

**Proposed Residential Building Development
Bushfire Assessment & Compliance Report
Lot A DP 373783
11 Beatty Street
Balgowlah Heights NSW 2093**



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Reviewed by:

Executive Summary – Achievable (Recommended) AS3959 Level of Compliance

Construction Standard	Building Elevation / Section
Flame Zone	
BAL 40	
BAL 29	
BAL 19	
BAL 12.5	All Elevations – Carport
Standard BCA Provisions	

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General Introduction

The following report outlines an assessment for the statutory compliance of the proposed residential building development to occur within 11 Beatty Street, Balgowlah Heights NSW 2093 – Lot A DP 373783 (herewith ‘the subject property’), and at least 140m beyond (herewith ‘the study area’). Appendix 1 / Map 1 denote the subject property and study area.

Australian Standard 3959:2009 (Construction of buildings in bushfire prone areas) and the *Building Code of Australia, 2016* (BCA) are the primary building compliance documents considered for this assessment. AS3959:2009 being the Deemed to Satisfy (DTS) provision or acceptable construction standard.

Methodology for this site assessment for bushfire attack is based on *NSW Planning for Bushfire Protection Guidelines, 2006* (PBP) and specifically, *Addendum: Appendix 3, 2010*.

Terrain (slope) considered by this assessment is based on the Department of Lands Online Six Viewer contours and a site inspection (30/6/2017) of the subject property.

Vegetation extent within the subject area has been derived from available online Council vegetation mapping, aerial photo interpretation (API) and a site inspection (30/6/2017) conducted prior to finalising this report.

The extent and location of the proposed ‘alterations and additions’ to the existing residential building, are based on drawings by Paul Carrick Associates (Project No. 968, Sheet Nos. 1 – 5, Revision A, Dated June 2017).

Photographic evidence (dated 30/6/2017) of the subject property and surrounds is appended to this report (Appendix 2 – Site Photos).

1.0 Property Details

Applicants Name: Karen & Nick Reader (herewith, 'the proponent')

Council: Northern Beaches Council (Manly LGA)

Council Reference: N/A

Lot: A **DP:** 373783 **Area:** 684.8m²

Address/Location: 11 Beatty Street, Balgowlah Heights NSW 2093.

Zoning: R2 – Low Density Residential
(Manly LEP 2013)

Bushfire Prone Land: YES

Aspect: The site currently has a North Easterly aspect.

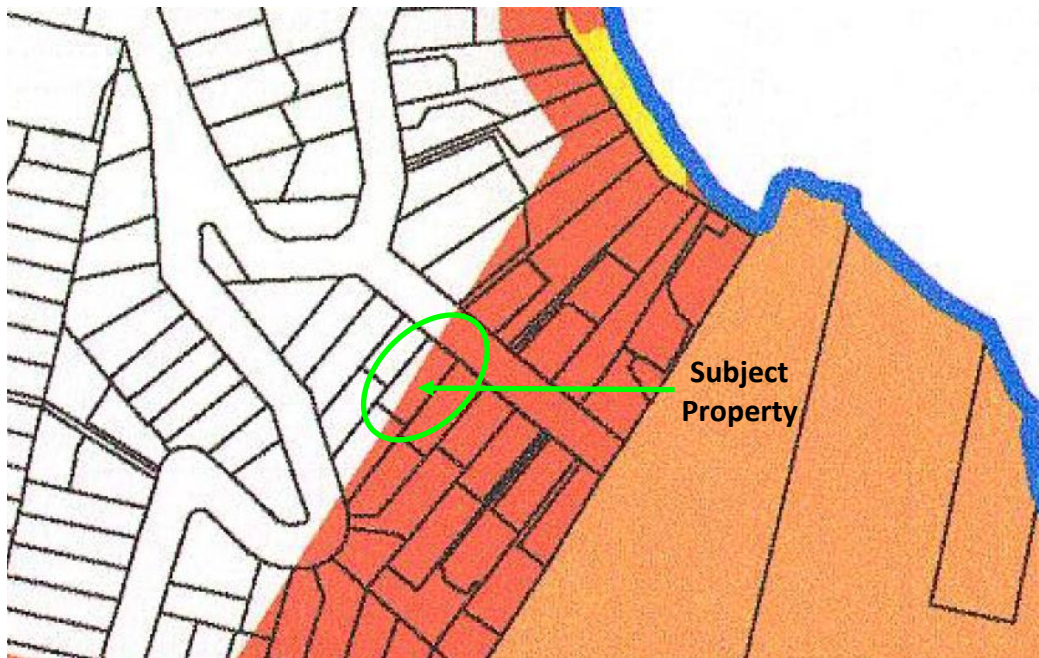
The subject property is mapped as being bushfire prone as currently shown by the Manly Council LGA Bushfire Prone Land Map (s146 EP&A Act). The site is located within the '100m bushfire vegetation buffer area' and is constrained by vegetation classified as 'Category 1 Bushfire Vegetation'. In this regard, any new building development should conform to the specifications and requirements of the document '*Planning for Bushfire Protection*', produced by the NSW Rural Fire Service, that are relevant to the development; as otherwise required under section 79BA of the *Environmental Planning & Assessment Act (NSW)*.

