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BCA Check Pty Ltd trading as Bushfire Certifiers

BUSH FIRE ASSESSMENT REPORT

Lot 10 Sec 33 DP 758403

51 Beech Street, Evan Head

Two-lot Strata Subdivision &

Class 1a Detached Dual Occupancy Dwelling and Pool.

S100B Rural Fires Act

Prepared for: Brody Aleckson

Date: 6 March 2024, Rev. A

Reference: 24/412

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Peter Thornton
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MFireSafeEng

DOCUMENT CONTROL				
Revision	**Date**	**Description**	**Prepared**	**Authorised**
A	07.03.24	Final report	Patrick Thornton	Peter Thornton

Table of Contents

1.0 EXECUTIVE SUMMARY

This bushfire assessment report has been prepared for the proposed two-lot strata subdivision, detached Class 1a dual occupancy dwelling and pool at Lot 10 Sec 33 DP 758403, 51 Beech Street Evan Head. The purpose of this report is to establish suitable bushfire mitigation measures for the proposed development to achieve compliance with Planning for Bushfire Protection 2019 (PBP2019) and to accompany an application for a Bush Fire Safety Authority.

The report establishes the existing allotment is located on mapped bushfire prone land and provides recommendations consistent with the acceptable solutions of PBP2019. The following table is provided as a summary of the recommendations and method of assessment.

MEASURE	RECOMMENDATION	METHOD OF ASSESSMENT
Construction Standards	**Proposed Dual Occupancy Dwelling** - BAL 12.5 AS 3959-2018 + s7.5 of PBP2019. **Existing dwelling** – The existing dwelling is to be upgraded to improve ember protection.	Acceptable Solution
APZ Required	Entire area of Lots 1 and 2 to be managed & maintained as IPA.	Acceptable Solution
Water Supply	Existing street hydrants provide coverage in accordance with AS 2419.1-2021	Acceptable Solution
Electricity Supply	To comply with Section 5.3.3 & Table 5.3c of PBP2019.	Acceptable Solution
Gas Supply	To comply with Section 5.3.3 & Table 5.3c of PBP2019.	Acceptable Solution
Landscape	Landscaping on proposed Lots 1 and 2 is to comply with Section 5.3.1 & Table 5.3a of PBP2019.	Acceptable Solution
Access	Standard driveway/s acceptable.	Acceptable Solution

The report makes the following recommendations for the development. The full report however is to be considered, including Section 2.2 detailing the Significant Environmental Features that are not considered by this report.

1. The proposed dual occupancy dwelling is to be constructed to BAL 12.5 AS 3959-2018 + s7.5 of Planning for Bushfire Protection 2019.

   The existing dwelling is to be upgraded to improve ember protection. This is to be achieved by covering external openings with a non-corrosive metal screen mesh having a maximum aperture of 2mm. Where applicable, this includes openable

windows, vents, weepholes, and gaps around penetrations. External doors are to be fitted with draft excluders.

2. Any proposed fences, gates and retaining walls are to comply with Section 7.6 of Planning for Bushfire Protection 2019.

3. At the commencement of works and in perpetuity the entire area of proposed Lots 1 and 2 are to be managed and maintained as an Inner Protection Area (IPA) to prevent the spread of a fire towards the buildings in accordance with Appendix 4 of Planning for Bushfire Protection 2019 and the requirements of 'Standards for Asset Protection Zones' RFS 2005, see Appendix B and Appendix C of this report.

4. Landscaping on proposed Lots 1 and 2 is to comply with Section 5.3.1 and Table 5.3a of Planning for Bushfire Protection 2019.

5. Electricity and gas are to comply with Section 5.3.3 and Table 5.3c of Planning for Bushfire Protection 2019 and AS3959-2018 as detailed in Section 6 of this report.

6. It is recommended the property owner and occupants familiarise themselves with relevant bushfire preparation and survival information located on the NSW Rural Fire Service website www.rfs.nsw.gov.au. This website should be accessed periodically to ensure the property owner and occupants are aware of the latest information.

2.0 INTRODUCTION

2.1 General

The purpose of this report is to establish suitable bushfire mitigation measures for the proposed two-lot strata subdivision, detached Class 1a dual occupancy dwelling and pool to achieve compliance with Planning for Bushfire Protection 2019 (PBP2019) and to accompany an application for a Bush Fire Safety Authority.

The recommendations within this report address the aims and objectives of PBP2019 to reduce the risk of ignition of buildings in a bushfire event. It is noted however that bushfire is a natural phenomenon and there can never be any guarantee that a building or occupants will not be adversely affected by bushfire.

2.2 Significant Environmental Features

An assessment is to be undertaken, if applicable, regarding:

- SEPP (Biodiversity and Conservation) 2021
- SEPP (Resilience and Hazards) 2021
- Biodiversity Conservation Act 2016 (NSW)
- Local Land Services Act 2013 (NSW)
- Land Management (Native Vegetation) Code 2017 (NSW)
- National Parks and Wildlife Act 1974 (NSW)
- Environmental Protection and Biodiversity Conservation Act 1999 (Cwlth)

This report does not consider the above legislation and in this regard this report should be read in conjunction with the Statement of Environmental Effects submitted with the development application. No native tree removal required to achieve the APZs.

2.3 Report Details

Report Reference No.:	24/412
Property Address:	51 Beech Street Evan Head, Lot 10 Sec 33 DP 758403.
Local Government Area:	Richmond Valley Council (FDI 80)
Proposal:	Two-lot strata subdivision, detached Class 1a dual occupancy dwelling and pool
Drawings:	Arthur Colledge Building Design Draftsman plans in Appendix A
Report Authorised By:	Peter Thornton MFireSafeEng BPAD – L3 Accredited Practitioner

3.0 PROPOSED DEVELOPMENT

The SEE describes the proposal as follows:

> *"To undertake the construction of a dwelling to create a detached dual occupancy (including Strata Title subdivision, construction of 1 x in-ground swimming pool and the demolition of 2 x sheds)"*

Access to the proposed 2-Lot strata subdivision is by way of Beech Street and Carrabeen Street. Street hydrants within Beech Street provide coverage of the proposed dual occupancy dwelling and the existing dwelling.

