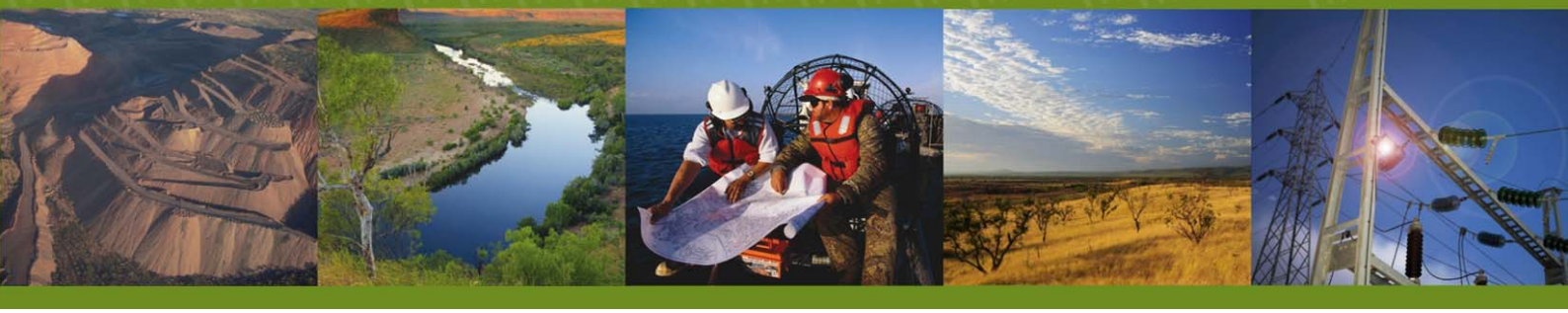

Fire Management Plan

Jindee Phase 1

Prepared for
Estates Development Company
by Strategen

June 2015

STRATEGEN
environmental consultants

Fire Management Plan

Jindee Phase 1

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June 2015

Limitations

Scope of services

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

Reliance on data

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

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

Environmental conclusions

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

Client: Estates Development Company

Report Version	Revision No.	Purpose	Strategen author/reviewer	Submitted to Client	
				Form	Date
Draft Report	Rev A	For review by client	Z Cockerill / R Banks	Electronic (email)	22/05/2015
Final Report	**Rev 0**	**Issued for use: for submission to City of Wanneroo**	**Z Cockerill**	**Electronic (email)**	**15/06/2015**

Filename: EDC15109_01 R001 Rev 0 - 15 June 2015

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1. Introduction

1.1 Background

Estates Development Company (EDC) has been granted conditional approval to subdivide early stages of the proposed Jindee residential development. These early stages of development will be located within the northern portion of Lot 9036 Marmion Avenue, Jindalee, hereon referred to as the Phase 1 area. The Phase 1 area is proposed to be developed for urban purposes in accordance with the approved Local Structure Plan (LSP) and staged subdivision design (Figure 1).

Proposed development of the Phase 1 area will result in significant on-site clearing in a staged process. However, there will be long term vegetation retention throughout the following areas of Phase 1 in accordance with scheme provisions and commitments made under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) approval to preserve a percentage of the site's foraging habitat for Carnaby's Black Cockatoo (*Calyptorhynchus latirostris*):

- Regional Open Space (i.e. the foreshore reserve to the west)
- a percentage of on-site Public Open Space (POS) to the northeast
- a percentage of four northern T2 Natural Living lots.

In addition, undeveloped future stages of Jindee (south of the Phase 1 area) will remain vegetated in the short to medium term until the required subdivision approvals for this area have been sought.

In response to the bushfire risk imposed by the abovementioned vegetated areas, the following condition has been applied to early stage subdivision approvals:

> *A fire management plan being prepared, approved and relevant provisions implemented during subdivisional works, in accordance with the WAPC's Guidelines Planning for Bushfire Protection Edition 2, May 2010 (in particular Appendix 3) to the specifications of the City of Wanneroo.*

EDC has commissioned Strategen to prepare this Fire Management Plan (FMP) to clear the abovementioned condition to progress development throughout the Phase 1 area. The FMP will guide ongoing bushfire protection of the Phase 1 area and ensure a suitable, compliant and effective bushfire management outcome is achieved for the site. This FMP has been prepared in accordance with *Planning for Bush Fire Protection Guidelines Edition 2* (PFBFP Guidelines; WAPC et al. 2010) with consideration of *Draft State Planning Policy 3.7 Planning for Bushfire Risk Management* (DoP & WAPC 2014) and accompanying revised guidelines. The FMP is for submission to City of Wanneroo (CoW). An FMP compliance checklist is contained in Appendix 1.

1.2 Purpose and application of the plan

The purpose of this document is to provide guidance on how to plan for and manage the bushfire risk to the proposed Phase 1 development through implementation of a range of bushfire risk treatment and mitigation measures. The FMP 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 adequate emergency suppression response. Therefore, the developer should aim to ensure future on-site assets of Phase 1 are self-protecting from bushfire.

Implementation of the FMP is a shared responsibility between the developer, CoW and prospective landowners to ensure bushfire risk treatment and mitigation measures are adopted and implemented on an ongoing basis to achieve bushfire management objectives.

1.3 Stakeholder consultation

Strategen has undertaken consultation with the developer, CoW and Department of Fire and Emergency Services (DFES) to ensure aims and objectives of the FMP are in accordance with stakeholder expectations and the FMP maintains compliance with PFBFP Guidelines.

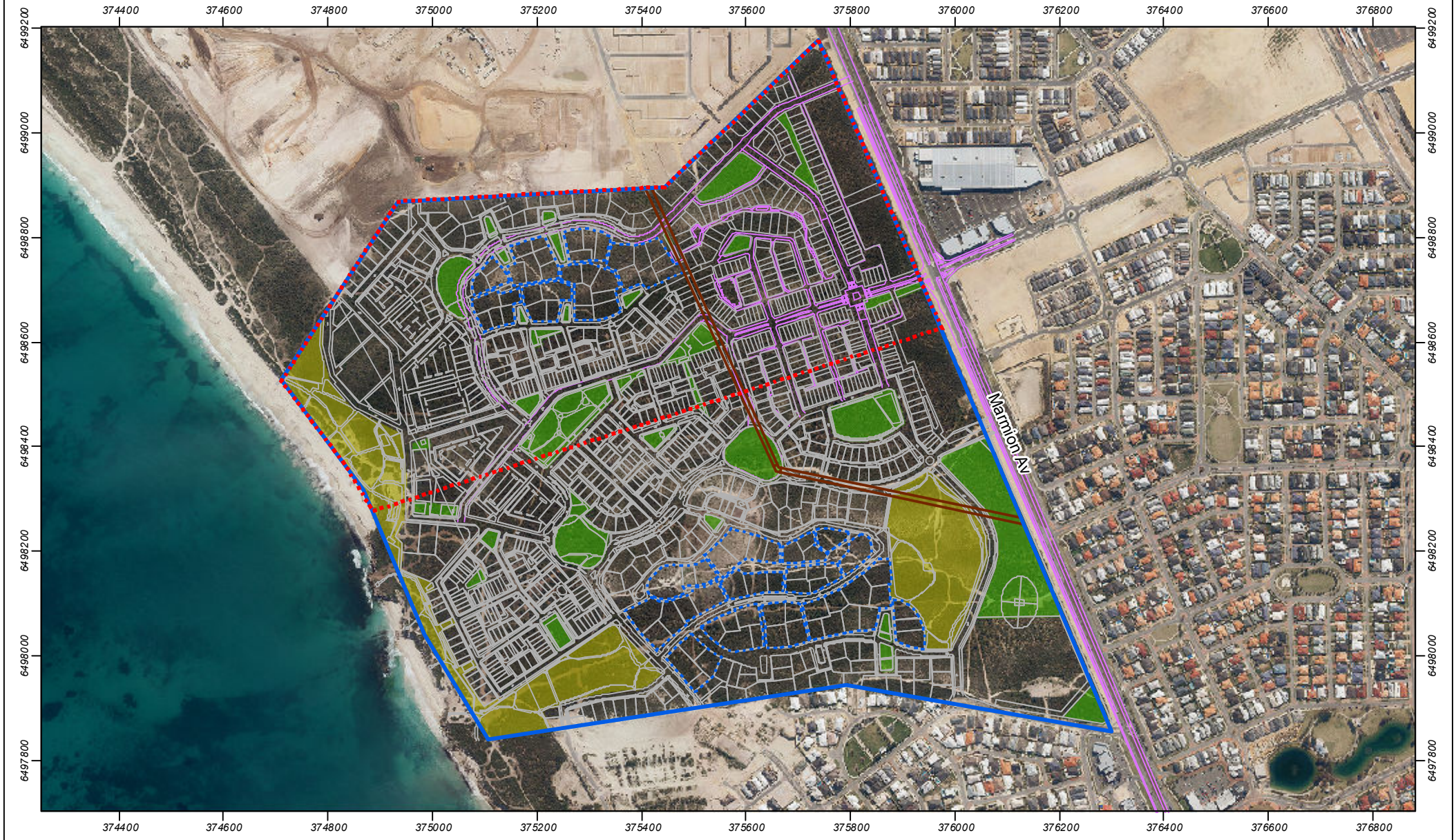

Figure 1 Jindee development plan

Scale 1:10,000 at A4

0 50 100 150 200 250 m

Coordinate System: GDA 1994 MGA Zone 50

Note that positional errors may occur in some areas

Date: 19/05/2015

Author: JCrute

Source: Aerial image: Landgate, flown 09/2014. Subdivision plan: Client 02/2015.

Legend

- Base plan
- Roads
- Easement
- Phase 1 area
- Jindee residential development
- T2 Natural Living
- ROS
- POS

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2. Aim and objectives

2.1 Aim

The aim of the FMP is to achieve a reduction in the occurrence of uncontrolled bushfires and minimise potential impacts on life and property of the proposed development through the following:

- quantifying the bushfire hazard and assessing the bushfire risk to the Phase 1 area
- documenting bushfire prevention requirements of the Phase 1 area to provide ongoing protection to future residents, visitors and built assets of the subject land
- identifying bushfire protection issues, appropriate strategies and those persons and/or organisations who have a responsibility to implement the FMP
- complying with PFBFP Guidelines and maintaining compatibility with bushfire management on neighbouring subdivisions
- providing guidance for the developer, CoW and prospective landowners to protect the subject land and on-site assets in the event that fire appliances may be unavailable to offer an adequate bushfire suppression response.

2.2 Objectives

Key objectives of the FMP and the relevant section of this document in which they are addressed are outlined in Table 1.

Table 1: Key objectives of the FMP

Objective	Section
Define areas where values are located	Section 3.6
Define and rank fire hazard areas	Section 4.2.1
Propose bushfire risk treatment and mitigation measures for the Phase 1 area, with due regard for life, property and the environment	Section 5
Nominate individuals and organisations responsible for fire management and associated works within the Phase 1 area	Table 5
Provide performance criteria and acceptable solutions for all fire management works (e.g. development location, vehicular access, water supply, siting of development and design of development)	Section 4.2.2 and Section 5

3. Description of the area

3.1 General overview

The Jindee residential development is located predominantly within Lot 9036 Marmion Avenue, Jindalee, situated in the City of Wanneroo (Figure 2). The proposed development is located approximately 37 km northwest of the Perth CBD, 14 km northwest of Joondalup City Centre and 1 km west of the Butler train station and District Centre.

The Phase 1 area comprises the northern portion of Lot 9036 and encompasses a proportion of Lot 3054 to the west (foreshore reserve), as depicted in Figure 3. The Phase 1 area adjoins:

- cleared land to the north (continuation of urban development by another land developer)
- coastline and Indian Ocean to the west
- undeveloped future stages of Jindee to the south
- Marmion Avenue and Butler/Brighton urban development to the east.

The Phase 1 area is currently undeveloped and fully vegetated. The bulk of on-site vegetation will be cleared in a staged process to enable urban development; however, as discussed in Section 1.1, the following vegetated areas will be retained to some extent and require consideration of bushfire risk:

- foreshore reserve to the west
- a percentage of on-site POS to the northeast (EPBC Act requirement)
- a percentage of four northern T2 Natural Living lots (EPBC Act requirement)
- undeveloped future stages of Jindee to the south.

The bushfire hazard and risk associated with the abovementioned vegetated areas will be assessed as part of this FMP to determine the level of mitigation response required to protect future life and property assets of Phase 1 and maintain compliance with PFBFP Guidelines.

3.1.1 Development context and fire management planning

The proposed Jindee residential development has a significant history of planning and detailed design dating back to 1992, including early corridor structure planning, Innovation Agreement between WAPC, CoW and landowner, MRS amendment, town planning scheme amendment, Local Structure Plans, subdivision approvals and Detailed Area Plan approval.

A bushfire hazard assessment was undertaken for the full Jindee site by TME (2012) in accordance with PFBFP Guidelines to support the LSP submission. The assessment provided strategic level designation of 'Moderate' and 'Extreme' bushfire hazard areas, which represented the vegetation extent proposed to be retained within MRS Parks and Recreation reserves and southern T2 Natural Living lots. The report recommended that a detailed FMP be prepared at the subdivision stage. A summary of the TME (2012) bushfire hazard assessment report is contained in Appendix 2 and these findings have been taken into consideration as part of this FMP.

The Phase 1 area is located in the north of the development site and represents the initial four stages of the Jindee subdivision. This FMP aims to address the bushfire issues and risks within this area to progress early stage development, independent of the balance undeveloped portion of the site to the south, which will remain vegetated until the latter stages of subdivision are approved. A separate FMP will be required to support development over the balance portion of the Jindee site to the south (i.e. those areas of the Jindee site located south of Phase 1).

Vegetation clearing within the Phase 1 area will be staged, which will result in a gradual transition from the current vegetated status of the site to an eventual suburban development footprint that will ultimately have limited bushfire risk. However, there will be times during the staging process where developed areas of Phase 1 adjoin undeveloped (vegetated) future stages. Cleared buffers will be strategically placed along the vegetation interfaces with future stages to manage the bushfire risk associated with development staging.

It is important to note that the measures outlined in this FMP will need to be progressively reviewed and updated to reflect changes in the on-ground fire environment as the vegetated status of the site transitions to a suburban landscape.

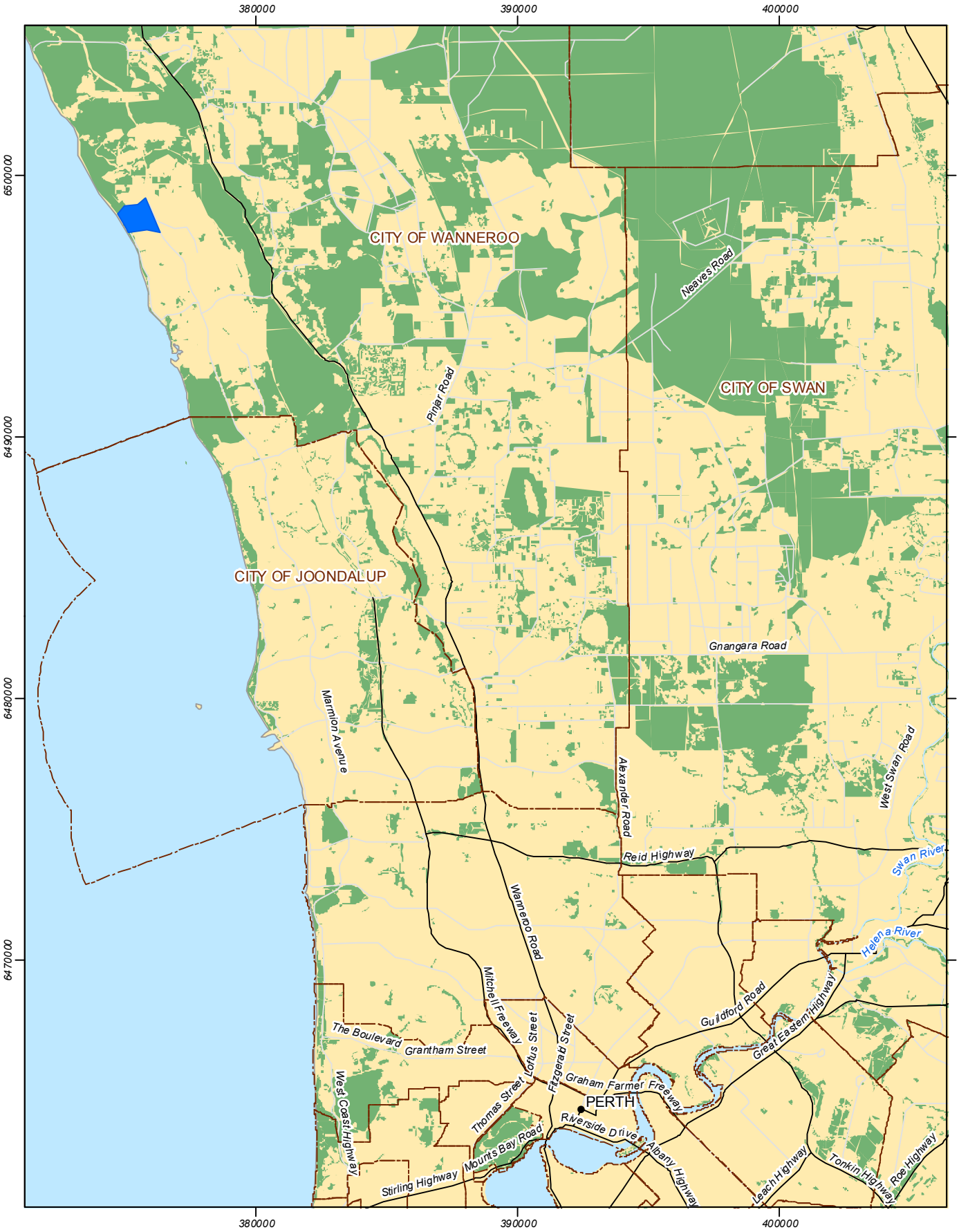

Figure 2 Regional location

Scale 1:200,000 at A4

0 1 2 3 4 5 km

Coordinate System: GDA 1994 MGA Zone 50
Note that positional errors may occur in some areas
Date: 18/05/2015
Author: JCrute
Source: Topography: Geoscience Australia 2011.

