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BUSHFIRE RISK ASSESSMENT REPORT

SITE ADDRESS

Lot 12 DP 25143
House No.: 220
Powderworks Road
INGLESIDE NSW 2101

OWNER/S

Bubalo

BUILDER

Mojo Homes
Level 4, 62 Norwest Boulevard
BAULKHAM HILLS NSW 2153

ASPECT

North & East

PROPOSAL

Construction of a two storey dwelling

yours locally

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1.0 EXECUTIVE SUMMARY

As required by Northern Beaches Council a bushfire risk assessment of the proposed dwelling has been carried out in accordance with the procedures and requirements outlined in the documents *Planning for Bushfire Protection* (2019) as issued by the NSW Rural Fire Service. A summary of the findings of this assessment is provided below. Subject to the recommendations proposed in this report, the proposed development has the potential to reasonably address and comply with the aims and objectives of *Planning for Bushfire Protection* (2019).

SITE ADDRESS			
Lot 12 DP 25143 House No.: 220 Powderworks Road INGLESIDE NSW 2101			
IDENTIFIERS			
Latitude: -33.690969 Longitude: 151.273486			
ASPECT			
North & East			
VEGETATION TYPE			
NORTH Remnant Vegetation	EAST Remnant Vegetation	SOUTH Managed Land	WEST Managed Land
EFFECTIVE SLOPE			
NORTH Flat / Upslope	EAST 0-5° Downslope	SOUTH N/A	WEST N/A
FIRE DANGER INDEX			
100			
ASSET PROTECTION ZONE SETBACKS			
ELEVATION	ASSET PROTECTION ZONE	INNER PROTECTION AREA	OUTER PROTECTION AREA
NORTH	11m	0m	0m
EAST	14m	0m	0m
SOUTH	14m	0m	0m
WEST	11m	0m	0m
SETBACK TO VEGETATION			
NORTH 44m	EAST 91m	SOUTH 140m	WEST 140m
BUSHFIRE ATTACK LEVEL			
NORTH BAL-12.5	EAST BAL-12.5	SOUTH BAL-12.5	WEST BAL-12.5

2.0 PROJECT BRIEF

We have been engaged by Mojo Homes Pty Ltd to assess the threat posed to the subject development in the event of a bushfire. Current fire maps prepared by Northern Beaches Council in accordance with the requirements of Section 10.3 of the *Environmental Planning and Assessment Act 1979* (as amended) (EPAA) indicate that the proposed development is situated within a 'Bushfire Prone Area' (BPA).

The aims of this report are:

- To identify the Bushfire Attack Level (BAL) to which the proposed dwelling may be exposed;
- To determine the construction requirements associated with the assessed BAL as defined in *AS3959-2018: Construction of buildings in bushfire prone areas*; and
- To recommend 'deemed-to-satisfy' solutions for meeting the performance criteria of bush fire protection measures indicated in *Planning for Bush Fire Protection* (2019)

This report will supplement the Statement of Environmental Effects submitted to Northern Beaches Council as part of the Development Application. It has been prepared in accordance with the procedures and requirements contained within the NSW Rural Fire Service (RFS) document *Planning for Bushfire Protection* (2019).

The report relies upon the following information:

- Inspection of the site;
- Details of the proposed dwelling provided by Mojo Homes Pty Ltd (See Appendices)

3.0 THE PROPOSED DEVELOPMENT

The proposed development is a dwelling that includes a family room, dining area, kitchen, bedrooms with bathrooms and garage. The construction of the dwelling will include a slab, with frames and roof covering on trusses. A veneer with roof covering with metal fascia and guttering will form the façade of the dwelling.

A rainwater tank is to be located on site to collect rainwater from the roof area. This water will be used in accordance with the requirements of the BASIX certificate prepared for the development.

4.0 SITE ASSESSMENT

The site is located in suburb of Ingleside within Northern Beaches Local Government Area and is situated on Powderworks Road, that will provide access to the property. The site immediately borders onto similar sized, managed allotments on the eastern, southern and western boundaries of the allotment. The northern boundary is adjacent to the public roadway. The vegetation to the east of the allotment was measured to be within 100m, and poses a significant threat in the event of a bushfire.

The subject allotment is rectangular in shape, with the site having a downward slope from the front of the property to the rear. At the time of the site inspection there were existing structures on the site, with the plans supplied being consistent with the conditions on the allotment.

All aspects of the site are adjacent to similar allotments that will be built on or public infrastructure assets such as roadways and footpaths. These properties and assets present reduced vegetation forms (i.e. maintained lawns and gardens) as well as areas of non-vegetation (i.e. dwellings, roads, paths, ancillary structures) and as such, are not considered to harbour any predominant vegetation formations which are described in the *Planning for Bushfire Protection* (2019). Any future developments within this area should also come under the relevant planning codes and restrictions in accordance with the appropriate planning policy and should present similar landscaping to the surrounding developments with ongoing management by the property owners.

An aerial photograph of the vegetation which affects the proposed development is shown in Figure 1. This immediate vegetation encompasses an area over multiple hectares. Figure 2 shows the allotment boundaries of the subject lot in the context of the subdivision.

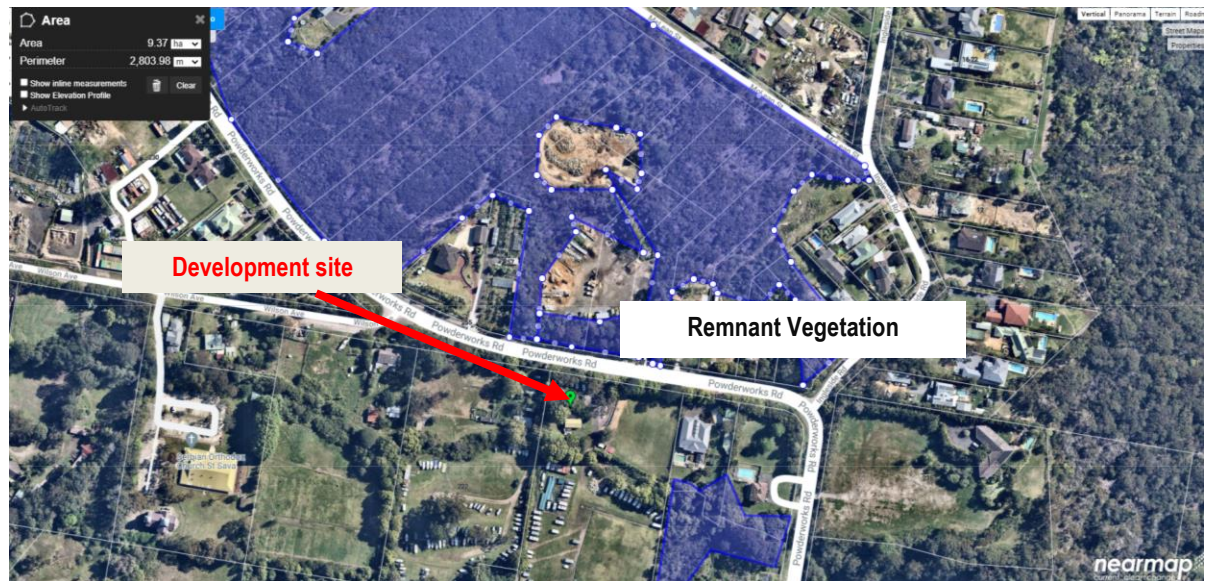


Figure 1 – Predominant Surrounding Vegetation Area Mapping (NearMap 2020)



Figure 2 – Boundaries of the subject allotment and the larger subdivision context (SixMaps 2020)

4.1 Asset Protection Zones

Planning for Bushfire Protection (2019) recommends that an Asset Protection Zone (APZ) be established and maintained on the hazard side of buildings in bushfire prone areas. As the proposed development will be near vegetation that poses a risk to the development, APZs will be required to be put into place and maintained around certain elevations of the proposed dwelling, with the sizes of these APZs based on vegetation composition, effective slope and fire danger index.

4.1.1 Vegetation Type

The predominant vegetation formations located within 140m of the proposed development have been determined in accordance with the provisions of Appendix A1.2 of the *NSW RFS Planning for Bushfire Protection (2019)* and Keith (2004) and are provided in Table 4.11.1.

Table 4.1.1 Vegetation Type							
NORTH		EAST		SOUTH		WEST	
Remnant Vegetation		Remnant Vegetation		Managed Land		Managed Land	

The predominant vegetation affecting the subject allotment is present to the northern and eastern boundaries of the site, and was first classified using Keith (2004). The classification of 'best fit' using the Key *An identification key to the vegetation formations of New South Wales and the Australian Capital Territory* was determined to be a 'Sydney Coastal Dry Sclerophyll Forest' (Keith 2004, pp.146-147). This opinion is based on observations at the time of the site inspection that the vegetation is being dominated by eucalyptus trees with a prominent layer of sclerophyllous shrubs in the understorey. A sparse ground cover of grasses was present.

As given in *Clause A1.2 of Planning for Bushfire Protection (2019)* 'Determining Vegetation Formation' this vegetation is classified as a 'Dry Sclerophyll Forest with shrub sub-formation'. This is due to the vegetation composition being dominated by eucalypts 10-30m tall with crowns that touch or overlap that has 20-50% foliage cover. There is also a sparse distribution of shrubs which is predicted to be composed of a surface fuel load of 22 tonnes per hectare [t/ha], and an overall fuel load of 36.1 t/ha (*Table A1.12.8 NSW RFS Planning for Bushfire Protection (2019)*).

The vegetation areas to the north and east of the proposed development were both classified as 'remnant' under *section A1.11.1 of Planning for Bushfire Protection (2019)* at the time of inspection. The area to the north had a potential fire run less than 50 metres in width and the area to the east is a size less than 1 hectare.

