



AUSTRALIAN BUSHFIRE CONSULTING SERVICES



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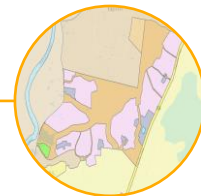
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**BRONZE
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Bush Fire Assessment Report



Concept Development Application for Subdivision
Kings Hill Development Pty Ltd

Kings Hill Urban Release Area

9th November 2018
Revised March 2020
Reference 18-026-5

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Abbreviations:

ABCS	Australian Bushfire Consulting Services Pty Ltd
APZ	Asset Protection Zone
AS3959	Australian Standard 3959 – 2009 including amendments 1-3
BAL	Bushfire Attack Level
BCA	Building Code of Australia
BPMs	Bushfire Protection Measures
BPLM	Bushfire Prone Land Map
Council	Port Stephens Council
DA	Development Application
EP&A Act	Environmental Planning and Assessment Act - 1979
ESD	Ecologically Sustainable Development
FR NSW	Fire & Rescue NSW
IPA	Inner Protection Area
KH URA	Kings Hill Urban Release Area
LGA	Local Government Area
NCC	National Construction Codes
NP	National Park
NSP	Neighbourhood Safer Place
OPA	Outer Protection Area
PBP	Planning for Bushfire Protection
ROW	Right of Way
RF Act	Rural Fires Act - 1997
RFS	NSW Rural Fire Service
SEPP	State Environmental Planning Policy
SFPP	Special Fire Protection Purpose
SWS	Static Water Supply
URA	Urban Release Area

1.0 Introduction.

This report documents the bushfire assessment criteria adopted by a Concept Development Application ('Concept DA') for subdivision involving two properties ('Subject Sites') within the Kings Hill Urban Release Area owned by Kings Hill Developments Pty Ltd. Kings Hill is located within the Port Stephens Council LGA, NSW. The proposed development includes residential, commercial, mixed use and open space areas in precincts bound by environmental corridors. The Concept Plan identifies a site for a future school, roads and infrastructure required to support the development.

The subject sites are subject to the Port Stephens Council Development Control Plan Part D14 Kings Hill – Raymond Terrace. The subject sites are mapped as bushfire prone land and therefore the application of Planning for Bush Fire Protection is relevant to the development proposal. This assessment has been undertaken against the pre-release PBP 2018. The NSW RFS have advised that:

PBP 2006 will continue to remain in force until PBP 2018 is adopted through referencing in relevant legislation and instruments. However, to assist in the interim period, proposals that comply with the requirements of the pre-release edition of PBP 2018 may still be considered.....

During the interim period up to the adoption of PBP 2018, the NSW RFS will assess applications for a BFSa under either PBP 2006 or the pre-release edition of PBP 2018. An assessment to which the proposal conforms with or deviates from either PBP 2006 or the pre-release edition of PBP 2018 will be required to accompany development applications which fall under section 100B of the RF Act

The aims of PBP are to *provide for the protection of human life and minimise impacts on property from the threat of bush fire, while having due regard to development potential, site characteristics and protection of the environment.* This is achieved by determining and applying the required asset protection zones and, where applicable applying the relevant construction requirements, ensuring satisfactory access and egress has been incorporated into the design and providing safe service supply and adequate water provisions for occupants and attending emergency services.

There is a road hierarchy plan included within this assessment however a specific subdivision lot layout is not proposed as part of the Concept DA. Approval to carryout subdivision will be the subject of future Development Applications, and the layout must not be inconsistent with the Concept DA (as approved). Recommendations included within this report ensure that the Concept DA will suitably accommodate asset protection zones in terms of size and location relative to proposed land uses (residential, commercial, environmental and Special Fire Protection Purpose development).

2.0 Property details.

Address: No. 35 Six Mile Road, Kings Hill.
No. 3221 Pacific Highway, Kings Hill.
Lot/DP: Lot 4821 DP 852073
Lot 41 DP 1037411
Zoned: R1 General Residential
E2 Environmental Conservation
B4 Mixed Use
B2 Local Centre
LGA: Port Stephens Council local government area

The two allotments subject to the application are not interconnected, and the properties are separated by No. 3385 Pacific Highway, Kings Hill in the north eastern area. The subject sites have frontage to Six Mile Road to the north, Pacific Highway to the east and New Line Road to the west. The proposed development footprint abuts other sections of the urban release area to the northeast, northwest and south. The urban release area generally abuts rural (RU1 & RU2) properties to the north and west and infrastructure land (SP1 Waste or Resource Management and SP2 Hunter Water) to the south and east.

The development will be generally in accordance with Port Stephens Council Development Control Plan (PSC DCP) Figure DAB *Kings Hill – Raymond Terrace Locality Controls Map*, providing a major road interchange from the Pacific Highway and facilitating an east west road corridor through to New Line Road. The proposed development layout has been driven by the location of environmentally constrained land and creek corridors. New Line Road will remain to the west and is planned to be upgraded as part of the growth of this area.

3.0 Legislative context.

The purpose of this report is to inform a development application to Council. The application is seeking Concept DA approval, with Stage 1 preliminary site preparation works being the only physical works proposed. All subdivision construction works will be subject to future DAs and only in areas where site preparation works have been completed in accordance with biodiversity management requirements.

There are no dwellings proposed within the Concept DA and any future application for the construction of a dwelling will require a separate application as infill development under section 4.14 of the Environmental Planning and Assessment Act 1979 (EP&A Act) or a certificate under section 3.4 as part of approval under SEPP Exempt and Complying Development.

Although buildings and subdivision construction works are not proposed, the proposal is classified as integrated development under s100B of the Rural Fires Act 1997 and therefore applying 4.47 of the Environmental Planning and Assessment Act 1979 Council must refer the application to the NSW RFS seeking a Bushfire Safety Authority (BFSA) from them as part of the development approval process.

Under the integrated development process, the approval authority (in this case the Commissioner of the RFS) is required to provide “general terms” of agreement to the consent authority. If the approval body informs the consent authority that it will not grant an approval, the consent authority may seek changes to the application or request withdrawal of the application, but cannot approve the application without the RFS issuing a BFSA. If the approval body fails to inform the consent authority whether or not it will grant the approval, the consent authority may determine the development application. In general, the approving authority has 40 days upon receipt of the development application and supporting documents in which to determine the matter. A refusal is subject to appeal to the Land and Environment Court. To support an application for a bush fire safety authority, an applicant is required to submit a bush fire assessment in accordance with clause 47 of the Rural Fires Regulation 2013.

Section 100B provides that where a BFSA is required for subdivision, or an SFPP, the development cannot be considered ‘complying development’ under any environmental planning instrument in a bush fire prone area.

4.0 Referenced documents and people.

The following documents have been referenced in the preparation of this report;

- Port Stephens Council Local Environmental Plan 2013,
- Port Stephens Council Development Control Plan 2012,
- Port Stephens Council Bushfire Prone Land Map,
- AS3959 – 2009 Construction of buildings in bushfire prone areas,
- Planning for Bush Fire Protection 2006,
- Pre release Planning for Bush Fire Protection 2018,
- Rural Fires Act 1997
- Rural Fires Regulation 2013
- 10/50 Vegetation Clearing Code of Practice,
- NSW RFS Guide for bush fire prone land mapping V5b Nov 2015,
- Ocean Shores to Desert Dunes – David Andrew Keith 2004,

The plans titled Kings Hill Development Masterplan prepared by Northrop reference DA-08-C1.00 [L], dated 6/12/19, DA-08-C2.00 [N] dated 6.12.19, DA-08-C3.00 Rev [K] dated 2/12/19 & DA-08-C8.00 Rev G 6/12/19 have been reviewed and assessed in the preparation of this report.

5.0 Copyright, scope and disclaimer.

This assessment of possible bushfire impact (including smoke, ember, radiant heat and flame contact) and compliance with matters such as Asset Protection Zones, access and service supply is pertinent to the subject site only. Where reference has been made to the surrounding lands, this report does not assess impact to those lands rather it is an assessment of possible bushfire progression and impact on or from those lands towards the subject site.

Apart from any use permitted under the Copyright Act 1968 no part of this document, including any wording, images, or graphics, can be modified, changed or altered in any way without written permission from Australian Bushfire Consulting Services Pty Ltd. This report may only be referenced, distributed or forwarded to other parties in its original format.

This report has been prepared as a submission document in support of a development application to Council and cannot be relied upon for commencement of works or construction until it has been included within the consent conditions issued by Council as part of the DA determination. **The onus is on the applicant to cross reference this document with any conditions of consent issued by Council or any requirements supplied by the NSW Rural Fire Service following development approval.** I can review and cross reference these documents however the onus is on the applicant / client to provide them to me and request this review.

Where any difference between this document and the development consent (or the NSW Rural Fire Service requirements) is found, the conditions of consent always take precedence until an application to review, amend or vary those conditions is approved.

The statements and opinions contained in this report are given in good faith and in the belief that such statements and opinions are correct and not misleading. AS3959 – 2009 states that “...*there can be no guarantee that a building will survive a bushfire event of every occasion. This is substantially due to the unpredictable nature and behaviour of fire and extreme weather conditions*”. The NSW RFS state “*Homes are not designed to withstand fires in catastrophic conditions*”. Correspondingly any representation, statement of opinion, or advice expressed or implied in this document is made on the basis that Australian Bushfire Consulting Services Pty Ltd is not liable to any person for any damage or loss whatsoever which has occurred or may occur in relation to that person taking or not taking (as the case may be) action in respect of any representation, statement or advice made by Australian Bushfire Consulting Services Pty Ltd.

6.0 Images and maps.

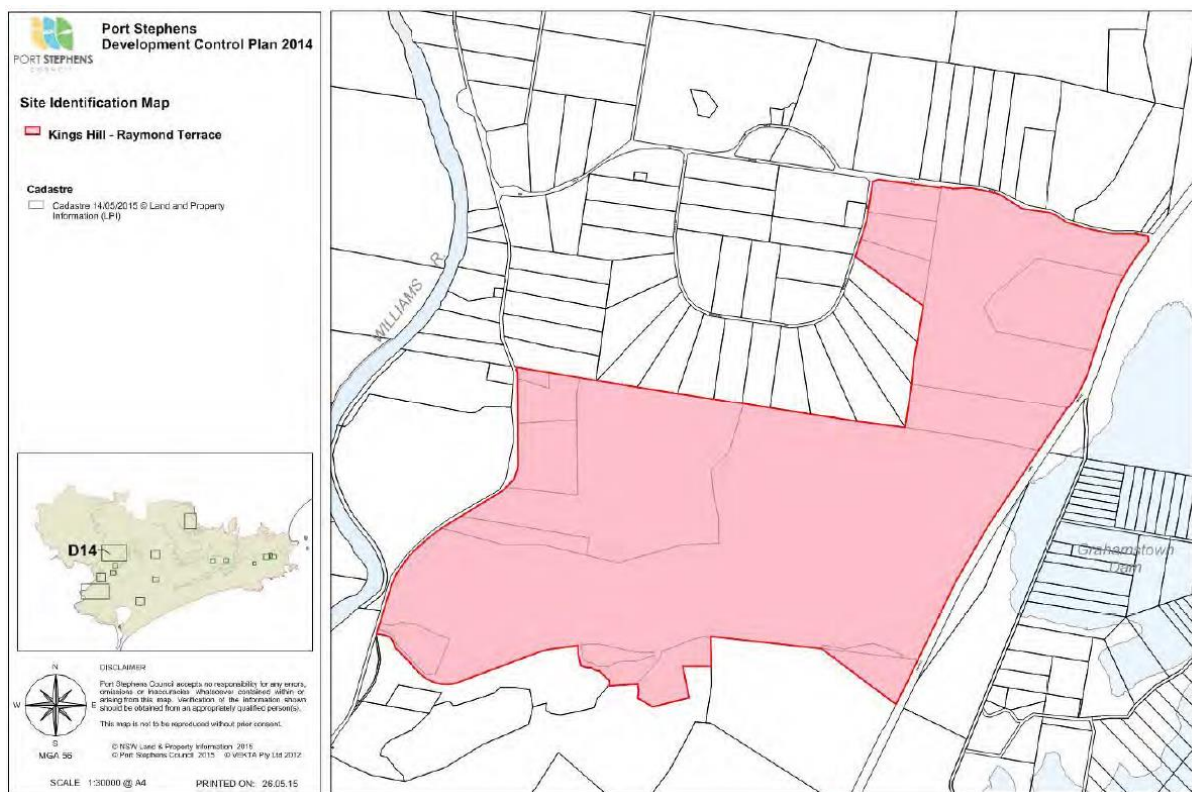


Image 01: Port Stephens Council DCP Figure DAA Land Application Map

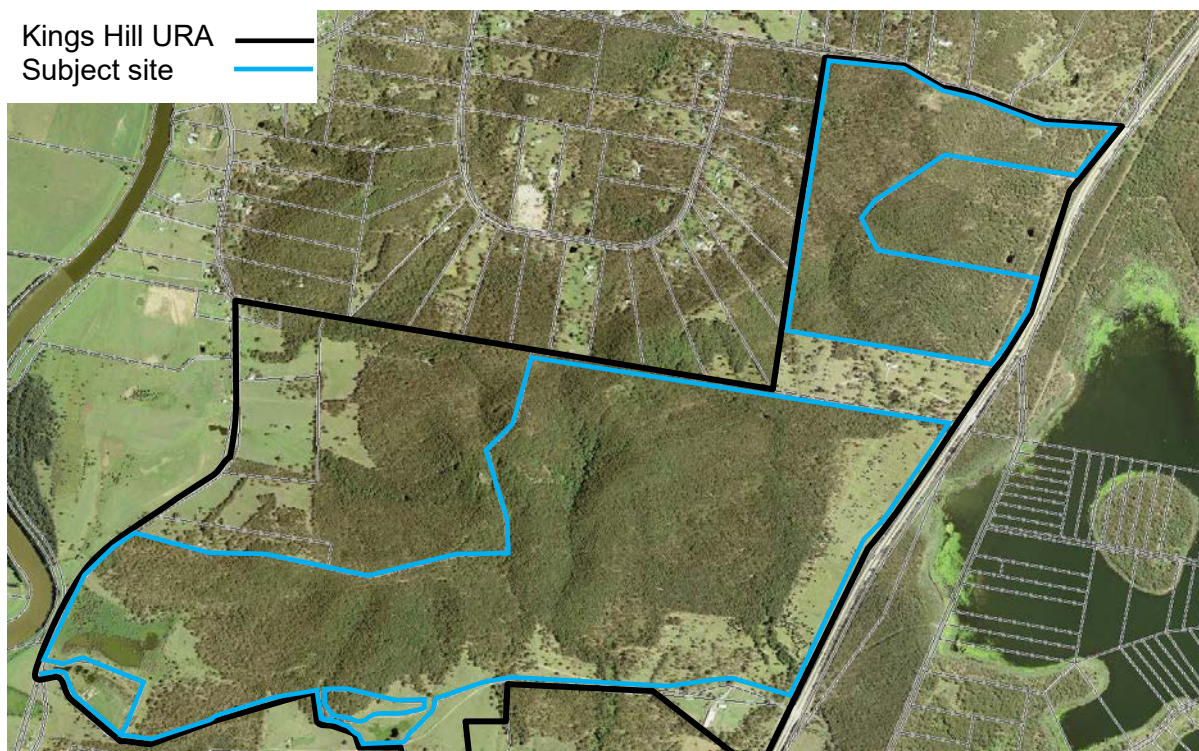


Image 02: Aerial image from NSW Gov. Spatial Services SIX Maps.

