

SUPPLEMENTARY BUSHFIRE HAZARD ASSESSMENT

**PROPOSED MODIFICATION TO
APPROVED SENIORS LIVING
RESIDENTIAL DEVELOPMENT**

**LOT 1 DP 1128633
&
LOT 84 DP 792945
52 BELLE O'CONNOR STREET,
SOUTH WEST ROCKS**

**CLIENT: SALTWATER LINKS
GROUP**

FEBRUARY 2018

This report has been prepared by David Pensini – Building Certification and Environmental Services with all reasonable skill, care and diligence for Saltwater Links Group.

The information contained in this report has been gathered from discussions with representatives of Saltwater Links Group, a review of the plans provided on behalf of Saltwater Links Group and experience.

No inspection or assessment has been undertaken on other aspects of the proposed development outside the scope of this report.

This report does not imply, nor should it be implied, that the proposed development will comply fully with relevant legislation.

The report shall not be construed as relieving any other party of their responsibilities or obligations.

David Pensini – Building Certification and Environmental Services disclaims any responsibility Saltwater Links Group and others in respect of any matters outside the scope of this report.

The report is confidential, and the writer accepts no responsibility of whatsoever nature, to third parties who use this report, or part thereof is made known. Any such party relies on this report at their own risk.

For and on behalf of David Pensini – Building Certification and Environmental Services.

Prepared by: David Pensini

Signed:



Dated: 27th February 2018

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1.0 INTRODUCTION

The land which comprises the subject site is currently known as Lot 1 DP 1128633 and Lot 84 DP 792945, 52 Belle O'Connor Street, South West Rocks.

Development Approval, (No. 08 – 0167), has been granted for a two hundred and sixty-nine (269) site seniors living development on the subject site. The approved seniors living development also includes open space areas, clubhouse, tennis court, bowling green, amenities building, swimming pool and caravan storage, new public road infrastructure, internal access roads, stormwater management infrastructure and utility services.

It is now proposed to modify the approved seniors living development via an additional seventy-nine (79) separate dwelling sites together with open space areas, internal access roads, stormwater management infrastructure and the provision of utility services. The additional dwelling site being accommodated within a westerly expansion of the already approved development.

This report is based on site assessments carried out on 9th August 2012, 23rd October 2016 and the 22nd March 2017.

The purpose of this report is to ensure that the proposed expansion of the approved seniors living development provides for compliance with the relevant requirements of NSW Rural Fire Service, **Planning for Bushfire Protection**, 2006.

It is noted that seniors living developments are integrated development under Section 91 of the *Environmental Planning & Assessment Act, 1979* and a Special Fire Protection Purpose (SFPP) development which requires a Bushfire Safety Authority under Section 100B of the *Rural Fires Act 1997*.

NOTE

The report has been prepared with all reasonable skill, care and diligence.

The information contained in this report has been gathered from field survey, experience and has been completed in consideration of the following legislation.

1. Rural Fires Act 1997.
2. Environmental Planning and Assessment Act 1979.
3. Building Code of Australia.
4. Council Local Environment Plans and Development Control Plans where applicable.
5. NSW Rural Fire Services, Planning for Bushfire Protection, 2006.
6. AS 3959 - 2009 Construction of Buildings in Bushfire Prone Areas.

The report recognizes the fact that no property and lives can be guaranteed to survive a bushfire attack. The report examines ways the risk of bushfire attack can be reduced where the site falls within the scope of the legislation.

The report is confidential, and the writer accepts no responsibility of whatsoever nature, to third parties who use this report or part thereof is made known. Any such party relies on this report at their own risk.

This report has been based upon the vegetation characteristics observed at the time of site inspection. No responsibility is taken where the vegetation characteristics of the subject site or surrounding areas is changed or modified beyond that which is presented within this report.

1.1 Objectives

The objectives of this report are to:

- Ensure that the proposed expansion of the approved seniors living development has measures sufficient to minimize the impact of bushfires; and
- Reduce the risk to property and the community from bushfire.

1.2 Legislative Framework

Any proposal to enlarge the already approved seniors living development, (SFPP), would require the issuing of a Bush Fire Safety Authority under Section 100B of the *Rural Fires Act 1997*. Accordingly, any development application which is submitted is an Integrated Application requiring referral to the Rural Fire Service for their assessment and concurrence to the issuing of a Bush Fire Safety Authority.

As per the Rural Fire Service's Fast Fact of 01/10 all development on bushfire prone land in NSW should comply with the requirements of Addendum Appendix 3 and other bushfire protection measures identified within NSW Rural Fire Services, ***Planning for Bushfire Protection***, 2006.

Proposals involving SFPP must therefore demonstrate that compliance with the relevant requirements of NSW Rural Fire Services, ***Planning for Bushfire Protection***, 2006 is possible for the proposed development. Key aspects of compliance with NSW Rural Fire Services, ***Planning for Bushfire Protection***, 2006 include;

- Suitable and appropriate APZ's can be provided to the subject development.
- Buildings can be constructed in accordance with the requirements of AS 3959-2009.
- An adequate supply of water is available for firefighting purposes and services such as electricity will be available.
- Adequate and suitable access and egress is available to and from the subject site.
- Emergency and evacuation planning.

This report therefore examines the relevant provisions of NSW Rural Fire Services, ***Planning for Bushfire Protection***, 2006 to determine the bushfire protection measures required to be implemented in conjunction with the proposed development.

In NSW, the bushfire protection provisions of the Building Code of Australia, (BCA), are applied to Class 1, 2, 3, Class 4 parts of buildings, some Class 10 buildings and Class 9 buildings that are Special Fire Protection Purposes, (SFPP's). It is noted that the proposed development is subject to the Special Fire Protection Purpose provisions of NSW Rural Fire Services, ***Planning for Bushfire Protection***, 2006.

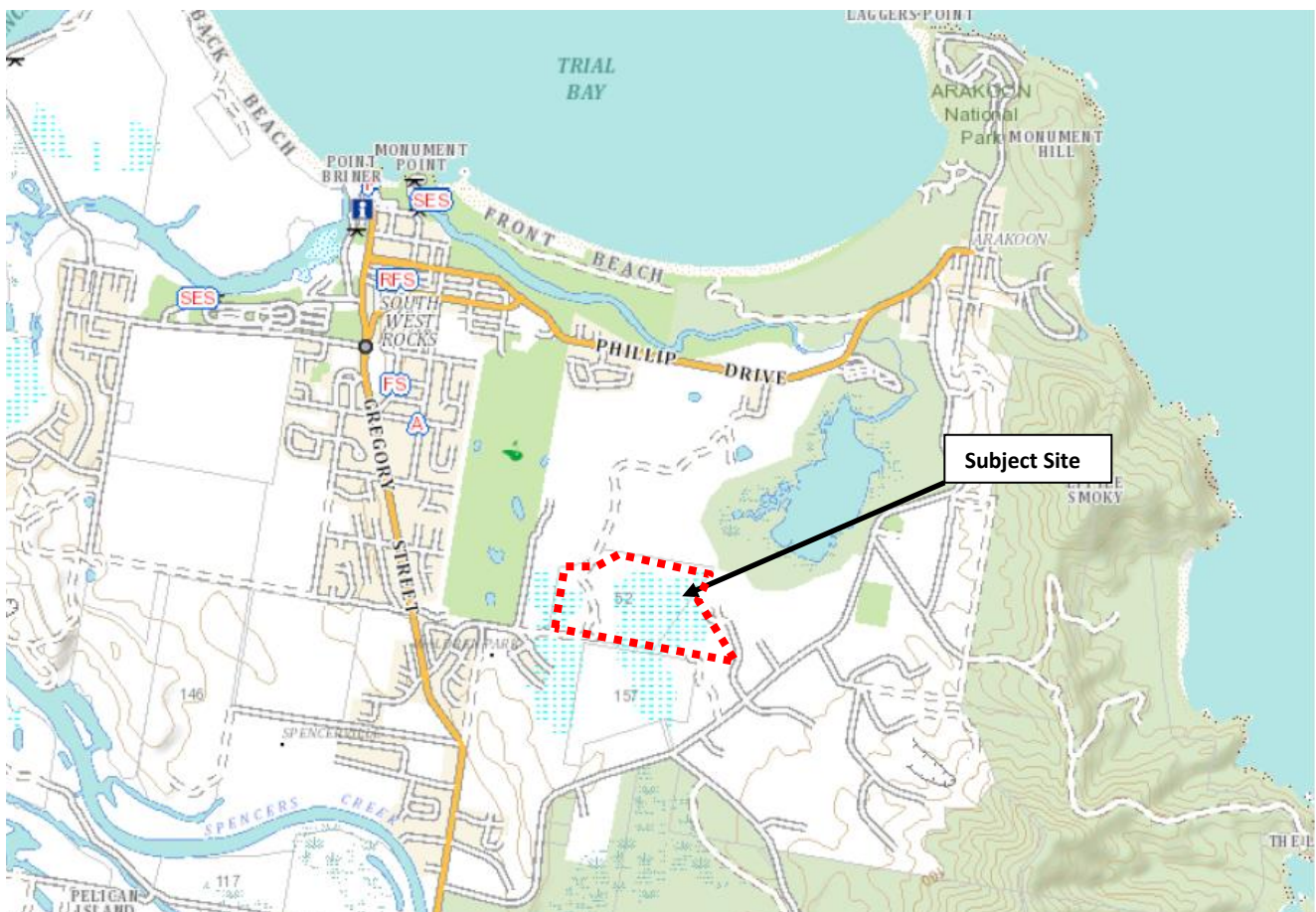
The BCA references AS3959 – 2009 as the Deemed-to-Satisfy (DTS) solution for construction requirements in bushfire prone areas for NSW.

1.3 Location and Site Description

The subject site is located off Belle O'Connor Street, South West Rocks which is within the Kempsey local government area, on the mid north coast of New South Wales.

The subject site is comprised of two lots being Lot 1 in Deposited Plan 1128633 and Lot 84 in Deposited Plan 792945. The subject site is located on the south-eastern fringe of the urbanized area of South West Rocks, refer to **Figure 1** below

Figure 1 – Site Location



Located at the base of local foothills, the subject site is bounded in the south by vacant land which will form part of the Seascope Grove Residential Estate, (developed stages are present to the southwest), which is progressively being developed for urban residential uses. The land to the north of the subject site was the subject of a rezoning to an environmental conservation land use zone as part of Amendment No.55 to KLEP, which was gazetted on 14 August 2009. To the west of the subject site is a recently commenced residential subdivision which occupies the western portion of the subject site before a transition to the South West Rocks golf course. To the east of the subject site are existing large lot residential properties. Further to the east of the subject site is the Hat Head National Park and the Pacific Ocean.

