

# Modern Methods of Construction: Time to Invest?

29<sup>th</sup> September 2021

# AGENDA

- 10:00 Welcome – Alex Barnes, Head of Specialist Risks, Vista Insurance**
- 10:05 Introduction to the session, Buildoffsite and overview of the MMC market - Joe Dyde, Business Manager, Buildoffsite**
- 10:15 A Government perspective – Mark Farmer, CEO & Founding Director, Cast Consultancy & UK Government Champion for MMC in Housebuilding**
- 10:35 Offsite product & process performance evaluation – Jeff Maxted, Director of Technical Consultancy, BLP & BOPAS**
- 10:45 Quality and assurance of offsite – Terry Mundy, Consultant, Lloyds Register & BOPAS**
- 10:55 Question & Answer Session with speakers and audience**
- 11:30 Close**

# Modern Methods of Construction: Time to Invest?



Welcome

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*Alex Barnes,  
Head of Specialist Risks at Vista Insurance*

# Modern Methods of Construction: Time to Invest?



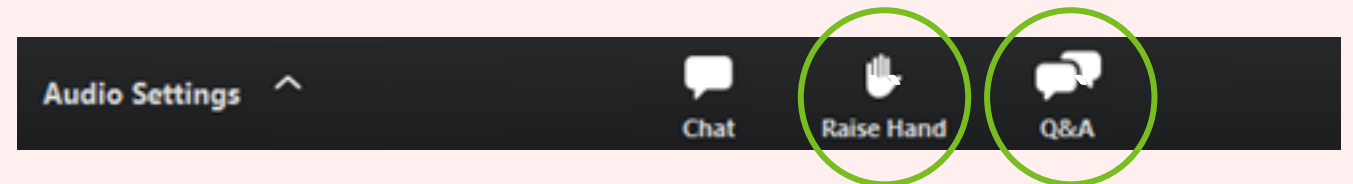
Introduction to the session,  
Buildoffsite & Overview of the  
MMC market

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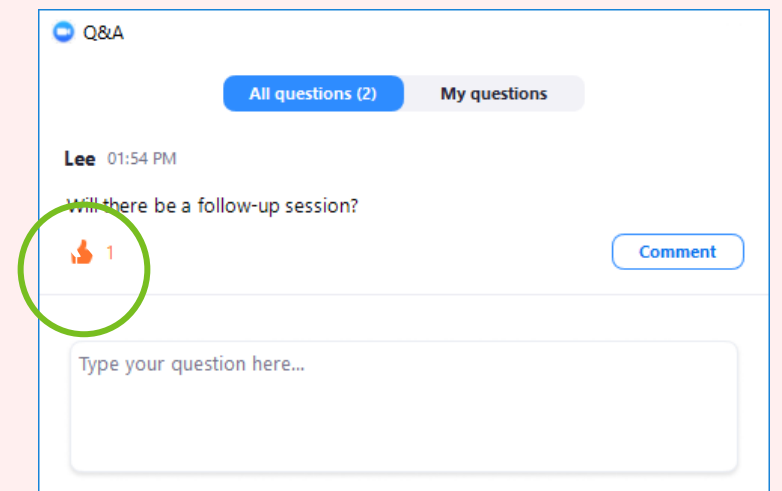
*Joe Dyde,*

*Business Manager at Buildoffsite*

# How it's going to work



- This conference is being recorded
- Attendees are in listen-only mode
- **Raise your hand** to indicate that you need something from the host
- Type your **questions** into the Q&A box
- Click the **thumbs up** to like other attendees' questions:  
this helps us identify the most popular questions



## Buildoffsite

For the past 16 years, Buildoffsite has been a NFP membership organisation working with, and on behalf, of the offsite sector.

Since its creation, Buildoffsite has sought to **promote, support and increase the adoption of offsite & pre-manufactured solutions** for the built environment.

Working with our membership, government, key industry stakeholders & partners, we seek to **deliver permanent, positive transformation and impact through collaboration.**

By 'normalising' offsite & Modern Methods of Construction, Buildoffsite enables **greater project delivery** and strives to **remove the perceived challenges** to offsite adoption.

Buildoffsite brings the industry together through our event programme, Client Group and Sector Working Groups and in the production of research & guidance.

# COLLABORATING FOR IMPACT

THE BUILDOFFSITE MANIFESTO

## OUR PLEDGES FOR MEMBERS & INDUSTRY

- Influence & Inform
- Lobby Government
- Inform Decision Making
- Challenge Perceptions
- Address Barriers
- Build Insight & Knowledge
- Demonstrate Evidence

# DIVERSE MEMBERSHIP



With over 90 members, the diversity of our network allows innovative networking, collaboration & problem-solving.

Clients Contractors Consultants Manufacturers Architects Insurance QS  
Research & Training Academia Developers Procurement Standards Logistics Media

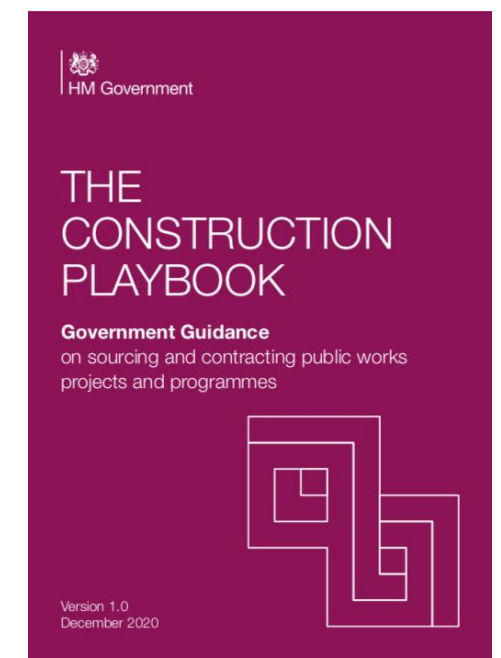


## PARTNER RELATIONSHIPS



# Offsite Sector - Growth Drivers

- Government led
  - Construction Industry & BIM Strategies
    - Safety
    - Environmental performance
    - Productivity
    - Balance of trade
  - Approach to procurement “Playbook”
  - Construction Innovation Hub
    - Platform development
    - Value toolkit
    - Quality management systems
- Client Led
  - Government departments
  - Investment funds – build to rent
  - Social housing suppliers – aggregating demand
  - Major residential builders
- Sector Led
  - Labour market analysis
  - Expansion of offsite capabilities
  - Building performance
  - Buildoffsite Property Assurance Scheme

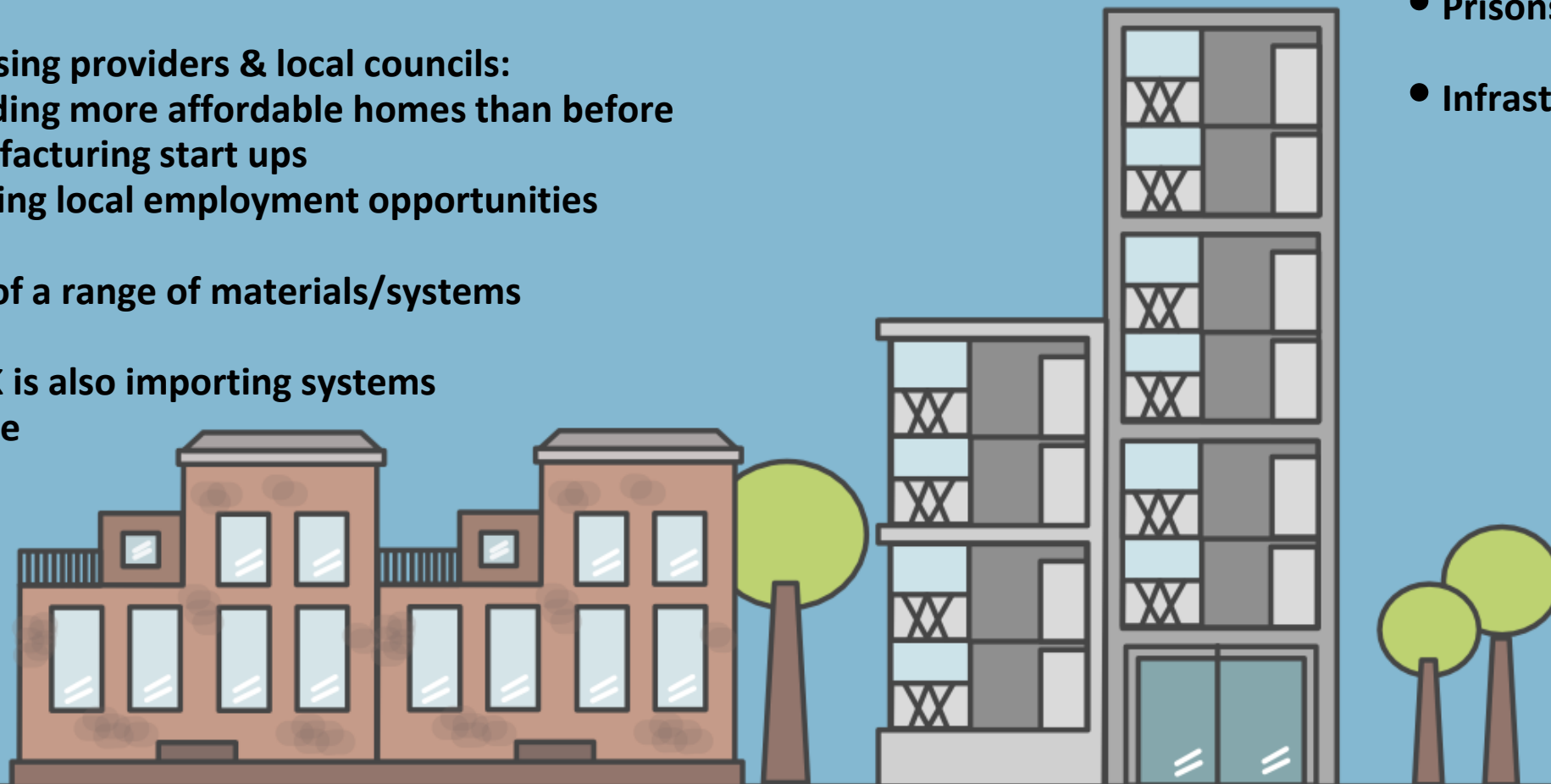


# Offsite Sector - Growth Delivery

- Existing manufacturers are growing
- Traditional builders moving into factory production
- Government initiatives driving supply:
  - Homes England
  - DLUHC
- Financial institutions investing in:
  - Private sector rental market
  - Manufacturing start-ups
- Social housing providers & local councils:
  - Providing more affordable homes than before
  - Manufacturing start ups creating local employment opportunities
- Adoption of a range of materials/systems
- But the UK is also importing systems
  - Europe
  - Asia

Building upon successes in:

- Hotels
- Student accommodation
- Healthcare
- Prisons
- Infrastructure



National homes building target is now 300,000 per annum Vs typically <200,000

# Modern Methods of Construction: Time to Invest?



## A Government perspective

*Mark Farmer,*

*CEO & Founding Director,*

*Cast Consultancy & UK Government  
Champion for MMC in Housebuilding*



# MMC – A Government Perspective



**Mark Farmer**

MMC: Time to Invest?  
29<sup>th</sup> September 2021

**Cast** 



# Declining Structural Resiliency & Finite Resources Have Major Political Ramifications



# Resiliency In A Dynamic Market



**resilience**

/rɪˈzɪliəns/

*noun*

1. the capacity to recover quickly from difficulties; toughness.  
"the often remarkable resilience of so many British institutions"
2. the ability of a substance or object to spring back into shape; elasticity.  
"nylon is excellent in wearability, abrasion resistance and resilience"



