CONSTRUCTION MANAGER

APRIL 2021
For members of the CIOB
constructionmanagermagazine.com

SHARING IS CARING

THE GROWTH OF EMPLOYEE-OWNED CONSTRUCTION COMPANIES

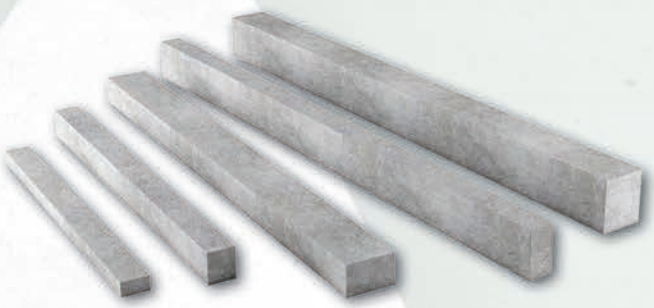
MANNOK

CUSTOM BUILT PRECAST SOLUTIONS FROM DESIGN TO INSTALLATION

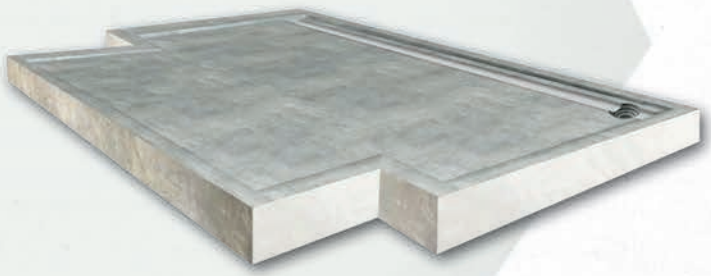
STAIRS AND LANDINGS

HOLLOWCORE FLOORING

BEAMS AND COLUMNS



BALCONIES AND TERRACES



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04/21

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Welcome

Employee ownership in construction is rare. It's not a common model in many sectors but while you might talk of partners in a law or consultancy firm, or marvel at the fact that a retailer such as John Lewis hands out bonuses to its sales assistants (at least in any 'normal' year), the same language can't generally be applied to a contractor.

And yet there are businesses in the sector that have taken the plunge and adopted such a model.

In fact, in the case of a contractor like Lindum, which became employee-owned in 1994, some are well established.

In recent years, employee ownership seems to have started to gain some traction in the sector. As we learn in this month's cover feature (p18), more recent converts include Glasgow-based Pacific Building and London-based demolition contractor McGee.

So why do it? While there are various different ways of creating an employee-owned company, indirect employee ownership via an employee trust appears to be one of the more popular models.

Companies who have chosen this path tell us not just of the ability to provide a clear succession plan as the founder heads for retirement, but how it helps to engender a marked shift in attitude among workers, who take more pride in their work and treat both each other and company property with more respect.

Construction's skills shortage and its productivity conundrum haven't gone away during the pandemic, and with a number of major infrastructure projects on the horizon, as well as the continuing drive to build more housing, they are challenges that are only likely to become more acute. Could employee ownership provide an answer?

Neil Gerrard
Associate editor, Construction Manager and BIMplus

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News

▲ McAlpine subcontractor creates ‘steel wheel’ for truss work

Scottish steelwork firm BHC Steel created an innovative steel wheel to assist the welding and painting of 16 steel trusses assembled in a factory for the construction of the 13-storey One Centenary Way, which spans the A38 Queensferry tunnel in Birmingham. The wheels supported and turned the trusses, which are up to 35m long and 199 tonnes in weight, saving the need to work underneath them.

▲ Winvic progresses latest giant warehouse

Logistics company DSV has engaged Winvic to design, construct and partially fit out its new industrial facility at Mercia Park in north-west Leicestershire. The Winvic team started on site on 26 October. Due for completion in August 2021, the main steel-framed warehouse covers 358,000 sq ft.

▶ Modular builder creates NHS wellness unit

Oxford-based modular builder Green Unit cranes in an eco-friendly ‘wellbeing pod’ for NHS workers at Stoke Mandeville Hospital in Aylesbury. The private space provides a calming place for Buckinghamshire Healthcare NHS Trust colleagues when they need time away from their working day, supporting their wellness during and after the covid-19 pandemic.

News story for CM?
Email neil@atompublishing.co.uk

ACO Water Management has developed products including guidance systems, tunnels and escape ladders to keep endangered wildlife, including hedgehogs, safe amid new construction projects.

▶ NG Bailey joins Manchester Town Hall renovation team

NG Bailey is undertaking the removal and replacement of all mechanical, electrical and plumbing services, as part of the refurbishment and partial restoration of Manchester Town Hall, which dates back to 1877. The refurbishment is being led by Lendlease for Manchester City Council.

▲'The beauty of concrete'

The winners of an international photography competition capturing the "beauty and importance of concrete" have been unveiled. Overall winner and winner of the urban concrete amateur category was Nurlan Tahirli for this image of the Heydar Aliyev Center, Baku, Azerbaijan.

▲ Interserve revives Tilbury Douglas name

Group fleet director Cliff Lewis shows off a newly branded Tilbury Douglas van, after Interserve Construction took the name of the business back to its roots. The Tilbury Douglas name dates back to the London and Tilbury Lighterage Company Limited, founded in 1884. In 2001, the business dropped the names and rebranded as Interserve.

◀ 10,000-tonne double-arch steel bridge floated into place

A prefabricated double-arch steel bridge was floated into place and lowered onto its concrete piers by a semi-submersible barge in Hong Kong. The five-hour operation had to take place at high tide and involved the barge taking on seawater to sink. The 200m Eternity Arch is a component of the 1.8km Cross Bay Link.

How steel is tackling fire safety, p32

Housing groups ramp up building safety skills

Leading social housing landlords prepare staff for new building safety legislation

Clarion has created a digital record of the Bekesbourne tower block in Orpington, London

Major housing groups and local authorities are pushing their asset management staff through specialist training ahead of the looming Building Safety Act becoming law.

Organisations including the country's biggest landlord, Clarion, which manages 125,000 homes, have been signing up staff for the CIOB Level 6 Diploma in Building Safety Management. Housing LMS, an accredited CIOB Training Provider, launched a pilot programme with Clarion in February, with seven of the housing group's building safety management team.

Clarion has already introduced new building safety initiatives over the past three years, including digital mapping of existing tower blocks, developing its building safety case capability and employing four building safety managers.

"It is paramount we provide our building safety managers with a solid grounding in building safety training, not only the technical aspects, but also in stakeholder management, resident engagement and safety case management," said Brent O'Halloran, Clarion building safety advisor.

Other organisations which have joined the LMS building safety courses include Gateshead Council, Great Places Housing Group, A2dominion, Accent Group and Paradigm Housing.

"The course is delivered via live weekly webinars, which are recorded so that candidates can watch them back," explained Roger Gillespie, managing director of Housing LMS. "The course is assessed via regular ongoing tasks and lasts around 40 weeks."

"The CIOB has aligned this work with our quality commission, chaired by past president Paul Nash, set up in response to the Edinburgh school's collapse of 2016," explained Ros Thorpe, CIOB head of education. "We started developing the diploma after the Hackitt review was published in 2018, and worked with Trafford Housing Trust to identify the skills required for the new dutyholder roles that will come in with the Building Safety Act.

"We can adapt the diploma once the act provides more clarity on responsibilities accountabilities."

The Building Safety Bill is expected to be read by parliament later this year, but industry figures including Nash have warned the built environment sector currently lacks the skills to meet its requirements.

Housing LMS will welcome a further intake for the diploma in April, with staff from Grenfell Housing Services, Home Group, Ealing Council and SK Fire Safety Consulting.

CIOB Level 6 Diploma in Building Safety Management

The diploma comprises six units:
1 Fire safety legislation for construction;
2 Fire safety management for construction;
3 Building safety management;
4 Health, safety and wellbeing for building safety;
5 Technology and structures for building safety;
6 Building Regulations for construction.
The first two units lead to a certificate in fire safety for construction; all six units complete the diploma.

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LANDMARK

Rising Stars
The CIOB's Rising Star Awards are now open for entries. Morgan Sindall's Kelly Attwood was a winner last year, see p50

CIOB backing for construction's 'most ambitious' skills plan

CLC campaign includes culture focus to make industry more inclusive

Backing for the plan: CIOB's Caroline Gumble, Mace's Mark Reynolds, CITB's Sarah Beale

The CIOB has thrown its support behind the sector-wide skills campaign launched by the Construction Leadership Council (CLC), described as the 'most ambitious' the industry has ever produced.

The Industry Skills Plan for the UK Construction Sector 2021-25 sets out the key skills challenges, with actions and commitments for both industry and government, in four areas: careers; standards and qualifications; training, education and development; and culture and working environment.

The CLC also said it supported the drive towards increased direct employment. The plan supports government mandates on direct employment through procurement.

Mark Reynolds, group CEO of Mace and CLC member, said: "This is the most ambitious and wide-ranging skills plan the construction sector has ever produced. It should have a far-reaching impact on how we attract, retain and develop people in construction and help deliver the government's homebuilding and infrastructure plans.

Caroline Gumble, CIOB CEO and a member of the CLC Senior Advisors Group, said: "The CIOB is fully behind the Industry Skills Plan and is well placed to support much of the work, with our expertise in competencies and educational frameworks.

"I'm pleased to see the social and cultural aspects of our industry referenced. Attracting those who are embarking on their careers and making the industry as inclusive as possible are also important areas of focus."

Sarah Beale, CEO of Construction Industry Training Board and chair of the CLC Skills Network, said: "While the past year has been incredibly challenging for all of us, the industry has pulled together more than ever, and this plan is the result. We all need to get behind this plan."

Industry Skills Plan – key points

- A 'Talent View' portal to improve access to construction careers and boost their attractiveness to new entrants.
- An industry standard for work experience, with up to 7,000 STEM (science, technology, engineering and mathematics) students encouraged to join the scheme.
- Construction traineeship programmes with a pathway from further education into the industry.
- Competence frameworks.
- Training standards for net zero, digital and offsite construction.

Employers must 'take lead' on net zero training

Reports warn of industry's carbon skills challenge

Stevens: "Emphasis on quality"

Construction businesses need to step up their eco training otherwise the UK's net zero targets could be in jeopardy.

Reports by the CITB and the Institute for Public Policy Research (IPPR) warn of the carbon skills challenge facing the industry, and a contributor to the IPPR study called on employers to act.

Jean Stevens (formerly Duprez), chair of the CIOB business development board, said: "Construction employers urgently need to put net zero training in place for existing workers, but also the new people who will come into the industry from sectors like retail and hospitality. These aren't skills that can be learned quickly; the emphasis needs to be on quality."

Stevens added that green skills and knowledge were also lacking at leadership level in construction organisations. "To achieve net zero, we need better awareness at the top of our industry," she said.

Meanwhile, a Construction Leadership Council initiative, CO2nstruct Zero, has urged firms to play their part in the industry's decarbonisation. Chair Andy Mitchell said it would build on construction's united response to the pandemic.

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Data

500,000

Additional skilled tradespeople required over the next 20 years to retrofit housing energy improvements, according to the CLC

Carbon data shows scale of net zero challenge

Construction must change course on investment and innovation to deliver a genuine green recovery, writes **Kris Hudson**

2021 will be a defining year in the UK's drive for net zero. The pandemic has presented a vast opportunity for change, and decisions taken to build back better – and greener – will be scrutinised as we host the 26th UN Climate Change Conference (COP26) in November. The UK was the first major economy to commit to reducing carbon emissions to net zero by 2050 – and has since pledged to hit 68% of this target by the end of this decade.

Construction will be central to the net zero transition. Globally, the construction and operation of buildings account for 38% of energy-related carbon emissions. While total UK carbon emissions have fallen in the last 30 years, those generated by the industry have been steadily rising – tracking the trend in construction output. With 2021 set to be a year of expansion, emissions are likely to rise further.

From the Green Industrial Strategy to the Construction Playbook, government has made clear that construction has a starring role to play both as an engine of the post-covid recovery and as a force for environmental good. But the challenge is significant, and the relative silence from the chancellor on green policies in the recent Budget raised eyebrows.

To 'build back greener', direct CO_2 emissions from construction need to be addressed, and residential building, which accounts for 65.2% of the total, is the biggest area to tackle. Legislation already in place means from 2025 all new UK homes must be highly energy efficient and 'zero carbon ready'.

But to meet this benchmark Future Homes Standard, investing in industry expertise, alongside increasing adoption of modern methods of construction (MMC) and offsite manufacture, will be crucial.

The new £10m taskforce to accelerate the delivery of MMC homes in the UK acknowledges the urgency of industry transformation, but an industrywide switch to green construction techniques and retrofitting existing assets will put huge demands on suppliers and workforce skills.

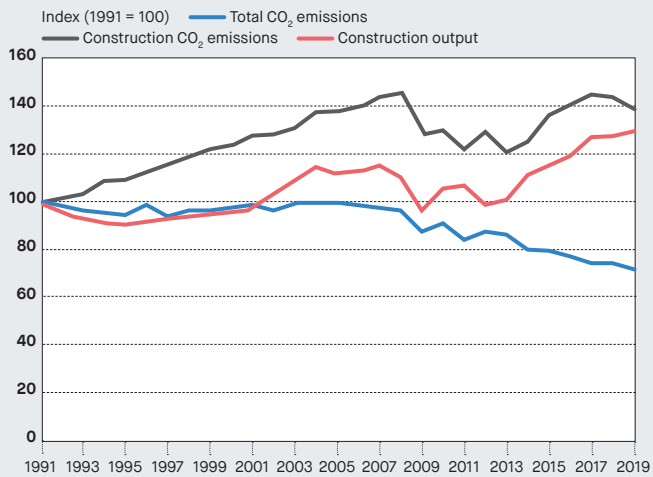
London has so far led the way, with two Retrofit Accelerator schemes tackling the energy consumption of homes and public buildings.

Yet to reduce the cost premium of sustainable building, the industry must break its low-margin, low-investment cycle and change how it builds capability – embedding net zero throughout the supply chain and prioritising investment and innovation.

The prize is a truly green recovery, but the industry must come together and change course now – or we risk missing this opportunity.

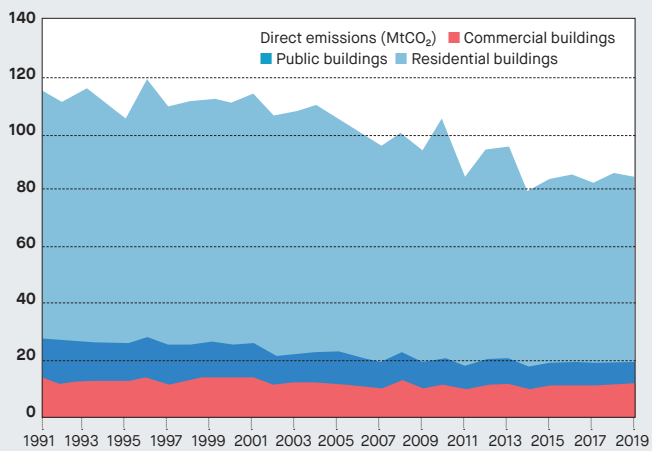
Kris Hudson is an economist and associate director at Turner & Townsend.

UK carbon dioxide (CO_2) emissions and construction output



SOURCE: ONS

Direct CO_2 emissions from the buildings sector



SOURCE: NATIONAL ATMOSPHERIC EMISSIONS INVENTORY (2020). BREAKDOWN OF UK GHG EMISSIONS BY SOURCE AND GREENHOUSE GAS

News in numbers

£10bn

Estimated cost of energy-efficiency measures needed to make London a zero-carbon city, according to the mayor's office

44%

Reduction in Britain's carbon emissions since 1990, according to BEIS

£1bn

Total funding pledged under a new Net Zero Innovation Portfolio in the 2021 Budget

80%

Whole-life carbon saving on ISG's 'deep green' Entopia office project in Cambridge, compared to a standard refurbishment

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Opinion

Caroline Gumble
CIOB

How the CIOB is taking action on climate change

The institute is working with policy-makers and other professional bodies to help the built environment's transition to net zero, explains **Caroline Gumble**

"I believe collaboration across the sector is the most impactful way to make a meaningful contribution to our industry and society"

One of the most pressing issues facing society – and, of course, the construction industry – is climate change and the requirement to move towards net zero carbon emissions.

