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DEVELOPMENT CONSULTANTS
SURVEYORS • PLANNERS • ECOLOGISTS • BUSHFIRE CONSULTANTS

BUSH FIRE ASSESSMENT REPORT

For the Proposed Two Lot Subdivision At

12 NOBLE ROAD, KILLCARE, NSW

(LOT 56 IN DP 13551)

June 2020

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DOCUMENT TRACKING

Project Location	12 Noble Road, Killcare
Date	17/06/20
Prepared by	Ashley Dowdle
Reviewed by	Kristan Dowdle
Approved by	Kristan Dowdle
Status	FINAL
Version	2

1.0 INTRODUCTION

Clarke Dowdle & Associates has been engaged to conduct a Bush Fire Assessment Report on the property located at 12 Noble Road, Killcare. The proposal is for the subdivision of the current allotment to form two separate allotments.

This Bush Fire Assessment Report serves to identify issues relating to the condition of the site as part of the level of assurance required for consent by Central Coast Council to the Development Application (DA) pertaining to the proposed subdivision on the site. A Bushfire Assessment is required as the site falls within a Bushfire Prone Area as identified by Central Coast Council. As the proposed development involves a subdivision it is classified as integrated under Section 4.46 (1) of the *Environmental Planning and Assessment Act*. Under Section 100B of the *Rural Fires Act* therefore, the development application must be submitted to the Commissioner of the Rural Fires Services for approval and issue of a 'Bushfire Safety Authority'. The issue of a 'Bushfire Safety Authority' authorises development to the extent that it complies with standards regarding setbacks, provision of water supply and other matters considered by the Commissioner to be necessary to protect persons, property or the environment from danger that may arise from a bushfire.

The assessment was performed in June 2020 and was conducted in accordance with the procedures and methods recommended in the NSW Rural Fire Service published document NSW Rural Fire Service published document '*Planning for Bushfire Protection, 2019'* (PBP). This report will form the basis for providing an assessment of the bushfire protection requirements for the development and will provide recommendations on the provision of Asset Protection Zones, accessibility, water supplies and preliminary comments on construction standards of future developments within the site.

1.1 Proposed Development

The proposed development will involve the subdivision of the existing allotment to form two (2) separate allotments. The proposal will form;

- Proposed lot 56 (1173.2m^2) – vacant
- Proposed lot 57 (691.2m^2) - which will contain the existing dwelling

Figures 1 provides a site plan of the proposed development.

The final building plans outlining the size and dimension of the proposed development will accompany the Development Application.

