BLACKASH
BUSHFIRE CONSULTING

Bushfire Assessment Report

Infill Development St John of God Hospital redevelopment, North Richmond

Prepared for
Johnstaff

BPAD Bushfire Planning & Design Accredited Practitioner Level 3

12 November 2020
Version 1.4

Document Tracking

Project Name	Bushfire Hazard Assessment St John of God Hospital, North Richmond Redevelopment
Client Details	Mr. Damian Gibson Senior Project Manager Johnstaff Level 5, 9 Castlereagh Street Sydney, NSW, 2000 By email: damian.gibson@johnstaff.com.au
Project Address	Richmond Hospital 235 Grose Vale Road, North Richmond, 2754 Lot 11 DP1134453

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Version	Primary Author	Description	Date Completed
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Contents

Glossary of Terms

APZ	Asset Protection Zone
AS2419	*Australian Standard – Fire hydrant installations*
AS3745	*Australian Standard – Planning for emergencies in facilities*
AS3959	*Australian Standard – Construction of buildings in bushfire-prone areas 2009*
BAL	*Bushfire Attack Level*
BCA	*Building Code of Australia*
BFSA	Bush Fire Safety Authority
EPA Act	*Environmental Planning & Assessment Act 1979*
FDI	Fire Danger Index
ha	Hectare
m	Metres
PBP 2006	*Planning for Bush Fire Protection 2006*
RF Act	*Rural Fires Act 1997*

1. Summary

Development Type	Integrated development Infill - Special Fire Protection Purpose Hospital
Application	For a Bushfire Safety Authority SFPP Infill development - Proposed additions - new lift/walkways In accordance with the Planning Secretary's Environmental Assessment Requirements SSD-10394
Project Address	St John of God Hospital at 235 Grose Vale Road, North Richmond, 2754
Lot & DP	Lot/Section/Plan no: 11/-/DP1134453
Local Government Area	Hawkesbury Council
Assessment	☐ *Planning for Bushfire Protection 2006* ☒ *Planning for Bushfire Protection 2019* ☒ Meets the deemed to satisfy provisions ☐ Alternate solution/ performance-based assessment
Site inspection	Yes 6th December 2019

2. Introduction

Johnstaff have commissioned Blackash Bushfire Consulting (**Blackash**) to prepare a Bushfire Hazard Assessment for the proposed redevelopment to the St John of God Hospital at 177 Grose Vale Road, North Richmond, 2754 (the site) which is legally known as Lot/Section/Plan no: 11/-/DP1134453 in the Hawkesbury Local Government Area (see Figure 1).

The current facility on the site has been developed since 1953 when the Hospitaller Order of the Brother of St John of God (SJOG) purchased the estate. Over the years the hospital has been extended and developed to meet its expanding role of a mental health facility. The hospital currently is a mix of building of various ages and several them do not meet with current guidelines for health facilities, or the expectations of the private patients.

The hospital is now commencing a redevelopment at Richmond that will see mental health undergo a total service transformation. The proposed new hospital development will form an early part of this transformation, to create an environment that will enable patients to experience a first-class facility with amenities that will assist in their recovery and wellbeing and well as creating an environment that will aid the caregivers in creating exceptional care to patients.

The project involves the redevelopment of the existing hospital facility including the demolition of a portion of the existing facilities, upgrading of existing facilities and construction of new facilities (Figure 2, 3 and 4).

A significant feature of the site is Belmont House. Built in 1892 this substantial building is of historical significance and has a commanding position on the site overlooking lawns and mature specimen trees.

This Bushfire Hazard Assessment will form part of the required Environmental Impact Statement (EIS) to support an application for a State Significant Development (SSD) under Part 4, Division 4.7 of the (EP&A Act).

The report has been completed in accordance with the Planning Secretary's Environmental Assessment Requirements (**SEARs**) under Section 4.12(8) of the EPA Act and Schedule 2 of the Environmental Planning and Assessment Regulation 2000 issued on 5 December 2019.

A hospital is categorised by Section 100B of the Rural Fires Act 1997 (**RF Act**) as being a Special Fire Protection Purpose Development (**SFPP**) development. Section 4.46 of the EPA Act identifies integrated development, that in order for it to be carried out, requires development consent from

Council and approval from the NSW Rural Fire Service (**RFS**).

A State Significant Development is exempt from requiring a Bushfire Safety Authority (**BFSA**) from the Commissioner of the RFS. However, the SEARs (application number SSD-10394) required that:

> *17. Address bushfire hazard and, if relevant, prepare a report that addresses the requirements for Special Fire Protection Purpose Development as detailed in Planning for Bush Fire Protection 2006 (NSW RFS).*

The SEARs requires assessment against Planning for Bushfire Protection 2006 (**PBP 2006**) including standards regarding setbacks, provision of water supply and other measures in combination considered by the Commissioner necessary to protect persons, property or the environment from danger that may arise from a bushfire. PBP 2006 has been reviewed by the RFS and the new version Planning for Bushfire Protection 2019 (**PBP 2019**) has been release and was gazetted in March 2020. As PBP 2019 is the most current version of the document, this assessment has been completed against the most current version, PBP 2019.

Clause 44 of the Rural Fires Regulation (RF Reg) prescribes the requirements for an application for a BFSA. This Bushfire Hazard Assessment has been completed in accordance with the RF Reg and the requirements of PBP 2019. As an existing development, the site is afforded the infill provisions of PBP 2019. This application has considered the requirements of PBP 2019 to provide a better bushfire risk outcome than currently exists on site.

The site is currently managed as an asset protection zone and meets the RFS *Standards for Asset Protection Zones*.

The proposed alterations and additions are required to respond and implement an appropriate level of bushfire protection measures, as per PBP 2019 to provide a "better bushfire outcome" than currently exists on site. This report will demonstrate that an appropriate combination of protection measures has been considered and achieved to provide compliance with the intent and performance measures within PBP 2019.

This assessment has been prepared by Lew Short, Director Blackash Bushfire Consulting (FPAA BPAD Level 3 Certified Practitioner No. BPD-L3-28853) who is recognised by the NSW Rural Fire Service (**RFS**) as qualified in bushfire risk assessment and have been accredited by the Fire Protection Association of Australia as a suitably qualified consultant to undertake alternative solution proposals.

