REGULATING FIRE SAFETY

a concrete overview

REINFORCED INSIGHT

BAR
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The British Association of Reinforcement (BAR) is the trade association of UK manufacturers and fabricators of steel reinforcement products including cut and bent bar and mesh as well as suppliers of associated reinforcement products. BAR aims to add value to the UK reinforcement sector through promotion of good industry and health and safety practices, market and product development, and forwarding the UK reinforced concrete industry as a whole.

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Introduction

The British Association of Reinforcement (BAR) has welcomed the publication by the Building Safety Regulator of its first three-year Strategic Plan for 2023 – 2026. The plan forwards a vision of a built environment where buildings, particularly high-rise, are of high quality and safe. BAR believes that the inherent non-combustible fire resistance of reinforced concrete means that the construction material is unrivalled in providing the safe buildings envisaged by the Regulator.

A NEW FIRE SAFETY REGIME

The Regulator was a key requirement of the Building Safety Act 2022. The Building Safety Act called for:

- The establishment of a dedicated Building Safety Regulator to act as the sole Building Control body and to ensure advisory and competence committees are established,
- A 3-stage gateway process which requires approval at the planning, pre-construction and completion stages,
- An Accountable Person to be appointed to have legal responsibility for ensuring that fire and structural risks are understood, and that appropriate steps and actions to mitigate and manage these risks are taken.

For the planning, design and construction of high-rise buildings the new regime involves:

- Planning application to the local planning authority must show early consideration and incorporation of fire safety needs relevant to land use planning. These include site layout, water supply for fire fighting, access for fire services

As part of the building safety reforms, the Building Safety Regulator will be the building control authority for high-rise buildings and will have a range of enforcement powers throughout the design and construction process. Planning applicants will no longer be able to choose their building control body.

- Building safety risks will need to be considered from the initial design phase so that buildings are safe to build and safe to use or live in.
- Before starting any building work, applicants will need to submit a design application to BSR. The application will include information that shows how the design will meet building regulations, manage change control and assist duty holders meet legal requirements. The application will need to show the assumptions that have been made about the occupied building once built. Any assumptions and proposals must be reasonable and justified.
- Building work must not start until approved by BSR. Ongoing requirements include: key milestone site inspections; reporting certain occurrences; managing change; identifying ang storing key building information.
- At completion, BSR will assess the application against the building regulations, undertake final inspections of the completed building work and assess the documents to be given to the building owner. On approval, BSR will issue a completion certificate.
- After a completion certificate is issued, the building will need to be registered. An application to register the building should be made to BSR. Residential units must not be occupied until the building is registered. Any proposals for phased construction or occupation should be agreed at the design stage. Construction work should not start on a phase or stage without approval from BSR.

The Building Safety Act forwards the majority of recommendations of the Grenfell Tower Inquiry – the Grenfell Tower fire in 2017 tragically resulted in the death of 72 people in the worst UK residential fire since World War II.

Following the Grenfell Tower fire, a ban on the use of combustible materials in and on the external walls of flats over 18m in England as well as hospitals, student accommodation and dormitories in boarding schools, was introduced in December 2018. This has been extended to new hotels, hostels and boarding houses over 18m. In addition, new statutory guidance restricts the combustibility of materials used in and on the external walls of residential buildings between 11-18m in height.

The Building Safety Regulator aims to lead a critical change in culture and behaviours across industry and the whole built environment. The Strategic Plan establishes a vision to create a built environment where everyone is competent and takes responsibility to ensure that buildings are of high quality and are safe. It sets out the guiding principles that the Building Safety Regulator has established in order to deliver a new regime of fire safety which will embrace fundamental changes to the safety and standard of all buildings.

The inherent fire resistance and non-combustibility of reinforced concrete allows for the realisation of the safe built environment envisaged by the Building Safety Act. Importantly, for developers and building owners, these benefits provide concrete assurance for the newly required building fire and structural safety reports.

CONCRETE FIRE PROTECTION

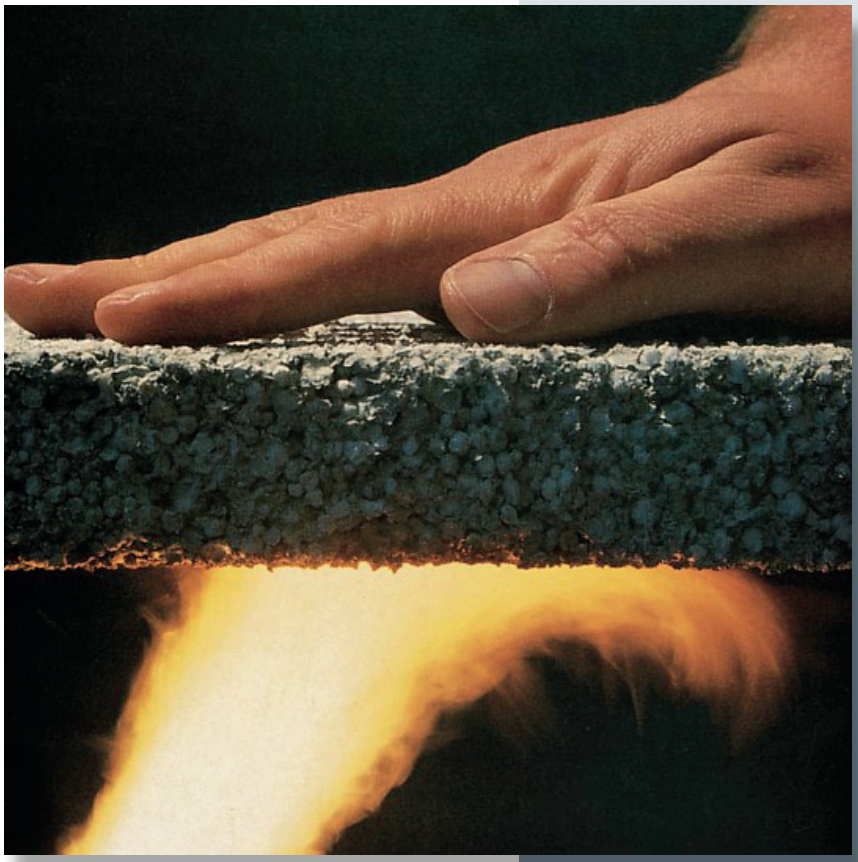
The temperatures in a building fire can quickly reach between 600°C and 1,200°C. In addition to this intense heat, harm to building occupants is caused by a combination of the effects of smoke and toxic gases emitted from burning materials. There is also the danger resulting from the building's failed structural integrity.

