

# DISASTER RESILIENCE



Windsor Bridge, NSW, under floodwaters (2022)

**Concrete stands strong in the face of disaster, it doesn't burn,<sup>[1]</sup> is resistant to bushfires<sup>[2]</sup> and is weather-resilient.<sup>[3,4]</sup> This is vital for sustainable buildings and infrastructure in Australia.**

Natural disasters are becoming increasingly common,<sup>[5]</sup> and building for resilience to flooding, bushfires and high wind events is vital for economic, social and environmental sustainability.

Resilient homes and infrastructure are often made from concrete,<sup>[2]</sup> as its natural strength and durability makes it more able to survive disasters.<sup>[2],[3],[4]</sup>

Designing and constructing for Disaster Resilience helps reduce the need (and therefore cost and speed) of post-disaster reconstruction. In this way, demand for raw materials in reconstruction is lowered, as is the production of demolition waste, both of which lower potential greenhouse gas emissions.

Concrete's resilience then also supports the recovery of communities, as businesses can return to operation and occupants to housing more quickly.

## Wind

Storm events, cyclones, blizzards in alpine regions and other high wind events have devastating impacts on buildings and their occupants. Concrete is more resistant to high winds and to damage/penetration by wind-borne objects. Indeed, many concrete buildings, such as schools and hospitals have become safe room shelters in storm events.

Moreover, according to MIT researchers, concrete-engineered building in coastal regions shows cost savings when hazard costs are incorporated into evaluations with affected communities spending less energy and fewer resources on emergency response, reconstruction, repair and recovery.<sup>[6]</sup>

## Floods

Floods exert huge pressure on buildings, while debris carried by floodwaters - as well as the dynamic forces of the water itself - place additional strain on structures. The rigid nature of concrete and its high density, helps it to better endure high water pressures.

Concrete buildings therefore often survive flooding, and as with high wind events, concrete buildings can also provide shelter from flooding.

## Bushfires

Bushfires are unfortunately a fact of life in many parts of both rural and urban Australia, and construction materials selected in at risk areas should be non-combustible and robust. Concrete fulfils this criteria exceptionally well.

### References:

- [1] [Non combustible means not deemed combustible as determined by AS 1530.1 - combustibility tests for materials. Refer RMIT Fire Testing Report \(2020\) for testing on the non-combustibility of Concrete. \[bit.ly/3LmLVdS\]\(https://bit.ly/3LmLVdS\)](#)
- [2] [Bushfire Resilient Building Guidance for Queensland Homes \(2020\) Queensland Government and CSIRO - Page 91](#)
- [3] [Storm Tide Resilient Building Guidance for Queensland Homes \(2019\) The State of Queensland - Pages 17-19, 22.](#)
- [4] [Flood Resilient Building Guidance for Queensland Homes \(2019\) The State of Queensland](#)
- [5] [Come Heat or High Waters, World Disasters Report \(2020\) International Federation of Red Cross and Red Crescent Societies - Pages 43-55.](#)
- [6] [Molecular Dynamics-based Resilience Assessment of Structures \(2020\), MIT CSHub](#)



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