

The benefits of offsite manufacture and modern methods of construction are driving efforts to overcome the challenges, report **David Osrin and Paul Wornell**

# Backing innovation

**T**he use of non-traditional construction systems such as offsite manufacture presents a number of challenges. Chief among these are longer term concerns about systemic failure, accessibility for essential maintenance and repairability. More immediate concerns are about fire spread and water ingress, both during the construction phase and after completion.

Factory production and prefabrication have been around in various guises in the post war era and occasional dramatic failures have led to adverse publicity. The most recent focused on timber frame, after incidences of rapid spread fires both during and post construction.

This is a useful prompt to note the impact on different insurance policies. Fires during construction would be potential claims on the contractor's insurance of the works. Post construction, claims would be made on a defect warranty insurance and/or on a buildings insurance taken out by the building owner. Proven design defects may end up as a claim against a designer's professional indemnity insurance.

## Assurance scheme

For the UK residential market, many concerns around the use of modern methods of construction (MMC) have been addressed by the implementation of the Buildoffsite Property Assurance Scheme (BOPAS). This provides long-term assurance to mortgage lenders, their valuers and the ultimate homeowner.

While equally applicable, the commercial market has different drivers, which makes the proposition less obvious. Interestingly, the origins of BOPAS were in the commercial sector. Buildoffsite originally partnered with Lloyd's Register to develop an accreditation scheme to improve supply chain efficiencies and quality using non-traditional construction methods. The scheme was supported by several high-profile clients, including BAA, GlaxoSmithKline and Marks & Spencer. BLP Insurance provided expertise in



**m** Where does MMC start and stop? This commercial scheme used a non-standard brick format in lime mortar, reuse of existing basement retaining walls and ground-source boreholes

relation to latent defects insurance along with a detailed 60-year durability and maintenance assessment.

Richard Ogden, Chairman of Buildoffsite, spent a significant part of his 40-year career overseeing construction for McDonald's and its standard volumetric modular units were the inspiration for many commercial organisations that use them today. Once considered innovative, today the concept is very well established.

Whole rooms and bathroom pods are common in the construction of hotels, classrooms, while plenty of student accommodation uses offsite manufactured volumetric systems. Tesco favours factory finished modules, as do hospitals, where the shortage of bed space requires faster build times and

the lack of skilled workers requires more innovative solutions. The fact that some units are designed to be relocated also contributes to the increased drive for sustainability. Other new materials and mixtures of materials along with novel engineering are also encountered.

Today, most large commercial buildings include an element of innovation, such as service systems and plant that are typically fabricated in sections offsite. Indeed, the Lloyd's building (which celebrates its 30th birthday next year) was conceived partly on the basis of offsite manufactured volumetric units, with prefabricated toilets and staircase units stacked on top of one another. Its designer Richard Rogers also used prefabricated services units to create distinctive external features



on his commission for the Channel 4 headquarters building in London.

## Defining MMC

So, what qualifies as MMC? Boxes completely kitted out with services and finishings that arrive on trucks to be craned into final location are 'offsite' but not necessarily a modern method. Stacking the boxes to 20 storeys does perhaps make it conceptually modern and certainly innovative.

At the other end of the spectrum, insulated concrete formwork systems are equally offsite and innovative; simply polystyrene hollow blocks that slot together and filled with concrete. Although they perhaps fail the criteria because of the intense on-site work required to build a structure, starting with stacking small 'lego style' components, they pass the test because they are a relatively new variant method of construction or more importantly, because they embody innovation that has not been road tested long term.

In between these extremes are any number of 'panel' systems; factory assembled flat panels that bolt together on site to form complete walls, floors and sometimes roofs. This type of system is typified by traditional timber frame, but more recently the panels are coming as cross laminated timber (CLT), structural insulated panels, and light gauge steel. Timber frame has been going through a re-invention as a consequence of the demand for more thermally efficient buildings – the traditional 50 x 100mm stud framing replaced with deep composite I sections to provide a home for 200mm+ of insulation.

So what might almost have been deemed traditional construction becomes an MMC. A useful definition could be something that has not been tested in use in the longer term. It is salutary to note that even a slight change in the chemical composition of an adhesive can impact on the performance of say a CLT panel – so further innovation could easily pass under the radar. Interestingly, some of the most durable and innovative systems that BLP Insurance has

underwritten were sea containers converted into commercial business units. Similarly, the volumetric systems used for hotels and student accommodation are now readily accepted and considered a normal, standard insurance risk.

## Insurance risk

From an insurance perspective, MMC can have implications during and post completion. It can be difficult to find sufficient insurance limits for timber frame systems. Equally, CLT frames going up to eight-plus storeys can be difficult from both a surveyor and insurer perspective, especially when used in combination with heavyweight masonry claddings.

Refurbishments are another potential issue for surveyors, where assumptions might be made based on a traditional build rather than something innovative. But arguably, the real challenge is that should something go wrong in one unit, the others will need to be checked, which creates a greater exposure for the insurer and can lead to the perception of a systemic failure.

During construction, the market appears to be pragmatic towards MMC. Mike Carolan, Director at Willis' UK Construction practice, says that each insurer will differ, but as long as sufficient information can be provided, no loadings will apply to premiums. The insurer will want to know where the project is being built, which systems are being used, details of the construction methods and how they are being used.

Carolan adds that owner coordinated insurance programmes (OCIP) are popular alternatives to the traditional contractor all-risks policy (which has limitations in the event of insolvency), because they cover everything that is manufactured offsite as part of the project. An OCIP also allows for a smooth transition to the property owner's policy.

In time, the insurance market may recognise that MMC can offer benefits to business interruption cover, where in the event of a failure, speed of construction (and ultimately reduced loss of profit/cost of alternative accommodation) become all important.

**m** Why ship components in containers when you can just use the containers? One of the more innovative and durable solutions

## Surveyor perspective

Helpful insight on MMC from the surveyor's perspective is offered by Chris Mahony, Director of Cloud Surveyors. Most commercial property surveyors are not involved in the design process but at a much later stage, often at the sale or letting, so simply being able to identify the innovation can be an issue; and where does MMC stop and start? Even if the project manager is a surveyor, there are still challenges for the design team in understanding how the parts fit together.

Mahony makes the point that it is important to understand the implications of using glue as opposed to mechanical fixings and confirms BLP's view that more often than not, it is the design or the workmanship that is the problem, rather than the materials used. One such example is push-fit plumbing or waste pipes in pods, where the access cost is the biggest expense in the event of a failure that might be caused by poor design or workmanship, rather than a faulty product.

There will always be challenges when dealing with innovation of any kind, so it is vital to fully understand the risk implications and ensure measures are in place to mitigate those risks. Ironically, this remains true even when dealing with traditional systems. However, the well-documented benefits of offsite manufactured systems and MMC make it vital that innovation is not stifled and complications not labelled as failure. **b**

## More information

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