Delivering More Homes and a Long-lasting Housing Stock

A response by the Modern Masonry Alliance to "Fixing our broken housing market", the Housing White Paper by the Department of Local Communities and Government, February 2017

The Modern Masonry Alliance (MMA)

The Modern Masonry Alliance seeks to ensure developers and designers, customers and occupants understand the benefits of masonry solutions. It provides guidance on best practice for the design of masonry and evidence to government and stakeholders of how masonry can contribute to a sustainable built environment. Founding funders of MMA are Aircrete Product Association, Brick Development Association, Concrete Block Association and Mortar Industry Association.

Market Context

According to the National Audit Office (NAO) [1] the need for new housing in England has in recent years grown faster than its supply, and housebuilding needs to increase across the country.

Two of the Department for Communities and Local Government's (DCLG) four strategic objectives for this Parliament are focused on housing: increasing home ownership and increasing the supply of homes, with an ambition of delivering a million new homes in England by 2020.

Projections suggest there will be at least 227,000 new households formed each year between 2011 and 2021. This is substantially higher than the annual average of 166,000 extra homes in England over the last 10 years. Delivery of the Government's million new homes ambition by 2020 will require 174,000 net additions each year.

Modern Masonry Alliance Response to the Government's Housing White Paper

Masonry solutions are already contributing to over 80% of the housing market (as evidenced by National House Building Council (NHBC) statistics). Output has been increased in recent years to meet increased demand and new capacity is already in place to maintain and increase output to help meet the Government's aspiration of a million new homes by 2020. The MMA confirms its general support for the need for more housing.

The DCLG's Housing White Paper, 'Fixing our broken housing market', was published on 7th February. The MMA supports the broad analysis and recognition of past problems limiting growth in housing numbers stated in the White Paper, as well as the inclusion of helpful recommendations such as the promotion of and aid for small and medium sized home-builders. However, the White Paper incorrectly attributes delay to shortcomings in traditional construction and is misinformed as to the contribution offsite construction methods can make in terms of numbers, long-term quality and immediate delivery.

Nearly all of the factors behind the shortage of new homes are outside the control or influence of product manufacturers, as is evidenced by the consultation; they include access to finance and land, a range of planning issues and the fact that, up until now, delivery has been concentrated within private sector housing for purchase.

1. Invest in proven products with a proven track record and a long-life

There are now potentially new players that may change market dynamics well beyond the changes proposed by Government in the White Paper. In particular, the build-to-rent sector, housing for the growing senior living sector and now the potential re-entry of Local Authorities led by Homes England (formerly Homes and Communities Agency (HCA)). All of these have a long-term interest in their housing stock, making masonry with its proven track record, durability and resilience an attractive option.

The HCA has been reported as stating that public money will be used to fund land and factory construction for offsite and modern methods of construction, in line with the tenor of the White Paper analysis and proposals. This, however, leads to a real concern that Government policy is now incentivising certain construction methods and materials at the taxpayers' expense, which could lead to an increase in imported materials at the detriment of UK GDP.

The current proposals to favour offsite and modern methods of construction, fail to recognise the long-term benefits of masonry and potentially give rise to the risk of focusing on speed at the expense of long-term quality, durability, long-life and whole-life carbon reduction.

Support for increased offsite construction and even the expenditure of public funds to provide land and factories which may stimulate greater use of imported materials rather than indigenous materials needs to be questioned, particularly when local product and labour is available, which avoids the need to wait for new factories to be built, and for factory workers skills to be developed before production can commence.

The Government's focus on new and modern methods of construction to meet the immediate requirement and challenge of a million new homes within the term of this Parliament ignores the sector that is already contributing over 80% of current output and which has existing capacity for expansion.

Members of both the Home Builders Federation (HBF) and the Federation of Master Builders (FMB) see no reason to change their position and the use of masonry construction is still overwhelmingly the solution of choice.

2. Invest in a UK supply chain and increase production to deliver more homes

HBF claims to have increased supply by 52% over the last 3 years (2013-2016) [2] and NHBC statistics show an increase overall of 22% in total completions over that period [3].

This expansion has been supported by the increase of blockwork manufacturing output, which is already in hand through investment in new production lines and additional working shifts as well as further measures to improve and increase skilled trades/training. This will be aided further by proposed measures to encourage small and medium sized contractors back into house-building where the size of projects undertaken is most likely to favour flexible off-the-shelf masonry solutions.