Figure 1: Location of subject property *Source: NSW Gov six maps*

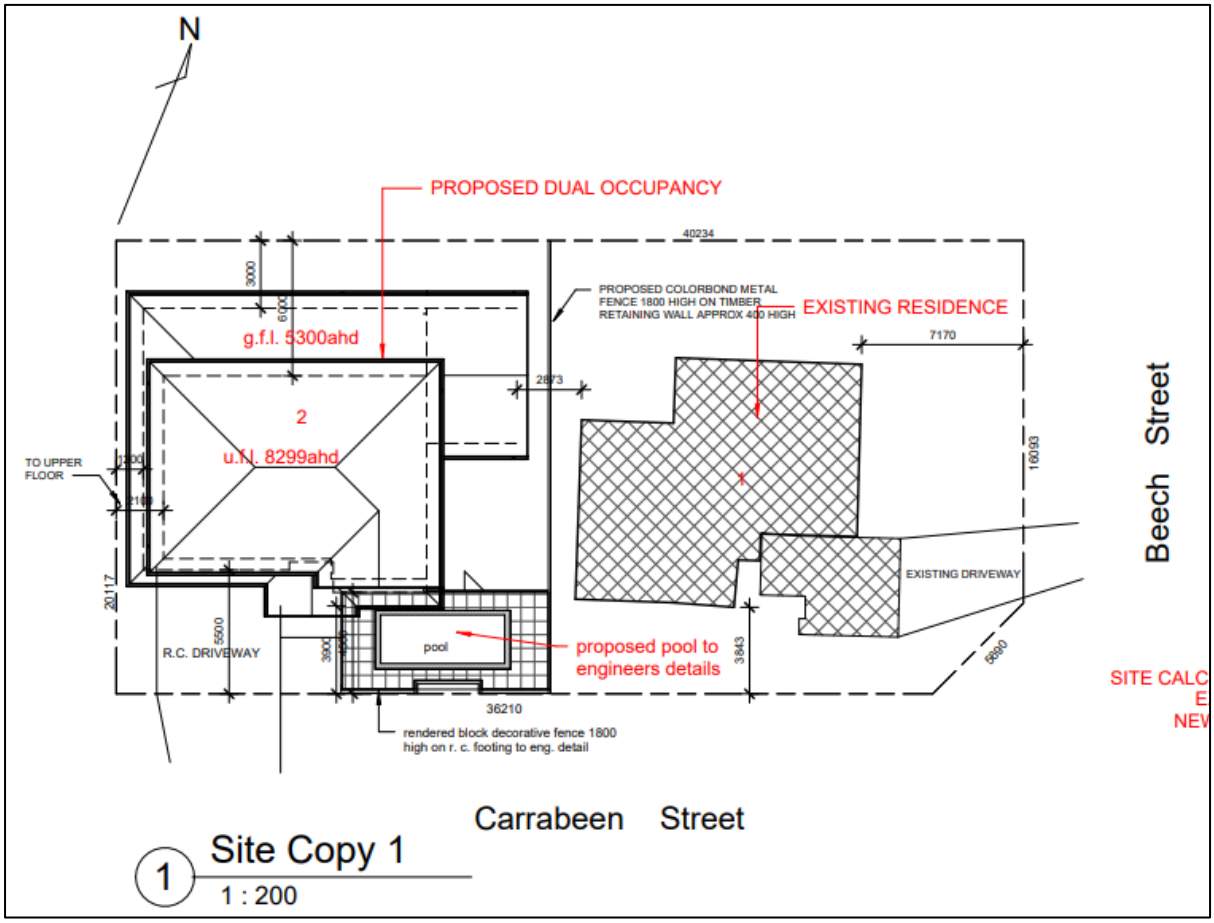


Figure 2: Site Plan

4.0 BUSHFIRE THREAT ASSESSMENT

4.1 Overview

The bushfire threat assessment determines the Bushfire Attack Level (BAL) and asset protection zone comprises identification of vegetation formations within 140m of the site and effective slope as required by PBP2019. For the purposes of determining a BAL for the proposed dual occupancy dwelling the assessment has been made over 100m in accordance with Table A1.12.6 PBP2019.

4.2 Bushfire Prone Land Map

Bushfire prone land mapping identifies the subject allotment as bushfire prone as indicated in Figure 3. Aerial mapping and inspection of the site reveals the bushfire prone land map to be accurate with respect to the current bushfire hazard.

Figure 3: Bushfire prone land map *S ource: planningportal.nsw.gov.au*

4.3 Vegetation Classification and Slope Analysis

Identification of the vegetation formations in accordance with Keith (2004) classifications was undertaken and described below, together with slope assessment.

North, South and West

Within 100m, to the north, south and west of the proposed dual occupancy dwelling is low threat land, including residential housing and managed road reserves as shown by the aerial plan in Figure 4.

East

To the east of the proposed dual occupancy dwelling is the existing dwelling within the subject allotment and low threat land along the Beech Street road reserve. Approximately 44m from the proposed dwelling on the eastern side of Beech Street is forest vegetation on generally flat ground as shown by Photos 1 and 2.

Photo 1: Beech Street road reserve with forest vegetation beyond.

Photo 2: Forest vegetation to the east.

Figure 4: Bushfire threat and slope analysis *Nearmap image dated 07.07.23*

5.0 ASSET PROTECTION ZONES AND CONSTRUCTION STANDARDS

Asset Protection Zones are areas established and maintained to ensure that bushfire fuels are progressively reduced between the development and the bushfire hazard. The asset protection zone incorporates an Inner Protection Area (IPA) having reduced fuel loadings of approximately 3t/ha.

The proposed 2-Lot strata subdivision will be required to comply with the APZ criteria for subdivisions as set out in Section 5.3.1 and Table 5.3a of PBP2019 which states:

- APZs are provided in accordance with Table A1.12.3 of PBP. Potential building footprints must not be exposed to radiant heat levels exceeding 29kW/m^2 on each proposed lot.
- APZs are to be managed in accordance with Appendix 4 of PBP 2019.
- APZs are wholly within the boundaries of the development site.
- APZ are located on lands with a slope less than 18 degrees.

The proposed strata lots are capable of supporting a building footprint complying with the APZ setback requirements of Table A1.12.3 PBP2019 as demonstrated in Table 1. The proposed dual occupancy dwelling on Lot 2 has been assessed against Table A1.12.3 and A1.12.6 of PBP2019 as demonstrated in Table 2.

Table 1: Summary Bushfire Threat Assessment, APZs – Proposed 2-lot Strata Subdivision

ASPECT	**SLOPE**	**VEG. CLASS AND DISTANCE** Figure A1.2 PBP2019	**Setback required to hazard.** Table A1.12.3	**APZ RECOMMENDED**	**≤29kW/m^2 Threshold** Table A1.12.3 PBP2019
North	n/a	Low threat	n/a	Entire area of proposed Lots 1 and Lot 2 to be managed & maintained as an IPA.	Dwellings on the proposed strata lots are capable of being sited so as not to receive ≤29kW/m^2 radiant heat flux.
South	n/a	Low threat	n/a		
East	Upslope /Flat	Forest	≥20m Note: 20m to hazard from Lot 1 Eastern Boundary		
West	n/a	Low threat	n/a		

d/s - downslope, Up/s - upslope

Both proposed Lots 1 and 2 are capable of providing a minimum setback of 20m from hazard vegetation so that existing or future dwellings are capable of being sited to receive radiant heat levels less than or equal to 29kW/m^2 from bushfire.

Table 2 summarises the category of bushfire attack pursuant to Planning for Bushfire Protection 2019 in relation to the proposed dual occupancy dwelling on Lot 2.

Table 2: Summary Bushfire Threat Assessment, APZs and construction standards – Proposed Class 1a dwelling (Lot 2)					
ASPECT	**SLOPE**	**VEG. CLASS AND DISTANCE** Figure A1.2 PBP2019	**Required setback from hazard.** Table A1.12.3	**APZ RECOMMENDED**	**CONSTRUCTION**
North	n/a	Low threat	n/a	Entire area of proposed Lots 1 and 2 to be managed & maintained as an IPA.	The proposed dwelling is to be constructed to BAL 12.5 AS 3959:2018 + 7.5 PBP 2019
South	n/a	Low Threat	n/a		
East	Upslope /Flat	Forest	40m		
West	n/a	Low Threat	n/a		

d/s = downslope

The proposed dual occupancy dwelling on proposed Lot 2 is sited to receive ≤12.5kW/m^2 and is to be assessed in accordance with s4.14 of the *Environmental Planning and Assessment Act 1979* and Planning for Bushfire Protection 2019.

