BUSHFIRE ASSESSMENT REPORT

SHAOLIN TOURIST AND RESIDENTIAL DEVELOPMENT
COMBERTON GRANGE
SOUTH NOWRA

AUGUST 2012
(REF: 2025)

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PREFACE

This document prepared by *Conacher Environmental Group* provides an assessment of the bushfire attack potential and the necessary bushfire protection strategies for the proposed development located at Comberton Grange, South Nowra. Aspects considered in relation to the Bushfire Assessment Report include; vegetation type, slopes, water supplies, entry and egress access, provision of asset protection zones, defendable space and construction standards for the proposed buildings.

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SECTION 1

INTRODUCTION

1.1 INTRODUCTION

This Bushfire Assessment Report has been prepared by *Conacher Environmental Group* for a proposed multi-type tourist and residential development located at the Comberton Grange, South Nowra.

The objectives of this Report are to:

i) Address the relevant requirements of Planning for Bushfire Protection (Rural Fire Service, 2006);

ii) Identify if the development complies with the aims and objectives of Planning for Bushfire Protection (RFS, 2006);

iii) Prepare a Report that supplies the relevant information for the Rural Fire Service and Council prior to granting a Bushfire Safety Authority (RFS) or development approval (Council).

1.2 DESCRIPTIOPN OF THE SUBJECT SITE

Location

The subject site covers approximately 1248 hectares located off Comberton Grange Rd and Forest Rd approximately 2 kilometres east of the Princess Highway. The site is located 6 kilometres from South Nowra. The proposed development is to be located in the southern and northern parts of the site.

Topography

The site is characterised by undulating hills and hill crests with moderately sloped hill sides. Floodplains associated with Currambene Creek are located in the southern parts of the site.

Elevations range from 1 metre in the south to 76 metres in the eastern parts of the site. Slope gradients are highly variable with low slope gradients of 1-5^{o} present in the southern and western parts of the site with steeper slope gradients of 5-10^{o} located in the northern parts and along various hill slopes to the north of the site.

Drainage

Several small drainage lines flow through the areas of proposed development which flow into Georges Creek. Georges Creek is a tributary of Curambene Creek. The site is located within the Jarvis Bay catchment area.

Vegetation

In relation to bushfire hazard the principal vegetation of the site comprises dry sclerophyll forests dominated by Scribbly Gum, Silvertop Ash, Blackbutt, Spotted Gum and some remnant pine plantation forests.

This vegetation varies in species composition and structure depending on its topographic location, soil types, drainage patterns and past disturbance. For bushfire assessment purposes the vegetation is classified as having a dry sclerophyll forest vegetation formation.

A detailed flora survey and vegetation community description has been prepared by Kevin Mills and Associates.

1.3 PROPOSED DEVELOPMENT

The proposed development will be an integrated tourist and religious facility with associated residential development within community title provisions managed under the ownership of the Shaolin Temple Foundation.

The proposed Shaolin Village will comprise the following developments:

- Buddhist Temple Sanctuary Precinct;
- Village Centre Precinct;
- Health and Wellness Precinct;
- Hotel and Tourist Cabin Precinct;
- Information Precinct;
- Three Residential Precincts;
- Eighteen hole Golf Course surrounding the central and northern parts of the site;
- Extensive landscaping, gardens and open space areas.

The project is being assessed under the provisions of Part 3A of the EP & A Act.

SECTION 2

BUSHFIRE ATTACK ASSESSMENT

2.1 BUSHFIRE ASSESSMENT CRITERIA

Bushfire Prone Land Map
Council's Bushfire Prone Land Map shows that the site is located within an area mapped as containing Category I Vegetation.

Forest Fire Danger Index
The subject site is located within the Shoalhaven City Council Local Government Area in the Illawarra / Shoalhaven Fire Area. The Forest Fire Danger Index for the Illawarra / Shoalhaven Fire Area is rated at 100 for use in determining asset protection zone requirements and categories for bushfire attack.

