

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: Lot 9347 and 9357 Drumpellier Drive

Suburb: Ellenbrook

State: WA

P/code: 6069

Local government area: City of Swan

Description of the planning proposal: Subdivision application

BMP Plan / Reference Number: RDP17401.01

Version: R001 Rev 3

Date of Issue: 10/06/2020

Client / Business Name: Roberts Day

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

Name	Accreditation Level	Accreditation No.	Accreditation Expiry
Zac Cockerill	Level 2	BPAD 37803	31/08/2020
Company		Contact No.	
Strategen-JBS&G		9792 4797	

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

Signature of Practitioner



Date 10/06/2020

Bushfire Management Plan

Lots 9347 and 9357 Drumpellier
Drive, Ellenbrook Town Centre

Prepared for
Roberts Day
by Strategen-JBS&G

June 2020

Bushfire Management Plan

**Lots 9347 and 9357 Drumpellier
Drive, Ellenbrook Town Centre**

Strategen-JBS&G is a trading name of
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June 2020

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.

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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, Strategen-JBS&G reserves the right to review the report in the context of the additional information.

Client: Roberts Day

Report Version	Revision No.	Purpose	Strategen-JBS&G author/reviewer	Submitted to Client	
				Form	Date
Draft Report	Rev A	For client review	A Ennis / Z Cockerill (BPAD37803)	Electronic (email)	17/08/2017
Final Report	Rev 0	Issued for use: to accompany subdivision application	A Ennis	Electronic (email)	22/08/2017
Final Report	Rev 1	Issued for use: updated to address City of Swan queries	Z Cockerill (BPAD37803)	Electronic (email)	30/07/2019
Final Report	Rev 2	Issued for use: updated to address revised lot layout	B Mastrangelo (BPAD45985) / L Wears (BPAD19809)	Electronic (email)	15/10/2019
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Filename: RDP17401_01 R001 Rev 3 - 10 June 2020

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1. Introduction

1.1 Background

RobertsDay, on behalf LWP Property Group, is seeking to progress staged urban residential subdivision within Ellenbrook Town Centre Lots 9347 and 9357, Drumpellier Drive, Ellenbrook (the project area) within the City of Swan. The proposed subdivision (see Figure 1) will ultimately result in creation of:

- 298 residential lots, of which 60 are already titled within the Hesperia subdivision area
- balance title of Lot 9357 to the southeast
- four areas of Public Open Space (POS), of which one is already constructed.

Portions of the project area are designated as bushfire prone on the *WA Map of Bush Fire Prone Areas* (DFES 2017). Strategen-JBS&G (formerly Strategen) has prepared this Bushfire Management Plan (BMP) to address the following information requirements triggered by subdivision application under *State Planning Policy 3.7 Planning in Bushfire Prone Areas* (SPP 3.7; WAPC 2015) in accordance with Policy Measure 6.4:

- a Bushfire Attack Level (BAL) contour map to determine the indicative acceptable BAL ratings across the project area, in accordance with *Guidelines for Planning in Bushfire Prone Areas* (the Guidelines; WAPC 2017) – refer to Section 2.3 and Figure 4.
- identification of any bushfire hazard issues arising from the BAL contour assessment – refer to Section 2.4
- assessment against the bushfire protection criteria contained within the Guidelines demonstrating compliance within the boundary of the subdivision site – refer to Section 3 and Table 4.

This BMP has been prepared in accordance with the Guidelines and addresses the above information requirements to satisfy SPP 3.7.

Strategen prepared a BMP (Strategen 2017) to accompany the Structure Plan and, where relevant, the assessment and outcomes of this BMP are consistent with the BMP for the Structure Plan.

1.2 Purpose and application of the plan

The purpose of this BMP is to provide guidance on how to plan for and manage the bushfire risk to future life and property assets of the development area through incorporation of a range of bushfire management measures into subdivision design and construction. The BMP outlines how future on-site assets can be protected during the summer months when the threat from bushfire is at its peak. This is particularly relevant when existing fire appliances in the area may be unable to offer an immediate emergency suppression response; therefore, development planning and design should aim to provide mitigation strategies that protect future life and property from bushfire as a priority.

2. Spatial consideration of bushfire threat

2.1 Existing site characteristics

2.1.1 Location

The project area comprises Lots 9347 and 9357 Drumpellier Drive, Ellenbrook, in the City of Swan (Figure 2) and is bound by:

- The Promenade and residential development to the north
- future stages of Ellenbrook Town Centre subdivision to the southeast
- existing residential development to the south
- existing residential and commercial development to the east
- Drumpellier Drive and State forest/plantation estate to the west.

2.1.2 Zoning and land use

The project area is currently zoned 'Special Use Area' (SU4) under provisions of the City of Swan Local Planning Scheme No 17, with the special use being for the development of Ellenbrook Estate.

Land to the north, east and south is also zoned 'Special Use Area' and land to the west is reserved 'State forests' and 'Parks and Recreation' under provisions of the Local Planning Scheme No 17.

Adjacent land to the south and east will be subject to staged development under the Ellenbrook Town Centre Structure Plan.

2.1.3 Assets

The project area does not contain any significant life or infrastructure assets by virtue of the undeveloped nature of the site.

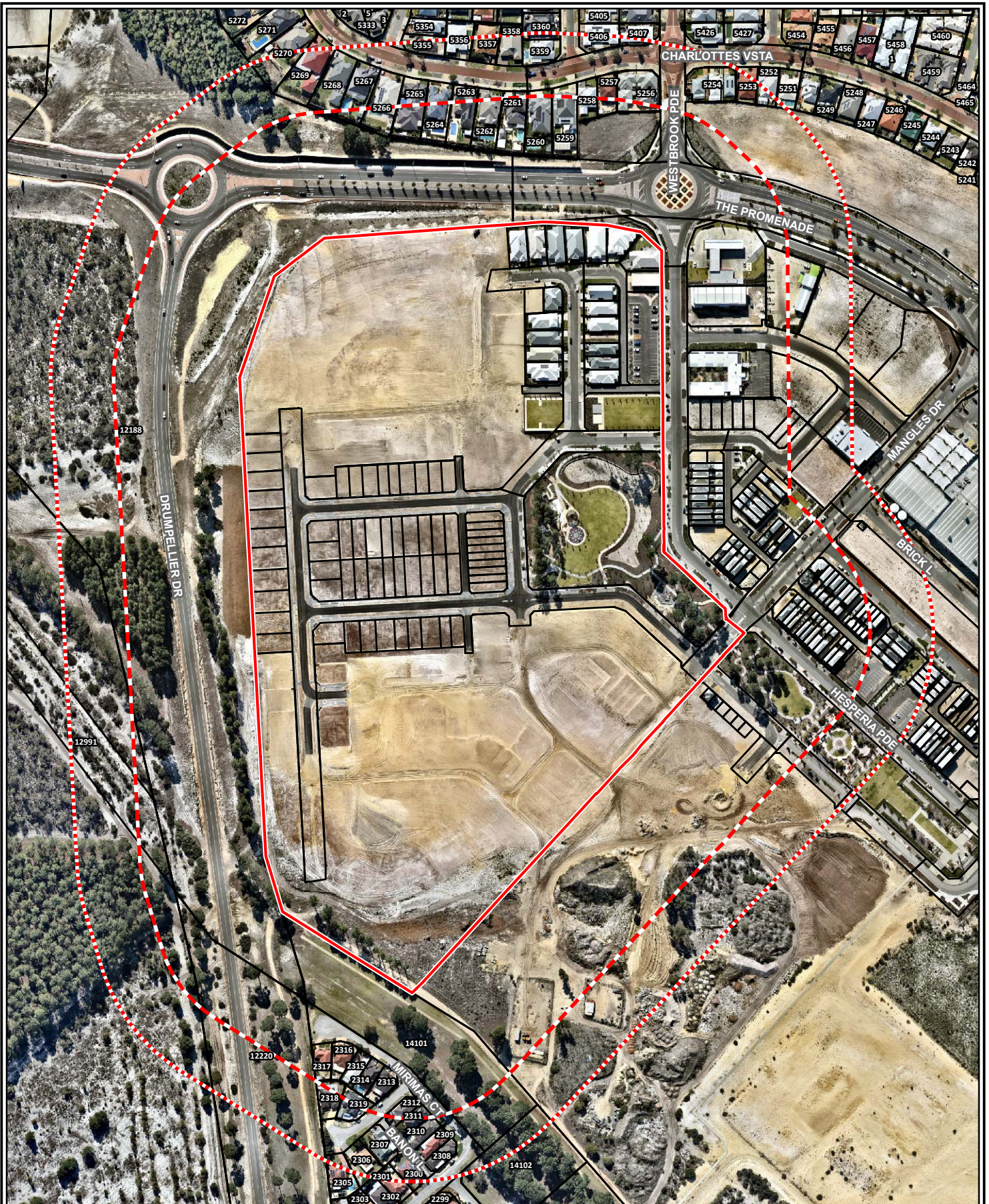
There are no significant environmental assets present due to the site being predominantly cleared. The project area previously contained a plot of State-owned *Pinus pinaster* (Pine) plantation asset, which was harvested by Forest Products Commission in March 2017.

2.1.4 Access

The project area is situated adjacent to main access roads in Drumpellier Drive to the west and The Promenade to the north. Multiple internal access connections occur to existing developed areas to the east of the project area (i.e. Cumberland Avenue, Catalpa Avenue, Clarinda Lane and Mangles Drive).

2.1.5 Water and power supply

Reticulated water and underground power supply infrastructure and services are available to the development area from surrounding development.



- Legend:**
- Project area
 - 100m assessment area
 - 150m assessment area
 - Existing cadastral boundaries

Scale 1:4,000 at A4

Coord. Sys. GDA 1994 MGA Zone 50

Job No: 57114

Client: Roberts Day

Version: A

Drawn By: cthatcher

Date: 09-Jun-2020

Checked By: CT

Ellenbrook Town Centre, WA

SITE OVERVIEW

FIGURE 2



2.2 Existing fire environment

2.2.1 Vegetation classification

Strategen-JBS&G undertook an assessment of the vegetation within the project area and 150 m of surrounding land on 7 August 2017 and revalidation on 21 February 2017 and 12 March 2020.

Vegetation was assessed in accordance with the *Visual guide for bushfire risk assessment in Western Australia* (DoP 2016) and *Australian Standard 3959-2009 Construction of Buildings in Bushfire Prone Areas* (AS 3959: SA 2009). The following provides a summary of the site investigation, as depicted in Figure 3, with georeferenced site photos provided in Appendix 1:

- the project area has been completely cleared in preparation for proposed urban development (Photo 1, Photo 2, Photo 3, Photo 4, Photo 5, Photo 6, Photo 7, Photo 8 and Photo 9)
- the adjacent 150 m of land consists of:
 - * Class A forest (pines) opposite The Promenade to the north (Photo 10) and Drumpellier Drive to the west (Photo 11)
 - * Class B woodland opposite Drumpellier Drive to the west (Photo 12)
 - * Class D scrub opposite Drumpellier Drive to the southwest (Photo 15)
 - * Class G grassland opposite Drumpellier Drive to the west (Photo 11)
 - * non-vegetated areas (e.g. roads and buildings) or low threat managed land including areas of on-site pine plantation that have been harvested (Photo 17, Photo 18, Photo 19, Photo 20, Photo 21, Photo 22, Photo 23, Photo 24, Photo 25, Photo 26 and Photo 27)
 - * areas of shrubland (Photo 13 and Photo 14) and grassland (Photo 16) to the southeast that occupy less than 1 ha in area and are situated greater than 100 m from any other classified vegetation and as such, are excludable under Clause 2.2.3.2 (b) of AS3959.

