

All Party Parliamentary Group for Excellence in the Built Environment

Inquiry into the Quality of New Build Housing in England

Fourth evidence session - **Doing things differently**

Monday, 14 December 2015

Speakers giving evidence

Mineral Wool Insulation Manufacturers Association - Steven Heath, Policy Committee Chairman

BLP Insurance - Jeff Maxted, Director of Technical Consultancy

Chartered Institute of Architectural Technologists- Kevin Crawford, Vice- President Technical

Leeds Sustainability Institute, Centre for the Built Environment - Prof Chris Gorse, Director
Dr Stephen and Mrs Elisabeth Watkins

Committee members present

Oliver Colvile MP (Chair)

Earl of Lytton

Rt Hon Nick Raynsford

Tony Burton

Peter Bonfield OBE

Stephen Stone

Andy von Bradsky

Turlogh O'Brien

Apologies

Maria Miller MP

Helen Hayes MP

Mark Garnier MP

Lord Best

Speaker 1: Mineral Wool Insulation Manufacturers Association - Steven Heath,
Policy Committee Chairman. Stephen Heath speaking

We submitted evidence around trying to deliver against three goals. Number one, it seems reasonable to make a home as efficient as cost optimal, as affordable, to keep the costs down over the running life, not just the purchase life for homeowners, keep fuel poverty at the lowest possible level. So energy efficiency of the property is one key factor. And of course energy security, all those other key issues as well.

So number one, make a home as energy efficient as possible. Number two, do what it says on the tin. At the moment, we can't be certain that homes coming off the supply chain are delivering what we hope they should be delivering.

And number three, not to be lost is the idea of comfort. In a home, we have a sort of 'Goldilocks zone,' we want it to be within humidity parameters, we want it to be within temperature parameters. Too humid, possible health issues. Too dry, same principle. So a comfortable environment is desirable.

But again we come back to, can you measure at an individual property level? We can measure at a stock level – over the last 10 years as far as retrofit is concerned, 30% lower gas bills for the whole housing stock, within 10 years. By today's prices, that's about £5billion a year lower gas bills relative to 10 years ago.

So we can measure at a stock level, but we can offer no guarantee to the individual home owner that they will save. And that's a flaw for us, and for anyone involved in this supply chain. And the challenge is, can anyone guarantee their annual bills, like a mobile phone plan? We can't at this stage guarantee their bills in a new home.

So how do we do that at the moment? There's robust quality control processes, we're not NASA, we don't build within the tolerances that they build – probably a bit too costly if we did. So whether it be renovation or new build, the question is, can we cost-optimally better challenge those build processes that deliver a better outcome?

And I even talk about a thought experiment here – this parliament, five years' time (???). Rather than saying 'we'll incentivise better homes when we know we can measure it,' I'd say look back five years' time. We have smart meters coming in, apparently every home will have one by 2019. Challenging, but that's the government's ambition. We have an array of smart, internet connected thermostats, whether that be Google owned Nest and British Gas have Hive. I noticed Worcester-Bosch, the biggest boiler manufacturer, released one just recently.

You've got the drop of the cost in sensors, whether it be internal temperature, outdoor temperature, humidity plummeting, and cloud computing power, plummeting, broadband cost, plummeting.

When I said you can't measure energy efficiency of a home, you can at the moment. What we do is give Professor Gorse here an awful lot of money to conduct what is called a co-heating test. We put the occupants on holiday for 2 weeks, Chris moves his heating equipment in, we artificially heat that home, and then see how long it takes to cool down. And then Chris does some calculations and tells us the heat loss coefficient of that property.

My challenge/thought experiment is – and I don't think the industry is ready for this – in five years' time, I don't think it will be £50,000, I think it will be very cheap to do that, and I think it will be done to us if we're not ready. A cost effective route to metering the impact of a home's performance, new builder renovation, should I think be available relatively soon, cost effective, and cheap.

But what's government's role in that? Give us a prod. Within Part L, say a little line within the regulation next time you update Part L, say 'as soon as someone produces a cost effective meter for the home, we'll forget the modelling for the moment, and within 12 months we'll move to that system. And you can't sell a home that is underperforming against that benchmark.' Same for retrofit; hold us to account.

In the incentive schemes currently incentivising loft and cavity wall insulations, say 'as soon as we discover a viable route to metering the impact of energy efficiency in the home, we'll move the subsidy to that. We'll stop subsidising the proxy wall or loft insulations, we'll simply subsidise evidenced savings in a home.'

So I would say get ready for it, and government incentivise it.

Speaker 2: BLP Insurance - Jeff Maxted, Director of Technical Consultancy.

Thank you for inviting BLP to present to this inquiry.

As one of the leading housing warranty providers in the UK we believe BLP are extremely well placed to comment on the quality of new build housing in England.

As an organisation we have been providing housing warranties as HAPM (Housing Association Property Mutual) from 1989 which provided 35-year cover for housing associations, and as BLP since 2004.

Our focus here is on the quality of construction rather than design aspects such as space, storage and daylight which we believe are being addressed by initiatives such as the Housing Forum Home Performance Label and BRE's Home Quality Mark.

You will already have heard the views of warranty providers who represent the "National" housebuilders. The BLP customer base ranges from the very high end quality developers through to the medium and smaller house builders, so we experience a broad spectrum of the current built housing stock in the UK.

Our experience over recent years clearly supports the fact that that the industry is suffering from two significant problems:

- A desperate lack of materials, from bricks to roof tiles. This can lead to spiralling costs and substitution of inferior materials to those specified
- The biggest skills shortage for a generation with estimates showing that the construction industry needs 35,000 new entrants just to stand still.

Despite the best efforts of Building Control bodies and warranty providers, this materials and skills shortages can result in poor construction quality on site, manifestation of defects and a failure of homes to perform as designed.

We believe for the UK to be successful in overcoming the chronic housing supply shortage, the industry needs to look beyond traditional forms of construction. The requirement to fill the supply and demand gap of over 100,000 homes needs to be met with housing that is durable, sustainable and cost effective. If the industry embraces offsite or non-traditional forms of construction this could significantly contribute to the required number of homes being provided.

