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OCTOBER 2020
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Circulation: Net average 30,887
Audit period: July 2019 to June 2020
Subscriptions: To subscribe or
 for enquiries, please contact:
Subscription team:
 Tel: 01293 312160 Or go online at:
<http://constructionmanager.imbmsubscriptions.com>

Or write to us at the address below:
Construction Manager
 Published for the Chartered Institute
 of Building by Atom Media Partners,
 3 Waterhouse Square, 138 Holborn,
 London EC1N 2SW
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News story for CM?
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▲ Fast track installation on Hinkley's second reactor

Construction of the 170-tonne 'liner cup' at Hinkley Point C's second reactor has been completed in 39 days, 30% quicker than on reactor one, EDF Energy has said. The cup, the base for the reactor's steel containment, is being prefabricated in five parts and lifted into place by 'Big Carl', the world's largest crane. This innovation means welding can take place in covered bunkers protected from weather, improving quality and efficiency, according to EDF.

► Murphy grows site allotment

Coronavirus-related food shortages prompted contractor J Murphy & Sons' North Bristol project team to set up a site allotment. They planted a wide variety of vegetables and have employed a local chef made redundant as a result of the pandemic to use the fresh produce in the site canteen.



The Department for Transport (DfT) has enlisted Deliveroo, Uber, Tesco and Ocado to help audit the nation's potholes with support from highway data and mapping specialist Gaist and local authorities.



◀ BAM completes £51m British Antarctic Survey wharfs

BAM has completed work for the British Antarctic Survey (BAS) to build two new wharfs at separate locations in the Antarctic. BAM, supported by Sweco and technical advisor Ramboll, constructed a new £40m, 74m wharf at Rothera Research Station over 18 months, to moor the new polar ship, the RSS Sir David Attenborough. Meanwhile, the £11m wharf at King Edward Point research station on the sub-Antarctic island of South Georgia was built in 108 days.

▼ Structures take shape on Tolent's £84.5m Milburngate job

Contractor Tolent has completed the steel frame for a 92-bed Premier Inn hotel in Durham and is now in the process of building the steel frame for a block containing 153 build-to-rent apartments. The firm started an £84.5m contract to build the 41,800 sq m mixed-use development in June last year. The site, on the banks of the river Wear, is surrounded by a 236m retaining wall.



◀ A68 repaired in under a month after storm collapse

The A68 near Fala in Scotland has been repaired in under a month after part of the trunk road was destroyed in a storm in the early hours of 12 August. A 20m-high embankment collapsed, leaving a large gap in the carriageway. Road maintenance firm Bear Scotland cleared and stabilised the site and used an estimated 5,000 tonnes of rock to rebuild the embankment before resurfacing the road and adding a safety barrier and other road furniture.



▲ Everton reveals final designs for 52,000-seater stadium

Everton Football Club has unveiled final designs for its 52,000-seater stadium ahead of a detailed planning application to Liverpool City Council. Designed by MEIS architects, the new designs take into account consultation feedback from heritage bodies, with a river-facing stepped plaza outside the stadium's west stand and a slight reduction in the overall height of the stadium in line with world heritage site guidance.

Building Safety Bill is ‘once in a generation’ opportunity

PARLIAMENT EXPECTED TO BEGIN DEBATING THE BILL THIS AUTUMN, WITH CIOB BACKING ALL ITS RECOMMENDATIONS



The construction industry must seize the “once in a generation opportunity for change” presented by the government’s Building Safety Bill.

That is the message from the CIOB with the bill expected to begin its passage through parliament this autumn.

“There is likely to be substantive change across the system, with design, specification, procurement, construction, building control, management of buildings during occupation, and the competencies of those working on buildings all in scope,” said Eddie Tuttle, director of policy, research and public affairs.

He expects the passage of the bill to take about a year but warned that it will require substantial secondary

legislation which will likely take “many years” to introduce. “Getting that detail right will be crucial,” Tuttle added.

“Some classes of building that we might have expected to be covered by the draft bill are absent, such as care homes, hospitals, hotels,” he noted. “But the bill gives the Building Safety Regulator powers to advise the Secretary of State to amend definitions of the buildings in the legislation.”

The CIOB remains concerned about the implementation of the proposals in the bill and whether the industry has the skills or the culture to deliver the wide-ranging changes required.

Paul Nash, the CIOB past president who sits on the Industry Safety

The bill is expected to take a year to go through parliament

Steering Group (ISSG), said: “The underlying message we’re getting back from the industry is that people will not change unless there is legislation forcing them to do so. While we’ve seen some early adopters, and some companies have begun implementing the recommendations of Dame Judith Hackitt’s *Building a Safer Future* report, many are still lagging behind.”

Further detail on skills and competency standards for those working on higher risk buildings will emerge from the imminent final report from the Competence Steering Group (CSG), Nash said. Meanwhile, the British Standards Institute is leading development of standards for the duty holder roles under the new building safety regime and the CIOB is leading the working group responsible for developing standards for the principal contractor role.

“We are also considering the processes that will be needed to assess and assure the competence of our members performing these roles in the future,” added Nash. ●

Paul Nash on the ISSG report, p10.

Building Safety Bill: likely timeline

- Autumn 2020: Begins passage through parliament
- June or October 2021: Becomes law as Building Safety Act
- 2021-2024: Implementation across built environment sector
- From 2021 onwards: Secondary legislation

Concerns rise over ‘green skills’ competence

Questions are mounting over construction’s ability to deliver ‘low to no carbon’ work, following a new study.

The government recently announced the £2bn Green Homes Grant scheme, among a spate of initiatives to stimulate eco-friendly

building work, but there are concerns about workforce competence.

Seven out of 10 businesses who responded to the Electrical Contractors Association (ECA) and Building Engineering Services Association survey said they do not have enough competent employees

to undertake ‘green’ building work.

Nearly half (48%) said that there was not ‘sufficient industry training’ for those involved in low carbon work. Technologies including solar PV, heat pumps and energy storage systems were cited as being most problematic.

Concerns have also been expressed over quality and workmanship, with the government urging tradespeople delivering Green Homes Grant work to sign up with TrustMark accreditation, a move welcomed by the CIOB.

Which low carbon tech will prove most popular? See p28-31.



Major housing group creates digital toolkit for offsite homes, p44-45

‘Golden thread’ should apply to all buildings – CIOB survey

RESEARCH BY THE INSTITUTE AND I3PT ALSO IDENTIFIED CONSTRUCTION’S CULTURE AS A MAJOR OBSTACLE TO IMPLEMENTING THE BUILDING SAFETY BILL

Almost three-quarters of respondents to a CIOB survey on the ‘golden thread’ – the looming requirement for accurate and up-to-date records of project data – said it should apply to all buildings, not just the higher-risk residential buildings as set out in the government’s draft Building Safety Bill.

