

Bushfire Assessment Report

Proposed:
Carpark

At:
**Oxford Falls Grammar
School, Oxford Falls**

Reference Number: 200310B

Prepared For:
Oxford Falls Grammar School
C/- epm Projects Pty Ltd

16th March 2021



Prepared By:
**Building Code & Bushfire
Hazard Solutions Pty Limited**

Tel: (02) 9457 6530
Fax: (02) 9457 6532

PO Box 124
Berowra NSW 2081
ABN 19 057 337 774

www.bushfirehazardsolutions.com.au



Contents

	<u>Page No.</u>
Copyright and Disclosure	2
List of Abbreviations	3
1.0 Introduction	4
2.0 Purpose of Report	4
3.0 Scope of Report	4
4.0 Referenced Documents and Persons	4
6.0 Compliance Tables & Notes	5 - 6
6.0 Aerial view of the subject allotment	7
7.0 Bushfire Hazard Assessment	8 - 14
8.0 Site and Bushfire Hazard Determination	15
9.0 Recommendations	16
10.0 Conclusion	17
11.0 Annexure	18
- List of referenced documents and attachments	
- Attachments	

Copyright:

Where agreed to by Building Code and Bushfire Hazard solutions Pty. Ltd, this report may only be copied, distributed or forwarded to other parties in its original format. No part of this document including any wording, images, or graphics can be modified, changed or altered in any way without the express permission of Building Code and Bushfire Hazard Solutions Pty. Ltd. (Copyright Act 1968).

Where this document is found to have been used or altered in any way without the express permission of Building Code and Bushfire Hazard Solutions Pty. Ltd. including any wording, images, or graphics, Building Code and Bushfire Hazard Solutions Pty. Ltd. will not be held liable for any incidental or consequential loss or damages, financial or otherwise resulting from the use of the modified document. Building Code & Bushfire Hazard Solutions Pty. Ltd. will if it considers it necessary, seek to advise third parties including authorities of such illegal use or modifications.

Legal status:

This report has been prepared as a submission document in support of a development and in instances may rely upon information provided by a number of external sources including Councils, State Government Agencies and it is assumed that the information provided was accurate at the time. This report cannot be relied upon for commencement of works or construction until such time as it has been endorsed or otherwise included within the consent conditions issued by the Authority Having Jurisdiction as part of the determination process.

S100B applications under the Rural Fires Act 1997 (subdivisions and Special Fire Protection Purpose Developments), Flame Zone determinations and Alternate Solutions *must* be referred by Council to the NSW Rural Fire Service for review and receipt of a Bushfire Safety Authority (BSA) or other such recommended conditions from the NSW Rural Fire Service before the consent can be granted.

The onus is on the applicant to cross reference this document with any conditions of consent or any requirements supplied by the NSW Rural Fire Service following development approval. BCBHS can review and cross reference these documents however the onus is on the applicant to provide them to us and request this review – Building Code and Bushfire Hazard Solutions Pty. Ltd. is not in a position to track every development approval and we rely upon the applicant to undertake this role as project co-ordinator.

Where any discrepancy between this document and the development approval or the NSW Rural Fire Service requirements is found, the conditions of consent always take precedence until such time as an application to review, amend or vary these conditions is approved.

Disclaimer:

This report has been prepared with due care and diligence by Building Code and Bushfire Hazard Solutions Pty. Ltd and the statements and opinions contained in this report are given in good faith and in the belief on reasonable grounds that such statements and opinions are correct and not misleading bearing in mind the necessary limitations noted in previous paragraphs.

Further, no responsibility is accepted by Building Code and Bushfire Hazard Solutions Pty. Ltd. or any of its officers or employees for any errors, including errors in data which is supplied by a third party, or which Building Code and Bushfire Hazard Solutions Pty. Ltd. is required to estimate, or omissions howsoever arising in the preparation of this report, provided that this will not absolve Building Code and Bushfire Hazard Solutions Pty. Ltd. from liability arising from an opinion expressed recklessly or in bad faith.

Any representation, statement of opinion, or advice expressed or implied in this document is made in good faith on the basis that Building Code and Bushfire Hazard Solutions Pty. Ltd. employees and / or agents are not liable (whether by reason of negligence, lack of care or any other reason) to any person, company or their agents for any damage or loss whatsoever which has occurred or may occur in relation to that person taking or not taking (as the case may be) action in respect of any representation, statement or advice referred to above.

