

CLARKE DOWDLE & ASSOCIATES
DEVELOPMENT CONSULTANTS
SURVEYORS • PLANNERS • ECOLOGISTS • BUSHFIRE CONSULTANTS

BUSH FIRE ASSESSMENT REPORT



For the Proposed Residential Development
at

**LOT 321 HAWKESBURY RIVER,
PATONGA, NSW
(LOT 321 IN DP 755251)**

October 2020

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DOCUMENT TRACKING

Project Location	Lot 321 Hawkesbury River, Patonga
Date	28/10/2020
Prepared by	Ashley Dowdle
Reviewed by	Kristan Dowdle
Approved by	Kristan Dowdle
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1.0 INTRODUCTION

We have attended the above-described property for the purpose of undertaking a Bush Fire Assessment Report (BFAR) in accordance with the guidelines outlined in Planning for Bushfire Protection, 2019 (PBP), to determine the level of bushfire threat to the site. Central Coast Council has provided mapping of Bushfire Prone Areas that identifies areas of bushfire threat. This mapping identifies properties that are in the buffer zone of 100m metres from Category 1 mapped vegetation or 30m from Category 2 & 3 mapped vegetation. All developments occurring on land mapped as bushfire prone are subject to the conditions detailed in the planning document PBP.

The subject site has been mapped as bushfire prone land (See Figure 1); therefore, the purpose of this BFAR is to provide information to Central Coast Council to ascertain compliance or otherwise with AS3959-2018 'Construction of Buildings in Bush Fire Prone Areas' and PBP.

This report will provide an independent assessment of the bushfire risk to the proposal, based upon the surrounding site conditions with reference to Section 4.14 of the Environmental Planning and Assessment Act 1979, PBP and AS3959-2018.



Figure 1: Bushfire Mapping (site boundary in yellow)
Source: Department of Planning, 2020

1.1 Proposed Development

The site contains a two-storey dwelling of which has had the first-floor cladding and internal walls removed due to termite damage. The proposed development will involve the construction of additions and alterations to the dwelling but also the rectification works of the dwelling. Figure 2 provides a site plan of the proposal.

Appendix A provides the full set of building plans outlining the size and dimension of the proposed development.

2.0 SITE IDENTIFICATION

The site is located at Lot 321 Hawkesbury River, Patonga (Lot 321 DP 755251). The site is in the Local Government Area (LGA) of Central Coast Council (Fire Danger Index-100). The site is only accessible by boat and via the Hawkesbury River to the east.

The site is a residential parcel of land that contains an existing dwelling on the eastern portions of the property and a shed further to the west. Land conditions within the site consist of predominately managed lands.

The site is not connected to the town-reticulated supply of water but is connected to the mains electrical grid.



Figure 3: Aerial Photograph of the site (site boundary bordered in blue)
Source: Nearmap, 2020

3.0 BUSH FIRE HAZARD ASSESSMENT

3.1 Surrounding Vegetation

The surrounding land and vegetation found within 140m of the site are detailed below.

North, South & East

The surrounding land on these aspects is occupied by developed residential allotments containing predominately managed curtilage throughout and Hawkesbury River to the east. Whilst some trees do exist on these aspects predominantly managed lands exist beneath and therefore these aspects are deemed not to contain a bushfire hazard.

West

To the west and directly adjoining the site is vegetation existing on a steep east-facing land and that has been mapped by council as containing a mixture of *Dharug Footslopes Apple Redgum Forest* and *Exposed Hawkesbury Woodland*. The site inspection found that this vegetation meets with the Keith (2004) description of a 'dry sclerophyll forest'. Under the assessment guidelines outlined with Appendix 1 in PBP for determining the bushfire hazard, the vegetation meets with the classification known as a 'Forest'.

