



CLARKE DOWDLE & ASSOCIATES

DEVELOPMENT CONSULTANTS
SURVEYORS • PLANNERS • ECOLOGISTS • BUSHFIRE CONSULTANTS
ABN 15 114 156 740

BUSH FIRE ASSESSMENT

For the Industrial Building

At

90 GINDURRA ROAD, SOMERSBY, NSW
(LOT 4 IN DP 227279)

JUNE 2018



Clarke Dowdle & Associates

PO Box 3122, Umina Beach NSW 2257
Ph: (02) 4344 3553 Fax: (02) 4344 6636
EMAIL: admin@cdasurveys.com.au
WEBSITE: www.cdasurveys.com.au



CONTENTS

1.0 INTRODUCTION	3
1.1 Proposed Development.....	3
2.0 SITE IDENTIFICATION AND DESCRIPTION	5
2.1 Site Identification and Location	5
2.2 Bushfire Prone Mapping.....	6
2.3 Surrounding Vegetation	6
2.4 Effective Slope	8
3.0 BUSHFIRE RISK ASSESSMENT	10
3.1 Background Information	10
3.2 Asset Protection Zones	10
3.3 Bushfire Attack Level (BAL)	10
4.0 RECOMMENDATIONS	12
4.1 Asset Protection Zones	12
4.2 Environmental and Aboriginal Heritage Impacts.....	12
4.3 Construction Standards.....	12
4.4 Property Access and Evacuation Safety.....	13
4.5 Water and Utility Services Supply	14
5.0 PERFORMANCE CRITERIA COMPLIANCE	15
6.0 CONCLUSION	16

TABLES

Table 1: Bushfire Attack Assessment (Method 1 -AS3959-2009)	11
---	----

DOCUMENT TRACKING

Project Location	90 Gindurra Road, Somersby
Date	15/06/2017
Prepared by	Kristan Dowdle
Reviewed by	Anthony Clarke
Approved by	Kristan Dowdle
Status	FINAL
Version	4

1.0 INTRODUCTION

Clarke Dowdle & Associates have been engaged to conduct a Bush Fire Assessment on the property located at 90 Gindurra Road, Somersby. The assessment was performed in June 2018 and was conducted in accordance with the procedures and methods recommended in the NSW Rural Fire Service published document '*Planning for Bushfire Protection, 2006*' (PBP) (NSW Rural Fire Service and Planning NSW, 2006).

This Bush Fire Assessment 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 development on the site. A Bush Fire Assessment is required as the site falls within a Bushfire Prone Mapped Area.

As the development involves the construction of a commercial type building, the development is not legally subject to PBP or Section 4.14 of the *Environmental Planning and Assessment Act*. However, PBP states;

“The BCA does not provide for any bush fire specific performance requirements and as such AS 3959 does not apply as a set of ‘deemed to satisfy’ provisions. The general fire safety construction provisions are taken as acceptable solutions, but the aim and objectives of PBP apply in relation to other matters such as access, water and services, emergency planning and landscaping/vegetation management”

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 defensible spaces, accessibility, water supplies and construction standards of developments within the site.

1.1 Proposed Development

The subject property currently contains a number of outbuildings on the northern portions of the site of which will be demolished for the subsequent construction of a large industrial building with an attached office on the northern aspects. The development does not contain any habitable rooms/buildings. Figure 1 provides a site plan of the proposal.

