Bushfire Assessment and Recommendations

Proposed Residential Development
Detached Secondary Dwelling
Lot 17 Section F DP 7686
32 Quinlan Parade
Manly Vale NSW 2093

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Introduction

The following report has been commissioned by Granny Flat Solutions, here in '*the proponent*', to provide a Bushfire Assessment and Recommendations for bushfire safety and design compliance for the proposed residential development of **Lot 17 Section F DP 7686** – 32 Quinlan Parade, Manly Vale NSW 2093 (Northern Beaches Council Local Government Area), herein '*the subject property'* or *'subject development*'.

The development application involves the proposed construction of a new 'detached secondary dwelling' (and all associated infrastructure) within a single existing residential allotment. No boundary adjustments are proposed.

This assessment considers the subject development site on the basis of;

- A site-specific inspection undertaken on the 4/2/2020,
- An analysis of the site and associated DA Plans, prepared by Granny Flat Solutions, Thornleigh (Job Ref. 193715, Sheet Nos. CDC01 – CDC05, Revision E, Dated 21/02/2020) &
- A desktop assessment using licensed or on-line spatial data resources available at the time of this report.

The subject property has been identified as being within, or bounded by, bush fire prone land. In this regard, the NSW legislative requirements for building, or land subdivision development on bush fire prone lands is applicable.

The development is **not** considered to be 'Integrated Development' (pursuant to *Section 100B – A1.3* of the *Rural Fires Act 1997*), and as such does not technically require a 'Bush Fire Safety Authority', however, it has still been assessed against the requirements and principals (aim and objectives) as outlined within Section 4.1 of the NSW document *'Planning for Bushfire Protection 2006 (PBP 2006)'.*

This is in line with the NSW Rural Fire Service requirements as noted within the *'Community Resilience Fast Fact – Increased Density on a Single Parcel of Land 4/12 (Version 1 Dated September 2012)'.*

PBP states;

'*The aim of PBP is to use the NSW development assessment system to provide for the protection of human life (including firefighters) and to minimise impacts on property from the threat of bush fire, while having due regard to development potential, on-site amenity and protection of the environment.*

More specifically, the objectives are to:

(i) afford occupants of any building adequate protection from exposure to a bush fire;

(ii) provide for a defendable space to be located around buildings;

(iii) provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent direct flame contact and material ignition;

(iv) ensure that safe operational access and egress for emergency service personnel and residents is available;

(v) provide for ongoing management and maintenance of bush fire protection measures, including fuel loads in the asset protection zone (APZ); and

(vi) ensure that utility services are adequate to meet the needs of firefighters (and others assisting in bush fire fighting).'

This assessment includes an analysis of the potential (persisting) bushfire hazard extent and threat to the subject development and recommends standards and bush fire mitigation measures that should be introduced to address the objectives of PBP 2006.

Bushfire safety compliance, as purported by this report, for the subject development site comprises a package of *measures in combination* including asset protection zones, vehicle access and egress, construction standards & fire fighting water supplies as applicable.

The above measures have been derived from provisions and recommendations as outlined within the document *'Planning for Bushfire Protection 2006'*.

The following bushfire assessment has been prepared in accordance with the *NSW Rural Fires Regulation 2002, Clause 44 - Application for a Bushfire Safety Authority.*

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1.0 Description of the property

1.1 Lot and deposited plan (DP) number of the subject property

Lot: **16** Section: **F** Deposited Plan Number: **7678**

1.2 Street address and locality map

32 Quinlan Parade, Manly Vale NSW 2093.

Locality map is as denoted in attached map 1.

1.3 Zoning of the subject land and any adjoining lands

The subject property is currently zoned 'R2 – Low Density Residential' (Warringah LEP 2011). All adjoining residential allotments are also zoned similarly, and the reserve to the North is zoned 'RE1 – Public Recreation'.

Extract Warringah LEP 2011

1.4 Staging issues, if relevant, and description of the whole proposal

Description of the whole proposal

The subject site currently contains a single residential dwelling (to be retained) and all associated infrastructure. It is proposed to construct a new detached 'Secondary Dwelling', and all associated infrastructure, within the rear of the subject site.

The site presently contains no persistent bushfire vegetation. The site generally contains an urban garden, and is considered to be 'cleared & managed land'.

The allotment is a traditional urban residential allotment, and is accessed directly from Quinlan Parade (part of the public road system), by way of a sealed, all-weather driveway.

The construction of the new secondary residential building will also be subject to another assessment under *s4.14* of the *EP&A Act 1979* (to determine relevant bushfire construction requirements – Bushfire Attack Levels). This assessment also forms part of this report.

Staging Issues (temporary and reciprocal asset protection zone easements / agreements)

For the purposes of bushfire safety compliance, the subject development will not rely on any temporary or reciprocal asset protection zone (APZ) easements / agreements on adjoining lands.

1.5 Aerial or ground photographs of the subject land, existing and proposed cadastre

An ortho-photo and boundary overlay of the subject property is as shown attached Map 1. Ground / site photos (captured 4/2/2020) of the subject property, neighbouring lands and existing public access roadway are appended to this report (Appendix 1).

Contours as shown / considered by this report are derived from the Department of Lands SIX Viewer Digital Elevation Model (DEM) data (10m Contour Interval). The cadastral boundaries are as denoted in attached map 2.