Of course, prefabrication in a factory setting is by no means a new concept and the improvements and benefits we are seeing are very clear:

- Speed of construction
- Certainty of design at point of manufacture
- Reliability of materials and durability
- Better quality control
- Improved performance and a potential reduction in construction costs.
- Reduction in waste

Of course, prefabrication doesn't come without its challenges. Concerns around systemic failure, fire spread and water ingress, both during the construction phase and after completion, are often raised. And there is an absolute need to give confidence to Lenders, funders and purchasers that homes built from non traditional techniques will be durable and not require disproportionate maintenance throughout their life.

These concerns are being addressed by BOPAS, The Build Offsite Property Assurance Scheme, which was launched in 2013.

The Scheme has been developed by Build offsite, The Royal Institute of Chartered Surveyors, Lloyds' Register, BLP, the Council of Mortgage Lenders and the BSA, to provide assurance to the lending community that non-traditional constructed properties against which they may be lending, will be sufficiently durable as to be readily saleable throughout the duration of two mortgage terms, and that the structural integrity will not have a negative impact on the mortgage security during that term.

We are seeing project funders and RSL's are requiring BOPAS accreditation for projects using off site techniques.

The Assurance Scheme comprises:

- A 60 year durability assessment
- Process Assessment and accreditation

- The provision of a web based data base comprising property details

The BLP durability assessment is a rigorous and structured process following the principles for service life planning of built and constructed assets in the international standard ISO 15686 and is based on a standard time frame of 60 years. This would be the minimum expectation for structural components.

The assessment and accreditation part of the process is undertaken by Lloyds Register. Founded in 1760, Lloyds Register is a global independent risk management and accreditation organisation

Their process is designed to ensure consistent delivery of design, process and manufacturer each and every time the product is produced.

It includes regular monitoring to ensure standards are being maintained.

A web enabled database has been created comprising details of assessed building methodologies, registered sites and registered/warranted properties.

Developed schemes using a BOPAS accredited system are uploaded to the database allowing valuers to assess by postcode if a particular property constructed from non-traditional means has been through the BOPAS process.

Acknowledging the need to promote the take up of offsite technologies the RICS in their 2015 Residential Policy statement to Government stated

“Government should support the Build Offsite Property Assurance Scheme (BOPAS) to provide reassurance to the lending community that innovatively constructed properties against which they may be lending, will be sufficiently durable as to be readily saleable for a minimum of 60 years”.

We therefore propose, as recommended by the RICS that Government should endorse BOPAS as an independent accreditation process to improve confidence in the durability and quality of homes manufactured from offsite technologies.

We believe that this will give confidence to investors and funders and provide stimulus to the industry in addressing the UK housing shortage, supporting innovation in construction, and delivering consistent quality homes that will perform as designed.

Speaker 3: Chartered Institute of Architectural Technologists- Kevin Crawford, Vice-President Technical and Diane Dale-Practice and Technical Director. Kevin Crawford speaking

I would like to thank the committee for inviting CIAT to participate in this inquiry. As Vice-President Technical, part of my role is to oversee various committees and taskforces, carry out research, gather evidence and report back to the institute board and council.

The main subject matters of this inquiry are core to the daily workings of the membership of CIAT.

I have here with me as set of the new nationally described space standards which in lay terms set a minimum sizes for houses or flats. These standards for all intents and purposes are the benchmark.

We feel that there could be more clarity on areas of general indoor amenity, sanitary provision and more importantly private outdoor amenity space. These aspects of the house or flat, make the home.

The design of a new home cannot be looked at in isolation, it must take account of its new surroundings and the community which is being created around it, or changes to an existing community which a new housing development will bring.

Moving on however, these standards in our view, must be embraced by all, whether there is a consensus or not and we are aware that there are opposing views on minimum standards from all sides of the industry.

So, in summary for this item we believe that:

1. The house building and developer industry as well as local council planning departments must be allowed to implement these new base standards for a measurable period before any review or change.
2. More specifically, the occupancy of a dwelling should be advertised as part of any sales literature. The reason behind this statement – The new standards are clear and straightforward; and in the highly congested portion of the private housing market, namely 3 and 4 bedroom properties, the amount of information available to the house purchaser is limited at best and can be misleading.

Design Quality - As a Professional body, with an inclusive membership policy that embraces all of the design professions, we feel that we can speak with authority on this matter. Design quality is subjective and whilst we encourage quality supplementary design guidance, it should be localised and be non-prescriptive.

Also, planning authorities should be encouraged to engage with the development industry through pre-application and this should be a funded service and not a local authority money making exercise, which is what it appears to be. Developers and house builders are using the current pre-application consultation process less and less when investigating development opportunities as any guidance given has no statutory weight and cannot be relied on. If developers engaged with the planning department at the start of the design process, which incidentally is the intention of the national guidance, in the knowledge that

any advice given at pre-app would not be withdrawn or amended at application stage, the whole process should be smoother.

Finally, the introduction of Design Statements, for example in housing, has been good for giving designers a platform in which to inform the planning authority of the design philosophy behind a particular scheme. Unfortunately, some are generated using standard templates and written as a response to published planning policy to demonstrate compliance with the policy and not for the purpose that was initially intended. This is not a fault of industry or central government, it is unfortunately in our view, the result of a level of complacency in that a standard response in a standard format is deemed as acceptable, and even desirable. A review of the Design statement is an area where we feel significant improvements could be made to the overall process of understanding and presenting a design, especially if an application was to be presented to a planning committee, the design statement should form part of the committee paperwork, this on its own could encourage the applicant to produce a more specific and design orientated statement.

Effective Control, Implementation of regulation, better quality workmanship, are really all tied together. As stated in our submission we believe that the general overall quality has improved although in today's fast passed connected society, consumers are now more likely to raise complaints to the developer when they feel there has been a failure and this is correct and proper.