A specific review of plans relating to construction details and materials for compliance with AS 3959-2018 + Section 7.5 of PBP2019 has not been undertaken and does not form part of the scope of this report. The plans are to be designed for compliance with Bushfire Attack Level specified in the conditions of Development Consent, and shall be assessed by the Accredited Building Certifier as being compliant with the conditions of the Development Consent prior to the issue of a Construction Certificate.

At the commencement of works and in perpetuity the entire area of proposed Lot 1 and Lot 2 is to be managed and maintained as an Inner Protection Area (IPA) to prevent the spread of a fire towards the future dwelling/s in accordance with Appendix 4 of Planning for Bushfire Protection 2019 and the requirements of 'Standards for Asset Protection Zones' RFS 2005, see Appendix B and C of this report.

<u>Existing Dwelling – Ember Protection Upgrade</u>

When increasing the residential density of a property (e.g. dual occupancy), Section 8.2.1 of Planning for Bushfire Protection 2019 suggests upgrading the existing dwelling in relation to ember protection. This is to be achieved by covering openings in the facade with a non-corrosive metal screen mesh having a maximum aperture of 2mm. Where applicable, this includes openable windows, vents, weepholes, and gaps around penetrations. External doors are to be fitted with draft excluders.

6.0 WATER AND UTILITY SERVICES

6.1 WATER SERVICES

Water supply is to comply with Section 5.3.3 and Table 5.3c of Planning for Bushfire Protection 2019. A reticulated water supply and street hydrants in Beech Street provide coverage of the development in accordance with AS 2419.1 – 2021 as shown in Photos 3 and 4. It is noted that hydrant pressures have not been tested as part of this report.

Photo 3: Street hydrant located in Beech Street north of the subject property.

Photo 4: Street hydrant located in Beech Street south of the subject property.

6.2 Electricity Services

New electrical transmission lines if required are to comply with Section 5.3.3 and Table 5.3c of Planning for Bushfire Protection 2019 as follows:

- where practicable, electrical transmission lines are underground; and
- where overhead, electrical transmission lines are proposed as follows:
  - lines are installed with short pole spacing of 30m, unless crossing gullies, gorges or riparian areas; and
  - no part of a tree is closer to a power line than the distance set out in accordance with the specifications in ISSC3 *Guideline for Managing Vegetation Near Power Lines*.

6.3 Gas Services

Where provided, gas services are to comply with Section 5.3.3 and Table 5.3c of Planning for Bushfire Protection 2019:

- reticulated or bottled gas is installed and maintained in accordance with AS/NZS 1596:2014 – *The storage and handling of LP Gas*, the requirements of relevant authorities, and metal piping is used;
- all fixed gas cylinders are kept clear of all flammable materials to a distance of 10m and shielded on the hazard side;
- connections to and from gas cylinders are metal;
- polymer-sheathed flexible gas supply lines are not used; and
- above-ground gas service pipes are metal, including and up to any outlets.

7.0 ACCESS

The proposed access to the proposed dual occupancy dwelling on proposed Lot 2 of the will be provided by way of Carrabeen Street. The existing access to the dwelling on proposed Lot 1 is by way of Beech Street.

The existing street hydrants are located to provide coverage in accordance with AS 2419.1-2021 and the proposed dwelling is within 70m of the public road. In turn, there is not specific bushfire access requirement and a standard driveway to the requirements of the Local Government Authority will be acceptable.

8.0 LANDSCAPING

Most buildings adversely impacted upon in a bushfire event happen through ember attack and in this regard combustible material surrounding the building e.g. landscaping can play a significant part during the event. Adequate management of landscaping is critical to the survivability of an asset and for occupant safety during a bushfire. Existing landscaping is shown in Photos 7-10 and Figure 5.

It is recommended that landscaping be undertaken in accordance with Section 5.3.1 and Table 5.3a of Planning for Bushfire Protection 2019 detailed below, and managed and maintained for the life of the development. It is noted that landscape upgrade will be required to ensure compliance. Landscape plans have not been assessed by this office.

- landscaping on the entire site (proposed Lots 1 and 2) to comply with Appendix 4 of PBP2019 , see Appendix B and C of this report.
- Proposed fencing and retaining walls are constructed in accordance with section 7.6 of PBP2019.

It is noted there will be no tree removal required to the existing site (lot 1) to meet the landscape requirements recommended.

Photo 5: Existing dwelling Beech Street facade

Photo 6: Existing dwelling Beech Street facade

Photo 7: Existing landscaping along Carrabeen Street

Photo 8: Existing dwelling Beech Street facade

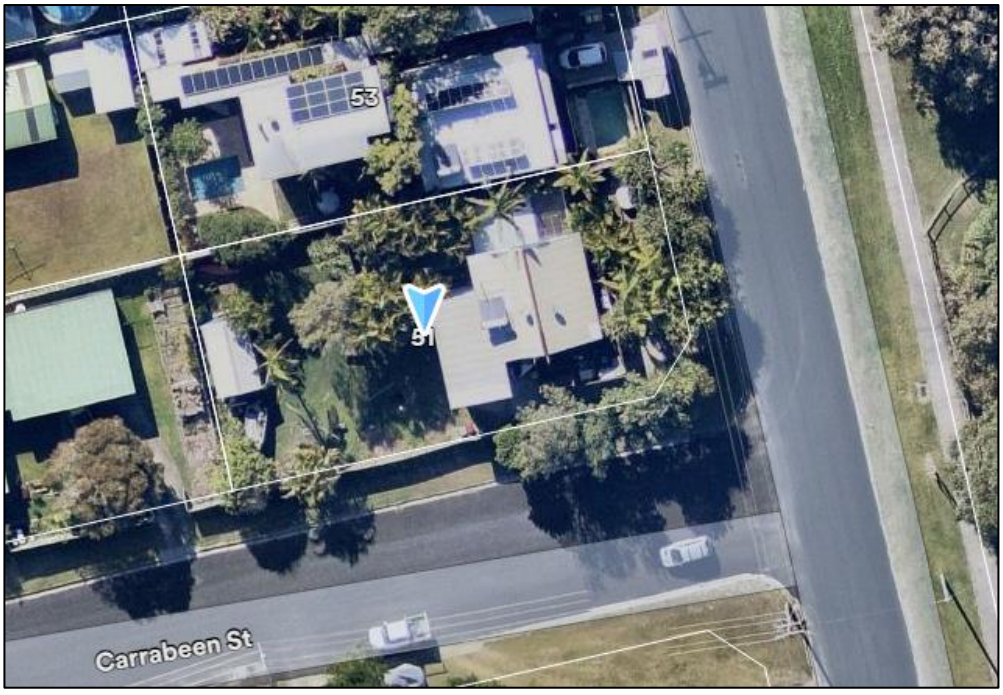


Figure 5: Existing landscaping on the site.

9.0 CONCLUSION

This assessment provides recommendations consistent with the acceptable solutions of Planning for Bushfire Protection 2019. Further detail of compliance with the construction recommendations will be required with the application for construction certificate for approval by the Registered Building Certifier.

DISCLAIMER

This report was prepared for the purposes and exclusive use of the stated client to accompany an application to Richmond Valley Council specifically relating to the proposed 2-lot strata subdivision and proposed dual occupancy dwelling, and is not to be used for any other purpose or by any other person or Corporation. BCA Check Pty Ltd accepts no responsibility for any loss or damage suffered howsoever arising to any person or Corporation who may use or rely on this report in contravention of the terms of this clause.