Other Known Constraints:

It is **not** a recommendation of this assessment to remove or alter any vegetation within the study area, as part of the bushfire protection measures.

A desktop assessment of the publicly available council mapping and planning enquiry system has found no other constraints to be considered in regard to development upon the subject property

No other known significant environmental features have been noted, recorded or advised of as part of this assessment.



Extract Manly LGA Bushfire Prone Land Map 2012

2.0 Type of Proposal

- | | | |
|--|--|---|
| ☐ New Building | ☒ Urban | ☐ Dual Occupancy |
| ☐ Rural Residential | ☒ Alterations/Additions | ☐ Isolated Rural |

Proposal Description

The proposed building development is to construct minor 'alterations and additions' to the existing residential building/dwelling structure (Class 1 (a) – as defined by BCA) – limited to modifications to the existing carport.

The extent and location of the proposed 'alterations and additions' to the existing residential building, are based on drawings by Paul Carrick Associates (Project No. 968, Sheet Nos. 1 – 5, Revision A, Dated June 2017).

The approximate location/site of the proposed 'alterations and additions' (herewith 'the subject development') is as denoted in Appendix 1 – Map 2.

3.0 Bushfire Attack

3.1 Vegetation (bushfire hazard) within 100m of the proposed building

The vegetation within the study area is mapped as 'Bushfire Prone Vegetation Category 1' on Council Bushfire Prone Land Maps.

The vegetation constraining the development is located within the Sydney Harbour National Park, generally remote from, and East – South East of the subject site. All vegetation within this area is considered to be 'Coastal Sandstone Gully Forest'.

Based on a determination of vegetation formation using the Keith 2004 Identification Key, the vegetation (East) having the potential to affect the subject development, based on a site visit, is most representative of 'Dry Sclerophyll Forest (Open Forest)'.

In terms of Addendum: Appendix 3 (PBP 2010) Section A.3.5 requires a conversion of vegetation types used in this assessment from Keith 2004 to Specht (AUSLIG 1990). Table A.3.5.1 converts 'Dry Sclerophyll Forest (Open Forest)' to 'Forest'.

PBP 2006 states, *'for the purposes of assessment, the following are not considered a hazard or as a predominant vegetation class/formation and can be included within an asset protection zone;*

- *non-vegetated areas including roads, footpaths, cycle ways, waterways, buildings, rocky outcrops and the like; and*
- *Reduced vegetation including maintained lawns, golf course fairways, playgrounds or sports fields, vineyards, orchards, cultivated ornamental gardens and commercial nurseries.*

The proposed development is located within a well-established residential subdivision. All adjoining residential allotments generally contain cleared & managed land.

The approximate / estimated extent of these managed lands is clearly denoted in Appendix 1 – Map 2.