Figure 1 Site Location

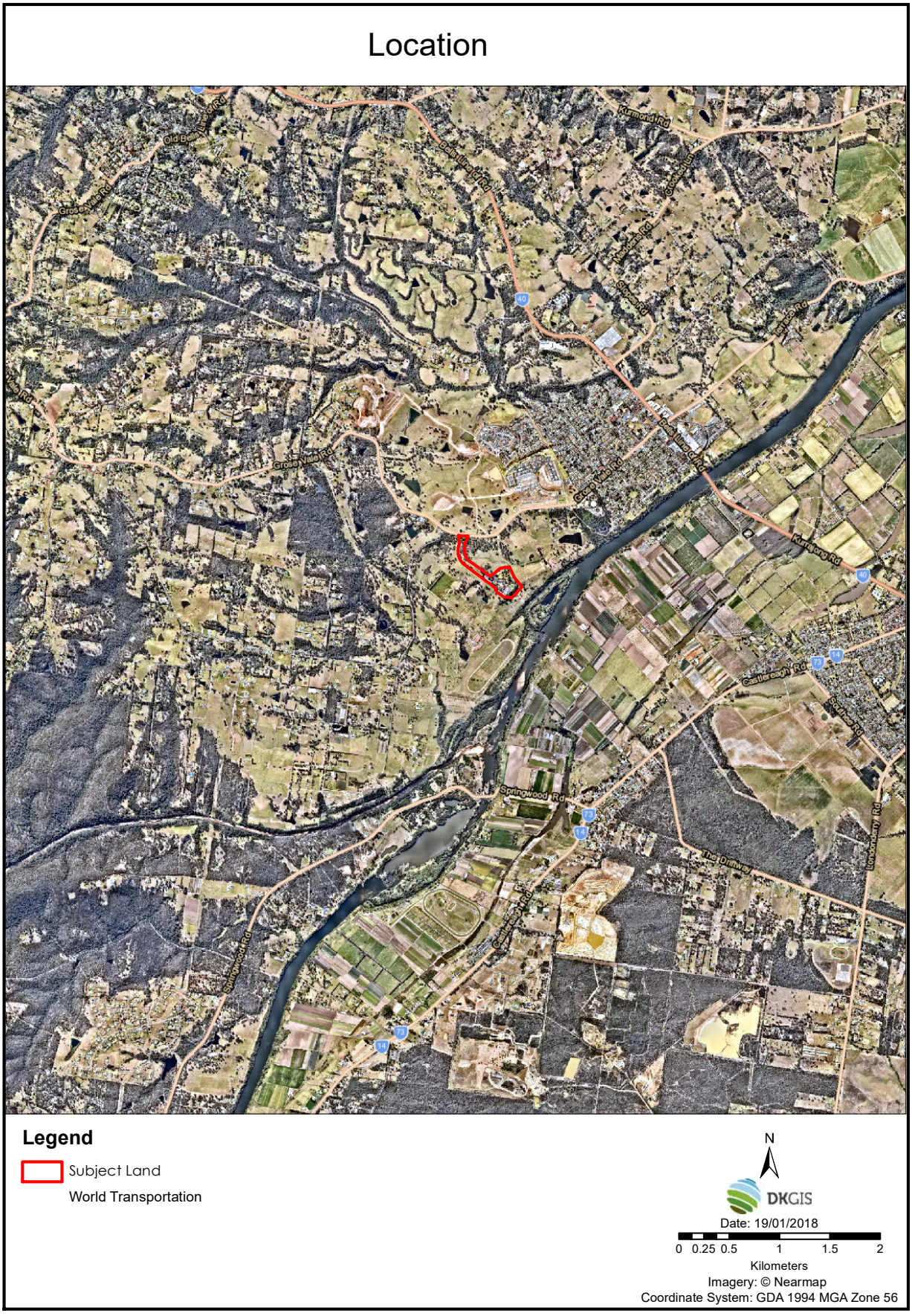


Figure 2 Site Plan

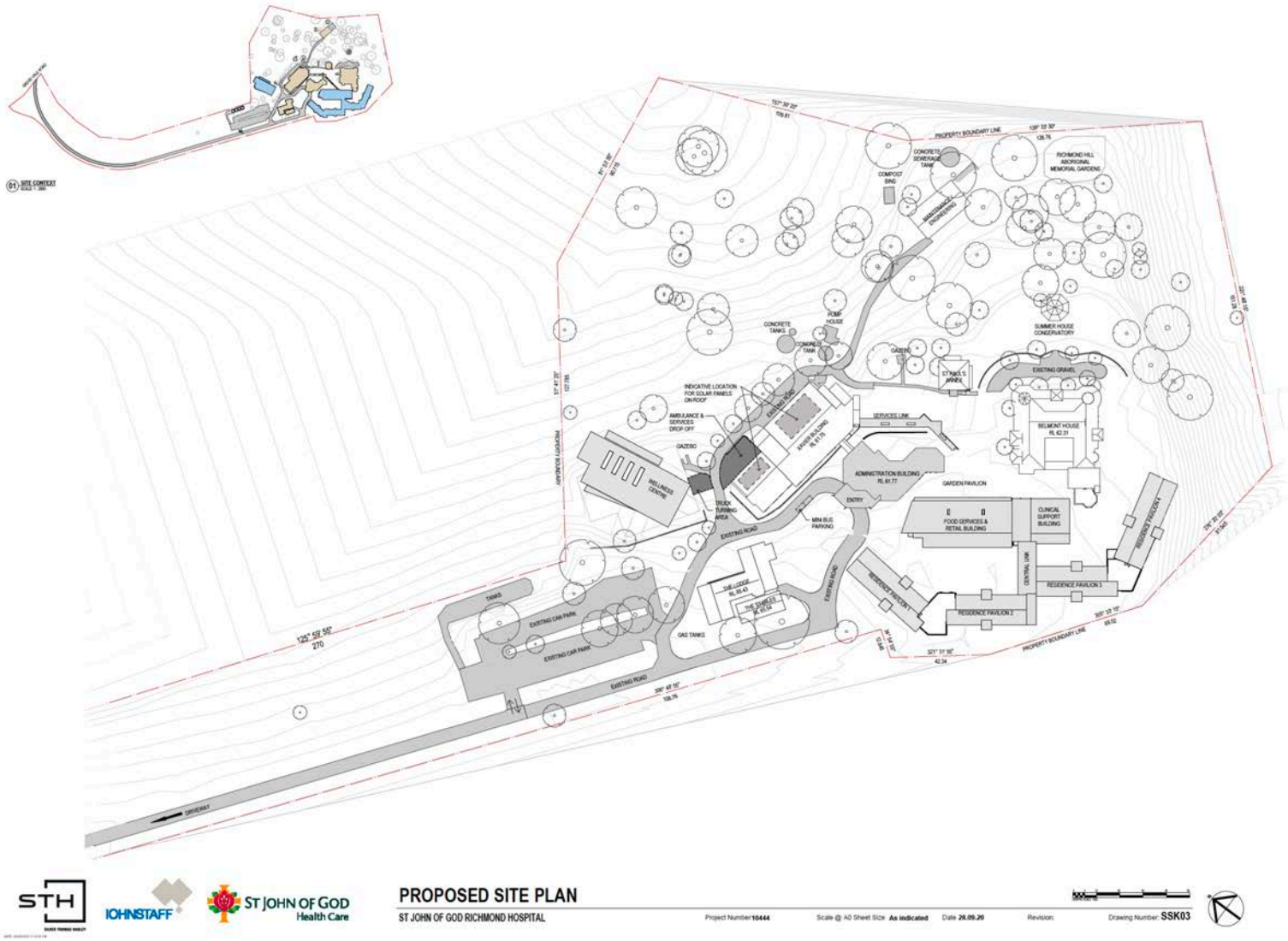
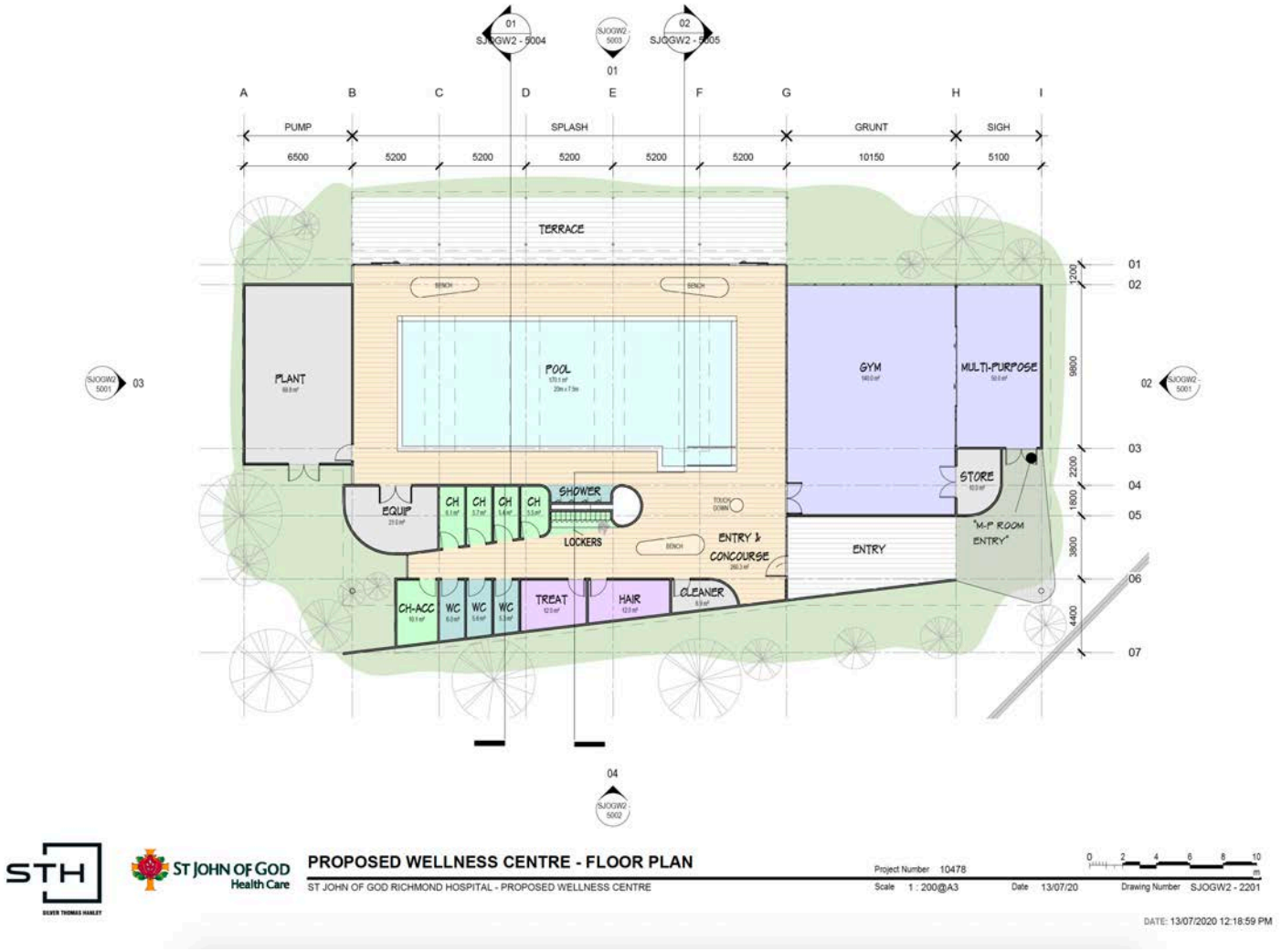


