



Regulatory review

Douglas Barnett and **Dr Jim Glocking** discuss the need for an urgent review of Building Regulations to address changing building methods, materials deployed and fire loss experience in the UK

FIRE PROTECTION requirements for UK buildings are set out in two documents that conveniently address commercial and residential buildings separately. In both cases, the life safety objectives of these documents may be achieved by alternative fire engineered approaches. Insurance in the UK is similarly split into commercial and household, but it is important to realise that apartment blocks and flats are generally dealt with as commercial insurance.

Over the past three years, RISCAuthority has reported extensively on the challenges facing the insurers of new building types, with the main issues best encapsulated in the fire experience from light timber frame apartment blocks in construction, and even once occupied. In-construction fires are quite easy to understand – building out of combustible materials can involve stacking

large quantities of raw materials in a configuration that will assist ignition and fire spread, with one of the last construction details applied being the fire-resisting elements (predominantly plasterboard and mineral fibre packing). Building Regulations have no jurisdiction during construction – this period is handled by the local building control or approved inspector and the Health and Safety Executive (HSE).

Industry response

The timber framing industry has responded with a series of guides promoting sound project management strategies to limit exposed frame times and combustible material quantities, promote good housekeeping and ensure site security is appropriate. Insurer requirements are promoted in the 8th edition of the *Joint Code of Practice on the Protection from*

Fire of Construction Sites and Buildings Undergoing Renovation.

New to the 8th edition is a focus specifically on timber frame construction; but as methods change, many of the additional recommendations will be equally relevant to all forms of construction having combustible structure or using combustible insulation and cladding. To mitigate many of the construction risks, this document asks that serious consideration is given during the design stage to:

- constructing the ground floor from non-combustible construction (concrete, masonry or steel) as a means of reducing risk from low level accidental and deliberate fire raising
- the treatment of all combustible elements with an appropriate fire protection treatment

The occupied challenges have been somewhat more difficult to quantify, due to the fact that identified problems arise from many different sources and potential solutions range from the impossible/impractical to the simple.

At the difficult end of the spectrum is 'construction quality'. On paper, all designs should be fire-safe. The drawn building will show perfect fire compartments with abutting plasterboard joints forming tight boxes with any wiring and plumbing penetrations, appropriately stopped with the correct devices. Wall cavities will be drawn with cavity barriers perfectly positioned and filling the gaps, making them impervious to untimely fire spread. The reality is sadly sometimes very different.

Following a fire in a large, light timber frame apartment block insured by AXA, during which the fire spread uncontrolled around the wall cavities, the following forensic study revealed that:

- behind the false ceilings in the apartments, wall plasterboard sections failed to span to the ceiling – the on-drawing fire compartments had therefore never existed
- where the fire-resisting linings had been penetrated by a soil pipe, plumbing or wiring, the required fire stopping device or measure was sometimes found to be missing, inappropriate, or inappropriately positioned
- cavity barriers designed to stop fire spreading in the wall voids were sometimes missing or incomplete
- critical fire stopping points, such as where electrical feeds to the apartments emerge from the wall cavity, were noted to be entirely unstopped

These are all hindsight observations. The message in this case is that clearly the construction focused on the beauty of the bits of the building that could be seen and gave little attention to the out-of-sight-out-of-mind potentially lifesaving design details. How could



this be prevented from happening again? Well, that's a difficult one to answer. The effort has to occur during construction because once the surface finishes are applied, it would require destructive surveying to determine whether all has been done right and that's not on the cards for any of the potential inspecting bodies. The danger is that insurers, potential buyers and occupants alike might use broad brushes in the future when making their minds up about these forms of construction and prejudice well-crafted buildings at the same time.

Outside sources

And now perhaps something simpler, though no less important. On a number of occasions, fire has broken into light timber frame structures from an outside source. This is an area where again our Building Regulations have little or no jurisdiction; but given the change in building methods and materials, perhaps now is the time that they should. The threat from bin fires being set close to a building's curtilages is easily understandable, well known and not unknown in many loss scenarios. This is understandable since it is a major 'seat of fire' with often long flame lengths that may reach susceptible areas, such as roof overhangs. What might

be less well understood is the emerging evidence of very small sources, such as discarded smoking materials, finding a low-level route into the combustible cavity of light timber frame structures, which then can go on to cause major destruction.

