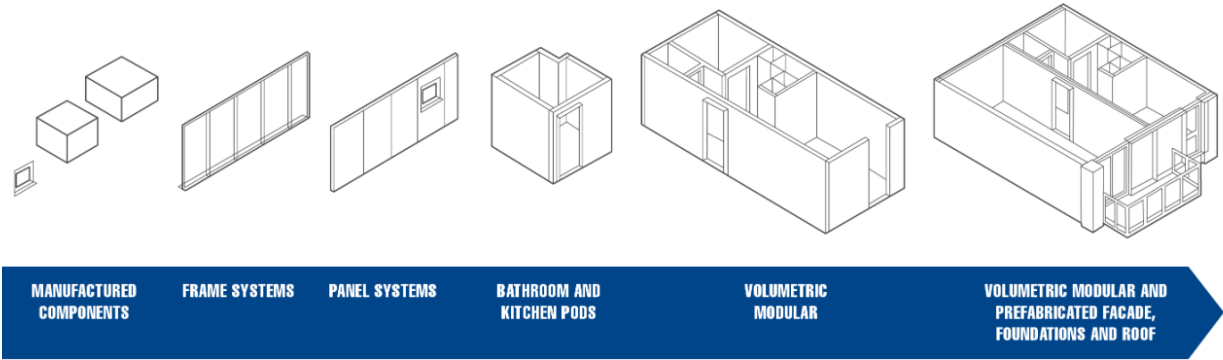


Modern Methods of Construction

MMC Ireland



Scott Tacchi

MMC: Think differently.... Do it better!

Objectives

To discuss current issues surrounding the hot topic of Modern Methods of construction – does it live up to the hype?

Discussion points :

- Why MMC (Industrialised Construction);
- What is MMC?
- Government lead drive for greater efficiency;
- Future;

- Practical Application – Cramlington Maternity

Culture & Mindset!

“When we are confronted with evidence that challenges our deeply held beliefs we are more likely to reframe the evidence than we are to alter our beliefs.

We simply invent new reasons, new justifications, and new explanations.

Sometimes we ignore the evidence altogether”.

Matthew Syed

Black Box Thinking; Marginal Gains and the Secrets of High Performance

“Productivity isn’t everything, but in the long run it is almost everything. A country’s ability to improve its standard of living over time depends almost entirely on its ability to raise its output per worker.”

Paul Krugman

The Age of Diminishing Expectations, 1994

Separation of Housing from Main Contracting!

MMC housing is not representative of MMC main contracting.

Parliamentary built environment committee language misleading.

Unsung Hero's of MMC:

DIO,

DfE,

MOJ,

National Highways,

BTR Market (i.e. Vision / Tide).

