

Technical Appendix B -BMP

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: Forrestfield North Residential Precinct

Suburb: High Wycombe

State: WA

P/code: 6057

Local government area: City of Kalamunda

Description of the planning proposal: Structure Plan application

BMP Plan / Reference Number: 60690/140,968

Version: R01 Rev2

Date of Issue: 04/10/2021

Client / Business Name: Element on behalf of City of Kalamunda

Reason for referral to DFES

Has the BAL been calculated by a method other than method 1 as outlined in AS3959 (tick no if AS3959 method 1 has been used to calculate the BAL)?

☐
☒

Have any of the bushfire protection criteria elements been addressed through the use of a performance principle (tick no if only acceptable solutions have been used to address all of the BPC elements)?

☐
☒

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

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

☐
☒

Strategic planning proposal (including rezoning applications)

☒
☐

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

☐
☒

High risk land-use

☐
☒

Vulnerable land-use

☐
☒

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

Structure Plan application

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

BPAD Accredited Practitioner Details and Declaration

Name

Louisa Robertson

Accreditation Level

Level 3

Accreditation No.

BPAD 36748

Accreditation Expiry

28/02/2022

Company

Strategen-JBS&G

Contact No.

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 04/10/2021

Forrestfield North Residential Precinct Local Structure Plan

Bushfire Management Plan

Prepared for
Element
by Strategen-JBS&G

October 2021

61690/140,968 (Rev 2)



Forrestfield North Residential Precinct Local Structure Plan

Bushfire Management Plan

Strategen-JBS&G is a trading name of
JBS&G Australia Pty Ltd
Level 1, 50 Subiaco Square Road Subiaco WA 6008
ABN: 62 100 220 479

October 2021

Limitations

Scope of services

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

Reliance on data

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

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

Environmental conclusions

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

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

Strategen-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 Strategen-JBS&G, and should not be relied upon by other parties, who should make their own enquiries.

Document control

Client: Element

Report Version	Revision No.	Purpose	Strategen-JBS&G author/reviewer and accreditation details	Submitted to Client	
				Form	Date
Draft Report	Rev A	For review by client	L Robertson (BPAD36748) / Z Cockerill (BPAD37803)	Electronic (email)	11/04/2018
Final Report	Rev 0	Issued for use: to accompany Local Structure Plan submission	L Robertson (BPAD36748) / Z Cockerill (BPAD37803)	Electronic (email)	24/04/2018
Final Report	Rev 1	Revised with updated Local Structure Plan	L Robertson (BPAD36748) / Z Cockerill (BPAD37803)	Electronic (email)	26/06/2020
Final Report	Rev 2	Revised with updated Structure Plan	L Robertson (BPAD36748, Level 3)	Electronic (email)	04/10/2021

Table of contents

1. Proposal details	1
1.1 Background	1
1.2 Site description	1
1.3 Purpose	1
1.4 Other plans/reports	3
2. Environmental considerations	6
2.1 Native vegetation – modification and clearing	6
2.2 Revegetation / Landscape Plans	7
3. Bushfire assessment results	8
3.1 Assessment inputs	8
3.1.1 Vegetation classification	8
3.1.2 Effective slope	10
3.2 Assessment outputs	13
3.2.1 Bushfire Hazard Level (BHL) assessment	13
4. Identification of bushfire hazard issues	16
4.1.1 Bushfire context	16
4.1.2 Bushfire hazard issues	17
5. Assessment against the bushfire protection criteria	19
5.1 Compliance table	19
6. Responsibilities for implementation and management	21
7. References	22

List of tables

Table 1: Compliance table	19
Table 2: Vehicular access technical requirements	20

List of figures

Figure 1: Structure Plan (Element 2021)	4
Figure 2: Site overview	5
Figure 3: Pre-development vegetation class and effective slope	11
Figure 4: Post-development vegetation class and effective slope	12
Figure 5: Pre-development bushfire hazard levels	14
Figure 6: Post-development bushfire hazard levels	15

List of appendices

Appendix 1 Concept Landscape Plan (Place Laboratory, 2021)
Appendix 2 Georeferenced site photos
Appendix 3 City of Kalamunda 2021/22 Firebreak and Fuel Load Notice
Appendix 4 Town Park Concept Plan (Element 2021)
Appendix 5 Guideline standards for Asset Protection Zones (APZs)

1. Proposal details

1.1 Background

Element, on behalf of City of Kalamunda (the City), intends to lodge a Structure Plan over a 123.05 ha area of land known as the Forrestfield North Residential Precinct (hereafter referred to as the Residential Precinct/project area). The Residential Precinct is located in the suburb of High Wycombe and is bound by Roe Highway to the east, Sultana Road West to the south, Milner Road to the west and Poison Gully Creek to the north. The Structure Plan is depicted in Figure 1 and shows the proposed development as comprising the following elements:

- eight separate development cells (Cells 01 to 08)
- nine public open space (POS) areas (POS-01 to POS-09)
- thirteen environmental conservation reserves (EC-01 to EC-13)
- Town Park
- six drainage basins (DB-01 to DB-06)
- public road network
- potential future fly-over Roe Highway
- three connections to the TOD Precinct at the northwest site boundary
- Public Purposes – Primary School site
- residential lots (R30 to R100)
- re-vegetation area adjacent to Roe Highway overpass.

The Forrestfield North Residential Precinct forms part of the overall Forrestfield North District Structure Plan (DSP), which also includes an adjacent 61.02 ha parcel of land directly to the north, which is known as the Forrestfield North Transport Oriented Development (TOD) Precinct. A separate Activity Centre Plan application is currently in progress for the TOD Precinct.

The City has engaged in significant stakeholder consultation throughout the early planning stages and the resulting LSP has been designed to maximise retention of key environmental assets.

1.2 Site description

Rural residential properties form the predominant existing land use within the Residential Precinct and commercial zoned properties are also present in the south. The site includes Brae Road Reserve Bush Forever site in the north and the Brand Road old tip site in the east. The Residential Precinct is surrounded by the following, as depicted in Figure 2:

- Bush Forever site 123 adjacent to the southwest corner of the site
- Industrial properties abutting the southern site boundary, including a number of logistics businesses
- Commercial and Rural Residential properties to the north/northwest
- Bush Forever site 45, which includes the Poison Gully Creek foreshore area that transects the northern site boundary.

1.3 Purpose

The Residential Precinct is situated within a designated bushfire prone area according to the DFES State Map of Bush Fire Prone Areas (DFES 2019; refer to Plate 1), which triggers bushfire planning requirements under Policy Measure 6.2 and 6.3 of *State Planning Policy 3.7 Planning in Bushfire Prone Areas* (SPP 3.7; WAPC 2015).

This Bushfire Management Plan (BMP) has been prepared in accordance with Section 5.2.5 of *Guidelines for Planning in Bushfire Prone Areas* (the Guidelines; WAPC 2017), which requires LSP submissions to be accompanied by a BMP that includes the results of a strategic level Bushfire Hazard Level (BHL) assessment.