List of Abbreviations:

APZ	Asset Protection Zone
AS3959	Australian Standard 3959 – 2018
BAL	Bushfire Attack Level
BCA	Building Code of Australia
BPMs	Bushfire Protection Measures
BPLM	Bushfire Prone Land Map
Council	Northern Beaches Council
ELVIS	Elevation and Depth Foundation Spatial Data – Geoscience Australia
EP&A Act	Environmental Planning and Assessment Act - 1979
ESD	Ecologically Sustainable Development
FRNSW	Fire and Rescue NSW
IPA	Inner Protection Area
NCC	National Construction Code
NSP	Neighbourhood Safer Place
OPA	Outer Protection Area
PBP	Planning for Bush Fire Protection – 2019
ROW	Right of Way
RF Act	Rural Fires Act - 1997
RFS	NSW Rural Fire Service
SEPP	State Environmental Planning Policy
SFPP	Special Fire Protection Purpose
SWS	Static Water Supply

1.0 Introduction

The development proposal relates to a new building project within an existing educational establishment known as Oxford Falls Grammar School, Oxford Falls. The proposed works include the construction of the new carpark.

This bushfire assessment report will support a Review of Environmental Factors (REF) prepared in accordance with Part 5 of the *Environmental Planning and Assessment Act 1979* on behalf of Oxford Falls Grammar School.

The subject property is located at 1078 Oxford Falls Road, Oxford Falls NSW (Lot 1 DP 1046451) and is within Northern Beaches Council's local government area. The subject property has street frontage to Oxford Falls Road to the east and Dreadnought Road to the south, Wakehurst Parkway road reserve and Wakehurst Parkway to the west and abuts a vegetated allotment to the north.

The vegetation identified as being the hazard is to the east of the proposed works within vegetated private allotments and west of the subject site within Wakehurst Parkway road reserve.

Northern Beaches Council's Bushfire Prone Land Map identifies the subject property as containing the 100 metre buffer zone from Category 1 Vegetation therefore the application of Planning for Bush Fire Protection - 2019 (PBP) must apply in this instance.

The School has been subject to multiple development applications under PBP.

2.0 Purpose of Report

The purpose of this Bushfire Assessment Report is to provide epm Projects, Oxford Falls Grammar School and the Rural Fire Service with an independent bushfire determination together with appropriate recommendations for both new building construction and bushfire mitigation measures considered necessary having regard to construction within a designated 'bushfire prone' area.

The recommendations contained within this report may assist in forming the basis of any specific construction conditions and/or bushfire mitigation measures issued for the subject development.

3.0 Scope of this Report

The scope of this report is limited to providing a bushfire assessment and recommendations for the subject property. Where reference has been made to the surrounding lands, this report does not purport to directly assess those lands; rather it may discuss bushfire impact and/or progression through those lands and possible bushfire impact to the subject property.

4.0 Referenced Documents and Persons

Comments provided are based on the requirements of the NSW Environmental Planning and Assessment Act 1979 (EP&A Act), the Rural Fires Act 1997, the Rural Fires Regulation 2013, the RFS document known as 'Planning for Bush Fire Protection – 2019' for the purposes of bushfire hazard determination and Australian Standard 3959 – 2018 titled 'Construction of buildings in bushfire-prone areas' for building/structural provisions.

Company representatives have undertaken several site inspections of the subject property and the surrounding area. The plans prepared by Allen Jack & Cottier, Project No. 18025, Issue 3, Dated 02/03/21 have been referenced in the creation of this report.

5.0 Compliance Tables & Notes

The following table sets out the projects compliance with *Planning for Bush Fire Protection – 2019*.

	North	East (Close)	East (Far)	West
Vegetation Structure	Scrub	Remnant	Forest	Remnant
Hazard Slope	0° & up	6° up	>15° up	0 - 5° down
Minimum Required APZ for new SFPP	50 metres	38 metres	67 metres	47 metres
Car Park Separation	>200 metres	60 metres	>100 metres	60 metres
Significant Environmental Features	Existing school buildings & Maintained grounds	Maintained grounds & Oxford Falls Road	Maintained grounds & Oxford Falls Road	School playing field
Threatened Species	APZ Existing	APZ Existing	APZ Existing	APZ Existing
Aboriginal Relics	APZ Existing	APZ Existing	APZ Existing	APZ Existing
Bushfire Attack Level	BAL LOW	BAL 12.5	BAL LOW	BAL 12.5
Required Construction Level	BAL 12.5	BAL 12.5	BAL 12.5	BAL 12.5

Asset Protection Zones Compliance

The minimum required Asset Protection Zones were determined from Table A1.12.1 of Planning for Bush Fire Protection 2019.

The closest point of the proposed carpark exceeds the minimum required Asset Protection Zones for new Special Fire Protection Purpose development to all aspects.

The Asset Protection Zones consist of maintained land within the subject site and land equivalent to an APZ being Oxford Falls Road.

Construction Level Compliance

The highest Bushfire Attack Level to the proposed carpark was determined from Table A1.12.5 of PBP 19 to be 'BAL 12.5'. The proposed carpark is required to comply with section 3 and BAL 12.5 section 5 under AS 3959 – 2018 and the section 7.5 of PBP 19.

