

A stylized topographic map with contour lines in shades of green and grey, located on the left side of the page.

Bushfire Protection Assessment

Shoalhaven District Memorial Hospital Acute Services Building

Health Infrastructure NSW

DOCUMENT TRACKING

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LIMITATIONS

The bushfire protection measures recommended in this report do not completely remove the risk to life and property, and they do not guarantee that a development will not be impacted by a bushfire event. This is substantially due to the degree of vegetation management, the unpredictable nature and behaviour of fire, and extreme weather conditions.

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Abbreviations

Abbreviation	Description
ASB	Acute Services Building
AS 3959	Australian Standard 3959:2018 'Construction of buildings in bushfire-prone areas'
APZ	Asset Protection Zone
BAL	Bushfire Attack Level
BFPL	Bush fire prone land
BPM	Bushfire protection measures
DA	Development Application
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
FDI	Fire Danger Index
IPA	Inner Protection Area
NASH	National Association of Steel-framed Housing
NCC	National Construction Code
OPA	Outer Protection Area
PBP	'Planning for Bush fire Protection 2019'
RFS	NSW Rural Fire Service
SDMH	Shoalhaven District Memorial Hospital
SFPP	Special Fire Protection Purpose

1. Property and proposal

Table 1 identifies the subject property and outlines the type of development proposed.

Table 1: Subject site and development proposal summary

Street address:	Corner of Scenic Drive and Shoalhaven Street, Nowra
Postcode:	2541
Lot/DP no:	Lot 373 DP 755952, Lot 7034 DP 1031852, Lot 104 DP 1165533, Lot 1032 DP 1208730 and Lot 1 DP 1043088
Local Government Area:	Shoalhaven City Council
Fire Danger Index (FDI)	100
Current land zoning:	SP2 – Health Services Facilities, SP2 Educational Establishment and RE1 Public Recreation
Type of development proposed:	Special Fire Protection Purpose (SFPP) - Existing

1.1 Description of proposal

The proposal is for the construction of an Acute Services Building (ASB) along with associated covered walkways, utilities and internal road infrastructure at the Shoalhaven District Memorial Hospital, Corner of Shoalhaven Street and Scenic Drive, Nowra (hereafter referred to as the ‘subject land’) as shown in Figure 1.

While the ASB itself is not located on land mapped as bush fire prone by Shoalhaven City Council’s (SCC) Bush Fire Prone Land (BFPL) map¹, the western side of the SDMH is partially mapped within the 100 m buffer of Category 1 forest vegetation located on the western side of Scenic Drive adjoining the Shoalhaven River.

1.2 Assessment process

Being a Special Fire Protection Purpose (SFPP) development, the development proposal was assessed in accordance with Section 100B of the *Rural Fires Act 1997* and ‘Planning for Bush Fire Protection 2019’ (RFS 2019), herein referred to as ‘PBP’.

The proposed development is being assessed under a State Significant Development Application (SSDA).

This assessment is based on the following information sources:

- Background documentation provided by Health Infrastructure NSW;
- Information contained within the proposed site plan provided by Johnstaff (Project 20278, Plan ASB-SD-DR-AR-1000-10, Issue 10 dated 14 April 2022, Figure 1);
- GIS analysis including online spatial resources (i.e. Google Earth, SIX Maps, Nearmap and the NSW Government Planning Portal); and
- Site inspection undertaken by Susan Courtney on 16 April 2021.

¹ <https://www.planningportal.nsw.gov.au/spatialviewer/#/find-a-property/address>

Table 2 identifies the bushfire protection measures (BPM) assessed and whether an acceptable or performance solution is being proposed.

Table 2: Summary of bushfire protection measures assessed

Bushfire Protection Measure	Acceptable Solution	Performance Solution	Report Section
Asset Protection Zones	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3.1
Landscaping	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3.2
Construction standard	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3.3
Access	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3.4
Water supply	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3.5
Electrical services	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3.6
Gas services	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3.7
Emergency management	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3.8
PBP objectives for existing SFPP development	Satisfies objectives	N/A	4

1.3 Significant environmental features

A Biodiversity Development Assessment Report (BDAR) has been undertaken by Eco Logical Australia (ELA 2022a) which has determined that the proposed bushfire protection measures (BPM) will not have a significant impact on any significant environmental features, threatened species, populations or ecological communities under the *Biodiversity Conservation Act 2016*.