Similar to every fire is a 'chance element' – an unlikely meeting of happenings, such as the discarding of a cigarette still burning that is then wind-blown to a place where dry leaf litter has similarly collected, and the location of a viable point of entry. In this case, it is the ingress route where intelligent product choice could radically benefit the statistical likelihood of these events occurring for the better. The objects in question that appear to be the unifying feature of these losses are 'plastic fittings' – air bricks, bathroom vents, dryer vents and even plumbing pipes formed of plastic all demonstrate an all-too-ready ability to take a flame from a small source and transmit it into the cavity of the building either through the hole they transit or by forming a burning pool below.

Recreating fires

Such scenarios have been recreated at FPA's fire laboratory and some plastic air bricks would take and hold a lighter flame after just five seconds' application.



While it would be understandable for readers to assume penetrations in external walls would be fire stopped or protected in the same way that pipe, ducts and vents are between internal fire compartments (for example between adjoining flats), they would be wrong. The external envelope of a building is not considered part of the fire compartment, so the rules do not apply to these walls.

The solution is simple: choose better performing materials such as clay vents in place of plastic, or protect penetrations as you would if placed in an internal compartment wall. How to achieve this is another matter. In an ideal world, Building Regulations would accept the problem and extend their scope of authority to include factors to mitigate fire ingress, rather than pursue their current approach of leaving it to the internal cavity barriers to deal with. In most risk manager's eyes, this represents an after-the-horse-has-bolted measure, made worse by the suspected quality issues formerly mentioned with cavity barrier installation. Such a measure would be high on the list for consideration were the FPA Safe Futures Campaign to succeed in getting this on to Building Regulations Advisory Committee's agenda in time for the next review.

In the meantime however, RISCAuthority's building

protection documentation, *Building Regulations 2000: Approved Document B (Fire Safety) – Volume 2 – Buildings and other than Dwellinghouses Incorporating Insurers' Requirements for Property Protection* is being updated with specific references to structures potentially displaying these vulnerabilities to include: 'Where the risk assessment deems these measures unnecessary (concrete plinth, FR treatment [see above]), it is additionally recommended that all fittings that breach the external envelope of the building up to first floor level (such as air-bricks, plumbing pipes, drains, bathroom/kitchen extract ducts, and washer/dryer vents) and any associated ductwork, be made of non-combustible materials to mitigate the risk of fire ingress.'

RISCAuthority will be conducting further testing pertaining to new building methods that utilise significant quantities of combustible material in structure, cladding and insulation during the remainder of 2014 and into 2015.

Insurer guidance

It is important to remember that insurers are not condemning timber frame, as it is a long established form of construction; however the parameters of its use have been extended and pushed to large structures over recent years.

Insurer guidance on loss mitigation has been developed over many decades by understanding how building systems and materials perform in fire and this is where we are with timber frame. Poor workmanship in the finishing of timber frame buildings has become more apparent with levels of fire damage in structures far exceeding those that would normally be expected.

We are not calling for full scale change in the design and construction phase of timber frame, but rather sensible and cost effective change and the improvement in workmanship and surveillance during the construction phase. Testing will continue at the FPA laboratories and these results will be shared and incorporated into insurer guidance.

'Fresh eyes' review

This clearly demonstrates the thinking behind our recently launched campaign to try to persuade ministers to undertake a 'fresh eyes' look at the fire aspects of the Building Regulations with respect to modern methods of construction.

Building methods and materials have changed in recent years with more lightweight construction and the introduction into the construction process of more combustible materials such as lighter weight timber. It would seem only logical therefore that regulations designed and compiled to accommodate buildings made predominantly of masonry and steel were given a sense check as to their appropriateness, relevance and likely performance in fire when fundamentally changing the nature and characteristics of the base materials used ■

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