Legend

- Town
- Major road
- Minor road
- Major river
- Lakes
- Local government boundary
- Native vegetation
- Jindee residential development

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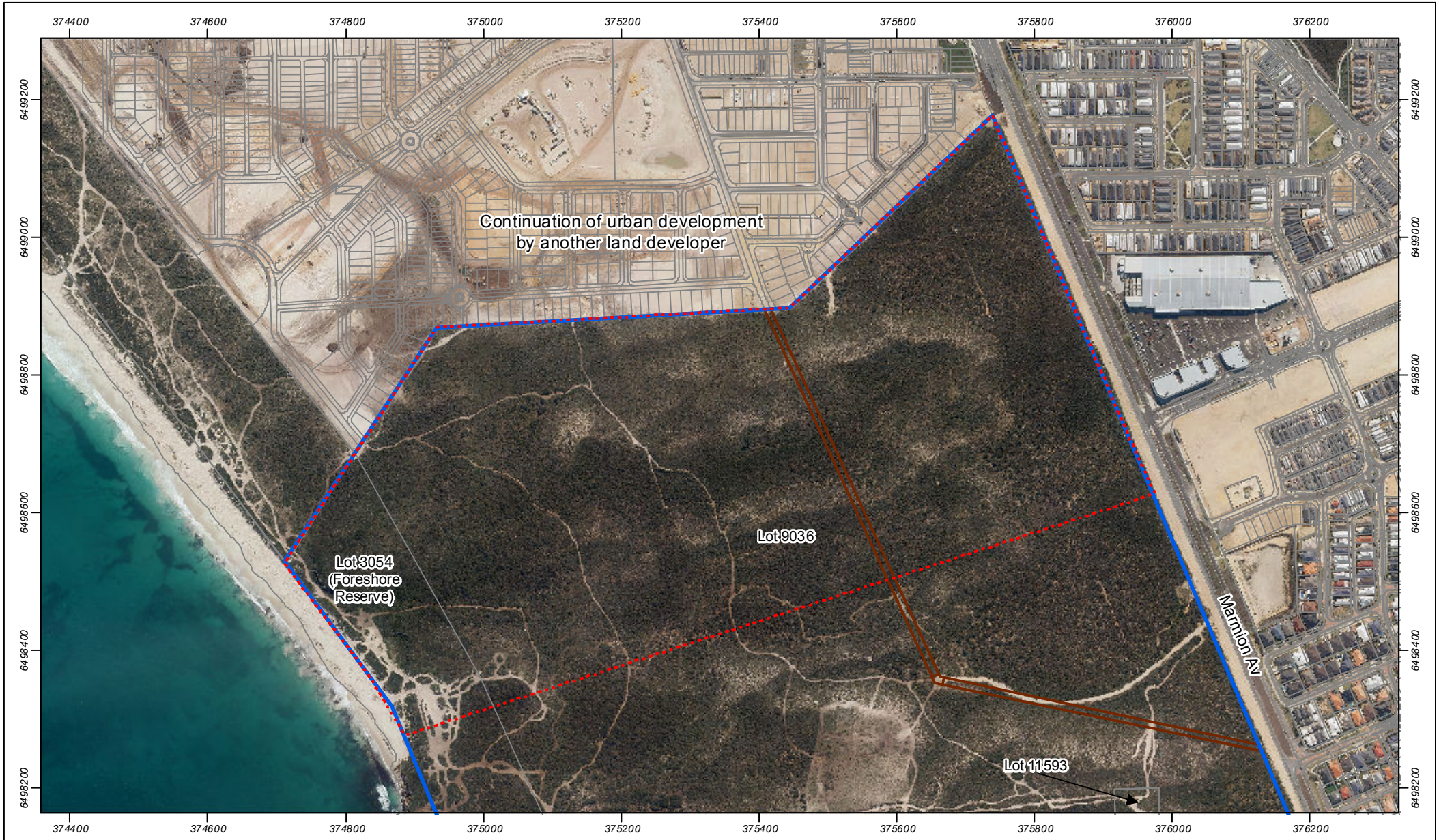

Figure 3 Site overview

Scale 1:7,500 at A4

0 50 100 150 m

Coordinate System: GDA 1994 MGA Zone 50

Note that positional errors may occur in some areas

Date: 12/06/2015

Author: JCrute

Source: Aerial image: Landgate, flown 09/2014. Subdivision plan: Client 02/2015.

Legend

- Easement
- Existing cadastre
- Phase 1 area
- Jindee residential development

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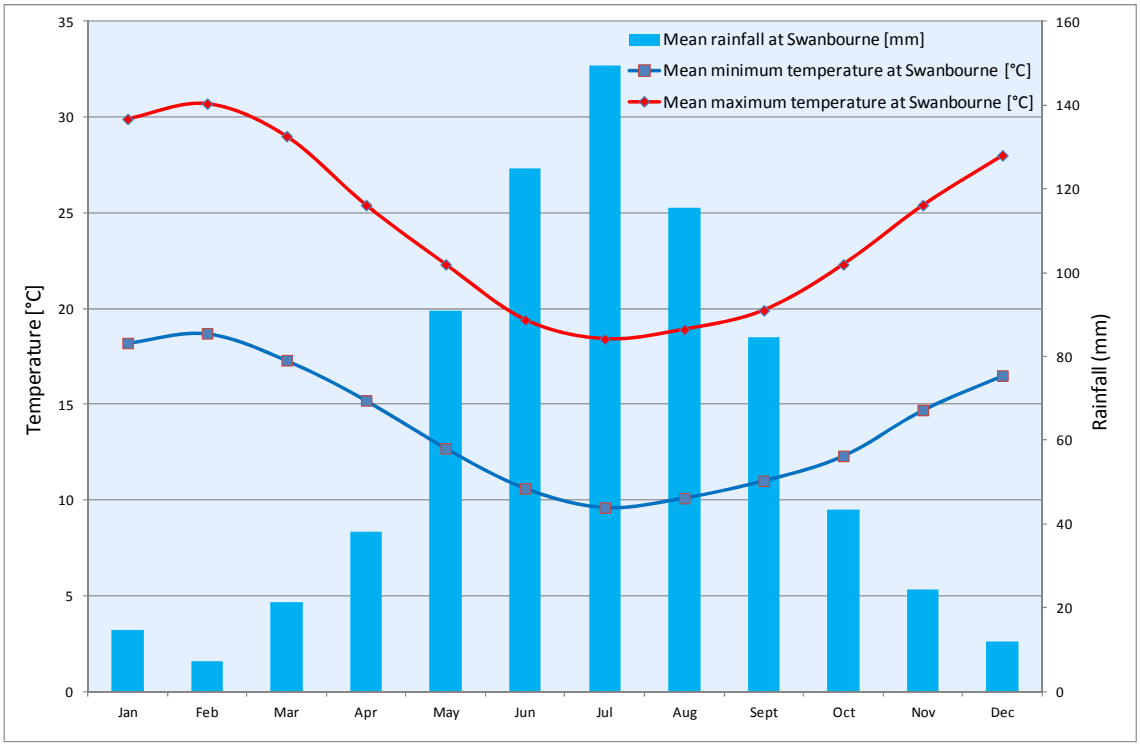
3.2 Local climate

The Jindalee locality experiences a Mediterranean climate characterised by mild, wet winters and warm to hot, dry summers. The Bureau of Meteorology (BoM) weather station at Swanbourne (Station No. 9215, located approximately 35 km south of Jindalee) is the nearest weather station to the Phase 1 area that provides the full range of climate statistics for the Perth Metropolitan coastline. Mean monthly climate statistics for Swanbourne are outlined in Figure 4.

Mean annual rainfall recorded at Swanbourne since 1993 is 717.7 mm (BoM 2015). Rainfall may occur at any time of year; however, most occurs in winter in association with cold fronts from the southwest. Highest temperatures occur between December and March, with mean monthly maximums ranging from 28°C in December to 30.7°C in February (BoM 2015). Lowest temperatures occur between June and September, with average monthly minimums ranging from 9.6°C in July to 11°C in September (BoM 2015).



Source: BoM 2015

Figure 4: Mean monthly climate statistics for Swanbourne (Station No. 9215)

3.2.1 Worst case fire weather conditions

Southwest Western Australia generally experiences a cool to mild growing season in the months of August through to November of each year, followed by four months of summer drought conditions, which is when the potential for bushfire occurrence is at its peak.

The worst fire weather conditions occur during this dry period 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 very 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).

3.2.2 Predominant fire weather conditions

Predominant fire weather conditions are considered to occur 95% of the time during the designated bushfire season. These conditions generally align with average January climatic conditions for the locality.

Mean 9:00 am and 3:00 pm January wind profiles for Swanbourne are contained in Appendix 3. These illustrate that the predominant winds during the designated bushfire season are from the east in the morning averaging around 20 km/h; and from the southwest in the afternoon averaging around 28 km/h (BoM 2015).

Mean 9:00 am and 3:00 pm relative humidity for Swanbourne during the designated bushfire season is 53% and 55% respectively, with mean monthly maximum temperatures peaking at around 31°C (BoM 2015). These predominant fire weather conditions correlate with an average fire danger index of 'High', as determined using the Commonwealth Science and Industrial Research Organisation Fire Danger and Fire Spread Calculator (CSIRO 1999).

3.2.3 Potential bushfire scenarios

The bushfire scenario most likely to affect future assets of the Phase 1 area is following ignition and bushfire occurrence within undeveloped future stages of Jindee to the south/foreshore reserve to the west. This vegetated land directly adjoins the Phase 1 area's southern and western boundaries; therefore, the potential impacts of any such bushfire are expected to be greatest during the afternoon period under standard summer climatic conditions in association with predominant winds from the south/southwest, which are likely to direct a fire front and embers to the north/northeast and into the proposed development.

Any such fire within or adjacent to the Phase 1 area is expected to be managed promptly through a standard bushfire suppression response from DFES and/or City of Wanneroo Volunteer Bushfire Brigades, including brigades located at Wanneroo, Quinns Rocks, Wanneroo Fire Support and Two Rocks.

3.3 Landform and topography

The Jindee site is located on the western side of the Swan Coastal Plain, which is a low lying coastal plain dominated by woodlands of banksia and tuart on sandy soils, sheoak on outwash plains and paperbark in swampy areas (McKenzie et al. 2003). The predominant Jindee landform comprises dunes and undulating limestone ridge terrain typical of coastal landforms associated with the Quindalup unit and the low, hilly landscapes of the Cottesloe unit (EDC 2014).

The Phase 1 area contains undulating to steep topography, which reflects the sporadic nature of the dune systems throughout the coastal landscape (Figure 5). Following clearing, earthworks and site levelling, the majority of vegetation will be removed from the Phase 1 area and the finished grade will be significantly reduced across the site. However, the following areas of vegetation will be retained to some extent within 100 m of the Phase 1 area and the slope under vegetation is described for each:

- foreshore reserve to the west: elevation ranges from a maximum of 6–25 mAHD (Australian Height Datum), slope under vegetation is a maximum of >5–10 degrees and the vegetation is located down-slope from proposed development
- future development stages of Jindee to the south: elevation ranges from a maximum of 17–32 mAHD, slope under vegetation is a maximum of >5–10 degrees and the vegetation is located both down-slope and up-slope from proposed development
- percentage of POS to the northeast: elevation ranges from a maximum of 22–32 mAHD, slope under vegetation is a maximum of >0–5 degrees and the vegetation is located both down-slope and up-slope from proposed development
- percentage of four northern T2 Natural Living lots: elevation ranges from a maximum of 21–28 mAHD, slope under vegetation is a maximum of >0–10 degrees and the vegetation is located both down-slope and up-slope from proposed development.

This information will be taken into consideration as part of the Bushfire Attack Level (BAL) assessment outlined in Section 4.2.3.

Figure 5 Site topography

Scale 1:7,500 at A4

0 50 100 150 m

Coordinate System: GDA 1994 MGA Zone 50

Note that positional errors may occur in some areas

Date: 12/06/2015

Author: JCrute

Source: Aerial image: Landgate, flown 09/2014. Subdivision plan: Client 02/2015.

Legend

- Easement
- Existing cadastre
- Surface elevation (mAHD)
- Phase 1 area
- Jindee residential development
- 100m wide assessment area

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3.4 Vegetation

3.4.1 Vegetation complexes

The Jindee development site is currently naturally vegetated apart from localised areas of clearing associated with tracks and off-road vehicle routes. The effect of off-road vehicle activity and associated uncontrolled recreation is particularly evident near the shoreline within the foreshore reserve where historical and ongoing transit along the coast to northern destinations has created significant damage to vegetation and dune landforms (RPS 2012).

Regional scale vegetation survey and mapping (Heddle et al. 1980) indicates that two vegetation complexes occur throughout the Jindee development site and adjacent land, including:

1. Quindalup Complex: coastal dune complex consisting mainly of the strand and fore-dune alliance, and the mobile and stable dune alliance. Local variations include low closed forest of *Melaleuca lanceolata–Callitris preissii* and closed scrub of *Acacia rostellifera*. The Quindalup Complex is mapped over most of the Jindee site extending from the coast inland and occupies the landforms mapped as Quindalup dunes.
2. Cottesloe Complex (Central and South): characterised by a closed heath on limestone areas with shrubs such as *Melaleuca huegelii*, *Acacia* species, *Grevillea thelemanniana* and *Trymalium ledifolium*. The deeper sands support a mosaic of Tuart, Jarrah and Marri. Banksia species are also common. The Cottesloe Complex (Central and South) occurs in the areas mapped as Karrakatta sand which are located in the easternmost portion of the Jindee site.

3.4.2 On-site vegetation extent

Vegetation mapping of the Jindee site is depicted in Figure 6, which outlines a total of 13 different vegetation units, as well as vegetation condition across the site.

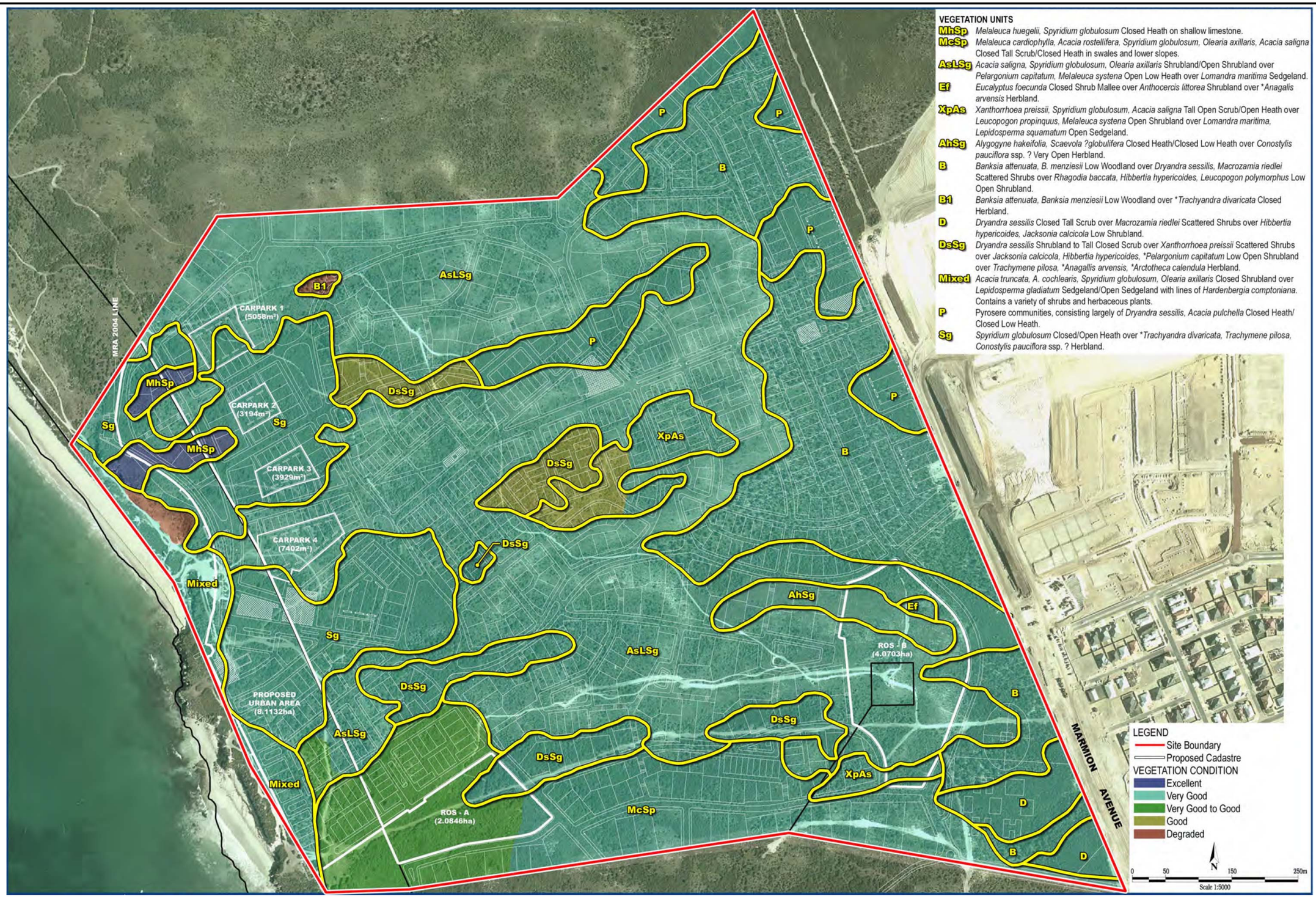
The Phase 1 area is predominantly occupied by low coastal shrubland/heath vegetation consistent with the Quindalup Complex with key species being *Acacia saligna*, *Spyridium globulosum*, *Olearia axillaris*, *Dryandra sessilis*, *Xanthorrhoea preissii*, *Acacia pulchella*, *Melaleuca huegelii* and *Acacia truncata* (RPS 2012). The Phase 1 area also contains a woodland component to the far east of the site consistent with the Cottesloe Complex (Central and South), which contains a predominant overstorey of *Banksia attenuata* and *Banksia menziesii* (RPS 2012).