Do we feel that there is a need for a "National Register" or "League tables" - No.? The house building industry is a private sector industry and cannot be compared on a like for like basis. There could however be a standard, set by government of minimum levels of expectation and develop an industry report on that basis.

As stated in our submission, we feel that an independent assessment scheme should be set up to measure build quality and thermal performance.

Finally, on improved customer service, we would re-iterate the concept of Soft Landings by (BSRIA) whilst aimed at commercial projects, these could be adapted for domestic for pre and post construction to encourage our industry to gather information and use it to improve standards and communication.

Speaker 4: Prof Chris Gorse, Director, Professor Christopher Gorse, Leeds Sustainability Institute, Leeds Beckett University

The evidence collected by Leeds Beckett University on the whole building performance and heat loss, collected through co-heating test methodology, elemental heat flux and blower door pressure testing, is based on an invited sample and is not a random sample. While it may be expected that such buildings would perform well, the work shows this is not always the case. The body of work is one of the largest of its kind and provides useful performance information.

The increased productivity plan for 1 million new homes by 2020 will place pressure on the industry where evidence of defects and underperformance exists. It is essential that new homes, especially those classed as affordable, sustain their economic value and do not compromise standards.

Of particular importance and factors that our research has questioned include: build quality, function performance and operational efficiency. To achieve quality and sustain economic value performance gaps must be addressed.

Key issues we believe will take the industry forward include: Establishing an acceptable performance baseline and tolerance – relevant to energy testing, assessment and certification; assuring building performance, through photographic evidence of assembly, assessment, commissioning and build. Use time dated, geotagged records, images tied to each dwelling, with person responsible for delivery and commissioning time tagged to the records. The industry must produce engineered and repeatable solutions on mass.

All parties are concerned with performance gaps in new build and the unintended consequence related to the enhanced energy performance measures that are being adopted. However, this should not be the case there are examples of buildings that perform and are appropriately engineered.

The mass production of energy efficient homes will require a very different approach. Much greater attention to detail design and consistent practice is required to ensure moisture, mould, fire safety, structural integrity, air quality and energy efficiency are not compromised.

The work undertaken by Leeds Beckett University on new housing has tested and found energy performance gaps. In some cases the fabric is unable to provide the thermal resistance required, with twice the amount of heat energy consumed or 100% more energy passing through the envelope than expected. Errors and fault are not being identified by building control and the likes of PAS 2030 for retrofit are not robust enough for technical competence to manifest as a quality product. Greater responsibility, accountability and assurance of performance is required.

Current testing requirements also miss the bulk of dwellings – for example air tightness tests only apply to 5% of new homes. Contractors focus attention on the few tested and the air tightness performance is not the spread across the whole body of house produced.

Leeds Beckett University's performance data, collected through whole building and element based energy testing, heat flux measurements and air tightness assessment are supported with simple forensic photographic evidence which exposes defects and irregularities in construction.

Photographs are used and often exist on construction sites as records of progress and sub contractor works but these are not tied to dwellings. Quality sign off sheets should be replaced with geo and date tagged photographic records of construction, demonstrating the actual quality of assembly.

A quality file should be produced and remain with the building as assurance and provide for a smart maintenance system. Drawings, specifications, photographs of hidden features, data and geotagged can be stored with the property. This may move the real construction assembly closer to that designed.

Once dwellings are built, as designed, attention should be placed on achieving performance within an acceptable tolerance. An acceptable tolerance that allows for slight inaccuracy in testing and workmanship deviation can be established, for example about 15% deviation may be considered acceptable but not the 50% plus that we commonly find. Currently there are no safety margins.

Continuing to allow defects that affect build integrity, affecting fire safety, acoustics and thermal performance are not acceptable. As an industry we do not practice recall nor do we adequately repair or demolish buildings that are not fully function or even economically viable.

Homes once built become socially complex and difficult to address. A product fit for purpose should be built first time around.

System engineered buildings has to be a primary focus to achieve a better manufactured product. More projects that pay attention to detail through R&D to provide viable repeatable solution are required.

There are examples, exemplars, of developers engaging in more systematic development and manufacturing process led by phased or prototype development. We, at Leeds Beckett University, have tested low energy, Passivhaus and nearly zero buildings that perform without a significant gap, demonstrating that high quality builds are possible.

Smart energy monitoring has advanced and against building type, base lined measured and tested data, real operational energy banding of buildings can be achieved. Reliance on SAP, as a performance tool, can be reduced and emphasis place on actual performance.

Engineered manufactured systems, simple regulations supported by smart monitoring, core skills training, evidence based construction and commissioning, offer a direction for future build quality.

Speaker 5: Dr Stephen & Mrs Elizabeth Watkins. Dr Watkins speaking for the most part ("We" refers to Stephen and Elizabeth Watkins; "I" refers to Stephen Watkins who presented the evidence)

Attitudes

Builders should get things right first time every time and put things right where they are wrong. Instead there is resistance and denial.

We found our builder cleaning thick green mould off the floor instead of asking why it was there.

Our builder told us the wood floor was warping because wood was a natural product. Our surveyor said it was because there was no damp-proof layer below the ungrouted floor and the subfloor was not ventilated. The builder retrospectively added some air bricks and pretended they had always been there.

The NHBC issued the builder with a “promissory note”, without carrying out any compliance checks, to allow him to claim it didn’t matter that he hadn’t used them for building control as contracted.

The NHBC said cracks large enough to see through were non-structural.

Our surface water system should drain to the lake but doesn’t; the NHBC suggested blocking the drains from a neighbour’s garden. We don’t believe our experiences are unusual.

Ruxley

Where rectification would be disproportionate the *Ruxley* ruling allows a small cash sum to be paid instead. Misuse of that ruling strengthens tolerance of error.

The RICS surveyor assessed £425 instead of rectification for roof straps that were too short and £1600 instead of rebuilding for a utility room that was half the contracted size. These probably were correct uses of *Ruxley* but the sums seem paltry.