The NSW Minister for Planning is the determining authority for this development and will assess more thoroughly any potential environmental issues. No additional Asset Protection Zone (APZ) establishment is required to support the proposed development.

1.4 Aboriginal cultural heritage

An assessment of any Aboriginal cultural heritage objects (within the meaning of the *National Parks and Wildlife Act 1974*) that may potentially be affected by the proposed BPM has been undertaken by ELA and has determined that there will be no significant impact (ELA 2022b).

There are no additional APZ proposed as part of the BPM for this development. The NSW Minister for Planning is the determining authority for this development and will assess more thoroughly any potential Aboriginal cultural heritage issues.

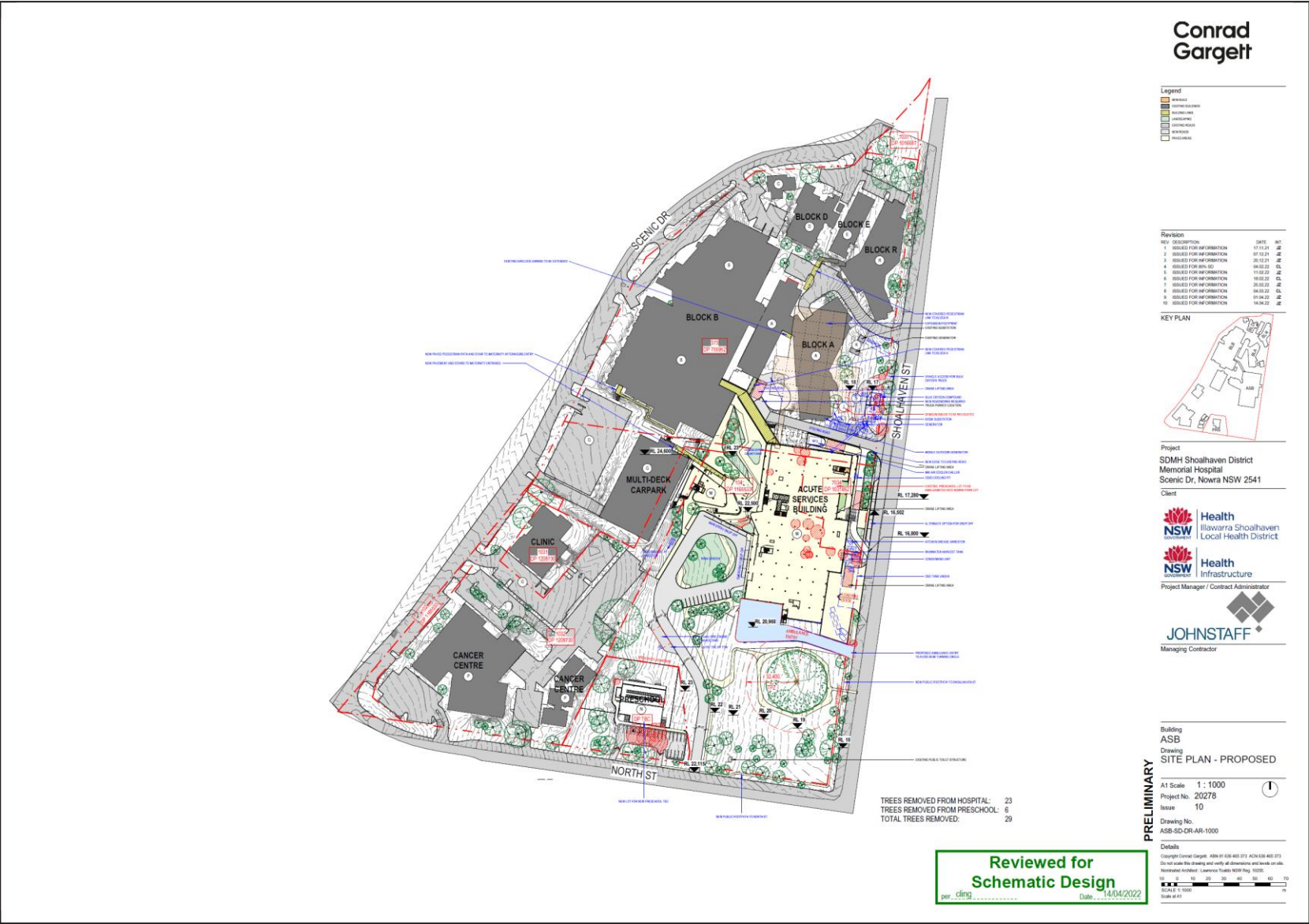


Figure 1: Site plan

2. Bushfire hazard assessment

2.1 Process

The site assessment methodology from Appendix 1 of PBP has been used in this assessment to determine the required APZ and Bushfire Attack Level (BAL) construction requirements.

Figure 2 and Table 3 show the effective slope and predominant vegetation representing the highest bushfire threat potentially posed to the proposed ASB from various directions.

2.2 Vegetation assessment

In accordance with PBP, the predominant vegetation has been assessed for a distance of at least 140 m from the subject land in all directions.

