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Building Homes Better

The quality challenge



About this report

Over the course of 2017, a cross-sector group of members of The Housing Forum formed a working group chaired by Rory Bergin, HTA Design, to investigate how building better quality homes can be delivered to improve the experience of those buying and renting them. We decided to limit our remit to the quality of individual homes while fully acknowledging that good place making and appropriate and sustainable infrastructure are essential to the creation of good living environments.

We have looked into the points of interaction between customers and the housing industry and found systemic failures to provide quality outcomes, either in terms of design quality or customer satisfaction.

This report is intended to highlight where those problems occur, and what we think can be done about them to achieve a positive change for quality.

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Working Group Chair

Rory Bergin
Partner, HTA Design
December 2017

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The Housing Forum would like to thank all those that contributed to this report (see page 33).

Join The Housing Forum

The Housing Forum is the only cross-sector, industry-wide organisation that represents the entire housing supply chain as the voice of the industry.

We have 150 member organisations, from both public and private sectors, and are uniquely placed to interpret the whole housing market and provide a timely examination of the issues that will encourage the recognition of quality homes.

The views in this report are the views of The Housing Forum and have been contributed from Working Group discussions.

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Foreword

Rory Bergin, Chair of the Working Group

This report aims to highlight the view of a cross-sector group of housing experts who are members of The Housing Forum. This is a group that procures, designs, makes and builds homes across the UK and which cares deeply about the quality of the final result. Our families, friends, tenants and customers occupy the results of our work, and our reputations depend on it being good quality housing. No one in the housing industry should be satisfied with anything less than this. Unfortunately, many are.

The mistake has been made by some in the industry of confusing low cost or affordable housing with a sub-standard poorly finished product. Some companies have let the pressures for profit and speed override their natural concerns to deliver the best quality that they possibly can at an affordable price. This is letting both themselves down and their customers down. The results of failures tarnish the entire sector and throw doubts in the mind of customers whether they are in fact getting value for money, even when they are. It is also driving customers to purchase older homes in the mistaken belief that they represent better value for money.

We want a housing industry that delivers more for less, that aims for the highest quality in each price range, and which aims to deliver a right first-time product that we can all be proud of. In this report we set out how we think this can be achieved through a series of new ideas, case studies and recommended changes to practices and policy.

Our focus has been on the changes needed in policy and industry practice to put quality and the consumer at the centre. This is ever more pressing given the government's commitment to increase the numbers of net homes provided to 300,000 by the mid-2020s. The Housing Forum will build on this work in 2017/18 with further study into site practices and processes covering procurement, contracting and ongoing maintenance. This work will report in 2018.

Executive summary

Our focus has been on the changes needed in policy and industry practice to put quality and the consumer at the centre. The Housing Forum will build on this work in 2017/18 with further study into site practices and processes covering procurement, contracting and ongoing maintenance. This work will report in 2018.

Government policy has prioritised growth in housing delivery, but not specifically encouraged quality. Instead, it has relaxed a number of regulations and standards that previously helped raise the bar on housing quality, on the grounds that they might slow down delivery. In practice, housing delivery has not increased at anything like the rate needed, and the quality of new homes from a tenant or buyer point of view has declined.

Consumers are not at the centre of the housebuilding process and overall customer satisfaction levels have fallen from 90% to 84% since 2011. Poor quality and workmanship was documented in *More homes, fewer complaints*, the report published in 2016 by the All Party Parliamentary Group for Excellence in the Built Environment. It pointed to a lack of skills and inadequate inspection.

A sellers' market, the rush to build, and dire skills shortages, has meant consumers have suffered. More employees are leaving the industry than joining it and skills shortages look set to be exacerbated by Brexit.

For all of these reasons there is a widespread and growing sense that our approach to housebuilding needs to change to give customers more choice and better quality.

Above all, we must all start to see housing as a long-term asset. Today's new housing should last at least 100 years. That makes every home we build a once in a lifetime opportunity.

The remedies involve everyone. The Government must demonstrate that it is prepared to show leadership and act on its promises; deregulation has not proved to be a solution and it perpetuates uncertainty. Clients must be clearer about their objectives and design professionals and other team members must work more collaboratively. Developers must think differently about the kind of housing they build and how they deliver it. And contractors must regain 'pride in work', embrace modern methods of construction and invest in skills training. Communities and individual buyers and renters must be more involved at all stages.

If implemented, our recommendations would make quality housing the norm rather than the exception. It will need a concerted effort and it will not be quick, but there is a growing sense that the time is right.

Key recommendations

Supporting a quality culture

- Government should direct efforts to increase supply towards housing associations, institutional landlords, local authorities, custom build, and build-to-rent providers – namely, those parts of the market that are interested in the long-term benefits that quality housing brings. It should use public land released for new housing to demonstrate different approaches to delivering high quality.
- Government should review its deregulation policy and accept that appropriate legislation sends a signal it intends to set a decent bar for quality, provides a safeguard against unacceptable outcomes and creates the certainty and the level playing field that a competitive sector needs.

Protecting tenants and buyers

- We want Government to support the proposition that tenants and buyers should be made aware of the size, quality and performance of their dwelling on a wide range of metrics before signing contracts to purchase or occupy.
- We recommend that Government should end the practice of tying the Building Regulations compliance of the site to the time of registration of the first phase.
- We would like to see the setting up of customer-focused rating systems to gather feedback from buyers and tenants about how well or badly their new home is working and whether it is proving expensive to maintain.

- The industry should collect and publish statistics on occupant satisfaction through unconnected independent bodies.
- Government needs to support a mechanism to aid homebuyers gain redress for faulty homes. The idea of a New Homes Ombudsman has been mooted already and we think this is the right step to take.

Improving pre-planning, regulation and design quality

- Government to mandate that all major housing projects are built to Building for Life or a similar design quality standard, eg BRE Home Quality Mark or LEED, supported by a training programme for local planning authorities, developers and others that make use of the standard.
- Government to review the Building Regulations with the aim of encompassing a wider set of quality issues than is currently included, such as space standards, daylight, overheating and environmental impact.
- We want Government to mandate the introduction of adequate space standards in all dwellings to protect first-time occupiers.
- We recommend that Government and industry demand higher technical and design standards for large-scale development and dense urban development such as the Manchester Residential Quality Guide and London Housing Design Guide.

Improving procurement and construction

- We recommend that the industry works to ensure that there is a role within the design team for a quality champion to identify and protect the quality elements of the scheme from the beginning to the end of the process, ideally the architect of the scheme. This professional role can work alongside the local planning authority, ensuring quality is delivered through planning to construction.
- We recommend that the industry supports the creation of a revised form of contract between design and build contractors and their clients to give a clear role to the quality champion and to independent site supervision. This will help to counter the tendency to cut costs and quality without recognising the long-term problems it causes.
- We recommend that the industry, supported by Government, works with insurers and mortgage lenders to promote new and innovative forms of construction that will speed up delivery, reduce build costs and improve the final quality of new homes.

PART ONE: POLICY AND PRACTICE

Fostering a quality culture

Introduction

Rising consumer expectations and advances in technology have meant that the things we construct or manufacture such as cars, bicycles, computers and home appliances have improved over time. Housing bucks that trend. While new homes are increasingly energy efficient, it is an uncomfortable truth that older homes tend to be bigger, more desirable and wear better than those built over the last 50 years. Housing is a vital national resource. We should ensure that new homes will still be useful and valued for the second, third and fourth generation of occupiers.

The initial cost of building a good home is often no more than the cost of building a poor one, yet poor quality often leads to higher maintenance and repair costs, affects wellbeing and leads to early obsolescence.

However, recent Government policy has prioritised growth in housing delivery, but not specifically encouraged quality, relaxing a number of regulations and standards that previously helped raise the bar on housing quality. This was on the grounds that they might slow down delivery. In practice, housing delivery has not increased at anything like the rate needed, and satisfaction with new homes from a buyer point of view has declined.

A sellers' market, the rush to build, and dire skills shortages has meant consumers have suffered. As the Farmer Review on the UK labour model published in October 2016¹ points out, more employees are leaving the industry than joining it and that is before the expected loss of skilled people because of Brexit.

For all of these reasons, there is a widespread and growing sense that our approach to housebuilding needs to change to give customers more choice and better quality.

¹ *Modernise or Die: The Farmer Review on the UK construction labour model*, Department for Communities and Local Government: <https://www.gov.uk/government/organisations/department-for-communities-and-local-government> and Department for Business, Energy & Industrial Strategy: <https://www.gov.uk/government/organisations/department-for-business-energy-and-industrial-strategy> October 2016. <https://www.gov.uk/government/publications/construction-labour-market-in-the-uk-farmer-review>

Cane Hill, Coulsdon: The development located in the Green Belt won the Graham Pye Award for the most family friendly plan. © HTA Design LLP



What we mean by quality

Quality covers a wide range of attributes or performance criteria such as sustainability, usability and beauty.

