

# Bushfire Consulting Bushfire Management Statement

Project No22144 V3



## Barron Building Surveying

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## Property Address

Lot 15 379 Red Emperor Drive  
South Greenough

## Client

Rob Williams]



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*Appendix 5 Department of Mines Guidelines for the safe management of private power poles and lines.*

## A. Disclaimer and Limitation

This assessment has been completed in accordance with *AS 3959* and *WA State Planning Policy SPP3.7* for the sole purpose of calculating the potential Bushfire Hazard to the propose **Single story Ancillary Dwelling**.

A fire event is in most cases, unpredictable and can be influenced by many factors. Some of these factors include, but are not limited to, temperature, wind speed, wind direction, humidity, the slope of the land, vegetation fuel load, growth, planting or the level of implementation and maintenance of fire prevention measures and the construction of additional structures upon the property that are not included as part of this assessment. If you are concerned or notice that factors have changed, a review of this management or assessment should be undertaken.

As permitted by the law and to its greatest extent, Barron Building Surveying (Chadwick Barron) and its associated employees exclude all liability whatsoever for: damage, loss, injury, death or claim to any property and/or person caused by a fire regardless of how that fire was caused and errors and/or omissions in this report with the client expressly acknowledging that such exclusion of liability is reasonable in all circumstances.

This assessment, recommendation and development of Bushfire Management Statement (BMS) does not in any way certify that the proposed structure(s) have been constructed in accordance with the assessed BAL rating. In providing this report as part of a development application or building license the client and landowner acknowledges that they understand, approve and will comply with all requirements to maintain the separation distances detailed in this report. Furthermore, the client/landowner acknowledges and accepts all responsibility in maintaining the required Asset Protection Zone.

This report is valid for 12 months only from the date of issue and supersedes all previous assessment if not noted otherwise.

## B. Scope of Assessment

Assessment for the proposed **Single story Ancillary Dwelling on land at Lot 15 red Emperor Drive South Greenough** which is located within the Bushfire Prone Area as predefined by the *Department of Fire and Emergency Services Bushfire Prone Areas*. The scope of this document is to address the Bushfire Protection Criteria for compliance with *State Planning Policy SPP3.7 Clause 6.5* and to provide a Bushfire Management Statement (BMS) for proposed development. Consideration shall be taken as far as possible to address the Geraldton Scheme.

This Bushfire Management Statement has been prepared by Barron Building Surveying in accordance with the scope of services set out in the contract, or as otherwise agreed, between the clients. 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 the assessment method below.

## C. Assessment Methods/Processes

Method of assessment is to determine the type of classifiable vegetation that may increase bushfire risk to the proposed development area. This will be undertaken by using method one assessment as per *AS 3959* and comprise of an assessment against the *State Planning Policy SPP3.7 Clause 6.5* as an acceptable solution. This will be determined using all reference documents and liaising with the owner of the property and other consultants as required.

**D. Executive Conclusion**

The proposed development achieves an acceptable solution, by implementation of the proposed management strategies. The management strategies are reducing the overall bushfire risk to proposed buildings and the surrounding community. The seating locations of the building on the allotment reduces the impact to the development and provides a good balance between both potential risk and land use. Essentially this provides a good effective land use for a **Single story Ancillary Dwelling** that the landowner can manage. This will be achieved by the install of an Asset Protection Zone and the building location being seated away from the extreme bushfire risk.

**E. Acknowledgement by Stakeholder/Owners**

As the Stakeholders for which this Bushfire Management Statement has addressed and has been assessed, We/I understand the proposed development and confirm and agree with the executive conclusion, outputs, and management strategies of this Bushfire Management Statement. I shall comply with this report, and I am aware and understand the requirements set out within this Bushfire Management Statement and must ensure it is fulfilled in its entirety.

STAKEHOLDER/OWNER NAME	OWNER POSTAL ADDRESS	SIGNATURE(S)	DATE

**CERTIFICATION / PBAD ACCREDITED PRACTITIONER DETAILS**

Chadwick Barron – Barron Building Surveying  
 Building Surveying Contractor (Level 2) BSC Reg 93  
 Bushfire Planning and Design Accreditation Scheme (Level 2) BPAD 36543

Signature & Date



## 1. Proposal Details

PROPERTY DESCRIPTION	
Address of Development	Lot 15 – 379 Red Emperor Drive South Greenough
Local Government Area	City of Greater Geraldton
Proposal	Single Story Ancillary Dwelling
Town Planning Scheme	5

### 1.1 Site Location

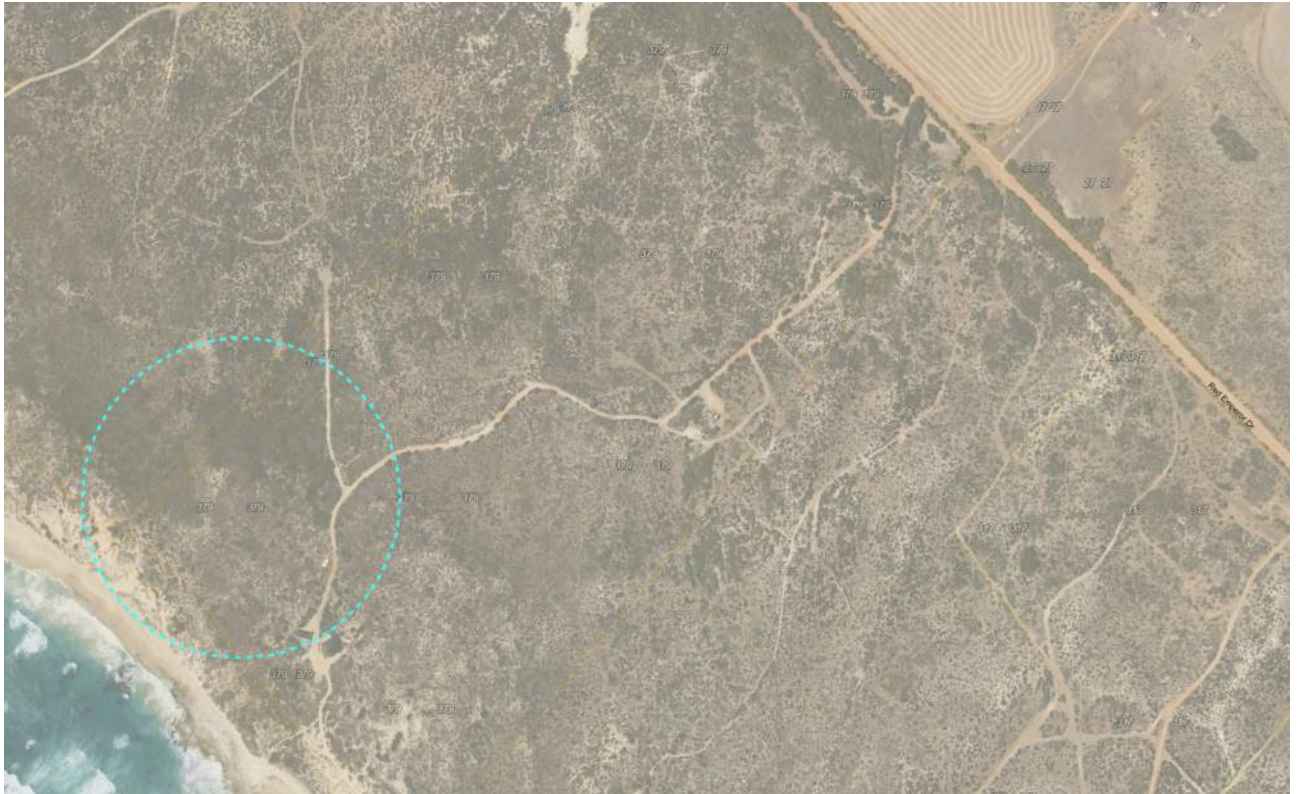


Figure 1 Site Location



Figure 2 DFES Mapping Screen Shot (2022 Dec)

## 2. Bushfire Assessment Results

### 2.1 Assessment Inputs

Site plots plan, [Figure 3 Bushfire Vegetation Classification \(A3 Page\)](#) shows all classifiable vegetation within 150m of the allotment boundaries. [Figure 4 Bushfire Assessment Map \(A3 Page\)](#) also shows all exclusions considered under AS 3959 Clause 2.2.3.2. The inputs are to identify the vegetation classification and hazard for justification for the proposed development. Onsite assessment and data collection has taken place and clarifies the results in [Table 1 Hazard Level Table](#) and [Table 2 Bushfire Attack Level Output on Proposed Development – BAL](#).

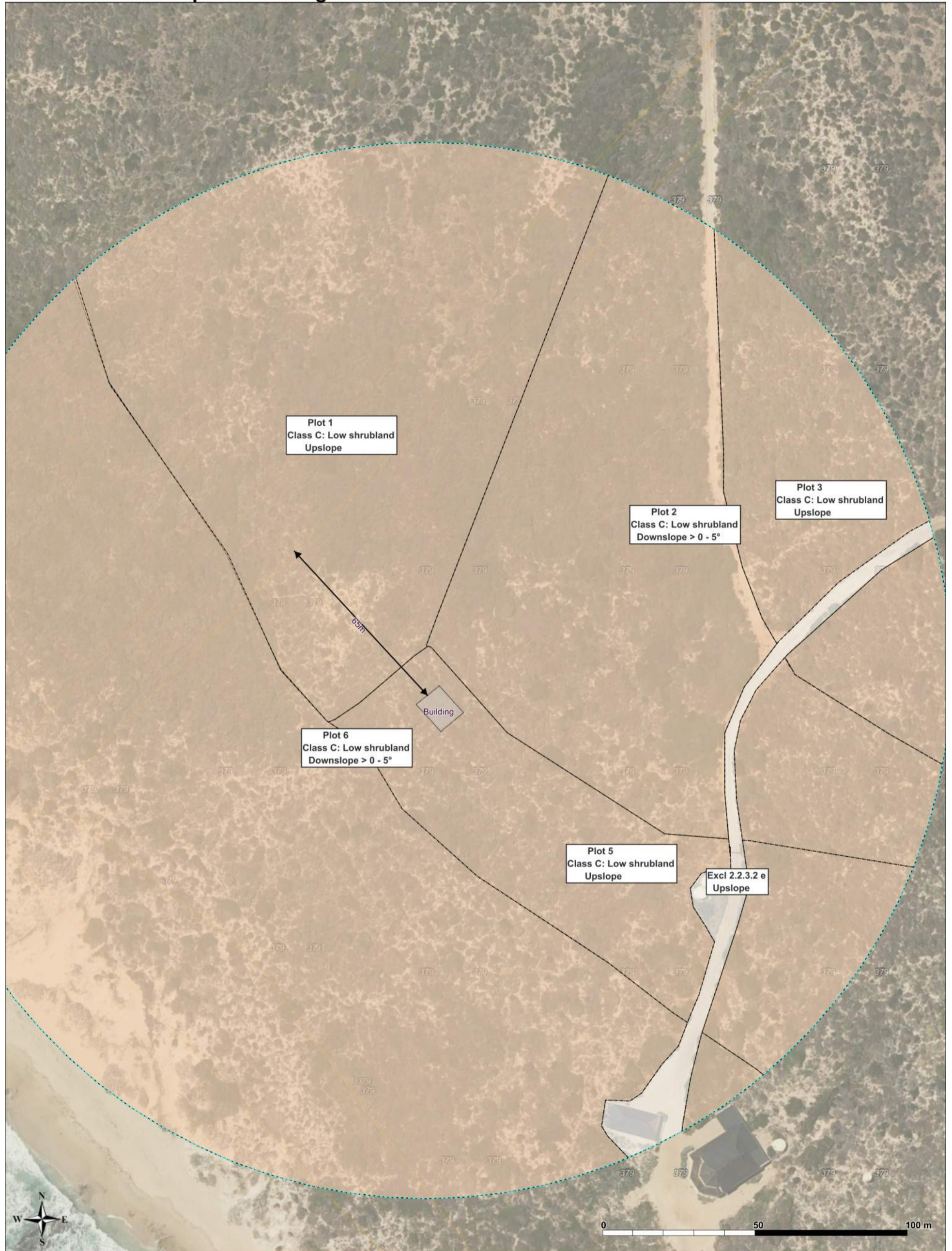
#### Topography

The allotment is located on a coastal plain vegetation. The allotment has some slightly higher points and has mixed of slopes that effect the Bushfire risk. The classification of the site would be deemed to be located where there is Non-Shielded, Terrain 3, and Topographic T1 as per AS 4055.

#### Vegetation Classification Assessment

All vegetation within 150m of the site/proposed development was classified in accordance with AS 3959 Clause 2.2.3.1 and *Department of Planning Visual Guide for Bushfire Risk Assessment* and the *Fire and Emergency Services Authority Visual Fuel Load Guide*. Each distinguishable type of vegetation has been plotted with the potential to determine the Bushfire Attack Level and Bushfire Hazard Level is identified. Refer to [Figure 4 Bushfire Assessment Map \(A3 Page\)](#)

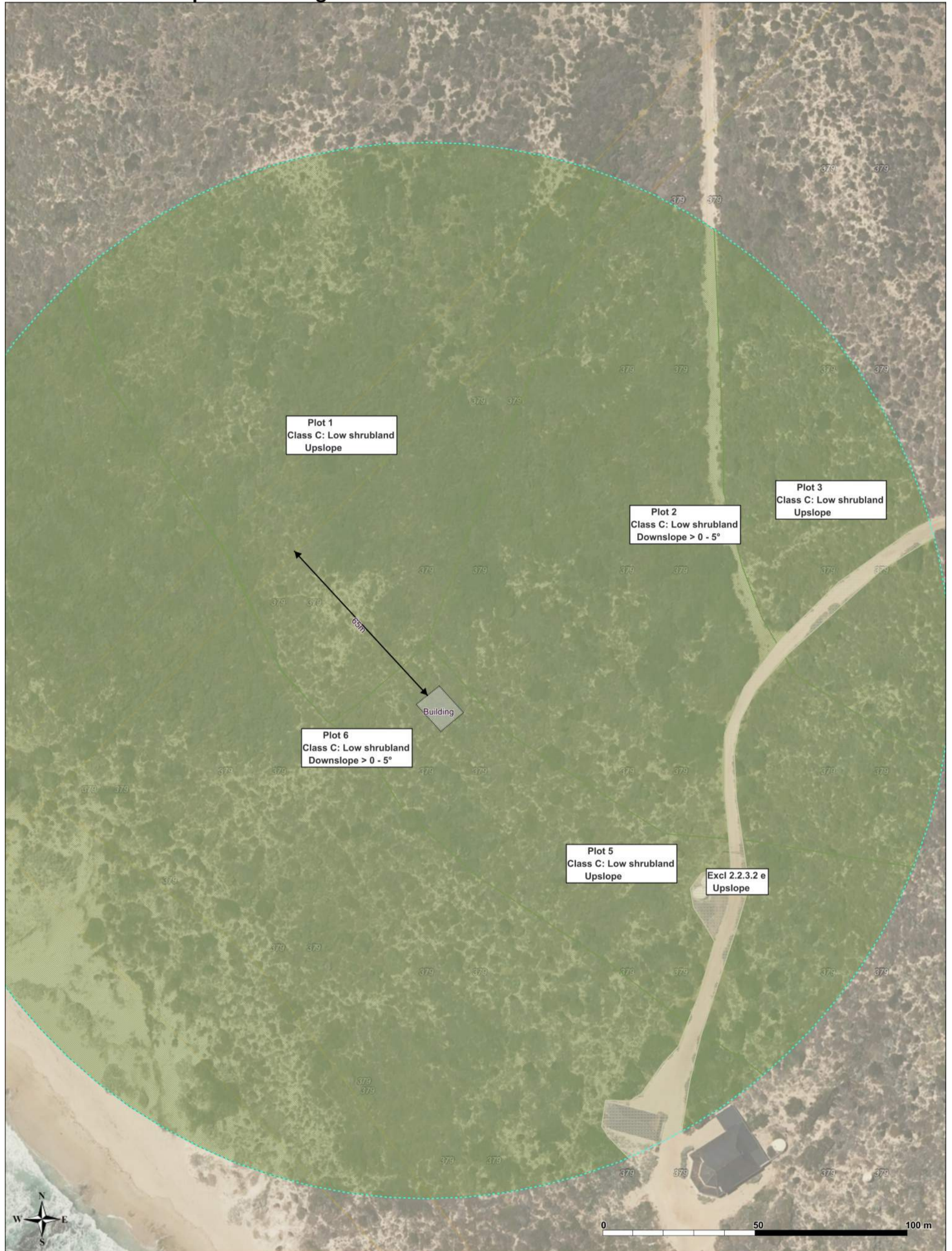
# Lot 15 - 379 Red Emperor Drive Vegetation



