Travers

bushfire & ecology

bushfire protection assessment

Addendum

Health Co (Health & Welfare Services)

Lot 12 DP 1192443
243 Forrester Road, St Marys

Under Section 100B of the Rural Fires Act (1997)

July 2021
(Ref: 18RCP03)

Bushfire Protection Assessment

Health Co (Health & Welfare Services)

Lot 12 DP 1192443
243 Forrester Road, St Marys

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Date:	16 July 2021
File:	18RCP03

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The mapping is indicative of available space and location of features which may prove critical in assessing the viability of the proposed works. Mapping has been produced on a map base with an inherent level of inaccuracy, the location of all mapped features is to be confirmed by a registered surveyor.

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EXECUTIVE SUMMARY

Travers bushfire & ecology prepared a bushfire report for the proposed redevelopment of a former Masters Centre to create a health and wellness precinct at No. 243 Forrester Road, St Marys in December 2020 with the NSW RFS subsequently issuing a bushfire safety authority for the development on 8/4/2021 (RFS ref: DA20210202000372).

This revised assessment has been undertaken to address the proposed redesign of the development and in particular the removal of the radiant heat barrier and redesign of the childcare centre to ensure a 50m APZ setback.

The proposed development will utilise the existing building to include services such as medical facilities, gymnasium, nutrition / retail shops, dentist, physiotherapist, pet store & vet as well as a childcare centre. The proposed childcare centre is identified by the NSW Rural Fire Service (NSW RFS) as being a special fire protection purpose (SFPP) development and, as a result, this classification requires the NSW RFS to issue a bushfire safety authority (BSA) in accordance with Section 100b of the *Rural Fires Act 1997 (RF Act).*

This proposal has been assessed in accordance with *Planning for Bush Fire Protection 2019 (PBP). PBP* dictates that the subsequent extent of bushfire attack that can potentially impact a SFPP building must not exceed a radiant heat flux of 10kW/m^2. This rating assists in determining the size of the asset protection zone (APZ) to provide the necessary defendable space between hazardous vegetation and a building.

This assessment has found that bushfire can potentially affect the development from the Cumberland Dry Sclerophyll Forest vegetation located beyond the site boundary to the north resulting in possible ember and radiant heat attack.

However, the bushfire risk posed to the development can be mitigated if appropriate bushfire protection measures are put in place and managed in perpetuity.

This assessment has concluded that the proposed future development can provide:

- Use of an alternative solution (method 2 of AS3959 2018) to determine minimum APZs for the childcare centre within the northern portion of the site.;
- Provision of access in accordance with the acceptable solutions outlined in *PBP;*
- Water, electricity and gas supply in compliance with the acceptable solutions outlined in *PBP;*
- Any building upgrades in compliance with the appropriate construction sections of *AS3959-2009 (BAL 19)* and *PBP.* Noting that the existing building was required to be constructed in accordance with BAL 19 as per previous DA consent conditions; and
- Emergency management and evacuation in compliance with *PBP* and NSW RFS guidelines for the *Preparation of an Emergency / Evacuation Plan*.

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GLOSSARY OF TERMS

AHIMS	Aboriginal Heritage Information System
APZ	asset protection zone
AS1596	*Australian Standard – The storage and handling of LP Gas*
AS2419	*Australian Standard – Fire hydrant installations*
AS3745	*Australian Standard – Planning for emergencies in facilities*
AS3959	*Australian Standard – Construction of buildings in bushfire-prone areas 2018*
BAL	bushfire attack level
BCA	*Building Code of Australia*
BSA	bushfire safety authority
EEC	endangered ecological community
EP&A Act	*Environmental Planning & Assessment Act 1979*
FDI	fire danger index
FFDI	forest fire danger index
IPA	inner protection area
l	litres
LEP	Local Environmental Plan
LGA	local government area
m	metres
NCC	*National Construction Code*
OPA	outer protection area
PBP	*Planning for Bush Fire Protection 2019*
RF Act	*Rural Fires Act 1997*
NSW RFS	NSW Rural Fire Service
SFPP	special fire protection purpose

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Introduction 1

The property is located on land mapped by *Penrith City Council* as being bushfire prone (refer Figure 1.1). This triggers a formal assessment in respect of the NSW RFS policy against the provisions of *PBP.*

The proposal is considered (in part) a SFPP development under Section 100B of the *Rural Fires Act 1997 (RF Act)*. This triggers the need for an integrated referral to the NSW RFS and an assessment against *PBP* for any future development application within the site. This will also require the NSW RFS to consider issuing a bushfire safety authority (BSA).

Figure 1.1 – Bushfire prone land map
(source: ePlanning Spatial Viewer, 2020)

1.1 Aims of the assessment

The aims of the bushfire protection assessment are to:

- review the bushfire threat to the landscape
- undertake a bushfire attack assessment in accordance with *PBP*
- provide advice on mitigation measures, including the provision of APZs, construction standards and other specific fire management issues
- review the potential to carry out hazard management over the landscape.

1.2 Project synopsis

The site currently supports a large-plate building formerly occupied by Masters as a home and garden centre. The site also includes an expansive area of at-grade parking occupying the western portion of the site.