As previously discussed, the majority of the Phase 1 area will be cleared in a staged process to enable proposed development of the site. However, the following areas of vegetation will be retained on-site:

- foreshore reserve to the west, which contains low coastal shrubland/heath vegetation (note that the future concept for the foreshore reserve will be documented in a Foreshore Management Plan, which may trigger an update to this FMP if the foreshore reserve vegetation is modified).
- a percentage of POS to the northeast, which contains banksia woodland
- a percentage of four northern T2 Natural Living lots, which contain low coastal shrubland/heath vegetation.

3.4.3 Adjacent vegetation extent

A large proportion of land adjacent to the Phase 1 area has been cleared for urban development, including land to the east and north. The foreshore reserve extends along the coastline to the north and south of the Phase 1 area and remains vegetated with low coastal shrubland/heath vegetation consistent with the Quindalup Complex. Future development stages of Jindee to the south of the Phase 1 area will remain vegetated in the short to medium term and the vegetation description for these areas is in accordance with Figure 6, which is generally either low coastal shrubland/heath or banksia woodland.



Source: RPS 2012

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Fire Management Plan: Jindee Phase 1

Vegetation type

Figure 6

3.5 Zoning and land use

3.5.1 Current zoning and land use

The Jindee site is currently zoned 'Smart Growth Community' under the City of Wanneroo Town Planning Scheme No. 2 (TPS No. 2), which is consistent with the proposed urban use over the site. The land is currently covered by remnant coastal heath and has no current active use. Regional 'Parks and Recreation' reserves are also depicted in TPS No. 2, which comprise the foreshore reserve and the east-west linking vegetation corridor towards the south of the site.

3.5.2 Proposed land use

The Jindee residential development will ultimately result in creation of approximately 1300 dwellings plus significant areas of neighbourhood retail, POS, roads, parking and other infrastructure.

The Phase 1 area contains numerous POS areas, the bulk of which will be landscaped and managed for public recreation or drainage purposes in accordance with approved landscape plans. These areas will not pose a significant bushfire risk to future assets of the development due to the vegetation clearance/landscaping proposed and ongoing management of POS areas.

Only one POS area within Phase 1 will retain a percentage of remnant bushland in accordance with commitments made as part of the EPBC Act approval to preserve a percentage of foraging habitat for Carnaby's Black Cockatoo. This POS occurs in the northeast of the Phase 1 area and approximately 0.25 ha of remnant banksia woodland will be retained. Although this area of vegetation does not trigger formal bushfire hazard assessment, fire management measures will be considered as a precaution to mitigate any potential bushfire risk to adjacent assets.

3.5.3 Adjacent land use

Land adjoining the northern and southern boundaries of the Jindee site is currently being developed as part of ongoing urban development by other land developers. Land to the east of the Jindee site (opposite Marmion Avenue) is also currently being developed as part of ongoing urban development of the Butler and Brighton suburbs. The foreshore reserve extends along the coastline to the north and south of the Jindee site and remains vegetated.

3.6 Site assets

The Phase 1 area is currently undeveloped, so does not contain any existing life or property assets. Proposed development of the Phase 1 area will increase the life and property assets of the site, with approximately 1300 dwellings proposed plus significant areas of neighbourhood retail, POS, roads, parking and other infrastructure. This will significantly intensify the number residents, visitors and built assets across the subject land.

3.7 Water and power supply

Water and power supply services will be extended throughout the Phase 1 area from the surrounding urban extent, which will result in provision of a reticulated water supply and underground power supply for proposed lots.

3.8 Site access

The Jindee site is currently accessed from Marmion Avenue via a network of informal access tracks. Proposed vehicular access throughout the Phase 1 area will comprise a significant network of formal roads, with links to Marmion Avenue to the east and adjoining urban development to the north and south. The proposed vehicular access network will also aim to provide a level of hazard separation between vegetated areas (e.g. the foreshore reserve) and adjacent developed areas.

4. Fire problem

4.1 Bushfire history, ignition risk and fire suppression response capability

The Jindalee locality does not have a recent history of bushfire and there have been no significant occurrences of uncontrolled bushfire since 1989 (Landgate 2015). The nearest localities where past bushfires have occurred are situated adjacent to Mitchell Freeway greater than 5 km north and south of site. These fires occurred in 2005 and 2007 respectively (Landgate 2015).

The lack of recent bushfire history in the area can be attributed to numerous factors, including:

- ongoing clearing of vegetation for urban development, which removes the fuel and prevents a long north-south fire run along the coastline
- proximity to the coastline, maritime effects and higher salt and moisture contents compared to inland areas (i.e. resulting in moderated fire danger indices for the site)
- lack of public access and resident/visitor occupancy throughout the site (i.e. lower risk of ignition)
- lower fuel tonnages of the predominant shrubland vegetation extent, compared to woodland or forest types located further inland.

The current risk of ignition throughout the Phase 1 area is considered to be low on the basis of the above site characteristics and justification. However, the risk of ignition within retained vegetated areas post development (particularly the foreshore reserve and undeveloped areas of Jindee to the south) is expected to increase with ongoing intensification of residents and visitors at the bushland interface.

Any such fire within or adjacent to the Phase 1 area is expected to be managed within 30 minutes through a standard bushfire suppression response from DFES and/or the City of Wanneroo Volunteer Bushfire Brigades, including brigades located at Wanneroo, Quinns Rocks, Wanneroo Fire Support and Two Rocks.

4.2 Bushfire hazards

A bushfire hazard assessment aims to classify the bushfire hazard at both the strategic and local level, which leads to an assessment of the BAL. Assessment of the vegetation class and bushfire hazard has been undertaken across the Phase 1 area and adjacent land within 100 m of the Phase 1 boundary in accordance with procedures outlined in PFBFP Guidelines.

4.2.1 Classifying the bushfire hazard

Vegetation class

The majority of vegetation within the Phase 1 area will be removed on development of the site. In addition, slashed buffers will be implemented adjacent to each stage and at the southern and western bushland interfaces to mitigate the bushfire risk from development staging. However, the following vegetated areas will be retained either on-site or within 100 m of the Phase 1 area and the vegetation class has been assessed for each on the basis of vegetation survey and mapping undertaken by RPS (2012):

- foreshore reserve to the west (shrubland vegetation class, Plate 1)
- a percentage of POS to the northeast (woodland vegetation class, Plate 2)
- a percentage of four northern T2 Natural Living lots (shrubland vegetation class, Plate 3)
- north-south extension of foreshore reserve along the coastline (shrubland vegetation class, similar to Plate 1)
- future development stages of Jindee to the south (combination of shrubland and woodland vegetated classes, similar to Plate 2 and Plate 3 respectively).

A vegetation class map depicting the full extent of ‘Shrubland’ and ‘Woodland’ vegetation located within 100 m of the Phase 1 area is provided in Figure 7.

Plate 1: Shrubland vegetation within foreshore reserve

Plate 2: Woodland vegetation within on-site POS

Plate 3: Shrubland vegetation within northern T2 Natural Living lots

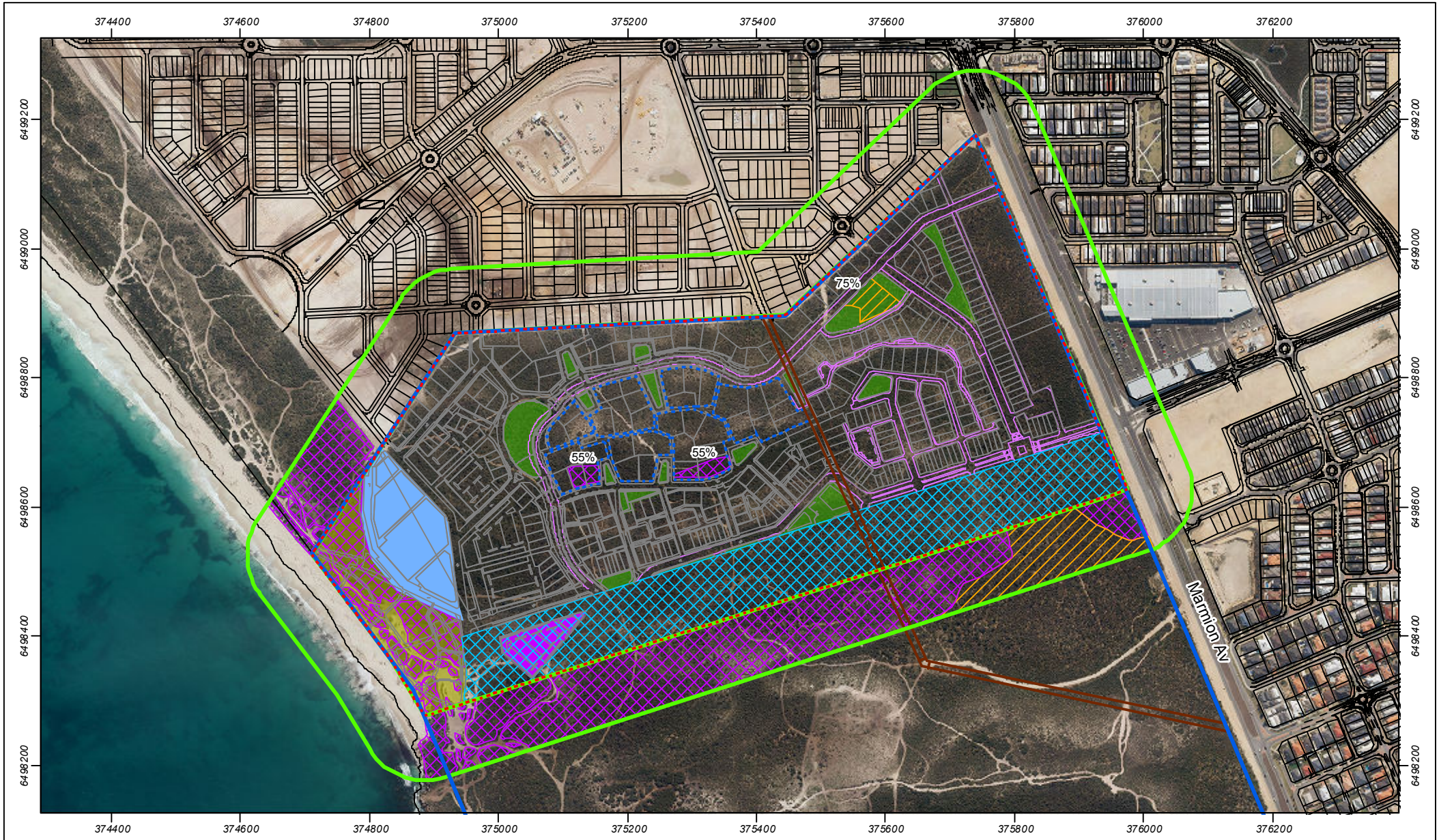

Figure 7 Vegetation class map

Scale 1:8,000 at A4

0 50 100 150 m

Coordinate System: GDA 1994 MGA Zone 50

Note that positional errors may occur in some areas

Date: 19/05/2015

Author: JCrute

Source: Aerial image: Landgate, flown 09/2014. Subdivision plan: Client 02/2015.

Legend

- Existing cadastre
- Base plan
- Roads
- Easement
- Phase 1 area
- Jindee residential development
- 100m wide assessment area
- T2 Natural Living
- Cleared buffer (100m wide)
- Car park constructed within buffer
- Cleared buffer
- ROS
- POS

Vegetation class

- Shrubland
- Woodland

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Bushfire hazard levels

Bushfire hazard levels of the predominant vegetation located within 100 m of the Phase 1 area are displayed in the Bushfire Hazard Assessment Map (Figure 8). Classifying the bushfire hazard by assessing the predominant vegetation is a key to the initial determination of site suitability for development. This also leads to determination of the potential level of construction standard by the application of AS 3959–2009.

The classified shrubland extent within the foreshore reserve to the west and future stages of Jindee to the south are considered to have an 'Extreme' bushfire hazard level. This is also the case for the classified woodland extent within future stages of Jindee to the south.

According to PFBFP Guidelines, land with an assessed 'Extreme' bushfire hazard level is classified as bushfire prone land, which triggers implementation of AS 3959–2009 and increased building construction standards for any proposed development that cannot achieve a 100 m wide separation distance. This zone is depicted in Figure 8 by the 100 m wide BAL application area. Distances between proposed lots and 'Extreme' bushfire hazard areas are also depicted in Figure 8 to inform the BAL assessment. The separation distances depicted on Figure 8 also take into consideration the cleared buffers proposed along the southern and western boundaries of the Phase 1 area.

The classified shrubland extent within the four northern T2 Natural Living lots and the classified woodland extent within on-site POS to the northeast are considered to have a 'Low' bushfire hazard level. A proportion of each of these areas is approved to be cleared under the EPBC Act, which will result in only a percentage of the vegetation being retained in each area, as depicted in Figure 8. Following the approved clearing, each vegetated area will occupy 0.25 ha or less and vegetation of this size does not trigger a bushfire hazard level of 'Moderate' or 'Extreme'.

4.2.2 Bushfire hazard performance criteria

The relationship between various bushfire hazard levels and development performance criteria is set out in Table 2. A proportion of proposed lots cannot achieve the full 100 m wide separation distance to bushfire prone areas contained within the foreshore reserve (to the west). Consequently, a comprehensive suite of bushfire risk treatment and mitigation measures, including application of AS 3959–2009, will need to be implemented to assist in mitigating the bushfire risk to these lots.

Compliance with performance criteria for a 'Moderate' bushfire hazard level will be achieved for the proposed development, focussing on the key areas of development location, vehicular access, water supply, siting of development and design of development. Performance criteria will be achieved through adoption of recommended acceptable solutions outlined in PFBFP Guidelines.

Table 2: Bushfire hazard levels and performance criteria

Bushfire hazard level	Bushfire protection performance criteria required
Low hazard	Development does not require special bushfire planning controls. Despite this, DFES strongly recommends that ember protection features be incorporated in design where practicable.
Moderate hazard	Performance criteria for: • location (Element 1) • vehicular access (Element 2) • water (Element 3) • siting of development (Element 4) • design of development (Element 5).
Extreme hazard	Development is to be avoided in areas with these hazard levels.

Compliance of the proposed development with bushfire protection performance criteria and associated acceptable solutions is detailed in Section 5 and documented in a completed compliance checklist contained in Appendix 1.

