

Modern Methods of Construction in Healthcare



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Modern Methods of Construction (MMC) is a key part of the delivery of future healthcare infrastructure. The need for better outcome certainty is critical in such projects, with particular focus on programme, quality and carbon emissions.

MMC is considered to comprise three components; Design for Manufacturer and Assembly (DfMA), Offsite Construction and digital design. The use of standardised, offsite construction methods has been employed in construction for over 100 years, and in healthcare since the post-war era. Therefore, to be modern, digital - integrated with other MMC initiatives such as offsite - is therefore key to the successful transformation of the industry and linking of efficient delivery through to efficient performance.

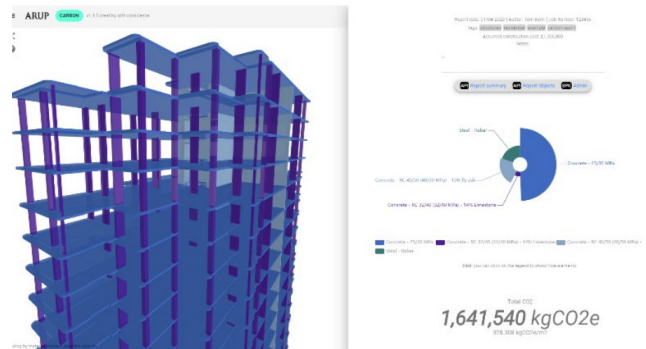
Design stage: better data

During design, there are a number of digital interventions that contribute to a modern approach to healthcare infrastructure design. For example:

Project Information Models (PIM) and Virtual Design Models (VDM); forming Building Information Model (BIM) processes are commonplace within the construction industry, used for coordination between disciplines. BIM level 2 being a minimum standard requirement.

However, greater opportunities exist to embed data and use the intelligence developed within these models to provide better certainty within the construction process.

Using such models to programme and quantify costs is not unusual, but as we strive for safer, smarter and less carbon intensive designs these models need to



Arup Carbon
REVIT-based carbon assessment tool

be expanded to capture greater levels of data.

Design stage: efficiency

On delivering a programme of healthcare, as within the UK, these models should form the backbone of data collection to allow benchmarking of good practice, and importantly within the context of aiming to zero carbon – the material intensity, specification and therefore carbon emissions.

Standardising methods of construction is the backbone to efficient design, and a key enabler to MMC. The repeatable room strategy and the NHS Activity Data Base provides a great set of pre-populated information that can be readily included within BIM models. Such information can be used to very quickly assess the spatial, equipment and

environmental requirements within healthcare spaces, as well as automatically produce schedules of accommodation.

Moving forward, the inclusion of a greater number of parameters will allow for a greater level of standardisation across a programme – avoiding the potential for interpretation.

The Golden Thread of Data

To unlock the potential for standardisation, there is requirement to develop clear workflows, consistent data and transitions in a clear manner creating a Golden Thread of Data throughout the project.

Improving design and user experience

Layering into this the use of digital way-finding and optimisation of circulation patterns within healthcare projects, such as Mass Motion, can assist in optimisation of workflow patterns and predict the implications of interventions; e.g.

what happens if we have to rapidly change rooms or if we improved throughout.

Augmented reality and virtual reality can describe patient and users experience: ‘the day in the life of the user’ approach can help with detailed stakeholder engagement, alongside tools like ‘virtual engage’ to reach the widest audiences and garner the most comprehensive feedback on evolving design. This is crucial in healthcare design where stakeholder groups can be extensive.

Digital Construction

During delivery, a greater emphasis on delivery safety and certainty, as well as understanding the impact of the delivery phase.

Digital tracking of assets and materials can assist with productivity tracking, but more importantly creating better data for construction carbon monitoring.



Similar to the design stage, the construction stage BIM can be used to facilitate programming and costing, but can also be used to direct fabrication, from model to factory to site approach using Common Data Environments (CDE) to exchange data. The out-turn material information can be captured, enabling faster benchmarking across a range of parameters.

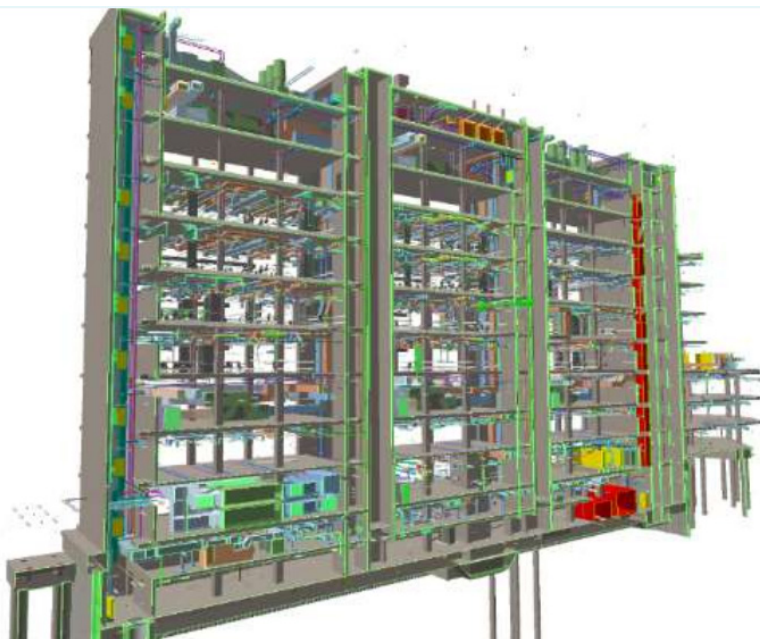
clients. On a practical level the such software output is shared openly with contractors to enable them to take immediate action on defect correction and progression of the works.

The construction industry needs to transform and the MMC approach is a key part of this transformation – with better data and digital integration being at the core of this.

Commissioning is critical

Commissioning is a key phase of healthcare delivery. Using smart commissioning technology to log These systems bring efficiencies and reduce paperwork for all whilst also allowing Clients real-time access to our defects register to understand current issues. The systems create a dashboard of actions which would be used as the basis for regular formal reporting.

Such systems have changed reporting, providing swift and precise real world, real time observations and automating reporting and data aggregation. Visual, accessible and flexible, these packages save time and facilitates clear communication between project teams and



Combined REVIT model