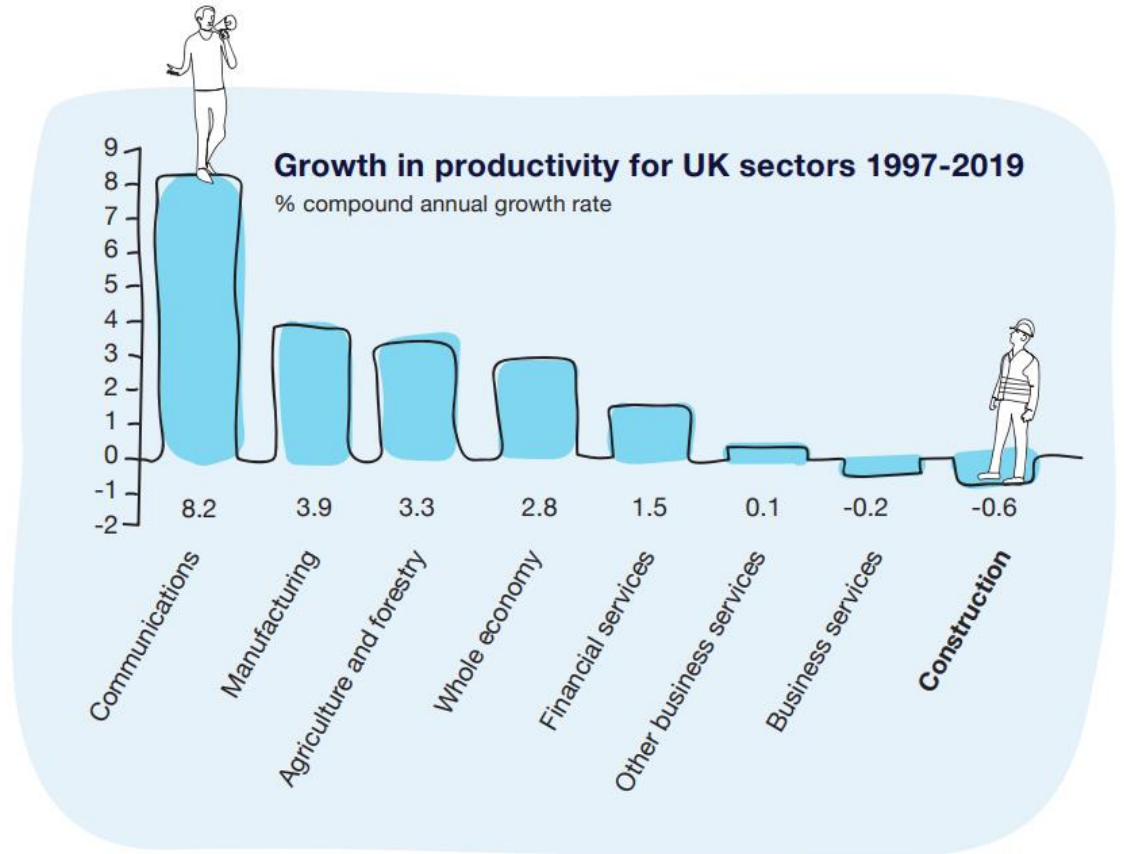
Why;

The UK construction industry and supply chain is currently:

- highly fragmented,
- lacks transparency and
- often suffers from a lack of trust.

UK construction productivity also lags behind that of other countries and other sectors of the UK economy.

Since 1997 UK construction productivity growth has fallen by an average of -0.6% each year between 1997 and 2019 according to new research by Oxford Economics.² Over the same period, productivity of the whole UK economy rose by 2.8% while the productivity of manufacturing grew by 3.9%



MMC: Barriers & Enablers

Current State

Parts of the UK construction sector are characterised by:

- Low productivity growth in comparison with other sectors within the economy such as manufacturing, and in comparison with other countries.
- Lack of innovation
- Fragmented supply chain
- Adversarial and transactional approach to contracting
- Procurement decisions based on cost rather than wider value considerations
- Skills shortages and lack of training.
- Working conditions that for many are unattractive
- High dependency on overseas skilled workers
- Majority of labour hours in exposed conditions on site

Push Factors

- Skills shortages resulting from aging workforce demographic and over-reliance on overseas skilled workers
- Need to improve sector resilience and shorten supply chains
- Need to increase output
- Need to optimise production efficiency and close 'productivity gap' by incorporating aspects of manufacturing efficiencies within construction process

Pull Factors

- Need for improved productivity and increased process efficiency
- Need for improved project certainty
- Potential to significantly decrease costs with increased volume over time
- Potential for improved quality, reduced defects
- Potential for improved environmental performance, reduced energy and carbon

Barriers & Enablers

Capex

Converting from conventional construction techniques to MMC may entail significant private sector capital investment in plant, premises, labour & R&D.

Investors seeking ROI will be more inclined to lend when credible future demand is signalled through long-term **pipeline**.

Lack of standardisation

Manufacturing savings are best achieved through **standardisation** of output enabling: volume repetition, economies of scale, learning curve, JIT/continuous flow, process optimisation, lean manufacturing, improved procurement, material handling and reduced wastage.

Skills

MMC adoption could be accelerated through targeted **skills training** and job creation initiatives, particularly in areas of high economic deprivation.

R&D

MMC adoption requires **investment in R&D** in order to develop systems and processes optimised to meet demand.