In two other instances *Ruxley* was used where we think full rectification should have been required. We were told it was disproportionate to spend a few hundred pounds to level an uneven and sloping floor since it didn’t matter in a room in the loft. The builder put double glazed units into single glazed window frames. Instead of £5487 to replace them it was assessed as £1200 to recut the frames and refit the units plus £1,000 for loss of quality. The law should change so *Ruxley* only applies where rectification is indeed disproportionate.

Inspections and warranties

Last week, RICS advocated an onsite person ensuring compliance. That won’t happen when builders and warranty providers get away with tolerating poor quality. We think there should be inspection systems which confirm compliance with a mandatory set of technical and quality standards covering all the things that the consumer reasonably expects. They should be supported by a comprehensive warranty.

In our written evidence you can see a list of defects present in our house when the NHBC ‘finalled’ it. You might wonder how the NHBC missed this. NHBC is mainly interested in the risks covered in its warranty –it said as much in its evidence last week. Its warranty is very limited.

In our case the warranty doesn’t cover

- Defective roof ventilation. Building regulations require it in order to prolong the life of the roof but NHBC say the damage hasn’t yet occurred

- A sinking drive. It is a defect in the grounds not in the house
- Give in the gable end walls. It is said not to be causing damage
- Defects in the sewage system, including failing pumps and infestation with Japanese knot weed, which the builder was contracted to rectify and didn't. It isn't covered because it wasn't a newly constructed system
- The roof is insufficiently strong for the attic room to be used as a store room or bedroom. It hasn't been used yet, so NHBC say there has been no damage.

All the organisations that gave evidence last week said regulation should focus on issues that affect health, safety and environment rather than consumer quality. We disagree. That is like suggesting that if you buy a toaster you should have a warranty that covers you if it catches fire but not if it doesn't toast bread. We think homes warranties should be as good as those for toasters.

As a public health doctor I give professional evidence today that the emotional stress of dealing with quality defects in housing is a health issue every bit as much as those covered by building regulations.

It is well known that heart disease, cancer, infections, anxiety, depression and gastrointestinal disturbances result from a threat to an aspect of well being, central to a person's identity, hanging over them for a prolonged period of time without the power to influence it. That describes the situation of victims of quality issues in their home under our present system. Consumers deserve quality.

Limitation periods

The statutory limitation period of 6 years can mean defects are not discovered until after the builder has ceased to be liable. Clauses limiting the builder's liability to the NHBC Buildmark shorten the period from 6 years to 2 years. The issues we have just described, as not covered by our warranty, are caught by this. We are without remedy.

Redress systems

When we had a dispute with our builder we thought we had the NHBC resolution system to help us and we had legal expenses insurance. We found the NHBC resolution system would only enforce NHBC standards, not higher contractual specifications, and yet we would have to pay all the money in hand on the contract in order for the builder to rectify just some of the defects. As to our legal expenses insurance the entire £50,000 indemnity limit was spent on expert reports, investigations and solicitor's letters to justify withholding the balance of £65,000. Without our legal insurance it would have been simpler just to pay the builder. We were told construction disputes are prohibitively expensive and it would cost several hundred thousand pounds to take the case to court.

Whilst court proceedings are so expensive as that there is no rule of law in this country; the celebration of Magna Carta is a sham.

We ask you to recommend a Residential Construction Ombudsman. We prefer that to a New Homes Ombudsman so it can also cover extensions and renovations need an effective redress system.

There is currently the Financial Ombudsman Service for disputes with the NHBC but it is very slow, its powers are limited to £150,000, it is ill equipped to deal with construction issues and there has been considerable criticism of the way it deals with factual disputes as it often relies only on the insurers' file and rarely holds hearings. In our case the NHBC would only quantify the claims it accepts if we accepted that sum as a comprehensive settlement – effectively holding a valid claim to ransom in an attempt to force us to abandon claims we saw as valid.

Housing and planning bill

Since a social conversation we had with John Healey last Thursday it has occurred to us that many of the changes that we are advocating could be implemented by a new chapter in Part 1 of the Housing and Planning Bill. It is too late now for the Commons but it could still be added in the Lords. We have given some thought to how such a chapter might be formulated; we could share these with the APPG. (though we appreciate this might not now work with the time table of the report)

Gagging clauses

We have sent you a copy of the confidentiality clause in an offer made to us by the NHBC. This may have had quite innocent intentions and simply been rather widely drawn by an overenthusiastic lawyer. However, had we accepted that offer, we could not have given much of our evidence today. People feel gagged by these clauses.

Last week you heard from NHBC how wonderful the warranty system is. It is easy to talk a good fight when they are talking mainly about their future plans and all their past victims are silenced. NHBC does excellent work in promoting quality and generating standards. But, when that fails, NHBC is not really available to help, and their standards aren't really applied.

Land banking

Our evidence addresses the anti-competitive impact of land banking. I know this is disputed but I first heard this argument from a medium sized builder telling me it could not provide the quality it wanted unless it was protected from competition for land by builders with a different attitude. Last week some members of the committee expressed reluctance to regulate. Sometimes we need regulation to protect responsible businesses from unfair competition by irresponsible businesses.

Regulation of warranty providers

That is true of warranty providers as well. It is not the ownership structure or the governance structure of NHBC that limits its effectiveness, but the commercial need to seek business as a warranty provider from building firms. That is why in all Australian states except the Northern Territory, a warranty is made available by the Crown and it is compulsory to subscribe to that warranty or to an alternative warranty provider which meets standards that are at least equivalent. I think we should have that system in this country.

Design

My own professional experiences of the attitudes of the industry to design standards derive from trying as a Director of Public Health to promote modern technology to create greenspace, address urban heat effect and prevent flooding.

Bluntly the industry is not interested in modern technology in these areas. There might be a possible future investigation for your committee in that topic.

Construction will shortly begin on an exciting greenspace-compatible development in Stockport with houses grouped round a swathe of open space leading from a deprived inner city estate into a country park. This has been possible because the Council owns the land and the planning designation justifies depressing its market value.

Without those advantages I have been unable to inspire the slightest interest from the private developers of a new garden village in having more open space and more houses by using earth-sheltered technologies.

