

COMMUNITY & ENTERPRISE OVERVIEW & SCRUTINY COMMITTEE

Date of Meeting	Wednesday 18 th September 2019
Report Subject	Modular Building
Cabinet Member	Cabinet Member for Housing
Report Author	Chief Officer (Housing & Assets)
Type of Report	Operational

EXECUTIVE SUMMARY

This report provides an update on the progress made to date on the use of Modern Methods of Construction (MMC) in Flintshire. The report details recent developments in the sector and identifies the benefits of the different technologies and arrangements which the use of MMC offers.

The report also details the current position in Flintshire and the use of MMC at Garden City on a 12 apartment scheme through the Welsh Government's Innovative Housing Programme (IHP).

The report also identifies initiatives being developed by partner organisations who are utilising MMC on their respective housing schemes and achieving broader social and employment initiatives.

Finally, the report details future opportunities for Flintshire to work in collaboration with partner agencies to deliver future MMC schemes.

RECOMMENDATIONS

1. Scrutiny is asked to support our approach in exploring and testing out Modern Methods of Construction and Modular Building to complement existing house building programmes.

REPORT DETAILS

1.00	BACKGROUND
1.01	<p>In his 2016 report about the construction industry, <i>Modernise or Die</i>, Mark Farmer identified a skills crisis in mainstream construction, likely to result in a decrease of 20-25% in the workforce over the next decade. It is well documented that the construction workforce is ageing, and the rate of new entrants is lagging behind those leaving. This is likely to be exacerbated by Brexit, as one in eight UK construction workers are foreign, rising to around one in four in London. In addition, the weakening pound has increased the cost of imported materials, with some 20% of bricks and brickmaking components imported, mostly from the European Union.</p>
1.02	<p>A combination of acute housing demand and market failures in terms of cost, quantity and quality, are forcing the industry to look at Modern Methods of Construction (MMC) as a solution. This has culminated in both the respective UK and Welsh Governments recognising that MMC has the potential to speed up delivery, improve productivity and modernise the sector.</p>
1.03	<p>The Independent Review of Affordable Housing Supply in Wales, led by Lynn Pamment, published its final report in May 2019, with 48 recommendations to increase the supply of affordable housing in Wales. The report recognised the important role that MMC can play in increasing the pace and scale of construction in Wales and in particular, the role it can play in achieving the Welsh Government's ambition on carbon reduction.</p>
1.04	<p>The market for MMC is still at the early stage of its development, particularly in Wales, and alongside their key recommendations, the Panel made further detailed recommendations to develop an assurance framework to support its development. These are set out in item 1.05 below.</p>
1.05	<p>The Panel's key recommendations:-</p> <ul style="list-style-type: none"> • Welsh Government should continue to support the trialling of Modern Methods of Construction (MMC) to help establish which methods can contribute to the objective of increasing the scale and pace of affordable housing with the existing resources available. • Welsh Government should develop a strategy to map out how Wales could further use off-site manufacturing (OSM) and MMC to deliver near zero carbon homes along with an appropriate timetable for achieving this.
1.06	<p>The Minister has now accepted these recommendations and Welsh Government has prepared a consultation document "<i>Re-imagining social house building in Wales, An Off-Site Manufacturing Strategy for Wales</i>". This strategy is aimed at social and affordable housing providers in Wales and sets out expectations relating to the Off-Site Manufacture (OSM) of homes, in order to provide clarity for leaders of Housing Associations, Local Government and private businesses. It aims to encourage organisations to relook at the building of new social housing, and consider complimenting traditional</p>

	construction methods, with new technologies and approaches to home building
1.07	Modern Methods of Construction (MMC)
1.08	Appendix 1 summarises the growing number of emerging MMC technologies and building solutions. The reason for such faith being placed on MMC can be attributed to three key elements reflecting the three principles driving change in the construction sector: Digitisation, Manufacturing and Performance.
1.09	The utilisation of pre-manufacturing technologies brings construction into the modern age by transferring production to the factory. With greater quality control and more efficient use of materials and labour, employing manufacturing techniques will boost productivity, enabling faster scheme delivery with less risk of programme disruption on site. With scale, costs can be reduced through greater efficiency in a safer, controlled environment for workers.
1.10	Digitisation may be deployed both in the production process to achieve precision assembly, and also provided through Building Information Modelling (BIM) and successor models, a dynamic database which is capable of tracking the unit through design, specification, procurement, construction/assembly, quality control and finishing, handover, letting/selling, residential occupation and management, depreciation and replacement and recycling and renewal. Digitisation has the potential to transform stakeholder confidence in the product including that of investors, manufacturers, builders, surveyors, lenders, insurers, managers, and, of course, consumers.
1.11	Performance will be much more closely monitored and scrutinised through digitisation and manufacturing. Moreover, for industry, MMC provides constructors and developers with wider options. By having a different profile and properties, MMC supplements existing capabilities. This introduces a new dynamic into a traditionally rigid operating environment, particularly around labour and resource factors, planning and engineering constraints, and sustainability and environmental performance.
1.12	Barriers to change
1.13	Given the stated advantages, MMC can become much more prominent in the sector. However, there are obstacles to overcome before MMC becomes mainstream.
1.14	Supply chain
1.15	The supply chains for many MMC technologies have yet to develop to a point at which it can meet the ambitions for the sector. Demand fluctuations, unstable investment and construction cycles, and a fragmented housing market procurement model is obviously not a good fit with factory production.

