Bushfire Threat Assessment

Lot 12 DP729973, Lot 36 DP755211 and Lot 37 DP755211 Huntlee Residential Development, Stages 2-5 Eastern Precinct

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/ March 2015

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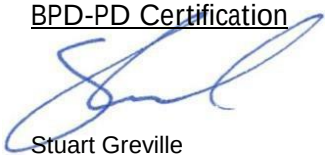
Document Status

Version	Purpose of Document	Orig	Review	Review Date
Draft	Draft for Client Review	LV	SG	17-2-2015
Final	Final for submission	LV	SG/MD	18-2-2015
Final	Final for submission with boundary amendment	MD	MD/SG	10-3-2015

Approval for Issue

Name	Signature	Date
Matt Doherty		10-3-2015

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 Stages 2-5 Eastern Precinct 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 Grasslands 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 (in part) and east of the site between the hazards and proposed development;
- A 25m APZ is recommended to the north (in part) and the north east of the site between the hazards and proposed development;
- A 10m APZ is required between the hazard on Lot 34 and the site;
- Minimum 100m temporary APZs are required to the north west and south on Lot 38;
- 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 (January 2015).

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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Appendix 1 Site Plan
Appendix 2 Overall Huntlee Plan

1.0 Introduction

RPS has been engaged by Huntlee Pty Ltd, to undertake a Bushfire Threat Assessment (BTA) for the Stages 2-5 Eastern Precinct of the Huntlee New town Residential Development, Lot 12 DP729973, Lot 36 DP755211 and Lot 37 DP755211 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	Lot 12 DP729973, Lot 36 DP755211 and Lot 37 DP755211 Huntlee New Town.
LGA	Cessnock City Council.
Area	Stages 2 - 5 Eastern Precinct occupies an area of approximately 47 hectares.
Zoning	The land is currently zoned R1 General Residential under the SEPP (Major Development) 2005.
Boundaries	The site is bordered by a combination of managed rural and farming lands and unmanaged vegetated lands.
Current Land Use	The land is currently cleared and vacant farming land.
Topography	The site gently undulates from east to west with the highest point occurring in the centre 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.

Legend

- Huntlee Stage 1 Boundary
- Site Boundary

N

0 0.5 1
kilometres

SCALE: 1:12,000 AT SIZE A3

TITLE: FIGURE 1: SITE LOCATION
LOCATION: NORTH ROTHBURY
DATUM: GDA 94
PROJECTION: MGA ZONE 56
DATE: 08/01/2015
PURPOSE: BTA
LAYOUT REF: "J:\JOBS\105k\105216 North Rothbury (Huntlee)\10- Drafting\Mapinfo\Bushfire\BTA Figures"
VERSION (PLAN BY): JS (A A3)

CLIENT: HUNTLEE
JOB REF: 105216

RPS AUSTRALIA EAST PTY LTD (ABN 44 140 292 762)
241 DENISON STREET BROADMEADOW PO BOX 428 HAMILTON NSW 2303
T: 02 4940 4200 F: 02 4961 6794 www.rpsgroup.com.au