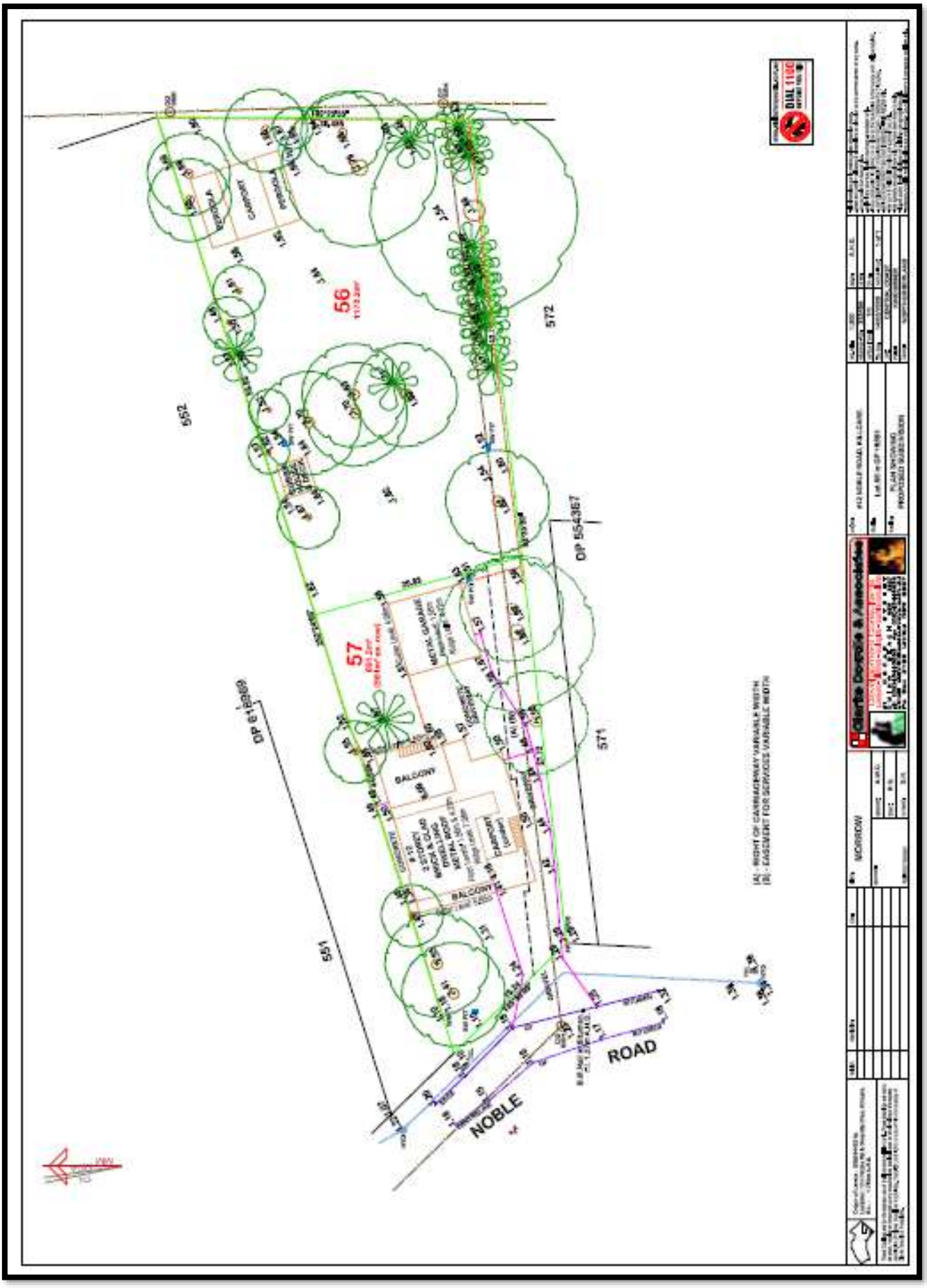


Figure 1: Proposed Subdivision Site Plan

2.0 OBJECTIVES AND SCOPE OF THE ASSESSMENT

The primary objectives of this report are to:

- Outline the degree of bushfire hazard currently affecting the site;
- Outline the degree to which any identified bushfire hazard can be managed;
- Indicate the potential of the site to provide a safe development;
- Provide recommendations for the provision of Asset Protection Areas and Construction standards;
- Review the accessibility of the site; and
- Identify any pre-existing bushfire protective measures such as roads and creeks.

In order to achieve the above objectives, the following work was conducted:

- Compilation and review of site information including a site detail plan, topographic map, aerial photograph and site photographs;
- Review of appropriate guidelines including Australian Standard AS3959-2018 '*Construction of buildings in Bushfire Prone Areas'* and PBP;
- Inspection of the proposed development site and surrounding areas to assess the topography, slopes, aspect, drainage vegetation and adjoining land usage;
- Identification of any existing bushfire protection advantages such as roads, creeks and sporting ovals; and
- Visual appraisal of bushfire hazard and risk to the site.

3.0 LEGISLATION

This report has been prepared in accordance with the following legislation and planning requirements:

- *Environmental Planning and Assessment Act, 1979*
- *Rural Fires Act, 1997 (Amended), Sections 63 (1) ,63 (2) and 100B*
- *Rural Fires Regulation 2013*
- *Planning for Bushfire Protection, 2019.*

4.0 SITE IDENTIFICATION AND DESCRIPTION

4.1 Site Identification and Location

The subject site is currently known as 12 Noble Road, Killcare, NSW (Lot 56 in DP 13551). The site is in the Local Government Area (LGA) of Central Coast Council (Fire Danger Index-100).

Figure 2: Aerial Photograph of the site (bordered in red)
Source: Nearmap, 2020

The site is a residential parcel of land that contains an existing dwelling on the western portions of the site. Lands within the site comprise of managed lawns and landscaped gardens. A number of trees do exist on the eastern portions of the site however managed lands exist beneath.

The site is connected to the town reticulated supply of water and to main electrical grid.