With the next UN Climate Change Conference (COP26) just over six months away, I am often asked by members what the CIOB is doing to contribute towards net zero, as an institution and in our leadership position to support and guide our members. My short and honest answer is not enough – yet.

For several years, we have been working across the industry to help make the case for greener construction policies and practices. While we have a responsibility to drive our own internal net zero agenda, I believe collaboration across the sector is the most impactful way to make a meaningful contribution to our industry and society.

The CIOB is a member of the Construction Industry Council's (CIC) Climate Change Committee, which is coordinating the efforts of sector professional institutes to meet the emissions target set out in the Climate Change Act 2008. This work also now covers the Industry Recovery Plan.

The committee comprises 10 workstreams, which are contributing to the development of a climate action plan. This plan brings together work that is already underway, as well as setting out actions that the CIC and its members believe need to be taken by the professional institutes over the next 10 years to achieve the 2050 net zero target. The committee intends to present the plan at COP26, in alignment with Built Environment Day.

The CIOB also sits on the RICS Building Carbon Database steering group, set up to oversee work on a database for use by all built environment professional institutes. This group is time limited, with the specific purpose of guiding work ahead of COP26.

We are also part of the Construction Leadership Council (CLC) domestic RMI (repair, maintenance and improvement) working group, which is developing recommendations for a national retrofit strategy to help underpin a sustainable recovery. This is being supported by research we are conducting into a 'help to fix' loan scheme to finance a national retrofit rollout, which has been adopted by the CLC as one of its key recommendations to government.

We will be committing to our own internal net zero plan, dialling up our influencing activity in this area, engaging with policy-makers and parliamentarians on the built environment's vital role in contributing to a green recovery and transitioning to net zero. ●

Caroline Gumble is CEO of the CIOB.

Graham Harle
Gleeds Worldwide

All eyes on construction at COP26

The UN Climate Change Conference later this year will scrutinise the built environment's sustainability credentials like never before. The industry must respond, says Gleeds CEO **Graham Harle**

The vaccine rollout has been a success, the PM has unveiled his 'roadmap' out of lockdown and our attention is slowly turning to life after covid. Over the past year there has been much talk about the positive impacts of the pandemic on the climate in the short term, as clear waters and deserted roads made headlines, but nothing will demonstrate the UK's long-term commitment to achieving carbon neutrality than its hosting of COP26 in Glasgow this November.

Probably the most important summit of the year, the 26th UN Climate Change Conference will bring together heads of state and climate experts, who will also report on progress made since COP21 (if any) when the Paris Agreement set out to limit global warming to 1.5 degrees C.

Inevitably, the world's gaze will fall on the UK's environmental performance. And COP26 represents a crucial opportunity to highlight the central role construction will play in achieving global climate change targets; its contribution will be scrutinised thanks to former business secretary Alok Sharma's Built Environment Day.

While the idea may not have been his own – Sharma was responding to an offer from the World Green Building Council to organise the day – construction should welcome this publicity.

But the industry has work to do on the green agenda. And while operational carbon is getting more consideration now, embodied carbon remains a challenge. Any definition of net zero must reflect this complete picture – extraction, manufacturing and processing, transportation and assembly – or we stand no chance of tackling the problem.

"If the cement industry were a country it would be the third largest emitter of carbon dioxide in the world"

Take concrete. Its production has a huge impact on the climate; after water, it is the most widely used substance on the planet. If the cement industry were a country, it would be the third largest emitter of carbon dioxide in the world.

Meanwhile, cities like London are reviewing their planning regulations to encourage sustainable building, and a more ecologically aware generation is gradually coming into the profession.

However, a recent report from the Institute for Public Policy Research – supported by major organisations including the CIOB – found that net zero targets could be threatened by the construction skills gap, with just 20% of those working in the industry under the age of 30. This threatens to deepen the disconnect between the government's ambition to 'build back better' and its ability to do so.

So COP26 is a chance to shine a spotlight on the troubles facing our planet – and also on how we as an industry must respond. Only by seeking out greener, cleaner ways of working, can construction join the fight against climate change – a global threat for which there is no vaccine. ●

Graham Harle is CEO of Gleeds Worldwide.

How Wates is helping eco tech startups

A new innovation network is linking firms with sustainable technology products, explains **Zainab Dangana**

The government has made clear that its plans to rebuild the economy post-pandemic would include 'building back greener'. With this came a £134m investment to keep the greenest, most innovative businesses thriving, to help others meet their environmental targets.

At Wates Sustainable Technology Services, we work with green technology startups and SMEs, and we've seen first-hand the impact they can have on our customers. So far, we've introduced more than 125 of them to our network of SME innovation partners, linking major businesses to new sustainable technology.

These eco tech businesses have always faced challenges in bringing their products to market. At Wates we try to bridge this gap. We can use our influence within construction, residential and property services to act as an 'innovation broker' between our customers and the sustainable technology marketplace.

It's meant we've linked Wates customers such as a leading UK banking group with tech providers who can help reduce its carbon footprint across more than 1,300 buildings. We've identified 20 potential sustainable innovations which might help, with nine on trial at sites across the estate. One already in place is EndoTherm, an energy and gas saving central heating additive that is independently proven to save up to 15% on heating bills.

We are now connected to 42 tried-and-tested suppliers, and this number is growing all the time. We're also seeing a major uptick in interest from our customers.

To connect more companies with our sustainable technology supplier portfolio, we've launched the Wates Innovation Network portal, a free-to-access online hub through which they can directly access a growing directory of approved companies.

What's more, we're no longer limiting our work to our customers. By providing the information as open source, we hope that more organisations and businesses will learn about the marketplace for green products. Any innovation on our portal will be subject to our technical screening panel, including more than 40 environmental experts from organisations such as the BRE Trust and AMD Environmental.

The Wates Innovation Network has a two-fold purpose: it provides a platform for new and emerging technologies, as well as a clear means for companies to source innovative products at a time and place that suits them.

Dr Zainab Dangana is sustainability technology services manager at Wates Group.

Feedback

A selection of readers' comments about news and issues in the industry from **www.constructionmanagermagazine.com**

CM 01/03
Women in construction
Professional and manual skills

Andrea Kelmanson
I am delighted to see so many women now getting somewhere at the more 'professional' end of the construction continuum. Sadly the same is not true for women who are keen to work at the manual skills end of the that same continuum, where virtually nothing has changed in the past 50 years, and women still represent only 2% of the skilled trades workforce.

Grant Gover
As a long-term supporter of women in construction and engineering, now doing a PhD in music, supporting women composers... this is extremely heartening and best wishes go to each contributor and all women in construction – and music.

CM 15/02
£500m pothole fund

Ian Rochez-Maggs
This is all very well but how many companies know how to fill a pothole? Yes, JCB have produced a machine that they say will repair X potholes an hour but I watched the video and it only was quicker in cutting out the area. You still had to bring in a 'tack coat' and then macadam and roll the area.

[In the video] they used a system of heating up the area under consideration, added more tarmac and then rolled that flat to the adjacent areas. There were no joins new to old. From an environmental point of view, it reused existing macadam.

That said, it would be good if we could get a degree of similarity in how we repair potholes because a good percentage of these repairs fail.

CM 26/02
Grenfell: BRE report on failed Kingspan fire test used to support 29 desktop studies

Peter Anderson
I hope they have now put in place a system which makes it mandatory to state in unequivocal terms whether a material or product has simply passed or failed a specific named/numbered test/certificate. This should be in red or green in large print on all pages of any certificate, report, paper or digitally produced information related to the material or product, including all manufacturers' literature.

CM 11/03
Palace of Westminster 'deteriorating rapidly'

Stuart Griffiths
The most economic way to solve the problem is to lose our society's hang-ups on old buildings, tear it down and build a new Parliament building that is "fit for purpose". There must be acres of space around the country to construct a new Parliament building in a place better suited, thereby bringing our society together.

Brian Collins
The cost is immaterial since the building is the symbolic heart of our democracy, national heritage and history and must survive. As for a new building, just look at the pathetic efforts in Scotland or Wales for examples of what you might get.

CM 02/03
Interserve Construction rebrands to Tilbury Douglas

Chris Jack
It's fantastic to see the [Tilbury Douglas] name re-emerge. I joined Tilbury Construction in 1979 and was sad to see it eventually change to Interserve. The merger with RM Douglas was a great fit, as we were already firm partners in scaffolding and formwork prior to the merger, but I had left by the time Tilbury Douglas was formed, although as a client by then, they were frequently on our tender lists. Welcome back.

CM 10/03
Grenfell: 'Poor' cavity barrier installation

Peter Anderson
It seems to me that responsibility for site installation should lie directly with the element subcontractor and that they themselves should certify that the work is in compliance with all requirements and manufacturers' method statements and specifications.

Work sub-elements should not be allowed to progress and be in default and uninsured until these sub-element-specific certificates are checked and also signed off by the main contractor, building control and client's agent and insurers.

If certificates were not produced in this way, valuation payments would be stopped and insurance cover would be invalid. This should be strictly applicable at each stage. Only in this way (from the bottom up), with jobs stalled and payment stopped, would industry sit up and be forced to get its house in order and not hide behind the present recipe of unclear responsibilities under design and build.

Provide your own feedback on latest industry issues by posting comments online at **www.constructionmanagermagazine.com** or by emailing the editor at **construction-manager@atompublishing.co.uk**

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DAVID WILSON HOMES

"We", "our", "us" refers to the Barratt Developments PLC Group brands and Site Managers. Our Group brands include Barratt Homes, Barratt London and David Wilson Homes. Trustpilot rating correct at time of going to press.

OUR SITE MANAGERS ARE NHBC PRIDE IN THE JOB WINNERS

To win an NHBC Pride in the Job Award is the highest accolade in the housebuilding industry. Each year, the NHBC join with leading experts to rigorously judge Site Managers from across the UK. We spoke to Kirk Raine, winner of the Supreme Award, to get a better understanding of the passion, dedication and leadership that's required in order to produce homes of exceptional quality.

How did you get into this role?
From the age of 12 I've always wanted to build houses. My father used to be in the industry so I've always loved building. I started off as an apprentice bricklayer and worked my way through the ranks, from Assistant Site Manager right the way through to Senior Project Manager. I've been doing site management now for 21 years – and I enjoy every minute of it!

What do you do day to day?
As a Site Manager, you're responsible from the moment the site compound is put in. You're working alongside the site team, customer care and all our contractors, just driving quality – I love my job every day.

Why do you enjoy working for Barratt Developments PLC?
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Kirk Raine – Supreme Award Winner

The Construction Director, Contracts Managers and all the team are fantastic to work for too, and I've got some fantastic contractors who I've worked with for years.

How does it feel to have won the PITJ Supreme Award?
Winning this award has been absolutely fantastic – all the contractors, the customers, everyone on site celebrating. We've got over 200 customers on phase 2 and 3 at Doseley and the customer satisfaction is at 100%. Everyone's happy and that's what I want – smiling faces when people move in.

What does this award mean for the team?
Obviously winning this award is absolutely fantastic for myself, but what everyone's got to realise is it's actually a team award. I've got such a good team around me, and the respect is both ways with the contractors and all our staff – because every day is a pride in the job day.

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**We are the only major national housebuilder to be awarded this key industry award 12 years in a row. Based on HBF star rating scheme from 2010 to 2021 derived from the NHBC national new homes survey at eight weeks, over 90% of Barratt Developments PLC group customers would recommend our brands to a friend.

Employee ownership

SHARING A PIECE OF THE ACTION

MORE CONSTRUCTION COMPANIES ARE MOVING TO AN EMPLOYEE OWNERSHIP MODEL. **NEIL GERRARD** ASKS WHAT BENEFITS IT CAN BRING TO EMPLOYEES AND EMPLOYERS ALIKE

Steel saws rarely used to last long on construction firm Lindum Group's sites. They would disappear without explanation, costing £1,000 a time to replace.

In just one year, a total of 29 of the saws went missing from Lindum sites, leaving the firm with a hefty bill. Two years later, however, that figure was down to just one.

What changed? It wasn't as a result of new security measures or the dismissal of a light-fingered employee. Instead, the business decided to take the route to employee ownership and that led to a major shift in mindset among workers, many of whom had since become shareholders.

While Lindum was an early convert to the model, making the switch back in 1994, it is comparatively rare among contractors. Architecture practices and big consultants like Arup, Mott MacDonald and Rider Levett Bucknall have embraced the concept, but only recently have more construction firms adopted this ownership model.

Last month, utility contractor Falco switched to an employee ownership trust, demolition firm McGee made the same move in May 2020, while Glasgow-based Pacific Building – a CIOB chartered building company – set one up in January 2019.

For Pacific founder Brian Gallacher, what prompted the decision to make a change was the need to put a succession plan in place. But it has delivered other benefits too.

"We hoped that by encouraging people to buy into the company, employees would be more likely to feel involved further"
David Chambers, Lindum Group

Lindum Group now has 480 employee shareholders – around two-thirds of the workforce

480

Above: Lindum Group staff holding their shares in 1994

Below: Lindum Group apprentice Katie Hughes

He explains: "The first thing I knew of employee ownership was when a subcontractor of ours who operates in the retail sector said he was doing it. He explained how it worked and I looked into it because as I pass my 60th year I do have to consider a succession plan.

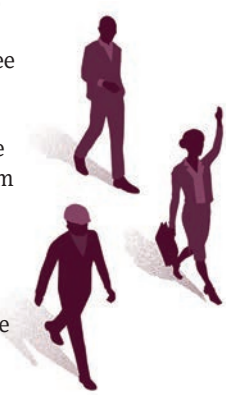
"The concern the directors, staff and I had was how do we make sure that the business retains the philosophy, culture and values if there was a change in management, particularly if the company was acquired by a business that didn't share those values?

"Employee ownership seemed the most seamless and simplest route to maintaining some kind of legacy."

In Pacific's case, setting up employee ownership took just over two years.

"I had a good look at the possible downsides and went to the Employee Ownership Conference in Birmingham and met people who were at various stages of the process. The harder I looked at it, the more appealing it became to me," Gallacher recalls.

He expected some employees to be suspicious of his motives and while he did meet some cynicism, it was short-lived. "When I announced it to the team here, a lot of them thought it was a really good opportunity and the majority quickly got it," he says.



Changing attitudes

Once the trust was in place and employees felt they had a stake in Pacific, Gallacher spotted an immediate shift in how employees viewed their job.

"There was a step change in some people's attitudes and that was what I really wanted. People who came in every day and treated it as just a job suddenly realised it was a bit more than a job. They wanted this business to be successful and for clients to love us. There has been a real improvement in productivity."

The sudden reduction in missing steel saws a quarter of a century ago was due to a similar shift in attitude, says David Chambers, chairman of Lindum Group, which operates out of offices in Lincoln, Peterborough and York. Lindum's decision to set up an employee ownership scheme followed completion of a complicated project.

"With hindsight, we felt some of the problems we encountered during the contract may have been avoided had there been a deeper level of pride, ownership and commitment among employees," he says. "We hoped that by encouraging people to buy into the company, employees would be more likely to feel involved further and this has been an important factor in our success ever since."

The company, which started life as a family-owned business 65 years ago, now has 480 employee shareholders – around two-thirds of the workforce – and is managed by a board of directors, who also own shares.

The process to establish employee ownership took a few months and Chambers says the main challenge was communicating the concept. "Employees needed to understand why we were suggesting they should become a partner in the business. We needed to be clear on the reasons, the potential benefits and, of course, the potential pitfalls," he explains.

