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Thinking about your APC summary of experience ahead of final assessment will mean you can draw from a breadth of work.
Many years ago while working for a local authority, I was asked to assist with the development of regulations and standards for an emerging African country so it could improve its building stock. One of the main aspects of the brief that struck me was that existing buildings would be reviewed every ten years, and upgraded to any new relevant standard as necessary.

This has never been a requirement in the UK, although some people say that in light of recent events such as the Grenfell Tower fire we should adopt the idea, in order that older buildings, constructed to former standards, can be improved to bring them in line with evolving requirements.

However, Building Regulation 4 demands that when carrying out work to extend or alter an existing building, such a building should continue to comply with the relevant standards, ‘or where it did not comply with any such requirement, is no more unsatisfactory in relation to that requirement than before the work was carried out’ (bit.ly/BRegs2010). This means when any work is carried out on an existing building, a building control officer should check to make sure it does not render that building non-compliant.

But how far should we go in making such an assessment? It all depends on what is proposed and what the effect of the work is on the existing building. On each occasion, an assessing officer must be clear about the proposals and ensure that the work does not lead to adverse effects on the building.

Let me give an example: a while ago an application was submitted to my employer to renovate an eight-storey office block. It had been built in the mid-1960s for a local authority education department and had recently been sold, with the new owners wanting to take down all partitions to make it open plan. This would triple the likely occupancy of the renovated building, but the existing staircase would be too narrow to accommodate all the occupants in the event that simultaneous evacuation was required on the staircase, while the alarm system was upgraded and the fire risk assessment revised. Further consultation was then undertaken with the fire authority, and all the details were passed to the new owners so that they could operate the building safely.

Another example is the application of Part L to existing buildings and the use of consequential improvements. The Grenfell Tower fire, for instance, has shown that applying insulation to the external fabric of a building may change its fire dynamics, and this must be taken into account.

Another consideration is where the building is of historical significance and proposed work may affect its performance. Historic England has a very good guide on how to apply Part L in these circumstances, and I would urge anyone involved with such buildings to consult this (bit.ly/HE-BRegs).

Bear in mind that these represent only a few possible impacts of work on existing buildings, and there are many others that can have a negative effect on their safe and efficient operation.

Wherever work is being carried out on an existing building, we must be vigilant to ensure that it does not jeopardise compliance with regulations or worsen existing defects.

Martin Conlon is the director of Assent Building Control
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Related competencies include:
Building control inspections,
Legal/regulatory compliance
Future-facing professionals set positive example

As part of engagement with members to ensure RICS is a body fit for the 21st century, the organisation has launched a digital brochure showcasing how its professionals are making the most of advances in technology, increased data availability, societal shifts and other changes.

RICS hopes that this will inspire others to adapt their business models and current ways of working not only to win business but also to enable the professions to address some of the urgent challenges our world faces.

future.rics.org

New fire publications out

Secured by Design, the Door & Hardware Federation and the Fire Industry Association have jointly published A Guide for Selecting Flat Entrance Doorsets: A publication for housing associations, landlords, building owners and local authorities in England, and BSI has also published BS 7974: 2019 Application of fire safety engineering principles to the design of buildings: Code of practice.

bit.ly/Doorsetguide
bit.ly/BS7974-2019

Consultant appointment forms revised

RICS has updated its forms of consultant’s appointment, which are intended for use by clients when considering the appointment of surveyors. There are three separate forms – standard, shorter, and designated for specialist services – to be used in conjunction with the relevant schedule of services and explanatory notes. The forms are only for use in England and Wales at present, but Scottish and Northern Irish versions are due to follow.

rics.org/ConsultantAppointment
Historic England guidance updated

Historic England (HE) has updated *Technical Conservation Guidance and Research* for 2019. The brochure lists all HE’s current free technical conservation guidance and research reports, and provides information on its practical building conservation books and guides on stone types. It also includes new advice on insuring historic buildings, reducing fire risks in thatched properties, installing solar arrays and carrying out hot works. bit.ly/HETechCons

CSCS Industry Accreditation to be withdrawn

Following consultation with industry professionals, the Construction Skills Certification Scheme (CSCS) has announced that it will be phasing out the Industry Accreditation (IA) system. Also known as the ‘grandfather rights’ scheme, IA allowed workers to obtain CSCS cards without an industry-recognised qualification, if they had adequate industry knowledge that had been validated by an employer’s recommendation.

All IA cards renewed from 1 January 2020 will expire on 31 December 2024 and will not be renewed. CSCS will cease renewing IA cards from 30 June 2024, and had already closed the scheme to new applicants in 2010.

This will be the final step in the plan to achieve the Construction Leadership Council’s objective of ensuring only those who have achieved, or are due to achieve, a nationally recognised construction qualification will be able to obtain a CSCS card.

There are around 60,000 IA card holders, and their next step depends on their occupation and any qualifications they already hold. Those who are unqualified must register for the appropriate qualification before their cards expire in 2024. cscs.uk.com/ia

Standards

Recently published
*Countering bribery and corruption, money laundering and terrorist financing* professional statement rics.org/amlps

Forthcoming
Asbestos guidance note
Party walls guidance note
Technical due diligence guidance note rics.org/standards

All RICS and international standards are subject to a consultation, open to RICS members. rics.org/iconult
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Cutting out corruption

A major new professional statement on bribery, corruption and money laundering takes effect this September. At the recent launch event, key figures covered the issues that will affect all RICS members

Nigel Sellars

The RICS Countering bribery, corruption, money laundering and terrorist financing professional statement was published in February, and will be effective for all members from 1 September.

The threat of bribery, corruption and money laundering is present across all surveying disciplines and RICS is committed to maintaining public confidence, which requires transparency and mandatory standards for all professionals.

A variety of organisations contributed to this professional statement, including Transparency International, the UK Home Office, industry associations and individual practitioners. As the sector is constantly evolving, this international standard has been drafted on the basis that it will be reviewed and amended over time.

Attendees at the launch were addressed by Ben Wallace, UK minister of state for security. He stressed the importance of global best practice for keeping dirty money out, and fostering a safe environment attractive to investors. He noted that suspicious activity reports (SARs) from real estate rose solidly from 2017 into 2018, but while this was encouraging, Transparency International still estimates that around £4.4bn of criminal proceeds are invested in the UK economy, much of this in property.

Everyone has their part to play, and even those who do not handle money can file SARs as necessary—a simple process that anyone can do quickly without disrupting a transaction, Wallace maintained. He concluded with a reminder that this money represents the proceeds of human misery around the world.

The statement’s technical author, Alex Ktorides of Ince Gordon Dadds, then explained the importance of defining terms so members can be clear on what constitutes a bribe. Everyone should know their responsibilities and what to do when they have concerns, however big or small their business. The statement contains definitions and template documents to assist members.

Ktorides stated that businesses too often poorly understand the actual sources of their custom. They need to look carefully at how they conduct business, how payments are made and their customers’ relatives, and plan how to check and raise issues. Having training and systems in place to deal with bribery and corruption is essential—policies must be reviewed annually and updated where needed. It can be hard to do the right thing when others aren’t, but saying no is important for the integrity of the profession.

Luis Campbell, head of compliance at JLL for the UK, Europe, Middle East and Americas, gave the corporate perspective, saying that JLL is reassured that the requirements and guidance are in keeping with their business practice, and that ‘making your risk assessment relevant to your organisation’ is key.

Halting corruption goes beyond simply checking ID, and firms could do more to share information with law enforcement. Professionals must not forget that dubious businesses are not only found in jurisdictions with poor reputations. Keeping business clean is ‘a marathon, not a sprint’, Campbell added, requiring continuous work that the professional statement will support.

Finally, RICS global director of professionalism and ethics Peter Bolton King spoke about the organisation’s work on International Ethics Standards, and the need for SMEs in particular to access support in maintaining the highest standards. Global parameters of acceptability vary and there is demand from both government and businesses to ensure things are done correctly at all levels.

Mindsets need to change as the profession gets used to sharing data, scrutinising customers more closely and mapping processes so everyone knows their duties. Combating money laundering, bribery and corruption is both good business and good for business, a message this professional statement will underpin.

Nigel Sellars is associate director, commercial property, RICS
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Related competencies include: Ethics, Rules of Conduct and professionalism

Further information: rics.org/amlps
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Your sustainable skill set

APC candidates must have a solid understanding of the Sustainability competency so they can help the profession face growing challenges

Susan Hanley

Sustainability is a mandatory competency to Level 1 across all APC pathways, and candidates must therefore ‘demonstrate knowledge and understanding of why and how sustainability seeks to balance economic, environmental and social objectives at global, national and local levels in the context of land, property and the built environment.’

In your summary of experience and during final assessment, you will be required to link your understanding of the principles of sustainability and the legislation relevant to your sector by demonstrating knowledge of the following:

- examples of sustainable technologies and renewable energy sources, as well as the way they operate and can be integrated
- examples of sustainable design and its effect on properties
- costs, including taxation, operational and maintenance costs and lifecycle costs.

You should also be aware of materials and technologies used in sustainable building, and of how sustainability is measured: for example, BREEAM is the principal system in the UK, while globally, it’s LEED.

At Level 1, make sure you link your knowledge to its source. In your summary of experience you could include the following type of statement.

• ‘At university I learnt about the three pillars of sustainability.’
• ‘Through work experience I have gained an understanding of sustainable technologies, such as...’
• ‘I attended a course that identified the effect of Building Regulations on reducing emissions in the residential sector.’
• ‘Through structured reading, I am aware of the systems that are used to measure sustainability.’

Start your research with RICS guidance, such as the Whole life carbon assessment for the built environment (RICS.org/wholelifecarbon).

There are numerous articles on sustainability in Modus, the RICS journals and other industry publications. To judge whether or not such reading would be suitable for your summary of experience or CPD record, you should try to verbalise your learning — being specific can help you recall your content at final assessment.

Once you have drafted your summary of experience in line with competency requirements and logged relevant CPD, you should consider the final assessment.

A CPD entry or part of your summary of experience on reading an article may prompt a question such as ‘Tell me about your learning outcome from what you read.’ Identifying a more specific learning outcome means assessors can focus the question: ‘I see you read an article on the impact of building information modelling on sustainability. Tell me about this.’

Although you may be asked direct questions on mandatory competencies, you also need to be aware they can be covered during questioning on other technical competencies or your case study, so make sure you have good knowledge of sustainable practices relevant to your sector, and refresh yourself on your learning outcomes and summary of experience.

With more than 40 per cent of the UK’s carbon footprint attributed to the built environment, knowledge of the ways the profession can raise awareness and tackle this is crucial. This competency is just the first step.

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Related competencies include:
Sustainability

You should be aware of materials and technologies used in sustainable building, and of how sustainability is measured
Clearing the desk

After selling or winding up their practices, what more remains for retiring surveyors to do? The third in our series on retirement looks at issues such as insurance and record-keeping

Alexandra Anderson and Jonathan Angell
Once you have sold or wound up your practice, you may think there is nothing further you need to do. However, even after you have retired there are a number of matters to which you must attend.

One of the main things to consider is which insurances you need to maintain after you cease practising. Broadly speaking, insurance policies provide cover on either an event-occurring or a claims-made basis. The former need to be in force at the date that the event giving rise to your loss or liability occurs if you are to claim under them. The latter must be in force either at the date when a claim is made against you or when you become aware of the possibility of a claim for which you will seek indemnity under your insurance.

This means that you will not normally need to maintain insurances that provide cover on an occurrence basis after you have ceased practising, such as office and contents cover, employer’s and public liability insurances. However, you ought to maintain policies that provide cover on a claims-made basis, such as professional indemnity insurance (PII), or directors’ and officers’ insurance if you have it.

The easiest way to decide which insurances you need to maintain and which you do not is to speak to your broker, who should be able to advise on this and on how long to maintain them, as well as being able to arrange these for you. Please do be aware that it is an RICS regulatory requirement for surveyors to maintain PII for at least six years after they cease practising. Where you operated on a partnership basis, or you are winding up your practice, it is being continued by others depending on whether you have sold your practice. Again, the position may differ after the event that gave rise to them.

Another ongoing obligation concerns the retention of other documents from your practice. Again, the position may differ depending on whether you have sold your practice, it is being continued by others or you are winding it up. In either of the first two cases, many if not all the practice records are likely to pass to the purchaser or remain with your former partners.

In the case of a sale, the share purchase agreement may address what happens with the documents and records. If you are leaving these behind when you retire, you are unlikely to have any ongoing obligations under the Data Protection Act 2018 or the General Data Protection Regulation (GDPR).

It is worth checking to ensure that you do not have documents or data from the practice on any of your personal computers or devices; if you do, you will have to decide what you need to do with these. If you are winding up your practice, you will have ongoing obligations under the 2018 Act and the GDPR, and will need to make arrangements either to keep any records or destroy them securely. It may be possible to keep many of these electronically rather than having to maintain paper copies.

The period for which you will need to retain records will vary with the nature of these documents. For example, you will need to keep project files should any issues arise subsequently about the adequacy of the work you carried out for your clients; these should be kept for an absolute minimum of six years from the date on which you completed the work, and best practice would be to keep them for 15 years. You will also need to keep other records, but should not need to keep these as long. How long you need to retain the records will vary depending on the purpose for which you are retaining them. Broadly speaking, under the 2018 Act and the GDPR, you should only keep records for as long as you need them, especially when they contain personal data. Any such records should be kept safely, and when they are not needed, you must make sure you destroy them securely.

Knowing which records to keep and for how long can be quite complex and it may be worth seeking expert advice on what you should do to fulfil your obligations under the data protection legislation.

In the final article, we will look at some further issues that may arise and obligations that may continue to apply after you retire.

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Related competencies include:
Business planning
Scotland strengthens standards

New building and fire safety regulations are to be introduced by Holyrood in response to a review of Scottish standards

Iain MacLaren

In 2017, the Scottish government launched a review of building standards, with an initial focus on high-rise domestic buildings in the light of the Grenfell Tower fire. The purpose was to appraise their appropriateness critically in relation to fire risk and to ensure people’s safety.

A ministerial working group was established, and in turn appointed three review panels to interrogate each of the following:
- building standards relating to fire safety
- compliance and enforcement of building standards
- the overall fire safety regime.

The role of the first review panel was to consider standards in the light of evidence from Grenfell Tower and provide an opinion on whether any changes were necessary, with specific consideration of fire safety guidance pertaining to domestic and residential buildings of 18m height or more.

The second review panel undertook a wider review of specific elements in the building standards system, including legislative requirements. The four key themes to be considered were verification, certification, enforcement and sanctions.

The third review panel was asked to consider whether the overall fire safety regime and regulatory framework in Scotland comprehensively protected residents of high-rise domestic buildings, and more specifically whether it was considered robust and fit for purpose.

Due to the breadth and depth of suitable knowledge and experience required for the review panels, representation was made to them by a range of stakeholders. After the reviews the system was generally considered fit for purpose; however, potential improvements to the standards and associated guidance were identified by the panels, which, following feedback and consideration, have resulted in series of recommendations from the ministerial group.

