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SPECIAL FIRE PROTECTION PURPOSE BUSHFIRE HAZARD ASSESSMENT

PROPOSED BAPS SWAMINARAYAN HINDU TEMPLE AT230-242 ALDINGTON
ROAD, KEMPS CREEK

LGA: Penrith
Lot 18 DP 253503
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SFPP BUSHFIRE HAZARD ASSESSMENT

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GRAD DIP BUSH FIRE PROTECTION, UWS
GRAD DIP ENVIRO MANG HERTS, UK,
GRAD DIP NAT RES UNE,
BSC APP SC, AGRICULTURE HAC

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This report aims to achieve the objectives of the PBP (2006):

1. Afford occupants of any building adequate protection from exposure to bushfire;
2. Provide for a defensible space to be located around buildings;
3. Provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent direct flame contact and material ignition;
4. Ensure that safe operational access and egress for emergency service personnel and residents is available;
5. Provide for ongoing management and maintenance of bush fire protection measures, including fuel loads in the asset protection zone (APZ);
6. Ensure that utility services are adequate to meet the needs of firefighters (and others assisting in bush firefighting);

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EXECUTIVE SUMMARY

This Bushfire Hazard Assessment was prepared for a Development Application for the proposed a BAPS Swaminarayan Hindu Temple at 230-242 Aldington Road, Kemps Creek.

This site will include facilities of a Traditional Temple, Community Kitchen and Dining Hall, Prayer and Congregation hall, Youth and Sport Centre, Offices, Community Garden, Library, Book Store and car parks for cars and busses.

This assessment identifies the main bushfire threat to be:

- Upslope Grassland located on the northern and western elevations;
- Downslope 0-5 degree Grassland located on the southern and eastern elevations;

The proposed Monks Residence can meet **BAL 12.5** as specified by AS3959 -2009 Construction for Buildings in Bushfire Prone Areas.

The proposed Mandir can meet **BAL 12.5** as specified by AS3959 -2009 Construction for Buildings in Bushfire Prone Areas.

The proposed Community Facilities Building can meet **BAL 29** on the northern and southern boundary facades and **BAL 19** on the eastern and western facades as specified by AS3959 -2009 Construction for Buildings in Bushfire Prone Areas.

An APZ over the entire subject lot should be established for and maintained for perpetuity.

The internal access provides a two-wheel drive, sealed, all weather, perimeter road with a width of 7.62 m. The access provides an entrance and exit from the site to Aldington Road. These exits face away from unmanaged land on the eastern side of the site.

The proposed internal access is required to comply with the PBP- Property Access. This includes:

- Curves a minimum inner radius of six metres;
- The minimum distance between inner and outer curves is six metres;
- The crossfall is not more than 10 degrees;
- Maximum grades for sealed roads do not exceed 15 degrees (28 per cent) and not more than 10 degrees (18 percent) for unsealed roads;
- The internal road surfaces and bridges have a capacity to carry fully loaded firefighting vehicles (28 tonnes).

Reticulated water is supplied to the subject lot and water supply is located at regular intervals. Access points for reticulated water supply are to incorporate a ring main system for all internal roads. Fire hydrants provided throughout the site should comply with the spacing, sizing and pressures of AS 2419.1 2005.

Any bottled gas will be installed and maintained in accordance with AS1596 and the requirements of the relevant authority. If gas cylinders need to be kept close to the buildings, the release valves must be directed away from the building and away from any combustible material. Polymer sheathed flexible gas supply lines to gas meters adjacent to buildings are not to be used.

Electrical transmission lines, if above ground, will be managed in accordance with specifications issued by Energy Australia.

An emergency /evacuation plan will be required as described in the PBB 2006. This will need to meet the criteria of the RFS guidelines for the Preparation of *Emergency/Evacuation Plan*. A copy must be submitted to the local Bushfire Management Committee for their information.

