Bushfire Threat Assessment

Huntlee Residential Development, 75W Modification Stage 1 Precincts 1-6

Prepared by:

RPS AUSTRALIA EAST PTY LTD

PO Box 428
Hamilton NSW 2303

T: +61 2 4940 4200
F: +61 2 4961 6794
E: newcastle@rpsgroup.com.au

Prepared for:

HUNTLEE PTY LTD

PO Box 199
Branxton NSW 2335

Client Manager: Matt Doherty
Report Number: PR105216
Version / Date: Final / September 2014

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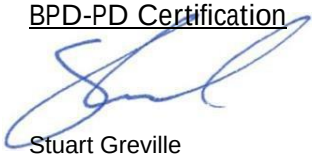
Document Status

Version	Purpose of Document	Orig	Review	Review Date
Draft	Draft for Client Review	LV	MD	4-9-2014
Final	Final for 75W submission	LV	MD/SG	4-9-2014

Approval for Issue

Name	Signature	Date
Matt Doherty		4-9-2014

BPD-PD Certification



Stuart Greville
BPD-PD-26202

Summary

RPS Australia East Pty Ltd (RPS) has been commissioned by Huntlee Pty Ltd to undertake a Bushfire Threat Assessment (BTA) over land at the proposed Huntlee Residential Development at North Rothbury NSW.

The BTA supports the development of the Stage 1 Precinct 1-6 within the Huntlee Residential Development and associated access roads.

The assessment aims to consider and assess the bushfire hazard and associated potential threats relevant to such a proposal, and to outline the minimum mitigative measures which would be required in accordance with the provisions of the *Planning for Bush Fire Protection, 2006* that has been released and adopted through the *Environmental Planning & Assessment Amendment* (Planning for Bush Fire Protection) *Regulation 2007* & the *Rural Fires Amendment Regulation 2007.*

In order to determine whether the proposed development is bushfire-prone, and if so, which setbacks and other relevant Bush Fire Protection Measures (BFPM) will be appropriate, this assessment adheres to the methodology and procedures outlined in "Planning for Bushfire Protection" (NSW Rural Fire Service, 2006) (hereafter referred to as 'PBP 2006').

This BTA found the land surrounding the site to support vegetation consistent with *Forest* and *Rainforest* vegetation formation as described by PBP 2006.

In summary, the following key recommendations have been generated to enable the proposed development to comply with PBP 2006:

- A 20 m wide Asset Protection Zones (APZ) is recommended to the north and east of the site between the hazards and proposed development;
- Future dwellings within the site should have due regard to the specific considerations given in the BCA, which makes specific reference to the Australian Standard (AS3959 – 2009) construction of buildings in bushfire prone areas.
- Roads are to be constructed in accordance with PBP 2006 as outlined in section 3.3 of this report.
- Consideration should be given to landscaping and fuel loads on site to decrease potential fire hazards on site; and
- Any proposed development are to be linked to the existing mains pressure water supply and that suitable hydrants be clearly marked and provided for the purposes of bushfire protection. Fire hydrant spacing, sizing and pressure should comply with AS2419.1, 2005.

This assessment has been made based on the bushfire hazards in and around the site at the time of inspection and production (September 2014).

In conclusion, should the recommendations above be duly considered and incorporated, the bushfire hazard present should be reduced to a level considered necessary to provide an adequate level of protection to life and property of the site, however will not prevent a bushfire from occurring offsite or radiating from the site.

Finally, the implementation of the adopted measures and recommendations forwarded within this report comply with PBP (2006) and will contribute to the amelioration of the potential impact of any bushfire upon the development estate, but they do not and cannot guarantee that the area will not be affected by bushfire at some time.

Terms and Abbreviations

Abbreviation	Meaning
APZ	Asset Protection Zone
AS2419 -2005	Australian Standard – Fire Hydrant Installations
AS3959-2009	Australian Standard – Construction of Buildings in Bush Fire Prone Areas
BCA	Building Code of Australia
BRMC	Bushfire Risk Management Committee
BFRMP	Bush Fire Risk Management Plan
BPA	Bush Fire Prone Area (Also Bushfire Prone Land)
BPL	Bush Fire Prone Land
BPL Map	Bush Fire Prone Land Map
BPMs	Bush Fire Protection Measures
BTA	Bushfire Threat Assessment
EPA Act	*NSW Environmental Planning and Assessment Act 1979*
FDI	Fire Danger Index
FMP	Fuel Management Plan
ha	hectare
IPA	Inner Protection Area
LEP	Local Environment Plan
LGA	Local Government Area
OPA	Outer Protection Area
PBP	Planning for Bushfire Protection 2006
RF Act	Rural Fires Act 1997
RF Regulation	Rural Fires Regulation
RPS	RPS Australia East Pty Ltd

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Appendices

1.0 Introduction

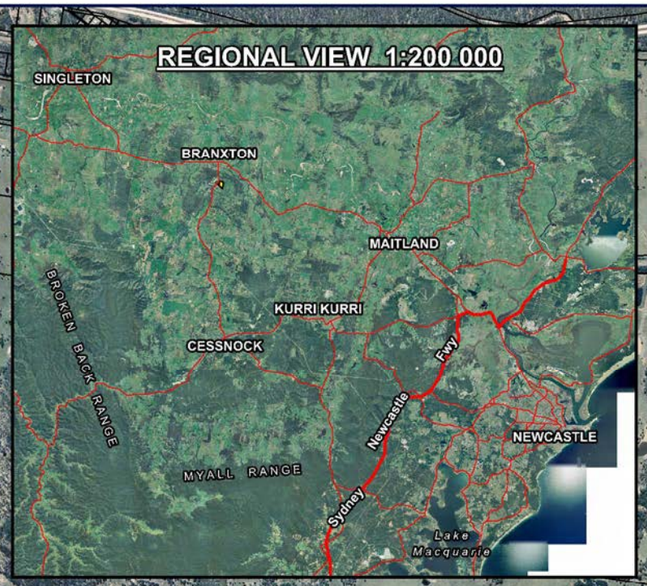
RPS has been engaged by Huntlee Pty Ltd, to undertake a Bushfire Threat Assessment (BTA) to inform a 75w Modification for the Stage 1 Precincts 1-6 of the Huntlee New town Residential Development, North Rothbury, NSW, hereafter referred to as the 'site' (**Figure 1**).