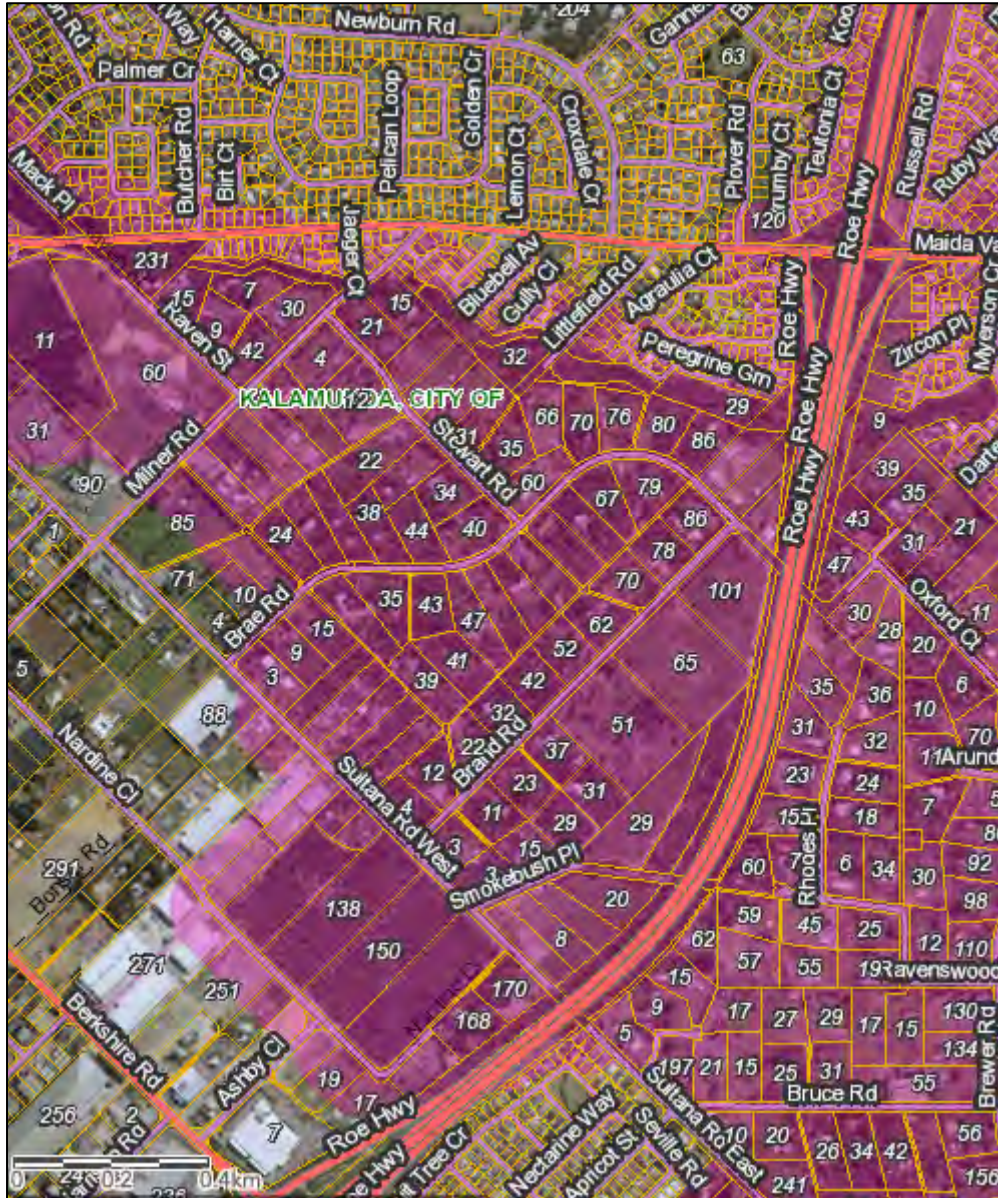


Plate 1: Map of bushfire prone areas (DFES) 2019

1.4 Other plans/reports

The first version of this BMP (Revision 0) was prepared in 2018 and has undergone several revisions in response to amendments to the Structure Plan design. This current BMP is Revision 2 and considers a Structure Plan design that was amended in 2021.

Other relevant reports that have been prepared for the project area include:

- Bushfire Management Plan in respect of the adjacent Forrestfield North TOD Precinct Activity Centre Plan (Strategen-JBS&G 2021a).
- Environmental Assessment and Management Strategy (EAMS) in respect of:
 - Forrestfield North Residential Precinct (Strategen-JBS&G 2021b); and
 - Forrestfield North TOD Precinct (Strategen-JBS&G 2021c).
- Local Water Management Strategy in respect of:
 - Forrestfield North Residential Precinct (Urbaqua 2020); and
 - Forrestfield North TOD Precinct (Strategen-JBS&G 2021c).



Figure 1: Structure Plan (Element 2021)



- Legend**
- Project area
 - 100m assessment area
 - 150m assessment area
 - Existing cadastral boundary
 - Bush Forever
 - Poison Creek Gully
 - Roads (MRWA)



0 200
metres

Job No: 61690

Client: Element

Drawn By: cthatcher

Checked By: LR

Scale 1:6,500 at A3

Coord. Sys. GDA 1994 MGA Zone 50

Version: A

Date: 30-Sep-2021

Forrestdale North Residential
Precinct, WA

SITE OVERVIEW

FIGURE: 2

2. Environmental considerations

2.1 Native vegetation – modification and clearing

An extensive consultative process has resulted in various updates to the LSP and driven design changes in response to agency issues in order to maximise retention of key environmental assets while reducing the bushfire impacts on future development as far as is reasonably practicable. The resulting LSP layout allows for retention of a vegetation corridor to maintain linkages to the Bush Forever sites to the north and south of the site and prevent further fragmentation within the area. The proposed design provides for the retention of the Threatened Wavy-leaved Smokebush within the corridor as well as individual environmental conservation reserves throughout the Residential Precinct.

The proposed development will require removal of remnant native vegetation to accommodate construction of roads and other built form and to establish various low threat landscaped POS areas throughout the residential precinct area. No clearing is proposed within the environmental conservation reserves or existing Bush Forever site. It is understood that various levels of vegetation thinning and some clearing will be conducted throughout some proposed POS areas to address bushfire impacts and to accommodate drainage requirements as well as for public amenity purposes. The recommended pathway for clearing approvals at the state and/or federal is yet to be determined; however, this will likely be achieved in consultation with relevant agencies via strategic assessment for individual proponents at future development stages as required. In consideration of the exhaustive design process that has been undertaken and current advice from leading environmental agencies, Strategen-JBS&G (formerly Strategen Environmental) considers the potential environmental impacts of proposed development have been carefully considered and are manageable, as documented in the *Environmental Assessment and Management Strategy* (EAMS; Strategen-JBS&G 2020), provided as part of the LSP submission.

A search of publicly available environmental data concluded that:

- the western portion of the Residential Precinct contains a mapped Multiple Use Wetland (MUW)
- a Resource Enhancement Wetland (REW) is mapped in the northwest corner of the Residential Precinct
- Bush Forever site 45, encompassing the Poison Gully Creek foreshore area, intersects the northern site boundary and partially extends into the Residential Precinct
- Bush Forever site 123 lies adjacent to the southern boundary of the Residential Precinct
- Brae Road Reserve located within the Residential Precinct is a Bush Forever site
- the Banksia Woodland EPBC listed Threatened Ecological Community (TEC) is mapped as occurring within the Residential Precinct
- the Residential Precinct is within the Perth Regional Ecological Linkage network.

The EAMS (Strategen-JBS&G 2021) should be read concurrently with this BMP. The report identifies the following additional environmental considerations in relation to native vegetation modification and clearing:

- five vegetation communities ranging from 'Degraded' to 'Excellent' condition were mapped within the Residential Precinct
- the Threatened Wavy-leaved Smokebush (*Conospermum undulatum*), which is listed as Vulnerable under the EPBC Act and WC Act, was extensively recorded within the Residential Precinct
- *Isopogon drummondii* (a Priority 3 species) was recorded in the Residential Precinct
- Four species of conservation significance including Carnaby's Black Cockatoo, Forest Red-tailed Black Cockatoo, Rainbow Bee-eater and Quenda were recorded within the Residential Precinct.

2.2 Revegetation / Landscape Plans

A Concept Landscape Plan has been prepared to support the LSP application by Place Laboratory (2021) and is included at Appendix 1. The plan provides a conceptual design for landscaping throughout the Residential Precinct and is consistent with the environmental, visual amenity, drainage and bushfire requirements for the site. This BMP takes into account areas of low threat landscaping and classified vegetation from the high-level landscaping design concepts.

The following areas of vegetation retention and revegetation are expected to occur within the Residential Precinct:

1. The Concept Landscape Plan designates "Ecological Protection Zones" that comprise a combination of environmental conservation (EC) reserves supporting classified vegetation as well as passive recreation zones (POS). The POS areas are expected to include low threat landscaping such as turf and manicured plantings as well as areas containing denser canopy coverage that would likely constitute classified vegetation.
2. The EAMS outlines requirements for the development of a POS revegetation management plan to identify the EC and POS zones and any areas of revegetation during future planning applications.
3. The EAMS requires that a POS interface plan is to be prepared for future planning stages to address revegetation of the POS and EC areas within the REW and associated buffer along Poison Gully Creek. This may include the provision for low threat landscaping adjacent to the residential lots to reduce potential bushfire impacts on future development.
4. The Concept Landscape Plan identifies low threat landscaped buffers within POS and drainage basins at key development interfaces to account for potential APZ requirements. The width of the buffers is to be determined at future planning stages to ensure that APZs are sufficient to achieve ratings of BAL-29 or lower for all proposed development.
5. Drainage basins are proposed to be developed throughout the Residential Precinct and it is likely these areas will be revegetated with classified vegetation. The design and species composition of the drainage basins will be determined at future planning stages, but it is expected that the vegetation will comprise a combination of Class B Woodland, Class C Shrubland and Class G Grassland. The drainage basins are to be assigned a precautionary effective downslope of >0 to 5 degrees at future planning stages to account for slope requirements in drainage area.
6. The Concept Landscape Plan includes the provision of revegetation within POS-01 which is adjacent to the school site, as part of the Ecological Protection Zone. Existing vegetation fringing the northern boundary of the school site is also proposed to be retained.
7. Revegetation is proposed to occur adjacent to the Roe Highway flyover to provide a vegetative link between the EC reserves abutting Roe Highway and the two EC reserves either side of the future TOD connector road (POS-02). It is expected that the vegetation would comprise Class B Woodland which is consistent with existing vegetation within the adjoining EC reserves.
8. Significant trees are proposed to be retained within the Town Park (POS-08) as detailed within the Town Park Concept Plan (see Appendix 4).
9. Street tree plantings are proposed along the major roads with the Residential Precinct. Streetscapes have been designed to account for potential APZ requirements.
10. No re-vegetation is expected to occur within the Brae Road Reserve Bush Forever site.

