

Fire safety for densified housing

As our housing becomes more densified, do current fire safety controls need to change to keep people safe from fire? A new BRANZ research programme is looking at this, focusing initially on fire resistance and fire spread.

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THE TRADITIONAL low-density, quarter-acre approach to housing in New Zealand has the advantage of distance to help maintain an acceptable level of fire safety between households.

As housing becomes more densified by necessity, the distance between households decreases. Without the buffer provided by distance, fire safety needs to be managed directly by the design and construction of the buildings themselves, requiring a different mindset and approach.

Fire safety challenges as housing changes

The pathways to achieve acceptable fire safety in densified housing are not always clear and well defined. For example, recent work by BRANZ looking at medium-density housing technical issues found that fire safety was one of the most common concerns.

The rationale and justification for existing fire safety controls is often unclear, perhaps introduced as a response to specific incidents or circumstances that no longer exist.

Changing needs and approaches to housing construction - for example, building for a low-carbon future - can also increase challenges for maintaining acceptable fire safety.

New BRANZ research programme

BRANZ is launching the *Building fire-safe densified housing* programme to help the building industry address some of these issues (Figure 1). This builds on previous BRANZ research to support fire safety in densified housing.

Initially, current and ongoing BRANZ research projects are investigating two key programme objectives - fire resistance and fire spread. A third objective investigating emergency egress is also planned.

Fire resistance

Fire resistance is about ensuring fire separations are in place to stop fire from spreading from the room of origin. Several key issues are being focused on:

- Developing a risk basis for fire resistance requirements in tall residential buildings - are they in line with societal risk tolerance? Does the use of mass timber (for example, cross-laminated timber) alter the risk?
- Maintaining fire separation performance - how sensitive is the overall fire safety performance of a fire separation to construction deviations or changes?

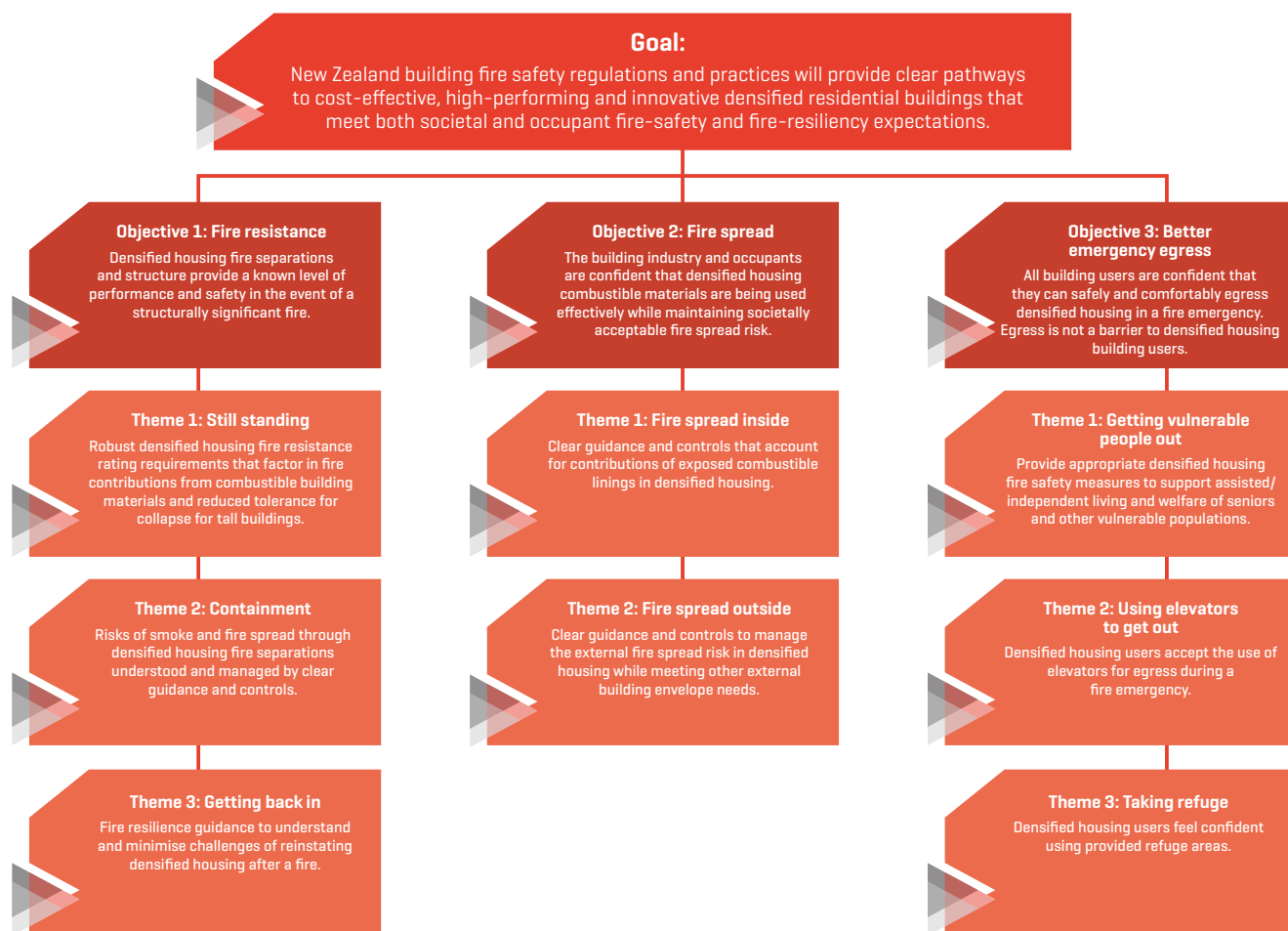


Figure 1: Building fire-safe densified housing programme goal and objectives.

- Building resilience - what are the issues and costs for post-fire building reinstatement? Are building fire safety features resilient to the effects of other events such as earthquakes?

Fire spread

The fire spread objective looks at two key issues:

- External fire spread - what are the right controls to prevent unacceptable fire spread like that observed in high-profile international fires (such as Grenfell) but still meet all the other necessary building façade objectives such as weathertightness, thermal performance, structural performance, sustainability and cost?
- Internal fire spread - how much do partial combustible linings - for example, exposed timber feature walls - contribute to the risk of internal fire spread?

Emergency egress

The University of Canterbury will lead the third objective, which will focus on improving emergency egress for everyone.

Options such as using elevators or refuge areas in certain situations will be explored. The human factors influencing the

acceptance and use of these means of escape features will be a particular focus.

Getting knowledge to those that need it

The timeline for the research work is 4 years although full adoption of the key findings is not anticipated until 2030.

The programme will not only include undertaking the research itself, but how this knowledge is transferred to those who will put it into practice.

BRANZ is already involved with initiatives such as the new Open Polytechnic Fire Engineering Diploma and the Fire Protection Association of New Zealand Firestopping Code of Practice. These can act as conduits to get the research into future densified housing.

The increasing need for densified housing in New Zealand is here to stay. The new *Building fire-safe densified housing* programme at BRANZ will look at keeping people safe from fire as they continue to live in closer proximity than ever before. ◀

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