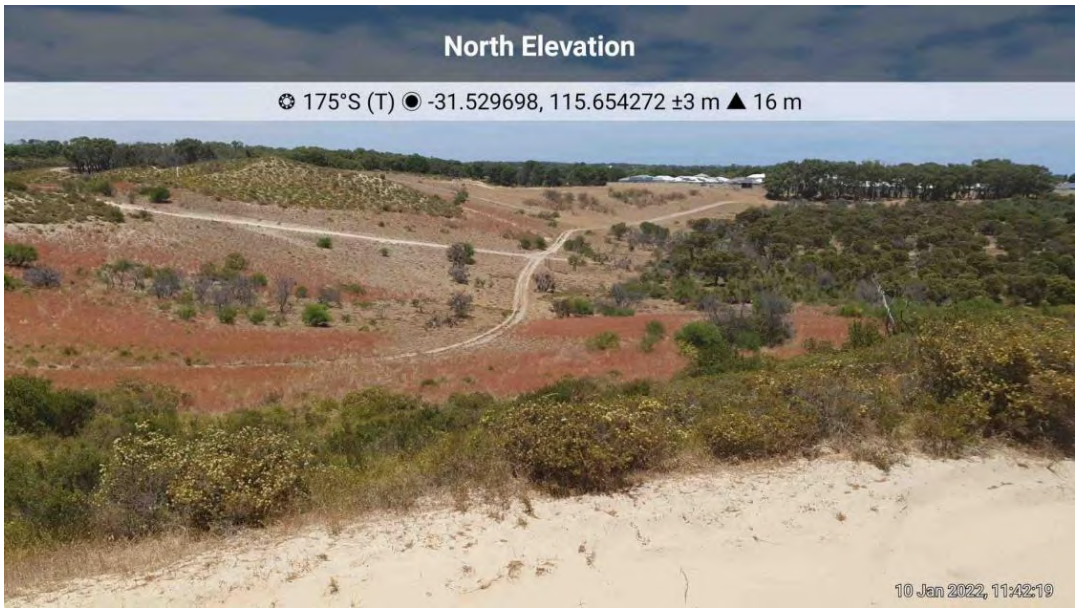


Photo ID: 3a

Plot number		Plot 3
Vegetation classification	**Pre-development**	Class C Shrubland
	Post-development	Class C Shrubland
Description / justification		Shrub vegetation less than 2 m high at maturity

Photo ID: 4a

Plot number		Plot 4
Vegetation classification	**Pre-development**	Class C Shrubland
	Post-development	Class C Shrubland
Description / justification		Shrub vegetation less than 2 m high at maturity

Photo ID: 5a

Plot number		Plot 5
Vegetation classification	**Pre-development**	Class C Shrubland
	Post-development	Class C Shrubland
Description / justification		Shrub vegetation less than 2 m high at maturity

Photo ID: 6a

Photo ID: 6b

Photo ID: 6c

Photo ID: 6d

Photo ID: 6e

Photo ID: 6f

Photo ID: 6g

Photo ID: 6h

Plot number		Plot 6
Vegetation classification	**Pre-development**	Class D Scrub
	Post-development	Class D Scrub
Description / justification		Vegetation with a continuous horizontal and vertical structure, greater than 2 m high at maturity

Photo ID: 6i

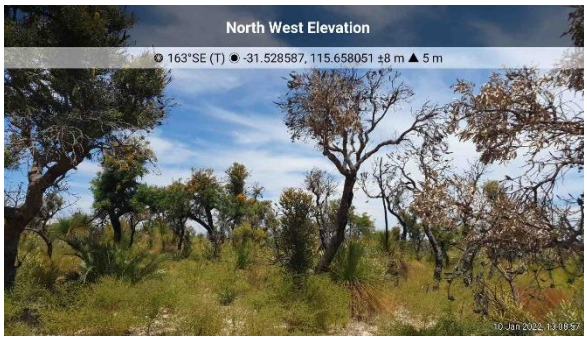


Photo ID: 6j

Photo ID: 6k

Photo ID: 6l

Plot number		Plot 6
Vegetation classification	**Pre-development**	Class D Scrub
	Post-development	Class D Scrub
Description / justification		Vegetation with a continuous horizontal and vertical structure, greater than 2 m high at maturity