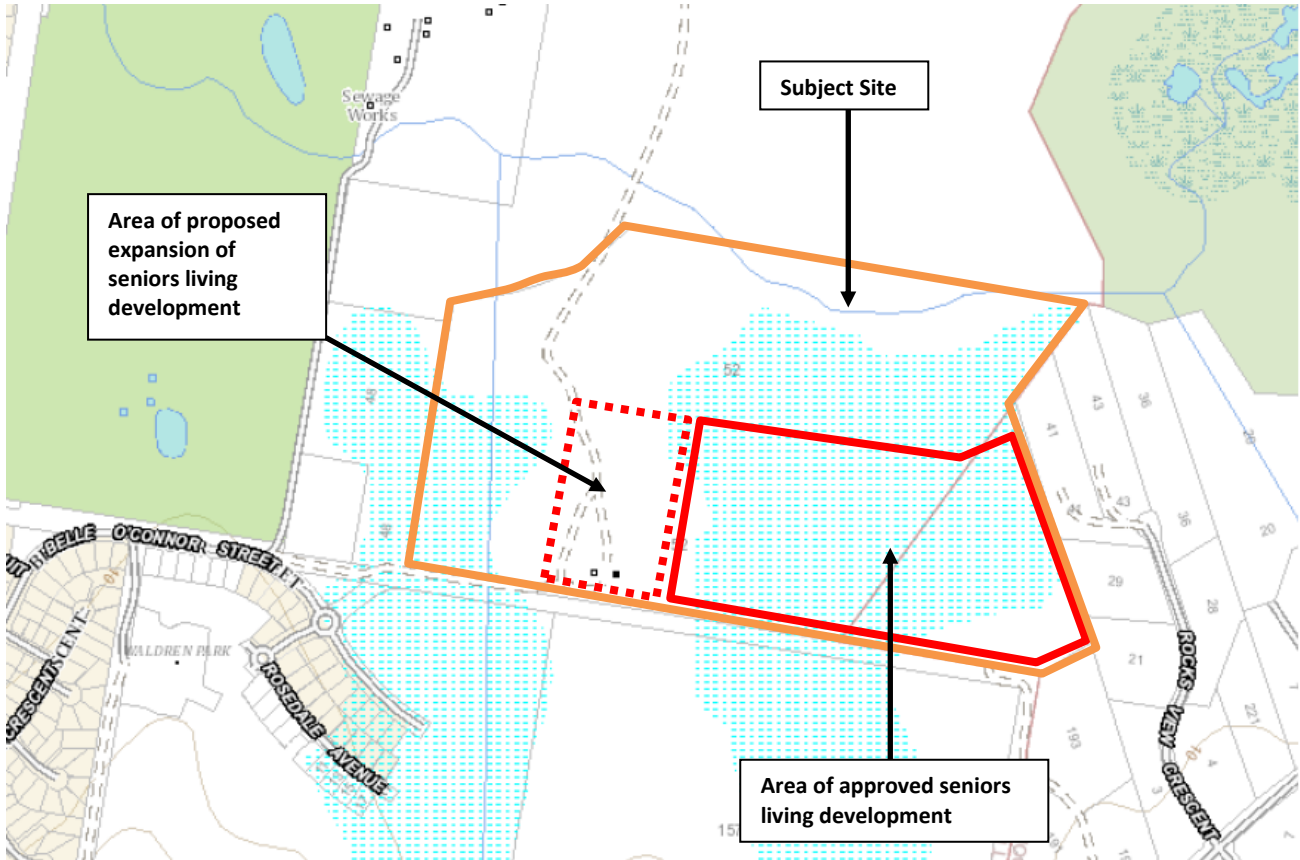
The South West Rocks golf course has been present to the west of the subject site for a considerable period of time whilst the South West Rocks Sewerage Treatment Works is located at distance to the northwest of the subject site.

The subject site is predominantly vacant land although each of the two lots which comprise the subject site contains residential dwellings and supporting infrastructure. Much of the northern portion of the subject site are covered by thick Coastal Heath vegetation whilst areas of 'Scribbly Gum' Dry Sclerophyll Woodland are present to the northwest of the subject site. The eastern and southern areas of the subject site and adjoining land to the west are largely cleared. Areas of managed grassland with scattered and small clusters of trees are present to the south of the subject site whilst similar vegetation is present to the east associated with the developed lots in this aspect. It is however noted that some areas of remnant Forested Westland and Coastal Heath vegetation are present in the eastern aspect.

A senior living development has recently been approved in the southern and central eastern portions of the area of land which comprises the subject site. It is noted that the area which is the subject of this report adjoins the approved senior living development immediately to the west. According the development site which is the subject of this report extends to the north from the unformed crown road reserve which adjoins the subject site to the south to the northern buffer zone to Saltwater Creek and approved but as yet undeveloped residential lots

in the far north-western portion of the subject site. Approved but as yet undeveloped residential lots in far western portion of Lot 1 DP 1128633 form the western boundary of the proposed development whilst the already approved seniors living development is present to the east of the area of land which is the subject of this report, refer to **Figure 2**.

Figure 2 – Land Use Context



As can be seen in **Figure 2** above surrounding land uses include:

- East - approved seniors living development and land zoned R5 Large Lot Residential.
- South - the 'Seascope Grove' residential estate. Construction of the first stages of this development has been completed.
- West - residential subdivision currently under construction. Beyond the subdivision is a right-of-way easement road providing access to the South West Rocks Sewerage Treatment Plant. The South West Rocks golf course extends beyond the access road.
- Northeast - Vacant land zoned for environmental conservation purposes. Saltwater Creek and Lagoon are located immediately to the north-east with an area categorised as a SEPP 14 Wetland.
- Northwest – Vacant land which has been approved for residential subdivision.

The land within the development site forms the lower slopes of the ridgeline that rises to the south, falling to the north towards Saltwater Creek at <2 degrees. The existing dwelling within the subject site is located on a low spur than also falls to the north at 1 – 2 degrees whilst falling to the east and west at 1 – 2 degrees to the overland flow path that extends to the north from the adjoining properties to the south of Belle O'Connor Street. The topography of adjoining and adjacent land is similar to that of the subject site with the predominance of gentle northerly down slopes towards Saltwater Creek and Saltwater Lagoon which are present to the north and northeast of the site respectively.

The closest Fire Service is located approximately 600m to the northwest of the subject site, (South West Rocks Fire Brigade), with the closest Fire Control Centre being at Kempsey which is approximately 35 kilometres southwest or 30 minutes by car from South West Rocks.

1.4 Site History

The site of the subject development is rectangular in shape.

Being on the south-eastern fringes of the developed areas of South West Rocks land uses within the area have until recently been dominated by bushland/rural activities. In this regard it is considered that the bushland/rural uses have predominated on the site and on adjoining and adjacent land for a considerable period of time.

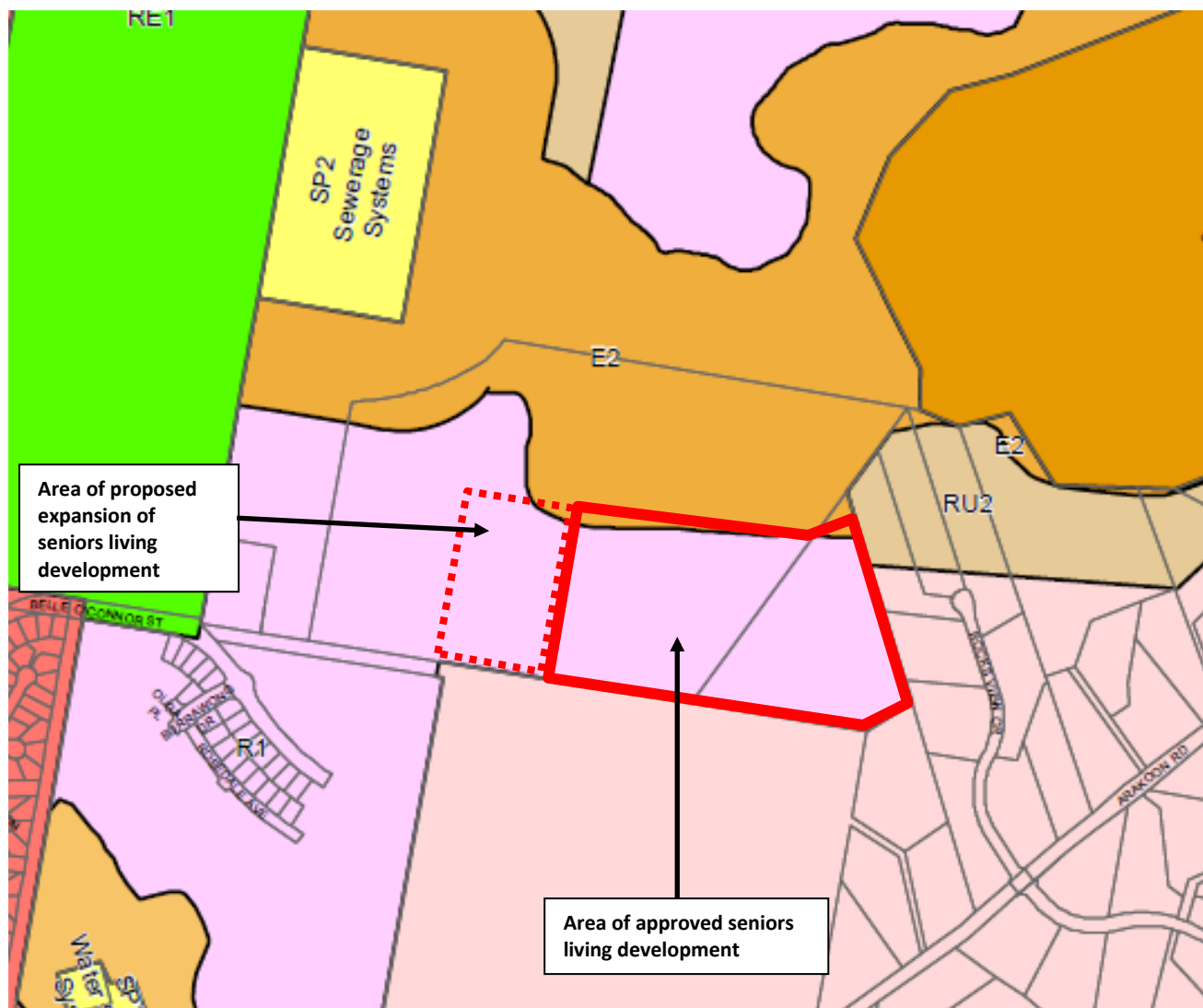
Development Approval No. 08 – 0167 was issued in 2011 for the residential subdivision of the subject site with subsequent modifications to the original approval providing for the creation of two hundred and seventy-six (276) separate residential sized allotments in addition to a large medium density development lot and a residue lot (public open space areas), refer to **Appendix 1**. It is noted that the western portion of the subject site is currently being developed for the purposes of residential lots in accordance with the existing development approval.

The 2011 Development Approval, (No. 08 – 0167), was subsequently modified in December 2017 so as to approve a two hundred and sixty-nine (269) site seniors living development over the central and eastern portions of the subject site in lieu of the originally approved residential subdivision, refer to **Appendix 2**. The approved seniors living development occupies land which had previously been approved for the creation of residential lots.

The approved development concept for the seniors living development also includes open space areas, clubhouse, tennis court, bowling green, amenities building, swimming pool and caravan storage, new public road infrastructure, internal access roads, stormwater management infrastructure and utility services.

The subject site is zoned, pursuant to Kempsey Councils LEP, (2013) Residential (R1) however the northern portion of the subject site has been zoned for Environmental Conservation (E2) purposes. Land with an Environmental Conservation (E2) extends to the north of the subject site whilst residential land (R1) is present to the west and south. Land to the east of the subject site is zoned Large Lot Residential (R5) and Rural Landscape (RU2), refer to **Figure 3** below.

Figure 3 - Landuse Zoning

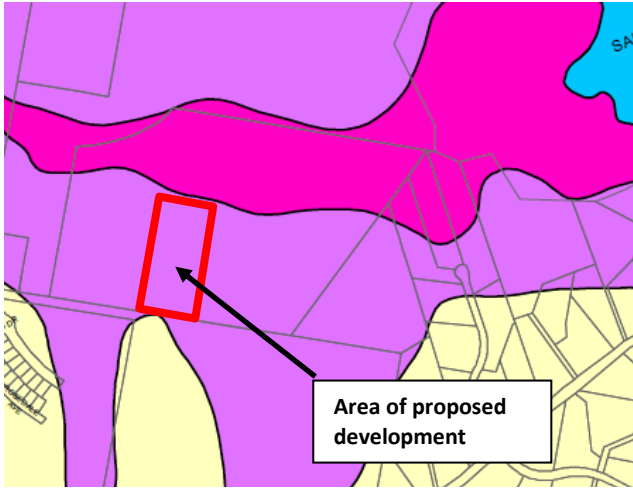


Fire has not recently occurred on the subject site or on adjoining and adjacent land.

The environmental and heritage features of the subject site in the area of the development which is the subject of this report are summarized as follows;

Table 1 – Environmental and Heritage Features

ENVIRONMENTAL/HERITAGE FEATURE	COMMENT
Riparian corridors	There are no riparian corridors in the area of the subject site which is proposed to be developed as an expansion of the already approved seniors living development.
SEPP 14 – Coastal Wetland	The site of the subject development is not identified as being subject to SEPP 14 – Coastal Wetlands.
SEPP 26 – Littoral Rainforest	The site of the subject development is not identified as being subject to SEPP 26 – Littoral Rainforest.
SEPP 44 – Koala Habitat	The site of the subject development is not considered to be subject to SEPP 44.
Areas of geological interest	The subject site is identified as potentially containing

	acid sulphate soils. According to the NSW Department of Natural Resources Acid Sulfate Soil Risk Maps, the subject site is categorised as being at risk of containing acid sulfate soils. Class 4 land is shown to be present on the subject site in the area of the subject development. Areas of Class 2 ASS could be present along the far northern portion of the development area.  Soil testing indicates the absence of ASS within the top 2 metres of all soil tested. Measures have been recommended for the preparation of an ASS Management Plan to be implemented during construction.
Environmental Protection Zones	The subject development includes the retention of high quality habitat along Saltwater Creek. This area is zoned as Environmental Conservation E2. This conservation area does not form part of the area of the subject site which will be developed for seniors living purposes.
Land slip	Areas of land slope which are greater than 18° are not present on the subject site. Areas of landslip are unlikely to exist on the subject site based upon topographical and geotechnical considerations.
Flood prone land	Whilst portion of the subject site is identified as being subject to flooding the design and construction of the subject development will be such that the subject development will be flood free. The subject site is not impacted by coastal inundation as ocean levels are much below the site levels to influence creek water levels at the subject site during both dry weather and all flooding events in the 1 in 100-year event. In this regard, coastal inundation under normal tidal conditions peaks at a level of 0.986m AHD, which is considerably below the creek bed level adjacent to the subject site.