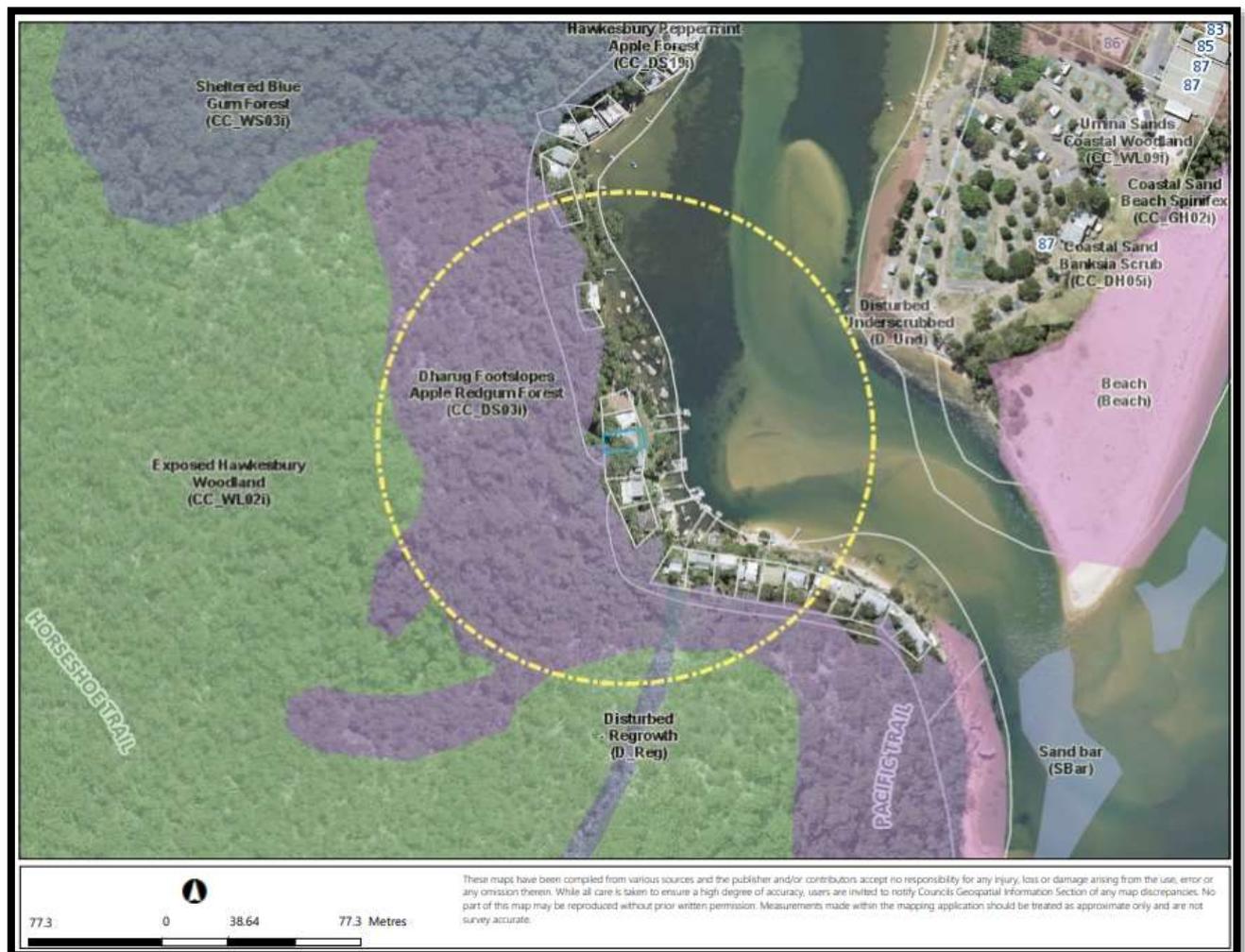


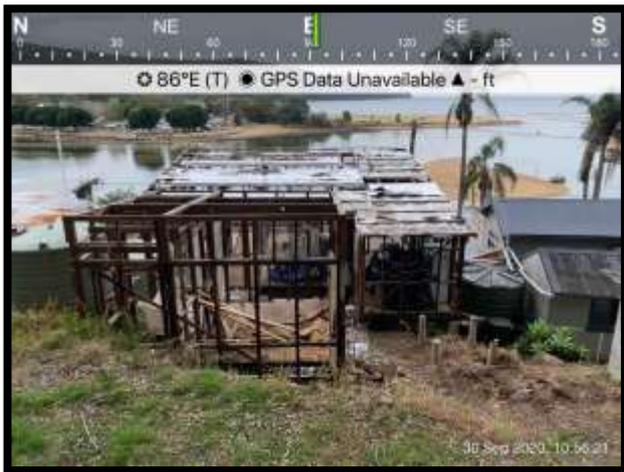
Figure 4: Vegetation Assessment (yellow circle is 140m from the site)
Source: Central Coast Council, 2020



1.



2.



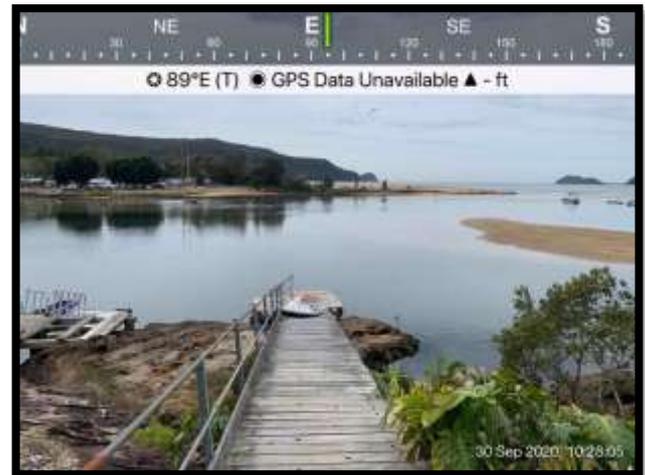
3.



4.



5.



6.

Note: See figure 5 for photograph location and direction.

3.2 Effective Slope

Figure 5 provides the topographic and vegetation mapping surrounding the proposal as sourced by NSW Spatial Services (1m contours). This data has a stated accuracy of 0.3m (95% Confidence Interval) vertical and 0.8m (95% Confidence Interval) horizontal.

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).'

The effective slope measured 100m from the proposed development for the hazard facing aspects are (See Figure 5);

West: >10° Up Slope

4.0 BUSHFIRE ATTACK LEVEL (BAL) ASSESSMENT

The bushfire risk to 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 and PBP. The categories of bushfire attack were determined for the vegetation conditions currently existing on the site and adjacent areas. Following the identification of the bushfire attack category for each aspect, the site will be assessed according to vegetation that presents the highest level of bushfire attack risk. 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** (alternate solution).

