



Bushfire Hazard Assessment

PROPOSED SUBDIVISION AT
1 Lakeview Drive, Deebing Heights
For
Kelly Consolidated Pty Ltd



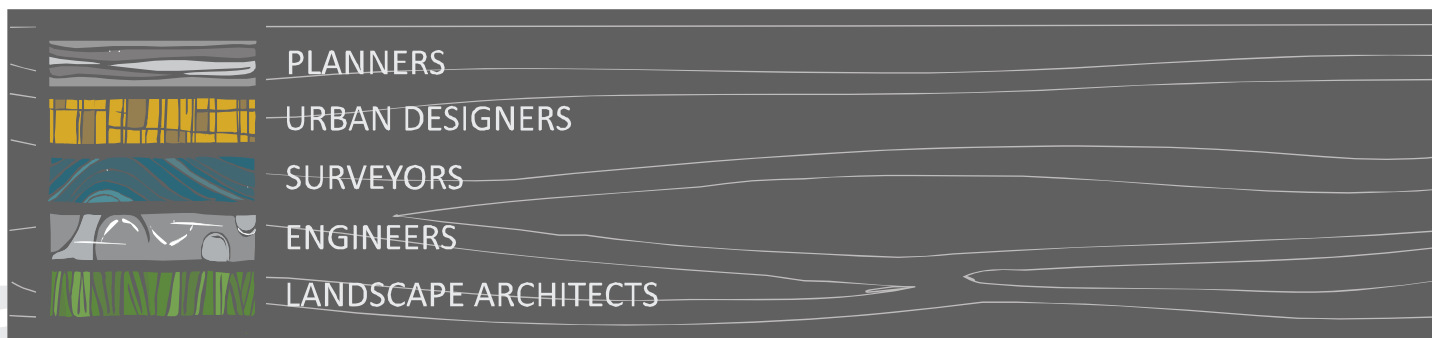
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Bushfire Hazard Assessment Report

PROPOSED SUBDIVISION AT
1 Lakeview Drive, Deebling Heights
For
Kelly Consolidated Pty Ltd

B3755 – Revision B

Prepared by JFP Urban Consultants Pty Ltd

Report Author: Lucy Healing
QA Review: DRAFT FOR INFORMATION ONLY



Table of Contents

CONTENTS

i	Executive Summary	5
1.0	Introduction	6
	1.1 Scope	6
	1.2 Methodology	6
	1.3 Site Description	6
	1.4 Project Description	7
	1.5 Planning Scheme Bushfire Overlay	7
	1.6 State Planning Policy	8
2.0	Site Analysis	10
	2.1 Step 1 – Vegetation hazard Class and Potential Fuel Load Map	10
	2.2 Step 2 – Create Slope Maps	11
	2.3 Step 3 - Create Potential Severe Fire Weather Map	11
	2.4 Step 4 – Create Potential Severe Fire Weather Map	12
	2.5 Step – Bushfire Hazard Class Map	13
3.0	AS3959 Construction of Building in Bushfire-Prone Areas	14
4.0	Mitigation	15
5.0	Conclusions and Recommendations	17

APPENDICIES

A	Baird and Hayes Proposed <i>Reconfiguration of 1 Lakeview Drive, Deebing Heights Lot 321 on SP187287</i>
B	Vegetation Management Act Mapping
C	JFP Plan BHA.01 <i>Vegetation Hazard Mapping</i>
D	JFP Plan BHA.02 <i>Slope Analysis</i>
E	JFP Plan BHA.03 <i>Potential Bushfire Intensity Map</i>
F	JFP Plan BHA.04 <i>Bushfire Hazard Management Recommendations</i>

Key to Acronyms

The following is a brief explanation of some specialist terms used in this document:

BAL refers Bushfire Attack Level as defined in the *Australian Standard 3959-2009 Construction of Buildings in bushfire prone areas*

DEHP refers to the Department of Heritage and Environment Protection

DoE refers to the Department of Environment

DSITIA refers to the Department of Science, Information Technology, Innovation and the Arts

RE refers Regional Ecosystems and defined under the Vegetation Management Act 1999

MNES refers to Matters of National Environmental Significance

PDA refers to Priority Development Area

QRFS refers to Queensland Rural Fire Service

VMA refers to the *Vegetation Management Act 1999*

i Executive Summary

The purpose of this Bushfire Hazard Review is to identify the likely bushfire hazard areas after proposed development at 1 Lakeview Drive, Deebling Heights, and assess if the hazards are likely to be manageable.

A mapping exercise has been undertaken by JFP to assess the bushfire hazard risk within development site and immediately adjacent (where information is available), as outlined in the *SPP - state interest technical manual Natural Hazards, Risk and Resilience - A 'Fit for Purpose' approach in undertaking natural hazard studies and risk assessments (April 2016)* for bushfire hazard assessments.

JFP plan BHA.01-BHA.03 illustrates the results of the mapping exercise. As identified in BHA.03 areas of Low and Medium Hazard border the project site.

BHA.04 illustrates the recommended bushfire hazard mitigation actions.

It is anticipated management systems will be able to be put into place to appropriately manage the risk.

1.0 INTRODUCTION

1.1 Scope

The aim of this report is to identify and assess the bushfire hazard risk present at 1 Lakeview Drive, Deebling Heights, and the way in which this may influence the proposed development. The site has a small area along the southern boundary mapped as 'Bushfire Risk Area' on the *Ipswich Planning Scheme Overlay Map OV1 Bushfire Risk Area*. This bushfire hazard assessment has been prepared in accordance with the SPP - state interest technical manual *Natural Hazards, Risk and Resilience - A 'Fit for Purpose' approach in undertaking natural hazard studies and risk assessments* (April 2016).

1.2 Methodology

In preparing the Bushfire Hazard Assessment the following steps have been undertaken:

- Desktop review - VMA Vegetation Management Supporting Map (DNRM, 2017); Ipswich City Council Planning Scheme Overlay mapping; surrounding contours;
- Assessment of land within 100m of the site;
- Site visit (by JFP ecologist) to assess vegetation communities and presence of fire scars, management of vegetation within and surrounding site;
- Determine Potential Bushfire Hazard Classes through producing Potential Fireline Intensity maps using the three inputs, Potential Fuel Load, Potential Severe Fire Weather, and, maximum Slope;
- Calculate Bushfire Attack Level using 'Method 1' AS3959-2009

1.3 Site Description

The site is located at 1 Lakeview Drive, Deebling Heights within the Ipswich City Council Ripley Valley Structure Plan Area and the Ripley Valley Priority Development Area.

The site area is 10.51 hectares and is described as:

Lot 321 on SP 187287 (hereon, referred to as 'the site').

A large cleared area towards the southern/central part of the site is a remnant of an old cricket pitch. This area and the surrounds are regularly used for illegal dumping of household rubbish and informal tracks criss-cross the site. The majority of the balance of the site is vegetated with native canopy species with a sparse shrub layer and a variety of native grasses and forbs.

An Order 2 waterway runs southwest to northeast through the site, and is a tributary of Deebling Creek to the east. The waterway appears to have been subject to a long history of erosion and sediment deposition, and in a number of areas the banks do not appear stable.

The site is fairly flat with a slight fall towards the east and north east of the site, towards Deebling Creek.

There are areas of vegetation on and adjoining the site that have been identified in the *Vegetation Management Act Regional Ecosystem and Remnant Map – Version 6.1* established under the provisions of the *Vegetation Management Act 1999* (VMA) as supporting remnant vegetation (refer **Appendix B**).