National Park Estate or other Reserves	The subject site and immediately adjoining and adjacent land does not form part of the National Park Estate or other Reserves.
Threatened species, populations, endangered ecological communities and critical habitat	An ecological Assessment undertaken in relation to the previously approved residential subdivision of the subject site by Whelans InSites found a total of ten (10) vegetation community types on site, one of which may constitute an Endangered Ecological Community (EEC) that is located within the proposed conservation area, as well as ten (10) threatened fauna species primarily found in the northern portion of the subject site to be retained for conservation purposes. The subject development will not involve the removal of vegetation as most vegetation has already been removed from the area of land which is the subject of this report.
Aboriginal Heritage	An Aboriginal Heritage Assessment undertaken in relation to the previously approved residential subdivision of the subject site found that whilst no archaeological evidence was found, the possibility of undetected sites occurring in proximity to the subject site and in particular in the vicinity of the creek channel could not be ruled out entirely and therefore a number of mitigation measures have been recommended in relation to the development of the subject site.

1.5 Development Proposal

As previously discussed the eastern and central areas of the subject site have been approved development as a senior living development in accordance with State Environmental Planning Policy Housing for Seniors or People with a Disability, 2004.

The already approved development concept for the site provides for the staged development of two hundred and sixty-nine (269) separate dwelling sites, open space areas, clubhouse, tennis court, bowling green, swimming pool, amenities building and caravan storage, an extension of public road infrastructure, internal access roads, stormwater management infrastructure and the provision of utility services, refer to **Appendix 2**.

It is now proposed to modify the approved seniors living development via a westerly expansion of the approved development which will provide for an additional seventy-nine (79) separate dwelling sites together with open space areas, internal access roads, stormwater management infrastructure and the provision of utility services, refer to **Appendix 3**.

Access to the proposed expanded seniors living development is proposed to be via new private access road infrastructure which will connect with the approved easterly extension of Burrawong Drive which will be extended off Belle O'Connor Street which currently terminates to the south west of the subject site. Burrawong Drive will be present within an existing unformed Crown Road reserve which adjoins the subject site to the south. Burrawong Drive will provide for the east to west movement of vehicles to and from the development site using public road infrastructure.

Burrawong Drive will connect with an internal road system which will provide for the north to south movement of vehicles and will separate the developed areas of the subject site from the undeveloped areas to the north. Access to the proposed individual dwelling sites will also be provided via the internal access roads which with a predominant east to west orientation will provide, in conjunction with the main internal access road, direct road frontage to each of the proposed dwelling sites. The approach to road design also provides for the minimization of

'dead end' roads with through roads providing for the efficient and effective movement of vehicles within the proposed development. It is also noted that the main internal access road will function as a perimeter road between the bushfire hazard vegetation and the majority of dwelling sites which are adjacent to the bushfire hazard interface.

All internal access roads will function as two-way and will be constructed to normal private access road standards.

It is noted that the proposed internal road system will connect with the internal road system servicing the already approved senior living development to the east. This interconnection will provide for a variety of access and egress options and opportunities within the overall senior living development. The design of the access and egress infrastructure servicing the proposed development also enhances the alternate access/egress points to Burrawong Drive, (Belle O'Connor Street), with the proposed expansion of the seniors living development providing for three separate points of connection to Burrawong Drive, (Belle O'Connor Street).

The proposed westerly expansion of the already approved senior living development which is the subject of this report does not alter the already approved access and egress strategy and infrastructure in relation to the already approved development. It is however noted that the proposed westerly expansion of the senior living development will provide for additional options for pedestrian and vehicle movement away from areas of hazard vegetation to locations which would be protected from the impacts of bushfire.

1.6 Fauna and Flora Issues

A fauna and flora evaluation has not been undertaken in conjunction with this bushfire hazard assessment and as such issues pertaining to fauna and flora are outside the scope of this report.

2.0 BUSHFIRE HAZARD ASSESSMENT

2.1 Assessment Methodology

Several factors need to be considered in determining the bushfire hazard for the subject site and subject development. These factors are slope, vegetation type, and distance from hazard, access/egress and fire weather. Each of these factors has been reviewed in determining the bushfire protection measures which are applicable to the subject site and subject development.

An assessment of the slopes and vegetation structures on and surrounding the subject site was carried out by David Pensini – Building Certification and Environmental Services on 9th August 2012, 23rd October 2016 and the 22nd March 2017.

The assessment of slope and vegetation being carried out in accordance with Appendix 2 of NSW Rural Fire Service, *Planning for Bushfire Protection*, 2006 and Section 2 of AS 3959 - 2009.

2.2 Slope Assessment

Slope is a major factor to consider when assessing the bushfire hazard of the proposed expansion of the approved seniors living development. Therefore, the slope of the subject site and surrounding area, (to a distance of 100m), was measured using a Suunto PM-5/360 PC Clinometer.

The hazard vegetation on the subject site and adjacent and adjoining land was identified and the slopes within the vegetation measured.

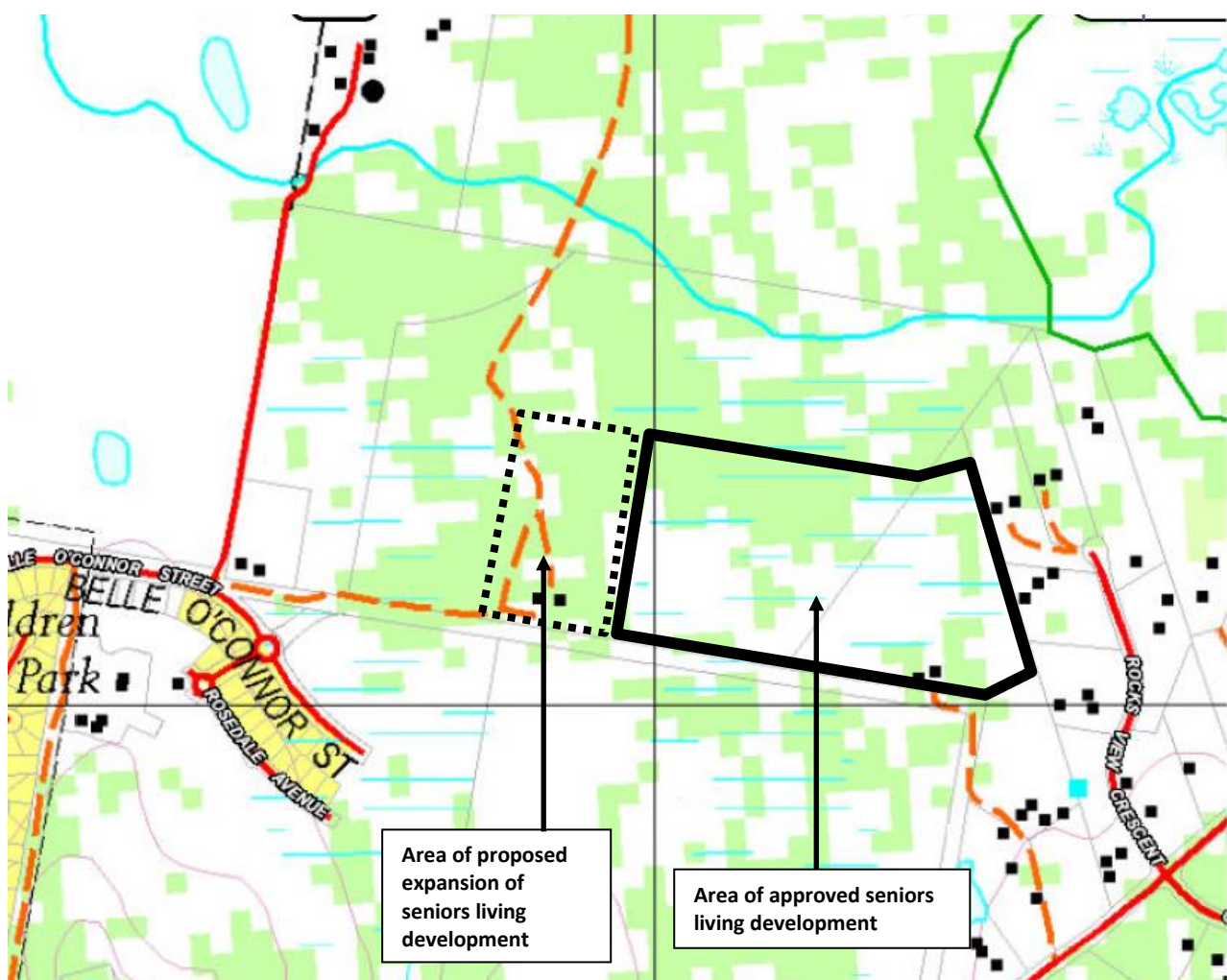
The land within the development site forms the lower slopes of the ridgeline that rises to the south, falling to the north towards Saltwater Creek at <2°. The existing dwelling within the subject site is located on a low spur than also falls to the north at 1° – 2° whilst falling to the east and west at 1° – 2° to the overland flow path that extends to the north from the adjoining properties to the south of Belle O'Connor Street.

The topography of adjoining and adjacent land is similar to that of the subject site with the predominance of northerly down slopes towards Saltwater Creek and Saltwater Lagoon which are present to the north and northeast of the site respectively.

The worst-case scenario for land slopes in the context of compliance with the acceptable solution requirements of NSW Rural Fire Service, **Planning for Bushfire Protection**, 2006 for the development of the subject site has been adopted for the purposes of this bushfire hazard assessment. This approach provides for a high level of conservatism in relation to bushfire hazard assessment.

The slope conditions within the subject site and on adjoining and adjacent land can be seen in **Figure 4** below;

Figure 4 – Topographic Conditions



The following table indicates the slopes which have been taken into consideration for the purposes of this bushfire hazard assessment.

Table 3 – Hazard Vegetation Slopes

HAZARD	SLOPE RANGE	UPSLOPE/DOWN SLOPE
North	1° - 2°	Down slope
South	2° - 3° (0°)	Up slope
East	0°	Flat
West	0°	Flat

****Note:** In accordance with NSW Rural Fire Services, **Planning for Bushfire Protection**, 2006 and AS3959 – 2009 all upslope vegetation is considered to be 0°.

All the above slopes were considered when assessing the required Asset Protection Zones and Bushfire Attack Levels for future residential buildings within the proposed westerly expansion of the already approved seniors living development.

2.3 Vegetation Assessment

The vegetation on and surrounding the development site was assessed over a distance of 140m from the proposed development.

The vegetation formations were classified using the system adopted as per Keith (2004) and in accordance with Appendix 3 of NSW Rural Fire Service, **Planning for Bushfire Protection**, 2006 and Table 2.3 of AS 3959 - 2009.

The following information is provided in relation to the floristic characteristics of the subject site and adjoining and adjacent land to the area of land which will support the proposed westerly expansion of the already approved seniors living development. In adopting a conservative approach to bushfire hazard assessment worst case vegetation characteristics have been identified.

2.3.1 Vegetation within Development Site

The following vegetation characteristics were identified as being relevant to the proposed westerly extension of the approved seniors living development.

The floristic characteristics of the subject site have been extensively modified via clearing with areas of Grasslands and disturbed site conditions over the majority of the area to be occupied by the subject development.



Existing clearing
over the area of
the subject
development and
adjoining land to
the west

2.3.2 Vegetation on Adjoining and Adjacent Land to the Development Site

The following vegetation characteristics were identified as being relevant to the proposed westerly expansion of the already approved seniors living development.