This report is not intended for or to be used where aluminium composite panels or intumescent paints are proposed. The report is not to be construed as an assessment of the building materials or compliance with the recommended bushfire attack level/s.

As identified in Planning for Bushfire Protection 2019 and the Building Code of Australia the report is to provide recommendations to reduce the risk of ignition and does not guarantee the complete protection of the building in the event of bush fire or that the building will not be adversely impacted upon.

Reporting has been based on the relevant Council and Rural Fire Service Guidelines however recommendations or suggestions given in this report are based on our site investigation at the time of reporting. In some cases site conditions may change dramatically within a few years due to rapid vegetation re-growth and invading weed species.

REFERENCES

NSW Rural Fire Service and Planning NSW (2019), *Planning for bushfire protection, A guide for councils planners fire authorities developers and homeowners.* Rural Fire Service NSW Australia.

Standards Australia, (2018), AS3959 *Construction of buildings in bushfire prone areas,* Australian Standards, Sydney. Including amendments 1 and 2

LEGISLATION

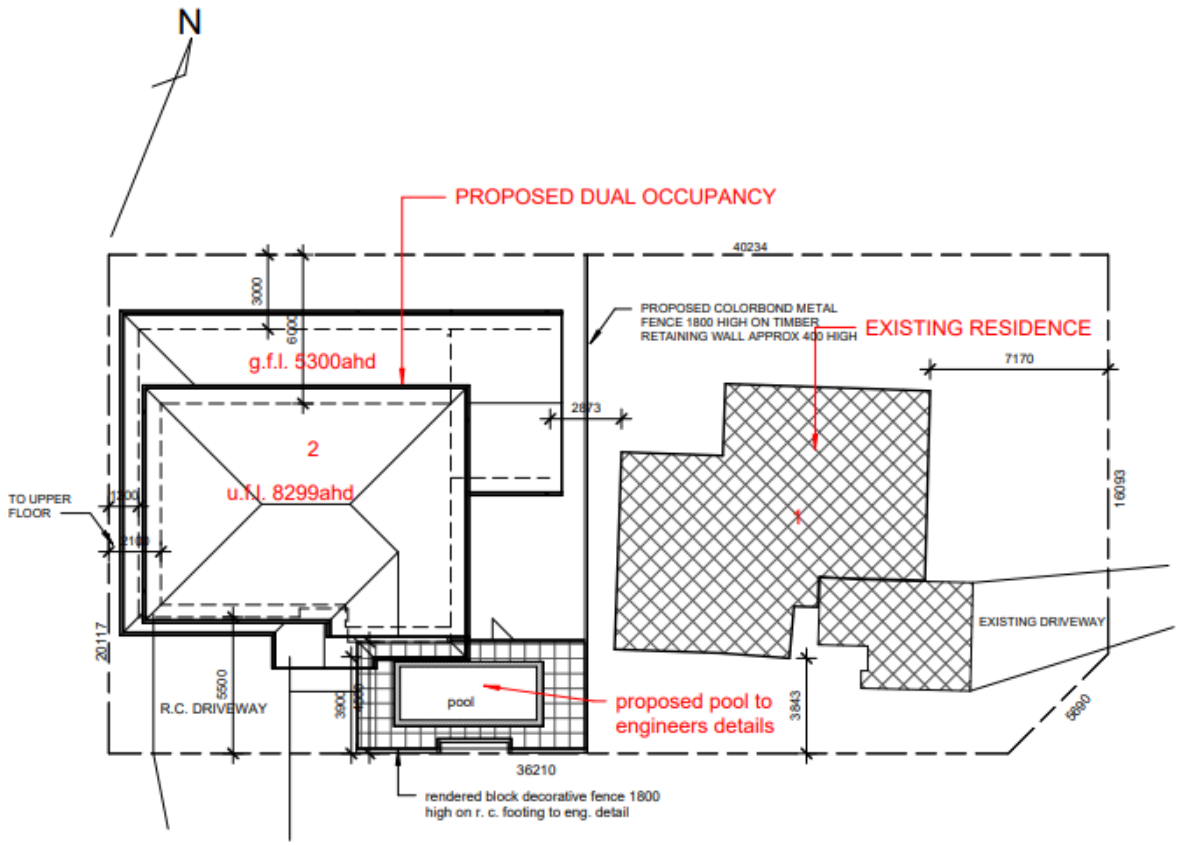
Environmental Planning and Assessment Act 1979 and Regulations 2021. *New South Wales.* Parliamentary Counsel's Office, NSW Government Information Service.

Rural Fires Act 1997. *New South Wales.* Parliamentary Counsel's Office, NSW Government Information Service.

Rural Fires Regulation 2022. *New South Wales.* Parliamentary Counsel's Office, NSW Government Information Service.

APPENDIX A

Site plans and floor plans



1 Site Copy 1
1 : 200

SITE CALCULATIOS : AREA OF SITE = 801M2
EXISTING FLOOR AREA (1) =153M2
NEW LIVINGFLOOR AREA (2) = 212M2
FLOOR SPACE RATIO = 45.6 %

Arthur Colledge
Building Design Draftsman

ph 0424083124
email arthurandsharon@bigpond.com
P.O. Box 592 Ballina

No	Description	Date
1	DA/WORKING PLAN	31/01/2024

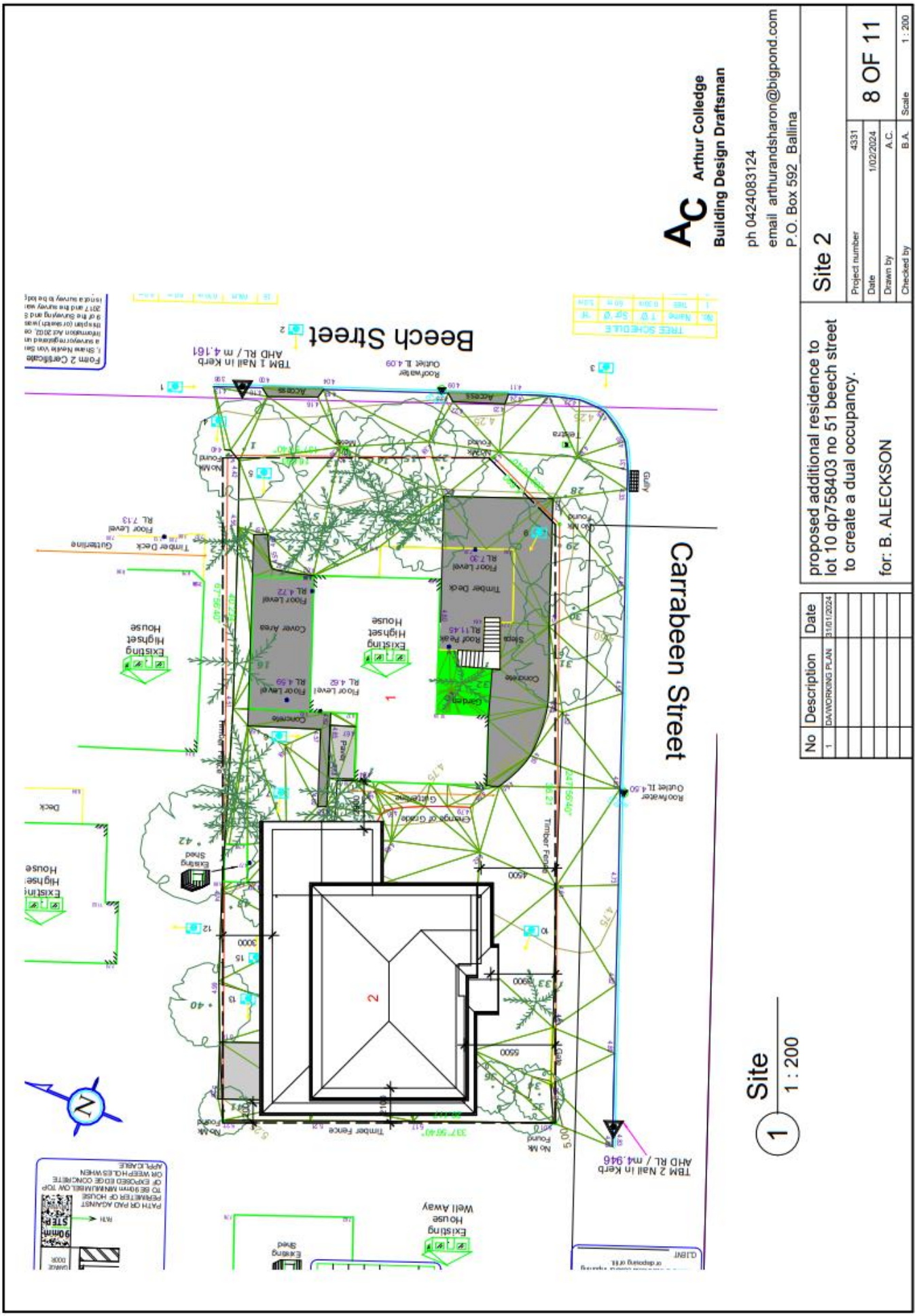
proposed additional residence to lot 10 dp758403 no 51 beech street to create a dual occupancy.