Photo ID: 7a

Photo ID: 7b

Plot number		Plot 7
Vegetation classification	**Pre-development**	Class D Scrub
	Post-development	Class D Scrub
Description / justification		Vegetation with a continuous horizontal and vertical structure, greater than 2 m high at maturity

Photo ID: 8a

Plot number		Plot 8
Vegetation classification	**Pre-development**	Class D Scrub
	Post-development	Class D Scrub
Description / justification		Vegetation with a continuous horizontal and vertical structure, greater than 2 m high at maturity

Photo ID: 9a

Photo ID: 9b

Plot number		Plot 9
Vegetation classification	**Pre-development**	Class D Scrub
	Post-development	Class D Scrub
Description / justification		Vegetation with a continuous horizontal and vertical structure, greater than 2 m high at maturity

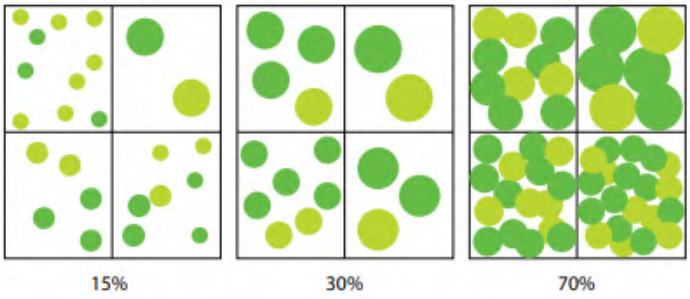
Photo ID: 10a

Plot number		Plot 10
Vegetation classification	**Pre-development**	Class A Forest
	Post-development	Class A Forest
Description / justification		Trees 10-30 m high at maturity, dominated by Eucalypts, multi-tiered structure comprising tall canopy layer, shrubby middle layer and grass/herb/sedge understorey

Photo ID: 11a

Plot number		Plot 11
Vegetation classification	**Pre-development**	Class A Forest
	Post-development	Class A Forest
Description / justification		Trees 10-30 m high at maturity, dominated by Eucalypts, multi-tiered structure comprising tall canopy layer, shrubby middle layer and grass/herb/sedge understorey

Appendix B Asset Protection Zones – standards (Schedule 1) and explanatory notes from the Guidelines

Schedule 1: Standards for Asset Protection Zones	
Object	**Requirement**
Fences within the APZ	• Should be constructed from non-combustible materials (for example, iron, brick, limestone, metal post and wire, 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). • Mulches should be non-combustible such as 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 overhang 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. • 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 percent and are not connected to the tree canopy outside the APZ. **Figure 19:** Tree canopy cover – ranging from 15 to 70 per cent at maturity 
Shrub* and scrub* (0.5 metres to six metres in height). Shrub and 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. • 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. • 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.

Schedule 1: Standards for Asset Protection Zones	
	• 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. • Must sit on a firm, level and non-combustible base and be secured to a solid structure.

** Plant flammability. Landscaping design and maintenance should be considered – refer explanatory notes*

Source: *Guidelines for Planning in Bushfire Prone Areas (WAPC 2021)*

Element 2 Siting and design of development – Explanatory Notes

E2 Landscaping and design of an Asset Protection Zone

E2 Plant flammability

There are certain plant characteristics that are known to influence flammability, such as moisture or oil content and the presence and type of bark. Plants with lower flammability properties may still burn during a bushfire event, but may be more resistant to burning and some may regenerate faster post-bushfire.

There are many terms for plant flammability that should not be confused, including:

- Fire resistant – plant species that survive being burnt and will regrow after a bushfire and therefore may be highly flammable and inappropriate for a garden in areas of high bushfire risk.
- Fire retardant – plants that may not burn readily or may slow the passage of a bushfire.
- Fire wise – plants that have been identified and selected based on their flammability properties and linked to maintenance advice and planting location within a garden.

Although not a requirement of these Guidelines, local governments may develop their own list of fire wise or fire retardant plant species that suit the environmental characteristics of an area. When developing a recommended plant species list, local governments should consult with ecologists, land care officers or environmental authorities to ensure the plants do not present a risk to endangered ecological communities, threatened, or endangered species or their habitat.