The predominant vegetation has been determined from site inspection.

2.3 Slope assessment

In accordance with PBP, the slope that would most significantly influence fire behaviour was determined over a distance of 100 m from the boundary of the proposed development under the classified vegetation.

The effective slope has been determined from 2 m contour data and confirmed from site assessment.

2.4 Summary of assessment

As shown in Figure 2, there is only one area of bush fire prone vegetation within 140 m of the SDMH.

This vegetation consists of a narrow band of dry sclerophyll forest and Eastern Riverine Forest along the cliff line to the west of the subject land on the opposite side of Scenic Drive on the bank of the Shoalhaven River (see Photograph 1 and Photograph 2 overleaf along with Photograph 3 - Photograph 8 in Section 8).

The vegetation is classified as 'low hazard' vegetation using the provision in Section A1.11.1 of PBP as it does not provide a potential fire run towards the study site of more than 50 m. Low hazard vegetation uses 'rainforest' setbacks and construction standards as a surrogate for the reduced fire behaviour expected from small and/or narrow areas of vegetation.

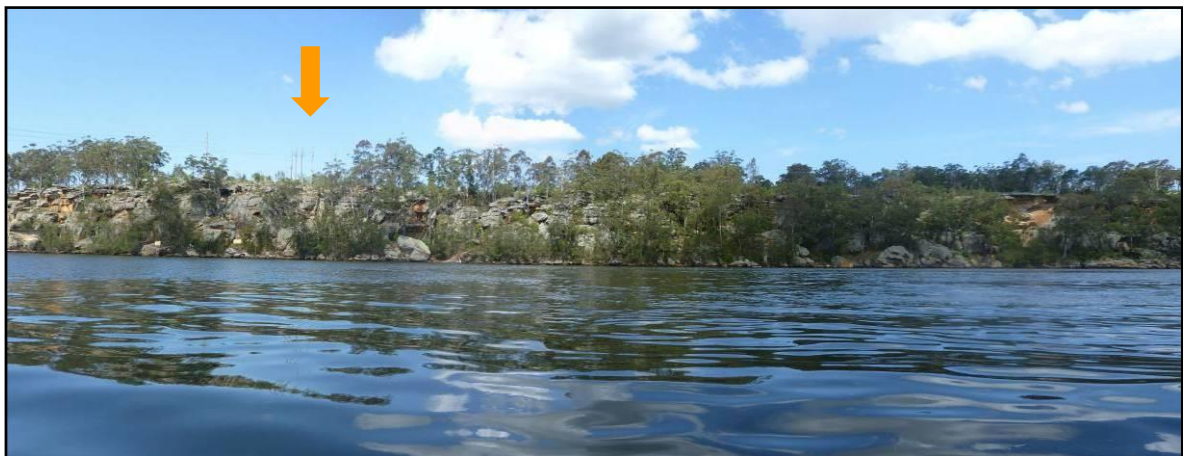
The 'low hazard' rating is further justified by the following:

1. The narrow width of the vegetated corridor (≤ 32 m);
2. Fuel loads are reduced by at least 70% due to large rock boulders and bare rock cliff faces occupy approximately 70% of the ground cover below the subject land (see Photograph 1 - Photograph 8);
3. A crown fire is not able to develop on the site due to the sheer vertical cliff face, high percentage of rock cover, minimal ground and shrub cover and narrow width of this riparian vegetation (see Photograph 1 - Photograph 8); and
4. Widespread higher intensity bushfire will not occur in the locality due to the narrow width of vegetation, extensive areas of rock and bare ground within that vegetation and the fact that it is surrounded by the Shoalhaven River and Nowra Golf Course to the west and existing residential development in all other directions.

Photograph 1: View of low hazard vegetation along cliff line to the west of the SDMH from the Shoalhaven River showing large rock boulders.



Photograph 2: View of low hazard vegetation along cliff line to the north-west of the SDMH from the Shoalhaven River showing large boulders and sheer cliff faces. The orange arrow shows the approximate location of the existing SDMH.



The only area of any continuity of vegetation near the subject land is between the top of the cliff line above the Shoalhaven River and the north-western side of Scenic Drive; this vegetation is no more than 15 m wide and it also has a high percentage of rock cover.

In all other directions from the SDMH study area, there are managed lands in the form of the managed grounds of the existing SDMH car parks, SCCC and GPHC, the Shoalhaven River and Nowra Golf Course to the west/north-west, riverside parkland/Nowra Rowing Club to the north, existing residential development to the east and Nowra Showground to the south.

The large, sheer cliff line and associated boulders within the narrow band of vegetation to the west of the SDMH have a significant effect on the 'effective slope' that influences fire behaviour within this vegetation.

There are downslopes of <5 degrees at both the base of the cliff into the Shoalhaven River (with only a few metres of vegetation cover); and at the top of the cliff line adjacent Scenic Drive (with vegetation up to 15 m wide). Between these two vegetated slopes is a sheer, vertical (and in many areas overhanging), bare rock cliff face (see Photograph 1 - Photograph 8).

Therefore, this assessment concludes that the slope most affecting fire behaviour in the low hazard vegetation to the west of the proposed ASB falls into the PBP slope category of 'downslope >0-5 degrees'.

Figure 2 summarises the identified effective slope assessed for each transect.

Consultation was undertaken with Bradley Bourke of Batemans Bay RFS Customer Service Centre via telephone on 13 May 2021 where it was confirmed that the previous bushfire assessment (ELA 2018), including vegetation/slope classification, would be applied to future development of the existing SDMH site.

Table 3 below shows the APZ requirements and existing APZ in place for the proposed ASB.

Table 3: Bushfire hazard assessment, APZ requirements and BALs

Transect #	Direction	Slope	Vegetation	SFPP APZ	Residential APZ	Existing APZ	Bushfire Attack Level	Comment
1	North-west	>0- 5° downslope	Low hazard	47 m	14 m	≥100 m	BAL-LOW	Minimum APZ in place entirely within Scenic Drive road reserve and remainder of APZ in place within already managed portion of the SDMH.
2	North	>0- 5° downslope	Low hazard	47 m	14 m	≥100 m	BAL-LOW	
All other directions		Managed land consisting of existing health care/residential development/Nowra Showground						



Figure 2: Bushfire hazard assessment

3. Bushfire protection measures

3.1 Asset Protection Zones

Table 3 shows the dimensions of the required APZ and where relevant, information on how the APZ is to be provided is included. The footprint of the APZ is also shown on Figure 2.

The compliance of the proposed APZ with Section 6.8.1 of PBP is provided in Table 4.