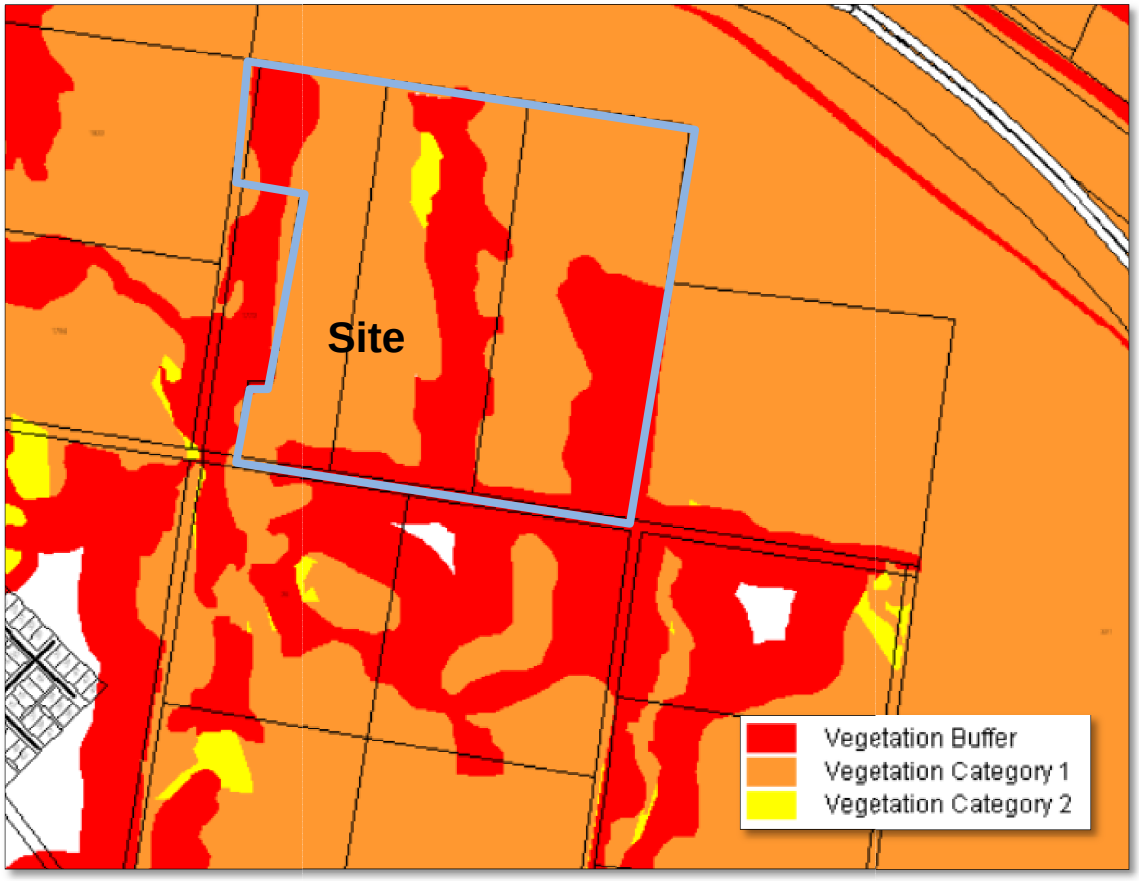

Figure 2 Bushfire Prone Land Map of the Site

1.2 Description of Proposal

The project entails the development of Stages 2-5 Eastern Precinct of Huntlee New Town, including up to 380 residential allotments and the provision of associated infrastructure and services; including a new sports ground.

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;
- On-site vegetation assessment; 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).

2.1.2 Predominant Vegetation Formation

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

Table 1 Vegetation Classification

Direction	Vegetation Description	Classification of Vegetation Formations (PBP 2006)
North	Vegetation	Forest (Hazard)
North East	Vegetation	Forest (Hazard)
East	Riparian Corridor (on Lot 43 DP755211 Huntlee owned lands)	Forest (Hazard)
South	Vegetation (Lot 38 DP755211 Huntlee owned lands and Lot 34 DP755211 privately owned). An unformed Crown Road and an existing access road abuts the southern boundary	Grasslands with scattered trees (Hazard)*
West	Private land with scattered trees on open grazing lands surrounded by existing and/or proposed residential development. No connectivity between vegetation.	Low Hazard
North West	Vegetation (Huntlee owned lands)	Grasslands with scattered trees (Hazard)

*The hazard applies to vegetation within Lots 34 and 38 and not the unformed crown road. Regular vehicular use of the crown road occurs for access to multiple properties in the area, thus prohibiting the growth of most vegetation along the crown road. A low number of scattered trees exist along the border of the crown road but they do not constitute a hazard.

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

Lot 2 DP1129191

Lot 221 DP1064738

Lot 12 DP729973
(Huntlee owned land)

Lot 36 DP755211
(Huntlee owned land)

Lot 351
DP806555

Lot 37 DP755211
(Huntlee owned land)

Lot 43 DP755211
(Huntlee owned land)

Huntlee Stage 1
Residential Development

Lot 7 DP729973

Lot 34 DP755211

Lot 38 DP755211
(Huntlee owned land)

Lot 11 DP729973
(Huntlee owned land)

0 200 400
metres

SCALE: 1:12,000 AT SIZE A3

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Legend

N

Site Boundary
100m Slope Assessment
140m Vegetation Assessment

Vegetation Classification (PBP 2006)

Hazard
- Forest
- Grasslands and scattered trees
- Riparian Zone

No Hazard
- Existing Residential
- Low Hazard Vegetation
- Future Development Area
- Dam
- Unformed Crown Road
- Cadastre
- 60 2m Contour