Vegetation that is currently managed in a low threat, minimal fuel condition is excluded from classification under Clause 2.2.3.2 (f) of AS 3959, including managed playing fields, POS, nature strips, cultivated gardens, managed cleared areas and managed grassland.

Any non-vegetated areas occupied by waterways, roads, dwellings or other infrastructure are excluded from classification under Clause 2.2.3.2 (e) of AS 3959.

A summary of the vegetation plot details is provided in Table 1. This information has been used to inform final vegetation classifications/exclusions (Figure 3) and BAL contour assessment (Figure 4).

2.2.2 Site topography and effective slope

Strategen-JBS&G has assessed site topography and effective slope under classified vegetation in accordance with AS 3959 methodology (Figure 3). This assessment involved on-ground verification of the slope under classified vegetation within the project area and adjacent 150 m as per conditions at time of assessment on 7 August 2017 and revalidation on 21 February 2017 and 12 March 2020.

The project area consists of flat to gently undulating land, with topographic elevation across the site ranging from approximately 50 Australian Height Datum (mAHD) in the north to approximately 55 mAHD in the south. The predominant slope under classified vegetation within the adjacent 150 m is situated either on flat land or up-slope from proposed development areas, with the exception of areas to the west of Drumpellier Drive that are located down-slope at >0–5 degrees.

A summary of effective slope details is provided in Table 1. This information has been used to inform the vegetation classifications/exclusions map (Figure 3) and BAL contour assessment (Figure 4).

Table 1: Vegetation classification and effective slope summary

Vegetation plot	Vegetation classification	Effective slope	Comments
1	Class A forest	Flat/upslope (0 degrees)	Pine plantation.
2	Class B woodland	Downslope >0-5 degrees	Woodland vegetation dominated by sparse banksia with a predominantly grassy understorey.
3	Class D scrub	Flat/upslope (0 degrees)	Scrub vegetation dominated by woolly bush greater than 2 m in height.
4	Class G grassland	Downslope >0-5 degrees	Unmanaged grassland vegetation greater than 10 cm in height.
6	Excluded under Clause 2.2.3.2 (b)	N/A	Areas of vegetation less than 1 ha in area and greater than 100 m from other post development classified vegetation,
7	Excluded under Clauses 2.2.3.2 (e) and (f)	N/A	Non-vegetated areas (i.e. buildings, driveways, roads, playgrounds, mulched areas) and low threat managed vegetation (i.e. managed gardens, manicured lawns, slashed road verges).

2.2.3 Drumpellier Drive and The Promenade road verge treatments

The eastern verge of Drumpellier Drive and the southern verge of The Promenade directly abut the project area and these verges have been converted to a low threat state via previous clearing of the former pine plantation and retention of sparse pines as required for screening/amenity/windbreak purposes. Being the primary road frontage to Ellenbrook Town Centre, these verges are intended to be well maintained for aesthetic purposes, including landscaping to a low threat state. Surface and understorey fuels have been removed and are currently being maintained in a low threat state by Ellenbrook Management in accordance with Clause 2.2.3.2 (f) of AS3959, with ongoing maintenance to be handed to the City as part of ultimate land transfer. Evidence of this exclusion is provided in Plate 1 and Plate 2 below, which is consistent with broader sections of the eastern Drumpellier Drive road verge situated south of the project area, as depicted in Plate 3.

The following correspondence from the City of Swan provides evidence of existing maintenance agreements to support the ongoing exclusion of the Drumpellier Drive (eastern) and The Promenade (southern) verges, including the drainage basin near the roundabout and the remnant pines to the east of the proposed development:

'The City has agreed to maintain the Drumpellier Drive verge in a low threat state, including the wide northern section near the roundabout.

City Reserves staff advise that the City has agreed to:

- *Maintain all of Drumpellier Drive including the northern parcel and drainage basins – it and the surrounding land will be vested to the City shortly*
- *Maintain it in a low threat state – which includes*
 - *In sections around the trees, mulching to 100mm thick (once every year minimum)*
 - *In other sections, ongoing slashing with mowers and tractors (once a month minimum).*

City Fire staff advise that they are comfortable that other verges and POS nearby to the subdivision area are/will be kept in a low threat state.'

Strategen-JBS&G understands that the proposed ongoing management works within Drumpellier Drive and The Promenade verges will ensure no classified vegetation is able to re-establish, and fuel loads within the verges will be maintained to achieve exclusion under Clause 2.2.3.2 (f) in perpetuity.



Plate 1: Eastern Drumpellier Drive road verge adjacent to project area (north) maintained in a low threat state



Plate 2: Eastern Drumpellier Drive road verge adjacent to project area (central) maintained in a low threat state



Plate 3: Eastern Drumpellier Drive road verge to the south of the project area

2.2.4 Revegetation/landscaping plans

Drainage basin planting has occurred within POS 1 (refer to Plate 4 and Figure 3), which is identified in the POS 1 landscaping plan (refer to Appendix 2). Strategen-JBS&G can confirm through a recent site assessment for Stage 2 Hesperia that, aside from the drainage basin, POS 1 has been established in low threat state (i.e. paths, manicured lawn, play areas, managed gardens, etc) and is being actively managed (refer to Plate 4 and Plate 5).



Plate 4: Photo of POS 1 drainage basin planting (March 2020)

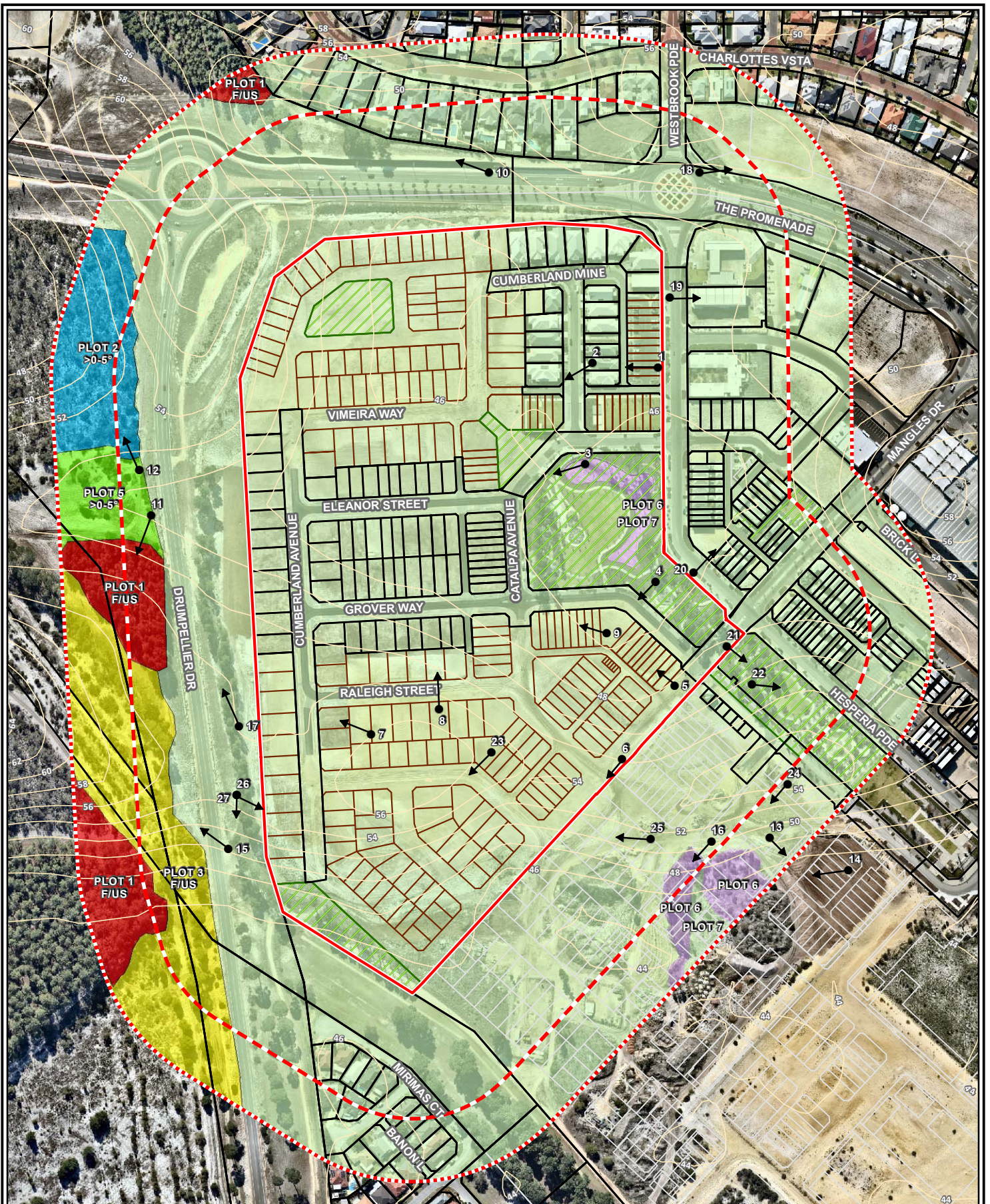


Plate 5: Photo of low threat outcome within POS 1 (March 2020)

Given that revegetation within POS 1 is less than 1 ha in size and located more than 100 m from any other areas of vegetation being classified, this area of revegetation is excluded from classification under Clause 2.2.3.2 (b) of AS 3959.

All other areas of POS within the project area and surrounding 150 m of land will be subject to ongoing maintenance that will achieve a low bushfire fuel state (less than 2 t/ha) all year round and therefore have been identified as being excluded under Clause 2.2.3.2 (f).

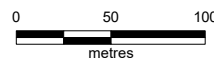
This information has been used to inform final vegetation classifications/exclusions (Figure 3) and BAL contour assessment (Figure 4).



Legend:

- Project area
 - 100m assessment area
 - 150m assessment area
 - POS
 - Existing cadastral boundaries
 - Proposed development
 - Future subdivision
 - Photo point and direction
 - Topographic contours (mAHd)
-
- Class A Forest
 - Class B Woodland
 - Class D Scrub
 - Class G Grassland
 - Clause 2.2.3.2 (b)
 - Clause 2.2.3.2 (e) & (f)

Scale 1:4,000 at A4



Coord. Sys. GDA 1994 MGA Zone 50



Job No: 57114

Client: Roberts Day

Version: A

Date: 10-Jun-2020

Drawn By: ctatcher

Checked By: CT

Ellenbrook Town Centre, WA

POST-DEVELOPMENT VEGETATION CLASSIFICATION AND EFFECTIVE SLOPE

FIGURE 3



2.3 BAL contour assessment

Any proposed habitable development that cannot achieve a full 100 m wide low fuel separation distance from post development classified vegetation will require application of AS 3959 to determine appropriate location and siting of development and potential increased building construction standards in response to the assessed BAL.

Strategen-JBS&G has undertaken a BAL contour assessment in accordance with Method 1 of AS 3959 for proposed development areas situated within the 150 m wide assessment area. The BAL contour assessment is based on post-development conditions on and adjacent to the site. The Method 1 procedure for calculating the BAL (as outlined in AS 3959) incorporates the following factors:

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

Based on the specified BAL contours, development location, siting and building construction requirements can be assigned subject to approval. A Method 1 BAL calculation for proposed development is outlined in the following subsections.

2.3.1 Fire Danger Index

A blanket rating of FDI 80 is adopted for Western Australian environments, as outlined in AS 3959 and endorsed by Australasian Fire and Emergency Service Authorities Council.

2.3.2 Post-development classified vegetation and exclusions

Proposed development will result in the clearing of vegetation within proposed road reserves and all residential lots within the development area.

All POS areas within the project area and surrounding 150 m of land will be subject to clearing/landscaping and ongoing management to achieve a low bushfire fuel state. Drainage basin planting within POS 1 is excluded on the basis that the drainage basin is less than 1 ha in size and located more than 100 m from any other vegetation being classified (see Section 2.2.4).

