Chartered Institute of Housing (CIH) submission to House of Lords Built Environment Committee's inquiry 'Modern methods of construction – what's gone wrong?'

1. Introduction and context

1.1. The Chartered Institute of Housing (CIH) is the professional body for people who work and have an interest in housing. We are pleased to have the opportunity to submit evidence to the Built Environment Committee's inquiry into modern methods of construction (MMC). This is a growing area of importance for CIH and the wider housing sector, given stagnating progress in building urgently needed new homes and the recent collapse of several construction and manufacturing firms in the modular and MMC housing sector.

1.2. While there is no generally adopted definition of modular and MMC housing, in 2019 the government published an MMC definition framework with seven categories, ranging from fully pre-manufactured 3D primary structural systems (Category 1) to site process led labour reduction and/or productivity improvements (Category 7).[1] Other categorisations split modular and MMC housing into five categories, ranging from off-site volumetric manufactured to non-off-site manufactured.[2] For simplicity, we use the terms modular and MMC housing in this submission to refer to **factory-made homes, or significant elements of homes, that are precision engineered in facilities using continuous improvement processes**.

1.3. CIH's view is that modular and MMC housing has a potentially pivotal role to play in meeting housing supply needs. In the main content of this submission, we summarise evidence from a review of academic and grey literature and from ongoing discussions with CIH members working in development and housing supply. **We focus on two key areas of the inquiry, namely**:

- The challenges of stabilising, scaling, and accelerating the modular and MMC housing market, including the key reasons for the recent withdrawal of some firms from the market.
- Recommendations that the Built Environment Committee may wish to consider as part of their inquiry.

1.4. In Annex One, we also present supplementary evidence on:

- The proposed benefits of modular and MMC housing.
- The housing supply challenges that modular and MMC housing can help to address.

2. 'What's gone wrong?' The challenges of stabilising, scaling, and accelerating the modular and MMC housing market

2.1. **Our research has identified at least nine challenges associated with stabilising, scaling, and accelerating the modular and MMC housing market**. Some of these challenges, especially those discussed in 2.2., 2.3., and 2.4., have particular relevance in helping to explain the recent withdrawal of some firms from the modular and MMC market. However, all the challenges noted in this section are affecting the capacity and ability of the sector to deliver an additional supply of new homes.

2.2. **High capital costs and the lack of sustainable pipelines**. The recent withdrawal of several MMC housebuilders from the market has been argued to have one common denominator: namely, that "*housebuilding factories are major capital commitments that rely on steady and predictable demand for their products*."[3] Specifically:

2.2.1. Consistent demand for factories is required for them to remain viable.[4] Factory closures leave large holes in manufacturing supply, and there are few alternatives for their clients if manufacturers cease trading. One study notes that some providers are forming consortiums to give manufacturers a security of pipeline and to secure standardisation, in a similar move to record labels joining consortiums to ensure the viability of vinyl pressing plants.[5] However, it is clear the common factor in recent closures of modular factories was that they did not have the steady and predictable demand required to justify, and sustain, their operations, especially given the capital commitment required to build and operate them.[6]

2.2.2. CIH members we consulted with in preparing this evidence noted that pipeline instability has also led some factories to take on unprofitable projects to try and shore up demand. This, combined with build cost inflation and high interest rates, has further contributed to financial losses and unsustainability in the modular and MMC sectors.

2.2.3. These factors resulted in several large modular housebuilding factories, such as those recently closed by Legal & General and Swan, running at a significant and unsustainable loss for several years. Swan noted that "*it is simply not financially sustainable to continue to build homes using modular construction, with Swan's factory having been running at a loss*",[7] while Legal & General stated that it had "*not been able to secure the necessary scale of pipeline to make the current model work*."[8]

2.2.4. Even prior to recent factory closures, research highlighted that there were not enough modular factories to deliver the quality and quantity of

homes that would be required in the scenarios (for example) proposed by Make UK Modular.[9]

2.2.5. More widely, one CIH member we consulted with noted that barriers within the planning system have sometimes made it more difficult to bring forward the requisite number of sites to achieve predicted MMC factory orders.

