



# Land & Fire Assessments Pty Ltd

PO BOX 104  
Wardell  
NSW 2477  
ACN 160 897 343  
Web: [landandfireassessments.com.au](http://landandfireassessments.com.au)

---

## **BUSHFIRE ASSESSMENT** **For Proposed State Significant Development** **at Lot 102 DP870722,** **771 Cudgen Road,** **CUDGEN, NSW**



Prepared By: Paola Rickard  
BPAD – Level 3 Accredited Practitioner – BPDAD-21855  
Land & Fire Assessments Pty Ltd  
For: NSW Health Infrastructure  
Project No.: LFA18020  
Date: 17 October 2018

### Disclaimer

*Land & Fire Assessments Pty Ltd (LFA) have conducted work concerning the environmental status of the site, which is the subject of this report, and has prepared this report on the basis of that assessment. The work was conducted, and the report has been prepared, in response to specific instructions from the client or a representative of the client and in reliance on certain data and information made available to LFA. The analysis, evaluations, opinions and conclusions presented in this report are based on that information, and they could change if the information is in fact inaccurate or incomplete.*

*Due consideration has been given to site conditions and to appropriate legislation and documentation available at the time of preparation of the report. As these elements are liable to change over time, the report should be considered current at the time of preparation only. Should further information become available regarding the conditions at the site, LFA reserves the right to review the report in the context of the additional information. LFA has made no allowance to update this report and has not taken into account events occurring after the time its assessment was conducted.*

*This report is intended for the sole use of the client and only for the purpose for which it was prepared. Any representation contained in the report is made only to the client unless otherwise noted in the report. Any third party who relies on this report or on any representation contained in it does so at his or her own risk*

### Revision List

| Revision No. | Revision Date | Report Title                                                                                                                  | Report Author                                                                                                                 | Field Survey By | Status              |
|--------------|---------------|-------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|-----------------|---------------------|
| 00           | 25.07.18      | Bushfire Assessment For Proposed State Significant Development and Rezoning at Lot 102 DP870722, 771 Cudgen Road, CUDGEN, NSW | Main Author:<br>Paola Rickard (LFA - Senior Environmental Planner & BPAD – Level 3 Accredited Practitioner – no. BPDAD-21855) | Paola Rickard   | Draft for review    |
| 01           | 13.08.18      |                                                                                                                               |                                                                                                                               |                 | Project Team review |
| 02           | 30.08.18      |                                                                                                                               |                                                                                                                               |                 | Project Team review |
| 03           | 11.09.18      |                                                                                                                               |                                                                                                                               |                 | Final               |
| 04           | 28.09.18      | Bushfire Assessment For Proposed State Significant Development at Lot 102 DP870722, 771 Cudgen Road, CUDGEN, NSW              |                                                                                                                               |                 | Final               |
| 05           | 17.10.18      |                                                                                                                               |                                                                                                                               |                 | Final               |

**LFA contact details: Paola Rickard: 0427 809 352 and Tony Coyle: 0427 483 099**



## TABLE OF CONTENTS

|                                                                                                |           |
|------------------------------------------------------------------------------------------------|-----------|
| <b>1. INTRODUCTION.....</b>                                                                    | <b>1</b>  |
| 1.1 BACKGROUND .....                                                                           | 1         |
| 1.2 THE PROJECT SITE .....                                                                     | 4         |
| 1.3 PROPOSED DEVELOPMENT .....                                                                 | 4         |
| 1.4 PROJECT SITE TOPOGRAPHY AND SLOPE .....                                                    | 5         |
| 1.5 PROJECT SITE & SURROUNDING VEGETATION .....                                                | 5         |
| <b>2. RISK ASSESSMENT AND CONSULTANT QUALIFICATIONS .....</b>                                  | <b>10</b> |
| <b>3. STATE SIGNIFICANT DEVELOPMENT CONCEPT PROPOSAL - BUSHFIRE INFORMATION REQUIREMENTS .</b> | <b>11</b> |
| 3.1 INTRODUCTION .....                                                                         | 11        |
| 3.2. SFPP BUSHFIRE PROTECTION MEASURES (S. 4.2.7 OF PBP).....                                  | 12        |
| 3.2.1 Asset Protection Zones .....                                                             | 12        |
| 3.2.2 Access - Internal Roads.....                                                             | 13        |
| 3.2.3 Water, Gas and Electricity Supply .....                                                  | 14        |
| 3.2.4 Emergency and Evacuation Planning .....                                                  | 14        |
| 3.2.5 Pre- Release PBP 2018.....                                                               | 15        |
| 3.2.6 Construction Standards (National Construction Code).....                                 | 17        |
| 3.3 ADDRESS OF DIRECTION 4.4 PLANNING FOR BUSHFIRE PROTECTION .....                            | 18        |
| <b>4. CONCLUSION .....</b>                                                                     | <b>19</b> |
| <b>5. REFERENCES.....</b>                                                                      | <b>21</b> |
| <b>APPENDICES .....</b>                                                                        | <b>22</b> |
| APPENDIX A – TVH MASTERPLAN .....                                                              | 23        |
| APPENDIX B - APZS REQUIREMENTS AND LANDSCAPING .....                                           | 24        |
| B.1 General Requirement for Asset Protection Zones .....                                       | 24        |
| B.2 Landscaping and Property Maintenance.....                                                  | 25        |
| B.2.1 Landscaping Features & Principles.....                                                   | 25        |
| B.2.1 Vegetation Management .....                                                              | 26        |
| B.2.3 Property Maintenance .....                                                               | 26        |
| APPENDIX C – NSW ADDITIONAL CONSTRUCTION REQUIREMENTS .....                                    | 27        |



# 1. Introduction

## 1.1 Background

This Bushfire Assessment report has been prepared by Land & Fire Assessments Pty Ltd (LFA) in accordance with the relevant provisions of Planning for Bushfire Protection (PBP) (RFS 2006) on behalf of NSW Health Infrastructure for a staged State Significant Development Concept Proposal submission at Lot 102 DP870722, 771 Cudgen Road, Cudgen, NSW (refer to Figs. 1-3).

This Bushfire Assessment is required because:

- The Project Site contains land designated as 'Vegetation Categories 1 & 2' and 'Buffer' on the Tweed Council Bushfire Prone Land Map, hence the site occurs on bushfire prone land (refer Fig. 1); and
- Future development proposed for the Project Site is for a new Tweed Hospital, which is considered a 'high risk' development as it will involve a Special Fire Protection Purposes Development.



**Figure 1.** Bushfire mapping for the Project Site (Yellow Star). Source: Tweed Shire Council Intramaps

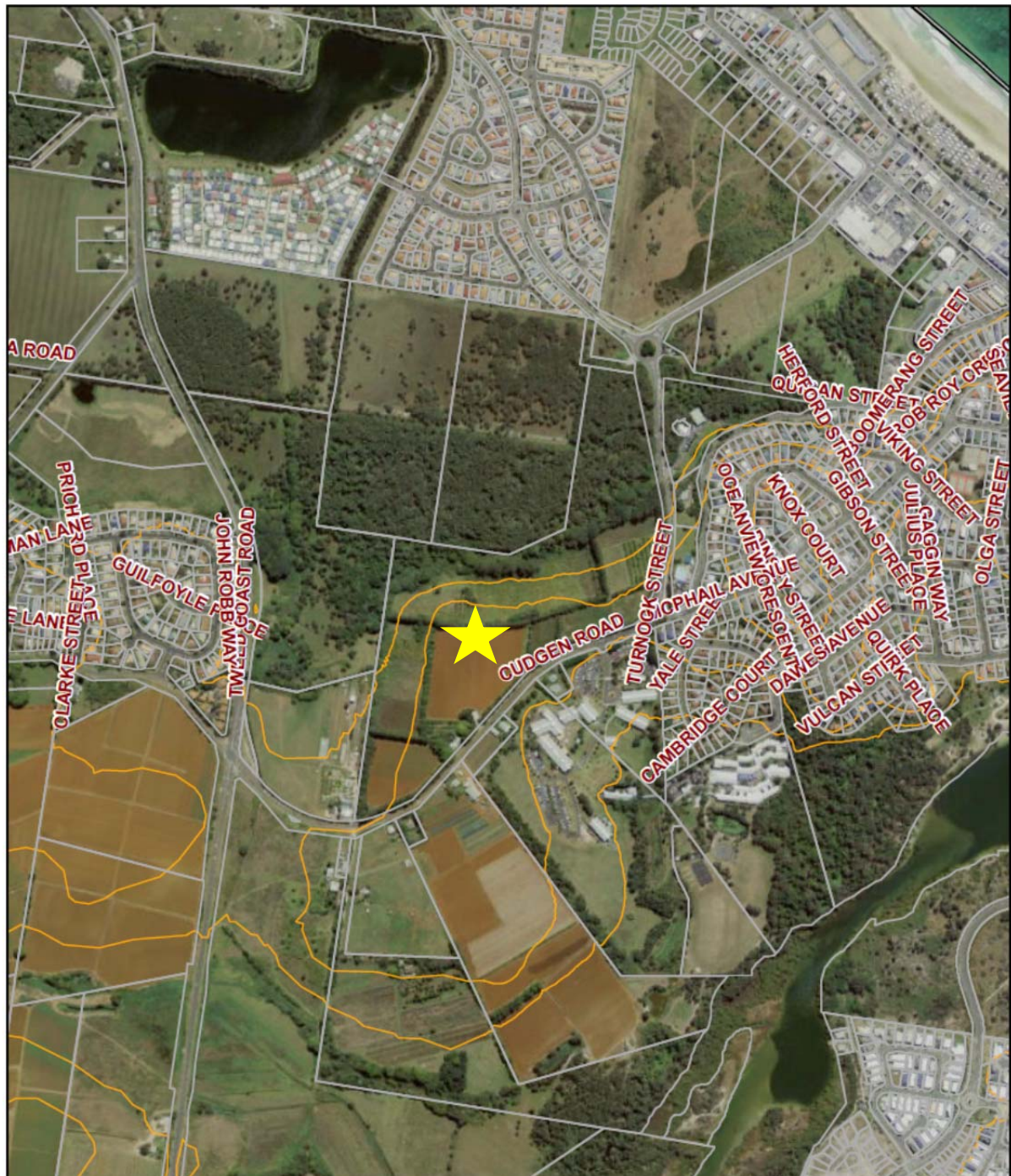
Planning for Bush Fire Protection 2006 (PBP) provides guidelines for use once an area has been identified and zoned for development. The Minister for Planning, under section 9.1(2) [former s. 117(2)] of the *Environmental Planning and Assessment Act 1979* (EP&A Act) issues directions that relevant planning authorities (such as local councils) must follow when preparing planning proposals for new Local Environmental Plans (LEP) and amending LEPs. Direction 4.4 Planning for Bushfire Protection identifies matters for consideration for rezoning that will affect, or are in proximity to land mapped as bush fire prone.

