3 SLOPE ASSESSMENT

In accordance with PBP (2006), an assessment of the slope throughout the site and for 140m around was undertaken to identify both the average slope and by identifying the maximum slopes present. These values help determine the level of gradient which will most significantly influence fire behaviour on the site. The slope assessment has been derived from topographic maps displaying 10m contour intervals and ground truthing. Refer to Table 3-1 below that details the slope in all directions from the lot.

The site contains gentle slopes that fall away to the water on all sides from the central to southern plateau, which continues to rise slightly off-site to the west. The south-western boundary of the site contains a steep drop-off to the water via a sandstone cliff face approximately 8m high. In general, the site is dominated by slope classes of 0-5 and 5-10 degrees.

4 DETERMINING APPROPRIATE SETBACKS

4.1 APZ's

An APZ is an area surrounding a development that is managed to reduce the bushfire hazard to an acceptable level to mitigate the risk to life and property. The required width of the APZ varies with slope and the type of hazard. An APZ can consist of both an Inner Protection Area (IPA) and an Outer Protection Area (OPA). The respective IPA and OPA widths for the required APZs are as detailed in Table 2. An APZ can include the following:

- lawns,
- discontinuous gardens,
- swimming pools,
- driveways,
- unattached non-combustible garages with suitable separation from the dwelling,
- open space / parkland, and
- car parking.

4.2 IPA

The IPA extends from the edge of the OPA to the development. The IPA aims to ensure that the presence of fuels which could contribute to a fire event / intensity, are minimized close to the development. The performance of the IPA must be such that:

- there is minimal fine fuel at ground level which could be set alight by a bushfire; and
- any vegetation in the IPA does not provide a path for the transfer of fire to the development – that is, the fuels are discontinuous.

The presence of a few shrubs or trees in the IPA is acceptable provided that they:

- do not touch or overhang any buildings;

- are well spread out and do not form a continuous canopy;
- are not species that retain dead material or deposit excessive quantities of ground fuel in a short period or in a danger period; and
- are located far enough away from any dwelling so that they will not ignite the dwelling by direct flame contact or radiant heat emission.

Woodpiles, wooden sheds, combustible material storage areas, large areas / quantities of garden mulch, stacked flammable building materials etc. are not be permitted in the IPA.

4.3 OPA

The OPA is located adjacent to the hazard. Within the OPA any trees and shrubs should be maintained in a manner such that the vegetation is not continuous. Fine fuel loadings should be kept to a level where the fire intensity expected will not impact on adjacent developments.

4.4 Determining the Appropriate Setbacks

No APZ's are considered necessary along the northern, southern, western and eastern boundaries due to the following reasons:

- the vegetation therein is extremely isolated and linear particularly following the removal of vegetation to incorporate proposed development within the site; and
- the remaining vegetation will essentially be managed, scattered trees located between residential development and a large body of water. In the extremely unlikely event of a fire starting in that area, the combustible fuel loads therein would be rapidly exhausted and the spread of fire into the proposed development would be considered unlikely.

5 ACCOMMODATION DESIGN AND CONSTRUCTION

The design of the accommodation buildings should have due regard to the specific considerations given within the Building Code of Australia (BCA), which makes specific reference to Australian Standard 3959 (AS 3959-1999) 'Construction of Buildings in Bushfire-prone Areas'. This standard aims to provide ways to improve the design and construction of a building by minimising the likelihood of the consequences of bushfire attack.

The design of the buildings and the materials utilised for construction should be chosen based on the information contained within this standard, and accordingly the relevant architect should be made aware of this recommendation. It may be necessary to have the building plans checked by the architect involved to ensure that the proposed buildings meet the relevant construction level criteria. If it becomes apparent that appropriate criteria is not being met, then either the design will have to be amended or the APZ setback distances may have to increase accordingly.

Appendix 3 of PBP (2006) outlines the criteria for the construction standards of dwellings or accommodation facilities in bushfire-prone areas. Construction standards for buildings in these areas fall into 3 categories defined as:

- **Level 3 construction** - required for dwellings / accommodation facilities located within specified distances from *Extreme Bushfire Attack* category;
- **Level 2 construction** - required for dwellings / accommodation facilities located within specified distances from *High Bushfire Attack* category; and
- **Level 1 construction** - required for dwellings / accommodation facilities located within specified distances from *Medium Bushfire Attack* category.
- No construction requirements relating to bushfire hazard apply to any proposed dwellings / accommodation facilities located more than 100m from any bushfire hazard

The proposed development is located greater than 100m from a bushfire hazard and consequently no construction level will apply.

6 WATER SUPPLY

As an integral part of the development water mains will be extended into the site. Provision of access to this supply should be provided for fire-crews in the form of readily accessible and easily located fire hydrants.