Figures 11 and 12 were taken during the site inspection on 8th November 2021 and support the opinion provided above. Figures 3-10 of this report show all aspects of the subject allotment, and were also taken at the time of the site inspection.

The fuel categories in the *Planning for Bushfires Protection (2019)* are described using botanical terminology, such as "Forest" and "Grassy Woodland". It should be noted that when used for bushfire hazard assessment these terms refer to the fuel production capacity and flammability of different vegetation types. Therefore, their meaning and application for bushfire hazard assessment may differ from their use in a strictly botanical context.



Figure 3: Northern aspect



Figure 4: North-Eastern Aspect



Figure 5: Eastern Aspect



Figure 6: South-Eastern Aspect



Figure 7: Southern Aspect



Figure 8: South-Western Aspect



Figure 9: Western Aspect



Figure 10: North-Western Aspect



Figure 11: Vegetation to the east of the allotment



Figure 12: Vegetation to the north of the allotment

4.1.2 Effective Slope

The intensity and rate spread of fires burning uphill increases markedly with increasing slope. This is reflected in an increase in the fire hazard index for a particular fuel type with an increasing slope. Similarly the rate of spread and intensity of fires decreases when they burn downhill.

Table 4.1.2 below outlines the general slope for 100m underneath the vegetation which affects proposed dwelling. The slope measurements are based on the measurements taken during the site inspection on the 8th November 2021 and plans prepared by Mojo Homes Pty Ltd (Job No. 03353, Issue B, dated 2nd October 2020). The northern and eastern slopes, being the elevations presenting the highest bushfire risk, each have upward and downward sloping gradients that were both measured to fall within the 0-5° range.

Table 4.1.2 Effective Slope					
NORTH	Flat / Upslope	EAST	0-5° Downslope	SOUTH	N/A
				WEST	N/A

4.1.3 Fire Danger Index

The fire danger index (FDI) for the subject site has been determined in accordance with the provisions of Appendix A1.6 of *Planning for Bushfire Protection (2019)* and is provided in Table 4.1.3. This subject site is located within the 'Greater Sydney Region', being within the Northern Beaches Local Government Area (LGA).

Table 4.1.3 Fire Danger Index	
100	

4.1.4 Detemination of Asset Protection Zones

The APZ around the proposed dwelling is required to be made up of Inner Protection Area (IPA) and Outer Protection Area (OPA) as determined by Appendix 1, Table A1.12.2 of *Planning for Bushfire Protection (2019)* and is designed to provide a safe defendable space in the event of bushfire for the property owner and fire fighters. As such, the recommendation is that the APZ be provided in accordance with those outlined in Table A1.12.2 of Appendix 1 of *Planning for Bushfire Protection (2019)*. These APZ's are outlined in Table 4.14.1 below:

Table 4.1.4 Asset Protection Zone Setbacks			
ELEVATION	ASSET PROTECTION ZONE	INNER PROTECTION AREA	OUTER PROTECTION AREA
NORTH	11m	0m	0m
EAST	14m	0m	0m
SOUTH	14m	0m	0m
WEST	11m	0m	0m

The recommended APZ can be established within the boundaries of the allotment to any elevation. These managed areas would provide a safe, operational space for emergency services in the event of a bushfire.

Landscaping within the APZ should aim to achieve a state that results in the fuel source being discontinuous and of low flammability in the event of a bushfire. General requirements for an APZ are listed in *Section 7.4. of NSW RFS Planning for Bushfire Protection (2019)*, *Appendix 1* and *Appendix 4 of Planning for Bushfire Protection (2019)* and the NSW RFS document '*Standards for Asset Protection Zones*' (2005) (See Report Appendices); in particular '*Step 6: Ongoing Management and Landscaping*'. These requirements should also be adhered to around the property where possible.

The on-going maintenance of the property's APZ should continue throughout the life of the development to ensure that the landscaping does not contribute to the spread of bushfires.

4.2 Bushfire Attack Level

4.2.1 Vegetation Types

The methodology for the classification of the vegetation type used for determining the bushfire attack level is the same as that used in the assessment of the Asset Protection Zone. As such reference is drawn to Section 4.1.1 of this report. The results of this assessment are provided in Table 4.1.1.

4.2.2 Effective Slope

The methodology for the identification of the effective slope beneath the vegetation used for determining the bushfire attack level is the same as that used in the assessment of the Asset Protection Zone. As such reference is drawn to Section 4.1.2 of this report. The results of this assessment are provided in Table 4.1.2.

4.2.3 Fire Danger Index

The methodology for the classification of the Fire Danger Index used for determining the bushfire attack level is the same as that used in the assessment of the Asset Protection Zone. As such reference is drawn to Section 4.1.3 of this report. The results of this assessment are provided in Table 4.1.3.

4.2.4 Determination of Bushfire Attack Level

The setbacks to the predominant vegetation at each elevation is indicated in Table 4.2.4.

These distances were measured at the time of undertaking the site inspection using a laser measuring unit and measuring wheel, then subsequently validated against plans provided as part of the application.

Table 4.2.4 Setback to Vegetation					
NORTH	44m	EAST	91m	SOUTH	140m
		WEST			140m

In accordance with the Table A1.12.5 of *Planning for Bushfire Protection (2019)*, the all elevations of the proposed dwelling have been determined as being located within an area where attack by burning debris is significant with radiant heat levels not greater than 12.5kW/m². Radiant heat is unlikely to threaten building elements. Specific construction requirements relating to ember protection and accumulation of debris are warranted. All elevations of the proposed dwelling must be built to Bushfire Attack Level 12.5 (BAL-12.5) construction requirements.

Table 4.2.5 Bushfire Attack Level					
NORTH	BAL-12.5	EAST	BAL-12.5	SOUTH	BAL-12.5
		WEST			BAL-12.5

4.2.5 Construction standards

Table 4.2.5 Bushfire Attack Level

NORTH	BAL-12.5	EAST	BAL-12.5	SOUTH	BAL-12.5	WEST	BAL-12.5
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Section 7.5 of *Planning for Bush Fire Protection (2019)* adopts additional construction requirements relevant to the BAL-12.5 elevations of this development. The requirements to be adhered to, where relevant, are in table 7.4b.

The construction requirements for a BAL-12.5 rating are given within Sections 3 and 5 of AS 3959-2018: *Construction of Buildings in Bushfire Prone Areas (2018)* and where relevant, Section 7.5 of *Planning for Bush Fire Protection (2019)*.

The assessed BAL requires compliance with Construction Guidelines outlined in Sections 3 and 5 of AS 3959-2018: *Construction of buildings in bushfire-prone areas/the Nash Standard*, incorporating any relevation variations from Section 7.5 of *Planning for Bush Fire Protection (2019)*.

5.0 SPECIFICATIONS AND REQUIREMENTS

In order to minimise the risk of bush fire attack and provide protection for emergency services, personnel, residents and others assisting fire fighting activities, a number of protection measures should be integrated into the development. These specifications and requirements are to be provided in accordance with the requirements of Clause 7.4 of the NSW Rural Fire Service document *Planning for Bushfire Protection (2019)*.

5.1 Asset Protection Zones

The performance criteria for asset protection zones are satisfied if the area is provided in accordance with *Appendix 1* and managed in accordance with *Appendix 4* of *Planning for Bush Fire Protection (2019)*. Recommendations related to asset protection zones are outlined in Section 6.

5.2 Access Requirements

Public Road Access



Figure 13 – Access route for fire fighting vehicles and evacuation route for occupants (NearMap 2020)

The route of travel for the Rural Fire Service or the NSW Fire Brigade to reach the subject site is an all weather two-way access road that is 8 metres wide. The road is capable of carrying loads of 15 tonnes. Streets are clearly sign posted and the subject site will be clearly identifiable by numbering. Figure 13 shows that potential access and egress to the site can be found along Powderworks Road. These roadways are deemed to provide safe operational access and egress for emergency service personnel and residents, and meet the access requirements of *Appendix 3 of NSW RFS Planning for Bushfire Protection* (2019).

Property Access

The proposed dwelling has ready access to the public roadway. The driveway access is proposed to be sealed concrete, which will provide a non-combustible all weather access way to allow reasonable vehicular access (including fire fighting vehicles) to the premises with suitable turning areas in accordance with the requirements of *Appendix 3 of NSW RFS Planning for Bushfire Protection* (2019).

5.3 Water Requirements

Water Supply

The site has access to a reticulated water system, with access to a hydrant point for firefighting services within 60m of the proposed dwelling. The installed system is assumed to have been assessed and installed as per NSW Rural Fire Service requirements as given within *Planning for Bushfire Protection* (2019), including appropriate pressurizing and access points. Figure 14 displays the location of the closest hydrant point in relation to the subject site.



Figure 14 – Closest hydrant point location in relation to the subject site.

Electrical Services

It is the intention of the proposed development to be serviced by registered electrical providers who have appropriate means of servicing bushfire prone areas. All electrical transmission lines were noted to be underground.

Gas Services

The location of gas services shall not lead to the ignition of surrounding bush land or the fabric of buildings. Metal connections are only to be used.

5.4 Construction Standards

This proposed development is located within an area that has been determined as being bushfire prone. Based off setback measurements and vegetation classification acquired during the site inspection on the 8th November 2021, and plans for the development as supplied by Mojo Homes Pty Ltd, a Bushfire Attack Level of **BAL-12.5** has been assigned for **all elevations** of the proposed dwelling.

Section 7.5 of *Planning for Bush Fire Protection (2019)* adopts additional construction requirements relevant to the BAL-12.5 elevations of this development. The requirements to be adhered to, where relevant, are in table 7.4b.