When selecting plants, private landholders and developers should aim for plants within the APZ that have the following characteristics:

- grow in a predicted structure, shape and height;
- are open and loose branching with leaves that are thinly spread;
- have a coarse texture and low surface-area-to-volume ratio;
- will not drop large amounts of leaves or limbs, that require regular maintenance;
- have wide, flat, and thick or succulent leaves;
- trees that have bark attached tightly to their trunk or have smooth bark;
- have low amounts of oils, waxes, and resins (which will often have a strong scent when crushed);
- do not produce or hold large amounts of fine dead material in their crowns; and/or
- will not become a weed in the area.

Refer to the WAPC Bushfire and Vegetation Fact Sheet for further information on clearing and vegetation management and APZ landscaping, design and plant selection reference material.

Source: *Guidelines for Planning in Bushfire Prone Areas (WAPC 2021)*

Appendix C Vehicular access – explanatory notes from the Guidelines

Technical requirement	1	2	3	4
	Public road	Emergency access way[1]	Fire service access route[1]	Battle-axe and private driveways[2]
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	4.5	4.5	4.5
Minimum weight capacity (t)	15	15	15	15
Maximum grade unsealed road[3]	As outlined in the IPWEA Subdivision Guidelines	1:10 (10%, 6°)	1:10 (10%, 6°)	1:10 (10%, 6°)
Maximum grade sealed road[3]		1:7 (14.3%, 8°)	1:7 (14.3%, 8°)	1:7 (14.3%, 8°)
Maximum average grade sealed road		1:10 (10%, 6°)	1:10 (10%, 6°)	1:10 (10%, 6°)
Minimum inner radius of road curves (m)		8.5	8.5	8.5

[1] To have crossfalls between 3 and 6%

[2] 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

[3] Dips must have no more than a 1 in 8 (12.5% -7.1 degree) entry and exit angle.

Acceptable Solution A3.1 – Public Roads

Explanatory Note E3.1

These 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.

The IPWEA Subdivision Guidelines, Liveable Neighbourhoods, Austroad Standards do not prescribe a horizontal clearance. However, it is recommended that a traversable verge is provided to allow for emergency services vehicles to stop and operate on the side of the public road, specifically where the public road may traverse large areas of classified vegetation.

Where local government roads are proposed to be widened by the proponent, they must obtain approval from the local government.

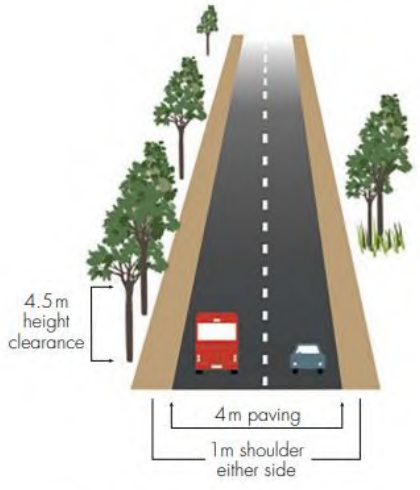


Figure 20: Example of a public road

Acceptable Solution A3.2a – Multiple access routes
Explanatory Note E3.2a

Two-way public road access is public road access from a lot in at least two different directions to two suitable destinations, and provides residents and the community, as well as emergency services, with access and egress from both the subdivision and individual habitable buildings/development in the event of a bushfire emergency. A single road provides no alternative route if the access becomes congested or is unable to be traversed due to smoke and/or fallen trees during a bushfire.

Two-way public road access applies to access/egress routes leading into a subdivision, as well as those within a subdivision. A road that loops back onto itself does not constitute the option of two different directions.

Two-way public road access should always be the first option. Where the site is not able to achieve two-way access within 200 metres of the lot boundary, due to demonstrated site or environmental constraints, the proponent should identify options for an emergency access way from the subject site to a suitable destination. Where an emergency access way cannot be provided, the proponent should demonstrate compliance with the performance principle.

Subject sites or proposed lots greater than 200 metres from an intersection, which provides two-way access, do not satisfy the requirement for two-way access unless they meet the provisions which allow for no-through roads greater than 200 metres in A3.2a.