Implementation of staging buffers within adjacent land under control of the proponent, as outlined in Section 3.1.4, will ensure that development within the project area will not be impacted by any temporary vegetation extent.

Previous areas of pine plantations within the project area and south and west of the project area, which have now been harvested, will also be subject ongoing management via implementation of off-site staging buffers (see Section 3.1.4) or road reserve management (see Section 3.1.3).

Therefore, post-development vegetation exclusions will include:

- vegetation that is currently or will be managed in a low threat, minimal fuel condition excluded from classification under Clause 2.2.3.2 (f) of AS 3959, including:
 - * proposed/existing POS
 - * staging buffers, including cleared areas previously consisting of pine plantation
 - * nature strips/windbreaks along road reserves.
- any non-vegetated areas occupied by roads, parking, dwellings or other infrastructure excluded from classification under Clause 2.2.3.2 (e) of AS 3959, including:
 - * proposed residential lots
 - * existing/proposed roads.
- areas of vegetation less than 1 ha in size and located more than 100 m from other classified vegetation excluded from classification under Clause 2.2.3.2 (b) of AS 3959.

The post development extent of vegetation will consist of Class A forest, Class B woodland, Class D scrub and Class G grassland. Where BAL contours differ based on the different BAL application distances associated with the vegetation classifications, the highest (worst case) BAL has been applied.

The post development vegetation extent and classes described above have been used to inform the BAL contour assessment for the development area.

2.3.3 Effective slope

Effective slope is described in Section 2.2.2 and consists of up-slope or flat land (0 degrees) and down-slope >0-5 degrees.

2.3.4 Distance between proposed development areas and the classified vegetation

Strategen-JBS&G has identified the minimum separation distances between future habitable buildings and the classified vegetation, as summarised in Table 2. Separation distances for a maximum BAL-12.5 rating or lower can be achieved for all proposed development areas.

The required separation distances will be achieved in the form of Asset Protection Zones (APZs) comprising existing/proposed road reserves and managed POS or low fuel areas which will achieve a BAL-12.5 rating or lower (refer to Section 3.1.1).

The width of each BAL contour in Figure 4 is set in accordance with AS 3959 and reflects the relevant BAL rating applicable to the respective Class A forest, Class B woodland, Class D scrub or Class G grassland vegetation types situated on the various assessed slopes (refer to Table 2).

Final separation distances between classified vegetation and proposed buildings will need to be confirmed at future planning/building stages.

2.3.5 Method 1 BAL calculation

A Method 1 BAL calculation has been completed for the development area in accordance with AS 3959 methodology (Table 2). The BAL rating gives an indication of the level of bushfire attack (i.e. the radiant heat flux) that may be received by proposed lots and subsequently informs the standard of building construction required for proposed lots to potentially withstand such impacts.

The assessed BAL contours are depicted in Figure 4 and represent post-development conditions outlined in Section 2.3.2. Land within the development area that is unaffected by a BAL rating on the BAL contour map is considered to be BAL-Low, where there is insufficient risk to warrant specific building construction requirements.

Table 2: BAL contour assessment results

Method 1 BAL determination					
Plot	Vegetation classification	Effective slope	BAL contour width	Initial BAL (to lot boundary)	Modified BAL (with APZs)
1	Class A forest	Flat/upslope (0 degrees)	48-<100m	BAL-12.5	N/A
2	Class B woodland	Downslope >0-5 degrees	41-<100m	BAL-12.5	Some lots may achieve a lower BAL rating (i.e. BAL-Low) with a minor building setback.
3	Class D scrub	Flat/upslope (0 degrees)	27-<100m	BAL-12.5	Some lots may achieve a lower BAL rating (i.e. BAL-Low) with a minor building setback.
4	Class G grassland	Downslope >0-5 degrees	>100m	BAL-Low	N/A
6	Excluded under Clause 2.2.3.2 (b)	N/A	N/A	N/A	N/A
7	Excluded under Clauses 2.2.3.2 (e) and (f)	N/A	N/A	N/A	N/A

The above BAL contours are based on post-development conditions and take into consideration the proposed clearing extent, drainage basin planting in POS 1, resultant vegetation exclusions and separation distances achieved in line with the proposed subdivision and approved Structure Plan. Should there be any changes in development design or vegetation/hazard extent that requires a modified bushfire management response, then the above BAL contours will need to be reassessed for the affected areas and documented in a brief addendum to this BMP prepared to accompany a future planning/development/building application.

2.4 Identification of bushfire hazard issues

There is no landscape scale bushfire risk to the development area since fire runs are limited through a highly cleared and fragmented vegetation extent located northwest, west and southwest of the development area.

The predominant bushfire weather conditions (i.e. average January conditions) for the subject locality are from the east and southeast in the morning and from the southwest in the afternoon (BoM 2017). 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 are sometimes associated with 'Extreme' or 'Catastrophic' fire dangers, which are consistent with very high temperatures, low relative humidity and strong winds. Based on the predominant summer climatic conditions of the local area, 'Extreme' and 'Catastrophic' fire dangers occur less than 5% of the time during the designated bushfire season, which equates to around six days between December and March (McCaw & Hanstrum 2003).

Strategen-JBS&G therefore considers a fire front approaching the development area from the northwest or southwest to be the worst case bushfire scenario due to the presence of fire runs through State forest in these directions.

The bushfire hazard located within State forest will remain post development of the site. However, some of this hazard is temporarily occupied by pine plantation that will be harvested by Forest Products Commission at some future stage, similar to what has occurred throughout recently harvested areas to the west of Drumpellier Drive. This hazard is likely to return on re-seeding of pine forest areas.

The bushfire risk to future life and property assets posed by this hazard can be managed through standard application of acceptable solutions under the Guidelines, including provision for and implementation of APZs, relevant bushfire construction standards (where relevant), provision of adequate emergency water supply and vehicular access, as well as through a direct bushfire suppression response if required.

On this basis, Strategen-JBS&G considers the bushfire hazards within and adjacent to the project area and the associated bushfire risk is readily manageable through standard management responses outlined in the Guidelines and AS 3959. 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.

3. Bushfire management measures

Strategen-JBS&G has identified a range of bushfire management measures that on implementation will enable all proposed areas to be developed with a manageable level of bushfire risk whilst maintaining full compliance with the Guidelines and AS 3959. The bushfire management measures are discussed in the following subsections and depicted in Figure 4 (where applicable).

3.1 Asset Protection Zones (APZs)

The BAL contours identified in Figure 4 demonstrate that all of the proposed residential lots have capacity to be located within areas of BAL-12.5 or lower and therefore can achieve minimum separation distances outlined in Table 2 through provision of APZs at all interfaces where proposed buildings abut post-development classified vegetation.

The required APZs at the northern and western interfaces of the project area will consist of The Promenade and Drumpellier Drive road reserves respectively.

This will meet minimum APZ requirements as per Guideline acceptable solution A2.1 and will ensure development is avoided throughout all areas of BAL-FZ and BAL-40 as per Guideline acceptable solution A1.1.

The APZs need to be maintained on a regular and ongoing basis at a fuel load less than 2 t/ha to achieve a low threat minimal fuel condition in accordance with acceptable solution A2.1 of the Guidelines. This may include regular slashing/weed control of road verges and grassland fuels where applicable. Timing and responsibilities for APZ implementation and maintenance are outlined below and summarised in Table 5.

Requirements under the Guidelines for APZs include:

- Fine Fuel Load: combustible dead vegetation matter less than 6 mm in thickness reduced to and maintained at an average of 2 t/ha
- Trees (>5 m in height): lower branches should be removed to a height of 2 m above the ground, canopy cover should be less than 15% with tree canopies at maturity well spread to at least 5 m apart as to not form a continuous canopy
- Shrubs (0.5 m to 5 m in height): should not be located under trees, should not be planted in clumps greater than 5 m² in area, clumps of shrubs should be separated from each other by at least 10 m
- Groundcovers (<0.5 m in height): can be planted under trees but must be properly maintained to remove dead plant material and any parts within 2 m of a structure
- Grass: should be managed to maintain a height of 10 cm or less.

3.1.1 On-site fuel management

Following subdivision approval, the developer will be responsible for the management of any vacant lots through regular slashing and weed control to ensure the understorey and surface fuels are kept in a low threat, minimal fuel condition in accordance with Clause 2.2.3.2 (f) of AS 3959 until such time that the lots are sold, after which the fuel management responsibility will be transferred to the respective landowners.

This is consistent with the City of Swan annual firebreak notice (Appendix 3), which requires flammable material, such as grass and weeds, to be slashed or mowed to a height no greater than 5 cm across all lots 5,001 m² or less in size.

Management Action BMP 1a

Cleared lots will 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. Management will involve slashing/mowing of grassland and weeds to height of less than 5 cm, which is driven through compliance with the City of Swan annual firebreak notice (refer to Appendix 3).

3.1.2 POS fuel management

All POS areas identified as excluded from classification will need to be managed on a regular and ongoing basis through slashing, weed control and manual fuel removal to ensure the understorey and surface fuels are kept in a low threat, minimal fuel condition in accordance with Clause 2.2.3.2 (f) of AS 3959. Individual trees throughout on-site POS areas can be retained for visual/aesthetic/screening purposes. POS management will be the responsibility of the developer until such time that these management responsibilities are transferred to the City.

Proposed landscaping plans for the project area will need to reflect the bushfire management measures required under this BMP.

Management Action BMP 1b

All POS areas, with the exception of the drainage basin less than 1 ha in size within POS 1, will be subject to ongoing management that will achieve a low threat minimal fuel condition all year around. The required works will include slashing of understorey grasses and weeds on a regular and ongoing basis to maintain fuel loads at less than 2 t/ha and achieve a low threat minimal fuel condition all year round consistent with requirements for an APZ.

3.1.3 Road reserve fuel management

Proposed internal roads will be in a non-vegetated state following construction; however, ongoing maintenance will be required to ensure the understorey and surface fuels are kept in a low threat, minimal fuel condition in accordance with Clause 2.2.3.2 (f) of AS 3959. Existing road reserves currently excluded from classification, including the eastern verge of Drumpellier Drive and southern verge of The Promenade, will also need to be managed to ensure that fuels are maintained in a low threat, minimal fuel condition (as per City low threat maintenance agreement documented in Section 2.2.3). Road verge management will be the responsibility of Ellenbrook Management until transfer of land to the City, after which the City will be responsible for ongoing management.

Management Action BMP 1c

Road verges will need 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. Road verge management will be the responsibility of Ellenbrook Management until transfer of land to the City, after which the City will be responsible for ongoing management.

3.1.4 Balance lot staging buffers

Management Action BMP 1d

Off-site 100 m wide low fuel buffers are proposed to the north, south, southeast and east of the project area within balance titles (see Figure 4). Once the buffers are created, they will need to be maintained on a regular and ongoing basis by the developer at a fuel load less than 2 t/ha until future development extends to the south, southeast and east and the buffer is extinguished. This will manage the bushfire risk from off-site temporary vegetation during development staging. Management may involve regular slashing/mowing of grassland and weeds to height of less than 10 cm. A sparse assembly of overstorey canopy can be retained within these buffers provided the level of retention is in accordance with Guideline requirements for APZs, as specified in Section 3.1.1.

3.2 Increased building construction standards

Strategen-JBS&G has assigned BAL contours for the development area as depicted in Figure 4. On the basis of the current subdivision plan, proposed new development can be located in BAL-12.5 areas or lower, with no development occurring in areas of BAL-FZ or BAL-40, in accordance with acceptable solution A1.1.

