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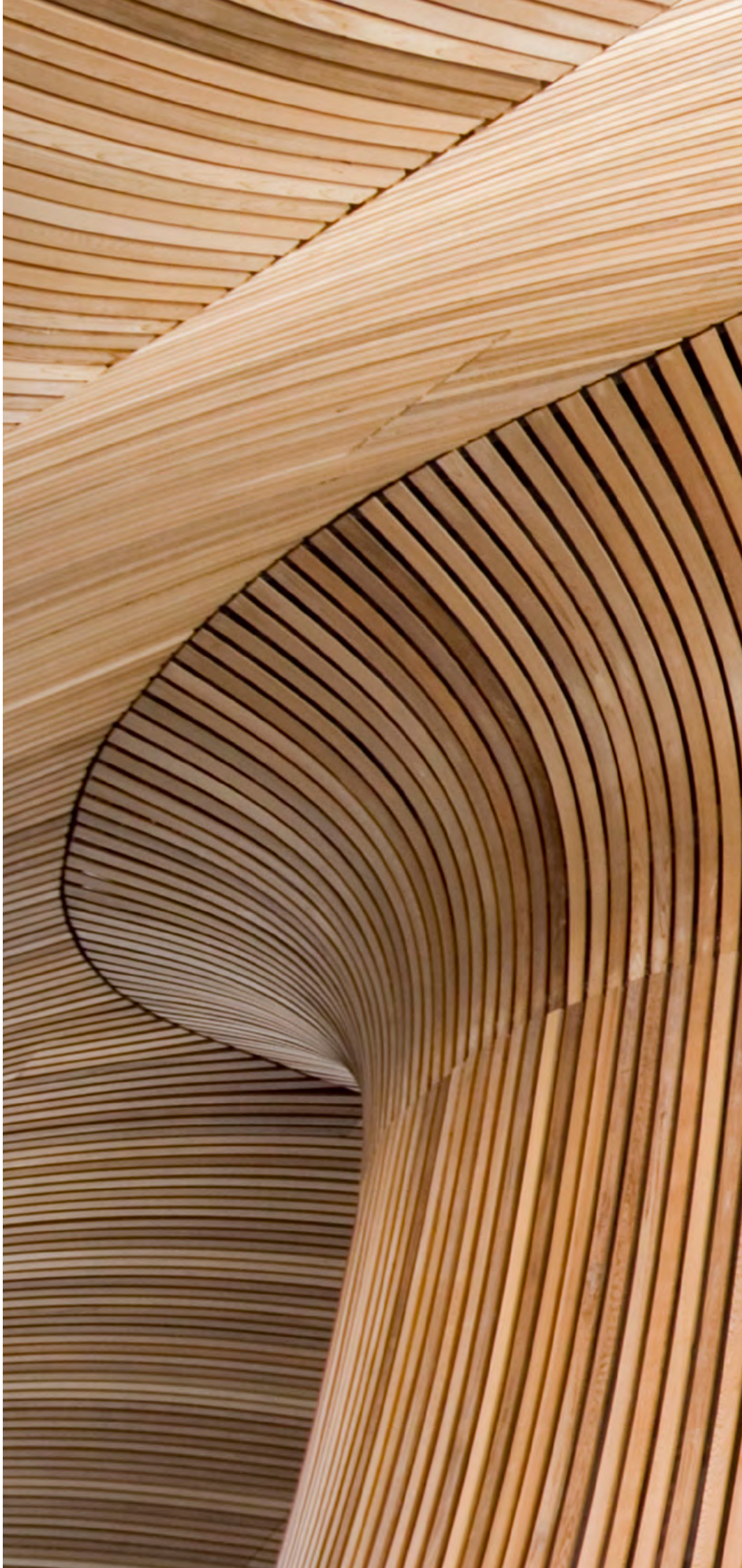

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CIAT

Editor's welcome

Another year has once again quickly flown by in the *Architectural Technology Journal* calendar and I suddenly find myself completing this winter issue. 2023 will commence a fresh era at CIAT with a new Chief Executive at the helm, who we will be meeting in the spring issue as we have just learnt the appointment of Tara Page.

This issue is Francesca Berriman's last as Editor in Chief and Chief Executive after three decades of involvement with this publication. Francesca was its predecessors Editor, BIAT Bulletin, continuing the role when ATJ began in September 1995. With her retirement, Francesca's contribution to the discipline has been recognised further with the Institute's highest honour, the Honorary Fellow. The full citation can be read on page ten.

The AGM took place on Saturday (26 November) which saw some presentations to Francesca from the President and on behalf of the Institute in appreciation of her 34 years at CIAT. The AGM will also be reported on in the spring issue. Here are just a few messages and memories from Past Chairmen and Presidents which were sent in for Francesca:

"What can you say about a Chief Executive par excellence? CIAT has had seven people occupy the 'top' position within our Central Office; two of them stood head and shoulders above them all – one being Graham Watts and the other Francesca. My time at Council was carried out largely prior to Francesca's term of office but whatever the occasion, Francesca has been an absolute delight to be with, always courteous and found time to speak with Past Presidents like me, leaving us in no doubt that we were still valued. I wish her well in her well-earned retirement."
Graham Jackson PCSSAT PPSAAT MCIAT

"Many years have passed since 28 November 1988 when Francesca started work at BIAT. The institute is unrecognisable today and evolved to CIAT. Francesca should be extremely proud of her contribution to its success today – steering it through the tremendous transitional periods is no mean achievement. Francesca deserves all the plaudits and hope she enjoys her retirement. It has been an absolute pleasure working with her over these many years."
Paul Newman PPSAAT PPBIAT MCIAT

"Working as a President of CIAT was made so much easier knowing that Francesca was the Chief Executive. You knew that she was not only able to guide the Institute within the wider industry but also to support the Institute's staff. More than that she was able to guide me as President in all the many meetings and events I undertook, a gargantuan set of tasks that she undertook so well. It was so good to see that at events and meetings, both formal and informal, Francesca was, and is, so well respected within the industry. This Institute would not be where it is today, so highly thought of, so centrally positioned if Francesca had not been there to represent, guide and support us. I enjoyed my time working with Francesca although we do have a football rivalry that will never be resolved!

We will all miss her, the Institute will miss her, the industry will miss her. I want to thank her for all she has done and wish her the very best for her retirement."
Mark Kennett PPCIAT FCIAT

"Francesca has become the pillar that we all relied on for help and support either as Council members or Presidents and although her background is in law, she certainly took to the role with gusto and excellent knowledge. I was grateful for her support during my Presidency. I am sad to see her go, but glad to have known her and I am grateful that we managed to keep her for so long. Just writing this short piece has brought a tear to my eyes as we have had some good times. I wish her all the very best for her future whatever it maybe."
Barry Le Beuvant PPCIAT FCIAT

As with every New Year, we look to a new and successful future, and I hope you are able to enjoy the festive season as I send my very best seasons greetings to you all.

Adam Endacott
Editor

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Revised Building Regulations Part F: What you should be doing differently and why

Words by Paul Williams, Domus Ventilation Product Manager

The world is a very different place since 2010, the year that the Building Regulations 'Ventilation: Approved Document F' was previously revised. In the years that have elapsed since, we have not only learnt considerably more about indoor air quality (IAQ), pollutants and their impact on our health, but we have also had to contend with the COVID-19 Pandemic that has changed our relationship with our home environment.

During this timeframe, albeit more recently, the drive towards the 2050 Net Zero goal has become more intense. To reduce emissions as close to zero as possible, we must decarbonise all sectors of the UK economy, including housebuilding. The Future Homes Standard, which will be introduced by 2025, is the housing sector's strategy to achieve this. It requires new homes to be considerably more energy efficient, with average homes having 80% less carbon emissions than those built to current energy efficiency requirements. Building Regulations is the method being used to achieve the Future Homes Standard.

Set amongst this context, it is without doubt that Building Regulations Part L (Conservation of fuel and power) and Part F were ripe for an update. After some delay, these were published in December 2021. The aim is to ensure new homes built from 2022 produce 31% less carbon emissions compared to current standards. A further revision will take place to come into force in 2025 to bring that figure to the 80% reduction.

Who needs to comply?

If a building notice, initial notice or full plans for building work have been submitted to a local authority before 15 June 2022 and the building work commences by the same date the following year, the new standards do not apply. For building works after those key dates, the revised Part L and Part F must be followed.

Furthermore, there are no exemptions based on the size of the new build. Under the previous Regulations, smaller developments were exempt from air tightness testing. Now, air tightness testing is mandatory in all new build dwellings. So, when it comes to Part F, all new dwellings have to comply with this aspect. This is necessary if we are to produce the type of airtight low energy buildings laid out in the Future Homes Standard.

The more airtight we make our homes, the greater the need for sufficient ventilation to maintain a healthy and comfortable atmosphere. The revisions to Part F are a direct response to this requirement. So, what has changed?

Mechanical ventilation systems

Mechanical ventilation systems in the form of mechanical extract ventilation (MEV) and mechanical ventilation with heat recovery (MVHR) are recognised in Building Regulations as the most proficient means of ventilating a dwelling. To ensure incoming air reaches all parts of a home – especially the bedrooms – the minimum ventilation rates have been increased as follows:

No. of bedrooms	Previous min. ventilation rate l/s	New min. ventilation rate l/s
1	13	19
2	17	25
3	21	31
4	25	37
5	29	43

For larger properties, this increase is substantial and will mean choosing mechanical systems with greater fan power.

In a much-welcomed move, predicted occupancy rates have been removed from the ventilation calculations, making them far more straightforward.

Background ventilation

Two key changes have been introduced here.

The first is the guidance on sizing background ventilators, including intermittent extract fans, trickle vents in windows and airbricks in the wall. These are to be done on a room-by-room basis rather than the whole property.

The second applies to extract only systems, such as MEVs, where the background vents must be increased in size from 2500mm^2 to 5000mm^2. This may well impact on the property's façade and window sizes.

Natural ventilation

Natural ventilation systems, such as background vents, remain an option although only for less airtight homes with a design air permeability of ≥ 5. However, with the background ventilation to be determined on a room-by-room basis, rather than based on the whole property, this will probably mean much larger grilles are required. No matter how well designed the grille is, it is likely to compromise the aesthetics of the property from both inside and out.

Ultimately, natural ventilation is not an efficient means of ventilating a home as heat will be lost and there is no guarantee of moisture or pollutants migrating outside.

The other change here is that passive stack systems have been removed as an option.

Air pollution guidance

With air pollution now firmly on the news agenda, and our increasing understanding of its dangers to our health, the revised Part F addresses both internal and external air pollutants more thoroughly.

Useful indoor air pollution guidance has been added, covering exposure limits and times for carbon monoxide (CO), nitrogen dioxide (NO2), formaldehyde (CH2O) and TVOC.

In areas with high level of outdoor pollution, advice has been provided on the location of intake grilles, primarily away

from the direct impact of the sources of local pollution. Where urban traffic is a source of pollution, the air intakes for dwellings next to busy urban roads should be as high as possible and located on the less polluted side of the building. Ventilation intakes should not be located in courtyards or enclosed urban spaces where air pollutants are discharged.

Reporting

With many homes unable to comply even with the previous Building Regulations Part F requirements, either through confusion and a lack of understanding of the requirements or through deliberate flouting of them, the reporting procedures have been tightened up under the 2021 revisions.

Now a new style commissioning sheet featuring a compliance report and photographic evidence must be provided to Building Control bodies and the building owner, along with a Home User Guide specifically for householders.

So much has changed in the eleven years since Building Regulations 'Ventilation: Approved Document F' was last revised. The changes made to Part F are both a reflection on this, but more importantly look to the future and how we as an industry can meet net zero and provide housing fit for purpose. ■

Window specifiers advised on compliance with new Part F Regulations

Words by The REHAU Group

New innovations in trickle vent technologies are required if window specifiers in the housing industry are to be properly supported following recent changes to the Future Homes Standard.

Under changes laid out by the Government's Department for Levelling Up, Housing and Communities in the Standard surrounding Approved Document F, which looks at ventilation requirements for homes, measures must be taken to futureproof all new windows from 15 June 2022 onwards. With the upheaval this could create for Architectural Technology professionals and specifiers, technical experts at polymer systems window manufacturer REHAU are citing the importance of trickle vents as a solution.

"The changes to the Building Regulations under the Future Homes Standard have been long advertised, but this should not downplay the huge impact it will have on all aspects of a project, including frame and sash design," explains Mark Gajda, Head of Technical Services and Certification at REHAU Windows. "Developers are under growing pressure to select products that adhere to increasing ventilation requirements set down by the Government, and window suppliers must be able step in to support them as best possible.

"In the immediate future, this means being aware of innovations around ventilation-minded window accessories such as trickle vents, and how they can combine with the most thermally efficient frames and sashes. These represent a readily available solution to meeting updated, mandatory Part F requirements on new and existing projects and installations. This is why suppliers like REHAU have developed accepted solutions in conjunction with plastic injection moulders such as Glazpart."

Taking these evolving Regulations into account, REHAU has recently launched its 'In the Frame' initiative to help housing specifiers navigate the complex legislative landscape, technical specifications and sustainability targets surrounding windows. As part of this programme, the polymer system provider has published a series of fact sheets guiding sector professionals through changes made to ventilation and energy efficiency requirements under the Future Home Standard.

"The legislative updates contained within the Future Homes Standard were supposed to lead to clarity for the sector, but the situation can still be quite confusing," concludes Mark. "Instead, specifiers are now being bombarded with multiple sources of conflicting advice. We hope these documents can help cut through the noise surrounding the Future Homes Standard and look at how solutions such as trickle vents can help projects meet stricter ventilation requirements."

For more information and to download the free fact sheets, please visit: rehau.com/uk-en/rehau-in-the-frame-fact-sheets. ■

Designers of residential builds – beware!

Words by Smartlouvre

A brand new UK Building Regulation is here. It came into effect on 15 June 2022, Part O deals with the growing issue of buildings being designed and constructed without due consideration to the building's potential internal temperature, during our warmest months.

Importantly, and in difference to many other updates to the Building Regulations, Part O will be applied retrospectively, regardless of when a planning application was submitted or approved, if projects have not actually started construction before 15 June 2023, they will be required to comply with Part O. This twelve-month transition period allows for designers and developers to make changes to planned projects to ensure they comply before their construction commences.

Overheating of buildings is not a new issue. Previously, it has been partially addressed with assessment tools and guidance by various bodies, but for the first time, the UK Government, in the form of the Department for Levelling Up, Housing and Communities (DLUHC) has firmly addressed the issue. The management of solar gains in buildings is to be enforced under the revised Building Regulations 2022, specifically the new Part O, which came into effect on 15 June 2022.

What is Part O?

Approved Document O covers the overheating mitigation requirements of the Building Regulations; **designing and constructing buildings to limit unwanted solar gains in summer and provide an adequate means of removing excess heat from the indoor environment.**

It applies to all residential and institutional dwellings, including care facilities and student accommodation, anywhere you would stay overnight (but excluding hotels), ranging from a single storey house to a high-rise apartment block.

Make no mistake, this is a significant change that will need to be acknowledged and adopted by all developers and designers with immediate effect, to avoid the risk of new homes failing to pass building regs.

Make no mistake, this is a significant change that will need to be acknowledged and adopted by all developers and designers with immediate effect, to avoid the risk of new homes failing to pass building regs.

Since December 2021 when Part O was released, Smartlouvre have been gathering feedback from those affected including house builders and housing associations. They have written a whitepaper to respond to this feedback, with input from designers, building physicists, simulation experts and members of CIBSE.