HealthCo is proposing to re-purpose the existing building to provide for the following uses:

- Medical centre
- Medical, allied health and support facilities
- Gym
- Organics, health and wellness grocer
- Pet store and vet
- Nutrition and other shops
- Café
- Food kiosks
- Warehouse / distribution centre
- Childcare Centre

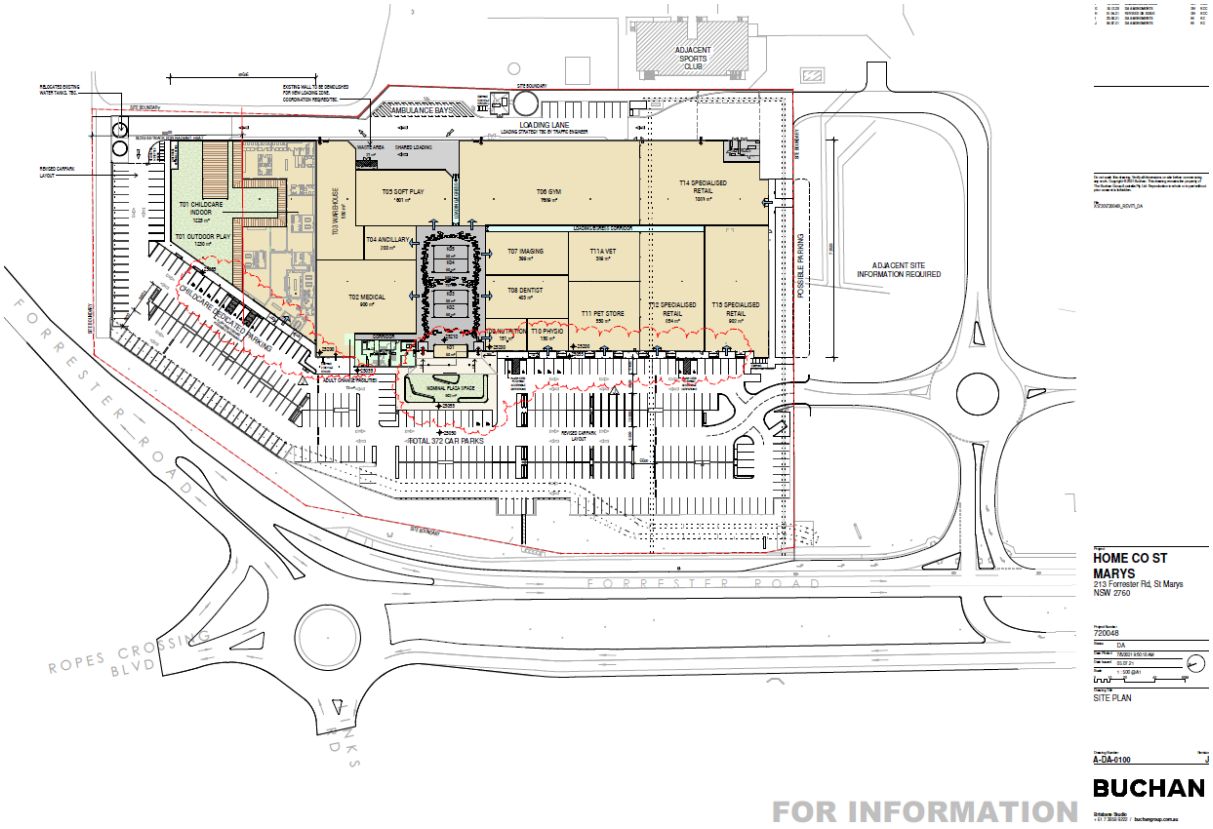

Figure 1.2 – Proposed Plan
(source: Buchan, 05/07/21)

1.3 Information collation

To achieve the aims of this report, a review of information relevant to the property was undertaken prior to the initiation of field surveys. Information sources reviewed include the following:

- Proposed site plan, prepared by *Buchan* (dwg no. A-DA-0100, revision J dated 05/07/2021
- *NearMap* aerial photography
- Topographical maps DLPI of NSW 1:25,000
- Australian Standard 3959 *Construction of buildings in bushfire-prone areas 2018*
- *Planning for Bush Fire Protection 2019 (PBP)*

An inspection of the proposed development site and surrounds was undertaken by Nicole van Dorst in December 2020 to assess the topography, slopes, aspect, drainage, vegetation and adjoining land use. The identification of existing bushfire measures and a visual appraisal of bushfire hazard and risk were also undertaken.

1.4 Site description

The property is identified as 243 Forrester Road, St Marys and is located within the local government area (LGA) of Penrith (refer Figure 1.3). The site has an approximate area of 3.2 hectares with a frontage to Forrester Road to the west. The site also directly adjoins an access road to the south, from which access to the site is gained.

The land to the north is zoned E2 – Environmental Conservation and contains bushland / forest vegetation. The land to the east and south the site is adjoined by St Marys Rugby League Club which includes a football stadium, clubhouse and restaurants, hotel accommodation, an indoor play centre and an outdoor adventure centre. Dunheved Industrial Precinct is located on the opposite side of Forrester Road to the west.