Fire hydrants spacing, sizing and pressures should comply with AS 2419.1 – 1994. Where this cannot be met, the RFS will require a test report of the water pressure 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 fire engineering principles.

Other future sources such as swimming pools and rainwater tanks for a supplementary source of water in the event of any fire emergency within the area are encouraged.

7 ACCESS / EGRESS (EVACUATION)

Any fire within the site would be attended in the first instance by the NSW Fire Brigades station at Morisset. Response time would be expected to be less than ten minutes. To facilitate quick and efficient action by fire-fighting crews upon arrival, it is recommended that all necessary connections to water sources be clearly marked and visible, and in good working order.

According to PBP (2006), the design specifications for internal public road networks in areas adjacent to bushfire hazards require that roads:

- be two-wheel drive, sealed all weather roads;
- not be hindered by an overuse of traffic calming devices such as speed humps and chicanes;
- be through roads, but if unavoidable then dead ends should be not more than 200m in length, incorporate a minimum 12m turning circle and should be clearly sign posted as dead ends;
- curves have a miminum inner radius of 6m and are minimal in number to allow for rapid access and egress
- have a minimum distance between inner and outer curves of 6m;
- have a maximum grade of 15 degrees and preferably no more than 10 degrees;
- have a minimum vertical clearance to a height of 4m at all times; and
- be clearly sign posted and buildings clearly numbered, with the load limit on bridges clearly displayed.

It is forwarded here that if the internal roads proposed for development as part of this proposal satisfy the necessary requirements and that adequate access has been provided to any potential hazards off the site

8 EMERGENCY & EVACUATION PLANNING

Any fire within the site would be attended in the first instance by the Peninsula Branch of the NSW Fire Brigade. Response time would be expected to be approximately 5-10 minutes.

To facilitate quick and efficient action by the Fire Brigade upon arrival, it is recommended that all necessary connections / pumps etc be clearly marked and visible, and in good working order.

It is recommended that and emergency / evacuation plan is prepared consistent with the RFS Guidelines for the *Preparation of Emergency / Evacuation Plan.*

9 ONGOING FUEL MANAGEMENT

Given that fuel reduction resulting from initial clearing and development of the site will greatly reduce the risk to a large proportion of the site, careful thought must be given to the type and physical location of any proposed site landscaping. Inappropriately selected and positioned vegetation has the potential to 'replace' the previously removed fuel load.

Whilst it is recognised that fire-retardant plant species are not always the most aesthetically pleasing choice for site landscaping, the need for adequate protection of life and property requires that a suitable balance between visual and safety concerns be considered. Any remnant vegetation and landscaping within the development should be managed such that it conforms with the requirements of PBP 2006 for an IPA.

It is reiterated again that it is essential that any landscaped areas and surrounds are subject to ongoing fuel management and reduction to ensure that fine fuels do not build up.

10 CONCLUSION & RECOMMENDATIONS

In conclusion, it has been recognised that a small part of the site constitutes BFPL. Therefore, any development proposal must be carried out in accordance with the specifications contained within PBP (RFS, 2006) as assessed and presented within this report.

If the recommendations contained within this report are duly considered and incorporated, the fire hazard present should be containable to a level considered necessary to provide an adequate level of protection to life and property on the site.

In summary, the following key recommendations have been made to enable any future proposal to meet the relevant legislative requirements.

- The vegetation within the site is classified as non-hazardous and therefore no internal APZ's are required.
- Any remnant vegetation and landscaping within the development should be managed such that it conforms with the requirements of PBP 2006 for an IPA.
- The internal road network should follow the design specifications outlined within PBP (2006).
- It is proposed that the subdivision will be connected to the reticulated water mains system. Access to potential supplementary water sources such as swimming pools, pond construction or the lake should also be considered.
- It is recommended that an emergency / evacuation plan is prepared consistent with the RFS Guidelines for the *Preparation of Emergency / Evacuation Plan.*
- Any future dwelling within the lots should have due regard to the specific considerations given in the BCA, which makes specific reference to the Australian Standard (AS3959 – 1999) construction of buildings in bushfire prone areas.

Finally, it is believed that the implementation of the measures and recommendations forwarded within this report would contribute to the amelioration of the potential impact of any bushfire upon this site, but they do not and cannot guarantee that the area will <u>not</u> be affected by bushfire at some time.

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APPENDIX A: PROPOSED DEVELOPMENT LAYOUT

TRINITY BAY
MARINA

BARDENS BAY

RL 1.0
RL 1.1
RL 2.6
RL 3.8
RL 2.4
RL 2.8
RL 4.2
RL 6.2

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SITE PLAN

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