Access and Services

Guideline Ref.	Proposed Development Determinations
Property Access	The existing internal roads provide vehicle access to the existing buildings within the subject property. A new connection will be constructed to Dreadnought Road to service the proposed car parking. Attending fire services have direct access to the hazard interfaces via Oxford Falls Road or Wakehurst Parkway for fire suppression or hazard reduction activities. In consideration of the comprehensive public road system surrounding the site the existing and proposed internal roads are considered adequate.
Water Supply	Existing hydrants are available within the subject property and along the surrounding roads. The internal hydrant system will be extended to cover the new carpark and must be installed in accordance with AS2419.1-2005.
Evacuation	It is recommended that the Bush Fire Evacuation Plan be updated to include the new works and be in accordance with the NSW Rural Fire Service guidelines for emergency management plans.

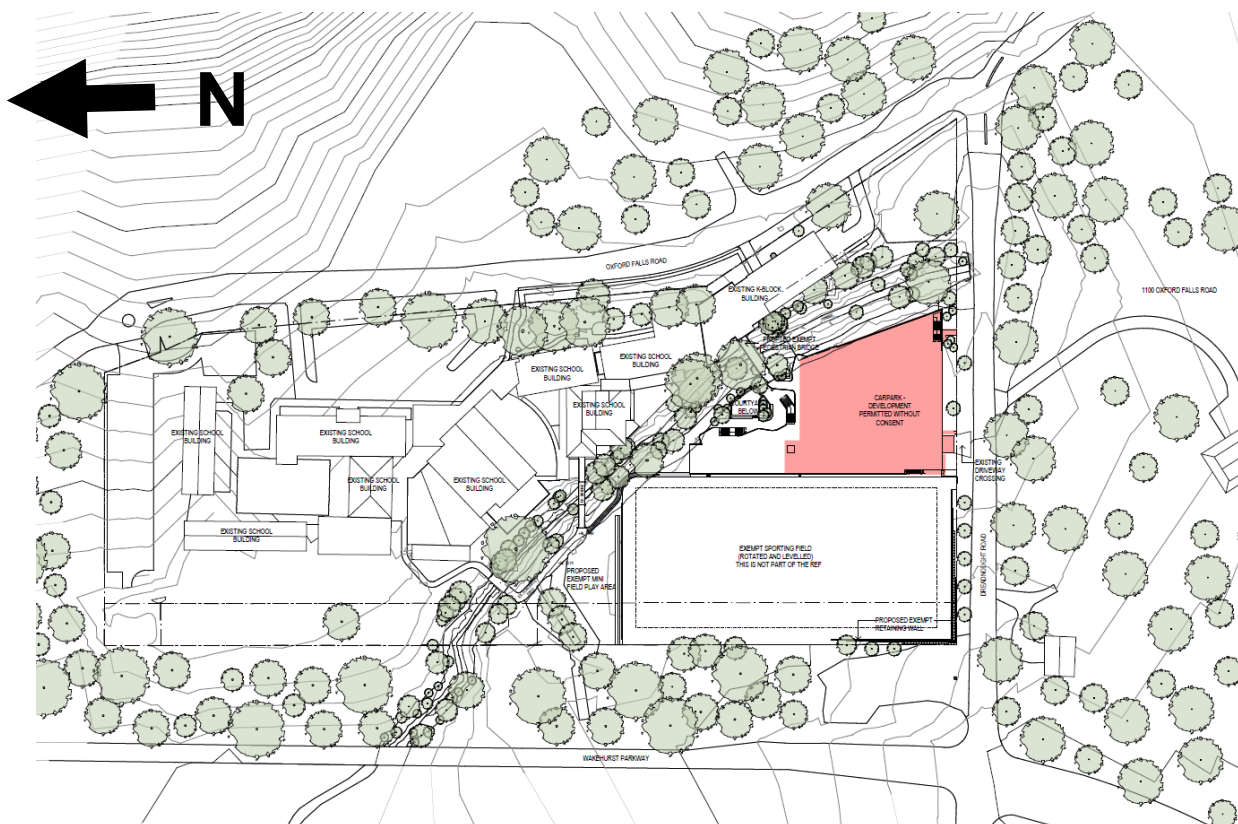


Image 01: Extract from the Site Plan

6.0 Aerial view of the subject allotment

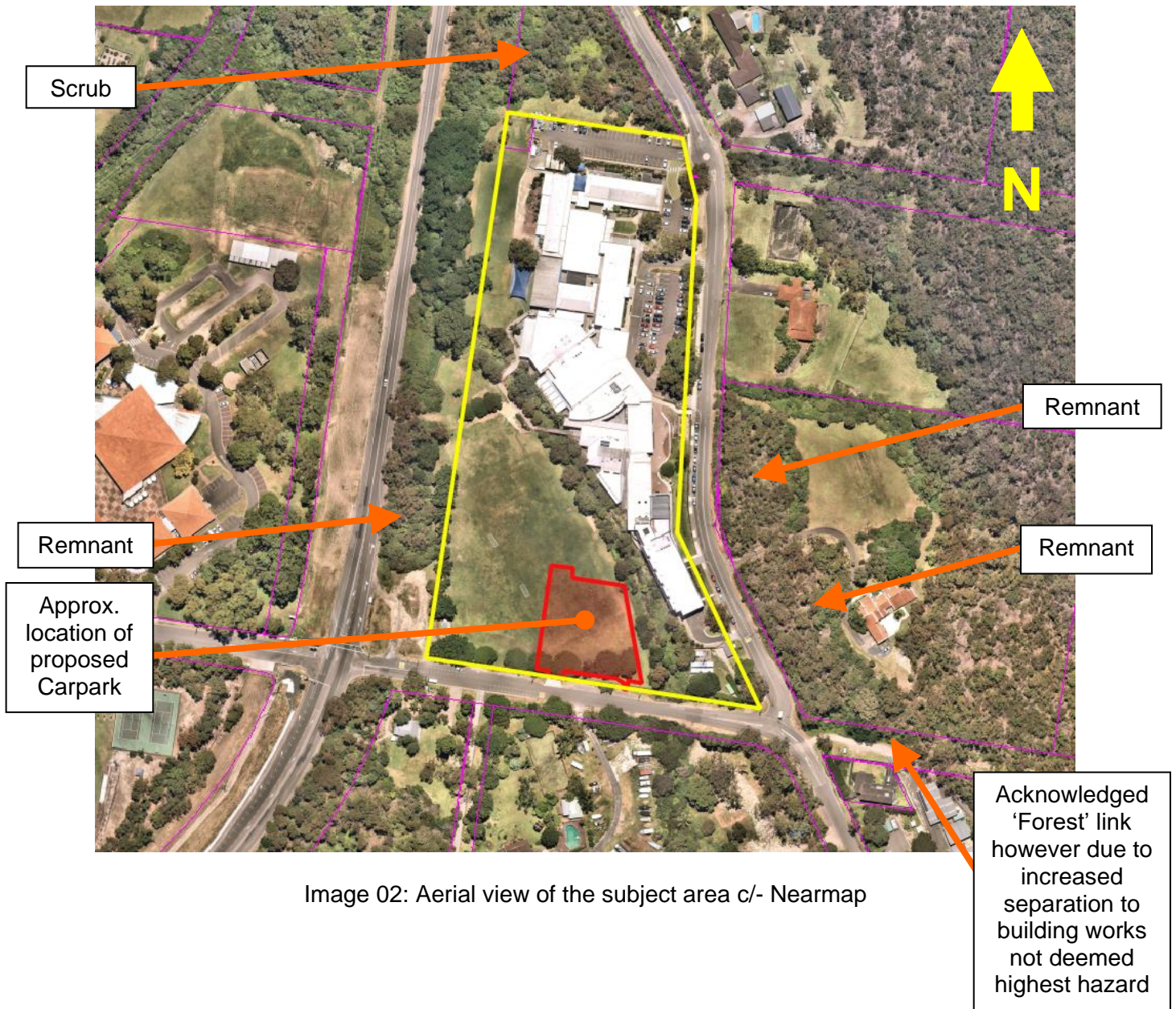


Image 02: Aerial view of the subject area c/- Nearmap

7.0 Bushfire Hazard Assessment

7.01 Preface

Properties considered to be affected by possible bushfire impact are determined from the local Bushfire Prone Land Map as prepared by Council and or the Rural Fire Service. All property development within affected areas is subject to the conditions detailed in the document 'Planning for Bush Fire Protection - 2019' (PBP). Set back distances for the purpose of creating Asset Protection Zones (APZ's) must be applied and any buildings must then conform to corresponding regulations detailed in Australian Standard 3959 – 2018 'Construction of buildings in bushfire prone areas'.

