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# Journal

## Built Environment



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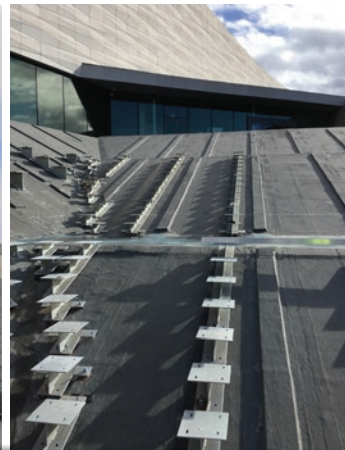
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The *Built Environment Journal* is the journal of the Building Control and Building Surveying Professional Groups and the Building Conservation Forum

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All RICS journals are available on annual subscription. Enquiries should be directed to licensing manager Louise Weale E: lweale@rics.org

**Published by:**

The Royal Institution of Chartered Surveyors,  
Parliament Square, London SW1P 3AD  
T: + 44 (0)24 7678 8555 W: rics.org  
ISSN 2631-8423 (print)  
ISSN 2631-8431 (online)

**Editorial & production manager:** Toni Gill

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**Design & production:** We Are Sunday



**Printer:** Geoff Neal Group

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## Technology

# ‘Unless you embrace proptech, you will find competitors accelerating past you’

**Trevor Rushton**  
Watts



I used to think of myself as being fairly tech-savvy. But after nearly 40 years in the profession, I am starting to see lights flashing in my rear-view mirror. Time to drop back into the slow lane, or put my foot down and start overtaking?

Technology is advancing at a rate that just a few years ago would have been unimaginable. Look at the likes of Amazon, Zoopla, Purple Bricks and others, for instance; I can check the value of my home and even sell it while barely lifting a finger.

Building surveyors have enthusiastically adopted drones, and many reports are now generated using systems such as Kycloud or GoReport. I'll wager that unless you embrace proptech, you will find competitors accelerating past you – fine, if that's what you want, but what do your employees think about it? Will they jump ship to find opportunities in firms that invest in technology? You probably know the answer.

In construction, traditional craft-based skills have given way to assembly and off-site manufacture. The industry is urged to exploit technology but is slow to adopt it; perhaps because many volume

housebuilders find little incentive to build in a different way.

But some of that construction is pretty average or even hazardous; it's taken the Grenfell Tower fire to make us realise that you can't take short cuts with things such as fire-stopping and cavity barriers. Perhaps a system of logging and recording each and every barrier and perforation and confirming its construction is correct would help cynics such as me report in a more positive fashion on the things we can't access without exploratory surgery.

Computer numerical control machining ([bit.ly/CNCMach17](http://bit.ly/CNCMach17)) and robotics make modular building sound attractive, and when properly made and assembled it can be advantageous. But often the system is let down by humans – failing to make joints weathertight, for example. Improvements are needed in capacity and investment before we can expect to see significant changes – as well as new professionals bringing their imagination to play.

Technology is often perceived as expensive – sophisticated software comes at a price, and you should beware of the

evergreen contract clauses that can come and bite you. However, balance this against the improvements in production time it allows; with many firms competing in a difficult market, finding ways to do things quicker is essential business sense. But even simple templates can remove or weaken the critical thinking vital to reporting. I have seen many standardised reports failing to affect their reader precisely as the author would have wished.

Artificial intelligence (AI) is as exciting as it is frightening. Recently, Law Geex pitted a team of 20 lawyers against its AI algorithm ([bit.ly/Lawgeex18](http://bit.ly/Lawgeex18)): the time taken to review five non-disclosure agreements averaged 92 minutes, against 26 seconds for the algorithm, with an accuracy level of 94 per cent for the machine and between 67 and 94 per cent for the lawyers. A new way of reviewing leases, perhaps?

At a very simple level, I use word search tools to identify those wretched indemnity clauses in forms of appointment, but the ability to scan and identify all pitfalls in an appointment would be wonderful. Of course, AI seeks to remove the intermediary, so valuers are increasingly at risk. Would a valuation prepared without human intervention be reliable? Valuers will have to respond to the challenge, perhaps by offering high-value consultancy services.

Blockchain – a shared transaction record – is a complicated system, but one with the potential to revolutionise the transfer of property ownership in a secure way. Such a system would reduce the current role of the property professional, improve liquidity and reduce costs – provided, of course, that cyber security concerns can be addressed.

RICS has examined the potential in its research paper *The Impact of Emerging Technologies on the Surveying Profession*, which suggests that real-estate professionals may become data scientists or client managers ([rics.org/emergingtech](http://rics.org/emergingtech)). While I can only scratch the surface of proptech here, what is clear is that, unless we as building surveyors embrace the opportunities it affords, we will become increasingly isolated. Floor that accelerator.

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# Briefing



## Degree-accrediting model updated

RICS has updated its policy and process for accrediting undergraduate and postgraduate degree programmes. A graduate with an RICS-accredited degree can now enrol on the chartered surveyor APC and qualify after two years' structured training experience.

The updated process combines elements of the two qualification routes that have been in place since 2008, partnership and traditional. The aim is to strengthen relationships between RICS and its university partners, reinforce its education standards, and support new entrants into the profession.

[rics.org/ricsaccreditation](https://rics.org/ricsaccreditation)

## UK heritage science framework published

The National Heritage Science Forum has established the Strategic Framework for Heritage Science in the UK 2018–23 following a year of consultation and development. The framework can be used to show how work helps to fulfil strategic outcomes under three themes: excellent research; a skilled and diverse heritage science community; and demonstrable social and economic impact.

[bit.ly/HSFstrategic](https://bit.ly/HSFstrategic)

## RICS extends Israeli training programme

In October, the Israeli Ministry of Finance and RICS launched the 13th building control surveyor training programme. There are now 388 building control surveyors in Israel, and RICS has recently signed an extension to its contract with the ministry, under which it will run two more courses as part of the training programme it already delivers in the country.

## Coalition prepares fire framework

The International Fire Safety Standards Coalition's standards-setting committee held its first meeting in January, where it created an overarching performance framework based on standards for fire safety design, engineering and construction, occupation and ongoing management. The committee aims to publish a draft document for consultation this summer.

[ifss-coalition.org](https://ifss-coalition.org)

## BSI report highlights off-site benefits

BSI has published the white paper *The role of standards in offsite construction*, now available free of charge online. A new BSI standard, BS 9414 *Fire performance of external cladding systems – Extended application of results from BS 8414-1 and BS 8414-2 tests*, is also open for public consultation until 7 April.

[bit.ly/BSloffsite](https://bit.ly/BSloffsite)

[bit.ly/BS9414consult](https://bit.ly/BS9414consult)



## Events

### RICS Building Surveying Conference 2019

2 May, Royal Lancaster Hotel, London

The conference will focus on the latest developments in biophilic design and well-being, building contracts, Building Regulations, dilapidations, data disruption, due diligence, fire safety, flooding, and off-site modular construction.

[rics.org/bsconf](https://rics.org/bsconf)

### World Built Environment Forum 13–14 May, Conrad New York

This year's forum will look at the themes of:

- changes in work and the workplace
- the impact of algorithms and tokenisation
- the outcomes of investing in the built environment for cities and citizens
- energy and transport finance models
- investment risk allocation.

[rics.org/wbef](https://rics.org/wbef)

### RICS Fire Safety Conference – North 21 May, The Principal, Manchester

Dame Judith Hackitt has been confirmed as a speaker at the third of our popular fire safety conferences.

[rics.org/fireconference](https://rics.org/fireconference)

### RICS Digital Built Environment Conference

5 June, etc.venues, St Paul's London  
[rics.org/digitalconference](https://rics.org/digitalconference)



## Electrical safety code for social housing

The Electrical Safety Roundtable has published the *Code of Practice for the Management of Electrotechnical Care in Social Housing*.

[bit.ly/ESRsochsg](https://bit.ly/ESRsochsg)

## PII run-off cover criteria revised

Changes to the RICS requirements for professional indemnity insurance (PII) run-off cover come into force on 1 April to ensure annual premiums are kept up, firms have access to required run-off, and eliminate the risk of any gaps in PII cover.

[rics.org/pii](https://rics.org/pii)

## Standards

### Recently published

*Countering bribery and corruption, money laundering and terrorist financing* professional statement

[rics.org/amlps](https://rics.org/amlps)

*Surveying safely* 2nd edition guidance note  
[rics.org/surveyingsafely](https://rics.org/surveyingsafely)

### Forthcoming

*Asbestos* guidance note  
*Party walls* guidance note  
*Technical due diligence* guidance note  
[rics.org/standards](https://rics.org/standards)

All RICS and international standards are subject to a consultation, open to RICS members.  
[rics.org/iconsult](https://rics.org/iconsult)

# Green light

An overwhelming 'yes' from our membership means RICS can move forward with its plans for the future of the profession, as the chair of the Standards Transformation Project Implementation Advisory Group details

**Justin Sullivan**

In November 2018, Governing Council asked the profession to vote for a modernised, future-facing form of governance fit for a 21st-century professional body. The result was announced at the AGM on 27 November.

Of those who voted, 86 per cent favoured this modernising agenda. The proposals for change have been ratified and sent to Privy Council for formal approval. This positive step will structure RICS to continue building a global professional body that is ready to equip the profession for the challenges and opportunities ahead. It will also enable RICS to meet the changing expectations of stakeholders, clients and the wider public.

The vote also allowed for the formation of a joint board to create and regulate standards, replacing the previously separate regulation and standards boards. RICS has been piloting the joint board for the past year, and the interaction between its professionals, regulators, staff and laypeople has been fascinating to watch. The standard-setters and regulators are all passionate about their remit: differences are debated and outcomes altered to ensure the standards we create are fit for purpose.

Governing Council has also reconfirmed its support for changes to the professional group board structure. We will be working with the active existing boards over the next year as they move away from their traditional single-discipline function to a cross-disciplinary, collaborative structure, focusing on market insight and standards creation and enforcement.

We have already run several successful leader forums – a key function of the new structure that brings together clients, fellow professionals from RICS, government departments and other market influencers. We aim to pilot a new digital community this year as well to reflect the activities of

the standard-setters. This will be managed through an app, enabling much more interaction between the profession, RICS and the market. The new model will also enable better collaboration with the regional structure of RICS.

Overall, the aim is simple: to encourage active members of the profession to stay involved, and for more of you to take part in shaping our profession's future. To keep up to date with the changes to the structure of RICS, visit [rics.org/professionalgroups](https://rics.org/professionalgroups).

*Justin Sullivan FRICS is chair of the Standards Transformation Project Implementation Advisory Group* [standards@rics.org](mailto:standards@rics.org)

## Modernised, future-facing governance

- A smaller, more diverse council
- Equipping the profession for the future
- Meeting the needs of clients, stakeholders and the public
- Changes to the professional group board structure
- A joint standards and regulation board
- Leader forums
- A new digital community

# Circumstances alter cases

RICS hosted the first Built Environment Leaders Forum at Parliament Square in July 2018 where key stakeholders debated how to effect much-needed change in the industry

**Steph Fairbairn**

The Grenfell Tower fire and the demise of Carillion are two key events that have highlighted recurring challenges in the built environment: productivity, fragmentation, delivery and process waste, and communication. Combine this with globalisation and technological advances, and the demand for change is reaching a crescendo. But it is proving difficult to harmonise fragmented and polarised perspectives from key stakeholders in order to begin addressing these challenges.

There is hope for change given the huge potential in technological developments, opportunities to learn from other industries and some of the changes proposed in the *Industrial Strategy: Construction Sector Deal* ([bit.ly/CSDJuly](https://bit.ly/CSDJuly)) – but will this be enough? The objective of the Built Environment Leaders Forum was to enable wide and insightful debate and in turn share that insight to provide thought leadership and guide the development of standards.

‘Digitisation and industrialisation are just the latest construction industry management [attempts at] panaceas: what is really needed is structural transformation of the industry, including new concepts of being a client, professionalism and contracting’ was the proposition for debate.

## Structural transformation

The argument in support of the proposition stated that while digital developments are important, they cannot flourish without structural transformation. It was argued that to achieve this, seamless communication is

required, as is a change in attitude towards the concept of cost, allowing digitisation and industrialised building to thrive.

The end users are key to the structural transformation of the industry. Clients must lead the change and in turn create a more holistic system. Heathrow Airport is one example: it is using off-site construction hubs around the UK to reduce the cost and environmental impacts of work on its third runway. The outcomes for the client should be our focus: integration, communication and commercial management are key. The industry is fundamentally broken, we must disrupt it ourselves to ensure change.

## Digitisation

Against the proposition, it was argued that digitisation and industrialisation are key to improving productivity, creating skills, and acting as the enabler for the future. To do so, it was claimed, a new blueprint for the built environment is needed, driven within the UK by the government’s commitment to increase research and development spending to 2.4 per cent of GDP.

The key question is whether our industry can move faster than its clients and the demands of the market. In reality, the architecture, engineering and construction industry is sheltered from change, partly by its own inertia and partly by its clients.

The world is demanding change, as we are in danger of becoming an industry that is outstripped by emerging technologies. We must act to integrate digital technology into all of our processes, rather than

evolving in a fragmented fashion. Digital tools will bring us greater transparency and predictability, as they have in the manufacturing and automotive industries.

## Moving forward

Despite differing views on the proposition, the forum agreed on a number of points:

- all elements of the proposition are linked
- the client needs to be the driver of change
- the industry lacks leadership and thus responsibility, as the Grenfell Tower fire inquiry and the Hackitt Review indicate.

In terms of professional development, we need new minds with new thinking, professionals with better-developed soft skills to enable better management and integration, and recognition of a longer tail of specialisms to cover the challenges of new technology and industrialisation. This forum will therefore lead to a greater consideration of RICS standards, behavioural and collaborative, to better guide the industry professional.

What was clear in the first Built Environment Leaders Forum was the industry’s commitment to find a way to overcome the issues we are facing. With so much change to effect such commitment is key, and RICS will continue to facilitate these conversations through future forums. We’d welcome your contribution.

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# A burning issue

Combustible cladding issues are not unique to the UK – there are also problems in Australia and New Zealand

Gary Strong

The tragic Grenfell Tower fire shone a much-needed spotlight on the regulatory and product sectors of fire safety in the UK construction industry.

RICS has been working closely with other countries, helping them understand what is known so far about the Grenfell fire, as well as what has happened since and potential changes to regulation and in other areas. The fire, and particularly combustible cladding, has attracted much attention in other countries, which want to learn from the UK experience.

Combustible rainscreen cladding and insulation has been around for decades (see Diego Alves articles on pp.26–27 of this issue and *Building Surveying Journal* May/June 2018, pp.16–17). In the UK, the use of combustible cladding and desktop studies in lieu of tests has been banned since 21 December 2018 for all new and refurbished residential, hospital, care

homes, schools with dormitories, and student accommodation buildings more than 18m high ([bit.ly/MHCLGcirc218](http://bit.ly/MHCLGcirc218)).

Australia and New Zealand have used these products extensively, especially in larger cities such as Sydney and Melbourne. The increase of tall towers in many cities has resulted in a proliferation of these cladding systems, which are often not entirely understood. The materials that make up the finished product perform differently when combined with other components, which is why fire testing is necessary to establish exactly how that product behaves.

Working with RICS Sydney, RICS Auckland and other key stakeholders, it has become clear how the different regulatory systems in these countries, together with different demographics and building codes, have still not prevented the possibility of combustible cladding.

## Australia

In the Commonwealth of Australia, the federal states and territories can define their own legislation. This causes a problem for the Federal Government of Australia, and RICS UK engagement with the government building minister and the Building Ministers Forum representing all the states has found different approaches and resolutions. For example, two of the main states, Victoria – covering Melbourne – and New South Wales – covering Sydney – have no unified approach.

The current requirement is that any measures listed on the building's fire safety schedule must be inspected within three months before issuing an annual statement to the local authority and fire brigade. This means a competent person must assess and verify that the measures installed in the building comply with the original design standards or codes ([bit.ly/2S1TITI](http://bit.ly/2S1TITI)).

In 2014, the Lacrosse building fire in Melbourne spread rapidly due to combustible cladding. Legal arguments have raged since about who is responsible for funding replacement cladding. In Victoria, the state cladding task force proposed a loan scheme attached to the council rates of a property to enable owners to fund remediation works and repay the loan through the tax system.

After Grenfell, each state has been trying to establish how many buildings have aluminium composite panel cladding, which they call ACP – a better term than aluminium composite materials as it is not easily confused with asbestos-containing materials (ACM).

The Australian regulatory system means that building surveyors, whose role is similar to UK building control surveyors, must be licensed by each state where they practise. A two-track system of local authority building control and private certifiers came about at the same time as the UK arrangement.

Unfortunately, Australian building surveyors have come in for a lot of criticism because of the combustible cladding saga, which is reckoned to affect more than 10,000 buildings across the country. As a result, RICS is engaged in developing proposals for the federal government, which will see an improvement in trained, qualified building inspectors in an RICS-regulated scheme that is backed by professional indemnity insurance.

## New Zealand

New Zealand is a much smaller country than Australia in terms of population; its cities and buildings are also smaller, as is the problem of combustible cladding.

Although there have been strenuous efforts to identify all buildings with ACP cladding, the building code requirements for sprinklers in all buildings above three storeys have meant there is less to do by way of remediation. A walk around the central business district of Auckland, the largest city in New Zealand, quickly reveals there are no really tall towers there, unlike Sydney or Melbourne.

Reviewing the fire risk for the whole building, as RICS recommends, has meant

that – with automatic fire suppression systems installed and other fire safety measures – cladding removal may not be necessary (see *Building Surveying Journal* May/June 2018, pp.8–10). Certainly, fire and rescue services in New Zealand are confident of their approach.

