



Bushfire Threat Assessment

Huntlee New Town – Stage 1 75W Modification 9

Prepared for

Huntlee Pty Ltd

Final / August 2018



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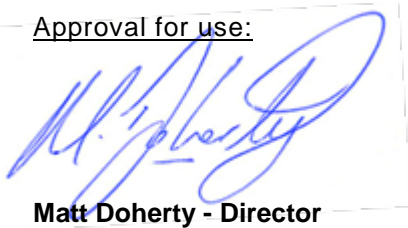
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EXECUTIVE SUMMARY

MJD Environmental has been engaged by Huntlee Pty Ltd, to prepare a BTA to accompany 75W Modification 9 to Stage 1 of Major Project (MP10_0137) for the Huntlee New Town Residential development, North Rothbury, NSW.

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 (PBP), 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 (BPM) will be appropriate, this assessment adheres to the methodology and procedures outlined in PBP 2006.

This assessment has been made based on the bushfire hazards in and around the site at the time of inspection and production (February and August 2018).

The assessment found that vegetation types consistent with forest, woodland, rainforest and riparian based on the criteria set out within in PBP (2006) occurred within 140m of the site. Slopes under the hazards identified varied from upslope/ cross slope to 0-5° Downslope.

Town Centre

- APZ of 25m is required from the forest hazard to the north of the Town Centre site for uses that trigger residential APZ setbacks. In the case of a SFPP increased setbacks in accordance with PBP (2006) shall apply.
- An APZ of 10m is required from the riparian corridor to the west.
- An APZ of 10m from the riparian corridor to the east shall be provided as defensible space within the Public Open Space and future detention basin.
- A temporary APZ of 100m will be established to the west and south of the Town Centre.

Retirement Village Site

- APZs of 60m and 20m for the SFPP and residential areas respectively are required from the forest hazard to the north-east.
- An APZ of 10m is required from the woodland hazard to the north.
- APZs of 40m and 10m for the SFPP and residential areas respectively are required from the riparian hazard to the south and west.
- All lands within the development area including Open space outside the nominated riparian corridors will be managed as an APZ.
- The development of sub-stages will occur in a staged fashion. A temporary APZ of 100m or to the Huntlee boundary is required between active or completed development stages and future development areas. Areas of retained vegetation (riparian corridors) shall be maintained in and APZ established in accordance with this BTA.
- 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 as outlined in Chapter 3, Section 3.2 of this report.
- Access is to comply with PBP (2006) as summarised and assessed in Chapter 3, Section 3.3 of this report.
- Services are to be provided and connected to the site in accordance with PBP (2006) as summarised and assessed in Chapter 3, Section 3.4 of this report.

- 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.
- Careful consideration of future site landscaping and ongoing fuel management must occur to minimise the potential impact of bushfire on the site. All lands within the development area including Open space outside the nominated riparian corridors will be managed as an APZ.

MP10_0137 (MOD 8) Area

- Approved APZ and BAL over reconfiguration of subdivision arrangement, previously approved under MP10_0137 (MOD 8) demonstrates consistency with the outcomes of the MOD 8 approval and improved separation from the hazard and opportunity to construct a modest dwelling within BAL-29 or lower exposure at areas to the north-east and south-east of site.

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

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GLOSSARY OF TERMS AND ABBREVIATIONS

Term/ 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
BC Act	NSW Biodiversity Conservation Act 2016
BCA	Building Code of Australia
BMP	Bush Fire Management Plan
BPA	Bush Fire Prone Area (Also Bushfire Prone Land)
BPL	Bush Fire Prone Land
BPLM	Bush Fire Prone Land Map
BPM	Bush Fire Protection Measures
BTA	Bushfire Threat Assessment
DoE	Commonwealth Department of the Environment
DPI Water	NSW Department of Primary Industries – Water
EPA Act	NSW Environmental Planning and Assessment Act 1979
EPBC Act	Commonwealth Environment Protection and Biodiversity Conservation Act 1999
FDI	Fire Danger Index
FMP	Fuel Management Plan
ha	hectare
IPA	Inner Protection Area
LGA	Local Government Area
OPA	Outer Protection Area
OEH	NSW Office of Environment and Heritage
PBP or PBP (2006)	Planning for Bushfire Protection 2006
RF Act	Rural Fires Act 1997
RF Regulation	Rural Fires Regulation
RFS	NSW Rural Fire Service
TSC Act	NSW Threatened Species Conservation Act 1995 (as repealed)

1 Introduction

MJD Environmental has been engaged by Huntlee Pty Ltd, to prepare a Bushfire Threat Assessment (BTA) to accompany 75W Modification 9 to Stage 1 of Major Project (MP10_0137) for the Huntlee New Town Residential development, North Rothbury(**Figure 1**).

Stage 1 of the planning approval (MP10_0137) for Huntlee was granted by the Planning and Assessment Commission (PAC) on 24 April 2013. The approval for Stage 1 of the development comprises residential subdivision of 1,473 lots, 14 superlots, a primary school allotment and the creation of drainage and open space reserves, site preparation works and internal and external road works. The stage 1 works have substantially commenced and accommodate approximately 100 finished dwellings.

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 (PBP), 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 (BPM) will be appropriate, this assessment adheres to the methodology and procedures outlined in PBP 2006.

This assessment has been made based on the bushfire hazards in and around the site at the time of inspection and production (February and August 2018).

1.1 Description of Proposal

The proposed 75W modification (Mod 9) to the Stage 1 Project Approval development consent comprises:

- Extension of the Stage 1 site boundary to facilitate the planning of the future Stage 2 development at Huntlee;
- Addition of a seniors living superlot, three residential superlots, and 16 residential allotments (Stage 16);
- Extension of the Town Centre boundary to include a school allotment which was formerly located in sub-stage 9;
- Reconfiguration of the subdivision layout of the Town Centre to better integrate with the future Stage 2 development, including revised internal street layout, hierarchy, and sub-stages sequencing; and
- Reconfiguration of subdivision arrangement, previously approved under MP10_0137 (MOD 8).

Refer to **Appendix A** for a plan of the proposal.

1.2 Site Context

Huntlee, in its regional context is shown in **Figure 1** below and is located to the south of the town of Branxton in the Hunter Valley of NSW. The Huntlee site straddles Wine Country Drive, which links Cessnock with the New England Highway and Hunter Expressway. Within the overall Huntlee site, the proposed urban area is bounded to the north and east by the Main North Railway and Hunter Expressway corridor, to the south by the village of North Rothbury and to the west by the Black Creek and floodplain. Other adjoining uses include vineyards, rural residential development and general agriculture.



Figure 1 Huntlee Regional Context

The stage 1 site relates to the first residential Village located to the east and north of the existing village of North Rothbury and includes the first 50.5 ha of the Town Centre area and the Wine Country Drive large lot residential area (120 lots). The Stage 1 area in the context of the overall Huntlee development framework is shown in **Figure 2** below.

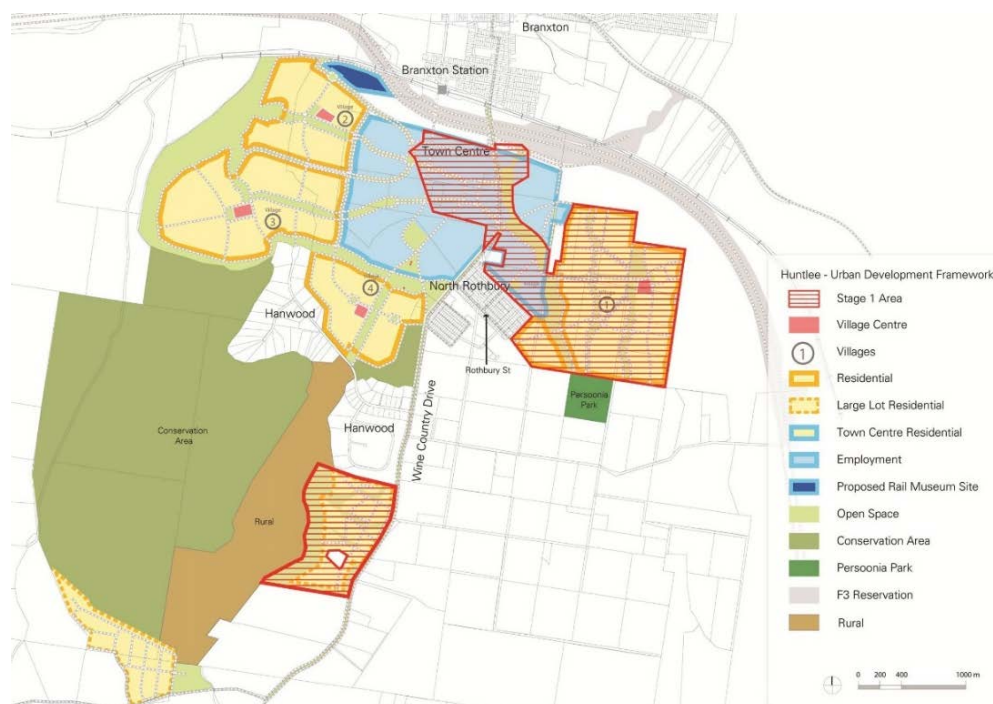


Figure 2 Stage 1 Project Application areas

1.3 Background

The Huntlee New Town development was Gazetted as a State Significant Site (SSS) with an amendment to Schedule 3 of State Environmental Planning Policy (Major Development) 2005 (Major Development SEPP) on 31 December 2010.

