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Abstract

The Grenfell Tower Inquiry reports paint a terrifying image of the construction industry, as an ensemble, and particularly, in all matters pertaining fire safe design. Carefully look at these reports will help define responsibilities and legal procedures will do this for many years to come. Nevertheless, it is also essential to address the future and how we evolve our practises and professionals in a manner that prevents a tragedy of this nature to happen again. For this purpose, a key message needs to be emphasized: a functional requirements system of regulation will not deliver what society expects unless a rigorous competency framework is created and implemented for all professionals involved in fire safety. The means to create and put in practise such a framework is at the core of the Grenfell Tower Inquiry Phase 2 recommendations.

Keywords: fire safe design; competency; grenfell tower fire; UN SDG Goals 3, 4, 8, 9, 10, 11, 12

Introduction

The Grenfell Tower Inquiry (GTI), having now completed its second phase, has laid out extensive recommendations to address systemic failings in fire safety practices within the construction industry; highlighting the way in which these poor practices have impacted, in a disproportionate manner, the most vulnerable.

Notably, the Inquiry's report underscores the need for the entire construction industry, including architects and engineers, to improve their knowledge and competency in fire safe design.

This second phase report [1] highlights actions by testing laboratories, authorities and manufacturers that encouraged the inappropriate use of products. It also lists the mistakes made by everyone involved with the refurbishment, maintenance, and management of Grenfell Tower. Poor response practises by all those with responsibilities – including ill-prepared risk assessors and fire brigade – are the last ingredients of this catastrophic failure. Most importantly, the report emphasises that behind these mistakes and poor practises was widespread incompetence. The report provides extensive evidence supporting the above statements, showing that this evidence of incompetent practice had accumulated through many years.

As instances of poor practice and inadequate investigations into past failures built-up, none of the relevant professional institutions were capable of enforcing competence. As a result, trust in the construction industry's capability to deliver fire safe design has eroded to the point that crucial decisions on fire safety are now mainly delivered by the courts and government, through the Building Safety Regulator. Thus, the construction sector is now grappling with the necessary changes required to recover confidence and prevent such a tragedy from happening again.

The GTI Phase II report clearly states responsibilities for the different actions that contributed to the tragedy, legal procedures will follow and further address these responsibilities. Without attempting to diminish the importance of the specific actions that resulted in the outcome of the Grenfell Tower fire, this article wants to focus on the necessary professional changes that could prevent a failure of this nature from occurring again. Recognizing that one of the central pillars of this transformation has been an examination of the way construction professionals are educated about fire safety.

The Grenfell Tower Inquiry has highlighted numerous shortcomings with the way in which professional engineers approached fire safety, many of which are outlined in Chapter 113 of the inquiry's report. The report points out that the professionals involved in Grenfell Tower had access to the required knowledge but did not have the requisite skills and experience to use this knowledge for the purpose of designing the building appropriately.

The report stresses that designers and engineers must take a more active role in the process of delivering fire safety; from the design phase through construction to the post-occupancy stages of a building's lifecycle. It identifies several areas where improvements are needed, including improving professionals' understanding of the Building Regulations, fire protection systems, management protocols, structural fire behaviour and material flammability. By improving education in these areas, professionals gain the necessary knowledge, skills, and experience to adequately identify fire risks and respond appropriately.

It is important to note that the report emphasises the necessary uplift in competence not only applies to fire safety engineers but for every professional involved in the construction industry, including architects and civil engineers.

Many of the recommendations are so evident as to be beyond reproach. To the extent that some have even been accepted and implemented prior to the release of the final report.

One of the key issues highlighted was the lack of understanding of the Building Regulations and of fire safe *design*. This was pointed out by Dame Judith Hackitt in 2018, emphasized by the 2022 Building Safety Act and further clarified through additions included in recent versions of Approved Document B.

The Architects Registration Board (ARB) for example, released the Competence Guidelines in 2021 for Fire & Life Safety Design, which states: *“Clients and users are entitled to expect that all architects will have the competence to prepare and execute designs that will maintain their safety and wellbeing, regardless of the type or scale of the project. Designing for fire and life safety includes understanding and managing the risks involved – regardless of scale and use – and managing these competently.”* Few would argue with this aspiration of professional competency, but the framework to achieve such competency has yet to be announced.

Civil Engineers have also responded. As early as October 2018, the report “In plain sight: assuring the whole-life safety of infrastructure” emphasises that *“it is vital that a responsible professional body, and its members, reflect on current practice to examine the actions that are needed to deliver safer and more effective whole-life stewardship of assets”* and eventually expanding the CROSS-UK (Collaborative Working for Safer Structures UK) confidential reporting system into fire safety matters. Furthermore, a joint competency register for engineers who are professionally qualified to design and deliver higher-risk buildings (HRBs) was agreed by the ICE and the IStructE in 2023.

The GTI phase two report calls for additional government funding towards the expansion of Master level higher education programmes. These programmes should not only respond to an adequate definition of the fire safety engineering discipline, but also include a competence uplift for all other professionals engaged in the construction industry, including those conducting fire risk assessments. The Inquiry report emphasises that significant strides towards such a definition have already been made by the Australian Warren Centre Report and should be carefully considered.