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

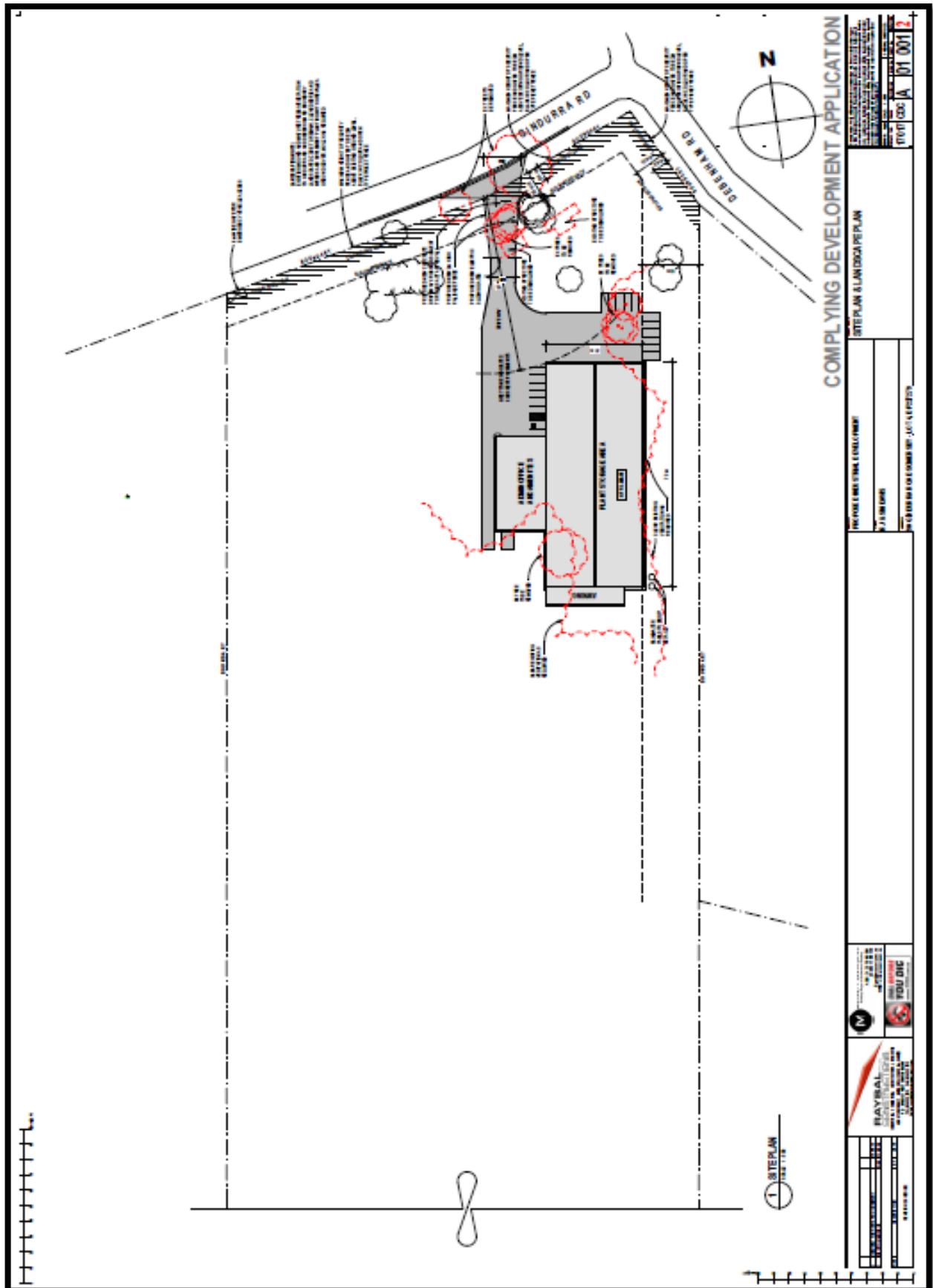


Figure 1: Proposed Development Site Plan

2.0 SITE IDENTIFICATION AND DESCRIPTION

2.1 Site Identification and Location

The subject site is known as 90 Gindurra Road, Somersby (Lot 4 in DP 227279). The site is in the Local Government Area (LGA) of Central Coast Council (Fire Danger Index-100).



**Figure 2: Aerial Photograph of site (boundary bordered in red)
(Approx. proposed development area circled in yellow)
Source: Nearmap & Sixmaps, 2018**

The site currently contains a number of sheds and outbuildings on the northern aspects of which are surrounded by predominately managed lands associated with hardstand areas, internal vehicle access roads/areas and materials storage. The southern portions of the site contain unmanaged vegetation. The site is provided access via Gindurra Road to the north.

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

2.2 Bushfire Prone Mapping

The land is mapped by Central Coast Council as being bushfire prone. The site has been mapped as being within the bushfire buffer (red) and containing Category 1 (orange) and Category 2 (yellow) vegetation. The following extract from the Central Coast Council Bushfire Mapping outlines this.