The key parameters of the overall Huntlee SSS development framework are:

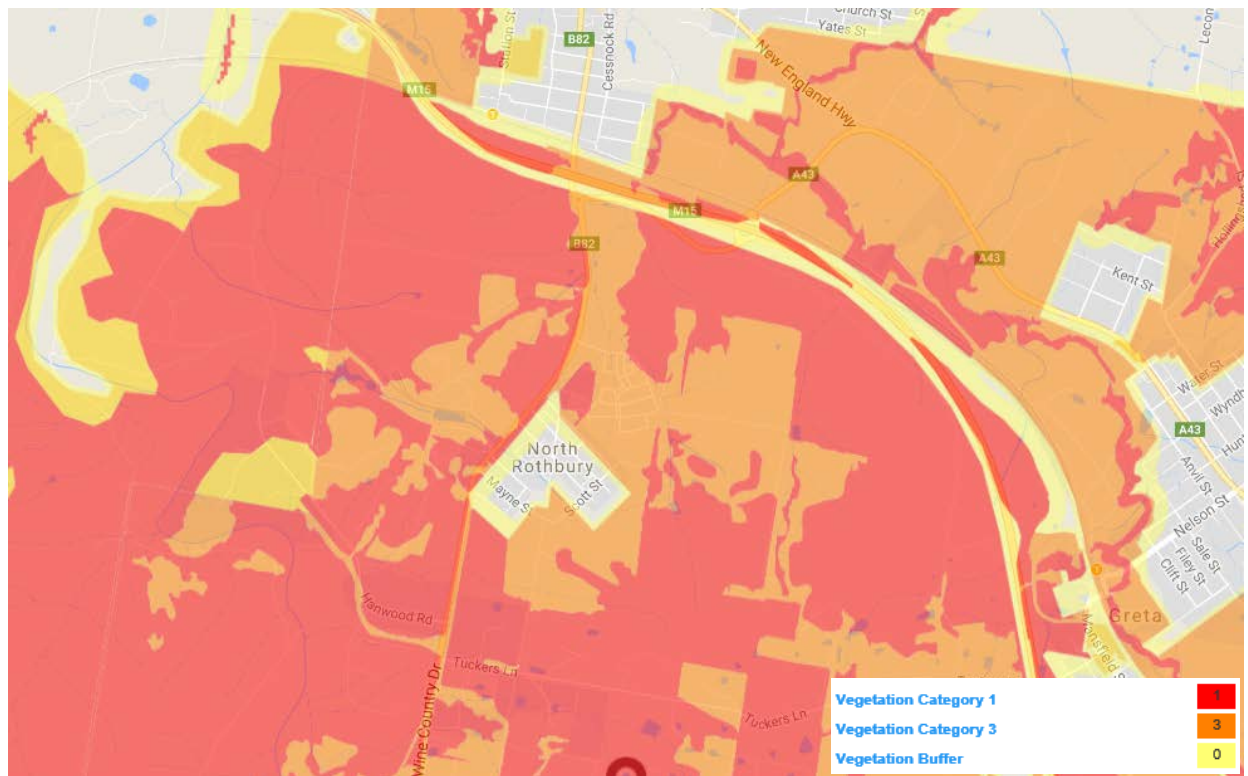
- Up to 5600 dwellings in residential zones of varying sizes covering up to 612 hectares;
- Employment lands totalling up to 200 hectares, including a mixed use town centre with up to 1,700 residential dwellings;
- Large lot residential development covering up to 93 hectares to achieve 200 lots;
- The provision of associated infrastructure including upgrades to roads, sewerage and water infrastructure and the dedication of land for education, health services, community facilities and utilities;
- Dedication of 780 hectares of conservation land within Huntlee;
- Dedication of Persoonia Park (17 hectares); and
- Dedication of up to 4988 hectares of conservation land elsewhere within the Lower Hunter Region.

The SEPP amendment established land use zoning and development controls for Huntlee and required the preparation of a Development Control Plan (DCP) to further articulate design, landscape and infrastructure principles and controls. The Development Control Plan will communicate the planning, design and environmental objectives and controls against which the consent authority will assess applications for future development stages for Huntlee.

A Part 3A Project Application Environmental Assessment Report for Stage 1 of the Huntlee New Town development was approved by the NSW Planning Assessment Commission on 24th April 2013 (MP10_0137). The site is situated within the approved Stage 1 Town Centre area of the Huntlee New Town development.

The Stage 1 Project Application was informed by bushfire threat assessment prepared by HDB (January 2011).

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 Vegetation Category 1, Vegetation Category 2, Vegetation Category 3 and Vegetation Buffer from bushfire vegetation on the Bushfire Prone Land Map (DPE 2018). Refer to **Figure 3** below.

Figure 3 Bushfire Prone Land Map

(Source: NSW Planning & Environment, 2018)

1.4 Site Description

The Stage 1 site area subject to assessment under the BTA is described as the following areas:

The following assessment has been broken up into two distinct areas as follows:

- 1) Retirement Village Site and Residential Area – demarcated on the Huntlee Stage 1 Development Area (**Appendix A**) as Stage 16.
- 2) Town Centre Area – demarcated on the Huntlee Stage 1 Development Area (**Appendix A**) as TC1 to TC5.
- 3) Reconfiguration of subdivision arrangement, previously approved under MP10_0137 (MOD 8).

Importantly there has been no change in site boundaries or riparian corridor extents that represent the hazard previously investigated and approved by the NSW RFS. The subdivision arrangement has been amended to facilitate improved access and where poorly cited lots existed, these have been modified (generally size increased) to provide improved separation from the hazard and opportunity to construct a modest dwelling within BAL-29 or lower exposure at areas to the north-east and south-east of site. As such this area has not been reassessed within **Chapter 2** of this report, however updated APZ and BAL plans as **Figure 7** and **Figure 9** respectively have been provided in **Chapter 3** showing the new subdivision layout.

The initial Stage 1 approval coupled with previous 75w modifications have been the subject of review and approval by the NSW RFS informed by the following Bushfire Threat Assessments:

- 1) The Stage 1 Project Application was informed by a Bushfire Threat Assessment prepared by HDB (January 2011).
- 2) A revised Bushfire Threat Assessment for Lot 12 DP729973, Lot 36 DP755211 and Lot 37 DP755211 Huntlee Residential Development, Stage 2-5 Eastern Precinct was prepared by RPS (2015). This assessment accompanied 75W Modification 3 to Stage 1 of Major Project

(MP10_0137) for the Huntlee New Town Residential development. The RPS (2015) BTA was assessed and approved by the NSW RFS. As such it is recognised as prevailing over the HDB (2011) BTA prepared for the Stage 1 approval.

- 3) A revised Bushfire Threat Assessment was prepared by MJD Environmental (2017) to accompany 75w Modification (Mod 8) to Stage 1 of Major Project (MP10_0137) for the Huntlee New Town Residential development.

1.5 Aims & Objectives

This assessment has been undertaken in accordance with clause 44 of the RF Regulation 2008. This BTA also addresses the six key BPM 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 Zone (APZ) (and their components being Inner Protection Areas (IPAs) and Outer Protection Areas (OPAs);
- 2) Construction standards and design;
- 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.

The Retirement Village site and School allocation is considered to trigger the Special Fire Protection Purpose (SFPP) criteria outlined within PBP (2006). As such APZ considerations have been made in relation to SFPP for these areas.

Notwithstanding the existing Stage 1 approval including bushfire assessment over the site, it is important to acknowledge the Huntlee New Town contains several intended development types. Within the Town Centre the zoning coupled with approved (Stage 1) concept is intended to facilitate commercial development types. Generally, these development types and buildings contained therein do not strictly trigger the criteria outlined with PBP (2006) for residential and/or SFPP. In these instances, section 1.3(b) of PBP states that the provisions under the BCA for fire safety will be accepted for bushfire purposes where the aims and objectives outlined in section 1.1 of PBP (2006) can be met. The broad objectives are listed below:

- (i) afford occupants of any building adequate protection from exposure to a bushfire;
- (ii) provide for a defensible space to be located around buildings;
- (iii) provide appropriate separation between a hazard and buildings which, in combination with other measure, 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 bushfire protection measures, including fuel loads in the APZ; and
- (vi) ensure that utility services are adequate to meet the needs of fire fighters (and others assisting in bush fire fighting).

An appraisal against these objectives is provided in **Section 3.7**.

2 Bushfire Hazard Analysis

2.1 Vegetation Assessment

Methodology

The vegetation in and around the site, to a distance of 140m, has been assessed in accordance with PBP 2006. This assessment has been made via a combination:

- aerial photo interpretation (NearMap 2018 – Aerial date 14-12-2017);
- reference to regional community vegetation mapping; and
- on site vegetation classification.