The Building Warrant of Fitness (BWOFF) system in New Zealand works reasonably well. A building owner needs to renew a BWOFF every 12 months, signing, issuing and publicly displaying it to prove the building's life-safety systems – referred to as specified systems – have been maintained and inspected. This applies to defined buildings, which includes most but not low-level residential buildings.

Each year, a BWOFF certificate must be issued for existing buildings, based on up to 16 system inspections. Without this, the building would be deemed unuseable and uninsurable; a BWOFF confirms that its specified systems have been inspected and maintained as required under the compliance schedule.

A compliance schedule will be issued by a council in one of the following scenarios:

- with a code compliance certificate, after completion of consented building work, if the building has any specified systems
- on application from the building owner, where, for some reason, a compliance schedule was not already issued.

The compliance schedule includes a detailed description of each specified system, performance standards for each and the inspection and maintenance procedures required to ensure they continue to function as intended. Specified systems help ensure a building is safe and healthy for people to enter, occupy or work in.

A building owner must:

- obtain a compliance schedule where one is required under the Building Act 2004; failure to do so could result in a fine upwards of NZ\$200,000
- display a compliance schedule statement in their building for the first 12-month period from its issue by the territorial authority; this states that the specified systems are covered by the schedule and the place where it is held
- ensure that the inspection, maintenance and reporting procedures for the specified

systems stated in the schedule have been carried out, and that they are performing – and will continue to perform – to the required standards

- engage an independent qualified person (IQP) to undertake the inspection, maintenance and reporting procedures listed on the schedule; frequency of inspection varies according to each specified system and might be weekly, monthly, six-monthly or annually
- following this, obtain a form 12A certificate from the IQP, verifying compliance with the inspection, maintenance and reporting procedures for each specified system; form 12A can be found in the Building (Forms) Amendment Regulations 2005, and is officially called a 'certificate of compliance with inspection, maintenance and reporting procedures'
- provide the BWOFF annually to the local authority, attaching the form 12A certificates from the IQP and publicly display a copy for the next 12 months; on the anniversary of its issue a new BWOFF will take its place
- keep the schedule in the location nominated on the compliance schedule statement and BWOFF to ensure all documents are readily available for inspection by authorised people, such as council inspectors, fire service personnel and IQPs.

Other documents include annual written reports, which must be kept with the compliance schedule for at least two years, and logbooks of inspections by owner, tenant, maintenance and inspection personnel, where these are a requirement of the compliance schedule.

The system is not perfect, and we are aware of minor grumbles from local practitioners, but we believe there are nonetheless lessons to be learned from the New Zealand system.

*Gary Strong FRICS is RICS global building standards director and chair of the UN-backed International Fire Safety Standards Coalition [gstrong@rics.org](mailto:gstrong@rics.org)*

**Related competencies include:**  
**Fire safety**

## Standards

# ‘With growing globalisation comes the expectation of common standards, in managing health and safety risks especially’

Anthony Taylor and Jeffrey Tribich



In November 2018, RICS published the *Surveying safely: health and safety for property professionals* second edition global guidance note ([rics.org/surveyingsafely](https://rics.org/surveyingsafely)).

It first published a document covering the subject in 1991, having begun work on this in April 1989 when it issued a discussion document. It was an initiative of the RICS Building Surveying Division, as was, and grew out of surveyors' need to be aware of the risks they faced when visiting properties. It was a simple and relatively short list of matters, together with a brief description of legal duties.

There was subsequently an entirely redrafted version, followed by a number of iterations in the early 2000s. These editions covered the general requirements of the Health and Safety at Work etc. Act 1974 and focused heavily on keeping safe on site, gradually broadening their remit with each successive publication.

Over the years the RICS Health and Safety Advisory Group has consulted on how best to promote health and safety to the wide group of professionals in its membership. Consultation with industry

groups revealed a wish and need to cover more areas and to treat each in greater depth, resulting in the publication of a considerably expanded *Surveying safely* in 2011, the first edition that had guidance note status.

With growing globalisation, there is an increased expectation of common standards, not least in respect of health and safety risk management. Many organisations, both national and international, expect the highest level of compliance across their real-estate portfolios. In light of these global changes and trends, RICS has published a new edition; as the revised name makes clear, it concentrates on principles. All references to UK law have been removed, allowing it to be published as a global guidance note in line with RICS' development as an international professional institution. Thus, wherever RICS has influence across the globe, health and safety standards are steadily improved.

The new edition includes a chapter on fire safety, although necessarily it cannot deal with it at any length, and short chapters of relevance to RICS professional

groups and residential property surveying. The latter refers to the RICS *Health and safety for residential property managers* first edition guidance note, published in January 2016 ([rics.org/resihealth](https://rics.org/resihealth)). It also includes some additional material; for example, property visit procedures have been tightened up and chapter 3, on risk, includes a new diagram and an explanation of the risk control hierarchy.

Member organisations expend much money, time and effort on health and safety training, but there is no agreed standardised material for this. The RICS Health and Safety Advisory Group has been working with the training team to develop easily accessible, high-quality training materials that will ensure more consistent information. The group is looking into setting up accredited online health and safety training courses and testing, with the possibility of online examination to pre-qualify APC candidates. All of these will be based on the *Surveying safely* guidance note.

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**Related competencies include:** Health and safety

# A design for life

A project is showcasing the best practice in design and technology to assist those with dementia

John O'Brien

The Building Research Establishment (BRE) has created a project to demonstrate how homes can assist those with dementia live independently for longer at its Innovation Park in Watford.

Dementia care costs families in the UK around £18bn a year. It affects about 850,000 people in this country alone, a figure expected to rise to more than 1m by 2025 ([alzheimers.org.uk](http://alzheimers.org.uk)). Two-thirds of dementia-related costs are paid by those who suffer from the condition and by their families. Early diagnosis is critical so the correct medication can be prescribed and adaptations to the home can be planned.

The BRE project, named Chris and Sally's house, has developed the Design for Dementia work carried out by Halsall Lloyd Partnership and Liverpool John Moores University and adapted it from new build to refurbishment, exploring the requirements and benefits of altering existing homes to meet the demands of our ageing population.

The design principles include clear lines of sight and increased natural lighting, which is proven to help people to stay alert during the day and so sleep better at night, while noise reduction features can lower stress, according to the Alzheimer's Society.

Better insulation improves warmth, and the location of appliances, level access and wide doorsets allow for greater mobility in the home. The colour contrasts of walls, floors and furnishings can help residents navigate more safely around the home and prevent accidents. Views of green space also stimulate the brain, maintaining alertness.

Those with some forms of dementia can be distressed by unexpected noises that could be interpreted as an intruder in

the home, so special care has been taken with insulation for acoustics as well as warmth. The washing machine has been isolated from the living area and visitors can be easily identified through adaptations such as well-connected rooms with clear sightlines to the external doors.

A stylish wet room has been fitted with handrails, as the walls have been strengthened and the dimensions are Part M-ready (see photo, right). The home is also equipped with plenty of IT infrastructure, such as monitors for temperature, humidity and movement, to test innovative assisted living technologies.

The ground floor is designed for early onset dementia where the resident can maintain independence through cooking and an active lifestyle. The upper floor demonstrates support for more advanced dementia, with the emphasis on 24-hour care. It has an additional carer's bedroom, wheelchair charging points and capacity to install a hoist and a through-floor lift.

Project partners included Rockwool, Azko Nobel, Ideal Standard and John Lewis Business. Loughborough University has meanwhile brought to the project its expertise in internal environments and physical exercise to stimulate the brain and protect against the condition. The university has developed a range of exercises and products, as well as assistive technology, to prompt residents to maintain activity and hydration. Sensors in the property detect activity, air quality and temperature levels and control ventilation to maintain comfort levels.

A suite of characters such as Chris and Sally has been devised by the university



The refurbished home includes a wet room that has been designed for compliance with Part M of the Building Regulations

to represent different stages of dementia; in one case, Chris has dementia and his wife Sally is his carer. They give a sense of how the condition affects day-to-day life, and they are portrayed by actors in videos on the BRE website ([bit.ly/BREdfhome](http://bit.ly/BREdfhome)). This enables comparison of good days, medium days and bad days, to build a better understanding of the impact on those with dementia, their carers and family.

The project will look to evaluate the marginal costs of incorporating the design principles into routine improvements and alterations. It will also inform homeowners and landlords on how to adapt their dwellings so that the residents can remain in their homes, near the support network of friends and family, with familiar surroundings that will help occupants remain independent for longer.

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**Related competencies include:** Design and specification, Inclusive environments



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## Cyber fraud

# 'Surveyors are vulnerable to a multitude of cyber risks, which are exacerbated by emerging technologies'

**Stuart Mangion**  
JLT Specialty



Despite the valuable data they possess, surveyors have largely managed to steer clear of cyber criminals. However, there is increasing potential for hackers to exploit weaknesses in surveyors' systems to access the large amounts of money they hold.

Criminals are becoming more inventive, and increased scrutiny under the General Data Protection Regulation means security breaches can have devastating effects on a company. Consequently, clients are seeking reassurances on security from the outset.

Surveyors are vulnerable to a multitude of cyber risks including identity theft and social engineering, email compromise, or phishing attacks and ransomware. These are exacerbated by emerging technologies such as building information modelling (BIM), as this allows data to be shared by employees at all stages. If BIM is breached, hackers could gain access to client databases, occupier details, information about security systems and other internal controls.

The current trend for short-term, multi-occupier use of space brings other risks. The transient client base, minimal contact with occupiers, the greater number

of people accessing the space and increasing use of fully web-based systems increases the risk of security breaches, the theft of personal information and identity fraud.

Everyone has a duty to ensure data is protected. Regular staff training can help employees spot suspicious behaviour immediately and avoid accidentally compromising your data security by:

- clicking on a malicious attachment or link
- giving unauthorised access in a bid to help
- oversharing information on social media
- using one password for multiple accounts
- sending confidential information to personal accounts
- using work devices on insecure networks.

The UK's certification scheme, Cyber Essentials ([bit.ly/UKcybess](http://bit.ly/UKcybess)), can help your staff understand the basics of good practice. For added protection, companies can also employ a third-party security service provider or appoint an internal operational risk manager. The National Cyber Security Centre provides advice for small and medium-sized enterprises, where hiring or appointing a dedicated cyber risk specialist may not be feasible ([bit.ly/NCSCsmallbus](http://bit.ly/NCSCsmallbus)).

Prioritising the issue and reporting it back to the board can improve ongoing internal communication, as can ensuring staff's technological knowledge is kept current. A robust cyber security strategy also demands that the latest technology is installed on your systems. Security software can filter urls, scan content and block any suspicious emails or links to reduce the opportunities for human error. Multi-factor authentication and end-to-end encryption can control access to your system, while virtual private networks can ensure that all internal communication remains secure. Cloud-based back-ups can also help with recovery following a ransomware attack.

From an insurance perspective, proactive companies with strong IT defences are a much lower risk. It is essential for firms to show that appropriate controls and procedures have been set up and – more importantly – communicated throughout.

Surveyors should ensure that their professional indemnity insurance coverage is broad enough to cater to their specific needs, particularly third-party liability. If necessary, there are a variety of specialist stand-alone crime and cyber policies that complement your current arrangements.

When assessing your insurance, read the small print. Hacks and outages can amount to potentially bankruptcy-level recovery costs, which can easily exceed minimal limits. There will rarely be the opportunity to negotiate a commercial settlement – will your policy's indemnity limits really be enough to protect your business? Exclusions can have a colossal effect on your finances when applied broadly; paying attention to and negotiating the wording of these exclusions can make all the difference.

Surveyors must pair robust security controls with fit-for-purpose insurance and improved internal communication so employees at all levels can help minimise the potential impact of a cyber attack.

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**Related competencies include:** Client care, Data management, Ethics, Rules of Conduct and professionalism

# Good conduct

What do assessment candidates need to know about the competency Ethics, Rules of Conduct and professionalism?

**Susan Hanley**

Ethics, Rules of Conduct and professionalism is the only mandatory Level 3 competency for all RICS assessments, including the APC, so it is imperative that all candidates have a detailed understanding of what is required. Ultimately, the aim is to assess whether you are a safe pair of hands and will foster trust in the profession.

## Assessment method

Candidates have to complete the ethics module in the portal of the Assessment Resource Centre in the 12 months before final assessment, and can record the time spent doing so as part of their CPD.

The final assessment process itself starts with the assessor reviewing the candidate's summary of experience. Before submitting this, candidates should have ensured that it complies with RICS documentation, and that content is tested and approved by a counsellor or supervisor. A guide to what the summary of experience should contain is given in Table 1.

## What to expect at interview

At final assessment, ten minutes are set aside towards the end of the interview for demonstrating that you have fulfilled the requirements of the competency. This time is defined in the interview structure

section of the APC *Candidate guide* as the 'Chairperson's area of questioning on professional and technical matters, CPD, Rules of Conduct and mandatory competencies'. In their questioning, the chair may ask candidates to put themselves in a hypothetical position and to consider how they would react or respond to different scenarios.

## What you need to know

Candidates must know the RICS' five ethical standards, which are:

- act with integrity
- always provide a high standard of service
- act in a way that promotes trust in the profession
- treat others with respect
- take responsibility.

Most candidates will soon identify that they are, in the course of their role, already complying with these, and will have copious examples showing where they have demonstrated as much.

While there is no way to predict what questions candidates will be asked at final assessment, they need to have detailed Level 1 knowledge of the competency description. Many candidates make the mistake of memorising the ethical standards alone, and this is not sufficient.

The examples of what candidates need to know contained in the competency descriptor are an excellent starting point for revision and include:

- the structure of RICS
- RICS' global and professional ethical standards
- mandatory professional statements, for example *Conflicts of interest*

## Direction for candidates

RICS ethics and professional standards

**[rics.org/ethics](https://www.rics.org/ethics)**

*Conflicts of interest* global professional statement, 1st edition

**[rics.org/conflictsofinterest](https://www.rics.org/conflictsofinterest)**

International Ethics Standards

**[rics.org/ies](https://www.rics.org/ies)**

Information for APC candidates, counsellors and assessors

**[rics.org/apcinfo](https://www.rics.org/apcinfo)**

## Ultimately, the aim is to assess whether you are a safe pair of hands and will foster trust in the profession

- guidance notes
- RICS' CPD policy
- RICS bodies such as Matrics or LionHeart
- the Rules of Conduct for members
- the Rules of Conduct for firms
- policy documents
- RICS bye-laws
- government legislation and regulation
- common law
- relevant case law.

The regulation pages on [rics.org](https://www.rics.org) and the detailed guidance listed in the box, left, will help you gain an understanding of these.

### Work placements

While on placements, candidates must take the following due diligence measures.

- Ensure they are familiar with their employer's policies in relation to professional indemnity insurance – who does this cover, and at what level?
- Investigate their organisation's complaints-handling procedure.
- Look into their organisation's policy on gifts and hospitality, and how this relates to RICS guidance and the Bribery Act 2010.

### Summary

RICS ethical standards form a basis for providing professional services. All RICS candidates and members are required to embrace and adopt the organisation's ethical standards, both as part of their professional practice and in life outside work.

RICS guidance states: 'All members must maintain a relevant and current understanding of our professional and ethical standards during a rolling three-year period.' Divergence from this will generally affect perception of RICS and potentially your membership. Counsellors and supervisors should also be up to date with professional and ethical standards, ensuring they undertake required ethics-based CPD.

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**Related competencies include:** Ethics, Rules of Conduct and professionalism

## Top tips for candidates

- Before submitting your summary of experience for final assessment, ensure you have checked it against the RICS ethical documents.
- Memorising the ethical standards alone is not sufficient; you need a comprehensive knowledge of the competency as a whole.
- Start reviewing ethics and regulations as early as possible to ensure you are acting appropriately, and identify evidence of practical application, at Level 2, and reasoned advice, at Level 3.
- Take the ethics test as soon as you can to get a feel for the requirements. You can always retake it nearer the time if need be. Be sure not to leave it to the last minute – if you do not pass, the system can take 24 hours to reset.
- Remember that the way you conduct yourself both inside and outside work can have a bearing on your RICS membership.

**Table 1. What should your summary of experience contain?**

| Requirement                                                                      | Example                                                                                                                                                                                                                                                                                                                         | Level |
|----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| Indicate sources of learned knowledge                                            | <ul style="list-style-type: none"> <li>• 'While undertaking the RICS ethics module, I learned...'</li> <li>• 'I reviewed the Ethics and the Regulation pages of the RICS website and learned...'</li> </ul>                                                                                                                     | 1     |
| Demonstrate what you know about the module                                       | <ul style="list-style-type: none"> <li>• 'I am aware of the RICS' five ethical standards and its Rules of Conduct for members and firms...'</li> <li>• 'I am aware of the need for professional indemnity insurance...'</li> <li>• 'I am aware of the requirement for firms to have a complaints-handling policy...'</li> </ul> | 1     |
| Give evidence of practical application with real-life, project-specific examples | <ul style="list-style-type: none"> <li>• 'I identified a conflict of interest when...'</li> <li>• 'I'm involved in running my local RICS Matrics, and promote the benefit of this to others by...'</li> <li>• 'I read my employer's policy on hospitality and checked this against legislation and RICS guidance...'</li> </ul> | 2     |
| Offer evidence of giving reasoned advice                                         | <ul style="list-style-type: none"> <li>• 'I handled my client's money in accordance with...'</li> <li>• 'On this project I dealt with a complaint...'</li> <li>• 'On this project I advised the client regarding a potential conflict of interest...'</li> </ul>                                                                | 3     |

# Closing time

**What do surveyors need to do  
when winding up their practices?  
The second in our series of articles  
on retirement looks at the issues**

Alexandra Anderson and Jonathan Angell

In the last article in this series, we looked at some issues that might arise if, on deciding to retire, you chose to sell your practice (*Built Environment Journal* February/March, pp.10–11). In this piece, we look at the procedures for winding it up instead, and identify some of the matters you will need to address before you can do so. While these considerations are definitely relevant if you have decided to close your practice, they may also apply if you sell, depending on whether you retain ownership of the vehicle through which you carried on the practice or whether you have sold it.

