



House of Commons
Housing, Communities and
Local Government Committee

Modern methods of construction

Fifteenth Report of Session 2017–19

*Report, together with formal minutes
relating to the report*

*Ordered by the House of Commons
to be printed 24 June 2019*

Housing, Communities and Local Government Committee

The Housing, Communities and Local Government Committee is appointed by the House of Commons to examine the expenditure, administration, and policy of the Ministry of Housing, Communities and Local Government.

Current membership

[Mr Clive Betts MP](#) (*Labour, Sheffield South East*) (Chair)

[Bob Blackman MP](#) (*Conservative, Harrow East*)

[Mr Tanmanjeet Singh Dhesi MP](#) (*Labour, Slough*)

[Helen Hayes MP](#) (*Labour, Dulwich and West Norwood*)

[Kevin Hollinrake MP](#) (*Conservative, Thirsk and Malton*)

[Andrew Lewer MP](#) (*Conservative, Northampton South*)

[Teresa Pearce MP](#) (*Labour, Erith and Thamesmead*)

[Mr Mark Prisk MP](#) (*Conservative, Hertford and Stortford*)

[Mary Robinson MP](#) (*Conservative, Cheadle*)

[Matt Western MP](#) (*Labour, Warwick and Leamington*)

[Mohammad Yasin MP](#) (*Labour, Bedford*)

Powers

The Committee is one of the departmental select committees, the powers of which are set out in House of Commons Standing Orders, principally in SO No 152. These are available on the internet via www.parliament.uk.

Publication

© Parliamentary Copyright House of Commons 2019. This publication may be reproduced under the terms of the Open Parliament Licence, which is published at www.parliament.uk/copyright/

Committee's reports are published on the Committee's website at www.parliament.uk/hclg and in print by Order of the House.

Evidence relating to this report is published on the [inquiry publications page](#) of the Committees' websites.

Committee staff

The current staff of the Committee are Mike Winter (Clerk), Jack Dent (Second Clerk), Nick Taylor and Alison Pickard (Committee Specialists), Tony Catinella (Senior Committee Assistant), Eldon Gallagher (Committee Support Assistant) and George Perry (Media Officer).

Contacts

All correspondence should be addressed to the Clerk of the Housing, Communities and Local Government Committee, House of Commons, London SW1A 0AA. The telephone number for general enquiries is 020 7219 4972; the Committee's email address is hclgcom@parliament.uk.

You can follow the Committee on Twitter using [@CommonsCLG](#)

Contents

Summary	3
1 Introduction	7
2 Government’s homebuilding targets and the case for MMC	9
Potential benefits of using MMC to build homes	10
Barriers to using MMC to build homes	12
3 Defining MMC	14
What do “modern methods of construction” encompass?	14
The MMC definition framework	14
4 Quality assurance and warranties	16
Primary concerns	16
Accessing long-term data	18
Tracking database	18
Warranty providers and an “MMC Scheme”	21
5 Workforce and training	23
Workforce shortages	23
Apprenticeships and training	25
Research and development	26
6 Supply chain	28
Aggregating demand	28
Designs for MMC homes	28
Identifying best practice in MMC	30
Industrial Strategy Construction Sector Deal	31
7 Local authorities	33
Social housing	33
The planning system	34
8 Access to land	36
9 Building regulations and energy efficiency	39
Building regulations and MMC	39
Energy efficiency	41
10 Access to finance	43
Government backed schemes	43

SME homebuilders	45
Conclusion	46
Conclusions and recommendations	47
Formal minutes	54
Witnesses	55
Published written evidence	56
List of Reports from the Committee during the current Parliament	58

Summary

For decades this country has not built enough homes, which has led to rising housing costs. The Government has set an ambitious target to build 300,000 homes annually by the mid-2020s but constraints such as the shortage of skilled workers mean it cannot meet that target using traditional building methods alone. **A significant proportion of homes must be built using modern methods of construction (MMC) if we are to meet the target to deliver 300,000 homes annually.** The conclusions and recommendations in this report are intended to make this happen.

This inquiry focused on the benefits of using MMC to build homes and the barriers that prevent greater take-up. It sought to address those barriers and make recommendations that will help the industry to overcome them.

The main conclusions and recommendations are as follows:

- **The Ministry should report annually the total amount allocated to MMC developments across all its different funding streams and implement a coordinated strategy across all relevant government departments to increase MMC homebuilding.**

The Ministry should track how much of its total spending on housing goes towards MMC developments specifically. It should also implement a coordinated strategy with other government departments that oversee schemes such as construction skills provision and research and development (R&D), to increase MMC housing output. It should monitor how many homes are built using MMC annually, in order to evaluate the impact of this strategy.

-
- **Homebuilders should use more digital technology in their processes and not simply move construction off-site.**

There is some disagreement about which methods should come under the banner of MMC but to take advantage of the predicted benefits, such as improved quality, homebuilders must use more digital technology.

-
- **The lack of long-term data on the durability of MMC homes in the UK is a considerable barrier to industry actors engaging with MMC housing schemes.**

Financial service providers, including insurers, mortgage lenders and valuers need to have certainty that MMC homes are safe and durable if they are to engage with them.

- **The Government should develop a digital database that records the design, processes and materials used in the construction of buildings.**

Digital technology makes it possible to create a database that would store and track data about built environment. It should record the materials and processes used in

the construction of homes. It could also track repairs and alterations in larger housing developments and make this information available to relevant stakeholders, including insurers and fire services.

- **We welcome the proposal for an “MMC Scheme” that will set out a single set of standards for warranty providers against which to make decisions.**

Currently, warranty providers set their own standards against which to assess homes. The “MMC Scheme” which is being developed by the MCHLG Joint Industry Working Group will provide financial service providers with more certainty about the quality of MMC homes.

-
- **The Government must ensure skills programmes, apprenticeship schemes and the new T Level give learners the skills they need for both traditional techniques and MMC and encourages more young people into the sector.**

The shortage of workers with relevant skills is one of the main constraints to increasing homebuilding in the UK. It is vital the Government increases skills provision and turns homebuilding into an appealing career choice for young people.

-
- **There is a lack of robust supply chains for MMC homes.**

Supply chains for MMC homes are underdeveloped in the UK. The Government should help to aggregate demand for MMC products to provide certainty and allow businesses in the supply chain to invest in factories to produce relevant components and machinery.

-
- **Local authorities need to start building homes in far greater numbers than they have done in recent years.**

In the past, local authorities have been major homebuilders and have contributed significantly to the total number of homes delivered. If we are to get close to delivering 300,000 homes per year, local authorities must supply a significant proportion of them. Social housing is particularly well suited to MMC because it often includes large numbers of similar homes which reduces unit costs and provides certainty of demand to the supply chain.

-
- **Helping homebuilders to access land for development is key if we are to increase rates of homebuilding.**

Homebuilders cite the lack of access to land as a constraint to increasing housing supply. It is even harder to access privately owned land for MMC developments than traditional developments. The Government should help MMC homebuilders to access land that it controls so they can increase their overall delivery of homes and shore-up demand for the supply chain.

-
- **The Government should urgently set out a clear plan for the review of the building regulations, including the whole suite of Approved Documents, and consider how they relate to MMC buildings.**

The current system of building regulations is confusing, and homebuilders told us it is difficult to apply the guidance to MMC buildings. We welcome the Government's review of Approved Documents in light of the Independent Review of Building Regulations and Fire Safety, led by Dame Judith Hackitt but the review should go further and consider specific guidance for homes manufactured off-site.

- **The building regulations should set more stringent energy performance targets for homes to take into account achievable levels of energy efficiency.**

At present, many new homes do not achieve the high levels of energy efficiency possible with MMC. The Government has set a target to eradicate the UK's net contribution to climate change by 2050 and the built environment has a major role to play in achieving that target. The Government should strengthen energy performance targets to reflect this.

-
- **If current schemes are insufficient to provide the finance needed to increase MMC output, new schemes aimed at MMC developments should be considered.**

MMC homebuilders require capital upfront to pay for factories and assembly lines. This presents the biggest barrier to SME homebuilders that do not have reserves to draw on to invest in MMC. Private investors are cautious about investing in innovative methods of construction, so the Government should ensure it is enabling homebuilders to access the finance they need for MMC.

1 Introduction

1. In its Report ‘Capacity in the homebuilding industry’, published in April 2017, our predecessor Committee said “For decades the country has not built enough homes” and that “The continued failure to build enough homes has contributed to the cost of buying or renting a home continuing to rise.”¹ The Committee acknowledged that modern methods of construction (MMC) could make an important contribution towards addressing the industry’s problems and speed up the delivery of homes. They described MMC as:

a collective term for a wide range of non-traditional building systems. These include modular construction where units are fully fitted out off-site, panelised systems (such as timber or light steel frames, site based MMC such as thin joint block work and sub-assemblies and components (such as pre-fabricated chimneys, porches etc).

2. It recommended the Government “take a more active role to improve the wider sustainability of the MMC supply chain and to encourage the market to grow”.² In its response to the Report the Government said:

To increase housing supply, we need a diversified housing market where all firms embrace innovation to become more productive and deliver a better product to the consumer—building more homes using modern methods of construction would be a part of this.³

The response pointed to the Housing White Paper published in February 2017, entitled ‘Fixing our broken housing market’, which made several commitments to support MMC:

- stimulate the growth of this sector through our Accelerated Construction programme and the Home Builders’ Fund;
- support a joint working group with lenders, valuers and the industry to ensure that mortgages are readily available across a range of tested methods of construction;
- work with local areas who are supportive of this type of manufacturing to deliver growth, provide jobs, and build local housing more quickly;
- alongside the Home Building Fund, consider the opportunities for offsite firms to access innovation and growth funding and support for them to grow.⁴

Despite these positive words, it is clear that the use of MMC to build homes has continued to lag a long way behind traditional methods, with around 15,000 homes delivered

1 Communities and Local Government Committee, Tenth Report of Session 2016–17, [Capacity in the homebuilding industry](#), HC 46, para 2.

2 Communities and Local Government Committee, Tenth Report of Session 2016–17, [Capacity in the homebuilding industry](#), HC 46, para 3.

3 Department for Communities and Local Government, [Government Response to the Communities and Local Government Select Committee Report: Capacity in the Homebuilding Industry](#), CM 9517, October 2017, p.13

4 Department for Communities and Local Government, [Fixing our broken housing market](#), February 2017, p54

annually using MMC.⁵ In January 2018 Homes England, described as “the government’s housing accelerator”,⁶ replaced the Homes and Communities Agency. Homes England has adopted measures to promote MMC; its Strategic Plan for 2018/19–2022/23 says it will:

incorporate MMC into our building lease disposals to demonstrate a range of MMC products on Homes England land. We’ll also encourage partners to use MMC through our provision of development finance to developers.⁷

3. It is in this context that we decided to launch this inquiry. We believe that MMC are key to increasing the delivery of homes and working towards the target to deliver 300,000 new homes annually by the mid-2020s. Mark Farmer, CEO of Cast Consultancy, and author of *The Farmer Review of the UK Construction Labour Model*, entitled ‘Modernise or Die’, told us:

The need to diversify the production process is as important in solving the housing crisis as some of the more well-publicised issues like land availability, planning systems and affordability. They are all part of a very complex jigsaw.⁸

4. The focus of this inquiry is on the barriers that prevent greater take-up of MMC among homebuilders and we have sought to make recommendations that will help to overcome those barriers. The first chapter considers the Government’s homebuilding targets in general, the potential benefits of using MMC to build more homes and the barriers to greater take-up identified by witnesses to this inquiry. Chapters two to nine look in more detail at the barriers to take-up and what is already being done to overcome them. We then make recommendations for further action on each of these topics to increase take-up of MMC in the residential sector.

5. We thank everyone who has contributed to our inquiry. We received over 50 written submissions from across the industry. The key themes of the written evidence were explored in four oral evidence sessions in which we heard from 23 representatives from the construction industry and related organisations, including the Department for Business, Energy and Industrial Strategy and the Ministry of Housing, Communities and Local Government.

6. We also express our thanks to Sir Robert McAlpine Ltd and Swan Housing Association for hosting the Committee at their housing developments, which greatly enhanced our insight into how MMC are used in homebuilding. Finally, we thank our Specialist Advisor, Professor Christine Whitehead.

5 HL Deb, 24 April 2019, [col 678](#) [Lords Chamber]

6 Homes England, ‘[About us](#)’, accessed 12 June 2019

7 Homes England, [Strategic plan 2018/19 - 2022/23](#), October 2018, p22

8 [Q8](#)

2 Government's homebuilding targets and the case for MMC

7. There are deep seated problems with the housing market in this country and too few new homes have been built over recent decades to keep up with demand. The result has been rising house prices, lower rates of home ownership and increasing homelessness. In 2017 the Government published its Housing White Paper entitled 'Fixing our broken housing market' which described the problems in the homebuilding industry, and listed three main challenges:

- over 40 per cent of local planning authorities do not have a plan that meets the projected growth in households in their area;
- the pace of development is too slow;
- the very structure of the housing market makes it harder to increase supply.⁹

In order to overcome these challenges the Government included priorities to build homes faster and diversify the market.¹⁰ Its proposals for how to achieve these priorities included taking steps to address the skills shortage by growing the construction workforce, backing small and medium sized (SME) homebuilders, bringing in new contractors through the Accelerated Construction Programme and boosting productivity and innovation by encouraging MMC.¹¹

8. In its 2017 election manifesto the Conservative Party pledged to meet the 2015 Government's commitment to secure one million additional homes to the housing stock by 2020 and said it would add half a million more by 2022.¹² In its Single Departmental Plan published in May 2018, the Ministry of Housing, Communities and Local Government reiterated this commitment and said it would put it on track to deliver 300,000 net additional homes annually by the mid-2020s.¹³ However, in 2018, only 165,090 new homes were completed¹⁴ and there continue to be regular reports in the media about the poor quality of some new developments built using traditional techniques. Mark Farmer told us there seems to be a trade-off between quantity and quality of new housing:

As quantity increases, quality diminishes. We need new techniques but we need to have approaches that are technology-enabled and that make the most of how we use digital in particular not to only design but then to manufacture, to create scalability.¹⁵

9. Low levels of productivity has been an enduring feature of the homebuilding industry. Building homes faster was identified as one of the Government's priorities in its housing White Paper. One of the potential benefits to using more MMC is the reduction in time

9 Department for Communities and Local Government, [Fixing our broken housing market](#), February 2017, p13–14

10 Department for Communities and Local Government, [Fixing our broken housing market](#), February 2017, p14

11 Department for Communities and Local Government, [Fixing our broken housing market](#), February 2017, p18–19

12 The Conservative and Unionist Party, [Forward, Together: Our Plan for a Stronger Britain and a Prosperous Future: The Conservative and Unionist Party Manifesto 2017](#), May 2017, p70

13 Ministry of Housing Communities and Local Government, [Ministry of Housing, Communities and Local Government single departmental plan](#), May 2018,

14 Ministry of Housing, Communities and Local Government, [House building; new build dwellings, England: December quarter 2018](#), March 2019, p7

15 [Q8](#)

it takes to build homes. The report by the National Audit Office entitled ‘Using modern methods of construction to build homes more quickly and efficiently’ found using new methods of construction could reduce construction time by more than half and enable up to four times as many homes to be built with the same on-site labour.¹⁶

10. In the House of Lords debate on Residential Construction Methods and Housing Supply on 24 April 2019, Deputy Speaker, Lord Palmer of Childs Hill OBE, said that across the UK 15,000 homes per year are factory made,¹⁷ but growth in the sector has been slow; this figure represents just 5% of the homes that need to be delivered annually in the coming years if we are to average 300,000 net additions.