Figure 1.3 – Aerial appraisal
(source: NearMap)

1.5 Legislation and planning instruments

Is the site mapped as bushfire prone?	Yes
Proposed development type	Special fire protection purpose (SFPP) (Childcare)
Is the development considered integrated for the purposes of Section 100B of the *Rural Fires Act 1997?*	Yes – referral to and approval by the NSW RFS is required for the issue of a BSA.
Zoning	IN2 – Light Industrial
Significant environmental features	No know. A small parcel of road side vegetation will be maintained as an APZ.
Details of any Aboriginal heritage	No known
Does the proposal rely on an alternative solution?	Yes – Method 2 of *AS3959* using fuel loads associated with Cumberland Dry Sclerophyll Forest

Bushfire Threat Assessment 2

To assess the bushfire threat and to determine the required width of an APZ for a development, an assessment of the potential hazardous vegetation and the effective slope within the vegetation is required.

2.1 Hazardous fuels

PBP guidelines require the identification of the predominant vegetation formation in accordance with David Keith (2004) if using the simplified acceptable solutions in *PBP*, or alternatively the vegetation class if adopting the comprehensive vegetation fuel loads (as allowable when undertaking an assessment under Method 2 of *AS3959*). The hazardous vegetation is calculated for a distance of at least 140m from a proposed building envelope.

The bushland vegetation to the north and east of the site is mapped as a mixture of Coastal Valley Grassy Woodlands and Cumberland Dry Sclerophyll Forest (refer Figure 2.1 & Photo 1 & 2). However, for the purposes of this assessment the predominate vegetation has been determined as Cumberland Dry Sclerophyll Forest. The results of this assessment with the vegetation conversions and associated fuel loads are identified in the following Table 2.1.

Table 2.1 – Vegetation

Vegetation formation	Vegetation classification	Comprehensive fuel loads (t/ha)	Acceptable solution fuel loads (t/ha) *(PBP)*
Dry Sclerophyll Forest	Cumberland Dry Sclerophyll Forest	14/24.97	22/36.1

Note: The following assessment has adopted the comprehensive fuel loads (column 3).

The roadside vegetation located within of the western site boundary is narrow in width (10m) and is separated from other bushfire prone vegetation by a distance of greater than 20m. In accordance with 'Clause A1.10 Low threat vegetation – Exclusions' (*PBP, 2019*) this vegetation is excluded and is not required to be considered for the purposes of *PBP*.

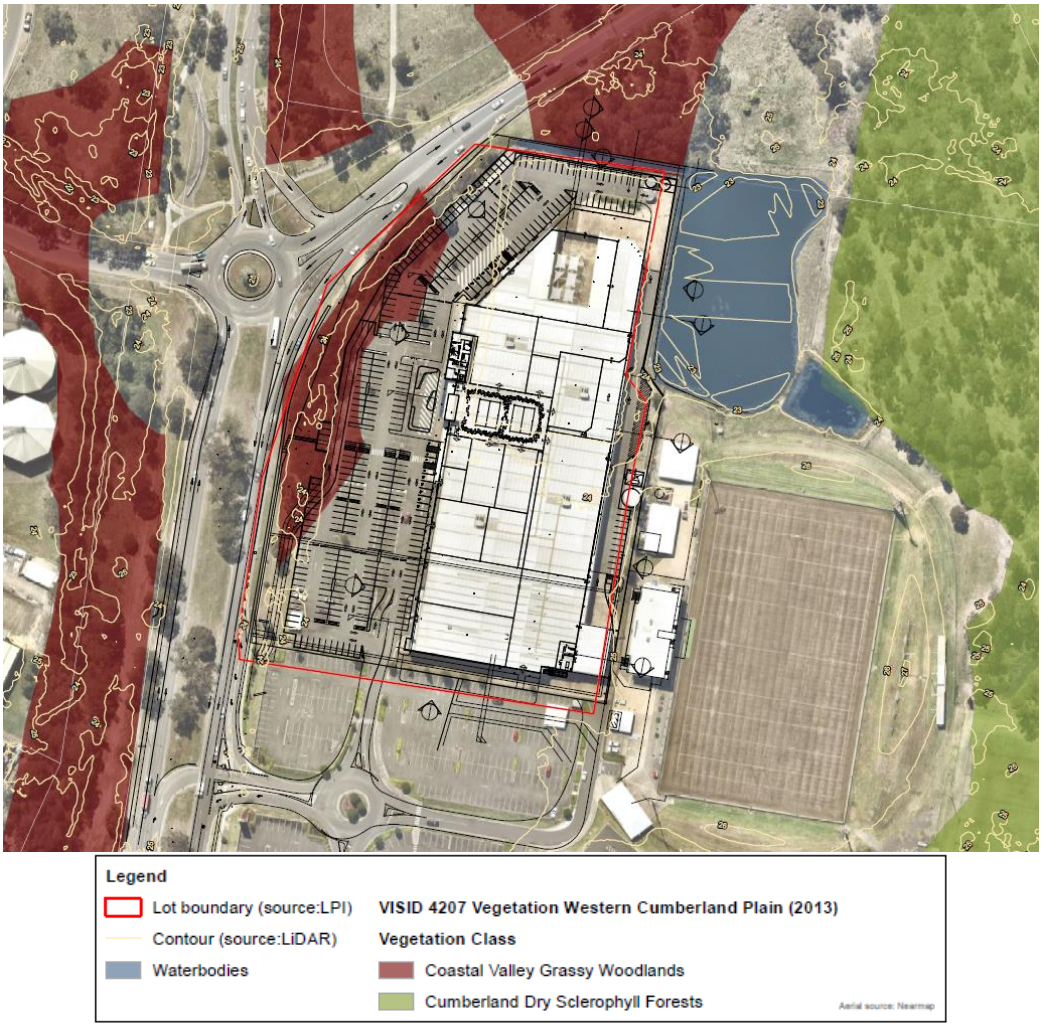

Figure 2.1 – Vegetation Mapping
(source: Western Cumberland Plain (2013)

Photo 1 – Forest vegetation to the north

Photo 2 – Forest vegetation to the north

2.2 Effective slope

The effective slope is assessed for a distance of up to 100m. Effective slope refers to that slope which provides the most effect upon likely fire behaviour. A mean average slope may not in all cases provide sufficient information such that an appropriate assessment can be determined.