You will usually carry on practice as a sole trader, through a partnership, or through a corporate entity, either a limited liability company or limited liability partnership (LLP). If you are the first, there is no legal entity you need to bring to an end when closing down your practice because you own all the business's assets and are personally responsible for discharging its liabilities. If you practise through a partnership, however, your course of action will depend on whether you are simply retiring from the partnership or whether all partners are ceasing to practice at the same time.

The procedures to be followed in either case will be governed by the terms of the partnership deed and the provisions of the Partnership Act 1890. If you are retiring from the partnership but your partners intend to continue with the business, they will generally do so in the same name, whereas if all partners are retiring you will need to take steps to wind up the partnership as a whole.

Where you have carried on business through a corporate structure you will eventually want to bring its existence to an end, whether or not you have sold its business in the meantime. The Companies Act 2006 allows for the voluntary striking off and dissolution of companies and LLPs that are no longer trading, which may be the easiest option if certain criteria are met. Alternatively, a solvent liquidation may be more suitable. Your legal and accountancy advisers can help you identify the best option.

Another consideration is ensuring you have reviewed how any of the practice's outstanding liabilities will be satisfied, and that you have taken all steps necessary to bring it to an orderly closure. If you are unable to satisfy any such liabilities you may need to seek insolvent liquidation. Either route will require significant planning.

Where you have employees working in the business, you will need to work out how to bring their contracts to an end. The procedures to follow, including how much notice you must give, will be set out in their contracts, although you may also need to have regard to the general principles of employment law regarding termination. You should have valid grounds for terminating the contracts, but this is unlikely to be an issue as cessation of your business will generally be sufficient. You will also have to work out what pay and benefits you must provide before your employees leave, and consider what to do about providing references.

Bear in mind that there may be tension between your own needs – in particular, ensuring that you have sufficient staff to keep the business running until it closes – and your employees' – wanting to move jobs sooner rather than later. You may thus have to be flexible in dealing with their requests. If you have set up a company pension scheme, you will likewise need to make arrangements to ensure your employees' rights in this respect are properly protected.

At some stage, you will need to tell your clients that you are closing down your practice too, and have proper arrangements in place either to conclude matters for them or transfer ongoing work to another practice if they would prefer this. Failure to make adequate arrangements for handling client matters could have financial and regulatory consequences.

In order to carry on business, you will have entered into numerous contracts, some of which may have some time still to run at the date when you are hoping to cease practising; for example, any lease for the premises you use. You will need to review these contracts to see what they say about how they can be brought to an end. In particular, you will need to understand the consequences of early termination, and how much notice you need to give before the end of the contractual period.

Furthermore, there are a number of regulatory aspects you must consider, including notifying RICS of your intention to cease practising, ensuring that you deal properly with any client monies you hold, and arranging for the safe keeping of your records after you have closed the business. However, you do not have to leave RICS as you can become a retired member.

You should retain your records for at least six years and in some cases will need to keep them longer, for example where you were appointed under a deed. Best practice would be to retain your records for 15 years. This will involve you in ongoing responsibilities under data protection legislation, especially the Data Protection Act 2018 and the General Data Protection Regulation, which require you to keep data securely and review it regularly to consider whether you still need to hold it.

You will need also to consider what insurances you must maintain after your practice ceases. Although you should not need to maintain employer's liability or property insurance, you will need to renew policies such as your professional indemnity insurance because this needs to be in force at the time any claim is made rather than at the time the work giving rise to a claim was carried out. It is also a regulatory requirement that you maintain run-off professional indemnity insurance for a minimum of six years after you cease business.

Many of the above areas are complex, and you should consider seeking professional advice to ensure you comply with your obligations. Some of the steps require you to give notice well in advance of the date on which you want to cease practising, and it may be helpful to prepare a timeline. The better you plan, the less likely you are to overlook your obligations and the greater the chance that you will be able to close down your practice in an orderly fashion and with the minimum of stress.

In the next article, we will look at some of the issues that may arise and some of the obligations which may continue to apply post-termination.

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**Related competencies include:** Business planning

# Efficient encouragement

Surveyors must identify why owner-occupiers are making energy efficiency refurbishments to ensure that these improvements meet their expectations

Samantha Organ

The Intergovernmental Panel on Climate Change's October 2018 report highlights the necessity of limiting global warming to 1.5°C ([bit.ly/IPCC1pt5](https://www.ipcc.ch/report/sr15/)). This will require significant action across society – and clearly has implications for building surveyors, whose skills will be needed in improving UK buildings' energy efficiency and resilience to climate change.

In order to predict the energy efficiency of a building or a proposed improvement ahead of construction or installation and to produce an energy performance certificate (EPC), a calculation is carried out using the Standard Assessment Procedure (SAP). Building Regulations require submission of an SAP calculation and a predicted EPC for new dwellings before any work commences.

When looking at the average SAP rating, some of the most inefficient housing can be found in the private rental sector, although this is likely to have shifted since the introduction of the Minimum Energy Efficiency Standards in April 2018

([bit.ly/MEESLL17](https://www.eia.gov/energy_efficiency/)). With social housing representing some of the more efficient buildings overall – as found by the *English Housing Survey: Energy efficiency, 2016* ([bit.ly/EHSeneff16](https://www.eia.gov/energy_efficiency/)) – it is owner-occupied housing that remains the biggest challenge.

Past research has shown that we need substantial energy efficiency refurbishments to reduce domestic carbon emissions sufficiently. Ideally, these would take a whole-house approach, but piecemeal improvements can be effective.

Housing in the UK is predominantly owner-occupied ([bit.ly/DweStkEst17](https://www.eia.gov/energy_efficiency/)), and has the greatest potential for larger carbon reductions. The original Green Deal, scrapped in 2015, was one attempt to reduce the finance barrier for improving homes. But while earlier research has shown that an all-measures approach is needed to meet carbon reduction targets for housing, the Green Deal did not take such an approach, so even where it was adopted it did not sufficiently increase home energy efficiency.

The abrupt end of the deal also represents a missed opportunity to make additional improvements: previous research suggests refurbishments that fail to incorporate adequate energy efficiency improvements prevent further such measures for two or more decades.

Other incentives have been attempting to encourage improved efficiency, such as the scheme run by Uttlesford District Council ([bit.ly/UDCEnergy](https://www.uddc.gov.uk/energy/)), the Kirklees Warm Zone project ([bit.ly/Kirkleeswz](https://www.kirklees.gov.uk/warmzone/)), and consequential improvement programmes in Berkeley, California ([bit.ly/BerkeleyRECO](https://www.berkeley-reco.org/)). Yet so far, none of these has resulted in the extensive improvements necessary as the adoption of energy efficiency measures relies very much on the motivation of individual owner-occupiers, particularly where more significant measures are called for.

## Four types of motivation

Individuals will typically be motivated by wanting to ensure their home is sufficiently

functional: that is, the opportunity to improve a property's energy efficiency is clearer where it is necessary to address malfunctioning technology, building defects or building condition.

There are various barriers to action, though, from cost to competing priorities. It is now understood that simply giving individuals information will not result in action, although it improves their awareness of the issues and the steps they might take.

Looking at 25 owner-occupied houses across Bristol that had adopted, or planned to adopt, energy-efficiency measures, my own research has shown that motivations are multiple and complex ([bit.ly/Organ2015](http://bit.ly/Organ2015)). People will not act without a reason; any action taken must result in the desired outcome, and not be perceived as a waste of time, money, energy or other resources.

What an owner-occupier desires depends on their personal values. These, along with other factors such as their sense of responsibility, perception of self and social norms, contribute to the motivation type. The research identified four such types, and owner-occupiers will typically experience two or more of these at one time.

- **Economic motivation** includes being driven to save money on utility bills.
- **Social motivation** includes improving comfort and giving a platform for positive social interaction; that is, creating a welcoming environment in which occupants can receive their visitors.
- **Waste motivation** relates to action taken to reduce energy, material, money or other forms of waste.
- **Environmental motivation** concerns an individual seeking to be a good citizen, helping safeguard or improve the local or global environment.

The latter two are grounded in individuals' childhood and life experiences, and regular interaction with the local environment.

Motivations are dynamic as well, and can change type between and within projects. While they are shaped by internal factors, they alone do not shape the course of action adopted. This is also influenced by external factors such as available finance, grants and incentives, costs, physical building constraints, and the owner-occupier's awareness of the options.

In my research, motivations did not significantly differ according to neighbourhood deprivation levels or between socio-demographic categories. There was in fact a greater level of action among those in more deprived neighbourhoods, resulting in a higher instance of energy efficiency measures. This was not because these areas had received more incentives, rather that in such neighbourhoods owner-occupiers were particularly conscious of their ability to afford the desired levels of comfort.

The research found that the adoption or decision to adopt energy efficiency measures by these households often coincided with transitions such as house moves, retirement and changes to the family. This highlights the opportunity to undertake energy efficiency work at these key life points.

There are barriers that inhibit or attenuate owner-occupiers' motivations for making energy efficiency refurbishments, or demotivate them entirely. These include economic barriers such as the cost of work and the availability of finance; the inconvenience to occupants; conflicting messages about products, services and policies, in particular abrupt changes to the latter; and loss aversion.

Individuals are loss-averse, typically favouring the status quo. Potential losses will be overestimated and gains underestimated. However, this provides us with the opportunity to reframe information given to owner-occupiers, highlighting the threat to the affordability of their comfort, and therefore to home functionality, that would follow from not making improvements.

### **Emotional response**

Emotions are important, and ensuring a positive emotional experience will increase the likelihood of owner-occupiers adopting further energy efficiency measures in the future. Crucial to owner-occupier emotions in this regard are RICS' principles to provide a high standard of service and promote trust in the profession.

Negative emotional experiences reduce the likelihood of future action, and thus emphasise the importance of providing a

good experience of improvement works. Building surveyors are in a strong position to ensure this by using their knowledge and understanding to specify suitable responses and provide project management skills.

We can recognise that work is opportunistic, and we can use planned improvements as a foot in the door to highlight potential energy efficiency measures to owner-occupiers. Any information we offer must therefore be clear and trustworthy. When presenting opportunities, we should frame these according to the four motivation types identified, appealing particularly to the economic, waste and social themes, which are the owner-occupier motivations that are more consistently held across different types of neighbourhood.

We need to ensure the measures and processes used to improve the energy efficiency of owner-occupied housing are not only appropriate to the building but are also relevant to the owner-occupier's needs and context. Improvements should enhance a home's functionality and be suitable for occupiers' daily lives and local environment, so we need to engage with them to better understand their concept of a functional home. Helping identify relevant incentives and grants will also lower the cost barrier, while our project management skills can limit the inconvenience experienced by owner-occupiers during any works.

Improving owner-occupied housing's energy efficiency is a huge task and needs careful consideration to avoid resulting in future defects. Building surveyors are in a strong position to provide advice and services to owner-occupiers, after early engagement with them to identify their motivations and desired outcomes as well as energy efficiency opportunities and other improvement works.

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**Related competencies include:**  
Ethics, Rules of conduct and professionalism, Sustainability

# Flue remedies

**Modifications to chimneys and flues must be careful to ensure they maintain their load-bearing strength and performance. This, the third in our series on common site issues, looks at how to identify and remedy defects**

John Miles



Chimneys stacks have been common on the roofscape since before the Industrial Revolution, and were a feature of many 17th-century manor houses for instance. Historically, they have played a key part in running a house: fires were used for heating and cooking, with the chimney providing the natural way for the smoke to leave the property, and they continue to serve an important function in modern dwellings.

Regardless of whether chimneys are ornate or plain, they are exposed to the elements and the full force of any adverse weather such as rain, frost or snow. They are also exposed to intense heating and cooling, condensation, and chemical attack from open fires or gas or oil appliances.

Work to chimneys can vary from simple pointing and maintenance to rebuilds and removals, and anything beyond maintenance almost always requires a building control application. This would also require service of a party structure notice under the Party Wall (etc.) Act 1996 before work starts.

Any work that involves lining the chimney, increasing or reducing its height or removing it – or indeed installing one for the first time – will require approval under the Building Regulations, must meet the criteria of Approved Documents A on structure, B on fire safety and J on heat-producing appliances, and will need an agreement under the 1996 Act.

Defects in chimneys are common as a result of unsupervised or poorly conceived works. Typically, building control surveyors often get involved in cases where stacks are being removed, which often occurs

## Chimneys are exposed to the full force of any adverse weather such as rain, frost or snow

in older properties where they were built using relatively soft, porous clay bricks and lime mortar (see *Built Environment Journal* February/March, pp.30–33).

In any case where the chimney is being removed, proper consideration should be given to the existing structure and the neighbouring property.

### Chimney removal works

The traditional method for removal is to support the remaining chimney stack in the roof space with triangular gallows brackets made of steel bolted to the wall beneath it. The security of stack and brackets alike largely depends on the quality of the brickwork underneath; if this is very soft or loose, it may not be possible to obtain a secure fixing for the bolts. Another consideration is whether the chimney also supports a neighbouring one. A more secure alternative to brackets is a steel L-section beam that sits on the load-bearing walls of the house and supports the stack above.

Any project that requires the full or partial removal of a chimney needs to be supported by the provision of structural

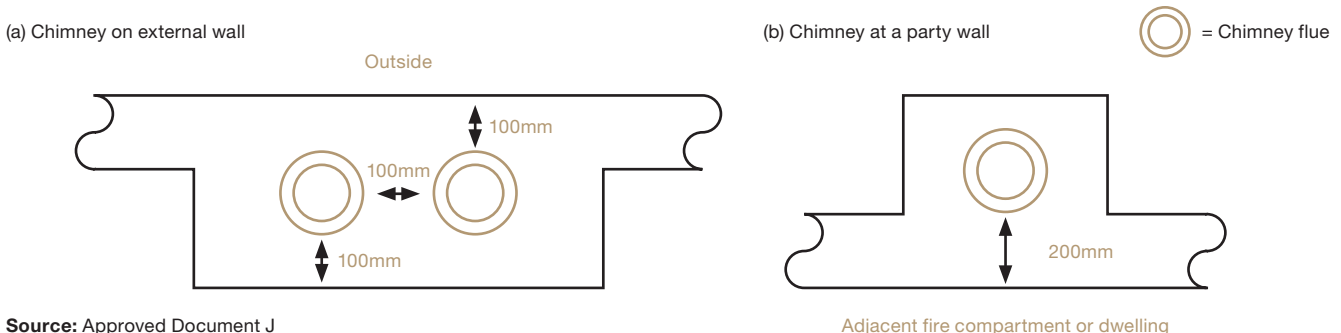
calculations. Photo 1, overleaf, shows the ground floor of a property where the chimney has been removed and an L-section beam installed. As a result of the chimney's removal the rear lining is visible, and the party wall separating the chimney from that of the neighbouring property is exposed. There are holes in the rear of the stack caused by the partial demolition, and these will need rectification before the wall is made good and the ceiling reinstated.

The structural repairs are visible, and on the left of the photo is the steel beam on padstones that supports the remaining redundant stack, which also acts as a buttress to the existing party wall.

These padstones need resetting to ensure the beam is adequately supported. Remedial works will likewise be required to make good the party wall where it was damaged during the stack removal, as there is a possibility of carbon monoxide or dioxide leaking from the neighbour's flue should their fire still be in use (see photo 2).

All poor brickwork should be replaced and repointed, ensuring that the neighbouring chimney is not adversely

**Figure 1. Wall thicknesses for masonry and flueblock chimneys**



Source: Approved Document J

affected, and that as a result of the works the function complies with diagram 20 of Approved Document J Combustible appliances and fuel storage systems (see [bit.ly/AppDocJ](http://bit.ly/AppDocJ) and Figure 1), and the agreement in place under the 1996 Act.

A smoke test should be carried out by a Gas Safe-registered engineer on the neighbour's flue to check for any leakage. Photo 2 also shows that a new ceiling will be formed to ensure adequate fire protection is provided for 30 minutes to the structural supports from the room below.

It should be noted that removal works should not use the following methods.

- Corbelling should not be attempted into the existing structure as it will not be possible to gain a sufficiently strong bond between the two kinds of brickwork.
- Timber bearers are often seen as an easy fix, akin to the trimming of joists; but the loads imposed by a chimney are far greater than those of a floor, and using timber may lead to collapse of the ceiling or floor.

Dampness around existing chimneys is one of the most common problems. This could be a result of poor maintenance, or damage to or inadequate flashing to the stack. Such defects are often not noticed until further works are being carried out, and any remedial works should be undertaken at this point to remedy the defect as part of the wider scope of works.

All chimneys should have a capping in place with a drip that will shed water clear of the brickwork below, a flashing to prevent rain passing between the chimney and adjacent roof covering, and a damp-proof course in the chimney at the damp intersection between roof and chimney to protect the masonry.

Any repairs need to comply with Approved Documents A and C and BS EN 1443: 2003, as well as following the BRE *Good Repair Guide* 15 of 1998. Assessment of any chimney works starts at the plan-checking process, with the proposed height needing to fulfil the criteria of Approved Document A section 2D diagram 20 (see Figure 1), and those of Approved Document J for positioning and size. Site inspections give the surveyor the opportunity to review compliance and identify any potential problems.

### Competency evidence

For APC candidates this process and the assessment of the design, risks and remedial work count as evidence towards the following competencies.

- **Building control inspections:** carrying out site inspections to ensure that building work to a chimney meets relevant performance requirements, and having the ability to observe, assess and take action against contraventions on site.
- **Building pathology:** understanding defects analysis and being able to relate building fabric failure to chimney failure.
- **Construction technology and environmental services:** understanding design and construction, and being aware of construction solutions to problems.
- **Works progress and quality management:** knowledge of construction technology techniques and their relevance on site, good-quality work being vital in ensuring long-term functionality.