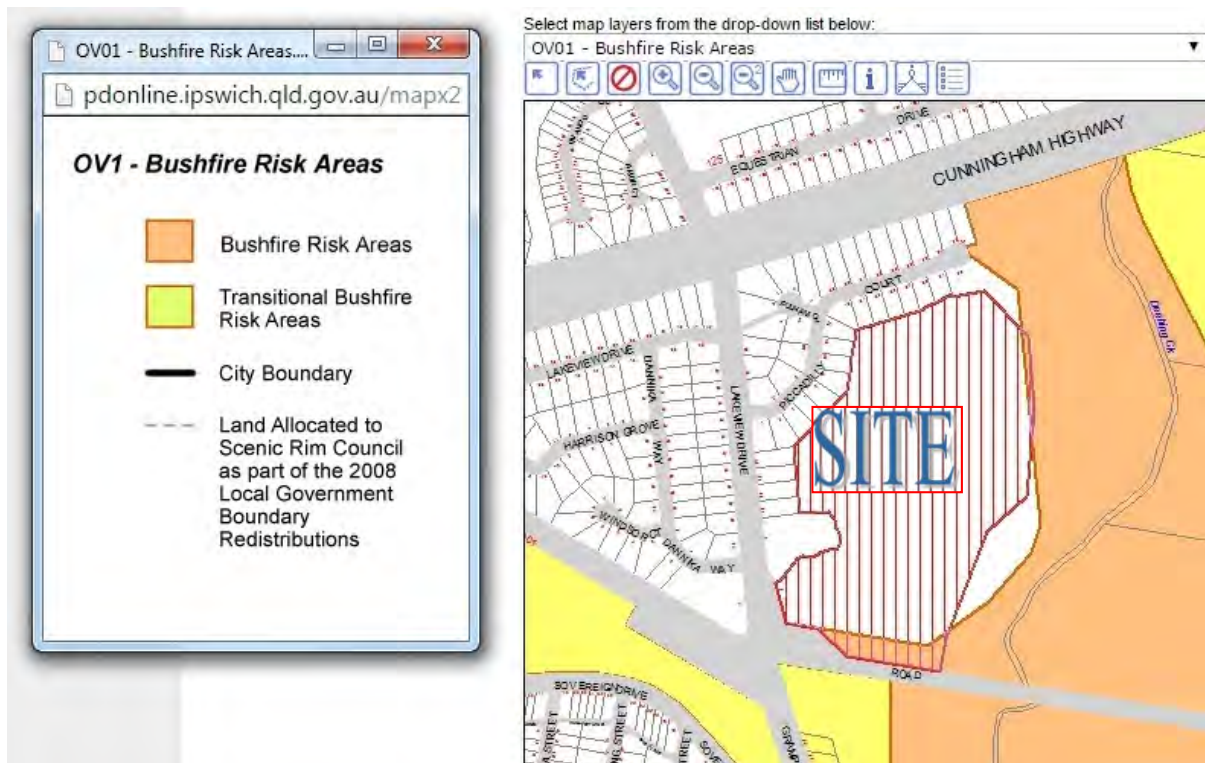


Figure 2. Screenshot of Ipswich City Council Overlay Map OV01-Bushfire Risk Areas.

Development Constraints Overlay Code (Bushfire Risk Areas) Probable Solution 1(a)(iii) includes a minimum 20m wide fire protection buffer around the proposed building*. This 20m wide buffer is to consist of a minimum 10m wide inner zone, and 10m wide outer zone. The inner 10m is 'a clear area (fuel free inner zone)', while the outer 10m is a '(fuel-reduced outer zone) may be planted with fire retardant vegetation species'.

*The definition of a building is not provided in the Code, though in the Planning Scheme Dictionary it refers to the *Building Act 1975*. In the *Building Act 1975* a building 'is a fixed structure that is wholly or partly enclosed by walls or is roofed. The term includes a floating building and any part of a building'.

1.14 *Development Constraints Overlay Code (Bushfire Risk Areas)* Probable Solution 1(b) requires that if trees are planted on the development site they are -

- 'of a species that grow to over 2 meters in height to maintain separation between lower canopy and the ground;
- have vertical and horizontal separation between each plant to ensure the canopy is not contiguous; and
- do not grow closer to the building than a distance equivalent to the tree's expected height so that the branches do not overhang the eaves of the building' (refer Figure 11.4.4, Ipswich Planning Scheme).

1.6 State Planning Policy

Matters of state interest have been mapped within the site by the Department of Infrastructure, Local Government and Planning within the SPP Interactive Mapping System (DA) - 'Bushfire Hazard Area' (as illustrated in **Figure 3** below). The majority of the site falls within the 'Medium Potential Bushfire Intensity' mapping, with the balance mapped as 'Potential Impact Buffer'.

The State-interest guideline *Natural hazards, risk and resilience* (April 2016) states the Bushfire Hazard Code is 'currently under review'.

The SPP is supported by State-interest Technical manual to assist the implementation of the Policy into a Local Government's Planning Scheme. SPP - state interest technical manual *Natural Hazards, Risk and Resilience - A 'Fit for Purpose' approach in undertaking natural hazard studies and risk assessments* (April 2016) outlines the methods to prepare state-wide and localised bushfire hazard area maps.

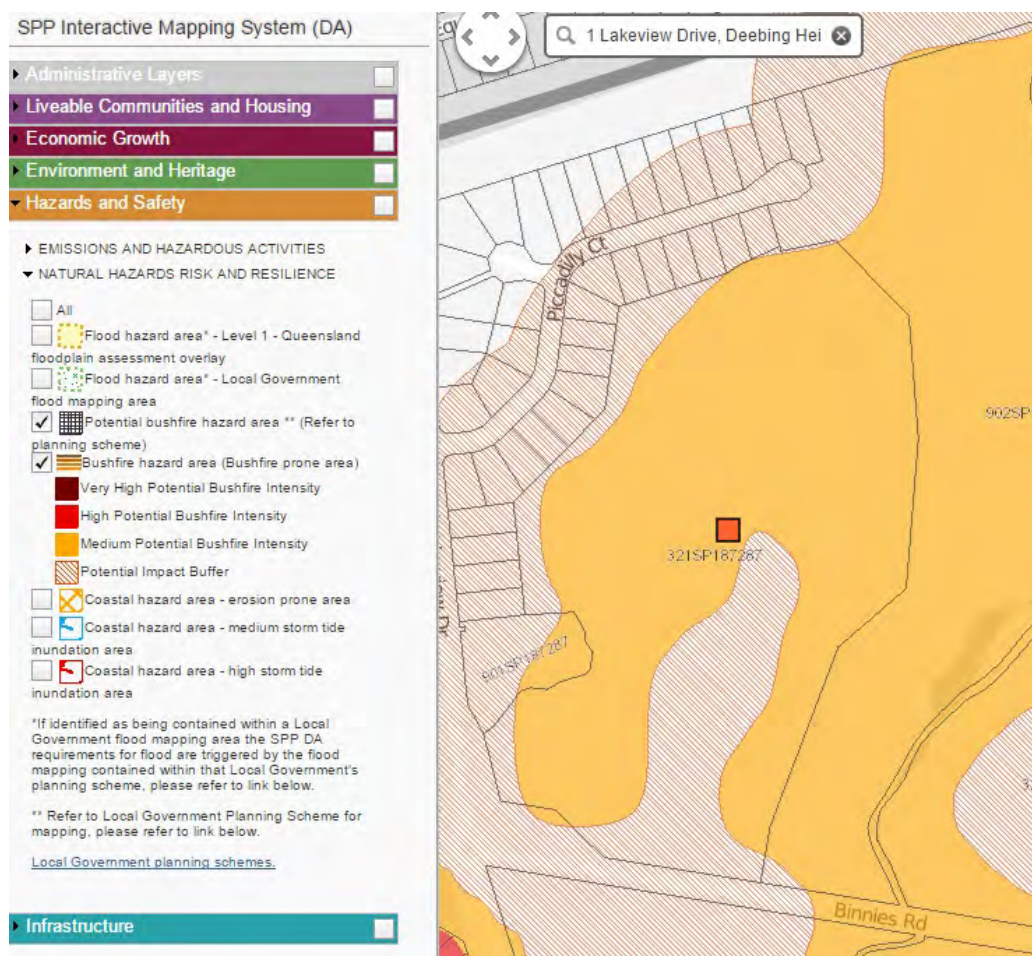


Figure 3 Screenshot of SPP Interactive Mapping System (DA) illustrating the mapped Bushfire hazard area.

2.0 SITE ANALYSIS

The following bushfire hazard assessment has been undertaken in accordance with B2.1. Preparing State-wide bushfire hazard area maps Steps 1 -5 (*SPP Natural Hazards, Risk and Resilience - state interest technical manual, April 2016*).

2.1 Step 1 - Create Vegetation Hazard Class and Potential Fuel Load Maps

Vegetation hazard classes and the associated Potential Fuel Load map has been created through an assessment of Regional Ecosystem mapping (refer **Figure 4** *Vegetation Management Supporting Map*), aerial imagery, ground-truthing, and, an assessment (refer Ecological Assessment Report) as to the likely extent of future rehabilitation (that may be required as part of an RoL approval). The vegetation has been classified as per Table 1: Vegetation Hazard Classes (VHC) and associated Potential Fuel Loads of the SPP.

Where the vegetation could fit into two different hazard classes or has been mapped in the *Vegetation Management Supporting Map* as containing more than one Regional Ecosystem (RE), the Higher Potential Fuel Load (PFL) has been included calculations. **Table 1** below provides an overview of the vegetation hazard classes present within 100m of site boundary. This is illustrated in JFP Plan BHA.01 *Vegetation Hazard Mapping* (**Appendix C**).