To demonstrate compliance with the performance principle for two-way access, the bushfire planning practitioner may have regard to:

a. the extent of the bushfire hazard, location and vegetation classification, the likelihood, potential severity and impact of bushfire to the subject site and the road network;
b. time between fire detection and the onset of conditions in comparison to travel time for the community to evacuate to a suitable destination;
c. available access route(s) travelling towards a suitable destination; and
d. turn-around area for a fire appliance for no-through roads.

Figure 21: Example of compliant and non-compliant two-way

Source: *Guidelines for Planning in Bushfire Prone Areas (WAPC 2021)*

Acceptable Solution A3.2b – Emergency access way
Explanatory Note E3.2a

An emergency access way is not a preferred alternative to through public road access and should only be considered acceptable where it has been demonstrated that it will provide the safety and performance needs of emergency services and the community, including consideration for future needs, and that public road access to satisfy A3.2a cannot be achieved due to site constraints, such as an established road network with no opportunity to provide a public road for secondary access. Acceptance of an emergency access way should also consider the ability to accommodate reasonable worst-case vehicle volumes.

The principle function of the emergency access way is to provide a contingency (second) community evacuation route and simultaneously provide access for emergency services, in the event of a bushfire emergency. Where an emergency access way traverses classified vegetation, which has the potential to create a bushfire hazard, an emergency access way performs the secondary function of providing access by emergency services to this vegetation.

Emergency access ways should connect to a public road to allow alternative two-way through access. An emergency access way should not exceed 500 metres in length as they may not be as safe for road-use due to not being designed or constructed to the full requirements of a public road and may present uncertainties to emergency service personnel and the public as they are not part of the daily road network and not identified on Maps.

Permanent public emergency access way

An emergency access way can be provided as either a public easement in gross or a right-of-way. In both approaches, the management of the emergency access way is by the local government as the grantee of the easement or management body of the right-of-way. The proponent must obtain written consent from the local government that the local government will accept care, control and management of the easement or right-of-way; this must be provided to the decision-maker prior to granting planning approval. The approach taken is at the discretion of the decision-maker and/ or the local government and is also dependent on whether the land is to remain in private ownership or be ceded to the Crown. Consultation with Land Use Management at the Department of Planning, Lands and Heritage should also be considered if the land is to be ceded to the Crown or if the local government is uncertain of which approach to take.

If the emergency access way is provided as an easement, it should be provided as a public easement in gross under sections 195 and 196 of the Land Administration Act 1997 in favour of the local government and/or public authority, to ensure accessibility for emergency services and the public at all times. To be provided as a right-of-way the emergency access way should be vested in the Crown under section 152 of the Planning and Development Act 2005 as a right-of-way and such land to be ceded free of cost and without any payment or compensation by the Crown. If gates are used to control traffic flow during non-emergency periods, these will be managed by the local government and must not be locked. Gates should be double gates wide enough to access the full pavement width and accommodate Type 3.4 fire appliances with the design and construction to be approved by the relevant local government.

Temporary public emergency access way

A temporary emergency access way may be proposed to facilitate the staging arrangements of a subdivision. The provision of two public roads may not be possible in the first stage of the subdivision and an emergency access way can be provided as an interim access route until the second public road is developed and gazetted in a subsequent stage of the subdivision (see figure 22). The emergency access way should be provided in the same manner as a permanent emergency access way, but it should be removed from the certificate of title once the public road is developed and gazetted. Where an emergency access way is proposed as an alternative to a public road, the Bushfire Management Plan should provide thorough justification for its use.

Restricted public emergency access way

There may be some instances where a restricted emergency access way is proposed as a performance principle based solution where access is only available to the public in the event of a bushfire emergency. This option can only be considered where the local government or Main Roads WA have advised that vehicular access on the emergency access way is not allowed during non-emergency periods, as it provides an additional thoroughfare and entry point on a local or State road. In this scenario, the emergency access way can be provided as an easement under section 195 of the Land Administration Act 1997, as public access in the event of a bushfire emergency or vested in the Crown as a reserve under section 152 of the Planning and Development Act 2005. Such land is to be ceded free of cost without any payment or compensation by the Crown. The proponent must obtain written consent from the local government that the local government will accept care, control and management of the proposed reserve and agree to the terms of the Management Order Conditions (if applicable); this must be provided to the decision-maker prior to granting planning approval.