The assessment aims to consider and assess the bushfire hazard and associated potential threats relevant to such a proposal, and to outline the minimum mitigative measures which would be required in accordance with the provisions of the *Planning for Bush Fire Protection, 2006* that has been released and adopted through the *Environmental Planning & Assessment Amendment* (Planning for Bush Fire Protection) *Regulation 2007* & the *Rural Fires Amendment Regulation 2007.*

In order to determine whether the proposed development is bushfire-prone, and if so, which setbacks and other relevant Bush Fire Protection Measures (BFPM) will be appropriate, this assessment adheres to the methodology and procedures outlined in "Planning for Bushfire Protection" (NSW Rural Fire Service, 2006) (hereafter referred to as 'PBP 2006').

1.1 Site Particulars

Locality	Huntlee New Town.
LGA	Cessnock City Council
Area	Stage 1 Precincts 1-6 occupies an area of approximately 30 ha.
Zoning	The land is currently zoned as MDP SEPP (Major Development) (Cessnock City Council 2011)
Boundaries	The site is bordered by a combination of managed lands and unmanaged vegetated lands.
Current Land Use	The land is currently undergoing civil construction works for the development.
Topography	The site gently undulates from east to west with the highest point occurring to the south of the site.
Climate / Fire History	The site lies within a geographical area with a Fire Danger Index (FDI) rating of 100. Extreme bushfire weather is therefore associated with long periods of drought, high temperatures, low humidity and gusty often north-westerly winds. The site is classified by Cessnock City Council as Vegetation Category 1, Vegetation Category 2 and Vegetation Buffer on the Bushfire Prone Land Map (2011b) **Figure 2**.



WARNING
No part of this plan should be used for critical design dimensions. Confirmation of critical positions should be obtained from RPS Newcastle

NEW

BRANXTON

ENGLAND

HIGHWAY

NORTH ROTHBURY

GRETA

LEGEND

- Hunter Expressway
- Huntlee New Town
- Stage 1 Boundary
- Stage 1 Precinct 1-6 Boundary (approx)

N

0 2,500

metres

Scale: 1:28,000

TITLE: FIGURE 1 SITE LOCATION	LOCATION: HUNTLEE NEW TOWN	DATUM: DATUM PROJECTION: MGA ZONE 56 (GDA 94)	DATE: 4-9-2014 PURPOSE: REPORT FIGURE	LAYOUT REF: J:\JOBS\105k\105216 North Rothbury (Huntlee)\10- Drafting\Bushfire VERSION (PLAN BY): MD (A-A3)	

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JOB REF: 105216

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241 DENISON STREET BROADMEADOW PO BOX 428 HAMILTON NSW 2303
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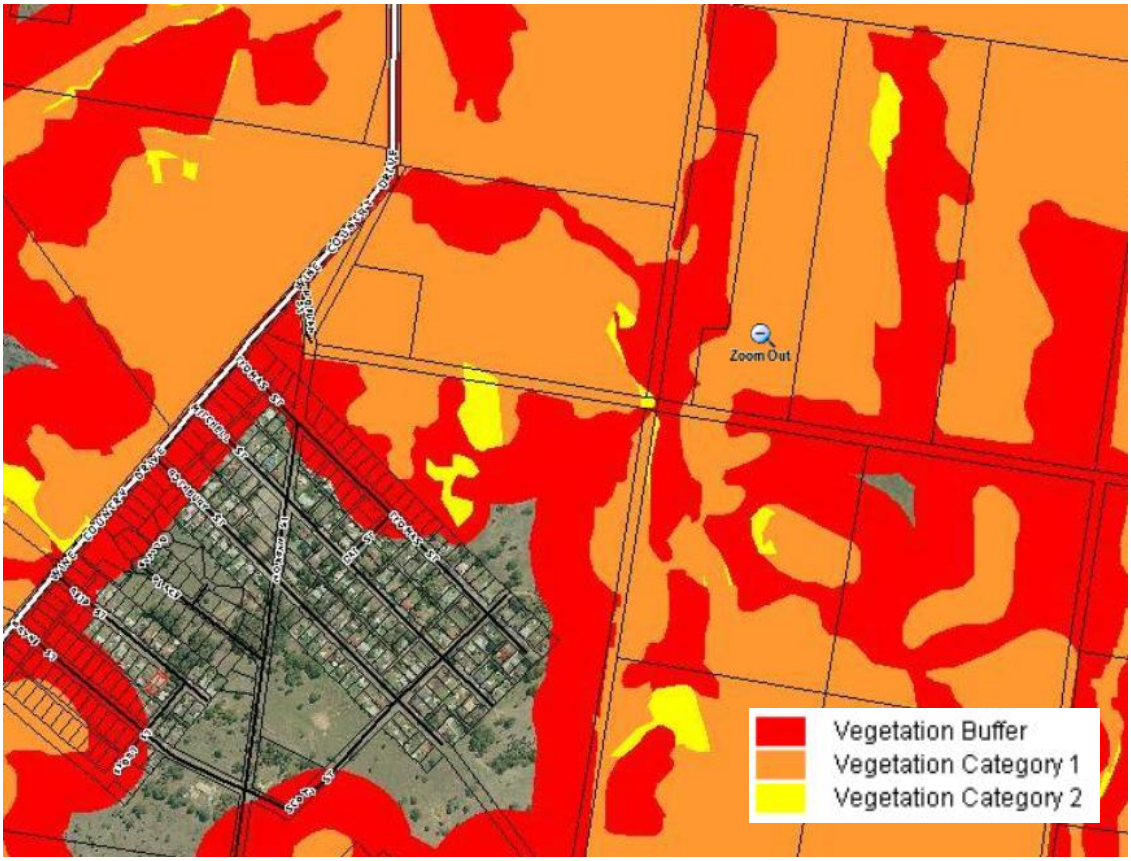
Figure 2 Bushfire Prone Land Map of the Site



1.2 Description of Proposal

The project entails a 75w modification to a the approved Stage 1 development of Huntlee New Town, specifically Precincts 1 to 6 for torrens title residential subdivision and provision of associated infrastructure and services.