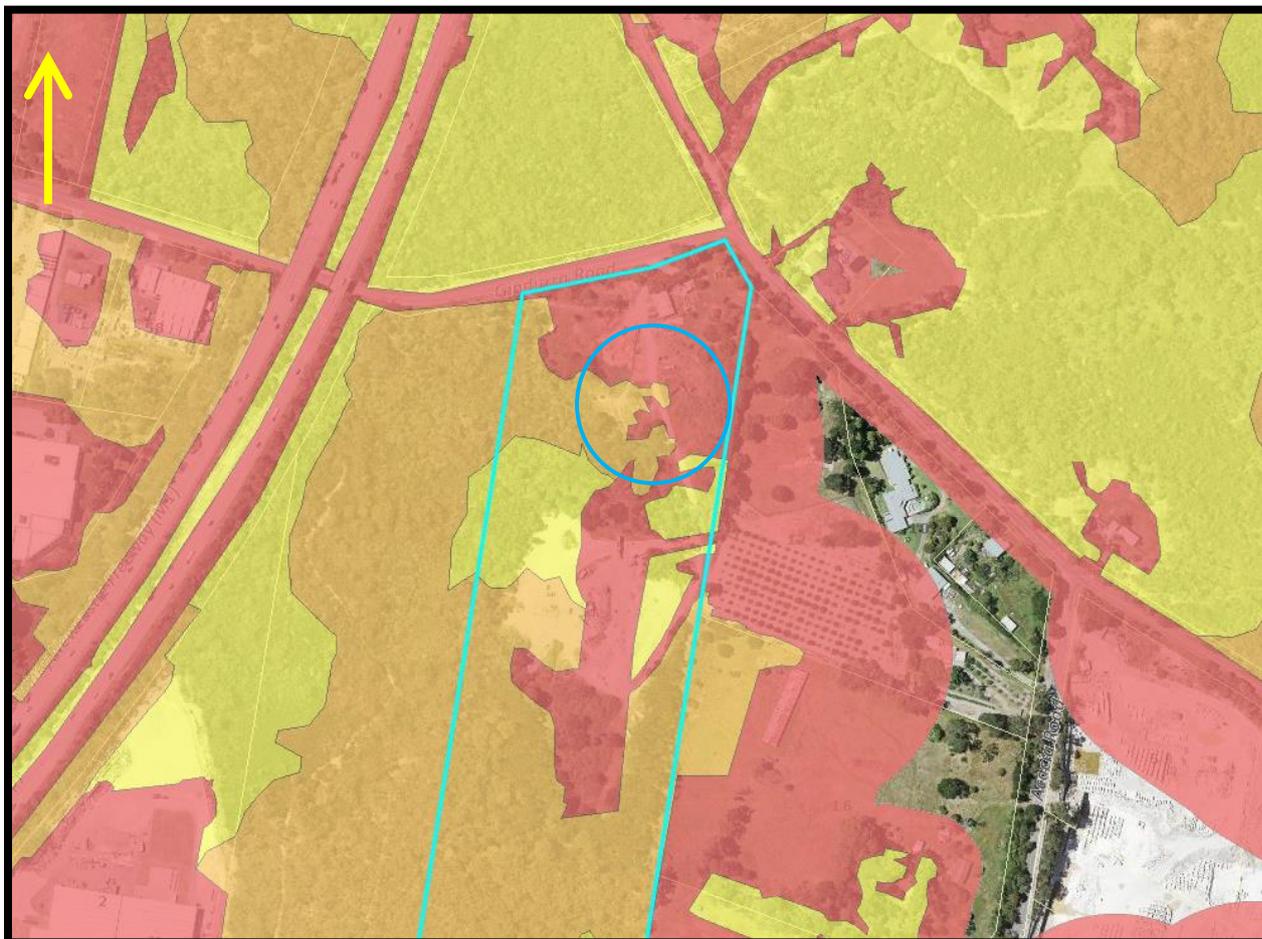


Figure 3: Bushfire Prone Mapping and approximate location of site (highlighted in blue)
Source: Central Coast Council, 2018

2.3 Surrounding Vegetation

2.3.1 Non-Hazard Aspects

There are no non-hazard facing aspects

2.3.2 Hazard Aspects

North

To the north of the site beyond Gindurra Road is vegetation that has been mapped as containing *Hawkesbury Banksia Scrub – Woodland* and meets with the Keith (2004) description of a 'Shrubland.' Therefore, in accordance with conversion table 3.7 in Addendum: Appendix 3 in PBP, the vegetation will be assessed as **Scrub** as per AUSLIG 1999 Pictorial Analysis (AS 3959-2009).