3.2 Distance/Separation between building line and bushfire hazard

For the purposes of bushfire safety compliance, this assessment notes that the subject property is generally clear of persistent bushfire vegetation.

Considering the location of the proposed development ('alterations and additions') and the extent of the mapped bushfire vegetation on adjoining lands, the achievable separation distance has been assessed as:

Direction	Distance
East	98m

The above is denoted in Appendix 1 – Map 2.

3.3 Effective slope that will influence bushfire behaviour

The effective slope within approximately 100m of the subject development site, which would influence bushfire behaviour, has been assessed as predominately;

Direction	Effective Slope
East	>5 – 10 Degrees Downslope

The above is denoted in Appendix 1 – Map 2.

3.4 Fire Danger Index (FDI) for Local Government Area (LGA)

☒ 100 ☐ 80 ☐ 50

Manly Council – Greater Sydney Region (Table A2.3 PBP, 2006)

3.5 Determination of Bushfire Attack Level (AS 3959:2009)

Direction	Vegetation	Slope	Minimum Distance	BAL Exposure Level
East	Forest	>5 – 10 Degrees Downslope	98m	BAL 12.5

4.0 Construction Standards (AS 3959-2009 – BCA DTS)

4.1 AS 3959:2009 Construction for Bushfire Attack Level

Building Elevations	Vegetation	Slope	Minimum Distance	Construction Standard
All	Forest	>5 – 10 Degrees Downslope	98m	BAL 12.5

Considering the subject developments location and the calculated extent of the APZ area recommended by this report, the subject development is capable of complying with AS3959:2009.

5.0 Water Supplies

5.1 Reticulated Water Supply

☒ Yes ☐ No ☐ Proposed

The subject development/building is currently connected to a reticulated water supply which services the existing residential area within Beatty Street. Hydrants are visible along Beatty Street.

Apart from the above, the proponent has not provided any specific advice (at the time of this assessment) regarding the reticulated water infrastructure and mains size, supply pressure or guarantee of delivery. Considering the building site denoted by this report (and corresponding access / driveways), the subject building would be <90m from the nearest and reasonably available fire hydrant connection point as denoted in attached Map 1.

PBP acceptable solutions for a reticulated water supply area (relevant to the subject development) states that:

- *fire hydrant spacing, sizing and pressures comply with AS 2419.1 – 2005. Where this cannot be met, the RFS will require a test report of the water pressures anticipated by the relevant water supply authority, once development has been completed. In such cases, the location, number and sizing of hydrants shall be determined using fire engineering principles.*
- *hydrants are not located within any road carriageway.*
- *all above ground water and gas service pipes external to the building are metal, including and up to any taps.*

Fire fighting water supply recommendations are as listed section 9.3 (Bushfire Safety & Compliance Recommendations).

5.2 Distance to hydrant from subject proposed development

The distance from the furthest part of the proposed development to a reticulated hydrant is approximately **40m**.

5.3 Existing or planned water supply provided for fire fighting purposes

☒ Yes ☐ No ☐ Proposed

As stated, the travel distance associated with this development is <90m, and as such, is technically able to comply with the acceptable solutions for reticulated water supplies.

6.0 Gas Supplies

Reticulated Gas: ☒ Yes ☐ No

Bottled Gas: ☐ Yes ☒ No

7.0 Electricity Supplies

The subject development site is currently serviced by an above ground electrical supply grid which services the residential subdivision within Beatty Street. The connection to the existing residence is currently located above ground.

It is not proposed, as part of this development application, to alter the existing arrangement.

8.0 Vehicle Access/Egress (Property Access)

PBP acceptable solutions for property roads (for this specific development location) states that;

'No specific access requirements apply in an urban area where a 70m unobstructed path can be demonstrated 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 (i.e. a hydrant or water supply).'

Access to the subject property is by way of a short sealed all weather driveway, directly off Beatty Street. Beatty Street is part of the public road system. It is a sealed all weather road approximately 9m in width within a road reserve of approximately 20m. It has a speed limit of 50 kph.