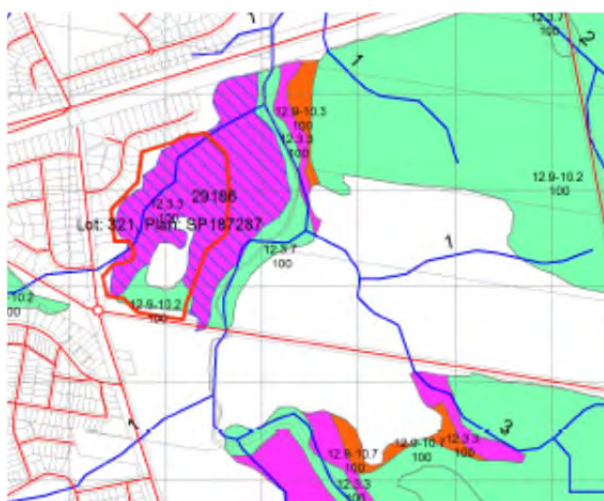


Figure 4 Extract of Vegetation Management Supporting Map (VMA). Mapped Regional Ecosystems.

Table 1. Overview of the vegetation hazard classes present within 100m of site boundary

Vegetation communities observed on site	SPP - Vegetation Hazard Class	SPP PFL tonnes per ha
Includes the existing streets and residential area to the west, and the future residential area to the south (area of Preliminary Approval south of Binnies Rd), and the proposed residential area.	41.4 Low grass or tree cover in built-up areas	3.0
includes the more densely vegetated area along the minor waterway within the site (to the north and northwest of the proposed development footprint). These areas are dominated by <i>Eucalyptus moluccana</i> , <i>E. tereticornis</i> , and <i>E. crebra</i>	9.1 Moist to dry open forest on coastal lowlands and ranges	24.1

with disturbed understorey of Acacia regrowth and lantana.		
Includes areas that have the same overstorey as VHC9.1, but are scattered in distribution with a clear or grassy understorey	12.1 Dry eucalypt woodlands on sandstone and shallow soils	17.3
Includes the more densely vegetated area to the east of Deebling Creek. These areas are dominated by <i>Eucalyptus citriodora</i> with a grassy understorey.	10.1 Spotted gum dominated open forest	20.8
Includes a band of <i>Allocasuarina littoralis</i> adjacent the main waterway to the east of the site. Reflects long-term potential of re-establishment of Eucalypt species	16.1 Eucalyptus dominated open forest on drainage lines and alluvial plains	15.9
Areas largely clear of trees and shrubs and include paddocks and the road verge along the Cunningham Hwy	40.4 Low grass or tree cover in rural areas	5.0

2.2 Step 2 - Create Slope Maps

The slope map has been produced using the Lidar contours provided by Baird and Hayes. This is considered more accurate than creating 25m resolution digital terrain model as described in the SPP State-interest Technical Manual (April 2016).

The topography of the site and surrounds is relatively flat, gently sloping towards the north and east and, becoming steeper adjacent the Deebling Creek waterway corridor.

The majority of the site and the land to the south and west have a less than a 2 degree slope. The banks of the minor waterway within the site are quite steep in places from apparent erosion. As these areas are discreet from the gradient of the overall landform, they have been mapped within the <2° extent. Refer JFP Plan BHA.02 *Slope Assessment* (Appendix D).

2.3 Step 3 - Create Potential Severe Fire Weather Map

The Forest Fire Danger Index (FFDI) 5% AEP for the site has been determined through reference to the Queensland Fire and Rescue Service GIS Unit Mapping Update *Potential Fire Weather Severity Map* (31 July 2014), in combination with a hand-adapted chromatic surrogate (in Photoshop by JFP) FIGURE 5 – FFDI 5% AEP (Annual Exceedance Probability).

FFDI (5% AEP) for the subject land is estimated from the above to be 58. Worst case of **65** has been adopted in all calculations as a precaution and to account for future drying on account of climate change. Refer **Figure 5**. This is considered a worst case scenario, as AS3959-2009 identifies in *Table 2.1* a FDI for Queensland of 40.

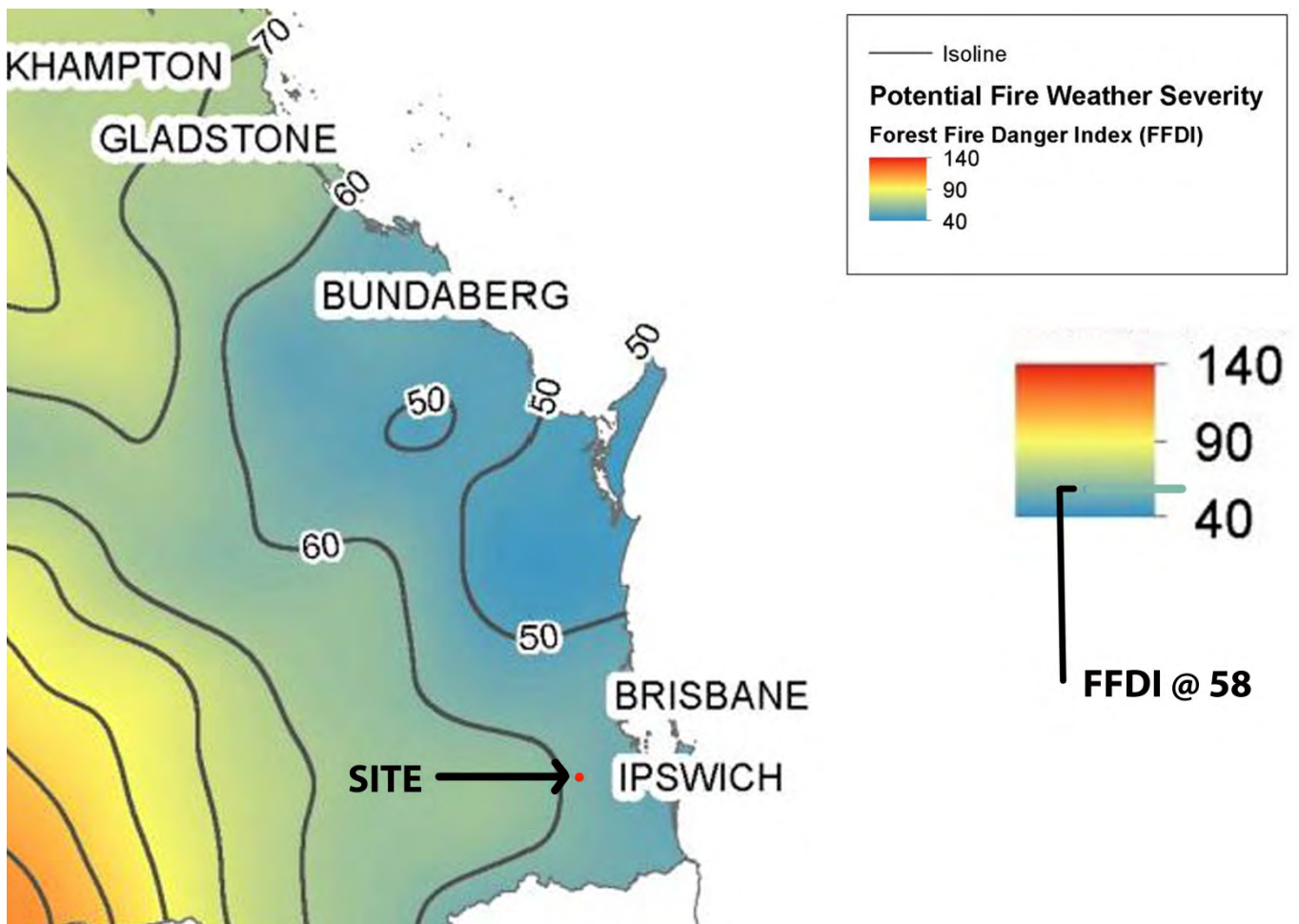


Figure 5 Potential Severe Fire Weather Map

2.4 Step 4 - Create Potential Severe Fire Weather Map

The three inputs, Potential Fuel Load, Potential Severe Fire Weather and maximum Slope are combined using the following equation:

$$PFI = 0.62 PFL^2 FFDI \exp(0.069 \text{ Slope})$$

Where:

PFI = Potential Fireline Intensity (kW/m)

PFL = Potential Fuel Load (tonnes/ha)

FFDI = Potential severe fire weather

Slope = max slope (degrees)

The results of these calculations are illustrated in JFP Plan *Potential Bushfire Intensity Map BHA03 (Appendix E)*.

2.5 Step 5 – Bushfire Hazard Class Map

HAZARD CLASS	POTENTIAL FIRELINE INTENSITY
1. Very High	40,000+kW/m
2. High	20,000 - 40,000kW/m
3. Medium	4,000 - 20,000kW/m
4. Grass Fire Hazard	Generally Less than 4,000 kW/m
5. Low Hazard	0-4,000kW/m

Table 2 of Natural Hazards, Risk and Resilience - state interest technical manual (SPP, April 2016).