East

To the east of the site beyond the cleared adjoining allotment and Debenham Road South is vegetation that has been mapped as containing *Hawkesbury Banksia Scrub – Woodland* and meets with the Keith (2004) description of a 'Shrubland.' Therefore, in accordance with conversion table 3.7 in Addendum: Appendix 3 in PBP, the vegetation will be assessed as **Scrub** as per AUSLIG 1999 Pictorial Analysis (AS 3959-2009)

West/South-West

To the west/south-west of the proposed development area and existing within the site is vegetation on south-west facing land and that has been mapped as containing a mixture of *Hawkesbury Banksia Scrub - Woodland* and *Exposed Hawkesbury Woodland*. Therefore, in accordance with conversion table 3.7 in Addendum: Appendix 3 in PBP, the vegetation will be assessed as **Forest** as per AUSLIG 1999 Pictorial Analysis (AS 3959-2009).



1.



2.



3.



4.

Note: See Figure 5 for photograph location and direction

2.4 Effective Slope

PBP states in A2.3(b) that effective slope is;

'the gradient within the hazard (vegetation) which will most significantly influence the fire behaviour of the site having regard to vegetation class found.'

In regards to the site, the effective slopes for each hazard facing were inspected and calculated through a combination of topographic mapping from the Central Coast Council (1m contours) and ground truthing. The effective slope measured 100m from the proposed development for the hazard facing aspects are;

North: Flat/Up Slope
South-West/West: 0-5° Down Slope
East: 5-10° Down Slope

Figure 4 provides the topographic mapping for the site and surrounding area.

