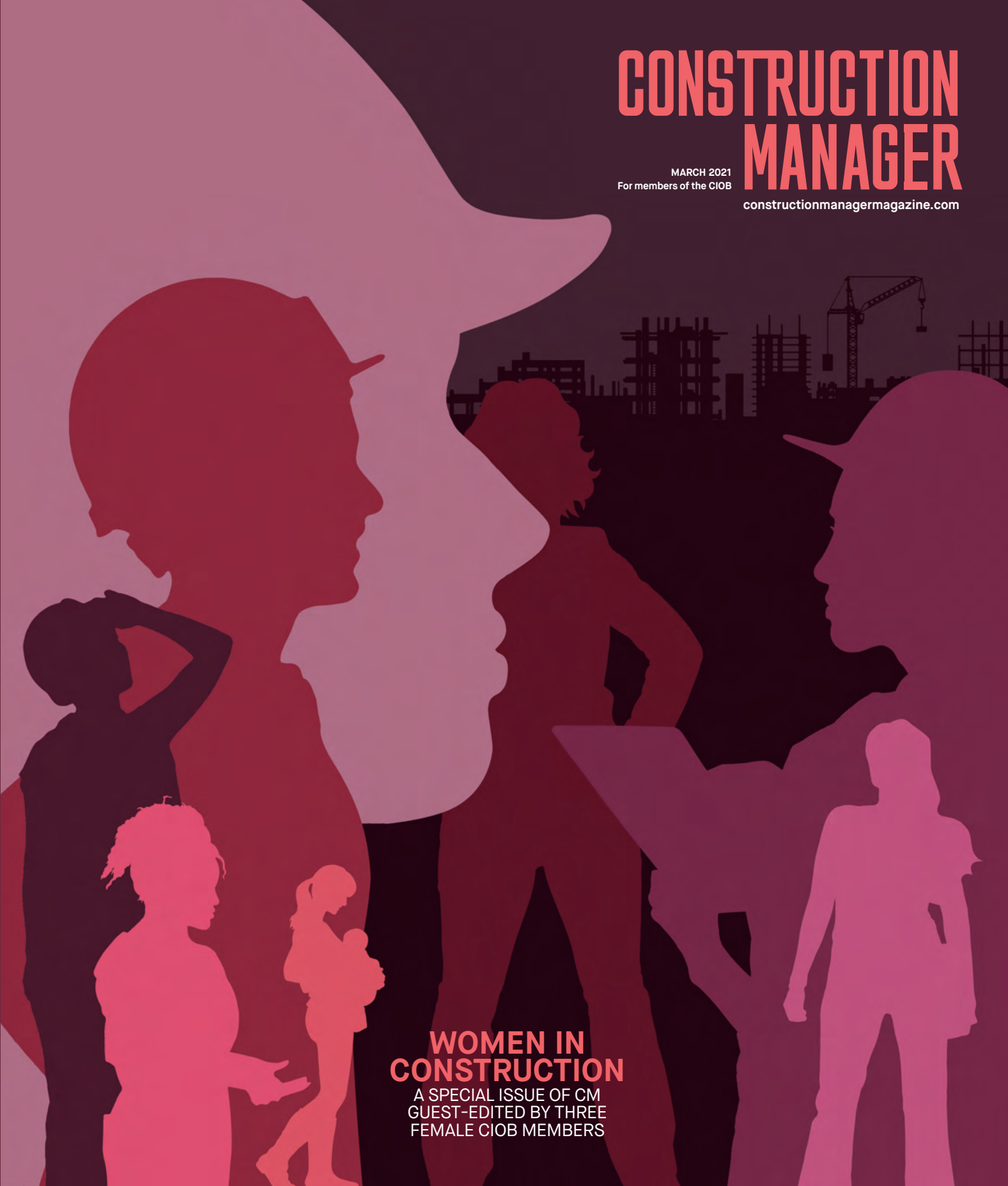
CONSTRUCTION MANAGER

MARCH 2021
For members of the CIOB
constructionmanagermagazine.com



WOMEN IN CONSTRUCTION

A SPECIAL ISSUE OF CM GUEST-EDITED BY THREE FEMALE CIOB MEMBERS

CIOB

CIOB'S NEW EDI LEAD | THE GOVERNMENT VIEW ON INDUSTRY DIVERSITY | WOMEN IN BIM

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Contents

Welcome

If the March issue of CM has a different feel to it, that's because the magazine has been 'guest edited' by a panel of three female readers.

To mark International Women's Day on 8 March, we have turned the spotlight on the many females who work in construction, from site level and the supply chain right up to the boardroom.

But the content of the magazine is relevant to everyone in the industry, whatever your gender; the females we have interviewed for this issue talk about what drew them to a career in construction, the day-to-day challenges they face in their jobs, their achievements, and their aspirations.

They include Kier's Olivia Perkins, project lead for the complex Luton DART transit scheme (p20), Bayan Omar of Dubai contractor Alec, who is working on the extraordinary One Za'abeel, which features the longest cantilever ever recorded (p16), and industry newcomers like BIM coordinator Isobel Robinson at Winvic, who was inspired by the digital possibilities in a construction career (p44). There are many others too.

As UK construction minister Anne-Marie Trevelyan explains (p13), companies which improve their gender balance are likely to find that diversity is "good for business", leading to "better decision-making and improved performance across the board". They will be more representative of society and therefore more likely to win the trust of their clients.

Only one in eight females work in construction, and it's high time that changed. Quite simply, as the minister puts it: "The industry needs more women."

Anjali Pindoria
Projects surveyor, Avi Contracts

Anna Koukoullis
Head of social value, Willmott Dixon Interiors

Virginia Borkoski
Program executive, New York Metropolitan Transportation Authority

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News

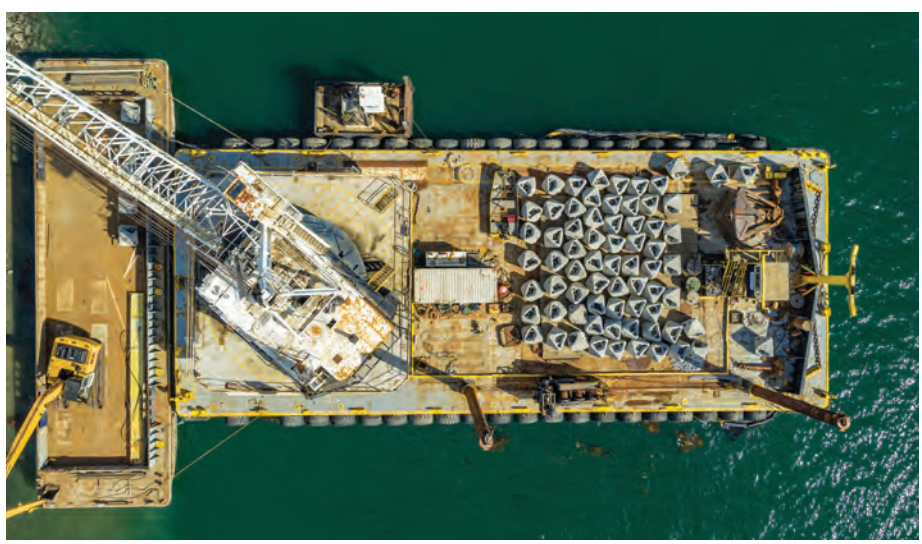
TIDEWAY

▲ Barhale completes Tideway shaft work

Civil engineering firm Barhale has completed the first shaft secondary lining in the central section of the Thames Tideway Tunnel, which means internal shaft work can begin. The Ferrovial Construction and Laing O'Rourke (FLO) joint venture is main contractor for the 12.7km central section of the 25km Thames Tideway Tunnel.

▶ Eco-friendly concrete used to create tidal pools

Eco-friendly concrete is being used in a pilot project designed to protect the port of San Diego in the USA from coastal flooding at the same time as creating a launch pad for sustainable aquaculture. ECOncrete will install 72 interlocking tidal pool armour units as part of a three-year project.



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

In transit:
Kier's senior project manager Olivia Perkins on the complex Luton DART, p20

JLD

▲ Campaign to support LGBTQ+ allyship launches

A new campaign to support allyship of the LGBTQ+ community within construction has been launched by Building Equality. The organisation has created a toolbox talk aimed at empowering colleagues across the industry to become active allies.

◀ BAM female apprenticeships jump

Krystal Hutchinson is an apprentice at BAM Construction, where nearly a third of all apprentices enrolled on the firm's Level 4 apprenticeship programme are female. The proportion of women undertaking Level 4 apprenticeships, which cover construction management, site supervisors, quantity surveying and civil engineering, has risen from 20% to nearly 30% in four years.

▲ Morgan Sindall pushes 11,000t concrete box under rail line

Morgan Sindall has pushed an 11,000 tonne curved concrete box into place under the East Coast Main Line near Peterborough. The tunnel at Werrington, which will enable slower-moving freight trains to pass underneath the passenger route and use an adjacent line northwards, was installed over nine days.

▶ Buro Happold plans Cornish geothermal rum distillery

Consultancy Buro Happold is leading a study into the use of high-temperature geothermal heat pumps that it hopes will provide low-carbon heat for maturing rum at a distillery in Cornwall. The Cornish Geothermal Distillery Company (CGDC) has won funding from the UK government's Green Distilleries Competition for the study.

GRIMSHAW ARCHITECTS

Top contractors promise more women in boardrooms

CM asks the UK's biggest tier 1 construction firms how they plan to improve gender imbalance in senior positions

The UK's biggest construction contractors have vowed to boost the proportion of women in senior roles, as research by *CM* showed that on average women occupy just over a quarter (28%) of board-level positions at the firms.

Among the 10 biggest firms by turnover in 2020, the proportion of women on the board of directors ranged from 12.5% at its lowest level, to 43% in the case of ISG, where three women and four men make up its statutory board.

The mode average proportion of women on the contractors' boards was 25% – with Balfour Beatty, Mace, Laing O'Rourke and Amey all reporting that women occupied a quarter of the most senior positions in their companies.

At Kier, Skanska UK and Morgan Sindall, that figure was 29% (two out of seven in all three cases). Meanwhile two out of six members of Galliford Try's board are women, and one out of its six-strong executive team. At Interserve Construction, one woman sits on the board out of eight attendees.

Among prominent female figures at the contractors are Amey chief executive Amanda Fisher. Fisher is a former army officer and former managing director of Balfour Beatty Living Places. She was appointed as chief executive of Amey in December 2019, having been managing director of facilities management, defence and justice at Amey since 2017.

Skanska UK executive vice-president Katy Dowding joined the firm in 2003, having previously worked for Tarmac/Carillion for 15 years. Dowding works alongside chief financial officer Kelly Gangotra, who has been with the firm since 2012.

ISG chief operating officer Zoe Price leads the firm's UK construction business, having previously served as head of public sector frameworks, helping to more than triple the revenue ISG generates from public sector frameworks within three years.

Group director of strategy Mandy Willis joined Mace in 2014, having supported the board as an external commercial tax advisor for 14 years.

Women now hold a third of board positions in the UK's top public companies, according to the government-backed Hampton-Alexander review, released in February 2020.

This means that the top construction contractors in the UK, on average, are five percentage points down on the average across all boardrooms among the top 350 UK listed companies.

The Hampton-Alexander review also highlighted how women in boardrooms are over-represented in some roles and under-represented in others. They made up only 15% of finance directors, compared with 66% of human resources directors.

"The mode average proportion of women on the contractors' boards was 25%"

Women on the boards of major contractors include (from top): Mandy Willis, Mace; Katy Dowding, Skanska UK; Kelly Gangotra, Skanska UK; Amanda Fisher, Amey; Zoe Price, ISG

SOLK

40% of Laing O'Rourke's Europe Hub Executive Committee is female

40%

What the majors say about diversity at board level

Leading UK contractors explain their policies

Balfour Beatty

"We have not set a target for the number of women at board level, however we continue to deliver on our UK Diversity and Inclusion Action Plan, which includes actions to increase female talent throughout the business and support their career development. At an executive committee level, our group head of communications and our group general counsel are women. Last year, the proportion of hires into senior roles rose from 20% female in 2019 to 32%."

ISG

"Our statutory board comprises three women – chief financial officer, chief human resources officer, and chief operating officer for construction – and four men. So that's not quite parity – but it is one of the most diverse in construction. We feel we have broader conversations with those different perspectives. There is evidence to show that more diverse businesses perform better, and all the board are committed to the journey we are on."

Morgan Sindall

"We want our board diversity to be exemplary within our industry. To this end, we are working towards women making up at least one-third of our senior management team and aim to have recruited at least one person from a BAME background to the board by December 2024. We have about double the number of women than the sector average working for the different divisions that make up the group."

Laing O'Rourke

"We have been working hard to attract, develop and retain talented women in senior positions and through our early talent recruitment and training programmes. We are pleased that 40% of our Europe Hub Executive Committee is female, but recognise there is more to do. At the same time, our investment in modern methods of construction will help build an industry that is attractive and fair for the next generation, regardless of gender."

Amey

"We recognise the importance of diversity at all levels of our business and we are committed to increasing the number of women in senior leadership positions at Amey. We have a number of initiatives in place to support this, such as our Women's Development Programme, which nurtures the skills, knowledge and capability of our 20 most talented women each year and our Women at Amey network which encourages inclusivity."

Kier

"We are steadfast in our commitment of having a diverse, inclusive culture which supports and encourages everyone. Our aim is to make sustained improvement to our gender split over the longer term. Encouraging women to join Kier and accelerate their careers into management and leadership roles remains critical to us and we will continue to be open and transparent with our progress, by publishing our gender pay gap data annually."

The women running SME contractors

Away from the big names, there are more examples of women in operational or director roles

While the number of women at board level among contractor SMEs is relatively small, there are examples of females in operational or managing director roles, some of whom started their companies.

Chandni Vora (pictured) is chief operating officer of London-based main contractor Vascroft (see also p16). With a background including finance, engineering and telecoms, she says her skills in project management, process improvement and change management have helped her progress.

"Being in this industry has brought challenges but helped me grow stronger and more resilient, even if I had to prove myself more," she said. "Construction companies have come a long way to help balance historical gender inequality. There's still work to do [but] I believe the world is changing for the better and more opportunities for women in construction will be available for the next generation."

Other females leading SME construction companies include Julie White, who has been managing director of specialist diamond drilling firm D-Drill & Sawing since 2008. She has taken up a role on the Build UK board alongside Lynn Way, financial director of another SME, Chris Sedgeman Scaffolding.

Monika Slowikowska is owner and director of high-end constructor-developer Golden Houses and Kelly Vincent set up and now runs electrical business Kelly Electrics, and in 2014 was a finalist at the Women in Construction Awards.

‘Diversity brings creativity, innovation and profitability’

In January this year, Mark Harrison started his new role as head of equality, diversity and inclusion (EDI) transformation at the CIOB – a first for the organisation. He tells **Neil Gerrard** how adopting inclusive practices and promoting diversity will benefit CIOB membership and the construction industry

Mark Harrison CV

- 2008-2013 Diversity strategy manager, Metropolitan Housing Partnership
- 2013-2015 Diversity and inclusion manager, The Children’s Society
- 2015-2017 Diversity and inclusion manager, SOAS
- 2017-2020 Head of inclusion, University of London
- October 2020-January 2021 EDI consultant, The Alan Turing Institute
- January 2021-present Head of EDI transformation, The Chartered Institute of Building

What is involved in the role of head of EDI transformation?
Created by Caroline Gumble [CIOB chief executive], the role is a new one for the CIOB and its remit is across all functions of the institute.

I will be reporting directly to the CEO in order to demonstrate commitment to EDI at the highest level. The role will involve considering who our members are, the services and education we provide and how we provide those services to ensure they meet the needs and aspirations of our diverse membership.

We will also be looking at how we recruit a more diverse membership to better reflect wider society. I will also be thinking about how we can promote EDI in our role as an employer and working with CIOB colleagues to embed inclusive practices in our events, communications and across our global operations.

Where do you plan to start?
My induction is well underway and I am meeting a range of stakeholders in the sector – CIOB members involved in our hubs, our expert EDI panel, trustees, the leadership team and colleagues. I have also started networking with EDI practitioners in sister institutions so that we can share learning and have a cohesive approach to promoting change.

There is clearly a huge appetite for positive change at the CIOB and within the sector. Gender equality is a key focus of this energy for change, but it goes beyond that to ensuring fairness in respect of other characteristics such as race and disability.

Will it be movements like MeToo and Black Lives Matter or practical considerations like skills shortages that drive change in construction?
Both! One of the many positive things that came out of the MeToo movement and Black Lives Matter protests is an impatience for change. But I also think there is a growing recognition in construction that diversity at senior levels brings more creativity, innovation and profitability. The skills shortage means that being an employer of choice for all communities and individuals is critical.

“There is clearly an appetite for positive change at the CIOB and within the sector”
Mark Harrison, CIOB

Does being a white male present a challenge in undertaking this role?
I’ve heard that question before, and more people probably wonder without actually asking it! Firstly, I would emphasise that the EDI agenda is not limited to considerations of gender and race. We must also consider the barriers faced by those with other characteristics such as disability, faith and sexual orientation and, of course, the intersections of those characteristics.

