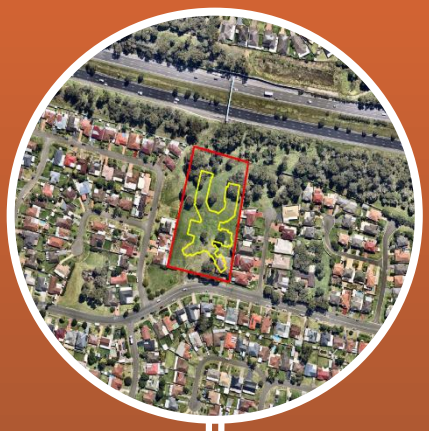
Bush Fire Assessment Report



Proposed:
Residential Aged Care Facility (RACF)

At:
94 – 100 Explorers Way, St Clair NSW

Reference Number: 210370

Prepared For:
Principal Healthcare Finance Pty Ltd
C/- Pact PM

13th August 2021

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FPA AUSTRALIA SILVER MEMBER Fire Protection Association Australia

Contents

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Section 4.14 applications (under the Environmental Planning and Assessment Act 1979) and all infill development applications *may be* referred by Council to the NSW Rural Fire Service for review and concurrence during the DA process. S100B applications under the Rural Fires Act 1997 (subdivisions and Special Fire Protection Purpose Developments), Flame Zone determinations and Alternate Solutions *must be* referred by Council to the NSW Rural Fire Service for review and receipt of a Bushfire Safety Authority (BSA) or other such recommended conditions from the NSW Rural Fire Service before the consent can be granted.

The onus is on the applicant to cross reference this document with any conditions of consent issued by Council or any requirements supplied by the NSW Rural Fire Service following development approval. BCBHS can review and cross reference these documents however the onus is on the applicant to provide them to us and request this review – Building Code and Bushfire Hazard Solutions Pty. Ltd. is not in a position to track every DA through Council and we rely upon the applicant to undertake this role as project co-ordinator.

Where any discrepancy between this document and the development approval or the NSW Rural Fire Service requirements is found, the conditions of consent always take precedence until such time as an application to review, amend or vary these conditions is approved.

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Version Control			
Version	Date	Author	Details
1	15/04/2021	Stuart McMonnies BPAD Accreditation No. 9400	Draft Report
2	29/04/2021	Stuart McMonnies BPAD Accreditation No. 9400	Final Report

List of Abbreviations:

APZ	Asset Protection Zone
AS3959	Australian Standard 3959 – 2018 as amended
BAL	Bushfire Attack Level
BPMs	Bushfire Protection Measures
BPLM	Bushfire Prone Land Map
Council	Penrith City Council
DA	Development Application
ELVIS	Elevation and Depth Foundation Spatial Data
EP&A Act	*Environmental Planning and Assessment Act* - 1979
FRNSW	Fire and Rescue NSW
IPA	Inner Protection Area
NASH	National Association of Steel-framed Housing
NCC	National Construction Code
NP	National Park
NSP	Neighbourhood Safer Place
OPA	Outer Protection Area
PBP	*Planning for Bush Fire Protection* – November 2019
ROW	Right of Way
RF Act	*Rural Fires Act* - 1997
RFS	NSW Rural Fire Service
SEPP	State Environmental Planning Policy
SFPP	Special Fire Protection Purpose
SWS	Static Water Supply

Executive Summary:

Building Code and Bushfire Hazard Solutions P/L has been commissioned by Principal Healthcare Finance Pty Ltd to provide an independent Bushfire Assessment Report to accompany a Development Application which seeks approval for a development at 94 - 100 Explorers Way, St Clair.

The development proposal relates to the construction of a new Residential Aged Care Facility, comprising of 154 aged care beds, and associated infrastructure.

Penrith City Council's Bushfire Prone Land Map identifies the subject property as containing the 100 metre buffer zone from designated Category 1 Vegetation and therefore the subject site is considered 'bushfire prone'.

Seniors Housing is listed Special Fire Protection Purpose (SFPP) development under section 100b(6) of the *Rural Fires Act 1997*.

As the proposal involves a listed SFPP development on bushfire prone land it is classified as integrated development under section 4.46 of the *Environmental Planning and Assessment Act* 1979. The Development Application subsequently requires a Bushfire Safety Authority from the NSW Rural Fire Service.

The vegetation identified as posing a bushfire hazard to the subject site is within the unformed portion of the Western Motorway road reserve to the north.

The vegetation posing a bushfire hazard in this instance presents unique characteristics to which the application of the prescriptive tables in Planning for Bush Fire Protection 2019 and Australian Standard 3959 'Construction of buildings in bushfire-prone areas' 2018 or the use of bushfire design modelling for a fully developed fire would over represent the potential bushfire impact.

The vegetation posing a hazard to the north was found to have a less than 50 metre fire run directly toward the subject site and consequently does not exceed the maximum threshold for the use of specialist Short Fire Run (SFR) modelling.

The underlying prerequisite for the use of SFR modelling is that the vegetation posing a hazard must be considered low risk vegetation. A review of the 'Fire History – Wildfires and Prescribed Burns' dataset, which maps wildfires over the last 107 years, found that there were no recorded wildfires in the vegetation to the north. There were also no visual indicators of any previous bushfires at the time of our inspections.

As the perceived risk of vegetation can be somewhat subjective formal Pre-DA Advice was sought from the NSW Rural Fire Service to ascertain agreement for the use of SFR modelling for this matter. The following response was received:

> *No objection is raised in principle to the use of SFR methodology for the proposed development to demonstrate compliance with the provisions of Planning for Bush Fire Protection 2019.*

SFR modelling found that the location of the proposed building did not exceed the maximum radiant heat level of 10kW/m^2 permitted for new SFPP development.

It is of our opinion that the proposal satisfies all relevant specifications and requirements of *Planning for Bush Fire Protection 2019*.

1.0 Introduction

The development proposal relates to the construction of a new Residential Aged Care Facility (RACF), comprising of 154 aged care beds, and associated infrastructure within an existing allotment located at 94 - 100 Explorers Way, St Clair NSW.