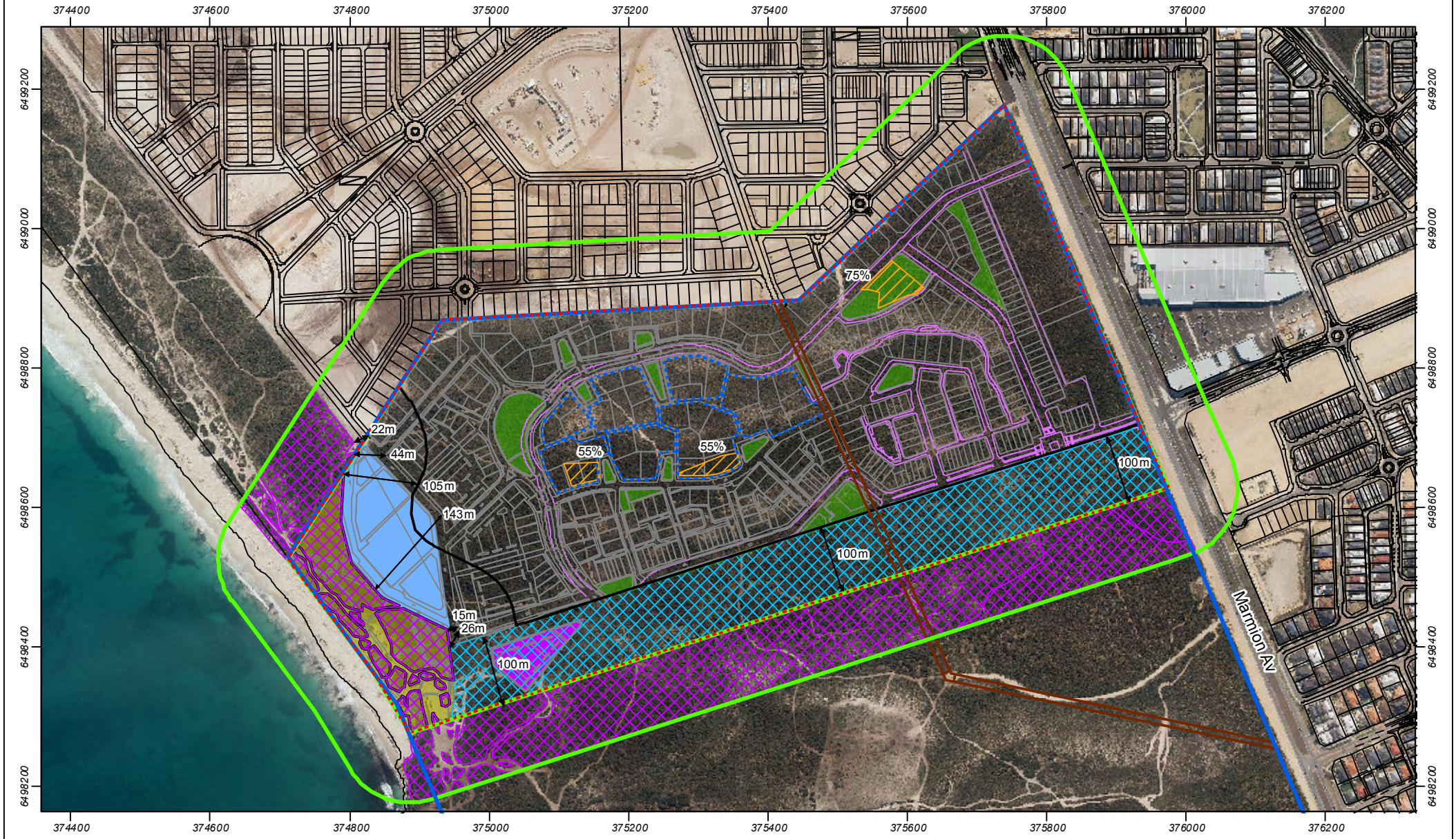

Figure 8 Bushfire hazard assessment map

Scale 1:7,500 at A4

0 50 100 150 m

Coordinate System: GDA 1994 MGA Zone 50

Note that positional errors may occur in some areas

Date: 19/05/2015

Author: JCrute

Source: Aerial image: Landgate, flown 09/2014. Subdivision plan: Client 02/2015.

Legend

- Base plan
- Roads
- Easement
- Existing cadastre
- Phase 1 area
- Jindee residential development
- 100m wide assessment area
- T2 Natural Living
- ROS
- POS
- Cleared buffer (100m wide)
- Car park constructed within slashed buffer
- Cleared buffer

Bushfire hazard level

- Extreme
- Low
- 100m wide BAL application area

Distance between Extreme bushfire hazard level and lot boundaries

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4.2.3 Classifying the Bushfire Attack Level (BAL)

This procedure, as outlined in PFBFP Guidelines and AS 3959–2009, uses a combination of the following parameters to specify the BAL:

- state-adopted Fire Danger Index rating: FDI 80
- classified vegetation: shrubland within foreshore reserve (all other vegetation is either low hazard or being managed through cleared buffers)
- slope under classified vegetation: the foreshore reserve is down-slope of proposed development at a maximum of >5–10 degrees
- the current distance maintained between proposed development areas and the classified vegetation: a minimum separation distance of 20 m will be achieved in the form of a Building Protection Zone (BPZ) between the predominant vegetation and proposed development areas.

It is important to note that some parameters outlined above may change as development staging progresses within the Phase 1 area, such as the distance between development areas and the classified vegetation as a result of future vegetation clearance and/or fuel treatment measures. This is particularly relevant for the foreshore reserve, which is likely to contain areas for public access and recreation in accordance with a Foreshore Management Plan. Therefore, this FMP will need to be progressively updated to reflect any changes in the on-ground fire environment (that this FMP has not accounted for) as the vegetated status of the site transitions to a suburban landscape.

The above parameters result in a combination of BAL 19 and BAL 12.5 being required throughout the 100 m wide BAL application area adjacent to the foreshore reserve. A Method 1 BAL calculation is outlined in Table 3, with the relevant BAL ratings and corresponding separation distances shaded green.

All proposed lots located outside the 100 m wide BAL application area will not require heightened building construction standards.

Table 3: Determination of Bushfire Attack Level (BAL)

Vegetation class	Bushfire Attack Level (BAL)				
	BAL FZ	BAL 40	BAL 29	BAL 19	BAL 12.5
	Distance (m) of the site from the predominant vegetation class				
	Down-slope >5 to 10 degrees				
Shrubland	<8 (not supported in WA)	8–<11 (not supported in WA)	11–<17	17–<25	25–<100

Source: WAPC et al. 2010

Relevant sections of AS 3959–2009 that outline construction standards for buildings in areas specified as BAL 19 and BAL 12.5 are provided in Table 4. Construction standards for BAL 19 and BAL 12.5 are fully explained in Appendix 4.

Table 4: Building construction standards

Bushfire Attack Level (BAL)	Classified vegetation within 100 m of the site and heat flux exposure thresholds	Description of predicted bushfire attack and levels of exposure	Relevant section of AS 3959–2009
BAL 12.5	≤12.5 kW/m^2	Ember attack	3 and 5
BAL 19	>12.5 kW/m^2 ≤19 kW/m^2	Increasing levels of ember attack and burning debris ignited by windborne embers together with increasing heat flux	3 and 6

4.3 Summary of key bushfire issues

The following is a summary of key bushfire issues that have been considered as part of the FMP to inform development of specified bushfire risk treatment and mitigation measures:

- the Jindee site has not been affected by significant uncontrolled bushfire for some time and the vegetation remains long unburnt
- the risk of ignition is currently low, but is expected to increase throughout vegetated areas following the introduction of high levels of public visitation and resident occupancy at the bushland interface
- emergency response times in the event that the Phase 1 area is threatened by uncontrolled bushfire are expected to be within 30 minutes from DFES and/or local Bushfire Brigades stationed throughout City of Wanneroo
- the Phase 1 area currently contains shrubland and woodland vegetation, the majority of which is proposed to be cleared to enable development of the site
- on-site POS will be cleared/landscaped in accordance with approved landscape plans, except for a percentage of POS in the northeast of the Phase 1 area
- the on-site and adjacent vegetation extent is either a shrubland or woodland class, as depicted in Figure 7
- the on-site and adjacent vegetation extent is either a 'Low' or 'Extreme' bushfire hazard level, as depicted in Figure 8
- the foreshore reserve is currently the only significant bushfire hazard that will affect the Phase 1 area (this equates to shrubland vegetation, 'Extreme' bushfire hazard level, >5–10 degree slope, down-slope from proposed development)
- the foreshore reserve is therefore currently a bushfire prone area, which triggers application of AS 3959–2009 and increased building construction standards for all proposed lots that cannot achieve a 100 m wide hazard separation distance
- a BAL assessment undertaken for the proposed development reveals that building construction standards applicable to BAL 12.5 and BAL 19 will apply throughout the 100 m wide BAL application area adjacent to the foreshore reserve
- a 20 m wide BPZ will be achieved at the interface between the foreshore reserve and proposed development areas
- the above implications of the foreshore reserve will need to be reviewed and made consistent with the proposed Foreshore Management Plan
- the remainder of on-site and adjacent vegetation is either a 'Low' bushfire hazard or is located 100 m or more from proposed development areas due to strategic placement of cleared buffers adjacent to each development stage.

5. Bushfire risk treatment and mitigation

The following subsections outline how the bushfire risk to future life and property will be mitigated to achieve a suitable and effective bushfire management outcome for the Phase 1 area. This will be achieved by complying with performance criteria and acceptable solutions in accordance with PFBFP Guidelines. Where applicable, these measures are illustrated on an aerial image of the Phase 1 area in Figure 9 to assist with implementation of the FMP.

5.1 Development location

Strategic location, layout and management of future development at the planning stage can reduce future fire threat and risk to critical life and property assets.

The proposed development will result in creation of a significant cleared and built footprint across the Phase 1 area. In addition, the following strategic buffers will be implemented to mitigate the bushfire risk from development staging (Figure 9):

- a 100 m wide cleared buffer will be constructed and maintained annually at less than 2 t/ha along and within the southern boundary of Phase 1 (this buffer will also contain a car park)
- a cleared buffer of varying width will be constructed and maintained annually at less than 2 t/ha along the western boundary of Phase 1 at the interface with the foreshore reserve
- 100 m wide cleared buffers will be constructed adjacent to each development stage within the Phase 1 area and maintained annually at less than 2 t/ha.

Aside from POS area No. 11 (which is discussed further in Section 5.4.3), all on-site POS will be cleared and landscaped in accordance with approved landscape plans. Fuel loads within these POS areas will be maintained annually at less than 2 t/ha and as a result, these areas are not expected to pose a bushfire risk to the proposed development.

Strategic location of development and placement of low fuel hazard separation areas such as BPZs, roads and cleared buffers has enabled the development to achieve a BAL 29 rating or lower through application of AS 3959–2009, while also providing defendable space and vehicular access between bushfire hazards and proposed development areas.

5.1.1 Compliance statement

The above measures will ensure proposed dwellings are not located in areas of 'Extreme' bushfire hazard or require BAL 40 or BAL FZ construction standards under AS 3959–2009. This meets performance criteria for development location (Element 1) by adopting acceptable solution A1.1.

5.2 Vehicular access

Vehicular access throughout the Phase 1 area will be in accordance with Figure 1. This network provides a significant level of public and emergency vehicular access throughout the site, with numerous linkages to Marmion Avenue and adjacent developed areas to the north, as well as links to future development areas to the south. The proposed vehicular access network also provides public and emergency access along each bushland interface.

All public roads will be constructed in accordance with Main Roads WA, CoW and DFES requirements.

5.2.1 Compliance statement

The abovementioned measures adopt the following acceptable solutions to assist in meeting performance criteria for vehicular access (Element 2):

- A2.1 Two Access Routes: two different vehicular access routes, both of which connect to the surrounding public road network, are available to all residents/the public at all times
- A2.2 Public Roads: public roads meet the requirements of Main Roads WA, CoW and DFES (refer to PFBFP Guidelines for additional detail).

Acceptable solutions for cul-de-sacs (A2.3), battle axes (A2.4), private driveways (A2.5), emergency access ways (A2.6), fire service access routes (A2.7), gates (A2.8), firebreak widths (A2.9) and signs (A2.10) are not applicable to this development.

5.3 Water supply

A reticulated water supply will be extended throughout the Phase 1 area to ensure an all year round supply of water is provided 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'.

5.3.1 Compliance statement

The above measures adopt the following acceptable solution to ensure the development meets performance criteria for water supply (Element 3):

- A3.1: Reticulated Areas: the development is provided with a reticulated water supply, together with fire hydrants, in accordance with specifications of the water supply authority and DFES.

Acceptable solutions for non-reticulated areas (A3.2) and dams (A3.3) do not apply to this development.

5.4 Siting of development

When considering the overall bushfire management of the Phase 1 area, protection should be provided to critical life and property assets (residents, visitors and built assets) as a priority. Low fuel buffers between fire hazard areas and critical assets and application of AS 3959–2009 can be implemented to achieve this.

5.4.1 Formal fire planning requirements

Building construction standards applicable to BAL 12.5 and BAL 19 will apply to the Phase 1 area in accordance with Figure 9 (refer to Section 4.2.3 for results of the BAL assessment). In addition, a 20 m wide BPZ will be implemented (in accordance with Figure 9) along the western boundary at the interface with the foreshore reserve where proposed lots are situated adjacent to bushfire prone areas:

The above BPZ will be accommodated within a road reserve and cleared buffer and is to be maintained annually at less than 2 t/ha via mechanical slashing and weed control. All BAL requirements will be specified through DAPs for relevant lots.

All proposed lots located outside the 100 m wide BAL application area will not require heightened building construction standards.

The above measures will need to be reviewed following any changes in the on-ground fire environment and vegetated status of the Phase 1 area (that this FMP has not accounted for) as the site transitions to a suburban landscape, particularly with regards to the foreshore reserve, which will be guided by the proposed Foreshore Management Plan.

5.4.2 Compliance statement

The abovementioned measures adopt the following acceptable solutions to ensure the development meets performance criteria for siting of development (Element 4):

- A4.1 Hazard separation–moderate to extreme bushfire hazard level: every building is sited a minimum distance of 100 m from any vegetation classified under Table 1 and Figure 1 of Appendix 1 of PFBFP Guidelines as forests, woodlands, closed scrub, open scrub, mallee/mulga and rainforest (i.e. in an area with a moderate or extreme bushfire hazard level) or has its construction standard increased to align with the appropriate BAL for that location
- A4.3 Building protection zone: every residential building is surrounded by a building protection zone that meets DFES requirements (refer to PFBFP Guidelines for additional detail).

Acceptable solutions for hazard separation–low bushfire hazard (A4.2), hazard separation zone (A4.4) and reduction in BAL due to shielding (A4.5) are not applicable to this development, or have been addressed through the application of AS 3959–2009 or the suggested fire planning measures described below.

5.4.3 Suggested fire planning measures

Four northern T2 Natural Living lots, located central to the Phase 1 area, will contain remnant bushland to satisfy EPBC Act approval conditions; however, this bushland will be less than 0.25 ha in size, which is less than that required to be formally designated as a bushfire prone area. As a result, this vegetation has been classified as a 'Low' bushfire hazard and does not trigger formal application of AS 3959–2009 for the surrounding 100 m of development. Notwithstanding, fire planning measures will be considered for these four lots as a precaution at the building application stage in the form of appropriate location of building envelopes, provision of defendable space in the form of BPZs and application of increased building construction standards, such as BAL 12.5. These measures are not mandatory, but will be considered to mitigate the bushfire risk posed by the small bushland remnants retained within the four northern T2 Natural Living lots.

POS 11, located in the northeast of the Phase 1 area, will contain remnant bushland to satisfy EPBC Act approval conditions; however, this bushland will be 0.25 ha in size, which is less than that required to be formally designated as a bushfire prone area. As a result, this vegetation has been classified as a 'Low' bushfire hazard and does not trigger formal application of AS 3959–2009 for the surrounding 100 m of development. Notwithstanding, fire planning measures will be implemented and the retained bushland remnant will be bound by a 3 m wide mineral earth firebreak or crushed limestone path plus an additional perimeter road. These measures are not mandatory, but will be implemented as a precaution to provide adequate defendable space and emergency access between the remnant vegetation and adjacent developed areas, which is considered sufficient to mitigate the bushfire risk posed by the 0.25 ha bushland remnant retained within POS 11.

5.5 Design of development

Since the proposed development complies with the relevant performance criteria for siting of development as previously discussed (i.e. compliance with A4.1 through to A4.5 where applicable) the proposed development is considered compliant and there are no special design requirements for Element 5.

5.6 Additional bushfire risk mitigation

The following measures will be implemented in addition to those outlined previously to provide a more thorough level of bushfire protection to residents, visitors and built assets of the subject land:

1. Annual fuel inspections: undertaken by CoW staff in accordance with the current City of Wanneroo Annual Firebreak Notice under provisions of the *Bush Fires Act 1954*. Failure to comply with this FMP and the specified requirements of the current annual notice may result in the issuing of fines (refer to Appendix 5 for the current annual firebreak notice).
2. Landowner education and awareness: landowners should obtain a copy of local government and DFES bushfire information booklets that are currently available. In addition, attendance by landowners at annual DFES bushfire awareness briefings would be advantageous.
3. Section 70 Notification: to be placed on those Titles of the proposed development assigned with a specified BAL rating to ensure prospective landowners are aware that an FMP exists over the site and that specified building requirements apply.

5.7 FMP review and update

The on-ground fire environment and vegetation extent will transition over time in response to staged clearing and development within the Phase 1 area. Consequently, the bushfire risk will change as the current vegetated landscape is progressively cleared. This FMP will therefore need to be reviewed and updated following any significant changes to the bushfire hazard extent (that this FMP has not accounted for) to ensure the proposed management responses reflect the actual bushfire risk. This is particularly relevant for the foreshore reserve, which is likely to contain areas for public access and recreation in accordance with a Foreshore Management Plan.

5.8 Summary of bushfire risk mitigation and works program

A summary of the bushfire risk treatment and mitigation measures described in Section 5, as well as a works program, is provided in Table 5. These measures will be implemented to ensure the ongoing protection of proposed life and property assets is achieved. Additional optional measures are also provided and can be adopted by residents to further mitigate the risk to life and property from uncontrolled bushfires. Timing and responsibilities are also defined to assist with implementation of each management measure.