4.2 Bushfire Prone Mapping

The land is mapped by Central Coast Council as being bushfire prone. The site has been mapped as being partially within the bushfire buffer (yellow) and predominantly containing Category 1 (red) vegetation. The following extract from the Department of Planning Bushfire Mapping outlines this.

Figure 3: Bushfire Prone Mapping and approximate location of site (highlighted in yellow)
Source: Department of Planning, 2020

5.0 BUSHFIRE HAZARD ASSESSMENT

5.1 Surrounding Vegetation

The following hazardous vegetation was calculated for a distance of at least 140m from proposed site boundaries (See Figure 5).

5.1.1 South & East

The surrounding land on these aspects contain managed lands associated with developed residential allotments. Whilst some trees do exist on these aspects predominantly managed lands exist beneath and therefore this aspect is deemed not to contain a bushfire hazard.

5.1.2 North

To the north beyond the site and managed lands associated with rows of developed residential allotments and Fraser Road is vegetation that has been mapped as containing *Narrabeen Coastal Blackbutt Forest*. This vegetation meets with the Keith (2004) description of a 'dry sclerophyll forest' and therefore, in accordance with Appendix 1 in PBP the vegetation will be assessed as **Forest** and provides a bushfire risk to the proposal.

5.1.3 West

To the west beyond the site and Noble Road is vegetation bordering Hardys Bay that has been mapped as containing *Estuarine Swamp Oak Forest*. Groundtruthing revealed however that this vegetation contains Mangroves (Saline Wetlands) which are assessed under A1.10 in PBP as being *Low threat vegetation – exclusions* and therefore is not required to be considered as a hazard for the purposes of PBP.

1.

2.

3.

4.

Note: See figure 5 for photograph location and direction.

5.2 Effective Slope

PBP states in A1.5 that effective slope is;

'The slope of the land under the classified vegetation has a direct influence on the rate of fire spread, the intensity of the fire and the ultimate level of radiant heat flux.

The effective slope is the slope of the ground under the hazard (vegetation). It is not the slope between the vegetation and the building (slope located between the asset and vegetation is the site slope).'

In regards to the proposal the following effective slopes are applicable.