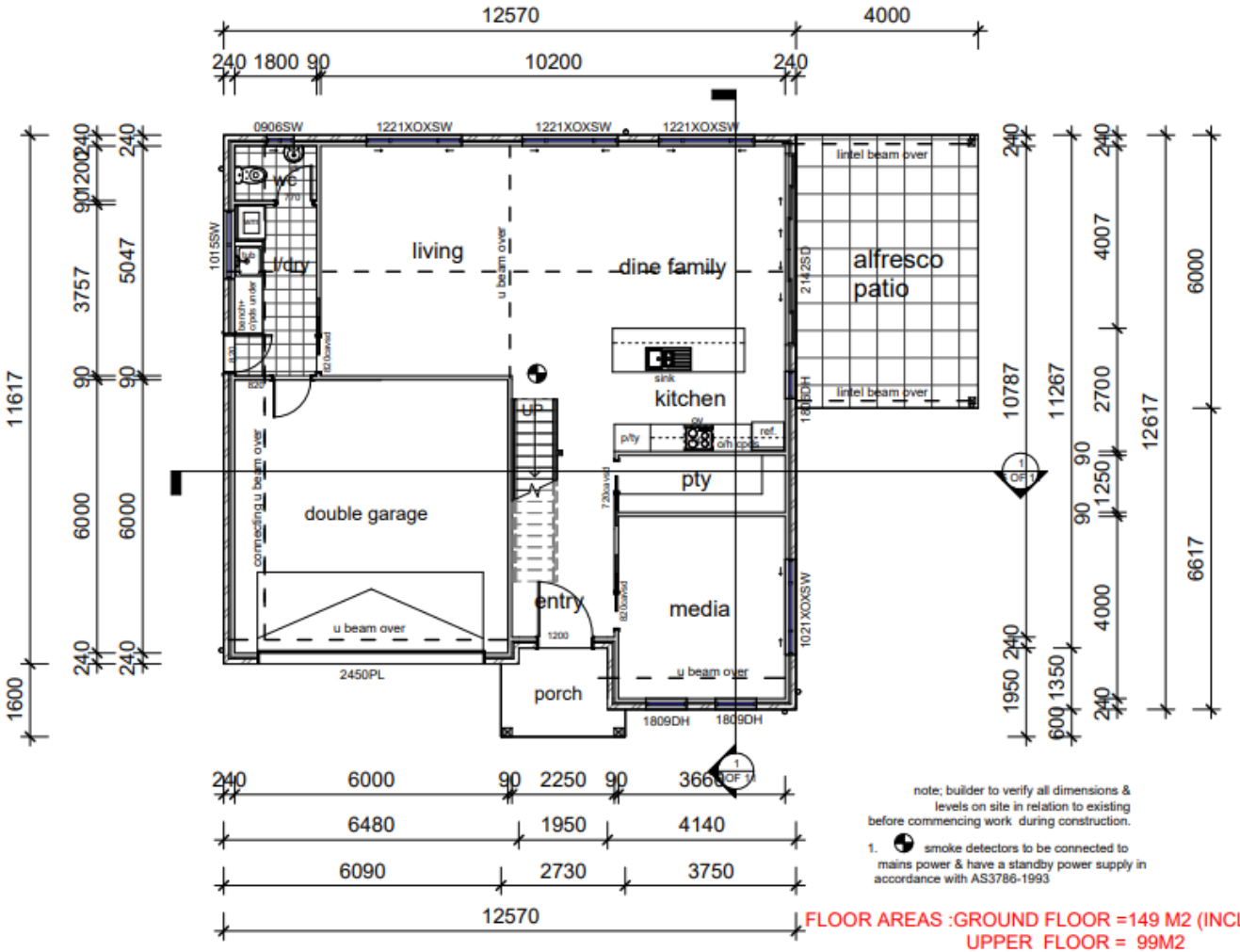
for: B. ALECKSON

Site 1

Project number	4331
Date	1/02/2024
Drawn by	A.C.
Checked by	B.A.
Scale	1 : 200

7 OF 11





note; builder to verify all dimensions & levels on site in relation to existing before commencing work during construction.

1. smoke detectors to be connected to mains power & have a standby power supply in accordance with AS3786-1993

FLOOR AREAS :GROUND FLOOR =149 M2 (INCLUDING GARAGE)
UPPER FLOOR = 99M2
ALFRESCO = 24M2
PORCH = 5M2
TOTAL = 277M2

Architectural Notes

1. Check & Verify all dimensions prior to construction commencing.
2. This drawing read in conjunction with : Engineering drawings & Basix report.
3. All construction shall be in accordance with the building code of australia & australian standards contained therin.
4. All timber framing shall be in accordance with the n.s.w. timber framing code & AS1684 & AS1720
5. Construction shall be in accordance with the terms & conditions of councils development approval.
6. Electrical contractor to discuss layout with client prior to wiring commencing.
7. Termite protection in accordance with AS3660 shall be included in building contract & installed by approved licensed contractor.