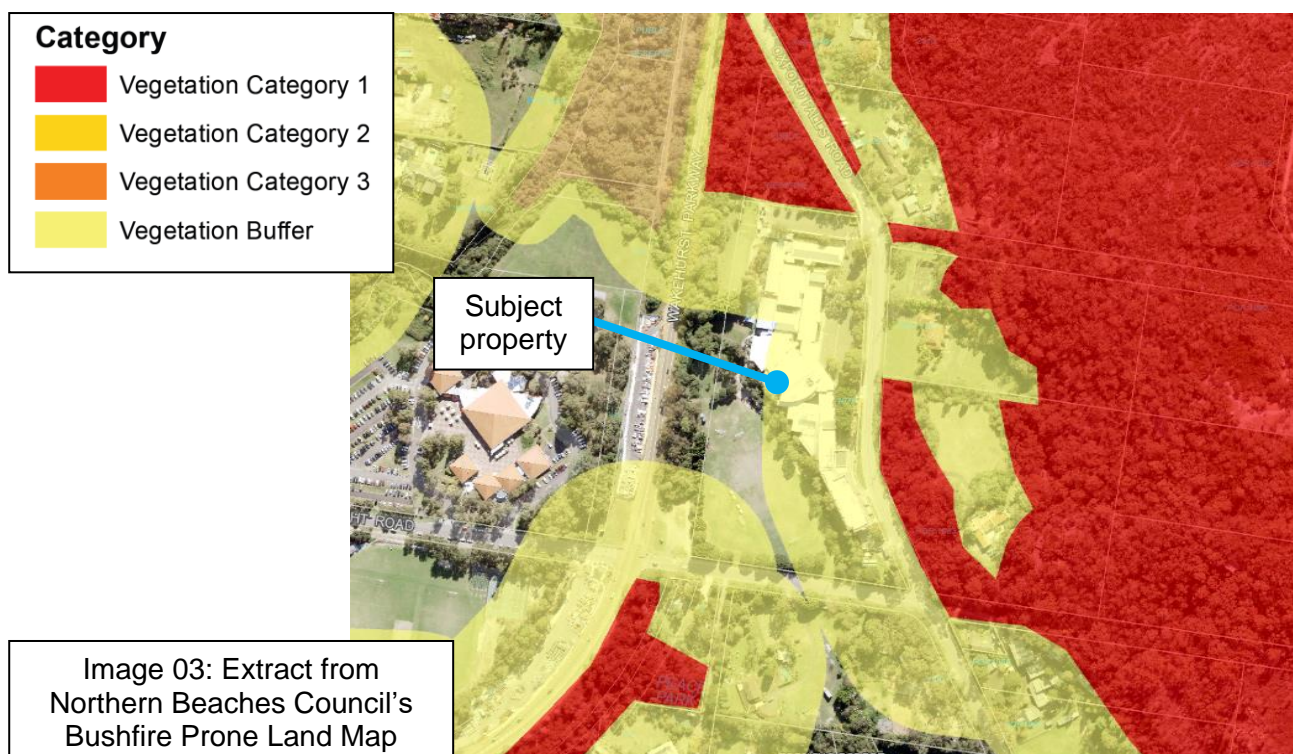
Planning for Bush Fire Protection – 2019, (PBP) formally adopted on the 1st March 2020 provides for the protection of property and life (including fire-fighters and emergency service personnel) from bushfire impact.

The thrust of the document is to ensure that developers of new properties or sub-divisions include the constraints associated with the construction of buildings in bushfire prone areas within their proposed development sites. PBP is applicable to proposed development inside a determined Category 1 or 2 areas and also inside a buffer zone radius of 100m from a Category 1 bushfire area or 30m from a Category 2 bushfire area.

The document also acknowledges 'infill' developments associated with re-development of existing properties and allows some higher levels of building safety where the increased 'set backs' (APZ's) may not be achievable.

The subject development relates to new building works within an existing educational establishment.

To accord with PBP the development is classified as Special Fire Protection Purpose development and assessed as a section 100b application under the Rural Fires Act 1997. The site contains a functional SFPP development and has therefore the proposal has been assessed under section 6.4 'Development of existing SFPP facilities' of Planning for Bush Fire Protection 2019.



7.02 Location

The subject property is known as Oxford Falls Grammar School being located at 1078 Oxford Falls Road, Oxford Falls (Lot 1 DP 1046451) and is within Northern Beaches Councils Local Government Area. The subject property has street frontage to Oxford Falls Road to the east, Dreadnought Road to the south, Wakehurst Parkway road reserve and Wakehurst Parkway to the west and abuts a vegetated allotment to the north.

The vegetation identified as being the hazard is to the east within a private allotment and west of the subject site within Wakehurst Parkway road reserve.



Photograph 01: View into the School from Oxford Falls Road



Image 04: Extract from street-directory.com.au

7.03 Vegetation

The predominant vegetation within the subject site around the existing buildings was found to consist of maintained lawns and gardens.

The subject property has had numerous developments which have been assessed and approved under Planning for Bush Fire Protection. These developments included conditions of consent that the site be maintained in accordance with an Asset Protection Zone, this being reinforced in the latest Bushfire Safety Authority (BSA) issued by the NSW Rural Fire Service (ref: D17/3206, dated 27th October 2017) for the School. This BSA also required the establishment of a Fuel Management Plan which has been complete.

The vegetation identified as being the hazard is to the east within a private allotment and west of the subject site within Wakehurst Parkway road reserve.