These vegetation communities have been classified for bushfire purposes into structure and formation using the system adopted by Keith (2004) and using Table A2.1 of PBP (2006) with due regard to Addendum Appendix 3 (PBP 2006).

Vegetation Classification

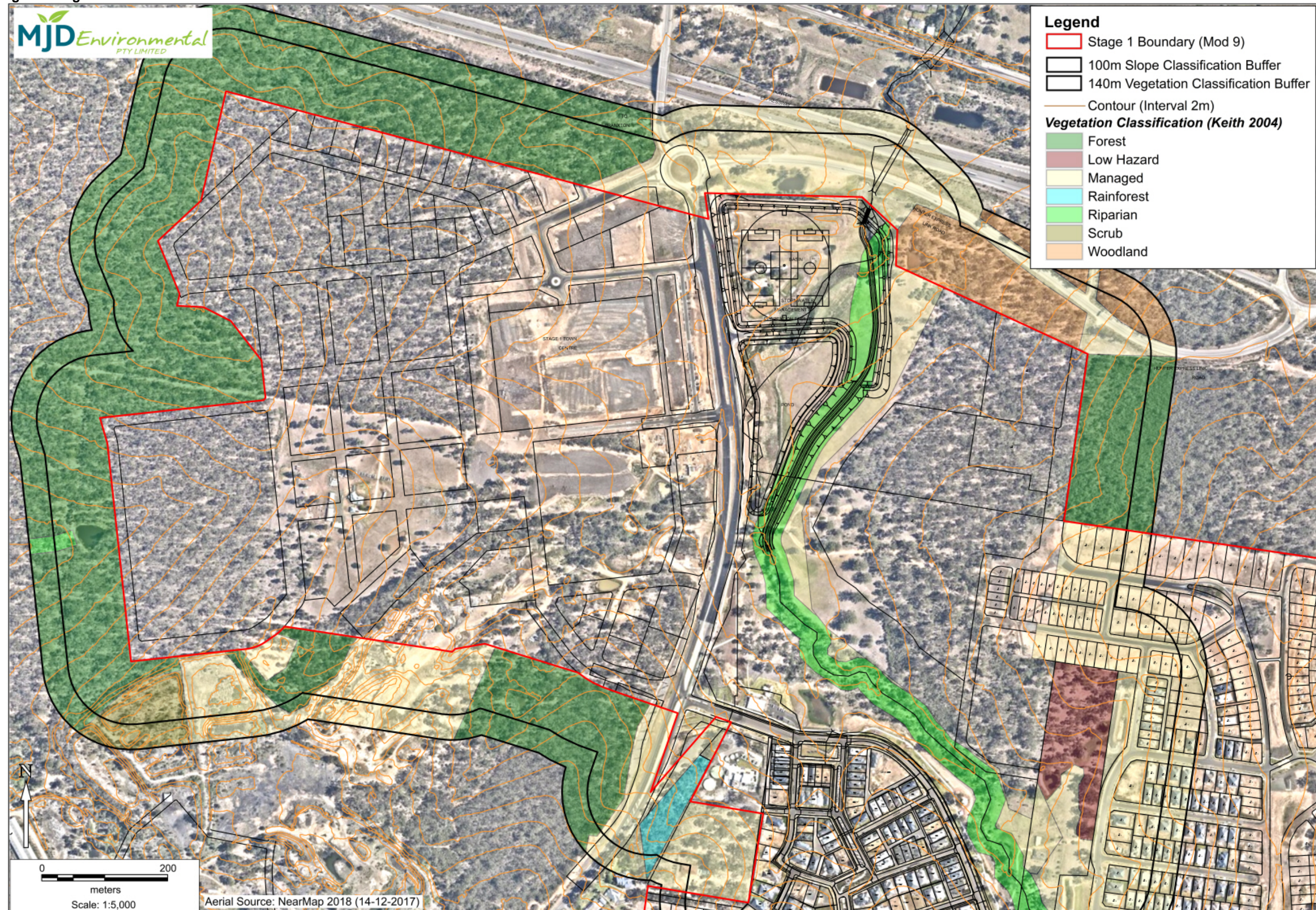
Vegetation classification has been presented in **Table 1** below and **Figure 4**. For the purposes of assessing vegetation and slope (along with subsequent APZ/ BAL assessment) the development has been split into 3 areas.

Table 1 Vegetation Classification

Direction	Description	Vegetation Classification
Town Centre		
North	<ul style="list-style-type: none"> ▪ Vegetation covering lands not owned or controlled by Huntlee. ▪ Managed area 	Forest
East	<ul style="list-style-type: none"> ▪ Huntlee Stage 1 approval area containing areas of public open space ▪ Future significant detention basin and sports field. ▪ Riparian zone ▪ Future retirement village / residential area. 	No Hazard / Riparian
South-East	<ul style="list-style-type: none"> ▪ Huntlee Stage 1 Development area ▪ Existing North Rothbury residential area ▪ Local Water Centre ▪ Small pocket of unmanaged remnant vegetation 6,852m² approx. in area. 	No Hazard / Rainforest
South	<ul style="list-style-type: none"> ▪ Future Huntlee New Town Development area. ▪ Unmanaged area of vegetation in land owned/controlled by Huntlee ▪ Managed areas 	No Hazard / Forest / Scrub
West	<ul style="list-style-type: none"> ▪ Future Huntlee New Town Development area. ▪ Unmanaged area of vegetation in land owned/controlled by Huntlee ▪ Riparian vegetation to be retained as part of future development 	Forest / Riparian
Retirement Village Site / Residential		
North	<ul style="list-style-type: none"> ▪ Vegetation containing pasture and scattered trees covering lands not owned or controlled by Huntlee. 	Woodland
North-east	<ul style="list-style-type: none"> ▪ Vegetation covering lands not owned or controlled by Huntlee. 	Forest
East	<ul style="list-style-type: none"> ▪ Huntlee Stage 1 Development area existing as constructed and currently 	No hazard / Low Hazard Vegetation*

Direction	Description	Vegetation Classification
	<p>under construction. The area includes a temporary APZ that extends into the site.</p> <ul style="list-style-type: none"> Privately owned land (Lot 351 DP 806555) containing dwelling, ancillary structures, pasture and grazed areas. This land will be isolated under the proposal to all aspects. 	<p>* The subject land has been assessed as Low Hazard Vegetation in a Bushfire Threat Assessment for the Huntlee Residential Development over Lot 12 DP 729973, Lot 36 DP 755211 and Lot 37 DP 755211 by RPS (2015). The approved bushfire report determined low hazard based on the characteristics of the land at the time of assessment and of key note, future Huntlee development arrangements. To this end the subject land will become isolated by neighbouring development to the east and west. The report was assessed and approved by the NSW RFS for the Huntlee development and now underpins the subdivision delivery.</p>
South	<ul style="list-style-type: none"> Riparian corridor Managed areas that form part of the Stage 1 approval including areas of open space and park. 	No Hazard/ Riparian
West	<ul style="list-style-type: none"> Riparian corridor Managed areas that form part of the Stage 1 approval including areas of open space, detention basin and sports field. 	No Hazard/ Riparian

Figure 4 Vegetation Classification



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2.2 Slope Assessment

Methodology

In accordance with PBP (2006), an assessment of the slope throughout the site (where a hazard is to remain) and for a distance of 100m around the site in the hazard direction. Both the average slope and maximum slopes were considered to determine the level of gradient which will most significantly influence fire behaviour on the site.

Slope assessment was assisted by:

- Aerial photo coupled with contour overlays as a 2m contour data set and Lidar with 0.5m intervals.

Effective Slope

The slope class under the bushfire hazards identified in **Section 2.1** is presented in **Table 2** below and **Figure 4**.

Table 2 Slope Class

Direction	Vegetation Classification	Slope Class
Town Centre		
North	Forest	0-5° Downslope
East	No Hazard / Riparian	0-5° Downslope
South-East	No Hazard / Rainforest	Flat / Cross slope
South	No Hazard / Forest / Scrub	Upslope / Flat (cross slope) / 0-5° Downslope
West	Forest / Riparian	0-5° Downslope
Retirement Village Site / Residential		
North	Woodland	Flat/ cross slope
North-east	Forest	Upslope
South	No Hazard/ Riparian	0-5° Downslope
West	No Hazard/ Riparian	0-5° Downslope

3 Bushfire Protection Measures

PBP sets out a suite of BPMs and criteria that require consideration and assessment for applicable proposals on bushfire prone land in order to provide an adequate level of protection to new developments.

