

Written evidence submitted by Sam Liptrott, Fire Engineer and Director at OFR Consultants Ltd

## **1 EXECUTIVE SUMMARY**

- 1.1 Mass timber construction is the primary focus of my answers below, as that is the primary area where fire engineers can influence sustainable building methods currently.
- 1.2 Mass timber is experiencing a “push” from the construction market, but as it is not a common material there is no guidance on how to use it and few people competent in how to adequately design and build with it. Construction is also feeling the effects of the current ‘crisis’ re cladding and combustible insulation, which is undermining trust in the construction sector generally. This leaves a vacuum of confidence from both Statutory Approvers and Insurers.
- 1.3 The obvious answer is to develop the Building Regulatory guidance to cover mass timber buildings, supported by a rapid and extensive research programme to better understand modern building materials and methods.
- 1.4 A significant current impediment to mass timber construction is the insurance industry reluctance to provide equitable property insurance for most types of mass timber building. There would be, therefore, little value in planners incentivising mass timber right now as an uninsurable building wouldn’t get built.
- 1.5 Since the Grenfell Fire, regulators appear to have had a tendency towards ‘protecting’ against the less competent and credible elements of the industry, and revising guidance
- 1.6 At the vanguard of the construction industry, however, there are extremely competent and visionary developers, designers and contractors who want to achieve net-zero in a safe and sustainable way. This is already being seen on numerous projects, buildings, and pan-industry initiatives.
- 1.7 The question with low carbon alternatives to current building methods is whether there is enough time to let this knowledge cascade down to the whole industry, or whether a catalyst is needed from government. In my view, the government need to show courage and willingness to invest otherwise the industry will flounder in its critical pursuit of net zero.

## **2 INTRODUCTION**

- 2.1 I am a Fire Engineer with nearly 20 years of experience and am founder / director of the UK's largest specialist Fire Engineering practice, OFR Consultants. OFR have over 100 fire engineers across the UK, and have worked on over 2,000 projects in the last 6 years. I have personally been involved with over 500 building projects in the last 20 years as either designer or reviewer.
- 2.2 OFR Consultants have been particularly involved with mass timber construction over the last 5 years which includes curating a significant testing programme for the Structural Timber Association, carrying out several other large scale tests for specific projects, funding mass timber related PhDs, and being designer or reviewer on over 40 buildings involving mass timber.
- 2.3 I am the Fire Engineering industry representative on the Mass Timber Know How forum, the Timber Accelerator Hub and a working group including London Fire Brigade, the National Fire Chiefs Council and several academic bodies looking to secure funding for another significant programme of mass timber fire testing. I also liaise regularly with insurance industry representatives on issues including mass timber, through working groups and project discussions.

### **3 WHAT ROLE CAN THE PLANNING SYSTEM, PERMITTED DEVELOPMENT AND BUILDING REGULATIONS PLAY IN DELIVERING A SUSTAINABLE BUILT ENVIRONMENT?**

- 3.1 Mass timber construction is the primary focus of my answers below, as that is the primary area where fire engineers can influence sustainable building methods currently. That is not to trivialise the work of fire engineers in trying to ensure fire damage in buildings is kept to a minimum, which is itself a significant sustainability benefit. It is, however, focusing on the current 'hot topic' re sustainability and fire.
- 3.2 Fundamentally, there needs to be joined up thinking between those parts of the regulatory system that seek to encourage innovation in building materials and those parts tasked with ensuring safety in the built environment. That is not currently the case.
- 3.3 Mass timber is experiencing a "push" from the construction market with regards to a desire to reduce costs, improve speed of construction and deliver sustainability. Guidance currently provided to accompany the building regulations with regards to fire safety sets out to address "common building types". Common building types typically means buildings made of traditional materials (steel, concrete, glass or masonry structures) assembled using methods that prevailed in the 1960's and 70s.
- 3.4 What is demonstrably not 'common' are large scale building which are partially or entirely constructed of mass / engineered timber. They are not common in number, and neither are they common in the unique challenge the present. Therefore there few designers and contractors who are competent in the use of mass timber. There is also no standard guidance on how to design using mass / engineered timber. This lack of guidance and general lack of competence leaves a vacuum of confidence from both Statutory Approvers and Insurers.
- 3.5 The obvious answer is to develop the Building Regulatory guidance to cover mass timber buildings, and create a 'safety framework' which designers and contractors can use to adequately design and build under. I would recommend this is supported by a rapid and extensive research programme to better understand modern building materials and methods. What constitutes a *modern* common building needs to be better reflected in guidance.
- 3.6 Uncommon buildings can then be subject to greater scrutiny. In order to effect this, there would also be a need for regulators to engage with suitably competent, skilled and experienced experts. Designs should also be subject to third party review by competent

persons, as there is inherently a competence gap between regulator and industry which may not in practice be bridged (as the skills required could evolve continuously as novel methods and materials emerge).