Bushfire hazard vegetation to the northeast of the subject site consists predominantly of Tall Coastal Heath regrowth with Swamp Forest extending to the north of the Heath.



**Tall Coastal Heath
to the northeast of
the area of the
subject**

At distance to the north/north-west of the development site is an area of 'Scribbly Gum' Woodland.



**'Scribbly Gum'
Woodland to the
north/northwest
of the area of the
subject
development**

To the south of the subject site are extensive areas of Grassland with scattered and small clusters trees. This area of land has been identified for future residential subdivision. Given the size of this area of land, its residential land use zoning and the apparent ongoing management regime for this area of vegetation this area of vegetation was assessed as being Grasslands for the purposes of this report.



Grasslands on adjoining land to the south of the area of the subject development

To the west of the subject site are the highly disturbed ground covers associated with the residential lots which are under construction and the managed areas of the South West Rocks Golf Course. Given the high levels of vegetation management associated with such facilities it is considered that there are no areas of bushfire hazard vegetation in the western aspect of the subject site.



Managed vegetation within the South West Rocks Golf Club

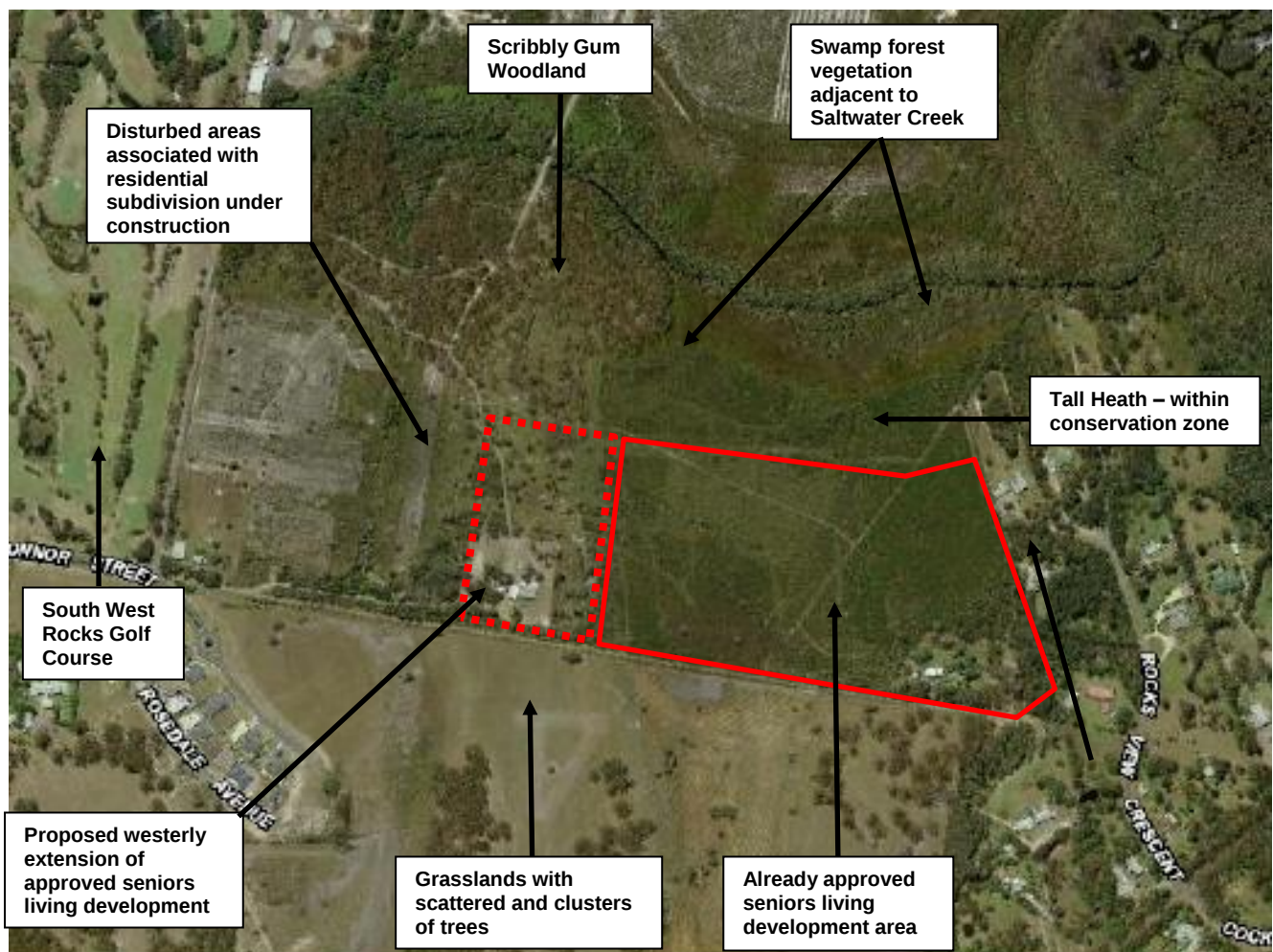
The area of land which has already been approved as a senior living development is present to the east of the subject site. This area of land has been the subject of substantial vegetation clearing with grasslands and other ground covers together with scattered trees present for >140m to the east of the area of land which is proposed to be developed as a westerly extension of the already approved seniors living development. Given the size of this area of land, its approval for residential occupation and the apparent ongoing management regime for this area of vegetation this area of vegetation was assessed as being Grasslands for the purposes of this report.



Grasslands with scattered trees in area approved for development as a senior living development

An indication of the relationship of the vegetation of bushfire significance to the proposed westerly expansion of the already approved seniors living development is presented in **Figure 5** below.

Figure 5 - Vegetation Relationships to Proposed Development Area



The following table summarizes the various vegetation structures which are of bushfire significance to the proposed development.

Table 4 – Summary of Vegetation Characteristics

ASPECT	VEGETATION DESCRIPTION	VEGETATION CLASSIFICATION – (Keith, 2004)
Northeast	Tall Coastal Heath associated with undeveloped northern area of the subject site	Tall Heath
North/Northwest	'Scribbly' Gum Woodland vegetation at distance to the north-western of the development site.	Woodland
South	Grasslands with scattered and clusters of trees within residentially zoned but undeveloped areas.	Grasslands
East	Grasslands with scattered trees in area of already approved seniors living development.	Grasslands

2.4 Fire Danger Index

The fire weather for the site is assumed on the worst-case scenario. In accordance with NSW Rural Fire Services, **Planning for Bushfire Protection**, 2006 and Table 2.1 of AS 3959 - 2009, the fire weather for the site is based upon the 1:50 year fire weather scenario and has a Fire Danger Index (FDI) of 80.

3.0 BUSHFIRE THREAT REDUCTION MEASURES

The following bushfire issues and constraints have been identified through considering the requirements of NSW Rural Fire Service, **Planning for Bushfire Protection**, 2006 in relation to the subject development, (expansion of already approved seniors living development).

In order to reduce the bushfire threat, it is suggested the following measures be included in any strategy developed for the modified layout of the already approved seniors living development.

3.1 NSW Rural Fire Services, Planning for Bushfire Protection, 2006

3.1.1 Asset Protection Zones

A Defendable Space/Asset Protection Zone (APZ) is to accompany the proposed development and is to be positioned on the hazard side of the development. The APZ provides for; minimal separation for safe firefighting, reduced radiant heat, reduced influence of convection driven winds, reduced ember viability and dispersal of smoke. The APZ consists of an Inner Protection Area (IPA) and Outer Protection Area (OPA).

The IPA is an area closest to the buildings that incorporates defendable space and is used for managing heat intensities at the building surface. The OPA is positioned adjacent to the hazard and the purpose of the OPA is to reduce the potential length of flame by slowing the rate of spread, filtering embers and suppressing the crown fire.

It is noted that this type of development requires APZ's in accordance with Special Fire Protection Purposes (SFPP) requirements of NSW Rural Fire Service, **Planning for Bushfire Protection**, 2006. APZ's in SFPP situations must be such that radiant heat levels of greater

than 10kW/m² will not be experienced by occupants or emergency workers entering or exiting a building.

The following table indicates the minimum Asset Protection Zones required from the hazard vegetation to the proposed buildings, (future dwellings), which are the subject of this report. The table is based upon the vegetation type, slopes and fire weather (FDI) which is applicable to this assessment.

Table 5 - Asset Protection Zone Requirements (PfBP 2006)

DIRECTION OF HAZARD	SLOPE	VEGETATION TYPE	IPA	OPA	TOTAL APZ REQUIRED	MINIMUM APZ ABLE TO BE PROVIDED	COMPLIANCE WITH APZ
Northeast	1° - 2° Down slope	Tall Heath	50m	-	50m	Minimum 50m	
North/Northwest	1° - 2° Down slope	Woodland	50m	-	50m	Minimum 50m	
South	2° - 3° (0°) Upslope	Grassland	10m	-	20m	Minimum 20m**	
East	0° Flat	Grassland	10m	-	20m	Minimum 20m**	

****Note: required so as to provide for a worst case radiant heat exposure of 10kW/m² where staging does not provide for managed land**

Having regard to the above the minimum required APZs which would be applicable to the subject development can be achieved in relation to the development of the subject site.

The APZ acceptable solution provisions which apply to SFPP's are detailed in the following table:

Table 6 – APZ Performance Requirements

Intent of measures: to provide sufficient space for fire fighters and other emergency services personnel, ensuring radiant heat levels permit operations under critical conditions of radiant heat, smoke and embers, while supporting or evacuating occupants.		
The intent may be achieved where:		
Performance Criteria	Acceptable Solutions	Compliance Comment
Radiant heat levels of greater than 10kW/m ² will not be experienced by occupants or emergency workers entering or exiting a building	An APZ is provided in accordance with the relevant tables/ figures in Appendix 2 of NSWRFs Planning for Bushfire Protection 2006	 The minimum required asset protection zones can be provided – refer to Table 5 above.
	Exits are located away from the hazard side of the building.	 The design of the buildings provide for exits being located away from the hazard side of the buildings or being of sufficient distance to provide for radiant heat attenuation to less than 10kW/m ² .
	The APZ is wholly within the boundaries of the development site. Exceptional circumstances may apply (see section 3.3 of NSWRFs Planning for Bushfire Protection	 The minimum required asset protection zones can be provided within the property boundaries of the subject site.

	2006)	
Applicants demonstrate that issues relating to slope are addressed: maintenance is practical, soil stability is not compromised and the potential for crown fire is negated.	Mechanisms are in place to provide for the maintenance of the APZ over the life of the development.	✓ All APZ's can be maintained over the life of the development.
	The APZ is not located on lands with a slope exceeding 18 degrees.	✓ All APZ's are to be located on flat land.
APZs are managed and maintained to prevent the spread of fire towards the building.	In accordance with the requirements of Standards for Asset Protection Zones (RFS, 2005) <i>Note: A Monitoring and Fuel Management Program should be required as a condition of development consent.</i>	✓ APZ's will need to be created and maintained to the standards which are applicable to Inner and Outer Protection Areas.
Vegetation is managed to prevent flame contact and reduce radiant heat to buildings, minimise the potential for wind driven embers to cause ignition and reduce the effect of smoke on residents and fire fighters.	Compliance with Appendix 5.	✓ Landscaping and vegetation management will comply with the requirements of Appendix 5.

Therefore, the acceptable solution, ('Deemed-to-Satisfy'), provisions for APZ's as detailed in Table A2.6 of NSW Rural Fire Services, **Planning for Bushfire Protection**, 2006 can be achieved for the proposed westerly expansion of the already approved seniors living development.

3.1.2 Asset Protection Zone Requirements

In accordance with NSW Rural Fire Service, **Planning for Bushfire Protection**, 2006 the following fuel loadings are required to be created and maintained within the Inner Protection Areas are applicable to the proposed seniors living development.

(i) Inner Protection Area (IPA)

An IPA should provide a tree canopy cover of less than 15% and should be located greater than 2 metres from any part of the roofline of a dwelling.

Garden beds of flammable shrubs are not to be located under trees and should be no closer than 10m from an exposed window or door.

Trees should have lower limbs removed up to a height of 2 metres above the ground

It will be necessary to provide and maintain for the life of the proposed development the minimum Asset Protection Zones as required by **Table 5** of this report. It is noted that the Vegetation in the north-eastern aspect of the development site will need to be modified so as to comply with the requirements for Inner Protection Areas.