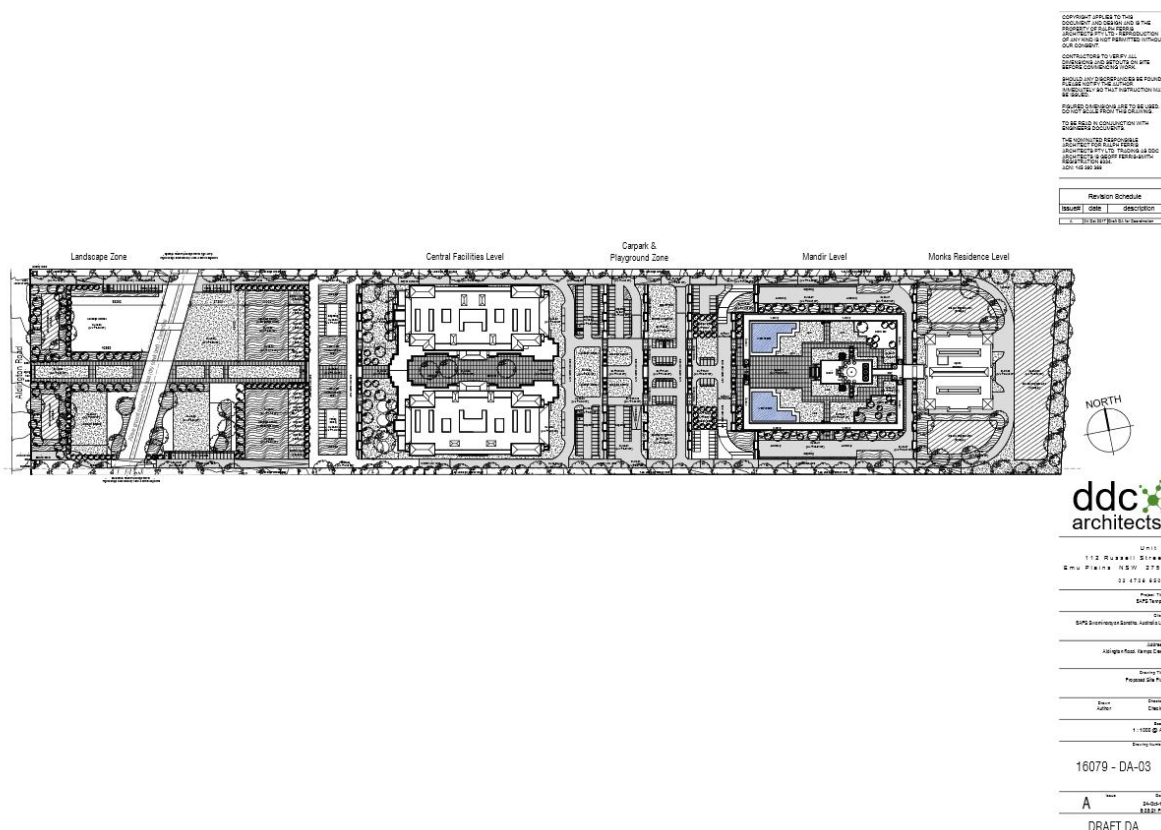
1. PROPOSAL

Harris Environmental Consulting was commissioned to undertake this Bushfire Hazard Assessment. The owners of 230-242 Aldington Road, Kemps Creek propose a BAPS Swaminarayan Hindu Temple on Lot 18 DP 253503. This site will include facilities of a Traditional Temple, Community Kitchen and Dining Hall, Prayer and Congregation hall, Youth and Sport Centre, Offices, Community Garden, Library, Book Store and car parks for cars and busses. Figure 1 shows the proposed plans.

Visitors to the site will include approximately 600 patrons on a weekly basis for Sunday congregation. On weekdays and Saturdays it is expected around 40-50 patrons will be on site for individual prayers twice a day. For Festivals, it is expected up to 800 patrons to visit the site for 7 major festivals throughout the year.

The site will have 2 on-site managers that will be residing on the property. There will also be 7-8 monks living on site on an irregular basis. There will be a number of volunteers and workers on the site, on weekdays approximately 10 and on weekends and events up to approximately 50 people.

FIGURE 1 PROPOSED PLANS PROVIDED



2. PROPERTY DESCRIPTION

2.1 Subject Site

The subject lot is located on Aldington Road and is approximately 10.3 ha in size as shown in Figure 2. Figure 3 shows an extended aerial view of the location and shows how the proposal is located in Grassland. The Bushfire Prone Land Map from Penrith Council in Figure 4 shows how the property and surrounding lots are mapped “Category 2” on the Bushfire Prone Land Map. The LEP Zone Map shows the subject site is mapped “RU2 Rural Landscape” as shown in Figure 5.