The subject property has street frontage to Explorers Way to the south and abuts the Western Motorway to the north and residential allotments and managed reserves to the east and west.

Penrith City Council's Bushfire Prone Land Map identifies the subject property as containing the 100 metre buffer zone from designated Category 1 Vegetation and therefore the subject site is considered 'bushfire prone'.

Seniors Housing is listed Special Fire Protection Purpose (SFPP) development under section 100b(6) of the *Rural Fires Act 1997*.

As the proposal involves a listed SFPP development on bushfire prone land it is classified as integrated development under section 4.46 of the *Environmental Planning and Assessment Act* 1979. The Development Application subsequently requires a Bushfire Safety Authority from the NSW Rural Fire Service.

Figure 01: Extract from Penrith City Council's Bushfire Prone Land Map

2.0 Purpose of Report

The purpose of this Bushfire Assessment Report is to provide Principal Healthcare Finance Pty Ltd, the Rural Fire Service and Council with an independent bushfire assessment together with appropriate recommendations for both new building construction and bushfire mitigation measures considered necessary having regard to construction within a designated 'bushfire prone' area.

The recommendations contained within this report may assist in forming the basis of any specific construction conditions and/or bushfire mitigation measures that Council and/or the NSW Rural Fire Service may elect to place within any consent conditions issued for the subject Development Application.

3.0 Scope of this Report

The scope of this report is limited to providing a bushfire assessment and recommendations for the subject property. Where reference has been made to the surrounding lands, this report does not purport to directly assess those lands; rather it may discuss bushfire impact and/or progression through those lands and possible bushfire impact to the subject property.

4.0 Aerial view of the subject allotment

Figure 02: Aerial view of the subject locality

Figure 03: Aerial view of the subject area. Courtesy Nearmap – March 2021

Subject site (red outline) and building envelope (yellow outline)

5.0 Site Assessment

5.01 Location

The subject property comprises of an existing allotment located at 94 - 100 Explorers Way, St Clair (Lot 36 DP 239502). The subject site is zoned R2: Low Density Residential and located within Penrith City Council's local government area.

The subject property has street frontage to Explorers Way to the south and abuts the Western Motorway to the north and residential allotments and managed reserves to the east and west.

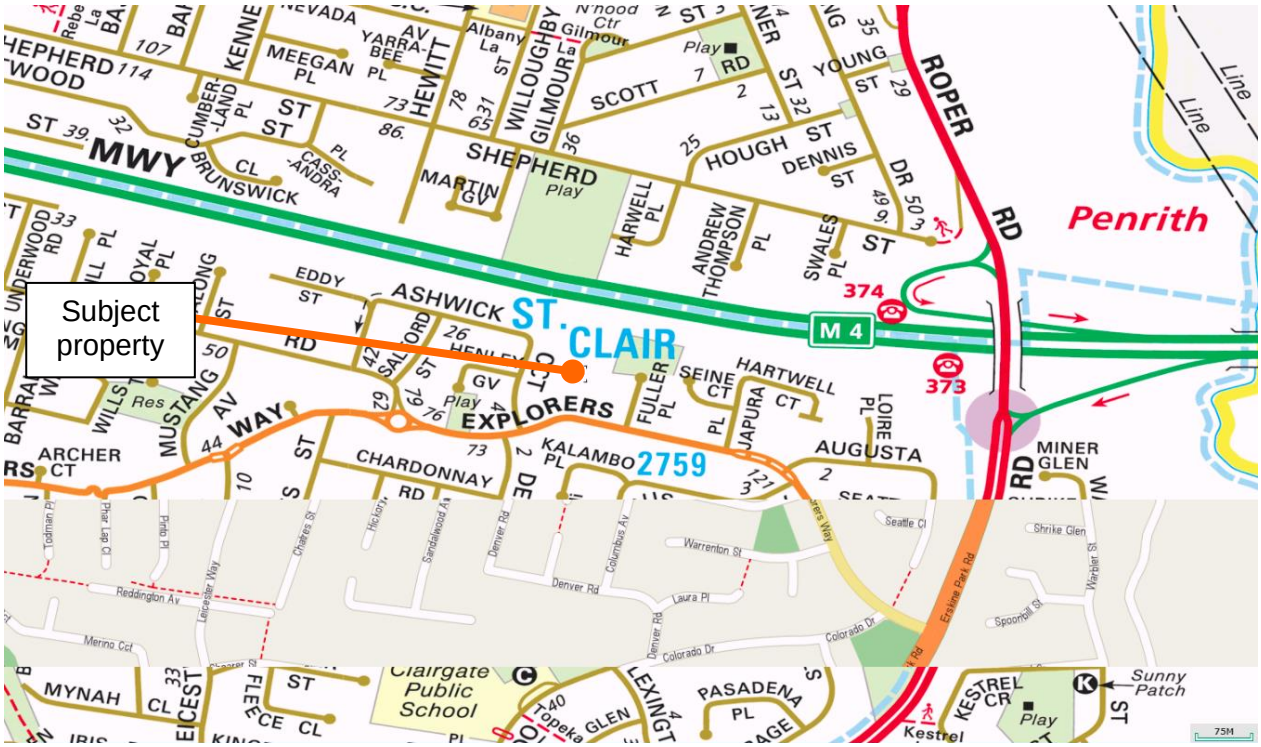

Figure 04: Extract from street-directory.com.au

5.02 Vegetation

In accordance with Appendix 1 'Site Assessment Methodology' of PBP we have undertaken an assessment of all vegetation formations within 140 metres of the development site for each aspect as per Keith (2004).

The vegetation within the subject site, neighbouring private residential allotments and reserves to the east and west comprise of managed land consistent with A1.10 of PBP. It is of our opinion these properties do not pose a bushfire threat. This assessment is consistent with Council's Bush Fire Prone Lands Map.

The vegetation identified as posing a bushfire hazard to the subject site is within the unformed portion of the Western Motorway road reserve to the north.