"In the beginning, we invited senior staff to buy shares and then we gave away free shares to every employee. This helped to embed the system and encouraged people to continue their investment. As personnel changes, being clear on the reasons for doing it remains a priority even today. The difference is that now we have real-life examples of how the shares scheme works and how it can be beneficial to them." ▶

The three main forms of employee ownership

Employee ownership can take one of three forms:

- **Direct employee ownership – using one or more tax-advantaged share plans, employees become registered individual shareholders of a majority of the shares in their company;**
- **Indirect employee ownership – shares are held collectively on behalf of employees, normally through an employee trust;**
- **Combined direct and indirect ownership – a combination of individual and collective share ownership.**

SOURCE: EMPLOYEE OWNERSHIP ASSOCIATION

"I think there is also a camaraderie and a togetherness that perhaps might not have existed in its fullest extent pre-employee ownership"
Brian Gallacher, Pacific Building

DAVID BOYES WORDMEDIACO

Pacific Building celebrates its move to employee ownership in 2019

Company strategy

Under an employee ownership trust model, Gallacher and his management team still make all of the decisions about company strategy at Pacific. The shareholding is held by a trust so none of the employees has individual shares.

"The official status of the employees is that they are beneficiaries of the trust. The trust can make awards based on profitability to each beneficiary or employee should the business have a good year," says Gallacher.

The firm's trustee board is made up of five people – two employee representatives and two management representatives, as well as one independent. The management team meets with the trust a couple of times a year to tell the trust how it plans to run the business. The trustees can interrogate the management team's decisions but can't prohibit it from making decisions.

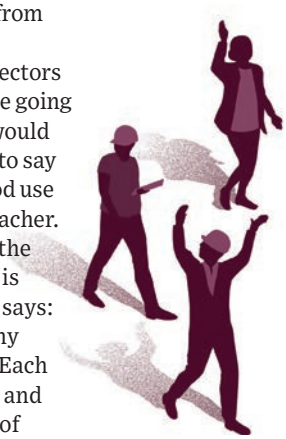
"But if all of the board of directors were to suddenly say they were going to buy themselves Ferraris, I would fully expect the trustee board to say that they don't think it is a good use of company money," adds Gallacher.

At Lindum, Chambers says the approach to decision-making is "the best argument wins". He says: "Lindum Group is one company made up of several divisions. Each division has its own directors and management structure. Each of these work with their teams to determine the direction of their business within the group plan. Divisions manage their own business development, with the support of central resources, and all employees are encouraged to see potential business opportunities.

"We also have an annual AGM to which all employees are invited. This is an opportunity to discuss the business and ask questions directly of its board of executive directors."

Employee-owned construction companies

Pacific Building Main contractor
Lindum Group Main contractor
McGee Demolition contractor
Erith Demolition contractor
Falco Utility contractor
Raised Floor Solutions Flooring contractor



Negotiating the pandemic

The unpredictable, volatile environment that has been created by the covid-19 pandemic has hit nearly every sector of the economy hard, and construction has been no exception. But Gallacher thinks the employee ownership model is a useful one to have when it comes to negotiating tough conditions.

"Employee ownership wouldn't make a bad business good, but it helps a good business be better and stronger," he says. "We had some good cash reserves which will continue to help us, because we are obviously burning a bit of cash at the moment.

"Had there been a management buy-out or a trade sale it would probably have sucked all the cash out and we would likely be operating on an overdraft. I think there is also a camaraderie and a togetherness that perhaps might not have existed in its fullest extent pre-employee ownership."

Chambers agrees that employee ownership helps Lindum to handle obstacles. "If we save more money, by delivering good client service or being careful how we spend money and looking after our kit, then our shares will perform better," he says.

"In terms of the pandemic, our sites were able to reopen quite quickly provided they abided by strict regulations. Our employees understood that it was in everyone's best interest to be back in action swiftly but without compromising on social distancing and hygiene."

Gallacher certainly has no regrets. He says: "It won't work for everyone but I know that I have done the right thing."

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STARS ALIGN FOR MODULAR STEEL

IT COULD BE A SERENDIPITOUS TIME FOR MODULAR STEEL. **KRISTINA SMITH** EXPLAINS

Modular steel construction has been boosted by the pandemic

While 2020 was labelled 'the worst year ever' by many, sentiments in the modular steel sector are rather different.

"The pandemic has perversely been quite good for us," says Ryan Simmonds, Sigmat's pre-contracts director, almost apologetically.

The Leeds-based light gauge steel frame manufacturer's turnover is forecast to reach £37m this year, and it's a similar story at Wernick Buildings in Port Talbot, south Wales, which expects to turn over £40m.

"There has been unprecedented demand in the last 12 months, an order book I could only dream of," says the company's managing director, Stuart Wilkie.

Meanwhile, Intelligent Steel Solutions, sister company to Henley Homes, reports a doubling in turnover during the covid period.

These bulging pipelines can't be attributed solely to the pandemic. There are other forces at work here: the government-led drive towards modern methods of construction (MMC) and their linked sustainability gains; the fear of a Brexit-driven skills exodus; and the introduction of new fire regulations which have put the growth of structural timber on hold for taller buildings – and even low-rise ones.

"We have seen an uptick in people moving away from timber, even the two- and three-storey housing market," reports Simmonds.

Covid has underlined the benefits of having fewer people on site and a more controlled construction environment in the factory. In a year of uncertainty, investing upfront on a project to give certainty of time, cost and quality becomes more attractive.

New players to the market certainly see promise for modular steel in the UK. Japanese giant Daiwa House acquired Netherlands offsite specialist Jan Snels in December 2020 and is setting up a facility in south Wales. New venture CoreHaus is preparing a factory in the same region.

Investors are on it too. In April 2020 Impact Capital Group, set up by property developers Robert Whitton and Nick Shattock, bought Peterborough-based Lesko Modular – now Impact Modular – with £100m of financial backing already on board. The group has recently set up a fund, Impact Lending, for other would-be sustainable housing developers.

Sectors expand

There are many types of modular steel systems on offer, panelised and volumetric, largely light gauge steel but some hot-rolled too. Each supplier is different, and each has a different niche or blend of sectors.

30,000

Number of modular student rooms delivered by Sigmat

"We often reject projects because they are so advanced in design, you would have to go backwards to modularise them"
Stuart Wilkie, Wernick

They report growth in all breeds of residential, healthcare, education, retirement – the list goes on.

Variety is the spice of life for Sigmat. It has delivered huge amounts of student accommodation – over 30,000 rooms in 24 locations – but works in many other sectors too. Its current schemes include a five-star hotel, a luxury bungalow scheme, a 10-storey mixed-use building in Nottingham and a retirement home in Hexham, Northumberland. The latter is one of five it will deliver in 2021 for McCarthy Stone in a deal signed last year.

For Wernick, education is the dominant sector, accounting for 30-35% of its workload, says Wilkie. Projects range from temporary classrooms up to huge university buildings, such as a 2,600 sq m two-storey teaching building for Swansea University, including a lecture theatre for up to 500 students.

Wilkie expects education to remain strong. "The new schools programme has a large element of modular in it," he points out. Healthcare and transport buildings, such as those at airports, are also important sectors for Wernick. This year supplying offices for HS2 works has also boosted its workload.

Traditionally, Wernick worked with cold-rolled steel frames but has recently added hot-rolled steel to meet demand for taller buildings. "We can provide modular buildings up to six storeys because we are using hot-rolled steel," says Wilkie.

Residential is the main market for Intelligent Steel Solutions, which manufactures 2D panels, some of which go on to volumetric suppliers to be turned into 3D modular structures. It also supplies panels for custodial, military, healthcare, education and hotels.

Another niche but fast-growing market is airspace, says managing director Nigel Storey, where volumetric modules are craned onto the top of existing building. Apex Airspace, the brainchild of its CEO Arshad Bhatti, is a pioneer in this emerging sector, focusing on social housing in London (see box, p26).

New approach

New venture CoreHaus differs from its competitors in a couple of ways. First, it is a social enterprise, like one of its parents, Fusion21, which runs frameworks for the public sector. Second, its system is hybrid, a mixture of volumetric and panelised.

"There is still a little bit of a stigma about MMC and full volumetric," says CoreHaus managing director Scott Bibby. "This allows people to try something that is not full volumetric."

Having already trialled the concept on a project belonging to its other parent, housebuilder Carlton & Co Group, Corehaus is now setting up its own factory in Murton near Seaham in County Durham. Production ▶

Corehaus trialled its technology on a Homes by Carlton site in County Durham, alongside a traditional build. The system was built on site, rather than in the factory, to prove the concept

"In an ideal world, we would be working with a potential client before they negotiated with a main contractor"
Ryan Simmonds, Sigmat

will begin in the summer with the first four units built here due on a Carlton site in Thorpe Thewles, near Stockton-on-Tees, by September.

Any profits CoreHaus generates will be recycled through the Fusion21 Foundation, which aims to help disadvantaged people and invest in community businesses to create social good. The Corehaus facility will use only green energy.

CoreHaus's approach could be attractive to some social housing providers because of its social conscience. One of the difficulties for modular construction can be that it isn't feeding into jobs and the economy locally, says Storey: "If you talk volumetric, the social value does not happen where you are building, you are not bringing jobs into the area. Sometimes a hybrid modular build, like our 2D panelised system is more attractive. It's important to have a blend of different modular solutions; not one hat fits all."

Jan Snel is starting small in the UK with just two houses planned on the Coed Darcy site in south Wales (see box, this page). Jan Snel UK manager Ben Pemberton expects to see growth in education and healthcare too.

Pemberton is currently recruiting staff and setting up a manufacturing facility in south Wales, which he says will be operational "soon". Until that happens, projects can be supplied from the HQ in the Netherlands, he says.

Construction meets manufacture

When it comes to adopting a design for manufacture-type approach, it sounds like many clients and designers still didn't get the memo. "Very often we reject projects because they are so advanced in design, you would have to go backwards to modularise them," says Wilkie. ▶

Sigmat is supplying its system to a new hotel at Sandy Park in Exeter, home to premiership rugby club Exeter Chiefs

Low carbon is the key for Jan Snel

Dutch firm is futureproofing Coed Darcy urban village

A steel module is craned into place at Coed Darcy

Jan Snel has been supplying modular steel structures to a variety of sectors and countries around Europe from its group HQ in the Netherlands. But its UK branch, set up in late 2020, is working on its very first project: two homes for Coastal Housing Group and Waterstone Homes on the Coed Darcy urban village in south Wales.

At the end of February, the units were being craned into place. The homes have been designed to have a low carbon footprint, with radiant heating panels rather than gas, a solar array with batteries, and EV charge points.

"We are trying to futureproof the house," says Jan Snel's UK manager Ben Pemberton. He sees low carbon as the most important selling point for modular steel housing – which he thinks his competitors have been slow to pick up on.

Coed Darcy is being built on the former Llandarcy oil refinery site and will eventually have 4,000 homes, schools and other community facilities.

Construction on the site began in 2012 and is expected to take around 20 years to complete.

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"There is still a bit of a stigma about MMC; we allow people to try something that is not full volumetric"
Scott Bibby, CoreHaus

Problems could include window positions that fall on module joints, building dimensions that don't marry up with standard unit sizes and modules that would be too tall to transport. Another nonsense for Wilkie is buildings with a modular frame and then traditional brickwork cladding and roof, which destroys most of the programme benefits.

Late changes continue to be a problem. All the suppliers mentioned the need for earlier 'design freeze'.

Designers also must understand that uniform loading is key to getting an optimum solution, says Storey. "It is a line loaded system," he says. "You have to get the loads into the ground without putting extra steelwork in to transfer loads. If you pull together a team that understands that, then you can really benefit from steel modular construction. More bespoke is doable – but not as efficient." Architectural practices with specialisms in modular steel are emerging, says Simmonds.

Intelligent Steel Solutions is investing to improve its design efficiency further. "We work with Tekla, a 3D modelling system," says Storey. "We are investing £100,000 this year to be able to run a smart system that has a degree of intelligence. So, for instance, when you put a door in you don't have to detail every individual element – the system does it for you."

Considerations around site operations are largely linked to logistics: getting units to site, securing road closures if they are needed, getting the cranage right. Occasionally there is a mismatch between factory precision and what is considered "good enough" on site, says Wilkie.

The other challenge with the factory-site interface is when the programme on site slips for some reason – whether funding issues, unforeseen ground conditions or bad weather. Then there is the chance that the factory slot may be missed. Sigmat has an overflow storage facility to cope with this problem.

Despite the fact that modular steel looks set for more growth, there are still some problems to be ironed out. The big one is procurement.

Frameworks are a step in the right direction, says Wilkie. Around 50% of Wernick's work comes through this route. "The downside is it introduces very high levels of competition – up to 10 firms chasing one job – and it costs a lot of money to tender," he says.

Intelligent Steel Solutions manufactures 2D panels for volumetric suppliers, chiefly in the residential market

"In an ideal world, we would be working with a potential client before they negotiated with a main contractor," says Simmonds. Often Sigmat doesn't see projects until RIBA stage 3-4.

There's a whiff of change, though, says Simmonds. There are some pre-construction service agreements (PCSA), where Sigmat is paid for its design work before contract award, but mostly suppliers are working under JCT and expected to do significant amounts of work at risk. "More customers want to understand what we offer and how we can realise the cost efficiencies," he adds.

Procurement issues notwithstanding, it does seem that the covid kickstart that the sector has received could continue. With the government's 'green industrial revolution' and 'levelling up' strategies targeting deprived industrial areas, there could be more funding and opportunities for growth. Maybe the stars really are aligned for modular steel.

Using modular steel to extend existing buildings

Apex Airspace expands two housing blocks in Bermondsey

Why just replace the roof when you could add 30 new homes and upgrade the whole building?

This was Apex Airspace's proposition to Lambeth & Southwark Housing Association for Antony House and Roderick House in Bermondsey (pictured).

Apex is adding two extra storeys of apartments, plus additional homes at the ends of the blocks and a new lift core which will join the two buildings. It is using a mixture of modular units for the rooftop apartments and light gauge steel sections for the ends and infill.

Contractor Adston is delivering the development, with modules manufactured at its factory in Ireland.

One of the important issues at the feasibility stage is whether the existing foundations can take the weight, explains Apex Airspace's chief operation officer Phillippa Prongué. If there's more than 10% additional weight to be added, then usually an exoskeleton, supported on piles, would be added, as is the case in Bermondsey.

"This is a way that local authorities can expand their portfolios on land that they already own," says Prongué. "Airspace is one of the few models that enable 100% affordable."