They have also been in contact with the Department of Levelling Up, Housing and Communities to ensure what they create is a rounded document, which de-mystifies the regulation and provides unbiased advice, whilst giving thought provoking comment as to how we in the construction sector can design in consideration of user comfort and health as a primary consideration. ■

To read the whitepaper please visit smartlouvre.com

Honorary Fellows

Honorary Fellow, HonFCIAT, is awarded by the Institute to a distinguished individual in recognition of their contribution to the discipline and profession. It is the highest accolade that the Institute can bestow on non-members in recognition of their support to the discipline and profession. In the last issue of the *Journal*, the Institute was delighted to announce the inaugural recipients and here are their citations reproduced in full.

Francesca Berriman MBE HonDTech for:

- **eminence working in fields related to Architectural Technology, and work which has had a positive impact on Architectural Technology;**
- **significant contribution to Architectural Technology; and**
- **significant and continued association with Architectural Technology.**

Nominated by Adam Endacott, Creative & Communications Director:

Francesca Berriman has been immersed in the discipline of Architectural Technology for over 30 years. In her time with the Institute, Francesca has become the trusted face of the discipline and CIAT, and as such is highly regarded, respected and an inspiration to many. This was recognised in 2012 when the MBE was conveyed on her by Her Majesty, Queen Elizabeth II for her services to Architectural Technology. As Chief Executive, Francesca has guided and led an array of members and a workforce of staff across four decades to achieve a number of milestones and advanced recognition for the discipline, profession, membership and Institute – in the UK and internationally.

As her time with the Institute comes to an end, I am nominating Francesca to receive Honorary Fellow to recognise her distinguished and credible contribution to Architectural Technology. Whilst she is a paid employee, Francesca has gone above and beyond over her dedicated 34 years and will continue to be a champion even though she is retiring from Central Office.

Known for her professionalism and generosity, Francesca has represented the discipline externally at

numerous events, exhibitions, meetings and more. This has included as a Trustee of the Building Research Establishment (BRE) and Chair of its Programmes Committee; a Council member and former Vice-Chair of both the Society for the Environment (SocEnv) and the Construction Industry Council (CIC); and a member of Edge, a think tank for the built environment. Francesca has been a judge for a variety of awards such as the Women in Construction Award, Engineering Awards, and the Landscape Institute Awards. She has sat on panels and spoken at events and seminars internationally and was the keynote speaker at the 2016 National Building Design International Conference in Australia – all promoting Architectural Technology.

Whilst there have been numerous milestones and achievements over 34 years, some notable ones which were overseen or led by Francesca include:

- The change from British Institute of Architectural Technicians to British Institute of Architectural Technologists.
- Grant of the Royal Charter with the protected title, Chartered Architectural Technologist.
- The development of degrees in Architectural Technology and the Level 4 N/SVQ.
- The development of the QAA Subject Benchmark Statement for Architectural Technology.
- The introduction of the AT Awards, a suite of Awards to recognise excellence.

These solid and tangible changes and developments have raised the profile of Architectural Technology immensely, ensuring that it is recognised for its importance, value and merit as a distinct discipline – remaining so in a changing built environment landscape. Francesca keeps the members and affiliates at the forefront of all that she does for the Architectural Technology community. Her guidance, enthusiasm and knowledge make Francesca an effective leader who produces positive results with humility and integrity.

Francesca is one of that handful of figures who have changed the course of Architectural Technology history through the sheer force of their talent and determination. She has revolutionised the discipline and successfully built upon its foundations and turned it into the respected and leading profession in the sector that it is today. The Honorary Fellow is given to an individual who has, in a fundamental way, advanced Architectural Technology. For that reason, I nominate Francesca Berriman and her incalculable contribution to the discipline.

Professor Jaffer A A Khan PhD for:

- **significant contribution to Architectural Technology; and**
- **significant and continued association with Architectural Technology.**

Nominated by Tara Page, Education & International Director:

The following citation is for Dr Jaffer AA Khan, an eminent architect based in India and New Zealand who has worked closely with the Institute over recent years and who has a passionate interest in the field of Architectural Technology. Jaffer was initially approached by CIAT when an article written by him was brought to our attention about the importance of AT, despite having no association with the Institute at the time. In India, the work of the AT has traditionally been undertaken by the architect, and Jaffer identified (and still promotes) the need for an additional, distinct discipline which would enable Indian architecture students and practitioners to distinguish themselves in a very large field.

Throughout the period in which CIAT has been acquainted with Jaffer, he has been an energetic, positive and influential advocate of the Institute and the discipline, who would be well deserving of CIAT's Honorary Fellow accolade.

Jaffer is a renowned, innovative leader within the broad field of architecture in both higher education and industry practice. He currently works in a higher academic leadership role as the Dean of School of Environment, Architecture and Design (SEAD) at SRM Institute of Science and Technology, Chennai, where he is responsible for undergraduate and graduate programmes in Architecture and Interior Design. He also directly mentors the M.Arch programme and plans to introduce Technology Futures as a specialised course within Architecture Technology, focusing on the digital footprint in architecture and technology space.

Jaffer is active on an international scale both in regard to architectural practice, teaching and research and he possesses leadership skills critical to the successful development of the institutions with whom he works, through his extensive network which he has nurtured throughout his career. Through these international networks, he has been able to make financially viable and profitable ventures for his associated educational institutions by establishing interdisciplinary schools of research in architecture and AT.

Jaffer's research activity in the broad field of architecture started more than 40 years ago and his work has been recognised and celebrated throughout his career. For example, he undertook research for an urban ecology project in Paris, which was awarded the Academy of Architecture Award in 1993. Later he was involved in an urban revitalisation project for Mostar Old Town which won the Aga Khan Award for Architecture (Urban Design and Conservation) in 1996. His work on this was published as a compilation.

Throughout his working life, Jaffer has consistently pursued an integrative approach to teaching, research and practice, allowing his teaching to be informed by research, and research to be engaged with practice. His work has been published in magazines such as Inside-Outside and Architecture+ Design which are widely read among the architecture fraternity in India. His works and opinions have also been published in magazines such as Built Expressions, The Indian Express and The Hindu. He has been a correspondent for the Journal of the Indian Institute

of Architects, Mumbai and currently contributes regularly to architectural education articles for Antarya, an Indian Institute of Interior Design (IIID) magazine, which he introduced to CIAT, who subsequently also had an article published.

As well as being a prolific writer and advocate of Architectural Technology in the public domain, Jaffer has delivered numerous lectures through various forums in India and further afield on the technology of architecture, including climate change, urban ecology and heritage. Most recently he presented at an international conference in Kuala Lumpur, organised by the International Islamic University Malaysia (IIUM), whose papers are to be published in the American Scientific Journal.

Jaffer's first joint venture with CIAT was in 2017 when he was an Adjunct Professor of Architecture at Vellore Institute of Technology (VIT). Together with CIAT's International Department, he organised an international conference on AT which was hosted by VIT, with the CIAT team in attendance. This association has deepened and developed over the years. Jaffer was one of the keynote speakers at the CIAT-AICTE conference in New Delhi in 2019 which had a team of expert speakers from India and the UK. In 2021, CIAT's association with Jaffer strengthened further when an international webinar was held in collaboration with VIT, which again had a wide range of international speakers. This was a very successful three-day event, with more than 300 participants in attendance on each day. Jaffer was instrumental to the success of each event, through his hard work and determination in facilitating them, promoting them and sourcing high profile speakers.

Collaboration has been key to his success in Jaffer's practice, teaching, and research. He has served as a validator/inspector of architectural standards for many schools in India, appointed by the Council of Architecture, under the Ministry of Human Resources and Development Government of India. He has also been responsible for the Education, Research and Publication Panel of the RIBA India Chapter.

In practice, he has collaborated with large architectural corporations such as HOK and Ryder HKS on projects in India. For example with HOK, his practice carried out the masterplan of a township near Chennai of 1,200 acres. Jaffer is passionate about working collaboratively to produce meaningful architecture that is technology-focused, and he strives to nurture students at the educational institutions with whom he engages.

Jaffer's practice and teaching research philosophy is to design ecologically sustainable high-tech buildings in terms of engineering, materials, sciences, services and digital technology, through collaboration; resulting in buildings and spaces that can offer a wider variety of experiences and that can adapt to the client's vision and the changing needs of modern society. In his practice he has dealt with various complex technology challenges in architectural projects and has constructively engaged with professionals from a range of disciplines throughout the process. An example of this is one of his large residential projects in Bangalore (200,000 sqm, accommodating 1000 homes) where he collaborated with experts to use Computational Fluid Dynamics (CFD) to understand the comfort levels of building users, considered the potential hazards caused by the indoor air quality of the buildings, incorporated solar technology and established robust water treatment technology.

Jaffer continues to engage with CIAT to inspire VIT students to join the Institute's aspirATion Group, and he has initiated discussions on the Accreditation of the B. Arch programme at VIT. In his new role as the Dean at SRMIST in Chennai, he has also promoted aspirATion among the students and his aim – as well as pursuing CIAT Accreditation of relevant programmes – is to establish AT as a significant profession to younger generations in India, and beyond.

Jaffer is passionate about the technology of architecture, and he has an impressive gift of being able to enthuse and influence others too, from students to senior decision makers. As an Honorary Fellow of the Institute, his advocacy for the discipline, profession and Institute will continue, and with his support, interest in AT in India and further afield will grow.

Professor Sean Smith BSc PhD

- **for eminence working in fields related to Architectural Technology, and work which has had a positive impact on Architectural Technology;**
- **significant contribution to Architectural Technology; and**
- **significant and continued association with Architectural Technology.**

Nominated by Professor Sam Allwinkle PPBIAT FCIAT

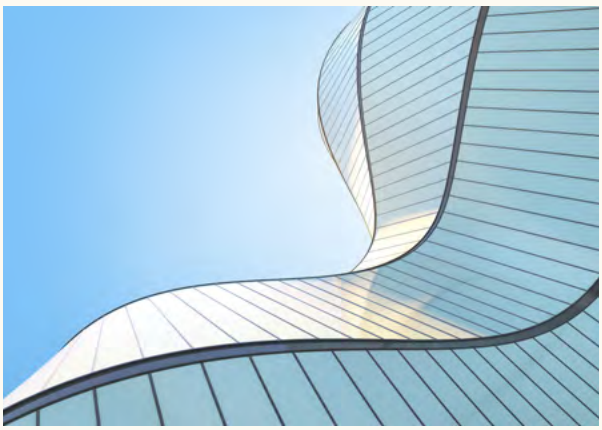
Context
I have known and worked with Sean for more than twenty years and his exceptional contributions to Architectural Technology are recognised nationally and internationally by academia, industry, professions and governments. Sean is Professor of Future Construction and Director of Centre for Future Infrastructure, within the School of Engineering at the University of Edinburgh. He joined the University in June 2020.

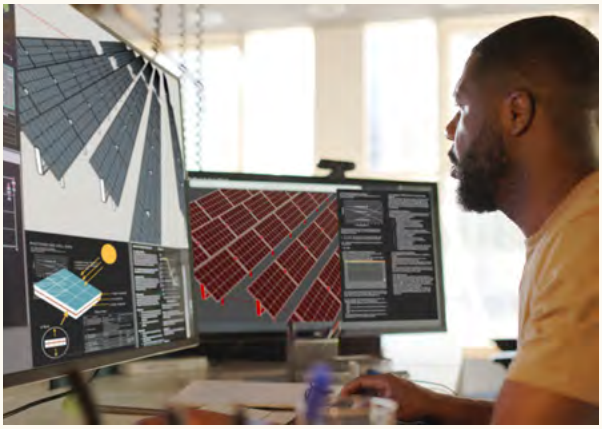
He is a Fellow of the Institute of Acoustics, Fellow of the RSA and is an Honorary Fellow of RIAS. From 1988-92 he studied at Heriot-Watt University (BSc Building Economics & QS). In 1992 he commenced an EPSRC funded PhD investigating complex vibration analysis for timber frame buildings using statistical energy analysis. He took up a research associate post for 3 years jointly funded by EPSRC and Defence Evaluation Research Agency (DERA) investigating application of his theoretical prediction models for sound and vibration in rotary and fixed wing aircraft.

Positive impact
Between 1994-99 he was an invited guest scientist at the government construction research laboratories in Canada (NRC), Italy (IENGF) and Germany (PTB). In 2001, he joined RMP Acoustics and Napier University and he led the technical development of robust details for sound insulation for Part E of the Building Regulations. A complex project involving the design and construction of 1,400 new homes over 9 months with innovative engineering solutions. This led to a white paper before the UK Parliament published by Office of the Deputy Prime Minister and his engineering specifications have now been utilised in over 1.3 million UK homes and led to significant improvement in sound insulation and quality of life for home occupants.

Significant contribution and excellence
From 2010 to 2020 he was Director of the Institute for Sustainable Construction, Edinburgh Napier University, managing 5 research centres involving offsite construction, energy, timber engineering, wood science technologies and noise & vibration. He was a founding member and led the UK consortia for the EU Cost Action (TU0901) involving 32 countries investigating future harmonisation of standards related to ISO 717. In 2009-13 he led the EU ERDF funded Low Carbon Building Technologies (LCBT) Gateway applied research team, supporting with his colleagues over 200 new construction products and systems.

He led the government review of the Scottish Offsite construction sector in 2012 and initiated the 11 universities partnership with industry to form in 2014 the Construction Scotland Innovation Centre (CSIC). From 2017-20 he led the CIAT Centre of Excellence at Edinburgh Napier University and previously served on CIAT Education and Research Committees.





In 2019 he successfully led the £6 million bid for Housing, Construction & Infrastructure (HCI) Skills Gateway for Edinburgh & SE Scotland City Region Deal to support inclusive growth and future skills for construction, engineering and infrastructure.

In 2019, he chaired the Scottish Government group on New Housing & Future Construction Skills which was published and was incorporated into the programme for government in 2020. He served in 2021 on the Zero Emissions Social Housing Task Force resulting in a strategy paper published by Scottish Government recommending a mass retrofit technical approach.

He has been an advisor to CEN and ISO committees and formed research networks with 40+ countries. He serves on a range of external committees and boards involved in innovation, construction regulatory compliance, housing, infrastructure and skills.

Significant and continued association
Sean is a major influencer within academia, government, industry and professional institutes and supports and promotes Architectural Technology, Architectural Technologists and CIAT and is an important and significant advocate for the Institute and the profession. He is a leading voice and is well placed to ensure that CIAT gains and maintains recognition at the highest level.

Building resilience to climate change

Words by Insulation Manufacturers Association (IMA)

Faced with the disruptive challenges of the COVID-19 Pandemic, war in Europe and widespread changes to our climate over the past two years, the world must strengthen its resilience against these global events. The same should be said for the built environment, as it adapts to changing climate conditions. It is why, when it comes to buildings, they must be designed in a way to adapt to changing conditions.

With the UK facing soaring and unprecedented energy prices, resilient design, its relationship to sustainability and how it will futureproof our built environment to the challenges ahead must be considered.

Our world is changing and we must make changes in response. With more extreme climate events becoming the norm whether it is the deep freezes and floods of winter to the record-breaking temperatures of the summer of 2022, it is crucial that our built environment is able to withstand long-term climate changes. When you consider that a typical building will still be in use 60 years from now, the climate that building will encounter may be significantly different. It therefore needs to be resilient, particularly in light of the energy price shocks we are currently experiencing. But what do we mean by 'resilient design'?