The research, carried out by the CIOB and software company i3PT Certification, asked industry professionals about their understanding of the golden thread and how it will be delivered in practice.

Initial analysis shows some 74% of respondents felt the draft bill did not go far enough, and that the golden thread should become law for all buildings, while a further 13% said it was ‘relevant’ to other sectors. Many were concerned about healthcare, care homes and schools.

The research indicated that industry culture would be the biggest obstacle to implementing the golden thread. Some 82% of respondents picked this out as a ‘blocker’ to change, followed by commercial investment (52%), lack of repercussions (48%), unclear requirements (43%) and technology (32%).

Furthermore, more than half (54%) agreed with the statement, “the industry understands the need to change but the right culture is not in place to support it”. Only 9% disagreed.

The consensus is it will take construction a long time to implement the changes necessary to deliver a golden thread of information on all high-risk projects. Only 7% of respondents thought it would take less than 12 months, while one in five said it would

take between one and two years. Some 41% thought it would require two to five years and 23% said over five years.

Encouragingly though, 85% of survey respondents said the golden thread will “enable better decision-making and create a clearer chain of accountability across the built environment”.

The ‘golden thread’ was identified by Dame Judith Hackitt in her Independent Review of Building Regulations and Fire Safety, published after the Grenfell fire. She highlighted the need for “robust record keeping, with a digital ‘golden thread’ of key building information running through all phases of design, construction and occupation”.

The i3PT/CIOB survey gathered responses from 156 built environment professionals and organisations. A full analysis will be published this month. ●

What the industry said about the golden thread

74%

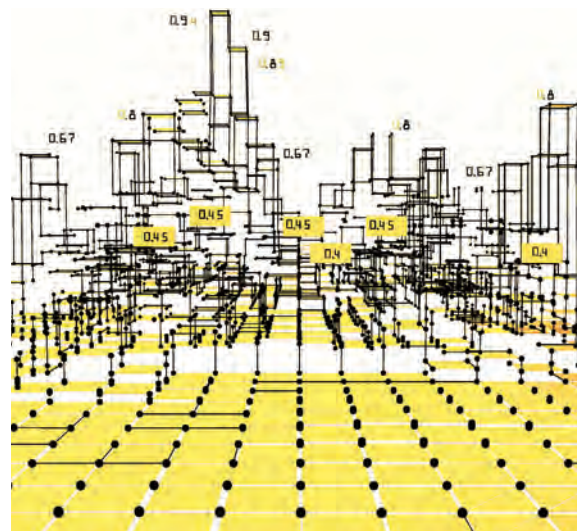
said it should apply to all buildings

85%

said it would mean better accountability

82%

said industry culture was a blocker to implementation



Covid planning made sites ‘more productive’

Fewer workers improved sequencing, says research

Construction sites may have been more productive thanks to fewer workers operating on site during the covid-19 pandemic, a new report suggests.

Research by Loughborough University with contractors including Balfour Beatty, Kier, Mace, Morgan Sindall and Skanska found that, with more time spent planning tasks and better forward planning, site managers were able to deploy better sequencing for tasks and avoid unnecessary overlapping of trades.

Typically, frontline workers have been deployed in smaller groups than normal, and trades have been working in sequence instead of alongside each other.

This, suggests the report, has led to increased worker effectiveness and productivity and improved logistics and housekeeping on site.

Those interviewed for the research generally considered individual productivity had improved, even if the total site productivity was reduced due to fewer workers being on site.

The report did however note that some tasks still took longer than usual due to the requirement for workers to observe social distancing rules, in addition to the delays in obtaining certain materials.

It also noted a perceived reduction in health and safety risk as a result of increased planning and fewer workers.

Loughborough University interviewed 33 representatives working on six different projects to provide a snapshot of the impact of the coronavirus pandemic on construction.

See Opinion: Caroline Gumble, p12.



769,300

Number of construction employees furloughed in August, according to HMRC

Will end of furloughing affect industry capacity?

All eyes on employment – industry capacity will be critical to a healthy recovery, says **Kris Hudson**



This autumn will be a critical juncture for the UK construction industry. With the plug about to be pulled

on the government's Job Retention Scheme (JRS), there may be significant and long-term repercussions on employment in the sector.

As of Q1 2020, construction workforce jobs remained -3.7% below the peak seen prior to the 2008/09 recession. In simple terms, jobs that were cut directly after the global financial crisis still had not returned before the covid-19 recession gripped the UK (first chart).

The most recent data from the Office for National Statistics showed that 11.5% of the construction industry remained on partial leave or furlough during the period from 10 August to 23 August 2020.

This is positive, and fairly low by comparison to many other industries, but we should be concerned by the potential rollover effect on construction employment.

If those roles still on furlough eventually translate into redundancies as the JRS tapers off, industry capacity and capability may be reduced and materially lowered. Ultimately, this can have a significant knock-on for industry pricing.

In the last recession output dropped, contractors bid low to lock in

turnover and construction employment belatedly fell as workloads diminished. This is because employment reacts slowly to changes in demand, partly due to unions and contracts.

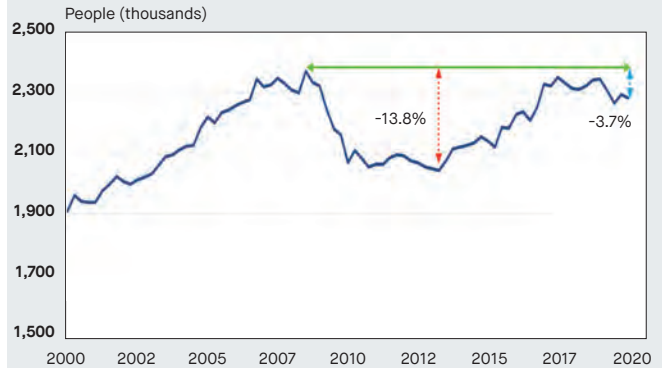
After construction output started to accelerate from 2013 Q1, employment and pricing diverged. Tender price inflation increased by 39.3% over the next five years as workloads increased and employment levels remained stubbornly low. Companies hesitated when making hiring decisions, fearful that green shoots of recovery may not take root, and jobs growth increased by just 13% in comparison (second chart).

This is important because construction workers are ultimately the lifeblood of the industry. Any squeeze on industry capacity or capability can contribute to upwards pressure on pricing. A rise in redundancies following the closure of the furlough scheme could therefore be hugely significant, tempering tender price reductions in the short term, but exacerbating increases in the long term.

As the government switches off the life-support machine, it is not just contractors that need to understand how their headcount may be affected. Investors, suppliers and asset owners will need to keep a very close eye on their supply chain for signs of instability that could impact the whole sector.

