Commentary from a building designer

Building regulations and the Bankstown fire

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As details have not been disclosed on the cause and rapid intensification of the fatal fire at the Euro Terraces apartment in Bankstown on September 6, it is not yet possible to make a full assessment of the adequacy of the regulations that covered the building and its fire safety systems. Certain general aspects of construction regulation are worth probing, however.

The Building Code of Australia (BCA), which covers the regulation of buildings throughout Australia, was first published in 1990, and adopted by the state of New South Wales in 1993. Historically, building regulations had developed within state jurisdictions.

The Hawke and Keating governments of 1983 to 1996 introduced the BCA as part of the Labor Party's program of "economic reform" and de-regulation to cut business costs at the expense of workers' jobs, living standards and working conditions.

Before losing office in 1996, Labor presided over the drafting of a new version of the BCA, which made a fundamental change, converting the code into a more "performance-based" document. The axis became "Performance Requirements" that can be met either via prescriptive "Deemed-to-Satisfy Provisions" or "Alternative Solutions" that allow "innovative" measures to modify or avoid the detailed prescriptions. Details of Alternative Solutions employed at Euro Terraces have not been made public.

The Euro Terraces apartment blocks are Class 2 buildings, defined by the BCA as "a building containing 2 or more sole-occupancy units each being a separate dwelling." In these buildings, the conception underpinning the BCA is that a fire within an apartment can burn unimpeded for a certain period, usually at least one hour, contained within each apartment, without spreading to adjoining units.

Within that time frame, it is assumed that the apartment's occupants will escape, everyone else within the building will safely evacuate and the fire brigade will extinguish the fire, protecting adjoining apartments and the structural integrity of the building.

It appears that at Euro Terraces the two young women who jumped from a bedroom window were prevented from leaving their apartment by the smoke and/or flames that separated them from their apartment entry door, and that smoke spread to the common areas where an atrium roof trapped the smoke, preventing other residents from fleeing to safety. For this to have happened, the assumptions on which the BCA is based must have been breached.

In line with the BCA assumptions for Class 2 buildings, fire extinguishers within apartments are not required. No fire fighting mechanism is mandated within an apartment. The only option for residents, faced with a fire, is to escape.

Fundamental to many BCA regulations is building height. The BCA Table E1.5 states that sprinklers in a Class 2 building are only required "if any part of the building has an effective height of more than 25 m[etres]." Similarly, smoke management, emergency lift operation and other measures only apply to buildings higher than 25 metres. There are thus substantial construction and maintenance cost disincentives to property developers and owners if they build taller than 25 metres.

According to a paper prepared for the Australasian Fire and Emergency Service Authorities Council (AFAC) 2010 conference, titled "A History of Alternative Solutions and the NSW Fire Brigades," the 25-metre rule dates back to 1912, when high-rise buildings—then a new phenomenon—were legally defined as those above 80 feet (approximately 25

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metres). This height was arbitrary and based on the height limitations of fire fighting equipment and escape ladders at the beginning of the 20th century.

Today, Class 2 buildings over 25 metres high need to be referred to Fire and Rescue NSW for comment on their design. The research paper complained about inconsistency in the format and quality of reports supporting Alternative Solutions, the lack of standardised qualifications of those preparing the safety reports, and under-resourcing and lack of staff with expertise to handle the workload.

Numbers of official reports have raised concerns about Alternative Solutions. A 2002 NSW parliamentary committee "Report on the Quality of Buildings" quoted a building consultancy that reported that "cost savings to developers" had been provided by substituting key fire safety facilities with Alternative Solutions "without any thought to community or Collateral Damage to building occupants and businesses."

In the same report, the Australian Institute of Building Surveyors provided an example of Alternative Solutions "that rely on one system as the dominant safety mechanism and remove complementary systems or reduce them to a lower standard." While sprinklers were not required in the example that the institute gave, they were installed as a less expensive alternative. As a trade off, the allowable BCA distance of 6 metres from apartment entries to an exit stair was increased to 20 metres. Solid core doors were also used in lieu of fireproof doors. Thus the sprinklers became the primary fire safety mechanism. If the sprinklers failed, however, the other systems would then be inadequate.

Whether Alternative Solutions are used or not, the BCA regulations are premised on firefighters getting to a fire within a maximum time. Thus, doors and structures are designed for that specific time frame. If fire brigade response times exceed that response time, then the fire protection system can fail.

The fact that Euro Terraces has no sprinklers means that greater reliance is placed on smoke alarms, self-closing fireproof apartment doors and a high level of understanding among residents of the dangers they face in the event of a fire. The reported constant malfunctioning of fire alarms points to a failure of these systems.

Contemporary building regulations and fire safety systems are complex and depend on quality of construction, maintenance, provision of services and the education and training of building users. If any component is missing, the whole system is liable to fail.

Moreover, builders and designers exploit loopholes in the BCA. In the event of a disaster, such as Euro Terraces, or last November's nursing home fire in the Sydney suburb of Quakers Hill that killed 10 elderly residents, revisions may be made to the BCA, only to have developers find new loopholes.

The issues of cost and profit involved here are class issues. A housing development for working class people in Bankstown is constructed in a manner that barely satisfies the minimum and seemingly inadequate building regulations. By contrast, sophisticated fire prevention systems and back-ups are utilised for installations such as a computer server room for a major bank.

Where corporate profits are at stake, building regulations are treated seriously, as is consideration of every imaginable risk. Each potential fire and safety scenario would be carefully worked through, engineered and funded. Yet, where the lives and safety of ordinary workers and students are involved, different standards apply.

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