11. In the financial year 2017–18 the Ministry of Housing, Communities and Local Government spent £7,563 million on “Fixing the broken housing market”, including a plethora of schemes to increase home ownership and help homebuilders to access land and finance. Some of these schemes are designed to increase use of MMC; for example, the Accelerated Construction Programme was launched to help homebuilders access land for MMC developments. Other schemes such as the Home Building Fund, can be accessed by both MMC homebuilders and traditional builders. But many schemes make no special provision for MMC and it appears that only a small proportion of overall spending has gone to MMC developments. There is a lack of overall strategy to coordinate these schemes and the picture is complicated further when programmes overseen by other government departments are taken into account. The Ministry should coordinate with other governmental bodies, including skills providers and R&D programmes, such as the Transforming Construction Programme, to ensure it has a coherent cross-government strategy to increase MMC homebuilding.

12. We support the Government’s ambition to add one million additional homes to the housing stock by 2020 and increase annual output to 300,000 by the mid-2020s; however, these volumes will not be achieved unless there is much wider adoption of MMC, alongside traditional building methods. Adopting higher levels of MMC would diversify the market and help to increase the numbers of new homes delivered, but capacity in off-site construction will have to increase rapidly and new entrants come into the market, if it is going to play a significant role in meeting the Government’s homebuilding targets. *To track how much the Ministry is spending on MMC specifically, it should report annually the total amount allocated to MMC developments across all its different funding streams, including generic schemes such as Help to Buy. It should implement a coordinated strategy across all relevant government departments to increase MMC homebuilding and monitor how many homes are built using MMC, in order to evaluate the impact of this strategy.*

Potential benefits of using MMC to build homes

13. This country builds most of its homes using traditional methods, but it is widely acknowledged we are not building enough homes to meet demand and reports of poor-quality workmanship are commonplace. Our predecessor Committee said that MMC could make an important contribution towards addressing the industry’s problems

16 National Audit Office, [Using modern methods of construction to build homes more quickly and efficiently](#), November 2005, p1

17 HL Deb, 24 April 2019, [col 678](#) [Lords Chamber]

and speed up the delivery of homes. Advocates of using MMC cite several benefits to using these methods in comparison with traditional construction techniques. The most commonly cited benefits of using MMC in written evidence to this inquiry include:

- **Quicker and more predictable delivery**—a possible 20–60% reduction in the construction programme time.¹⁸ Many submissions highlighted the benefits of working indoors, avoiding weather disruption.¹⁹
- **Better quality of delivery**—Great Places Housing Group found greater accuracy and “Zero defects on completion with reduced incidents of defects occurring in use. This results in reduced maintenance workload and consequential reduced costs for the landlord.”²⁰
- **Reduction in costs**—a possible 20–40% reduction in construction costs²¹ and the potential for improved whole life cost.²²
- **Fewer people on site**—potential for a reduction of 70%+ in onsite labour.²³
- **Improved health and safety for workers**—A larger proportion of the workforce is factory based, working at safe heights in controlled environments.²⁴
- **More diverse workforce**—currently women make up 12% of the construction workforce.²⁵ An increasing proportion of factory based work and standardised hours could encourage different people into the workforce.
- **Creation of local employment**—factories provide stable employment and can be situated in areas with higher levels of unemployment to generate employment opportunities.²⁶
- **More efficient use of materials** - half the total waste produced in UK comes from construction.²⁷ Factories can be optimised to minimise material waste to below 1% of the total, in comparison with traditional construction which typically vary between 18% and 22%.²⁸
- **Overall reduction in energy consumption**—Keepmoat Homes told us they can use 20–30% less energy to heat MMC homes in comparison with traditionally built new homes²⁹
- **Fewer deliveries to the site**—fewer lorries travelling backwards and forwards to the site to deliver materials and components means less noise, disruption and pollution in the surrounding area.³⁰

18 Royal Institute of British Architects ([MMC 0030](#))

19 eg. Enbuild Ltd ([MMC0039](#)) and Stonewater ([MMC0031](#))

20 Great Places Housing Group([MMC001](#))

21 Royal Institute of British Architects ([MMC0030](#))

22 Buildoffsite ([MMC0034](#))

23 Royal Institute of British Architects ([MMC0030](#))

24 Sir Robert McAlpine ([MMC0042](#)).

25 Royal Institute of British Architects ([MMC0030](#))

26 E.g. Royal Institution of Chartered Surveyors ([MMC0040](#))

27 Royal Institute of British Architects ([MMC0030](#))

28 Buildoffsite ([MMC0034](#))

29 Keepmoat Homes [[MMC0041](#)]

30 London Assembly Planning Committee ([MMC0022](#))

- **Lighter weight of construction and shallow foundations**—modular builds can be around 30% lighter than conventional masonry construction³¹ and can withstand shallower foundations which means they can be erected in areas where underground tunnels might prevent the construction of traditional buildings.³²
- **More choice for consumers**—greater possibility for customisation with some techniques enabling customers to choose finishes from a specification menu, including facing material, floor coverings, internal configurations and extra bedrooms.³³
- **Dynamic database tracking**—Using Building Information Modelling (BIM) software a database tracks the unit from its original design through to occupation. This information can be shared with stakeholders and therefore has the potential to improve stakeholder confidence in the system³⁴

14. **We received a wide range of evidence that detailed the potential benefits of using MMC to build homes. As our predecessor Committee said, MMC have the potential to make an important contribution to addressing the industry’s problems and increase the speed at which homes can be built. Therefore, the Government should take steps to exploit these benefits and help the MMC market to grow.**

Barriers to using MMC to build homes

15. Traditional methods of construction continue to dominate the market. There are several barriers that prevent greater uptake of MMC which must be overcome if we are to see homes built using MMC in greater numbers. This report will look into these barriers and make recommendations on how the Government can help to overcome them, including on:

- **Lack of certainty about which techniques come under the banner of MMC (chapter 2);**
- **Negative perceptions due to past failures, both from a purchaser and developer / industry perspective (chapter 3);**
- **Difficulties making adjustments to the property and repairs after damage (chapter 3);**
- **Difficulties securing warranties, insurance and mortgages for MMC homes (chapter 3);**
- **Lack of long-term data or proof of resilience to flood and fire (chapter 3);**
- **Lack of knowledge about the materials and techniques used in the construction of a building once completed and sold (chapter 3);**
- **Lack of skilled workers in the construction industry (chapter 4);**

31 Great Places Housing Group([MMC001](#))

32 London Assembly Planning Committee ([MMC0022](#))

33 Royal Institution of Chartered Surveyors ([MMC0040](#))

34 Royal Institution of Chartered Surveyors ([MMC0040](#))

- **Risk of pipeline disruption (chapter 5);**
- **Difficulties navigating the planning system (chapter 6);**
- **Lack of access to land for MMC developments (Chapter 7);**
- **Difficulties complying with the building regulations (chapter 8);**
- **Difficulties accessing up-front capital (chapter 9).**

16. We received a wide range of evidence that explained the current barriers to uptake of MMC to build homes. The Government must adopt the recommendations in this Report to overcome these barriers if we are to achieve greater uptake of MMC and enable them to play a significant role in delivering the homes this country needs.

3 Defining MMC

17. One of the main difficulties when discussing MMC is defining what the term means and deciding which methods should be included under the banner of “modern methods of construction”. Much of the written evidence submitted to this inquiry referred to forms of off-site manufacture for construction, including modular and panellised systems, and timber or steel framed homes. However, others put more emphasis on the role of digitalisation in modern construction and the precision finishing that digital technology can help to deliver.

What do “modern methods of construction” encompass?

18. During our oral evidence session with representatives from homebuilders Barratt Developments and Taylor Wimpey, they told us they were trialling a number of different MMC techniques to take advantage of the benefits of MMC, most pressingly to overcome the skills shortage in traditional trades. Barratt Developments is currently building 19% of its new homes using timber frames and aims to increase this to 20% by 2020.³⁵ However, Chairman of the Local Government Association, Lord Porter of Spalding CBE did not agree that these types of homes should be included in the definition of MMC:

First of all, you should clear up what MMC is. Based on the session I have just listened to, it is about as modern as—I do not know. We have been building timber-frame houses since Elizabethan times, so it is not really that modern. I do not think MMC is applicable.³⁶

This view is not unique, written evidence submitted by Stonewater made a similar point:

Stop classing traditional construction techniques, including timber frame, as an MMC product. MMC should be using cutting edge technology that makes real use of innovation.³⁷

To take advantage of the benefits of MMC outlined in this report, it is crucial homebuilders make use of innovative materials, precision manufacturing techniques and digital working and do not just shift their traditional construction methods off-site.

19. To benefit from the predicted advantages of MMC, such as better-quality finishes from precision manufacturing and developing a high-tech industry that is more appealing for potential employees to be employed in, homebuilders should use more digital technology such as Building Information Modelling (BIM) in their processes and not simply move construction off-site.

The MMC definition framework

20. To overcome the confusion around new and innovative techniques and increase understanding of what MMC involves, the Government asked the MHCLG Joint Industry

35 [Q68](#)

36 [Q111](#)

37 Stonewater [[MMC0031](#)]

Working Group on MMC, launched in January 2018 and led by Mark Farmer, CEO of Cast Consultancy to develop a definitional framework into which all modern construction techniques can be categorised.

21. The framework published in March 2019 includes a spectrum of seven broad categories, of which the first five relate to forms of pre-manufacturing, the sixth includes innovation in materials—such as systems where pieces slot together to make construction simpler, in comparison with traditional techniques. The seventh category encapsulates other forms of site-based improvements that can improve productivity, including Building Information Modelling (BIM), digital augmentation, robotics and drones.³⁸

Box 1: Overview of MMC definitional framework³⁹

- 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**

22. The framework covers a wide variety of construction techniques and should help to provide clarity about the range of construction methods that homebuilders may choose to use. Charlie Blagbrough from the Building Societies Association told us that using these typologies will help financial service providers such as mortgage lenders to embed and capture the data they need to better engage with MMC buildings.⁴⁰

23. The definitional framework for MMC developed by the MHCLG Joint Industry Working Group on MMC enables the categorisation of all forms of MMC and will help industry actors to understand the different types of construction that could be used in the residential sector. This framework is designed to help insurers, mortgage lenders and other industry actors to engage with MMC developments and provide them with the relevant financial products; so they should take this opportunity to make use of the framework and increase their involvement with the MMC sector.

24. It is equally important that MMC is explained clearly to consumers and the benefits and disadvantages are understood by the wider public.

38 Ministry of Housing, Communities and Local Government, [Modern Methods of Construction working group: developing a definition framework](#), March 2019

39 Ministry of Housing, Communities and Local Government, [Modern Methods of Construction working group: developing a definition framework](#), March 2019

40 [Q153](#)

4 Quality assurance and warranties

25. Demonstrating long-term performance is a common problem for innovative products which have no long-term data to draw on. A lack of confidence in the durability of MMC buildings from financial service providers, including valuers, insurers and mortgage lenders has been a key barrier to greater uptake. High profile problems with previous housing developments, have caused reputational damage to MMC homes. To combat these problems the Ministry of Housing Communities and Local Government established the Joint Industry Working Group on MMC to draw together representatives from across the industry to improve “stakeholder education and understanding of MMC with particular reference to enabling better access to mortgage finance, insurance and assurance.”⁴¹ The Working Group needs to develop solutions that will encourage these financial service providers into the market.

Primary concerns

26. The insurance industry has been particularly cautious to engage with MMC developments due to the lack of data on the long-term performance of homes built using innovative techniques. Without that data, it is difficult to assess the risk level of those homes. The Association of British Insurers said:

At present, compared to the wealth of historical data and evidence on which to assess the risk posed by a traditionally built property, there is a lack of data and evidence on the ability of MMC buildings to withstand the effects of named perils in real-world scenarios, therefore limiting the assessments which insurers can make on such properties.⁴²

27. Confidence in MMC for homebuilding has also been affected by a number of high-profile failings in previous MMC developments which have led to long-standing reputational problems. More than forty non-traditional house types were classified as defective under part XVI of the Housing Act 1985. For example, the Cornish Type 1 House incorporated pre-cast reinforced concrete panel walls on the ground floor and a second storey within a timber-framed mansard roof. The pre-cast concrete proved to be susceptible to carbonisation and loss of structural integrity and the homes were poorly insulated.⁴³ More recently, some of the “£60,000 homes” built in the 2000s and have reportedly begun to rot.⁴⁴ Insurance provider, Zurich Insurance plc described case studies from their customers who have experienced problems in their MMC homes:

Box 2: Zurich Insurance plc case study⁴⁵

2.13 Zurich previously assisted two customers who had experienced near identical issues at their respective housing developments which had been built using common MMC such as timber frames, wooden cladding and components manufactured off-site. Just a decade after construction the customers were alerted by staff and tenants

41 Ministry of Housing, Communities and Local Government, [Modern Methods of Construction working group: developing a definition framework](#), March 2019, p2

42 Association of British Insurers ([MMC0029](#))

43 Cockrams Surveyors, ‘[Cornish Unit Type 1](#)’, accessed 20 June 2019

44 ‘[Labour’s £60,000 homes ‘are rotting’](#)’, The Telegraph, 17 May 2014, accessed 13 June 2018

45 Zurich Insurance plc [[MMC0023](#)]

to a number of concerns including cracks appearing in walls, uneven floor surfaces and windows and doors not fitting properly in their frames. Given the nature of the construction such movement raises significant concern as to the remaining integrity of the fire stopping within the buildings, given that there is minimal inbuilt resilience to such defects within these structures.