2.3. **Business models and finance**. In addition, pipeline issues must be seen in the wider context of challenges with finance and business models in the sector. Several pieces of research flag issues with finance and the development of sustainable business models:

2.3.1. Local authorities and housing associations have access to GLA and Homes England grants, which makes up their biggest source of funding for modular. One survey reported that 67 per cent of public sector respondents had no more difficulty securing funding for MMC than for traditional build.[10] However, this research noted some concern in the public sector about the acceptability of modular properties as security for funding.

2.3.2. In the private sector, this same survey reported that less than half of private sector organisations had no more difficulty securing funding for MMC than for traditional build.[11] Since 2019, there has been a shift in funding models in the private sector, with a greater use of development finance and equity to develop modular. The cost of investment required to adopt and sustain modular housing development models is however high, and is noted elsewhere as a barrier to their uptake. Namely, and as noted in above, one challenge restricting the shift to sustainable business models is the lack of a demand pipeline large and stable enough to ensure the market can absorb new homes and maintain the viability of off-site modular manufacturing factories.[12] This amounts to a chicken and egg problem of demand and supply, slowing investment and investor confidence.

2.3.3. Housing developers can be deterred by the large upfront investment that is required for viable modular housing manufacturing, which is more frontloaded than traditional build.[13] This has undoubtedly contributed to the insufficient levels of demand that have precipitated the closure of some modular factories in 2023.

2.4. **Skills, capacity, and the supply chain**. While there are undoubtedly capacity challenges in traditional construction, particularly skilled labour shortages, two specific challenges relating to capacity and skills in modular and MMC housing have been noted.

2.4.1. Modular requires different skills sets to traditional construction that may be less specialised, but are nonetheless required in greater quantities.[14] This includes skills for constructing modules of homes in factories and the precision required for on-site assembly. Furthermore, many workers in the construction industry do not have experience with MMC, and the education system (e.g. university courses) does not currently include sufficient modules on MMC to grow the skills required.

2.4.2. Broader issues relating to shifting economic geographies of housing supply may occur. For example, one study suggests that de-anchoring major parts of the construction process from specific sites/areas may have unforeseeable local and regional economic impacts. This study notes that adopting MMC can lead to a 70 per cent reduction in on-site labour requirements, which may negatively impact local employment rates.[15]

2.5. **Accreditation and standardisation**. There is currently a lack of accreditation and standardisation across the modular housing sector, which includes standardised warranties and information required by valuers.[16] Organisations such as NHBC, LABC, and the Build Offsite Property Assurance Scheme (BOPAS) offer accreditation, but there is a misalignment between what they assess and offer security for. For example, BOPAS provides assurance regarding the lifespan of the product whereas the NHBC and LABC schemes provide insurance-backed cover for defects. In addition, government has not yet concluded its work with the British Standards Institute (BSI) on PAS8700, a new standard for the MMC sector.[17] Given concerns with fire safety, noted in 2.10. below, this is a key gap in accreditation and standardisation of MMC build.

2.6. **Data monitoring and accuracy**. Statistics about the current levels of modular housing construction in the UK vary, and there is currently no comprehensive database.[18] Furthermore, the different shades of MMC definitions noted above make it very difficult to assess which forms of modular housing are developing in certain ways. As a result, there is no reliable data on which to make investment decisions or develop local and national government policy.

2.7. **Lack of state leadership and support**. Make UK Modular argue that a lack of appropriate state support, including regulation, funding, and soft support, is restricting the development of the modular housing industry.[19] This is also supported by other studies, which suggests confusing regulations, not just in the planning space, are hindering MMC uptake.[20] One study insists that state leadership will be crucial in promoting and incentivising MMC as a mainstream form of housing provision.[21] Summarily, although modular is included within Homes England targets and recognised as such, there is an argument for stronger state backing for the nascent industry. It is noteworthy that in Wales, an affordable homes programme and strategy were established in 2020 to support the use of

MMC in social housing.[22] No parallel exists for social housing in England or the wider UK.

2.8. **Incumbency and inertia**. One study suggests that a bias towards tradition and inertia within the business models of housebuilders constitutes a barrier, and that incumbent developers with large market shares may seek to inhibit structural shifts towards modular that would challenge their existing business models.[23] This helps to explain why MMC and modular have hitherto been the preserve of 'disruptor' or specialist SMEs.