The effective slope within the vegetation has been determined as level.

2.3 Bushfire attack assessment

A fire danger index (FDI) of 100 has been used to calculate bushfire behaviour on the site based on the site's location within the Greater Sydney region.

The assessment provided in Table 2.2 has determined the APZ via the following approaches;

- Table A1.12.1 of *PBP*; and
- Appendix B Method 2 (alternative solution) of *AS3959 Construction of buildings in bushfire prone areas* (2018).

Table 2.2 – Bushfire attack assessment

Aspect	Predominant vegetation within 140m of development	Effective slope of land	APZ required (Table A1.12.1 of *PBP*)	APZ provided
West	Excluded vegetation (refer Note 1)	N/A	N/A	40-45m
North	Cumberland Dry Sclerophyll Forest	Level	67m	50m (refer Note 2)
East				77m

Aspect	Predominant vegetation within 140m of development	Effective slope of land	APZ required (Table A1.12.1 of *PBP*)	APZ provided
South	Managed land	N/A	N/A	>100m

Note 1: The roadside vegetation located within of the western site boundary is narrow in width (10m) and is separated from other bushfire prone vegetation by a distance of greater than 20m. In accordance with Clause A1.10 Low threat vegetation – Exclusions *(PBP, 2019)* this vegetation is excluded and is not required to be considered for the purposes of *PBP*.

Note 2 - A performance-based assessment using Appendix B of *AS3959* was undertaken to determine the expected radiant heat impact on the childcare centre based on the fuel loads associated with Cumberland Dry Sclerophyll Forest on level slopes. The results of the assessment, provided below was prepared using the bushfire attack level calculator developed by *Flamesol.*

FPA AUSTRALIA | FLAMESOL

Calculated July 16, 2021, 11:45 am (MDc v.4.9)

North

Minimum Distance Calculator - AS3959-2018 (Method 2)			
Inputs		Outputs	
Fire Danger Index	100	Rate of spread	1.68 km/h
Vegetation classification	Forest	Flame length	13.91 m
Understorey fuel load	14 t/ha	Flame angle	65 °, 70 °, 75 °, 78 °, 79 ° & 84 °
Total fuel load	24.97 t/ha	Elevation of receiver	6.3 m, 6.53 m, 6.72 m, 6.8 m, 6.83 m & 6.92 m
Vegetation height	n/a	Fire intensity	21,673 kW/m
Effective slope	0 °	Transmissivity	0.858, 0.84, 0.8139999999999999, 0.791, 0.78 & 0.726
Site slope	0 °	Viewfactor	0.4155, 0.309, 0.2083, 0.1411, 0.1147 & 0.0308
Flame width	100 m	Minimum distance to < 40 kW/m²	16.5 m
Windspeed	n/a	Minimum distance to < 29 kW/m²	22 m
Heat of combustion	18,600 kJ/kg	Minimum distance to < 19 kW/m²	31.3 m
Flame temperature	1,200 K	Minimum distance to < 12.5 kW/m²	42.9 m
		Minimum distance to < 10 kW/m²	50 m

Rate of Spread - Mcarthur, 1973 & Noble et al., 1980

Flame length - NSW Rural Fire Service, 2001 & Noble et al., 1980

Elevation of receiver - Douglas & Tan, 2005

Flame angle - Douglas & Tan, 2005

Radiant heat flux - Drysdale, 1999, Sullivan et al., 2003, Douglas & Tan, 2005

Specific Protection Issues

3

3.1 Asset protection zones

Table 3.1 outlines the proposal's compliance with the performance criteria for APZs.

Table 3.1 – Performance criteria for asset protection zones

Performance criteria		Acceptable solution	Acceptable solution	Performance solution	Comment
ASSET PROTECTION ZONES (APZS)	Radiant heat levels of greater than 10kW/m² (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	☐	☑	As outlined in Section 2.3, radiant heat levels have been determined as <10kW/m²
	APZ maintenance is practical, soil stability is not compromised and potential for crown fires is minimised	The APZ is not located on lands with a slope exceeding 18°	☑	☐	Complies
	APZs are managed and maintained to prevent the spread of a fire towards the building The APZ is provided in perpetuity	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. Vegetation within the APZ will be managed to the standards of an IPA
		Other structures located within the APZ need to be located further than 6m from the refuge building	☑	☐	Complies
Landscapin	Landscaping is designed and managed to minimise flame contact and radiant heat to buildings, and the	Landscaping is in accordance with Appendix 4	☑	☐	Complies. The APZ is to be managed as an inner protection area (IPA).

