Royal Institute of British Architects

House of Lords Built Environment Committee: Modern methods of construction – what's gone wrong?

November 2023

The Royal Institute of British Architects is a global professional membership body driving excellence in architecture. We serve our members and society in order to deliver better buildings and places, stronger communities and a sustainable environment. Being inclusive, ethical, environmentally aware and collaborative underpins all that we do.

RIBA welcomes the opportunity to respond to the House of Lords Built Environment Committee's inquiry into the future of modern methods of construction (MMC).

If undertaken with the right approach, the increased use of MMC has the potential to grow the rate at which homes are delivered, as well as improving quality and delivering better sustainability outcomes.

As we outlined in our 2019 response to the Housing, Communities and Local Government Committee's inquiry into MMC, its use can result in a 20% - 60% reduction in construction programme time, 20% - 40% reduction in construction costs, 70%+ reduction in onsite labour, and greater programme certainty. There are also a number of clear environmental benefits, with MMC use allowing for significant reductions in energy consumption during the construction process and reductions in onsite waste compared to traditional construction methods.

While there are clear benefits to the use of MMC, it is imperative that it does not result in poorer quality development. Our support for increased use of MMC is contingent on its ability to add value to the construction process without reducing quality.

As the inquiry notes, there are currently a number of barriers to the development of homes through MMC. These include lack of uptake, issues with perception, existing funding models for housing delivery and lack of incentives. There is a role for MMC in tackling the housing crisis in the UK, and as such measures should be taken to reduce the obstacles that prevent its increased application.

RIBA recommends the Government should:

- Consider the implementation of monitoring processes to track the use of MMC and baselines to incentivise the use of MMC when delivering housing.
- Examine the role of incentives in supporting the use of MMC through programmes such as the Affordable Homes Programme.
- Require Post-Occupancy Evaluation (POE) on all Government funded projects involving the use of MMC and promote the use of POE on all other projects.

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What are the major barriers for the further development of MMC and the maturity of the market? What specific steps should be taken to address them?

We are aware of a number of barriers which inhibit the further development of MMC to deliver homes. The housing construction market itself can serve as one barrier: high profits and land costs often mean that incremental increases in construction productivity are not viewed as a worthwhile investment by volume housebuilders. However, it is beneficial to be specific when using the term MMC – there are seven categories of MMC and more often than not, it is primarily spoken about in relation to the offsite volumetric. This is the predominant category discussed in terms of businesses going into administration.

A significant barrier to wider MMC use is lack of uptake, though it is unclear whether this is primarily due to lack of demand, either from within the sector or among the public. A consistent pipeline of work is vital to ensuring that MMC is able to develop and sustain itself, which is hard to achieve should uptake not be consistent. Unlike traditional construction methods, where elements of the supply chain and attached workforce can be employed on a flexible, demand-oriented basis, MMC relies on a vertically integrated factory model for production with specifically trained employees.

There are also barriers that lie in the existing funding models for delivering housing and the infancy of the supply chain. As we outlined in our 2019 response, the cyclical nature of the housing market and lack of certainty that results from this can discourage long-term funding decisions. Some forms of MMC require a higher level of upfront investment than traditional construction, which creates added risk should there be a subsequent economic downturn.

We noted that there is a lack of incentive for volume housebuilders to adapt their business model to accommodate MMC. As a result, a large amount of innovation comes from SMEs which are interested in utilising MMC but have far less capital to invest in research and development to make rapid progress. Public housebuilding programmes are part of the answer to this, as they can provide investment in the event of an economic downturn and help insulate developers from the effects of a volatile market. The public sector is more able to implement volume arrangements through framework agreements with MMC providers to guarantee a consistent pipeline and drive quality up, while keeping costs down. Vitally, they can also provide certainty of pipeline to SMEs, enabling them to increase production and invest in research and development.

Further, procurement is a key area of focus for encouraging greater use of MMC. As cost is a determining factor in successfully bidding for public tenders, a change is needed to government procurement processes to give more weighting to recognising the wider benefits provided by using MMC, rather than basing procurement primarily on best price alone.

Another barrier is a preference for traditional construction methods. This can be due to perceiving it to be more robust, manageable and possibly easier in terms of insurance. Ensuring that there is early and ongoing discussion and clear communication between the clients, design teams and eventual owners and users can help address these hesitations.

Another factor in the lack of development of the market for MMC could be the need for specialist design input, as there are potentially prohibitive cost implications to design team and programme increases. However, there is also a cost benefit in terms of MMC – with additional costs and risks being undertaken in the pre-construction period, should all go to plan delivery becomes smoother and faster, with less room for errors and as a result, increased quality.

For off-site manufacturing, another consideration is access and transportation. This entails looking at how the pre-made components will be delivered to site, including considerations across the whole journey as well as immediate site constraints. In contradiction to this, a constrained site may benefit offsite construction where there is little space to safely build out the scheme more traditionally and where there is potential to crane the systems and components.

The Government provides both direct support to MMC companies as well as using programmes such as the Affordable Homes Programme to drive up the use of MMC more broadly across the sector. Do you believe these schemes are working and if not what should be changed about them?

The Government must take a leading role if the use of MMC is to be increased. Investment into research and development would drive noticeable advances in the sector. There are levers available to the Government to ensure that its funding programmes contribute directly to the increased use of MMC. Attaching conditions for the use of MMC to funding is an important tool.