2.9. **Prefab perceptions and choice**. Some studies note that negative perceptions of post Second World War 'prefab' housing and the potential lack of consumer choice associated with modular homes may be a barrier to the adoption.[24] Specifically, the advance planning, exterior and interior design, and lack of flexibility required by modular may make it more difficult for consumers to customise elements of their homes (e.g. kitchens, bathrooms), potentially making modular less attractive. However, it should be noted that some forms of MMC allow for this, especially those that are hybrid manufactured, which try to balance standardisation and customisation. This is referred to in one place as 'housing as a service',[25] analogous to how kitchens or bathrooms are designed on a computer in store, and would enable tailored solutions and interiors within a broader basic housing archetype.

2.10. **Fire safety.** Recent investigations undertaken by Inside Housing have suggested that there may be significant fire safety and structural integrity issues with some MMC homes.[26] Inside Housing's investigation noted that a report highlighting potential fire safety issues in MMC homes had been commissioned, completed, but not published by the government. This echoes previous concerns raised by the National Fire Chiefs Council (NFCC), which made a range of urgent recommendations to government on preventing the creation of building safety issues, especially when used in high-rise buildings or buildings housing vulnerable people.[27] While new homes are urgently required, the potential of MMC to accelerate housing supply should not come at the expense of building standards and fire safety.

3. Policy recommendations

3.1. **Modular and MMC housing is not absent from current housing policy in the UK.** Homes England retains a focus on supporting MMC, with a distinct KPI on the share of supported completions using MMC included in its new strategic plan.[28] The plan states that "*MMC can drive greater efficiency and productivity, reduce carbon emissions, decrease disruption caused by construction, and increase consumer choice*." Later, the plan states that Homes England: "*will support the growth of the MMC sector, increasing demand for MMC by incorporating requirements into programmes and contracts. We will continue to*

encourage partners to deliver homes using forms of MMC which bring the greatest innovation, productivity or sustainability benefits. We will collect data across relevant programmes and will continue our research into the MMC sector to provide much-needed data and insight."

3.2. In CIH's recently published *Homes at the heart – A strategy for housing*,[29] **we set out why we feel government should respond to the evidence presented in this paper by**:

3.2.1. Renewing its commitment to the development of MMC to build more green homes, and exploring how it can support the sector to scale sustainably.

3.2.2. Legislating to ensure all new homes are built to a truly zero carbon standard aligned with science-based targets from 2025, and ensuring that MMC are supported and enabled as part of the forthcoming Future Homes Standard.

3.3. **Make UK Modular suggest three main steps[30]** to developing the modular and MMC industry in the UK:

3.3.1. Removing the accidental double government levy charge on modular manufacturers by exempting them from the scope of the CITB levy.

3.3.2. Building supply chain capacity by repurposing the £10 million allocated for the MMC Taskforce and using it to support a match-funded supply chain transformation programme based on those government has successfully delivered in aerospace, offshore wind, and nuclear.

3.3.3. Dedicating 40 per cent of the Affordable Homes Programme to MMC. One CIH member we consulted with noted that given the number of government funded homes that are procured through package deals, this could also encourage developers and contractors to deliver more MMC.

3.4. **Other policy suggestions made in the literature and by CIH members are as follows**:

3.4.1. Reorientating policy and regulatory focus from MMC towards Modern Methods of Development (MMD), which could lead to a broader consideration of how key components of residential development can enable or constrain MMC uptake.[31]

3.4.2. Reforming planning policy to give clarity to the modular industry and enable more modular homes to be manufactured, assembled, and absorbed into the housing market.[32] This could include speeding up the

planning process to reduce the risk of delays and help give the sector more certainty on pipeline development.

3.4.3. Examining the extent to which devolved government support for MMC in social housing in Wales could be replicated across the UK.

3.4.4. Supporting research and development into innovative and hybrid MMC business models that are not dependent on large, expensive factories. For example, Cornerstone Place utilise a hybrid model entitled *Impact First Social Housing*, whereby the design of modular components is separated from their delivery and construction.[33] In this model, architects design components for new-build schemes, and the components themselves are built by manufacturers local to the build site, therefore supporting existing businesses and spreading the financial benefit among a larger number of suppliers. This model has the advantage of not necessitating large modular and MMC factories to be viable. While it may not be suitable for a fully volumetric approach, this model is effective in building volume in multiple locations across a region or country.

