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Building Surveying Journal

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OPINION

Alex Charlesworth considers the tools that enhance our daily work and how technology is changing the built environment

Technology works

I have always been a champion of technology to help us with our daily business, but it must stand the business case test. That is, does it work, and how does the cost compare with the return?

In the case of building information modelling (BIM), I feel that the promotion of its benefits to building surveyors falls down, because the vast majority of us do not yet appreciate what it is, how its cost measures up to its return, and why it would benefit us. That is, we are not able to apply the business case test.

I believe we are at a tipping point, however, where BIM will start to have more and more of an impact on our daily lives the more we embrace it. Bear in mind that BIM is not just about 3D modelling and collaboration: it is about document management and a centralised platform for sharing data, made up of many different systems all talking to each other. But in order for us to embrace this new technology, the proponents of BIM must first persuade building surveyors of the business benefits (see p.12).

Tools

The technology used in building investigations is also improving. For instance, infrared cameras are now being used more frequently by building surveyors, adding value to our reports and our defect diagnosis. Drones also arrived with a flurry of excitement – a toy that can be justified as a business tool! – until regulation restricted their use (see p.10). Nevertheless, they will still be able to enhance our forensic investigations, although many of us will employ specialist companies to operate them rather than buying our own.

Using tablets to gather data and prepare surveys is another area where surveyors increasingly see the benefits of time being saved on site. Doing so while maintaining the quality of service is a clear justification for using this new technology, leading to a boom in take-up (see p.16).

> “BIM is not just about 3D modelling and collaboration

Workspace changes

Technology is also changing the environment in which we work, and in turn, this is leading to changes in the way that investors, developers and occupiers view the workspace. Improved wifi enables laptop users to roam around buildings, accessing data via cloud storage based off site. This has reduced the need for servers in each building, therefore lowering cooling and power requirements.

Thanks to employees' demands, buildings are now beginning to work harder for organisations, with different areas enabling different working environments. For example, collaboration space allows cross-selling of ideas and co-creation space lets clients and partners work together in the same environment, while buildings' connectivity is improved. We no longer need rely on having to work in the office at all, as connectivity has improved in our homes, coffee shops, transport hubs and even in the outside world. Without the constraints of wires or paper, we are free to select the most appropriate setting for the activity in hand.

This is just common sense, though, and we are starting to see businesses really embrace it. However, there are still many companies who look to office space as a place in which they should squeeze as many employees as possible. This will change.

Retail

Retail is another area where technology has really changed the high-street, industrial and logistics sectors, driven by the public pressure exerted by online shopping.

Retailers have reacted by making substantial changes to the supply chain, and as our confidence and trust in the internet is growing, we will continue to see huge changes in this sector. The UK is more advanced than many European countries, and forward-thinking investors are predicting similar growth patterns and taking pre-emptive action in the property market as a result.

With changes in how property is used and viewed come opportunities, particularly for building surveyors. Developments in technology will no doubt lead and continue to influence how we use and interact with the built environment. We must embrace change using technology tools that help our daily work, and have the foresight to see the benefits to the built environment that technology will bring.

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Getting to grips

As International Property Measurement Standards become mandatory, **Tom Pugh** gives a ground-level view of how it will affect professional practice

On 1 January, the way we approach reporting the size of office buildings saw a step-change. It follows the incorporation of the International Property Measurement Standards (IPMS) into a new professional statement *RICS Property Measurement*, 1st edition – itself a redrafting of the RICS *Code of Measuring Practice* (CoMP).

Why is it needed?

Differing measurement standards across the world can lead to a variance of up to 24% in the reported area of the same building. Considering that property accounts for 70% of global wealth, the magnitude of this discrepancy is vast.

The need to formulate a uniform approach to measuring buildings was clear, and a coalition was formed to agree on a set of global standards. So far, the IPMS coalition has released the standards for offices: residential, industrial and retail will follow. As the new sections are released, the RICS professional statement will also be updated.

Differences: RICS CoMP vs IPMS

Unlike its predecessor, the professional statement is mandatory for all RICS members. Reporting under RICS CoMP and the IPMS is different, although not hugely so. Most obviously, naming conventions have changed: gross external area (GEA), gross internal area (GIA) and net internal area (NIA) are now known as IPMS 1, IPMS 2 – Office and IPMS 3 – Office, respectively.

The differences are fully set out in the professional statement, but the most important are as follows:

- balconies, covered galleries and rooftop terraces are now included in IPMS 1 and IPMS 2 – Office
- in IPMS 3 – Office, columns are included while standard building facilities (e.g. corridors, toilets, lifts, stairs) are excluded
- IPMS 3 – Office also introduces the concept of "limited-use areas" such as those with restricted ceiling height – these can be highlighted separately, enabling comparison/translation between IPMS and preceding standards
- internal measurements are now taken to the internal dominant face for both IPMS 2 – Office and IPMS 3 – Office.

There is no requirement to review leases in light of the release of IPMS where the existing lease or contract is based on measurement figures derived from an existing standard or stipulates a particular measurement standard to follow. Deviation from the professional statement is also acceptable where a client has stated, in writing, that they would prefer an alternative, specified standard to be used.

Buildings must, however, be measured under IPMS "in the event of a physical change to a building" or for "any new event requiring the use of building measurements" such as new agreements, rent reviews, sale or purchase or revaluations. Adopting a long-term view on when IPMS measurements are taken may well be the shrewdest approach. For example, it will be much more cost-effective if the landlord of a multi-let office measures the whole building, rather than measuring each space as the individual leases expire. It would also eliminate the potential confusion in having the newly let unit's rent calculated using IPMS, while service charges are still CoMP-based until the remaining units' leases expire.

It is also worth pointing out that IPMS measurements can be used by all property stakeholders for a range of purposes, not just agreeing rent and valuations, but also in costing refurbishment, space planning and service charges, to name but a few, so the benefits of IPMS are wide-reaching.

Market value

Although building areas will change on paper, the market value of a building remains exactly as it always has been – that is, what a purchaser is willing to pay. The data that sits alongside a valuation will be consistent across property markets, which will lead to a clearer comparison of the relationship between valuation and space in the different markets.

There is no standard ratio between CoMP and IPMS, but with that in mind, RICS has developed a free online tool that converts IPMS office measurements in local standards.

It is envisaged that there will be a period of dual reporting, in which areas will be presented in both formats, while the new system becomes embedded into market practices.

It may well be that measured survey instruction levels will rise as a result of IPMS, at least in the first instance. But this is not just an opportunity for geomatics and land surveyors: it is very much a positive way to promote greater transparency, comparability and consistency, and to boost confidence in the property industry as a whole. And that is no bad thing for us all.

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For details on IPMS, visit
www.ipmsc.org/standards/office
www.rics.org/internationalstandards
https://consultations.intstandards.org

Related competencies include
Legal/regulatory compliance, Conduct rules, ethics and professional practice, Inspection

UPDATE

Skills shortages restrict UK construction

Skills shortages continue to hamper growth and drive up wages in the UK construction industry, according to the RICS UK Construction Market Survey for the fourth quarter of 2015.

Average construction earnings have risen by more than 6% in the year to October – a marked increase on the average UK wage rise over the same period, which was less than 2%.

"The construction skills crisis is slowing growth in a sector that is vital to UK plc," warns Sally Speed, RICS Future Talent Director. "Unless the government looks to address the problem urgently, some of its key housing and infrastructure programmes could soon face crippling delays and spiralling costs.

"Ministers must look to draw a link between education, future careers and skills. Employers need to take the lead in improving skill levels, providing more vocational pathways to work and actively engaging with schools and colleges."

› http://bit.ly/1J4YfLV

Building Surveying Conference

19 April, QEII Centre, Westminster, London

The RICS flagship annual conference will feature sessions on:

- building information modelling
- construction, design and maintenance regulations
- inclusive design
- dilapidations case law
- party walls
- defects
- APC mentoring.

› Visit www.rics.org/bsconf

BRE signs China retrofit deal

BRE is to advise Chinese property developer Evergrande on a £200m green retrofit programme across its portfolio. Under the joint agreement with Tsinghua University, the goal will be for Evergrande's properties to achieve the BREEAM international energy standard and the Chinese three-star national standard.

› http://bit.ly/1PW63jF

Publications

The National House Building Council's *Technical Extra* 19 has stated that the requirement for sprinklers to be fitted in residential premises in Wales has been extended to all new homes built in Wales from 1 January.

In addition, following reported fires in consumer units that have burnt through moulded thermoplastic enclosures, Amendment 3 to BS 7671:2008, *IET Wiring Regulations*, 17th edition, has introduced a regulation requiring that consumer units and similar switchgear assemblies in domestic premises should be fitted with non-combustible enclosures.

› http://bit.ly/1NXirPH

A free, downloadable guide from Building Services Research and Information Association, *Building performance evaluation in non-domestic buildings*, provides a general introduction to the evaluation process, explaining its importance and how it can be carried out.

› http://bit.ly/1lZQvng

Survey reveals lack of readiness for BIM

Three-quarters of surveyors believe that failure to adopt building information modelling (BIM) could seriously hinder the UK construction sector over the next year, according to RICS research.

The government is committed to using BIM to improve its management and operation of buildings, and infrastructure is requiring BIM Level 2 for centrally procured contracts from April 2016.

› http://bit.ly/1FkTkyW

In brief...

International standards

A new consultation platform is now online for international standards, allowing consultations to be carried out in a safe, transparent and auditable way.

› https://consultations.intstandards.org

RICS library ejournal service

Members looking for information on a new market, a business issue or informal CPD can use the RICS Library's ejournal service, which is available by logging on to rics.org and visiting:

› www.rics.org/ejounals

RICS training and events

22 March, London
Surveys in practice roadshow, focusing on the interior of properties
› www.rics.org/surveysroadshow2

30 March, London
Commercial building pathology: analysis and reports
› www.rics.org/commbuildingpath

RICS Online Academy

Web classes this spring include:

4 April
Dilapidations: a case study
› www.rics.org/dilapscasestudy

22 April
Damp: identification and treatment
› www.rics.org/damptreatment

25 April
Dilapidations: schedule, quantified demand and tenant's response
› www.rics.org/dilapschedule

UPDATE

A new green deal

In December 2015, at the conclusion of the United Nations Climate Change Conference (COP21), the Paris Agreement adopted by 195 countries and the European Union was described as a "turning point for the world".

The agreement set an important challenge – to limit the increase in the global average temperature to well below 2°C and preferably to 1.5°C, requiring a significant reduction in greenhouse gas emissions. The reaction has been positive, especially from organisations such as the Breakthrough Energy Coalition, launched at COP21, which will provide funding to help accelerate the pace and scale of investment in renewable energy and energy efficiency retrofitting.

The UK government has stated it is determined "to keep energy bills as low as possible", which has resulted in cuts to its financial support for renewable energy and energy efficiency retrofits. In addition, over the course of 2015 a number of standards such as the Code for Sustainable Homes and zero-carbon buildings were scrapped (see p.14).

Energy security is a key policy issue in the UK, with a pressing need to increase new energy sources – principally shale gas, nuclear, and offshore wind – to offset the reduction in supply capacity due to the proposed phase-out of coal-fired power stations by 2025 and reduce the reliance on imported energy.

The government has taken a number of positive steps in response to this, including the introduction of the Minimum Energy Efficiency Standard under the Energy Efficiency Regulations, and the implementation of the Energy Savings Opportunity Scheme, which have both helped to raise awareness of energy performance.