The purpose of the reserve should be for a public purpose specified in the condition related to the subdivision, for example for emergency access only, or for emergency access and recreation. A reserve for emergency access and

recreation can optimise the land-use as a dual purpose where it provides vehicular access in the event of a bushfire emergency, but can be accessed by the public (on foot) on a day-to-day basis as a recreation link. Appropriate signage can

Acceptable Solution A3.2b – Emergency access way
Explanatory Note E3.2a

ensure the general public is aware of the purpose of the reserve. The approach taken is at the discretion of the decision-maker and/or local government.

Right-of-carriageway emergency access way

There may be some instances where a right-of-carriageway easement is proposed as a performance principle-based solution. This may be where particular landowner(s) and emergency services, but not the public, require access over a neighbouring lot(s). A right-of-carriageway easement should be provided under section 195 of the Land Administration Act 1997. The easement is to provide alternative access for the particular landowner(s) in the event of a bushfire emergency and not for use by the public. In this scenario, support will be necessary from the adjoining lot owner(s). The easement is to be granted to the local government and it is to agree with the landowner on the arrangements of the management of the easement area by deed. These management arrangements will be at the discretion of the local government. If gated, the easement area can be locked to restrict day-to-day vehicular access.

Figure 22: Example of an emergency access way

Source: *Guidelines for Planning in Bushfire Prone Areas (WAPC 2021)*

Acceptable Solution A3.3 – Through roads

Explanatory Note E3.3

In bushfire prone areas, a proposed structure plan or subdivision that incorporates no-through roads should be avoided because they do not provide a connected and legible design that allows for easy access and egress by the community, residents and emergency services in the event of a bushfire. No-through roads also reduce the options available for access and egress in the event of a bushfire emergency.

There will however be situations where a subject site is accessed via an existing or proposed no-through road and alternative access cannot be provided. In these situations, the proponent should demonstrate to the decision-maker, that all efforts have been made with the local government and/or adjoining landowners to secure alternative public road access or an emergency access way and that a redesign has been explored. The bushfire planning practitioner may need to develop a performance principle-based solution or address the non-compliance and demonstrate to the decisionmaker why discretion should be exercised in accordance with section 2.6 of these Guidelines.

No-through roads will only be considered an acceptable solution where it is demonstrated by the proponent, to the satisfaction of the decision maker, that a no through-road cannot be avoided due to site constraints. For example, the internal road design of a structure plan or subdivision where site constraints, such as a water body or Bush Forever, prevent the ability to create a through-road and a nothrough road may be a more appropriate road layout.

No-through roads should be a maximum of 200 metres from the lot(s) boundary to an intersection where two-way access is provided and may only exceed 200 metres if it meets the provisions which allow for no-through roads greater than 200 metres in A3.2a.

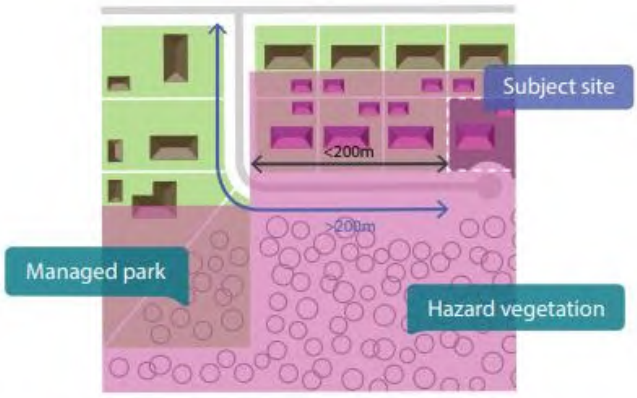


Figure 23: Example of a site on a no-through road greater than 200 metres from the intersection, but within 200 metres of BAL-LOW