- 3.7 The construction industry is currently in the grip of another building safety crises re cladding and combustible insulation. Any and all activity from regulators appears to be focused on that issue, including the amendment of the Building Regulations to ban certain materials, the creation of the Building Safety Bill, and the recent release of a draft British Standard on residential design. If one were to review these recent, it would be credible to conclude that the direction of travel from the regulators is currently to see less mass timber in buildings, not more. A recent draft BS on residential development goes as far as specifically precluding the use of mass timber in certain instances in certain types of residential building.
- 3.8 It appears that they have chosen not to create a pathway for uncommon building methods, which is in direct opposition to the need for novel thinking in construction. The effects of this are evident to anyone currently involved in mass timber and construction. In the last 2 years, I am aware of more than 10 proposed buildings which have jettisoned timber in exchange for steel and concrete, and all of them cited the lack of clear Building Regulations guidance as one reason, amongst others, for doing so.
- 3.9 The current status quo is that there are a few competent and responsible developers and contractors who are pioneering the use of mass timber, but that is being done on a project-by-project basis. Those parties are paying for project specific testing, doing project specific research and producing safe, efficient and adequate building designs. It is, however, on a local scale, not a national one.
- 3.10 The flip side of this is that there are other developers and designers who are attempting to deliver mass timber schemes without the same rigour or competence, in some instances going as far as not even mentioning that the proposed buildings are intended to be constructed of mass timber in the fire safety submissions. The lack of guidance creates the environment in which that can happen and go unidentified.
- 3.11 It would be a failure of the DLUHC if it did not broaden the focus of its attention from cladding to include the wider topic of novel materials and methods. In so doing, they could create the necessary environment to foster the innovation necessary for future sustainable buildings, without impacting on safety. That would require engaging with the few people who are competent re mass timber and MMC and seeking to create a framework in which mass timber and other new methods and materials can be appropriately used and encouraged in building projects, both new build and refurbishment.

#### **4 HOW CAN THESE POLICIES INCENTIVISE DEVELOPERS TO USE LOW CARBON MATERIALS AND SUSTAINABLE DESIGN?**

- 4.1 It feels like a Catch 22 situation, as planning policy cannot incentive the use of mass timber if there is no clear guidance around its use, and if insurers are still unwilling to provide property insurance for mass timber buildings.
- 4.2 If planners were to incentivise the use of timber now, they would either have to limit that to low rise and small scale buildings. There is a risk that, if they were to push that further and incentive it for taller and larger buildings, there would be a rush to develop without the requisite knowledge or competence from designers and contractors.
- 4.3 The most meaningful incentive right now would be a significant investment in testing and the development of knowledge to be able to create guidance and a framework for timber to be used safely. If that guidance were considered to set out a path to meeting the Building

Regulations, and was validated by Statutory Approvers (Building Control Bodies) and Fire Services, there would be significantly more interest from developers to use timber.