3. Bushfire assessment results

3.1 Assessment inputs

3.1.1 Vegetation classification

Strategen-JBS&G assessed classified vegetation and exclusions within 150 m of the Residential Precinct through on-ground verification on 12 September 2017 in accordance with *AS 3959—2009 Construction of Buildings in Bushfire-Prone Areas* (AS 3959; SA 2009) and the *Visual Guide for Bushfire Risk Management in Western Australia* (DoP, 2016). Georeferenced site photos are contained in Appendix 2.

Figure 3 illustrates the existing (pre-development) vegetation classifications within the Residential Precinct. Figure 4 shows the post-development vegetation classifications following completion of construction works and implementation the POS, drainage basins, environmental conservation reserves and low threat landscaping.

Pre-development vegetation classification

A summary of the assessed pre-development classified vegetation are as follows (refer to Figure 3):

- Class A Forest occurs within:
 - * the Poison Gully creek foreshore area that transects the northern cadastral boundary
 - * the internal rural residential properties abutting the northern site boundary and within Lots 2 and 92 Milner Road, which are partially mapped as an REW
 - * Lot 50 Smokebush Place, which forms part of the Brand Road old tip site and within the adjoining Roe Highway road reserve
 - * both the western and eastern sides of Roe Highway.
- Class B Woodland vegetation occurs:
 - * across a large proportion of the Residential Precinct with the majority of the rural residential lots supporting remnant banksia woodland with minimal land cleared for building footprints and Asset Protection Zones (APZs)
 - * within the Brae Road Reserve (existing Bush Forever)
 - * within Bush Forever site 123 (abutting the southern cadastral boundary) and extending into the neighbouring properties to the east
 - * within other external rural residential properties to the west and east of the Residential Precinct
- Class G Grassland (grass greater than 100mm in height) occurs within:
 - * the Brand Road old tip site and adjacent Lot 15 Brand Road
 - * vacant lots to the south of Smokebush Place
 - * a number of rural residential properties within and external to the Residential Precinct.

The City's Fire Hazard Reduction Notice (refer to Appendix 3) requires that all vacant and occupied land of any size is to "slash, mow, or trim dead grasses, dead shrubs, and dead plants to a height no greater than 50mm and remove cuttings/swath across the entire property". Although all lots within the 150m assessment area are legally required to maintain grassland in a low threat state, lots that were not maintained at the time of the inspection were classified as Class G Grassland.

A summary of the assessed pre-development exclusions are as follows (refer to Figure 3):

- Clause 2.2.3.2 (e) occurs across the assessment area and includes all permanently non-vegetated areas such as roads, footpaths, building footprints, carparks, hardstand areas and private driveways
- Clause 2.2.3.2 (f) occurs across the assessment area and includes all land maintained in a low threat state, including cultivated gardens, maintained lawns within residential properties and grassland managed below 50mm in accordance with the City's Firebreak and Fuel Load Notice (refer to Appendix 3).

Post-development vegetation classification

On completion of development, the majority of the Residential Precinct area will be modified to a low threat state. Classifiable vegetation remaining within the site will be located within the EC reserves, POS areas, Brae Road Bush Forever site and drainage basins. Roe Highway has a vegetated verge and is adjacent to the Residential Precinct, however, the development does not propose any modification of vegetation within this corridor.

The post-development vegetation assessment that development of the TOD Precinct will not occur prior to development of the Residential Precinct and the remaining vegetation classifications external to the Residential Precinct are expected to remain the same as per pre-development classifications. Any changes to vegetation within the 150m assessment prior to development of the Residential Precinct will be captured in an updated Bushfire Hazard Level (BHL) assessment and/or future BAL contour assessment at future planning stages.

A summary of the expected post-development classified vegetation within the Residential Precinct is as follows (refer to Figure 4):

- Class A Forest vegetation will occur within:
 - * the EC reserves sited along the northern site boundary identified as EC-09, EC-10, EC-12 and EC-13
 - * the reserve identified as EC-01, which is existing Lot 50 Smokebush Place
 - * POS-08, which lies within the Town Park site
 - * a portion of DB-04, located along the northern site boundary
 - * both the western and eastern sides of Roe Highway
- Class B Woodland vegetation will occur within:
 - * the EC reserves sited adjacent to the future TOD connector boulevard, identified as EC-02 and EC-03
 - * the EC reserves sited within the central corridor linkage, identified as EC-04 to EC-08
 - * the POS areas located within the central corridor linkage and throughout the Residential Precinct, identified as POS-01, POS-03, POS-04, POS-05 and POS-07
 - * POS-02, situated adjacent to the future TOD connector boulevard
 - * POS-06, located on Brae Road, within the northeast of the site
 - * POS-07, situated along the northern site boundary
 - * Brae Road Reserve (existing Bush Forever site; BF-01)
 - * Drainage basins (DB) 01 and 02, a portion of 03, 04 and 06– these drainage basins have been classified as Class B Woodland as a precautionary measure given that the majority will lie immediately adjacent to external Bush Forever sites or internal EC reserves; however, the likely classification will be a combination of Class B Woodland, Class C Shrubland and Class G Grassland and any exclusions identified at the detailed landscape planning stage.

A summary of the expected post-development exclusions within the Residential Precinct are as follows (refer to Figure 4):

- Clause 2.2.3.2 (b) will occur within POS-09/EC-11 in the centre-west of the Residential Precinct. This area is less than 1 ha and not located within 100 m of any other classified vegetation

- Clause 2.2.3.2 (e) will occur throughout the Residential Precinct and will include all permanently non-vegetated areas such as roads, footpaths, building footprints, carparks, hardstand areas and private driveways
- Areas of Clause 2.2.3.2 (f) exclusions will occur within the POS areas, which will include low threat turf, manicured plantings and low threat buffers to residential development
- DB-05 (Town Park) will comprise managed turf and parkland trees and will meet exclusion Clause 2.2.3.2 (f)
- All street tree plantings are assumed to meet the low threat criteria of AS 3959 Clause 2.2.3.2 (f)
- Clause 2.2.3.2 (f) will occur throughout the Residential Precinct and will include all land maintained in a low threat state, including cultivated gardens and maintained lawns within residential properties, the community purpose site, portions of the school site and associated playing fields and all other actively maintained POS areas (including a portion of POS-01).

On completion of development, maintenance of all land in a low threat state will be enforceable under the City's Firebreak and Fuel Load Notice (refer to Appendix 3), which requires that all vacant and occupied land is to "have all flammable matter slashed, mowed or trimmed down by other means to a height no greater than 50mm across the entire property".

3.1.2 Effective slope


Strategen-JBS&G assessed effective slope under classified vegetation through on-ground verification 12 September 2017 in accordance with AS 3959. Results are depicted in Figure 3 and Figure 4.

Site observations indicate that the Residential Precinct is predominantly flat, with little variation in relief. The terrain inclines very gradually from 35 mAHD in the west to 45 mAHD in the northeast over an approximate distance of 1.2 km.

Class B Woodland vegetation within Bush Forever site 123 to the south of the site has an effective downslope of >0 to 5 degrees. Class A Forest vegetation within the Poison Gully Creek foreshore area transecting the northern cadastral boundary has an effective downslope ranging from >0 to 10 degrees. The remainder of the external classified vegetation is located on land that is predominantly flat in relation to the Residential Precinct.

On completion of the development, the retained areas of classified vegetation within the Residential Precinct would be predominantly flat in relation to areas supporting habitable development. The drainage basins are to be assigned a precautionary effective downslope of >0 to 5 degrees to account for a slight slope required for drainage purposes.



Legend <div><div><div><div></div><div>Residential Precinct</div></div><div><div></div><div>100m wide assessment area</div></div><div><div></div><div>150m wide assessment area</div></div><div><div></div><div>Cadastral boundary</div></div><div><div></div><div>Poison Creek Gully</div></div><div><div></div><div>Topographic contours (mAH)</div></div><div><div></div><div>Roads (MRWA)</div></div></div><div><div><div>Class A Forest</div></div><div><div>Class B Woodland</div></div><div><div>Class G Grassland</div></div><div><div>Excluded Clause 2.2.3.2 (e) and (f) of AS3959-2009</div></div></div></div>	 <div><div>Job No: 57806</div><div>Client: Element</div><div>Drawn By: hsullivan</div><div>Checked By: CT</div></div>	<div><div>0200metres</div><div>Scale 1:6,500 at A3</div><div>Coord. Sys. GDA 1994 MGA Zone 50</div></div> <div><div><div></div></div><div>Version: A</div><div>Date: 21-May-2020</div></div>	<div>Forrestfield North Residential Precinct, WA</div> <div>PRE-DEVELOPMENT VEGETATION CLASSIFICATION AND EFFECTIVE SLOPE</div> <div>FIGURE: 3</div>
---	--	--	--

3.2 Assessment outputs

3.2.1 Bushfire Hazard Level (BHL) assessment

Pre-development bushfire hazard levels

Strategen-JBS&G has mapped the pre-development bushfire hazard levels within the Residential Precinct and the 150 m wide assessment area. The bushfire hazard levels have been assessed on the basis of the vegetation discussed in Section 3.1.1 and the current pre-development extent of vegetation within and surrounding the Residential Precinct.