> "Energy security is a key policy issue in the UK, with a pressing need to increase new energy sources

On the horizon are replacements for the Energy Company Obligation and Green Deal schemes and the proposed simplification of business energy tax. Of note is the UK's world-leading Climate Change Act 2008, which sets long-term, legally binding targets to reduce carbon emissions by 80% by 2050, compared to 1990 levels.

Also of note is the industry's response to this, which has been reassuringly forward-thinking, particularly from the property investment and construction community in relation to optimising buildings' operational energy performance and supporting low-carbon energy generation.

In conclusion, the government faces a challenging conundrum – how to improve energy security while maintaining affordability and how to reduce our greenhouse gas emissions to limit global warming to 2°C or below. This requires innovative thinking and support from the private sector, which is where chartered surveyors can help.

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Making space

In October last year, the Chief Building Surveyors Society (CBSS) merged with the Society for Public Architecture, Construction, Engineering and Surveying (SPACES) to make a stronger, multidisciplinary society. SPACES had itself been formed earlier in the year to bring together the Society of Construction and Architecture in Local Authorities and the Society of Mechanical and Electrical Engineers.

CBSS was founded in 1972, and the first annual general meeting was held at the Royal Institute of British Architects.

The original purpose was to provide a forum for surveyors working in local government who were primarily engaged in the maintenance of public buildings. The primary drivers for the merger were to promote and share best practice in the strategic maintenance of public buildings and make the professional experience and knowledge of its members more widely available.

While membership of the CBSS was originally intended for those working in local authorities, it has more recently been opened up to staff at consultancies working in the public sector.

Over the past 40 years, members have become more widely involved in the stewardship of public buildings, including asset management planning, facilities and estate management, design and modernisation. CBSS has also evolved in response to ongoing changes such as outsourcing, delegation of budgets, efficiency agendas, and reducing energy use and carbon emissions.

Meeting regularly at both national and regional level, the society has addressed and survived the changes of organisation and responsibilities in local government, a widening of roles in departments due to the integration of teams and the disaggregation of financial budgets. These have led to major changes in the management of the property function and also to typically smaller in-house property department teams.

The vote to join SPACES represents the coming together of those working in building design, management and maintenance of public buildings, who will now be better able to grow and thrive.

Links with RICS will be maintained through a member of the Building Surveying Professional Group Board who will also take on a key role in a Surveyors Interest Group at SPACES.

Further details of the society are available at
www.thespaces.org.uk

Leading from the front

RICS is taking the initiative on sustainability and risk management, explains President **Martin Brühl**

I have benefitted enormously from RICS over the years. My outlook and career have been substantially shaped by its concepts, standards and ethos.

I wanted to bring new areas of expertise to RICS, to share what I have learned. As President, I have come through the route of practice, not governance. My experience comes from extensive stakeholder engagement rather than RICS working groups.

I believe that this is the time for RICS to lead on the important issues, both of today and the future. We cannot hope to lead on every issue in our sector, but we can choose to offer leadership in those areas that matter most. During my Presidential year, I am focusing on responsible property investment, and more particularly, the areas of risk management and sustainability. These topics are vitally important and require renewed emphasis

Risk management

As head of global transactions for a fund manager deploying €2.5bn of investment per year, I am acutely aware of my duty to invest other people's money responsibly. This has never been easy, but the present pressures to cut corners are great. We are operating in a world of historically low interest rates engineered by central banks, greater demand for pension funds in the emerging economies, and a trend towards more fund investment in real estate as an alternative asset class.

My clients traditionally prefer safe investments in the core cities of their home country. But a global market requires us to look beyond core cites and spread investments across geographical regions and diverse assets. The associated risks can never be quantified with complete accuracy – and are only ever an expression of probability.

These topics, and many more, are discussed at the quarterly RICS Global Investment Risk Management Forum. I have established these meetings to bring chief risk and investment officers together. The primary aim is to share our knowledge, to help foster public and market confidence in real estate investment around the world.

RICS has a role to educate and regulate so that risk managers understand the changing nature of risk. We are ideally placed to make a difference, as an internationally respected professional body. RICS has an opportunity to help foster public and market confidence in real estate investment.

The broader risk we face is to our profession as a whole. It could come from shifts in market practices, from the slow but sure onset of climate change, or from the broader reputational damage that could result from opaque supply chains. The likelihood of mistakes can be lowered through professional risk management based on technical and professional standards, ethical behaviour and effective regulation.

However, I believe that the answers will not come solely from within our own ranks: specialists can provide insights on topics such as central bank policy and regulation, forecasting and alternative property investment classes. These experts can complement the rich knowledge and experience our profession offers and help us to have greater impact.

Ultimately, standards are the bedrock of our approach to risk, and we must continue to engage the profession constantly to develop and adapt them.

Sustainability

Sustainability is a key theme that goes hand in hand with risk management to create responsible businesses. It has many facets, from protecting the environment to creating a diverse and viable future for our industry, from investing ethically to acting in the public interest.

During my inauguration speech in June, I was delighted to launch a toolkit RICS developed with the UN Global Compact. *Advancing Responsible Business Practices in Land, Construction and Real Estate Use and Investment* is a guide for organisations looking to take responsible decisions at every stage of the real estate life cycle. It translates the Global Compact's 10 principles on human and labour rights, environmental protection and anti-corruption into practical steps.

Our long-term relationship with the UN led RICS to COP21 in Paris in December, the annual climate change conference. We are truly leading from the front for the built environment in this arena. The Global Alliance for Buildings and Construction was launched at the event,

Image © iStock

a worldwide building sector network backed by the governments of France, Germany, Japan, the United Arab Emirates, Cameroon and Senegal among others. RICS is the only professional body on the list of initiating partners.

At COP21, we focused on how collective action and commitments could support the international climate agenda. The World Bank estimates that 70% of the world's wealth is bound up in real estate. Buildings account for 40% of global energy consumption and one third of greenhouse gas emissions. UN statistics estimate that the building sector employs 111 million people, and is worth more than US$7tr – around 10% of global GDP. We have a clear collective responsibility to take action on climate change.

My message to participants, from an investor's perspective, was that green buildings attract a premium. They diminish risks for investors and offer occupiers greater certainty about running costs.

COP21 was all about commitments. RICS is in a particularly strong position to make commitments and deliver on them. We already have the mechanisms in place to measure and monitor progress, including our international standards and the know-how of our vast network of RICS professionals operating in more than 145 countries.

We are committing to influence and change the way our sector does business.

Public interest

Risk management and sustainability are strongly linked to RICS' public interest remit. In the run-up to our 150th anniversary in 2018, we have been reconsidering what the public interest means in the present day.

RICS' founders defined the public interest in our Royal Charter by talking of "usefulness" and public "advantage". But these are words of their time. To the Victorians, usefulness was grounded in a prevailing moral philosophy, that of utilitarianism. It focused on maximising the utility of all individuals to achieve the greatest happiness for as many as possible.

But are the wishes of the majority always synonymous with the public advantage? And is the public interest purely a human concept, or does it have ecological and environmental dimensions too?

We have been asking stakeholders what the public interest means to them throughout my Presidential year and have received a range of thought-provoking responses.

There is a strong idea that public interest does include environmental dimensions. Becoming more sustainable can work in the interests of both investors and the wider public. By investing in sustainability now, assets are more assured of value in the future. Others have noted that sites can have different types of value. Land that may have limited value on the open market, for instance a public open space, can have great value in terms of societal benefit. There needs to be a better understanding of this type of value.

Still others have commented that taking care of the public interest also represents enlightened self-interest. Complying with laws and regulations is not always enough. If we act against the public interest but in line with the law, would we be happy for such activities to be reported in the media? Most likely we would not.

It is unlikely that codes of professional conduct or standards of ethics will be adequate to define the public interest. There also remains a question about how individual professionals can be expected to judge in practice what is in the public's best interests, not least as they rarely – if ever – have access to all the relevant information.

Let's continue to lead on the important issues for our sector today and in the future. We have much to add, but also to learn, to meet our public interest commitments and deliver on our promise of professionalism.

Martin Brühl is RICS President
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Just think about it

Milton Silverman draws attention to the hidden impact of EU regulations

EU directives have had a bad press in the UK over the years. They direct EU member states to implement specific, workable national legislation in accordance with generalised proposals; but sometimes these directives and the subsequent legislation have effects beyond those envisaged. This is arguably the case with Council Directive 2011/88/EU and similar directives, which aim to protect consumers in respect of contracts negotiated somewhere away from the provider's business premises, and distance contracts negotiated by email or phone.

The Consumer Contracts (Information, Cancellation and Additional Charges) Regulations 2013 (the regulations) came into force in June 2014 and apply to valuers, estate agents, surveyors and many others. They aim to protect vulnerable consumers from pressurised selling, for example by door-to-door salespeople, where they do not have a chance to reflect or compare prices. The actual effects are rather more wide-ranging, however.

The importance of the regulations is that sellers of goods or services to consumers, but not businesses, must provide certain information and documentation and a 14-day cooling-off period from the time of purchase, failing which consumers are entitled to their money back for more than a year afterwards.

The regulations:

- apply only where businesses are selling goods or services to a consumer who is acting in an individual, personal capacity
- require consumers who enter into most distance or off-premises contracts to be provided with a 14-day cooling-off period following their agreement to sign up for or purchase the goods or services
- require provision of information and documentation (detailed in the regulations) that sets out rights to cancellation for the consumer before they are bound by the contract.

Failure to provide the requisite information and cancellation documentation can be a criminal offence, and there are fines and provisions for enforcement. Most importantly, if the service provider does not give such information, the client has the right to cancel an off-premises or distance contract, and reimbursement of any sums paid for one year and 14 days after the time when the cancellation period would otherwise have

Email to clients

Dear (client)

If, when you have read the information below, you would like me to commence work immediately (specify the work if not already clear from the context), please email me as follows:

"I have read the information below, and attached Request for Immediate Commencement (the request). I now ask you to commence work immediately in accordance with the provisions of the request."

Information for clients

Cancellation provisions

Where we are acting for you as an individual in your personal affairs (and not in a business capacity) the Consumer Contracts (Information, Cancellation and Additional Charges) Regulations 2013 will apply to your engagement of our services. These require us to provide you with certain information when the contract is made. In this regard, your attention is drawn to the Consumer Provisions and other information below.

You have the right to cancel your engagement of our services (the Agreement) within 14 days of the date hereof. You can do so without giving any reason: your attention is drawn to the attached Notice of the Right to Cancel and the Request for Immediate Commencement of Work.

Consumer provisions

Our details:

- (name, address and phone number of service provider). Our contact email address is the same as that from which this email is sent
- the services we intend to provide are surveyor/valuation services (as applicable)
- the manner in which our fees are calculated and arrangements for payment are set out in the documents enclosed/previously supplied
- the Agreement is of indeterminate duration and it is not possible to set out the exact time by which the services will be fully performed. We shall keep you informed of progress but please contact us if you have any questions relating to the completion of our work. The conditions for termination are set out in our letter of engagement enclosed/previously supplied
- we are RICS members (*www.rics.org*) and adhere to its code of conduct and complaint-handling service
- you acknowledge that you are aware that we are prevented from starting work on your instruction until after the cancellation period without your consent (see attached Request for Immediate Commencement).

Should you have any complaint concerning our engagement (to include the advice you have been given/fees you have been charged) please contact (name).

Request for immediate commencement

For return to Super Surveyors Co. Ltd

If you require us to commence work immediately (specify the work), please email confirming such request or sign and date the form below.

Instructions to commence work immediately
To Super Surveyors and Co. Ltd
(address and contact details)

I hereby instruct you to commence work with immediate effect.