BHA.03 (refer **Appendix F**) illustrates the PFI calculations as 'potential bushfire hazard classes'. The proposed development is largely bordered by areas that have a PFI of less than 4000kW/m and are mapped as a Low Hazard as per *Table 2 of Natural Hazards, Risk and Resilience - state interest technical manual (SPP, April 2016)*.

A small area to the west of the development footprint and some to the south east have a PFI of 4,000 - 20,000kW/m and are a Medium Bushfire Hazard. The potential for a bushfire presenting hazard to the proposed development from the west is mitigated somewhat due to the large urban area located to the west and the Medium Hazard width of the less than 100m. To the east the larger area of native vegetation, east of Deebing Creek, presents a greater bushfire hazard within the vicinity.

3.0 AS3959 CONSTRUCTION OF BUILDING IN BUSHFIRE-PRONE AREAS

AS 3959-2009 outlines construction requirements for buildings in bushfire hazard areas in order to improve their resistance to bushfire attack from burning debris, radiant heat, or, flame contact.

Bushfire attack levels (BALs) are a means of measuring the severity of a building's potential exposure to ember attack, radiant heat and direct flame contact, using increments of radiant heat expressed in kilowatts (kW)/m², and the basis for establishing the requirements for construction to improve protection of building elements to attack by bushfire (Section 1.5.3A AS3959-2009). AS3959-2009 outlines different BAL which relate to particular construction standards depending on the level of bushfire risk.

While the SPP PFI mapping determined that some of the surrounding vegetation is a Low Bushfire Hazard, this does not imply that buildings within the site are not at risk. Due to the proximity to large areas of native vegetation, it is appropriate for construction of buildings to be in accordance AS3959-2009 Construction of Buildings in bushfire-prone areas. To this end, it appropriate for buildings to be constructed to BAL12.5 as a minimum construction standard.

Using a FFDI of 50 (as per Table 2.1 of AS3959-2009), the following setbacks are a minimum required to achieve BAL construction requirements.

Setbacks to achieve BAL - 12.5 construction Levels			
Development boundary	Forest	Woodland	Shrubland
West, north, and northeast	32	22	19 (Biobasin)
East and Southeast	38	26	
Setbacks to achieve BAL – 19 construction Levels			
West, north, and northeast	23	15	13 (Biobasin)
East and Southeast	27	18	
Setbacks to achieve BAL – 29 construction Levels			
West, north, and northeast	16	10	9 (Biobasin)
East and Southeast	19	12	

As per AS3959-2009 Section 3.5, a reduction in construction requirement for the next lower BAL than determined for the lot may be applied to an elevation of the building where 'the elevation is not exposed to the source of the bushfire attack'. However the construction requirements for a shielded elevation shall not be less than BAL – 12.5

While some of the vegetation adjacent to the development has been determined to be woodland as per the SPP 'Vegetation Hazard Classes', it is anticipated that with rehabilitation of the proposed open space, this will be ultimately (outside proposed Outer Building Protection Zone) 'Forest'. Vegetation within the Outer Building Protection Zone is to be rehabilitated to 'Woodland'.

4.0 MITIGATION

4.1 Construction Standards

Buildings on proposed lots must adopt the following construction standards, and fencing and retaining walls should be constructed of non-flammable materials. The BALs are illustrated on JFP plan BHA.04.

Lots	Heat flux thresholds	BAL	Exposure	AS3959-2009 Construction Section
403-409, 413-417, 420-424, 429-432, 435-438, 443-446, 449-452, 456-457	$\leq 12.5 \text{ kW/m}^2$	BAL – 12.5	Ember attack	3 and 5
402, 410, 418-419, 433-434, 447-448, 453-455, 458-461	$> 12.5 \text{ kW/m}^2$ $\leq 19 \text{ kW/m}^2$	BAL - 19	Increasing level of ember attack, burning debris, increasing heat flux	3 and 6
401, 411-412, 425-426, 427-428, 439-442, 453-454, 462	$> 19 \text{ kW/m}^2$ $\leq 29 \text{ kW/m}^2$	BAL- 29	Increasing level of ember attack, burning debris, increasing heat flux	3 and 7

4.2 Access roads

As the development site or part thereof, is located in an Ipswich City Council Planning Scheme *Transitional Bushfire Risk Area*, the development is required to address the Development Constraints Overlay Code 11.4.4 Bushfire Risk Areas. The development layout includes a 16m wide public road (8m pavement), separating the majority of proposed lots from the bushfire risk. Lot 410 is separated from the bushfire risk by a 10m emergency access path, and the remaining lots 455 and 462 are separated from the bushfire risk by an 8m wide cleared road/path.

4.3 Water supply

The proposed development is to have access to main water supply.

4.4 Building Protection Zones

An Outer Building Protection Zone (OPZ) 7-13m wide has been designated within the future open space along the western edge of the development footprint (refer BHA.04). A small portion of the existing open space at the south eastern edge of the site has also been designated as an OPZ and the inner 15m of the proposed biobasin area is within an OPZ. Planting within the biobasin should be set back a minimum of 2m from the edge of the 8m wide road, to ensure a minimum 10m setback of lots 455 and 462 from hazardous vegetation. It is noted that planting in the biobasin may not include any trees however unless mown grass will still be potential source of fuel. All OPZ are to be rehabilitated to a woodland vegetation structure with no fibrous-bark trees or shrub planting and are to be maintained as a reduced fuel area.

Inner Building Protection Zones (IPZ) (refer BHA.04) have been designated over the front of 11 lots (lots 411-412, 425-428, 439-442, 453-454). The IPZ are to be very low fuel areas, with lawns and non-flammable structures. IPZ range 4-5m in width to achieve a minimum 20m separation between flammable structures and hazardous vegetation.

Landscaped gardens within the IPZ are permitted if separated from windows and doors, and, lawns to be mowed to <100mm in height. Trees can be planted as long as their canopy does not overhang roofs or are planted as individual specimens.

5.0 CONCLUSIONS and RECOMMENDATIONS

Consistent with Ipswich Planning Scheme *Figure 11.4.2: Bushfire Protection Buffers* the proposed layout includes a Fire Protection Buffer of 20m (refer BHA.04). The road and verges form the 8-16m wide Inner Bushfire Protection Zone. The Outer Bushfire Protection Zone incorporates the adjacent 7-13m of vegetation within the proposed open space, 15m of the proposed biobasin, in which will contain no shrub layer (very little present), and ground fuel reduced. A 4m wide Outer building Protection Zone has also been designated within the existing open space, opposite proposed lot 401. While this is not located within the site property boundary no trees have been surveyed within this area and, it could easily be incorporated within a wider grass verge.

As this is a preliminary assessment, bushfire hazard risk should be reassessed with further detailed design however, the following recommendations are provided:

- Rehabilitation of Outer Building Protection Zones - does not include planting of shrub species and; planting of tree species, that do not have a fibrous bark or long strips of hanging bark, to a density that results in an overall tree density of no more than 1 tree per 200m²; understorey planting is restricted to evergreen groundcovers that do not result in a build-up of ground fuel, no shrubs planted; selectively remove woody shrubs over 300mm.
- Inner Building Protection Zones - Contain lawns and non-flammable structures. Landscaped gardens within the IPZ are permitted if separated horizontally from windows and doors. Lawns to be maintained to <100mm in height. Trees can be planted as long as their canopy does not overhang roofs or are planted as individual specimens.
- Street trees planted are less flammable species and do not result in overhanging future buildings
- Buildings are constructed according to the recommended BAL
- Fencing and retaining walls constructed within 20m of buildings on lots directly exposed to the source of bushfire hazard (lots with a BAL of BAL - 19 and BAL - 29) are constructed of non- flammable materials
- Fire fighting water supply and hydrants supplied in accordance with Queensland Urban Utilities Standards
- Future residents will prepare their home and occupants for the annual fire season in accordance with QRFS recommendations.

6.0 REFERENCES

- Commonwealth Scientific and Industrial Research Organisation (CSIRO) 2014, A new methodology for State-wide mapping of bushfire prone areas in Queensland, CSIRO and State of Queensland 2014
- Department of Infrastructure, Local Planning and Mapping (17 January 2017). *SPP Interactive Mapping*. Accessed May 2017.
<http://www.dilgp.qld.gov.au/planning/state-planning-instruments/spp-interactive-mapping-system.html> >
- Department of Science, Information Technology and Innovation (2017) *Copy of the Remnant Regional Ecosystem Map - Version 10.0*. Online RE Map, The Department of Science, Innovation Technology and Innovation, Brisbane.
- McDonald, R.C., Isbell, R.F., Speight, J.G., Hopkins, M.S, (1990). Australian Soil and Land Survey Field Handbook. 2nd ed. Melbourne, INKATA.
- Queensland Department of Local Government and Planning (DLGP) 2003, State Planning Policy Guideline Mitigating the Adverse Impacts of Flood, Bushfire and Landslide 01/03, 2003
- Queensland Department of State Development, Infrastructure and Planning (DSDIP) 2014, State Planning Policy 2014, July 2014
- Standards Australia Limited (Standards Australia) 2009, *Australian Standard 3959-2009 Construction of buildings in bushfire prone areas*, Incorporating amendments 1, 2 and 3, 10 March 2009

7.0 DISCLAIMER

Recommendations in the report are based on best practice, relevant training, site information and Australian Standards, including *AS4970-2009 (Protection of Trees on Development Sites)*. Clients may choose to accept or disregard the recommendations of this assessment and report. This report must be read in its entirety. At no time shall part of this report be used unless taken in the full context of the report.