The vegetation posing a hazard to the north was found to comprise of a narrow corridor of fully structured Forest, modified drainage channel and managed areas. The managed areas include service trails and a 5-6 metre slashed buffer adjacent the subject site and neighbouring properties.

Vegetation mapping (Data CumberlandPlain LT10pc_E_2222) identifies the adjacent Western Motorway road reserve as containing Shale Gravel Transition Forest, which attracts a Cumberland Dry Sclerophyll Forest (DSF) classification sensu Keith (2004).

The vegetation posing a hazard was found to provide a less than 50 metre fire run toward the subject site (approx. 40m) and therefore in accordance with A1.11.1 'Simplified Approach' of PBP can be assessed as a Remnant hazard and a rainforest structure applied to determine the minimum required APZ.

To better reflect the potential bushfire impact to the proposed building it was proposed to utilise Short Fire Run (SFR) modelling.

The underlying prerequisite for the use of SFR modelling is that the vegetation posing a hazard must be considered low risk vegetation. A review of the 'Fire History – Wildfires and Prescribed Burns' dataset, which maps wildfires over the last 107 years, found that there were no recorded wildfires in the vegetation to the north. There were also no visual indicators of any previous bushfires at the time of our inspections.

As the perceived risk of vegetation can be somewhat subjective formal Pre-DA Advice was sought from the NSW Rural Fire Service to ascertain agreement for the use of SFR modelling for this matter. The following response was received:

> *No objection is raised in principle to the use of SFR methodology for the proposed development to demonstrate compliance with the provisions of Planning for Bush Fire Protection 2019.*

SFR modelling was subsequently adopted to determine the potential bushfire impact to the proposed building.

While the adjacent hazard was found to have managed and disturbed areas, which have significantly reduced fuel loads, as a margin of safety a Cumberland DSF classification was applied across the entire area.

Two fire runs were also modelled, being a fire impacting directly from the north and another on a tangent along the existing drainage channel. The parameters of these fire runs are illustrated in Figure 06 of this report.

Photograph 01: View north from the northern boundary of the adjacent reserve to the east of the subject site

Photograph 02: View east from the north-western corner of the subject site

Photograph 03: View north from within the subject site toward the drainage channel

5.03 Slope and Topography

The slope of the land under the classified vegetation has a direct influence on the forward rate of spread, fire intensity and radiant heat exposure. The effective slope is considered to be the slope under the classified vegetation which will most significantly influence bushfire behaviour toward the development site.

In accordance with A1.4 'Determine slope' of PBP the slope assessment is to be derived from the most detailed contour data available.

The slope that would **most significantly** influence bushfire behaviour was determined from topographic imagery (1 metre contours sourced from ELVIS - Geoscience Australia) in conjunction with site observations to be:

- 0 degrees across slope within transect 1 (north)
- 1 degrees down slope within transect 2 (northeast)

Figure 05: Extract from ELVIS – Geoscience Australia – 1 metre contours

5.04 Fire Weather

All development which attracts an Asset Protection Zone under PBP requires the identification of the relevant Forest Fire Danger Index (FFDI). The FFDI required to be used for development assessment purposes is based on the local government boundaries, being Penrith City Council in this instance.

In accordance with the NSW Rural Fire Service publication 'NSW Local Government Areas FDI' (2017) Penrith City Council forms part of the Greater Sydney Region Fire Weather District and attracts an FFDI of 100.

6.0 Bushfire Assessment

6.01 Planning for Bush Fire Protection - 2019

Properties considered to be affected by possible bushfire impact are determined from the local Bushfire Prone Land Map as prepared by Council and or the Rural Fire Service.

Penrith City Council's Bushfire Prone Land Map identifies the subject property as containing the 100 metre buffer zone from Category 1 Vegetation and therefore the subject site is considered 'bushfire prone'.

Seniors Housing is listed Special Fire Protection Purpose (SFPP) development under section 100b(6) of the *Rural Fires Act 1997*.

As the proposal involves a listed SFPP development on bushfire prone land it is classified as integrated development under section 4.46 of the *Environmental Planning and Assessment Act* 1979. The Development Application subsequently requires a Bushfire Safety Authority from the NSW Rural Fire Service.

In accordance with the submission requirements for a Bush Fire Safety Authority detailed in clause 44 of the *Rural Fires Regulation* 2013 an assessment of the extent to which the proposed development conforms with or deviates from *Planning for Bush Fire Protection* (PBP) is required.

The application of PBP requires satisfactory demonstration of the aim and objectives and the specific objectives and bushfire protection measures relevant to the type of development.

In this instance the proposal relates to a Special Fire Protection Purpose development and therefore in addition to the aim and objectives detailed in Chapter 1 'Introduction' the proposal must satisfy the specific objectives and bushfire protection measures detailed in Chapter 6 'Special Fire Protection Purpose Development' of PBP.

6.02 Specific Objectives

The following table lists the specific objectives for Special Fire Protection Purpose development in accordance with section 6.2 of PBP applicable to the proposal and our comments on compliance or otherwise.

Specific Objective	Comment
minimise levels of radiant heat, localised smoke and ember attack through increased APZ, building design and siting;	The proposal does not exceed the maximum radiant heat exposure of 10kW/m^2 at any point of the proposed building. The proposed building attracts a Bushfire Attack Level of BAL 12.5. The proposed bushfire protection measures will minimise levels of radiant heat and localised smoke and ember attack.

Specific Objective	Comment
provide an appropriate operational environment for emergency service personnel during firefighting and emergency management;	The proposed internal roads within the subject site in conjunction with the existing surrounding public roads provide an appropriate operational environment for emergency service personnel. Attending fire service can access the hazard via the Western Motorway, subject site or adjacent managed reserves for fire suppression activities.
ensure the capacity of existing infrastructure (such as roads and utilities) can accommodate the increase in demand during emergencies as a result of the development; and	There are multiple egress routes available from the subject site via existing public roads. These public roads provide egress routes away from the identified hazard. These roads are considered adequate to accommodate a timely evacuation from the site, in the unlikely event it is considered necessary. The external utility providers have systems in place to cater for increased demand as necessary.
ensure emergency evacuation procedures and management which provides for the special characteristics and needs of occupants.	This assessment includes a recommendation that the Bushfire Emergency Management Plan be prepared.