# The Big Picture Drivers That Are Now Exposing The Resiliency Decline in UK Homebuilding

Decarbonisation

**Workforce  
Attrition**

Technology  
Advancements

Building Safety

**Material Supply  
Chain Fragility**

Disintermediation  
Threats

Pandemic

**ESG Driven  
Investment &  
Lending**

Quality &  
Consumerism





# A Reminder of What I Said To UK Government in 2016....Human Capital Is A Natural Resource!

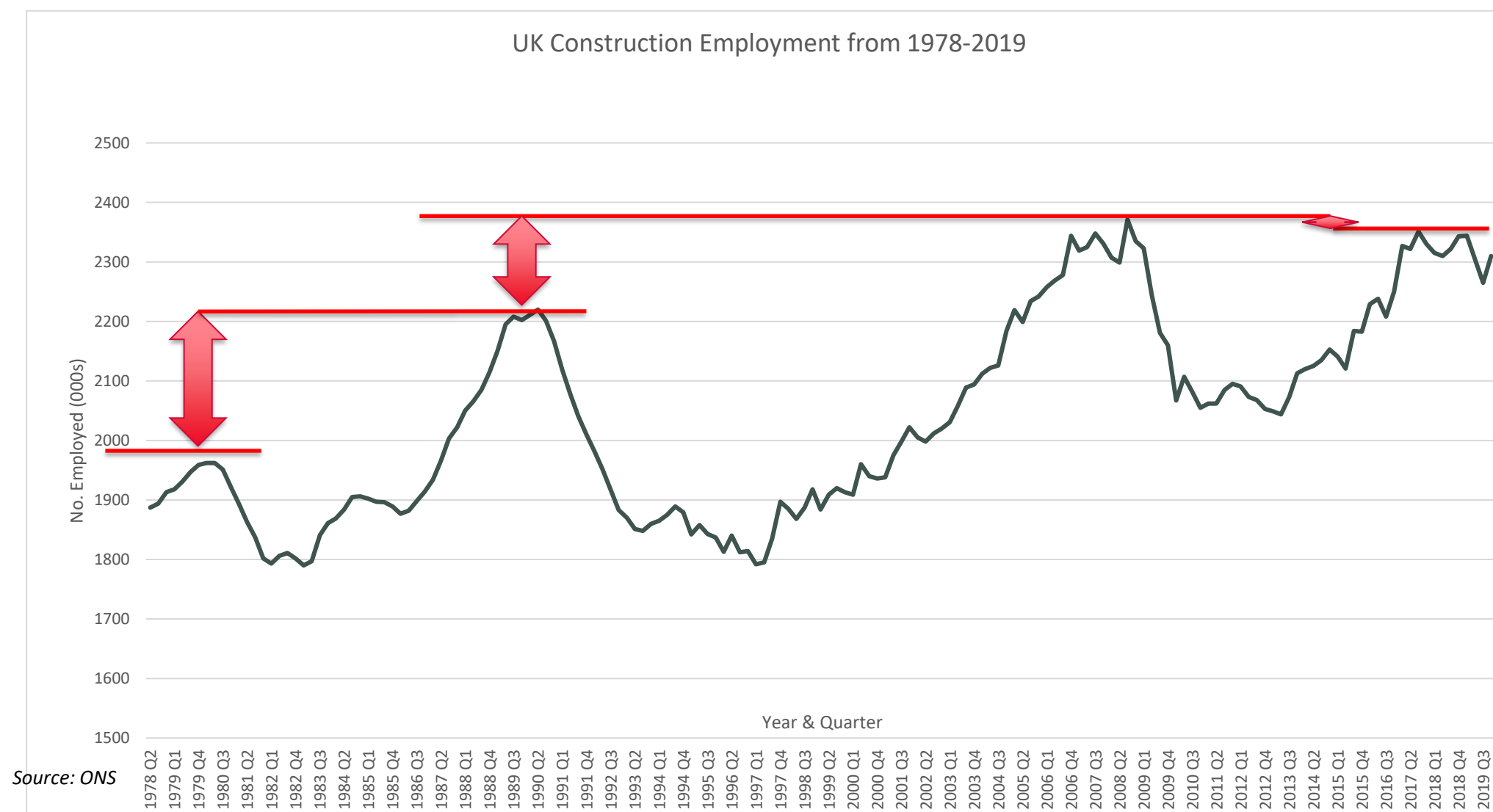


## SYMPTOMS

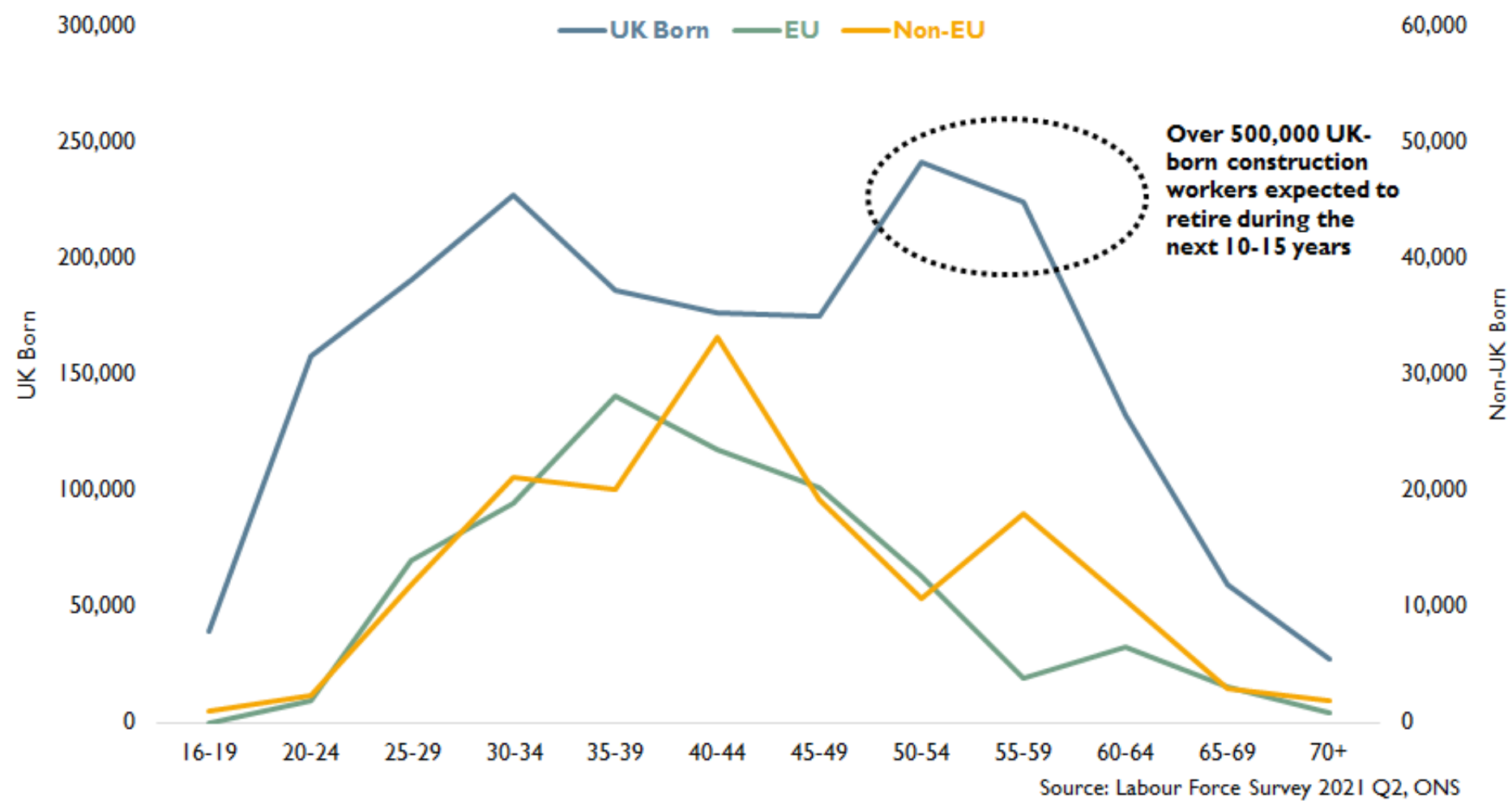
The critical symptoms of failure and poor performance have been identified in this review as:



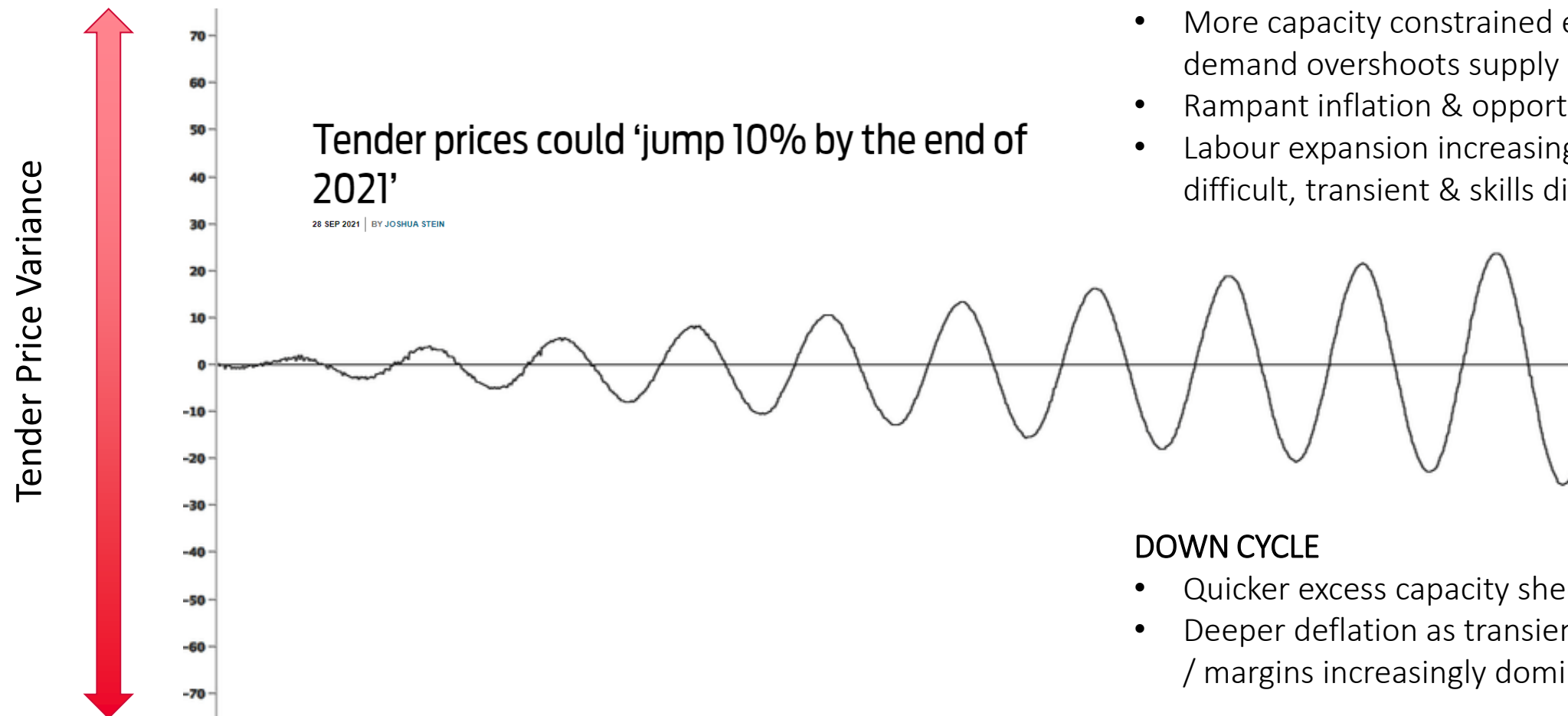
# Industry Labour Resiliency Has Been In Structural Decline in UK For 40 Years – But There Is Now A Visible Tipping Point



# Demographics & Geopolitics



# Economic Cycle Amplification Suggests The Industry Is In Irreversible Decline



## UP CYCLE

- More capacity constrained expansion where demand overshoots supply
- Rampant inflation & opportunism
- Labour expansion increasingly prolonged, difficult, transient & skills diluted

## DOWN CYCLE

- Quicker excess capacity shedding
- Deeper deflation as transient labour market & risk / margins increasingly dominate pricing



