

# FIRE MANAGEMENT PLAN

Balance Lot 9003 Breakwater Drive

Two Rocks

City of Wanneroo

Approved Subdivision Plan 139757

WAPC Reference 147652



*FirePlan WA*

September 2013

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Disclaimer: The measures contained in this fire management plan are considered to be minimum standards and they do not guarantee that a building will not be damaged in a bush fire. All surveys, forecasts, projections and recommendations made in this report associated with the project are made in good faith on the basis of information available to FirePlan WA at the time; and achievement of the level of implementation of fire precautions will depend among other things on the actions of the landowners or occupiers over which FirePlan WA has no control. Notwithstanding anything contained therein, FirePlan WA will not, except as the law may require, be liable for any loss or other consequences (whether or not due to the negligence of the consultants, their servants or agents) arising out of the services rendered by the consultants.

## 1.0 INTRODUCTION

The purpose of this Fire Management Plan is to detail the fire management methods and requirements that will be implemented for the subdivision of part of Lot 9003 Breakwater Drive Two Rocks. Lot 9003 is located South of Breakwater Drive and south of the junction of Birdsong Drive and Breakwater Drive. Refer Figure 1: Location Plan.

This Fire Management Plan satisfies the requirements of the City of Wanneroo and the Western Australian Planning Commission (WAPC) via *Planning for Bush Fire Protection* Edition 2 (WAPC and Department of Fire and Emergency Services 2010).

This Fire Management Plan will likewise outline the responsibility and timing for implementing and maintaining the fire protection measures and strategies contained within, allocating these responsibilities between individual land owners, the developers and the City of Wanneroo.

As fire management strategies may require altering to meet changing weather, environment and land use needs, it must be advised that the provisions of the *Bush Fires Act 1954* and Regulations may still be enforced, in addition to this Fire Management Plan.

The City of Wanneroo will be responsible for initiating a review of this Fire Management Plan as it may deem necessary to do so.

In the event of large bushfires it is essential that landowners understand that fire appliances may not be available to protect each dwelling/building so it is in the Landowners best interest to provide adequate fire protection to their assets, the minimum requirements are detailed in this Fire Management Plan.

The recommendations made within this Plan relating to the clearing or modification of vegetation to meet setback requirements does not constitute approval or authority to modify or remove vegetation. All such approvals must be undertaken in consultation with the relevant authorities.

In the Foreword of AS 3959- 2009 it states that “It should be borne in mind that the measures contained in this standard cannot guarantee that a building will survive a bushfire event on every occasion. This is substantially due to the degree of vegetation management, the unpredictable nature and behavior of fire and extreme weather conditions.” This Fire Management Plan has been prepared in accordance with the acceptable solutions detailed in the Guidelines.

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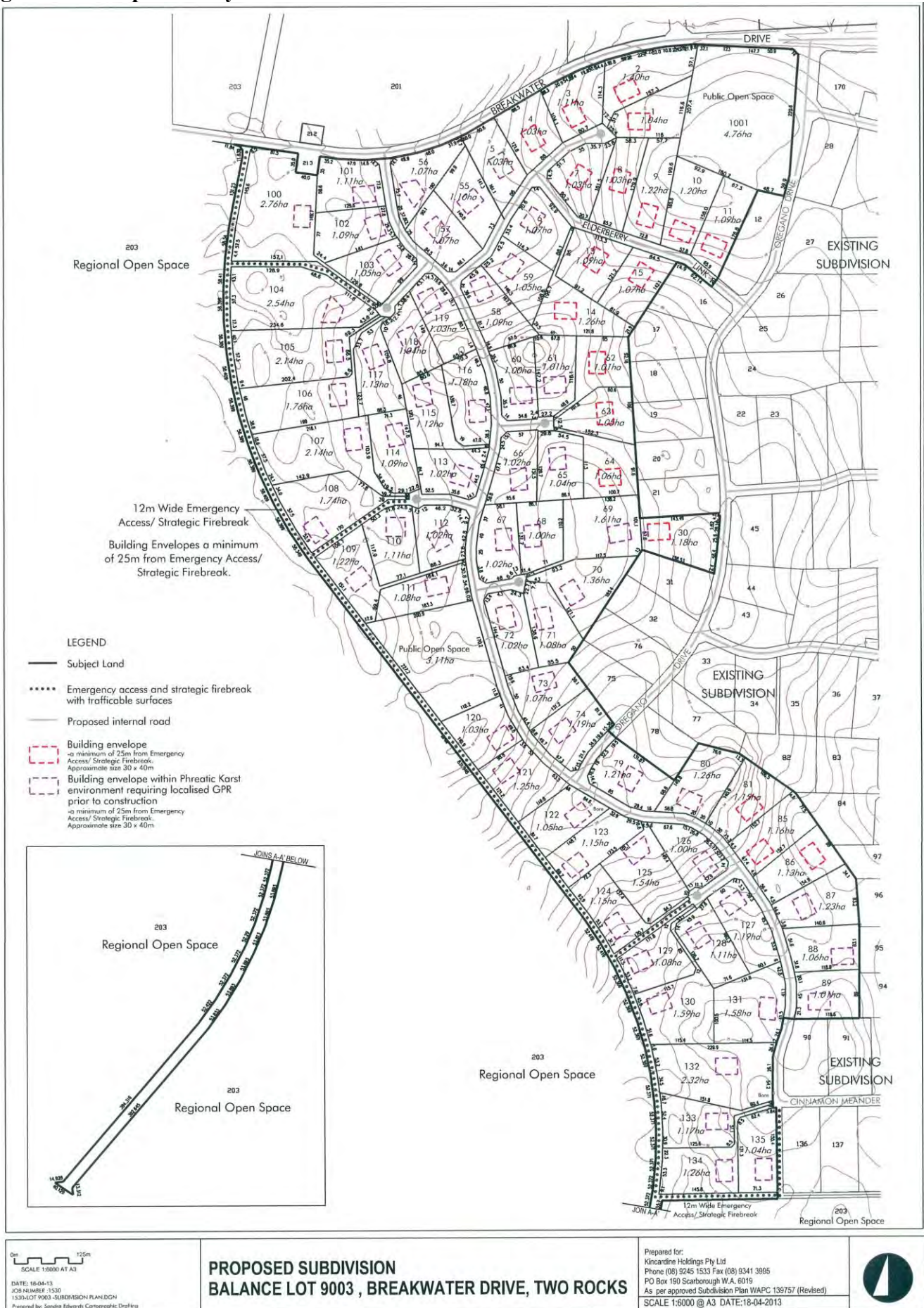
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Date: Friday, 23 August 2013

City of Wanneroo

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Figure 2 Development Layout



## 2.0 AIM

The aim of the Fire Management Plan is to reduce the occurrence of and minimise the impact of bush fires thereby reducing the threat to life, property and the environment.

The Fire Management Plan sets out to reduce this threat by:

- Identifying the objectives of this Fire Management Plan (Section 3)
- Providing a description as to, topography, cultural features and land use (Section 4);
- Identifying the potential bush fire issues within the Site (Section 5); and
- Outlining the fire mitigation strategies for the Site that will reduce the risk of bush fires impacting on the proposed subdivision including the potential threat and impact of bushfire to residents, fire fighters and environmental values, including identifying the parties responsible for undertaking these fire mitigation strategies (Section 6).
- Allow easy access and egress of fire fighters and residents if a fire does occur.

The City of Wanneroo has the responsibility and powers under the Town Planning Scheme and the *Bush Fires Act 1954* to ensure that this Fire Management Plan, City of Wanneroo Fire Control Notice and any Special orders issued under the *Bush Fires Act 1954* are complied with.

## 3.0 OBJECTIVES

The objectives of this Fire Management Plan are to:-

- Identify bushfire hazards and propose bush fire prevention measures for the Site;
- Identify access and egress for firefighting operations and residents;
- Identify and respond to bushfire hazards to special rural land use of the Site.
- Define the building construction standards where lots interface with vegetation within the Site;
- Identify current and future landowner, developer and City of Wanneroo responsibilities for various components of this fire management plan; and
- Document in the Appendices section of this Fire Management Plan, the acceptable solutions adopted for the subdivision of Lot 9003 Breakwater Drive Two Rocks.