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

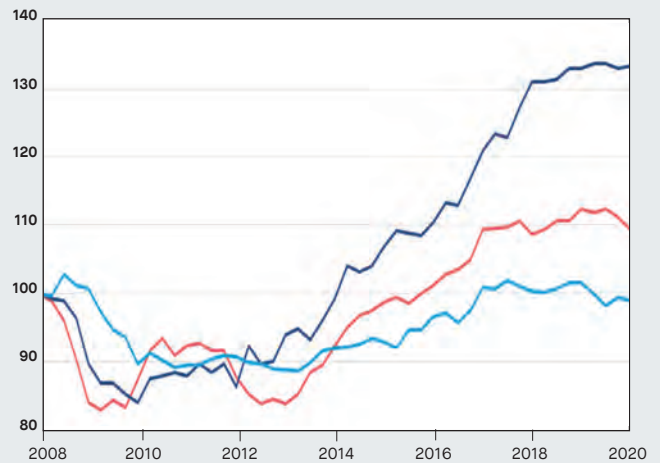
UK construction workforce jobs, seasonally adjusted



SOURCE: OFFICE FOR NATIONAL STATISTICS

Construction output, workforce jobs and tender price inflation performance
GDP peak prior GFC recession - GDP peak prior to covid-19 recession

Index: 2008 = 100
— Construction output — BCIS tender price index — Construction workforce jobs



SOURCE: OFFICE FOR NATIONAL STATISTICS, BUILDING COST INFORMATION SERVICE

News in numbers

1.5

Average number of external job vacancies construction firms are actively recruiting for, according to the Office for National Statistics (ONS)

12.2%

The proportion of construction firms with operating costs that exceed turnover following the coronavirus pandemic, according to August ONS figures

£11.5bn

The value of the government's new Affordable Homes Programme, to be delivered from 2021 to 2026. It aims to deliver up to 180,000 new homes "should economic conditions allow"

156m

Number of bricks delivered in the UK in July – the highest monthly figure all year as residential construction activity picks up again

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Opinion



Paul Nash
CIOB

Building safety: five key issues for construction

THE INDUSTRY SAFETY STEERING GROUP (ISSG) RECENTLY PUBLISHED ITS SECOND REPORT. **PAUL NASH** HIGHLIGHTS FIVE CENTRAL THEMES THAT EMERGED FROM THE GROUP'S WORK



Safety focus: cladding is removed from a student accommodation block in Bristol

1. Unsafe cladding

The issue of unsafe cladding and how this was affecting leaseholders' ability to buy, sell, insure or remortgage their properties was already making headlines when the ISSG heard from mortgage lenders last year.

The uncertainty was a consequence of government advice at the time that had made building owners responsible for checking that the external wall system on their buildings was

safe. The problem was that landlords were reluctant to carry out the necessary checks and individual leaseholders couldn't afford to do it.

RICS, UK Finance and the Building Society Association, together with lenders, valuers, and other industry representatives, have since come up with a solution. The 'External Wall Fire Review' process (and the EWS1 form) is an important step forward.

2. Competence

In August last year the Competency Steering Group (CSG) published its interim report, *Raising the Bar*, which set out measures to raise standards of competency for those who design, construct, inspect, maintain and operate higher risk buildings. The final report, *Setting the Bar*, will be published soon.

The British Standards Institute has been setting up a Built Environment Competence Standards Strategy Group (BECS) to lead and coordinate the development of standards for the dutyholder roles under the new building safety regime. The CIOB has been asked to lead the working group responsible for developing standards for the principal contractor role.

The discussion about competency raises an important question for professional bodies. Where their members undertake the dutyholder roles, how do they ensure that they not only have the required technical knowledge but demonstrate the right behaviours?

3. Digital 'golden thread'

One of the issues highlighted by Dame Judith Hackitt's *Building a Safer Future* report was the "lack of complete, accurate and up-to-date building information" and the need for "robust record keeping, with a digital 'golden thread' of key building information running through all phases of design, construction and occupation".

The 'golden thread' is a key concept underpinning the new safety regime and one that offers a foundation for behavioural change too.

Some organisations are already working to embed the golden thread into their new and existing housing stock. Alongside this, the CIOB's golden thread survey findings will help

"Where members of professional bodies undertake the dutyholder roles, how do they ensure that they not only have the required technical knowledge but demonstrate the right behaviours?"

the industry's understanding of what the golden thread is and how it will be delivered in practice.

4. Building control

Building control has a key role to play in the new building safety regime. After slow initial progress, in July the building control bodies published *Future of Building Control*, setting out recommendations on the future regulation of the building control sector and profession.

It is essential the vision becomes a reality, given the proposals in the draft Building Safety Bill which will see the Building Safety Regulator become the building control authority for buildings in scope, with power to oversee and report on the performance of building control bodies. It also sees the separation of those who inspect from those who approve.

5. Culture change and leadership

One theme that runs throughout the work of the ISSG and features strongly in the report is the need for culture change in our industry.

While some parts of the industry are making real progress, too many are waiting for legislation before acting.

The coming year is going to be challenging for the economy and the industry. But ensuring that residents feel safe and are safe in their homes remains a priority. The message is clear: Don't wait for legislation to make the changes that are necessary now to ensure that we never have another tragedy like Grenfell. ●

Paul Nash is past president of the CIOB and sits on the Industry Safety Steering Group. Chaired by Dame Judith Hackitt, it reports on the progress of construction in delivering culture change and holds the industry to account on behalf of the government.

Circular economy has a key role to play in reducing UK carbon emissions

INFRASTRUCTURE PROJECTS ACCOUNT FOR 16% OF THE UK'S CARBON EMISSIONS, WHICH IS WHY CONSTRUCTION NEEDS TO APPLY A CIRCULAR ECONOMY FOCUS TO PROJECTS, SAYS **PHILIP CHARLES**



Circular strategies could cut infrastructure emissions by 50%

As the country begins its journey to recover from the covid-19 pandemic, the prime minister's urgent call to build back better, greener and faster is expected to accelerate project delivery. As we emerge from the global outbreak, we must also work towards reducing greenhouse emissions in line with achieving net zero carbon emissions by 2050.

Infrastructure accounts for 16% of the UK's total carbon emissions and has influence over a further 37% which is attributable to the materials and energy required to build, maintain and operate projects. The Major Infrastructure – Resource Optimisation Group (MI-ROG), of which Aecom is a convener, believes it is imperative that a circular economy focus is applied to the planning and delivery of infrastructure projects to make sure the amount of carbon that is produced is limited.

While deploying new materials will be unavoidable at times, implementing circular approaches in line with net zero goals during the early stages of the design process can help the UK infrastructure sector reduce carbon emissions by up to 50% as well as cut costs and support a more resilient supply chain.