Table 4: APZ requirements and compliance (adapted from Table 6.8a of PBP)

Performance Criteria	Acceptable Solutions	Compliance Notes
The intent may be achieved where:		
Radiant heat levels of greater than 10kW/m ² (calculated at 1200K) will not be experienced on any part of the building.	The building is provided with an APZ in accordance with Table A1.12.1 in Appendix 1.	Complies APZ provided in accordance with Table A1.12.1 as shown in Table 3 and Figure 2.
APZ maintenance is practical, soil stability is not compromised and the potential for crown fires is minimised.	The APZ is located on lands with a slope less than 18 degrees.	Complies APZ is not located on slopes greater than 18°.
APZs are managed and maintained to prevent the spread of fire to the building.	The APZ is managed in accordance with the requirements of Appendix 4 of this document, and is wholly within the boundaries of the development site;	Complies APZ to continue being managed in accordance with PBP. Fuel management specifications provided in Appendix A.
	APZs are wholly within the boundaries of the development site; and	Complies APZ located entirely within Scenic Drive road reserve (15 m) and remainder within managed portion of SDMH site.
The APZ is provided in perpetuity.	Other structures located within the APZ need to be located further than 6 m from the refuge building.	Not applicable ASB is >6 m from any other existing hospital building and will not be required to act as the refuge building for the SDMH.

3.2 Landscaping

The compliance of the proposed landscaping with Section 6.8.1 of PBP is provided in Table 5.

Table 5: Landscaping requirements and compliance (adopted from Table 6.8a of PBP)

Performance Criteria	Acceptable Solutions	Compliance Notes
The intent may be achieved where:		
Landscaping is managed to minimise flame contact and radiant heat to buildings, and the potential for wind-driven embers to cause ignitions.	Landscaping is in accordance with Appendix 4 of PBP; and	Complies APZ/landscaping is to continue being managed in accordance with PBP. Landscaping specifications provided in Appendix A.
	Fencing is constructed in accordance with Section 7.6 of PBP.	New fencing is to be constructed in accordance with Section 7.6 of PBP.

3.3 Construction standards

The building construction standard is based on the determination of the BAL in accordance with Appendix 1 of PBP. The BAL is based on known vegetation type, effective slope and managed separation distance between the development and the bushfire hazard.

The proposed ASB is exposed to **BAL-LOW** as identified in Table 3.

3.3.1 Construction requirements

The Deemed to Satisfy (DtS) provisions of the NCC for construction requirements for buildings in designated bush fire prone areas are specified in:

- AS 3959:2018 Construction of buildings in bushfire-prone areas (SA 2018); and
- NASH Standard: Steel Framed Construction in Bushfire Areas 2014 (NASH 2014).

The exposure of BAL-LOW for the proposed ASB is based on insufficient bushfire risk to warrant specific construction standards.

While some of the walkway structures that link existing buildings to one another within the SDMH and also link existing buildings to the proposed ASB are located within a BAL-12.5 risk exposure area, given that these structures are covered walkways only, a specific BAL is not considered necessary for these Class 10b ancillary structures.

3.3.2 Additional construction requirements

Additional ember protection provisions identified in Section 7.5 of PBP, as modified by the NSW state variation of the NCC, do not apply to the proposed ASB as it is classified as BAL-LOW.

3.3.3 Building Upgrades

Given the factors below, ember protection upgrades are not recommended for the existing buildings within the SDMH site as part of the proposed ASB construction:

- a. Low landscape bushfire risk (see Section 2.4);
- b. There is onsite fire panel monitoring for early fire detection;
- c. Internal sprinkler systems are installed on many of the more recently constructed buildings; and
- d. Rapid fire suppression response is likely due to its urban location and service provision by Fire and Rescue NSW and NSW Rural Fire Service.

3.3.4 Fences and gates

To comply with Section 7.6 of PBP, all fencing and gates are to be constructed of hardwood or non-combustible material. Where fencing is within 6 m of a building, it should be made of non-combustible material only.

3.4 Access

The SDMH site is accessed via an existing surrounding public road network consisting of Shoalhaven and North Streets and Scenic Drive as shown in Figure 1. The proposed public and ambulance access to the new ASB will be provided by driveways that are located >100 m from the low hazard vegetation to the north-west and there are no specific PBP requirements for these driveways.

