On 11 November 2023, a balcony belonging to a property on the Weavers Quarter housing estate in Barking partially collapsed.

Tests subsequently carried out by BioComposites Centre at Bangor University on behalf of the BBC found that the materials used in the balcony included plywood made from a non-durable species of poplar and a weak glue. It was, the report said, "totally unsuitable for outdoor use as it was so susceptible to decay and collapse".

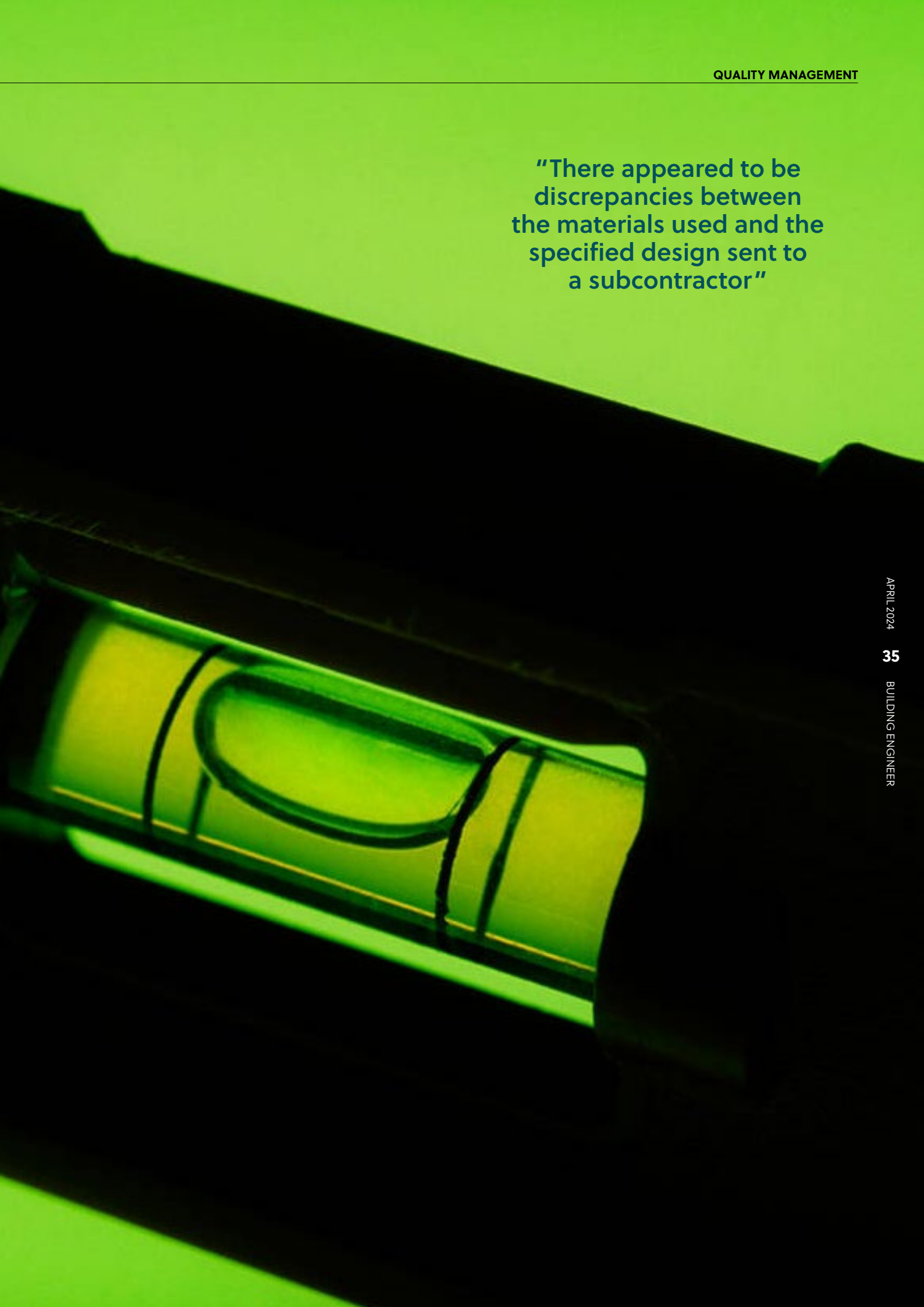
Bouygues UK, the firm that built the housing estate, said there appeared to be discrepancies between the materials used and the specified design it sent to a subcontractor. The result was 77 balconies in the Weavers Quarter needing to be shored up with scaffolding, with residents told not to walk on them in case those other balconies also crumbled.