The key principle is to ensure that future development is capable of complying with PBP. To achieve this it is necessary to undertake a constraint assessment of the Project Site in respect to bushfire to identify potential bush fire risks to the individual site and proposed forms of development.

Thus this bushfire assessment will identify elements (if any), which may restrict development or that will be impacted upon by development such as water supply, access and evacuation. In addition, hospitals are treated differently in PBP and fall into the classification of Special Fire Protection Purposes (SFPP) developments. SFPP developments require greater setback from hazardous vegetation (i.e. Asset Protection Zone or APZ) than residential developments and require suitable

emergency and evacuation (and relocation) arrangements for occupants in acknowledgement of the fact that occupants in a hospital are particularly vulnerable to the impacts of a bushfire and might not be able to readily evacuate.

In summary, this assessment reviews the suitability of the Project Site for the State Significant Development (SSD) application for the proposed hospital Concept Proposal in accordance with the applicable bushfire protection provisions.



May 15, 2018

Property Boundaries

1:12,054  
0 0.07 0.15 0.3 mi  
0 0.13 0.25 0.5 km

**Figure 2.** Project Site (yellow star) located at 771 Cudgen Road Cudgen (i.e. Lot 102 DP870722). Source: Tweed Shire Council Intramaps





**Figure 3.** Close up of Project Site - The Site consists of predominantly cleared/cultivated land with Swamp Sclerophyll Forest to the north east of the site and along northern boundary. Source: <http://maps.six.nsw.gov.au/>



## 1.2 The Project Site

The Project Site for the purpose of this assessment is Lot 102 DP870722, 771 Cudgen Road, Cudgen, NSW, as shown on Figs. 1-5. The Project Site occurs immediately north of the TAFE NSW Kingscliff and west of the township of Kingscliff (Plate 1). Landuse in the general locality comprises residential



development to the east, educational institution to the south east, agricultural land to the south west, hydroponic establishment to the west, and remnant bushland to the north (refer to Fig. 4). Cudgen Road and Turnock Street bound the land along the south-south east and east. The Site is located in the Tweed Shire Council Local Government Area.

**Plate 1.** Looking north east along Cudgen Rd. Project Site is to the left and the TAFE is to the top right of photo

The Site is ~23.23ha in area and has direct access to Cudgen Road. The Project Site consists of predominantly cleared/cultivated land with Swamp Sclerophyll Forest and Subtropical Rainforest to the north east of the Project Site and along northern boundary. The Swamp Sclerophyll Forest is also found to the north of the Project Site. A dwelling house and shed are found to the south (with direct access from Cudgen Road).

Lot 102 DP870722 is zoned R1 - General Residential, RU1 Primary Production and DM- Deferred Matter in the Tweed Local Environmental Plan 2014.

## 1.3 Proposed Development

The Project consists of a staged State Significant Development (SSD) Application under section 4.22 of the *Environmental Planning and Assessment Act 1979* (EP&A Act), which will consist of the following:

- a concept proposal application for early and enabling works (this report); and
- a second development proposal application (Stage 2) which will include detailed design, construction and operation of the Tweed Valley Hospital.

Health Infrastructure has also requested that the Department of Planning and Environment (DPE) prepare a site-specific State Environmental Planning Policy (SEPP), pursuant to Divisions 3.2 and 3.3 of the EP&A Act, to amend the Tweed Local Environmental Plan 2014 (TLEP 2014) to rezone part of the Project Site to SP2 Infrastructure to facilitate the determination of the application.

The proposed Tweed Valley Hospital Masterplan is provided in Appendix A. As noted previously, this assessment is concerned with the SSD application for the Concept Proposal (to be lodged, exhibited and assessed concurrently). Stage 2 of the SSD will involve detailed design, construction and operation and will be assessed as a separate application.

Removal of native vegetation associated with the proposal would be limited to removal of windrow vegetation found within the cultivated portion of the Project Site, and potentially the removal of some trees adjacent to the Cudgen Road to allow the creation of access points. The existing



vegetation found along the northern boundary and to the north east of the Project Site will be retained.

Relevant details pertaining to the Project are contained in the following reports as appendices in the Concept Proposal SDD application:

- Tre Removal, Preservation and Landscape Plans – Details of vegetation to removed, retained and added;
- Hydraulics and Fire Services - details of water for both domestic supply and fire services supply, proposed fire services systems and proposed gas supply;
- Civil and Structural Design Report – details of proposed earthworks and topographic contours.

A separate Bushfire Assessment Report as part of the SDD (Stage 2) application will address the following:

- detailed design plans that address siting and design principles, and construction BAL standards;
- detailed trafficable defensible space access provision to the hazard (and building facade facing the mapped hazard);
- detailed fire fighting water supply plan incorporating raise standpipes and parking provisions within the proposed trafficable defensible space;
- detailed landscaping plans certified compliant to PBP requirements. These plans will include any structures associated with the passive or recreation uses of the APZ;
- environmental management plans relating to the conservation of the unmanaged vegetation within the allotment.

Any future expansion of the Project Site would require separate applications that will also need to address the following:

- Detail design plans with a bush fire report addressing siting and design principles and construction BAL standards;
- Detailed trafficable defensible space access provision to the hazard (and building facade facing the mapped hazard);
- Detailed fire fighting water supply plan incorporating raise standpipes and parking provisions within the proposed trafficable defensible space;
- Detailed landscaping plans certified compliant to PBP requirements; and
- Environmental management plans relating to the conservation of the unmanaged vegetation within the allotment.

## 1.4 Project Site Topography and Slope

The Project Site consists of a broad flat portion, which then slopes down to the north 13° before levelling out again to a flat slope as shown on Fig. 5. Elevations within the Project Site range between approximately 20m AHD on the central and southern portion of the Project Site to 10m AHD to the north.

## 1.5 Project Site & Surrounding Vegetation

As shown on Fig. 4 and Plates 2-5, the Project Site consists of predominantly cleared/cultivated land with Swamp Sclerophyll Forest to the north east of the Project Site and along the northern boundary. The Swamp Sclerophyll Forest and Subtropical Rainforest is also found to the north of the Project Site - this vegetation is the hazardous vegetation (along with the portion found on the Project Site)



and is classified as 'Forested Wetland - Coastal Swamp Forest'. This classification has been confirmed following receipt of information from project ecologist. The slope of the affected vegetation is flat.

**Plate 2.** Looking east across Project Site - classified Forested Wetland -- Coastal Swamp Forest to left of photo



**Plate 3.** Looking west across Project Site



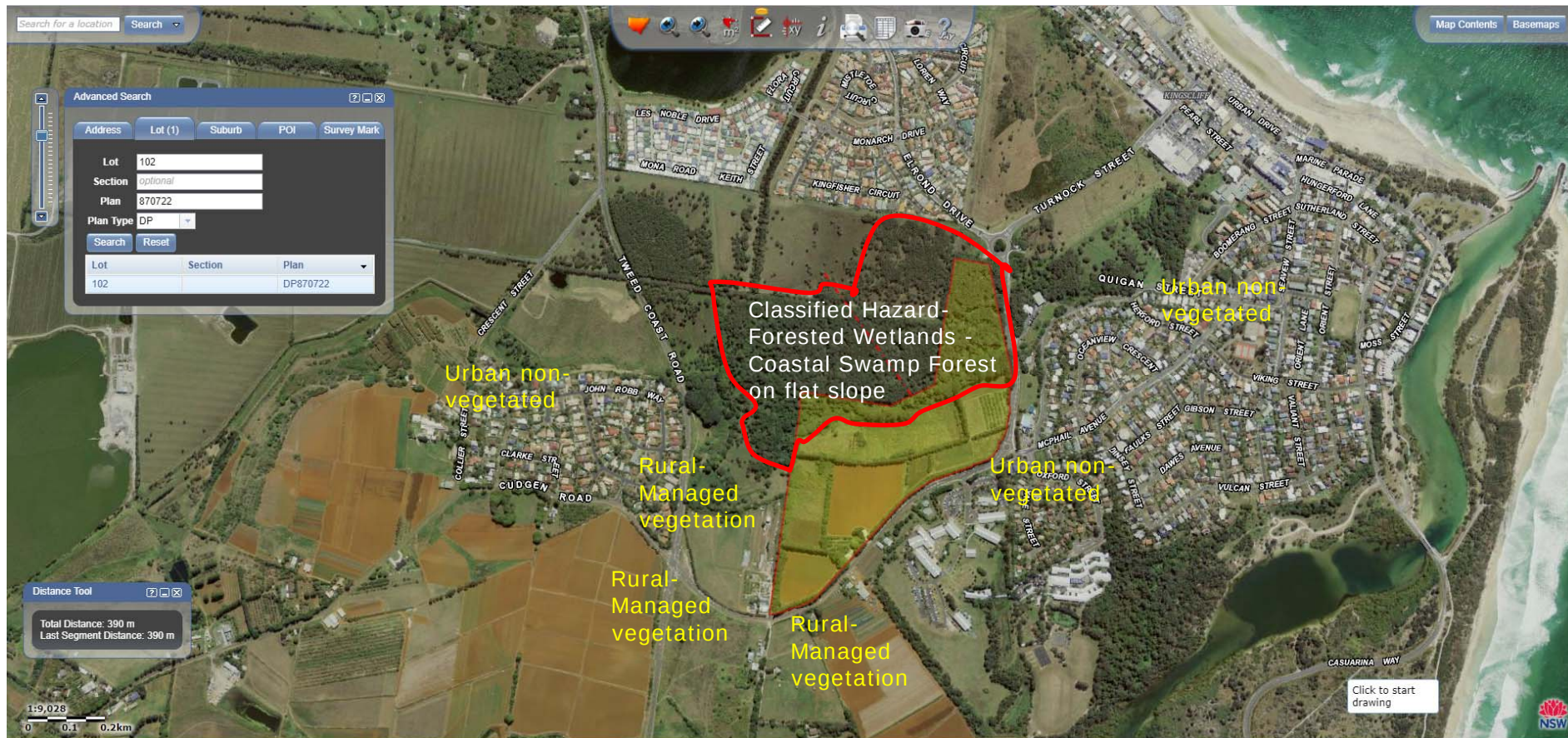
**Plate 4.** Looking south west from classified vegetation