**Dimensions** 150m survey  
**Buildings** Building Location  
**Bushfire Assessment Area** C. Shrubland, 0  
 ← Setback Bushfire Assessment Area 150m C. Shrubland, -5 Excluded, e, 0

Map Printed from FireMaps on Fri Dec 09 10:43:06 AWST 2022

# Lot 15 - 379 Red Emperor Drive Vegetation



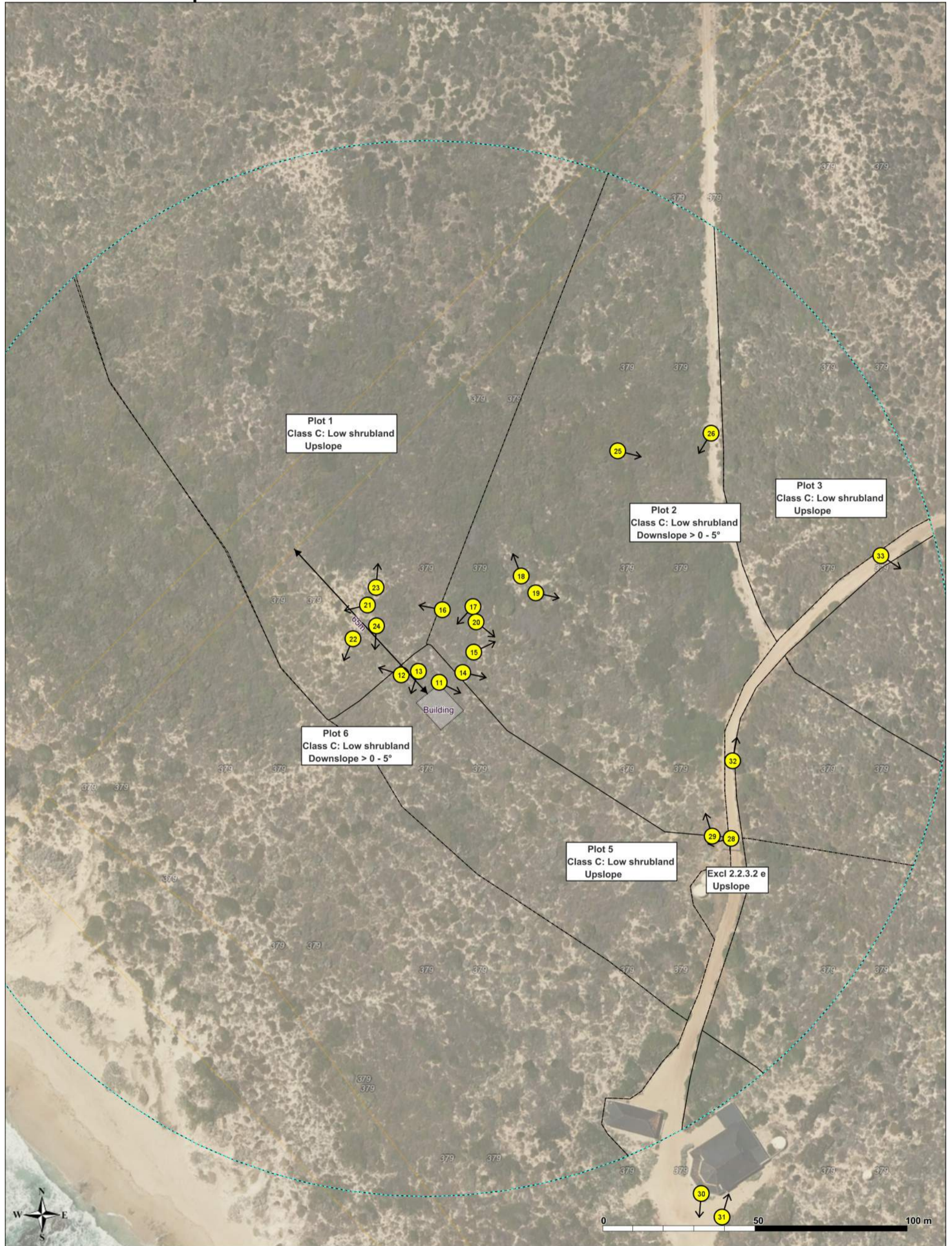
**Dimensions** 150m survey  
**Buildings** Building Location  
**Bushfire Assessment Area** C. Shrubland, 0  
 C. Shrubland, -5  
 Excluded, e, 0  
**Setback**  
**Bushfire Assessment Area 150m**

Map Printed from FireMaps on Fri Dec 09 10:43:50 AWST 2022

Figure 3 Bushfire Vegetation Classification (A3 Page)



# Lot 15 - 379 Red Emperor Drive

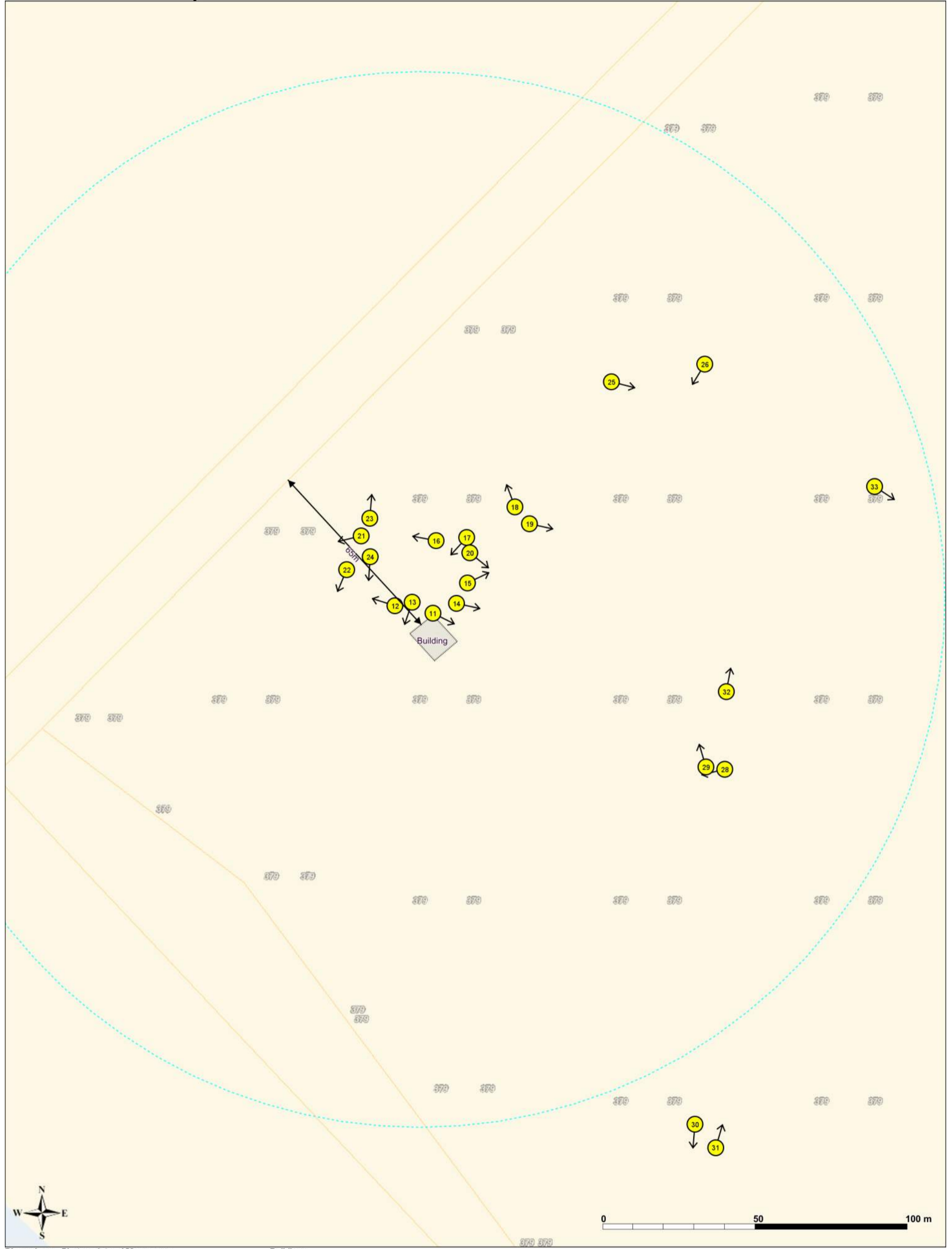


Dimensions Photo points 150m survey Buildings Bushfire Assessment Area C. Shrubland, 0  
 ← Setback ● Bushfire Assessment Area 150m Building Location C. Shrubland, -5 Excluded, e, 0

Map Printed from FireMaps on Fri Dec 09 10:45:30 AWST 2022

Figure 4 Bushfire Assessment Map (A3 Page)

# Lot 15 - 379 Red Emperor Drive



Dimensions    Photo points    150m survey    Buildings  
 ← Setback    ●    - - - - - Bushfire Assessment Area 150m    ■ Building Location

Map Printed from FireMaps on Fri Dec 09 10:46:45 AWST 2022

Figure 5 Photo Location Map

## 2.2 Bushfire Assessment Outputs

The potential bushfire impact to the site/proposed development from each of the identified vegetation plots is as per [Figure 4 Bushfire Assessment Map \(A3 Page\)](#). The fire danger index for this site has been determined in accordance with [AS 3959 Table 2.1 \(FDI 80\)](#). The potential bushfire impact to the allotment from each of the identified vegetation plots are referred in [Table 1 Hazard Level Table](#) and show in [Figure 6 Bushfire Hazard Level Map \(A3 Page\)](#). A Bushfire Contour Map has been produced to show the impact on the building and allotment area, refer to [Figure 7 Bushfire Asset Protection Zone Map \(A3 Page\)](#).

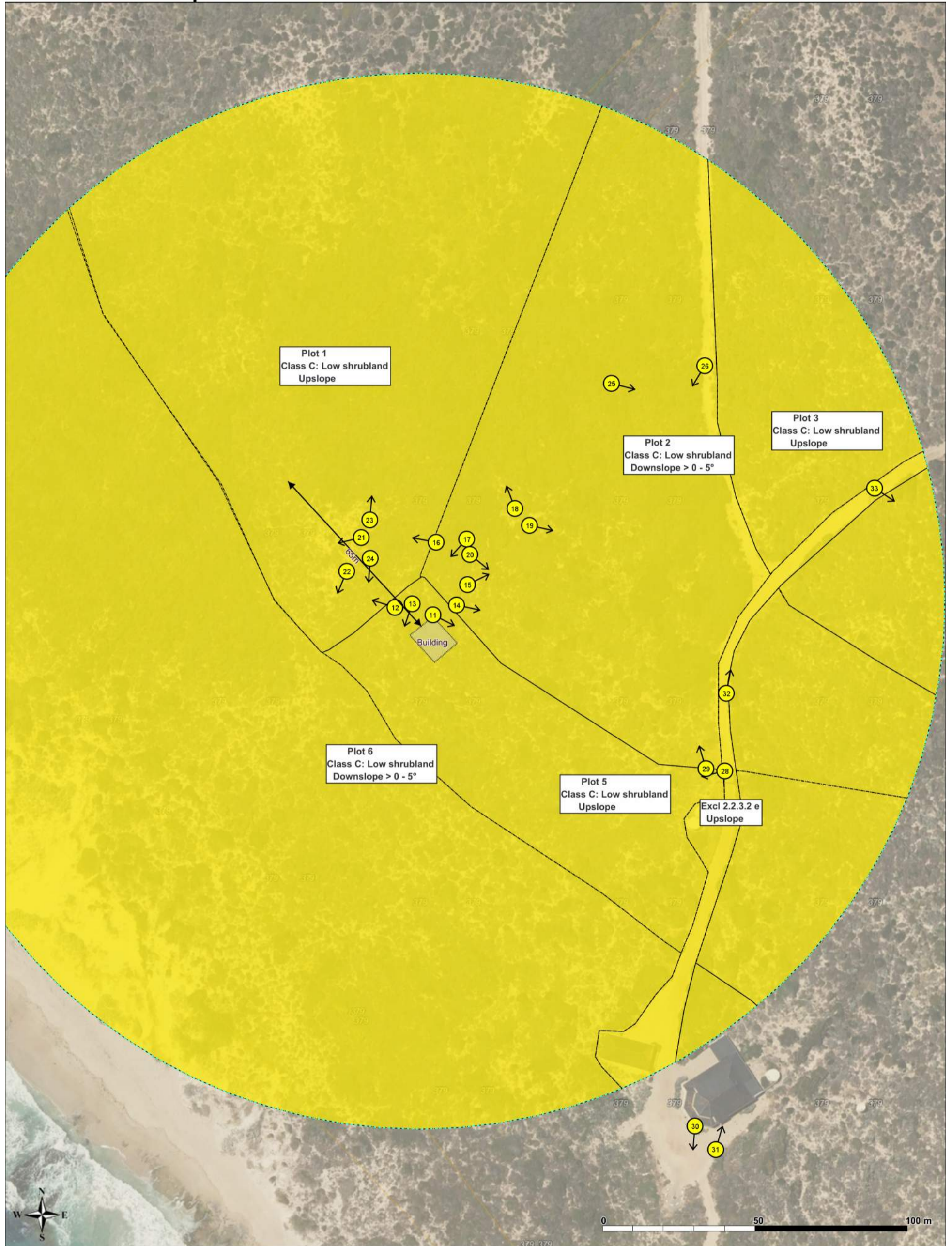
Table 1 Hazard Level Table

HAZARD LEVEL TABLE			
Vegetation Plot	Vegetation Classification	Effective Slope Under Classified Vegetation	Hazard Level
1	Class C Shrubland	All upslopes and flat land (0 degrees)	Moderate
2	Select Classification	Downslope >0 to 5 degrees	
3	Select Classification	All upslopes and flat land (0 degrees)	
4	Excludable – Clause 2.2.3.2(f)	All upslopes and flat land (0 degrees)	
5	Select Classification	All upslopes and flat land (0 degrees)	
6	Select Classification	Downslope >0 to 5 degrees	

Table 2 Bushfire Attack Level Output on Proposed Development – BAL

Vegetation Plot	Photo Numbers	Vegetation Classification	Effective Slope	Separation (m)	BAL	BAL Level on Implementation of APZ
1	12-16-21-23	Class C Shrubland - Low shrubland C-12	All upslopes and flat land (0 degrees)	0 m	BAL – FZ	BAL 19 on install off 15m Separation to unmanaged Vegetation  APZ as per Figure 7
		Shrubs <2 m high; greater than 30% foliage cover. Understory may contain grasses. Acacia and Casuarina often dominant in the arid and semi-arid zones.				
2	14-15-18-19-25-26	Select Classification	Downslope >0 to 5 degrees			
		Shrubs <2 m high; greater than 30% foliage cover. Understory may contain grasses. Acacia and Casuarina often dominant in the arid and semi-arid zones.				
3	33-10	Select Classification	All upslopes and flat land (0 degrees)			
		Shrubs <2 m high; greater than 30% foliage cover. Understory may contain grasses. Acacia and Casuarina often dominant in the arid and semi-arid zones.				
4	32-28	Select Classification	All upslopes and flat land (0 degrees)			
		Access roadway to existing Dwelling – non vegetation road 4m wide.				
5	11-13-28	Select Classification	All upslopes and flat land (0 degrees)			
		Shrubs <2 m high; greater than 30% foliage cover. Understory may contain grasses. Acacia and Casuarina often dominant in the arid and semi-arid zones.				
6	13-21-22-24	Select Classification	Downslope >0 to 5 degrees			
		Shrubs <2 m high; greater than 30% foliage cover. Understory may contain grasses. Acacia and Casuarina often dominant in the arid and semi-arid zones.				