The measures required to be assessed are listed below and discussed throughout this chapter:

- Asset Protection Zones (APZ)
- Construction Standards and Design – Bushfire Attack Levels (BAL) set out in AS3959-2009
- Access
- Services – Water supply, Gas and Electricity
- Landscaping and Fuel Management
- Emergency Management

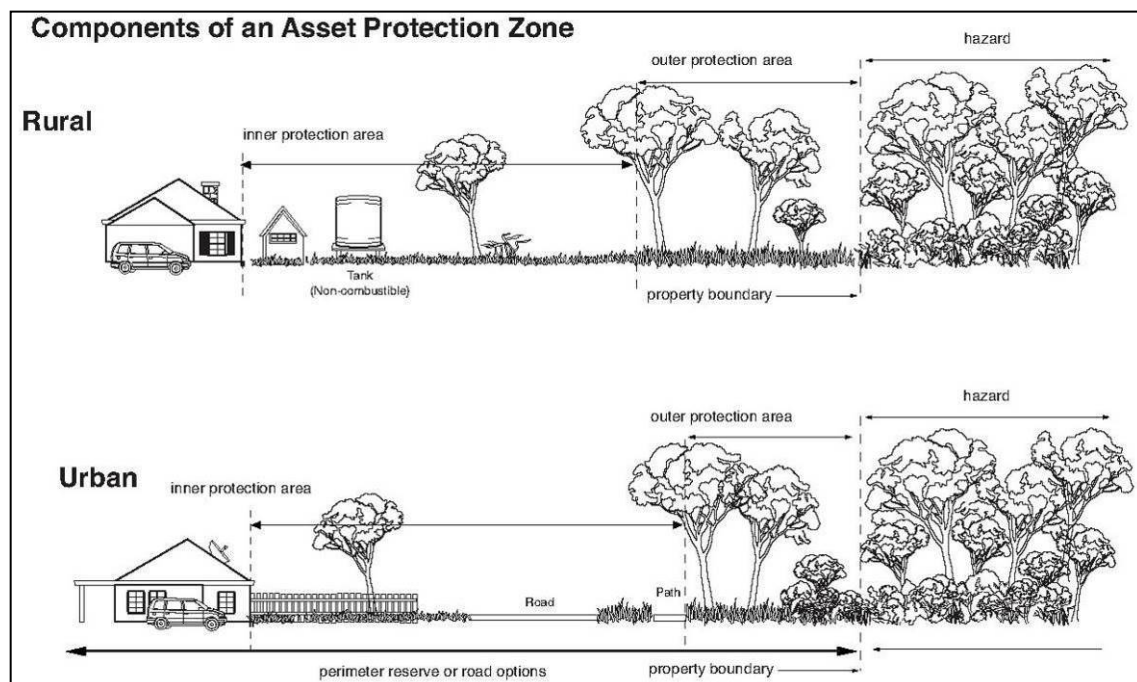
3.1 Asset Protection Zone

An APZ is a buffer zone between the hazard and buildings that is progressively managed to minimise bushfire hazard (fuel loads and reduce potential radiant heat levels, flame, ember and smoke attack) PBP (2006), in order to mitigate risk to life and asset. Where a forest or woodland vegetation classification has been determined, an APZ can consist of two areas being:

- 1) Inner Protection Area (IPA) – The IPA extends from the edge of the development/ buildings to the OPA. The IPA aims to provide defensible space and reduce potential for direct or spontaneous ignition by maintain providing a heavily reduced or fuel free zone.
- 2) Outer Protection Area (OPA) – 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 in order to reduce flame length and fire intensity. A properly managed OPA can aid in ember attack by filtering embers and slowing the fires rate of spread.

Refer to **Figure 5** that shows the components of an APZ presented in PBP (2006).

Figure 5 Components of an APZ (PBP 2006)



An APZ can include the following:

- Lawns;
- discontinuous gardens;
- swimming pools;
- driveways;
- detached garages;
- open space / parkland;
- car parking;
- swales; and
- cycleway and formed walkways.

3.1.1 Determining APZs

The subject site lies within the Cessnock City Council LGA and therefore is assessed under an FDI (Fire Danger Index) rating of 100. By applying Table A2.4 and Table A2.6 for the Retirement Village Site and School allocation, within PBP (2006) the deemed to satisfy setbacks have been calculated based on the bushfire hazard analysis presented in Chapter 2. Refer to **Table 3** below and **Figure 6** for the required APZs.

A plan showing APZ over the reconfigured subdivision layout within MP10_0137 (MOD 8) area has been provided as **Figure 7**.

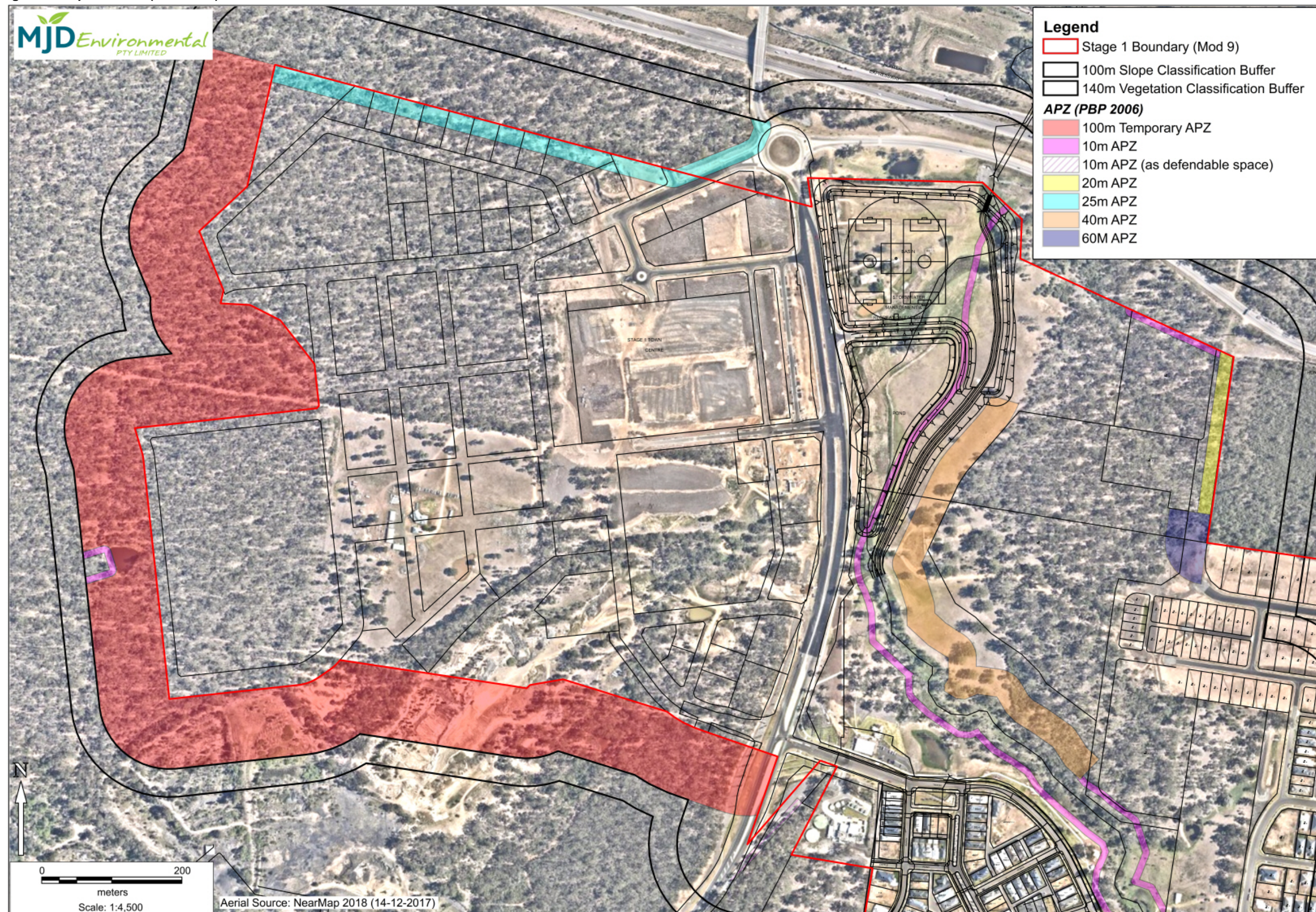
Table 3 Required APZ (PBP 2006)

Direction	Vegetation Classification	Slope Class	APZ (PBP 2006)	Notes
Town Centre				
North	Forest	0-5° Downslope	25m	Residential APZ has been shown on Figure 6. The building type (commercial) does not trigger the need for a residential or SFPP APZ. Combination of measures proposed to achieve aims and Objectives of PBP (2006).
East	Riparian	0-5° Downslope	10m	APZ separation provided by Public Opens Space area and Wine Country Drive as defensible space.
South-East	Rainforest	Flat / Cross-slope	10m	APZ separation provided by Wine Country

Direction	Vegetation Classification	Slope Class	APZ (PBP 2006)	Notes	
				Drive as defensible space.	
South	Forest	Upslope	20m	Temporary APZ of 100m to be established within future Huntlee Development area. Vegetation within Riparian Zone corridor to be retained.	
		0-5° Downslope	25m		
	Scrub	Flat	15m		
West	Riparian	0-5° Downslope	10m		
	School Allocation (TC5 Appendix A) will be protected by 100m temporary APZ to the west and south. The riparian corridor to be retained as part of future development is situated 80m to the west.				
Retirement Village Site / Residential			SFPP	Residential	
North	Woodland	Flat/ cross slope	40m	10m	Residential APZ shown on Figure 6 in this location
North-east	Forest	Upslope	60m	20m	
South	No Hazard/ Riparian	0-5° Downslope	40m	10m	
West	No Hazard/ Riparian	0-5° Downslope	40m	10m	