**Plate 5.** Eastern corner of Project Site (Turnock St side) looking at classified vegetation

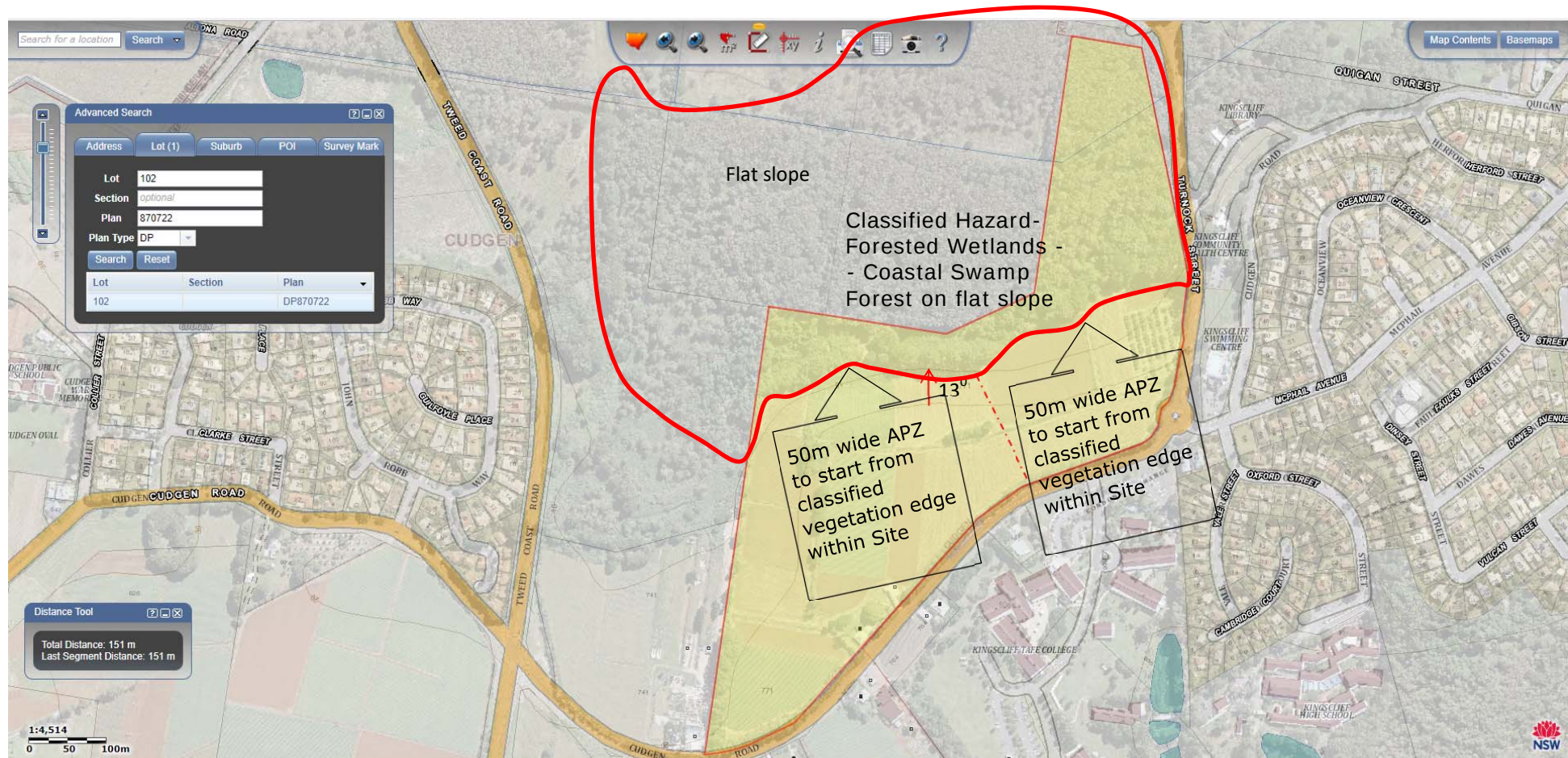
A number of windrows are found within the cultivated portion of the Project Site. The windrows include some native and non-native vegetation regrowth. Custard Apple orchard is found to the east (south of the Forested Wetland found on the Project Site).





**Figure 4.** The Project Site and surrounding landuse. The vegetation of concern is the Swamp Sclerophyll Forest to the north of the Project Site - this vegetation is considered the hazardous vegetation and is classified as Forested Wetland- - Coastal Swamp Forest





**Figure 5.** The land consists of a broad flat portion, which then slopes down to the north  $13^{\circ}$  before levelling out again to a flat slope. The Classified Hazard vegetation boundary is shown (thick red line). A 50m wide setback (APZ) from the classified vegetation edge within the Project Site to the proposed building will be required (note the APZ provisions in the Pre- Release PBP 2018 are considerably different and require a 67m wide APZ for Forested Wetlands - Coastal Swamp Forest) - Note the dashed redline showing the narrowest available distance from road to vegetation edge is 151m



## 2. Risk Assessment and Consultant Qualifications

As noted in s. 1.2, the Project Site occurs within a predominantly built-up environment and agricultural land. The main potential bushfire hazard consists of a patch of remnant floodplain vegetation to the north of the Project Site. Therefore, the Project Site is considered to have a low bushfire risk.

The Fire Protection Association Australia (FPA) **has in place the Bushfire Planning and Design Accreditation Scheme (BPAD), which is recognised by the NSW Rural Fires Services (RFS).** Paola Rickard is a **BPAD - Level 3 Accredited Practitioner** (Accreditation no. BPAD 21855) and is listed on the FPA Australia web site register.

BPAD- Level 3 Accredited Practitioner can perform the following:

- *BPAD- Level 3 Accredited Practitioner meet specific requirements in relation to identifying bushfire prone land, assessing potential bushfire impact, and submitting designs and plans, both deemed to satisfy and alternate solution, to meet the performance requirements of the Building Code of Australia and the specific state or territory legislation, for subdivisions, new buildings or modification to existing buildings aiming to minimise the risk to future developments, their occupants and responding emergency services from a bushfire event.*

Paola holds a **Graduate Diploma in Design for Bush Fire Prone Areas with Distinction** from the University of Western Sydney and is a **bronze corporate member of the Fire Protection Association Australia (FPA Australia).** She is a participating **member of the FPA Technical Advisory Committee (TAC) /20 Bushfire Safety.** The TAC provides a nationally focussed forum for discussion between practitioners, fire services and regulators on the design and construction of property in areas prone to bushfires.

Since 2015, Paola has been appointed as a **BPAD member to the NSW Bushfire Working Group (NSWBWG)** set up by FPA Australia. The NSWBWG provide a forum to discuss the application, interpretation and periodic review of NSW Government-based bushfire related regulatory requirements governing land use planning and building construction in areas subject to bushfire impact.

Paola also holds a **Bachelor Degree in Applied Science, a Certificate in Bushland Regeneration,** and is a member of the **Australian Association Bush Regenerators.** She has over 18 years of experience in flora surveys and vegetation management issues, and **has been undertaking bushfire assessments since 2003.**

Paola has attended the “NSW Consulting Planners Bushfire Training Course” in Sydney in 2003 and has attended the “Planning for Bushfire Protection Short Course” held by the University of Technologies (UTS) Sydney in 2007. She has obtained certification for the short course. In November 2010, Paola attended the “One-day Planning for Bushfire Prone Areas Update Course” conducted by the Centre for Local Government UTS, Sydney. Additionally, Paola has a ‘Basic Bush Fire Awareness’ certificate and has experience in fire control and planning while living on a rural land sharing community.



## 3. State Significant Development Concept Proposal - Bushfire Information Requirements

### 3.1 Introduction

As noted in s. 1.1, Direction 4.4 Planning for Bushfire Protection identifies matters for consideration for landuse intensification proposals that will affect, or are in proximity to land mapped as bush fire prone. Accordingly, the Rural Fire Service (RFS) requires specific information to accompany a rezoning relating to Bushfire Prone Land, which is detailed as follows:

Part 1 – Objectives or Intended Outcomes relating to bush fire prone land that is:

Protect life, property and the environment from bush fire hazards, by discouraging the establishment of incompatible land uses in bush fire prone areas, and encourage sound management of bush fire prone areas.

Part 2 – Explanation of the Provisions - The identified objectives can be achieved by ensuring that new controls imposed on development will:

- not increase the risk to life from bush fire,
- not introduce controls that place inappropriate developments in areas exposed to unacceptable bush fire hazard,
- ensure that appropriate bush fire protection measures can be afforded to property at risk of bushfire,
- minimise negative impacts on the surrounding environment,
- ensure that provision are made for adequate evacuation/shelter options for the community, and
- ensure that development is capable of complying with Planning for Bush Fire Protection 2006 (PBP).