A summary of results is provided below and depicted in Figure 5:

- all Class A Forest has been assigned a bushfire hazard level of Extreme
- all Class B Woodland has been assigned a bushfire hazard level of Extreme
- all Class G Grassland has been assigned a bushfire hazard level of Moderate
- in accordance with the bushfire hazard level assessment methodology detailed in Appendix 2 of the Guidelines, vegetation that has a Low hazard level but is within 100 m of Extreme or Moderate hazard level vegetation has been assigned a Moderate hazard level
- all remaining areas have been assigned a bushfire hazard level of Low.

The pre-development BHL assessment shows that based on the existing vegetation, the Residential Precinct contains land with Moderate and Extreme bushfire hazard levels.

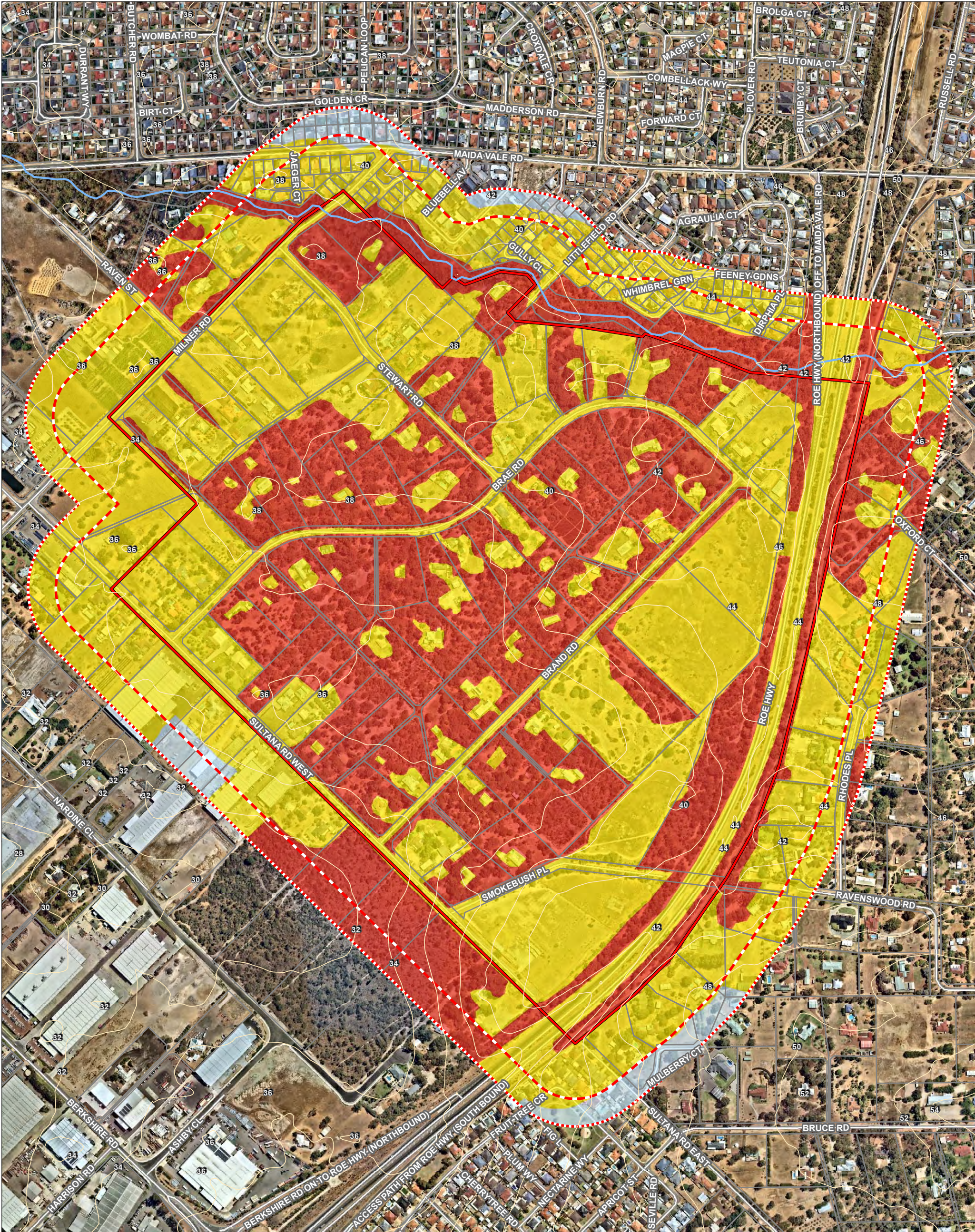
Post-development bushfire hazard levels

Strategen-JBS&G has mapped the post-development bushfire hazard levels to demonstrate that the future bushfire hazard levels will be acceptable for future development to occur within the Residential Precinct. The bushfire hazard levels have been assigned on the basis of the vegetation discussed in Section 3.1.1 and the future expected vegetation within and surrounding the Residential Precinct.

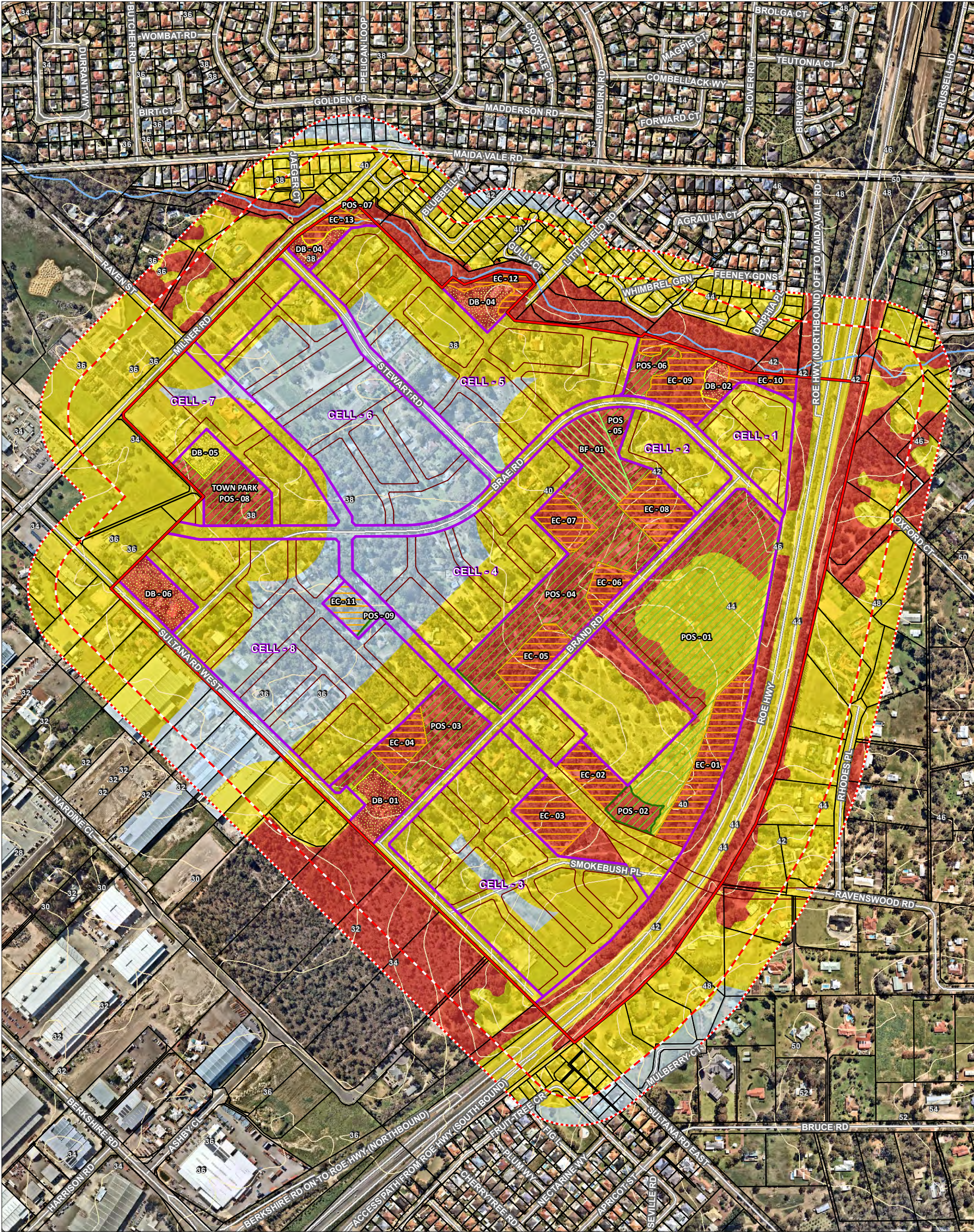
A summary of results is provided below and depicted in Figure 6:

- all Class A Forest has been assigned a bushfire hazard level of Extreme
- all Class B Woodland has been assigned a bushfire hazard level of Extreme
- all Class G Grassland has been assigned a bushfire hazard level of Moderate
- in accordance with the bushfire hazard level assessment methodology detailed in Appendix Two of the Guidelines, vegetation that has a Low hazard level but is within 100 m of Extreme or Moderate hazard level vegetation has been assigned a Moderate hazard level
- all remaining areas have been assigned a bushfire hazard level of Low.