According to the Resilient Design Institute, resilient design is defined as 'the intentional design of buildings, landscapes and communities to adapt to changing conditions in order to maintain functionality'. It is based on eight key principles which we will look at in more detail:

- Resilience anticipates change and context;
- Passive and flexible solutions are superior;
- Resilience identifies and mimics solutions in nature;
- Local, renewable resources are superior;
- Resilience transcends scale;
- Resilience safeguards basic human needs;
- Resilience of diverse and redundant systems, and;
- Resilience is not absolute.

Resilience anticipates change and context

One of the biggest changes we are currently experiencing are the energy price rises, and the context remains that we still need to achieve net zero. Enshrined into law, this 2050 target has not shifted, but the environment within which we are operating has, not just in terms of COVI-19 and the fact that people continue to work from home more, but also because of the energy price rises. It is imperative that we ensure our homes are adaptable to those sorts of changes within the context of the net zero targets. These are legally binding targets and we welcome the net zero review that Chris Skidmore MP will be carrying out over the future months to ensure the UK will deliver on its climate change targets. These are significant changes that people are experiencing and are likely to experience in the next few years.

Passive and flexible solutions are superior
Priority should always be given to passive solutions, which is why a building's fabric needs to be upgraded first. Active, bolt-on renewable technologies exist, but are only as good as the building in which they are to be installed. Therefore, if the building is leaky and inefficient to begin with, there is only so much the new technology can achieve. By reducing the total energy demand of a building, the size and capacity of any renewables can be reduced, which in turn will reduce capital and running costs. Only when energy demands are reduced to a low level, is it possible to service those demands in the most efficient way. It is important not to add undue burdens through the running costs of renewables.

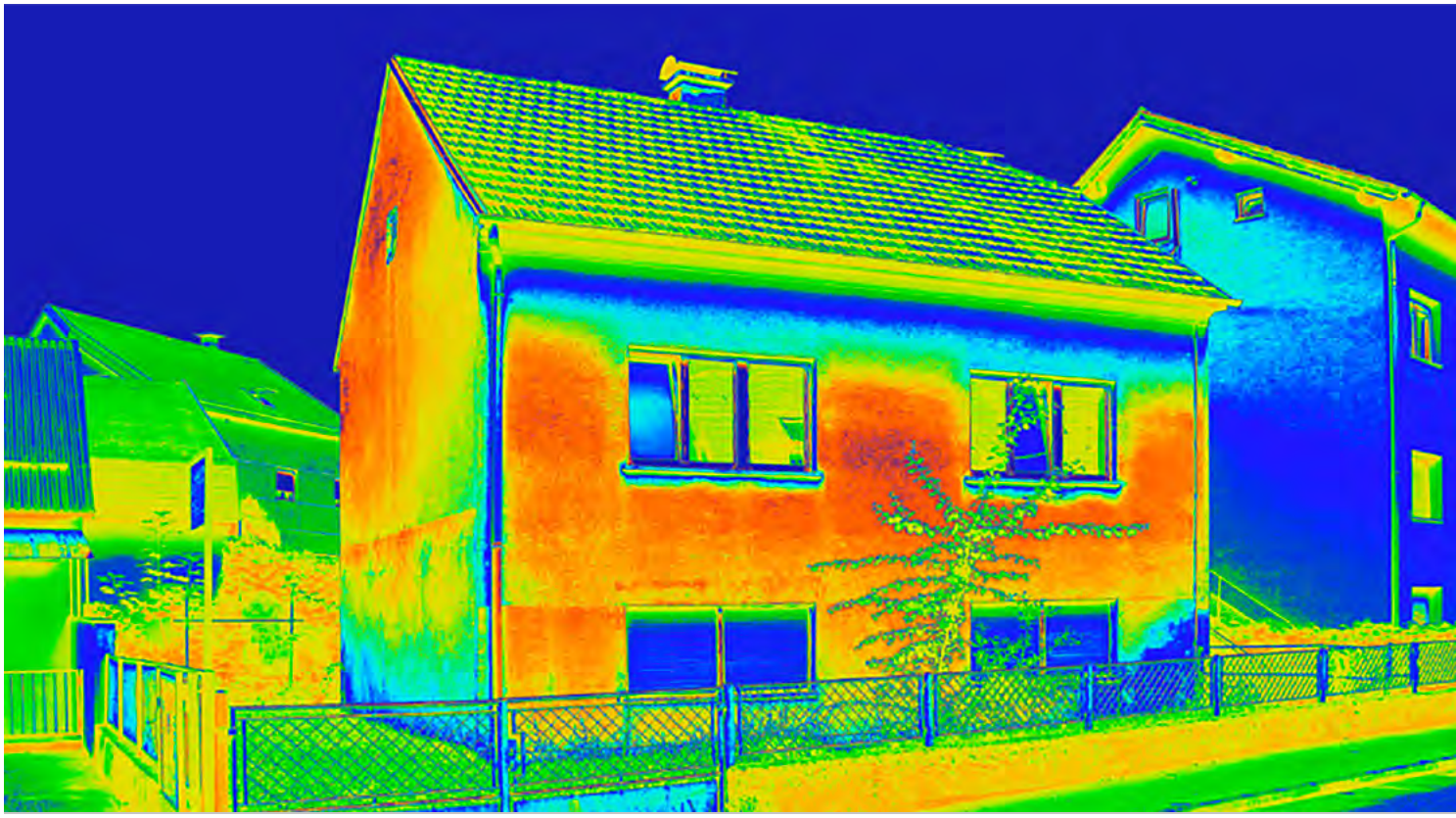
In 2010, analysis by the Energy Saving Trust[1] found that of the sample tested, the majority of heat pumps installed as part of a government scheme did not achieve their efficiency of performance. Further research between EST, government and industry found that performance and efficiency of heat pumps improved in well-insulated homes[2].

Resilience identifies and mimics solutions in nature
The natural world has evolved to achieve resilience and there is a move towards more bio-based solutions. There is extensive research and development into biomimicry (nature-inspired innovation) within organisations that are looking at how we can make our products more renewable and bio-based, both in terms of the environmental and social aspects. Of course, it is one thing having the most bio-based solution, but if this is at the expense of agricultural land, then it is not the right thing to do. Bio-based raw materials such as mycelium[3] is one area of focus as a potential building material. This is a mushroom-based fungi insulation material which is durable and resistant to water, mould and fire. It's a promising and unconventional new material and a low-impact solution for buildings, but this is early days in terms of its development.

Local renewable resources are superior
Renewable resources that are produced locally and reduce the need for travel are particularly relevant to resilience. Given the issues with COVID-19 and the very long lag times for delivery due to various lockdowns in China and other countries, global supply chains struggled to meet demand and manufactured products did not arrive in time. Local renewably sourced products can not only reduce transport-related carbon emissions but will help meet environmental targets, as many companies are looking at certifications such as BES 6001: Responsible Sourcing of Construction Products standard and reducing their Scope 3 emissions. Many companies have set in place ambitious environmental targets to become net zero. This involves targets for on-site generation and solar panels, alongside reducing the energy intensity of their products.

Resilience transcends scale
Climate change is a global long-term issue and efforts need to be taken now to ensure that the buildings we build today are resilient for future generations. This will mean avoiding expensive retrofits in the future to get to net zero homes as we have the resources, capacity and capabilities to build these homes today. The timescales that we need to work within are urgent but this would help build resilience of our built environment for the longer term.

Resilience safeguards basic human needs
Rising energy bills will mean an increase in fuel poverty this winter with many people having to make the choice between heating and eating. Research by the Institute for Government (IfG) has said that UK households are still likely to be facing high energy bills in the winter of 2023 which is why the adoption of resilient energy efficiency



measures within our homes (which are currently amongst the least energy efficient in Europe) will safeguard these households from the shock of rising gas prices.

Those who cannot afford to heat their homes are typically living in homes that need the most work done in terms of insulation – it is therefore a double dilemma. These are likely to be pre-1980s homes built to pre-Part L Regulations. If they are not able to afford heating, they are unlikely to be able to afford to pay for the cost of the installation of energy saving measures and as winter comes, will need to make choices between heating and eating.

Resilience of diverse and redundant systems

More diverse communities, ecosystems, economies and social systems are better able to respond to the global challenges we face, which in turn makes them more resilient. It may sometimes be in conflict with our drive for a sustainable built environment, but a retained redundant system could increase resilience as it could provide a back-up in the event a primary system fails.

Resilience is not absolute.

Resilience is not simply a tick box exercise when it comes to futureproofing our built environment. It is an ever-evolving process, as our buildings must be able to respond to both what is expected and also what is unexpected. The changes that have occurred due to climate change and the chaos this is likely to bring, will mean resilience must respond and adjust to different kinds of weather and the challenges this will bring. We also need to look at our populations, including our ageing population, mass migration and the nature of how we live. Whilst resilience to all situations is impossible, incremental changes can always be taken in order to respond to vulnerabilities.

A fabric first approach

One of the most important things we could do is to make our homes more resilient to some of these energy shocks that we are currently experiencing. As we have stated, the best way of doing so is to improve the fabric of the building, rather than relying on additional technologies and having to buy a renewable solution to reduce energy. By bringing in passive measures from the outset, energy demand for space heating can be significantly reduced allowing energy to be used more efficiently, prudently and to a higher performance. This will mean improving the fabric of the building before bringing in other technologies to provide optimal performance for the home. In turn, householders will see reduction in energy bills and a quicker payback if energy prices continue to increase at this rate.

Eighteen months ago, the return on investment for a deep retrofit would have been much longer than it is now. Fast forward to today and the return on any investment made will have a much faster rate of return as the money saved on bills will be much more substantial[4].

Futureproofed

Resilient design is a complex issue that involves long-term thinking both in terms of a building and its use, but also in relation to the altered climate of the future. As the first line of defence, an improved and thermally efficient building fabric will not only go some way to ensure our homes are resilient to a changing climate but also has potential to contribute to solving fuel poverty. Turning resilient design into reality can also be done at a fraction of the cost of the government's short-term 'sticking plaster' approach to rising energy costs and will put us on the best route to building better for the future. Future Homes and Future Buildings Standards which will significantly improve the thermal performance are critical and therefore it is essential their implementation is brought forward to avoid building homes that will not be future proofed. ■

For more information about IMA or to download best practice guides visit: insulationmanufacturers.org.uk

1 Analysis from the Energy Saving Trust's heat pump field trial – GOV.UK (www.gov.uk)
2 Pathways to high penetration of heat pumps: Report prepared for the Committee on Climate Change, October 2013
3 The Science And Art Of Sustainable Mushroom-Based Building Materials (forbes.com)
4 Insulating Britain: If not now, when? | UCL Institute for Environmental Design and Engineering – UCL – University College London

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Creating a new chapter for World Heritage Site, Caernarfon Castle

Words by Alex Scrimshaw MCIAT, CIAT-Accredited Conservationist, Senior Architectural Technologist, Buttress

Castles have long been one of the most intriguing parts of our built heritage. Originally designed to deter and defend against invaders, today, many of them exist as major tourist attractions, often welcoming hundreds of thousands of visitors each year.

Whilst these structures offer a fascinating insight into our past, they can often pose a number of limitations to visitors – with narrow access corridors, winding spiral staircases and worn treads making them inaccessible to many. As such, the need to conserve and enhance their significance is tremendous, as is the need for them to adapt to accommodate all visitors – enabling the widest possible range of people to explore, enjoy and understand these important parts of our history.

Since 2016, Buttress has been working with Cadw on a landmark project to redevelop the King's Gate at Caernarfon Castle. Recognised internationally as one of the greatest structures of the Middle Ages, the castle is Grade I listed and a designated Scheduled Monument, becoming a part of Wales' first UNESCO World Heritage Site in 1986.

Our brief was to make a larger section of the upper battlements accessible to all, to improve interpretation of the site, and to create new visitor facilities including a café provision and lookout, offering some of the best views across North Wales.

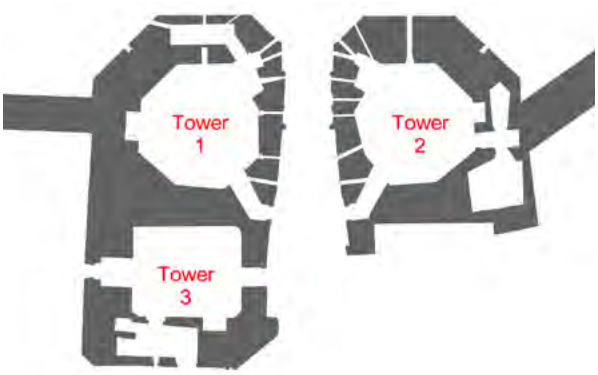
It was important to maintain the charm and historic significance of the castle whilst also providing usable spaces and incorporating interventions that are both reversible and non-intrusive. Our plans have added a new layer of architecture to the medieval building through the creation of a lightweight structure that sits on top of and within the triple-towered King's Gate. On the upper levels, this structure spans the King's Gate, providing seating areas offering views across the castle complex and beyond.

Improving accessibility

Achieving improved access to the site has resulted in a new lift within the King's Gate; the first intervention of its kind within a UK World Heritage site. The passenger lift is located within Tower 1 and provides access from ground level, perforating the viewing platform with glazing to all four sides.

Balustrading is frameless to the outer perimeter of the platform with concealed fixing plates, capped with a bespoke deep profiled timber handrail with an inset flush metal strip, providing the opportunity to pause and gaze out across the castle grounds.

The platform walkways, elements and components have been designed to sit below the 'as existing' wall head height, giving the illusion of the glazing extending from the stone wall heads.



Adding a new layer of architecture

Our approach respects the fact that the King's Gate was left as incomplete, recognising that this is part of the outstanding universal value of the World Heritage site. As such, our designs have not sought to complete the building, but simply add another layer to its history. All new interventions have been designed to be visually and physically separate from the castle walls, only lightly touching the building at access points.

This approach has also been applied to the way in which we introduce furniture into the spaces. The majority has been prefabricated off-site, brought in and slotted into place. Other pieces have been handmade and built to fit around walls or other areas of the existing fabric.

The new elements are sympathetic to the original fabric whilst being legible as modern, with a palette of materials that sit in harmony with the limestone and granite blocks. Sustainably sourced timber will be left to patina and colour naturally over time, whilst large expanses of frameless glass allow views and vistas to be maximised, unrestricted by physical posts and framing members. All glazing has been specified with low reflexivity glazing to minimise the visual impact on the monument and reduce distortion which can be found with standard glass.

Two large-glazed floor panels have been sunken into the viewing platform to provide increased daylighting into the chapel space below. The glazing has been uniquely etched with a bespoke pattern and provides a degree of privacy whilst also providing a slip-resistant surface.

No direct fixings

Similarly, mechanical fixings through the fabric have been kept to an absolute minimum to both limit scarring and to allow for the creative reuse of the existing mass.

Former ledges and joist pockets were reused to restrain structural elements and take vertical loadings. New steel ring beams were fabricated to follow the skewed octagonal plan form across Towers 1 and 2 and were designed to sit upon existing stone ledges. The steel structure of Tower 3 required more careful consideration, with a concealed interwoven web of steelwork installed upon the existing undulating wall head.

No new openings or penetrations were formed within the King's Gate. Wherever possible, the existing footprint, door openings and staircases have been reused. This can be seen in Tower 3, where the remnants of a stone spiral staircase have been revitalised and brought back into use with the introduction of a new, highly bespoke timber spiral staircase as an extension to the existing, which sits upon the original stone newel post. The staircase has been constructed from a high-performance modified wood, which is extremely durable and sustainably sourced.