I am aware of the following:

- I have the right to ask that you do not start work on my behalf until after the 14-day cancellation period; however, I wish you to commence work immediately
- as I have requested work to begin on my instruction during the cancellation period, I will be liable for any fees, disbursements and applicable VAT you may charge me for work reasonably incurred during that period
- in the event that the work is completed by you during the 14-day cancellation period, I will lose my right to cancel.

(Signed and dated by customer)

Notice of right to cancel

You, the client, have a right to cancel the agreement referred to in the accompanying email within 14 days of the date hereof (the cancellation period). You can do so without giving any reason. To exercise that right, you must inform us (name of organisation, registered, address, phone and email details) in a clear, written statement of your decision to cancel.

You may use the cancellation form below, but this is not obligatory. A dated letter or email to the above address setting out your clear decision to cancel will also suffice. To meet the deadline, your communication must be sent before the cancellation period has expired.

Effects of cancellation
If you exercise your right to cancel, we will not undertake any services on your behalf and you will not incur any charges. However, if you request work to begin on your instruction during the cancellation period, and subsequently cancel the Agreement after work has started as requested but before the expiry of the cancellation period, we may charge you any fees, disbursements and applicable VAT reasonably incurred during that period.

Cancellation form
This is only to be returned if you do not wish us to continue to act for you in respect of your instruction before the end of the cancellation period

To Super Surveyors and Co. Ltd

I (client name) hereby give notice that I wish to cancel the Agreement (dated ...) for the provision of valuation/survey services (as applicable).

(Signed, dated, printed name and address of signatory)

commenced (i.e. normally 14 days, although only if all is done properly from the beginning). In practical terms, a customer who has not been supplied with the relevant information will not have to pay.

In relation to service providers, there is provision to enable the customer to request that a provider commence work during the cancellation period (effectively waiving the regulations), provided that the requisite information and documentation has been properly supplied. As long as the customer has received the paperwork on their rights relating to the 14-day cooling-off period, they can waive those rights and request immediate commencement.

In 2014, the Supreme Court considered the case of Robertson v Swift [2014] UKSC50. The owner of a removal business failed to supply the relevant information to the customer. Their Lordships ruled that the owner was not entitled to his outstanding fees and he had to repay the deposit.

It is far better and simpler to get the paperwork organised beforehand, send it to the client and, having received their signed instructions, to commence work.

The statutory information can be set out on two sides of A4; how best to integrate it into your business practice and PR will require more thought. Suggested sample forms are shown (left and above), but please note they are drafts only, and you should take legal advice prior to using them.

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Related competencies include
Client Care and Business Planning

Craig Lippett explains the rules, regulations and training needed to fly unmanned aerial vehicles

High flyers

The exponential expansion in the use of unmanned aerial vehicles, or drones, is transforming the way a wide range of industry sectors conduct their business, none more so than the surveying community.

However, the pace of technological advancement has outstripped the evolution of regulations, an issue that continues to pose challenges for operators who wish to fly in more complex environments to meet the needs of their customers.

The majority of those entering this new sector have little or no experience, many simply being established professionals such as surveyors, inspection engineers, asset managers, agronomists and archaeologists. The principles of operating a drone are new so each organisation must learn quickly.

Across Europe, each country has broadly similar regulations, although the transfer of qualifications and operating permissions between states has not been harmonised.

The UK Civil Aviation Authority (CAA) has adopted a light-touch approach to drone regulation, with the aim of striking the right balance between managing risk to the public while enabling the industry to grow.

Two years ago there were 260 organisations in the UK certified to operate drones, with 1,600–1,700 qualified remote pilots. Now there are 920 organisations, and with 10 more being approved each week they could number between 2,500 and 3,000 in another two years.

To become certified, a company must obtain a CAA Permission for Aerial Work (PfAW), which allows the holder to work for commercial gain and also sets the operational limitations. The key document in the PfAW submission is the Company Operations Manual, which outlines how flying activity will take place, what drones will be used and the safety principles employed. An organisation must be insured for drone operations.

Flying test

Pilots must undergo a certification process offered by national qualified entities (NQEs) on behalf of the CAA. They must undergo theoretical training or demonstrate an acceptable means of compliance such as a private pilot licence and a competency assessment, in the form of a practical flying test.

This full certification process is offered by the NQEs that have emerged in recent years to deliver on behalf of the CAA.

The theory element is normally classroom-based, over two to three days (although can be as little as one day), and focuses on regulation, airspace considerations, how a drone works, how to set up a flying site, and conducting pre-site surveys and risk assessments.

The culmination is a flying test, during which the candidate is given a representative flying task and demonstrates their ability to plan, set out a flying site, perform basic flying skills and show how they react to emergency situations to assess their competency.

If successful, the pilot is certified to fly the configuration and weight category of the drone tested. For example, if it was a Phantom 3 UAV, then the pilot could fly four-, six- or eight-engine rotorcraft up to a weight of 7kg. Between 7kg and 20kg, the remote pilot is automatically qualified for the below-7kg category.

> “Although initially slow to recognise the benefits, the survey community is now embracing drone technology

The next step is completion of the operations manual, which is submitted to the CAA together with evidence of pilot competency and insurance, and around two months later the organisation can expect to be issued with its PfAW.

The vast majority of firms holding a PfAW are concerned with basic aerial imagery for marketing, inspection and high-end production video.

Preparing a drone for flight

Joining the armoury

Although initially slow to recognise the benefits, the surveying community is now embracing drone technology as an additional, essential tool for capturing data and imagery. Sophisticated drone technology means that a surveying professional can find it easier and cheaper to get a sensor in a point in time and space to capture the raw data they need.

Drones come in all shapes and sizes, but the class below 20kg are used by almost all currently certified organisations. They can be rotorcraft – a helicopter with multiple rotors, usually four, six or eight engines – or fixed-wing. These fly like conventional aircraft with forward motion generating lift to keep the platform in the air. They can be hand-, bungee- or rail-launched and often employ features such as parachutes to ensure a safe landing.

With safety in mind, all drones must have and be able to demonstrate failsafe features that automatically bring them back to their launch point in the event that the radio link between the remote pilot and the platform is lost.

The proliferation of drone use means that awareness among the general public has grown, and news pieces about near misses with airliners keep them in the forefront of people's minds.

The rules enable a remote pilot to operate in a 500m radius from the launch position and up to 120m above the ground, keeping the drone in sight at all times. A margin of 50m must be maintained from people, cars and buildings unless they have been briefed and pilots cannot fly over large groups of people or congested areas – by definition, villages, towns and cities.

The UK has a high population density, second only in Europe to the Netherlands and Belgium, and a lot of the available work, especially in support of the construction industry, can be found in built-up areas. The CAA has recently released the operational safety case concept. This enhanced permission requires the applicant to demonstrate a greater level of safety but could mean an easing of the usual limitations.

For instance, the standard lateral distance of 50m might be reduced to as little as 10–15m if the applicant can show the correct level of risk mitigation.

This can be demonstrated by more comprehensive pilot training, a greater number of safety features on the drone and more safety elements built in to the operational procedures. In general, the more safety features submitted, the wider the choice of work for the operator.

Around 1,300 enhanced companies certified permissions have currently been granted, which puts the holders in a select club of those who can perform work that the vast majority of certified drone companies cannot. In this sector, as in others, it pays to stand out from the crowd.

For surveyors, drones are not the answer to every problem, but employed in the right way they fulfil a useful function. And as sensors develop, the future holds some exciting visions.

What about miniature pocket-sized drones that can be taken out and thrown into the air? They could survey a 50ha area in 20 minutes in all weathers, with data uploaded to the cloud to be processed and delivered to the client two to three hours after capture – all with no direct human interaction. Perhaps not as far away as you think.

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Related competencies include **Remote sensing and photogrammetry, Legal and regulatory requirements, Mapping**

Image © Craig Lippett

Martin Hoyle discusses opportunities in the renewable energy sector in the light of significant changes to government subsidies

Adapting to change

In July 2015, the Department of Energy and Climate Change made the shock announcement that subsidies for UK renewable energy projects would be withdrawn without notice, in favour of investment in gas and nuclear technologies to secure future UK energy supply. While the removal of subsidies was inevitable, the speed at which it has happened, coupled with the confused government energy policy, has led to considerable uncertainty in the sector.

In addition, there is also a potential 15% VAT hike on the horizon for solar photovoltaics (PV) on residential properties. Currently, householders pay VAT at 5% on domestic solar installations, a level which the European Court of Justice has ruled breaches its VAT Directive. As a consequence, HMRC is currently consulting on the rules, with any changes set to come into force in August 2016. These could add £900 to a typical 4kW installation, potentially extending the payback period by 12 to 18 months. The impact of a VAT increase could be a significant reduction in the installation of PV on residential properties, and consequently less work for installers.

As a building surveyor active in the renewables sector, I have experienced first hand the impact the most recent changes have had. Some investors have decided to leave the market, some are already focusing on other investments, and active developers have either left the sector or are seeking opportunities in other parts of the world. As an example, I am now reviewing or hearing about renewable developments in Turkey, India, Jamaica and Africa, so perhaps our skills will naturally be redeployed around the world in coming months.

But is this the end of renewable energy investment in the UK?

The country has to attract investment for new energy infrastructure in order to keep the lights on, as it only has a 1.5% capacity margin at present. The government has stated that such investment will not happen without its intervention, but while it is looking to subsidise new gas plants, it seems illogical that it is cancelling support for renewables at the same time.

Subsidies

My experience is that the sector is very experienced in dealing with change and adapting to new environments: where else would you find the technology, creativity, skills and capability to drive investment in renewable technology but the UK?

However, the near abolition of subsidies and the decision by the European Commission last December to launch an inquiry into the use of minimum import pricing (MIP) for solar PV modules from China will only further the uncertainty in the sector, as it could take up to 15 months to reach a finding on whether to keep or remove MIP.

To enable the development of renewable energy plant, the costs need to be reduced to bring them in line with more traditional technologies such as gas and nuclear. If you consider that the global average price for solar modules is currently around €0.40/W but that with the MIP Chinese panels must be imported at €0.56/W, costs could be reduced by 30% if the MIP were removed.

With the wholesale market at around £45/MWh, gas needs between £65 and £72/MWh to build new generation, whereas technologies such as solar have only proved to be competitive at £79/MWh in the Contracts for Difference auctions.

Therefore, if the MIP's removal were combined with sector-wide technology advancements and associated cost reductions, then perhaps the industry would once again thrive without subsidy.

Adaptation

The sector should be able to adapt to the latest policy changes, although it will look different as a result, taking longer to redirect its efforts and re-establish itself. Advances in technology such as battery storage will also play a part, as will the cost reductions and creativity necessary to make potential schemes viable.

This may require alterations to planning consents, making underground grid connections overland instead, a possible increase in the size of plant, and a reduction in anticipated returns for investors and profits for developers.

Finally, there are also emerging opportunities for building surveyors in the UK energy sector with short-term operating reserve and peak power generation, neither of which are clean technologies but will help to keep the lights on. Adaptation may be the name of the game – always a vital skill for any building surveyor.