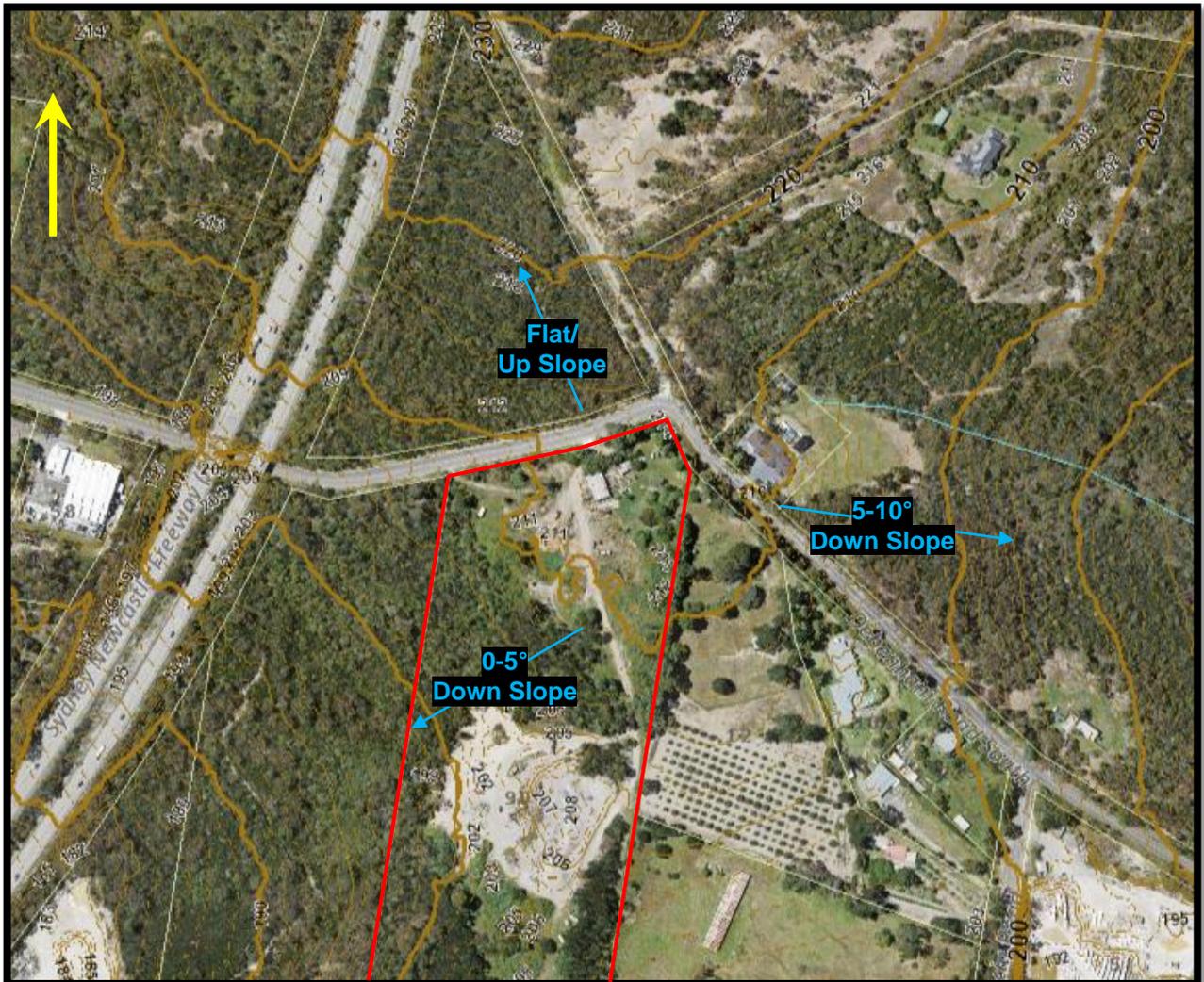


Figure 4: Site Topography



Figure 5: Bushfire Assessment Site Plan

3.0 BUSHFIRE RISK ASSESSMENT

3.1 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) (AS3959-2009) 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 distance (Asset Protection Zones – refer to Appendix B) and Bushfire Attack Levels (BAL) (refer to Appendix C) required in development for residential purposes that are found to fall in areas designated as bushfire-prone.

3.2 Asset Protection Zones

Appendix 2 of PBP provides a methodology for determining the Asset Protection Zone (APZ) required for any given proposed development. APZ's describes 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.

3.3 Bushfire Attack Level (BAL)

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 AS3959-2009 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. AS3959-2009 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**.

The level of bushfire attack then determines the construction standards necessary for the proposed development. These protective construction measures are outlined in Australian Standard AS3959-2009. The BAL required for each of the aspects/facades for the proposed development are summarised in Table 1.

Table 1: Bushfire Attack Assessment (Method 1 -AS3959-2009)

	ASPECT		
	Northern	Southern & Western	Eastern
Vegetation¹ within 100m of development	Forest	Forest	Forest
Effective Slope of Land	Flat/Up Slope	0-5° Down Slope	5-10° Up Slope
APZ Recommended/Provided²	~76m	32m	~85m
Bushfire Attack Level (BAL)³	BAL 29	BAL 29	BAL 29
Recommended Construction Standard	Construction to comply with NCC requirements for industrial/commercial developments		

Notes for Table 1:

- (1) Refer to Keith (2004), AS 3959-2009 and Table A2.1 in *PBP*
- (2) Distance to vegetation
- (3) Bushfire Attack Levels are in accordance with AS3959-2009

As detailed in Table 1 and Table 2.4.2 in AS3959-2009, based upon recommendation of providing an APZ of 32m to the south and west, the proposed development would theoretically be subject to BAL 29 as per AS3959-2009.

The NCC does not provide for any bushfire specific performance requirements for the proposed development and as such AS3959, 2009 does not apply as a deemed to satisfy provision. The general fire safety construction provisions of the NCC are taken as acceptable solutions; however, the aims and objectives of PBP must be considered. It is noted that the development is for the construction of a large metal building. The non-combustible construction would serve to mitigate the effects of radiant heat and ember attack from bushfire.

Along with the non-combustible construction, additional bushfire protection measures are provided within the recommendations of this report which are seen to meet with the aims and objectives of PBP.

4.0 RECOMMENDATIONS

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

This Bushfire Threat and Protection Assessment 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.