The proposed driveways are ≥ 6.5 m wide, provide parking outside the carriageway and hydrants will be provided outside both the parking areas and the road carriageways. The loop road on the main public access driveway and the large ambulance driveway turning area will provide PBP compliant turning areas for fire tankers and there is an additional fire tanker parking bay on the public access driveway.

3.5 Water supplies

Assessment of compliance of the proposed water supply with Section 6.8.3 of PBP is shown in Table 6.

Table 6: Water supply requirements (adapted from Table 6.8c of PBP)

Performance Criteria	Acceptable Solution	Compliance Notes
Adequate water supplies is provided for firefighting purposes.	Reticulated water is to be provided to the development where available; or	Complies Proposal serviced by a reticulated water supply.
	A 10,000 litres minimum static water supply dedicated for firefighting purposes is provided for each occupied building where no reticulated water is available.	Not applicable
Water supplies are located at regular intervals; and The water supply is accessible and reliable for firefighting operations.	Fire hydrant, spacing, design and sizing complies with the relevant clauses of Australian Standard AS 2419.1 (SA 2005); Hydrants are not located within any road carriageway; and Reticulated water supply to urban subdivisions uses a ring main system for areas with perimeter roads.	Existing reticulated water supply. Boosted hydrants and hydrant network to be supplied as per structural firefighting specifications.
Flows and pressure are appropriate.	Fire hydrant flows and pressures comply with the relevant clauses of AS 2419.1 (SA 2005).	Existing reticulated water supply
The integrity of the water supply is maintained.	All above-ground water service pipes are metal, including and up to any taps; and	To comply
	Above-ground water storage tanks shall be of concrete or metal.	Not applicable

3.6 Electricity services

Assessment of compliance of the proposed supply of electricity services with Section 6.8.3 of PBP is shown in Table 7.

Table 7: Assessment of requirements for the supply of electricity services (adapted from Table 6.8c of PBP)

Performance Criteria	Acceptable Solution	Compliance Notes
Location of electricity services limits the possibility of ignition of surrounding bush land or the fabric of buildings.	Where practicable, electrical transmission lines are underground;	Complies Electricity services to the site are aboveground however will be underground to the proposed development.
	Where overhead, electrical transmission lines are proposed as follows: <ul style="list-style-type: none"> • Lines are installed with short pole spacing (30 m), unless crossing gullies, gorges or riparian areas; and • No part of a tree is closer to a power line than the distance set out in ISSC3 'Guide for the Management of Vegetation in the Vicinity of Electricity Assets' (ISSC3 2016). 	Not applicable

3.7 Gas services

Assessment of compliance of the proposed supply of gas services (reticulated or bottled gas) with Section 6.8.3 of PBP is shown in Table 8.

Table 8: Assessment of requirements for the supply of gas services (adapted from Table 6.8c of PBP)

Performance Criteria	Acceptable Solution	Compliance Notes
Location and design of gas services will not lead to ignition of surrounding bushland or the fabric of buildings.	<ul style="list-style-type: none"> • Reticulated or bottled gas is installed and maintained in accordance with AS/NZS 1596:2014 'The storage and handling of LP gas', the requirements of relevant authorities, and metal piping is used; • All fixed gas cylinders are kept clear of all flammable materials to a distance of 10 m and shielded on the hazard side; • Connections to and from gas cylinders are metal; • Polymer-sheathed flexible gas supply lines are not used; and • Above-ground gas service pipes are metal, including and up to any outlets. 	To comply The advice of a relevant authority or suitably qualified professional should be sought, for certification of design and installation in accordance with relevant legislation, Australian Standards and Table 6.8c of PBP.

3.8 Emergency and Evacuation Planning

Assessment of compliance of the proposed emergency and evacuation planning with Section 6.8.4 of PBP is shown in Table 9.