The construction requirements for a BAL-12.5 rating are given within Sections 3 and 5 of AS 3959-2018: *Construction of Buildings in Bushfire Prone Areas (2018)*, incorporating any elevation variations from Section 7.5 of *Planning for Bush Fire Protection (2019)*.

5.5 Landscaping and Maintenance

Landscaping will be designed and managed to minimise flame contact and radiant heat to buildings and the potential for wind driven embers to cause ignition. In addition to maintaining the vegetation onsite, the site should be prepared and maintained in readiness for a bushfire. All landscaping should be carried out on the site in accordance with the NSW RFS publication '*Standards for Asset Protection Zones*' which is given as an Appendix in this report.

6.0 RECOMMENDATIONS

6.1 Asset Protection Zones

1. Landscaping within the Asset Protection and/or defensible space around the dwelling should aim to provide a low flammability, avoid continuity of vegetation (horizontally and vertically), and on-going maintenance. Any plant species can ignite under the right conditions; however, some plants are considered to be less flammable than others. Plants that have a lower flammability have the following features:
 - High moisture content
 - High levels of salt
 - Low volatile oil content of leaves
 - Smooth barks
 - Dense crown and elevated branches.
2. Plants that have a loose stringy bark should be avoided; these plants encourage ground fire and are easily ignited. Noxious weeds should be avoided from being introduced to the garden and should be removed.
3. Consideration should be given to the layout of the garden ensuring that the vegetation does not provide a continuous path to the structure, or placed under vulnerable parts of the building façade such as windows and glazing. To avoid this, plants should be arranged in 'clumps' rather than rows and should be located far enough away from the asset so that if a fire were to ignite in the vegetation, the risk of flame contact and radiant heat ignition of the asset would be reduced. Other aspects that should be considered with designing the layout of a garden within an APZ are as follows:
 - Short green grass located around the asset will reduce an impending fire's intensity and slow the fire and to provide unimpeded access for fire fighters.
 - Branches two (2) metres from the ground should be pruned to prevent the spread of ground fire.
 - Woodpiles, wooden sheds, combustible material, storage areas, large quantities of garden mulch should be stored in a designated area, cleared of vegetation, with no direct contact with the bushfire hazard.

- Fire trails, gravel paths, dams, creeks, swimming pools, tennis courts and vegetable gardens can be incorporated into part of the property's APZ
- 4 Maintenance of the site should involve:
- Maintaining a low cut lawn.
 - Keeping areas under fences, gates and trees raked and clear of fuel.
 - Using non-combustible fencing and retaining walls
 - Not using organic mulch.
 - Ensuring trees to not overhang the roof.

6.2 Access Requirements

8. Residents of this site should consider participating in community early response programs with the Rural Fire Service and education programs.
9. The unnecessary occupation of the street and driveway by vehicles; trailers and the like should be avoided.
10. It is recommended that any proposed rainwater tanks of tanks required by BASIX be repositioned to the rear of the site to avoid any obstruction to personal gaining access to the rear yard.
11. Any proposed gas cylinders should be located to maximize the distance from any heat source and to remove the tanks from presenting an unnecessary obstacle.

6.3 Water Requirements

12. The following notations be included on the architectural plans submitted to the Certifying Authority as part of any application for a Construction Certificate or Complying Development Certificate;
 - Hydrant spacing, design and sizing comply with *AS2419.1:2005*.
 - Hydrant flows and pressures comply with *Table 2.2 of AS2419.1:2005*
 - All above-ground water service pipes external to the building are metal, including up to any taps.
 - Reticulated and bottled gas shall be installed and maintained in accordance with AS 1596.
 - Metal piping shall be used, including connections to and from cylinders.
 - All fixed gas cylinders shall be kept clear of all flammable materials to on distance of 10 meters and shielded on the hazard side of the installation.
 - Release valves to gas cylinders are to be directed away from the building.
 - If the gas cylinders need to be kept close to the building, the release valves shall be directed away from the building. Notwithstanding this fact the proposed location of the gas cylinder should be reconsidered and positioned at the least vulnerable position along the dwelling.
 - Polymer sheathed flexible gas supply lines to gas meters adjacent to the building are not to be used.

6.4 Construction Standards

13. Garage doors (if applicable) should be tight fitting to the doorframe and jambs with gaps no greater than 3mm when closed.
14. All fencing and gates are to be constructed in accordance with the requirements of Section 7.8 of *Planning for Bushfire Protection (2019)*.
15. All windows are required to be screened internally or externally with screens which comply with Clause 5.5.2 of AS 3959-2018.
16. Any external timber on the dwelling or within landscaping features of the property should be of a species listed within *Appendix F of AS 3959-2018*.

6.5 Landscaping & Maintenance

17. All landscaping should comply with the requirements of the NSW RFS 'Asset Protection Zone Standards' contained in Appendix 4 of *NSW RFS Planning for Bushfire Protection (2019)*
18. All fencing and retaining walls are to be constructed in accordance with the requirements of Section 7.8.
19. Remove litter from roof and gardens and ensure the roof materials are in good condition.
20. Ensure painted surfaces are in good condition.
21. Ensure water supplies and any required sprinkler systems are in good working order.
22. Ensure trees and vegetation does not provide an obstruction in the access to the property.

23. Flyscreens should be checked for any damage and replaced if necessary.
24. Ensure draught seals are maintained.
25. Non-combustible gutter and valley guards should be installed on the dwelling to inhibit the accumulation of debris in the gutter system, particularly as the development is within 100m of bushfire threatening vegetation with a high level of tree and leaf debris accumulation over time possible.

6.6 Siting And Design

26. Keep the bulk of the building as small as possible to minimise the extent of exposed surfaces to the threat of bushfire.
27. Minimise the glazing within the building facades or any proposed courtyards.
28. Include gutter guarding to all gutters and any gutter valleys if provided.
29. Ensure that defensible space is provided around the full perimeter of the building.

7.0 CONCLUSION

In conclusion, construction standards for building within bushfire-prone areas are set out in Australian Standard AS 3959–2018: *Construction of Buildings in Bushfire Prone Areas*. *Planning for Bushfire Protection* (2019) provides a procedure for determining the category of bushfire attack and the appropriate level of construction. It is considered that the proposed dwelling is at potential risk warranting a **BAL-12.5 construction**; hence the following requirements should be adhered to:

- All of the elevations of the proposed dwelling are to be constructed so as to comply with a **BAL-12.5 rating** as defined by AS 3959-2018, incorporating any variations outlined in *Section 7.5 of Planning for Bushfire Protection* (2019).
- The implementation of an APZ to the site as recommended within, and to be maintained in accordance with *Standards for Asset Protection Zones* (2005)

Further, the following recommendations are also provided to the development:

- The installation of non-combustible gutter and valley guards on the dwelling to inhibit the accumulation of debris in the gutter system.

Table 7.0 Bushfire Attack Level							
NORTH	BAL-12.5	EAST	BAL-12.5	SOUTH	BAL-12.5	WEST	BAL-12.5

In making any determination under Section 4.14 of the Environmental Planning and Assessment Act, 1979 (as amended) it is recommended that the Consent Authority should give consideration to the recommendations contained in this report.



Craig Hardy

MBA

M.App.Sc.(Env.Toxicology)

B.App.Sc.(Env.Health)

Accredited Certifier – Building Surveying A2 – 0167

BPAD-D Certified Practitioner – 24168

ASSOCIATIONS

Fire Protection Association of Australia

Association of Accredited Certifiers

Australian Institute of Building Surveyors

November 2021

8.0 REFERENCES

- Keith, D.A, & New South Wales. Department of Environment and Conservation & New South Wales. National Parks and Wildlife Service (2004) *Ocean shores to desert dunes : the native vegetation of New South Wales and the ACT*, Hurstville, NSW Dept. of Environment and Conservation (NSW)
- Nearmap Pty Ltd (2020) *PhotoMaps by Nearmap*. Available: <http://maps.au.nearmap.com/>. Last accessed 11th November 2021
- NSW Rural Fire Service (2005) *Standards for Asset Protection Zones*. NSW Rural Fire Service, Lidcombe NSW – Available: http://www.rfs.nsw.gov.au/__data/assets/pdf_file/0010/13321/Standards-for-Asset-Protection-Zones.pdf
- NSW Rural Fire Service (2019) *Planning for Bushfire Protection; A Guide for Councils, Planners, Fire Authorities, Developers and Home Owners*. NSW Rural Fire Service, Lidcombe NSW.
- NSW State Government. (2020). *SixMaps*. Available: <https://maps.six.nsw.gov.au/>. Last accessed 11th November 2021
- Standards Australia (2018) *Australian Standard AS 3959–2018: Construction of Buildings in Bushfire-Prone Areas*. SAI Global Ltd, Sydney.

9.0 APPENDICES

1. Site plan prepared by Mojo Homes Pty Ltd, job no. 858592, Issue 1, Dated 09/04/2021.
2. Standards for Asset Protection Zones as issued by the NSW Rural Fire Service in 2005.

COMPLIANCE ACHIEVED
SUBJECT TO COUNCIL APPROVAL
FRONT SETBACK
DA - PITTWATER DCP

SITING SUBJECT TO RECEIPT OF ALL RELEVANT DOCUMENTATION PERTAINING TO RESTRICTIONS ON THE SUBJECT PROPERTY.