This call for reform has already prompted responses from industry leaders and academic institutions. Among these, University College London (UCL) has introduced a Master of Architecture (MArch) in Fire Safe Design [2] – a significant step forward in enhancing the knowledge and skills of practicing architects. This program aims to respond directly to the concerns highlighted in the GTI by providing graduates with the expertise necessary to design beautiful, functional and safe buildings. It is important to note that this is the first programme of its kind globally and is aimed specifically at equipping professionals with skills needed to design intrinsically safe buildings. In a similar manner, the University of Edinburgh has reformed their pioneering MEng offerings in Fire Safety Engineering [3] to support the needs of Civil and Structural Engineers. This is the only fire safety programme accredited by the Joint Board of Moderators (JBM).

The GTI phase two report does not argue against the principles of designing fire safe buildings by means of functional requirements; it does however question the way it has been implemented to date. The report points towards the limitations of current testing practises in assessing the explicit performance of a product or system; and emphasises the significant weight placed on the competency of those professionals using and interpreting the test data. Furthermore, it recognizes the inadequacy of current design guidance calling for a comprehensive review of Approved Document B. If we are to remain within a functional requirements framework, the way fire safety is implemented must change completely; with the emphasis being given to a competent application of first principle concepts and tools.

It's like learning to cook without following a recipe.

The aim of a functional requirements system is to integrate fire safety into a building design such that the provisions for fire safety are indistinguishable from the architectural design and its engineering implementation.

Architecture, including its engineering implementation, has in many cases already achieved this integration with structural engineering, MEP engineering and sustainability. It is the hope that the same will happen with fire safety when fire safe design is in the hands of graduates of programmes such as the MArch in Fire Safe Design or the MEng in Structural and Fire Safety Engineering. The additional resources devoted to higher education and recommended by the GTI should lead to the proliferation of many other such programmes and the acceleration of the transition.

A curriculum of this nature needs to incorporate the historical context of fire safety – including significant fires that impacted our current legislative framework; specific technical skills and design options available – including understanding the behaviour of structural materials under fire conditions. These programmes give students the opportunity to integrate fire safety into building design concepts, ensuring that fire safety is not treated as an afterthought. This holistic approach is in line with the inquiry’s call for architects and engineers to take greater responsibility for fire safety through the lifecycle of a building.

The unique aspect of these programmes is that they teach design professionals how to comply with the UK Building Regulations without relying only on Guidance. Several pages have now been added to the introduction section of Approved Document B, stressing that this is exactly how the document *should* be used. It states: “*Each approved document contains legal requirements (which you must follow) and guidance (which you may or may not choose to follow). The text in a box with a green background at the beginning of each section of an approved document is taken from the Building Regulations. This text sets out the legal requirements. The explanation which follows the legal requirements is guidance*”^[4] Furthermore, it states that those who do not understand the Guidance should not be using it at all. This currently, and sadly, represents the vast majority of building design professionals including fire engineers.

Most architects and engineers have exceptional reasoning skills, sound intuition and basic common sense. It is a lack of technical knowledge and a culture of regulatory ‘box-ticking’ that appears to have caused stagnation in professional competency with respect to fire. The GTI phase two report (figure 1) seeks to address the knowledge gap and change the culture; to enable building design professionals to transition from ‘intuitively-safe’ to ‘demonstrably-safe’ design.

While current initiatives are a step forward, they must be part of a wider shift within the building design profession and the construction industry as a whole. The Grenfell Tower fire exposed deep-rooted issues in how fire safety is incorporated into the design, construction, operation and management of buildings. Many professionals showed a misunderstood reliance on fire engineers and other specialists to address fire safety issues, without fully understanding their own responsibilities and the implications of their choices. Furthermore, fire engineers were found to

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bear “*considerable responsibility for the fact that Grenfell Tower was in a dangerous condition on completion of the refurbishment*” and to show an attitude that: “*was wholly inconsistent with the careful approach to matters affecting the safety of life to be expected of a reasonably competent fire engineer.*”

As the construction industry continues to evolve in response to the findings of the Grenfell Tower Inquiry, the role of education and continuous professional development will be critical in ensuring that such a tragedy never happens again. The necessary cultural change towards fire safety will require a deep professional introspection for all disciplines involved in the construction industry as well as a sustained commitment from across the sector to truly effect lasting change.

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4. Building Regulations (2010) *Approved Document B: Volume 2: Buildings other than dwellings*. 2019 edition incorporating 2020 and 2022 amendments.

Figure captions

Figure 1. Grenfell Tower Inquiry Phase 2 Report

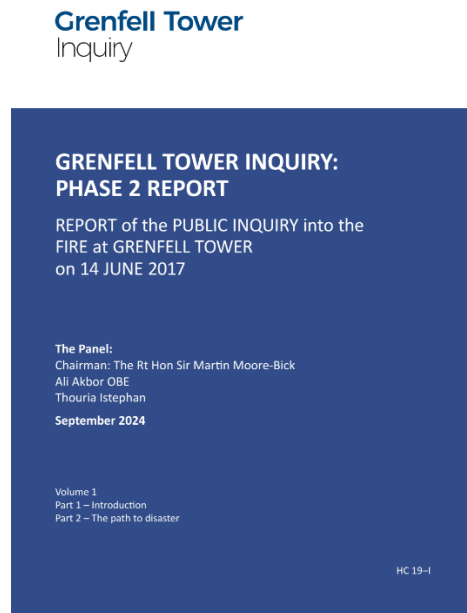


Fig. 1