2.0 Classification of vegetation out to 140m from the development

2.1 Structural description consistent with the identification key in Keith D (2004) and PBP

Vegetation extent (bushfire hazard) within the study area is derived from aerial photo interpretation (API), a desktop review of local vegetation classification mapping and an inspection of the subject property.

The subject property has been mapped as bush fire prone land within the Northern Beaches Shire Council Bush Fire Prone Land Map. The property is constrained by bush fire vegetation, within the study area, classified as 'Vegetation Category 1'.

The vegetation constraining the development is located within the David Thomas Reserve, to the North – North East, of the subject development, running around the local playing fields etc. The vegetation within the study area is considered to be predominantly 'Sydney Northern Exposed Sandstone Woodland', although somewhat degraded within some places.

Based on a determination of vegetation formation using the Keith 2004 Identification Key, the bushfire vegetation 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'.

Extract Northern Beaches Council LGA BFPLM

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:*

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

Considering the above, this report notes that all adjoining residential properties are considered 'cleared and managed lands'.

2.2 Past disturbance factors and any future intended land uses that could alter the vegetation classification in the future

Considering the location of the development site, within an established urban residential area, and the zoning of adjacent lands, it would be reasonable to suggest that the potential extent of bushfire vegetation that may persist or accumulate adjacent to the subject development site will not increase any further in the future.

3.0 Assessment of the effective slope to a distance of 100m

Slope analysis (used by this assessment) is derived from 10m grid digital elevation model (DEM) and a general inspection of the subject development site. This includes deriving contours for each 10m change in elevation and the approximate areas of slope / gradient based on PBP slope classes. The effective slope surrounding or affecting the subject development site, primarily influencing bushfire behaviour has been assessed as;

- North East: >10 – 15 Degrees Downslope

4.0 Identification of any significant environmental features

The proponent has not advised of any constraint, restriction or burden over the subject property for the purposes of land development and associated asset protection zone maintenance.

Based on a brief desktop assessment of the subject property, the following table outlines any significant environmental features potentially affected by the subject development.

Table 1.0	*Present within Subject Property*	*Present within Study Area*	*Comment*
Native Forest / Vegetation	No	Yes	Native forest vegetation is located within the study area. However, it is not proposed to remove any significant vegetation to achieve compliance with the bushfire planning provisions.
Riparian Corridor	No	No	
SEPP 14 – Wetland	No	No	
SEPP 26 – Littoral Rainforest	No	No	
SEPP 44 – Koala Habitat	No	No	
Areas of Geological Interest	Undetermined	Undetermined	
Environmental Protection Zones	No	No	
Steep Lands (>18˚)	No	No	
Land Slip Area	No	No	
Flood Prone Area	Undetermined	Undetermined	
National Park / State Forest	No	No	

5.0 Details of threatened species, populations, endangered ecological communities and critical habitat known to the applicant

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

No known threatened species, populations or ecological communities identified under the *Biodiversity Conservation Act 2016* have been noted, recorded or advised of as part of this assessment.

For the purposes of this assessment, the proponent has not provided, nor indicated there to be any other threatened species issues or occurrence potentially affecting the subject land / development.

6.0 Details of Aboriginal heritage known to the applicant

No known Aboriginal relics (being a relic within the meaning of the *NSW National Parks and Wildlife Act 1974*) or Aboriginal place (within the meaning of that Act) have been noted, recorded or advised of as part of this assessment.

For the purposes of this assessment, the proponent has not provided nor indicated there to be any items or issues of Aboriginal heritage potentially affecting the subject property / development.

Likewise, this assessment has not considered any past studies, surveys for the area or any documentation supplied to council in relation to any items or issues of Aboriginal heritage potentially affecting the subject property / development.

7.0 Bushfire assessment (including methodology)

Methodology for this site assessment for bushfire attack and recommended mitigation measures (setback distances) are based on Appendix 2 of PBP 2006.

Minimum required asset protection zones and other recommended setback measures for bushfire protection are derived from distances outlined by PBP 2006 for a residential subdivision development within an **FDI 100** Fire Area (PBP Appendix 2 – A2.4).

The Northern Beaches Council LGA is designated as potentially having an **FDI** of **100** as a 1:50 year event (PBP Appendices 2 – Table A2.3).

8.0 Asset protection zones (including any management arrangements or easements including those contained on adjoining lands)

The minimum specified APZ / setback required for the above parameters of slope and vegetation as determined from PBP 2006 (for a 'Residential Subdivision Development' Table A2.4) for the building siting from any persisting and available bushfire vegetation (hazard) within the study area are as follows.

Table A2.4 Appendix 2 PBP 2006

Direction	Vegetation	Minimum APZ Distance	Slope	k/Wm^2
North East	Forest	>50m (Actual >90m)	>10 – 15 Degrees Downslope	29

PBP 2006 acceptable solutions for APZ compliance require that;

- *an APZ is provided in accordance with the relevant tables / figures [within PBP 2006],*
- *the APZ is wholly within the boundaries of the development site, &*
- *the APZ is located on lands with a slope less than 18 degrees*.

Considering the above, the subject development site can reasonably facilitate the specified minimum APZ / setback from potentially unmanaged and persisting bushfire vegetation.

Where the minimum specified APZ distance extends beyond the boundary of the subject development site the adjoining land is a residential (managed / maintained) area.

9.0 Siting & adequacy of water (in relation to reticulation rates or where dedicated water storage will be required)

The subject development site is currently connected to a reticulated town water supply which services the residential building development along Quinlan Parade.