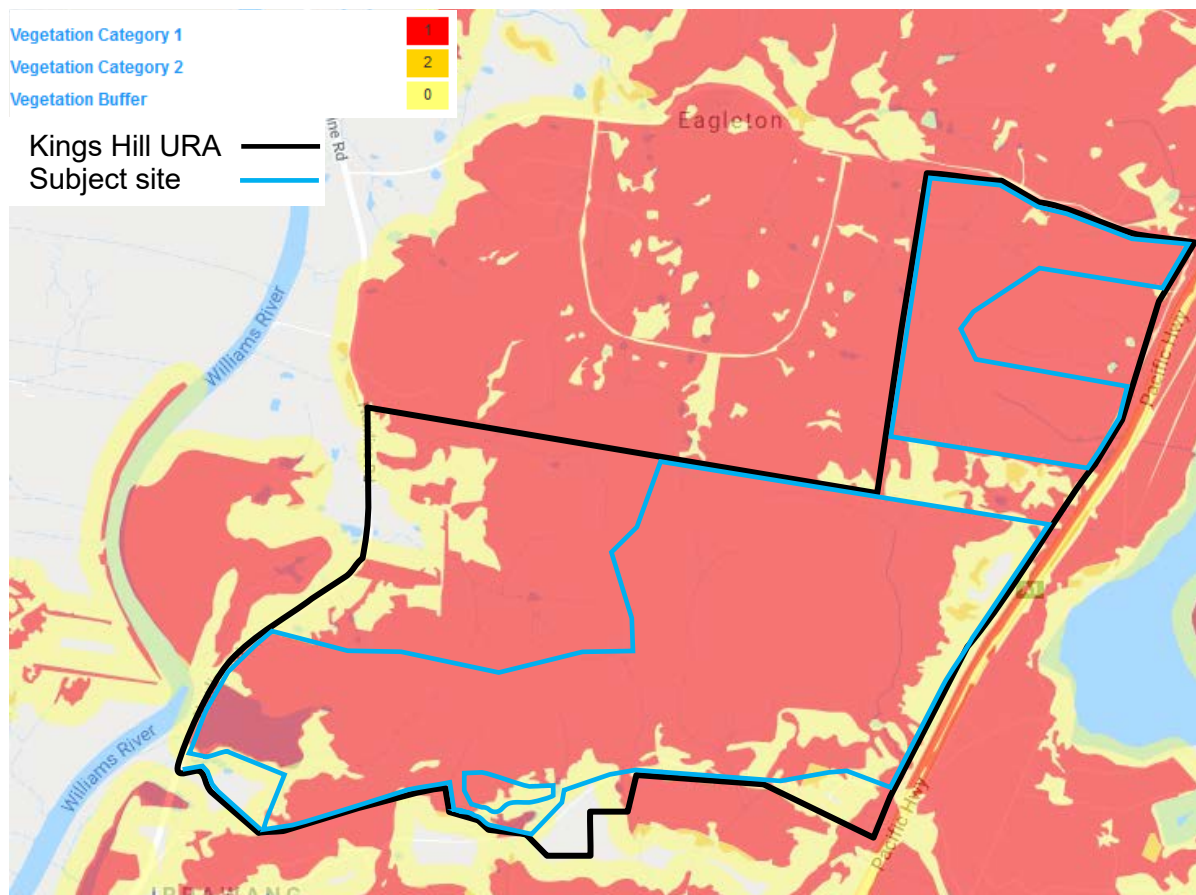


Image 03: Extract from Port Stephens Council's Bushfire Prone Land Map.

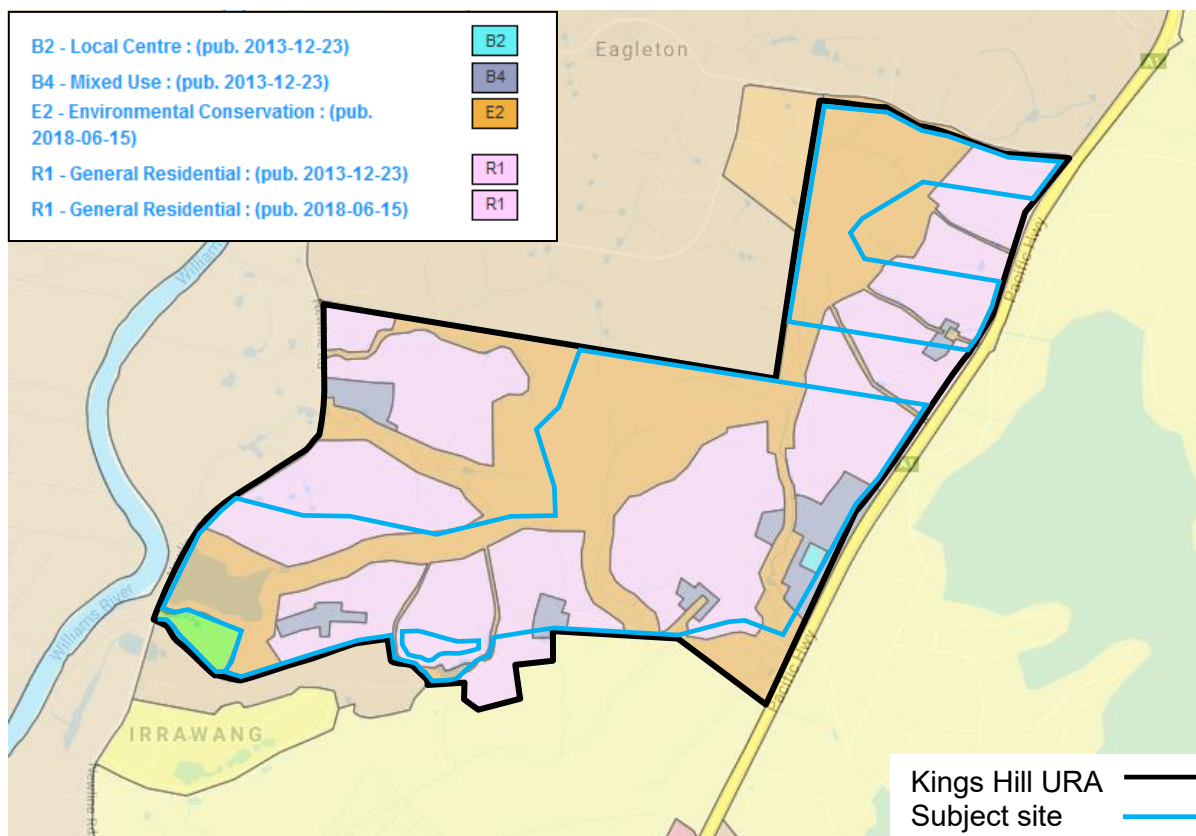


Image 04: Extract from Port Stephens Council's LEP Zone Map.

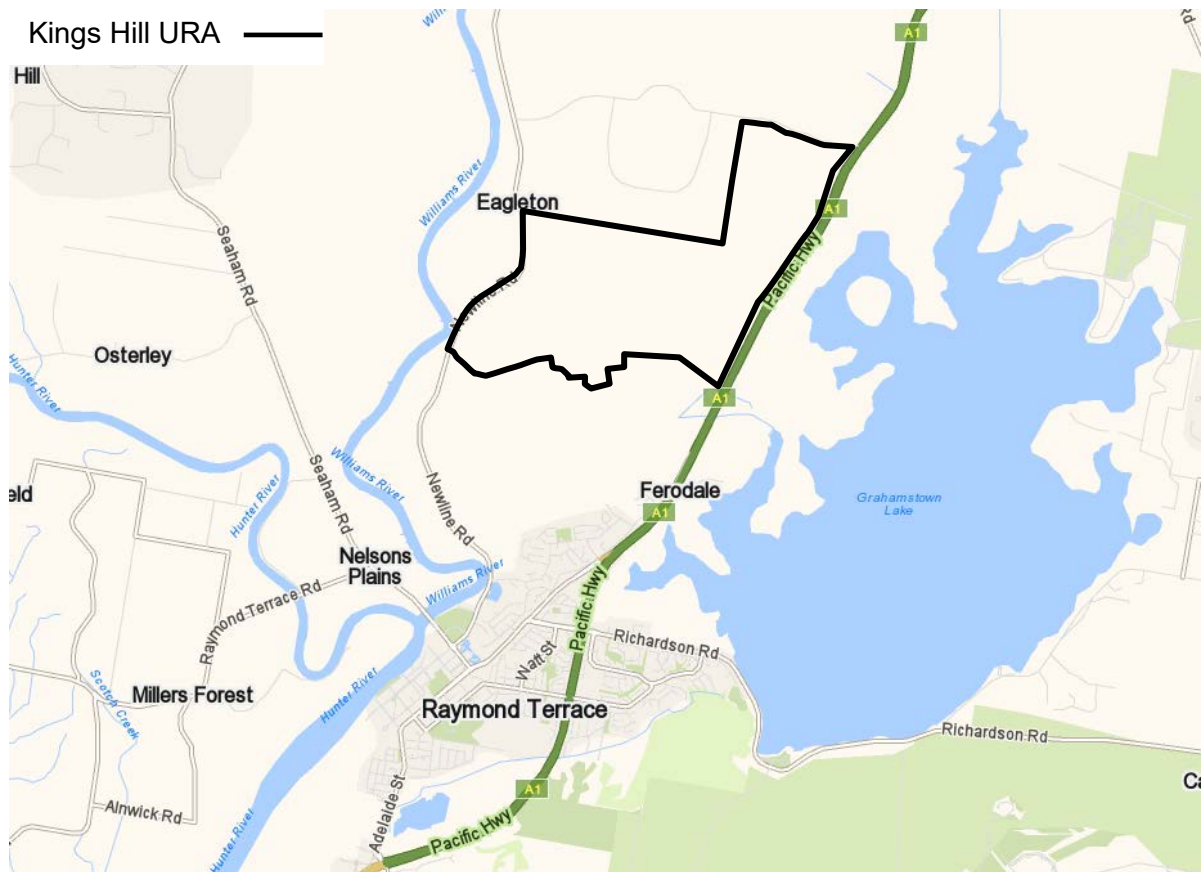


Image 05: Extract from where-is.com.au

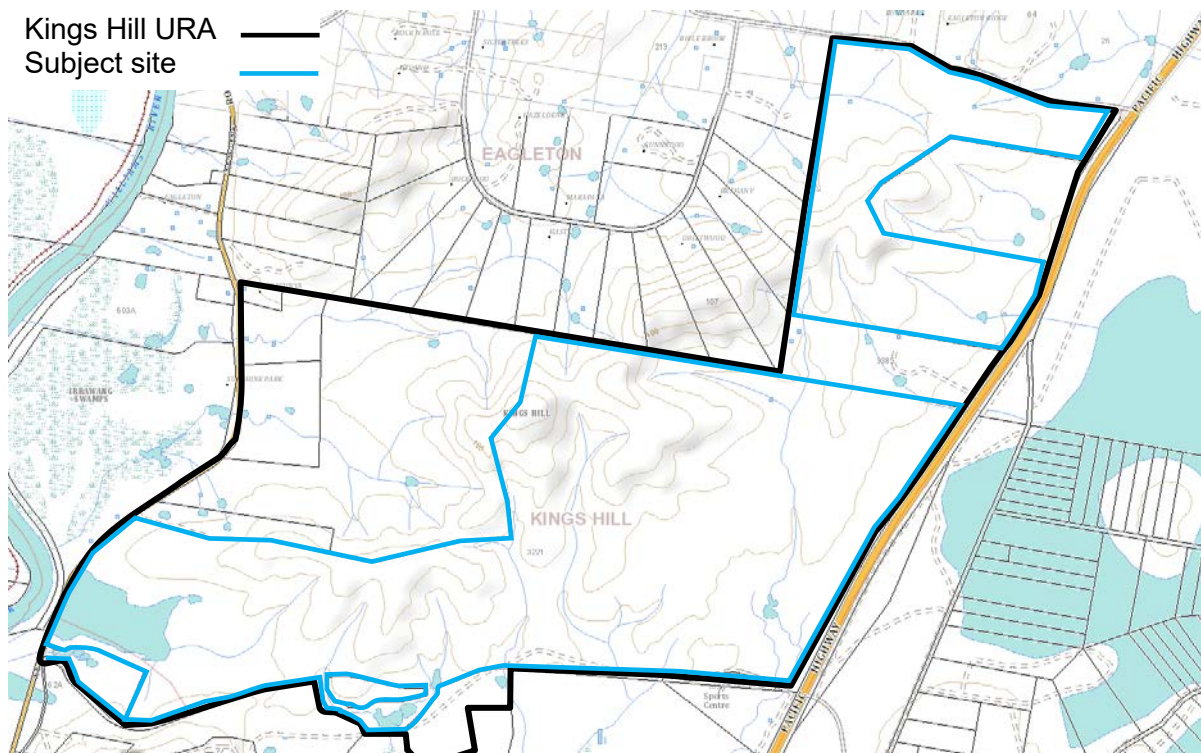


Image 06: Topographic image from NSW Gov. Spatial Services SIX Maps.