The post-development BHL assessment demonstrates that on completion of the development, areas of the Residential Precinct supporting habitable development will be within an area of Low or Moderate hazard level and all future development will avoid Extreme bushfire hazard level areas, meeting acceptable solution A1.1 of the Guidelines.



<div><div><div><div></div><div>Residential Precinct</div></div><div><div></div><div>100m wide assessment</div></div><div><div></div><div>150m wide assessment</div></div><div><div></div><div>Cadastral boundary</div></div><div><div></div><div>Poison Creek Gully</div></div><div><div></div><div>Topographic contours (mAHD)</div></div><div><div></div><div>Roads (MRWA)</div></div></div><div><div><div></div><div>Bushfire Hazard Level</div></div><div><div></div><div>Extreme</div></div><div><div></div><div>Moderate</div></div><div><div></div><div>Low</div></div></div></div>		<div><div><div><div></div><div>strategen</div></div><div><div></div><div>JBS&G</div></div></div></div>		<div><div><div>0</div><div></div><div>200</div></div><div>metres</div></div>		<div>Forrestfield North Residential Precinct, WA</div>			
		<div>Job No: 57806</div>		<div>Scale 1:6,500 at A3</div>		<div><div></div></div>		<div>PRE-DEVELOPMENT BUSHFIRE HAZARD LEVEL</div>	
		<div>Client: Element</div>		<div>Coord. Sys. GDA 1994 MGA Zone 50</div>					
<div>Drawn By: hsullivan</div>		<div>Checked By: CT</div>		<div>Version: A</div>		<div>Date: 21-May-2020</div>		<div>FIGURE: 5</div>	



Legend <div><div></div> Project area</div> <div><div></div> 100m assessment area</div> <div><div></div> 150m assessment area</div> <div><div></div> Existing cadastral boundary</div> <div><div></div> Bush Forever</div> <div><div></div> Drainage basin</div> <div><div></div> Environmental Conservation Reserve</div> <div><div></div> POS</div>
--

4. Identification of bushfire hazard issues

4.1.1 Bushfire context

Strategen-JBS&G considers that the Residential Precinct is unlikely to be impacted by a landscape scale bushfire as the surrounding vegetation is largely fragmented and not of a sufficient size to support fire runs of any great length.

Intact vegetation adjacent to the Residential Precinct includes banksia woodland within Bush Forever site 123 to the south; narrow strips of forest vegetation adjacent to the Roe Highway in the east; and a narrow band of forest vegetation associated with Poison Gully Creek in the north. Land directly to the west comprises rural-residential development predominantly managed as low threat development, with some areas of unmanaged grassland.

Under predominant afternoon summer weather conditions for the location, the likely prevailing winds are from the east in the morning and southwest in the afternoon. Summer winds from the north are less common and can occur during the bushfire season when a low-pressure trough forms off the west coast and strong winds develop from the north or northeast. These conditions have the potential to direct a bushfire towards the site and contribute elevated levels of radiant heat and ember attack on the proposed development.

Strategen-JBS&G therefore considers a fire front approaching the Residential Precinct from the south, east and north to be the worst-case bushfire scenarios due to the presence of fragmented but intact bushfire fuels in these directions.

During summer afternoon southwest winds, a bushfire within Bush Forever site 123 has the potential to support fire runs of up to 350 m; however, Strategen-JBS&G considers that the isolated nature of the vegetation would restrict potential impacts to moderate levels of radiant heat and ember attack. A bushfire occurring in forest vegetation within the western side of Roe Highway would most likely impact the site in the morning during prevailing easterly winds. The fire would be severely restricted in fire run potential; however, future residential development abutting this vegetation could be impacted by radiant heat and ember attack if sufficient setbacks are not employed. The forest vegetation associated with Poison Gully Creek is similarly restricted in fire run potential; however, with an effective downslope of up to 10°, adjacent development has the potential to be impacted by a bushfire in this vegetation.

The retained vegetation within the EC reserves and POS serve the purpose of linking remnant native vegetation with the adjacent Bush Forever sites. In this regard, there is potential for an external bushfire to spread into the site from the surrounding vegetation. Strategen-JBS&G considers that the narrow width and likely fragmented nature of the vegetation corridor would not support extended bushfire behaviour; however, setbacks and/ or APZs sufficient to achieve BAL-29 do need to be adopted at future planning stages.

4.1.2 Bushfire hazard issues

Examination of strategic development design as per the LSP, conceptual landscaping design and existing and post-development bushfire hazard levels has identified the following bushfire hazard issues to be considered at future planning stages:

- The Residential Precinct contains Extreme bushfire hazard level areas not suitable for habitable development. However, the post-development BHL assessment demonstrates that on completion of the development all habitable development areas will be located on land with a Low or Moderate bushfire hazard level. Therefore, the development is able to comply with A1.1 of the Guidelines.
- Development design will include the retention of native vegetation within the Brae Road Reserve Bush Forever site, EC reserves, POS and drainage basins, which are classified as Extreme hazard level vegetation. Where habitable development is proposed within proximity to the retained vegetation, setbacks and/ or APZs sufficient to achieve BAL-29 are to be employed. Given the size of the proposed development cells adjacent to these hazard areas, appropriate setbacks are expected to be easily achieved.
- The development is sited adjacent to bushfire prone vegetation within Bush Forever Site 123 in the south, Roe Highway road reserve in the east and Poison Gully Creek in the north. Although the conceptual lot layout has been designed to avoid direct interfaces with external vegetation wherever possible, consideration should be given to areas of the Residential Precinct where the proximity of habitable development to external vegetation could result in BAL impacts exceeding BAL-29.
- The applicable habitable building setbacks from internal and external bushfire prone vegetation required to achieve BAL-29 are to be determined through site-specific BAL Contour map analysis at future planning stages but are likely to be:
 - * Class A Forest, Flat/ Upslope: 21 m
 - * Class A Forest, Downslope >0 to 5 degrees: 27 m
 - * Class A Forest, Downslope >5 to 10 degrees: 33 m
 - * Class B Woodland, Flat/ Upslope: 14 m
 - * Class B Woodland, Downslope >0 to 5 degrees: 17 m
 - * Class C Shrubland, Downslope >0 to 5 degrees: 10 m
 - * Class G Grassland, Downslope >0 to 5 degrees: 9 m.
- The design and species composition of the drainage basins have not yet been finalised but it is expected that the vegetation will comprise a combination of Class B Woodland, Class C Shrubland and Class G Grassland. The Concept Landscape Plan (Appendix 1) depicts the drainage areas as containing trees with substantial canopy coverage. On this basis, the BHL assessment has taken a precautionary approach to classify the entirety of each drainage basin as Class B Woodland, however, it is likely that vegetation with a lower classification will be planted in these areas. The drainage basins are to be assigned a precautionary effective downslope of >0 to 5 degrees at future planning stages.
- The Concept Landscape Plan (Appendix 1) includes low threat managed buffers around the perimeter of the POS and drainage basin areas that abut residential development. The purpose of the buffers is to accommodate the APZs for future residential development and to ensure that a minimum of BAL-29 is able to be achieved. The final design of the POS and drainage areas, including the required width of the low threat buffers, will be determined at the subdivision stage of planning.
- For the purposes of this high-level BHL assessment, the entire area of POS-02, POS-03, POS-04, POS-05, POS-06, POS-7 and POS-8 has been assigned an Extreme bushfire hazard level which is based on the presence of Class B Woodland (and Class A Forest for POS-08). This precautionary classification does not take into consideration the low threat buffers mentioned above or other low threat areas such as maintained turf, paving, footpaths and landscaped gardens. Low threat areas can be incorporated into the BAL Contour assessment at the subdivision stage of planning, once the landscaping design has been finalised.