About CIH

The Chartered Institute of Housing (CIH) is the independent voice for housing and the home of professional standards. Our goal is simple – to provide housing professionals and their organisations with the advice, support, and knowledge they need. CIH is a registered charity and not-for-profit organisation. This means that the money we make is put back into the organisation and funds the activities we carry out to support the housing sector. We have a diverse membership of people who work in both the public and private sectors, in 20 countries on five continents across the world. Further information is available at: www.cih.org.

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Annex One: The proposed benefits of modular and MMC housing, and the housing supply challenges that modular and MMC housing can help to address

A1. The proposed benefits of modular and MMC housing

A1.1. We have identified at least eight proposed benefits of modular and MMC housing in our work. These are:

A1.1.1. **Energy efficiency and affordability**. Evidence suggests that modular homes cost 55 per cent less to heat than the average UK home and 32 per cent less than traditional new builds, delivering £800 maximum savings a year for a three-bed house.[34] One study also noted that most stakeholders in their work expect data to show that homes built using modular methods deliver cost-savings in terms of long-term running costs.[35]

A1.1.2. **Design and build quality**. Factory construction is associated with higher standards of build quality than traditional construction methods. One study examining the motivations for developing modular and MMC homes found that build quality was the key motivator for local authorities, developers, and others in the sector.[36] Relatedly, higher efficiency and build quality should lead to less asset management issues (e.g. repairs), although there is no evidence for this thus far. However, recent evidence suggests that not all modular homes will necessarily have a higher build quality, with one development experiencing issues with mould and water ingress. This emphasises the need for strict quality control.[37]

A1.1.3. **Embodied carbon**. Modular and MMC homes have been associated with carbon savings over the full development cycle. For example, one study noted that modular housing offsite technology can generate nearly 40 per cent lower emissions than traditional construction,[38] and research from Herriot Watt University indicated that just one modular-manufactured building at Greenford Green saved the equivalent CO2 to planting 160,000 trees.[39]

A1.1.4. **Job creation and Levelling Up**. Make UK Modular suggest that an expansion of the modular and MMC housing industry would benefit post-industrial cities and towns by de-anchoring housebuilding from the physical location of the homes themselves.[40] They also suggest that, currently, modular and MMC factories are increasingly located in post-industrial cities or towns, creating 3,000 jobs, and delivering £700mn of investment to deprived areas.

A1.1.5. **Reduced cost of development**. An academic study found that the cost of modular and MMC can be 22 per cent less than for traditional

construction,[41] and reduced costs were also noted by a second global study,[42] which concluded modular and MMC housing could achieve more than 20 per cent in construction cost savings once optimised for scale.

A1.1.6. **Speed of development**. The use of volumetric modular and panelised systems can significantly reduce build time, with one study noting an example development that was 18 months quicker than it would have been if constructed using traditional methods.[43] A second study of global modular and MMC stated that the industry has already established a solid track record of accelerating project timelines by 20–50 per cent.[44]

A1.1.7. **Accessibility standards**. As noted by CIH in previous work, MMC homes can be associated with improved space and accessibility.[45] Previously, building regulations in England and Wales have produced houses that are generally inaccessible, particularly for people who use wheelchairs, because although they incorporate wheelchair standards this aspect of the regulations is not mandatory. MMC provides an opportunity to achieve proper space and accessibility standards. However, this is dependent on the development of a national standard for MMC, which is uncompleted (see 2.5. above).

A1.1.8. **Waste reduction**. Many developers have social and environmental imperatives to reduce the waste associated with housebuilding. The construction industry is a considerable source of waste generation, requiring large areas of land for processing, treatment, and landfilling.[46] One academic study shows that modular construction can reduce the overall weight of waste by up to 83.2 per cent, corresponding to a 47.9 per cent decrease in the cost of waste for large structures.[47]

A2. The housing supply challenges that modular and MMC housing can help to address

A2.1. Evidence suggests that modular and MMC housing can help to address several housing supply and quality issues. Specifically, modular and MMC housing may address the following challenges.

A2.1.1. **Accelerating the supply of new homes**. Make UK Modular argues that by 2025, the modular sector will have the capacity to building 20,000 new homes per annum across England.[48] This is from a baseline of around 3,300 homes per annum at present, and output has doubled since 2017. Another report suggests that if a third of all new homes use MMC, this could supply an additional 265,000 homes in the next ten years.[49]

A2.1.2. **Tackling inconsistency in design, build quality, and energy efficiency.** On-site construction can encounter issues related to

inconsistent build, for example cold spots or defects. It is suggested that the prefabricated construction of modular homes in a factory setting is less likely to be affected by these issues, promoting consistency and better quality.[50]

A2.1.3. **Addressing labour and skills shortages in the housing and construction sector**.

