

# Bushfire Management Plan Coversheet

This Coversheet and accompanying Bushfire Management Plan has been prepared and issued by a person accredited by Fire Protection Association Australia under the Bushfire Planning and Design (BPAD) Accreditation Scheme.

## Bushfire Management Plan and Site Details

**Site Address / Plan Reference:** Stages 10, 12 & 13 Clementine Estate (Northern Precinct)

**Suburb:** Upper Swan

**State:** WA

**P/code:** 6069

**Local government area:** City of Swan

**Description of the planning proposal:** Subdivision application

**BMP Plan / Reference Number:** 63802 R01

**Version:** Rev 0

**Date of Issue:** 15/11/2023

**Client / Business Name:** Satterley Property Group

| Reason for referral to DFES   | Yes                      | No                                  |
|---|--------------------------|-------------------------------------|
| Has the BAL been calculated by a method other than method 1 as outlined in AS3959 (tick no if AS3959 method 1 has been used to calculate the BAL)?  | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Have any of the bushfire protection criteria elements been addressed through the use of a performance principle (tick no if only acceptable solutions have been used to address all of the BPC elements)? | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| <b>Is the proposal any of the following special development types (see SPP 3.7 for definitions)?</b>  |                          |                                     |
| Unavoidable development (in BAL-40 or BAL-FZ)   | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Strategic planning proposal (including rezoning applications)   | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Minor development (in BAL-40 or BAL-FZ)   | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| High risk land-use  | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Vulnerable land-use   | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

If the development is a special development type as listed above, explain why the proposal is considered to be one of the above listed classifications (E.g. considered vulnerable land-use as the development is for accommodation of the elderly, etc.)?

N/A

**Note:** The decision maker (e.g. local government or the WAPC) should only refer the proposal to DFES for comment if one (or more) of the above answers are ticked "Yes".

## BPAD Accredited Practitioner Details and Declaration

|   |                                       |  |   |
|---|---------------------------------------|--|---|
| <b>Name</b><br>Louisa Robertson           | <b>Accreditation Level</b><br>Level 3 | <b>Accreditation No.</b><br>BPAD 36748 | <b>Accreditation Expiry</b><br>28/02/2024 |
| <b>Company</b><br>JBS&G Australia Pty Ltd |                                       | <b>Contact No.</b><br>08 9792 4797     |   |

I declare that the information provided within this bushfire management plan is to the best of my knowledge true and correct

Signature of Practitioner

*LM Robertson*

Date 15/11/2023



# Lots 1 & 3 Apple Street and Lot 9006 Orange Avenue

Stages 10, 12 & 13 Clementine Estate Northern Precinct

Satterley Property Group

Bushfire Management Plan (Subdivision application)

150,332 | 63802

14 November 2023



**We acknowledge the Traditional Custodians of Country throughout Australia and their connections to land, sea and community.**

We pay respect to Elders past and present and in the spirit of reconciliation, we commit to working together for our shared future.



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## Abbreviations

| Term       | Definition   |
|------------|--|
| AHD        | Australian Height Datum  |
| AS         | Acceptable Solution  |
| AS 3959    | <i>Australian Standard 3959-2018 Construction of buildings in bushfire-prone areas (SA 2018)</i> |
| APZ        | Asset Protection Zone  |
| BAL        | Bushfire Attack Level  |
| BMP        | Bushfire Management Plan   |
| BPAD       | Bushfire Planning and Design   |
| CCW        | Conservation Category Wetland  |
| DBCA       | Department of Biodiversity Conservation and Attractions  |
| DFES       | Department of Fire and Emergency Services  |
| DPLH       | Department of Planning, Lands and Heritage   |
| EP Act     | <i>Environmental Protection Act 1986</i>   |
| EPBC Act   | <i>Environment Protection and Biodiversity Conservation Act 1999</i>                             |
| ESA        | Environmentally Sensitive Area   |
| F/US       | Flat/upslope   |
| FDI        | Fire Danger Index  |
| Guidelines | <i>Guidelines for Planning in Bushfire Prone Areas Version 1.4 (WAPC 2021)</i>                   |
| POS        | Public Open Space  |
| SA         | Standards Australia  |
| SPP 3.7    | <i>State Planning Policy 3.7 Planning in Bushfire Prone Areas (WAPC 2015)</i>                    |
| TEC        | Threatened Ecological Community  |
| WAPC       | Western Australian Planning Commission   |

# 1. Proposal details

Satterley Property Group has prepared a subdivision application to guide future residential development within Stages 10, 12 and 13 of the Clementine Estate Northern Precinct, located within a portion of Lots 1 and 3 Apple Street and Lot 9006 Orange Avenue (the project area). The project area is located in Upper Swan, in the municipality of the City of Swan. The subdivision plan (Figure 1; Rowe Group 2023) identifies the following features of the proposed subdivision:

- 167 proposed residential lots (162 m<sup>2</sup> – 861 m<sup>2</sup>)
- internal road layout with proposed public road connections to Apple Street and Orange Avenue
- temporary turnaround areas for proposed temporary no-through roads
- proposed emergency access way (EAW) leading to the approved subdivision within the Southern Precinct, directly to the south
- proposed EAW leading to Railway Parade in the northeast
- 2.29 ha of Public Open Space
- 3.30 ha of Foreshore Reserve
- balance of Lots 1, 3 and 9006.

## 1.1 Site description

The project area is approximately 15.75 ha in area and forms the first stages of the Clementine Estate Northern Precinct residential development. The Southern Precinct, adjoining Lot 9006 to the south, has been granted subdivision approval and is currently undergoing staged construction (see Figure 2).

Land use within the project area is historically viticulture and pastoral grazing, which has resulted in the land being predominantly cleared. Remnant native vegetation in the form of mature Eucalypts with paperbark understorey exists primarily alongside the foreshore area and along the drainage line in the south of the project area, and as scattered paddock trees. The remaining vegetation comprises grassland.

The project area is bound to the west by the Ellen Brook foreshore reserve, which is administered by the Department of Lands Planning and Heritage (DPLH). The subdivision plan provides for additional areas of land to be incorporated into the foreshore reserve which will enhance natural values within the local area. Vegetation within the foreshore area currently comprises a combination of open forest (flooded gum), paperbark scrub, and weeds.

The northern and eastern project area boundaries are bordered by future stages of the Northern Precinct development area, and currently contain grassland and decommissioned grapevines. The southern project area boundary is bordered by future stages of the Southern Precinct and contains grassland, as well as areas that have been cleared during construction works for the Southern Precinct.

## 1.2 Bushfire prone designation

The eastern boundary of the project area located within a designated bushfire prone on the *Map of Bush Fire Prone Areas* (DFES 2021), as depicted in Plate 1. The central and west portions of the project area not located within a bushfire prone area.



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

### 1.3 Purpose of this report

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) and in accordance with *AS 3959-2018 Construction of Buildings in Bushfire-Prone Areas* (AS 3959; SA 2018).

This report provides an assessment of the proposed development, bushfire risk context, and required bushfire mitigation measures and includes:

- a review of existing and post-development vegetation class and slope within the project area and surrounds,
- the results of a Bushfire Attack Level (BAL) contour assessment to demonstrate the indicative BAL ratings across the project area,
- details of any bushfire hazard issues relevant to the site and proposed development,
- a compliance assessment to demonstrate the proposed development can comply with the bushfire protection criteria of the Guidelines, and
- a list of stakeholder responsibilities for implementing the bushfire measures set out within this BMP.

### 1.4 Other plans/reports

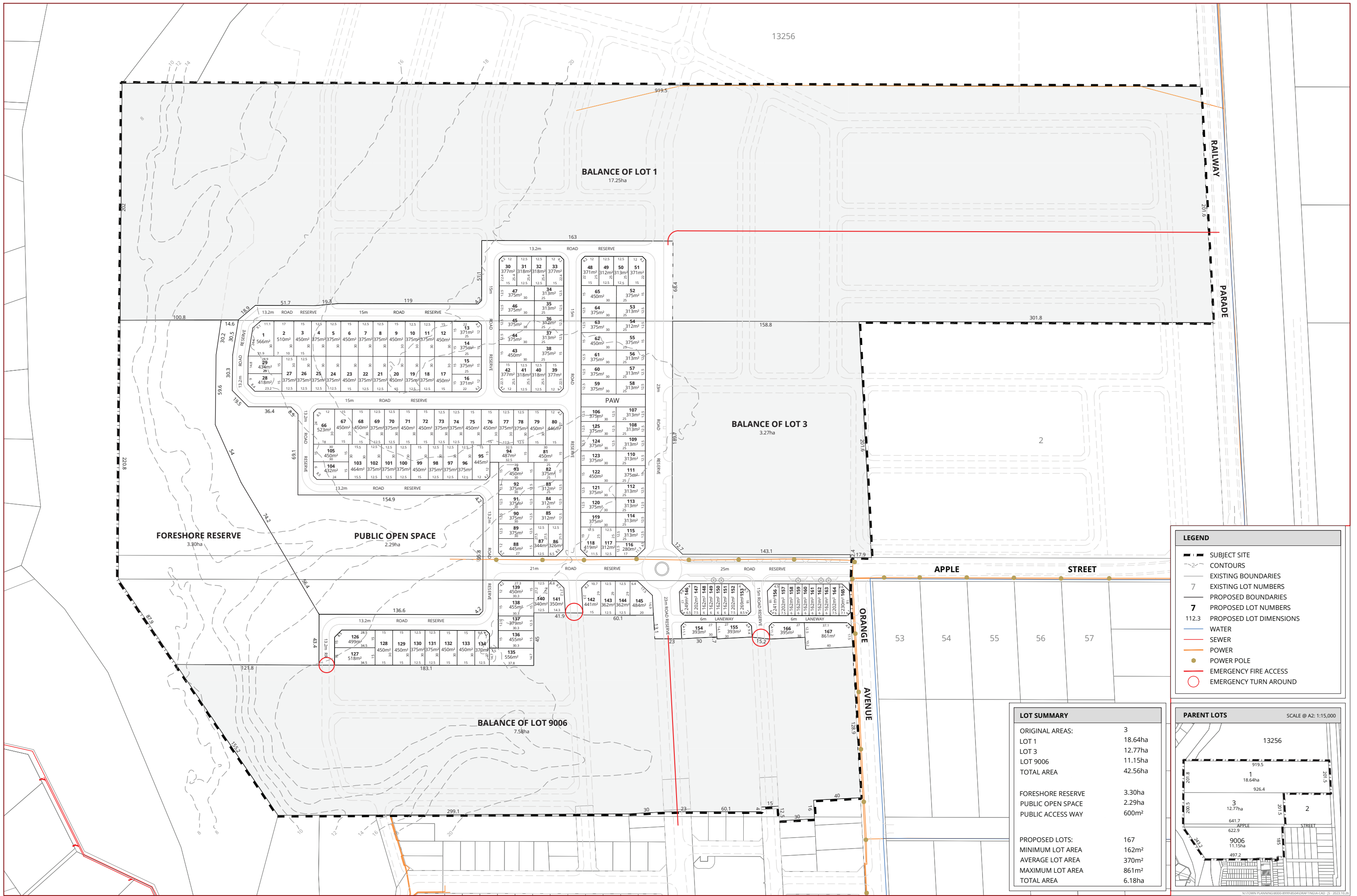
JBS&G (then Strategen) prepared a BMP in 2017 to support the Structure Plan application for the overall Upper Swan Residential Development (now known as Clementine Estate). The BMP incorporates the current project area, however, is outdated in terms of being prepared under a

previous version of the Guidelines and does not contain the level of detail necessary to support a subdivision application.

The 2017 Structure Plan BMP was submitted alongside the subdivision application for the Southern Precinct, which was subsequently approved. In order to ensure current day bushfire planning requirements were addressed, and to assist with clearing of the subdivision conditions, JBS&G prepared a subdivision stage BMP for Stage 1 (2020a) and Stages 2, 3 and 6 (2020b), however this approach was not continued for later stages of release since the required information was captured in BMP compliance reports in line with the subdivision conditions imposed by the WAPC.

The following environmental reports prepared for the project may have implications for bushfire planning:

- Fauna Management Plan (JBS&G 2023)
- Foreshore Management Plan (JBS&G 2020c)
- Biological Survey Report (JBS&G 2016).

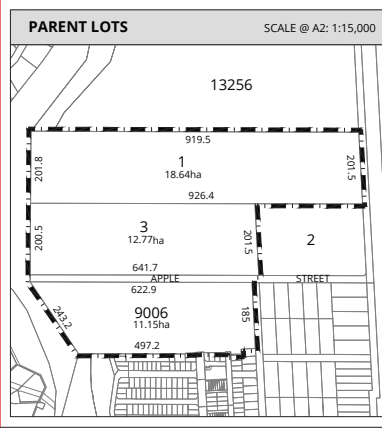


**LEGEND**

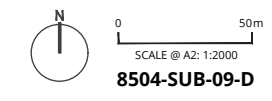
- SUBJECT SITE
- CONTOURS
- EXISTING BOUNDARIES
- EXISTING LOT NUMBERS
- PROPOSED BOUNDARIES
- PROPOSED LOT NUMBERS
- PROPOSED LOT DIMENSIONS
- WATER
- SEWER
- POWER
- POWER POLE
- EMERGENCY FIRE ACCESS
- EMERGENCY TURN AROUND

**LOT SUMMARY**

|                   |                   |
|-------------------|-------------------|
| ORIGINAL AREAS:   | 3                 |
| LOT 1             | 18.64ha           |
| LOT 3             | 12.77ha           |
| LOT 9006          | 11.15ha           |
| TOTAL AREA        | 42.56ha           |
| FORESHORE RESERVE | 3.30ha            |
| PUBLIC OPEN SPACE | 2.29ha            |
| PUBLIC ACCESS WAY | 600m <sup>2</sup> |
| PROPOSED LOTS:    | 167               |
| MINIMUM LOT AREA  | 162m <sup>2</sup> |
| AVERAGE LOT AREA  | 370m <sup>2</sup> |
| MAXIMUM LOT AREA  | 861m <sup>2</sup> |
| TOTAL AREA        | 6.18ha            |



**PLAN OF SUBDIVISION**  
 LOTS 1 & 3 APPLE STREET AND LOT 9006 ORANGE AVENUE  
 UPPER SWAN





|  |  |   |  |                                    |  |                             |  |  |  |
|--|--|---|--|------------------------------------|--|-----------------------------|--|--|--|
| <b>Legend</b><br>Project area<br>Cadastral boundary<br>Northern Precinct boundary<br>Bush Forever site (DPLH)<br>Environmentally Sensitive Areas (DWER - 046)<br>Western Swamp Tortoise habitat (DWER-071)<br>Geomorphic wetlands (DBCA)<br>Conservation |  | <b>Swan River Planning Scheme Zones and Reserves (DPLH-092)</b><br>Conservation<br>Local road<br>Priority agriculture<br>Rural residential<br>Highway<br>Minor road |  |                                    |  | <br>Scale 1:8,000 at A3<br> |  | Clement ne Estate<br>Northern Precinct Stages 10 and 12<br>Upper Swan, WA<br><br>SITE OVERVIEW |  |
| Job Number: 63805<br>Client: Sat erley Property Group  |  | Version: Rev A<br>Date: 23-Oct-2023   |  | Drawn By: jcrute<br>Checked By: LR |  | FIGURE: 2                   |  |  |  |

## 2. Environmental considerations

### 2.1 Environmental values

A search of publicly available environmental information and a review of the Biological Survey Report prepared for the overall Clementine Estate site in 2016 (JBS&G) is summarised in Table 1 to provide an overview of the environmental values associated with the project area and proposed development.