Technical performance including safety, stability, wind and weather-tightness, energy and water efficiency and durability can usually be measured and tested fairly objectively, and has traditionally been the domain of the Building Regulations.

A quality product by any normal standard is free from defects at the point of purchase, but this is often not the case in the UK housing industry.

Aesthetic criteria are much more subjective, and along with other design issues such as density, scale, materials, car-parking, outdoor space etc, has been dealt with through local planning policy and standards – in so far as it is dealt with at all. Some facets of practicality and usability such as soundproofing and accessibility fall within regulation; others, such as internal space and sunlight, fall under planning; and the remainder, including daylight and overheating, are often not dealt with at all.

The Housing Forum firmly believes that quality and quantity are compatible objectives, not mutually exclusive. But to raise the bar requires changes along all stages of the process. Quality is bound up with how we fund, design, build, inspect, market, inhabit, manage and maintain our homes, and who takes responsibility for each of those facets. It is affected by how land is traded, the planning and regulatory processes that set standards, procurement and inspection regimes, and the over-arching priorities of the prevailing Government.

Better governance of the industry, increased training and supervision, greater use of offsite construction, more emphasis on good design underpinned by standards, and better procurement and more transparency for consumers, can provide a bedrock for improved housing quality.

We believe that policy makers, regulators and housing developers should take a long-term view on the importance of quality and longevity and expect all parts of the housebuilding sector to do the same.

We were heartened that the Government's housing white paper *Fixing our broken housing market*² made much of building more homes while stressing that those that are to be built must be of better quality and we hope that more focus is given to doing that going forward.

It should also be noted that the deregulation agenda sits uneasily alongside a manifesto commitment to improve quality and we urge Government to review this urgently. Good designers and good builders have nothing to fear from regulations and standards – on the contrary, they welcome them.

Recommendations for supporting a quality culture

- Government should direct efforts to increase supply towards housing associations, institutional landlords, local authorities, custom build, and build-to-rent providers – namely, those parts of the market that are interested in the long-term benefits that quality housing brings. It should use public land released for new housing to demonstrate different approaches to delivering high quality.
- Government should review its deregulation policy and accept that appropriate legislation sends a signal it intends to set a decent bar for quality, provides a safeguard against unacceptable outcomes and creates the certainty and the level playing field that a competitive sector needs.

² *Fixing our broken housing market*, Department for Communities and Local Government, housing white paper, February 2017
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/590464/Fixing_our_broken_housing_market_-_print_ready_version.pdf

Improving the experience of tenants and buyers

What are the current problems?

The experience of tenants and buyers across the industry is variable, sometimes excellent, sometimes reported as shocking even in expensive locations. Other industries have dealt better with improving quality and customer care. Arguably, some consumers are short changed across the process, and some homes are being built to out of date standards.

In its research, British Gypsum asked 600 consumers who had bought a new home, or were about to buy one, for their views for its *Building Better Homes Report 2016*.³ The results revealed that 38% said they would prefer to avoid buying another new build property in the future and 77% of these were concerned about the saleability of their new build property based on the quality of building work.

The All Party Parliamentary Group for Excellence in the Built Environment looked at the issues around quality of workmanship in new homes and customer care.⁴ It pointed to a decline in customer satisfaction with the quality of their new homes and made a number of recommendations to redress the imbalance that has been created over time between housebuilders and their customers.

The report said:

“We need to see housebuilders putting consumers at the heart of what they do. This will involve new mechanisms and a fresh culture at every step of the process. It requires more onus on housebuilders to aspire to deliver the following: zero-defect construction; greater transparency to make consumers more aware of the inspection and warranty process; and easier and quicker forms of redress to solve disputes.

“We believe that housebuilders should be upping their game and putting consumers at the heart of their business model. Alongside this, Government should use its influence to promote quality at every opportunity.”

We wholeheartedly agree.

Amongst its recommendations was that the Department for Communities and Local Government should initiate steps to set up a New Homes Ombudsman which would drive quality improvements by making redress for problems far easier. It also said builders should be required to provide buyers with a comprehensive information pack.

We have endorsed both of these suggestions in our report.

Problems encountered by tenants and buyers include the following:

- **Poor quality of finishes and workmanship:** The performance of new homes cannot be relied upon. In the 2017 Home Builders Federation Customer Satisfaction Survey, customer satisfaction with their new home was 84%; in 2011 customer satisfaction was 90%.
- **Lack of information on performance:** The information on the actual performance of new homes presented to buyers is thin and incomplete. The area of the home may be difficult to discern, the energy performance is not clearly identified, daylight is not measured, and the version of the Building Regulations the home is built to may not be identified.
- **Homes are built to out-of-date regulation:** New homes on large developments are often built to the regulations in force at the time of registration, on the basis that developers can't be made responsible for future changes in regulation. This can mean that some owners could be buying homes built to standards that are 10 years out of date, without realising it. No other industry would do this. Either developers should build quickly while current regulations are in force, or if they delay bring the homes into line with the revised regulations. Developers can price this risk into their land purchases as they price other risks.
- **Lack of independent scrutiny:** Consumers don't have the power they have in other purchases for a host of reasons, including lack of competition and choice in the market. A tangible improvement could be the introduction of an independent quality index.

³ *Building Better Homes Report 2016*, British Gypsum, 2016.
<http://www.british-gypsum.com/case-studies/building-better-homes>

⁴ *More homes, fewer complaints*, the All Party Parliamentary Group for Excellence in the Built Environment, July 2016.
<http://cic.org.uk/services/inquiry-into-the-quality-of-new-build-housing-in-england.php>



The residents of New Ground senior cohousing co-designed the multi award winning development – prompting hundreds of enquiries from people keen to follow their example. Photo ©Tim Crocker.

Recommendations for protecting tenants and buyers

- **We want Government to support the proposition that tenants and buyers should be made aware of the size, quality and performance of their dwelling on a wide range of metrics before signing contracts to purchase or occupy.** Builders and developers can make 'good quality' a differentiation and key selling point for their product. Both Sweden and Australia have systems in place to check post-construction energy performance.
- **We recommend that Government should end the practice of tying Building Regulations compliance of the site to the time of registration of the first phase.** Developers are capable of pricing in the risk of changes to the market; they can price in changes to regulations too. Customers should not be asked to pay the same price for homes built to superseded sets of regulations.
- **We would like to see the setting up of customer-focused rating systems or a quality index to gather consumer feedback about how their new home is working.** Plans are already being formulated amongst some housing developers to set up a feedback mechanism to connect design teams with real data from end users. Such a feedback loop needs to become standard industry practice, and the information used to inform design decisions and policy about new homes.
- **The industry should collect and publish statistics on occupant satisfaction through unconnected independent bodies.** A recommendation in the Farmer Review is for housebuilders to have an independent customer satisfaction survey, which is visible and transparent to the public. Currently, the annual Home Builders Federation Star Ratings are based on Customer Satisfaction Surveys independently undertaken by NHBC. Setting up a completely independent survey would be a major step forward in providing homebuyers with information on which to base their purchasing decisions. Having the survey taken after the occupant has spent time in the property is critical and would encourage better building. The New Homes Review has recently been set up to start this process⁵ with the first set of results due to be published towards the end of 2017.
- **Government needs to support a mechanism to aid homebuyers gain redress for faulty homes. The idea of a New Homes Ombudsman has been mooted already and we think this is the right step to take now.**

Pre-planning, regulation and design quality

What are the current problems?

Part of the reason for the housing shortage is that the poor design quality of some development can evoke opposition from local people, which delays or derails housing delivery. We need good design to ensure a strong and sufficient housing supply.

The current, and long-standing, housing shortage means that new homes, even those of lower quality, are not hard to sell. There is minimal competition between one housebuilder and another in many areas, there is little variety in design and type and the customer has little or no opportunity to 'shop around'.

Quality can be underpinned by appropriate regulations, which also create a level playing field for developers. The unregulated price of land can also impact quality, in that developers pay too much and then look to claw back on costs by cutting corners. The Greater London Authority (GLA) is looking at new approaches to land values, which we think could have wider potential (see Putting a ceiling on land value page 31).