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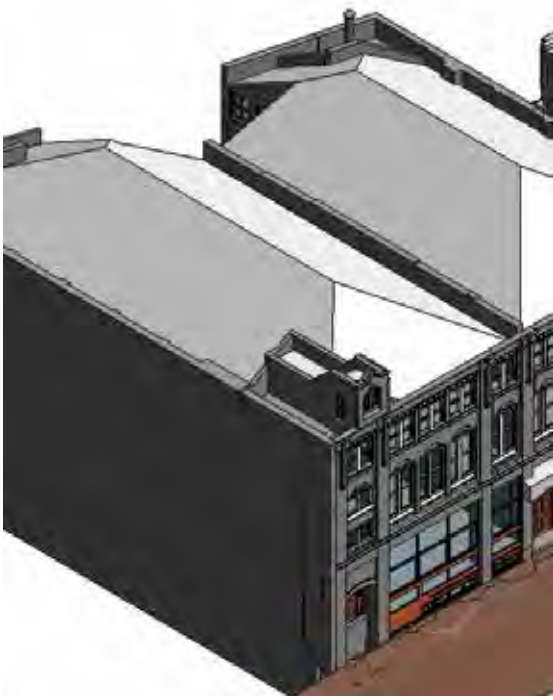
Related competencies include
Sustainability

Image © PMBC

Ian Sutton outlines the progress of building information modelling in the UK

The way forward



In May 2011, the Cabinet Office published the government construction strategy, which had the goal of cutting the cost of government construction projects by 15%–20% by reducing waste, reforming industry practice and securing better value through procurement. Central to achieving these ambitions is promoting building information modelling (BIM).

Introducing *BIM in 2012*, the then Cabinet Office minister Francis Maude stated: "This government's four-year strategy for BIM implementation will … unlock new, more efficient and collaborative ways of working. This whole sector's adoption of BIM will put us at the vanguard of a new era and position the UK to become the world leader in BIM" (*http://bit.ly/1phZewm*).

It was an ambitious goal to set – but is it an achievable one? One year later, an update to the strategy included a progress review, the results of which confirmed the beliefs of BIM advocates across the industry: it reported that "cost reductions of £72m have been achieved in one year and whole project life cost reductions of £279m have been identified on new contracts awarded and projects registered during 2011/12" (*http://bit.ly/1IoHHh6*).

From these figures, it is clear that BIM has enabled significant savings on public capital projects. So what is stopping BIM being used more widely in building surveying?

Financial benefits

Governments are often among the first client groups to favour BIM. As stated, they not only identify direct savings to programmes financed by public capital, but as a result, also seek to enhance efficiency.

Facilities management (FM) is often cited as the stage in the property life cycle that BIM offers the greatest return on investment. However, for commercial developers, with whom the building surveyor is often engaged, this is of little value if those assets are to be sold on practical completion.

Building surveyors should be guiding these clients to see BIM as a marketing tool, potentially delivering assets as turnkey investments with a ready-made FM solution as part of the handover and close-out.

However, some private-sector clients have already recognised the financial benefits that BIM can provide; the UK university sector is one example where there are clear advantages in establishing a digital view of the entire estate and handing it over after design and construction. Technically, the state still regards universities as private-sector and they must comply with all the relevant fiscal rules.

An adequate asset information model can be used to automate large elements of any planned preventative maintenance schedule, and even flag potential cost savings by replacing elements that are nearing the end of their serviceable life and are difficult to access.

A lack of understanding

The introduction of BIM is often compared to the industry's move from paper drawings to CAD during the 1990s. However, where CAD computerised a single process, leaving macro-level processes largely the same, BIM workflows fundamentally change the way that professionals interact. Perhaps unsurprisingly, a lack of knowledge about BIM's benefits has stymied wider adoption.

RICS polled its members on their current understanding of BIM, and in response, commissioned a model of its Parliament Square headquarters, to share the challenges and benefits of the process and broaden understanding.

Subsequently, between 2013 and 2015, the Chartered Institute of Civil Engineering Surveyors BIM Action Group carried out a heat map survey that determined levels of understanding and awareness of BIM across the built environment industry at large (*http://bit.ly/1PG0F43*).

The results show that the industry is still heading in the right direction, but perhaps not as quickly as some would like. There also continues to be a lack of understanding of the BS/PAS 1192 family of documents and the acronyms associated with them.

The Publicly Available Standards (PAS) suite of documents are fundamental to achieving the government's 2016 level 2 targets, but the BIM Action Group believes that, while most individuals on a project should know the basics of the BS/PAS 1192 family, it would be too much to expect every employee to have a thorough working knowledge of every standard and specification.

This is a huge opportunity for building surveyors to secure themselves a more central role.

Key BIM documents

For the layperson, the entire BIM process is underpinned by the information delivery cycle set out in PAS1192 – 2.

At the capital expenditure stage, the first key document setting a strategy to meet the client's needs and underpinning the entire BIM process is known as the employer's information requirements (EIRs). The EIRs set out the information that the client requires to run their new facility and make decisions about its development throughout the delivery process. It is the client's responsibility to produce this document so clearly the building surveyor conversant with these documents can do so on their behalf.

Once this strategy is in place, procurement can take place, and a BIM

Image © CBRE

Revit model produced by CBRE for the One Crown Place, London, BIM project

execution plan (BEP) can be created based on the EIRs; these may also form the basis of the supply chain information execution plan, commonly referred to as the supply chain capability summary.

The key components of the BIM and who is responsible for them needs to be agreed.

The BEP explains how the information modelling aspects of the project will be carried out, and should address the following four areas:

- project information: listing project description, scope, foreseeable challenges, the main stakeholders and key BIM personnel
- project objectives and goals: listing BIM objectives as set out by the client in the EIRs, and the specific tasks for each professional or team engaged by the client, programming, and key performance indicators
- collaborative working: listing project BIM standards, project coordinates, modelling standards, communication and meetings, data exchange protocols, model/data validation protocols, model/data subdivision, modelling units, BIM mock-ups and area calculation methodology
- project resources and IT requirements: listing stakeholder BIM software expertise, common data environments, hardware/technology infrastructure requirements for all stakeholders, software requirements for all stakeholders and any project-specific BIM content.

Following the tendering process, the master information delivery plan (MIDP) is produced, setting out the information that is to be prepared, who needs to put it together and how it should be produced and circulated.

Once the MIDP is produced, the design team can begin delivering the project following the six stages set out by RIBA, creating their information model in full accordance with the client's requirements.

These stages are governed by PAS 1192 – 2 and end with a project information model, which can then be handed over at the operating expenditure stage.

It is at this point that the asset management phase begins. This is governed by PAS 1192 – 3 and results in an asset information model, which the client can use in the life-cycle management of the building.

It is clear that building surveyors are ideal candidates for the management, audit and/or production of these BIM documents, as these duties go hand in hand with surveyors' more traditional roles, such as contract administration, development and project monitoring.

Threat to workloads?

A small proportion of the quantity surveying profession, however, believes that the prospect of automated quantitative take-offs, as promised with the introduction of '5D BIM', is a threat to their workloads.

This '5D BIM' refers to the intelligent linking of individual 3D CAD components with schedule/time constraints (4D) and then cost-related information (5D), which can enable automated take-offs.

As a result, some quantity surveyors are reluctant to adopt BIM, which raises the question of whether building surveyors should adopt a similar stance. But can BIM processes actually help inform and empower them?

For example, when acting in a development monitoring capacity, the building surveyor can to a degree protect a bank that is providing development finance by keeping it abreast of costs and issues along the way. If something goes wrong, the building surveyor is expected to notify the bank, which in turn may be able to reduce or terminate its funding for the project. However, this relationship can sometimes break down or fail to work as intended, potentially leaving both financier and surveyor exposed to financial risk.

In the case of Lloyds Bank Plc v McBains Cooper Consulting Limited [2015], a number of irregularities were recorded by both sides, which led to the amount of funding provided by the bank for the entirety of the development being nearly exhausted after 21 months, leaving the development far from complete.

If this project had been following BIM procedures, it is more than likely that the irregularities on both sides would have been identified and recorded much earlier on, even before commencement on site. As such, there would have been an auditable paper trail, clearly protecting and informing both parties and potentially negating their losses.

BIM processes might not be a best fit for all projects; however, our industry is evolving, and in providing our clients with the most up-to-date and informed advice, BIM can only benefit our profession.

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RICS is publishing a guidance note on BIM for building surveyors in 2016

Related competencies include
Design and specification, Data management, Teamworking, Managing resources

A picture paints a thousand words

Although tablets are becoming ubiquitous in data capture, they are not always the right answer says **Craig MacDonald**

The profession is becoming increasingly comfortable with technology as it gains traction, and grows in relevance and importance, as Table 1 indicates. Indeed, the time will come when the majority of surveyors will not remember when technology was not part of their lives. Changes aside, the act of collecting data will remain at the heart of what any surveyor does.

I recently researched technology use in the industry through questionnaires. The question in Table 2 deliberately omitted tablet as an option. A tablet can do all of these things but I knew it would not be clear in isolating what may be the most important tool at our disposal. The majority selected the stills camera option, and when asked to qualify their selection a common response was the adage: "A picture is worth a thousand words."

The notion that a complex idea can be conveyed with a single still image, or that an image of a subject conveys its essence more effectively than a description, aptly characterises one of the main goals of visualisation, namely making it possible to absorb large amounts of data quickly.

Capturing images today is incredibly fast and straightforward. Photography is a must for any site inspection, even if only for the surveyor's own reference at a later date. Often, though, unless featuring as part of a report or schedule, images will remain unorganised and become archived, with their rich context being lost with each passing day.

Taking a record

RICS' *Building surveys and technical due diligence of commercial property*, 4th edition guidance note recommends that the surveyor always takes and keeps a permanent record of site notes (*http://bit.ly/1N7pULW*). There are solutions that use technology to aid note taking. However, our respondents were clear when asked to consider the disadvantages:

- electronic forms are often not reflective of the specific skills and expertise of the user, diminishing the surveyor's role
- forced data validation and restricted fields often conflict with the real life scenario, demonstrating a lack of flexibility and capacity for decision making
- added risk from repetitive strain injury, be it raised arms carrying loads, or a crooked neck and back from prolonged periods of looking down at a cradled tablet.

These disadvantages are a clear invitation to approach data capture differently. We apply a recommended methodology to inspections, so perhaps we should be doing the same for the images we capture.

Context

If an image paints a thousand words, it becomes the surveyor's responsibility to record them. After all, without recording the detail in good time, those words are likely to be forgotten.

Further context can be mined from images saved as specific file formats. Most have accompanying metadata, a record of key data such as date and time. Images captured by GPS-enabled devices (i.e. any smartphone) will also record geodata such as latitude and longitude to an accuracy dependent on your signal strength. When harnessed correctly, the context of images mapped by location for a client can become very valuable information.

A host of apps are now available for this task, saving time, and thus clients' money. Other factors such as consistency, flexibility and scalability become secondary selling points. GoReport and Kykloud have gained traction in this area. However lighter-weight approaches are emerging such as Beyond Condition.

Table 1

What statement best describes you?

I'm comfortable with technology and don't mind trying something new	71%
People often come to me with their computer problems	18%
If I can avoid having to learn how to use a new smartphone or app, I will	12%

Table 2

Consider tools you use to collect data on site. Which do you consider to be most important of the following?

Pen/pad/paper	24%
Stills camera	65%
Distance measuring tool	6%
Dictaphone	6%

Image ©Craig MacDonald

As versatile as the device has proven to be, is a tablet really our data capture endgame?

Tablets

The success of Apple's iPad cannot be ignored. In the design and marketing, a perception has developed that the 'future' is likely to feature the product. As versatile as the device has proved to be, is a tablet really our data capture endgame in the search for increased productivity?

Many app solutions estimate how much time a building surveyor could save, but in truth this is difficult to quantify. Many exercise some kind of rule of thumb, whereby an hour spent on site is worth five at the desk, reports that would otherwise take three days become much shorter, and covering 1,000m^2 will not necessarily take a day.

However, some respondents appear to be more realistic: "every brief is different, every site is different"; "it takes as long as it takes". In addition, surveyor's performance and experience will naturally differ from one another. Taking these factors into account, the gambit of tablets and their apps saving surveyors' time does not hold.