**Building standards on fire safety**

The following changes are to be made to the standards to improve building and fire safety:
- removal of reference to British Standards for ‘reaction to fire tests’ where European Standards are also cited
- external cladding to any building more than 11m tall must achieve a European classification of A1 or A2
- there will be an increased range of new buildings needing cladding to achieve a European classification of A1 or A2 regardless of height, including all care and hospital buildings and places of assembly
- full-scale fire testing to BS 8414 and BR 135 will remain as an alternative means of showing cladding compliance, if appropriate
- reference to the new BS 9414 will also be included, which covers an extended range of cladding system applications that already have a standard BS 8414 test and BR 135 report
• all domestic buildings greater than a particular height – yet to be specified – will require two stairwells
• fire service-activated sounders for evacuation of every flat should be installed in high-rise domestic buildings.

These changes will be enforced through amendment to existing legislation and are anticipated autumn 2019. Some further medium- to long-term recommendations are also likely to be adopted, including:
• extending the requirement for automatic fire suppression systems to additional building types, including certain houses in multiple occupation, new flats and all new-build social housing
• improved mechanism for verifying fire safety engineering applications for complex buildings, with a national hub proposed to validate these.

Building standards compliance
Improvements were also considered necessary to strengthen compliance with statutory procedural requirements and address non-compliant works on construction sites. These improvements include the following:
• support for local authorities to recruit, train and retain staff, with a more robust regime to be adopted for inspecting as-built construction, replacing the current focus on design intent
• greater onus placed on owners and developers to produce evidence of compliance
• better use of technological aids and platforms for sharing and streamlining information
• greater engagement with fire authorities at project milestones
• specific focus on fire-stopping, with shorter-term mandatory submission of photographic evidence and longer-term proposals for a certification of construction scheme
• pre-assessments and compliance plans required for higher-risk and more complex constructions, creating a golden thread of information
• licensing of contractors that undertake certain complex construction projects
• replacing temporary occupation certificates with more credible qualified completion certificates
• greater focus on enforcing penalties for non-compliance.

Timeframes for the implementation of these recommendations have yet to be confirmed by the Scottish government.

Fire safety regime
The following short-term actions were identified and are expected to be implemented through legislation before the end of November this year:
• specific fire safety guidance published for all residents of high-rise domestic buildings
• implementation of fire safety guidance in purpose-built flats and specialised housing
• introduction of guidance for fire risk assessments in Scotland
• clarification of roles and responsibilities for material storage, removal and enforcement of responsibilities in common areas of flats, with a targeted fire safety campaign in relation to same.

Some longer-term actions are also under consideration, including a publicly accessible database to record safety-critical information, such as where aluminium composite materials have been used on existing high-rise domestic buildings.

Legislation for fire and smoke alarms in domestic dwellings in Scotland is also set to change, resulting in the minimum tolerable standards already in place for private rented housing now being extended to include all homes. The new minimum criteria include:
• one smoke alarm in the room most frequently used for general daytime living
• one smoke alarm in every circulation space on each storey
• one heat alarm in every kitchen
• smoke and heat alarms to be ceiling-mounted and interlinked
• mains-operated alarms permitted, as are tamper-proof, long-life lithium battery-powered units
• alarms to be regularly maintained and tested, with a maximum life of ten years
• carbon monoxide detectors fitted in all rooms where a fixed combustion appliance or flue is present.

Greater attention can be expected on design, specification, build quality and verification of construction and refurbishment projects, with a more rigorous sign-off regime anticipated. Robust records of design and construction information will also now be increasingly important to ensure an accurate paper trail for the verification and sign-off stages.

All stakeholders will need to consider how these changes will affect their projects, and specifically any programme and cost implications, because there will be less flexibility for value engineering of specifications. The changes will also create new roles and requirements, including a need for additional data collection, qualified verifiers, compliance plans and licensing of contractors for certain projects. Appropriate training and investment will therefore be necessary to ensure that professionals are equipped with any new skills that they require for their work, and to mitigate associated risk.

Iain MacLaren is an associate, building consultancy, at Cushman and Wakefield  iain.maclaren@cushwake.com

Related competencies include: Fire safety
Safe for life

Fire safety requires an holistic approach to managing risks, involving many specialists throughout an asset’s lifecycle

Stuart Broadhurst

When not properly planned and implemented, fire risk management can be limited to a small number of actions carried out by a few key staff in an organisation. However, the process should establish procedures for identifying the requirements of individual buildings, sites or complexes. Undertaken effectively, it means facilities and assets comply with regulations and design standards.

Fire risk management should therefore apply to each of the Royal Institute of British Architects’ Plan of Work stages (bit.ly/RIBAPlanWork), rather than being something that is only implemented once the building is occupied. Different platforms can be employed to assess whether assets comply with the Regulatory Reform (Fire Safety) Order 2005 and associated legislation, beginning at the design stage.

Local authority assessment starts with the application for planning permission, followed by building warrant stage when the fire authority and leading local authority verify the proposed designs, while building control staff or approved inspectors offer guidance to ensure the application complies with Building Regulations.

The Construction (Design and Management) or CDM, Regulations 2015 specify which duty-holders are responsible for coordinating design work and managing risks during the design and construction phases, for assessing residual risks and for passing information on these risks to clients, building occupiers and future asset owners. The importance of this information flow is highlighted through the requirement of CDM Regulation 12 to provide a health and safety file, and Building Regulation 38 regarding provision of information for the fire safety manual.

Building information modelling

As technology develops, so too do the opportunities for managing and modelling information, though the role of building information modelling (BIM) in fire risk management is still to be defined.

BIM offers potential for modelling scenarios such as smoke dynamics, structural fire engineering, radiation and evacuation. Its main drawback at present is the lack of speed with which it is being embraced by professionals.

Design standards determine the development of building fire strategies based on the requirements of Approved Document B and BS 9999 Fire safety in the design, management and use of buildings, or its counterpart for sleeping accommodation, BS 9991 Fire safety in the design, management and use of residential buildings.

Fire strategies meanwhile provide assets with appropriate active and passive fire protection to ensure that, no matter how complex or high-risk they are, they will function, comply with regulations, and safeguard lives and property alike.

While offering a basis for fire safety, standard building design guides can be overly restrictive, especially when it comes to innovative or unusual approaches. An alternative in such cases is fire engineering, which provides a route to compliance for complex buildings.

Such measures focus on ensuring the design is safe from fire rather than just complying with a particular standard, and consider the incorporation of fire engineering such as sprinklers, gaseous suppression, smoke extraction and fire curtains, which may permit deviation from the Building Regulations.

For example, a fire engineering approach could recommend introducing an extraction
Management planning
The compliance management process involves identifying what needs to be done then planning for action, implementing these plans and checking and reviewing them, as well as executing improvements recommended following the review process.

Management planning should start at the earliest opportunity, with building and facilities managers involved from the initial design stages. This process is key to:
• policy development
• risk evaluation, prioritisation and allocating resources
• identifying and procuring the professionals and specialists to help develop management strategies
• identifying and implementing suitable maintenance strategies
• implementing remedial actions from the various audits
• ensuring continuous review and improvement.

Policy development helps managers to determine what measures need to be put in place for managing assets, identifying the required documentation, plus procedures and arrangements that must be followed. Risk evaluation then informs the prioritisation of action, focusing on high-risk assets or activities to allocate resources according to risk profile.

Due to the complexity of the legal environment for built assets, many specialists are required to help managers develop the strategies needed to operate them effectively. Procurement of these specialists must be carried out according to their competency for the type of work involved and the circumstances in which they will be employed.

Also key to asset management of workplaces is the process of maintaining, inspecting and testing installations such as fire alarms, electrical devices, sprinkler systems, boilers, lifts and all other mechanical, electrical and plumbing assets.

Effective management planning requires allocation of resources for the process, for implementing and reviewing plans, and planning and executing remedial actions. This should also ensure that suitable qualified, competent people who are experienced with appropriate support mechanisms are employed.

Managing compliance today can additionally involve a wide range of equipment for implementing the plans, from computers, laptops, tablets, cameras and surveying equipment to bespoke software that enables asset managers to work more effectively.

Auditing
Auditing is the process of inspecting, correcting and certifying facilities, and begins the moment a client decides to develop a site or buy an asset, continuing for the duration of their ownership.

For most people, fire safety compliance is largely about this process of auditing, and few see the aspects that relate to design, management planning and resources preceding any audits. Examples of ongoing auditing include:
• clerk of works’ quality assurance
• building control inspections
• CDM assurance
• post-construction reviews
• fire strategy reviews following building works
• compartmentation surveys
• fire risk assessment
• policy review
• maintenance inspection and testing.

These are only a small sample of the many different types of fire risks audit.

To conclude, rather than determining fire risk management requirements solely through fire risk assessment, clients and asset managers need many specialists to be involved to support them and ensure that they have arrangements in place to manage these assets effectively.

The holistic approach to fire safety brings together all the information to devise a coherent plan covering all elements necessary to compliance, from project inception through the lifecycle of the building. This is likely to entail a bespoke approach for each asset. The process should continue through building adaptations, and will consider the effect each of these and all building works on the existing fire strategy. This requires continuous auditing, reviews and planning.

Such an approach to fire risk management ensures compliance at all times, addressing all statutory duties. This includes protecting asset owners and managers from enforcement action, protecting occupants, and providing premises that are fit for their intended use. It also entails ensuring there is suitable property protection, to reduce both the likelihood of a fire occurring in the first place, and the damage should one actually break out.

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Related competencies include: Building information modelling (BIM) management, Fire safety, Legal/regulatory compliance
Sprinklers save lives

Despite continued fatalities in domestic fires, the construction industry seems reluctant to fit sprinklers in new-build properties. A bereaved surveyor explains how vital they can be

Richard Kent
I write this piece having just seen news reports about the deaths of four young children in a house fire in Stafford, and I cannot help but think again of the night of 7 January 2003.

It was extremely cold, and my two grown-up sons happened to be staying with us as they were playing in a golf match at our local club the following day. We lived in a detached, three-bedroom house built in 1966 that was fitted with smoke alarms. My eldest son was a firefighter with East Sussex Fire and Rescue Service and so very keen on fire prevention.

At around 2.30am on 8 January, he woke my wife to tell us that the house was on fire, and we went downstairs. The lights were on and we could not hear, see or smell fire; neither had the smoke alarms activated, I had woken our youngest son before coming downstairs.

When I opened the door to the lounge, fumes did set off the smoke alarms, and my eldest rang 999. But I could still not see, hear or smell a fire. I suggested to my wife that if there was a fire then we should move our two cars in the drive in case the emergency services needed access.

Having done so, we were going back into the hall when the lounge area erupted into a fireball. I tried to get further into the hall but the fumes were suffocating. I was pulled out by a neighbour who had arrived on the scene. He explained later that he had been a retained firefighter himself and knew what might happen.

We went to the back of the house. The window to my youngest son’s bedroom was flung open as black smoke belched out and we heard him shouting at his brother. Then silence. All these events took no more than three minutes.

During the rebuilding we had had a sprinkler system fitted, but the insurer did not want to know

The fire service arrived along with the ambulance. My wife and I were taken in by neighbours wearing nothing but our nightclothes. The Red Cross arrived and gave us some second-hand clothes, for which we were very grateful.

At some point a representative of the police and ambulance service arrived to tell us our sons had been taken out of the house but were pronounced dead on arrival at hospital.

My sister-in-law, who lived fairly nearby, arrived to take the two of us away. Later that morning I had to drive to my mother, who was then in her mid 90s, to explain she no longer had any grandchildren.

Our house was a total ruin. We had lost all our possessions — everything. I cannot begin to describe what having absolutely nothing really means. We were interviewed by the police and had to give statements on the events of the night before.

Meetings with loss adjusters and builders took place, and two weeks later our sons’ funerals were held. I cannot begin to describe how terrible this day was. In the main, we were comforting friends and acquaintances of our sons.

In the following months my wife and I received great support from the surveying profession as a whole and we moved back into our rebuilt house in November 2003.

At the behest of the fire service, I gave a number of talks to many professional groups in the building industry, and also met housing and building services ministers. Finally, we had to attend an inquest. I thought we had been through the worst; but listening to members of the fire service relate what they had found and how they dealt with the fire was quite the most traumatic thing we had to endure.

I got back in touch with our insurers who were happy to insure the new building and contents. They wanted to know whether we had a burglar alarm fitted, which we had; I also mentioned that during the rebuilding we had been approached by the Residential Sprinkler Association and had had a sprinkler system fitted, but the insurer did not want to know.

I wrote again to the insurers, stressing that in the event of another fire losses would be minimal thanks to the sprinkler system. I have seen many demonstrations of such systems. I received a response from the firm’s chief executive officer, who stated quite plainly that there were few fires in domestic properties so it was not worth taking the sprinklers into account. You can imagine our disgust.

It has been said that if sprinkler systems were made compulsory it would inhibit the building of more homes. But did the need to wear seat belts reduce the sale of cars? The cost to the insurers of reinstating our house was around £165,000, the cost of the sprinkler system 1.5 per cent of that. When will the government and the construction industry begin to take fire seriously?

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Related competencies include:
Fire safety

Sprinklers legislation
Since 2016, sprinklers have been mandatory in all new residential buildings in Wales. As part of the review of Approved Document B in England, RICS is pressing for changes to mandatory sprinkler installation requirements (rics.org/sprinklerspolicy).
Gary Strong FRICS is RICS global building standards director gstrong@RICS.org

rics.org/journals
How can we all work together to make buildings safer? How can a better understanding of cleaning and maintaining ductwork improve the design of ventilation systems and reduce fire risk?

These were among the questions that prompted the formation of the National Association of Air Duct Specialists UK (NAADUK). Our aim is simple: to talk to and work with surveyors, manufacturers, designers, installers, maintainers, fabricators, fire prevention associations, fire brigades and environmental health authorities to solve such problems together.

Ductwork contaminated by grease and other substances can contribute to kitchen fires if poorly cleaned and maintained. Such fires put at risk the lives not only of staff and the general public but also the fire crews who have to tackle them. Although at the time of writing there has yet to be a loss of human life through such fires, damage to or destruction of property has become a considerable expense for the courts and the insurance profession.

The aim of this article is thus to consider how we make ductwork accessible for cleaning and maintenance, and hence make it fire-safe for all.

**Regulatory requirements**

In April 2004, the European Parliament introduced regulation (EC) 852/2004 on the general hygiene of foodstuffs, with which food business operators must comply to protect consumers ([bit.ly/ECfoodsafety](bit.ly/ECfoodsafety)). These rules took effect on 1 January 2006 and, in the case of UK law, became enforceable by environmental health officers, leading to kitchen shutdowns and fines related to fire safety considerations in some cases.

Annex II, chapter 1, paragraph 5 of the regulation states: ‘There must be suitable and sufficient means of natural or mechanical ventilation. Mechanical airflow from a contaminated area to a clean area must be avoided. Ventilation systems must be so constructed as to enable filters and other parts requiring cleaning or replacement to be readily accessible.’

Since ductwork is a component part of a kitchen ventilation system it falls under the regulation’s requirements — and hence, under paragraph 5, ‘Filters and other parts of the system must be accessible either directly or through access panels.’
There has yet to be a loss of human life from kitchen duct fires, but damage to or destruction of property has become a considerable expense

This regulation thus has potentially far-reaching consequences for the design, construction and installation of kitchen grease extraction ductwork because it has to enable maintenance and cleaning.