A concept plan for the provision of APZ's to the subject development is included as **Appendix 4**. Vegetation within those areas which are shown to be forming the minimum required Asset Protection Zones must comply with the applicable standards at all times.

3.1.3 Operational Access and Egress

Access to the proposed expanded seniors living development is proposed to be via new private access road infrastructure which will connect with the approved easterly extension of Burrawong Drive which will be extended off Belle O'Connor Street which currently terminates to the south west of the subject site. Burrawong Drive will be present within an existing unformed Crown Road reserve which adjoins the subject site to the south. Burrawong Drive will provide for the east to west movement of vehicles to and from the development site using public road infrastructure.

Burrawong Drive will connect with an internal road system which will provide for the north to south movement of vehicles and will separate the developed areas of the subject site from the undeveloped areas to the north.

The proposed westerly expansion of the already approved senior living development which is the subject of this report does not alter the already approved access and egress strategy and infrastructure in relation to the already approved senior living development. It is however noted that the proposed westerly expansion of the senior living development will provide for additional options for pedestrian and vehicle movement away from areas of hazard vegetation to locations which would be protected from the impacts of bushfire.

The design and construction of the proposed public road infrastructure which will provide access to and egress from the seniors living development is to comply with the requirements of Section 4.1.3 of NSW Rural Fire Service, **Planning for Bushfire Protection**, 2006 and summarized as follows.

Table 7 - Public Road Requirements (PFBP 2006)

Intent of measures: to provide safe operational access to structures and water supply for emergency services, while residents are seeking to evacuate from an area.		
The intent may be achieved where:		
Performance Criteria	Acceptable Solutions	Compliance Comment
• fire fighters are provided with safe all-weather access to structures (thus allowing more efficient use of firefighting resources)	• public roads are two-wheel drive, all weather roads.	 Complies – already required in order to service the existing approved seniors living development
• public road widths and design that allow safe access for fire fighters while residents are evacuating an area.	• urban perimeter roads are two-way, that is, at least two traffic lane widths (carriageway 8 metres minimum kerb to kerb), allowing traffic to pass in opposite directions. Non-perimeter roads comply with Table 4.1 – Road widths for Category 1 Tanker (Medium Rigid Vehicle). • the perimeter road is linked to the internal road system at an interval of no greater than 500 metres in urban areas. • traffic management devices are constructed to facilitate access by emergency services vehicles. • public roads have a cross fall not exceeding 3 degrees. • all roads are through roads. Dead end roads are not recommended, but if unavoidable, dead ends are not more than 200 metres in length, incorporate a minimum 12 metres outer radius turning circle, and are clearly sign posted as a dead end and direct traffic away from the hazard. • curves of roads (other than perimeter roads) are a minimum inner radius of six metres and	 Final design to comply

	minimal in number, to allow for rapid access and egress. • the minimum distance between inner and outer curves is six metres. • maximum grades for sealed roads do not exceed 15 degrees and an average grade of not more than 10 degrees or other gradient specified by road design standards, whichever is the lesser gradient. • there is a minimum vertical clearance to a height of four metres above the road at all times.	
• the capacity of road surfaces and bridges is sufficient to carry fully loaded fire fighting vehicles.	• the capacity of road surfaces and bridges is sufficient to carry fully loaded fire fighting vehicles (approximately 15 tonnes for areas with reticulated water, 28 tonnes or 9 tonnes per axle for all other areas). Bridges clearly indicate load rating.	 Final design to comply
• roads that are clearly sign- posted (with easily distinguishable names) and buildings/properties that are clearly numbered.	• public roads greater than 6.5 metres wide to locate hydrants outside of parking reserves to ensure accessibility to reticulated water for fire suppression. • public roads between 6.5 metres and 8 metres wide are No Parking on one side with the services (hydrants) located on this side to ensure accessibility to reticulated water for fire suppression.	 Final design to comply
• there is clear access to reticulated water supply	• public roads up to 6.5 metres wide provide parking within parking bays and locate services outside of the parking bays to ensure accessibility to reticulated water for fire suppression. • one way only public access roads are no less than 3.5 metres wide and provide parking within parking bays and locate services outside of the parking bays to ensure accessibility to reticulated water for fire suppression.	 Final design to comply

Access to the proposed individual dwelling sites will also be provided via the internal access roads which with a predominant east to west orientation will provide, in conjunction with the main internal access road, direct road frontage to each of the proposed dwelling sites. The approach to road design also provides for the minimization of 'dead end' roads with through roads providing for the efficient and effective movement of vehicles within the proposed development. It is also noted that the main internal access road will function as a perimeter road between the bushfire hazard vegetation and the majority of dwelling sites which are adjacent to the bushfire hazard interface.

All internal access roads will function as two-way and will be constructed to normal private access road standards.

It is noted that the proposed internal road system will connect with the internal road system servicing the already approved senior living development to the east. This interconnection will provide for a variety of access and egress options and opportunities within the overall senior living development. The design of the access and egress infrastructure servicing the proposed development also enhances the alternate access/egress points to Burrawong Drive, (Belle O'Connor Street), with the proposed expansion of the seniors living development providing for three separate points of connection to Burrawong Drive, (Belle O'Connor Street).

It will therefore be necessary to construct all new internal access roads within the subject development so as to comply with the relevant provisions of the internal access road requirements of Section 4.1.3 of NSW Rural Fire Services, **Planning for Bushfire Protection**,

2006. The specific internal road design requirements provided for in Section 4.2.7 of NSW Rural Fire Services, **Planning for Bushfire Protection**, 2006 are also required to be complied with. The relevant internal road provisions which are applicable to the subject development are summarized as follows;

Table 8 - Acceptable Solutions (Access/Internal Roads)

Intent of measures: to provide safe access to/from the public road system for firefighters providing property protection during a bush fire and for occupants faced with evacuation.		
The intent may be achieved where:		
Performance Criteria	Acceptable Solutions	Compliance Comment
Access to properties is provided in recognition of the risk to fire fighters and/ or evacuating occupants.	At least one alternative property access road is provided for individual dwellings (or groups of dwellings) that are located more than 200 metres from a public through road	 Alternative internal access roads have been provided for each of the proposed dwellings in the design of the development – this include the existing approved access and egress points servicing the seniors living development. The design of the subject development provides for three (3) means of access to and egress from the seniors living development.
The capacity of road surfaces and bridges is sufficient to carry fully loaded fire fighting vehicles. All weather access is provided.	Bridges clearly indicate load rating and pavements and bridges are capable of carrying a load of 15 tonnes.	 No bridges are proposed.
	Roads do not traverse a wetland or other land potentially subject to periodic inundation (other than a flood or storm surge).	 Roads will be all weather in design and construction.
Internal road widths and design enable safe access for emergency services and allow crews to work with equipment about the vehicle	Internal roads are two-wheel drive, sealed, all weather roads. Internal perimeter roads are provided with at least two traffic lane widths (carriageway 8 meters minimum kerb to kerb) and shoulders on each side, allowing traffic to pass in opposite directions; Roads are through roads. Dead end roads are not more than 100m in length from a through road, incorporate a minimum 12 meters outer radius turning circle, and are clearly signposted as a dead end; Traffic management devices are constructed to facilitate access by emergency service vehicles; A minimum vertical clearance of four meters to any overhanging obstructions, including tree branches, is provided; Curves have a minimum inner radius of	 The design and construction of roads is to provide for compliance with the relevant design and construction provisions. The design of the internal road system provides for a through road configuration with access and egress from each of the proposed dwelling sites via individual access driveways which connect directly with the through road system.

	six meters and are minimal in number to allow for rapid access and egress; The minimum distance between inner and outer curves is six meters; Maximum grades do not exceed 15 degrees and average grades are not more than 10 degrees; Cross fall of the pavement is not more than 10 degrees; Roads do not traverse through a wetland or any other land potentially subject to periodic inundation (other than flood or storm surge); Roads are clearly sign posted and bridges clearly indicate load ratings; The internal road surfaces and bridges have a capacity to carry fully-loaded fire fighting vehicles (15 tonnes);	
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It is considered that the proposed access arrangements are acceptable for the subject development having regard to the nature, construction and extent of the existing public road infrastructure which is present and the new public road and internal road infrastructure which is proposed to be provided.

It is considered that the intent of the requirement for the provision of access and egress as required by NSW Rural Fire Services, *Planning for Bushfire Protection*, 2006 can be satisfied for the proposed development.

3.1.4 Services - Water, Gas and Electricity

As set out in Section 4.2.7 of NSW Rural Fire Services, *Planning for Bushfire Protection*, 2006, Special Fire Protection Purpose Developments in bushfire prone areas must maintain a water supply reserve dedicated to firefighting purposes.

The existing approved seniors living development together with the subject development will involve the extension of the reticulated town water supply which currently services the existing and proposed residential subdivisions to the west and south-west of the subject site. The provision of a reticulated town water supply will provide a water supply that is available for firefighting purposes. It is however noted that in accordance with NSW Rural Fire Services, *Planning for Bushfire Protection*, 2006 the determination of a guaranteed water supply is to be made by the water supply authority where mains water supply is available.

Electricity supply is available and is available for connection to the subject development. Reticulated gas services are not available to the site; however any reticulated or bottled gas supply is to be installed and maintained in accordance with AS1596 and the requirements of the relevant authorities. Metal piping is to be used. All fixed gas cylinders are to be kept clear of all flammable materials to a distance of 10m and shielded on the hazard side of the installation.

If gas cylinders need to be kept close to a building, the release valves are to 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. Connects to and from gas cylinders need to be metal. Polymer sheathed flexible gas supply lines to gas meters adjacent to buildings are not to be used.

The incorporation into the subject development of the relevant provisions of the following acceptable solutions as provided for by Section 4.1.3 of NSW Rural Fire Services, *Planning for Bushfire Protection*, 2006 will ensure compliance with the intent for the provision of services to the existing and proposed seniors living development.

Table 9 – Service Provision Requirements

Intent of measures: to provide adequate services of water for the protection of buildings during and after the passage of a bush fire, and to locate gas and electricity so as not to contribute to the risk of fire to a building		
The intent may be achieved where:		
Performance Criteria	Acceptable Solutions	Compliance Comment
Reticulated water supplies Reticulated water supplies are easily accessible and located at regular intervals	Access points for reticulated water supply to SFPP developments incorporate a ring main system for all internal roads. Fire hydrant spacing, sizing and pressures comply with AS 2419.1 – 2005. Where this cannot be met, the RFS will require a test report of the water pressures anticipated by the relevant water supply authority, once development has been completed. In such cases, the location, number and sizing of hydrants shall be determined using the fire engineering principles. No services or hydrants are located within the parking bays	 The subject development will have access to the reticulated water supply which services the urban area. The water supply is to be designed and constructed so as to comply with the relevant requirements.
Electricity Location of electricity services will not lead to ignition of surrounding bushland or the fabric of buildings or risk to life from damaged electrical infrastructure	Electrical transmission lines are underground	 To comply.
Gas Location of gas services will not lead to ignition of surrounding bushland or the fabric of buildings	Reticulated or bottled gas is installed and maintained in accordance with AS 1596 and the requirements of relevant authorities. Metal piping is to be used. All fixed gas cylinders are kept clear of all flammable materials to a distance of 10 metres and shielded on the hazard side of the installation. If gas cylinders need to be kept close to the building, the release valves are directed away from the building and at least 2 metres away from any combustible material, so that they do not act as a catalyst to combustion. Connections to and from gas cylinders are metal. Polymer sheathed flexible gas supply lines to gas meters adjacent to	 Reticulated gas supplies are not available within the area. Gas bottles and other sources of ignition are stored away from the hazard and also in positions to reduce the risk.

	buildings are not used.	
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The provision of services to support the future residential occupation of each of the proposed seniors living dwelling sites would need to have regard to the specific details of the development of each of the proposed sites.

3.1.5 Landscaping

Landscaping is a major cause of fire spread to dwellings and therefore any future landscaping on the subject development will need careful planning to produce gardens that do not contribute to the spread of a bushfire.

Appendix 5 of NSW Rural Fire Services, **Planning for Bushfire Protection**, 2006, contains standards that are applicable to the provision and maintenance of landscaping. Any landscaping proposed to be undertaken in conjunction with the proposed subdivision is to comply with the principles contained in Appendix 5 of NSW Rural Fire Services, **Planning for Bushfire Protection**, 2006.