# Lot 15 - 379 Red Emperor Drive Hazard Level



Dimensions Photo points 150m survey Buildings Bushfire Assessment Area C. Shrubland, 0 BAL Hazard  
 ← Setback ● Bushfire Assessment Area 150m Building Location C. Shrubland, -5 Excluded, e, 0 Moderate

Map Printed from FireMaps on Fri Dec 09 11:11:19 AWST 2022

Figure 6 Bushfire Hazard Level Map (A3 Page)

### 3. Identification of Bushfire Hazard Issues

- The proposed development is located adjacent to unmanaged vegetation. There is not very well-maintained vegetation surrounding the proposed building site.
- The vegetation on the coastal area is fragile due to poor soil condition and rainfall and the *South Greenough to Cape Burney Coastal Planning Strategy* which generally discourages clearing within the 'Dune System' precinct.
- There is a risk potential within the allotment internal power lines to have an impact on the surrounding vegetation.

### 4. Assessment against Bushfire Protection Criteria

#### Objectives

- Avoid any increase in the threat of bushfire to people, property and infrastructure.
- Reduce vulnerability to bushfire.
- Ensure that all level of planning documents consider bushfire protection requirements and include specified bushfire protection measures.
- Achieve an appropriate balance between bushfire risk management measures and other environmental issues.

*Table 3 SPP3.7 Solution Compliance Table* is based on the *State Planning Policy SPP3.7 Guidelines for Planning in Bushfire Prone Areas Version 1.4 Appendix 4, Bushfire Protection Criteria*. The details for the acceptable solution of the *State Planning Policy SPP3.7*, are commented on and show how the development is addressing the bushfire risk.

Table 3 SPP3.7 Solution Compliance Table

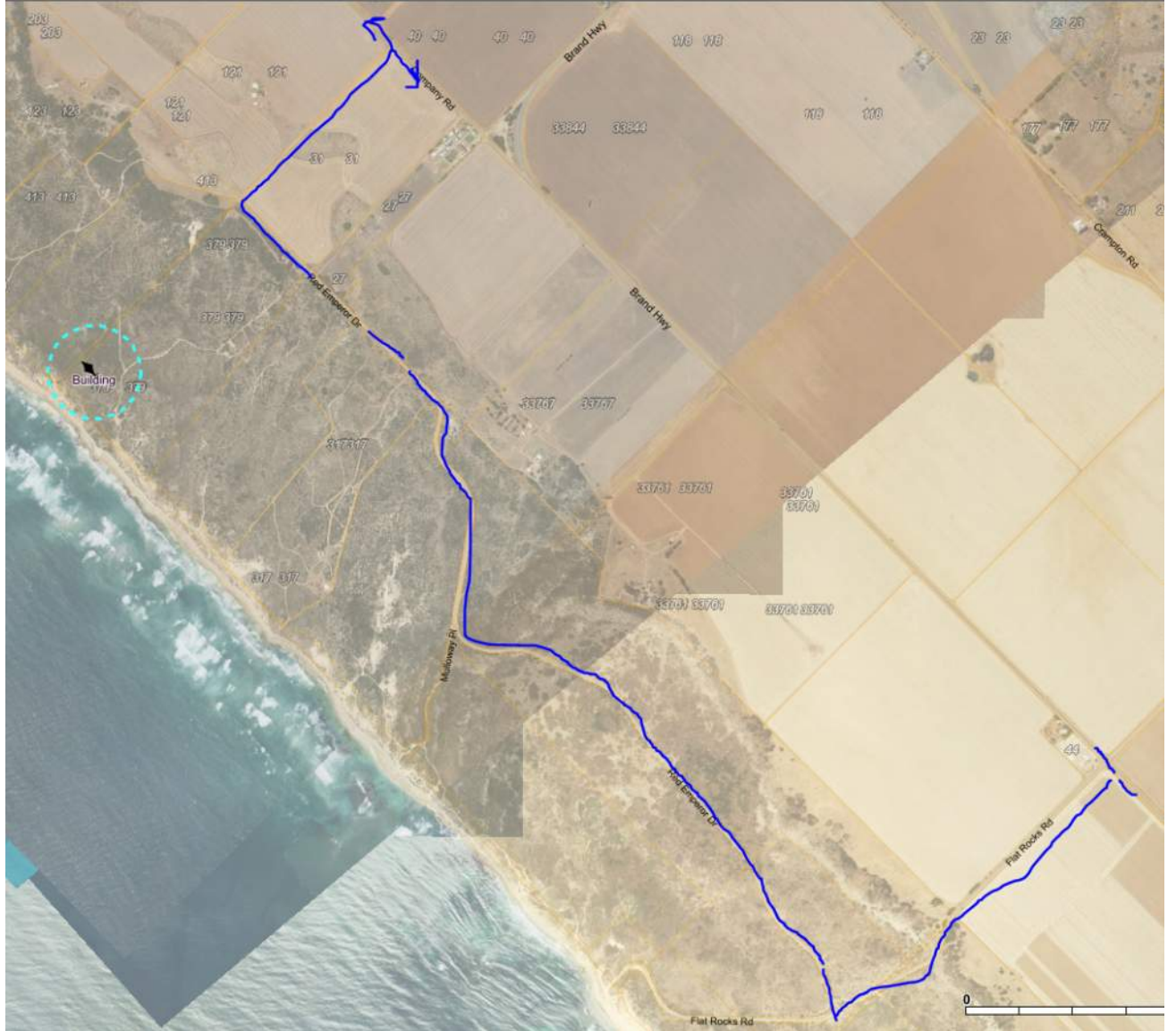
ELEMENT 1: LOCATION	
PERFORMANCE PRINCIPLE	PROPOSED ACCEPTABLE SOLUTIONS
P1	A1.1 Development location
STATEMENT OF COMPLIANCE	
The proposed Ancillary Dwelling is located near the mid third of the overall landform slope. The vegetation surrounding the site is Low Shrubland which is a moderate hazard risk as per figure 6. The seating of the development has considered the management of vegetation as per <i>South Greenough to Cape Burney Coastal Planning Strategy</i> for land use and is considered to have minimized the impact of the coastal vegetation by the building location. The seat of the new ancillary building will provide additional access to for maintenance of vegetation within the fringe of the hill and accessways.	
ELEMENT 2: SITING AND DESIGN OF DEVELOPMENT	
PERFORMANCE PRINCIPLE	PROPOSED ACCEPTABLE SOLUTIONS
P2	A2.1 Asset Protection Zone (APZ)
STATEMENT OF COMPLIANCE	
The proposed is to install and APZ of 15m to the West and East and 13m to the North & South. This will enable the building to be seated with a BAL rating of 29 to the North and South and BAL 19 from the West and East. The approach has been adopted to ensure the risk from the down slope is reduced to the building by increasing separation distance to the bushfire risk vegetation.	
ELEMENT 3: VEHICULAR ACCESS	
PERFORMANCE PRINCIPLE	PROPOSED ACCEPTABLE SOLUTIONS
P3i	A3.1 Public roads
STATEMENT OF COMPLIANCE	
No public road proposed for this development. Red Emperor Drive is the existing roadway. In Appendix 1 photos 40 and 45 show the road condition. This road is managed under the Local government.	

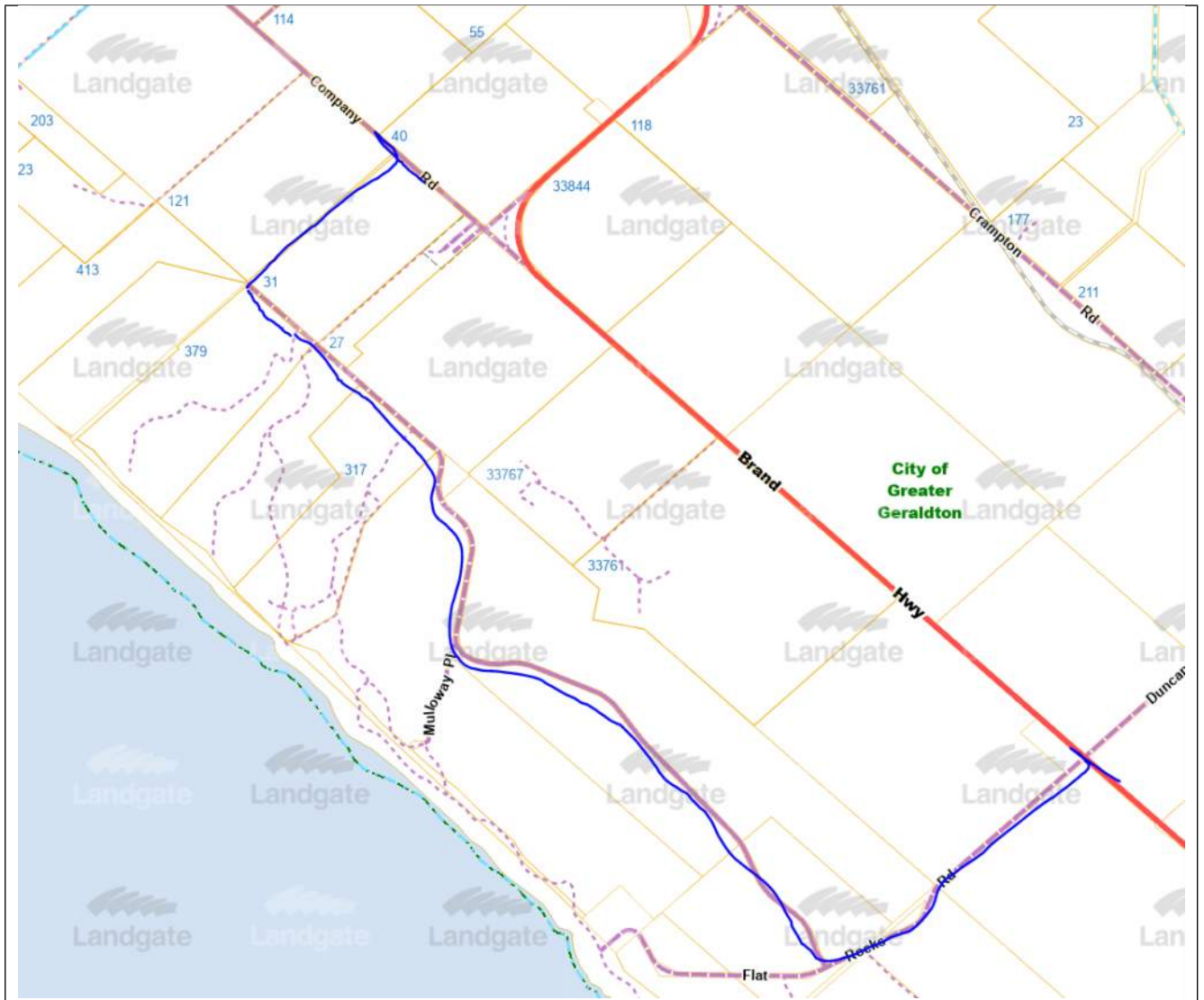
**PERFORMANCE PRINCIPLE**  
P3i

**PROPOSED ACCEPTABLE SOLUTIONS**  
A3.2a Multiple access routes

**STATEMENT OF COMPLIANCE**

The property entry fronts onto Red Emperor Drive. Red Emperor Drive is and constructed gravel road that leads to Company Road to the North and Flat Rocks Road to the South. Both Company and Flat Rocks Road are sealed roads. Appendix 1 photos 47 & 48 show the existing Land ID 3727220 access road for emergency. Photo 45 shows the constructed road heading south on Red Emperor Drive.





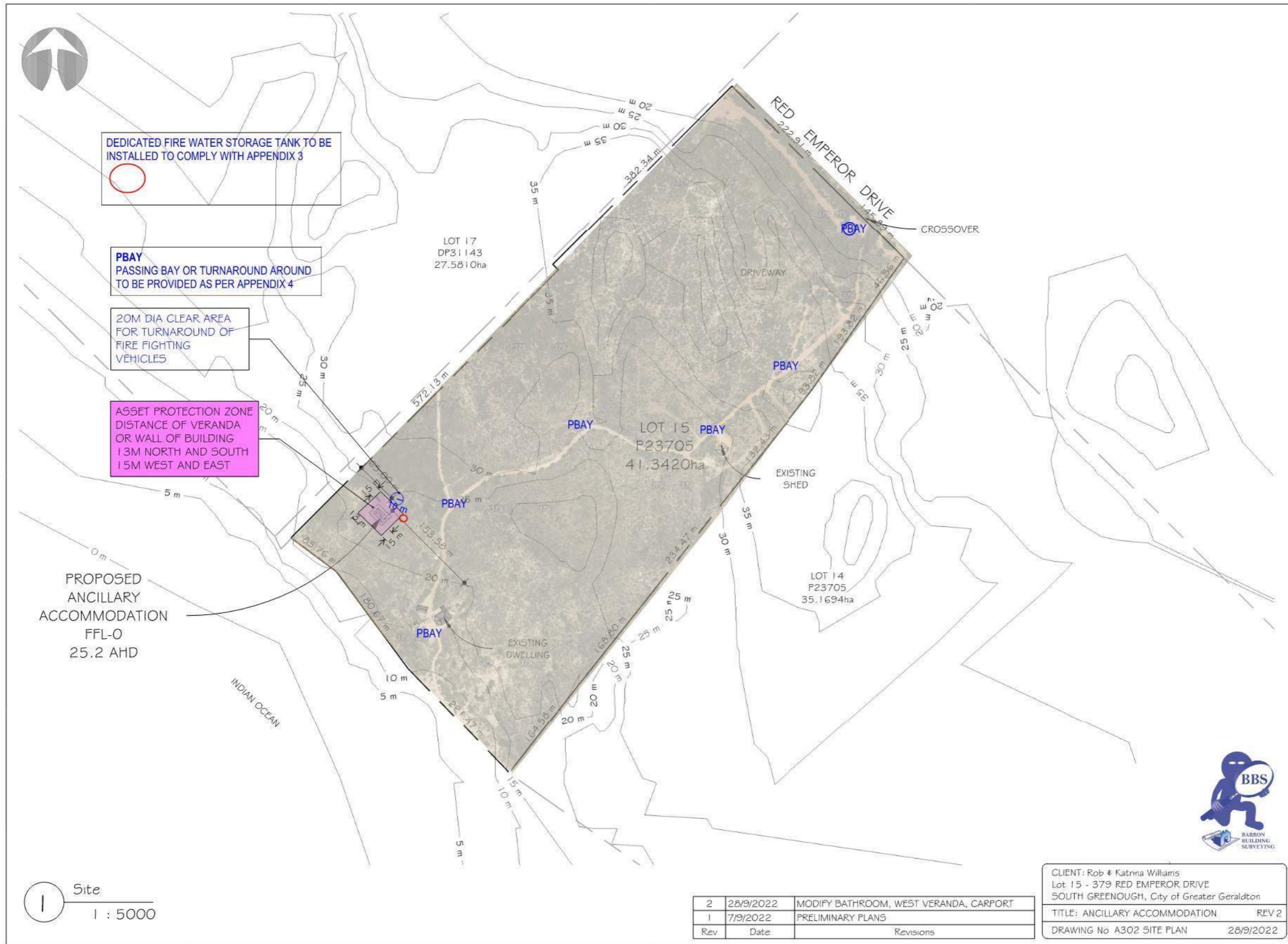


<b>PERFORMANCE PRINCIPLE</b> P3i	<b>PROPOSED ACCEPTABLE SOLUTIONS</b> A3.2b Emergency access way
<b>STATEMENT OF COMPLIANCE</b>	
The existing marked emergency access way on the North end of Red Emperor is 900m in length and connect to a sealed public road, Company Rd. Consideration should be considered the existing road infrastructure.	
<b>PERFORMANCE PRINCIPLE</b> P3i	<b>PROPOSED ACCEPTABLE SOLUTIONS</b> A3.3 Through-roads
<b>STATEMENT OF COMPLIANCE</b>	
N/a	
<b>PERFORMANCE PRINCIPLE</b> P3ii	<b>PROPOSED ACCEPTABLE SOLUTIONS</b> A3.4a Perimeter roads
<b>STATEMENT OF COMPLIANCE</b>	
n/a	
<b>PERFORMANCE PRINCIPLE</b> P3iii	<b>PROPOSED ACCEPTABLE SOLUTIONS</b> A3.4b Fire service access route
<b>STATEMENT OF COMPLIANCE</b>	
n/a	
<b>PERFORMANCE PRINCIPLE</b> P3iv	<b>PROPOSED ACCEPTABLE SOLUTIONS</b> A3.5 Battle-axe access legs
<b>STATEMENT OF COMPLIANCE</b>	
Both Company and Flat Rocks Road are sealed roads. Appendix 1 photos 47 & 48 show the existing Land ID 3727220 access road for emergency. Photo 45 shows the constructed road heading south on Red Emperor Drive. Both these roadways have the wide and surface on their entire length to be able to comply with Table 6 column 4.	
<b>PERFORMANCE PRINCIPLE</b> P3iv	<b>PROPOSED ACCEPTABLE SOLUTIONS</b> A3.6 Private driveways
<b>STATEMENT OF COMPLIANCE</b>	
The new and existing building is access by the internal access road which is longer than 70m and in a non-reticulated water area. The additional management strategies have included the provision of A3.6 for compliance. It is noted that the existing internal access road has been in place for several years and in good condition. Appendix 1 photos 1-2 -3 9-10-27-30 show the road condition. The area around the existing dwelling, water tanks and shed provided turnaround space that complies with Figure 24. See photos 27 -30 - 36	
<b>ELEMENT 4: WATER</b>	
<b>PERFORMANCE PRINCIPLE</b>	<b>PROPOSED ACCEPTABLE SOLUTIONS</b>
P4	A4.1 Identification of future water supply
<b>STATEMENT OF COMPLIANCE</b>	
N/a	
<b>PERFORMANCE PRINCIPLE</b> P4	<b>PROPOSED ACCEPTABLE SOLUTIONS</b> A4.2 Provision of water for firefighting purposes
<b>STATEMENT OF COMPLIANCE</b>	
There is existing water services on the allotment to service the existing buildings. This being 2 @ 25,000Lt at top of hill near access road, one smaller tank near dwelling at 10,000Lt. it is proposed that the new ancillary dwelling be services by and storage tank of not less than 10,000Lt for firefighting, this has been included has been the additional management strategies.	