2.14 Structural engineers conducted an intrusive survey of the developments which raised a number of concerns including: the existence of large voids in the internal structures which would allow fire to move quickly and undetected throughout the entire building; holes in the walls and around fire doors breaching vital firebreaks as a result of structural settlement and drying out; and large holes in firebreak walls and floors as a result of contractors installing piping and electrical services and not subsequently back filling them to the required standard and approved detail.

28. In their written evidence, the insurance industry and fire protection agencies raised concerns about the risk of fire in MMC homes due to the types of materials they incorporate. The Association of British Insurers said:

MMC products often incorporate lightweight combustible materials such as wood, polystyrene and recycled materials, which have the potential to increase the risk of fire spread, leading to major damage to property and significant insurance claims costs for reinstatement. Hidden cavities and voids caused by bad practice during the installation phase can also enable the spread of flame, smoke and toxic gases causing harm to any inhabitants within the building.⁴⁶

The Minister of State for Housing, Kit Malthouse MP, told us he is undertaking work on data accountability—on safety in particular—to ensure it is “auditable, inspectable and assessable”.⁴⁷

29. The Association of British Insurers also raised concerns about the repairability, maintenance and modification of MMC homes:

The insurance industry also considers there to be a lack of information regarding repairability, maintenance and modification of MMC buildings, specifically relating to the associated costs and practicalities of repair, and would therefore welcome clarification on this⁴⁸

30. In its written evidence the Association of British Insurers said it was concerned that if a small part of a modular home suffered damage, the whole module may need to be replaced. This makes repairs more difficult and costlier than for homes built traditional techniques.⁴⁹ Other witnesses raised questions about the adaptability of MMC homes; the Home Builders Federation said “for homes built out of Structured Insulated Panels (SIPs), homeowners will be unable to add an extension or additional windows once the property has been constructed.”⁵⁰ This may make it a less appealing option to consumers.

46 Association of British Insurers ([MMC0029](#))

47 [Q287](#)

48 Association of British Insurers ([MMC0029](#))

49 Association of British Insurers ([MMC0029](#))

50 Home Builders Federation ([MMC0011](#))

Accessing long-term data

31. The panel of representatives from financial service providers was asked whether they look to different building types such as schools or to other countries where MMC is more commonly used, in order to find data, but Mike Basquill of the Royal Institution of Chartered Surveyors explained the unique nature of the residential market, which, from their point of view, makes it difficult to read across from other types of building.⁵¹ James Dalton from the Association of British Insurers told us they were engaging with industry colleagues in Germany to understand their experience of MMC-related products. The advice they received was: “It gets better once you know how the product responds”.⁵² The Building Societies Association had also been on tours of the self and custom build town of Almere in Netherlands to better understand the product.⁵³ Charlie Blagbrough of the Building Societies Association was also positive about the potential for the categorisations developed by the MHCLG Joint Working Group on MMC to help marshal information and enable them to aggregate data on the long-term performance of different types of MMC.⁵⁴

32. The lack of long-term data on the durability of MMC homes in the UK is a considerable barrier to industry actors—the insurance industry in particular—engaging with MMC housing schemes. The Minister of State for Housing acknowledged this in his oral evidence to the Committee and said that he was working on data and accountability that is “auditable, inspectable and assessable”. *The Minister should engage industry to ensure this work results in a tangible output that helps industry actors access the relevant data.*

33. *The industry needs to demonstrate that MMC homes are safe and can be easily repaired and adapted if they are to be a viable product. The Government should encourage financial service industries, including insurers and mortgage providers to gather data from other types of buildings such as student accommodation, which incorporate MMC, or from other countries where use of MMC is more prevalent, if applicable.*

Tracking database

34. A number of written submissions said that it can be difficult to decipher which materials and processes have been used in the construction of MMC buildings and whether modifications have been made after completion which might affect how they will perform over their lifecycle. The Association of British Insurers said:

Another issue relating to design and installation, is the ability to identify the materials used within the property, particularly when various types of MMC are installed within one structure. During the installation phase other risks may appear, such as the extent to which combustible elements are exposed, leading to an increased risk of accidental ignition / arson or other hazards. In addition, it is important to consider insufficient knowledge of installers on the impact of deviations from the installation requirements may have on the building’s performance. These problems in the design and

51 [Q152](#)

52 [Q152](#)

53 Building Societies Association [[MMC0011](#)]

54 [Q153](#)

installation phases make it more difficult for insurers to accurately identify the risks associated with MMC buildings and have confidence in insuring the buildings once completed.⁵⁵

35. The materials and processes used in the construction of homes and later modifications will affect how they perform in a fire. The London Fire Brigade said the lack of information available to them about the construction of buildings can endanger firefighters and members of the public:

There has been an overall lack of cohesion across the industry, with fire services left out of the loop with regards to MMC and, as such, information and knowledge regarding these systems and materials are not always shared in a transparent and accessible manner or in a way that can be translated into the knowledge that firefighters need to conduct firefighting operations. This leaves fire services learning retrospectively, which has the potential not just to hamper firefighting operations, but also to endanger firefighters and members of the public.⁵⁶

36. Many written submissions suggested that information relating to the construction and maintenance of homes built using MMC should be recorded and shared with relevant stakeholders using digital technology.⁵⁷ In their 2016 report ‘Laying the foundations for MMC’ The Building Societies Association suggest a property log book for homes built using MMC could assist the customer with arranging a mortgage, home insurance and undertaking future maintenance of the property.⁵⁸ It would be passed along with the property in the same way as a log book is used for cars and would expand on the NHBC Foundation Home User Guide (HUG). It could record property type and construction method data. Zurich Insurance plc also suggested that building construction data should be collected and shared:

Building construction data must be clearly documented and maintained to ensure contractors (including those involved in minor day to day maintenance) have an awareness of the complexities and limitations of the building—including such aspects as fire protections, service routes and protections, and structural integrity⁵⁹

37. The Association of British Insurers, Zurich Insurance plc and insurance provider, LV= all suggest that a publicly accessible database would enable this information to be stored and shared to overcome the lack of information available to relevant stakeholders. The Royal Institution of Chartered Surveyors said digitisation could “transform” stakeholder confidence and the data collected could be used to inform future designs. They explained how digital technology and Building Information Modelling (BIM) could assist in deploying such a database:

Digitisation may be deployed both in the production process to achieve precision assembly, and also provided through BIM and successor models, a dynamic database which is capable of tracking the unit through design,

55 Association of British Insurers ([MMC0029](#))

56 London Fire Brigade ([MMC0016](#))

57 E.g. Royal Institution of Chartered Surveyors ([MMC0040](#)), Zurich Insurance plc [[MMC0023](#)]

58 Building Societies Association, [Laying the foundations for MMC](#), November 2016, p25

59 Zurich Insurance plc [[MMC0023](#)]

specification, procurement, construction/assembly, quality control and finishing, handover, letting/selling, residential occupation and management, depreciation and replacement and recycling and renewal.⁶⁰

38. The Association of British Insurers said it is in discussions with the Ministry of Housing Communities and Local Government about how such a database can be delivered but described progress as a “slow burn”.⁶¹ In their written evidence, they said:

The Association of British Insurers has met with the Ministry of Housing, Communities and Local Government to discuss whether this type of information could be available and the most appropriate vehicle for delivery. Initial discussions around the land registry being a suitable platform were explored and MHCLG were going to investigate the potential of using the ‘Building Control Information Hub’ or alternative platforms to deliver an electronic database⁶²

The Minister of State for Housing told us that in light of the Independent Review of Building Regulations and Fire Safety, led by Dame Judith Hackitt, the building developers should hold a database where they can prove they have made a safe building, but said they are a long way from launching a central database which fire crews could access:

In the end, the way the system should work, or the way the system will work in the future, coming out of Hackitt—and we keep talking about this golden thread—is that, fundamentally, there is an auditable database held by the producer of the building where they can prove that they have created a safe building that might provide that kind of information. As for whether there should be a central database into which a fire crew on its way to a fire can dial to say, “We are heading for this building; please throw up the blueprints and all the rest of it, so we know what we are dealing with”, we are a step away from that. But you could imagine that, if there are standardised products produced, when they are on their way to a certain address, a fire crew can tap into the iPad, “We are going to 7 Acacia Avenue and it is a Berkeley Homes Balmoral MK III; these are the issues that we have had with this in the past” or, “This is the layout and this is what we need to know”. That would be a great place to get to, but we are not going to get there straight away. What we do want to get to is a situation where everybody who is putting up a building has that data somewhere that is auditable and inspectable.⁶³

However, Fergus Harradence Deputy Director for Construction at the Department for Business, Energy and Industrial Strategy indicated the Government had already been undertaking work on this type of innovation. He said they had been looking at how digital information about the built environment should be collected, stored and made available. The Innovation in Buildings group has published a “smart construction dashboard”⁶⁴

60 Royal Institution of Chartered Surveyors ([MMC0040](#))

61 [Q175](#)

62 Association of British Insurers ([MMC0029](#))

63 [Q294](#) [Kit Malthouse MP]

64 Construction Leadership Council, ‘[Smart Construction Dashboard and Metrics Report](#)’, October 2018, accessed 24 June 2019

which will track performance indicators such as energy efficiency of MMC homes.⁶⁵ Furthermore, the Department are funding the Digital Framework Taskforce through the Transforming Construction Programme, to provide a forum to discuss the trade-off between sharing data and ensuring sensitive information cannot be used to cause harm.⁶⁶

39. Digital technology makes it possible to collect, store and share data about the construction, maintenance and materials used in MMC buildings. This can be beneficial to customers wanting to make changes to their homes, insurers who need to better understand the products they are underwriting and fire services who must tackle fires in all types of building.

40. The Government should develop a digital database that records the design, processes and materials used in the construction of buildings. For larger developments, such as blocks of flats, the database should also track modifications and repairs made after completion. This would help to track and aggregate data about homes built using different types of MMC in order to build up a model and inform stakeholders of the likely performance of homes built using the same method in future.

Warranty providers and an “MMC Scheme”

41. Despite problems in the past, most of the written submissions to this inquiry agreed that homes built using the precision manufacturing techniques of MMC have the potential to be better quality than traditionally-built homes. However, builders of MMC homes need to be able to demonstrate to financial service providers their homes are good quality and durable in the long-term, so that customers can obtain valuations, mortgages and insurance on them.

42. At present, many developers obtain a Build Offsite Property Assurance Scheme (BOPAS) accreditation to demonstrate the quality and durability of their MMC homes. The BOPAS accreditation is a “risk based evaluation”⁶⁷ that demonstrates homes will last at least 60 years but it does not have the financial backing of a warranty scheme that would pick up the cost if failings occur. Therefore, homebuilders must also obtain a warranty for their MMC homes, as they would for any other residential property.

43. Currently, there are several warranty providers, each of which use different criteria for their assessments of homes making it difficult for financial service providers and customers to know what these homes have been tested for. It is particularly challenging when homes are built using innovative techniques and materials which may perform differently to the traditional methods the warranty providers are used to. The Joint Industry Working Group on MMC is developing a standardised set of criteria against which to assess homes to ensure they all reach the same standard. Mark Farmer called this an “MMC Scheme”,⁶⁸ the National House Building Council called it a “Warranty Assessment Protocol (WAP)”.⁶⁹ The objective of the scheme is to give certainty to customers, insurers and mortgage lenders that homes built using MMC are good quality and will last into the future in the same way as a traditionally constructed home would. This should help provide assurances

65 [Q289](#)

66 [Q296](#)

67 Build Offsite Property Assurance Scheme, [‘Welcome to the Build Offsite Property Assurance Scheme’](#), accessed 13 June 2019

68 [Q24](#)

69 NHBC [[MMC0032](#)]

to financial service providers and help them provide valuations, mortgages and insurance on MMC homes. However, Isobel Stephen, Director of Housing Supply at the Ministry of Housing, Communities and Local Government told us there is currently no deadline for the launch of the scheme.⁷⁰

44. It is very difficult to assess the long-term durability of homes built using new and innovative techniques, which has led to difficulties obtaining financial products such as insurance and mortgages on MMC homes. We welcome the work the Government has undertaken to set up the MMC Working Group led by Mark Farmer to bring together industry actors and overcome barriers that prevent financial service providers from engaging with MMC developments. We also welcome the proposal for an “MMC Scheme” that will set out a single set of standards for warranty providers against which to make decisions and provide quality assurance to industry actors. *We believe the MMC Scheme should be launched by the end of this year to help increase the take-up of MMC for homebuilding.*

5 Workforce and training

45. The construction industry workforce faces numerous problems which were set out in the 2016 report commissioned by the Construction Leadership Council. The Farmer Review of the UK Construction Labour Model, entitled ‘Modernise or Die’, identifies ten critical symptoms of failure and poor performance across the industry:

- Low Productivity
- Low Predictability
- Structural Fragmentation
- Leadership Fragmentation
- Low Margins, Adversarial Pricing Models and Financial Fragility
- A Dysfunctional Training Funding and Delivery Model
- Workforce Size and Demographics
- Lack of Collaboration and Improvement Culture
- Lack of R&D & Investment in Innovation
- Poor Industry Image⁷¹

46. The report is clear the industry will not be able to deliver the infrastructure or homes this country needs unless it quickly modernises and takes advantage of new digital technology and off-site methods of construction and attracts new workers into the sector.