A2.1.3.1. Make UK Modular suggest that the UK is struggling to meet the labour requirements of 300,000 homes constructed per annum by 2025, noting that the sector requires 137,000 more workers but that only 11,000 construction apprenticeships were completed in the previous year.[51] This is supported by other research, which notes that falling participation in the construction sector workforce is one of the key blockers on housing delivery.[52] Make UK Modular continue that the UK needs to build approximately 92,000 extra homes annually on 2021 levels to reach the 300,000 per annum target, and propose that modular could deliver this with an extra 46,000 workers, around half of what would be needed to build the homes through traditional methods.[53] Further, they claim that due its factory-based nature, the barrier for new labour is lower or less skilled, opening the modular labour pool to a wider base of workers, "*including career changers, people coming out of economic activity, or less-qualified workers*."[54]

A2.1.3.2. Evidence from a global review by McKinsey also suggests that modular construction could be embraced in areas of the UK with real estate demand and a shortage of skilled labourers for on-site construction.[55] They note that London and the South East of England may be well placed to benefit from this relationship.

A2.1.3.3. However, it should be noted that one study argues that modular requires *different* skills, not *fewer* skills, and that if upscaled modular could suffer the same challenges regarding low apprenticeship numbers and a lack of required skills for off-site construction and manufacturing.[56]

A2.1.4. **Supporting the aims and implementation of the Future Homes Standard.** Due to its theoretical ability to manufacturer greater quantities of energy efficient homes at speed, modular housing could help the sector to meet new requirements of the Future Homes Standard from 2025. Make UK Modular note that modular manufacturers deliver a disproportionate number of EPC A rated homes, and that if modular reaches potential capacity in the mid-2020s, it could deliver 20,000 EPC A homes per annum.[57] However, slow progress is being made in development of the

Future Homes Standard and it is important that this is given priority by government.

Ends.

[1] MHCLG (2019) Modern Methods of Construction: introducing the MMC definition framework.
[2] GLA (n.d.) Rapporteur review: The potential of modular housing to help solve London's housing crisis.
[3] Inside Housing (2023) Does MMC have a future?
[4] Trower and Hamlins (2022) Funding and development of modular housing: a view from the public and private sectors, p.12.
[5] Trower and Hamlins (2022) Funding and development of modular housing: a view from the public and private sectors, p.12.
[6] Inside Housing (2023) Does MMC have a future?
[7] Quoted in Inside Housing (2022) Landlord closes both its loss-making modular factories.
[8] Quoted in Inside Housing (2023) Legal & General to 'cease production' of new homes at modular factory.
[9] Trower and Hamlins (2022) Funding and development of modular housing: a view from the public and private sectors, p.12.
[10] Trower and Hamlins (2022) Funding and development of modular housing: a view from the public and private sectors, p.6.
[11] Trower and Hamlins (2022) Funding and development of modular housing: a view from the public and private sectors, p.6.
[12] Cambridge Centre for Housing & Planning Research (2021) Deploying modular housing in the UK: exploring the benefits and risks for the housebuilding industry.
[13] Trower and Hamlins (2022) Funding and development of modular housing: a view from the public and private sectors, p.6.
[14] Cambridge Centre for Housing & Planning Research (2021) Deploying modular housing in the UK: exploring the benefits and risks for the housebuilding industry, p.18-19.
[15] Cambridge Centre for Housing & Planning Research (2021) Deploying modular housing in the UK: exploring the benefits and risks for the housebuilding industry, p.19.
[16] Trower and Hamlins (2022) Funding and development of modular housing: a view from the public and private sectors, p.10.
[17] BSI Group (2023) Modern methods of construction: offsite construction of residential buildings.
[18] Cambridge Centre for Housing & Planning Research (2021) Deploying modular housing in the UK: exploring the benefits and risks for the housebuilding industry, p.8.
[19] Make UK Modular (2022) Greener, better, faster: modular's role in solving the housing crisis.
[20] Arup (n.d.) How Modern Methods of Construction can deliver 'more' through the planning system.
[21] UK Collaborative Centre for Housing Evidence (2023) The potential role of Modern Methods of Construction in addressing systemic supply issues, p.37.
[22] See Welsh Government (2020) Re-imagining social house building in Wales: A Modern Methods of Construction Strategy for Social Housing; Welsh Government (2020) Innovation Housing Programme (IHP) & Modern Methods of Construction (MMC): Guidance Document 2020-21 (Year 4).
[23] UK Collaborative Centre for Housing Evidence (2023) The potential role of Modern Methods of Construction in addressing systemic supply issues, p.23-25.
[24] Cambridge Centre for Housing & Planning Research (2021) Deploying modular housing in the UK: exploring the benefits and risks for the housebuilding industry, p.20.
[25] Cambridge Centre for Housing & Planning Research (2021) Deploying modular housing in the UK: exploring the benefits and risks for the housebuilding industry, p.16.
[26] Inside Housing (2023) Government accused of 'suppressing' report into safety of modular building.
[27] NFCC (2022) Modern Methods of Construction Policy Position Statement.
[28] Homes England (2023) Homes England strategic plan 2023 to 2028. Quotes from p.20 and p.40 respectively.
[29] CIH (2023) Homes at the heart – a strategy for housing, p.20-22.
[30] Make UK Modular (2022) Greener, better, faster: modular's role in solving the housing crisis.