Offsite construction has hitherto been limited in its application, needing high throughputs and significant repetition to be cost effective. It also requires long-term certainty to attract investors for the appropriate investment in time, essential research, production facilities and trained operatives. Whilst offsite may have a role to play, masonry was and will always remain the main solution and is a proven product that is available now.

3. Masonry: local, low carbon and long-lasting

Masonry is a locally and responsibly produced, long-life, low carbon, lowest cost option and requires little or no imports. Local jobs and industries already exist and need support: why resort to and encourage further use of imported materials? Housing built with masonry and concrete construction has inherent whole-life benefits of fire resistance, acoustic separation and climate change resilience (flooding, overheating and extreme weather) that outlast short-term, lightweight, imported systems.

Masonry is a low carbon product that has high thermal mass properties, which, when used correctly in buildings, enables the storage and then slow release of heat. This has the effect of stabilising the temperature within a building so that less heating is required in winter and less cooling is required in summer. This in turn reduces the energy demand of buildings such that the embodied carbon dioxide of a typical building can be "paid off" within 11 years [4]. This 'demand side flexibility' offered by heavyweight buildings could be a key solution to the growing imbalance between energy demand and renewable energy generation [5]. As space heating alone accounts for around 20 to 50 per cent of a building's energy consumption depending on type [6], and around a third of the carbon emissions from all UK buildings [7], masonry and concrete can make a valuable contribution to reducing emissions in residential and service sectors.

Masonry is also a very durable material and when it eventually reaches end of life, it is 100% recyclable. Also, masonry is fire resistant. Government statistics show that fires in timber-framed buildings are more extensive than those of no special construction [8]. Choosing masonry protects property against fire damage.

Concrete blocks gradually absorb carbon dioxide through a natural process called carbonation. This process reduces the embodied carbon of concrete blocks by around a third over the lifecycle of the material [9].

4. Masonry Homes: energy efficient

A study by Arup [10], shows that any additional embodied carbon included in a traditional masonry built house can be offset by the energy savings from thermal mass from between 11 and 21 years depending on the density of the blockwork, and from that time on can have a lower whole-life carbon footprint than equivalent timber frame housing. The thermal mass of concrete and masonry also provides some additional protection from overheating and ultimately delays any future requirement for energy intensive air-conditioning.

5. Masonry: resource efficient

As part of the Concrete Industry Sustainable Construction Strategy, the concrete sector in partnership with the brick industry has invested in Resource Efficiency Action Plans. These REAPs were developed with stakeholders and aim to ensure that efficiencies are explored to protect resources, reduce waste and provide the most sustainable and efficient buildings over their whole lifecycle.

One aspect of resource efficiency is longevity – doubling longevity is as effective as halving resource use. As can be seen from our existing housing stock, masonry and concrete give long-term durability and robustness and can last for hundreds of years if maintained. This long-service life of our housing must not be compromised if we are to provide a long-term solution to housing an increasing population.

6. Masonry Homes: resilient to climate change

Climate change resilience is a matter of ensuring that homes, buildings and infrastructure are resilient to the impacts of a changing climate. Thus, resistance to overheating [11], flooding, storm, high winds and extreme weather events is critical when investing in our housing of the future. Once again, the inherent characteristics of heavyweight solutions, such as concrete and masonry housing, can meet all the requirements.

7. Masonry does not burn and has superior fire resistance

Since the Great Fire of London, masonry solutions have been recommended to address the risk of fire spread both within buildings, between buildings and to reduce the combustible structural content in our urban environment. Fire safety for occupants of dwellings is included in Building Regulations. However, the safety of firefighters, (knowledge of building combustible content and quantum of combustible material) has not been addressed elsewhere. Neither have the needs of fire protection to protect property structure and its ability to be quickly or cost effectively reinstated after a fire (a key insurance issue) nor the potential risks evident during construction and pre-completion, which have been highlighted by a series of unfortunate incidents where combustible materials have been used as structure.

Government statistics show that the impacts of fire are greater in buildings of combustible construction [8].

Whilst recognising that fires occur in all building types and forms of construction a recent document endorsed by LABC, FPA, ASFB and RISC advises; "Masonry buildings are by their nature and materials resistant to fire. The designer or specifier should remember that this fundamental quality leads to simpler detailing and construction and this simplicity in turn benefits the thermal and acoustic detailing as well as the construction. Masonry is an excellent material for a 'fabric first' approach".