AC Arthur Colledge
Building Design Draftsman
ph 0424083124
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P.O. Box 592 Ballina

1 Ground Floor
1 : 100

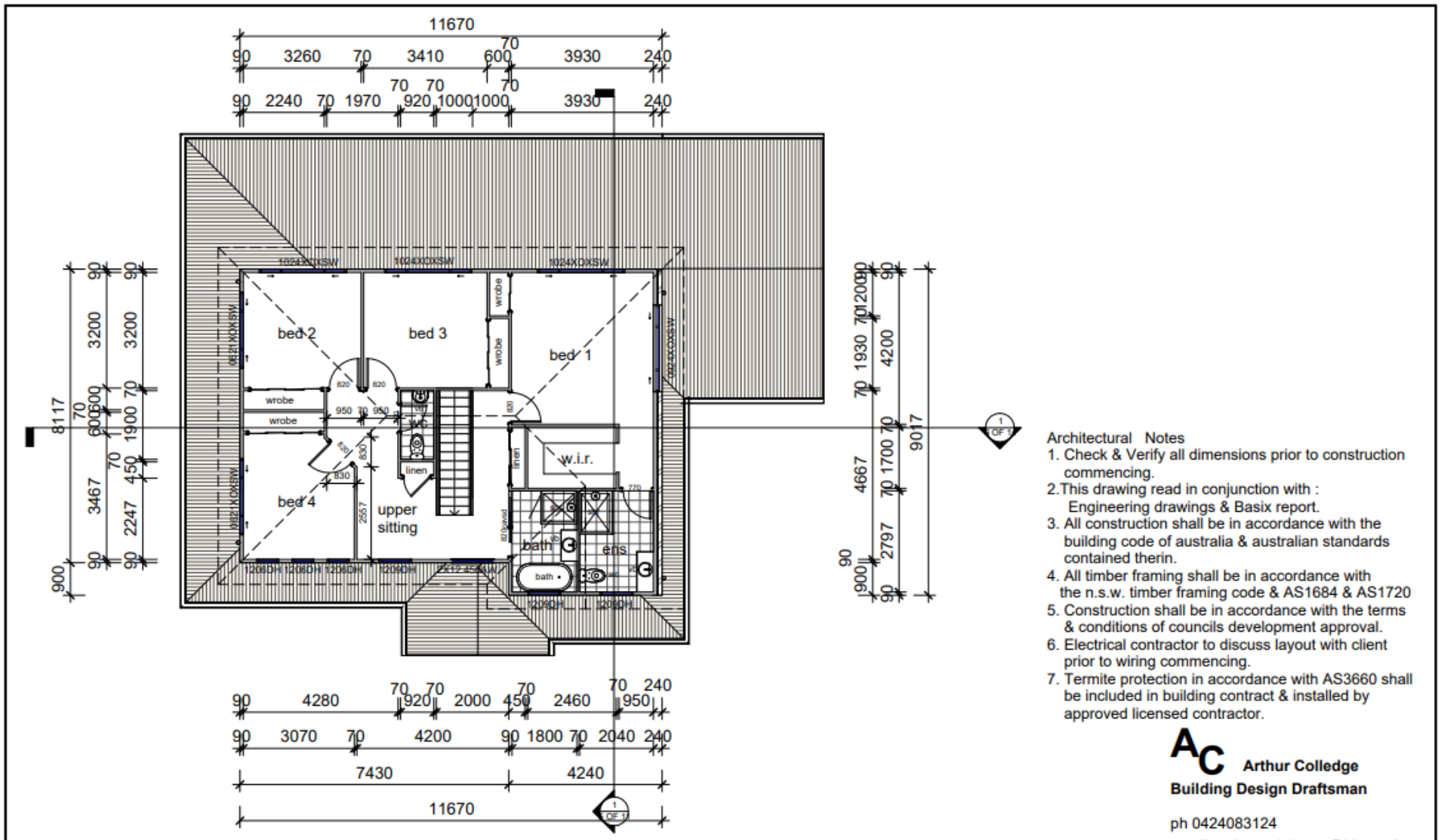
No	Description	Date
1	DA/WORKING PLAN	31/01/2024

proposed additional residence to lot 10 dp758403 no 51 beech street to create a dual occupancy.

for: B. ALECKSON

Floor Plan

Project number	4331		1 OF 11
Date	1/02/2024		
Drawn by	A.C.		
Checked by	B.A.	Scale	1 : 100



1 Upper Floor
1 : 100

Architectural Notes
1. Check & Verify all dimensions prior to construction commencing.
2. This drawing read in conjunction with : Engineering drawings & Basix report.
3. All construction shall be in accordance with the building code of australia & australian standards contained therin.
4. All timber framing shall be in accordance with the n.s.w. timber framing code & AS1684 & AS1720
5. Construction shall be in accordance with the terms & conditions of councils development approval.
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No	Description	Date
1	DA/WORKING PLAN	31/01/2024

proposed additional residence to lot 10 dp758403 no 51 beech street to create a dual occupancy.

for: B. ALECKSON

Upper Floor

Project number	4331
Date	1/02/2024
Drawn by	A.C.
Checked by	Checker
Scale	1 : 100

2 OF 11

APPENDIX B

Asset Protection Zone Requirements - Appendix 4 PBP 2019

APPENDIX 4

ASSET PROTECTION ZONE REQUIREMENTS

In combination with other BPMs, a bush fire hazard can be reduced by implementing simple steps to reduce vegetation levels. This can be done by designing and managing landscaping to implement an APZ around the property.

Careful attention should be paid to species selection, their location relative to their flammability, minimising continuity of vegetation (horizontally and vertically), and ongoing maintenance to remove flammable fuels (leaf litter, twigs and debris).

This Appendix sets the standards which need to be met within an APZ.

A4.1 Asset Protection Zones

An APZ is a fuel-reduced area surrounding a building or structure. It is located between the building or structure and the bush fire hazard.

For a complete guide to APZs and landscaping, download the NSW RFS document *Standards for Asset Protection Zones* at the NSW RFS Website www.rfs.nsw.gov.au.

An APZ provides:

- a buffer zone between a bush fire hazard and an asset;
- an area of reduced bush fire fuel that allows for suppression of fire;
- an area from which backburning or hazard reduction can 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.

Bush fire fuels should be minimised within an APZ. This is so that the vegetation within the zone does not provide a path for the spread of fire to the building, either from the ground level or through the tree canopy.

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

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

The methodology for calculating the required APZ distance is contained within Appendix 1. The width of the APZ required will depend upon the development type and bush fire threat. APZs for new development are set out within Chapters 5, 6 and 7 of this document.

In forest vegetation, the APZ can be made up of an Inner Protection Area (IPA) and an Outer Protection Area (OPA).

A4.1.1 Inner Protection Areas (IPAs)

The IPA is the area closest to the building and creates a fuel-managed area which can minimise the impact of direct flame contact and radiant heat on the development and act as a defendable space. Vegetation within the IPA should be kept to a minimum level. Litter fuels within the IPA should be kept below 1cm in height and be discontinuous.

In practical terms the IPA is typically the curtilage around the building, consisting of a mown lawn and well maintained gardens.

When establishing and maintaining an IPA the following requirements apply:

Trees

- tree canopy cover should be less than 15% at maturity;
- trees at maturity should not touch or overhang the building;
- lower limbs should be removed up to a height of 2m above the ground;
- tree canopies should be separated by 2 to 5m; and
- preference should be given to smooth barked and evergreen trees.

Shrubs

- create large discontinuities or gaps in the vegetation to slow down or break the progress of fire towards buildings should be provided;
- shrubs should not be located under trees;
- shrubs should not form more than 10% ground cover; and
- clumps of shrubs should be separated from exposed windows and doors by a distance of at least twice the height of the vegetation.

Grass

- grass should be kept mown (as a guide grass should be kept to no more than 100mm in height); and
- leaves and vegetation debris should be removed.