I would also respectfully suggest that it is neither ethical nor practical to pass the burden of promoting equity to those who already face discrimination. I see it as my responsibility to use the advantage I have had to contribute to much-needed change.

Having a male EDI lead reporting to a female CEO at the CIOB could be the right formula, given the current gender imbalance in the sector.

What are the next steps?
During 2021 we will be developing and launching a comprehensive EDI strategy that will set out how we will make progress on EDI over the next three years. I would encourage all members to contribute to the consultation exercise that will be hosted on the CIOB Members’ Portal.

Fair and equitable access to opportunities and inclusive practices will contribute to a stronger economy, across and beyond the construction industry.

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Data

200

How many years GMB estimates it will take to achieve gender equality in construction at the current pace

Mind the (gender) gap

We must not let the covid-19 recession risk progress on female representation in construction, says **Phoebe McCulloch**

The construction sector has the lowest proportion of female workers of any industry in the UK economy – just 13% of its 2.3 million-strong workforce are women. But this hasn't gone unnoticed, and the past 10 years have brought progress as the sector slowly works to address this imbalance and encourage more women into the sector.

In the past decade, female representation has increased in every occupational area within construction except for administrative and secretarial operations, where women were already over-represented. Crucially, significant improvements have been made in professional and tech occupations, with the proportion of women in these roles up by approximately 8.0 percentage points. Speaking from my own experience, the adoption of new technologies, coupled with a greater focus on diversity and inclusion, is making the construction sector a more attractive career choice.

Training schemes are also having an impact. Female take-up of apprenticeship schemes is growing – ONS data reveals the number of female construction trainees in the 2019/20 academic year was up 19% on the previous 12 months, and a staggering 333% on 2014/15.

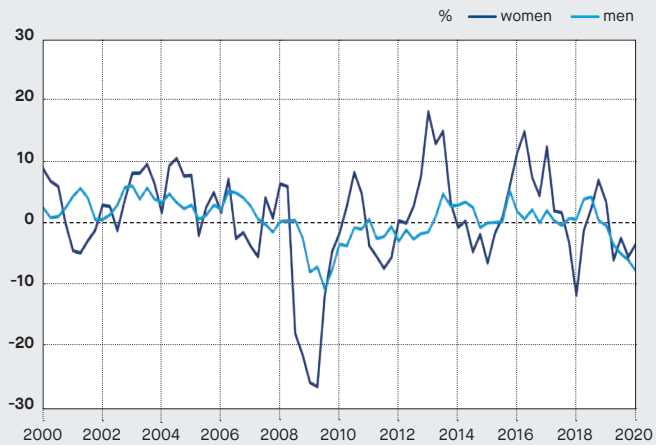
Yet there are concerns that female construction workers are more likely to be economically and financially disadvantaged by the post-covid recession, which threatens to derail this progress. Following the global financial crisis in 2008, the rate at which women left the construction sector was almost twice that of men – dropping 30.4% from peak to trough compared to 17.4%.

Encouragingly, there are early signs that the downturn brought on by the pandemic has so far bucked this trend. From Q1 to Q3 2020, female employment has only dropped by 4.3%, whereas the number of men employed in construction has fallen by 6.4%, as government support schemes, loans and subsidies help to support jobs.

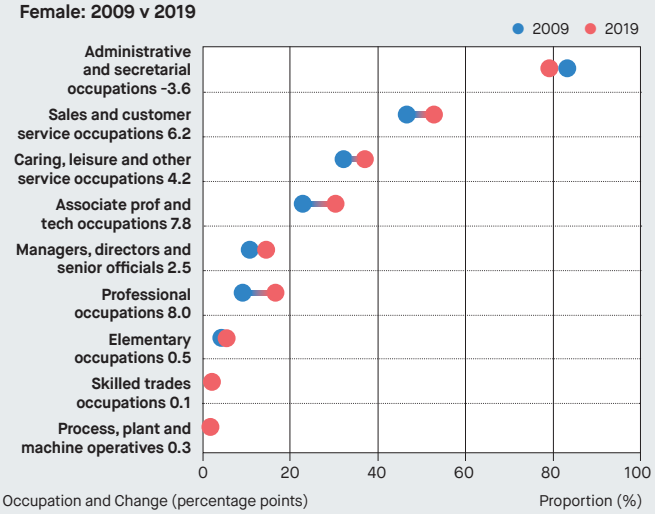
Nonetheless, it is vital that the industry doesn't take its eye off the ball when it comes to recruiting and retaining female talent. As construction looks to shore up capacity – and increase productivity – for the economic recovery ahead, women remain a significant pool of untapped potential.

Phoebe McCulloch is a data analyst at Turner & Townsend.

Employment in construction, by gender. Quarter on year percentage change



UK construction employment proportions, by occupations
Female: 2009 v 2019



SOURCE: OFFICE FOR NATIONAL STATISTICS. STANDARD INDUSTRIAL CLASSIFICATION, SECTION F: CONSTRUCTION

News in numbers

8.4

The reduction, in percentage points, in construction's gender pay gap over the past 10 years

2.3

How much less, in percentage terms, women on a full-time contract in construction earn than their male counterparts, compared to an average of 10.1% across all UK industries

7

Parents are seven times more likely to picture their sons working in construction than their daughters, says a report by the Commission on Gender Stereotypes in Early Childhood

333

Percentage increase in number of female construction trainees in the 2019/20 academic year, compared to 2014/15

CIOB | AUTODESK.

Plotting your digital construction journey

Autodesk and the Chartered Institute of Building (CIOB) have teamed up to create this new infographic. It'll help you visualise your journey, create a roadmap and define your next steps - leading to better project outcomes.

View at: www.autode.sk/ciob-digital-journey

Opinion

Anna Koukoullis
Willmott Dixon

Can remote working fast track diversity?

Remote working is a step forward towards the culture and behaviour change construction needs to embed inclusive working practices, says **Anna Koukoullis**

Since the pandemic hit, more businesses have started to shift to remote ways of working. Could this help to improve gender equality and diversity in the workplace?

It should do – but I am not entirely convinced. I remember a story from a female construction worker, who had left her career as a building manager over a decade ago, because childcare duties clashed with the 7am site opening hours. Remote working hasn't changed this.

McKinsey suggests that, during the pandemic, women's jobs were 1.8 times more vulnerable than men. This is in part because women continue to bear the brunt of childcare responsibilities, despite remote working.

It took a global crisis to rethink how, when and where we work, but tackling the stereotypes associated with gender roles is still a key challenge. Changing these perceptions could see the biggest shift in caring responsibilities since the second world war.

Challenging perceptions

Remote working is not revolutionary; but there is work to do to challenge the perception of the male 'breadwinner' and the female 'caregiver'.

So where does this leave the industry? Suicide rates for construction workers in the UK are over three times the national average. Could the way we work on site and the pressures of being a 'breadwinner' impact these statistics?

Women make up around 14% of construction professionals – still relatively low. Is the role of 'female caregiver' still causing issues recruiting and retaining women? While the industry has drastically improved over the years, competition still drives a toxic alpha culture where being vulnerable or empathetic is considered weak. Men working in construction have in the past faced inappropriate banter for clocking off early for childcare or health issues.

The pandemic presents a nice opportunity to rethink perceptions around caring responsibilities and work-life balance.

At Willmott Dixon we are committed to 50:50 gender parity in all roles by 2030. Over the last year our people working in support functions and preconstruction teams have successfully worked remotely. It has been heartening to see everyone embracing their humanity, with toddlers appearing on screens becoming the norm for both genders.

Teams on site have also started to stagger working patterns to enable social distanced working practices. Male workers have commented how much they have enjoyed regaining quality time with their families and are talking more openly about caring duties.

Remote working is a step forward in the right direction, but we need the right culture and behaviours to embed truly inclusive working practices. I urge construction companies to consider how they are helping to break the perceptions associated with fatherhood and caring duties.

If we can succeed in this, we will have happier people, more productive teams, and a better place to work for all.

"It took a global crisis to rethink how, when and where we work, but tackling the stereotypes associated with gender roles in society is still a key challenge"

Anna Koukoullis is head of social value and equality, diversity and inclusion at Willmott Dixon Interiors and a CIOB policy board member.

Anjali Pindoria
Avi Contracts

Specialists need main contractors' help on EDI

Introducing EDI can be a challenge for the supply chain, but main contractors can make it happen, says **Anjali Pindoria**

I have always wanted to be the voice for change for the betterment of our industry and being part of large movements doing great things is important to me. Equality, diversity and inclusion (EDI) is one such movement. But I question if we are supportive enough of EDI among the majority of companies in our sector – our supply chain.

Around 343,000 businesses make up the built environment sector. With 90% of our industry comprising the supply chain, that means approximately 308,700 companies are pivotal to modernising our industry through improved EDI.

EDI is more than just acceptance and diversity of appearance, in fact, it delves deep into heritage, skills, languages, upbringing and education. This makes you stop and think: what percentage of those 308,700 businesses truly understand EDI and its importance?

Having spoken about EDI at events, I have always noticed only a small percentage of the supply chain is there. Why is this? Surely there should be a larger representation of the majority?

From my supply chain experience, there is a fundamental lack of support for EDI. They have fewer resources compared to larger organisations. They do not have the expertise and cannot make the investment required due to the size and scale of their operations. In any case, all drastic changes to their businesses are driven by main contractors.

So how do we make our industry inclusive – if the majority of our sector do not know where to start?

We must educate the supply chain, providing incentives and mandatory guidelines. Some main contractors add EDI clauses within contracts, which are beneficial in the short term, but do not add value to the culture of small businesses in the long term. Suppliers may comply for the duration of the contract, but without understanding the true meaning of embodying EDI.

In any case, EDI should not be about a bid race; in fact, it should be a relay race, where the main contractors pass the baton to the supply chain, who then pass it on to merchants and suppliers. Main contractors could hold onsite workshops, educate their suppliers and have honest conversations about the struggles these small companies may face when introducing EDI into the SME culture. They could also set targets or standards, as is the case with health and safety and sustainability.

With EDI, the rules of a normal race do not apply. The race has to be a team effort, where everyone joins in – but the whole built environment will be a winner if we embrace the change our industry needs. ●

Anjali Pindoria is a project surveyor at Avi Contracts and vice-chair of the CIOB London Novus group.

Building a female future

Construction minister **Anne-Marie Trevelyan** calls on the sector to be a more attractive employer for women

Hard hats, diggers and drills. Looking back to my childhood, from the toys we played with to the careers advice on offer, the construction site was often painted as a physically demanding, macho environment. I loved Meccano and puzzles, but the world of construction seemed entirely male.

Now, I stand proud as the second female UK construction minister in history, with a sector that accounts for 8% of GDP and the opportunity to highlight that construction represents a fantastic career for women – hard hats and all.

It's no secret the construction industry is still lagging behind many others when it comes to gender equality. In 2019, only one in eight UK construction workers were women.

Equality in the workplace is about breaking down barriers, and it is important we pursue it not least because diversity is good for business. Opportunities for all – from apprenticeships through to managerial positions – can lead to better decision-making and improved performance across the board.

What's more, often diverse project teams better reflect the clients. They are more likely to be leaders in innovation, build infrastructure suitable for all and can show more empathy towards – and secure the trust of – a diverse customer base.

Drawing on a wider pool of candidates for roles is also good for business. It ensures they aren't missing out on valuable insights that may be missed. This could help alleviate the industry's wider skills shortages.

At a time of unprecedented government investment in the industry – with a £600bn investment pipeline over the next 10 years – now is the time for construction to become more representative of the society it builds for.

Let's try and change the image of the industry some see as an unwelcoming environment for a woman's career. From diversifying companies' recruitment practices, to calling out sexism on the building site where we see it, companies must focus on making the sector a more attractive employer for a wider talent pool.

However we get there, my point today is clear: the industry needs more women. And it starts with you.

Anne-Marie Trevelyan is minister for business, energy and clean growth (including the construction brief) at the Department of Business, Energy and Industrial Strategy.

Caroline Gumble
CIOB

Cladding proposals need a rethink

The government's solution for replacing unsafe cladding should not burden leaseholders with paying for something over which they had no influence or control, says **Caroline Gumble**

Recladding work on Galliard's New Capital Quay development in Greenwich

The CIOB has been actively supporting the building safety agenda and, as part of that, monitoring the issue of cladding remediation for some time now. It is very clearly a matter of public interest and relevant across the breadth of the construction industry.

It is important to understand the scale of the problem – figures from the new build database and the Office for National Statistics (ONS) indicate that up to 11 million people in the UK are in accommodation that is potentially unsafe.

There's no doubt that this situation is causing unnecessary distress to so many people – and it's clearly compounded by the current lockdown, with some people literally stuck all day, every day in a high-rise flat.

While there is no doubt that the construction industry has a role to play in ensuring that a situation such as that which led to the Grenfell tragedy can never happen again, there is also leadership required from government to work with the industry and residents impacted by this issue.

The government recently announced a package of measures intended to help with the remediation of potentially unsafe cladding on high-rise buildings. Robert Jenrick MP, secretary of state for housing, communities and local government, outlined what he called an "unprecedented intervention", with some additional funding and a five-point plan which was supposed to "provide reassurance to homeowners".

Those proposals will only help to alleviate the distress of a fraction of those affected.

Early in February, in response to an opposition day debate on 'protecting tenants and leaseholders from unsafe cladding', the CIOB issued a call to the government, to commit to acting immediately on finding a funding solution which does not penalise leaseholders and leave them burdened with paying, even in part, for historical building safety remediation works, while also ensuring that these costs are excluded from the proposed building safety charge.

While those in the industry are leading the way on driving up quality standards in construction, I believe we need to see a more practical and targeted response from government, including prioritising buildings under 18m in height where there might be vulnerable residents, and a funding solution which does not penalise leaseholders and leave them burdened with paying for something over which they had no influence or control. ●

Caroline Gumble is CEO of the CIOB.

Entering 'the room where it happens'

We need more women in positions of influence to shift construction's gender balance. By **Virginia Borkoski**

Just 9%. That is still the percentage of women working in all roles in the US construction industry. This statistic has remained steady for years now. As a woman with over 30 years' experience in the construction industry, now in an executive leadership role, I continuously ask myself, and am asked by others, one simple question: Why?

One question I have in response: Are we in 'the room where it happens'? If you know the Hamilton song, you will also know that it is an elitist mystery, as to what actually happens, 'in the room where it happens'.

To be able to shape policy and have a voice, a strong voice, women need to be in that room. Power influence, respect, confidence, alliances, politics and strategy all emanate from here. Plans are made, deals are struck, relationships forged, negotiations conducted. When women are in the room, we can and must influence a shift in policies and attitudes that can raise that 9% statistic.

Whether it is a boardroom for a public company, a not-for-profit organisation, a senior leadership conference room, a partners' dinner or an executive Zoom call – if women are not in the room, we are easily forgotten. Research tells us that unconscious and implicit bias have significant exclusionary effects on women's potential for advancing in the consistently male-dominated industry.

All of us recognise 'replicative hiring and selection', and even when proactive policies are instituted to improve diversity, most companies still either consciously or unconsciously look for similar cultural, personality, background and values traits, perpetuating hiring 'in our own image'.

How do women get into these 'rooms'? Through perseverance. Being proactive. Confidence. Experience. Having a champion. And yes, some luck. And what happens when you finally find yourself 'in the room'?

The bar is set high for the small percentage of women that make it, requiring a balance of setting the example while setting the stage. Bringing others with us in spirit who have not yet arrived. Understanding the responsibility to influence hearts and minds. Reaching up with one hand, while reaching back to raise others up. Championing women's advancement. Making space and opening doors – especially those that lead to 'the room where it happens'.
Virginia Borkoski FCIOB is program executive at New York City Metropolitan Transportation Authority and a trustee of the CIOB.

Feedback

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

CM 14/01

CIOB Quality Guide

Setting standards for best practice

Alan Edwards
I wholeheartedly endorse this move by the CIOB, which will lead to better quality buildings by the participation of all those parties involved at every stage in the briefing, design, procurement and construction process. It will lead to better quality assets in the built environment which will be more valuable for our society and for future generations.

Craig Edwards
Quality is only achieved by experience, training, work culture, guidance and supervision and a great work ethic. A body of text alone will not achieve greater quality.

Andrew A Abiona
I am sure this guide will be full of good approaches that will bring about improvements in quality in the construction industry and the built environment. Thank you CIOB.

Eric Beaven
Focusing on quality during the site production and assembly stage of a project is useful but it needs to start at the outset of a project. Clients need to be encouraged to focus on the product deliverables when putting the initial scheme together to ensure the contractor and its team are inheriting a strong base from which they can continue the development.

Mike Wood
Raising quality far above the bare minimum should be followed by "of course" automatically. There shouldn't have to be a campaign. But quality is sadly undervalued, and the supply network too pressured. Raising quality won't happen easily unless pressure is taken off the supply chain. Build for quality is important, But first understand what quality means.

CM 18/01

Westminster Hall restoration

John Woodward
Looks an excellent piece of work worthy of its heritage, and securing this very fine building for the public to enjoy for many years to come. I used its design as inspiration to recreate in a very small way a barn conversion many years ago. I enjoyed seeing the real thing. Any notion of the cost of the works?