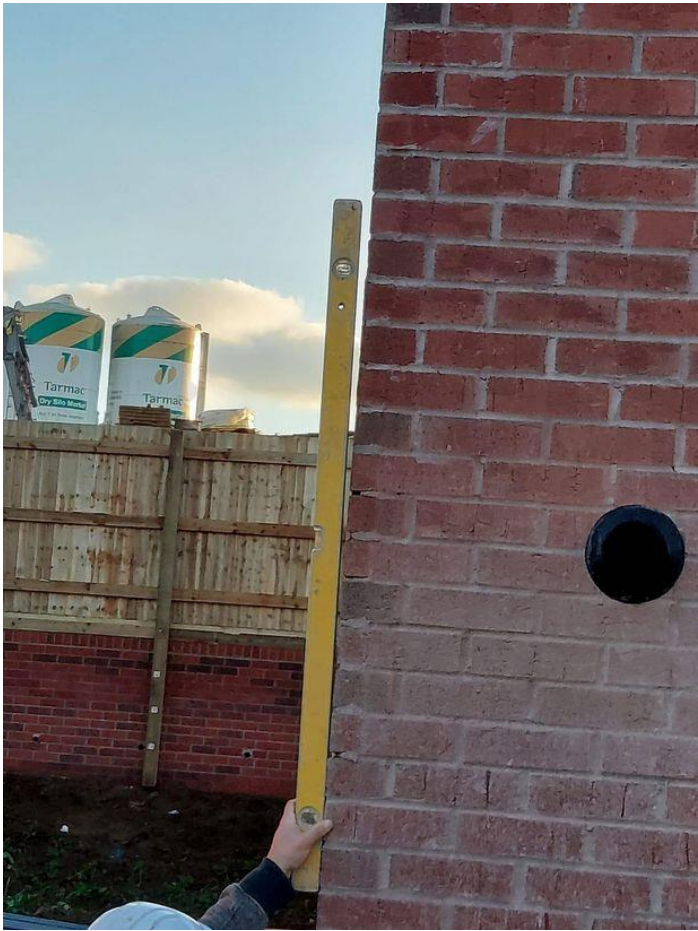


5 October 2021





# Quality Failure & Brand Risk Is Engulfing The Industry



DAILY NEWSPAPER OF THE YEAR

# THE TIMES

Thursday April 19 2018 | [thetimes.co.uk](http://thetimes.co.uk) | No 72593

Only £7 to subscribers £160

## Terror on Flight 1380

How former fighter pilot saved jet World, page 31

### Why the sun means more work for women

Deborah Ross, Times2

## Cotton buds and plastic stirrers will be banned from sale

Francis Elliott Political Editor

132 million cotton buds a year, more than any other member of the EU, as well as 44.1 million stirrers and 42 billion straws, according to the World Wildlife Fund for Nature.

The straws, expected to come into force by next year, is designed to curb 'single-use litter' to encourage products, the environment secretary writes in *The Times*. The UK uses

why cotton buds, straws and stirrers have been singled out, he says: "We have targeted these products because they are simply available for use but developed in alternative forms but when discarded they create a pollution problem for hundreds of years. Their agency can be left."

"Once our need for them has passed, but too many are chucked down the

drain before finding their way into rivers and seas. There, they have been found blocking the noses of sea turtles and performing the same role of penguins."

The ban in England is the latest in a series of measures to reduce single-use plastics as ministers take advantage of a change in public sentiment prompted in part by the BBC's *Blue Planet* series,

which highlighted marine pollution. Mr. Gove instilled plans last month to require retailers to impose a deposit on plastic bottles and has extended the ban on plastic bags to smaller shops.

Straws for an industry very much at the forefront of the plastics industry are also under way in the Treasury. Many retailers

Continued on page 3, col 3

## Buyers in despair at badly built new homes

'Underhand' Bovis delaying essential repairs

**TIMES INVESTIGATION**

Andrew Elliot Consumer Affairs Correspondent Sam Blanchard

One of Britain's biggest housebuilders is mismanaging homes and 'deliberately delaying essential repairs to poorly built homes, an investigation by *The Times* has found.

Bovis Homes, which builds about 3,000 properties a year, has also been accused of being deliberately to repair defects and engaging in 'underhand behaviour' to limit bad publicity. At least one disgruntled homebuyer claimed that they were prevented from taking about 'underhand' gagging clause.

Last year Bovis was forced to apologise to customers for poor workmanship after this newspaper revealed that hundreds of buyers had complained of buzzing and vibrating floors, leaks, missing insulation panels, poor drainage and unfinished gardens. In one home, leaks exposed to be building up first floor bedrooms were found to be seeping in plasterboard. In another, a sufferer was blocking the left hand.

The company at last more than 100 million to deal with the complaints, but customers say service standards remain appalling. A spokesman who worked as a customer service manager said he feared that construction problems were so common that the company may need to spend significantly

more. The problem contributed to Bovis becoming the only national builder to be awarded a five-star rating out of five in the House Builders Federation's (HBF) annual customer satisfaction survey for the year ending September 2017 published last month. A two-star rating means that between 30 and 40 per cent of customers would not recommend the company to a friend.

When *The Times* did a mystery shop on eight Bovis developments, all but one claimed to have a star rating of three or above. Staff claimed the company had four on five stars. Our sales representative said: "We're at five stars at the moment. We're moving at five stars that it's not official yet." HBF room sales representative said: "We only have one star rating for marketing."

"The whole situation, which did not want to be named, said: "I am amazed that you get two stars to be honest. It should probably have been one. Some of the houses I came across were terrible. They get me wrong, they look lovely but when you start looking around from a construction perspective some were a disaster."

"They were not fitted properly, air bricks were not fitted, walls were not level and the ground out level. In one case I saw a soil pipe that was not capped and an enormous spider filling up behind kitchen cabinets."

He believes the construction structure required by Bovis encourages

Continued on page 3, col 3

## Government accused of overcharging for citizenship

Francis Elliott Richard Ford Home Correspondent

The Home Office has been accused of overcharging on citizenship applications from children born in the UK.

Thousands of young people who are not British citizens despite being born in this country are among those who have to pay more than £1,000 when they apply, despite the cost of the process being less than £400.

Other immigration fees charged by the Home Office are also much higher than the cost of handling them.

The fees are criticised by a House of Lords report. "It is impossible that the government should seek to make excessive profits out of those seeking naturalisation," government citizenship and civic engagement committee said.

The fee should be much lower to the cost to the Home Office of administering the naturalisation process, and the cost to the local authorities of the citizenship ceremony.

Application fees for citizenship have risen in the past seven years from £836 to £1,250, and the fee for registering a child as British has increased from £340 to £1,012. In 2016, 47 fees for settlement, residence and nationality rose by 25 per cent.

The report comes as Amber Rudd's department admitted that the number of cases relating to Windrush generation migrants trying to prove they are in the UK legally has risen from 49 to 521.

The Home Office was still unable to confirm if any of those who came from the West Indies between 1948 and 1971 had been removed from the UK, because they were unable to prove they had been in the country since arriving.

Thomas May and Jeremy Corbyn, leaders of the Conservative and Labour parties respectively, have both expressed concern over the issue of deterring Windrush migrants.

The prime minister said the decision was taken under Labour. A business case to dispose of millions of people's records was approved by the UK Border Agency in June 2016, with a further "operational" decision to destroy records taken in October 2016.

Continued on page 3, col 3

Guests arrive Meghan Markle arrives at a Commonwealth event in London, where she and Prince Harry pledged to focus on promoting LGBT rights. Page 9



# Symptoms Still Showing Themselves – Construction Sector Financial Failure

## Cleveland Bridge to shut after failing to secure buyer

10 SEP 2021 | BY TIYA THOMAS-ALEXANDER

## Balfour Beatty hit by £23m loss at UK construction business

By Jordan Marshall | 18 August 2021

## Imtech suffers £27m loss as COVID hits problem jobs

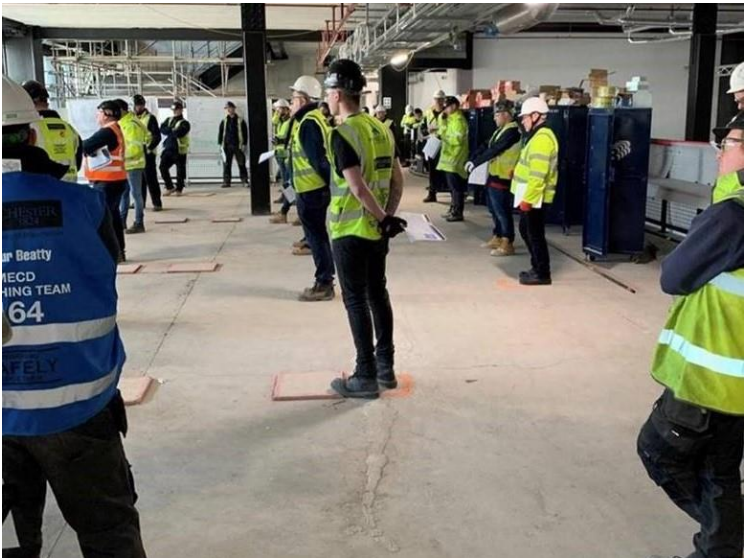
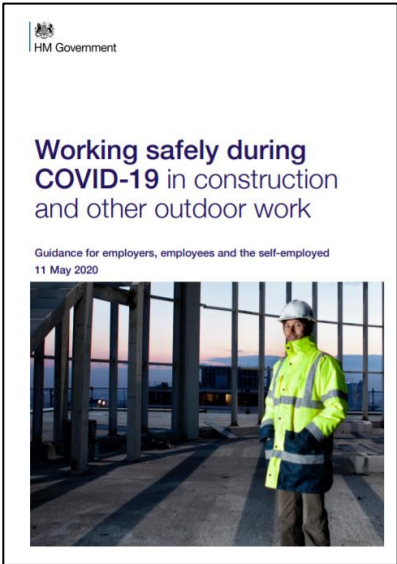
03 SEP 2021 | BY DAVID PRICE

## Major losses see O'Keefe Construction heading for CVA





# And Covid Has Just Told Us What We Already Knew About Our Labour Model

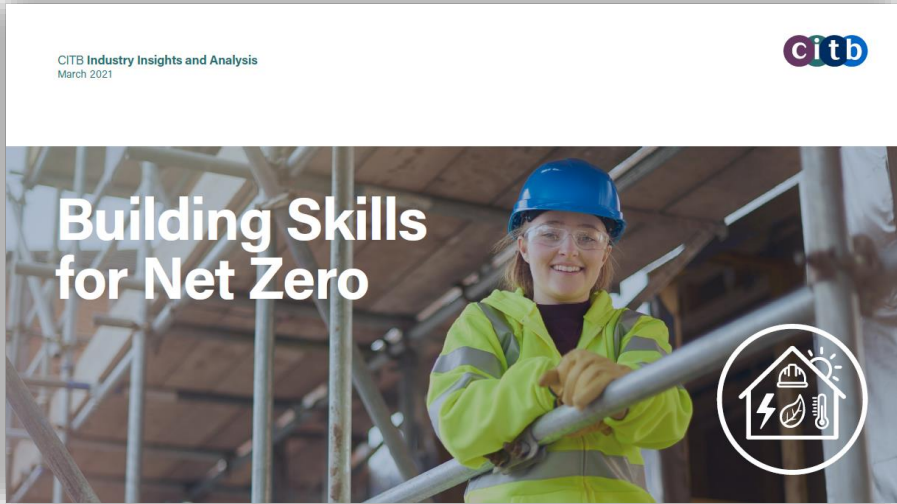
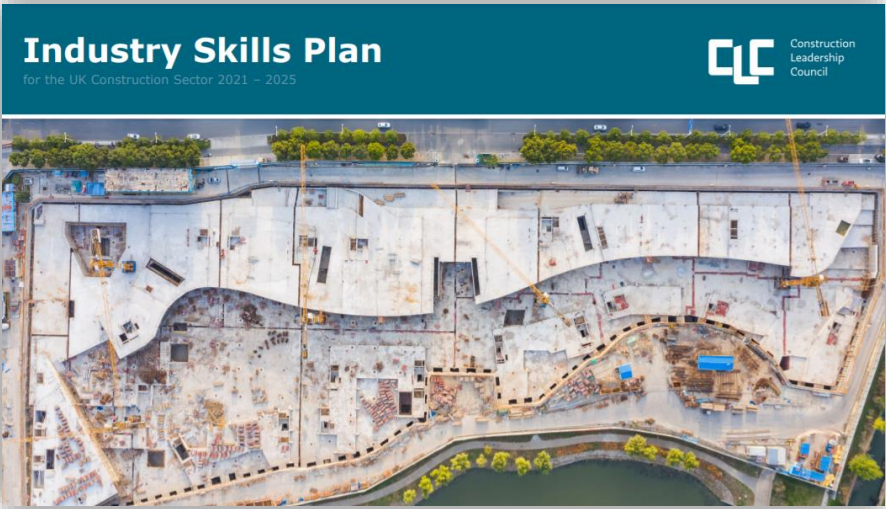