The level of bushfire attack then determines the construction standards necessary for the proposed development. These protective construction measures are outlined in Australian Standard AS3959-2018. The BAL required for each of the aspects/facades for the proposed development are summarised in Table 1.

Table 1: Bushfire Attack Assessment

	ASPECT	
	Northern, Southern & Eastern	Western
Vegetation¹ within 100m of development	Managed Lands	Forest
Effective Slope of Land		>10° Up Slope
APZ Required/Setback Provided²	>100m	Dwelling
		Shed
		~9m
		~4m
Bushfire Attack Level (BAL)⁴	BAL FZ/40 ⁴	BAL FZ
Recommended BAL Rating	BAL 40	BAL 40

Notes for Table 1:

- (1) Refer to Keith (2004), AS 3959-2018 and PBP
- (2) Distance to vegetation
- (3) BAL's are in accordance with Table A1.12.5 in PBP
- (4) PBP states where an elevation is shielded from direct radiant heat arising from bush fire attack, then the construction requirements for that elevation can be reduced to the next lower BAL except when BAL 12.5 where all aspects shall comply with BAL 12.5. The shielding of an elevation shall apply to all the elements of the wall but shall not apply to subfloors or roofs.
- Table 1 **does not display applicable BAL Ratings** for each aspect (**See recommendations of this report**)

4.1 Performance Solution

With reference to Table 1 and Table A1.12.5 in PBP, the development is technically subject to BAL FZ – flame zone from the west aspects.

