

# Call for Evidence Submission



## **Inquiry: The Quality of New Build Housing in England**

**By: All Party Parliamentary Group for Excellence in the Built**

**Environment** Written submissions should be sent electronically to the APPGEBE Secretary, Graham Watts OBE c/o [APPGInquiry@cic.org.uk](mailto:APPGInquiry@cic.org.uk)

**Response from: The Concrete Centre, part of the Mineral Products Association (MPA)**

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### **Background to Mineral Products Association (MPA)**

This submission is on behalf of the members of the Mineral Products Association, representing the major material and product supply chain of the construction sector including concrete, masonry and mortar products. These UK produced and responsibly sourced local materials are the construction solution for the majority of new build housing and our members are committed to providing products with excellent performance credentials and engaging with designers and stakeholders to ensure that concrete and masonry solutions continue to meet the demands of our long term housing needs.

The Mineral Products Association (MPA) is the United Kingdom trade association for the aggregates, asphalt, cement, concrete, dimension stone, lime, mortar, and silica sand industries. With the recent addition of The British Precast Concrete Federation (BPCF) and the British Association of Reinforcement (BAR), it has a growing membership of 480 companies and is the sectoral voice for mineral products. MPA membership is made up of independent SME companies throughout the UK, as well as the 9 major international and global companies. It covers 100% of GB cement production, 90% of aggregates production and 95% of asphalt and ready-mixed concrete production and 70% of precast concrete production. Each year the industry supplies £21 billion worth of materials and services to the Economy and is the largest supplier to the construction industry, which has annual output valued at £135billion. Industry

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production represents the largest materials flow in the UK economy and is also one of the largest manufacturing sectors.

In a typical year, the UK mineral products industry supports:

- the building of over 100,000 new homes
- over £7 billion of school and university improvements
- maintenance of our 230,000-mile road network
- a £3 billion programme of improvements to water services
- over £3.5 billion of investment in our rail network
- supplies of special sands for glass foundry and other industries
- cleansing of emissions from coal-fired power stations

In addition:

- every year over three tonnes of aggregates are needed per head of the population in the UK. 30% of industry supply is from recycled sources.
- a typical family indirectly demands a lorry load of aggregates each year.
- a new house requires some 50 tonnes of aggregates.
- the mineral products industry employs around 70,000 people directly and indirectly.

The MPA is pleased to submit on behalf of its members to the Inquiry into the Quality of New Build Housing in England.

## **1. Introduction**

The inquiry is tackling the potential impacts from the commitment to build up to 1m new homes during the lifetime of this parliament, requiring a nearly 20% compound growth over that period from existing estimated levels and if achieved will require a range of solutions and players from both public and private sectors.

The question as to whether increased output will put a strain on quality is sound, as is the assumption that quality can always be improved. **Quality** and **quantity** can be interdependent but are not the same, but each have a direct link with **time** and **cost**.

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The quality of our new build housing has always been important but has in the past been too often sacrificed for cost and time. That is not to deny their own importance but in 50-100 years' time who will ask how much did this cost and how quickly was it built; assuming that the home has lasted that long.

The benchmark for quality should surely be that homeowners and occupiers of the future are able to proclaim that their homes provide high quality, comfortable and affordable accommodation in a quality environment capable of adaptation to a changing climate and its potential consequences such as overheating, flood, storm, wind and fire.

Currently representing some 85% of market share as measured by NHBC statistics, masonry and concrete is predominant and uses local materials and labour thus reducing the carbon footprint but also contributing to our economy.

Many of the challenges to housing quality may be outside the influence and remit of material/product suppliers, but an ongoing and concerted investment by the industry to provide appropriate, sustainable and high quality materials has meant that market share of has been improved upon over the last few years. This in a regulatory climate where standards for both technical and sustainability performance are increasing and concrete and masonry solutions are continuing to meet and exceed performance requirements.

Recent high level discussions between senior representatives of MPA and HBF members have discussed and given assurance as to the ability of the concrete and masonry sectors to grow their output to meet this potential increased demand. It is recognised that to meet this target the supply chain will need to provide housing solutions developed across a range of scales from single-dwelling self-build projects and SME builders to major new towns and development areas for private and public sectors.

However, it is acknowledged that there are more challenges for the built environment ahead. The Concrete Industry Sustainable Construction Strategy, evidenced by its annual reporting of progress since 2008, its 2020 targets and a sector wide commitment to improving service to stakeholders, is just one example of how this UK industry is prepared for the demands of our built environment. The industry is capable and prepared for the increase in demand for

products/materials emanating from an increase in new build housing and the performance credentials required to meet and exceed the standards for building fabric and design.

Increased housing provision requires increased capital investment which at present is not available in the quantity called for, however our submission is premised on the assumption that this major hurdle is addressed by new sources of funding and that the target of 1 million new homes can be paid for and built by 2020.