- **North: Flat/Up Slope**

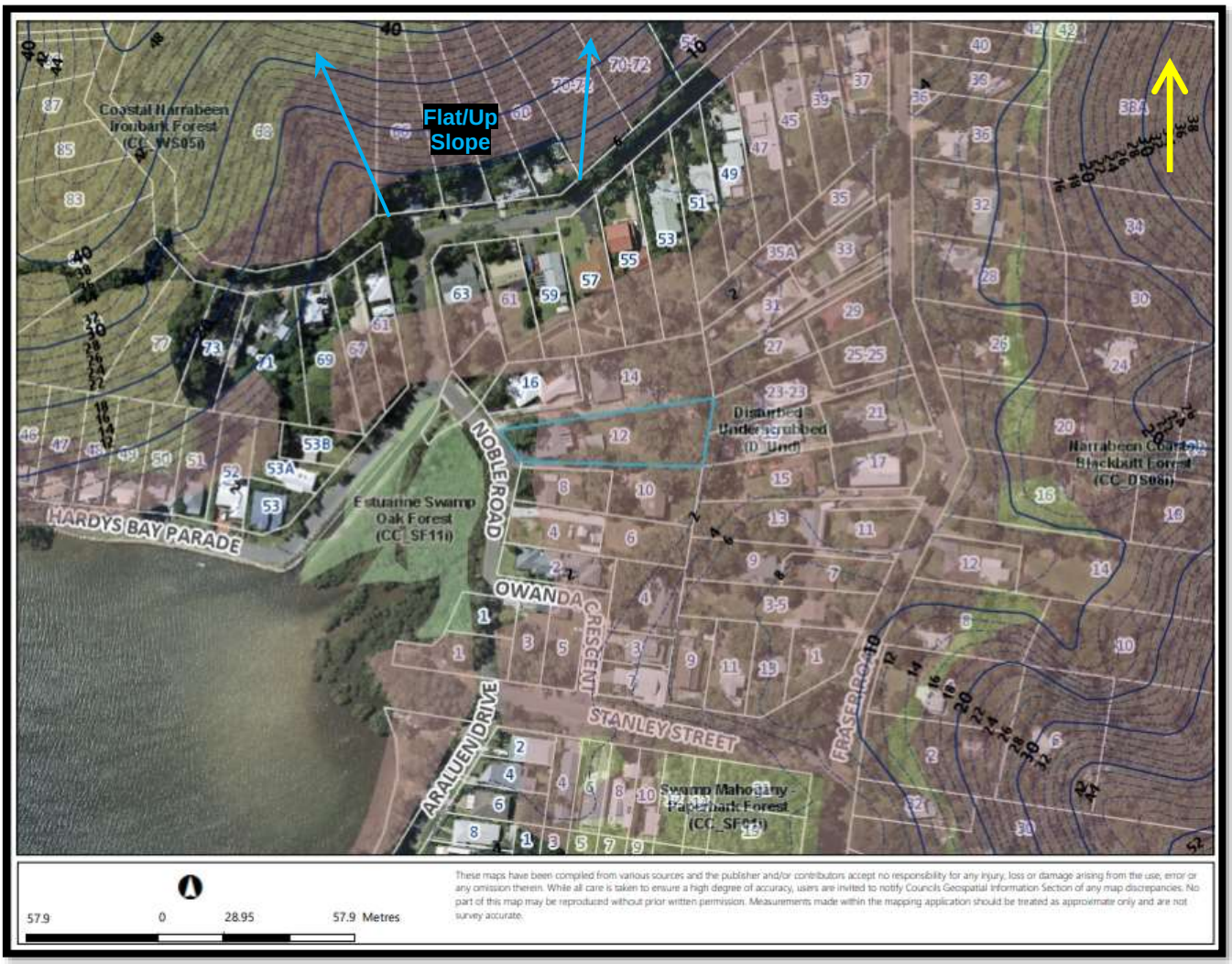


Figure 5: Topographic & Vegetation mapping
Source: Central Coast Council, 2020 (2m contours)

6.0 BUSHFIRE RISK ASSESSMENT

6.1 Background Information

This bushfire assessment follows the methods and procedures recommended in PBP. This document provides concepts for (via a NSW State variation to the BCA) Class 1, 2, 3 buildings, Class 4 parts of buildings, some Class 10 structures and Class 9 buildings that are Special Fire Protection Purposes (SFPP) (AS3959-2018) in bushfire prone areas and gives guidance on planning and development control processes in relation to bushfire protection measures. The document also provides a methodology for determining setback and Bushfire Attack Levels (BAL) required in development for residential purposes that are found to fall in areas designated as bushfire-prone.

6.2 Asset Protection Zones

Appendix 1 of PBP provides a methodology for determining the Asset Protection Zone (APZ) required for any given proposed development. APZ's describe the distance between the proposed development (the asset) and the hazard (the bushland) and vary according to topography and vegetation type. PBP states that the primary purpose of an APZ is to ensure that a progressive reduction of bushfire fuels occurs between the bushfire hazard and any habitable structures within the development.

A summary of the APZ's required for each aspect of the proposed developments is provided in Table 1.

6.3 Bushfire Attack Level (BAL)

Following on from the subdivision stage, any future construction is subject to Section 4.14 of the *EP&A Act* or the code's SEPP (Clause 1.19). *AS3959*-2018 is not applied until building construction stage.

The bushfire risk to a property depends on the vegetation type, slope and proximity of vegetation to the proposed development, and can be classified as BAL-LOW, BAL-12.5, BAL-19, BAL-29, BAL-40 and BAL FZ as outlined in AS3959-2018. AS3959-2018 provides two methods to determine complying Bushfire Attack Levels, these are the Simplified Procedure-Method 1 (deemed-to-satisfy) and Detailed Method for Determining the Bushfire Attack Level-Method 2.

Table 1: Asset Protection Zone Summary (Proposed Lots 56 & 57)

Aspect	Vegetation[1] within 140m of development	Effective Slope of Land	Required APZ[2]	Distance to vegetation[3]	Bushfire Attack Level (BAL)[4]
North	Forest	Flat/Up Slope	24m	~105m	BAL Low
South, East & West	Managed Lands	-	-	>100m	BAL Low

Notes for Table 1:

- (1) Refer to Keith (2004) and Appendix 1 in *PBP*
- (2) Refer to A1.12.1 in PBP for Residential Subdivision Development
- (3) See Figure 5
- (4) Refer to Table A1.12.5 in *PBP*

The minimum APZ's detailed in Table 1 can be accommodated and exceeded with the inclusion of the adjoining managed properties. Although no new dwellings are proposed as part of this application, as no bushfire hazard was located within 100m of the proposal, the existing and any proposed new dwelling is subject to BAL Low.