While carrying out the inspection on the chimney, the surveyor should also be able to identify the types of defect discussed above and provide appropriate measurements and photographs in site reports.

The detail should be reviewed against the approved plans or submitted specification appropriately using Approved Document A, BRE *Good Repair Guide* 15 and other guidance such as the NHBC technical standards to determine whether the structure is stable and the chimney construction acceptable.

From there, the surveyor would be able to take appropriate action, such as advising on remedial measures or the need for further review by a structural engineer. Where an APC candidate is identifying and resolving such site defects, it should be possible to record their general experience under at least Level 2, and potentially Level 3 where advice has been given for the competency of Building control inspections.

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### Related competencies include:

Building control inspections,  
Legal/regulatory compliance



1. Example of L-section beam in place and alternative angle of defect

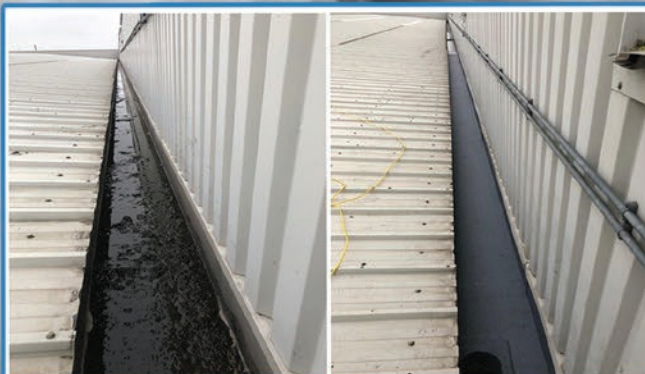


2. Damage to party wall by chimney removal

IMAGES © JOHN MILES

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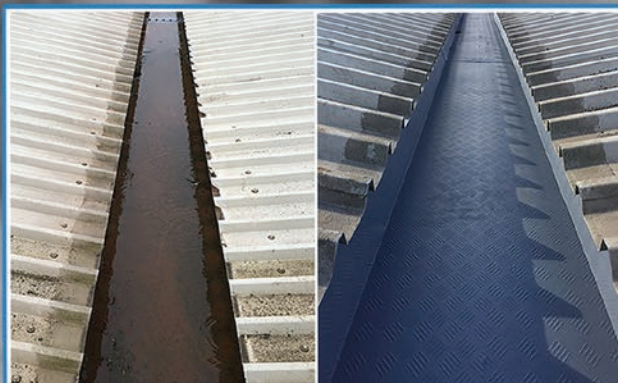
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# Effective or defective?

Surveyors should be on the look-out for fire-related defects to ensure that buildings comply with regulation revised following the Grenfell Tower fire

Diego Alves

In June 2017, the fire at Grenfell Tower in west London resulted in a significant loss of life. In response, the government commissioned an independent review of the Building Regulations and fire safety from Dame Judith Hackitt, who published her final report last May.

The Hackitt Review drew on experience across the industry to determine where exceptional events such as this fire could lead to the risk of fatalities on a large scale. Dame Judith's report made 53 key recommendations, which included setting demanding roles and responsibilities for duty-holders, more rigorous enforcement powers, and stronger control over changes to standards. The building surveying profession must help to ensure that these recommendations are strictly implemented.

In November, the government announced that it would ban combustible cladding materials for all new residential buildings; that is, places where people sleep, whether apartments, hospitals, hotels, care homes or student accommodation. It also sought to speed up the replacement of cladding made from unsafe aluminium composite material (ACM), as used at Grenfell Tower.

The necessary change in legislation was made in the Building (Amendment) Regulations 2018 ([bit.ly/MHCLGcirc218](https://bit.ly/MHCLGcirc218)), which became legally binding on 21 December. The ban is implemented by amended regulation 7, which deals with materials and the quality of work, and applies to all elements used in external wall construction; it is now mandatory, rather than simply being guidance.

The legislation covers new construction as well as extensive refurbishment projects, that is those classed as major alteration.

It is at present unlikely that the ban on combustible materials will apply retrospectively to existing buildings; however, more clarification is expected as this issue goes to press.

## Risk levels

When reviewing any property with respect to fire, whether existing or new build, property owners are advised to identify the level of risk in accordance with Approved Document B, which provides specific requirements and guidance to enable compliance with the Building Regulations. Achieving this on site is essential to ensure the preservation of life.

In the first instance, it is important to distinguish between the diverse types of construction and the respective category of fire risk, which in broad terms may be described as follows:

- **traditional brick/masonry construction:** low risk
- **aluminium and glass curtain wall:** low risk
- **rainscreen cladding:** low to high risk, depending on type and combination of materials
- **ACM rainscreen cladding with polyethylene core:** high risk
- **ACM rainscreen cladding with fire-retardant core:** low to medium risk
- **high-pressure laminates (HPLs):** medium to high risk
- **HPLs with fire-retardant core:** low to medium risk
- **acrylic render:** medium to high risk according to render/substrate
- **timber constructions, including decking in balconies:** medium to high risk.



Indifferent and excessive installation of cavity barriers

### Combustible materials

The combustibility of ACM with a polyethylene core was found to be one of the main causes of the rapid spread of fire at Grenfell Tower, together with combustible insulation behind the ACM, the lack of proper cavity barriers and unsatisfactory installation.

On top of the combustible materials there are other hazards to consider, including droplets from melting plastics, toxic fumes and asphyxiants given off by burning insulation and other plastics found in a modern cladding system. The combustibility of ACM is now well known, but it is just one of several combustible cladding materials used in rainscreen cladding, which also include structural insulated panel (SIP) backing walls.

A key feature of rainscreen cladding is the void between a wall construction and the rear of the cladding panel. Strict rules govern the way that the internal walls of a building must be constructed to contain fire and assist safe evacuation, but the same is not always true of the external walls, where there are few requirements to prevent the spread of flame and heat from outside. Devices and features in this void such as vapour membranes and bathroom or kitchen vents can transmit fire and smoke from the cladding system into occupied spaces. These, together with uPVC windows, certain paint finishes and timber balconies, can all increase the fire load.

On the basis that the external wall has been designed in accordance with Approved Document B 2018, it is important to check installation of cavity barriers, proper fire compartmentation and service penetrations as well as combustible cladding is effective by undertaking intrusive inspections.

This is particularly relevant when rainscreen cladding has been identified on a property. Several recent inspections have found

cavity barriers and poor penetration detailing in rainscreen systems to be a significant concern, and intrusive inspections must be carried out to confirm compliant installation.

Approved Document B clause 12, as amended 2018, states how the external wall must be designed and installed so that its performance is assured in the event of a fire. Cavity barriers perform their fire safety function only once, but they must be totally effective on that one occasion. It cannot be overstated that these preventative measures are intended to preserve life rather than the asset.

### Ineffective fire controls

Intrusive inspections of many properties by CBRE's facade team have found a catalogue of defective installations and materials, all of which can potentially put lives at risk. Such defects are due to a variety of causes from poor design and incorrect use of materials to inconsistent installation of cavity barriers, insulation and cladding, as well as substandard support substructures.

Apart from combustible cladding materials, the construction behind rainscreen cladding is largely unseen and can be a huge concern in terms of fire risk. The void or cavity formed in rainscreen systems is susceptible to propagation of fire by the chimney effect. It is therefore imperative that effective measures be taken to contain the spread of fire in the cavity: defective installation can mean that closers will not form a compartment in the event of a fire, and their ability to contain it is then completely lost. Cavity barriers must be fitted so they remain in place securely throughout the life of the construction while allowing ventilation of the cavity. However, they must close off the cavity as it intumesces when exposed to fire, thus starving the space of oxygen.

If such barriers are not secured properly, they will detach, sag or deform, rendering them incapable of performing their function. Following one intrusive inspection, the maximum allowable gap for the intumescent strip on a mineral wool cavity barrier is marked clearly on the product as being limited to 25mm. However, the cavity barrier air gaps were found to be up to 80mm, so would be unable to close off the cavity in the event of a fire. The photo, above left, shows indiscriminate installation of cavity barriers that are totally ineffective in the event of a fire.

Prevention of fire passing through the rainscreen at services penetrations is also a major concern. Apart from fire, lethal toxic fumes and asphyxiants can pass through small voids and openings in cladding systems. However, proprietary products are available to deal with this potentially serious fire safety risk.

The key to successful compliance with the amended Building Regulations is correct product specification along with intrusive inspections to confirm that materials are fitted as specified.

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**Related competencies include:** Construction technology and environmental services, Fire safety, Inspection

**Further information:** [bit.ly/HsgAct2004pwrs](https://bit.ly/HsgAct2004pwrs)

# Preventing combustion in construction

Plastic materials are not only found in cladding systems, so understanding the composition of fixtures and fittings will enable better assessment of fire risk

**Trevor Rushton, with contributions from Terry Walker**

In 1973, the disastrous fire at the Summerland Centre in Douglas on the Isle of Man claimed 50 lives and seriously injured 80. Within minutes, a fire in a small kiosk had engulfed the building thanks to its highly flammable Oroglas transparent acrylic cladding. Yet although the Building Regulations were amended subsequently, it has taken the lives of the 72 Grenfell Tower victims to see proper attention being paid to plastics in external construction.

In the past year, we have focused on fire tests, in line with the methods set out in BR 135, and on the lamentable performance of many kinds of plastic-based insulation used in tandem with aluminium composite materials. However, fires in cladding systems are merely one example of the risks associated with the plastic materials and components that may be found virtually everywhere in modern

construction and in the furnishings and equipment we use in our buildings.

It would be easy to assume that all plastics perform badly in a fire, but this is not necessarily the case. Many plastics contain fire-retardants that modify their behaviour; others contain polymers that burn at high temperatures and produce toxic gases. In its report to the Hackitt Review, however, the Association of British Insurers (ABI) claimed that the fires in most tests used wood as an ignition source, when fires in contemporary buildings usually involve around 20 per cent plastic, resulting in a temperature increase of 100°C.

These findings were contested by the Building Research Establishment, but the fact remains that some plastics will contribute to the overall fire load of a building. Interestingly, the latest revision to Approved Document B (England) in

November last year suggests that BR 135 tests are no longer acceptable for residential buildings that are in excess of 18m in height ([bit.ly/BuildRegsAmd18](https://bit.ly/BuildRegsAmd18)).

## Chemical composition

Plastics are formed of naturally occurring organic materials, usually one or more polymeric substances. A polymer itself is usually composed of molecules called monomers that hook together and form long chains.

These are the basis of plastics that have three broad classifications: thermosets, thermoplastics and elastomers. Thermosets form their final shape by heating and cannot be softened without deformation; thermoplastics are moulded by heat and pressure and can usually be reformed by heating; and elastomers or synthetic rubbers can stretch and return to their shape but cannot be reheated and reformed.

Some of the monomers used in plastic manufacturing can be very hazardous; for example butadiene gas, which is used to make neoprene and other elastomers, is flammable and also thought to be a carcinogen. Yet once they are combined in completed products, many monomers stabilise and do not present a danger in normal use – a good job, because you are probably wearing some now.

The burning characteristics of plastics are extremely varied, and it would be unreasonable to class them all as hazardous in fire. Factors such as ignitability, flame

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**Many plastics contain fire-retardants that modify their behaviour; others contain polymers that burn at high temperatures and produce toxic gases**

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## The burning characteristics of plastics are extremely varied and it would be unreasonable to class them all as hazardous in fire

spread, heat release and smoke opacity all need to be considered.

When plastics do burn they may produce toxic gases, including asphyxiants such as carbon monoxide and hydrogen cyanide, irritants and carbon dioxide. Above a volume of about two per cent, the latter makes those who inhale it breathe faster, which in turn increases their exposure to other gases generated by fire.

### Plastics in construction

One of the most commonly used construction materials is the uPVC found in windows, plumbing, cable insulation and various other fittings. This is very difficult to ignite, and performs far better in fire than some other plastics.

According to the British Plastics Federation, the temperature required to ignite rigid PVC is more than 150°C higher than that of timber. Unlike thermoplastics, it does not produce flaming droplets but tends to char into a carbonaceous structure that protects the material beneath.

However, uPVC is not suitable as a cavity barrier so care must be taken when replacing timber-framed windows with PVC ones. Concerns have been expressed, too, that in a fire the chlorine content of PVC reacts to form hydrogen chloride gas – a toxic irritant – but in reality fire victims are more likely to inhale lethal doses of carbon monoxide.

Thermoplastics and thermosets are often used in rigid insulation boards, both internally in floors and walls and externally in roofs and insulation systems. They are

efficient insulators, but are unlikely to satisfy requirements for non-combustibility or use in systems of limited combustibility. In contrast, the alternative stone-wool or mineral-fibre systems are less efficient, so thicker insulation layers are needed – again, a potential problem in retrofits.

A group of thermoplastic materials often selected for strength and transparency are polycarbonates, either single or multiwall sheets of which are used for rooflights and glazing. The performance of such materials in fire depends on a variety of factors such as thickness and addition of fire-retardants. Testing systems vary throughout the world, and in the UK polycarbonate materials cannot be tested to BS 476 part 3 or BS EN 13501 part 5 because the material melts under the conditions used. The material is rated as normally flammable to the German DIN 4102 and DIN 13501 codes – comparable to other materials such as wood, save that ignition behaviour depends on factors such as multi- or single-skin use.

Polymethyl methacrylate (PMMA), also known as acrylic or acrylic glass, is a transparent thermoplastic often used in sheet form as a shatter-resistant or lightweight alternative to glass or a cheaper alternative to polycarbonate. Certain brands generate almost no smoke compared with many other plastics, and under normal circumstances combustion only gives rise to carbon dioxide and water. Being thermoplastic, though, PMMA melts in the event of a fire, with the flow depending on the grade of acrylic and the development of the fire.

During the Summerland fire the burning Oroglas melted, allowing more oxygen to enter the building and increase the intensity of the fire, while burning droplets contributed to fire spread and injury. One should not assume that current formulations would behave in exactly the same way, but the ever-increasing use of plastics in furniture is a concern given that it is not generally covered by the Building Regulations. There are some regulations relating to flammability, but once a fire has started the use of such products may well create a highly toxic environment in a building very quickly.

The performance of plastic components can also be critical. For example, the ABI's submission to the Hackitt Review considered the effects of plastic vents and ducts passing through a cladding system. In one test involving a section of wall, temperature readings indicated that such a vent was providing an almost instantaneous route for fire directly into the void between the wall and cladding, long before it would have taken the fire to break through the outside cladding panels. The existence of vents will make a big difference to the performance of other materials and forms of construction, and yet standard test methods do not model these.

In summary, while the manufacturing industries strive to improve the performance of plastics in fire, the ever-increasing use of such materials in construction will almost certainly contribute more and more to the fire load of a building. But this may well occur in a way that is not necessarily modelled in standard fire tests, which often concentrate on the materials themselves rather than their use in combination.

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**Related competencies include:** Building pathology, Construction technology and environmental services, Fire safety

# Kept in check

Fire safety in buildings is now more than ever a key consideration during inspection, so it helps to have an overview of potential defects and other issues

Joshua West

Fire safety is of the highest importance, but the nature of legislation, industry guidance, and building information can be confusing for surveyors and other professionals inspecting and advising on built assets.

Nevertheless, a good building survey report should evidence understanding of the way a building prevents the cause or spread of fire, with advice given on promoting responsibility for fire safety management and fostering a fire safety culture. It should be noted that we are not fire engineers; but this article provides an overview of key areas we must consider in ensuring fire safety in a property is assessed holistically.

The typical methodology includes being aware of the appropriate legislation before carrying out the initial desktop review and a site inspection. The following are the key pieces of legislation on building fire safety:

- the Regulatory Reform (Fire Safety) Order 2005
- Building Regulations 2010, with Approved Document B – Fire Safety being of particular relevance
- BS 9999: 2017.

## Desktop review

Initially, the fire strategy for the building should be requested for review. A report on this should provide a full, well-structured description of the design approach for the building, with regard to whether it is a new build, an existing property or one that has recently been refurbished or redeveloped. If a strategy is not available then the landlord should be advised to commission a new one, because a fire risk assessment can only properly be undertaken once this strategy is fully understood.

The building's evacuation plan and its fire detection and warning system should also be known; the latter should be the correct category and type for the building it serves. To ensure adequate means of escape, the occupational densities on each floor, protected fire escape routes, travel distances, the widths of fire exit doors and stairs, and final exit locations must all be understood. The emergency lighting, signage and assembly points should be evaluated too, along with the provisions for evacuation of people with disabilities.

## Facades and facilities

Regard should be had to the height of the building – is it more than 18m tall from ground level? Is the cladding of the building a composite panel system with combustible insulation? Approved Document B states: 'in a building with a storey 18m or more above ground level, any insulation product used in the external wall construction should be of limited combustibility'.

The fire strategy should indicate the extent of the cladding's combustibility after a review of the as-built documentation; if it does not, the property management team should be advised that samples of cladding panels be sent for testing to determine this.

While samples have been removed for testing and the facade is open, the installed barriers that close the edges of cavities and are fitted around openings should also be reviewed. Although such testing is seen as critical for high-rise buildings, cavity barriers should also be reviewed in sensitive buildings with high occupancy rates, such as schools and hospitals, and those where occupants sleep, such as hotels, student

accommodation and the like. It is important to note such barriers are used in all types of building to prevent the spread of fire, and are not just limited to those listed above.

The building should provide adequate access and facilities for the fire service too, with all the following taken into account:

- vehicle access
- access for firefighters in and around the building
- the need for a fire-resistant lift shaft
- the provision of fire mains and dry risers
- venting for heat and smoke from basement areas
- provision of adequate water supplies.

### Fire risk assessment

The fire risk assessment (FRA) for the building should be requested for review as well. The FRA document's quality should be scrutinised as, in my experience, these can vary dramatically, with little control in the industry over who undertakes them.