Table 9: Assessment of emergency requirements (adopted from Table 6.8d of PBP)

Performance Criteria	Acceptable Solutions	Compliance Notes
The intent may be achieved where:		
A bushfire emergency and evacuation management plan [BEMEP] is to be prepared.	<p>Bushfire emergency management and evacuation plan is to be prepared or updated consistent with the:</p> <ul style="list-style-type: none"> • The NSW RFS document: A Guide to Developing a Bush Fire Emergency Management and Evacuation Plan; <ul style="list-style-type: none"> ○ NSW RFS Schools Program guide; ○ Australian Standard AS 3745:2010 'Planning for emergencies in facilities' [SA 2010a]; and ○ Australian Standard AS 4083:2010 'Planning for emergencies – Health care facilities' [SA 2010b]. • The bushfire emergency and evacuation management plan should include a mechanism for the early relocation of occupants. <p>Note: A copy of the bush fire emergency management plan should be provided to the Local Emergency Management Committee (via SCC) for its information prior to occupation of the development.</p>	<p>To comply</p> <p>Not applicable</p> <p>To comply</p> <p>To comply</p> <p>Not applicable</p> <p>Early relocation of occupants of the SDMH would be difficult to coordinate and unlikely to be required given the low landscape risk to the site and likelihood of having firefighting resources in place.</p>
Appropriate and adequate management arrangements are established for consultation and implementation of the bush fire emergency and evacuation management plan.	<ul style="list-style-type: none"> • 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; and • Detailed plans of all emergency assembly areas including 'on-site' and 'off-site' arrangements as stated in AS 3745:2010 are clearly displayed, and an annual (as a minimum) trial emergency evacuation is conducted. 	<p>To comply</p> <p>To comply</p>

4. PBP Objectives for Existing SFPP Development

Section 6.4 of PBP outlines specific objectives for existing SFPP development. Assessment of whether the ASB meets these objectives is contained in Table 10

Table 10: Assessment against PBP objectives for SFPP development (adopted from Section 6.4 of PBP)

Objective	How satisfied by proposed development	Report Section
Provide an appropriate defensible space.	The ASB exceeds minimum PBP APZ for new SFPP development.	3.1 and Figure 2
Site the building in a location which ensures appropriate separation from the hazard to minimise potential for material ignition.	As above.	3.1 and Figure 2
Provide a better bush fire protection outcome for existing buildings.	Proposal will improve access to existing buildings within the SDMH site and provide upgrades to water supply.	3.4 and 3.5
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 [of PBP])	Proposed ASB is located further from the hazard than any other existing building within the SDMH (<130 m).	3.1 and Figure 2
Ensure there is no increase in bush fire management and maintenance responsibility on adjoining land owners without their written confirmation.	Proposed development is located entirely within the subject land and there is no increase in bushfire management/maintenance for adjoining land owners.	Figure 2
Ensure building design and construction enhances the chances of occupant and building survival	Proposed ASB is BAL-LOW as located >130 m from nearest bushfire hazard.	3.1 and Figure 2
Provide for safe emergency evacuation procedures including capacity of existing infrastructure (such as roads).	Proposed ASB includes 2 new driveways providing improved access to existing buildings and BEMEP to be developed/updated for the SDMH to include the ASB.	3.4 and 3.8

5. Conclusion

The proposed Acute Services Building (ASB) within the existing Shoalhaven District Memorial Hospital (SDMH) has been assessed as compliant with the relevant specifications and requirements under the acceptable solutions and/or performance criteria within 'Planning for Bush Fire Protection 2019', as outlined in Table 11 below including meeting all of the specific PBP objectives for existing SFPP development.

Table 11: Development bushfire protection measures and recommendations

Bushfire Protection Measures	Recommendations	Acceptable Solution	Performance Solution	Report Section
Asset Protection Zones	APZ dimensions are detailed in Table 3 and shown in Figure 2. Identified APZ to be maintained in perpetuity to the specifications detailed in Appendix A.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3.1
Landscaping	Any future landscaping meets the requirements of PBP listed in Appendix A.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3.2
Construction standard	BAL-LOW	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3.3
Access	No specific access requirements.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3.4
Water supply	ASB will be serviced by a boosted hydrant.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3.5
Electricity service	Electricity supply located underground.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3.6
Gas service	Gas services are to be installed and maintained in accordance with AS/NZS 1596:2014.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3.7
Emergency Management	Bushfire Emergency Management and Evacuation Plan to be developed or updated prior to occupation of the ASB.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3.8
Specific PBP objectives for existing SFPP	Proposal satisfies all objectives.	Objectives satisfied.	N/A	4

6. Recommendations

It is recommended that the proposed development be approved with consent conditions based on the findings in Table 11.