Beatty Street terminates 90m South East of the subject site, and provides for a hardstand/sealed manoeuvring area - at that point (20m in length x 12m in width)

The public road system servicing the proposed development is able to provide safe operational access for emergency services and egress in varying directions for evacuating residents.

Evacuation, from a severe bushfire event, should be initially in the North Western direction and away from the persistent bushfire hazard.

9.0 Bushfire Safety/Compliance Recommendations

9.1 Defendable Space / Asset Protection Zone (APZ) Recommendations

Recommendation 1.

As denoted in Appendix 1 – Map 2, the entire site identified as ‘**Recommended Inner Protection Area (IPA)**’ is to be managed/maintained as an APZ area for the life of the development.

The above recommendation should ensure that no easily combustible material, structures, available forest fuel/bushfire vegetation or other items be installed, stored or allowed to re-accumulate and become contiguous within the area. The IPA extent should not support or carry a running bushfire towards the subject development site and associated infrastructure.

The area identified as **Inner Protection Area (IPA)** should be managed in terms of PBP A2.2 (vi) which states: *The IPA is critical to providing a defendable space and managing heat intensities at the building surface. The IPA should provide a tree canopy cover of less than 15% and should be located greater than 2 m from any part of the roofline of a dwelling. Garden beds of flammable shrubs are not to be located under trees and should be no closer than 10 m from an exposed window or door. Trees should have lower limbs removed up to a height of 2 m above the ground.*

9.2 Construction Standard Recommendations

Construction standards have been determined from the following sections of the planning legislation and based on the relevant bushfire assessment as discussed above.

AS 3959-2009 Section 3 Construction General
(See Recommendation 2)

AS 3959-2009 Section 5 Construction for Bushfire Attack Level 12.5 (BAL 12.5)
(See Recommendation 3)

Planning for Bushfire Protection Addendum – Appendix 3 (2010)
Section A 3.7. ‘Additional Construction Requirements’ - NSW State Variation
(See Recommendation 4)

Recommendation 2.

Where any part of a garage, carport, veranda or similar roofed structure is attached to, or shares a common roof space with, or is within 10m of, a building required to comply with the standard (AS 3959-2009), the entire attached structure shall comply with the construction requirements of the standard (as per Recommendation 3), as applicable to the subject building.

Alternatively, the structure may be separated from the subject building by a wall complying with Section 3.2.1 a) or b) of the standard (i.e. fire rated construction as specified).

Recommendation 3.

Predicated upon the maintenance of the APZ area as per Recommendation No. 1 of this report, it is recommended the proposed residence incorporate, as a minimum, the following levels of construction as per *AS3959 – 2009 Construction of Buildings in Bushfire Prone Areas*;

Carport – All Elevations ('alterations and additions')

Construction for Bushfire Attack Level 12.5 (BAL 12.5) – Section 5 (AS3959-2009)

Recommendation 4.

Sarking

All sarking used shall be:

- Non-combustible, **or**
- Breather type sarking complying with AS/NZS 4200.1 and with a flammability index of not more than 5 (see AS1530.2) and sarked on the outside of the frame, **or**
- An insulation material conforming to the appropriate Australian Standard for that material.

Recommendation 5.

General

- No brushwood fencing shall be used
- All new fencing shall be 'non-combustible' or 'Bushfire Resistant Timber'

9.3 Water Supply Recommendations

Recommendation 6.

- Reticulated supply in urban subdivision with hydrant spacing, sizing and pressures to comply with AS 2419.1 – 2005. (As per Acceptable Solutions, PBP 2006, Section 4.1.3). **This is reasonably assumed.**
- Any above ground and external water pipes (including taps) incorporated as part of the subject building development and potentially exposed to radiant heat from any adjacent bush fire hazard are to be of metal design and manufacture.

9.4 Gas Supply Recommendations

Recommendation 7.

- Any new gas connection is installed and maintained in accordance with AS1596 and the requirements of relevant authorities.
- Metal piping should be used.
- Polymer sheathed flexible gas supply lines to gas meters adjacent to the building are not used.