This temptation to 'appify' solutions may be distracting us from examining what works well and exploring how to make that work better. The findings of the questionnaire suggest that cameras work well for everyone, regardless of the device or app into which it has been integrated.

In the context of a building survey, we observe instances where human behaviour will still seek to avoid the use of the tablet and any restrictions it presents. It is important to examine these behaviours to ensure we are achieving true productivity. In the majority of cases the camera becomes our failsafe, our comfort blanket.

Future

In using a tablet as a primary and sometimes sole means to undertake work, the danger is that we may be swept up with this decade's fashionable trend. The image of someone working with a tablet instead of a paper pad presents to clients a progressive and innovative firm.

However, we should think about the lack of transparency for clients, especially when it is not often we have unambiguous data supporting the benefits we are selling, be it saving time or otherwise. We need to examine what we are good at, and how we can take advantage of the strengths presented by new tools without overlooking those have always aided us.

Our membership holds us accountable for undertaking CPD. This should not just mean catching the occasional seminar; we should be seizing opportunities to try new ways of doing things.

Newer members of the profession, raised with mobile screens and internet access, should also consider the implication of this and not become complacent simply because they are used to tablets. It is our ability to reflect on that data we have captured that cannot be substituted with automation.

Even though the humble camera has undergone major advances over the decades, it is still doing what it does best: recording a moment in time. Surveyors ought to give it the respect it deserves, and acknowledge that only we can decide how many words that picture paints. "Est modus in rebus" ("There is measure in all things") – even with photographs.

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Related competencies include **Inspection, Data management, Team working**

Assessing online

A review carried out between 2012 and 2014 provides detailed research on the performance of RICS membership assessments, writes **Kirsty Gould**

We constantly review our process for assessments to ensure their objectivity and rigour is maintained, any potential confusion over routes to membership is avoided, and they are globally consistent. Based on this analysis, our assessments continue to evolve so that they remain fit for purpose.

The research has revealed some areas in the assessment methodology where processes could be improved, together with opportunities to increase rigour and consistency. The evolution of the membership assessments plan has been defined to ensure that RICS assessment procedures remain reputable, cutting-edge and relevant around the world.

The plan is based on seven pillars of work. One of these is for us to provide greater candidate support, and the project team want to share how we are doing this.

Currently, the assessment process for the majority of candidates is manual, with limited support and connection for candidates or counsellors throughout the process. It also includes around 6,000 candidates who are no longer engaged, and have stopped working towards their assessment; lack of support has been identified as a reason for this by both candidates and employers. Our stakeholders have said they need the process to be simpler, clearer and available online.

Online pilot test

We introduced an online application for enrolment in the UK last July, as a pilot test. More than 3,000 people had used this facility by the end of October, with 1,400 progressing to become fully enrolled candidates or student members. As this functionality is integrated into the RICS systems, we can now see those who part-completed the application, allowing us to contact them on an individual basis to help and support them through the process.

The assessment environment is not simply about having a system or an online presence, but improving the entire experience. Success will lead to:

- personalised candidate communication
- improved stakeholder satisfaction
- greater understanding of candidates' experience throughout the process
- increased global performance
- reduction in administrative tasks, with greater resources invested in engagement and support
- increased data security
- increased quality and reduced duplication of content for candidates.

Counsellors

As part of the online facility there will be a dedicated area for counsellors, with a dashboard offering full tracking and audit of their candidates' progress. Counsellors receive notifications when a candidate has added experience against their competencies or submitted their case study for sign-off. Counsellors can also send messages regarding key dates and material, as well as 121 templates for meetings and virtual training for their role.

The assessment environment is designed to cover the enrolment and progress of candidates and combine the various elements of the submission and information that are required for them to apply for final assessment. Only when all the key elements are complete – including mandatory competencies, technical competencies, ethics module, ethics test, case study, relevant education and employment history – and signed off by the counsellor will the option to apply for final assessment become available. The candidate's work will then be merged into a pdf, pulling together their profile and submission documentation ready for assessment.

Assessors will also have an area where they can provide details of their availability, the pathways in which they can assess, and access to the latest marksheets and guidance notes. They will also be able to download the candidate assessment submissions if they wish.

Global roll-out

It is expected that the online assessment process will be available globally in August and become mandatory for all new candidates. Transitional arrangements will be introduced for those candidates already in progress.

In the meantime the project will include all new candidates from the RICS School of the Built Environment in India, all current and new candidates from the North America and Caribbean region and between 100 and 200 UK candidates, covering a mixture of pathways, assessment types and stages.

The simple step of moving assessments online increases the security of the candidate's information and documents, streamlines the process, obviates the need to post hard copies to all assessors and saves on the assessment panel's paperwork.

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Waterproofing walls

Building quality and good construction are vital when walls have to act as a defence against flooding, as **Jessica Lamond**, **Colin Booth** and **David Beddoes** found in their recent research

Flooding seems to be becoming an annual issue for homes and businesses across the UK, as demonstrated by the events in Cumbria, north-western England, last December. As a consequence, advice on flood protection is increasingly sought by property owners and occupiers.

There is a large array of property-level protection available on the market, with many products kitemarked to certify that they protect openings against the ingress of water. But how watertight is the fabric of a building itself? Are there any ways of improving the performance of masonry walls to keep water out during a flood?

Watertightness of walls

Most of the scientific evidence and the performance standards on the watertightness of walls are predicated on resistance to wind-driven rain permeating the masonry. However, the hydrostatic pressure of floodwater is a different issue, as water may then seep through walls and floors, rising inside a property at alarming rates. The resulting internal devastation comes as a shock to households and business owners, who believed their properties were protected.

It is well known in the professional community that water can exploit the weakest component or joint in a building to gain entry, hence the quality of the construction is important.

Government-sponsored research suggests that seven litres of water can penetrate a metre of external wall per minute, resulting in a flood depth of 1m inside a property within half an hour. In practice, this means that, unless the building is of well-constructed and low-porosity (engineering) brick or protected in some way, the water inside the property can rapidly match the level outside.

Different types of bricks and renders were also tested during the same research programme, and the conclusions were that well-constructed walls of class A or B engineering bricks can be much more water-resistant than traditional construction, and that renders can be helpful, if well applied and maintained. This research contributed to the formulation of advice for new construction in the floodplain.

Retrofit coatings

Many existing buildings also require flood protection, however, and the use of retrofit coatings offers a potential solution by boosting the resistance of walls to flooding. There are many different coatings available; renders have often been applied or waterproof coatings. However, waterproof coatings can slow drying causing potential post-flood problems and maybe condensation issues, so new technology developed in recent years aims to allow breathability – letting water vapour out – as well as water resistance.

New independent research, carried out with the support of the University of the West of England, has tested waterproof masonry coating under hydrostatic pressure that simulates a flood.

The work sought to find a low-cost way to waterproof walls, recognising that veneering systems and renders can be very effective, but also expensive and difficult to maintain. Following research and consultation, a silane-based water repellent was selected for mortar admixture and impregnation of the surface.

Silane products have previously been shown to have water-repellent properties but also, importantly, they allow the treated wall to 'breathe'. This means that the danger of moisture trapped in the wall leading to frost damage is minimised, and it will also not impede drying after a flood.

As these products penetrate the fabric of the wall rather than simply remaining on the surface, they are also thought to be more durable and need less maintenance. Testing was carried out on Shropshire red-clay-brick walls with a 1:6 Portland cement: sand mix; these were recently constructed, but designed to represent typical walls found in many nineteenth- and early twentieth-century buildings in the UK. An innovative field testing method looked at the rate that water was absorbed into walls through the bricks and the mortar joints.

The research showed that, when properly applied and allowed to cure under plastic sheeting, and with the inclusion of waterproof mortar additives and well-filled joints, the coatings can significantly slow the ingress of water to masonry walls.

This treatment did not achieve the very low rates of leakage required for barrier products kitemarked under PAS 1188 – 1:2014, but it reduced the ingress rate by two-thirds. This reduction means that the water could then be controlled and expelled by pumps, preventing more serious damage arising. Further work is currently being undertaken to explore whether different combinations of treatments can improve on this.

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RICS property-level flood resilience briefing
http://bit.ly/1ThwsrC
BS 85500:2015: Flood-resistant and resilient construction. Guide to improving the flood performance of buildings
http://bit.ly/1YhhB1P
A clear, impartial guide to flooding
http://bit.ly/1QqbWae
Flood recovery guide
http://bit.ly/1EhhRFu

Related competencies include
Building Pathology, Sustainability, Design and Specification, Construction technology and environmental services

Solving problems

Elina Grigoriou discusses how to reduce risk and increase project success through procurement and delivery for a Ska-assessed interiors project

Decisions taken in the early days of a project can affect its long-term performance. There are cases where the designers specifying products and materials on such a Ska-assessed project have not considered all of the client's needs, in terms of style, durability, cost, maintenance and environmental performance, passing the responsibility for fulfilling the remainder on to the delivery team. During the tender period, decisions should be made as to whether to include all requirements or not, to manage expectations during delivery.

Tender stage

As the tender returns are reviewed during this stage, you should check that the main contractor has sent the individual measures to the relevant subcontractors according to their trade, giving them clear advance warning that they are required to submit the evidence at the end.

It also is good practice to check whether the main and subcontractors have a dedicated individual who will manage the collation of evidence. Many measures end up being unachievable simply because evidence cannot be collated.

If any changes take place during delivery, the surveyors managing the change order process must ensure that any alternatives proposed also comply with the Ska criteria. This is not just the case for specific, targeted measures but also for general measures such as D20 Timber, which includes timber elements on items that may not themselves be targeted.

For example, if timber battens are used to support the interior cladding of a lift car, the measure for assessing the lifts is not affected but they will affect the overall performance of timber on the project, and thus whether or not it fulfils measure D20.

Good practice

The upfront purchase cost of some compliant items can, in certain cases, be less competitive than the industry standard; some surveyors' assumption that this applies across the board is incorrect. As a result, project teams can find themselves ruling out measures at the early stages without reviewing the real details and opportunities available. The market is increasingly offering more environmentally friendly products at competitive prices, which are as good as traditional solutions.

Being aware of delivery lead times and product availability is important as some Ska-compliant materials or products may need longer to source, and some of them cannot be replaced, with only a limited range of alternatives on the market at present. This runs the risk of requiring last-minute substitutions, which may not comply with Ska criteria, as in the case of companies that are used to working on projects with off-the-shelf products. If they are replaced with non-compliant items, Ska criteria may not be fulfilled.

If a project is targeting good practice rather than simply standard practice then some actions and specifications will of necessity not be typical (i.e. standard), and neither will the delivery method. This is a fundamental principle that must be understood from the outset by clients and project management teams during good practice procurement, to ensure that design and delivery teams are also on board with this thinking.

Managing risk

During the delivery process, issues that were not in the scope of the design stages might be re-introduced as the subcontractors finalise details on site. This process will skew the project ranking of measures, and thus affect the scoring. It is particularly critical when a measure targeted is in a gateway position and the introduction of another measure above it in the ranking causes it to drop out of the gateway measures.

This means, for example, that projects heading for the highest Ska rating, gold, can get downgraded to silver, or from silver to bronze. But it can also work in a project's favour, when a project might go from unrated to bronze due to the inclusion of a new, high-ranking measure. A good designer, contractor or assessor will always keep an eye on this and be aware of the issues, so as to design out risks before they occur.

The 100th gold certificate was awarded in September to a retail scheme assessment. The total number of projects certified by December 2015 was 436, with 114 achieving the gold rating.