When assessing whether ductwork is accessible for cleaning and maintenance, it is important to consider the following.

- Can all access panels be removed by an operative without being obstructed?
- Can an operative access all panels using either a stepladder or tower?
- Fabrications such as fan or attenuator housings, supports and lighting tray conduits, along with fans themselves and other in-line components, should not need to be moved to enable access.

Inspecting and cleaning ductwork
To inspect or clean the inside of a duct, there must be a point of access via a hatch. As stated, these must be readily accessible and sufficient in number to allow full system cleaning. The design and fitting of the ductwork by the architect and installer is therefore key to the cleaning and maintainability of a duct system.

NAADUK has tested a number of different samples of ductwork supplied by manufacturers and made unidentifiable so no bias could affect the outcome. The aim was to see how the samples would respond to caustic chemicals used in commercial cleaning, combined with agitation from a rotary brush system. The findings were presented to the manufacturers via the Association for Specialist Fire Protection.

In a number of cases the intumescent seals were found to be damaged when using high concentrations of sodium hydroxide, a caustic cleaning chemical. It was concluded that a solvent-based cleaner, the use of grease-scraping tools or a combination of the two would be a safer option to maintain ductwork integrity.

A number of examples of poor system design reviewed by the NAADUK membership included:
- duct located behind a solid ceiling with no point of access
- duct located in a surrounded riser with no point of access, for example, a riser surrounded by wall fabric or brickwork
- low-level plant, conduit, lighting or other fittings obscuring the duct
- an external riser
- pitched roof exhaust
- horizontally obscured duct with other services running alongside, above or below
- false, tiled or suspended ceilings restricting access to void and duct
- no fan access
- two or more in-line components adjacent to each other in a duct system
- silencer, fire-rated duct, insulation or suppression systems, all of which might prevent ready access to ductwork to carry out maintenance
- obscured access panels
- flat roof access without edge protection
- welded or riveted exhaust grilles preventing easy removal
- duct located directly over hoods or canopies, which will not support operatives’ weight and enable safe access for cleaning
- open ceiling height
- data trunking or cabling physically restricting access
- physical obstructions below the duct.

To conclude, there are a number of principles to consider when designing kitchen extraction ductwork, as follows.

First, avoid costly retrofit of panels or post-installation building works to provide access: access should be considered and installed at the time of fabrication or manufacture as recommended in DW 144, the specification for sheet metal ductwork.

Second, eliminate the number of inaccessible sections. Keep the ductwork as short as possible and make a feature of it in the kitchen and associated areas so it is not hidden away and forgotten.

Third, it is NAADUK’s contention that a combination of the above could reduce the need for more expensive cleaning methods and specialist access equipment. Excessive emission of aerosols into the atmosphere along with the huge increase in restaurants and takeaways are becoming a concern for environmental health officers, but exhaust systems no longer need to run vast distances up the side of buildings, as cooking technology and improved filtration methods combined with well-trained technicians should lower the levels of aerosols being emitted (bit.ly/UKrsrtrts0817).

Filter systems can protect the fan and should be routinely monitored, cleaned and, when necessary, replaced. Carbon filters can be used to remove odours and smells associated with cooking, while wool-type pre-filters may also help reduce contamination at the point of entry into the duct system.

Finally, detection in a fire suppression system should be made less invasive, as its physical location inside a duct or plenum can prohibit cleaning of either without specialist dismantling and servicing.

As an association, we are constantly reviewing the impact of corrosive chemicals used on fireproof ductwork, and also excessive panels cut into it that may affect its structural ability to resist collapse during a fire.

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Related competencies include: Design and specification, Fire safety, Inspection
Kept in the loop

Installation of ground-source heating and cooling systems needs to be carried out carefully to ensure they function correctly and there are no adverse effects on local ground conditions.

Neville Rye

Ground-source heating and cooling, if designed and installed correctly, can provide more energy-efficient heating and cooling than conventional systems such as gas-fired boilers and air-cooled chillers. However, the cost and complexity of installing a system, much of which will be buried underground, means that care and attention are required during the design, construction and commissioning stages.

Heat pumps make use of the relatively constant year-round ground temperature to provide heating, while ground-source heating and cooling systems (GSHCS) transfer heat to and from the ground and are thus able to provide heating and cooling in one integrated system. These systems can be installed in either open-loop or closed-loop forms.

- Open-loop systems extract groundwater or river water, heat or cool it, circulate it around a building and then pump it back. Such systems require a licence for abstraction and discharge.
- Closed-loop systems instead simply circulate the thermal transfer fluid or antifreeze in a closed-pipe network. While they do not require a licence, closed-loop systems with a heating capacity of more than 45kW will require planning consent. Closed-loop systems may also require approval when installed on environmentally sensitive sites.

Closed-loop pipework is often buried horizontally at a depth of a few metres over a wide area. The loops are commonly referred to as slinkies, thanks to their resemblance to the toy, and where there is insufficient area the pipes can be installed vertically in the ground as boreholes.

Pipes can also be installed within the structural piles of the building: in this case closed loops are placed in a steel-reinforced cage and then encased in concrete to form the pile. The structural pile design must take into account the thermal loads imposed by the GSHCS.

The shallower depth of the structural pile will provide less capacity than the deeper vertical boreholes, but can be a lower-cost option as the only uplift is the addition of the pipe to the structural pile. This is referred to as a vertical closed-loop thermal pile. Deeper piles, around 25m down, will be more economic than shallower ones, as increasing the depth will provide greater heat transfer.

Ground-source system function can be classified as follows.

- Heating only: schools and housing, for example, will require heating alone.
- Cooling only: buildings such as data centres on the other hand need just cooling.
- Balanced heating and cooling: this type of GSHCS uses the ground as a thermal store during the summer and extracts heat...
An unfused pipe joint excavated following a system leak. In this case, the electrofusion joint was not completed correctly.

A balanced GSHCS to function properly, the amount of heat extracted from the ground must roughly balance the amount returned to the ground over an annual cycle. If not, the temperature of the ground will increase or decrease year on year, hampering the system's performance over time and possibly rendering it unusable. This type of system is suited to buildings that have both a heating and cooling requirement, such as hospitals and offices.

It is important to get a number of things right during the design stage of vertical closed-loop borehole systems.

• Ensure that the heating and cooling loads required are established early in the design process. As the borehole system will usually be installed near the start of construction, it can be difficult to change the capacity subsequently. Avoid using any rules of thumb without understanding the actual ground performance.

• Don’t place boreholes too close together, or indeed slinkies if too many ground-source systems are placed in a small geographical area, as this leads to thermal interference and the ground can become heat-saturated. On heating-only schemes in particular, the boreholes or slinkies must be at sufficient distance from each other so the ground will return to its normal temperature during the summer, ready for the next winter. Vertical boreholes for closed-loop heating- or cooling-only schemes would normally be spaced more than 10m apart.

• Placing the intake and discharge too close together on open-loop systems can cause thermal interference. This is a particular problem where the site footprint limits the possible distance between the boreholes.

• Balanced systems must be designed to ensure that the heating and cooling loads even out the ground temperature year on year; failure to do so will result in the ground temperature changing. Ensure that the design life of all buried elements is the same as that of the building — typically, at least 50 years.

• Design the pipework to allow for expansion and contraction over the operating temperature range. Typically, this can be between −7°C and 35°C, and the expansion of plastic pipework is around 15 times that of steel. Incorrect design can lead to leaks, particularly at the manifolds.

Common problems

As the key parts of any ground-source system are buried in the ground, and in some instances under the building, the quality of the installation must be carefully controlled. Rectification work can be costly and in some instances impossible. The following measures are advised.

• Design the pipework with the fewest joints possible, as this will minimise the potential for poor-quality work on site.

• Individually connect each borehole back to accessible valve chambers, and avoid daisy-chaining them. A failure then only results in the loss of one borehole rather than several.

• Boreholes should always be comprehensively grouted. Gravel should be avoided as it will provide a pathway for contaminants to leak into aquifers.

• Ensure trenches for interconnecting pipework are free from stones and sharp edges that could result in damage. Trenches should be filled with sand, and have at least 300mm of cover on all sides.

• Site operatives should be trained in electrofusion jointing techniques, with test samples submitted by each before any works commence.

It is important to ensure independent testing and inspection of all interconnecting pipework before placement of backfill material, plus third-party inspection of borehole placement. Do sign off all borehole and system testing records.

For closed-loop systems, the antifreeze content must be maintained in accordance with the design. Monitoring the system for leaks is also important as any water in the make-up or drop in pressure could signal a leak. For open-loop systems, building owners will need to comply with the Environment Agency licence requirements.

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Related competencies include:
Construction technology and environmental services
In my job at the Environment Agency, I spend a lot of time planning for the effects of the changing climate. I know I am not alone in this: whether you work in the private or public sector, climate change is making everyone consider how we prepare for an uncertain future.

The evidence for rising sea levels and increasing global temperatures is well documented. Coastal communities face the loss of great swathes of coast to the sea within decades. The latest UK climate projections, published in November 2018 (bit.ly/UKCP2018), estimate that the UK’s highest sea level rise will be in London. By 2100 we could see an increase as high as 1.15m.

In January 2018, the UK government published its 25-year environment plan, the goals of which include creating a ‘cleaner, greener country … using land more sustainably’ and establishing ‘what is necessary to adapt to the effects of a changing climate, improving the resilience of infrastructure, housing and the natural environment’ (bit.ly/UK25yrenvplan). This requires strategies not only to protect and enhance the natural and built environment but also to adapt to the effects of climate change across all sectors, from development and construction to food and agriculture.

This is at the forefront of our work at the Environment Agency, but it is not something that we can tackle alone. Projected levels of growth in London offer an opportunity to work together to create a built environment that can be adapted to a changing climate. The Environment Agency and its partners — including riverside councils and bodies such as the Greater London Authority and the
Department for Environment, Food & Rural Affairs – have been working hard to implement the Thames Estuary 2100 Plan.

Approved by the government in 2012, this is a long-term tidal flood risk management strategy designed to protect 1.3m residents and £275bn worth of property and infrastructure at risk of tidal flooding in the Thames Estuary. It sets out how risk-management and planning authorities, developers and landowners need to work together to tackle the challenge of increasing tidal flood risk.

Many of the 350km of flood walls and embankments, nine flood barriers, numerous flood gates and other structures that work in conjunction with the Thames Barrier to protect the estuary will need to be replaced or improved over the next 50 years. The barrier itself is expected to need replacing by 2070 as well.

Although the plan includes proposals for managing flood risk in the long term, many of the recommendations require action now – and not only from those of us who are directly involved. Professionals and communities with an ability to influence future land use, planning and development, including surveyors, all have a role to play.

One option for managing tidal flood risk in the estuary is to increase the height of existing walls and embankments. However, we also want to ensure Londoners do not become disconnected from the river and the historic, cultural, social and economic value attached to it. Instead, we want to work with those who are developing the riverside now to incorporate effective defences in a more natural, visually appealing way, increasing access to the riverside, creating habitat, improving well-being and enhancing quality of life for people living and working on the Thames.

We are looking to work with planners, developers and anyone who has an interest in the built environment of the Thames to develop a riverside strategy: an holistic approach to development that incorporates flood defence improvements while ensuring sustainable growth.

We are already seeing this approach with the Charlton Riverside Masterplan, a vision for redevelopment in this part of the Royal Borough of Greenwich. The development incorporates flood defences that are set back from the river’s edge, along with green spaces and well-planned housing and commercial development (bit.ly/CharltonRside).

Investing in flood defences will mean greater protection against the increasing threat of rising sea levels and extreme weather events, but is also an opportunity to enable sustainable, green growth. This not only embraces the government’s 25-year environment plan, but is echoed locally by the Mayor of London’s recently updated London Environment Strategy.

As we approach the tenth anniversary of the Thames Estuary 2100 Plan’s development by the Environment Agency and our partners (bit.ly/TEPlan2100), we are beginning work on our first full review. This is an opportunity to take stock of everything that has changed in the estuary during this time, both in the physical and social environment, and to check that the original recommendations remain relevant. It is also an opportunity for
Flood risk management in London is not just about building walls to hold back water, but working with natural processes to slow water down

others to get involved in managing increasing tidal flood risk and fulfil our wider ambitions for a riverside that not only protects the communities along it but also creates habitat, provides access, and improves well-being.

The threat of flooding in London doesn’t just come from storm surges and rising sea levels. We are seeing extreme weather events such as sudden heavy downpours happen more frequently as the climate changes. In urban areas this can lead to surface water flooding when rainfall overwhelms drainage systems. As a high-density urban environment, and one served by a Victorian sewer system, London is particularly vulnerable. Around 70,000 homes and businesses are at high risk of surface water flooding in London, seven times more than those at high risk of flooding from rivers and the sea.

The Environment Agency takes the lead in managing fluvial and tidal flooding, while unitary or county councils are responsible for managing surface water flooding risks. However, in reality, joined-up working across different professions will be needed to address and adapt to these risks. These challenges also create opportunities for innovation, which will ultimately lead to better places to live and work in the capital.

A greener approach

Flood risk management in London is not just about building walls to hold back water. It is also about working with natural processes to slow water down before it gets into the drainage system. Natural flood management systems are a part of this process, representing a greener approach to flood risk with a great potential to bring organisations, businesses and communities together.

Firs Farm Wetlands, Park and Playing Fields at Winchmore Hill in north London are an example of this greener, more inclusive approach. Led by the London Borough of Enfield with support from the charities Friends of Firs Farm and Thames 21, this site combines flood storage areas with wetlands (see photo below left and firsfarm21.org).

It creates a habitat that will help reduce both surface water flooding and pollution entering the watercourse by storing flood water during extreme rainfall events and then slowly releasing it via the wetlands, filtering and cleaning it as it passes through. The scheme also enhances the area for people and wildlife: several amenities have been created, including a network of footpaths and cycleways and recreation areas, while the work has given the local community hands-on experience in the transformation of the site.

Firs Farm is one example of sustainable urban drainage systems (SUDS), a multipurpose way of providing green spaces, promoting biodiversity, managing surface water flooding and mitigating pollution. SUDS can also be applied to pavements and the built environment, not just open land and green spaces.

One example of their use is at Bridget Joyce Square at White City in west London, an area that was at high risk of surface water and sewer flooding (bit.ly/BJSqSUDS). Permeable block paving has been installed to collect rainfall from roads and roofs and direct it to a series of storage basins and some wonderfully designed rain gardens. Up to 50 trees and thousands of plants were added, and these not only help to soak up rainwater but increase biodiversity and make the area more attractive.

From green spaces to the riverside environment, flood risk management can connect people to their environment, supporting the ambitions of the 25-year environment plan while enabling society and the economy to adapt to a changing climate. By using new methods and incorporating innovative design, flood risk management can enable sustainable growth rather than being a barrier to it. Working together at the earliest opportunity in the planning process, we can maximise environmental, social, cultural and economic benefits.

We all have a part to play, so let’s continue to think and talk about climate change and embrace the challenges ahead — together.