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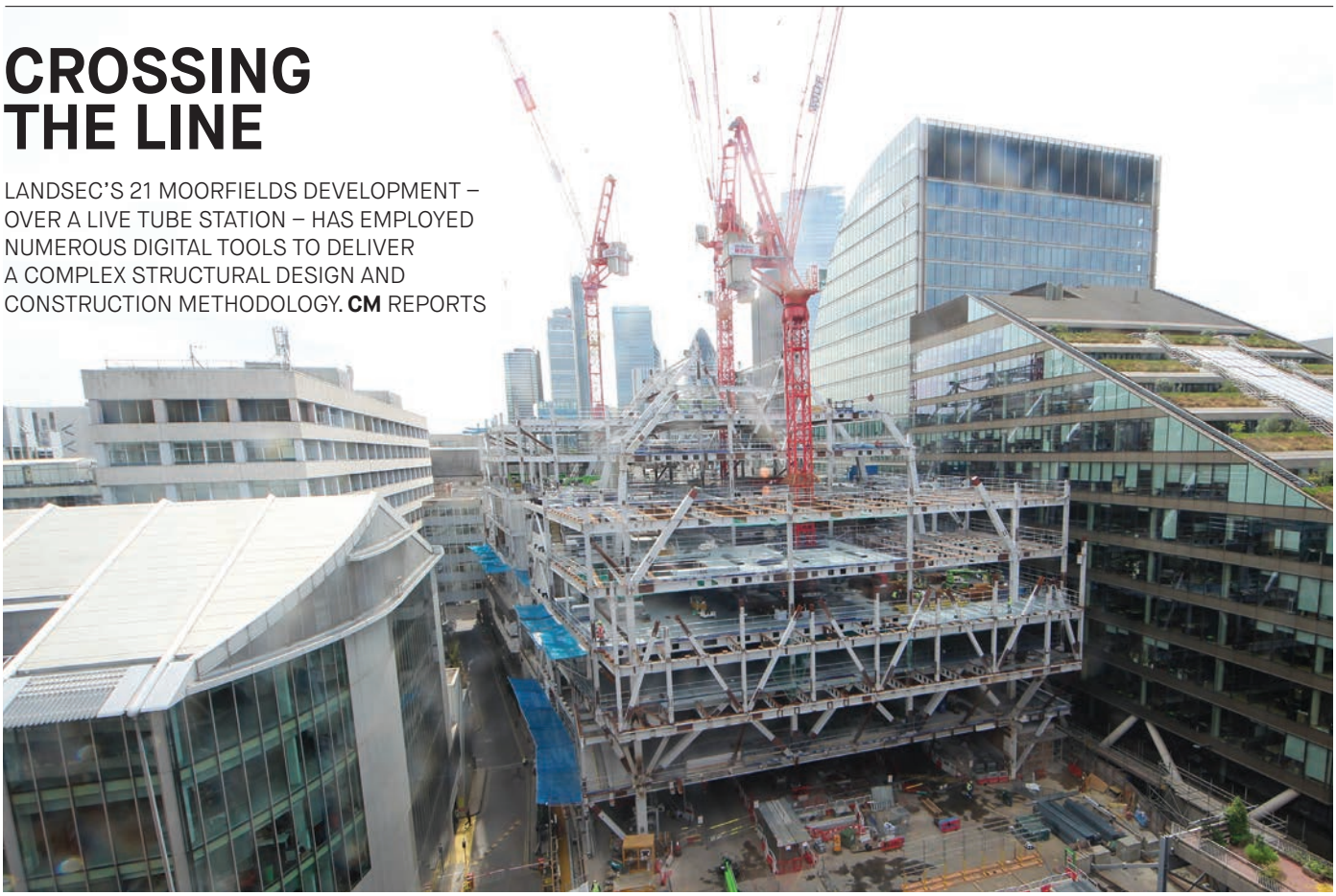
CROSSING THE LINE

LANDSEC'S 21 MOORFIELDS DEVELOPMENT – OVER A LIVE TUBE STATION – HAS EMPLOYED NUMEROUS DIGITAL TOOLS TO DELIVER A COMPLEX STRUCTURAL DESIGN AND CONSTRUCTION METHODOLOGY. **CM** REPORTS



Steel frame erection progress, taken from Moor Lane, to the west of the site

Bridging a 55m-span over Moorgate Station, the 17-storey 21 Moorfields development is a new landmark feat of engineering for the City of London.

The 60,000 sq m commercial building project, which straddles three Tube lines, Underground sidings and Crossrail, required a complex structural design – which was developed in conjunction with the build strategy – aided by cutting edge digital tools.

The approach to the Landsec project was conceived and delivered by the team of engineers at Robert Bird Group (RBG), working with architect Wilkinson Eyre and contractor Sir Robert McAlpine.

Logistically and technically, RBG had to take a holistic view of the design and construction process, bringing its in-house construction engineering division to work with the main design team from concept stage.

"The consideration of buildability within the permanent structural system was fundamental to our design philosophy," says RBG project director Nick Cole.

From the outset, it was non-negotiable that Moorgate Station had to remain operational throughout demolition and construction activities. Other constraints the team had to negotiate included the limited loading capacity of the slab which forms the existing station roof, which had to support construction activities, including cranes, plus safely constructing the structural frame directly over the live station.

For these reasons, RBG decided to use an early construction methodology and erection sequencing approach with the structural design, plus integrated erection stress analysis. This approach, usually applied at later project stages, allowed the team to understand risk, cost and programme for the works, and validate the construction methodology and programme with LandSec and Transport for London.

10
Height in storeys of the six steel arches in the structure

"Where possible, we always integrate temporary works or smart construction sequencing into the structural design to simplify construction"
Nick Cole, Robert Bird Group

The superstructure design has been shaped by the tight location and the limitations of the station roof slab. While efficient in the permanent condition, the capacity of the roof required an alternative support system to enable the construction of the steel structure.

The structural design features a series of six 10-storey-high steel arches. Each of these incorporates a two-storey 'launching truss' at the base of the building. These act as temporary works during construction, but will then be integrated as architectural features in the finished building at lower levels.

Otherwise, the superstructure is conventional in form, using steel columns to support cellular beams up to 21m long, which work compositely with metal-decked lightweight concrete floors. The structure rests on 15 2.4m diameter piles – among the highest loaded ever driven in London – which had to be threaded delicately through numerous underground constraints, to depths of 60m.

The erection stress analysis for the above-ground structure used a staged construction finite element model – created in analysis software Midas – to prove the concept and identify approximate costs, which allowed for the omission of significant temporary works, according to RBG.

"Where possible, we always integrate temporary works or smart construction sequencing into the structural design to simplify construction," explains Cole. "This may result in a slightly heavier permanent structure but always results in overall programme and cost reductions."

As the concept developed, more details about the construction methodology and erection sequencing were layered into the design. Some of the steel members were too heavy for the crane capacity and splices were required for the trusses, arches and 21m-span secondary beams.

This is where the digital tools started coming into their own.

"An automated script, written in [programming language] Dynamo, within Revit flagged non-compliant members through the design and construction planning process, providing certainty on the number of splices, piece count and key architectural connection locations and details," explains Cole.

The steel erection sequencing model was also developed in detail. In collaboration with William Hare, the steel frame contractor, working under a pre-construction service agreement (PCSA) prior to main contract award, RBG coordinated a sequence that would reduce the construction programme with as few constraints to follow on trades as possible.

RBG linked this sequencing model, created using finite element analysis software Strand7, to visualisation tools 3ds Max, producing both stills and video renders of the developed construction sequence. This was used to inform the main contract tender.

"Extracting our analysis data into a tangible and accessible format improves coordination, communication of risks and enhances the contractors' understanding of the structural frame constraints," says Cole.

As the main contractor Sir Robert McAlpine, also working under a PCSA, developed the final construction sequence and temporary works schemes, RBG developed the erection stress analysis model to include all temporary works members, providing a model that simulated the construction method as close as possible.

The tender process identified that it would be necessary to jump tower ▶

Project team

Project: 21 Moorfields
Client: Landsec
Consulting engineer: Robert Bird Group
Architect: Wilkinson Eyre
Main contractor: Sir Robert McAlpine
Steel frame contractor: William Hare

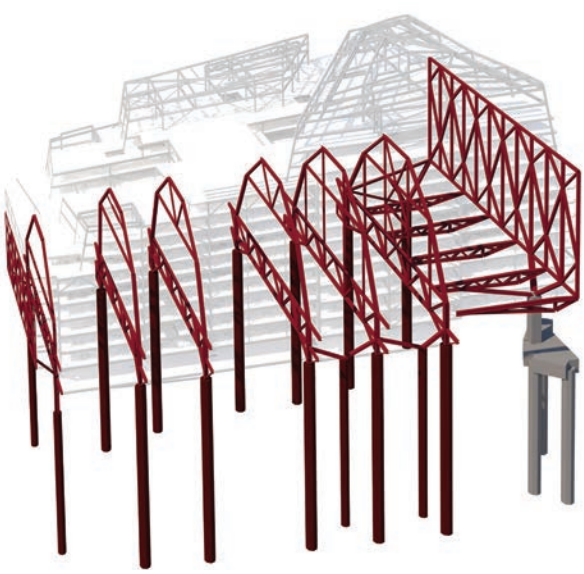
Cross-section of 21 Moorfields showing the underground railway constraints

cranes off the station roof and onto the structural frame, loading the launching trusses.

"As a result, the erection sequencing model was adapted and assessed to identify member and connection overloading, allowing the necessary steps to be taken within the fabrication process prior to work starting on site," says Cole.

With such a complex structural design, the project team needed to understand how movements in the frame would develop once construction work started, with Sir Robert McAlpine's formal appointment in October 2018. To help with this, RBG uses visual programming software Grasshopper to link its erection stress analysis model with 3D design application Rhino.

"Construction movements are a significant issue due to the complex interaction between the launching truss and arch systems, which work independently as the frame is erected to level 10, and together thereafter," explains RBG's project lead at 21 Moorfields, Chris Papanastasiou.



3D model showing the six long-span arches and supporting trusses

"Issues such as welded nodes, bolted connection stiffness, construction loading and frame temperature all affect the movement performance of the frame as it is built. An understanding is required to ensure the frame is installed within the desired construction tolerance, accounting for variable effects noted above, and to assess any potential issues with the follow-on trades such as cladding and fit out.

"To address this, we used a script in Grasshopper with Rhino to help visualise movements during construction. We developed a monitoring specification based on gathering site data taken at key nodes and processing it against predictions from our erection sequencing approach model.

"The scripting also allowed us to extract data from the erection sequencing approach model onto Bluebeam PDF drawings, enabling better quality assurance and checking. This information was used directly by William Hare to set out the frame during construction."

Monitoring variables

The construction team also monitored variables such as steel temperature and estimated construction loading, while recording survey data to compare against the predictions in the erection sequencing approach model.

Another bespoke analysis tool was created in Rhino – using the Python programming language – to assess the stiffness of the structural frame and its connections based on the survey data.

"The function of this tool was two-fold, the first was the production of a visualised 'red-amber-green' plot system based in Rhino, to allow the team to differentiate between expected movements and installation tolerances during construction," says Papanastasiou.

"The second was to modify the erection sequencing approach model, accounting for amended element stiffnesses, which could be used to predict future movements, flagging any future concerns before they are realised onsite and promoting conversations about tolerance adjustments during the build."

Cole says the integrated construction methodology on 21 Moorfields has remained consistent from an initial sketch through to work being executed on site. "It is also a rare opportunity to work on a project that gives us this level of live feedback during construction as it allows us to calibrate our models and improve our processes for future projects," he adds.

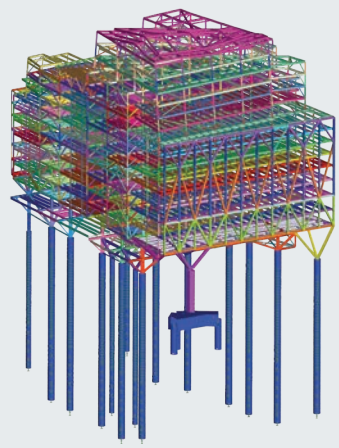
What is erection stress analysis?

How simulations can help understand performance

Erection stress analysis forms an essential part of early construction methodology and erection sequencing for structures where stresses and deformations generated by the erection process can lead to inferior structural performance, increased frame material or excessive temporary works.

The process involves simulating the incremental construction sequence within the structural analysis model to understand the performance of the building during construction.

The screenshot below from Strand7 shows the model for 21 Moorfields.



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Dr David Moore
BCSA

HOW CAN STRUCTURAL STEEL IMPROVE FIRE SAFETY?

NEW GUIDANCE AND TRAINING WILL IMPROVE STEEL'S RESISTANCE TO BOTH FIRE AND CORROSION, WRITES **DR DAVID MOORE**

Factory application of intumescent paint

©HEMPEL

Fire safety is not a common concern for the steel sector. However, the tragic events at the Grenfell Tower in 2017 prompted the British Constructional Steelwork Association (BCSA) to review the National Structural Steelwork Specification (NSSS).

A further driver was corrosion, a perpetual problem for steel in all industries, with a destructive cost estimated at £1.8bn worldwide and £46bn in the UK, including downtime, maintenance and replacement of assets. Effective anti-corrosion measures improve the design life of structures and reduce structural failures.

The outcome of the review was the creation of a new section in the NSSS for the specification, purchase, application and inspection of intumescent paint.

Both a fire protection product and a protective coating, intumescent paint reacts when exposed to heat and swells up to provide insulation. This insulation, or char, enables intumescent coatings to provide a reactive fire protection solution on structural steel; its insulation properties slow down the time it takes for steel components to reach their failure temperatures.

Intumescent coatings can be applied either in-shop (off site) or on site. However, the causes of intumescent failures suggest that in-shop application is much less prone to failure than application on site.

The challenges for site application are the adverse effects of bad weather during painting as well as having to apply an intumescent onto a fully cured primer which may have been exposed to contaminant like road salts and site dirt during transportation of the steelwork to site.

In winter, the necessary environmental conditions can be especially difficult to achieve and an intumescent may be exposed to condensation, wet weather and ponding before its protective sealer coats can be applied. These issues can cause detachment of the intumescent from the primer coat.

It is for these reasons that the new section on intumescent coatings in the NSSS is limited to application in-shop rather than on site.

Intumescent systems are an essential part of a structure's fire safety and it is important to ensure that these systems are correctly specified, applied and inspected. Overall responsibility for this task should be assigned to a 'responsible painting coordinator'.

A competent and knowledgeable person should inform authorities and clients that the system has been applied correctly, and this information should form part of the 'golden thread' of project information – from specification to application – as set out in the Hackitt report.

For BIM Level 2 projects, the NSSS requires the steelwork contractor to provide COBie data – including information on fire and correction protection systems – in the O&M manual issued to the client. ●

Dr David Moore is CEO of the BCSA.

Responsible painting coordinators training

BCSA course planned

The BCSA has developed a training course for responsible painting coordinators, who will oversee all aspects of the application of both protective coatings and intumescent systems including specification, preparation of steel, application of paint, inspection and adherence to health and safety requirements.

The responsible painting coordinator will also be in charge of ensuring that the qualifications and training of those preparing the steel, the paint applicators and the inspectors meet the required standards.

The training course runs for three days and covers most types of steel-framed structures. It only applies to surface preparation, protective coating and intumescent application practices carried out in-shop and not on site except for repairs and maintenance of the coating system.

BCSA hopes to launch the course once covid-19 restrictions end.

FIREPROOFING EXISTING STEEL STRUCTURES

RETROFITTING STEEL-FRAMED BUILDINGS WITH INTUMESCENT COATINGS MUST FOLLOW STRICT STANDARDS. **CM** REPORTS

25 North Colonnade is a commercial office in London's Docklands, built in 1991. In 2018, ISG was awarded the £70m contract to refurbish the 15-storey building. Its makeover features exposed soffits and internal steel columns and beams for a 21st century minimalist interior.

The challenge for LDD Construction, the contractor responsible for the fire protection package, was to make sure the exposed steel structures would be adequately fireproofed.

Above: A VariBlast operative works on the internal structural steelwork

Right: Rusty steel beams at 25 North Colonnade prior to blast-cleaning

Exposed steel has to be protected with intumescent paint and must be thoroughly prepared beforehand. There are no shortcuts; if the steel surfaces are not prepared to the required Sa2.5 level (under ISO 8501-1:1988 – *Preparation of steel substrates before application of paints and related products*) the paint manufacturers will not guarantee the performance of their product.

LDD brought in blast-cleaning specialist VariBlast to remove cementitious coating remnants and mill scale from the steel structures, blast-cleaning 21,000 sq m of internal structural steelwork to a surface preparation level of Sa2.5.

"Our first thought is the logistics: moving specialist equipment, materials and waste safely, possibly in a building that was partly occupied," explains VariBlast managing director Warren Farrow. "At 25 North Colonnade, we needed 80 tonnes of grit, which arrived on pallets at basement level, then had be transported through the building to the blast floor. Once used, the grit had to be swept up, and then collected and removed from site in skips."