Problems encountered in planning, regulation and design include the following:

- Quality standards dropped:** Many issues around quality, including daylight, sound reduction, space standards, sustainable materials, homeworking, cycle storage, amenity space and renewable energy, are not dealt with by current regulations. They were covered by the Code for Sustainable Homes, which Government wound down in March 2015 for new developments. Critics of the Code argued that it restricted efforts to supply more homes and increased housing costs. However, in the years since, supply has not increased substantially, costs have continued to rise and quality is variable.
- Internal space:** Housing is currently being built to meet short-term need, often at the smallest size possible and without considering the impact of the future needs of families in the long term. A RIBA report, *The Case for Space*,⁶ revealed that the average one-bedroom new build home in the UK is 46 sq m – the same size as a Jubilee Line train carriage on the London Underground. That makes them the smallest in western Europe.
- Design and specification of homes and their products is not given due consideration:** Many homes in the UK are designed in-house by building companies; there is little variety and therefore little choice, and, in many cases, little or no attempt to reflect the character of the neighbourhood. Builders continue to provide the same designs for as long as possible to avoid the costs of redesign, and anticipating new trends in the market or adapting to suit customer demands is not always in their business model.
- End use not addressed:** Designers and constructors should think more about the end product and how a home will be lived in, rather than only designing to achieve planning permission and not addressing long-term liveability. Every home should be flexible and adaptable enough to cope with changing circumstances, in terms of tenure, and suit a range of people including some older and disabled residents.
- Design not given proper scrutiny by planners:** Severe budget cuts have left local authority planning and building control departments under-skilled as well as under-resourced. In a housing shortage, the 'presumption in favour of sustainable development' clause too easily translates into granting permission for what would otherwise be regarded as poor-quality development. Design review can be helpful but is not yet embedded as routine practice. Bespoke design codes for larger developments can also provide a useful steer, particularly in relation to local character, but the status of this advice and guidance is often unclear.
- Rise of micro-flats:** Permitted development, including office to residential conversions, is exposing the extent to which quality is put at risk when the planning process is not required. Some new homes coming onto the market in London are only suitable for very short-term occupation. This is not quality housing for the long term.

⁶ *The Case for Space*, RIBA, May 2014: <https://www.architectsjournal.co.uk/Journals/2011/09/14/b/a/t/CaseforSpace.pdf>



Recommendations for improving pre-planning, regulation and design quality

- **Government to mandate that all major housing projects are built to Building for Life or a similar design quality standard eg BRE Home Quality Mark or LEED, supported by a training programme for local planning authorities, developers and others that make use of the standard.** Though inexpensive to apply, standards are rarely stipulated. Local planning authorities and developers need to be trained in the use of such tools to ensure that they are used appropriately. The BRE's BREEAM Communities masterplanning standard is also relevant, particularly for larger developments, and includes issues and processes like consultation, flood resistance, climate change, landscape design, street design and many others. It provides a sustainable development accreditation for large-scale development, encouraging client and design teams to follow good practice. Other standards such as HQM, LEED, Passivhaus and ActiveHouse are also relevant to design quality.
- **Government to review the Building Regulations with the aim of encompassing a wider set of quality issues than is currently included, such as space standards, daylight, overheating and environmental impact.**
- **We want Government to mandate the introduction of adequate space standards in all dwellings to protect first-time occupiers.** There is already in place nationally described space standards but more resources need to be made available to local planning authorities to encourage them to apply these. Were they to be widely applied, they would contribute to wellbeing and provide an important way to offer choice and flexibility. But the current process of applying them is difficult, time consuming and expensive, at a point in time when local authorities' budgets are already stretched. There is evidence that office to residential conversions are sometimes inadequately sized; we think that there needs to be a regulatory minimum standard for a home.
- **Government and industry to demand higher technical and design standards for large-scale development and dense urban development.** The Manchester Residential Quality Guide and London Housing Design Guide have had a positive impact in their areas of influence and should be used as examples for other areas of large-scale housing development to follow.

Procurement and construction

What are the current problems?

Even when a top-end scheme with high-quality design has passed through planning, the delivery system is not robust enough to capture the detail and provide the scrutiny required to ensure the quality of the brief and design is achieved on the ground. There is a host of issues through the procurement and construction stages that militate against producing good-quality homes.

Procurement

Problems include the following:

- **No clear responsibility for design:**

In terms of procurement, design and build contracting has created a 'pass the parcel' approach to building and provided an excuse for poor building for decades. The preference for design and build contracting means that the lead designer (architect or other consultant) is no longer responsible for oversight of the design and the specification of materials and products from inception to completion of the project. Design responsibility is very often transferred to the contractor and sub-contractors, leaving no single point of responsibility. Crucially, it has left clients and customers with inadequate redress.

- **Limited choice of goods:** High-quality manufactured products which offer benefits to consumers in terms of lifestyle, finish, or quality are not offered to them. There are more choices available to customers who refurbish their own homes than there are available to people who have bought a new home. The benefits of installing higher quality products are demonstrated in projects carried out by British Gypsum (see Selecting products to improve the experience of residents page 16).

- **Substituting products specified by the architect for similar ones:** Design and build has distanced architects from the construction stage and this has had a number of consequences. It has led to the partial de-skilling of the architectural profession. It means that some designs are more difficult, and therefore costlier, to build than they perhaps should be, and that proposed materials, products and details are likely to be reviewed by the contractor and cheaper alternatives substituted. Where 'equal and approved' is used, substitutions are being made by contractors without understanding what 'equal' means in this context. Some changes which may appear to be acceptable are, on closer inspection, found to contravene fire, durability or sound tests because those changing the specification do not understand the performance and therefore the rationale for their choice.
- **Cost is often not weighed against lifecycle cost:** There is a separation in the public sector between capital and revenue budgets that leads to unhelpful outcomes. Cheaper products cost less to buy but need to be replaced more often. The customers' needs are not represented in this discussion.
- **Testing of materials:** Testing is done on individual products, and then desktop studies are used to assess suitability of composite products. This is true for fire as well as acoustic and thermal performance and contributes to the performance gap in these areas.

Construction

Complaints about poor-quality workmanship are becoming widely documented. The results of the Home Builders Federation Customer Satisfaction Survey for 2017 published at the end of March show that 84% of respondents were satisfied with their new home – a 1% fall on the previous year. Satisfaction has fallen since 2010/11 when it peaked at 90%.⁷

In February 2017, Bovis Homes announced it was slowing its construction programme by up to 15% this year in order to boost overall build quality. It also announced that it had set aside £7m to cover remedial work and compensation for poor quality construction on its homes. The group admitted customer service standards “fell significantly” during 2016 after being dogged by complaints about homes sold unfinished and with electrical and plumbing faults.

Again, as we have documented earlier, poor quality and workmanship was evidenced in the All Party Parliamentary Group for Excellence in the Built Environment report, *More homes, fewer complaints*, published in July 2016. It blamed a lack of skills, inadequate inspection, a poor culture amongst housing developers and lack of competition in the market, for the rise in problems.

Problems include the following:

Poor-quality building leading to a performance gap: There is a well-understood ‘performance gap’ between the quality of what is promised and what is delivered. Many homes, when surveyed post-completion, do not meet the standards that they are meant to deliver, particularly with energy performance. A recent report from BRE fire investigators said that in regard to spread of fire in cases they had investigated in housing, 30% was down to poor-quality workmanship.⁸ Soundproofing is another area where improvement needs to be made. One way forward is to adopt pattern books of details that builders can sign up to. We discuss the benefits of Robust Details later in the report (see How a smart regulatory framework enabled a high performing industry friendly solution page 22).

- **Lack of independent inspection and supervision:** The virtual disappearance of the role of the clerk of works or site architect and the loss of independent oversight of construction and workmanship on behalf of the client leads to defects and poor-quality work being overlooked. Under design and build contracts, architects are sometimes not allowed on site to check if work is being carried out correctly or to check if the design specification is being delivered.
- **Skills shortages:** The demand for increased numbers of homes is beyond the capacity of the existing industry. Skills shortages exist in all sectors and at all skill levels, with quality of workmanship falling as a result.



⁷ Customer Satisfaction Survey results for 2107, Home Builders Federation. <http://www.hbf.co.uk/policy-activities/customer-satisfaction-survey/2017-results/>

⁸ BRE Global, *Construction Manager*, June 2017. <http://www.constructionmanagemagazine.com/news/fi3re-invest8igations-unco9ver-cost-scale-poor-wo/>

Recommendations for improving procurement and construction

Procurement

- We recommend that the industry works to ensure that there is a role within the design team for a quality champion to identify and protect the quality elements of the scheme from the beginning to the end of the process. Ideally this should be the architect of the scheme. This professional role can work alongside the local planning authority in ensuring quality is delivered through planning to construction.

The fragmented nature of development means that the company which delivers the project is often not the one that initiated it. Design quality can seem like an unhelpful add-on when the delivery company was not part of the project's passage through planning.

