



Fire - Let Precast Concrete Become your Bushfire Barrier

Flame comes in a 120 km/hr firestorm in a big bushfire like the recent fires in Victoria. Survivors talk of it sounding like a jet aircraft directly outside their house. Fire fronts create their own terrifying wind, easily capable of propelling burning parts of tree limbs. Wind driven impact of flying objects weighing in excess of 5kg is not unusual. Usually after about 15 minutes the fire front has passed.

But even if a building survives the fire front, the period immediately after its passing is critical and many buildings have been lost during this time. Not only are the combustible parts of a building at risk, but ember attack can cause significant

damage. Use of lightweight building materials can become a real problem as they can provide an entry for flames/embers and searingly hot smoke. Smoke alone can result in loss of life.

Recognising this fact, authorities are endeavouring to amend building codes to raise the standard of construction in bushfire prone areas. To combat the impact factor, ordinary lightweight construction will need to answer some searching questions, particularly when impact resistance will be needed for full protection assurance.

The solution is to provide fire and impact resistant buildings which provide shelter from the fire front in assured safety while protecting vital possessions.

National Precast President Peter Healy sees a bigger role for precast concrete in construction in fire prone areas, following the aftermath of the Victorian bushfires.

“Nobody should have to re-build their lives or suffer the tragic loss of loved ones and precast is the perfect choice of construction material to offer protection in bushfire prone areas. Precast concrete walls on a concrete slab, combined with fire protected (or fire resistant) windows, sprinkler systems and ember proofing of structures offers a truly assured method of protecting property and lives. Sensible vegetation management solutions are also important, and many councils will need to review their policies in this regard when allowing building in fire prone areas,” said Mr Healy.

“It is critically important that codes right around the country are reviewed and

that the design and construction industry specifies to address this devastating problem," he said.

It is reassuring to know that precast concrete wall panels are impact resistant and offer a 4-hour fire resistance in 170mm thickness (AS 3600-2001 Section 5 Design for Fire Resistance).

Deriving the benefits of precast – a house that protects its occupants

Stephen and Emma Richardson are the proud owners of an interesting new precast concrete house in Sydney's Harbourside suburb of Castlecrag. The testing nature of the site and multiple family requirements have resulted in a relatively complex building. The challenge presented by this complexity was well answered by the choice of precast concrete. Hanson Precast was the supplier/installer of the precast panels.

Mackenzie Architects won a limited design competition to design the home. The brief was reasonably specific, and in essence consisted of making the home private, securing against bushfire and storm, enabling a view from all habitable rooms and the language of the house had to be timeless. With this in mind, the design was formalised and pitched to the clients, who immediately loved the ideas and ran with the concept.

Dugald MacKenzie said: *"Looking at Castlecrag and the natural features of the area was one source of inspiration, but also my love of concrete, and particularly precast concrete, was another."*

"The client also liked the idea of precast concrete, but also wanted an internal softness so that the home wasn't a museum, but something with warmth and heart. The precast panels are located primarily to the street and as internal features around the main stair spine and the family rooms. There

is a mixture of panel sizes, including a series of 80mm blades facing the street which provide screening and visual access," he said.

Dugald MacKenzie concludes: *"The great thing about using concrete in this way is that over the years it will age gracefully and form more of the natural environment."*



Putting ideas into practice

National Precast Executive Officer Sarah Bachmann believes in putting her ideas into practice as she builds a house which fronts onto the bush of the Adelaide Hills. The house is being constructed with precast concrete walls and fire resistant windows.

"Yes, fire resistance was a determining factor in the choice of precast concrete for the house, but we will also derive the benefits of an extremely thermally efficient, acoustically efficient and durable home. We have taken advantage of the thermal storage properties of precast concrete sandwich panels to even out temperature extremes on hot summer days and cold winter nights," she said.

For more information go to www.hillsideproject.net The Precast Bushfire Advantage

Passive fire protection, such as precast wall panels offer the inherent advantage of being a permanent barrier to fire, heat, impact, and smoke – needing no additional protection. These natural advantages include absence of toxins under any fire conditions, heat absorption, structural integrity, fast construction and single-source supply.

Active fire protection systems such as fire pumps and rooftop sprinkler systems can be very effective in combating the ravages of bushfires. Like any mechanical or electrical system, no one can claim 100% reliability. If the system goes down there may be no time to effect alternative protection when a fire is bearing down.

Minimisation of Joints is a great advantage of precast in inhibiting the likelihood of ember penetration. Lightweight buildings usually have many more joints/gaps than solid precast concrete walls. Fires have started from miniscule gaps due to entry by multiple embers which can be not much larger than a pinhead.

Increasing Emphasis on Risk Avoidance means that building approvals are going to become more difficult to achieve without a considerable increase in fire protection. Insurance companies are taking note of precast's fire advantages, offering lower rates for precast structures in some instances.

A winning combination sees precast delivering compelling longterm savings – in addition to its ability to save lives.

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