**Table 1: Summary of environmental values**

| Environmental value  | Present within or adjacent to the project area |          | Description  |
|--|--|----------|--|
|  | Within   | Adjacent |  |
| Environmentally Sensitive Area (ESA)                               | ✓  | ✓        | The west portion of the project area is located within an ESA, which is in association with the Ellen Brook foreshore and Conservation Category Wetland to the west of the site. Remnant native vegetation is proposed to be retained within the designated on-site ESA where practical, and as part of low threat landscaping, where required.<br><br>Land directly to the east of Railway Parade (approx. 80 m from the project area). is classified as an ESA, due to wetlands and foreshore areas present to the east of the site. The proposed development is not anticipated to impact this ESA. |
| Swan Bioplan Regionally Significant Natural Area                   | ✗  | ✗        | N/A  |
| Ecological linkages  | ✓  | ✓        | The Ellenbrook Foreshore area forms a regional ecological linkage which facilitates connectivity with vegetation corridors to the north and north east, and to the south. Bushfire mitigation measures are not proposed to impact these linkages.<br><br>Furthermore, the foreshore POS has potential to be rehabilitated which will result in enhancement of the linkage.   |
| Wetlands   | ✓  | ✓        | Lot 1 and Lot 3 contain portions of Conservation Category Wetland (CCW) along the western boundary. This land will be ceded to WAPC as a foreshore reserve. The remainder of the project area is nominated as a Multiple Use Wetland (MUW).  |
| Waterways  | ✗  | ✓        | Ellen Brook is located directly to the west of the project area.   |
| Threatened Ecological Communities (TECs) listed under the EPBC Act | ✗  | ✗        | EPBC listed 'Clay Pans of the Swan Coastal Plain' TEC (Critically Endangered) and ' <i>Corymbia calophylla</i> – <i>Xanthorrhoea preissii</i> woodlands and shrublands of the Swan Coastal Plain' TEC (Endangered) were identified as potentially occurring within the project area. A flora and vegetation survey confirmed that these TECs do not occur within the greater Clementine Estate site (Strategen 2016).  |

| Environmental value  | Present within or adjacent to the project area |          | Description   |
|--|--|----------|---|
|  | Within   | Adjacent |   |
| Threatened and priority flora  | Likely   | Likely   | No threatened or priority flora species are known to occur within the project area (Strategen 2016).  |
| Fauna habitat listed under the EPBC Act  | ✓  | ✓        | Foraging habitat of negligible to moderate quality for Carnaby's Black Cockatoo (Endangered), Baudin's Black Cockatoo (Endangered) and Forest Red-tailed Black Cockatoo (Vulnerable) occurs within the foreshore area (Strategen 2016). |
| Threatened and priority fauna  | ✓  | Likely   | Quenda (Priority 4) was recorded within the greater Clementine Estate site (Strategen 2016).  |
| Bush Forever Site  | ✗  | ✓        | Bush Forever Site 300 is located directly west of the project area, within the Ellen Brook foreshore reserve  |
| DBCA managed lands and waters (includes legislated lands and waters and lands of interest) | ✗  | ✓        | DBCA Lands of Interest are located within Lot 505 Almeria Parade and Lot 507, to the east of the project area. The proposed development is not expected to impact these areas.  |
| Conservation covenants   | N/A  | N/A      | The project area is not known to be encumbered by any conservation covenants, however, portions of the project area will be ceded to WAPC as foreshore reserve as part of the subdivision proposal.                                     |

## 2.2 Native vegetation – modification and clearing

Proposed clearing of remnant native vegetation will be limited given the project area is predominantly cleared. Clearing of some Eucalypts will be required in the southern portion of the project area to facilitate construction of roads and residential lots. The line of trees along the drainage line in the southwest portion of the project area (proposed POS) is proposed to be modified to a low threat state, or to achieve Class D Scrub classification, as indicated on the Landscape Principles Plan (Appendix A) and in Figure 3.

The overall Clementine Estate development has been previously referred under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act; EPBC 2017/8062) due to potential impacts to Matters of National Significance (MNES). In March 2018, the project was determined to be a controlled action by the delegate for the Minister of Environment, thereby requiring preparation of a Fauna Management Plan in 2019 to ensure no residual impacts to fauna, including the Western Swamp Tortoise, Carnaby's Black Cockatoo and Forest Red-tailed Black Cockatoo. In January 2020, the proposed development was approved with conditions under the EPBC Act by a delegated officer under the DCCEEW (EPBC 2017/8062).

## 2.3 Revegetation / Landscape Plans

At the advice of the Department of Biodiversity, Conservation and Attractions (DBCA), the BAL contour map prepared within this BMP has made a precautionary assumption that the Foreshore Reserve may be revegetated to achieve Class A Forest classification. This assumption has been applied to the entirety of the Foreshore Reserve, even where the current vegetation is grassland. As a result, the subdivision design has been modified to ensure lots interfacing the western foreshore area are capable of supporting future habitable development within areas of BAL-29 or lower.

A Landscape Design Principles Plan has been prepared to guide future landscaping works within the foreshore reserve and foreshore POS adjacent to Stages 10, 12 and 13 and is included in Appendix A. The plan indicates the following concepts:

- Foreshore Reserve
  - A combination of irrigated garden beds with low shrubs and groundcovers, along with irrigated turf and scattered trees within the foreshore envelope, and retention of existing Class A Forest vegetation.
  - As discussed above, the BAL contour assessment has made a broad assumption that the entirety of the foreshore reserve will meet Class A Forest classification. Therefore, there is potential for additional areas of revegetation works to be carried out within the foreshore POS, if required, or at a later stage, by DBCA.
  - Effective slope within the Foreshore Reserve is assumed to be downslope  $>0-5^{\circ}$ , and flat/upslope ( $0^{\circ}$ ), which is consistent with the current on-site topography.
- Foreshore POS
  - General POS
    - General areas of POS are proposed to comprise a combination of irrigated garden beds with low shrubs and groundcovers, along with irrigated turf and scattered trees, which would meet low threat criteria of *AS 3959:2018 Construction of buildings in bushfire prone areas* (AS 3959), exclusions 2.2.3.2 (e) and (f).
  - Drainage basins
    - Drainage basins are proposed to be planted with low sedges and shrubs (up to 1 m), and irrigated.
    - The BAL contour assessment has assumed Class C Shrubland classification will be applicable to the drainage basins.
    - Effective slope is assumed to be downslope  $>5-10^{\circ}$  (Plot 3) or  $>10-15^{\circ}$  (Plot 4), as indicated on the Landscape Design Principles Plan.

A detailed landscape plan will be prepared to confirm the final landscape design at subdivision clearance stage.

## 3. Bushfire assessment results

### 3.1 Assessment inputs

JBS&G has undertaken a Bushfire Attack Level (BAL) contour assessment in accordance with Method 1 of AS 3959 for the project area. 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 vegetation classifications and effective slope observed at the time of inspection that will be retained post-development
- consideration of the proposed on-site clearing extent and resultant vegetation exclusions
- separation distances between future habitable development and classified vegetation achieved in line with the plan of subdivision
- consideration of potential future revegetation works within the Foreshore Reserve, as advised by DBCA

#### 3.1.1 Vegetation classification

JBS&G assessed classified vegetation and exclusions within the project area and adjoining 150 m (the assessment area) through on-ground verification on 18 October 2022 in accordance with AS 3959 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 B, with vegetation plots being depicted in Figure 3.

#### 3.1.2 Effective slope

JBS&G assessed effective slope under classified vegetation within the assessment area through on-ground verification on 18 October 2022 in accordance with AS 3959. Results were cross-referenced with DPIRD 2m contour data and are depicted in Figure 3.

Site observations indicate that land slopes upward and away from the project area along the western side of Ellen Brook.

Land to the east of the watercourse predominantly slopes gently toward the project area, with effective slope ranging from 0° (flat) and 5° downslope. Whilst there is a small section of foreshore reserve adjacent to the southwest corner of the project area with an effective downslope of approximately 8°, the run extends over distance of only approximately 35 m toward the site and is not considered to be the predominant slope within the foreshore area. It is also noted that this area is currently grassland, and the Class A Forest classification has only been applied precautionarily. In this regard, the blanket >0-5° classification is considered appropriate.

Temporary grassland hazards directly north and south of the project area are slightly downslope of the project area (>0-5°), and flat/upslope (0°) to the east.

### 3.1.3 Proposed landscaping and revegetation

Proposed landscaping treatments and corresponding AS 3959 vegetation and effective slope classifications are discussed in Section 2.3 and summarised in Table 2.

**Table 2: AS 3959 vegetation and effective slope classifications for proposed foreshore**

| Landscaped area   |                 | AS 3959 classification                     | Effective slope                         |
|-------------------|-----------------|--|---|
| Foreshore Reserve |                 | Class A Forest*                            | Downslope >0-5°^                        |
| Foreshore POS     | General POS     | Low threat, Exclusions 2.2.3.2 (e) and (f) | N/A                                     |
|                   | Drainage basins | Class C Shrubland                          | Downslope >5-10°#<br>Downslope >10-15°# |

**NOTES:**

\*Precautionary classification as advised by DBCA

^Predominant effective slope within the foreshore area

#As indicated on the Landscape Design Principles Plan

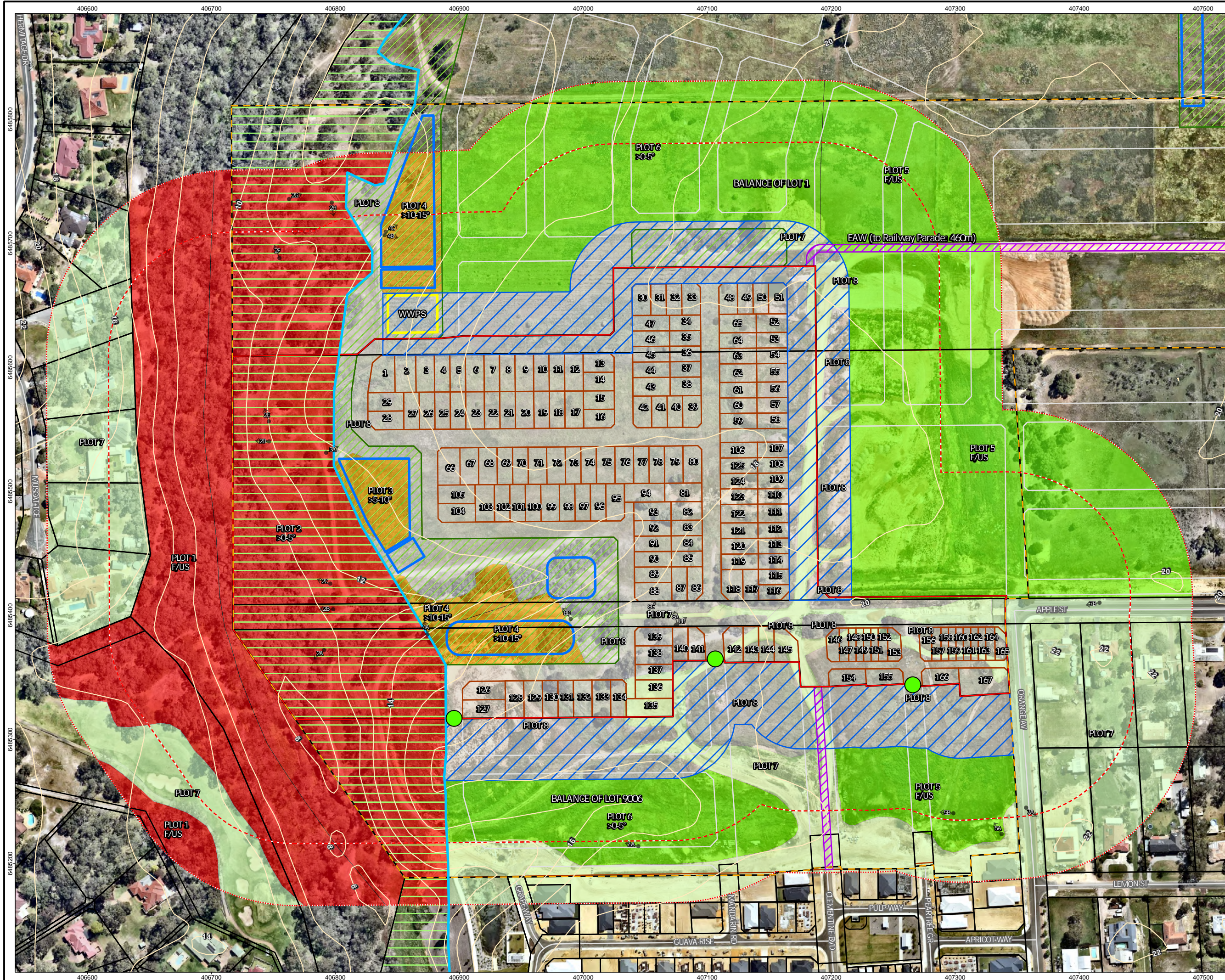
### 3.1.4 Summary of inputs

Figure 3 illustrates the anticipated post-development vegetation classifications and exclusions following completion of subdivision works and implementation of low threat landscaping throughout the project area and adjacent 150 m. The post-development vegetation classifications/exclusions and effective slope are summarised in Table 3.