- We recommend the industry supports the creation of a revised form of contract between design and build contractors and their clients giving a clear role to the quality champion and to independent site supervision.

This will help counter the tendency to cut costs and quality without recognising the long-term problems it causes.

- The industry should work more closely and in a more integrated way to achieve the desired cost goals, rather than using multiple tendering stages to achieve the result.
Close relationships between client, designers and constructors which operate over a long term are needed to produce successful buildings. Current procurement behaviour produces the opposite result. Examples of the benefits of integrated working are presented later on in the report (see Harnessing the benefits of integrated supply chains page 24).
- Government should lead by example, procuring homes through long-term relationships with quality targets set out from the beginning and with rewards for the construction partner for achieving quality and penalties for failure.
- Clients, including Government, should aim to achieve cost savings by aggregating demand and using standardised high-quality approaches rather than by going for the lowest price.
- When there are cost pressures, the private sector should be encouraged to add value instead of cheapening the outcome.
The private sector is very good at adding value, but less good at protecting value in the face of cost cutting.

Offsite manufacture and digitalisation

- The industry should be encouraged by Government and led by it in the drive to modernise, adopt more industrialised production to achieve higher quality outcomes and, over time, push down the cost of construction.
Offsite manufacture would deliver more homes to higher quality and is essential to address the skills shortages – as also pointed out by Mark Farmer in his Review⁹ and a recent report from the Greater London Authority.¹⁰ We have been heartened on this front by the announcement that some of the £2bn accelerated building fund will promote offsite homes and we look forward to receiving more details on how this proposal will work in practice. Exceptional long-term savings can be made from offsite construction but too often design decisions have been made before this approach can be fully considered. Quality is helped by a design-led system that brings certainty into the process early on. Case studies using offsite construction systems coupled with building information modelling are provided in the second part of our report (see Creating efficiencies through offsite manufacture page 26 and Marrying BIM and offsite technology to improve quality page 28).

⁹ *Modernise or Die: The Farmer Review on the UK construction labour model*, Department for Communities and Local Government: <https://www.gov.uk/government/organisations/department-for-communities-and-local-government> and Department for Business, Energy & Industrial Strategy: <https://www.gov.uk/government/organisations/department-for-business-energy-and-industrial-strategy> October 2016.

¹⁰ *Designed, sealed, delivered, The contribution of offsite manufactured homes to solving London's housing crisis*, Nicky Gavron, Chair Planning Committee, Greater London Authority, August 2017. https://www.london.gov.uk/sites/default/files/london_assembly_osm_report_0817.pdf

- We recommend that the industry, supported by Government, works with insurers and mortgage providers to promote new and innovative forms of construction that will speed up delivery, reduce build costs and improve the final quality of new homes.
- Manufacturers, working with contractors or developers, could be offered a licence to construct homes for a short period. They could be offered sites under specific terms, which include speed of delivery and high environmental quality, which would bring more players in the market. This would also enable product quality to be brought to the attention of consumers.

Construction skills

We appreciate that a skills shortage is adding to the problems of housing quality and we agree with a number of reports that this needs to be tackled urgently.

As we mentioned earlier, the APPG report on improving build quality, *'More homes, fewer complaints'*, put forward a number of recommendations to boost quality to allay consumer concerns. It called for a floor on the number of inspections that must be carried out by building control organisations to prevent a race to the bottom brought about by too much competition. We also believe that tighter regulation is now essential.

The same APPG for Excellence in the Built Environment has subsequently published *Building on Brexit*.¹¹ This report makes recommendations to increase home-grown skills and training in the wake of Brexit when the already dire skills shortages will worsen without free movement of EU labour. Again, we endorse the report's recommendations around skills and training.

- **We would urge Government to act on the recommendations set out in the Building on Brexit report to tackle skills shortages.** To reiterate, these are:
 - Government to stabilise the existing workforce by ensuring existing EU migrant workers are able to remain in the UK and then putting in place transitional arrangements for a period of time so that access to foreign workers does not fall off a cliff edge.

- Industry to get behind an overarching ambition to attract, train and retain a greater domestic workforce, with skills aligned to more modern ways of working.
- The formation of a single body to provide strategic oversight on training and skills at all levels and to attract new talent across the spectrum of the built environment, rather than just trades. Making the industry more attractive to young people is absolutely essential. Links need to be better developed between further education colleges, subcontractors, suppliers and clients to ensure a pipeline of apprenticeships, jobs and higher education-ready candidates.

Another specific recommendation we would like to make is:

- **A greater focus on increasing diversity and inclusion.** We need to investigate and tackle the barriers to women in construction. Women make up 11% of those working in construction but just 1% of the trades. If the situation is to be improved, it needs to be acknowledged that problems with working conditions, welfare facilities, working hours and a non-family-friendly environment are still making construction an unattractive proposition to women.

PART TWO: NEW IDEAS AND CASE STUDIES

Selecting products to improve the experience of residents

David Kowal, Market Development Manager, British Gypsum, on new research which shows that better quality acoustic products can also pay dividends for the housebuilder.

Products from third parties play an important role in delivering a high-quality home for purchasers. This can vary from kitchen white goods supplied with the home, to windows which come from a well-known manufacturer, or materials that are ingrained within the fabric of the building itself.

However, the more the materials are embedded within the construction, the less likely the homeowner or occupant is to know about them or to become familiar with the company name. This separation from the eventual market makes it difficult for high-quality material manufacturers to justify a premium for a product, even when it can deliver a better customer experience.

Few, if any, homebuyers or renters would actively seek a home with materials of a particular manufacturer. They are much more likely to seek out a particular type of kitchen supplier or white goods supplier as evidence that the home is of high quality.

Custom build offers homebuyers a chance to make the material selection for themselves and the custom build homes are often built to significantly higher standards than a house builder standard product, simply because the custom build homebuyer is investing for themselves and takes a long-term view of housing quality.

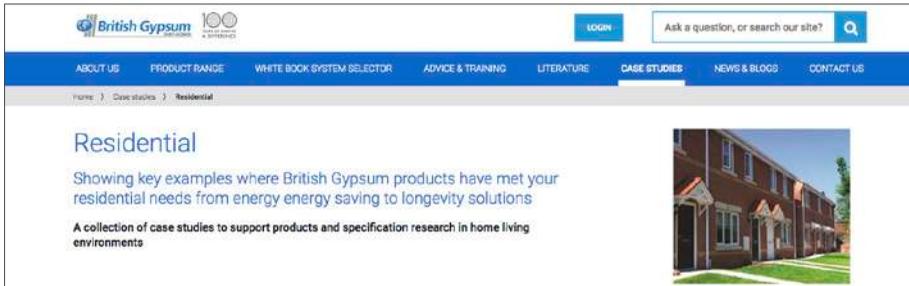
In some ways, this difference highlights the distance between the traditional housebuilder approach to products, which is based on the lowest cost of meeting regulatory compliance, and a market where the customer has more of a direct engagement in the quality of materials and the cost of the build.

For manufacturers, motivation to engage in research and development activity to develop better products is greatly inhibited by current practices and cultural attitudes in the construction sector.

As a result, the majority of housebuilders, developers and contractors are not pushing manufacturers to develop better products for the end homeowner. Instead they want cheaper products; or ones which provide a speed benefit, which reduces construction time and affords a reduction in labour costs. The net result leads to commoditisation and potentially more value engineering on an individual product basis. This also has the knock-on effect of reducing the earning potential of skilled craftsmen who install the materials, consequently making such trades a less attractive career opportunity contributing to skills shortages in our industry.

This modus operandi will only lead to a dumbing down of products and poorer end specifications for homeowners, unless regulatory or cultural change occurs.

What seems astounding is that brand and value propositions exist in every other industry with consumers having choice and happily paying premiums for products they perceive as offering better value. From car to cereal manufacturers, massive price variants exist for products, which on the face of it perform similar overall functions. However, effective marketing in other industries informs consumers of the benefits and value choices they have when selecting certain brands and products.



Find out more information from the British Gypsum Residential Case studies online.

Despite these challenges, companies such as British Gypsum and parent company Saint-Gobain have invested heavily in R&D, focusing on the needs of the occupant. Innovations have focused on how to create healthier buildings through improving air quality, light levels, thermal and noise comfort.¹²

Homeowners want flexibility and adaptability of their rooms and spaces. Importantly, they want to turn a new house into a home, suited for their needs, and they want to be able to do this quickly and easily.¹³

A lack of building regulations for internal acoustics means that most homes have very poor sound insulation between rooms and floors. With increases in flexible and home working, inter-home acoustic performance plays a major part in how family members may have to compromise their activities.