Leslie Saint
The work is impressive and I appreciate the complexities of the site. It compares to two separate projects I am involved with currently, the reroofing of the Grade-I-listed Hexham Abbey, which required extensive vinyl protection while open to the public pre-pandemic and a lead flèche at Durham town hall which may require sand-cast lead when the survey report is complete.

CM 25/01

JCB machines to send digital 'health alerts'

Brian Wood
In my naivete, I was hoping this was going to be about health of the worker – for example their heart rate, temperature, breathing, stress, not taking a break.

Alan Vowler
As a health & safety professional, I see a number of incidents with plant and the cause of a failure is often a partially deflated tyre. Does the system monitor tyre pressures to avoid failures? The worst incidents often involve telehandlers in my experience.

CM 15/01

Modular nuclear hybrid plan for Wales

Graham Power
The new generation of small reactors are ideal for these sites but why not go a step further and create a hydrogen-fuelled gas power station as well? These hybrid sites have the infrastructure in place as the grid already links up to the old defunct power stations. A multi-fuelled power generating hub or several can easily replace these proposed massive nuclear reactors that cost £25-30bn and run years behind schedule, and as yet not one is working.

CM 01/02

CIC urges 'rethink' on permitted development rights

Grahame Wiggin
It is remarkable that many in the construction industry vigorously complain about the planning system and yet when governments try to do something to rectify the faults, vested interests rush to ensure that we keep the status quo.

Constant changes and backtracking are wasteful and we need some consistency. Smooth planning, good building regulation and less confusion every time a government or minister changes could be a good start.

If there is poor quality in permitted development, it is a funder, management and building control matter, not a planning issue.

CM 18/01

CIOB gives members subscriptions boost

Godwin Ediae
Just paid my subscription for 2021. It is good to see the CIOB being considerate towards members during this period of economic difficulty. Every penny saved really helps.

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**

WOMEN IN CONSTRUCTION: CHANGING THE FACE OF THE INDUSTRY

FROM SPECIALIST SUPPLIERS TO MAIN CONTRACTOR BOARDROOMS, FEMALES NOW WORK AT ALL LEVELS OF WHAT WAS TRADITIONALLY A MALE-DOMINATED INDUSTRY. AHEAD OF INTERNATIONAL WOMEN'S DAY ON 8 MARCH, **CM** TALKS TO A CROSS-SECTION OF WOMEN IN CONSTRUCTION ABOUT THEIR ACHIEVEMENTS AND ASPIRATIONS

MATTHEW JOSEPH

Leena Begum
Civil engineering apprentice, Atkins

Leena Begum started as a health and safety apprentice on major infrastructure projects, before switching to Atkins to start a civil engineering apprenticeship, where she has been working on Hinkley Point C.

"I am working on the earthing model as the lead modeller, creating 3D models and working with other disciplines to achieve a clash-free model," Begum explains. "The highlight is working with the global design centre in India, collaborating with other modellers in different time zones."

Begum, who is working towards her EngTech qualification, has also been assessing flood assets for the Environmental Agency and her longer-term ambition is to help construct a flood relief tunnel in Bangladesh.

Her most satisfying career achievement to date is the pioneering creation of PPE for female Muslims and maternity wear on Tideway.

"This will introduce a different talent pool into the industry," Begum enthuses. "The whole process from sketching my design on a Post-it note, through to now, where it is available on the market, has been incredible."

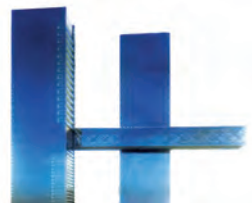
She wants to see a more diverse workforce in construction, which she describes as a "problem solving" industry. "To deliver effective solutions to the built environment we need to broaden our talent pool," she reasons.

"To deliver effective solutions to the built environment we need to broaden our talent pool"
Leena Begum, Atkins

Bayan Omar
4D planning and virtual design-construct specialist, Alec Engineering & Contracting, United Arab Emirates

Bayan Omar works for Dubai-based construction business Alec and has spent almost a decade in digital roles. She has a master's degree in project management engineering, and a bachelor's degree in civil engineering, both from the University of Jordan.

Projects she is currently working on include One Za'abeel, a Dubai mixed-use scheme with the longest



Bayan Omar is working on the One Za'abeel project in Dubai

cantilever ever recorded, and SeaWorld Abu Dhabi, a landmark theme park project.

"My role is to provide technical support and training for planning staff in 4D practices and digital technologies, plus I am part of Alec's innovation and research team which is responsible for enabling technology adoption," Omar explains.

She takes great satisfaction from "changing mindsets" about digital construction and "showing the benefits of new technologies".

"I would like to see our industry adopt 3D printing, AI, big data and machine learning the way other industries have," Omar continues. "This would unleash more innovation in design and construction, reduce waste and promote agility."

Chandni Vora

Chief operating officer, Vascroft Contractors

With a background spanning accounting, telecoms and engineering, Chandni Vora can call on more diverse experience than most people in construction. She graduated from City University, worked for Bechtel and BAE, then joined Vascroft Contractors 10 years ago in a finance role, progressing to board level where she works as chief operating officer.

"My financial experience, skills in project management, process improvement and change management over the years have helped me transition into this role," she explains. "I have implemented ISO qualifications for the company, new document management systems and infrastructure changes. I listen and empower the team, visit sites to engage with the operational teams, sharing lessons learned to improve the company's efficiency and quality."

Vora says construction "continues to inspire me", particularly the rapid technological change, and feels lockdown has forced the adoption of new technologies. "The industry has had to encourage working from home, conduct site progress meetings through videoconferencing, and virtual site walkarounds," she says.

Chandni Vora on site at Vascroft's Queensbridge House project in the City, a 220-bed hotel for Westin

Although on the board at Vascroft, Vora believes her gender – and ethnicity – has held her back on occasions during her career. "Being in this industry has brought challenges but helped me grow stronger and more resilient, even if I had to prove myself more," she explains.

"Over the years, construction has embraced how women have added value to a build. Companies are striving to improve on diversity and inclusion, and balance the historic gender inequality. There's still work to do, starting with our education system, but I believe the world is changing for the better and more opportunities for women in construction will be available for the next generation."

"I believe the world is changing for the better and more opportunities for women in construction will be available for the next generation"

Chandni Vora, Vascroft Contractors

Kate McAdam

Project manager, Morgan Sindall

Kate McAdam has one of the more unusual backgrounds in construction; before joining Morgan Sindall, she was an operatic soprano, but a health issue affecting her vocal cords meant she had to look for other career options.

"I enjoy renovating houses with my husband, and so I tried interior design initially, but found it quite lonely as I like people around me – and that's when I realised that construction project management was the obvious thing for me," she explains.

McAdam joined Morgan Sindall's graduate trainee scheme in 2016, doing a NVQ in Construction Site Management while working full time. Her first project was Albion School in Rotherhithe, London, and she is now project manager on the £7.1m refurbishment of a Grade II-listed senior school in Fulham.

"Refurbs makes me tick," she says, "bringing old buildings back to life, remodelling them into spaces that work for students. It's important from a green perspective too; retrofitting existing stock rather than building new is more sustainable. Construction has to take more of a role in saving the planet."

McAdam takes great pride in how quickly she has progressed to project manager level. "When I joined Morgan Sindall, many people thought it would take me 10 years, rather than four," she says. "But career changes are common now. In my role, every day I am talking to clients, dealing with people from many different walks of life; my background in music has prepared me well for that. After all, life is a performance!"

Despite her own rapid progression, McAdam believes construction still has work to do on diversity and inclusion.

"Morgan Sindall is committed to improving its gender balance," she says. "However, since January 2020, the only two women on my site have been the site cleaners, and Anjali [Pindoria] from subcontractor Avi Contracts – that's out of 500 operatives on site. I still hear, second hand, that many men are shocked that I am running a project. Yet there is no reason why women can't work in trades; I enjoy tiling and decorating as part of renovating my own houses, and I am sure others would too."

Fred Sherratt MCIOB
Interim deputy dean for research and innovation, Faculty of Science and Engineering, Anglia Ruskin University

A native Mancunian, who spent a decade in site roles for Laing O'Rourke, Fred Sherratt now works in academia at Anglia Ruskin University. But she often misses the site "vibe".

"I started out as a temporary site secretary, loved the buzz, and Laing (as they were then) kept me on," she says.

Sherratt took a construction management HNC then a BSc at the University of Bolton, sponsored by Laing O'Rourke, who also supported her PhD on site safety. She progressed to construction manager, before moving into lecturing in 2011 at Bolton, joining ARU three years later.

"Because of my site background, I can bring the practical side to lecturing," Sherratt says. "When I first started, I was teaching students I'd previously supervised on site and ticked off for not having the right PPE. I've also brought through people from trades backgrounds and when these students graduate with new opportunities in front of them, it brings a tear to my eye. When I joined ARU, student satisfaction on the construction management degree rose from 79% to 96%."

"When I first started, I was teaching students I'd previously supervised on site and ticked off for not having the right PPE"
Fred Sherratt MCIOB, Anglia Ruskin University

She feels that "far more" women would enjoy working on site, but tend to get pointed towards architecture. "The site isn't for everyone; but it's a meritocracy where it's pretty clear if you can do your job or not; the wall stays up or it doesn't," Sherratt says. "But I have never found construction sexist, though I did experience sexism in a previous life, working for a blue-chip company."

Sherratt remains involved with research and is part of the CIOB's Health & Safety Special Interest Group. Her latest project is the DigiConCo-Op, supported by the Transforming Construction Network Plus, which aims to create a more collaborative approach to micro-project delivery.

"It is partly inspired by the principles of Factory Records, as laid down by co-founder Tony Wilson," she explains, "where the artists own everything. I'd like to see that thinking on small, community projects for the construction workers, who are as much artists in their own right."

Kirsty Parkin, crane operator and surveyor, **Olivia Rollinson,** crane operator, GGR Group

Olivia Rollinson joined Kirsty Parkin last year as the second crane operator at GGR Group, where they have been involved in major lifting projects for National Grid and Network Rail.

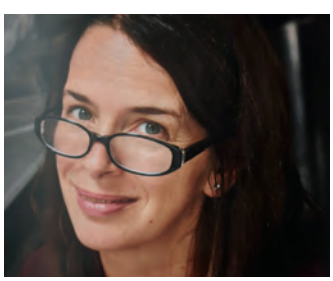
Parkin grew up on a farm in New Zealand, surrounded by machinery, and joined GGR in 2012, where specialist training has qualified her to operate, spider cranes, crawler cranes and trailer cranes. She now works as a technical surveyor, while working an operator or appointed person when needed.

Rollinson was previously at York University, graduating with a 2:1 in Biology, and joining GGR's training scheme.

"For any females looking to get into the crane industry, all it takes is dedication to gaining the right qualifications and a company willing to give you the experience and tools to succeed," Parkin says.

Kirsty Parkin (left) and Olivia Rollinson

"For any females looking to get into the industry, all it takes is dedication to gaining the right qualifications and a company willing to give you the experience and tools to succeed"
Kirsty Parkin, GGR Group



Emma Nicholson FCIOB
Development project manager, SLC Rail

Emma Nicholson has 22 years of built environment project management consultancy, recently moving to the rail sector. She is a member of the CIOB's equality, diversity and inclusion advisory panel and a board trustee for the Women's Engineering Society (WES).

A chartered environmentalist, who worked as venues sustainability manager for London 2012's sustainability team, she recently set up the Women in Sustainable Rail group.

"I believe legislation can make a difference in driving down carbon emissions, rather than voluntary sustainability obligations on projects which can be avoided," Nicholson says.

"I hope to see changes in diversity and inclusion this decade, and EDI data collection can support this; for example, a WES survey has highlighted the issues women face with PPE."

40%

Nuclear Sector Deal's target of 40% women in the industry by 2030

From left: Daniela Perciog, Tanya Hamilton, Gerda Ruksna, Dovile Jokimciute, Jun Yue, Sylvia Wheatcroft

Daniela Perciog MCIOB, Tanya Hamilton, Gerda Ruksna, Dovile Jokimciute, Jun Yue and Sylvia Wheatcroft, various roles, Lee Marley Brickwork

Specialist stonework contractor Lee Marley has six female professionals working in the business: Daniela Perciog, quantity surveyor; Tanya Hamilton, scaffolding surveying manager; Gerda Ruksna, site administrator; Dovile Jokimciute, health, safety and environment manager; Jun Yue, system manager; and Sylvia Wheatcroft, logistics manager.

Perciog says: "Construction industry is a male-dominated industry and this can be intimidating, but from experience, as soon as you can prove that you know what you're talking about, you gain respect from the entire workforce. Remember you have just as much to offer as any male colleague."

She feels the industry needs to change its perception as a "male-only career" to help plug the skills gap.

Lidia Bosa MCIOB Project manager, Sizewell C/EDF Energy

Australian by birth, Lidia Bosa has spent the last decade with EDF Energy, working in the nuclear new-build sector, firstly for Hinkley Point C and recently switching to Sizewell C.

At Hinkley, her role included developing and implementing mitigation strategies for communities affected by noise and property blight caused by the construction of the new plant. Her new role at Sizewell C will also focus on stakeholder engagement.

"I love what I do; and that is to help people stand back and see the bigger picture," Bosa explains. "I am so proud to have the opportunity to be working on these mammoth, exciting projects. My days are varied, and even during lockdown I have been out visiting sites. A typical day at Hinkley might range from dealing with Wessex Water over a leak, to arranging noise insulation at a local resident's property."

Bosa is involved with the Women in Nuclear group and was lead for the western region while at Hinkley. "We are supporting the mission to achieve the Nuclear Sector Deal's target of 40% women in the industry by 2030; currently it is at 22%," she says. "My work includes getting ambassadors to join the network and become mentors, speaking at events and promoting women in nuclear on social media."

OCEAN DRIVE MEDIA

Dr Bridgette Gasa
Managing director,
The Elilox Group, South Africa

Dr Bridgette Gasa first qualified as an architectural practitioner in 1998, and her "appreciation" for the variety across the built environment disciplines led to a transition to construction project management and she later completed a PhD in construction management before setting up her own "flourishing" contractor business.

"I have built facilities varying from schools and clinics to commercial properties," Gasa says. "Currently, I am looking into an energy project development which will be a definite game-changer in South Africa."

A past president of the CIOB's Africa region, Gasa says that starting The Elilox Group is the career achievement that has given her "the most satisfaction", though she feels there is still "a shortage of professional females at C-Suite levels".

"I would still like to see a more representative gender balance in the industry and an increase in embracing digitisation; the pandemic has accelerated this need," she adds.

"There is still a shortage of professional females at C-Suite levels"
Dr Bridgette Gasa, The Elilox Group

Technical

SHAUN ARMSTRONG

LUTON DART POINTS IN RIGHT DIRECTION

THE TRANSIT SYSTEM BEING BUILT TO CONNECT LUTON AIRPORT WITH ITS NEAREST RAIL STATION IS A COMPLEX JOB, INTERFACING WITH LIVE ROAD, RAIL AND AIR ENVIRONMENTS. KIER'S OLIVIA PERKINS, WHO IS RUNNING THE BUILD, TALKS **CM** THROUGH THE MAJOR CHALLENGES

The Gateway Bridge was moved to the site on two self-propelled transporters

"Communication is absolutely key here," says Olivia Perkins, Kier's senior project manager in charge of the Luton DART project, which has an overall value of £225m. And it's not difficult to follow her reasoning when she describes the complexities of scheme.

Officially known as Direct Air-Rail Transit, this cable-drawn passenger transport system will link London Luton Airport with the nearby mainline Luton Airport Parkway station across a busy dual carriageway. There are several significant design and engineering challenges to coordinate, plus interfaces with live airport, rail and road environments and a workforce of over 200 at peak to manage.

Fortunately, Perkins has plenty of experience of major infrastructure projects – and large project teams.

"I've got five section managers in charge of the seven different sections [see map], and each of them is always vying for shared resources," she explains. "We've only got one concrete supplier across the whole DART project and at times there were clashes over which concrete pours took priority. So I had to make tough choices and do what's right for the job overall, and the client."

The VolkerFitzpatrick-Kier JV (VFK) began work on the DART scheme in April 2018. From the Parkway station next to the mainline rail connection, the route – which climbs around 30m

The Gateway Bridge is a 1,000 tonne steel structure with concrete deck

1,000

over its 2.1km course – heads south-east over a 350m-long concrete viaduct then crosses the A1081 Airport Way on the curving Gateway Bridge.

This 1,000 tonne sloping steel structure, 80m long, was prefabricated over eight months at a location half a mile away before being taken to the site on two self-propelled transporters. The bridge was raised up on jacks, then lowered into place during a 10-hour window in November 2019.

"The design of the bridge structure had to be stiffened to take into account the transportation, the equipment required to install it at the site, and the temporary propping," says Perkins.

"Digital visualisations were really helpful in planning the operation. We created a simulation of the bridge travelling along the road and were able to see if any trees or street lighting would be affected. Demonstrating how the structure would be lifted off the transporters and set into place was very helpful for the workforce. The simulation was also informative for the local council and our airport client."

After the Gateway Bridge, the DART turns north-east, climbing steeply alongside the A1081, before running in a trough through the mid-stay car park. It then dives into a cut-and-cover tunnel, beneath the taxiway, before twisting under the A1081 again, then emerging in the Central Terminal station.