FIGURE 2 LOCATION OF PROPERTY

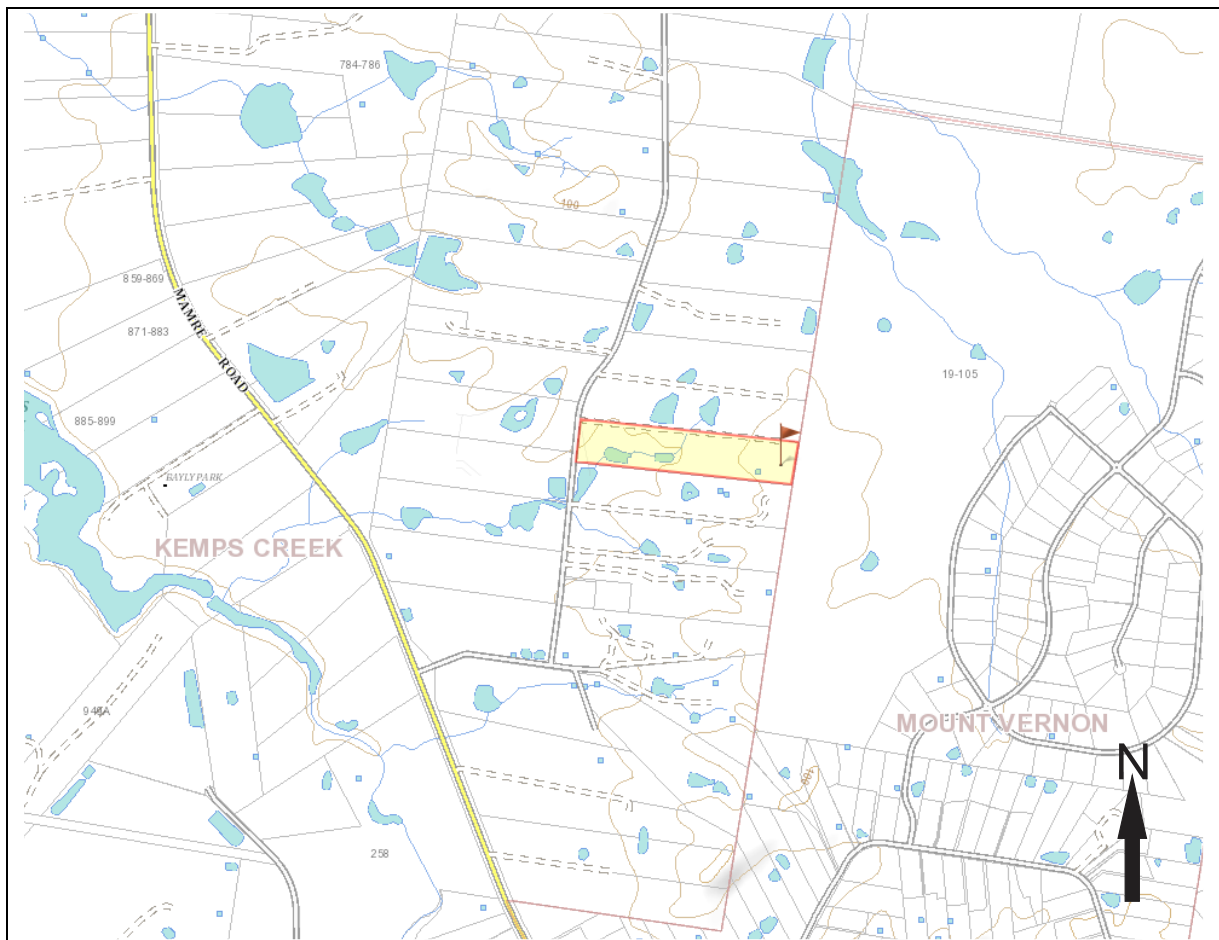
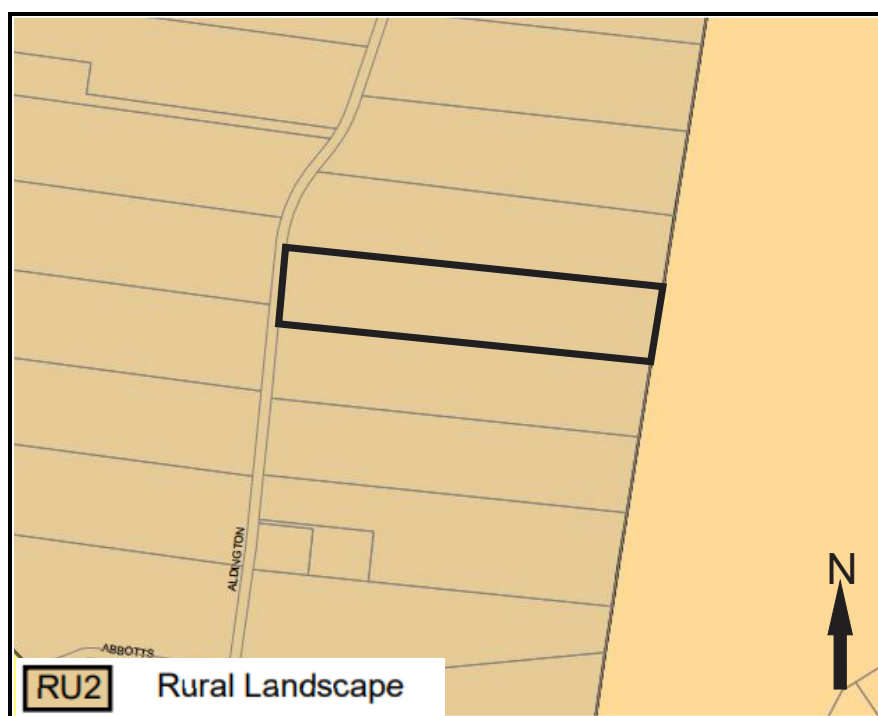