## 1.1 Headline recommendations for improved quality;

- **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.**
- **Provide increased funding for material innovation and building methods.**
- **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 home owner'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.**
- **Implement regulatory and mineral planning reform for appropriate expansion of local material extraction/use.**

## 1.2 Actions by MPA Members

- **Complete capacity survey and actions.**
- **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, 3d printing and other material and construction method improvements.
- Maintain the most cost-effective solutions for new build housing.

## 2. Quantity

Masonry construction currently represents some 85% of market share as measured by NHBC statistics, is meeting current demand and is able to meet and exceed the highest performance standards.

The Mineral Products Association and its sectors representatives from British Precast, British Ready Mixed Concrete Association, Modern Masonry Alliance and The Concrete Centre have already met with the Home Builders Federation to discuss increased material availability in a future where significant increases may be required.

Over the last two years, following a prolonged recession, capacity has been increased, factories reopened, and new capacity and efficiency measures have been introduced and more is planned.

UK is blessed with plentiful resources of minerals and has a locally based industry utilizing local labour and using locally sourced materials to meet current demand throughout the UK, with significant potential to meet an increase in demand.

However planning is a potential constraint to further medium to long term expansion. Future supply of raw materials needs to be not unreasonably restricted as this in turn may lead to a growth in imported materials, with the environmental and cost impacts that this implies, and lead to a loss of local employment.

## 2.1 Skills

One further constraint outside the control of material production is the availability of construction skills which is acknowledged as a potential barrier to increased output.

Within the range of onsite and offsite solutions offered, all will require re-employment, expansion of skills or re-training in order to provide the necessary workforce to meet increased demand. (HBF have suggested numbers in the region of 90,000).

Training and training centres for masonry construction methods (such as block and brick-laying) are well established and a pool of well-trained operatives still exists which has been built up over the last 40 years. Though many have given up work, re-trained or found other employment during the recession the potential availability is significant. For concrete solutions (including insulated concrete formwork) there are increasing numbers of contractors and builders with experience .

A campaign such as “Housing Needs You” would build on this existing resource along with a range of measures to encourage new entrants and movement of skills and labour into the construction sector to meet the housing need.

Initiatives such as The Sustainability Supply Chain School need further support to enhance and update skills to meet improved standards.

## 3. Quality

This submission concentrates on the production and maintenance of quality materials and products for housing, however whilst concentrating on the material issues we must not lose sight of the need for quality design, townscape, planning, construction and maintenance of our built environment.

In order to disseminate useful technical information The Mineral Products Association and its specialist sector associations, British Precast, British Ready Mixed Concrete Association, Modern Masonry Alliance and The Concrete Centre provide publications and advice on a range of issues to stakeholders, designers, specifiers, contractors and manufacturers.

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Since the advent of the Code for Sustainable Homes, masonry and concrete solutions have shown themselves capable of meeting the highest environmental, energy and aesthetic challenges and now following a period of innovation and refinement offer energy efficient solutions for the long-term future; meeting both current building regulations and anticipated nearly zero energy homes requirements.

Increasingly there is a realisation that not only should we be building homes that are able to reduce whole life energy, in order to meet the objectives of carbon reduction, but also we have to use less resources and materials and ensure that our investment in construction can be resilient to climate change impacts, such as flood, overheating, fire and extreme weather events.

It is acknowledged that masonry and concrete are inherently able to provide energy efficient solutions. A ‘fabric first’ approach to building design involves maximising the performance of the components and materials that make up the building fabric itself, before considering the use of mechanical or electrical building services systems and renewables. This can help reduce capital and operational costs, improve energy efficiency and reduce carbon emissions.

Buildings designed and constructed using the fabric first approach aim to minimise the need for energy consumption through methods such as maximising air-tightness; using super-high insulation; utilising solar gain through the provision of openings and shading; optimising natural ventilation; using the thermal mass of the building fabric; capturing energy from occupants, electronic devices, cookers and so on. This can all be achieved with concrete and masonry construction.

As part of the Concrete Industry Sustainable Construction Strategy, our sector (in partnership with The Brick Industry) has invested in Resource Efficiency Action Plans to ensure that efficiencies are explored to protect resources and reduce waste to provide the most sustainable and efficient buildings across their whole lifecycle.

As can be seen from our existing building stock, masonry and concrete give long term durability and robustness and can last for hundreds of years if maintained. This long-service life must not be compromised, if we are to provide a long-term solution to housing an increasing population.

Concrete and masonry homes also represent an investment in carbon, which over the whole life of a building provides considerable carbon savings compared with other materials, such as timber.

### **3.1 Embodied Carbon**

A published paper, authored by Arup, indicates that the 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 also provides some additional protection from overheating and ultimately delays any future requirement for air conditioning.

### **3.2 Climate Change Resilience**

Climate change resilience is a matter of ensuring that the buildings are resilient to the exigencies of a changing climate. Thus overheating in lightweight homes, resistance to flood, 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.