Workforce shortages

47. The country faces a lack of workers with skills such as bricklaying and carpentry, necessary to build homes using traditional techniques. The industry has an ageing workforce and only 12% of workers are women.⁷² It is failing to attract young people in the numbers needed to increase housing output, due in part to a long-standing reputation for poor safety standards and old-fashioned ways of working.⁷³

48. Based on the average age of the current workforce and numbers of new entrants, the Farmer Review predicts the construction workforce could shrink by 20–25% over the next decade.⁷⁴ The need to attract new workers into the sector is even more pressing due to the uncertainty around the future jobs market following the UK’s decision to withdraw from the European Union. According to the Design Council, 8% of construction workers in the UK are from other EU countries and in London the figure is 28%.⁷⁵ Developers said the lack of skilled workers was one of the main reasons for them to try out more off-site techniques. Steven Boyes from Barratt Developments said:

71 Cast Consultancy, [Farmer Review of the UK Construction Labour Model: Modernise or Die](#), October 2016, p7

72 Royal Institute of British Architects ([MMC 0030](#))

73 Cast Consultancy, [Farmer Review of the UK Construction Labour Model: Modernise or Die](#), October 2016, p40

74 Cast Consultancy, [Farmer Review of the UK Construction Labour Model: Modernise or Die](#), October 2016, p8

75 Design Council [[MMC0044](#)]

We recognise that we need to increase volumes in the industry. We will not be able to do it using traditional skills, so the only way we will be able to achieve that is by using more MMC.⁷⁶

This view was repeated in many written evidence submissions which listed a number of benefits MMC would deliver to the workforce, such as:

- more digital working which will appeal to young workers looking for a modern career, using cutting edge technology;⁷⁷
- factory based jobs in an indoor environment are safer, with less working at height and workers are sheltered from the weather;⁷⁸
- factory based workers are not required to relocate around the county to different building sites;⁷⁹
- off-site methods of construction usually require fewer workers with traditional skills⁸⁰ and potentially fewer workers overall in comparison to traditional techniques.⁸¹
- factories can be strategically placed in areas of the country with higher rates of unemployment to provide local employment opportunities.⁸²

49. While there is potential for factories in areas of high unemployment, this must be balanced with obligations to use local labour, which could be imposed by local authorities under section 106 of the Town & Country Planning Act 1990. Alun Macey from Pocket Living told us:

The biggest challenge we have is probably the section 106 condition about using local labour. If you take a 50% portion of the construction and you put it in a location that is far away from the build location, it is obviously going to be a challenge. That is hard to overcome.

The 2017 Housing White Paper said the Government is “taking steps to address skills shortages by growing the construction workforce”.⁸³ Some of these measures will be described later in this chapter.

50. Housing developers identified the lack of skilled workers as one of the main constraints to building more homes using traditional techniques. The workforce will have to increase rapidly if it is to deliver 300,000 homes per year. Adopting more MMC could help to reduce the total number of workers required but will not be a panacea for the workforce shortages. If EU workers choose to leave, or the UK fails to attract as many EU workers in future, current shortages will be exacerbated unless new people are trained in both modern and traditional techniques and brought into the workforce.

76 [Q68](#)

77 E.g. NHBC [[MMC0032](#)], London Assembly Planning Committee ([MMC0022](#))

78 E.g., Buildoffsite ([MMC0034](#)), Housing Forum [[MMC0045](#)]

79 E.g. Homes for the North [[MMC008](#)]

80 Home Builders Federation ([MMC0011](#))

81 Savills ([MMC0024](#))

82 E.g. Royal Institution of Chartered Surveyors ([MMC0040](#))

83 Department for Communities and Local Government, [Fixing our broken housing market](#), February 2017, p18

51. **Adopting more MMC will take some of the work off-site and provide opportunities for more digital working which could help to attract young people into the sector and increase capacity. However, witnesses were clear that traditional techniques will continue to be used alongside MMC to build homes and therefore we also need more workers with traditional skills. Other workforce benefits such as providing new employment opportunities in parts of the country with higher levels of unemployment, could be achieved through strategic positioning of new MMC factories, however, this will have to be balanced with planning obligations to use local labour.**

Apprenticeships and training

52. Apprenticeships have traditionally played a key role in delivering skills for the construction industry. In its strategic plan 2018/19 - 2022/23, Homes England called upon industry actors to become ‘partners’ and offer more skills training for construction workers.⁸⁴ The Minister of State for Housing told us the Government’s target is for 25,000 apprentices per year across the construction industry but he also conceded that will not be enough.⁸⁵ We need a mixed approach to delivering homes so apprentices should learn traditional building techniques such as bricklaying and carpentry as well as receiving training in modern methods and digital technology, if we are going to modernise the construction industry.

53. The Construction Industry Training Board (CITB) is tasked with delivering skills for the industry and construction companies, including housing developers, pay a levy to the Board to cover its costs. However, Jennie Daly from Taylor Wimpey said: “At times, housebuilders have felt that the CITB has not been particularly focused on the specific skills that housebuilding, as opposed to general construction, requires.”⁸⁶ Instead, Taylor Wimpey run their own apprenticeship schemes but said the Government and other training bodies can assist. She added: “The HBF [Home Builders Federation] has a homes-skills training body, which has helped in raising the profile of the rich career that housebuilding can offer.”⁸⁷ Barratt Developments told us they are training apprentices in new skills such as erection crews for installing MMC homes. The Design Council said the CITB has a further challenge to reskill the current workforce.⁸⁸

54. The Government has worked with employers and businesses to design a new set of qualifications called T Levels which will be equivalent to three A Levels and provide students with a technical education which prepares them for work in a particular industry. T Levels will take two years to complete and will include a placement with an employer. The T Level in design surveying and planning, is designed for jobs in the construction industry and is due to be launched with the first tranche in September 2020.⁸⁹

55. **The Introduction of T Levels which are equivalent to A Levels will help to overcome some of the reputational problems the industry faces, raise the profile of the jobs available and hopefully encourage more young people into the sector.**

84 Homes England, [Strategic plan 2018/19 - 2022/23](#), October 2018, p8

85 [Q265](#)

86 [Q99](#)

87 [Q100](#)

88 Design Council [[MMC0044](#)]

89 Department of Education, Guidance: [‘Introduction of T Levels’](#), 19 May 2019

56. *The Government must ensure skills programmes, apprenticeship schemes and the new T Level give learners the skills they need for both traditional techniques and MMC and encourages more young people into the sector. Homes England must ensure their partners are delivering necessary skills for a modern workforce and the Construction Industry Training Board must ensure it is delivering the skills necessary for homebuilding. It should also support the reskilling of the current workforce so they can contribute to a modern construction industry.*

Research and development

57. Significant research and development (R&D) is necessary to develop the techniques that will drive modernisation in the construction sector. The Construction Leadership Council's Innovation in Buildings workstream identified sixteen physical and virtual organisations to form a network of 'Centres of Excellence' to share knowledge and best practice and support smart construction in the supply of housing.⁹⁰ The network includes the Advanced Manufacturing Research Centre (AMRC) in Sheffield which is developing automated techniques for off-site construction to improve productivity and quality in the sector.⁹¹ The AMRC received funding from Innovate UK, through the High Value Manufacturing Catapult which brings together business and academia to develop advanced manufacturing solutions to commercial problems.⁹² These networks should be utilised to coordinate the testing and standardisation of MMC processes and components to develop products that comply with the building regulations. Academic institutions in these networks should also deliver the advanced skills necessary for MMC. The AMRC has a training centre that provides learners with the practical and academic skills for a career in engineering and manufacturing. Homes England should work with the AMRC and other training centres to develop skills programmes that deliver the specific skills required for off-site modular construction.

58. Fergus Harradence, Deputy Director for Construction at the Department for Business Energy and Industrial Strategy told us that the Transforming Construction Programme is investing in projects that work with higher education institutions:

through the R&D budget that we have over the four years of the programme, we are supporting innovative projects that are led by large and small companies in collaboration with higher education institutions, technology and innovation centres and other organisations. Again, this is all about the development, the commercialisation and the demonstration of these technologies.⁹³

59. *We welcome the steps the Government has taken to support innovations in advanced manufacturing for the construction of homes. The networks of catapults and centres of excellence which bring businesses and academia together to develop advanced manufacturing solutions, should be coordinated with the central Transforming Construction Programme and the Construction Innovation Hub to ensure each has a*

90 Construction Leadership Council, '[Centres of Excellence' in the UK](#), accessed 14 June 2019

91 Advanced Manufacturing Research Centre/ The University of Sheffield, '[Building a new future with offsite construction](#)', 4 July 2018, accessed 19 June 2019

92 High Value Manufacturing Catapult, '[Catalyst for the future growth and success of manufacturing in the UK](#)', accessed 17 June 2019

93 [Q259](#)

specific area of focus. The Government should utilise these networks to coordinate the testing and standardisation of MMC processes and components to develop innovative products that comply with the building regulations.

60. The MHCLG MMC Joint Industry Working Group should extend its remit to look at advanced skills provision. It should work with Homes England, the AMRC, and other training centres to develop skills programmes that provide learners with the specific skills required for the off-site manufacture of MMC homes.

6 Supply chain

61. Many witnesses cited the lack of established supply chain as one of the largest barriers to greater uptake of MMC.⁹⁴ More joined-up working and investment is needed to establish resilient supply chains, but for this to happen, manufacturers need greater certainty in the demand for their products and developers need to be sure they can overcome shortfalls in delivery, should they encounter problems with a particular supplier.

Aggregating demand

62. Some witnesses said the Government should help to aggregate demand for MMC homes to shore-up supply chains for the components incorporated in those developments and reduce the risk of not being able to source certain components.⁹⁵ Homes England set out in their Strategic Plan 2018/19- 22/23 its priority to create new “strategic partnerships” with housing associations and work towards the delivery of at least 130,000 affordable housing starts by March 2022. Homes England are helping to increase demand for MMC products by requiring housing associations and homebuilders they support, to incorporate some form of MMC in developments of over 50 units. They also told the Committee they award additional points to companies bidding for their contracts if they go beyond the minimum.⁹⁶ Mark Farmer identified the Help to Buy Scheme as a publicly funded scheme that does not include any form of conditionality linked to modernisation of building methods.⁹⁷ Others have indicated that homes that benefit from public money could have conditionality attached in order to increase certainty in the MMC supply chain.⁹⁸ The Minister of State for Housing indicated he is willing to have a look at whether Help to Buy could be used in this way.⁹⁹

63. It is clear that for both suppliers and developers there is a lack of robust supply chains and this is a major barrier to greater uptake of MMC. The Government has the potential to shore-up supply chains through wider use of mandating for MMC in developments which benefit from public money. Though this should be used with caution so as not to deter developers from building at all if they are unable to use traditional methods.

64. The Government should consider setting requirements for homebuilding developments that benefit from public funds—such as those sold through Help to Buy Schemes—to incorporate the use of MMC techniques, to aggregate demand for MMC products and bolster domestic supply chains.

Designs for MMC homes

65. Uncertainty about the resilience of the supply chain is one of the barriers that prevents greater uptake of MMC. The estate agent, Savills explained that the Greater London Authority has commissioned work to look at a standardised design code for MMC homes

94 E.g. Sir Robert McAlpine [MMC0042], Royal Institution of Chartered Surveyors (MMC0040), NHBC [MMC0032]

95 E.g. Construction Leadership Council [MMC0014], National Housing Federation [MMC007]

96 Q199

97 Q8

98 Keepmoat Homes [MMC0041]

99 Q316

to increase compatibility and repeatability of components.¹⁰⁰ This would help to aggregate demand for those components that meet the codes and provide manufacturers with greater certainty of ongoing demand for them. It also helps to prevent the need to create bespoke products for each new housing development. While it is not desirable to have large numbers of identical homes, housing providers such as Swan Housing Association are demonstrating that it is possible to have a basic model for modular homes which can be replicated to achieve economies of scale but with the potential for customisation, so that the aesthetics and lay-out of homes are varied to suit the customers' choice.¹⁰¹ As well as choosing internal finishes, fixtures and fittings, homebuyers can alter the external appearance of their homes and in some cases have the choice between a fourth bedroom or a roof terrace. Swan have also built their own factory to construct homes, which helps them to avoid disruption in the supply chain. This is something more developers are looking to do, in order to vertically integrate production and reduce their dependence on external suppliers.

66. Homes built using modular methods of construction are transported from the factory to the site by lorry. We found some homebuilders limit their homes to a width of 5 metres to comply with normal road restrictions. Although it is possible to bolt additional modules together, some units which are designed as four-bed family homes do not incorporate the living space or storage facilities that many families would require. The Committee raised this problem with the Minister for Housing who said modules transported as wide loads through multiple policing wards would need multiple movement orders but he would look into what can be done.¹⁰² During the evidence session it appeared the Government doesn't have a plan in place to overcome this kind of difficulty. Members of the Committee raised concerns that this undermined the cross-government working at the heart of the Industrial Strategy Construction Sector Deal.

67. The Building Better, Building Beautiful Commission was launched by Secretary of State, The Rt Hon James Brokenshire MP to advise the government on how to promote high-quality design for new homes.¹⁰³ It should investigate designs for MMC homes that can overcome these size restrictions while delivering high quality homes. Mark Farmer told us that over the next decade he sees an opportunity for "flying factories" located close to the building site:

You will see more and more manufactured content being delivered either at the site or near the site, in what I would term flying factories, where smaller-scale digital manufacturing enables parts of buildings to be put together with a local workforce using manufacturing techniques. We are not there yet but it is coming.¹⁰⁴

100 Savills ([MMC0024](#))

101 Beechwood, '[Discover a new kind of home](#)', accessed 14 June 2019

102 [Q281](#)

103 Ministry of Housing Communities and Local Government, '[Building Better, Building Beautiful Commission](#)', accessed 14 June 2019

104 [Q13](#)

Identifying best practice in MMC

68. The Government has acknowledged that greater use of MMC could help to increase the supply of housing and is using programmes such as the Affordable Homes Programme and Accelerated Construction programme to promote take-up.¹⁰⁵ At the Gateshead Innovation Village, Homes England is partnering with Home Group Housing Association on a live research project to build a village of 35 new modular homes using five different house types and six traditionally constructed homes. The aim is to build a new community that will provide feedback on their experiences and feed into the tracking of the performance of the homes over time. The Innovation Village is a good example of how the Government and its partners can build up data on the performance of homes built using MMC techniques and potentially identify certain methods which should be prioritised and supported. By supporting particular forms of MMC, the Government could help supply chains to mature and give confidence to developers that they will be able to source the materials and components for MMC homes.