Containing and controlling dust is a necessary part of the work.

"Operatives are protected by supplying filtered air directly into their blast helmets, maintaining positive air pressure to ensure that dust cannot get through," says Farrow. "This, together with disposable FFP3 masks, ensures even the finest particles are captured.

"We also have to protect others in the building. The area where we are working must be completely contained, which is best achieved by working solely on one floor of a building and denying access to other trades until our works are complete."

"At 25 North Colonnade, we needed 80 tonnes of grit, which arrived on pallets at basement level, then had to be transported through the building to the blast floor"
Warren Farrow, VariBlast

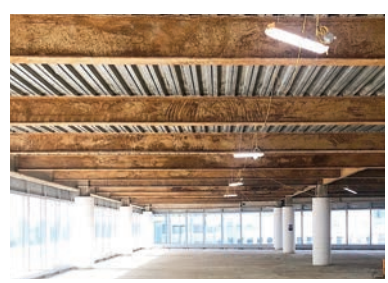
Compressors tend to be noisy and as big as a medium-sized van, so they have to be sited on the ground floor or basement levels.

"Then, one-inch airlines are installed through dry risers to the floor we are working upon," explains Farrow. "Usually, the compressors operate at 600 cfm, 170 psi – anything smaller would not be powerful enough when working throughout a multi-storey building."

The timeframe for completion varies, depending how the steel was previously treated.

"If it is bare steel (typically found in older buildings), a single operative can blast-clean around 100 to 150 sq m a day to an Sa2.5 standard, when removing a coating of oxidisation caused by exposure to humidity over time," Farrow says. "But if the steel is coated with a primer and topcoat or even a previous 'out of specification' fire protective coating, that slows the timeframe down to 40 or 50 sq m per blasting operative."

Variblast finished its work in late 2019, with coatings applied shortly after. Final decoration and the general fit out are still ongoing.



IN PICTURES: SIX INNOVATIVE USES OF CONSTRUCTIONAL STEELWORK

CM LOOKS AT SOME INVENTIVE APPLICATIONS FOR STRUCTURAL STEEL, FROM A NEW WHARF FOR THE BRITISH ANTARCTIC SURVEY TO A STATE-OF-THE-ART TRAINING GROUND FOR A PREMIER LEAGUE FOOTBALL CLUB

▶ Steel erection in extreme conditions

The steel-framed wharf of the new Rothera Research Station in Antarctica was completed late last year. Four-Tees Engineers fabricated 1,000 tonnes of steel in the UK, before shipping it nearly 9,000 miles for assembly on one of the most inhospitable construction sites on earth. BAM Nuttall is main contractor for the British Antarctic Survey project.

▲ Powering ahead at Battersea

Phase two of the redevelopment of south London's iconic former power station includes restoration of the original Grade II-listed building and the addition of shops, restaurants, offices and apartments. William Hare is installing some 24,000 tonnes of steelwork – connected into the existing structure in places – working with construction manager Mace.

▲ Scoring with steel at Leicester

McLaren Construction recently completed one of the largest football training centres in the UK for Premier League club Leicester City. The signature building, with a steel-framed structure erected by fabricator BHC, houses a full-size football pitch. Some 1,700 tonnes of steelwork were used for the project.

▼ Steel's tight squeeze in Hackney

The Britannia Leisure Centre and adjoining City of London Academy are being delivered by Morgan Sindall on a tight site in Hackney. An efficient structural design has maximised space on the limited footprint bordering Shoreditch Park, with some 2,200 tonnes of steelwork erected for both buildings by fabricator Severfield.

ALL PROJECT DETAILS AND PHOTOS SUPPLIED BY NEW STEEL CONSTRUCTION

▼ First-class delivery at Lord's

Part of Marylebone Cricket Club's ongoing masterplan to redevelop the historic Lord's Cricket Ground, two steel-framed stands are currently under construction. The new Compton and Edrich stands are both three-tier structures which will accommodate 11,600 spectators. Severfield is providing 2,300 tonnes of steel, working with main contractor ISG.

▲ Super spans at distribution hub

A major distribution centre for retailer Co-op in Biggleswade, Bedfordshire, features a steel portal structural design with spans of 36m and a maximum height of 15m. Caunton Engineering, working with main contractor Winvic, erected 2.5 tonnes of steel for the 61,409 sq m facility, while separate recycling and maintenance buildings have 28m-wide and 26m-wide spans respectively.

BIM & Digital

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CAN STEEL STAY AHEAD IN THE DIGITAL RACE?

SEVERFIELD'S KEVIN CAMPBELL IS TRYING TO REFOCUS THE STRUCTURAL STEEL SECTOR'S DIGITAL STRATEGY, AS HE EXPLAINS TO **CM**

Steel has a relaunched digital technology group. Tell us more.
The steel sector's position was 'we've been doing BIM for years, waiting for the rest of the world to catch up', but of course the world does catch up.

The British Constructional Steelwork Association (BCSA) doesn't want the sector to fall behind. So we renamed the old Tekla users' group to digital technology group. As well as Tekla updates, we look at the wider potential for digital technologies, whether in a factory, on site or in the office: cloud point scanning, HoloLens, integration into other software packages.

Steel is in a good position. But we're not sure of what's coming next within BIM – what digital assets of a building will look like, for example.

Is product data being commonly used by steel fabricators?
When we create a 3D model of a steel building in Tekla, we fully detail it and generate loads of information for ordering steel, exporting into manufacturing and management software packages. And, of course, the production process and the erection process generate information in terms of material test certificates, welder approvals, paint records and so on.

Tekla's view is this is not all going to fit in the model; you can't export that to an IFC and back into Revit because it's a potentially massive amount of data and a model is not created as a data warehouse.

So, there's work to be done if we want to be able to create a data pool for a structure where you could open a package, interrogate a model and click on a piece of steel to see its life history.

But what does the end-user, the client want? Would anybody ever use that level of information? Depending on the contract and the project and the purpose of the structure – if it's an oil refinery or processing plant – then working to the actual laid-down specification can be onerous. But in reality, on most projects, does the client check? No.

"We estimate you could only use robotics for 40% of work; the rest has to be fabricated conventionally"
Kevin Campbell, Severfield

Is there a place for robotics in steel fabrication?
Robotic assembly is great if you're manufacturing something small. But the steel beams we handle could be 20m long and weigh 10 tonnes, so handling the material is a challenge.

We looked at the application of robotics at Severfield and whether it was viable. We felt the technology wasn't quite ready. While the [robotic assembly] systems are quite flexible, there are only certain types of products you can give them. We estimated you could only use robotics for 40% of work; the rest has to be fabricated or welded on conventional lines.

What other digital tech is steel looking at?
Our challenge is making tech like barcoding [of steel products] and HoloLens mixed reality link with our production systems and Tekla.

We'd like to be able to put on a HoloLens in the factory, call up a virtual 3D image of a part, look at the actual piece of steel in front of us, superimpose one over the other, and then check it. We found the resolution and different aspects of it weren't quite good enough for that particular application.

So it has a limited application currently, but the ability to show images of a structure anywhere in the world can't be ignored.

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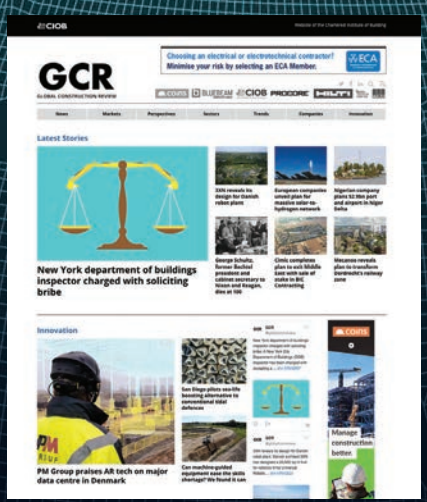

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Partnership

‘WE ALL NEED TO START TO THINK DIFFERENTLY’

ANNETTE BORÉN IS NOT JUST HEAD OF FINANCE IN NORTHERN EUROPE FOR TOOL MANUFACTURER HILTI, BUT ALSO IN CHARGE OF ITS SUSTAINABILITY STRATEGY IN THE REGION. SHE TELLS **CM** HOW THINKING HOLISTICALLY ABOUT THE TOOLS CONSTRUCTION COMPANIES USE CAN BOOST HEALTH AND SAFETY, REDUCE THE IMPACT ON THE ENVIRONMENT AND SWELL THE BOTTOM LINE – ALL AT THE SAME TIME

It’s not surprising that, as head of finance for Hilti in Northern Europe, Annette Borén has a head for numbers.

But Borén isn’t just interested in the pure financials – she is keen to show companies how they can improve their bottom line at the same time as safeguarding workers and reducing environmental impact through the use of high-quality, efficient and safe tools.

She explains: “Hilti is about cutting-edge technology. We constantly try to innovate ground-breaking products for the construction industry because we want to help with productivity but also with health and safety. Jobs that are done quicker, with healthier workers, help the bottom line. At the end of the day, that is great for all of us who work in finance.”

Borén adds that lighter, longer-lasting tools are not only easier to use but also have a positive impact on the environment. She points to Hilti’s handheld petrol saws. Traditionally one tool and one insert is required for 14-inch depths, and a second tool and a second insert for 12-inch depths. But Hilti’s petrol saws have a 12-inch blade that can cut to the depth of a 14-inch blade.

“Having a 12-inch blade that cuts as deep as a 14-inch blade is really great for the environment,” she says. “You need one tool, one insert and it’s great for the finance people because you don’t have to buy two blades and two petrol saws. The petrol saw is smaller, more compact and less heavy [than other tools on the market], which means it contains less material. You can connect it to water, without the need for a pressurised water cylinder, or a vacuum so it reduces the silica dust where the worker is operating. So it also helps the customer because they have a healthy, happy worker.”

“Jobs that are done quicker, with healthier workers, help the bottom line”
Annette Borén, Hilti

Changing attitudes

Borén admits that it can sometimes prove a challenge to convince firms to pay more up front for a higher-quality tool. But she urges businesses to look beyond the upfront cost.

“I think we all need to start to think differently,” she says. “At the end of the day, if the tool costs slightly more but it helps to protect the worker and increases productivity because it works faster and also means that you don’t have to replace someone because they have gone off sick, that is a significant

Top: Annette Borén, head of finance for Hilti in Northern Europe

Right: Hilti’s Jaibot removes the tough work of repetitive overhead drilling from humans

In partnership with Hilti

Diamond coring is an alternative method to traditional breaking

advantage. Isn't it a given that we want workers to work in a healthy environment and to be protected?

"By the time they display symptoms from conditions like lung disease, hand-arm vibration syndrome (HAVS) and musculoskeletal injuries, it's too late. It takes years and years to build up those injuries. We need to think more strategically and long-term to protect people, and also from an environmental perspective."

She also points out that companies could save significant money in the long run if they use tools that protect workers from long-term health conditions: "There is a wave of litigation coming to compensate people impacted by these conditions. But by using the latest innovation and technology we can reduce this.

"We already have alternative methods for protecting people from dust and silica, such as shot firing and diamond coring, which operate alongside the best possible systems for completing tasks traditionally where there is no alternative, such as drilling or breaking. We don't need to stick to the way we have always done things. It is important to create awareness and talk about it."

"We take a holistic approach and develop a full system," she explains. "When we develop a tool, we don't think about just one thing such as HAVS, we think end-to-end about the full impact the tool will have for people, on the environment and on productivity."

Annette Borén CV

- **2013-present** Head of finance and sustainability, Northern Europe, Hilti, based in Manchester
- **2012-2014** Non-executive board member of Swedish bank Sparbanken Öresund
- **2008-2013** Vice-president and chief financial officer of telecoms company Doro
- **2005-2008** Finance director of Länsförsäkringar Skåne
- **2001-2004** Regional manager/ sales director of financial firm Skandia
- **1996-2001** Financial controller, Atlas Copco

When it comes to cost, Hilti also has another solution which can help companies to see the benefits of tools without having to commit to investing in them – particularly important when it comes to a more costly diamond coring tools or the handheld petrol saw.

"Our tools might in some cases be more expensive and we have very specific tools for specific tasks but you can hire them with our tool hire partners across the country, try it and think about whether or not you want to invest. Or you can just hire it for a very specific job. So I think we open the market up to everyone. It is not just the bigger customers who can afford to invest in a tool portfolio."

Productivity amid the pandemic

Borén is keen to highlight how Hilti tools can boost productivity – a crucial consideration when sites need to maintain social distancing.

Hilti fastening tools allow for shot-firing rather than conventional drilling, which she argues can be more productive for some tasks, as well as cutting down on dust. Meanwhile, using diamond core drills instead of breakers also creates far less dust and requires fewer workers to clean up.

"The difference in productivity between using a breaker all day long or using a diamond corer that does the cutting is tremendous," she says.

"Solutions like lasers and direct fastening mean you can work quickly and efficiently, which is key to reducing contact between workers. Social distancing on jobs like aligning objects such as cladding, ceilings and dry lining is a struggle but with Hilti's tools you can overcome these problems easily."

Coming back to the theme of Hilti's holistic approach, she concludes: "It benefits everyone: it benefits the worker, it benefits people like me who oversee the P&L, and it helps our customers to get the job done quicker."

Robots and exoskeletons

Two Hilti innovations are taking construction into a new future

Hilti's new Jaibot is a robot that can take on the repetitive work of overhead drilling from humans.

Using BIM and digital planning as a base, the semi-autonomous machine has been designed for mechanical, electrical and plumbing (MEP) work.

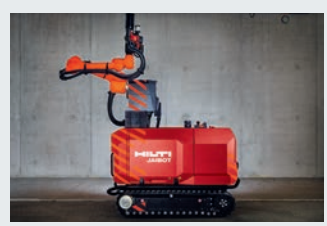
The cordless system can work for up to eight hours between charges and has a built-in dust removal and marking system. It marks and drills holes according to a digital plan, leaving workers to simply operate the robot.

To operate it, data from AutoCAD or Revit can be uploaded to the Hilti cloud, with the site laid out using Hilti's total station PLT 300. Hilti says the machine, which is capable of drilling thousands of holes to a preset depth and diameter, can reduce the risk of human error and complete projects faster.

The Hilti EXO-O1 human augmentation device was launched last summer. The wearable exoskeleton aims to tackle health and safety as well as labour shortage challenges.

The device is focused on reducing the strain caused by working overhead and at shoulder height and above. It contains no motors or batteries but transfers the weight of a worker's arms to their hips via arm supports using mechanical cable pulling technology.

Developed with orthotics expert Ottobock, it is claimed that it can reduce peak load on the muscles and relieve the shoulders by up to 47%.



True innovation takes a holistic approach to demanding tasks

Global

CAN BIDEN PLUG THE LEAKS IN US INFRASTRUCTURE?

THE NEW PRESIDENT HAS A MAJOR JOB ON HIS HANDS TO OVERHAUL AMERICA'S CREAKING DAMS, ROADS AND RAILWAYS, WRITES **ROD SWEET**

The US is paying only about half its bill for adequate infrastructure, with dams, schools, roads, airports and transit systems all getting 'Ds' in the latest quadrennial infrastructure 'Report Card' issued by the American Society of Civil Engineers (ASCE).

Releasing the report on 3 March, ASCE warned that the total investment gap has gone from $2.1tn (£1.51tn) over 10 years to nearly $2.59tn (£1.87tn), and that a failure to close it would cost $10tn (£7.21tn) in lost GDP and three million jobs by 2039.

"When we fail to invest in our infrastructure, we pay the price," ASCE said. "Poor roads and airports mean travel times increase. An ageing electric grid and inadequate water distribution make utilities unreliable. Problems like these translate into higher costs for businesses to manufacture and distribute goods and provide services. These higher costs, in turn, get passed along to workers and families."