A site plan for development of the proposal is contained in **Appendix 1**.

1.3 Objectives of Assessment

This assessment has been undertaken in accordance with clause 44 of the RF Regulation 2008. This BTA also addresses the six key Bush Fire Protection Measures (BFPMs) in a development assessment context being:

(1) The provision of clear separation of buildings and bush fire hazards, in the form of fuel-reduced Asset Protection Zones (and their components being Inner Protection Areas and Outer Protection Areas);

(2) Construction standards and design (Bushfire Attack Levels);

(3) Appropriate access standards for residents, fire-fighters, emergency workers and those involved in evacuation;

(4) Adequate water supply and pressure;

(5) Emergency management arrangements for fire protection and / or evacuation; and

(6) Suitable landscaping, to limit fire spreading to a building.

2.0 Bushfire Hazard Assessment

2.1 Vegetation Assessment

2.1.1 Methodology

Vegetation classification over the site has been carried out as follows:

- Aerial Photograph Interpretation to map the vegetation classification and extent; and
- Reference to regional vegetation community mapping.

In accordance with PBP (2006), an assessment of the vegetation over a distance of 140m in all directions from the site was undertaken. Vegetation that may be considered a bushfire hazard was identified in all directions from the site. The vegetation classification is based on the revised Appendix 3 of PBP (2006).

Refer to **Table 1** and **Figure 3** for vegetation classifications.

2.1.2 Predominant Vegetation Formation

Table 1 Vegetation Classification

Direction	Vegetation Community	Classification of Vegetation Formations (PBP 2006)
North	Vegetation	Forest (Hazard)
East	Vegetation	Forest (Hazard)
South	Existing residential development	No hazard
West	Managed land with residence, followed by unmanaged lands, Wine Country Drive and the Wine Country Drive extension area	Forest (Rainforest)*

*The linear strip of vegetation adjacent to the managed lands is approximately 0.75ha in size. Subsequently, it is considered a low hazard as it is <1 ha in size, and as outlined in Appendix 2 A2.3 of PBP 2006 the APZ setbacks and building construction standards for these areas will be the same as for rainforest.

WARNING
No parts of this plan should be used for critical design dimensions. Confirmation of critical positions should be obtained from RPS Newcastle.

Legend

- Stage 1 Boundary
- Approved Extent of Riparian Zone (Worley Parsons 2
- 100m Slope Assessment Buffer
- 140m Vegetation Assessment Buffer

Vegetation Classification (PBP 2006)

- Forest
- Future Development Area
- Managed Land
- Rainforest

N

0 500

metres

Scale: 1:4,500

TITLE: FIGURE 3 VEGETATION CLASSIFICATION (PBP 2006)

LOCATION: HUNTLEE ESTATE

DATUM: DATUM
PROJECTION: MGA ZONE 56 (GDA 94)

DATE: 4-9-2014
PURPOSE: REPORT FIGURE

LAYOUT REF: J:\JOBS\105k\105216 North Rothbury (Huntlee)\10- Drafting\Bushfire
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2.2 Effective Slope Assessment

2.2.1 Methodology

Slope assessment has been undertaken as follows:

- Aerial Photograph Interpretation in conjunction with analysis of electronic contour maps with a contour interval of 2m.
- Site inspection

In accordance with PBP 2006, an assessment of the slope affecting the bushfire behaviour was undertaken for a distance of 100m from the edge of the site boundary in the direction of the bushfire hazard.

The slopes leading away from the site in the direction of the identified bushfire threats have been evaluated to identify both the average slope and by identifying the maximum slope present. These values help determine the level of gradient which will most significantly influence the fire behaviour of the site.

2.2.2 Effective Slope

The slope of the bushfire hazard is documented in **Table 2** below.

Table 2 Slope Assessment

Direction of Vegetation	Vegetation Type	Slope Classes
North	Forest	Flat / Upslope
East	Forest	Flat / Upslope
West	Managed residential land followed by Rainforest	Upslope/Flat

2.3 Bushfire Risk Management Plan

The RF Act requires each bushfire management committee to prepare a bushfire risk management plan for a nominated area; commonly defined by local government area boundaries. The Hunter Bushfire Management Committee developed the Hunter Bush Fire Risk Management Plan (BFRMP) which was endorsed in April 2009 and finally approved in September 2009. The BFRMP investigated the community assets in the Cessnock Local Government Area and ranked them according to the assessed bushfire risk and the likely consequence of a bushfire attack.

BFRMPs are often not site specific, and individual sites or development do not have a statutory obligation to prepare a BFRMP, however it is often recommended as part of preparedness, a BFRMP is prepared.

Hunter Bush Fire Risk Management Plan

Part of the Huntlee development is located within an area identified as Human Settlement Type in the Hunter BFRMP (No.69). This asset is recognised by the Hunter Bush Fire Management Plan Committee as a High priority. It is recommended that the Hunter BFRMP be updated to include the entire Huntlee residential development to increase protection and maintenance relating to bushfire hazards.

A description of the different bushfire management zones are described in **Table 3** below.

Table 3 Bushfire Management Zones

Zone	Purpose	Suppression Objectives (s)	Zone characteristics
Asset Protection	To protection human life, property and highly valued	To enable the safe use of Direct Attack suppression strategies	As per RFS document *Standards for Asset Protection*

Zone	Purpose	Suppression Objectives (s)	Zone characteristics
Zone (APZ)	public assets and values.	within the zone.	*Zones.*
Strategic Fire Advantage Zone (SFAZ)	To provide strategic areas of fire protection advantage which will reduce the speed and intensity of bushfires and reduce the potential for spot fire development; To aid containment of wildfires to existing management boundaries.	To improve the likelihood and safe use of: **Parallel Attack** suppression strategies with the zone. and/or **Indirect Attack** (back burning) in high to very high fire weather conditions within the zone. To reduce the likelihood of: Crown fire development within the zone; and/or Spot fire ignition potential from the zone.	Zone width related to suppression objectives and dependant: Topography; Aspect; Spotting propensity; Location of adjacent firebreaks; Mosaic pattern of treatment; Assess Overall Fuel Hazard (OFH) once vegetation communities reach minimum fire thresholds within this plan. Management practises should aim to achieve mosaic fuel reduction patterns so that the majority of the SFAZ has an OFH of less than high.
Land Management Zone (LMZ)	To meet relevant land management objectives in areas where APZ's or SFAZ's are not appropriate.	As per the land management and fire objectives of the responsible land management agency. To reduce the likelihood of spread of fires. To undertake mosaic burning.	As appropriate to achieve land management eg. heritage and/or fire protection eg. broad scale mosaic burning objectives.
Fire Exclusion Zone (FEZ)	To exclude bushfires	N/A	Variable dependant on size of fire sensitive area requiring protection.