FIGURE 3 EXTENDED AERIAL VIEW OF THE SUBJECT LOT



FIGURE 4 BUSHFIRE PRONE LAND



FIGURE 5 LEP ZONE MAP

2.2 Slope and aspect of the site

The slope that would most significantly influence fire behaviour was determined over a distance of 100m out from the proposed building footprints. This assessment was made using digital contour map with 10 metre contour intervals and field inspection.

Table 1 summarises the identified effective slope in accordance with the PBP (2006) to a distance of 100m. The subject lot is located on a gentle slope that falls south east as shown in Figure 6.

TABLE 1 EFFECTIVE SLOPE

| ELEVATION | North | South | East | West |
|------------|---------|--------------------------|--------------------------|---------|
| TOPOGRAPHY | Upslope | Downslope 0-5 degrees | Downslope 0-5 degrees | Upslope |

FIGURE 6 **SLOPE**

2.3 Identification of significant environmental features

The owner has not provided any studies of environmental significance and no vegetation clearing will be required.

3. BUSHFIRE HAZARD ASSESSMENT REQUIREMENTS

3.1 SFPP Requirements

This proposal was assessed using the Planning for Bushfire Protection (PBP) (RFS, 2006) category of **Special Fire Protection Purposes (SFPP)**.

Special Fire Protection Purposes (SFPP) developments are required to obtain a Bush Fire Safety Authority (BFSA) from the Rural Fires Services (RFS) under section 100B of the *Rural Fires Act*.

There are a number of objectives for SFPP include:

- Minimise perimeters exposed to the bush fire hazards;
- Minimise bushland corridors that permit passage of bush fire;
- Ensure that separation distances (APZ) between a bush fire hazard and buildings enable conformity with the Deemed to satisfy requirements of the BCA;
- Ensure ongoing maintenance of asset protection zones;
- Provide clear and ready access to the public road system for all residents and emergency staff;
- Ensure provision of adequate supply of water and other services to facilitate effective firefighting.

Specific Objectives for SFPP include:

- Provide for the special characteristics and needs of occupants. These occupants are unlikely to be able to assist in property protection in the event of a fire;
- Provide for safe emergency evacuation procedures.