The warning came as a sub-committee of the US House Committee on Oversight and Reform launched an investigation on 3 March into the operator of Texas' power grid, the Electric Reliability Council of Texas (ERCOT), for its part in leaving millions of Texans without electricity during the February storm that left dozens dead. It demanded documents relating to ERCOT's preparations for extreme weather events going back to 2010.

ASCE defines a D grade as one up from F, which means unfit for purpose, with assets being "in fair to poor condition and mostly below standard, with many elements approaching the end of their service life".

"A large portion of the system exhibits significant deterioration," it says. "Condition and capacity are of serious concern with strong risk of failure."

There is some good news. For the first time in 20 years, US infrastructure's grade point average hit C-, up from a D+ in the last report in 2017, helped by a B in rail and slight improvements in aviation, drinking water, energy, inland waterways and ports.

But bridges went down, slipping to a C, while stormwater, graded for the first time, received a "disappointing D". Overall, 11 of 17 categories were stuck in the D range, which ASCE said was "a clear signal that our overdue bill on infrastructure is a long way from being paid off".

"The number of high-hazard-potential dams has more than doubled in the past two decades as development encroaches on once-remote structures"

One of the most pronounced funding gaps concerns the country's 91,000 dams, of which the number of high-hazard-potential dams has more than doubled in the past two decades as development encroaches on once-remote structures. ASCE cited the Association of State Dam Safety Officials' estimation that the number of deficient high-hazard-potential dams now exceeds 2,300. ASCE said $93.6bn (£67.5bn) needed to be spent on dams this decade, while just $12.5bn (£9bn) had been earmarked for the period.

Flooded intersection in Austin, Texas during the thaw following the February 2021 snowstorm

JNO.SKINNER

Number of American bridges considered structurally deficient **46,154**

Schools represent the second biggest infrastructure expenditure after highways, and yet the data indicates that 53% of public school districts report the need to update or replace multiple building systems, including HVAC systems. More than a third of public schools have portable buildings due to capacity constraints, with 45% of these portable buildings in poor or fair condition. Meanwhile, as a share of the economy, state capital funding for schools was down 31% in fiscal year 2017 compared to 2008.

ASCE says schools need $870bn (£624.7bn) this decade but are set to receive $490bn (£353.5bn).

Structurally deficient

Of America's more than 617,000 bridges, 42% are at least 50 years old, and 46,154 of them are considered structurally deficient. Across these structurally deficient bridges, 178 million trips are taken every day. ASCE notes a recent estimate of the national backlog of bridge repair was $125bn (£90bn), and that this work would not be complete until 2071 at the current rate of investment.

Spending on bridge rehabilitation should rise 58% a year, to prevent "overwhelming" deterioration, ASCE says.

Roads got a D, with ASCE saying that more than 40% of the network is now in poor or mediocre condition. "Federal, state, and local governments will need to prioritise strategic investments dedicated to improving and preserving roadway conditions that increase public safety on the system we have in place, as well as plan for the roadways of the future, which will need to account for connected and autonomous vehicles," ASCE said.

US infrastructure report card issued by the American Society of Civil Engineers, March 2021

'I'm drawn to talent'

Engineer Dr Hamza Momade helped organise a project management competition in Ontario, Canada, for students struggling to showcase their talent during the pandemic. **Rod Sweet** spoke to him

Dr Hamza Momade MCIOB is a project manager for Canadian residential developer Averton

Tell us about your background.

I'm from Mozambique. It was a challenge growing up because we didn't have schools or reliable electricity, so I studied in the kitchen from sunrise to sunset. When I and four others sat the GCSE exams, we were the first to do so in the country.

I was the only one of that group to pass university entrance exams and I did my bachelor's degree in Civil Engineering at the University of East London. I landed my first job with a CIOB Chartered Company and became a chartered member.

I completed my master's in Civil Engineering and PhD from Universiti Teknologi Malaysia, and I've been involved in design and construction management of warehouses, commercial and residential spaces in Malaysia, Singapore and now Canada.

What led you to set up the Ontario Project Management Competition?

Before the pandemic there were many networking events that allowed students to showcase their talent. But with face-to-face events cancelled, it has been tough creating good rapport virtually. Poor mental health is on the rise as graduates struggle with student loans. Canada also has a large influx of foreign skilled workers competing for the entry level jobs, so it all mounts up.

How does the competition work, and what has the response been like?

It has been taking place for six years in Vancouver and we adopted the idea for Ontario with help from the Project Management Institute (Toronto) and Wideman Education Foundation.

Teams of three to five students present a project that supports the UN Sustainable Development Goals. Their idea has to be costed and scheduled and must follow all the principles of project management. They speak for 15 minutes, and then take questions for 15 minutes from the judges, who are professional project managers.

The response was great. Twenty-four teams from colleges and universities around the province submitted projects, and 12 were selected as finalists on 20 February. The finals took place on 27 March. Employers liked the idea, too. Nine showed an interest in sponsoring the competition, and we picked four. The lead sponsor is one of Ontario's biggest developers.

And what do you get from it?

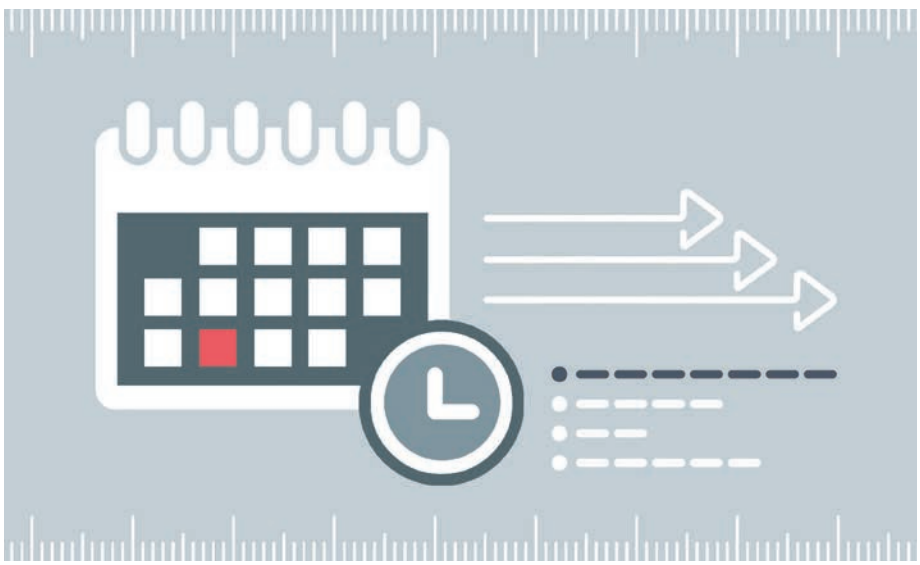
I'm drawn to talent. I wanted to help spotlight the talent that's there under the surface of the industry, which it needs to improve productivity and innovation. I believe construction is not just about building, but also building lasting relationships.

Legal

Manoj Bahl
FTI Consulting

A scalable tool for creating effective programmes

THE NEW CIOB PLANNING PROTOCOL 2021 AIMS TO REMOVE THE SUBJECTIVITY THAT OFTEN EXISTS WHEN ASSESSING SUITABILITY OF A PROJECT PROGRAMME, EXPLAINS **MANOJ BAHL**



The new CIOB Planning Protocol 2021 aims to help planners create robust schedules and mitigate risk. Previously known as the CIOB Programming Protocol, this is the institute's latest initiative to drive forward the successful delivery of projects in the industry and it is a powerful one.

Experience shows that the production of a programme by a contractor is often flawed from the outset of a project – due to time pressures, unknowns and a lack of due diligence – and often only a limited review of the programme is undertaken by an employer. This often results in inadequately produced programmes being adopted by a project team.

This can make it difficult, if not impossible, to understand the forecast completion date, progress, the planned or as-built critical paths, the impact of change, or the liability for any delays. This adversely affects all stakeholders.

"The 'pass/fail' nature of the protocol should make it easy for parties to understand what is required of the construction programme"

So, creating best practice guidelines for use in the production and verification of a construction programme would clearly be of huge benefit to all those involved in the life of a project, and resolving disputes afterwards.

For the tool to be relevant to all the stakeholders, broad planning expertise and input was required. Paul Taylor, from Mace's planning team, and Keith McCall, from the Arup project management team, joined me to provide their extensive experience.

Between us, we identified the key elements which a programme ought to comply with (stress tests), and guidelines (thresholds) which could be universally adopted by project teams to produce or verify a programme to assist in the management and timely delivery of a project.

From a practical perspective, the 'pass/fail' nature of the protocol should make it easy for parties to understand what is required of the construction programme, removing the subjectivity that often exists when assessing suitability.

The result of this work is a tool, specific to the UK industry but intended for use internationally, which is being used by contractors, project managers and clients to assist in the preparation of high-quality programmes. It also ensures that a reliable programme is available to help resolve time-related disputes, and has been used as the starting point for a number of delay analyses.

Manoj Bahl is senior managing director in the construction solutions team at FTI Consulting. The CIOB Planning Protocol 2021 is available to download free from www.ciobacademy.org/product/ciob-planning-protocol-2021-ciob-pp21.

Richard Ormerod
Elecosoft

Using software to mitigate programme risk

RICHARD ORMEROD EXPLAINS HOW THE CIOB PLANNING PROTOCOL 2021 CAN BE USED WITH SOFTWARE TO IDENTIFY HOW WELL A PROJECT HAS BEEN PLANNED

Creating a detailed and accurate plan is crucial to the successful completion of construction projects. Working with a good software tool is a key component but the skill and attention to detail of the planner is a critical factor to the quality of the plan.

The CIOB Planning Protocol 2021 (PP21) provides a way to check and benchmark the quality of a plan by comparing it against a recognised set of standards. Previously, only a US standard and internal company protocols were available.

Elecosoft has integrated PP21 within its Powerproject software since May 2020 and its schedule quality check (SQC) is widely in use. Planners can use this tool to check if their plan complies with the standards of the protocol. An SQC can be built in Powerproject as a combination of tests from a choice of 29 recognised industry metrics, and individual thresholds can be set. When the SQC is executed, an overall score is available and a detailed report is produced, which gives a value to rank the robustness of the plan as red, amber or green plus numeric scoring.

For example, a 'Link Logic' metric is included which checks that tasks have at least one incoming and one outgoing link – except the start and end tasks. For PP21, all tasks must pass this test. If unlinked tasks exist in the schedule they will not respond to changes or progress updates, so it is considered a failed test.

Also, a 'long durations' metric checks whether tasks exceed a desired maximum. If tasks are too long, they do not have enough detail to be monitored during the work and their state of progress is hard to assess. This is considered poor planning practice. For PP21, 100% of tasks must be less than 44 working days (approximately two working months).

Variations and breaches

PP21 is a guide to good practice and under the circumstances of a particular project the results may vary and breach some aspect of a metric. This is acceptable as long as the situation can be adequately explained to the satisfaction of all parties to a contract.

For example, the project may be over five years long and some of the later project scope is less certain so some tasks might exceed the desired maximum duration allowed under PP21.

In the Powerproject SQC, a pass or fail boundary can be set so that warnings are raised as well as failure highlighted. The metric passes if 100% of tasks are less than 44 working days, but only fails if 5% are greater than 44 working days.

"A schedule quality check can be built in Powerproject as a combination of tests from a choice of 29 recognised industry metrics"

If a metric fails it is highlighted and can be queried to see all the tasks which contribute to the failure – very useful in detecting and resolving issues and not just knowing that a problem exists.

An SQC can be saved in a library of checks, copied between projects and exported to help the propagation of standard tests.

Tony Lonergan, head of planning at Canary Wharf Contractors, has been using this tool for several months now and has used the protocol successfully for formulating and publishing guidelines for a robust project programme.

"A technically compliant programme that captures the core principles of good planning practice is fundamental in creating a document that can be trusted and relied on by the whole team," he says.

"As a business, we place time management at the centre of good delivery. We always seek to implement the principles set out in the protocol. As it is included within project planning software such as Powerproject, this new tool and guidance allows us to automatically run these checks on any new project programmes."

Through its capability to check plans against recognised standards, the CIOB Planning Protocol 2021 will help measure and improve the quality of construction plans and mitigate risk, bringing increased confidence to clients and contractors at a time when that is increasingly important. ●

Richard Ormerod is construction sector manager at Elecosoft, the developer of the Powerproject project planning software. He has been involved in the production of the CIOB Planning Protocol 2021.

Careers

What's it like working at...
BAM Construct UK

Culture club

LOOKING AFTER EMPLOYEES IS A BUSINESS STRATEGY NOT AN HR ONE AT BAM. HR DIRECTOR ANDREA SINGH TALKS TO **CM**

What is your USP as an employer?
Our people are our product. It is important to look after our people because they are who deliver to clients. Our research shows us that our clients praise us for our people.

Our culture is that people care about the business and each other. We involve people in our business, so they have a connection to what we are doing.

How do you look after staff wellbeing?
As with everything, we take the approach that wellbeing is not an HR issue but a business one. It works bottom up and top down.

We have a mental health steering group made up of people from across the business at all levels. It exists to challenge the stigma, to raise awareness, to deliver toolbox talks and run awareness days. We also explore issues with physical space – on site and in the office – looking at issues such as green spaces and light.

For mental health we support our managers so they can support their teams. We offer mind fitness training, guides for managers, have pledged to the Time To Change campaign as well as committed to the Building Mental Health Charter. We have 100 mental health first aiders and 140 wellbeing champions.

How do you enable staff to manage the work/life balance?
Covid has fast-tracked employers many years into new ways of working. In 2019 we were trialling new ways of working on one of our sites. But in a future, post-covid world there will be a blended approach. It's now about genuine flexibility; it can be a mix of working from home and on site/in the office. It will vary across roles but will be considered for all at BAM.

What are you doing to boost diversity?
Again it's about culture not initiatives. We have a diversity group and we have employee resource groups (ERGs) on gender, BAME, LGBTQ+ and carers. They comprise 30 people from all levels of seniority. They showcase materials, case studies, educate and write blogs, among other things. I work with the ERGs to make sure that we assess the D&I (diversity and inclusion) impact of anything we do.

We are planning a year of action including WISE membership, involvement with Stonewall, signing up to the Business in Community Race charter and working with other external organisations.

In BAM Construct 35% are women (55% in BAM FM) but among our new joiners we saw an increase of over 40% in female staff, so we are seeing the benefits of work we've done, such as using gender neutral language for recruitment ads.

It's all about working with the right partners. Since choosing Leeds College of Building as a training provider four years ago, BAM has significantly increased the number of female apprentices enrolled on its Level 4 programme from 20% to nearly 30%, compared to just one in eight (12.5%) construction workers nationally.

The apprenticeship programme is also five times more ethnically diverse than recorded in the construction sector. BAME representation stands at 35% compared to less than 6% of construction workers nationally. The inspiring diversity of staff in the Leeds College of Building lecturing team is a significant benefit to the apprenticeship programme.

Data is key. We make sure we have a baseline and measure against it so that we can measure progress and keep accountable.

"Our culture is that people care about the business and each other. We involve people in our business, so they have a connection to what we are doing"

TREVOR PALIN

Singh: "BAME apprentice representation stands at 35%"

Job spotlight
Tom Flemons
Stonemason and manager of Cliveden Conservation's Bath workshop

Art and craft

NO TWO WORKING DAYS ARE THE SAME IN A CONSERVATION WORKSHOP

RALPH HODGSON

Tom Flemons is a recent recipient of the SPAB Gwyn Watkins Award 2020 for his outstanding contribution to traditional building skills. He has over 30 years' experience in masonry, conservation, practice and management. He is also an advisor to the National Trust on stone and plaster.

What is a typical day in your role?
I manage a workshop for Cliveden Conservation in the West Country. For me, no two days are the same, so I don't really have a 'typical day'. Projects are very varied because Cliveden Conservation undertakes work with stone, plaster, terracotta and the decorative arts. Our portfolio varies in type and scale, requiring project management skills to oversee the conservation of buildings, with a similar skillset required for smaller-scale works to treasured objects and artefacts.