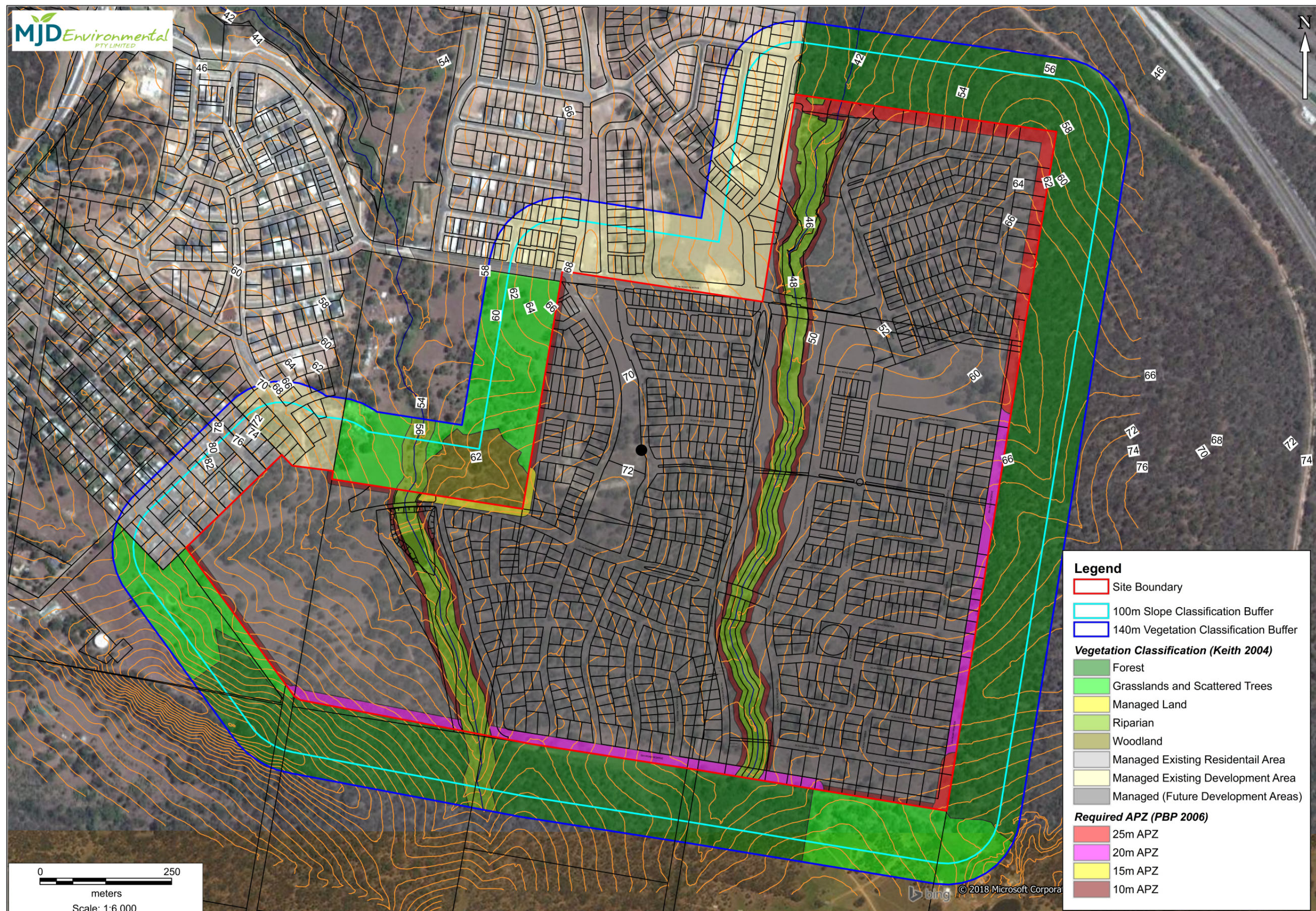
The development of sub-stages will occur in a staged fashion. As such a temporary APZ of 100m or to the Huntlee boundary will be established between active or completed development stages and future development areas.

Figure 6 Required APZ (PBP 2006)



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Figure 7 Required APZ (PBP 2006) over amended subdivision (MP10_0137 [MOD 8]) area



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3.2 Construction Standards & Design

Construction of Buildings in Bushfire Prone Areas is encompassed by AS3959-2009. This Australian Standard specifies construction requirements to improve a buildings ability to withstand attack from bushfire and afford protection to occupants and the building during a bush fire situation. By considering the bushfire hazard analysis outcomes presented in Chapter 2, this standard provides scalable construction specifications (Bushfire Attack Levels – BAL) relative to the building separation from a proximate hazard.

Addendum Appendix 3 of PBP (2006) was applied to the vegetation classification presented Chapter 2 to determine the AUSLIG (1990) vegetation equivalent. This coupled with the slope analysis was applied to Table 2.4.2 of AS3959-2009 to calculate the required Bushfire Attack Level (BAL) for the site. Refer to **Table 4** below and **Figure 8** for the required BAL.

A plan showing APZ over the reconfigured subdivision layout within MP10_0137 (MOD 8) area has been provided as **Figure 9**.

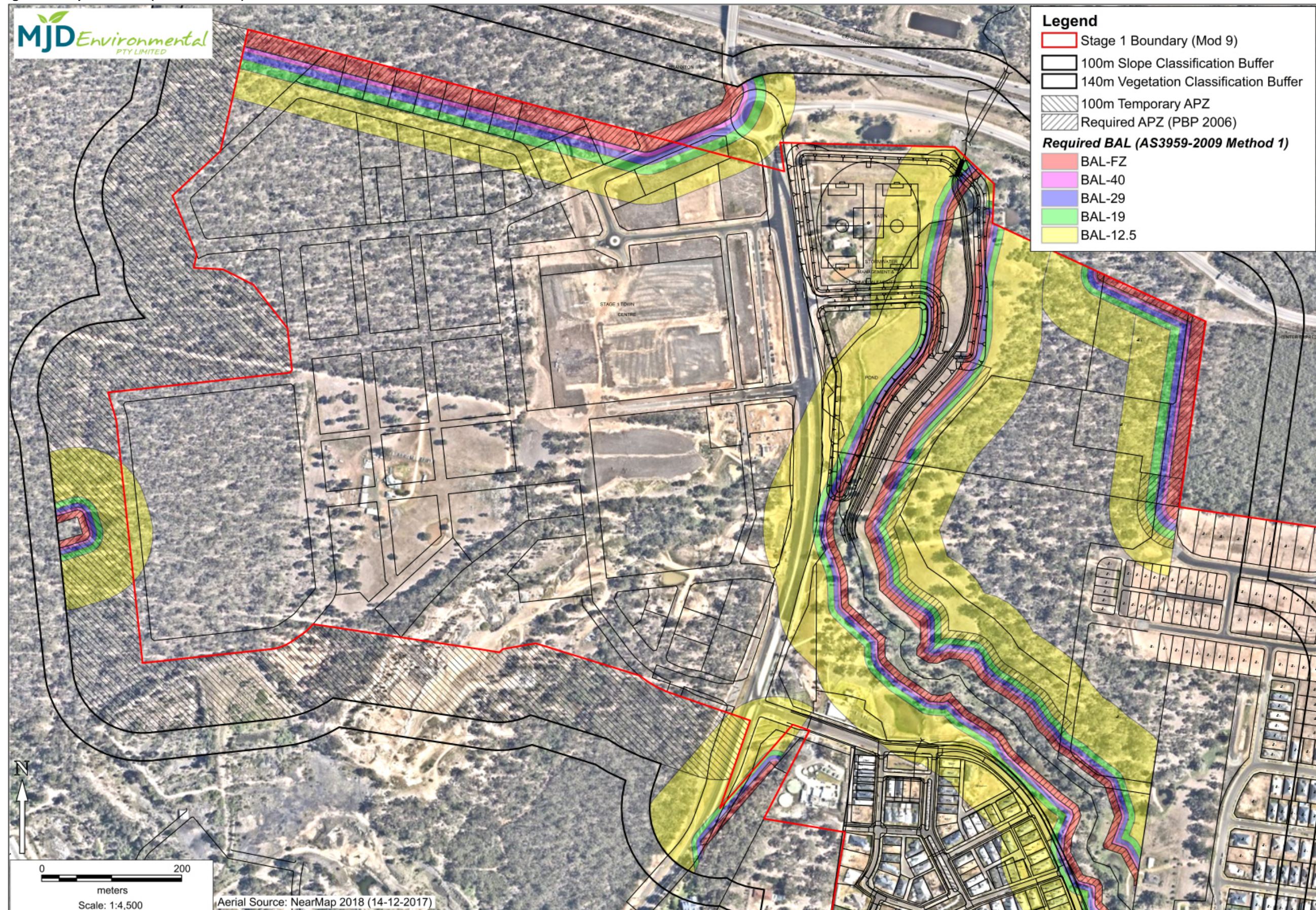
Table 4 Required BAL (AS3959-2009)

