

Editorial

Designing for fire resistance – a task for us all



Professor Roger Plank Guest Editor

The Grenfell Tower tragedy in London last June was a stark reminder of how rapidly a fire can spread and the horror which it can cause. In the wake of this disaster, the UK construction industry is actively examining what can be done to minimise the risk of similar tragedies in the future. It is likely that one of the recommendations will be a clearer identification of responsibilities, but whatever the outcome it will clearly be helpful for all members of the design team to have a good understanding of all aspects of fire safety, as well as detailed knowledge about those aspects under their direct control.

At present, there is very little emphasis or consistency on fire safety in the basic education or training of structural engineers throughout the world. Perhaps partly as a result of this, the vast majority of buildings are still designed in accordance with simple prescriptive procedures. It may be argued that such approaches have proved themselves since, apart from the collapse of the New York World Trade Center in 2001, when the buildings were subject to an exceptional combination of extensive physical damage and high temperatures, there have been very few instances of fatalities caused by structural failure in a building fire. However, the level of simplification implicit in such an approach may not be suitable for some of the more innovative forms of structure being constructed today, and in many cases may not provide best value. Moreover, the methods were developed when, in some respects, structures and materials were very different from current construction.

Recognising these deficiencies, more scientific ways of designing structures to achieve the required fire resistance are now available;

these range from relatively simple methods, as detailed in the Eurocodes, to finite-element modelling of whole structures, and are based on recent dramatic improvements in our understanding of building fires. But many uncertainties remain and further research continues apace. This will lead to further refinements in the current design methods and, despite the increasing number of fire engineering consultancies, structural engineers are well placed to put these methods into practice; this will, however, require some additional learning, typically as part of a programme of CPD, supported by short courses such as that offered by the Institution.

To support engineers who would like to improve their understanding of structural fire engineering, the Institution has published two guides, *Introduction to the Fire Safety Engineering of Structures* and *Guide to the Advanced Fire Safety Engineering of Structures*, with a new edition of the former currently in preparation. In addition, the papers in this special issue of *The Structural Engineer* cover a range of topics from a basic introduction to the latest developments in research and design, all aimed at a practising structural engineer with little or no specialist knowledge. Watch out, too, for details to be published later this year of a new Institution special diploma examination in fire structural safety.

Roger Plank recently retired from the University of Sheffield, and is currently a director of Vulcan Solutions, offering software and consultancy services in fire engineering. He has collaborated extensively with the steel construction sector in the field of fire engineering, and is a Past President of the Institution.

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