Figure 4 Hunter Bushfire Risk Management Plan

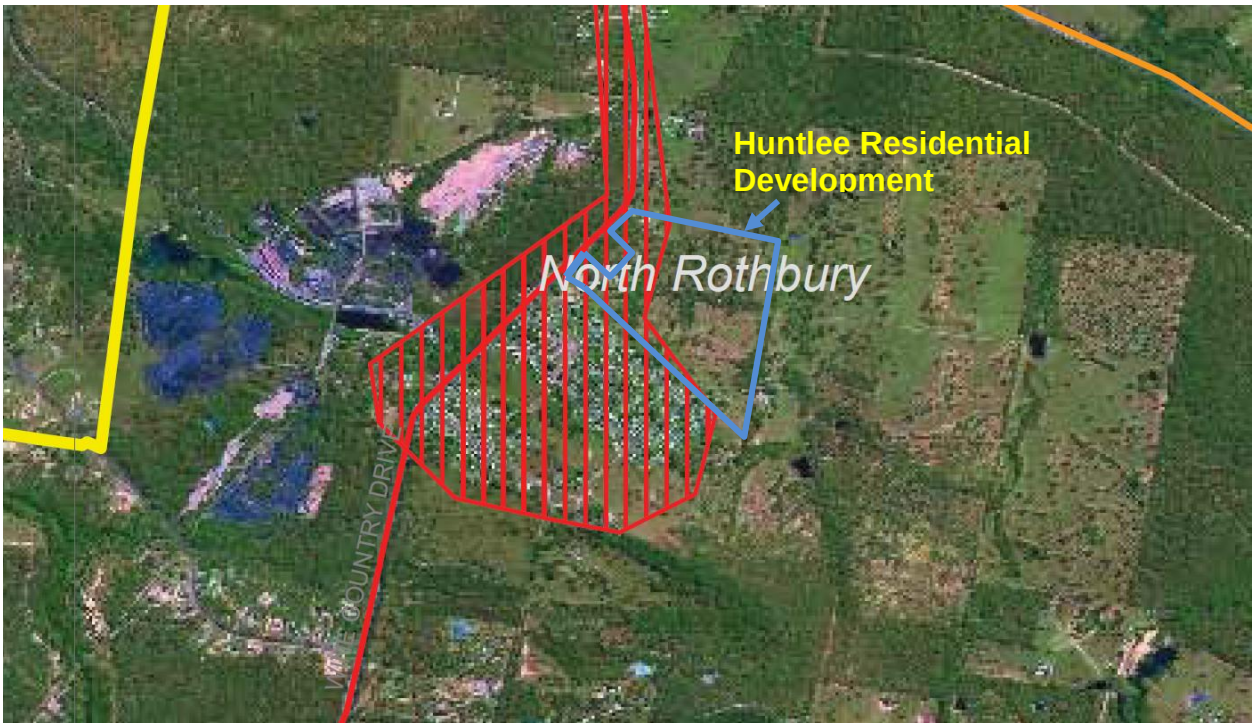


Figure 4 displays the context of the site in relation to other assets included in the BFRMP. The red hatching represents human residential.

The Hunter BFMC includes a series of treatment actions available for implementation at any particular site exposed to a bushfire threat. **Table 4** describes the available treatment actions.

Table 4 Asset specific treatments used in the Hunter BFMC area

Strategy	Targeted treatments used in the BFMC
Ignition Management	▪ Implement arson prevention campaign
Hazard Reduction	▪ Inspect APZ and maintain as required ▪ Survey new APZ, implement if required and maintain ▪ Inspect SFAZ and treat as required ▪ Implement mosaic burn regime in LMZ ▪ Plan and implement LMZ mosaic burns ▪ Inspect LMZ and treat as required ▪ Inspect SMR corridor and maintain as required
Community Education	▪ Plan and implement community education program
Property Planning	▪ Investigate need and implement PIP as required ▪ Develop and implement fire relocation plan
Preparedness	▪ Inspect Fire Trails and maintain as required ▪ Inspect access roads and maintain as required ▪ Develop management guidelines for s52 Operations Plan
Other	▪ Inspect bridges after fire events