The above criteria may be achieved where:

- An APZ is provided according to PBP requirements. The APZ can include existing roads, other buildings or managed properties (RFS 2006). This assessment applies minimum specifications for asset protection zones for special fire protection purposes from Table A2.5 PBP 2006;
- Radiant heat levels of greater than 10k /m² will not be experienced by occupants or emergency services workers entering or exiting a building;
- Mechanisms are in place to provide for the maintenance of the APZ over the life of the development, is wholly within the boundaries of the development site;
- Buildings are sited and designed to minimise the risk of bush fire attack;
- Safe operational access is provided (and maintained) for emergency services personnel in suppressing bushfire while residents are seeking to relocate, in advance of a bushfire;
- Adequate water and utility services are provided for firefighting operations. Gas and electricity services are located so as not to contribute to the risk of fire to a building;
- Landscaping is designed and managed to minimise flame contact and radiant heat to buildings and the potential for wind driven embers to cause ignitions.

The Fire Rating Index is determined by the NSW RFS for fire areas and council areas across NSW and assumed for a 1 in 50 year event (Table A2.3, RFS 2006). The Greater Sydney Region has been determined to have an **FDI rating of 100** for a 1 in 50 year event.

Effective slope is calculated as the gradient within the hazard which will most significantly influence the fire behaviour of the site. The Australian Standard AS3959-2009 identifies that the slope of the land under the classified vegetation is much more important than the slope between the site and the edge of the classified vegetation.

4. VEGETATION FORMATIONS

4.1 Vegetation formations within 140 m

Figure 7 shows the Bushfire Prone Land within 140 m of the subject lot boundary. The vegetation formations are described below:

The land within the subject lot will be landscaped and maintained gardens and roads.

Northern Elevation

The land on the northern elevation is considered upslope and classified "Grassland" for the majority of the adjoining lot. There is a setback of 11 m from the Proposed Community Facility Building, 48 m for the Proposed Monks Residence and 30.5 m from the Proposed Manir.

Southern Elevation

The land on the southern elevation is considered downslope 0-5 degrees and classified "Grassland" for the majority of the adjoining lot. There is a setback of 11 m from the Proposed Community Facility Building, 41 m for the Proposed Monks Residence and 30.5 m from the Proposed Manir.

Eastern Elevation

The land on the eastern elevation is considered downslope 0-5 degrees and classified "Grassland". There is a setback of 48 m from the Proposed Monks Residence.

Western Elevation

The land on the western elevation of the subject lot is considered upslope and classified "Grassland". This vegetation is not within 100 m of the proposed buildings

FIGURE 7 VEGETATION FORMATIONS 140 M



Photo 1 View of Grassland on the northern elevation



Photo 2 View of Grassland on the northern elevation



Photo 3 View of Grassland on the southern elevation



Photo 4 View of Grassland on the western elevation



5. BUSHFIRE PROTECTION MEASURES

5.1 APZ Required

For Special Fire Protection Purposes there is no minimum requirement for Grassland vegetation in the PBP (2006) and Table 2.4.2 of the AS3959 (2009) was used in this case using the vegetation and slope data identified. An FDI of 100 was used for this location.

An APZ over the entire subject lot should be established for and maintained for perpetuity.

TABLE 2 APZ AND BAL DETERMINATION FOR PROPOSED MONKS RESIDENCE

| | <i>NORTH</i> | <i>SOUTH</i> | <i>EAST</i> | <i>WEST</i> |
|--|---------------------|--------------------------|--------------------------|--------------------|
| GRADIENT | Upslope | Downslope 0-5 degrees | Downslope 0-5 degrees | Upslope |
| VEG | Grassland | Grassland | Grassland | Grassland |
| Distance between façade and vegetation | 48 m | 41 m | 48 m | >50 m |
| AS 3959 less than BAL 12.5 required APZ | 19-<50 m | 22-<50 m | 22-<50 m | 19-<50 m |
| BAL required | BAL 12.5 | BAL 12.5 | BAL 12.5 | BAL 12.5 |

TABLE 3 APZ AND BAL DETERMINATION FOR PROPOSED MANIR

| | NORTH | SOUTH | EAST | WEST |
|--|-----------------|--------------------------|--------------------------|-----------------|
| GRADIENT | Upslope | Downslope 0-5 degrees | Downslope 0-5 degrees | Upslope |
| VEG | Grassland | Grassland | Grassland | Grassland |
| Distance between façade and vegetation | 30.5 m | 30.5 m | >50 m | >50 m |
| AS 3959 less than BAL 12.5 required APZ | 19-<50 m | 22-<50 m | 22-<50 m | 19-<50 m |
| BAL required | BAL 12.5 | BAL 12.5 | BAL 12.5 | BAL 12.5 |