Total Site Output: ↓; Individual / Team Productivity: →↑






# Signs of Belated Concern On Skills & Resourcing – 3 Reports in 3 Months in 2021– Too Little Too Late?



# Nearly 40% of all Global Emissions Are Related To Built Environment – Circa 50% of Everything Construction Does Is Waste



Ministry of Housing,  
Communities &  
Local Government

**The Future Homes Standard: 2019**  
Consultation on changes to Part L  
(conservation of fuel and power) and Part F  
(ventilation) of the Building Regulations for  
new dwellings

Summary of responses received and Government response

January 2021  
Ministry of Housing, Communities and Local Government

## Buyers of brand-new homes face £20,000 bill to make them greener

Critics say the costs could have been avoided if ministers had agreed to bring in low-carbon standards sooner



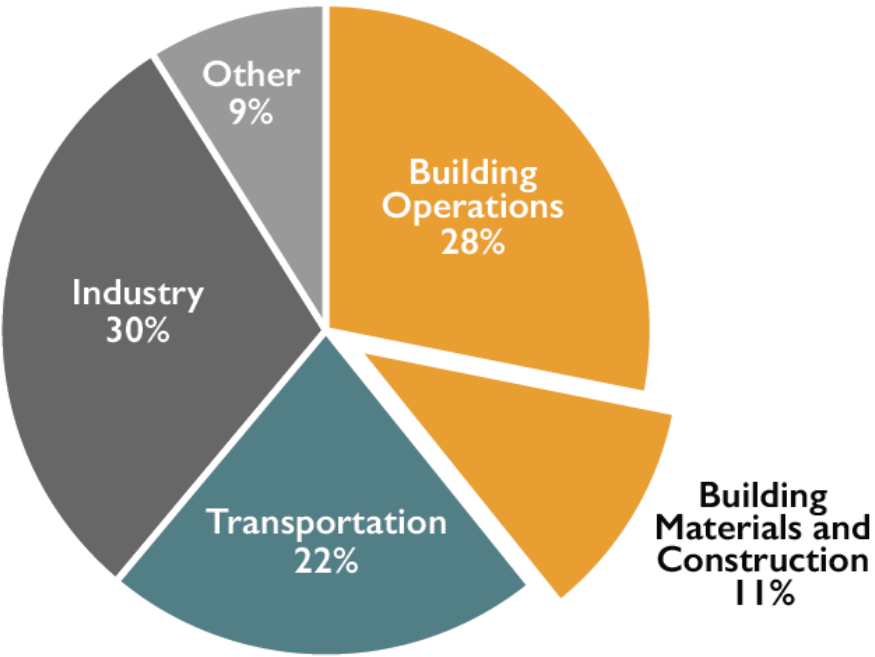
▲ All UK homes will need to be brought up to high standards of efficiency and equipped with low-carbon heating in place of gas boilers if the government is to meet its target of net zero greenhouse gas emissions by 2050.  
Photograph: Murdo MacLeod/The Guardian

## Government should consider homebuyer grants for zero carbon homes, say sector giants



TopHat and L&G have said the government should consider offering housebuyers a grant to encourage them to buy zero carbon homes.

Global CO<sub>2</sub> Emissions by Sector



Source: © 2018 2030, Inc. / Architecture 2030. All Rights Reserved. Data Sources: UN Environment Global Status Report 2017; EIA International Energy Outlook 2017



# So We Need To Square Decarbonisation With Building Safety Regulatory Reform

## How is the CLT industry responding to the combustibles ban?

By Joey Gardiner | 31 January 2019



Proponents of cross-laminated timber were up in arms when the government announced its plans to ban combustible materials from the external walls of high-rise buildings. But now the nascent industry is fighting back, reports Joey Gardiner



Odile Guzy Architectes' social housing scheme in Chalon-sur-Saône, France

5 October 2021

French public buildings to be built with 50 per cent wood

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## Steel and concrete are climate change's hard problem. Can we solve it?

Heavy industry produces more carbon dioxide than the entire US. Perfect the new technologies that could clean it up and we can score a crucial climate victory

### A new report predicts significant demand growth for mass timber components

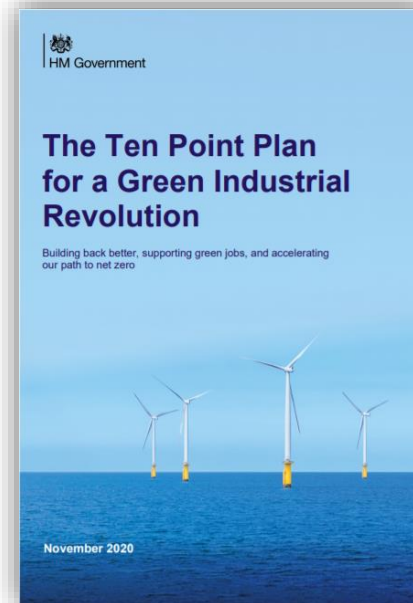
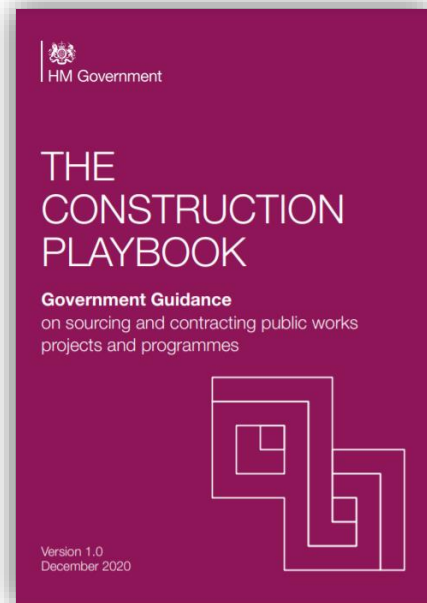
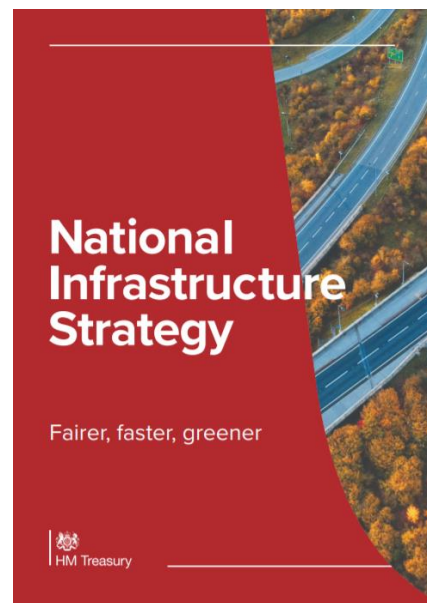
There should be plenty of wood, but production capacity needs to catch up.

BUILDING MATERIALS | JULY 05, 2020 | JOHN CAULFIELD, SENIOR EDITOR





# The Most Recent UK Government Announcements All Support The Move to MMC



5 October 2021



# UK Government Has Turned Up The Gas On Move To MMC Through Both Narrative & Policy Post Covid-19

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A quarter of affordable homes must be MMC

By Joey Gardiner | 11 September 2020

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Homes England to use deals signed under new £11.5bn Affordable Housing Programme

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A fifth of all new affordable homes must be MMC, says Jenrick

By Tom Lowe | 7 October 2020

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Housing secretary makes pledge and tells Tory conference any further cash in the spending review will be focused on MMC

5 October 2021

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Homes England boss says industry “getting away” with low MMC uptake for too long

By Joey Gardiner | 24 November 2020

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Nick Walkley says quango will 'ratchet up' offsite requirements and expand strategic partnership programme

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Modular Monitor

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Revealed: Ministers ramp up MMC target to 40% on affordable homes

News, views and more from the MMC sector

Sep 9

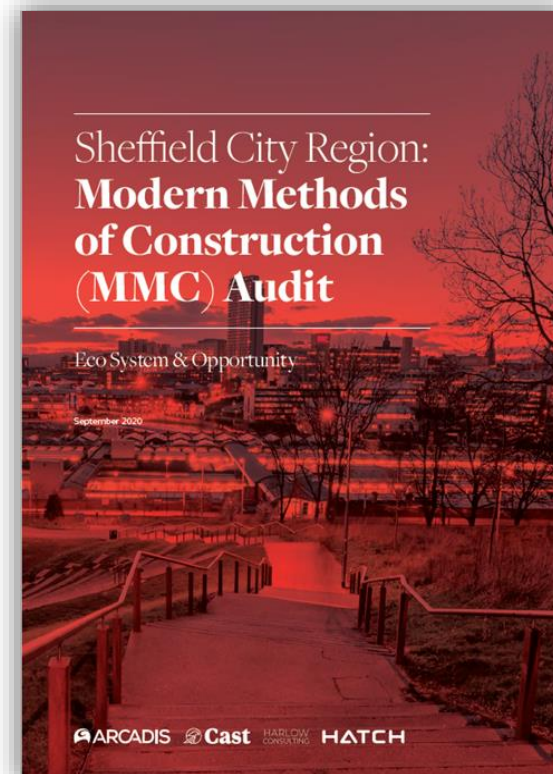
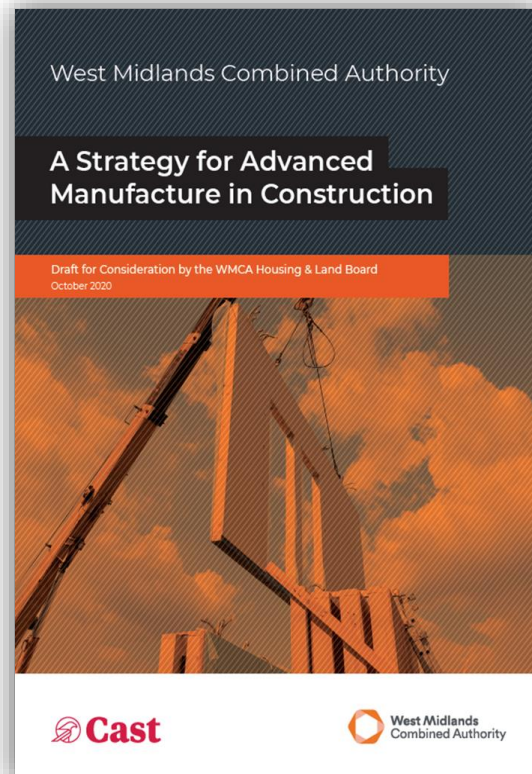
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29

# And The UK's Cities & Devolved Authorities Are Now Increasingly Identifying MMC As A Lever Of Local Industrial Strategy



Department for Levelling Up,  
Housing & Communities

Targeting more local homes - higher quality, lower carbon with new high productivity & technology led skills and associated inward investment in areas that need it most





# The UK Has Now Formally Defined ‘MMC’

## Category DEFINITIONS

The term 'pre-manufacturing' encompasses processes executed away from final workspace, 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 'workspace factories' are included in Category 7).