## 5. Additional Management Strategies

The proposed development has been designed to include management strategies that are acceptable under the *State Planning Policy SPP3.7 Guidelines for Planning in Bushfire Prone Areas Version 1.4*.

1. Ensure owners listed as having responsibility under this Bushfire Management Statement have endorsed it and provided future owners on transfers of land a complete copy of the current Bushfire Management Statement for their information.
2. The Ancillary Dwelling building must be designed and constructed to meet Bushfire Attack Level construction as per *AS3959 - BAL 29*.
3. All new buildings that the landowner/proponent has responsibility for, are designed and constructed in full compliance with the requirements of the *WA Building Act 2011* and the referenced *Building Code of Australia (BCA)*, and with any identified additional requirements of the relevant local government. For any Class 1, 2, or 3 buildings and associated Class 10a buildings or decks, this will include compliance with *AS 3959 Construction of Buildings in Bushfire Prone Areas (2018 as amended)* and/or for Class 1 buildings, the *National Association of Steel Housing – (NASH) Standard – Steel Framed Construction in Bushfire Prone Areas*, whereby construction standards corresponding to the assessed BAL will be applied.
4. Lodge a Section 70A (Transfer of Land Act 1893) notification on the certificate(s) of title of the proposed lot(s). Notice of this notification is to be included on the diagram or plan of survey (deposited plan). The notification is to state 'The lot(s) is/are in a bushfire prone area and (if applicable) are subject to a Bushfire Management Statement'. This shall alert the purchasers of land and successors in title of their responsibilities (*SPP3.7 s6.10 and 'Guidelines' s4.6.4 and s5.3.2*).
5. Asset Protection Zone to be installed and managed as per *State Planning Policy SPP3.7 Guidelines for Planning in Bushfire Prone Areas V1.4, Schedule 1* (refer to Appendix 2).
6. If vegetation planting is to take place within the Asset Protection Zone area, it shall be installed to meet the requirements of *State Planning Policy SPP3.7* (refer to Appendix 2).
7. Any classified vegetation that has directly contributed to the determined BAL rating must be managed such as to not change that vegetation to a higher risk classification.
8. Any clearing of Vegetation must consider the requirements of *South Greenough to Cape Burney Coastal Planning Strategy*.
9. A Fire map/plan shall be placed and made available in a visibly marked all-weather accessible sealed container, or on a sign, at the front of the allotment entry to Lot 15 (as shown on Figure 3). Map must show locations of vehicle turn-around areas and Fire Water Tank location.
10. Provide no less than 10,000lt Water Storage Tank for fire-fighting purpose only at the new Ancillary Dwelling and must have a fire-fighting hose coupling, and construction as per *State Planning Policy SPP3.7 Guidelines for Planning in Bushfire Prone Areas V1.4, Schedule 2* (refer to Appendix 3).



DEDICATED FIRE WATER STORAGE TANK TO BE INSTALLED TO COMPLY WITH APPENDIX 3

PBAY  
PASSING BAY OR TURNAROUND AROUND TO BE PROVIDED AS PER APPENDIX 4

20M DIA CLEAR AREA FOR TURNAROUND OF FIRE FIGHTING VEHICLES

ASSET PROTECTION ZONE DISTANCE OF VERANDA OR WALL OF BUILDING 1.3M NORTH AND SOUTH 1.5M WEST AND EAST

PROPOSED ANCILLARY ACCOMMODATION FFL-0 25.2 AHD

Site  
1 : 5000

Rev	Date	Revisions
2	28/9/2022	MODIFY BATHROOM, WEST VERANDA, CARPORT
1	7/9/2022	PRELIMINARY PLANS

CLIENT: Rob & Katrina Williams  
 Lot 15 - 379 RED EMPEROR DRIVE  
 SOUTH GREENOUGH, City of Greater Geraldton  
 TITLE: ANCILLARY ACCOMMODATION REV 2  
 DRAWING No A302 SITE PLAN 28/9/2022



Figure 7 Bushfire Asset Protection Zone Map (A3 Page)

## 6. Responsibilities for Implementation and Management of the Bushfire Measures

This section relates to the responsibilities of the developers(s), landowner(s) and local government with regards to the initial implementation and ongoing maintenance of the required actions.

LANDOWNER / DEVELOPER – PRIOR TO SALE OR OCCUPANCY	
No.	Implementation Action
1	<p>A notification, pursuant to Section 165 of the <i>Planning and Development Act 2005</i> or Section 70A of the <i>Transfer of Land Act 1893</i>, is to be placed on the certificates of title of the lots advising of the existence of a hazard or other factor.</p> <p>Notice of this notification is to be included on the diagram or plan of survey (deposited plan), and/or as required by the Western Australian Planning Commission. The notification is to state as follows:  <i>“This land is within a bushfire prone area as designated by an Order made by the Fire and Emergency Services Commissioner and is subject to a Bushfire Management Plan. Additional planning and building requirements may apply to development on this land”</i></p> <p>This is to alert potential purchasers of the land and successors in title of their responsibilities regarding bushfire mitigation and hazard management.</p>
2	A static dedicated fire water storage tank, of no less than 10,000lt capacity, is to be provided to the New dwelling for fire-fighting purposes only and constructed in accordance with the technical requirements of <i>State Planning Policy 3.7 Guidelines for Planning in Bushfire Prone Areas</i> .
3	Implementation of the Asset Protection Zone (APZ) and always maintained.
4	A Fire map/plan shall be placed and made available in a visibly marked all-weather accessible sealed container, or on a sign, at the front of the allotment entry to Lot 2 (as shown on Figure 3). Map must show locations of vehicle turn-around areas and Fire Water Tank location.
5	Protection of private power pole as per service provider requirements. Refer to appendix 5 for guidance.
LANDOWNER/OCCUPIER – ONGOING MANAGEMENT	
No.	Management Action
1	Comply with the relevant local government annual firebreak notice issued under <i>s33 of the Bush Fires Act 1954</i> .
2	Maintain all required low threat areas (e.g. lots, APZs, etc.) to the standards stated in this BMP to achieve the intended BAL outcomes.
3	Asset Protection Zone (APZ) always maintained.
Local Government Recommendation Conditions	
1	None recommended

## 7. Bushfire Attack Level Confirmation

### Bushfire Attack Level (BAL) Certificate for Install of Ancillary Building

#### Property Details and Description of Works

<b>Address Details</b>	Lot 15 -379 Red Emperor Drive		
	<b>Suburb</b> South Greenough	<b>State</b> WA	<b>Postcode</b> 6525
<b>Local Government Area</b>	City of Greater Geraldton		
<b>Main BCA Class of the building</b>	Class 1a	Use(s) of the building	Ancillary Dwelling
<b>Description of the building or works</b>	Single Story Standalone Building		

#### Bushfire Certification Statement

I certify that the development site has adopted and completed to a reasonable satisfaction all additional Management Strategies as per this Bushfire Management Plan to achieve the required Bushfire Attack Level Ratings.

#### BPAD Accredited Practitioner Details

<b>Name</b>		
<b>Company Details</b>		
<b>Dated</b>	<i>Authorized Practitioner Stamp</i>	

# Bushfire Consulting

Photographic Appendix 1

22144



**Barron Building Surveying**

PO Box 610 Dongara WA 6525

0476 000 842

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[www.bbswa.com.au](http://www.bbswa.com.au)

## Property Address

Lot 15 379 Red Emperor Drive  
South Greenough



This photographic evidence is supplied in support of the Bushfire Assessment BMP 22144. Each photo has been taken to identify the vegetation type and slope under the classifiable vegetation plots. Referred to in each photo heading or ID numbers.

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34 - .....	20
35 - Access Road .....	21
36 - Existing Shed .....	21
37 - Access road .....	22
38 - Access Entry .....	22
39 - Roadway .....	23
40 - Red Emperor Drive .....	23
41 - Red Emperor Drive .....	24
42 - Entry .....	24
43 - Red Emperor Drive .....	25
44 - Red Emperor Drive .....	25
45 - Red Emperor Road .....	26
46 - Red Emperor Drive .....	26
47 - Access Way .....	27
48 - Access way .....	27





1 -

Date: 2022:07:05 08:56:48

Latitude: -28.988623, Longitude: 114.766801, Direction: 159 degrees

Comments:

Entry Plot. Low Scrub area open entry area managed vegetation.

---



2 - Access road

Date: 2022:07:05 08:57:48

Latitude: -28.990206, Longitude: 114.766055, Direction: 226 degrees

Comments:

4m wide access way.

---



### 3 - Access Way

Date: 2022:07:05 08:57:57

Latitude: -28.990405, Longitude: 114.765804, Direction: 212 degrees

Comments:

4m wide access way, adjcent low scrub vegetation.

---



### 4 -

Date: 2022:07:05 08:58:16

Latitude: -28.990797, Longitude: 114.765247, Direction: 306 degrees

Comments:

Low Shrubland area, top of ridge.

---



5 -

Date: 2022:07:05 08:58:28

Latitude: -28.990968, Longitude: 114.76498, Direction: 258 degrees

Comments:

Low shrubland vegetation

---



6 -

Date: 2022:07:05 08:58:47

Latitude: -28.991546, Longitude: 114.76423, Direction: 257 degrees

Comments:

Low Shrubland Vegetation coastal sand dune.

---



7 -

Date: 2022:07:05 08:59:11

Latitude: -28.991655, Longitude: 114.763355, Direction: 308 degrees

Comments:

Shrubland

---



8 -

Date: 2022:07:05 08:59:35

Latitude: -28.991369, Longitude: 114.762478, Direction: 228 degrees

Comments:

Shrubland

---



## 9 -

Date: 2022:07:05 08:59:54

Latitude: -28.991809, Longitude: 114.76195, Direction: 187 degrees

Comments:

4m Wide access track. Top of ridge

---



## 10 - Access Road

Date: 2022:07:05 09:00:06

Latitude: -28.99194, Longitude: 114.761508, Direction: 205 degrees

Comments:

Low Shrubland

---



## 11 - Site Location

Date: 2022:07:05 09:10:45

Latitude: -28.992568, Longitude: 114.759269, Direction: 116 degrees

Comments:

---



## 12 -

Date: 2022:07:05 09:10:55

Latitude: -28.992546, Longitude: 114.759139, Direction: 288 degrees

Comments:

---



13 -

Date: 2022:07:05 09:11:08

Latitude: -28.992534, Longitude: 114.759199, Direction: 199 degrees

Comments:

---



14 -

Date: 2022:07:05 09:11:23

Latitude: -28.992538, Longitude: 114.75935, Direction: 102 degrees

Comments:

---



15 -

Date: 2022:07:05 09:11:37

Latitude: -28.992477, Longitude: 114.759388, Direction: 64 degrees

Comments:

---



16 -

Date: 2022:07:05 09:11:54

Latitude: -28.992365, Longitude: 114.759342, Direction: 281 degrees

Comments:

---





## 17 - Plot 2

Date: 2022:07:05 09:12:04

Latitude: -28.992341, Longitude: 114.759385, Direction: 222 degrees

Comments:

Low Shrubland area over site.

---



## 18 - Plot 2

Date: 2022:07:05 09:12:22

Latitude: -28.99225, Longitude: 114.759549, Direction: 340 degrees

Comments:

Low shrubland, low shrub less than 2m high of coastal dune.

---



## 19 - Plot 2

Date: 2022:07:05 09:12:33

Latitude: -28.992256, Longitude: 114.759562, Direction: 102 degrees

Comments:

Low Shrubland

---



## 20 - Plot 2

Date: 2022:07:05 09:13:03

Latitude: -28.992387, Longitude: 114.759396, Direction: 129 degrees

Comments:

Low Shrubland.

---



## 21 - Plot 1

Date: 2022:07:05 09:13:56

Latitude: -28.992336, Longitude: 114.759024, Direction: 256 degrees

Comments:

Low Shrubland, coastal shrub on sand dune.

---



## 22 - Plot 1

Date: 2022:07:05 09:14:04

Latitude: -28.992437, Longitude: 114.758975, Direction: 203 degrees

Comments:

Low Shrubland

---



## 23 - Plot 1

Date: 2022:07:05 09:14:14

Latitude: -28.992284, Longitude: 114.759053, Direction: 5 degrees

Comments:

Low Shrubland

---



## 24 - Plot 6

Date: 2022:07:05 09:14:34

Latitude: -28.992399, Longitude: 114.759055, Direction: 184 degrees

Comments:

Downslope low shrubland

---



## 25 - Plot 2

Date: 2022:07:05 09:47:43

Latitude: -28.991876, Longitude: 114.75988, Direction: 104 degrees

Comments:

downslope form site Low Shrubland

---



## 26 - Plot 2

Date: 2022:07:05 09:48:00

Latitude: -28.991823, Longitude: 114.760199, Direction: 212 degrees

Comments:

Access road proposed.

---



## 27 - Access road

Date: 2022:07:05 09:48:22

Latitude: -28.992377, Longitude: 114.760372, Direction: 129 degrees

Comments:

---



## 28 - Plot 5

Date: 2022:07:05 09:48:43

Latitude: -28.993035, Longitude: 114.760267, Direction: 257 degrees

Comments:

Water tanks location and power asset.

---



## 29 - Plot 2

Date: 2022:07:05 09:48:48

Latitude: -28.993028, Longitude: 114.760203, Direction: 343 degrees

Comments:

Edge of plot 5 and 5 slope transition.

---



## 30 - Access Turn around

Date: 2022:07:05 09:50:51

Latitude: -28.994096, Longitude: 114.760165, Direction: 185 degrees

Comments:

Access turn around area and main Dwelling area. Surrounded by low shrubland vegetation.

---



## 31 - Dwelling

Date: 2022:07:05 09:55:22

Latitude: -28.994166, Longitude: 114.760236, Direction: 17 degrees

Comments:

Main Dwelling APZ area

---



## 32 - Plot 2

Date: 2022:07:05 10:02:18

Latitude: -28.992802, Longitude: 114.760273, Direction: 10 degrees

Comments:

Access road.

---





### 33 - Plot 3

Date: 2022:07:05 10:02:37

Latitude: -28.992189, Longitude: 114.760779, Direction: 123 degrees

Comments:

Low Shrubland area, shrub less than 2m in height on coastal dune area.

---



### 34 -

Date: 2022:07:05 10:02:59

Latitude: -28.991946, Longitude: 114.761776, Direction: 153 degrees

Comments:

---



### 35 - Access Road

Date: 2022:07:05 10:04:06

Latitude: -28.991534, Longitude: 114.764298, Direction: 102 degrees

Comments:

Managed land area wiht Shed location.