TITLE:	FIGURE 3: VEGETATION CLASSIFICATION	LOCATION:	NORTH ROTHBURY	DATUM: PROJECTION:	GDA 94 MGA ZONE 56	DATE: PURPOSE:	18/02/2015 BTA
LAYOUT REF: VERSION (PLAN BY):	"J:\JOBS\105k\105216 North Rothbury (Huntlee)\10- Drafting\Mapinfo\Bushfire\BTA Figures" JS (A A3)						

CLIENT: HUNTLEE
JOB REF: 105216

RPS AUSTRALIA EAST PTY LTD (ABN 44 140 292 762)
241 DENISON STREET BROADMEADOW PO BOX 428 HAMILTON NSW 2303
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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.

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	Cross Slope and 0-<5° Downslope
North East	Forest	0-<5° Downslope
East	Forest	Upslope*
South	Grasslands with scattered trees	Cross Slope
North West	Grasslands with scattered trees	Cross Slope

*The primary slope affecting the fire behaviour of the riparian strip (forest) to the east is upslope. An initial minor downslope occurs (approximately 14m maximum) from the western bank into the riparian zone however, the most influential slope affecting fire behaviour that connects to the northern vegetation is upslope.

2.3 Significant Environmental Features

The majority of the site is currently cleared land, however remnant scattered vegetation occurs across the site along with multiple small water bodies. No other significant environmental features such as riparian corridors, SEPP 26 Littoral Rainforest, Koala Habitat, steep lands, land slide or flood prone areas or national parks were recorded on site.

2.4 Significant Threatened Species

A search of the Atlas of NSW Wildlife Database and a Protected Matters Search of the Department of the Environment's online Protected Matters Search tool were conducted on 15th January 2015. These searches include records of threatened species listed under both the NSW *Threatened Species Act 1995* and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*. Although a number of threatened flora and fauna have been recorded within a 10km radius of the site, no threatened flora and fauna records were located within the site boundaries.

2.5 Cultural Significance

A search of The Aboriginal Heritage Information Management System (AHIMS) confirmed that there are no records of culturally significant artefacts on the site or within the surrounding area.

2.6 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 Zone (APZ)	To protection human life, property and highly valued public assets and values.	To enable the safe use of Direct Attack suppression strategies within the zone.	As per RFS document *Standards for Asset Protection 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.