# CATEGORY DEFINITION	1 Pre-manufacturing (3D primary structural systems)	2 Pre-manufacturing (2D primary structural systems)	3 Pre-manufacturing components (non-systemised primary structure)	MMC SPECTRUM
4 Additive manufacturing (structural and non-structural)	5 Pre-manufacturing (non structural assemblies & sub-assemblies)	6 Traditional building product led site labour reduction / productivity improvements	7 Site process led site labour reduction / productivity / assurance improvements	PMV ANALYSIS

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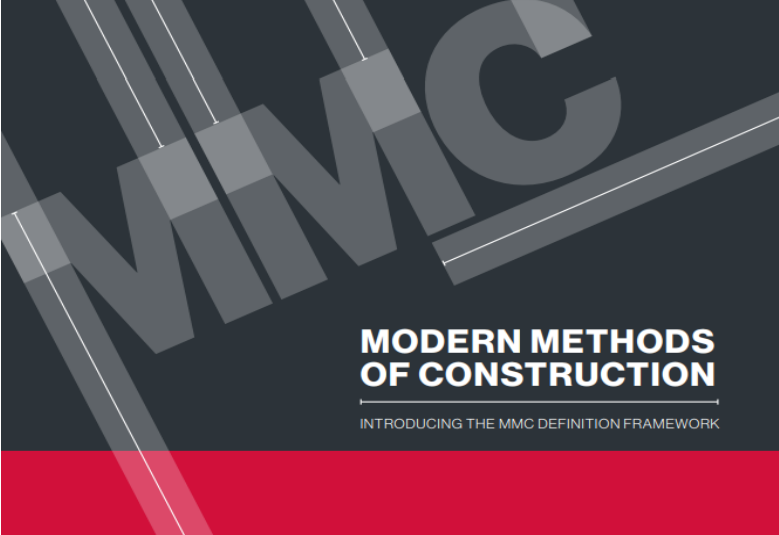
Independent report  
**Modern Methods of Construction  
working group: developing a definition  
framework**

The Modern Methods of Construction (MMC) definition  
framework has been developed by a specialist sub-group of  
the MHCLG MMC cross industry working group.

Published 29 March 2019  
From: [Ministry of Housing, Communities & Local Government](#)

Documents

[Modern Methods of Construction:  
introducing the MMC definition framework](#)  
[http://www.cast-consultancy.com/vip-content/uploads/2019/03/MMC-Pad-  
base\\_GOVUKFINAL\\_SECURE.pdf](http://www.cast-consultancy.com/vip-content/uploads/2019/03/MMC-Pad-<br/>base_GOVUKFINAL_SECURE.pdf)



# And UK Government Is Using PMV To Measure Design & Construction Modernisation Progress

For more information see link below:

<https://www.cast-consultancy.com/knowledgehub/toolkit/pre-manufactured-value-pmv-estimator/>



## Pre-Manufacturing:

The inclusive term for all processes encompassed by construction materials, component, sub-assembly manufacture, consolidation and pre-assembly prior to final movement and installation at the construction workplace. This, for the avoidance of doubt, can include offsite, near site and on-site temporary factory led processes.

THE PMV FORMULA IS  
A SIMPLE EQUATION

$$\text{PMV \%} = \frac{\text{Pre-manufactured value (£)}}{\text{Gross Construction Cost (£)}} \times 100$$

The equation is visually represented with a red 3D cube icon above the numerator and a black circle icon with three white overlapping circles below the denominator.

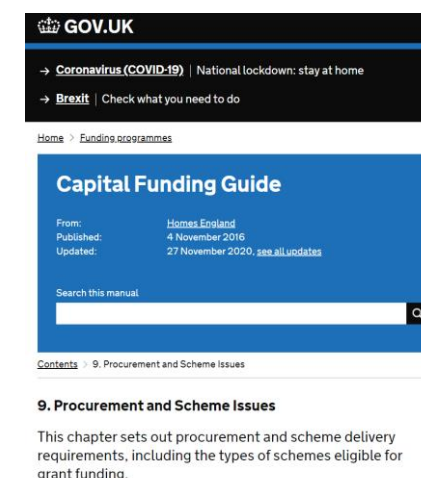




# Homes England Application



<https://www.gov.uk/guidance/capital-funding-guide/8-procurement-and-scheme-issues#mmc>

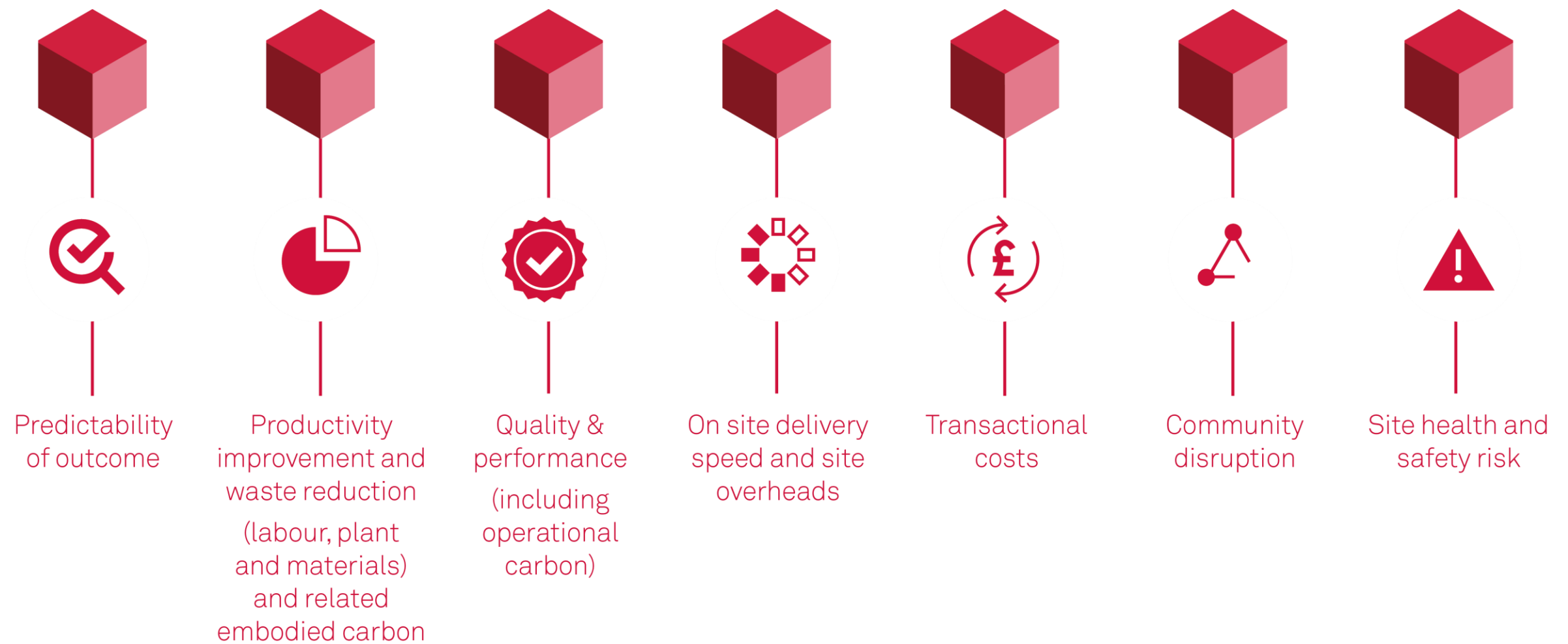


3.5.1 Where homes are being produced using MMC, all providers are required to assign them to one (or more) of the seven category definitions of MMC listed and summarised below. For funding through the AHP 2021 to 2026, this is regardless of whether funding is accessed through CME or through a Strategic Partnership. This information will be collected through Homes England's Investment Management System.

3.5.5 In the AHP 2021 to 2026, Strategic Partnerships must achieve at least 25% of homes delivered as MMC. The selected 25% of homes should use the above framework to categorise the MMC delivered on a project. Organisations can deliver the requirement using any of the categories in the framework. However, we expect organisations to use categories 1, 2 or with construction processes that achieve a pre-manufactured value (PMV) score of 55% or above.



# Why Measure PMV?



# Change is Already Happening But It's Slow



## Mace unveils 'next generation' construction method

December 5, 2019



5 October 2021

## Countryside to open two more modular homes factories

### Bam Construct eyeing move into modular residential

24 MAY 2021 | BY DAVID PRICE

## Barratt sets new MMC target after beating 2020 aims

### Guinness pays £10m for stake in offsite specialist Ilke Homes

NEWS 27.09.21 11:35 AM BY JAMES WILMORE

The Guinness Partnership has become the latest large housing association to take a stake in offsite specialist Ilke Homes by paying £10m for a minority shareholding, it has emerged.

35

### NEWS

#### Wates moves offsite manufacturing to new Coventry facility

24 September 2019 | By Neil Gerrard



SES Engineering's Prism facility in York

### News

## Robots to ramp up Sisk margins in productivity push

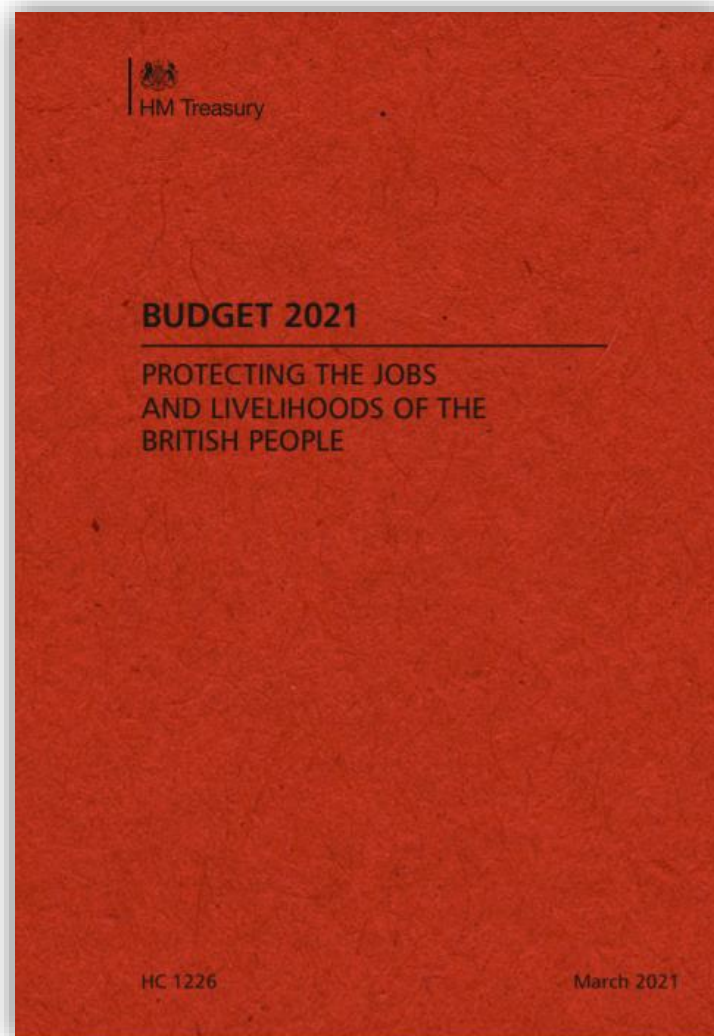
Aaron Morby 1 year ago

Share

John Sisk & Son is on a major productivity drive with plans to buy an offsite manufacturing business and deploy block and bricklaying robots.



# The Opportunity To Mobilise Modernisation At A Local Level Has Been Recognised by Government In Last Budget



- **Modern Methods of Construction (MMC) Taskforce** – The Ministry of Housing, Communities and Local Government (MHCLG) will establish an MMC Taskforce, backed by £10 million of seed funding, to accelerate the delivery of MMC homes in the UK. The Taskforce will consist of world-leading experts from across government and industry to fast-track the adoption of modern methods of construction. It will be headquartered in MHCLG's new office in Wolverhampton. The Taskforce will work closely with local authorities and Mayoral Combined Authorities, including the West Midlands Combined Authority and the Liverpool City Region who have already brought forwards ambitious proposals.