Digital technology has come into its own here too, says Perkins.

"For the cut and fill section, we used GPS machine control using Trimble software, programming the earthmoving equipment with the required profile data," she explains. "This meant a more efficient dig, minimising the amount of material excavated, and by using 'fill areas' around the airport, we sent zero waste to landfill."

The excavated sections were lined with sheet piles and the tunnels and tunnel approach areas – around 350m of the route – were braced with hydraulic props from Groundforce. "Through value engineering, we were able to remove approximately one-third of the props along this section, compared to the original design," says Perkins. "Sensors monitor the loads on the props and validate the assumptions in design."

Construction of the two stations also required complex engineering. The Parkway station sits at ground level, extending 7m in height, while the Central Terminal station is being built underground, using a mix of top-down and bottom-up methods, beneath the airport's old drop-off area.

Both feature parasol-style roof designs – "giant umbrellas which span the width of the station", as Perkins puts it, with gold-coloured cladding.

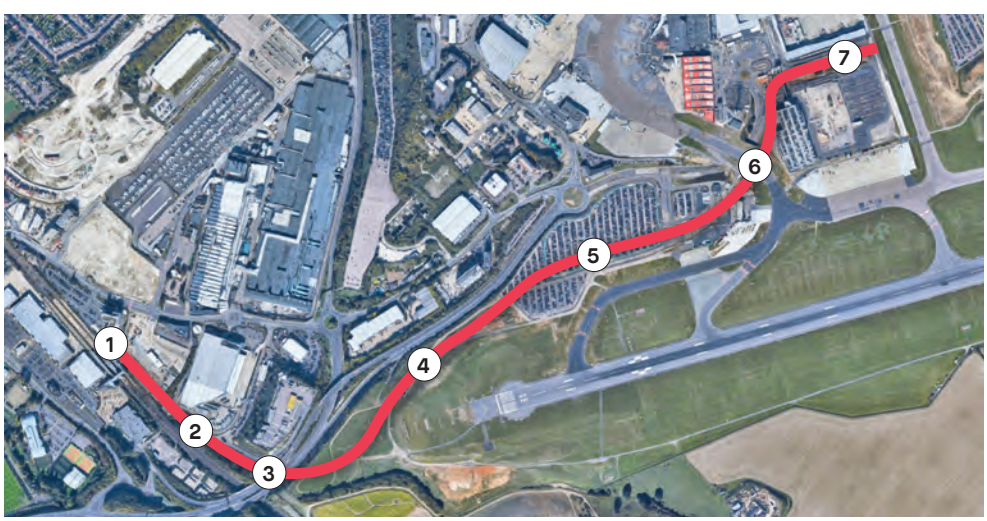
The Luton DART build sections

1. **Luton Airport Parkway station** 150m long, 7m above ground level, constructed from reinforced concrete
2. **Viaduct** 325m-long, 15m wide, seven 15m-tall piers, built in situ
3. **Gateway Bridge** 72m long, 1,000 tonne steel structure with concrete deck
4. **Cut and fill section** Excavations along the DART route which runs parallel to the A1081
5. **Trough** Excavated channel through mid-stay car park with sheet-piled retaining walls
6. **Tunnel section** 350m-long cut-and-cover construction, under taxiway
7. **Central Terminal station** 100m long, reinforced concrete box, mixture of top-down and bottom-up construction.

Construction manager CV: Olivia Perkins, Kier

During her civil engineering MEng at Loughborough University, Perkins spent a year with Kier Regional Building, but she has worked on infrastructure schemes since graduating. She spent four years on Crossrail, then moved to HS2, working on tenders and the ECI phase, and spent two months in France with Kier's JV partner Eiffage, to learn more about high-speed rail. After a travelling sabbatical, she joined the Luton DART scheme in May 2019, taking overall responsibility for the project in summer 2020.

Luton DART route and build sections



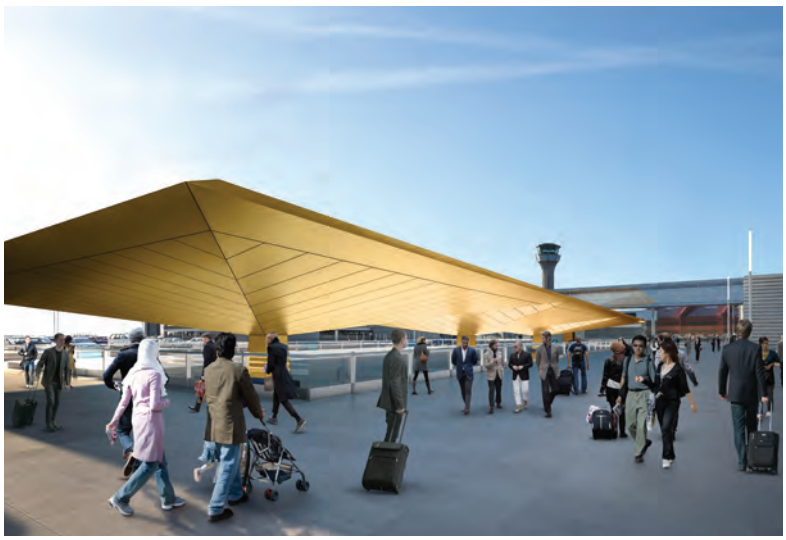
Cantilever beams

The structure of each parasol comprises central columns which support eight high-level cantilever beams, spanning longitudinally, transversely and on the diagonals. Each bay is 22m wide. The cantilever beams are tapered steel plate-girders, varying from 1.2m deep at the root to 0.45m at the tip, to limit their weight.

"To take the weight of the cladding, we had to pretension the cantilever steels which extend out from the vertical sections," says Perkins.

"This type of roof structure can deflect under asymmetric loading, particularly wind. Stainless Macalloy bars, 42mm in diameter and ▶

22 The 22m-wide parasol roofs are supported with pretensioned cantilever steels



preloaded to 230kN each, provided the necessary restraint against deflections."

The 100m-long Central Terminal station is being constructed in a deep concrete box, where the design required a fair-faced finish on the 8m-high lining walls. "Normally, we'd tie the shuttering into those walls so the shutters wouldn't pull away during the concrete pour – however the client didn't want tie holes visible," explains Perkins.

"Instead, our subcontractor NJ Doyne, with Peri, devised a temporary works solution where we had two parallel wall shuttering systems, one on either side of the station box, with a massive prop in between to balance out the forces. Once this system was in place, we could do a pour a week, moving the shuttering system along the length of the station."

On completion, the Kier JV will hand over a full digital asset model to the client – down to the concrete mixes used. This process is managed using Dalux BIM management software, which was also used to digitise daily diaries and checksheets.

The project has remained operational throughout the pandemic, working in line with the CLC's site operating procedures, says Perkins.

"This has actually promoted safety improvements," she explains. "We stopped and reassessed a number of the operations for social distancing, which allowed us to rethink how activities were executed that we sometimes take for granted. For example, we reduced manual handling to improve social distancing, increasing mechanical methods for moving materials around during the reinforced concrete works.

"Installing the parasols meant having more than one person in a cherry picker. We couldn't avoid that. So we used larger MEWPs, minimised close proximity time, added PPE and put teams into 'bubbles'. "

Skills training hub

One legacy of DART that Perkins is especially proud of is the Construction Skills Hub, a joint venture between Kier, VolkerFitzpatrick, the client and local authority. "We have delivered construction skills training for 720 people in the local community and employed 33 apprentices across the project," she says. "The DART project may be relatively small in terms of national infrastructure, but the local upskilling programme has been a major achievement."

Reflecting on her role leading the project, Perkins says "this was a stretch position" but a "great experience".

"I have worked on major infrastructure schemes before but working in and around a live airport is challenging. We have worked hard as a team to build trust with the airport, local council and our client.

"The main focus for me has been good communication and creating a framework that gets the team working together. We have had a diverse and young team at Luton DART, keen to prove themselves, alongside some highly experienced foremen. It is the shared achievements of a number of these individuals that has created a level of teamwork that has overcome the many technical challenges."

The project is scheduled to finish early in 2022. Once in service, the Luton DART will allow rail passengers alighting at the Parkway station to reach the airport in under four minutes, 24 hours a day.

Project team

Client: London Luton Airport Ltd
Value: £225m
Main contractor: VolkerFitzpatrick-Kier
Main consultant: Arup
Transit system: Doppelmayr
Other consultants: Tony Gee & Partners, Hewson Consulting Engineers, RPS Group, Coffey
Key subcontractors: NG Bailey, NJ Doyne, M O'Brien, Severfield, Prater, Victor Buyck, GEL Engineering, Cemex, Arcelor
Programme: April 2018-early 2022

"The main focus for me has been good communication and creating a framework that gets the team working together"
Olivia Perkins, Kier

Top: Visualisation of the parasol roof of the Central Terminal station

Below: The team working on the Tunnel section of the DART project

A WEIGHT OFF

A KING'S CROSS MIXED-USE DEVELOPMENT WAS THE FIRST PROJECT MANAGEMENT ROLE FOR BAM'S EMILY HOGGINS. LIVE RAIL TUNNELS, A UNIQUE ROOF DESIGN AND A PANDEMIC ENSURED IT POSED PLENTY OF CHALLENGES

N1C, the brand new postcode for the regenerated King's Cross, is welcoming its latest addition in the form of mixed-use development Q1 at 22 Handyside Street.

This build is one of 50 new and refurbished buildings that make up the biggest mixed-use development in single ownership in central London for over 150 years. Residents include Google and Universal Music – and Facebook is soon to move in.

Built by BAM, Q1 offers 36,000 sq ft of office space with retail units on the ground floor. The commercial building sits above Network Rail's three Gasworks Tunnels, which run 1m beneath it, on the corner of York Way and Handyside Street.

Coffey Architects' building design captures light cleverly but its shape was born out of the constraints of the tunnels. The building's form is determined by three factors: the position of the sun, the site perimeter and the site's structural grid. Sitting above Grade II-listed railway tunnels, it needed to be super lightweight. Responding to these elements, Coffey Architects shifted the three-storey building diagonally. This helped balance the weight of the building while improving the orientation for heat gain, directional flow and outward views.

But what this design and the position over tunnels also did was present technical challenges for BAM and Emily Hoggins, who oversaw the build in her first role as project manager.

"It was built over three Network Rail tunnels – two of which were live – so we needed a specific construction methodology. The tunnels are Victorian brick built, so any product over them had to be lightweight," she explains.

Below: The building occupies a corner plot above live railway tunnels

Right: 22 Handyside Street is built of lightweight concrete and steel

COFFEY ARCHITECTS

BAM built 750mm-deep strip foundations with a bespoke lightweight concrete with stringent QA procedures, and Jablite infills

750

"It was my first project as project manager and it was a big step up. I had to look at every element from design and planning to build"
Emily Hoggins, BAM

JOHN STURROCK

22 Handyside Street is built of lightweight concrete and steel. The steel frame was designed by Arup, which also helped devise a construction methodology working in 7m sections to avoid too much heave on the ground, with the lowest point 800mm from the crown of the tunnels. BAM built 750mm-deep strip foundations with a bespoke lightweight concrete with stringent QA procedures, and Jablite infills.

The bespoke concrete was essential to meet the weight restrictions – to ensure it was light but strong.

"We used Socotec and had it weighed and quality checked. As we were so very close to the tunnels, we had it constantly monitored with readings every 15 minutes and designed to send out alerts 24 hours a day – even at 2am on a Saturday night," says Hoggins.

It took over a year to develop the strategy and methodology for this challenge, which had a nine-week programme. Hoggins says BAM worked closely with the project partners – Network Rail, the King's Cross Estate, Arup and Argent (which has managed the regeneration of King's Cross since creating the masterplan in 2001).

The unique roof design – a pitched roof form with a diagonal emphasis following the lines of the tunnels – was also tricky. "The complicated standing-seam pitched roof had eight valleys at a 45-degree pitch – all angles and twisted roof steel," Hoggins explains.

"The installation was difficult – even getting a handrail there was a challenge with the geometry. Ensuring it was safely installed was tricky. The copings were a challenge too due to the pitch of the roof, so had to be modelled, individually laser cut, bent and then dipped."

The building boasts a facade composed of glazed curtain walling and embossed and perforated anodised aluminium panels and is on target for BREEAM Outstanding.

Testing times

As if the build couldn't present enough challenges, along came covid. Inevitably it delayed progress – Q1 was at fit-out stage when lockdown happened in March, with completion due on 20 July.

"We stopped for a week and then put into place safety, welfare and hygiene measures, which included one-way walkways and raising RAMs (risk assessment method statements)," says Hoggins. "We got back to 40% productivity and adapted as the guidance changed until we got back to maximum productivity. We completed, with only a 12-week delay, on 19 October."

She attributes riding out this challenge to good understanding between parties. Having worked on King's Cross projects since 2010, Hoggins already had a relationship with Argent – "I knew their way of working," but adds "I really appreciated the relationships with partners, especially when covid hit. We relied on our subcontractors hugely but we all pulled together and made it move forward safely. There were different operating procedures and details but working in a close-knit team made the difference."

Throughout, Hoggins says her biggest task was quality management – a new demand as project manager, having previously worked at senior site manager level, but one she has clearly met successfully. The build received critical praise and is now fully let.

"It was a big thing for us and as project manager I had to ensure quality standards were adhered to. It was my first project as project manager and it was a big step up. I had to look at every element from design and planning to build. I was in at the deep end."

Construction manager CV: Emily Hoggins

Emily has worked in construction for 12 years with BAM since joining on a university placement. She has worked on King's Cross projects for 10 years, including the University of the Arts, the £145m Western Transit Shed and the £49m Aga Khan Centre, before taking on her first project management role on King's Cross Q1.

Project team

Client: King's Cross Central Limited Partnership
Principal contractor: BAM
Structural Engineer: Arup
Architect: Coffey Architects
Subcontractors:
Facade and roof: Fleetwood Architectural Aluminium
Steel frame: B&K
Raised access floor: Kingspan
Drylining: Wallrite
Valchromat: Calanpoint
MEPH: Michael J Lonsdale
Carpentry: Atlantic Contracts
Lifts: KONE
Glazed screens: OAG

COFFEY ARCHITECTS

Perforated anodised aluminium panels and glazed curtain walling on the facade

Errolene Stanbridge
Viega

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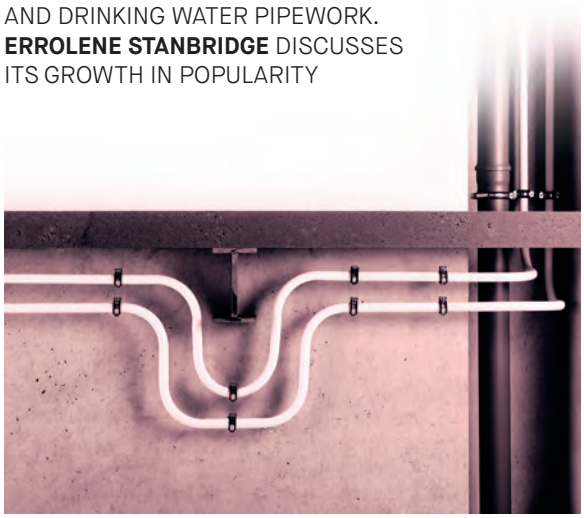
HOW TO MAKE PIPEWORK INSTALLATIONS SIMPLER

DEVELOPMENTS IN MULTILAYER PIPE MEAN IT IS NOW INCREASINGLY USED FOR APPLICATIONS SUCH AS HEATING SYSTEMS AND DRINKING WATER PIPEWORK. **ERROLENE STANBRIDGE** DISCUSSES ITS GROWTH IN POPULARITY



While copper and stainless steel are the traditional go-to materials for many building service systems, the properties of multilayer pipe can provide additional benefits such as a reduced number of fittings, minimal pressure loss and the ability to work in narrow areas.

Multilayer pipe consists of inner and outer layers of thermally resistant cross-linked polyethylene (PEX) with a layer of aluminium between, which delivers durability and retains the shape. The inner and outer layers protect the metal from corrosion. Similar to copper, multilayer pipe has a variety of applications including heating systems, hot and cold-water pipework and drinking water.

Above: Flexible Viega Smartpress multilayer piping reduces the need for connectors

Right: Lengths of multilayer pipe can be cut direct from the coil and easily installed

As building size increases, the complex geometry to which the pipes must conform increases as well – this can be a challenge when specifying piping systems. One benefit of multilayer piping is that it can be easily shaped using hand-held tools, without the risk of buckling.

This means that pipes can be adapted easily to the needs of the building without the need for cutting and joining them together. Additionally, multilayer pipe can be supplied in lengths of up to 200m and can be used directly off the coil – the installer simply needs to cut the length of pipe that is required.

Being able to bend the pipes is an important consideration, as the larger the number of connectors needed for a piping system, the greater the impact on the performance of the building services. Fittings and pipe connectors all contribute to the overall friction of the pipework and cause a reduction in flow and water pressure.

The resistance added by each component can be measured as a pressure loss coefficient, also known as the zeta value. The total interior surface area of the pipe also contributes to the friction within the system, so longer pipe runs will increase the pressure loss. The selection of both pipe and connectors with low zeta values will help optimise the performance of the system.