- As mentioned above, POS-08 has been classified as Class A Forest as a precaution due to the proposed canopy cover and potential understorey vegetation which is detailed in the Town Park Concept Plan (Appendix 4), which will be finalised at the subdivision stage of planning. However, this vegetation will most likely be excluded in a future BAL Contour assessment on the basis that it is less than 1 ha in area and not within 100 m of any other classifiable vegetation. At the time this assessment was carried out, there was unmanaged grassland identified within adjacent Lot 1563, which is outside of the Structure Plan area. As management of the grassland is enforceable under the firebreak notice, there is grounds for this vegetation to be excluded in the future. The effect of excluding this vegetation will be that there will be no setback requirements from this vegetation.
- The Concept Landscape Plan (Appendix 1) identifies street tree landscaping throughout the Residential Precinct. It is assumed that the design of the street tree landscaping would meet the low threat exclusion criteria of AS 3959 Clause 2.2.3.2 (f). A sparser tree canopy has been considered to occur at key development interfaces to account for potential APZ requirements.
- The development has been designed to provide perimeter roads at the interface with both internal and external bushfire prone vegetation where possible. Although the perimeter roads have been sited to reduce the BAL impacts on adjacent residential lots, in instances where the roads are not of a sufficient width for the lots to achieve BAL-29 or lower, habitable building setbacks may be required.
- The Concept Landscape Plan (Appendix 1) includes the retention of vegetation within the school site and revegetation within POS-01 directly to the northeast. Future planning stages are to consider the potential bushfire impact of this vegetation on the school, in particular, ensuring that future buildings can achieve a minimum of BAL-29.
- The LSP includes a primary school site that is considered to be a Vulnerable Land Use under Policy Measure 6.6 of SPP 3.7. The future school will be subject to a development application and will need to be accompanied by an updated BMP that includes a Bushfire Attack Level (BAL) assessment and a bushfire emergency evacuation plan (BEEP). Any other Vulnerable Land Uses in an area greater than BAL-LOW will need to address Policy Measure 6.6 at the DA stage of planning.
- Development of the LSP is expected to occur in stages with each cell being constructed independently. Staging of development is to ensure that at least two access routes are provided at all times in accordance with acceptable solution A3.1 of the Guidelines (see Section 5).
- As the Residential Precinct contains relatively large amounts of bushfire prone vegetation, staged construction at the subdivision stage of planning is to consider the BAL impacts from adjacent future stages that have not yet been developed. Low threat buffers may need to be implemented around the current stage of development to ensure there is no residual impact from vegetation that has not yet been cleared or landscaped to achieve a low threat state.
- Fire service access routes (FSARs) may be required to provide access around the perimeter of the Residential Precinct where public roads are not proposed. Temporary FSARs may also be required during staged development to ensure firefighters are able to gain access to the site perimeter prior to future subdivision roads being constructed. Emergency access ways (EAWs) may also be required to link public roads during staging of development.

Strategen-JBS&G considers the bushfire hazards within and adjacent to the Residential Precinct and the associated bushfire risks are readily manageable through standard management responses outlined in the Guidelines and AS 3959 and the strategic level bushfire management strategies outlined in this BMP. These responses will be factored in to proposed development early in the planning process to ensure a suitable, compliant and effective bushfire management outcome is achieved for protection of future life and property assets.

5. Assessment against the bushfire protection criteria

5.1 Compliance table

In response to the requirements of SPP 3.7 and the Guidelines, strategic level bushfire management measures have been devised to demonstrate how the bushfire protection criteria will be met at subsequent stages of the planning process.

Table 1: Compliance table

Bushfire protection criteria	Method of compliance	Proposed bushfire management strategies
	Acceptable solutions	
Element 1: Location	A1.1 Development location	The post-development BHL assessment (Figure 6) identifies areas of land within the Residential Precinct with that will have a moderate bushfire hazard level on completion of the development. All habitable development is to be avoided on land with an extreme bushfire hazard level.
Element 2: Siting and design	A2.1 Asset Protection Zone	APZs sufficient to achieve BAL-29 are to be implemented for all lots subject to a BAL rating above BAL-LOW. The required APZs are to be identified at future planning stages based on future subdivision/ development design and following a BAL assessment. APZs are to be implemented and maintained in accordance with Schedule 1 of the Guidelines (Appendix 5) and the City's Firebreak and Fuel Load Notice (see Appendix 3).
Element 3: Vehicular access	A3.1 Two access routes	On completion of development, the Residential Precinct will be serviced by multiple access routes leading to destinations in all directions. The new main connecting road proposed as part of the development will provide an arterial linkage to the existing surrounding public road network. During staged development, each stage is to be provided with two access routes.
	A3.2 Public road	All public roads are to be constructed to comply with requirements of A3.2 (see Table 2 for technical details).
	A3.3 Cul-de-sac (including a dead-end-road)	The LSP does not include any dead-end roads. Temporary dead-end roads may be required during staged development, in which case they will need to comply with the requirements of A3.2 (see Table 2 for technical details). Sultana Road West is proposed to be closed near DB-01 which will result in a 70 m long dead-end that terminates with a carparking area. The road is unable to be constructed though because of the drainage basin and ecological link and is therefore considered to be unavoidable. As the dead-end portion of the road is relatively short and does not service any habitable development, it is not considered to be prohibitive of development or subject to any significant bushfire risk.
	A3.4 Battle-axe	N/A.
	A3.5 Private driveway longer than 50 m A private driveway is to meet detailed requirements (refer to the Guidelines for detailed private driveway requirements)	Where habitable development in an area above BAL-LOW requires a driveway longer than 50 m, the driveway is to comply with the requirements of A3.5 (see Table 2 for technical details).

Bushfire protection criteria	Method of compliance	Proposed bushfire management strategies
	Acceptable solutions	
	A3.6 Emergency access way	Temporary EAWs may be required to provide through access to a public road during staged development (see Table 2 for technical details). Based on the conceptual development design, the development is not considered to require any permanent EAWs.
	A3.7 Fire service access routes (perimeter roads)	FSARs may be required to provide firefighter access to the perimeter of the site and/ or development cells where public roads are not proposed (see Table 2 for technical details). Temporary FSARs may be required during staging of development to provide firefighter access to undeveloped areas of the Residential Precinct.
	A3.8 Firebreak width	Each stage of development is required to comply with the requirement of the City's Firebreak and Fuel Load Notice as amended (refer to Appendix 3). On completion of the development, the residential portions of the Residential Precinct will be fully managed and firebreaks would not be required for residential lots. Consultation with the City may be required to determine whether perimeter firebreaks would be applicable to the Brae Road Bush Forever site and the EC reserves abutting the northern and eastern boundaries, as these areas have significant environmental value.
Element 4: Water	A4.1 Reticulated areas	The Residential Precinct is serviced by an existing reticulated hydrant network. Future development will be provided with a reticulated supply compliant with Water Corporation DS-63 requirements.
	A4.2 Non-reticulated areas	N/A.
	A4.3 Individual lots within non-reticulated areas (Only for use if creating 1 additional lot and cannot be applied cumulatively)	N/A.

Table 2: Vehicular access technical requirements

Technical requirement	Public road	Cul-de-sac	Battle-axe legs and private driveways longer than 50 m	Emergency access ways	Fire service access routes
Minimum trafficable surface (m)	6*	6	4	6*	6*
Horizontal distance (m)	6	6	6	6	6
Vertical clearance (m)	4.5	N/A	4.5	4.5	4.5
Maximum grade <50 m	1 in 10	1 in 10	1 in 10	1 in 10	1 in 10
Minimum weight capacity (t)	15	15	15	15	15
Maximum crossfall	1 in 33	1 in 33	1 in 33	1 in 33	1 in 33
Curves minimum inner radius	8.5	8.5	8.5	8.5	8.5

* Refer to E3.2 Public roads: Trafficable surface

Source: WAPC 2017

6. Responsibilities for implementation and management

This BMP has been prepared as a strategic guide to demonstrate how development compliance will be delivered at future planning stages in accordance with the Guidelines. Aside from the preparation of future BMPs to accompany future subdivision and development applications where appropriate, there are no further items to implement, enforce or review at this strategic stage of the planning process.

Future BMPs prepared for subsequent subdivision and development applications are to meet the relevant commitments outlined in this strategic level BMP, address the relevant requirements of SPP 3.7 (i.e. Policy Measures 6.4 and 6.5 respectively) and demonstrate in detail how the proposed development will incorporate the relevant acceptable solutions to meet the performance requirements of the Guidelines. Future BMPs are to include the following detailed information:

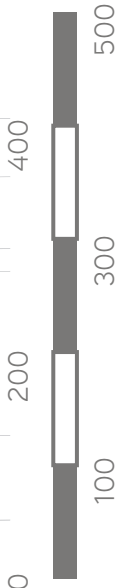
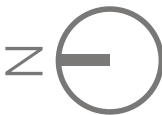
- proposed lot layout and detailed POS, reserve and drainage basin design
- post development classified vegetation extent, effective slope and separation distances
- post development BAL application requirements
- BAL contour map demonstrating that proposed development areas will achieve a rating of BAL-29 or lower
- width and alignment of compliant APZs
- confirmation of how bushfire management will be addressed during development staging
- confirmation of how bushfire management will be addressed with regards to temporary bushfire hazards on adjacent future development stages, including staging buffers or temporary quarantining of lots where required
- proposed approach to fuel management or AS 3959 application in response to on-site POS or easements (if and where required)
- vehicular access provisions, including demonstration that a minimum of two access routes will be achieved for each stage of development in accordance with acceptable solution A3.1
- water supply provisions with regards to reticulated water
- future requirements for any identified vulnerable land uses, such as provision of a Bushfire Emergency Evacuation Plan at the DA or building permit stage for the proposed school site
- provisions for notification on Title for any future lots with a rating of BAL-12.5 or greater as a condition of subdivision
- compliance requirements with the current City annual firebreak notice
- acceptable solutions assessment against the bushfire protection criteria
- proposed audit program outlining all measures requiring implementation and the appropriate timing and responsibilities for implementation.