### **3.3 Alternative methods of construction**

As can be seen from our existing building stock masonry and concrete give long term durability and robustness and can last for centuries, if maintained and occupied. Reviewing previous periods of housing expansion, such as in the 1930's, much is still in use today.

Unfortunately, some of the non-standard housing types built in our more recent past, where speed and low cost were the main drivers have not always been successful; providing homeowners with issues in securing mortgages and insurance. Some of these historic solutions, did not have sufficient, credible, research and testing which led to some wasteful, unsuccessful short term output; many have been demolished or have issues with their longer term adaptability and their life span is limited due to inappropriate social engineering design, technology or material selection.

The challenge of our existing housing stock in relation to its energy efficiency is still a major issue, but where traditional materials have been used there is the potential to extend the life



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of the home and invest in measures to increase performance. For example; the retrofit of a concrete ground floors can increase the thermal mass and flood resilience of existing homes. The inherent durability and thermal mass of our existing concrete and masonry housing stock can help with resilience to climate change including reducing the risks from overheating.

Traditional masonry solutions since The Fire of London have been used to address the question of fire spread both within buildings, between buildings and the reduction of combustible structural content in our urban environment. Fire safety for occupants of buildings 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 longer term fire protection to protect property structure and its ability to be quickly or cost effectively reinstated after a fire (one 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.

Whilst recognizing that fires occur in all building types and forms of construction a recent document endorsed by LABC, FPA, ASFB and RISC Authority 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”.

Concrete and masonry solutions can also address the modern methods of construction agenda; these solutions include thin joint masonry, insulated concrete formwork and single leaf concrete masonry wall construction. All allow a range of options for the external rain screen and elevational treatment, including brick slip, render, timber, glass, and metal panel to meet aesthetic and planning requirements.

High quality offsite concrete and masonry solutions exist (e.g. panelised precast systems) but only represent a small percentage of the market due to the investment levels required and the size of projects necessary for cost effectiveness of the offering. Investment is disincentivised by the historic cyclical nature of housebuilding and the high initial startup costs of factory production common to all offsite systems.

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## **4. Time and cost**

Speed of procurement and construction has to be addressed. Concrete and 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 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 accretions to our existing cities, towns and villages, each with their own vernacular and local requirements. Concrete and masonry flexibility lends itself to the demands of localism at any scale.

Offsite solutions will lend themselves to larger schemes with high levels of repetition. They have a longer lead in time, and a cost premium, but can reduce time on-site.

Offsite construction as advised at Offsite15 (an exhibition to promote offsite solutions) can be from 3-12% more expensive, and where it is lightweight comes with a shorter life than heavyweight alternatives and consists of imported materials such as timber and steel. Stuart Delgarno of Stewart Milne (a major timber frame exponent and supplier) has confirmed that "Local wood sources are not structural, nor available in assured quantities". (Offsite 2015)

## **5. Innovation**

Innovation is required in all sectors from materials to construction and design. The concrete and masonry industries are already investing in major developments in BIM, EPDs, novel cements and 3D printing, but these and future innovations need time to develop and market confidence to encourage investment. Existing products can also be part of innovation design solutions, achieving Passivhaus performance standards, being part of floating houses in flood-prone areas - there are many exemplars for a wide range of situations and scenarios.

Concrete and masonry solutions are providing 90% of our homes in England (source: NHBC), as the materials are tried and tested, cost-effective, high performance and constructed with confidence by house builders, and in demand from homeowners. Operational and maintenance costs for masonry housing solutions are low and enhanced by the long life of their constituent materials.

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## **6. Home Quality Mark**

BRE are currently consulting on a new Home Quality Mark system that is predicated on the homeowner's interests and drivers and trying to differentiate on quality under a range of headings, 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, water efficiency, space efficient functional and adaptable design. As with BREEAM rated buildings the benefits of masonry and concrete will be able to meet the highest standards.

The Concrete Centre and Modern Masonry have provided consultation responses to BRE in the development of the Home Quality Mark.

### **Appendix 1:**

The Concrete Centre, on behalf of the Mineral Products Association and members have published best practice guidance that demonstrate that concrete and masonry is the high performance solution for housing, enabling designers and housebuilders to achieve high quality housing.

As example please see: Thermal Performance Part L.

[http://www.concretecentre.com/online\\_services/publication\\_library/publication\\_details.aspx?PublicationId=804](http://www.concretecentre.com/online_services/publication_library/publication_details.aspx?PublicationId=804)

### **Appendix 2:**

The Concrete Centre has worked with organisation such as Zero Carbon Hub to work with industry to drive continuous improvement in quality and performance.

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## MASONRY

[http://www.concretecentre.com/online\\_services/publication\\_library/publication\\_details.aspx?PublicationId=762](http://www.concretecentre.com/online_services/publication_library/publication_details.aspx?PublicationId=762)

## INSULATED CONCRETE FORMWORK

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