A4.1.2 Outer Protection Areas (OPAs)

An OPA is located between the IPA and the unmanaged vegetation. It is an area where there is maintenance of the understorey and some separation in the canopy. The reduction of fuel in this area aims to decrease the intensity of an approaching fire and restricts the potential for fire spread from crowns; reducing the level of direct flame, radiant heat and ember attack on the IPA.

Because of the nature of an OPA, they are only applicable in forest vegetation.

When establishing and maintaining an OPA the following requirements apply:

Trees

- tree canopy cover should be less than 30%; and
- canopies should be separated by 2 to 5m.

Shrubs

- shrubs should not form a continuous canopy; and
- shrubs should form no more than 20% of ground cover.

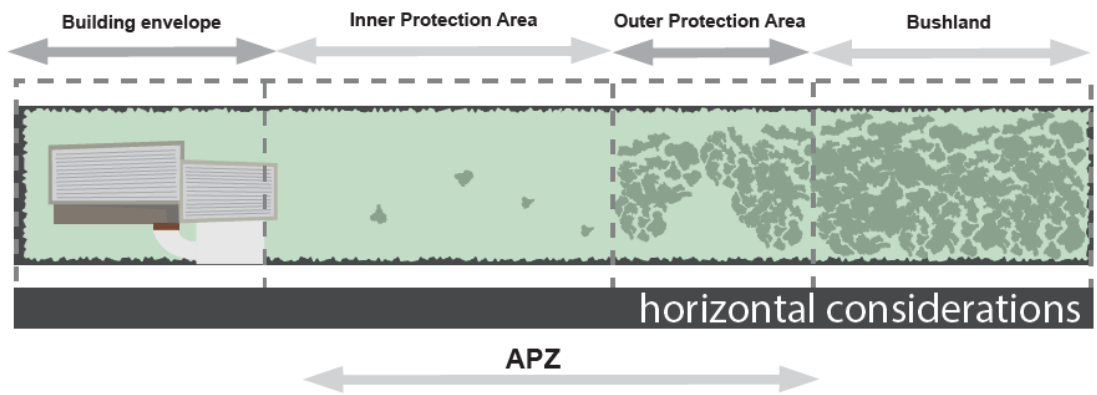
Grass

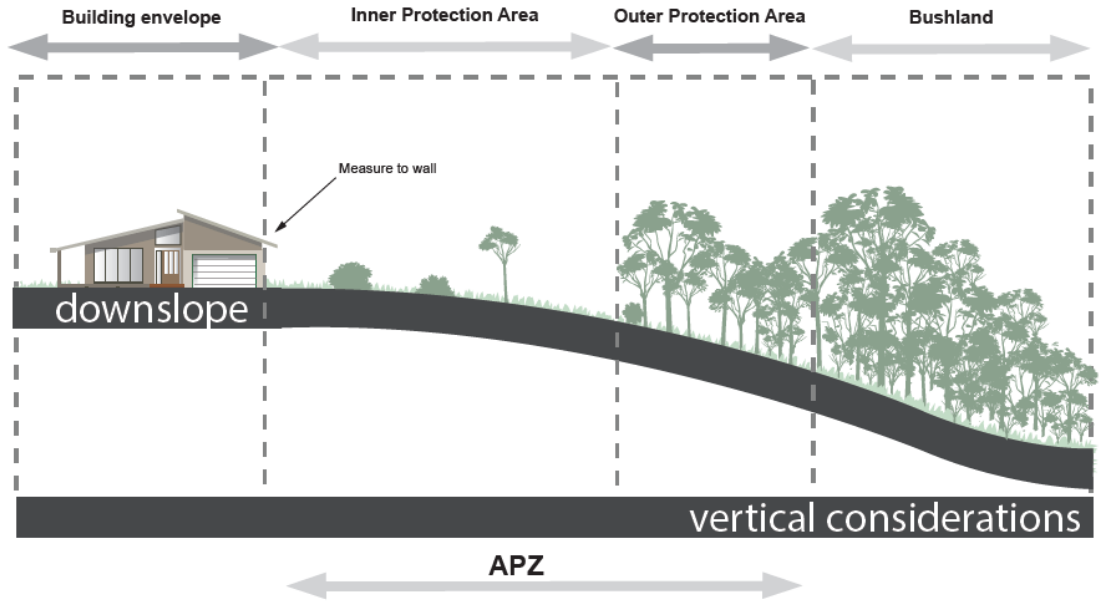
- grass should be kept mown to a height of less than 100mm; and
- leaf and other debris should be removed.

An APZ should be maintained in perpetuity to ensure ongoing protection from the impact of bush fires. Maintenance of the IPA and OPA as described above should be undertaken regularly, particularly in advance of the bush fire season.

Figure A4.1

Typical Inner and Outer Protection Areas.





APPENDIX C

Standards for Asset Protection Zones RFS 2005

standards

for asset protection zones

protection

NSW RURAL FIRE SERVICE

STANDARDS FOR ASSET PROTECTION ZONES

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.

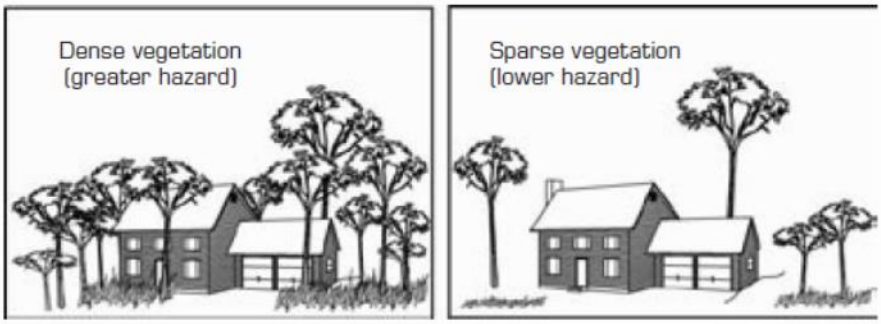
STEP 1. DETERMINE IF AN APZ IS REQUIRED

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.

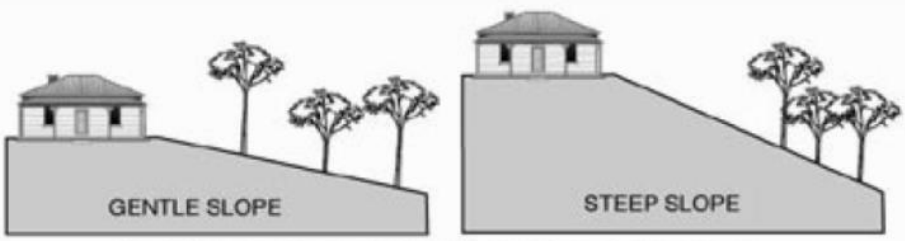
If your current development consent provides for an APZ, you do not need further approvals for works that are consistent with this consent.

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.

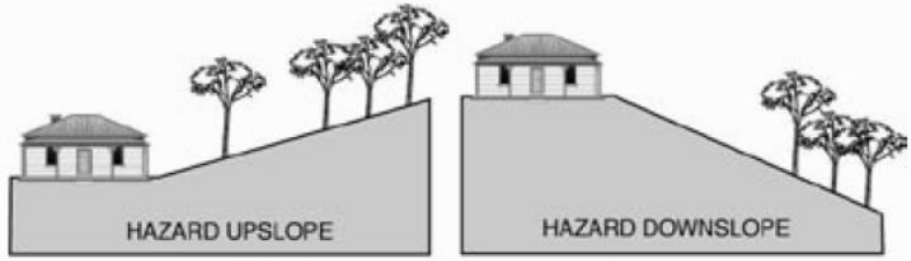
STEP 3. DETERMINE THE APZ WIDTH

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.