Apart from the above, the proponent has not provided any specific advice (at the time of this assessment) regarding proposed reticulated water infrastructure and mains size, supply pressure or guarantee of delivery. This report notes a number of hydrant connection points within Quinlan Parade.

The proposed development will be <**90 m** from the nearest and reasonably available fire hydrant connection. 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.

Based on AS2419 requirements, hydrant connection points;

- fed by mains supply only, should be located so as to be **no greater than 90m** from the furthest most point of buildings or areas that may require protection or water supply during a fire event

Firefighting water supply recommendations are as listed section 17.0 (Bushfire Safety & Compliance Recommendations).

10.0 Capacity of public roads (especially perimeter roads and traffic management treatments)

The subject development site is currently accessed from Quinlan Parade. Quinlan Parade is an urban residential road, it is approximately 8m wide (verge – verge, with formed carriageway), two-way access with constructed roadside drainage and verge areas either side. The maximum speed limit along Quinlan Road is 50 kph.

As a considered opinion, all existing public roadways servicing the subject development site should easily have the capacity to handle an increase in traffic associated with the subject development and a potential bushfire emergency.

11.0 Public roads link to fire trails and have two-way access

The subject development site does not propose nor necessarily require any fire trail access to service the subject development site.

12.0 Adequacy of access and egress for emergency response

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 Quinlan Parade, which is part of the public road system.

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.

13.0 Adequacy of maintenance plans and emergency procedures

No additional advice or information regarding bushfire maintenance plans & fire emergency procedures has been provided by the proponent. Should a bushfire emergency impact upon this area, the implementation of the existing *'The Northern Beaches (Warringah) Local Emergency Management Plan'* should be adequate for bushfire suppression, hazard management and maintenance.

The implementation, and on-going future maintenance, of building construction standards described and recommended *Section 14.0 (Construction standards to be used)* and APZ areas as described *Section 8.0 (APZ)* should reasonably facilitate bushfire maintenance for the subject development.

14.0 Construction standards to be used

Based on the above assessment, APZ recommendations and current separation distances stated by this report, the subject development site **will** provide sufficient separation for the current and proposed secondary residential dwelling to comply with BCA DTS provisions or otherwise the application of AS3959-2009/2018.

The site methodology used for this assessment is based on *Addendum: Appendix 3 of PBP*. This addendum requires a conversion of vegetation classification from David Keith to the AUSLIG Pictorial Analysis in AS3959-2009. Based on this conversion, **'Dry Sclerophyll Forest (Open Forest)'** converts to **'Forest'**.

In terms of establishing the construction levels relevant to the proposal, the following table illustrates the relevant BAL exposure levels for the proposal.

Table 2.0

Direction	Vegetation	Actual Separation	Slope	BAL Exposure Level
North East	Forest	>90m	>10 – 15 Degrees Downslope	BAL 12.5

15.0 Adequacy of sprinkler systems & other fire protection systems

Sprinkler systems are neither recommended nor necessarily required for the subject development site (based on the recommended building safety designs and siting as considered by this report).

Likewise, no other alternate fire protection measures are recommended by this report (over and above AS3959-2018 DTS & PBP requirements).

16.0 An assessment of how the development complies with the acceptable solutions, performance requirements and relevant specific objectives within Chapter 4 of PBP

16.1 Performance criteria / acceptable solution compliance

The following table outlines how the subject development complies with PBP provisions for a residential or rural residential subdivision. Compliance is stated as;

- ***YES*** – the subject development can facilitate the acceptable solution for bushfire safety,
- ***REASONABLY ASSUMED*** – the subject development can reasonably facilitate the acceptable solution for bushfire safety, predicated on assumptions of future design and activities likely to occur,
- ***NOT CONSIDERED*** – the acceptable solution for bushfire safety is considered unnecessary or otherwise overly exceeds the relative risk associated with a bushfire event affecting the subject development. Bushfire safety compliance is based on performance criteria,
- ***NOT APPLICABLE (N/A)*** – the acceptable solution is not applicable to the design or construction of the subject development,
- ***NO*** – the subject development will not facilitate the acceptable solution for bushfire safety compliance. Bushfire safety compliance is based on performance criteria.

Table 3.0 Derived from PBP Chapter 4; 4.1.3 – Standards for Bush Fire Protection Measures for Residential and Rural Residential Subdivision

Performance Criteria	Acceptable Solution	Compliance	Assessment / Comment
Radiant heat levels at any point on a proposed building will not exceed 29 kW/m²	*an APZ is provided in accordance with the relevant tables and figures in PBP*	***Yes***	Compliance as per Recommendation No. 1 of this report.
	the APZ is wholly within the boundaries of the development site	***No***	Where the minimum specified APZ areas extend beyond the boundary of the subject site, the adjoining land is 'cleared and managed' urban residential lands and road reserve.