**Table 3: Summary of post-development vegetation classifications, exclusions and effective slope**

| Vegetation plot | Vegetation classification | Effective slope   | Comments  |
|-----------------|---------------------------|-------------------|---|
| 1               | Class A Forest            | Flat/upslope (0°) | Existing forest vegetation situated west of the Ellen Brook watercourse.  |
| 2               | Class A Forest            | Downslope >0–5°   | Existing forest vegetation situated east of the Ellen Brook watercourse.<br>Includes remaining portions of proposed Foreshore Reserve which have potential to be revegetated and/or unmanaged.<br>Predominant effective slope is >0-5°. |
| 3               | Class C Shrubland         | Downslope >5–10°  | Future drainage basin within foreshore POS, proposed to be planted with sedges and low shrubs.  |
| 4               | Class C Shrubland         | Downslope >10–15° | Future drainage basin within foreshore POS, proposed to be planted with sedges and low shrubs.  |
| 5               | Class G Grassland         | Flat/upslope (0°) | Temporary grassland hazards within future subdivision stages to the north and south (areas where effective slope is slightly downslope).  |
| 6               | Class G Grassland         | Downslope >0–5°   | Temporary grassland hazards within future subdivision stages to the east (areas where effective slope is flat/upslope).   |

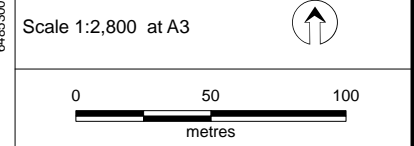
| Vegetation plot | Vegetation classification  | Effective slope | Comments  |
|-----------------|--|-----------------|---|
| 7               | Excluded – Non-vegetated and Low threat (Clause 2.2.3.2 [e] and [f])         | N/A             | Existing areas of low threat land: <ul style="list-style-type: none"> <li>• Surrounding rural-residential and residential properties</li> <li>• Existing roads</li> <li>• Areas cleared during construction of adjacent stages of Clementine Estate.</li> </ul> |
| 8               | Modified to non-vegetated and/or low threat (Clauses 2.2.3.2 [e] and/or [f]) | N/A             | Areas proposed to be modified to and maintained in a low threat state: <ul style="list-style-type: none"> <li>• Proposed roads and residential lots</li> <li>• Proposed low threat POS</li> <li>• Proposed 50 m wide low threat staging buffers.</li> </ul>     |



- Legend**
- Project area
  - 100m assessment area
  - 150m assessment area
  - Cadastral boundary
  - Subdivision boundary
  - WWPS
  - Indicative drainage basins
  - Proposed POS
  - 50m wide low threat staging buffer
  - 6m wide EAW
  - Foreshore reserve
  - Foreshore envelope
- Vegetation classification**
- Class A Forest
  - Class C Shrubland
  - Class G Grassland
  - Clause 2.2.3.2 (e) & (f)
  - Area to be modified to non-vegetated and low threat state
  - Proposed lot layout
  - Concept subdivision layout
  - Photo point directions
  - Topographic contours (mAHD)
  - Minor road
  - Temporary turnaround



Job No: 63805  
 Client: Satterley Property Group  
 Version: A      Date: 07-Nov-2023  
 Drawn by: jcrute      Checked By: LR



Coord. Sys. GDA2020 MGA Zone 50

**Clementine Estate  
 Northern Precinct Stages 10 and 12  
 Upper Swan, WA**

**POST-DEVELOPMENT  
 VEGETATION CLASSIFICATION  
 AND EFFECTIVE SLOPE**

**FIGURE 3**

### 3.2 Assessment outputs

The results of the BAL contour assessment are detailed in Table 4 and illustrated in Figure 4.

The highest BAL applicable to the external boundary of the proposed lots is BAL-FZ, which applies to proposed Lots 126 and 127 only. This rating results from the precautionary classification of grassed areas of proposed foreshore reserve as Class A Forest. The subdivision has been designed to enable future buildings within Lots 126 and 127 to be constructed within areas of BAL-29 or lower by:

- providing a perimeter road at the development/reserve interface,
- orientating the lots in an east-west direction, and
- providing for an elongated lot depth of 34.5 m.

A restrictive covenant will be placed on the title of the two affected lots to ensure development is limited to areas of BAL-29 or below.

In this regard, the BAL contour assessment demonstrates that the proposed subdivision has capacity for all future habitable development to be located in areas of BAL-29 or below. The BAL contour assessment will be revised at subdivision clearance stage to incorporate final landscaping design.

**Table 4: BAL contour assessment results**

| Plot                                   | Vegetation classification  | Effective slope   | Separation distance (to nearest lot boundary) | Highest BAL (to lot boundary) | APZ setback                    | Highest BAL (with APZ setback) |
|--|--|-------------------|---|-------------------------------|--------------------------------|--------------------------------|
| 1                                      | Class A Forest   | Flat/upslope (0°) | >100 m  | <b>BAL-Low</b>                | N/A                            | N/A                            |
| 2                                      | Class A Forest   | Downslope >0–5°   | 13.2 m  | BAL-FZ                        | 13.8 m from west lot boundary* | <b>BAL-29</b>                  |
| 3                                      | Class C Shrubland  | Downslope >5–10°  | 24 m  | <b>BAL-19</b>                 | N/A                            | N/A                            |
| 4                                      | Class C Shrubland  | Downslope >10–15° | 13 m  | <b>BAL-29</b>                 | N/A                            | N/A                            |
| 5                                      | Class G Grassland  | Flat/upslope (0°) | 50 m  | <b>BAL-Low</b>                | N/A                            | N/A                            |
| 6                                      | Class G Grassland  | Downslope >0–5°   | 50 m  | <b>BAL-Low</b>                | N/A                            | N/A                            |
| 7                                      | Excluded – Non-vegetated and Low threat (Clause 2.2.3.2 [e] and [f])         | N/A               | N/A   | N/A                           | N/A                            | N/A                            |
| 8                                      | 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                            | N/A                            |
| <b>Highest BAL (with APZ setbacks)</b> |  |                   |   |                               |                                | <b>BAL-29</b>                  |

\*Applies to Lots 126 and 127 only

## 4. Identification of bushfire hazard issues

### 4.1 Bushfire context

The predominant bushfire hazard to the project area occurs to the west and is associated with dense forest and scrub vegetation along the Ellen Brook watercourse. While the foreshore vegetation forms a relatively narrow band which will act to generally moderate bushfire behaviour, there is potential for the corridor to support fire spread from larger areas of vegetation, including the Ellen Brook Nature Reserve, located to the east/northeast, and Walyunga National Park located further east of this, especially under predominant summer morning easterly wind conditions. The Ellen Brook Nature Reserve was directly impacted by the February 2021 Wooroloo bushfire, and spotting from the fire within this vegetation is known to have reached the foreshore reserve located within the northern portion of the Northern Precinct (to the north of the project area).

Vegetation within the Ellen Brook foreshore reserve has been classified as Class A Forest due to the existing tiered vegetation structure as well as potential for revegetation works to be carried out by the DBCA, including within currently grassed areas, at a later stage. BAL-29 separation between proposed residential development and this vegetation will be provided by low threat areas of Foreshore POS fringing the foreshore reserve, consisting of landscaped irrigated lawn areas and managed landscaping, as well as the proposed 13.2 m wide perimeter road along the west and northern boundaries of the subdivision site. Landscaped batters to Class C Shrubland classification and drainage basins vegetated to maximum Class C Shrubland status, will also be strategically sited within the foreshore reserve and POS to ensure BAL-29 can be achieved for the interfacing habitable buildings.

Potential impacts from temporary grassland hazards surrounding the project area will be mitigated through provision of a 50 m wide low threat staging buffer, to be maintained until the adjoining stages of subdivision are developed.

The Southern Precinct is expected to be fully developed prior to construction of the Northern Precinct and there are substantial areas of large residential lots to the southeast. In this regard, bushfire threat from the south is negligible.

The DFES Career fire station located at Ellenbrook, and Volunteer fire stations located at East Swan and West Swan, are expected to provide a best case emergency suppression response time of 15 minutes should a bushfire threaten development within the project area.

It is acknowledged that the bushfire risk to the proposed development posed by these hazards can be appropriately managed through the bushfire mitigation measures proposed within this BMP, as discussed below and in Section 5.

### 4.2 Bushfire hazard issues

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

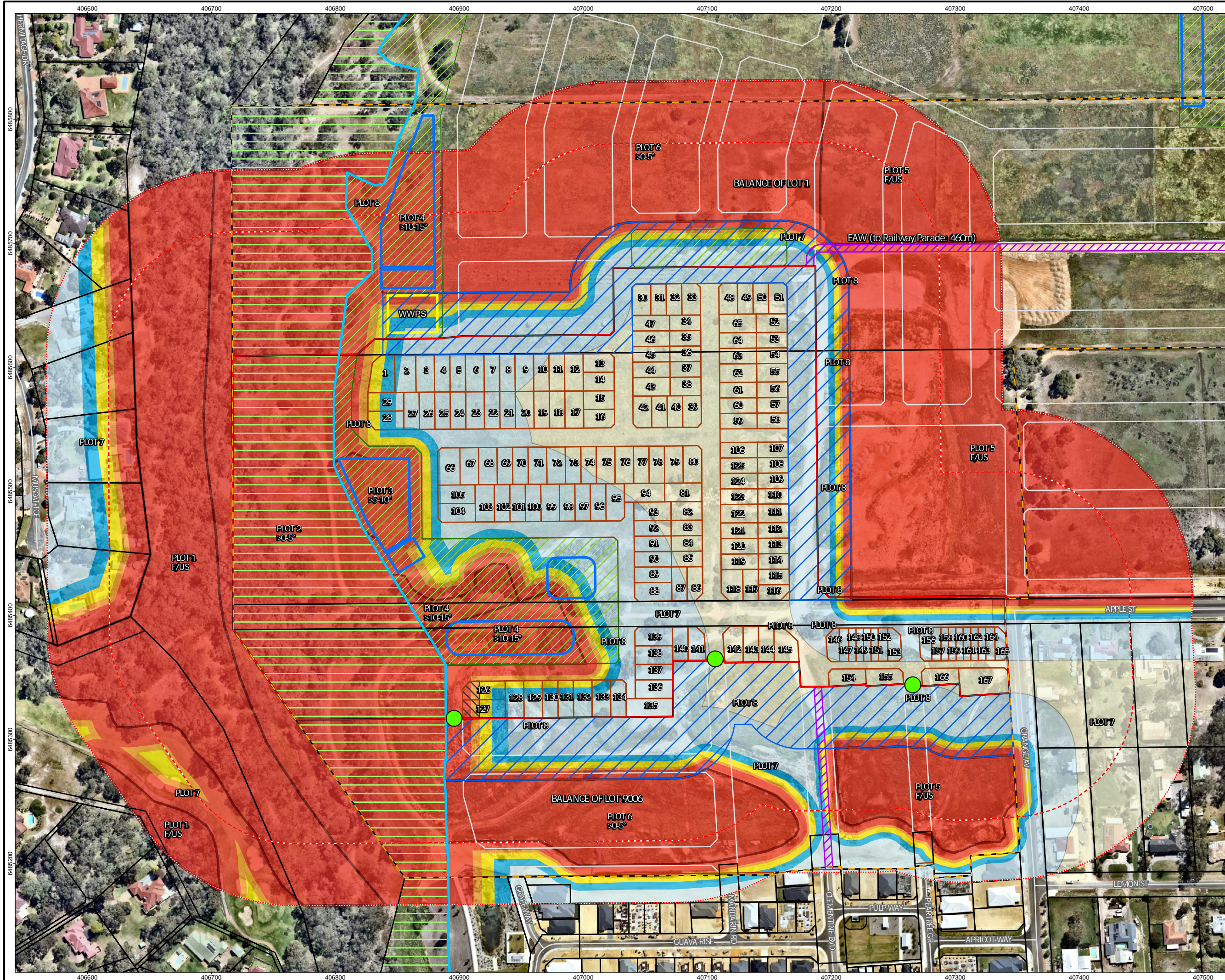
1. The project area is located within a bushfire prone area and subject to a BAL above BAL-Low due to the surrounding bushfire prone vegetation hazards and therefore requires an assessment against the bushfire protection criteria of the Guidelines in accordance with Policy Measure 6.4 of SPP 3.7.
2. The BAL Contour assessment identifies that future habitable development within all proposed lots has capacity to achieve BAL-29, with the majority of lots being able to achieve BAL-12.5 or BAL-Low.

The western portion of two lots (Lots 126 and 127) are subject to BAL-40/FZ impacts. Mandatory APZ setbacks will be applied to these lots to ensure that all habitable development is restricted to areas of BAL-29 or below.

3. Future habitable development within a designated bushfire prone area requires a bushfire construction response in accordance with AS 3959 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.
4. 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. If development is staged, vehicular access arrangements will also need to ensure that all occupiers and visitors are provided with at least two vehicular access routes at all times. Potential staging matters are discussed as key management measures in Section 5.3.
5. The project area will be accessed by two connections to the public road network, approximately 40 m apart (Orange Avenue and Apple Avenue). Two EAWs are proposed to provide an alternative means of access/egress to the northeast and south and to ensure the subdivision is provided with at least two different access routes to two suitable destinations.
6. Since Stages 10, 12 and 13 do not directly abut an existing developed subdivision area, several temporary (compliant) no-through roads will exist at the southern development interface, until they are constructed through to join future roads to the south. Temporary turnaround areas will be provided to enable emergency services and other vehicles to turn around safely.
7. Given the surrounding vegetation hazards, access will be required at the site perimeter to facilitate a direct firefighter suppression response. This will be achieved by provision of the proposed public perimeter road and a network of 3 m wide trafficable paths within the Foreshore Reserve and POS.
8. The project area requires a fire water supply that is appropriate for the scale and size of the development. This will be provided by extension of the surrounding water reticulation scheme.