6.4 Aboriginal and Environmental Considerations

No aboriginal artefacts/cultural survey were conducted as part of the subdivision.

No ecological surveys were conducted as part of the proposed subdivision however impacts associated with bushfire protection is seen as minimal.

Figure 5: Bushfire Assessment Site Plan (site bordered in red)
Source: Nearmap, 2020

7.0 PERFORMANCE CRITERIA COMPLIANCE

The following table outlines the proposed subdivision's compliance or otherwise with each of the performance requirements and acceptable solutions provided in Section 4.2 of PBP.

7.1 Asset Protection Zones

Intent of measures: *to provide sufficient space and maintain reduced fuel loads to ensure radiant heat levels at the buildings are below critical limits and prevent direct flame contact.*

	PERFORMANCE CRITERIA	ACCEPTABLE SOLUTIONS	COMMENTS
ASSET PROTECTION ZONES	potential building footprints must not be exposed to radiant heat levels exceeding 29 kW/m² on each proposed lot.	APZs are provided in accordance with Tables A1.12.2 and A1.12.3 based on the FFDI.	APZ's have been recommended and can be accommodated complying with Table A1.12.1 in Appendix 1.
	APZs are managed and maintained to prevent the spread of a fire towards the building.	APZs are managed in accordance with the requirements of Appendix 4.	APZ's have been recommended and can be accommodated complying with Table A1.12.1 in Appendix 1.
	the APZs is provided in perpetuity.	APZs are wholly within the boundaries of the development site	Complies
	APZ maintenance is practical, soil stability is not compromised and the potential for crown fires is minimised.	APZs are located on lands with a slope less than 18 degrees.	APZ's will occur upon lands less than lands with a slope less than 18 degrees.
LANDSCAPING	landscaping is designed and managed to minimise flame contact and radiant heat to buildings, and the potential for wind-driven embers to cause ignitions.	landscaping is in accordance with Appendix 4; and fencing is constructed in accordance with section 7.6.	The development **complies** provided the appropriate condition is included on the Bush Fire Safety Authority (BFSA) upon application

7.2 Access

Intent of measures: *to provide safe operational access to structures and water supply for emergency services, while residents are seeking to evacuate from an area.*

	PERFORMANCE CRITERIA	ACCEPTABLE SOLUTIONS	COMMENTS
ACCESS	firefighting vehicles are provided with safe, all-weather access to structures.	• property access roads are two-wheel drive, all-weather roads; • perimeter roads are provided for residential subdivisions of three or more allotments; • subdivisions of three or more allotments have more than one access in and out of the development; • traffic management devices are constructed to not prohibit access by emergency services vehicles; • maximum grades for sealed roads do not exceed 15 degrees and an average grade of not more than 10 degrees or other gradient specified by road design standards, whichever is the lesser gradient; • all roads are through roads; • dead end roads are not recommended, but if unavoidable, are not more than 200 metres in length, incorporate a minimum 12 metres outer radius turning circle, and are clearly sign posted as a dead end; • where kerb and guttering is provided on perimeter roads, roll top kerbing should be used to the hazard side of the road; • where access/egress can only be achieved through forest, woodland and heath vegetation, secondary access shall be provided to an alternate point on the existing public road system; and • one way only public access roads are no less than 3.5 metres wide and have designated parking bays with hydrants located outside of these areas to ensure accessibility to reticulated water for fire suppression.	The proposed road providing access to Lots will comply with this condition.
	the capacity of access roads is adequate for firefighting vehicles	the capacity of perimeter and non-perimeter road surfaces and any bridges/causeways is sufficient to carry fully loaded firefighting vehicles (up to 23 tonnes); bridges/causeways are to clearly indicate load rating.	No perimeter and non-perimeter roads are proposed
	there is appropriate access to water supply.	• hydrants are located outside of parking reserves and road carriageways to ensure accessibility to reticulated water for fire suppression; • hydrants are provided in accordance with the relevant clauses of AS 2419.1:2005 - *Fire hydrant installations System design, installation and commissioning*; and • there is suitable access for a Category 1 fire appliance to within 4m of the static water supply where no reticulated supply is available.	Any future development upon the site will be required to comply with this condition