Sarah Smith is a flood and coastal risk manager for London at the Environment Agency enquiries@environment-agency.gov.uk

Related competencies include: Sustainability
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People power

Negotiating dilapidations depends as much on people skills as it does on surveying expertise. What can you do to ensure you succeed?

Mike and Simon Hazeldine
To be a good building surveyor, you need to know how buildings work; but to be a great building surveyor, you need to know how people work too.

This advice is particularly relevant to dilapidations negotiations. Surveyors are great at dealing with the technical aspects, but not so great when it comes to the negotiation stage. This is mainly because surveyors are well trained in those technical aspects, and also reasonably well trained in the legal ones, but sadly lacking when it comes to training in negotiation.

Many surveyors also believe they are negotiating when they are in fact simply haggling. Haggling is making an offer at different price points until a deal is made, and typically concerns itself with price alone. Negotiation is about getting something of equal or higher value in exchange for any concession you may make.

It is vital that you enhance your capability and confidence as a negotiator. A key principle in this is to focus as much on people as on the technical aspects. A good starting point is to understand that most negotiations go through five stages, as follows.

First, far too many dilapidations negotiators fail to plan or prepare correctly. This is a vital: without effective planning and preparation you can only react to what happens in the negotiation rather than controlling it.

It is important to consider each item on the schedule without losing sight of the overall settlement, and the implications of section 18 valuations, supersession arguments, betterment and interpretations of repair standards also need to be taken into account. It is also vital to keep up to date with relevant case law and legislation.

You should also plan for the kind of person you will be facing, as your approach to negotiating with an experienced fellow surveyor will be different from that when dealing with an uninformed tenant, and different again when facing a ruthless business owner who may be uninterested in RICS guidance and pre-action protocols.

Second, discussion: depending on the subject and the people involved, this stage can be relatively calm or it can descend into an argument. Whatever the nature of the conversation, the purpose of this stage is to review the issues fully and exchange information. It is vital that every possible effort is made to understand the other party’s point of view, and to be sure that they understand yours.

Third, signalling and proposing: each negotiation in which you are involved will typically result in an agreement that falls somewhere between meeting all your needs and meeting all those of the other party. As a negotiator, therefore, you need to be on the lookout for signs of willingness from the other party to consider movement towards your ideal outcome.

Such signals are usually followed by proposals — actions, approaches or processes that one party suggests to the other. Proposals advance negotiations and without them not a lot happens, so discussions go round in circles and increase the possibility of deadlock.

Fourth, bargaining: this stage is characterised by the two parties trading with each other so each can achieve their objectives. The key to effective bargaining is giving to get, and a basic rule of negotiation is never to make a concession without getting something of equal or greater value in return. In dilapidations negotiations, the return could come some time after the concession was made as you work your way through the schedule, so it is important you do not lose track and keep careful notes.

Some items offer less opportunity for negotiation but there will always be some negotiation on price. It is therefore best to avoid getting stuck if you cannot find common ground on a given item. Simply suggest that you park the topic and move on to the next. Return to the trickier items towards the end of the negotiation when a sense of progress has been established.

Fifth, closing: this is when agreement to proceed is reached. Make sure you summarise clearly the agreed deal to ensure you have a common understanding.

The most important remains the first stage: up to 90 per cent of your success as a negotiator depends on the quality of the planning and preparation you do in advance. Some of the vital elements you should include in the planning and preparation are as follows:

- **Objectives**: what specifically do you want to achieve, and how will you measure your success? Ensure that you write your objectives down as this will make them more concrete; unclear objectives will usually lead to poor results. It is also vital to consider the objectives the other party may have, and then confirm these during the discussion stage.

- **Negotiation parameters**: because most agreements will fall somewhere between the ideal outcome of both parties, it is important to consider the range in which a settlement is possible. Define your own or your client’s ideal outcome, then a realistic outcome based on your knowledge to date, and finally your musts. Next, consider the likely range of the other party. If you cannot secure your musts then you must walk away and discuss alternative actions with your client, such as a part 36 offer. Part 36 of the Civil Procedure Rules allows either party to make a settlement offer; if this is not accepted and the opposing party fails to beat the offer at trial, then the court can impose costs and penalties. As a major incentive to settle, this so can be a powerful negotiating tool.

- **Negotiable areas**: what elements will the negotiation centre on? List those that are important to you and those that you anticipate are important to the other party. During the negotiation you will attempt to get some of what you want by trading something they want in return. Work out what each concession will cost you so you can make sure you always get something of equal or greater value in return. It is useful to look at elements such as tenant alterations that can be legitimately claimed for, but which are less important to you or your client.

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Related competencies include:
Conflict avoidance, management and dispute resolution procedures, Landlord and tenant

rics.org/journals 29
Since the lime revival of the 1980s, the benefits of using lime mortar for the repair of traditional buildings have become increasingly well understood. Compared with cement, lime is much more compatible with the surrounding fabric, especially as it permits the absorption and evaporation of moisture.

Most lime mortars used in the UK before 1919 tended to be either non-hydraulic or feebly hydraulic, and had a much higher lime content than most of those specified today. Evidence shows that mortars tended to be produced by slaking — combining quicklime with water to produce calcium hydroxide — or by mixing quicklime in damp sand, a process known as hot mixing. For decorative finishes, mortars tended to be lime putty-based, as they did in the early years of the lime revival.

Although hot mix and lime putty-based mortars are still frequently used, there appears to have been a trend towards using increasingly stronger mortars based on imported natural hydraulic limes (NHLs). This has partly been in an effort both to reduce the risk of premature failures in new lime work and to mitigate the perceived difficulties contractors have in mixing, applying and curing slower-setting traditional mortars.

However, despite the anxiety that often accompanies the use of traditional mortars, failures are almost always found to be a result of detailing issues, lack of maintenance, inherent dampness, inappropriate specification or poor-quality work. Any of these largely avoidable factors can, and usually will, cause the premature breakdown of lime work, and yet are often ignored, written off as another lime failure (see photo 1). There is no reason why an appropriately specified and well-applied lime should ever fail on a well-detailed and regularly maintained building.

Detailing issues, particularly managing rainwater run-off and ground drainage, are possibly the biggest cause for early failure of external lime work. Managing rainwater, especially in a country now subject to greater annual rainfall and more frequent instances of extreme weather, is crucial to the long-term success of lime mortar.

Although one of the benefits of lime is its ability to allow masonry to breathe, areas subject to regular and concentrated
wetting are much more prone to early failure. Ensuring that appropriately sized rainwater goods and well-detailed weathering features, such as wallheads, copes and cills, are in place is critical to minimising run-off over wall surfaces. This may require discreet adaptation to increase effectiveness, especially if details do not project far enough beyond the finished face of the new lime work. Another area vulnerable to failure is immediately above ground level: ideally, effective ground drainage should be in place to reduce dampness here, and consideration ought to be given to reducing splashback from hard surfaces.

Lack of regular maintenance, such as ensuring rainwater goods and ground drainage are running free and kept clear of debris, is another common cause of early failure in lime work. As with poor detailing, this will result in localised saturation leaving lime vulnerable. Frequent inspections to identify maintenance needs such as localised repointing or patching in high-risk areas will not only maintain the finished appearance but also reduce the chance of larger-scale repairs being required in future. It will also minimise the risk of penetrating dampness affecting substrates and interiors.

Inevitably, there will always be areas at greater risk, so increased attention is necessary to maintain the appearance of the finished work. Clients should be made aware of the need to plan regular maintenance, particularly in high-risk areas such as immediately below flush, crow-stepped gables or at ground level exposed to road de-icing salts, and budget for localised repair and reapplication.

The risk of failure also increases when lime is applied to masonry that is saturated. The walls of a building undergoing repair, where cement-based pointing or harling has been removed, will often remain damp for a considerable period. The risk of carrying out lime work in these circumstances is that the new work will be vulnerable to discolouration and the damaging effects of frost and salt recrystallisation as the substrate slowly dries from behind. Ideally, saturated masonry should be allowed to dry before application of lime work. If this is not possible, increased maintenance and localised repair should be planned to rectify areas affected (see photo 2).

Professionals should avoid the temptation to routinely re-use specifications written for other projects, as they are unlikely to be appropriate in every case. They should also avoid specifying overstrong lime mortars to reduce the risk of failure or make it easier for an inexperienced contractor; a well-detailed and appropriately maintained building should not require overspecification. Mortar specifications should be carefully designed and prepared to meet the requirements of the structure.

A key principle of lime mortar specification is ensuring that it is never stronger than the background or substrate to which it is applied. Porosity and capillarity are as important considerations as compressive strength — perhaps more so — and specifying too strong a mortar has the potential to trap moisture and restrict movement of salts in the underlying substrate. This leaves the masonry beneath at risk and can lead to damp-related issues internally as well as poor thermal performance.

In contrast, an appropriately specified lime mortar should, in normal conditions, allow transfer of moisture and salts more readily. It will also minimise the risk of damage to the surrounding fabric by being sacrificial should issues arise; that is to say it will be the lime work that fails, not the masonry, should it be exposed to salts or excessive moisture. A failure of lime work is often the first indication that other issues need addressing.

When specifying repair mortars, a useful starting point is having the original mortar analysed to determine the proportions and method of mixing, and the characteristics of lime and aggregate sources. However, the nature of the substrate and its condition and the exposure of the structure should also be considered. For example, the original mortar used to construct the wall of a now ruined property is unlikely to be appropriate to consolidate an
Building conservation  Lime

Clients should be made aware of the need to plan regular maintenance, particularly in high-risk areas, and should budget for periodic, localised repair and reapplication

exposed wallhead which is devoid of a roof and weathering details to protect it.

Similarly, the mortar required to repoint skew copes or re-bed chimney cans may need to be more robust than on less-exposed masonry beneath performing a different function. Appearance also matters, especially when patch-repairing finishes, and so a range of sample panels should be completed where possible to ensure a good visual match is achieved.

Good-quality work relies on good preparation, application and aftercare; good preparation means ensuring that mortars are accurately gauged and mixed, and backgrounds well prepared to control suction, remove dust and provide a sufficient key.

The principle of good application requires the amount of mortar to be kept to a minimum by introducing pinning stones to fill voids and wider joints, and avoiding the temptation to apply overly thick coats of render, harling, plaster or limewash. It also requires an attention to detail to ensure that joints, renders, harls and limewashes are appropriately finished, cured and protected from exposure to sun, wind, rain and freezing conditions until the mortar has sufficiently set and carbonated (see photos 3 and 4).

To gain full strength, most lime mortars require two simultaneous chemical reactions to take place. The first of these is hydration, a reaction of hydraulic compounds within the lime once it is mixed with water, and the second is carbonation, when the lime re-absorbs carbon dioxide from the atmosphere to convert it from calcium hydroxide to calcium carbonate. If new lime work is not properly protected or cured, this increases the risk of premature failure interrupting or disrupting these processes.

Engaging a contractor who has experience in the use of lime mortars is advisable. However, such is the availability of training courses and information, inexperienced contractors can be upskilled, providing they are prepared to carry out the work correctly. References should be followed up and qualifications checked before appointment, and sample panels completed before commencing the repairs. A competent contractor should understand the health and safety requirements of working with lime and be able to provide methods statements and risk assessments before works start.

The majority of lime failures can be avoided. To avoid the risk of premature failure when preparing specifications for lime work, even before considering an actual mix, understanding the condition of the building or structure and ensuring it is properly detailed is paramount. This, and anticipating regular maintenance of lime finishes — especially in areas already subject to long-term dampness or frequently affected by run-off — will not only maintain the appearance of the new work but will also minimise the need for larger-scale, costly repairs.

Despite ongoing debate on the appropriateness of specifying imported hydraulic limes, including NHLs, rather than using traditional lime mortars, there is a potential longer-term risk of damaging the fabric of buildings and structures when specifying overstrong mortars rather than making good poor detailing or attempting to pre-empt the need for future maintenance. In the same vein, it’s better to promote the development of skills by encouraging contractors to attend training on the appropriate preparation and use of lime mortars than specifying something that in the longer term may cause more problems.

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3 (top) and 4 (above). Poor substrate preparation, with a failure to fill voids adequately and build outwards in thin coats can lead to an inconsistent finish and increased risk of new lime work failing prematurely
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Putting the I in BIM

Intelligent asset data can be used by surveyors in facilities management to enable efficient maintenance, but barriers to BIM adoption are still to be overcome

David Evans and Warren Teague

Building surveyors, particularly those with long experience of building maintenance, have become used to changes in working routines and managerial approaches, with the continuing introduction of new workplace technology and practices.

Consider changes in terminology: ‘estate management’ became ‘asset management’ and subsequently ‘facilities management’ (FM). Coupled with this, building maintenance, record-keeping and asset condition recording are moving from clipboard and pencil to mobile device to point clouds and beyond. As for building information modelling (BIM), what can this technology do for building surveyors in property maintenance?

Buildings are notoriously expensive investments for any business, typically second only to staff wages in terms of cost. As building maintenance is often regarded as highly inefficient given inherent deficiencies in asset data, the overreliance on human knowledge and time-consuming procedures, the value of the information in BIM is worth considering.

Building surveyors in FM unquestionably have a critical role in maintaining assets efficiently, and it is in the occupancy and operational stages that the ‘I’ in BIM could offer the most value. Yet many in FM are still to be convinced by the business case for BIM. The true significance of BIM in FM perhaps lies in the asset data itself: as part of a building information model, this may not only inform those managing the buildings, but can enhance maintenance efficiency and the credibility of future economic decisions.

Maintenance inefficiency is typically blamed on factors ranging from poor strategies and operational procedures to
Many surveyors involved in facilities management are still to be convinced by the business case for BIM

the hasty commissioning of new assets to ensure timely handover. Surveyors will recognise how often designers are accused of ignoring FM and in particular building maintenance, with claims of inadequate specifications leading to a subsequent rise in maintenance cost.

This is because efforts have traditionally, and perhaps understandably, focused on the contract and client budgets rather than researching the long-term performance of products and materials, with the commissioning process subsequently being rushed and less than rigorous.

That in turn means those managing the buildings typically have to invest considerable resources in reconfiguring plant and equipment to meet occupiers’ requirements, duplicating effort and hence increasing cost.

Surveyors often enter the debate at this stage to advise on the most appropriate maintenance strategies. These can include the following.

- **Condition**: predictions based on the data collected from surveys are used to inform proactive, preventative maintenance.
- **Time**: maintenance activities are scheduled to correlate with warranties, life expectancy or legislative requirements.
- **Corrective methods**: maintenance is undertaken when an asset fails or is about to fail.

A 1997 study offers a useful rationale for selecting appropriate strategies, but concludes that the best approaches rely on aspects of all three of these methods (bit.ly/Horneretal97). Another study from 2012 suggests time-based strategies can lead to overmaintenance and increase cost because they are heavily influenced by manufacturers’ recommendations and do not focus on savings (bit.ly/LindMuyingo12).

What then does the I of BIM have to offer? Perhaps unsurprisingly, there are numerous views on integrating asset data into maintenance strategies. Some studies present a compelling argument for enhancing collaboration between design, construction and FM in order to take into account the impact that design decisions have on maintenance efficiency (bit.ly/AlwanGledson2015). Perhaps here is where the key role for surveyors in FM is likely to develop: analysing the BIM data and enabling the client to make informed, assured decisions.

