**BUILDING FOR BUSHFIRE**

**Bushfire Attack Level (BAL) Assessment**

A Bushfire Attack Level (BAL) assessment is an evaluation of the potential bushfire risk to a house or block of land based on conditions in the area immediately surrounding the site. This assessment considers a number of factors including the nature of the surrounding vegetation, its distance to the building area and the slope of the ground under the vegetation. Using this information, the bushfire practitioner is able to determine a Bushfire Attack Level (BAL) for the site. The BAL is a numeric value which relates to heat exposure (radiant heat) on the vertical surfaces of the structure. The BAL is used to determine the required construction standard.

The BAL assessment usually forms part of a Bushfire Hazard Report which is necessary to meet legislative compliance when building or sub-dividing in a bushfire-prone area.

Developments that are closer to bushfire-prone vegetation will be assessed as having a higher Bushfire Attack Level (BAL) and as a result, more rigorous building construction standards will be required.

An Accredited Bushfire Hazard Practitioner will provide advice on how to best develop or build on a site for bushfire safety. The location of the building site will be shown on a bushfire hazard management plan.
1. Fire Danger Index

The Fire Danger Index (FDI) warns of the potential impact of a bushfire on any given day, based on forecast weather conditions.

Fire Danger Ratings (FDR) of Severe, Extreme and Catastrophic indicate a fire will be unpredictable, uncontrollable and fast-moving.

Tasmania Fire Service specifies a Fire Danger Index of 50 for use in Bushfire Attack Level assessment, as detailed within Australian Standard 3959.2009, Construction of Buildings in Bushfire Prone Areas. It is important to remember that in Tasmania conditions can exceed FDI 50 which may make property defence highly dangerous for occupants.

2. The type of vegetation

Un-managed vegetation (Classified vegetation) refers to areas of continuous vegetation such as native bush-land, scrub, grassland, timber plantation or agricultural land.

During a bushfire, different classes of vegetation will produce different levels of radiant heat; therefore the class of un-managed vegetation adjacent to the site will influence the dimensions of cleared areas around building sites (hazard management areas) required for protection of life and property. For example, burning grassland produces less radiant heat than will burning forest at the same distance, so will result in a lower Bushfire Attack Level.

3. How close is the proposed building to classified vegetation?

A Hazard Management Area will provide a degree of protection for people from the life threatening consequences of radiant heat by providing separation from unmanaged vegetation. Providing greater separation from classified vegetation will risk to buildings and occupants.
4. What is the Effective Slope?

Effective Slope refers to the slope (or gradient) beneath the unmanaged vegetation in relation to the site (not the slope between the un-managed vegetation and your site).

Effective Slope influences rate of spread, intensity and the amount of radiant heat produced by a bushfire. It has a direct influence on the size of the hazard management areas required for occupant and building survival.

In relation to a building, flat ground and uphill slopes beneath the vegetation will not increase the severity of a fire burning towards a structure whereas a downslope will increase rate of spread and fire intensity resulting in a higher Bushfire Attack Level.

<table>
<thead>
<tr>
<th>Flat</th>
<th>Up slope</th>
<th>Down slope</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slope does not increase radiant heat or fire intensity toward site.</td>
<td>Slope does not increase radiant heat or fire intensity towards site.</td>
<td>Slope does increase radiant heat and fire intensity as fire burns uphill towards site.</td>
</tr>
<tr>
<td>Effective Slope = Flat</td>
<td>Effective Slope type = Up slope</td>
<td>Effective Slope type = Down slope</td>
</tr>
</tbody>
</table>

Figure 4
5. Building Construction and Design

Building construction and design are important factors to be considered when building in bushfire-prone areas. Construction requirements are detailed in Australian Standard 3959-2009, Construction of Buildings in Bushfire Prone Areas and vary according to which Bushfire Attack Level a development falls into.

The various bushfire attack levels and what they represent are shown above in Figure 5.

The cost of compliance typically increases at each BAL increment as the required level of building performance increases.