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.

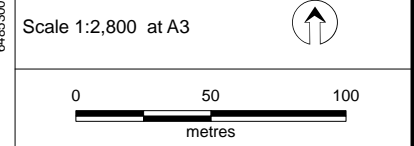
Bushfire mitigation measures designed to address the abovementioned bushfire hazard issues and achieve compliance with the bushfire protection criteria of the Guidelines are described in Section 5 of this BMP.



- Legend**
- Project area
  - 100m assessment area
  - 150m assessment area
  - Cadastral boundary
  - Subdivision boundary
  - WWPS
  - Indicative drainage basins
  - Proposed POS
  - 50m wide low threat staging buffer
  - 6m wide EAW
  - Foreshore reserve
  - Classified vegetation
  - APZ setback
- BAL contours**
- BAL FZ
  - BAL 40
  - BAL 29
  - BAL 19
  - BAL 12.5
  - BAL Low
- Foreshore envelope
  - Proposed lot layout
  - Concept subdivision layout
  - Minor road
  - Temporary turnaround



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 Version: A Date: 07-Nov-2023  
 Drawn by: jcrute Checked By: LR



Coord. Sys. GDA2020 MGA Zone 50

**Clementine Estate  
 Northern Precinct Stages 10 and 12  
 Upper Swan, WA**

**BAL CONTOUR MAP**

**FIGURE 4**

## 5. Assessment against the bushfire protection criteria

### 5.1 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 5.

**Table 5: Compliance with the bushfire protection criteria of the Guidelines (Elements 1 – 4)**

| Bushfire protection criteria        | Performance Principle   | Method of compliance<br>Acceptable solutions   | Statement of development compliance   | Compliance achieved |
|-------------------------------------|---|--|---|---------------------|
| <b>Element 1: Location</b>          | <b>P1</b> – 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.  | <b>A1.1 Development location</b><br><br>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.   | The BAL contour assessment (see Figure 4 and Table 4) indicates that all proposed lots (aside from Lots 126 and 127) can achieve BAL-29 or lower.<br><br>For Lots 126 and 127 (which are subject to BAL-40/FZ), the lots have been designed with appropriate orientation and depth such that habitable development can be practically constructed in areas of BAL-29 or below (see below).  | ✓                   |
| <b>Element 2: Siting and design</b> | <b>P2</b> – The siting and design of the strategic planning proposal, subdivision or development application, including roads, paths and landscaping, is appropriate to the level of bushfire threat that applies to the site. The proposal incorporates a defensible 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. | <b>A2.1 Asset Protection Zone</b><br><br>Every habitable building is surrounded by, and every proposed lot can achieve, an APZ depicted on submitted plans, which meets the requirements set out in Schedule 1.  | The following APZs are proposed to ensure all habitable buildings can be situated in BAL-29 or below (see Figure 4): <ul style="list-style-type: none"> <li>• 50 m wide low threat staging buffers, to provide separation between lots at the outer edge of the Stage 10 area and temporary grassland hazards,</li> <li>• 13.8 m APZ setback from the western boundary of Lots 126 and 127, to ensure future habitable development is limited to areas of BAL-29 or below, and</li> <li>• 13.2m wide perimeter roads at the interface between Foreshore Reserve and POS and residential lots.</li> </ul> The abovementioned APZs are to be subject to ongoing management in accordance with standards outlined in the Guidelines (see 0). | ✓                   |
| <b>Element 3: Vehicular access</b>  | <b>P3i</b> – 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.   | <b>A3.1 Public roads</b><br><br><i>The minimum requirements under this acceptable solution are applicable to all proposed and existing public roads.</i><br><br>Public roads are to meet the minimum technical requirements in Table 6, Column 1.<br><br>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. | All public roads will be constructed to the relevant technical requirements of the Guidelines (see Appendix D).   | ✓                   |
|                                     |   | <b>A3.2a Multiple access routes</b><br><br>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).<br><br>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 project area will be provided with multiple access routes to multiple suitable destinations, as follows: <ul style="list-style-type: none"> <li>• The project area will be directly accessed by Apple Street from the east. Apple Street leads to: <ul style="list-style-type: none"> <li>◦ Railway Parade, which provides access to the townsite of Bullsbrook approx. 11 km to the north and Great Northern Highway approx. 2 km to the south.</li> <li>◦ Great Northern Highway, approx. 1 km to the east. Great Northern Highway facilitates access to suitable destinations to</li> </ul> </li> </ul>  | ✓                   |

| Bushfire protection criteria | Performance Principle   | Method of compliance  | Statement of development compliance   | Compliance achieved |
|------------------------------|---|---|---|---------------------|
|                              |   | <b>Acceptable solutions</b>   |   |                     |
|                              |   | <p>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:</p> <ul style="list-style-type: none"> <li>the no-through road travels towards a suitable destination; and</li> <li>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.</li> </ul>   | <p>the north (e.g. Bullsbrook) and south (e.g. Upper Swan, Middle Swan).</p> <ul style="list-style-type: none"> <li>The project area will also be directly accessed by Orange Avenue, along the eastern project area boundary, which provides access north to Apple Street (and the access options outlined above) and southeast to Railway Parade (also discussed above).</li> <li>A temporary 460 m long EAW will be provided from the northeast corner of the project area to Railway Parade in the east.</li> <li>A further temporary 140 m long EAW will be provided to connect the southern portion of the project area with Clementine Boulevard, enabling access/egress into the Clementine Estate Southern Precinct and further afield via the public road network.</li> </ul>   |                     |
|                              |   | <p><b>A3.2b Emergency access way</b></p> <p><i>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.</i></p> <p>An emergency access way is to meet all the following requirements:</p> <ul style="list-style-type: none"> <li>requirements in Table 6, Column 2;</li> <li>provides a through connection to a public road;</li> <li>be no more than 500 metres in length; and</li> <li>must be signposted and if gated, gates must open the whole trafficable width and remain unlocked.</li> </ul>   | <p>Two temporary EAWs are proposed as follows:</p> <ul style="list-style-type: none"> <li>Approx 460 m long EAW to connect the northeast corner of the project area with Railway Parade, in the east.</li> <li>Approx. 140 m long EAW to connect the southern portion of the project area with Clementine Boulevard, and the Southern Precinct.</li> </ul> <p>The two proposed temporary EAWs are to be constructed to the relevant technical requirements of the Guidelines (see Appendix D) and will need to be signposted, with gates kept unlocked at all times. The developer will be responsible for maintaining the EAWs until decommissioned when the surrounding public roads are constructed, and two suitable public access routes can be provided.</p>  | ✓                   |
|                              |   | <p><b>A3.3 Through-roads</b></p> <p>All public roads should be through-roads. No-through roads should be avoided and should only be considered as an acceptable solution where:</p> <ul style="list-style-type: none"> <li>it is demonstrated that no alternative road layout exists due to site constraints; and</li> <li>the no-through road is a maximum length of 200 metres to an intersection providing two-way access, unless it satisfies the exemption provisions in A3.2a of this table.</li> </ul> <p>A no-through road is to meet all the following requirements:</p> <ul style="list-style-type: none"> <li>requirements of a public road (Table 6, Column 1); and</li> <li>turn-around area as shown in Figure 24.</li> </ul> | <p>Three temporary no-through roads are proposed at the southern project area interface. These roads will be constructed to provide through access to the Southern Precinct on future development of the balance of Lot 9006. The two no-through roads closest to Orange Avenue are minor in nature, servicing 0 – 2 lots each (depending on where the lot entry is situated). The no-through road adjacent to the foreshore reserve is approx. 195 m from an intersection providing two potential access routes to the furthest lot (Lot 127). It should be noted that the no-through portion of the road will not be located adjacent to forest as depicted in Figure 3, as this classification is precautionary only. The current classification of adjoining vegetation is Class G Grassland, which will remain for the tenure of the temporary no-through road. All three temporary no-through roads will be provided with a temporary turn around area.</p> <p>Clementine Boulevard is also a temporary no-through road, however, will be connected through to the south by an EAW, as discussed above.</p> <p>The proposed temporary no-through roads will achieve compliance with all relevant requirements of the Guidelines (see Appendix D).</p> | ✓                   |
|                              | <p><b>P3ii</b> – The design of vehicular access and egress provides:</p> <ul style="list-style-type: none"> <li>access and egress for emergency service vehicles while allowing the community to evacuate;</li> <li>a defensible space for emergency services personnel on the interface</li> </ul> | <p><b>A3.4a Perimeter roads</b></p> <p>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:</p> <ul style="list-style-type: none"> <li>separating areas of classified vegetation under AS3959, which adjoin the subject site, from the proposed lot(s); and</li> </ul>   | <p>Perimeter roads are proposed at all permanent interfaces between Foreshore Reserve or POS, and residential lots. The roads will be constructed to the relevant technical requirements of the Guidelines (see Appendix D).</p>  | ✓                   |

| Bushfire protection criteria | Performance Principle   | Method of compliance<br>Acceptable solutions   | Statement of development compliance   | Compliance achieved |
|------------------------------|---|--|---|---------------------|
|                              | <ul style="list-style-type: none"> <li>between classified vegetation and development site; and</li> <li>hazard separation between classified vegetation and the subject site to reduce the potential radiant heat that may impact a lot(s).</li> </ul>  | <ul style="list-style-type: none"> <li>removing the need for battle-axe lots that back onto areas of classified vegetation.</li> </ul> <p>A perimeter road is to meet the requirements contained in Table 6, Column 1.</p> <p>A perimeter road may not be required where:</p> <ul style="list-style-type: none"> <li>the adjoining classified vegetation is Class G Grassland;</li> <li>lots are zoned for rural living or equivalent;</li> <li>it is demonstrated that it cannot be provided due to site constraints; or</li> <li>all lots have frontage to an existing public road.</li> </ul>   |   |                     |
|                              | <p><b>P3iii</b> – Vehicular access is provided which allows:</p> <ul style="list-style-type: none"> <li>access and egress for emergency service vehicles;</li> <li>defendable space for emergency services</li> <li>personnel on the interface between classified vegetation and development; and</li> <li>hazard separation between classified vegetation and the site to reduce the potential radiant heat that may impact a lot(s).</li> </ul> | <p><b>A3.4b Fire service access route</b></p> <p><i>Where proposed lots adjoin classified vegetation under AS3959 (excluding Class G Grassland), 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.</i></p> <p>A fire service access route is to meet all the following requirements:</p> <ul style="list-style-type: none"> <li>requirements in Table 6, Column 3;</li> <li>be through-routes with no dead-ends;</li> <li>linked to the internal road system at regular intervals, every 500 metres;</li> <li>must be signposted;</li> <li>no further than 500 metres from a public road;</li> <li>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</li> <li>turn-around areas designed to accommodate type 3.4 fire appliances and to enable them to turn around safely every 500 metres.</li> </ul> | <p>As discussed under A3.4a, the subdivision design includes perimeter roads at all permanent external boundaries of the subdivision area. The only interface that is not provided with perimeter access is along the southern boundary where staging boundaries have necessitated an interface between lots and grassland vegetation. A 50 m wide low threat staging buffer will be provided around the lots, which will ultimately be bordered by future residential development. In addition, the relatively small size of the lots will enable a fire suppression response to be carried out from the proposed internal roads and firebreaks installed within the balance land will enable access to the rear. In this regard, fire service access routes (FSARs) are not considered to be required for the proposed development.</p> <p>Three meter wide dual use paths for service and emergency vehicle access will be provided within the Foreshore POS and depicted on the future Landscape Plan, as discussed in Section 5.3.9.</p> | ✓                   |
|                              | <p><b>P3iv</b> – Vehicular access is provided which allows emergency service vehicles to directly access all habitable buildings and water supplies and exit the lot without entrapment.</p>  | <p><b>A3.5 Battle-axe access legs</b></p> <p><i>Where it is demonstrated that a battle-axe cannot be avoided due to site constraints, it can be considered as an acceptable solution.</i></p> <p>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.</p> <p>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:</p> <ul style="list-style-type: none"> <li>requirements in Table 6, Column 4; and</li> <li>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).</li> </ul>  | <p>No battle-axes are proposed as part of the subdivision and the project area is not serviced by an existing battle-axe.</p>   | N/A                 |
|                              |   | <p><b>A3.6 Private driveways</b></p> <p>There are no private driveway technical requirements where the private driveway is:</p> <ul style="list-style-type: none"> <li>within a lot serviced by reticulated water;</li> <li>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</li> </ul>  | <p>The proposed lots are of size where all future habitable development will be located within 50 m of a public road. Any private driveway compliance requirements will be addressed at DA stage.</p>   | N/A                 |

| Bushfire protection criteria | Performance Principle  | Method of compliance  | Statement of development compliance   | Compliance achieved |
|------------------------------|--|---|---|---------------------|
|                              |  | <p><b>Acceptable solutions</b></p> <ul style="list-style-type: none"> <li>accessed by a public road where the road speed limit is not greater than 70 km/h.</li> </ul> <p>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:</p> <ul style="list-style-type: none"> <li>requirements in Table 6, Column 4;</li> <li>passing bays every 200 metres with a minimum length of 20 metres and a minimum</li> <li>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</li> <li>turn-around area as shown in Figure 28 and within 30 metres of the habitable building.</li> </ul>  |   |                     |
| <b>Element 4: Water</b>      | No performance principle applies   | <p><b>A4.1 Identification of future water supply</b></p> <p>Evidence that a reticulated or sufficient non-reticulated water supply for bushfire fighting can be provided at the subdivision and/or development application stage, in accordance with the specifications of the relevant water supply authority or the requirements of Schedule 2.</p> <p>Where the provision of a strategic water tank(s) is required a suitable area within a road reserve or a dedicated lot the location should be identified, should be identified on the structure plan, to the satisfaction of the local government.</p>  | A4.1 is applicable to strategic planning applications only.   | N/A                 |
|                              | <p><b>P4 – Provide a permanent water supply that is:</b></p> <ul style="list-style-type: none"> <li>sufficient and available for firefighting purposes;</li> <li>constructed from non-combustible materials (e.g. steel), or able to maintain its integrity throughout a bushfire; and</li> <li>accessible, with legal access for maintenance and re-filling by tankers and emergency service vehicles.</li> </ul> | <p><b>A4.2 Provision of water for firefighting purposes</b></p> <p>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:</p> <ul style="list-style-type: none"> <li>The provision of a water tank(s), in accordance with the requirements of Schedule 2; and</li> <li>Where the provision of a strategic water tank(s) is applicable, then the following requirements apply: <ul style="list-style-type: none"> <li>land to be ceded free of cost to the local government for the placement of the tank(s);</li> <li>the lot or road reserve where the tank is to be located is identified on the plan of subdivision;</li> <li>tank capacity, construction, and fittings, provided in accordance with the requirements of Schedule 2; and</li> <li>a strategic water tank is to be located no more than 10 minutes from the subject site (at legal road speeds).</li> </ul> </li> </ul> <p>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.</p> | The proposed subdivision will be provided with a reticulated water supply in accordance with Water Corporation DS 63 standards. | ✓                   |

## 5.2 Compliance with Element 5

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

## 5.3 Specific and additional management measures

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.