In order to minimise framing materials and obscuring architectural features, large bespoke structural glass sheets have also been installed within the existing window apertures internally. The glazing follows the outline of the window openings, offset to the perimeter to encourage cross-ventilation across the interior. The windows were designed to provide a safe physical barrier, limit water ingress, and increase ventilation, whilst retaining existing stone mullions, transoms and tracery.

Physical fixings into the building fabric have been coordinated to align with mortar joints only, with no direct fix through facing stonework. This resulted in staggered and stepped fixings to coincide with the locations of suitably sized mortar beds. A bespoke steel fixing stake was developed after vigorous prototyping, sampling and load testing. The stake also provides some degree of tolerance to allow for in situ adjustments of glazed panel positions. In total, approximately 400 brackets have been installed throughout the King's Gate.

All mechanical and electrical cabling and components are surface fixed across the walls and ceilings of the castle, with fixings taken into mortar joints. Malleable black armoured cabling was favoured over the use of surface fixed conduits, allowing for fixings to be tighter and less

intrusive than angular conduit. Several strategically placed vertical risers allow for the transfer of services across floor levels, with the floor plates or raised access floors allowing for the network of cabling to be distributed undetected and hidden, whilst also being readily accessible through the careful placement of access panels.

Natural ventilation

During the early stages of the project, the impracticality of enveloping the exterior walls of the King's Gate to provide a wholly watertight interior solution was agreed upon. As such, a semi-waterproof solution was developed, which involved the introduction of roofs within each of the towers. Existing wall heads remain in situ, reliant upon their sheer mass to control and mitigate water ingress, whilst interior spaces have been designed to encourage cross-ventilation maintained through existing window openings, with underfloor heating installed across the full floor plate to provide some background heating.

To supplement and encourage air flow through the interior spaces, ventilation is brought in at roof level through carefully concealed openings, masked by an array of organic timber seating. Air is drawn down mechanically and distributed across floor plates within a network of hidden ducting.

Fabric repairs

General fabric defects included loose mortar, spalled and friable masonry, fissures and fractures through mullions and transoms, soiled surfaces with carbon deposits, and a sulphate crust with localised soft vegetation growth, due in part to the castle's proximity to the coast.

The general philosophy towards fabric repairs was to retain as much of the original fabric as possible. Prior to undertaking any physical repairs, the fabric was closely assessed, and stone and fabric repair techniques were agreed upon by the designers, stone masons and conservation officer.

Carved stonework, statues and projections were closely inspected using pull and touch tests to ascertain their condition. The sections of stone that had become detached over time were gently worked free and reattached in situ using stainless steel dowels and resin, whilst delaminated or heavily spalled stones were cut out and new ones indented to match the existing in size, texture and bond.

The facing stone, windowsills and ledges that were dished or prone to ponding were either carefully dressed back or filled with mortar to encourage water to flow towards the face, reducing the risk of a freeze/thaw cycle and causing stone defects.

A light conservation clean was also undertaken to reduce surface soiling alongside vegetation, with the cementitious mortar carefully raked out by skilled, experienced masons and repointed with a lime mortar following extensive sampling.

A sustainable approach

Given the castle's designation as a World Heritage site and Scheduled Monument, the opportunity to introduce intrusive elements within accessible areas was restricted, whilst the archaeological constraints of the site limited the scope for any underground solutions. However, air source heat pumps have successfully been installed following careful consideration with Cadw.

In addition, a layer of insulation has been introduced across each of the new tower roof decks as well as the installation of LEDs, linked to PIRs where practical.

Materials and products have been sourced locally where available, such as stone from nearby quarries.

The result is a bold and innovative approach, yet subtle from the exterior, challenging convention whilst revealing and enhancing universal value of this remarkable place. The castle is now accessible to a wider audience for future generations to enjoy and explore. ■

When does cost outweigh conservation?

Words by Paul Trace, Stella Rooflight

It is hard to imagine a tougher economic climate. Having emerged from the COVID-19 Pandemic, businesses and homeowners are beset by the rising costs of fuel and materials, economic shockwaves from the war in Ukraine and stark warnings of 11% inflation from the Bank of England. This is compounded by ongoing building supply issues that are still being experienced as a result of Brexit.

As the cost of most building materials such as timber, steel and glass continue to increase, the impact will most keenly be felt among those working on self-build, renovation and extension projects. No doubt, this perfect storm of economic woe has resulted in the postponement of many such project, however, for those that are pressing on, most will be looking to cut back on budgets in whatever way they can and compromises on quality are inevitable.

Fortunately, when it comes to the majority of building projects, especially new build or modern homes, there is plenty of choice out there for most materials and components, and shopping around a little can yield useful savings. However, if your project is historically sensitive, for example a Listed Building, barn conversion or a property in a conservation area, then choices may be more limited.

There are many examples of imitation 'conservation' products on the market, for example plastic being used as a replacement for cast iron rainwater goods, windows and rooflights. While these products might offer a cheaper alternative, there are few, if any examples where these materials should be considered appropriate.

According to Historic England, the public body that looks after England's historic environment, in their Materials for Historic Building Repairs article[1] "The use of authentic traditional materials helps to retain the character of historic buildings and in turn supports traditional industries and vital craft skills. They argue that "some materials can actually harm the existing historic fabric and speed up deterioration" and urge for consideration to be given to "the potential durability of the material used and its future maintenance requirements", they conclude in saying "what might seem like the cheapest option might not

always work out so in the long run".

Looking more closely at the rooflight market; just because something is sold as a conservation product, that does not automatically make it suitable for all building types. If a rooflight is going to be introduced, it has to meet the conservation specifications of that particular area or type of building. If your building is Listed or in a conservation area then the criteria for using conservation rooflights are much stricter and you should always gain approval, not only for their use but also the manufacturer that you would want to use.

There are only a handful of companies that specifically make conservation rooflights and even fewer who design, manufacture and assemble in the UK. Many conservation rooflights available online are simply other products which have been spruced up to look like they meet the requirements of that type of product. There are many elements which go into a genuine conservation design and price is always a reflection on quality.

If a conservation rooflight is all frame, then there is little point in having one. Genuine conservation designs should be manufactured with slim, clean lines and a low-profile to match the roofline. A number of skylight companies try to produce conservation rooflights using modern bulky aluminium or plastic profiles, which sit proud of the roofline, particularly slate. It is widely accepted that most authentic conservation rooflights are manufactured from steel because it provides great strength while offering a slim profile and excellent glass to frame ratios. There are many types of steel conservation rooflights and for unrivalled protection and lifespan, one should always consider 316 stainless steel, which will protect against the common issue of rust.

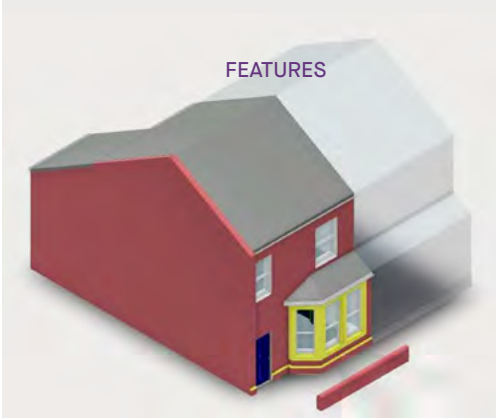
Consideration should also be given to the viewable area of a rooflight. Large rooflights do not always guarantee lots of light and you should always check what the finished viewable (often referred to as clear viewable) area of the rooflight will be. You might think that a conservation rooflight with a whole frame size of 900mm (w) x 1200mm (h) would have a similar clear viewable area regardless of the manufacturer, but you would be wrong and bulky framed modern types or the flat rooflights posing as pitched conservation styles will let in considerably less light than a genuine steel framed version.

Understanding what constitutes a genuine conservation product is vitally important in an age where we are witnessing far too many cheaper, often imported, plastic products, being used in sensitive buildings across the UK. The use of such products very rarely contributes anything to historic character of a building, indeed the visual impact of using modern materials on older buildings usually has quite the opposite effect.

While there is no denying that bone fide conservation products are more expensive – and hopefully the reasons for this have been demonstrated in this article – builders, designers and homeowners must resist the temptation to use alternative materials when looking at areas in which to cut back on budgets. As we continue to feel the economic squeeze we can only hope that decisions are taken in the best interests of the long term preservation of our heritage and that cost cutting does not end up having a long term impact on our important historical buildings.

For further information or to discuss your conservation rooflight requirement visit stellarooflight.co.uk

1 https://historicengland.org.uk/advice/technical-advice/buildings/building-materials-for-historic-buildings/



There's no BIM like home Part 16

Words by Dan Rossiter FCIAT, Chartered Architectural Technologist

AT Journal continues its exclusive access to serialise Dan's blog on how he used BIM to produce an information model of his home.

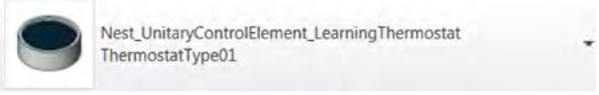
Object naming
We have discussed how to name objects previously, so I will not repeat myself here. However, as I mentioned in the last instalment it is not always as simple as complying to the standards; for one there is no guidance on type naming. To enforce this I have modified my BIM execution plan to include the following new heading and clauses under 5.4 Object Naming:

To satisfy **EIR, section 3.5** all objects produced will be named in accordance with **BS8541-1**. Specified below are

Source	Type	SubType
Author	See Ifc(Type)	See ...TypeEnum
Manufacturer		See product name

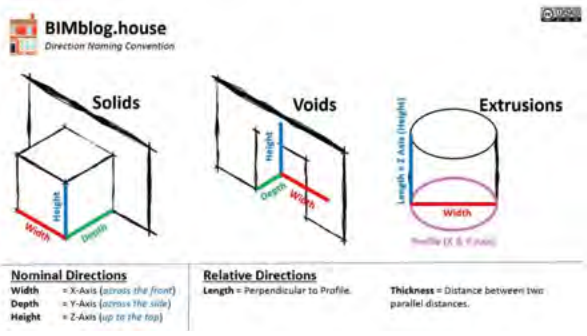
All objects types shall also be named following the following convention:

[...TypeEnum]Type[Number] e.g DoorType01.



By using the objects allowed enumerated values I get a consistent a human readable set of object types.

Attribute data conventions
Finally to control the application of consistent attribute data I have come up with the following convention which has been included within my BIM¬¬ execution plan:



For consistency I will be using the following convention:

***Width** = X-Axis (across the front)*
***Depth** = Y-Axis (across the side)*
***Height** = Z-Axis (up to the top)*

For a boiler it is rather simple. It has a height, width and depth. As it has no profile, it is given no length, leaving height and width to appear on the type worksheet, and depth to appear on the attribute worksheet. While this may seem a little messy, the benefit will be realised once the information is exported out of COBie and into a data management system.

For a door, this can be applied in a *fairly* straight forward manner. My doors have height and width, but depth is controlled by the host so it is not required; so I only need to record height and width. Once again, as it has no profile it is given no length. My kitchen worktop on the other hand is a little more complex.

As you see the profile used is the side of the worktop (Y-Axis), meaning that the length is perpendicular (X-Axis).

By modelling my kitchen worktop the way I have the profile has a height of 38mm, a depth of 625mm and a variable width (***width=length***). This means width is not required (***as it is instance driven***), leaving height and length and to appear on the type worksheet, and depth to appear on the attribute worksheet.

Constraints		
Length (default)	1200.0	=
Materials and Finishes Dimensions		
Depth	625.0	=
Height	38.0	=

By spending a little longer sorting out my BIM execution plan, I have a much tighter set of standards, methods, and procedures to follow which will result in a better data set now I am at the final stretch in completing my information models.

Now I take a look at my Amazon dash buttons.

What is it?
The **Amazon dash button** is a Wi-Fi enabled device, linked to specific products on Amazon. When you are starting to run low of a product, you simply press the button and an order will be placed and delivered using the details you have provided.

How does it work?
Using an Amazon account, you register the Amazon dash button as a device. Once the device is registered, you are able to select a product from the shortlist Amazon supports for your branded button. Once all of this has been completed, pressing the button sends a command over WI-FI to place an order for that product; it is as simple as that. The button also has a fail-safe that stops someone from pressing it multiple times by as default only allowing a single active order.

How did I model it?
Under the Industry Foundation Class (IFC) Schema, there is no obvious IFC Type, so I did what I always do in a situation such as this; ask **Twitter**. Following the voting, the majority of people thought that it should be a communication appliance. However, I have overruled this verdict and used SwitchingDevice_MomentarySwitch. I did this as my **Amazon dash buttons** have no 'position' and simply trigger an action to occur; making them switches.

Similar to my Nest Thermostat, I used a face based generic model to create my object, but this time I have modelled the object as a solid oval. Due to the low level of graphical detail used the object file is only around 296KB. The file was named following the **BS8541-1** naming convention to:

Amazon_SwitchingDevice_DashButton

Using the requirements set out within my data requirements, I populated this object with the data needed to manage my Amazon dash buttons. Capturing information such as: installation data, serial number, replacement cost and warranty information.

Is it smart?
The **Amazon dash button**, unfortunately, does not really tick the right boxes to be considered smart.

- **Data in:** Without any sensors, the data input method on the **Amazon dash button** is the button itself which means that the **only** way to activate it is by physically pressing the button. Also, annoyingly, the buttons settings can only be edited through the mobile app, and these settings are rather limited. For example, there is no way to rename my buttons despite being able to name other devices on my account.

- **Data out:** There is also little data available from the device. Aside from the default order history held on an Amazon account, no other information is available apart from a confirmation email received after the button is pressed.

- **Connectivity:** Due to the proprietary nature of the service, it is no surprise that it offers little connectivity. These buttons are basically physical do buttons, but without any connectivity to other applications.

The verdict
Is it smart? The answer is no. The Amazon dash buttons sounded pretty interesting when they were first released, however, after fitting a couple into my home I am disappointed at how little information I get out and put into them. Compared to other smart home products, it seems odd how isolated the Amazon dash buttons are especially when you consider how connected something like Amazon Echo is. ■

To be continued in the next issue.

@DRossiter87

Why transparency through digitisation is the solution for construction

Words by Matthew Jones, Founder of Open ECX

The construction industry has long been criticised for its lack of innovation and slow adoption of modern business practices. Many of which existed before the COVID-19 Pandemic and Brexit, such as cash flow, supply chain disruption and problematic project management, but have only been exacerbated due to recent events. As of late, we are also seeing an increased focus on sustainability – with more scrutiny on the industry to ensure it is doing what it can to help tackle the climate crisis.

The solution to most of these problems? Industry transparency. Whilst there are efforts being made, such as the introduction of the Construction Leadership Council (CLC) and the governments BIM mandate, we are yet to see as many tangible results as anticipated, with blockers still in place for digital transformation.

A 2020 report found that construction is slower than any other industry in adopting digital processes (McKinsey's Report) – despite a RICS report that very same year, finding that 72% of construction firms worldwide would class digital transformation as a priority. Within the same RICS report, it also found that 32% of the firms surveyed invested less than 3% of annual turnover on digitisation. With two years having passed since both McKinsey and RICS published the reports, as an industry, we are still unable to say that a clear transition has taken place and work still needs to be done.