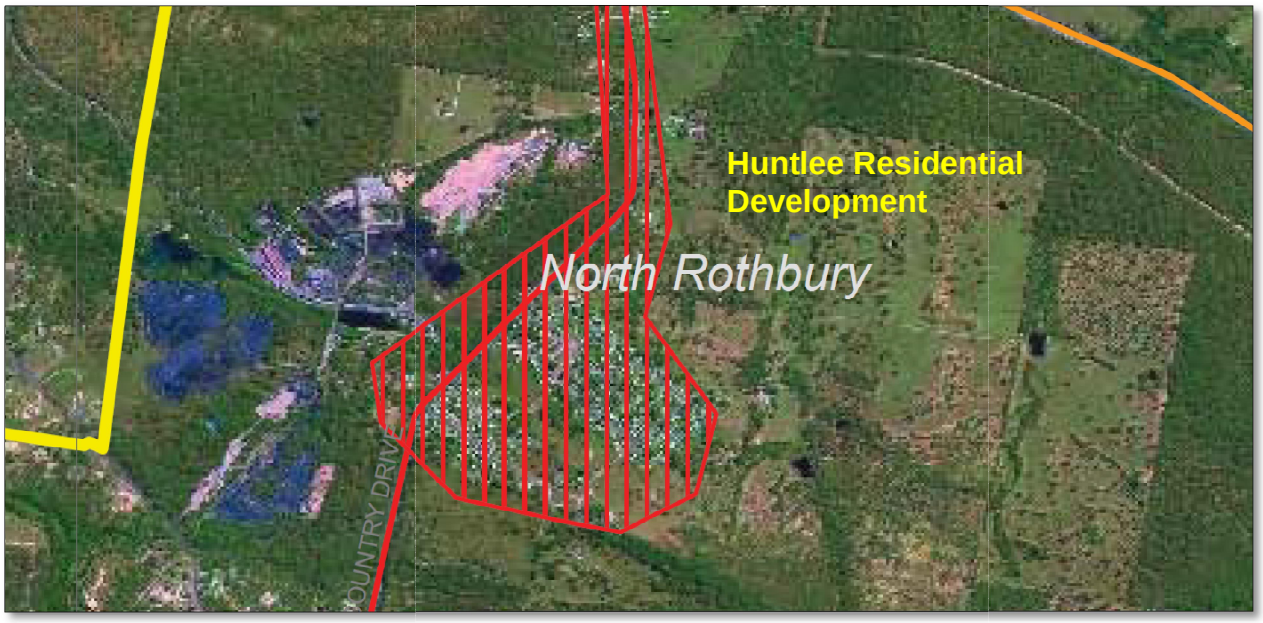


Figure 4 Hunter Bushfire Risk Management Plan

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

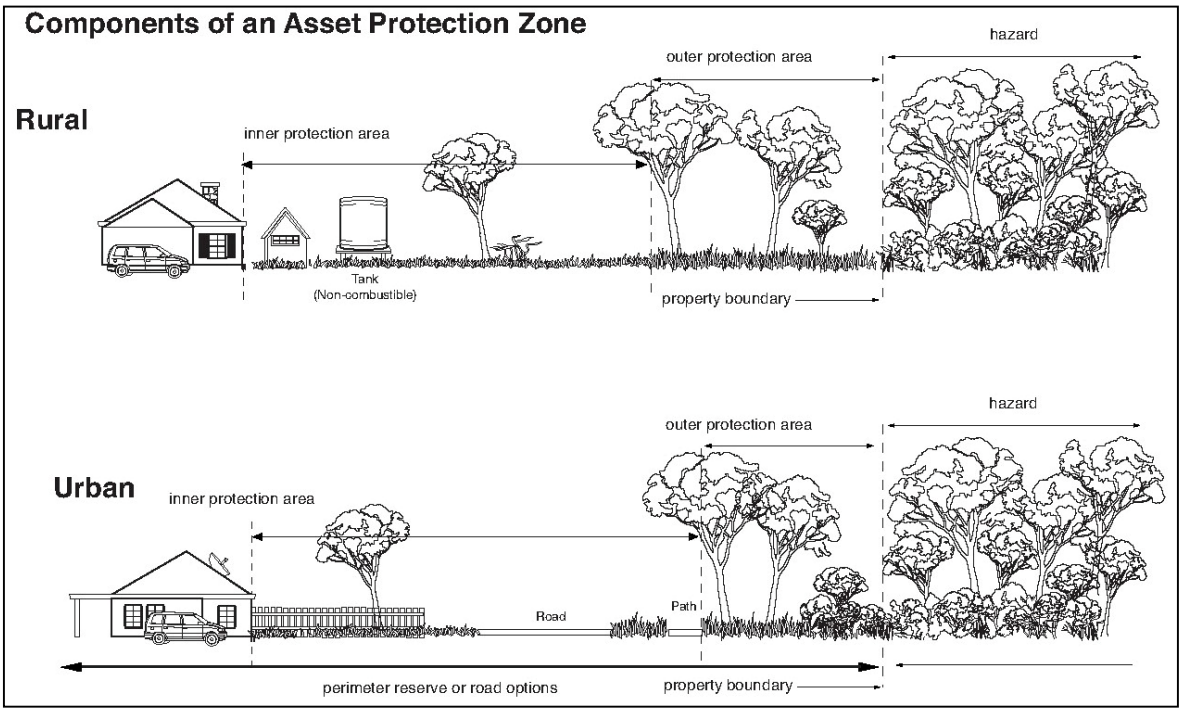
3.0 Bushfire Protection Measures

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

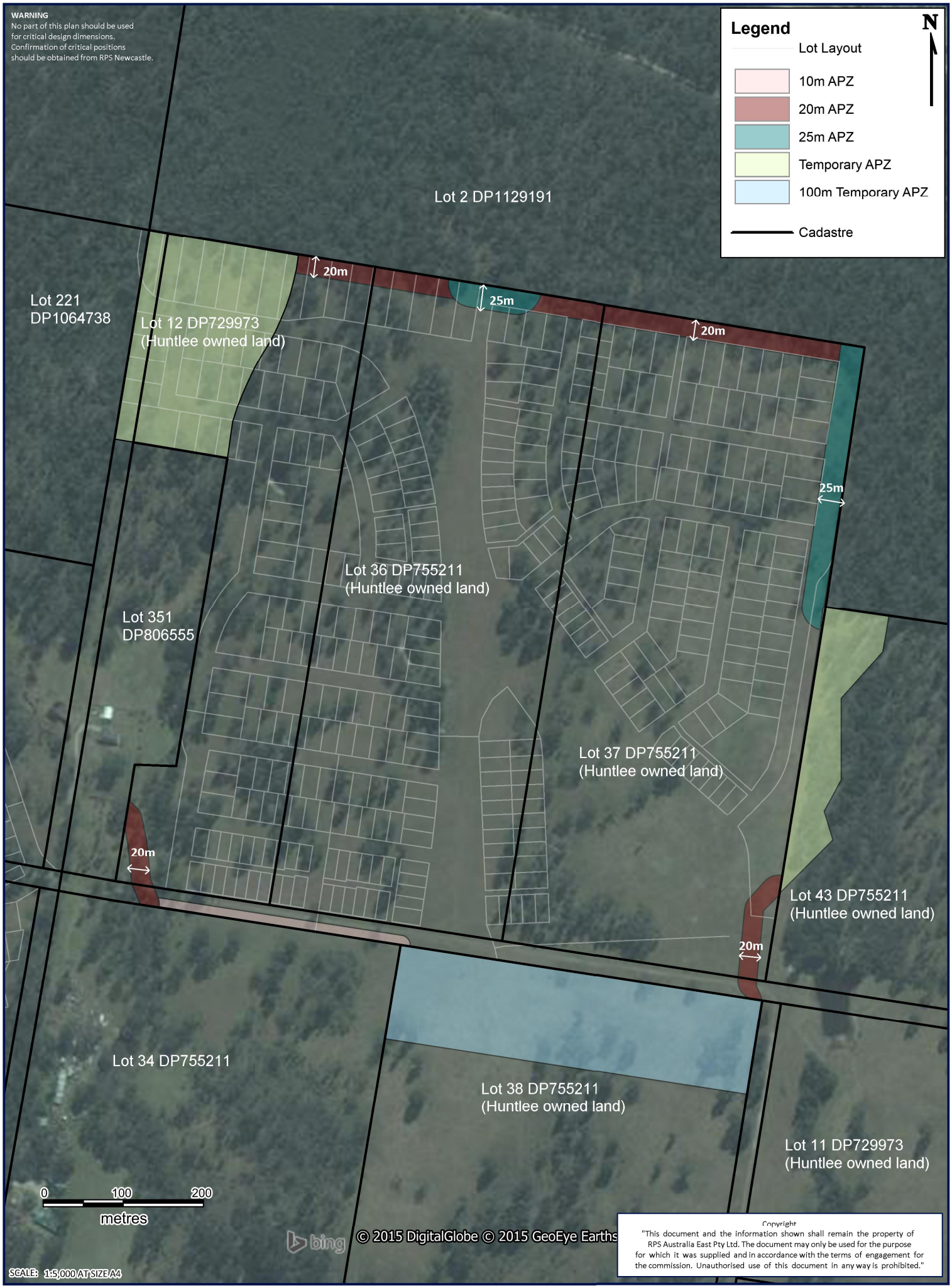
The site lies within the Cessnock LGA and therefore is assessed under a FDI rating of 100. In accordance with Table A2.4 and Table A2.7 within PBP (2006), the appropriate width setbacks have been calculated based on the topography and the vegetation on and around the site. Refer to **Table 5** and **Figure 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)	APZ Provided
North	Forest	Cross Slope	20m	10m IPA + 10m IPA	10m IPA + 10m IPA
North	Forest	0-<5° Downslope	25m	10m IPA + 15m OPA	10m IPA + 15m OPA
North East	Forest	0-<5° Downslope	25m	10m IPA + 15m OPA	10m IPA + 15m OPA
East	Forest	Upslope	20m	10m IPA + 10m IPA	10m IPA + 10m OPA
South (Lot 38)	Grasslands with scattered trees	Cross Slope	10m	NA	Temporary 100m APZ[1]
South (Lot 34)	Grasslands with scattered trees	Cross Slope	10m	NA	20m Low Fuel Zone[2]
North West	Grasslands with scattered trees	Cross Slope	10m	NA	Temporary 100m APZ[1]

1. Lot 38 and land adjacent to the site at the North West is owned by Huntlee. Therefore, a temporary APZ of minimum 100m will be provided at these aspects. This will subsequently negate the requirement for BALs on lots at these aspects as the hazard will be greater than 100m away. Future residential development is proposed for these neighbouring Lots.