The age of the FRA is crucial; it should be reviewed in line with the recommended review date, and again when any significant or relevant changes are made, to assess whether these have affected the risk and whether the on-site safety measures remain appropriate. The property management team should confirm that any shortcomings or potential for improvements raised by the FRA have been actioned rather than just filing the document away.

The fire safety management process is presently fragmented, and the structure must be changed from the top down. FRAs need more respect, and should command greater involvement – and therefore higher fee levels – to achieve the consistently higher standard required by the industry.

Other documentation that should be requested includes:

- building control certification, although this should not be presumed conclusive evidence of compliance in every case
- fire compartmentation surveys
- third-party installation accreditation
- test data relating to as-built products.

### On-site inspection

While the building surveyor is on site, the reviewed documentation should be checked to make sure it is a true reflection of the

current state of affairs. If any changes have been made to the strategy or building, confirmation should be sought that they have been approved by the relevant statutory body.

When considering a building's fire protection system, many commonly think about its alarms and sprinklers alone, when the system actually comprises both active and passive fire protection measures. The former include fire or smoke alarms, sprinklers and fire extinguishers; passive fire protection meanwhile involves compartmentation of a building, with walls and floors rated for fire resistance to help control and prevent fire or smoke spreading. Active and passive fire protection systems are equally important and work together during a fire, not in place of one another.

The sealing of each compartment should be inspected to ensure it will prevent the spread of fire effectively. Deficiencies are often found behind the scenes, especially but not exclusively in plant rooms or service risers, above ceilings and in voids below raised floors. In my experience, it is common to have concerns about the inadequacies of fire compartmentation after inspection, with advice regularly stating that work will be required to provide the necessary degree of protection.

Although such concerns can be a result of poor-quality work in newly built or refurbished buildings, it can also be seen in existing buildings; for instance, in penetration works undertaken by the landlord's or tenant's contractors through installed fire-rated walls, or openings where the compartmentation or stopping has been disturbed but not reinstated. Even where it has been reinstated, it is common to find poorly applied expanding foam used as a filler, which is highly likely to be incorrectly specified to achieve the required fire rating for the materials it replaces.

Other common issues include the failure to install fire-rated collars on service penetrations through structural slabs. Inspection of fire doors serving riser cupboards, protected fire escape routes and the like will also be needed. Tenants and other building occupants can create fire risks as well, by locking fire doors or leaving them propped open; storing combustible



Poorly applied expanding foam repair



Disturbed fire battery compartmentation

materials in electrical risers and plant rooms; and making unauthorised alterations such as installing new doors in fire compartment walls, among other things.

A comprehensive review should be undertaken to identify any deficiencies in the on-site occupational test information associated with the fire precautions and means of escape, to ensure they all are in date and renewed on a cyclical basis. This includes testing certification for the fire alarm, smoke detection, emergency lighting system and dry riser, with supporting records to cover extinguishers, hose reels and sprinkler systems.

To conclude, it is important to step back and review the building works holistically rather than inspecting each element individually and separately.

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**Related competencies include:** Fire safety, Inspection

# Compliant conservation

To ensure the significance of heritage assets is protected, conservation professionals must get to grips comprehensively with the legislative context in which they work

Dr Michael Stubbs

There is a vast amount of legal information for professionals involved in heritage planning to understand, with definitions, documents and case law providing a solid knowledge base for UK practitioners. One key concept is listed building consent (LBC), which falls within the broader remit of conservation and offers a way to label or identify the social value of heritage assets.

Conservation itself is the process of assessment or approval and is defined by the Historic England (HE) Conservation Principles, Policies and Guidance 2008 as 'managing change to a significant place in its setting in ways that will best sustain its heritage values, while recognising opportunities to reveal or reinforce those values for present and future generations'.

This is similarly expressed in the UK's other nations as follows:

- **Wales:** 2011 Cadw *Conservation Principles*
- **Scotland:** *Historic Environment Scotland Policy Statement June 2016*
- **Northern Ireland:** the work of the Historic Buildings Council and Historic Monuments Council.

In contrast to conservation's specifics, significance is a term that covers the sum of cultural and natural heritage values;

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**A listed building is one that is for the time being included in a list compiled by or approved by the secretary of state as defined in the relevant legislation**

implicitly, a range of values that together enhance the overall status of a place, which may be archaeological, architectural, artistic or historic. A key, established principle is that heritage assets should be managed to sustain this value, and that needs a thorough understanding of significance.

## Listed buildings

A listed building is one that is for the time being included in a list compiled by or approved by the secretary of state as defined in the relevant legislation:

- **England:** section 1(5) of the Planning (Listed Buildings & Conservation Areas) Act 1990

- **Wales:** section 23 of the Historic Environment (Wales) Act 2016
- **Scotland:** section 1 of the Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997
- **Northern Ireland:** section 80 of the Planning (Northern Ireland) Act 2011.

Listed status will cover the building itself, and any object or structure fixed to the building or in its curtilage that, although not fixed to the building, forms part of the land and has done so since before 1 July 1948, or later if specified in the listing. Listed buildings come under the bracket of designated heritage assets (see Figure 1). An assessment of the degree to

which an object or structure is attached or annexed and the purpose behind this is required to determine what is fixed to a building. It is possible for an extension or structure to be listed because it is fixed, but if it is of no special interest its alteration may not require LBC, although its demolition would.

*Shimizu UK Limited v Westminster City Council* [1997] UKHL 3 clarified the point that if the partial demolition of a listed building is deemed an alteration that affects the character of the building as one of special architectural or historic interest then LBC will be needed. In effect, to claim a matter is simply an alteration so LBC is not required would be the wrong approach.

The extent of a listed building's curtilage can be notoriously difficult to establish. In heritage cases, curtilages may extend beyond current ownership boundaries to those of the historic estate and its relationships; for example, a farmed landscape once linked to the estate and a part of its wider context and setting could readily be deemed the original and relevant curtilage. Where such cases become complex and intractable, specialist legal advice is often required.

### Legislation and policy

In England, the principal legislation governing the protection of listed buildings is still the 1990 Act. Section 66(1) of this establishes a key duty that 'In considering whether to grant planning permission for development which affects a listed building or its setting, the local planning authority ... shall have special regard to the desirability of preserving the building or its setting or any features of special architectural or historic interest which it possesses'. The equivalent guidance in the other nations is:

- **Wales:** the 2016 Act, which amends the 1990 Act
- **Scotland:** the 1997 Act and Planning (Listed Building Consent and Conservation Area Consent Procedure) (Scotland) Regulations 2015
- **Northern Ireland:** part 4 of the 2011 Act.

Below the high-level legal tests sit national government policy:

- **England:** the National Planning Policy Framework (NPPF) of 2018 ([bit.ly/GovNPPF](http://bit.ly/GovNPPF))

- **Wales:** Planning Policy Wales of 2016 ([bit.ly/GovWalesPP](http://bit.ly/GovWalesPP))
- **Scotland:** Historic Environment Scotland (HES) *Historic Environment Circular 1* of 2016 ([bit.ly/HESenviron](http://bit.ly/HESenviron))
- **Northern Ireland:** as derived from the 2011 Act.

Specialist national guidance has furthermore emerged in all jurisdictions as:

- **England:** Ministry of Housing, Communities & Local Government planning practice guidance ([bit.ly/GovPPG](http://bit.ly/GovPPG))
- **Wales:** Welsh Government Technical Advice Note (TAN) 24: *The Historic Environment* (2017) ([bit.ly/WalesTAN24](http://bit.ly/WalesTAN24))
- **Scotland:** HES's Managing Change in the Historic Environment series of guidance notes ([bit.ly/HESmangchg](http://bit.ly/HESmangchg))
- **Northern Ireland:** Department for Communities' Historic Environment Division planning guidance ([bit.ly/NIplanning](http://bit.ly/NIplanning)).

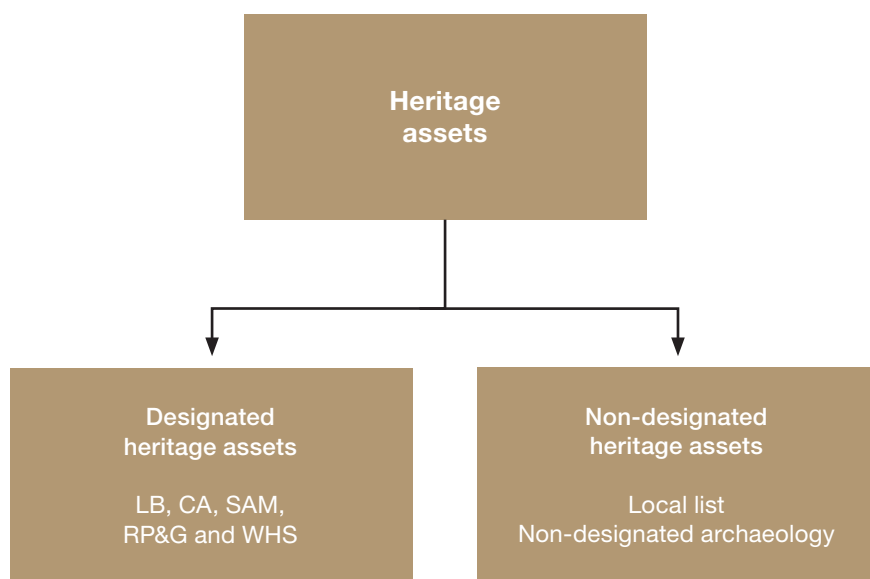
In recent years, such policy and guidance has set out a series of presumptions making significance central to the system, defining some heritage assets or elements as critical

and some as tradable when balanced against other benefits. These are referred to as the substantial or less than substantial harm tests in the revised 2018 NPPF in England. Welsh TAN 24 guidance states that heritage assets represent a finite resource, and the HES policy statement that listed buildings can be robbed of their special interest by inappropriate alteration or demolition.

While the main duty of preservation is legally mandated, practitioners may become embroiled in complex and sometimes lengthy discussions as to the critical and tradable elements in an LBC application. For example, a project may involve restoration or repair that results in the loss of some historic fabric, understandably exacerbating tensions. An assessment mechanism is therefore required to support LBC applications. This would most appropriately take the form of the following, according to the nation in which it is made:

- **England:** a statement of significance; see planning practice guidance and HE's Good Practice Advice notes on planning
- **Wales:** a heritage impact assessment;

**Figure 1. Summary of the UK heritage system**



**Key:** LB = listed building; CA = conservation area; SAM = scheduled ancient monument; RP&G = registered park and garden; WHS = World Heritage Site

**Note:** Definitions of these assets can be found at [bit.ly/HEHPRDEFINITIONS](http://bit.ly/HEHPRDEFINITIONS)

**Table 1. Recommended documents to consult when conducting heritage appraisal for LBC applications**

| Guidance                                                                                                                                                                              | Where relevant    | Example                                                                                                                                                                                                   |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Cadw <i>Conservation Principles</i> 2011<br><a href="http://bit.ly/CadwConservprinciples">bit.ly/CadwConservprinciples</a>                                                            | Wales             | Explanation of key values and tests when considering alterations to heritage assets                                                                                                                       |
| Cadw <i>Heritage Impact Assessment in Wales</i> 2017<br><a href="http://bit.ly/HIAinWales">bit.ly/HIAinWales</a>                                                                      | Wales             | Leading guidance on content of impact assessments and the processes they inform                                                                                                                           |
| Charles Mynors and Nigel Hewitson, <i>Listed Buildings and Other Heritage Assets</i> , 5th edition, 2017<br><a href="http://bit.ly/MynorsHewitson">bit.ly/MynorsHewitson</a>          | England and Wales | Leading authority on heritage law, covering policy tests and legislative foundations                                                                                                                      |
| HE Advice Notes<br><a href="http://bit.ly/HEplanningsystem">bit.ly/HEplanningsystem</a>                                                                                               | England           | Ten wide-ranging notes covering the most relevant issues for the historic environment including tall buildings, adaptive re-use of farm buildings, sustainability assessment and the historic environment |
| HE <i>Conservation Principles, Policies and Guidance</i> , 2008 and 2018 draft revision<br><a href="http://bit.ly/HEConservprinciples">bit.ly/HEConservprinciples</a>                 | England           | Explanation of key values and tests when considering alterations to heritage assets; draft revisions have not yet been formally issued                                                                    |
| HE Good Practice Advice notes<br><a href="http://bit.ly/HEplanningsystem">bit.ly/HEplanningsystem</a>                                                                                 | England           | Four useful notes on local plans, heritage significance, settings and enabling development                                                                                                                |
| HES <i>Policy Statement</i> June 2016<br><a href="http://bit.ly/HESenviron">bit.ly/HESenviron</a>                                                                                     | Scotland          | Explanation of the system and consent regimes, and how decisions are to be made                                                                                                                           |
| NI Department for Communities <i>Guidance on Setting and the Historic Environment</i> February 2018<br><a href="http://bit.ly/NIplanning">bit.ly/NIplanning</a>                       | Northern Ireland  | Guidance on development within the setting of a heritage asset                                                                                                                                            |
| Society for the Protection Ancient Buildings <i>The SPAB Approach to the conservation &amp; care of old buildings</i><br><a href="http://bit.ly/SPABapproach">bit.ly/SPABapproach</a> | All four nations  | Long-established and enduring heritage principles that will guide projects                                                                                                                                |

see Cadw 2017 guidance *Heritage Impact Assessment in Wales* ([bit.ly/HIAinWales](http://bit.ly/HIAinWales))

• **Scotland and Northern Ireland:**

supporting information to justify change.

Consulting the documents in Table 1 is recommended for projects involving heritage appraisal in LBC applications.

The UK system of heritage control is built around the broad philosophy that heritage assets such as listed buildings are retained in optimum viable use or the most appropriate conservation use, and, where change is necessary, this should respect and retain special interest, that is, significance. The lexicon of heritage language constantly evolves as international conventions and national legislation and policy define and refine new ways of approaching this LBC regime. This LBC is itself a separate consent from planning permission, and may be required in addition to it, or by itself for works such as internal alterations that do not do not themselves require permission.

Importantly, the planning law concept of development does not apply to LBC, so that works for the maintenance, improvement or other alteration of a building that only affect the interior – which ordinarily do not require planning permission – may require LBC. LBC is always required if works affect the character of a building of special interest, but this is a matter of judgement. As a result there is scope for differences of opinion between different local planning authorities and listed building owners.

### Conclusion

To list a building is to identify it as important and to attribute to it a value or worth. These values are themselves based on judgements and the current interpretation of what is appropriate restoration, conservation and repair: note that conservation is a process, while restoration and repair are methodologies or end states. Although some policies across the UK diverge, it is commonly agreed that any decision to demolish, alter or extend a heritage asset must be assessed against the implications for its special interest.

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# Control conditions

**The University of Salford's Energy House research facility has enabled much more practical and accurate assessment of energy efficiency**

Will Swan and Richard Fitton

In 2011, the University of Salford launched a new kind of building research facility. The Salford Energy House is a replica of a Victorian solid-wall end terrace built in a large-scale environmental chamber, where temperature, solar radiation, wind, rain and snow can be simulated and controlled.

The facility was built in response to the sustainable retrofit agenda. At the time, it was clear that progress was being made in improving the understanding of energy efficiency in new properties, to meet the more stringent requirements in Part L of the Building Regulations.

Existing stock, however, was highlighted as the central problem for policy-makers in terms of meeting aspirations on climate change and fuel poverty. Sustainable retrofit – that is, retrofitting a property specifically to improve its energy efficiency – became a national priority.

The traditional ways of understanding the impact of any measure made to improve domestic energy efficiency were twofold. The performance of products such as insulation, heating or controls was often assessed using laboratory-based tests – typically as a single element, with walls tested in isolation from roofs and floors. The argument against this approach is that these tests were often not reflective of the product's performance in the context of that whole



Energy House 2.0

system, and did not account for issues caused by use, installation or interaction with other improvements, such as the interrelationship between fabric and heating systems or ventilation.

The second approach was the field trial. However, the findings of such studies are confounded by the fact that the real world is complex and messy and, sometimes, it is difficult to establish what the impact of the product or system might be. The vagaries of weather, occupant behaviour and the differences in properties mean that larger data sets are required to draw conclusions that are robust, making them expensive and time-consuming. Field trials are also notoriously difficult in terms of issues from communication to data loss and, occasionally, awkward occupants.

The Salford Energy House was therefore a bold new proposition. It countered the issues of laboratory tests as the products were installed as part of a whole system. It also provided a level of control and repeatability for tests that was impossible in field trials; weather and occupancy profiles could be run on the house both with and without the improvement, to isolate its impact by reducing the noise in the data from other factors. A more scientific approach could thus be taken to the examination of a dwelling's thermal performance, with higher degrees of accuracy than those found in on-site measurement of single properties.

The Salford Energy House hosted a number of major research programmes during this period. Working with manufacturer Saint Gobain, a team consisting of staff from the University of Salford, Saint Gobain Recherche and Leeds Beckett University carried out two whole retrofits, using both external and internal insulation wall measures. These demonstrated the potential for a significant reduction in heating demand using off-the-shelf products.

Meanwhile, work with the British Electrical and Allied Manufacturers Association provided robust evidence on the impact of simple domestic heating controls, which were found to be more effective than previously thought. This work is currently being used to inform changes to the UK's regulatory energy model, the Standard Assessment Procedure.

One of the other benefits of controlled conditions that had not been considered when designing the facility was the development of new methods for assessing buildings. The rapid whole-house quick U-value of buildings (QUB) test and the prize-winning fast U-value measurement system were thus both trialled and developed in the energy house.

At the start, the original energy house was part of a growing sector increasingly interested in finding faster, cheaper and more effective ways of understanding buildings. Over its lifetime, we

have seen considerable change in that sector. Government-led energy efficiency schemes such as the Green Deal and Energy Company Obligation attempted to encourage retrofit in the UK, but came up against the complexities of the market, a limited understanding of buildings and a declining political will.