COP26 renewed the focus on sustainability in the industry, with decision-making bodies now under intense pressure to implement quotas and methods of assessing the environmental impact of a product, process or service, and companies under intense scrutiny to reach such quotas. Since April this year, the UK Government has legally required large corporations to report on different factors that indicate their environmental impact including carbon emissions, which are now heavily monitored in all industries.

In any given project within construction, we can expect there to be different contractors, suppliers and stakeholders involved, which makes it difficult to collate information and report on the carbon emissions of a project over a length of time. However, there is an opportunity here for businesses to harness technology for good and allow for easier and more accurate reporting on

carbon emissions. Using digital systems such as ISO 14001:2015, companies can report on sustainability and achieve immediate accreditation on their level of sustainability.

This is just one example of how standardisation in technology, throughout the industry and in a specific project, ensures that all levels of the supply chain are reporting and accurately in line with each other, from the suppliers and contractors to the developers.

Recent events have of course disrupted the supply chain, which has had a huge global impact on many sectors, construction included. Construction is very much reliant on material supply and it is imperative that everyone involved, from material manufacturers to site managers and developers, have access to information on the source and status of supplies. ONS data recently revealed that the construction industry has seen stock levels fluctuate 5% quarter-to-quarter since 2019, as a result of Brexit, the COVID-19 Pandemic and to an extent – the blockage of the Suez Canal in March 2021.

Such fluctuation signals issues in ordering, supplying and invoicing – all of which can be remedied with better communication, transparency and digitisation. Currently, inventory in the UK construction industry is at the lowest point since Q4 2019, highlighting again why it is more important than ever that materials are closely tracked and monitored, avoiding easy mistakes when ordering. Open ECX's eOrdering platform ensures there is no room for error, as a cloud-based technology that integrates all levels of the supply chain, from material manufacturer to the businesses managing projects of any scale. Saving time, expense and helping to avoid human error, Open ECX's solution automatically processes orders and transmits the data to sales and finance teams, in real time.

As a high-risk, low-profit margin industry, it is imperative that projects are also delivering in cash flow. Digital solutions support industry transparency through real-time data transfer and faster payments. We are now seeing more industries adopt a SSOT (single source of truth) model of data management, which collates all relevant data onto one single system, allowing for better workplace efficiency and easier accessibility.

In 2019, a study in the *Journal of Building Engineering* found that 44% of construction projects resulted in a loss. The pandemic left lessons to be learnt, on the real importance of cash flow in the industry – with the sector coming to a standstill and businesses becoming reliant on their limited cash reserves, highlighting the importance of prompt payment.

There is an opportunity here for business to harness technology for good

The introduction of the Fair Payment Charter in 2016, which encourages suppliers and contractors to be transparent and ensures accountability in payment times, has further encouraged companies to adopt clearer reporting processes. Open ECX's eInvoicing hub supports this, allowing automation of the accounts payable function. With an end-to-end, paperless system, invoices and payments are available on one system in real-time, saving time, ensuring greater accuracy and transparency, and supporting more efficient ways of working.

In conclusion, the big global events mentioned above have of course had a huge impact on the construction industry – however, they have pushed already existing issues into the spotlight, encouraging the sector to make real changes to ensure a brighter future. Internally, suppliers, contractors and manufacturers are becoming more transparent every day, with investments into internal technology. We must now look at how the industry can work together to tackle the climate crisis, improve cash flow and future-proof the industry. ■

Mind the AI gap: three common artificial intelligence pitfalls and how architectural practices can avoid them

Words by Rob Smith, Chief Technology Officer, Creative ITC

Artificial intelligence (AI) promises to bring strategic benefits to architectural firms, improving decision-making, increasing project efficiencies and enhancing client experiences. Yet, scaling up and unlocking the full potential of any emerging technology can prove difficult. Drawing on lessons learned deploying technology solutions to some of the world's leading players in the sector, this article explains how architectural and design practices can avoid common AI minefields to achieve greater return on investment.

In the wake of the coronavirus pandemic, construction projects are still being impacted by labour and materials shortages, causing continued budget and time overruns. As organisations progress digital transformation to gain a competitive edge, the inexorable rise of artificial intelligence (AI) and machine learning (ML) in the architecture, engineering and construction sector shows no sign of slowing. Offering firms new ways to accelerate and improve decision-making, efficiency and customer service, two thirds of companies plan to invest more in AI over the next three years.

These new technologies offer unprecedented capabilities for architectural practices to improve decision making, automate calculations and test design variations to fast-track client projects. The new ability – to quickly analyse data, identify patterns and make informed decisions with minimal human intervention – is set to transform how firms operate. Released from time-consuming tasks such as workflow and resource planning, Architectural Technology professionals can spend more time on billable work and business development activities.

As well as boosting productivity through workflow and scheduling automation, there is also a role for AI to inform designs and plans, aid materials selection and improve the way multi-disciplinary teams translate these plans into completed structures. With increased use of drones by construction teams and growing adoption of advanced cameras by site workers, AI can easily knit together captured images and videos into usable 3D-reality models, floor plans and site maps. The technology can be successfully used to compare those images and models to create design versus reality visualisations and rapidly identify deviations. Advanced analytics accelerate and improve decision making, with ability to run millions of permutations of how a project schedule and costs will be affected to ensure the right course of action is taken and minimise risks and delays.

Moving beyond individual structures, AI can also be deployed successfully at large scale developments to enhance urban planning and highlight sustainability opportunities. AI-driven tools can be used to analyse and optimise factors such as views, daylight, traffic movements, parking and more. To improve human comfort and energy efficiency, tools can model wind movements between buildings, predict sound levels from traffic and identify contributory factors causing heat islands.

Hidden pitfalls

However, although many architectural and construction firms are achieving successful results from these kind of AI deployments, scaling up enterprise-wide remains unattainable for many - particularly when complex, multi-disciplinary supply chains are taken into account. All too often, AI expansion often reveals underlying problems.

AI projects frequently over-run, overspend and fall short in terms of results. The most common constraints to scaling up are:

- **Legacy infrastructure issues**
  Huge AI processing requirements swamp data centre and network capacity, causing latency issues or even outages. Trying to share actionable insights with stakeholders in multiple locations can reveal further weaknesses in legacy IT infrastructures, which haven't been designed to share such datasets securely at speed and scale. Frequently, this leads to poor user experiences and collaboration challenges.

- **Unforeseen costs**
  New technologies are stretching IT budgets. Total cost

of ownership (TCO) does not stop with acquiring the AI solution itself, of course; it also includes implementing and maintaining the right IT infrastructure and integration systems to support long-term AI deployment.

- **Internal resource and skills gaps**
  To optimise AI workloads and allow an organisation to realise its potential business benefits, specialist IT skills are required. Most architectural practices are not able to employ and retain large, multi-skilled IT teams, or devote adequate resources to ensure long-term AI success.

Boosting chances of AI success

Architectural firms are increasingly moving to the cloud to satisfy these extra IT infrastructure requirements. Many companies use a combination of cloud and on-premise platforms to give them the agility and scalability they need for high loads, without the need to own and maintain unused capabilities during quieter times. Research shows that the businesses enjoying the biggest gains from AI are taking greater advantage of cloud infrastructure than their peers.

With the added pressure AI brings to in-house IT teams, many organisations quickly realise that trying to achieve this perfect mix of infrastructure, resources and skills on-site and maintain a cloud estate is simply not feasible.

Infrastructure-as-a-Service (IaaS) provides a cost-effective, robust foundation for AI growth. Providing on-demand access to computing power and storage via the cloud, it allows firms to overcome legacy issues, while offloading hardware costs, upgrade burdens and skilled resourcing requirements to a managed service provider (MSP). This route quickly pays back with savings on data centre space, infrastructure, licensing, support, training and headcount, providing a fully-managed service in a predictable, monthly OpEx model.

Choosing the right AI partner

Here are five key questions to ask to ensure you choose the right MSP to ensure AI success:

1. Do they have a strong track record in architecture, engineering and construction and can help you meet industry and regulatory requirements?
2. Can you retain necessary data and workloads on-site, while accessing the latest technologies across public, private and hybrid cloud environments?
3. Can they evidence expertise to deploy the right IaaS solution with ongoing management, optimisation and UK-based 24/7 support?
4. Do they have expertise in high-performance graphics processing units (GPUs) capable of handling vast and complex workloads simultaneously, which are essential for rapid AI and real-time business analysis?
5. Do they have end-to-end expertise from devices, connectivity and cloud to storage, security and UX?

IaaS solutions are empowering organisations across many sectors with more effective handling of complex AI workloads and headache-free management. With pandemic challenges still lingering, this route is helping architecture and design practices to stay ahead of the competition, providing new flexibility, speed and scalability on a realistic budget and time frame. The leading architecture firms are increasingly leveraging as-a-Service models to unlock greater ROI from new technologies. This trend is accelerating digital transformation across the sector and enabling IT leaders to unlock greater strategic benefit. ■

Data is a tool for the Architectural Technology professional of the future

Words by Håvard Haukeland, Co-Founder of Spacemaker and Senior Director at Autodesk

Architectural Technology is currently undergoing the next fundamental shift enabled by technology. New digital tools are transforming the way Architectural Technology professionals work, evolving from analogue 2D plans to digital, networked 3D representations, data analysis and AI-supported software applications. These new tools present challenges, but more importantly, they open up a wealth of new opportunities that empower Architectural Technology professionals to design better buildings for a rapidly changing and increasingly complex world.

For example, computer-aided design (CAD) - an industry tool dating back to the 1970s - has allowed for faster and more accurate ways of working, but it is essentially a digital drawing that accurately reproduces what used to be communicated manually: plans, sections, elevations and details.

What happens when this representation is no longer sufficient, when the preferred and most productive tool no longer meets the industry's requirements? The construction industry is currently undergoing this upheaval, which means that many Architectural Technology professionals need to familiarise themselves with new digital tools.

Meeting future challenges through data

The biggest societal challenges we face now and in the coming decades are rapid urbanisation combined with population growth and climate change. The complexity of urban areas has increased massively and meanwhile, climate change is fundamentally affecting the way people live and work in cities.

At the same time, the economic demands on the architectural and construction industry are also increasing. This means the creativity of Architectural Technology professionals are being challenged to maximise building density and use of space without negatively impacting people's quality of life and the environment.

The main digital transformation so far arrived in the shift to BIM (Building Information Modelling) which offers Architectural Technology professionals comprehensive support in this increasingly complex construction landscape. What makes BIM special is the wealth of information that can be accessed quickly and clearly by everyone involved across all stakeholders and disciplines - not only dimensions and quantities, but also costs, deadlines, materials and much more.

Meanwhile, 3D models, digital renderings and, more recently, virtual reality technology provide entirely new perspectives on construction plans and the built environment. Later in the building lifecycle, Digital Twin technology comes into play, where 3D digital models of buildings can be used to plan day-to-day operations based on real-time data. The accuracy, detail and information density of these tools provide the foundation for more efficient collaboration and greater engagement by all stakeholders.

Intelligent insights in early-stage design

Even though BIM has become a natural part of the detailing and construction phases, it has been too cumbersome to be used effectively for early-phase design, leaving Architectural Technology professionals without intelligent tools, for example, for feasibility and concept studies. However, precisely in these stages, it is essential to conduct thorough analyses; after all, this is where the cornerstone of up to 50% of the ultimate value creation is laid. Until now, such measures have been time-consuming and corresponding work approaches counterintuitive for Architectural Technology professionals who typically design first and then analyse, not the other way around.

Thanks to cloud computing and the availability of digital data, this familiar workflow can suddenly be turned on its head: Starting in the early design phase, technology becomes an enabler to supercharge Architectural Technology professional's intuition and experience. Data is game-changing as it gives Architectural Technology professionals detailed insights so they can make more informed decisions during an entire project starting from feasibility studies to evaluating building performance. Previously selected data was available to Architectural Technology professionals but in manuals, books - now it is all around us and up-to-date: think BIM databases, IoT devices, weather and traffic data, user feedback.

AI, the next evolution in the Architectural Technology professional's toolbox is a tool that excels at completing specialised tasks, thinking along with Architectural Technology professionals to make light work of normally time-consuming, tedious tasks. Data and AI help Architectural Technology professionals move towards a more outcome-based way of working to achieve better end results and enables them to digitally test a wide variety of scenarios and find optimal solutions within the chosen parameters. This risk-free testing environment, integrating design and analysis in one single platform, inspires the discovery of new creative approaches. Designers can test and incorporate factors such as sun, daylight, noise, microclimate in real time right from the start. This lays a solid evidence-based foundation for a more sustainable project and cost-efficient construction phase later down the line.

> **The pencil and computer are, if left to their own devices, equally dumb and only as good as the person driving them**

Expertise of Architectural Technology professionals remain irreplaceable

So what is next for the Architectural Technology professional's toolbox? It is an exciting time: architecture is moving closer to a data-driven, collaborative way of working. As mundane processes become more standardised thanks to technology and more effective workflows, this frees up more time for design.

Only by making data a tool for every designer can we meet the global challenges we currently face.

The one constant in this development is and remains the intuition and expertise of Architectural Technology professionals – they will never be replaced. It is the Architectural Technologist who has a keen understanding of local specifics and needs - be it cultural and aesthetic values, local and regional building codes, or the complex web of multi-layered relationships that are key to real estate development today and in the future. In the words of renowned architect Sir Norman Foster, "The pencil and computer are, if left to their own devices, equally dumb and only as good as the person driving them." ■

How social media engagement can drive website traffic and lead generation in the construction sector

Words by Sarah Kauter, Chief Executive, Construction PR

When it comes to social media, companies within the construction and architectural industries (and those similar) have always tended to shy away. Instead, most opt for the more traditional approach; newspaper ads, billboards, or even appearing on the radio or local TV spots. There is, of course, still merit to each and every one of these marketing strategies. If you want to truly maximise the reach of your business, however, it is essential that it remains visible amongst the bulk of your target audience. In today's digital age, social media is the answer.

What many companies fail to grasp is that creating a profile and uploading a static post on Instagram once a week is simply not enough. Instead, adhering to a strategic approach for your social media strategy is a requisite, enabling you to showcase your brand's personality, skills, USPs, and more, in an effort to stand out in an increasingly saturated market.

When undertaken correctly, social media can be harnessed to grow your brand and facilitate lead generation, but how do you maximise this tool's potential for your own brand? This article shares my insight into how you can develop an effective social media marketing plan for your built environment sector business, and how best to utilise it to drive prospective clients to your website.

What is social media marketing?

Social media marketing is the use of social media platforms – such as Facebook, Twitter and Instagram – to build up a company's brand; market products and services; engage with their audience; and reach prospective customers, with the intention of driving traffic to their website and translating it into sales. What's more, with tracking and monitoring metrics – such as Google analytics, or within each platform's in-built software – these analytical tools can help you precisely target the optimal audience, and even reach untapped audiences that paid media or local advertising typically cannot.

Just how useful is it within the construction industry?
Naturally, the construction and architectural industries have never been as engaged on social media as compared to others, primarily because digital media is relatively dissimilar from the typical brick and mortar approach that they are used to. There are, however, few better tools for businesses looking to drive traffic to their website and propel lead generation than social media, regardless of the industry. An effective approach enables you to grow your relationships with your existing and prospective clients, as well as solidify your reputation in the eye of the consumer.

Within the UK alone, there are as many as 57.6m active social media users as of November 2022 – a penetration rate of 90.02%. Whilst the majority of these individuals will be far outside of your target audience, not even remotely interested in what you have to offer, there will also be project managers, homeowners looking for developments, business owners, and more. In fact, according to research from the 'Construction Marketing Association', as many as 97% of construction industry professionals are now using social media in one form or another, so this is something you certainly do not want to miss out on.