Concrete is one of the most fire-resistant construction materials. Under European Standards (EN 13501-1:2007-A1:2009), it's classified as an A1 material – the highest grade of fire resistance.

The construction fire safety of concrete is underlined by the fact that it is non-combustible, is non-toxic and has low thermal conductivity.

This means that concrete does not easily transfer thermal heat and does not react easily with other substances (meaning that in the event of a fire there are no noxious gases released). These inherent benefits make concrete one of the safest and most effective materials for structural fire protection. The inherent fire resistance also means that concrete buildings can provide a high level of fire resistance and safety well above that required for life safety. This provides greater evacuation and rescue time plus increased structural integrity and safety for fire fighters entering burning buildings.

In most cases, concrete does not require any additional fire-protection because of its built-in resistance to fire. Concrete ensures that structural integrity remains, fire compartmentation is not compromised and shielding from heat can be relied upon.



Because of concrete's inherent material properties, it can be used to minimise fire risk for the lowest initial cost while requiring the least in terms of ongoing maintenance. Other construction materials rely on fire protection, fire safety engineering or rate of loss of combustion. The reliance on additional materials and engineering makes these materials susceptible to fire risks resulting from poor workmanship, changes to building use, modification to building structure, compliance with management procedures and errant human behaviour.

CONCLUSION

The Grenfell Tower tragedy underlined how fire safety must be an essential key consideration in the design and use of buildings and structures. This lesson has been emphasised by the resultant Building Safety Act and the establishment of the Building Safety Regulator together with the new planning, design and construction regime for high-rise buildings.

The legislation is designed to provide greater safety, quality, transparency of the building process and accountability of the professionals involved and provide key stakeholders, such as residents, with reassurance and confidence that the buildings that they are utilising are safe.

The inherent fire resistance of concrete enables owners, developers, designers and constructors fulfil their legislative and regulatory responsibilities and deliver, with confidence, the necessary fire safety.

Concrete construction ensures that structural integrity remains, fire compartmentation is not compromised and shielding from heat is assured. This increases the fire resistance of buildings, gives building occupants more time to escape, provides fire services greater security to fight fires and fulfils the safe built environment as envisaged by the Building Safety Act.

The Reinforced Insight series from the British Association of Reinforcement provides an insight to issues affecting the specification and use of reinforced concrete. As with all BAR publications the series is available as a free download from: **www.uk-bar.org**

Other Reinforced Insight titles include:

REINFORCED INSIGHT: IS CROSS LAMINATED TIMBER A TROJAN HORSE?

Questions the assumed environmental and structural benefits of cross laminated timber (CLT) construction. In particular, the report explains that when it comes to sustainability the belief that 'wood is good' is naively simplistic. Consideration should be given to the CO_2 emissions resulting from timber harvesting and rotting tree stumps, the energy used for the industrial process to dry the timber and fabricate the CLT panels and the CO_2 impact of timber transportation often from several thousand miles away. In addition, consideration should be given to operational CO_2 emissions and questions arising over long-term structural performance.

REINFORCED INSIGHT: REINFORCED HEALTH AND SAFETY

The health and safety of employees in the steel reinforcement sector is a key priority for the British Association of Reinforcement (BAR) and its members. This publication provides an insight BAR members' ongoing development and implementation of health and safety programmes and initiatives aimed at achieving zero health and safety incidents. This includes full engagement and communication with employees and the ongoing development and improvement of health and safety protocols and initiatives. The over-riding objective is the establishment of a health and safety culture that is embraced by all from management to those on the mill and fabricator factory floor.

REINFORCED INSIGHT: SOCIAL VALUE – CHALKING UP SUCCESS

For the construction industry, social value involves demonstrating how a project provides added value in terms of society, local community, economic and environmental benefits. Following government mandatory procurement requirements, the concept of social value is now being further defined and forwarded. This publication provides an insight as to how delivery of social value has been fully embraced by the members of the British Association of Reinforcement as part of their corporate responsibility commitments. They are fully ready to work with construction clients and partners to fulfil social value ambitions that 'raise the bar'.

RAISE THE BAR

FOR REINFORCED SUCCESS CHOOSE A MEMBER OF THE BRITISH ASSOCIATION OF REINFORCEMENT

- DELIVERING QUALITY AND ADDED VALUE
- FULL ADHERENCE TO REQUIRED TECHNICAL AND INDUSTRY STANDARDS
- COMPLIANCE WITH RELEVANT CERTIFICATION SCHEMES
- COMMITMENT TO HEALTH & SAFETY, SUSTAINABILITY AND SOCIAL VALUE
- ONGOING PRODUCT INNOVATION AND PROCESS DEVELOPMENT

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BAR MEMBERS: GIVING YOUR PROJECT A REINFORCED ADVANTAGE

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