Performance criteria		Acceptable solution	Acceptable solution	Performance solution	Comment
	potential for wind-driven embers to cause ignitions.	Fencing is constructed in accordance with Section 7.6	☑	☐	Can be a condition of consent (see Note 1 below).
	Note 1: Section 7.6 of PBP states that all fences in bush fire prone areas should be made of either hardwood or non-combustible material. However, in circumstances where the fence is within 6m of a building they should be made of non-combustible material only.				

3.2 Building protection

The existing building has been constructed to comply with BAL 19 (as per previous consent conditions). Any proposed building upgrades / extensions are to ensure compliance with BAL 19 in accordance with *AS3959 Construction of buildings in bushfire prone areas (2018)* or NASH Standard and Section 7.5 of *Planning for Bush Fire Protection 2019*.

3.3 Hazard management

The asset protection zones (as depicted in Schedule 1) are to be maintained as an inner protection area (IPA) in accordance with RFS guidelines *Standards for Asset Protection Zones* (RFS, 2005), with landscaping design to comply with Appendix 4 of *PBP*. The APZ includes the body of water which runs parallel to the northern site boundary (refer Photo 3).

A summary of the guidelines for managing APZs (including landscaping guidelines) is attached as Appendix 2 to this report.

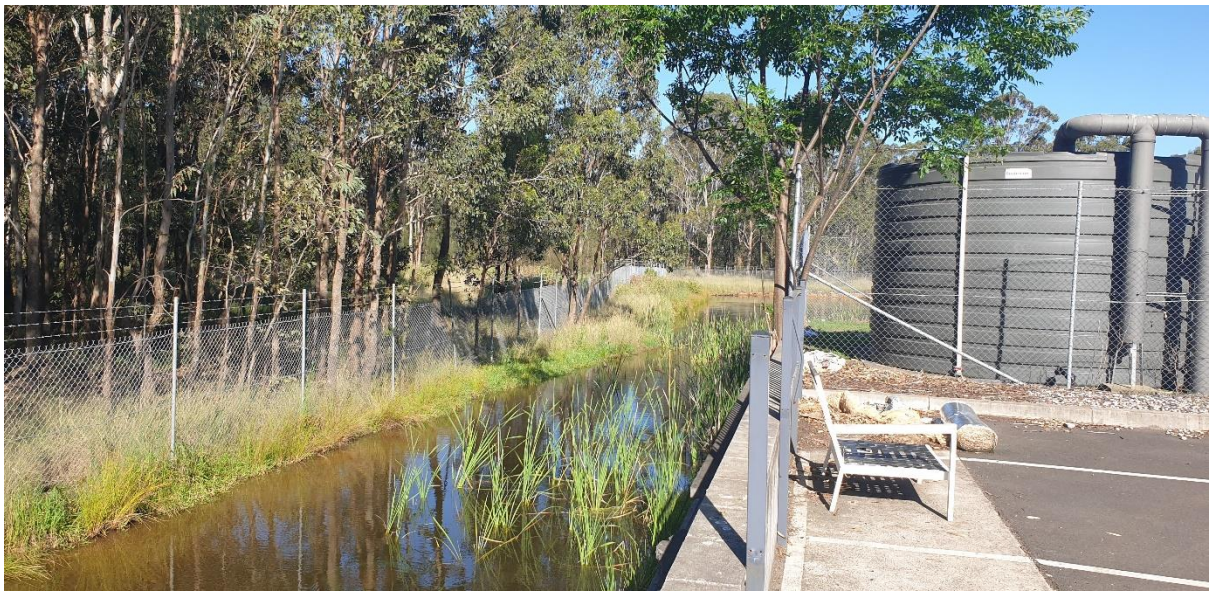

Photo 3 – Water body to north of site forming part of APZ.

3.4 Access for fire-fighting operations

The existing access to the site is via a network of internal roads extending from Foresters Road in the west. This includes a perimeter road which runs along the sites eastern and northern boundary. The internal access design and its compliance to *PBP* is outlined in Table 3.2 below.

Table 3.2 – Performance criteria for access

Performance criteria		Acceptable solution	Acceptable solution	Performance solution	Comment
ACCESS	Firefighting vehicles are provided with safe, all-weather access to structures and hazard vegetation.	SFPP access roads are two-wheel drive, all-weather roads.	☑	☐	Complies
		Access is provided to all structures	☑	☐	Complies
		Traffic management devices are constructed to not prohibit access by emergency services vehicles.	☑	☐	Complies, will be a condition of consent
		Access roads must provide suitable turning areas in accordance with Appendix 3.	☑	☐	All access roads are through roads
		One-way only public access roads are no less than 3.5mm wide and have designated parking bays with hydrants located outside of these areas to ensure accessibility to reticulated water for fire suppression.	☑	☐	N/A all roads are two way.
ACCESS	The capacity of access roads is adequate for firefighting vehicles.	The capacity of road surfaces and any bridges / causeways is sufficient to carry fully loaded firefighting vehicles (up to 23 tonnes); bridges and causeways are to clearly indicate load rating.	☑	☐	Complies
	There is appropriate access to water supply.	Hydrants are located outside of parking reserves and road carriageways to ensure accessibility to reticulated water for fire suppression.	☑	☐	Complies, will be a condition of consent.
		Hydrants are provided in accordance with *AS 2419.1:2005.*	☑	☐	