This limited vision may apply to other areas of design as well.

Questions:

Question Peter Bonfield:

You mentioned an ombudsman, I'm just thinking about how you might do that. The ombudsman might be one way. You've got a scheme in place, so do others, how might you go about having a straight forward way of having reliance certification schemes and all that stuff, so that a consumer can trust what is being proposed or certified is right?

Answers

Kevin Crawford, CIAT: we currently have schemes right now, although there are various views on whether they're suitable for purpose or not.

You could have an army of thousands of qualified assessors, who will take the physical and technical submission, check it against the stats and say 'this is what it should perform at.' It is not a big stretch to make. [says something else that is inaudible].

The government has actually been quite good at saying 'we want these audits, we want these check procedures,' and every time I submit an audit request I'm chewing my nails off.

I know that audits fail, and questions are asked and inspectors suspended and all the rest of it, but there's no reason why that can't be extended to a physical check.

Our feeling is that on the mass industry, it's not a major expense to do checks on the 1 in 50 model, because if 1 in 50 passes and it's completely random there will always be exceptions, there will always be one that slips through, unless you check every single property that's going to get built you have to accept that there will be statistical error built into it. You have to trust that your audit scheme works.

And if that means increasing the selection process, fine, increase it. But the industry has to pay for that themselves. Because they will know that they are producing a better product.

[says some stuff I can't hear]

You've got to remember, energy performance is only valid for 10 years. [some more words inaudible] Increase the scope of what's already there. We don't need brand new schemes; we've already got schemes in place.

There's more than enough around the UK that have the expertise to provide the training for people to do this, it's not that difficult. As you said, the expertise and the technology – let's be honest you can pick up a thermal imaging camera for £50. Five years ago it was rocket science, it's not anymore. We now have the technology to do this sort of thing.

MIMA Steven Heath: at the moment yes, it seems whether it be renovation or new build, to a degree there's an element of working to the test. And the test is SAP, It's 'well look, this product exists in this home – box ticked, move on.' And to a degree, renovation works the same.

And I've no evidence of that other than what Chris Gorse is saying there's a serious underperformance in a lot of homes, not uniformly.

So for me, what would focus us as manufacturers to really start putting a lot of our R&D in supporting robust process flows, to make sure it's going in there, well first, we need to be asked the question by a lot of people. We're already doing a lot of work with Chris on this, but at the moment we don't see that robust process flow where it offers a reward on investment, you're doing it for good practice to a degree.

So we come back, and in our evidence we simply said three goals; one, more energy efficient homes, two, a far better reliance that every home is performing against that badge, and three, more comfortable homes.

For me, the government set a bit of an indicator by saying 'we're going to bring in condensing boilers.' You're familiar with that, in 2005 they said 'here's a plan, we will bring in condensing boilers and you'll have to install them. Get used to it, you've got a few years.'

And that was our evidence to say well, you can't say there is a cheap and reliable test that's going to come on in 4 or 5 years, but I think it is not beyond the wit of man to take the expensive university tests and in 3 or 4 years come up with a relatively cheap test to determine if a home is performing within tolerances.

Now for me, we don't even need it to exist, we build into Part L regulations to say that if such a test exists, we're going to bring it in at the next SAP iteration. That, I think, would immediately focus us and everyone from the house builders to start looking at these robust process flows. To start looking at how do you control your type testing, your construction robust details etc.

At the moment, we appear to be able to build the test, and that's it. So we need government to come in and say 'we will have the intention of doing this should the option exist in 2 or 3 years' time.

Dr Watkins: this isn't my area of expertise, but of course these kinds of problems occur in all industries. Within my 30 years in the medical profession I've seen a dramatic change in the attitude to error and to evidence, from a situation where you did what you'd been taught and if it was wrong you did your best to defend yourself, to a situation where we try to do everything in an evidence based way, and we try to investigate errors and learn from them.

And I think that is the method by which any system improves. It's the method by which the railway signalling industry improved, the airline industry, and the medicine industry, although not yet completely.

But yes a lot has changed in medicine in that aspect, and I think it's time the construction industry did the same

Jeff Maxted BLP: as has been said, there are lots of different options and assessment processes out there, BRE's home quality mark for example, and the Housing Forum's performance labelling, two different ways of looking at quality in a home. Both have their own merits, and there's probably space for both of them. How does the consumer know which is the right one and which is the wrong one?

The warranties are very similar, and it's probably the only insurance product where the consumer doesn't get to choose the one they want, because it's imposed on them by the developer.

All warranty providers are different in many ways.

Oliver: perhaps the buyer needs to offered a choice of which provider they go with

Chris Gorse, Leeds University: I think initially, we've got to remove the sign off procedures in construction, because they are flawed. The first thing we need to establish is the design is right, the construction process is right and is meeting standards.

And so whilst we do whole building analysis for performance, when we actually get down to what is wrong, we produce photographs of the construction phase which show ill fitting products or a problem of interfaces, which would be obvious to any person on site.

So actually trying to tie systematic photographic evidence of the construction process, is actually I think a good way of empowering people to look back at the building they've just acquired, and also if we tag the people who are responsible for those phases of construction, there is some real ownership to that which has been photographed.

Photographic evidence exists on all sites, I used to take it myself when I was on site, it's common practice, it's just that we don't tie it to construction. And I think that will help encourage good practice

The next stage is how we encourage development to move the whole process forward. Acquiring the evidence and aligning that to a building with all the technology we've got coming online, I don't think it's a remit necessarily of the industry, it's going to happen anyway that we're going to be able to pick up evidence that's tied to locations and time tact, but in terms of improving standards and going through version controls so that people will buy or invest in the next product and know what that product is, I think is important.

It's something the industry is not used to. We buy a house, we don't buy the version one, the mark 2, we don't have a way of really differentiating, which actually sort of underpins some of the standards that we might be trying to sell or aspire to, so that's something that needs to be encouraged.