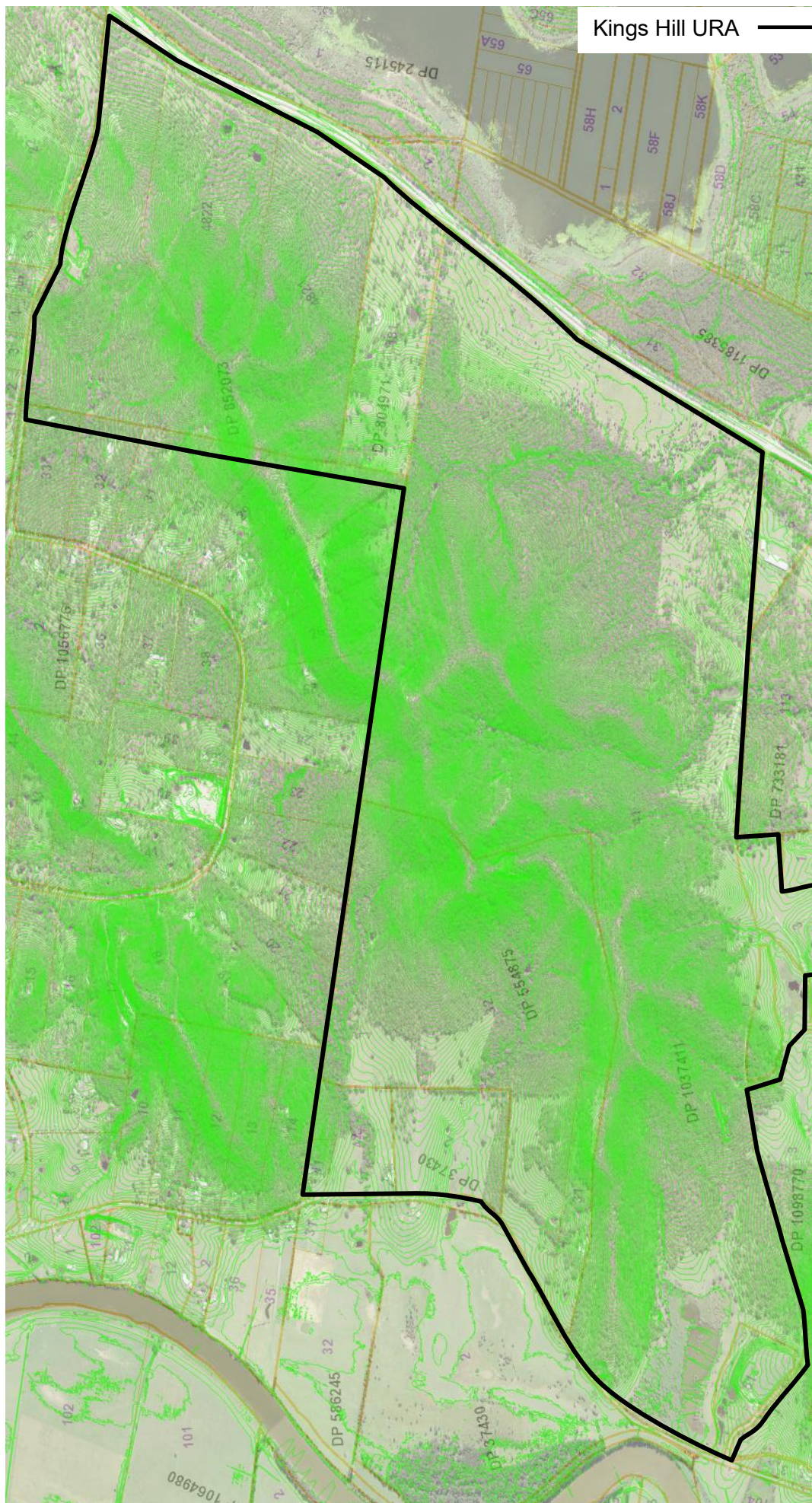


Image 07: Topographic map from Geoscience Australian Elevation Information System (ELVIS)

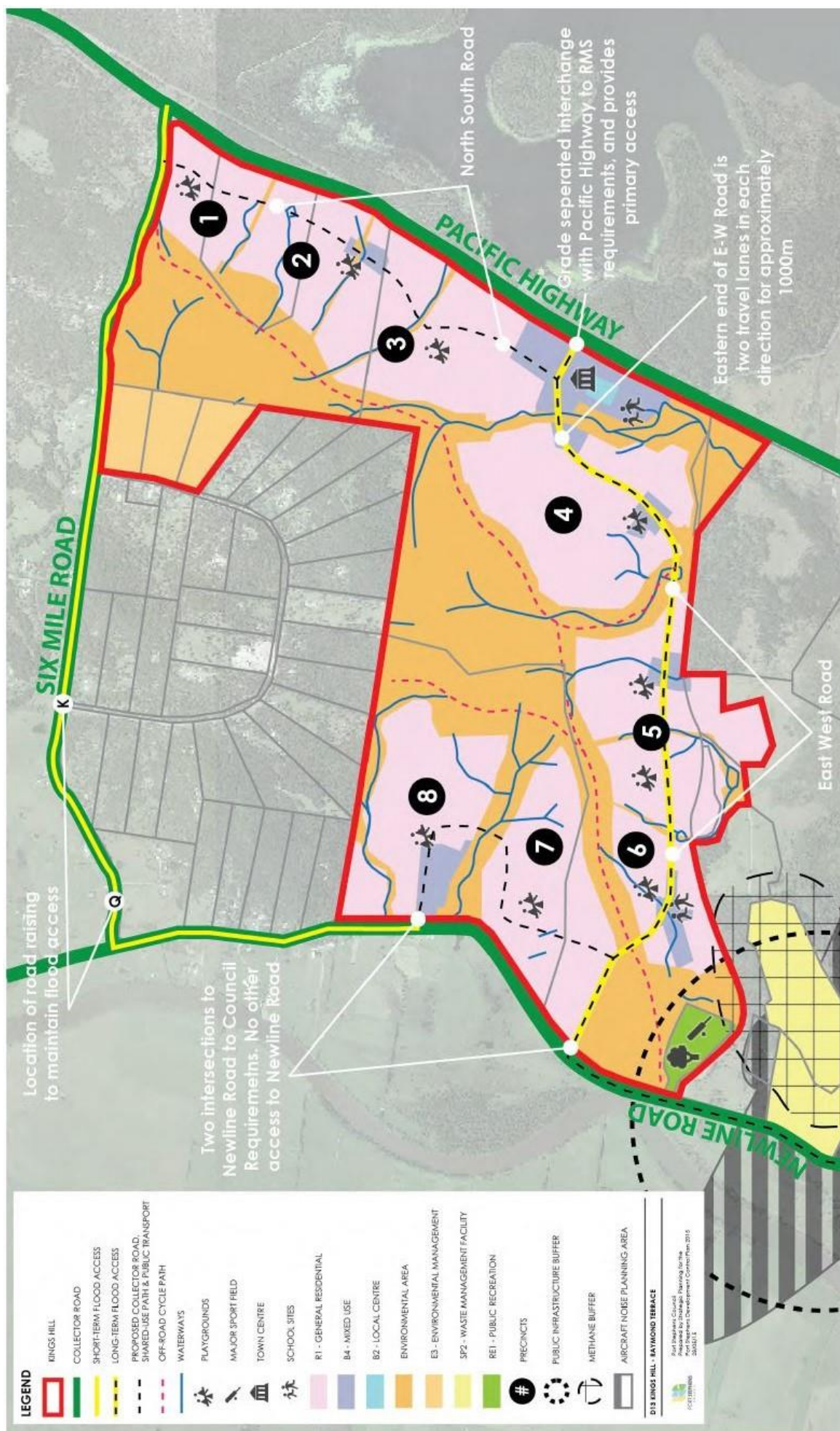


Image 08: Port Stephens Council DCP Figure DAB Kings Hill – Raymond Terrace Locality Controls Map





7.0 Bushfire hazard assessment

Properties considered to be bushfire prone land are identified on Councils Bushfire Prone Land Map as being:

- *within or within 100 m of Category 1 (high) hazards or,*
- *within or within 30 m of Category 2 (low) hazards or,*
- *within or within 30 m of Category 3 (medium) hazards.*

The NSW RFS document PBP – 2006 or 2018 is applicable to all development on bushfire prone land, this includes an assessment of the proposals adequacy in providing an appropriate combination of bushfire protection measures in terms of asset protection zones, landscaping, access and service supply. This document also provides a means of determining the necessary level of building construction under AS3959 - 2009. All integrated development on bushfire prone land must be accompanied with a bushfire hazard assessment that includes;

- description of the property
 - provide Lot No., DP of subject land
 - street address with locality map
 - zoning of subject land and any adjoining lands
 - staging issues, if relevant, and description of the whole proposal;
 - aerial or ground photographs of subject land including contours and existing and proposed cadastre
- the classification of vegetation out to 140 metres from the development
- an assessment of the effective slope to a distance of 100 metres
- identification of any significant environmental features - these could include the presence of:
 - riparian corridors
 - SEPP 14 – Coastal Wetlands
 - SEPP 26 Littoral rainforests
 - SEPP 44 – Koala Habitat
 - areas of geological interest
 - environmental protection zones or steep lands (>180)
 - land slip or flood prone areas
 - national parks estate or various other reserves.
- details of threatened species, populations, endangered ecological communities and critical habitat known to the applicant
- details of Aboriginal heritage known to the applicant
- a bush fire assessment that addresses
 - asset protection zones (including any management arrangements, any easements including those contained on adjoining lands)
 - siting and adequacy of water (in relation to reticulation rates or where dedicated water storage will be required)
 - capacity of public roads (especially perimeter roads and traffic management treatments)
 - whether public roads link to fire trails and have two way access
 - adequacy of access and egress
 - adequacy of maintenance plans (e.g. landscaping) and emergency procedures (especially SFPP developments)
 - construction standards to be used (where non-conformity to the deemed-to-satisfy arrangement is envisaged, which aspects are not intended to conform)
 - adequacy of sprinkler systems (only as an adjunct to other passive controls).
- an assessment of how the development complies with the acceptable solutions, performance requirements and relevant specific objectives within Chapter 4 of PBP.

Councils Bushfire Prone Land Map identifies the subject sites as containing Category 1 and 2 Vegetation and the 100 metre and 30 metre buffer zone from Category 1 and 2 Vegetation and therefore it is appropriate to consider PBP 2006 or PBP 2018.

By incorporating bush fire protection measures into a development, the six objectives of bushfire protection are addressed:

1. *afford occupants of any building adequate protection from exposure to a bush fire*
2. *provide for a defensible space to be located around buildings*
3. *provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent direct flame contact and material ignition*
4. *ensure that safe operational access and egress for emergency service personnel and residents is available*
5. *provide for ongoing management and maintenance of bush fire protection measures, including fuel loads in the asset protection zone (APZ)*
6. *ensure that utility services are adequate to meet the needs of fire fighters (and others assisting in bush fire fighting).*

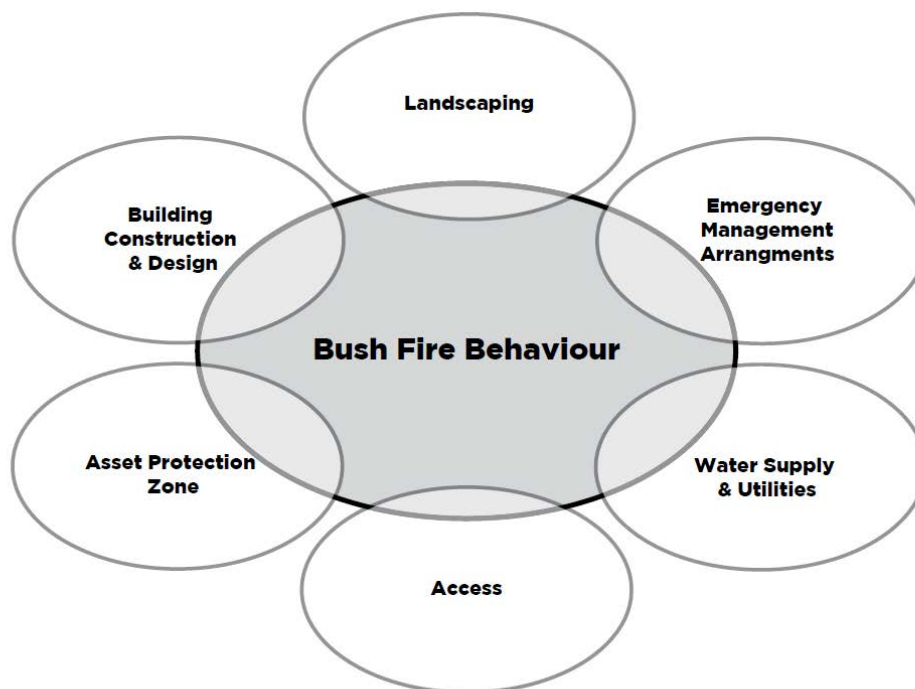


Image 11: Extract from PBP 2018 illustrating bush fire protection measures in combination.

7.1 Site

The Kings Hill Urban Release Area is located within the Greater Hunter region of the east coast of NSW between Raymond Terrace and Eagleton. The two sites subject to this application are No. 35 Six Mile Road, Kings Hill and No. 3221 Pacific Highway, Kings Hill which are separated by No. 3385 Pacific Highway, Kings Hill in the north eastern area of the URA.

No. 35 Six Mile Road, Kings Hill is located at the northern end of the URA and is bounded by Six Mile Road to the north, private rural lifestyle allotments zoned E3 and RU2 to the west, and the Pacific Highway to the east. The allotment to the south is split zoned B4, R1 and E2 however is as yet undeveloped. No. 35 Six Mile Road is a horseshoe shaped property and No. 7 Six Mile Road (which is also part of this URA) is located centrally within the horseshoe area. No. 7 Six Mile Road is also split zoned E2 and R1, is not part of this masterplan, and is yet to be developed.

