The MMC Definition Framework

July 2019
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WHAT IS THE MMC DEFINITION FRAMEWORK?
## Addressing inconsistencies in the language used

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MHCLG MMC Working Group set up in 2018 to address definition of MMC. Definition Framework published in March 2019. Seven Categories of MMC – Structural / Non Structural / Onsite / Offsite
Category 1 – Pre-manufacturing (3D)

- Systemised approach of volumetric construction
- Structural units pre-manufactured off site or near site
- Production three-dimensional units
- Variety of forms: basic structure only to fully finished ready to install
Category 2 – Pre-manufacturing (2D)

- Systemised approach using flat panel framing construction
- Structural performance assembled into a three-dimensional structure onsite
- Open panel systems with services, insulation, cladding installed onsite
- Closed panel systems with more factory-based fabrication
- Excludes non-load bearing walling systems such as unitised systems
Category 3 – Pre-manufacturing (Components)

- Non-systemised approach to construction
- Form part of the primary structure as stand-alone components
- Components are fixed and installed on site
- Variety of forms: floor slabs, columns, beams, stair cases, roof structures etc.
Category 4 – Additive Manufacturing

- Structural or non-structural
- Process of printing parts of buildings using various materials
- Process based on digital design and manufacturing techniques
- Carried out off site or on site
- Variety of forms: structural forms / components or non-structural components
Category 5 – Pre-manufacturing (Non structural)

- Non structural assemblies and sub-assemblies
- Constructed using volumetric or panelised approaches
- Tend to be used for areas which are more repeatable such as kitchens, bathrooms, risers etc.
- Excludes sub-assemblies such as windows and doors that are fixed onsite.
Category 6 – Traditional build / site labour reduction

- Concerned with the traditional building product
- Leads to site labour reduction / productivity improvements
- Use of large format / pre-cut configurations to reduce extent of site labour
- Excludes digital-led or automated techniques (covered by Category 7)
Category 7 – Site process led labour reduction

- Approaches utilising innovative site based construction techniques
- In addition to the use of building products defined in Category 7
- Examples include: lean construction techniques, workface robotics, digital worker augmentation etc.
What makes it MMC?

- Scale at which categories is been considered over traditional build techniques
- Integrating multiple categories to enhance productivity and efficiencies
- Process / application of a form of material in production or construction
- Level of investment in production processes to enhance quality, productivity and efficiency
- Introducing a digital approach to design – Revit / Inventor
- Wider approach to delivery to retain greater control e.g. construction management, vertical integration or alliancing
- Sustainable approach to development ‘acquisition to delivery to operation’
WHY IS IT IMPORTANT?
Five reasons why it is important?

- We need a common language to provide clarity
- Engagement and adoption levels are growing
- Need to understand the design considerations for a category
- The number of suppliers is on the rise
- The procurement model can look different to traditional
| Cat 1 | 3D Primary Structural Systems | • Perceived area of greatest unknown = most intrigue  
• High level of influence |
| Cat 2 | 2D Primary Structural Systems | • High familiarity  
• New recognition for open vs close panels |
| Cat 3 | Pre-manufacturing components | • Perceived area of low level of influence within existing delivery model |
| Cat 4 | Additive manufacturing | • Little understanding / seen as ‘futuristic’  
• Outside of influence |
| Cat 5 | Non structural assemblies | • Area of high familiarity  
• Hybrid approach with Category 2 |
| Cat 6 | Traditional building led reduction | • Perceived area of little client influence |
| Cat 7 | Site process led reduction | • Perceived area of little client influence |

We need a common language to provide clarity
<table>
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<th>LOW</th>
<th>MEDIUM</th>
<th>HIGH</th>
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<td>Academic research</td>
<td>Speaking at conferences</td>
<td>Market disrupters</td>
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<td>Attending conferences</td>
<td>Category 1 or 2</td>
<td>Long term investment</td>
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<td>Meeting manufacturers</td>
<td>Researching categories</td>
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<tr>
<td>Category 1 (maybe 2)</td>
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<td>Identifying opportunities</td>
<td>Considering delivery model</td>
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Engagement and adoption levels are growing
- To retain flexibility in the design process as long as possible
- To refrain from selecting an MMC Category at the project start
- To control the architectural vernacular of the building
- To have the ability to customise the internal specification of a unit
- To gain efficiencies in materials / components over WLCC
- ‘New wave’ To integrate standard typologies from the inside out

Design consideration in Category 1
When aligning expectations that impact design developers will need to consider the following points.

**Category 2 to 7**

1) Do they have the ability to influence a main contractor?
2) Do they have the opportunity to consider an alternative delivery model?
3) Have any standard typologies and buildings been designed using a DfMA approach?
4) Are they able to bulk purchase components or sub-assemblies for a portfolio?

*It will be beneficial to develop a standardised approach to design through engagement with the supply chain for each of the MMC categories being considered.*
Increase in market suppliers
Traditional procurement model is based on RIBA Stage 3 full risk transfer (design, price and programme) through a single contracting relationship (warranty provision).

**Category 1**
- Single contract but limited capacity / experience
- Early engagement without the ability to provide lump sum fixed price
- Design freeze / reduced flexibility
- Tender weighting tends to be towards lowest price on capital cost
- Requirement for upfront payment
- Moving away from project-by-project procurement

**Category 2 to 7**
- Insufficient value in individual packages to have a single contract
- Ability to influence a main contractor / alternate traditional delivery model
- Categories 6 to 7 can depend heavily on strong onsite management capabilities

Understanding barriers – procurement
THANK YOU