## 4.0 DESCRIPTION OF THE AREA

### 4.1 GENERAL

A Fire Management Plan was prepared and approved for this area in 2004. Lots 79-89 and 122- 134 are currently being developed under the current approved Fire Manage Plan. This Fire Management Plan applies to Lot 9003 Breakwater Drive Two Rocks which is to be subdivided into lots of approximately 1.0ha in size with two Public Open Space (POS) areas of 4.7ha and 3.1 ha.

The proposed site has been parkland cleared and was used for stock grazing. The majority of the area is Tuart Woodland with some areas of remnant northern Jarrah/Marri.

The area adjoins Regional Open Space- Bush Forever (Lot 203) to the west and south and the Mitchell Freeway Reserve to the east. DPaW Pine Plantations (F65 5611) adjoin the Mitchell Freeway Reserve to the east.

The area to the north of Breakwater Rd has been subdivided with similar lot sizes.

In Stage 1 of the original Development, Land was set aside for the City of Wanneroo for Emergency Service use for a Bush Fire Brigade. A shed has been erected on this Site.

## 4.2 CLIMATE

The Mediterranean climate experienced by the area in which Lot 1 is located is characterized by hot dry summers and mild wet winters with the majority of rain falling in late autumn through to late spring. This rainfall supports substantial vegetation growth which dries off in Summer/Autumn.

In summer the area has strong easterly winds in the morning that ease off around midday and in the afternoon on most days a southwesterly wind occurs in the afternoon reducing the temperature by as much as ten degrees. See Figure 4 for a sample of the summer wind direction as strength that would be similar to this development site. January is typical wind direction and strength for the January to end of March each year.

The bush fire season is generally from October to the following May, but is subject to seasonal changes and drought conditions.

Table 1 Weather Data for Pearce RAAF – 1940-2012 (BOM Website August 2013)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Mean Max Temperature (°C)	29.3	29.6	27.6	24.4	20.6	18.1	17.3	17.7	19.2	21.2	24.4	27	
Mean 3pm Temperature (°C)	28.2	28.7	26.7	23.0	19.8	17.5	16.7	17.0	18.3	20.7	23.1	25.9	
Mean 9am Relative Humidity (%)	49	52	55	62	72	79	80	76	68	59	52	49	
Mean 3pm Relative Humidity (%)	37	36	38	45	51	57	58	55	53	48	43	39	
Mean Monthly Rainfall (mm)	14.6	16.8	14.9	43.5	106.3	162.4	174.5	124.6	85.4	47.3	29.0	10.5	

The weather data for Pearce RAAF has been used as it is the nearest weather station with a complete set of data. This set of weather data would be similar to the weather conditions experienced in the development site.



Figure 3 Sample Wind Roses showing Wind direction and Strength for January (1940-2012) Pearce RAAF.

Rose of Wind direction versus Wind speed in km/h (02 Nov 1940 to 31 Oct 2011)

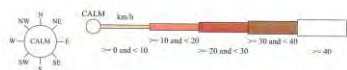
Custom times selected, refer to attached note for details

PEARCE RAAF

Site No: 009053 • Opened Jan 1937 • Still Open • Latitude: -31.6669° • Longitude: 116.0189° • Elevation 40m

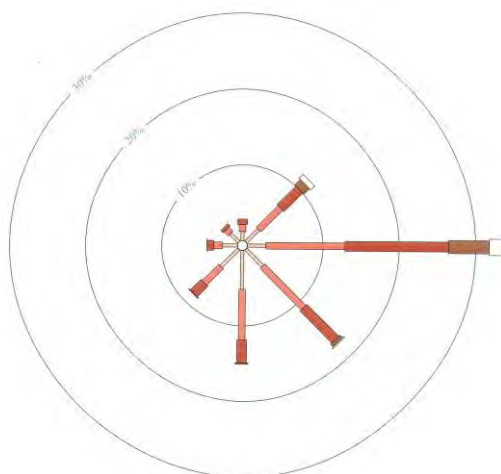
An asterisk (\*) indicates that calm is less than 0.5%.

Other important info about this analysis is available in the accompanying notes.



9 am Jan  
1093 Total Observations

Calm 3%



Rose of Wind direction versus Wind speed in km/h (02 Nov 1940 to 31 Oct 2011)

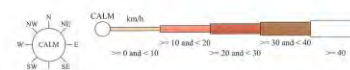
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PEARCE RAAF

Site No: 009053 • Opened Jan 1937 • Still Open • Latitude: -31.6669° • Longitude: 116.0189° • Elevation 40m

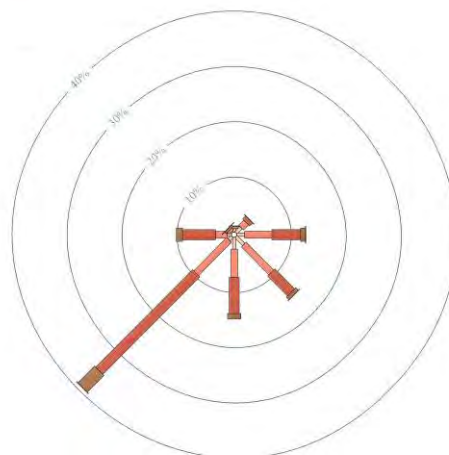
An asterisk (\*) indicates that calm is less than 0.5%.

Other important info about this analysis is available in the accompanying notes.



3 pm Jan  
1015 Total Observations

Calm 2%



### 4.3 TOPOGRAPHY

The topography of the “Site” is undulating with slopes varying up to 7° and will be used as a factor in determining the AS 3959 BAL rating for the construction of dwellings. See Section 7.2.

### 4.4 BUSH FIRE FUELS

The bush fire fuels for the site in the woodland (Tuart woodland) due to the grassy nature of the site as it was previously used for stock grazing fuels would be at the lower end of the 15-25 tonnes/ha of fuel loads. As part of the mitigation the developer will be required to reduce fuel loads prior to the issue of Land Titles to comply with Building Protection and Hazard Separation Zone standards as detailed later in this Fire Management Plan.

### 4.5 LAND USE

The lots in this “Site” subject of this Fire Management Plan will be used as Special Rural Lots. The Regional Open Space adjoining the site will be managed for the Conservation values as Bush Forever. The Mitchell Freeway Reserve is for the future extensions to the Mitchell Freeway. The Pine Plantations will remain as such for the foreseeable future. The area to the north of Breakwater Drive will remain as Rural Residential with potential further development to the west of the Regional Open Space on both the north and south of Breakwater Drive. The Mitchell Freeway Site and the pine plantation are to the east of the original land releases and have no direct bearing of this development however they are part of the land use and potential source of where a bush fire may start in the general area.

### 4.6 LOCAL ASSETS

The local rural residential area is improved with assets comprising dwellings, sheds, fences, lawn and gardens. The Regional Park, Mitchell Freeway Reserve, Pine Plantations, Public Roads and Power Lines are also infrastructure that can be affected by bush fire.

## **4.7 ACCESS**

The internal road system has a loop system with two access/exits onto Breakwater Drive. There are several short Cul de sacs and Battle axe access which comply with fire access guidelines. An emergency Access (previously called a strategic firebreak in the original fire management plan) linking into the internal road system is to be located on the western boundary of the “Site.”. See Section 6.4 for further details and standards are detailed in Section 7.2.

## **4.8 WATER SUPPLIES**

Water Corporation has advised that reticulated water supply can be provided to all Lots.

### **4.8.1 Water for Fire Fighting**

This subdivision is going to have reticulated water and fire hydrants are to be installed every 400m along the internal roads. Fire Hydrants are to meet the *Water Corporation No 63 Water Reticulation Standard*. See Section 7.2 for fire hydrant marking standards

### **4.8.2 Domestic Water Supply**

Each Lot will be supplied with reticulated water.

## 5.0 BUSH FIRE ASSESSMENT

### 5.1 BUSH FIRE HISTORY

There was no recorded bush fire history available for the site.