Vegetation Classification
The vegetation within 140 metres of the proposed development is classified as forest. Following development, some of this vegetation will be removed for buildings and therefore the internal vegetation types will change and will have a lower bushfire hazard following development.

Development Category
The residential and rural residential development are subject to bushfire attack construction levels (BAL) identified in the Building Code of Australia with building levels to conform with AS3959-2009 Construction of Buildings in Fire Prone Areas.

The proposed Educational, Village Centre, Health and Temple Sanctuary Precincts parts of the development is classified as a Special Fire Protection Purpose (SFPP) under Chapter 4 of Planning for Bushfire Protection (RFS 2006).

Planning for Bushfire Protection (RFS, 2006)
Due to the presence of bushfire prone land within and adjacent to the proposed developments on the Bushfire Prone Land Map the development proposed is required to include a Bushfire Assessment Report prepared in accordance with the requirements of *Planning for Bushfire Protection* (RFS 2006).

State Legislation
The development within the site is subject to the provision of the EP&A Act and the Rural Fires Act in relation to bushfire hazard assessment and protection.

Adjoining and Surrounding Development

The site is adjoined in all directions by underdeveloped bushland areas, including areas of State Forest.

2.2 BUSHFIRE ATTACK ASSESSMENT

An assessment of the bushfire attack in relation to each of the proposed development precincts is provided in Tables 2.1 to 2.8.

TABLE 2.1 BUSHFIRE ATTACK ASSESSMENT (VILLAGE CENTRE PRECINCT SFPP) (from Table A2.6 RFS, 2006)			
Direction	**Vegetation Classification (within 140m) After Development**	**Effective Slope (within 100m)**	**Recommended Width of APZ (metres)**
North	Forest	0-5^{o} downslope	70
South	Golf Course/ Managed Land	0-5^{o} upslope	NR
East	Forest	0-5^{o} downslope	70
West	Golf Course/ Managed Land	0-5^{o} upslope	NR
NR – No requirement as no bushfire hazard present			

TABLE 2.2 BUSHFIRE ATTACK ASSESSMENT (EDUCATIONAL PRECINCT SFPP) (from Table A2.6 RFS, 2006)			
Direction	**Vegetation Classification (within 140m) After Development**	**Effective Slope (within 100m)**	**Recommended Width of APZ (metres)**
North	Forest	0-5^{o} downslope	70
South	Managed Land	0-5^{o} downslope	NR
East	Forest	0-5^{o} downslope	70
West	Forest	0-5^{o} upslope	60
NR – No requirement as no bushfire hazard present			

TABLE 2.3 BUSHFIRE ATTACK ASSESSMENT (TEMPLE SANCTUARY PRECINCT SFPP) (from Table A2.6 RFS, 2006)			
Direction	**Vegetation Classification (within 140m) After Development**	**Effective Slope (within 100m)**	**Recommended Width of APZ (metres)**
North	Gardens/Managed Land	0-5^{o} downslope	NR
South	Forest	0-5^{o} downslope	70
East	Golf Course/Managed Land	0-5^{o} downslope	NR
West	Forest	0-5^{o} downslope	70
NR – No requirement as no bushfire hazard present			

TABLE 2.4 BUSHFIRE ATTACK ASSESSMENT (HEALTH & WELLNESS PRECINCT SFPP) (from Table A2.6 RFS, 2006)			
Direction	**Vegetation Classification (within 140m) After Development**	**Effective Slope (within 100m)**	**Recommended Width of APZ (metres)**
North	Managed Land	0-5^{o} downslope	NR
South	Managed Land	0-5^{o} upslope	NR
East	Managed Land	0-5^{o} downslope	NR
West	Managed Land	0-5^{o} upslope	NR
NR – No requirement as no bushfire hazard present			

TABLE 2.5 BUSHFIRE ATTACK ASSESSMENT (HOTEL PRECINCT SFPP) (from Table A2.6 RFS, 2006)			
Direction	**Vegetation Classification (within 140m) After Development**	**Effective Slope (within 100m)**	**Recommended Width of APZ (metres)**
North	Forest	0-5^{o} downslope	70
South	Forest	0-5^{o} downslope	70
East	Forest	0-5^{o} upslope	60
West	Forest	0-5^{o} upslope	60
NR – No requirement as no bushfire hazard present			