2. The unformed crowned road provides a suitable defendable space between the hazard in Lot 34 and the site. As the road is not within the site, it cannot be termed an APZ as the client cannot manage this land. However, given the road's existing use as an access way, it is highly unlikely to revegetate to a state that constitutes a vegetation hazard.



TITLE: FIGURE 6: APZ	LOCATION: HUNTLEE	DATUM: GDA 94 PROJECTION: MGA ZONE 56	DATE: 10/03/2015 PURPOSE: BTA	LAYOUT REF: 'J:\JOBS\105k\105216 North Rothbury (Huntlee)\10- Drafting\Mapinfo' VERSION (PLAN BY): JS/MD (B-A4)

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RPS AUSTRALIA EAST PTY LTD (ABN 44 140 292 762)
241 DENISON STREET BROADMEADOW PO BOX 428 HAMILTON NSW 2303
T: 02 4940 4200 F: 02 4961 6794 www.rpsgroup.com.au

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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.

3.2.1 Bushfire Attack Level for the Proposed Development

Using the Addendum: Appendix 3 (NSW Rural Fire Service, 2010) and the Simplified Procedure (Method 1) of AS3959-2009, 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.

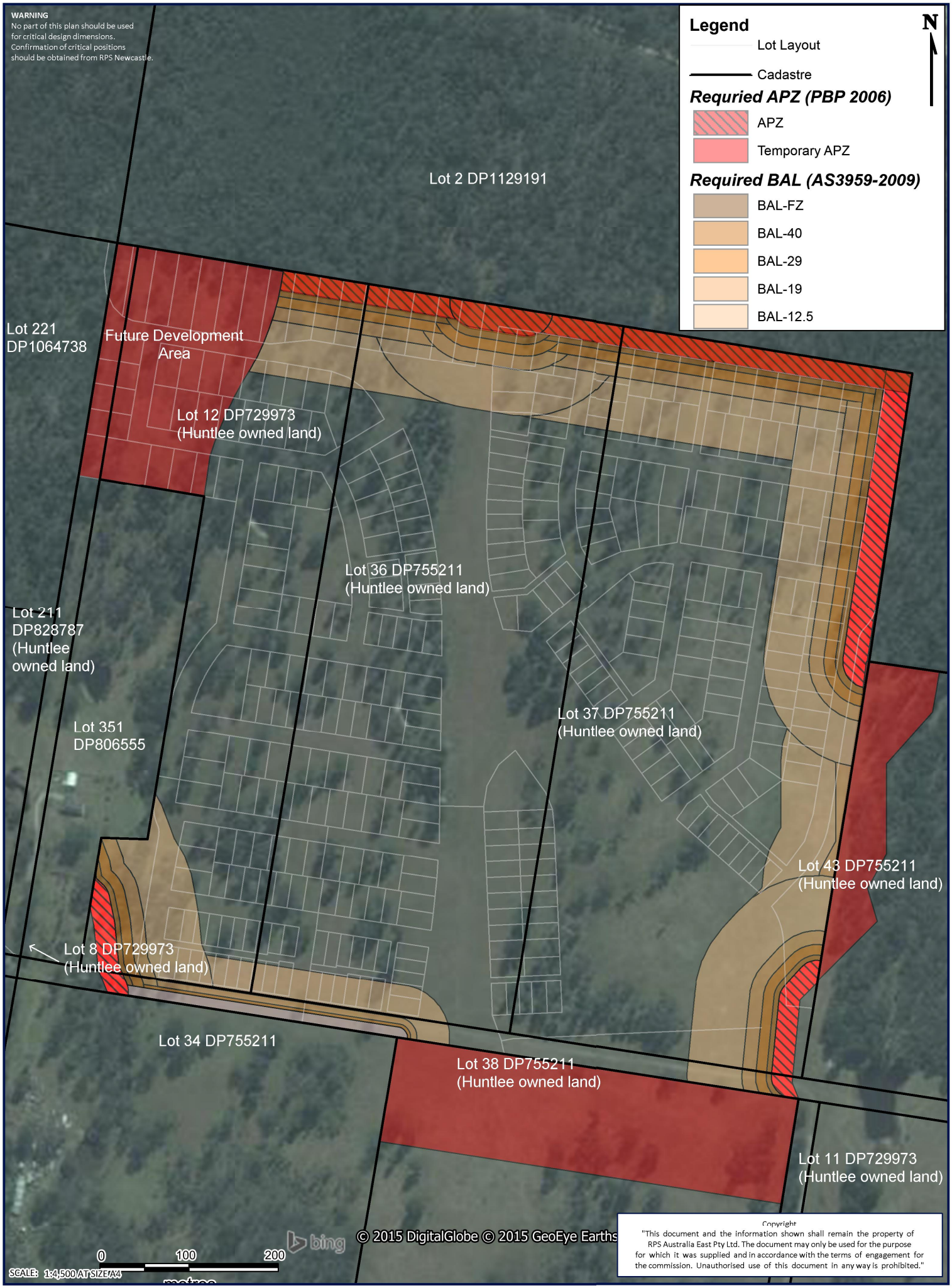
Refer to **Table 6** and **Figure 7** for the BALs calculated for the site.