Imagine accessible, unlimited intelligent data in building information models, with benchmarks for the performance of all boilers, roof coverings, curtain-wall systems and more. This data could be very valuable for clients, provided that surveyors are on hand to orchestrate and manipulate maintenance strategies, and are also monitoring and comparing actual with modelled performance. This function could mean that the presence of surveyors in FM becomes obligatory.

Risks still exist, though: the required financial investment and time frames of three to six years undoubtedly present barriers to BIM adoption, particularly during the present uncertain economic climate. Other considerations and challenges include:

- the need to update models with maintenance activities and physical changes — such as repositioned doorways, partitions or electrical sockets — to maintain a continuous record
- the initial cost of creating 3D models retrospectively; this also relies on the accuracy of as-built drawings, which can have significant discrepancies that then require further survey work
- lack of software compatibility between BIM-capable platforms
- the inherent risk that asset owners are unable to define their information requirement before generating the model, leading to overmodelling.

Worryingly, the value of BIM data may never be fully harnessed. Facilities managers and designers are traditionally disconnected from each other and often reluctant to share this information. So in future, construction organisations may be best positioned to do so because they can harness the asset data earlier than traditional FM organisations.

They are responsible for creating the asset information model and are thus strategically better placed to make the most of information than facilities managers, who are historically better engaged towards the end of a development. This could create a significant opportunity for construction companies to exploit the value of asset data intelligence and tender competitively for FM services at an earlier stage — arguably with greater accuracy than traditional FM approaches.

The complex skill set of a building surveyor will remain of immense value provided that the surveyors in the FM sector are proactive and responsive to technological changes and challenges.

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**Related competencies include:** Building information modelling (BIM) management, Maintenance management
Unfit for retrofit

Increasing numbers of buildings are facing issues with insulation systems that have been incorrectly specified or installed. What can be done to remedy this?

Rob McCormack

Over the past few years, there has been an increase in the number of issues and complaints coming from homeowners and tenants who have had cavity-wall insulation (CWI) or external-wall insulation systems installed. The main issue is that incorrectly specified or installed systems have gone on to compromise the fabric of properties.

Although the remediation of non-compliant installations should be a simple task, the work we have undertaken at BBA Consultancy, Investigation and Training (BBA CIT) in surveying social housing stock and privately owned properties has found many severe defects that could easily have been resolved if the right action had been taken at the right time.

In their work, our inspectors regularly see a need to improve overall standards, specifically in the areas of property suitability assessment and assuring the quality of installations. Similarly, our technical assessors repeatedly discover that conditions in many private dwellings and social housing units have deteriorated due to inappropriate retrofitting or improper installation of insulation.

In most cases, this has been because the surveyor who initially assessed the building for a retrofit failed to evaluate the home’s condition accurately and did not identify existing defects. These conditions can be compounded by an installation that isn’t completed to specification, and results in additional housing defects. We have also witnessed this issue with cavity insulation extractions and re-installation, where many installers are not following industry standards.

The main challenge for homeowners and social housing providers – especially where they do not understand how important accurate property suitability assessments are – is ensuring that installation works are overseen as they are carried out, to make certain that standards are met. Regular inspections are also needed alongside servicing so as to maintain eligibility for any installation guarantees, specifically in the case of social housing providers. When assessment of works is conducted retrospectively, a maintenance response request or a housing disrepair claim can in many cases be very costly.
To make sure works comply with regulation, we recommend that clients adopt a regular project monitoring protocol

Poor work will cost
We recently consulted for the Vale of Glamorgan Council in Wales, work that involved assessing housing stock to find the cause of several issues arising after a CWI retrofit programme in the 1990s. In surveying the houses in question, a couple of major problems were discovered.

- A common approach had been taken to the work for the buildings, which did not take into consideration the peculiarity of each property.
- Previous remedial work undertaken as part of the Standard Assessment Procedure that the council had used to assess the environmental performance of a dwelling had not properly identified or rectified the problems.

The council now had to find a way to waterproof more than 4,000 two-storey homes against driving wind and rain in one of the most weather-exposed regions of the country, where precipitation can hit levels of more than 100ml/m² per spell. It was calculated that the council had spent around £10,000 per home during the preceding years trying either to maintain or rectify the CWI retrofit.

This particular work also highlighted that a job completed without due diligence and supervision can ultimately require costly long-term efforts in remediation. However, it is worth noting there are measures that can be followed to ensure retrofitting is carried out successfully.

For instance, many insulation retrofits have been incorrectly recommended for properties with damp and condensation issues. Installing insulation in such circumstances won’t solve the problem, and has the potential to make it even worse. When damp or condensation is found in a building, it is important to know the cause, carry out required remediation and then assess whether the problem has been resolved, before reassessing the property for an insulation retrofit.

Remediation needs should also be identified ahead of works. Properties that are not regularly maintained or are in a state of disrepair are very likely to be unsuitable for retrofitting. Such properties can sometimes be identified by cracked walls, defective window or door seals, damp-proof courses of inadequate height and cavities that aren’t clear of rubble and debris, all of which could have a detrimental effect on the future performance of both a dwelling and the insulation itself.

It is recommended that the building condition be assessed by a suitability qualified assessor, and all identified remediation works be completed before retrofitting insulation. As a rule, the identification of buildings that are not suitable for an insulation retrofit is more cost-effective in the long term than undertaking work in the short term.

In extreme situations, wind-driven rain can penetrate a building’s outer leaf and track across the insulation to cause damp inside the property. It is important that the relevant checks are always conducted on the property to ensure it is suitable for the proposed installation, and to assess carefully local exposure to weather conditions such as wind and rain that may affect the installation.

In broad terms, much of the UK’s westerly coastline, Scotland, Wales and the South West of England are highly exposed locations, with the most receiving around 100ml/m² per spell of wind-driven rain. In these locations, additional measures may be required, which a specialised company would need to undertake.

A lack of oversight by landlords and their failure to engage with suppliers throughout the installation process is where things generally go wrong. In order to make sure works comply with regulation, we recommend that clients adopt a regular project monitoring protocol, keep a close eye on best practice, stick to the specification, and procure contractors who are trained, certificated and insured. It is also recommended that clients obtain third-party verification of claims made about a product’s or system’s performance, its suitability for the intended use and compliance with regulations, and a guarantee of works completed.

The activity of occupants — and in some cases their lack of knowledge about how to manage the building adequately after insulation has been retrofitted — can also be the cause of defects. For example, adequate ventilation is crucial to allow warm, moist air that may previously have dissipated through the walls to escape. If such air builds up then issues with humidity and damp may arise.

It is important that building occupiers are always advised what is required of them, to ensure that the property and the insulation alike perform as they are designed to do, and that guarantees are not invalidated.

To conclude, the situation is not as dire as it might seem. Through our work with various local authorities and housing associations across the country, we have seen some examples of best practice being implemented, while benefits are being gained from assessment of housing stock by independent organisations such as ourselves.

Such bodies not subsequently involved in making any identified improvement or maintenance works can provide impartial health checks of housing stock, which focus on technical assessment of the dwelling’s suitability and condition and the performance of any retrofits. This allows landlords to prioritise and select the most suitable, cost-effective housing improvements and maintenance.

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Related competencies include: Building pathology, Construction technology and environmental services, Inspection
Insolvency is all too prevalent in the construction industry and adjudication is vital to restore cash flow.

There is a right to adjudicate a dispute under a construction contract ‘at any time’. Many construction contracts explicitly provide for this, as does section 108 of the Housing Grants, Construction and Regeneration Act 1996 (bit.ly/HGCRA1996). Critically, this is a right that cannot be contracted out of.

However, an adjudication will only decide a single dispute and will not resolve other issues. Furthermore, adjudication is only a temporary remedy and may be challenged in subsequent legal proceedings.

An insolvency procedure can take one of the following forms, among others.

- **Administration**: the company may continue to trade, but is under the control of a licensed insolvency practitioner and action against it is prevented. The aim is to rescue the company as a going concern, achieve a better outcome for creditors than an immediate winding-up, or to realise assets to make a dividend distribution to secured or preferential creditors.

- **Liquidation**: the company ordinarily ceases to trade, its assets are realised with proceeds distributed to creditors, and the company is ultimately dissolved.

A company in either of these situations may bring a claim, but insolvency set-off rules require the company and third parties to take account of mutual dealings to set off sums due against each other to come to a final position. Thus adjudication and the set-off rules clearly have different purposes.

The recent Court of Appeal cases Bresco Electrical Services Ltd (in liquidation) v Michael J Lonsdale Electrical Ltd and Cannon Corporate Limited v Primus Build Limited [2019] EWCA Civ 27, which were heard together as they considered similar points of law, considered these issues.

Lonsdale successfully obtained an injunction to prevent an adjudication brought by Bresco, which was in liquidation, from proceeding. Primus meanwhile obtained summary judgment to enforce its adjudication decision despite being in a company voluntary arrangement (CVA), which is an insolvency procedure with similar aims to administration.

Cannon Corporate reconfirms that the court will order summary judgment to enforce an adjudication decision obtained by a company in a CVA, or in administration more generally, because the purpose of such arrangements is to enable the company to return to trading as normal.

However, a company in administration is protected by Schedule B1, paragraph 43 of the Insolvency Act 1986. It can bring and enforce an adjudication, but cannot have one brought against it.

As set out above, liquidation aims to wrap up a company’s relationships with creditors or debtors and ultimately dissolve it; underlying disputes can be determined through the courts or arbitration as these decisions are final.

So it follows that, were the parties to agree that adjudication is binding, the court would not grant an injunction preventing a party in liquidation from progressing an adjudication for a monetary award.

However, where adjudication is not binding it would be futile to allow it to proceed. This is because a summary judgment to enforce a decision for a monetary award cannot be obtained by a company that is in liquidation.

Such enforcement would be unjust because an adjudication decision is normally open to challenge, but the finality of liquidation would render this futile — or worth much less — and not allow for set-off in the normal way.

But there are exceptions. For example, where a company’s financial position is due, either wholly or in significant part, to the defendant’s failure to pay sums awarded by an adjudicator, the court will allow an adjudication to proceed, as in Wimbledon v Vago [2005] EWHC 1086 (TCC).

**Related competencies include:** Legal and regulatory compliance
We hear regular reports of construction site accidents where workers come into contact with live services when opening up, uncovering and excavating. The root cause of these accidents can often be found in the failure to provide information, instruction, training and supervision.

These are important issues in an industry involving so many different parties, and need to be given careful consideration not only by those directly involved in construction but also by professionals involved in project management, building design and contract administration.

The legal requirements are simple and represent a pragmatic expression of good practice. The basic duty, which derives from case law, is codified in section 2 of the Health and Safety at Work etc. Act 1974 (bit.ly/HSWA1974): ‘the duty of every employer [is] to ensure, so far as is reasonably practicable, the health, safety and welfare at work of [their] employees’. These requirements are echoed and reinforced by regulations 10 and 13 of the Management of Health and Safety at Work Regulations 1999, covering, respectively, information and training (bit.ly/MHSWregs99).

A criminal case from early 2017 demonstrates some of these statutory principles and shows how the Construction (Design and Management), or CDM, Regulations 2015 can extend those duties beyond employees (bit.ly/Ameycase17). This involved infrastructure services company Amey LC, which appointed a subcontractor to carry out roadworks. One of the subcontractor’s workers hit an 11,000V cable while digging out a concrete service box and sustained life-changing injuries including burns and nerve and eye damage.

The facts of the case were as follows.

- Amey had employed a cable avoidance specialist to scan nearby services, but had not passed the results on to its subcontractor gang. It had also spray-painted markings on to the road ahead of the excavation area but had not briefed the gang on what these meant.
- Amey provided a map, but at 1:1,250 scale it was unclear due to the congestion of services in the area.

There were clear failures to provide adequate information, instruction, training and supervision. The gang in this case were not Amey’s employees, so the employee provisions of the 1974 Act did not apply directly: the prosecution was made under CDM Regulation 25 on energy distribution installations, specifically 25(4), which concerns the carrying out of suitable and sufficient steps to prevent risks from underground services.

It is also worth mentioning CDM Regulation 8: ensuring people have necessary skills, knowledge and experience. This goes hand in hand with the facts of this case, and is one of the areas on which the Health and Safety Executive is focusing in its enforcement efforts.

With the support of principal designers and consultants, clients can help avoid such accidents by ensuring that appointed contractors have the necessary skills, knowledge and experience and adequate organisational capability by providing contractors with information about buildings and sites as part of CDM preconstruction information. This will go a long way towards helping contractors control such situations, but the final onus is on the contractors themselves.

The introduction of the health and safety sentencing guidelines in February 2016 has had the effect of increasing the level of fines significantly. Amey was penalised £600,000, but the amount could easily have been a lot more.

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Related competencies include: Health and safety, Legal/regulatory compliance

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Related competencies include: Health and safety, Legal/regulatory compliance
Cavity caveats

If cavity-wall construction does not follow the relevant guidance then a number of problems may develop. This, the fourth in our series on issues faced on site by surveyors, looks at how to identify and remedy defects

John Miles
In the previous article we looked at cavity-wall insulation and the defects that retrofitted insulation causes (Built Environment Journal February/March, pp.24–25). This article looks into cavity-wall construction as a whole, and the issues that can occur if you don’t follow the Approved Documents’ guidance.

Cavity walls have become synonymous with contemporary wall construction; however they didn’t become commonplace until the 1920s. The advent of industrialised concrete block production made construction cheaper and quicker as builders could split the external wall into an inner and outer skin.

This meant that the amount of expensive brick or stonework required was halved, and it also addressed the issue of damp that was common with the more traditional nine-inch (230mm) solid wall. A cavity wall could also separate a largely aesthetic facade of brick or stonework that keeps weather at bay from an internal load-bearing wall.

The fundamental requirements for cavity-wall construction haven’t changed much since then. Wall thicknesses should be constructed in accordance with Table 3 of Approved Document A, while parapet walls should follow the design criteria in Diagram 4 (bit.ly/AppDocA).

All such walls should have a 50mm minimum cavity and be supported with wall ties spaced horizontally by 900mm and vertically by 450mm, as per paragraph 2C8 of the document; paragraph 2C19 and Table 5 in turn set the required cavity tie length, as well as specifying that ties should be either stainless steel or basalt, so as to conform with PD 6697: 2010 Recommendations for the design of masonry structures to BS EN 1996-1-1 and BS EN 1996-2 (bit.ly/2Uhmw3O).

Although a cavity wall would appear to be a simple construction, a number of failures can occur that could entail remedial works or ultimately reconstruction. One of the most common is wall-tie failure, in particular the rusting of corroded metal ties. Expansion of ties can meanwhile cause the outer leaf to crack and distort and lead to possible collapse. Wall-tie failure can often be identified by the horizontal cracking that results from the expansion caused by rusting.

Another problem from a works quality management perspective is the incorrect setting out of a cavity wall. This can cause a number of issues, including insufficient cavity width and eccentric loading of foundations, which they are not designed to take.