Quite aside from the obvious threat to the safety of not only the owners of affected properties but also

IMAGE: ALAMY

Quality street

Alongside the culture changes to safety and competency, **Matt Lamy** asks where the construction industry is in terms of managing quality and where it should be



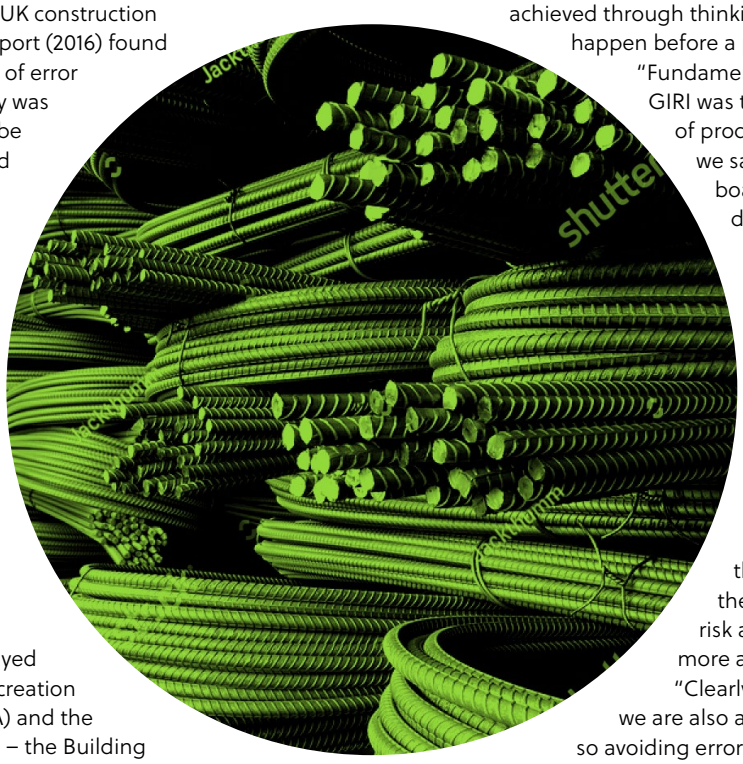
"There appeared to be discrepancies between the materials used and the specified design sent to a subcontractor"

anybody walking in the street below, the incident resulted in damage to Bouygues UK's reputation, created unnecessary inconvenience for a significant number of people and, of course, required substantial additional costs to rectify the problem. This was all because of a failure in quality management.

Getting it right

In 2015, the Institution of Civil Engineers hosted a meeting of interested parties to discuss how much the construction industry wastes through error. One outcome of that meeting was GIRI – the Get It Right Initiative – a not-for-profit body with a stated aim to "improve value by eliminating error" and encourage more thorough preparation to prevent potential errors and defects before work on a construction project even begins.

Another result of that meeting was the commissioning of a study to look at the overall context of quality management in the UK construction industry. The GIRI Research Report (2016) found that, on average, the total cost of error to the UK construction industry was 21% of total spend. This could be broken down into: 5% recorded direct costs; 7% indirect costs; 6% unrecorded process waste; and 3% latent defects. With the value of the construction industry in Great Britain in 2021 recorded at £115bn by the Office for National Statistics, it means that potentially £24bn is lost to substandard quality in construction every year.