All development situated outside of the 100 m wide assessment area is considered to be BAL-Low, where there is insufficient risk to warrant specific building construction requirements. The extent of BAL-Low throughout the site relies on the separation distances and fuel management measures being implemented.

The BAL contour map outlined in Figure 4 is considered suitable for the purposes of informing subdivision and future building permit approval processes; however, acceptance of the BAL contour map at future planning or building permit stages is at the discretion of the City and reassessment of the BAL for individual lots located in designated bushfire prone areas may be required at the building permit stage in accordance with WA building legislation.

Management Action BMP 2a

All dwellings will be constructed to the assessed BAL rating, either in accordance with this BMP or future reassessment of the BAL to support future planning/building permit stages.

3.3 Vehicular access

3.3.1 Public and internal access

As all of the proposed residential lots within the project area will directly front the proposed or existing access network, all lots will have at least two different points of vehicular access for all development stages at all times. Existing access routes leading into the project area also provide egress to more than two different destinations via The Promenade to the east and Drumpellier Drive to the south. One permanent cul-de-sac is proposed in the northern portion of the project area. The cul-de-sac is unavoidable due to proximity to an existing intersection that is unable to be provided as a through connection. The cul-de-sac is approximately 45 m in length, services five proposed lots and is situated in an area of BAL-Low, so compliance with technical requirements of the Guidelines is not warranted.

The proposed internal public access network links with the surrounding existing public road network and achieves a circular access network. Public roads proposed as part of the development will need to comply with technical requirements of the Guidelines, as outlined in Table 3. Temporary cul-de-sacs (including temporary turnaround areas) and Emergency Access Ways (EAWs) may be required to maintain compliant vehicular access provisions during staged development and will be required to meet the technical requirements of the Guidelines, as specified in Table 3. Any temporary cul-de-sacs will be less than 200 m in length and have minimum 17.5 m diameter turnaround heads. Any temporary EAWs are to be less than 600 m in length and must be clearly signposted. No permanent battle-axes or EAWs are proposed and given the proposed lot sizes, no private driveways longer than 50 m will be required.

Table 3: Vehicular access technical requirements

Technical requirement	Public road	Cul-de-sac	Emergency Access Ways
Minimum trafficable surface (m)	6*	6	6*
Horizontal distance (m)	6	6	6
Vertical clearance (m)	4.5	N/A	4.5
Maximum grade <50 m	1 in 10	1 in 10	1 in 10
Minimum weight capacity (t)	15	15	15
Maximum crossfall	1 in 33	1 in 33	1 in 33
Curves minimum inner radius	8.5	8.5	8.5

* Refer to E3.2 Public roads: Trafficable surface

Source: WAPC 2017

Management Action BMP 3a

All public roads and any temporary cul-de-sacs/EAWs constructed as part of the development will comply with technical requirements of the Guidelines in accordance with A3.2 and A3.3 (refer to Table 3).

3.3.2 Individual lot firebreaks

The City of Swan annual firebreak notice (Appendix 3) requires 3 m wide (with 4 m vertical clearance) boundary firebreaks on land greater than 5000 m².

Firebreaks will not be required throughout the residential lot component of proposed development since these lots will be of a size that will not trigger firebreak requirements; however, firebreaks may be required for larger lots (such as staged balance lots and POS) in accordance with acceptable solution A3.8 and the City of Swan annual firebreak notice.

Management Action BMP 3b

Three metre wide, mineral earth internal perimeter firebreaks with four metre vertical clearance will be required around the boundaries of relevant lots in accordance with requirements of the City of Swan annual firebreak notice (Appendix 3).

3.4 Reticulated water supply

Management Action BMP 4a

Proposed development areas will be provided a reticulated water supply. The reticulated system will ensure an all year round supply of water is provided for each lot to meet minimum domestic and emergency water supply requirements.

A network of hydrants will also be provided along the internal road network at locations which meet relevant water supply authority and DFES requirements, in particular the Water Corporation Design Standard DS 63 'Water Reticulation Standard Design and Construction Requirements for Water Reticulation Systems up to DN250'. This standard will guide construction of the internal reticulated water supply system and fire hydrant network, including spacing and positioning of fire hydrants so that the maximum distance between a hydrant and the rear of a building envelope (or in the absence of a building envelope, the rear of the lot) shall be 120 m and the hydrants shall be no more than 200 m apart.

3.5 Additional measures

Strategen-JBS&G makes the following additional recommendations to inform ongoing stages of development.

Management Action BMP 5a:

Where relevant, a notification pursuant to Section 165 of the *Planning and Development Act 2005* is to be placed on the certificates of title of proposed lots with a BAL rating of 12.5 or above, advising of the existence of a hazard or other factor. The notification is to state as follows:

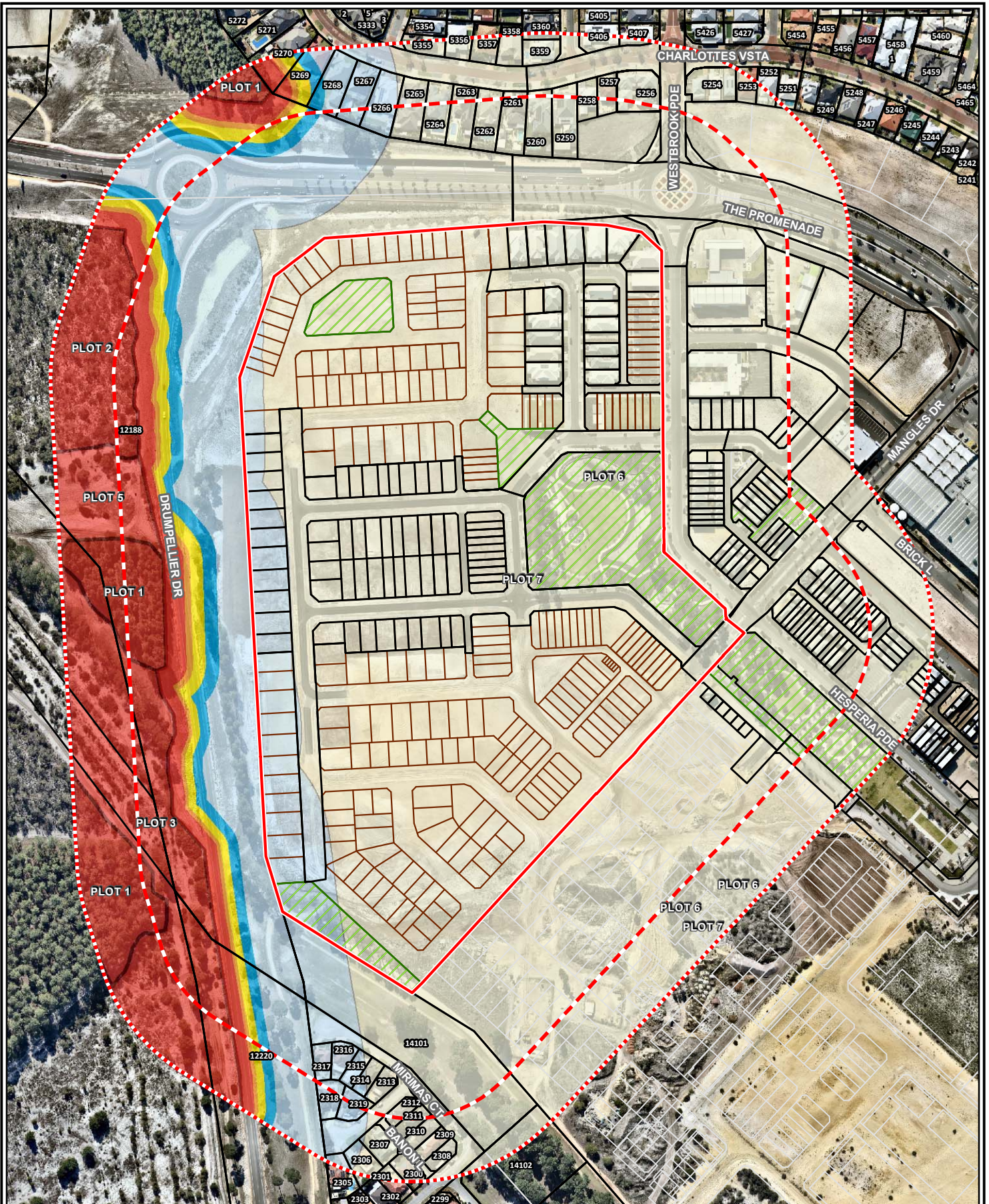
This land is subject to a Bushfire Management Plan. Additional planning and building requirements may apply to development on this land.

Management Action BMP 5b:

Reassessment of the BAL to inform individual building permit applications may be required at the discretion of the City or if any changes occur to proposed development design and/or vegetation class extent which may result in a different BAL rating being applied.

Management Action BMP 5c

All parties are to comply with the current City of Swan annual firebreak notice as outlined in Appendix 3.



- Legend:**
- Project area
 - 100m assessment area
 - 150m assessment area
 - POS
 - Existing cadastral boundaries
 - Proposed development
 - Future subdivision
 - Classified vegetation
 - BAL contours
 - BAL FZ
 - BAL 40
 - BAL 29
 - BAL 19
 - BAL 12.5
 - BAL Low

Scale 1:4,000 at A4 0 50 100 metres

Coord. Sys. GDA 1994 MGA Zone 50 ↑

Job No: 57114

Client: Roberts Day

Version: A Date: 09-Jun-2020

Drawn By: ctatcher Checked By: CT

Ellenbrook Town Centre, WA

BAL CONTOUR MAP

FIGURE 4

4. Proposal compliance and justification

Proposed development within the development area is required to comply with SPP 3.7 under the following policy measures:

6.2 Strategic planning proposals, subdivision and development applications

a) Strategic planning proposals, subdivision and development applications within designated bushfire prone areas relating to land that has or will have a Bushfire Hazard Level (BHL) above low and/or where a Bushfire Attack Level (BAL) rating above BAL-LOW apply, are to comply with these policy measures.

b) Any strategic planning proposal, subdivision or development application in an area to which policy measure 6.2 a) applies, that has or will, on completion, have a moderate BHL and/or where BAL-12.5 to BAL-29 applies, may be considered for approval where it can be undertaken in accordance with policy measures 6.3, 6.4 or 6.5.

c) This policy also applies where an area is not yet designated as a bushfire prone area but is proposed to be developed in a way that introduces a bushfire hazard, as outlined in the Guidelines.

6.4 Information to accompany subdivision applications

Any subdivision application to which policy measure 6.2 applies is to be accompanied by the following information in accordance with the Guidelines:

a) a BAL Contour Map to determine the indicative acceptable BAL ratings across the subject site, in accordance with the Guidelines. BAL Contour Maps should be prepared by an accredited Bushfire Planning Practitioner;

b) the identification of any bushfire hazard issues arising from the BAL Contour Map; and

c) an assessment against the bushfire protection criteria requirements contained within the Guidelines demonstrating compliance within the boundary of the subdivision site.

Implementation of this BMP is expected to meet the following objectives of SPP 3.7:

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

In response to the above requirements of SPP 3.7, the bushfire management measures, as outlined in Section 3, have been devised for the proposed development in accordance with acceptable solutions of the Guidelines to meet compliance with bushfire protection criteria. An 'acceptable solutions' assessment is provided in Table 4 to assess the proposed bushfire management measures against each bushfire protection criteria in accordance with the Guidelines and demonstrate that the measures proposed meet the intent of each element of the bushfire protection criteria.

