Cast

MMC DEFINITION SUMMARY

This document is intended to support bidders to the Affordable Housing Programme (AHP) by providing a plain English guide to the concept and definition of Modern Methods of Construction (MMC). Bidders to the AHP will be required to note the types of MMC that are being deployed within their delivery programmes. To support bidders in that exercise, this note explains the MMC definition framework, and the types of construction that are currently encompassed within the seven categories of MMC. It should be noted that MMC is a rapidly evolving approach, and that the forms of construction in each of the categories may change over the course of the AHP. The GLA will notify investment partners if the definition of MMC changes from what is set out in this document.

Modern Methods of Construction (MMC)

Pre-manufacturing
(3D primary structural systems)

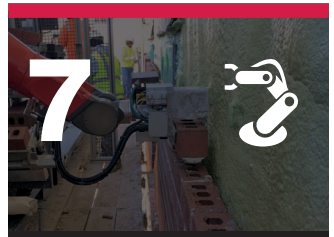
Pre-manufacturing
(2D primary structural systems)

Pre-manufacturing components
(non-systemised primary
structure)

Additive manufacturing
(structural and non-structural)

Pre-manufacturing
(non structural assemblies
& sub-assemblies)

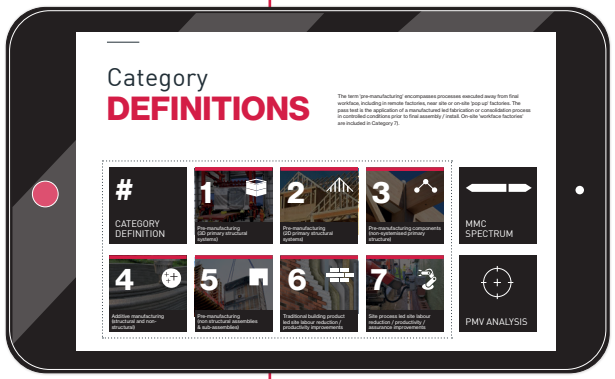
Traditional building product
led site labour reduction /
productivity improvements



Site process led site labour
reduction / productivity /
assurance improvements

WHAT IS THE MMC FRAMEWORK?

The MMC definition framework is a seven category definition framework that enables a full and future-proofed range of 'Modern Methods of Construction' used in homebuilding to be better understood with regularised terminology. The GLA requires bidders to the AHP to include information on the forms of MMC they are using, and the MMC definition framework enables this information to be collated in a structured manner. All categories outlined in this document form part of the Government's definition of MMC, as adopted in London's AHP.



The definition framework spans all types of pre-manufacturing, site-based materials and process innovation. This definition framework is an output of the MHCLG Joint Industry Working Group on MMC which is tasked with improving stakeholder education and understanding of MMC with particular reference to enabling better access to mortgage finance, insurance and assurance. The term 'pre-manufacturing' encompasses processes executed away from final workface, including in remote factories, near site or on-site 'pop up' factories. The pass test is the application of a manufactured led fabrication or consolidation process in controlled conditions prior to final assembly / install. On-site 'workface factories' are included in Category 7).

The pages that follow explain each of the categories in more detail, incorporating the sub-categories that bidders will be required to report against.

Category 4, additive manufacturing, relates to the 3D printing of components or whole elements of buildings. While this form of MMC is not available for use in construction projects currently, it is expected to be used in the future and so it has been included to ensure the definition framework is future-proofed. Given this, we exclude category 4 from the more detailed explanation of the categories on the pages that follow.

WHAT IS MMC?

A range of approaches which spans off-site, near site and on-site pre-manufacturing, process improvements and technology applications.

CATEGORIES

1 2 3 4 5 6 7

Off-site and near site pre-manufacturing

Site based process improvement

Category 1. MMC – Vision Modular Systems for Pocket Living at Mapleton Crescent

Category 1

PRE-MANUFACTURING (3D PRIMARY STRUCTURAL SYSTEMS)

The creation of 3D volumes – boxes effectively – away from site which are then combined on site to create a building. The extent of work that is carried out to the "box" can vary, as set out below. This is the form of MMC that incorporates the highest level of pre-manufacture, and utilises a range of core materials, also set out below.

Four sub-types based on the amount of factory-based finishing:

1a. Module only, fitted out on site;
1b. Module plus internal fit out only;
1c. Module plus internal fit out plus cladding and roof;
1d. Module plus pods to fit out rooms

TYPICAL SYSTEMS

- Timber
- Steel
- CLT

NOTES

Although this category has the highest level of pre-manufacture it can still be combined with other categories such as foundation systems (category 3), pods (5) and material and process improvements (6 & 7)

Category 2b. MMC – Cygnum for Norwich City Council, Goldsmith Street

Category 2

PRE-MANUFACTURING (2D PRIMARY STRUCTURAL SYSTEMS)

The creation of 2D panelised and framing systems away from site that are assembled on site to create the structure of a building. There is a wide range in the extent of pre-manufacture between the three sub-categories with the systems utilised in category 2c incorporating significantly more consolidation of materials than 2a. Typically utilises timber and steel as the core component, with concrete solutions also available although generally these are used less in residential development.