Performance criteria		Acceptable solution	Acceptable solution	Performance solution	Comment
		There is suitable access for a Category 1 fire appliance to within 4m of the static water supply where no reticulated supply is available.	☐	☐	N/A
PERIMETER ROADS	Perimeter roads are designed to allow safe access and egress for firefighting vehicles while residents are evacuating as well as providing a safe operational environment for emergency service personnel during firefighting and emergency management on the interface.	There are two-way sealed roads.	☑		Complies
		Minimum 8m carriageway width kerb to kerb.			
		Parking is provided outside of the carriageway width.			
		Hydrants are located clear of parking areas.			
		There are through roads, and these are linked to the internal road system at an interval of no greater than 500m.			
		Curves of roads have a minimum inner radius of 6m.			
		The maximum grade road is 15° and average grade is 10°.			
		The road crossfall does not exceed 3°.			
		A minimum vertical clearance of 4m to any overhanging obstructions, including tree branches, is provided.			
NON-PERIMETER ROADS	Non-perimeter access roads are designed to allow safe access and egress for firefighting vehicles while occupants are evacuating	Minimum 5.5m width kerb to kerb.	☑	☐	Complies
		Parking is provided outside of the carriageway width.	☑	☐	
		Hydrants are located clear of parking areas.	☑	☐	
		There are through roads, and these are linked to the internal road system at an interval of no greater than 500m.	☑	☐	
		Curves of roads have a minimum inner radius of 6m.	☑	☐	

Performance criteria		Acceptable solution	Acceptable solution	Performance solution	Comment
		The maximum grade road is 15° and average grade is 10°.	☑	☐	
		The road crossfall does not exceed 3°.	☑	☐	
		A minimum vertical clearance of 4m to any overhanging obstructions, including tree branches, is provided.	☑	☐	

3.5 Water supplies

Town reticulated water supply is available to the proposed development. The development shall comply with the acceptable solutions outlined in Table 3.3 below.

Table 3.3 – Performance criteria for reticulated water supplies (*PBP* guidelines pg. 47)

Performance criteria	Acceptable solutions	Acceptable solution	Performance solution	Comment
Adequate water supplies are provided for firefighting purposes.	Reticulated water is to be provided to the development, where available.	☑		Reticulated water is available to the development.
	A 10,000L minimum static water supply for firefighting purposes is provided for each occupied building where no reticulated water is available.	N/A	N/A	
Water supplies are located at regular intervals. 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 2419.1:2005.*	☑		Can be made a condition of consent.
	Hydrants are not located within any road carriageway.	☑		Can be made a condition of consent.
	Reticulated water supply to SFPPs use a ring main system for areas for areas with perimeter roads.	☑		Can be made a condition of consent.
Flows and pressure are appropriate.	Fire hydrant flows and pressures comply with the relevant clauses of *AS 2419.1:2005.*	☑		Can be made a condition of consent.

Performance criteria	Acceptable solutions	Acceptable solution	Performance solution	Comment
The integrity of the water supply is maintained.	All above-ground water service pipes are metal, including and up to any taps.	☑		Can be made a condition of consent.

3.6 Gas

The development shall comply with the acceptable solutions outlined in Table 3.4 below.

Table 3.4 – Performance criteria for gas supplies

Performance criteria	Acceptable solutions	Acceptable solution	Performance solution	Comment
Location of gas services will not lead to the ignition of surrounding bushland land or the fabric of buildings.	Reticulated or bottled gas bottles are to be installed and maintained in accordance with *AS1596:2014* and the requirements of relevant authorities. Metal piping is to be used.	☑	☐	Can be made a condition of consent.
	All fixed gas cylinders are to be kept clear of flammable materials to a distance of 10m and shielded on the hazard side of the installation.	☑	☐	Can be made a condition of consent.
	Connections to and from gas cylinders are metal.	☑	☐	Can be made a condition of consent.
	If gas cylinders are to be kept close to the building the release valves must be directed away from the building and at least 2m away from any combustible material, so that they do not act as a catalyst to combustion.	☑	☐	Can be made a condition of consent.
	Polymer sheathed flexible gas supply lines to gas meters adjacent to buildings are not to be used.	☑	☐	Can be made a condition of consent.
	Above-ground gas service pipes external to the building are metal, including and up to any outlets.	☑	☐	Can be made a condition of consent.

3.7 Electricity

The intent of measures is to locate electricity so as not to contribute to the risk of fire to a building. Table 3.5 outlines the required acceptable solutions for electricity supply.

Table 3.5 – Performance criteria for electricity services

Performance criteria	Acceptable Solutions	Acceptable solution	Performance solution	Comment
Location of electricity services limit the possibility of ignition of surrounding bushland or the fabric of buildings.	Where practicable, electrical transmission lines are underground.	☑	☐	Electricity complies with the acceptable solutions.
	Where overhead electrical transmission lines are proposed: • lines are installed with short pole spacing (30m), 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 *Guideline for Managing Vegetation Near Power Lines.*	☑	☐	

3.8 Emergency and evacuation planning

Table 3.6 outlines the required performance criteria for the proposal's emergency procedures

Table 3.6 – Performance criteria for emergency and evacuation planning

Performance criteria	Acceptable solutions	Acceptable solution	Performance solution	Comment
A bush fire emergency and evacuation management plan is prepared.	A bush fire emergency management and evacuation plan is prepared consistent with the: • 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),	☑	☐	An evacuation plan will be prepared for the childcare centre.
Note: A copy of the Bush Fire Emergency Evacuation Plan should be provided to the Local Emergency Management Committee for its information prior to occupation of the development.				