Our 2019 response suggested that agencies such as Homes England, through its Affordable Homes Programme (AHP), have a role to play in driving up the use of MMC. However, analysis from the National Audit Office in 2022 showed that the AHP had a limited effect on supporting the use of MMC. This is as "no targets were established, and no incentives were put in place on grant rates or approvals to support delivery."[1] To rectify this, an evaluation of Homes England's delivery of the AHP recommends that:

> "For any subsequent grant funding programmes, where wider non-housing delivery priorities are identified at the outset (e.g. employment and apprenticeship opportunities, the use of MMC, involvement of the commercial housing sector, and the use of smaller housebuilders), Homes England should consider setting baselines and/or putting in place monitoring processes to track delivery."

In order to track and incentivise the scaling up of MMC use across the sector, we would support the implementation of monitoring processes and baselines as suggested in the above evaluation. We also agree that the use of incentives for grant rates and approvals would be a sensible approach.

What needs to happen for the MMC sector to be able to deliver without active Government support?

As we have outlined elsewhere in this response, and in our 2021 Design for Manufacture and Assembly (DfMA) Overlay to the RIBA Plan of Work, there is a conundrum holding back the mainstream adoption of MMC. On the one hand, demand is inhibited by the low supply capacity. On the other, suppliers are reluctant to increase capacity because of uncertain constancy of demand. Capital investment needs steady demand, but construction is highly cyclical in nature. For this reason, there is an argument that MMC is well-suited to the public sector with a long-term construction commitment from the Government.

Breaking the deadlock has been too big a risk for the industry on its own. This has led to government intervention, and with it publishing its pipeline of future work, its presumption in favour of offsite construction, and the other policies in its Construction Playbook, it is hoped that this will help to provide the necessary catalyst to reach a critical mass of capacity. Large private clients are already doing something similar by applying MMC approaches across their entire portfolios, so that solutions are optimised over time and standardised to work across multiple similar buildings, reaping considerable economies of scale. This practice allows MMC delivery without considerable government support, though for smaller clients this may not be a practicable option.

[1] https://www.insidehousing.co.uk/news/affordable-homes-programme-review-4-social-rent-homes-delivered-so-far-83272

Conducting Post Occupancy Evaluation (POE) is part of the solution for allowing the MMC sector to grow and improve. POE is the process of obtaining feedback on a building's performance in use after it has been built and occupied via collecting information on building and energy use and user satisfaction. It has the potential to de-risk projects over the long term as the feedback on the design and construction process and continuous improvements ensures that lessons are learnt from previous experience. POE is a tool that can help identify systemic issues that may occur in a project that utilises MMC and rectify these issues for future projects. This saves time and money in the long run by constructing buildings that do not require fixing in the future. This is not only important when projects utilise MMC, but some projects, for example, schools, supermarkets and hospitals often use standardised designs. There are also issues in terms of the planning system which impact uptake of MMC, and addressing these will likely have a positive impact on the pipeline of MMC projects being brought forward. As the DfMA Overlay states, the planning system incentivises putting off decisions that are critical for successful MMC before consent is secured, and rushing to site as quickly as possible thereafter. The later the decisions and appointments are made, the more design rework is likely and the greater the opportunity costs, undoing many of MMC's advantages. In short, DfMA needs to be considered before the planning application is made. It generally becomes very hard to adapt designs once constraints related to planning permission are applied.

Are the existing training programmes in the construction industry adequate to equip the workforce to use MMC effectively?

We are aware that there is an existing knowledge and skills gap with regards both to the built environment sector, It is crucial that appropriate and continual training on skills and competency is available for all contractors working on MMC homes and buildings. This will ensure that all contractors are experienced in use of relevant materials and the associated assembly, maintenance and repair techniques.

DfMA, including MMC, is often linked to digitisation, automation and earlier engagement between disciplines, and requires good knowledge of manufacturing processes and logistics to succeed. However, these new skills are only just entering into the building designers' core curricula of formal training and education. Where the skills do exist, they are distributed across many different roles – such as architects, structural engineers, project managers, contractors, suppliers – meaning that very few have an overarching understanding.

Although the educational syllabuses for the traditional disciplines are slow on the uptake, some training providers are responding to this need. For example, the Bartlett (University College London's school of architecture) has set up a postgraduate degree in Design for Manufacture. Elsewhere, the Construction Industry Training Board (CITB) and providers such as the Manufacturing Technology Centre (MTC), Construction Scotland Innovation Centre (CSIC) and the Supply Chain Sustainability School are running courses on offsite skills, which include DfMA. Organisations such as Buildoffsite and the Building Engineering Services Association (BESA) have also published DfMA-based methodologies.

In terms of MMC and the workforce, MMC can also have better production control, ensuring better quality and longer-lasting outputs that save money in the long run and can complement renewable or sustainable material specification. The cost advantages extend to the workforce that carry out this work. Because the workspace is controlled, there is less risk of accidents and greater certainty for employees on hours and location of work, which can be more unpredictable on a building site. This industrialised approach to construction creates safety and predictability, making construction jobs more desirable to a more diverse pool of talent. Some research has also explored whether MMC will support more women to enter the construction workforce. As offsite construction takes place within a contained environment, this allows for a permanent working location alongside shift patterns and job security which may provide an improved gender balance.