### 5.3.1 Temporary staging buffers

#### External staging buffer

As the proposed subdivision is part of a staged development within the Northern Precinct, temporary vegetation interfaces are likely to be created due to the presence of grassland that will not be cleared until on ground works commence for the adjoining stages.

In order to ensure there are no temporary BAL impacts from classified vegetation within the adjoining stages, a 50 m wide low threat staging buffers are to be established around the northern, eastern and southern boundaries of the project area to reduce the BAL impacts from temporary Class G Grassland hazards to BAL-Low. The external low-threat staging buffer will require ongoing management of grassland at 100 mm or below.

The proposed low threat staging buffers are depicted in Figure 3 and Figure 4.

#### Internal staging buffers (due to internal staging)

If development within the project area itself is staged, clearing in advance will need to occur to ensure building construction is not inhibited by a temporary vegetation extent located within adjacent land yet to be cleared. This can be achieved by ensuring that each approved stage subject to construction is surrounded by an on-site cleared or low threat buffer to development. The buffer width will be 50 m where the surrounding vegetation is Class G Grassland and 100 m for all higher classifications of vegetation. The buffers will not extend into any vegetation proposed to be retained as part of an unmanaged or rehabilitated Foreshore Reserve/POS.

#### Maintenance of low threat buffers

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.

### 5.3.2 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 different access routes to two suitable destinations 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.

### 5.3.3 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 City via continuation of the current verge management regime.

### 5.3.4 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 0) and will involve slashing/mowing of grassland and weeds to height of less than 100 mm.

### 5.3.5 Enforcement of mandatory BAL-29 APZ setbacks on lots with areas of BAL-40 and/or BAL-FZ

Development of habitable buildings within portions of lots impacted by areas of BAL-40 and/or BAL-FZ (i.e. Lots 126 and 127) will be restricted via application of one or a combination of the following enforcement mechanisms, at the discretion of the appropriate decision-making authority:

1. Mandatory Residential Design Code (R-Code setbacks), where the setbacks are sufficient to cater for the required BAL-29 APZ setback.
2. Application of a restrictive covenant on title via the following subdivision condition:

*'A restrictive covenant to the benefit of the local government, pursuant to section 129BA of the Transfer of Land Act 1893, is to be placed on the certificate(s) of title of the proposed lot(s) advising of the existence of a restriction on the use of the land within areas that have been assessed as BAL-40 or BAL-Flame Zone. Notice of this restriction is to be included on the diagram or plan of survey (deposited plan). The restrictive covenant is to state as follows: 'No habitable buildings are to be built within areas identified as BAL-40 or BAL-Flame Zone.'*

3. Preparation of a Local Development Plan (LDP) as a condition of subdivision approval.

### 5.3.6 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 City.

### 5.3.7 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 their 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).*

### 5.3.8 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 the bushfire specific building construction requirements of AS 3959, where the building is located within the designated bushfire prone area.

### 5.3.9 Emergency and service vehicle access within the Foreshore Reserve/POS

A network of 3 m wide multi-purpose paths/roadways will be provided within the Foreshore Reserve/POS to provide vehicular access to this area for the purposes of maintaining the foreshore and engaging in a direct fire suppression response at the vegetation interface if required. The trafficable path will connect to the development at regular intervals as indicated on the Landscape

Principles Plan (Appendix A) and will be depicted on a future detailed Landscape Plan. The trafficable path will be managed by City of Swan.

#### **5.3.10 BMP compliance report**

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

#### **5.3.11 Landscape Plan**

A detailed Landscape Plan will be prepared at subdivision clearance stage to demonstrate that the landscaping assumptions made within this BMP will be implemented as intended. The Landscape Plan will need to demonstrate the extent and structure of revegetation within the Foreshore POS is consistent with a low threat outcome as per with Clause 2.2.3.2 of AS 3959 and areas of drainage in accordance with a Class C Shrubland classification. It is anticipated that the BAL contour map will need to be revised to consider final landscaping (as well as earthworks) design at subdivision clearance stage.

Responsibilities for establishment of low threat landscaping is discussed in Section 6.

#### **5.3.12 Compliance with annual firebreak notice**

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

The City of Swan Firebreak Notice requires grassland to be maintained to a height of no greater than 10 cm on lots up to 2.5 ha. These provisions apply to all proposed residential lots.

The balance lots are between 3.27 ha and 17.25 ha in area. The firebreak notice requires 3 m wide by 4 m high firebreaks within 5 m of the external property boundaries with grass to be slashed to a maximum height of 10 cm immediately adjacent to firebreaks for a minimum width of 3 m.

The firebreak notice includes provisions to ensure future landowners comply with the requirements of the firebreak notice in addition to requirements of this BMP as follows:

*“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.”*

## 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 6 to drive implementation of all bushfire management works associated with this BMP.

**Table 6: Responsibilities for implementation and management of the bushfire measures**

| Implementation/management table         |   |
|---|---|
| Developer – prior to issue of titles    |   |
| No.                                     | Implementation action   |
| 1                                       | Construct (or have works bonded in accordance with civil engineering plans) the public roads to the standards stated in the BMP.  |
| 2                                       | Construct (or have works bonded in accordance with civil engineering plans) the temporary no-through roads and turn around areas to the standards stated in the BMP.                            |
| 3                                       | Construct (or have works bonded in accordance with civil engineering plans) the reticulated water supply to the standards stated in this BMP.   |
| 4                                       | Construct the temporary EAWs to the standards stated in the BMP.  |
| 5                                       | Prepare a detailed Landscape Plan for adjacent Foreshore POS.   |
| 6                                       | Establish low threat landscaping within the Foreshore POS to the standards stated in the BMP, and in accordance with the future detailed Landscape Plan (as per item 5).                        |
| 7                                       | Modify the project area and 50 m wide low threat external staging buffers to a low threat state as per the standards stated in this BMP.  |
| 8                                       | Enforce APZ setbacks via R-codes, restrictive covenants on title and/or LDPs (method of enforcement to be determined by relevant decision maker) for lots affected by BAL-40/FZ.                |
| 9                                       | Comply with the Shire’s annual firebreak notice, as amended.  |
| 10                                      | Undertake a BMP compliance assessment.  |
| Developer – until sale/transfer of lots |   |
| No.                                     | Implementation action   |
| 1                                       | Maintain the temporary EAWs to the standards stated in the BMP.   |
| 2                                       | Maintain areas of low threat landscaping within the Foreshore POS to the standards stated in the BMP, and in accordance with the future detailed Landscape Plan.                                |
| 3                                       | Maintain residential lots and 50 m wide low threat external staging buffers to a low threat state as per the standards stated in this BMP.  |
| 4                                       | 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. |
| 5                                       | Maintain verges in a low threat minimal fuel condition as per Clause 2.2.3.2 (f) of AS 3959, until handover.  |
| 6                                       | Comply with the Shire’s annual firebreak notice, as amended.  |

| Implementation/management table                                 |   |
|---|---|
| Landowner/occupier – prior to building construction and ongoing |   |
| No.   | Implementation action   |
| 1   | Maintain entirety of residential lots in a low threat state to achieve exclusion Clause 2.2.3.2 (f) of AS 3959, including maintenance of grassland and weeds to height of less than 100 mm until developed to a permanent low fuel state. |
| 2   | Comply with the relevant provisions of the City’s annual firebreak notice.  |
| Local government – ongoing management                           |   |
| No.   | Implementation action   |
| 1   | Maintain road verges 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.  |
| 2   | Maintain low threat landscaped portions of the Foreshore POS in a low threat state.   |

## 7. Limitations

This report has been prepared for use by the client who has commissioned the works in accordance with the project brief only, and has been based in part on information obtained from the client and other parties.

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.

JBS&G accepts no liability for use or interpretation by any person or body other than the client who commissioned the works. This report should not be reproduced without prior approval by the client, or amended in any way without prior approval by JBS&G, and should not be relied upon by other parties, who should make their own enquires.

Sampling and chemical analysis of environmental media is based on appropriate guidance documents made and approved by the relevant regulatory authorities. Conclusions arising from the review and assessment of environmental data are based on the sampling and analysis considered appropriate based on the regulatory requirements.

Limited sampling and laboratory analyses were undertaken as part of the investigations undertaken, as described herein. Ground conditions between sampling locations and media may vary, and this should be considered when extrapolating between sampling points. Chemical analytes are based on the information detailed in the site history. Further chemicals or categories of chemicals may exist at the site, which were not identified in the site history and which may not be expected at the site.

Changes to the subsurface conditions may occur subsequent to the investigations described herein, through natural processes or through the intentional or accidental addition of contaminants. The conclusions and recommendations reached in this report are based on the information obtained at the time of the investigations.

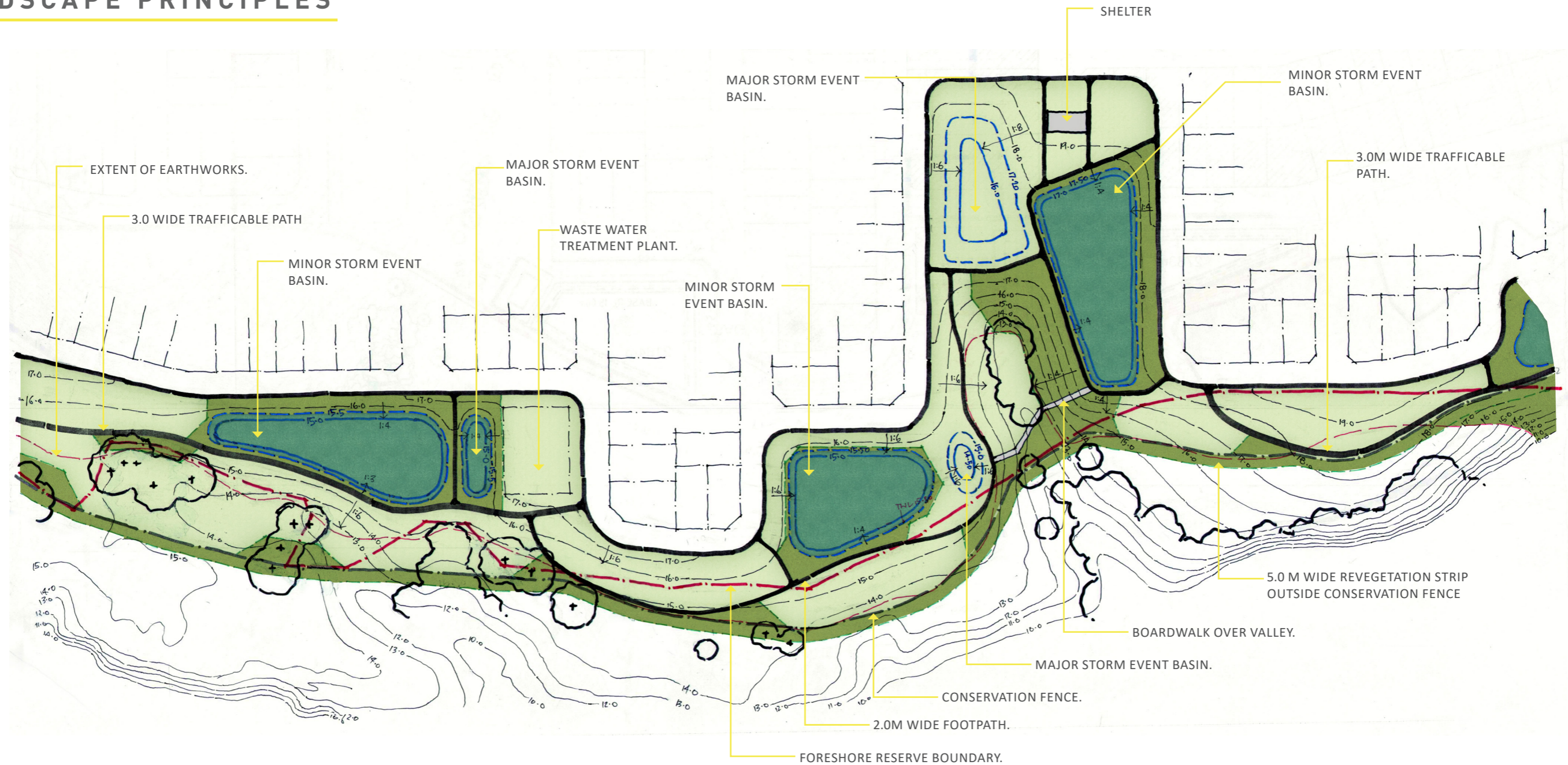
This report does not provide a complete assessment of the environmental status of the site, and it is limited to the scope defined herein. Should information become available regarding conditions at the site including previously unknown sources of contamination, JBS&G reserves the right to review the report in the context of the additional information.