The UK government's Infrastructure Carbon Review (ICR) explores various ways

the industry can reduce carbon emissions when designing and delivering infrastructure projects. According to the latest MI-ROG white paper, circular economy approaches can be applied to the ICR themes as illustrated below:

- Build nothing – challenging the need for new infrastructure and exploring alternatives.
- Build less – maximising the use of existing assets through optimised operation and management.
- Build clever – designing and implementing low-carbon materials, streamlining delivery processes and resource efficiency.
- Build efficiently – embracing innovation and eliminating waste.

In order to accelerate this idea and make sure infrastructure owners and operators have the knowledge and tools to reduce carbon emissions in line with net zero goals, new business models are required. This includes a shift from product to service business models while embracing new low-carbon materials, digital design and modular construction as well as facilitating delivery of innovation.

It is imperative to gather relevant baseline data and set ambitious yet achievable targets, which will amplify the need to execute a successful circular economy approach. Compiling data on material use, recycled content and embodied carbon from pilot projects can be used as a tool to measure performance and identify further opportunities for carbon reductions.

For this idea to successfully develop and achieve maximum benefits, collaboration is key, particularly across the infrastructure sector as this will influence future policy and standards. ● **Philip Charles is principal consultant, climate change and sustainability services, Aecom.**

Exemplar competence in the electrical sector

Dame Judith Hackitt praised the ECS for its high standards. **Phil Wilbraham** explains its plans



Dame Judith Hackitt identified the Electrotechnical Certification Scheme (ECS) as an exemplar in her Independent Review

of Building Regulations and Fire Safety. The scheme, covering more than 175,000 electrotechnical operatives in electrical, fire, emergency and security systems, network infrastructure and allied trades, has a long history of high standards, working hard to formalise training and qualifications for the sector, to keep the workforce competent, safe and healthy.

Its work complements that of the Competence Steering and Working Groups set up in the wake of the Grenfell Tower disaster in 2017. Since then, members of the ECS steering committee have been feeding into this process through Working Group 2 for Installers.

The focus now is on raising standards further. Recommendations on how to improve standards in the industry from Working Group 2 include setting minimum qualifications for each sector. These include a Level 2 or 3 diploma, CSCS or partner scheme cards, certification of the business, greater continuing professional development (CPD) and knowledge of fire safety in buildings.

ECS registered electrician status was introduced in 2017 to raise standards and recognise those qualified electricians who keep up to date with the latest edition of the Wiring Regulations and commit to an ongoing programme of CPD. The ECS steering committee is supportive of this move to raise the bar further through the Competence Steering Groups, as well as introducing new digital technologies to make the processes of identifying competence easier than ever before.

An expansion of the online ECS Employer Portal, used by almost 3,000 electrical contractors, ECS Check for Clients and the Supply Chain provides some of the industry's largest clients and contractors with visibility throughout the supply chain. Digital solutions like this help everyone to recognise the importance of competency and make identifying qualifications, skills and training simple through the use of a real-time system and a downloadable app for use on site.

Further work will focus on introducing greater support for storing CPD, more flexibility on health, safety and environmental assessments and greater industry collaboration between the trades to ensure no one is left behind.

Phil Wilbraham is chair of the Electrotechnical Certification Scheme steering group.



Caroline Gumble
CIOB

Putting construction front and centre of the economic recovery

THE CIOB IS WORKING HARD TO ENSURE THAT CONSTRUCTION'S VOICE IS HEARD LOUD AND CLEAR AS THE GOVERNMENT LOOKS AT WAYS TO SECURE A POST-PANDEMIC RECOVERY, SAYS **CAROLINE GUMBLE**



As the construction sector picks itself up and dusts itself off following the coronavirus lockdown, efforts are underway to give the wider economy a shot in the arm.

One such initiative is the UK Business, Energy and Industrial Strategy Committee's inquiry on post-pandemic economic growth, looking at the options available in trying to secure economic recovery.

The CIOB has submitted a response. Our full submission runs to 12 pages but here are some of the key issues.

Making the case for a greener, more carbon neutral economy, we see a big opportunity for construction if government provides real focus on upgrading existing housing stock through repair, maintenance and improvement (RMI). This work is environmentally, socially and economically valuable. It can serve to improve the health and wellbeing of residents

and have a positive impact at local level – work grounded in local supply chains, making it ideal to maximise employment within our sector, support regional growth and provide opportunities for training and retraining in low-carbon skills.

Training and education are key. The financial crisis of just over a decade ago devastated the construction workforce, with some 400,000 people losing their jobs across the sector. The sector's capacity has slowly but steadily been restored in the intervening years, but not completely. We need to retain our existing workforce and recruit new entrants. Improving access to, and the quality of, education and training is needed to ensure a pipeline of qualified individuals committed to careers in construction. We would like to see the government consult with the sector to develop a labour market that is flexible, responsive and able to adapt to the industry's future needs.

We also want the government to consider ways in which, as a key industry client, it can support more efficient and effective business models. Around 99% of businesses in our sector are SMEs. Any late payment to businesses down the supply chain has significant consequences. Combined with the consequences of lockdown, many businesses are now at risk. The failure of a single business can delay entire project pipelines.

The CIOB will, of course, work with the government and any other industry partners to push these initiatives forward but we first need government to commit to putting our industry where it should be – front and centre as a key part of the economic recovery. ●

Caroline Gumble is chief executive of the CIOB.

Use AI and data to drive recovery

Construction must 'harness data, AI and digital twins' to aid recovery from covid, says **Richard Robinson**



The impact of covid-19 has been devastating and will continue to affect virtually every aspect of society for the foreseeable future. Recovery

will take time, and we must all get used to constantly evolving norms as we look to keep the pandemic at bay while safely going about our daily lives, where we can, be it professionally or personally.

Atkins' latest Infrastructure Insights report, which surveyed nearly 400 public and private sector industry leaders, is about understanding the present, so we can help steer tomorrow. We know that covid has presented huge problems for the infrastructure sector, but we mustn't lose sight of the role we will play in conceiving of and preparing for the future.

The report asks what more the private sector can do to aid recovery...and highlights the importance of digital innovation in accelerating projects and ensuring that we build back smarter as well as better.

A total of 95% of the survey respondents stated that digital innovation will be increasingly important after the covid-19 crisis. Nearly two-thirds want to see digital innovations from the design, engineering and consultancy sector to help support their organisation during the covid-19 crisis and recovery.

For me, this represents an incredible opportunity for our industry to help shape the UK's recovery by harnessing data, AI and digital twins to give us greater certainty when delivering projects. It's no secret that we need to transform how we design and build to improve productivity and offer greater predictability – the evidence is there for all to see when projects are delayed or costs spiral.

Respondents expect big changes in the infrastructure sector following covid-19. There is general agreement that the sector will not emerge from the crisis in the same form, with digital innovation and working from home playing a much bigger part than before. Effectively adopting digital innovation in particular is seen as crucial to accelerating growth.