The vegetation posing a hazard to the east was found to comprise of shrubs >2 metres in height consisting of Banksias and Wattles and a scattered eucalyptus overstorey. A review recent high resolution aerial imagery of the subject area (Image 05) demonstrates that for the majority of its length the eastern hazard provides a less than 50 metre fire run directly toward the subject site.

Appendix 1.11 of PBP allows for vegetation that provides a less than 50 metre fire run toward the development to be assessed as a Remnant hazard and a Rainforest classification is subsequently used to determine the minimum required Asset Protection Zone and Bushfire Attack Level.

This vegetation is broken from the larger hazard to the east by maintained curtilages, an existing dwelling and formed access drive. The hazard beyond is on a considerable upslope for in excess of 340 metres, has a high concentration of exposed rock outcrops (limiting fuel connectivity) and given the aspect fire impacting towards the subject site from this vegetation would be influenced by the cooler winds from the Pacific Ocean.

We are of the opinion a Remnant classification to this eastern hazard is an accurate reflection of the bushfire hazard from this aspect.

It is noted that there is a narrow link to the larger hazard further south however due to increased separation to the building works was not deemed highest hazard to this aspect.

The vegetation posing a hazard to the west was also found to provide a maximum potential fire run toward the proposed building works of less than 50 metres and has therefore also been determined to be a Remnant hazard.



Image 05: Aerial view of subject area with measurements



Remnant
hazard

Photograph 02: View east from Oxford Falls Road toward the Remnant hazard

7.04 Slope and Topography

The slope that would most significantly affect bushfire behaviour within the hazard must be assessed for at least 100 metres from within the bushfire hazards. The slope was measured onsite using an inclinometer and verified from topographic imagery of the area.

The results are as follows:

- 6 degrees up slope within the hazards to the east (close)
- >15 degrees up slope within the hazard to the east (far)
- 0 – 5 degrees down slope within the hazard to the west