But since that 2016 report, there have been moves to address the issue of construction quality. The Grenfell Tower fire, in which a lack of construction quality played a defining role, has led to the creation of the Building Safety Act (BSA) and the formation of three new bodies – the Building Safety Regulator (BSR), the National Regulator of Construction Products and the New Homes Ombudsman. The Act has the expressed intention of providing the homebuilding industry with a clear, proportionate framework to deliver better, high-quality homes.

Created in parallel, the British Standards Institute (BSI) has developed the BS 99001 standard, which expands upon the requirements of ISO 9001 with sector-specific requirements for areas such as competence, design quality, temporary works, inspection and test plans and documented information. According to Ian Richardson, BSI Built Environment Sector Lead, BS 99001 "enables users to demonstrate a commitment to providing a high level of quality assurance on projects".

So, the tide towards a more quality-focused construction industry appears to be turning, but how quickly – and how far – does it have to go?

"The adoption of best practice was dependent on people seeing the benefit and recognising that something needed to change"

Cliff Smith, Executive Director, Get It Right Initiative

"In the construction industry, we have a number of organisations that are interested in improving quality, but what GIRI does is aim to avoid error in the first place. We don't go around checking things to see if they are right; our objectives are more often achieved through thinking about what is going to happen before a project begins.

"Fundamentally, our first objective at GIRI was to improve quality in terms of productivity – that was where we saw most interest from boardrooms because that can directly improve performance. But we then found that, as we worked with and discussed issues with people, there were other benefits from an error-free approach. For example, you get safety benefits. According to Australian research, 37% of accidents occur during rework. When people go back and do things again, they don't necessarily follow the same safety procedures or risk assessments, so there are more accidents during rework.

"Clearly, if we are wasting materials we are also affecting our carbon footprint, so avoiding error can have a benefit on the sustainability. And, of course, if you are getting things right, your quality is better as well. All of these things, when you take them together, means that productivity and your out-turn predictions are more accurate. In construction, we hear a lot about being late and over budget, but if you set out to avoid error in the first place, you are going to have a more predictable outcome. The reputation for your business and the industry as a whole improves.

Proper preparation

"With our projects, we do what's called a pre-mortem. We look at a project and we gather a group of experts who have experience in delivery of that kind of project and who understand what the potential errors are. Then we look at how they are going to be resolved.

"We're not design management, but some of our research has looked into the root causes of error. Six of the top ten root causes mention design in one

IMAGES: SHUTTERSTOCK, NOUN PROJECT

THE **TOTAL COST OF ERROR** TO THE UK CONSTRUCTION INDUSTRY WAS

21%

OF **TOTAL SPEND**

form or another. Top of the list was planning, both in a macro sense – in terms of planning to have enough time to deliver the project – and in the micro sense of what are we going to do today. Culture is another of the issues, as is communication.

"Because of this, the courses that we run are focused on behaviours and culture. We use phrases like 'push pause' to avoid error, and 'don't do something if you don't think you can do it right'. It is a challenge to create an environment on construction projects where people can do that because everybody is trying to get things done as quickly as possible.

"We have recently produced the GIRI Error Reduction Framework, which says you need to adopt a systematic process to avoid error in your project or your business. We set out the steps needed but we also identify the tools that can be used in each of those steps. Some of those are well-respected tools that are already available across other industries: for example, lean thinking and the use of fishtail diagrams. We are also working with the Construction Leadership Council to develop a cross-industry metric to be used primarily to remove retentions, but it is a quality measure similar to the safety accident frequency rate. What we are looking to produce is an error frequency rate.

"Back in 2003, then Deputy Prime Minister John Prescott said that the construction industry needed to get its act together when it came to fatalities and safety. Despite there being legislation in place, it just wasn't seen as a top priority. Over the next 20 years, safety became a main factor construction. But it took ten years for people to work to comply with legislation and then another ten years to change the culture and behaviours of people with regards to safety. I think having an equivalent impact on quality and error avoidance could take a similar sort of time period. We're on a journey and we're a few years into it – GIRI was formed in 2017 – so we're getting some traction. There are obviously areas of the industry that could do with improvement, but all of them can be helped by a change of culture, a belief in thinking things through and a commitment to doing things right."