As the government looks to accelerate infrastructure development, I hope it will consider embracing a procurement model that actively incentivises the use of the latest digital tools and in so doing puts the industry on the path to a more productive, innovative future.

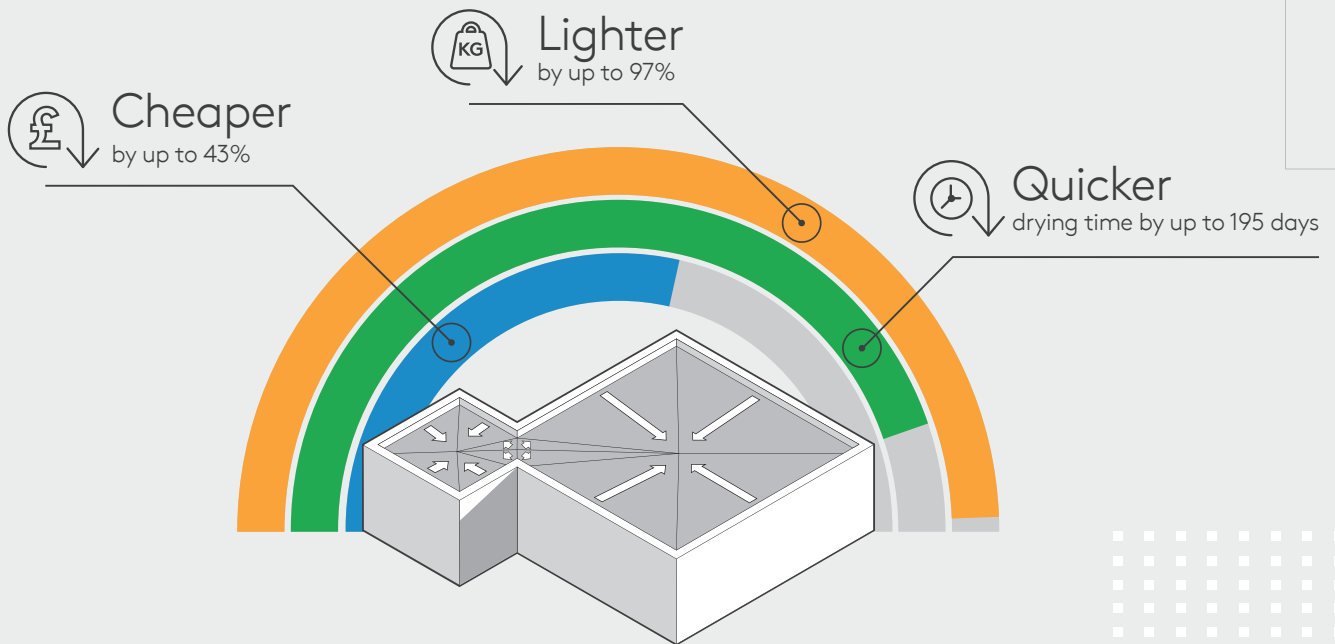
Richard Robinson is Atkins CEO UK & Europe.

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Learn more about fire resistance and engineered wood panels from our CPD, p40



Feedback

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

Why has covid-19 added to Crossrail's cost overruns?



CM 07/09

Permitted development rights

Grahame Wiggins
Having started in the building industry 62 years ago, I am cognisant of the deadening effect of planning regulations on the progress of developments.

I am amazed at suggestions that the extension of Permitted Development Rights could lead to a decline in construction quality (p7, CM September 2020). Are we, as members of the Chartered Institute of Building, not capable of keeping up build quality standards?

We do not set space standards, create regulations or control design criteria. That is for others. All we must do is build whatever is funded to the highest possible standards.

Any proposal that frees industry from the stranglehold of planning bureaucracy should be welcomed.

CM 01/09

Laing O'Rourke targets 90% factory-built by 2025

David Hall
I wonder in the future if Ray O'Rourke will be seen, on a par with Brunel and the likes, as a visionary who leads on, drives and commits to more modern, productive construction practices.

David Chisholm
Precast has been around for 200 years.

Rahul Aggarwal
I have design experience on DfMA for two major projects for Laing O'Rourke when I was in WSP. Nobody is considering it. Only some big players are taking all the work.

Tom
Factory-built products are not new – it's just that the British building industry hates change. They prefer to block it with meaningless red tape and so-called 'experts' (both trade and media) pontificating on products and systems they know nothing about. Even India is some 11 years ahead of the UK in this area!

CM 24/08

Crossrail bill spirals to £19bn

Graham Skeer
London, London. There are other parts of the UK who would just love to have some of these billions being spent on them. Why has the cost spiralled due to covid-19? Nobody has been working – material prices must have stayed the same. Disappointed northwesterners.

Hugh Kidd
This is an extremely challenging project by any standards and to try at this stage hold people accountable for cost overruns can only be described as premature judgement. You have to fully understand the complexity of this project before you pass any judgement whatsoever.

CM 07/09

Insurer calls for school sprinklers

Owen Jordan
What this article shows is that you can make a case for anything by selective

use of statistics. It does not make a case for sprinklers in schools; that would require something rather more robust. Risk to life is very low, not least because most fires occur out of school hours.

Ian
I see many reports of this type from insurers. While the underlying message is sound and morally correct, this is essentially driven by insurers wanting to control their own exposure to risk, i.e. avoidance of claims.

Possibly if they included information regarding how adopting better measures would reduce the premiums and by what average amount, it would help schools to secure the required funding.

Steve Jervis
In doing fire risk assessment (FRA) in schools in Yorkshire, the common theme is fire doors. The current legislation will not allow an old door to be a fire door. Fire doors generally need replacing on common areas but school repair budgets will not allow.

Paul Bray
It's great that this subject is being discussed but disappointing that it has to be, because this has been covered before, many years ago.

Back in 2007 the report *The Impact of School Fires: A study of the wider economic and social impacts on schools and the local community* was published by the LGA educational research programme (www.nfer.ac.uk/publications/lfw01/lfw01.pdf).

Zurich is quoted in the report, raising similar issues, but did anyone listen?

Phillip Leeder
I recently undertook a fire risk assessment of a primary school when it was closed. There were contractors installing fire doors in the school at the time of the audit.

One problem noted was that they had removed all the old doors before installing the new doors – this of course left the school without any fire compartmentation.

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Analysis

VALUE CHAIN

AT FIRST GLANCE, THE HUMBLE BICYCLE MAY NOT LOOK LIKE THE BEST BET FOR REDUCING EMISSIONS GENERATED BY DELIVERIES TO CONSTRUCTION SITES. BUT MORE CONTRACTORS ARE STARTING TO TRIAL SPECIALLY ADAPTED, ELECTRONICALLY ASSISTED E-CARGO BIKES FOR DELIVERY OF SMALL ITEMS. CAN THEY SERIOUSLY REPLACE VANS AND TRUCKS FOR CITY-CENTRE CONSTRUCTION DELIVERIES?, ASKS **NEIL GERRARD**

“Every time I see an adult on a bicycle, I no longer despair for the future of the human race,” author HG Wells is reputed to have said. But even one of Britain’s foremost science fiction writers could scarcely have predicted that one day the humble machine could be adapted to ferry hundreds of kilograms worth of equipment backwards and forwards to construction sites.