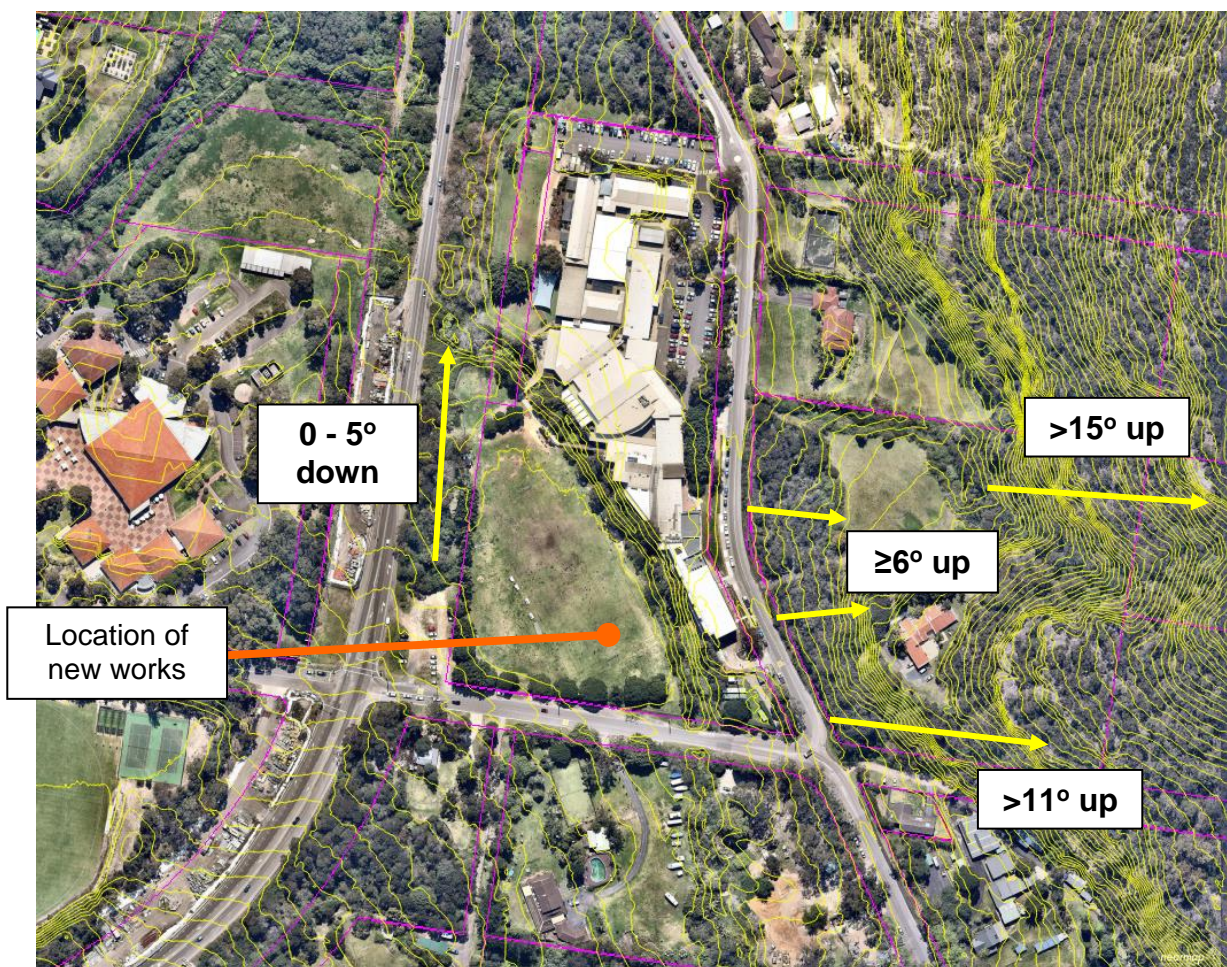


Image 06: Elevation and Depth Foundation Spatial Data – Geoscience Australia

7.05 Asset Protection Zones

Asset Protection Zones for new Special Fire Protection Purpose (SFPP) development are determined from Table A1.12.1 of PBP or bushfire design modelling achieving a radiant heat impact of no more than 10kW/m^2 at the closest point of the available building footprint.

The minimum required Asset Protection Zones for new SFPP development were determined to be 40 metres to the east (closest hazard), 60 metres east (far hazard) and 40 metres to the west.

The closest point of the proposed carpark was found to be located 60 metres from the hazard to the east (close) and west and >100 metres from any other hazard. The proposed carpark works therefore exceed the minimum required Asset Protection Zones for new Special Fire Protection Purpose development to all aspects.

The Asset Protection Zones consist of maintained land within the subject site and land equivalent to an APZ being Oxford Falls Road. The Asset Protection Zones are already enforced by previous approvals to be managed as an Inner Protection Area and are subject to a Fuel Management Plan.



Western
hazard

Photograph 03: View southwest from within the School grounds of the existing APZ



Photograph 04: View south along Oxford Falls Road of the existing eastern APZ

7.06 Fire Fighting Water Supply

An internal boosted hydrant system is available throughout the site. Further to this existing in ground hydrants are available along Oxford Falls Road and surrounding streets.

The existing water supply is considered adequate for the replenishment of attending fire services and will be extended to cover the proposed new carpark. This extension must comply with the sizing, spacing and pressures detailed in AS2419.1-2005.

7.07 Property Access

Clear access to the School is available from existing surrounding public road infrastructure. Persons seeking to egress from the subject property are be able to do so freely from the internal road system and along existing road infrastructure.

A new connection has been constructed to Dreadnought Road to service the proposed carpark.

Attending fire services have direct access to the hazard interfaces via Oxford Falls Road or Wakehurst Parkway for fire suppression or hazard reduction activities.

In consideration of the comprehensive public road system surrounding the site the existing and proposed internal roads are considered adequate.

It is recommended that the Bush Fire Evacuation Plan be updated as necessary to include the new works and be in accordance with the NSW Rural Fire Service guidelines for emergency management plans.

The existing access provisions are considered adequate.

8.0 Site & Bushfire Hazard Determination

8.01 Planning for Bush Fire Protection - 2019

Planning for Bush Fire Protection – 2019 (PBP) is applicable to those lands determined as being within a ‘bushfire prone area’ in accordance with a local Bushfire Prone Land Map as provided by the Rural Fire Service and Council.

The most appropriate method of determining site bushfire hazard under the terms of PBP is to consider the site in a singular form.

Bushfire prone areas are defined as those areas;

- containing or within 100m of Category 1 Vegetation; or
- containing or within 30m of Category 2 or 3 Vegetation.

In this instance the subject property has been identified as being bushfire prone land therefore it is appropriate to apply PBP.

8.02 Australian Standard AS 3959 – 2018 ‘Construction of buildings in bushfire –prone areas’

Australian Standard 3959 – 2018 ‘Construction of buildings in bushfire-prone areas’ provides for six (6) levels of building construction these being BAL - Low, BAL - 12.5, BAL - 19, BAL - 29, BAL - 40 and BAL - FZ. The Australian Standard 3959 specifies construction standards for buildings within various Bushfire Attack Levels as determined by the Planning for Bush Fire Protection – 2019 document. The NSW Rural Fire Service will not accept deemed to satisfy provisions for BAL Flame Zone and therefore have a NSW variation to the listed standard provisions of BAL FZ under AS3959 - 2018.