PERIMETER ROAD	access roads are designed to allow safe access and egress for firefighting vehicles while residents are evacuating as well as providing a safe operational environment for emergency service personnel during firefighting and emergency management on the interface.	• are two-way sealed roads; • minimum 8m carriageway width kerb to kerb; • parking is provided outside of the carriageway width; • hydrants are located clear of parking areas; • are through roads, and these are linked to the internal road system at an interval of no greater than 500m; • curves of roads have a minimum inner radius of 6m; • the maximum grade road is 15 degrees and average grade of not more than 10 degrees; • the road crossfall does not exceed 3 degrees; and • a minimum vertical clearance of 4m to any overhanging obstructions, including tree branches, is provided.	No perimeter roads are applicable
NON-PERIMETER ROAD	access roads are designed to allow safe access and egress for firefighting vehicles while residents are evacuating.	• minimum 5.5m carriageway width kerb to kerb; • parking is provided outside of the carriageway width; • hydrants are located clear of parking areas; • roads are through roads, and these are linked to the internal road system at an interval of no greater than 500m; • curves of roads have a minimum inner radius of 6m; • the road crossfall does not exceed 3 degrees; and • a minimum vertical clearance of 4m to any overhanging obstructions, including tree branches, is provided.	The development **complies** provided the appropriate condition is included on the Bush Fire Safety Authority (BFSA) upon application
PROPERTY ACCESS	firefighting vehicles can access the dwelling and exit the property safely	• There are no specific access requirements in an urban area where an unobstructed path (no greater than 70m) is provided between the most distant external part of the proposed dwelling and the nearest part of the public access road (where the road speed limit is not greater than 70kph) that supports the operational use of emergency firefighting vehicles. In circumstances where this cannot occur, the following requirements apply: • minimum 4m carriageway width; • in forest, woodland and heath situations, rural property access roads have passing bays every 200m that are 20m long by 2m wide, making a minimum trafficable width of 6m at the passing bay; • a minimum vertical clearance of 4m to any overhanging obstructions, including tree branches; • provide a suitable turning area in accordance with Appendix 3; • curves have a minimum inner radius of 6m and are minimal in number to allow for rapid access and egress; • the minimum distance between inner and outer curves is 6m; • the crossfall is not more than 10 degrees; • maximum grades for sealed roads do not exceed 15 degrees and not more than 10 degrees for unsealed roads; and • a development comprising more than three dwellings has access by dedication of a road and not by right of way.	See comments below.

		Note: Some short constrictions in the access may be accepted where they are not less than 3.5m wide, extend for no more than 30m and where the obstruction cannot be reasonably avoided or removed. The gradients applicable to public roads also apply to community style development property access roads in addition to the above.	

7.2.1 Additional Comments

The subdivision will be provided with an access road that is 3.5m in width, reduces to 3.0m for a short section before expanding to 3.5m and meeting with proposed lot 2. It is noted that there is potential that any development within Lot 2 could be greater than 70m from Noble Road and therefore is technically not exempt from a 4m wide access road.

As stated, the subdivision was been shown to be subject to a low bushfire threat (BAL Low) as no bushfire hazard was located within 100m of the proposed boundaries. Due to this, it is unlikely the RFS vehicles would attend the site and therefore it is acknowledged that fire appliances will generally operate from the public road system. On the basis of this, the following NSW Fire and Rescue guidelines are relevant;

6.1 Minor residential development should ensure no part of any dwelling is more than 90m from a carriageway that can be readily accessed and traversed by a fire appliance (see Figure 1 and Figure 2).

Note: The 90m distance is equivalent to three lengths of standard 30m firefighting hose being connected to the fire appliance.