6.03 Bushfire Protection Measures

Section 6.8 'Bush fire protection measures' of PBP outlines the specific Bushfire Protection Measures (BPMs) applicable to Special Fire Protection Purpose development, including APZs, Construction, Access, Services and Emergency Management Plan.

The following section addresses each BPM and the proposals compliance or otherwise.

Asset Protection Zones

Asset Protection Zones for new Special Fire Protection Purpose (SFPP) development are determined from Table A1.12.1 of PBP or bushfire design modelling achieving a radiant heat impact of no more than 10kW/m^2 at the closest point of the available building footprint.

In this instance specialist Short Fire Run (SFR) modelling has been used to accurately represent the bushfire threat to the proposed building and determine the maximum radiant heat exposure.

To thoroughly assess the potential bushfire impact from the north two transects have been considered, being a fire impacting directly from the north and another on a tangent along the existing drainage channel to the northeast.

The NSW RFS have released a document titled 'Short Fire Run - Methodology for assessing bush fire risk for low risk vegetation' which provides an overview of the NSW RFS method for assessing lower threat bush fire hazards for SFR in bush fire prone areas. We have undertaken the SFR modelling for this matter consistent with this document.

Consistent with the NSW Rural Fire Service publication 'Short Fire Run – Methodology for assessing bush fire risk for low risk vegetation' the following assumptions and limitations have been adopted for this assessment.

Assumptions

- Wind direction and speed is constant in the direction of fire spread;
- Slope is considered relatively flat and uniform throughout the length of the fire run;
- Fuel load is distributed equally and is continuous for the entire fire run length;
- The shape of the fire is based on a uniform slope;
- The fire develops from a single ignition point and does not consider time of ignition or fire growth;
- Flaming is restricted to surface, near surface and elevated fuels;
- The fire does not become a crown fire (scorching and intermittent involvement of the canopy fuels permitted, no sustained crown fire).
- Fire run is measured perpendicular to contours.
- No allowance for ember showers has been considered.

Limitations

- Limited to 30 degrees for downslope inputs.
- Limited to 20 degrees for the site slope due to fuel management issues;
- Limited to 15 degrees for upslope;
- Limited to 150 metre fire run length, measured on the effective slope;
- Limited to maximum input of 2 metres in height for elevated fuel (Project Vesta) in forest formations only; and
- Forest and Heath formation fuel loads are as advised by University of Wollongong research.

Figure 06: Aerial view of the subject area showing the assessed transects.

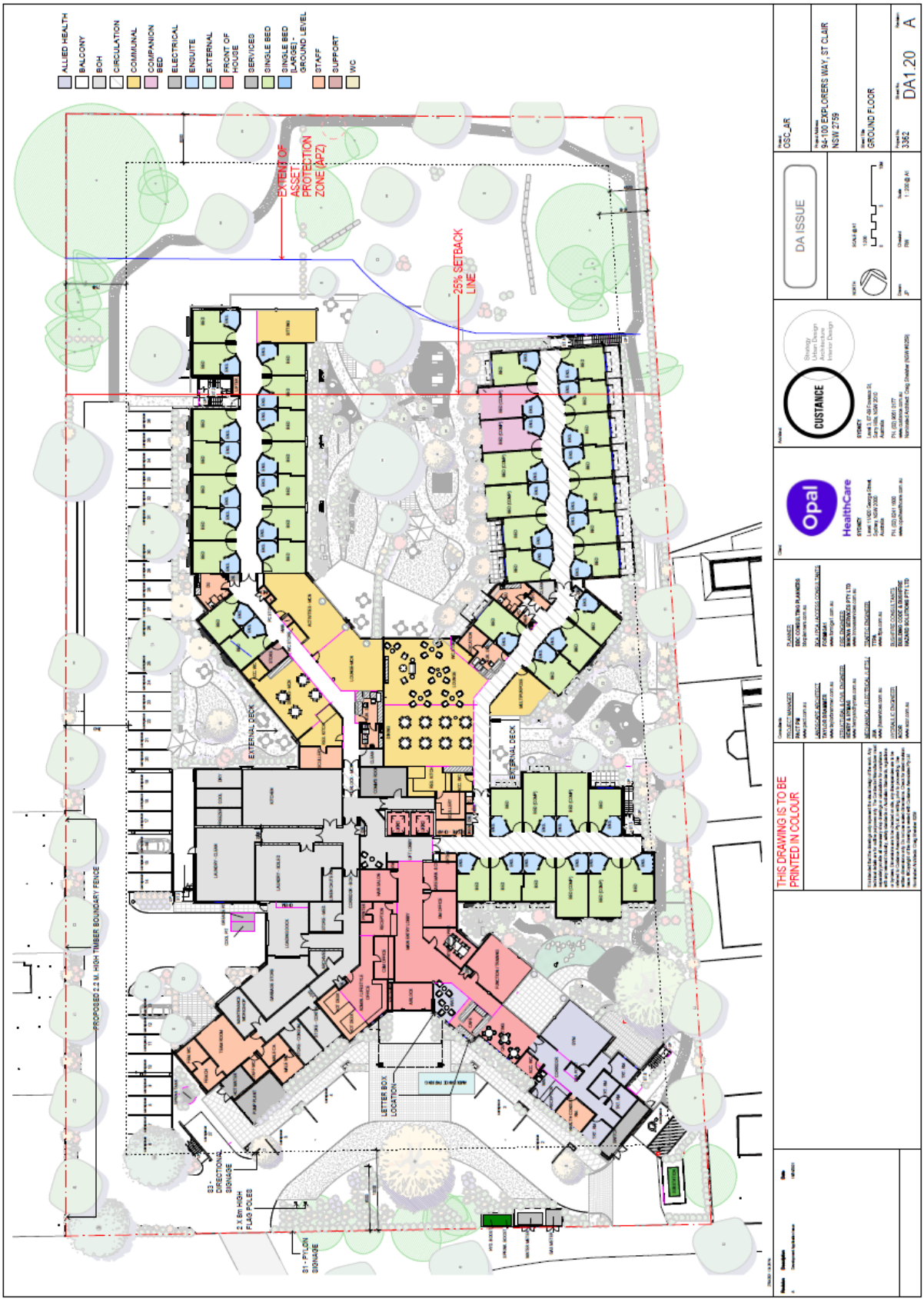

Figure 07: Extract from the Ground Floor Plan, showing the extent of the minimum required Asset Protection Zones and building compliance