Cavity width will also vary with location. As the purpose of a cavity wall is to keep moisture on the outside and a dry insulated load-bearing wall on the inside, the Building Regulations recognise regional differences in wind exposure and split the UK into four climatic zones. Each has its own risk profile and prescriptions for the way insulated cavity walls should be built. Incorrect spacing of a cavity wall construction can lead to insufficient clear space within the cavity as required by paragraphs 5.12 and 5.13, Diagrams 11 and 12 and Table 4 of Approved Document C (bit.ly/AppDocC), which set limits and minimum cavity widths depending on building location and exposure to the elements. This determines the thickness of cavity-wall construction.

Photo 1 shows a wall construction with a cavity that is insufficiently wide. Achieving the correct width was in this instance especially difficult, given the unevenly coursed stone walls of varying thickness. The main issues were:

- residual cavity of less than 25mm; a 25mm width was permitted by the BBA certification for the ridged board insulation, but good practice in exposed locations is still to maintain a 50mm residual cavity, and this is likewise a requirement of warranties provided by the NHBC and similar organisations
- significant mortar deposits that completely bridged the cavity
- wall ties to a back fall, meaning that moisture can run to the inner leaf rather than back towards the outer leaf.

The lack of foresight in the design process has resulted in uneven stonework built in a way that collects mortar. This mortar is termed a snot, and if not removed can eventually bridge the cavity wall, providing a pathway for moisture to the internal skin of the wall. The wall and the cavity is also not of the required thickness to enable the amount of insulation required...

It is common to see a generic specification and accompanying detail when the Standard Assessment Procedure calculation is completed. This can result in the builder trying to achieve a target U-value by fitting thick, partial-fill insulation into a cavity designed for a thinner profile – as can also be seen in photo 1, where the insulation is too close to the external leaf.

In climatic zones where exposure is minimal and the external wall is masonry, some insulation manufacturers have tested their product to enable the residual cavity to be less than the width prescribed in Table 4 of Approved Document C. In such instances, although the guidance supplied by the manufacturer should be followed, the construction is still required to provide a cavity that should be kept clean throughout the construction process and meet the requirements of the warranty provider.

Photo 1 also shows issues with tie placement in a building that has a stone external wall and a block internal leaf. Ties as specified in Approved Document A should be used in sufficient number, but without enabling a pathway for moisture to the internal leaf.

In this instance, the provision of a full-fill insulation was discussed with the builder by building control surveyors as an alternative approach. As shown in Diagram 12 of Approved Document C the site exposure was only moderate, and such full-fill insulation would have addressed the residual cavity and mortar snot issues.

Wall ties also pose an issue when used incorrectly on timber-framed dwellings. Photo 2 not only shows debris within a cavity but also poorly bedded ties and even a hammer that has been left wedged in the cavity. Remedial works in this instance involved adding extra wall ties to support the external skin and clearing out the cavities by removing the debris and knocking the snots off the wall ties.

For the surveyor specifying repair works to cavity walls, all remedial ties should be obtained from suppliers registered to ISO 9000. There are a range of ties available, so the choice of a suitable product should be discussed with the installer and, if necessary, a structural engineer.

All works should be carried out in accordance with the guidance in BRE Digest 329, Installing wall ties in existing construction of 1991, and pull-out tests should also be carried out on site to prove the suitability of the system adopted.

Remedial wall ties should be tested to ensure they comply with the specification of BRE Digest 401, Replacing wall ties of 1995. When carrying out this work, all the original wall ties should be replaced to ensure the defect does not recur.

Another common defect in cavity wall construction is that walls run out of plumb – that is, they are not strictly vertical. Typically, remedial works to walls running out of plumb will either involve providing support with additional ties, or the removal and rebuilding of the structure.

The processes discussed above can be applicable to the following competencies.

- **Building control inspections**: carrying out site inspections to ensure that cavity-wall construction meets relevant performance requirements, observing, assessing and taking action against contraventions on site. This would normally demonstrate that a candidate had attained Level 2 of the competency, although where remedial works are required and reasoned advice is provided then they could achieve Level 3.

- **Building pathology**: understanding defects analysis, and explaining building fabric failure. Using this knowledge to identify potential failures, offer advice, and identify cavity wall-tie failure and its causes as well as the remedial works required, to demonstrate their achievement of Level 3.

- **Construction technology and environmental services**: understanding the 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.

While carrying out an inspection, the surveyor should be able to identify the types of defect discussed above, and provide appropriate measurements and photographs in site reports. The detail should be reviewed appropriately using relevant guidance such as Approved Documents A and C, BRE Digests 329 and 401 and other guidance such as the NHBC technical standards to determine whether the external wall is constructed to the relevant requirements.

From this point, the surveyor would be able to take appropriate action, such as advising on remedial measures or the requirement for further review by a structural engineer. Where a candidate is identifying and resolving such site defects, they may be able to record their experience under at least Level 2, and potentially under Level 3, for the competency of Building control inspections.

**John Miles is a technical and business development manager at Assent Building Control johnmiles@assentbc.co.uk**

**Related competencies include**: Building control inspections, Building pathology, Legal/regulatory compliance
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Surveying a rewarding career

Work continues to be busy but fulfilling, reflects the winner of the 2018 RICS Young Building Surveyor of the Year award

Jonathan Wright

A career as a building surveyor is rewarding in itself: each day brings new and varying challenges, making it a fascinating occupation that requires you to grow and develop.

Those who know me well claim that I was interested in buildings long before I even knew what a surveyor was — a much-loved book of home repairs that I grabbed from my buggy still sits proudly on my bookshelf at home alongside my copy of Harry Builds a House.

Having graduated during the global financial crisis, however, I was left unsure whether I would be able to find my first job and start a career in surveying — so you can imagine how pleased I was, a decade on, to win the 2018 RICS Young Building Surveyor of the Year award.

When I first heard I had been shortlisted, I was delighted just to have my name and achievements published alongside a talented group of capable young surveyors. Winning on the night was totally unexpected, and the numerous congratulatory messages I received from clients, colleagues and friends were positive reminders of what a great profession ours is. The judges’ comments on my selection were also highly encouraging: they recognised my achievements and my client focus, and that I am already giving back to the profession.

We all strive to achieve the best for our individual clients, but the endorsement for giving back to the profession feels particularly personal, reflecting my appreciation for my early mentors. Grateful for the support they gave me in my early days through my work placement and the APC process, I am motivated to pay this back in what little ways I can.

I live and was educated in and around Cambridge, and it is to Bidwells — coincidentally, now my employer — that I owe my initial professional experience. The firm was able to offer me my first taste of surveying in practice when it took me on for work experience shortly after starting university. Undertaking surveys and site visits confirmed my belief that this was an interesting career that I wanted to pursue, having chosen this path aged 14. On leaving school I had ventured north to study at Sheffield Hallam University, enjoying both my degree course in building surveying and a year out on industrial placement, working in the university’s own estates department, which began at the start of the recession in 2008. Although the department hadn’t been my planned destination, I soon learned how fortunate I was: it provided a safe learning environment in which I could start putting my knowledge into practice ahead of my final year of study, after which I graduated with a first-class honours degree.

If finding a placement at the start of the recession was hard, finding a suitable job after graduating was near impossible; so I am grateful, too, to Carter Jonas, which provided further work experience, eventually leading to a role in its commercial team. Two years later I secured a post with Bidwells, working full-time as a building surveyor at last.

Since I joined the firm, I have been given the support needed to develop my skills, becoming chartered in 2014 and being offered further help in growing my career steadily since. I have also had access to a wide range of professional opportunities that both enhance my career and help repay some of the time invested in me: mentoring colleagues, joining the local RICS Matrics committee and being appointed as an APC assessor.

Core work

These opportunities have been very satisfying, but so too has been my core work as a surveyor. I have been fortunate to be involved
with some stimulating projects in recent years, for great clients. With our dedicated commercial and project management teams, for instance, I am privileged to take a lead building surveying role on many instructions for Trinity College, across the world-renowned Cambridge Science Park as it is redeveloped (see photo above and bit.ly/CamSciPk). This covers more than 185,000m² of office research and development space across a 60ha site. Bidwells has been involved with the site from inception in the early 1970s, and it offers a pioneering example of the kind of collaborative work that we undertake.

On the park there is always something to do, and I am usually advising on several jobs at once. Whether these be dilapidations and landlord and tenant works, simple repair or wholesale refurbishments, the tasks are never boring or repetitive. For instance, we have just finished an unusual project that involved upgrading the site-wide CCTV system and infrastructure, comprising more than 16km of duct and cable installations, which has been three years in the planning. This, alongside a new-build estate office and a comprehensive category A office refurbishment, extension and fit-out, has kept me busy recently. Over the next few months, I will be working on the demolition of the original phase of buildings on the site, and the team has further exciting instructions in the pipeline.

This year also sees the culmination of other projects begun in my five years of work at Bidwells, as we see the first of four aircraft hangar refurbishments with Marshall Aerospace Defence Group near completion. I started working on these as a graduate in the lead design role, taking the client through the initial feasibility stages and concept development. This continuity of work for a single client has been rewarding, enabling me to build stronger ongoing relationships than is possible with shorter instructions. When the construction phase started, the role of the team was extended to take on the project management duties alongside the lead design. I now look forward to completing the first hangar as we ramp up operations, hoping to make a seamless switch to work on the second hangar later in the year.

Working in the city in which you grew up and still call home can be challenging at times. While it is exciting to be involved in the development of the built environment around you, the changes themselves overlay childhood memories of places you know well. But I am lucky to be working at Bidwells: although celebrating 180 years in business, it is today a modern, progressive firm offering an amazing, agile working environment. It has maintained its core client base, providing the opportunity to work with some of the oldest and most influential institutions and landowners in the area. This includes the University of Cambridge and many of the associated colleges, which seek to protect and enhance their surroundings and respect the heritage of the city I know and love.

I also enjoy working in the construction industry as it brings me into contact with a wide variety of people and entails collaborative working, which is stimulating. I’m proud to be involved in the Employers’ Advisory Board at Sheffield Hallam University, too, which offers me the opportunity to travel back each year with colleagues and maintain relationships with my former lecturers – as well as meeting future surveyors and helping them find their way into the profession. Maybe one of them will themselves become a Young Building Surveyor of the Year.

Jonathan Wright is an associate, building surveying, at Bidwells jonathan.wright@bidwells.co.uk
‘If asked to advise a landlord or its managing agents, building surveyors must check with care the terms of the lease’

Vivien King
Malcolm Hollis

‘Service charges’ — the words so often equate, sorry to say, to arguments and disputes in the landlord and tenant field. Thank heavens, say building surveyors, that the arena is one for management surveyors and not for us. But is that so? And can building surveyors afford to ignore the new RICS Service charges in commercial property professional statement?

Although this document is a first edition professional statement, as of 1 April 2019 it supersedes three former editions published as codes of practice; applies throughout the UK; and contains mandatory requirements for all RICS members acting in the service charge field (RICS.org/servicechargesps).

The lease provisions should, of course, always be read with care. The professional statement does not override these provisions but should be read in conjunction with them.

The services to be provided by a landlord and for which it can charge its tenants are set out in the service charge provisions in the relevant lease. Words such as ‘repair’, ‘maintain’, ‘amend’ and ‘renew’ appear often, and the principles applied to a tenant’s covenant to repair — in which the same words are so commonly used — will be applied in this context too. Judgments in service charge cases will ring very loud bells with the many building surveyors working in the field of dilapidations.

Take for instance the Hon. Mr Justice Blackburne’s judgment in the service charge case Fluor Daniel v Shortland Investments [2001] EWHC 705 (Ch). Before implementing works pursuant to service charge provisions it presupposes that ‘the item in question suffers from some defect (i.e. some physical damage or deterioration or, in the case of plant, some malfunctioning) such that repair, amendment or renewal is reasonably necessary’, the judge said.

Furthermore, he stated, ‘the condition of the item in question must be such as to be no longer reasonably acceptable, having regard to the age, character and locality of the premises, to a reasonably minded office tenant of the kind likely to take a lease of the building. Whether, once those conditions are established, the item must be repaired or renewed is a question of fact and degree having regard to the nature and extent of the defect and, not least, to the costs likely to be involved.’

Sound familiar? Of course it does. It reflects judgments in numerous dilapidation cases and, as with covenants to repair, the precise wording of the service charge provisions will vary from lease to lease. Sadly, many disputes highlight that the varying wording is misunderstood, misinterpreted or, worse, ignored. Those seeking to recover the costs of works that the landlord wishes done will often make assumptions as to what the provisions say.

No longer. The first mandatory requirement of the new professional statement is: ‘All expenditure that the owner and manager seek to recover must be in accordance with the terms of the lease.’ If asked to advise a landlord or its managing agents, building surveyors must check with care the terms of the lease in question.

Although the remaining mandatory requirements are clearly addressed to management surveyors — covering, for instance, the provision of an explanatory commentary to accompany budgets, preparation of accurate and timely accounts and keeping service charge monies in separate bank accounts — building surveyors should be aware of them. The mandatory requirements are underpinned by core principles, which cover, for instance, allocation, as well as a demonstrably fair and reasonable apportionment of the service charge between the tenants.

The financial level of service charges has often come as a nasty shock to tenants; that should no longer be the case. Timely and regular communication and consultation with the tenants should ensure that they understand what will be provided and at what cost. Also, improvement costs above those of normal maintenance, repair or replacement should not be included.

So, should building surveyors ignore this professional statement? Certainly not.

Vivien King is a consultant to Malcolm Hollis vivien.king@malcolmhollis.com

Related competencies include: Landlord and tenant, Property management
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Concrete understanding

The first of two articles on historic concrete structures looks at how the material came to be so widely used

Simeon Wilkie
While it is unclear when concrete originated, it is likely that attempts to make it occurred at several locations during the Neolithic period. Some of the oldest known examples include lime concrete floors at Yiftahel, southern Galilee, from around 7000 BCE, and Lepenski Vir, Serbia, around 5600 BCE.

By 500 BCE, concrete was being used in Greece with a degree of skill, and some of this contained highly siliceous, volcanic Santorin earth. Roman builders, often incorrectly thought to be the inventors of concrete, were the first to appreciate its full potential and used it in some notable structures, including the Colosseum and the Pantheon. They also mastered the use of pozzolana, volcanic ash from Pozzuoli containing silica and alumina, which allowed them to create hydraulic cements. While engineers carried this knowledge with them throughout the empire, the use of hydraulic limes and concrete died out with the fall of Rome, and was not rediscovered until the 18th century.

In 1756, John Smeaton received a commission to build the third Eddystone Lighthouse in the English Channel. Due to the failure of the previous timber lighthouses, Smeaton concluded that it must be made of stone blocks cemented together, and that this could only be done by using an hydraulic mortar. After experimenting, he selected one comprising equal parts Blue Lias lime from south Wales and Italian pozzolana from Civitavecchia.

By the end of the 18th century, there was a demand for reliable hydraulic cement as civil engineers sought to build canals, harbours and bridges. Furthermore, the London Building Act 1774, which effectively prohibited the use of exposed timber details on buildings, prompted great experimentation and resulted in many different types of hydraulic cement. The most famous was James Parker’s so-called Roman cement, and although it set too quickly to be used in foundations, it became popular for structures in contact with water as it rendered them watertight.