Most homeowners only become aware of these issues once they have moved into their new home and consequently question its quality.

This feedback and perception of new build is very real. We asked consumers for their views for our *Building Better Homes Report 2016*.¹⁴ The results revealed that 38% said they would prefer to avoid buying another new build property in the future. Of these, 77% were concerned about the saleability of their new build property based on the quality of building work, ranking thin/flimsy walls (32%) and cheap materials (27%) amongst their five most negative aspects of new build homes. With noise travelling between rooms noted as an issue with almost a third (30% of new homes) and with 47% of consumers aspiring to own an older home, there is clearly an issue.

Interestingly, many of these fabric innovations outlined above have been exported to countries where current housing levels are of a higher standard than those of the UK. For these countries some products have actually provided a cost benefit solution because existing homes have been constructed to a much higher standard already. These occupiers expect nothing less. Due to the current supply situation in the UK, it will be a while before natural market forces drive up quality. However, this provides an excellent opportunity for some housebuilders to establish a brand associated with quality and benefit commercially if they can work effectively with manufacturers to market these differentiators to homebuyers and tenants.

For builders of social housing, higher quality means they can increase tenant satisfaction levels and reduce ongoing RMI costs too, but development and RMI need to align budgets and factor lifetime costs in the development decision (see Case study: London Borough of Newham page 18).

For many manufacturers, the current lack of desire to specify better products within houses risks stifling R&D activity in the sector - especially in construction products, which are not obviously 'visible' to potential buyers. However, contrary to many housebuilders' beliefs, if benefits are conveyed effectively to homeowners they provide real excitement factor for homeowners and brand differentiators for housebuilders.¹⁵

¹² <https://www.multicomfort.co.uk/>

¹³ www.roomsmadeforyou.co.uk

¹⁴ *Building Better Homes Report 2016*, British Gypsum

<http://www.british-gypsum.com/case-studies/building-better-homes>

¹⁵ <https://vimeo.com/202385585>

Following on from his call for better quality building products, David Kowal, Market Development Manager, British Gypsum, reports on the approach taken by the London Borough of Newham.

Case study: London Borough of Newham

Name of project

London Borough of Newham.

Location

Newham, London.

Brief description

First phase of a development of six, three-bedroom affordable houses.

Start and completion

An initial test-house was constructed over summer 2016, which now accommodates Newham Council's highway maintenance offices. This was followed by London Borough of Newham's first own offsite timber development, featuring six three-bed homes, in which its first residents moved in before Christmas 2016. This initial development phase is expected to be followed by an additional 32 timber-framed homes.

Principal partners

London Borough of Newham (housebuilder), British Gypsum (internal wall system manufacturer).

Brief description of the differences

Homes have been constructed using the council's own offsite timber frame manufacturing facility - with the capacity to provide two new homes per week. Key sections of each housing unit produced at the facility – such as the walls and roof – are built on timber frames and assembled on site. Highly durable products, such as specialist plasterboard from British Gypsum, are used throughout to maximise maintenance cycles. The end result is high-quality homes which deliver significant time and cost savings compared to traditional-builds and provide liveability benefits for residents.

Why chosen

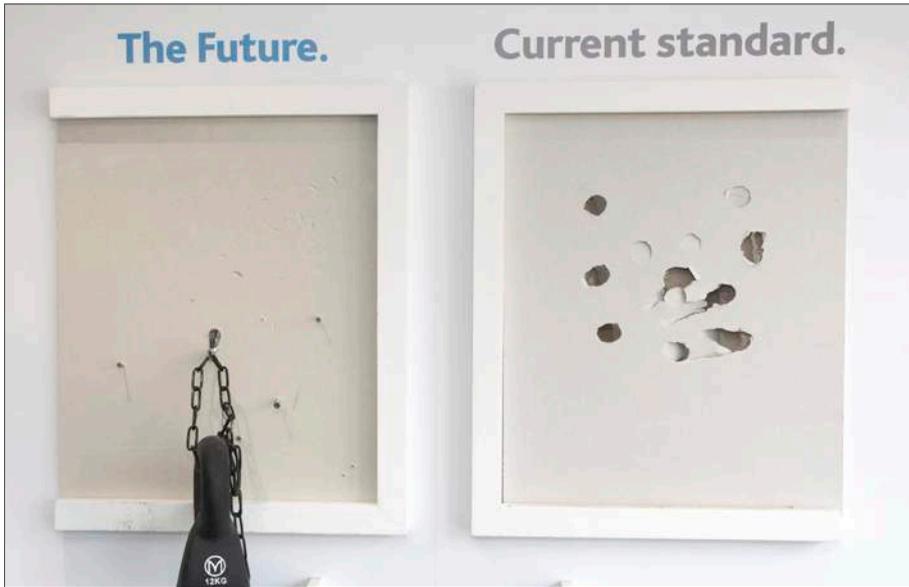
London is feeling the full force of the UK's housing affordability crisis. Responding to this issue, the London Borough of Newham Council has taken an innovative approach to developing a sustainable solution, working with British Gypsum to produce affordable housing with minimised maintenance costs.

Westley Mitchell, Site Manager, London Borough of Newham, explains:

"With the cost of homes and rents rising higher and higher, particularly here in London, increasing the supply of affordable housing is hugely important to ensure local people have a place they can comfortably live.

An offsite, timber frame home is up to 40% cheaper to develop than a traditional build. These savings mean we can deliver more units within the same development budget, helping more residents across Newham access high-quality affordable housing."

Supporting the requirement to reduce long-term expenditure on property maintenance, British Gypsum's Gyrproc Habito plasterboard has been specified as standard across the new homes. The plasterboard, which features a specially developed reinforced core, is five times stronger than standard products. This increased durability means properties can better withstand every day wear and tear, increasing the time between maintenance call-outs and reducing total lifetime maintenance costs.



British Gypsum's Gyproc Habito demo unit shows how strong the board is compared to the current standard.

Find out more information from the British Gypsum Residential Case studies online.

Were there any additional considerations?

Part of the testing phase was to align designs with efficient manufacturing processes and sequences to ensure the end house product met performance requirements. Working with a new product such as Gyproc Habito required British Gypsum to oversee installation to begin with. However, once subtle changes to standard practice were demonstrated these were simple enough to ensure best practices were adhered to moving forward.

How did costs compare to alternatives?

The decision to utilise Gyproc Habito board versus standard wallboard added around £1,000 per property. However, when factoring in ongoing call out charges, repairs and void periods these upfront costs are expected to be recouped within a year or two. The fixability and flexibility of the board will also improve customer satisfaction levels, which whilst difficult to translate into monetary terms clearly has a value to London Borough of Newham and its tenants.

Would you use this again?

Yes. Based on learnings and enhancements made to the overall timber frame construction designs during the first phase development, London Borough of Newham has decided to specify Gyproc Habito as a replacement for standard wall board moving forward.

What are your reasons?

On the decision to use Gyproc Habito, Westley Mitchell, Site Manager, London Borough of Newham says: *"Our repairs team are in high demand across our housing stock and, as a result, we've struggled to keep up with maintaining the walls in our properties. This means we need a robust, long-lasting product, which is also easy to install and replace when it is time to undertake maintenance on a home.*

We were impressed by the strength of Gyproc Habito. Its ability to help in significantly increasing maintenance cycles makes it the perfect product for the development of high-quality social housing. It's also really important to us that our residents can make our accommodation feel like their home.

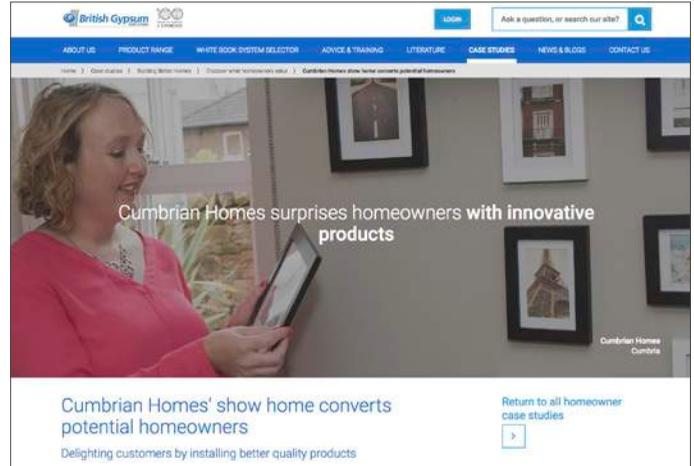
Simply being able to personalise rooms and fix up additional storage, if required, by just using a screwdriver, can be done easily by the resident, with minimal touch up required at the end of the tenure. A home's adaptability and liveability are extremely important to residents of all tenures and all too often forgotten in the design and specification stages."