Future State

The future state envisaged could be:

- ✓ Significantly increased productivity and output.
- ✓ UK as global leaders in MMC/Offsite/DfMA construction
- ✓ Delivering projects more efficiently
- ✓ Retaining internal (and industry) expertise
- ✓ Encouraging investment and innovation in delivery
- ✓ Supporting jobs creation and skill training
- ✓ Partnering and enterprise approach to long-term business planning
- ✓ Making procurement decisions based on wider value consideration of: natural, social, human, manufactured and financial value.
- ✓ More efficient construction output contributing to carbon reduction targets
- ✓ Majority of labour hours in controlled and safe indoor manufacturing environment

Traditional construction:
Bespoke projects
On site construction
Reliance on skilled trades



Factory-based construction:
Standardisation
Offsite JIT fabrication
Batch processes
Economies of scale



Manufactured production:
Mass customisation
Continuous flow
DfMA manufactured
Components



MMC Definition (SRM);

What's the right solution?

Net zero
Collaboration
Industrialised

Digital Twin

Offsite Manufacture

Reduced margins
Construction

Safe

Volumetric

Poor quality

Modern Methods of construction

PMX

DFMA

Standardisation

Loss of control

Repeatable platform

Lifecycle improvement

Improved H&S

Integrator

Collaborative

Modular

Output represents input

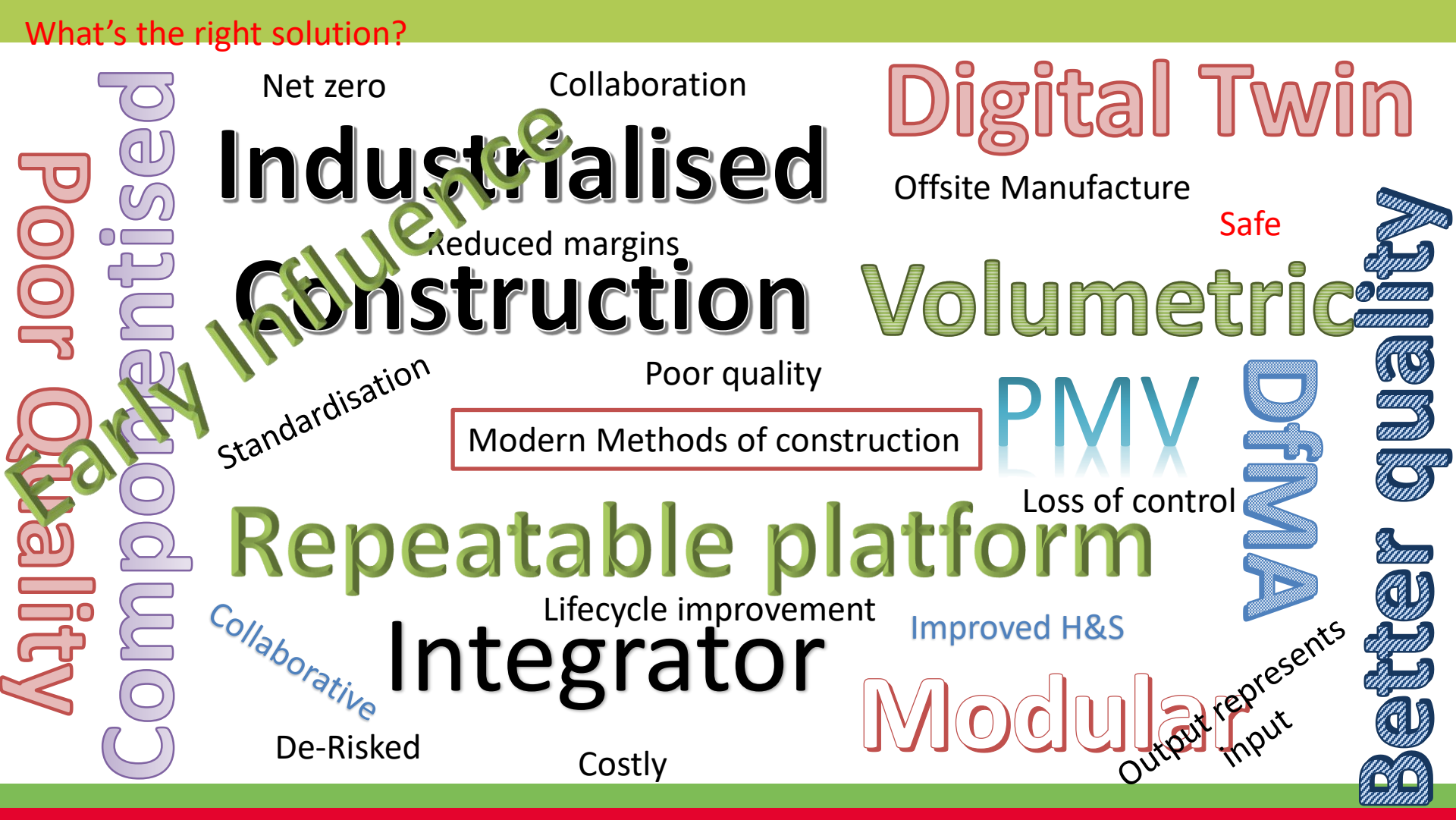
De-Risked

Costly

Poor Quality

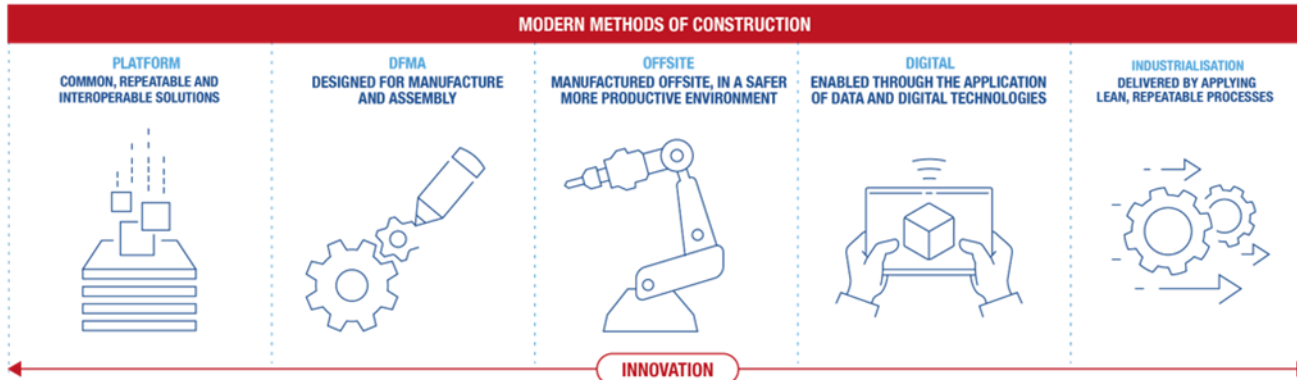
Commoditised

Better quality



WHAT IS MMC?

MMC - a **broad** term to describe **contemporary innovations** in construction, including new technologies (such as digital tools and techniques), offsite **manufacture** and use of efficient **processes** to deliver productive, sustainable and **better outcomes**.



**Government lead drive for greater
efficiency;**

Government Position and Players

2019 Presumption in Favour of MMC

1998 Egan report

1994 (April) Latham, report

Recommendations:

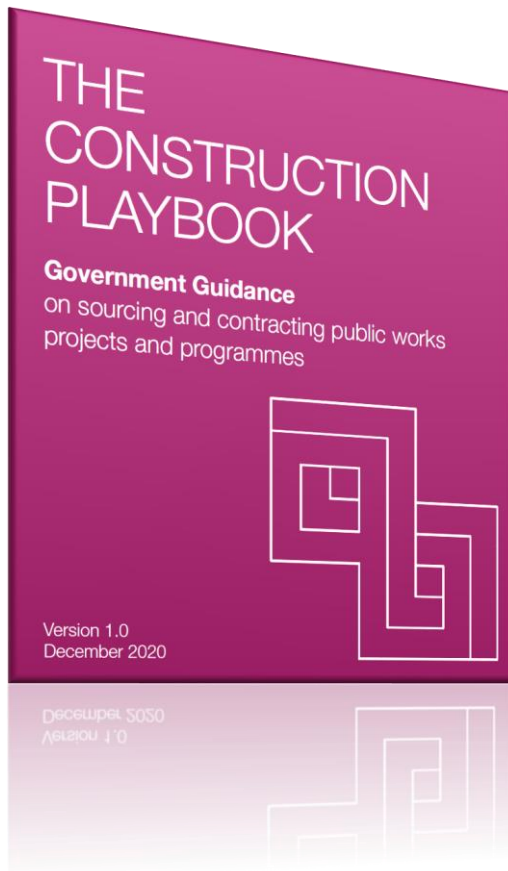
Contracts: Latham recommended that contracts between professionals (such as architects, engineers, and contractors) should be defined in a clear and precise manner.

Adjudication: The report proposed the use of statutory adjudication to resolve disputes quickly.

Supply Chain Management: Latham emphasized the importance of efficient supply chains and better coordination among stakeholders.

Teamwork: The report highlighted the need for collaborative working relationships among all parties involved in a construction project.





Drive innovation and MMC



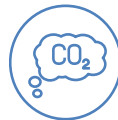
Standardise designs, components and interfaces



Set outcome-based specifications to drive continuous improvement and innovation



Increase project and programme delivery speed through up front time and resource investment



