



Bushfires and Energy Efficient Housing

In rebuilding Canberra's burnt out suburbs, it's important that we take the opportunity to build homes that are both environmentally sustainable and more fire resistant.

Fortunately these two goals are highly compatible. Housing designs that offer greater resistance to radiant heat and ember attack during bushfires also incorporate many energy efficient design principles.

While direct flame contact and radiant heat can result in house ignition and combustion the real enemy is the embers that attack the house before and after the flame front hits. The challenge is to rebuild our lost homes to resist any future bushfire threat and provide residents with energy efficient housing.

What do we want to achieve?

Rebuilt Canberra homes that are energy efficient and offer greater resistance to ember attack and combustion during bushfires.

What are the main benefits of energy efficient housing?

Energy efficient housing keeps your home cool in summer and warm in winter. You'll spend less on energy bills and put less strain on our natural resources. Many energy efficient building principles also decrease the risk of fire.

What are the key energy efficiency and bushfire protection design principles I should consider when rebuilding my house?

Slab on ground construction

Slab on ground (SOG) construction hugs the earth preventing the spread of fire through sub floor areas while also providing a cooler floor. Ground level houses also use paving and grass for outdoor areas instead of the more flammable timber decking.

Roofing

Steel roofs can be better than tiles roofs provided the ridge capping and eaves are designed to prevent ember entry. New building designs should minimise valley gutters, for example at the corner of an L-shaped roof, where burning material may accumulate. Tile roofs must rely on full sarking to provide the necessary ember protection. Any perforations of ventilation of the roof space need to be screened.

High mass internal construction

High mass internal construction such as internal brick walls, also help to regulate the internal temperature of your house. It can reduce flame spread and maintain the structural integrity of the house for longer during fire exposure.

Insulation

Good insulation in walls and ceilings reduces the passage of heat through the shell of the house, reducing the possibility of spontaneous ignition of paint and other finishes. Insulation moderates the internal

temperature of your house, which will reduce your energy bills and save precious natural resources. All insulation has to be fire resistant under building regulations. Insulation such as polystyrene and cellulose tend to contribute to the bushfire risk in some cases.

Windows

Windows designed for improved thermal performance protect the house from heat transfer during a fire. Laminated double glazed windows are harder to shatter during a fire and they also conduct less heat from outside. Removable exterior flywire screens block up to 20% of the radiant heat striking the glass, keeping temperatures lower while protecting windows from flying debris. During winter, removing flywire screens lets in the valuable winter sun to warm your home and reduce heating bills.

Materials and finishes

Reduce the use of complex artificial finishes such as plastics and paints to decrease the flammability of finished surfaces. When you use natural materials such as stone, rock, earth and timber the structural integrity of the house can be less prone to fire damage and the intensity of a house fire can also be reduced. Smooth surface finishes on materials such as timber will prevent the capture of embers and the spread of flame.

House orientation

Houses can be orientated on your block to maximize winter sunlight infiltration and minimise summer heat radiation. For example, large windows on the northern face of your house will maximise solar gain. Bushfire protection benefits will be enhanced by planting low vegetation on the north face of the house and away from windows.

Water

Retaining water onsite through use of rainwater tanks and grey-water recycling reduces the ecological impact of your home, while providing increased resources for fire protection.

Other building considerations

All gaps around doors, windows and eaves should be sealed to improve energy efficiency and reduce entry points for embers.

In coming to grips with the horrific bushfires Canberra has just faced, we need to recognise how well our homes and our city responded and then look at how to better prepare for any future occurrence. To enjoy living in the bush capital, we need to build houses that are better adapted to the environment we live in - houses that combine the dual benefits of greater energy efficiency and greater resistance to combustion during bushfires.