Figure 3 Wellness Centre



3. Pre DA-Application

A pre-DA meeting request was sent to the RFS on 15 November 2019 to discuss the project and bushfire issues to ensure the RFS was engaged as a key stakeholder in the redevelopment process. However, due to operational requirements, the RFS have not been able to hold the pre-DA meeting. As such, this infill application has been completed with best endeavors to take a risk based approach to the redevelopment and meet the requirements of PBP 2019.

4. Site Context

The site is located outside the township of North Richmond, on a 10-hectare site. Richmond is rapidly expanding toward the hospital and built up areas are being developed to the north of the site, removing bushfire prone land. The site and adjoining land to the south, east and west is intensively grazed, providing a significantly fuel reduced area surrounding the site.

The main access handle into the site is intensively managed by St John of God as an APZ and provides for fire fighter access. The kerb on the road are roll top and ample width is provided for two way traffic movement.

The entry to the hospital is approximately 650m from developed residential areas on the outskirts of Richmond.

Remnant native vegetation occurs at the north western boundary and south eastern boundary of the study area. The remaining vegetation within the site comprises mixed native and exotic plantings including along the access driveway and surrounding the existing car park and buildings. The subject land comprises buildings, access roads and landscaped areas.

The study area is identified as containing a local heritage item under the Hawkesbury Local Environmental Plan 2012, being 'St John of God Hospital (former "Belmont Park", mansion, garden, building, gatehouse and curtilage)'.

5. Project Overview

The study area was historically and continues to be used as a mental health hospital facility. Currently an 88-bed hospital of varying room types including shared rooms and shared facilities.

The new development will deliver the following;

- 112 sole occupancy bedrooms with ensuites;
- Generous lounge and break out areas within the Residence Pavilions;
- Large dining area with various seating arrangements for a restaurant feel;
- Alfresco dining areas;
- Café;
- Pharmacy;
- Group rooms and associated clinical support areas, and
- ECT & TMS Suite.

The above will form the bulk of the new building which will be linked together with a multi-use space that will have informal seating areas and provide a communal area from the residences to dining pavilion. Refurbishment of the existing administration building will include the new home of the Chapel, as well as reception and waiting area upgrades.

Along with the demolition of the sub-standard building stock and proposed new build, site wide infrastructure will be upgraded, extended parking and traffic management implemented with landscaping to the new buildings undertaken.

A wellness centre has been identified as a key component for the health and well being of clients staying at the facility. The wellness centre, also designed by STH, forms part of this report and is to be included in the SSDA submission.

To ensure the hospital remains in operation during constructions works, the project will be staged to allow for separate construction and operation stages.

Previous studies undertaken on the site identified a logical location for any new build to occur on the southern ridge, behind Belmont House. This location has many attributes that reinforces this location including;

- While the topography is still varied, it is the more ideal building platform location that could afford a minimum cut and fill approach to any earthworks required;
- Expansive view towards the Blue Mountains and the Hawkesbury River in particular;
- Has a sympathetic location to Belmont House and allows the existing house to stand alone and restores its presence on site as a significant heritage building that can be appreciated from many aspects around the site;
- Has good adjacencies to the existing reception and administration building that will be retained;
- Limits the impact to existing site infrastructure such as the existing road network.

The planning of the new facility has been developed with clear and defined zones that create separate areas with defined uses, to create public and private spaces that address the needs of the guests and welcome visitors and family with a sense of place.

Four Residential Pavilions, each with 28 single occupancy bedrooms and ensuites, over two floors with a total of 112 beds. The residences also contain associated staff clinical areas with generous guest lounge areas and break out spaces. The Residences will staggered over the site with gardens and external areas between to create private and semi-private spaces for guest.

The Residences are connected to the Garden Pavilion that will form the main guest hub of the complex, via a multipurpose space that will create informal lounge areas with direct access to external courtyards and spaces;

The Garden Pavilion contains the dining, kitchens and café and the ECT and TMS suite.

The existing administration and reception building will be refurbished and will house the new location of the chapel;

Xavier House will be extensively refurbished on the ground floor and will contain a medical centre and the Counselling and Therapy Centre. Back of House areas such as stores, supplies and waste stores will be located on the lower ground floor.

The proposed Wellness Centre (Figure 3) will be located to the west of the site on the current tennis court location. No accommodation is proposed in this building.

6. Bushfire Context

The site is bushfire prone and sits on a small ridgeline/spur that run roughly north-west to south-east. The hospital is located at the end of the north south spur and is accessed by a single two-way paved road. The surrounding land is rural lots that are in varying states of management.

The configuration of the existing development and adjoining grazed land provides a high likelihood that the site will be impacted by bushfire. There is potential for the site to be impacted from three sides with bushfire attack in the form of ember attack, smoke, radiant heat and direct flame contact. The land surrounding the site is intensively grazed.

The bushfire season in the Sydney Basin generally runs from October to March. Prevailing weather conditions associated with the bushfire season in the area are strong northwest winds, low humidity and high temperatures. These conditions combined with dry vegetation dramatically influence the behaviour of bushfires in the area. Although bushfires may occur at any time of the year, the highest probability of bushfires occurs in December and January. However, the trend in recent years has seen the fire season stretch with significant fires (Blue Mountains) being recorded in early September that lengthens the potential for high intensity fires from October through to April.

Contiguous areas of forest vegetation do not run into the site. The surrounding land is effectively managed for rural purposes which breaks up heavier fuels and provides good opportunity for fire services to access fires. However, the grazed land is considered as grassland in accordance with PBP 2019 and the RFS and the scattered trees would present some of the area as woodland vegetation.

The main access road into the site is the only access point. A second access can not be provided and is not considered necessary. Within the hospital, the grounds are well managed and meet the RFS standards for asset protection zones.

7. Legislative Framework

Hospital development is identified as Special Fire Protection Purpose (**SFPP**) development in section 100B of the RF Act. They are required to obtain a Bush Fire Safety Authority (**BFSA**) from the RFS and are also "integrated developments" under section 4.45 of the EP&A Act.

Alterations and additions to existing SFPP's (i.e. approved prior to 1st August 2002), including their external appearance or finish, which may involve an increase in size and footprint of the building or redevelopment of an existing building are considered to be infill development[1].

SFPP infill development proposals will be constrained by existing situations – pre-existing subdivision patterns, roads, infrastructure, services and existing built forms surrounding the subject site. Consequently, each proposal must be considered on its merits.

Where alterations or additions to existing SFPP's facilities are proposed, the RFS requires an appropriate combination of bush fire protection measures and compliance with the intent and performance criteria of each measure within PBP 2019.