69. Through Innovate UK, the Government is providing £6.5 million funding for research and development in panellised systems (category 2 of the definitional framework). In March 2019 it launched the three-year Advanced Industrialised Methods for the Construction of Homes (AIMCH) project, which works collaboratively with industry actors and aims to use advanced manufacturing techniques to overcome the problems the industry faces:

It is expected that AIMCH will result in new digital design tools, manufacturing advancements, improved near-to-market offsite systems and lean site processes. The ultimate goal of the project is to support the sector by delivering the 120,000 target for the same or less cost than traditional craft methods, which are built 30% more quickly plus have a 50% reduction in defects. The project has potential to impact on 35,000 homes being delivered by AIMCH partners across the UK, each year.¹⁰⁶

70. Homebuilders must deliver a product which is well designed and desirable to homebuyers; homes need to be adaptable and provide ample living space and storage if they are to meet the needs of buyers. When designing homes, methods of construction and transportation need to be considered at an early stage. If the factory manufacturing components for a build is situated a long distance from the site where homes will be installed, developers might need to consider types of construction, such as panellised units which can be transported within the container of standard sized lorries, rather than modular construction.

71. There is a plethora of MMC techniques being developed and utilised by different homebuilders. This means designs and components are developed to suit a particular method but may not be compatible with another type of MMC. The result is that new designs are required for different developments and components being manufactured for one development cannot be used for another. This prevents homebuilders from taking advantage of economies of scale to drive down costs or the speed advantages of being able to recycle designs.

105 Ministry of Housing, Communities and Local Government ([MMC0028](#))

106 Advanced Industrialised Methods for the Construction of Homes, Press release '[Innovation consortium set to modernise how we build homes](#)' 29 May 2019, accessed 24 June 2019

72. Some types of MMC will be appropriate for certain sites but not others, for example, if there are limitations on site access it might not be possible to install externally produced, modular homes. Therefore, it is not desirable to concentrate too narrowly on certain types of MMC. Likewise, it is important there remains room for innovation in the industry, but it would be helpful to identify, develop and promote a smaller number of techniques to enable the industry to take advantage of economies of scale.

73. We welcome the work Homes England is undertaking to identify the most effective types of MMC through programmes such as the Innovation Village in Gateshead. We also welcome the funding the Government is putting into innovation in panellised systems through Innovate UK to improve advanced manufacturing techniques and believe this will contribute to the establishment of a modern construction industry underpinned by robust supply chains.

74. The Joint Industry Working Group on MMC should undertake further work to identify types of MMC that work best and can be used at scale to deliver the good quality homes this country needs with an emphasis on the functional design for the people who will live in them. This will enable the industry to benefit from economies of scale and bolster the supply chains for those types of product.

75. The Government should use initiatives such as the AIMCH project to harness the skills and knowledge of industry actors to learn what their priorities are and develop best practice in construction in order to build the homes the country needs. The Building Better, Building Beautiful Commission should investigate designs for MMC homes that can overcome road capacity size restrictions, while delivering high quality homes.

Industrial Strategy Construction Sector Deal

76. The Industrial Strategy Construction Sector Deal highlights the opportunities of a modern construction sector for British industry and the potential for the sector to increase export opportunities. However, when we visited live building sites where MMC homes are being installed, homebuilders told us that many developers are importing, most of their machinery, components and materials for building MMC homes from other countries. Businesses in the supply chain for MMC homes face many of the same barriers as homebuilders, including uncertainty about future demand and accessing up-front capital to set-up factories and production lines. The Construction Leadership Council suggested some of the £4.5 billion Home Building Fund could be used to provide low cost loans to businesses in the MMC supply chain.

77. The Government is taking steps to support off-site manufacturing for homebuilding; for example, the Industrial Construction Sector Deal includes £170 million for the Transforming Construction: Manufacturing Better Buildings programme, a proportion of which will be used to support housing.¹⁰⁷ In May 2019 the Government brokered a deal with Sekisui House, Japan's largest homebuilder, to boost MMC in UK homebuilding. Sekisui House invested £22 million and the Home Building Fund contributed £30 million of equity and debt funding into regeneration company, Urban Splash to increase

107 Department for Business, Energy and Industrial Strategy, [Industrial Strategy Construction Sector Deal](#), July 2018, p13

output.¹⁰⁸ If the Government kept a record of how many components for MMC homes are being imported, it could set targets for reducing the industry's reliance on imports and help to measure whether initiatives to bolster the supply chain are increasing capacity domestically.

78. The Government is taking welcome steps to support off-site manufacturing for homebuilding but if the benefits of the Industrial Strategy Construction Sector Deal are to be realised, more of the machinery and components for MMC homes should be manufactured in this country. The Government should record how many components for MMC homes are imported and set targets to reduce their use in proportion to the UK manufactured supply chain. It should enable manufacturers in the supply chain for MMC homes to access low-cost loans through the Home Building Fund so they can invest in factories, increase capacity and help homebuilders to reduce their reliance on imported components. The Government should use its record of imported components to assess the effectiveness of these measures at boosting domestic supply.

108 ["Boost for housing market as Japan's biggest housebuilder Sekisui House moves into the UK"](#), Ministry of Housing, Communities and Local Government press release, 14 May 2019

7 Local authorities

79. Local authorities play an important role in the housing sector as land owners, administrators of the planning system and as providers of social housing. It is important they are engaged with advancements in MMC and are ready to accommodate it when necessary.

Social housing

80. Provision of social housing has been falling; between World War II and 1980 an average of 126,000 new social homes were built every year but in 2018 only 6,463 new social homes were delivered.¹⁰⁹ Shelter's Commission on social housing report published in January 2019, entitled 'Building for our future: A vision for social housing' recommends "a historic renewal of social housing with a 20-year programme to deliver 3.1 million more social homes."¹¹⁰ This would require an average of 150,000 new social homes to be built each year. To meet those targets local authorities will have to increase the rate at which they are adding homes to the social housing stock rapidly. In response to Shelter's report, Cllr Martin Tett, Housing spokesman for the Local Government Association, said

The last time we built enough homes councils built 40 per cent of them. We need to get back to those levels if we're to tackle our housing crisis, building a new generation of at least 100,000 high quality social homes a year.

New social housing will have to add a significant proportion of the total homes built annually for the Government to get close to its target of delivering 300,000 homes each year by the mid-2020s.

81. Witnesses told the Committee that MMC is particularly well suited to sectors that require high volume, repetitive designs that can be built off-site and transported to the building site to be erected.¹¹¹ This makes social and affordable housing good candidates for the off-site approach, where there can also be advantages in the speed of delivery. Ordering similar housing units in bulk helps to provide surety in the supply chain for the components used and lowers the cost per unit. Many housing associations are keen for more collaboration between local authorities and housing associations to come together and drive demand for certain MMC products and achieve economies of scale.¹¹²

82. Several witnesses said that MMC homes are usually more energy efficient than homes built using traditional methods.¹¹³ This helps to reduce heating bills means the whole-life running costs of such buildings could be lower than other homes. For this reason, The Royal Institute of British Architects said that if the whole-life value of residential units were taken into account at the procurement stage, it would increase the demand for MMC homes.¹¹⁴

109 Shelter's commission on the future of social housing, [Building for our future: A vision for social housing](#), January 2019, p14

110 Shelter's commission on the future of social housing, [Building for our future: A vision for social housing](#), January 2019, p178

111 Keepmoat Homes [[MMC0041](#)]

112 National Housing Federation [[MMC007](#)]

113 E.g Association of British Insurers ([MMC0029](#)), Centre for London ([MMC006](#))

114 Royal Institute of British Architects ([MMC0030](#))

83. In the 2018 Budget, the Government announced plans to abolish the Housing Revenue Account borrowing cap that controls the amount local authorities can borrow for housing.¹¹⁵ The Government forecasts this will enable councils in England to build an additional 10,000 homes per year.¹¹⁶ Local authorities could take this opportunity to borrow money to invest in MMC social homes which could help to speed-up the delivery of homes and benefit the manufacturers in the supply chain.

84. If we are to deliver 300,000 homes annually and meet demand for social housing, local authorities need to start building homes in far greater numbers than they have done in recent years. MMC are particularly well suited to this type of tenure because the large volumes of standardised accommodation help to bring down unit costs. Some forms of MMC have also proven to be more energy efficient than traditional construction techniques which helps to reduce fuel bills and running costs for tenants. Housing associations have been among the early adopters of MMC for building homes. Swan Housing Association and Accord Homes have both chosen to integrate the supply chain and build their own factories in which to construct homes off-site.

85. While social housing has a role to play in supporting greater take-up of MMC, it is important that lower cost designs are fully tested to ensure that MMC is delivering sustainable, durable, high quality social homes, so that MMC does not become associated with negative examples. Its use in this context should not be seen as a testing ground for its wider use and steps should be taken to promote MMC in all tenures, as we outline through this Report. *Local authorities should increase rapidly the pace at which they build new social homes. They should further engage with housing associations which have already adopted MMC, in order to better understand best practice and explore the potential for more MMC use in the supply of social housing. Local authorities should also factor in whole-life running costs of social homes when tendering for building contracts.*

The planning system

86. This inquiry also looked into whether the planning system presents a significant hurdle for MMC homebuilders. Although some of the written evidence suggested the localised planning system could cause difficulties, most witnesses did not think there needs to be special considerations for MMC homes. The Housing White Paper included a commitment to look in more detail at how the planning system works for developments that use MMC.¹¹⁷ The Ministry of Housing, Communities and Local Government said it has looked into issues in the planning system and no further action is required:

Earlier this year, MHCLG hosted a MMC planning roundtable with local authorities, developers, manufacturers and others to better understand the issues to establish whether specific intervention, including best practice planning guidance was needed. We found that, while there were some issues that could be addressed in the planning system, all stakeholders agreed these were not specific to MMC. We are not taking forward further action at this time.¹¹⁸

115 HM Treasury, [Budget 2018](#), October 2018, p62

116 HM Treasury, [Budget 2018](#), October 2018, p62

117 Department for Communities and Local Government, [Fixing our broken housing market](#), February 2017, p54

118 Ministry of Housing, Communities and Local Government ([MMC0028](#))

Many witnesses agreed; Lord Porter of Spalding CBE said: “Planning should be blind to the type of construction method here.”¹¹⁹ And Mark Farmer said MMC should not need special treatment.¹²⁰ Local planning authorities are beginning to include the use of MMC in their local plans which can help to stimulate demand for MMC products but such decisions should continue to be taken locally. The Local Government Association said:

consideration of MMC developments within local plans is becoming more common. It is crucial, however, that the development of MMC works within the locally-led planning system, rather than be the subject of national targets which ignore override community involvement.¹²¹

87. The localised planning system causes challenges for all homebuilders but does not present an insurmountable barrier to homebuilders using MMC techniques, so no major changes are required for MMC specifically. Local plans should be neutral to the type of construction method used in new housing developments as long as the homes meet local design standards and need.

119 [Q111](#)

120 [Q13](#)

121 Local Government Association ([MMC003](#))

8 Access to land

88. The lack of access to land is regularly cited as one of the main barriers to homebuilders—small and medium sized (SME) homebuilders in particular—increasing their delivery of new MMC homes. Homebuilder, WElink Homes UK said: “land owners are nervous of hosting new building methods so securing land can be very expensive”.¹²² The Centre for London suggest local authorities could help by identifying small sites for SME builders.¹²³ The Government has announced several initiatives to help homebuilders access land, including the Accelerated Construction Programme, Small Sites Fund and Land Assembly Fund; the progress of those initiatives is discussed in this chapter.

89. In the 2017 Housing White Paper, the Government set out proposals for a new Accelerated Construction Programme, administered through the Homes and Communities Agency (now Homes England), to address the shortage of land for MMC builders by allowing easier access to surplus local authority land.¹²⁴ In its written evidence the Ministry of Housing, Communities and Local Government explained:

The Accelerated Construction Programme will help ensure surplus central [government] and local authority land is built out more quickly, and sets conditions on focusing support for SME builders and off-site construction techniques.¹²⁵

90. The Accelerated Construction Programme has been asking for expressions of interest from local authorities since January 2017, however, Homes England has been slow to deliver any homes through the Programme. Our predecessor Committee’s Report: ‘Capacity in the homebuilding industry’ said the Accelerated Construction Programme should not be another stalled initiative and recommended the Homes and Communities Agency (now Homes England) provide regular updates on its progress to this Committee. The Government did not agree with this recommendation and said updates are published online but it would respond to specific requests from the Committee.¹²⁶ Now our predecessor Committee’s concerns have been realised and to-date, zero homes have been delivered through the Programme. Work has recently begun on the first pilot sites and over the next 12 months work will start on 1,544 MMC homes across seven sites¹²⁷ but this is more than two years after the initial call for expressions of interest.

91. The Accelerated Construction Programme also includes a £450 million grant programme for local authorities. Stephen Kinsella of Homes England explained how it works:

We issue grants to local authorities directly to unlock sites in their ownership. We are expecting to sign up to 200 grant agreements by March next year to unlock sites. These are typically brownfield sites, which require some help, so that means enabling works, demolition and remediation, to get them moving. As a consequence, when a local authority draws down the grant,

122 WElink (MMC005)

123 Centre for London (MMC006)

124 Department for Communities and Local Government, [Fixing our broken housing market](#), February 2017, p48

125 Ministry of Housing, Communities and Local Government (MMC0028)

126 Department for Communities and Local Government, [Government Response to the Communities and Local Government Select Committee Report: Capacity in the Homebuilding Industry](#), October 2017, p6

127 Correspondence with Homes England, relating to the [Accelerated Construction Programme](#), dated 12 April 2019

they commit to delivering the site using MMC. This is a great opportunity for us to stimulate demand on local authority land using funding from Homes England.¹²⁸

92. Helping homebuilders to access land for development is key if we are to increase rates of homebuilding. Homes England should have utilised The Accelerated Construction Programme to boost MMC homebuilding, but it has become another stalled initiative. Construction is still at pilot stage and zero homes have been delivered so the expected benefits of the Programme are yet to be achieved. Homes England must speed up progress on its Accelerated Construction Programme. Current developments must keep to their deadlines and Homes England should prevent delays on future sites. We reiterate the recommendation made by our predecessor Committee that Homes England should provide the Committee with regular updates on progress across the full range of initiatives to bring additional land into use.