It is noted that to construct the new works to a BAL FZ, while attached to an existing building that has been given no consideration for bushfire protection (timber cladding), is seen as not practical. In justification of this statement, section 7.8 of PBP states;

“Consideration should be given to whether strict compliance with the NCC is the best outcome for the property or whether a more balanced holistic outcome that addresses the entire building is more appropriate”.

In regards to the above clause in PBP, we have been involved with applications assessed by the NSW Rural Fire Service where a discretionary approach has been applied. The basis being that;

- upgrading of an existing dwelling which was built prior to the implementation of PBP and/or bushfire regulations;
- the new development is less than 50% of the existing dwelling floor area; and
- not extend any closer towards the hazard.

In acknowledgement of the above criteria, the landowner wishes to improve bushfire protection of the property, however, upon investigating the costs that will be incurred to achieve compliance with BAL FZ as detailed in AS3959-2018 and PBP, the application may not proceed due to the affordability. As a result, should the development not proceed, the existing dwelling is not constructed to any bushfire codes and no better outcome would be provided to the inhabitants. Therefore, in recognition of Section 7.8 of PBP, a significantly improved bushfire safety outcome is achievable by upgrading the dwelling with additional works, and then applying a reduced BAL rating, in this instance BAL 40, for the existing and new development.

On the basis of recommending BAL 40 construction for the new development, along with upgrading of the existing dwelling not forming part of the application, the proposal would be provided with a much better outcome than if the development only proceeded and the BAL FZ provisions were applied to the new works only. The following works/upgrading to the existing dwelling (not forming part of the application) is proposed;

- All external cladding/walls to comply with BAL 40
- All roofing to comply with BAL 40
- All external fixtures to comply BAL 40
- Replace all existing windows & glass doors with BAL40 bush fire-rated aluminium framed windows and doors

On the basis of the above works, a far better level of safety is achieved through a level of bushfire construction for the entire building and provides '*more balanced holistic outcome that addresses the entire building*'.

Therefore, under Section 7.8 of PBP and the discretionary approach applied under this clause by the RFS, a reduced BAL 40 is deemed to be appropriate and meet with the intention of PBP along with the upgrading of the existing dwelling as detailed in the recommendations of this report.