4.1 Asset Protection Zones

- An APZ/defendable space of at least 32m be provided to the south and west of the proposal,
- The APZ and all areas on the northern portions of the allotment as depicted in Figure 5 should be maintained with regular maintenance of the landscaped areas, managed lawns in accordance with an IPA and RFS guidelines: *Standards for Asset Protection Zones* (NSW RFS, 2005).
- Notwithstanding the above stated guidelines, the following advice for maintaining APZ's within the site are to be followed:

Inner Protection Area (IPA)

Trees:

- *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 ground*
- *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*
- *shrubs should not be located under trees*
- *shrubs should not form more than 10% ground cover*
- *clumps of shrubs should be separated from exposed windows and doors by a distance of at least twice the height of the vegetation.*

Grass:

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

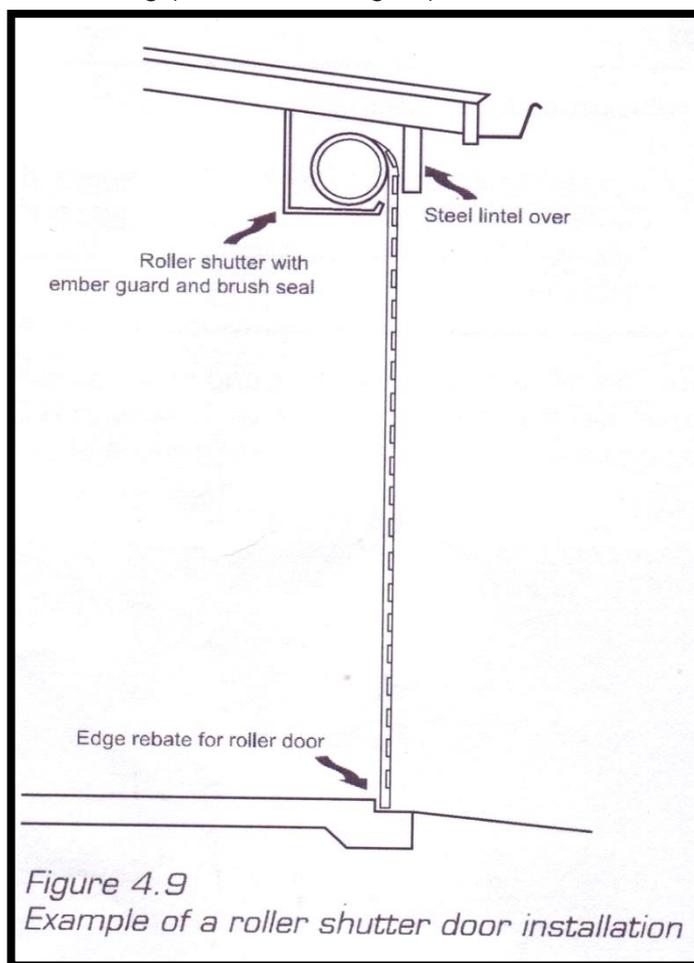
4.2 Environmental and Aboriginal Heritage Impacts

- An aboriginal artefacts study was not completed upon the site however no known artefacts or cultural heritage sites and known to occur on site according to the site owner
- A Flora and Fauna Report was not conducted upon the site as part of this application.

4.3 Construction Standards

The proposal will be constructed to the industrial/commercial requirements of the **National Construction Code** resulting in the provision of non-combustible or fire rated walls and other fire safety measures. In addition to this, minimal construction requirements are also recommended, as although the external finishes will be non-combustible, internal material may be not. These are as follows;

- Roof gutters and valleys should be leaf-proofed by the installation of an external gutter protection system that stops leaves from entering the gutter and building up in the gutter. The material used in such a system should have a flammability index of no greater than 5 (AS AS1530.2);
- All new fencing and gates shall be constructed in accordance with the NSW Rural Fire Service guideline: *Fast Fact-Fences or Gates in Bushfire Prone Areas*
- That all openable windows shall be externally screened with metal mesh screens having a maximum aperture size of 1.8mm
- That all external doors shall be fitted with weather strips where the doors do not close on a rebated edge
- That any roller doors are to be 'boxed in' or sealed in a manner that restricts ember penetration within a building (see attached figure)



Source: PBP

4.4 Property Access and Evacuation Safety

- Safe access is provided to the subject property via Gindurra Road. These roads will serve both as an access point for fire fighters and an egress point for residents during a bushfire event.
- Direct access to the site will be via a driveway running from Gindurra Road. As the proposed building will be within 70m of this road in accordance with Section 4.1.3 in PBP, no specific access and egress arrangements are required
- 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)