Other comments?

The success of the trial has proved that by considering upfront CAPEX costs versus ongoing RMI / operation costs, investing in 'better, more expensive' products in the construction phase can be commercially viable and beneficial. Having a holistic view of design, construction, maintenance and resident satisfaction levels creates the right environment for better decisions and building better homes.

Another housing development which has been investing in higher quality materials is Cumbrian Homes. David Kowal presents the findings.

Case study: Cumbrian Homes



Find out more information from the British Gypsum Residential Case studies online.

Name of project

Cumbrian Homes; Carleton Manor Park Development.

Location

Eastern fringe of Penrith, Cumbria.

Brief description

Exclusive development of 44 luxury new homes comprising six different designs including four-bedroom homes, three-bedroom bungalows and one, two and three-bedroom apartments within the 'manor' and its flanking buildings.

Start and completion

Site work commenced in February 2016 with later phases due to be completed in 2018.

Price per unit

Ranging from £230,995 for a two-bedroom luxury apartment to £595,995 for a six-bedroom family detached house.

Principal partners

Cumbrian Homes (housebuilder), Ashwood Designs (architect), British Gypsum (internal wall system manufacturer), Fibaro UK (home automation consultant and installer).

Brief description of the differences

The properties included:

- **Silent Floor** – acoustically insulated floors, at twice the level of current Building Regulations. This high level makes home working in a family environment feasible. It allows homeowners to enjoy what they are doing without worrying about disturbing other members of the household within the home.
- **Future-proof walls** – all internal walls have been 'future proofed' with Gyproc Habito boards which are five times more durable than current new build standards. As well as protecting walls from everyday knocks and bumps, the product allows homeowners to fix an 15kg item from a single woodscrew. This makes adapting rooms and space extremely easy at any point in time, with minimal hassle and addresses homeowners concerns that new build properties have 'flimsy walls'.
- **Magnetic plaster** – which provides 'interactive' walls. Items can be attached and be moved without damaging walls. Thistle Magnetic Plaster is included within the kitchen and a bedroom wall of the homeowners' choice.

- **Smart home / home automation technology** – including smart heating, lighting and security, which allows homeowner to all of these remotely from a smartphone/tablet and maintain efficient heating, lighting control and visitor monitoring.

Why chosen

Cumbrian Homes wanted to differentiate and improve its offer to customers. The company already had a reputation as a quality builder in the region but wanted to explore enhancements to the fabric of the building, as well as technology, to provide homes, that can adapt with the changing needs of families and lifestyles. It also wanted to prove that a new home can be a 'better home'.

Were there any additional considerations?

There was initial scepticism from Cumbrian Homes regarding how much homeowners would value the enhanced fabric propositions. There were also some concerns around the subcontractors' willingness to work with new products.



The subcontractors' concerns were addressed by providing on-site support and guidance at the initial stages. To provide in-market feedback, initially only three homes were selected for all three fabric enhancements. Homeowner feedback on the value of the enhancements following launch of the site provided real in-market evidence that the need for these solutions was real and that by providing these solutions homeowner concerns about new properties can be met.

How did costs compare to alternatives?

For the fabric enhancements there was an additional total cost to the construction budget of around £3,000. This was for all three propositions (Habito board throughout, silent floor system and magnetic plaster on two walls) to a 2,000 sq ft house.

Would you use this again?

Based on the reaction of prospective homebuyers to the fabric enhancements, Cumbrian Homes made the decision to include all three fabric propositions as their standard specification on the Carlton Manor Park development and future phases on other developments.

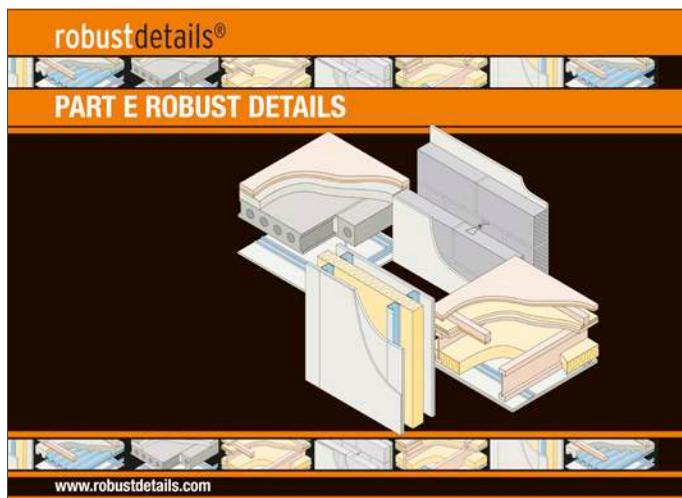
What are your reasons?

Cumbrian Homes takes the view that its customers deserve the best available home for their money, especially as this is likely to be the biggest investment of their lives. From a commercial perspective, Cumbrian has been able to pass the additional costs to customers who are perfectly happy to pay for what they see as a demonstrably better home. Provision of these home benefits continues to enhance the Cumbrian Homes brand and helps differentiate it from the competition, which has also helped with the speed of reservations.

Other comments?

The success of the trial has proved that a developer can improve brand, profitability and customer satisfaction levels by including 'better' products within its homes. Even if these products are not instantly visible, as long as the benefits are highlighted effectively they will excite homeowners, which in turn provides significant benefits for housebuilders adopting them.

How a smart regulatory framework enabled a high performing industry friendly solution



A 'pattern book' of construction details accompanied by a sound business model could provide a way forward to solving the performance gap, says John Tebbit, Chief Executive, Robust Details.

Background

Robust Details is an example of how effectively industry can deliver the policy objectives of Government in an industry-friendly way when the correct framework is put in place. It also shows how a pattern book of standard details can dramatically improve performance of the industry that we have, rather than the one we wish we had.

The background to this was that in 2003 the Government acted to significantly improve sound insulation between dwellings. At the time, the political profile of poor performing separating walls and floors in new homes was very high. The new Part E 2003 introduced not only a substantial improvement in the design performance but also sample testing of completed homes known as PCT. The industry felt that the cost and disruption of this approach would be very high and set out to develop an alternative, namely a pattern book of approved pre-tested designs.



After a year of testing and development, Government agreed to the scheme, subject to a continuing surveillance system. Crucially it set a clear regulatory framework for builders to be able to use either the Robust Details scheme or PCT. Robust Details was launched in 2004 with the requirement to achieve 95% compliance with Part E within 10 years. Today there are over 60 different details covering all the main construction types, with compliance running at around 99%. The scheme is fully accredited by UKAS to BS EN ISO17065.

The challenge

Back in 2003 the problem of poor sound insulation in new homes was filling up MPs' letter boxes. Compliance to the relatively poor standard was probably not much better than 50:50. The Government decided to act and updated the Building Regulations with a new Part E that set a significantly tougher standard coupled with Pre-Completion Testing (PCT) of a minimum of 10% of each type of home.

The housebuilding industry felt that this would cause uncertainty and extra costs as any failure of a test would be very close to the completion date and sale of a new home. Housebuilders argued for a more certain method of compliance. The industry invested over £1m in developing and site testing possible solutions. In less than a year, there was a set of a dozen 'robust details' with performance well above the regulatory minima, designed to be resilient to site workmanship and tested to prove performance in the pattern book. Robust Details as a scheme was launched in 2004.

Smart regulation

While much of the focus on the success of Robust Details has been on the technical performance (compliance is now around 99%) and on its widespread use (more than two thirds of new attached homes use the scheme), the generally unrecognised factor in its success is the smart regulatory framework. Given a regulatory requirement, housebuilders wanted a more industry friendly way of demonstrating compliance.

Government recognised that for any scheme to survive without continuing taxpayer support the industry needed to pay for it. However, the Government did not want to be seen as putting a levy or tax on the industry.

The solution was to set a clear binary choice in regulation. The housebuilder could choose to build and then test and pay nothing to Robust Details. Or the builder could use the Robust Details scheme by paying a fee and getting a Unique Reference Number (URN) to show building control who would then agree that no testing was needed. Builders who built to a detail in the pattern book but who didn't pay the fee to get the URN still had to test. Thus all the users paid. This has enabled the scheme to continue to operate, increasing the number of details to over 60 today (including systems for offsite manufacturing and modern methods of construction) and to carry out monitoring and testing via independent acoustic consultants. With over 19,000 test results to date, the Robust Details database is one of the largest in the world and has helped inform the development of acoustic standards in the UK and Europe with real life, rather than theoretical, data.