# The Need For An Integrated & Multi-Faceted MMC Strategy For Housing

- Demand Stimulation & Aggregation
- Supply Chain Support & Collaboration
- Standardisation
- Building Safety, Quality & Accreditations
- Indirect Measures – Carbon, Levelling Up, Planning etc



THANK YOU FOR LISTENING



# Modern Methods of Construction: Time to Invest?



Offsite product & process  
performance evaluation

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*Jeff Maxted,*

*Director of Technical Consultancy at BLP &  
BOPAS*

**BOPAS**

Buildoffsite Property  
Assurance Scheme

# IPF – OFFSITE PERFORMANCE ASSESSMENT

*Jeff Maxted – Director BLP  
Technical Services (UK) Ltd*



**buildoffsite**



Recognised assurance for innovative or  
non-traditional methods of construction



# Are MMC Durable ???????

**BOPAS**

Buildoffsite Property  
Assurance Scheme



## **BOPAS Criteria - There are 7 categories within the MMC Definition Framework:**



**Category 1 – Pre-Manufacturing – 3D primary structural systems**

**Category 2 – Pre-Manufacturing – 2D primary structural systems**

**Category 3 – Pre-Manufacturing – Non systemised structural components**

**Category 4 – Pre-Manufacturing – Additive Manufacturing**

**Category 5 – Pre-Manufacturing – Non-structural assemblies and sub-assemblies**

**Category 6 – Traditional building product led site labour reduction/productivity improvements**

**Category 7 – Site process led labour reduction/productivity improvements**



# Durability Assessment the scope

Compliance with British and European Standards

Assessment of Height

Loadings and Spans

Exposure suitability

Good Building Practise





# Durability Assessment the detail

**BOPAS**

Buildoffsite Property  
Assurance Scheme

Roof details

Structural Frame

Floors

Walls

Claddings

Interface with foundation & ground

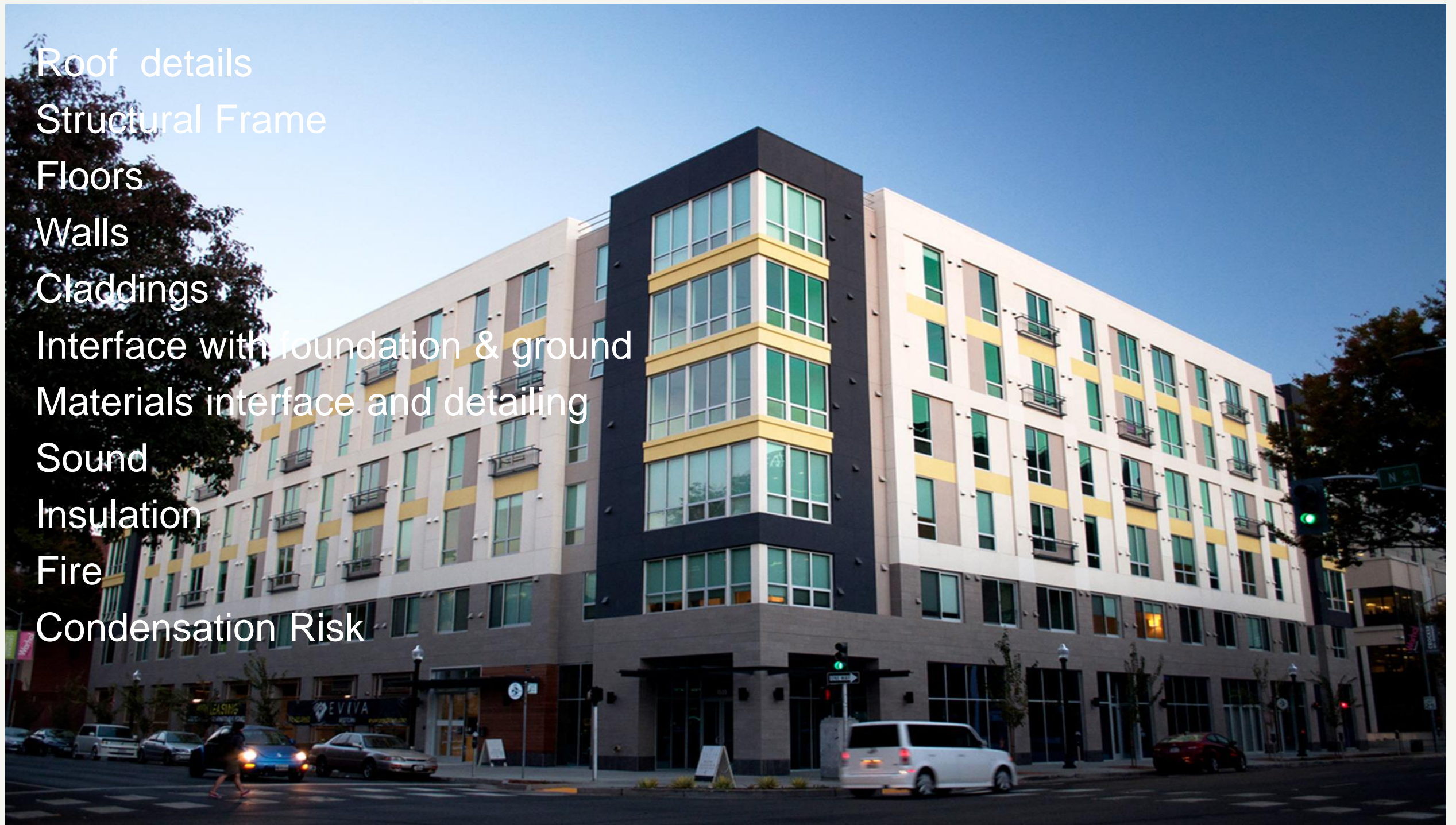
Materials interface and detailing

Sound

Insulation

Fire

Condensation Risk







Component life and maintenance  
appended to assessment

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In addition to “system accreditation” BOPAS can offer the following services to demonstrate sustainability and carbon performance of MMC

- Life cycle assessment and comparison with traditional construction
- Embodied Carbon and comparison with traditional construction
- Can offer durability assessment to 100 years for the structural system

- Embodied carbon is the carbon footprint of a building or infrastructure project before it becomes operational
- Buildings and the construction sector are responsible for nearly 40% of annual global carbon emissions.
- 28% of those emissions are embodied in the materials

# Modern Methods of Construction: Time to Invest?



Quality and assurance of offsite

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*Terry Mundy,*

*Consultant at Lloyd's Register & BOPAS*



# BOPAS

Buildoffsite Property  
Assurance Scheme

## MMC: Time to Invest?

Terry Mundy BOPAS Consultant

September 2021



*buildoffsite*



# BOPAS Development team

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# Offsite construction

## Challenges:

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Risk of systemic failure

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Durability uncertainty

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Transportation constraints

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Water ingress

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Interface issues between design, manufacture and construction

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Uncertainty of construction system for valuation purposes