Compliance with Appendix 5 of **NSW Rural Fire Services, Planning for Bushfire Protection**, 2006, will satisfy the intent of the bush fire protection measures that are applicable to the provision of landscaping.

3.1.6 Emergency Evacuation Planning

Special Fire Protection Purpose developments should have suitable management arrangements and structures capable of developing and implementing an Emergency Plan. Before occupation of any residential buildings within the seniors living development, an Emergency Evacuation Plan incorporating bushfire evacuation will be required to be produced for the seniors living development.

Compliance with the following acceptable solutions as provided for by Section 4.2.7 of NSW Rural Fire Services, **Planning for Bushfire Protection**, 2006 will ensure compliance with the intent for Emergency Evacuation Planning before occupation of the subject development.

Table 10 - Acceptable Solutions for Emergency and Evacuation

Intent of measures: to provide suitable emergency and evacuation (and relocation) arrangements for occupants of special fire protection purpose developments		
The intent may be achieved where:		
Performance Criteria	Acceptable Solutions	Compliance Comment
An Emergency and Evacuation Management Plan is approved by the relevant fire authority for the area.	An emergency evacuation plan is prepared consistent with the RFS Guidelines for the preparation of <i>Emergency/Evacuation Plan</i> . Compliance with AS 3745-2002 'Emergency control organization and procedures for buildings, structures and workplaces for residential accommodation.'	 To comply
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 schools) and staff in developing and implementing an Emergency Procedures Manual. Detailed plans of all Emergency Assembly Areas including "onsite" and "offsite" arrangements as stated in AS 3745-2002 are clearly displayed, and an annual (as a minimum) trial	 To comply

	emergency evacuation is conducted.	
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It is noted that the Clubhouse building within the already approved seniors living development provides for an assembly, shelter and evacuation point which is consistent with the requirements for Special Fire Protection Purpose Developments.

3.1.7 Construction of Buildings

It is noted that Appendix 3 of NSW Rural Fire Service, **Planning for Bushfire Protection**, 2006 now contains specific construction requirements which the NSW Rural Fire Service will seek to impose, through the development control process, in addition to the construction requirements contained within AS3959 – 2009.

Accordingly, the determination of the construction requirements which will be applicable to any specific development proposal will need to have regard to the construction requirements nominated in Appendix 3 of NSW Rural Fire Service, **Planning for Bushfire Protection**, 2006 in addition to the requirements of AS3959 – 2009.

The construction requirements that will be applicable to the subject residential buildings are further discussed in Section 3.2 of this report.

Notwithstanding the above the relevant building construction requirements of NSW Rural Fire Services, **Planning for Bushfire Protection**, 2006, are summarized as follows;

Table 11 – Building Siting and Design Requirements (PfBP 2006)

Performance Criteria	Acceptable Solutions	Compliance Comment
in relation to siting and design: • buildings are sited and designed to minimize the risk of bush fire attack.	• buildings are designed and sited in accordance with the siting and design principles	 Applies at individual lot development stage
in relation to construction standards: • it is demonstrated that the proposed building can withstand bush fire attack in the form of wind, smoke, embers, radiant heat and flame contact.	• construction determined in accordance with Appendix 3 and the <i>Requirements for attached garages and other structures</i>	 Applies at individual lot development stage

3.2 AS3959 – 2009 Construction of Buildings in Bushfire Prone Areas

3.2.1 General

The bushfire construction requirements of Volume 2 of the Building Code of Australia for residential dwellings are now applicable in NSW. In this regard the Building Code of Australia provides that compliance with the relevant requirements of AS3959 – 2009 satisfies the performance requirements which are applicable to Part 3.7.4, (Bushfire Areas), of Volume 2 of the Building Code of Australia.

It is however noted that there are a number of NSW variations to the application of AS3959 – 2009 including a restriction on the utilization of the Bushfire Attack Level – Flame Zone requirements of the Australian Standard as a 'deemed to satisfy solution' for these situations. Consequently, in NSW all situations which are determined as being subject to the Bushfire Attack Level – Flame Zone requirements of AS3959 – 2009 must be treated on merit with construction requirements being determined on a site specific assessment basis.

The determination of specific bushfire related construction requirements of AS 3959 – 2009 (as amended by NSW Rural Fire Service, **Planning for Bushfire Protection**, 2006), applies to each of the proposed dwellings sites.

3.2.2 AS3959 – 2009 Construction of Buildings in Bushfire Prone Areas

To complete the Bushfire Attack Level (BAL) assessment under AS 3959 -2009 the vegetation, as originally assessed in accordance with Keith, has to be converted to Specht. The following table shows the conversion:

Table 12– Summary of Vegetation Characteristics

ASPECT	VEGETATION CLASSIFICATION – (Keith, 2004)	VEGETATION CLASSIFICATION – (Specht)	SLOPE
Northeast	Tall Coastal Heath	Scrub	1° - 2° Down slope
North/Northwest	Woodland	Woodland	1° - 2° Down slope
South	Grassland	Grassland	1° - 2° (0°) Upslope
East	Grassland	Grassland	0° Flat

It is noted that the BAL assessment has been based upon the provision of the minimum required Asset Protection Zones.

The following construction requirements in accordance with AS 3959 – 2009 *Construction of Buildings in Bushfire Prone Areas* is required for the bushfire attack level categories.

Table 13 – Bushfire Attack Levels

BUSHFIRE ATTACK LEVEL (BAL)
BAL – Low Risk (No construction requirements under AS 3959-2009)
BAL - 12.5
BAL - 19
BAL - 40
BAL - FZ

Based upon the information presented in Section 2 of this report the following Bushfire Attack Levels pursuant to AS3959 – 2009 have been determined as being applicable to the proposed westerly expansion of the already approved seniors living development dwelling sites), refer to **Appendix 5**.

In accordance with AS 3959-2009 the following construction requirements are applicable to the proposed seniors living buildings.

Table 14 – Specific Construction Requirements (AS3959 – 2009)

BUILDING	BUSHFIRE ATTACK LEVEL (BAL)
Dwelling Sites; 1 - 33 56 - 65 72 - 79	BAL 12.5
Dwelling Sites; 34 - 55 66 - 71	BAL Low Risk (no construction requirements)

The information presented in the above table indicates that under the worst case spatial separation scenario between future buildings and areas of bushfire hazard vegetation the

subject development would be subjected to a Bushfire Attack Level of 12.5 by virtue of the vegetation which is present in the northern, southern and eastern aspects of the subject site.

Notwithstanding the above it is recommended that the construction requirements (AS3959 – 2009 as amended by NSW Rural Fire Service, **Planning for Bushfire Protection**, 2006), which are applicable to each dwelling within the seniors living development be the subject of a further Bushfire Attack Level (BAL) assessment prior to the commencement of the construction of individual seniors living dwellings on the subject site.

4.0 SUMMARY OF REQUIREMENTS

The following requirements are provided in response to the proposed westerly expansion of the already approved seniors living development provided as **Appendix 3**.

- (i) Minimum required Asset Protection Zones are to be provided in accordance with Sections 3.1.1 and 3.1.2 of this report.
- (ii) The areas of land between the proposed dwelling sites and the areas of bushfire hazard vegetation identified in Section 2.3 of this report are to be created and managed so as to meet the standards which are applicable to Inner Protection Areas, refer to Sections 3.1.1 and 3.1.2 of this report.
- (iii) An Emergency and Evacuation Plan is to be prepared for the subject development.
- (iv) Adopt Landscaping principals in accordance with the report.
- (v) Water and other services are to be provided as detailed in Section 3.1.4 of this report is to be provided to the subject development.
- (vi) Ensure that gas bottles and other sources of ignition are stored away from the hazard and also in positions to reduce the risk.
- (vii) The construction of the proposed seniors living dwellings are to comply with the Bushfire Attack Levels as provided for by **Table 13** of this report. In this regard the BAL 12.5 construction requirements of AS 3959 -2009 (as amended by NSW Rural Fire Services, **Planning for Bushfire Protection**, 2006), refer to **Appendix 6**.
- (viii) The construction requirements (AS3959 – 2009 as amended by NSW Rural Fire Service, **Planning for Bushfire Protection**, 2006), which are applicable to each dwelling within the proposed seniors living development be the subject of a further Bushfire Attack Level (BAL) assessment prior to the commencement of the construction of individual seniors living dwellings on the subject site.
- (ix) The design and construction of the new public road infrastructure is to comply with the acceptable solutions provided for in Sections 4.1.3 of NSW Rural Fire Services, **Planning for Bushfire Protection**, 2006.
- (x) The design and construction of the new internal road system is to comply with the acceptable solutions provided for in Sections 4.1.3 and 4.2.7 of NSW Rural Fire Services, **Planning for Bushfire Protection**, 2006.

5.0 CONCLUSION

It is considered that the proposed westerly expansion of the already approved seniors living development on land known as Lot 1 DP 1128633 and Lot 84 DP 792945 Belle O'Connor Street, South West Rocks is at risk of bushfire attack; however, it is in our opinion that with the implementation of the bushfire threat reduction measures and consideration of the recommendations in this report, the bushfire risk is manageable for the subject development.

With the implementation of the recommendations it is considered that it will be possible for the subject development to meet the applicable acceptable solutions as provided for in NSW Rural Fire Service, **Planning for Bushfire Protection**, 2006 having regard to the nature and extent of the subject development.

This report is however contingent upon the following assumptions and limitations.

Assumptions

- (i) For a satisfactory level of bushfire safety to be achieved regular inspection and testing of proposed measures, building elements and methods of construction, specifically nominated in this report, is essential and is assumed in the conclusion of this assessment.
- (ii) It is assumed that the building works will comply with the DTS provisions of the BCA including the relevant requirements of Australian Standard 3959 – 2009.
- (iii) The buildings are constructed and maintained in accordance with the risk reduction strategy in this report.

Limitations

- (i) The data, methodologies, calculations and conclusions documented within this report specifically relate to the building and must not be used for any other purpose.
- (ii) A reassessment will be required to verify consistency with this assessment if there is building alterations and/or additions, change in use, or changes to the risk reduction strategy contained in this report.
- (iii) This report has been based upon the vegetation characteristics observed at the time of the site inspections. No responsibility is taken where the vegetation characteristics of the subject site or surrounding areas is changed or modified beyond that which is presented within this report.

6.0 REFERENCES

NSW Rural Fire Services, **Planning for Bushfire Protection**, 2006

NSW Rural Fire Services, **Planning for Bushfire Protection**, 2001
AS 3959-2009, **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**, Department of Environment and Conservation

NSW State Government, **Rural Fires Act**, 1997

Port Macquarie-Hastings Councils, **Bushfire Prone Land Mapping**

NSW Rural Fire Service, **Guideline for Bushfire Prone Land Mapping**, 2002

Australian Building Codes Board, **Building Code of Australia**, 2011

NSW Rural Fire Service – **Guideline for Bushfire Prone Land Mapping**, 2002

Disclaimer

The findings referred to in this report are those which, in the opinion of the author, are required to meet the requirements of NSW Rural Fire Service, **Planning for Bushfire Protection**, 2006. It should be noted that the Local Authority having jurisdiction for the area in which the property is located may,

within their statutory powers, require different, additional or alternative works/requirements to be carried out other than those referred to in this report.

This report has been prepared partially on information provided by the client. Information provided by the client in respect of details of construction.

The author denies any legal liability for action taken as a consequence of the following:

- The Local Authority requiring alternative or additional requirements to those proposed or recommended in this report.
- Incorrect information, or mis-information, provided by the client with regard the proposed building which are in good faith included in the strategies proposed in this report and later found to be false.