### 5.2 BUSH FIRE RISK

As most bushfires are caused by human activity either by deliberate actions or carelessness, risk can be aligned with human activity and available fuel sources. Land for a Bush Fire Brigade was allocated in the original stages of Development. The combination of people, property and infrastructure systems (transport, communications etc.) is components of the “risk” for the site. As people cause the majority of wildfires in this area and have the assets in some way, shape or form, the table below rates the risk for the site based on the Department of Fire & Emergency Services (DFES) Rural Urban Bush Fire Threat Analysis tool.

**Table 2 Bush Fire Risk Assessment**

#### Hazard Assessment

**Scoring:** High or Yes = 1 Low or No = 0

**Ratings:** Extreme = 6 High = 4 – 5 Medium = 2 – 3 Low = 0 – 1

Hazard Component	High or Yes	Low or No
<i>Likelihood of occurrence (risk of ignition)</i>		0
<i>Fuel load (vegetation) &gt; standard (intensity)</i>		0
<i>Vegetation assessment area with fire hazard (manageability)</i>	1	
<i>Hazard reduction &lt;80% of assessment zone</i>		0
<i>High visitor usage in area</i>		0
<i>Recent or proposed residential and industrial developments</i>	1	

**Total 2 = medium bush fire risk**

#### Management Assessment

**Scoring:** High or Yes = 1 Low or No = 0

**Ratings:** Extreme = 4 High = 3 Medium = 2 Low = 1

Management Component	High or Yes	Low or No
<i>Easily accessible (access roads and trails)</i>	1	
<i>Fire agency response time &lt; 30 minutes</i>		0
<i>Limited to Inadequate water supply</i>		0
<i>Inadequate resources</i>	1	

**Total 2 = Medium management risk**

Although the site indicates a medium bush fire risk, the Fire Management Plan in conjunction with agency and Local Government requirements, aims at reducing this risk through mitigation works and sound response protocols. The management of the site has two entrances/egress onto Breakwater Drive and an emergency access along the western boundary, the Fire & Rescue Service is located in the Two Rocks townsite and supported by Local Bush Fire Brigades. Fire hydrants will be available for fire fighting along internal roads and new dwellings will be constructed to AS 3959.

The majority of the general area is Woodland/grassland/shrubland. In Section 6 fire mitigation strategies will be detailed to lower the vegetation around proposed dwelling to comply with AS 3959. In a bush fire in this general area (including adjoining land) ember attack may cause damage to dwellings and out buildings, power poles may be burnt down cutting power supplies to some areas, trees/vegetation may fall across roads causing temporary road closures. During a bushfire, fighting operations may restrict access to roads.

Although the “Site” has Regional Open Space –Bush Forever, a Freeway Reserve and Pine Plantations as adjoining Lands to the whole of the Breakwater Estate, the Development (through the mitigation strategies detailed in this Fire Management Plan) is not reliant on fire mitigation being undertaken in these areas.

There is a risk that buildings that have evaporative air conditioners installed without effective screening around the roof mounted unit have an increased risk of a building catching on fire due to embers starting a fire in the air conditioning unit.

### 5.3 BUSH FIRE HAZARD

In the WA Planning Commission’s publication *Planning for Bush Fire Protection* Edition 2 (2010) (the “Guidelines”) at Appendix 1 the methodology for classifying bush fire levels is detailed. The methodology rates bush fire hazard using vegetation type. The methodology is also based on the underlying assumption that land in Western Australia is predominantly undulating. The methodology specifies three bush fire hazard levels “Low”, “Moderate” and “Extreme”.

This methodology has been used in this Fire Management Plan.

The assessment of fire risk takes into account existing site conditions which include:

- Topography with particular reference to ground slopes and accessibility;
- Vegetation cover – both remnant and likely revegetation; and
- Relationship to surrounding development.

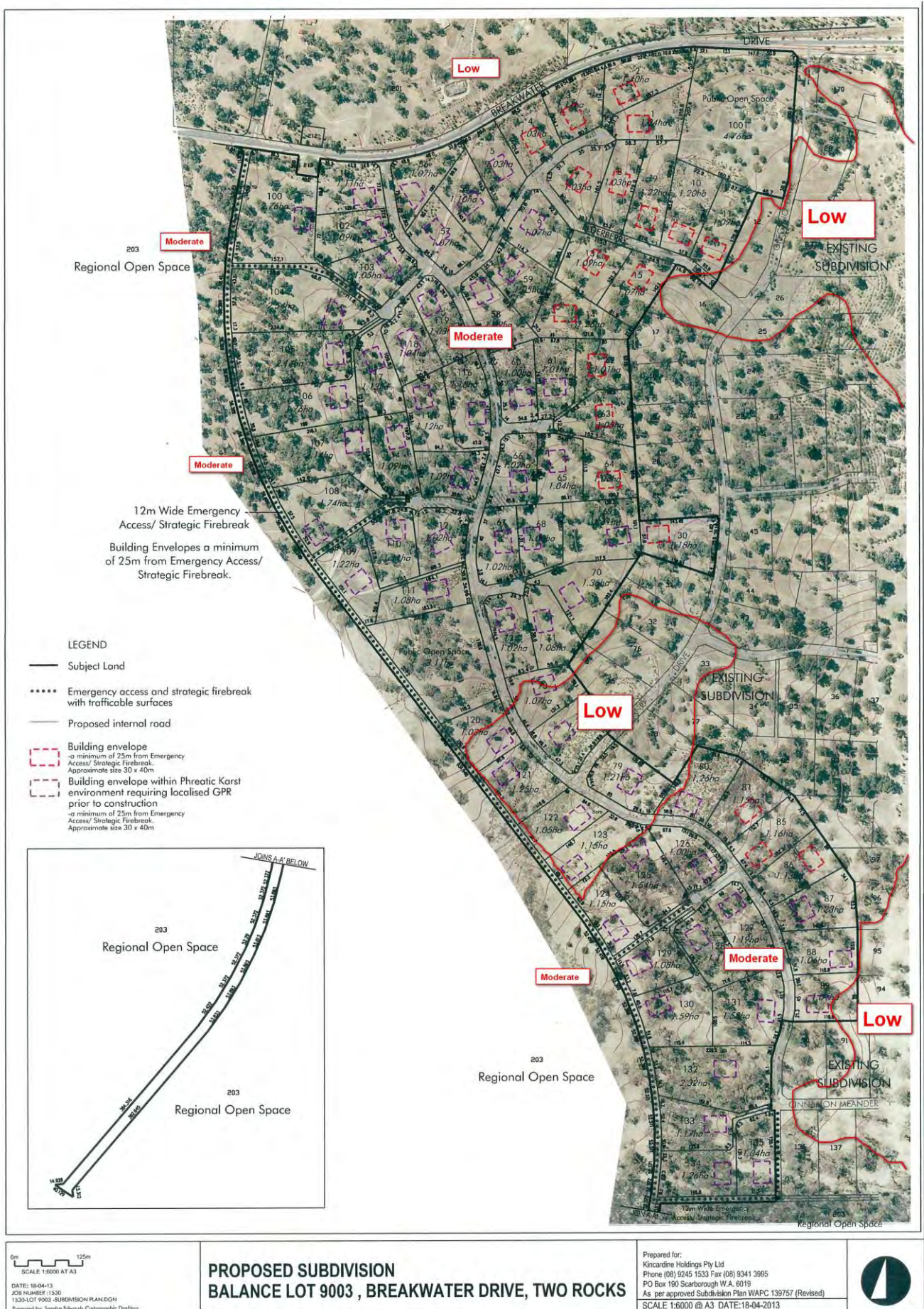
The Bush Fire Hazard for the site is based on the vegetation types for the site. (Refer to Figure 4)

Woodland, Scrub	-	Moderate	-	Grassland Class B & D respectively
Adjoining Lots				
Regional Park	-	Moderate	-	Class B Woodland and Class D Scrub

Due to the “Moderate” bush fire hazard of the “Site” and adjoining lands this development is located in a bush fire prone area and the current version of AS 3959 will apply.



Figure 4 Bush Fire Hazard



## **5.4 BUSH FIRE THREAT**

The site is identified as exposed to a high level of threat and there is a likelihood of a fire originating on the development “Site” the bush fire threat reduces as the “Site” is developed and bush fire fuels are reduced.