# What is involved?

Process  
accreditation

60 year  
durability  
assessment

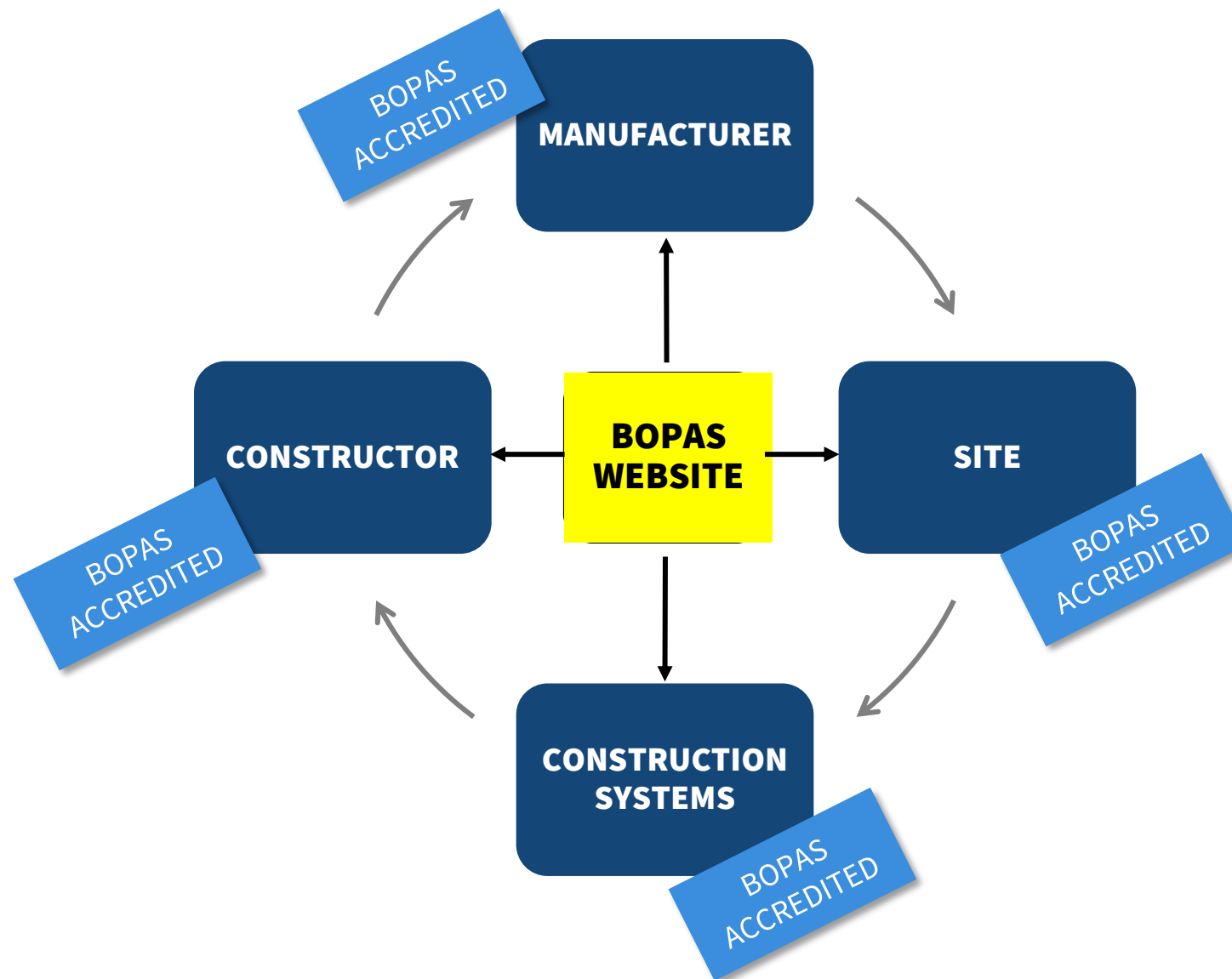
Web based  
search  
facility



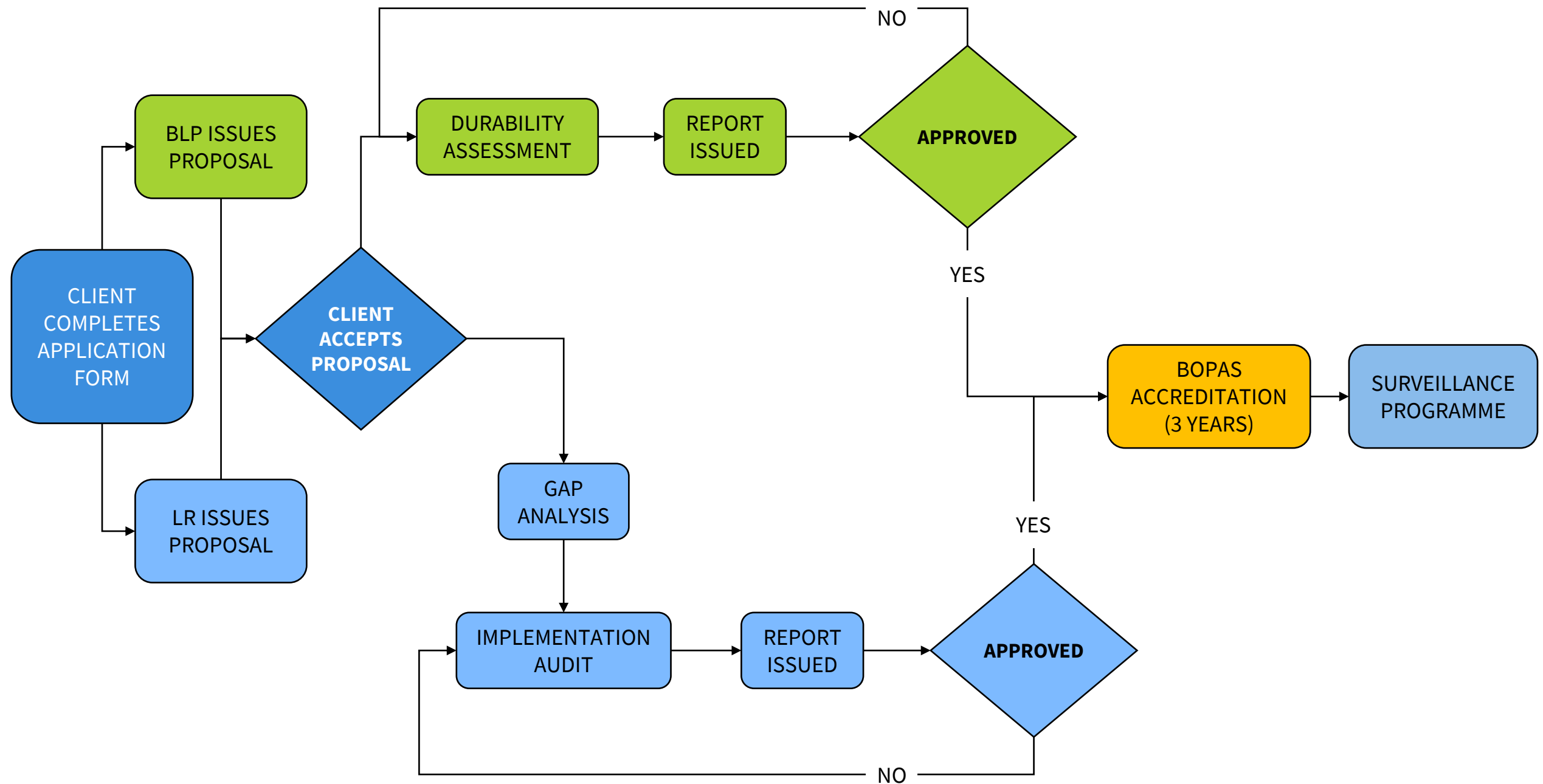


# What's the purpose of the scheme?

Developers can demonstrate to lenders that each element is accredited.



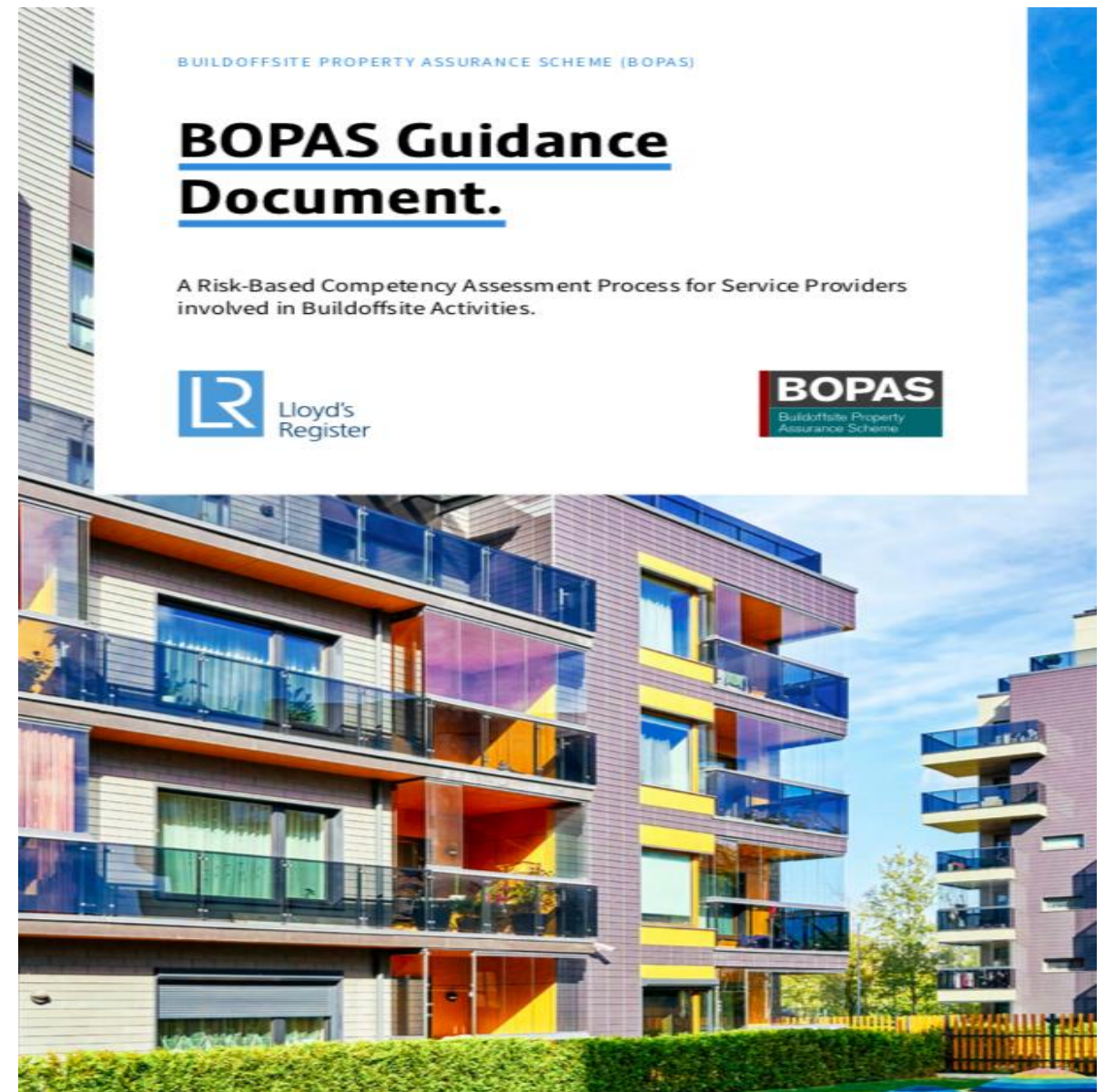
# Assessment process



# Assessment Criteria

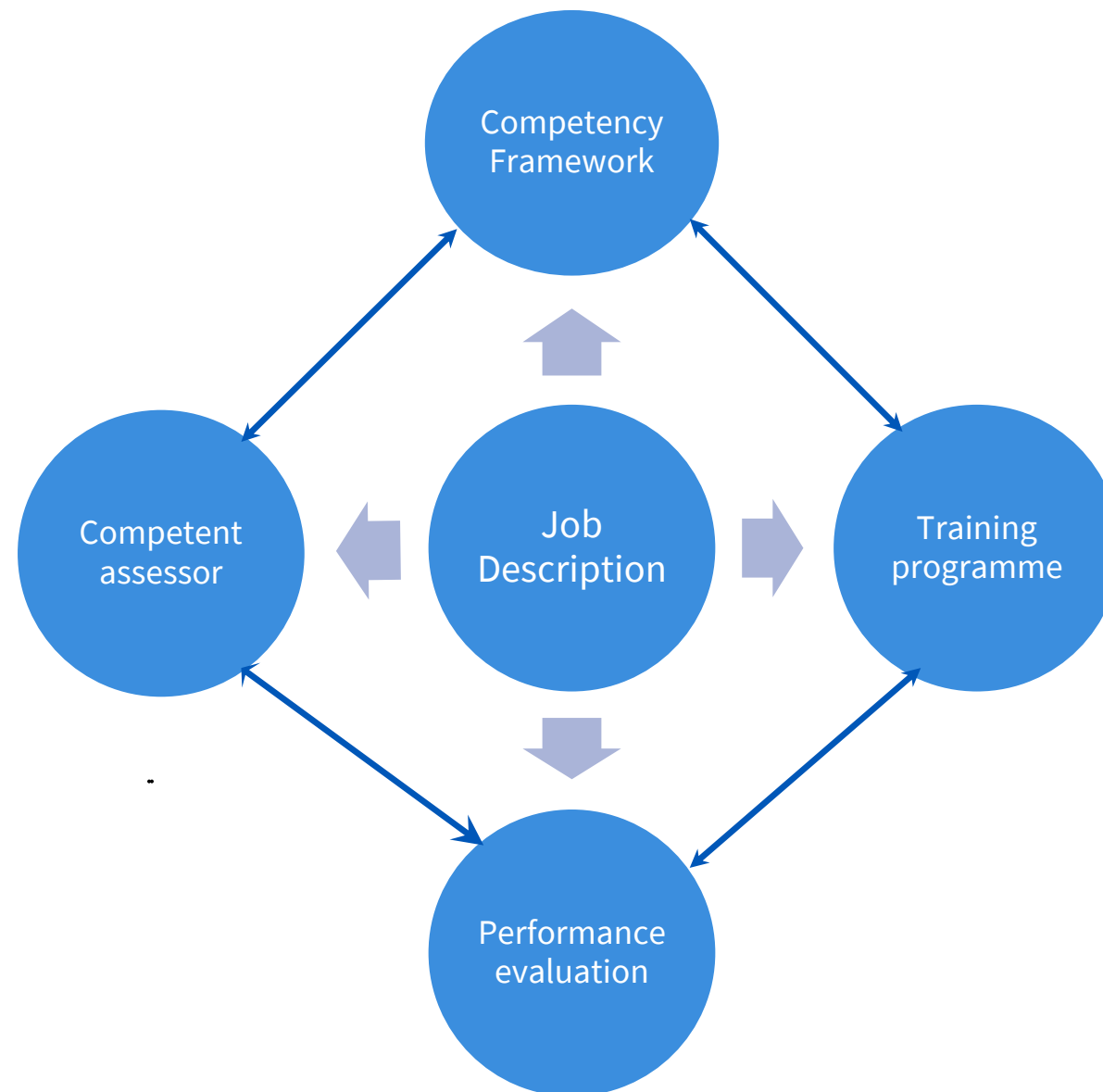
## BOPAS Guidance document

- Accessed via the BOPAS website
- Defines process and assessment criteria
- Subject to 6 monthly reviews and updates



# Competency process

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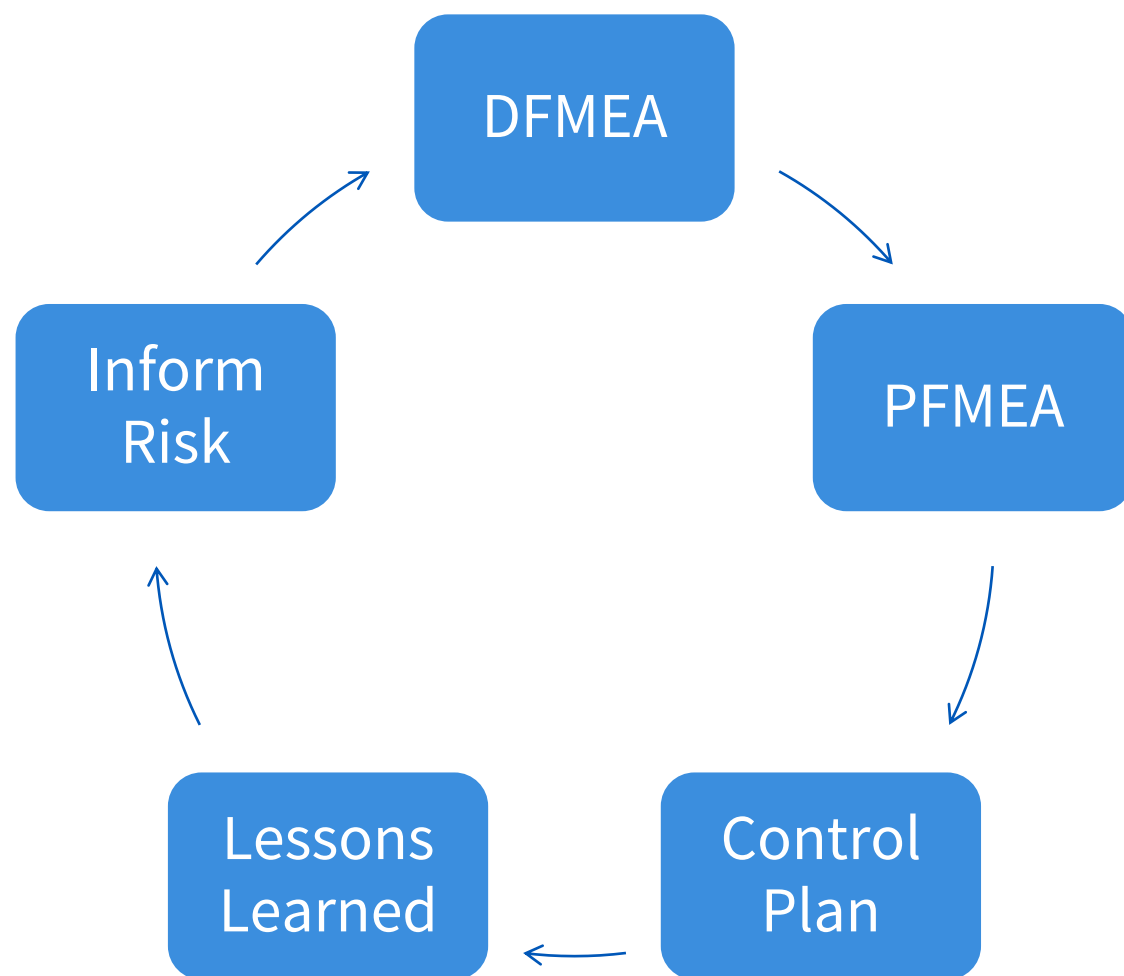