Transect 1 (north):

Data	Recording	Comment
effective slope	0° across	Recorded onsite with inclinometer & verified from 1m contours.
site slope	0° across	Recorded onsite with inclinometer & verified from 1m contours.
elevation of receiver	3.54 metres	Calculated peak elevation of receiver.
vegetation formation and fuel load	Cumberland Dry Sclerophyll Forest 14 t/ha / 24.97 t/ha	Sourced from the on the CumberlandPlain LT10pc_E_2222 vegetation layer. Fuels loads consistent with Appendix A of SFR paper.
distance from asset to vegetation	24 metres	Measured from plans provided.
regional climatic data (FFDI)	100	Sourced from NSW Rural Fire Service publication 'NSW Local Government Areas FDI' (2017).
measured SFR length	40 metres	Measured from high resolution aerial imagery.
average elevated fuel height	0.9 metres	Maximum detailed within Appendix B of SFR paper.
flame temperature	1200K	Consistent with Special Fire Protection Purpose development.

The resultant modelling calculated the maximum radiant heat flux is **5.36 kW/m^2**.

Transect 2 (northeast):

Data	Recording	Comment
effective slope	1° down	Recorded onsite with inclinometer & verified from 1m contours.
site slope	0° across	Recorded onsite with inclinometer & verified from 1m contours.
elevation of receiver	3.79 metres	Calculated peak elevation of receiver.
vegetation formation and fuel load	Cumberland Dry Sclerophyll Forest 14 t/ha / 24.97 t/ha	Sourced from the on the CumberlandPlain LT10pc_E_2222 vegetation layer. Fuels loads consistent with Appendix A of SFR paper.
distance from asset to vegetation	28 metres	Measured from plans provided.
regional climatic data (FFDI)	100	Sourced from NSW Rural Fire Service publication 'NSW Local Government Areas FDI' (2017).
measured SFR length	110 metres	Measured from high resolution aerial imagery.
average elevated fuel height	0.9 metres	Maximum detailed within Appendix B of SFR paper.
flame temperature	1200K	Consistent with Special Fire Protection Purpose development.

The resultant modelling calculated the maximum radiant heat flux is **8.97 kW/m^2**.

The location of the proposed building therefore does not exceed the maximum radiant heat level of 10kW/m^2 permitted for new SFPP development.

Building construction, siting & design

Australian Standard 3959 – 2018 'Construction of buildings in bushfire-prone areas' (AS3959) specifies construction standards for buildings within various Bushfire Attack Levels as determined by Planning for Bush Fire Protection – 2019.

AS3959 provides for six (6) levels of building construction these being BAL - Low, BAL - 12.5, BAL - 19, BAL - 29, BAL - 40 and BAL - FZ.

Correlation between bushfire impact and AS3959		
Bushfire Attack Level	Maximum radiant heat impact (kW/m^2)	Level of construction under AS3959-2018
Low		No special construction requirements
12.5	≤12.5	BAL - 12.5
19	12.6 to 19.0	BAL - 19
29	19.1 to 29.0	BAL - 29
40	29.1 to 40.0	BAL - 40
Flame Zone	>40.0	BAL FZ No deemed to satisfy provisions

The highest Bushfire Attack Level to the proposed building was determined from bushfire design modelling to be 'BAL 12.5'. The proposed building works are required to comply with sections 3 and 5 (BAL 12.5) of AS 3959 – 2018 and the additional construction requirements detailed in section 7.5 of PBP.

In addition to satisfying the relevant Bushfire Attack Level it should be noted the building will also be Type C construction and be fitted with a sprinkler system in accordance with the NCC.

Access

The subject site has street frontage to Explorers Way to the south. Vehicle access to the proposed building will be via either the proposed one-way loop at the front of the building or two-way dead-end road on the western side of the building, both of which are accessed from Explorers Way.

The proposed one-way loop will provide a minimum 3.5 metre carriageway with parking and hydrants located outside this area.

The proposed two-way dead-end will provide a minimum 5.5 metre carriageway with parking and hydrants located outside this area. A suitable turning area in accordance with Appendix 3 of PBP has also been provided. This turning area utilising the loading dock entry and allows for an appliance to exit the site in a forward motion.

All proposed internal roads will have an all-weather surface and capacity sufficient to carry fully loaded fire-fighting vehicles (up to 23 tonnes).

Clear pedestrian access will be available around the proposed building.

Attending fire services have comprehensive vehicle access to the bushfire hazard via the Western Motorway and associated service trails. Vehicle access is also available via Ashwick Circuit or Fuller Place and their respective managed reserves or the subject site.

The access provisions are considered adequate for occupant evacuation and fire service access and can comply with the requirements for Access as described in section 6.8.2 of PBP.

Water Supply & Utilities

The proposed building will be connected to the existing towns water main for its commercial needs. Existing hydrants are available along Explorers Way, Ashwick Circuit, Fuller Place and surrounding streets for the replenishment of attending fire services.

The existing hydrant network will be extended into the site to service the proposed building.

The hydrant spacing, design, sizing, flows and pressures must comply with AS2419.1-2005. Hydrants are not permitted within the carriageway of any road.

The proposed water supply is considered adequate for the replenishment of attending fire services.

The proposed building will be connected to the existing electrical network.

Recommendations will be included to ensure compliance with the electricity and gas services requirements.

Bushfire Emergency Management Plan

The intent of the Bushfire Emergency Management Plan measure is to provide suitable emergency and evacuation arrangements for occupants of SFPP developments.