Table 5: Summary of bushfire risk mitigation measures and works program

Bushfire risk mitigation	Recommended works	Mandatory	Optional	Timing	Responsibility
Development location	Undertake development in accordance with the approved FMP and subdivision design to ensure the development is not subject to an 'Extreme' bushfire hazard level or requires BAL 40 or BAL FZ construction standards. Refer to FMP Section 5.1.	Yes	No	Throughout implementation of the development	Developer
	Maintain the available fuel load at less than 2 t/ha within all POS areas (with the exception of retained vegetation within POS 11). This can be achieved through mechanical slashing and weed control. Refer to FMP Section 5.1.	Yes	No	Annually prior to the onset of the designated bushfire season	Developer during development, CoW thereafter
	Construct cleared buffers in accordance with Figure 9, as well as 100 m wide cleared buffers adjacent to each individual development stage within the Phase 1 area to mitigate the bushfire risk from development staging. The cleared buffers will be maintained annually at less than 2 t/ha. Refer to FMP Section 5.1.	Yes	No	Prior to construction within each stage and ongoing maintenance thereafter	Developer
Vehicular access	Implement the proposed vehicular access network as per the approved subdivision design. Refer to FMP Section 5.2.	Yes	No	During earthworks and servicing for each subdivision stage	Developer
	Construct all public roads in accordance with Main Roads WA, CoW and DFES requirements. Refer to FMP Section 5.2.	Yes	No	During earthworks and servicing for each subdivision stage	Developer
Water supply	Provide a reticulated water supply throughout the proposed development. Refer to FMP Section 5.3.	Yes	No	During earthworks and servicing for each subdivision stage	Developer
	Provide a network of hydrants along the internal road network at locations which meet relevant water supply authority and DFES requirements (i.e. in accordance with Water Corporation Design Standard DS 63 'Water Reticulation Standard Design and Construction Requirements for Water Reticulation Systems up to DN250'). Refer to FMP Section 5.3.	Yes	No	During earthworks and servicing for each subdivision stage	Developer
Siting of development	Apply BAL 12.5 and BAL 19 building construction standards to future lots in accordance with Figure 9. Refer to FMP Section 5.4.1.	Yes	No	During building construction	Builder, prospective landowners
	Construct the 20 m wide BPZ in accordance with Figure 9. Refer to FMP Section 5.4.1.	Yes	No	Prior to construction and ongoing maintenance thereafter	Developer
	Maintain the BPZ at less than 2 t/ha. This can be achieved through mechanical slashing and weed control. Refer to FMP Section 5.4.1.	Yes	No	Annually prior to the onset of the designated bushfire season	Developer during development, relevant managing authority thereafter
	Specify BAL requirements for relevant lots through DAPs. Refer to FMP Section 5.4.1.	Yes	No	At the DAP stage	Developer
	Consider the suggested fire planning measures for the four northern T2 Natural Living lots that have a retained vegetation extent. Refer to FMP Section 5.4.3	Yes	No	At the building application stage	Developer, prospective landowners
	Implement a 3 m wide mineral earth firebreak or crushed limestone path around remnant bushland retained within POS 11. Refer to FMP Section 5.4.3	Yes	No	During landscape works for POS 11 and annual maintenance thereafter	Developer during development, CoW thereafter
Design of development	Comply with all relevant acceptable solutions for siting of development (Element 4) to prevent special design requirements. Refer to FMP Section 5.5.	Yes	No	During implementation of the development	Developer

Bushfire risk mitigation	Recommended works	Mandatory	Optional	Timing	Responsibility
Additional bushfire risk mitigation	Comply with the current annual firebreak notice. Refer to Appendix 5.	Yes	No	Annually prior to the onset of the designated bushfire season	Developer, prospective landowners
	Undertake an inspection of fuel hazards across the development area to assess compliance with the FMP and annual firebreak notice. Refer to FMP Section 5.6.	No	Yes	Annually prior to the onset of the designated bushfire season	CoW staff
	Issue work orders or fines where compliance with the *Bush Fires Act 1954*, FMP or annual firebreak notice has been compromised. Refer to FMP Section 5.6.	No	Yes	Annually prior to the onset of the designated bushfire season	CoW staff
	Obtain bushfire information booklets and attend annual DFES bushfire awareness briefings. Refer to FMP Section 5.6.	No	Yes	Annually	Prospective landowners
	Place a Section 70 Notification on those Titles affected by a specified BAL rating to ensure prospective landowners are aware that an FMP exists over the site and that specified building requirements may apply. Refer to FMP Section 5.6.	Yes	No	On creation of Titles	Developer
	Comply with City of Wanneroo-determined burning periods. Refer to Appendix 5.	Yes	No	As specified by City of Wanneroo	Developer, prospective landowners
FMP review	Review the FMP following any significant changes in the on-ground bushfire hazard extent (that the FMP has not accounted for) and update the proposed management responses of this FMP accordingly.	Yes	No	Following any significant changes in the on-ground bushfire hazard extent that this FMP has not accounted for	Developer
	Update the FMP where required to ensure consistency is maintained with the Foreshore Management Plan.	Yes	No	During preparation of the Foreshore Management Plan	Developer

6. Implementation of the Fire Management Plan

6.1 Implementation of bushfire risk treatment and mitigation

The works program provided in Table 5 provides clear direction for the implementation of all works associated with this FMP, including appropriate timing and responsibilities. In addition, the full range of bushfire risk treatment and mitigation measures, as well as location of implementation as specified in this FMP, is provided in Figure 9. The plan has been overlain on an aerial image of the Phase 1 area to assist with implementation.

6.2 Assessment of bushfire risk treatment and mitigation measures

Implementation of the bushfire risk treatment and mitigation measures outlined in this FMP will ensure that should a bushfire occur within or adjacent to the proposed residential development, fire intensity on site will be minimised and life and property assets will have a higher level of protection. In addition, a fire occurring on the site is highly likely to be readily contained within 30 minutes, which is the expected emergency response time provided by local Bushfire Brigades.

The cost of undertaking the various tasks and initiatives outlined in the FMP will provide significant cost benefit to the developer and prospective landowners when compared with the possible loss of life or infrastructure within the site.

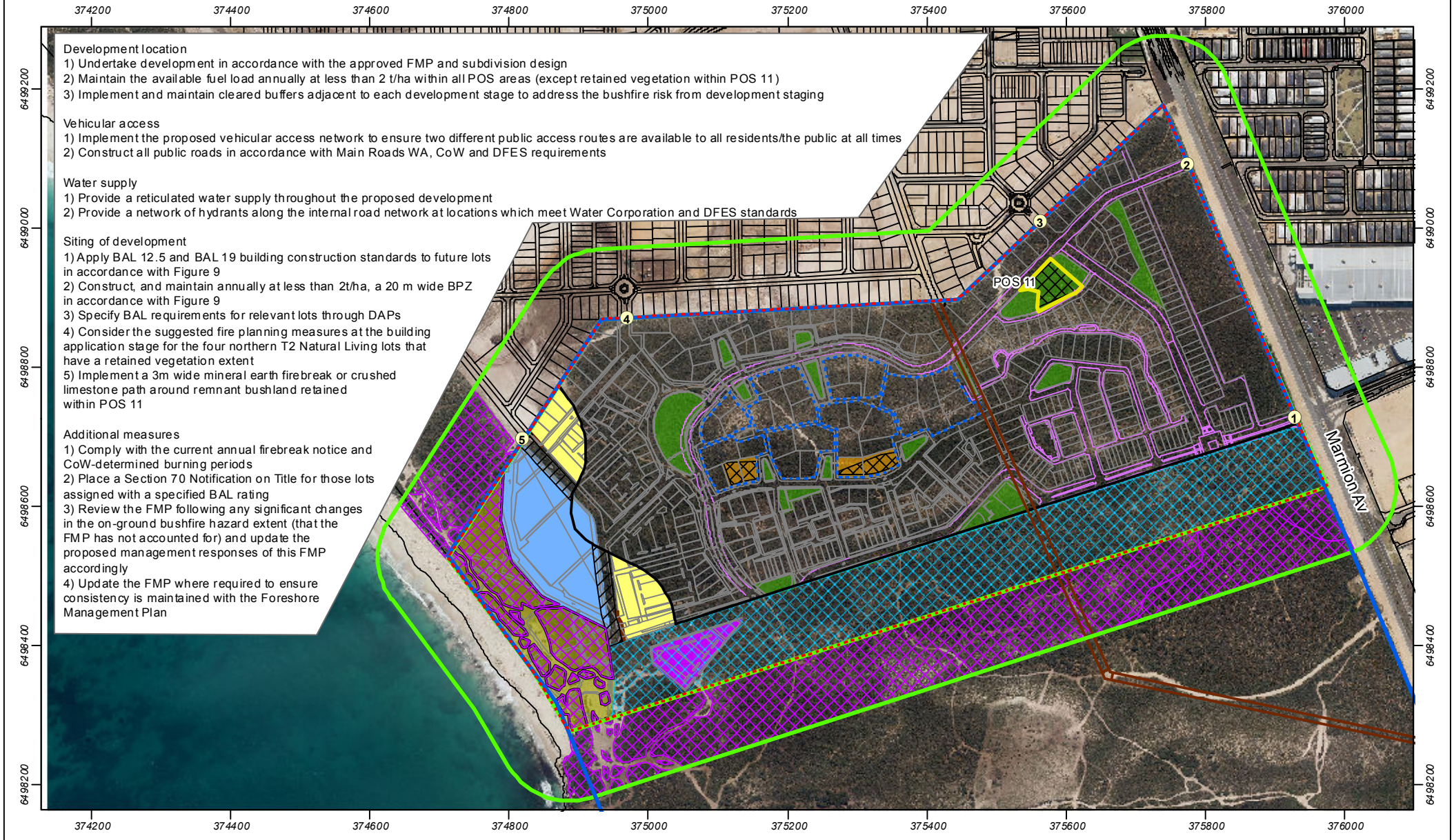

Figure 9 Fire Management Plan: Jindee Phase 1

Scale 1:7,500 at A4

0 50 100 150 m

Coordinate System: GDA 1994 MGA Zone 50
Note that positional errors may occur in some areas
Date: 15/06/2015

Author: JCrute
Source: Aerial image: Landgate, flown 09/2014.
Subdivision plan: Client 02/2015.

Path: Q:\Consult\2015\EDC\EDC15109\ArcMap_documents\R001\Rev0\EDC15109_01_R001_Rev0_F009.mxd

Legend

- 1 Access route
- Easement
- Existing cadastre
- Base plan
- Roads
- 3m wide mineral earth firebreak or crushed limestone path
- Phase 1 area
- Jindee residential development
- 100m wide assessment area
- T2 Natural Living
- Bushfire prone areas
- 100m wide BAL application area
- 20m wide BPZ
- Low fire hazard
- Cleared buffer
- Precautionary fire planning recommended for Natural Living lots
- Car park constructed within slashed buffer
- Cleared buffer (100m wide)
- ROS
- POS
- BAL 19
- BAL 12.5

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6.3 Legislative requirements, specifications and standards

The legislative requirements, specifications and standards applicable to implementation of this FMP are referenced in Section 7 and pertain to the following:

- *Bush Fires Act 1954*
- *Planning and Development Act 2005*
- *Environment Protection and Biodiversity Conservation Act 1999*
- *Environmental Protection Act 1986*
- *Wildlife Conservation Act 1950*
- Building Code of Australia
- Planning for Bush Fire Protection Guidelines (Edition 2)
- Draft State Planning Policy 3.7 Planning for Bushfire Risk Management
- Draft Planning for Bushfire Risk Management Guidelines
- Australian Standard AS 3959–2009 Construction of Buildings in Bushfire-prone Areas
- City of Wanneroo Annual Firebreak Notice
- AFAC Bushfire Glossary.

7. References

Bureau of Meteorology (BoM) 2015, *Climate statistics for Australian locations: Monthly climate statistics for Swanbourne*, [Online], Commonwealth of Australia, available from: *http://www.bom.gov.au/climate/averages/tables/cw_009215.shtml*, [15/05/2015].

Commonwealth Science and Industrial Research Organisation (CSIRO) 1999, *Fire Danger and Fire Spread Calculator*, Commonwealth Science and Industrial Research Organisation, Perth.

Department of Planning and Western Australian Planning Commission (DoP & WAPC) 2014, *Draft State Planning Policy 3.7 Planning for Bushfire Risk Management*, Western Australian Planning Commission, Perth.

Estates Development Company (EDC) 2014, *Jindee Local Structure Plan*, report prepared for Estates Development Company, December 2014.

Landgate 2015, *Firewatch*, [Online], Government of Western Australia, available from: *http://firewatch.landgate.wa.gov.au/landgate_firewatch_public.asp*, [21/05/2015].

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.

McKenzie NL, May JE and McKenna S 2003, *Bioregional Summary of the 2002 Biodiversity Audit of Western Australia*, Department of Conservation and Land Management, Perth.

RPS 2012, *Environmental Assessment Summary: Local Structure Plan Lot 9036 and Part Lot 3054 Marmion Avenue, Jindee*, report prepared for Estates Development Company, May 2012.

Rural and Land Management Group 2012, *Bushfire Glossary*, Australasian Fire Authorities Council, Melbourne.

Standards Australia (SA) 2009, *Australian Standard AS 3959–2009 Construction of Buildings in Bushfire-Prone Areas*, Standards Australia, Sydney.

TME 2012, *Jindee Estate Fire Hazard Assessment*, report prepared for Estates Development Company, September 2012.

Western Australian Planning Commission, Department of Planning and Fire and Emergency Services Authority (WAPC et al.) 2010, *Planning for Bush Fire Protection Guidelines (Edition 2)*, Western Australian Planning Commission and Fire and Emergency Services Authority, Perth.

Appendix 1
Fire Management Plan compliance checklist

Compliance checklist for performance criteria and acceptable solutions

Element	Acceptable solution	Compliance	Yes/No	Explanation (if no)
1. Location	A1.1 Development location	Does the proposal comply with performance criteria P1 by applying acceptable solution A1.1?	Yes	
2. Vehicular access	A2.1 Two access routes	Does the proposal comply with performance criteria P2 by applying acceptable solution A2.1?	Yes	
	A2.2 Public roads	Does the proposal comply with performance criteria P2 by applying acceptable solution A2.2?	Yes	
	A2.3 Cul-de-sacs	Does the proposal comply with performance criteria P2 by applying acceptable solution A2.3?	N/A	
	A2.4 Battle axes	Does the proposal comply with performance criteria P2 by applying acceptable solution A2.4?	N/A	
	A2.5 Private driveways	Does the proposal comply with performance criteria P2 by applying acceptable solution A2.5?	N/A	
	A2.6 Emergency access ways	Does the proposal comply with performance criteria P2 by applying acceptable solution A2.6?	N/A	
	A2.7 Fire service access routes	Does the proposal comply with performance criteria P2 by applying acceptable solution A2.7?	N/A	
	A2.8 Gates	Does the proposal comply with performance criteria P2 by applying acceptable solution A2.8?	N/A	
	A2.9 Firebreak widths	Does the proposal comply with performance criteria P2 by applying acceptable solution A2.9?	N/A	
	A2.10 Signs	Does the proposal comply with performance criteria P2 by applying acceptable solution A2.10?	N/A	
3. Water	A3.1 Reticulated areas	Does the proposal comply with performance criteria P3 by applying acceptable solution A3.1?	Yes	
	A3.2 Non-reticulated areas (a)	Does the proposal comply with performance criteria P3 by applying acceptable solution A3.2?	N/A	
	A3.3 Non-reticulated areas (b)	Does the proposal comply with performance criteria P3 by applying acceptable solution A3.3?	N/A	
4. Siting of development	A4.1 Hazard separation – moderate to extreme bushfire hazard level	Does the proposal comply with performance criteria P4 by applying acceptable solution A4.1?	Yes	
	A4.2 Hazard separation – low bushfire hazard level	Does the proposal comply with performance criteria P4 by applying acceptable solution A4.2?	N/A	
	A4.3 Building protection zone	Does the proposal comply with performance criteria P4 by applying acceptable solution A4.3?	Yes	
	A4.4 Hazard separation zone	Does the proposal comply with performance criteria P4 by applying acceptable solution A4.4?	N/A	
	A4.5 Reduction in bushfire attack level due to shielding	Does the proposal comply with performance criteria P4 by applying acceptable solution A4.5?	N/A	
5. Design of development	A5.1 Compliant development	Does the proposal comply with performance criteria P5 by applying acceptable solution A5.1?	Yes	

Element	Acceptable solution	Compliance	Yes/No	Explanation (if no)
	A5.2 Non-compliant development	Does the proposal comply with performance criteria P5 by applying acceptable solution A5.2?	N/A	

Note: Performance criteria and acceptable solutions are in accordance with *Planning for Bush Fire Protection Guidelines (Edition 2)* (WAPC et al. 2010).

Applicant Declaration

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

Full name: Roger Banks

Applicant signature: 

Date: 15/06/2015

Appendix 2
Bushfire hazard assessment summary
(TME 2012)

Planning for Bushfire Protection Guidelines (WAPC, FESA)

A bushfire hazard assessment of the site has been undertaken in accordance with the requirements of the Planning for Bushfire Protection Guidelines to identify the relevant bush fire management issues which need to be addressed in the implementation of the LSP, DAPs and subdivision design (refer Part 3 – Bushfire Hazard Assessment).

The classification of the bush fire hazard in Planning for Bushfire Protection is based upon the existing vegetation in the undeveloped site. It classifies the existing vegetation based on tree height and the percentage of canopy cover. The general principles within the Planning for Bush Fire Protection Guidelines contain a presumption against development in areas with an "extreme" bush fire hazard rating.

The majority of the undeveloped site has a moderate to extreme bush fire hazard rating. Planning for Bushfire Protection Guidance Statement A3 stipulates that in areas with an extreme bush fire hazard level, permanent hazard reduction measures must be implemented to allow development to occur.

While the hazard assessment relates to the undeveloped land, the final fire management measures must have regard to the proposed development and its relationship to the surrounding location. These measures will be established through the Fire Management Plan(s) that will be prepared at subdivision stage.