BUSHFIRE ASSESSMENT SITE PLAN

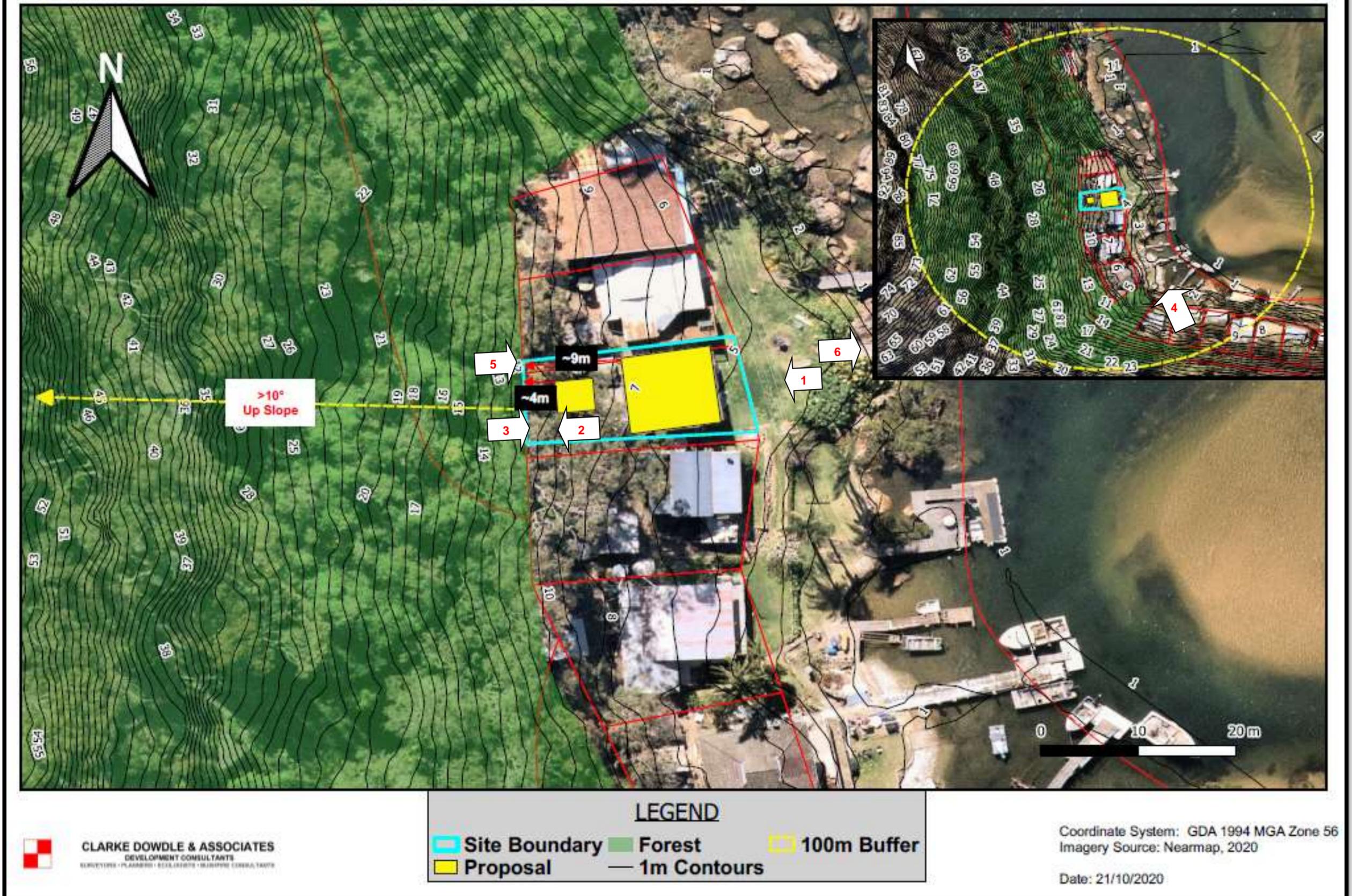


Figure 5: Bushfire Site Plan

5.0 RECOMMENDATIONS

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

5.1 Asset Protection Zones

- **All areas currently maintained site shall be maintained as an APZ for the lifetime of the development.**
- The APZ shall be maintained to meet with the requirements of an Inner Protection Area (IPA) as outlined within Appendix 4 in PBP.

5.1.1 Environmental Considerations

No tree clearing will be required for bushfire protection purposes.

5.2 Construction Standards

Proposed Development & Existing Dwelling

- The **proposed development & existing dwelling** is recommended to be constructed to comply with AS3959-2018 **Sections 3 & 8 (BAL 40)** and section 7.5 in PBP.
- **Service Pipes**
All exposed piping should be of metal. Pipes of other materials should be buried to a depth of at least 300mm below the finished ground level.
- **Fencing (if applicable)**
All new fencing shall be constructed in accordance with section 7.6 in PBP.

5.3 Property Access and Evacuation Safety

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

5.4 Water and Utility Services Supply

5.4.1 Water

The site is not connected to the town reticulated supply of water however the site does contain water tanks supplying water to the existing dwelling of which provides water supplies exceeding 10,000 litres (PBP requirement for properties <10,000m²). Therefore, the following recommendations are made;

- a connection for firefighting purposes is located within the IPA or non-hazard side and away from the structure; 65mm Storz outlet with a ball valve is fitted to the outlet;
- all new above-ground water service pipes external to the building are metal, including and up to any taps;
- Hoses should be provided great enough in length and number to provide adequate protection to all structures.

5.4.2 Gas (if applicable)

- Any gas cylinders or gas connections should be installed and maintained under Australian Standard AS1596 - *The Storage and Handling of LP Gas* and the requirements of relevant authorities.
- If gas cylinders need to be kept close to the building, the release valves are directed away from the building and at least 2 metres away from any combustible material, so that they do not act as a catalyst to combustion.