The National Audit Office highlighted the Green Deal as a policy failure. This failure was the result of factors such as the high cost of credit, poor consumer take-up and limited understanding of the savings that a retrofit could offer, because predicted performance was often not reflected in that actually achieved – a phenomenon known as the performance gap. It was these kinds of issue that the energy house was designed to address.

However, the problem of energy efficiency in buildings has not gone away. Commercial and residential buildings represent 45 per cent of EU energy consumption and in the UK the domestic sector consumes more than a quarter of total energy, largely through heating and hot water use, which can account for 75 per cent of an individual home's energy demand. So if we are to address fuel poverty, carbon emissions and energy security – which remain the energy policy triumvirate – then the built environment, and particularly housing, must be central to the discussion.

### Energy House 2.0

Energy House 2.0 takes the original concept and extends it into a global facility. The £16m project commenced early this year, and is partly funded by the European Regional Development Fund under the Greater Manchester Sustainable Urban Development (Low Carbon and Research and Innovation) Call.

Two significant changes have been made to Energy House 2.0, when compared to the original facility. The first is that the two chambers will recreate weather conditions representing those experienced by 95 per cent of the world's population, as opposed to mainly temperate northern climates, by achieving temperature ranges of  $-20^{\circ}\text{C}$  to  $+40^{\circ}\text{C}$  in both heating and cooling latitudes in each of the two chambers.

The second is that the chambers provide greenfield sites with hangar doors enabling access for diggers and lorries. This allows a variety of properties to be built, tested and then replaced. The original Energy House structure reflected around 20 per cent of UK stock and could not be modified or replaced, but the new facility can embrace any construction type, including small non-domestic buildings. This particular improvement has been made with a view to supporting international markets, as well as the growing interest in off-site and modular build methods.

Together, these changes radically alter the type of work that can be undertaken. The facility can look at off-site technology, temporary accommodation for disasters, and coatings and materials for a global market.

The Energy House 2.0 also operates in a context different to that of the original project at the start of the decade; while energy efficiency is still a major issue, buildings are now increasingly viewed as part of a more complex energy system. The links between storage, renewables, electric vehicles, smart meters and homes are taking buildings into a different environment. This model has

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## If we are to address fuel poverty, carbon emissions and energy security then the built environment must be central to the discussion

been embraced at a policy level through *The Grand Challenges*, the Department for Business, Energy and Industrial Strategy (DBEIS) policy paper on the government's industrial strategy published in May 2018 and updated in December ([bit.ly/DBEISgrandchal](http://bit.ly/DBEISgrandchal)).

So while the transition is likely to take time, it is happening. This may well mean a shift in some of the ways we understand buildings. The Smart Meter-Enabled Thermal Efficiency Ratings project, announced by DBEIS in July 2018, indicates a possible future for evaluating building fabric performance using smart meter data, supported by data from internal and external sensors.

More importantly, there is a movement to look not only at the energy efficiency of a property but also wider issues such as ventilation and related air-quality factors. This reflects a developing understanding of building performance as a series of interrelated factors rather than thermal performance alone. Such approaches start to link issues of building performance to the smart and connected homes agenda, to help occupants access data that was not previously available to them.

When Energy House 2.0 is completed, it will be able to support the industry in a period when rapid technological change is expected. We can see emerging domestic energy systems linking with electric vehicles, storage and renewables and potential new fuels such as hydrogen. There are new models of energy consumption, such as time-of-use tariffs, and virtual power stations where demand, generation and storage capacity for multiple homes are managed externally. All these changes are underpinned by the growing use of information technology such as smart meters and smart homes.

Energy House 2.0 is a vital step between the laboratory and people's homes, providing a swift way to develop robust evidence and minimise risk in what is starting to look like a radical technological transition for UK domestic energy consumption.

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# Thoroughly modern builders

Recent years have seen an upsurge of interest in modern methods of construction as the UK strives to supply more new, high-quality homes, and building control bodies have a crucial role to play in assuring that quality

**Richard Lankshear and Paul Williams**

The increasing interest in modern methods of construction (MMC) is partly due to the publication of the Farmer Review, *Modernise or Die*, in October 2016 ([bit.ly/FarmerRev](http://bit.ly/FarmerRev)), and the Ministry of Housing, Communities & Local Government white paper *Fixing our broken housing market*, published the following February ([bit.ly/housingfix](http://bit.ly/housingfix)). Coupled with the well-publicised shortage of skilled labour in the housing market, we are now seeing more housebuilders investigating new ways of building.

NHBC, for example, previously received between four and eight innovative systems to review each year, but in recent years this number has risen dramatically, with more than 30 received in 2016 and a record of 42 submitted in 2018. To meet this rising demand, NHBC launched the MMC Hub in 2016, an online portal providing guidance and listing building systems accepted as meeting our standards ([bit.ly/MMCHub](http://bit.ly/MMCHub)).

The types of MMC system we see at NHBC are varied, and include traditional

construction materials such as timber, steel and precast concrete as well as less common materials such as aerated concrete and cross-laminated timber, and occasionally innovations such as 3D printing and glass-fibre-reinforced materials.

We have also seen a change in the types of MMC submitted for review. Whereas two years ago most were on-site MMC systems – such as insulated concrete formwork and thin-bed mortar blocks – or panellised systems, there has been a shift towards more complex whole-house volumetric systems. The recent NHBC Foundation Report *Modern methods of construction: Who's doing what?* demonstrated the growing interest in and benefits of using MMC ([bit.ly/MMCwhat](http://bit.ly/MMCwhat)).

We have seen such interest before, but there are a number of new factors behind the growth in use of MMC. For a start, concern about skills shortages in housebuilding has driven up the cost of traditional trades, leading builders to

explore alternative ways of construction. Then there are the opportunities that come from the use of new, viable technologies that help realise the potential of MMC.

Notably, however, it is the investment in off-site manufacture by housebuilders that shows the value that can be achieved using MMC. This move towards vertical integration by some of the major builders allows them to realise the benefits of MMC through procurement and direct management of the supply.

Despite the growth in activity, NHBC's rate of acceptance for these systems is not increasing. The main reason for this is because many simply fail to demonstrate that they meet our standards. Typically, we see two areas of concern:

- the need for an early design freeze so that specification of components and proof of their performance can be fully demonstrated before manufacture begins
- factory production controls – the biggest risk in off-site manufacture is that of

systemic defects, so we require production to be carried out under an audited and approved quality management system.

Often the materials or technologies are not new, but where and how they are assembled is innovative. The change in sequence from traditional forms of construction means that interfaces are created that cannot be detailed by the usual methods, and new details need to be designed with regard to the buildability, structural stability, durability, acoustics, weatherproofing, performance in fire and thermal performance of the building.

As a result of the industry-wide increase in use of MMC, and whole-house volumetric systems in particular, there will be a need to adapt to the changes that the new processes bring, especially for everyone working in the building control sector. Whole-house volumetric system manufacturers will need to take greater ownership of the designs, production and site delivery process for the MMC systems.

The experience that NHBC Building Control has of whole-house volumetric systems to date clearly identifies there is an opportunity for building control bodies (BCBs) to use their expertise and knowledge to work alongside manufacturers and ensure compliance with warranties and the Building Regulations before delivery to site.

BCBs will need to consider whether manufacturers have the right level of in-house expertise and controls in place on the production line and on site to enable this. BCBs would also be wise to consider reviewing their operating procedures and approach before dealing with volumetric systems, since the technical information and building control compliance package would ideally need to be scrutinised before production commences in the factory.

This highlights the importance of engaging with the manufacturer and builder before production starts. Engagement at this stage will ensure that a detailed, early technical review is carried out with building control so no further changes are made to the working drawings and specifications. Early involvement with BCBs also reduces the chance of the product being delivered when not fully compliant with Building Regulations, and also limits the risk of



Assembling a house that has been manufactured off site: housebuilders are investing more in modern methods of construction, partly in response to skills shortages

having to rectify non-compliant features later on site. Ensuring compliance is highly dependent as well on the manufacturing programme keeping to the agreed plans and specifications reviewed by the BCB.

Another important function of early engagement between the design team and BCB is establishing a suitable inspection regime. This will ensure each home built using MMC systems has an inspection record that covers the process from off-site manufacturing to delivery on site and installation, allowing a final certificate to be issued. One challenge that may need to be taken into account by BCBs is factory production and its location. The production line might be hundreds of miles from the construction site, so BCBs might consider it necessary to carry out ad hoc or planned inspections in the factory as well as site inspections to ensure production complies with the agreed specification.

NHBC is geared up to support the industry as it moves to diversify the methods for building homes. But while we support innovation, it must be responsible, and performance proven for all elements

of the home. All involved in the design, procurement, manufacture and building of MMC systems should acknowledge the extent of information required to demonstrate compliance; this will often need to be concluded at an earlier stage than for conventional construction since the technical design and manufacturing controls need to be reviewed and accepted before manufacture begins. Successful MMC systems have invested extensive resources in developing the design of both the product and manufacturing processes.

With responsible innovation, new homes can be built to high standards, supporting NHBC's core purpose to give homeowners confidence in their quality.

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## Training

# 'LABC is seeing a significant rise in new recruitment, and a huge increase in numbers signing up for structured training and qualifications'

**Anna Thompson**  
LABC



For years, people were talking about how building control surveying was facing a demographic time bomb, with an ageing workforce and far greater numbers leaving the profession than joining as new recruits.

There were dozens of articles written and many discussions across the profession about the lack of interest in surveying generally and building control more specifically. It wasn't seen as a sexy career, and certainly not as attractive as becoming an architect or an engineer.

But all that has changed. Local Authority Building Control (LABC) is now seeing a significant increase in new recruitment, with the total number of surveyors and technicians rising by more than 400 in recent years and a huge interest shown by those signing up for the new structured training and qualifications.

Undoubtedly, the renewed attention on building control and standards over the past 18 months has helped. The media, television and mainstream press have started to mention the discipline, and in the public sector there is now greater acknowledgement of its vital role as well

as a recognition that it must be properly resourced and supported.

LABC is making it easier for employers in the public sector to do so through our commitment to developing our own surveyors rather than simply recruiting graduates with degrees in other subjects. Our qualification pathway – set up in partnership with the Chartered Institute of Building and the University of Wolverhampton – allows flexible levels of entry from Level 4 diploma up to Level 6 degree, the latter of which attracts apprenticeship levy funding (see *Building Control Journal* April/May 2018, pp.18–19).

Surveying has traditionally been one of the most male-dominated professions, but we are now finding that even this gender bias is being turned around. Our boot camps are always a good indicator of who's joining the profession, and 40 per cent of surveyors participating in a recent residential workshop were female. The main reason for this turnaround has been LABC's continued investment in standards and competencies. This has included the introduction of a national ISO-accredited

quality management system, with most local authority teams now either fully accredited or well on the way there.

LABC has introduced level 6A Fire Safety Specialist certification in association with the Institution of Fire Engineers and rigorous fire safety assessments for its most experienced surveyors. A new virtual learning environment – an online resource for LABC's 3,500 surveyors and technical staff – also offers more than 200 hours of learning in more than 100 different courses. It is removing barriers to attracting and training new recruits by making it easier for them to take part in training and personal development and improve and evidence their competencies.

The online platform contains almost all the courses a surveyor will need to develop their career in building control, covering subjects from agile working to working at height. The system automatically tracks individual learning, books training courses and updates personal development plans. Apart from formal accredited qualifications, all these courses are free of charge for LABC surveyors and technicians as well.

LABC is committed to the highest standards, and is constantly seeking ways to measure the competency of our surveyors so those in public service building control can more easily develop their skills. The initial feedback we're getting is extremely encouraging, and we're confident that, because of the online resource's ease of use and quality of learning, we'll see a strong uptake from our building control teams. This will in turn further increase confidence in public-service building control.

In a demonstration of LABC's commitment to the future generation of surveyors, Bhavesh Patel from Hertfordshire Building Control was recently named LABC Trainee of the Year. The competition was extremely fierce, with excellent candidates nominated, and this only goes to show the strength developing at all levels among our LABC surveyors around the country.

*Anna Thompson is LABC's head of business development* [anna.thompson@labc.co.uk](mailto:anna.thompson@labc.co.uk)

# Surveying safely in the outback

Inspecting buildings in remote or hazardous environments will proceed much more smoothly and safely with a full assessment of the risks faced, as a schedule of visits to schools across Western Australia demonstrates

Craig MacDonald

The second edition of the RICS *Surveying safely* guidance note, which became effective in February, contains valuable lessons for all surveyors (see p.12 of this issue and [rics.org/surveyingsafely](https://rics.org/surveyingsafely)).

KPMG's property due diligence team, for which I work, operates across Australia in all sectors and on all building types, and every time the risks are different. We could be inspecting a roof-level plant room in a 30-storey building, or travelling to an asset someone owns in the middle of nowhere.

Take for example a job I found myself doing: inspecting remote schools in the outback of Western Australia. The fact that the guidance note does not comment on certain aspects of working in this environment does not permit inadequate consideration

of the risks. On the contrary, when there are such unknowns we use the tools and advice at our disposal to ensure as many of the risks are identified as possible, so we can manage or mitigate them. As property professionals, we are expected to have a level of competence sufficient to enable us to take personal responsibility for managing health and safety.

In order to begin the risk assessment at these schools, I chose to determine the itinerary first so I would have something I could sound out with a colleague. The isolated inspection schedule included 11 of the schools to be visited, with an estimated driving distance of 2,000km over nine days. Although some days would involve no driving, other days would be nothing but.

The outback presents many potential hazards, and ensuring appropriate transport is only one of them

Part of confirming the itinerary included contacting each school. This was more than just a case of confirming the time and date of my attendance; it was also an opportunity to gather as much information as possible. The buildings themselves weren't considered special or unique, and the majority were transportables or those constructed as part of the Building the Education Revolution initiative for new cavity-walled classrooms. Apart from ensuring access to all structures, gathering details about local conditions was a priority. It included details you wouldn't be able to find online – first-hand accounts of conditions, accommodation, phone signal and, in one instance, an Aboriginal funeral that would be taking place.

Once we had determined that the inspection schedule could not be fulfilled by flying to each location, a driving route was established and journey times estimated. With my itinerary to hand, a risk management exercise could be performed by considering how my plan of action might deviate from expectations. Table 1 provides information on hazards specific to the high-risk environment of driving through the outback, while hazards associated with the inspections themselves are detailed in Table 2, overleaf.

The *Surveying safely* guidance note mentions at the outset that, from an international perspective, it is important to consider cultural differences in terms of health and safety. Aboriginal communities, for instance, treat deaths and funerals with a high level of cultural sensitivity and respect. In such cases, the risk level for outsiders varies with each community for several reasons, including the seniority of the community member who has passed away and whether or not alcohol is prohibited in the region.

Often a ceremony will not commence until most of the affected tribe members have travelled to the community, which can take days or weeks. In the interim, unrest and violence is known to break out in certain communities, creating an especially high-risk environment for outsiders; this period of mourning is known to Aboriginals as 'sorry business'. While I was confirming access arrangements to a remote Aboriginal community school, the principal advised me that the community was observing sorry business, and I therefore had to update my risk assessment (see Table 3, overleaf).

So long as you take the time to go through your itinerary and your scope of work step by step, you should identify all the hazards. But do be certain to review the document with a fresh set of eyes, or pass it to other colleagues who have experience relevant to the job.

Most of the risks being considered concern life safety or well-being; however, something I have not

**Table 1. Examples of hazards specific to the high-risk environment of driving through the outback**

| What are the hazards?                                                                                        | How could you be harmed?                                                                                                                                     | What action are you taking?                                                                                                                                                                                                                                                                                                | What further action is necessary?                                                                                                                                                                                                                                                         |
|--------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| No access to phone signal, wifi etc.                                                                         | Unable to contact anyone in an emergency                                                                                                                     | Rental of satellite phone for emergency use only                                                                                                                                                                                                                                                                           | None                                                                                                                                                                                                                                                                                      |
| Driving terrain requires a 4x4 vehicle                                                                       | Not being prepared for road conditions by having the wrong type of vehicle, or not being trained properly to negotiate such terrain with the correct vehicle | <ul style="list-style-type: none"> <li>Check that rental insurance covers the route and use of vehicle on unsealed roads</li> <li>Complete 4x4 driving training course</li> </ul>                                                                                                                                          | <ul style="list-style-type: none"> <li>Check road reports before this part of drive</li> <li>Consider travelling with an air compressor to re-inflate tyres after driving on sand</li> <li>Consider travelling with 4x4 recovery tracks in case of getting bogged down in sand</li> </ul> |
| Weather events e.g. flash flooding, river crossings                                                          | Sudden change in road conditions could cause a vehicle accident or stranding                                                                                 | <ul style="list-style-type: none"> <li>Plan inspection schedule for a time of year outside the wet season</li> <li>Monitor weather reports on ongoing basis</li> <li>Confirm road conditions with local school contacts</li> </ul>                                                                                         | Confirm phone numbers for all relevant shire road report lines, and check before relevant portions of the route while in signal range                                                                                                                                                     |
| Animals and other fauna                                                                                      | Kangaroos, emus, goats, cattle and large monitor lizards are commonly found on the route or crossing the road. All could collide with vehicle                | <ul style="list-style-type: none"> <li>Train in first aid, with specific focus on the outback e.g. dealing with snake bites and bandaging</li> <li>Avoid driving at dawn and dusk, the highest-risk period for encountering kangaroos and wallabies on the road</li> <li>Take satellite phone for emergency use</li> </ul> | Ask local school contacts about frequency of animals in their areas, and their experiences driving in and out of the communities                                                                                                                                                          |
| Lone working                                                                                                 | No one would know if an accident occurred or I didn't return from a property or community                                                                    | <ul style="list-style-type: none"> <li>Agree to check in with nominated colleague by text, email or phone at key waypoints where phone signal is available</li> <li>Copy of trip itinerary left with nominated colleague</li> </ul>                                                                                        | None                                                                                                                                                                                                                                                                                      |
| <ul style="list-style-type: none"> <li>No fuel stations</li> <li>Vehicle tank size not big enough</li> </ul> | Vehicle running out of fuel and becoming stranded in outback                                                                                                 | <ul style="list-style-type: none"> <li>Check tank size of rental 4x4 is greater than 70 litres</li> <li>Identify fuel locations and plan stops</li> </ul>                                                                                                                                                                  | Obtain and fill extra 40-litre can of fuel following collection of rental 4x4                                                                                                                                                                                                             |



touched on that we must all consider frequently are the commercial risks associated with our day-to-day roles, which still apply in the context of working remotely. These include reputational risk should something go wrong or be mismanaged, or financial risk if data for a remote site is lost and a fresh visit is required, which not only entails further costs but also subjects a person to all the previously identified hazards once more.