This assessment includes a recommendation that a Bushfire Emergency Management Plan be prepared. This recommendation satisfies the acceptable solutions detailed in Table 6.8d of PBP.

6.04 Aim & Objectives of PBP

The following table details the aim and objectives of Planning for Bush Fire Protection 2019 and the proposals ability to comply.

Aim / Objective	Comment
The aim of PBP is to provide for the protection of human life and minimise impacts on property from the threat of bush fire, while having due regard to development potential, site characteristics and protection of the environment.	With the inclusion of the recommendations made herein it is of our opinion that the aim of PBP has been satisfied.
(i) afford buildings and their occupants protection from exposure to a bush fire;	The proposed building exceeds the minimum required APZs for SFPP development. In conjunction with the application of BAL 12.5 to the building works the proposed building and its occupants are afforded protection from a bushfire.

Aim / Objective	Comment
(ii) provide for a defendable space to be located around buildings;	The proposed building is located such that it exceeds the minimum required APZs. There is suitable managed areas / defendable space around the proposed building.
(iii) provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent the likely fire spread to buildings;	The available APZs to the proposed building exceed the corresponding minimum required under PBP. The proposed building will be constructed to BAL 12.5, being the relevant Bushfire Attack Level. The available APZs in conjunction with the proposed landscaping and general construction type will prevent the likely fire spread to the buildings.
(iv) ensure that appropriate operational access and egress for emergency service personnel and occupants is available;	Attending fire services have comprehensive vehicle access to the bushfire hazard via the Western Motorway and associated service trails. Vehicle access is also available via Ashwick Circuit or Fuller Place and their respective managed reserves or the subject site. There are multiple egress routes available from the subject site via existing public roads. Appropriate operational access and egress is provided.

Aim / Objective	Comment
(v) provide for ongoing management and maintenance of bush fire protection measures, (BPMs); and	The grounds within the subject site are to be maintained in accordance with the NSW Rural Fire Service's document 'Standards for Asset Protection Zones' and Appendix 4 of *Planning for Bush Fire Protection* 2019. Any new landscaping is to comply with the provisions of Appendix 4 of PBP.
(vi) ensure that utility services are adequate to meet the needs of firefighters.	Explorers Way and surrounding roads have a hydrant network available for the replenishment of fire service vehicles. The existing hydrant network will be extended into the site to service the proposed building. The existing and proposed water supply is considered adequate to meet the needs of firefighters.

It is therefore of our opinion that the proposal can satisfactorily comply with the aim and objectives of *Planning for Bush Fire Protection 2019*.

6.05 Submission Detail

Clause 44 of the *Rural Fires Regulation* 2013 identifies various items which must be addressed and included within an application for a Bush Fire Safety Authority. The following table outlines these items and includes a corresponding response.

Submission Detail	Response
(a) a description (including the address) of the property on which the development the subject of the application is proposed to be carried out,	See section 6.01
(b) 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 Planning for Bush Fire Protection,	See section 6.02
(c) 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),	See section 6.03
(d) identification of any significant environmental features on the property,	Shale Gravel Transition Forest
(e) the details of any threatened species or threatened ecological community under the Biodiversity Conservation Act 2016 *that is known to the applicant to exist on the property,*	Shale Gravel Transition Forest

Submission Detail	Response
(f) the details and location of any Aboriginal object (within the meaning of the National Parks and Wildlife Act 1974*) or Aboriginal place (within the meaning of that Act) that is known to the applicant to be situated on the property,*	No known sites
(g) a bush fire assessment for the proposed development (including the methodology used in the assessment) that addresses the following matters—	See section 7.0
(i) the extent to which the development is to provide for setbacks, including asset protection zones,	See section 7.03
(ii) the siting and adequacy of water supplies for fire fighting,	See section 7.03
(iii) the capacity of public roads in the vicinity to handle increased volumes of traffic in the event of a bush fire emergency,	There are multiple egress routes available from the subject site via existing public roads. These roads are considered adequate to accommodate a timely evacuation from the site, in the unlikely event an evacuation is considered necessary.
(iv) whether or not public roads in the vicinity that link with the fire trail network have two-way access,	The surrounding public roads do not link with a registered fire trail network within the immediate area.
(v) the adequacy of arrangements for access to and egress from the development site for the purposes of an emergency response,	See section 7.03
(vi) the adequacy of bush fire maintenance plans and fire emergency procedures for the development site,	See section 7.03
(vii) the construction standards to be used for building elements in the development,	See section 7.03
(viii) the adequacy of sprinkler systems and other fire protection measures to be incorporated into the development,	There is no existing bushfire sprinkler system, nor is one proposed. See section 7.03 for all bushfire protection measures.
(ix) any registered fire trails on the property,	There are no registered fire trails within the subject site.

7.0 Recommendations

The following recommendations are provided as the minimum necessary for compliance with Planning for Bush Fire Protection – 2019 and Australian Standard 3959 'Construction of buildings in bushfire-prone areas - 2018.

General

1. That the proposed development is to comply with the Site Plan prepared by Custance, project no 3362, sheet no DA0.20, rev A, dated 23.06.2021.

Asset Protection Zones

2. That all grounds within the subject site not built upon are to be managed as an inner protection area (IPA) as outlined within section 4.1.3 and Appendix 4 of 'Planning for Bush Fire Protection 2019' and the NSW Rural Fire Service's document 'Standards for asset protection zones'.

Note: The NSW Rural Fire Service publication 'Standards for Asset Protection Zones' allows for the retention of native trees and shrubs as clumps or islands provided they do not exceed a covering of more than 20%.

Landscaping

3. That any new landscaping is to comply with section 3.7 and Appendix 4 of *Planning for Bush Fire Protection 2019*.

Construction

4. That new construction shall comply with Australian Standard AS3959 - 2018 "Construction of buildings in bush fire-prone areas" sections 3 & 5 (BAL 12.5) & section 7.5 of Planning for Bush Fire Protection 2019.

Emergency Management

5. That a Bushfire Emergency Management Plan be prepared / updated consistent with the NSW Rural Fire Service Guidelines for the *Preparation of Emergency / Evacuation Plan*.