Direction	Vegetation Classification	Slope Class	APZ (PBP 2006)	Separation Distance	BAL	Notes
Town Centre						
North	Forest	0-5° Downslope	25m	<24m 24-<32m 32-<43m 43-<57m 57-<100m >100m	BAL-FZ BAL-40 BAL-29 BAL-19 BAL-12.5 BAL-Low	Commercial Class buildings. Application of the provisions set out in PBP (2006) indicate that BAL does not strictly apply to these structures given the separation distance from building classes/ structures requiring application of BAL. Additionally in all cases the Commercial Class buildings are separated by a distance of greater than 6m from a building required to comply with AS3959-2009.
East	Riparian	0-5° Downslope	10m	<10m 10-<14m 14-<20m 20-<29m 29-<100m >100m	BAL-FZ BAL-40 BAL-29 BAL-19 BAL-12.5 BAL-Low	
South-east	Rainforest	Flat / Cross-slope	10m	<8m 8-<11m 11-<16m 16-<23m 23-<100m >100m	BAL-FZ BAL-40 BAL-29 BAL-19 BAL-12.5 BAL-Low	
South	Forest	Upslope	20m (100m temp APZ provided)	<19m 19-<25m 25-<35m 35-<48m 48-<100m >100m	BAL-FZ BAL-40 BAL-29 BAL-19 BAL-12.5 BAL-Low	Land to South and West protected by 100m temporary APZ until future development occurs within Huntlee.
		0-5° Downslope	25m (100m temp APZ provided)	<24m 24-<32m 32-<43m 43-<57m 57-<100m >100m	BAL-FZ BAL-40 BAL-29 BAL-19 BAL-12.5 BAL-Low	Refer to Addendum Appendix 3 of PBP (2006) and Sections 1,3, 5-7 of AS3959-2009.

Direction	Vegetation Classification	Slope Class	APZ (PBP 2006)	Separation Distance		BAL	Notes
	Scrub	Flat	15m (100m temp APZ provided)	<10m 10-<13m 13-<19m 19-<27m 27-<100m >100m		BAL-FZ BAL-40 BAL-29 BAL-19 BAL-12.5 BAL-Low	
West	Riparian	0-5° Downslope	10m (100m temp APZ provided)	<10m 10-<14m 14-<20m 20-<29m 29-<100m >100m		BAL-FZ BAL-40 BAL-29 BAL-19 BAL-12.5 BAL-Low	
Retirement Village Site / Residential			SFPP	Resi			
North	Woodland	Flat/ cross slope	40m	10m	<12m 12-<16m 16-<24m 24-<33m 33-<100m >100m	BAL-FZ BAL-40 BAL-29 BAL-19 BAL-12.5 BAL-Low	Refer to Addendum Appendix 3 of PBP (2006) and Sections 1,3, 5-7 of AS3959-2009
North-east	Forest	Upslope	60m	20m	<19m 19-<25m 25-<35m 35-<48m 48-<100m >100m	BAL-FZ BAL-40 BAL-29 BAL-19 BAL-12.5 BAL-Low	
South	No Hazard/ Riparian	0-5° Downslope	40m	10m	<10m 10-<14m 14-<20m 20-<29m 29-<100m >100m	BAL-FZ BAL-40 BAL-29 BAL-19 BAL-12.5 BAL-Low	
West	No Hazard/ Riparian	0-5° Downslope	40m	10m	<10m 10-<14m 14-<20m 20-<29m 29-<100m >100m	BAL-FZ BAL-40 BAL-29 BAL-19 BAL-12.5 BAL-Low	

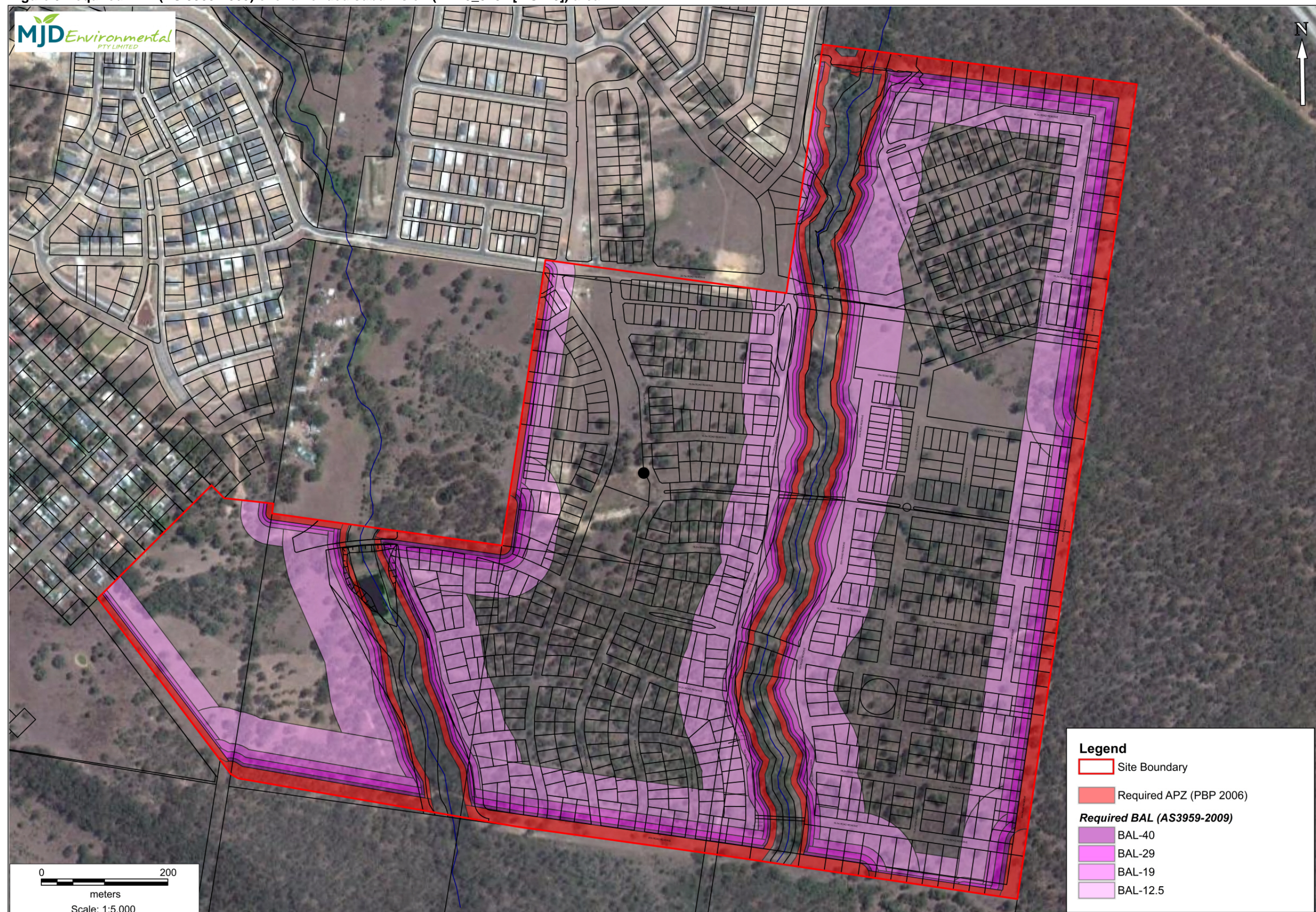
Refer to Addendum Appendix 3 of PBP (2006) and Sections 1,3, 5-7 of AS3959-2009

Figure 8 Required BAL (AS 3959-2009)



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Figure 9 Required BAL (AS 3959-2009) over amended subdivision (MP10_0137 [MOD 8]) area



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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. All access within the subdivision is generally consistent with the Huntlee Concept Approval where the site will have multiple ingress and egress routes that will ultimately connect to Wine Country Drive.

The following summarises the requirements of PBP (2006).

PBP (RFS, 2006) recommends a perimeter road be designed for any future residential development. A perimeter road forms part of the APZ and will provide a separation between the building and the boundary of the bush fire hazard.

Any **perimeter road** 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;
- non perimeter roads comply with Road widths for Category 1 Tanker (Table 4.1 PBP 2006);

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

- the perimeter road is linked to the internal road system at an interval of no greater than 500m in urban areas;
- not be hindered by an overuse of traffic calming devices such as speed humps and chicanes;
- public roads do not have a cross fall not exceeding 3 degrees;
- all roads are through roads, but if unavoidable then dead ends should be not more than 200m in length, incorporate a minimum 12m turning circle and should be clearly sign posted as dead ends;
- 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;
- the minimum distance between inner and outer curves is 6m;
- maximum grade for sealed roads does not exceed 15° and an average grade of not more than 10° of other gradient specified by road design standards, whichever is the lesser gradient;
- there is a minimum vertical clearance to a height of 4m above the road at all times;

- 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. Bridges clearly indicate load rating;
- 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 2.6m wide from kerb edge to road pavement. No services or hydrants are located within the parking bays; and
- public roads 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 roads** require that:

- at least one alternative property access is provided for individual dwellings (or group of dwellings) that are located more than 200m from a public through road;
- a minimum carriageway width of four metres for rural-residential areas, rural landholdings or urban area with a distance greater than 70 metres from the nearest hydrant point to the most external part of the proposed building;

Note: No specific access requirements apply in a urban area where a 70m 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;
- on forest, woodland and heath situations, rural property access roads have passing bays every 200m that are 20 metres long by two metres wide;
- internal roads for rural properties have a loop road around any dwelling or incorporate a turning circle with a minimum 12 metre outer radius;
- curves have a minimum inner radius of six metres and are minimal in number to allow for rapid access and egress;
- the cross fall is not more than 10°;
- maximum grades for sealed roads do not exceed 15° and not more than 10° for unsealed roads; and
- access to a development comprising more than three dwellings have formalised access by dedication of a road and not by right of way.