1.16	Skills
1.17	The skills issue in the construction sector can also impact on the development of offsite construction. Assuming that there are no skills or labour supply problems at the factory end, there will still be the requirement for sub-structure, superstructure and finishing trades on site, as well as issues around utilities. Moreover, as MMC strategies are tied into digitisation, IT literacy amongst construction workers will be a concern. Given the recent pattern of concentration and fragmentation in the sector, high levels of investment in training and education will be required, not least with regard to growing SMEs and new entrants into the evolving market.
1.18	Cost and data
1.19	From a cost, value and performance perspective, modern offsite construction is relatively untested and is still in an evolutionary phase. The data on cost of construction, value and performance using offsite is not robust yet, and as techniques evolve, cost information and performance changes, and previous data becomes obsolete. This makes it hard for the industry to estimate costs, assess benefits and plan appropriately. This is an issue for investors, lenders, valuers and insurance/warranty providers naturally concerned about product durability, value and ongoing maintenance cost. In recent years key players such as Barclays and HSBC have now entered the market.
1.20	Susceptibility to Fire
1.21	Concerns have also been raised around potential fire issues in relation to MMC. However, timber frame construction meets the fire resistance qualities required to achieve Building Regulations part B.
1.22	Changing work profile and inflexibility
1.23	As the objective is for up to 70% of cost to be incurred offsite in factories and at the design phase, the points at which labour is most intensively used throughout a project differs from traditional build, with the cost curve far more front-loaded. This cost profile demands a 'right first time' ethos from initiation. This also means less flexibility to change elements of the projects later on. That is to say, as a large portion of labour and other cost is generated early, there is greater project risk earlier, which is exacerbated by uncertainty around land and planning, and development period funding.
1.24	Industry familiarity
1.25	Lack of familiarity with different offsite construction techniques can lead to risk averse decisions against its use. This is reinforced by the subcontracting model and informal networks.
1.26	Consumer perception
1.27	There is still consumer resistance, with an abiding image of post-war emergency housing rather than 21st Century technology delivering better quality, safer, and far more cost-effective and highly energy efficient homes at the same or, with upscaling, at a lower cost.

1.28	Standardisation and scalability
1.29	Standardisation of different technologies is also critical to reducing complexity and achieving deliverable solutions to meet a variety of property and tenure types.
1.30	Welsh Government Housing Innovation Programme (IHP)
1.31	In order to address some of these issues and also stimulate the uptake of MMC and other innovative methods of construction, the Cabinet Secretary for Communities and Children announced the Innovative Housing Programme (IHP). This followed the publication of the Farmer Report into the construction industry which indicated that the construction sector must ' <i>Modernise or Die</i> ' and the 'More: Better' report into modern methods of construction. The latter was commissioned by Welsh Government.
1.32	Aims and Objectives of the IHP
1.33	<p>The scheme seeks to support innovation in a broad context covering construction techniques, delivery pathways and housing types across all tenures. Refurbishment of existing residential dwellings is not eligible. The main aims of the IHP are to:</p> <ul style="list-style-type: none"> • Increase the supply of affordable housing as part of the 20,000 additional affordable homes target, set by Welsh Government. • Do this in a way that aligns with the design and delivery of affordable housing with the seven goals of the Wellbeing of Future Generations Act (WFGA); • Address cost and value in new homes, and develop housing that meets specific current and future housing needs; • Provide support for those willing to innovate through the use of alternative approaches; • Demonstrate benefits associated with alternative approaches, with a view to encouraging wider uptake; • Harness opportunities to deliver jobs, skills training, and develop local industry; • Publicly disseminate key findings and maximise learning; • Help to tackle poverty by providing homes which are more energy efficient and cheaper to run; • Support wider regeneration and economic development.
1.34	The IHP has a target of 1,000 affordable homes as part of the Welsh Government's 20,000 affordable homes target and has been approved for three years, with a budget over this period of £90 million. The Programme was launched in 2017/18. Twenty demonstrator affordable housing projects from housing associations and local authority projects were funded in 2017-18 – Year 1, with a total grant commitment of £19 million.
1.35	Land at St Andrews Church, Garden City
1.36	The Minister for Housing announced on October 16th that Flintshire had been successful with its submission for the development of 12 apartments with the