8.03 Correlation between bushfire impact and AS3959

Bushfire Attack Level	Maximum radiant heat impact (kW/m ²)	Level of construction under AS3959-2018
Low		No special construction requirements
12.5	≤12.5	BAL - 12.5
19	12.6 to 19.0	BAL - 19
29	19.1 to 29.0	BAL - 29
40	29.1 to 40.0	BAL - 40
Flame Zone	>40.0	BAL FZ No deemed to satisfy provisions

8.04 Viable Construction Method

One of the objectives of Planning for Bush Fire Protection – 2019 are for the protection of life including fire fighters. Provided these objectives can be met the construction of buildings is feasible and the consent authority should be in a position to consider such applications.

The highest Bushfire Attack Level to the proposed carpark was determined from Table A1.12.5 of PBP 19 to be ‘BAL 12.5’. The proposed carpark is required to comply with section 3 and BAL 12.5 section 5 under AS 3959 – 2018 and section 7.5 of PBP 19.

9.0 Recommendations

The following recommendations are provided as the minimum necessary for compliance with Planning for Bush Fire Protection – 2019 and Australian Standard 3959 'Construction of buildings in bushfire-prone areas' - 2018. Additional recommendations are provided to supplement these minimum requirements where considered necessary.

Asset Protection Zones

N/A Already enforced by previous development consent (RFS Ref. D17/3206).

Landscaping

1. That any new landscaping is to comply with Appendix 4 'Asset Protection Zone Requirements' under Planning for Bush Fire Protection 2019.

Construction

2. That the proposed carpark shall comply with section 5 (BAL 12.5) Australian Standard AS3959-2018 "Construction of buildings in bush fire-prone areas" and section 7.5 of Planning for Bush Fire Protection 2019.

Bushfire Emergency Management

3. That the bushfire emergency / evacuation plan is updated consistent with the NSW Rural Fire Service Guidelines for the *Preparation of Emergency / Evacuation Plan*.

Water Supply

4. That the new hydrant sizing, spacing and pressures must comply with AS2419.1 – 2005.

10.0 Conclusion

Given that the property is deemed bushfire prone under Northern Beaches Council's Bushfire Prone Land Map any development would need to meet the requirements of Planning for Bush Fire Protection – 2019 and of the construction requirements of Australian Standard 3959 – 2018. The determination of any bushfire hazard must be made on a site-specific basis that includes an assessment of the local bushland area and its possible impact to the subject property.

The development proposal relates to new building works within an existing educational establishment known as Oxford Falls Grammar School. The proposed works include the construction of a new carpark.

The vegetation identified as being the hazard is to the north within the vegetated allotment (>200m), east within a private allotment and west of the subject site within Wakehurst Parkway road reserve. The vegetation posing a hazard to the east and west was determined to be Remnant.

The minimum required Asset Protection Zones for new SFPP development were determined to be 38 metres to the east (close), 67 metres to the east (far) and 47 metres to the west. The closest point of the proposed carpark was found to be located 60 metres from the hazard to the east (close) and west and >100 metres from any other hazard.

The proposed carpark therefore exceed the minimum required Asset Protection Zones for new Special Fire Protection Purpose development to all aspects.

The highest Bushfire Attack Level to the proposed carpark was determined from Table A1.12.1 of PBP 19 to be 'BAL 12.5'. The proposed carpark is required to comply with section 3 and BAL 12.5 section 5 under AS 3959 – 2018 and section 7.5 of PBP.

In accordance with the bushfire safety measures contained in this report, and consideration of the site specific bushfire risk assessment it is our opinion that when combined, they will provide a reasonable and satisfactory level of bushfire protection to the subject development.

We are therefore in support of the development.

Should you have any enquiries regarding this project please contact me at our office.

Prepared by
Building Code & Bushfire Hazard Solutions



Duncan Armour
Bushfire Consultant

Reviewed and endorsed by
Building Code & Bushfire Hazard Solutions P/L



Stuart McMonnies

G. D. Design in Bushfire Prone Areas.
Certificate IV Fire Technology
Fire Protection Association of Australia BPAD – L3 Accredited Practitioner
Accreditation number – BPAD 9400



11.0 Annexure 01

List of Referenced Documents

- a) Environmental Planning and Assessment Act - 1979
- b) Rural Fires Act 1997 as amended
- c) 'Planning for Bush Fire Protection'- 2019 - NSW Rural Fire Services & Planning NSW
- d) 'Construction of buildings in bushfire prone areas' - AS 3959 – 2018
– Standards Australia
- e) 'Ocean Shores to Desert Dunes' David Keith
- f) Northern Beaches Council's Bushfire Prone Land Map
- g) Plans prepared by Allen Jack & Cottier, Project No. 18025, Issue 3, Dated 02/03/21
- h) Acknowledgements to:
 - NSW Department of Lands – SixViewer
 - Street-directory.com.au
 - Google Maps
 - Geoscience Australia

Attachments

Attachment 01: N/A