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8.0 APPENDICES

8.1 Appendix A – Reconfiguration Plan

REVISION			
REV.	DESCRIPTION	DATE	BY
A	RECONFIGURATION & P.O.D. LODGE	08/06/2017	P.E
B	PRELODGEEMENT ADVICE	20/06/2017	P.E

The areas and distances on this plan are approximate only and are subject to Local Authority approval and final survey

		% OF DEVELOPMENT	NUMBER OF LOTS	LOT RATIO
TOTAL SITE AREA	10.51ha			
AREA SUBJECT TO RESIDENTIAL - VILLA (400m ² - 429m ²)	8137m ²	8%	20	32%
AREA SUBJECT TO RESIDENTIAL - COURTYARD (430m ² - 449m ²)	1.230ha	12%	28	45%
AREA SUBJECT TO RESIDENTIAL - TRADITIONAL (450m ² +)	6780m ²	6%	14	23%
AREA SUBJECT TO OPEN SPACE DEDICATION	5.7912ha	55%	2	
AREA OF NEW ROAD	1.9976ha	19%		
NEW ROAD LENGTH	1074m			

NOTES:

- All boundaries at formed road corners to be truncated with 6.0m 3 chord truncations at time of survey.
- All roads to be a minimum of 16m wide reserve at time of survey.
- Lots 900 & 901 to be dedicated and transferred to Council for Open Space and Stormwater Management.
- Preliminary servicing plans show that all services will remain within road reserve and will not require easements within the proposed lots.
- A small land dedication may be required for Electrical Transformer unless a suitable location can be determined within proposed road reserve. This land will be dedicated as Road Reserve and the exact location will be confirmed though the detailed design stage following Council Approval. The location of the transformer site will not affect the proposed residential lots and/or their proposed sizes.

LEGEND

CADASTRAL BOUNDARY	PRIMARY STREET FRONTAGE	SECONDARY STREET FRONTAGE	0.25m CONTOURS
DEVELOPMENT AREA	PROPOSED RETAINING WALL	BUILDING ENVELOPES & HOUSE PRESENTATION DIRECTION	PROPOSED BIO BASIN LOCATION
PROPOSED WATERMAIN	PROPOSED SEWER LOCATION	PRIVATE OPEN SPACE LOCATION	PROPOSED FOOTPATH
PROPOSED ELECTRICAL	PROPOSED STORMWATER		
PEDESTRIAN ACCESS ONLY	VEHICLE ACCESS LOCATION		



Level Datum:	N/A
Bench Mark Location:	N/A
Adopted Level:	N/A
Contour Interval:	0.25m AHD vide ICC Records and Earlier Survey

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DWG. TITLE
**Proposed Reconfiguration
of
1 Lakeview Drive,
Deebling Heights
Lot 321 on SP187287**

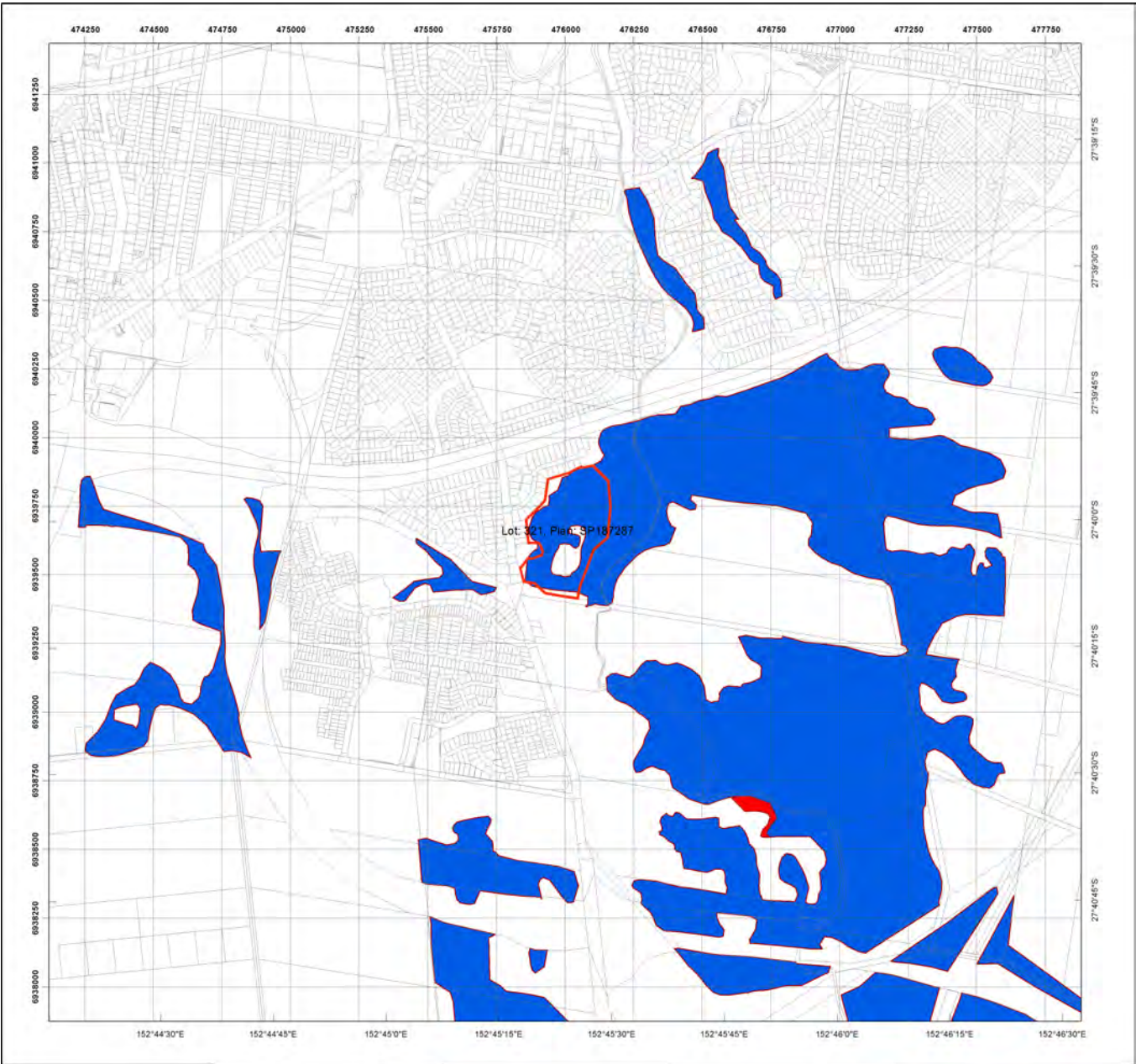
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PROJECT
**Kelly Consolidated
Pty Ltd**

REF NO.
12970

DWG. NO. Rev.
P18-02b

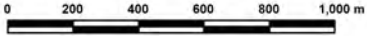
8.2 Appendix B – Vegetation Management Act Mapping



Regulated Vegetation Management Map

Legend

- Lot and Plan
- Category A area (Vegetation offsets/compliance notices/VDecs)
- Category B area (Remnant vegetation)
- Category C area (High-value regrowth vegetation)
- Category R area (Reef regrowth watercourse vegetation)
- Category X area (Exempt on Freehold, Indigenous and Leasehold land)
- Water
- Area not categorised
- Cadastral line
- Property boundaries shown are provided as a locational aid only