Performance Criteria	Acceptable Solution	Compliance	Assessment / Comment
Applicants demonstrate that issues relating to slope are addressed: maintenance is practical, soil stability is not compromised and the potential for crown fires is negated	*the APZ is not located on lands with a slope exceeding 18 degrees*	***Yes***	
APZs are managed and maintained to prevent the spread of a fire towards the building	*in accordance with the requirements of 'Standards for Asset Protection Zones (RFS 2005)*	***Yes***	Compliance as per Recommendation No. 1 of this report, and a reasonable assumption that future property maintenance and landscaping would ensure APZ areas remained managed / fuel reduced for the life of any future residential building development.
Fire fighters are provided with safe all weather access to structures (thus allowing more efficient use of fire fighting resources)	*public roads are two-wheel drive, all weather roads*	***Yes***	Quinlan Parade and the surrounding road infrastructure are two-wheel drive, all weather sealed roads. The current driveway will provide all-weather access.
Public road widths and design that allow safe access for fire fighters while residents are evacuating an area	*urban perimeter roads are two-way, that is, at least two traffic lane widths (carriageway 8 metres minimum kerb to kerb), allowing traffic to pass in opposite directions*	***N/A***	The subject development will not incorporate any new public roadways. The existing public roadway system can reasonably support any increased traffic flow due to operational firefighting or emergency evacuations.
	non perimeter roads comply with Table 4.1 – Road widths for Category 1 Tanker (Medium Rigid Vehicle)	***N/A***	
	the perimeter road is linked to the internal road system at an interval of no greater than 500 metres in urban areas	***N/A***	
	roads are through roads. Dead end roads are not more than 200 metres in length from a through road, incorporate a minimum 12 metres outer radius turning circle, and are clearly sign posted as a dead end	***N/A***	
	traffic management devices are constructed to facilitate access by emergency services vehicles	***N/A***	

Performance Criteria	Acceptable Solution	Compliance	Assessment / Comment
	there is a minimum vertical clearance to a height of four metres above the road at all times	***N/A***	
	curves have a minimum inner radius of six metres and are minimal in number to allow for rapid access and egress	***N/A***	
	the minimum distance between inner and outer curves is six metres	***N/A***	
	maximum grades for sealed roads do not exceed 15 degrees and an average grade of not more than 10 degrees or other gradient specified by road design standards, whichever is the lesser gradient.	***N/A***	
	public roads have a cross fall not exceeding 3 degrees	***N/A***	
	the internal road surfaces and bridges have a capacity to carry fully-loaded firefighting vehicles (15 tonnes)	***N/A***	
The capacity of public road surfaces and bridges is sufficient to carry fully loaded fire fighting vehicles ***Roads that are clearly sign- posted (with easily distinguishable names) and buildings/properties that are clearly numbered***	*the capacity of road surfaces and bridges is sufficient to carry fully loaded fire fighting vehicles (approximately 15 tonnes for areas with reticulated water, 28 tonnes or 9 tonnes per axle for all other areas). Bridges clearly indicate load rating*	***N/A***	The subject development will not incorporate any new public roadways. The existing public roadway system can reasonably support any increased traffic flow due to operational firefighting or emergency evacuations.
There is clear access to reticulated water supply	*public roads greater than 6.5 metres wide to locate hydrants outside of parking reserves to ensure accessibility to reticulated water for fire suppression*	***N/A***	The subject development will not incorporate any new public roadways. The existing public roadway system can reasonably provide sufficient access to the existing reticulated water supply
	public roads between 6.5 metres and 8 metres wide are No Parking on one side with the services (hydrants) located on this side to ensure accessibility to reticulated water for fire suppression	***N/A***	

Performance Criteria	Acceptable Solution	Compliance	Assessment / Comment
	public roads up to 6.5 metres wide provide parking within parking bays and locate services outside of the parking bays to ensure accessibility to reticulated water for fire suppression	***N/A***	
	one way only public access roads are no less than 3.5 metres wide and provide parking within parking bays and locate services outside of the parking bays to ensure accessibility to reticulated water for fire suppression	***N/A***	
Parking does not obstruct the minimum paved width	*parking bays are a minimum of 2.6 metres wide from kerb edge to road pavement. No services or hydrants are located within the parking bays*	***N/A***	
	public roads directly interfacing the bush fire hazard vegetation provide roll top kerbing to the hazard side of the road	***N/A***	
Access to properties is provided in recognition of the risk to fire fighters and/ or evacuating occupants	*at least one alternative property access road is provided for individual dwellings (or groups of dwellings) that are located more than 200 metres from a public through road*	***N/A***	Based on the proposed building siting denoted by this report, the proposed residential building will be <200m from the main property access point off Quinlan Parade.
The capacity of property access road surfaces and bridges is sufficient to carry fully loaded fire fighting vehicles	*bridges clearly indicate load rating and pavements and bridges are capable of carrying a load of 15 tonnes*	***N/A***	The current driveway will facilitate all-weather access, does not require bridges or traverse wetlands etc.
All weather access is provided	*roads do not traverse a wetland or other land potentially subject to periodic inundation (other than a flood or storm surge)*	***Yes***	
Property road widths and design enable safe access for vehicles	*<u>Note:</u> 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 70 kph)*	***Yes***	Recommendation No. 6 of this assessment. All public access roads, within the study area, support the operational use of emergency firefighting vehicles (i.e. a hydrant or water supply. Access to the subject development will be provided via a sealed, all weather driveway