Part 3 – Justification - The level of justification should be proportionate to the impact that the planning proposal will have.

Furthermore, hospitals are treated differently in PBP and fall into the classification of Special Fire Protection Purposes (SFPP) developments. SFPP developments require greater setback from hazardous vegetation (i.e. Asset Protection Zone or APZ). In fact, BPB states that *‘when it comes to SFPPs developments, there is more reliance on space around buildings (as defensible space and APZs for fuel load control) and less reliance on construction standards.’*

According to PBP, *‘SFPP developments are highly dependent on suitable emergency evacuation arrangements, which require greater separation from bush fire threats’*. Thus, there is an added emphasis on access, greater APZ, and emergency and evacuation planning.

PBP further notes the following concerning this type of proposals:

Hospitals are harder to design with bush fire protection in mind. They require ease of access for emergency patients arriving by ambulance or car with larger doorways that are difficult to ember proof. Patients can have a range of physical conditions and most emergency plans are based on fire within the building rather than bush fire threat. In many cases patients could suffer from asthma, emphysema or obstructive diseases and smoke may exacerbate these conditions. People with emotional or psychological problems may suffer increased anxiety and unwarranted stress during a bush fire, making evacuation arrangements difficult to coordinate and implement.

**Thus, in order to address Direction 4.4 Planning for Bushfire Protection it is required to demonstrate that the future development for the Project Site is capable of complying with PBP. To achieve this it is necessary to undertake a constraint assessment of the Project Site in respect to bushfire to identify potential bush fire risks to the site in question and the proposed form of**



**development (i.e. SFPP development).** Therefore, section 3.2 reviews the acceptable solution for the applicable Standards for Bushfire Protection Measures (BPMs) for SFPP (detailed in s. 4.2.7 of PBP 2006) so to ensure that the future development is capable of complying with PBP. The provisions of the Pre-Release PBP 2018 are also considered in s.3.2.5. Construction Standards are discussed in s.3.2.6. Whilst, s.3.3 addresses the Direction 4.4 Planning for Bushfire Protection matters for consideration against the BPMs discussed in s. 3.2.

## 3.2. SFPP Bushfire Protection Measures (s. 4.2.7 of PBP)

### 3.2.1 Asset Protection Zones

As noted previously, SFPP development such as the proposed Tweed Valley Hospital require greater setback from hazardous vegetation. This is because occupants are likely to be highly vulnerable to the effects of bush fire events. The vulnerability of occupants is due to their susceptibility to the effects of fire, lower mobility, adverse health effects, and lack of comprehension of the risk being faced during a fire or the need of high levels of care during an emergency event. Therefore, greater setbacks from the potential hazard are required. The following provisions will address the intrinsic vulnerability of evacuating occupants during a potential bushfire emergency:

1. Based on the classified vegetation being 'Forested Wetlands - Coastal Swamp Forest' and a flat slope, the required APZ from the boundary of the classified vegetation is 50m (Table A2.6- Appendix 2 of PBP)<sup>1</sup>. A 50m wide setback (APZ) from the classified vegetation edge within the Project Site to the proposed building (or buildings) will be required as shown in Fig. 5. This APZ has been reflected in the Masterplan design shown on Appendix A. Accordingly, the proposed development (Rezoning and SSD Stage 1) is capable of providing the APZs requirements prescribed in Table A2.6-Appendix 2 of PBP.
2. According to the Masterplan Concept Proposal (Appendix A), exits are located away from the hazard side of the building and the APZs can be wholly contained within the boundaries of the Project Site.

**The measures detailed in points 1 & 2, will ensure that radiant heat levels of greater than 10kW/m<sup>2</sup> will not be experienced by occupants or emergency services workers entering or exiting a building.**

It will be also required to ensure that:

3. Mechanisms are in place to provide for the maintenance of the APZ over the life of the development.
4. APZs are managed and maintained to prevent the spread of a fire towards the hospital buildings.
5. Vegetation is managed to prevent flame contact and reduce radiant heat to buildings, minimise the potential for wind driven embers to cause ignition and reduce the effect of smoke on residents and fire-fighters.

The measures detailed in points 3-5 will need to be addressed in detail as part of the SSD Stage 2 Application for the new hospital. Appendix B provides guidance concerning the general requirements for APZs and appropriate landscaping and property maintenance.

In summary, the proposed hospital can meet the APZ intent of measures, which is:

***To provide sufficient space for firefighters and other emergency services personnel, ensuring radiant heat levels permit operations under critical conditions of radiant heat, smoke and embers, while supporting or evacuating occupants.***

<sup>1</sup> Refer to s. 3.2.5 for discussion on APZ requirements under the Pre-Release PBP 2018, which are greater than current PBP 2006 requirements. Notably the increased APZ has also been reflected in the Masterplan design shown on Appendix A



### 3.2.2 Access - Internal Roads

The public road system in the Project Site locality provide alternative access or egress for firefighters and residents during a bush fire emergency if part of the road system is cut by fire. Nevertheless, the impact of increased traffic and traffic management in the locality needs to be considered. Thus, the need for safe access for emergency services in case of a bushfire is paramount with this type of development. PBP (RFS 2206) provides the following guidance for access road design:

- For internal roads, at least one alternative access road needs to be provided for individual dwellings or groups of dwellings more than 200 metres from a public through road. The routes of these roads should be selected to ensure that both roads are unlikely to be simultaneously cut by a fire.
- Short access roads are preferable to long ones for the safe evacuation of residents and for emergency service personnel. Therefore, dwellings should be sited as close as possible to public through roads. Large numbers of vehicles may be attempting to simultaneously enter or leave an area, congesting roads and restricting fire services and other emergency services personnel accessing an area. For this reason, roads should be planned for suitable widths to permit access into and out of the area during such situations.

Accordingly, design of appropriate access for the proposed hospital will need to comply with above guidance and the acceptable solutions to address performance criteria of s.4.2.7 of PBP, which are reproduced in Table 1.

**Table 1.** Performance criteria for internal roads (as per s.4.2.7 PBP)

| Performance Criteria                                                                                                               | Acceptable Solutions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Internal road widths and design enable safe access for emergency services and allow crews to work with equipment about the vehicle | <ul style="list-style-type: none"> <li>• internal roads are two-wheel drive, sealed, all-weather roads;</li> <li>• internal perimeter roads are provided with at least two traffic lane widths (carriageway 8 metres minimum kerb to kerb) and shoulders on each side, allowing traffic to pass in opposite directions;</li> <li>• roads are through roads. Dead end roads are not more than 100 metres in length from a through road, incorporate a minimum 12 metres outer radius turning circle, and are clearly sign posted as a dead end;</li> <li>• traffic management devices are constructed to facilitate access by emergency services vehicles.</li> <li>• a minimum vertical clearance of four metres to any overhanging obstructions, including tree branches, is provided.</li> <li>• curves have a minimum inner radius of six metres and are minimal in number to allow for rapid access and egress.</li> <li>• the minimum distance between inner and outer curves is six metres.</li> <li>• maximum grades do not exceed 15 degrees and average grades are not more than 10 degrees.</li> <li>• crossfall of the pavement is not more than 10 degrees.</li> <li>• roads do not traverse through a wetland or other land potentially subject to periodic inundation (other than flood or storm surge).</li> <li>• roads are clearly sign-posted and bridges clearly indicate load ratings.</li> <li>• the internal road surfaces and bridges have a capacity to carry fully-loaded firefighting vehicles (15 tonnes).</li> </ul> |

As part of the SSD Stage 2, the proposed hospital design will need to demonstrate compliance with the measures prescribed in Table 1 and the applicable guidance principles. Nevertheless, it is purported that internal access arrangements for the hospital as shown on the Masterplan (Appendix A) provides for the following:

- several entry and exit points
- all internal roads are two-wheel drive, sealed, all-weather roads
- roads are predominantly through roads



Accordingly, final design should be able comply with intent of measures, which is:

***To provide safe operational access for emergency services personnel in suppressing a bush fire, while residents are accessing or egressing an area.***

### 3.2.3 Water, Gas and Electricity Supply

Services are already available to the Project Site; however, upgrades are likely to be required for the provision of services to this development. Accordingly, such upgrades to be developed at the SSD Stage 2 will need to comply with acceptable solutions to address performance criteria of s.4.2.7 of PBP, which are reproduced in Table 2.

**Table 2.** Performance criteria for water, gas and electricity supply (as per s.4.2.7 PBP)

| Performance Criteria                                                                                                                                                                           | Acceptable Solutions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Reticulated water supplies</b><br><br>Water supplies are easily accessible and located at regular intervals                                                                                 | <ul style="list-style-type: none"> <li>Access points for reticulated water supply to SFPP developments incorporate a ring main system for all internal roads.</li> <li>Fire hydrant spacing, sizing and pressures comply with AS2419.1 – 2005. Where this cannot be met, the RFS will require a test report of the water pressures anticipated by the relevant water supply authority, once development has been completed. In such cases, the location, number and sizing of hydrants shall be determined using fire engineering principles.</li> <li>The provisions of public roads in section 4.1.3 in relation to parking are met.</li> </ul>                    |
| <b>Electricity</b><br><br>Location of electricity services will not lead to ignition of surrounding bushland or the fabric of buildings or risk to life from damaged electrical infrastructure | <ul style="list-style-type: none"> <li>Electrical transmission lines are underground.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Gas</b><br><br>Location of gas services will not lead to ignition of surrounding bushland or the fabric of buildings                                                                        | <ul style="list-style-type: none"> <li>Reticulated or bottled gas is installed and maintained in accordance with AS1596 and the requirements of relevant authorities. Metal piping is to be used.</li> <li>All fixed LPG tanks are kept clear of all flammable materials and located on the non-hazard side of the development.</li> <li>If gas cylinders need to be kept close to the building, the release valves are directed away from the building and away from any combustible material, so that they do not act as catalysts to combustion.</li> <li>Polymer sheathed flexible gas supply lines to gas metres adjacent to buildings are not used.</li> </ul> |

### 3.2.4 Emergency and Evacuation Planning

As discussed previously, SFPP developments are highly dependent on suitable emergency evacuation arrangements. In acknowledgement of the fact that hospital occupants are particularly vulnerable to the impacts of a bushfire and might not be able to readily evacuate it is required to provide suitable emergency and evacuation (and relocation) arrangements for occupants of special fire protection purpose developments.