Failure to adapt to this will quickly leave you stuck behind your competitors, and with the continuous development in digital technology, companies from all fields, industries, and niches are turning to social media as a sales generation tool to help separate them from the rest.

Why should your construction company embrace social media?
First and foremost, it is important to remember that construction and architecture are both visual industries, and there are no better platforms to show off your company's impressive designs and creations than that of social media. Especially when considering the high value investments that clients in these sectors are looking to make, they will take a considerable amount of time weighing up each company individually before deciding which would be the best for them. With as many as 75% of internet users utilising social media to research products and services throughout the purchasing process, being able to showcase the finished product, whilst also enabling prospective clients to visualise the 'before and after' for themselves, will have a significant impact on brand reputation and credibility, as well as the likelihood of enquiries and conversion.

Being active and consistent on social media also holds a positive impact on your brand's search engine optimisation (SEO), meaning that your website will appear higher up on Google's ranking, and therefore, towards the top of its search engine results pages. The more mentions and interactions your company has online that link back to your website – whether that's on Facebook's construction communities or the blog of a satisfied client – the better you will rank. With the vast majority of people typically avoiding venturing past the first page of Google's search results, this can significantly increase the traffic to your website, in turn providing you with an influx of potential leads.

How to build a strong social media presence.

> **Social media can be harnessed to grow your brand**

Understanding your customers
Before even beginning to set up profiles and schedule posts, the most important pre-requisite to consider is ensuring you understand exactly who your audience is. This is of particular importance in industries, such as construction and architecture, where your products and services are designed for a specific market segment, and will typically have next to no appeal to those outside of it. Data for determining this can be collected from a variety of sources, be it Google or social media analytics, feedback analysis, and more.

Select the right social platforms to focus on
Once you have determined your optimal customer profile, the next step is to examine what platforms best represent and cater to your brand's target demographic. LinkedIn, for example, is considered one of the most effective social networks for B2B heavy construction firms, enabling brands to connect with like-minded businesses and individuals within the industry, share news, build connections, and network for new projects. For more B2C-focused businesses, however, Facebook will typically be your go-to option, with its tailored platform enabling customers to easily locate contact information, reviews, case studies, images, and all other resources collated into a single space.

Particularly within industries such as Architectural Technology and architecture, where the design and aesthetic of the finished product are of the greatest importance, then more visual platforms, such as Instagram and even YouTube, will prove additionally beneficial for your business.

Embrace and engage with social media interactions
Engagement and interactions with your existing, new, and prospective audience is essential for any successful social media strategy. As mentioned, due to the high value investments that clients are looking to make within these industries, it is only natural that they want to collate as much information as they can prior to contracting their project. Therefore, if someone was to ask a question, ensure you and your team go above and beyond to provide them with whatever help and information they need. Not only can it help to build trust and loyalty towards a brand, but also has been shown to positively correlate to increased enquiries, email signups and website traffic, as the more engaged your audience is, greater is the likelihood of them wanting to do business with you. ■

1 https://www.architecture.com/knowledge-and-resources/resources-landing-page/riba-plan-of-work

Design buildings that support mental wellbeing, with the *Happy Design Toolkit*

If you were to design a building that puts occupants' happiness first, what would it look like? How would the materials, form and layout support healthy ways of living and working?

From the author of 2018's hugely successful *Happy by Design, The Happy Design Toolkit* by architect, TEDx speaker and noted wellbeing advocate Ben Channon delves into the latest evidenced-based research in his new book, and helps readers create happier, healthier places.

Essential reading for anybody interested in how the built environment affects how we feel the book explores how lighting, temperature, access to nature, exercise and social interaction can enormously affect how we feel.

A highly anticipated and extremely timely guide, the book includes easy-to-understand tips and design ideas for both residential and commercial projects. These include inviting in the natural world with roof gardens and living facades and counteracting social isolation with through 'social furniture' or communal areas that encourage chance interaction.

"With everything that's happened in the last two years, now more than ever it is vital that we all understand the ways in which buildings and cities affect how we feel. We all have the right to homes and workplaces that keep us healthy, support our mental health and help us to thrive – both now and for many generations to come."

Alongside more than 100 hand-drawn illustrations by the author, each of the featured architectural interventions includes analyses of the wellbeing benefits they offer, as well as potential limitations or challenges.

With *The Happy Design Toolkit*, learn how your buildings can encourage healthier lifestyles through a happier and more inclusive built environment for all. ■

Available from all good bookshops and online retailers.

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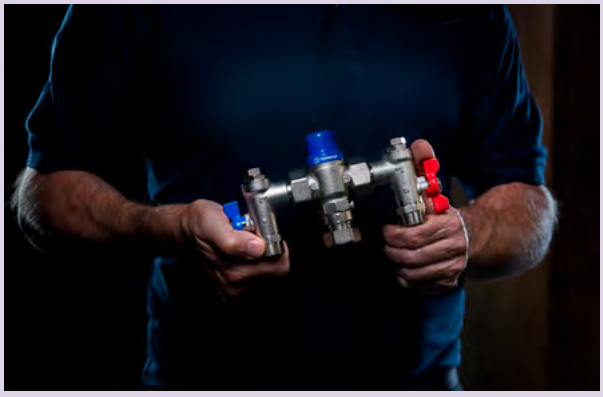
Do not get your ABCs confused – all you need to know about TMVs, PRVs and the Tenant Valve

Words by Richard Bateman, Product Marketing Manager, RWC

The specification process is an essential part of the life cycle of any plumbing system. It is important that specifiers are knowledgeable on not only what valves are required, but their key benefits and reasons for installation. The key plumbing valves – the TMV, PRV and Tenant Valve each have their own crucial role to play.

Depending on the application, there are many complexities and factors to take into account when specifying the valves for a plumbing system in both domestic and commercial new builds. Specifiers must consider the unique demands of each building, which will vary widely depending on type of building, in addition to regulatory requirements that vary by product and application, as well as end user needs and maintenance.

In times of skyrocketing energy prices and cost of living expenses, not to mention the ambitious net zero targets from the Government for the building industry, everything that goes into the fabric of our buildings counts to ensure our buildings are as energy efficient and economical in the long-term as possible. From the smallest fitting to every pipe and the most essential valve, what goes on behind the walls is just as important as the brickwork our future is built on. In this feature, we discuss the benefits and common uses of the most important valves, making it as straight-forward as possible for specifiers to identify what variation of each valve to use, where and when.



Thermostatic Mixing Valve

Whether a homeowner or landlord or a local council, building owners have a duty of care for those living, working, or using their facilities, which is why thermostatic mixing valves (TMV) play a crucial role in all plumbing systems. It is imperative that some form of TMV be specified for every hot water system. The main benefit of a TMV is keeping water at a safe temperature, which therefore prevents scalding and helps stop the build-up of harmful Legionella bacteria. This is achieved by mixing hot and cold-water streams together to ensure a safe temperature at the outlet.

The type of TMV required for an individual application will vary greatly on what kind of building the specification is taking place in, as domestic and commercial buildings have a different requirement to buildings in the healthcare sector.

It is recommended that in domestic and commercial environments, a TMV2 approved valve is specified, and safely installed, tested and maintained to current standards. These valves are designed to reduce the risk of scalding at outlets, while minimising the potential build-up of Legionella bacteria in the pipework that is fed from the outlet side of the valve to the tap. They are typically found under sinks and basins, and never more than 2m away from the outlet they are serving. For buildings occupied by the healthcare sector, such as hospitals, a TMV3 needs to be specified, which functions the same way as a TMV2, but undergoes more rigorous testing, both at the point of installation, as well as every six months after initial sign-off. This is to ensure the safety of the end users, who are likely to be more vulnerable to both scalding and the potential harmful infection from Legionella bacteria.

Where a TMV2 can typically only work with water pressures of 5 bar or below, a TMV3 is safe to work with 10 bars of water pressure.

Pressure Reducing Valve

A pressure reducing valve (PRV) functions, as the name suggests, by reducing a high inlet pressure at the inlet to a safer, lower water pressure at the outlet. The benefits of PRVs are multiple, as lower water pressures can decrease the amount of damage to heating systems, appliances, and buildings. Considering water pressure in the UK can vary from 1 bar to 20 bar, it is important that any risk to plumbing and heating systems is minimised to keep buildings and people safe.

As there are no regulations on water pressure in the UK there are no regulations for specifying PRVs, however, to reduce risk of unsafe water pressure it is highly recommended to specify them not only for domestic buildings, but especially for commercial buildings, where it is not uncommon to have sudden jumps in water pressure. PRVs ensure that the flow rate of water is not only correct for its intended purpose but that there is a safe water pressure that will allow other valves, such as thermostatic mixing valves, to function correctly as well. The individual valve that should be specified will depend heavily on the type of building, the water flow rate, and whether or not it is being used on a hot or cold-water supply.

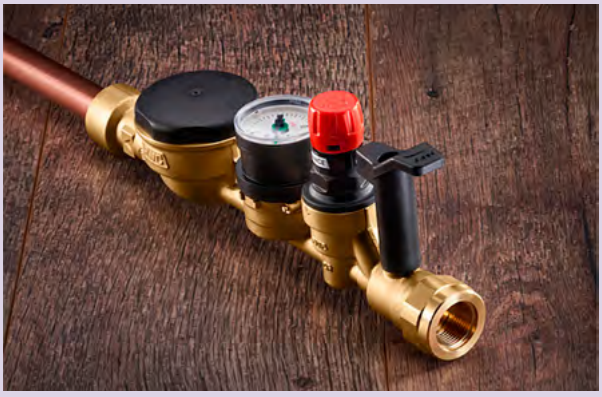
Tenant Valve

The most innovative valve in recent years is the Tenant Valve Plus from Reliance Valves, a specialist combination valve that is designed for use in large multiple-occupancy buildings, such as apartment complexes and high-rises. The Tenant Valve Plus combines an approved stop cock, a pressure reducing valve, inline strainer, water meter carrier and backflow prevention device into a single and compact unit for large domestic buildings, where having a central, adjustable plumbing hub is much more desirable.

Additionally, this allows for each residence to have individual control depending on their requirements, whilst mitigating the need for installing inlet valve chains. Inlet valve chains often take up a lot of room in riser cupboards or service hatches, which also makes them difficult to adjust or maintain. Having a long chain of valves also means many more leak points than the Tenant Valve's single piece design. All components are accessible from one side of the Tenant Valve, which is supplied with a moulded insulating cover. For use up to 16 bar and 85°C and adjustable between 1.5 – 6.0 bar, the Tenant Valve is suitable for almost all UK multi-occupancy buildings.

All valves in one place

Valves are some of the most important components in a plumbing and heating system, and specifying the right valve for the right application and usage, can have a huge and lasting impact on the life cycle of each system and the building it is in. When specifying valves for a plumbing and heating system you want to be sure that the valve is perfect for the intended purpose. ■



Finalist 2022

AWARD FOR EXCELLENCE IN ARCHITECTURAL TECHNOLOGY | SMALL TO MEDIUM

Devon House

Words by 16A Architecture

Our original brief was to look at solutions to extend and renovate the original house. It quickly became evident that most of the house was in such a poor state of repair that renovation would, in the older parts of the structure not be possible, and as a whole would not be economical. Issues with the existing structure included:

- Water ingress over many years through both a leaking roof and flooding as a result of a ground floor lower than the adjacent ground level.
- Structural settlement causing large cracks in both internal and external walls.
- Solid brick walls to most of the structure providing very poor thermal performance.
- No DPC to much of the structure.
- Decay to structural timber and steel members.
- No central heating system and outdated electrical installations.

The existing fabric and structural issues combined with the client's requirements for an energy efficient home with a more open plan layout led us toward a replacement dwelling. We undertook an appraisal of the options for a new dwelling, and the works required to renovate the existing, together with budget costings and presented these to the clients.

Knowing this was a home that had been in the client's family for some thirty years we proposed a solution to provide a new home that reflected both the feeling of the existing and incorporated some of the existing materials into the new.

Our clients fully embraced this idea and agreed on a revised brief based on a reclamation and re-incarnation of the existing property.

The design and layout of the house to function as a home was developed in collaboration with our clients. The immediate topography and concept designs were 3D modelled in Autodesk Revit. This allowed us to invite the clients into our office and explore the proposed

designs using our virtual reality headset; very much assisting with the evolution of the design and minimising any changes when in build.

The design also included raising the level of the ground floor to overcome flooding from surface water run off from the adjacent field.

Various construction methods were considered for the structure including cavity masonry construction, timber frame and SIPS panels. Restricted access to the site, and limited space for offloading at the site, meant that a prefabricated framed system would not be possible. Wanting improved sustainable benefits over

cavity masonry construction and knowing we would be commencing the build in the winter we opted for Durisol ICF for the structural envelope. This offered excellent thermal performance in a recycled material which matched the ethos of the build. The laying of the blocks, being dry stacked, were also not as prone to the impacts of the often-wet Devon winter months.

Whilst the layout is specific to the clients' requirements now; it has been designed for easy adaption to meet any future needs. The ground floor WC has been sized to allow it to be easily converted to a compliant WC/wet room and the study could become a future bedroom if required. Provision has also been allowed for a platform lift to be easily fitted allowing access to all first-floor rooms. On both ground and first floors corridor and door widths are provided to ensure future accessibility.

Rather than just demolishing the original house it was internally and externally stripped of any salvageable items and then carefully dismantled.

Our clients were very active during the build process working alongside the main contractor. They sorted and cleaned all of the reclaimed materials In all, they cleaned by hand some 9,500 bricks, de-nailed and treated timbers, sanded floorboards, sorted stone and tiles, organised the re-enamelling of baths and so on.

The reclaimed bricks were used for the external and some internal feature walls, the stone was used for plinths and boundary walls, timber joists were used for feature beams, oak shelves were re-purposed into window cill boards and the old pine floorboards were used for the mezzanine floor finish. The old doors were re-used for cupboards and en-suite doors, allowing their smaller size to be accommodated. Chimney pots, fire surrounds and other items were all re-used including most of the salvaged sanitaryware and brassware. Timbers not directly incorporated into the house structure were used for other items such as washstands for basins in the en-suite and bathroom.

Larch from a woodland owned by our clients provided the cladding to the majority of the house. This was charred creating a durable water repellent/hardened surface.

As a forever home, our clients were keen that the house should be as energy efficient as possible. They were also very keen that the house be simple to 'operate' once built. A fabric first approach was agreed as a starting point to provide an efficient home.

Durisol walls provided both an excellent U value and good thermal mass to provide a comfortable indoor environment suited to the selected heating system.

The as-built U values for the house were:

- Walls 0.15W/m2K
- Roof 0.17W/m2K
- Ground floor 0.11W/m2K

The central core of the house and both end bedrooms all benefit from vaulted ceilings. We were keen to ensure these spaces would not suffer from heat gain through the roof. An 80mm wood fibre sarking board was specified to the cover the rafters. The wood fibre insulation has a high specific heat capacity making it excellent in absorbing heat and ensuring a comfortable internal environment. The wood fibre also provides very good sound insulation ensuring the bedrooms remain quite even on the stormiest of days.

Coupled with this windows and roof windows were

triple glazed thermally broken units providing excellent thermal performance. To ensure an airtight/robust construction accredited details were provided and detailed on the construction drawings ensuring the designed air tightness of 5m³/h.m² @50Pa could be achieved. As the bulk of the building was to be timber clad the Durisol wall received a sand cement parge coat to ensure any small gaps were sealed.