TABLE 4 APZ AND BAL DETERMINATION FOR PROPOSED COMMUNITY FACILITY BUILDING

| | NORTH | SOUTH | EAST | WEST |
|---|---------------|--------------------------|--------------------------|---------------|
| GRADIENT | Upslope | Downslope 0-5 degrees | Downslope 0-5 degrees | Upslope |
| VEG | Grassland | Grassland | Grassland | Grassland |
| Distance between façade and vegetation | 11 m | 11 m | >50 m | >50 m |
| AS 3959 less than BAL 29 required APZ | 9-<13 m | 10-<15 m | | |
| BAL required | BAL 29 | BAL 29 | BAL 19 | BAL 19 |

5.2 Adequate Water and Utility Services

Reticulated water is supplied to the subject lot and water supply is located at regular intervals. Access points for reticulated water supply are to incorporate a ring main system for all internal roads. Fire hydrants provided throughout the site should comply with the spacing, sizing and pressures of AS 2419.1 2005.

Electrical transmission lines are to be located underground where possible. Electrical transmission lines, if above ground, will be managed in accordance with specifications issued by Energy Australia.

Any bottled gas will be installed and maintained in accordance with AS1596 and the requirements of the relevant authority. If gas cylinders need to be kept close to the buildings, the release valves must be directed away from the building and away from any combustible material. Polymer sheathed flexible gas supply lines to gas meters adjacent to buildings are not to be used.

5.3 Construction Standards

The Australian Standard AS3939 – 2009 is the enabling standard that addresses the performance requirements of both parts 2.3.4 and Part GF5.1 of the Building Code of Australia for the construction of the Class 1, 2 and Class 3 buildings within a designated Bushfire Prone Area.

In regard to Special Fire Protection Purpose developments, the PBP 2006 recognises the need for more reliance on space around buildings (as defensible space and APZs for fuel load control) and less reliance on construction standards. It is also anticipated that some developments are hard to ember proof.

The following was determined for this site:

Relevant fire danger index..... FD1 100
Flame temperature1090 K

The proposed Monks Residence can meet **BAL 12.5**.

The proposed Mandir can meet **BAL 12.5**.

The proposed Facilities Building can meet:

- **BAL 29** on the northern and southern boundary facades;
- **BAL 19** on the eastern and western facades.

5.4 Access

The PBP (2006) requires the provision of safe operational access to structures and water supply for emergency services, while residents are seeking to evacuate from an area.

The subject property is located on Aldington Road. This is a two-wheel drive, all weather road. The capacity of road surfaces and bridges is sufficient to carry fully loaded firefighting vehicles.

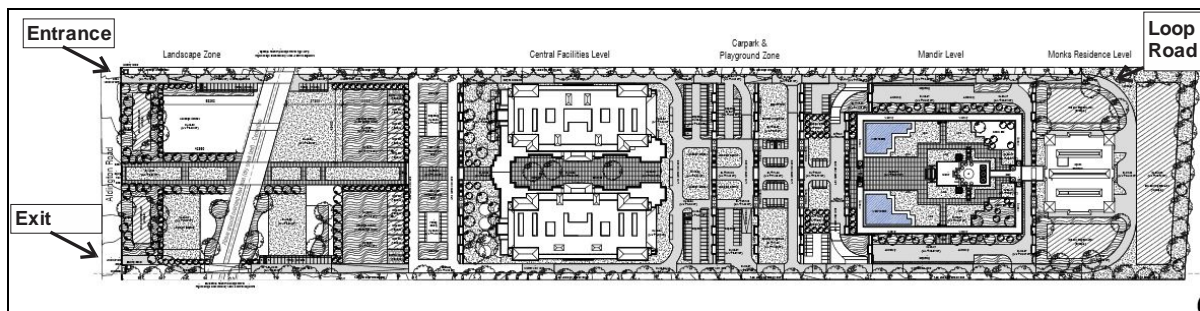
The internal access provides a two-wheel drive, sealed, all weather, perimeter road with a width of 7.62 m. The access provides an entrance and exit from the site to Aldington Road. These exits face away from unmanaged land on the eastern side of the site. The internal access is shown in Figure 8.