Gentle slopes require a smaller APZ distance than steep slopes



A hazard downslope will require a greater APZ distance then a hazard upslope 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.

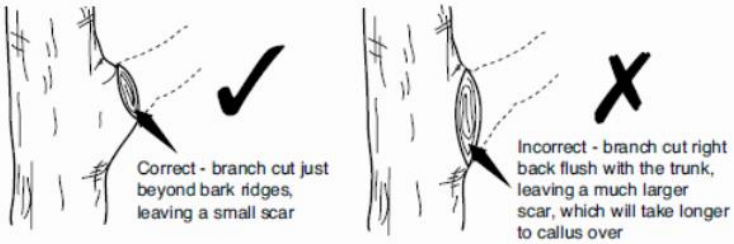
When choosing plants for removal, the following basic rules should be followed:

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 acordance 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

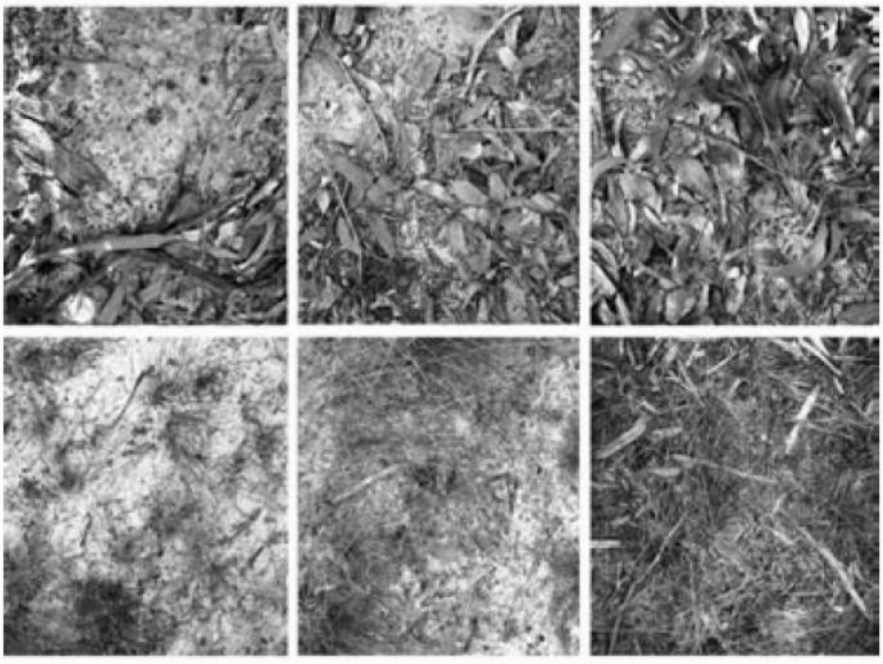
While the removal of fuel is necessary to reduce a bush fire hazard, you also need to consider soil stability, particularly on sloping areas.

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.

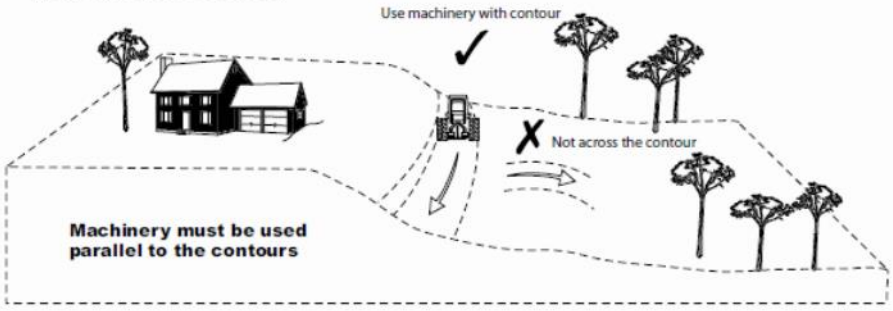
When using mechanical hazard reduction methods, you should retain a ground cover of at least 75% to prevent soil erosion. However, if your area is particularly susceptible to soil erosion, your Hazard Reduction Certificate may require that 90% ground cover be retained.



50% **75%** **100%**

Ground Cover

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.

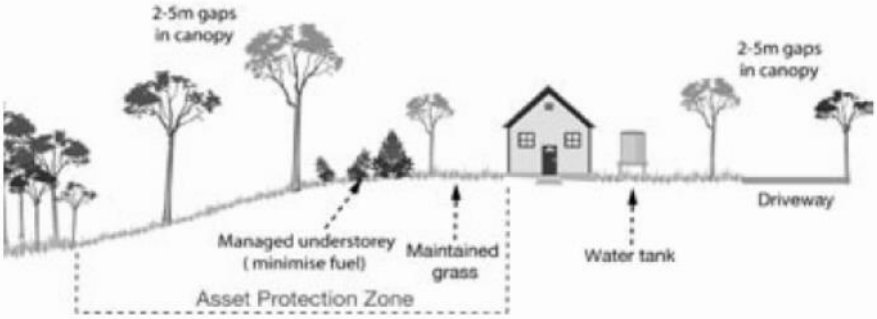


STEP 6. ONGOING MANAGEMENT AND LANDSCAPING

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.*

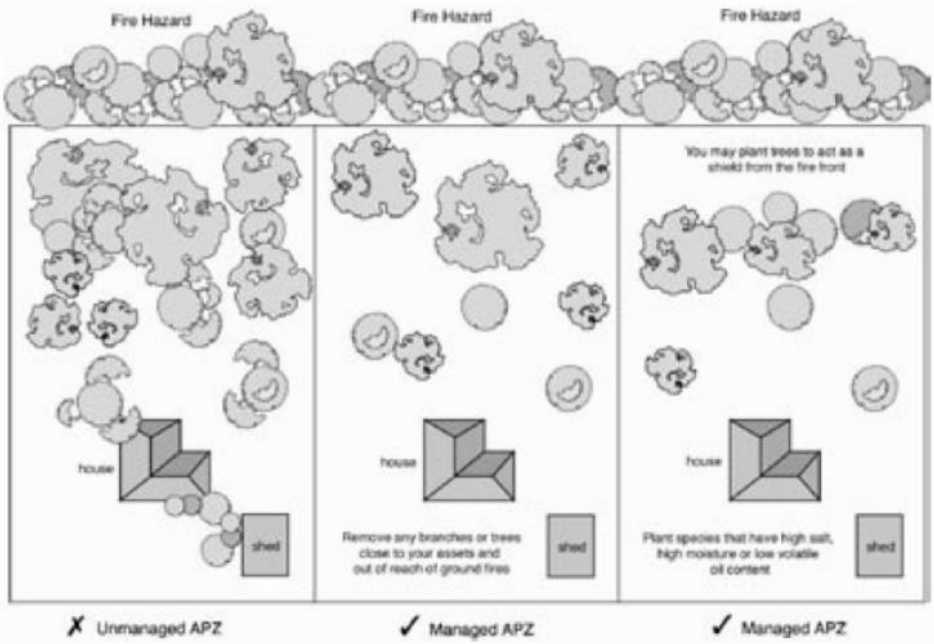
WIND BREAKS

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.**

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