Actually, I think the consumer is becoming empowered, and their voices are getting heard through social media. There's a real risk to the industry that the thermal cameras are becoming cheaper, and that the youth will actually be able to pick these up and use them to see what's behind walls.

And that's a very basic assessment. It doesn't take us particularly forward but it is a risk to the industry. And even if there isn't obvious legal recourse, I think the power of groups of people has been shown already, to attack authorities, where poor quality contractors are probably responsible.

Question: Nick Raynsford

In sessions so far we've heard suggestions that fall into 2 broad categories, first is to have a stronger inspection process, second is to give greater power to consumers. Which of those processes do you instinctively feel is the best?

Second question concerns retrofitting. We have poor quality of energy efficiency in our current housing, but no one has talked about mechanisms for a solution, regulations don't cover retrofit. Are we going to see the difference in energy efficiency between existing and new houses widen?

Answers

MIMA Steven Heath: I'd like to take the second question specifically, because I just drafted a response to Peter Benfield's review a couple of days ago.

And it picks up exactly what Professor Gorse has been talking about, that the piece missing is that what ties the assessor to the assessment, what ties the installer to the installation, who's conducting that assessment process, what tools are available to them in terms of an app collecting the decisions and reasons for those decisions, what's the sanction process for where things haven't gone right.

At MIMA level, we're writing a straw man to try and get industry around to say what really works. But that high level element of tying an individual and a corporation to the work, and having that easily searchable is powerful.

And I would say to your first question, greater power to consumers yes absolutely explore it, but number one, tie the work and the individual and the company to the output, whether it be retrofit or new build.

Elizabeth Watkins: I'd like to make a point about the warranty system, and how we can improve that. Last week we heard quite a lot about what NHBC are going to do in the future. Well in 1998, when our house was built, there were very good standards about mandatory technical guidelines, and also the definition of an NHBC builder was that they should be competent and work to NHBC guidelines.

So that was very good advertising and it makes the purchaser feel confident. However, that didn't happen, and in the event of a claim, all that was disregarded. And it's no different from going into a shop a buying a cashmere jumper, only to later find it's not in fact cashmere. Because I want the product I thought I was buying, and I think there may be an element of distain with these warranties

Kevin Crawford CIAT: there's a great difference between retrofit and new build, it's a different skillset. The people required to carry out retrofit are not necessarily the same as new build. Any building built pre-1919, which is the definition of a historic building, will not perform well if you treat it with modern retrofit methods. You have to choose materials extremely carefully, and this a skill which I'm afraid to say isn't well understood.

The STB Alliance produces masses and masses of guidance, and one of the things they mention is that buildings such as this were never meant to be air tight. They were meant to be ventilated through a great lead chimney and a fire place.

But buildings became sick when we began to close them in. I'm all for airtight buildings with proper ventilation. The ventilation standards we are putting out today within the building regulations are designed for modern fabric, they are not designed for historic fabric, and we must be extremely careful if we are going to try and apply modern standards to historic buildings. Because we could end up having serious problems.

So cavity insulation of older buildings must be looked at very carefully on an individual basis. But people are pumping cavity insulation into these old buildings, and it will not work. There are more expensive solutions that will work, however the standard off the shelf solution will not work in every case and it must be looked at very carefully on an individual basis.

Jeff Maxted BLP: I'd like to come back to the warranty point you raised again, and I don't want to see all warranty providers painted with the same brush, because we do have a different approach to warranty. We're effectively an underwriting agent for Allianz, who pay out on any claims.

And if there is a claim, BLP do not get involved in going out to site and checking those claims. Allianz provides an independent loss adjustor to go out, assess the claim, deal with it, and as quickly as possible, resolve it. So if it's a legitimate claim under the policy, Allianz

will settle that. There's no way we get involved, it's an independent assessment by Allianz, who are the insurer.

And they come down on us on the technical side like a ton of bricks if we get these things wrong, and don't pick things up on site. So we're under a lot of pressure to make sure things are being built properly

Comment Oliver Colvile: *I think the problem is this: there's been a lot of new building in my constituency, some of it's been very good, some rather shoddy. And I'd just make this point that someone who's actually invested this amount of money to actually buy this property, to then discover there's all these issues, they don't know frankly where else they can go to in order to get this thing rectified. And that's what people want, someone who they can go to in this situation*

Question Stephen Stone

In all the sessions, the evidence has been around warranties, quality of build, inspection regimes and testing. So I've written down a few things that I think might be helpful. One, a no fuss clearly understood warranty. The second thing is I want to build a house fit for purpose, build a house per the approved drawings, because often you get into a debate with the consumer as to what an interpretation is. And the third thing is, if something goes wrong, no qualms with putting it right, which I think is what the consumer is looking for. So feedback on that would be nice.

Also, we've heard about all the stuff that goes wrong, but I think 90% of builders do get it right, and everyone is trying to get it right, it's horrible for both consumer and builder when it goes wrong. Everyone is trying to get it right, but it doesn't always happen. And therefore we need a check and approval system. Because experts always seem to want testing, but it's far too late. When you're talking about public health, and the stresses put on the consumer, you need to get it right during the process. So I actually love the idea of the photographic record.

Answers

Chris Gorse: I think the fitness for purpose you mentioned is the key agenda here, whether it's new build or retrofit. And one of the problems with retrofit is we've got a lot of opinions on what works and what doesn't. And yes some insulations products won't work in some situations, but to say cavity wall insulation won't work on a 1960s house is a wrong approach. For some archetypes it'll be absolutely applicable to depending on that situation.

And that can be rolled out en masse with a system, if you've got enough information about that archetype and the system. And that you need insulation manufacturers to offer some assurance assigned to that.

And I think we need to understand the building types in terms of retrofit, and the systems that we think we're adopting for those, and up skill the workforce so that they can install them, and recognise where the slight differences make that a problem.

Dr Watkins: We thought 'we all love this house,' so we took lots of photos of it while it was being constructed, which I have to say have been invaluable evidence over the years, and I do believe that maintaining photographic evidence of construction could work well.