The internal access provides enough turning area for firefighting vehicles.

The proposed internal access is required to comply with the PBP- Property Access. This includes:

- Curves a minimum inner radius of six metres;
- The minimum distance between inner and outer curves is six metres;
- The crossfall is not more than 10 degrees;
- Maximum grades for sealed roads do not exceed 15 degrees (28 per cent) and not more than 10 degrees (18 percent) for unsealed roads;
- The internal road surfaces and bridges have a capacity to carry fully loaded firefighting vehicles (28 tonnes).

FIGURE 8 PLAN OF ACCESS



5.5 Emergency Management

An emergency /evacuation plan will be required as described in the PBB 2006. This will need to meet the criteria of the RFS guidelines for the Preparation of *Emergency/Evacuation Plan*. A copy must be submitted to the local Bushfire Management Committee for their information.

6. LANDSCAPING

An Asset Protection Zone is proposed to be provided over the entire subject lot and maintained for perpetuity.

Appendix 5 (PBP) provides guidelines for landscaping and Bushfire Provisions within the APZ. To incorporate bushfire protection measures into future development, the owner is advised to consider the following:

- Avoid planting trees species with rough fibrous bark, or which retain/shed bark in long strips or retain dead material in their canopy.
- Avoid planting deciduous species that may increase fuel at surface/ground level by the fall of leaves.
- Avoid climbing species to walls and pergolas.
- Locate combustible materials such as woodchips/mulch, flammable fuel stores (LPG gas bottles) away from the building.
- Locate combustible structures such as garden sheds, pergolas and materials such as timber furniture away from the building.
- Ensure any vegetation planted around the house is a suitable distance away so these plants do not come into physical contact with the house as they mature.
- The property should be developed to incorporate suitable impervious area surrounding the house, including courtyards, paths and driveways.

7. HOW THIS PROPOSAL MEETS DEEMED TO SATISFY

The following table shows how the proposed development meets the Performance Based Controls of the PBP (2006) section 4.3.5

TABLE 5 HOW THIS PROPOSAL MEETS THE BUSHFIRE PROTECTION REQUIREMENTS

| REQUIREMENT | HOW THIS PROPOSAL COMPLIES |
|--|---|
| An APZ is provided according to PBP requirements. The APZ can include existing roads, other buildings or managed properties (RFS 2006). | The subject lot will be maintained as a landscaped APZ which includes a perimeter loop road. This APZ provides for buildings within the site to meet BAL 29 and less. |
| Radiant heat levels of greater than 10kW /m ² will not be experienced by occupants or emergency services workers entering or exiting a building | The proposed <u>Monks Residence</u> can meet BAL 12.5 . The proposed <u>Mandir</u> can meet BAL 12.5 . The proposed <u>Facilities Building</u> can meet: BAL 29 on the northern and southern boundary facades; BAL 19 on the eastern and western facades. |
| Mechanisms are in place to provide for the maintenance of the APZ over the life of the development, is wholly within the boundaries of the development site | The owners will provide a fuel management plan before occupation certificate is issued |
| Buildings are sited and designed to minimise the risk of bush fire attack | The proposed <u>Monks Residence</u> can meet BAL 12.5 . The proposed <u>Mandir</u> can meet BAL 12.5 . The proposed <u>Facilities Building</u> can meet: BAL 29 on the northern and southern boundary facades; BAL 19 on the eastern and western facades. The subject lot will be maintained as a landscaped APZ which includes a perimeter loop road. |
| Safe operational access is provided (and maintained) for emergency services personnel in suppressing bushfire while residents are seeking to relocate, in advance of a bushfire; | The subject property is located on Aldington Road. This is a two-wheel drive, all weather road. The capacity of road surfaces and bridges is sufficient to carry fully loaded firefighting vehicles. The internal access provides a two-wheel drive, sealed, all weather, perimeter road with a width of 7.62 m. The access provides an entrance and exit from the site to Aldington Road. These exits face away from unmanaged land on the eastern side of the site The proposed internal access is required to comply with the PBP- Property Access. This includes: <ul style="list-style-type: none"> ○ Curves a minimum inner radius of six metres; ○ The minimum distance between inner and outer curves is six metres; ○ The crossfall is not more than 10 degrees; ○ Maximum grades for sealed roads do not exceed 15 degrees (28 per cent) and not more than 10 degrees (18 percent) for unsealed roads; ○ The internal road surfaces and bridges have a capacity to carry fully loaded firefighting vehicles (28 tonnes). |