Therefore, the provisions detailed on Table 3 concerning the preparation of an emergency and evacuation plan will need to be implemented as part of the proposal at the SSD Stage 2. Appropriate planning for emergency evacuation as detailed on Table 3 will ensure the proposal meet the intent of measures, which is:

***To provide suitable emergency and evacuation (and relocation) arrangements for occupants of special fire protection purpose developments.***



**Table 3.** Performance emergency and evacuation planning (as per s.4.2.7 PBP)

| Performance Criteria                                                                                                      | Acceptable Solutions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|---------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| An Emergency and Evacuation Management Plan is approved by the relevant fire authority for the area                       | <ul style="list-style-type: none"> <li>An emergency/evacuation plan is prepared consistent with the RFS Guidelines for the Preparation of Emergency/Evacuation Plan.</li> <li>Compliance with AS 3745-2002 'Emergency control organisation and procedures for buildings, structures and workplaces' for residential accommodation'.</li> <li>Compliance with AS 4083-1997 'Planning for emergencies- for health care facilities'.</li> </ul> <p><i>Note: The developer should provide a copy of the above document to the local Bush Fire Management Committee for their information prior to the occupation of any accommodation of a special fire protection purpose or community title subdivision.</i></p> |
| Suitable management arrangements are established for consultation and implementation of the emergency and evacuation plan | <ul style="list-style-type: none"> <li>An Emergency Planning Committee is established to consult with residents (and their families in the case of aged care accommodation and schools) and staff in developing and implementing an Emergency Procedures Manual.</li> <li>Detailed plans of all Emergency Assembly Areas including "onsite" and "offsite" arrangements as stated in AS 3745- 2002 are clearly displayed, and an annual (as a minimum) trial emergency evacuation is conducted.</li> </ul>                                                                                                                                                                                                      |

### 3.2.5 Pre- Release PBP 2018

The RFS has been undertaking a review of PBP 2006 since 2016. Following targeted consultation, the draft PBP was revised and placed on public exhibition in 2017. Since that time, the RFS has worked extensively with the Department of Planning and Environment (DPE) and relevant stakeholders to prepare a pre-release version of the document. On the 3<sup>rd</sup> September 2018, the RFS issued the Pre-Release PBP 2018. According to the RFS website (<https://www.rfs.nsw.gov.au/plan-and-prepare/building-in-a-bush-fire-area/planning-for-bush-fire-protection>):

It is anticipated that PBP 2018 will become legislated by mid – 2019, to coincide with the enactment of the National Construction Code 2019. Until then, PBP 2018 is in a 'pre-release' stage, also known as the transitional period.

Until PBP 2018 becomes legislated, PBP 2006 will remain the legally referenced document and PBP 2018 can be used on a performance basis in consultation with NSW RFS only.

Additional guidance (in the form of a Fact Sheet) concerning transition provisions is also found on the RFS website. For SFFP developments, the following is stated:

#### Section 100B Rural Fires Act 1997 (RFA)

Under section 100B of the RFA, the Commissioner of the NSW RFS may issue a Bush Fire Safety Authority (BFSA) for subdivision or special fire protection purpose (SFFP) development. The application for a BFSA must be made to the Commissioner in accordance with the *Rural Fires Regulation 2013* (RFR).

Clause 44 of the RFR provides that an application for a BFSA must be made in writing and must include an assessment of the extent to which the proposed development conforms with or deviates from the standards, specific objectives and performance criteria set out in Chapter 4 (Performance Based Controls) of PBP 2006.

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 RFA Act.



Thus in accordance with above provisions, SFFP developments may need to be assessed against ‘under either PBP 2006 or the pre-release edition of PBP 2018’. Notably, SSD developments do not require a Bush Fire Safety Authority (BFSa) to be issued by the Commissioner of the NSW RFS, since the integrated planning provision do not apply to SSD proposal. Nevertheless, advice from the RFS is usually sought.

Review of the Pre- Release PBP 2018, indicates that the key constraints for SFFP developments identified in this assessment and the identified bushfire protection measures detailed in s.3.2 are generally similar to the current PBP provisions. However, there some key differences which are detailed as follows.

The SFFP development provisions are detailed in Section 6 of the Pre- Release PBP 2018.

- **6.4.1 APZ and building Construction -**

- The building is provided with an APZ in accordance with Table A1.12.1 (Appendix 1). In accordance with the Classified vegetation being Coastal Swamp Forest on flat land, Table A1.12.1 prescribes a **67m wide APZ**. The proposed hospital is currently being designed to meet the increased APZ, as shown in the Masterplan (appendix A). Notably, however a key change is the way the APZ is measured. The Pre-Release PBP 2018 requires the APZ to be taken from the canopy rather than the base of the trees as per BBP 2006. The current APZ measurements shown on the Masterplan in Appendix A have been taken in accordance with the surveyed vegetation edge taken at the base of trees.

The other provisions concerning location and management of APZ detailed in s.3.2.1 of this report are similarly applied in the PBP 2018.

- A construction level of BAL-12.5 under AS 3959 or NASH and Table 7.4b<sup>2</sup> is applied (PBP 2018). This component was not clearly identified in s. 4.2.7 of PBP 2006, but is now clearly outlined. **The requirement to apply a BAL 12.5 Construction Standard to the building, which is to be addressed at the SSD Stage 2, is further discussed in s. 3.2.6 of this report.**

- **6.4.2 Access -**

- Access provisions are generally consistent with the PBP 2006 requirements as detailed in s. 3.2.2 of this report.

- **6.4.3 Services - Water, gas and electricity -**

- Water provisions are generally consistent with the PBP 2006 requirements as detailed in s. 3.2.3 of this report. However, hydrants are not located within any road carriageway and all above-ground water service pipes external to the building are metal, including and up to any taps.
- Electricity services provisions allow more flexibility to install overhead transmission lines (with certain limitations) when underground transmission lines are not feasible, this option is not available in PBP 2006.
- Gas services provisions are generally consistent with the PBP 2006 requirements detailed in s. 3.2.3 of this report. However, clarification is provided concerning the location of

<sup>2</sup> To ensure the performance criteria for construction standards given in Table 7.4a can be met, PBP adopts a suite of additional measures over and above AS 3959:2009 and the NASH Standard as follows:

- construction measures for ember protection at the lower bush fire attack levels (BAL-12.5 and BAL-19) provided by AS 3959;
- ember protection for all openings found within a residential dwelling constructed using the NASH Standard;
- construction measures for development in the Flame Zone; and
- requirements over and above the performance criteria contained within AS 1530.8.1 and AS 1530.8.2 apply in regards to flaming.



fixed gas cylinders, which needs to be kept clear of all flammable materials to a distance of 10m and shielded on the hazard side. Furthermore, if gas cylinders need to be kept close to the building, safety valves are directed away from the building and at least 2m away from any combustible material, so they do not act as a catalyst to combustion.

- **6.4.4 Emergency management planning -**

- Emergency planning provisions are generally consistent with the PBP 2006 requirements detailed in s. 3.2.4 of this report. However, evacuation planning needs to be consistent with the following:
  - The NSW RFS document: *A Guide to Developing a Bush Fire Emergency Management and Evacuation Plan*,
  - NSW RFS Schools Program Guide (where applicable)
  - Australian Standard AS 3745:2010 *Planning for emergencies in facilities*, and
  - Australian Standard AS 4083:2010 *Planning for emergencies – Health care facilities* (where applicable), and
  - the emergency and evacuation management plan should include a mechanism for the early relocation of occupants

In summary, apart from the greater APZ, which has been planned for in the Masterplan (Appendix A), complying with the Pre-Release PBP 2018 requirements for SFFP developments will be addressed at the SSD Stage 2.

### **3.2.6 Construction Standards (National Construction Code)**

Although not specified as bushfire protection measure to be addressed under 's4.2.7 standards for SFFP' in PBP 2006, construction standards do apply to Class 9a health care buildings if they are SFFP. This is now clarified in the pre-release PBP 2018 as discussed in s. 3.2.5.

This requirement is specified in the National Construction Code Volume One – State & Territories appendices in the NSW variation – Section G Ancillary Provisions– specifically Part G5 Construction in Bushfire Prone Areas. The relevant provisions are reproduced as follows

#### **Deemed to Satisfy Provisions**

##### **NSW G5.2 Protection**

In a *designated bushfire prone area*, a Class 2 building, a Class 3 building, a Class 4 part of a building or a Class 9 building that is a *special fire protection purpose* or a Class 10a building or deck associated with such a building or part, must comply with the following—

- (a) AS 3959 except for Section 9 Construction for Bushfire Attack Level FZ (BAL-FZ). Buildings subject to BAL-FZ must comply with specific conditions of development consent for construction at this level; or
- (b) the requirements of (a) above as modified by the development consent following consultation with the NSW Rural Fire Service under section 79BA of the Environmental Planning and Assessment Act 1979; or
- (c) the requirements of (a) above as modified by development consent with a bushfire safety authority issued under section 100B of the Rural Fires Act 1997 for the purposes of integrated development.