Table 4: Acceptable solutions assessment against bushfire protection criteria

Bushfire protection criteria	Intent	Acceptable solutions	Proposed bushfire management measures	Compliance statement
Element 1: Location	To ensure that strategic planning proposals, subdivision and development applications are located in areas with the least possible risk of bushfire to facilitate the protection of people, property and infrastructure	A1.1 Development location The strategic planning proposal, subdivision and development application is located in an area that is or will, on completion, be subject to either a moderate or low bushfire hazard level, or BAL-29 or below.	Refer to Section 3.2 and Figure 4, which demonstrate that all new development will only occur in areas of BAL-12.5 or lower. No development will occur in BAL 40 or BAL FZ areas.	The measures proposed are considered to comply and meet the intent of Element 1 Location.
Element 2: Siting and design of development	To ensure that the siting and design of development minimises the level of bushfire impact	A2.1 Asset Protection Zone Every building is surrounded by an APZ, depicted on submitted plans, which meets detailed requirements (refer to the Guidelines for detailed APZ requirements).	Refer to Section 3.1 and Figure 4, which demonstrate that all lots have capacity to achieve minimum APZ requirements to achieve a rating of BAL-12.5 or lower.	The measures proposed are considered to comply and meet the intent of Element 2 Siting and design of development
Element 3: Vehicular access	To ensure that the vehicular access serving a subdivision/development is available and safe during a bushfire event	A3.1 Two access routes Two different vehicular access routes are provided, both of which connect to the public road network, provide safe access and egress to two different destinations and are available to all residents/the public at all times and under all weather conditions. A3.2 Public road A public road is to meet the requirements in Table 4, Column 1. A3.3 Cul-de-sac (including a dead-end-road) A cul-de-sac and/or a dead end road should be avoided in bushfire prone areas. Where no alternative exists (i.e. the lot layout already exists and/or will need to be demonstrated by the proponent), detailed requirements will need to be achieved (refer to the Guidelines for detailed cul-de-sac requirements). A3.4 Battle-axe Battle-axe access leg should be avoided in bushfire prone areas. Where no alternative exists, (this will need to be demonstrated by the proponent) detailed requirements will need to be achieved (refer to the Guidelines for detailed battle-axe requirements). 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).	Refer to Section 3.3.1, which demonstrates that two access routes will be achieved for all proposed lots. Refer to Section 3.3.1, which demonstrates that all proposed public roads will meet minimum technical requirements of the Guidelines as outlined in Table 3. Refer to Section 3.3.1, which specifies that all temporary cul-de-sacs required as part of staging will meet minimum technical requirements of the Guidelines as outlined in Table 3. N/A - no battle-axes are proposed as part of the development. N/A - no private driveways longer than 50 m are proposed as part of the development.	The measures proposed are considered to comply and meet the intent of Element 3 Vehicular access

		<p>A3.6 Emergency access way An access way that does not provide through access to a public road is to be avoided in bushfire prone areas. Where no alternative exists (this will need to be demonstrated by the proponent), an emergency access way is to be provided as an alternative link to a public road during emergencies. An emergency access way is to meet detailed requirements (refer to the Guidelines for detailed EAW requirements).</p>	N/A - no EAWs are proposed as part of the development.	
		<p>A3.7 Fire service access routes (perimeter roads) Fire service access routes are to be established to provide access within and around the edge of the subdivision and related development to provide direct access to bushfire prone areas for fire fighters and link between public road networks for firefighting purposes. Fire service access routes are to meet detailed requirements (refer to the Guidelines for detailed fire service access route requirements).</p>	N/A - no fire service access routes are proposed as part of the development.	
		<p>A3.8 Firebreak width Lots greater than 0.5 hectares must have an internal perimeter firebreak of a minimum width of three metres or to the level as prescribed in the local firebreak notice issued by the local government</p>	Refer to Section 3.3.2, which demonstrates that no firebreaks will be required for individual residential lots. However, should any firebreaks be required for larger lots (such as staged balance lots and POS) these will meet requirements of the Guidelines and the City of Swan annual firebreak notice.	
Element 4: Water	To ensure that water is available to the subdivision, development or land use to enable people, property and infrastructure to be defended from bushfire.	<p>A4.1 Reticulated areas The subdivision, development or land use is provided with a reticulated water supply in accordance with the specifications of the relevant water supply authority and Department of Fire and Emergency Services.</p>	Refer to Section 3.4, which demonstrates that the development area will be provided a reticulated water supply and network of hydrants in accordance with local water authority, City and DFES requirements.	The measures proposed are considered to comply and meet the intent of Element 4 Water
	<p>A4.2 Non-reticulated areas Water tanks for firefighting purposes with a hydrant or standpipe are provided and meet detailed requirements (refer to the Guidelines for detailed requirements for non-reticulated areas)</p>	N/A - the proposed development is within a reticulated area.		
	<p>A4.3 Individual lots within non-reticulated areas (Only for use if creating 1 additional lot and cannot be applied cumulatively) Single lots above 500 square metres need a dedicated static water supply on the lot that has the effective capacity of 10 000 litres.</p>	N/A - the proposed development is within a reticulated area.		

5. Implementation and enforcement

Implementation of the BMP applies to the developer, landowners and the City to ensure bushfire management measures are adopted and implemented on an ongoing basis. A bushfire compliance table is provided in Table 5 to drive implementation of all bushfire management works associated with this BMP.

Table 5: Bushfire compliance table

Reference	Action	Timing	Responsibility
BMP 1a (refer to Section 3.1.1)	Establish and maintain bushfire fuels within all cleared lots to achieve exclusion Clause 2.2.3.2 (f) of AS 3959	Ongoing, all year round	Establishment – developer Maintenance – developer until vacant land is developed, landowners thereafter
BMP 1b (refer to Section 3.1.1)	Establish and maintain portions of POS to be cleared/excluded as depicted on Figure 4 in a low threat state to achieve exclusion Clause 2.2.3.2 (f) of AS 3959	During subdivisional works, ongoing thereafter (all year round)	Establishment – developer Maintenance – developer until transfer of land, City thereafter
BMP 1c (refer to Section 3.1.1)	Maintain excluded areas of existing roads reserves and new road verges in a low threat state to achieve exclusion Clause 2.2.3.2 (f) of AS 3959 (this includes the eastern Drumpellier Drive road verge and southern Promenade road verge in accordance with existing City management arrangements specified in Section 2.2.3)	Ongoing, all year round	Ellenbrook Management until transfer of land to the City, City thereafter
BMP 1d (refer to Section 3.1.3)	Implement staging buffers within balance lots around each development stage where required, prior to development within that stage, and maintained as required to ensure the buffer is kept in a low threat minimal fuel condition on a regular and ongoing basis until developed	Until such time that implementation of staged clearing within adjacent land occurs	Developer
BMP 2a (refer to Section 3.2)	Construct buildings in accordance with AS 3959, either in accordance with this BMP or future reassessment of the BAL to support the building permit stage	At building construction	Landowners / builder
BMP 3a (refer to Section 3.3.1)	Construct public roads and temporary cul-de-sacs/EAWs (as required) in accordance with subdivision approval and relevant technical requirements of the Guidelines	During subdivisional works	Developer
BMP 3b (refer to Section 3.3.2)	Construct firebreaks around boundaries of relevant lots in accordance with requirements of the City of Swan annual firebreak order outlined in Appendix 3	During subdivisional works and ongoing maintenance thereafter	Developer prior to lot sale or land transfer and landowner or land management authority thereafter
BMP 4a (refer to Section 3.4)	Construct reticulated water supply and network of hydrants in accordance with DA approval and water authority, DFES and City technical requirements	During subdivisional works	Developer
BMP 5a (refer to Section 3.5)	Place notification on the Certificates of Title of all proposed lots with a BAL rating of 12.5 or above	At creation of Title	Relevant authority
BMP 5b (refer to Section 3.5)	Reassess BALs for individual lots	Prior to title, or at the building stage	Developer prior to lot sale or landowner following lot purchase
BMP 5c (refer to Section 3.5)	Comply with the City of Swan annual firebreak order outlined in Appendix 3	Ongoing all year round	All parties

6. References

- Bureau of Meteorology (BoM) 2017, *Climate statistics for Australian locations: Monthly climate statistics for Pearce RAAF*, [Online], Commonwealth of Australia, available from:
http://www.bom.gov.au/climate/averages/tables/cw_009053.shtml, [8/8/2017].
- Department of Fire and Emergency Services (DFES) 2017, *Map of Bush Fire Prone Areas*, [Online], Government of Western Australia, available from:
<http://www.dfes.wa.gov.au/regulationandcompliance/bushfireproneareas/Pages/default.aspx>, [15/10/2019].
- Department of Planning (DoP) 2016, *Visual guide for bushfire risk assessment in Western Australia*, Department of Planning, Perth, WA.
- McCaw L and Hanstrum B 2003, 'Fire environment of Mediterranean south-west Western Australia', in *Fire in Ecosystems of South-West Western Australia: Impacts and Management*, eds I Abbott & ND Burrows, Backhuys Publishers, Leiden, Netherlands, pp. 171–188.
- Standards Australia (SA) 2009, *Australian Standard AS 3959–2009 Construction of Buildings in Bushfire-prone Areas*, Standards Australia, Sydney.
- Strategen 2017, *Bushfire Management Plan, Ellenbrook Town Centre*, prepared for Roberts Day, March 2017.
- 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, Version 1.2, August 2017*, Western Australian Planning Commission, Perth

Appendix 1
Site photos



Photo 1: On-site cleared/managed low fuel areas (excluded under Clause 2.2.3.2 e and f)



Photo 2: On-site cleared/managed low fuel areas (excluded under Clause 2.2.3.2 e and f)



Photo 3: On-site cleared/managed low fuel areas (excluded under Clause 2.2.3.2 e and f)



Photo 4: On-site cleared/managed low fuel areas (excluded under Clause 2.2.3.2 e and f)



Photo 5: On-site cleared/managed low fuel areas (excluded under Clause 2.2.3.2 e and f)



Photo 6: On-site cleared/managed low fuel areas (excluded under Clause 2.2.3.2 e and f)



Photo 7: On-site cleared/managed low fuel areas (excluded under Clause 2.2.3.2 e and f)



Photo 8: On-site cleared/managed low fuel areas (excluded under Clause 2.2.3.2 e and f)



Photo 9: On-site cleared/managed low fuel areas (excluded under Clause 2.2.3.2 e and f)



Photo 10: Off-site Class A forest to the north



Photo 11: Off-site Class A forest in background and Class G grassland in foreground to the west



Photo 12: Off-site Class B woodland to the northwest



Photo 13: Off-site Class C shrubland southeast of project area



Photo 14: Off-site Class C shrubland southeast of project area

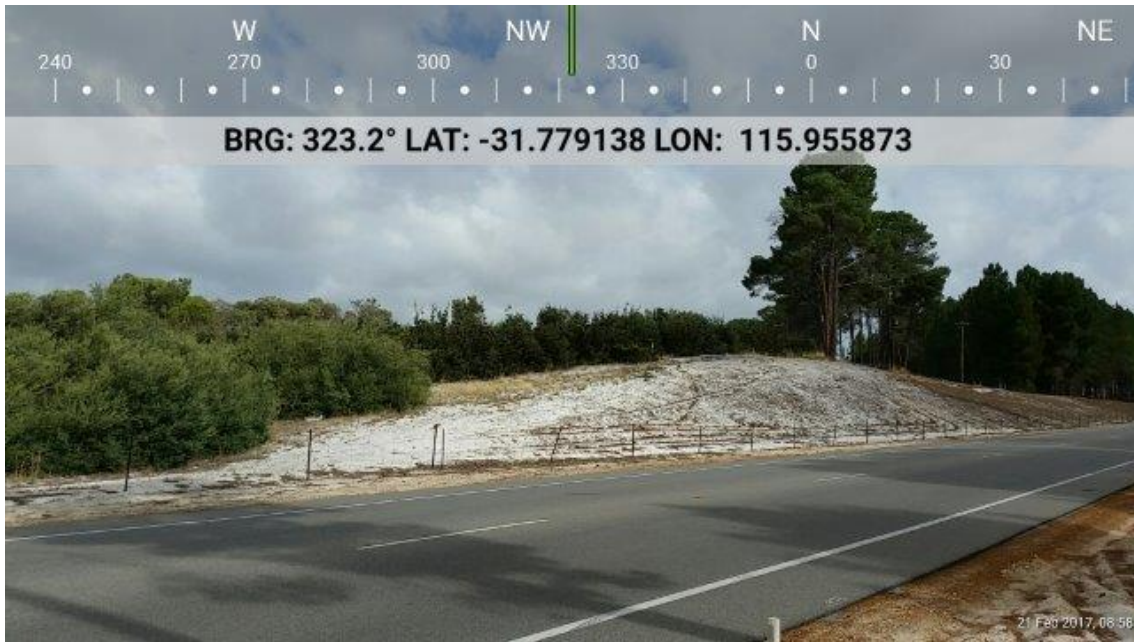


Photo 15: Off-site Class D scrub southwest of project area



Photo 16: Off-site Class G grassland south of project area



Photo 17: Off-site cleared/managed low fuel areas (excluded under Clause 2.2.3.2 e and f) west of project area