	flexibility to meet changing needs in social housing including apartment's size, wheelchair accessibility and supported living on land at St Andrews Church, Garden City. Appendix 2 provides plans for the proposed scheme.
1.37	The scheme is being delivered through the Strategic Housing And Regeneration Programme (SHARP) and marks a new way of developing affordable homes for the Council. Work commenced in June 2019 and will be completed by March 2020. This will bring the total number of properties completed or approved by Cabinet, and delivered by SHARP, to 305. The properties will be managed within the Council's Housing Revenue Account (HRA) and will be sufficiently flexible to house a range of local people as well as enabling the Council to explore different delivery models.
1.38	Monitoring and Evaluation
1.39	Meeting the research aims set out in the technical specification is integral to the success of the IHP. The scheme will be required to participate in the monitoring and evaluation exercise as a condition of grant. Welsh Government intends to build an evidence base of what works and what doesn't, to inform future policy and investment decisions.
1.40	Future Opportunities for MMC
1.41	A number of housing association partners zoned in Flintshire are developing new social and affordable housing units in Flintshire which utilise MMC technologies.
1.42	Former Buckley Medical Centre
1.43	Grŵp Cynefin has specified Welsh timber for a scheme of 24 apartments now under construction in Buckley town centre. Residents will also benefit from a significant reduction in energy costs, thanks to a specification to optimise energy-efficiency.
1.44	Built on the site of the former Buckley Medical Centre, the two-storey timber-framed building will comprise 14 two- and ten one-bedroom apartments. Being developed in partnership with Flintshire County Council, one section of its roof will comprise photo-voltaic (PV) panels, helping minimise running costs for the all-electric properties. The timber is from Sitka spruce tree sourced from forests around a sawmill in Newbridge, near Llandrindod Wells, mid-Wales. The frames are manufactured in Bala and have been delivered in small batches for assembly on site.
1.45	Modular House Factory, Cartrefi Conwy
1.46	Cartrefi Conwy has opened a new 'modular house' factory to produce low-energy homes with running costs of just £200 a year. The facility, on Holyhead's Penrhos Industrial Estate, has made the timber frame for a new bungalow in less than three days and already has orders for more than 40 houses. The venture is believed to be the first of its kind by a social enterprise in Wales and has created four new jobs, with more in the pipeline as the operation grows. One of the benefits is that the houses can be erected within 10 days once on site.

1.47	<p>They already have contracts to provide homes for Anglesey County Council, Cartrefi Conwy and Conwy County Borough Council and there is “considerable interest” from other local authorities and housing associations across North Wales and the North West. Creating Enterprise, based at the Cartrefi Conwy Business Park, in Mochdre, near Colwyn Bay, was established in 2015. The social enterprise, the first of its kind in Wales, also runs an Employment Academy to provide opportunities, training and qualifications for unemployed local people, including Cartrefi Conwy tenants.</p> <p>They have now partnered with Norfolk-based Beattie Passive, the UK’s leading manufacturer of advanced passivhaus homes, low-energy buildings, which can save residents up to 90% in annual energy costs.</p>
1.48	Berwyn Prison
1.49	<p>Flintshire has recently begun early dialogue around the principle of working with HMP Berwyn and a private sponsor to build timber frame buildings or pods for either existing projects or for the planned refurbishment of the Riverside Traveller site in Queensferry. The project could support affordable housing being built by the men at Berwyn so giving them realistic prospects of future employment and an emotional link to the programme as ultimately this could be their accommodation going forward.</p>
1.50	<p>Working with Berwyn on the Riverside development may also break down any perceived barriers between the gypsy and traveller community, the settled community and men serving custodial sentence. This will embrace the principles around the Future Generations Act and the priorities for our Local Authority.</p>

2.00	RESOURCE IMPLICATIONS
2.01	No resource implications associated with this report.

3.00	CONSULTATIONS REQUIRED / CARRIED OUT
3.01	No consultation undertaken / required as part of this report.

4.00	RISK MANAGEMENT
4.01	No risk required with this report.

5.00	APPENDICES
5.01	Appendix 1 - Summary of Modern Methods of Construction.

6.00	LIST OF ACCESSIBLE BACKGROUND DOCUMENTS
6.01	<p>None.</p> <p>Contact Office: Melville Evans Job Title: Housing Programmes Manager Telephone: 01352701436 E-mail: Melville.evans@flintshire.gov.uk</p>

7.00	GLOSSARY OF TERMS
7.01	<p>Modern Methods of Construction - is a collective term used to describe a number of construction methods. The methods being introduced into UK house building differ significantly from so-called conventional construction methods such as brick and block.</p>
7.02	<p>Building Information Modeling (BIM) - is an intelligent 3D model-based process that gives architecture, engineering, and construction (AEC) professionals the insight and tools to more efficiently plan, design, construct, and manage buildings and infrastructure.</p>