**Since, this bushfire assessment has already identified that the proposal can comply with an APZ which will result to radiant heat not greater than 10kW/m<sup>2</sup>, then the Class 9a building will need to be built to Bushfire Attack Level (BAL) 12.5 as per AS3959-2009 construction standards.**

This matter **is to be addressed at the SSD Stage 2**. BAL 12.5 is concerned principally with protecting a building from ember attack. The main issue is to provide appropriate screening to openings to prevent ember penetration. Notably additional provisions apply in NSW to BAL 12.5; these are detailed in Appendix C (also refer to footnote no. 2).



### 3.3 Address of Direction 4.4 Planning for Bushfire Protection

*Part 1 – Objectives or Intended Outcomes relating to bush fire prone land that is:*

*Protect life, property and the environment from bush fire hazards, by discouraging the establishment of incompatible land uses in bush fire prone areas, and encourage sound management of bush fire prone areas.*

Response: The proposed SSD to accommodate a future regional hospital is a compatible land use on this land as the Project Site occurs within a predominantly built-up environment and agricultural land. The main potential bushfire hazard consists of a patch of remnant floodplain vegetation to the north of the Project Site. Therefore, the Project Site is considered to have a low bushfire risk.

*Part 2 – Explanation of the Provisions - The identified objectives can be achieved by ensuring that new controls imposed on development will:*

- *not increase the risk to life from bush fire,*  
Response: The Project will not increase the risk to life from bushfire as adequate controls can be implemented in the hospital design to minimise such risk.
- *not introduce controls that place inappropriate developments in areas exposed to unacceptable bush fire hazard,*  
Response: As noted previously, the Project occurs within a predominantly built-up environment and agricultural land. The main potential bushfire hazard consists of a patch of remnant vegetation to the north of the Project Site. Accordingly, the development will not be exposed to unacceptable bush fire hazard.
- *ensure that appropriate bush fire protection measures can be afforded to property at risk of bushfire,*  
Response: Appropriate bushfire protection measures can be accommodated at the Project Site as demonstrated in s. 3.2.
- *minimise negative impacts on the surrounding environment,*  
Response: The future hospital development can be designed to minimise negative impacts on the surrounding environment.
- *ensure that provision are made for adequate evacuation/shelter options for the community,*  
Response: As discussed in s. 3.2.4, the provisions detailed on Table 3 concerning the preparation of an emergency and evacuation plan will be implemented as part of the proposal at the SSD Stage 2.
- *and ensure that development is capable of complying with Planning for Bush Fire Protection 2006 (PBP).*  
Response: The development is capable of complying with the relevant SFPP provisions of PBP as demonstrated in s. 3.2.

*Part 3 – Justification - The level of justification should be proportionate to the impact that the planning proposal will have.*

Response: The Project will not have an undue impact on the locality in terms of bushfire risk. This assessment has found that the proposal can comply with the Direction 4.4 Planning for Bushfire Protection and is capable of complying with PBP.



## 4. Conclusion

This Bushfire Constraint Assessment report has been prepared by Land & Fire Assessments Pty Ltd in accordance with the relevant provisions of Planning for Bushfire Protection (RFS 2006) on behalf of NSW Health Infrastructure for a staged State Significant Development (SSD) at Lot 102 DP870722, 771 Cudgen Road, Cudgen, NSW.

Specifically, this assessment reviewed suitability of the Project Site for landuse intensification and the SSD application for the hospital Concept Proposal. Detailed design and construction will be assessed at the Stage 2 SSD application.

Direction 4.4 Planning for Bushfire Protection identifies matters for consideration for landuse intensification proposals that will affect, or are in proximity to land mapped as bush fire prone.

A key principle should be to ensure that future development is capable of complying with PBP. To achieve this it was necessary to undertake a constraint assessment of the Project Site in respect to bushfire to identify potential bush fire risks to the Project Site and the proposed forms of development (i.e. the SSD Concept Proposal/Masterplan).

Thus this bushfire assessment found that the Project:

- will not increase the risk to life from bush fire;
- will not introduce controls that place inappropriate developments in areas exposed to unacceptable bush fire hazard;
- can provide for appropriate bush fire protection measures to properties at risk of bushfire
- does not have adverse impacts on the surrounding environment;
- does not place additional burden to current evacuation/shelter options for the community; and
- the proposed development is capable of complying with Planning for Bush Fire Protection 2006.

The proposed hospital is deemed Special Fire Protection Purposes (SFPP) developments. PBP (RFS 2006) notes that *'SFPP developments are highly dependent on suitable emergency evacuation arrangements, which require greater separation from bush fire threats.'* Accordingly, there is an added emphasis on access, greater APZ, and emergency and evacuation planning.

Therefore, this bushfire assessment has looked at whether the Project could be implemented while ensuring compliance with the relevant SFPP provisions specified in s. 4.2.7 of PBP. It has also identified any elements, which may restrict development or that will be impacted upon by development such as water supply, access and evacuation. Particular attention will be required to comply with APZs, internal access road requirements, provision of services and emergency and evacuation planning. The Masterplan Concept Proposal shown on Appendix A generally accommodates access and APZ requirements. Also the building will need to be built to Bushfire Attack Level (BAL) 12.5 as per AS3959-2009 construction standards. Nevertheless, the applicable Bushfire protection measures and construction standards for SFPP development discussed in this assessment will need to be implemented as part of the proposal at the SSD Stage 2.

Notably, review of the Pre-Release PBP 2018, indicates that the key constraints for SFPP developments identified in this assessment and the identified bushfire protection measures detailed in s.3.2 are generally similar to the current PBP provisions. However, there some key differences. In particular, APZ distances are greater and there are other slight changes as detailed in s. 3.2.5. In summary, apart for the increased APZ, which has been planned for in the Masterplan (Appendix A), complying with the Pre-Release PBP 2018 requirements for SFPP developments will be addressed at



the SSD Stage 2. Although, transitional provisions are in place until mid-2019, it is likely that the RFS will require compliance with pre-release edition of PBP 2018.

**In conclusion, this assessment has found that the Concept Proposal complies with the Direction 4.4 Planning for Bushfire Protection and is capable of complying with performance criteria specified in s.4.2.7 of PBP (RFS 2006). Accordingly, the Project Site is suitable for an intensification of landuse and the proposed Concept Proposal application (concept and early/enabling works) for the Tweed Valley Hospital can meet the applicable bushfire protection measures for SFPP developments (including the revised provisions of the pre-release edition of PBP 2018).**



## 5. References

---

CFA 2004, *Living in the Bush – Bushfire Survival Plan Handbook*, CFA Headquarters, East Burwood, Victoria.

Keith, D. A. 2004, *Ocean Shores to Desert Dunes*, Department of Environment and Conservation (NSW), Hurstville NSW.

Queensland Government, 2000, *Protecting Your Home against Bushfire Attack*, Department of Communication and Information, Local Government, Planning and Sport.

Ramsay, C & Rudolph, L 2006, *Landscape and Building Design for Bushfire Areas*, CSIRO Publishing.

Rural Fire Service (RFS) 2010a, *BCA 2010 - Fast Fact 01/10*, NSW Rural Fire Service.

Rural Fire Service (RFS) 2006, *Planning for Bushfire Protection*, Produced by NSW Rural Fire Service in cooperation with the Department of Planning.

Rural Fire Service (RFS) 2007, *Building in Bush Fire Prone Areas - Single Dwellings*, NSW Rural Fire Service.

Rural Fire Service (RFS) 2017, *Planning for Bushfire Protection*, DRAFT FOR PUBLIC CONSULTATION - ISSUED April 2017.

Rural Fire Service (RFS) 2018, *Planning for Bushfire Protection* Pre-Release - ISSUED August 2018.

Rural Fire Service NSW (RFS) undated, *Standards for Asset Protection Zones*, NSW Rural Fire Service, <[https://www.rfs.nsw.gov.au/\\_\\_data/assets/pdf\\_file/0010/13321/Standards-for-Asset-Protection-Zones.pdf](https://www.rfs.nsw.gov.au/__data/assets/pdf_file/0010/13321/Standards-for-Asset-Protection-Zones.pdf)>



# Appendices

---

|                                                                 |           |
|-----------------------------------------------------------------|-----------|
| <b>APPENDICES .....</b>                                         | <b>22</b> |
| APPENDIX A – MASTERPLAN .....                                   | 23        |
| APPENDIX B – APZs REQUIREMENTS AND LANDSCAPING .....            | 24        |
| <i>B.1 General Requirement for Asset Protection Zones .....</i> | <i>24</i> |
| <i>B.2 Landscaping and Property Maintenance.....</i>            | <i>25</i> |
| B.2.1 Landscaping Features & Principles.....                    | 25        |
| B.2.1 Vegetation Management .....                               | 26        |
| B.2.3 Property Maintenance .....                                | 26        |
| APPENDIX C – NSW ADDITIONAL CONSTRUCTION REQUIREMENTS .....     | 27        |



## Appendix A – Masterplan





ESSENTIAL ENERGY  
SWITCHING STATION

NOTES

LANDSCAPE INDICATIVE ONLY - REFER LANDSCAPE ZONAL PLAN L-MP-12

LEGEND

- SITE BOUNDARY
- MAXIMUM PLANNING ENVELOPE
- TREE TRUNK LINE
- APZ OFFSETS
- PROBABLE MAXIMUM FLOOD LEVEL
- INDICATIVE BUILDING ENTRIES



COPYRIGHT

ALL RIGHTS RESERVED. THIS WORK IS COPYRIGHT AND CANNOT BE REPRODUCED OR COPIED IN ANY FORM OR BY ANY MEANS (GRAPHIC, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING) WITHOUT THE WRITTEN PERMISSION OF THE PRINCIPAL UNDER THE TERMS OF THE CONTRACT. ANY LICENSE, EXPRESS OR IMPLIED, TO USE THE DOCUMENT FOR ANY PURPOSE WHATSOEVER IS RESTRICTED TO THE TERMS OF THE AGREEMENT OR IMPLIED AGREEMENT WITH THE PRINCIPAL UNDER THE TERMS OF THE CONTRACT.