9.5 Electricity Supply Recommendations

Recommendation 8.

As the electricity supply will be located aboveground ensure that any vegetation is managed in accordance with the specifications in 'Vegetation Safety Clearances' issued by Energy Australia (NS179, April 2002).

9.6 Vehicle Access/Egress Recommendations

Recommendation 9.

The proposed building development currently incorporates an all weather driveway area for vehicle access and parking within the subject property. The access road / driveway will continue to provide direct access from Beatty Street.

No additional vehicle access requirements are recommended.

10.0 Compliance or non-compliance with PBP Specific Objectives for infill. (As per PBP 2006 Section 4.3.2)

Specific Objective	Comment
Ensure that the bushfire risk to adjoining land is not increased.	The subdivision is pre existing. The construction of 'additions and alterations' to this building will not increase the bushfire risk to adjoining land. Subsequent bushfire fuel management from within the subject property will effectively reduce the risk to both the subject property and adjoining premises.
Provide a minimum defensible space.	A complying APZ (defendable space) has been recommended. This space consists of an area maintained as an IPA.

Provide better bushfire protection, on a redevelopment site, than the existing situation. This should not result in new works being exposed to greater risk than an existing building.	The site is located within an existing subdivision. Recommendations, relating to the 'alterations & additions', include strict building construction standards. The additions will not be exposed to any greater risk than the existing building.
Ensure that the footprint of the proposed building does not extend towards the hazard beyond existing building lines on neighbouring land.	The additions to the building are contained within the approved building envelope. They do not extend towards the hazard beyond the existing building lines /development on adjoining lands.
Not result in an increased bushfire management and maintenance responsibility on adjoining land owners unless they have agreed to the development	The development has not increased bushfire management and maintenance on adjoining land owners. For the purpose of this application, the management and maintenance responsibilities on adjoining land owners have not increased beyond existing legislative requirements.
Ensure building design and construction; enhance the chances of occupant and building survival.	The recommendations (above) relating to the design and construction of the 'alterations and additions', include a range of 'bushfire protection measures', that will enhance the chances of occupant and building survival.

11.0 Compliance or non-compliance with PBP performance criteria and intent for bushfire safety protection measures for infill development.

Performance Criteria	Comment
APZ A defendable space is provided on site. An APZ is provided and maintained for the life of the development.	Can Comply – Recommendation No. 1. A defendable space will be provided within the site boundaries with the entire site being maintained as an IPA. This is complimented by 'cleared and managed lands' on some adjoining properties.
Siting and Design Buildings are sited and designed to minimise the risk of bushfire attack.	Can Comply – Recommendation Nos. 1 – 5 The proposed development will be located within the approved building envelope. Predicated upon the proposed building standards and recommended APZ areas stated by this report, the risk of bushfire attack should be minimised upon the subject development/building.

Construction Standards Demonstrated that the proposed building can withstand bushfire attack in the form of wind, smoke, embers, radiant heat and flame contact.	Can Comply – Recommendation Nos. 2 – 5 Predicated upon the recommended APZ areas and siting requirements, BAL 12.5 construction standards can achieve the performance requirements of the planning legislation.
Access Safe, operational access is provided (and maintained) for emergency service personnel in suppressing a bushfire while residents are seeking to relocate, in advance of a bushfire (satisfying the intent and performance criteria for access roads in sections 4.1.3 and 4.2.7).	Can Comply - Recommendation No. 9 Access/Egress is provided from Beatty Street. The access arrangements are sufficient for operational fire fighting and emergency egress.
Water and Utility Services Adequate water and electricity services are provided for fire fighting operations. Gas and electricity services are located so as not to contribute to the risk of fire to a building.	Can Comply – Recommendation Nos. 6 & 8 Can Comply – Recommendation Nos. 7 & 8
Landscaping Designed and managed to minimise flame contact and radiant heat to buildings, and the potential for wind driven embers to cause ignitions.	Can Comply – Recommendation No. 1 of this report.