Performance Criteria	Acceptable Solution	Compliance	Assessment / Comment
Property road widths and design enable safe access for vehicles	*that supports the operational use of emergency firefighting vehicles (i.e. a hydrant or water supply.*		
	in forest, woodland and heath situations, rural property access roads have passing bays every 200 metres that are 20 metres long by two metres wide, making a minimum trafficable width of six metres at the passing bay	***N/A***	
	a minimum vertical clearance of four metres to any overhanging obstructions, including tree branches	***N/A***	
	internal roads for rural properties provide a loop road around any dwelling or incorporate a turning circle with a minimum 12 metre outer radius	***N/A***	
	curves have a minimum inner radius of six metres and are minimal in number to allow for rapid access and egress	***N/A***	
	the minimum distance between inner and outer curves is six metres	***N/A***	
	the cross-fall is not more than 10 degrees	***N/A***	
	Maximum grades for sealed roads do not exceed 15 degrees and not more than 10 degrees for unsealed roads. Note: Some short constrictions in the access may be accepted where they are not less than the minimum (3.5m), extend for no more than 30m and where the obstruction cannot be reasonably avoided or removed. The gradients applicable to public roads also apply to community style development property access roads in addition to the above	***N/A***	
	access to a development comprising more than three dwellings have formalised access by dedication of a road and not by right of way	***N/A***	

Performance Criteria	Acceptable Solution	Compliance	Assessment / Comment
The width and design of the fire trails enables safe and ready access for fire fighting vehicles	*a minimum carriageway width of four metres with an additional one-metre-wide strip on each side of the trail (clear of bushes and long grass) is provided*	***N/A***	The subject development does not incorporate nor require any new or redesigned fire trail access.
	the trail is a maximum grade of 15 degrees if sealed and not more than 10 degrees if unsealed	***N/A***	
	a minimum vertical clearance of four metres to any overhanging obstructions, including tree branches is provided	***N/A***	
	the cross-fall of the trail is not more than 10 degrees	***N/A***	
	the trail has the capacity for passing by: *- reversing bays using the access to properties to reverse fire tankers, which are six metres wide and eight metres deep to any gates, with an inner minimum turning radius of six metres and outer minimum radius of 12 metres; and/or* *- a passing bay every 200 metres, 20 metres long by three metres wide, making a minimum trafficable width of seven metres at the passing bay*	***N/A***	
Fire trails are trafficable under all weather conditions. Where the fire trail joins a public road, access shall be controlled to prevent use by non authorised persons	*the fire trail is accessible to fire fighters and maintained in a serviceable condition by the owner of the land*	***N/A***	The subject development does not incorporate nor require any new or redesigned fire trail access.
	appropriate drainage and erosion controls are provided	***N/A***	
	the fire trail system is connected to the property access road and/or to the through road system at frequent intervals of 200m	***N/A***	
	fire trails do not traverse a wetlands or other land potentially subject to periodic inundation (other than a flood or storm surge)	***N/A***	

Performance Criteria	Acceptable Solution	Compliance	Assessment / Comment
	gates for fire trails are provided and locked with a key/lock system authorised by the local RFS	***N/A***	
Fire trails designed to prevent weed infestation, soil erosion and other land degradation	*fire trail design does not adversely impact on natural hydrological flows*	***N/A***	The subject development does not incorporate nor require any new or redesigned fire trail access.
	fire trail design acts as an effective barrier to the spread of weeds and nutrients	***N/A***	
	fire trail construction does not expose acid-sulphate soils	***N/A***	
(Reticulated water supplies) ***Water supplies are easily accessible and located at regular intervals***	*reticulated water supply to urban subdivisions uses a ring main system for areas with perimeter roads*	***Yes***	Reticulated water supply is located along the public road system. All services can reasonably achieve the acceptable solutions under s4.14. Hydrants are located within the pathway areas.
	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.* *In such cases, the location, number and sizing of hydrants shall be determined using fire engineering principles*	***Reasonably Assumed***	
	hydrants are not located within any road carriageway	***Yes***	
	all above ground water and gas service pipes external to the building are metal, including and up to any taps	***Reasonably Assumed***	
	the provisions of parking on public roads are met	***Yes***	
(Non - Reticulated water supplies) For rural residential and rural developments in bushfire prone areas, a water supply reserve dedicated to firefighting purposes is installed and maintained.	*the minimum dedicated water supply required for firefighting purposes for each occupied building excluding drenching systems, is provided in accordance with Table 4.2.*	***N/A***	A reticulated water supply services the subject development site. All services will also achieve the acceptable solutions under s4.14.
	a suitable connection for firefighting purposes is made available and located within the IPA and away from the structure. A 65mm Storz outlet with a gate or Ball valve is provided.	***N/A***	

Performance Criteria	Acceptable Solution	Compliance	Assessment / Comment
The supply of water can be an amalgam of minimum quantities for each lot in the subdivision, or held individually on each lot.	*Gate or Ball valve and pipes are adequate for water flow and are metal rather than plastic.*	***N/A***	
	all above ground water and gas service pipes external to the building are metal, including and up to any tap. Pumps are shielded.	***N/A***	
	underground tanks have an access hole of 200mm to allow tankers to refill direct from the tank. A hardened ground surface for truck access is supplied within 4 metres of the access hole.	***N/A***	
	above ground tanks are manufactured of concrete or metal and raised tanks have their stands protected. Plastic tanks are not used. Tanks on the hazard side of a building are provided with adequate shielding for the protection of fire fighters.	***N/A***	
(Electricity Services) ***Location of electricity services limits the possibility of ignition of surrounding bushland or the fabric of buildings*** ***Regular inspection of lines is undertaken to ensure they are not fouled by branches.***	*where practicable, electrical transmission lines are underground*	***Yes***	As is the existing practice, any new electrical supplies will be located underground.
	where overhead electrical transmission lines are proposed: *- lines are installed with short pole spacing (30 metres), unless crossing gullies, gorges or riparian areas; and* *- no part of a tree is closer to a power line than the distance set out in accordance with the specifications in 'Vegetation Safety Clearances' issued by Energy Australia (NS179, April 2002)*	***N/A***	
(Gas Services) ***Location of gas services will not lead to ignition of surrounding bushland or the fabric of buildings***	*gas is installed and maintained in accordance with AS 1596 and the requirements of relevant authorities. Metal piping is to be used*	***Reasonably Assumed***	Reticulated domestic gas supply is available. All future reticulated or bottled gas services are to be installed and maintained in accordance with Recommendation 5 of this report.
	all fixed gas cylinders are kept clear of all flammable materials to a distance of 10 metres and shielded on the hazard side of the installation	***Reasonably Assumed***	