And yet that’s exactly what has started to happen on some projects in the capital, as the mayor of London and Transport for London look for ways to fulfil an ambition to make the city ‘zero carbon’ by 2030.

Already, Transport for London has helped to arrange over 100 deliveries to sites including Crossrail, Tideway and HS2, with the involvement of contractors like FM Conway, Mace, and Morgan Sindall, explains Michael Barratt, TfL’s development impact assessment manager.

Barratt’s job is to find innovation and efficiencies on construction projects within the M25, collaborating with councils, communities and industries. A keen advocate of e-cargo bikes, he liaises with contractors and introduces them to companies such as passenger

and cargo service PedalMe and zero-emissions logistics operator Zedify to see how suitable materials – lighting, hand tools, signage, bolts, nuts and screws to name just a few – could be transported to their sites around the capital.

The bikes themselves vary, some offering a loading bed in front of the rider, and some carrying a trailer behind. Assisted by electric motors that typically offer around 250W of extra power to the

TfL’s Michael Barratt rides an Urban Arrow e-cargo bike



“I asked FM Conway if they had considered making deliveries by bikes and they didn’t think it was possible, but the C3 cycle lane runs right along the Thames”

Michael Barratt, TfL

rider, power delivery is governed by how hard the rider pushes the pedals. The bikes can generally carry up to 150kg, although certain models like Urban Arrow’s three-wheeled Tender can carry up to 250-300kg. They are usually speed-limited to 14-15mph, at which point the power assistance cuts out.

Barratt approached FM Conway after he heard that the firm was working on phase two of the Illuminated River project, which involves fitting LED lights to five London bridges.

Reducing van deliveries

Originally, FM Conway had planned for materials and equipment to be delivered by van. However, TfL raised the benefits of e-cargo bikes because it is attempting to implement London mayor Sadiq Khan’s ambition to reduce the number of lorries and vans entering central London in the morning peak by 10% by 2026.

“I asked FM Conway if they had considered making deliveries by bikes and they didn’t think it was possible, but the C3 cycle lane runs right along the Thames and so we got the conversation going,” explains Barratt. Another e-bike firm, Fully Charged, loaned three bikes to the project and Barratt began examining what sort of materials could be loaded onto them.

FM Conway workers underwent trials and training to ride a loaded bike and Adam Barnes, senior contract manager at FM Conway, says the process was easier than he expected: “As a cyclist with average experience, I was initially ►



MICHELE MARCONI



“The ride itself really demonstrated the flexibility and capability of the bikes in terms of being used for general logistics within the construction industry”

Adam Barnes, FM Conway

hesitant to ride the cargo bike. However, I was quickly reassured,” he says.

“As soon as I got on the bike to do some practice laps of our yard in Southwark, I quickly realised the ease of riding with the use of the electric assist motor on the bike. As to be expected, you must be aware of the slightly larger frame of the bike, but the handling and engineering of the bike make it very user-friendly. The ride itself really demonstrated the flexibility and capability of the bikes in terms of being used for general logistics within the construction industry.

“With the use of TfL’s cycle highways and local quiet way route, before we even knew it we had arrived at our first destination, Blackfriars Bridge. The ride was very easy; it felt comfortable

and safe even when encountering some unforeseen highway works on the route.

“Being on the ride has really given me a better perspective for the use of cargo bikes from both the view of the rider and the operational potential within the industry. I am now more motivated than ever to incorporate their use into our site logistics model within central London and further investigate their use in site operations in other areas of the business.”

FM Conway has since gone on to purchase three e-cargo bikes and Barratt is pleased that the trial appears to have been a success. Although in most cases, he wouldn’t expect contractors to own and operate bikes themselves. “Ideally the goal is to get contractors involved but I can see that you would generally contract it out,” he says. “It would make more sense for a lot of companies because they don’t want extra fleet to manage themselves, they would rather just pay someone else to do the work.”

Barratt is aware that concerns around safety, both for operators and members of the public, are key for contractors, and in addition to producing risk assessment for the firms he collaborates with, he has been working with the Metropolitan ▶

E-cargo bikes deliver for Morgan Sindall

Same-day deliveries even during the pandemic



A PedalMe bike delivery at Morgan Sindall’s site in Hackney

In partnership with TfL, e-cargo bikes have been used to deliver tools, plant and PPE to the £384m New Britannia Leisure Centre and Academy in London’s Hackney, where Morgan Sindall is the main contractor, and subcontractor O’Neill & Brennan is delivering the logistics package.

O’Neill & Brennan operations manager Barry Walker explains that PedalMe bikes were used to transport paint, timber, screws, plant, vacuums, small tools, PPE and signage. A dedicated e-cargo bike loading bay was even set up on the site.

“I was very surprised by the vast amounts that they can store and carry,” he says. “I think cost-wise for certain items (welfare in particular), they haven’t been as efficient on value due to a large number of our suppliers offering free delivery with their orders, but I feel that the more we use them, the more efficient deliveries will be, especially with multiple products being collected on one delivery, which is allowing us to add greater value against the cost.

“We have certainly seen savings on deliveries of paint, timber, screws and plant, which tend to have larger delivery costs.”

Walker remarked that the speed of delivery has also been impressive. “During covid-19 the e-cargo bikes have been of huge assistance. While a lot of suppliers furloughed staff, we were able to get emergency items delivered same day.”

Having trialled the bikes with the help of TfL, Walker is also optimistic that they will be used more in the future.

“We are currently in talks to purchase a cargo bike for New Britannia and also another project in the Vauxhall area. Once purchased, we are planning on putting one of our operatives through Cargo Bike Training so that we can use the cargo bike to collect and deliver products and materials to the project on a full-time basis.

“This service being supplied by our client means that all subcontractors can use and book cargo bike deliveries throughout the project,” he says.



Small items can be easily loaded onto the bike for flexible delivery stops

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TfL is working on guidance to explain the dynamics of using e-cargo bikes

Police's cycle safety team to work on guidance around the height of load, so that riders can see the road properly, and on a limit to the bike's motor capacity.

And he is confident that the machines will be attractive to construction because of the potential cost savings involved. He cites the example of a custom-made workbench weighing 130kg that was delivered to Crossrail that would have cost £100 to deliver by van but was £35 by e-cargo bike, transported in a trailer in just one load.