Work towards 2050 net zero goal and focus on a whole life carbon approach

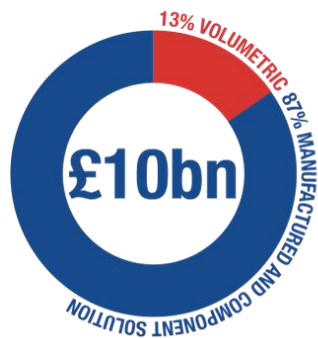


Promote social value

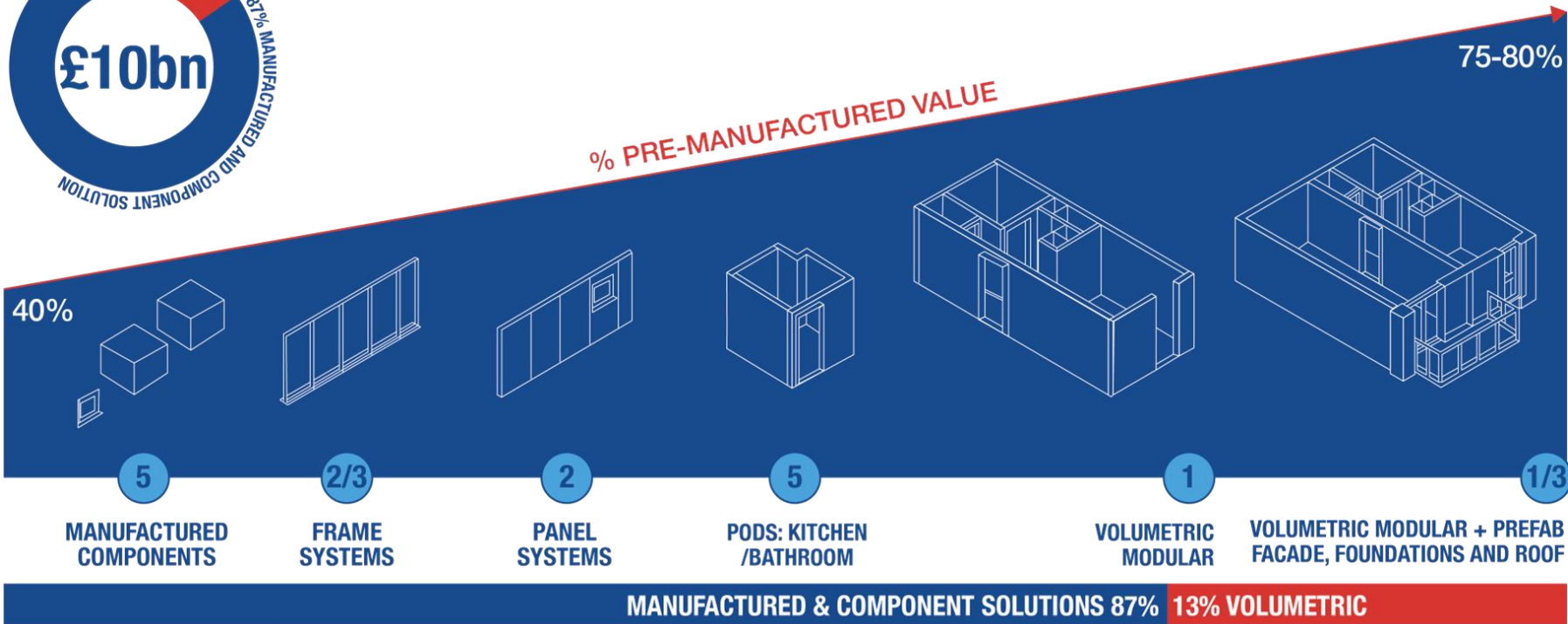
Decision Making Timeframes

RIBA Stage	0-1	2	3	4	5
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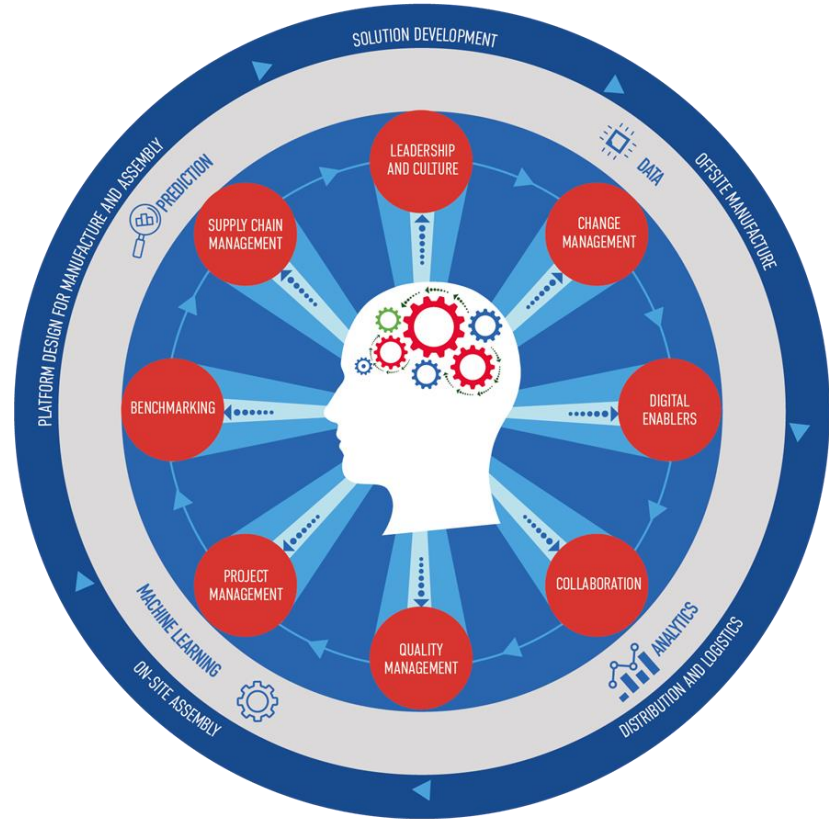


% PRE-MANUFACTURED VALUE



MANUFACTURED & COMPONENT SOLUTIONS 87% 13% VOLUMETRIC

- ✓ **The Strategy is already set**
- ✓ **Start planning for MMC at the outset**
- ✓ **Digital is critical**
- ✓ **Learn and refine**



Future of Construction;

Future of Construction

‘Technology, Innovation & R&D’ as a Key Delivery Service Pillar - Our Digital Construction Team having been delivering and implementing **new digital solutions** and **innovative ways of working** to improve our day-to-day delivery and processes across the SRM portfolio.