The Fire Management Plan is structured to reduce threats to residents and fire fighters in the event of a bushfire within or near the site. It has been developed to incorporate fire management mitigation strategies including:-

- Adhering to the City of Wanneroo annual Fire Control Notice;
- Setbacks from retained vegetation within and adjoining the site;
- Dwelling construction standards;
- Fuel Loadings within the development area will be reduced by the Developer in the Building Protection Zone and Hazard Separation Zone prior to the issue of Land Titles and maintained by the landowner in perpetuity

## **5.5 SUMMARY OF BUSH FIRE POTENTIAL ISSUES**

The potential bush fire issues that have been identified for the Site are:-

- Linkages required between three cul de sac heads and Emergency Access route;
- Requirement for setbacks from retained vegetation to proposed buildings along the western boundary of the site;
- Implementation and maintenance of Building Protection Zones and Hazard Separation Zones and compliance with current AS 3959.

The protection of future buildings will be enhanced by maintaining the Building Protection Zones and new dwellings will be constructed to AS 3959-2009 which will reduce the chance of a dwelling catching on fire due to ember attack.

Notices issued by the City of Wanneroo under the Act and Fire Management Plans are to be enforced in areas both within and outside the development site.



## **6.0 FIRE MITIGATION**

### **6.1 HAZARD MANAGEMENT**

Hazard Management on the lots will be controlled by:-

- All dwellings will be setback 25 metres from Emergency Access routes;
- Setbacks of buildings from emergency access routes to be managed as Building Protection Zone (BPZ) to the BPZ standard and maintained in perpetuity by the landowner. See standards in Section 7.2;
- The developer will reduce bush fire fuels to Hazard Separation Zone standard prior to the issue of Land Title over the whole of a Lot and maintain to that standard until the Lot is sold;
- The landowner is to maintain the fuel loadings on their Lot irrespective of whether they are going to build on the Lot or not and maintained these standards in perpetuity;
- The landowner is to install the Building Protection Zone around their dwelling at the time of site works and maintain to that standard in perpetuity;
- All new dwellings will be constructed to increased standard (refer to Section 7.2) of a minimum of AS 3959-2009 BAL 19 as detailed in Section 7.2; and
- Compliance with the annual Notice issued by the City of Wanneroo under the Act. Under the Act, compliance with a Notice is a landowner/occupier responsibility

### **6.2 BUSH FIRE RISK MANAGEMENT**

#### **6.2.1 Total Fire Ban Days**

A Total Fire Ban is declared because of the extreme weather conditions or when fires are seriously stretching fire fighting resources. A Total Fire Ban is declared by DFES following consultation with Local Governments.

When a Total Fire Ban is declared it prohibits the lighting of any fires in the open air and any activities that might start a fire. The ban includes all open fires for the purpose of cooking or camping. It also includes incinerators, welding, grinding soldering and gas cutting.

The Department of Fire and Emergency Services and the City of Wanneroo are to continue to educate the public on what a Total Fire Ban means and what actions the public need to take.

#### **6.2.2 Public Education Program**

The City of Wanneroo is to continue to provide the community with advice on bush fire prevention and preparedness through brochures, newspaper articles, the Firebreak Notice & Hazard Reduction Notice issued to rate payers and on their web site.

The developer is to provide a copy of the current City of Wanneroo Firebreak Notice, *The Homeowners Survival Manual* and *Prepare Act Survive* brochure and this Fire Management Plan at the time of sale of a Lot. It is essential that the Real Estate agent handling the sale of Lots on behalf of the Developer advises

potential landowners that a Fire Management Plan exist and the modification of vegetation and ongoing fuel reduction will be required within this development.

The City of Wanneroo Firebreak Order requires landowners to install firebreaks around all buildings, Sheds, fuel storage including drums and flammable chemicals.

The use of machinery such as tractors and vehicles can be controlled by the City of Wanneroo as detailed in the Bush Fires Act and Regulations. Landowners within this development will need to comply with these directions.

The use of open fires for the purpose of cooking or camping, incinerators, welding, grinding soldering and gas cutting are controlled by the City of Wanneroo through its powers in the Bush Fires Act and Regulations.

Other Public Safety and Community information on Bush Fires is available on the Department of Fire and Emergency Services web site [www.dfes.wa.gov.au](http://www.dfes.wa.gov.au) and the City of Wanneroo website [www.wanneroo.wa.gov.au](http://www.wanneroo.wa.gov.au).

## **6.3 FUTURE DEVELOPMENT**

This Fire Management Plan has been prepared on the basis of the site being subdivided in accordance with the plan layout detailed in Figure 2. Any future proposed subdivision or development that results in a variation to this subdivision plan and would impact on the Bush Fire Risk Management will require approval from Western Australian Planning Commission and/or Local Government and may result in the need to review the provisions of this Fire Management Plan.

## **6.4 ACCESS AND FIREBREAKS**

### **6.4.1 Road System**

The proposed development consists of an internal loop road system with two entrances/ egress onto Breakwater Drive. These internal roads as a minimum will comply with acceptable solution A2.1 and A2.2. See Section 7.2 for specifications. As the Site is bounded by Regional Parks, the Mitchell Freeway Reserve and Pine Plantations on three sides there is no opportunity for additional access routes to link in with other public roads thus providing an alternative access / egress than onto Breakwater Drive. This road system was approved in the original Structure Plan and subdivision approval WAPC Ref: 139757.

An emergency access route has been planned on the outside of the site with linkages into the internal road system. See below for details.

The emergency access is to have Rural gates or removable Bollards erected at all access onto the emergency access routes so as to restrict day to day use. Gates or Bollards are as a minimum comply with A2.8. See specification in Section 7.2.

Signs are to be erected on the Gates or Bollards with the Wording “Emergency Access Only” or wording agreed to by the City of Wanneroo, Signage as a minimum will comply with Acceptable solution A2.10. See specification in Section 7.2

### **6.4.2 Internal Firebreaks**

Notwithstanding the provisions of this Fire Management Plan, all lots within the site must comply with the City of Wanneroo Fire Control Notice as amended from time to time that is issued to landowners annually. All internal firebreaks (cleared to mineral earth) are to be installed by the Developer by the date shown in the City of Wanneroo Fire Control Notice or as part of the sale of a Lot whichever comes first.

### **6.4.3 Emergency Access**

A 12m wide Emergency Access route cleared to 12metres wide with a 6m wide trafficable surface, suitable for 2wd vehicles is to be constructed from Breakwater Drive down the western boundary of the proposed subdivision. Similarly a 12 metre Emergency Access is to be constructed along the southern boundary with links into Cinnamon Meander. Linkage from three short Cul de Sacs to the western boundary are to be provided. See location of linkages in Figure 2. The emergency access routes are to be cleared to their maximum width except mature trees provided they are 15 metres apart and or crowns are not touching (and will not touch when trees mature). See Section 7.2 for Specifications.

Emergency access routes are to be maintained to the Building Protection Zone Standard. See specification in Section 7.2.

Emergency access routes and links from cul de sacs are to be constructed by the developer and maintained by the City of Wanneroo and will as a minimum comply with acceptable solution A2.6.

### **6.4.4 Cul de sacs**

There are 6 cul de sacs in this proposal and as a minimum they will comply with acceptable solution A2.3. Cul de sacs will be installed by the Developer and maintained by the City of Wanneroo. See specifications in Section 7.2

#### **6.4.5 Battle Axe access**

There are thirteen (13) Lots with Battle Axe providing access to the Lot. The Battle axe access will as a minimum comply with acceptable solution A 2.4. Battle axe access will be installed by the developer and maintained by the landowner. See specifications in Section 7.2.

#### **6.4.6 Private Driveways**

Private driveways are to be installed and maintained by the landowner and as a minimum comply with acceptable solution A2.5. See specifications in Section 7.2.

### **6.5 FIRE SAFER AREAS**

In the event of a bush fire, the Incident Controller of Fire Fighting Operations will advise if an evacuation is necessary and, in conjunction with the City of Wanneroo Emergency Services, direct residents to Safer Refuge Areas. These areas would have been previously identified in the current Local Emergency Management Arrangements for the City of Wanneroo.