93. Homes England also stipulate the use of MMC in developments in the Single Land Programme. Stephen Kinsella told us:

The Single Land Programme is the agency's owned land assets. We own land for circa 60,000 homes. It is land we have acquired in recent years from the private sector or from other Government Departments, or it is land that we have had from our legacy land holdings [...] on every single site we require a form of MMC. That is going quite well. Now we have 40 sites with an obligation to build a form of MMC in contract. Another 73 sites will get into contract in this next 12 months and, overall, that will deliver in the region of 15,000 homes, with an obligation to build according to one form of MMC or another.¹²⁹

Mandating for MMC use on land made available on these Government backed schemes will help to increase demand for MMC products but Jennie Daly from Taylor Wimpey warned against stipulating the introduction of a proportion of MMC use on land made available because it could be a burden to smaller builders:

Homes England is looking at introducing a proportion of MMC use as a sort of entry gateway to accessing its land. That may cause more constraint for a small builder that needs access to land in order to grow and expand, by introducing an additional burden rather than a boon. It is a balance as to how that incentive is used. It needs to be an incentive, rather than potentially yet another burden or an impact on their viability.¹³⁰

94. Several witnesses said that small and medium sized builders experience the most difficulties accessing land and as a consequence will need extra support if we are to increase diversity in the market. In its Strategic Plan 2018/19 - 2022/23 Homes England committed to supporting smaller builders to access land through the Small Sites Fund launched in September 2018:

128 [Q218](#)

129 [Q218](#)

130 [Q104](#)

Often, small sites require upfront financial support to unlock them for development. We will support this through the Small Sites Fund Where we own sites which are too large to be developed by smaller builders, we'll look for opportunities to create smaller parcels which better suit their capacity.¹³¹

When he launched the Small Sites Fund in September 2018, The Secretary of State for Housing, Communities and Local Government said “the £630 million Small Sites Fund will provide grant funding to speed up getting the right infrastructure in place to support home building on stalled small sites”.¹³² He also announced £1.3 billion for a new Land Assembly Fund to acquire land which requires work to get it ready for development, and undertake the necessary preliminary work to make it less risky for homebuilders to invest in.¹³³

95. We welcome the introduction of the Single Land Programme and hope it will increase uptake of MMC. We also welcome the Small Sites and Land Assembly Funds to help SME builders access land and therefore diversify the market, but these have not been designed to increase MMC homebuilding in particular. It is quite early to assess how effective the funds are at helping SME builders to access land, but the Government must ensure progress on these programmes is quicker than previous schemes. *The Government should ensure the Small Sites Fund and Land Assembly Fund do not become additional stalled initiatives. It should provide the Committee with an update in September 2019 to show what progress has been made in the year since the launch of the Funds.*

131 Homes England, [Strategic plan 2018/19 - 2022/23](#), October 2018, p24

132 [“Government investment to overcome barriers to building”](#) Ministry of Housing, Communities and Local Government press release:, 17 September 2018

133 [“Government investment to overcome barriers to building”](#) Ministry of Housing, Communities and Local Government press release:, 17 September 2018

9 Building regulations and energy efficiency

96. The suite of Approved Documents published by the Ministry of Housing, Communities and Local Government set out how builders can meet the building regulations. They provide general guidance on expected performance of materials and building work and provide examples and solutions on how to achieve compliance¹³⁴ but do not include any specific guidance on MMC. The Approved Documents also set out safety standards and energy performance targets for all building types. The Interim Report of the Independent Review of Building Regulations and Fire Safety, led by Dame Judith Hackitt, commissioned by the Government following the fire at Grenfell Tower criticised the current suite of Approved Documents and said they are not user-friendly:

The Approved Documents are not produced in a user-friendly format. The current format of covering each requirement (fire safety, thermal insulation, noise abatement, etc.) in separate sections leads to multiple, separate specifications for overlapping or common elements of a building, with no easy means for these to be integrated into a single, compliant specification.¹³⁵

97. In December 2018 the Government published its implementation plan in response to the recommendations of the Independent Review, in which it committed to consulting on the current suite of Approved Documents and how to make them more user friendly. In June 2019 the Ministry of Housing, Communities and Local Government launched its consultation for a new building and fire safety programme entitled 'Building a Safer Future: Proposals for reform of the building safety regulatory system'. On MMC the consultation document says:

A key issue for compliance will be confidence in quality assurance systems being used for fabrication offsite and installation onsite. Our proposal is that the construction products regulators should play a role in ensuring modern methods of construction meet the standards they are being marketed as meeting and work with other regulators to make sure they are installed and used in a safe way.¹³⁶

However, it does not indicate the guidance within the Approved Documents will be updated to take MMC into account.

Building regulations and MMC

98. Representatives from homebuilders, Barratt Developments and Taylor Wimpey said building regulations needed updating to facilitate compliance and to take into account MMC for building homes:

Steven Boyes: Building regulations need overhauling and need a specific section on MMC. Currently, you need to go through all the various parts of building regulations to get to those elements relative to MMC. If MMC

134 Ministry of Housing, Communities and Local Government, Collection: '[Approved Documents](#)', April 2016

135 Independent Review of Building Regulations and Fire Safety: '[Interim Report](#)', December 2017, p16

136 Ministry of Housing, Communities and Local Government, '[Building a Safer Future Proposals for reform of the building safety regulatory system](#)', p.102

is going to be a big driver of volumes, it needs to have its own section. I also feel that there needs to be more clarity with regard to fire safety in building regulations.¹³⁷

Jennie Daly: The current building regulations do not tend to focus on MMC. Approved Documents A and B focus on traditional and timber frame construction, and MMC is then left to interpretation to a degree, which is not particularly helpful with compliance. [...] We would be supportive of updating the building regulations to reflect the needs and different requirements of MMC.¹³⁸

99. Some witnesses also raised concerns about innovative methods of construction and fire safety in the context of the building regulations. The London Fire Brigade reiterated the findings of the Independent Review of Building Regulations and Fire Safety and said the current system does not ensure MMC buildings are safe:

However, the wider industry has forged ahead with increasingly innovative construction methods and materials at a time when it has been identified in the Independent Review of Building regulations and Fire Safety led by Dame Judith Hackitt that the system which is meant to ensure the safety of buildings is broken. In our experience this has sometimes resulted in a building being proposed using MMC materials where the potential fire performance has not been fully appreciated.¹³⁹

100. The Fire Sector Federation raised similar concerns:

This also raises the matter of effective control by regulators and again current concerns exists that UK building guidance and regulations are not sufficiently detailed to ensure safe use of MMC. Common use building materials like plastic can in certain circumstances create pathways for external fires to enter structures or fire barriers and seals may be rendered ineffective by surrounding materials. Guidance and understanding are essential in maintaining effective fire stopping.¹⁴⁰

101. The current suite of Approved Documents is confusing and difficult to comply with. It is particularly difficult for homebuilders that use MMC to apply the regulations to their developments. This could result in compromised safety standards in MMC buildings. The consultation on the building and fire safety system is welcome but does not consider specific guidance for MMC builders to help them comply with current regulations. *The Government should urgently set out a clear plan for the review of the whole suite of Approved Documents, including a timeline for implementation. This review should consider how the Approved Documents relate to MMC buildings and where relevant, provide additional guidance on how MMC homebuilders might reach the required standards.*

137 [Q84](#)

138 [Q84](#)

139 London Fire Brigade ([MMC0016](#))

140 Fire Sector Federation ([MMC0037](#))

Energy efficiency

102. Estimates on the proportion of total UK carbon emissions produced by the built environment vary; The Royal Institute of British Architects quoted 30% for direct and indirect emissions,¹⁴¹ while the UK Green Building Council put the figure at 40%.¹⁴² It is clear that the built environment produces a significant proportion of the UK's greenhouse gas emissions and therefore has a key role to play in making buildings more energy efficient and reducing their carbon footprint, in order to meet the Government's target to eradicate the country's net contribution to climate change by 2050.¹⁴³ WRAP estimate that modular construction can reduce energy used in the construction process by 67%¹⁴⁴ and waste produced onsite, by 70–90% in comparison with traditional construction methods.¹⁴⁵ James Thomson from Keepmoat Homes told us that MMC homes: “take about 20–30% less to heat than a traditionally built new home”.¹⁴⁶

103. The building regulations set the standard for energy performance in new and existing buildings. The Chartered Institute of Housing warned that in future higher levels of energy efficiency might be required in order to reduce the impact of the built environment on climate change. In that case, inefficient homes built today would need retrofitting at a later date in order to comply with the more stringent energy performance requirements:

Just 1% of new homes built in 2018 met the highest Energy Performance Certificate standard (Band A). This represents a huge and irresponsible waste of an opportunity to upgrade the energy efficiency of the stock—especially as the least efficient of the homes built now will need expensive retrofit work within a few years if standards are suddenly raised, as the climate worsens. MMC provides the opportunity to tackle this problem by embedding high standards—but also carries the risk of it being extremely difficult to retrofit in later years if houses are built to inadequate standards now and by methods that make retrofitting expensive or technically difficult.¹⁴⁷

104. In its written evidence, homebuilder, Keepmoat Homes said its MMC homes are: “built using high performance materials which exceed current building regulations by over 20%”.¹⁴⁸ In his oral evidence, James Thomson from Keepmoat Homes suggested that if regulations on sustainability was tightened it would push developers towards modular construction.¹⁴⁹ The Minister of State for Housing said if MMC homes are more energy efficient we should encourage more of them:

Mary Robinson: If passive house standards are more achievable through MMC, should we be encouraging more MMC?

141 Royal Institute of British Architects ([MMC 0030](#))

142 UK Green Building Council, [Climate Change](#), accessed 14 June 2019

143 Prime Minister's Office, 10 Downing Street, [PM Theresa May: We will end UK contribution to climate change by 2050](#), 12 June 2019

144 WRAP, [Waste Reduction Potential of Offsite Volumetric Construction](#), p7

145 WRAP, [Current Practices and Future Potential in Modern Methods of Construction](#), January 2007, p 18

146 [Q86](#)

147 Chartered Institute of Housing ([MMC 0046](#))

148 Keepmoat Homes [[MMC0041](#)]

149 [Q86](#)

Kit Malthouse: Yes, absolutely. If we get better standards with MMC, we absolutely should. This is an imperative that we have, morally as well as practically, to do our bit for climate change¹⁵⁰

105. To meet its target to eradicate the UK's net contribution to climate change by 2050, the Government should embrace every opportunity to reduce carbon emissions. It should be ambitious in setting carbon reduction targets for the built environment both during construction and in use. The building regulations should set more stringent energy performance targets for homes to take into account achievable levels of energy efficiency. MMC should be used to deliver more efficient homes now to avoid costly retrofitting of homes later to comply with more rigorous energy efficiency targets.

10 Access to finance

106. The lack of access to finance is one of the main constraints that stops homebuilders from increasing their output. It is particularly pressing for small and medium sized housebuilders that do not have large reserves of their own to draw on. The finance model for MMC developments is an even bigger challenge because capital is required upfront to set up factories and assembly lines before any houses can be installed. Homebuilders, Galliford Try Partnerships and Regeneration said “The modular companies we have been in contact with would all expect at least 30% of the overall contract value upfront.”¹⁵¹ The Centre for London found that 80% of MMC companies in London find it very difficult to secure funding from high street banks due to a lack of confidence.¹⁵² Research conducted by the NHBC Foundation in 2016 suggested that capital cost was the highest concern and barrier to MMC use among homebuilders.¹⁵³

107. Since the economic downturn in 2008, many small and medium sized homebuilders have moved out of the market. The 2017 Housing White Paper estimates their market share decreased from 68% in 2008 to 41% in 2015 and the number of new homes registered by SME builders decreased from 44,000 in 2007 to 18,000 in 2015.¹⁵⁴ In the White Paper, the Government made commitments to diversify the market, help this sector to grow and add capacity in the homebuilding industry.

Government backed schemes

108. Recent governments have acknowledged how difficult it is for homebuilders to access finance and have introduced a range of schemes and funds to tackle this. In October 2016 the Government launched the Home Building Fund (HBF) which provides loan finance to private sector businesses to build new homes and prepare sites for new homes. £2.5 billion of the £4.5 billion fund provides loan finance to MMC, SME and custom build developers.¹⁵⁵ The Ministry said the Fund has invested over £206 million in MMC developments so far and over 90% of completed applications received since October 2016 have been from SME builders.¹⁵⁶ Since the 2017 Housing White Paper, the Government has launched further initiatives to help homebuilders access finance and increase their output. The Ministry of Housing, Communities and Local Government explained the Government is engaging with stakeholders to address problems around access to finance:

The Government is working with the Construction Leadership Council, the British Business Bank, firms in the construction and financial services sectors and their representative bodies to identify what types of funding are required, the extent to which these can be provided by the financial services market and current providers, and any gaps in provision. Where gaps are identified, the Government will work with stakeholders to address these, to ensure that the industry has access to the finance that it needs to expand its off-site manufacturing capacity.¹⁵⁷

151 Galliford Try Partnerships and Regeneration [[MMC0013](#)]

152 Centre for London ([MMC006](#))

153 NHBC [[MMC0032](#)]

154 Department for Communities and Local Government, [Fixing our broken housing market](#), February 2017, p47

155 Ministry of Housing, Communities and Local Government ([MMC0028](#))

156 Ministry of Housing, Communities and Local Government ([MMC0028](#))

157 Ministry of Housing, Communities and Local Government ([MMC0028](#))

109. The 2017 Autumn Budget was promoted as the “housing budget” and promised to make available £15.3 billion in new financial support for housing over the following 5 years. This took the total figure for housing to at least £44 billion over that period. In the 2018 Budget the Government announced the British Business Bank would deliver a new scheme to provide guarantees to support up to £1 billion of lending to SME housebuilders. The ENABLE Guarantee is funded through the ENABLE scheme which helps SMEs to access loans. The Minister said it will be launched in early 2019/20.¹⁵⁸

110. Homes England launched The Housing Delivery Fund¹⁵⁹ with Barclays in September 2018 to provide up to £1 billion in residential development loans of between £5 million and £100 million, with the aim of increasing the number or accelerating the progress of new homes in England.¹⁶⁰ It has also brokered the £250 million Housing Growth Partnership with Lloyds to forge partnerships with small housebuilders and residential developers to help them grow their businesses and increase the number of homes they build.¹⁶¹

111. Homes England’s Strategic Plan says it is considering further types of financial support including equity investment guarantees to support the sector. Another example of support is the Housing Infrastructure Fund which is divided into two parts:

- a Marginal Viability Fund to provide the final or missing piece of infrastructure funding to get additional sites allocated or existing sites unblocked quickly;
- a Forward Fund for a small number of strategic and high-impact infrastructure projects.¹⁶²

The 2017 Budget more than doubled funding for the Housing Infrastructure Fund to £5 billion, before the 2018 Budget further extended it by £500 million to provide support for up to 650,000 homes in total. **It is important the Government helps homebuilders to access finance to build more homes, so we welcome the Home Building Fund, launched in 2016. We note, only £206 million from the Fund has been invested in MMC developments to-date. The Government should use the Home Building Fund to provide further finance to MMC homebuilders urgently. It is not clear whether the other funds the Government has launched will help MMC builders to access the upfront capital they need. The Government should ensure these funds can be utilised to build more MMC homes.**

112. *The plethora of different funds is confusing, so the Government should provide signposting for homebuilders, to enable them to easily identify which funds they can access.*

158 [PQ 223118](#) [on Housing: Construction] 27 February 2019

159 [“£1 billion housing delivery fund launched by Brokenshire in partnership with Barclays”](#), Ministry of Housing, Communities and Local Government news story, 12 September 2018.