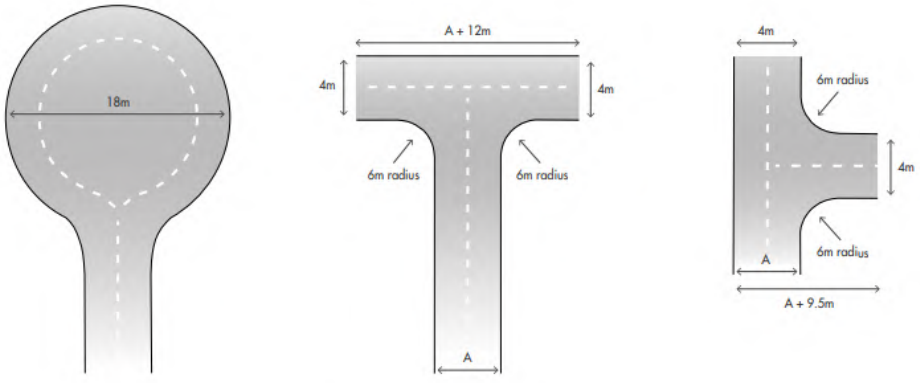


Figure 24: Turn-around area dimensions for a no-through road

Source: *Guidelines for Planning in Bushfire Prone Areas (WAPC 2021)*

Acceptable Solution A3.4a – Perimeter roads
Explanatory Note E3.4a

Where a planning proposal includes the creation of 10 or more lots adjacent to each other, which adjoin classified vegetation under AS 3959 with the exception of Class G Grassland, as part of a greenfield development or large urban infill site, hazard separation and defendable space should be provided in the form of a perimeter road. Greenfield is 'undeveloped or minimally developed areas that have been identified for urban development'; and urban infill is 'the redevelopment of existing urban areas at a higher density than currently exists'. The creation of 10 or more lots includes cumulative subdivision applications where the subdivision application may be part of a staged subdivision.

A perimeter road 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 as per the requirements of a public road in Table 6, Column 1.

As the road is likely to function as a key neighbourhood distributor, or similar, consideration should be given to the provision of additional width to allow for emergency services vehicles to stop and operate on the side of the perimeter road, whilst simultaneously proving for the evacuation of the community (Figure 20).

When designing a strategic planning proposal and/or subdivision, creating a large setback between classified vegetation and proposed lots with a perimeter road, and orientating habitable buildings to front onto (rather than back onto) areas of vegetation has many benefits, including:

- passive surveillance;
- defendable space for firefighting and emergency management purposes;
- reducing the potential radiant heat that may impact a habitable building in a bushfire event;
- reducing the need for battle-axe lots; and
- unconstrained public access/egress for the community in the event of a bushfire.

In developments where no perimeter road exists, property defence in a bushfire event is difficult and can be impossible. Where proposed lots have frontage to an existing public road and abut the hazard at the rear or side, it may be an undesirable planning outcome to create lots which front the existing public road and back onto a perimeter road. In this instance, consideration should be given to a fire service access route. Refer to E3.4b below.

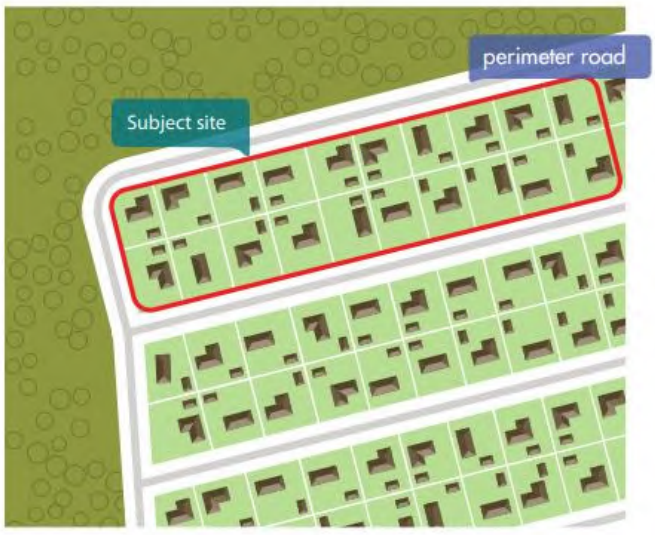


Figure 25: Example of a perimeter road

Source: *Guidelines for Planning in Bushfire Prone Areas (WAPC 2021)*

Acceptable Solution A3.6 – Private driveways

Explanatory Note E3.6

In areas serviced by reticulated water, where the road speed limit is not greater than 70 km/h, and where the distance from the public road to the further part of the habitable building is no greater than 70 metres, emergency service vehicles typically operate from the street frontage.

In the event the habitable building cannot be reached by hose reel from the public road, then emergency service vehicles will need to gain access within the property. Emergency service vehicles will also need to gain access within the property, where access to reticulated water (fire hydrants) is not possible. In these situations, the driveway and battle-axe (if applicable) will need to be wide enough for access for an emergency service vehicle and a vehicle to evacuate.