We are fortunate to work across the UK and occasionally abroad on many significant buildings; it is a real privilege to be involved in safeguarding our heritage.

Obviously you need expert knowledge to do what you do. How did you acquire your skills?
I initially undertook a three-year City and Guilds apprenticeship with a marble masonry company, attending Vauxhall College. I then moved on to study architectural stone conservation for a year at Weymouth College. After working for a few years as a mason/conservator I was privileged to be awarded a place on the William Morris Craft Fellowship run by the Society for the Protection of Ancient Buildings (SPAB). I have spent over 30 years in the field and find that you learn something every day; from colleagues, fellow professionals or from the buildings and objects we work with.

You won the 2020 Gwyn Watkins award in part for encouraging craftspeople. What can the industry do to keep these skills?
Training is vital in our industry and the more support given to colleges the better. In my field there are less and less institutions offering apprentice training in stonemasonry. On large-scale projects, training can be a prerequisite part of the tender process, which is a good start but there is insufficient trickle down.

My role at Cliveden Conservation involves practical training to help organisations such as the National Trust and English Heritage develop and nurture skills. We are also developing CPDs to share best practice.

We need to enthuse schoolchildren and demonstrate the variety of roles out there, the job satisfaction to be found and the fact that a university education is not the only route into the world of work. ●

Apprentices can build a safer future

The apprenticeship levy can help the industry train staff in building safety, says **Ashley Wheaton**

The construction industry is currently experiencing a very real lack of appropriately qualified staff, particularly in the important area of building safety. The good news is that the industry already holds part of the solution: its passionate and dedicated workers. A key message from the Hackitt report, written after the tragic event of Grenfell, was that these professionals working in building safety need appropriate qualifications to inform the work that they are doing.

University College of Estate Management (UCEM) gets to play its part in realising a safer built environment through education. Our academic team worked with a supportive employer base to create our BSc (Hons) in Building Control, Building Control Surveyor degree apprenticeship and Construction Site Management degree apprenticeship.

Employers now have the opportunity to lead the industry in the right direction by ensuring their staff are suitably qualified. I'm aware that the covid-19 pandemic continues to be disruptive, however, I would argue that it's an opportune time to be looking at the potential of your staff and investing in them, with many employees currently using this time to evaluate their career options.

With the apprenticeship levy in place, there is little room for the argument that educating staff is too expensive. Smaller businesses only need to pay 5% of the training costs for an apprenticeship programme, and larger ones can use their levy pot for 100% of training costs.

I also hope that the industry is fully aware by now that apprenticeships can be used as a means to train any employee, not just college leavers. I'm delighted that UCEM currently has 89 apprentices aged 40-60 studying with us, proving that it's never too late to learn.

Helping to ensure that our buildings are safe has never been more important. A key priority therefore, is to ensure that the people who are responsible for safety in our industry have the necessary training and qualifications needed so that they can play their part in providing the highest quality buildings for both current and future generations.

For further information about employing an apprentice visit: www.ucem.ac.uk.
Ashley Wheaton is a principal at University College of Estate Management.

CIOB Community

Certification

CIOB conservation scheme welcomes retrofit roles

Certification programme expands entry requirements to include the sector

The CIOB's Building Conservation Certification Scheme has expanded its entry requirements to certify individuals working within the retrofit sector.

It applies the same criteria as other similar certifications, but with energy-efficiency and sustainability, in recognition that climate change must play a part in everybody's role.

The CIOB scheme, which is suitable for individuals working on traditional or listed buildings, was launched in June 2017 in response to a growing demand for certified conservation specialists, providing individuals working on these buildings with a route to certification.

Top: Stonemasons and roofers at work on major roof repairs at Dyrham Park, a historic mansion in Gloucestershire

"Regardless of the role an individual has in retrofit, membership of a building conservation certification scheme will help to demonstrate competence"

The building conservation certification scheme accepts a far greater number of roles within industry than any other scheme.

Candidates must have some knowledge and experience of working on traditional buildings, although this does not need to be on buildings in conservation areas or listed buildings.

Those who do not hold specific conservation qualifications are required to undertake the CIOB's two-day Understanding Building Conservation course.

Regardless of the role an individual has in retrofit, membership of a building conservation certification scheme will help to demonstrate competence. ●

More information can be found at: https://www.ciob.org/Your-Career/ciob-building-conservation-certification-scheme. To find out if you are eligible or for more information, please contact Laura Stirling via lstirling@ciob.org.uk.

Heritage

Annual CIOB conservation conference returns

Sustainability will be focus for April virtual event

The CIOB has announced that its annual conservation conference is returning for 2021 on 21 April.

Titled Balancing Heritage and Sustainability, it will focus on sustainability in relation to heritage and traditional buildings and dealing with climate change.

High-profile speakers from different fields in the UK and the international stage will set out what is possible in terms of change for so-called 'hard to treat' buildings.

This virtual conference will engage the audience to explore not just what has been achieved but what needs to be done in future – and how to achieve these aims.

Themes explored will include best practice, retrofit standards, science and the latest research – as well as the unexpected consequences of inappropriate interventions to traditional buildings.

Speakers will come from organisations including Historic England and English Heritage.

The conference will run from 9-5.30pm and can be booked on the CIOB website.

Story for Community? Email Nicky Roger
nicky@atompublishing.co.uk

Sustainability

Member gears up for cargo-bike study

Structure Tone's Ryan Healey takes part in south London alternative deliveries trial

One CIOB member has been part of an exemplar trial in sustainability involving delivery.

Ryan Healey, a senior project manager at Structure Tone, took part in a collaboration involving TfL, Southwark Council, Mace and Sir Robert McAlpine to set up strategies to raise construction standards at the Bankside development cluster area.

One initiative investigated alternative deliveries. A two-week trial took place where all three constructors shared a loaned cargo bike for a variety of activities, such as collections from Dulux.

The bike was supplied by Raleigh and rider training by Pedal Me.

A full case study is planned once the trial has been completed.

NEW VICE CHAIR FOR LONDON NOVUS

Anjali Pindoria, project surveyor at Avi Contracts, has become the vice-chair of the CIOB London Novus Committee.

A renowned public speaker on EDI issues, Pindoria (pictured) was one of three guest editors of the special Women in Construction March issue of *Construction Manager*.

Left: A cargo bike crosses Southwark Bridge

E-learning

CIOB Academy partners up for asset training

Specialist e-learning

The CIOB Academy and Asset Wisdom have come together to form a partnership to spread asset management knowledge throughout the building and housing sectors.

Asset Wisdom offers specialist e-learning to build corporate and individual asset management knowledge. For the individual, this offers a professionally recognised career path in asset management. For corporates, it enables significant and sustainable business performance improvement by developing and embedding asset management competency and confidence to across the organisation.

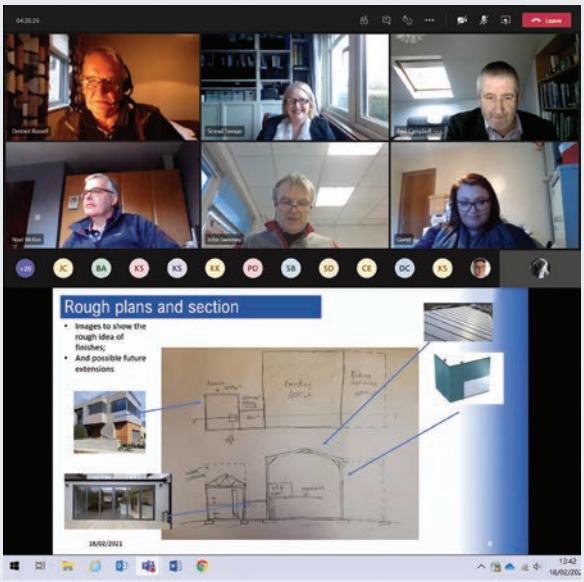
The academy offers two courses in asset management: the Asset Management Foundation Award and the Asset Management Certificate. The Foundation Award is an introduction to asset management, providing learners with understanding of basic theories and languages of asset management. The certificate is a 14-module course providing full coverage into the fast developing discipline of asset management.

Both courses are suitable for construction professionals looking to gain extensive knowledge of asset management to progress their career.

Adrian Montague, associate director of the CIOB Academy, said: "We believe there is a growing demand for asset management (AM) knowledge across the building and housing sectors. This is being driven, in part, to meet the major challenges post Grenfell, the government's net-zero decarbonisation targets and application of new technologies as well as the need for whole life, whole systems investment decisions.

"We are delighted to partner Asset Wisdom so that we can offer our membership proven AM e-learning that will offer individuals a new career pathway, add value to our corporate members' staff and business alike and start to address the challenges we face today and in the future."

For more information, email: amontague@ciob.org.uk.



Judges at the virtual event inspect the students' work

Competition

Students impress in Ireland challenge

Munster takes home the top prize in first online student event

Munster Technological University is this year's winner of the CIOB Student Challenge Ireland.

The team, which comprised Shane Brown, Stephen Donovan, PJ Duggan, and Conor Evans, supported by their lecturer, Joe Kehoe FCIOB, won the first-ever virtual Student Challenge Ireland, beating teams from six other third-level institutes around the country. Second place was taken by Limerick Institute of Technology and Letterkenny IT came third.

Donovan said: "We all worked well as a team – each bringing their own knowledge and skillset to each task asked of us."

The task required the teams to consider a project comprising a warehouse and administrative building. They had to produce a report and presentation which looked at the procurement, risks and programme.

Each team had 10 minutes to present their work, followed by five minutes of questions from the judges. The top three teams were then asked identical questions, based on the task itself and also on an industry topic.

The winners were announced by CIOB president Mark Beard, who spoke of young people being the future of the industry.

He talked about the 2030 Vision Project, which he launched, that ensures CIOB "stays at the vanguard of construction in a future that reflects the global needs of the next wave of talent and younger members".

Sinead Savage, one of the judges, commented: "This was a very different event to previous years and posed new online challenges for everyone involved."

The event was sponsored by CIF, Ardmac and Mitchell McDermott.

Event

Virtual Irish roadshow tackles the big issues

Dublin and Belfast get together for week of talks and webinars

Dublin & Belfast hubs ran their first virtual roadshow recently, with a week-long programme of daily webinars and presentations.

Caroline Gumble, CEO of CIOB, opened the roadshow, while Amy Gough, CIOB director of membership, talked about brand changes.

A roundtable discussion, led by Mark Devenport, former BBCNI political editor, saw trustees Ivan McCarthy and Noel McKee, Belfast Hub chair Roger Gillespie and Dublin Hub chair Derek Cassidy discuss a variety of issues including Brexit, attracting young people to the industry and the resilience of construction.

Other highlights of the week included training talks from Adrian Montague from the CIOB Academy and Barry Neilson, MD of CITB NI.

The roadshow closed with a talk from CIOB president Mark Beard and a networking session where members were randomly matched and had their 'elevator pitch' at the ready.

The roadshow was supported by Tughans.

CMYA

CIOB starts search for rising talent

Deadline for Rising Star Award entries is 18 June

The CIOB has opened applications for a second year for its international CIOB Rising Star Award.

The category is for those who have been in the industry for seven years or less and demonstrated excellence in their work, the industry and among their peers.

The award is presented at the Construction Manager of the Year Awards (CMYA). This year CMYA plans to be back at London's JW Marriott Grosvenor House Hotel on 29 September to celebrate the finalists and winners.

CIOB chief executive Caroline Gumble said: "It's so important to recognise new and emerging talent, especially at a time when our industry is facing a skills shortage, and I'm very much looking forward to seeing who makes the shortlist this year."

This award is free to enter and open to members and non-members. Judges will look for evidence of contribution within the last 12 months, and your employer must nominate you. The closing date is 18 June.

For more information, visit www.cmya.co.uk/rising-star-award.

Training

Greendale Construction strengthens apprenticeship programme

Poole-based Chartered Building Company invests in construction talent

Chartered Builder Greendale Construction has taken on two new first-year apprentices.

The new recruits join the Poole firm's second- and third-year apprentices, strengthening Greendale's commitment to training.

Jacob Barton, 19, joins the award-winning company as a first-year electrical apprentice. He will be studying at Bournemouth & Poole College for his Level 3 electrical installation/maintenance apprenticeship, while working closely with Greendale's electrical manager and gaining site experience,

Samuel Wright, 17, the second new apprentice, joined straight from St Aldhelm's Academy after previously spending two weeks' work experience with Greendale in 2019.

Wright will be studying towards his three-year NVQ Level 3 in site carpentry, mentored by one of Greendale's senior site carpenters.

Maria Seabright, the firm's finance/HR director, said: "Training for the future of the construction industry and offering young people the opportunity to specialise in a trade which will set them up with a career for life has always been a priority for Greendale.

"And never more so than during this time when many companies have been forced to put their apprenticeship programmes on hold due to the covid-19 pandemic.

SPECIALIST BECOMES CBC

Dorset-based firm Rebuild Cost Assessment has achieved Chartered Building Consultancy status.

Through its online portal, www.rebuildcostassessment.com, the firm has helped around 40,000 residential and commercial insurers avoid being underinsured.

Director Will Molland said: "We're delighted to have been accepted as a CIOB Chartered Building Consultancy.

"This will help us demonstrate to our clients our competence and professionalism in assessing rebuild costs."

Committees

Yorkshire Novus groups keep up the momentum

Leeds and Sheffield aim to build on past successes

The Novus group in the Yorkshire region continues to enjoy growth.

Jake Morrish stepped down after four years as chair of the Leeds Novus committee. Sam Dibaj, chair of Leeds Hub committee, called him a real asset to the group and said the growth of Leeds Novus was a testament to his hard work and enthusiasm.

Jordan Reid has taken over as chair, with Hamish Minshull as vice-chair. Reid and Minshull are looking to keep the momentum going – attracting new members and delivering a stimulating calendar of CPD events.

Sheffield Novus has gone from strength to strength and will announce its committee soon.

Left: Jordan Reid, the new chair of the Leeds Novus committee

Lianne Lawson

Meet a member

Lianne Lawson, construction manager, Willmott Dixon

Why construction? I became really interested in the industry as my older brother completed his architecture degree and I was finishing my A-Levels. I looked at his coursework and thought how amazing it would be if I could turn that drawing into reality. And I wanted a job that wouldn't be the same every day.

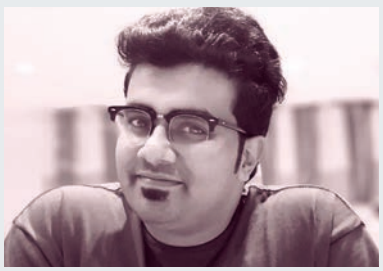
I studied BSc Construction Management at university, and became a site engineer, which led to project management. I've worked on some terrific buildings, such as a manufacturing research facility for AMRC at the University of Sheffield. I was then given my own project to deliver, the international pathways centre for the University of York, where I was nominated for the Construction Manager of the Year Awards – a real honour.

What achievement in your career has given you most satisfaction? As we entered our first lockdown in March 2020, I was leading a team delivering the £21.6m Dixons Trinity Chapeltown Academy project in Leeds. Knowing 980 essential school places were needed for the 2020/21 academic year, failure to complete would create enormous problems.

We innovated, used technology and problem-solved to embed the Construction Leadership Council's Site Operating Procedures, keeping the site open and productive. Our works completed just two weeks later than scheduled. However, as we were eight weeks ahead of schedule when the pandemic hit we were able to hand over ahead of the customer deadline.

Our customer had submitted my team for a Department for Education (DfE) award for 'Going Above & Beyond in Covid-19', which we won!

How would you like to see the construction industry change? We have already made huge progress, with a real desire to become a truly diverse and inclusive industry. I think the next decade will see construction become a leading industry on diversity, along with sustainable development and the use of digitalisation.

