

# Modern Methods of Construction

What are they and why  
are insurers interested?

# The aim of this article is to better understand what is meant by Modern Methods of Construction (MMC), to highlight the perceived positives and negatives of its use and the potential insurance implications.

## What do we mean by Modern Methods of Construction?

The term Modern Methods of Construction (MMC) is a collective term for a wide range of non-traditional building systems. They can be defined as the design, planning, manufacture and pre-assembly of construction elements or components in a factory environment, prior to installation on site. MMC can broadly be split into 7 categories:

- 1. 3D primary structural systems** – production of 3D units in an off-site factory environment ranging from fully fitted out apartments to the more common bathroom pods.
- 2. 2D primary structural systems** – off-site production of flat panel floor, wall or roof structures. These can be the basic skeleton structure or more complex closed panel systems incorporating the lining material and insulation and can include the services, windows, doors and cladding.
- 3. Non-systemised primary structures** – pre-manufactured structural members made of framed or mass engineering timber, cold/hot rolled steel or pre-cast concrete. This includes off-site produced load bearing beams, columns, walls, core structures and slabs.
- 4. Additive Manufacturing** - computer-controlled sequential layering of materials to create three-dimensional shapes. This can be used to easily produce complex structures and was utilised by Skanska for the printing of some of the decorative cladding on the Bevis Marks Building in London.
- 5. Non-structural assemblies and sub-assemblies** - The use of pre-assembled components that do not form the structure of the building. These solutions can be used in isolation in an otherwise traditionally constructed project, and include commonly used items such as bathroom/kitchen pods, M&E assemblies (utility cupboards, vertical risers) or roof cassettes.
- 6. Traditional building product led site labour reduction/productivity improvements** - The evolution of traditional building materials so that they are quicker, easier and safer to install. These can include large format walling (internal or external) or easy site install/jointing/interfaces features (brick slips, modular wiring, pipework).
- 7. Site process led labour reduction/productivity improvements** - The use of systems and processes on or off-site not covered under categories 1-6 above to drive productivity by removing unnecessary work stages. This can include the use of BIM, augmented/virtual reality, drones, autonomous plant (driverless cranes).

## Why is the construction industry looking to use Modern Methods of Construction?



**Speed** – factors like stacking of activities and reduced exposure to weather disruption can deliver time savings of up to 50%, resulting in an earlier operational revenue stream.



**Quality** – carrying out the processes in a controlled, dry, easily accessible environment leads to better quality control as outlined in The Farmer Review of Construction 2016. The lighter weight nature of some MMC products mean they require shallower foundations or provide less stress on the existing structure, reducing the time spent on site and the load capacity of the building.



**Safety** – as a larger proportion of the workforce moves to a factory environment, the hazards to which they are exposed reduce as the environment become more controlled. For example less working at height and less of chance of slips and trips compared with a traditional construction site.



**Diversification and permanency of work force** – 22% of construction workers are over 50 with 15% being over the age of 60 and this skills shortage has been further compounded by Brexit. An increasing proportion of factory based work and standardised working hours may encourage a more diverse range of people into the construction workforce.



**Environmental credentials** – factories can be optimised to minimise material waste compared with traditional construction. Fewer deliveries to construction sites means less transport emissions and pollution. Mace report that off-site manufacturing can result in a 75% saving on wasted materials and a 40% reduction in deliveries to site. The products themselves can also be built to be easier or more efficient to heat and/or cool.



**Reduced disruption** – as a consequence of the reduced construction period and personnel required on site, there is less of a requirement for material storage, car parking and welfare facilities. This can be particularly beneficial in built up areas where space on site is at a premium and the surrounding community are more susceptible to disturbance and disruption.

## Why are Insurers concerned about the use of Modern Methods of Construction?

There is a lack of data as to the reparability, maintenance and modification of MMC structures, specifically relating to the cost and practicability of repair. Insurers rely upon historical data to underwrite future exposures. Where this data is sparse or missing, insurers will price the cover, or restrict it accordingly.