The building achieved an air pressure test of 4.47m³/h.m² @50Pa.

Overall, the building produces 2.9 tonnes of CO2 per year; a saving of 3.1 tonnes when compared with the average house.

The decision was made at an early stage to opt for an air source heat pump for the ground floor heating and hot water. Zoned underfloor heating loops embedded in the ground floor screed function as the heat emitters and are controlled by individual room thermostats. This system allows for the house to be heated to a comfortable temperature. The system being embedded into the screed is not fast to respond to adjustments to the thermostat. This is seen as a benefit; combined with the thermal mass of the concrete in the Durisol wall, a steady balanced environment is provided that requires little to no occupier intervention and no spikes in energy use. The open plan and vaulted nature of the central core allows for the heat emitted on the ground floor to dissipate to the first floor.

This primary heating system is complimented with two wood burning stoves on the ground floor. The principal wood burner is in the open plan living room with its flue running internally the whole height of the two-storey vaulted area thus maximising the heat output from the fire. Both wood burners have direct air input, bringing external combustion air straight into the wood burner as opposed to a ventilation grill bringing cold air into the building.

To assist with the dissipation of rising warm air in the central vaulted area a basic MVHR system was incorporated. This extracts stale warm air from the top of the vaulted area and, via the heat exchanger, pre-warms the fresh air which is then ducted to the ground floor.

Additional first floor heating is provided via Herschel wall and ceiling mounted infrared panels. These panels are linked to the same Heatmiser thermostats as the ground floor heating and hot water systems. The unification of the different heat emitters and hot water into one control system has allowed for a simple interface for the clients to operate and monitor the heating and hot water systems.

The infrared panel system provides and efficient heating system to these low occupation rooms, heating the occupants rather than the fabric of the building.

With a reliance on electricity for all heating systems it was deemed essential that we included for on site generation through photovoltaic panels. The system provided is 4.14kW and is expandable; to provide maximum benefit from the on-site generation a Tesla battery has also been installed.

Finalist 2022

AWARD FOR EXCELLENCE IN ARCHITECTURAL TECHNOLOGY | SMALL TO MEDIUM

Ceres, Rush, North County Dublin, Ireland

Words by Patricia Mulvey MCIAT, Brackfield Consulting

A new build detached family home on an infill site in a beach front location.

The client commissioned a new build family dwelling in the side garden of their existing home facing onto the South Beach in Rush in North County Dublin. The brief was to design a 'wow house' – large but compact, innovative and efficient, modern family home.

The innovatively designed two storey square shaped dwelling follows the principles of Passivhaus design. The key was to provide a nearly zero energy dwelling, highly insulated and efficient in terms of heat demand, while minimising overheating and ensuring comfortable indoor air conditions throughout the year by installed mechanical ventilation.

The creative layout design takes full advantage of the south facing aspect and views to the rear overlooking the Irish Sea and Lambay Island.

From the outset the client's preferred method of construction was traditional block-built cavity wall with flat roof throughout. They trusted these well-known methods of construction. The technical design and finishes needed to be robust given the exposed location of the site. With the Architectural Technology and engineering expertise of the practice, Brackfield Consulting were able to produce a detailed design and specification package based on the 'fabric first approach'. U-values were reduced as low as necessary, without over specifying materials, to achieve this nearly zero energy building.

Although the house is large in scale, it is of simple form and design. Large open plan rooms and wide external openings were realised by tight, efficient design and value engineering. The structural spans were similar to small commercial projects this was planned and anticipated from early concept design stage.

External finishes include smooth rendered walls with selected sections finished in dark grey and crisp white to minimise the scale of the dwelling. Siberian

larch natural timber was selected and constructed with vertical planks to ensure a warmth and homely feel to the structure. The large flat roof structure provides much needed shading from solar gain, and shelter from high winds and ensured a large area to install a photovoltaic array.

High quality aluclad windows and doors where installed throughout. The frames of some of the larger openings could only support double glazing sections due to the weight of the glass, however the average U-value for all glazed window and door opening remains low at 1.1W/m^2k.

Internally air permeability was the key to ensuring low heating demand. All cavity walls have an internal service cavity to ensure there are no issues with services penetrating through the air permeability layer.

Inclusivity of the property within the environmental setting was equally important. The design of the property needed to be sympatric to the location and existing neighbouring dwellings. Along the beach front is changing and has modernised in recent years. The aesthetic design of the new dwelling reflects the building standards of today. The design and material choices made by the Chartered Architectural Technologist ensure that the visual impact of the dwelling is not imposing.

The proposed infill site was within a well-established residential area with an array of amenities already in place; public foul drainage, street lighting, town centre and shopping, primary and secondary schools, library, all within walking distance, therefore the inclusion of a residential property on this site is appreciated by all. A preliminary Home Performance Index (HPI) was calculated and 'HPI Certified' is achievable.

A Flood Risk Assessment of fluvial, pluvial, and costal flood risk was carried out to ensure the building would continue to function with predicted sea level rises. Following the analysis of the flood report flood risk mitigation was incorporated by increasing the ground floor level of the property by approximately 1m. This increase in height was compensated by designing a modern warm flat roof on the property, therefore allowing the new dwelling to sit alongside existing properties without being domineering. This is reflective of the discipline of Architectural Technology were the form of the building is innovatively designed, based on science and engineering to fulfil its function, while ensuring the buildings inclusivity within its environment.

Environmental sustainability was at the core of the design and construction of the beach house. The

building was designed to comply with nearly zero energy standards set out in the Building Control Technical Guidance Document Part L.

Although a full Life Cycle Assessment was not carried out, at all times resources and materials were quantified to ensure that the build was cost effective and environmentally responsible. The ethos was to use 'only what was needed'. This applied throughout the structural and thermal design of the project.

One example of where this theory was put into practice was in relation to the first floor structure. The client had the impression that hollow core concrete floors were 'better'. The functionality and buildability of the first floor was discussed and explained in terms of reducing qualities of mass concrete, reducing the overall weight of the building on the foundation, the support on internal leaf of the cavity wall and internal walls required to support the floor, and size of all steel members.

The use of a timber floor joists manufactured from a more sustainable material with substantially less embodied energy had many advantages beyond environmental sustainability. The use of innovative web joists would not only lower the overall carbon footprint of the build but would remove the need for a service void at ground floor ceiling level, further reducing materials, labour and cost.

A polished concrete screed was used throughout the ground floor layout. This was originally suggested as a design feature, however the client quickly learned that it was advantageous for distribution of low temperature underfloor space heating powered by the air-water heat pump. The thermal mass of the concrete has been proven to help regulate internal summer temperatures and reduce overheating. Polishing the screed reduced the requirement to install a decorative floor finish therefore further reducing the overall carbon footprint and also reducing costs. All of the innovative and sustainability items form part of the role of the AT. Their expertise was gained from intensive upskilling in the area of Energy Efficiency Design (Building Performance).

Permeable gravel material was used for the driveway to further enhance the Sustainable Urban Drainage System (SuDS) soakpit designed to accommodate all rain water runoff.

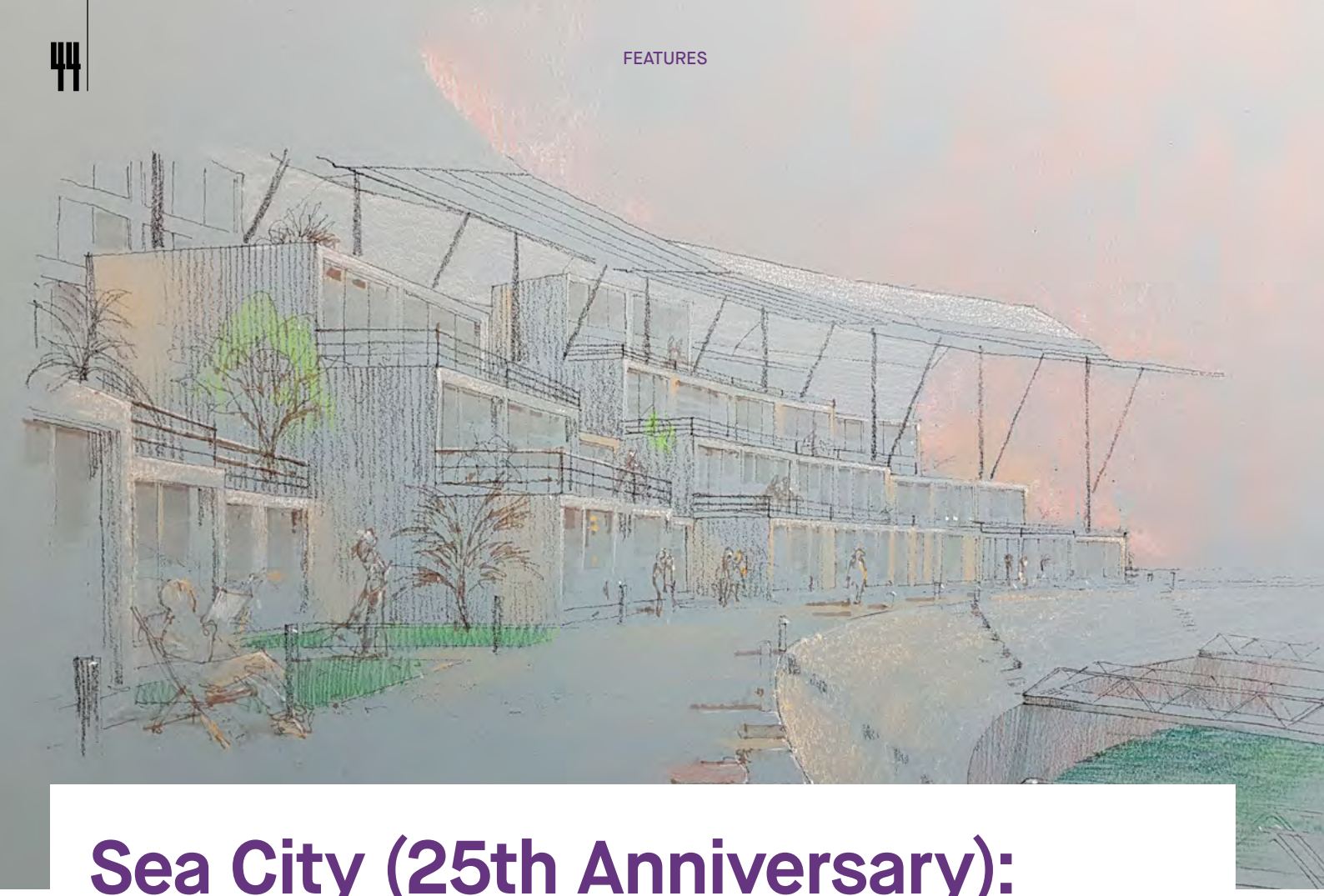
The role of the AT and engineering design team, along with the emerging science in relation to building performance allows the client to make informed choices when determining how their actions can impact the sustainability of our local and global environment.

The dwelling was detailed with innovative design which will ensure that the performance of this building will last for generations. The design and layout is robust, it has the ability to be flexible and to be reconfigured without extensive structural work. Large open spaces have been efficiently and effectively created, these area could be subdivided if required and opened up again when needed.

The building materials used throughout are also robust. They were specifically selected to withstand the damp Irish climate and the exposed windy location. As temperatures rise, the need for mechanical cooling has been designed-out by providing large overhangs and south and west facing shading. A central roof light on the first floor landing is openable to provide purge night cooling if required without any security risk.

Environmental sustainability is at the core of this design to ensure the home owner has very low primary energy demand. There is no burning of fossil fuels and the production of electrical energy can be increased by the addition of more photovoltaic panels and battery storage when the technology is available and cost effective.

The overall energy and building performance of the property is of a very high standard due to the care and attention of the main building contractor and oversight by the AT and engineers. Collection of data and collation of the smart home meter readings for the coming year will determine the overall performance of this creative and innovative home.



Sea City (25th Anniversary): A concept project for a sustainable oceanic settlement

Words by Tim Chetham MCIAT, Chetham Architecture Design

Background

Cast your minds back to the mid 90's. Global warming was in the news (even then), and the Kyoto Protocol had just been signed. I was a student at Hull School of Architecture (now sadly closed). The school had been involved in the Coastwise Europe project, where schools of architecture from around Europe had studied a stretch of coastline near to their university. We looked at the stretch of coast from Spurn Point at the tip of the Humber estuary to Flamborough head in the north. It was interesting to discover the number of small settlements and villages, which had been lost due to coastal erosion over the years. For small settlements such as these, government policy was not to try and defend them (as this can exacerbate the problem further down the coast) – instead people were forced to abandon their properties and simply retreat further in land. With the anticipated impact of global warming causing sea levels to rise, this situation was clearly only going to get worse. As a result, I started to look at an alternative solution – what if instead of retreating, we could create an oceanic settlement located off the coast, which wouldn't be affected by the rising sea levels? To this end, I started researching the credibility of building oceanic settlements off the coast of Britain, in a dissertation entitled 'All at Sea'.

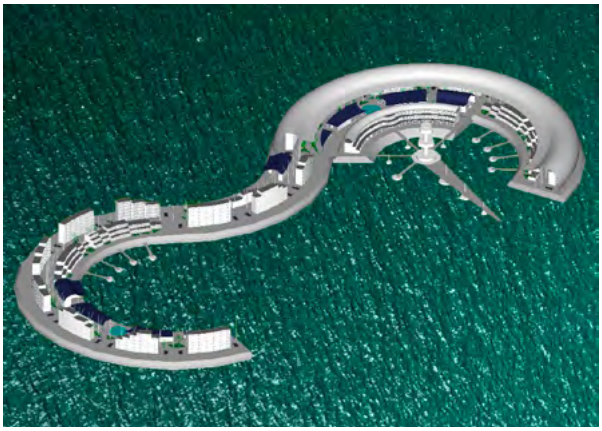
Community

Apart from the potential to accommodate displaced communities, an oceanic settlement could also be a destination in itself. A hotel and leisure facilities could attract people looking to escape from a hectic life on the mainland – with activities such as water sports, diving and fishing, or simply unwinding with the relaxing sound of the sea. The settlement could also be the base for a satellite campus for the University of Hull, for courses involved with the study of the sea and marine life. The North Sea is already home to small communities in the form of offshore oil and gas rigs. However, the accommodation is poor quality and means that the workers have to work shifts. What if there was a near-by settlement, with all the facilities of a small village on the mainland, where they could stay with their families? The fishing industry could also benefit from having an offshore base, with processing facilities and workshops, which would reduce travel and costs. Before long there is the basis for a mixed community, with all the supporting facilities of shops, cinema, gymnasium etc. A regular ferry service to the mainland, would ensure a healthy exchange of people, produce and culture.

Construction
Together with an engineer from the Easington Gas Terminal on the Holderness coast, I investigated the best location for an offshore settlement, based on weather conditions and the depth of the seabed etc. Initially, I started looking at a 'fixed' settlement, with piled construction. This technique has a rich heritage, from Asian 'water villages' to the British pleasure pier and is still practised today. However, inspired by floating oil rigs and pontoon bridges, the opportunities of a floating, more dynamic settlement, soon became apparent. The versatility of floating foundations would enable the structure to be towed out to sea before being joined together and secured onto the seabed. This would facilitate land based, dry dock construction, and enable an offshore development to be constructed in a piecemeal fashion. The settlement could then evolve in response to demand, with different configurations to suit the location. Having created a secure floating substructure, the superstructure could then be developed. Accommodation units would be prefabricated and assembled on site (old shipping containers could reappropriated for this purpose), whilst the larger 'public' buildings would be built utilising the principles of 'high-tech' architecture, so that they could be readily assembled (and dismantled). With a leeward entrance, the substructure would create a protected harbour, whilst a tensile translucent fabric canopy would provide protection from the worst of the weather and evoke nautical images of sails.