## 8. References





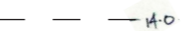

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## Appendix A Landscape Principles Plan

# LANDSCAPE PRINCIPLES



## LEGEND

-  IRRIGATED DRAINAGE BASIN PLANTED WITH LOW SEDGES & SHRUBS (1.0M OR LESS IN HEIGHT) TOLERANT OF WINTER WET & SUMMER DRY CONDITIONS, & SCATTERED TREES.
-  IRRIGATED GARDEN BEDS PLANTED WITH LOW SHRUBS & GROUNDCOVERS (0.5M OR LESS IN HEIGHT), & SCATTERED TREES.
-  IRRIGATED TURF PLANTED WITH SCATTERED TREES.
-  EXISTING TREES TO BE RETAINED WHERE POSSIBLE.
-  PROPOSED CONTOURS.
-  EXISTING CONTOURS.

## CLEMENTINE - STAGE 10 LSP AREA FORESHORE RESERVE & POS

PREPARED FOR SATTERLEY PROPERTY GROUP

LANDSCAPE PRINCIPLES PLAN  
SEPTEMBER 2023

JOB NO. 1601002  
1:2000 @ A3

C1.101  
0 20 40 60 80 100m  
REV A





PLAN  
E

**LANDSCAPE ARCHITECTS**  
L1/278 RAILWAY PDE,  
WEST LEEDERVILLE WA 6007  
T: (08) 9388 9566 E: mail@plane.com.au

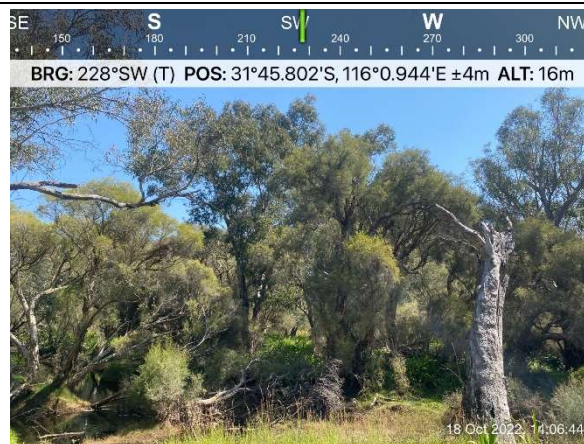
## Appendix B Photos of vegetation plots

## Plot 2

|                                  |                         |   |
|----------------------------------|-------------------------|---|
| <b>Vegetation classification</b> | <b>Pre-development</b>  | Class A Forest, Class D Scrub, Class G Grassland,     |
|                                  | <b>Post-development</b> | Class A Forest (precautionary blanket classification) |

### Description / justification

Existing forest vegetation situated east of the Ellen Brook watercourse. Includes remaining portions of proposed Foreshore Reserve which has potential to be revegetated and/or unmanaged.



**Photo ID: 2a**



**Photo ID: 2b**



**Photo ID: 2c**



**Photo ID: 2d**



**Photo ID: 2e**



**Photo ID: 2f**

|               |  |  |
|---------------|--|--|
| <b>Plot 2</b> |  |  |
| <b>Plot 3</b> |  |  |

|                                  |                         |                            |
|----------------------------------|-------------------------|----------------------------|
| <b>Vegetation classification</b> | <b>Pre-development</b>  | Class G Grassland          |
|                                  | <b>Post-development</b> | Class C Shrubland (>5-10°) |

**Description / justification**

Future drainage basin within foreshore POS, proposed to be planted with sedges and low shrubs.



**Photo ID: 3a**

**Plot 4**

|                                  |                         |                                     |
|----------------------------------|-------------------------|-------------------------------------|
| <b>Vegetation classification</b> | <b>Pre-development</b>  | Class B Woodland, Class G Grassland |
|                                  | <b>Post-development</b> | Class C Shrubland (>10-15°)         |

**Description / justification**

Future drainage basin within foreshore POS, proposed to be planted with sedges and low shrubs.



**Photo ID: 4a**



**Photo ID: 4b**



**Photo ID: 4c**

**Plot 5**

|                                  |                         |                                     |
|----------------------------------|-------------------------|-------------------------------------|
| <b>Vegetation classification</b> | <b>Pre-development</b>  | Class G Grassland                   |
|                                  | <b>Post-development</b> | Class G Grassland (Downslope >0–5°) |

**Description / justification**

Temporary grassland hazards within future subdivision stages to the north and south.



**Photo ID: 5a**



**Photo ID: 5b**

**Plot 6**

|                                  |                         |   |
|----------------------------------|-------------------------|---|
| <b>Vegetation classification</b> | <b>Pre-development</b>  | Class G Grassland                           |
|                                  | <b>Post-development</b> | Class G Grassland (Downslope flat/upslope°) |

**Description / justification**

Temporary grassland hazards within future subdivision stages to the east.



**Photo ID: 6a**

**Plot 7**

|                                  |                         |  |
|----------------------------------|-------------------------|--|
| <b>Vegetation classification</b> | <b>Pre-development</b>  | Excluded – Non-vegetated and Low threat (Clause 2.2.3.2 [e] and [f]) |
|                                  | <b>Post-development</b> | Excluded – Non-vegetated and Low threat (Clause 2.2.3.2 [e] and [f]) |

**Description / justification**

Existing areas of low threat land:

- Surrounding rural-residential and residential properties
- Existing roads
- Areas cleared during construction of adjacent stages of Clementine Estate.



**Photo ID: 7a**



**Photo ID: 7b**

**Plot 8**

|                                  |                         |  |
|----------------------------------|-------------------------|--|
| <b>Vegetation classification</b> | <b>Pre-development</b>  | Class B Woodland, Class G Grassland  |
|                                  | <b>Post-development</b> | Modified to non-vegetated and/or low threat (Clauses 2.2.3.2 [e] and/or [f]) |

**Description / justification**

Areas proposed to be modified to and maintained in a low threat state:

- Proposed roads and residential lots
- Proposed low threat POS
- Proposed 50 m wide low threat staging buffers.



**Photo ID: 8a**



**Photo ID: 8b**

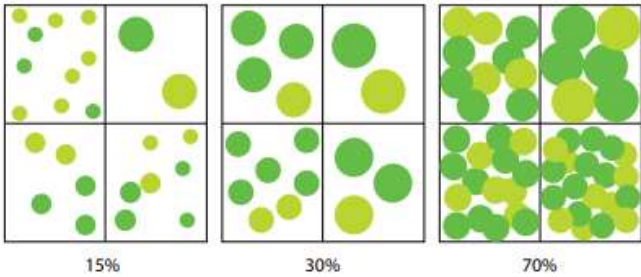


**Photo ID: 8c**



**Photo ID: 8d**

## Appendix C Asset Protection Zone standards and explanatory notes

| Schedule 1: Standards for Asset Protection Zones  |   |
|---|---|
| Object  | Requirement   |
| Fences within the APZ   | <ul style="list-style-type: none"> <li>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).</li> </ul>  |
| Fine fuel load (Combustible, dead vegetation matter <6 millimetres in thickness)  | <ul style="list-style-type: none"> <li>Should be managed and removed on a regular basis to maintain a low threat state.</li> <li>Should be maintained at &lt;2 tonnes per hectare (on average).</li> <li>Mulches should be non-combustible such as stone, gravel or crushed mineral earth or wood mulch &gt;6 millimetres in thickness.</li> </ul>  |
| Trees* (>6 metres in height)  | <ul style="list-style-type: none"> <li>Trunks at maturity should be a minimum distance of six metres from all elevations of the building.</li> <li>Branches at maturity should not touch or overhang a building or powerline.</li> <li>Lower branches and loose bark should be removed to a height of two metres above the ground and/or surface vegetation.</li> <li>Canopy cover within the APZ should be &lt;15 per cent of the total APZ area.</li> <li>Tree canopies at maturity should be at least five metres apart to avoid forming a continuous canopy. Stands of existing mature trees with interlocking canopies may be treated as an individual canopy provided that the total canopy cover within the APZ will not exceed 15 per cent and are not connected to the tree canopy outside the APZ.</li> </ul> <p>Figure 19: Tree canopy cover – ranging from 15 to 70 per cent at maturity</p>  |
| Shrub* and scrub* (0.5 metres to six metres in height). Shrub and scrub >6 metres in height are to be treated as trees. | <ul style="list-style-type: none"> <li>Should not be located under trees or within three metres of buildings.</li> <li>Should not be planted in clumps &gt;5 square metres in area.</li> <li>Clumps should be separated from each other and any exposed window or door by at least 10 metres.</li> </ul>  |
| Ground covers* (<0.5 metres in height. Ground covers >0.5 metres in height are to be treated as shrubs)                 | <ul style="list-style-type: none"> <li>Can be planted under trees but must be maintained to remove dead plant material, as prescribed in 'Fine fuel load' above.</li> <li>Can be located within two metres of a structure, but three metres from windows or doors if &gt;100 millimetres in height.</li> </ul>  |
| Grass   | <ul style="list-style-type: none"> <li>Grass should be maintained at a height of 100 millimetres or less, at all times.</li> <li>Wherever possible, perennial grasses should be used and well-hydrated with regular application of wetting agents and efficient irrigation.</li> </ul>  |

### Schedule 1: Standards for Asset Protection Zones

|                  |   |
|------------------|---|
| 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.<br>The pressure relief valve should point away from the house.<br>No flammable material within six metres from the front of the valve.<br>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 to explanatory notes*

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

### Element 2 Explanatory Notes

#### E2 Managing an Asset Protection Zone (APZ) to a low threat state

An APZ is a low fuel area maintained around a habitable building to increase the likelihood that it will survive a bushfire, by providing a defendable space and reducing the potential for direct flame contact, radiant heat exposure and ember attack.

Vegetation management within an APZ should provide defendable space and be maintained to a low threat state, in perpetuity, in accordance with the requirements outlined in Schedule 1.

The width of an APZ varies with slope and vegetation type, however it should only be as wide as needed to ensure the potential radiant heat impact of a bushfire does not exceed 29kW/m<sup>2</sup> (BAL-29), or 10kW/m<sup>2</sup> where a building is identified for use as an on-site shelter. An APZ is generally not required where a building or development site achieves 29kW/m<sup>2</sup> (BAL-29) or lower in its pre-development state (prior to any vegetation clearing or modification).

An APZ should include an area of defendable space immediately adjoining a building, that is kept free from combustible items and obstructions, within which firefighting operations can be undertaken to defend the structure. Where a lot contains a building envelope, it may not be necessary for the entire building envelope to achieve 29kW/m<sup>2</sup> (BAL-29) as this may result in significant unnecessary clearing. It is recommended that the BMP identifies that a sufficient APZ can be accommodated within the building envelope, with the development site and associated APZ to be determined at the development approval stage.

An APZ should be contained within the boundaries of the lot on which the building is situated, except in instances where it is demonstrated that the vegetation on the adjoining land is managed in a low threat state, as per cl. 2.2.3.2 of AS 3959, such as a road, managed park, rocky outcrop or a water body.

The siting of a habitable building and associated APZ should aim to minimise the clearing of vegetation. The BMP should demonstrate that the proposed APZ has minimised the unnecessary loss of vegetation or potential for conflict with landscape or environmental objectives; and complies with environmental approvals/exemptions (where necessary). A re-design or reduction in lot yield may be necessary to minimise the removal and modification of remnant vegetation.

It is recommended that development be located on flat areas or slopes less than 20 degrees (especially where classified vegetation is located downslope to a building) and away from ridge tops, crests or narrow gullies, as bushfire can spread rapidly in these areas. Circumstances where these locations may be suitable for development to occur include where the land is already cleared, and 29kW/m<sup>2</sup> (BAL-29) or lower can be achieved for the whole development

## Element 2 Explanatory Notes

site without the use of an APZ. To ensure soil stability within an APZ, vegetation removal on slopes exceeding 18 degrees is discouraged.

Fine fuel load should be maintained to less than two tonnes per hectare, however this is often a subjective assessment. Reducing fuel load levels does not necessarily require the removal of existing vegetation. A combination of methods can be utilised to reduce fuel load such as raking, weed removal, pruning, mulching and/or the removal of plant material.

A simple method to estimate fuel load is to roughly equate one tonne of fuel load per hectare as 100 grams per square metre. For example, two tonnes per hectare of leaf litter is roughly 200 grams of leaf litter per square metre and eight tonnes per hectare is roughly 800 grams.

Eucalyptus leaf litter is approximately 100 grams per handful, so two handfuls of litter per square metre will roughly equate to two tonnes per hectare. Different types of fine fuel, like mulch or pine needles may be more or less than a handful, however the 100 grams per square metre rule of thumb can still be used.

The landowner or proponent is responsible for maintaining an APZ in accordance with Schedule 1 - Standards for Asset Protection Zones. Ongoing maintenance of an APZ is usually enforced through the local government firebreak notice issued under section 33 of the Bushfires Act 1954, and/or through a condition of a development approval, which requires the implementation of measures identified within a BMP.

A copy of the firebreak notice and Schedule 1 should be included in a BMP specifically as a how-to guide for the landowner, and to demonstrate to decision-makers that the measures outlined in the BMP to achieve the appropriate BAL rating through provision and ongoing management of an APZ, can be implemented.

## E2 Landscaping and design of an Asset Protection Zone

Landscaping, design, and maintenance of an APZ in a bushfire prone area can significantly improve the bushfire resilience of a building. An APZ should not be seen as an area entirely cleared of vegetation, but as a strategically designed space that gives holistic consideration to how existing or proposed vegetation or non-combustible features interact with, or affect the building's bushfire resilience.

A well designed APZ provides a greater level of vegetation management within the first few metres of a building with, for example, less vegetation or inclusion of non-combustible materials. The vegetation within the remainder of an APZ can increase further away from the building with carefully considered plant selection and landscaping techniques.

Strategic landscaping measures can be applied, such as replacing weeds with low flammability vegetation (refer to E2 Plant Flammability) to create horizontal and vertical separations between the retained vegetation. The accumulation of fine fuel load from different plants is an important consideration for ongoing maintenance in accordance with Schedule 1. For example, when planting ground covers under deciduous trees within an APZ, the total fine fuel load prescribed in Schedule 1 will include any dead plant material from ground covers and leaf litter from the trees.