Insurers, in particular those underwriting professional indemnity insurance, are particularly concerned with series or systemic risks associated with MMC. These risks include:

- The potential for repetitive failures requiring rectification on a mass scale across multiple project sites;
- The significant costs associated with rectifying certain types of volumetric design issues, in particular where this involves significant intrusive demolition and rectification. This can be particularly problematic on projects which deliver a fully fitted out or furnished solution. In certain instances it will require the volumetric construction process to essentially be repeated from scratch;
- Repetitive issues associated with cladding and fire safety failures;
- Repetitive issues associated with failures to comply with statutory or contractually required standards. For example where a European standard is required but an alternate British standard is utilised;
- Issues associated with fit and finish that are challenging to retrospectively rectify;
- Protracted or problematic rectification programmes, leading to serious delays or consequential financial losses.

### Professional Indemnity underwriters have sought to address these issues in the following ways:

- A reluctance to offer terms to Insureds with a volumetric/modular construction risk, due to the issues outlined above;
- A higher premium rate requirement due to concerns over potentially higher claims amounts, due to the significant costs associated with rectification and consequential losses;
- Imposing self-insured excesses that address systemic issues (common defects excesses). Normally Professional Indemnity excesses are based on an each and every claim or series of claims arising out of one single incident basis. On volumetric/modular risks underwriters typically impose self-insured excesses that apply to each and every module/unit/building;
- Imposing broader fire safety and cladding exclusionary language and in certain instances total exclusions.

A lack of long term data around the durability of MMC structures and their resilience to flood and differential settlement of some MMC structures, has limited some insurers' appetite to insure such projects or indeed provide the necessary homeowner type warranties. The ability of such structures to rot or suffer from mould is another longer term concern of warranty providers.

Where MMC utilises lightweight combustible materials such as wood, polystyrene and recycled materials, there is potential to increase the risk of fire spread, leading to major damage to the property and significant insurance claims. Another consideration is the fire brigades willingness to extinguish a fire. The early 2000's saw a significant number of fires arising from the use of composite/sandwich panels in the food and drinks industry. More often than not, despite the efforts of the fire brigade, the buildings tended to be a total loss, making them a very unattractive insurance proposition. Though construction methods and regulations have moved on a lot since the early 2000's, these historic losses still taint insurers view on a risk. The recent, high profile fires involving ACM cladding systems and the like, continue to play on the minds of insurers.

Where wood is the main material, insurers have two key areas of concern. Firstly damage by water. This can occur due to adverse weather during both the transportation and installation phases or indeed the escape of water from internal sources within the building. Secondly damage by fire. Insurers may well be comfortable with the fire protection of the completed structure, but this protection is often lacking or incomplete prior to completion of the buildings as a whole, increasing the risk to the construction insurers.



## What do you need to consider from an insurance perspective when using Modern Methods of Construction?

It is clear that the construction industry is going to accelerate and expand the use of MMC in the future. At the same time the insurance industry appetite for these risks is not keeping pace. The onus will be on the construction industry to demonstrate these methods are viable and safe and bring insurers on that journey.

To assist you in the placement of these risks, we suggest:

- You engage early with your broker and potential insurers.
- You provide absolute clarity as to which parts of your project or business is using MMC and be prepared to provide information, in particular fire safety systems, water management processes and appropriate industry certification.
- You are mindful of the potential for increased premium charges or higher deductibles for certain elements, as well as the possibility of restrictions to cover and/or onerous warranties. This will apply equally to construction exposures as it does to operational (Real Estate) placements.

Specifically in relation to **Professional Indemnity**, in addition to the typical underwriting concerns associated with risk, quality and procurement management, underwriters will be particularly interested in:

- Previous systemic claims issues, the lessons learned and practices and procedures implemented to avoid a repeat of such claims issues;
- Audits on systemic claims issues;
- Practices and procedures implemented to ensure that statutory and contractual standards are met, with respect to design, specification, manufacture and materials selection.

**Employers Liability** – if the move to MMC means you are redeploying staff from site to factory, make sure you revise your annual declarations around staff categorisations.

**Real Estate (Post Completion and Handover)** – be prepared to see the insurance costs associated with MMC structures at double to triple the cost of traditional builds. It is imperative to engage with the property market before works start to ensure any risk recommendations can be incorporated into the construction phase.

Above all else make sure your broker has experience of, and understands the nuances of the insurance issues associated with the use of MMC. This should include an understanding of the potential issues with standard Design Exclusions and completed operations cover, as well as being mindful of the impact MMC may have on any delay in start-up or loss of anticipated revenue placement.

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