An underlying principle is that the larger the scale of development, the greater the need to comply with the APZ, construction and service requirements.

SFPP infill development should seek to achieve a better bush fire risk outcome (such as improved construction standards) than if the development did not proceed. The new building work should comply with AS 3959 - 1999 or be no closer to the hazard than the existing building.

Clause 44 of the Rural Fires Regulation (**RF Reg**) prescribes the requirements for an application for a BFSA. This Bushfire Assessment Report has been completed in accordance with the RF Reg and the requirements of PBP 2019. It has considered the requirements of PBP 2019 to inform the client of the modern planning and building controls to reduce the impact of bushfire on the proposed development.

The RFS, through PBP 2019 provide several principles for the development of existing facilities that have been incorporated into the design of the new buildings and site layout. These include (p. 52):

- *provide an appropriate defendable space;*
- *site the building in a location which ensures appropriate separation from the hazard to minimise potential for material ignition;*
- *provide a better bush fire protection outcome for existing buildings;*

[1] Planning for Bushfire Protection p. 52

- *new buildings should be located as far from the hazard as possible and should not be extended towards or situated closer to the hazard than the existing buildings (unless they can comply with section 6.8);*
- *ensure there is no increase in bush fire management and maintenance responsibility on adjoining land owners without their written confirmation;*
- *ensure building design and construction enhances the chances of occupant and building survival; and provide for safe emergency evacuation procedures including capacity of existing infrastructure (such as roads).*

PBP 2019 also provides specific objectives for SFPP developments that include provision for safe emergency evacuation procedures. A bushfire emergency management and evacuation plan is required prior to completion of the works.

8. Bushfire Prone Land

The site is identified as 'bushfire prone land' (see Figure 5) as mapped by Council for the purposes of Section 146 of the EPA Act and the legislative requirements for building on bushfire prone lands are applicable.

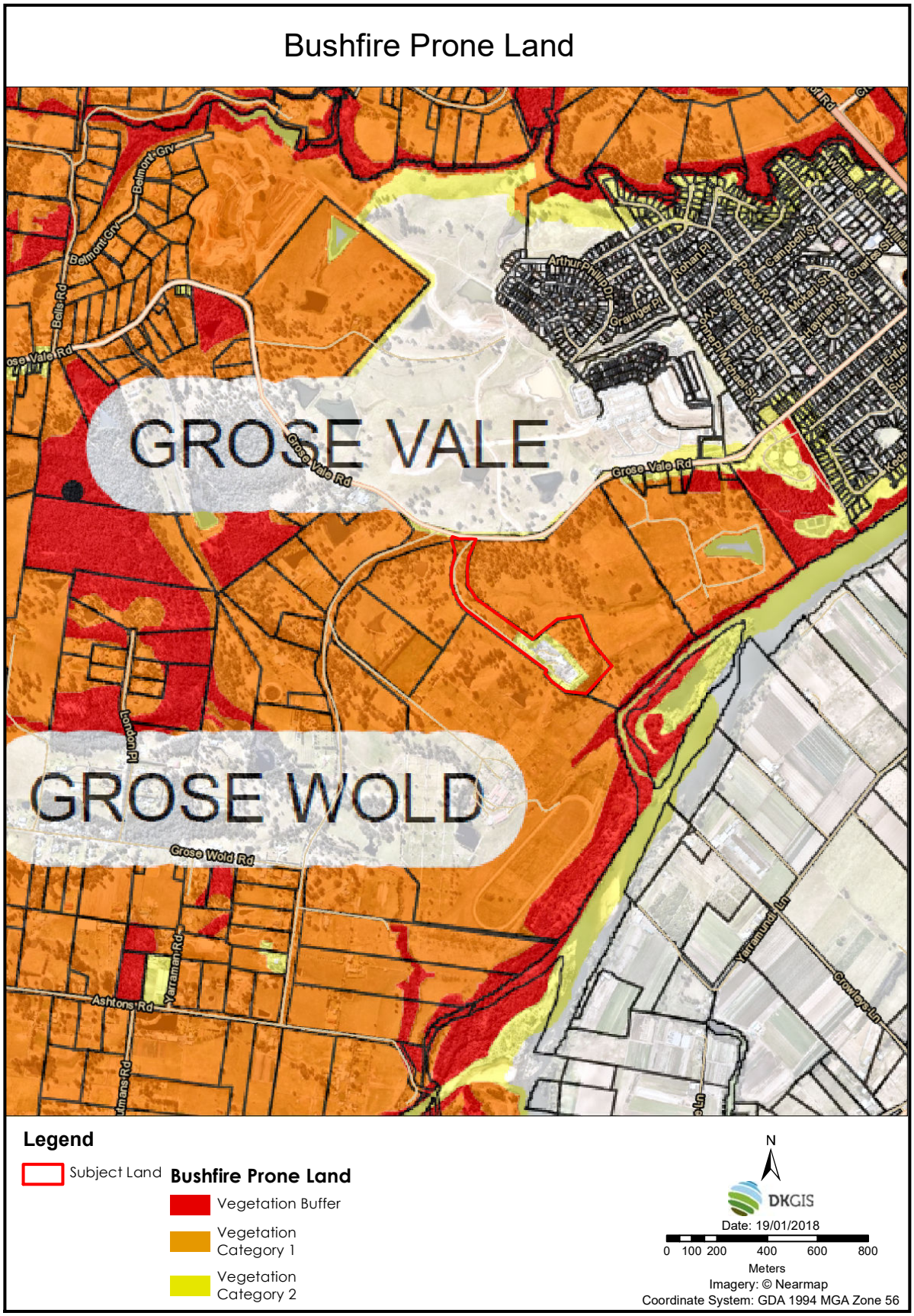
Bushfire prone land maps provide a trigger for the development assessment provisions and consideration of sites that are bushfire prone. Bushfire prone land (BFPL) is land that has been identified by council, which can support a bushfire or is subject to bushfire attack. Bushfire prone land maps are prepared by local council and certified by the Commissioner of the RFS.

Figure 5 shows that the site has bushfire prone Category 1 and Category 2 vegetation affecting it. Category 1 land is within the site and to the east and south of the site. These areas are intensively grazed with scattered trees within the vicinity of the main buildings. The Hawkesbury River is to the south of the site which has Category 2 land.

Land to the north of the site (zoned R2) is currently being subdivided and developed for residential development. The area north of Grose Vale Road is not identified as being bushfire prone due to the ongoing subdivision works and clearance of bushfire prone land. These areas will meet the requirements of managed land as per PBP 2019.

While the BFPM identifies a significant proportion of the site as Category 1, it is considered that this over represents the actual bushfire risk on the ground. All land within the site is managed to RFS APZ Standards and is not considered a threat.

Figure 4 Bushfire Prone Land



9. Bushfire Threat Assessment

9.1. Methodology

PBP 2019 provides a methodology to determine the size of any APZ that may be required to offset possible bushfire attack. These elements include the potential hazardous landscape that may affect the site and the effective slope within that hazardous vegetation.

The following assessment is prepared in accordance with Section 100B of the RF Act, Clause 44 of the RF Reg and PBP 2019. This assessment is based on both a site inspection, detailed GIS mapping and desktop assessment of the site assessment utilising the following resources:

- Planning for Bushfire Protection (NSW RFS, 2019);
- Council Bushfire Prone Land Map;
- Aerial mapping;
- Detailed GIS analysis;
- Site inspection.

The methodology used in this assessment is in accordance with PBP 2019 and is outlined in the following sections.

9.2. Fire Weather

The fire weather is dictated by PBP 2019 and assumes a credible worst-case scenario and an absence of any other mitigating factors relating to aspect or prevailing winds.

The site has a Fire Danger Index (FDI) of 100 as per PBP 2019.

9.3. Bushfire Hazard

An assessment of the Bushfire Prone Land is necessary to determine the application of bushfire protection measures such as Asset Protection Zone (**APZ**) locations and future building construction levels.

The vegetation formations (bushfire fuels) and the topography (effective slope) combine to create the bushfire threat that may affect bushfire behaviour at the site, and which determine the planning and building response of PBP 2019.