Existing Approved Residential Subdivision of Subject Site





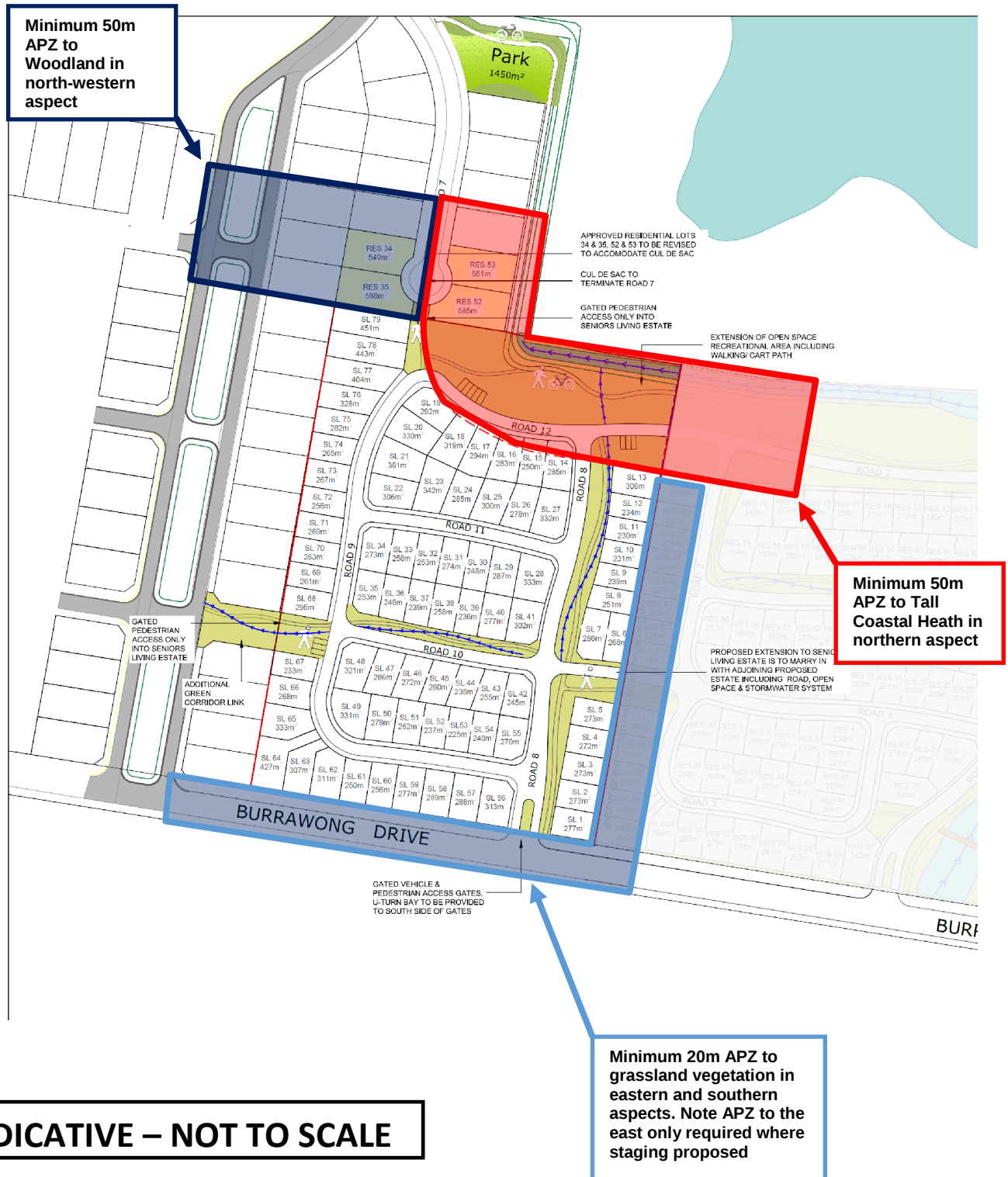
Proposed Expansion of Approved Seniors Living Development



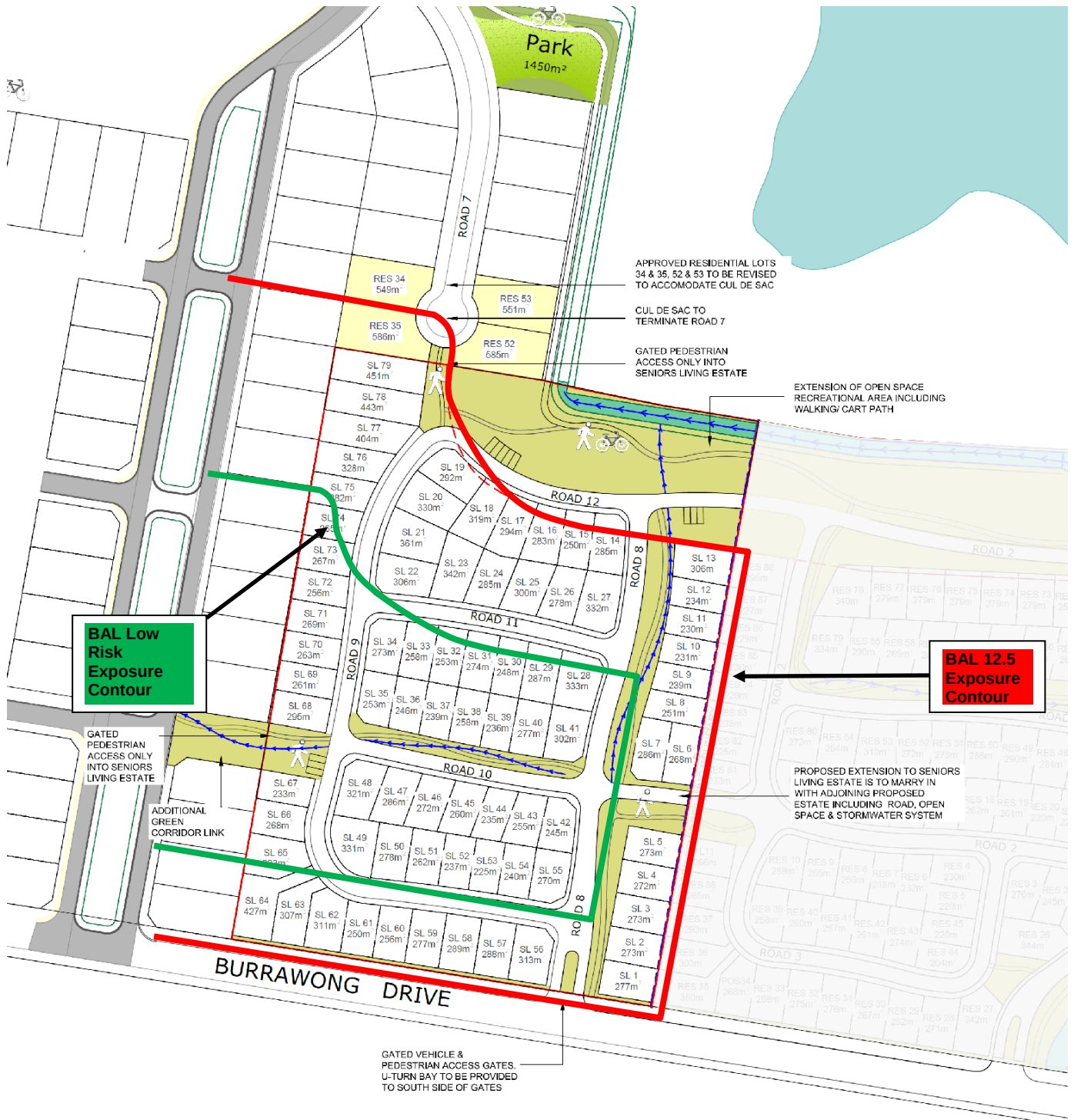
APPENDIX 4

Proposed APZ Compliance Concept

INDICATIVE – NOT TO SCALE



APPENDIX 5 BAL Contours



INDICATIVE – NOT TO SCALE

APPENDIX 6

Bushfire Attack Level 12.5 (Construction Requirements)

CONSTRUCTION FOR BUSHFIRE ATTACK LEVEL 12.5 (BAL-12.5)

Version 2.2

Part of Building	Specifically	Construction requirements in accordance with AS 3959-2009 and Appendix 3 (2010) of Planning for Bushfire Protection (2006)
Subfloor supports		This standard does not provide construction requirements for subfloor supports where the subfloor space is enclosed with: (a) a wall that complies with Clause 7.4 of AS 3959-2009; or (b) Corrosion resistant steel, bronze or aluminium mesh or perforated sheet with a maximum aperture size of 2 mm; or (c) a combination of items above. Where the subfloor space is unenclosed, the support posts, columns, stumps, piers and poles shall be: (i) of non-combustible material; or (ii) of bushfire-resisting timber (see Appendix F of AS 3959-2009); or (iii) a combination of items above. NOTE: This requirement applies to the principal building only and not to verandas, decks, steps, ramps and landings (see Clause 7.7)
Floors	Concrete slabs on ground	This Standard does not provide construction requirements for concrete slabs on the ground.
	Elevated floors	Enclosed subfloor This standard does not provide construction requirements for elevated floors, including bearers, joists and flooring, where the subfloor space is enclosed with (a) a wall that complies with Clause 7.4 of AS 3959-2009; or (b) corrosion-resistant steel, bronze or aluminium mesh or perforated sheet with a maximum aperture size of 2 mm; or (c) a combination of items above. Unenclosed subfloor space Where the subfloor space is unenclosed, bearers, joists and flooring, less than 400 mm above finished ground level, shall be one of the following: (a) Materials that comply with the following: (i) Bearers and joists shall be- (A) non-combustible; or (B) bushfire-resisting timbers (see Appendix F of AS 3959-2009) ; or (C) a combination of items above. (ii) Flooring shall be- (A) non-combustible; or (B) bushfire-resisting timbers (see Appendix F of AS 3959-2009); or (C) timber (other than bushfire-resisting timber), particle board or plywood flooring where the underside is lined with sarking-type material mineral wool insulation; or (D) a combination of items above; or (b) A system complying with AS 1530.8.1

		This standard does not provide construction requirements for elements which are 400 mm or more above finished ground level.
External walls	Walls	The exposed components of an external wall that are less than 400 mm from the ground or less than 400 mm above decks, carport roofs, awnings and similar elements or fittings having an angle less than 18 degrees to the horizontal and extending more than 110 mm in width from the wall (see Figure D3, Appendix D of AS3959 - 2009) shall be: (a) Non-combustible material. NOTE: Examples include, but are not limited to, the following (with a minimum of 90 mm in thickness): (a) Full masonry or masonry veneer walls with an outer leaf of clay, concrete, calcium silicate or natural stone. (b) Precast or in situ walls of concrete or aerated concrete. (c) Earth wall including mud brick. or (b) Timber logs of a species with a density of 680 kg/m³ or greater at a 12 percent moisture content; of a minimum nominal overall thickness of 90 mm and a minimum thickness of 70 mm (see Clause 3.11 of AS3959 - 2009); and gauge planed. or (c) Cladding that is fixed externally to a timber-framed or a steel-framed wall and is— (i) non-combustible material; or (ii) fibre-cement a minimum of 6 mm in thickness; or (iii) bushfire-resisting timber (see Appendix F of AS3959 - 2009); or (iv) a timber species as specified in Paragraph E1, Appendix E of AS3959 - 2009; or (v) a combination of any of Items (i), (ii), (iii) or (iv) above. or (d) A combination of any of Items (a), (b) or (c) above. This Standard does not provide construction requirements for the exposed components of an external wall that are 400 mm or more from the ground or 400 mm or more above decks, carport roofs, awnings and similar elements or fittings having an angle less than 18 degrees to the horizontal and extending more than 110 mm in width from the wall (see Figure D3, Appendix D of AS3959 - 2009).
	Joints	All joints in external surface material of walls be covered, sealed, overlapped, backed or butt jointed to prevent gaps greater than 3 mm.
	Vents and weep holes	Vents and weepholes in external walls shall be screened with a mesh with a maximum aperture of 2 mm, made of corrosion-resistant steel, bronze or aluminium, except where the vents and weepholes have an aperture less than 3 mm (see Clause 3.6 of AS3959-2009), or are located in an external wall of a subfloor space.
	Bushfire shutters	Where fitted, bushfire shutters must comply with Clause 3.7 of AS 3959-2009 and be made from- (a) Non-Combustible material; or (b) A timber species as specified in Paragraph E1 Appendix E of AS 3959-2009; or (c) Bushfire-resisting timber (see Appendix F of AS 3959-2009); or (d) A combination of any items (a) (b) or (c) above.
External glazed elements and assemblies and external doors.		