Photo 18: Off-site cleared/managed low fuel areas (excluded under Clause 2.2.3.2 e and f) northwest of project area



Photo 19: Off-site cleared/managed low fuel areas (excluded under Clause 2.2.3.2 e and f) east of project area



Photo 20: Off-site cleared/managed low fuel areas (excluded under Clause 2.2.3.2 e and f) east of project area



Photo 21: Off-site cleared/managed low fuel areas (excluded under Clause 2.2.3.2 e and f) east of project area



Photo 22: Off-site cleared/managed low fuel areas (excluded under Clause 2.2.3.2 e and f) east of project area



Photo 23: Off-site cleared/managed low fuel areas (excluded under Clause 2.2.3.2 e and f) south of project area



Photo 24: Off-site cleared/managed low fuel areas (excluded under Clause 2.2.3.2 e and f) south of project area

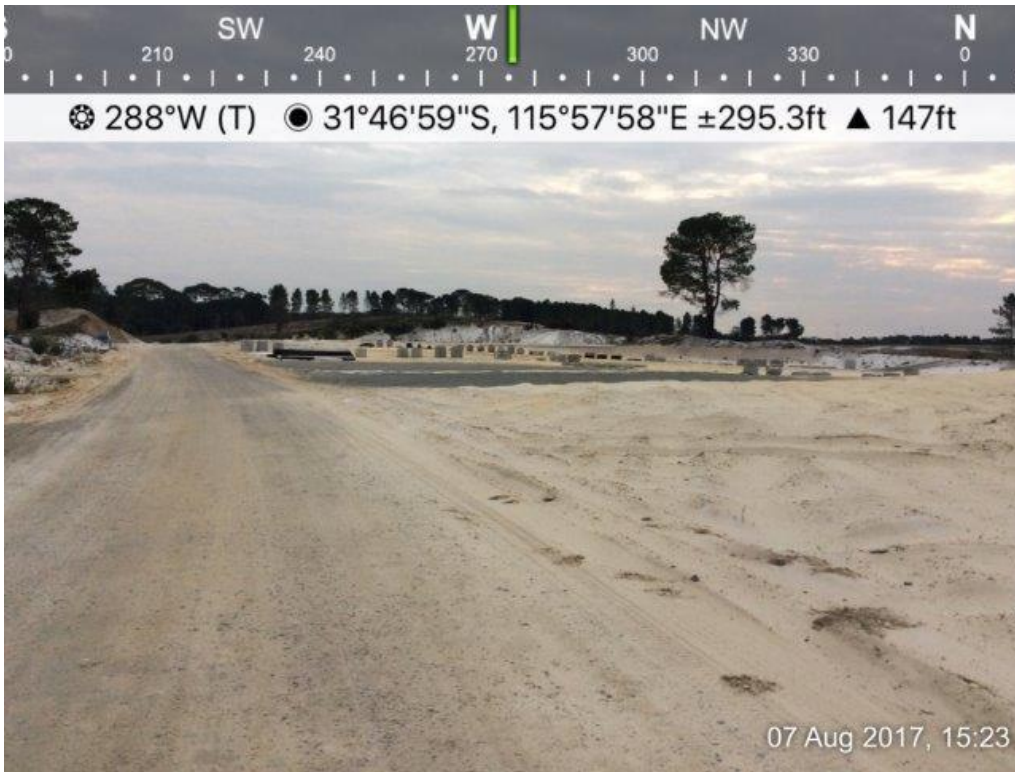


Photo 25: Off-site cleared/managed low fuel areas (excluded under Clause 2.2.3.2 e and f) south of project area



Photo 26: Off-site cleared/managed low fuel areas (excluded under Clause 2.2.3.2 e and f) south of project area



Photo 27: Off-site cleared/managed low fuel areas (excluded under Clause 2.2.3.2 e and f) south of project area

Appendix 2
POS landscape plan



CERTIFICATION:
This drawing shall not be used for construction purposes unless Revised 0 Issued for Construction and signed and approved by the Certifying Landscape Architect. Verify all dimensions on site before commencing work or ordering materials. Refer any discrepancy to Landscape Architect before proceeding with the works.

DATE	REV	DESCRIPTION	BY	AP
18.12.17	A	ISSUED FOR CIVIL INFORMATION	AL	AL
14.02.18	B	REVISED CONTOURS	AL	AL
04.04.18	C	REVISED CONTOURS	RL	AL
07.04.18	D	ISSUED FOR APPROVALS	RL	AL
11.09.18	E	ISSUED FOR TENDER	RL	AL
11.01.19	F	ISSUED FOR RE-TENDER	DW	KD
25.01.19	G	REISSUED FOR APPROVALS	RL	KD
11.03.19	0	ISSUED FOR CONSTRUCTION	RL	KD

DO NOT SCALE FROM THE DRAWING

LEGEND:

- GARDEN BED: IRRIGATED
MULCH: 75MM PINE BARK MULCH SUPPLY AND INSTALL
SOIL CONDITIONER: 15mm CWISE HORTICULTURE
- SWALE GARDEN BED: NON IRRIGATED
SOIL CONDITIONER: 15mm CWISE HORTICULTURE
- TURF GRASSING: SPECIES: KIKUYU. SUPPLY AND INSTALL BY OTHERS
IRRIGATED: BY OTHERS
- TURF GRASSING PREP: PREPARED SOIL: 100MM TURF SAND
SOIL CONDITIONER: 15mm C-WISE HORTICULTURE
- MULCH ONLY 1: TYPE: 100mm PINE BARK MULCH
SUPPLY AND INSTALL
- EXISTING TREES TO BE RETAINED & PROTECTED DURING CONSTRUCTION.

NOTE:

STREET TREES ARE TO BE LOCATED AT A MIN CLEARANCE OF 8m FROM STREET LIGHTS & 3.5m FROM SIDE ENTRY DRAINAGE PITS & SERVICE PITS AS PER COUNCIL/SHIRE REQUIREMENTS. IMPORTED SOIL TO ALL TREES INSTALLED BY CONTRACTOR. LANDSCAPE CONTRACTOR IS TO PEG ALL TREE LOCATIONS TO THE SUPERINTENDENT'S APPROVAL PRIOR TO INSTALLATION. PLANTS USED IN MIXED PLANTING ARE TO BE SPACED AS SHOWN & PLACED WHERE NO MORE THAN THREE (3) PLANTS OF THE SAME SPECIES ARE ADJACENT TO EACH OTHER. ALL PLANT CENTRES ADJACENT ALL KERBS, PAVEMENTS, WALLS AND SPRINKLERS TO BE OFFSET 500MM OR, HALF THE DIAMETER OF THE MATURE PLANT, WHICHEVER IS THE GREATER.

MIX 1

Key	Botanic Name	Qty.	Spacing	Pot
CAA	CASUARINA 'COUSIN IT'	138	750 mm	14.0mm
ACF	ACACIA 'FETTUCINE'	69	750 mm	14.0mm
ACL	ACACIA 'LIMELIGHT'	69	750 mm	14.0mm
SCA	SCAEVOLA 'AUSSIE CRAWL'	138	750 mm	14.0mm
HEP	HEMIANDRA PUNGENS	138	750 mm	14.0mm
SCC	SCAEVOLA 'CRASSIFOLIA'	69	750 mm	14.0mm
BRM	BRACHYSCOME 'MAUVE DELIGHT'	69	750 mm	14.0mm

MIX 2

Key	Botanic Name	Qty.	Spacing	Pot
BAN	BANKSIA NIVEA	557	600 mm	14.0mm
BAS	BANKSIA SPINULOSA 'BIRTHDAY CANDLES'	1111	600 mm	14.0mm
CAC	CASUARINA 'COUSIN IT'	835	600 mm	14.0mm
ACC	ACACIA COGNATA 'FETTUCINE'	1111	600 mm	14.0mm
ACL	ACACIA COGNATA 'LIMELIGHT'	1111	600 mm	14.0mm
JUC	JUNIPERUS CONFERTA	557	600 mm	14.0mm
VEN	VERTICORDIA NITENS	278	600 mm	14.0mm

MIX 3

Key	Botanic Name	Qty.	Spacing	Pot
LEG	LEPIDOSPERMA GLADIATUM	14.08	450 mm	TUBE
LOK	LOMANDRA 'KATIE BELLES'	14.08	450 mm	TUBE
JUP	JUNCUS PALLIDUS	2817	450 mm	TUBE
FIN	FICINIA NODOSA	2817	450 mm	TUBE
HYA	HYPOCALYMA ANGUSTIFOLIUM	14.08	450 mm	TUBE
MES	MEEBOLDINA SCARIOSA	84.5	450 mm	TUBE
MET	MELALEUCA TRETIFOLIA	84.5	450 mm	TUBE
BEE	BEAUFORTIA ELEGANS	84.5	450 mm	TUBE
MEH	MELALEUCA HUEGLII	84.5	450 mm	TUBE
ASF	ASTARTEA FASCICULARIS	84.5	450 mm	TUBE

MIX 4

Key	Botanic Name	Qty.	Spacing	Pot
DIR	DIANELLA REVOLUTA	319	500 mm	14.0mm
AGO	AGAPANTHUS ORIENTALIS	238	500 mm	14.0mm
ANR	ANIGOZANTHOS 'RUBY VIOLET'	119	500 mm	14.0mm
ANB	ANIGOZANTHOS 'BUSH RAMPAGE'	119	500 mm	14.0mm