9.4. Vegetation Assessment

The RF Regulation requires a classification of the vegetation on and surrounding the property (out to a distance of 140 metres from the boundaries of the property) in accordance with the system for classification of vegetation contained in PBP 2019.

Predominant Vegetation is classified by structure or formation using the system adopted by Keith (2004) and by the general description using PBP 2019.

Vegetation types give rise to radiant heat and fire behaviour characteristics. The predominant vegetation is determined over a distance of at least 140 metres in all directions from the proposed site boundary or building footprint on the development site. Where a mix of vegetation types exist, the type providing the greater hazard is said to predominate.

The vegetation affecting the site (see Figure 6) is:

- remnant forest to the south east (0.8ha) (see Photo 1 and 2) and north west (.58ha) of the buildings;
- a small portion of woodland (2.87ha) to the south west of the buildings;
- remaining areas being grassland. The grassland areas are grazed and could be considered managed.

An area of forest vegetation (6.95ha) is to the north west of the site impinging on the access road into the site. The *Emergency Management and Evacuation Plan* will provide for trigger points for refuge within the site or to evacuate the site. This will include provisions for bushfire to the north of the site.

Remnant vegetation is a parcel of vegetation with a size of less than 1 Ha or a shape that provides a potential fire run directly toward buildings not exceeding 50m. These remnants are considered a low hazard and APZ setbacks and building construction standards for these will be the same as for

rainforests (PBP p. 52). The vegetation within the remnant portion is well managed. There is no mid story vegetation and the ground fuels are slashed and managed to APZ Standards. The remnant trees are important to the hospital to provide shade and outlook for patients.

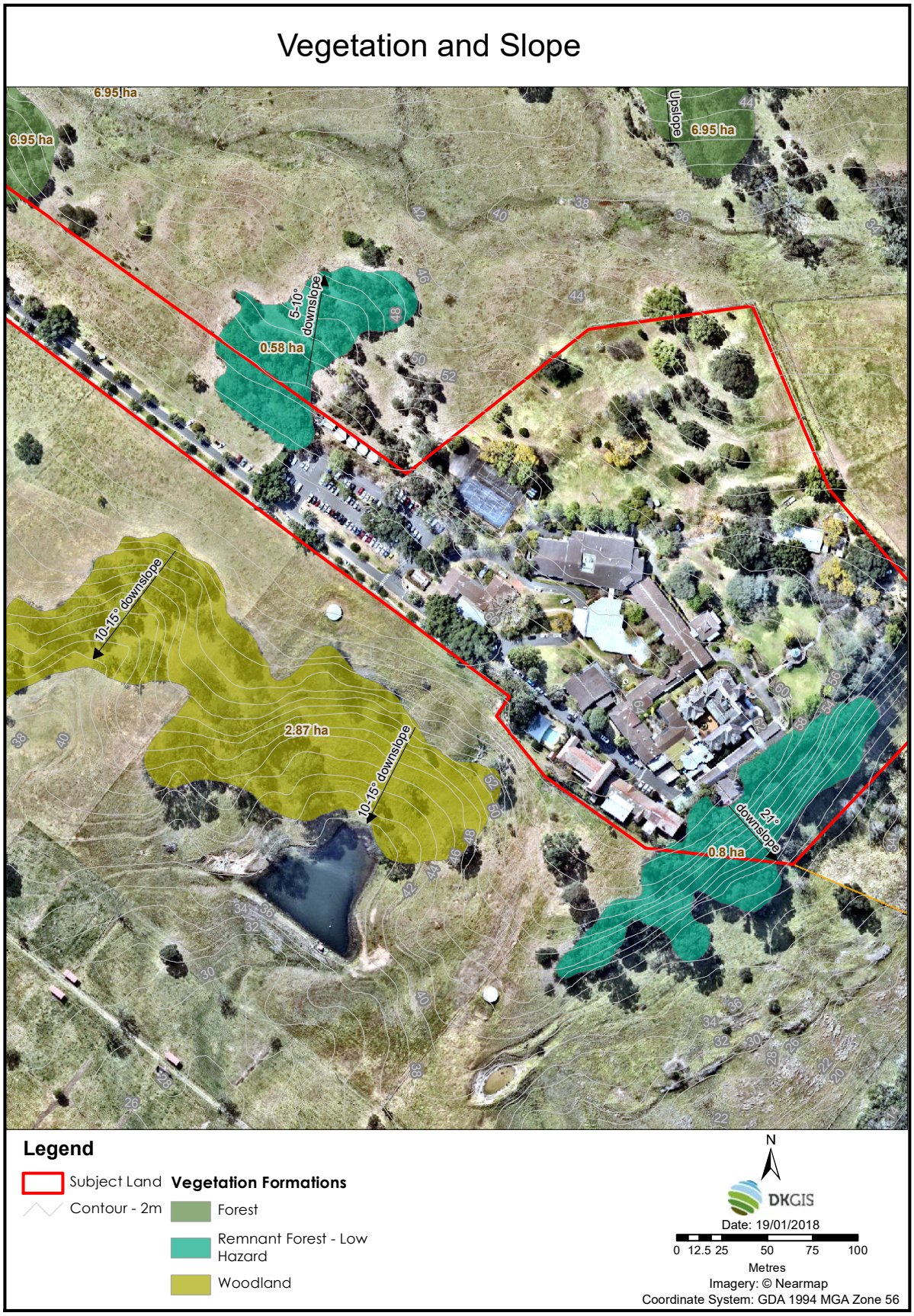
For the purposes of assessment by the RFS, the following are not considered a hazard or as a predominant vegetation class/ formation and can be included within an asset protection zone:

> *(a) non-vegetated areas including roads, footpaths, cycleways, waterways, buildings, rocky outcrops and the like; and*
>
> *(b) reduced vegetation including maintained lawns, golf course fairways, playgrounds or sports fields, vineyards, orchards, cultivated ornamental gardens and commercial nurseries.*

Photograph 1 Remnant vegetation showing no mid story and good management as an APZ

Photograph 2 Looking down from the site showing managed lands with no mid story

Figure 5 Vegetation and Slope



9.5. Slopes Influencing Bushfire Behavior

The RF Reg requires an assessment of the slope of the land on and surrounding the property (out to a distance of 100 metres from the boundaries of the property or from the proposed development footprint.

The effective slope' influencing fire behaviour approaching the sites has been assessed in accordance with the methodology specified within PBP 2019.