6. Subdivision Design

The subdivision of land in bushfire-prone areas requires a Bushfire Attack Level (BAL) assessment to ensure that each lot within the subdivision is able to provide a safe and compliant site for building. For a contemporary subdivision, the maximum permissible BAL level is 19 (unless a performance-based solution is proposed).

In Tasmania, BAL-40 and BAL– FZ (Flame Zone) can only be considered for building as part of a performance based solution, and will not receive building approval unless adequate safeguards are in place and it can be shown that bushfire risk has been adequately considered and mitigated.

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**Figure 5 BAL construction levels in context**

<table>
<thead>
<tr>
<th>BAL- LOW</th>
<th>BAL- 12.5</th>
<th>BAL- 19</th>
<th>BAL-29</th>
<th>BAL-40</th>
<th>BAL-FZ</th>
</tr>
</thead>
<tbody>
<tr>
<td>There is insufficient risk to warrant any specific construction requirements, but there is still some risk</td>
<td>Ember attack and radiant heat below 12.5 kW/m²</td>
<td>Increasing ember attack and windborne debris, radiant heat between 12.5 kW/m² and 19 kW/m²</td>
<td>Increasing ember attack and windborne debris, radiant heat between 19 kW/m² and 29 kW/m²</td>
<td>Increasing ember attack and windborne debris, radiant heat between 29 kW/m² and 40 kW/m². Exposure to flames from the fire front</td>
<td>Direct Exposure to flames, radiant heat and embers from the fire front</td>
</tr>
</tbody>
</table>
GLOSSARY

**Accredited person** means Accredited Bushfire Hazard Practitioner, holding the appropriate qualifications and insurances and being accredited in accordance with the requirements in the Fire Service Act 1979.

**Bushfire Attack Level (BAL)** - means the bushfire attack level as defined in AS3959 –2009, Construction of Buildings in Bushfire Prone Areas as ‘a means of measuring the severity of a building’s potential exposure to ember attack, radiant heat and direct flame contact, using increments of radiant heat expressed in kilowatts per metre squared, and the basis for establishing the requirements for construction to improve protection of building elements from attack by bushfire’.

**Bushfire hazard report** – means a report which provides an assessment of the bushfire risk to a home or property and includes hazard mitigation strategies and a bushfire hazard management plan.

**Bushfire hazard management plan** – means a plan showing means of protection from bushfires in a form approved in writing by the Chief Officer of the Tasmania Fire Service.

**Bushfire-prone area** means:

(a) land that is within the boundary of a bushfire-prone area shown on an overlay on a planning scheme map; and

(i) where there is no overlay on a planning scheme map; or

(ii) where the land is outside the boundary of a bushfire-prone area shown on an overlay on such a map, land that is within 100m of an area of bushfire-prone vegetation equal to or greater than 1 hectare.

**Bushfire-prone vegetation** – means contiguous vegetation including grasses and shrubs but not including maintained lawns, parks and gardens, nature strips, plant nurseries, golf courses, vineyards, orchards or vegetation on land that is used for horticultural purposes.

**Classified vegetation** – means vegetation which is classified as bushfire prone in accordance with AS3959. 2009, Construction of Building in Bushfire Prone Areas.

**Effective Slope** – means the slope under the classified vegetation which most influences the bushfire attack.

**Fire Danger Index (FDI)** – means a numerical scale which provides an indication of the potential severity of an uncontrolled fire if one were to start under those conditions.

**Fire Danger Rating** – means an indication of the consequences of a bushfire if a bushfire was to start. The higher the fire danger rating, the more dangerous the conditions and the more likely that people will be injured if a fire occurs.

**Hazard management area** – means the area, between a habitable building or building area and bushfire-prone vegetation, which provides access to a fire front for firefighting, which is maintained in a minimal fuel condition and in which there are no other hazards present which will significantly contribute to the spread of a bushfire.

**Property access** – means the carriageway which provides vehicular access from the carriageway of a road onto land, measured along the centre line of the carriageway, from the edge of the road carriageway to the nearest point of the building area.