---



### 36 - Existing Shed

Date: 2022:07:05 10:04:16

Latitude: -28.991478, Longitude: 114.764388, Direction: 109 degrees

Comments:

---



### 37 - Access road

Date: 2022:07:05 10:05:17

Latitude: -28.989204, Longitude: 114.766645, Direction: 106 degrees

Comments:

Vegetation near access road. Closed Shrub

---



### 38 - Access Entry

Date: 2022:07:05 10:05:32

Latitude: -28.988882, Longitude: 114.766683, Direction: 2 degrees

Comments:

---



## 39 - Roadway

Date: 2022:07:05 10:06:22

Latitude: -28.988512, Longitude: 114.766874, Direction: 70 degrees

Comments:

---



## 40 - Red Emperor Drive

Date: 2022:07:05 10:06:29

Latitude: -28.988462, Longitude: 114.766903, Direction: 309 degrees

Comments:

---



## 41 - Red Emperor Drive

Date: 2022:07:05 10:06:43

Latitude: -28.988523, Longitude: 114.766969, Direction: 242 degrees

Comments:

Vegetation near road planted closed scrub.

---



## 42 - Entry

Date: 2022:07:05 10:06:47

Latitude: -28.988525, Longitude: 114.766955, Direction: 280 degrees

Comments:

---



### 43 - Red Emperor Drive

Date: 2022:07:05 10:07:05

Latitude: -28.989106, Longitude: 114.767642, Direction: 271 degrees

Comments:

Road vegetation.

---



### 44 - Red Emperor Drive

Date: 2022:07:05 10:07:11

Latitude: -28.989183, Longitude: 114.767743, Direction: 85 degrees

Comments:

---



## 45 - Red Emperor Road

Date: 2022:07:05 10:07:37

Latitude: -28.99099, Longitude: 114.769808, Direction: 142 degrees

Comments:

---



## 46 - Red Emperor Drive

Date: 2022:07:05 10:07:55

Latitude: -28.991736, Longitude: 114.77069, Direction: 237 degrees

Comments:

Vegetation along roadway. Low Shrubland

---



## 47 - Access Way

Date: 2022:07:05 10:09:39

Latitude: -28.986649, Longitude: 114.764861, Direction: 335 degrees

Comments:



## 48 - Access way.

Date: 2022:07:05 10:09:52

Latitude: -28.98651, Longitude: 114.764937, Direction: 97 degrees

Comments:



## ELEMENT 2: SITING AND DESIGN OF DEVELOPMENT

### EXPLANATORY NOTES

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

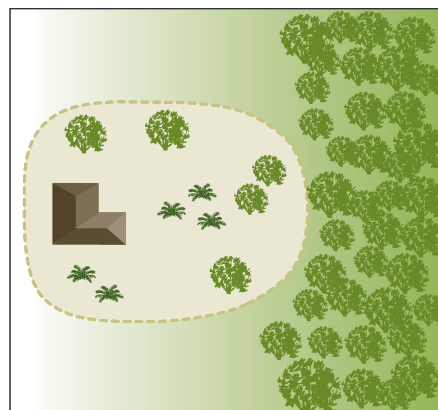
A simple method to estimate fuel load is to roughly equate one tonne of fuel load per hectare as 100 grams per square metre. For example, two tonnes per hectare of leaf litter is roughly 200 grams of leaf litter per square metre and eight tonnes per hectare is roughly 800 grams. Eucalyptus leaf litter is approximately 100 grams per handful, so two handfuls of litter per square metre will roughly equate to two tonnes per hectare. Different types of fine fuel, like mulch or pine needles may be more or less than a handful, however the 100 grams per square metre rule of thumb can still be used.

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

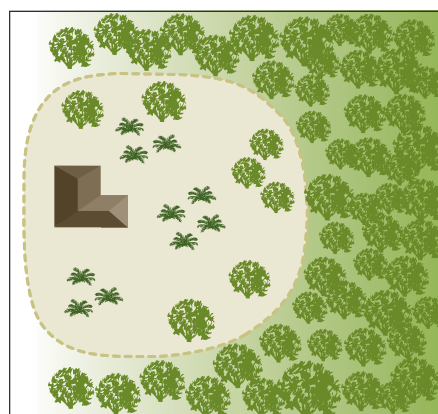
A copy of the firebreak notice and Schedule 1 should be included in a BMP specifically as a how-to guide for the landowner, and to demonstrate to decision-makers that the measures outlined in the BMP to achieve the appropriate BAL rating through provision and ongoing management of an APZ, can be implemented.

Regardless of whether an Asset Protection Zone exists in accordance with the acceptable solutions and is appropriately maintained, it should be noted that fire fighters are not obliged to protect an asset if they think the separation distance between the dwelling and vegetation is unsafe.

Hazard on  
one side



Hazard on  
three sides



Legend

-  APZ
-  trees
-  shrubs

Figure 18: Design of Asset Protection Zone

Refer to Schedule 1: Standards for Asset Protection Zones

## ELEMENT 2: SITING AND DESIGN OF DEVELOPMENT

### EXPLANATORY NOTES

#### E2 Landscaping and design of an asset protection zone

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

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

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

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

The location of plants within an APZ is a key design technique. Separation of garden beds with areas of low fuel or non-combustible material, will break up fuel continuity and reduce the likelihood of a bushfire running through an APZ and subjecting a dwelling to radiant heat or direct flame contact. It is important to note, where mature trees are separated from a building by six metres, but the canopy has grown to extend or overhang a building, maintenance and pruning to remove the overhanging branches should be undertaken without the entirety of the tree being removed.

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

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

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

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

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



## ELEMENT 2: SITING AND DESIGN OF DEVELOPMENT

### EXPLANATORY NOTES

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

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

### E2 Plant flammability

There are certain plant characteristics that are known to influence flammability, such as moisture or oil content and the presence and type of bark. Plants with lower flammability properties may still burn during a bushfire event, but may be more resistant to burning and some may regenerate faster post-bushfire.

There are many terms for plant flammability that should not be confused, including:

- Fire resistant – plant species that survive being burnt and will regrow after a bushfire and therefore may be highly flammable and inappropriate for a garden in areas of high bushfire risk.
- Fire retardant – plants that may not burn readily or may slow the passage of a bushfire.
- Fire wise – plants that have been identified and selected based on their flammability properties and linked to maintenance advice and planting location within a garden.

Although not a requirement of these Guidelines, local governments may develop their own list of fire wise or fire-retardant plant species that suit the environmental characteristics of an area. When developing a recommended plant species list, local governments should consult with ecologists, land care officers or environmental authorities to ensure the plants do not present a risk to endangered ecological communities, threatened, or endangered species or their habitat.

When selecting plants, private landholders and developers should aim for plants within the APZ that have the following characteristics:

- grow in a predicted structure, shape and height;
- are open and loose branching with leaves that are thinly spread;
- have a coarse texture and low surface-area-to-volume ratio;
- will not drop large amounts of leaves or limbs, that require regular maintenance;
- have wide, flat, and thick or succulent leaves;
- trees that have bark attached tightly to their trunk or have smooth bark;
- have low amounts of oils, waxes, and resins (which will often have a strong scent when crushed);
- do not produce or hold large amounts of fine dead material in their crowns; and/or
- will not become a weed in the area.

Refer to the WAPC Bushfire and Vegetation Fact Sheet for further information on clearing and vegetation management and APZ landscaping, design and plant selection reference material.



## ELEMENT 2: SITING AND DESIGN OF DEVELOPMENT

### SCHEDULE 1: STANDARDS FOR ASSET PROTECTION ZONES

OBJECT	REQUIREMENT
Fences within the APZ	<ul style="list-style-type: none"> <li>Should be constructed from non-combustible materials (for example, iron, brick, limestone, metal post and wire, or bushfire-resisting timber referenced in Appendix F of AS 3959).</li> </ul>
Fine fuel load (Combustible, dead vegetation matter <6 millimetres in thickness)	<ul style="list-style-type: none"> <li>Should be managed and removed on a regular basis to maintain a low threat state.</li> <li>Should be maintained at &lt;2 tonnes per hectare (on average).</li> <li>Mulches should be non-combustible such as stone, gravel or crushed mineral earth or wood mulch &gt;6 millimetres in thickness.</li> </ul>
Trees* (>6 metres in height)	<ul style="list-style-type: none"> <li>Trunks at maturity should be a minimum distance of six metres from all elevations of the building.</li> <li>Branches at maturity should not touch or overhang a building or powerline.</li> <li>Lower branches and loose bark should be removed to a height of two metres above the ground and/or surface vegetation.</li> <li>Canopy cover within the APZ should be &lt;15 per cent of the total APZ area.</li> <li>Tree canopies at maturity should be at least five metres apart to avoid forming a continuous canopy. Stands of existing mature trees with interlocking canopies may be treated as an individual canopy provided that the total canopy cover within the APZ will not exceed 15 per cent and are not connected to the tree canopy outside the APZ.</li> </ul>
<p><b>Figure 19:</b> Tree canopy cover – ranging from 15 to 70 per cent at maturity</p>	
Shrub* and scrub* (0.5 metres to six metres in height). Shrub and scrub >6 metres in height are to be treated as trees.	<ul style="list-style-type: none"> <li>Should not be located under trees or within three metres of buildings.</li> <li>Should not be planted in clumps &gt;5 square metres in area.</li> <li>Clumps should be separated from each other and any exposed window or door by at least 10 metres.</li> </ul>
Ground covers* (<0.5 metres in height. Ground covers >0.5 metres in height are to be treated as shrubs)	<ul style="list-style-type: none"> <li>Can be planted under trees but must be maintained to remove dead plant material, as prescribed in 'Fine fuel load' above.</li> <li>Can be located within two metres of a structure, but three metres from windows or doors if &gt;100 millimetres in height.</li> </ul>



## ELEMENT 2: SITING AND DESIGN OF DEVELOPMENT

### SCHEDULE 1: STANDARDS FOR ASSET PROTECTION ZONES

OBJECT	REQUIREMENT
Grass	<ul style="list-style-type: none"> <li>• Grass should be maintained at a height of 100 millimetres or less, at all times.</li> <li>• Wherever possible, perennial grasses should be used and well-hydrated with regular application of wetting agents and efficient irrigation.</li> </ul>
Defendable space	<ul style="list-style-type: none"> <li>• Within three metres of each wall or supporting post of a habitable building, the area is kept free from vegetation, but can include ground covers, grass and non-combustible mulches as prescribed above.</li> </ul>
LP Gas Cylinders	<ul style="list-style-type: none"> <li>• Should be located on the side of a building furthest from the likely direction of a bushfire or on the side of a building where surrounding classified vegetation is upslope, at least one metre from vulnerable parts of a building.</li> <li>• The pressure relief valve should point away from the house.</li> <li>• No flammable material within six metres from the front of the valve.</li> <li>• Must sit on a firm, level and non-combustible base and be secured to a solid structure.</li> </ul>

\* Plant flammability, landscaping design and maintenance should be considered – refer to explanatory notes



## EXPLANATORY NOTES

### E4 Use of water supply

Water supply for firefighting in the event of a bushfire can be provided on a lot for use by emergency services or for use by the landowner, if their [Bushfire Survival Plan](#) is to stay and defend their property. Water supply in the form of a dedicated standalone tank may be provided solely for use by emergency services, and/or a water supply may be provided for use by the landowner in the form of non-drinking water (garden or grey water for firefighting) or drinking water. It is important to note, that a combined tank of drinking water and water for firefighting purposes is not recommended. It is required to be separated in accordance with section 4.2.3 of AS/NZS 3500.1:2018. This requirement is necessary, as stagnant water may alter the quality of the drinking water and the emergency services, by law, may not be able to take water from the water supply to suppress a bushfire.

### E4 Independent water and power supply

Bushfires can directly impact a water service provider's equipment or pipes. As such, a reticulated water supply may not be reliable due to a reduction in water pressure or loss of supply. Where development is in a bushfire prone area (even if there is access to reticulated water), it is recommended that the landowner consider providing an additional water supply for use by emergency services.

Where a landowner intends on staying to defend their property during a bushfire event, as identified in their [Bushfire Survival Plan](#), it is recommended that pumping equipment separate to the electricity network be provided. The pumping equipment could be a diesel or petrol powered pump, or an electric pump if there is an onsite generator or backup power supply independent from electricity network grid.

It is recommended that combustion pumps should be a minimum 5hp or 3kW diesel or petrol powered pump and should be shielded against bushfire attack. Where an electric pump is used, a backup power supply independent from electricity network grid should be provided. A 3.7kw/12kw-h sized battery (14.8kw-h reserved solely for bushfire will power a 3.7kw system for 4 hours) with blackout protection or a generator should be provided.

### E4 Strategic water supplies

Many local governments have a well-developed network of strategic water tanks for firefighting within their local government area. Given this, it is at the discretion of the local government to determine if the water supply within a locality, is sufficient to cater for an increasing population when a subdivision is proposed. Local governments are encouraged to work with their local emergency services to ensure the water needs for firefighting is understood.

Where a structure plan or subdivision proposes to create more than three but less than 24 lots, it is optional as to whether each lot is provided with a 10,000 litre tank or a strategic water tank is provided for the entire development. If 25 or more lots are proposed, then it is recommended that a 50,000 litre strategic water tank (for every 25 lots) is provided. For every lot additional to the 25, it is at the discretion of the local government whether they require an additional strategic water tank or for each lot to be provided with a 10,000 litre tank. For example, 37 proposed lots require two strategic water tanks, or a 10,000 litre tank on each lot, or a combination of both with a strategic water tank and 12 proposed lots with a 10,000 litre tank on each lot. Where the local government, following consultation with the local emergency services, is of the opinion that a strategic water tank is unnecessary, a 10,000 litre standalone tank per lot can be provided.

A strategic water tank should be located no more than 10 minutes from the subject site (20-minute turnaround time). The turnaround time is the time it takes from a lot, to the water supply and return back to the lot, at legal road speeds. Where a strategic water tank has been provided at the subdivision stage and a development application is located within the 20-minute turnaround time of that (or another) strategic water source, then the decision-maker could remove the requirement for the provision of an additional water supply at the development application stage. Local government will need to consider whether the strategic water tank has the capacity to serve the lot identified in the development application i.e. what lots were identified at subdivision stage to be serviced by the strategic water tank. A landowner should enquire with their local government to determine whether a water supply on their lot will be required.



## EXPLANATORY NOTES

When there is fragmented ownership of a structure plan area, or when staging of a subdivision is to occur and the local government has determined that a strategic water tank is required, then the first stage should include arrangements for the installation of a water tank and the identification of land to be ceded to the local government authority (if applicable).

Where local planning scheme provisions provide for developer contributions for public infrastructure and the local government is supportive, then a cash-in lieu arrangement may be established for the provision of a strategic water tank.

Grouped dwellings may provide dedicated firefighting water supply in one standalone tank per lot or may provide one shared standalone tank with the accumulative amount of water needed, for the number of lots it will serve. For example, a development proposing three lots may either have three tanks of 10,000L (one per lot) or one tank with 30,000L (shared between three lots).

### E4 Alternative water sources

A dam, river or other source may be considered a firefighting water source if it complies with DFES guidelines and it can be demonstrated that the water level will be maintained above the top of the highest fire brigade suction point in perpetuity, if it is expected that the water supply will be used by emergency services. Approval for the use of these types of water supplies are on a case by case basis and at the discretion of the decision maker, in consultation with emergency services and local government.

### E4 Location of water tanks

A water tank should be located with consideration to surrounding vegetation and should avoid locations where the tank will be situated underneath existing vegetation or where vegetation will grow against or overhang the tank, as shown in Figure 30 below. Where a tank is located on the bushfire hazard side of a building, sufficient shielding for the protection of firefighters should be provided. In addition to the tank location, the fitting should be positioned and/or shielded from the bushfire hazard to allow access by emergency services. It is recommended that the fitting face away from the bushfire hazard and be within four metres of a hardstand area.



Figure 30: A good and bad example of landscaping around a water tank



## SCHEDULE 2: WATER SUPPLY DEDICATED FOR BUSHFIRE FIREFIGHTING PURPOSES

### 2.1 Water supply requirements

Water dedicated for firefighting should be provided in accordance with Table 7 below, and be in addition to water required for drinking purposes.