Services (where applicable)

Water:

10. That the new internal hydrant system is to comply with the requirements detailed in Table 6.8c of *Planning for Bush Fire Protection 2019*, specifically:

    - fire hydrant spacing, design and sizing comply with the relevant clauses of AS 2419.1:2005;
    - hydrants are not located within any road carriageway;
    - fire hydrant flows and pressures comply with the relevant clauses of AS 2419.1:2005.

- all above-ground water service pipes external to the building are metal, including and up to any taps.
- fire hose reels are constructed in accordance with AS/NZS 1221:1997 Fire hose reels, and installed in accordance with the relevant clauses of AS 2441:2005 Installation of fire hose reels.

Electricity:

11. Any new electrical services must comply with Table 6.8c of *Planning for Bush Fire Protection 2019*, specifically:

    - where practicable, electrical transmission lines are underground.
    - where overhead electrical transmission lines are proposed:
        - lines are installed with short pole spacing (30 metres), 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 Management Vegetation Near Power Lines*.

Gas:

12. Any new gas services must comply with Table 6.8c of *Planning for Bush Fire Protection 2019*, specifically:

    - 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 10m and shielded on the hazard side;
    - connections to and from gas cylinders are metal;
    - if gas cylinders need to be kept close to the building, safety valves are directed away from the building and at least 2m away from any combustible material, so they do not act as a catalyst to combustion;
    - polymer-sheathed flexible gas supply lines to gas meters adjacent to buildings are not to be used; and
    - above-ground gas service pipes external to the building are metal, including and up to any outlets.

Access

6. That the new internal roads are to comply with the following requirements for Access and Non-Perimeter Roads detailed in Table 6.8b of *Planning for Bush Fire Protection 2019*:

    - access roads are two-wheel drive, all-weather roads;
    - traffic management devices are constructed to not prohibit access by emergency services vehicles;

- one way only public access roads are no less than 3.5 metres wide and have designated parking bays with hydrants located outside of these areas to ensure accessibility to reticulated water for fire suppression.
- 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.
- hydrants are located outside of parking reserves and road carriageways to ensure accessibility to reticulated water for fire suppression;
- hydrants are provided in accordance with the relevant clauses of AS 2419.1:2005;
- minimum 5.5m carriageway width kerb to kerb (two-way roads);
- parking is provided outside of the carriageway width;
- hydrants are located clear of parking areas;
- curves of roads have a minimum inner radius of 6m;
- the maximum grade road is 15 degrees and average grade of not more than 10 degrees;
- the road crossfall does not exceed 3 degrees; and
- a minimum vertical clearance of 4m to any overhanging obstructions, including tree branches, is provided.

8.0 Conclusion

The development proposal relates to the construction of a new Residential Aged Care Facility (RACF), comprising of 154 aged care beds, and associated infrastructure within an existing allotment located at 94 - 100 Explorers Way, St Clair NSW.

Penrith City Council's Bushfire Prone Land Map identifies the subject property as containing the 100 metre buffer zone from designated Category 1 Vegetation and therefore the site is considered 'bushfire prone'.

Seniors Housing is a listed Special Fire Protection Purpose (SFPP) under section 100b(6) of the *Rural Fires Act 1997*.

As the proposal involves a listed SFPP development on bushfire prone land it is classified as integrated development under section 4.46 of the *Environmental Planning and Assessment Act* 1979. The Development Application subsequently requires a Bushfire Safety Authority from the NSW Rural Fire Service.

In accordance with the submission requirements for a Bush Fire Safety Authority as detailed in clause 44 of the *Rural Fires Regulation* 2013 an assessment of the extent to which the proposed development conforms with or deviates from *Planning for Bush Fire Protection* (PBP) is required.

It is of our opinion that the proposal satisfies all relevant specifications and requirements of *Planning for Bush Fire Protection 2019*.

In accordance with the bushfire safety measures contained in this report, and consideration of the site specific bushfire risk assessment it is our opinion that when combined, they will provide a reasonable and satisfactory level of bushfire protection to the subject development.

We are therefore in support of the development application.

Should you have any enquiries regarding this project please contact our office.

Prepared by
Building Code & Bushfire Hazard Solutions P/L

Stuart McMonnies
Manager Bushfire Section
G. D. Design In Bushfire Prone Areas.
Certificate IV Fire Technology
Fire Protection Association of Australia BPAD – L3 Accredited Practitioner
Certification number – BPAD 9400
BPAD Bushfire Planning & Design Accredited Practitioner Level 3

9.0 Annexure 01

List of Referenced Documents

Australian Building Codes Board (2019). *National Construction Code Volume Two - Building Code of Australia*. ABCB

Australian Building Codes Board (2019). *National Construction Code Volume One - Building Code of Australia*. ABCB

ELVIS -Elevation -*Foundation Spatial Data*. Elevation.fsdf.org.au. Available at: http://elevation.fsdf.org.au/

Keith, D. (2004). "*Ocean Shores to Desert Dunes*" Department of Environment and Conservation, Sydney

NSW Department of Planning and Environment (2019). *Planning Portal*. Accessed at: https://www.planningportal.nsw.gov.au/

NSW Rural Fire Service (2019). *Planning for Bushfire Protection. A Guide for Councils, Planners, Fire Authorities and Developers*.