The above road specifications are the acceptable solutions as detailed within PBP (RFS, 2006). Deviations from the above acceptable solutions for access may be considered (depending on the situation) through a performance-based assessment.

The proposed road layout is generally consistent with the requirements of PBP (2006).

Refer to **Appendix A** for Plan of Subdivision showing access and staging.

3.4 Services – Water, Electricity, Gas

The site is to be developed in accordance with the PBP (2006) acceptable solutions for services listed in Table 5.

The proposal is able to satisfy these requirements given:

- Reticulated water supply is available and shall be extended and augmented within the site.
- The site will be connected to power from the existing service available within Huntlee. This shall be extended and augmented within the site.
- Any future gas connection will be non-reticulated (bottled) and shall be installed in accordance with the provisions of PBP (2006).

Table 5 Acceptable solutions for services (PBP 2006)

Performance Criteria	Acceptable Solutions												
The intent may be achieved where:													
<p>Reticulated water supplies</p> <ul style="list-style-type: none"> ▪ water supplies are easily accessible and located at regular intervals <p>To note, if reticulated water supplies are considered inadequate or shall not be connected as part of the proposal, the PBP (2006) performance criteria for 'non-reticulated' water supply shall apply as detailed below.</p>	<ul style="list-style-type: none"> ▪ reticulated water supply to urban subdivisions uses a ring main system for areas with perimeter roads. ▪ 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. ▪ 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. ▪ the provisions of parking on public roads are met. 												
<p>Non-reticulated water supply areas</p> <ul style="list-style-type: none"> ▪ for rural-residential and rural developments (or settlements) in bush fire prone areas, a water supply reserve dedicated to firefighting purposes is installed and maintained. The supply of water can be an amalgam of minimum quantities for each lot in the subdivision (community titled subdivisions), or held individually on each lot. <table border="1"> <thead> <tr> <th>Development type</th><th>Water requirement</th></tr> </thead> <tbody> <tr> <td>Residential Lots (<1,000m²)</td><td>5,000 l/lot</td></tr> <tr> <td>Rural-residential Lots (1,000 – 10,000m²)</td><td>10,000 l/lot</td></tr> <tr> <td>Large Rural/Lifestyle Lots (>10,000 m²)</td><td>20,000 l/lot</td></tr> <tr> <td>Dual Occupancy</td><td>2,500 l/unit</td></tr> <tr> <td>Townhouse/Unit Style (eg Flats)</td><td>5,000 l/unit up to 20,000 l maximum.</td></tr> </tbody> </table> <p>Table 4.2 PBP 2006</p>	Development type	Water requirement	Residential Lots (<1,000m ²)	5,000 l/lot	Rural-residential Lots (1,000 – 10,000m ²)	10,000 l/lot	Large Rural/Lifestyle Lots (>10,000 m ²)	20,000 l/lot	Dual Occupancy	2,500 l/unit	Townhouse/Unit Style (eg Flats)	5,000 l/unit up to 20,000 l maximum.	<ul style="list-style-type: none"> ▪ the minimum dedicated water supply required for firefighting purposes for each occupied building excluding drenching systems, is provided in accordance with Table 4.2 (refer to insert on left). ▪ 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. ▪ Gate or Ball valve and pipes are adequate for water flow and are metal rather than plastic. ▪ 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. ▪ 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. ▪ all above ground water pipes external to the building are metal including and up to any taps. Pumps are shielded.
Development type	Water requirement												
Residential Lots (<1,000m ²)	5,000 l/lot												
Rural-residential Lots (1,000 – 10,000m ²)	10,000 l/lot												
Large Rural/Lifestyle Lots (>10,000 m ²)	20,000 l/lot												
Dual Occupancy	2,500 l/unit												
Townhouse/Unit Style (eg Flats)	5,000 l/unit up to 20,000 l maximum.												

Performance Criteria	Acceptable Solutions
Electricity Services <ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> where practicable, electrical transmission lines are underground. where overhead electrical transmission lines are proposed: <ul style="list-style-type: none"> 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).
Gas services <ul style="list-style-type: none"> location of gas services will not lead to ignition of surrounding bushland or the fabric of buildings 	<ul style="list-style-type: none"> reticulated or bottled gas is installed and maintained in accordance with AS 1596 and the requirements of relevant authorities. Metal piping is to be used. 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. 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. polymer sheathed flexible gas supply lines to gas meters adjacent to buildings are not used.

3.5 Landscaping & Fuel Management

All future landscaping on the site should be designed and managed to minimise impact of bushfire based on the principles set out in PBP (2006) being:

- Prevent flame contact / direct ignition on the dwelling;
- Provide a defensible space for property protection;
- Reduce fire spread;
- Deflect and filter embers;
- Provide shelter from radiant heat; and
- Reduce wind speed.

In this manner, consideration should be given to species selection, planting location, flammability and size at maturity to ensure discontinuous canopy/ structure both vertically and horizontally to ensure the above principles are met.

Ongoing fuel management across the site including existing managed areas and temporary APZs will be undertaken by Huntlee. The maintenance regime should give due consideration to the RFS Standards for Asset Protection Zones (2005) which provides guidance on maintenance activities to assist in achieving the landscape principles.

3.6 Emergency Management

Any fire within the site would be attended in the first instance by the Cessnock branch of the NSW Fire Brigade and/or the Rothbury and North Rothbury Rural Fire Brigade.

To assist emergency response from the NSW RFS and/or NSW Fire and Rescue, site access is to comply with the provisions set out in PBP (2006) and all tanks including connection points be readily accessible and clearly marked. If pumps are to be made available, they must be regularly maintained and in good working order.

3.7 Appraisal for non SFPP or residential development areas on site

The proposal elements that do not strictly trigger the criteria outlined with PBP (2006) for residential and/or SFPP is considered to be the Town Centre. The zoning coupled with intended development type in this area will facilitate commercial type development.

In these instances, section 1.3(b) of PBP states that the provisions under the BCA for fire safety will be accepted for bushfire purposes where the aims and objectives outlined in section 1.1 of PBP (2006) can be met. The broad objectives are listed below and a comment on how they are achieved has been provided in **Table 6** below.

Table 6 Appraisal against Aims & Objectives for non SFPP or residential development areas on site

Objective (PBP 2006)	Comment
(i) afford occupants of any building adequate protection from exposure to a bushfire;	<ul style="list-style-type: none"> DTS APZ and BAL can be provided for uses that trigger the requirements under PBP 2006 and AS 3959-2009. Rear setbacks will be incorporated into future design. Active site management for life of development. Commercial Class Buildings. <p>Application of the provisions set out in PBP (2006) indicate that BAL does not strictly apply to these structures given the separation distance from building classes/ structures requiring application of BAL. Additionally future buildings will be separated by a distance of greater than 6m from a building required to comply with AS3959-2009.</p> <p>Nevertheless, the proposal does acknowledge the bushfire proximate to these structures on site. The proposal provides a combination of bushfire mitigation measures including defendable space, vegetation management, access and circulation, water for firefighting purposes.</p> <p>This objective is satisfied.</p>
(ii) provide for a defendable space to be located around buildings;	<ul style="list-style-type: none"> DTS APZ and BAL can be provided for uses that trigger the requirements under PBP 2006 and AS 3959-2009. Defendable space in the form of managed areas, hardstand (eg roads, concrete/ bitumen pads). Emergency service access to be provided to the rear of lots with adjacent bushfire hazards being both pedestrian and vehicular as required based on distance of travel.

Objective (PBP 2006)	Comment
	<ul style="list-style-type: none"> Provision of water. <p>This objective is satisfied.</p>
(iii) provide appropriate separation between a hazard and buildings which, in combination with other measure, prevent direct flame contact and material ignition;	<ul style="list-style-type: none"> Refer to responses for item (i) and (ii) <p>This objective is satisfied.</p>
(iv) ensure that safe operational assess and egress for emergency service personnel and residents is available;	<ul style="list-style-type: none"> Refer to Section 3.3. The proposal shall provide and maintain appropriate ingress/ egress to site and suitable roads for emergency vehicle access. <p>This objective is satisfied.</p>
(v) provide for ongoing management and maintenance of bushfire protection measures, including fuel loads in the APZ; and	<ul style="list-style-type: none"> Refer to responses for item (i) and (ii) The site will be maintained for the life of development. <p>This objective is satisfied.</p>
(vi) ensure that utility services are adequate to meet the needs of fire fighters (and others assisting in bush fire fighting).	<ul style="list-style-type: none"> Refer to Section 3.4. The proposal will provide adequate water supply throughout the development Power and Gas connections will be in accordance with PBP (2006). <p>This objective is satisfied.</p>

4 Conclusion & Recommendations

MJD Environmental has been engaged by Huntlee Pty Ltd, to prepare a BTA to accompany 75W Modification 9 to Stage 1 of Major Project (MP10_0137) for the Huntlee New Town Residential development, North Rothbury, NSW.