Other contractors like Mace and demolition firm JF Hunt are now also getting involved in trialling the bikes, and TfL is working on a guidance document to explain the dynamics of the bikes, when they are best used, and their benefits, along with case studies, which is due to be published shortly.

Barratt is convinced that while they will never completely replace other modes of transport, e-cargo bikes will provide a rapid, cost-effective and environmentally friendly alternative to many van deliveries. "We want to get to a point where e-cargo bikes are included in the tender in the same way as Construction Logistics and Community Safety (CLOCS) or the Fleet Operator Recognition Scheme (FORS)," he says. ●

"Those who design and build our city have an important role in helping to shape a healthier, more sustainable future for it"

Chris Dyson,
Bike Lines London

Construction professionals demand wider cycle lane network

Bike Lines London is calling for dedicated routes



A group of construction professionals is calling on mayor of London Sadiq Khan to create a network of dedicated cycle lanes connecting local neighbourhoods to the city centre, as a means of getting people in the capital back to work safely amid the coronavirus pandemic.

The Bike Lines London group is made up of architects, engineers and contractors, all of whom are members of Club Peloton, a charity and community of cyclists.

Following the coronavirus lockdown, Khan announced that commuters would experience an 85% reduction in capacity on the transport network, while the mayor of London has an ambition for a 'Zero Carbon London' by 2030.

The Bike Lines London routes would turn roads into safe thoroughfares open only to bikes, public transport and emergency and delivery vehicles.

Chris Dyson, architect and member of Bike Lines London, which in June wrote an open letter to Khan about the scheme, said: "Our group came together not only because we are all keen cyclists but because we care about our environment. Those who design and build our city have an important role in helping to shape a healthier, more sustainable future for it."

"Our day-to-day jobs see us shape our towns and cities and we understand

all the constraints, challenges and issues facing stakeholders. The plan we have suggested to Sadiq Khan in our letter is brave, but it is vital to help London to recover from the pandemic and make the city a better place for all those who visit, live and work here."

CLOCS call
Meanwhile, the UK's biggest construction professional bodies have written to local authorities across Britain urging them to sign up to the Construction Logistics and Community Safety (CLOCS) construction vehicle safety scheme. In 2018 there were 5,517 people killed or injured by vehicles used in construction, many of them cyclists.

The Chartered Institute of Building (CIOB), the Institute of Civil Engineers, the Association for Project Safety, the Royal Town Planning Institute and Build UK are all backing the campaign. The CIOB warned that accidents involving construction vehicles was likely to grow, especially since the publication of Boris Johnson's cycling and walking strategy in response to the transport challenges posed by covid-19.

Caroline Gumble, CEO of the CIOB, said: "The CIOB has long supported the CLOCS campaign, a collaborative effort with construction industry partners to save lives and support community safety."



A 3D isometric illustration of a construction site. A winding black road with white dashed lines and yellow-and-black striped borders runs through the center. On the left, a yellow tower crane stands next to a worker in a blue shirt and black skirt pointing at a large digital screen displaying a 3D wireframe model. Another screen shows a bar chart. In the foreground left, there are orange traffic cones and a small circular platform with a flag. To the right of the road, a yellow excavator and a yellow cement mixer are positioned. Further right, a worker in an orange shirt and blue pants carries a long black beam. A white drone with four rotors flies in the upper right. In the bottom right, there is a green wireframe structure. Various data visualizations, including line graphs, bar charts, and pie charts, are floating in the background. The entire scene is set on a blue ground plane.

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ENGINEERING ROGERS' LATEST EXOSKELETON

THE SIGNATURE DESIGN OF ROGERS STIRK HARBOUR'S BOUTIQUE HOTEL IN MAYFAIR IS BEING BROUGHT TO LIFE BY MAIN CONTRACTOR ISG AND STRUCTURAL ENGINEER RAMBOLL. **WILL MANN** EXPLAINS



“This project is unique in the UK,” says Gary Le Carpentier, technical director with Ramboll and the consulting engineer’s lead on Rogers Stirk Harbour’s latest extraordinary structure.

He is referring to The Residences at Mandarin Oriental Mayfair, a luxury hotel development featuring the architect’s trademark external

expression of structure, which ISG is currently constructing. The design is in the best traditions of the practice’s co-founder Richard Rogers, responsible for the Pompidou Centre in Paris and London’s Lloyd’s Building, who announced his retirement last month.

The Mandarin Oriental project features a steel exoskeleton, which

Above: The facade under construction

Opposite top: CGI showing the finished building

Opposite right: Detail of the cruciform Vierendeel column

wraps around the development, and is designed as a Vierendeel structure. “That was the only way we could do it, but it’s pretty unusual in modern engineering,” says Le Carpentier.

“The engineering is among the most critical elements of the build,” adds Oliver O’Shea, ISG’s project director on the £50m shell-and-core scheme.

684

Number of
Vierendeel
sections in
the structure

“Everything had to be made stable externally. This also meant a unique approach to the build because the structure does not become stable till you build a full ring around the perimeter”

Gary Le Carpentier, Ramboll

The development at 22 Hanover Square comprises two towers, one nine and the other 11 storeys, linked via a translucent glass connecting core. The shorter tower, fronting the south-west corner of the square, has a six-storey bay feature jutting out to the east, which also forms the hotel entrance, plus a smaller bay on the west facade.

Maintaining stability

ISG’s design-and-build contract kicked off in June 2019. Demolition and construction of the three-storey basement was handled by Erith, which installed a large A-frame in the sub-structure to maintain lateral stability. “We had to leave it in place until the permanent superstructure had reached level six,” says O’Shea. The foundation design uses 314 secant piles in a retaining wall solution.

The engineering of the structure went hand in hand with planning the build.

“Because Rogers Stirk Harbour doesn’t do cores, everything had to be made stable externally,” says Le Carpentier. “This also meant a unique approach to the build because the structure does not become stable till you build a full ring around the perimeter. Working this out with ISG was key to constructing the design.”

The steel Vierendeel columns (VCs) are cruciform-shaped and the size of an A4 sheet of paper in profile. They are 6.5m high – so double storey height – and spaced at 1.6m centres. There are

four internal columns on each tower, precast offsite, giving spans of 8.2m to maximise internal space. External shear walls on the towers’ facing elevations, precast for ease of installation, provide further stability.

As well as the engineering, considerable care went into the finish of the structural sections.

“The vision of the architect meant we had to create the columns with a polished finish that was exposed on the facade,” explains O’Shea. “To do this, we had to create a steel channel, fill that with concrete, and then achieve the desired finish.

“It was an interesting challenge, as concrete will naturally try to shrink and then will crack. So we had to go through lengthy testing processes with the supply chain, creating mock-ups, trying to understand how the concrete would behave.”

The steel sections are a galvanised box construction, manufactured by fabricator Barretts of Aspley, with reinforcement bar welded inside for the concrete.