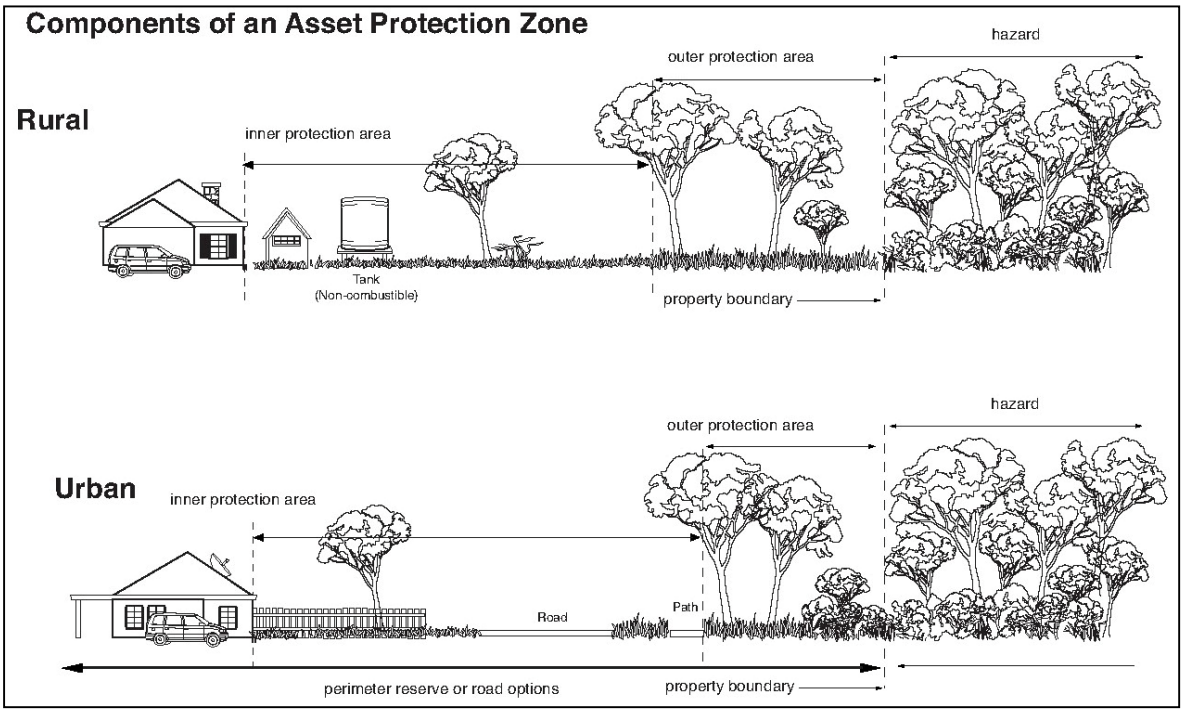
3.0 Bushfire Protection Measures

1.2 Asset Protection Zones

An APZ is an area surrounding a development that is managed to reduce the bushfire hazard to an acceptable level to mitigate the risk to life and property (refer to **Figure 5**). The required width of the APZ varies with slope and the type of hazard. An APZ can consist of both an Inner Protection Area (IPA) and an Outer Protection Area (OPA). The respective IPA and OPA widths for the required APZs are as detailed in Table 4. An APZ can include the following:

- lawns;
- discontinuous gardens;
- swimming pools;
- driveways;
- unattached non-combustible garages with suitable separation from the dwelling;
- open space / parkland; and
- car parking.

Figure 5 Components of an APZ (PBP 2006)



1.2.1 IPA (Inner Protection Area)

The IPA extends from the edge of the OPA to the development. The IPA aims to ensure that the presence of fuels which could contribute to a fire event / intensity, are minimised close to the development. The performance of the IPA must be such that:

- there is minimal fine fuel at ground level which could be set alight by a bushfire; and
- any vegetation in the IPA does not provide a path for the transfer of fire to the development – that is, the fuels are discontinuous.

The presence of a few shrubs or trees in the IPA is acceptable provided that they:

- do not touch or overhang any buildings;
- are well spread out and do not form a continuous canopy;
- are not species that retain dead material or deposit excessive quantities of ground fuel in a short period or in a danger period; and
- are located far enough away from any dwelling so that they will not ignite the dwelling by direct flame contact or radiant heat emission.

Woodpiles, wooden sheds, combustible material storage areas, large areas / quantities of garden mulch, stacked flammable building materials etc. are not be permitted in the IPA.

1.2.2 OPA (Outer Protection Area)

The OPA is located adjacent to the hazard. Within the OPA any trees and shrubs should be maintained in a manner such that the vegetation is not continuous. Fine fuel loadings should be kept to a level where the fire intensity expected will not impact on adjacent developments.

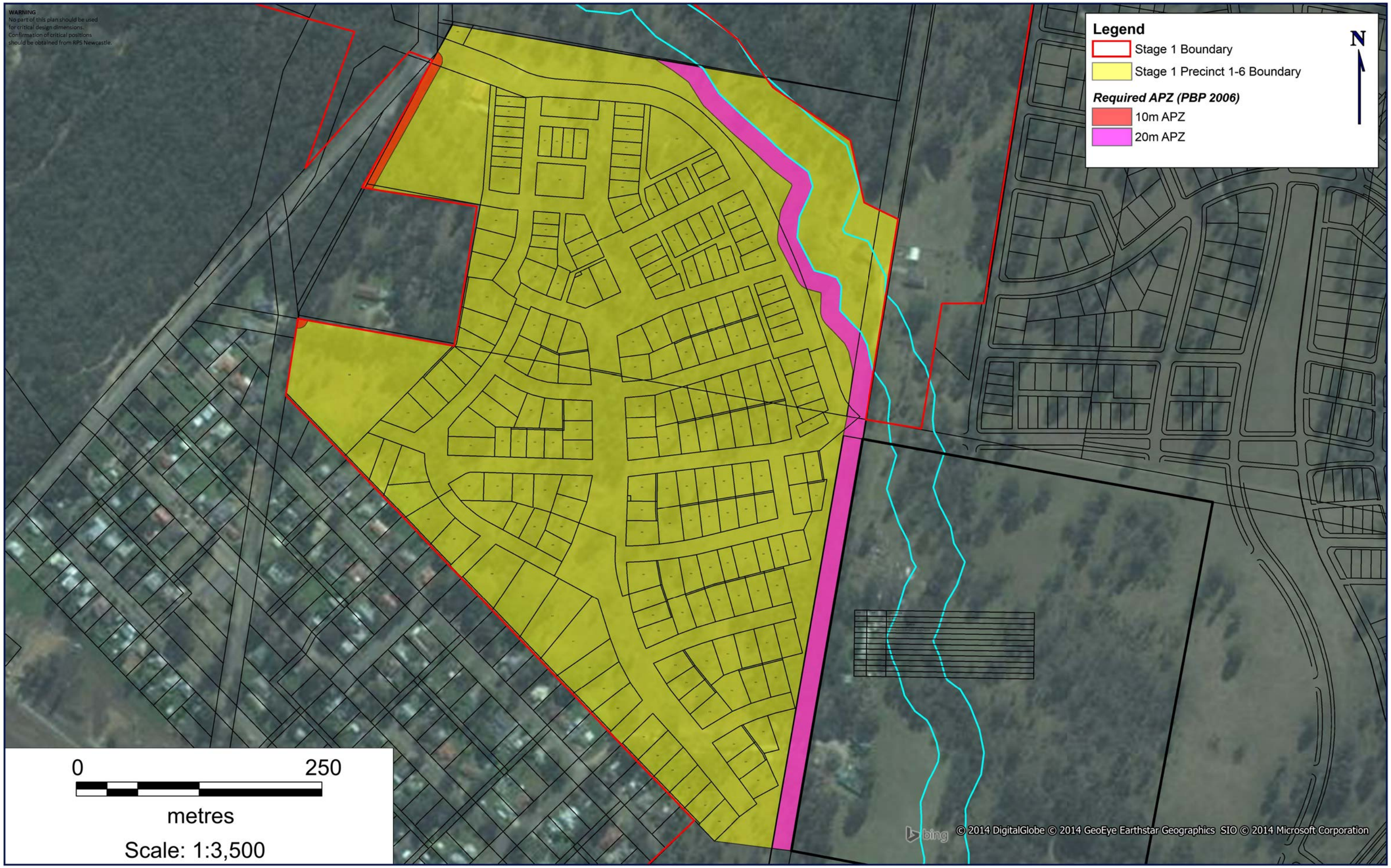
1.2.3 Determining the Appropriate Setbacks