LAND IS SUBJECT TO:	
- ZONING	RU2
- WIND CLASSIFICATION	TBC
- < 1km TO BREAKING SALT	NO
- < 100m TO SALT WATER	NO
- BUSHFIRE	YES, BAL-TBC
- MINE SUBSIDENCE	NO
- ACID SULPHATE SOILS	CLASS 5
- FLOOD	TBC
- BUILDING ENVELOPE	NO
- SLAB CLASSIFICATION	TBC
- HERITAGE	NO
- DEVELOPER GUIDELINES	NO
- APPLICABLE 88B CLAUSES	TBC
- ANY ADDITIONAL RESTRICTIONS	TERRESTRIAL BIODIVERSITY

BUILDING RESTRICTIONS:	
- FRONT SETBACK (MIN):	20m*
*SUBJECT TO ESTABLISHED BUILDING LINE	
- SIDE SETBACK (MIN):	2.5m
- REAR SETBACK (MIN):	6.5m
- SITE COVERAGE (MAX):	NOT SPECIFIED
- BUILDING HEIGHT (MAX):	8.5m
- WALL BREAKS (MAX):	8.0m FRONT FACADE
- LANDSCAPED AREA (MIN):	16,257m² (80%)
- CUT (MAX):	1.0m
- FILL (MAX):	1.0m

DRIVEWAY BY OWNER UNLESS NOTED OTHERWISE IN THE TENDER.

SITE, BOUNDARY, EARTHWORK AND SPOT LEVEL INFORMATION SHOWN IS INDICATIVE ONLY AND IS SUBJECT TO RECEIPT OF A DETAILED CONTOUR SURVEY COMPLETED BY AN APPROVED REGISTERED SURVEYOR.

AIR CONDITIONER LOCATION AND WATER TANK SIZE AND LOCATION IS INDICATIVE ONLY AND IS SUBJECT TO FINAL SELECTIONS AND DETAILED CONTOUR INFORMATION.

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APPROX. IMPORT/EXPORT FILL	
CUT VOLUME	58.44m³
FILL VOLUME	59.09m³
DIFFERENCE	0.65m³

EVEN CUT & FILL	
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TOTAL FLOOR AREAS		
AREA NAME	DROP FLOOR	AREA (m²)
GARAGE	NO	34.56
LIVING	NO	202.18
OUTDOOR LIVING	NO	15.92
PORCH	NO	4.43
		257.09 m²

COMPLIANCE AREAS	
LANDSCAPED AREA	19,963.62



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DRAWING
1 QUOTE SITING

DRAWN
AWK 2021.04.09

CLIENT:
NIGEL BUBALO

ADDRESS:
220 POWDERWORKS ROAD , INGLESIDE NSW 2101

LOT / SECTION / DP:
12 / - / 25143

COUNCIL:
NORTHERN BEACHES COUNCIL

HOUSE DESIGN:
RHAPSODY 28

FACADE DESIGN:
MODERN

SHEET TITLE:
QUOTE SITING

SHEET No.:
1 / 2

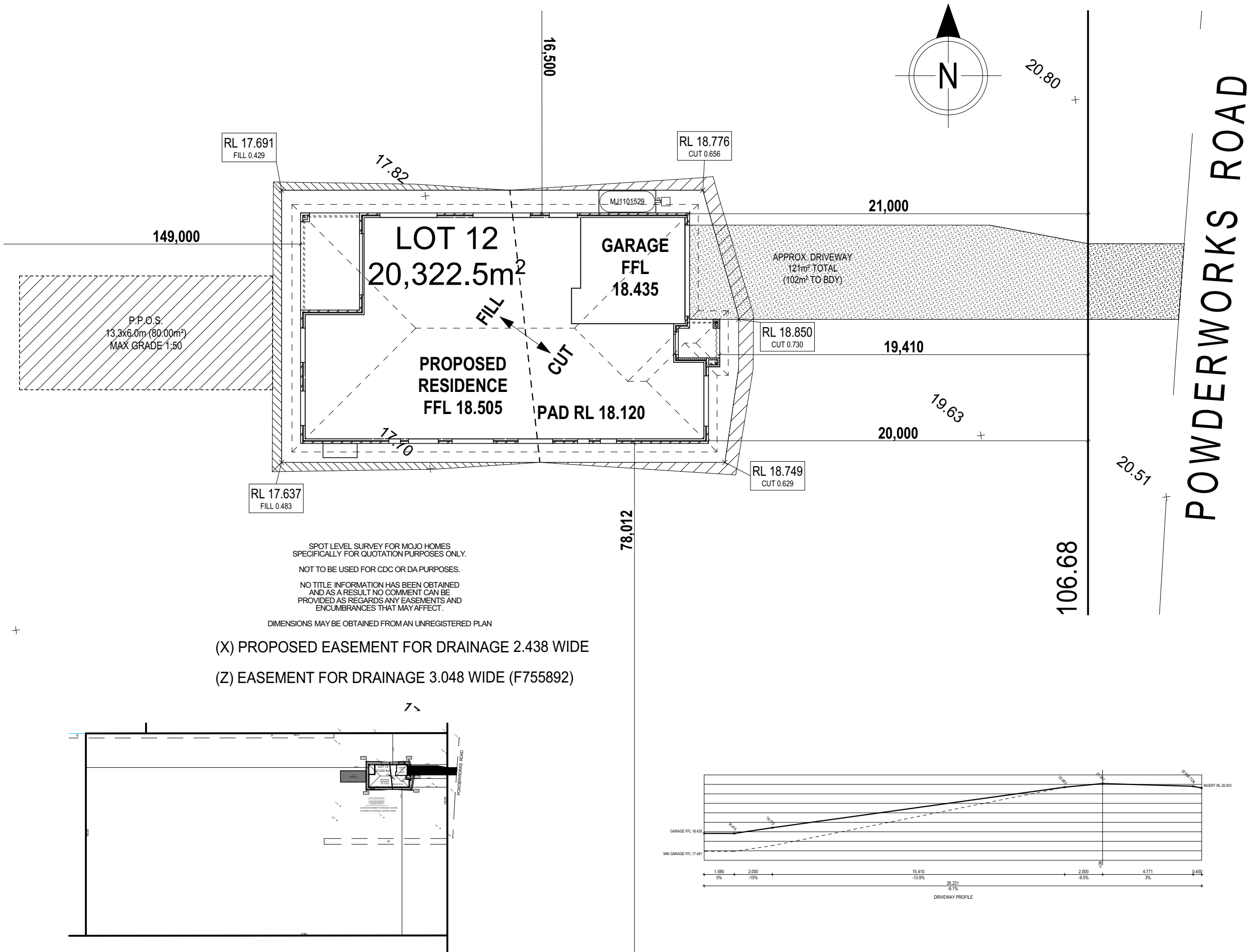
HOUSE CODE:

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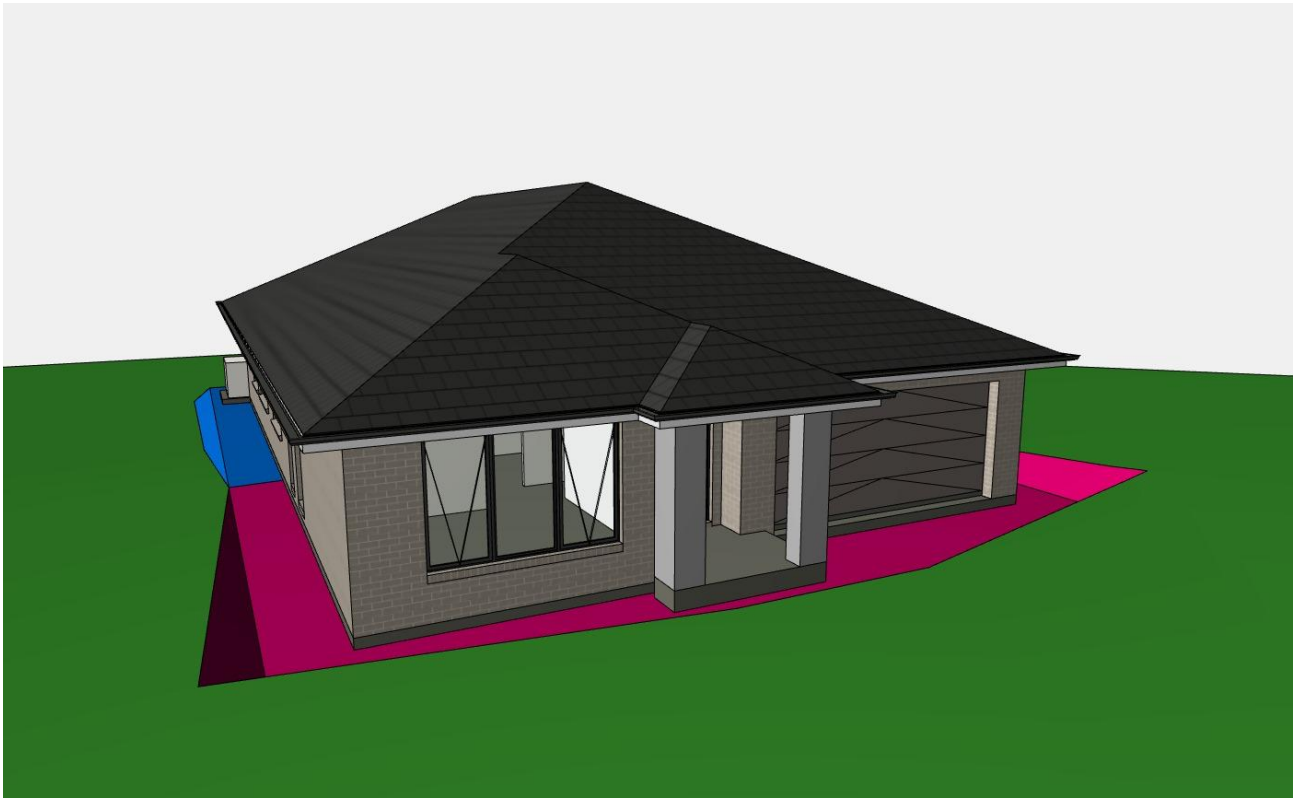
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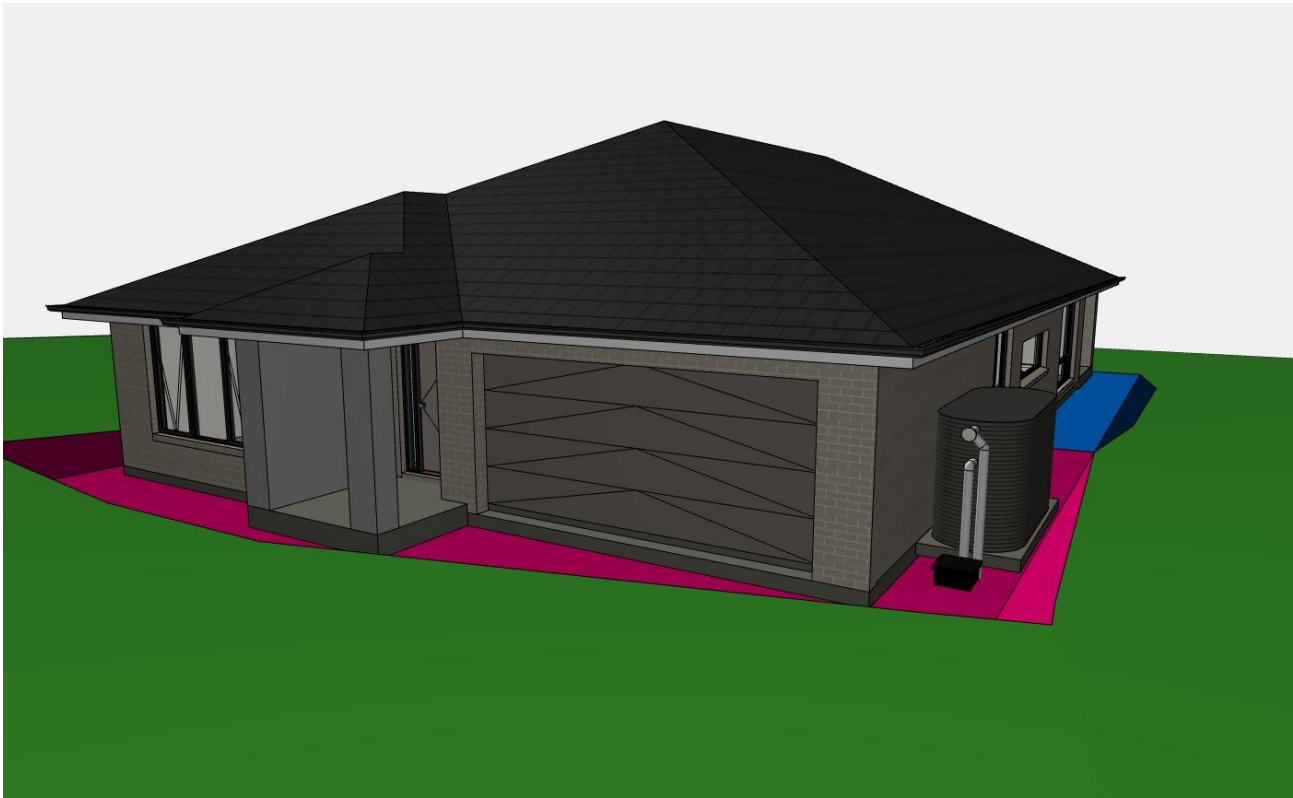
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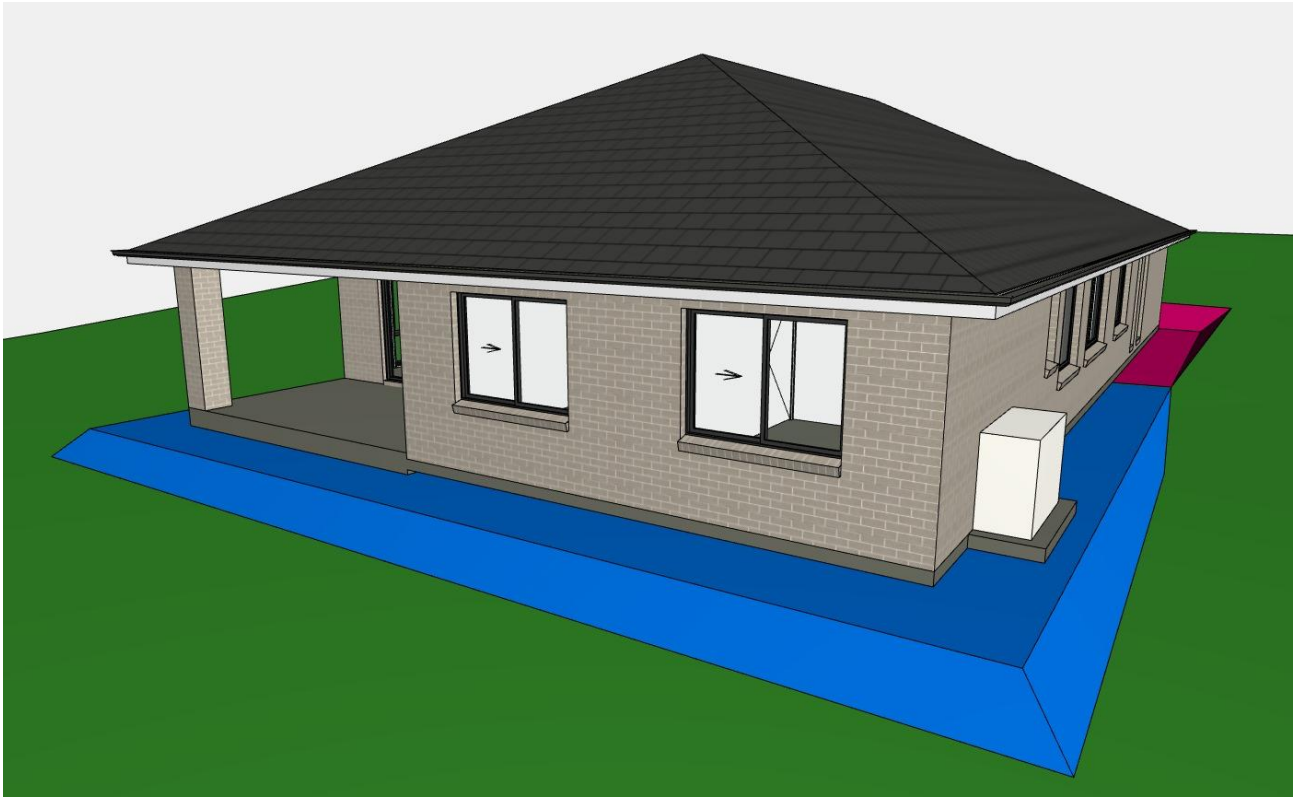
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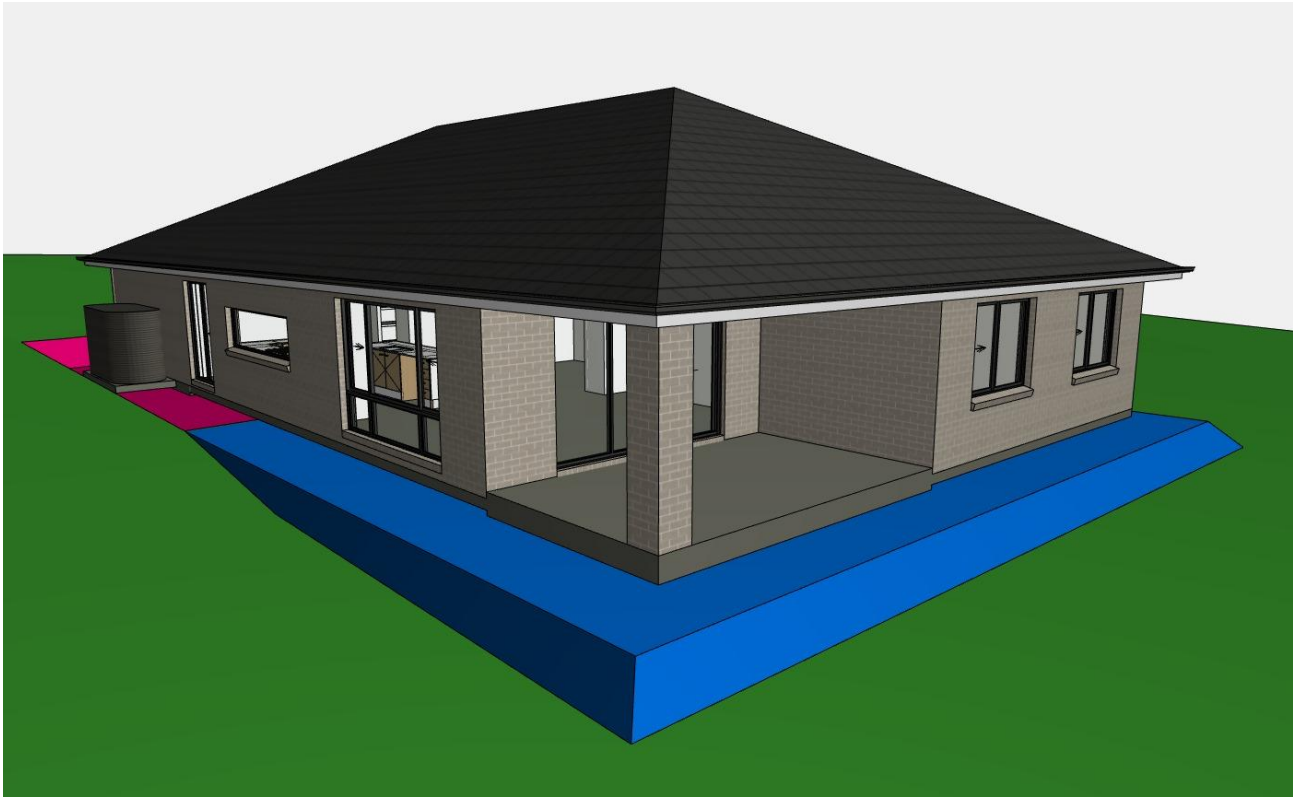
FRONT LEFT



FRONT RIGHT



REAR LEFT



REAR RIGHT

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				ADDRESS: 220 POWDERWORKS ROAD , INGLESIDE NSW 2101	FACADE DESIGN: MODERN	FACADE CODE:	
				LOT / SECTION / DP: 12 / - / 25143	SHEET TITLE: QUOTE SITING - 3D VIEWS	SCALES:	
				COUNCIL: NORTHERN BEACHES COUNCIL	SHEET No.: 2 / 2		858592

for asset protection zones

protection

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NSW RURAL FIRE SERVICE



STANDARDS FOR ASSET PROTECTION ZONES

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INTRODUCTION

For thousands of years bush fires have been a natural part of the Australian landscape. They are inevitable and essential, as many Australian plants and animals have adapted to fire as part of their life cycle.