Performance Criteria	Acceptable Solution	Compliance	Assessment / Comment
	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. Connections to and from gas cylinders are metal	***Reasonably Assumed***	
	polymer sheathed flexible gas supply lines to gas meters adjacent to buildings are not used	***Reasonably Assumed***	

Table 4.0 - PBP 2006 specific objective assessment

PBP 2006 Specific Objective	Assessment / Comment
(i) afford occupants of any building adequate protection from exposure to a bush fire	Where all recommendations stated by this report are reasonably and adequately incorporated, occupants remaining within the subject development site during a significant bushfire event would be afforded the benefit of bushfire protection '*measures in combination*'. In this respect, occupants remaining within a dwelling or else defending the dwelling during a potential fire storm should be reasonably protected (shielded) or separated from the effects of a bush fire event.
(ii) provide for a defendable space to be located around buildings	Where all recommendations relating to APZ areas stated by this report are reasonably and adequately incorporated and maintained, any proposed residential building would be afforded a defendable space. Fire fighters or occupants undertaking property protection activities in and around any future proposed residential buildings should reasonably be afforded protection and separation from radiant heat and an opportunity to quell small ignitions that may occur on or directly adjacent to the residential buildings.
(iii) provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent direct flame contact and material ignition	Where all recommendations relating to AS3959-2018 Construction standards and APZ areas as stated by this report are reasonably and adequately incorporated, the existing and any future proposed residential building should be afforded appropriate separation to prevent direct flame contact and material ignition.
(iv) ensure that safe operational access and egress for emergency service personnel and residents is available	Where all recommendations relating to property roadway access as stated by this report are reasonably and adequately incorporated, emergency services personnel and residents should be afforded safe operational access / egress for the subject development site.

PBP 2006 Specific Objective	Assessment / Comment
	The existing public roadway system should safely facilitate access and egress (early evacuation) from the subject development site for emergency services personnel and residents during a bushfire event.
(v) provide for ongoing management and maintenance of bush fire protection measures, including fuel loads in the asset protection zone (APZ)	Where all recommendations relating to AS3959-2018 Construction standards & APZ areas stated by this report are reasonably and adequately incorporated, it would be reasonable to assume regular residential property maintenance would ensure ongoing management and maintenance of bush fire protection measures. Should the standard or upkeep of APZ areas, buildings or vehicle access (required for bushfire safety compliance) become compromised during the life of the subject development site, it would also be reasonable to assume such issues (bushfire hazard) would be addressed by Council or the Fire Authorities through their standard policies and notice procedures.
(vi) ensure that utility services are adequate to meet the needs of firefighters (and others assisting in bush fire fighting)	Where all recommendations relating to fire fighting water supplies as stated by this report are reasonably and adequately incorporated, both emergency services personnel and others assisting in bush fire fighting should safely be able to draw on a water supply for property protection purposes. Similarly, where the installation or connection to electrical services incorporates the associated recommendations as stated by this report, both emergency services personnel and others assisting in bush fire fighting should safely be able to manage any electrical hazards associated during a bushfire event.

17.0 Bushfire Safety & Compliance Recommendations

The following recommendations (Table 5.0) are made for the bushfire safety & protection measures for the proposed residential development within 32 Quinlan Parade, Manly Vale NSW 2093.

These recommendations are based upon the relevant provisions (acceptable solutions or performance criteria) for residential building in bushfire prone areas and the NSW Rural Fire Service guideline entitled *Planning for Bushfire Protection 2006.*

Table 5.0 – Bushfire Safety / Compliance Recommendations

No.	PBP Standard	Recommendation
1	**Asset Protection Zone**	The area indicated (within Appendix 1 - Map 2) is to be maintained as an Asset Protection Zone (**Inner Protection Area**) for the life of the development.
2	**Building Construction Standard** **(BCA DTS)**	Based on the assessment given within 14.0 of this report the following construction standards are recommended: **New Detached Secondary Dwelling - All Elevations** **Construction for Bushfire Attack Level 12.5 (BAL 12.5) – Section 5 (AS3959-2018).** In addition, AS3959 Section 3 'Construction General" is to be applied where relevant, including: 3.2.1 'Attached Structures'. **Note**: In line with the NSW variation to AS3959-2018 the additional construction requirements outlined within PBP Addendum: Appendix 3 (A3.7) are to be applied. This section is relevant for any proposed: • Sarking. • Verandas, Decks, Steps, Ramps and Landings **Existing Residence** The existing/retained building is required to be upgraded to improve ember protection. This is to be achieved by enclosing all openings (excluding roof tile spaces) or covering openings with a non-corrosive metal screen mesh with a maximum aperture of 2mm. Where applicable, this includes any sub floor areas, open able windows, vents, weep holes and eaves. External doors are to be fitted with draft excluders (as per AS3959-2018 Section 5 - Bushfire Attack Level 12.5).
3	**Water Supply**	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.