In today's agile working environment, we are less often limited to one project at a time. For example, while he was working on the same school project elsewhere in Western Australia, a colleague found himself taking a conference call about the sale of an A\$250m office asset that patched in a Sydney client and Canadian investors – all of this on a dirt track after an inspection at a remote community school.

This blurs further the definition of the workplace, and underscores the importance of assessing risk. It is assumed that the basic requirements of making our place of work comfortable – such as access to water and temperature control – are being met, but inside a vehicle this will not always be possible. We are each responsible for assessing our own environments.

Bear in mind that other areas of the world will have altogether different considerations. For example, working in Papua New Guinea it is necessary to take medication to prevent malaria infection, and appoint a security guard detail to escort oneself between sites in rural areas. Such considerations are also likely to entail increased fees for the client.

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**Related competencies include:** Health and safety, Inspections

**Table 2. Examples of hazards associated with the school inspections in the outback**

| What are the hazards?         | How could you be harmed?                                                               | What action are you taking?                                                                                                                                                                                                                                                       | What further action is necessary? |
|-------------------------------|----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|
| Working in the sun            | I could become sunburnt                                                                | <ul style="list-style-type: none"> <li>• Use of sunscreen and sunglasses</li> <li>• Seeking shade</li> <li>• Wearing long-sleeved breathable clothing and broad-brimmed hat</li> </ul>                                                                                            | None                              |
| Snakes, flies, mosquitoes etc | Bites and stings ranging from uncomfortable to life-threatening                        | <ul style="list-style-type: none"> <li>• Application of repellents, use of nets</li> <li>• No opening up of concealed spaces or entering rooms without lighting</li> </ul>                                                                                                        | None                              |
| Roof access                   | Slips, trips and falls from height causing injury or death                             | Roof photography subcontracted to a licensed drone operator                                                                                                                                                                                                                       | None                              |
| Repetitive strain injury      | Use of tablet to collect and record survey data, causing strain on neck, arm and wrist | <ul style="list-style-type: none"> <li>• Take regular breaks</li> <li>• Determine which portions of the data collection could be completed as a desktop exercise, also meaning less time spent on high-risk sites, more effective use of travel and less accommodation</li> </ul> | None                              |
| Not drinking enough water     | Dehydration, sunstroke                                                                 | Ensure always travelling with a crate of bottled water and restocking at each population centre                                                                                                                                                                                   | None                              |
| Contact with local community  | Threat of violence, bodily harm                                                        | Obtain local advice from school contacts on further mitigation such as meeting at vehicle on arrival                                                                                                                                                                              | None                              |

**Table 3. Addition to risk assessment**

| What are the hazards?       | How could you be harmed?          | What action are you taking?                                                        | What further action is necessary?                                                                                                                                                                                                |
|-----------------------------|-----------------------------------|------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Aboriginal 'sorry business' | Violence, risk to personal safety | Liaising with site contact in the community to provide personal escort and updates | <ul style="list-style-type: none"> <li>• Consider revising itinerary so as not to stay overnight in the community, and resultant impact of distance driven in one day</li> <li>• Consider rescheduling the inspection</li> </ul> |



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# One brick at a time

Brick has been used as a building material across the UK since Roman times. This, the first of three articles on the subject, looks at its long history

Moses Jenkins

Templeton's Carpet Factory in Glasgow encapsulates a golden age of Victorian decorative brickwork

Britain first acquired the skills to manufacture fired clay bricks when large parts of the country became part of the Roman Empire in the first century AD. The bricks made by the Romans were generally wider and thinner than those today and were used in various ways, including as lacing courses in walls of rubble stonemasonry and in the construction of supporting pillars for hypocaust heating systems. Roman bricks can be found throughout the UK at significant sites such as Burgh Castle in Norfolk, and as far north as Newstead at Melrose in Scotland.

When the Romans left Britain in the fifth century, so too did brick-making, until the 12th century. Some buildings from the period in between were built with re-used Roman bricks, for example the nave of St Alban's Abbey. Construction on this began in the 11th century, reusing materials from the Roman British town Verulamium.

The earliest known use of brick manufactured in the UK after the Romans left is widely regarded as being Coggeshall Abbey in Essex, the oldest parts of the monastic buildings dating to 1190. Beverley North Bar in East Yorkshire is a very good surviving example of medieval English brickwork, construction of which began around 1409. The bricks used were thin at 50mm and, as with indigenous bricks of the time, somewhat uneven in shape and size. This gave the brickwork a distinctive character, with wider mortar joints and uneven bonding. Significant surviving examples of brick buildings from the medieval period include Rye House Gatehouse, built around 1443, and Thornton Abbey, Lincolnshire, built around 1382.

A decorative feature evident in medieval brickwork that extended into the 17th century was the use of diaper patterns. This saw saltires and diagonal intersecting lines picked out using well-vitrified or flared headers that were overburnt during firing and presented a grey to blue colour. Both cut and moulded bricks were used in this period to add decorative embellishment. Brick was built with considerable skill and good understanding of the properties of the material, and was used to create vaulting, circular and angled walls as well as arches. In this period, there was a status attached

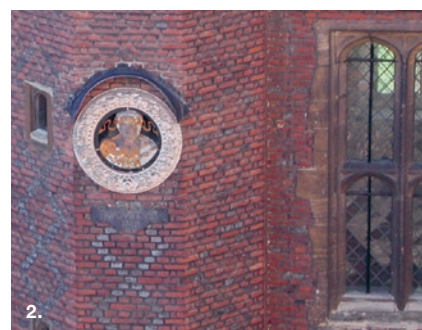


to the use of brick: it was largely confined to those at the upper echelons of society, in both church and state.

### Tudor and Stuart brickwork

Following the early brickwork of the medieval period, a greater use of the material occurred in the 16th century, including such buildings as Layer Marney Tower, built in 1523, and Hampton Court Palace (see photo 1). Brickwork at this time began to exhibit greater standardisation in terms of technical application, including greater use of bonds. These were most commonly English or English cross, although irregular bonding was still being used. The high status of the brick buildings being built is reflected in the use of decorative features such as diaper work (see photo 2) and techniques such as colour washing and the pencilling of joints. Bricks of this period continued to be somewhat irregular in size and shape. Some was of exceptional standard, for example at Leeze Priory, Essex, built 1563, and the moulded brickwork at Roos Hall, Suffolk, built 1583.

The use of brick grew further in the 17th century, with buildings such as Balls Park, Hertford, 1640, indicative of the time. The use of Flemish bond gained popularity, and



1. Hampton Court Palace is one of the most significant brick buildings of the Tudor period with brickwork of exceptional quality
2. Diaperwork patterns at Hampton Court Palace are indicative of decorative schemes of this type



3. The Georgian period saw brick used for housing in both urban and rural areas of the UK. Flatfield Farmhouse, Perthshire, shows many influences from vernacular building traditions  
 4. The 19th century saw brick used to house industrial workers on an unprecedented scale  
 5. Railway construction led to a high demand for bricks to construct infrastructure, as well as allowing brick manufacturers to transport the material far and wide

gauged brickwork emerged as an option for enrichment — a highly significant development in this period. Gauged brickwork involves cutting and rubbing softer bricks to allow very thin, precise joints to be used. An early example of such gauged brick enrichment is the Old Meeting House, Norwich, built in 1693.

A considerable amount of brick was used to rebuild London following the Great Fire in 1666. The great gathering of craftspeople occasioned by this rebuilding had a long-term impact on brickwork in the UK. Previously a material most commonly used for the houses of the powerful and wealthy, by the end of the 17th century brick was becoming much more commonly used for buildings of different classes. Its geographical spread also expanded at this time, as brick buildings become more common throughout England and Wales.

#### Georgian brickwork

The use of fired clay bricks in the UK became considerably more popular going into the 18th century. Brick was used to create many architecturally impressive buildings such as Chicheley Hall, Buckinghamshire, in 1719 and Bailey Hall,

Hertford, around 1700. Brick was also used for terraced housing in a way that was previously unseen; an example is Union Place, Wisbech, built around 1800. These buildings often incorporated gauged-brick enrichment, as both the quality of bricks and the skills of craftspeople improved.

Importantly, brick was also used during this time to build housing for both rural and urban workers as well as the privileged. This meant it was used across a greater geographical area, with considerable expansion in Scotland in the 18th century, for example. In some cases

rural housing reflected influences from vernacular construction techniques as at Flatfield Farmhouse, Perthshire, built in 1785 (see photo 3). Many early textile mills were constructed partly or wholly of brick, including the use of arched flooring to build fireproof mills, as at Ditherington in Shropshire in 1797. This strategy quickly became popular throughout Britain. Overall, the Georgian period was one of considerable expansion in the use of brick.

From a technical perspective, Flemish bond was commonly used in this period, although in rural buildings irregular bond

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**A golden age of decorative brickwork took place between 1860 and 1890, with decorative elements incorporated into even the most utilitarian of buildings**

was common. It was at this time that gauged brickwork became more widely practised throughout British brick buildings. Brick was often used in the 18th century for specific purposes in stone structures as well as to construct buildings in their own right. Such uses include vaulting, lining ashlar walls and the construction of internal partitions. Higher-quality bricks used on the front facade of a building would sometimes be snapped in half, resulting in poor binding with the brick wall behind and giving the illusion of an alternative bonding style.

### Victorian and Edwardian brickwork

In the early part of the 19th century, the use of brick continued in much the same way it had in the previous 100 years. The growth of railways and their use in the mid-19th century, however, meant a considerable expansion in the use of brick due to the need to construct bridges, line tunnels and ancillary structures (see photo 4). Other engineered constructions of brick at this time included tall chimneys, lighthouses and an incredible range of industrial structures. This use of brick in an engineered context has left a considerable legacy, from North Unst Lighthouse, Shetland, to St Pancras Station, London. Brick was used throughout Britain at this time to construct vast rows of housing for industrial workers (see photo 5).

The mid-19th century saw considerable change in the way brick-making was undertaken. The introduction of many new processes for the forming of bricks and advances in kiln technology made it more readily available and also allowed mass

production of special shapes, different colours and high-quality glazed and facing bricks. This led to a golden age of decorative brickwork between 1860 and 1890, which saw elements incorporated into even the most utilitarian of buildings. This reached its apogee with the construction of Templeton's Carpet Factory, Glasgow, in 1892 (see photo, p.48).

There are numerous technical features of note from this period including recognisable bond patterns that can be seen throughout British brickwork. The gauge to which brickwork was laid and the size of bricks both increased in the latter part of the 19th century; both bond and gauge varied considerably by region. Cavity-wall brickwork – which performs differently in structural terms to solid-mass brick walls – also come into use in the 19th century. However, this is not always evidenced by the use of stretcher bond. Where headers are used to tie across the cavity, bonds

such as the rat-trap bond may be seen, as in the brick housing in Main Street, Newtongrange, dating to 1872.

Through the centuries these developments have left us with a heritage of brick buildings that it is important to conserve and repair correctly. It is this conservation and repair that will form the basis of subsequent articles in this series.

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**Further information:** Resources include the British Brick Society ([bit.ly/BBSINFO](http://bit.ly/BBSINFO)), as well as the books R.W. Brunskill's *Brick and Clay Building in Britain* (2009), Gerard Lynch's *Gauged Brickwork* (2nd edition, 2013), Historic England's *Practical Building Conservation: Earth, Brick & Terracotta* (2015) and Moses Jenkins's *The Scottish Brick Industry* (2018).





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## Legal

# 'To succeed with a negligence claim a claimant will need to establish a duty of care'

**Laurence Cobb and Rona Westgate**, Taylor Wessing



The decision in *Lejonvarn & Burgess & Anor* [2017] EWCA Civ 254 in the Court of Appeal confirmed that an architect and project manager who provided professional services to friends and without entering a contract will owe a duty of care to carry out those services using reasonable skill and care. But in the attempt to sue for £265,000 for negligence, Mr and Mrs Burgess failed to substantiate their allegations of negligence.

The dispute arose out of a decision by the couple to landscape their garden in Hampstead. An initial quote from a landscape gardener was rejected as too pricey. Mrs Lejonvarn, a professional architect and friend, offered to help find a contractor to carry out the works and to provide some project management services for free. It was intended that she would also provide some design for a fee, although she did not as the former friends fell out over the cost and quality of the work. The garden was completed by others and the Burgesses brought proceedings against Mrs Lejonvarn alleging professional negligence.

The court heard evidence from several witnesses before finding that Mrs Lejonvarn

had not acted negligently during the project. The Burgesses were criticised by the court for their 'scattergun approach' and the fact that much of their factual evidence was 'of limited relevance'. Their claim for negligent design and project management also lacked 'credibility and conviction'.

Drawings by Mrs Lejonvarn were not produced negligently, she did not breach her duty by failing to spot defects in the work, and her budget was reasonable and competent. Falling out over the project cost did not mean there was merit in the claim for the actual costs incurred against those the Burgesses said they would have incurred had they hired the original designer.

A particular aspect of the decision was the court's comments that it appeared that the Burgesses had assumed that poor work by the contractor must automatically be Mrs Lejonvarn's fault for not noticing the defect and getting it rectified.

The court noted that a claim against an architect for failure to undertake supervision duties with reasonable skill and care will need to comply with the principles set out in *McGlavin v Waltham Contractors*

*Limited* [2007] EWHC 149 (TCC), including:

- the frequency and duration of inspections should be tailored to the nature of works
- depending on the importance of an element of the works, the architect may instruct the contractor not to cover it up until after inspection; this was unlikely to occur in most cases as the architect should have timed inspections so as to avoid affecting the progress of those works
- the fact that work is covered up during inspections was not automatically a defence to allegations of a failure to inspect, as the work's importance and the architect's reasonable contemplation of works being carried out needed to be taken into account
- a reasonable inspection does not need the architect to examine every matter in detail.

The takeaway points from this judgment are as follows.

- Evidence is crucial. Aspects of the Burgesses' case lacked credibility and Mr Burgess' evidence was argumentative and inconsistent with the documents.
- Contemporaneous documentation is key. The court preferred notes made by Mrs Lejonvarn at the time that enabled her to establish the number of times she visited the garden to inspect progress, whereas Mr Burgess gave evidence about what he thought was happening even while he was out of the country.
- It is not sufficient to allege that a supervising architect should have spotted defects; there will need to be some evidence as to the breaches and as to what should have been inspected, and when.
- To succeed with a negligence claim a claimant will need to establish a duty of care, and also demonstrate breach of that duty and that the breach caused a loss. There has to be linkage between the losses claimed and the alleged breaches.
- Falling out over money by itself does not mean there has been a breach of duty.

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### Related competencies include:

Client care, Design and specification, Legal/regulatory compliance

# A retail breakthrough

Building control surveyors had a significant role to play when it came to coordinating construction and ensuring safety in the extension of the Westfield shopping centre in Shepherd's Bush

Toyin Ore



In 2015, works began on extending the Westfield shopping centre at Shepherd's Bush in west London. Given its long association with the local authority, Westfield appointed the London Borough of Hammersmith and Fulham's building control service as its preferred provider.

The service set up a designated Westfield project team, most of whom had worked on the original centre and could thus bring extensive experience to the project. This team worked with Westfield consultants including architects Sheppard Robson, fire engineering firm WSP, structural and civil engineering company Walsh and service engineers Foreman Roberts.

### The project

The £600m extension created an extra 65,000m<sup>2</sup> of retail, dining, leisure and entertainment floorspace, and is reported in local media to be the largest shopping centre in Europe. The extension includes the anchor store John Lewis, several new retail units and car parking over eight floors, as follows:

1. level 10: basement car park
2. level 20: ground-floor retail
3. level 40: lower-mall retail, and the podium for a residential project that will include several blocks for social housing and private sale
4. level 50: upper-mall retail
5. level 55: mezzanine retail
6. level 60: car park
7. level 63: car park
8. level 65: roof.

The extension involved creating a tunnel to connect the existing centre's basement car park with the proposed new basement. The tunnel works were partially carried out under an access road, the restricted headroom of which influenced the type of piling rig used. The new mall levels 40, 50 and 55 were also connected with the existing centre, works that were referred to as the breakthrough, which formed a complex part of the project. It also included creating a new access road.

From the initial meetings, it was clear that the extension presented significant challenges for the ongoing operation of the existing centre. The works included relocating several units and stair cores and creating temporary escape routes that were separate from but close to the construction site. It was therefore critical that the borough's team consult the London Fire Brigade from an early stage and onwards throughout the project, to ensure that it was aware of the changes.

The initial priorities of project meetings were structural issues and fire safety, and they subsequently covered all other requirements according to urgency. The overall works were broken down into smaller

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## It was essential that the areas of construction were separated from the existing mall while works were carried out

projects, such as John Lewis itself, infilling an existing car park ramp with concrete and steelwork to enable rerouting of the road, and the breakthrough. Doing so helped to manage the vast quantity of information for the relevant part of the works.

### Site constraints

The extension was heavily constrained by the existing underground drainage and transport routes, as well as by structural and fire safety implications. Before the main project started, for instance, the enabling works included considerable diversion of drainage and utilities, which were inspected by the borough's in-house building control drainage specialist.