This product is projected into:
GDA 1994 MGA Zone 56

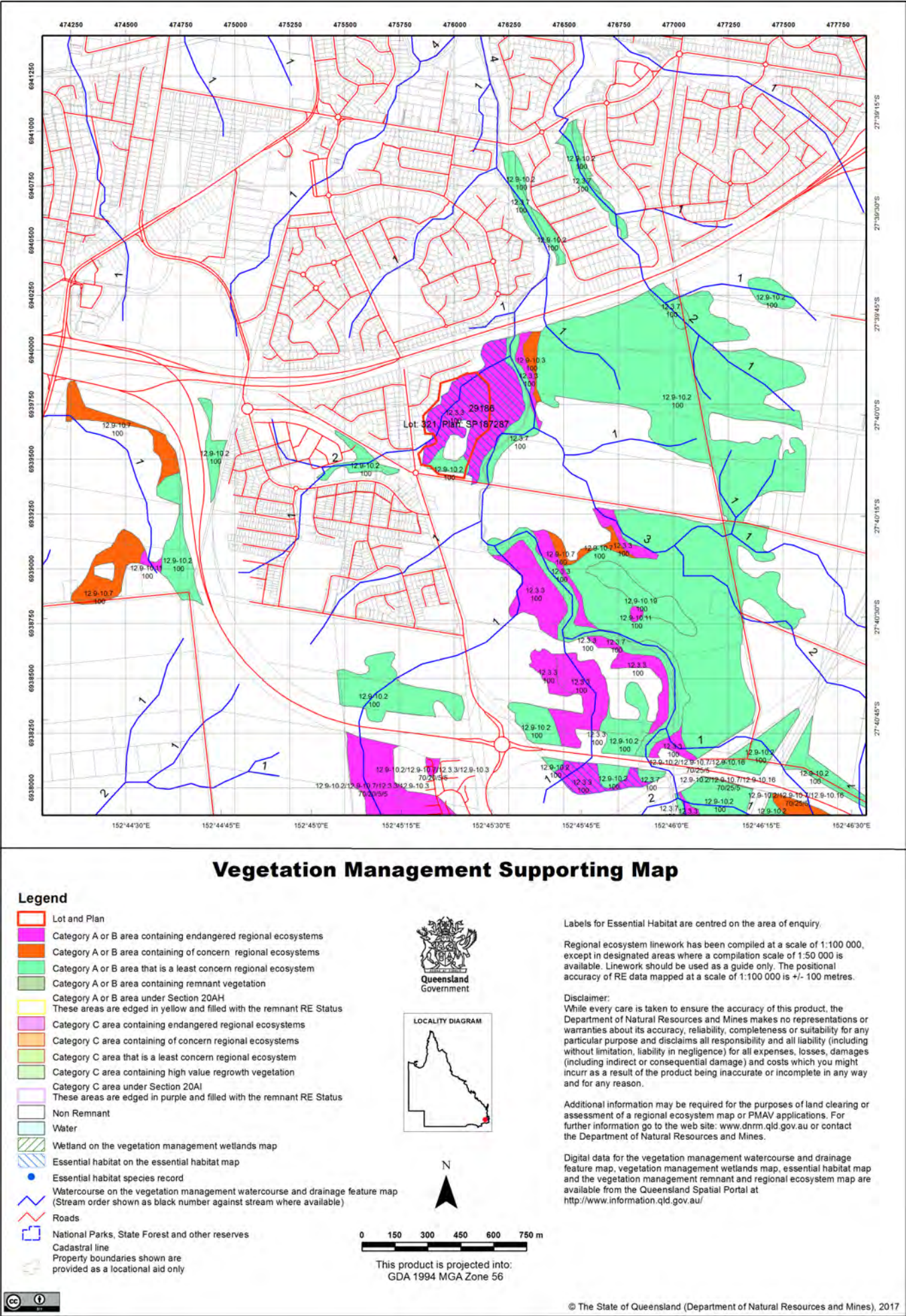
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Additional information required for the assessment of vegetation values is provided in the accompanying "Vegetation Management Supporting map". For further information go to the web site: www.dnrm.qld.gov.au or contact the Department of Natural Resources and Mines.

Digital data for the regulated vegetation management map is available from the Queensland Spatial Portal at <http://www.information.qld.gov.au/>

This map is updated on a monthly basis to ensure new PMAVs are included as they are approved.





Vegetation Management Act 1999 - Extract from the essential habitat database

Essential habitat is required for assessment under the:

- State Development Assessment Provisions - Module 8: Native vegetation clearing which sets out the matters of interest to the state for development assessment under the *Sustainable Planning Act 2009*; and
- Self-assessable vegetation clearing codes made under the *Vegetation Management Act 1999*

Essential habitat for one or more of the following species is found on and within 1.1 km of the identified subject lot/s or on and within 2.2 km of an identified coordinate on the accompanying essential habitat map.

This report identifies essential habitat in Category A, B and Category C areas.

The numeric labels on the essential habitat map can be cross referenced with the database below to determine which essential habitat factors might exist for a particular species.

Essential habitat is compiled from a combination of species habitat models and buffered species records.

The Department of Natural Resources and Mines website (<http://www.dnrm.qld.gov.au>) has more information on how the layer is applied under the State Development Assessment Provisions - Module 8: Native vegetation clearing and the *Vegetation Management Act 1999*.

Regional ecosystem is a mandatory essential habitat factor, unless otherwise stated.

Essential habitat, for protected wildlife, means a category A area, a category B area or category C area shown on the regulated vegetation management map-

- 1) (a) that has at least 3 essential habitat factors for the protected wildlife that must include any essential habitat factors that are stated as mandatory for the protected wildlife in the essential habitat database; or
- 2) (b) in which the protected wildlife, at any stage of its life cycle, is located.

Essential habitat identifies endangered or vulnerable native wildlife prescribed under the *Nature Conservation Act 1994*.

Essential habitat in Category A and B (Remnant vegetation species record) areas:1100m Species Information

(no results)

Essential habitat in Category A and B (Remnant vegetation species record) areas:1100m Regional Ecosystems Information

(no results)

Essential habitat in Category A and B (Remnant vegetation) areas:1100m Species Information

Label	Scientific Name	Common Name	NCA Status	Vegetation Community	Altitude	Soils	Position in Landscape
29186	Phascolarctos cinereus (southeast Queensland bioregion)	Koala	V	Open eucalypt forest and woodland that has: a) multiple strata layers containing Eucalyptus, Corymbia, Angophora, Lophostemon or Melaleuca trees that-at 1.3 metres above the ground-have a diameter both greater and less than 30 centimetres; and b) at least 1 of the following species: Eucalyptus tereticornis, E. fibrosa, E. propinqua; E. umbra, E. grandis, E. microcorys, E. tindalliae, E. resinifera, E. populnea, E. robusta, E. nigra, E. racemosa, E. crebra, E. exserta, E. seeana, Lophostemon confertus, L. suaveolens, Melaleuca quinquenervia.	Sea level to 1000m.	no soil information	None

Essential habitat in Category A and B (Remnant vegetation) areas:1100m Regional Ecosystems Information

Label	Regional Ecosystem (this is a mandatory essential habitat factor, unless otherwise stated)
29186	12.3.3, 12.3.4, 12.3.6, 12.3.7, 12.3.10, 12.3.11, 12.5.2, 12.5.3, 12.8.14, 12.9-10.4, 12.9-10.7, 12.9-10.17, 12.11.5, 12.11.18, 12.12.12

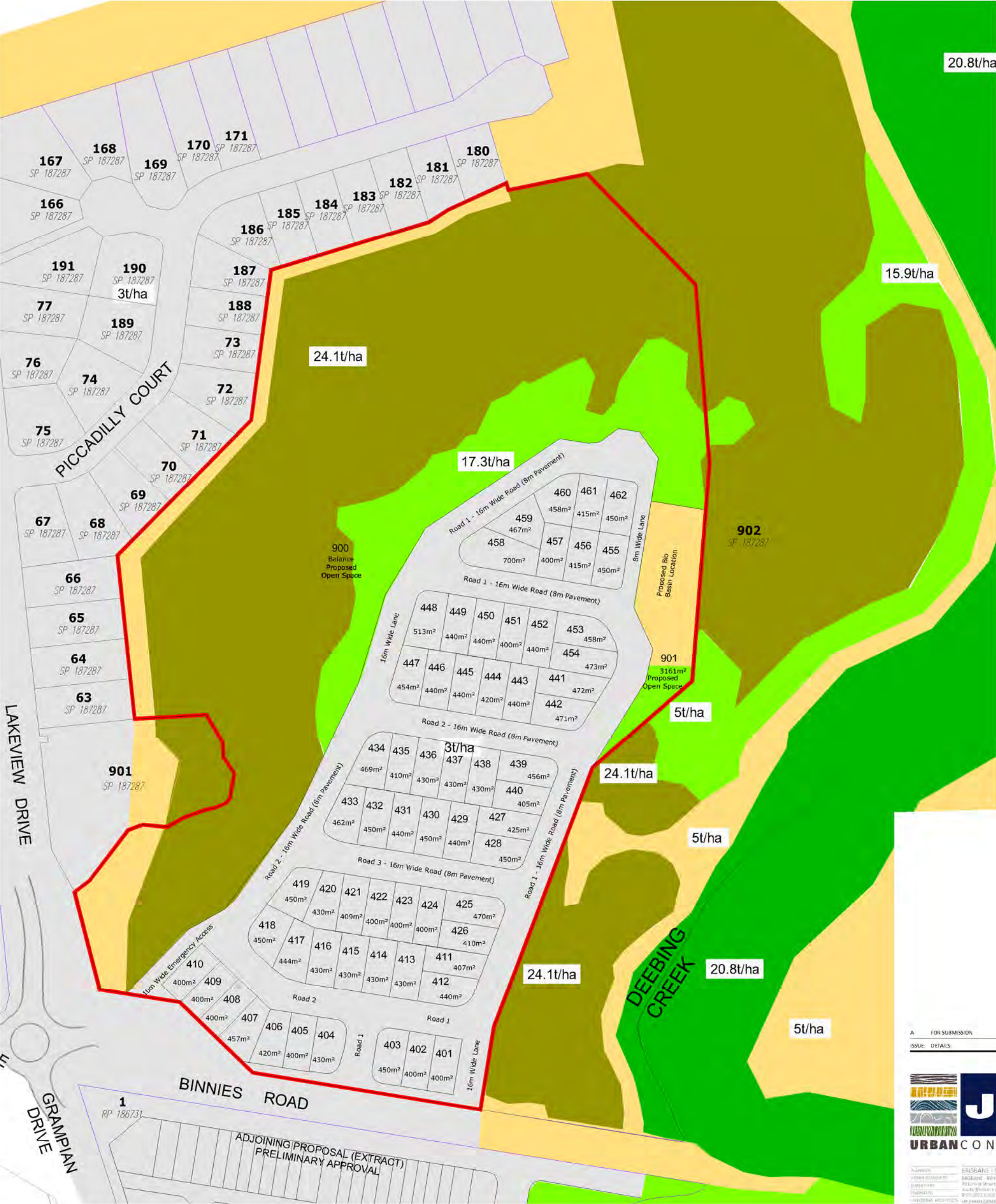
Essential habitat in Category C (High value regrowth vegetation) areas:1100m Species Information