**Table 7:** Water supply dedicated for bushfire firefighting purposes

PLANNING APPLICATION	NON-RETICULATED AREAS
Development application	10,000L per habitable building
Structure Plan / Subdivision: Creation of 1 additional lot	10,000L per lot
Structure Plan / Subdivision: Creation of 3 to 24 lots	10,000L tank per lot <b>or</b> 50,000L strategic water tank
Structure Plan / Subdivision: Creation of 25 lots or more	50,000L per 25 lots or part thereof Provided as a strategic water tank(s) or 10,000L tank per lot

### 2.2 Technical requirements

#### 2.2.1 Construction and design

An above-ground tank and associated stand should be constructed of non-combustible material. The tank may need to comply with AS/NZS 3500.1:2018.

Below ground tanks should have a 200mm diameter access hole to allow tankers or emergency service vehicles to refill direct from the tank, with the outlet location clearly marked at the surface. The tank may need to comply with AS/NZS 3500.1:2018. An inspection opening may double as the access hole provided that the inspection opening meets the requirements of AS/NZS 3500.1:2018. If the tank is required under the BCA as part of fire hydrant installation, then the tank will also need to comply with AS 2419.

Where an outlet for an emergency service vehicle is provided, then an unobstructed, hardened ground surface is to be supplied within four metres of any water supply.

#### 2.2.2 Pipes and fittings

All above-ground, exposed water supply pipes and fittings should be metal. Fittings should be located away from the source of bushfire attack and be in accordance with the applicable section below, unless otherwise specified by the local government.

##### 2.2.2.1 Fittings for above-ground water tanks:

- Commercial land uses: 125mm Storz fitting; or
- Strategic water tanks: 50mm or 100mm (where applicable and adapters are available) male camlock coupling with full flow valve; or
- Standalone water tanks: 50mm male camlock coupling with full flow valve; or
- Combined water tanks: 50mm male camlock coupling with full flow valve or a domestic fitting, being a standard household tap that enables an occupant to access the water supply with domestic hoses or buckets for extinguishing minor fires.

##### 2.2.2.2 Remote outlets

In certain circumstances, it may be beneficial to have the outlet located away from the water supply. In such instances in which a remote outlet is to be used, the applicant should consult the local government and DFES on their proposal.





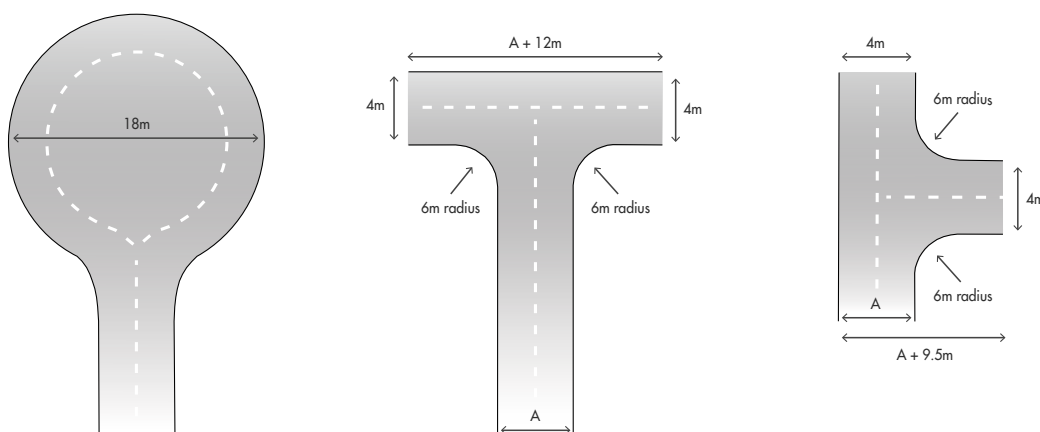
## EXPLANATORY NOTES

### E3.6 Private driveways

In areas serviced by reticulated water, where the road speed limit is not greater than 70 km/h, and where the distance from the public road to the further part of the habitable building is no greater than 70 metres, emergency service vehicles typically operate from the street frontage.

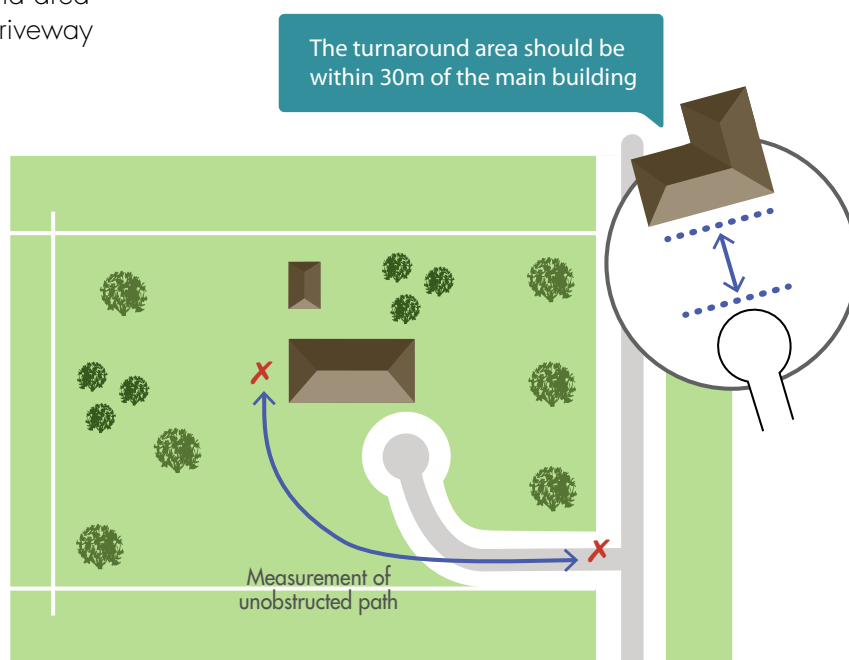
In the event the habitable building cannot be reached by hose reel from the public road, then emergency service vehicles will need to gain access within the property. Emergency service vehicles will also need to gain access within the property, where access to reticulated water (fire hydrants) is not possible. In these situations, the driveway and battle-axe (if applicable) will need to be wide enough for access for an emergency service vehicle and a vehicle to evacuate.

Turnaround areas should be available for both conventional two-wheel drive vehicles of residents and Type 3.4 fire appliances. Turn-around areas should be located within 30 metres of habitable buildings. Circular and loop driveway design may also be considered. Note that the design requirements for a turn-around area for a private driveway or battle-axe differ to a cul-de-sac.



**Figure 28:** Design requirements for a turn-around area for a private driveway or battle-axe

**Figure 29:** Design requirements for a private driveway where required under A3.6





Government of **Western Australia**  
Department of **Mines, Industry Regulation and Safety**  
**Building and Energy**

# Guidelines for the Safe management of private power poles and lines



September 2019

## Preface

These guidelines are issued under Section 33AA of the Electricity Act 1945 (WA) by the Director of Energy Safety, to assist property owners and electrical contractors in the selection, installation and safe management of private overhead power lines and poles.

There are risks and potential significant consequences of electrical or structural failure of private power poles and lines, including power interruptions, electrocution and fires. These risks and consequences can be mitigated through the proper selection of equipment and regular inspection and maintenance.

It is the property owner's legal responsibility (duty of care) under common law to install and maintain private power poles and lines so they do not pose a safety risk to the property occupants, adjacent properties and their occupants or the wider community.

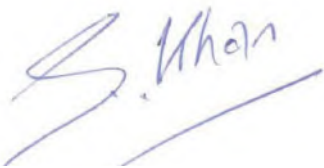
However, any activities which constitute electrical work must be carried out by licensed electrical contractors.

These guidelines provide the recommended technical requirements and practices for the safe management of privately owned power poles and lines, including:

- repair and maintenance; and
- new construction.

I strongly recommend compliance with the safe management practices set out in these guidelines.

Should you have any suggestions and comments on these guidelines, please send them to me in writing and I will be pleased to consider them.



Saj Khan

DIRECTOR OF ENERGY SAFETY

These guidelines replace the previous Building and Energy publication  
Private overhead power lines - guide for electrical contractors.

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# 1. Introduction

## 1.1 What are private power poles and lines?

Power lines on private property transporting electricity from the main switchboard and meter to the home or other buildings and facilities<sup>1</sup> are private power lines.

Poles on private property supporting the network operator's overhead service cable and poles supporting private power lines are private power poles.

Private power poles and lines do not include:

- the network operator's service cable;
- the meter (owned by the network operator); and
- power lines which cross private property in rural areas and are owned and managed by the network operator.

Some common private power line arrangements are shown in Figures 1 to 3 (below) and in the Appendix.

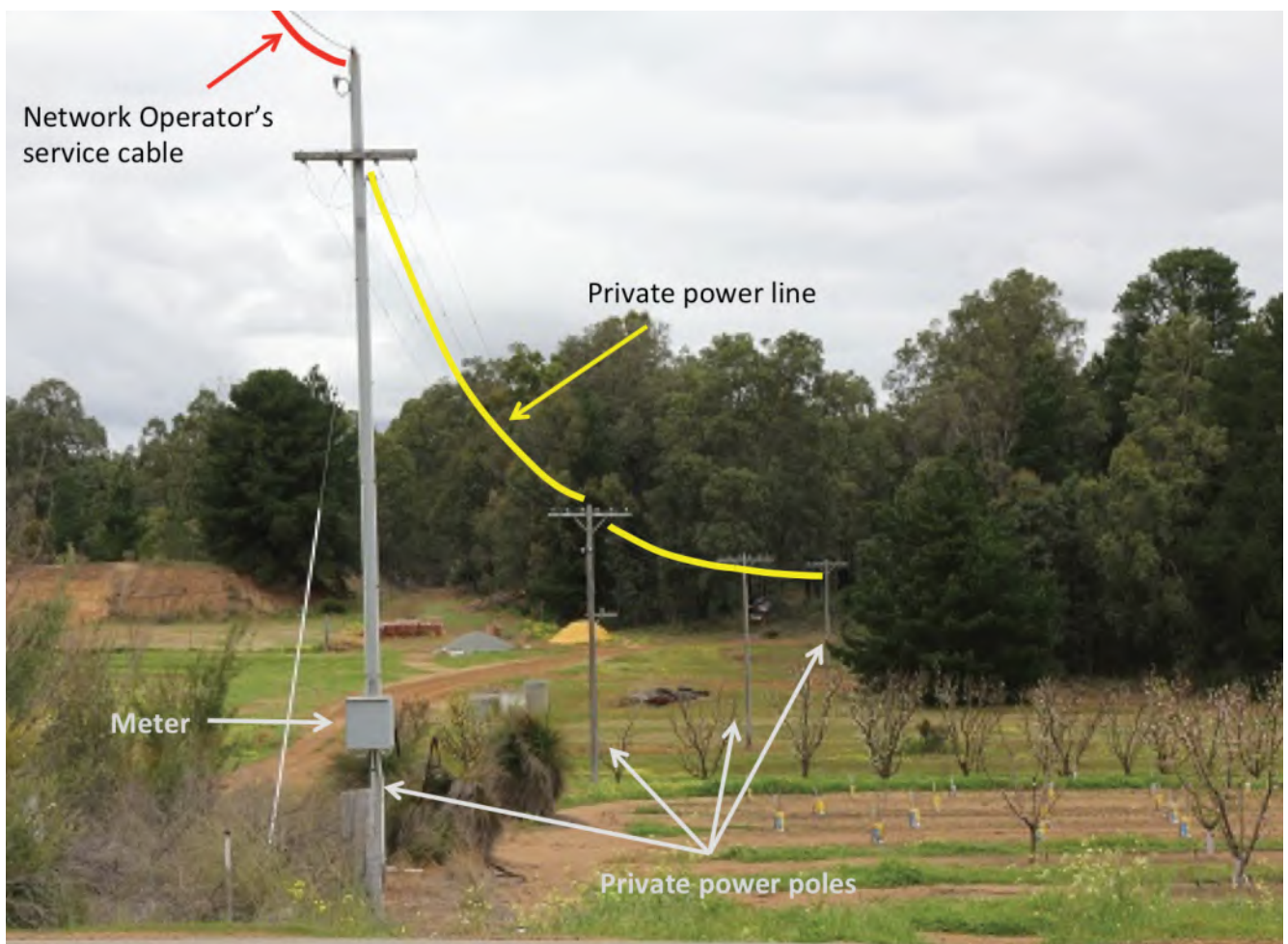


Figure 1 - Typical rural private overhead power line and private poles

<sup>1</sup>For example, water pumps.



Figure 2 - Typical urban residential private poles supporting network operator's service cables

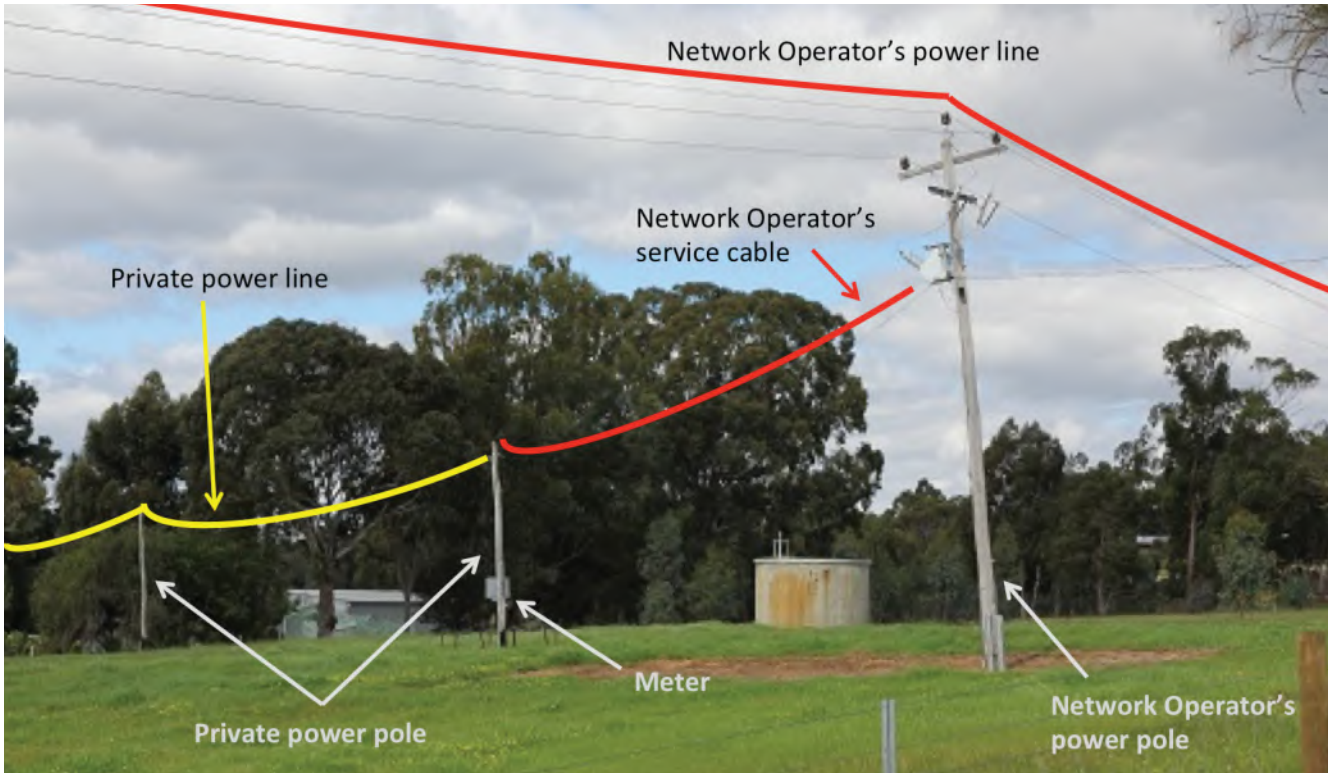


Figure 3 - Typical rural arrangement – network operator's power line transversing private property and private power line connection

## 1.2 Responsibilities

Property owners have a duty of care under Common Law to ensure that the assets on their property are constructed and maintained in a manner that does not present a safety risk to occupants, adjacent properties and their occupants or the wider community. These assets include any private overhead power lines or private power poles installed on the property.

Property owners should maintain all electrical equipment that they are responsible for in a safe and serviceable condition in order to reduce the risk of:

- injury or electrocution of residents or members of the public;
- a fire on the property or causing a bushfire; and
- adversely affecting the quality of electricity supply to other consumers.

Construction and maintenance of private overhead power lines will generally constitute electrical work and must be carried out by licensed electrical contractors.