# Risks

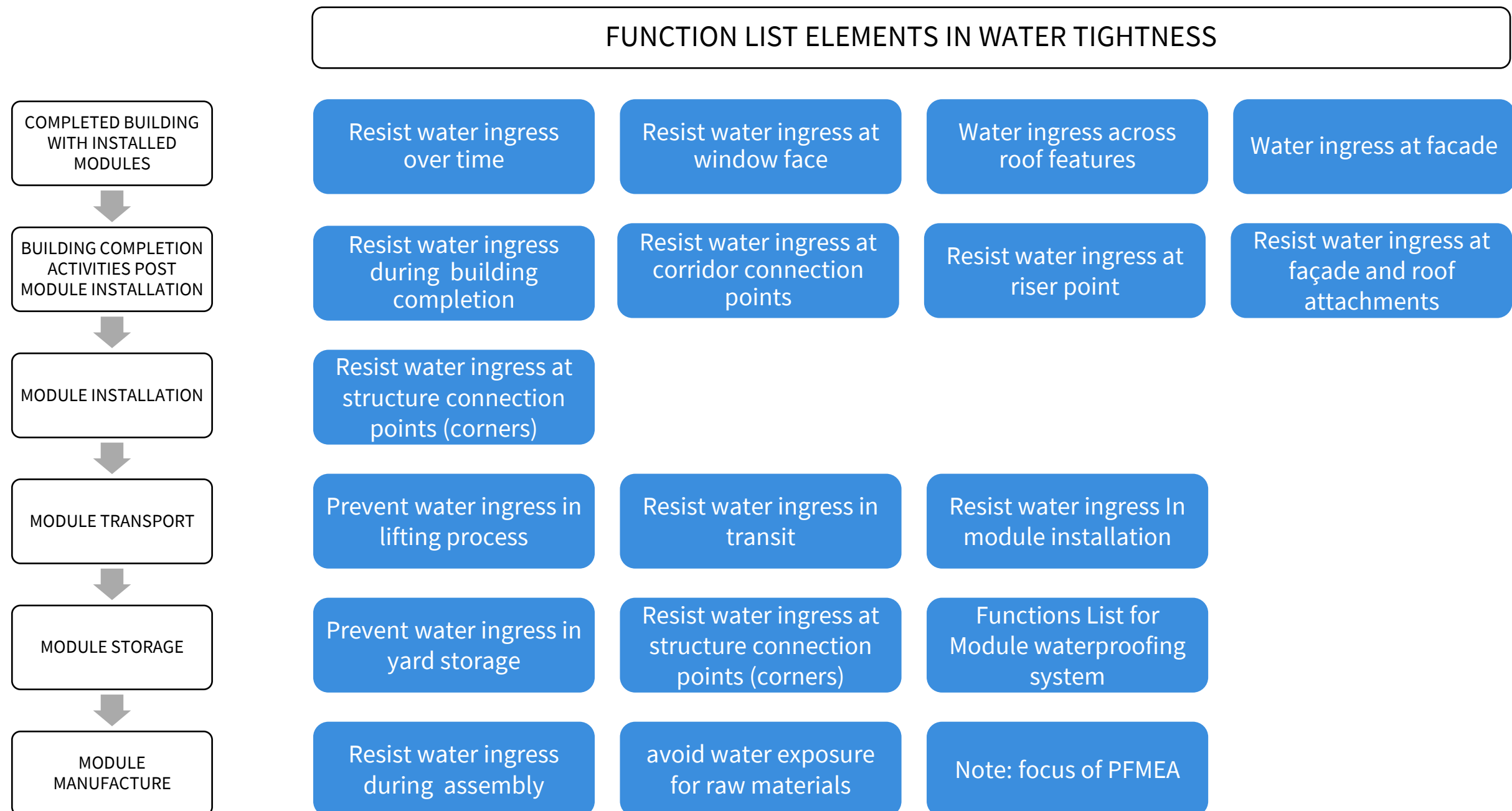
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## Systemic Failure/Water ingress....



- BOPAS requires comprehensive DFMEA and PFMEA to be completed
- Resultant control plan defines risk mitigation
- Process tested
- Review and capture lessons learned
- Lessons learned to inform risk and update DFMEA and PFMEA/Control Plan

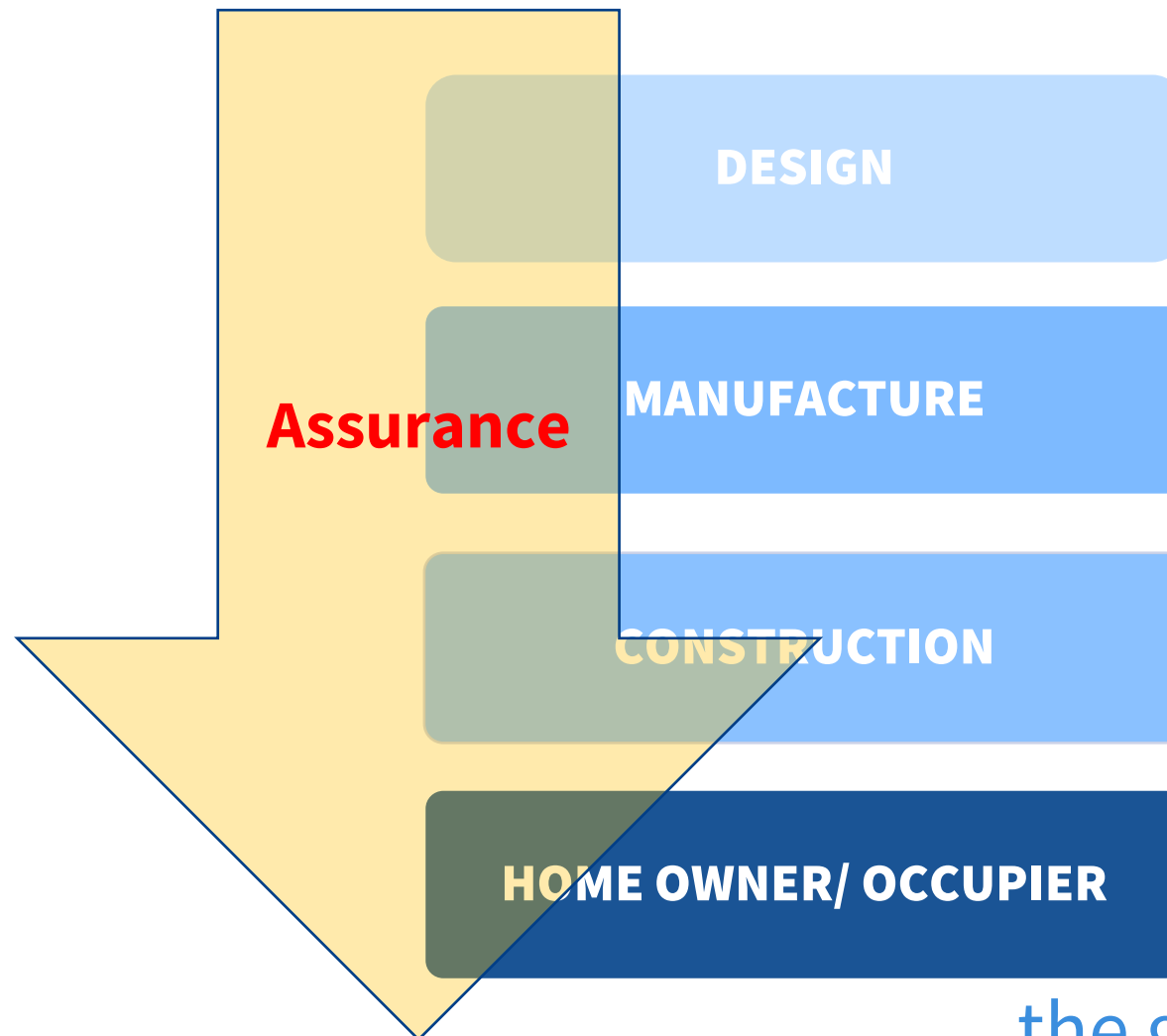
# Systemic Failure - Water Ingress



# Ensuring product integrity and instilling trust

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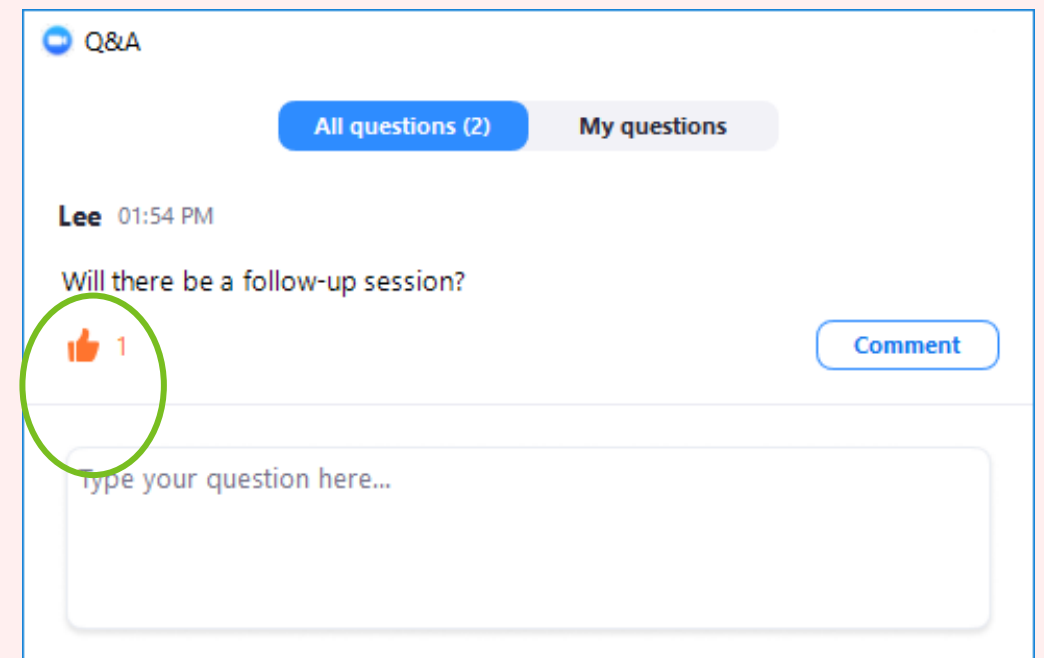
Focus on interface management



...the golden thread of assurance

# Q&A

Please put your questions or comments in the chat box





# Thank you