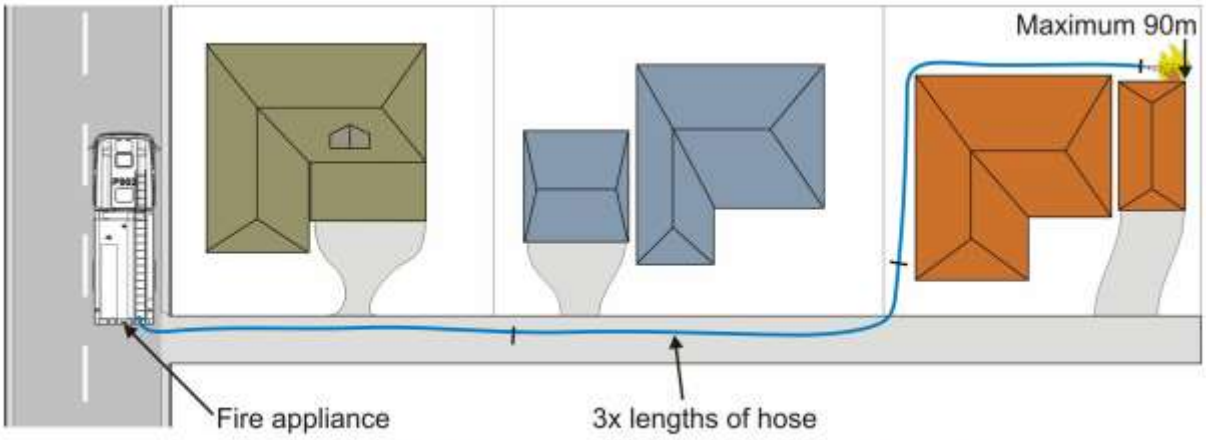


Figure 1 Example of 90m hose coverage from a public road

Source: NSW Fire and Rescue, 2016

Therefore, based upon the low bushfire threat to site (BAL Low), the urban context of the subdivision and the ability to comply with the requirements of NSW Fire and Rescue (<90m from the road), the access to the proposed subdivision is deemed as suitable.

7.3 Services-Water, electricity and gas

***Intent of measures**: to provide adequate services of water for the protection of buildings during and after the passage of a bush fire, and to locate gas and electricity so as not to contribute to the risk of fire to a building.*

	PERFORMANCE CRITERIA	ACCEPTABLE SOLUTIONS	COMMENTS
WATER SUPPLY	adequate water supplies is provided for firefighting purposes.	• reticulated water is to be provided to the development where available; • a static water and hydrant supply is provided for non-reticulated developments or where reticulated water supply cannot be guaranteed; and • static water supplies shall comply with Table 5.3d.	Will Comply
	• water supplies are located at regular intervals; and • the water supply is accessible and reliable for firefighting operations.	• fire hydrant, spacing, design and sizing complies with the relevant clauses of Australian Standard AS 2419.1:2005; • hydrants are not located within any road carriageway; and • reticulated water supply to urban subdivisions uses a ring main system for areas with perimeter roads.	Not Applicable
	flows and pressure are appropriate	fire hydrant flows and pressures comply with the relevant clauses of AS 2419.1:2005.	Not Applicable
	the integrity of the water supply is maintained.	• all above-ground water service pipes are metal, including and up to any taps; and • above-ground water storage tanks shall be of concrete or metal	Any future development upon the site will be required to comply with this condition
ELECTRICAL SERVICES	location of electricity services limits the possibility of ignition of surrounding bush land or the fabric of buildings.	• where practicable, electrical transmission lines are underground; • 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 ISSC3 *Guideline for Managing Vegetation Near Power Lines*.	Any future development upon the site will be required to comply with this condition
GAS SERVICES	location and design of gas services will not lead to ignition of surrounding bushland or the fabric of buildings.	• 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.	Any future development upon the site will be required to comply with this condition

8.0 RECOMMENDATIONS

The allotment falls within a bushfire prone area as deemed by Central Coast Council and therefore the requirements of PBP apply. This bushfire assessment has followed the methods and procedures recommended in this document.

This Bush Fire Assessment Report concludes that the proposed development will comply with the performance criteria for PBP if the proposed development acceptable solutions and recommendations are implemented. These items are outlined below.

8.1 Asset Protection Zones

APZs are to be provided to the proposed development. APZs are to be measured from the exposed wall of the any dwelling toward the hazardous vegetation.

- All newly created lots shall be maintained as an APZ for the lifetime of the development
- The APZ's shall be maintained in accordance with an Inner Protection Area (IPA) and be in accordance with NSW Rural Fire Service's document '*Standards for Asset Protection Zones*' and Appendix 4 of Planning for Bush Fire Protection 2019.

8.1.1 Environmental Considerations

The proposed development will not require any vegetation removal for bushfire purposes.