No. 3221 Pacific Highway, Kings Hill is located at the southern end of the URA and is the larger of the two allotments. The site is approx. 3.4 km wide extending from the Pacific Highway in the east through to New Line Road in the west. The subject site also abuts URA allotments to the north which are split zoned B4, R1 and E2 that are currently undeveloped. To the south of the site are large rural allotments with areas zoned R1, E2 and SP1 Waste or Resource Management and SP2 Hunter Water, with a quarry and a waste depot located adjacent the southwest corner.

The development will be generally in accordance with Port Stephens Council Development Control Plan (PSC DCP) Figure *DAB Kings Hill – Raymond Terrace Locality Controls Map* providing a major road interchange from the Pacific Highway through to New Line Road to the west. The steeper and environmentally constrained land will be retained which is located along the length of the northern boundary of No. 3221 Pacific Highway, and at the western end of this site where a large wetland / lagoon area will be retained within an E2 zoned area.

Riparian corridors are located within both properties, generally in a north south direction inside No. 3221 Pacific Highway and in an east west direction inside No. 35 Six Mile Road. These corridors split the development into defined residential areas which have driven the future staging of the development.

A commercial centre / town centre will be located at the eastern extremity of No. 3221 Pacific Highway. The Concept DA includes a future school site within this property, proposed within the eastern portion of the site adjacent a creek, a proposed outdoor open recreation area, and a sports oval. The proposed school site is located where residential development provides a large asset protection zone from the typical fire path aspects to the north and west and is of sufficient size that APZs compliant with PBP can be provided from the eastern creek line. Access to the school site is from either direction along the proposed main east west arterial road.



Photograph 01: View north into No. 3221 Pacific Hwy from the southeast area of the subject site



Photograph 02: View east along the northern boundary of No. 3221 Pacific Highway



Photograph 03: View west within the south-western parts of Precinct 4

7.2 Vegetation

Asset Protection Zones are a function of slope and vegetation types. Post subdivision the bushfire hazardous vegetation *within the sites* will consist of generally only two vegetation communities (and only one around the proposed school). This includes forest within the E2 zoned areas and wetland within the western part of the site. Forest has also been assumed within the E2 zoned area west of Precinct 6 (and east of the wetland / lagoon area).

Where the forest is retained as narrow corridors along creek lines forming a “riparian zone” less than 20 metres wide either side of a creek and / or where the vegetation provides a less than 50 metre fire run directly towards the development areas the hazard has been downgraded to “remnant” vegetation. Where remnant vegetation is identified the asset protection zones applied are the same as for rainforests.

Grassland areas have been identified adjacent the subject site to the south of Precincts 4 and 5 and to the north and west of Precinct 7.

Woodland and forest areas have been identified within No. 3385 Pacific Highway, Kings Hill that lies between Precinct 2 and 3 and also north of Precinct 1 within No. 26 Six Mile Road Eagleton.



Photograph 04: View west within the large environmental corridor between Precincts 2 & 3



Photograph 05: View north adjacent a riparian corridor within Precinct 5



Photograph 06: View west of the wetland and lagoon area west of Precinct 4



Photograph 05: View west from Pacific Hwy into No. 3385 Pacific Hwy, Kings Hill between Precincts 2 & 3



Photograph 05: View north from Six Mile Road into No. 26 Six Mile Rod Eagleton, north of Precinct 1

7.3 Topography

The slope must be assessed over a distance of at least 100 m from the existing property boundary (or proposed building footprint) towards the various vegetation communities constituting the hazard. In assessing the slope, it may be found that there are a variety of slopes covering different distances. The gradient within the hazard (vegetation) which will most significantly influence the fire behaviour must be determined.

The slope was determined by 1 metre contour topographic mapping and then verified in numerous locations onsite using an inclinometer. Where remnant vegetation has been identified PBP 2018 requires that the effective slope is to be determined under the remnant that provides the most significant bush fire behaviour. Recent discussions with the NSW RFS infer this to be the slope within the vegetation in a direct line towards the subject site, and as such the slopes perpendicular to the development areas into the remnant vegetation have been applied.

Slope and vegetation mapping is attached to this report and the following overlay summarises the assessment.

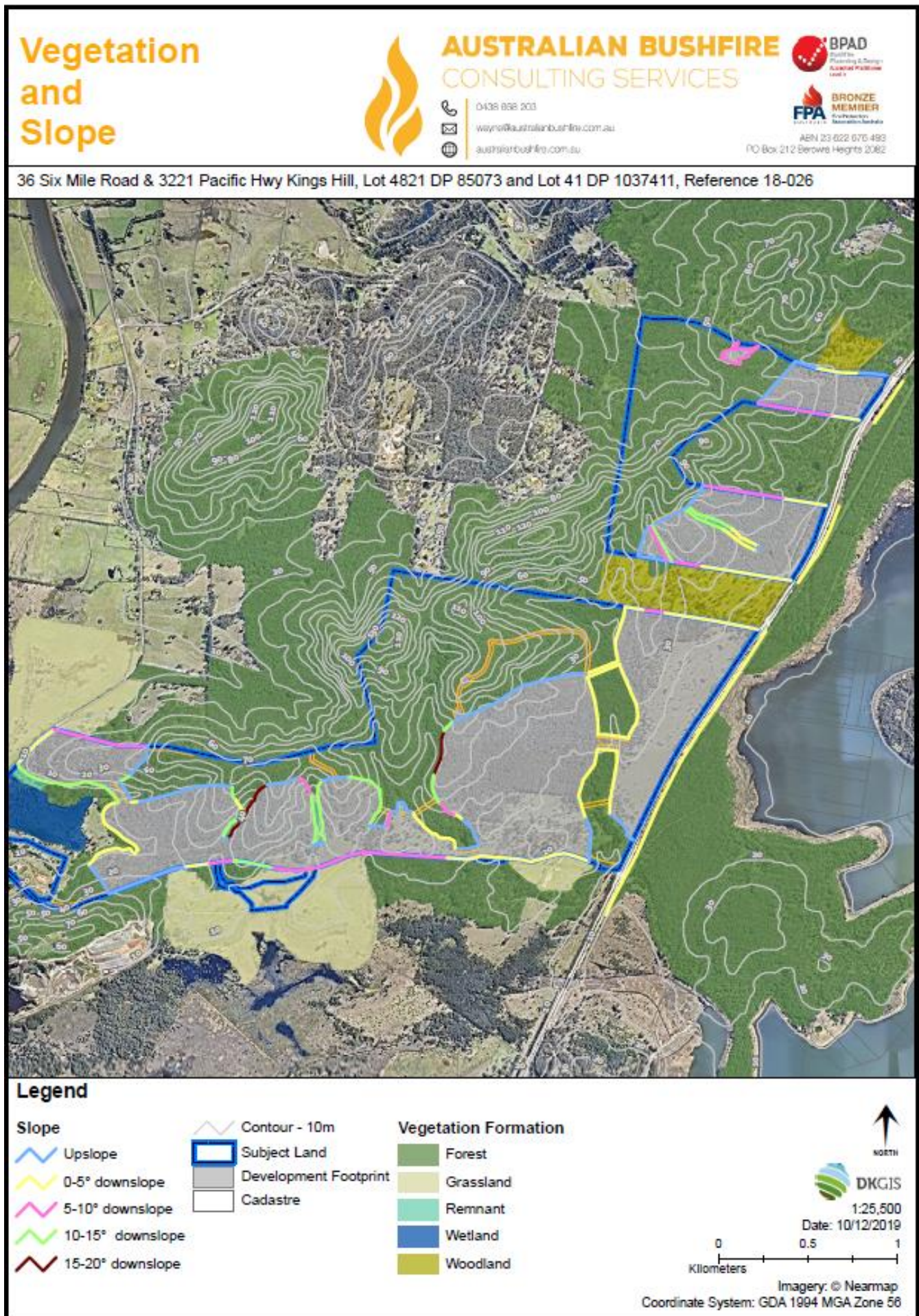


Image 12: Vegetation and Slope assessment plan.

7.4 Asset Protection Zones

An Asset Protection Zone (APZ) is a buffer zone between a bush fire hazard and buildings, which is managed progressively to minimise fuel loads and reduce potential radiant heat levels, flame, ember and smoke attack. A fuel-reduced, physical separation between buildings and bush fire hazards is the key element in the suite of bushfire protection measures. Minimum APZs for residential and Special Fire Protection Purpose Development (e.g. schools) are determined under PBP and must be such that, during a bushfire event, a building footprint is not exposed to greater than 29 k/Wm² (residential) or 10 k/Wm² (special fire protection purpose development). APZs can be determined from either deemed to satisfy tables within PBP or by alternate solutions using bushfire design fire modelling.

The APZ for residential and SFPP development have been applied from the following tables which have been derived from Appendix 1 of PBP 2018. Slight variations, (reductions) in APZ, may be applied using design fire modelling when each future precinct is lodged and assessed at a more micro level scale. In accordance with section 8.4 of PBP 2018 the provisions within Chapter 7 of that document should be used as a base for the development of commercial and industrial development and therefore APZs has also been provided to the commercial area and town centre in accordance with Appendix 1 of PBP 2018.

Note: The APZ detailed below are based on a draft document (pre-release BP 2018). Minor variations may occur in the final PBP 2019 when it is published.

Residential & commercial.

	EFFECTIVE SLOPE				
	Up slopes and flat	>0°-5°	>5°-10°	>10°-15°	>15°-20°
KEITH VEGETATION FORMATION	Distance (m) from the asset to the predominant vegetation formation				
Rainforest (or remnant forest vegetation)	11	14	18	23	30
Forest (Shrubby and Grassy)	24	29	37	45	57
Woodland	12	16	20	25	32
Grassland	10	12	13	15	17

Special Fire Protection Purpose Development (School).

	EFFECTIVE SLOPE				
	Up slopes and flat	>0°-5°	>5°-10°	>10°-15°	>15°-20°
KEITH VEGETATION FORMATION	Distance (m) from the asset to the predominant vegetation formation				
Rainforest (or remnant forest vegetation)	38	47	57	69	81
Forest (Shrubby and Grassy)	67	79	93	100	100

Allowable outer protection areas, in metres, within an APZ for forest vegetation (metres)

	EFFECTIVE SLOPE				
	Up slopes and flat	>0°-5°	>5°-10°	>10°-15°	>15°-20°
Residential development	10	10	15	20	25
Special Fire Protection Purpose Development (Schools)	20	25	25	25	15

Assessment summary table Precinct 4 School site.

Aspect	North	East	West	South
Vegetation Structure	n/a Precinct 4 residential release area	Forest	n/a Precinct 4 residential release area	n/a Precinct 4 residential release area
Slope	n/a	0-5° downslope slope	n/a	n/a
Asset Protection Zone	n/a	79 metres	n/a	n/a
Features that may mitigate the impact bush fire on the proposed development.	<p>The adjacent park to the northeast is a proposed sports oval and outdoor recreational area and all land within that park is to be managed as an asset protection zone. Between the oval and the school site is a first order stream and all land along the creek between the school and the oval is also to be maintained as an asset protection zone.</p> <p>The forest to the east is within a main north / south environmental corridor. Post development of the commercial centre this corridor will have a restricted fire development area of approx. 110 metres. Within the vegetation corridor there is also small wetlands / dams and forested wetland patches however forest has been applied uniformly from the hazard interface.</p>			
Noteworthy landform & environmental features.	Proposed east / west road corridor / residential development	Asset Protection Zone	Proposed east / west road corridor / residential development	Proposed road / residential development
Threatened Species	By others	By others	By others	By others
Aboriginal Relics	By others	By others	By others	By others
Bushfire Attack Level	BAL 12.5			

An Asset Protection Zone is applied from the edge of unmanaged vegetation. Where areas relied upon as an APZ are dedicated to Council or retained in separate ownership once the developable portions have been excised, then formal management arrangements must be made to ensure the ongoing maintenance of these areas. This is usually applied using *easements* or a *restriction to user* on the title of the allotments.