(no results)

Essential habitat in Category C (High value regrowth vegetation) areas:1100m Regional Ecosystems Information

(no results)

8.3 Appendix C – Vegetation Hazard Mapping



LEGEND

- Site Boundary
- Potential fuel load 3t/ha and under
- Potential fuel load 5t/ha
- Potential fuel load 15.9-17.3t/ha
- Potential fuel load 20.8t/ha
- Potential fuel load 24.1t/ha

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ISSUE:	DETAILS:	DATE:	INIT:	CHKD:



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URBAN CONSULTANTS

PROJECT: BRISBANE - SUNSHINE COAST - CENTRAL QLD
SUBDIVISION: 1 LAKEVIEW DRIVE, DEEBING HEIGHTS
FOR: KELLY CONSOLIDATED PTY LTD
PLAN TITLE: Vegetation Hazard Mapping

PROJECT TITLE:
SUBDIVISION
1 LAKEVIEW DRIVE, DEEBING HEIGHTS
FOR:
KELLY CONSOLIDATED PTY LTD
PLAN TITLE:
Vegetation Hazard Mapping

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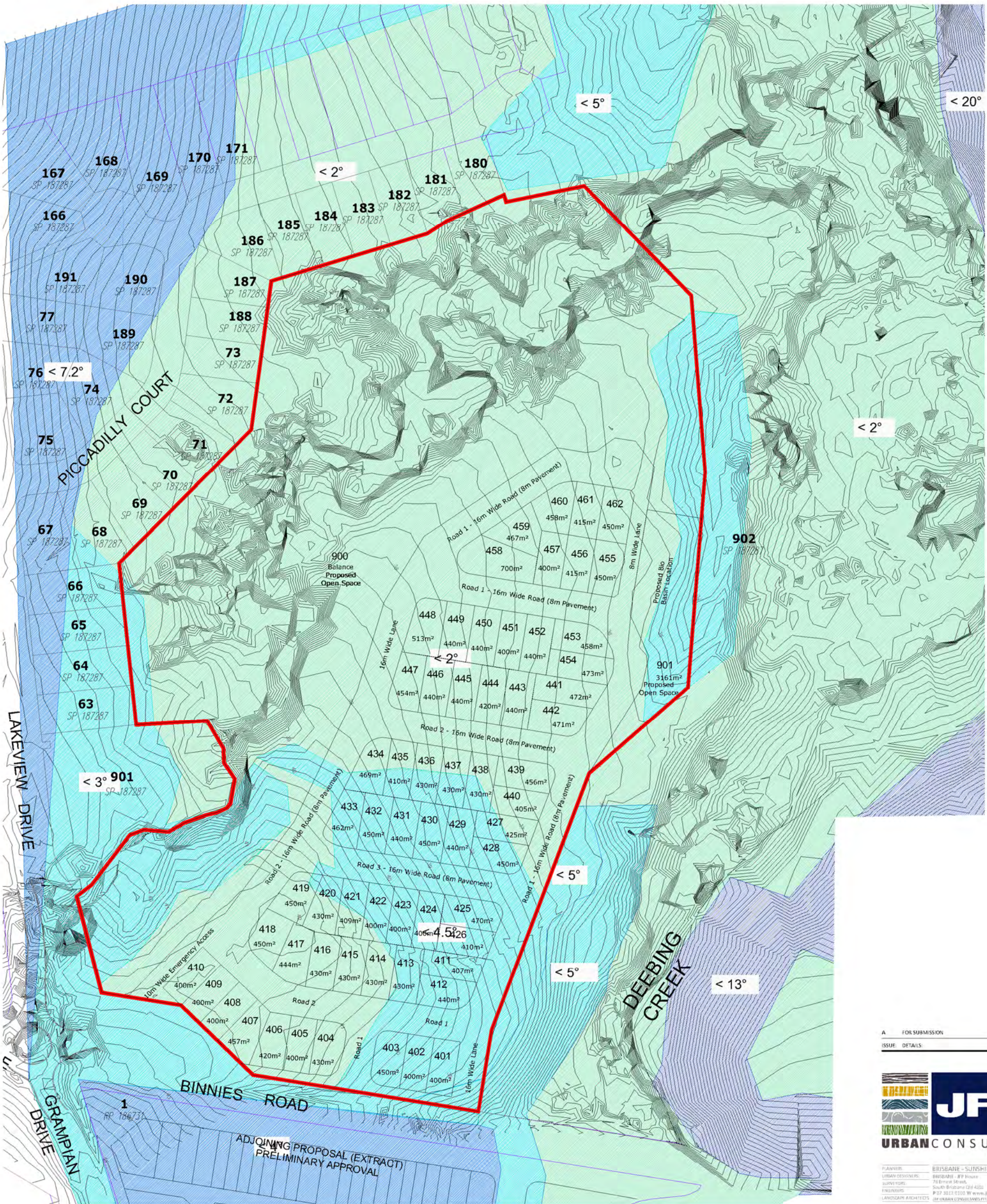
PROJECT:	PLAN:	ISSUE:	NOTCH:
B3755L BHA.01	A		I
SCALE: 1:2000 @ A3			
DATE:	26/06/2017		
FILE NAME:	B3755-BHA.DWG		

8.4 Appendix D – Slope Analysis

Bushfire Hazard Mapping - Step 2 Create Slope Map

Step 2 as per SPP - Natural Hazards, Risk and resilience - State Interest Technical Manual, April 2016, using Lidar contours as an alternative to landscape scale slope maps.

APPROVAL ISSUE



LEGEND

- Site Boundary
- Slope <2°
- Slope <5°
- Slope <10°
- Slope <15°

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ISSUE	DETAILS	DATE	INIT	CHKD



PLANNING: BRISBANE - SUNSHINE COAST - CENTRAL QLD
URBAN DESIGNERS: BRISBANE - JFP House
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ENGINEERS: South Brisbane QLD 4001
LANDSCAPE ARCHITECTS: P.O. BOX 10100 W. Brisbane QLD 4001

PROJECT TITLE:

SUBDIVISION
1 LAKEVIEW DRIVE, DEEBING HEIGHTS

FOR
KELLY CONSOLIDATED PTY LTD

PLAN TITLE:
Slope Assessment

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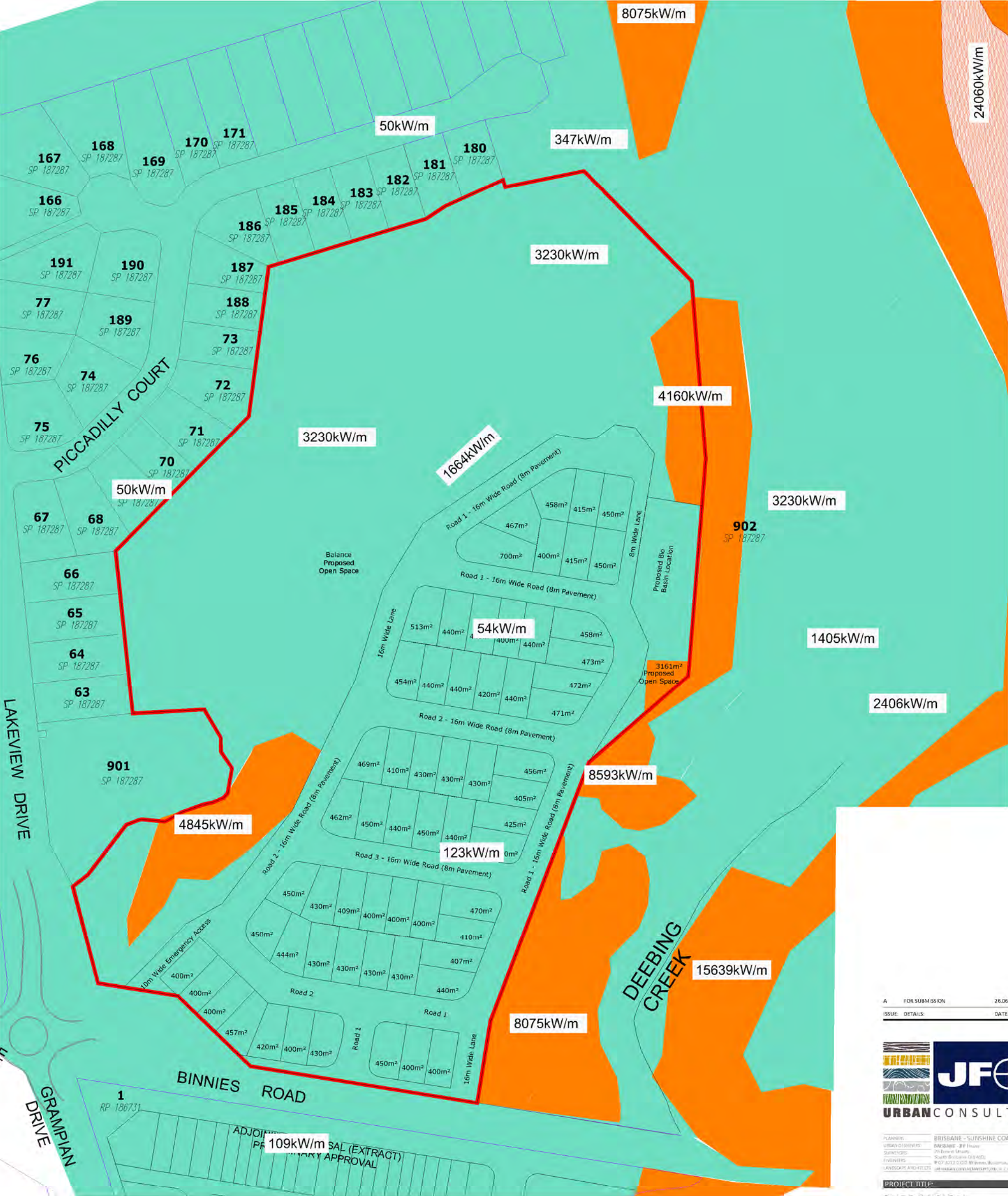
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SCALE: 1:2000 @ A3

DATE: 26/06/2017

FILE NAME: B3755-BHA.DWG

8.5 Appendix E – Potential Bushfire Intensity Map



LEGEND

- Site Boundary
- Low Hazard 0 - 4000kW/m
- Medium Hazard 4,000- 20,000kW/m
- High Hazard 20,000 - 40,000kW/m
- Very High Hazard 40,000+ kW/m

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ISSUE:	DETAILS	DATE:	INIT:	CHKD:

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URBAN CONSULTANTS

PLANNING:	BRISBANE - SUNSHINE COAST - CENTRAL QLD
URBAN DESIGNERS:	BRISBANE - JF Team
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ENGINEERS:	South Brisbane (CR 435)
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PROJECT TITLE:

SUBDIVISION
1 LAKEVIEW DRIVE, DEEBING HEIGHTS

FOR:
KELLY CONSOLIDATED PTY LTD

PLAN TITLE:
Potential Bushfire Intensity Map

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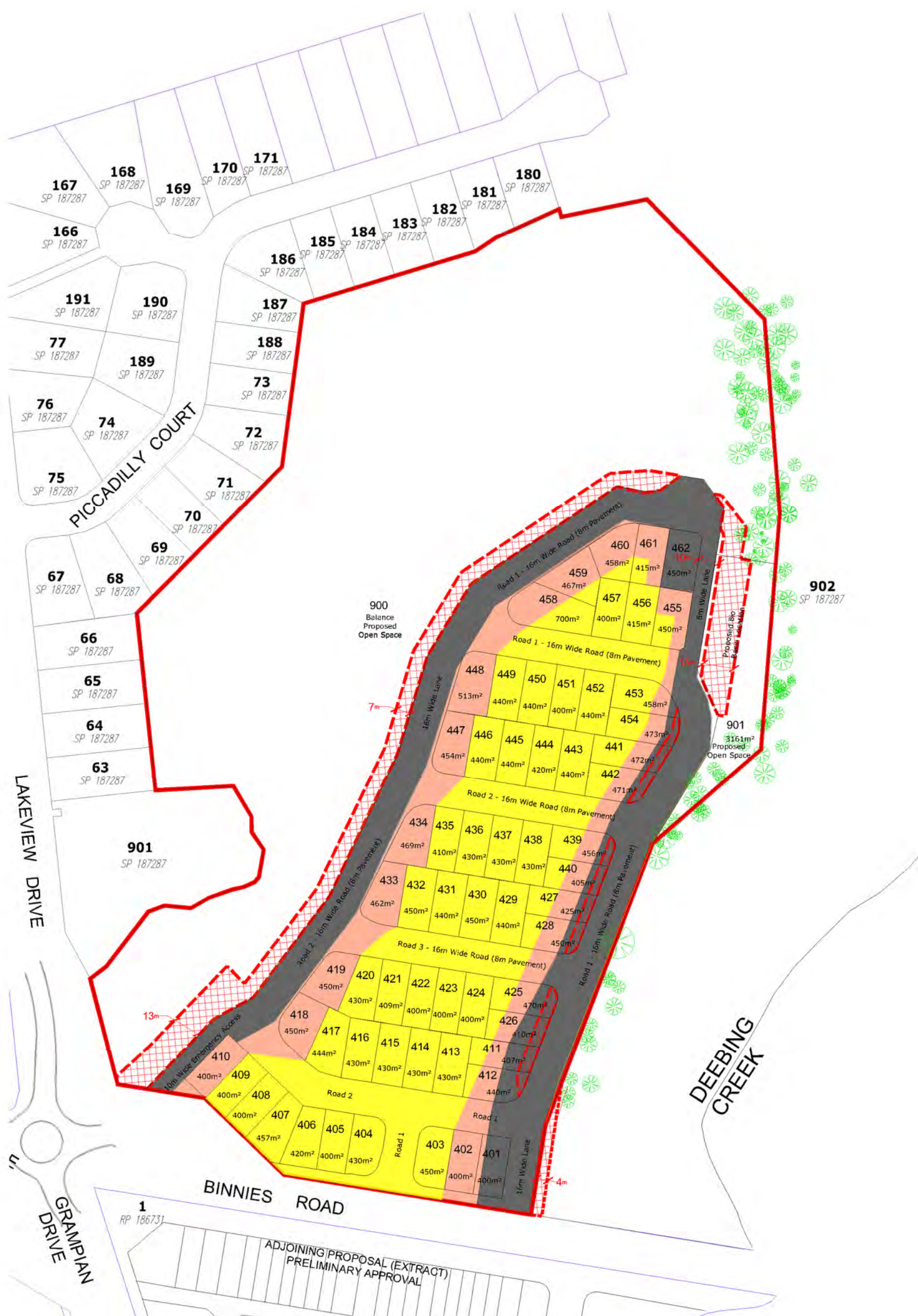
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

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Appendix F – Bushfire Hazard Management Recommendations



LEGEND

-  Site Boundary
-  Trees in existing Open Space surveyed within 10m of boundary by Baird & Hayes
- Approximate Bushfire Attack Levels**
-  BAL - 12.5
-  BAL - 19
-  BAL - 29
- Setbacks**
-  Outer Building Protection Zone
Maintain as open woodland. No shrub planting or fibrous-bark trees.
-  Inner Building Protection Zone.
Low fuel area.

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PROJECT TITLE:

SUBDIVISION
1 LAKEVIEW DRIVE, DEEBING
HEIGHTS

FOR
KELLY CONSOLIDATED PTY LTD

PLAN TITLE:
Bushfire Hazard Management
Recommendations

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