In recent years developments in bushland areas have increased the risk of bush fires harming people and their homes and property. But landowners can significantly reduce the impact of bush fires on their property by identifying and minimising bush fire hazards. There are a number of ways to reduce the level of hazard to your property, but one of the most important is the creation and maintenance of an Asset Protection Zone (APZ).

A well located and maintained APZ should be used in conjunction with other preparations such as good property maintenance, appropriate building materials and developing a family action plan.

WHAT IS AN ASSET PROTECTION ZONE?

An Asset Protection Zone (APZ) is a fuel reduced area surrounding a built asset or structure. This can include any residential building or major building such as farm and machinery sheds, or industrial, commercial or heritage buildings.

An APZ provides:

- a buffer zone between a bush fire hazard and an asset;
- an area of reduced bush fire fuel that allows suppression of fire;
- an area from which backburning may be conducted; and
- an area which allows emergency services access and provides a relatively safe area for firefighters and home owners to defend their property.

Potential bush fire fuels should be minimised within an APZ. This is so that the vegetation within the planned zone does not provide a path for the transfer of fire to the asset either from the ground level or through the tree canopy.

WHAT WILL THE APZ DO?

An APZ, if designed correctly and maintained regularly, will reduce the risk of:

- direct flame contact on the asset;
- damage to the built asset from intense radiant heat; and
- ember attack on the asset.

WHERE SHOULD I PUT AN APZ?

An APZ is located between an asset and a bush fire hazard.

The APZ should be located wholly within your land. You cannot undertake any clearing of vegetation on a neighbour's property, including National Park estate, Crown land or land under the management of your local council, unless you have written approval.

If you believe that the land adjacent to your property is a bush fire hazard and should be part of an APZ, you can have the matter investigated by contacting the NSW Rural Fire Service (RFS).

There are six steps to creating and maintaining an APZ. These are:

1. Determine if an APZ is required;
2. Determine what approvals are required for constructing your APZ;
3. Determine the APZ width required;
4. Determine what hazard reduction method is required to reduce bush fire fuel in your APZ;
5. Take measures to prevent soil erosion in your APZ; and
6. Landscape and regularly monitor in your APZ for fuel regrowth.

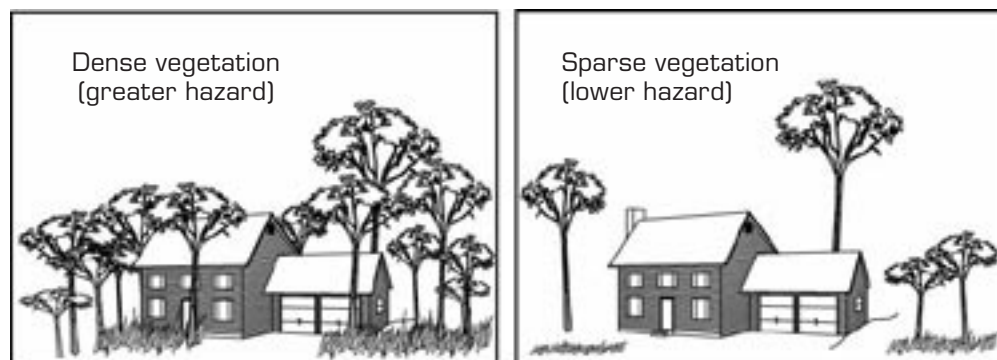
STEP 1. DETERMINE IF AN APZ IS REQUIRED

Recognising that a bush fire hazard exists is the first step in developing an APZ for your property.

If you have vegetation close to your asset and you live in a bush fire prone or high risk area, you should consider creating and maintaining an APZ.

Generally, the more flammable and dense the vegetation, the greater the hazard will be. However, the hazard potential is also influenced by factors such as slope.

- A large area of continuous vegetation on sloping land may increase the potential bush fire hazard.
- The amount of vegetation around a house will influence the intensity and severity of a bush fire.
- The higher the available fuel the more intense a fire will be.



Isolated areas of vegetation are generally not a bush fire hazard, as they are not large enough to produce fire of an intensity that will threaten dwellings.

This includes:

- bushland areas of less than one hectare that are isolated from large bushland areas; and
- narrow strips of vegetation along road and river corridors.

If you are not sure if there is a bush fire hazard in or around your property, contact your local NSW Rural Fire Service Fire Control Centre or your local council for advice.

STEP 2. DETERMINE WHAT APPROVALS ARE REQUIRED FOR CONSTRUCTING YOUR APZ

If you intend to undertake bush fire hazard reduction works to create or maintain an APZ you must gain the written consent of the landowner.

Subdivided land or construction of a new dwelling

If you are constructing an APZ for a new dwelling you will need to comply with the requirements in *Planning for Bushfire Protection*. Any approvals required will have to be obtained as part of the Development Application process.

Existing asset

If you wish to create or maintain an APZ for an existing structure you may need to obtain an environmental approval. The RFS offers a free environmental assessment and certificate issuing service for essential hazard reduction works. For more information see the RFS document *Application Instructions for a Bush Fire Hazard Reduction Certificate* or contact your local RFS Fire Control Centre to determine if you can use this approval process.

Bear in mind that all work undertaken must be consistent with any existing land management agreements (e.g. a conservation agreement, or property vegetation plan) entered into by the property owner.

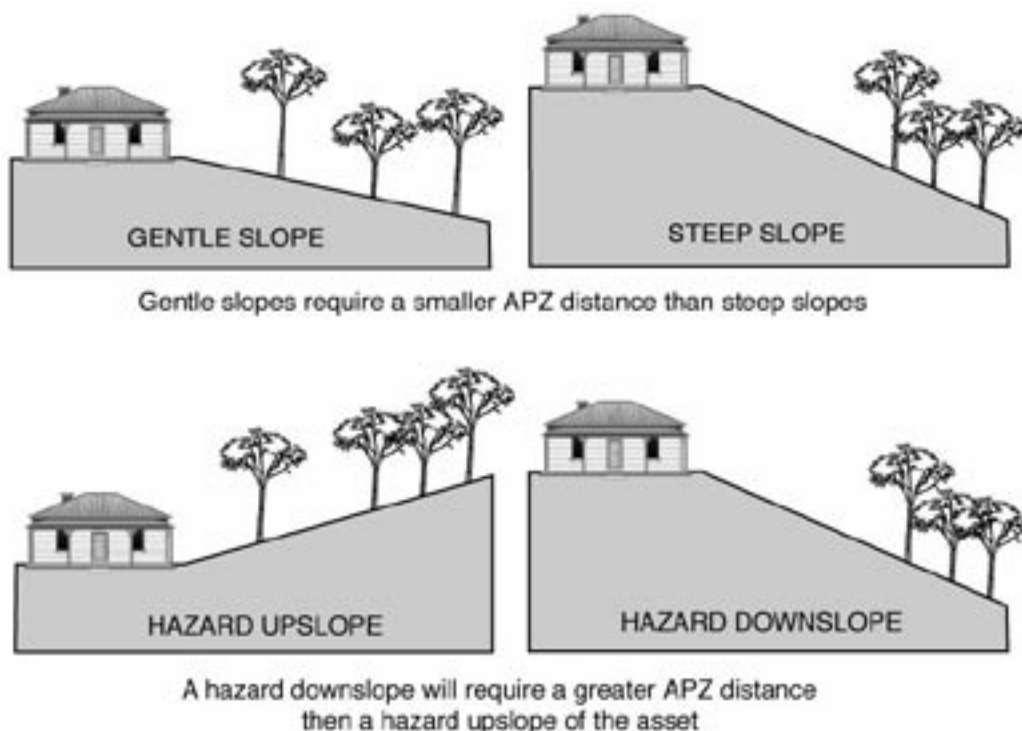
If your current development consent provides for an APZ, you do not need further approvals for works that are consistent with this consent.

If you intend to burn off to reduce fuel levels on your property you may also need to obtain a Fire Permit through the RFS or NSW Fire Brigades. See the RFS document *Before You Light That Fire* for an explanation of when a permit is required.

STEP 3. DETERMINE THE APZ WIDTH

The size of the APZ required around your asset depends on the nature of the asset, the slope of the area, the type and structure of nearby vegetation and whether the vegetation is managed.

Fires burn faster uphill than downhill, so the APZ will need to be larger if the hazard is downslope of the asset.



Different types of vegetation (for example, forests, rainforests, woodlands, grasslands) behave differently during a bush fire. For example, a forest with shrubby understorey is likely to result in a higher intensity fire than a woodland with a grassy understorey and would therefore require a greater APZ width.