Turnaround areas should be available for both conventional two-wheel drive vehicles of residents and Type 3.4 fire appliances. Turn-around areas should be located within 30 metres of habitable buildings. Circular and loop driveway design may also be considered. Note that the design requirements for a turn-around area for a private driveway or battle-axe differ to a cul-de-sac.

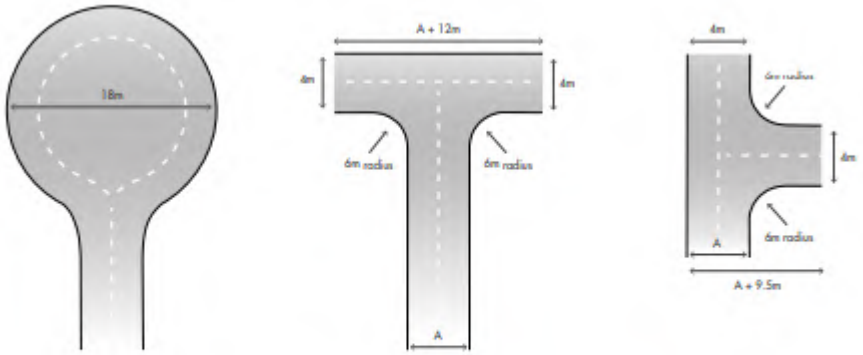


Figure 28: Design requirements for a turn-around area for a private driveway or battle-axe

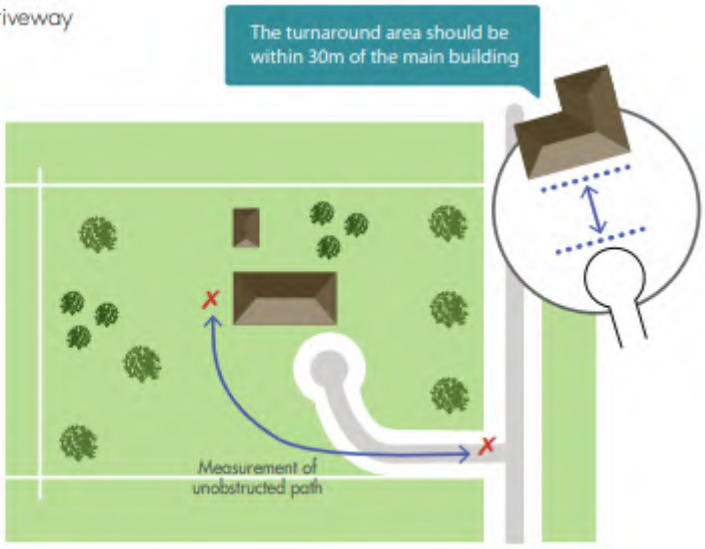


Figure 29: Design requirements for a private driveway where required under A3.6

Source: *Guidelines for Planning in Bushfire Prone Areas (WAPC 2021)*

Appendix D City of Wanneroo Firebreak Notice

City of Wanneroo

IMPORTANT
FIRE MITIGATION NOTICE

FIRE MITIGATION MEASURES MUST BE IN PLACE BY 1 NOVEMBER AND MAINTAINED UNTIL 30 APRIL EACH YEAR.

This is a requirement under the Bush Fires Act 1954 Section 33.

Failure to comply with this Notice may incur penalties of up to $5,000 and the works required by this Notice will be carried out at the expense of the owner/occupier.

FIRE MANAGEMENT REQUIREMENTS FOR LAND LESS THAN 4000sqm

- Maintain grasses and inflammable materials with the exception of living trees on the entire property to a height of no more than 50 millimetres. The entire property is required to be maintained below 50 millimetres from 1 November each year until 30 April the following year.

  OR

- A 3 metre wide trafficable firebreak as close as possible to all external boundaries of the property must be installed by 1 November each year and maintained until 30 April the following year.

- If it is not possible to install the firebreak adjacent to the external boundary of the property due to naturally occurring obstacles, it is acceptable to install the firebreak around the obstacle. If this requires the firebreak to be greater than 5 metres away from the external boundary, a firebreak variation is required.