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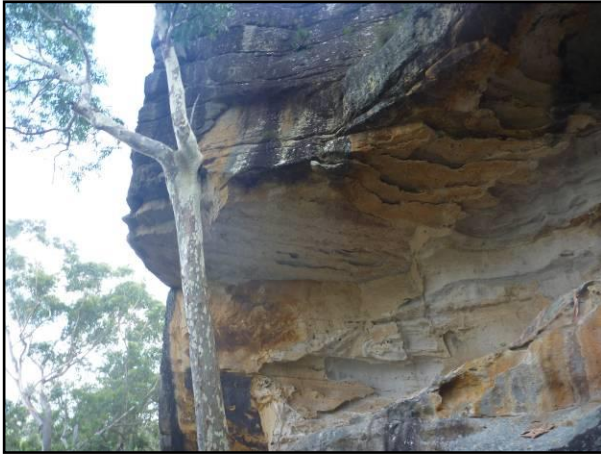


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8. Photographs

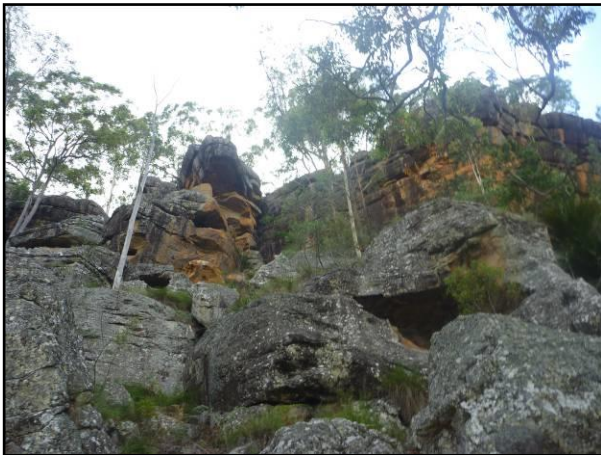
Photograph 3: Sample of cliff overhangs below subject land.



Photograph 4: Sheer cliff face below SDMH.



Photograph 5: Boulders within scant vegetation along Shoalhaven River west of SDMH.



Photograph 6: Small amount of forested wetland at base of cliff to west of SDMH.



Photograph 7: Cliffs below SDMH from Scenic Drive.



Photograph 8: Narrow band of forest along the top of the cliff near the SDMH



Appendix A - Asset protection zone and landscaping standards

The APZ management specified in Table 12 applies to the entire SDMH site which is to be maintained in perpetuity with the maintenance undertaken at least once per year and prior to the commencement of the annual Bush Fire Danger Period. Any landscaping planned for the site should be designed and maintained in accord with the PBP specifications below.

Further details on APZ implementation and management can be found on the NSW RFS website (<https://www.rfs.nsw.gov.au/resources/publications>).

Table 12: APZ management specifications

Vegetation Strata	Inner Protection Area (IPA)
Trees	<ul style="list-style-type: none"> • Tree 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 2 m above ground; • Canopies should be separated by 2 to 5 m; and • Preference should be given to smooth barked and evergreen trees.
Shrubs	<ul style="list-style-type: none"> • Create large discontinuities or gaps in the vegetation to slow down or break the progress of fire towards buildings should be provided; • Shrubs should not be located under trees; • Shrubs should not form more than 10% ground cover; and • Clumps of shrubs should be separated from exposed windows and doors by a distance of at least twice the height of the vegetation.
Grass	<ul style="list-style-type: none"> • Should be kept mown (as a guide grass should be kept to no more than 100 mm in height); and • Leaves and vegetation debris should be removed.