| | |
|--|--|
| Adequate water and utility services are provided for firefighting operations. Gas and electricity services are located so as not to contribute to the risk of fire to a building; | Reticulated water is supplied to the subject lot and water supply is located at regular intervals. Access points for reticulated water supply are to incorporate a ring main system for all internal roads. Fire hydrants provided throughout the site should comply with the spacing, sizing and pressures of AS 2419.1 2005. |
| Landscaping is designed and managed to minimise flame contact and radiant heat to buildings and the potential for wind driven embers to cause ignitions | The owners will provide a landscape plan for the APZ before occupation certificate is issued. |

8. SUMMARY

- The proposed Monks Residence can meet **BAL 12.5** as specified by AS3959 -2009 Construction for Buildings in Bushfire Prone Areas;
- The proposed Mandir can meet **BAL 12.5** as specified by AS3959 -2009 Construction for Buildings in Bushfire Prone Areas;
- The proposed Community Facilities Building can meet **BAL 29** on the northern and southern boundary facades and **BAL 19** on the eastern and western facades as specified by AS3959 -2009 Construction for Buildings in Bushfire Prone Areas;
- An APZ over the entire subject lot should be established for and maintained for perpetuity;
- The internal access provides a two-wheel drive, sealed, all weather, perimeter road with a width of 7.62 m. The access provides an entrance and exit from the site to Aldington Road. These exits face away from unmanaged land on the eastern side of the site.
- The proposed internal access is required to comply with the PBP- Property Access. This includes:
 - Curves a minimum inner radius of six metres;
 - The minimum distance between inner and outer curves is six metres;
 - The crossfall is not more than 10 degrees;
 - Maximum grades for sealed roads do not exceed 15 degrees (28 per cent) and not more than 10 degrees (18 percent) for unsealed roads;
 - The internal road surfaces and bridges have a capacity to carry fully loaded firefighting vehicles (28 tonnes).
- Reticulated water is supplied to the subject lot and water supply is located at regular intervals. Access points for reticulated water supply are to incorporate a ring main system for all internal roads. Fire hydrants provided throughout the site should comply with the spacing, sizing and pressures of AS 2419.1 2005;
- Any bottled gas will be installed and maintained in accordance with AS1596 and the requirements of the relevant authority. If gas cylinders need to be kept close to the buildings, the release valves must be directed away from the building and away from any combustible material. Polymer sheathed flexible gas supply lines to gas meters adjacent to buildings are not to be used;
- Electrical transmission lines, if above ground, will be managed in accordance with specifications issued by Energy Australia;
- An emergency /evacuation plan will be required as described in the PBB 2006. This will need to meet the criteria of the RFS guidelines for the Preparation of *Emergency/Evacuation Plan*. A copy must be submitted to the local Bushfire Management Committee for their information.

9. REFERENCES

ABCB (2010) *Performance Standard for Private Bushfire Shelters*

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

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

Standards Australia (2009) AS3959, *Construction of buildings in bushfire-prone areas.*

APPENDIX I DEFINITION OF ASSET PROTECTION ZONES

Vegetation within the APZ should be managed in accordance with APZ specifications for the purposes of limiting the travel of a fire, reducing the likelihood of direct flame contact and removing additional hazards or ignition sources. The following outlines some general vegetation management principles for APZs:

- 1) Discontinuous shrub layer (clumps or islands of shrubs not rows);
- 2) Vertical separation between vegetation strata;
- 3) Tree canopies not overhanging structures;
- 4) Management and trimming of trees and other vegetation in the vicinity of power lines and tower lines in accordance with the Specifications in "Vegetation Safety Clearances" issued by Energy Australia (NS179, April 2002);
- 5) Maintain low ground covers by mowing / whipper snipper / slashing; and
- 6) Non-combustible mulch e.g. stones and removing stores of combustible materials;
- 7) Vegetation to be planted should consist of fire retardant/ less flammable species strategically located to reduce attack from embers (i.e. as ember traps when in small clumps and short wind breaks).