On the basis of the information contained in this BMP, Strategen-JBS&G considers the bushfire hazards within and adjacent to the Residential Precinct and the associated bushfire risk is readily manageable through standard management responses outlined in the Guidelines and AS 3959. Strategen-JBS&G considers that on implementation of the proposed management measures, the Residential Precinct will be able to be developed with a manageable level of bushfire risk whilst maintaining full compliance with the Guidelines and AS 3959.

7. References

- Department of Fire and Emergency Services (DFES) 2019, *Map of Bush Fire Prone Areas*, [Online], Government of Western Australia, available from:
<https://maps.slip.wa.gov.au/landgate/bushfireprone/> [28/09/2021].
- Department of Planning (DoP) 2016, *Visual Guide for Bushfire Risk Management in Western Australia*, Perth.
- Element Town Planning + Design (Element), *Town Park Concept Plan – High Wycombe South Residential Precinct*. Element, Perth.
- Emerge Associates (2020), *Draft Forrestfield North Residential Precinct Local Structure Plan Strategic Conservation Management Plan*, Emerge Associates, Perth.
- Place Laboratory 2021, *Forrestfield North Landscape Plan*. Place Laboratory, Perth.
- Standards Australia (SA) 2009, *Australian Standard AS 3959–2009 Construction of Buildings in Bushfire-prone Areas*, Standards Australia, Sydney.
- Strategen-JBS&G 2020, *Local Water Management Strategy, Forrestfield North TOD Precinct*, Strategen-JBS&G, Perth/Bunbury.
- Strategen-JBS&G 2021a, *Bushfire Management Plan, Forrestfield North TOD Precinct ACP*, Strategen-JBS&G, Perth/Bunbury.
- Strategen-JBS&G 2021b, *Residential Precinct: Environmental Assessment and Management Strategy*, Strategen-JBS&G Perth.
- Urbaqua 2020, *Local Water Management Strategy, Forrestfield North Residential Precinct*, Urbaqua, Perth.
- Western Australian Planning Commission (WAPC) 2015, *State Planning Policy 3.7 Planning in Bushfire Prone Areas*, Western Australian Planning Commission, Perth.
- Western Australian Planning Commission (WAPC) 2017, *Guidelines for Planning in Bushfire Prone Areas*, Western Australian Planning Commission, Perth.

Appendix 1
Concept Landscape Plan (Place
Laboratory, 2021)



High Wycombe South - Landscape Plan

Legend

- Trees (canopy coverage >70%)
- Trees (canopy coverage 30-15%)
- Street trees
- Ecological protection zone
- Manicured planting (ground covering revegetation)
- Turf
- Street swale / rain garden
- Community
- Framework streets
- Plan boundary



Appendix 2

Georeferenced site photos



Photo 1: Class A Forest sited along the western side of Roe Highway. Vegetation has a tiered structure and >30% canopy cover.



Photo 2: Vegetation in distance is Class A Forest vegetation along the eastern side of Roe Highway.



Photo 3: Vegetation within Poison Gully reserve bordering the northern site boundary. Vegetation has a grassy understorey with a canopy cover greater than 30% and has been classified as Class A Forest.



Photo 4: Vegetation within Poison Gully reserve bordering the northern site boundary. Vegetation has a grassy and shrubby understorey with a canopy cover greater than 30% and has been classified as Class A Forest.



Photo 5: Vegetation within Poison Gully reserve bordering the northern site boundary. Vegetation has a grassy and shrubby understorey with a canopy cover greater than 30% and has been classified as Class A Forest



Photo 6: Vegetation within Poison Gully reserve bordering the northern site boundary. Vegetation has a grassy and shrubby understorey with a canopy cover greater than 30% and has been classified as Class A Forest



Photo 7: Class B Woodland vegetation in northwest corner of Residential Precinct. Comprises trees with canopy cover <30% and an unmanaged grassland understorey.



Photo 8: Class B Woodland bordering the northern side of Milner Road has a grassy understorey.



Photo 9: Vegetation within Poison Gully reserve to the north of Milner Road. Vegetation has a grassy and shrubby understorey with a canopy cover greater than 30% and has been classified as Class A Forest.



Photo 10: Class G Grassland vegetation within the northwest of the Residential Precinct. Grassland is unmanaged (>10 cm) and includes areas of Open Woodland (<10% canopy cover).



Photo 11: Class B Woodland within Brae Road Reserve. Vegetation comprises banksia woodland.



Photo 12: Vegetation within rural residential lots abutting the northern site boundary. Photo depicts banksia woodland classification. Area has been classified as Class A Forest as a precautionary measure due to connectivity to the Poison Gully Creek forest vegetation.



Photo 13: Class G Grassland vegetation within the east of the Residential Precinct. Grassland is unmanaged (>10 cm) and includes areas of Open Woodland (<10% canopy cover).



Photo 14: Class A Forest sited along the western side of Roe Highway. Vegetation has a tiered structure and canopy cover >30%.



Photo 15: Class A Forest sited along the western side of Roe Highway. Vegetation has a tiered structure and canopy cover >30%.



Photo 16: Class B Woodland located within the Brand Road old tip site. Vegetation comprises trees within canopy cover <30% and grassy understorey.



Photo 17: Class B Woodland within rural residential properties in east of Residential Precinct. Vegetation comprises trees with canopy cover <30% and grassy understorey.



Photo 18: Class G Grassland vegetation within Brand Road old tip site. Grassland is unmanaged (>10 cm) and includes areas of Open Woodland (<10% canopy cover).



Photo 19: Class B Woodland within rural residential properties in centre of Residential Precinct. Vegetation comprises banksia woodland.



Photo 20: Class B Woodland within Bush Forever site 123 south of the Residential Precinct. Vegetation comprises banksia woodland.



Photo 21: Class G Grassland vegetation in southeast of Residential Precinct. Grassland is unmanaged (>10 cm) and includes areas of Open Woodland (<10% canopy cover).



Photo 22: Class B Woodland within Bush Forever site 123 south of the Residential Precinct. Vegetation comprises banksia woodland.



Photo 23: Class A Forest sited along the western side of Roe Highway. Vegetation has a tiered structure and canopy cover >30%.



Photo 24: Class A Forest sited along the western side of Roe Highway. Vegetation has a tiered structure and canopy cover >30%.



Photo 25: Class B Woodland within rural residential properties in centre of Residential Precinct.
Vegetation has a grassy understorey and canopy cover <30%.



Photo 26: Class B Woodland within rural residential properties in centre of Residential Precinct.
Vegetation has a grassy understorey and canopy cover <30%.



Photo 27: Class B Woodland within rural residential properties in centre of Residential Precinct. Vegetation has a grassy/ shrubby understorey and canopy cover <30%.

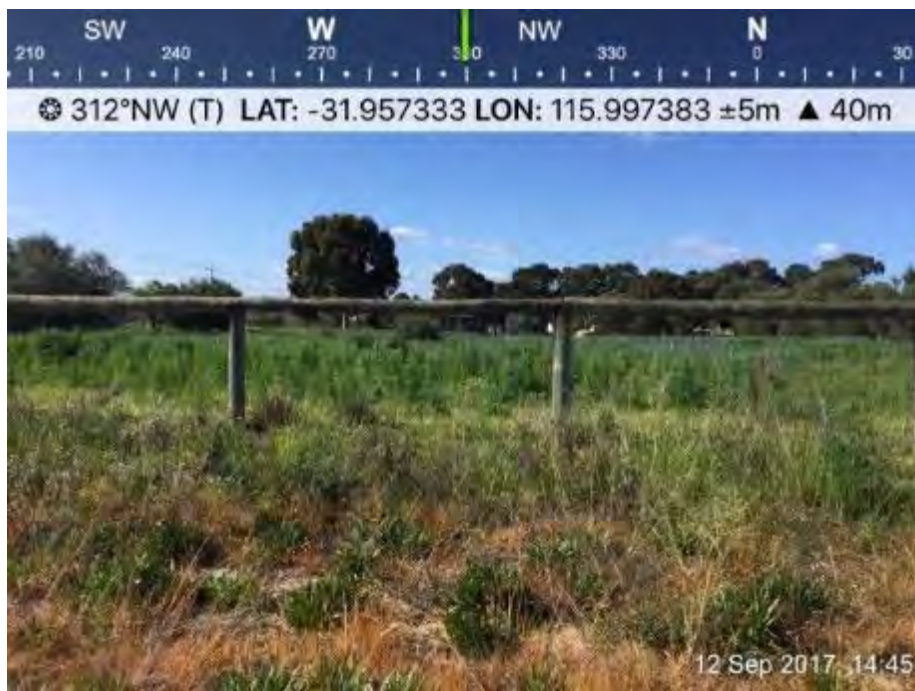


Photo 28: Class G Grassland vegetation in northwest of Residential Precinct. Grassland is unmanaged (>10 cm) and includes areas of Open Woodland (<10% canopy cover).



Photo 29: Low threat maintained lots excluded in accordance with AS 3959 Clause 2.2.3.2 (f).