DIMENSIONS

USE FIGURED DIMENSIONS. DO NOT SCALE. CONTRACTORS MUST VERIFY ALL DIMENSIONS ON THE SITE BEFORE COMMENCING ANY WORK OR MAKING ANY SHOP DRAWING WHICH MUST BE SUBMITTED AND REVIEWED BEFORE MANUFACTURE.

FIXTURES, FITTINGS & EQUIPMENT SPECIFICATIONS

SUBSTITUTE FF&E EQUIPMENT SPECIFICATIONS. THE FIT-OUT DESIGN AND DOCUMENTATION HAS BEEN COMPLETED ON THE BASIS OF FF&E AND EQUIPMENT ADVISED TO THIS OFFICE AT THE TIME OF BRIEFING THE DESIGN. THE DESIGN PROVISIONS FOR FF&E AND EQUIPMENT INCORPORATES SPATIAL ALLOCATIONS, SERVICING, LOADING AND ACCESS CLEARANCES AND WHERE APPROPRIATE SERVICES REQUIREMENTS, HAVING DUE REGARD FOR SURROUNDING FIXTURES AND FITTINGS. IT SHOULD BE NOTED THAT SUBSTITUTE FF&E OR EQUIPMENT WITH ALTERNATE SPECIFICATIONS SHOULD NOT BE PROCURED PRIOR TO VALIDATING THOSE SPECIFICATIONS AGAINST THE ITEM CONTROL SCHEDULE AND DESIGN PROVISIONS IN THE MODEL. THIS OFFICE ACCEPTS NO RESPONSIBILITY FOR THE PROCUREMENT OF SUBSTITUTE FF&E AND EQUIPMENT WHICH HAS NOT BEEN REVIEWED AND VALIDATED AGAINST THE ORIGINAL DESIGN PROVISIONS.

SERVICE POINTS DISCLAIMER

THE SERVICE POINTS IDENTIFIED ON THESE DRAWINGS HAVE BEEN OVERLAYED FROM THE BUILDING SERVICES ENGINEERING MODEL, AND ARE PROVIDED FOR INFORMATION AND SET-OUT PURPOSES ONLY. WE HAVE BEEN ADVISED BY THE SERVICES ENGINEERS THAT THE POINTS REPRESENTED ON THESE DRAWINGS ARE CORRECT AT THE TIME OF PUBLICATION. THIS OFFICE DOES NOT WARRANT THE ACCURACY OF THIS DATA. REFER TO THE BUILDING SERVICES ENGINEERING DOCUMENTATION FOR THE INSTALLATION OF THE SERVICE POINTS, AND THE INTERFACE BETWEEN THE SERVICE POINTS AND THE RESPECTIVE ENGINEERING SYSTEMS.

ISSUED FOR INFORMATION

ARCHITECTS



LEVEL 4, 89 YORK STREET,  
SYDNEY, NSW, 2000  
ABN: 73 861 269 057 PH: (02) 8299 4600  
email: syd@batesmart.com.au

43 BRISBANE STREET,  
SURRY HILLS, NSW 2010  
PH: (02) 8354 5100  
email: natalie@sth.com.au

THIS ARCHITECTURAL DESIGN IS THE COPYRIGHT OF SILVER THOMAS HANLEY AND BATES SMART AND SHALL NOT BE REPRODUCED WITHOUT THEIR WRITTEN PERMISSION

PROJECT MANAGER



CLIENT



PROJECT

**TWEED VALLEY HOSPITAL**  
**771 Cudgen Road, Cudgen**

DRAWING TITLE

**MASTERPLAN**  
**CONCEPT PLAN**

SCALE: 1:2500 @ A3 DATE: 19/09/2018 DRAWN BY: CE CHECKED: MH

PROJECT No: 10363 DRAWING No: AR-SKE-10-006 REVISION: 04

## Appendix B - APZs Requirements and Landscaping

### B.1 General Requirement for Asset Protection Zones

Asset Protection Zones (APZs) are buffer areas between development and a fire hazard, which aim to protect human life and property. The APZ comprises an Inner Protection Area (IPA) and an Outer Protection Area (OPA). These areas are to be managed to reduce the bushfire hazard. The general requirements for APZs are described in Tables 1B and 2B.

**Table 1B. Inner Protection Area (IPA) General Requirements**

| Specifications and Management  |                                                                                                                                                                                                                                                                                                                                                                |
|--------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Location</b>                | The IPA extends from the edge of the OPA to the development.                                                                                                                                                                                                                                                                                                   |
| <b>Purpose</b>                 | Ensures that the presence of fuel, which could become involved in fire, is minimised.                                                                                                                                                                                                                                                                          |
| <b>Depth</b>                   | Varies from 10 to 100 metres.                                                                                                                                                                                                                                                                                                                                  |
| <b>Fuel Loading</b>            | Minimum fine fuel at ground level, which could be set alight by bushfire.                                                                                                                                                                                                                                                                                      |
| <b>Vegetation Requirements</b> | Do not touch or overhang the building;<br>Are well spread out and do not form a continuous canopy;<br>Are not species that retain dead material or deposit excessive quantities of ground fuel in a short period; and<br>Are located far enough away from the house so that they will not ignite the house by direct flame contact or radiated heat emissions. |
| <b>Uses Within the Area</b>    | Tennis courts, swimming pools and gardens are permitted. Woodpiles, wooden sheds, combustible material storage areas, large quantities of garden mulch, stacked flammable building materials are not permitted.                                                                                                                                                |
| <b>Maintenance</b>             | This Area should be regularly mowed and all fuel removed e.g. fallen branches, leaf build-up.                                                                                                                                                                                                                                                                  |

**Table 2B. Outer Protection Area (OPA) General Requirements**

| Specifications and Management  |                                                                                                                                                                                                                                                                                          |
|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Location</b>                | Located adjacent to the hazard. Originally the OPA would have formed part of the bushfire hazard but becomes an area where the fuel loadings are reduced.                                                                                                                                |
| <b>Purpose</b>                 | Reduction of fuel in this area substantially decreases the intensity of an approaching fire and restricts the pathway of crown fuels; reducing the level of direct flame, radiant heat and ember attack on the IPA.                                                                      |
| <b>Depth</b>                   | Varies from 0 to 25 metres.                                                                                                                                                                                                                                                              |
| <b>Fuel Loading</b>            | Fine fuel loads should be kept to a level where the fire intensity expected will not impact on adjacent developments. In the absence of any policy to the contrary, 8 tonnes per hectare of fuel is commonly used. In grasslands, fuel height should be maintained below 10 centimetres. |
| <b>Vegetation Requirements</b> | Any trees and shrubs should be maintained in such a manner that the vegetation is not continuous.                                                                                                                                                                                        |
| <b>Maintenance</b>             | This Area should be regularly mowed and all excess fuels should be removed e.g. fallen branches, leaf build-up.                                                                                                                                                                          |

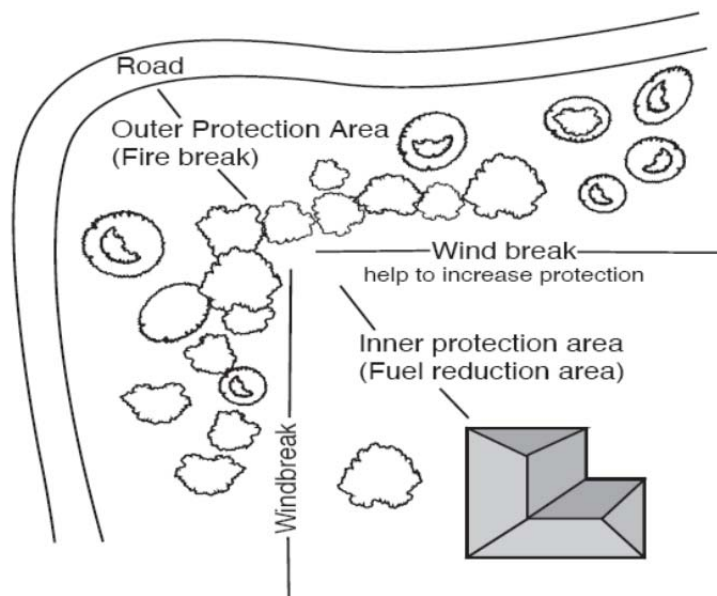
The RFS has also developed “Standards for Asset Protection Zones” which should be consulted for APZ specifications. Standards for Asset Protection Zones can be downloaded from <[https://www.rfs.nsw.gov.au/\\_\\_data/assets/pdf\\_file/0010/13321/Standards-for-Asset-Protection-Zones.pdf](https://www.rfs.nsw.gov.au/__data/assets/pdf_file/0010/13321/Standards-for-Asset-Protection-Zones.pdf)>



## B.2 Landscaping and Property Maintenance

### B.2.1 Landscaping Features & Principles

Bushland vegetation provides the fuel which feeds wildfires; however, by providing adequate



separation distance between the bush and buildings will effectively prevent the spread of bushfire. Still vegetation is not always the foe when it comes to bushfires and it is possible to use managed vegetation as a tool to reduce fire risk. According to many practitioners and researchers (Ramsay & Rudolph 2006; CFA 2004; RFS 2006; Queensland Government 2000; RFS undated), a well-designed garden can reduce bushfire hazard near buildings. In summary, homes and garden can blend with the natural environment and be landscaped to minimise the impact of fire at the same time.