Trialled

SETTING OUT ROBOTICS

Derbyshire projects



Scheduled Nov 23

DC AUTOMATION & AUTOMATED TRACKING

Pilots/rollout to be defined



Trialled

SITE LOGISTICS PLATFORM

Battersea Phase 3B



2024 Opportunity

ASSETS & DELIVERIES TRACKING

Victoria Tower



In Development

VIEWPOINT TO EDOCS CONNECTOR

Pilots/rollout to be defined



2024 Opportunity

INFRA INTEGRATION PLATFORM

HS2 & Sellafield Projects



In Development

FIELDVIEW TO BUILDOTS CONNECTOR

Pilots/rollout to be defined



2024 Opportunity

COLLABORATIVE PLANNING

TBC

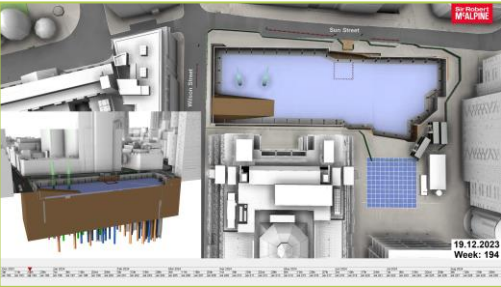
4D Planning - 2 Finsbury Ave.

Subcontractor interfaces:

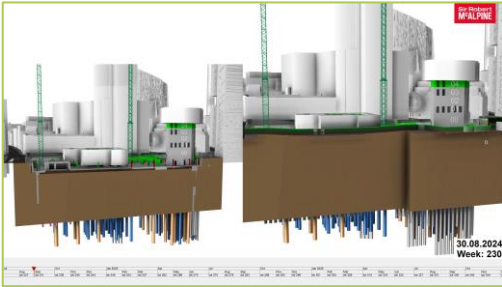
- Programme review
- Logistics review
- Communication



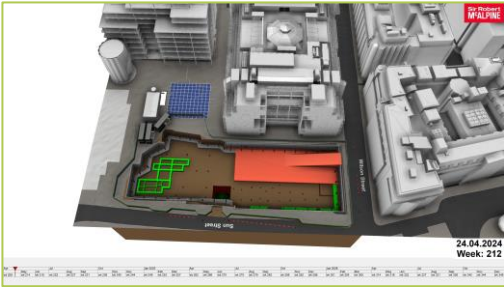
Demo > Piling



Piling > Concrete



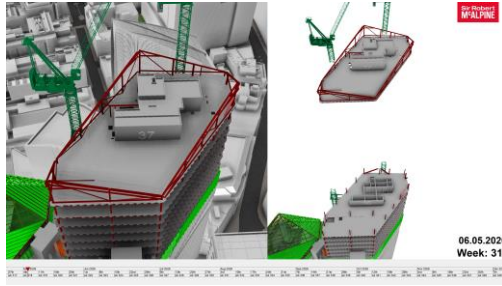
Top Down



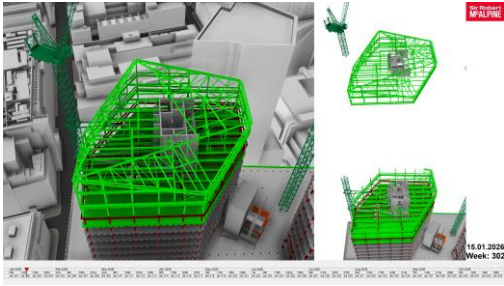
Cranes



Concrete > Steelwork



Roof East



Roof West

Supply Chain Integration & Value Offer:



Future of Construction

MMC is NOT volumetric

Standardisation and Rationalisation

Integrator contracting model with reflective contracts

Intelligent / informed clients

Much greater focus on stage 0

T1 contractors to collaboratively work with their supply chain



Example – P23 MMC toolkit

If anyone has any questions, please ask.