Plant density and final structure and form of mature vegetation should be considered in the initial landscaping stages. For example, clumps of sapling shrubs planted at a density without consideration of future growth, may increase the bushfire risk as a clump will quickly grow to exceed 5m<sup>2</sup>. It should be noted that in some cases, a single shrub in a mature state may be so dense as to fill a 5m<sup>2</sup> clump alone.

The location of plants within an APZ is a key design technique. Separation of garden beds with areas of low fuel or non-combustible material, will break up fuel continuity and reduce the likelihood of a bushfire running through an APZ and subjecting a dwelling to radiant heat or direct flame contact. It is important to note, where mature trees are separated from a building

## Element 2 Explanatory Notes

by six metres, but the canopy has grown to extend or overhang a building, maintenance and pruning to remove the overhanging branches should be undertaken without the entirety of the tree being removed.

Mulches used within the APZ should be non-combustible. The use of stone, gravel, rock and crushed mineral earth is encouraged. Wood mulch >6mm in thickness may be used, however it is recommended that it is used in garden beds or areas where the moisture level is higher by regular irrigation. These materials could be sourced from non-toxic construction and demolition waste giving the added benefit of reducing the environmental impact of any 'hard landscaping' actions.

Combustible objects, plants, garden supplies such as mulches, fences made from combustible material, should be avoided within 10 metres of a building. Vines or climbing plants on pergolas, posts or beams, should be located away from vulnerable parts of the building, such as windows and doors. Non-flammable features can be used to provide hazard separation from classified vegetation, such as tennis courts, pools, lawns and driveways or paths that use inorganic mulches (gravel or crushed rock). Consider locating firewood stacks away from trees and habitable buildings.

Incorporation of landscaping features, such as masonry feature walls can provide habitable buildings with barriers to wind, radiant heat and embers. These features can include noise walls or wind breaks. Use of Appendix F of AS 3959 for bushfire resistant timber selection within areas of 29kW/m<sup>2</sup> (BAL-29) or below, or the use of non-combustible fencing materials such as iron, brick, limestone, metal post and wire is encouraged.

In addition to regular maintenance of an APZ, further bushfire protection can be provided at any time by:

- ensuring gutters are free from vegetation;
- installing gutter guards or plugs;
- regular cleaning of underfloor spaces, or enclosing them to prevent gaps;
- trimming and removing dead plants or leaf litter;
- pruning climbing vegetation (such as vines) on a trellis, to ensure it does not connect to a building, particularly near windows and doors;
- removing vegetation in close proximity to a water tank to ensure it is not touching the sides of a tank; and/or
- following the requirements of the relevant local government section 33 fire break notice, which may include additional provisions such as locating wood piles more than 10 metres from a building.

Preparation of a property prior to the bushfire season and/or in anticipation of a bushfire is beneficial even if your plan is to evacuate. As embers can travel up to several kilometres from a bushfire and fall into small spaces and crevices or land against the external walls of a building, best practice recommends that objects within the APZ are moved away from the building prior to any bushfire event. Objects may include, but are not limited to:

- door mats;
- outdoor furniture;
- potted plants;
- shade sails or umbrellas;
- plastic garbage bins;
- firewood stacks;
- flammable sculptures; and/or
- playground equipment and children's toys.

### 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

## Element 2 Explanatory Notes

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 D Vehicular access explanatory notes

**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.

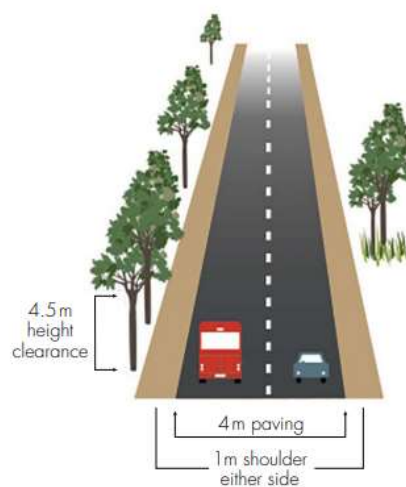


Figure 20: Example of a public road

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

**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.

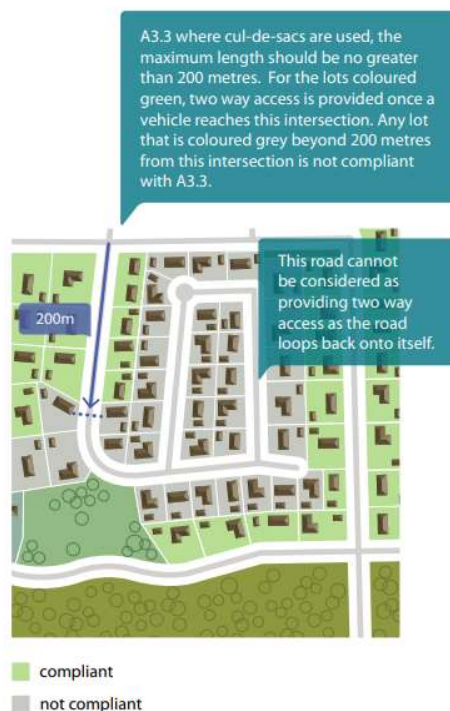


Figure 21: Example of compliant and non-compliant two-way

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

## Acceptable Solution A3.2b – Emergency access way

### Explanatory Note E3.2b

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

## Acceptable Solution A3.2b – Emergency access way

### Explanatory Note E3.2b

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 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.

Acceptable Solution A3.2b – Emergency access way

Explanatory Note E3.2b

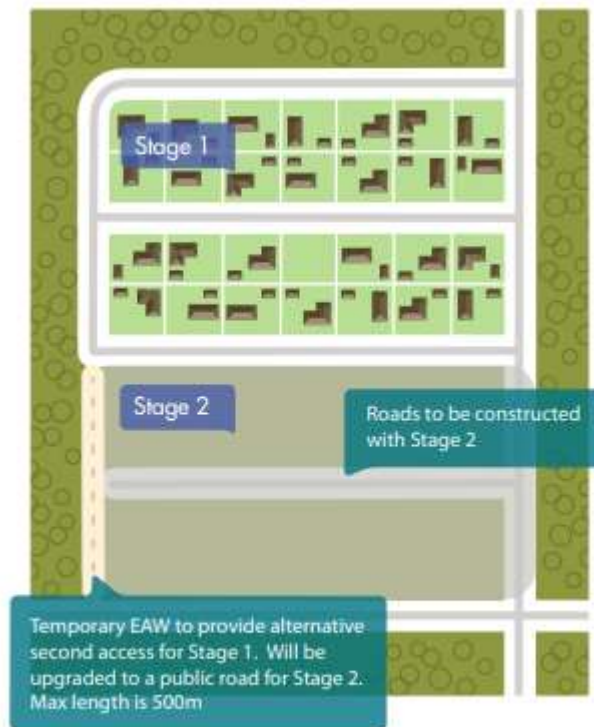


Figure 22: Example of an emergency access way

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

Acceptable Solution A3.3 – Through roads

Explanatory Note E3.3

where site constraints, such as a water body or Bush Forever, prevent the ability to create a through-road and a no through 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.

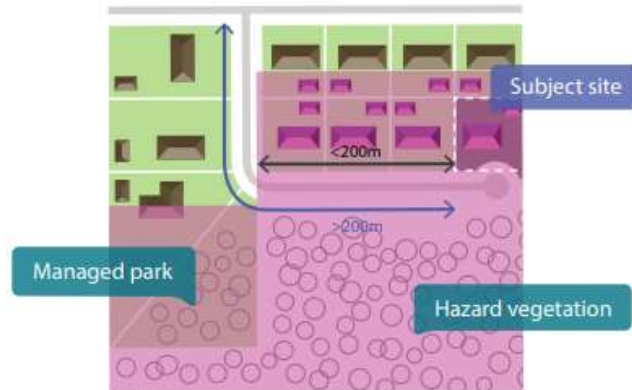


Figure 23: Example of a site on a no-through road greater than 200 metres from the intersection, but within 200 metres of BAL-LOW

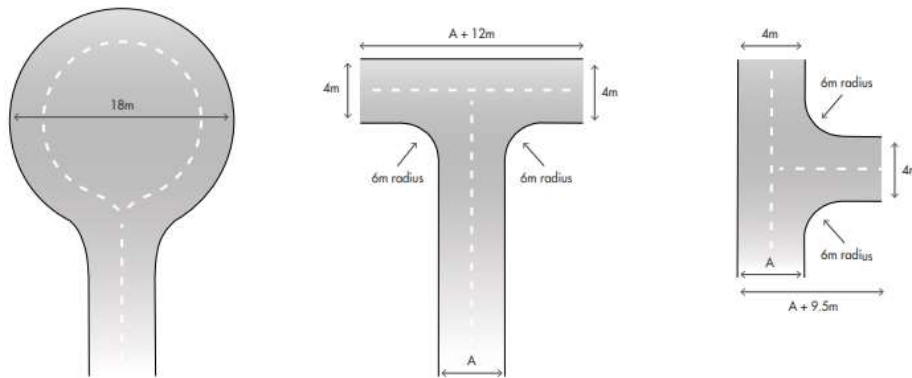


Figure 24: Turn-around area dimensions for a nothrough road

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 defensible 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 providing 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;
- defensible 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.

## Acceptable Solution A3.4a – Perimeter roads

### Explanatory Note E3.4a

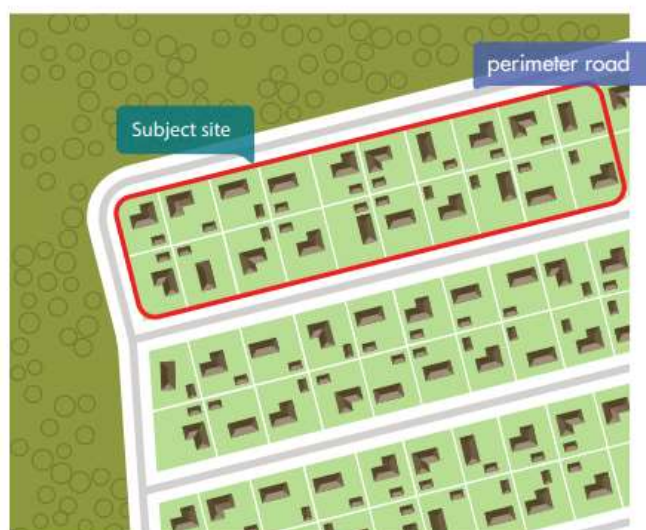


Figure 25: Example of a perimeter road

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

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

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

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

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

## Appendix E Local Government Firebreak Notice

# Bush Fires Act 1954

## City of Swan

### Fire Hazard Reduction Notice (Firebreak Notice)

Notice to Owners and/or Occupiers of land situated within the City of Swan.

To assist in the control of bush fires, and pursuant to Section 33 of the *Bush Fires Act 1954*, all owners and occupiers of land within the City of Swan are required on or before the 1st day of November, 2023, or within 14 days of becoming an owner or occupier of land after that date, meet the fire hazard reduction conditions described in this notice and maintain these conditions up to and including the 30th day of April, 2024.

**1. All land less than 5,000m<sup>2</sup> (0.5 Hectares or 1.2 Acres)**

- 1) Install and maintain an asset protection zone in accordance with the requirements specified in clause 13 of this notice.
- 2) Maintain all grass to a height of no greater than 10cm.
- 3) Areas of natural vegetation to be maintained at or below 8 tonnes per hectare.
- 4) 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.

**2. All land between 5,000m<sup>2</sup> and 25,000m<sup>2</sup> (0.5 - 2.5 Hectares) or (1.2 - 6.2 Acres)**

- 1) Install and maintain an asset protection zone in accordance with the requirements specified in clause 13 of this notice.
- 2) Install firebreaks as close as practicable inside of, but no more than 5m from, the property's external boundaries. Firebreaks need to be 3 metres wide with a 4 metre vertical height clearance free from flammable materials and overhanging branches (see section 10 in this notice for further details).
- 3) Maintain all grass to a height of no greater than 10cm.
  - a) If the land is stocked, the grass must be reduced and maintained to a height of no greater than 10cm by the 1st day of December.
- 4) Natural vegetation within 100 metres of buildings including attached and adjacent structures and essential infrastructure shall be maintained at or below 8 tonnes per hectare, by passive methods of fuel reduction that does not permanently remove or reduce the quantity or occurrence of the native plants, shrubs and trees within the subject area.
- 5) 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.

**3. All land with an area greater than 25,000m<sup>2</sup> (2.5 Hectares or 6.2 Acres)**

- 1) Install and maintain an asset protection zone in accordance with the requirements specified in clause 13 of this notice.
- 2) Install firebreaks as close as practicable inside of, but no more than 5m from, the property's external boundaries. Firebreaks need to be 3 metres wide with a 4 metre vertical height clearance free from flammable materials and overhanging branches (see section 10 in this notice for further details).
  - a) Properties over 100 hectares require additional firebreaks to divide the land into areas not exceeding 100 hectares.
- 3) Maintain all grass immediately adjacent to one side of any firebreak to a height of no greater than 10cm and a minimum width of 3 metres.
  - a) If the land is stocked, this grass must be reduced and maintained to a height of no greater than 10cm by the 1st day of December.
- 4) Natural vegetation within 100 metres of buildings including attached and adjacent structures and essential infrastructure shall be maintained at or below 8 tonnes per hectare, by passive methods of fuel reduction that does not permanently remove or reduce the quantity or occurrence of the native plants, shrubs and trees within the subject area.
- 5) 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.

#### **4. Plantations**

- 1) Install and maintain external and internal firebreaks, firebreaks that form compartments (cells), firebreaks and hazard reduction measures that protect neighbouring communities and essential infrastructure in accordance with the requirements of a fire management plan approved in writing by the City of Swan; or
- 2) Where no such approved fire management plan exists,
  - a) Install and maintain external and internal firebreaks and firebreaks that form compartments (cells) and carry out all other firebreaks and hazard reduction measures which are required in accordance with the requirements and specifications within the Department of Fire & Emergency Services 'Guidelines for Plantation Fire Protection' 2011 or later publication.