8.2 Construction Standards

- The **existing dwelling** and any new dwelling have been assessed to be subject to **BAL LOW** with no specific construction requirements are required under AS3959-2018 and PBP.

8.3 Property Access and Egress

- The proposed lots are provided access by public roads that comply with Table 5.3b Property Access of PBP.

- Both new allotments will be within 70m of Noble Road and therefore no specific access requirements under Table 5.3b Property Access of PBP.

8.4 Duty of Care

- It is recommended that the building occupants prepare a bushfire survival plan which addresses the option to leave early prior to bushfire impacting the site. Details on how prepare this plan is provided by the NSW RFS website (http://www.rfs.nsw.gov.au/file_system/attachments/Attachment_BushFireSurvivalPlan.pdf)

- The landowner / manager is to be made aware of their liability to manage the development lands for the ongoing protection of themselves and their neighbours (refer *Section 63(2) Rural Fires Act*).

- Landowners living in bushfire prone areas should familiarise themselves with publications published by the NSW Rural Fire Service. These are located on the RFS web site www.rfs.nsw.gov.au.

8.5 Water and Utility Services Supply

Water, electricity and gas supply for each allotment is to comply with Table 5.3c of PBP.

9.0 CONCLUSION

Clarke Dowdle & Associates were engaged to conduct a Bush Fire Assessment Report on the property located at 12 Noble Road, Killcare. The assessment was performed in June 2020 and was conducted in accordance with the procedures and methods recommended in the NSW Rural Fire Service published document '*Planning for Bushfire Protection'* (PBP).

This report has outlined and provided recommendations as to how the proposal may comply with the Specific objectives outlined section 5.2 of PBP as summarised below;

minimise perimeters of the subdivision exposed to the bush fire hazard (hourglass shapes, which maximise perimeters and create bottlenecks should be avoided);

The proposed subdivision design complies with this objective

minimise vegetated corridors that permit the passage of bush fire towards buildings;
The proposed subdivision does not adjoin any vegetation corridors that would allow the passage of fire towards and new or existing buildings.

provide for the siting of future dwellings away from ridge-tops and steep slopes, within saddles and narrow ridge crests;

Any future dwelling will not be located on ridge-tops, steep slopes, within saddles and narrow ridge crests;

ensure that APZs between a bush fire hazard and future dwellings are effectively designed to address the relevant bush fire attack mechanisms;
APZs have been provided which comply with and/or exceed the minimum requirements of Table A1.12.2 of *PBP*. The future buildings will be constructed in accordance with *AS3959-2018* and Section 7.5 in PBP

ensure the ongoing maintenance of APZs;
Fuel management within the residential lots can be undertaken by the land owners under the guide of Appendix B and as outlined within NSW RFS publications such as *Standards for Asset Protection Zones* available from the RFS website at www.rfs.nsw.gov.au.

provide adequate access from all properties to the wider road network for residents and emergency services;
Access complies with the performance requirements outlined in Table 5.3b in PBP, 2019

provide access to hazard vegetation to facilitate bush fire mitigation works and fire suppression; and
Not applicable as hazardous vegetation does not occur within and/or immediately adjoining the property.

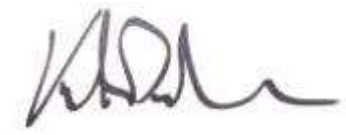
ensure the provision of an adequate supply of water and other services to facilitate effective firefighting.
Water supply, gas services and electricity are to comply with Table 5.3c in PBP, 2019

The determining authorities and Rural Fire Service may suggest further or additional measures to be implemented in the planning and constructions on the subject site.

We would be pleased to provide further information on any aspects of this report.

For and on behalf of

Clarke Dowdle and Associates



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Disclaimer

PBP States;
Not withstanding the precautions adopted, it should always be remembered that bushfire burn under a wide range of conditions and an element of risk, no matter how small always remains.

AS 3959-2018 states;
It should be borne in mind that the measures contained in this standard cannot guarantee that the building will survive a bushfire event on every occasion. This is substantially due to the unpredictable nature and behaviour of fire and extreme weather conditions.

This report provides the required information to assist Local Council and the Rural Fire Service in determining compliance in accordance with PBP and AS 3959-2018 and as stated above, this report does not guarantee that the proposal will withstand bushfire attack on every occasion.

REFERENCES

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