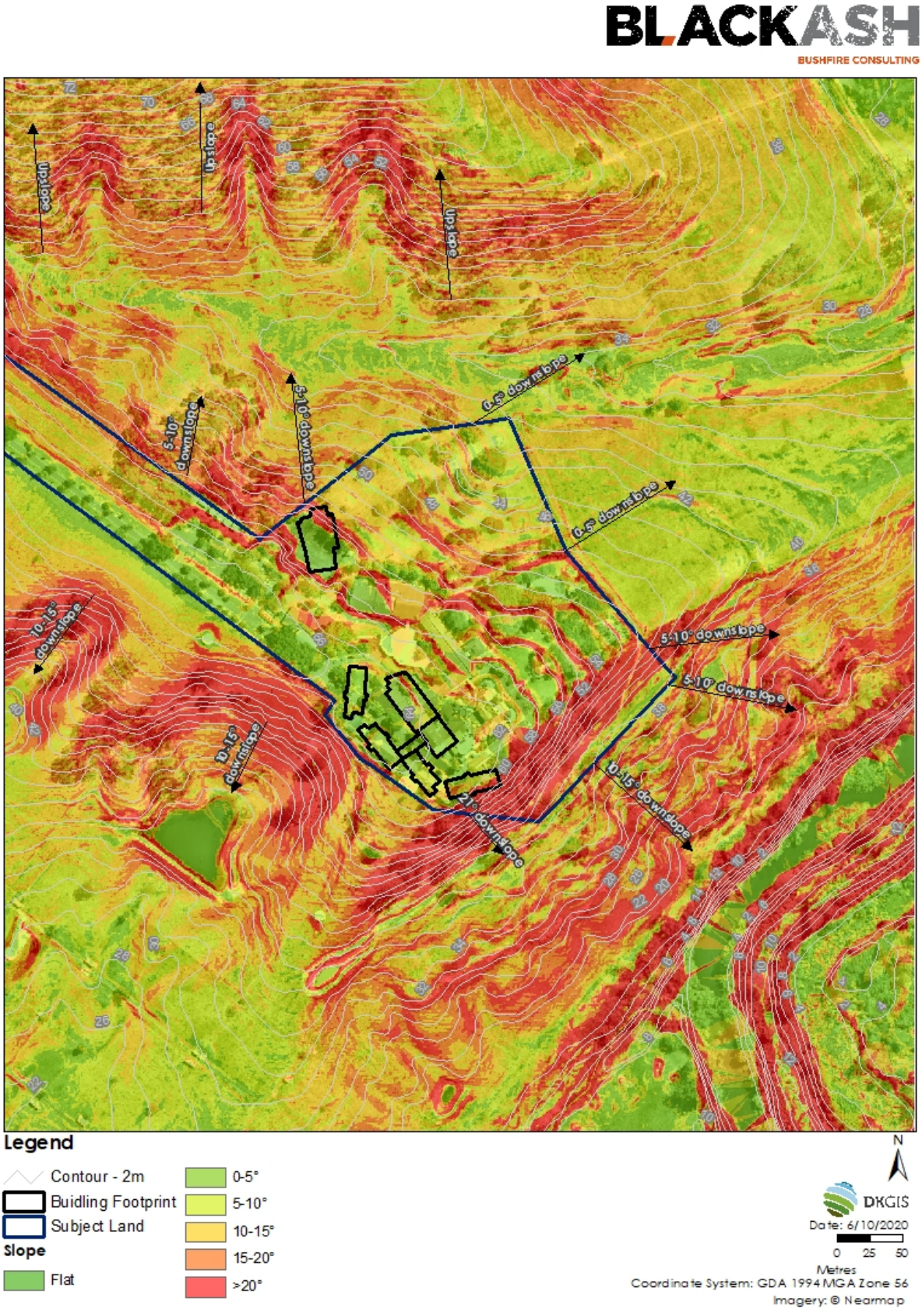
This is conducted by measuring the worst-case scenario slope where the vegetation occurs over a 100m transect measured outwards from the development boundary or the existing/ proposed buildings. Figure 5 shows the effective slopes relevant to the proposal and a detailed slope map is shown in Figure 6.

The slopes range from:

- 10- 15 degrees downslope to the south west;
- 21 degrees downslope to the south east and
- 5 – 10 degrees downslope to the north and north east.

The slopes to the south east of the site are steep (21 degrees). However, this slope is short (< 25m) and is managed as an APZ.

Figure 6 Detailed Slope Map



9.6. Bushfire Attack Levels

The building construction levels for new development are determined using the *Australian Standards for Construction of Buildings in Bushfire Prone Areas* (**AS3959**). AS3959 is primarily concerned with improving the ability of a building in a bushfire prone area to better withstand bushfire attack (ember, radiant heat, smoke and direct flame contact), thus giving a measure of protection to the building and occupants until the fire front passes.

Improving the design and construction of buildings in bushfire prone areas is a fundamental aspect of good bushfire planning. Importantly, AS3959 will not guarantee that a building will survive the impact of a bushfire, but it will increase the resilience of the building to a point where it should survive the passage of the fire.

The AS3959 provides an accepted way of determining the Bushfire Attack Level (BAL) that a building may be subject to. The BAL is a measure of severity of a building's potential exposure to ember attack, radiant heat and direct flame contact using increments of radiant heat expressed in kilowatts per metre squared and is the basis of establishing requirements for constriction of buildings in bushfire prone areas. The deemed to satisfy BAL Map from AS3959 is shown at Figure 8.

Given the location of the site in western Sydney, the retention of trees within the site is important to provide shade. This is a fundamental aspect of providing reduced heat stress to the buildings and occupants. The bushfire risk for the site coupled with the potential fire behavior is limited and a fire will not get into the crown of the trees. It is expected that the entire site will continue to be managed as an APZ to Inner Protection Area Standards.

A small area of an easement is being negotiated with adjoining landowners to the south west and north (of the Wellbeing Centre) to ensure the current practice of grazing, which provides minimal fuel will be provided. The negotiations for the easements are ongoing and will not be determined in time for submission with the DA. As such, two options are provided:

- Option 1 without easements (Figure 7) with Bushfire Attack Levels and Construction in accordance with Table 1.
- Option 2 with easement (Figure 8) to provide BAL 29 construction for the new buildings. The Wellbeing Centre will provide an APZ to achieve a BAL 40 rating as the building does not provide accommodation. Bushfire Attack Levels and Construction in accordance with Table 2.

The proposed BAL: levels for the new buildings are:

Table 1 Bushfire Attack Levels without easements

Building Identification (as per Figure 7)	**BAL level (AS3959)**
Residence Pavilion 1	BAL 29 on the south, east and west elevations BAL 19 on shielded sides – north elevation
Residence Pavilion 2	BAL 29 on the south, east and west elevations BAL 19 on shielded sides – north elevation
Residence Pavilion 3	BAL Flame Zone on the south, east and west elevations BAL 40 on shielded sides – north elevation
Residence Pavilion 4	BAL Flame Zone on the south, east and west elevations BAL 40 on shielded sides – north elevation
Food retail and retail building	BAL 12.5
Clinical Support Building	BAL 19 on the south, east and west elevations BAL 12.5 on shielded sides – north elevation
Health and Wellness Centre	BAL Flame Zone on the north, east and west BAL 40 on shielded sides – south elevation
Existing Buildings	The existing buildings will be upgraded to provide basic ember protection such as screening of openable windows and doors.