Paul Nash, Chair of the Chartered Institute of Building (CIOB) Quality Implementation Group

"When we set up the CIOB's Quality Commission in 2017, we wanted to understand the issues, promote the right behaviours around quality and then put in place best practice guidance, training and education. But in all honesty, the adoption of best practice was dependent on people seeing the benefit and recognising that something needed to change.

"Grenfell changed all that overnight. Suddenly it was a case of what needs to change to ensure that something like this never happens again.

"Much has happened in the aftermath of Grenfell. I sit on the Industry Safety Steering Group, which is chaired by Dame Judith Hackitt, and one thing that is really interesting about that group is that it is made up of people from major hazard sectors such as oil

and gas, chemicals and aviation. Essentially, other industries have had similar incidents to Grenfell and we are learning from them. What has flowed from Grenfell in terms of our understanding of systemic issues within the industry in particular are issues around competence and the types of behaviours that underpin this. That was one of the issues highlighted by Dame Judith in her *Building a Safer Future* report. A lot of work has been done on that through the Competence Steering Group and the BSI.

"We've seen different parts of the industry moving at different paces. Some have really stepped forward and put in place processes to improve quality on-site through independent inspection and investment in training and development, but it's still a very mixed picture in terms of take-up. However, I think the biggest driver in terms of changing outcomes around quality – when you look at it from a systemic level – is the BSA. That has legislated for these issues, and not just for residential buildings over 18m – the Act applies to all buildings that building regulations apply to.

"A lot of the work – the requirements to evidence competence is a good example, or changes to the building control system – is driving a requirement through compliance that goes way beyond anything I could have anticipated when we set up the Quality Commission.

More time needed

"I think at one end of the spectrum, you see a failure in quality that leads to the loss of 72 lives, and at the other end we have people living in new build housing that is riddled with defects. But that situation makes no sense. If you look at the cost of going back to make good defects, it's many times the cost of getting it right in the first place. So why not spend the money to get it right and allow time to get it right?

"That leads to the other issue here: speed of construction. Interestingly enough, with the BSA, the more onerous requirements around building control and evidence of building regulation compliance at both the application and completion stage are going to affect timetables. Clients are going to have to factor more time into their programmes to get that right.

"Of course, the biggest challenge then is getting back to the client and saying, 'no, you can't have your building in 12 months – it's going to take 15 months, but it will be right.' That has to be part of the message – making sure clients build realistic timescales into their appraisal right from the start because something has to give in this business model if we are going to get this right.

Long road ahead

"There is a cost and a time implication in getting this right and understanding what you need do – not just to comply with the regulations but to deliver safer buildings to the right quality for the people who ultimately will use them. I think we are starting to move on that journey. Some people will get it and some people will already be doing it – there are several tier 1 contractors I work with who are already well ahead of the curve, and it's about tightening up existing processes they already had in place. But in other cases there is still a long way to go.

"Fundamentally, though, this is about changing attitudes and behaviours to quality and building safety in our industry. We need to educate people that what they do on-site and how they do it really matters, and the way we do it really matters. And we need them to understand that when they get it wrong, it affects people's lives and livelihoods."

Barry Cope, Group Managing Director, Building Compliance Testers Association

"Quality is largely subjective, and when we say construction quality or building quality, we need a metric to measure that against. For example, do we measure quality against meeting building regulations? In which case, if you're a contractor

"If you look at the cost of going back to make good defects, it's many times the cost of getting it right in the first place"

you might say: 'I've met the building regulations, therefore I've made a quality building.' However, if you're a building scientist, you might say that by meeting the building regulations you've only met the lowest legally permissible quality threshold.

"So quality is subjective, but there are lots of things happening, particularly with the BSR. I see there are various groups now looking to define quality. Will that change the industry? I think it will only change if everybody is onboard. My personal feeling is that not everybody is onboard. People still want to build faster and cheaper, and they will always find the cheapest and simplest ways to build buildings to the lowest standard required.