Three types based on the amount of consolidation in the panel system:

2a. Frame only – typically walls, floors, roof and stairs;
2b. Frame plus insulation, internal linings;
2c. As 2b plus doors, windows, external cladding

TYPICAL SYSTEMS

- Light Gauge Steel
- Timber frame

NOTES

The remainder of the construction beyond the frame may subsequently be delivered using traditional methods and/or elements from other categories such as foundation systems (category 3), pods (5) and material and process improvements (6 & 7)

Category 3c. and 3d. MMC – Mace for QDD at East Village

Category 3

PRE-MANUFACTURING COMPONENTS (NON-SYSTEMISED PRIMARY STRUCTURE)

The use of pre-manufactured components to form part of the structure of a building. Can incorporate foundation solutions as well as solutions for the main structure. Typical materials include timber and concrete.

Seven typical types:

Foundations
3a. Driven or screw piles;
3b. Pre-fabricated pile caps or ring beams

3c. Columns, walls and/or beams;
3d. Floors;
3e. Integrated columns and walls and beams;
3f. Staircases;
3g. Roofs

NOTES

These solutions can be used in combination with any of the other categories, with the foundations systems able to work with volumetric (category 1) and panelised (2) and all categories able to be combined with non-structural components (5) and material and process improvements (6 & 7)

Category 5a. and 5i. MMC – Mace for QDD at East Village

Category 5

PRE-MANUFACTURING (NON STRUCTURAL ASSEMBLIES AND SUB-ASSEMBLIES)

The use of pre-assembled components that do not form the structure of the building but which consolidate materials and processes that otherwise would be delivered on site. These solutions can be used in isolation in an otherwise traditionally constructed project, and include reasonably commonly used items such as bathroom pods.

Two overarching types of component:

- 3D – e.g. pods
- 2D – e.g. façades, floors, walls

In total there are 12 types as follows:

3D

5a. Bathroom pods; 5b. Kitchen pods; 5c. Bathroom and kitchen pods combined; 5d. Mechanical and electrical (M&E) pods, e.g. pre-fabricated utility cupboard

2D

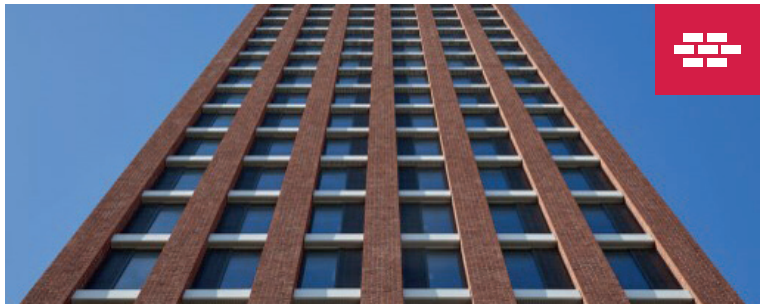
5e. Façade assemblies; 5f. Roof assemblies

M&E assemblies

5g. In-unit assemblies; 5h. Vertical risers; 5i. Central plant;
5j. Floor cassettes; 5k. Wall cassettes; 5h. Pre-hung door sets

NOTES

This category of solution can be used in isolation or in combination with any of the other categories



Category 6e. brick slips, Stofix for Urbanest, Vauxhall

Category 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. This can typically involve either large format versions of traditional materials, or materials that have been developed to be easier to install with less reliance on on-site labour.

In total there are **five types** as follows:

LARGE FORMAT PRODUCTS

6a. Internal walls;
6b. External walls;
6c. Roofing finishes;

OTHER

6d. Materials that have been specifically cut to size, e.g. pre-sized plasterboard;
6e. Materials that have been adjusted to be easier to install, e.g. brick slips

NOTES

This category of solution can be used in isolation or in combination with any of the other categories

Category 7d. visual aid – mixed reality goggles being trialled by Trimble

Category 7

SITE PROCESS LED SITE LABOUR REDUCTION / PRODUCTIVITY / ASSURANCE IMPROVEMENTS

The use of systems and processes on-site to drive productivity by removing unnecessary workstages, enabling better and faster installation and improving health and safety.

This is the category with the largest breadth of options and the list is likely to grow. There are **nine types** as follows:

SITE CONDITIONS PROTECTION/IMPROVEMENT

7a. Measures to protect, or encapsulate, the site to secure weather-proof conditions; 7b. Standardised temporary work (e.g. a modular scaffold)

DIGITAL PROCESS IMPROVEMENT

7c. Use of BIM connected to on-site workflows

SITE WORKER AUGMENTATION

7d. Visual aids (e.g. AR/VR); 7e. Physical aids (e.g. exoskeletons);
7f. Productivity tools (e.g. GPS)

SITE MANAGEMENT TOOLS

7g. Robotics (e.g. brick laying); 7h. Autonomous plant (e.g. driverless cranes); 7i. Digital verification (e.g. digital scanning)

NOTES

This category of solution can be used in isolation or in combination with any of the other categories

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