TABLE 2.6 BUSHFIRE ATTACK ASSESSMENT (RESIDENTIAL PRECINCT A) (from Table A2.4 RFS, 2006)			
Direction	**Vegetation Classification (within 140m) After Development**	**Effective Slope (within 100m)**	**Recommended Width of APZ (metres)**
North	Forest	0-5^{o} upslope	20
South	Forest	0-5^{o} downslope	25
East	Managed Land	0-5^{o} downslope	25
West	Forest	0-5^{o} downslope	25
NR – No requirement as no bushfire hazard present			

TABLE 2.7 BUSHFIRE ATTACK ASSESSMENT (RESIDENTIAL PRECINCT B) (from Table A2.4 RFS, 2006)			
Direction	**Vegetation Classification (within 140m) After Development**	**Effective Slope (within 100m)**	**Recommended Width of APZ (metres)**
North	Forest	0-5^{o} downslope	25
South	Forest	0-5^{o} downslope	25
East	Managed Land	0-5^{o} downslope	NR
West	Forest	0-5^{o} upslope	20
NR – No requirement as no bushfire hazard present			

TABLE 2.8 BUSHFIRE ATTACK ASSESSMENT (RESIDENTIAL PRECINCT C) (from Table A2.4 RFS, 2006)			
Direction	**Vegetation Classification (within 140m) After Development**	**Effective Slope (within 100m)**	**Recommended Width of APZ (metres)**
North	Forest	0-5^{o} upslope	20
South	Forest	0-5^{o} downslope	25
East	Forest	0-5^{o} downslope	25
West	Forest	0-5^{o} downslope	25
NR – No requirement as no bushfire hazard present			

The bushfire attack assessments provided in Tables 2.1–2.8 has identified that the surrounding forest vegetation is the principal bushfire hazard impacting on future development. This assessment has considered the retention of native vegetation within the main drainage lines as provided in the concept master plan. For bushfire assessment purposes this riparian vegetation has been assessed as a forest vegetation formation and not as remnant vegetation because the width of the riparian zone vegetation is greater than 20 metres and the area of retained vegetation exceeds one hectare in area. Therefore these areas of retained riparian vegetation do not qualify as being categorised as remnant vegetation within the provisions of Planning for Bushfire Protection (RFS 2006). The APZ distances have been determined following the assessment requirements of Planning for Bushfire Protection (RFS 2006).

The Information Centre Precinct is not classified as a residential subdivision or a Special Fire Protection Purpose Development. Future buildings in this precinct are likely to be a Class 5 (Office) type building which are not subject to the bushfire attack level construction requirements of AS3959-2009. However the provision of areas of car parks, lawns and gardens and golf course areas around the Information Centre Precinct will provide a suitable area of defendable space and asset protection zones for buildings within this precinct.

SECTION 3

BUSHFIRE PROTECTION MATTERS

3.1 ASSET PROTECTION ZONE AND BUSHFIRE HAZARD MANAGEMENT

The distances for asset protection zones to buildings within each of the proposed precincts are identified in Tables 2.1 to 2.8. These APZ distances vary according to the slope gradients of the land which contains the bushfire hazard which is assessed as a forest vegetation formation. These APZ distances also vary depending on whether the development is for the Educational, Village, Temple or Health Precincts (special fire protection purposes) or for rural/residential dwellings. For rural/residential dwellings the APZ distances will vary for the level of construction of dwellings identified by AS3959-2009. The APZ distances increase as the level of construction for dwellings decrease from BAL 12.5 to BAL 40.

3.2 BUILDING CONSTRUCTION LEVELS

Due to the isolated nature of the site and potential bushfire hazard affecting the areas of proposed tourist and residential development and the distance to the bushfire hazard, the future residential dwellings should be constructed to at least a BAL 12.5 construction standard (AS3959-2009).