Viega's Smartpress system, for example, can reduce pressure loss by over 80% compared to standard designs, due to its very low zeta values. A standard design brass degree elbow connector with a zeta value of 17 will result in a pressure loss of 340mbar at a flow rate of 2m/s, whereas Viega Smartpress offers a flow-optimised alternative with a zeta value as low as 2.7, resulting in a pressure loss of only 54mbar at the same flow rate.

In addition, the Viega Smartpress system replaces the traditional O-ring construction with a robust and durable polyphenylsulfone (PPSU) support structure that also simplifies the installation process. This provides up to a 30% time saving on site when compared with alternative systems.

To ensure reliability, Viega's Smartpress range features a solution to highlight any connections that may have been inadvertently left unpressed during installation.

Some press connection products will appear secure by not leaking at a nominal test pressure, only to fail when the system is operational, but Viega's Smartpress products incorporate a flowpath channel called the SC-Contur, meaning that unpressed connections are guaranteed to leak during a test; wet pressure tests use pressures anywhere between 1.0 and 6.5 bar, and dry tests between 22mbar and 3.0bar.

The Viega Smartpress system is manufactured from high quality stainless steel, ensuring a reliable and durable system – as a lower quality multilayer pipe can buckle under pressure, causing costly remedial work later on. In addition, it is tested and approved for use within drinking water applications, to certify that it does not contaminate the water.

For further information about Viega's range of solutions, including the Viega Smartpress system, visit: www.viega.co.uk.

Errolene Stanbridge is a technical sales manager at Viega.

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Timber

RICHARD NEWTON / ALAMY

The government's 10-point plan for the Green Industrial Revolution is keen to encourage carbon capture and storage. Planting forests with trees we can build with should be part of the plan, say proponents of timber construction

TIMBER TARGETS GREEN INDUSTRIAL REVOLUTION

CARBON REDUCTION, OFFSITE MANUFACTURING, WELLBEING, LOCAL SOURCING – TIMBER ANSWERS MANY OF UK CONSTRUCTION'S MOST PRESSING QUESTIONS. BUT WHEN WILL THE SECTOR START, ER, PULLING UP TREES? BY **KRISTINA SMITH**

It feels a bit like Groundhog Day. In October 2000, the Wood for Good campaign launched, with its message about the environmental benefits of using timber more widely in construction. Twenty years later, it is still trying to get that message across.

"We wanted to go back to basics and communicate with a variety of audiences," explains Wood for Good's campaign manager Sarah Virgo of the body's 'Wood CO_2ts less' campaign, which was launched last summer. "It focuses on the entire cycle, the fact that we need sustainably managed forests because they help suck up all the CO_2 from the atmosphere and store it."

With the government's pressing emissions reductions targets, its so-called 'Green Industrial Revolution', and its instructions to count whole-life carbon in its new procurement guide, *The Construction Playbook*, Wood for Good should be pushing at an open door. But it isn't. There seem to be too many opposing forces at the other side of the door: concerns over fire performance, interests of other materials manufacturers and an unwillingness to force change on commercial housebuilders.

"Government legislation has held innovating with timber back," says Tabitha Binding, university and regional engagement manager at the Timber Trade Federation (TTF). "It's not that we cannot do it; the problem is that there's no drive

"We need sustainably managed forests because they help suck up all the CO_2 from the atmosphere and store it"
Sarah Virgo, Wood for Good

to do it without the legislation and regulation we need."

Nevertheless, there have been some significant changes in the way we use timber in our buildings since Wood for Good was created. The use of structural engineered timber such as CLT (cross-laminated timber), nail-laminated timber (NLT) and glue-laminated timber (GLT or glulam) has come on in leaps and bounds. This is timber, but not as we knew it – modified so that its properties are enhanced and uniform, offering new possibilities for design and construction.

Locking up carbon

As well as mass-engineered timber, there has also been an increase in engineered timber for applications such as doors, windows and other joinery. Engineered timber of all types enhances the environmental good news story, explains Ewa Bazydlo, environmental manager at timber product supplier James Latham Group.

Take Accoya, for instance. It is made from treating fast-growing pine trees that take around 30 years to reach maturity, yet Accoya has a lifespan of 60 years.

Engineered timbers, such as Thermowood or Latham's WoodEx, have other benefits too. Because they don't have the variations that natural timber does, there is less waste; you don't have to throw away the knotty bit. "They increase the technical performance of the product, the lifespan and the durability," says Bazydlo. "They are also more stable, and easy to work with."

One downside to this good-news story is that most engineered timber is imported to the UK from northern Europe – which means we are losing out nationally on those carbon sequestration benefits that come from growing our building materials. Two research projects in Scotland are demonstrating how we can work with home-grown timber (see box below).

"Although there will always be a place for imports, there really is a big market opportunity, particularly for CLT," says Virgo.

To create locally engineered timber products requires long-term vision, says Dr Antiopi Koronaki, a research associate at the University of Cambridge's Centre for Natural Material Innovation. ▶

Housebuilder Barratt, which has set itself demanding carbon reduction targets, bought timber manufacturer Oregon last year

Home-grown homes

Research projects in Scotland and Wales aim to encourage the use of home-grown timber for housing construction

Wales' Home-Grown Homes Project published an in-depth report about its findings in December 2020 after nearly three years of work. Led by Powys County Council, its output is a raft of tools and guidance on everything from designing for net-zero whole-life carbon to building a Welsh wood economy to fighting negative perceptions.

In Scotland, a consortium is manufacturing the first Scottish-sourced cross-laminated timber (CLT) and nail-laminated timber (NLT), using the UK's only vacuum press at the Construction Scotland Innovation Centre (CSIC) facility in Hamilton.

The CLT and NLT will be used to create the superstructure for a house to be showcased at the COP26 United Nations conference on climate change, which will be held in Glasgow in November.

Researchers from the Scottish project say that their home-grown solution could reduce capital cost by up to 10% – as well as reducing carbon emissions by reducing transportation costs.

Precision-engineered timber components for schools could be manufactured using robotically aided CNC tools

"Engineered timber of all types enhances the environmental good news story"
Ewa Bazydlo, James Latham Group

"We need to be careful and strategic about what type of trees we plant," says Koronaki, who is researching the use of digitally delivered engineered timber for schools (see box, right). "We need to be sure that we can get the engineered products we need and that the trees we plant contribute to the biodiversity of the forest."

Her project aims to demonstrate how we could deliver even more value from engineered timber by using manufacturing techniques that link logistics, design, manufacture and assembly. The proposition is that schools would cost less to deliver, less to run, emit less carbon, boost the UK manufacturing sector – and boost the wellbeing of our kids.

New timber generation

New materials, such as engineered timber, require new skill sets. "When you use timber, you really need to understand its properties to get the best from it," says Binding. "You need to understand what product to use where." ▶

The use of structural engineered timber such as glued laminated timber has grown in popularity in the UK, but use of combustible materials in any part of an external wall above 18m is now prohibited

Digitally designed timber schools

Cambridge University's Centre for Natural Material Innovation is devising a blueprint for the delivery of engineered timber school buildings

The thought of sending our children to school in a building dominated by timber, rather than concrete and steel, will seem appealing to many. And probably unrealistic. With the huge number of schools needed, the current mood is that buildings must be cost effective and utilitarian.

With engineered timber you can have it all, says Dr Antiopi Koronaki, a research associate at the University of Cambridge's Centre for Natural Material Innovation.

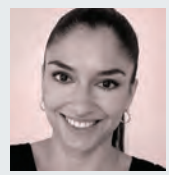
"You don't have to choose between a high quality, healthy environment and utility and cost efficiency," she says. "Modern construction methods and engineered timber can address both of these challenges."

Koronaki is researching how precision-engineered timber and digital design and delivery can lead to healthier schools. The three-year project, which is around halfway through, aims to look at the changes to procurement and policy that would be needed, as well as technical issues.

"Our aim is to develop a set of school designs and a means of fabricating them," says Koronaki, an architect-engineer who specialises in fabrication.

The project is led by Dr Michael H Ramage and Koronaki's collaborators include Dr Darshil U Shah, Dr Aurimas Bukauskas and Ana Gatóo. The research forms part of the Centre for Digital Built Britain's (CDBB) work at the University of Cambridge within the Construction Innovation Hub (CIH). The CIH is funded by UK Research and Innovation through the Industrial Strategy Challenge Fund.

Delivering schools in this way at scale would require a more collaborative approach which involves architects, engineers and digital fabrication specialists.



"You don't have to choose between a high quality, healthy environment and utility and cost efficiency"
Dr Antiopi Koronaki, Cambridge University

It would also need new skill sets, says Koronaki: "For the broad application of engineered timber construction, the government may also have a role to play in funding and coordinating with industry bodies to deliver skills training programmes for workers across the supply chain."

Engineers, architects and others need to understand how the engineered timber panels and components are used, how to design connections and what the construction sequence will be. It's vital to consider logistics: for instance, the size of CLT panels, how they will be transported and how they can be most efficiently manufactured into building components.

"It's important to develop methods that recognise the different stakeholders and allow them to collaborate from Day Zero," says Koronaki. "It requires more coordination early on. The costs shift to the beginning of the project, but they are fixed earlier, you reduce the risk and any contingencies and it's easier to assign risk to the right stakeholders."

The project will also be working closely with policymakers to try and make changes there. "While there is knowledge on how to build schools using timber in the UK, there is a lack of incentives and policies for timber to be used more widely," says Koronaki.

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"When you use timber, you really need to understand its properties to get the best from it"

Tabitha Binding, Timber Trade Federation

Binding works with universities, lecturers and students to educate them about the challenges of designing with wood. Though traditionally it has not been part of the curriculum, universities including Anglia Ruskin, Cambridge and Edinburgh Napier are now including timber on their courses.

The TTF with the Timber Research and Development Association (TRADA) also holds an annual interdisciplinary competition for students. This year's competition, which was launched at the beginning of February, asks the students to design housing for Riverside Sunderland to create a carbon neutral quarter; more than 150 students from 25 universities have enrolled.

Multi-disciplinary teams are vital for efficient design and delivery in timber, says Binding: "My real plea is that construction is seen as a skilled industry, where people understand building risks and complexity."

Force for change

There was disappointment, when the government published its response to the Future Homes Standard consultation in January this year, that it had ignored the many calls for embodied carbon to be included.

While the government fails to join up the dots between climate change, embodied carbon and building materials, some built environment professionals are taking matters into their own hands. Organisations such as the Architects' Climate Action Network (ACAN) and the London Energy Transformation Initiative (LETI) are campaigning and creating guidance to precipitate change.

There is force from shareholders and investors too. Housebuilder Barratt set itself demanding carbon reduction targets, including embodied carbon, in April last year.

Then there's the growing business of carbon offsetting, used by Barratt and many others to help reach their corporate carbon neutral goals. Forestry group BSW launched CarbonStore in September last year where landowners can market woodland carbon and businesses can buy it. Virgo suggests housing associations or housebuilders could even invest in forests which they could later build homes in.

It feels like the forces pushing on that timber door are gaining in number and in strength. How much longer will the government keep it closed?

Most engineering timber is imported from northern Europe, though there is increasing research into home-grown alternatives

Fire still a hot topic

Fire safety remains thorny issue for the timber sector

Following the Hackitt review into the Grenfell tragedy, the government banned combustible materials in any part of an external wall above 18m, not just cladding, which means structural wood is out.

It could get worse: the current Combustible Materials review – government response yet to be published – could lower that to 11m.

Many in the industry are calling for a more intelligent approach. "Rather than banning one aspect, we should really be looking at all the different aspects that we can add or take away from a building," says Sarah Virgo.

There is lots of testing and research work underway to help us better understand timber and fire safety, which is vital, says Dr Antiopi Koronaki.

"Timber construction can provide fire protection – amendments to current regulations are necessary to focus the ban of combustible materials on cladding panels above 18m only and make a clear distinction between cladding and primary structure."

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IN PICTURES: SIX INNOVATIVE USES OF TIMBER IN CONSTRUCTION

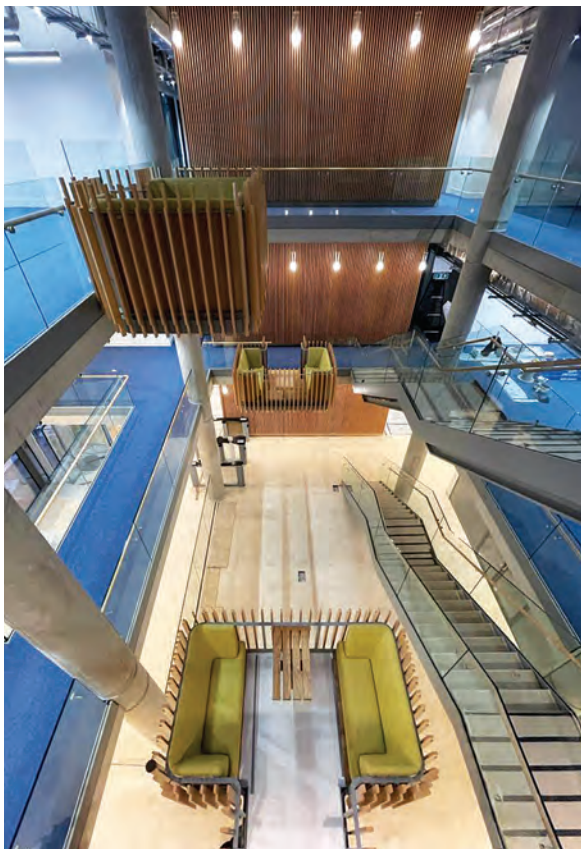
CM LOOKS AT HOW TIMBER IS BEING USED TO DELIVER STRIKING DESIGNS, ACCELERATE PROGRAMMES AND RESTORE HISTORIC BUILDINGS ON CONSTRUCTION PROJECTS AROUND THE WORLD

▲ Sustainable services built with timber

A glulam timber structure, with a curvilinear living roof, is the most striking design feature of one of the most sustainable motorway services on the UK network. Leeds Skelton Lake Services on the M1 in Yorkshire, which features EV charging using 100% renewable energy, was designed by Corstorphine + Wright and constructed by Morgan Sindall.

◀ Timber roofs speed up Bristol housing scheme

Prefabricated timber pitched roof cassettes from Taylor Lane were used by developer Acorn on Brooks Dye Works in Bristol. The cassettes were manufactured offsite in Herefordshire and assembled onsite in around 10 days, a saving of almost two weeks compared to a traditional loose-cut roof. The 80-home site is due for completion in July 2022.



◀ Timber lights up Pears Building atrium

At the Pears Building, the new Institute of Immunity and Transplantation at the Royal Free Hospital in London, timber features strongly in the light-filled atrium, with dramatic acoustic panelling, bespoke timber seating pods, oak stair treads and handrails. Specialist joinery supplier Avi Contracts worked on the installation with main contractor Willmott Dixon.

▼ Milwaukee set for world's tallest wooden building

Currently under construction, the Ascent tower in Milwaukee, USA, will soon be the tallest timber structure on earth. The apartment building uses a system of glued-laminated timber beams and columns, which support cross-laminated timber floors, with two concrete cores providing lateral stability. Korb & Associates Architects designed the building, which will open in 2022.

BETH WALSH

▲ Stepnell restores historic Royal Shakespeare Company building

The Royal Shakespeare Company's costume workshop in Stratford-upon-Avon has been restored by contractor Stepnell, including sensitive works to the timber roof structure of the Grade II-listed building. The work required a thorough heritage and structural survey, with the majority of the existing structure retained, and supplemented with new sympathetically sourced timber.

BURST DESIGN

▲ Glulam features in super sustainable Earth Lab

Earth Lab, a new learning centre in Oxfordshire for environmental charity Earth Trust, has been built using sustainable construction methods including a glulam timber frame, cedar shingle casing, straw bale insulation panels and a rammed earth wall. Contractor Beard will hand over the £1.3m project in March, with an internal fit out before the centre's opening in the autumn.