Components of an Asset Protection Zone

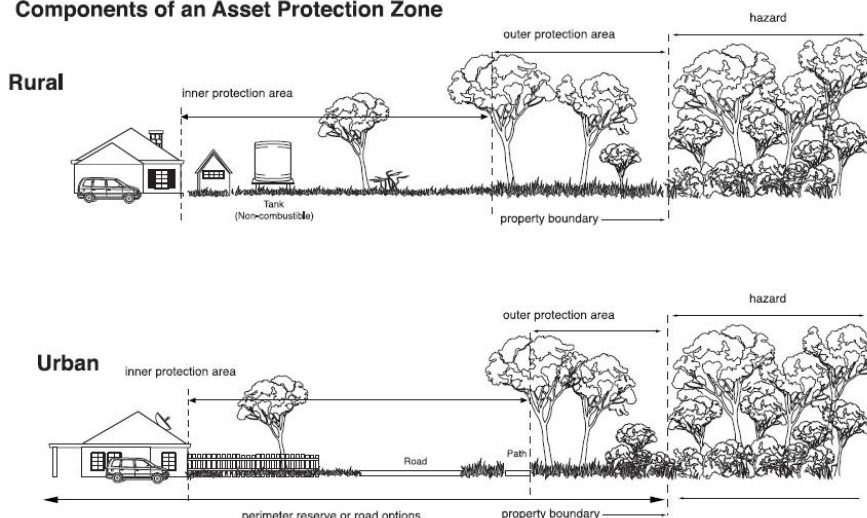
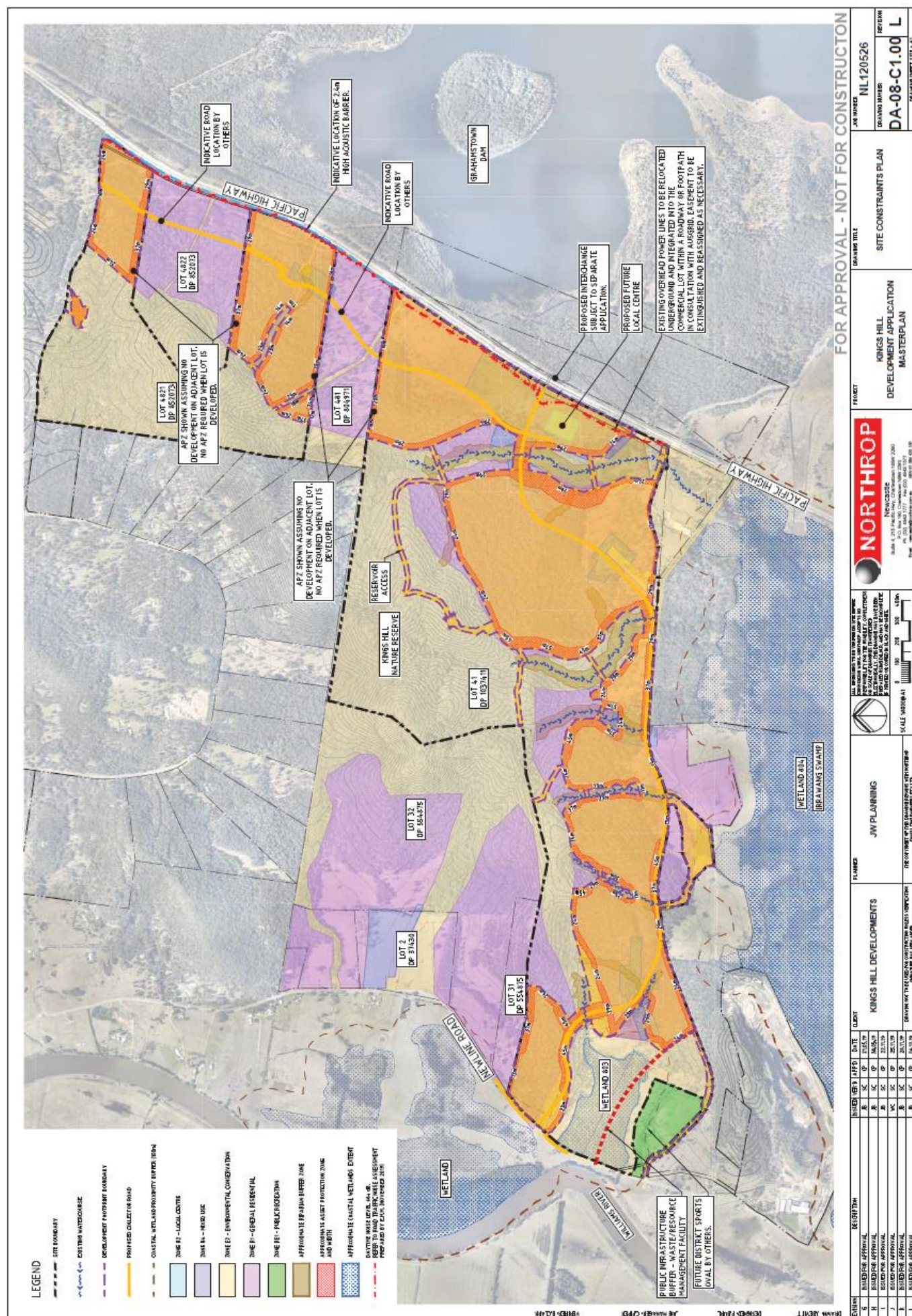


Image 12: Extract from PBP 2006 showing components of an Asset Protection Zone

Asset Protection Zone mapping is attached to this report and the following overlays summarises the assessment. To avoid any doubt, the extent and location of the recommended APZs are outside of the land zoned or intended for Conservation zoned areas.



7.5 Access & egress

PBP addresses design considerations for access roads for properties determined to be bushfire prone. The requirements are applied to internal roads and are designed to enable safe access for emergency services and allow crews to work with equipment around the vehicle.

The current legislated document PBP 2006 states that:

Perimeter roads should be the normal arrangement for urban areas and not perimeter fire trails.

A perimeter road is the preferred option to separate bushland from urban areas. Fire trails will only be considered acceptable in exceptional circumstances

The pre-release PBP 2018 states:

Fire trails are not a requirement of PBP. A fire trail is not a substitute for a road, nor is it considered an appropriate trade-off for the provision of perimeter, non-perimeter and property road access requirements.

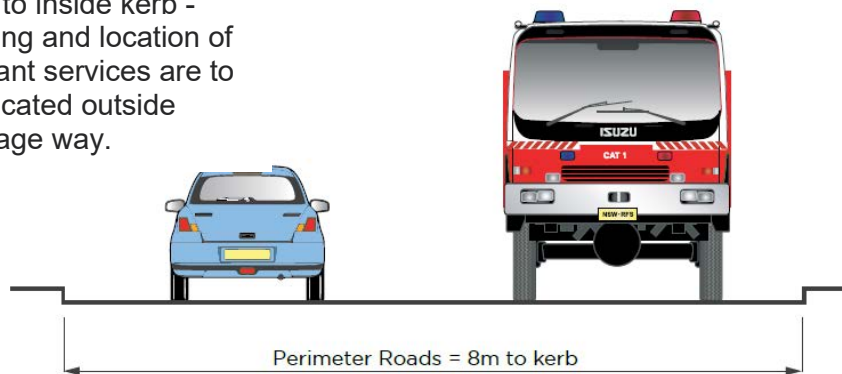
The Rural Fire Service requirements are;

- property access roads are two-wheel drive, all-weather roads; and
- perimeter roads are provided for residential subdivisions of three or more allotments; and
- subdivisions of three or more allotments have more than one access in and out of the development; and
- traffic management devices are constructed to not prohibit access by emergency services vehicles; and
- maximum grades for sealed roads do not exceed 15 degrees and an average grade of not more than 10 degrees or other gradient specified by road design standards, whichever is the lesser gradient; and
- all roads are through roads. Dead end roads are not recommended, but if unavoidable, dead ends are not more than 200 metres in length, incorporate a minimum 12 metres outer radius turning circle, and are clearly sign posted as a dead end; and
- where kerb and guttering is provided on perimeter roads, roll top kerbing should be used to the hazard side of the road; and
- where access/egress can only be achieved through forest, woodland or heath vegetation, secondary access shall be provided to an alternate point on the existing public road system.
- the capacity of perimeter and non-perimeter road surfaces and any bridges/causeways is sufficient to carry fully loaded firefighting vehicles (up to 23 tonnes); bridges/causeways are to clearly indicate load rating.
- hydrants are located outside of parking reserves and road carriageways to ensure accessibility to reticulated water for fire suppression;
- hydrants are provided in accordance with AS 2419.1:2005;
- there is suitable access for a Category 1 fire appliance to within 4m of the static water supply where no reticulated supply is available

Perimeter roads:

- perimeter roads are two-way sealed roads; and
- 8m carriageway width kerb to kerb; and
- parking is provided outside of the carriageway width; and
- hydrants are located clear of parking areas; and
- there are through roads, and these are linked to the internal road system at an interval of no greater than 500m; and
- curves of roads have a minimum inner radius of 6m; and
- the maximum grade road is 15° and average grade is 10°; and
- the road crossfall does not exceed 3°; and
- a minimum vertical clearance of 4m to any overhanging obstructions, including tree branches, is provided

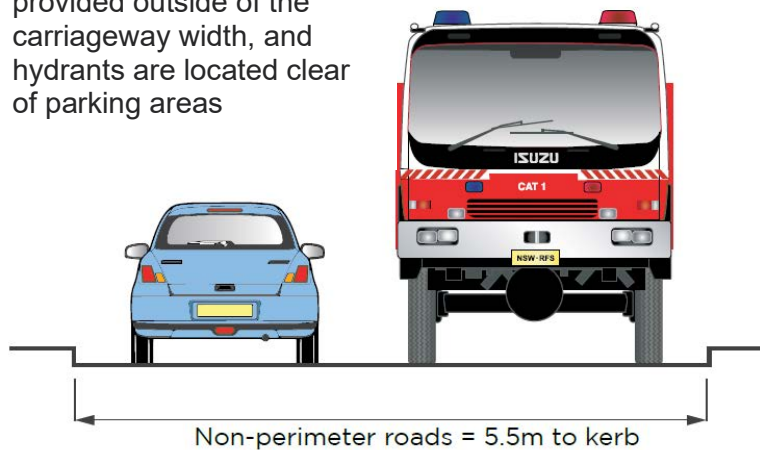
Perimeter road widths:
8 metres wide - inside
kerb to inside kerb -
parking and location of
hydrant services are to
be located outside
carriage way.



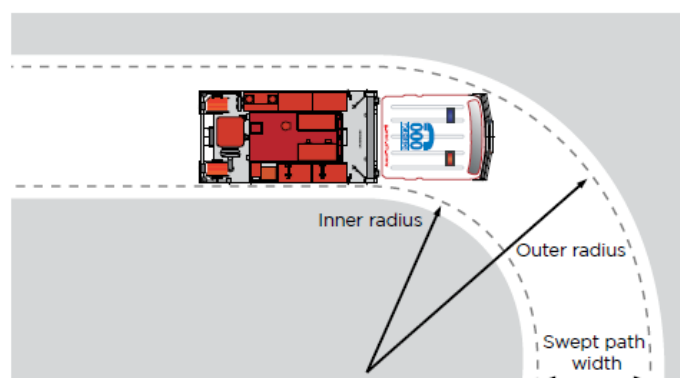
Non-perimeter roads:

- minimum 5.5m width kerb to kerb; and
- parking is provided outside of the carriageway width; and
- hydrants are located clear of parking areas; and
- roads are through roads, and these are linked to the internal road system at an interval of no greater than 500m; and
- curves of roads have a minimum inner radius of 6m; and
- the road crossfall does not exceed 3°; and
- a minimum vertical clearance of 4m to any overhanging obstructions, including tree branches, is provided.

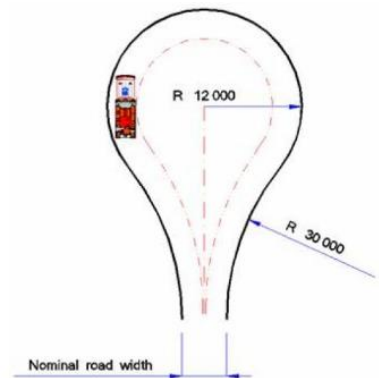
Non perimeter road widths:
5.5 metres wide - parking is
provided outside of the
carriageway width, and
hydrants are located clear
of parking areas



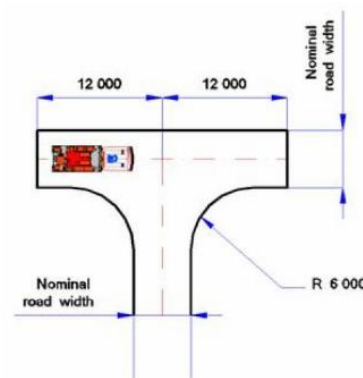
Swept path width for turning vehicles



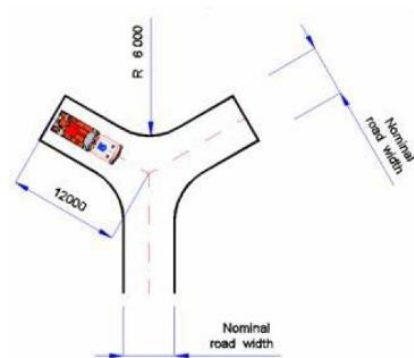
Curve radius (inside edge in metres)	Swept path (metres width)
< 40	4.0
40 - 69	3.0
70 - 100	2.7
> 100	2.5



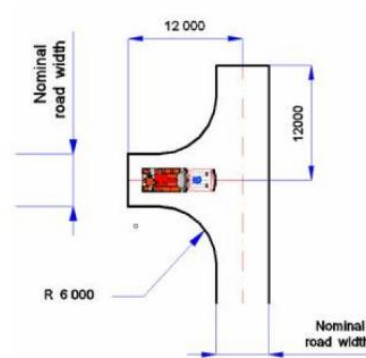
Type A



Type B



Type C



Type D

Property access drives:

No specific access requirements apply in a urban area where a 70 metre unobstructed path can be demonstrated between the most distant external part of the proposed dwelling and the nearest part of the public access road (where the road speed limit is not greater than 70kph) that supports the operational use of emergency firefighting vehicles (i.e. a hydrant or water supply).

In circumstances where this cannot occur, the following requirements apply:

- minimum carriageway width of 4m;
- in forest, woodland and heath situations, rural property access roads have passing bays every 200m that are 20m long by 2m wide, making a minimum trafficable width of 6m at the passing bay; and
- a minimum vertical clearance of 4m to any overhanging obstructions, including tree branches; and
- provide a suitable turning area and
- curves have a minimum inner radius of 6m and are minimal in number to allow for rapid access and egress; and
- the minimum distance between inner and outer curves is 6m; and
- the crossfall is not more than 10°; and
- maximum grades for sealed roads do not exceed 15° and not more than 10° for unsealed roads; and
- a development comprising more than three dwellings has formalised access by dedication of a road and not by right of way.

Note: Some short constrictions in the access may be accepted where they are not less than the minimum (3.5m), extend for no more than 30m and where the obstruction cannot be reasonably avoided or removed. The gradients applicable to public roads also apply to community style development property access roads in addition to the above.



7.6 Services

Planning for Bush Fire Protection also addresses the installation of services (i.e. water, electricity and gas) within bushfire prone areas. The following are the requirements for services.

Water Supply:

A water supply is provided for firefighting purposes, the water supplies are located at regular intervals and the water supply is accessible and are reliable for firefighting operations

- reticulated water is to be provided to the development, where available;
- fire hydrant spacing, design and sizing comply with the Australian Standard AS 2419.1:2005; hydrants are not located within any road carriageway; reticulated water supply to urban subdivisions uses a ring main system for areas with perimeter roads.
- fire hydrant flows and pressures comply with AS 2419.1:2005.

Electricity:

The location of an electricity service limits the possibility of ignition of surrounding bush land or the fabric of buildings

- Where practicable, electrical transmission lines are underground.
- Where overhead electrical transmission lines are proposed:
 - lines are installed with short pole spacing (30 metres), unless crossing gullies, gorges or riparian areas; and
 - no part of a tree is closer to a power line than the distance set out in accordance with the specifications in ISSC3 Guideline for Managing Vegetation Near Power Lines

Gas:

The location and design of gas services will not lead to ignition of surrounding bushland or the fabric of buildings.