[31] UK Collaborative Centre for Housing Evidence (2023) The potential role of Modern Methods of Construction in addressing systemic supply issues.
[32] Arup (n.d.) How Modern Methods of Construction can deliver 'more' through the planning system.
[33] See www.cornerstoneplace.co.uk
[34] Make UK Modular (2022) Greener, better, faster: modular's role in solving the housing crisis, p.8.
[35] Trower and Hamlins (2022) Funding and development of modular housing: a view from the public and private sectors, p.4.
[36] Trower and Hamlins (2022) Funding and development of modular housing: a view from the public and private sectors, p.4.
[37] Inside Housing (2023) As L&G's factory is shuttered, problems emerge with some finished homes.
[38] Cambridge Centre for Housing & Planning Research (2021) Deploying modular housing in the UK: exploring the benefits and risks for the housebuilding industry, p.16.
[39] Cited in Cambridge Centre for Housing & Planning Research (2021) Deploying modular housing in the UK: exploring the benefits and risks for the housebuilding industry, p.16.
[40] Make UK Modular (2022) Greener, better, faster: modular's role in solving the housing crisis, p.22.
[41] Nazir, F.A. et al. (2021) Comparison of modular and traditional UK housing construction: a bibliometric analysis, Journal of Engineering, Design and Technology 19 (1).
[42] McKinsey (n.d.) Modular construction: From projects to products in brief.
[43] Trower and Hamlins (2022) Funding and development of modular housing: a view from the public and private sectors, p.4.
[44] McKinsey (n.d.) Modular construction: From projects to products in brief.
[45] CIH (2019) Written evidence submitted to the HCLG Committee inquiry into modern methods of construction.
[46] Loizou, L. et al. (2021) Quantifying Advantages of Modular Construction: Waste Generation, Buildings 11 (12).
[47] Loizou, L. et al. (2021) Quantifying Advantages of Modular Construction: Waste Generation, Buildings 11 (12).
[48] Make UK Modular (2022) Greener, better, faster: modular's role in solving the housing crisis, p.15.
[49] Arup (n.d.) How Modern Methods of Construction can deliver 'more' through the planning system, p.5.
[50] Arup (n.d.) How Modern Methods of Construction can deliver 'more' through the planning system, p.4.
[51] Make UK Modular (2023) Who will be the builders? Modular's role in solving the housing labour crisis, p.6.
[52] Nazir, F.A. et al. (2021) Comparison of modular and traditional UK housing construction: a bibliometric analysis, Journal of Engineering, Design and Technology 19 (1).
[53] Make UK Modular (2023) Who will be the builders? Modular's role in solving the housing labour crisis, p.8.
[54] Make UK Modular (2023) Who will be the builders? Modular's role in solving the housing labour crisis, quote from p.8.
[55] McKinsey (n.d.) Modular construction: From projects to products in brief.
[56] Cambridge Centre for Housing & Planning Research (2021) Deploying modular housing in the UK: exploring the benefits and risks for the housebuilding industry, p.14.
[57] Make UK Modular (2022) Greener, better, faster: modular's role in solving the housing crisis, p.18.