The site lies within the Cessnock LGA and therefore is assessed under a FDI rating of 100. In accordance with Table A2.4 and Table A2.7 within PBP (2006), the appropriate width setbacks have been calculated based on the topography and the vegetation on and around the site. Refer to **Table 5** and **Figure 6** for required APZs.

Table 5 Required APZ

Direction of Hazard	Vegetation Classification	Slope	Required APZ (PBP 2006)	APZ Components (Table A2.7 PBP 2006)
North	Forest	Upslope	20m	10m IPA + 10m IPA
East	Forest	Upslope	20m	10m IPA + 10m IPA
West	Rainforest	Upslope/flat	10m	10m IPA

The existing managed land with residence is situated between the hazard and site. As such the site is in the mod portion greater than 10m from the rainforest hazard.



TITLE: FIGURE 6 REQUIRED APZ (PBP 2006)

LOCATION: HUNTLEE NEW TOWN

DATUM: DATUM
PROJECTION: MGA ZONE 56 (GDA 94)

DATE: 4-9-2014
PURPOSE: REPORT FIGURE

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3.2 Dwelling Design and Construction

Building design and the materials used for construction of future dwellings should be chosen based on the information contained within AS3959-2009, and accordingly the designer/architect has been made aware of this recommendation. The dwelling plans should be checked by the architect to confirm they meet the relevant Bushfire Attack Level (BAL) as detailed in AS3959-2009.

The determinations of the appropriate BAL are based upon parameters such as weather modelling, fire-line intensity, flame length calculations, as well as vegetation and fuel load analysis. The determination of the construction level is derived by assessing the:

- Relevant FDI = 100
- Flame temperature
- Slope
- Vegetation classification; and
- Building location.

The following BAL, based on heat flux exposure thresholds, are used in the standard:

(a) **BAL – LOW** The risk is considered to be **VERY LOW**

There is insufficient risk to warrant any specific construction requirements but there is still some risks.

(b) **BAL – 12.5** The risk is considered to be **LOW**

There is a risk of ember attack.

The construction elements are expected to be exposed to a heat flux not greater than 12.5 k/m^2.

(c) **BAL – 19** The risk is considered to be MODERATE

There is a risk of ember attack and burning debris ignited by wind borne embers and a likelihood of exposure to radiant heat.

The construction elements are expected to be exposed to a heat flux not greater than 19 kW/m^2.

(d) **BAL-29** The risk is considered to be **HIGH**

There is an increased risk of ember attack and burning debris ignited by windborne embers and a likelihood of exposure to an increased level of radiant heat.

The construction elements are expected to be exposed to a heat flux no greater than 29 kW/m^2.

(e) **BAL-40** The risk is considered to be **VERY HIGH**

There is much increased risk of ember attack and burning debris ignited by windborne embers, a likelihood of exposure to a high level of radiant heat and some likelihood of direct exposure to flames from the fire front.

The construction elements are expected to be exposed to a heat flux no greater than 40 kW/m^2.

(f) **BAL-FZ** The risk is considered to be **EXTREME**

There is an extremely high risk of ember attack and burning debris ignited by windborne embers, a likelihood of exposure to an extreme level of radiant heat and direct exposure to flames from the fire front. The construction elements are expected to be exposed to a heat flux greater than 40 kW/m^2.

3.2.1 Bushfire Attack Level for the Proposed Development

Using the Addendum: Appendix 3 (NSW Rural Fire Service, 2010), the information relating to vegetation and slope as presented within this report and according to Table 2.4.2 of AS3959-2009 the BAL for the site was calculated.

Refer to **Table 6** and **Figure 7** for the BALs calculated for the site.

Table 6 Required BAL (AS 3959-2009)

Direction of Hazard	Vegetation Classification (PBP 2006)	Slope Class	Separation Distance	BAL	Construction Section (AS3959-2009)
North	Forest	Upslope	<19m	BAL - FZ	Sect 4, 5, 6, 7, 8 and 9 of AS3959-2009 and Sect A3.7 of PBP Addendum Appendix 3.
			19-<25m	BAL – 40	
			25-<35m	BAL – 29	
			35-<48m	BAL – 19	
			48-<100m	BAL – 12.5	
East	Forest	Upslope	<19m	BAL - FZ	
			19-<25m	BAL – 40	
			25-<35m	BAL – 29	
			35-<48m	BAL – 19	
			48-<100m	BAL – 12.5	
West	Rainforest	Upslope/flat	<8	BAL - FZ	
			8-<11m	BAL – 40	
			11-<16m	BAL – 29	
			16-<23m	BAL – 19	
			23-<100m	BAL – 12.5	

To Note: *The construction requirements for the next lower BAL than that determined for the site may be applied to an elevation of the building where the elevation is not exposed to the source of bushfire attack. An elevation is deemed to be not exposed to the source of bushfire attack if all straight lines between that elevation and the source of bushfire attack are obstructed by another part of the building.*

WARNING
No part of this plan should be used for critical design dimensions. Confirmation of critical positions should be obtained from RPS Newcastle.