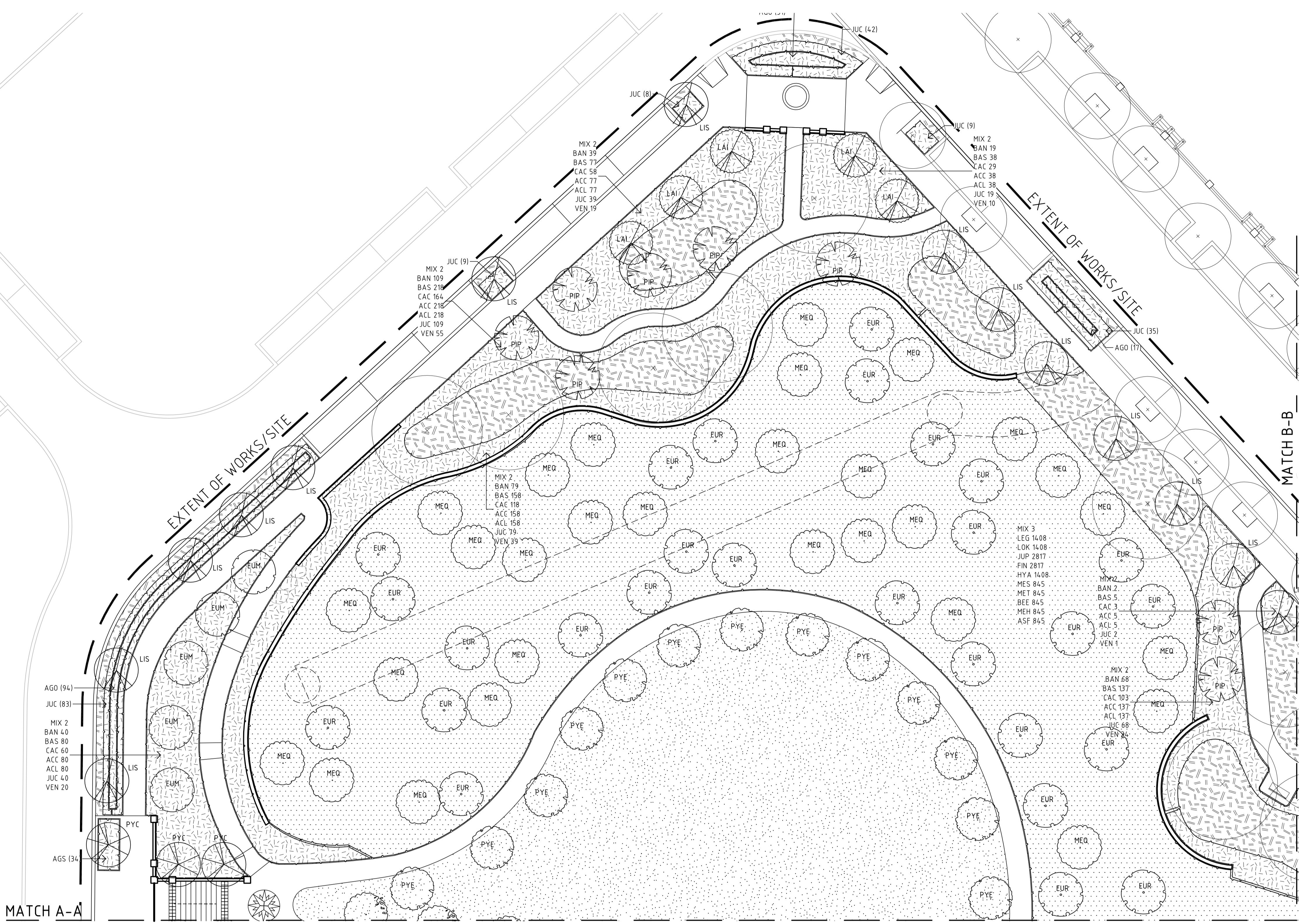
MIX 5

Key	Botanic Name	Qty.	Spacing	Pot
DIT	DIANELLA 'TAS RED'	527	500 mm	14.0mm
ADD	ADENANTHOS ORIENTALIS	527	500 mm	14.0mm

PLANTING

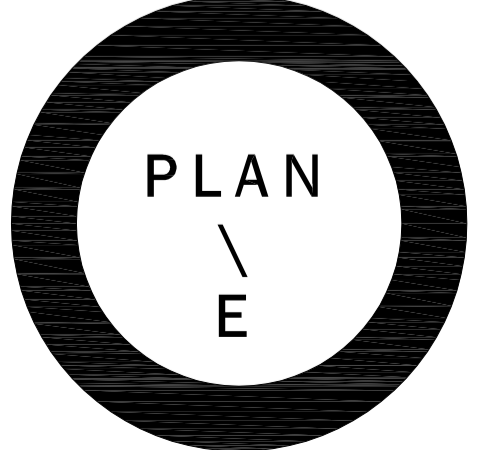
Key	Botanic Name	Qty.	Spacing	Pot
MAR	MACROZAMIA RIEDLEI	16	AS SHOWN	13L
AGO	AGAPANTHUS ORIENTALIS 'BLUE'	682	500 mm	170mm
AGS	AGAPANTHUS 'SNOWBALL'	103	500 mm	170mm
JUC	JUNIPENS CONFERTA	775	700 mm	14.0mm
LOL	LOMANDRA 'LIME TUFF'	49	500 mm	14.0mm

NOTE: ALL TUBE STOCK TO BE 50mm FORESTRY TUBES
PLANT SCHEDULES ARE FOR THE TOTAL FOR DRAWINGS L5.101/L5.102/L5.103



TREES

Key	Botanic Name	Qty.	Spacing	Pot
EUM	EUCALYPTUS MACULATA	21	AS SHOWN	45L
MEQ	MELALEUCA QUINQUINERVA	34	AS SHOWN	45L
PYE	PYRUS 'EDGEWOOD'	38	AS SHOWN	100L
LIS	LIQUIDAMBAR STYRACIFLUA	74	AS SHOWN	100L
LAI	LAGESTROEMIA INDICA	14	AS SHOWN	200L
LIT	LIQUIDAMBAR STYRACIFLUA	6	AS SHOWN	200L
BRA	BRACHYCHITON ACERIFOLIUS	1	AS SHOWN	500L
JAM	JACARANDA MIMOSIFOLIA	12	AS SHOWN	500L
PYC	PYRUS CALLERYANA 'ARISTOCRAT'	15	AS SHOWN	100L
PIP	PINUS PINASTER	26	AS SHOWN	45L
ADC	ADENANTHOS 'SERICEUS' 'SILVER STREAK'	38	AS SHOWN	13L
EUR	EUCALYPTUS RUDIS	27	AS SHOWN	45L
PYD	PYRUS 'EDGEWOOD'	9	AS SHOWN	200L





CERTIFICATION: This drawing shall not be used for construction purposes unless Revised 0 Issued for Construction and signed and approved by the Certifying Landscape Architect. Verify all dimensions on site before commencing work or ordering materials. Refer any discrepancy to Landscape Architect before proceeding with the works.

DO NOT SCALE FROM THE DRAWING			
DATE	REV	DESCRIPTION	BY
18.12.17	A	ISSUED FOR CIVIL INFORMATION	AL
14.02.18	B	REVISED CONTOURS	AL
04.04.18	C	REVISED CONTOURS	RL
07.04.18	D	ISSUED FOR APPROVALS	RL
11.09.18	E	ISSUED FOR TENDER	RL
11.01.19	F	ISSUED FOR RE-TENDER	DW
11.03.19	0	ISSUED FOR CONSTRUCTION	DW

MATCH A-A

MATCH B-B

LEGEND:

- GARDEN BED: IRRIGATED
MULCH: 75MM PINE BARK MULCH SUPPLY AND INSTALL
SOIL CONDITIONER: 15mm CWISE HORTICULTURE
- SWALE GARDEN BED: NON IRRIGATED
SOIL CONDITIONER: 15mm CWISE HORTICULTURE
- TURF GRASSING: SPECIES: KIKUYU. SUPPLY AND INSTALL BY OTHERS
IRRIGATED: BY OTHERS
- TURF GRASSING PREP: PREPARED SOIL: 100MM TURF SAND
SOIL CONDITIONER: 15mm C-WISE HORTICULTURE
- MULCH ONLY 1: TYPE: 100mm PINE BARK MULCH
SUPPLY AND INSTALL
- EXISTING TREES TO BE RETAINED & PROTECTED DURING CONSTRUCTION.

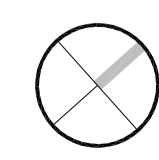
NOTE:
STREET TREES ARE TO BE LOCATED AT A MIN CLEARANCE OF 8m FROM STREET LIGHTS & 3.5m FROM SIDE ENTRY DRAINAGE PITS & SERVICE PITS AS PER COUNCIL /SHIRE REQUIREMENTS. IMPORTED SOIL TO ALL TREES INSTALLED BY CONTRACTOR. LANDSCAPE CONTRACTOR IS TO PEG ALL TREE LOCATIONS TO THE SUPERINTENDENT'S APPROVAL PRIOR TO INSTALLATION. PLANTS USED IN MIXED PLANTING ARE TO BE SPACED AS SHOWN & PLACED WHERE NO MORE THAN THREE (3) PLANTS OF THE SAME SPECIES ARE ADJACENT TO EACH OTHER. ALL PLANT CENTRES ADJACENT ALL KERBS, PAVEMENTS, WALLS AND SPRINKLERS TO BE OFFSET 500MM OR, HALF THE DIAMETER OF THE MATURE PLANT, WHICHEVER IS THE GREATER.



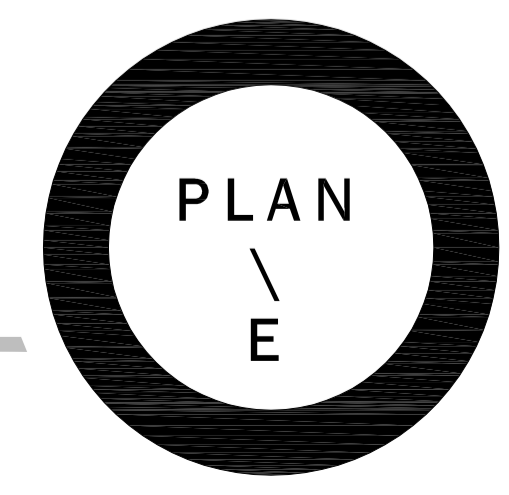
ELLENBROOK TOWN CENTRE - HESPERIA POS
PREPARED FOR ELLENBROOK MANAGEMENT PTY LTD

LANDSCAPE CONSTRUCTION
SOFT WORKS DRAWING

JOB NO. 0409780 L5.102 REV 0 MAR 2019
1:200 @ A1



LANDSCAPE ARCHITECTS
414 ROKEBY RD SUBIACO WA 6008
T: (08) 9388 9566 E: mail@plane.com.au
LANDSPACE PTY LTD ACN 056 538 679