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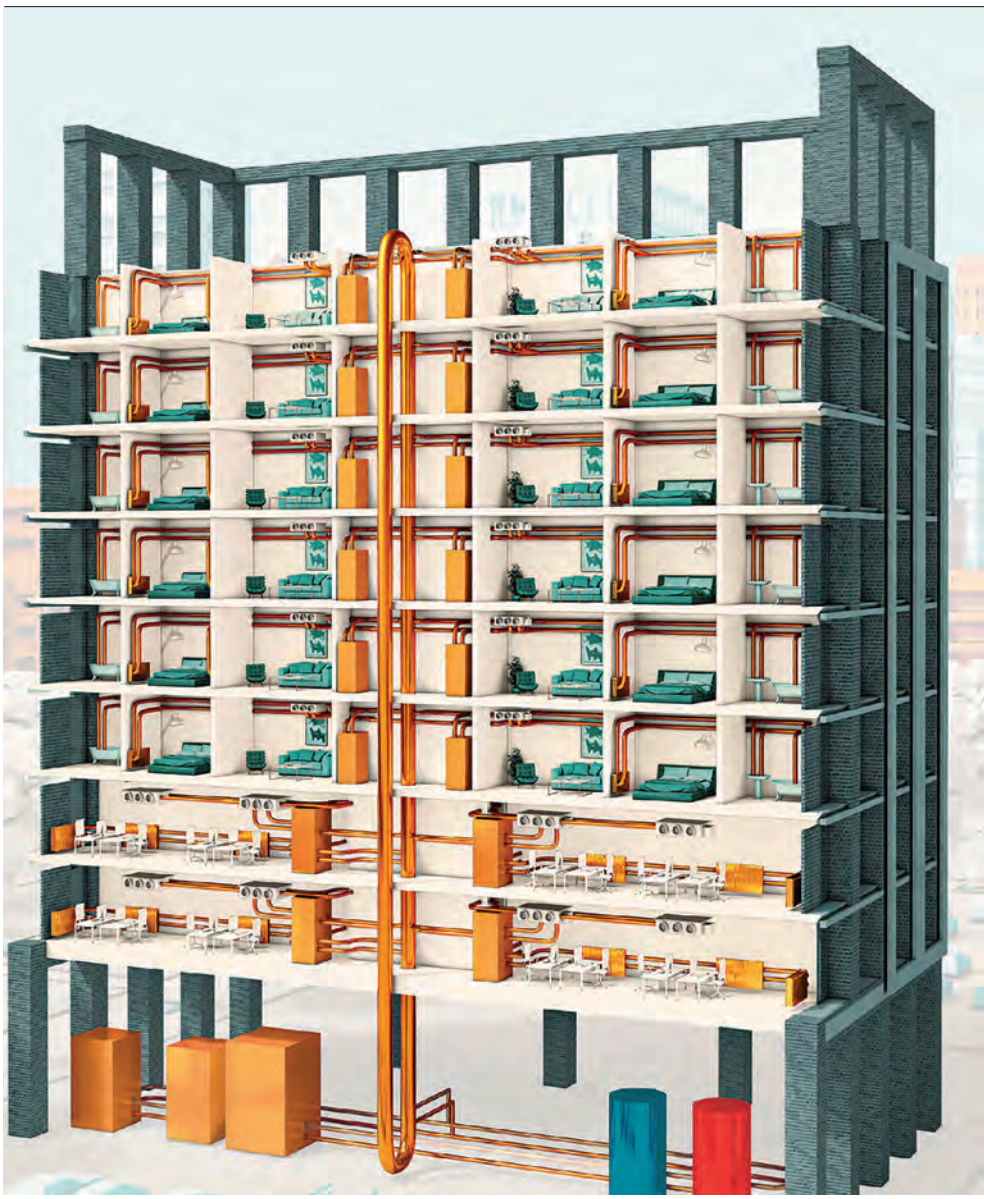

In Glen Dimplex's Zeroth communal heating system a heating loop feeds individual heat pumps for each apartment

RESIDENTIAL HEAT PUMPS AND ENERGY EFFICIENCY

THIS CPD, IN ASSOCIATION WITH GLEN DIMPLEX, CONSIDERS THE APPLICATION OF PACKAGED RESIDENTIAL WATER SOURCE HEAT PUMPS IN CONJUNCTION WITH COMMUNAL AMBIENT HEAT NETWORKS, FOR ENERGY-EFFICIENT FUTURE HOMES

In November 2020, prime minister Boris Johnson outlined a 10-point plan for a "Green Industrial Revolution", which included an increasingly decarbonised electrical supply grid and the "ambition" for an additional 600,000 heat-pump installations by 2028. The target came alongside a desire to implement the Future Homes Standard in "the shortest possible time".

Heating and hot-water production in UK homes are responsible for around 13% of the nation's carbon emissions. As part of the effort to reduce greenhouse gas emissions to net zero by 2050, the draft Future Homes Standard anticipates that an average home will have 75-80% fewer carbon emissions than a home constructed to current standards.

The plan is to realise this by introducing high fabric-efficiency standards, combined with low-carbon heating systems.

As reported in 2015 by the Department of Energy and Climate Change (DECC), UK heat-network schemes – including district heating and communal heating – are thought to serve 200,000 dwellings and 2,000 commercial and public buildings.

District heating serves more than one building (and more than one customer), while communal heating refers to a single building served that has more than one customer.

Although the largest heat-network schemes are predominantly found in cities and on university campuses,

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"Benefits from the increased use of heat networks can include energy cost and CO_2 emissions reductions"

there are also a large number of smaller schemes in the domestic sector, often linking communally heated blocks of flats.

Benefits from the increased use of heat networks can include energy cost and CO_2 emissions reductions, by allowing the exploitation of lower CO_2 and higher-efficiency forms of centralised heat generation. This has traditionally included combined heat and power (CHP), biomass, heat pumps, waste heat and low-grade heat sources.

Generations of heat networks

Heat networks are typically described in terms of 'generations' (see box, p38). Current UK district heating networks are often second to third generation, supplying water at approximately 85°C to meet the needs of existing buildings. Any cooling is typically provided by separate systems, often employing local chillers rather than a district cooling system.

Much of the UK sector has been CHP-based, as the high value of electricity and relatively low cost of gas often made it an economic solution. However, decarbonisation of the electricity grid means CHP is increasingly hard to justify based on carbon savings, As, for example, the UK grid electricity emission factor dropped to an average of 214 g CO_2 per kWh.

An oft-used alternative in new urban, multi-residential buildings – particularly where there is no access to a wider district heat network – is communal heating.

This would typically consist of a main plantroom with heat generators delivering a heating water loop under the control of a building management system (BMS). This heating loop then feeds individual heat interface units (HIUs) in each dwelling, which provide heating and hot water on demand.

The HIU includes a plate heat exchanger with accompanying valves and pumps to distribute the heat to the heating system in each dwelling, or to heat the hot water, as required.

The design of such systems applies diversity to the size and mix of the heat generators in the plantroom to ensure that there is always sufficient heat available while also meeting the local statutory requirements for system efficiency. This – as with all diversity calculations – is subject to degrees of uncertainty, which inevitably leads to some oversizing to ensure no deterioration in service.

The 2015 DECC report *Assessment of the costs, performance, and characteristics of UK heat networks* indicated that the losses for schemes that deliver heat to the individual customer (each dwelling or apartment) were significant, with one scheme – from the selection of 14 existing large heat-network schemes selected as representative of UK installations – recording losses of 43% (with the overall sample average being 28%).

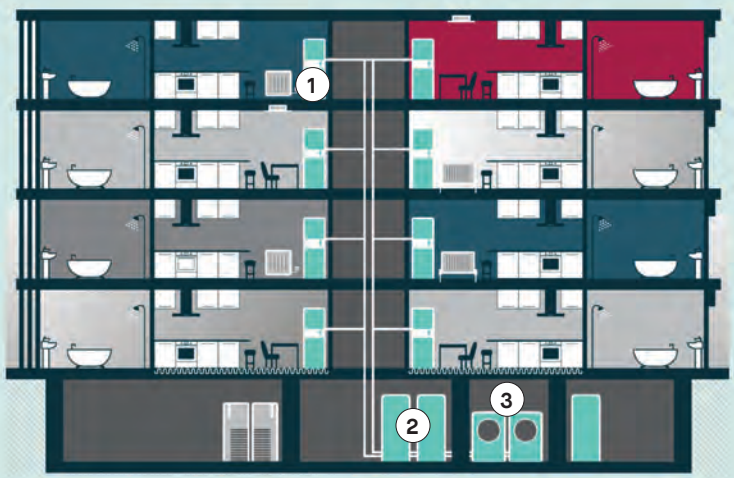
These losses will not only reduce the overall efficiency of the systems, but are also likely to add to overheating problems in summer, as building heat networks operate to meet the need of individual apartment HIUs to deliver domestic hot water (DHW).

Such overheating is particularly prevalent in communal areas – such as corridors, where heat-network pipework traditionally runs in ceiling voids – which can require separate ventilation measures or temporary fans and comfort air conditioning to deal with the issue.

The recently published London Energy Transformation Initiative (LETI) *Climate Emergency Design Guide* illustrates indicative opportunities for reducing energy consumption in new residential ▶

The Zeroth cylinder and heat pump module has been designed to fit within a standard kitchen unit and is suitable for prefabricated applications

Fig 1. Ambient network system with water source heat pumps



1 Packaged water source heat pump and DHW cylinder
2 Chillers
3 Heating generators

developments to transform energy use – in terms of energy use index (EUI) kWh·m^{-2} per year – from current practice to one that delivers a low-energy design.

Among the basket of measures – most of them associated with good building practices – approximately 40% of EUI reduction could potentially be from the application of heat pumps and, to a smaller extent, mechanical ventilation and heat recovery (MVHR) and hot-water efficiency.

Among several other feasible options, LETI identifies water source heat pumps in apartments that are connected to a tempered ambient loop as having the potential for zero carbon once the electricity supply grid is decarbonised (or if the systems are powered by onsite renewables).

The promise of the Future Homes Standard, together with established methodologies such as CIBSE TM59: *Design methodology for the assessment of overheating risk in homes*, and tools such as those developed by the Good Homes Alliance, all aim to identify and mitigate overheating risks in new homes using passive means before mechanical cooling solutions are considered.

However, some homes may require active cooling systems. Without appropriate system design at the planning stage, this will inevitably lead to the further proliferation of the portable air conditioner.

"The use of an ambient network provides greater opportunity to recover waste and employ renewable heat sources"

Residential heat pumps, together with whole-home ventilation systems employing heat recovery, may be designed to effectively provide cooling (as well as heating and DHW). Employing a water source heat pump for each residential unit, exchanging heat with an appropriately designed and controlled ambient communal water loop, can provide heat recycling within a building and can connect to district heat networks so that heat rejected from cooling systems is redistributed to buildings with heat demands.

Renewable heat sources

The use of an ambient network (as opposed to fourth-generation) provides greater opportunity to recover waste and employ renewable heat sources, such as solar water heating, seasonal thermal storage and heat recovered from sewage.

In a system such as that shown in Figure 1, the individual heat pumps are connected to a single communal ambient heat loop, nominally maintained at 25°C flow temperature and, typically, 15°C to 20°C return water temperature. This flow temperature was chosen for this system as an effective mid value, so that the R410A-charged heat pumps can perform consistently at high heating coefficient of performance (COP) and cooling energy efficiency ratio (EER), while also reducing the potential for heat transfer between the insulated loop pipework and the air within the building. ▶

The maturation of heat networks

Popular until the mid-20th century, first- and second-generation networks (steam and latterly high-pressure hot water) were notable for high heat losses.

● Third-generation networks circulate hot water at 70°C to <100°C, but many reportedly suffered from poor control. Most existing UK heat networks use this technology.

● Fourth-generation networks operate at lower temperatures of around 40°C to 60°C. These are more able to use low carbon heat sources and result in lower heat losses.

● Fifth-generation, or 'ambient', heat networks employ water at, or close to, ambient temperature, reducing or eliminating heat loss and reducing the reliance on pipe insulation significantly. These are used in conjunction with heat pumps to raise temperature to deliver heating and hot water.

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Fig 2. Example of installed 6kW heating/4kW cooling residential package

1 **Top –** Heating and cooling system expansion vessels, valves and connections out to heating, cooling and DHW circuits
Mid – Indirect, domestic hot-water cylinder
Bottom – Heat pump and heat exchangers
2 MVHR main unit, including plate heat exchanger, heating/cooling coils and fans
3 Local controller

"Heating and cooling is in the control of the individual residents, so the principal cost of heating and cooling is also directly under their control"

The heat pump in each apartment can be indirectly connected to a range of emitters, including air coils, radiators, underfloor heating and fan convectors. DHW is provided by an indirect hot-water cylinder, packaged within the modular unit, which is charged by the heat pump. An optimised legionella protection cycle employs a direct electric immersion heater to provide top-up heat to stored DHW beyond the 55°C economically attainable from the heat pump.

The heating systems within the space are limited to a flow temperature of 55°C for applications such as underfloor heating, air coils and low-temperature radiators. A 6kW heating/4kW cooling unit, such as that shown in Figure 2, has a heating COP of between 3.5 and 4.1 when producing water up to 55°C, with ambient loop temperatures between 15°C and 25°C. To provide chilled water at 10°C the EER is 5.1, with an ambient loop temperature of 25°C. The unit produces a sound power of 36dBA (similar to a domestic refrigerator/freezer).

The insulated ambient loop design is optimised to ensure the best compromise between maintaining a low pressure drop and minimising heat transfer to the adjacent air. The water flowrate and temperature is controlled to ensure the most effective operating conditions while satisfying the load requirements of the individual heat pumps.

Maintaining flow temperature

The ambient loop flow temperature can be maintained with centralised heating and cooling plant, or may be connected to renewable sources or a wider area heat network (which may benefit from 'waste' heat from district network resources). These systems can be readily included in the calculation of Standard Assessment Procedure (SAP) evaluations through specific methodologies, such as that developed by BRE for the illustrated system.

Capital costs (produced by the manufacturer) of an example single communal ambient loop used to provide heating and cooling through residential heat pumps were compared with those of a system comprising a gas boiler, CHP and chiller system, using both chilled and hot water HIUs and fan coils for cooling for a building with 125 apartments. The cost of the single communal ambient loop and heat pump system indicates a significant saving.

Such systems can satisfy year-round health and comfort needs within apartments and reduce overheating in communal areas, as there are practically insignificant heat gains from the single communal ambient loop. Heating and cooling is in the control of the individual residents, so the principal cost of heating and cooling is also directly under their control, without the need for heat metering. As the electricity grid decarbonises, their carbon emissions reduce.

The operating costs for both resident and building operator are likely to be reduced compared with more traditional third- and fourth-generation systems. ●

This article is based on a CIBSE Journal CPD, written by Tim Dwyer and supported by GDHV. www.cibsejournal.com/cpd

CPD Questions

1: Which generation do UK district heating networks often belong to currently?
a) First generation
b) Second to third generation
c) Third to fourth generation
d) Fifth generation

2: Where are overheating issues particularly common in communal heating systems?
a) Bedrooms
b) Plant rooms
c) Communal areas such as corridors
d) Kitchens

3: What was the average loss from UK large-heat-network schemes according to a 2015 DECC report?
a) 19% b) 28%
c) 11% d) 1%

4: By how much can the use of heat pumps potentially reduce the energy use index (EUI)?
a) 20% b) 90%
c) 54% d) 40%

5: What is the sound power produced by the cooling unit shown in Figure 2?
a) 1dBA
b) 4bBA
c) 36dBA
d) 98dBA

To test yourself on the questions above, visit www.constructionmanagermagazine.com/cpd-articles.

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BIM & Digital

WILL DIGITAL HELP DRIVE INDUSTRY DIVERSITY?

THE GROWTH OF BIM AND DIGITAL CONSTRUCTION MAY IMPROVE CONSTRUCTION'S GENDER BALANCE. HERE **CM** TALKS TO FOUR FEMALE PROFESSIONALS ABOUT THEIR CAREERS IN THE DIGITAL BUILT ENVIRONMENT

Adriana Sobral
Senior BIM coordinator, Bouygues

Adriana Sobral graduated in architecture in Brazil in 2014, moving to the UK in 2018, where she joined Bouygues. Now a passionate advocate for all things digital, she is also a Women in BIM mentee.

"During the first years of my career, I was frustrated by the repetitive and dull tasks used to produce drawings and design documentation," she explains. "After becoming aware of alternative ways to produce parametric 3D models that automatically update drawings, I decided to learn Revit and that was my first step into the BIM world."

Sobral took an interest in using technology to increase productivity and felt that BIM adoption would be a "game changer" for digitalisation of design and construction workflows.

She started her current role, on a £240m regeneration scheme in Canning Town, east London, after last year's lockdown, which meant working from home and using technology to adapt workflows. This has been positive, she says: "I have been able to work on BIM improvements for the project and help the design team collaborate more effectively."

"If I were to list the benefits of having diverse teams, the stimulating working culture that results from the assortment of talents would be at the top"
Adriana Sobral, Bouygues

Sobral says the cloud-based platform Hypar has helped with knowledge-sharing in her role. "It can quickly generate hundreds of design options based on a repository of building knowledge and expertise," she explains. "In this industry, starting projects from a blank page is among the toughest tasks. Hypar makes starting a project from scratch a much faster process compared to traditional methods."

She has noticed that the BIM field attracts a greater diversity of backgrounds than the wider construction industry, but says there is "still a long way to go". Sobral adds: "If I were to list the benefits of having diverse teams, the stimulating working culture that results from the assortment of talents would be at the top."

Digital story for CM or BIMplus?
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ILLUSTRATEDMAN

Emma Hayes

Managing director, Digital Built Consultants, Republic of Ireland

As a BIM consultant, Emma Hayes says her biggest professional challenge is convincing the construction industry to adopt a new way of working.

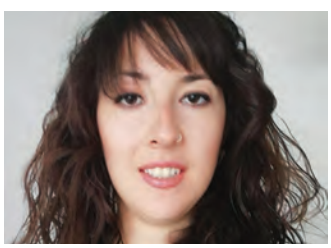
"People's mindsets and attitudes are one of the main impediments to BIM adoption," she says. "But in my experience, it is also about good communication, especially when working with virtual teams. BIM technology will become easier to use, but unless the team are willing to engage with the processes, it is more difficult to implement."