The specific construction levels for future residential dwellings will be dependent on the slope gradient, topographical location of future dwellings and overall distance from the dwelling to the areas of retained forest vegetation external to the site or located within the riparian areas and other site areas. The Bushfire Attack Levels applicable to the subject site are summarised in Table 3.1 and have been determined from analysis of site topography, slope and vegetation and the requirements of Table 2.4.2 of AS3959-2009.

TABLE 3.1
BUILDING CONSTRUCTION REQUIREMENTS

VEGETATION SLOPE	BUSHFIRE ATTACK LEVELS				
	BAL FZ	BAL 40	BAL 29	BAL 19	BAL 12.5
	DISTANCE FROM BUILDING TO BUSHFIRE HAZARD (M)				
FOREST UPSLOPE	<19	19-<25	25-<35	35-<48	48-100
FOREST DOWNSLOPE 0-5^{o}	<24	24-<32	32-<43	43-<57	57-<100
FOREST DOWNSLOPE 5-10^{o}	<31	31-<39	39-<53	53-<69	69-<100

3.3 ACCESS

Section 4.2.7 of PBP (RFS 2006) outlines the requirements for public access roads within a SFPP development. The objective of the public access road system in a bushfire emergency is stated in PBP (RFS 2006) as:

"The public road system in a bush fire prone area should provide alternative access or egress for fire fighters and residents during a bush fire emergency if part of the road system is cut by fire. This is of critical importance for areas with the higher densities associated with SFPP developments."

and

"For internal roads, at least one alternative access road needs to be provided for individual dwellings or groups of dwellings more than 200 metres from a public through road. The routes of these roads should be selected to ensure that both roads are unlikely to be simultaneously cut by a fire.

Short access roads are preferable to long ones for the safe evacuation of residents and for emergency service personnel. Therefore dwellings should be sited as close as possible to public through roads.

Large numbers of vehicles may be attempting to simultaneously enter or leave an area, congesting roads and restricting fire services and other emergency services personnel accessing an area. For this reason, roads should be planned for suitable widths to permit access into and out of the area during such situations."

Other acceptable solutions for public access roads are shown on page 35 of PBP (RFS 2006). A summary of these acceptable solutions is provided below:

- internal roads are two-wheel drive, sealed, all-weather roads;
- internal perimeter roads are provided with at least two traffic lane widths (carriageway 8 metres 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 100 metres in length from a through road, incorporate a minimum 12 metres outer radius turning circle, and are clearly sign posted as a dead end;
- maximum grades do not exceed 15 degrees and average grades are not more than 10 degrees;
- the internal road surfaces and bridges have a capacity to carry fully-loaded firefighting vehicles (15 tonnes).

Due to the location of the proposed development as a large, isolated development, and the extent of access roads required through bushfire prone forested lands it is appropriate that the Rural Fire Service be consulted to comment on the access proposals for this development.

The provision of maintained asset protection zones along the access roads may also be required by RFS.

3.4 WATER SERVICES

If the proposed development is to be connected to Councils reticulated water supply, the reticulated mains (town) water supply, fire hydrant spacing, sizing and pressure is to comply with the requirements of AS2419.1 – 2005. A certification or test report from the Water Supply Authority is to be provided to demonstrate that the requirements of AS2419.1-2005 can be achieved during a bushfire event.

The provision of on-site dedicated water supply for bushfire fighting purposes should be implemented with this project. The extent and design for on-site storage of water for use during a bushfire emergency should be determined following detailed consultation with the RFS.

SECTION 4

CONCLUSIONS AND RECOMMENDATIONS

4.1 AIM AND OBJECTIVES OF PLANNING FOR BUSHFIRE PROTECTION

"*The aim of Planning for Bushfire Protection is to use the NSW development assessment system to provide for the protection of human life and to minimise impacts on property form the threat of bushfire, while having due regard to development potential, on site amenity and protection of the environment" (PBP pg 1).*

The preparation of this Bushfire Assessment Report and subsequent assessment by Council and the Rural Fire Service ensures compliance with the aim of Planning for Bushfire Protection.