**Figure 1B.** Example of landscaped design aimed at minimising the impact of fire. Source RFS (undated)

According to the RFS (undated), this can be achieved by providing an effective Asset Protection Zone (APZ), which incorporates features such as fire resistant plants, radiant heat barriers and windbreaks in the landscape layout as shown on Fig. 1B. The key features required when using landscaping as tool to reduce bushfire risk are summarised as follows (Ramsay & Rudolph 2006; RFS undated; RFS 2006):

- Plants with low flammability are selected (eg. broad leaves with high moisture and mineral content, smooth-trunk species with high branches, etc.)
- Vegetation does not provide a continuous path to the house
- Vegetation is located far enough away from the asset so that plants will not ignite the asset by direct flame contact or radiant heat emission
- Planted (or cleared) vegetation is into clumps rather than continuous rows
- Planted or retained species possesses attributes which makes them a good barrier against bushfire and wind attack
- Low branches are pruned two metres from the ground to prevent a ground fire from spreading into trees
- Lawn is planted and maintained around the future dwellings as this will slow the fire and reduce fire intensity. Alternatively, non-flammable pathways directly around the dwelling are provided
- Shrubs and other plants do not directly abut the dwelling. Where this does occur, gardens should contain low-flammability plants and non-flammable ground cover such as pebbles and crush tile
- Brush type fencing and planting “pencil pine” type trees next to buildings are avoided, as these are highly flammable.

Therefore, the features noted above and the principles listed in the following section should be applied to the landscaping and property maintenance for future dwellings.



### **B.2.1 Vegetation Management**

Vegetation management is the responsibility of individual landowners and should, as per PBP, include:

- *Maintaining a low cut lawn;*
- *Keeping areas around the garden free of fuel;*
- *Utilising non-combustible fencing materials;*
- *Breaking up tree and shrub canopies by defining garden beds;*
- *Using non-flammable mulch;*
- *Ensuring tree branches do not overhang roofs;*
- *Ensuring tree canopies are not continuous; and*
- *Installing windbreaks in the direction from which fires are likely to approach.*

### **B.2.3 Property Maintenance**

Property maintenance should, as per PBP, include:

- *Removal of material such as litter from the roof and gutters;*
- *Ensure painted surfaces are in good condition with decaying timbers being given particular attention to prevent the lodging of embers within gaps;*
- *Check pumps and water supplies are available and in working order;*
- *Driveways are in good condition with trees not being too close and forming an obstacle during smoky conditions;*
- *Check tiles and roof lines for broken tiles or dislodged roofing materials;*
- *Screens on windows and doors are in good condition without breaks or holes in flyscreen material and frames are well fitting into sills and window frames;*
- *Drenching or spray systems are regularly tested before the commencement of the fire season;*
- *Hoses and hose reels are not perished and fittings are tight and in good order;*
- *Doors are fitted with draught seals and well maintained;*
- *Mats are of non-combustible material or in areas of low potential exposure; Woodpiles, garden sheds and other combustible materials are located downslope and well away from the house; and*
- *Trees and other vegetation in the vicinity of power lines and tower lines should be managed and trimmed in accordance with the specifications in “Vegetation Safety Clearances” issued by Energy Australia (NS179 April 2002).*



## Appendix C – NSW Additional Construction Requirements

The following is reproduced from Addendum: Appendix 3 (RFS 2010b, pp 8 - 10)

*Planning for Bush Fire Protection* is designed to provide for improved bush fire protection outcomes through the planning system, whereas the construction requirements are established through the operation of the BCA. However, based on a review of AS3959-2009 and recent developments through the interim findings from the Victorian Royal Commission, the RFS has concerns over the levels of safety for ember protection at lower BAL levels (BALs 12.5 and 19) provided by AS3959-2009. The RFS is concerned that by adopting the new Standard there would be a reduction in safety created from that afforded by the previous NSW application of AS3959-1999 in relation to ember protection. In this regard, the RFS will aim to maintain the safety levels previously provided by AS3959-1999. In particular, the areas of concern arise from requirements for:

- Sarking
- Sub floor screening
- Floors
- Verandas, Decks, Steps, Ramps And Landings

In addition, in order to provide a suitable combination of bush fire protection measures the NSW Rural Fire Service will, as part of the planning assessment process, recommend /require additional construction requirements beyond those prescribed in AS3959-2009 as deemed appropriate.

Planning requirements for grasslands are contained within the main body of PBP.

As part of the planning requirements, the following will create part of the suite of protection measures required to form compliance with *Planning for Bush Fire Protection*.

### **SARKING**

Any sarking used for BAL-12.5, BAL-19, BAL-29 or BAL-40 shall be:

- a. Non-combustible; or
- b. Breather-type sarking complying with AS/NZS 4200.1 and with a flammability index of not more than 5 (see AS1530.2) and sarked on the outside of the frame; or
- c. An insulation material conforming to the appropriate Australian Standard for that material.

### **SUBFLOOR SUPPORTS**

For BAL 12.5 and BAL 19, Clause 5.2 and 6.2 shall be replaced by the provisions of Clause 7.2. In this regard, Clause 7.2 states:

#### ***“7.2 SUBFLOOR SUPPORTS***

*This Standard does not provide construction requirements for subfloor supports where the subfloor space is enclosed with—*

- a. *a wall that complies with ..... (Clause 5.4 or 6.4 as appropriate); or*
- b. *a mesh or perforated sheet with a maximum aperture of 2 mm, made of corrosion resistant steel, bronze or aluminium; or*
- c. *a combination of Items (a) and (b) above.*

*Where the subfloor space is unenclosed, the support posts, columns, stumps, piers and poles shall be—*

- (i) of non-combustible material; or*
- (ii) of bushfire-resisting timber (see Appendix F); or*
- (iii) a combination of Items (i) and (ii) above.*

*NOTE: This requirement applies to the principal building only and not to verandas, decks, steps, ramps and landings (see Clause 7.7).”*



## ELEVATED FLOORS

For BAL 12.5 and BAL 19, Clause 5.3 and 6.3 shall be replaced by the provisions of clause 7.3. In this regard, clause 7.3.2 states:

### *“7.3.2 Elevated floors*

#### *7.3.2.1 Enclosed subfloor space*

*This Standard does not provide construction requirements for elevated floors, including bearers, joists and flooring, where the subfloor space is enclosed with—*

- a. a wall that complies with .... (Clause 5.4 or 6.4 as appropriate); or*
- b. a mesh or perforated sheet with a maximum aperture of 2 mm, made of corrosion resistant steel, bronze or aluminium; or*
- c. a combination of Items (a) and (b) above.*

#### *7.3.2.2 Unenclosed subfloor space*

*Where the subfloor space is unenclosed, the bearers, joists and flooring, less than 400 mm above finished ground level, shall be one of the following:*

- a. Materials that comply with the following:*
  - (i) Bearers and joists shall be—*
    - A. non-combustible; or*
    - B. bushfire-resisting timber (see Appendix F); or*
    - C. a combination of Items (A) and (B) above.*
  - (ii) Flooring shall be—*
    - A. non-combustible; or*
    - B. bushfire-resisting timber (see Appendix F); or*
    - C. timber (other than bushfire-resisting timber), particleboard or plywood flooring where the underside is lined with sarking-type material or mineral wool insulation; or*
    - D. a combination of any of Items (A), (B) or (C) above. or*
- b. A system complying with AS 1530.8.1*

*This Standard does not provide construction requirements for elements of elevated floors, including bearers, joists and flooring, if the underside of the element is 400 mm or more above finished ground level.”*

## LANDINGS

For BAL 12.5 and BAL 19, Clause 5.2 and 6.2 shall be replaced by the provisions of clause 7.2 (sic). In this regard, clause 7.2 (sic) states:

### *“7.7 VERANDAS, DECKS, STEPS, RAMPS AND LANDINGS*

#### *7.7.1 General*

*Decking may be spaced.*

*There is no requirement to enclose the subfloor spaces of verandas, decks, steps, ramps or landings.*

#### *7.7.2 Enclosed subfloor spaces of verandas, decks, steps, ramps and landings*

##### *7.7.2.1 Materials to enclose a subfloor space*

*The subfloor spaces of verandas, decks, steps, ramps and landings are considered to be ‘enclosed’ when —*

- a. the material used to enclose the subfloor space complies with .... (Clause 5.4 or 6.4 as appropriate); and*
- b. all openings greater than 3 mm are screened with a mesh or perforated sheet with a maximum aperture of 2 mm, made of corrosion-resistant steel, bronze or aluminium.*

##### *7.7.2.2 Supports*

*This Standard does not provide construction requirements for support posts, columns, stumps, stringers, piers and poles.*

##### *7.7.2.3 Framing*



*This Standard does not provide construction requirements for the framing of verandas, decks, ramps or landings (i.e., bearers and joists).*

*7.7.2.4 Decking, stair treads and the trafficable surfaces of ramps and landings Decking, stair treads and the trafficable surfaces of ramps and landings shall be—*

- a. of non-combustible material; or*
- b. of bushfire-resisting timber (see Appendix F); or*
- c. a combination of Items (a) and (b) above.*

*7.7.3 Unenclosed subfloor spaces of verandas, decks, steps, ramps and landings*

*7.7.3.1 Supports*

*Support posts, columns, stumps, stringers, piers and poles shall be—*

- a. of non-combustible material; or*
- b. of bushfire-resisting timber (see Appendix F); or*
- c. a combination of Items (a) and (b) above.*

*7.7.3.2 Framing*

*Framing of verandas, decks, ramps or landings (i.e., bearers and joists) shall be—*

- a. of non-combustible material; or*
- b. of bushfire-resisting timber (see Appendix F); or*
- c. a combination of Items (a) and (b) above.*

*7.7.3.3 Decking, stair treads and the trafficable surfaces of ramps and landings*

*Decking, stair treads and the trafficable surfaces of ramps and landings shall be—*

- a. of non-combustible material; or*
- b. of bushfire-resisting timber (see Appendix F); or*
- c. a combination of Items (a) and (b) above.*

*7.7.4 Balustrades, handrails or other barriers*

*Those parts of the handrails and balustrades less than 125 mm from any glazing or any combustible wall shall be—*

- a. of non-combustible material; or*
- b. bushfire-resisting timber (see Appendix F); or*
- c. a combination of Items (i) and (ii) above.*

*Those parts of the handrails and balustrades that are 125 mm or more from the building have no requirements.”*