12.0 Statement assessing the environmental impact of any proposed bushfire protection measures.

Bushfire Protection Measure	Likely Environmental Impact	Comment
APZ (Rec. No. 1)	Insignificant	The recommended APZ within the subject property is generally clear of persistent vegetation.
Construction Standard (Rec. Nos. 2 - 5)	Insignificant	New additions are to be constructed within approved / current building envelope.

Water Supply for fire fighting (Rec. No. 6)	Insignificant	A reticulated water supply currently services the existing development.
Utility service protection (Rec. Nos. 6 - 8)	Insignificant	Utilities are currently located underground, or are located within the existing APZ area.
Vehicle Access (Rec. No. 9)	Insignificant	Direct access to public road system is by way of existing driveway, only ongoing maintenance is required.

13.0 Conclusion/Summary

Based on the above assessment and the 9 recommendations to protect persons and property from danger that may arise from a bushfire, the Consent Authority should determine that this development proposal can comply with *Planning for Bushfire Protection, 2006* as required under *section 79BA of the Environmental Planning and Assessment Act 1979*.

As a considered opinion, the recommended mitigation measures and construction requirements as stated in this report would reasonably address the aims and objectives of PBP 2006, consistent within the relative and current bushfire risk to the subject development site.

The recommended mitigation measures include the establishment of an Asset Protection Zone, maintained as an IPA (Recommendation No.1) and the use of BAL 12.5 construction standards.

As infill development, the residence will be able to fully comply with the Acceptable Solutions provided within PBP 2006.

In this regard, the subject development can reasonably facilitate PBP objectives in as far as;

- Affording occupants of any building adequate protection from exposure to bushfire;
- Providing for a defendable space to be located around buildings;
- Providing appropriate separation between a hazard and buildings which, in combination with other measures, prevent direct flame contact and/or material ignition;
- Ensuring that safe operational access and egress for emergency service personnel and residents is available;
- Providing for ongoing management and maintenance of bushfire protection measures, including fuel loads in the APZ; and

- Ensuring that utility services are adequate to meet the needs of fire fighters (and others assisting in bush firefighting).

Should any of the above information require clarification or further discussion, please contact the author.



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(Note: Scott Jarvis is a recognised / suitably qualified consultant pursuant to Rural Fire Service of NSW requirements - Community Resilience Fact Sheet - Requirements for Suitably Qualified Consultants 8/15, Fast Fact 5/10 Version 3 Dated 7 March 2011 & Development Control Practice Note 1/10 Version 2 Dated 4 February 2011)

References/Further Reading

Australian Standard 3959-2009, Construction of buildings in bushfire prone areas – Standards Australia.

Building Code of Australia (2016) – Australian Building Codes Board, Canprint.

Environmental Planning and Assessment Act (1979) – NSW Government Printer.

- Section 79BA Consultation and Development Consent Certain Bushfire Prone Land
- Section 146 Bushfire Prone Land

Rural Fires Act (1997) – NSW Government Printer

Landscape and building design for bushfire areas (2003) – Ramsay G C & Rudolf L, CSIRO Publishing, Collingwood Victoria.

Ocean shores to desert dunes: the native vegetation of NSW and the ACT (2004) – Keith D, NSW Dept of Environment and Conservation, Hurstville NSW.