Despite these challenges, Hayes says: "Supporting businesses with the development of a fit-for-purpose BIM implementation strategy and then helping them realise and roll this out, with training and guidance gives great satisfaction."

She notes that covid-19 has led to more widespread adoption of digital processes, in particular remote collaborative working.

"That demonstrated how proactive and agile our industry can be to rise above a problem," she says. "Although virtual collaboration is not a new technology, I believe remote or virtual teams will become more normal for project teams."

Hayes is the Ireland regional lead for Women in BIM, and hopes that emerging digital roles will attract diverse talent to the industry. "If construction is to continue to innovate and become more efficient, it needs to become more diverse," she adds.



Marta Baron

BIM manager, O'Keefe

Marta Baron started her career in Spain as a building engineer for a tier 1 contractor, but decided to move to the UK to continue her career as a quantity surveyor. However, she says it "was not challenging enough" and she "missed the technical aspect of construction". Baron took a specialised course in BIM management and switched to a BIM manager role.

"I coordinate a team of 14 modellers and liaise with the rest of the company to produce drawings, videos, models or volume calculations we need from tender stage to handover," she explains.

"I also check quality to make sure project deliverables meet O'Keefe's standards, and test new software to find ways to make our processes faster and automated where possible.

"Lately, we have been working at health and safety, producing visuals of site hazards or risks as part of improving safety and compliance on sites."

Baron is "proud" of the digital progress she has been part of at O'Keefe. "The efficiency and the quality of our work has improved," she says. "Document collaboration tools like Bluebeam Revu and 3D design review packages bring our teams together on projects."

However, Baron feels that plenty of change lies ahead for the construction industry. "A few companies are ahead in terms of inclusion, efficiency and digitalisation, but smaller companies are farther back," she notes. "We must all work together to improve working conditions, especially on mental health, and be more open to new trends or systems that can work for our benefit."

"A few companies are ahead in terms of inclusion, efficiency and digitalisation, but smaller companies are farther back"
Marta Baron, O'Keefe

Isobel Robinson

BIM coordinator/manuals application coordinator, Winvic Construction

Isobel Robinson grew into a BIM career after joining Winvic in an O&M manuals administrator role.

"It was my responsibility to collate the hard copies of everything clients required as part of the project handover process, but it wasn't long before I began to learn about BIM as we moved over to digital manuals," she explains.

"I found the concept so interesting that I started to do my own research into BIM. My appetite to learn more was noticed and I was offered a new, combined role of BIM coordinator and manuals application coordinator, which I started in July 2020."

Robinson now spends half her time assembling cloud-based buildings manuals and the other half supporting the wider design team in areas like clash detection, stakeholder liaison and enforcing quality control.

Among the innovations she has worked on is developing QR codes for Winvic's multi-room and industrial projects. "This allows clients and tenants to access information, drawings and images quickly and accurately," she says. "It blew my mind when I first heard about it."

Having attended an all girls' school, and worked with more women than men in previous jobs, Robinson was "a little apprehensive about coming into a traditionally male-dominated industry". But she says: "Winvic is committed to empowering women as role models in the industry and there are many women working here in on and offsite roles."

Legal

Theresa Mohammed
Trowers & Hamlins
and NAWIC

Returning to work: how progressive is construction?

THE INDUSTRY DOESN'T MAKE IT EASY FOR WORKING PARENTS TO RETURN TO EMPLOYMENT AFTER MATERNITY LEAVE OR A CAREER BREAK. **THERESA MOHAMMED** ASKS IF FLEXIBLE WORKING DURING LOCKDOWN HAS CHANGED ATTITUDES

Returning to work following maternity or a career break usually prompts excitement and unease in equal measure, with working parents having to manage both workload and childcare. Historically, construction has been reluctant to encourage agile working and has preferred face-to-face meetings involving considerable travel time. Have attitudes changed since the first lockdown a year ago, and, if so, are women now better off?

Many heralded the working changes necessitated by covid-19 as proof that presenteeism is an outdated culture, which would help women and working parents. Office and site culture would be driven by necessity and efficiency rather than showing up to prove you were working. The focus would shift to output and value rather than stacking up hours. Technology and innovation would make the industry more agile.

This initial positivity has been tainted by the wider aspects of the pandemic. While it has been the catalyst for home working, the closure of schools has exacerbated the continuous challenges for working parents. There is a huge additional burden placed upon them without access to childcare. Further, if the lion's share of responsibility for home schooling and childcare falls upon women, this compounds existing inequality.

Many construction firms have outwardly expressed support for employees, relaxed working hours, provided financial allowances for IT equipment and used virtual platforms to host training sessions, team meetings and social events. There is more flexibility on paid and unpaid leave and in-house mentoring, coaching and counselling are encouraged. There has been a sea change in attitudes towards talking about mental health at work.

"While the location of the working day may have changed, the demands of the job have not. The time available to focus on work is now subject to disruption throughout the day"

Even so, while the location of the working day may have changed, the demands of the job have not. The time available to focus on work is now subject to disruption throughout the day. Screen time has increased, with long hours spent on back-to-back video calls.

Construction professionals typically work nine to 12 hours a day. Add to that travel to and from sites, home schooling, childcare and domestic chores and there is way too much for anyone to sensibly manage. Even with co-parenting at home, there are not enough hours in the day.

The only way to manage for some has been to delay return to work post maternity leave, potentially stalling career progress and increasing financial pressure, or to employ live-in childcare. The alternatives are stark: request furlough, reduce hours, reduce productivity, take paid or unpaid leave or resign. This should worry an industry already struggling to find skills to deliver the huge pipeline of projects that lies ahead.

There is pressure mounting on employers to alleviate the pressures faced by many employees. The reopening of schools and the vaccine programme may reduce stresses a little, but the industry needs to think carefully about this 'new way of working', with a focus on work-life balance, physical health and mindfulness, and using technology to facilitate productivity rather than longer hours. ●

Theresa Mohammed is a partner at Trowers & Hamlins and chair of the National Association of Women in Construction.

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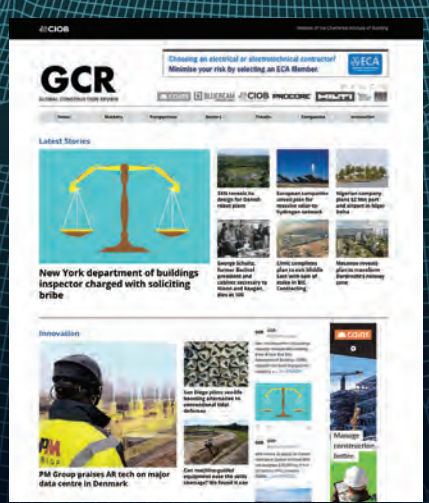

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Careers

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Diversity driven

WITH THREE FEMALES IN THE BOARDROOM, ISG'S PEOPLE STRATEGY HAS A DIVERSE PERSPECTIVE. **CM** SPEAKS TO CHIEF HR OFFICER JANE FALCONER

What feedback do staff give you on working at ISG?
We want to offer the best employment experience and we are measuring that by partnering with Best Companies, who survey our employees. That tells us what staff think across a range of measures: how the business is led; your relationship with your manager; how you are supported and your wellbeing and how successfully we give back to society. In their last 'b-Heard' survey, 77% of respondents said they would recommend ISG as a great place to work and 87% were proud to work for ISG.

Best Companies has rated us a one-star employer, which is a great score, rather like having a Michelin star. By 2024, we want to be a three-star employer. So we have a target and a measure of what we're doing.

What are your USPs as an employer?
We have a diverse portfolio of work and we're an international business, so that means fabulous opportunities for our people to move around. One of our UK project directors is moving to become managing director of our Engineering Services business in Asia.

We have a lean overhead and we are decentralised with a flat non-hierarchical structure. That means people are empowered to come up with great ideas.

Contract wins like Britishvolt – ISG will lead construction on the UK's first battery gigaplant – give staff the chance to work on really innovative projects.

How do you develop staff?
We partnered with Willis Towers Watson to develop our capability framework and create a profiling tool and interviewing guide which helps hiring managers when they recruit. We also use this framework to help define development interventions.

This year we are focused on project leaders, developing technical and leadership skills, with internal and external coaching. Our coaches come from a variety of backgrounds, many non-construction, such as former professional athletes. This different perspective challenges paradigms.

IMAGE COURTESY OF ISG

25% of ISG's workforce is female

"Best Companies has rated us a one-star employer, which is rather like having a Michelin star"
Jane Falconer, ISG

We also have mentoring built into our talent programmes, which members of our board are involved with, including CEO Paul Cossell.

How important are professional qualifications, such as CIOB membership?
Professional accreditation is incredibly important. Firstly, it provides a measure of the individual and how they are viewed by their peers, and secondly, it offers a fantastic network for them, where they can learn. We support staff financially, in terms of achieving membership, and continuing professional development.

How are you trying to boost diversity?
We have no absolute targets, but we are trying to improve each year on our organisational diversity This year, 37% of our apprentices are women and 23% of graduates, and 25% of our workforce is female. We have three women on our board, making it one of the most diverse in construction. All were promoted internally. We feel we have broader conversations with those different perspectives. There is evidence to show that more diverse businesses perform better, and all the board are committed to the journey we are on.

How do you look after staff wellbeing?
We have a partnership with Mental Health UK, voted for by our employees, and we have worked with them to deliver training to our managers. In addition, we have courses to raise awareness of mental health matters for managers, and our mental health first aiders get two days of training. The partnership includes charity work and last year we raised over £100,000 through the business.

Job spotlight
Vicki Reynolds
Chief technology officer, i3PT Certification

Digital vision

KEEPING UP WITH THE LATEST TECH IS AT THE HEART OF VICKI REYNOLDS' ROLE

Describe a typical day in your job?
Every day in my job is completely different, and that is why I love it.

As chief technology officer of i3PT I manage the technology and software development strategies for the business. This includes maintaining the development roadmap for our software platform CertCentral, as well as driving innovation and digitalisation both internally within the company and externally for our clients and the wider industry.

I keep up to date with new legislation and digital developments across the built environment by engaging with industry groups and initiatives, and by continuously working on my personal learning and professional development.

Does your role demand specific skills and knowledge?
Alongside my role at i3PT I am the vice-chair of Women in BIM, a UK BIM Alliance Ambassador, part of the CIOB's digital special interest group, a member of the Built Environment panel for the IET, and one of the founders of the Digital Twin Fan Club, so I'm never short of projects to work on.

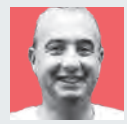
Balancing these interests is probably the most challenging part of my job. I am extremely passionate about everything I devote my time to and I am not prepared to drop anything, so over the years I have had to become very good at managing my calendar and being clear and honest about what I can and cannot commit to. I need to retain a lot of detail about a lot of different things, and so the way I take notes and manage my tasks is extremely important. It sounds so simple, but good notetaking is critical for me to stay focused and productive.

You joined construction from another industry. How did you find the change?
It was a shock. I found out quickly that one toxic influence in a project environment can be enough to make being a woman on site very uncomfortable. Thankfully, this was almost a decade ago and I genuinely believe that I have seen a change since then. I have had some wonderful mentors, and I have been a mentor for a handful of great women and men who are disrupting the industry from the inside.

I see my colleagues continuously pushing for improvement and innovation, and I can confidently say that today I believe construction is an exciting and rewarding career choice for any young person, whether they are male or female.

Time construction talked openly about menstruation

We need period dignity across our sites, argues **Mark Bennett**



A few years ago, I was out having a coffee with my daughter, when she started her period for the first time. Finding somewhere to purchase the right products, and a clean, hygienic toilet, was quite a challenge. We finally found a nearby hotel, but the experience had a profound effect on me, not only as a father and a man, but also as a building manager working on a male-dominated construction site. This led me to question how women working on construction sites might feel.

Working on trade union Unite's Period Dignity Campaign, I learned that a recent survey showed 32% of men think it is unprofessional for women to talk about their periods in the workplace. Yet many women, like my daughter, have been 'caught short' at some point; some 86% say they have started their periods without any period products to hand.

I firmly believe that talking about periods should not be taboo, and that period products should be freely available for all women. Last year, Willmott Dixon partnered with social enterprise Hey Girls to provide free period dignity items on all our sites. As part of this, for every box purchased, they donated a box to those suffering from 'period poverty'. We also ran an online event called 'Menstruation is not a Taboo' to raise awareness of the issue, a first for a construction company.

We received positive feedback from women both inside and outside Willmott Dixon, with many calling it 'ground-breaking'. But is it, in the 21st century? Talking about periods and providing period products should be the norm.

Being the father to a young daughter, my eyes have been opened to these issues. And having open conversations around this is important to change behaviours and ensure females are not ashamed about their periods.

I never thought a few years ago that I would see period products on sites, let alone know about pads, tampons – suitable for light, medium or heavy flow – and menstrual caps. If all companies and in particular construction sites could make period products freely available, it would avoid embarrassment for our female colleagues on site, as well as supporting gender diversity and inclusion.

Mark Bennett is a senior building manager and co-chair of the equality, diversity, and inclusion team at Willmott Dixon Interiors.

CIOB Community

ROBERT EVANS / ALAMY

CMYA

CIOB begins search for next top construction manager of 2021

Entries are open for the industry's Oscars – the Construction Manager of the Year 2021

Frank Connolly of Mace (left) was 2020's CMYA winner for his work on the Centre Building in Holborn (top)

For more than 40 years the CMYA awards have shone a light on the amazing skills and talent within the discipline of construction management. These awards are unique in the sector and celebrate the talent of those who manage construction projects rather than the project itself. It is recognised as one of the most challenging and career-defining awards to win.

"I'm sure that, once again, we'll see fierce competition from the finest construction managers in the industry, showcasing the highest levels of professionalism and commitment"
Caroline Gumble, CIOB

In 2020 the prestigious CMYA event became a virtual ceremony, hosted by architect and TV presenter George Clarke FCIOB. This year the CIOB is planning to be back at London's JW Marriott Grosvenor House Hotel, on 29 September 2021, to celebrate the finalists.

Past winners and industry leaders make up an expert panel of judges from across the UK who assess applications, conduct interviews and scrutinise every aspect of the project.

The awards are free to enter and the CIOB encourages the industry to put forward its best talent to showcase the very best of the industry.

CIOB chief executive Caroline Gumble is already looking forward to what this year's competition brings.

"The CMYA has always sought out the very best of leadership and talent in our sector," she said. "Even last year, when our sector faced immense challenges, the line-up of finalists was incredibly impressive and a testament to the remarkable resilience of our industry.

"I'm sure that, once again, we'll see fierce competition from the finest construction managers in the industry, showcasing the highest levels of professionalism and commitment."

Last year's winner was Frank Connolly MCIOB of Mace.

The CMYA is open for nominations until 19 March 2021. To submit a nomination – you may enter yourself or nominate one of your colleagues – visit: www.cmya.co.uk.

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

Research

CIOB scholars push progress

Claire Mullen receives this year's Sir Ian Dixon scholarship to boost research into gender equality

The 2021/22 Sir Ian Dixon scholarship has been awarded to Claire Mullen, a chief engineer and chair of the gender affinity network at Sir Robert McAlpine.

Mullen was responsible for delivery of the external works on the Battersea phase 3A development. She was the winner of the National Association of Women in Construction Award 2012 and works to promote STEM subjects within schools.

Her scholarship project is titled: 'Engaging men as agents of change to achieve gender equality in the construction industry'. Across the UK women are underrepresented in the industry: only 4% of tradespeople, 7% of CIOB members and 10% of chartered civil engineers identify as female.

Mullen says a team with differences in gender, background and outlook creates a more resilient workforce capable of withstanding challenges: "My proposal has the potential to effect change not just in the workplace but in society overall – by engaging with everyone it is hoped that a roadmap of gender equality will be set out for future generations."

Her research will: explore why barriers exist to attract, retain and promote women in the industry; assess the extent of gender inequality and project what the future should look like; and present solutions and a roadmap for a more equitable industry in the UK.

The two 2020/21 Sir Ian Dixon scholars were Mackenzie Thompson and Eugene Healy.

Thompson's research was 'How can temporary towns and architecture

Left, from top: 2021/22 scholar Claire Mullen and 2020/21 scholars Eugene Healy and Mackenzie Thompson

provide a place of architectural quality whilst temporarily being on a site?' She graduated in July 2019 with a degree in architecture and now works as a Part I architectural assistant focusing on the retail and residential sector.

Healy explored 'Creating value through contractor design in large scale infrastructure projects.' He works as an associate architect and has spent the last 10 years in architectural consultancy delivering the designs for rail and infrastructure projects for HS2, Crossrail, Thames Tideway and Network Rail. He currently leads a number of infrastructure projects for Weston Williamson architects.

For more details on the scholarship see www.ciob.org/scholarships/sir-ian-dixon-scholarship.

CIOB VIRTUAL ADAPT & THRIVE CONFERENCE

On 24 March a CIOB virtual conference will explore how the global built environment needs to transform post covid-19.

Speakers from industry bodies, government officials, key influencers from the construction industry and tech companies will share visions for achieving an agile and productive industry.

They will tackle questions such as: What will the industry look like post pandemic? How does the built environment sector need to change to meet the changing needs of society? How can the industry adapt to futureproof both itself and the buildings it creates?

Digital technology and modernisation is key to future success. The industry needs to reimagine the next normal to create a built environment fit for all.

