Performing under fire

20 May 2016

Wilf Butcher highlights the fire safety assumptions that are made during the design, construction and maintenance of a building

In almost every aspect of our daily lives we all make assumptions ? often based on a limited knowledge of the matter in hand, but in our opinion sufficient to form a reasoned judgement.

When designing a building, many assumptions will of necessity be made about how it should perform in a fire, though these will have one primary goal: the safe evacuation of everyone inside should a fire break out. But should this be the only assumption made about fire safety? For example, is it also assumed that the building and its contents are to be protected from a fire?

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This is an important ? indeed, a fundamental ? assumption, as statisticians tell us that upward of 40% of businesses that experience a significant fire will be out of business within 12 to 18 months. The knock-on effect of this is the potential loss of jobs and the impact of this on the local community.

While a building control authority will approve a fire design if it complies with the minimum code requirements for life safety, this does not mean that the building itself will be protected from fire, or that the fire service will attempt to save the building where there is no threat to life.

Critical questions

The client needs to be clear about how they wish the building to perform in the event of a fire. The building designer must therefore ask a number of critical questions about the client's business needs, since these will affect the fire strategy.

- What is the maximum acceptable damage value?
- Should any fire that breaks out be contained within a defined compartment area?
- How quickly should the fire be extinguished following the time of ignition?
- How soon should the building be reoccupied for trading?

Throughout the design and build processes, myriad changes will need to be made to take account of unforeseen circumstances. When the building is handed over to the client,

though, they will not unreasonably assume that the building will be fit for purpose. But in terms of the building's fire performance, how can they be sure?

Third-party certification

Certain processes and procedures can improve the likelihood of the building's fire performance meeting expectations.

These processes start at the design stage with the fire protection materials and systems specified, and continue throughout the building phase in terms of the competency of those that install them.

The specification of third-party-certificated products and systems is not mandatory, but it does minimise the assumptions that need to be made when determining appropriate performance. This is because it offers:

- proof of product performance from a range that has been tested (not single tests)
- evidence from tests used in assessments to create a scope of certification covering the product range's performance
- factory production control audits or inspections of product manufacture, typically conducted annually
- requirements for manufacturers to declare any changes made to products
- ongoing product verification (through audit tests or inspections) at predetermined frequencies.

However, product certification is just one factor. Without competent installation, there can be no assurance that the product or system installed will be fit for purpose in the event of fire.

As with the choice of product, the selection of an installer certificated by a third party is not mandatory; however, it can eliminate the need to make assumptions in many essential areas of risk by offering:

- an audit of company operational or management procedures and processes (typically on an annual basis)
- regular inspection of ongoing site work
- competence assessment of supervision and installation personnel on site
- a certificate confirming the scope of product types that a company can install
- the assurance provided by the listing of a company on the certification body website
- the ability to issue a certificate of conformity to the client for works carried out on each specific project supported by that certification body.

Building handover

When a building is finally handed over, further assumptions will have been made by both designer and builder, who will expect that their fire provisions will be adequately maintained for the rest of the building's life. Similarly, the manufacturers and installers of the fire-resistant products and systems will expect them to be maintained in accordance with their instructions, so as to preserve their warranties.

In England and Wales, <u>Building Regulation 38</u> requires that fire safety information must be provided to the responsible person on completion of construction, where a building is erected or extended, or is subject to a material change of use. It also requires that the building will comply with the <u>Fire Safety Order</u>.

The information is essential to help the responsible person meet their legal obligations in

terms of undertaking a suitable and sufficient fire risk assessment for the building, so full details must be passed to this person by the applicant no later than the date of completion of the work or the date of occupation, whichever is the earlier. Where Regulation 38 does not apply, it is not a statutory requirement to produce fire safety information, though it may often be good practice to do so. Regulation 38 defines "fire safety information" as relating to the design and construction of the building or extension, and the services, fittings and equipment provided in or in connection with the building or extension to assist the responsible person in operating and maintaining the building or extension with reasonable safety.

Those involved in the provision of fire protection, at any level, share liability for its usefulness and its operation, and remain liable in the event of a court case

After completion or occupation, the full weight of responsibility falls on the building's owner, who must ensure that all fire safety provision is monitored and maintained and any future modifications to the building or its fabric do not compromise its overall fire performance.

Fire-engineered solutions

How well a building owner understands what may be complex fire-engineered solutions will be vital in ensuring that the building will still perform as expected during a fire. All activities in the building that might affect its fire performance must be monitored, and action taken where necessary.

This is essential when allowing follow-on trades to undertake work that may, for example, breach the building's compartmentation. While it should be expected that any such trade is vetted to ensure they are competent to undertake work? for instance the installation of new telecommunication cabling? it should not be assumed that they are competent in recognising when they have breached the fire compartmentation provision and then reinstating it. Such damage to the compartmentation can significantly compromise the intended fire provision of a building, leaving the expected fire performance in question.

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The <u>ASFP</u> <u>Guide to Inspecting Passive Fire Protection for Fire Risk Assessors</u> offers essential guidance to building owners and risk assessors, while <u>Ensuring Best Practice</u> <u>for Passive Fire Protection in Buildings</u> defines the roles and responsibilities of professionals with responsibility for the fire safety of a building throughout its life cycle. Both publications are free to download.

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Further information

Related competencies include: Fire and safety

This feature was taken from the RICS Building Control journal (April/May 2016)