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	Cross Slope	<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	
North	Forest	0-<5° Downslope	<24m	BAL - FZ	
			24-<32m	BAL – 40	
			32-<43m	BAL – 29	
			43-<57m	BAL – 19	
			57-<100m	BAL – 12.5	
North East	Forest	0-<5° Downslope	<24m	BAL - FZ	
			24-<32m	BAL – 40	
			32-<43m	BAL – 29	
			43-<57m	BAL – 19	
			57-<100m	BAL – 12.5	
East	Forest	Upslope	<19m	BAL - FZ	
			19-<25m	BAL – 40	

Direction of Hazard	Vegetation Classification (PBP 2006)	Slope Class	Separation Distance	BAL	Construction Section (AS3959-2009)
			25-<35m	BAL – 29	
			35-<48m	BAL – 19	
			48-<100m	BAL – 12.5	
South (Lot 34)	Grasslands	Cross Slope	<6m	BAL - FZ	
			6-<9m	BAL – 40	
			9-<13m	BAL – 29	
			13-<19m	BAL – 19	
			19-<50m	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.*



TITLE: FIGURE 7: REQUIRED BALS AS3959-2009	LOCATION: HUNTLEE	DATUM: GDA 94 PROJECTION: MGA ZONE 56	DATE: 10/03/2015 PURPOSE: BTA	LAYOUT REF: 'J:\JOBS\105k\105216 North Rothbury (Huntlee)\10- Drafting\Mapinfo' VERSION (PLAN BY): JS/MD (B A4)

CLIENT: HUNTLEE
JOB REF: 105216

RPS AUSTRALIA EAST PTY LTD (ABN 44 140 292 762)
241 DENISON STREET BROADMEADOW PO BOX 428 HAMILTON NSW 2303
T: 02 4940 4200 F: 02 4961 6794 www.rpsgroup.com.au
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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).

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.

The site will have multiple ingress and egress routes that will ultimately connect to Wine Country Drive to the west.

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

Refer to **Appendix 1** for Proposed Plan of Subdivision showing access.

3.4 Water

Associated with any kind of development upon the land, it is expected that water mains 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.

3.6 Fire Fighting Capability

To facilitate quick and efficient action by the NSW Fire and Rescue and/or the NSW 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. Where stored water tanks exist on site in which fire fighters can utilise in the event of an emergency, the 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.