### **6.6 ASSESSMENT OF FIRE MANAGEMENT STRATEGIES**

All the actions and recommendations in this Fire Management Plan meet the requirements of the Act and associated Regulations and the Guidelines and are sound, measurable and practical having been used and proven over time. These recommendations take into account the various costs, alternatives available, benefits for protection of residents and the wider community, the environment and biodiversity protection.

This Fire Management Plan will be implemented as condition of subdivision for the site.

The clearance of the condition of subdivision approval requiring the preparation and implementation of this Fire Management Plan will be the responsibility of the Developer /subdivider.

Likewise it is the responsibility of the City of Wanneroo to ensure that all standards required in this Fire Management Plan are met by the Developer/subdivider prior to the City recommending to the WA Planning Commission clearing any conditions of subdivision relating to this Fire Management Plan.

After any major fires that may occur during or once the subdivision of the "Site" has been completed, the City of Wanneroo may conduct a Post Incident Analysis of the fire, which may include identifying and implementing any changes that may be needed to improve the performance of fire prevention strategies.

### **6.7 IMPLEMENTATION OF THE FIRE MANAGEMENT PLAN.**

This Fire Management Plan becomes operational as a condition of subdivision.

In implementing this Fire Management Plan, the following responsibilities have been determined.

#### **6.7.1 Property Owner's Responsibilities**

To maintain the reduced level of risk and threat of fire, the owners/occupiers of all lots created by this proposal will be responsible for undertaking, complying and implementing measures protecting their own assets from the threat and risk of bush fire:

- Maintaining the property in good order to minimize potential bushfire fuels to mitigate the risk of fire on the property as detailed in Section 6.1;
- Installing private driveways in accordance to Section 6.4 and 7.2
- Ensuring that the lot complies with any Firebreak Control Notice issued by the City of Wanneroo as detailed in Section 6.4. To be carried out annually;
- Installing and Maintaining Building Protection Zones and maintain Hazard Separation Zones in perpetuity as detailed in Section 6.1. Refer to Table 3 for widths and standards in Section 7.2;
- Carrying out hazard management works as detailed in Section 6.1 of this Fire Management Plan;
- Ensuring that new dwellings are constructed to AS 3959 Table 3 Section 7.2.
- Complying with the Section 70A notification placed on the Certificate of Title for each Lot advising that a Fire Management Plan has been prepared for each lot. Refer to Section 7.2;
- Complying with the instructions of DFES Fire Services, the City of Wanneroo and/or volunteer fire services as may be issued under the Act for the purposes of maintaining the property or during the event of a bushfire;
- Landowners are to familiarize themselves with the City of Wanneroo *Protect Your Home and Property from Bush Fires* notice and the use of machinery such as tractors and vehicles, use of open fires for the purpose of cooking or camping, incinerators, the use of welding, grinding soldering and gas cutting equipment.
- Ensuring that in the event an evaporative air conditioner is installed at the property, suitable external ember screens are installed to roof mounted units and that they comply with AS 3959, and that the screens are checked annually

### 6.7.2 Developers Responsibilities

As a condition of subdivision the subdivider shall be required to carry out works described in Section 6 of this Fire Management Plan to the satisfaction of the City of Wanneroo and the Western Australian Planning Commission:

- Install gates /Bollards and signage as detailed in Section 6.4. and 7.2 to restrict day to day access to Emergency access routes;
- Install internal roads, cul de sacs, battle axe access emergency access as detailed in Section 6.4 to the standards detailed in Section 7.2;
- Prior to the issue of Land Titles on any lot, carry out fuel reduction on the lot to the limits of the HSZ to the HSZ standard and maintain until Lot is sold as detailed in Section 7.2;
- Each lot is to comply with any Notice issued by the City of Wanneroo under the Bush Fires Act and as gazetted/issued annually. Firebreaks are to be maintained by the developer for each lot until each lot is sold;

- Install Fire Hydrants as detailed in Section 4.8 and fire hydrant markings in Section 7.2;
- Supply a copy of this Fire Management Plan and *The Homeowners Bush Fire Survival Manual, Prepare Act Survive (or similar suitable documentation)* and the annual Notice issued by the City of Wanneroo to each affected property purchaser upon sale of the lot;
- Place a Section 70A notification on the Certificate of Title to each lot, advising landowners of the existence of this Fire Management Plan.

### 6.7.3 City of Wanneroo

The responsibility for compliance with the law rests with individual property owners and occupiers and the following conditions are not intended to unnecessarily transfer these responsibilities to the City of Wanneroo.

The City of Wanneroo shall be responsible for:

- Assessing building plans at the Building Permit Application stage to comply with the current adopted AS3959 for any habitable structure, renovation or extension to any existing dwelling on proposed lots that is required to have an increased construction standard and is undertaken following issue by the City of a Building Permit;
- Enforcing any Notice issued by the City of Wanneroo under the Act;
- Monitoring bush fire fuel loads in the adjoining lands and liaise with relevant landowners or occupiers (or serve Notices upon owners or occupiers) for the purposes of maintaining bush fire fuel loads to safe levels;
- Maintaining internal roads, cul de sacs, emergency access roads and Gates/Bollards;
- Providing fire prevention and preparedness advice to landowners upon request; and
- Ensuring compliance with this Fire Management Plan prior to clearance of conditions of subdivision.

## 7.0 APPENDICES

### 7.1 WORKS PROGRAM

The works detailed in Section 6.7.2 in this Fire Management Plan must be implemented by the subdivider as a condition of subdivision approval.

Landowners will be responsible for the annual maintenance required in any Notice issued by the City of Wanneroo under the Act, the carrying out of any annual works associated with maintaining private driveways, Gates and BPZ's as detailed in this Fire Management Plan.

Activity	Responsibility	Maintenance	Responsibility
Installation of internal roads, cul de sacs, battle axes and emergency access	Developer	Checking of quality of Roads	City of Wanneroo to maintain internal roads, cul de sacs, emergency Access. Landowners to maintain battle axe access.
Implement fire protection	Developer	Developer Annually	Landowner in



measures as detailed in Sections 6.1		maintenance required until Lots sold.	perpetuity
Compliance with Firebreak Notice. Details Section 6.4.	Developer	Compliance with Firebreak Notice annually	Landowner
Modify fuels in Lots to HSZ Section 7.2	Developer	Annually Maintain HSZ in perpetuity	Developer until Lot is sold then landowner
Modify fuels in BPZ and maintain in perpetuity Section 7.2	Landowner	Annual maintenance	Landowner in perpetuity
Installation of and marking of fire hydrants Section 4.8	Developer	Water Corporation Standard	Water Corporation
Section 70 A notification on Tile of each Lot advising FMP applies to each Lot	Developer	Maintain Lot in accordance with Landowners responsibilities	Landowner
Provide a copy of following a sale of Lot:- Fire Management Plan Home Owners Survival Manual Prepare Act Survive Fire Control Notice	Developer	Landowners to familiarise themselves and annually update actions in the event of fire and annual maintenance of the above	Landowner

#### Prior to Building Permit

Activity	Responsibility	Maintenance	Responsibility
A Fire Consultant may re-assess AS 3959 BAL as part of Building Permit Application	Landowner	Landowner to ensure Building design complies with relevant AS 3959 BAL rating	City of Wanneroo to approve Building Permit application

## 7.2 GUIDELINES SPECIFICATIONS AND MINIMUM STANDARDS

The following section outlines the required specifications and minimum development standards that are required under this Fire Management Plan.