- reticulated or bottled gas is installed and maintained in accordance with AS/NZS 1596:2014 and the requirements of relevant authorities, and metal piping is used;

7.7 Construction

Australian Standard 3959 – 2009 'Construction of buildings in bushfire-prone areas' provides for six (6) levels of building construction these being BAL - Low, BAL - 12.5, BAL - 19, BAL - 29, BAL - 40 and BAL - FZ. The Australian Standard 3959 specifies construction standards for buildings within various Bushfire Attack Levels as determined by the Planning for Bushfire Protection – 2018 document. The NSW Rural Fire Service will not accept deemed to satisfy provisions for BAL Flame Zone and therefore have a NSW variation to the listed standard provisions of BAL FZ under AS3959 - 2009.

There is no allotment specific subdivision layout proposed as part of this development and the application is for the masterplan only. Each future precinct will be subject to a separate application for subdivision approval and assessed again as integrated development at that time.

There are therefore no dwellings proposed as part of this development and any future application for the construction of a dwelling within the future allotments will also require a separate application as infill development under section 4.14 of the Environmental Planning and Assessment Act 1979 (EP&A Act) or a certificate under section 3.4 as part of approval under SEPP Exempt and Complying Development.

It should be noted that as the application has been assessed under the pre-Release PBP 2018 there should be no new allotment created where the BAL determination exceeds BAL 29.

7.8 Staging

Staging of development must consider section 3.2.1 of PBP 2018. There are two important considerations for staging of this development.

- 1) Development should not occur in a manner that creates a bottle neck or where there is potential for entrapment of the community, nor should it create areas that may become inaccessible for fire fighters. The main north-south vegetation corridor could provide an impediment to access and egress to the Pacific Highway from the western side of this corridor. Commencement of the subdivision construction stage will include construction of the east west collector road which will be an all-weather access. This provides a suitable secondary egress from the precincts as they are developed.
- 2) There are areas where vegetation will be reduced to less than 50 metre widths and, based on these shortened fire runs, a downgrade of the hazard classification to a remnant is applied. This enables smaller APZs to be achieved. As a precinct is commissioned the management required to achieve the reduction in fire runs must be completed on ground prior to the release of a subdivision certificate. Temporary APZ are acceptable and can be provided to the advantage of the preceding development. The temporary APZ can be a combination of an inner and outer protection area and be of sufficient depth for the intended purpose of providing a discontinues fire path.

Alternatively, no allotment within an area affected by the assumed reduction can be released until development and APZ is completed within the ensuing precinct.

7.9 Environmental Works Depot

There is a development footprint denoted within the E2 area adjacent Six Mile Road to the north. This is an old quarry site and is entirely identified as an asset protection zone (i.e. no residential development footprint available). The purpose of this area is for an environmental protection works depot e.g. site sheds, landscape supplies and equipment to facilitate this development. Non habitable Class 10 structures located greater than 6 metres from a residence do not attract any specific asset protection zones or construction requirements and this is a suitable location for the depot.

7.10 Vegetation and Biodiversity Management Plans.

It is assumed that all areas within the development footprint will be managed in accordance with a Council approved Vegetation Management Plan (VMP) for the life of subdivision construction works, which has provisions within to provide landscape scale fuel management to meet APZ standards specified in PFBP 2018 (i.e. vegetation clearing procedure). The management of the adjoining Conservation Area is to be in accordance with a separate Biodiversity Management Plan (BMP) where ecological fire management practices may occur. This report does not rely on any management regime specified in the VMP or BMP for compliance with PBP 2018.

The revegetation and environmental management in the Conservation Area and outside the development area is inconsequential to the recommendations of this report. Within the development area are detention basins and bio filtration and retention basins. These areas shall be vegetated consistent with the requirements for an asset protection zone with trees spaced 2 – 5 metres and understory (grasses) managed to below 100 mm. These areas will therefore not compromise the bushfire protection provided by the recommendations of this report.

7.11 Koala Fence

A koala exclusion fence is proposed around the perimeter of the development footprint and environmental corridors. It is therefore envisaged that a koala exclusion fence will be incorporated within nearly all asset protection zones.

No hazard reduction (burning) is required for asset protection zone purposes however it may be needed from time to time for ecological reasons. Additionally, backburning may be undertaken as an active firefighting measure. To this end access through the fence at regular intervals will be necessary for fire fighter access to the hazard interface.

The fence will be installed within the development footprint area and it has been proposed that it will be offset from the outer limit of the footprint extent so that a managed area can be maintained either side of the fence. This is important in that it also provides dual functionality allowing pedestrian access along the hazard interface where fire fighters can work adjacent to, an parallel to, any retained vegetation for firefighting, backburning or ecological burning purposes.

The distance between access points should be sufficiently spaced that provides for reasonable hose lengths and to this point it is common for 3 standard hose lengths and a 10 metre water jet to be deemed the furthest extent that hose lays are deployed. This equates to 70 metres and also assumes that a fire appliance will be parked within 20 metres of a hydrant.

Pedestrian access gates should be installed along the koala exclusion fence so that these distances are achieved. The design should therefore locate the gates within 20 metre of a hydrant and the distance between gates should be 140 metres less the distance between the gate and the location where a fire appliance can be parked nearest the gate. For example, where the perimeter road has mountable curbs and a fire appliance can be located within say 2 metres of a gate and a hydrant is within 20 metres of the gate then the spacing between the gates shall be 136 metres.

The gates should also be provided with keyed alike locking arrangement suitable to the local district NSW Rural Fire Services requirements.

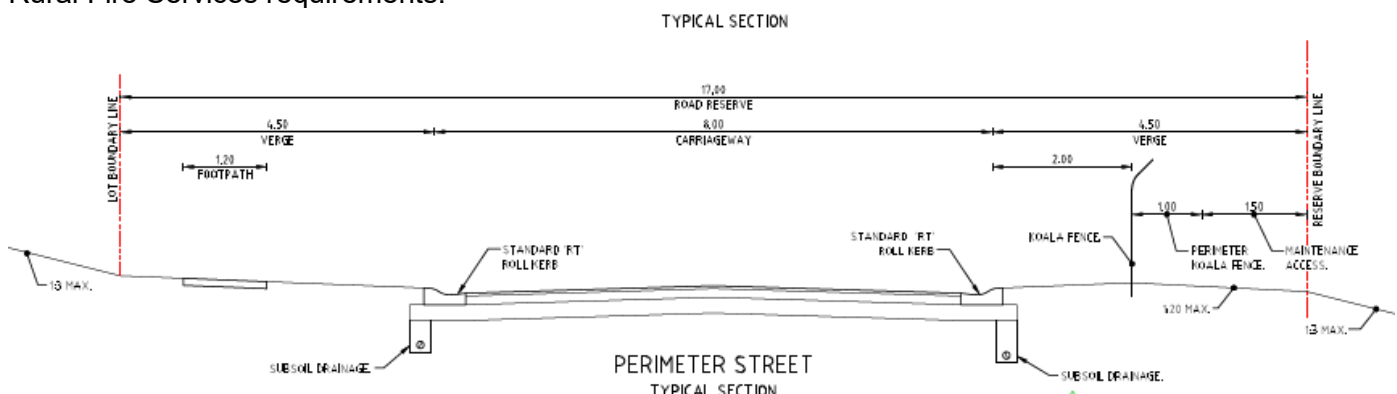


Image 14: Indicative design of perimeter road and Koala exclusion fence design

8.0 Recommendations

8.1 Asset Protection Zones

1. That the proposed development be generally in accordance with the plans titled Road Hierarchy and Pedestrian Connectivity Plan by Northrop Job N120526 DA-08-C3.00 Rev K 2/12/19.
2. That asset protection zones on all future precincts comply with PBP 2018 Appendix 1 Table A1.12.1 and A1.12.2 as appropriate. These asset protection zones are generally as shown on plans by Northrop Reference Northrop Job N120526 Dwg DA-08-C1.00 [L] dated 6.12.19 forming Attachment 02 to this report. Variations in APZ may be necessary or applied using design fire modelling when the layout within each precinct is known and assessed at a more micro level scale.

Note: The APZ are based on a draft document pre-release PBP 2018 and minor variations may apply in the final published document.

3. APZs are managed in accordance with the requirements of Appendix 4 Planning for Bush Fire Protection 2018 and are located on lands with a slope less than 18 degrees.
4. That where a precinct assumes a narrow creek line due to future precinct development, then temporary APZ must be provided to the advantage of the preceding development. The temporary APZ can be a combination of an inner and outer protection area must and be of sufficient depth for the intended purpose of providing a discontinues fire path. Alternatively, no allotment within an area affected by the assumed reduction can be released until development and APZ is completed within the ensuing precinct.

8.2 Services

Electricity

5. That electricity supply is to comply with Table 5.3c of Planning for Bush Fire Protection 2018, in particular;
 - Where practicable, electrical transmission lines are underground.
 - Where overhead electrical transmission lines are proposed:
 - lines are installed with short pole spacing (30 metres), unless crossing gullies, gorges or riparian areas; and
 - no part of a tree is closer to a power line than the distance set out in accordance with the specifications in 'Vegetation Safety Clearances' issued by Energy Australia (NS179, April 2002).

Gas

6. That gas supply is to comply with Table 5.3c of Planning for Bush Fire Protection 2018, in particular;
 - That the location of gas services will not lead to ignition of surrounding bush land or the fabric of buildings by;
 - Reticulated gas;
 - Reticulated gas is installed and maintained in accordance with AS 1596 and the requirements of relevant authorities.
 - Metal piping is to be used. Polymer sheathed flexible gas supply lines to gas meters adjacent to buildings are not used.

Water

7. That water supply is to comply with Table 5.3c of Planning for Bush Fire Protection 2018, in particular;
 - The sizing, spacing and pressures of any new hydrant system must comply with AS2419.1-2017.
 - Hydrants are not located within any road carriageway.

8.3 Access

8. That access is to comply with Table 5.3b and Appendix 3 of Planning for Bush Fire Protection 2018 (see section 7.5 of this report).

8.4 Koala exclusion fence

9. That pedestrian access gates shall be installed along the koala exclusion fence. The gates shall be within 20 metre of a hydrant and the distance between gates shall be 140 metres less the distance between the gate and the location where a fire appliance can be parked nearest to the gate.
10. That the gates are provided with keyed alike locking arrangement suitable to the local district NSW Rural Fire Services requirements.

9.0 Conclusion

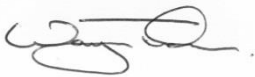
The subject property is determined to be bushfire prone land and the development is classified as integrated development under s100B of the Rural Fires Act 1997. Therefore, under s4.16 of the Environmental Planning and Assessment Act 1979 Council must refer the application to the NSW RFS seeking a Bushfire Safety Authority (BSA) from them as part of the development approval process.

The proposed development must, to the degree necessary, meet the intent of measures and performance requirements of Planning for Bushfire Protection 2006 or 2018. In new subdivisions this is achieved with an appropriate combination of bushfire protection measures, especially an APZ, which is a fundamental component of the package of bushfire protection measures applied. In addition to an APZ suitable access, services supply and means of maintaining the bushfire protection measures for the life of the development are applied. Where necessary construction measures are also included. In this instance the requirements detailed within the pre-Release PBP 2018 have been applied to the application.

This bushfire hazard and determination has been made on a site-specific basis which includes an assessment of the local bushland area and its possible impact to the subject property. Inclusive of the recommendations made herein the proposal meets the aims and objectives of PBP by compliance with the intent of measures and performance requirements of that document. I am satisfied the recommendations made herein will provide a reasonable and satisfactory level of bushfire protection to the proposed future subdivision.

I am therefore in support of the development application.

Australian Bushfire Consulting Services Pty Ltd



Wayne Tucker

Managing Director
G. D. Design in Bushfire Prone Areas.
Certificate IV Fire Technology
Ass Dip Applied Science
FPA Australia BPAD Level 3 Accredited Practitioner
BPAD Accreditation No. BPAD9399



List of attachments

Attachment 01: Vegetation and Slope Mapping

Attachment 02: Asset Protection Zone Overlay

Attachment 03: Development Clearing and Staging Plan

Attachment 04: Road Hierarchy and Pedestrian Connectivity Plan

Attachment 05: Proposed plan of subdivision

Vegetation and Slope



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36 Six Mile Road & 3221 Pacific Hwy Kings Hill, Lot 4821 DP 85073 and Lot 41 DP 1037411, Reference 18-026



Legend

Slope

- Upslope
- 0-5° downslope
- 5-10° downslope
- 10-15° downslope
- 15-20° downslope