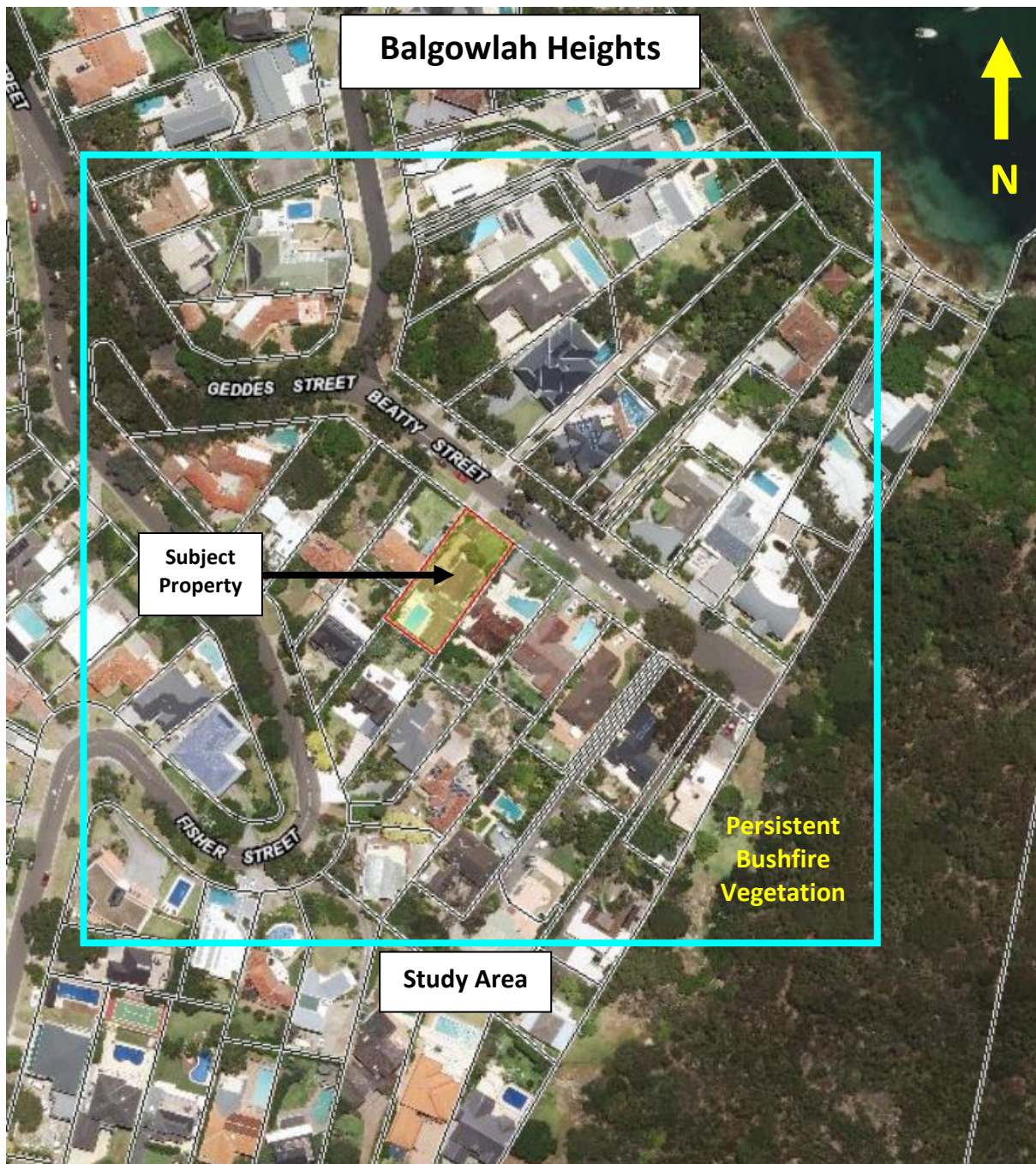
Planning for Bushfire Protection. A guide for councils, planners, fire authorities and developers (2006) – NSW Rural Fire Service.

Addendum: Appendix 3 - Planning for Bushfire Protection. A guide for councils, planners, fire authorities and developers (2010) – NSW Rural Fire Service.