Figure 7 BAL Map

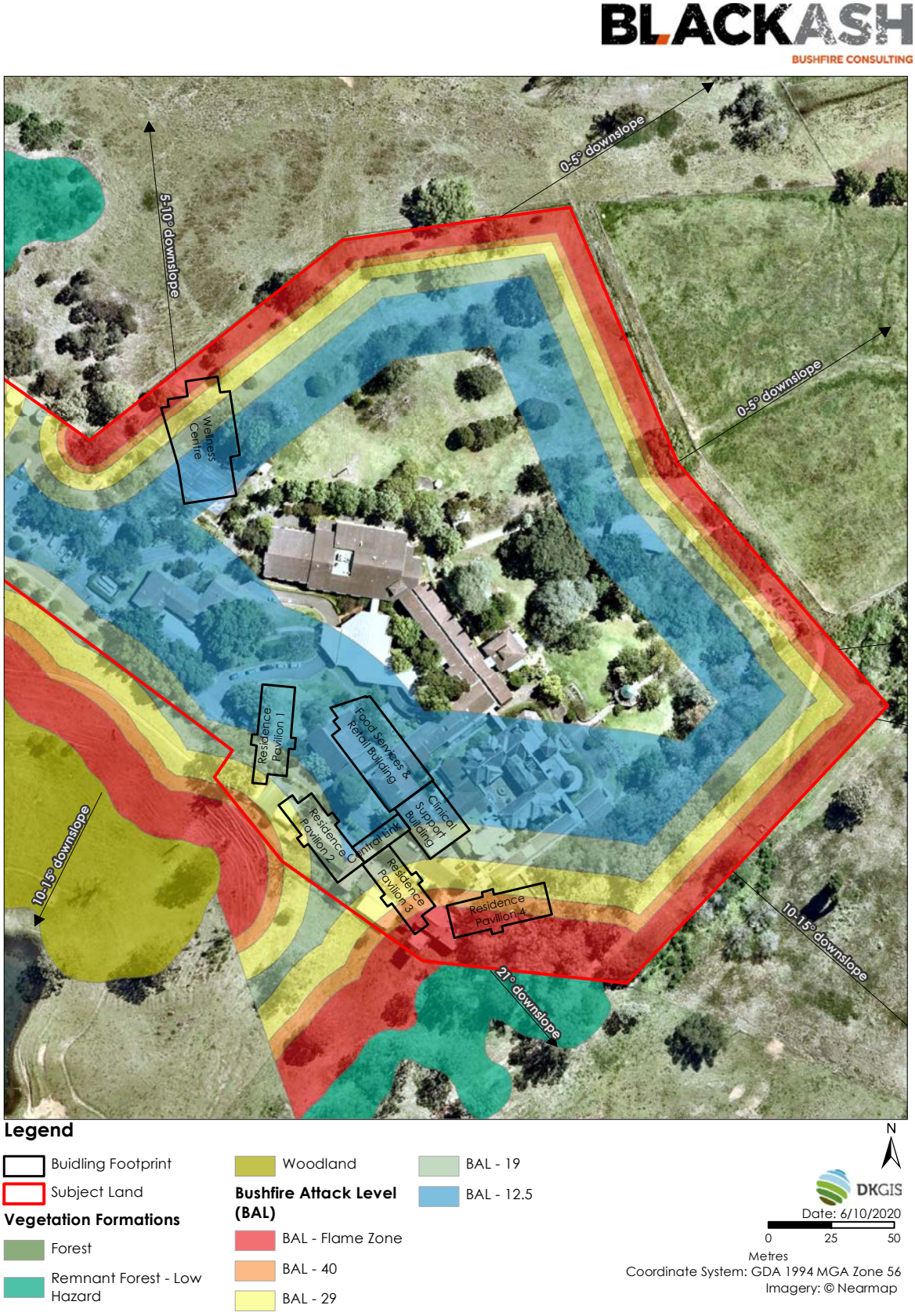


Figure 8 BAL with Easements offsite to provide BAL 29 to the south east and BAL 40 to the Wellbeing Centre

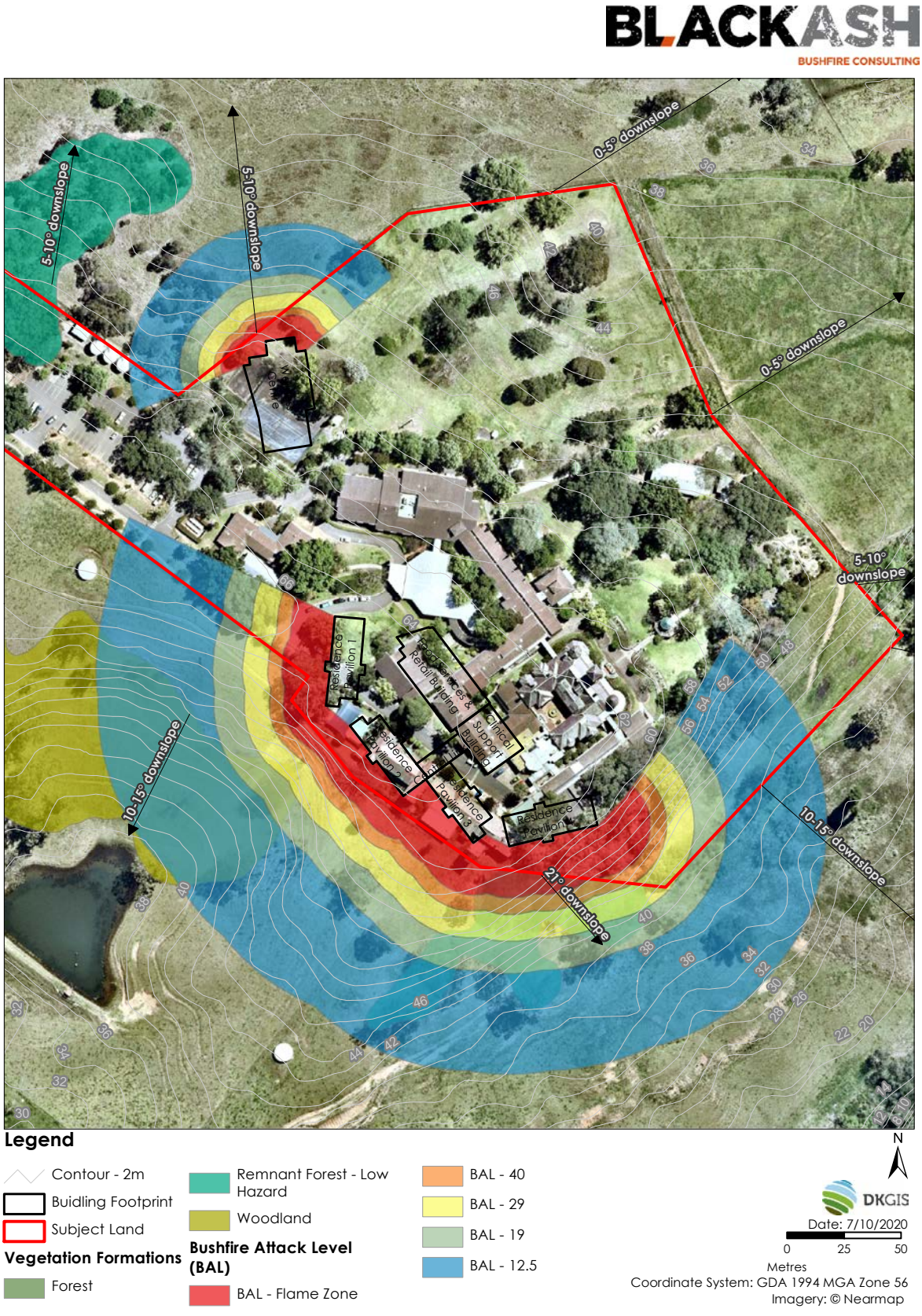


Table 2 Bushfire Attack Levels with easements – achieving BAL 29

Building Identification (as per Figure 8)	**BAL level (AS3959)**
Residence Pavilion 1	BAL 29 on the south, east and west elevations BAL 19 on shielded sides – north elevation
Residence Pavilion 2	BAL 29 on the south, east and west elevations BAL 19 on shielded sides – north elevation
Residence Pavilion 3	BAL 29 on the south and east elevations BAL 19 on shielded sides – north and west elevation
Residence Pavilion 4	BAL 29 on the south, east and west elevations BAL 19 on shielded sides – north elevation
Food retail and retail building	BAL 12.5
Clinical Support Building	BAL 12.5
Health and Wellness Centre	BAL 29 on the north, east and west BAL 19 on shielded sides – south elevation
Existing Buildings	The existing buildings will be upgraded to provide basic ember protection such as screening of openable windows and doors.

10. Services – Water, Gas and electrical supplies

The existing facility is connected to mains supplied power and water. No new services will be required. Any gas services are to be installed and maintained in accordance with Australian Standard AS/NZS 1596 'The storage and handling of LP Gas' (Standards Australia 2008). This complies with PBP.

11. Access

No new roads are proposed. The existing road network provides good linkage and opportunities for heavy fire tanker to access the site and turn around. Fire fighters can stage appliances off the roadways and can readily gain access between the buildings to adjacent areas as necessary.

The existing roads throughout the site are two way and variable width with roll top kerbs, and parking areas more than accommodates the intent of measures of section 4.2.7 of PBP and the objectives within section 1.2, for internal roads and provision of safe operational access for emergency services personnel in suppressing a bush fire, while residents are accessing or egressing an area (PBP p 34).

12. Fire Maintenance Plan and Emergency Procedures

An existing emergency management and evacuation plan is in place for the hospital. The plan will be reviewed prior to the commencement of the 2020 Bushfire Danger Period (1 October 2020).

13. Environmental Features

The management of these ecological features/considerations shall be managed in accordance with the relevant consent authority and the relevant experts, and are not anticipated to compromise the bushfire protection outcomes for the proposed development. No trees are required to be removed.

14. Threatened Species

The management of these ecological features/considerations shall be managed in accordance with the relevant consent authority and the relevant experts, and are not anticipated to compromise the bushfire protection outcomes for the proposed development.

15. Aboriginal Objects or Places

A place of Aboriginal cultural heritage significance, the Battle of Richmond Hill memorial garden, occurs in the north eastern corner of the study area.

16. Assessment Against the Aim and Objective of PBP

The RF Reg requires 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 PBP 2018.

All development in Bushfire Prone Areas needs to comply with the aim and objectives of PBP.

Table 2 shows the compliance with PBP.