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 Grasslands 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 (in part) and east of the site between the hazards and proposed development;
- A 25m APZ is recommended to the north (in part) and the north east of the site between the hazards and proposed development;
- A 10m APZ is required between the hazard on Lot 34 and the site;
- 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.
- The road network is to be designed and constructed in accordance with PBP 2006; where possible, 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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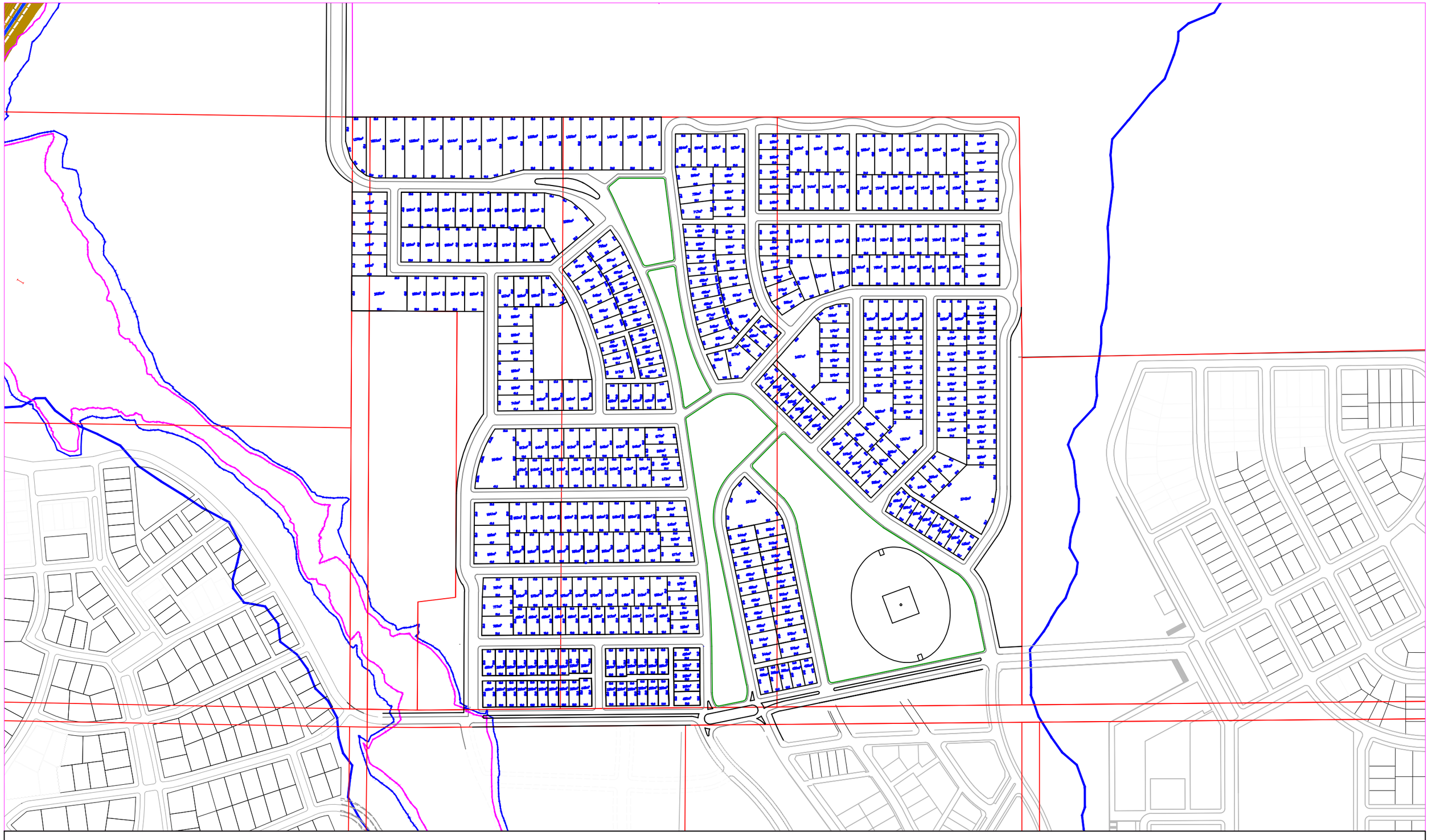
Appendix 1

Site Plan



LWP bringing communities to life

RD great places_

HUNTLEE MASTERPLAN PRECINCT 2 STAGES 2-5

REV	DESCRIPTION	YYMMDD	DRAWN	APPR'D
E	Masterplan refine	150212	EC	AK

N

SCALE 1:4000

SHEET A3

REF NO	DRAW NO	REV
LWP HDD	RD1 309	E

LEGEND

- Boundaries
- Avenue Streets
- Collector Streets (Bus Route)
- Collector Streets (no parking and 1.5m verge)
- Collector Streets (1.5m verge on park side)
- Local Streets
- Local Streets (1.5m verge on park side)
- Local Park Edge Streets
- Local Park Edge Streets (no parking)
- One-way Street (3.5 carriageway and 1.5m verge)
- Pedestrian Path
- Residential Laneway

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HUNTLEE MASTERPLAN PRECINCT 2 STREET HIERARCHY

REV	DESCRIPTION	YYMMDD	DRAWN	APPR'D
H	Masterplan Street Heirarchy	150212	EC	AK

N

SHEET A3
SCALE 1:4000

REF NO LWP HDD
DRAW NO RD1 309