Conclusion

There have been other attempts by Government and industry to set up similar schemes to Robust Details, including thermal bridging and construction detailing. These have not succeeded despite initial funding to develop their pattern books. In each case the problem has been a lack of an ongoing income stream. This has often resulted in the details becoming out of date; and without any robust monitoring system to check real world performance in the field, there is no closing of the build-inspect-test-improve-inform loop that has driven the improvement of real world performance for sound insulation.

To be successful in improving long-term compliance, any future pattern book schemes must not only be technically sound but also have a sound business plan; funding ongoing surveillance and constant improvement is crucial. For Robust Details, it was the smart regulation that allowed the development of an industry-friendly scheme that has been economically sustainable and has delivered high levels of compliance.

Harnessing the benefits of integrated supply chains

Jon Wardle, Director, AMCM Group, on how an integrated supply chain can improve the construction of homes.

As noted within the foreword of the Farmer Review there is an “*absence of alignment between the industry and client interests*” and this is very prevalent when you consider the intrinsic structure of traditional supply chain models where there is limited, if any connection, between client, suppliers and manufacturers of products specified by designers, installed or assembled by contractors and the operative who is responsible for the quality of the finished product.

It is an all too common fact that when the built environment is being designed, procured, and manufactured, the processes are owned, managed and executed by 95% of individuals who are salaried, and some might say emotionally invested in the quality of the product. However, when the project reaches site, the final aspect of the quality process is very often owned and managed by operatives who are self-employed and only invested in the scheme for that one transaction. Not only do we have a declining labour force but our current procurement and delivery models manifest a lack of ownership at the very point when quality and not quantity really counts.

A focus on quantity to deliver quality

Standardisation of a product does not have to reduce quality and, with the right processes, it should in fact enhance quality via shared experience, learning and most importantly investment. If clients were to integrate their supply chains, including designers, manufacturers and installers, earlier in the process and across more than one project, then all parties would benefit from greater transparency of forward order books. Greater certainty of volumes would lead to an environment where more parties could naturally invest in R&D and skills development, which would improve productivity and reduce

costs. These savings could then be reinvested in quality assurance resources and processes.

A focus on quantity and standardisation must not be seen as a way to reduce costs but a way to increase investment and collaboration.

A focus on sustainable profit to deliver quality

When industries and businesses generate sustainable margins, R&D and investment inevitably follows. We believe that central and local government should utilise current and future procurement frameworks to provide greater transparency of workloads beyond the traditional models to engage with designers, suppliers, manufacturers and installers in return for transparent investment in quality focused R&D and skills.

By providing the framework and catalyst for investment in the key elements of the development value chain, the Government will influence the private sector as the public and private sectors' supply chains are intrinsically linked.

Traditionally, the private sector element of housing development has focused on reducing CAPEX to improve and sustain profit margins. However, a successful private rented sector business model is aligned to that of a local authority or housing association asset owning/managing model. This model is one whereby 70% of revenue is impacted by improvements in whole life costs and asset management and ultimately customer/resident satisfaction. We would recommend that procurement routes that allow joint investment in products and services and skills be created whereby quality and a reduction in whole life costs is a key metric for the private and public sector.



Shepway District Council councillors visiting site for 35 new affordable homes specially designed for people with disabilities.
© Shepway District Council

A focus on developing and integrating skills to deliver quality

Whilst the underlying definition of quality should be the same from project to project, there are key elements that are bespoke to each project. It is therefore critical that:

- The quality metrics are defined and understood at the beginning of a project including those that are bespoke; and
- That the relevant skills are developed and integrated into the project team to ensure that the client's and stakeholders' aspirations are fully met.

Developing and integrating skills is relevant when thinking about being a good client, designer, manufacturer, contractor or self-employed operative and is particularly relevant when considering the impact of new forms of procurement, design, manufacture, construction and quality control.

We would recommend that via the CITB and its industrial strategy, the Government demonstrates leadership and investment to equip the industry to not only survive but to thrive. This must be done by regulating skills-based programmes and employment initiatives across the broad spectrum of roles within the industry.

For example, designers need to be trained in virtual reality and manufacturing processes, we must invest in training to create qualified semi-skilled and skilled operatives in construction manufacturing facilities and, most importantly, on site, which must be seen as the final section of the assembly line where quality concludes rather than diminishes. In conjunction with these design and production skills, whether by procurement and delivery outputs or by regulation, the role of quality inspection and management must be a skill that is integrated into the delivery process throughout the project brief, design, manufacture and construction. New forms of procurement and contracts must require investment and ownership in the quality process from inception to completion by the actual procuring client.

We would also recommend that manufacturers and suppliers are incentivised to demonstrate that their products are installed and QA approved by a network of approved and accredited installers. We believe that this framework would ensure that suppliers invest in the training and development of the skills required to retain the quality of their products during construction as well as manufacture. These processes are already prevalent in certain elements of the industry where long-term insurance backed warranties are provided by the suppliers of materials. For example, the roofing industry has seen vast improvements in quality and a reduction in defects since roofing material suppliers began using accredited installers.

A focus on quality to achieve quality

How much focus do we really put on delivering a quality product? How many man hours are expended on quality inspections on site compared to the man hours constructing? Unfortunately, we currently only have anecdotal evidence to suggest not very many but, as has been proven with Robust Details, if you focus on quality through design, construction and inspection and testing, huge improvements can be made.

Our recommendation is that the 'chassis' of projects, foundations, drainage, frame, envelope etc are regulated by clear guidance and objective-driven outputs, and that the inspection procedures and approvals are regulated by legislation.

Consider again the dynamic where 95% of people on a construction site are self-employed and only for a limited time with very probably no employment contract or job description. It brings into perspective why the quality and testing regimes on site must be even more robust than in a controlled manufacturing environment.

Creating efficiencies through offsite manufacture in lightweight steel



Working Group member **Kate Henry-Aston, Director at Employer's Agent & Cost Consultancy Hunters, pays a visit to Fusion's factory.**

Skills shortages and the drive to improve quality are pointing in the direction of using offsite methods to build new homes, as we say earlier in our report. One such method is a system called Fusion.

Fusion is a building superstructure solution based on primarily (but not exclusively) light gauge steel (LGS). The company says its unique feature is a patented pre-insulated external wall system which integrates structure, insulation and cladding support in a single factory process. Fusion's extensive experience of some 5,300 structures has enabled the business to evolve to incorporate varied superstructure solutions for walls, floors, stairs and roofs.

Delivery and erection of a factory-manufactured pre-insulated structure reduces the requirement for site-based labour, although there is still a need for traditional trades on site to undertake the groundworks, cladding, internal works and finishes.

Fusion's light gauge steel panelised superstructures are currently being used on 15 new home and student accommodation projects nationwide, with a further 20 in the pipeline. When compared to traditional building methods, Fusion's offsite system enables entire building programmes to be reduced by 30%, requires five-times fewer deliveries to site and produces virtually zero waste, the company says.

The skillset required for offsite construction such as Fusion is very different from the traditional skilled construction trades used on site. Operatives in the factory need to be multi-skilled and training for eight or nine processes within the factory, including manual handling, can be completed in around six months. Specialist erector gangs are also trained and employed in-house, as three-year apprenticeship are also be offered by Fusion, leading to a higher skill level being achieved.



The use of multi-skilled operatives in the factory may overcome some of the skills shortages, especially the traditional craft-based skills, but the core professional skills including design staff, engineers and project management are just as important with offsite manufacture. There needs to be an even greater understanding of the interaction between these professions. Fusion employs in-house engineers, architectural technicians and CAD framers and this ensures early inclusion of the design team and a better understanding of the interface between the offsite and on site environment.

Furthermore, the company is investing in new bespoke, fully BIM-compliant software to aid the transfer of information throughout the supply chain.

Offsite construction may be able to address some of the current issues associated with skills shortages and the need for more new homes, but there are a number of key challenges which need to be overcome in order to maximise the benefits.

One of the biggest challenges for offsite manufacture is the peaks and troughs in demand. Continuity is key to manufacture and there may be potential for large companies and public bodies to take up the slack. Payment terms also need to be addressed, as traditional payment terms within the construction industry do not work for offsite. With around 10% of the contract sum being tied up with the offsite system for a company like Fusion, payment when the frame is in situ results in a lengthy payment period, which is difficult to sustain. Additionally, the design needs to be frozen earlier in the programme, generally eight weeks before the start on site. This requires earlier involvement of the design team and client commitment to freezing the design at an earlier stage.

Training for offsite construction tends to be bespoke in-housing training, although an increase in offsite construction would provide a need and opportunity for more standard training across the industry. The Farmer Review has highlighted the long-term shrinking workforce and offsite construction is therefore seen as key to maintaining the existing construction industry and also allowing it to grow.