### 7.2.1 Public Roads A2.2

Public roads meet the following requirements:

- minimum trafficable surface: 6 metres
- horizontal clearance: 6 metres
- vertical clearance: 4 metres
- maximum grades: 1 in 8
- maximum grade over <50 metres: 1 in 5
- maximum average grade: 1 in 7
- minimum weight capacity: 15 tonnes
- maximum crossfall: 1 in 33
- curves minimum inner radius: 12 metres

### 7.2.2 Cul de sac A2.3

Cul-de-sacs (including dead end roads) are generally not encouraged in bush fire prone areas. Where used, however, cul-de-sac standards are to be as follows:

- maximum length: 200 metres (if emergency access is provided between cul-de-sac heads maximum length can be increased to 600 metres provided no more than 8 lots are serviced)
- minimum trafficable surface: 6 metres
- horizontal clearance: 6 metres
- maximum grades: 1 in 8
- maximum grade over <50 metres: 1 in 5
- maximum average grade: 1 in 7
- minimum weight capacity: 15 tonnes
- maximum crossfall: 1 in 33
- curves minimum inner radius: 12 metres
- as per turn around area requirements – including 21 metres head

### 7.2.3 Battle axe access.

Battle axe access legs meet the following requirements:-

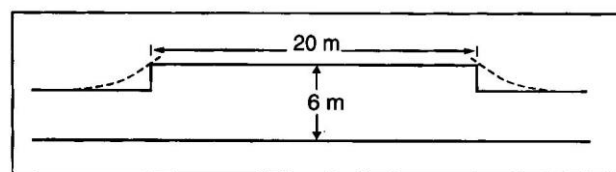
- Maximum length: 600 metres
- Minimum width: 6 metres
- Minimum trafficable surface: 4 metres
- Horizontal clearance: 6 metres
- Vertical clearance: unlimited vertical clearance
- Maximum grades: 1 in 8
- Maximum grade over less than 50 metres: 1 in 5
- Maximum average grade: 1 in 7

- Minimum weight capacity: 15 tonnes
- Maximum crossfall: 1 in 33
- Curves minimum inner radius: 12 metres.

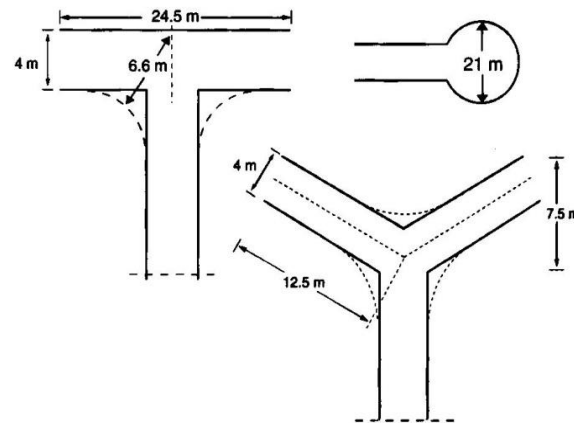
#### 7.2.4 Private Driveways A2.5

Constructed private driveways from the end of the Reciprocal Right of Way meet the following requirements:

- required where the house site is more than 50 metres from a public road;
- Minimum trafficable surface: 6 metres;
- Horizontal clearance: 6 metres;
- Vertical clearance: unlimited vertical clearance;
- Maximum grades: 1 in 8;
- Maximum grade over less than 50 metres: 1 in 5
- Maximum average grade: 1 in 7;
- Minimum weight: 15 tonnes;
- Maximum crossfall: 1 in 33
- Curves minimum inner radius: 12 metres
- Turn around areas designed to accommodate 3.4 fire appliances and to enable them to turn around safely every 500 metres and within 50 metres of a house;
- Passing bays every 200 metres with a minimum length of 20 metres and minimum width of 6 metres. Total length of battle axe to be less than 200 metres.



*Passing bay measurements.*



*Turn around area measurements.*

### 7.2.5 Emergency Access Way A2.6

Emergency access ways, providing alternative links to public roads during emergencies meet the following requirements:

- minimum trafficable surface: 6 metres
- horizontal clearance: 6 metres
- vertical clearance: 4 metres
- maximum grades: 1 in 8
- maximum grade over <50 metres: 1 in 5
- maximum average grade: 1 in 7
- minimum weight capacity: 15 tonnes
- maximum crossfall: 1 in 33
- curves minimum inner radius: 12 metres
- must be signposted.

### 7.2.6 Gates A2.8

All gates used to restrict traffic on Fire Service Access meet the following requirements:

- minimum width 3.6 metres required width 4.1 metres
- design and construction: to be approved by relevant local government
- emergency access way gates: must not be locked
- signposted.

### 7.2.7 Firebreaks A2.9

Lots greater than 0.5 hectares must have an internal perimeter firebreak of a minimum 3 metres width and pruned to 4 metres high, no obstructions to be placed in the firebreak area with access via main entrance to all properties. .

### 7.2.8 Signage for Emergency Access Way A2.10

Signs are erected where emergency access ways and fire services access routes adjoin public roads, and meet the following requirements:

- minimum height above ground: 0.9 metres
- design and construction: to be approved by relevant local government
- lettering height: 100 millimetres

- to display the following wording (as appropriate): ‘Emergency Access Only’.

### 7.2.9 Building Protection Zone A4.3

The aim of the Building Protection Zones (BPZ) is to reduce bush fire intensity close to buildings, and to minimise the likelihood of flame contact with buildings.

The Building Protection Zone is a low fuel area immediately surrounding a building complying with Acceptable Solution A4.3 of the Guidelines.

A Building Protection Zone is to apply around all dwellings as detailed in Table 3 or to the Lot boundary and must fulfil the following conditions:

- The minimum width of the BPZ is to be 25 metres measured from any external wall of the building or asset.
- The location of the BPZ is to be within the boundaries of the lot on which the building or asset is situated.
- Loose flammable material within the BPZ must be removed to reduce the fuel load to less than 2 tonnes per hectare and this is to be maintained to this level.
- All grasses within the BPZ are to be maintained to a height of a maximum 50mm.
- The crowns of trees within the BPZ should be separated where practical such that there is a clear separation distance between adjoining tree crowns.
- Prune lower branches of trees within the BPZ (up to 2 metres off the ground) to stop a surface fire spreading to the canopy of the trees.
- There are to be no tree crowns or branches overhanging the building or asset and a minimum horizontal clearance of 2 metres is required between tree branches and buildings or assets.
- Do not clump shrubs close to building. Ensure that there is a gap of at least 3 times the height (at maturity) of the shrub away from the building.
- Trees or shrubs in the BPZ are to be cleared of any dead material.
- Fences, sheds and structures within the BPZ should be constructed of non-flammable material and be clear of trees and shrubs as per building requirements.
- Gas Cylinders should be isolated from the Flame Zone and should be stored in an area that is clear of all flammable material. Gas vent valves should face away from the building and anything flammable. Gas cylinders should be securely tethered with non-flammable fastenings to prevent toppling over.
- Fire wood storage should be at least 20 metres from the building unless contained in sealed non-flammable container.
- Driveways and access ways must allow for the safe passage of large fire appliance 2.4 (2000 litre capacity 4 wheel drive) to all buildings and assets on the land.
- Roof gutters should be free of leaves and other combustible material.
- Roof mounted evaporative air coolers must be fitted with ember proof screens to the filter media to reduce the possibility of bushfire embers igniting the air cooler.

It is further recommended that property owners, where possible and practical, further extend the width of the defendable space around assets by reducing fuel loads and fire hazards.

NOTE:

- The purpose of the BPZ is to reduce flammable fuel in the immediate vicinity of structures and other assets to reduce the bushfire attack level in accord with Australian Standard AS3959 section 2.
- The requirements for BPZ within Western Australia for new buildings are specified in the Guidelines.
- Maintained gardens are not classed as flammable for the defendable space.
- Areas such as pathways, drives, lawn, vegetable gardens, pools etc. all serve to reduce fire intensity and will form an integral part of any BPZ. The effectiveness of these in reducing the risk of fire damage to a building is enhanced if these areas are close to the building.

The Building Protection Zone is to be installed by the Landowner and maintained by the landowner in perpetuity.

The above Building Protection Zone Standard was copied from the DFES website.

#### **7.2.10 Hazard Separation Zone A 4.4**

Hazard Separation Zone Standards are:-

- A Hazard Separation Zone is to be installed around the outside the Building Protection Zones is to be treated as a Hazard Separation Zone;
- Bush fire fuel loadings must be maintained within the Hazard Separation Zone to a maximum of 4-6 tonnes/ha.
- Dry grass is to be slashed to 25 mm in height
- All accumulated litter, twigs, bark of trees, fallen tree branches and logs should be removed from the area on a regular basis prior to and during the Bush Fire Season.