8. Time, cost and flexibility

Masonry materials can be bought in bulk or off-the-shelf from a builder's merchant. They lend themselves to swift programme changes and are flexible for a range of solutions. Their lead-in-time is relatively short, thus able to match the overall order-to-completion times of offsite solutions. This procurement path, linked with available skills and the lowest cost, lend themselves to the current private housebuilders' programmes. Concrete and masonry solutions can be sped-up and slowed down to meet sales rates and protect the cash-flow of house builders.

Much of our future housing will be on brownfield sites, infill and small additions to our existing cities, towns and villages, each with their own vernacular and local requirements. The flexibility and versatility of concrete and masonry solutions can easily meet the demands of localism.

9. Innovation

Innovation is required in all sectors from materials to construction and design. The masonry industry is already investing in major developments in Building Information Modeling (BIM), Environmental Product Declaration (EPD), novel cements, but these and future innovations need time to develop and market confidence to encourage investment. Existing products can also be part of innovative design solutions, such as achieving Passivhaus performance standards or being part of floating houses in flood-prone areas – there are many exemplars for a wide range of situations and scenarios.

10. Home buyers confidence for healthy and energy efficient homes

BRE have recently launched a new Home Quality Mark scheme, that focuses on the interests and drivers of homeowners and aims to differentiate on quality in areas such as flood resilience, safety and security, air quality, noise, cost, energy reduction, renewable energy, overheating risk/controlled ventilation, responsible ethical materials selection, low environmental impacts, life cycle costs, durability and resilience, combustibility, water efficiency, space efficient functional and adaptable design. As with BREEAM rated buildings, the benefits of masonry and concrete will enable designers to use these materials to meet the highest standards.

Modern Masonry Alliance - Recommended actions for policy-makers

- Build on existing supply chains for local materials and an immediate response.
- Expand and re-engage existing skilled work force as well as increase training provision.
- Increase funding for training provision.
- Ensure that Planning and Building regulations encourage whole-life sustainable solutions.
- Ensure that whole-life measurement is a basis for assessment of appropriate design solutions.
- Ensure that housing solutions are climate resilient.
- Adopt homeowner's principal quality criteria.
- Increase quality control via Building Control.
- Add protection of fabric in the event of fire to the current protection of occupants in the Building Regulations.

Modern Masonry Alliance - Proposed actions for our Members

- Maintain capacity surveys and continue actions to further increase supply.
- Increase training including commitment to Sustainability Supply Chain School.
- Continue to commit to targets, actions and data collection as part of Concrete Industry Sustainable Construction Strategy, and publication of annual performance report and Resource Efficiency Action Plans.
- Continue dissemination of good practice to designers, specifiers and stakeholders.
- Continue with lowering carbon and other emissions in line with Government commitments to 2050.
- Continue investment in innovation, novel cements, BIM, EPDs, and other material and construction method improvements.
- Maintain the most cost-effective solutions for new build housing.

Note: Specific Consultation Response: Question 35 on Resilience

MMA support the proposals to amend national policy to:

a) Amend the list of climate change factors to be considered during plan-making, to include reference to rising temperatures.

Masonry homes are inherently well suited to tackle the overheating issue by virtue of the thermal mass they provide. Thermal mass is a useful attribute of concrete blocks, which can be used to good effect when designing in measures to control overheating. It basically describes the ability of masonry and other medium/heavyweight materials to soak up excess heat inside a building, without the structure warming significantly. The consequence is that when used in the construction of a dwelling's walls and floors, the rooms can maintain a relatively stable temperature during warm conditions, improving occupant comfort and lowering the risk of overheating. The thermal mass provided by lightweight homes manufactured offsite is minimal and cannot be used to help control overheating.

b) Make clear that local planning policies should support measures for the future resilience of communities and infrastructure to climate change.

Designing resilient homes:

An increasingly important benefit of concrete and masonry buildings is the inherent resilience they provide to a range of environmental risks, particularly flooding and overheating [12]. An overview of these topics and links to further information are provided below, along with information on fire, which is another resilience issue where concrete and masonry performs well. For a broad overview, the publication This is Concrete – Ahead of the Game Building Resilience [13] provides a range of articles on topics including: climate change; whole-life and sustainable industry performance; high-performance homes; and concrete credentials.

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Modern Masonry Alliance
The Old Rectory, Main Street,
Glenfield, Leicestershire LE3 8DG
Tel +44 (0)116 2325170

www.modernmasonry.co.uk
Twitter: @masonrymodern

modern masonry ALLIANCE