Performance criteria	Acceptable solutions	Acceptable solution	Performance solution	Comment
Suitable management arrangements are established for consultation and implementation of the emergency and evacuation plan.	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.	☑	☐	Will be a condition of consent
	Detailed plans of all emergency assembly areas including 'on-site' and 'off-site' arrangements as stated in *AS 3745* are clearly displayed, and an annual (as a minimum) trial emergency evacuation is conducted.			

Conclusion & Recommendations

4

4.1 Conclusion

This bushfire protection assessment has been undertaken to support the proposed redevelopment of a former Masters Centre to create a Health and Wellness Precinct at No. 243 Forrester Road, St Marys.

This assessment has found that bushfire can potentially affect the development from the Cumberland Dry Sclerophyll Forest vegetation located beyond the site boundary to the north resulting in possible ember and radiant heat attack.

However, the bushfire risk posed to the development can be mitigated if appropriate bushfire protection measures are put in place and managed in perpetuity.

This assessment has concluded that the proposed future development can provide:

- Use of an alternative solution to determine minimum APZs for the childcare centre within the northern portion of the site to ensure the radiant heat impact on the building is <10kW/m^2.
- Provision of access in accordance with the acceptable solutions outlined in *PBP.*
- Water, electricity and gas supply in compliance with the acceptable solutions outlined in *PBP.*
- Any building upgrades in compliance with the appropriate construction sections of *AS3959-2009 (BAL 19)*, and *PBP.* Noting that the existing building was required to be constructed in accordance with BAL 19 as per previous DA consent conditions.
- Emergency management and evacuation in compliance with *PBP* and NSW RFS guidelines for the *Preparation of an Emergency / Evacuation Plan*.

The following recommendations are provided to ensure that the development is in accordance with the requirements of *PBP.*

4.2 Recommendations

Recommendation 1 - The development is as generally indicated on the attached Schedule 1 – Plan of Bushfire Protection Measures.

Recommendation 2 - The asset protection zone (as depicted in Schedule 1) is to be managed as an inner protection area (IPA) as outlined in Appendix 4 of *Planning for Bush Fire Protection 2019* and the NSW RFS document *'Standards for asset protection zones'.*

Recommendation 3 – The child care building is to comply with (BAL 19) as outlined in *AS3959 Construction of buildings in bushfire prone areas (2018)* or NASH Standard and Section 7.5 of *PBP.*

Recommendation 4 - The building (other than the childcare centre) must comply with section 3 and section 5 (BAL 12.5) Australian Standard AS3959-2018 Construction of buildings in bush fire-prone areas or NASH Standard (1.7.14 updated) National Standard Steel Framed Construction in Bushfire Areas – 2014 as appropriate, and Section 7.5 of Planning for Bush Fire Protection 2019.

Recommendation 5 - Any new Class 10b structures as defined per the National Construction Code (including the feature walls and batten screens) must be non-combustible.

Recommendation 6 - Water, electricity and gas supply is to comply with Section 6.8.3 of *PBP.*

Recommendation 7 - A Bushfire Emergency Management and Evacuation Plan is to be prepared for the childcare centre to comply with Section 6.8.4 of *PBP.*

REFERENCES

Australian Building Codes Board (2010) – *Building Code of Australia*, Class 1 and Class 10 Buildings Housing Provisions Volume 2

Chan, K.W. (2001) – *The suitability of the use of various treated timbers for building constructions in bushfire prone areas*. Warrington Fire Research

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

Rural Fire Service (2006) - *Planning for bushfire protection – a guide for councils, planners, fire authorities and developers*. NSW Rural Fire Service

Rural Fire Service (2006) - Bushfire Attack Software on RFS web site

Tan, B., Midgley, S., Douglas, G. and Short (2004) - *A methodology for assessing bushfire attack.* RFS Development Control Service

Plan of Bushfire Protection Measures

S1

DISCLAIMER: CAD not georeferenced & has been aligned to georeferenced aerial. Verification by a registered surveyor required prior to finalisation

Legend

- Lot boundary (source:CAD)
- Contour (source:LiDAR)
- Waterbodies
- Outdoor play
- Childcare centre
- Excluded vegetation
- Asset Protection Zone (APZ)

Aerial source: Nearmap

0 30 60 m

Disclaimer: The mapping is indicative of available space and location of features which may prove critical in assessing the viability of the proposed works. Mapping has been produced on a map base with an inherent level of inaccuracy, the location of all mapped features are to be confirmed by a registered surveyor.