On the issue raised of people having a choice of warranty provider, I think where someone is buying off plan, before the house has been constructed, in those circumstances I think that's absolutely right, it should be the consumer who chooses the warranty provider, and they should have the information that allows them to do that.

But the problem is, if someone's buying a house that's already been built, by that system you break the link between the technical inspection and the warranty provider

Question: Andy von Bradsky

So much said about consumer, quite rightly so, but little said about other aspects of quality. Just thinking about regulatory aspects, lots done through housing standards review, space standards etc, will be interesting to see take up of space standards.

But there are regulatory gaps, I'm surprised we haven't heard more about overheating. I think there is a role for regulation, and the question for me is are all our regulations fit for purpose, do they work? Are there overhauls that need to be considered? What's the role for regulators to empower the consumer? I like the idea of 'simple regulation' that someone mentioned, so what simple things would you want from government?

Answers

Kevin Crawford CIAT: what you've mentioned is stuff that I'm dealing with on a daily basis, like overheating, over specification, under specification, insulation performance – it's something that we as design professionals understand but the consumer doesn't. The consumer generally doesn't want to understand, they want to walk into a property, they want that property to do what they want it to do, not necessarily what we've designed it to do.

There's been talk today of Passivhaus standards. Passivhaus is a fantastic benchmark environmental energy efficiency product. However, to live in a Passivhaus standard house, you have to understand what it is and how it operates.

There was a project in Essex that was all built to Passivhaus standards, and within three months, the poor designer, who was a fantastic, certified designer, was getting countless calls because everyone was saying the house didn't work. It did work, but the users were not informed properly on how to operate the property.

And this comes back to what I was saying, what can house building industry do for consumer advice? The house builders are now producing very technically adept properties; smart heating systems, highly airtight buildings with ventilation that needs to be carefully controlled, because if it's not controlled you get Mould City.

That's what happened in the 60s 70s and 80s with air conditioning. Now, modern commercial and industrial buildings generally understand it, but it's taken a long time. We're now putting that kind of performance into a domestic building, and expecting the end

user to know what to do without any advice. We have to ensure that the information is handed over to the consumer. It's like a car manual. It's a regulatory requirement where I come from.

Oliver Colvile: *my argument is that at the end of the day, we as politicians should set the policy around what is going on, and therefore if that's pushing a bit further to make sure that information is available, that is our job to try and do*

Steven Heath MIMA: a lot of what we're saying... we talked a little bit about comfort, and for me, comfort is goldilocks bands around humidity, air quality etc.

But again we come back to that measurement problem, it's an abstract at the moment. How do we make sure? Yes, absolutely proper guidance and testing etc, but what you're describing I think is a world where... when's the first energy serviced home going to be sold? i.e. with the package for energy services. 'We think we'll guarantee that this home will cost X to run, we'll support you on how it's going to be run, it's got a bit of smart tech but because of the dropping costs of sensors etc it's not much there.'

And at the moment I'm looking across the whole space, and that's the innovation.

Dr Watkins: in the first two thirds of our evidence, the consumer bit, we argue for clear, firm standards that are comprehensive, and are rigorously enforced.

But in the last two pages, I also argue for the innovative use of new technology, and it's very important of course that regulation doesn't constrain the innovative use of new technology.

I wish I had £100 for every time I'd looked at a planning application and seen the standard plan that has been approved and failed in hundreds of other applications around the country, but they know it will pass the planning inspector.

And when I try to engage with them on the issue and say 'why don't you have one that will actually work?' they say 'oh we know this will pass scrutiny.'

So we do need to be careful that regulation is actually capable to adapting to improve technology. Things that might have been acceptable a few years ago might not be acceptable today, as the technology has moved on

Jeff Maxted BLP: I think there's a real issue around making homes too complicated for the people who live in them, and I'm a big advocate of the fabric first approach.

[something] very much involved AMC4, which looked, which looked at producing high quality homes that didn't rely on very complicated kit which various home owners had to be able to operate.

And that in the long term will have a significant impact on the life cycle of the building. Which may be more important for Housing Associations or the PRS arena where they do have think about how much the buildings cost to run.

So I think a fabric first approach is the way we should be going as the housing industry. And I think regarding government, it's difficult to see what other things they could do. I think

they're going to have a situation where, having gone away from the zero-carbon homes legislation, now with the agreement in Paris, are they going to have to reintroduce that?

Question Turloch O'Brien

Can we explore the contribution that greater off-site construction could make to the quality agenda? [also wants to talk about BOPAS and consumers' ideas of quality including much not covered on warranty]

Answers

Jeff Maxted BLP: - the difference between BOPAS and a warranty is that BOPAS is an assurance. It was very much delivered by the lenders who were getting nervous about the amount they were seeing off site construction in the residential sector; they didn't know how long it was going to last, valuers didn't know how to value them, didn't understand what the impacts of defects were going to be.

So they got together a team who could look at an offsite home from cradle to grave, with a requirement that any assurance assessment on it would be a 60 year assessment, these properties would last for 60 years without undue maintenance or repair. They would much rather have a 60 year warranty, but such a thing is just not available and never will be.

So that's why BOPAS was produced, and it does look at all aspects of the design, not just the structural design but also the quality issues throughout the production phase, to ensure that the quality product that comes out the factory gate will be the same quality product that comes out the factory gate.

There has been a fairly slow take up of BOPAS, and we were at a meeting the other day where one of my colleagues from Lloyds described BOPAS as a 'cottage industry' in the UK.

And I think that has almost been the case, but now we're seeing Laing O'Rourke working to develop their supply chain and develop their own factory to build 10,000 homes a year, and I know BRE are involved in that supply chain process and looking at a standard for modular construction.

And I know Barratt and Crest are also looking at offsite, because there is more of an assurance of quality in a factory environment, particularly with the current skills shortage we have in the industry which is going to be very difficult to address. I know Crest have got a training and apprenticeship programme in place but we need to find an awful lot of people to fill the gaps we've got at the moment. And offsite is going to be the way forward, there's absolutely no doubt about that. And it should address performance gap issues we're seeing at the moment.