Contour - 10m

- Subject Land
- Development Footprint
- Cadastre

Vegetation Formation

- Forest
- Grassland
- Remnant
- Wetland
- Woodland

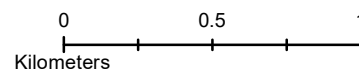


NORTH



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Date: 10/12/2019



Imagery: © Nearmap
Coordinate System: GDA 1994 MGA Zone 56

Vegetation and Slope



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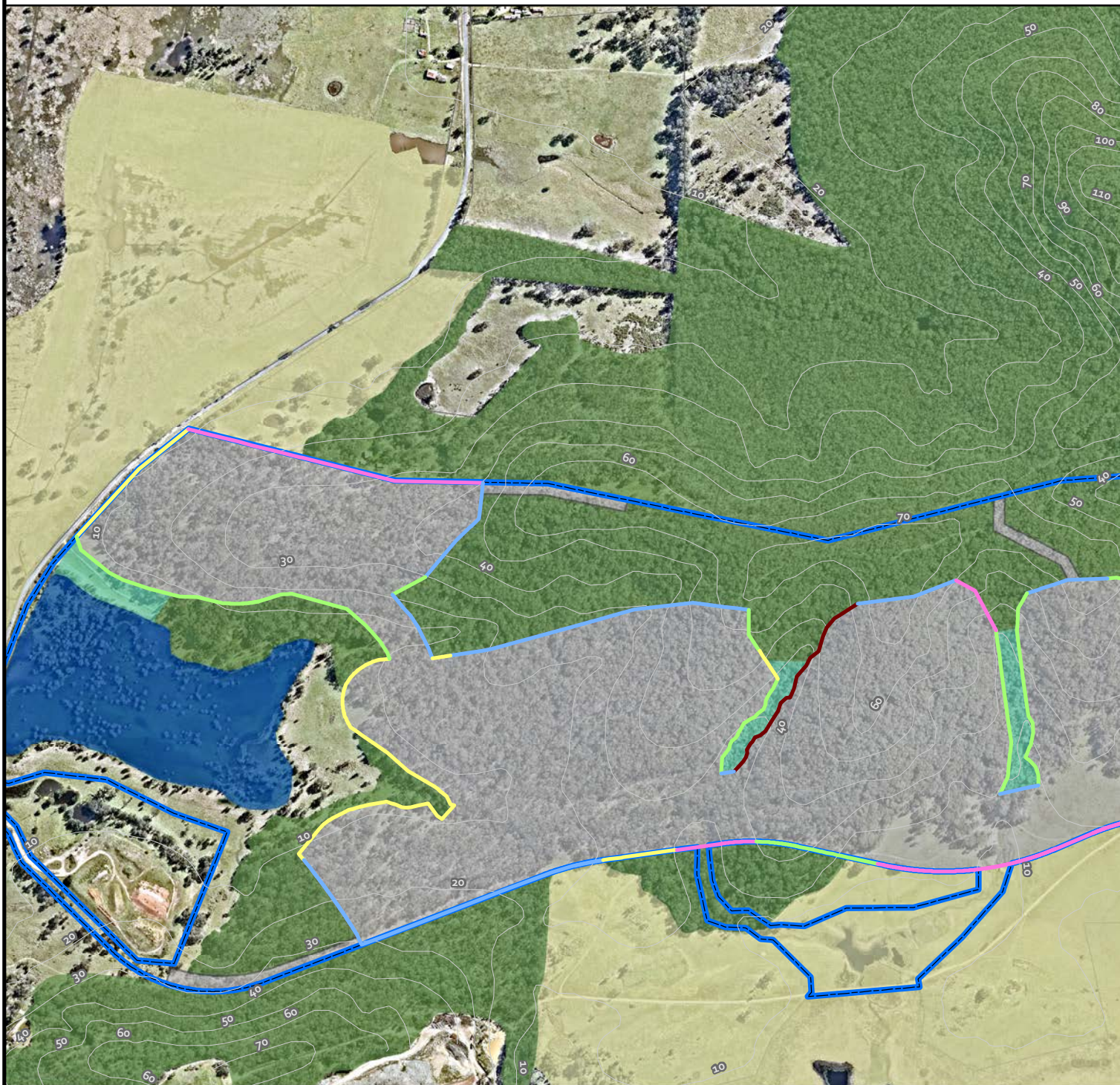
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PO Box 212 Berowra Heights 2062

36 Six Mile Road & 3221 Pacific Hwy Kings Hill, Lot 4821 DP 85073 and Lot 41 DP 1037411, Reference 18-026



Legend

Slope

- Upslope
- 0-5° downslope
- 5-10° downslope
- 10-15° downslope
- 15-20° downslope

Contour - 10m

- Subject Land
- Development Footprint
- Cadastre

Vegetation Formation

- Forest
- Grassland
- Remnant
- Wetland



1:10,000
Date: 10/12/2019

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Meters

Imagery: © Nearmap
Coordinate System: GDA 1994 MGA Zone 56

Vegetation and Slope



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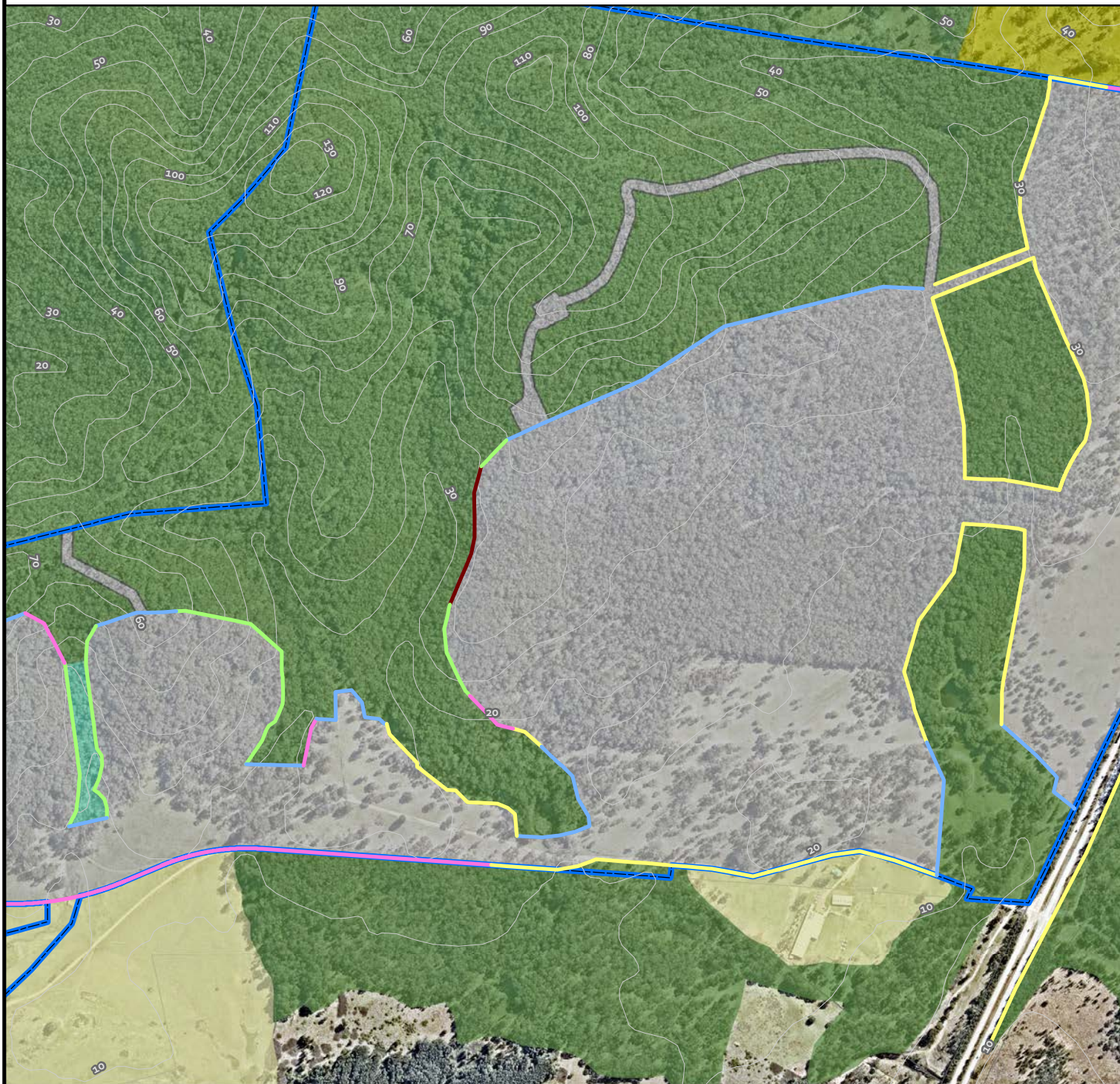
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36 Six Mile Road & 3221 Pacific Hwy Kings Hill, Lot 4821 DP 85073 and Lot 41 DP 1037411, Reference 18-026



Legend

Slope

- Upslope
- 0-5° downslope
- 5-10° downslope
- 10-15° downslope
- 15-20° downslope

Contour - 10m

- Subject Land
- Development Footprint
- Cadastre

Vegetation Formation

- Forest
- Grassland
- Remnant
- Woodland



NORTH



1:10,000
Date: 10/12/2019

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Meters

Imagery: © Nearmap
Coordinate System: GDA 1994 MGA Zone 56

Vegetation and Slope



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Legend

Slope

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- 5-10° downslope
- 10-15° downslope

Contour - 10m

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- Development Footprint
- Cadastre

Vegetation Formation

- Forest
- Remnant
- Woodland



NORTH



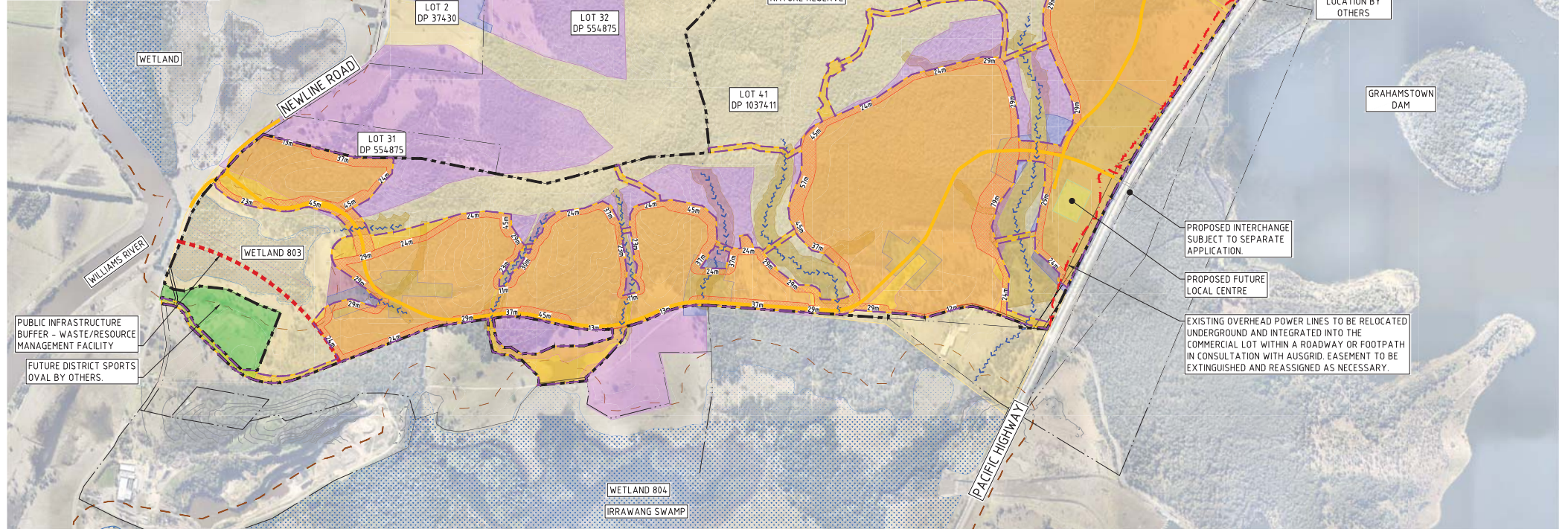
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Meters

Imagery: © Nearmap
Coordinate System: GDA 1994 MGA Zone 56

LEGEND

- SITE BOUNDARY
- EXISTING WATERCOURSE
- DEVELOPMENT FOOTPRINT BOUNDARY
- PROPOSED COLLECTOR ROAD
- COASTAL WETLAND PROXIMITY BUFFER (100m)
- ZONE B2 - LOCAL CENTRE
- ZONE B4 - MIXED USE
- ZONE E2 - ENVIRONMENTAL CONSERVATION
- ZONE R1 - GENERAL RESIDENTIAL
- ZONE RE1 - PUBLIC RECREATION
- APPROXIMATE RIPARIAN BUFFER ZONE
- APPROXIMATE ASSET PROTECTION ZONE AND WIDTH
- APPROXIMATE COASTAL WETLANDS EXTENT
- DAYTIME NOISE LEVEL 66+ dB
REFER TO ROAD TRAFFIC NOISE ASSESSMENT
PREPARED BY E.J.M. (NOVEMBER 2019)



FOR APPROVAL - NOT FOR CONSTRUCTION

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE	CLIENT
G	ISSUED FOR APPROVAL	JB	SC	CP	21.05.19	KINGS HILL DEVELOPMENTS
H	ISSUED FOR APPROVAL	JB	SC	CP	28.05.19	
I	ISSUED FOR APPROVAL	JB	SC	CP	22.11.19	
J	ISSUED FOR APPROVAL	WC	SC	CP	25.11.19	
K	ISSUED FOR APPROVAL	JB	SC	CP	28.11.19	
L	ISSUED FOR APPROVAL	JB	SC	CP	06.12.19	

CLIENT	PLANNER
KINGS HILL DEVELOPMENTS	JW PLANNING

CLIENT	PLANNER
KINGS HILL DEVELOPMENTS	JW PLANNING

CLIENT	PLANNER
KINGS HILL DEVELOPMENTS	JW PLANNING

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KINGS HILL DEVELOPMENTS	JW PLANNING