The Ska rating for higher education will be launched in spring 2016, with another scheme update for retail to start later this year. A list of Ska-compliant products can be found on the RICS website at *www.rics.org/ska* and the searchable directory at *www.specifinder.com*.

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The online system and good practice measures documents are free to use, and can be found at

www.rics.org/uk/knowledge/ska-rating

The Ska rating team also welcomes feedback on the current schemes.

Related competencies include
Sustainability

A matter of doubt

Matthew Hearsum discusses the legal issues arising from a recent case involving basement extension work

The decision in Chaturachinda v Fairholme [2015] was welcomed as removing the restriction on reinforced underpinning in basement extensions. However, there are a number of reasons why this is not actually the case and the restriction remains. Basement extensions are usually formed by underpinning the party wall between two adjoining properties. Reinforcing the underpinning is a popular choice because the tensile strength of the steel rods that are used allows the concrete to be substantially thinner than a mass concrete alternative, which in turn means that there is greater space in the new basement.

Special foundations

Underpinning a party wall is subject to the Party Wall etc. Act 1996. Section 7(4) provides: "Nothing in this Act shall authorise the building owner to place special foundations on land of an adjoining owner without his previous consent in writing".

Special foundations are defined as: "foundations in which an assemblage of beams or rods is employed for the purpose of distributing any load".

The starting point, therefore, is that an owner wanting to construct a basement may only use reinforced underpinning with the prior written consent of the owner of the adjoining property.

In Chaturachinda, the design was unusual; the basement slab rested on a mass concrete rail rather than the more usual 'basement box' design. The building owner argued that the foundations were not special foundations according to the meaning of section 20; instead the mass concrete rail was the "foundation" and the reinforced underpinning was only a wall, in which case the adjoining owners' consent was not required.

The third surveyor agreed, making an award permitting the works without the adjoining owners' consent. The adjoining owners appealed to the county court,

> "Extensions are usually formed by underpinning the party wall between two adjoining properties

which listed the question of whether the underpinning was a "special foundation" as a preliminary issue.

The court found that the reinforced underpinning was not a 'special foundation' because:

- the mass concrete rail was the foundation, and not the underpinning
- to be a special foundation, it must transfer load to the adjoining owner's land, which this design did not.

It has been said that, following this decision, a building owner can avoid the restriction on special foundations by putting a pad or blinding of mass concrete beneath the underpinning. In fact, the court expressly rejected this approach: "neither such a pad or blinding layer will protect the Building Owner from the Adjoining Owner's veto in section 7(4) ... the proper legal construction in these circumstances will be that neither pad nor blinding layer constitute a foundation independent of the reinforced installation which will itself comprise the basement foundations".

Therefore, in most cases the building owner will still require the prior written consent of the adjoining owner. Only in a limited number of cases, where the mass concrete "'foundation' is a permanent part of the design and provides a permanent and considerable level of support, will the restriction on special foundations not apply".

Distribution of load

The court also considered whether distribution of load could be regarded in deciding whether a foundation constituted a "special foundation". The court found that one can only look at whether it is distributing load to the ground on which the wall rests "and cannot therefore extend to the distribution of load to ground which is not ground on which the wall rests". The court went on to say that in the case of a special foundation, "there must still be a distribution of load to the land of the Adjoining Owners".

With respect to the learned judge this must, in my view, be wrong in law. The definition of special foundations refers to "distributing any load". The use of the word "any" without restriction gives it a very broad meaning and – again, in my view – certainly does not support the narrow interpretation suggested by the court.

This decision also does not support the idea that reinforced underpinning may be used more widely; in fact, the opposite is true. The court expressly rejected the practice of putting an unnecessary pad of mass concrete beneath the underpinning to avoid the restriction on special foundations. Moreover, as seen above, the guidance given in the case on what is a special foundation is likely – in my view – to be wrong in law.

So the position is still uncertain. It may be that in the not-too-distant future another adjoining owner may brave the Court of Appeal, where this much-debated issue may be resolved.

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Related competencies include **Legal/regulatory compliance, Design and specification, Construction technology and environmental services**

Image © Alamy

Dipen Vanmali, winner of RICS Matrics Young Building Surveyor of the Year Award 2015, discusses the benefits of RICS membership and some of the projects he has worked on

Career opportunities

As someone who wanted to enter the surveying profession since my early teens, qualifying as a chartered surveyor then going on to win a prestigious RICS award is more than I could ever have wished.

I must admit there was an element of shock when I first heard that I had won, but I am thrilled to have succeeded in this, my first foray into professional awards. I am also grateful to my employer, the independent management, design and construction consultancy Pick Everard, for encouraging me to enter and supporting me through the process.

I attribute much of my career success – including winning this award at the age of 33 – to the help and support I have received from my directors and colleagues at the firm, and to the many opportunities for professional development in RICS.

After graduating from De Montfort University in 2003 with a BSc (Hons) in building surveying, I worked for EC Harris, Leicester and then Jones Lang Lasalle in Birmingham, before joining Pick Everard's Leicester office in 2008.

Chartered status

Although I was happy to have secured employment in my chosen profession immediately after university, I was determined not to remain in graduate roles for the next five to seven years, so I set out to do all I could to gain chartered status.

As we all know, being a good team player is vital in our sector, but so is being able to stand on your own two feet and promote your industry's values. Through my RICS membership, I've been able to meet fellow professionals and develop opportunities and make my face known around Leicester and the rest of the county.

My RICS connections have also given me access to vast learning resources, which have been extremely useful in my career progress. In fact, while I was working towards chartered status, I spent hours studying and researching surveying information at the RICS' excellent library in London.

Projects

Of course, the projects I have worked on and their outcomes will have influenced the judges' decision, and I have been lucky to play a prominent role in some exceptional contracts with Pick Everard.

I was, for example, New Engineering Contract (NEC) supervisor for the Old Square shopping centre project in Walsall – a multimillion pound retail scheme that has revitalised retail in the town and seen the arrival of fashion chain Primark and a Midcounties Co-operative food store. The improvements carried out are already having a positive impact, with footfall up by 20%.

The Walsall Old Square shopping centre

I was charged with bringing together several parties to establish a single team, liaising with mechanical and electrical, civil and structural engineers in advance of monthly site meetings with the client.

One of the most rewarding aspects of this scheme was being able to collaborate with students on work experience, and form a team with client and contractor to enable the young people to gain a greater understanding of everyone's roles.

I am also interested in looking at how innovations in technology can assist us in our day-to-day work, and on this initiative we used Snagmaster Lite, an app that can identify and resolve snagging issues on site.

This app was used to great effect on the site, because the software produces reports that include photographs, it gives the subcontractor a better indication of where a defect is.

I also thoroughly enjoyed working for National Grid on a scheme to transform an underused premises in Chesterfield into a central hub with state-of-the-art conference facilities.

One of the biggest challenges on this project was to revamp the building while staff were going about their daily activities on site, and to work to tight deadlines and budget constraints. Now accommodating 24 people – double its previous workforce – the premises will become a key hub for National Grid stakeholders in the north of England.

I have had some very positive comments from National Grid on this project and it has been gratifying to receive recognition of my award from Pick Everard's clients and colleagues. Gaining this accolade will not only raise my own profile in the industry but also reflect well on my employer regionally and nationally.

I have never doubted that I chose the right path. From the moment I met construction professionals at a school careers fair when I was 14, I knew I wanted to be a surveyor. It was definitely the career option that ticked all the boxes for me.

I think that it is this enthusiasm for the job and my determination to get on in my own career that make me want to support others in fulfilling their professional objectives. I am

on the committee of a local professional networking group, Leicester Hotshots, representing the construction sector, and I served as chairman of the RICS Matrics Leicestershire, Northamptonshire and Rutland (LN&R) committee between 2011 and 2012.

Mentoring

I especially like mentoring and, outside my day-to-day role, I mentor colleagues to help them achieve chartered status, guiding them through the APC process. As part of the APC forum, I am entrusted by my directors to help train our future chartered surveyors, and through the RICS I get to promote construction careers to undergraduates at Loughborough University, Nottingham Trent University and the University of Leicester.

As well as being an ambassador for my industry, I think it is also good to give something back to the communities we serve – even if that means literally going the extra mile. By running the Leicester half-marathon with sponsorship from colleagues and contacts, we made several hundred pounds for an historic church in Thringstone, Leicestershire. I had recently worked as a building surveyor on a project at the church, and given as it is a charity, I know it appreciated both our professional input and funds for their cause.

I was also privileged, as RICS LN&R Matrics chairman, to organise a fundraising event with the rugby club Leicester Tigers, at which former Tigers player and England international Matt Hampson, who became tetraplegic following a scrummage practice accident, was our guest of honour.

Although I am still reeling from the excitement of winning the award, work commitments are keeping me grounded. I've just been appointed NEC surveyor on a £26m five-storey bioscience centre for Nottingham City Council and am also working on other projects for both National Grid and EDF Energy.

Entering the RICS awards has been a boost to my career and my confidence, and I would definitely recommend the chartered route to other members of my profession. I look forward to continuing my support to RICS via my active involvement in LN&R Matrics.

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Related competencies include
Conduct rules, ethics and professional practice

A fundamental matter

Ewan Craig, a speaker at the RICS annual It's Your APC conference, outlines how imperative the construction technology and environmental services competency can be

Construction technology and environmental services form one of the core competencies of the building surveying APC. This has often been regarded as the fundamental competency, because so many other building surveying competencies rely on it.

Example questions for this competency were covered in a previous *Building Surveying Journal* article (see July/August 2013, p.26), so this piece will look afresh at just how fundamental the competency is through a review of some of the previous items on other APC competencies between 2013 and 2015.

The levels

The requirements of each level of the competency are as follows.

At level 1

Demonstrate knowledge and understanding of the principles of design and construction relating to your chosen field of practice.

At level 2

Apply your knowledge to the design and construction processes.

At level 3

Advise on the selection and application of particular processes in your area of experience. This should include liaison with specialists and consultants to develop project-specific design and construction solutions.

The assessors will ask questions based on your submission documents. Do listen carefully to what they ask and answer them, rather than misinterpret the questions. Try to listen for command words that will guide you to the appropriate level: for example, know, understand (level 1); do, achieve, prepare, consider, apply (level 2); or advise, recommend, direct (level 3).

Design and specification

This article (March/April 2014, p.26) included questions on refurbishment and an industrial workshop. Your experience can also bring in the construction technology and environmental services competency, by applying your knowledge of the building's construction to derive design or specification options and then make recommendations based on these. The connection between design and the construction technology and environmental services competency is explicit, with "design" referred to in the definition of the competency's levels.

Building pathology

The piece (October/November 2013, p.26) included questions on wall-tie failure and the effect of vermin on the building's fabric. The construction technology and environmental services competency would be intrinsic to this. Knowledge of the building's construction, how to apply this knowledge in considering possible causes, developing remedial options and noting any effect these would have on the construction are prerequisites to providing a complete solution.

Inspection

This (May/June 2014, p.26) included questions on inspecting drainage and inspecting a flat roof, both of which would draw on your competency in construction technology and environmental services. The inspection, and your recommendation on the approach to take, would require a good knowledge of the building elements and how they should be constructed; to consider what information or data should be ascertained, what to inspect, how to inspect it and what further action to take such as where this uncovers anomalies.

Legal and regulatory compliance

In this piece (December 2013/January 2014, p.26) there was a question on ways of remedying a state of disrepair. You would need to apply your construction technology and environmental services competency to this, to appreciate the current situation, what constitutes the disrepair which repairs might be an option, and then to establish which would be the most economic and appropriate remedy.