The development will result in the vast majority of the site's vegetation being cleared. Vegetation will be retained within the existing MRS Parks and Recreation reserves and in the southern T2 Zone.

The key implications arising from the hazard assessment are:

1. The majority of the site will have a low fire hazard as the existing hazard will be permanently removed by the clearing of most of the land for development;
2. The MRS Parks and Recreation reservations are likely to remain as a moderate to extreme bush fire hazard;
3. It is possible that some development within 100m of the MRS Parks and Recreation reserves and development within the southern T2 Zone may need to be constructed in accordance with Australian Standard AS3959. This will be determined through the fire management plan prepared at subdivision stage;
4. The southern T2 Zone is likely to a be a moderate bush fire hazard because of the management of the land and the fragmentation due to roads, driveways, building sites, fences and services;
5. The subdivision design within the southern T2 Zone will need to comply with the provisions of the Planning for Bush Fire Protection Guidelines;
6. The major public open space reserves will need to be subject to further assessment of the landscaping design in order to determine if there will be any associated bush fire hazard.

It is submitted that the design of the structure plan is appropriate to the level of bush fire hazard that will apply to the developed site as:

1. The site is being developed predominantly for urban purposes;
2. Dwellings within 100m of the MRS Parks and Recreation reservations and within the southern T2 Zone can be constructed in accordance with the assigned Bushfire Attack Level under Australian Standard AS3959; and
3. A fire management plan will be prepared for the subdivision which will document specific fire management measures.

LEGEND

SUBJECT LAND

LOW HAZARD
Urban development, cleared lots with associated earthworks.

MANAGED OPEN SPACE
Managed public areas which are predominantly local POS. The hazard rating will depend upon the landscaping characteristics and is to be determined when subdivided.

MODERATE HAZARD
Southern T2 Natural Living Area
Potential moderate rating due to fragmentation from roads, driveways, fence lines etc. Will be subject to a fire management plan as part of the DAP and dwellings will be constructed in accordance with AS3959 construction standards.

EXTREME HAZARD
MRS Parks and Recreation reservations.
The rating in parts of the reserves may be "moderate" depending upon the level of revegetation and maintenance which is done.

JINDEE LSP AREA

The bush fire hazard assessment report recommends:

1. That a fire management plan should be submitted in conjunction with any subdivision application so as to ensure that the design complies with the requirements of the Planning for Bush Fire Protection Guidelines. This plan should also address:
    (a) The extent of earthworking (cut and fill with proposed finished surface levels) and vegetation clearing for that stage;
    (b) The interface treatment between the development and any classified bush fire hazard;
    (c) Any interim fire management measures which are required for staging of the subdivision;
    (d) Where AS3959 construction standards will be required; and
    (e) A Bushfire Attack Level (BAL) classification plan for those nominated areas.
2. That the preparation of the Environmental Management Plan for the southern T2 Zone should consider:
    (a) The minimum height of vegetation required;
    (b) The degree of "openness" of the foliage;
    (c) The specific density of groundcover;
    (d) The ability to remove dead material and maintain leaf litter;
    (e) The need to include appropriate BAL setbacks;
    (f) How the continuity of the corridor will be affected by three metre wide driveways and any associated earthen shoulders/ embankments;
    (g) How the continuity of the corridor will be affected by boundary firebreaks up to 6m wide i.e. 3m either side of the boundary on lots of more than 2,000sqm.
3. That the preparation of the DAP for the southern T2 Natural Living area should consider:
    (a) The vegetation rehabilitation and management requirements;
    (b) The implications of AS3959 construction standards including the required BAL setbacks;
    (c) The management of vegetation within the BAL setbacks;
    (d) A potential variation of the CoW Firebreak Notice to remove the requirement for boundary firebreaks.

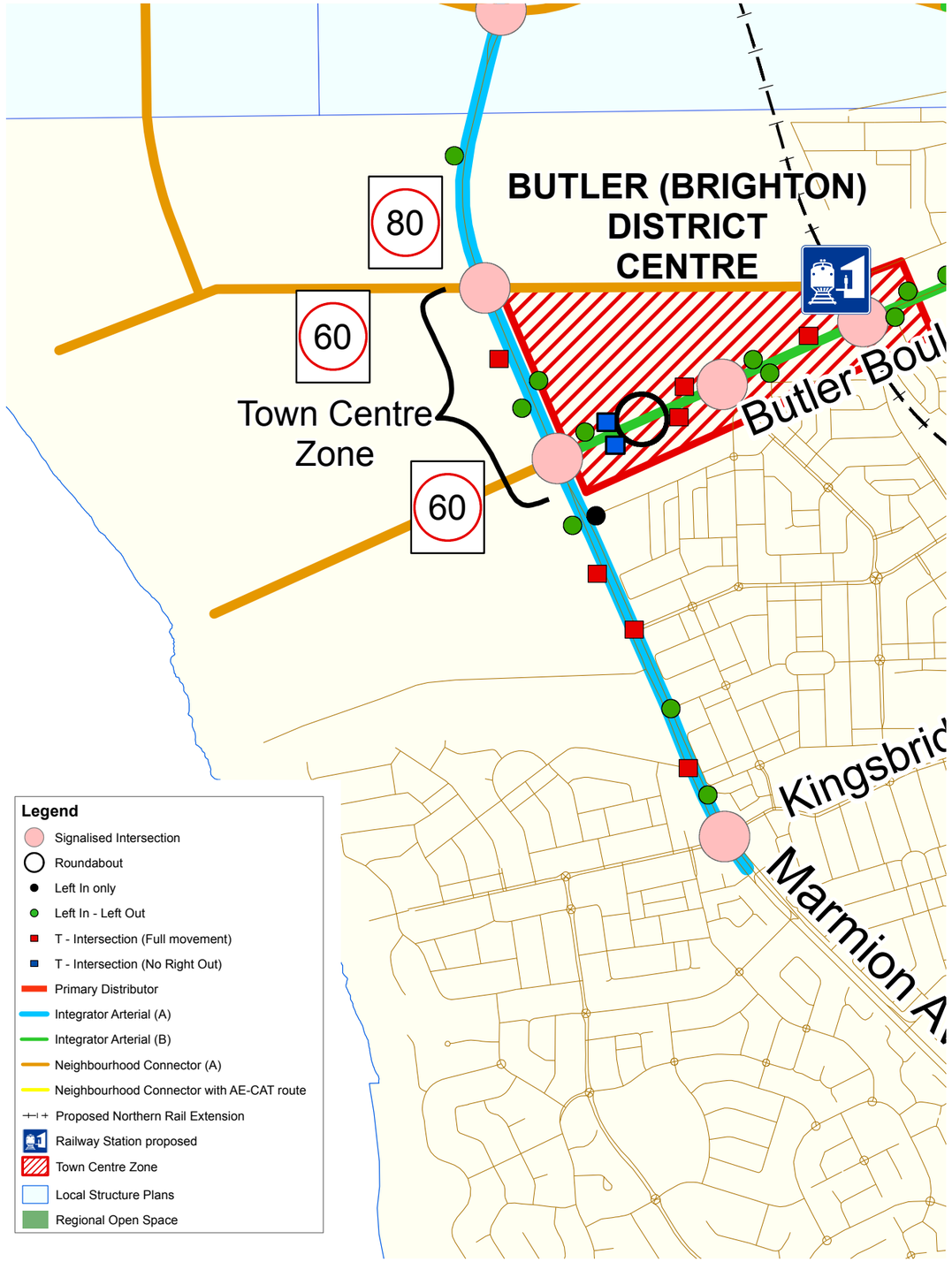
City of Wanneroo Local Policies

Part 1 includes a provision that exempts Jindee from complying with current CoW policies unless otherwise stated in the adopted policy.

The provision accepts that the Transect-Based Code standards and the types of requirements that are to be regulated through the DAPs will supplant many of the policy provisions of the City.

LPP 3.8: Marmion Avenue Arterial Road Access Policy (CoW, 2012), which was prepared by the CoW in consultation with Marin Roads Western Australia, is a notable exception that will continue to apply to Jindee. Access provisions for Jindee off Marmion Avenue contained within this LSP address and conform with the requirements of this policy.

Local policies may be prepared specifically for Jindee to address issues not covered in the LSP or DAPs. These policies will be subordinate to the provisions of Part 1 and/or the DAPs and therefore, in the event of any inconsistencies, the provisions of the LSP and/or the DAPs will prevail.



Appendix 3
January wind profiles for Swanbourne (BoM 2015)

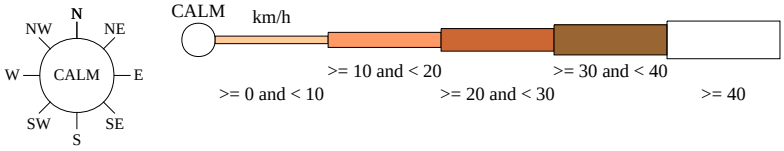
Rose of Wind direction versus Wind speed in km/h (10 Sep 1993 to 30 Sep 2010)

Custom times selected, refer to attached note for details

SWANBOURNE

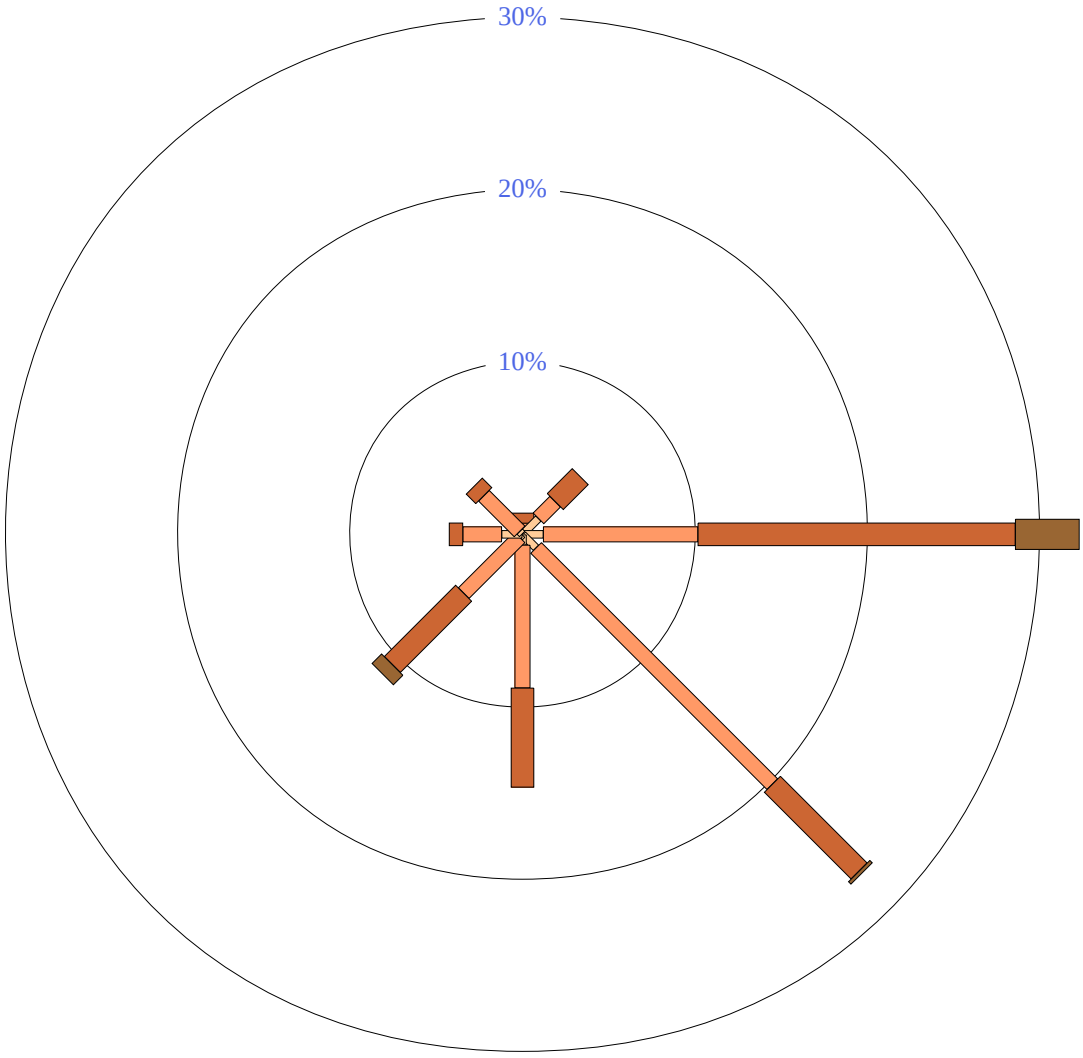
Site No: 009215 • Opened Nov 1985 • Still Open • Latitude: -31.9558° • Longitude: 115.7619° • Elevation 40.9m

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
513 Total Observations

Calm *



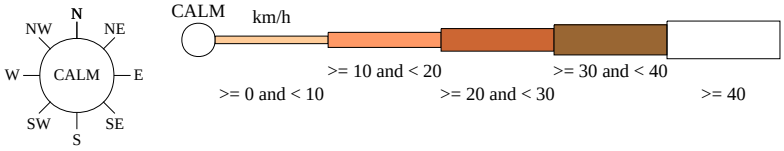
Rose of Wind direction versus Wind speed in km/h (10 Sep 1993 to 30 Sep 2010)

Custom times selected, refer to attached note for details

SWANBOURNE

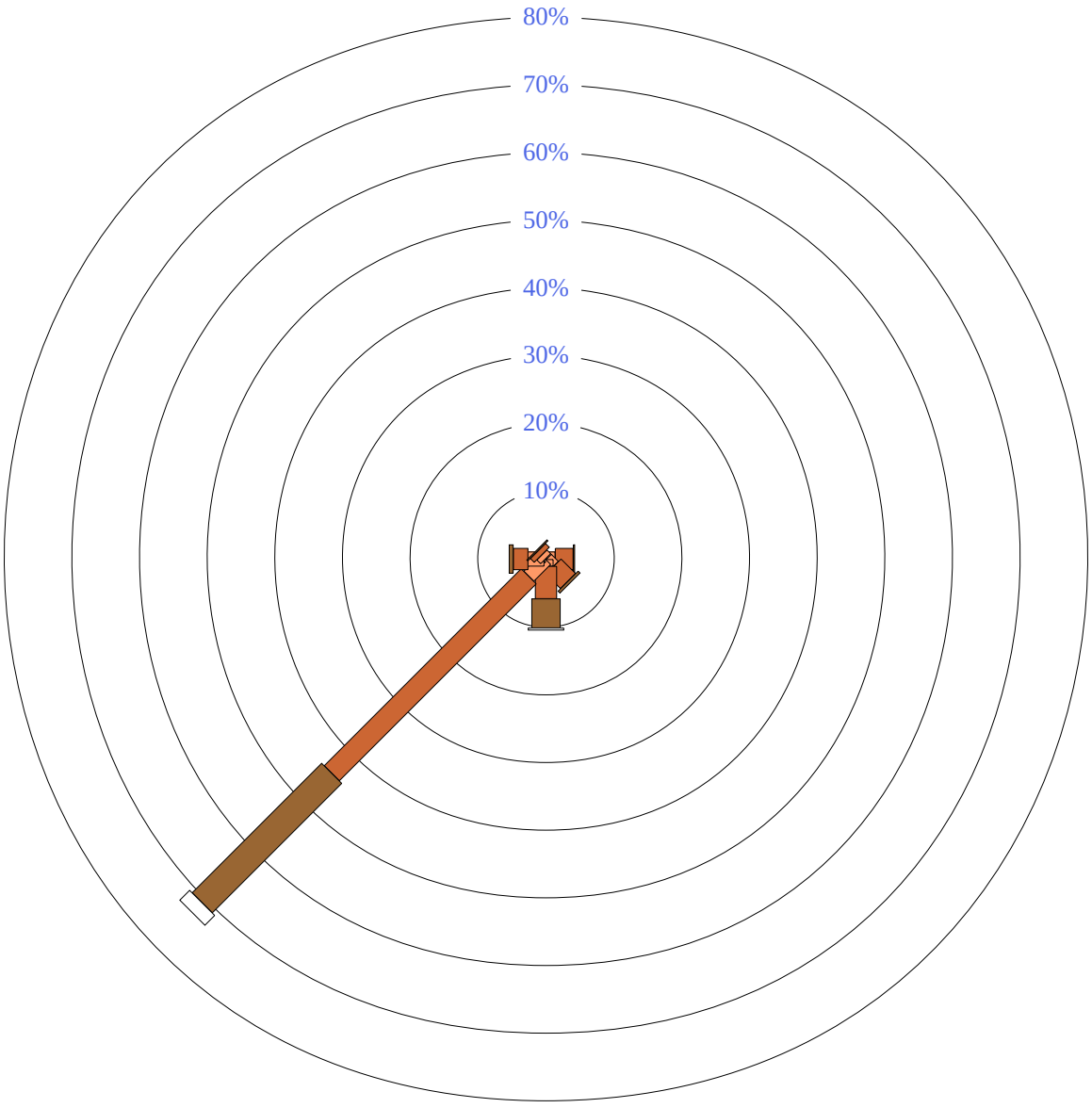
Site No: 009215 • Opened Nov 1985 • Still Open • Latitude: -31.9558° • Longitude: 115.7619° • Elevation 40.9m

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
514 Total Observations

Calm *



Appendix 4
Building construction standards for BAL 12.5 and BAL 19 as per AS 3959–2009

SECTION 5 CONSTRUCTION FOR BUSHFIRE ATTACK LEVEL 12.5 (BAL — 12.5)

5.1 GENERAL

A building assessed in Section 2 as being BAL—12.5 shall comply with Section 3 and Clauses 5.2 to 5.8.