CLIENT	PLANNER
KINGS HILL DEVELOPMENTS	JW PLANNING

LEGEND

PROPOSED COLLECTOR ROAD AND BUS ROUTE

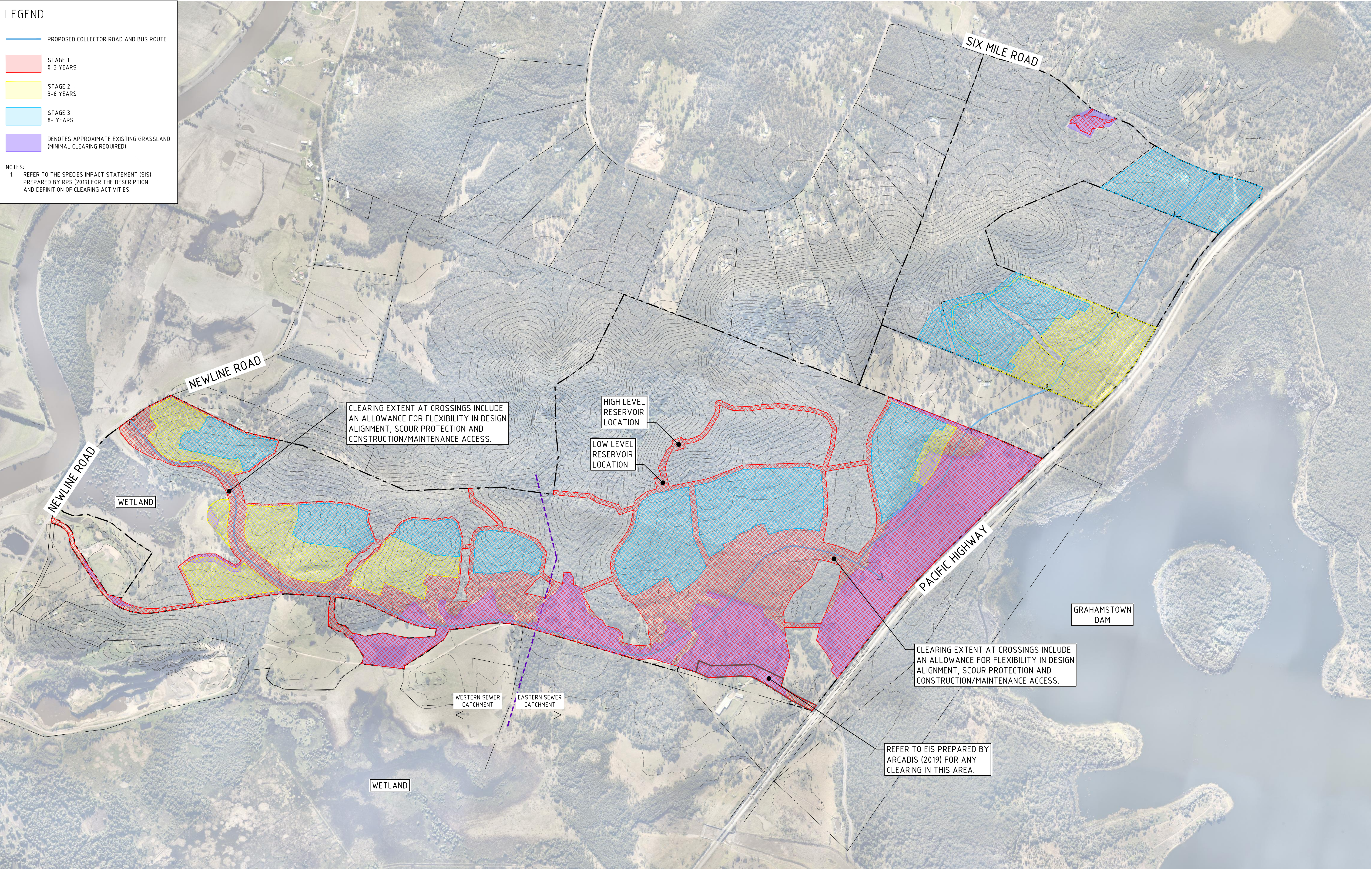
STAGE 1
0-3 YEARS

STAGE 2
3-8 YEARS

STAGE 3
8+ YEARS

DENOTES APPROXIMATE EXISTING GRASSLAND
(MINIMAL CLEARING REQUIRED)

NOTES:
1. REFER TO THE SPECIES IMPACT STATEMENT (SIS)
PREPARED BY RPS (2019) FOR THE DESCRIPTION
AND DEFINITION OF CLEARING ACTIVITIES.



DRAWN J BEVITT
DESIGNED P BURL
JOB MANAGER C PIPER
VERIFIER B CLARK

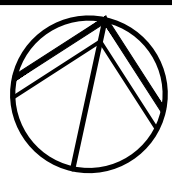
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E	ISSUED FOR APPROVAL	JB	SC	CP	25.11.19	
F	ISSUED FOR APPROVAL	JB	SC	CP	28.11.19	
G	ISSUED FOR APPROVAL	JB	SC	CP	06.12.19	

KINGS HILL DEVELOPMENTS

JW PLANNING

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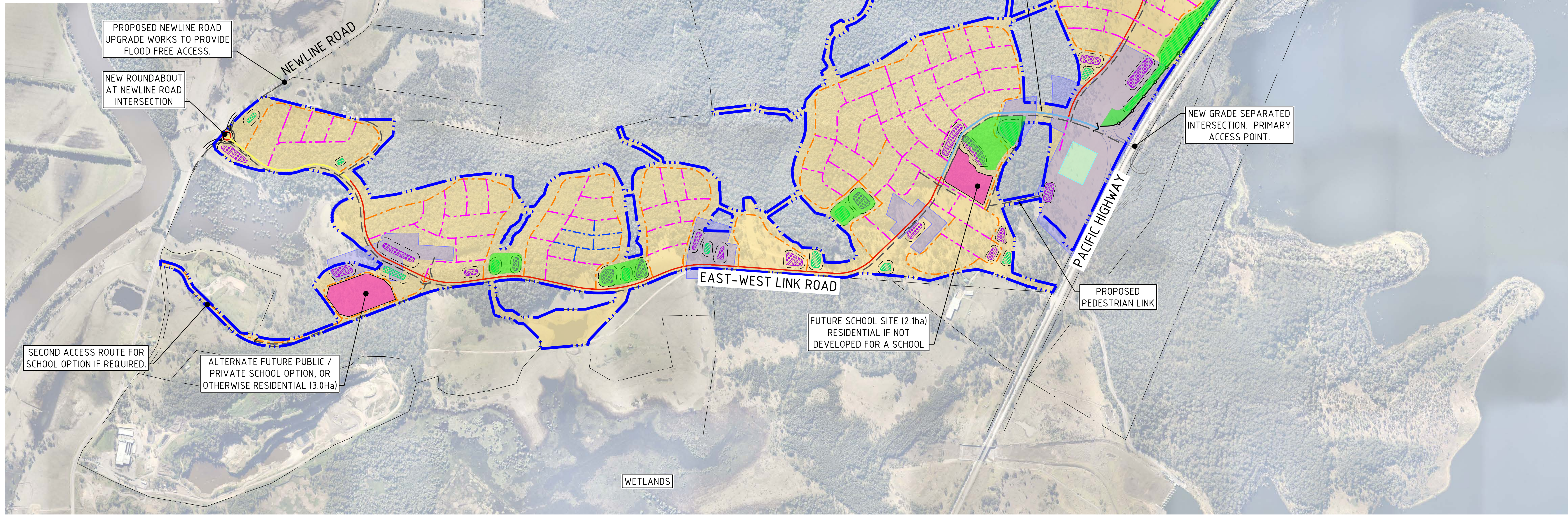
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**KINGS HILL
DEVELOPMENT APPLICATION
MASTERPLAN**

DRAWING TITLE
**DEVELOPMENT
CLEARING AND STAGING**

JOB NUMBER NL120526	REVISION
DRAWING NUMBER DA-08-C8.00	G
DRAWING SHEET SIZE = A1	

LEGEND

- PROPOSED SHARED PEDESTRIAN CYCLE LINK
- INDICATIVE LOCATION OF LANEWAY
- INDICATIVE LOCATION OF LOCAL STREET
- INDICATIVE LOCATION OF PERIMETER ROAD
- PROPOSED COLLECTOR ROAD AND BUS ROUTE - TYPE 1
- PROPOSED COLLECTOR ROAD AND BUS ROUTE- TYPE 2
- PROPOSED COLLECTOR ROAD AND BUS ROUTE- TYPE 3
- DENOTES APPROXIMATE EXTENT OF THE DEVELOPMENT'S FOOTPRINT
- DENOTES APPROXIMATE EXTENT OF OPEN SPACES
- DENOTES APPROXIMATE EXTENT OF SCHOOL ZONE
- ZONE B2 - LOCAL CENTRE
- ZONE B4 - MIXED USE
- DENOTES APPROXIMATE EXTENT OF DETENTION BASIN
- DENOTES APPROXIMATE EXTENT OF COMBINED BIO-FILTRATION AND RETENTION BASIN
- DEVELOPMENT FOOTPRINT BOUNDARY
- 2.4m HIGH ACOUSTIC FENCE



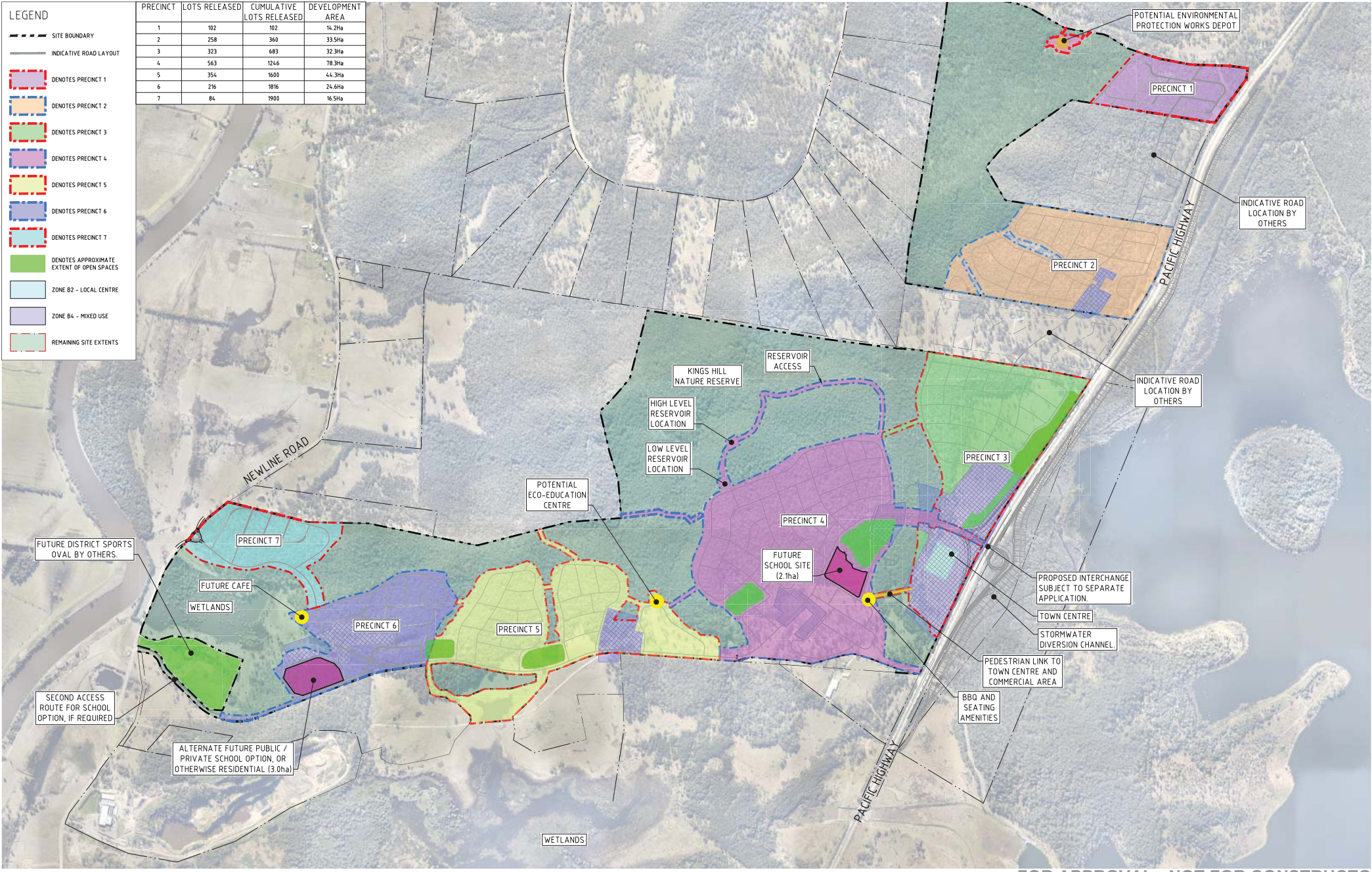
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H	ISSUED FOR APPROVAL	JB	SC	CP	22.11.19								
I	ISSUED FOR APPROVAL	JB	SC	CP	25.11.19								
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K	ISSUED FOR APPROVAL	JB	SC	CP	2.12.19	DRAWING NOT TO BE USED FOR CONSTRUCTION UNLESS VERIFICATION SIGNATURE HAS BEEN ADDED	THE COPYRIGHT OF THIS DRAWING REMAINS WITH NORTHROP CONSULTING ENGINEERS PTY LTD.						

LEGEND

- SITE BOUNDARY
- INDICATIVE ROAD LAYOUT
- DENOTES PRECINCT 1
- DENOTES PRECINCT 2
- DENOTES PRECINCT 3
- DENOTES PRECINCT 4
- DENOTES PRECINCT 5
- DENOTES PRECINCT 6
- DENOTES PRECINCT 7
- DENOTES APPROXIMATE EXTENT OF OPEN SPACES
- ZONE B2 - LOCAL CENTRE
- ZONE B4 - MIXED USE
- REMAINING SITE EXTENTS

PRECINCT	LOTS RELEASED	CUMULATIVE LOTS RELEASED	DEVELOPMENT AREA
1	102	102	14.2Ha
2	258	360	33.5Ha
3	323	683	32.3Ha
4	563	1246	78.3Ha
5	354	1600	44.3Ha
6	216	1816	24.6Ha
7	84	1900	16.5Ha



FOR APPROVAL - NOT FOR CONSTRUCTION

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE	CLIENT	PLANNER	SCALE	PROJECT	DRAWING TITLE	JOB NUMBER	DRAWING NUMBER	REVISION
I	ISSUED FOR APPROVAL	JB	SC	CP	20.05.19	KINGS HILL DEVELOPMENTS	JW PLANNING	0 100 200 300 400m	PROJECT	PROPOSED PLAN OF SUBDIVISION	NL120526	DA-08-C2.00	N
J	ISSUED FOR APPROVAL	JB	SC	CP	21.05.19								
K	ISSUED FOR APPROVAL	JB	SC	CP	22.11.19								
L	ISSUED FOR APPROVAL	WC	SC	CP	25.11.19								
M	ISSUED FOR APPROVAL	JB	SC	CP	28.11.19								
N	ISSUED FOR APPROVAL	JB	SC	CP	06.12.19								

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SCALE 1:8000 @ A1

0 100 200 300 400m

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PROJECT: KINGS HILL DEVELOPMENT APPLICATION MASTERPLAN

DRAWING TITLE: PROPOSED PLAN OF SUBDIVISION

JOB NUMBER: NL120526

DRAWING NUMBER: DA-08-C2.00

REVISION: N

DRAWING SHEET SIZE: A1