No.	PBP Standard	Recommendation
4	**Electrical Services**	Electrical supply connections to service any proposed residential building should be designed & located in accordance with PBP, including; • New or re-positioned electrical transmission lines are located underground (from supply point).
5	**Gas Services**	Any future gas service connection/installation should comply with the acceptable solutions of PBP, including: • Reticulated gas is installed and maintained in accordance with AS1596 and the requirements of the relevant authorities • Metal piping is to be used and polymer sheathed flexible gas supply lines to gas meters adjacent to buildings are not used.
6	**Access & Egress**	The development will incorporate an all-weather driveway area for vehicle access and parking within the subject property. The driveway will provide direct access from Quinlan Parade. No additional vehicle access requirements are recommended.

18.0 Conclusion

Provided that the proposed residential building development, APZ areas, access and water supply facilities within the subject development site are constructed / designed / maintained in accordance with the recommendations as described by this report, it is a considered opinion that the subject development can satisfy the aims, objectives and performance requirements of *Planning for Bushfire Protection 2006* that are considered relevant to the development under *Section 100B* of the *NSW Rural Fires Act 1997* and *Section 4.14* of the *EP&A Act 1979.*

Bushfire safety compliance and mitigation (as recommended and/or purported by this report) for the subject development site comprises a package of '*measures in combination*' primarily including asset protection zoning, construction standards, property roadway access & adequate water supply for fire fighting purposes.

The above measures have been derived from provisions and recommendations as outlined within the document '*Planning for Bushfire Protection Guidelines 2006'*, engineered judgment, considered opinion, and previous advice from the NSW Rural Fire Service Development Control Unit.

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Graduate Diploma Design for Bushfire Prone Areas
Diploma of Building Surveying
Diploma of Public Safety (Fire Fighting Management) (Dip PSFM)
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19.0 References

Australian Standard 3959-2009/2018, Construction of buildings in bushfire prone areas – Standards Australia.

Building Code of Australia (2019) – Australian Building Codes Board, Canprint.

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

- Section 4.14 Consultation and Development Consent Certain Bushfire Prone Land
- Section 10.7 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.

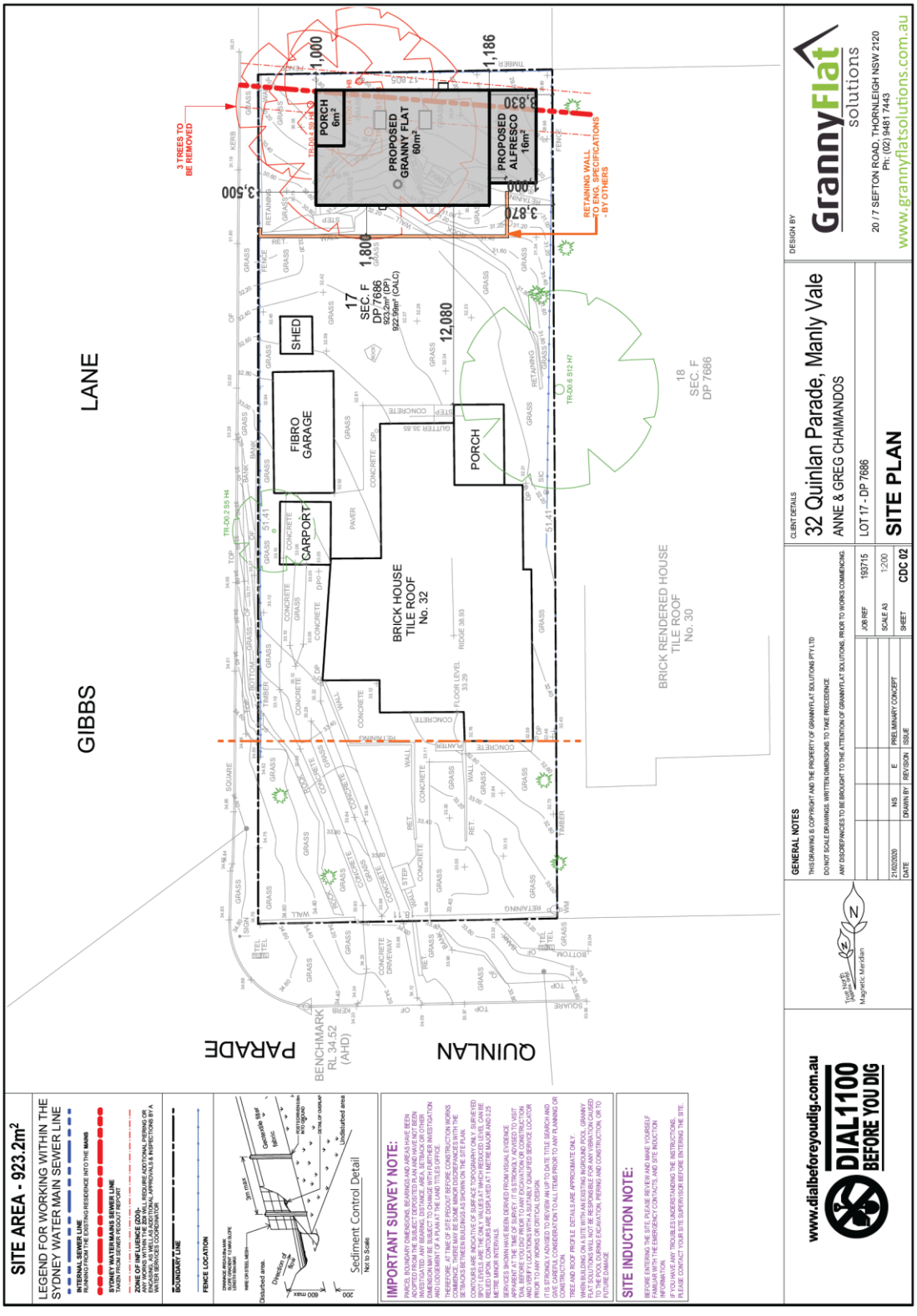
Planning for Bushfire Protection. A guide for councils, planners, fire authorities and developers (2006) – NSW Rural Fire Service.