Table 2 Compliance with Aim & Objectives of PBP

Aim	Meets Criteria	Comment
The aim of PBP is to use the NSW development assessment system to provide for the protection of human life (including fire fighters) and to minimise impacts on property from the threat of bushfire, while having due regard to development potential, onsite amenity and the protection of the environment.	Yes	Landscaping, defendable space, access and egress, emergency risk management and construction standards are in accordance with the requirements of PBP and the aims of PBP have been achieved. The Bushfire Attack Level is shown in Table 1.
Objectives	**Meets Criteria**	**Comment**
Afford occupants of any building adequate protection from exposure to a bushfire.	Yes	A bushfire risk assessment has bene completed for the site. The Bushfire Attack Level is shown in Table 1. Detailed emergency management arrangements will be put in place to avoid the threat of bushfire to occupants.
Provide for defendable space to be located around buildings.	Yes	Defendable space is provided on all sides of the proposed development.
Provide appropriate separation between a hazard and buildings, which, in combination with other measures, prevent direct flame contact and material ignition.	Yes	An asset protection zone to the site boundaries for the new works commensurate with the BAL has been provided. Separation will be provided in the form of easements or construction will comply with the AS3959.
Ensure that safe operational access and egress for emergency service personnel and occupants is available.	Yes	The site has direct access to internal and public roads, and access and egress for emergency vehicles and evacuation is adequate.
Provide for ongoing management and maintenance of bushfire protection measures, including fuel loads, in the asset protection zone	Yes	A bushfire management plan will be completed prior to the start of the Bushfire Danger Period 1 October 2020.
Ensure that utility services are adequate to meet the needs of firefighters (and others assisting in bushfire fighting).	Yes	Fire services are being updated throughout the site.

17. Providing a Better Outcome

The extent of the alterations and additions are materially insignificant to the broader site and upgrading of existing buildings beyond basic ember protection is not proposed.

The site provides good internal road access for fire fighters.

The Bushfire Emergency Management and Evacuation Plan will be reviewed prior to 1 October 2020 to ensure it reflects RFS *A guide to developing a Bush Fire Emergency Management and Evacuation Plan*. The plan will include trigger points and actions that reflect a range of likely scenarios for the site.

Defendable space which is a subset of the existing APZs are available throughout the site which provides a workable area in which firefighters can undertake property protection before and after the passage of a bushfire.

The site is currently managed as an asset protection zone. A recommendation has been incorporated to manage the entire site as an Inner Protection Area (IPA).

The IPA is the area closest to the asset and creates a fuel-managed area which can minimise the impact of direct flame contact and radiant heat on the development and be a defendable space. Vegetation within the IPA should be kept to a minimum level. Litter fuels within the IPA should be kept below 1cm in height and be discontinuous.

In practical terms the IPA is typically the curtilage around the dwelling, consisting of a mown lawn and well-maintained gardens.

When establishing and maintaining an IPA the following requirements (PBP 2018 p. 116) apply:

Trees:

- canopy cover should be less than 15% (at maturity)
- trees (at maturity) should not touch or overhang the building
- lower limbs should be removed up to a height of 2m above ground
- canopies should be separated by 2 to 5m
- preference should be given to smooth barked and evergreen trees.

Shrubs:

- create large discontinuities or gaps in the vegetation to slow down or break the progress of fire towards buildings
- shrubs should not be located under trees
- shrubs should not form more than 10% ground cover
- clumps of shrubs should be separated from exposed windows and doors by a distance of at least twice the height of the vegetation.

Grass:

- should be kept mown (as a guide grass should be kept to no more than 100mm in height)
- leaves and vegetation debris should be removed.

18. Recommendations

A small area of an easement is being negotiated with adjoining landowners to the south west and north (of the Wellbeing Centre) to ensure the current practice of grazing, which provides minimal fuel will be provided. The negotiations for the easements are ongoing and will not be determined in time for submission with the DA. As such two recommendations are provided that are contingent on the provision or not of the easement. We would ask that these conditions be included in the Bushfire Safety Authority.

The following recommendations are made for the bushfire protection measures for the site.

1. **(a) Without an easement provided to adjoining land: Construction Standard:** are to be provided in accordance with Australian Standard for the Construction of Buildings in Bushfire Prone Areas such that:

Building Identification (as per Figure 7)	**BAL level (AS3959)**
Residence Pavilion 1	BAL 29 on the south, east and west elevations BAL 19 on shielded sides – north elevation
Residence Pavilion 2	BAL 29 on the south, east and west elevations BAL 19 on shielded sides – north elevation
Residence Pavilion 3	BAL Flame Zone on the south, east and west elevations BAL 40 on shielded sides – north elevation
Residence Pavilion 4	BAL Flame Zone on the south, east and west elevations BAL 40 on shielded sides – north elevation
Food retail and retail building	BAL 12.5
Clinical Support Building	BAL 19 on the south, east and west elevations BAL 12.5 on shielded sides – north elevation
Health and Wellness Centre	BAL Flame Zone on the north, east and west BAL 40 on shielded sides – south elevation

Existing Buildings	The existing buildings will be upgraded to provide basic ember protection such as screening of openable windows and doors.

OR

1. (b) Bushfire Attack Levels *with easements – achieving BAL 29*

Building Identification (as per Figure 8)	**BAL level (AS3959)**
Residence Pavilion 1	BAL 29 on the south, east and west elevations BAL 19 on shielded sides – north elevation
Residence Pavilion 2	BAL 29 on the south, east and west elevations BAL 19 on shielded sides – north elevation
Residence Pavilion 3	BAL 29 on the south and east elevations BAL 19 on shielded sides – north and west elevation
Residence Pavilion 4	BAL 29 on the south, east and west elevations BAL 19 on shielded sides – north elevation
Food retail and retail building	BAL 12.5
Clinical Support Building	BAL 12.5
Health and Wellness Centre	BAL 29 on the north, east and west BAL 19 on shielded sides – south elevation
Existing Buildings	The existing buildings will be upgraded to provide basic ember protection such as screening of openable windows and doors.

2. **Asset Protection Zones:** At the commencement of building works and in perpetuity, Asset Protection Zone shall be established to the property boundaries. These APZs shall be established and maintained as an inner protection area as outlined within PBP 2019 and the NSW RFS document '*Standards for Asset Protection Zones*'.

3. **Services:** Any gas services are to be installed and maintained in accordance with *Australian Standard AS/NZS 1596 'The storage and handling of LP Gas'* (Standards Australia 2008).

4. **Updated Emergency Plan**: An updated bushfire emergency management and evacuation plan will be completed prior to occupation of the new buildings. The plan will include trigger points and actions that reflect a range of likely scenarios for the site.

19. Conclusion

The report has demonstrated that an appropriate combination of bushfire protection measures has been implemented to provide compliance with the intent and performance measures and the overall aim and objectives in section of PBP 2019.

The bushfire risk to the new development is minimal and recommendations have been provided in Section 18 that will provide compliance with PBP 2019. Broader site recommendations have been provided commensurate with the extent of works to provide better bushfire risk management than currently exists at the site.

In the author's professional opinion, the bushfire protection measures demonstrated in this report comply with Planning for Bush Fire Protection 2019.

Lew Short | Director
BlackAsh Bushfire Consulting

Appendix 1 - References

Australian Building Codes Board *Building Code of Australia*

Volumes 1&2 Australian Standard AS/NZS 1596 'The storage and

handling of LP Gas'

Councils of Standards Australia AS3959 (2009) – *Australian Standard Construction of buildings in bushfire-prone areas*

Keith, David (2004) – *Ocean Shores to Desert Dunes – The Native Vegetation of New South Wales and the ACT*. The Department of Environment and Climate Change

NSW Rural Fire Service (2015) *Guide for Bushfire Prone Land Mapping*

NSW Rural Fire Service (2011) Practice Note 1/11 Telecommunication Towers in Bushfire Prone Areas

NSW Rural Fire Service (RFS). 2006. *Planning for Bushfire Protection: A Guide for Councils, Planners, Fire Authorities, Developers and Home Owners.* Australian Government Publishing Service, Canberra

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NSW Government (1979) *Environmental Planning and Assessment Act 1979*. NSW Government Printer