The developer is to maintain current fuel loadings on all Lots within the Hazard Separation Zone as detailed above prior to the sale of Lots. Landowners are also required to maintain hazard separation zones in perpetuity in accordance with this fire management plan.

Removal of bush fire fuels may be carried out by burning or mechanical means. If burning is used it must be carried out in accordance with the provisions of the Bush Fires Act 1954 and the City of Wanneroo *Protect Your Home and Property from Bush Fires* Notice.

#### **7.2.11 Building Construction**

Individual dwellings on all lots shall be designed and built to conform with:

- The Building Code of Australia; and
- AS 3959 *Construction of Buildings in a Bushfire Prone Area*;

The minimum distance of 100 metres (from vegetation rated 'Moderate' or 'Extreme') may be reduced in compliance with AS 3959. Under AS 3959 as the distance from the vegetation is reduced, the construction standard must be increased. Table 2.4.3 AS 3959 sets out this relationship and Section 2 of AS 3959 details the methodology of determining the Bushfire Attack Level (BAL).

BAL (Bushfire Attack Level) Determination Using Methodology from Section 2.2.1 of current adopted AS 3959- 2009 and Table 2.4.3 which applies to all Lots:



**Table 3 Summary of Determination of BAL using Fire Danger Index 80**

Vegetation Class	Setback from Vegetation (meters)	Slope	BAL	Construction Standard AS 3959-2009	BPZ (metres)	HSZ (METRES)
B Woodland	25-35	0°-5°	19	S 3 & 5	25	10
B Woodland	31-43	5°-10°	19	S 3 & 6	25	10
B Woodland	22-31	5°-10°	29	S 3 & 7	25	6
D Scrub	22-31	0°-5°	19	S 3 & 6	25	6
D Scrub	24-35	5°-10°	19	S 3 & 6	25	10

New dwellings on the proposed Lots will comply with an indicative AS 3959-2009 BAL 19 (Table 3). As detailed in Section 6.1 dwellings are to be setback a minimum of 25 metres from the Emergency access way which are cleared to 12 metres wide this together with the 25 metre Building Protection Zone makes a total width of 37 metres which complies with Table 3 above.

The developer is to provide the City of Wanneroo with a map showing the current AS 3959 BAL ratings for a particular stage of land release as part of the Conditions of subdivision approval prior to the issue of Land Titles.

The Building Protection Zone standards are detailed in Section 7.2.9

A BAL assessment may be carried out (on behalf of the landowner) at the time of Building Permit Application that will confirm the above BAL rating or determine a new rating. A Fire Consultant will carry out the BAL assessment and provide documentation confirming the AS 3959 BAL construction standard which will accompany the Building Permit Application.

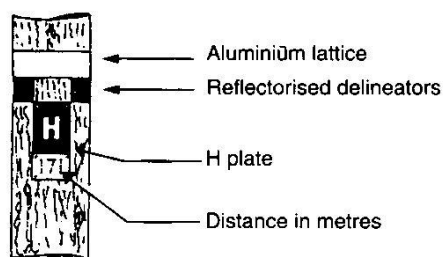
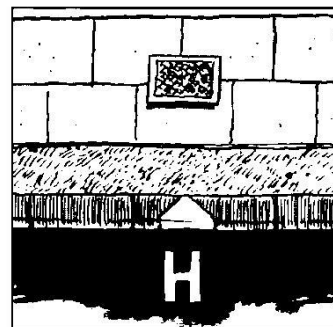
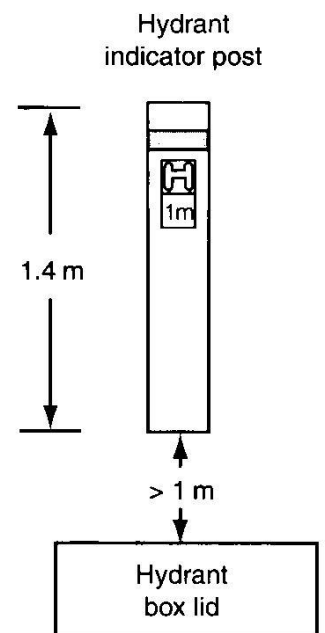
With increased dwelling construction the Emergency Access way around the outside of the “Site” the protection of dwellings within the lots will not be dependent on fuel modification/ reduction being carried out in vegetation located in Regional Park.

As a result of ember attack evaporative air conditioners can be the cause of a fire starting in a building. It is a requirement that the roof unit of an evaporative air conditioner is enclosed in a suitable external ember protection screen. More information is available at [www.dfes.wa.gov.au](http://www.dfes.wa.gov.au) and in AS 3959.

## 7.2.12 Fire Hydrant Markings



*Hydrant indicators post.*

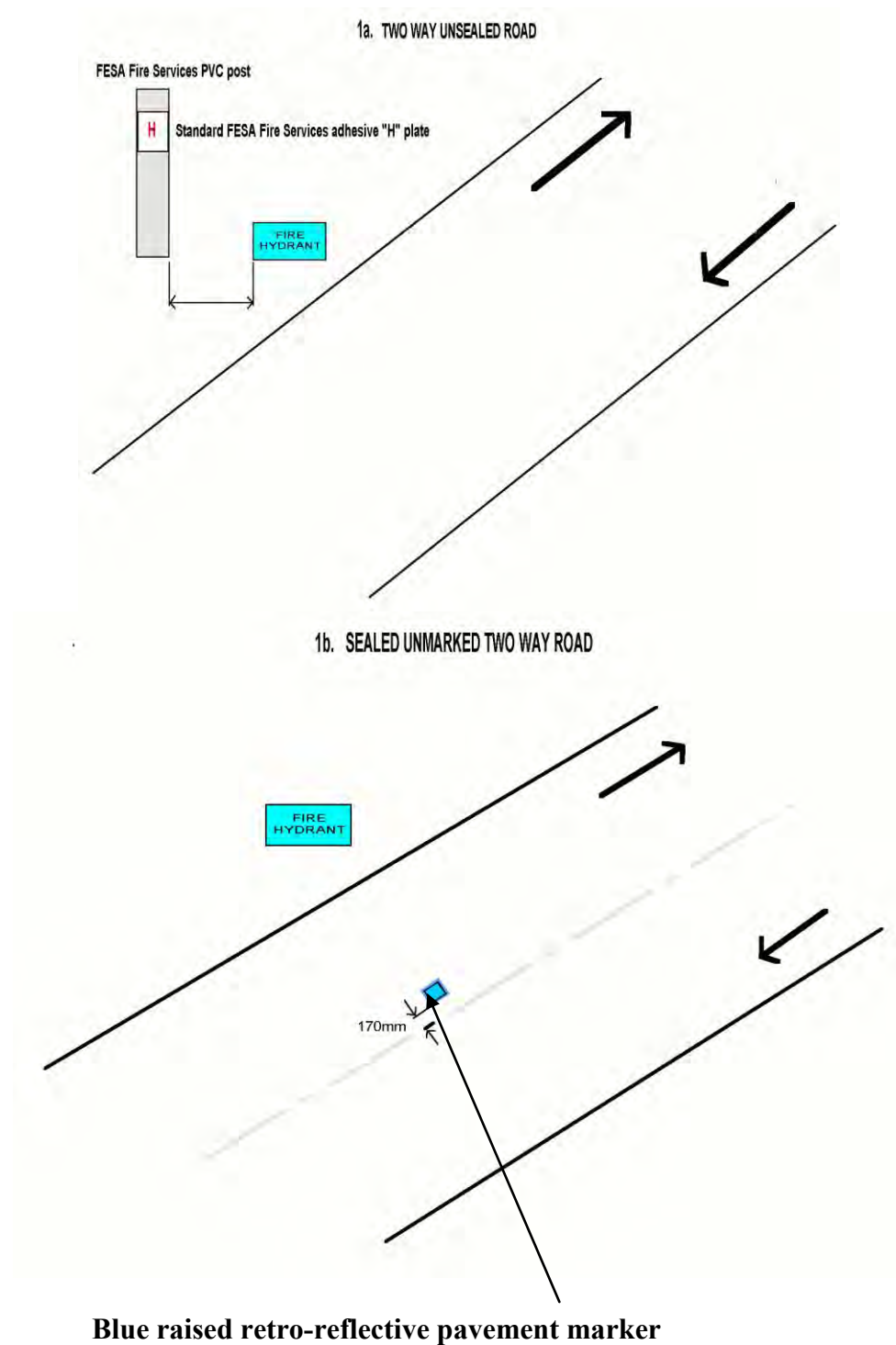


Indicates that the hydrant is on the same side of the street as the pole



Indicates that the hydrant is on the opposite side of the street as the pole

The implementation of the blue raised retro reflective pavement marker (RRPM's) and new hydrant indicating regime is designed to provide greater ability for fire fighters to readily identify fire hydrant locations, particularly at night or where smoke affects visibility.