5.4.3 Electricity

- The site is connected via overhead lines

6.0 SPECIFIC OBJECTIVES FOR INFILL IN PBP

With a combination of bushfire protection measures, the proposal is seen to comply with the aim and objectives of PBP for infill development. The Specific Objectives for infill development and a comment as to how they are achieved by the proposed development is provided below:

Objective 1: “provide a defensible space to enable unimpeded access for firefighting around the building”.

The proposal will not increase the bushfire risk to adjoining lands. The bushfire risk will be decreased as the proposed development will be constructed to comply with the relevant BAL creating a safer environment for occupants and reducing the chances of building to building fire propagation. The proposal provides compliance with the objective.

Objective 2: “provide better bush fire outcomes on a redevelopment site than currently exists, commensurate with the scale of works proposed;”.

The proposed development will be constructed to BAL 40 under AS3959. In addition, upgrading of the existing dwellings and shed openings has been recommended to meet with BAL 40 construction (where applicable) to withstand ‘a likelihood of exposure to a higher level of radiant heat and some likelihood of direct exposure to flames from the fire front’ as detailed in AS3959-2018. Therefore, the proposal provides compliance with the objective.

Objective 3 “design and construct buildings commensurate with the bush fire risk”.

The proposed development will be constructed BAL 40 under AS3959. This level of construction will involve the usage of non-combustible external materials and significantly increase the bushfire resilience of the dwelling and provide a better bushfire outcome to the existing dwelling. The proposal provides compliance with the objective.

Objective 4” provide access, services and landscaping to aid firefighting operations;”.

Access to the site is via river access only

Objective 5 “not impose an increased bush fire management and maintenance responsibility on adjoining land owners; and

The maintenance of the APZ’s within the site will not result in increased bushfire management and maintenance responsibility on adjoining land owners. The proposal provides compliance with the objective.

Objective 6 ‘increase the level of bush fire protection to existing dwellings based on the scale of the proposed work and level of bush fire risk’; The proposed development will be constructed to BAL 40 under AS3959. Also, upgrading of the existing dwelling has been recommended to meet with BAL 40 to withstand ‘a likelihood of exposure to a higher level of radiant heat and some likelihood of direct exposure to flames from the fire front’ as detailed in AS3959-2018. This level of construction will involve the usage of non-combustible external materials and significantly increase the bushfire resilience of the dwelling and **provide a better bushfire outcome to the existing dwelling**. The proposal provides compliance with the objective.

7.0 CONCLUSION

Clarke Dowdle & Associates have been engaged to conduct a Bush Fire Assessment Report upon the property located at Lot 321 Hawkesbury River, Patonga NSW. This original assessment was performed in October 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 demonstrating how the proposed development may comply with the performance criteria set out in PBP. Specifically, the report has addressed Section 7.8 of PBP and provided comment on how the recommendations outlined within this report do provide a better bushfire outcome than the existing situation.

The determining authorities and Rural Fire Service may suggest additional measures to be implemented with any planning and construction upon 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

Ashley Dowdle
Bushfire Consultant
Planning for Bushfire Prone Areas - UTS Short Course

Disclaimer

PBP States;
Due to a range of limitations, the measures contained in this document do not guarantee that loss of life, injury and/or property damage will not occur during a bush fire event

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

- Keith, D. (2004), *Ocean Shores to Desert Dunes*. Department of Environment and Conservation, Sydney
- National Construction Code (2019), Building Codes Australia, *Class 1 and Class 10 Building Housing Provisions Volume 2*
- NSW Rural Fire Service and Department of Planning (2019), *Planning for Bushfire Protection, A guide for Councils, Planners, Fire Authorities and Developers*. NSW Rural Fire Service.
- Schauble, J. (2004). *The Australian Bushfire Safety Guide*. Harper Collins Publishers, Sydney, Australia.
- Standards Australia, (2018), *AS3959 Construction of Buildings in Bushfire-prone Areas*. Standards Australia International