4.5 Water and Utility Services Supply

The site will be connected to the reticulated supply of water and within 70m of a water hydrant. In recognition of these, the following recommendations are made;

- The proposed development will be required to comply with **Part E1 of the NCC 'Fire Fighting Equipment'**, of which will include fire extinguishers etc. Along with the requirements of Part E1 of the NCC, the following recommendations are made;
 - A fire hose reel system is installed which is capable of reaching all extremities of all buildings associated with proposed development.
- Any gas cylinders or gas connections for the proposal should not be located on the southern/western aspects of the proposed development. The gas bottles should be installed and maintained in accordance with Australian Standard AS1596 - The Storage and Handling of LP Gas and the requirements of relevant authorities.

5.0 PERFORMANCE CRITERIA COMPLIANCE

The following table indicates compliance or otherwise with Section 4.3.5 of PBP

PBP PERFORMANCE CRITERIA	ACCEPTABLE SOLUTION COMPLIANCE
<p>in relation to Asset Protection Zones:</p> <ul style="list-style-type: none"> • a defensible space is provided onsite. • an asset protection zone is provided and maintained for the life of the development. 	<p>The proposal is provided with an APZ as outlined in Appendix 2 in PBP. Therefore proposal provides compliance.</p>
<p>in relation to siting and design:</p> <ul style="list-style-type: none"> • buildings are sited and designed to minimise the risk of bush fire attack. 	<p>The proposal will be provided with suitable APZ's. Therefore proposal provides compliance</p>
<p>in relation to construction standards:</p> <ul style="list-style-type: none"> • it is demonstrated that the proposed building can withstand bush fire attack in the form of wind, smoke, embers, radiant heat and flame contact. 	<p>Non-combustible construction to comply with NCC requirements for commercial developments.</p>
<p>in relation to access requirements:</p> <ul style="list-style-type: none"> • safe, operational access is provided (and maintained) for emergency services personnel in suppressing a bush fire while residents are seeking to relocate, in advance of a bush fire, (satisfying the intent and performance criteria for access roads in sections 4.1.3 and 4.2.7). 	<p>The proposal is provided direct access via a Gindurra Road. The proposal meets with the requirements of Section 4.1.3 of PBP and therefore the proposal is deemed to provide compliance</p>
<p>in relation to water and utility services:</p> <ul style="list-style-type: none"> • adequate water and electricity services are provided for firefighting operations • gas and electricity services are located so as not to contribute to the risk of fire to a building. 	<p>Services will be provided that meet with the requirements of section 4.1.3 of PBP. Therefore proposal provides compliance</p>
<p>in relation to landscaping:</p> <ul style="list-style-type: none"> • it is designed and managed to minimise flame contact and radiant heat to buildings, and the potential for wind driven embers to cause ignitions 	<p>The site will be maintained to meet with the requirements of a APZ. Therefore proposal provides compliance</p>

6.0 CONCLUSION

Clarke Dowdle & Associates have been engaged to conduct a Bush Fire Assessment upon the property located at 90 Gindurra Road, Somersby, NSW. This assessment was performed in June 2018 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.

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



Kristan Dowdle

B. Env. Sc.
Grad Dip. Design in Bushfire Prone Areas
Environmental & Bushfire Consultant

Disclaimer

PBP States;

Notwithstanding 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 3959-2009 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 is a Bush Fire Assessment that provides the required information to assist Local Council and the Rural Fire Service in determining compliance in accordance with PBP and AS 3959-2009 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 (2016), Building Codes Australia, *Class 1 and Class 10 Building Housing Provisions Volume 2*
- NSW Rural Fire Service (2005). *Standards for Asset Protection Zones*. NSW Rural fire Service
http://www.rfs.nsw.gov.au/file_system/attachments/State/Attachment_20060130_7DE0A145.pdf
- NSW Rural Fire Service (2006). *Asset Protection Zone Calculator*
<http://bfaa.rfs.nsw.gov.au/apzcalc.html>
- NSW Rural Fire Service and Department of Planning (2006), *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, (2009), *AS3959 Construction of Buildings in Bushfire-prone Areas*. Standards Australia International