The following comments are provided in relation to satisfying the objectives of PBP.

Objective 1
(i) afford occupants of any building adequate protection from exposure to a bush fire;

Future dwellings will be required to be constructed to achieve construction levels of between BAL 40 and BAL 12.5 depending on the extent of asset protection zones implemented. APZ provisions are also relevant to the tourist accommodation and training academy. As identified in Tables 2.1 to 2.7 the width of the asset protection zone is variable, depending on the vegetation type present, slope gradient of the land and whether the vegetation is upslope or downslope of proposed dwellings.

Objective 2
(ii) provide for a defendable space to be located around buildings;

All dwellings and buildings can be constructed with the provision for defendable space to all aspects of the buildings. This defendable space will be incorporated into the asset protection zones within each of the proposed development zones. The perimeter golf course provides a defendable space and APZ for the development precincts (excluding Residential Precinct C).

The design and provision of major bushfire refuge areas within the development will need to be incorporated into the village design to provide occupants with a safe refuge area designed to withstand impacts of a bushfire event. The location and size of the refuge areas will need further consultation with the RFS prior to project finalisation.

Objective 3
(iii) provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent direct flame contact and material ignition;

This objective can be achieved for the proposed development through the combination of asset protection zones and building construction levels.

Objective 4
(iv) ensure that safe operational access and egress for emergency service personnel and residents is available;

All new roads will require design and construction to meet the performance standards for access/egress roads identified in Planning for Bushfire Protection (RFS 2006).

Objective 5

(v) provide for ongoing management and maintenance of bush fire protection measures, including fuel loads in the asset protection zone (APZ);

The requirements for management and maintenance of bushfire protection measures including fuel loads in the Asset Protection Zones (APZs) is to be undertaken by the community association in accordance with a future Bushfire Hazard Reduction Plan.

Objective 6

(vi) ensure that utility services are adequate to meet the needs of fire fighters (and others assisting in bush fire fighting)

The adequacy of utility services such as water supply is discussed in Section 3.4 of this document. The utility services will need to be adequate to meet the needs of fire fighters (and others assisting in bush fire fighting).

4.2 CONCLUDING COMMENTS

Bushfire protection requirements for the proposed dwellings and associated precincts will be required to comply with PBP (RFS 2006). Bushfire protection is achievable by establishing separation distance and suitably sized asset protection zones to all aspects and the utilisation of an adequate water supply.

The 'Deemed to Comply' requirements for the proposed development cannot be provided at this stage as further consultation is required with the RFS before some important details on access, water supply, emergency refuge and evacuation planning can be finalised.

4.3 RECOMMENDATIONS

The following recommendations are provided for future planning in relation to reducing the potential for loss of life and property by the impact of bushfire.

i. All APZs should be maintained as Inner Protection Areas (IPAs) as described in Section 4.1.3 of PBP (RFS, 2006).
ii. The access roads to any part of the proposed development are to comply with the requirements of Section 4.2.7 of PBP (RFS 2006).
iii. Regular inspections and maintenance of the APZs within the subject site is to be undertaken by the owners / managers (or their agents) according to PBP (RFS, 2006).
iv. The requirements for access, APZs and adequate water supply within the proposed development should be discussed with the Rural Fire Service.
v. An Evacuation Plan is recommended for this site.
vi. A Fuel Management Plan/Bushfire Hazard Reduction Plan is to be prepared for any future development of the site.
vii. This report should be referred to the Rural Fire Service for their review, and comment and also for their advice regarding possible solutions for bushfire protection and compliance issues for the proposed development.

REFERENCES

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

Rural Fire Service (2006) Planning for Bushfire Protection. A Guide for Councils Planners, Fire Authorities and Developers. NSW Rural Fire Service and Dept of Planning.

Standard Australia (2009) AS3959 Construction of Buildings in Bushfire Prone Areas.

Standard Australia (2005) AS2419.1 – 2005 Fire Hydrant Installations System Design, Installation and Commissioning