- 4.4 The current commercial reality however, which outweighs any planning or regulatory impediment, is that there are few, if any, mainstream insurers who are willing to equitably underwrite a scheme predominantly constructed of mass timber. I cannot say that, without exception, cover cannot be found, but in my experience I know of only 2 schemes for which insurers have offered to provide cover. Both are relatively small, with a total construction value significantly less than the typical commercial office or residential building values in London.
- 4.5 I don't know for certain the reasons for this, but in numerous meetings with insurance industry representatives I have variously been told that it is due to a lack of relevant data on timber fires, concerns about moisture ingress, a lack of knowledge about the durability of mass timber, and a general lack of trust in the construction industry. In these meetings, I have seen that there is a broad range of knowledge within the insurance industry about mass timber. Some insurance risk advisors demonstrate a reasonable level of knowledge, but others demonstrate a complete lack of understanding of basic fire behaviour and the material properties of timber. There have also been several indications in these meetings that the currently reluctant to insure mass timber is driven as much, if not more, by a commercial lack of appetite versus technical concerns.
- 4.6 If planners or Building Regulators were to incentivise the use of timber currently, therefore, it could only be for small, relatively low value buildings. If that were done for larger, higher value buildings, it would be futile at the moment as the insurance industry intransigence would ultimately scupper any scheme that may be granted planning.
- 4.7 It could also be the case that, without more guidance re the design and construction of them, incentivisation and a more receptive insurance environment could be injurious to the long term use of mass timber, as the current paucity of competence could lead to more inadequate schemes.

## **5 WHAT IMPACT HAS THE GRENELL FIRE HAD ON THE CHOICE OF LOW CARBON MATERIALS?**

- 5.1 It is unarguable that the 2018 ban on combustible materials (which arose directly from the Grenfell Fire) had a significant impact on the use of mass timber in residential buildings. There were numerous such schemes that were in planning around 2018 which have subsequently been cancelled, or switched to steel and / or concrete. The impact of the ban on commercial and office buildings is less easy to define.
- 5.2 The construction industry is generally a conservative sector, slow to adapt and embrace new ideas on the big scale; whilst at a local scale change can be rapid as innovative products emerge continually. Hence change in the construction sector tends to be evolutionary, not revolutionary. That is, in part, because it is a huge industry, with an extremely wide range of competence and capability, and with limited, poorly understood, managed and enforced regulation. The appetite for risk in the development and contracting sector has decreased post-Grenfell, and the perception of the risk presented by materials like mass timber has increased. At the same time, and in my opinion not unfairly, the perception of the competence of the construction industry generally has decreased, as has its credibility.
- 5.3 Since the Grenfell Fire, the government, British Standards committees and regulators appear to have had a tendency towards 'protecting' against the less competent and credible elements of the industry. No doubt, brakes needed to be applied, but somehow those brakes need to be released, with due caution to enable future sustainable developments.
- 5.4 This has, in turn, led to a stifling of innovation and advancement. The net result has led to a general reluctance by funders, developers, insurers and approvers to accept mass timber, and newer, less well known technologies generally (such as other modern methods of construction). This malaise has had a detrimental on mass timber, and its effect will be felt by the majority of bodies seeking to develop and promote the use of more low carbon materials.
- 5.5 At the vanguard of the construction industry, however, there are extremely competent and visionary companies and individuals. There are also developers and clients who want to achieve net-zero, and do it in a way that is safe, sustainable and responsible.
- 5.6 These pre-eminent forces have the capability and appetite to drive the change the industry needs, and are already doing so on numerous projects, buildings and pan-industry initiatives. Regulators etc always lag behind leaders, with lessons cascading down to be enshrined in guidance and best-practice eventually. The question with low carbon alternatives to current building methods, however, is whether there is enough time to let this cascading down happen organically, or whether a catalyst is needed from government.
- 5.7 Unfortunately, as the Grenfell Tower Inquiry has revealed, there is also those that will seek to exploit low competency in regulatory application and badly defined liability structures to promote unsafe practices in the pursuit of profit. We need to open the door to innovation whilst having proper guardianship against the less reputable elements of the industry. This is not achieved through prescription, it is achieved through recognising when further scrutiny is needed and competency in design and approval.
- 5.8 In my view, the current environment is one of risk aversion, stifled ambition and the progress made possible by the competent being neutered due to the fear and legacy of the inadequate. With those prevailing conditions, the government need to show courage and willingness to invest in the vanguard, otherwise the industry will continue to flounder in its critical pursuit of net zero.
- 5.9 Between the late 1950's and early 2000's the government and UK steel industry spent millions of pounds on developing testing, knowledge and repeatable ways of using steel in buildings of all sizes and types. They pooled resources, coordinated pan-European testing programmes, obtained government funding and generally invested significant sums to gradually earn credibility for steel as a construction material. The reason steel is used as widely as it is

nowadays is largely a result of that investment.

5.10 No such endeavours have been made for low carbon materials such as mass timber to date, but it is time we moved more in that direction.

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