Sustainability
An oceanic settlement, constructed from prefabricated units on floating pontoons, would have minimal effect on the environment. It could also utilise the energy from the sea, sun and wind. Since my original scheme, offshore wind farms have become commonplace, and are now a big industry in Hull. As the old oil and gas fields are wound down, there is now a more sustainable industry in the North Sea - which will require maintaining. With a diverse population, a mixed-use floating settlement would also be socially and economically sustainable. Recent events further afield have also shown how a floating off- shore settlement could provide sanctuary to displaced populations throughout the world.

The future
Originally designed in 1997, the graphics look a bit dated now, but the concept is just as relevant today. The slow response of governments to climate change, means that global warming and rising sea levels are an even more pressing issue now. There has also been renewed interest in building at sea. The Seasteading Institute, based in California, promotes the concept of floating oceanic communities and recently work has begun on a floating settlement in the Maldives – a country on the front line of rising sea levels. Since Sea City was first designed, advances in technology and communications mean that people and businesses can now work remotely from the mainland, without the extra costs of land based property. First conceived in the maritime city of Hull, Sea City could be the catalyst for our seafaring nation to once again take to the world's oceans in search of a more sustainable future...



"The sound, the light, the wetness of living on water changes earthbound society, offering a new perspective of openness, a new sensitivity to human relationships, which are not defined by earth's boundaries."
Bertrand Goldberg

With thanks to Len Rye for his support and encouragement. ■

Futurebuild is back in 2023 for its most important year ever and taking a stand for a better built environment, supported by CIAT

Futurebuild, the leading showcase for product innovation in the construction industry is back in 2023 and taking a stand for a better built environment. The sustainability pioneer will return to ExCeL London from 7-9 March and provide the stage for inspiring ideas, innovative solutions and knowledge sharing to help us create net zero buildings faster, more safely and more efficiently.

Now in its 17th year, Futurebuild has kept sustainability at its core and this year's theme sees the event taking a stand for a better built environment. Futurebuild will continue its mission to build a better future and show its commitment to playing its part in our net zero outcomes. Having launched their 'Take a Stand' campaign this summer, Futurebuild is also urging companies and professionals throughout the construction supply chain to act now and take a similar step, all pledges will be displayed at the event in March.

Definitive action is needed now if we are going to meet our net zero goal and that is why Futurebuild is set to be the most significant event in the built environment calendar as well as the most important edition in Futurebuild's (previously Ecobuild) history. It will bring together specifiers, decision-makers and disruptive thinkers in one place to exchange know-how, discover game-changing new products and technologies, and forge new business connections as we accelerate our journey to net zero.

More than 15,000 professionals from across the entire supply chain including designers, housebuilders, developers, consultants, contractors and manufacturers will come together to discover these solutions and find new ways of delivering quality buildings more sustainably, whilst meeting and exceeding regulatory and compliance requirements.

Innovations underpins everything

Futurebuild will continue to be the industry platform for innovation and elevate further with a wealth of opportunities to showcase the most innovative technology, products and services. With the events floorplan packed with over 400 of the most innovative brands, start-ups and industry leaders, this year's show will cover every aspect of the built environment.

At the heart of this is FutureX Innovation (in partnership with BEIS) which will focus on start-ups and SMEs who will bring never seen before innovations to the event and share their experience of taking their innovation from initial idea through development to realisation. The spotlight will also include an Innovation Stage that will host the new Big Ideas Pitch giving companies another way to get involved and share, what could be, the next revolutionary idea.

Those attending can also find further inspiration through the return of the renowned Innovation Trail, providing a showcase for 20 Innovation Partners. The Trail will give leading specifiers and decision-makers the opportunity to explore revolutionary products, solutions and materials and meet the leading thinkers behind these innovations. The Big Innovation Pitch will also return and offer exhibiting companies the chance of being crowned winner in 2023. A huge success in 2022, last year's competition received over 90 submissions, that were shortlisted down to six finalists who then battled it out by pitching live in the conference arena.

Varied and engaging seminar and conference programmes

Futurebuild will be curated into eight show sections including Buildings, Digital, Energy, Interiors, Materials, Offsite, and Sustainable Infrastructure. The newly expanded Retrofit section, in partnership with The Retrofit Academy CIC and Osmosis, will be showcasing the best solutions, technologies and services, that together, can unite and strengthen the delivery of whole house retrofit at scale. The event will also feature three new spotlights, Lighting in partnership with KNX UK, District Energy in partnership with UKDEA and FutureX Innovation in partnership with BEIS.

The Futurebuild 2023 conference programme, sponsored by SNRG and Hub Brussels, will explore the role we all have to play to meet our net zero targets and will feature world-class speakers sharing their experiences and debating the most critical issues. Each day will have a different focus; Day one *Looking Forward*, Day 2 *Changing* and Day 3 *Taking Action*.

The seminar programme has expanded for 2023 with content delivered across eight stages. The programme will deliver practical learning and guidance providing you with the knowledge and advice you need. All sessions in

this year's programme will be curated by over 90 industry leading partners and associations such as CIAT, The Good Homes Alliance, BRE, Passivhaus Trust, Built by Nature and RIBA to name but a few.

"Sustainability has been at the heart of Futurebuild for 16 years and we are more committed than ever to ensure our built environment remains on track to achieving our net-zero goals" explains Martin Hurn, event director at Futurebuild. "Futurebuild is an open invitation to a better built environment and is the place to see innovation first hand. Our event is a hub of shared ideas, debate and solutions, and by coming together we can begin to understand the advancements in sustainable construction and the emerging technologies that will make net zero possible."

Futurebuild 2023 will take place from 7-9 March at London's ExCeL. For more details visit futurebuild.co.uk Don't miss out on next year's event. Visitor registration is now open ■

CIAT Chartered Practices – services to promote your CIAT Chartered Practice

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CIAT Chartered Practice Logo

The CIAT Chartered Practice logo is a great visual symbol to demonstrate that your practice is on the Register of CIAT Chartered Practices.

The CIAT Chartered Practice logo is free and available from the Practice Department. Please email practice@ciat.global

CIAT Chartered Practice Site Signboards Service

Uniquely available to those on the Register of CIAT Chartered Practices, the range boasts three varying options:

1. With one line

2. With two lines

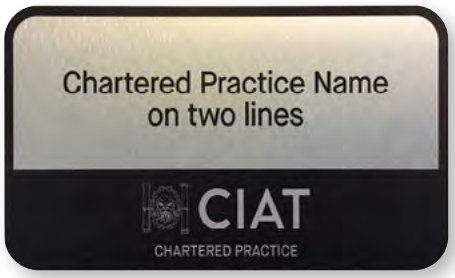
3. With three lines

The signboards are available in standard sizes (4'x1' and 8'x2'), produced on 5mm rigid foamex board (suitable for outdoor), a vinyl sticker (suitable for windows) or a mesh banner (suitable for outdoor/scaffolding). Other sizes and materials are available upon request.

To place an order, complete the order form which you will find in the 'My CIAT' area of the website, and email it to ribadesignservice@riba.org

CIAT Chartered Practice Plaque

The CIAT Chartered Practice Plaque is only available to CIAT Chartered Practices. It provides a stylish visual display of your status that can be displayed at your practice.



Your order can be placed by completing the CIAT Site Signboard order form and emailing the RIBA Design Services Team or alternatively, please email ribadesignservice@riba.org with your CIAT Chartered Practice name and number or call +44(0)20 7307 3737.

CIAT Chartered Practice Certificate

The CIAT Chartered Practice Certificate, which is issued annually from 1 May, is also exclusive to CIAT Chartered Practices. It provides a formal visual confirmation of your status that can be displayed at your practice. It has a dated hologram to validate its authenticity.

To order please contact the Practice Department, practice@ciat.global for further information.

Connect and broaden your organisation's engagement with the Architectural Technology community by joining CIAT

Your organisation is invited to become a part of the Architectural Technology world by joining the Institute's Affiliate Group Body Corporate (AGBC) scheme. This new scheme allows your organisation to support and engage with the discipline and profession of Architectural Technology in collaboration with the Chartered Institute of Architectural Technologists (CIAT), as the regulatory and professional body for the discipline.

The AGBC will allow you to create a new business-to-business relationship, or take your existing relationship, with the regulatory and lead body in Architectural Technology to the next level!

Why be part of the AGBC Scheme?
Being part of the AGBC Scheme will demonstrate your body corporate's commitment to the highest professional and ethical standards in Architectural Technology – an additional promotional tool for your organisation. It will also allow you to connect and develop through access to the AT CPD Register, a subscription to AT Journal, the My CIAT portal and much more.

Can my body corporate be part of the AGBC Scheme?
The AGBC is inclusive and accessible to all who wish to join, engage with and support the discipline, profession and Institute. This is a great opportunity for your body corporate to grow your relationship with CIAT – and to develop your legal entity with our support and resources.

How do I register our interest?
The AGBC Scheme launches in summer 2022. In preparation for the launch, we invite you to register your interest by emailing our Membership Department – membership@ciat.global

Costs
There is a £100 application fee for all packages. Subscription packages for 2022/23, which run from 1 May to 30 April, are:

Size of organisation	Bronze package	Silver package	Gold package
10 employees or less	£250	£550	£750
11-249 employees	£300	£600	£800
250+ employees	£400	£700	£1,150

Find out more by visiting architecturaltechnology.com/joining/agbc.html

Membership news

Chartered Architectural Technologists

We would like to congratulate the following who successfully attended their Professional Interview and are now Chartered Architectural Technologists, MCIAT:

029065	Bradley Stenson	Yorkshire, 02
028303	Derry Waters	Yorkshire, 02
036195	Nadir Abadeer	North West, 03
027441	James Wright	North West, 03
029682	Alaa Yafawi	North West, 03
027896	Abdul Zafar	North West, 03
023938	Amin Ismail	East Midlands, 04
030568	Andrew Thornhill	East Midlands, 04
026338	Billy Walker	East Midlands, 04
027450	Narain Dagon	West Midlands, 05
029580	Sophie Meakin	West Midlands, 05
030716	Frazer Reynolds	West Midlands, 05
036747	Barry Teasdale	West Midlands, 05
022087	Richard Owen	Wessex, 06
033122	Thomas Hughes	East Anglia, 07
024697	Matthew O'Keefe	East Anglia, 07
036744	Octavia Stan	East Anglia, 07
035341	Brett Hughes	Central, 08
028456	Andrew Kent	Central, 08
028038	James Murtagh	Central, 08
032825	Brandon Dellaway	Greater London, 09
035725	Kuo-Hui Liu	Greater London, 09
025771	Claire Raftery	Greater London, 09
019950	Hernando Hermosura	South East, 10
034070	Charlie Power	South East, 10
024486	Kevin Rooney	South East, 10
034727	Lisa Gray	Channel Islands, 11
036756	Andrew Bennellick	Western, 12
026794	Ruaraidh Marr	Scotland East, 14
032737	Catriona Slane	Northern Ireland, 15
035291	Aiswarya Premjith Madambikattil	Middle East & Africa, C7

Welcome back

We would like to welcome back the following Chartered Architectural Technologists:

026784	James White	North West, 03
019093	Richard Cowie	West Midlands, 05
019791	Kenroy Hylton	West Midlands, 05
014409	Mark Campbell	Northern Ireland, 15

Fellow Members

We would like to congratulate the following Chartered Architectural Technologists who successfully completed their application and are now Fellow Members, FCIAT:

027191	William Price	Northern, 01
013083	Toni Page	Central, 08
023319	Elizabeth Olubaju	Greater London, 09
020887	Paul Roddy	Republic of Ireland, C2
035806	Ashok Iyer	Middle East & Africa, C7

In memoriam

We regret to announce the death of the following members and affiliates:

002324	Amrik Sohel	Yorkshire, 02
002605	Gordon Tucker	South East, 10

Quality Assurance Agency (QAA) publish revised Subject Benchmark Statement for Architectural Technology

A new Subject Benchmark Statement (SBS) for Architectural Technology has been published. The revised SBS was developed by an expert subject advisory group, supported by extensive consultation with disciplinary communities in 2021 and 2022.

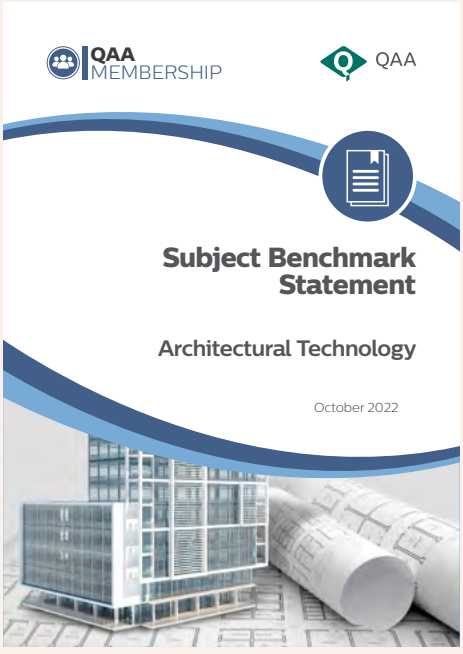
The SBS is a document that defines what can be expected of a graduate in the subject, in terms of what they may know, do and understand at the end of their studies. The SBS also outlines the benchmark required at Masters level study, thus demonstrating the maturity of the discipline and a high level of recognition within Higher Education.

The revised document also considers how practice within the discipline addresses wider social goals, including:

- equality, diversity and inclusivity;
- education for sustainable development;
- the requirements of disabled students; and
- enterprise and entrepreneurship

The SBS underpins all CIAT Accredited Honours and Masters degree programmes.

The revised SBS can be downloaded from: qaa.ac.uk/docs/qaa/sbs/sbs-architectural-technology-22.pdf?sfvrsn=6e9da481_4. There is also a summary document designed to provide a short and accessible overview of the main document for students, employers and academics.



Become a Fellow, FCIAT

Fellow Membership, FCIAT, complements the 'Chartered Architectural Technologist' professional qualification and is an acknowledgement of a Chartered Member's significant contribution to and/or excellence in Architectural Technology.

Benefits include:

- The designation, FCIAT which sits alongside the protected descriptor 'Chartered Architectural Technologist'.
- It is an acknowledgement of your contribution to and/or excellence in Architectural Technology from your Institute and peers.
- Distinction within Architectural Technology.
- Additional external recognition and eminence from colleagues, peers, clients and employers.
- It forms part of the continued profile-raising of Architectural Technology as a discipline and profession.
- It offers the opportunity to be involved with, and represent the Institute within your area of excellence and/or significance.
- It enables you to be part of the built environment community of Fellows.

Fellow Membership is an accolade which awards the FCIAT designation and is recognition that demonstrates your significant contribution to and/or excellence in Architectural Technology. It is not an additional demonstration of competence or an elevated level of qualification to your Chartered Architectural Technologist, MCIAT status.

Who can apply for Fellow Membership?

All Chartered Architectural Technologist are eligible to apply and can aspire to become a Fellow Member should they choose to do so.

Visit our website to apply or if you have any queries, contact James Banks, Membership Director, j.banks@ciat.global

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