160 UK Finance ([MMC0015](#))

161 Lloyds Banking Group, [‘Lloyds Banking Group and Homes England announce further funding to Housing Growth Partnership’](#), 13 March 2018, accessed 13 June 2019

162 [“Housing Infrastructure Fund”](#) Ministry of Housing, Communities and Local Government policy paper page, 4 July 2017, accessed 14 June 2019

SME homebuilders

113. Small and medium sized builders are important to the homebuilding industry and some are well placed to deliver smaller schemes using off-site manufacturing.¹⁶³ A number of SME builders have proven the potential for using MMC in their developments; Pocket Living planned to deliver 204 homes for first time buyers in London in 2018, with 44% of homes constructed using MMC.¹⁶⁴ In order to deliver those homes, Pocket Living received a £25 million loan from the London Mayor’s Innovation Fund in 2017 to help finance ongoing site purchases.¹⁶⁵ Without such public funding smaller homebuilders like Pocket Living would continue to struggle to access finance.

114. The up-front investment needed for MMC developments is an additional barrier that limits take-up among homebuilders—SME homebuilders in particular, in comparison with traditional methods. We hope the work undertaken by the MMC Working Group to provide assurances to the sector will give more investors the confidence to engage with MMC builders.

115. We welcome the ENABLE Scheme and Housing Growth Partnership to help SME homebuilders to access finance but urge the Government to ensure these schemes allow homebuilders to access the up-front capital required to invest in innovation and MMC. These initiatives must be closely monitored to ensure they are helping homebuilders to increase output, including MMC output. If current schemes are insufficient to increase MMC output, new schemes aimed at MMC developments should be considered.

163 Housing Forum ([MMC0045](#))

164 National House Building Council, [Modern Methods of Construction: Who’s doing what?](#), November 2018, p25

165 Greater London Authority, [‘Mayor invests in more than 1,000 ‘pocket homes’ for first-time buyers’](#), 15 August 2017, accessed 14 June 2019

Conclusion

116. There is significant interest in the benefits and opportunities of MMC from across the homebuilding industry but those benefits have been known for many years and to-date, only a small proportion of homes are being constructed using modern techniques. Significant barriers remain and until they are overcome, take-up will continue to be low.

117. We will not reach 300,000 net additions annually by the mid-2020s unless MMC are used in a significant proportion of homes. MMC can help to overcome some of the constraints that limit homebuilding but should be used in conjunction with traditional methods to build the homes this country needs. Some homes will be built entirely using MMC, some using traditional methods and some using a mixture of both. Current trials into innovative methods of construction are key to understanding what works well and ensuring good quality homes are constructed to last into the future.

118. Further action is needed now to overcome the problems of the construction industry and increase capacity in homebuilding. In the financial year 2017–18 the Ministry of Housing, Communities and Local Government spent £7,563 million on “Fixing the broken housing market” but only a small percentage of this seems to have been spent on MMC developments. To track how much the Ministry is spending on MMC specifically, it should report annually the total amount allocated to MMC developments across all its different funding streams, including generic schemes such as Help to Buy. It should also monitor how many homes are built using MMC, in order to evaluate the impact of this spending. The Government will need to indicate the measures they are taking to ensure sufficient use of MMC is being used to deliver the housebuilding target.

119. The Government has taken welcome steps to overcome the barriers to take-up of MMC, such as convening the MHCLG Joint Working Group on MMC, led by Mark Farmer to identify ways to provide quality assurance to industry actors. Across Government several programmes and initiatives have been implemented that can be utilised to promote MMC, including the introduction of the new T Level in design surveying and planning, the work of the Transforming Construction Programme and Homes England’s Accelerated Construction Programme. It is crucial governmental bodies and departments take a collaborative approach to supporting MMC so that programmes complement each other and deliver an effective strategy to increase take-up. Fergus Harradence from the Department for Business Energy and Industrial Strategy told us “it is very hard to argue against the point that more should have been done years ago to encourage the use of these technologies across the industry.”¹⁶⁶ We agree. **Now is the time for consistent action to: give clarity on standards for MMC homes; provide certainty of demand for the supply chain; introduce a bigger social housing programme and substantially increase funding for MMC homes. We must stimulate a lasting increase in the use of MMC to help deliver the homes this country vitally needs.**

Conclusions and recommendations

Government's homebuilding targets and the case for MMC

1. We support the Government's ambition to add one million additional homes to the housing stock by 2020 and increase annual output to 300,000 by the mid-2020s; however, these volumes will not be achieved unless there is much wider adoption of MMC, alongside traditional building methods. Adopting higher levels of MMC would diversify the market and help to increase the numbers of new homes delivered, but capacity in off-site construction will have to increase rapidly and new entrants come into the market, if it is going to play a significant role in meeting the Government's homebuilding targets. *To track how much the Ministry is spending on MMC specifically, it should report annually the total amount allocated to MMC developments across all its different funding streams, including generic schemes such as Help to Buy. It should implement a coordinated strategy across all relevant government departments to increase MMC homebuilding and monitor how many homes are built using MMC, in order to evaluate the impact of this strategy.* (Paragraph 12)
2. We received a wide range of evidence that detailed the potential benefits of using MMC to build homes. As our predecessor Committee said, MMC have the potential to make an important contribution to addressing the industry's problems and increase the speed at which homes can be built. Therefore, the Government should take steps to exploit these benefits and help the MMC market to grow. (Paragraph 14)
3. We received a wide range of evidence that explained the current barriers to uptake of MMC to build homes. The Government must adopt the recommendations in this Report to overcome these barriers if we are to achieve greater uptake of MMC and enable them to play a significant role in delivering the homes this country needs. (Paragraph 16)

Defining MMC

4. To benefit from the predicted advantages of MMC, such as better-quality finishes from precision manufacturing and developing a high-tech industry that is more appealing for potential employees to be employed in, homebuilders should use more digital technology such as Building Information Modelling (BIM) in their processes and not simply move construction off-site. (Paragraph 19)
5. The definitional framework for MMC developed by the MHCLG Joint Industry Working Group on MMC enables the categorisation of all forms of MMC and will help industry actors to understand the different types of construction that could be used in the residential sector. This framework is designed to help insurers, mortgage lenders and other industry actors to engage with MMC developments and provide them with the relevant financial products; so they should take this opportunity to make use of the framework and increase their involvement with the MMC sector. (Paragraph 23)

6. It is equally important that MMC is explained clearly to consumers and the benefits and disadvantages are understood by the wider public. (Paragraph 24)

Quality assurance and warranties

7. The lack of long-term data on the durability of MMC homes in the UK is a considerable barrier to industry actors—the insurance industry in particular—engaging with MMC housing schemes. The Minister of State for Housing acknowledged this in his oral evidence to the Committee and said that he was working on data and accountability that is “auditable, inspectable and assessable”. *The Minister should engage industry to ensure this work results in a tangible output that helps industry actors access the relevant data.* (Paragraph 32)
8. *The industry needs to demonstrate that MMC homes are safe and can be easily repaired and adapted if they are to be a viable product. The Government should encourage financial service industries, including insurers and mortgage providers to gather data from other types of buildings such as student accommodation, which incorporate MMC, or from other countries where use of MMC is more prevalent, if applicable.* (Paragraph 33)
9. Digital technology makes it possible to collect, store and share data about the construction, maintenance and materials used in MMC buildings. This can be beneficial to customers wanting to make changes to their homes, insurers who need to better understand the products they are underwriting and fire services who must tackle fires in all types of building. (Paragraph 39)
10. *The Government should develop a digital database that records the design, processes and materials used in the construction of buildings. For larger developments, such as blocks of flats, the database should also track modifications and repairs made after completion. This would help to track and aggregate data about homes built using different types of MMC in order to build up a model and inform stakeholders of the likely performance of homes built using the same method in future.* (Paragraph 40)
11. It is very difficult to assess the long-term durability of homes built using new and innovative techniques, which has led to difficulties obtaining financial products such as insurance and mortgages on MMC homes. We welcome the work the Government has undertaken to set up the MMC Working Group led by Mark Farmer to bring together industry actors and overcome barriers that prevent financial service providers from engaging with MMC developments. We also welcome the proposal for an “MMC Scheme” that will set out a single set of standards for warranty providers against which to make decisions and provide quality assurance to industry actors. *We believe the MMC Scheme should be launched by the end of this year to help increase the take-up of MMC for homebuilding.* (Paragraph 44)

Workforce and training

12. Housing developers identified the lack of skilled workers as one of the main constraints to building more homes using traditional techniques. The workforce will have to increase rapidly if it is to deliver 300,000 homes per year. Adopting more MMC could help to reduce the total number of workers required but will not

be a panacea for the workforce shortages. If EU workers choose to leave, or the UK fails to attract as many EU workers in future, current shortages will be exacerbated unless new people are trained in both modern and traditional techniques and brought into the workforce. (Paragraph 50)

13. Adopting more MMC will take some of the work off-site and provide opportunities for more digital working which could help to attract young people into the sector and increase capacity. However, witnesses were clear that traditional techniques will continue to be used alongside MMC to build homes and therefore we also need more workers with traditional skills. Other workforce benefits such as providing new employment opportunities in parts of the country with higher levels of unemployment, could be achieved through strategic positioning of new MMC factories, however, this will have to be balanced with planning obligations to use local labour. (Paragraph 51)
14. The Introduction of T Levels which are equivalent to A Levels will help to overcome some of the reputational problems the industry faces, raise the profile of the jobs available and hopefully encourage more young people into the sector. (Paragraph 55)
15. *The Government must ensure skills programmes, apprenticeship schemes and the new T Level give learners the skills they need for both traditional techniques and MMC and encourages more young people into the sector. Homes England must ensure their partners are delivering necessary skills for a modern workforce and the Construction Industry Training Board must ensure it is delivering the skills necessary for homebuilding. It should also support the reskilling of the current workforce so they can contribute to a modern construction industry.* (Paragraph 56)
16. *We welcome the steps the Government has taken to support innovations in advanced manufacturing for the construction of homes. The networks of catapults and centres of excellence which bring businesses and academia together to develop advanced manufacturing solutions, should be coordinated with the central Transforming Construction Programme and the Construction Innovation Hub to ensure each has a specific area of focus. The Government should utilise these networks to coordinate the testing and standardisation of MMC processes and components to develop innovative products that comply with the building regulations.* (Paragraph 59)
17. *The MHCLG MMC Joint Industry Working Group should extend its remit to look at advanced skills provision. It should work with Homes England, the AMRC, and other training centres to develop skills programmes that provide learners with the specific skills required for the off-site manufacture of MMC homes.* (Paragraph 60)

Supply chain

18. It is clear that for both suppliers and developers there is a lack of robust supply chains and this is a major barrier to greater uptake of MMC. The Government has the potential to shore-up supply chains through wider use of mandating for MMC in developments which benefit from public money. Though this should be used with caution so as not to deter developers from building at all if they are unable to use traditional methods. (Paragraph 63)

19. *The Government should consider setting requirements for homebuilding developments that benefit from public funds—such as those sold through Help to Buy Schemes—to incorporate the use of MMC techniques, to aggregate demand for MMC products and bolster domestic supply chains.* (Paragraph 64)
20. Homebuilders must deliver a product which is well designed and desirable to homebuyers; homes need to be adaptable and provide ample living space and storage if they are to meet the needs of buyers. When designing homes, methods of construction and transportation need to be considered at an early stage. If the factory manufacturing components for a build is situated a long distance from the site where homes will be installed, developers might need to consider types of construction, such as panellised units which can be transported within the container of standard sized lorries, rather than modular construction. (Paragraph 70)
21. There is a plethora of MMC techniques being developed and utilised by different homebuilders. This means designs and components are developed to suit a particular method but may not be compatible with another type of MMC. The result is that new designs are required for different developments and components being manufactured for one development cannot be used for another. This prevents homebuilders from taking advantage of economies of scale to drive down costs or the speed advantages of being able to recycle designs. (Paragraph 71)
22. Some types of MMC will be appropriate for certain sites but not others, for example, if there are limitations on site access it might not be possible to install externally produced, modular homes. Therefore, it is not desirable to concentrate too narrowly on certain types of MMC. Likewise, it is important there remains room for innovation in the industry, but it would be helpful to identify, develop and promote a smaller number of techniques to enable the industry to take advantage of economies of scale. (Paragraph 72)
23. We welcome the work Homes England is undertaking to identify the most effective types of MMC through programmes such as the Innovation Village in Gateshead. We also welcome the funding the Government is putting into innovation in panellised systems through Innovate UK to improve advanced manufacturing techniques and believe this will contribute to the establishment of a modern construction industry underpinned by robust supply chains. (Paragraph 73)
24. *The Joint Industry Working Group on MMC should undertake further work to identify types of MMC that work best and can be used at scale to deliver the good quality homes this country needs with an emphasis on the functional design for the people who will live in them. This will enable the industry to benefit from economies of scale and bolster the supply chains for those types of product.* (Paragraph 74)
25. *The Government should use initiatives such as the AIMCH project to harness the skills and knowledge of industry actors to learn what their priorities are and develop best practice in construction in order to build the homes the country needs. The Building Better, Building Beautiful Commission should investigate designs for MMC homes that can overcome road capacity size restrictions, while delivering high quality homes.* (Paragraph 75)