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

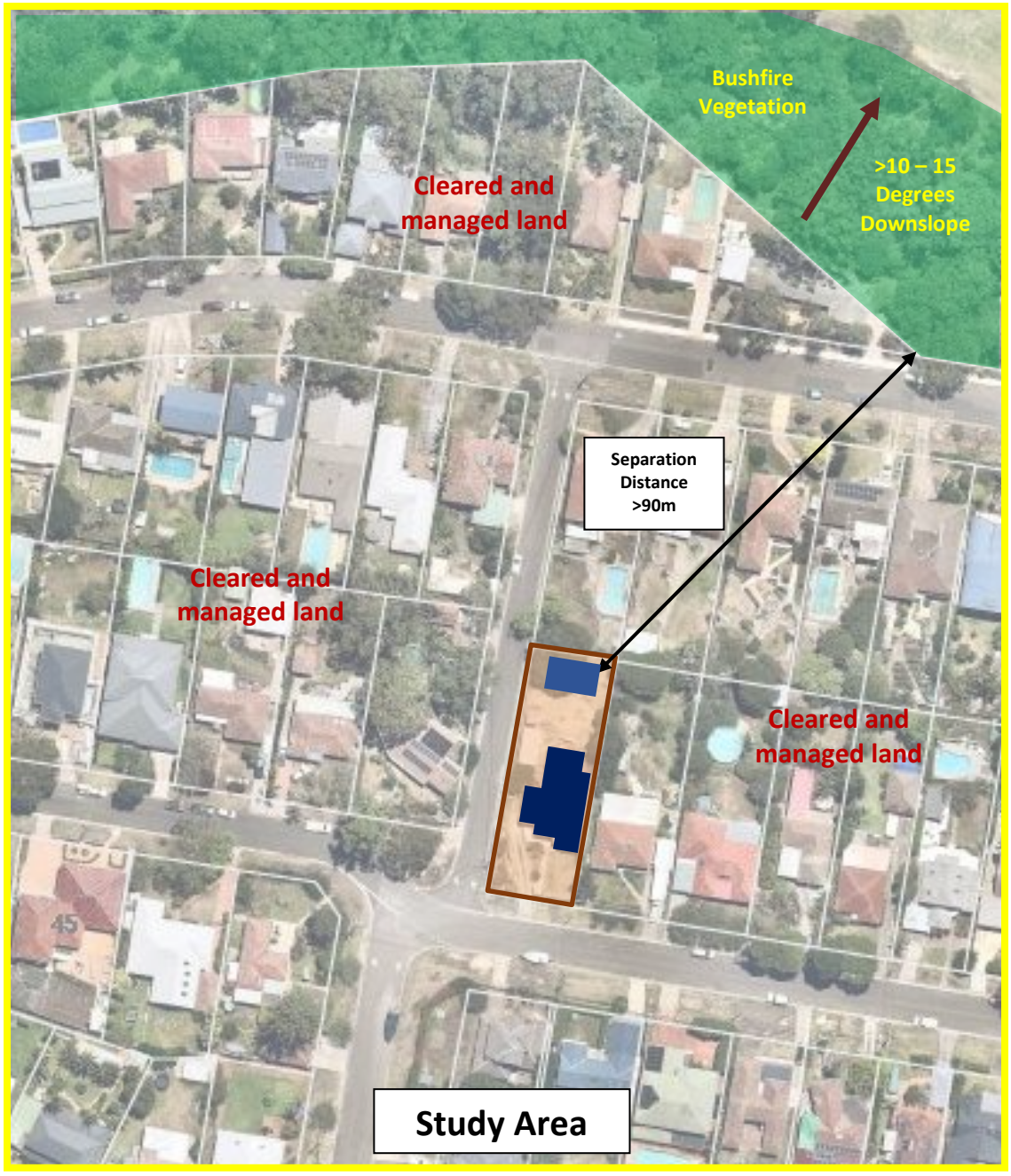
Standards for Asset Protection Zones – NSW Rural Fire Service

Map 1 – Overview & Access

Map 2 – Site Plan



Appendix 1 - Bushfire Constraints



Existing Dwelling

Secondary Dwelling

Subject Property
Lot 17 Sect F DP 7686

Recommended Inner Protection Area (IPA)

Study Area

Slope Direction

Appendix 2 – Site Photos (4/2/2020)

Existing residence, looking N

Existing driveway/access, looking N

Quinlan Parade, looking W

Quinlan Parade, looking E

Electrical supply connection point

Reticulated water supply in pathway

Typical forest vegetation, beyond adjacent residences, within public reserve, looking NW

Typical forest vegetation, beyond adjacent residences, within public reserve, looking NE