	Screens for windows and doors	Where fitted, screens for windows and doors shall have corrosion-resisting steel, bronze or aluminium mesh or perforated sheet with a maximum aperture size of 2 mm. Gaps between the perimeter of the screen assembly and the building elements to which it is fitted shall not exceed 3 mm. The frame supporting the mesh or perforated sheet shall be made from— (a) metal; or (b) bushfire-resisting timber (see Appendix F of AS3959 - 2009); or (c) a timber species as specified in Paragraph E2, Appendix E of AS3959 - 2009).
	Windows	Window assemblies shall comply with one of the following: (a) They shall be completely protected by a bushfire shutter that complies with Clause 5.5.1 of AS 3959-2009; or (b) They shall be completely protected externally by screens that comply with Clause 5.5.1A of AS 3959-2009; or (c) They shall comply with the following: (i) For window assemblies, less than 400 mm from the ground or less than 400 mm above decks, carport roofs, awnings and similar elements or fitting having an angle less than 18 degrees to the horizontal and extending more than 110 mm in width from the window frame (see figure D3, Appendix D of AS 3959-2009), window frames and window joinery shall be made from: (A) Bushfire resisting timber (see Appendix F of AS 3959-2009); or (B) A timber species as specified in Paragraph E2, Appendix E of AS 3959-2009; or (C) Metal; or (D) Metal reinforced PVC-U. The reinforcing members shall be made from aluminium, stainless steel or corrosion-resistant steel and the frame and sash shall satisfy the design load, performance and structural strength of the member. (ii) Externally fitted hardware that supports the sash in its functions of opening and closing shall be metal. (iii) Where glazing is less than 400 mm from the ground or less than 400 mm above decks, carport roofs, awnings and similar elements or fittings having an angle less than 18 degrees to the horizontal and extending more than 110 mm in width from the window frame, the glazing shall be Grade A safety glass minimum 4 mm thickness, or glass blocks with no restrictions on glazing methods. (iv) Where glazing is other than specified in (iii), annealed glass can be used. (v) Openable portions of windows shall be screened internally and externally with screens that apply with Clause 5.5.1A of AS 3959-2009.
	Doors- Side hung external doors (including French doors, panel fold and bi-fold doors)	These doors must comply with one of the following: (a) Doors and door frames shall be protected by bushfire shutters that comply with Clause 5.5.1 of AS3959 - 2009. - or (b) Doors and door frames shall be protected externally by screens that comply with Clause 5.5.1A AS3959 - 2009. - or (c) Doors and door frames shall comply with the following: (i) Doors shall be—

		(A) non-combustible; or (B) a solid timber, laminated timber or reconstituted timber door, having a minimum thickness of 35 mm for the first 400 mm above the threshold; or; (C) a door, including a hollow core door, with a non-combustible kick plate on the outside for the first 400 mm above the threshold; or (D) a door, including a hollow core door, protected externally by a screen that complies with Clause 5.5.1A AS3959 - 2009; or (E) a fully framed glazed door, where the framing is made from materials specified for bushfire shutters (see Clause 5.5.1 of AS3959 - 2009), or from a timber species as specified in Paragraph E2, Appendix E of AS3959 - 2009. Where doors incorporate glazing, glazing must comply with glazing requirements for windows. Doors must be tight fitting to the door frame and to an abutting door, if applicable. Where any part of the door is less than 400 mm from the ground or less than 400 mm above decks, carport roofs, awnings and similar elements or fittings having an angle less than 18 degrees to the horizontal and extending more than 110 mm in width from the door (see figure D3, Appendix D of AS 3959-2009), that part of the door frame shall be made from; (a) Bushfire resisting timber (see Appendix F of AS 3959-2009); or (b) A timber species as specified in Paragraph E2, Appendix E of AS 3959-2009; or (c) Metal; or (d) Metal reinforced PVC-U. The reinforcing members shall be made from aluminium, stainless steel or corrosion resistant steel and the door assembly shall satisfy the design load, performance and structural strength of the member. Weather strips, draught excluders or draught seals shall be installed at the base of side-hung external doors.
	Doors- sliding doors	Sliding doors shall comply with one of the following; a) They shall be completely protected by a bushfire shutter that complies with Clause 5.5.1 of AS 3959-2009; or b) They shall be completely protected externally by screens that comply with Clause 5.5.1A of AS 3959-2009; or c) They shall comply with the following: (i) Any glazing incorporating in sliding doors shall be Grade A safety glass complying with AS 1288. (ii) Both the door frame supporting the sliding door and the framing surrounding any glazing shall be made from: (a) Bushfire resisting timber (see Appendix F of AS 3959-2009); or (b) A timber species as specified in Paragraph E2, Appendix E of AS 3959-2009; or (c) Metal; or (d) Metal reinforced PVC-U. The reinforcing members shall be made from aluminium, stainless steel or corrosion resistant steel and the frame must be able to hold the design load and structural strength.

		(iii) No requirements to screen the openable part of the sliding door. However, if screened must comply with Clause 5.5.1A of AS 3959-2009. (iv) Sliding doors shall be tight-fitting in the frames.
	Doors- vehicle access doors (garage doors)	The following applies: (a) Lower portion of vehicle access door that is within 400 mm of the ground when door is closed shall be made from: (i) Non-combustible material; or (ii) Bushfire resisting timber (see Appendix F of AS 3959-2009); or (iii) Fibre cement sheet, a minimum of 6 mm in thickness; or (iv) A timber species as specified in Paragraph E1, Appendix E of AS 3959-2009; or (v) A combination of any item above. b) Panel lift, tilt doors or side-hung doors shall be fitted with weather strips, draught excluders, draught seals or guide tracks, as appropriate to the door type with maximum gap no more than 3 mm. c) Roller doors shall have guide tracks with maximum gap no greater than 3 mm and fitted with a nylon brush that is in contact with the door, (see figure D4, Appendix D of AS 3959-2009). d) Vehicles access doors shall not include ventilation slots.
Roofs (Including veranda and attached carport roofs, penetrations, eaves, fascias, gutters and downpipes)	General	The following apply to all types of roofs and roofing systems. Roof tiles, roof sheets and roof covering accessories shall be non-combustible. The roof/wall junction must be sealed to prevent openings greater than 3 mm, by using fascia and eaves lining or by sealing between the top of wall and underside of roof and between the rafters at the line of the wall. Roof ventilation openings such as gable and roof vents, shall be fitted with ember guards made of non-combustible material or a mesh or perforated sheet with a maximum aperture of 2mm, made of corrosion-resistant steel, bronze or aluminium.
	Tiled roofs	Tiled roofs shall be fully sarked. The sarking shall— (a) be located on top of the roof framing, except that the roof battens may be fixed above the sarking; (b) cover the entire roof area including ridges and hips; and (c) extend into gutters and valleys.
	Sheet roofs	Sheet roofs shall— (a) be fully sarked in accordance with Clause 5.6.2, except that foil-backed insulation blankets may be installed over the battens; and (b) have any gaps greater than 3 mm (such as under corrugations or ribs of sheet roofing and between roof components) sealed at the fascia or wall line and at valleys, hips and ridges by— (i) a mesh or perforated sheet with a maximum aperture of 2 mm, made of corrosion-resistant steel, bronze or aluminium; or (ii) mineral wool; or (iii) other non-combustible material; or (iv) a combination of any of Items (i), (ii) or (iii) above.
	Veranda, carport awning roofs	The following apply to veranda, carport and awning roof: A veranda, carport or awning roof forming part of the main roof space, (see figure D1 (a), Appendix D of AS 3959-2009), shall meet all requirements for the main roof, as specified in Clauses 5.6.1,

		5.6.2, 5.6.3, 5.6.5 and 5.6.6 of AS 3959-2009. A veranda, carport or awning roof separated from the main roof space by an external wall, (see figures D1 (b) and D1 (c), Appendix D of AS 3959-2009), complying with clause 5.4 of AS 3959-2009, shall have a non-combustible roof covering.
	Roof penetrations	The following applies to roof penetrations: Roof penetrations, including roof lights, roof ventilators, roof mounted evaporative cooling units, aerials, vent pipes and supports for solar collectors, shall be adequately sealed at the roof to prevent gaps greater than 3 mm. The material used to seal the penetration shall be non-combustible. Openings in vented roof lights, roof ventilators or vent pipes shall be fitted with ember guards made from a mesh or perforated sheet with a maximum aperture of 2 mm, made of corrosion-resistant steel, bronze or aluminium. This requirement does not apply to the exhaust flues of heating or cooking devices with closed combustion chambers. In the case of gas appliance flues, ember guards shall not be fitted. NOTE: Gasfitters are required to provide a metal flue pipe above the roof and terminate with a certified gas flue cowl complying with AS 4566. Advice may be obtained from State gas technical regulators. Grade A safety glass complying with AS 1288 is required for all overhead glazing. Glazed elements in roof lights and skylights may be a polymer provided a Grade A safety glass diffuser, complying with AS 1288, is installed under the glazing. Where glazing is an insulating glazing unit (IGU), Grade A toughened safety glass minimum 4 mm thickness, shall be used in the outer pane of the IGU. Flashing elements of tubular skylights may be of a fire-retardant material, provided the roof integrity is maintained by an under-flashing of a material having a flammability index no more than 5. Evaporative cooling units shall be fitted with non-combustible butterfly closers as close as practicable to the roof level or the unit shall be fitted with non-combustible covers with a mesh or perforated sheet with a maximum aperture of 2 mm, made of corrosion-resistant steel, bronze or aluminium. Vent pipes made from PVC are permitted.
	Eaves lining, fascia's and gables.	The following apply to eaves linings, fascia's and gables: (a) Gables shall comply with Clause 5.4 of AS 3959-2009. (b) Eaves penetration shall be protected the same as for roof penetrations, as specified in Clause 5.6.5. (c) Eaves ventilation openings greater than 3 mm shall be fitted with ember guards made of non-combustible material or a mesh or perforated sheet with a maximum aperture of 2mm, made of corrosion-resistant steel, bronze or aluminium. Joints in eaves linings, fascia's and gables may be sealed with plastic joining strips or timber storm moulds. This Standard does not provide construction requirements for fascia's,

		bargeboards and eaves linings.
	Gutters and downpipes.	This Standard does not provide requirements for— (a) Gutters, with the exception of box gutters; and (b) Downpipes. If installed, gutter and valley leaf guards shall be non-combustible. Box gutters shall be non-combustible and flashed at the junction with the roof with non-combustible material.
Verandas, Decks, Steps, Ramps and landings.	General	Decking may be spaced. There is no requirement to enclose the subfloor spaces of verandas, decks, steps, ramps or landings.
	Enclosed subfloor spaces of verandas, decks, steps, ramps and landings.	Materials to enclose a subfloor space The subfloor spaces of verandas, decks, steps, ramps and landing are considered to be 'enclosed' when- (a) the material used to enclose the subfloor space complies with Clause 7.4 of AS 3959-2009; and (b) all openings greater than 3 mm are screened with a corrosion-resistant steel, bronze or aluminium mesh with a maximum aperture of 2mm. Supports This standard does not provide construction requirements for support posts, columns, stumps, stringers, piers and poles. Framing This standard does not provide construction requirements for the framing of verandas, decks, ramps or landing (i.e., bearers and joists). Decking, stair treads and the trafficable surfaces of ramps and landings Decking, stairs treads and trafficable surfaces of ramps and landings shall be- (a) of non-combustible material; or (b) of bushfire-resisting timber (see Appendix F); or (c) a combination of items above.
	Unenclosed subfloor spaces of verandas, decks, ramps and landings.	Supports Support posts, columns, stumps, stringers, piers and poles shall be; (a) of non-combustible material; or (b) of bushfire-resisting timber (see Appendix F of AS 3959-2009); or (c) a combination of items above. Framing Framing of verandas, decks, ramps or landing (i.e. bearers and joists), shall be: (a) of non-combustible material; or (b) of bushfire-resisting timber (see Appendix F of AS 3959-2009); or (c) a combination of the items above Decking, stair treads and the trafficable surfaces of ramps and landings Decking, stair treads and the trafficable surfaces of ramps and landings shall - (a) of non-combustible material; or (b) of bushfire-resisting timber (see Appendix F of AS 3959-2009); or

		(c) a combination of items above
	Balustrades, handrails or other barriers	Those parts of the handrails and balustrades less than 125 mm from any glazing or any combustible wall shall be- (a) of non-combustible material; or (b) of bushfire-resisting timber (see Appendix F of AS 3959-2009); or (c) a combination of items above Those parts of the handrails and balustrades that are 125 mm or more from the building have no requirements.
Water and gas supply pipe		Above-ground water and gas supply pipes shall be metal.

Note: Any sarking shall be:

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

*** This includes Addendum: Appendix 3 of Planning for Bushfire Protection, 2006.**