NSW Rural Fire Service (2019). *Short Fire Run - Methodology for assessing bush fire risk for low risk vegetation*

NSW Rural Fire Service NSW (2005). *Standards for Asset Protection Zones*

Site Plan prepared by Custance, project no 3362, sheet no DA0.20, rev A, dated 23.06.2021

Ground Floor Plan prepared by Custance, project no 3362, sheet no DA1.20, rev A, dated 16.04.2021

Standards Australia (2018). *AS3959:2018 Construction of buildings in bushfire-prone areas.*

Standards Australia (2014). *AS/NZS 1596 The storage and handling of LP Gas*

Acknowledgements to:

Geoscience Australia
NSW Department of Lands – SIXMaps
Street-directory.com.au

Attachments

Attachment 01:	NSW Rural Fire Service Pre-DA Advice
Attachment 02:	Bushfire Design Modelling

NSW GOVERNMENT

NSW RURAL FIRE SERVICE

PRE-DA ADVICE SUMMARY

Applicant:	Stuart McMonnies, Building Code & Bushfire Hazard Solutions P/L
Subject:	94-100 Explorers Way St Clair RFS Ref. PRE-DA20201030000214

Details of the proposal

- ☑ SFPP — Proposed residential aged care facility
- ☐ Residential subdivision
- ☐ Other

Bush fire protection issues discussed

- ☐ Hazard Assessment — Comments on use of short fire run (SFR) methodology
- ☐ Asset Protection Zones
- ☐ Access
- ☐ Construction Standards
- ☐ Services
- ☐ Emergency and Evacuation Planning

Documentation / plans referenced

Aerial images, SFR calculations

Advice Provided

- No objection is raised in principle to the use of SFR methodology for the proposed development to demonstrate compliance with the provisions of *Planning for Bush Fire Protection 2019*.
- Please note that the pre DA advice issued is preliminary in nature and that no detailed assessment of the site or development is undertaken nor is it intended for the purpose of submitting revised information/bushfire engineering brief for further review of the original advice. The aim of the service is to identify any potential issues before the formal DA is lodged.

Disclaimer

RFS advice is based on information provided and policy and legislative requirements applicable at the time. The advice should be copied into, or referenced in, any subsequent development application.

All efforts are made to identify issues of relevance and likely concern with the preliminary proposal. However, the comments and views in this document are based only on the plans and information submitted for preliminary assessment and discussion at the pre-DA meeting. You are advised that: -

- The views expressed may vary once detailed plans and information are submitted and formally assessed in the development application process, or as a result of issues contained in submissions by interested parties;

- Given the complexity of issues often involved and the limited time for full assessment, no guarantee is given that every issue of relevance will be identified;
- Amending one aspect of the proposal could result in changes which would create a different set of impacts from the original plans and therefore require further assessment and advice; and,
- The Pre-DA advice given does not bind Council officers, the elected Council members, or other parties to the DA process.

Submitted by:

Alastair Patton
Development Assessment and Planning Officer
Planning and Environmental Services (East)

Approved by:

Kalpana Varghese
Team Leader
Development Assessment and Planning
Planning and Environmental Services (East)

Date: 11 November 2020

NBC Bushfire Attack Assessment Report V4.1

AS3959 (2018) Appendix B - Detailed Method 2

Print Date: 14/04/2021 **Assessment Date:** 14/04/2021

Site Street Address: 100 Explorers Way, St Clair

Assessor: Stuart McMonnies; Bushfire Hazard Solutions

Local Government Area: Penrith **Alpine Area:** No

Equations Used

Transmissivity: Fuss and Hammins, 2002
Flame Length: RFS PBP, 2001/Vesta/Catchpole
Rate of Fire Spread: Noble et al., 1980
Radiant Heat: Drysdale, 1985; Sullivan et al., 2003; Tan et al., 2005
Peak Elevation of Receiver: Tan et al., 2005
Peak Flame Angle: Tan et al., 2005

Run Description: Transect 1 (North)

Vegetation Information

Vegetation Type: Cumberland DSF

Vegetation Group: Dry Sclerophyll Forests (Shrub/Grass)

Vegetation Slope: 0 Degrees **Vegetation Slope Type:** Level

Surface Fuel Load(t/ha): 14 **Overall Fuel Load(t/ha):** 24.97

Vegetation Height(m): 0.9 Only Applicable to Shrub/Scrub and Vesta

Site Information

Site Slope: 0 Degrees **Site Slope Type:** Level

Elevation of Receiver(m): Default **APZ/Separation(m):** 24

Fire Inputs

Veg./Flame Width(m): 14.64 **Flame Temp(K):** 1200

Calculation Parameters

Flame Emissivity: 95 **Relative Humidity(%):** 25

Heat of Combustion(kJ/kg 18600 **Ambient Temp(K):** 308

Moisture Factor: 5 **FDI:** 100

Program Outputs

Level of Construction: BAL 12.5 **Peak Elevation of Receiver(m):** 3.54

Radiant Heat(kW/m2): 5.36 **Flame Angle (degrees):** 74

Flame Length(m): 7.37 **Maximum View Factor:** 0.058

Rate Of Spread (km/h): 1.68 **Inner Protection Area(m):** 24

Transmissivity: 0.831 **Outer Protection Area(m):** 0

Fire Intensity(kW/m): 21674

Run Description:	Transect 2 (Northeast)		
Vegetation Information			
Vegetation Type:	Cumberland DSF		
Vegetation Group:	Dry Sclerophyll Forests (Shrub/Grass)		
Vegetation Slope:	1 Degrees	**Vegetation Slope Type:**	Downslope
Surface Fuel Load(t/ha):	14	**Overall Fuel Load(t/ha):**	24.97
Vegetation Height(m):	0.9	Only Applicable to Shrub/Scrub and Vesta	
Site Information			
Site Slope:	0 Degrees	**Site Slope Type:**	Downslope
Elevation of Receiver(m):	Default	**APZ/Separation(m):**	28
Fire Inputs			
Veg./Flame Width(m):	40.26	**Flame Temp(K):**	1200
Calculation Parameters			
Flame Emissivity:	95	**Relative Humidity(%):**	25
Heat of Combustion(kJ/kg	18600	**Ambient Temp(K):**	308
Moisture Factor:	5	**FDI:**	100
Program Outputs			
Level of Construction:	BAL 12.5	**Peak Elevation of Receiver(m):**	3.79
Radiant Heat(kW/m2):	8.97	**Flame Angle (degrees):**	78
Flame Length(m):	7.75	**Maximum View Factor:**	0.098
Rate Of Spread (km/h):	1.8	**Inner Protection Area(m):**	28
Transmissivity:	0.82	**Outer Protection Area(m):**	0
Fire Intensity(kW/m):	23222		