Clockwise from top left: Lin Qi; Don Sibe; Rachael Keeble; Joshua Waterman

2030

Young professionals shape the future of CIOB

Steering group of CIOB's 2030 Visionary Project is set to announce further plans soon

In June 2020 CIOB president Mark Beard announced the launch of the CIOB 2030 Visionary Project.

The initiative aims to set up a global vision for the CIOB based on industry best practice and where the built environment should develop over the next decade, analysing emerging trends and implementing new technologies.

Consultations with members began last summer and the 2030 Visionary Steering Group led by Rachael Keeble, a senior project manager at 3PM, will announce plans soon.

Also involved are: Lin Qi, assistant project manager at LM JV (Laing O'Rourke and Murphy Group Joint Venture) and chair of Birmingham Novus; Don Sibe, junior planning engineer at Kier Group in Dubai and vice-chair at Novus-CIOB UAE; and Joshua Waterman, associate director at Turner & Townsend.

Sibe was inspired by Beard's vision of a CIOB that "stays at the vanguard of construction in a future that reflects the global needs of the next wave of talent and younger members". He loves its global nature: "It is great to know the UAE is included and the Vision 2030 is not just for the UK."

Qi joined as she is passionate about shaping the industry. "I wanted the opportunity to champion the best interests of the younger generation, especially women, into the engineering and construction industry."

Being a part of the group provides her with an excellent opportunity to positively influence change: "As an advocate of diversity and inclusion I wanted the prospect of inspiring a greater number of diverse members to join the CIOB and to ensure that the importance of diversity and inclusion has an emphasis in the 2030 vision."

Waterman too saw joining the group as a "once in a generation" chance to help shape the future of the body.

He said: "It's important to make sure the CIOB can support and help students and young professionals through their careers in the future, exactly like it hugely helped me during my career."

Meeting

Student reps step up for CIOB

University construction professionals get on board

The Midlands and Eastern Novus team ran a successful new student rep meeting recently. A dedicated group of early-career professionals attended, representing the CIOB and their universities from across the region.

The CIOB thanks Lin Qi and Cameron MacKenzie for pulling an excellent presentation together and driving the initiative forward.

CIOB Midlands & Eastern University Reps are: Emily Cardy, Tim Hale, Louis Shortland, Abigail Cofie, Shifa Saif, Sam Lloyd, Phil Kenyon, Jack Ruane, Aaron Mcphie, Gurshakti Singh, Toochi Chigbo, Ryan Apps, Jonathan Asiegbunam, Rhys Jones, Gael Kayombo, Danielle Miller, Bradley Trickett, and Scott Drewery.

OBITUARY: BERNARD IMMS

Bernard Imms sadly passed away on 27 January 2021. He was 94 years old.

Imms (pictured) became a member of the CIOB in 1968. In 2001 he was made an honorary member.

In 1951 he obtained an HND in building at Brighton Technical College. He went on to work as a quantity surveyor and estimator for a number of different companies in the south of England.

Most of his career was spent working for John Hunt in Gosport (1958-1976), where he ultimately became a company director and a fellow of the CIOB.

Imms ended his career as a lecturer in quantity surveying and estimating at Crawley College of Technology (1977-1996).

He was married to Jane and is survived by three children, six grandchildren and five great-grandchildren.

Partnership

Sir Robert McALPINE

Beyond carbon

Making heritage sustainable should be the new normal. Why aren't we there yet, asks **Grace Herring** of Sir Robert McAlpine Special Projects

Pictured outside St Marylebone Parish Church, Samuel Wilson represents the new generation of skilled tradespeople. A former apprentice, currently SRM package manager, he is studying with the Building Crafts College to combine heritage skills with his knowledge of MMCs and 3D modelling

The refurbishment of our existing buildings is going to play a critical role in cutting our carbon emissions, as the UK aims to transition to net zero carbon by 2050.

As Historic England's Heritage Counts research has shown, demolishing a historic building and replacing it with a new one can result in greater carbon emissions by 2050 due to the associated embodied carbon.

The social, economic, cultural and environmental benefits of restoring and repurposing existing buildings are clear: they form part of our culture and the identity of our streetscapes and villages. It is our duty to break down the barriers to make heritage more accessible to all. Historic assets can only be part of our carbon-friendly future if they are cared for by skilled people, and if the occupier understands – and cares for – their building.

At the CIOB conservation conference last year, Sir Robert McAlpine Special Projects, along with other distinguished speakers, discussed what the industry can do to make traditional craft skills more accessible. How do we make sure that existing building stock is cared for and repurposed when we have a traditional skills shortage?

A cross-industry group of heritage experts is working to facilitate this and we use every opportunity to address the issue on our projects.

The St Marylebone Changing Lives project, led by the Grade I-listed St Marylebone Parish Church in central London, is a good example. Focusing on community need, apprenticeships and sustainable materials, the scheme is delivering one of London's most community-engaged heritage projects.

Urgent improvements are underway. Replacing the roof and modernising the crypt will improve energy efficiencies and deliver new visitor and community spaces with safer, fully accessible and compliant entrance routes for all.

The £10m scheme, partially funded by the National Lottery Heritage Fund, will also provide individuals starting their heritage careers with an opportunity to develop skills through workshops and hands-on experiences.

"Heritage buildings hold intrinsic value and importance over and above their carbon capture"
Hannah Prowse, English Heritage

On-the-job training opportunities

Owing to the strong link between St Marylebone Parish Church and the Building Crafts College, Sir Robert McAlpine will facilitate the employment of multiple final year masonry and carpentry students during the project, providing on-the-job training and experience.

The 200-year-old church will remain open, allowing public worship, the St Marylebone Healing and Counselling Centre and the Marylebone Health Centre to continue. We have put measures in place to minimise disruption to worshippers, visitors and people working in the building, maintaining its presence as a community hub.

"Heritage buildings hold intrinsic value and importance over and above their carbon capture. They have been proven to increase wellbeing," says Hannah Prowse, head of national projects, English Heritage.

If we truly value our historic buildings, we must count the whole-life carbon of them. We must also prioritise the expert trades, architects and consultants who will enable this to happen for generations to come.

Grace Herring is proposals coordinator, Sir Robert McAlpine Special Projects.

Below: New flooring and suspended ceilings were introduced

Bottom right: Racking had to be removed through the narrow doorways

Me and my project

Cool runnings

Managing the refurbishment of a temperature-controlled unit proved complex but rewarding for Pexhurst site manager Mick Ward. He shares his experience with **CM**

ChillBox is a major temperature-controlled facility in Thurrock, Essex, serving the metropolitan area. It is one of the south-east's largest logistics buildings, with a floor space of 18,225 sq m across five individually controlled chiller chambers.

Works consisted of a Cat A fit out to the internal main offices on the ground and first floors, forming a new open-plan office environment with new flooring, suspended ceilings and a new LED modular lighting system. In addition to the office space, the wall panelling was deep-cleaned and a new resin floor coating applied to all five chambers.

"To futureproof servicing requirements for the building equipment and due to the fragile flooring in the roof void and top of the chambers, we were also responsible for installing a new mansafe system with a special harness that would deliver you safely to the floor below if you fell through," explains Mick Ward, site manager with Pexhurst.

Project team

Location: ChillBox, Thurrock, Essex

Project manager: Trident Building Consultancy

Client: CBRE Global Investors

Value: £2.3m

Programme: 26 weeks (January-September 2020)

Site manager: Mick Ward

In addition, all existing shutter doors and dock levellers were either repaired or replaced. The external face of all cladding and curtain walling was sprayed, along with a new coat to the roof. Finally, the team tested, validated and commissioned various aspects of the mechanical and electrical installations, focusing on the sprinkler system, fire alarms and chiller chambers.

"The building, while unique, was in a very poor state of repair and transforming it into a sleek, functional and modern industrial building in a very tight programme proved to be challenging at certain points," says Ward.

All five chambers featured original 10m-high racking which had to be removed and manoeuvred through narrow entrance doorways using a new 10m-high reach excavator purchased especially for this project.

The coating of the roof area and spraying of the perimeters of the external cladding around a live industrial state were complex too, says Ward. "Tasks required a great deal of site team coordination and collaboration.

"Despite these project challenges and amidst a wider context of national covid-19 restrictions, I'm proud of the entire project team's effort to progress the refurbishment – keeping the site open and adapting in line with CLC guidelines and Public Health England to provide a safe working environment. And the results speak for themselves: CBRE Global Investors successfully let the building to leading British meal kit retailer Gousto on a 10-year term."

Ward adds that his team also received very positive feedback from the project management team, with Dan Roe from Trident commenting: "Your delivery team runs a tight ship; your response to covid-19 and health and safety both from a site and company perspective was excellent."

Ward sums it up: "Logistically speaking, this was one of the largest and most challenging jobs I have managed in my 23 years with Pexhurst, but this made the outcome and the success of the project all the more rewarding. It really is one of those milestone projects that I'll never forget."

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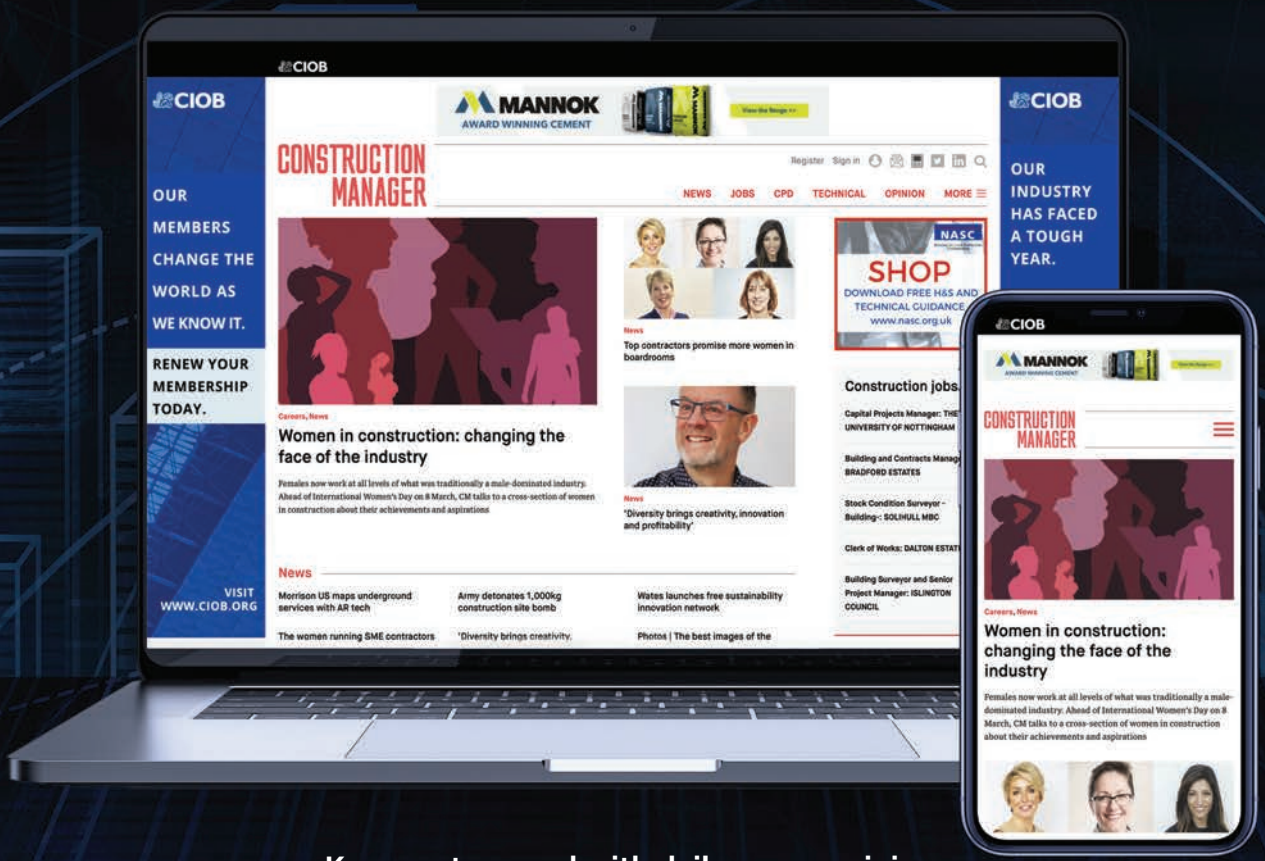

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Diary dates

HIGHLIGHTS OF THE CIOB CALENDAR FOR THE COMING MONTH. ALL EVENTS ARE ONLINE WEBINARS UNLESS OTHERWISE STATED

Bristol Mayoral Debate 2021
8 April, 4-5pm
On 6 May, Bristol holds its third mayoral election (postponed from 2020). A collaborative partnership of the CIOB, Institution of Civil Engineers (ICE), Royal Institute of British Architects (RIBA), Royal Town Planning Institute (RTPI) and Constructing Excellence South West are hosting a debate for candidates to outline and be quizzed on their aspirations, ideas and plans around placemaking, infrastructure and the climate.

CIOB Student Festival
7-8 April, 10am-3.15pm
The CIOB Student Festival brings together our global student community in a two-day festival that will provide an insight from industry and academic leaders across the spectrum.

Student members will hear of personal reflection, industry best practice and future career guidance and can expect to build upon their competence, confidence and knowledge of the built environment sector – developing skills, sector know-hows and will take away top tips to excel in their future career.

This is a free-of-charge student-only event and you must be a CIOB student member to register.

CIOB student membership is free of charge for full-time students. For more information on becoming a student member, please check out the membership route.

How Local Authorities Achieve Net Zero Carbon
20 April, 1-2pm
Join Arnab Mukherjee, head of capital projects at Wokingham Borough Council, and the project team for a live webinar on how local authorities achieve net zero carbon.

The session will focus on a case study of a recent project and Mukherjee will be joined by: Tim Searle, senior construction project manager at Wokingham Borough Council; Vince Ruane, director and founder of RCDC, a building services and sustainability consultancy; Alex Pullin, project architect with HLM Architects; and Paul Ruddick, the CEO of REDS10, a main contractor with established modern methods of construction and zero-carbon credentials.

CIOB Annual Conservation Conference: Balancing Heritage and Sustainability
21 April, 9am-5.30pm
The 2021 annual CIOB Conservation Conference focuses on sustainability in relation to heritage and traditional (pre-1919) buildings and dealing with climate change. This year's conference will be virtual, using Hopin as the event platform provider. Tickets cost:
- CIOB member: £25+VAT
- Non-member: £35+VAT
- Students and apprentices: £15+VAT.

Project Controls
21 April, 12-1pm
In this webinar project controls professional Dale Healey will be joined by 4/5D & BIM expert Jimmy Bettega to discuss how robust project controls increase certainty on project outcomes. Both offer project controls services through LogiKal, which specialises in providing the industry with award-winning project controls and performance management services.

Meditation for Real Life
21 April, 6.30-7.30pm
With everything the world is throwing at us right now, it is more important than ever to look after ourselves both mentally and physically. As part of the CIOB London Hub Wellbeing series, this webinar will give an insight into meditation and to use and apply it to your life. The speaker will cover what meditation is, as well as techniques and applications.

Construction and Covid: What Now?
22 April, 6-7pm
Join the CIOB London Hub for a panel discussion, looking at different perspectives on the immediate and long-term future for construction. Learn from peers and experts how challenges have been tackled and what the long-term outcomes might be for the industry. You'll hear four perspectives, ranging from risk and project management, through contracting, to the legal and commercial challenges we face as we head into the rest of 2021.

The Need to be Inclusive in Construction – EDI
29 April, 5.45-7pm
Sarah Sorrell, surveyor and access Consultant for Oakley Estates, will present a webinar looking at the need to be inclusive, how to be an accessible business and designing with access in mind. She will cover the legislation and obligations driving this. Key documents are the Equality Act 2010, BS8300.2.2018 and Part M of the Building Regulations.

For a full list of events and to register visit ciob.org.

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