Contract administration

This item (July/August 2014, p.26) featured a question on a variation order to repair a wall following discussions on site, and a further question on how changes to a building may affect the completion date. Your competency in construction technology and environmental services would help you understand and discuss the options on site, to repair the wall and specify the variation order to achieve the repair to meet your client's brief. This competency would also be necessary to understand the sequence of construction, and what effect any changes to the construction would have on a building and the programme of works.

As this all suggests, the construction technology and environmental services competency can be seen as imperative, a foundation for many other areas of a building surveyor's practice. To prepare for the APC, you should consider how your experience covers your competencies and be ready to address questions arising. You may also find it helpful to read the previous issues of *Building Surveying Journal*, as well as using isurv and other APC sources.

Care

Given the time constraints of the APC, your answer should be a brief but complete response to the question. The answers given above are not exhaustive, however, so care should be taken to demonstrate your own skills, abilities and knowledge to the assessors.

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For details on the APC pathway guide for building surveyors, please visit **http://bit.ly/10ylTaW**

RICS

Building Conservation Journal

OPINION

Straight talking

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As you will see from this issue, RICS has been working through the Historic Environment Forum (HEF) to produce a client's guide to commissioning advice on historic building conservation. A lot of our work involves helping clients get good advice, especially when they are not sure what advice they need.

Fortunately, the pathways to good advice are largely already mapped – by our shared ethics and the competencies that RICS Certified Historic Buildings Professionals have demonstrated in the accreditation process.

At the outset, the client needs to find a practitioner who puts them first. Most clients like an atmosphere of trust so they can say what's on their mind rather than simply acquiescing to a standard brief, or accepting what funders or service providers want. Moreover, the consultant can't solve a problem about which they know nothing. Shared experience is important at this point in the briefing. So, with the right safeguards about confidentiality and a commitment to the briefing process, the client and consultant can begin a productive relationship.

The second step is that the client should only appoint someone who has a reputation for getting things done. This is where a commitment to act in the public interest allows professionals to gain the trust of others, such as planners, builders and engineers, to weigh things up objectively and offer the client a realistic view of which solutions are the most promising. Blindly following codes or policy is not enough – the different regulatory layers don't always concur, especially in complex cases. The effective professional is a confident negotiator, but is also able to prioritise dispute avoidance and de-escalation where others' needs are entwined with the client's.

Finally, clients need to ask how conflicts of interest are managed. What if another client is competing to buy the same building? Suppose a bigger client tries to make overriding demands? The onus is on both the client and the provider to be upfront and work it out. If that means they can't go ahead, this bad news ideally comes with a referral, or a suggestion for the next step, so the client still gets what they came for – namely, a bit of sound advice.

RICS is building on the guides that it has already produced, such as the client guide to expert witness services, as well as gathering feedback from stakeholders. In particular, I will be seeking the views of those who rely on accreditation systems, such as that of the RICS Certified Historic Buildings Professional, for assurance on standards. Above all, I invite you to join the debate online. What would you really like to see in the HEF client guide? ●

CONTENTS

CONTACTS

Building on our heritage

John Klahn, Robert Mallett and **Alan Cripps** look at how RICS is highlighting the role of its members in conservation

Across the UK and Ireland, around 25% of all buildings are of traditional construction, dating from before 1919, and their conservation and maintenance clearly represent a major activity for heritage professionals. If one considers the vast number of challenges, including pollution, environmental change and tourism, involved in the daily management of historic assets around the world, then the scale of the task faced by the global conservation sector is plainly as enormous as it is essential.

RICS began a programme of profile-raising in 2015, to highlight the global nature of the heritage sector and the work of RICS and its conservation professionals. A staff-led conservation task force was formed to work in partnership with the member-led Building Conservation Forum Board. The task force's initial objective is to identify ways in which the work of conservation experts and the successes of the Board can be promoted. In 2016 and beyond, both bodies will work to recruit greater numbers of conservation professionals from within and outside RICS. A programme engaging key stakeholders is already in progress, and together we plan to extend this globally. This article sets out the developments that the staff–member partnership is progressing.

New advocates

One mechanism for recruiting more talent is to encourage greater student participation in key events such as the RICS and Society for the Protection of Ancient Buildings (SPAB) Summer School. We are also investigating practitioner and student days, where both undergraduates and postgraduates will be able to participate in workshops run by key conservation experts. In time, we expect to expand our training provision in heritage and develop global conservation training along with other providers.

As a member of the Council on Training in Architectural Conservation, RICS supports the development and promotes the use of the Understanding Conservation website. The content is based on the International Council on Monuments and Sites education and training guidelines, and supports individuals in developing their conservation skills.

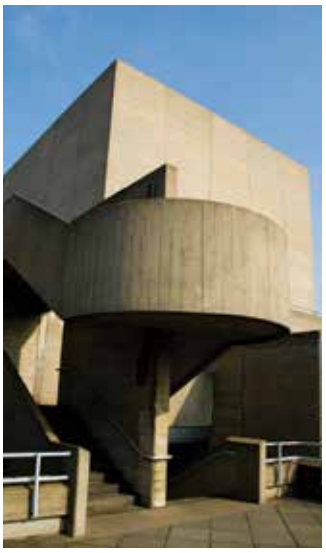
Influence and reform

A new UK government and changes to UK heritage agencies have provided opportunities to promote our role in protecting historic buildings. We have contributed to Historic Environment Forum task groups that aim to generate demand for conservation specialists and enable reform of the listed building consent process. We have also established effective new relationships with heritage agencies through the Edinburgh Group, which was set up in 2003 to represent professional bodies and key clients and encourage a comprehensive, common approach to the development, monitoring and promotion of historic environment conservation accreditation. Meetings last year led to the presentation of a protocol to UK heritage agencies seeking to give formal support to the criteria for approving conservation professionals on grant-aided projects.

Planned reform in the care of churches has also highlighted RICS members' role in providing quinquennial inspections. A legal requirement for all Anglican churches, which has also been adopted by other religions, these surveys are vital to protecting the spiritual, cultural and historical significance of the buildings. Working with RIBA and Church of England representatives, we will be presenting recommendations to the Church Buildings Council to improve the value and performance of these surveys.

Case studies

Recognising the contribution of historic buildings to society and the expertise and effort involved in maintaining them allows us to showcase the sector's importance. The RICS Awards' Building Conservation category continues to be popular.



The winner of UK Project of the Year 2015 was Advocate's Close in Edinburgh, a mixed-use commercial scheme in the Old Town conservation area and World Heritage Site.

Perhaps the best way of illustrating the skill required to work on historic building conservation is to explore the issues faced by RICS conservation professionals. The *Building Conservation Journal* provides this in the form of technical articles on materials and techniques, including building information modelling (BIM), iron, masonry and water damage, and case studies on project approaches and design, including Buckingham Palace, Windsor Chapel and Hong Kong's Courtroom and Central Police Station. In future issues, we will be highlighting the extensive renovation of many areas of Hampton Court Palace and, in conjunction with Historic Royal Palaces,

will present a series of case studies on key areas such as brickwork, ironwork, paving and archaeology. In the near future, we will also be looking in detail at the work of our professionals in renovating Westminster Palace – perhaps one of the most ambitious conservation projects ever undertaken in the UK.

Standards

RICS has produced professional guidance, and provides professional development training for individuals dealing with historic buildings. The *Historic building conservation* guidance note is essential reading for all professionals, while the *Valuation of historic buildings* information paper examines the factors to be considered when appraising such assets.

In the conservation guidance note, former Chair of RICS Building Conservation Forum Board Adrian Stenning says: "The diverse nature of conservation projects dictates that no single approach can embrace all situations. ... The case for developing the approach to suit the project is far greater than usual. In spite of the unique technical and management challenges our old buildings pose, it is the history of these buildings, their previous use and how to adapt them for a modern, sustainable use that provides interest." He adds that this "makes working with our historic environment far from easy, but ultimately a highly rewarding experience".

For residential homebuyer and condition surveys, RICS training continues to be popular, as many members will be exposed to properties of varying historic value during such work. With this in mind, the opportunities and risks faced by all land, property and built environment professionals in dealing with historic buildings are gaining more recognition. The *RICS property measurement* professional statement, which mandates the use of International Property Measurement Standards for all members, includes a specific section on measuring office spaces in converted historic buildings.

The use of drones and BIM is being explored to support the maintenance and management of historic properties and to scan and record historic sites that might be at risk. RICS is contributing to the national BIM4 conservation group, and has commissioned modelling of its own Grade II listed headquarters in Westminster.

The sustainability agenda is also having an impact on conservation, and facilities managers must understand the significance of property assets beyond their financial value.

Accreditation

Since 1992, RICS has assessed individuals' competence in conservation best practice, identifying them with Building Conservation Accreditation. Over the past four years, interest in accreditation has grown by 200%, with the number of accredited individuals increasing by over 40%. These include professionals in the USA, Ireland and New Zealand as well as the UK, with interest also rising in Hong Kong after the RICS Heritage Conference there last year.

BS 7913, *Guide to the conservation of historic buildings*, states "the immediate objective of building conservation is to secure the protection of built heritage, in the long-term interest of society". This objective will be best achieved if all professionals dealing with a property understand its significance.

To address both this and the developments discussed above, the accreditation has been refocused to reflect opportunities throughout the property life cycle for professionals to adopt a custodial approach. RICS Certified Historic Building Professionals, as they are now known, will be recognised as the most effective custodians of our built heritage, balancing the often conflicting demands of owners and the wider community. As we approach 25 years of the accreditation in 2017, we will continue to report on this progress.

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In his second article detailing conservation work at Hampton Court Palace, **Andrew Harris** describes how the Anne Boleyn Gatehouse embodies centuries of building, repair and continual change

The Anne Boleyn Gatehouse

The Anne Boleyn Gatehouse, built for Cardinal Thomas Wolsey between around 1514 and 1522, is one of the most significant structures at Hampton Court Palace. It is one of a small number of surviving 16th-century royal and collegiate gatehouses, with other examples including those at Christ's College Cambridge and St James's Palace. As one of the most outwardly impressive elements of Hampton Court Palace, the gatehouse contains a rich variety of architectural and decorative features.

The structure was significantly altered between 1532 and 1540, in the first place to incorporate both an entrance to a new staircase leading to the King's Great Hall and a new stone vault decorated with Henry's and Anne's initials. A second phase of work in 1540 saw the installation of a large, state-of-the-art astronomical clock (see picture 1). This clock originally had two dials, a large dial facing into Clock Court – which survives, albeit in a much-restored fashion – and a smaller dial facing Base Court. The latter was removed in 1835 and replaced by a slate clockface from St James's Palace bearing William IV's monogram.

In 1707, Sir Christopher Wren oversaw the redesign of the bell turret, installing a central bell house and lead cupola that survive today. Subsequent conservation work – for example the restoration of brickwork and the gatehouse vault in the 1880s – is also significant in its own right. It is these multiple layers that the most recent conservation programme by Historic Royal Palaces (HRP) has respected, understood and, in some cases, revealed.

The astronomical clock

The first stage of the conservation programme was the restoration of the astronomical clock by a team of conservators, curators, paint and metal specialists and horologists who were overseen by Zoe Roberts of the Conservation and Collection Care Department at HRP.

The clock was a masterpiece of Tudor engineering, with a mathematically complex gearing that ran three dials: lunar, solar and sidereal. As well as being a high-status Renaissance scientific instrument, the astronomical clock was a work of art, with the three richly decorated and gilded dials set in a painted frame. Sadly, none of the original Tudor decorative scheme survives – today's clock is essentially a 1960s replica based on extensive restoration in the 1880s. Nevertheless, the mechanism remains intact, with the initials of French Tudor clockmaker Nicholas Oursian rediscovered on the gearing.