- Ensure a minimum vertical clearance of 4 metres is maintained along the firebreaks to enable vehicles to drive along the firebreaks without access being obstructed.

- Where a property is affected by an approved bushfire management plan, property owners must still comply with all requirements in this Notice and with any additional requirements outlined within that plan.

FIRE MANAGEMENT REQUIREMENTS FOR LAND GREATER THAN 4000sqm

- A 3 metre wide trafficable firebreak as close as possible to all external boundaries of the property must be installed by 1 November each year and maintained until 30 April the following year.

- If it is not possible to install the firebreak adjacent to the external boundary of the property due to naturally occurring obstacles, it is acceptable to install the firebreak around the obstacle. If this requires the firebreak to be greater than 5 metres away from the external boundary, a firebreak variation is required.

- Ensure a minimum vertical clearance of 4 metres is maintained along the firebreaks to enable vehicles to drive along the firebreaks without access being obstructed.

- Install and maintain a 20 metre bare earth area around all hay stacks and/or fuel dumps.

- Where a property is affected by an approved bushfire management plan, property owners must still comply with all requirements in this Notice and with any additional requirements outlined within that plan.

ALL VACANT LAND GREATER THAN 4000sqm

- A 3 metre wide trafficable firebreak as close as possible to all external boundaries of the property must be installed by 1 November each year and maintained until 30 April the following year.
- Ensure a minimum vertical clearance of 4 metres is maintained along the firebreaks to ensure vehicles can drive along the firebreaks without being impeded by tree branches.
- If the land is an area of 50,000sqm (5 hectares) or greater, the grass must be maintained on the land to a height no greater than 50 millimetres for a distance of 10 metres from any firebreak.

Frequently Asked Questions

I live in a residential area, does this notice apply to me?

Yes. All City of Wanneroo property owners must comply with the Bush Fires Act 1954.

Please refer overleaf for fire management requirements to be in place by 1 November to ensure your property is compliant.

Most properties under 1000sqm will automatically comply if gardens are maintained.

Do I need a Bushfire Survival Plan?

If you live in, on or near bushland, you are at risk from a bushfire and developing a bushfire survival plan is critical. Visit the Department of Fire and Emergency Services website for information on how to develop a plan for your property **dfes.wa.gov.au**

I am concerned my neighbour's property is not compliant, what can I do?

All properties are required to be compliant by 1 November. If you think your neighbour's property does not comply with the requirements as outlined in this Notice, please contact the Community Safety and Emergency Management team on 9405 5297.

I own a vacant lot, do I need a firebreak?

A 3 metre wide trafficable firebreak as close as possible to all external boundaries of the property must be installed by 1 November each year and maintained until 30 April the following year.

I am unable to meet the requirements outlined, what should I do?

If it is considered impracticable for any reason to implement any of the requirements of this Notice, an application for a firebreak variation must be made to the City of Wanneroo by no later than 18 October of each year. If permission is not granted, the requirements of this Notice must be complied with.

Visit the City's website **wanneroo.wa.gov.au/firebreakvariation** to apply for a variation.

Where can I learn more about this Notice and bushfire management?

Visit the City's website **wanneroo.wa.gov.au/fireinformation** to learn more.

Please note, in addition to the requirements of this Notice, if a City of Wanneroo Fire Control Officer considers further works are necessary to reduce the risk of bushfire, Landowners will be notified via letter to the address shown on the City of Wanneroo rates record for the relevant land.

For further information call the City of Wanneroo Community Safety and Emergency Management Team on **9405 5000** or visit **wanneroo.wa.gov.au/fireinformation**

000 EMERGENCY

TO REPORT ALL FIRES
CALL 000

Document Status

Report version	Rev No.	Purpose	Author	Reviewed and Approved for Issue	
				Name	Date
Draft Report	Rev A	Issued for review	Linden Wears (BPAD 19809, Level 3)	Linden Wears (BPAD 19809, Level 3)	2 March 2022
Draft Report	Rev B	Issued for review	Linden Wears (BPAD 19809, Level 3)	Linden Wears (BPAD 19809, Level 3)	12 May 2022
Final Report	Rev 0	Issued for review	Linden Wears (BPAD 19809, Level 3)	Linden Wears (BPAD 19809, Level 3)	13 June 2022

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