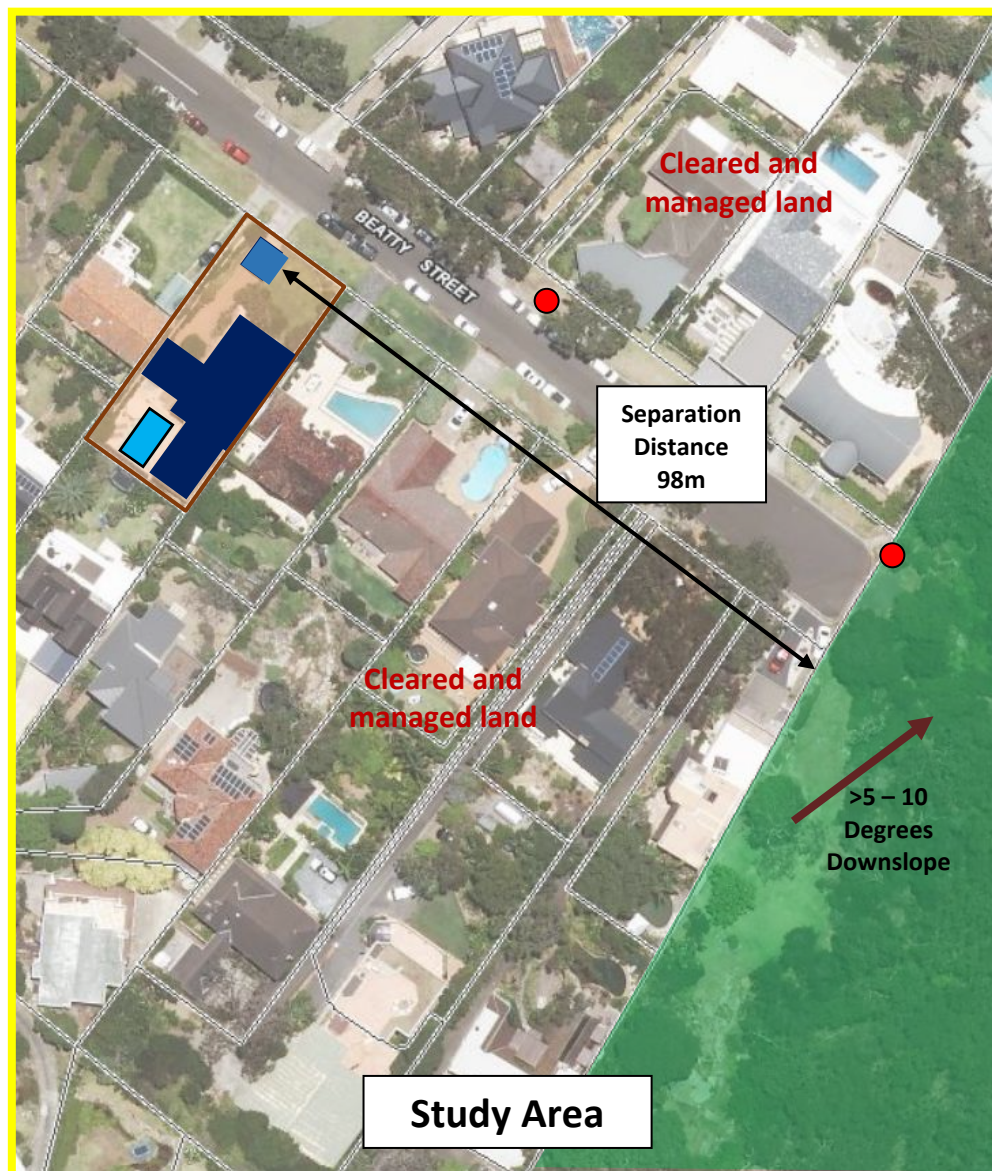
Standards for Asset Protection Zones – NSW Rural Fire Service

Appendix 1

Map 1 – Overview



Map 2 – Study Area / Subject Lot / Slopes / APZ extent



Appendix 2 – Site Photo (30/6/2017)



Existing development site, looking SW



Existing driveway / vehicle access



Beatty Street, looking W



Beatty Street, looking E



Existing front yard, subject site



Existing pool, subject site



Reticulated water supply along Beatty Street



Typical Dry Forest vegetation within National Park, looking NE



Typical Dry Forest vegetation within National Park, looking E



Typical Dry Forest vegetation within National Park, looking SE