The offsite light gauge steel fabrication from Fusion takes site trades such as brickwork off the critical path – for example, as roof tiling – or alternatively some internal works can commence before brickwork is completed. But more importantly, the use of multi-skilled operatives in the factory reduces the reliance on traditional craft-based skills and overcomes some of the well-recognised skills shortages, which will continue to worsen over the next decade.

Marrying BIM and offsite technology to improve quality

Denise Chevin reports how David Miller Architects and Hill Bespoke are ensuring defect-free homes in east London.



Offsite manufacture and building information modelling (BIM) are being harnessed to deliver a housing scheme in east London, which could provide a blueprint for improving quality, with minimal disruption to other site residents, whilst meeting tight timescales and budgets.

David Miller Architects is working with Hill Bespoke to deliver the fourth and final phase of Orchard Village for Clarion Housing. Orchard Village is the redevelopment of the Mardyke Estate in Rainham, in the London Borough of Havering.

This £30m final phase of the estate redevelopment will create 130 new homes for rent and shared ownership. It embodies the recommendations set out in the report from the London Assembly's Planning Committee *Designed, sealed, delivered*, which called on the mayor, Sadiq Khan, to encourage offsite manufacturing to solve London's housing crisis.

Phase four started on site in September 2017 and when completed in at the end of 2018, there will altogether be 530 new homes across the development.

The original phases, one to three, of the Orchard Village site had been the subject of large numbers of tenant complaints with a high level of dissatisfaction for both the client (then Circle Housing, before it merged with Affinity Sutton to form Clarion) and tenants concerning the overall quality of the buildings, insulation, leaks and the internal fixtures of each unit.

The client therefore wanted a different approach in phase 4, appointing a new contractor, Hill Bespoke, to deliver it. It has become particularly important for the housing association to demonstrate that it is listening to, and acting on, resident concerns and taking positive action to alleviate them.

DMA was appointed post planning by Hill Bespoke to deliver the scheme using modern methods of construction. Hill Bespoke came to DMA on the back of the success of a previous project they had worked on together. This had used pioneering technology and BIM to renovate listed barns near Cambridge, for which they have won a number of awards.



By this stage, phase four of Orchard Village already had already received planning permission for the masterplan so the footprint and massing of the buildings had been established. The apartments in this phase are arranged in a number of blocks of differing heights. The main block is shaped like a quarter of a circle around a courtyard, so includes a sweeping curve (see image above).

Elements Europe, a Telford-based volumetric unit manufacturer which specialises in student accommodation, is making the modules. These come fully fitted out with services, kitchen, bathroom, doors, windows, finishes and lighting specified to a particular Circle Housing standard. They are also fitted with balconies.

This is a relatively new form of construction for large-scale housing schemes, making it a pioneering project on this scale.

The steel modules will be 'stacked up' and then clad on site with traditional brickwork; this exterior façade will also form the curved element.

The bricklaying trades will follow on from the volumetric units being assembled. The first modules will go on site in November 2017 for completion at the end of 2018. The modular approach for construction reduces traditional space tolerances, which enabled DMA to add to the size of individual apartments.

The challenge for DMA, working as the executive delivery architect, was how to configure the units to fit the masterplan footprint most efficiently. Each modular unit is about 12m x 4m – the maximum size it's possible to be transported by an articulated lorry.

Hill Bespoke also required the project to be BIM Level 2 compliant and to provide a 3D model suitable for generating accurate components and material quantities. The accuracy of BIM allowed DMA to forensically and rapidly resolve upfront the difficult structural requirements in the scheme (load-bearing walls for modular placement) and process detailed information to inform the fabrication stage.

Meticulous, detailed design work of all apartments and homes prior to manufacture enabled full quality control of all fixtures and fittings (building services, plumbing, socket placement, etc).

The use of BIM to resolve the complex design issues of creating modular apartments within a curved design ensured that all interfaces and details were resolved prior to manufacture so that completed units could be fabricated for a precision fit.

However, the data generated exceeds a project's normal level says Tim Murphy, project architect.

"We've had to create a model for each different apartment to dovetail with how they are manufactured. Usually there would be one model for a project. There are 130 flats. Because of the irregular layout of the design, aspects like stair cores and cycle cores, there are 71 unique units – so each one needs a different model."



Then there are eight different consultants and contractors feeding into each model – which we have to coordinate. So the quantity of information and number of models that we host and manipulate is huge. This scheme wasn't designed originally for manufacture which makes it more complicated. But if you design with a simple floor plate, you could get down to four to five-unit types."

DMA is also running clash detection with each unique unit – which can run to 100 separate clashes being found including glitches like pipe openings. Says Murphy:

"This offsite methodology needs a design freeze early on, and this will give that opportunity."

In a belt and braces approach to ensuring quality, each element within the units is also assigned a unique bar code, which is scanned on installation. DMA has also been working with NHBC to reassure the warranty provider about the construction and quality process.

Says Murphy:

"It certainly has been a learning curve. But if we can make it work on this scheme, it proves that it can work more widely."

I think it will lead to a new vernacular. If factory built housing is going to become the new norm, then architects will need to work harder creating more interest on the facades, of what will be far simpler structures."

Mike Beckett, Managing Director of Hill Bespoke commented:

"This is a remarkable project, from the very early design conception stage, through to the offsite manufacturing process of the modules, once complete this project will be an exemplar scheme for modern methods of construction."

The models are hosted in Autodesk, and DMA is using its 360 suite to manage the information and Navisworks for clash detection within the models.

Beckett added:

"To ensure quality control, every module is barcoded and has a suite of QC checklists aligned to each manufacturing phase. They must be completed and signed off on an iPad before it can move on to the next stage. The completed checklists then sit in the 360 Field data base and they are used to precisely assess amounts for payment based on approved work."

Putting a ceiling on land value

Working Group member Jeremy Barkway, Strategic Partnerships Manager, Southern Housing Group, discusses how a new approach to land evaluation could impact quality.



The highly competitive process of buying land can have a detrimental impact on the quality of a new home. The usual practice to date has been to 'over pay' for land and seek reductions in planning obligations. This then creates immense pressure to reduce build costs and as a consequence compromise on quality.

A more objective measure of land value and a tempering of vendors' expectations would represent a major change in the process. The draft Affordable Housing and Viability Supplementary Planning Guidance (SPG) for The London Plan refers, for the first time, to an explicit methodology for calculating land value, referred to as 'Existing use value plus'. Enforcement of this policy should lead to developers aligning the price paid for land with this viability benchmark, and, in the process, embed planning gain into the land transaction process. This approach was also advocated by Shelter in a report published in February, *New Civic Housebuilding*.¹⁶

The 'existing use value plus' approach to determining the benchmark land value is based on the current use value of a site plus a premium, as the incentive to release the site, taking into account the various planning obligations. The intended effect is to set a limit on the value enhancement from the change to housing use.

This is cutting edge policy and the details are still to be worked out. But as part of a process for facilitating improved quality, the adoption of The London Plan SPG by the rest of the local planning authorities in the country would be a major step forward in ensuring that the incidence of overpayment for land is reduced. If land valuation can be moderated, a platform is created which could give aspirations of quality a better chance of surviving in the mix of the economics of the development system.

Conclusions

As an industry, we know how to design and build quality housing; we just don't do it often enough. If implemented, our recommendations would make quality housing the norm rather than the exception.

By ensuring that new homes are built to good quality standards we can make certain that they will be valued by future generations and not cost us money and environmental damage by having to be replaced for many generations to come.

In a properly functioning market, many of these problems would resolve themselves. The current, and long-standing, housing shortage means that new homes, even those that are of lower quality, are not hard to sell. If supply matched demand, buyers and renters would be in a position to pick and choose and the industry would have to up its game. This is very long way off and we cannot afford to wait.

As an industry, we know how to design and build quality housing; we just don't do it often enough. If implemented, our recommendations would make quality housing the norm rather than the exception. It will need a concerted effort and it will not be quick, but there is a growing sense that the time is right.

The remedies involve everyone. The Government must demonstrate that it is prepared to show leadership and act on its promises; deregulation has not proved to be a solution and it perpetuates uncertainty. Clients must be clearer about their objectives and design professionals and other team members must work more collaboratively. Developers must think differently about the kind of housing they build and how they deliver it. And contractors must regain 'pride in work', embrace modern methods of construction and invest in skills training. Communities and individual buyers and renters must be more involved at all stages.

Above all, we must all start to see housing as a long-term asset. Today's new housing should last at least 100 years. That makes every home we build a once in a lifetime opportunity. Let's not waste that opportunity by continuing to perform so far below our true capability.

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