A key benefit of an APZ is that it reduces radiant heat and the potential for direct flame contact on homes and other buildings. Residential dwellings require a wider APZ than sheds or stockyards because the dwelling is more likely to be used as a refuge during bush fire.

Subdivided land or construction of a new dwelling

If you are constructing a new asset, the principles of *Planning for Bushfire Protection* should be applied. Your Development Application approval will detail the exact APZ distance required.

Existing asset

If you wish to create an APZ around an existing asset and you require environmental approval, the Bush Fire Environmental Assessment Code provides a streamlined assessment process. Your Bush Fire Hazard Reduction Certificate (or alternate environmental approval) will specify the maximum APZ width allowed.

For further information on APZ widths see *Planning for Bushfire Protection* or the *Bush Fire Environmental Assessment Code* (available on the RFS website), or contact your local RFS Fire Control Centre.

STEP 4. DETERMINE WHAT HAZARD REDUCTION METHOD IS REQUIRED TO REDUCE BUSH FIRE FUEL IN YOUR APZ

The intensity of bush fires can be greatly reduced where there is little to no available fuel for burning. In order to control bush fire fuels you can reduce, remove or change the state of the fuel through several means.

Reduction of fuel does not require removal of all vegetation, which would cause environmental damage. Also, trees and plants can provide you with some bush fire protection from strong winds, intense heat and flying embers (by filtering embers) and changing wind patterns. Some ground cover is also needed to prevent soil erosion.

Fuels can be controlled by:

1. raking or manual removal of fine fuels

Ground fuels such as fallen leaves, twigs (less than 6 mm in diameter) and bark should be removed on a regular basis. This is fuel that burns quickly and increases the intensity of a fire.

Fine fuels can be removed by hand or with tools such as rakes, hoes and shovels.

2. mowing or grazing of grass

Grass needs to be kept short and, where possible, green.

3. removal or pruning of trees, shrubs and understorey

The control of existing vegetation involves both selective fuel reduction (removal, thinning and pruning) and the retention of vegetation.

Prune or remove trees so that you do not have a continuous tree canopy leading from the hazard to the asset. Separate tree crowns by two to five metres. A canopy should not overhang within two to five metres of a dwelling.

Native trees and shrubs should be retained as clumps or islands and should maintain a covering of no more than 20% of the area.

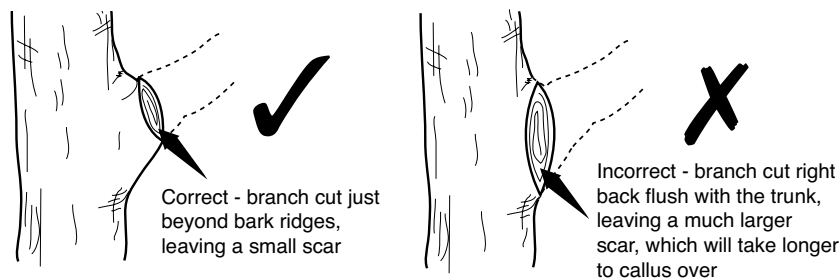
When choosing plants for removal, the following basic rules should be followed:

1. Remove noxious and environmental weeds first. Your local council can provide you with a list of environmental weeds or 'undesirable species'. Alternatively, a list of noxious weeds can be obtained at www.agric.nsw.gov.au/noxweed/;
2. Remove more flammable species such as those with rough, flaky or stringy bark; and
3. Remove or thin understorey plants, trees and shrubs less than three metres in height

The removal of significant native species should be avoided.

Prune in accordance with the following standards:

- Use sharp tools. These will enable clean cuts and will minimise damage to the tree.
- Decide which branches are to be removed before commencing work. Ensure that you maintain a balanced, natural distribution of foliage and branches.
- Remove only what is necessary.
- Cut branches just beyond bark ridges, leaving a small scar.
- Remove smaller branches and deadwood first.



There are three primary methods of pruning trees in APZs:

1. Crown lifting (skirting)

Remove the lowest branches (up to two metres from the ground). Crown lifting may inhibit the transfer of fire between the ground fuel and the tree canopy.

2. Thinning

Remove smaller secondary branches whilst retaining the main structural branches of the tree. Thinning may minimise the intensity of a fire.

3. Selective pruning

Remove branches that are specifically identified as creating a bush fire hazard (such as those overhanging assets or those which create a continuous tree canopy). Selective pruning can be used to prevent direct flame contact between trees and assets.

Your Bush Fire Hazard Reduction Certificate or local council may restrict the amount or method of pruning allowed in your APZ.

See the *Australian Standard 4373 (Pruning of Amenity Trees)* for more information on tree pruning.

4. Slashing and trittering

Slashing and trittering are economical methods of fuel reduction for large APZs that have good access. However, these methods may leave large amounts of slashed fuels (grass clippings etc) which, when dry, may become a fire hazard. For slashing or trittering to be effective, the cut material must be removed or allowed to decompose well before summer starts.

If clippings are removed, dispose of them in a green waste bin if available or compost on site (dumping clippings in the bush is illegal and it increases the bush fire hazard on your or your neighbour's property).

Although slashing and trittering are effective in inhibiting the growth of weeds, it is preferable that weeds are completely removed.

Care must be taken not to leave sharp stakes and stumps that may be a safety hazard.

5. Ploughing and grading

Ploughing and grading can produce effective firebreaks. However, in areas where this method is applied, frequent maintenance may be required to minimise the potential for erosion. Loose soil from ploughed or graded ground may erode in steep areas, particularly where there is high rainfall and strong winds.

6. Burning (hazard reduction burning)

Hazard reduction burning is a method of removing ground litter and fine fuels by fire. Hazard reduction burning of vegetation is often used by land management agencies for broad area bush fire control, or to provide a fuel reduced buffer around urban areas.

Any hazard reduction burning, including pile burns, must be planned carefully and carried out with extreme caution under correct weather conditions. Otherwise there is a real danger that the fire will become out of control. More bush fires result from escaped burning off work than from any other single cause.

It is YOUR responsibility to contain any fire lit on your property. If the fire escapes your property boundaries you may be liable for the damage it causes.

Hazard reduction burns must therefore be carefully planned to ensure that they are safe, controlled, effective and environmentally sound. There are many factors that need to be considered in a burn plan. These include smoke control, scorch height, frequency of burning and cut off points (or control lines) for the fire. For further information see the RFS document *Standards for Low Intensity Bush Fire Hazard Reduction Burning*, or contact your local RFS for advice.

7. Burning (pile burning)

In some cases, where fuel removal is impractical due to the terrain, or where material cannot be disposed of by the normal garbage collection or composted on site, you may use pile burning to dispose of material that has been removed in creating or maintaining an APZ.

For further information on pile burning, see the RFS document *Standards for Pile Burning*.

In areas where smoke regulations control burning in the open, you will need to obtain a Bush Fire Hazard Reduction Certificate or written approval from Council for burning. During the bush fire danger period a Fire Permit will also be required. See the RFS document *Before You Light that Fire* for further details.

STEP 5. TAKE MEASURES TO PREVENT SOIL EROSION

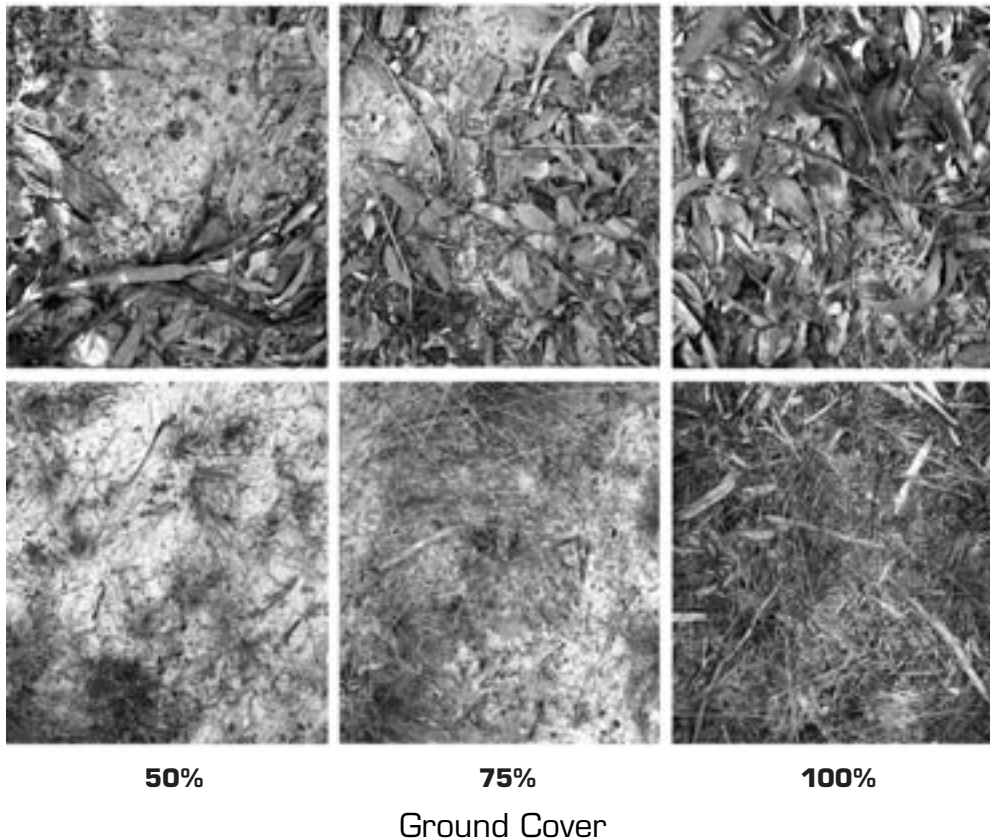
While the removal of fuel is necessary to reduce a bush fire hazard, you also need to consider soil stability, particularly on sloping areas.

