bushfire CRC

RESEARCH AND INVESTIGATION INTO THE PERFORMANCE OF RESIDENTIAL BOUNDARY FENCING IN BUSHFIRES

A recent testing project involving the Co-operative Research Centre for Bushfire (Bushfire CRC) and the CSIRO has revealed that different types of fencing can play an important part in defending homes against the threat of bushfire.

The research project was conducted in the NSW Rural Fire Service Experimental Testing Site at Mogo on the south coast of NSW, at what is believed to be the only bushfire simulator of this type in the world.

The research investigated the effects of typical Australian bushfire exposures on residential boundary fencing systems manufactured from prepainted and metallic coated sheet steel, treated softwood (pine) timber and hardwood timber.

The project received support and cooperation from BlueScope Steel.

THE RESEARCH

Anecdotal evidence already exists to suggest that steel fencing offers greater protection to residential housing against bushfire than alternative materials because of its non-combustibility.

The full results from this research will be used by the Bushfire CRC and the CSIRO to:

a) Influence how building codes and planning guides are developed, particularly around bushfire risk areas
b) Help provide advice to residents on the level of risk their individual property faces
c) Help develop education programmes for local communities

NSW RURAL FIRE SERVICE EXPERIMENTAL TESTING SITE AT MOGO.

RESULTS

1. STEEL FENCING

Of the different materials tested, prepainted and metallic coated sheet steel fencing (in this case made from COLORBOND® steel) performed best under all exposure conditions and in particular when faced with a 30-minute flame immersion test used to simulate potential effects of an adjacent house fire, which is common during bushfire events. (See table overleaf for further detail on exposure levels.)

2.TREATED PINE TIMBER FENCING

Treated pine timber fencing systems burnt to completion when subjected to the level one exposure (ember attack), and collapsed in sections during these exposures. This resulted in the breakage of window glass on the simulated house placed at the minimum allowable separation distance from a fence boundary in accordance with the Building Code of Australia.

3.HARDWOOD TIMBER FENCING

Hardwood timber fencing systems performed better than treated pine timber, supporting flame spread during the radiant heat and flame contact phases in exposure levels two and three. However, when faced with the 30-minute flame exposure test of level four, the hardwood timber fencing systems resulted in fence collapse within some minutes.

THE TABLE BELOW OUTLINES THE LEVELS OF EXPOSURE THAT EACH FENCING PRODUCT WAS EXPOSED TO AND THE RESULTS OF THAT EXPOSURE.

LEVEL OF EXPOSURE	STEEL	HARDWOOD	TREATED SOFTWOOD (PINE)
1. LITTER IGNITED Leaf litter placed typically on fence rails and around fence posts and ignited to investigate and observe the influence of this ignition source – Ember Attack.	No structural failure of fencing system	No structural failure of fencing system	Burnt to completion in 1 to 2 hours during testing.
2. LITTER IGNITED + PRE-RADIATION Typical of an advancing bushfire occurring on a fire danger day of FDI* 40 but with sufficient clearing to avoid direct flame contact with the fence.	No structural failure of fencing system	Structural failure of fencing system in sections	Burnt to completion in 1 to 2 hours during testing.
4. SIMULATION OF STRUCTURAL FIRE Full continuous flame immersion for a period of 30 minutes. Designed to simulate a worst case structural fire where the fencing system may increase or decrease the risk of adjacent house ignition.	No structural failure of fencing system	Structural failure of fencing system in sections	Not tested – because exposure levels: 1. Litter ignited; 2. Litter ignited + Pre-radiation; and 3. Simulation of bushfire passage; Burnt down the fencing system to completion.
Note: Ember attack can occur before, during and after the Main Fire event. Hence this structural impact can create risk for the occupants in a number of different ways. * FDI - Fire Danger Index			

THE DEVASTATING EFFECTS OF BUSHFIRES, CANBERRA 2003.

FURTHER INFORMATION

For more information on the testing, contact Richard Thornton at Bushfire CRC (03) 9412 9608 or visit www.bushfirecrc.com

The Bushfire CRC and its researchers involved in this project acknowledge the support of BlueScope Steel for this project and the valuable collaboration of the NSW Rural Fire Service which is a partner in the CRC.

This research was conducted as part of Project D1 Protecting People and Property, part of the Bushfire CRC's national research program.