Tackling culture

"Culture is definitely an issue. I think culture change has improved, but culture is an issue per site and it is defined by the specific people working there. If you go onto a site and you are met and inducted and there is a series of walkways, you are probably likely to see much higher quality. If you go onto a site and it's chaos, then I think you're not likely to see quality. That all stems from the culture and leadership.

"If you want a nice tidy building site and really high quality, you need to pay top people top money to manage it. It's easy to feel bad for the person in that position, having to do 15 different jobs that they aren't necessarily trained to do and being under immense pressure to get buildings finished. That's where quality falls down. It's possible that we can use technology to improve aspects of that, and I do see technology being used to improve quality. But technology and culture costs money.

"The Building Compliance Testers Association specialises in building testing, but I don't think testing, at least not in the UK, has had much of a role in improving quality so far. Testing is done because there is a lack of trust. Blower door – or airtightness – testing is a perfect example. The reason we test is because we are not sure that those buildings are airtight. In Norway, Sweden and other cold countries, they don't do anywhere near as much testing because they trust that their buildings are airtight; with their climate being so cold in winter, it becomes apparent if not. In the UK, with our milder climate, we tend to put up and shut up a little bit. So, we test because we don't trust that buildings haven't been put up right. I'd be the first person to say that none of this testing would exist if there was 100% pass rate because we would have trust that it was built correctly, it was commissioned properly and it all worked.

"That said, in the coming years I do think testing may play an increasing role in helping to instigate higher quality, although I think in slightly different ways. For example, I think we will increasingly see results-based performance. Right now we have a lot of theoretical modelling of our homes, such as the Standard Assessment Procedure (SAP) calculation or the Home Energy Modelling (HEM) in the domestic market. These model the home's energy usage based on thousands of factors – for example, Q values, windows or the dishwasher you use. It's a huge amount of data, but that data is only valid if you build it the way you say you are going to build it. That goes for things like air leakage characteristics, acoustic characteristics and insulation being fitted correctly.

"I think what we'll start to see is homes being tested once they are built, with overnight heating tests. That will be the way we measure our homes going forward. That will be how we get our EPC ratings: it won't be theoretical, it will be measured performance that will reflect how the building has actually been built. That's where tested performance could be an absolute game changer in terms of quality."

Cliff Smith, Executive Director, Get It Right Initiative

Paul Nash, Chair of the Chartered Institute of Building (CIOB) Quality Implementation Group

Barry Cope, Group Managing Director, Building Compliance Testers Association

Daniel Hicks, Technical Research Manager, National House Building Council (NHBC)

Daniel Hicks, Technical Research Manager, National House Building Council (NHBC)

"As the UK's largest insurance and warranty provider for new build homes, NHBC's core purpose is to raise standards in house building. As such, we welcome all measures that provide further protection for homeowners and focus on new build quality.

"We continuously review the NHBC Standards, which define the technical requirements and performance standards for the design and construction of new homes registered with NHBC. We make sure they keep pace with the needs of the industry and the regulatory environment and, wherever possible, anticipate changing consumer expectations. We consult with stakeholders from across the industry to ensure the standards are always relevant and provide the required support for builders and developers to keep raising the level of quality in housebuilding.

"NHBC also works with the Future Homes Hub as it lays out the housebuilding industry's roadmap to net zero and wider climate targets. Within this, NHBC supports the new build homes sector to deliver homes that are more energy efficient and sustainable. Although transition will be required, NHBC is already responding to ensure our standards and approach remain agile to aid in the delivery of high-quality, environmentally-friendly homes resilient to the impacts of climate change.

"We believe the enhanced regulation of the building control industry and the competence assessment of building control professionals will benefit not only the housebuilding sector, but ultimately homeowners and residents. They remain at the heart of our aim to raise standards in housebuilding." be

Further reading

The GIRI Research Report bit.ly/GIRI_report

GIRI Error Reduction Framework Webinar bit.ly/GIRI_webinar

CIOB Code of Quality Management bit.ly/CIOB_code

Building Compliance Testers Association bcta.group

National House Building Council nhbc.co.uk