Chris Gorse, Leeds: The early indications, I mean it's only small amounts of research but where we've tested the more pre-fabricated modular system build, they've been closer to performance measures generally, and it isn't a random sample so how that's skewed we don't know, but where people are paying a lot of attention to detail looking at their processes and function fit, then the performance is getting initially a lot closer to that which they expected achieve.

But I also think they're paying closer attention to a whole range of tolerances(?) and I think that's what we're not doing, going back to the earlier issue of standards, when you go to manufactured or system build, you're looking at what your minimum target is and then you're working towards that as your fabric performance.

Equally people are thinking more about overheating and how they're going to shade the buildings, the type of glazing they're going to use, and how to exhaust a building if the occupancy is higher than expected. And I think where you've got system builds they're scratching their heads just a bit more than you is with what may be described as a more bespoke traditional.

Although I'm not sure we still have a bespoke traditional, there's a lot of manufactured products in those that sweep through the market, it's just how we put those together.

But I think getting regulations to be a customer placing product, so if we're saying the U-Value is worth something, well not sell that instead of a design contact that informs regulation, give it to the customer. If it doesn't perform to that, that's something that can be challenged. And then we can look at tolerance and minimum standard – is that right? What's the variation we expect to see? Not error, but what variation do we expect.

Kevin Crawford CIAT: it's interesting what a lot of people call offsite manufacturing. You've actually got quite a vibrant offsite manufacturing industry in this country. It depends on what you mean by offsite manufacturing. If you mean building an entire house offsite, nobody does that, but if you mean building large scale panels, we have quite a substantial industry that does the system very well.

All of my developer clients at home, they all use large panel timber frame. That is offsite manufacturing, it's made in a factory, brought onsite, and built.

So it's how much resources do we want to put into that, and more importantly, is that a traditional method of construction – I think timber frame is a traditional method of construction, some of the oldest properties in this country are timber frame

Comment from Nick Raynsford – we have had evidence, and I'm sure you're aware this is the case, that if those systems are not assembled correctly, if insulation isn't done properly, then you get very fundamental problems and all the benefits of offsite lost

Kevin Crawford CIAT: well yes but that is actually about assembling onsite, if you can't do it then don't do it. But you do it in volume and you start to get better, and we do have a major skill shortage

Nick Raynsford ask but does that improve the quality? if it goes wrong – if errors on site will go wrong big time

Well yes it can do, there's a better chance of it improving quality. But as you just said, if there is an error, it's going to go wrong big time. With simpler constructions, it is easier to fix small errors. But when you go more offsite, it's harder to fix errors.

Oliver Colvile: *to put this into context, the government is very keen to make sure we have as much new build as possible, and we want to make sure it's a good quality build, rather than something that's going to produce masses of problems*

Tony Burton: *I was pleased to hear over these sessions about new methods of construction and there are some quite innovative things that have been talked about. But all these things come to site, and they're assembled where they're going to physically rest. And that's a different environment to a factory, and it's the interface issues.*

And I've heard people say people saying that going offsite will solve the problems, but I'm not sure that's true. So what do we need to do to ensure to workforce is equipped to get the quality right putting these things together?

Jeff Maxted BLP: I think you're right, an offsite home will not come to site with everything done. The foundation and drainage has got to be put in on site. We've just got to develop better on site practices, using a checklist or whatever you want to use to ensure these things are done properly.

We have a very structured, checklist approach to how we check designs, and also workmanship onsite. And I think that came out of work the BRE did many years ago that showed that if you went to site with just a checklist and did a quality check you'd identify a third of defects

Peter Bonfield Comments – *I'm looking into retrofit at the moment and how we make that better. It's really good to hear from the consumer about their experience, we heard the HBF last week say 90%, but that means 1 in 10 is not working, and that is just utterly wrong.*

The story I'm getting is that everybody in the industry has a part to play; more enforcement, better standards, more co-operation that people can trust. And by a way of balance it seems like there's a 20% requirement from the public sector to think more, regulate more, enforce more, and 80% for private sector to follow it up.

In the retrofit sector, it is the industry who are absolutely driving the need for change

Oliver interjects: *to say that the inquiry is focussing on new build rather than retrofit*

MIMA chap: there's still got to be that accountability. Again, there's got to be that retrofit person that's making decisions, what product they use, to be accountable for those decisions. And whoever is inspecting knows who has made the decision, knows the reason for that decision, and knows what product they've used.

So just like Chris was saying when you build, you tied the individual and the company and their professional reputation to delivering a good outcome. Because what you've described really is an engineering challenge to produce a good building, whether it be modern or traditional methods of construction, an engineering challenge

First of all, we've got to be challenged to do it. And then, when everyone understands their level of accountability is real and transparent, hopefully we end up with a good product. And failure rates that virtually negligible, and a good redress system for if there has been a failure, whether it be retrofit or new build.

Chris Gorse: the one concern I have with some of the system build resilience to change, and what people think they can do with it. With a masonry building, we have a lot more flexibility within the ways that we've traditionally altered buildings and punctured them, and they stand up to that change.

With some of the other systems we're looking towards, we don't know what some of the impacts will be if users alter them in certain ways. So either we say 'with this building you can't change it,' or we actually give some guidance on what may be possible in the future

CIAT Kevin Crawford: with respect, I would say if you compare a modern car to a car from 20 years ago, people now do not do work on their cars.

[Chris says that cars have diagnostics which houses do not]

But it's much easier to know how a house has been built these days. If you go back 30 or 40 years, it's very difficult to know how it was built, what the specifications were etc. But nowadays we have that information and it's there for all to see forever more.

And that ties in to what I was saying that consumer should get information on their property, which should say how the house was built. A lot of the information we've been talking about, it already exists, it's just about getting it to the right people

Stephen Stone: *that is a fair point about adaptability with system builds. And it is one where government are pushing to increase offsite manufacturing that adaptability and flexibility should be part of the briefing. Otherwise you're going to encounter huge consumer problems 20 years down the line as lifestyles change*

END