While the gearing and its works were repaired by the Cumbria Clock Company, the team set about restoring the decorative scheme. The clock was carefully dismantled, removed and put on display to give visitors a close-up view of an object that normally sits 15m above the ground. Dismantling and removal also protected the clock from dust and from potential damage arising from concurrent brick and stone repairs to the gatehouse. Paint analysis penetrated beneath the 1960s pigments to reveal traces of a colourful Tudor palette, and a 1962 replica – made for the Science Museum's new atrium and rediscovered in its stores – was an invaluable source for comparing the existing dials with the 1960s conservators' intentions. Meanwhile, a close study of substrate showed that

the dials had been fabricated in several pieces from sheet copper, dipped in a lead–tin alloy, and attached to a wrought iron armature. The mechanism and dials were found to be in good condition, with a new support to the solar dial pointer the only replacement necessary.

The most challenging decision concerned the painted decorative scheme, as the 1960s conservators had used an unstable synthetic organic pigment, which had chalked and faded and was flaking. Although stripping this layer away may have produced a clean surface for new paint to be applied, as per earlier conservation approaches, the 1960s scheme – however misguided – remained part of the history of the clock. By consolidating and isolating deteriorated paint surfaces and in-painting areas of loss, conservation of the existing scheme also raised serious questions about appearance, and whether conservation-grade materials and methods would survive in the external environment.

Despite initial hopes, archival research and paint analysis failed to

1 Henry VIII's restored astronomical clock by Nicholas Oursian; a lead drip was incorporated above for improved weather protection

2 A new lead-clad and gilded finial replaced Wren's original

3 Indent and pinning repairs in progress to the south-west facet of the Base Court oriel window frieze

reveal sufficient evidence of pre-1960s materials and design, and an agreed compromise sought to retain and reinvigorate the existing decorative scheme. HRP conservators worked closely with specialist conservators Hare & Humphreys to devise an appropriate treatment. Overpainting faded areas and patching worn symbols and figures allowed all the physical evidence provided by the clock to be maintained, while restoring a vivid appearance in accordance with its Tudor character. The team kept the materials palette simple to minimise the risk of technical failure, and avoided unnecessary overpainting to preserve as much of what was sound of the 1960s scheme as possible. A lead-based oil paint containing modern pigments was chosen, as it keyed well to all surfaces, offered long-lasting colours and should degrade in a more sympathetic manner than a modern paint.

The dials, which were reinstated in April 2008, achieve an appropriate balance between old and new, both in terms of the building and the object. Monitoring of and data collection from the decorative surface will, over time, enable the HRP conservation team to evaluate its approach.

The Wren lantern

Sir Christopher Wren's remodelling, which began in 1707, saw the relocation of the gatehouse's three bells – presumably associated with the Chapel Royal – from a corner turret to a new lead-clad timber lantern and cupola. As well as one of the clearest junctions between Tudor structure and baroque embellishment at Hampton Court, the lantern revealed surprising details about its construction as conservation work began.

On removal of its lead cladding, a gilded ball finial was found to be in very poor condition due to water ingress. Its construction was remarkable: rather than pegged and strapped segments of timber, it was a hollow sphere of three bisecting oak hoops and triangular infill sections. As it was found to be roughly half decayed, the consensus was that the original should be retained for display while a new gilded finial (picture 2) was made by McCurdy & Co. as a faithful replica.

The lantern frame (picture 5) is also a complex structure, with the repair of its cornice alone entailing the tagging and removal of around 120 separate components, each requiring individual assessment, replacement, repair and re-fixing. Once the lead had been stripped away, missing elements were replaced with replicas that were based on existing carpentry elsewhere on the lantern, while any that had been damaged by water ingress, insects or fungal decay were either replaced or, where possible, cut away and repaired with new seasoned oak. A deep layer of guano was cleared from the top of the soffit boards, revealing two clay pipes, which had presumably been left by the carpenters in 1711. These were reinstated on completion, and the frame is now protected by a bronze bird-mesh.

Inside the lantern, a timber bell frame demonstrated Wren's skill for improvisation as well as a tendency towards poor detailing. Rough treatment of some timbers to accommodate the bell frame within the lantern, as well as a lead-clad plinth roof revealed

4 The new Anne Boleyn gates, made from hand-finished, seasoned English Oak with hand-forged fire-welded strap hinges and ironmongery with bronze-sleeved adjustable pintails

5 The Anne Boleyn Gatehouse, Wren's lantern and cupola before repair and recladding

6 The new gates incorporate hand-carved spandrels, linen fold panels and hand-forged rove rivets. A pair of bi-folding wicket gates provide access, with quick-release concealed stile bolts in case of emergency

beneath the frame, suggested that this was prefabricated and inserted to give additional support to the moving bells, rather than designed as integral to the lantern.

When addressing repairs to the lantern's lead work, the overwhelming impression was that it had survived well, with perhaps only one cycle of renewal in the preceding 300 years. Bearing this in mind, any changes had to be made with absolute confidence that they would improve the lantern. The most evident problems were splits in the lead due to its inability to accommodate thermal movement. Previous conservation attempts, probably in the 1930s, had combined lead-wiped repairs with asbestos paste. This, together with the lead carbonate dust and guano, presented a hazardous cocktail that required specialist decontamination.

Almost all lead details were changed to some extent, while remaining as faithful as possible to their original appearance. The precise location of some laps was shifted to avoid driving the nails into fragile timbers or trapping lead beneath timber cornices. Fragile sarking on the lantern was replaced with battens to bear the new lead and to enable the curve of the roof and cupola to be followed without splitting.

Attempts to discern an original colour scheme proved elusive until the discovery of historic lead paint, pigmented to a stone colour, on a piece of timber skirting that had been removed to assess carpentry repairs. Following this precedent, the lantern was repainted to match the stone-coloured sample produced from analysis. The end result is transformational: whereas before conservation the lantern appeared dark and stunted, its restoration and repainting has fully revealed its elegant proportions.

The Anne Boleyn Gates

The final element of the programme – the Anne Boleyn Gates – represents the latest stage in both the Gatehouse's and the Palace's long history of change. A re-imagining of long-lost objects, the gates also represent the marriage of close archaeological study and a deep understanding of both historic precedents and modern-day regulations and visitor considerations.

Henry VIII removed the original Tudor gates in order to insert a new processional staircase up to the Great Hall. While early iron pintails survive in situ, their relationship to the stone arch suggests that ground levels may have been lowered to accommodate Henry's staircase – although this remains an intriguing architectural puzzle that has been left to future investigators. The archaeology of the surrounding masonry structure, including the vaulting about the gateway and the cambered historic cobbling, was a primary consideration, presenting particular constraints in the method of installation and alignment of new pintails and hinges. No rebate, jamb or archway were square or perpendicular as a result of historic movement and settlement, and the Victorian vaulting had been built without consideration for gates. In places, tolerances for fitting were down to 2mm.

The models for the new gates were those still surviving in the Great Gatehouse. For the new gates, McCurdy & Co. worked with the design team to incorporate a pair of wicket gates, which would require the loss of a traditional threshold piece so as to comply with disabled access requirements. Omitting a key structural element required significant modification to the bracing and stiffening of the main gate frames, because each gate weighs about 750kg.

Wrought iron fittings, nails and rivets were individually crafted by blacksmith Nick Peppitt and Andrew Hall, and long, sometimes curved, hinge straps were jointed using forge welding techniques and traditional hot riveting. While patterns for traditional fittings were informed by historic examples, innovation was necessary, because operational requirements dictated ease of opening, locking, security and the need for emergency access (pictures 4 and 6).

The choice of English air-dried oak was true to the original, and chosen to withstand shrinkage and movement. Good, straight-grained pieces were selected, along with curved pieces for the arched head of the stiles, while dry English oak boards were chosen for the linen-fold panels. Carved spandrel brackets, carrying Henry's and Anne's initials, were modelled on a fragment elsewhere. The untreated oak will weather, eventually resembling the original gates. Like the restored clock and cupola, they show Hampton Court's ongoing tradition of craftsmanship, conservation and innovation.

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Related competencies include
Conservation and restoration

UPDATE

+info

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Spending review 2015

The Department for Culture Media and Sport, whose brief includes heritage, will receive a 5% funding cut next year, which is less than expected. Historic England will face a reduction of 10% over four years. However, along with the Churches Conservation Trust, Historic England is to be given the operational freedoms that were granted to the museum sector in 2013. These include powers to take independent decisions on issues such as pay and procurement, and to access finance to unlock new projects, commercial revenues and philanthropic donations.

Historic England guidance

New Historic England guidance includes *The Historic Environment and Site Allocations in Local Plans*, *Digital Image Capture and File Storage* and *The Listing and Grading of War Memorials*. There is updated guidance on *Tall Buildings*, *Setting up a Heritage Partnership Agreement*, *Drawing up a Local Listed Building Consent Order*, *Piling and Archaeology*, *The Conservation, Management and Repair of War Memorials*, *Easy Access to Historic Buildings* and *Easy Access to Historic Landscapes*, plus a *Briefing Note on National Listed Building Consent Orders*, *Guidance for Grant Projects* and *Guidance for Tendered Projects.*

Guidance in preparation includes advice on preservation in situ, condition assessment and monitoring conservation area designation, appraisal and management, energy efficiency and historic buildings. For further information:
https://historicengland.org.uk/advice/latest-guidance/

Welsh historic environment legislation

The Historic Environment (Wales) Bill will – if enacted – be the first heritage legislation for Wales and make changes to current UK listed buildings and archaeology law. The stated aims of the bill are:

- to give more effective protection to listed buildings and scheduled monuments
- to improve the sustainable management of the historic environment, and
- to make decisions taken in relation to the historic environment more transparent and accountable.

These will be achieved through a wider definition of scheduled monuments, stronger enforcement powers and a parks and gardens register. Local authorities will be required to maintain historic environment records and heritage partnership agreements will be given statutory backing. For further information:
http://bit.ly/1PWNOwL

Scottish heritage bodies merge

Historic Scotland and the Royal Commission on the Ancient and Historical Monuments for Scotland merged in October 2015 to become Historic Environment Scotland, bringing statutory casework and advice services, properties open to the public and historic environment research into one body. The budget for this organisation remains stable, at £45m. For further information:
www.historic-scotland.gov.uk/historicenvironmentscotland

Heritage Counts 2015

The Historic Environment Forum and Historic England publish *Heritage Counts*, an annual audit of the sector in England. This year's edition surveys residential listed building owners, with some pertinent data. Only 50% of owners surveyed said they have had a good or very good recent planning experience, while only 20% found it clear what work required listed building consent. On the plus side, listed building owners were overwhelmingly proud to live in such properties and conservation areas.

Heritage Counts gives the current numbers of designations. World Heritage Sites remain unchanged at a total of 18, and there have been small increases in scheduled monuments (19,800 in total), listed building entries (376,100; though an entry on the list will often include more than one building) and registered parks and gardens (1,633). There are around 10,000 conservation areas. For further information:
www.hc.historicengland.org.uk/National-Report/

Local authority resources

The Institute of Historic Building Conservation has been monitoring the loss of conservation officer and archaeology capacity in councils since 2006. In that time, their historic environment capacity has decreased by 31%, but rose a little in the last year. Long-term decline will not be reversed in the foreseeable future, so there will need to be changes in the sources of heritage advice. Historic England is facilitating debate on how pressures on historic environment services can be reduced by new initiatives, such as improved guidance and accreditation of professional advisors in heritage planning.

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