Prominent figures who made use of Roman cement were Thomas Telford, who employed it in constructing the Chirk Aqueduct and Aberdeen Harbour, for instance, and Scottish civil engineer Robert Stevenson, in building Bell Rock lighthouse.

There followed several notable attempts to produce higher-quality cements, by Louis Vicat, James Frost and Charles Pasley for example, though none gained the popularity of Roman cement. When Parker’s patent lapsed in 1810, many manufacturers began to produce their own Roman cement, the most successful manufactured by Francis and White. This cement was famously used by Brunel on the Wapping–Rotherhithe tunnel under the Thames, and by other renowned figures, such as English railway engineer Robert Stephenson and, then president of the Institution of Civil Engineers, James Walker.

In 1824, Joseph Aspdin patented Portland cement; however, this was merely an hydraulic lime and did not contain the necessary clinker phases that modern Portland cement does. The first cement to do so was produced by Aspdin’s son William, who discovered that clinkered or overburnt material substantially increased its strength. Isaac Charles Johnson, works manager for White, then produced the first reliable Portland cement, as his understanding of chemistry allowed him to appreciate the importance of vitrification in burning raw materials.

The first known major use of concrete in 19th century Britain was by Sir Robert Smirke at Millbank Penitentiary, which was built between 1817 and 1822; he underset the walls with lime concrete to a depth of 3.7–5.5m. The rescue of the London Customs House from 1825 to 1827 then involved undersetting sinking walls with a new system of lime concrete and brickwork laid in cement. The use of lime concrete for foundations soon became standard practice, though further attempts to make structural concrete with natural cements, lime and Roman cement were of limited success. This changed, however, with the invention of Medina cement by Francis.

After the dissolution of the partnership of Francis and White, he relocated to the Isle of Wight where he produced a number of cements, including Medina, which was then used in several notable construction projects, including some on the island. One such was on Queen Victoria’s Osborne House estate, where it was used for the walls and arches of two houses. However, Medina cement’s success would be short-lived as, by 1848, it had to compete with reliable sources of Portland, which provided a more practical alternative. Yet, in the first major use of Portland cement for concrete at the breakwater at Cherbourg harbour, Medina also had to be used as Portland set too quickly. Around 20,000 concrete blocks were supplied for the project, each of which was 20m³ and required four tonnes of Portland cement and 1.75 tonnes of Medina.

In 1850, in an attempt to promote the use of his Portland cement for house construction, William Aspdin began work on a large mansion near Gravesend, Kent, called Portland Hall. It was to be completely cased in Portland cement stucco, to feature Portland cement statues and ornaments in its grounds, and to be surrounded by a high concrete wall, thought to be some of the earliest commercially produced precast concrete units.

Although improvements in Portland cement chemistry in the 1800s led to a stronger material with a wider range of applications, the use of concrete in construction was hindered by its tensile capacity. It was therefore confined to large, mass concrete structures that carried loads in compression. Examples of the ingenuity with which the compressive strength of mass concrete was put to use can be found in the viaducts on the West Highland Railway, particularly the Glenfinnan Viaduct, which was constructed by Sir Robert McAlpine in 1897.

Following the Industrial Revolution, it became apparent that there was a need for strong, economical and fire-resistant building materials in structures such as mills and warehouses, which were often destroyed in fires. This need could be met by concrete, reinforced with steel to increase tensile capacity. The invention is generally credited to William Wilkinson, who was granted a patent in 1854 and was the first to use reinforced concrete as a composite structure, embedding a network of flat iron bars or wire rope in floors or beams of flat or arched concrete. While his design was never adopted by the building
The most successful figure in the history of reinforced concrete is undoubtedly François Hennebique, whose system was the first to be widely used in the UK.

industry, Wilkinson applied it himself in constructing an entirely reinforced concrete cottage around 1865.

Numerous other reinforcing systems were patented and implemented in construction with varying levels of success. In 1855, François Coignet filed a patent describing a design for concrete flooring that contained iron rods; while the patent itself failed to take off in the UK, Coignet established himself as a contractor in France, and the ideas he put forward were further developed on this side of the channel by other contractors such as Joseph Tall and Charles Drake. As well as constructing some of the earliest reinforced concrete buildings in the UK, Tall is also noteworthy for his invention of standardised, re-useable timber shuttering, which significantly reduced the cost of concreting works. This system was improved by Drake, who also constructed a number of stately homes from concrete.

Further progress in reinforced concrete design can be attributed to US and European inventors. In 1871, American William E. Ward began to experiment with reinforced concrete and concluded that placing the reinforcement at the bottom of concrete beams was the most effective use of the iron’s strength. Another American, Thaddeus Hyatt, came to the UK in the early 1870s and investigated the most economical way of making reinforced concrete that was still fire-resistant.

The most successful figure in the history of reinforced concrete is undoubtedly François Hennebique, whose system was the first to be widely used in the UK. Hennebique’s success can be attributed to his design, which incorporated cheap, readily available reinforcement, and also the way he affiliated himself with established contractors, granting them access to operate his patents on the understanding that they followed his strict specifications on methods and supervision of work. Originally, all calculations were carried out by Hennebique’s engineers in Paris, but were later done by his agents in their own offices before being sent to the capital to be checked. In 1902, ten years after starting his company, Hennebique was handling more than 1,500 contracts a year and directing a company with licensed contractors in almost every country in Europe. By 1909, his system had been used in almost 20,000 structures, and the company had 62 offices across four continents.

The first decade of the 20th century saw the continued international development of many different reinforced concrete systems, with varying degrees of commercial success. At this time, there were no regulations for concrete and specialists had their own requirements for designs. It was not until 1904 that the first British textbook on reinforced concrete appeared; written by Charles Fleming Marsh, it described various proprietary systems developed in Europe and the USA, as well as structural theory and calculations. Despite this publication, and the formation of the Concrete Institute in 1908, the design of reinforced concrete structures remained in the hands of a few specialist consultants. However, this all changed in 1915, when reinforced concrete regulations were introduced and technical information finally became widely available to designers and contractors.

This was not only an era of experimentation with reinforcement systems but also the concrete’s physical composition. Concrete is a mixture of cement, sand, coarse aggregate and water, and while the basic mix design for reinforced concrete at this time was 1:2:4 of cement, sand and coarse aggregate, respectively, with proportions of 1:1:2 and 1:1.5:3 also common, many specialist contractors had their own mixes that they would specify for use with their reinforcement systems.

There was also a great deal of variation in the amount of water added to each mix. For example, Hennebique’s only specification for water content was that it resulted in a plastic mix that could be rammed — a requirement that would itself vary with the mix proportions, and the type and grading of aggregate used. The water-to-cement ratio is a key factor determining concrete’s durability, as it affects how porous the hardened material is and therefore how easily harmful agents can ingress and cause deterioration. This was not understood by engineers at that time.

The composition and size grading of aggregates were also extremely variable, primarily due to variations in local geology, the technology available to crush rock and a lack of scientific understanding. These factors not only affect the strength of hardened concrete but also the workability of the fresh mix and its tendency to segregate. It was not until 1907 that Fuller and Thompson published the first major work on the selection of aggregate grading, and not until much later, in the second half of the 20th century, that the effects of an aggregate’s chemical composition were properly considered.

While 20th-century building codes and design standards gradually evolved to take all these issues into account, there remain a vast number of structures around the world that have been built with various binders, aggregates, mix designs and reinforcing systems very different from those with which we are familiar today.

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In the long term it can be easier to do the right thing when you are told to do so, and this much may be evident in the amendments to Building Regulation 7.

After government consultation on combustible materials in external walls, regulation 7(2) now states: ‘building work shall be carried out so that materials which become part of an external wall, or specified attachment, of a relevant building are of European Classification A2–s1, d0 or Class A1’. This has now been made a legal requirement for buildings more than 18m tall, under regulation 7(4).

Most professionals should know the difference between guidance and statutory requirements; Approved Documents clearly state, for instance, that ‘there is no obligation to adopt any particular solution contained in an Approved Document if you prefer to meet the relevant requirement in some other way.’ The problem is the subjectivity of what is appropriate, adequate or reasonable, to cite the terms used in those documents.

Conversely, section 7 of the Building Act 1984, which is often overlooked, implies that any deviation from Approved Documents will suggest liability if there has been a failure to comply with the Building Regulations. This sort of legal conflict needs addressing.

To illustrate the difference between guidance and regulation, consider higher-risk residential buildings: a combination of compartmentation, smoke control and suitable sprinkler installation can offer layers of safety, but if these are suggested in guidance rather than stipulated by regulation it is possible, in theory, to engineer some elements out.

Added to this, enforcement of some regulations can prove problematic. Look at Building Regulation 27(2) on carbon dioxide emission calculations; this should be submitted by designers no later than the day before the work starts, but enforcing this is difficult to say the least.

More worryingly, in the past, there seemed to be a light touch with Building Regulation 38 on fire safety information and the requirement that ‘the person carrying out the work shall give fire safety information to the responsible person not later than the date of completion’ for some types of building. This has to change.

At a fire-stopping seminar last year, I asked whether there should be more prescription in the sector, such as making sprinkler installation mandatory in certain instances. My feeling is that some prescription may be necessary, particularly in high-risk buildings where, if the main protective measures such as compartmentation were compromised, there could be a serious threat to life safety.

Some panel members believed further prescription would be excessive. However, someone who deals with specialist fire protection also stated that there should be a regulatory requirement — in other words, prescription — for third-party fire-stopping certification. Everyone has their own agenda, but I think decision-makers should identify key criteria for fire safety and consider whether these should be made into regulation. The balance will be difficult, but for me this is important in the light of the Hackitt Review.

Realistically, would anyone now attempt to design out sprinkler protection in a 30m-tall apartment building? This has effectively become a prescription, and turning this and similar practices into regulation could make it difficult to ignore key safety issues.

Hackitt told the Housing, Communities & Local Government Committee on 28 January this year that she believes the government has done the right thing in banning combustibles in external walls. She has also accepted that there may need to be more regulation in future, with an extended ban on combustible materials for instance.

However, she also stresses that the emphasis should be on cultural change among those who are responsible for fire safety. Rather than viewing holes in guidance or regulation as a way of complying with statutory requirements, such duty-holders should take a more accountable and holistic approach.

Michael Morgan is a technical manager at jhai

Related competencies include: Fire safety, Legal/regulatory compliance
Legal

‘Until recently, courts had been ruling that the paying party could not bring an adjudication for true value’

Q: I am the main contractor on a large infrastructure project, and we subcontracted the work to a small firm. Towards the end of the project, this subcontractor issued an interim payment application that suddenly included an extra £3m, vastly overvaluing its works. I didn’t send any payment notice or pay-less notice, but simply paid a fair amount at the end of the month, omitting the £3m.

The subcontractor is threatening to adjudicate for the full sum it sought. If we have to pay its inflated figure, there won’t be sufficient time left on the project to recover the £3m by deducting it from subsequent interim payments. Can I start an adjudication for the true value of the subcontractor’s works and simply pay that sum?

A: This is a useful reminder that the paying party should always adhere to contractual notice requirements. The action threatened by the subcontractor is colloquially known as a smash-and-grab adjudication.

Until recently, the courts had been ruling that the sum applied for would be payable in these circumstances, and that the paying party could not then bring an adjudication for the true value of those works. Last November, the Court of Appeal confirmed in S&T (UK) Ltd v Grove Developments Ltd [2018] EWCA Civ 2448 that a paying party that has failed to serve both a payment notice and a pay-less notice is still entitled to commence an adjudication to have the true value of the application assessed and to reclaim any overpaid sum.

The judge gave six reasons for this decision, as follows.
- The first two centred on the fact that the courts and adjudicators have the power to open up, review and revise any sums shown as due in interim applications.
- The third and fourth centred on the judge’s finding that disputes on the notified sum are distinct from those on the true value of the works, so a decision on the former did not preclude an adjudication on the latter.
- The fifth reason was fairness: the contractor can challenge the value of the notified sum when seeking payment of a higher amount, so it is only fair the employer can do likewise to reduce the notified sum.
- In the sixth reason, the judge drew a comparison with the position at the final account stage, when a true-value adjudication is allowed, suggesting interim payments should be treated in a similar way.

In Grove, the Court of Appeal also considered the question of timing. The judge found a true-value adjudication could not start until after payment had been made, and that the mandatory payment provisions in the Housing Grants, Construction and Regeneration Act 1996 (as amended) must take priority over the statutory right to adjudicate: thus the paying party must pay first and adjudicate later. This position was followed in February 2019 in M Davenport Builders Ltd v Greer and another [2019] EWHC 318 (TCC).

It remains unclear whether a party can adjudicate for the true value if it commences this process either before the smash-and-grab adjudication, or after but before a decision on the notified sum. How a party seeking to run a smash-and-grab adjudication would stop the true-value adjudication if the paying party started one also needs clarifying — would it have to challenge the adjudicator’s jurisdiction or seek a court injunction?

Applying the judgments in Grove and Davenport, the main contractor may be best served by:
- starting an adjudication for the true value before the subcontractor starts its smash-and-grab adjudication, to convince the adjudicator of its jurisdiction regardless of the dispute on the notified sum
- seeking an expedited timetable so the notified-sum adjudication, if commenced subsequently, is not decided before the true-value adjudication.

Charles Blamire-Brown is partner and David Greenwood senior associate at Pinsent Masons

Charles Blamire-Brown and David Greenwood, Pinsent Masons

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Valuation vocation

A surveyor explains how her enthusiasm for the built environment inspired her transition from valuation assistant to FRICS

Trudy Woolf

When I became a valuation assistant, I had already worked in banking and insurance. Typing reports for valuers, I aspired to do more; but at the time the opportunity to do so was just not available.

I realised that I wanted a career linked with my passion for buildings. What better way to start than with a diploma in surveying at the College of Estate Management at the University of Reading.

I was one of the first valuation assistants at Colleys Surveyors, part of Lloyds Banking Group, to embark on this route to qualification. A two-year course alongside two years shadowing a surveyor was slightly daunting, but the opportunity was too good to turn down.

Returning to studying after a ten-year gap I was a little apprehensive, but I soon got to grips with distance learning. This meant I could spend a day a week studying, as well as continuing to work as a valuation assistant for the first year. I had to be self-disciplined, motivated and highly organised to juggle full-time employment and learning.

Through the course, I enjoyed understanding how buildings are put together, how they work, the likely associated defects, and how to apply lender policy — those criteria relating to, for example, property type, which may or may not be acceptable to lenders in given circumstances. After completing the diploma and two years’ practical experience shadowing a supportive mentor, I eventually qualified as a TechRICS. This led other valuation assistants in the business to follow the same career path to qualification.

I spent many years valuing and surveying residential properties for mortgage purposes in and around Birmingham. Although I was happy carrying out such work, my goal was to become a chartered surveyor — but without a degree I was still some way from achieving this.

Distance learning

I then decided to embark on a seven-year degree in building surveying, following the residential survey and valuation route. I used all my weekends, purchased additional annual leave as well as self-funding the course while I continued with full-time employment. After many years of hard work, I finally qualified with a first-class honours degree.

During this time an opening for a secondment became available in my organisation’s head office as part of a technical team, and after an interview I secured the role. The work was interesting and varied, and enabled me to gain experience in defects and professional valuation negligence complaints, as well as dealing with technical queries from valuers, brokers and intermediaries.