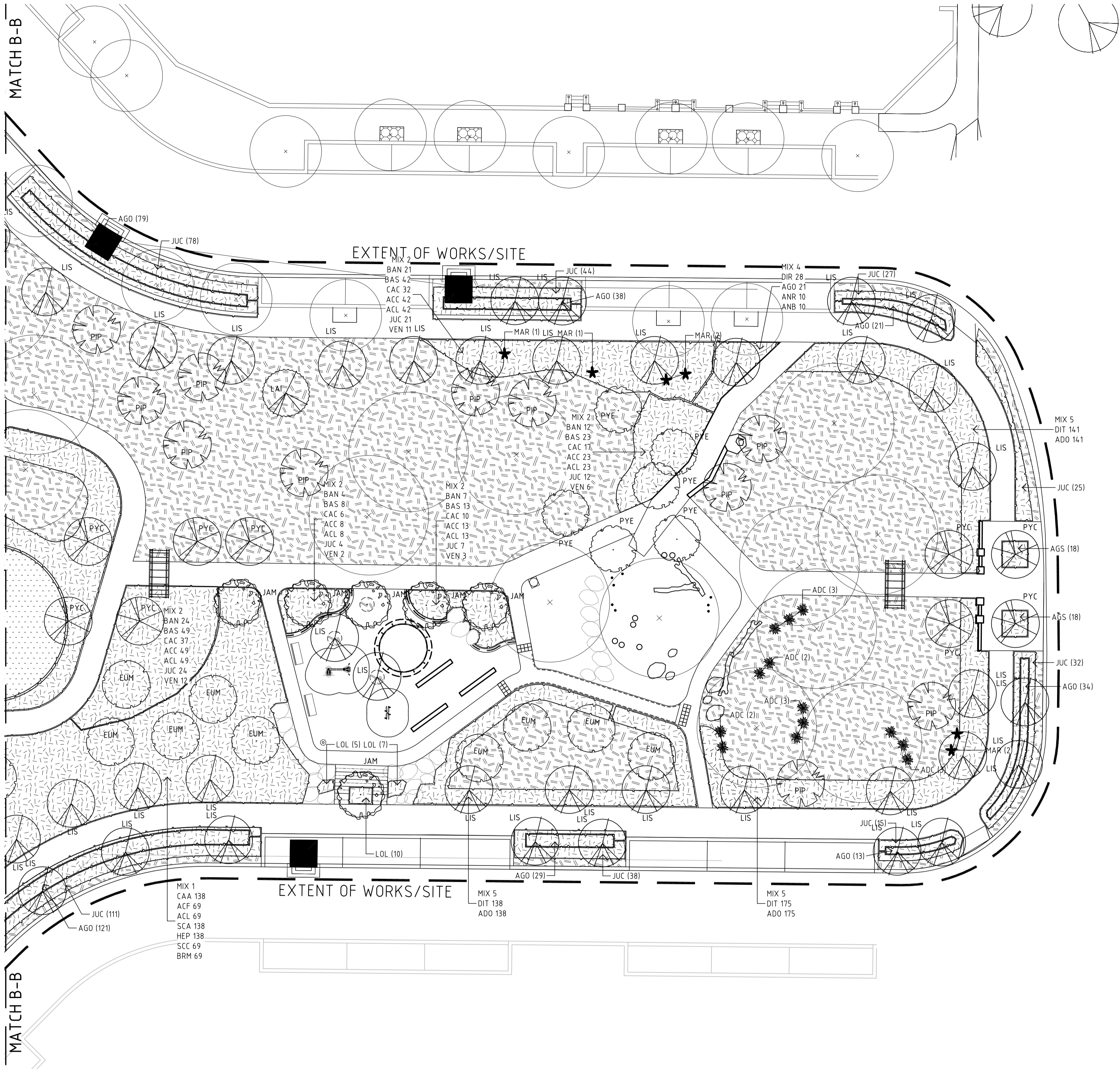
CERTIFICATION:
This drawing shall not be used for construction purposes unless Revised 0 Issued for Construction and signed and approved by the Certifying Landscape Architect. Verify all dimensions on site before commencing work or ordering materials. Refer any discrepancy to Landscape Architect before proceeding with the works.
DO NOT SCALE FROM THE DRAWING

DATE	REV	DESCRIPTION	BY	AP
18.12.17	A	ISSUED FOR CIVIL INFORMATION	AL	AL
14.02.18	B	REVISED CONTOURS	RL	AL
04.04.18	C	REVISED CONTOURS	RL	AL
07.04.18	D	ISSUED FOR APPROVALS	RL	AL
11.09.18	E	ISSUED FOR TENDER	RL	AL
11.01.19	F	ISSUED FOR RE-TENDER	DW	KD
11.03.19	0	ISSUED FOR CONSTRUCTION	DW	KD

LEGEND:

- GARDEN BED: IRRIGATED
MULCH: 75MM PINE BARK MULCH SUPPLY AND INSTALL
SOIL CONDITIONER: 15mm C-WISE HORTICULTURE
- SWALE GARDEN BED: NON IRRIGATED
SOIL CONDITIONER: 15mm C-WISE HORTICULTURE
- TURF GRASSING: SPECIES: KIKUYU. SUPPLY AND INSTALL BY OTHERS
IRRIGATED: BY OTHERS
- TURF GRASSING PREP: PREPARED SOIL: 100MM TURF SAND
SOIL CONDITIONER: 15mm C-WISE HORTICULTURE
- MULCH ONLY 1: TYPE: 100mm PINE BARK MULCH
SUPPLY AND INSTALL
- EXISTING TREES TO BE RETAINED & PROTECTED DURING CONSTRUCTION.

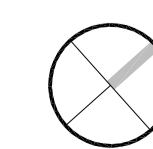
NOTE:
STREET TREES ARE TO BE LOCATED AT A MIN CLEARANCE OF 8m FROM STREET LIGHTS & 3.5m FROM SIDE ENTRY DRAINAGE PITS & SERVICE PITS AS PER COUNCIL/SHIRE REQUIREMENTS. IMPORTED SOIL TO ALL TREES INSTALLED BY CONTRACTOR. LANDSCAPE CONTRACTOR IS TO PEG ALL TREE LOCATIONS TO THE SUPERINTENDENT'S APPROVAL PRIOR TO INSTALLATION. PLANTS USED IN MIXED PLANTING ARE TO BE SPACED AS SHOWN & PLACED WHERE NO MORE THAN THREE (3) PLANTS OF THE SAME SPECIES ARE ADJACENT TO EACH OTHER. ALL PLANT CENTRES ADJACENT ALL KERBS, PAVEMENTS, WALLS AND SPRINKLERS TO BE OFFSET 500MM OR, HALF THE DIAMETER OF THE MATURE PLANT, WHICHEVER IS THE GREATER.



ELLENBROOK TOWN CENTRE - HESPERIA POS
PREPARED FOR ELLENBROOK MANAGEMENT PTY LTD

LANDSCAPE CONSTRUCTION
SOFT WORKS DRAWING

JOB NO. 0409780
L5.103 REV 0 MAR 2019
1:200 @ A1

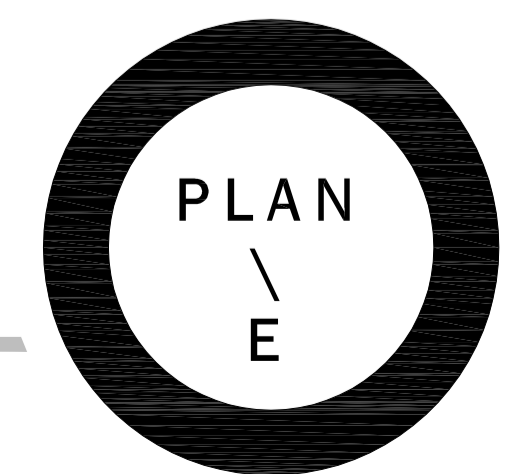


LANDSCAPE ARCHITECTS
414 ROKEBY RD SUBIACO WA 6008
T: (08) 9388 9566 E: mail@plane.com.au
LANDSPACE PTY LTD ACN 056 538 679

PLOT DATE: 11/03/2019 12:43:59 PM

FILE LOCATION: \\PLA-DC01\BUSINESS OPERATIONS\PROJECTS\2004 PROJECTS\04097 ELLENBROOK TOWN SQUARE\0409780 HESPERIA POS 1\PROJECT\PS DRAWINGS\CONDOCS\ACAD\0409780 L3.L4.L5.DWG

PLOTTED BY: MOHAN



Appendix 3
City of Swan annual 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, 2019, or within 14 days of becoming an owner or occupier of land after that date, you must meet the fire hazard reduction conditions described in this notice and maintain these conditions up to and including the 30th day of April, 2020.

1. All land up to 5,000m² (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 5cm.
- 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 5,000m² and 25,000m² (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 immediately inside and adjacent to all external property 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 25,000m² (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 immediately inside and adjacent to all external property 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) Slash or mow grass to a height no greater than 10cm immediately adjacent to firebreaks to 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; or
- 2) Where no such approved fire management plan exists,
 - a) Unless the City approves an alternative plan in writing in accordance with clause 4(2)(b), 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 publication; or
 - b) If it is considered impractical for any reason to carry out the plantation requirements outlined above in clause 4 (2)(a), plantation owners and managers may apply in writing to the City to implement an alternative plan or measures in accordance with clause 4 of this notice. A Fire Management Plan may be required to be developed and submitted as part of the application.

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 15th day of October, 2019 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 prior to the 1st day of November, 2019 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, or where depicted on an approved bushfire management plan Fire Service Access (Strategic Firebreaks) are required on the land, you are required to clear and maintain the Fire Service Access (Strategic Firebreaks) 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 (Strategic Firebreaks) must be unimpeded by obstructions including boundary fences unless fitted with gates and signage approved in writing by the City.
- 3) Gates may only be secured with City of Swan Fire Service padlock.
- 4) Fire Service Access (Strategic Firebreaks) 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, 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 unimpeded by obstructions including boundary fences unless fitted with gates and signage approved in writing by the City.
- 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 aligned immediately inside and adjacent to the external property boundaries.
- 4) Alternative Firebreaks that are approved in writing by the City, or as depicted within a bushfire management plan approved in writing by the City, 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 approved method that achieves the required standard.

11. Driveways

Where building sites are situated more than 50 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) Hazard Separation Zones - 8 tonnes per hectare
*This requirement only applies where HSZs are depicted within a Fire Management Plan approved in writing by the City.
 - c) 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 individual or groups of native grasses, shrubs or trees may only be carried out in accordance with the minimum requirements of this notice.
- 4) Permanent clearing of natural vegetation structures including individual plants, shrubs or trees, that exceeds the requirements of this notice or the specifications outlined within a bushfire management plan approved in writing by the City, is only permitted in accordance with the provisions and exemptions outlined within the Environmental Protection Act 1986, or with the approval of the Department of Water and Environmental Regulation and the City of Swan.

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 for habitable buildings and other assets must meet the following requirements:

- 1) Extend 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) Recommendation Only - Asset protection zones predominantly consist of non-flammable managed vegetation, reticulated lawns and gardens and other non-flammable features.
- 5) All grass is maintained to or under 5cm.
- 6) Fuel loads must be reduced and maintained at 2 tonnes per hectare or lower.
- 7) The crowns of trees are to be separated where possible to create a clear separation distance between adjoining or nearby tree crowns. The separation distance between tree crowns is not required to exceed 10 metres. Clearing or thinning existing trees to create distances greater than 10 metres separation between tree crowns within an asset protection zone is not required or supported by this notice and requires approval from the Department of Water and Environmental Regulation and the City of Swan.

- 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 2 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.

14. Burning

All burning must be carried out in accordance with the relevant provisions of this notice and the Bush Fires Act 1954, Health Act 1911 and the City's 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 Very High or above, or if a Total Fire Ban or a Harvest and Vehicle Movement Ban is declared.
- 2) Only one fire is allowed at any time and it does not exceed 1 cubic metre in size.
- 3) A 5 metre wide area clear of flammable material surrounds the pile.
- 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 Very High or above, or if a Total Fire Ban or a Harvest and Vehicle Movement 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) A 5 metre wide area clear of flammable material surrounds 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 may be required as specified in writing in a subsequent notice addressed to the land owner.
- 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 land owner, 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 land owner.
- 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 in relation to works undertaken on behalf of the land owner
- 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 external boundaries of a property.

'Alternative Firebreak Application' is an application that may be made by a land owner 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.

'City' means the City of Swan.

'Buildings, Attached and Adjacent Structures' means habitable buildings that are used as a dwelling, workplace, place of gathering or assembly, a building that is a car park, or a building used for the storage

or display of goods or produce for sale by whole sale in accordance with classes 1-9 of the Building Code of Australia. The term building includes attached and adjacent structures like garages, carports verandas or similar roofed structure(s) that are attached to, or within 6 metres of the dwelling or primary building.

'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 out dated 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 are installed immediately adjacent the external boundaries of a property.

'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.

'Hazard Separation Zone (HSZ)' if required by this notice and in accordance with a Fire Management Plan, means an area extending out from an asset protection zone a distance of 80 metres unless otherwise specified, to create a graduated fuel reduction and separation from natural vegetation.

'Natural Vegetation' means natural areas of forest, woodland, shrubland, scrub, mallee and mulga. 'Parkland Clearing' means areas of natural vegetation that has been significantly cleared of understory and tree density reduced to create a grassland or low vegetation area that can be walked through unimpeded with isolated, grouped or well-spaced trees.

'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.

'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.

By order of the Council,

MJ Foley

Chief Executive Officer

City of Swan