## 1.3 Purpose of these guidelines

These guidelines provide information and recommend practices for the safe management of low voltage overhead lines on private property. They do not apply to:

- underground low voltage power lines on private property;
- high voltage (overhead or underground) power lines on private property; and
- Network operators' electrical installations covered by the Electricity (Network Safety) Regulations 2015.

These guidelines complement, and should be read together with, other related documents including (but not limited to):

- Electricity (Licensing) Regulations 1991;
- *WA Electrical Requirements* (WAER) published by Building and Energy;
- the national electrical technical standard AS/NZS 3000:2018, Wiring Rules;
- the Building and Energy publication *Guidelines for the management of vegetation near power lines*; and
- the *Western Australian Distribution Connection Manual* (WADCM) published by Western Power and Horizon Power.

## 1.4 Definitions

For the purposes of these guidelines:

**Low voltage** means an operating voltage of less than 1,000 volts.

**High voltage** means an operating voltage of 1,000 volts and higher.

**Overhead power line** means a power line constructed using aerial electrical wiring (insulated or uninsulated) supported by poles, and associated apparatus.

**Network Operator** has the meaning given in the Electricity (Network Safety) Regulations 2015.

**Point of attachment** means the point at which a network operator's aerial service cable is physically secured on a property owner's structure.

## 2. Technical requirements

All electrical installations (new and subsequent augmentations) must be designed and constructed to a standard consistent with good industry practice, with careful consideration of the ongoing safety of the owner, occupants of the premises and members of the public, integrity of equipment and risks to property.

The detailed technical requirements for the design and construction of private power lines are adequately covered by existing legislation and technical standards and are not repeated in these guidelines.

The relevant documents include, but are not limited to:

- AS/NZS 3000:2018, Wiring Rules;
- AS/NZS 7000:2016, Overhead line design – Detailed procedures;
- the WAER; and
- other network operator technical requirements as set out in the WADCM.

In particular, relevant provisions in the WAER require that:

- new low voltage private power lines should be in the form of underground cables except in extenuating circumstances; and
- where new overhead lines are installed, they must be constructed using only prescribed pole types and insulated conductors.

## 3. Inspection of private overhead power poles and lines

### 3.1 General requirements

Property owners should inspect private power poles and lines at least once a year for any visible signs of deterioration including:

- vegetation growth near or in contact with the power line conductors;
- wood poles which are cracked, damaged, leaning, rotting or attacked by white-ants/termites;
- steel poles showing signs of significant rust and corrosion; and
- obvious defects such as support brackets pulling away from poles/buildings, damaged stay-wires, splits in wooden crossarms, broken strands in wires, damaged insulators or wires hanging much lower than others in the same section.

Private power poles and lines should also be checked for possible damage following significant weather events involving lightning, high winds, heavy rain and/or extremes of cold and heat.

If property owners identify any apparent defects, they should promptly arrange for further detailed inspection and/or repairs by a licensed electrical contractor.



### 3.2 Detailed inspection requirements

The following sections provide recommended practices for inspection of private power lines and their primary components **by electrical contractors**.

#### 3.2.1 Vegetation clearance

- Trees and branches must be maintained at least two metres away from bare power line conductors (Fig 4). Pruning vegetation within two metres of conductors must be carried out either with the electricity switched off or by using a competent vegetation control service provider<sup>2</sup>.

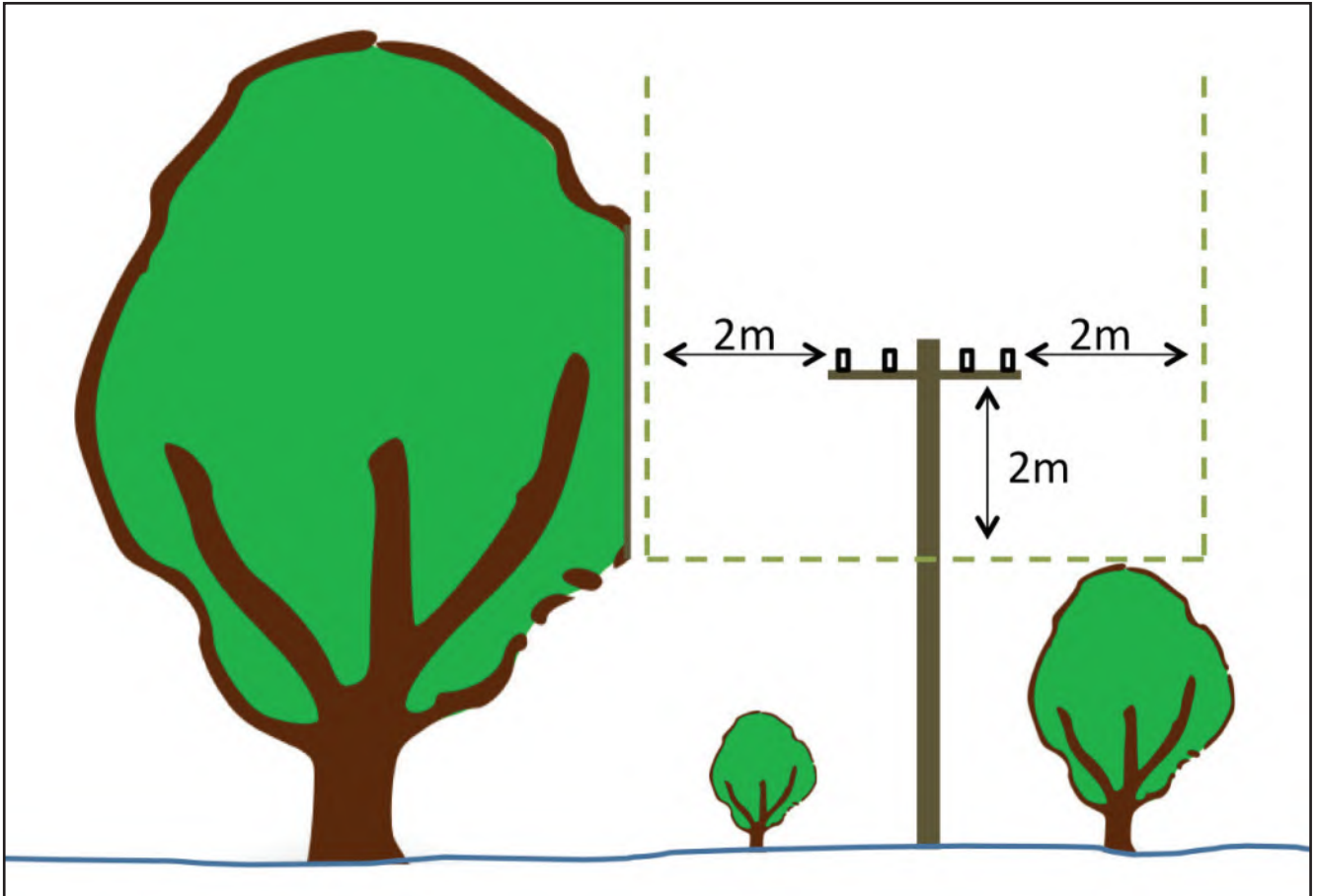


Figure 4 – Vegetation minimum clearance profile

- Safely remove any vegetation close to the base of all power poles and under the power lines to minimise the risk of starting fires or propagating ground fires.
- Further detailed information is provided in the Building and Energy publication *Guidelines for the management of vegetation near power lines* (see [www.dmirs.wa.gov.au/building-and-energy](http://www.dmirs.wa.gov.au/building-and-energy)).

#### 3.2.2 Power poles

Private power poles vary in type, with different life expectancies, and may be:

- hardwood (e.g. jarrah);
- softwood (e.g. pine); or
- steel (tubular or lattice).

<sup>2</sup>Check the Yellow Pages or contact the Tree Guild of WA for a list of trained contractors.

If poles have been in service for longer than their expected life, there is a strong possibility that they are no longer safe, even though there may be no obvious evidence of deterioration. Also, the life-expectancy of wood poles can vary significantly depending on their uses, species, climatic conditions and the location's soil properties. If there are any doubts about the strength of any pole, it should either be replaced or an expert assessment should be sought from a civil/structural engineer or asset management company.

If the poles are timber:

- They should be inspected for obvious defects such as ground line rot, large cracks, splitting or excessive leaning.
- It is important to determine the species of the timber and age of the poles (where possible) to determine the appropriate treatment of any defects.
- If the poles are made of **sawn timber**, they should be **replaced immediately**. Sawn timber should not be used to support power lines because of the high risk of deterioration and early failure.
- If termites/white ants are detected during an inspection, prompt treatment should be sought from a white ant inspector/pest controller. If damage is significant, the pole should be replaced.
- In some cases, ground-line reinforcements using galvanised steel supports can be used to extend the life of wood poles. However, this work must only be performed by asset management companies specialising in such services. Electrical contractors must not attempt to reinforce poles unless they can certify that the reinforced poles satisfy the structural properties prescribed in Appendix D of AS/NZS 3000:2018.



Figure 5 – Typical reinforcement of timber poles with steel supports

For hardwood poles:

- The difficulty in assessing the extent of internal deterioration and rotting in wood poles makes age-based replacements the only reliable option.
- If the poles are hardwood such as jarrah and are likely to have been in service for more than 25 years, they should either be replaced or structurally reinforced (where feasible).



Figure 6 - Complete failure of Jarrah wood pole due to decay/rot at ground line

For softwood poles:

- If the poles are softwood such as treated pine, the manufacturer or supplier should be contacted (where possible) to determine their life expectancy. If they have exceeded the service life prescribed by the manufacturer, they should either be replaced or structurally reinforced.

Where poles are steel:

- The life expectancy of steel poles is 30 years or more, depending on soil conditions, and provided they are galvanised and have well-constructed concrete footings. The correct installation method is for the footing to be finished at 100mm above ground level and shaped to shed water, as shown in Figure 7 below (refer AS/NZS 3000:2018 Appendix D2 Note 3(b)).
- However, all steel poles are subject to corrosion and should be checked. Where the concrete footing is not above ground level, there is a higher risk of below ground corrosion.



Figure 7 - Correct installation of steel pole with concrete footing finished above ground

### 3.2.3 Cross-arms

Cross-arms should be free from deterioration such as splitting, termite attack or fungal rot.



Figure 8 – A badly split low voltage crossarm

### 3.2.4 Spreaders

Spreaders in low voltage lines with bare conductors should be in sound condition and correctly installed.



Figure 9 - Low voltage spreader in good condition

### 3.2.5 Stays

Stays should be free of any visible damage or deterioration and the integrity of the following elements confirmed:

- Above ground:
  - ☒ stay wire;
  - ☒ insulator (where applicable); and
  - ☒ preformed or bolted wire terminations.
- Below ground:
  - ☒ no in-ground corrosion of anchor; and
  - ☒ no slippage of the anchor (indicated by a leaning pole).



Figure 10 - Stay insulator correctly installed and in good condition

### 3.2.6 Conductors

Electrical conductors should be free of:

- Deterioration or any visible signs of damage such as:
  - broken wire strands;
  - burn marks caused by clashing conductors or contact with vegetation;
  - severe corrosion and any loss of cross section; and
- if any of the insulation is missing or damaged, the exposed wire may be live. Contact could be fatal, and vegetation touching the bare conductor is more likely to start a fire. Damaged insulated conductors should be replaced, not repaired, so that the safety of the installation is not compromised.



Figure 11 - Broken conductor strand clearly visible

- Conductor-to-conductor clearance: Clashing bare conductors are a fire risk and can damage the conductors. Clearance between bare conductors must be maintained to reduce the risk of them clashing during windy weather. Table 3.10 of AS/NZS 3000:2018 prescribes the minimum spacing between conductors. In some cases, larger cross arms or spreaders may be required to increase or maintain the conductor clearance.
- Out of sag: If one conductor hangs much lower than the others on the same span, they are 'out of sag'. Conductors may become out of sag if the cross arms or king bolt on the pole have deteriorated, if the pole has twisted, or if the conductors were struck by tree limbs or machinery.
- Conductor ground clearance and tension: Contact with overhead conductors can be fatal. To ensure safety, conductors must meet minimum height requirements as prescribed in Table 3.8 of AS/NZS 3000:2018. Options to improve ground clearance are to untie and re-string conductors or install additional poles.
- Conductor building clearance: Minimum distances between buildings and conductors are essential to reduce the risk of accidental contact. Ensure structures have not been erected next to or underneath any power line which compromise clearances. If clearances cannot be achieved, installing an underground service may be an option. The minimum clearances to a building, structure, ground or elevated area are provided in Table 3.8 of AS/NZS 3000:2018.

### 3.2.7 Insulators

Insulators should be free of cracks or chips and broken wire ties.

### 3.2.8 Hardware and fixings

Mounting brackets should be structurally sound and not pulling away from the pole(s) or buildings. Steel components that are corroded significantly should be replaced.

### 3.2.9 Connections and joints in aerial conductors

- All electrical connections and joints must comply with Clause 3.7 of AS/NZS 3000:2018.
- Any defective metallic preformed terminations ('twisties') on insulated service leads must be replaced.
- Damaged or corroded mains connection boxes should be repaired or replaced.



Figure 12 - Example of aged conductor joints and ongoing safety risk

### 3.2.10 Cable supports

All cable supports must comply with Clause 3.9.3 of AS/NZS 3000:2018.

### 3.2.11 Switchboards

- Switchboards must be free of any visible damage/deterioration and comply with Clause 2.9 of AS/NZS 3000:2018.
- The correct sub-main fuse sizes must be installed.

#### 4. Refurbishment options for existing lines and poles

If the power poles on a property have exceeded their serviceable life or if the overhead power line needs substantial repair, options for remedial treatment include:

- 1) replacing the overhead line with an underground cable. This option is safer, requires less maintenance and vegetation clearance is not an issue. Refer to section 3 of the Wiring Rules for guidance;
- 2) replacing defective poles with new poles of the types prescribed in the WAER and/or replacing defective bare conductors with insulated conductors; or
- 3) reinforcing existing timber poles at the ground line with galvanised steel supports. This approach will depend on detailed assessment of the condition of the poles at and above the ground line. Installation of structural supports should only be undertaken by an asset management company specialising in such activities.

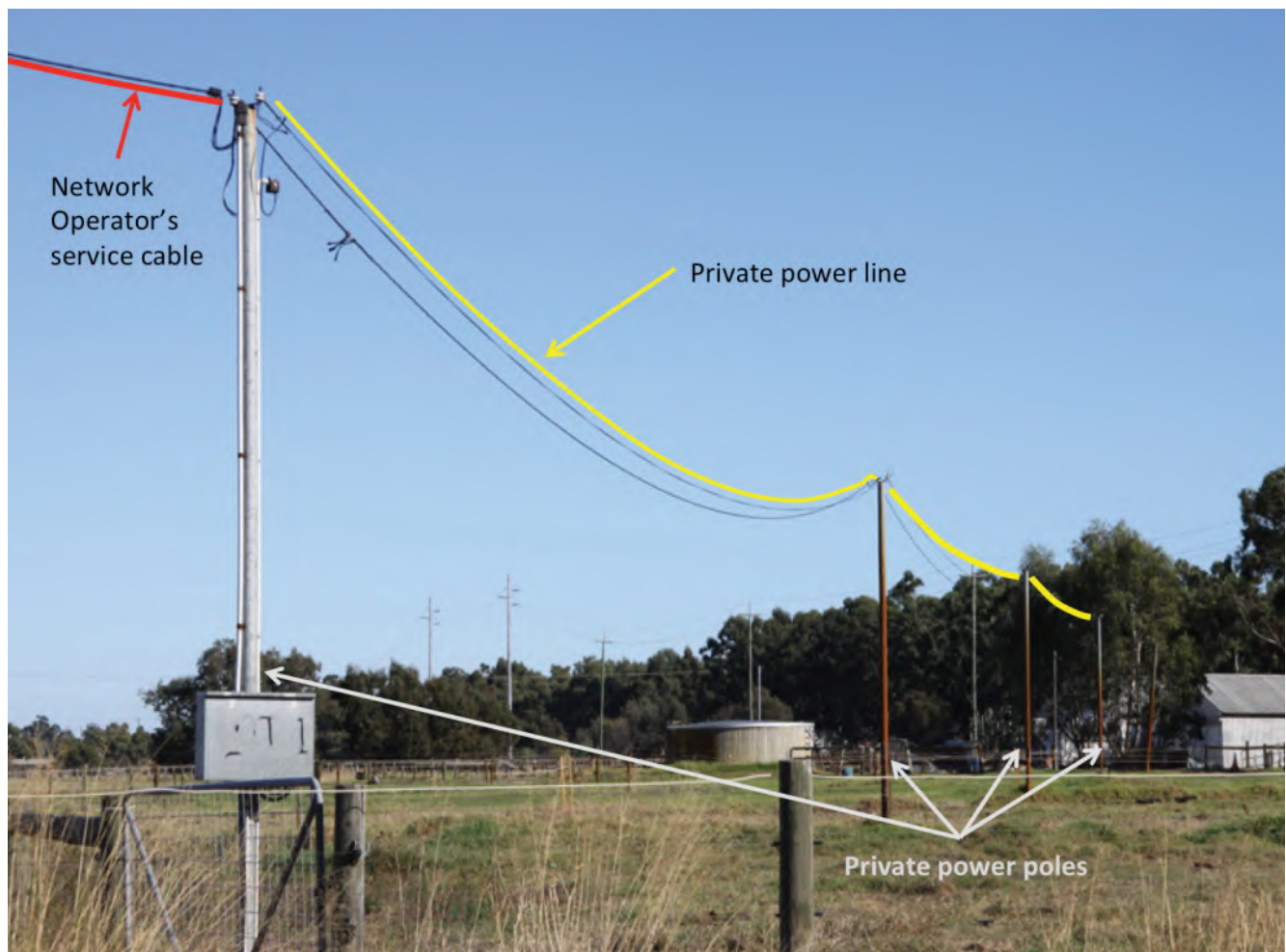


Figure 13 - Example of private line using steel poles and insulated conductors



## 5. New construction options

The technical requirements for new privately owned low voltage power lines and poles are set out in Sections 3.7 and 4.6 of the WA Electrical Requirements (WAER).