PROJECT & MXD REFERENCE	DATE & ISSUE NUMBER	SCALE & COORDINATE SYSTEM
Forresters Rd, St Marys 18RCP03_BF001	16/07/2021 Issue 1 SC	1:2,000 @A3 GDA 1994 MGA Zone 56

TITLE

Schedule 1 - Bushfire Protection Measures

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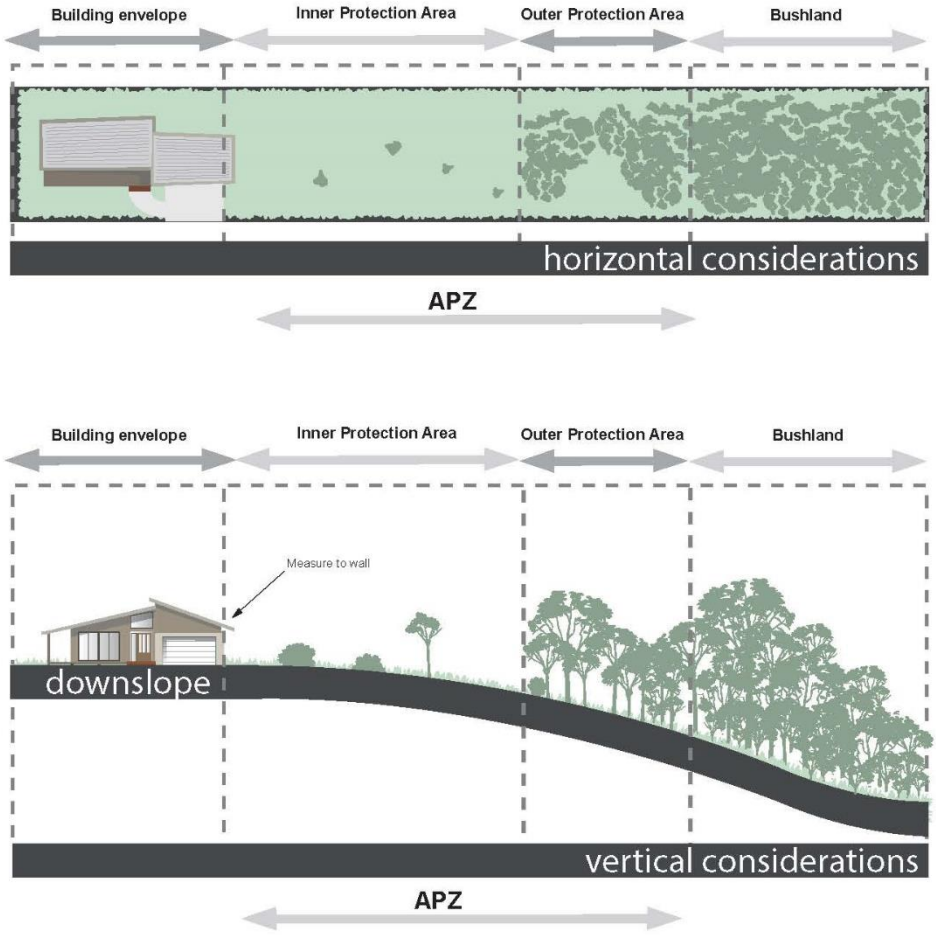
TRAVERS BUSHFIRE & ECOLOGY
A TBE ENVIRONMENTAL COMPANY

Management of Asset Protection Zones

A1

The NSW RFS provides basic advice in respect of managing APZs through documents such as *Standards for Asset Protection Zones* (RFS, 2005), with landscaping to comply with Appendix 5 of *PBP*.

The APZ generally consists of two subordinate areas, an inner protection area (IPA) and an outer protection area (OPA). The OPA is closest to the bush and the IPA is closest to the dwellings. The property is to be managed to IPA standards only. A typical APZ is graphically represented below:



APZs and progressive reduction in fuel loads
(Source: PBP)

Note: Vegetation management as shown is for illustrative purposes only. Specific advice is to be sought regarding vegetation removal and retention from a qualified and experienced expert to ensure APZs comply with the NSW RFS performance criteria.

The following provides maintenance advice for vegetation within the IPA and OPA. The APZ is to be maintained in perpetuity and should be undertaken regularly, particularly in advance of the bushfire season.

Inner protection area (IPA)
Fuel loads within the IPA are to be maintained so they do not exceed 4t/ha.

Trees are to be maintained to ensure;

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

Shrubs are to be maintained to ensure;

- large discontinuities or gaps in the vegetation are created 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% of ground cover; and
- clumps of shrubs should be separated from exposed windows and doors by a distance of at least twice the height of vegetation.

Grass is to be maintained to ensure:

- grass should be kept mown (as a guide grass should be kept to no more than 100mm in height); and
- leaves and vegetation debris should be removed (litter fuel within the IPA should be kept below 1cm).

Landscaping to the site is to comply with the principles of Appendix 5 of *PBP*. In this regard the following landscaping principles are to be incorporated into the development:

- suitable impervious areas being provided immediately surrounding the building such as courtyards, paths and driveways;
- restrict planting in the immediate vicinity of the building which may over time, and if not properly maintained, come in contact with the building;
- when considering landscape species, consideration needs to be given to estimated size of the plant at maturity.
- avoid species with rough fibrous bark, or which retain / shed bark in long strips or retain dead material in their canopies;
- use smooth bark species of trees species which generally do not carry a fire up the bark into the crown;
- avoid planting of deciduous species that may increase fuel at surface / ground level (i.e. leaf litter);
- avoid climbing species to walls and pergolas;
- locate combustible materials such as woodchips / mulch, flammable fuel stores away from the building;
- locate combustible structures such as garden sheds, pergolas and materials such timber garden furniture away from the building; and
- use of low flammability vegetation species.