Register at events@ciob.org.uk.

CIOB

Sir Robert McAlpine receives CBC status

Accreditation highlights company focus on quality

Following a lengthy and independent assessment, Sir Robert McAlpine has received Chartered Building Company status from the CIOB.

This accreditation is evidence of its ongoing commitments to upholding the highest standards of ethics and professional services, for its clients, its supply chain partners and their people. It further enhances the existing programme of professional development within the organisation to establish a fully qualified workforce.

As a chartered builder, the company will now benefit from the support of the CIOB in developing tailored specialist training. This is particularly valuable with the imminent introduction of the Building Safety Bill, and the growing need for construction professionals to be trained to high standards for fire safety and security.

It will also allow Sir Robert McAlpine to play a more significant part in leading by example on best practice across the industry and helping to shape the future of construction.

Alison Cox FCIOB, executive director of engineering and technical services, commented: "We are thrilled to receive this prestigious accreditation. We value our long-standing relationship with the CIOB, one of the leading and most influential bodies for construction management and leadership, and this is further validation of our ongoing focus on quality.

"This clearly demonstrates to our clients and our business partners that we are serious about delivering excellence across the board. For our people, it highlights our support to their ongoing professional development."

Bristol

Home and warm

Member manages project to update Salvation Army homeless hostel with external wall insulation system

A Salvation Army hostel for the homeless in Bristol has been updated with a new external wall insulation system. The project was managed by Mark Barrett, member of the North East CIOB committee.

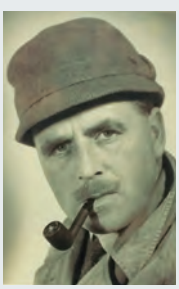
The main contractor, Sustainable Building Services, donated decorating materials and consumables to allow the current homeless residents to decorate the communal dining area.

Fellowship

Construction firm makes CIOB a family tradition

Matthew McCarrick is third-generation FCIOB in family firm

From left: Captain James, Michael and Matthew McCarrick



Matthew McCarrick scored a satisfying family hat-trick in December when he achieved CIOB Fellowship, representing the third successive generation of McCarricks to do so.

Matthew's grandfather Captain James McCarrick – who founded McCarrick Construction, the family construction company, in 1953 – joined the Institute of Builders (as it was then) in 1959 and was admitted as Fellow of the Chartered Institute of Building in 1980, the same year it was incorporated by Royal Charter.

His son Michael, Matthew's father, joined the company in 1976 and the CIOB in 1979, overseeing 40 years of expansion before retiring in 2016.

Their certificates are mounted in Matthew's office at the company headquarters in Chester-le-Street – a proud reminder of the effort put in by the McCarricks and hard-working employees over the last 67 years.

"I'm honoured to have achieved Fellowship status and will continue to promote the values of the CIOB across the North East region"

Matthew McCarrick, McCarrick Construction

Matthew is keen to promote the benefits of CIOB membership: "I'm honoured to have achieved Fellowship status and will continue to promote the values of the CIOB across the North East region."

DANROK

Honours

Member awarded MBE for Nightingale work

Garenne's Marc Burton recognised for role in building Jersey hospital in just 25 days

Marc Burton (left), chief executive of the Channel Islands operation of the Garenne Construction Group, was awarded an MBE in the 2021 New Year's Honours list.

The award is in recognition of his role as project director – J3 Ltd for the construction and delivery of the Jersey General Hospital – Nightingale Wing (above), which was designed and erected in 25 days.

He said: "I'm truly honoured to have been awarded an MBE for services to the Jersey community during the covid-19 pandemic.

"Whilst this is a personal award, this project was truly a team effort and I really must say thank you to a fantastic team, which saw Jersey's construction industry pull together and work collaboratively with many government departments including HCS [Health and Community Services], GHE [Growth, Housing and Environment], Property Holdings, Treasury, Planning, Building Control, Fire and Ambulance services and the Office of the Chief Executive.

"We employed 521 local people and 83 businesses to construct this 180-bed facility in a green field in just 25 days.

"A special thank you goes to my colleagues at J3, Garenne, Camerons, SRM and Geomarine for their valuable knowledge and support and a design team that worked around the clock."

Kelly Smith, CIOB student member and Novus member

Meet a member

Postgraduate student at the University of Chester, studying Flood Risk Assessment Modelling and Engineering MSc

Why did you choose construction?
I chose construction because of all the incredible avenues that it could take me down for future career prospects. It would give me the ability to be outdoors and active whilst working and having a brief opportunity to be indoors when the weather wasn't so appealing. I also enjoy the ability to be dynamic and work with various different stakeholders across any normal day. I have a short attention span and a very active personality so the construction industry was perfect for me.

You are hoping to take your postgraduate study in flood risk to PhD level. Why particularly this area?
Even the avenue that I've chosen to go down for that is particularly challenging; I have chosen to do a unique PhD in which I write the proposal and I dictate the way in which I want the research to be conducted. I am truly the leader of my own education. I also choose my own supervisor according to the research that they've previously done, the students that they've supervised and the subject areas they currently teach.

Similar to the Latham report or the Egan report, I would like to create something which provides guidance for the construction industry specific to flooding.

What I notice from working in the construction industry is that people only work towards the criteria that are set out for them. If the guidance legislation and policy is more stringent, the quality of product and service received by the service users and society at whole will be much better – and far fewer incidents will occur following better quality construction.

What are your career ambitions?
I am incredibly ambitious. Within the CIOB and CIWEM (Chartered Institution of Water and Environmental Management) I want to become fully chartered, and in education I would like to attain my PhD then get an undergraduate in mechanical engineering from a technical college, because I enjoy using the tools and machines.

Finally in my career I would like to be the permanent secretary for DEFRA or Housing and Urban Affairs. This would allow me to influence the policies that the industry follows.

How do you spend your spare time?
Prior to covid I used to enjoy swimming every week but since then my cycling and hiking has increased. I also have a keen interest in combat robotics. I'm incredibly grateful for nature and I like spending as much time as possible in it or sitting by the seafront to think.

Follow Kelly Smith's construction progress on Instagram at https://instagram.com/kweens_construction?igshid=1cx2n5qd2smu6.

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ADAPT AND THRIVE – THE ROADMAP TO RECOVERY

Virtual Conference, 24 March 2021

What will the construction industry look like, post-pandemic?

COVID-19 has affected and continues to affect communities across the globe. The return of construction workers on site during the pandemic highlighted the importance of the construction industry, both economically and socially. Building hospitals in just a few days, the industry played a critical role in responding to the crisis and the recovery. But now organisations need to think differently.

Sponsored by Autodesk, this conference will explore how the industry can reimagine itself, future-proofing the industry and creating a built environment that is fit for all.

Meet our inspirational speakers and watch a series of informative case studies that showcase different perspectives on this important issue.

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Opinion

Health matters

We need to promote health just as much as safety, says **Emma Eden**

I graduated with a degree in construction management in 1998 and worked in construction management for the following 10 years and loved working on site. However, with three young children, I found it increasingly difficult to work the hours required and realised that I had to make a choice between continuing to work in the job I loved or spending time with my children.

As health and safety was an integral part of my role and I had completed my NEBOSH National Construction Certificate, I made the decision to move into construction health and safety, offering consultancy services in conjunction with my husband's business. After completing a master's degree in occupational and environmental health and safety and with an increasing demand for our health and safety services, we started to offer services throughout all industries.

The Construction (Design and Management) Regulations 2017 are still not fully understood by many in the industry and the ethos of reducing the bureaucracy involved in construction health and safety has not yet been achieved. I continue to see organisations producing hundreds of pages of irrelevant health and safety information for projects which are not communicated, and I regularly speak to site personnel who are not fully aware of hazards relevant to their work.

It is essential to us that we promote and support improved health as well as safety across the industry. When we carry out health surveillance, we often identify that our practitioners are the first health professionals that some of the construction workforce have spoken to in years. The HSE's Construction Statistics 2020 detail that 81,000 construction workers suffered from work-related ill health, with the majority relating to either musculoskeletal disorders or stress, anxiety or depression.

"When we carry out health surveillance, we often identify that our practitioners are the first health professionals that some of the construction workforce have spoken to in years"
Emma Eden, Genesis OHS

We believe that many construction workers do not access support, so I strongly advise people to take the opportunity of health surveillance to signpost and provide information on improving health wherever possible. We have many examples of where our intervention has prevented more serious ill health.

Working in the construction industry is tough – it requires long hours and the aggressive behaviours and attitudes displayed by many would not be tolerated in many other workplaces. I don't think the industry has changed much since the start of my career in this respect, and this may be one of the factors that contribute to the high instance of stress, anxiety and depression. ●

Emma Eden is director/occupational and environmental health and safety practitioner at Genesis OHS.

Midlands

CPD webinar: Top 10 Ways to Avoid Adjudication

Keith Blizzard shares his practical experience

The CIOB in the Midlands is welcoming back Keith Blizzard FCIOB, CIOB Trustee and previous West Midlands Branch chair, to run another of his popular CPD sessions – this time on ways to avoid adjudication.

Blizzard (pictured) is a quantity surveyor and a non-solicitor partner in the construction and engineering team at Harrison Clark Rickerbys and has a wealth of knowledge and experience to share.

Top 10 Ways to Avoid Adjudication takes place online 12pm-1pm on 24 March. The presentation will include practical measures and procedures to follow, how to identify contract pitfalls, a refresher on payment regimes, advice on tactics and guidance on how to get out of a contract.
Register at https://events.ciob.org/ehome/200218103.

Dublin

Main event

Annette Main becomes new vice-chair of CIOB Dublin Hub

The CIOB Dublin Hub has appointed Annette Main as its new vice-chair.

Main (pictured) has over 20 years postgraduate experience on a variety of multi-million dollar projects across the globe. She is currently working with PM Group as the project controls lead for MSD Brinny, having returned to Ireland in 2016 after many years working in the Middle East.

Main became MCIOB in 2007 and relocated to Abu Dhabi in 2009. She was grateful to the CIOB for offering familiarity in new surroundings: "I was able to meet new people with similar interests and share my experiences. I'm thankful for the friendship and knowledge-sharing that helped to give me confidence in my new base."

She would like to repeat the same courtesy in Ireland. "Since returning to Ireland in 2016, I have found there have been many changes since I left – one of the most prominent is new migrants into Ireland and I would like to be able to support new migrants with their transition, to extend the same hand of friendship which was shown to me during my time abroad."

During her time in the Middle East she was very active with the branch committees, acting as secretary of the Dubai branch and vice chair of the Abu Dhabi branch.

CIOB IN THE NORTH SHINES A LIGHT TO LIFT SPIRITS

The CIOB in the North has launched a 'Shine a Light' campaign to highlight some inspirational stories and achievements from the industry and lift spirits during what has been a difficult time.

The first topic, Construction in Lockdown, gives everyone a chance to share how the industry has adapted and show the achievements still being made.

To take part, join the 'CIOB in North UK' LinkedIn Group and post your motivational treats with #ShineALight!

Appointments

New leaders for Novus

Alina Grigoruta and Lin Qi will be representatives in Midlands and Eastern regions

Lin Qi (far left) and Alina Grigoruta will represent the next generation of industry professionals

The Novus network has welcomed two new female representatives in the Eastern and Midlands regions.

Alina Grigoruta is a student member, studying a master's degree in Project Management in the Built Environment at Oxford Brookes University and will chair the Chelmsford Novus. Lin Qi is planner for LM JV (Laing O'Rourke and Murphy Group Joint Venture) and will chair Birmingham Novus.

They will represent the next generation of industry professionals, and will work with the committees and CIOB in supporting colleges, universities, schools and tomorrow's leaders.

Grigoruta says her plans in the Novus role are to help students and members forge their career paths: "As CIOB Novus chair I plan to engage and deliver a collaborative relationship, focusing on inspiring CIOB members and early career starters within the construction industry to share values, ethical culture, and professionalism. I am interested in communicating the importance of centralising a structured career path within the construction industry with the CIOB."

Opinion

All change please

Gemma Booth shares her views on gender equality in construction

I have now been in the construction industry 21 years and my experience is both positive and negative.

I enjoy all the graft that's involved and construction is a great industry to be involved in, but in order for females to be in the male-dominated industry I still believe we have to work five times harder to get by and prove that we are capable.

That's true whether on trade, site work or certain office roles – especially higher roles. I have been employed in all of these roles.

A lot needs to change in the industry to ensure we have a 50/50 split of women and men. Equality and inclusion need to be actually practised, not just written in a document, signed and ignored. Equal pay needs to be transparent: we don't see what everyone earns within companies so it is hard to address. Business owners and boards should be reviewing this more.

Being a female in construction has its positive elements. I enjoy the work and I like to work hard, but why do I have to work harder and prove to my employer that I am as capable as a male?

The work isn't the problem – it's the people. Many are still operating as if in the era when construction was all men, but times are changing and if they don't give more women a chance we will have no industry as we currently have a skills shortage. Women deserve the same opportunities and promotions as men and an end to stereotyping and assumption that we will not be capable of the same job roles as males.

Employers also ask if you have children or are planning on having any. [It is illegal under the Equality Act 2010 to ask a candidate whether they are married, have children or plan to have children in a job interview – editor].

Companies need to practise what they preach and do something about improving the industry to encourage more women into it – as we bring our own benefits to construction.

Gemma Booth is assistant site manager with Bellway Homes and member of Liverpool Hub Committee.

Diary dates

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

Repurposing Spaces: 2020 and Beyond

1 March, 6-7pm

With an increasing focus on sustainable practices and driven by the pandemic, the built environment is having to become even more creative in its use of space.

Join the CIOB and our great panel of speakers on this engaging CPD event about repurposing spaces.

We will be joined by Rob Burborough of 3PM, who will discuss commercial to labs, Daniel Buehler, from Welbeck Health, who will speak on conversion to medical and Steve Perkins, from Turner & Townsend, who will speak about high streets and town centres.

ABernal@ciob.org.uk

Engineering the Domino Sugar Refinery

9 March, 6-7pm

This event will look at the engineering behind the regeneration of the Domino Sugar Refinery Project in New York.

The structural team for the Domino Sugar Refinery will discuss:

- The history of the structure;
- Testing and surveying the existing masonry;
- Preservation of the existing masonry;
- Design and installation of the bracing;
- Demolition of the existing interior components of the refinery;
- Monitoring of the structure and nearby historic structures; and
- Design of the unique structural elements (mat foundation, liner wall for flood design, atrium, vaulted glass roof).

bgrange@ciob.org.uk

Smoke Control Solutions

11 March, 1-2pm

Smoke control is a key part of any building's fire strategy, as statistically smoke is the real threat to life in a fire situation.

Having effective smoke control systems in place means that, should a fire break out on site, occupants can evacuate quickly and calmly and the risks are reduced for firefighters.

Join Paul Evans from Ash Fire Management & Ventilation Systems for a live webinar on the specialist area of smoke control and the importance of venting smoke, heat and pressure.

The talk is certified by the Institution of Fire Engineers.

bmilton@ciob.org.uk

Sustainable Roofing Design

11 March, 1-2pm

Dave Campos, regional technical manager with the Garland Company UK, will present this live webinar.

This CPD seminar discusses the concepts and facts behind sustainable roofing. Contents covered are:

- What does sustainable design mean?
- Learn about different types of green roofing and the benefits of these.
- Learn about reflective coatings/ membranes and why they are used in building design.
- Understand photovoltaic technology and how it can benefit the environment and the building owner financially.
- Learn about recycled content in manufacturing and water harvesting.

The purpose of this seminar is to give an overview of most of the sustainable products and systems available, touching on their features and the advantages and disadvantages of each.

dthorpe@ciob.org.uk

Wildflower Sustainable Landscapes CPD

16 March, 4-5.30pm

Are you interested in sustainable landscapes? Join us for this virtual CPD event delivered by Helen Gillespie-Brown from Wildflower Turf, conveying Wildflower Turf's decades of experience in delivering wildflower spaces.

Nbreakspear@ciob.org.uk

CIOB Virtual Adapt & Thrive Conference

24 March, 9-5.30pm

Covid-19 continues to affect communities across the globe. The return of construction workers on site during the pandemic highlighted the importance of the construction, both economically and socially. Building hospitals in just a few days, the industry played a critical role in responding to the crisis

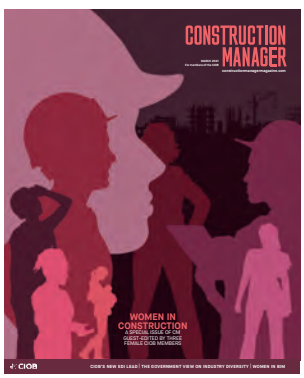
But with a shortage of skilled labour recognised before the pandemic hit, the role of digital technology and modernisation is key to future success and longevity.

The industry needs to reimagine the next normal to create a built environment that is fit for all.

- What will the construction industry look like post-pandemic?
- How does the built environment sector need to change to meet the changing needs of society?
- How can the industry adapt to futureproof both the industry and the buildings it creates?

Speakers from a broad selection of Industry bodies, government officials, key influencers from the industry and innovative tech companies will share their vision for achieving an agile and productive industry that is fit to underpin the social and economic demands of modern day living.

events@ciob.org.uk



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