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 (PBP), 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 (BPM) will be appropriate, this assessment adheres to the methodology and procedures outlined in PBP 2006.

This assessment has been made based on the bushfire hazards in and around the site at the time of inspection and production (February & August 2018).

In summary, the following key recommendations have been generated to enable the proposal to comply with PBP (2006) and AS3959-2009.

Town Centre

- APZ of 25m is required from the forest hazard to the north of the Town Centre site for uses that trigger residential APZ setbacks. In the case of a SFPP increased setbacks in accordance with PBP (2006) shall apply.
- An APZ of 10m is required from the riparian corridor to the west.
- An APZ of 10m from the riparian corridor to the east shall be provided as defensible space within the Public Open Space and future detention basin.
- A temporary APZ of 100m will be established to the west and south of the Town Centre.

Retirement Village Site

- APZs of 60m and 20m for the SFPP and residential areas respectively are required from the forest hazard to the north-east.
- An APZ of 10m is required from the woodland hazard to the north.
- APZs of 40m and 10m for the SFPP and residential areas respectively are required from the riparian hazard to the south and west.
- All lands within the development area including Open space outside the nominated riparian corridors will be managed as an APZ.
- The development of sub-stages will occur in a staged fashion. A temporary APZ of 100m or to the Huntlee boundary is required between active or completed development stages and future development areas. Areas of retained vegetation (riparian corridors) shall be maintained in and APZ established in accordance with this BTA.
- 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 as outlined in Chapter 3, Section 3.2 of this report.
- Access is to comply with PBP (2006) as summarised and assessed in Chapter 3, Section 3.3 of this report.
- Services are to be provided and connected to the site in accordance with PBP (2006) as summarised and assessed in Chapter 3, Section 3.4 of this report.

- 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.
- Careful consideration of future site landscaping and ongoing fuel management must occur to minimise the potential impact of bushfire on the site. All lands within the development area including Open space outside the nominated riparian corridors will be managed as an APZ.

MP10_0137 (MOD 8) Area

- Approved APZ and BAL over reconfiguration of subdivision arrangement, previously approved under MP10_0137 (MOD 8) demonstrates consistency with the outcomes of the MOD 8 approval and improved separation from the hazard and opportunity to construct a modest dwelling within BAL-29 or lower exposure at areas to the north-east and south-east of site.

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

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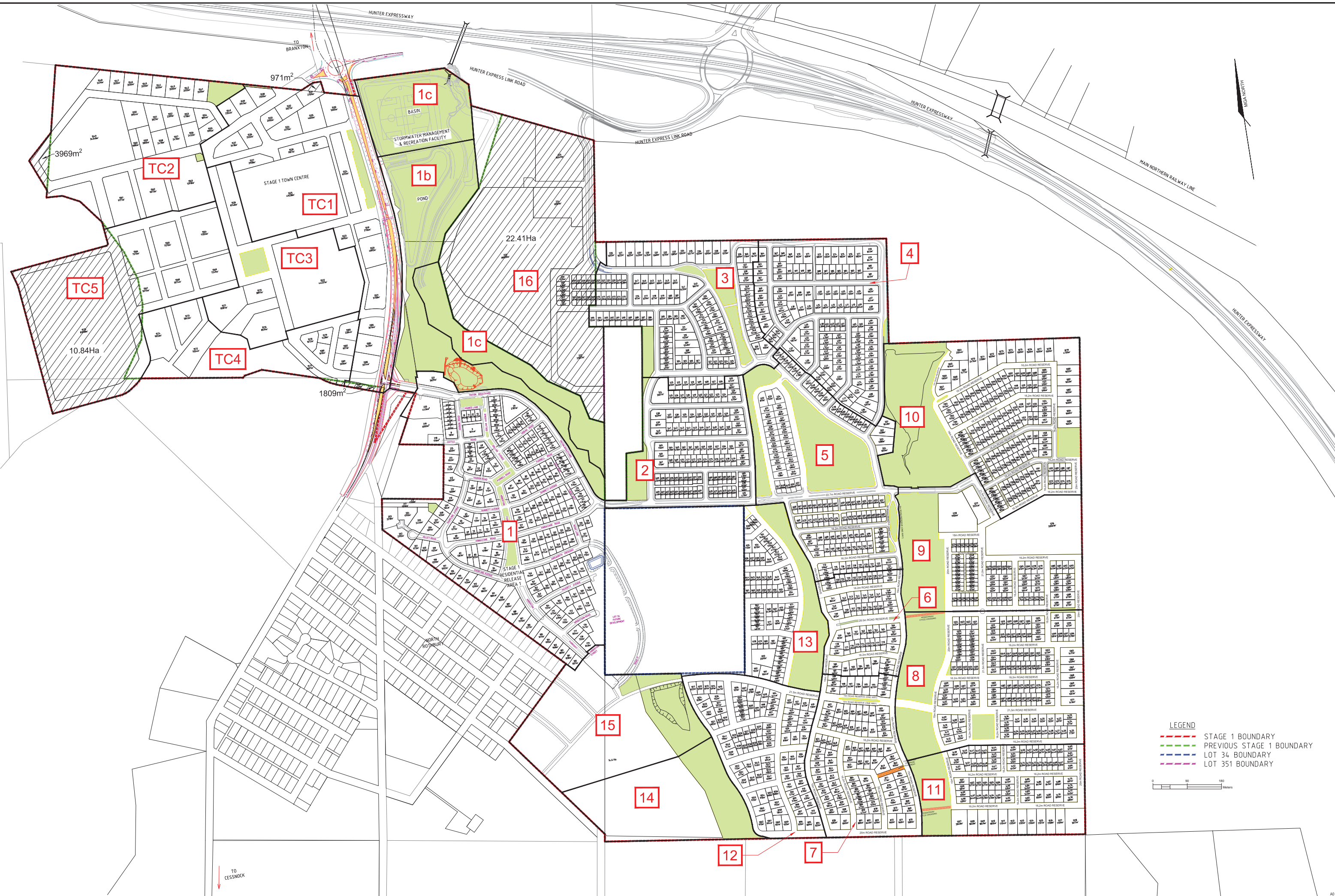
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Appendix A Plan of Proposal



ISSUE	DATE	PURPOSE	ISSUE	DATE	PURPOSE	DRAWING STATUS	COPYRIGHT	CLIENT	SCALE	DRAWING TITLE	PROJECT	CLIENT
(1)	28/09/2017	VARIOUS CLIENT AMENDMENTS	(7)	13/12/2017	ADD LOTS/AMEND BACKGND TC/STG9, AMEND STAGE 1 & SUB-STAGE BOUNDARIES TC	PRELIMINARY REVIEW NOT FOR CONSTRUCTION THIS IS A COLOUR DRAWING AND SHOULD NOT BE REPRODUCED IN BLACK AND WHITE	COPYRIGHT © Daly Smith PTY LTD ABN 81 083 228 880 THE DRAWING IS PREPARED SOLELY FOR THE USE OF THE CONTRACTUAL CUSTOMER OF Daly Smith PTY LTD AND Daly Smith PTY LTD ASSUMES NO LIABILITY TO ANY OTHER PARTY FOR ANY REPRESENTATIONS CONTAINED IN THIS DRAWING.	Huntlee	1:3000	20406-1 TO 3000 (MOD9)	HUNTLEE STAGE 1 - DEVELOPMENT AREA WINE COUNTRY DRIVE, HUNTLEE	HUNTLEE PTY LTD.
(2)	28/09/2017	VARIOUS CLIENT AMENDMENTS	(8)	12/02/2018	AMEND LOT 1451 IN TC1							
(3)	19/10/2017	THICKEN SUB STAGE AND PROJECT BOUNDARIES	(9)	26/06/2018	VARIOUS CHANGES PER MARKUPS FROM GLENN SENT 22/06/2018							
(4)	27/10/2017	AMEND BACKGROUND EXISTING/PROPOSED BOUNDARIES	(10)	29/06/2018	VARIOUS CHANGES PER MARKUPS FROM GLENN SENT 28/06/2018							
(5)	21/11/2017	AMEND VIEWPORT, BACKGROUND & BOY TC, ADD LOTS & GREENSPACE SUBSTAGES 7-13	(11)	20/07/2018	VARIOUS CHANGES PER MARKUPS FROM GLENN SENT BETWEEN 02 - 18/07/2018							
(6)	22/11/2017	ADD LOTS SUBSTG 3-4 & RET.VILL., AMEND BACKGND, AMEND/ADD STG1 & SUB STG16 BOY	(12)	16/06/2018	AMEND STAGES 8, 13 & 20, AMEND ROADS & HATCH NEAR RETIREMENT VILLAGE							

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