Photo 30: Low threat public road and maintained verge vegetation excluded in accordance with AS 3959 clauses 2.2.3.2 (e) & (f).

Appendix 3
City of Kalamunda 2021/22 Firebreak
and Fuel Load Notice

FIRST AND FINAL NOTICE

FIRE HAZARD REDUCTION NOTICE 2021/2022

COMPLIANCE DUE BY:

1 NOV 2021

ASSESSMENTS COMMENCE FROM: 1 NOV 2021

Important: The works outlined below must be completed by 1 November 2021 and maintained in this state up to and including 31 March 2022.

NOTICE TO ALL OWNERS AND OCCUPIERS OF LAND WITHIN THE CITY OF KALAMUNDA

Pursuant to Section 33 of the *Bush Fires Act 1954* (WA), the City of Kalamunda (City) gives written notice to act as specified in this notice to land that you own and/or occupy and with respect to any matter which is upon the land that you own and/or occupy within the City. Failure or neglect to comply with this notice is an offence and can result in a penalty of up to \$5000. The City advises that its officers, servants, workmen, contractors, vehicles, machinery, and appliances (as the officers deem fit) may carry out the requisitions of this notice that are not complied with by the date specified above, and any costs and expenses incurred may be recovered from you as the owner and/or occupier of the land.

ALL LAND WITH A TOTAL AREA OF 4000m² OR MORE

❑ FIRE BREAKS

Install or upgrade a **3-metre-wide** by **4-metre-high clearance, bare mineral earth, continuous** (no dead ends) **trafficable** fire break as close as possible inside the entire perimeter of the land. Maintained, reticulated living lawns that are kept completely green is acceptable in conjunction with, or in lieu of, a mineral earth fire break/s (see definition FIRE BREAK).

❑ DEAD FLAMMABLE MATERIAL (DFM)

Reduce and/or maintain all dead flammable material below 8 tonne per hectare (see definition FUEL LOAD).

❑ SLASHING

Slash, mow, or trim dead grasses, dead shrubs, and dead plants to a height no greater than 50mm and remove cuttings/swath across the entire property.

❑ ASSET PROTECTION ZONE (APZ)

Maintain a fuel reduced zone around all buildings or assets which extends 20 metres from the outermost point of the building or asset.

- Gutters, roofs, and walls of all buildings to be free of flammable matter and maintained.
- Fuel load within the 20-metre zone is reduced and maintained to no more than 2 tonne per hectare.
- Trees over 5 metres in height within the 20-metre zone to be under pruned up to 2 metres.
- Trees or shrubs within 2 metres of the asset shall be pruned to a height no greater than 2 metres and/or pruned away from the asset to a distance no greater than 2 metres.

ALL LAND WITH A TOTAL AREA LESS THAN 4000m²

❑ DEAD FLAMMABLE MATERIAL

Reduce and/or maintain all dead flammable material below 8 tonne per hectare (see definition FUEL LOAD).

❑ SLASHING

Slash, mow, or trim dead grasses, dead shrubs, and dead plants to a height no greater than 50mm and remove cuttings/swath across the entire property.

❑ CLEAN GUTTER DEBRIS

Gutters, roofs, and walls of all buildings to be free of flammable matter and maintained.

VARIATION TO THE FIRE HAZARD REDUCTION NOTICE

If you consider it impractical to meet a requirement/s of this Notice, you may apply to the City for a variation **no later than 1 October 2021**.

Note: A variation is not an exemption but an application to employ other methods of property preparedness to land that you own and/or occupy.

An administration fee of \$150 applies for applications received after 1 October 2021.

If your application is not granted you must comply with all requirements outlined in the Fire Hazard Reduction Notice 2021/2022.

Variation request application forms are available before 1 October 2021 on the City's website at:

www.kalamunda.wa.gov.au/fire

ADDITIONAL WORKS

You may be required to carry out further bushfire property preparedness works on your land to reduce any fire hazards considered necessary by a Fire Officer. If required, these will be outlined in a 'work order' and sent to the address of the owner and/or occupier.

EMERGENCY MANAGEMENT PLANS AND CITY APPROVED TREATMENT PLANS

All properties and/or land subject to a Bushfire Management Plan, Emergency Management Plan, or an approved Bushfire Attack Level assessment (BAL), as a result of subdivision, development application or a City approved treatment plan, must comply with the listed requirements in their entirety. **Compliance with any additional plans does not constitute compliance with this Notice.**

ENVIRONMENTAL CONDITIONS

Any property subject to environmental values such as, but not limited to, Threatened Ecological Communities (TEC), Bush Forever sites, Declared Rare Flora and Fauna (DRF) sites etc, should seek further information about what can or cannot be done prior to carrying out requirements under this Notice.

DEFINITIONS

FIRE BREAK: A strip of land free of all flammable material with the intention of minimising the spread or extension of a bushfire and provide safe access on the property for emergency vehicles and other firefighting operations.

- » Clearance must be no less than 3-metres wide and 4-metres in height inside and along all boundaries (including boundaries adjacent to roads, rail and drain reserves and all public open space reserves).
- » Must not be more than 4-metres wide (further width extensions may be considered upon written application for approval to the City).
- » Maintained, reticulated living lawns are lawns considered to be kept completely green. Driveways may be acceptable in conjunction with, or in lieu of, mineral earth fire breaks. Contact a City Fire Officer for further assistance.
- » Must have a corner turning radius of up to 10 metres.
- » Must be a mineral earth break with a continuous trafficable surface for a 4WD vehicle, be clear of any obstructions and must not terminate in a cul-de-sac (dead end).

FUEL LOAD: Can be live and dead vegetation that accumulates over time.

This Notice refers only to dead vegetation.

Fine fuels include = leaf litter, grasses, twigs (up to 6mm diameter), bark etc.

Heavy (course) fuels include = branches, logs, stumps etc.

- » A fuel load depth of 15mm (fine fuels) to the mineral earth is indicative of approximately 8 tonne per hectare. The more fuel load, the higher the flame height and increased fire intensity.
- » Mulch piles, stored firewood and burn piles can contribute to fuel loading on land and must be stored safely away from assets, removed from the property, or actioned as directed by a Fire Officer.

If you require any further information, please contact the City of Kalamunda Community Safety team on (08) 9257 9999, email at enquiries@kalamunda.wa.gov.au or visit www.kalamunda.wa.gov.au/fire

Rhonda Hardy
CHIEF EXECUTIVE OFFICER

kalamunda.wa.gov.au

T 9257 9999 F 9293 2715 E enquiries@kalamunda.wa.gov.au
2 Railway Road KALAMUNDA WA 6076 PO Box 42, KALAMUNDA WA 6926
ABN 60 741 095 678

Appendix 4
Town Park Concept Plan (Element 2021)



Town Park Concept Plan

High Wycombe South Residential Precinct

Date: 21 Sep 2021 Scale: 1:1000 @ A3 1:500 @ A1 File: 17-527 ST-13 A Staff: MC GW Checked: MC



Appendix 5
Guideline standards for Asset
Protection Zones (APZs)

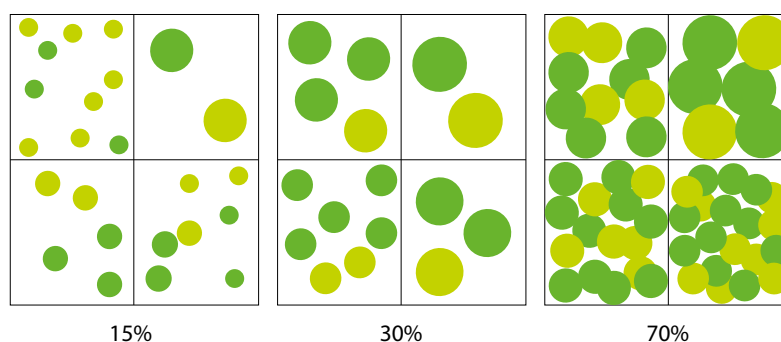
Contents	1	2	3	4	5	6	Appendices
	Introduction	Policy framework overview	Bushfire prone areas	Assessing bushfire risk in the planning context	Applying SPP 3.7	Roles and responsibilities	

ELEMENT 2: SITING AND DESIGN OF DEVELOPMENT

SCHEDULE 1: STANDARDS FOR ASSET PROTECTION ZONES

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

Figure 18: Tree canopy cover – ranging from 15 to 70 per cent at maturity



- **Shrubs (0.5 metres to 5 metres in height):** should not be located under trees or within 3 metres of buildings, should not be planted in clumps greater than 5m² in area, clumps of shrubs should be separated from each other and any exposed window or door by at least 10 metres. Shrubs greater than 5 metres in height are to be treated as trees.
- **Ground covers (<0.5 metres in height):** can be planted under trees but must be properly maintained to remove dead plant material and any parts within 2 metres of a structure, but 3 metres from windows or doors if greater than 100 millimetres in height. Ground covers greater than 0.5 metres in height are to be treated as shrubs.
- **Grass:** should be managed to maintain a height of 100 millimetres or less.