This then led to further opportunities to work on technical training online, with projects including a one-stop portal for building surveying-related articles, technical papers and training material for surveyors who specialise in building interiors. I also helped support and coordinate a surveying graduate programme, providing a range of technical support and mock interviews. I was then able to draw on all this experience when I became a chartered surveyor in 2011.

Given my enthusiasm for buildings, I decided that my final dissertation would explore the factors affecting whether or not to move historic properties; I also had a journal article published covering the topic (see Building Conservation Journal May/June 2011, pp.4–5; isurv.com/historicbuildings).

Together with additional experience in trainee and graduate programmes, I applied for FRICS designation, which I was lucky enough to achieve in 2014 between two spells of maternity leave. I am now an expert adviser to residential chartered valuation surveyors on technical matters, as well as a subject matter expert on new build.

I would encourage anyone who has a passion for buildings, surveying and valuation to look into what courses are available that fit your work schedule and lifestyle. Juggling a young family and work is difficult, but I find it incredibly rewarding, and for the past few years I have also been helping the RICS associate assessor programme.

Trudy Woolf is a quality assurance and new build technical manager at Legal & General Surveying Services

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Professional practice

In the second of a series on becoming RICS-qualified through the APC, one candidate reflects on achieving competencies before devoting time to preparing for the final interview

Uzoma Jemade

I get asked a lot by people who hope to get into the construction industry whether a degree is needed if you want to become a building control surveyor, and what professional qualifications you can achieve. I give the same answer each time: a degree is not always necessary, but it will make your life easier if you complete an RICS-accredited degree because it will shorten the timescale needed to achieve chartered status. Having done an accredited master’s myself at Kingston University, I am now progressing through my APC towards MRICS status (see Built Environment Journal April/May, p.58).

To help me prepare for the last 15 months of the process, I have come up with some coping strategies. I want to hone my public speaking skills for my final interview in June next year, in which I will be quizzed by three APC assessors, so I have found it useful to practise PechaKucha presentations. These consist of 20 slides you have to get through with only 20 seconds for each; to ensure that I have processed the information and that I’m not just reading from slides, I use images only.

Another strategy I find useful is to network with other surveyors doing their APC and to keep up to date with developments by reading this journal as well as Modus and connecting on LinkedIn. By doing so, I have been able to access good resources and CPD.

My employer, jhai, is gearing up for an audit by the Construction Industry Council in the coming months. This brings to the fore the need for the utmost professionalism, which includes keeping CPD records up to date and demonstrating that our duty as approved inspectors is discharged properly. It is thus important for a company to employ a good proportion of chartered surveyors, highlighting the necessity of the APC pathway in Building Control.

In my role as a building control surveyor, I relate my experience of the working day back to the APC in my diary and consider how the knowledge I have gained can be applied and demonstrated. One example of this is a project I was working on recently. Although this was completed in 2011, a final inspection was not requested until this year. The homeowner informed me that she was not in possession of the Gas Safe and Part P electrical certificates for the works undertaken. I told her we would need these to demonstrate compliance with J1–3 and Parts 1 and 2 of the Building Regulations. I searched the Gas Safe website and found out that the gas work was completed in 2013 and she could purchase a duplicate certificate. This experience was valuable, and helped me achieve the Client care competency.

My experience of more complex projects is increasing. I am currently working on a site where land is contaminated; an investigation revealed that the topsoil contains fragments of ash and slag and a strong petrol odour in various locations. Advising on this project will help with completing the Contaminated land competency in my APC summary of experience. As I work in London, I also find it useful to ask colleagues in other regional offices whether they have projects I could work on, given that ground conditions and construction techniques can vary throughout the country.

The case study of the APC is undoubtedly the most sizeable element of the 24-month structured pathway. It will differ to my master’s dissertation as I will have to refer to my own experiences and offer detailed and professional advice. I renewed my RICS membership in January as I continue with the APC, which promises to be the toughest but most rewarding journey of my career.

Uzoma Jemade is a trainee building control surveyor at jhai
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The best way to learn

Since writing my last article (Built Environment Journal February/March, p.59), the biggest personal change I have experienced is that I am now able to work proficiently without the guidance of a senior surveyor.

I can now quote for, plan-check and inspect a much larger range of jobs, although my work still needs to be signed off by a qualified colleague. The feeling of being trusted with more kinds of work has accelerated my development and given me great confidence.

I have always strongly believed that the best way to learn is to do. Even though mistakes may be made, these can serve as lesson so we don’t repeat them. This system also provides a safe way to learn: all trainees have their work checked by a qualified member of staff, so any mistakes on a job will have no serious implications.

My confidence in my studies has also been bolstered. One of the main topics that we’ve been studying is fire safety; I have recently completed the assessment, and I have been assigned to look at fire safety in nightclubs. Having researched this in great depth, I have been deeply shocked by some of the tragedies that have occurred over the years, and this is in just one particular building type.

Lessons should have been learnt from experience but have not been; regulations suggest buildings should be constructed to meet minimum standards instead of the safest ones, and in my eyes the latter should always take precedence.

After researching various case studies, such as the 2013 Kiss nightclub fire in Rio Grande do Sul, Brazil and the 2003 Station nightclub fire in Rhode Island, USA, I have been reminded of why our job is so very important. Although both fires may not have been avoided had the buildings been covered by the present-day UK regulations, the death tolls would certainly not have been as high. In studying this topic, I have been able to use my expanding knowledge of Building Regulations while also being reminded that there is a human cost in not doing a good job.

Back at the start of my APC training, I had to select certain optional competencies in which I would develop my skills and reach a certain level. One of these was Building pathology, which I selected under the guidance of my mentor and fellow journal author John Miles in the knowledge that it was a subject that I would be studying for a year.

It has been taught by our course leader and been a highlight of my university day; studying methods that surveyors use to understand building defects. Learning such subjects from the ground up has given me a great understanding, and I believe this is an important part of ensuring building control surveyors of the future are well rounded.

I am also completing my APC diary on a weekly basis, which is a good way to identify areas that require extra focus. On any given day I am likely to be inspecting simple domestic work that covers required competencies such as Building control inspections and Building pathology, while also vetting plans and issuing quotes for client care.

One area that is barely covered by these tasks, however, is fire safety. To ensure I am progressing in this critical competency, I am assisting qualified surveyors with more complex and commercial jobs, and shadowing them on site at high-rise residential and large commercial projects.

This is improving my understanding of why our job is so important. We are not just ensuring buildings comply with regulations for today’s occupants – we are ensuring they are safe for generations to come.

Jake Green is an assistant building control surveyor at Assent Building Control jakegreen@assentbc.co.uk

Jake Green

Detailed research on fire safety and independent work on a range of sites are helping a trainee building control surveyor to progress through his APC, as he explains in the third of a series of articles.
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Sports redirect

A trainee surveyor explains how he returned to his family’s profession of building control after a career in sport and fitness

Chris Pratt

With both parents working in building control, I grew up hearing discussions about it around the dinner table. The talk of statistics and legislation day in day out almost put me to sleep, and I couldn’t think of much worse a fate than joining my parents in the profession.

While my brother chose architecture as a career, close enough to our parents’ work to contribute to the conversations while still doing his own thing, I jumped as far from that particular ship as I could when I left school. Instead, I chose to study sport in college before going on to take a degree in exercise, health and fitness at university.

Throughout my studies I worked in the leisure sector as a lifeguard, immersing myself in sport as a hobby and a career. I have a lot to thank sport for, not least helping me overcome some personal issues. But I didn’t start to consider a career change until my brother introduced me to Tough Mudder — a series of events designed to challenge you physically and mentally — as a way of overcoming those issues.

Tough Mudder quickly became my passion. I not only compete nationally at weekends but have also been appointed as an ambassador by the organisation. Employed in the health and fitness sector I had very little opportunity myself for sport or competing — working weekends are the norm — added to which even though I was only 23 I had quickly hit the progression ceiling. But I had my degree as well as management experience, so I started to give serious thought to a change in career.

The family dinner-table conversations must have infiltrated my consciousness because I now started to consider building control. Hearing about my dad’s work as a building control manager made me realise that a career in the profession was not only a credible but attractive option, and with the clear route for progression that I craved. It offered everything I’d been looking for — work–life balance, earning potential, employment opportunities, variety, teamworking and ongoing training.

I applied for and secured the role of trainee building control surveyor with Derbyshire Building Control Partnership (DBCP), a service combining the knowledge of six established local authority services. Although I was taking an initial step back in terms of salary and having to begin learning again, the opportunities far outweighed any short-term drawbacks.

I now combine my time in the office and on site shadowing DBCP’s surveyors with attendance at the local college one day a week studying a Level 4 HNC in Construction and the Built Environment.

The amount of knowledge required in building control has been a surprise: as well as existing legislation there are regular updates and new building techniques and products, all of which have to be learnt and understood. It’s daunting but I’m enjoying it and it’s certainly never dull. I feel part of a supportive team at DBCP. Just being in the office helps as I absorb a lot from the conversations the building control managers are having, all of which contributes to building my personal knowledge and learning.

I’ve gone from saving people as a lifeguard to preventing disaster for building users. It’s a different type of job satisfaction, but one that I am glad to have.

Chris Pratt is a trainee building control surveyor at DBCP

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How can you go about improving your APC summary of experience?

Ewan Craig

Next to your case study, your summary of experience is a significant part of your APC submission. Your summary represents you and your work to the APC assessors; and even before you meet them, it is a key consideration in a preliminary review of whether you are ready to proceed to final assessment or not.

As the assessors’ first impression of you comes from your submission, your summary of experience needs to be first-rate. It tells them what you have achieved and what you selected for each competency to best represent your work. Your selection of experiences is also important as these influence most of the 35 minutes of APC interview that follows questions on your case study.

There are differing approaches that can improve your submission. Do follow the APC guidance and sample APC submission (rics.org/candidate), and give yourself plenty of time for preparing, considering and checking your summary, as the process needs both time and careful management if it is to be successful.

A basic schedule or Gantt chart will help create targets and deadlines. You can develop a plan by working backwards from the submission date and allowing time for proofing, drafting, building up the experiences, reviews and so on. Your plan could be as basic as a simple spreadsheet or dates in a calendar, provided you stick to it and take action if needed. Time spent on preparation also enables you and your supervisor or counsellor to identify any competencies where you may not gain enough experience. A strategy should be in place to address any deficiencies early on.

You should record experiences against the relevant competencies when they are fresh in your mind and you have access to the relevant data. Ideally you will have a range of suitable experiences from which to select the best for your summary. When selecting, do consider demonstrating your breadth of experience. Building surveying practice pertains to properties and facilities that can vary, for example, by type, age, use, client, regulation and region, so it is better to demonstrate your range of experience to your assessors by discussing different types where possible.

Depth and diversity

There can be a temptation to use the same project or even the case study repeatedly. However, even if you are only involved in one project, usually a substantial one, or with a single client, do show the breadth of your work. Although you may feel constrained by having only one client, such as a housing association, there can be valuable experiences that demonstrate work on different buildings, such as offices, or community facilities.

Your supervisor or counsellor can help guide you in selecting a good mixture that showcases your breadth and depth of experience. When drafting your summary of experience, always write in the first person, for example, ‘I did …’ or ‘My role …’. You must communicate what you did and were responsible for, to show that you meet the specific competency at or even above that level. Do acknowledge whether others were involved, but be specific about your part, which at Level 2 or 3 must be as an active participant in providing the service.

Do keep to the word limits, which proportionally allow about 100 words per mandatory competency level and 166 words per core and optional competency level. Successful summaries often reduce the number of words used for Level 1 to allow more at Levels 2 and 3. Level 3 experiences should communicate your reasoned advice, so typically convey greater detail through fewer examples and a proportionally higher word count.

Having the submission checked for spelling or grammar errors as well as being proofread by at least one other person is highly recommended. Do also ask someone who is knowledgeable about the competencies to give you critical feedback. Then prepare the final draft for your submission (rics.org/pathways).

Ewan Craig is an APC assessor, APC coach and local director with Right Surveyors ecraig@rightsurveyors.co.uk
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BUILDING MATERIALS INFORMATION SHEET 9: Structural timber

Summary
For centuries, timber has played a crucial role in construction. It can be used for primary structural components, such as frames and beams, for non-load-bearing partitions and decorative panelling, for external cladding and roofing, and for individual components such as windows and doors. This is in part due to its wide availability, ease of working and aesthetic qualities, but most importantly its inherent properties. Responsible forestry management also ensures it is a low-carbon material. Selecting the correct timber for repair or replacement of historic building elements is complex as a result of the high degree of variability.

Tree structure and type
As a tree grows it becomes thicker. At the centre of the trunk is the pith, surrounded by heartwood, while the outer layers — bark, cambium and sapwood — are alive and growing. The heartwood is ideal for structural timber, as it is stronger than sapwood and naturally resistant to biological attack.

There are two types of timber, namely softwoods and hardwoods — though not all softwoods are weak and not all hardwoods are stiff and strong. In general, hardwoods are higher-density than softwoods. Softwoods are derived from gymnosperm trees such as conifers, hardwoods from deciduous trees and broad-leaved evergreens. There are more than 60,000 tree species in the world, of which about 150 are used commercially.

Durability and strength
The durability of structural timber depends on its response to agents of decay such as fungi or beetles. Rosewood and teak are two of the most durable types; Sitka spruce and willow are two of the least. A stable, low moisture content discourages biological attack.

The strength of wood varies between species, within species and even within a single tree. Timber is strong in both compression and tension in the direction of the grain, but weak against forces that pull the grain apart. The nomenclature of timber strength classes has changed over the decades, with the current standard having 12 softwood classes from C14, weakest, to C50, strongest, and 14 hardwood classes from D18, weakest, to D80, strongest.

Repair and replacement
Wood can decay as a result of biological, chemical, thermal, mechanical and photochemical processes, as well as the more immediate damage caused by, for example, fire. In some cases, timber can be treated to arrest the decay and sustain its function in situ; however, in others it may be degraded to the point where it is no longer fit as a building material and needs replacing.

A key difficulty in performing like-for-like timber repairs is that the original timber is difficult to assess. Over time it can change chemically, losing acetyl groups from hemicellulose polymers.

Using species as a guide for replacement is challenging as very few people are trained in timber identification, and the level of variation in strength within a single species means this approach may not be ideal anyway. Systems such as acoustic testing can indicate the strength of timber before installation, but not in situ.

Successful repairs follow a few simple guides. Minimal repairs are preferred to large-scale timber replacement, and when this is done successfully the repaired member containing both old and new timber should act as a single unit. Assessing the timber in terms of density is a good first step if analytical tools are not available.

This materials information sheet was compiled by Craig J. Kennedy, associate professor of building materials at Heriot-Watt University, Edinburgh. craig.kennedy@hw.ac.uk

Additional data sources
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<th>OVERCLADDING</th>
<th>LIQUASIL COATING</th>
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<td>Asbestos Roof</td>
<td>£65-75* psm</td>
<td>£35-40* psm</td>
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<tr>
<td>Metal Roof</td>
<td>£60-65* psm</td>
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### OVERCLADDING
- May require planning permission
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