The WAER states that all new privately owned low voltage power lines should be in the form of underground cables to maximise the safety of property and people. However, it is acknowledged that this may not be practical or cost-effective in some circumstances.

For example:

- if it is difficult and expensive to install underground cables in ground conditions that are predominantly rock; and
- for long line lengths, underground cables may be cost prohibitive.

Installation of a new overhead line is justified where such circumstances can be demonstrated.

However the WAER requires that only prescribed pole types and insulated overhead electrical wires are used for constructing new, or replacing existing overhead lines.

The prescribed pole types are:

- timber poles treated with Copper Chrome Arsenic (CCA) wood preservative;
- fibre reinforced cement poles; or
- galvanised steel poles.

Sawn timber poles, untreated<sup>3</sup> timber poles (both hardwood and softwood) and bare electrical wiring are no longer permitted for new lines and replacements.

## 6. Private pole selection guide

- 1) Poles on private property that support the network operator's service cable should comply with the network operator's technical requirements. At the time of publication of these Guidelines, all network operators required these poles to be galvanised steel.
- 2) For all poles other than those used for supporting the network operator's service cable, the choice between galvanised steel, fibre reinforced cement and CCA treated timber poles is the decision of the property owner<sup>4</sup>.
- 3) Where CCA treated timber poles are used, it is recommended that all poles are covered with a fire protection coating from 400mm below to 1.8 metres above the nominal ground line, as shown in Figure 16, to reduce the risk of damage from low intensity ground fires.

<sup>3</sup> Not treated with CCA preservative

<sup>4</sup> Advice should be sought from a licensed electrical contractor

16 Safe management of private power poles and lines

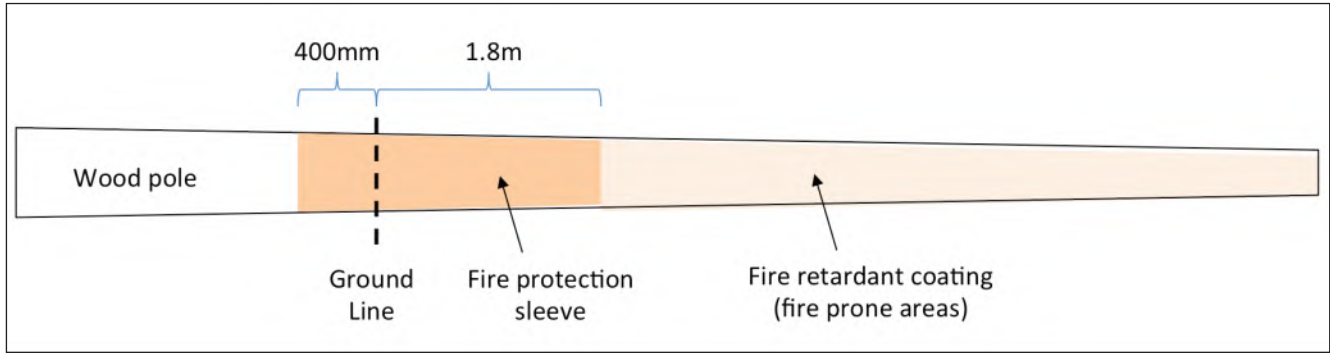


Figure 14 Wood pole fire protection details

- 4) Where galvanised steel poles are used in areas of known (or suspected) corrosive soil conditions, it is recommended that:
- (a) an additional corrosion protection coating is applied from the base of the pole to 200mm above the nominal ground line; and
  - (b) the minimum standard of the coating is a paint system equivalent to System 31 (two pack epoxy) in Table 7.1 of AS/NZS 2312.2:2014<sup>5</sup>.

Typical ground conditions likely to be highly corrosive to steel include:

- saline soils; or
- low lying areas subject to seasonal flooding and/or with a high water table.

- 5) The following Figures 15 and 16 illustrate the recommended application of pole options in different areas of the State:

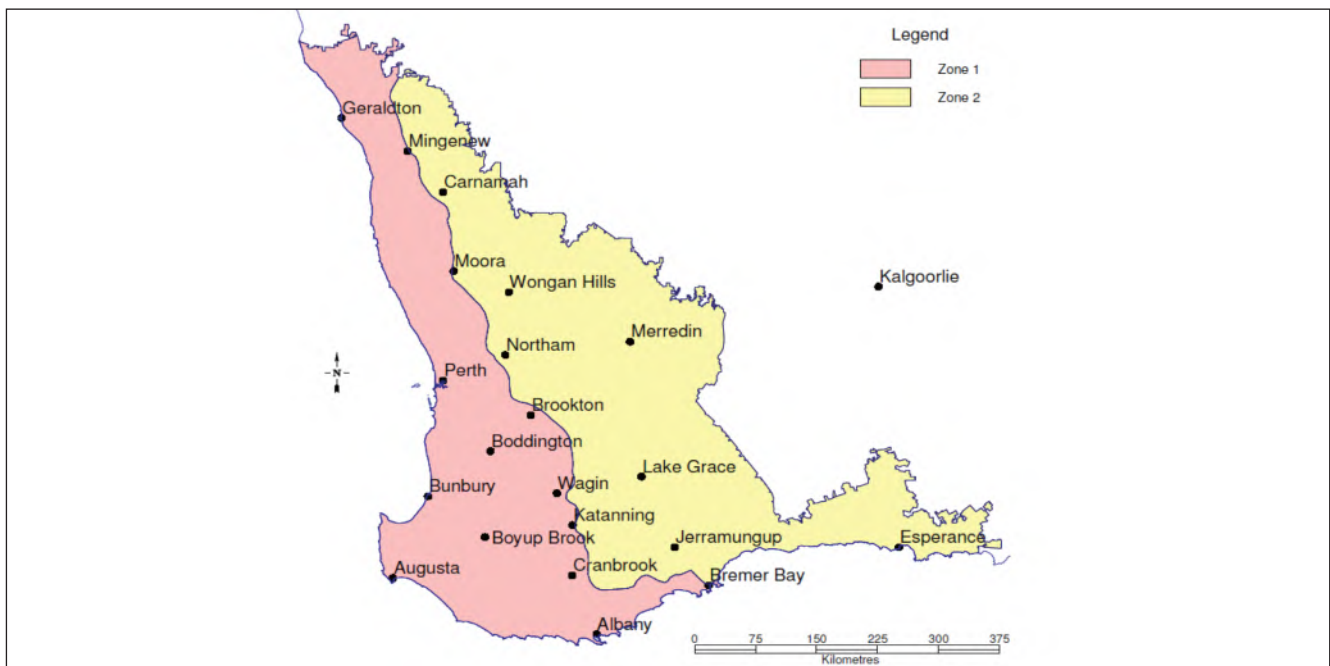


Figure 15 Recommended pole application zones

<sup>5</sup> Guide to the protection of structural steel against atmospheric corrosion by the use of protective coatings Part 2: Hot dip galvanising

## Zone 1

This area is characterised by predominantly benign soils and low lying areas subject to seasonal flooding.

## Zone 2

This area is characterised by widespread saline soil conditions.

## Rest of the State

This area is characterised by highly variable soil conditions.

LOCATION	LOCAL GROUND CONDITIONS	RECOMMENDED POLE TYPES			
		Galvanised steel	Galvanised steel with corrosion protection coating	Fibre reinforced cement	CCA treated timber with fire protection sleeve
ZONE 1	Well drained soil	✓		✓	✓
	Saline soil or low lying area subject to seasonal flooding		✓	✓	✓
ZONE 2	All soils		✓	✓	✓
REST OF THE STATE	Well drained soil	✓		✓	✓
	Saline soil or low lying area subject to seasonal flooding		✓	✓	✓

\*Note: In fire prone areas, application of a fire retardant to exposed timber surfaces above ground is also recommended.

Figure 16 Recommended pole application guide

## 7. Regulatory requirements

The Electricity (Licensing) Regulations 1991 require that:

- Under Regulation 62(1), any defects found in an electrical installation (including private power lines and poles) which render the installation unsafe must be reported by the electrical contractor to both the property owner and the network operator.
- For any notifiable electrical work (including new or modified private power lines and poles), Regulations 51 and 52 require the electrical contractor to submit a Preliminary Notice and Notice of Completion to the relevant network operator.
- Under Regulation 52B, the electrical contractor must provide an Electrical Safety Certificate to the property owner for any electrical work performed (both notifiable and minor work).

NOTE: The property owner should also be advised that submission of the Notice of Completion may trigger a formal inspection of the electrical installation by the network operator.

## **8. Further information**

Any questions about the ownership of the overhead power lines and poles on private property should be directed to the relevant network operator:

Western Power – 13 10 87

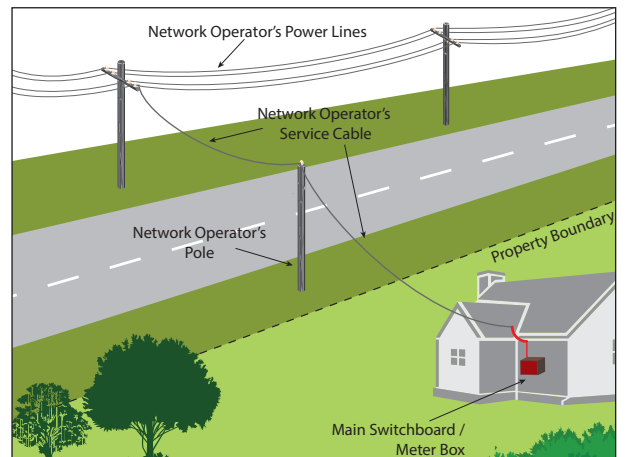
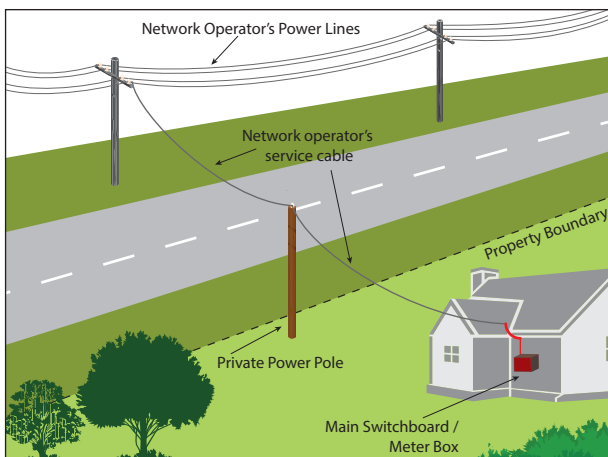
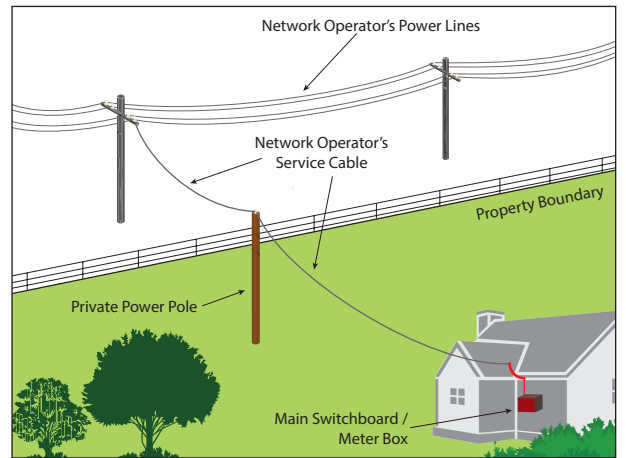
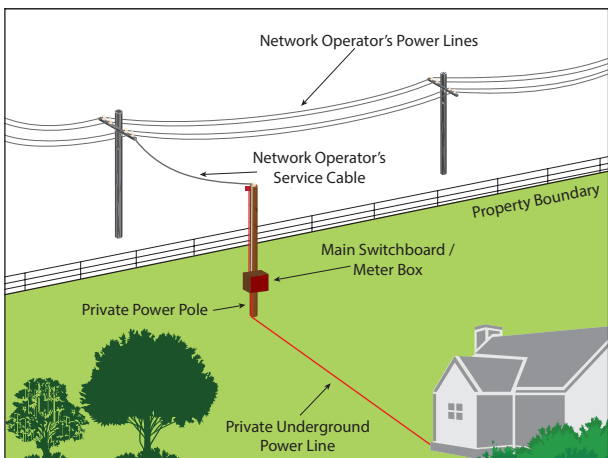
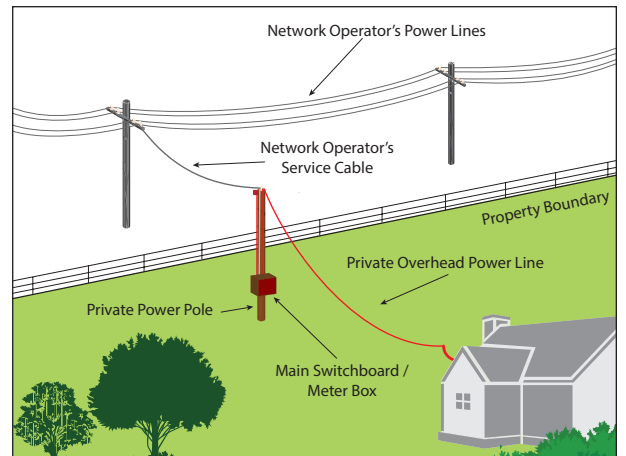
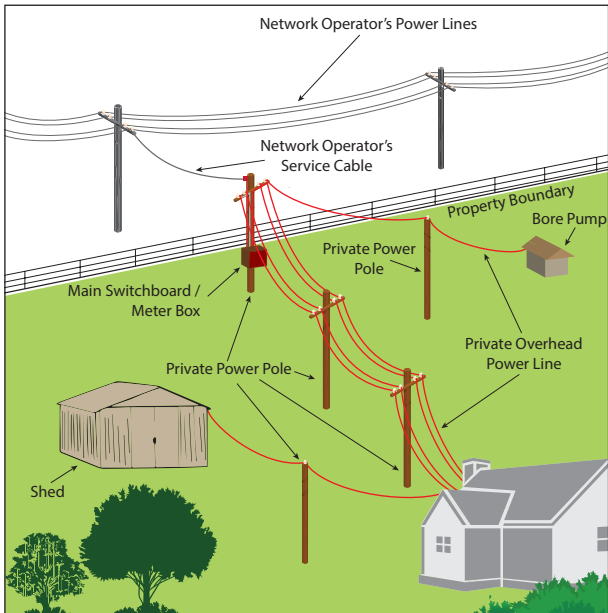
Horizon Power – 1800 267 926

Rio Tinto – 1800 992 777

BHP – Newman 1300 632 483

# Appendix

A number of common private power line arrangements are shown in the following diagrams, for information only:



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