## 7.3 GLOSSARY

### **Acceptable Solution**

A statement describing an acceptable means of complying with the requirements of corresponding performance criteria.

### **Appliance or Fire Appliance**

A fire fighting appliance (vehicle) with structural, grass and bush fire fighting capabilities, with either a 2000 litres water capacity (2.4 appliance) or a 3000 litre water capacity (3.4 appliance) and four (4) wheel drive.

**BAL** – (abb) Bushfire Attack Level.

**Bushfire Attack Level** – an assessed rating of a site's risk to a bushfire, based on vegetation type, slope of the land and its proximity to buildings.

**Building Construction Standard Buffer** - An area 100 metres wide Including a Building Protection Zone in which an increase in building construction standard in accordance with AS3959 will apply.

### **Building Protection Zone (BPZ)**

Low fuel area immediately surrounding buildings as described in Section 7.2.9. Minimum width 20 metres, increasing with slope. Created as part of the development of any habitable building on a lot and where necessary, extending to the lot boundary. Maintained by the landowner in perpetuity.

### **Bush**

Under the Bush Fires Act 1954 the term bush is defined to include trees, bushes, plants, stubble, scrub and undergrowth of a kind whatsoever whether dead or alive and whether standing or not standing.

### **Bush Fire or Wildfire**

A general term used to describe fire in vegetation that is not under control.

### **Bush Fire Hazard.**

The flammability, arrangement and quantity of vegetation, dead or alive, that can be burnt in a bush fire. Development is to be avoided in extreme bush fire hazard designated areas, unless that hazard is reduced.

**Bush fire prone area** - for the purposes of this Fire Management Plan, a bush fire prone area is an area that has been declared as such by the relevant local government responsible for an area. Once an area is declared bush fire prone, then AS 3959 applies to new residential development within it.

### **Bush Fire Risk**

The chance of a bush fire starting that will have harmful consequences on life and property. It is measured in terms of consequences and likelihood and arises from the interaction of hazards, communities and the environment.

### **DFES**

Department of Fire and Emergency Service formally FESA.

### **DPaW**

Department of Parks and Wildlife previously the Department of Conservation and Wildlife.

### **Development Application**

An application for approval to carry out a development under either a local planning scheme or regional planning scheme.

**Dwelling setback** – the horizontal distance between a wall of the dwelling at any point, and an adjacent lot boundary, measured at right angles (90 degrees) to the boundary.

**Emergency Access Way**

Road not normally open but available to the public (using two wheel drive vehicles) for evacuation during a bush fire emergency.

**Fire Break or Firebreak**

Any natural or constructed discontinuity in a fuel bed not less than 3m wide and surrounding a lot or section of land used to segregate, stop and control the spread of a bush fire or to provide a fire line from which to suppress a bush fire and cleared to reduce the risk of bush fire damage.

**FDI- Fire Danger Index**

The chance of a fire starting, its rate of spread, its intensity and the difficulty of its suppression, according to various combinations of air temperature, relative humidity, wind speed and both the long and short- term drought effects.

**Fire Protection**

A generic term used to describe the range of services and systems used to mitigate the impact of fire on the community. It encompasses both fire prevention and emergency response.

**Fire Management Plan**

Ongoing, dynamic document that sets out the medium to long term mitigation strategies for fire hazards and risks in particular developments within local government areas.

**Fire Services Access Route**

Accessible by heavy four wheel drive fire fighting vehicles.

**Fuel Reduction also Hazard Reduction**

Removal and modification of bush fire fuel, or increase in building construction standards or a combination of the two.

**Hazard Separation Zone (HSZ)**

The fuel reduction area between an area bush fire hazard and the buildings (and associated building protection zones) of a development.

**Low Fuel Area**

An area 100 metres wide of reduced bush fire fuels that is required to surround a Stage of land release and negates the need to increase the standard of dwelling construction on the edge of the Stage of land release. It complies with the Building Protection Zone standards is temporary until the next stage of land is cleared for release.

**Performance Criteria.**

Statement which specifies the outcomes required for the protection of life and property from bush fires.

**Structural Fire**

A fire in a building.

## 8.0 FIRE MANAGEMENT PLAN COMPLIANCE CHECKLIST FOR PERFORMANCE CRITERIA AND ACCEPTABLE SOLUTIONS

PROPERTY DETAILS: Lot 9003 Breakwater Drive Two Rocks

Local Government: City of Wanneroo

### Element 1: Location

**Does the proposal comply with the performance criteria by applying acceptable solution A1.1?**

Increased building construction and appropriate BPZ & HSZ

Yes

☒

No

☐

### Element 2: Vehicular Access

**Does the proposal comply with the performance criteria by applying acceptable solution A2.1?**

Yes

☒

No

☐

**Does the proposal comply with performance criteria by applying acceptable solution A2.2?**

Yes

☒

No

☐

**Does the proposal comply with the performance criteria by applying acceptable solution A2.3?**

Yes

☒

No

☐

**Does the proposal comply with the performance criteria by applying acceptable solution A2.4?**

Yes

☒

No

☐

**Does the proposal comply with the performance criteria by applying acceptable solution A2.5?**

Yes

☒

No

☐

**Does the proposal comply with the performance criteria by applying acceptable solution A2.6?**

Yes

☒

No

☐

**Does the proposal comply with the performance criteria by applying acceptable solution A2.7?**

Not Applicable

Yes

☐

No

☐

**Does the proposal comply with the performance criteria by applying acceptable solution A2.8?**

Restrict day to day traffic along emergency access.

Yes

☒

No

☐

**Does the proposal comply with the performance criteria by applying acceptable solution A2.9?**

Complying with City of Wanneroo Firebreak Control Notice.

Yes

☒

No

☐

**Does the proposal comply with the performance criteria by applying acceptable solution A2.10?**

Yes

☒

No

☐



**Element 3: Water**

Does the proposal comply with the performance criteria by applying acceptable solution A3.1?

Yes ☒ No ☐

Does the proposal comply with the performance criteria by applying acceptable solution A3.2?

Yes ☐ No ☐

Not Applicable

Does the proposal comply with the performance criteria by applying acceptable solution A3.3?

Yes ☐ No ☐

Not Applicable

**Element 4: Siting of Development**

Does the proposal comply with the performance criteria by applying acceptable solution A4.1?

Yes ☒ No ☐

BPZ and increased dwelling construction

Does the proposal comply with the performance criteria by applying acceptable solution A4.2?

Yes ☒ No ☐

Does the proposal comply with the performance criteria by applying acceptable solution A4.3?

Yes ☒ No ☐

Does the proposal comply with the performance criteria by applying acceptable solution A4.4?

Yes ☒ No ☐

Does the proposal comply with the performance criteria by applying acceptable solution A4.5?

Yes ☐ No ☐

Not Applicable

**Element 5: Design of Development**

Does the proposal comply with the performance criteria by applying acceptable solution A5.1?

Yes ☒ No ☐

The development uses acceptable solutions as appropriate to meet the requirements under performance criterion P5.

Does the proposal comply with the performance criteria by applying acceptable solution A5.2?

Yes ☐ No ☐

Not Applicable

**Applicant Declaration:**

I declare that the information provided is true and correct to the best of my knowledge.

**Name of Person Preparing the Fire Management Plan:**

Full Name: *B.W. Barrie* for FirePlan WA

Date: 27/08/2013

**Developer:**

Full Name: \_\_\_\_\_ Signature: \_\_\_\_\_

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