NOTE: There are a number of Standards that specify requirements for construction; however, where this Standard does not provide construction requirements for a particular element, the other Standards apply.

Any element of construction or system that satisfies the test criteria of AS 1530.8.1 may be used in lieu of the applicable requirements contained in Clauses 5.2 to 5.8 (see Clause 3.8).

NOTE: BAL—12.5 is primarily concerned with protection from ember attack and radiant heat up to and including 12.5 kW/m^2 where the site is less than 100 m from the source of bushfire attack.

5.2 SUBFLOOR SUPPORTS

This Standard does not provide construction requirements for subfloor support posts, columns, stumps, piers and poles.

NOTE: The exclusion of requirements for subfloor supports applies to the principal building only and not to verandas, decks, steps, ramps and landings (see Clause 5.7).

C5.2 *Ideally, storage of combustible materials beneath a floor at this BAL would not occur and on this assumption, there is no requirement to enclose the subfloor space or to protect flooring materials from bushfire attack. However, should combustible materials be stored, it is recommended the area be protected as materials stored in the subfloor space may be ignited by embers and cause an impact to the building.*

5.3 FLOORS

5.3.1 Concrete slabs on ground

This Standard does not provide construction requirements for concrete slabs on the ground.

5.3.2 Elevated floors

This Standard does not provide construction requirements for elevated floors, including bearers, joists and flooring.

5.4 EXTERNAL WALLS

5.4.1 Walls

That part of an external wall surface that is less than 400 mm from the ground or less than 400 mm above decks, carport roofs, awnings and similar elements or fittings having an angle less

than 18 degrees to the horizontal and extending more than 110 mm in width from the wall (see Figure D3, Appendix D) shall be of—

(a) non-combustible material; or

(b) fibre-cement external cladding, a minimum of 6 mm in thickness; or

(c) bushfire-resisting timber (see Appendix F); or

(d) a timber species as specified in Paragraph E1 and listed in Table E1, Appendix E; or

(e) a combination of any of Items (a), (b), (c) or (d) above.

There are no requirements for external wall surfaces 400 mm or more from the ground or for external wall surfaces 400 mm or more above decks, carport roofs, awnings and similar elements or fittings having an angle less than 18 degrees to the horizontal and extending more than 110 mm in width from the wall (see Figure D3, Appendix D).

5.4.2 Joints

All joints in the external surface material of walls shall be covered, sealed, overlapped, backed or butt-jointed to prevent gaps greater than 3 mm.

Alternatively, sarking-type material may be applied over the outer face of the frame prior to fixing any external cladding.

5.4.3 Vents and weepholes

Vents and weepholes in external walls shall be screened with a mesh with a maximum aperture of 2 mm, made of corrosion-resistant steel, bronze or aluminium, except where the vents and weepholes are less than 3 mm (see Clause 3.6), or are located in an external wall of a subfloor space.

5.5 EXTERNAL GLAZED ELEMENTS AND ASSEMBLIES AND EXTERNAL DOORS

5.5.1 Bushfire shutters

Where fitted, bushfire shutters shall comply with Clause 3.7 and be made from—

(a) non-combustible material; or

(b) a timber species as specified in Paragraph E1 and listed in Table E1, Appendix E; or

(c) bushfire-resisting timber (see Appendix F); or

(d) a combination of any of Items (a), (b) or (c) above.

5.5.2 Windows

Window assemblies shall comply with one of the following:

(a) They shall be completely protected by a bushfire shutter that complies with Clause 5.5.1.

or

(b) They shall be completely protected externally by screens with a mesh with a maximum aperture of 2 mm, made of corrosion-resistant steel, bronze or aluminium.

or

(c) They shall comply with the following:

(i) For window assemblies less than 400 mm from the ground or less than 400 mm above decks, carport roofs, awnings and similar elements or fittings having an angle less than 18 degrees to the horizontal and extending more than 110 mm in width from the window frame (see Figure D3, Appendix D), window frames and window joinery shall be made from one of the following:

(A) Bushfire-resisting timber (see Appendix F).

or

(B) A timber species specified in Paragraph E2 and listed in Table E2, Appendix E.

or

(C) Metal.

Or

(D) Metal-reinforced PVC-U. The reinforcing members shall be made from aluminium, stainless steel, or corrosion-resistant steel and the frame and sash shall satisfy the design load, performance and structural strength of the member.

(ii) Externally fitted hardware that supports the sash in its functions of opening and closing shall be metal.

(iii) Where glazing is less than 400 mm from the ground or less than 400 mm above decks, carport roofs, awnings and similar elements or fittings having an angle less than 18 degrees to the horizontal and extending more than 110 mm in width from the window frame (see Figure D3, Appendix D), the glazing shall be Grade A safety glass minimum 4 mm, or glass blocks with no restriction on glazing methods.

NOTE: Where double glazed units are used the above requirements apply to the external face of the window assembly only.

(iv) Where glazing is other than that specified in Item (iii) above, annealed glass may be used.

(v) The openable portions of windows shall be screened with mesh with a maximum aperture of 2 mm, made of corrosion-resistant steel, bronze or aluminium.

5.5.3 Doors—Side-hung external doors (including French doors, panel fold and bi-fold doors)

Side-hung external doors, including French doors, panel fold and bi-fold doors, shall comply with one of the following:

(a) They shall be protected by a bushfire shutter that complies with Clause 5.5.1.

or

(b) They shall be completely protected externally by screens with a mesh with a maximum aperture of 2 mm, made of corrosion-resistant steel, bronze or aluminium.

or

(c) They shall comply with the following:

(i) Doors shall be—

(A) non-combustible; or

(B) a solid timber door, having a minimum thickness of 35 mm for the first 400 mm above the threshold; or

(C) a door, including a hollow core door, with a non-combustible kickplate on the outside for the first 400 mm above the threshold; or

(D) a fully framed glazed door, where the framing is made from materials required for bushfire shutters (see Clause 5.5.1), or from a timber species specified in Paragraph E2 and listed in Table E2, Appendix E.

(ii) Where doors incorporate glazing, the glazing shall comply with the glazing requirements for windows.

(iii) Doors shall be tight-fitting to the doorframe and to an abutting door, if applicable.

(iv) Where any part of the door assembly is less than 400 mm from the ground or less than 400 mm above decks, carport roofs, awnings and similar elements or fittings having an angle less than 18 degrees to the horizontal and extending more than 110 mm in width from the door (see Figure D3, Appendix D), that part of the door assembly shall be made from one of the following:

(A) Bushfire-resisting timber (see Appendix F).

or

(B) A timber species specified in Paragraph E2 and listed in Table E2, Appendix E.

or

(C) Metal.

or

(D) Metal-reinforced PVC-U. The reinforcing members shall be made from aluminium, stainless steel, or corrosion-resistant steel and the door assembly shall satisfy the design load, performance and structural strength of the member.

(v) Weather strips, draught excluders or draught seals shall be installed at the base of side-hung external doors.

5.5.4 Doors—Sliding doors

Sliding doors shall comply with one of the following:

(a) They shall be protected by a bushfire shutter that complies with Clause 5.5.1.

or

(b) They shall be completely protected externally by screens with a mesh with a maximum aperture of 2 mm, made of corrosion-resistant steel, bronze or aluminium.

or

(c) They shall comply with the following:

(i) Any glazing incorporated in sliding doors shall be Grade A safety glass complying with AS 1288.

(ii) There is no requirement to screen the openable part of the sliding door. However, if screened, the screens shall be a mesh or perforated sheet made of corrosion-resistant steel, bronze or aluminium.

NOTE: The construction of manufactured sliding doors should prevent the entry of embers when the door is closed. There is no requirement to provide screens to the openable part of these doors as it is assumed that a sliding door will be closed if occupants are not present or during a bushfire event. Screens of materials other than those specified may not resist ember attack.

(iii) Sliding doors shall be tight-fitting in the frames.

5.5.5 Doors—Vehicle access doors (garage doors)

The following apply to vehicle access doors:

(a) The lower portion of a vehicle access door that is within 400 mm of the ground when the door is closed (see Figure D4, Appendix D) shall be made from—

(i) non-combustible material; or

(ii) bushfire-resisting timber (see Appendix F); or

(iii) fibre-cement sheet, a minimum of 6 mm in thickness; or

(iv) a timber species specified in Paragraph E1 and listed in Table E1, Appendix E; or

(v) a combination of any of Items (i), (ii), (iii) or (iv) above.

(b) Panel lift, tilt doors or side-hung doors shall be fitted with suitable weather strips, draught excluders, draught seals or guide tracks, as appropriate to the door type, with a maximum gap no greater than 3 mm.

(c) Roller doors shall have guide tracks with a maximum gap no greater than 3 mm and shall be fitted with a nylon brush that is in contact with the door (see Figure D4, Appendix D).

(d) Vehicle access doors shall not include ventilation slots.

5.6 ROOFS (INCLUDING VERANDA AND ATTACHED CARPORT ROOFS, PENETRATIONS, EAVES, FASCIAS, GABLES, GUTTERS AND DOWNPIPES)

5.6.1 General

The following apply to all types of roofs and roofing systems:

(a) Roof tiles, roof sheets and roof-covering accessories shall be non-combustible.

(b) The roof/wall junction shall be sealed, to prevent openings greater than 3 mm, either by the use of fascia and eaves linings or by sealing between the top of the wall and the underside of the roof and between the rafters at the line of the wall.

(c) Roof ventilation openings, such as gable and roof vents, shall be fitted with ember guards made of non-combustible material or a mesh or perforated sheet with a maximum aperture of 2 mm, made of corrosion-resistant steel, bronze or aluminium.

5.6.2 Tiled roofs

Tiled roofs shall be fully sarked. The sarking shall—

(a) have a flammability index of not more than 5;

(b) be located directly below the roof battens;

(c) cover the entire roof area including the ridge; and

(d) be installed so that there are no gaps that would allow the entry of embers where the sarking meets fascias, gutters, valleys and the like.

5.6.3 Sheet roofs

Sheet roofs shall—

(a) be fully sarked in accordance with Clause 5.6.2, except that foil-backed insulation blankets may be installed over the battens;

or

(b) have any gaps greater than 3 mm, under corrugations or ribs of sheet roofing and between roof components, sealed at the fascia or wall line and at valleys, hips and ridges by—

(i) a mesh or perforated sheet with a maximum aperture of 2 mm, made of corrosion-resistant steel, bronze or aluminium; or

(ii) mineral wool; or

(iii) other non-combustible material; or

(iv) a combination of any of Items (i), (ii) or (iii) above.

5.6.4 Veranda, carport and awning roofs

The following apply to veranda, carport and awning roofs:

(a) A veranda, carport or awning roof forming part of the main roof space [see Figure D1(a), Appendix D] shall meet all the requirements for the main roof, as specified in Clauses 5.6.1, 5.6.2, 5.6.3, 5.6.5 and 5.6.6.

(b) A veranda, carport or awning roof separated from the main roof space by an external wall [see Figures D1(b) and D1(c), Appendix D] complying with Clause 5.4 shall have a non-combustible roof covering.

NOTE: There is no requirement to line the underside of a veranda, carport or awning roof that is separated from the main roof space.

5.6.5 Roof penetrations

The following apply to roof penetrations:

(a) Roof penetrations, including roof lights, roof ventilators, roof-mounted evaporative cooling units, aerials, vent pipes and supports for solar collectors, shall be adequately sealed at the roof to prevent gaps greater than 3 mm. The material used to seal the penetration shall be non-combustible.

(b) Openings in vented roof lights, roof ventilators or vent pipes shall be fitted with ember guards made from a mesh or perforated sheet with a maximum aperture of 2 mm, made of corrosion-resistant steel, bronze or aluminium.

(c) All overhead glazing shall be Grade A laminated safety glass complying with AS 1288.

(d) Glazed elements in roof lights and skylights may be of polymer provided a Grade A safety glass diffuser, complying with AS 1288, is installed under the glazing. Where glazing is an insulating glazing unit (IGU), Grade A toughened safety glass, minimum 4 mm, shall be used in the outer pane of the IGU.

(e) Flashing elements of tubular skylights may be of a fire-retardant material, provided the roof integrity is maintained by an under-flashing of a material having a flammability index no greater than 5.

(f) Evaporative cooling units shall be fitted with butterfly closers at or near the ceiling level or, the unit shall be fitted with non-combustible covers with a mesh or perforated sheet with a maximum aperture of 2 mm, made of corrosion-resistant steel, bronze or aluminium.

(g) Vent pipes made from PVC are permitted.

5.6.6 Eaves linings, fascias and gables

The following apply to eaves linings, fascias and gables:

(a) Gables shall comply with Clause 5.4.

(b) Eaves penetrations shall be protected the same as for roof penetrations, as specified in Clause 5.6.5.

(c) Eaves ventilation openings greater than 3 mm shall be fitted with ember guards made of non-combustible material or a mesh or perforated sheet with a maximum aperture of 2 mm, made of corrosion-resistant steel, bronze or aluminium.

Joints in eaves linings, fascias and gables may be sealed with plastic joining strips or timber storm moulds.

This Standard does not provide construction requirements for fascias, bargeboards and eaves linings.

5.6.7 Gutters and downpipes

This Standard does not provide material requirements for—

(a) gutters, with the exception of box gutters; and

(b) downpipes.

If installed, gutter and valley leaf guards shall be non-combustible.

Box gutters shall be non-combustible and flashed at the junction with the roof with non-combustible material.

5.7 VERANDAS, DECKS, STEPS, RAMPS AND LANDINGS

5.7.1 General

Decking shall be either spaced or continuous (i.e., without spacing).

There is no requirement to enclose the subfloor spaces of verandas, decks, steps, ramps or landings.

C5.7.1 *Spaced decking is nominally spaced at 3 mm (in accordance with standard industry practice); however, due to the nature of timber decking with seasonal changes in moisture content, that spacing may range from 0–5 mm during service. The preferred dimension for gaps is 3 mm (which is in line with other 'permissible gaps') in other parts of this Standard. It should be noted that recent research studies have shown that gaps at 5 mm spacing afford opportunity for embers to become lodged in between timbers, which may contribute to a fire. Larger gap spacings of 10 mm may preclude this from happening but such a spacing regime may not be practical for a timber deck.*

5.7.2 Enclosed subfloor spaces of verandas, decks, steps, ramps and landings

5.7.2.1 *Materials to enclose a subfloor space*

This Standard does not provide construction requirements for the materials used to enclose a subfloor space except where those materials are less than 400 mm from the ground.

Where the materials used to enclose a subfloor space are less than 400 mm from the ground, they shall comply with Clause 5.4.

5.7.2.2 *Supports*

This Standard does not provide construction requirements for support posts, columns, stumps, stringers, piers and poles.

5.7.2.3 *Framing*

This Standard does not provide construction requirements for the framing of verandas, decks, ramps or landings (i.e., bearers and joists).

5.7.2.4 *Decking*

This Standard does not provide construction requirements for decking that is more than 300 mm from a glazed element.

Decking less than 300 mm (measured horizontally at deck level) from glazed elements that are less than 400 mm (measured vertically) from the surface of the deck (see Figure D2, Appendix D) shall be made from—

(a) non-combustible material; or

(b) bushfire-resisting timber (see Appendix F); or

(c) a timber species, as specified in Paragraph E1 and listed in Table E1 of Appendix E;

(d) PVC-U; or

(e) a combination of any of Items (a), (b), (c) or (d) above.

5.7.3 Unenclosed subfloor spaces of verandas, decks, steps, ramps and landings

5.7.3.1 *Supports*

This Standard does not provide construction requirements for support posts, columns, stumps, stringers, piers and poles.

5.7.3.2 *Framing*

This Standard does not provide construction requirements for the framing of verandas, decks, ramps or landings (i.e., bearers and joists).

5.7.3.3 *Decking*

This Standard does not provide construction requirements for decking unless it is less than 300 mm from a glazed element.

Decking less than 300 mm (measured horizontally at deck level) from glazed elements that are less than 400 mm (measured vertically) from the surface of the deck (see Figure D2, Appendix D) shall be made from—

(a) non-combustible material; or

(b) bushfire-resisting timber (see Appendix F); or

(c) a timber species, as specified in Paragraph E1 and listed in Table E1, Appendix E; or

(d) a combination of any of Items (a), (b) or (c) above.

5.7.4 Balustrades, handrails or other barriers

This Standard does not provide construction requirements for balustrades, handrails and other barriers.

5.8 WATER AND GAS SUPPLY PIPES

Above-ground, exposed water and gas supply pipes shall be metal.

SECTION 6 CONSTRUCTION FOR BUSHFIRE ATTACK LEVEL 19 (BAL — 19)

6.1 GENERAL

A building assessed in Section 2 as being BAL—19 shall comply with Section 3 and Clauses 6.2 to 6.8.

NOTE: There are a number of Standards that specify requirements for construction; however, where this Standard does not provide construction requirements for a particular element, the other Standards apply.

Any element of construction or system that satisfies the test criteria of AS 1530.8.1 may be used in lieu of the applicable requirements contained in Clauses 6.2 to 6.8 (see Clause 3.8).

NOTE: BAL—19 is primarily concerned with protection from ember attack and radiant heat greater than 12.5 kW/m2 up to and including 19 kW/m2.