26. *The Government is taking welcome steps to support off-site manufacturing for homebuilding but if the benefits of the Industrial Strategy Construction Sector Deal are to be realised, more of the machinery and components for MMC homes should be manufactured in this country. The Government should record how many components for MMC homes are imported and set targets to reduce their use in proportion to the UK manufactured supply chain. It should enable manufacturers in the supply chain for MMC homes to access low-cost loans through the Home Building Fund so they can invest in factories, increase capacity and help homebuilders to reduce their reliance on imported components. The Government should use its record of imported components to assess the effectiveness of these measures at boosting domestic supply. (Paragraph 78)*

Local authorities

27. If we are to deliver 300,000 homes annually and meet demand for social housing, local authorities need to start building homes in far greater numbers than they have done in recent years. MMC are particularly well suited to this type of tenure because the large volumes of standardised accommodation help to bring down unit costs. Some forms of MMC have also proven to be more energy efficient than traditional construction techniques which helps to reduce fuel bills and running costs for tenants. Housing associations have been among the early adopters of MMC for building homes. Swan Housing Association and Accord Homes have both chosen to integrate the supply chain and build their own factories in which to construct homes off-site. (Paragraph 84)
28. While social housing has a role to play in supporting greater take-up of MMC, it is important that lower cost designs are fully tested to ensure that MMC is delivering sustainable, durable, high quality social homes, so that MMC does not become associated with negative examples. Its use in this context should not be seen as a testing ground for its wider use and steps should be taken to promote MMC in all tenures, as we outline through this Report. *Local authorities should increase rapidly the pace at which they build new social homes. They should further engage with housing associations which have already adopted MMC, in order to better understand best practice and explore the potential for more MMC use in the supply of social housing. Local authorities should also factor in whole-life running costs of social homes when tendering for building contracts. (Paragraph 85)*
29. The localised planning system causes challenges for all homebuilders but does not present an insurmountable barrier to homebuilders using MMC techniques, so no major changes are required for MMC specifically. Local plans should be neutral to the type of construction method used in new housing developments as long as the homes meet local design standards and need. (Paragraph 87)

Access to land

30. Helping homebuilders to access land for development is key if we are to increase rates of homebuilding. Homes England should have utilised The Accelerated Construction Programme to boost MMC homebuilding, but it has become another stalled initiative. Construction is still at pilot stage and zero homes have been

delivered so the expected benefits of the Programme are yet to be achieved. *Homes England must speed up progress on its Accelerated Construction Programme. Current developments must keep to their deadlines and Homes England should prevent delays on future sites. We reiterate the recommendation made by our predecessor Committee that Homes England should provide the Committee with regular updates on progress across the full range of initiatives to bring additional land into use.* (Paragraph 92)

31. We welcome the introduction of the Single Land Programme and hope it will increase uptake of MMC. We also welcome the Small Sites and Land Assembly Funds to help SME builders access land and therefore diversify the market, but these have not been designed to increase MMC homebuilding in particular. It is quite early to assess how effective the funds are at helping SME builders to access land, but the Government must ensure progress on these programmes is quicker than previous schemes. *The Government should ensure the Small Sites Fund and Land Assembly Fund do not become additional stalled initiatives. It should provide the Committee with an update in September 2019 to show what progress has been made in the year since the launch of the Funds.* (Paragraph 95)

Building regulations and energy efficiency

32. The current suite of Approved Documents is confusing and difficult to comply with. It is particularly difficult for homebuilders that use MMC to apply the regulations to their developments. This could result in compromised safety standards in MMC buildings. The consultation on the building and fire safety system is welcome but does not consider specific guidance for MMC builders to help them comply with current regulations. *The Government should urgently set out a clear plan for the review of the whole suite of Approved Documents, including a timeline for implementation. This review should consider how the Approved Documents relate to MMC buildings and where relevant, provide additional guidance on how MMC homebuilders might reach the required standards.* (Paragraph 101)
33. To meet its target to eradicate the UK's net contribution to climate change by 2050, the Government should embrace every opportunity to reduce carbon emissions. It should be ambitious in setting carbon reduction targets for the built environment both during construction and in use. The building regulations should set more stringent energy performance targets for homes to take into account achievable levels of energy efficiency. MMC should be used to deliver more efficient homes now to avoid costly retrofitting of homes later to comply with more rigorous energy efficiency targets. (Paragraph 105)

Access to finance

34. It is important the Government helps homebuilders to access finance to build more homes, so we welcome the Home Building Fund, launched in 2016. We note, only £206 million from the Fund has been invested in MMC developments to-date. *The Government should use the Home Building Fund to provide further finance to MMC homebuilders urgently. It is not clear whether the other funds the Government*

has launched will help MMC builders to access the upfront capital they need. The Government should ensure these funds can be utilised to build more MMC homes. (Paragraph 111)

35. *The plethora of different funds is confusing, so the Government should provide signposting for homebuilders, to enable them to easily identify which funds they can access. (Paragraph 112)*
36. The up-front investment needed for MMC developments is an additional barrier that limits take-up among homebuilders—SME homebuilders in particular, in comparison with traditional methods. We hope the work undertaken by the MMC Working Group to provide assurances to the sector will give more investors the confidence to engage with MMC builders. (Paragraph 114)
37. *We welcome the ENABLE Scheme and Housing Growth Partnership to help SME homebuilders to access finance but urge the Government to ensure these schemes allow homebuilders to access the up-front capital required to invest in innovation and MMC. These initiatives must be closely monitored to ensure they are helping homebuilders to increase output, including MMC output. If current schemes are insufficient to increase MMC output, new schemes aimed at MMC developments should be considered. (Paragraph 115)*

Conclusion

38. Now is the time for consistent action to: give clarity on standards for MMC homes; provide certainty of demand for the supply chain; introduce a bigger social housing programme and substantially increase funding for MMC homes. We must stimulate a lasting increase in the use of MMC to help deliver the homes this country vitally needs. (Paragraph 119)

Formal minutes

Monday 24 June 2019

Members present:

Mr Clive Betts, in the Chair

Bob Blackman	Andrew Lewer
Mr Tanmanjeet Singh Dhesi	Mr Mark Prisk
Helen Hayes	Mohammed Yasin

Draft Report (*Modern methods of construction*) proposed by the Chair, brought up and read.

Ordered, That the Report be read a second time, paragraph by paragraph.

Paragraphs 1 to 119 read and agreed to.

Summary agreed to.

Resolved, That the Report be the Fifteenth Report of the Committee to the House.

Ordered, That the Chair make the Report to the House.

Ordered, That embargoed copies of the Report be made available, in accordance with the provisions of Standing Order No. 134.

[Adjourned until Monday 1 July at 3.30 p.m.]

Witnesses

The following witnesses gave evidence. Transcripts can be viewed on the [inquiry publications page](#) of the Committee's website.

Monday 4 March 2019

Mark Farmer, Founding Director and CEO, Cast Consultancy, **Dr Chris Goodier**, Director, Centre for Innovative and Collaborative Construction Engineering, Loughborough University and **Victoria Pinoncely**, Former Research Manager, Centre for London [Q1–43](#)

Ben Derbyshire, President, Royal Institute of British Architects, **Ivan Harbour**, Senior Partner, Rogers Stirk Harbour + Partners and **Dr Chris Millard**, Technical Director, Assets and Manufacturing, Laing O'Rourke [Q44–64](#)

Monday 18 March 2019

Steven Boyes, Chief Operating Officer and Deputy Chief Executive, Barratt Developments, **James Thomson**, Non-Executive Director and former Chief Executive, Keepmoat Homes, **Alun Macey**, Head of Construction, Pocket Living and **Jennie Daly**, Director, Group Operations, Taylor Wimpey [Q65–109](#)

Lord Porter of Spalding CBE, Chairman, Local Government Association, **Wayne Hill**, Director, Construction Services, L&Q Group, and **Trina Chakravarti**, Project Director, Building Better, National Housing Federation [Q110–135](#)

Monday 1 April 2019

James Dalton, Director, General Insurance Policy, Association of British Insurers, **Charlie Blagbrough**, Policy Manager, Housing and Mortgages, Building Societies Association, **Neil Smith**, Head of Standards, Innovation and Research, National House Building Council, and **Mike Basquill**, Associate Director, UK Residential, Royal Institution of Chartered Surveyors [Q136–192](#)

Louise McGough, Senior Policy Officer, Housing and Land, Greater London Authority, and **Stephen Kinsella**, Executive Director, Land, Homes England [Q193–251](#)

Tuesday 7 May 2019

Kit Malthouse MP, Minister of State for Housing, Ministry of Housing, Communities and Local Government, **Andrew Stephenson MP**, Parliamentary Under Secretary of State, Minister for Business and Industry, Department for Business, Energy and Industrial Strategy, **Fergus Harradence**, Deputy Director, Construction, Department for Business, Energy and Industrial Strategy and **Isobel Stephen**, Director, Housing Supply, Ministry of Housing, Communities and Local Government [Q252–317](#)

Published written evidence

The following written evidence was received and can be viewed on the [inquiry publications page](#) of the Committee's website.

MMC numbers are generated by the evidence processing system and so may not be complete.

- 1 Age UK ([MMC0021](#))
- 2 Arcadis UK ([MMC0019](#))
- 3 Association of British Insurers ([MMC0029](#))
- 4 Association of British Insurers ([MMC0050](#))
- 5 B&CE/People's Health ([MMC0004](#))
- 6 British Property Federation ([MMC0035](#))
- 7 British Standards Institution ([MMC0012](#))
- 8 Building Societies Association ([MMC0025](#))
- 9 Buildoffsite ([MMC0034](#))
- 10 C4Plus Ltd ([MMC0002](#))
- 11 Centre for London ([MMC0006](#))
- 12 Chartered Institute of Housing ([MMC0046](#))
- 13 CITB ([MMC0052](#))
- 14 Construction Leadership Council ([MMC0014](#))
- 15 Design Council ([MMC0044](#))
- 16 Dorset Local Enterprise Partnership ([MMC0018](#))
- 17 Enbuild Ltd ([MMC0039](#))
- 18 Fire Protection Association / RISC Authority ([MMC0017](#))
- 19 Fire Protection Association / RISC Authority ([MMC0038](#))
- 20 Fire Sector Federation ([MMC0037](#))
- 21 G15 ([MMC0026](#))
- 22 Galliford Try Partnerships and Regeneration ([MMC0013](#))
- 23 Great Places Housing Group ([MMC0001](#))
- 24 Greater London Authority ([MMC0047](#))
- 25 Greater London Authority ([MMC0049](#))
- 26 HBF ([MMC0011](#))
- 27 Homes for the North ([MMC0008](#))
- 28 The Housing Forum ([MMC0045](#))
- 29 Keepmoat Homes ([MMC0041](#))
- 30 Keepmoat Homes ([MMC0048](#))
- 31 Local Government Association ([MMC0003](#))
- 32 London Assembly ([MMC0022](#))
- 33 London Councils ([MMC0009](#))

- 34 London Fire Brigade ([MMC0016](#))
- 35 LV= ([MMC0020](#))
- 36 MHCLG ([MMC0028](#))
- 37 Mineral Products Association ([MMC0010](#))
- 38 National Federation of Builders ([MMC0051](#))
- 39 National Housing Federation ([MMC0007](#))
- 40 NHBC ([MMC0032](#))
- 41 PegasusLife Group ([MMC0033](#))
- 42 Randall, Mr Philip ([MMC0027](#))
- 43 Royal Institute of British Architects ([MMC0030](#))
- 44 Royal Institution of Chartered Surveyors ([MMC0040](#))
- 45 Savills ([MMC0024](#))
- 46 Sir Robert McAlpine ([MMC0042](#))
- 47 Stonewater ([MMC0031](#))
- 48 Tarmac ([MMC0043](#))
- 49 UK Finance ([MMC0015](#))
- 50 WElink Homes (UK) ([MMC0005](#))
- 51 Zurich Insurance Plc ([MMC0023](#))

List of Reports from the Committee during the current Parliament

All publications from the Committee are available on the [publications page](#) of the Committee's website. The reference number of the Government's response to each Report is printed in brackets after the HC printing number.

Session 2017–19

First Report	Effectiveness of local authority overview and scrutiny committees	HC 369 (Cm 9569)
Second Report	Housing for older people	HC 370 (Cm 9692)
Third Report	Pre-legislative scrutiny of the draft Tenant Fees Bill version	HC 583 (Cm 9610)
Fourth Report	Private rented sector	HC 440 (Cm 9639)
Fifth Report	Business rates retention	HC 552 (Cm 9686)
Sixth Report	Pre-legislative scrutiny of the draft Non-Domestic Rating (Property in Common Occupation) Bill	HC 583 (Cm 9633)
Seventh Report	Long-term funding of adult social care: First Joint Report of the Health and Social Care and Housing, Communities and Local Government Committees	HC 768
Eighth Report	Planning guidance on fracking	HC 767
Ninth Report	Independent review of building regulations and fire safety: next steps	HC 555 (Cm 9706)
Tenth Report	Land Value Capture	HC 766 (Cm 9734)
Eleventh Report	High streets and town centres in 2030	HC 1010 (CP 84)
Twelfth Report	Leasehold Reform	HC 1468
Thirteenth Report	Brexit and local government	HC 493 (CP 109)
Fourteenth Report	Funding of local authorities' children's services	HC 1638