Soil erosion can greatly reduce the quality of your land through:

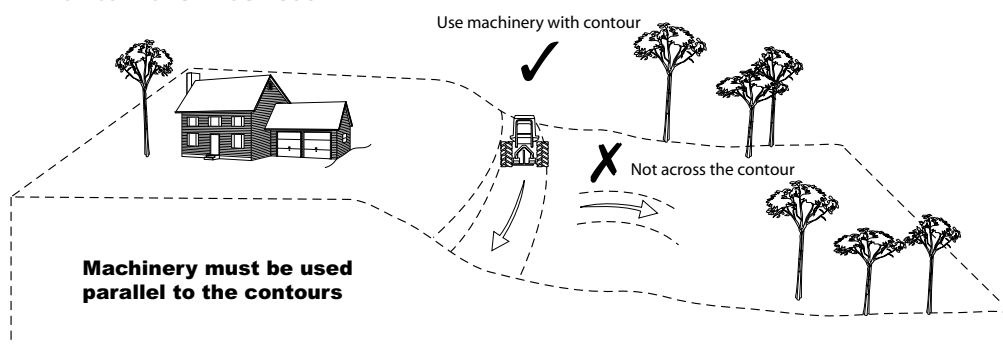
- loss of top soil, nutrients, vegetation and seeds
- reduced soil structure, stability and quality
- blocking and polluting water courses and drainage lines

A small amount of ground cover can greatly improve soil stability and does not constitute a significant bush fire hazard. Ground cover includes any material which directly covers the soil surface such as vegetation, twigs, leaf litter, clippings or rocks. A permanent ground cover should be established (for example, short grass). This will provide an area that is easy to maintain and prevent soil erosion.

When using mechanical hazard reduction methods, you should retain a ground cover of at least 75% to prevent soil erosion. However, if your area is particularly susceptible to soil erosion, your Hazard Reduction Certificate may require that 90% ground cover be retained.



To reduce the incidence of soil erosion caused by the use of heavy machinery such as ploughs, dozers and graders, machinery must be used parallel to the contours. Vegetation should be allowed to regenerate, but be managed to maintain a low fuel load.



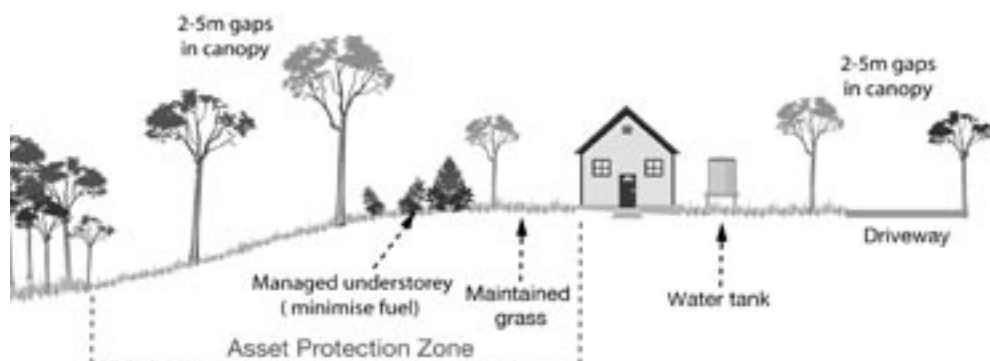
STEP 6. ONGOING MANAGEMENT AND LANDSCAPING

Your home and garden can blend with the natural environment and be landscaped to minimise the impact of fire at the same time. To provide an effective APZ, you need to plan the layout of your garden to include features such as fire resistant plants, radiant heat barriers and windbreaks.

Layout of gardens in an APZ

When creating and maintaining a garden that is part of an APZ you should:

- ensure that vegetation does not provide a continuous path to the house;
- remove all noxious and environmental weeds;
- plant or clear vegetation into clumps rather than continuous rows;
- prune low branches two metres from the ground to prevent a ground fire from spreading into trees;
- locate vegetation far enough away from the asset so that plants will not ignite the asset by direct flame contact or radiant heat emission;
- plant and maintain short green grass around the house as this will slow the fire and reduce fire intensity. Alternatively, provide non-flammable pathways directly around the dwelling;
- ensure that shrubs and other plants do not directly abut the dwelling. Where this does occur, gardens should contain low-flammability plants and non flammable ground cover such as pebbles and crush tile; and
- avoid erecting brush type fencing and planting “pencil pine” type trees next to buildings, as these are highly flammable.



Removal of other materials

Woodpiles, wooden sheds, combustible material, storage areas, large quantities of garden mulch, stacked flammable building materials etc. should be located away from the house. These items should preferably be located in a designated cleared location with no direct contact with bush fire hazard vegetation.

Other protective features

You can also take advantage of existing or proposed protective features such as fire trails, gravel paths, rows of trees, dams, creeks, swimming pools, tennis courts and vegetable gardens as part of the property's APZ.

PLANTS FOR BUSH FIRE PRONE GARDENS

When designing your garden it is important to consider the type of plant species and their flammability as well as their placement and arrangement.

Given the right conditions, all plants will burn. However, some plants are less flammable than others.

Trees with loose, fibrous or stringy bark should be avoided. These trees can easily ignite and encourage the ground fire to spread up to, and then through, the crown of the trees.

Plants that are less flammable, have the following features:

- high moisture content
- high levels of salt
- low volatile oil content of leaves
- smooth barks without “ribbons” hanging from branches or trunks; and
- dense crown and elevated branches.

When choosing less flammable plants, be sure not to introduce noxious or environmental weed species into your garden that can cause greater long-term environmental damage.

For further information on appropriate plant species for your locality, contact your local council, plant nurseries or plant society.

If you require information on how to care for fire damaged trees, refer to the Firewise brochure *Trees and Fire Resistance; Regeneration and care of fire damaged trees*.

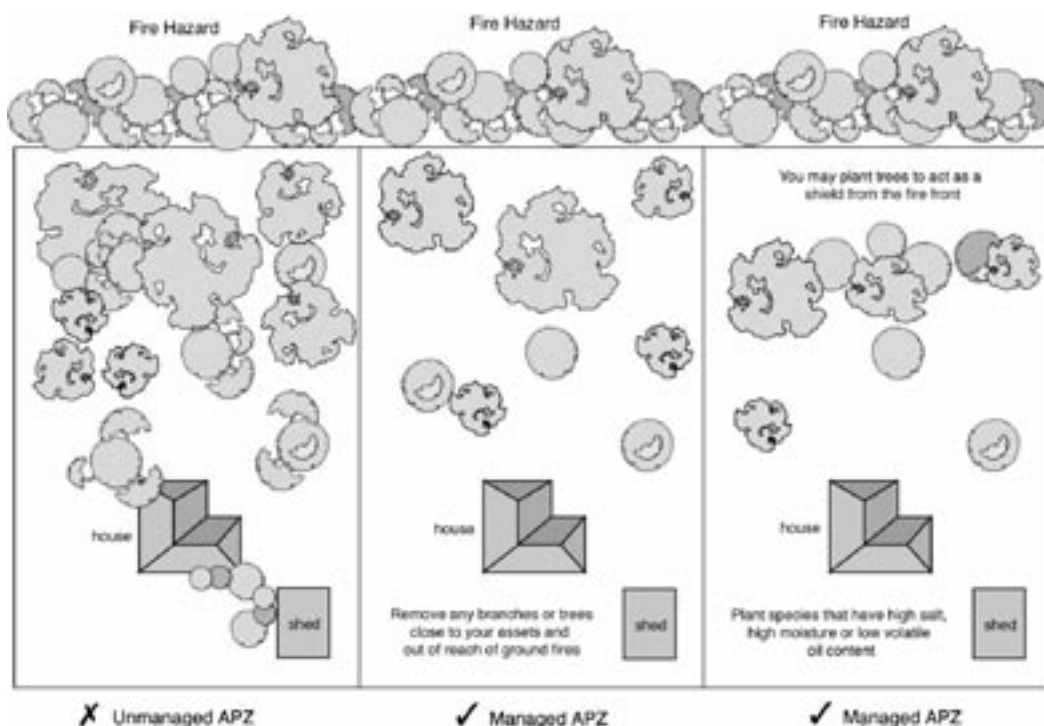
WIND BREAKS

Rows of trees can provide a wind break to trap embers and flying debris that could otherwise reach the house or asset.

You need to be aware of local wind conditions associated with bush fires and position the wind break accordingly. Your local RFS Fire Control Centre can provide you with further advice.

When choosing trees and shrubs, make sure you seek advice as to their maximum height. Their height may vary depending on location of planting and local conditions. As a general rule, plant trees at the same distance away from the asset as their maximum height.

When creating a wind break, remember that the object is to slow the wind and to catch embers rather than trying to block the wind. In trying to block the wind, turbulence is created on both sides of the wind break making fire behaviour erratic.



HOW CAN I FIND OUT MORE?

The following documents are available from your local Fire Control Centre and from the NSW RFS website at **www.rfs.nsw.gov.au**.

- Before You Light That Fire
- Standards for Low Intensity Bush Fire Hazard Reduction Burning
- Standards for Pile Burning
- Application Instructions for a Bush Fire Hazard Reduction Certificate

If you require any further information please contact:

- your local NSW Rural Fire Service Fire Control Centre.
Location details are available on the RFS website or
- call the NSW RFS Enquiry Line 1800 679 737
(Monday to Friday, 9am to 5pm), or
- the NSW RFS website at **www.rfs.nsw.gov.au**.

**Produced by the NSW Rural Fire Service, Locked Mail Bag 17,
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