Legend

- Stage 1 Boundary
- Stage 1 Precinct 1-6 Boundary
- Required APZ (PBP 2006)

Required BAL (AS3959-2009)

- BAL-12.5
- BAL-19
- BAL-29
- BAL-40
- BAL-FZ

N

0 250

metres

Scale: 1:3,500

TITLE: FIGURE 7 REQUIRED BAL (AS3959-2009)

LOCATION: HUNTLEE NEWCASTLE TOWN

DATUM: DATUM
PROJECTION: MGA ZONE 56 (GDA 94)

DATE: 4-9-2014
PURPOSE: REPORT FIGURE

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3.3 Access

In the event of a serious bushfire threat to the proposed development, it will be essential to ensure that adequate ingress/ egress and the provision of defendable space are afforded in the subdivision design. The following summarises the requirements of PBP (2006).

The NSW RFS prefer perimeter roads to be incorporated into all subdivisions wherever possible. Perimeter roads should be fully sealed and have a minimum road reserve width of 8m minimum kerb to kerb with the following design specifications:

- roads should be two wheel drive, all weather roads;
- roads should be two-way: i.e. at least two traffic lane widths with shoulders on each side, allowing traffic to pass in opposite directions;
- roads should be through roads where possible, any dead end roads should not be more than 200m in length with a 12m radius turning circle and clearly sign posted as such;
- the capacity of road surfaces and bridges should be sufficient to carry fully loaded fire fighting vehicles (approximately 28 tonnes or 8 tonnes per axle); and
- roads should be clearly sign posted and buildings clearly numbered.

According to PBP (2006), the design specifications for **internal public road** require that roads:

- be two-wheel drive all weather roads;
- not be hindered by an overuse of traffic calming devices such as speed humps and chicanes;
- be through roads, but if unavoidable then dead ends should be not more than 200 metres in length, incorporate a minimum 12 metres turning circle and should be clearly sign posted as dead ends;
- 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 for all other areas). Bridges clearly indicate load rating;
- non perimeter roads comply with table – Road widths for Category 1 Tanker;

Curve radius (inside edge metres)	Swept Path (metres width)	Single lane (metres width)	Two way (metres width)
<40	3.5	4.5	8.0
40 – 69	3.0	3.9	7.5
70 – 100	2.7	3.6	6.9
>100	2.5	3.5	6.5

- curves of roads (other than perimeter roads) are a minimum inner radius of 6 metres and minimal in number, to allow for rapid access and egress;
- public roads do not have a cross fall exceeding 3 degrees;
- maximum grade for sealed roads do not exceed 15^{o} and an average grade of not more than 10^{o} or other gradient specified by road design standards, whichever is the lesser gradient;
- have a minimum vertical clearance to a height of four metres at all times;
- public roads between 6.5m and 8m wide are no parking on one side with the services (hydrants) located on the side to ensure accessibility to reticulated water for suppression;
- one way public access roads are no less than 3.5m wide and provide parking within parking bays and locate services outside of the parking bays to ensure accessibility to reticulated water for fire suppression;
- 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; and

- that part of the public road directly interfacing the bush fire hazard vegetation should provide roll top kerbing to the hazard side of the road.

According to PBP (2006), the design specifications for **property access** require that roads:

- Roads do not traverse a wetland or other land potentially subject to periodic inundation;
- Bridges clearly indicate load rating and pavements and bridges are capable of carrying a load of 15 tonnes;
- At least one alternative property access road is provided for individual dwellings that are located more than 200 metres from a public road;
- A minimum carriageway width of four metres for rural-residential areas, urban areas with a distance of greater than 70 metres from the nearest hydrant point to the most external part of a proposed building (or footprint).

Note: No specific access requirements apply in a urban area where a 70 metres unobstructed path can be demonstrated between the most distant 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 fighting vehicles (i.e. a hydrant or water supply).

- A minimum vertical clearance of four metres to any overhanging obstructions, including tree branches;
- Curves have a minimum radius of six metres and are minimal in number to allow for rapid access and egress;
- The minimum distance between inner and outer curves is six metres;
- The cross-fall is not more than 10º;
- Access to a development comprising more than three dwellings have formalised access by dedication of a road and not by right of way; and
- Maximum grades for sealed roads do not exceed 15º and not more than 10º for unsealed roads.

Note: some short constrictions in the access may be accepted where they are not less than 3.5m, extend for no more than 30 metres 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.

According to PBP (2006), the design specifications for **fire trails** require:

- A minimum carriageway width of 4 metres with an additional 1 metre wide strip on each site of the trail (clear of bushes and long grass is provided);
- The trail is a maximum grade of 15^0 id sealed and not more than 10^0 if unsealed;
- A minimum vertical clearance of4 metres to any overhanging obstructions;
- The crossfall of the trail is not more and 10^o;
- The trail has the capacity for passing by:
  - Reversing bays using the access to properties to reverse fire tankers, which are 6 metres wide and 8 metres deep to any gates, with an inner minimum turning radius of 6 metres and outer minimum of 12 metres; and/or

    A passing bay every 200 metres, 20 metres long by 3 metres wide, making a minimum trafficable width of 7 metres at the passing bay.

- 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
- Fire trails do not traverse wetlands or other land potentially subject to periodic inundation (other than a flood or storm surge); and
- Gates for fire trails are provided and locked with a key/lock system authorised by the local RFS.

Access has been assessed by the NSW RFS previously. The access arrangements, circulation paths, widths and design specifications provide due consideration of PBP (2006) performance criteria and remain concurrent with that previously assessed by the NSW RFS.

Refer to **Appendix 1** for Proposed Layout showing access.

3.4 Water

Associated with any kind of development upon the land, it is expected that water mains will be extended into the site. Provision of access to this supply should be provided for fire-crews in the form of readily accessible and easily located fire hydrants. Fire hydrant spacing, sizing and pressure should comply with AS 2419.1 – 2005. Hydrants are not to be 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.

3.5 Gas

Any reticulated or bottled gas should be installed and maintained according to the requirements of the relevant authorities and AS 1596 – 2002. It is expected that the location of gas services will not lead to ignition of surrounding bushland or the fabric of buildings.