London Underground's Central Line also runs through the breakthrough, so there were structural implications along its length, and access points in the vicinity of the extension that would need to be available both during and after the works. The surrounding roads and access into the car park directly below the extension were likewise kept operational throughout the project, with diversions when relevant.

The foundations include nearly 2,000 piles, with diameters ranging from 600mm to 1,500mm. The reinforced concrete pile caps and core caps have unique designs according to their location; while the former are mostly of standard sizes, some have unique designs because they bear the load of multiple columns. The superstructure on top of these foundations then consists of composite steel frame, with an arrangement of primary and secondary beams overlain by concrete on metal deck, the latter being integrated with the beams. The design has been futureproofed by allowing for the loads of a possible additional level of retail and car parking, or three additional levels of parking.

The extension was designed in accordance with BS 9999: 2017 *Code of practice for fire safety in the design, management and use of buildings*. This means that it is designed for evacuation on a zone-by-zone basis,



Westfield, Shepherd's Bush: works to extend the shopping centre had to be kept separate from the existing structure

separately from the plan for the existing centre, with a smoke curtain provided between the two structures. The original centre will continue to rely on proactive fire safety management.

### The breakthrough

The breakthrough involved connecting the extension to the existing centre, with significant structural and fire safety implications.

The existing frame structure that would be affected by the breakthrough generally consisted of an eight-by-eight column grid, supported by pile foundations. Columns below level 40 comprised a mixture of reinforced concrete and concrete-encased steel, with steel columns above that level.

The breakthrough thus entailed removing separate areas of steelwork, floor slabs and a number of vertical structures. New transfer structures were introduced in the original mall, and these were designed as key elements. Work was also carried out to strengthen several of the existing columns.

The operational fire strategy for the existing centre was affected by the extension works as well; it fell under the Regulatory Reform (Fire Safety) Order 2005, while the construction site was also subject to all relevant health and safety legislation until work was completed. It was crucial that the centre's management was aware of any works that were likely to affect the

fire strategy so this could be updated accordingly. The construction site was separated from the public mall by a 60-minute fire-resistant hoarding.

Westfield made provision to relocate units affected by the works to other vacant units. It was essential that the areas of construction were separated from the existing mall while works were carried out, and that all the relevant parties in Westfield were fully apprised of progress. This was particularly relevant when one of the existing firefighting cores in the original centre was to be partially demolished; during the period beforehand, two new cores had to be built and made operational.

Meetings and site visits were held to discuss the safest ways of evacuating members of the public from the new cores to a place of safety, and to ensure firefighting access was satisfactory while construction was ongoing. The building control team continued to liaise with London Fire Brigade to ensure it was kept informed of the progress on site.

On a project of this size, keeping on top of the substantial amount of documentation and the design changes was an enormous challenge. Another particularly difficult aspect was coordinating the testing and commissioning of life safety systems due to the number of different zones, levels and interfaces involved, works which were vital in ensuring that the centre opened on schedule.

All these works were undertaken with minimal disruption to occupiers and shoppers in the existing centre — a great achievement given their complexity, especially in the breakthrough areas and in keeping the car park and roads in operation throughout the project.

It is ten years since Westfield first opened its doors, and the local authority's building control service believes its partnership has helped create a world-class shopping centre, serving both those who work and live in the borough.

*Toyin Ore is a senior building control officer at the London Borough of Hammersmith and Fulham*  
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**Related competencies include:** Construction technology and environmental services, Design and specification, Fire safety

## Legal

# ‘When determining whether a notice is required and has been served properly, the contract should be your first port of call’

Charles Blamire-Brown and  
David Greenwood, Pinsent Masons



**Q: My contractor has just served notice of its intention to suspend performance under an unamended JCT Design and Build Contract 2016. It did so by phone and provided no reasons for wanting to suspend. Two days later, the contractor stopped all works on the project. Is this notice valid, and if not, is my contractor still entitled to suspend performance?**

**A:** Used correctly, notices enable effective administration, and are the means by which contractual entitlements are communicated between parties. However, failing to serve a compliant notice could lead to an entitlement being lost.

When determining whether a notice is required and whether it has been served in a valid manner, the contract should always be your first port of call. The standard forms vary in terms of what they consider to constitute valid service, and the JCT Design and Build Contract 2016 clauses set out the following requirements.

• **Clause 1.7.1:** ‘Any notice ... that is expressly referred to in the Agreement or these Conditions shall be in writing.’

• **Clause 1.7.2:** ‘each such notice ... shall be sent or transmitted by the means (electronic or otherwise) and in such format as the Parties from time to time agree.’

• **Clause 1.7.3:** ‘any notice ... may be given or served by any effective means and shall be duly given or served if delivered by hand or sent by pre-paid post to ... 1. the recipient’s address stated in the Contract Particulars ... or 2. ... [its] last known principal business address/registered office.’

In the present scenario, notice was given orally by phone. In light of the above considerations this method of service is invalid, since the notice has to be in writing.

Whether an email qualifies as ‘in writing’ used to be a grey area until the case of *AET Inc Ltd v Arcadia Petroleum Ltd (the ‘Eagle Valencia’)* [2010] EWCA Civ 713, which confirmed it does unless the contract has been amended to exclude notice by email.

In the case of *Ticket2final OU v Wigan Athletic AFC Ltd* [2015], the notice needed to be ‘delivered by hand or sent by first-class pre-paid post ... or by facsimile transmission’. The court decided that this clause excluded email, highlighting the

need for the method of service to comply with the contract.

The JCT contract contains particulars that enable the parties to specify the addresses for the purposes of serving notices. Always check the address and addressee, as this is a common pitfall when notices are served.

It is vital to get the timing of the notice right as well. Indeed, for time and money claims, timely notice is often a condition precedent to entitlement. With suspension of performance, section 112(2) of the Housing Grants, Construction and Regeneration Act 1996 states that the party intending to suspend must first give the party in default at least seven days’ notice of this, and this is reflected in clause 4.11 of the JCT contract. In the present scenario, the contractor only gave two days’ notice.

Section 112(2) of the 1996 Act also mentions that the notice must include the grounds on which the contractor intends to suspend performance; again, this is reflected in clause 4.11 of the JCT contract. In the present scenario, the contractor has fallen foul of this requirement too.

The contractor’s right to suspend performance hinges on its notice being served correctly on the employer. In the present scenario, the contractor has fallen short on a number of grounds. It will, having served an invalid notice, be in breach of contract in not performing its works, and potentially at risk of termination under clause 7.4.1 if it does not resume its works before it serves a valid notice of suspension.

Many other actions under construction contracts, including claims for extensions of time, liquidated damages and extra payment, also require notices to be served in a prescribed manner. Check carefully that you are complying with the requirements for contractual notices to avoid falling at the first hurdle.

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**Related competencies include:**  
Legal/regulatory compliance

# The gold standard

The first of a series of updates on becoming RICS-qualified through the APC looks at how a candidate is achieving competencies on the Building Control pathway

**Uzoma Jemade**

Being at the top of your chosen profession is an aspiration for many. In ours, becoming a chartered surveyor with RICS is undoubtedly the gold standard. It speaks volumes about the prestige of the RICS qualification that many other professional bodies will grant you membership purely because you are an MRICS.

I am currently aiming for chartered status on the RICS APC Building Control pathway. It consists of 24 months' structured training that combines both practical and theoretical experience. I became eligible by completing an RICS-accredited MSc in Building Surveying at Kingston University in 2017.

I fill in my online APC diary weekly, detailing inspections or administrative work I have undertaken, and which technical and mandatory competencies this fulfils. I find it useful to record only key inspections; otherwise, it becomes mundane and you forget the objective behind the activity. My older colleagues always remark how efficient everything with the APC process is now that it can be done online.

I have found that it helps to get a second opinion on everything, so I liaise with my supervisor and counsellor fortnightly and send them excerpts of the work I have done on my summary of experience. This consists of mandatory competencies such as Communication and negotiation and core competencies such as Fire safety.

I have chosen Works progress and quality management, Contaminated land, and Construction technology and environmental services as my optional competencies. Everyday activities such as providing clients with quotes for building control inspections and using the

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## It is not feasible to achieve all the required competencies from in-house supervision alone

database of my employer also helps achieve competencies such as Data management.

It is not feasible to achieve all the required competencies from in-house supervision alone, so with my supervisor and counsellor I will arrange to work at a local authority for a short period of time. I am also keen to gain experience of safety at sports grounds, which is not something I deal with on a daily basis in my current role.

Achieving chartered status is probably the most challenging task I'll undertake in my career. I have found that the APC process is more manageable if it is broken down into sections. I am trying to achieve all the Level 1 competencies, which requires you to demonstrate knowledge and understanding, before I move on to the Level 2 and 3 competencies, which are more extensive and require practical examples.

At Jhai, I have been provided with supplementary training to help achieve RICS status, in the form of weekly workshops on technical topics such as fire safety and drainage. Sources such as DeLever ([delever.co.uk](http://delever.co.uk)) and the RICS website have also proved useful resources during the early days of my APC.

I have also found it useful to keep a technical notebook of questions from clients or contractors that I have not been able to answer on site, which I can then discuss with senior colleagues. This helps with Level 3 competencies as it puts me in a position to give accurate guidance in future.

By June, I hope to have started my case study project. This will test my abilities to advise clients competently and professionally on technical issues that arise during a construction project. My case study does not have to be large in scope and extent; however, the remedial actions suggested should not be an easy fix but a thoughtfully engineered solution, using approved Building Regulations guidance.

I have attended many APC training days and watched other candidates present their case studies; they typically zone in on a stage of the project such as the foundation and the issues encountered there, but more complex projects may need a multidisciplinary approach to resolve. I am looking forward to the task.

*Uzoma Jemade is a trainee building control surveyor at jhai [uzoma.jemade@jhai.co.uk](mailto:uzoma.jemade@jhai.co.uk)*



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Shanghai Oriental Investment Supervision Co., Ltd. ("Oriental") was established in 1996. Oriental is one of the largest domestic consulting enterprises which specializes in engineering cost consulting. It has participated in many major construction projects for the Belt and Road Initiative. Oriental was the diamond sponsor of the 2012 RICS Fit for the Future Conference in Beijing and the title sponsor of the 2017 RICS World Built Environment Forum Summit in Shanghai. Over the years, Oriental has developed more than 50 MRICS and 10 RICS Assessors and helped nearly 100 professionals in mainland China to get MRICS.

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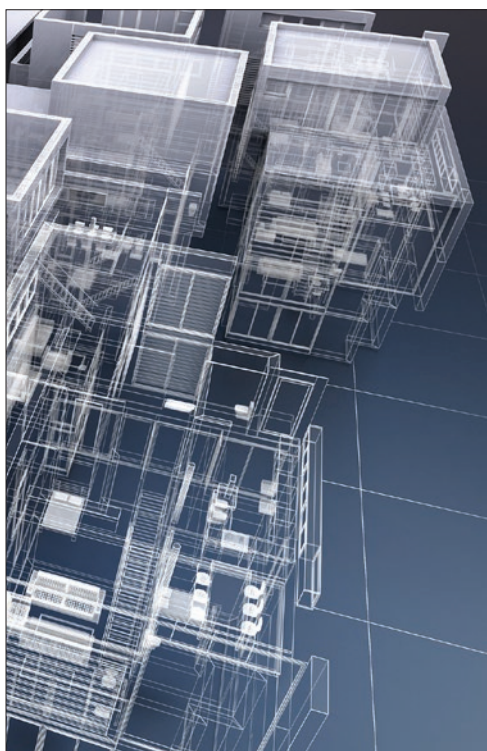


China's first underground hotel - The Intercontinental Shanghai Pit Hotel (whole process investment supervision)



Chairman Yin Baoxing is a fellow of MCECA, FCIQB and FRICS. He is also a founding member of RICS China committee who was re-elected for three consecutive sessions.

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# The case in hand

Choosing projects for your APC case study must be done carefully to best reflect your skills and experience

Ewan Craig

Your case study is one of the most pivotal sections in your APC submission. It is a major component in terms of quantity, as the basis of your ten-minute presentation and subsequent questioning.

An ideal project will have drawn on your professionalism to consider key issues and options then make recommendations for resolution. You should have a choice of projects that you are working on so you can evaluate which are best for your APC.

You will spend time and effort preparing the submission and presentation, so focus on your project with the greatest potential. A good starting point is to evaluate your projects against the APC *Candidate guide* to eliminate those that fail to meet the criteria, then reassess the remainder as they progress for your best choice.

Sometimes the project that you had the highest hopes for falls by the wayside or fails to meet the criteria in some way; it helps to have an alternative project as a contingency. Be proactive in gaining advice and guidance from your APC supervisor and counsellor when selecting your case study.

What could you look for in selecting your project? First, you should ensure the project is within two years of your APC submission date. Many candidates select a project where they are actively involved within one year of the submission date – if they are on the two-year structured training route they are likely to be given more responsibility in this second year, so it will be fresher in their mind and in certain circumstances it might be re-used if they are referred.

Second, if you provided reasoned advice on Building Surveying Level 3 core competency matters, then it has potential. Ideally, you

will have identified the project early on as one where you are likely to be personally involved at Level 3.

Third, if your project has two or three key issues that relate to your Building Surveying competencies then it starts to look very promising. These will vary by project; examples include building defect investigation and repair, redesigning a refurbishment due to a client change, or the selection and specification of a product.

There should be meaningful options to consider when determining how the key issue should be resolved. If you had to research or reflect on an event in order to reach a reasoned decision on the project then this could be a key issue. Where you had already identified the project early on as a possible case study then it is a great help if you note key issues as they arise so you can select from these and have a ready-made aide memoire.

If you feel there are no meaningful key issues or options then do discuss the project or projects, key issues and options with your supervisor, counsellor or others involved in the projects; they may provide useful suggestions or advise you towards another project.

When preparing the 3,000-word case study, it can be tempting to select more than one project and also three key issues. While the 3,000-word limit is usually easily reached, the challenge is often to provide the clarity, accuracy and detail. This can limit your demonstration of the issues, decision-making ability, reasoned judgement and so on. Do take your supervisor's or counsellor's advice on the number of projects and key issues to cover. You may have a valid need for more than one project and three key issues.

Many case studies are on a single project and two key issues. Using two instead of three allows more detail, which should enhance clarity while helping you to keep to the word limit. An additional benefit of a single project and two key issues is in your ten-minute presentation, as it will allow you more time per issue.

Once selected, make the case study your own. It is a key part of the APC, representing you and your work, so take pride in its preparation and the chance to show assessors your professionalism.

Ewan Craig is an APC assessor, APC coach and local director with Right Surveyors [ecraig@rightsurveyors.co.uk](mailto:ecraig@rightsurveyors.co.uk)

**Related competencies include:** Communication and negotiation  
**Further information:** [rics.org/pathways](https://www.rics.org/pathways)

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**Evaluate your projects against the APC *Candidate guide* to eliminate those that fail to meet its criteria, then reassess the rest**

## BUILDING MATERIALS INFORMATION SHEET 8: Cast iron

### Summary

Cast iron has been valued for its strength, durability and versatility for centuries. The Industrial Revolution enabled mass production, and specialist foundries still cast replacement ironwork for repairs.

### History

Technological advances in the 18th and early 19th centuries enabled cast iron to be mass produced and thus more affordable, and it became popular for structural and decorative architecture. In Scotland, hundreds of foundries were established at this time and many exported around the globe. Popularity peaked in the 1890s.

### Composition and characteristics

Cast iron is made by melting iron in a furnace, then pouring it into a sand mould constructed using a carved timber pattern. These patterns enabled mass production of ornate decorative elements at much less cost than carving the same designs in timber or stone. Traditional moulds are made of green sand, whose soft, round grains have a high clay content. Moulds are made in two halves so the pattern can be removed after pressing the green sand around it.

Grey cast iron was typically used for traditional decorative architectural castings and is still readily available for replacements. It has a crystalline microstructure and typically contains two to four per cent carbon in the form of graphite flakes. It is relatively brittle, with lower tensile strength and shock resistance than steel. It does, however, have good compressive strength and corrosion resistance. Grey iron shrinks at a rate of about 1cm per metre as it cools, which should be accounted for in new castings. As welding often fails as a repair technique due to thermal shock, brazing is more successful. Neither white nor malleable cast irons are suitable replacement materials.

Ductile iron, also known as spheroidal graphitic (SG) iron, includes small round carbon particles that make it more shock-resistant than grey cast iron. The carbon content is between 3.2 and 3.6 per cent. This iron can be cast in a wider range of section thicknesses than malleable iron.

### Installation and identification

Traditionally, cast-iron structures and components were not welded together but assembled using lugs, mortices and tenons, and flanges and bolts that interlocked. Joints and flanges were usually packed with caulking such as red lead paste or putty to cushion and protect concealed surfaces and prevent water lodging there.

### Decay and degradation

Corrosion usually occurs where water sits for long periods in and around fixing points, joints and other mating surfaces. Cracked and failing paint can also draw in and trap moisture. As corrosion develops it can exert enough force to fracture castings and



Removing the pattern from a sand mould, leaving a void into which to pour the metal

surrounding materials such as masonry. Sharp impacts and shifting foundations can also cause fractures and material loss.

### Maintenance and repair

Regular maintenance is the best way to ensure that cast ironwork remains in good condition. During annual checks, you should look for signs of corrosion at vulnerable points and damage to the paint. Cleaning and repairs are usually more successfully carried out in a workshop. If work in situ is unavoidable, special care needs to be taken to ensure that ironwork is completely dry before paint is applied. Repairs should aim to retain original fabric and assembly where possible, using the same material and detailing if necessary.

*This materials information sheet was compiled by Ali Davey, project manager at Historic Environment Scotland (HES) [ali.davey@hes.scot](mailto:ali.davey@hes.scot)*

### Additional data sources

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