6.2 SUBFLOOR SUPPORTS

This Standard does not provide construction requirements for subfloor support posts, columns, stumps, piers and poles.

NOTE: The exclusion of requirements for subfloor supports applies to the principal building only and not to verandas, decks, steps, ramps and landings (see Clause 6.7).

C6.2 Ideally, storage of combustible materials beneath a floor at this BAL would not occur and on this assumption, there is no requirement to enclose the subfloor space or to protect flooring materials from bushfire attack. However, should combustible materials be stored, it is recommended the area be protected as materials stored in the subfloor space may be ignited by embers and cause an impact to the building.

6.3 FLOORS

6.3.1 Concrete slabs on the ground

This Standard does not provide construction requirements for concrete slabs on ground.

6.3.2 Elevated floors

This Standard does not provide construction requirements for elevated floors, including bearers, joists and flooring.

6.4 EXTERNAL WALLS

6.4.1 Walls

That part of an external wall surface that is less than 400 mm from the ground or less than 400 mm above decks, carport roofs, awnings and similar elements or fittings having an angle less than 18

degrees to the horizontal and extending more than 110 mm in width from the wall (see Figure D3, Appendix D) shall be made from—

(a) non-combustible material; or

(b) fibre-cement external cladding, a minimum of 6 mm in thickness; or

(c) bushfire-resisting timber (see Appendix F); or

(d) a timber species, as specified in Paragraph E1 and listed in Table E1, Appendix E; or

(e) a combination of any of Items (a), (b), (c) or (d) above.

This Standard does not provide construction requirements for external wall surfaces 400 mm or more from the ground or for external wall surfaces 400 mm or more above decks, carport roofs, awnings and similar elements or fittings having an angle less than 18 degrees to the horizontal and extending more than 110 mm in width from the wall (see Figure D3, Appendix D).

6.4.2 Joints

All joints in the external surface material of walls shall be covered, sealed, overlapped, backed or butt-jointed to prevent gaps greater than 3 mm.

Alternatively, sarking-type material may be applied over the outer face of the frame prior to fixing any external cladding.

6.4.3 Vents and weepholes

Vents and weepholes in external walls shall be screened with mesh with a maximum aperture of 2 mm, made of corrosion-resistant steel, bronze or aluminium, except where they are less than 3 mm (see Clause 3.6), or are located in an external wall of a subfloor space.

6.5 EXTERNAL GLAZED ELEMENTS AND ASSEMBLIES AND EXTERNAL DOORS

6.5.1 Bushfire shutters

Where fitted, bushfire shutters shall comply with Clause 3.7 and be made from—

(a) non-combustible material; or

(b) a timber species, as specified in Paragraph E1 and listed in Table E1, Appendix E; or

(c) bushfire-resisting timber (see Appendix F); or

(d) a combination of any of Items (a), (b), or (c) above.

6.5.2 Windows

Window assemblies shall comply with one of the following:

(a) They shall be completely protected by a bushfire shutter that complies with Clause 6.5.1.

or

(b) They shall be completely protected externally by screens with a mesh with a maximum aperture of 2 mm, made of corrosion-resistant steel, bronze or aluminium.

or

(c) They shall comply with the following:

(i) For window assemblies less than 400 mm from the ground or less than 400 mm above decks, carport roofs, awnings and similar elements or fittings, having an angle less than 18 degrees to the horizontal and extending more than 110 mm in width from the window frame (see Figure D3, Appendix D), window frames and window joinery, shall be made from one of the following:

(A) Bushfire-resisting timber (see Appendix F).

or

(B) A timber species, as specified in Paragraph E2 and listed in Table E2, Appendix E.

or

(C) Metal.

or

(D) Metal-reinforced PVC-U. The reinforcing members shall be made from aluminium, stainless steel, or corrosion-resistant steel and the frame and the sash shall satisfy the design load, performance and structural strength of the member.

(ii) Externally fitted hardware that supports the sash in its functions of opening and closing, shall be metal.

(iii) Where glazing is less than 400 mm from the ground or less than 400 mm above decks, carport roofs, awnings and similar elements or fittings, having an angle less than 18 degrees to the horizontal and extending more than 110 mm in width from the window frame (see Figure D3, Appendix D), the glazing shall be toughened glass, minimum 5 mm, or glass blocks with no restriction on glazing methods.

NOTE: Where double-glazed units are used, the above requirements apply to the external face of the window assembly only.

(iv) Where glazing is other than that specified in Item (iii) above, annealed glass may be used. Where annealed glass is used, the fixed and openable portions of windows shall be screened externally with a mesh with a maximum aperture of 2 mm, made of corrosion-resistant steel, bronze or aluminium.

(v) Where toughened glass is used, the openable portions of windows shall be screened internally or externally with a mesh with a maximum aperture of 2 mm, made of corrosion-resistant steel, bronze or aluminium.

(vi) Glazed elements that are designed to take internal screens shall use toughened glass and the openable portion shall be screened in such a way to have no gaps greater than 3 mm in diameter. Screening material shall be a mesh with a maximum aperture of 2 mm, made of corrosion-resistant steel, bronze or aluminium.

6.5.3 Doors—Side-hung external doors (including French doors, panel fold and bi-fold doors)

Side-hung external doors, including French doors, panel fold and bi-fold doors, shall comply with one of the following:

(a) They shall be protected by a bushfire shutter that complies with Clause 6.5.1.

or

(b) They shall be completely protected externally by screens with a mesh with a maximum aperture of 2 mm, made of corrosion-resistant steel, bronze or aluminium.

or

(c) They shall comply with the following:

(i) Doors shall be—

(A) non-combustible; or

(B) a solid timber door, having a minimum thickness of 35 mm for the first 400 mm above the threshold; or

(C) a door, including a hollow core door, with a non-combustible kickplate on the outside for the first 400 mm above the threshold; or

(D) a fully-framed glazed door, where the framing is made from materials specified for bushfire shutters (see Clause 6.5.1).

(ii) Where doors incorporate glazing, the glazing shall be toughened glass minimum 5 mm.

(iii) Doors shall be tight-fitting to the doorframe and to an abutting door, if applicable.

(iv) Where the doorframe is less than 400 mm from the ground or less than 400 mm above decks, carport roofs, awnings and similar elements or fittings having an angle less than 18 degrees to the horizontal and extending more than 110 mm in width from the door (see Figure D3, Appendix D) the doorframe shall be made from one of the following:

(A) Bushfire-resisting timber (see Appendix F).

or

(B) A timber species, as specified in Paragraph E2 and listed in Table E2, Appendix E.

or

(C) Metal.

or

(D) Metal-reinforced PVC-U. The reinforcing members shall be made from aluminium, stainless steel, or corrosion-resistant steel and the door assembly shall satisfy the design load, performance and structural strength of the member.

(v) Weather strips, draught excluders or draught seals shall be installed at the base of side-hung external doors.

6.5.4 Doors—Sliding doors

Sliding doors shall comply with one of the following:

(a) They shall be completely protected by a bushfire shutter that complies with Clause 6.5.1.

or

(b) They shall be completely protected externally by screens with a mesh with a maximum aperture of 2 mm, made of corrosion-resistant steel, bronze or aluminium.

or

(c) They shall comply with the following:

(i) Any glazing incorporated in sliding doors shall be toughened glass, minimum 5 mm.

(ii) There is no requirement to screen the openable part of the sliding door. However, if screened, the screens shall be mesh or perforated sheet made of corrosion-resistant steel, bronze or aluminium.

NOTE: The construction of manufactured sliding doors should prevent the entry of embers when the door is closed. There is no requirement to provide screens to the openable part of these doors as it is assumed that a sliding door will be closed if occupants are not present or during a bushfire event. Screens of materials other than those specified may not resist ember attack.

(iii) Sliding doors shall be tight-fitting in the frames.

6.5.5 Doors—Vehicle access doors (garage doors)

The following apply to vehicle access doors:

(a) The lower portion of a vehicle access door that is within 400 mm of the ground when the door is closed (see Figure D4, Appendix D) shall be made from—

(i) non-combustible material; or

(ii) bushfire-resisting timber (see Appendix F); or

(iii) fibre-cement sheet, a minimum of 6 mm in thickness; or

(iv) a timber species, as specified in Paragraph E1 and listed in Table E1, Appendix E; or

(v) a combination of any of Items (i), (ii), (iii) or (iv) above.

(b) Panel lift, tilt doors or side-hung doors shall be fitted with suitable weather strips, draught excluders, draught seals or guide tracks, as appropriate to the door type, with a maximum gap no greater than 3 mm.

(c) Roller doors shall have guide tracks with a maximum gap no greater than 3 mm and shall be fitted with a nylon brush that is in contact with the door (see Figure D4, Appendix D).

(d) Vehicle access doors shall not include ventilation slots.

6.6 ROOFS (INCLUDING VERANDA AND ATTACHED CARPORT ROOFS, PENETRATIONS, EAVES, FASCIAS, GABLES, GUTTERS AND DOWNPIPES)

6.6.1 General

The following apply to all types of roofs and roofing systems:

(a) Roof tiles, roof sheets and roof-covering accessories shall be non-combustible.

(b) The roof/wall junction shall be sealed, to prevent openings greater than 3 mm, either by the use of fascia and eaves linings or by sealing between the top of the wall and the underside of the roof and between the rafters at the line of the wall.

(c) Roof ventilation openings, such as gable and roof vents, shall be fitted with ember guards made of non-combustible material or a mesh or perforated sheet with a maximum aperture of 2 mm, made of corrosion-resistant steel, bronze or aluminium.

6.6.2 Tiled roofs

Tiled roofs shall be fully sarked. The sarking shall—

(a) have a flammability index of not more than 5, when tested to AS 1530.2;

(b) be located directly below the roof battens;

(c) cover the entire roof area including the ridge; and

(d) be installed so that there are no gaps that would allow the entry of embers where the sarking meets fascias, gutters, valleys and the like.

6.6.3 Sheet roofs

Sheet roofs shall—

(a) be fully sarked in accordance with Clause 6.6.2, except that foil-backed insulation blankets may be installed over the battens;

or

(b) have any gaps greater than 3 mm under corrugations or ribs of sheet roofing and between roof components sealed at the fascia or wall line and at valleys, hips and ridges by—

(i) a mesh or perforated sheet with a maximum aperture of 2 mm, made of corrosion-resistant steel, bronze or aluminium; or

(ii) mineral wool; or

(iii) other non-combustible material; or

(iv) a combination of any of Items (i), (ii), or (iii) above.

6.6.4 Veranda, carport and awning roofs

The following apply to veranda, carport and awning roofs:

(a) A veranda, carport or awning roof forming part of the main roof space [see Figure D1(a), Appendix D] shall meet all the requirements for the main roof, as specified in Clauses 6.6.1, 6.6.2, 6.6.3, 6.6.5 and 6.6.6.

(b) A veranda, carport or awning roof separated from the main roof space by an external wall [see Figures D1(b) and D1(c), Appendix D] complying with Clause 6.4 shall have a non-combustible roof covering.

NOTE: There is no requirement to line the underside of a veranda, carport or awning roof that is separate from the main roof space.

6.6.5 Roof penetrations

The following apply to roof penetrations:

(a) Roof penetrations, including roof lights, roof ventilators, roof-mounted evaporative cooling units, aerials, vent pipes and supports for solar collectors shall be adequately sealed at the roof to prevent gaps greater than 3 mm. The material used to seal the penetration shall be non-combustible.

(b) Openings in vented roof lights, roof ventilators or vent pipes shall be fitted with ember guards made from a mesh or perforated sheet with a maximum aperture of 2 mm, made of corrosion-resistant steel, bronze or aluminium.

(c) All overhead glazing shall be Grade A laminated safety glass complying with AS 1288.

(d) Glazed elements in roof lights and skylights may be of polymer provided a Grade A safety glass diffuser, complying with AS 1288, is installed under the glazing. Where glazing is an insulating glazing unit (IGU), Grade A toughened safety glass of minimum 4 mm shall be used in the outer pane of the IGU.

(e) Flashing elements of tubular skylights may be of a fire-retardant material, provided the roof integrity is maintained by an under-flashing of a material having a flammability index no greater than 5.

(f) Evaporative cooling units shall be fitted with butterfly closers at or near the ceiling level, or the unit shall be fitted with non-combustible covers with a mesh or perforated sheet with a maximum aperture of 2 mm, made of corrosion-resistant steel, bronze or aluminium.

6.6.6 Eaves linings, fascias and gables

The following apply to eaves linings, fascias and gables:

(a) Gables shall comply with Clause 6.4.

(b) Eaves penetrations shall be protected the same as for roof penetrations, as specified in Clause 6.6.5.

(c) Eaves ventilation openings greater than 3 mm shall be fitted with ember guards made of non-combustible material or a mesh or perforated sheet with a maximum aperture of 2 mm, made of corrosion-resistant steel, bronze or aluminium.

Joints in eaves linings, fascias and gables may be sealed with plastic joining strips or timber storm moulds.

This Standard does not provide construction requirements for fascias, bargeboards and eaves linings.

6.6.7 Gutters and downpipes

This Standard does not provide material requirements for—

(a) gutters, with the exception of box gutters; and

(b) downpipes.

If installed, gutter and valley leaf guards shall be non-combustible.

Box gutters shall be non-combustible and flashed at the junction with the roof with non-combustible material.

6.7 VERANDAS, DECKS, STEPS, RAMPS AND LANDINGS

6.7.1 General

Decking shall be either spaced or continuous (i.e., without spacings).

There is no requirement to enclose the subfloor spaces of verandas, decks, steps, ramps or landings.

C6.7.1 Spaced decking is nominally spaced at 3 mm (in accordance with standard industry practice); however, due to the nature of timber decking with seasonal changes in moisture content, that spacing may range from 0–5 mm during service. The preferred dimension for gaps is 3 mm (which is in line with other ‘permissible gaps’) in other parts of this Standard. It should be noted that recent research studies have shown that gaps at 5 mm spacing afford opportunity for embers to become lodged in between timbers, which may contribute to a fire. Larger gap spacings of 10 mm may preclude this from happening but such a spacing regime may not be practical for a timber deck.

6.7.2 Enclosed subfloor spaces of verandas, decks, steps, ramps and landings

6.7.2.1 *Materials to enclose a subfloor space*

This Standard does not provide construction requirements for the materials used to enclose a subfloor space except where those materials are less than 400 mm from the ground.

Where the materials used to enclose a subfloor space are less than 400 mm from the ground, they shall comply with Clause 6.4.

6.7.2.2 *Subfloor supports*

This Standard does not provide construction requirements for subfloor support posts, columns, stumps, stringers, piers and poles.

6.7.2.3 *Framing*

This Standard does not provide construction requirements for the framing of verandas, decks, ramps or landings (i.e., bearers and joists).

6.7.2.4 *Decking*

This Standard does not provide construction requirements for decking that is more than 300 mm from a glazed element.

Decking less than 300 mm (measured horizontally at deck level) from glazed elements that are less than 400 mm (measured vertically) from the surface of the deck (see Figure D2, Appendix D) shall be made from—

(a) non-combustible material; or

(b) bushfire-resisting timber (see Appendix F); or

(c) a timber species, as specified in Paragraph E1 and listed in Table E1, Appendix E; or

(d) a combination of any of Items (a), (b), or (c) above.

6.7.3 Unenclosed subfloor spaces of verandas, decks, steps, ramps and landings

6.7.3.1 *Supports*

This Standard does not provide construction requirements for support posts, columns, stumps, stringers, piers and poles.

6.7.3.2 *Framing*

This Standard does not provide construction requirements for the framing of verandas, decks, ramps or landings (i.e., bearers and joists).

6.7.3.3 *Decking*

This Standard does not provide construction requirements for decking that is more than 300 mm from a glazed element.

Decking less than 300 mm (measured horizontally at deck level) from glazed elements that are less than 400 mm (measured vertically) from the surface of the deck (see Figure D2, Appendix D) shall be made from—

(a) non-combustible material; or

(b) bushfire-resisting timber (see Appendix F); or

(c) a timber species, as specified in Paragraph E1 and listed in Table E1, Appendix E; or

(d) a combination of any of Items (a), (b), or (c) above.

6.7.4 Balustrades, handrails or other barriers

This Standard does not provide construction requirements for balustrades, handrails and other barriers.

6.8 WATER AND GAS SUPPLY PIPES

Above-ground, exposed water and gas supply pipes shall be metal.

Appendix 5
City of Wanneroo Annual Firebreak Notice

Firebreaks

Firebreaks are a simple way to help protect your property from fire.

A firebreak is a strip of cleared or ploughed land to allow easy access for emergency vehicles during a fire. Firebreaks must extend around the entire perimeter of the land immediately inside the boundary.

Firebreaks are a legal requirement and property owners are required to clear firebreaks by 15 November each year and maintain them until the following April.

Property less than 2,000 sqm

A firebreak no less than 2 metres wide by 2 metres high is required around the perimeter and the growth on the firebreak cannot exceed 20mm high.

Property greater than 2,000 sqm

A firebreak no less than 3 metres wide by 3 metres high is required around the perimeter and the growth on the firebreak cannot exceed 20mm high.

Firebreak inspections

From the 16 November each year, firebreak inspections are carried out by the City's Rangers/Fire Control Officers on all vacant urban land and rural properties.

Firebreak inspections are carried out on all vacant residential, rural, semi-rural, special rural and special residential land annually and if not constructed, an on the spot fine of $250 will be issued to the owner of the property.