Additionally any flammable or hazardous materials are to be stored separately in a suitably bunded area no less than 100m from the nearest identified bushfire threat.

3.6 Fire Fighting Capability

To facilitate quick and efficient action by the Fire Brigade / Rural Fire Service upon arrival, it is recommended that all necessary connections / pumps etc on the property be clearly marked and visible, and in good working order. Stored water tanks will exist on site in which fire fighters can utilise in the event of an emergency. In this regard all stored water tanks should be fitted with a suitable connection – 65mm Storz outlet with a Gate or Ball valve.

3.7 Landscaping

Landscaping should be designed and managed to minimise flame contact and radiant heat to buildings and the potential for wind driven embers to cause ignitions.

In choosing plants for landscaping consideration should be given to plants that possess properties, which help to protect buildings. If the plants themselves can be prevented from ignition, they can improve the defence of buildings by:

- filtering out wind-driven burning debris and embers;
- acting as a barrier against radiation and flame; and
- reducing wind forces.

Consequently landscaping of the site should consider the following:

- meet the specifications of an Inner Protection Area (IPA) detailed in PBP 2006;
- priority given to retaining or planting species which have a low flammability and high moisture content;
- priority given to retaining or planting species which do not drop much litter in the bushfire season and which do not drop litter that persists as ground fuel in the bush fire season; and
- create discontinuous or gaps in the vegetation to slow down or break the progress of fire towards the dwellings.

Specific landscaping commitments from the project include the following features:

- Setbacks which wrap around three sides of the development for bushfire management;
- A combination of hard and soft landscaping;
- An intensive area of planting centred on a contoured garden mound on the southern boundary of the site to provide an effective screening of the development from future residential development; and
- A selection of plants suitable to the landscape objectives based on native species.

3.8 Vegetation Fuel Management

Consideration should be given to vegetation fuel loads present on site with particular attention on APZs.

Careful thought must be given to the type and physical location of any proposed site landscaping. Inappropriately selected and positioned vegetation has the potential to 'replace' any previously removed fuel load.

Bearing in mind the desired aesthetic and environment sought by site landscaping, some basic principles have been recommended to help minimise the chance of such works contributing to the potential hazard on site.

Whilst it is recognised that fire-retardant plant species are not always the most aesthetically pleasing choice for site landscaping, the need for adequate protection of life and property requires that a suitable balance between visual and safety concerns be considered.

It is reiterated again that it is essential that any landscaped areas and surrounds are subject to ongoing fuel management and reduction to ensure that fine fuels do not build up.

The primary objective of an integrated system of bushfire protection measures is to maintain the safety of all those persons on site. Economic assets and infrastructure that is not critical to the ongoing operation can be assessed for its capability of withstanding bushfire attack. Furthermore, the consequences of those assets failing and subsequent recovery time and cost should be acknowledged prior to reducing the desired bushfire protection measures.

4.0 Conclusion and Recommendations

It is clear from this investigation and assessment that the site constitutes Bushfire Prone Land. In accordance with the provisions of PBP 2006, the recommendations outlined within this assessment will substitute as appropriate actions to reduce the risk of damage and/or harm in the event of a bushfire event.

This BTA found the land surrounding the site to support vegetation consistent with Forest and Rainforest as described by PBP 2006.

In summary, the following key recommendations have been generated to enable the proposed development to comply with PBP 2006:

- A 20 m wide Asset Protection Zones (APZ) is recommended to the north and east of the site between the hazards and proposed development;
- Future dwellings within the site should have due regard to the specific considerations given in the BCA, which makes specific reference to the Australian Standard (AS3959 – 2009) construction of buildings in bushfire prone areas.
- Roads are to be constructed in accordance with PBP 2006 as outlined in section 3.3 of this report.
- Consideration should be given to landscaping and fuel loads on site to decrease potential fire hazards on site; and
- Any proposed development are to be linked to the existing mains pressure water supply and that suitable hydrants be clearly marked and provided for the purposes of bushfire protection. Fire hydrant spacing, sizing and pressure should comply with AS2419.1, 2005.

A review of the site and proposed development layout indicates that compliance with the above recommendations can be achieved or practically implemented without substantial change to the proposed layout or construction methodology.

Finally, the implementation of the adopted measures and recommendations forwarded within this report comply with PBP 2006 and will contribute to the amelioration of the potential impact of any bushfire upon the development, but they do not and cannot guarantee that the area will not be affected by bushfire at some time.

5.0 Bibliography

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Appendix 1

Site Plan

A0

ISSUE	DATE	PURPOSE	ISSUE	DATE	PURPOSE
(0)	16/7/2014	PRELIMINARY REVIEW BY CLIENT			
(1)	6/8/2014	INCLUDE PROPOSED STAGE 5, AMEND ROAD NAMES			
(2)	12/8/2014	REVISE LOT NUMBERS , CHECK AREAS WHERE RED LINES AND REMOVE RED LINEWORK			
(3)	20/8/2014	REVISE LOT NUMBERS , UPDATE WP DESIGNS - TOWN CENTRE, REMOVE DIMENSIONS			
(4)	21/8/2014	UPDATE WP DESIGNS			

DRAWING STATUS

PRELIMINARY REVIEW

NOT FOR CONSTRUCTION

THIS IS A COLOUR DRAWING AND SHOULD NOT BE REPRODUCED IN BLACK AND WHITE

CLIENT

Huntlee

LWP bringing communities to life

SCALE 1:3000

SHEET SIZE A0

DRAWN BY ADM

CHECKED BY GJS

DRAWING TITLE 20406 - STAGE 1 - 1 TO 3000 MASTER PLAN

PROJECT HUNTLEE STAGE 1 - DEVELOPMENT AREA
WINE COUNTRY DRIVE, HUNTLEE

CLIENT HUNTLEE PTY.LTD.

DALY.SMITH Pty Ltd
Surveying & Land Development Services
CENTRAL COAST & HUNTER
3/48 NEWCASTLE STREET, MORISSET
Ph (02) 49732745
Email: morisset@dalysmith.com.au
www.dalysmith.com.au

DALY.SMITH JOB No (Rev): **20406(4)**

SHEET NO: 1 OF 1

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