#### **5. Application to Vary Firebreak and Hazard Reduction Requirements**

- 1) If it is considered impractical for any reason to clear firebreaks in a manner or location required by this notice, or to carry out any fire hazard reduction work or measures required by this notice, you may apply in writing on or before the 1st day of October, for approval to provide firebreaks in alternative positions or to take alternative measures to abate fire hazards on the land. Alternative firebreak application forms can be downloaded from the City of Swan website.
- 2) If permission is not granted in writing by the City of Swan prior to the 1st day of November, you shall comply with the requirements of this notice.
- 3) When permission for alternative firebreaks or fire hazard reduction measures has been granted, you shall comply with all conditions on the endorsed permit and maintain the land to the required standard throughout the period specified by this notice.
  - a) Where a property is affected by an approved bushfire management plan, property owners must comply with any additional requirements and responsibilities outlined within that plan.

#### **6. Fuel Dumps and Depots**

Remove all flammable material within 10 metres of fuel dumps, fuel ramps or where fuel drums, whether containing fuel or not, are stored.

#### **7. Hay Stacks**

Clear and maintain a firebreak completely surrounding any haystack on the land, within 60 metres of the haystack.

#### **8. Fire Service Access (Strategic Firebreaks)**

- 1) Where under a written agreement with the City of Swan, or where depicted on an approved bushfire management plan Fire Service Access are required on the land, you are required to clear and maintain the Fire Service Access a minimum of 6 metres wide along the agreed alignment to provide restricted vehicular access to emergency services and authorised vehicles.
- 2) Fire Service Access must be free from flammable material and unimpeded by obstructions including boundary fences and gates unless approved in writing by the City of Swan.
- 3) Gates may only be secured with City of Swan Fire Service padlock.
- 4) Fire Service Access shall be graded to provide a continuous 4 wheel drive trafficable surface a minimum of 4 metres wide with a 1 metre shoulder on either side.
- 5) All branches must be pruned and obstacles removed to maintain a 4 metre vertical height clearance above the full 6 metre width of the trafficable surface.

#### **9. Emergency Access Ways**

- 1) Where under a written agreement with the City of Swan, or where depicted on an approved bushfire management plan, Emergency Access Ways are required on private land, you are required to clear and maintain a vehicular access way to a minimum of 6 metres wide along the agreed alignment.
- 2) Emergency access ways must be free from flammable material and unimpeded by obstructions including boundary fences and gates unless approved in writing by the City of Swan.
- 3) Gates on Emergency Access Ways must remain unlocked at all times.
- 4) Emergency Access Ways shall be graded and have suitable drainage to provide a minimum 6 metre wide continuous trafficable surface suitable for all types of 2 wheel drive vehicles.
- 5) All branches must be pruned and obstacles removed to maintain a 4 metre vertical height clearance above the full 6 metre width of the trafficable surface.

## 10. Firebreak Construction

- 1) Firebreaks are to be developed and maintained clear of all obstacles and flammable materials to create a minimum of 3 metres wide trafficable surface suitable for 4 wheel drive vehicles.
- 2) Overhanging branches must be pruned to provide a 4 metre vertical clearance above the full width of the firebreak surface.
- 3) Boundary firebreaks must be installed as close as practicable inside of, but no more than 5m from, the property's external boundaries.
- 4) Alternative Firebreaks that are approved in writing by the City of Swan, or as depicted within a bushfire management plan approved in writing by the City of Swan, are to be constructed to the same standard as general firebreaks and must be constructed along the specified alignment.
- 5) Firebreaks must not terminate in a dead end.
- 6) Firebreaks may be constructed by ploughing, grading, raking, burning, chemical spraying or any other method that achieves the required standard.

## 11. Driveways

Where a dwelling is situated more than 70 metres from a public road,

- 1) Driveways must be maintained clear of all permanent obstacles and flammable materials to create a minimum 3 metre wide trafficable surface suitable for all types of 2 wheel drive vehicles.
- 2) Overhanging branches must be pruned to provide a 4 metre vertical clearance above the driveway.

## 12. Fuel Reduction – Natural Vegetation

- 1) Available bushfire fuels must be maintained at or below:
  - a) Asset Protection Zones - 2 tonnes per hectare
  - b) Natural Vegetation - 8 tonnes per hectare for areas of natural vegetation within 100 metres of buildings, attached and adjacent structures and essential infrastructure
- 2) Passive Fuel Reduction within natural vegetation may be achieved by burning, raking, pruning, weed management, removal of dead materials and any other approved method.
- 3) Permanent removal or partial clearing of natural vegetation including native grasses, shrubs or trees may only be carried out to meet the minimum requirements of this notice.

Note: Advice and resources on how to measure and manage native vegetation fuel loads are available from the Department of Fire and Emergency Services or the City of Swan.

## 13. Asset Protection Zones Specification

Asset protection zones must be installed around relevant buildings (see section 17) and must meet the following requirements:

- 1) Extends 20 metres out from any external walls of the building, attached structures, or adjacent structures within 6 metres of the habitable building, unless varied under an approved bushfire management plan.
- 2) On sloping ground, the asset protection zone distance shall increase with 1 metre for every degree in slope on the sides of the building/ structure that are exposed to down slope natural vegetation.
- 3) Asset protection zone requirements only apply within the boundaries of the lot on which the asset is located and cannot be enforced across boundaries.
- 4) The average fuel loads must be reduced and maintained at two tonnes per hectare or lower.
- 5) It is recommended asset protection zones predominantly contain vegetation of low-flammability, reticulated lawns and gardens and other non-flammable features.
- 6) All grass is maintained to or under 10cm.
- 7) The crowns of trees are to be separated where possible to create a clear separation distance between adjoining or nearby tree crowns. Clearing or thinning trees to create distances greater than 10 metres separation between tree crowns is not required or supported by this.
- 8) A small group of trees within close proximity to one another may be treated as one crown provided the combined crowns do not exceed the area of a large or mature crown size for that species.
- 9) Trees are to be low pruned (or under pruned) to at least a height of 2 metres from ground.
- 10) No tree, or shrub over 2 metres high is planted within 3 metres of a building, especially adjacent to windows.
- 11) There are no tree crowns or branches hanging over buildings.
- 12) Clear and prune scrub to reduce to a sparse density (able to walk through vegetation with relative ease with minimal deviation around trees and shrubs).
- 13) Install paths or clear flammable or dry vegetation, debris and materials immediately adjacent to the building.

- 14) Wood piles and flammable materials stored a safe distance from buildings.

### **Environmental Considerations**

Clearing or modifying native vegetation beyond what is required under this notice will require approval from the appropriate Government body and the City of Swan. Please refer to the Department of Water and Environmental Regulation (DWER) and the Department of Fire and Emergency Services (DFES) websites for further information and contact details.

### **14. Burning**

All burning must be carried out in accordance with the relevant provisions of this notice and the *Bush Fires Act 1954*, *Health (Miscellaneous Provisions) Act 1911* and the City of Swan Consolidated Local Laws 2005.

**Prohibited Period:** All burning, including garden refuse and camping fires are prohibited.

**Restricted Period:** All burning requires a permit except for the burning of garden refuse and camping fires which are subject to the following conditions:

- 1) The fire must not be lit if the Fire Danger Rating is High or above, or if a Total Fire Ban is declared.
- 2) Only one fire is allowed at any time and it does not exceed 1 cubic metre in size.
- 3) No flammable material within 5 metres of the fire.
- 4) The fire is only lit between 6 pm and 11 pm and completely extinguished by midnight.
- 5) At least one person capable of controlling the fire is in attendance at all times with adequate means of extinguishing the fire.

### **15. Cooking Fires**

Fires for the purpose of cooking are exempt from burning period restrictions subject to the following conditions:

- 1) The fire must not be lit if the Fire Danger Rating is High or above, or if a Total Fire Ban is declared.
- 2) The fire is contained in a purpose built appliance and
  - a) at a person's home; or
  - b) an area is set aside for that purpose by the State Authority or City of Swan
- 3) No flammable material within 5 metres of the fire.
- 4) At least one person capable of controlling the fire is in attendance at all times with adequate means of extinguishing the fire.

### **16. Compliance**

- 1) In addition to the requirements of this notice, further works which are considered necessary by an Authorised Officer of the City of Swan may be required as specified in writing in a subsequent notice addressed to the landowner.
- 2) Where the owner or occupier of the land fails or neglects to comply with the requirements of this notice or a subsequent notice addressed to the landowner, the City of Swan may enter onto the land with workmen, contractors, vehicles and machinery to carry out the requisitions of the notice at the expense of the landowner.
- 3) Failure to comply with this notice and subsequent written notices may result in a penalty not exceeding \$5,000, or the issue of a \$250 infringement notice and liability for any costs incurred by the City of Swan in relation to works undertaken on behalf of the landowner.
- 4) 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.

### **17. Definitions**

**'Alternative Firebreak'** is a firebreak that is in an alternative position or alignment to the requirement specified in paragraph 2 and 3 of this notice.

**'Alternative Firebreak Application'** is an application that may be made by a landowner to install firebreaks in an alternative position, or to carry out alternative measures in lieu of general firebreaks.

**'Available Fuel'** is the bush fuel consisting of live and dead vegetation such as stubble, mulch, leaf litter, twigs, trash, scrub and other vegetation less than 6mm in diameter capable of carrying a running fire and will actually burn under prevailing conditions.

**'Asset Protection Zone (APZ)'** is a low fuel area that is reduced of flammable vegetation and materials surrounding buildings and essential infrastructure to minimise the likelihood and impact that direct flame contact, radiant heat or ember attack may have on buildings and assets in the event of a bushfire. This area must extend out from the external walls of a building or asset a minimum of 20 metres.

**'Bushfire Management Plan'** or 'Fire Management Plan' is a comprehensive plan that may be placed on the certificate of title(s) of land that has been developed as a condition of development or subdivision. Bushfire Management Plans may become outdated and it's the responsibility of the property owner to review and keep them current. Where a property is affected by an approved bushfire management plan, property owners must still comply with all requirements in the Annual Fire Hazard Reduction Notice and with any additional requirements outlined within that plan.

**'Emergency Access Way'** is a two wheel drive trafficable, 6 metre wide access route to provide local residents, general public and emergency services alternative links to road networks at the end of cul-de-sacs or areas where access is limited during an emergency incident.

**'Essential Infrastructure'** or **'Critical Infrastructure'** means assets, infrastructure, systems and networks that provide essential services necessary for social and economic wellbeing and is typically public infrastructure. Assets and infrastructure, usually of a public nature, that generate or distribute electricity, water supply, telecommunications, gas and dams are typical assets that are essential to society and are often located in, or traverse areas that are prone to bushfires.

**'Firebreak'** is an area of land cleared of flammable material (see available fuel above) to minimise the spread of a bushfire and to provide access for firefighting services. For the purpose of this notice the term firebreak is a strip of land at minimum 3 metres with a 4 metres vertical clearance, constructed to provide a 4 wheel drive trafficable surface for access by emergency and authorised vehicles. Boundary firebreaks must be installed as close as practicable inside of, but no more than 5m from, the property's external boundaries.

**'Fire Hazard'** means accumulated fuel (living or dead) such as leaf litter, twigs, trash, bush, dead trees and scrub capable of carrying a running fire but excludes standing living trees and isolated shrubs.

**'Fire Service Access (Strategic Firebreaks)'** is a firebreak that is 6 metres wide established to provide strategic access and links to road networks whilst providing a wider control/containment line to protect town sites, estates and similar exposures during bushfire operations.

**'Natural Vegetation'** means natural areas of forest, woodland, shrubland, scrub, mallee or mulga.

**'Passive Fuel Reduction'** means lowering the amount of available fuel that will burn under prevailing conditions by means that will not permanently reduce or modify the structure or life cycle of plant, shrub, scrub or tree communities within an treated area. This is typically achieved by undertaking a cool, controlled burn of an area during cooler, damper months, or by physical removal of built up leaf litter, dead materials, weeds and slashing long dry grasses without damaging live native plants within the area.

**'Plantation'** is any area of native or exotic planted trees that exceeds three hectares in a gazetted town site, or elsewhere a stand of trees of 10 hectares or larger that has been planted and managed intensively for their commercial and environmental value. A plantation includes roads, firebreaks and small areas of native vegetation.

**'Relevant building'** is classified under the Building Code as one of the following:

- single dwelling such as a detached house, duplex, villa or townhouse (Class 1a);
- small boarding house, guest house or hostel (Class 1b);
- dwellings such as apartments and flats in a building containing two or more units (Class 2);
- accommodation for unrelated people such as hotel, motel, residential part of a school, accommodation for the aged, children or people with disabilities (Class 3);
- building of a public nature such as a health care building (9a), an assembly building such as a school (9b) or an aged care building (9c);
- private bushfire shelters associated with a single dwelling (Class 10c); or
- non-habitable building including sheds, carports and private garages (Class 10a) when within six metres of a class 1a, 1b, 2, 3 or 9 building.

**By order of the Council,**



**Chief Executive Officer**

**City of Swan**

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#### Document Status

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|                     |              |                          |   | Name  | Date                    |
| Draft Report        | Rev B        | For client review        | Louisa Robertson (BPAD 36748, Level 3)        | Louisa Robertson (BPAD 36748, Level 3)        | 14 November 2023        |
| <b>Final Report</b> | <b>Rev 0</b> | <b>For client review</b> | <b>Louisa Robertson (BPAD 36748, Level 3)</b> | <b>Louisa Robertson (BPAD 36748, Level 3)</b> | <b>15 November 2023</b> |



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T: 08 8431 7113

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Turrbal/Yuggera Country | Level 37, 123  
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T: 07 3211 5350

### Bunbury

Wardandi Noongar Country | 177  
Spencer Street Bunbury, WA 6230  
T: 08 9792 4797

### Canberra

Ngunnawal Country | Level 1, The Realm  
18 National Circuit Barton, ACT 2600  
T: 02 6198 3278

### Darwin

Larrakia Country | Suite G1, Level 1  
48-50 Smith Street, Darwin NT 0800  
T: 08 8943 0600

### Hobart

Muwununa/Nuenon Country | Level 6,  
111 Macquarie Street Hobart, TAS 7000  
T: 03 6108 9054

### Melbourne

Kulin Country | Level 5, 10 Queen  
Street, Melbourne, VIC 3000  
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