Project team

Client: Mandarin Oriental

Client architect: Rogers Stirk Harbour + Partners

Main contractor (shell and core): ISG

Project architect: AFK

Structural engineering: Ramboll

Value: £50m

Programme: June 2019 to December 2020

Contract: Design and build

Key subcontractors:

Demolition and basement: Erith

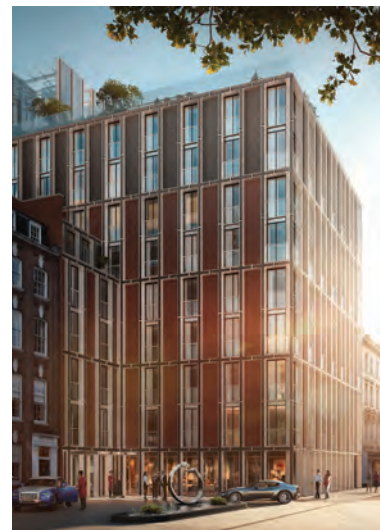
Post-tensioned floors: McGee

Steel frame: Barretts of Aspley
Facade: Metallbau Frueh



Technical story for CM?

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Using mock-up sections, ISG went through a “trial and error” testing process to work out how to achieve the architect’s intended concrete finish, says O’Shea.

“Barretts created moulds which would deliver the clean straight lines we wanted. We poured in standard grey concrete at the bottom then used a darker concrete for the top 30mm to 40mm.

“We had consistency issues with the face finishes due to seasonal challenges – columns manufactured during the summer looked different to those manufactured in winter.

“In the end, we decided that using plasterers was the best way to achieve the desired finish. The optimum solution was to use rougher grit (50 grit) sanding pads to take out the big ripples and dips on the face of the columns. It creates an almost granite-like finish but with concrete. That is the finished product which is now on the building.”

Transporting the sections to site was the next consideration.

“We had to work out how we could get enough columns onto a lorry and deliver them to site to achieve a ▶



Panels made by
attaching brick
'baguettes' to
a steel frame



credible programme, within our client's ambitions," explains O'Shea.

"Because of the point load created by the VCs, we couldn't lie them on a flatbed because we had to crane them up into position on site. So we had to get three trailers modified by Barretts so they were stiff enough to take the point load during transportation."

The rectangular-shaped site, bounded tightly by buildings on all sides except the front, has a total footprint of roughly 35m x 15m, says O'Shea. "All materials come in through one letterbox on Brook Street and there was little space to lay down materials," he explains.

This meant the VCs would have to arrive by lorry and go straight up on to the building, using a combination of tower crane, located between the two towers, and cherry picker. Meanwhile, O'Shea was working out how this would interface with the floor slab construction, where McGee was the specialist contractor. This had to be planned with "military precision," he says.

"We installed Titan decks for the floor slabs, then the reinforcement for the post-tensioned slabs went

Above: Seven to eight VCs were installed every day on average

Below right: A gap was left on each tower's structure so bathroom pods could be brought in; it will be filled in later in the programme

in, then the slab was cast," O'Shea recounts. However, the VC installation complicated the process.

"The VCs are double storey height, with support shelf angles at each level (two per column), so cannot be installed floor by floor," he explains. "To construct the frame in the most efficient way possible, we decided to



"The Vierendeel columns are double storey height, with shelf angles at each level (two per column) so cannot be installed floor by floor"

Oliver O'Shea, ISG

pour two slabs in one cycle. To do this, we left out a 1m 'pour strip' around the perimeter of the first slab in each cycle, then installed the columns, then filled in the strip when we poured the second slab. Then the next level of decking was fitted and the cycle began again."

The VCs were installed clockwise in a rigid sequence. "The continuity of labour was planned day by day, hour by hour, including materials schedules," explains O'Shea. "McGee would pour a slab on one tower while Barretts was installing the columns on the other."

Complex frame construction

There are 52 VCs wrapping around the perimeter every two levels and seven to eight VCs were installed per day on average. The whole structure has 684 of the Vierendeel sections, with 11 different types. "It was quite a jigsaw puzzle to put together," says O'Shea.

The logistics of the frame construction were further complicated by the need to bring bathroom pods and other materials inside the structure. The solution was to leave out a bay of columns on each tower, to be completed at the end of the programme. "This required the VCs on either side of the opening to be strengthened in the structural design," says O'Shea.

As well as the two towers, another "unique" structural feature of the development, says Le Carpentier, is the connecting core which contains the hotel's entrance lobby. ▶

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“The principle of the exoskeleton design is carried into the connecting core, so the edges of the flanges of the steel columns read across the space”

Gary Le Carpentier, Ramboll

“This is essentially a glass box with a steel frame inside,” he explains. “It serves as a fire escape core for both towers but also spans between two buildings. So the structural design of the core had to factor in any expansion or contraction of the two adjoining buildings.

“The principle of the exoskeleton design is carried into the connecting core, so the edges of the flanges of the steel columns read across the space,” Le Carpentier continues. “Some columns within the core space are ‘dummy’ precast elements, finished to look exactly the same as the VC faces. The precast shear walls also have the same finish.”

The thin plate staircase cantilevers out from the core’s main structure, on one side of the lobby, while the scenic lifts – glass boxes manufactured by Kone in Finland – are on the other side.

ISG expects to complete its work on the central core in December and shortly after, Mandarin Oriental’s fit-out contractors will move in. Besides the apartments, the development’s other facilities will include a spa, swimming pool and gym in the basement, plus restaurant and retail concessions. ●

Left: The Vierendeel columns in Barretts’ factory

Below: Facade work on the entrance bay. The site footprint is bordered tightly on three sides by existing buildings

Building the facade with brick ‘baguettes’

Venetian brick-faced panels are put together on site



The brick ‘baguettes’ were made up into cassettes on site

The facade construction is also part of ISG’s contract and features alternating glazing with Juliet balconies and Venetian brick-faced panels.

“These are made from brick ‘baguettes’,” explains O’Shea, “which are brick slips with horizontal steel reinforcement rods running through the centre of them. The baguettes are individually bolted into the supporting framework. These are then attached to a powder-finished steel frame which is attached to lugs which are welded on to the side of the VC units.”

The panels were supplied by German firm Metallbau Frueh with the brick baguettes already attached.

“The bricks were shipped from Italy to Germany and fixed to the reinforcement rods by Metallbau Frueh to create the baguettes,” says O’Shea. “We did consider shipping them as complete cassettes but we were worried about damage in transit. So we set up a mini production line on site with Metallbau Frueh to manufacture the panels.”

They are bulky units, ranging from 4.6 to 6.3 tonnes for the corner sections.

“They took up a lot of our hook time, which meant we had to look at our methodology,” says O’Shea. “We did consider using a large spider crane but couldn’t make that work. However, we were able to use a spider for the precast structural elements to free up the tower crane hook.”



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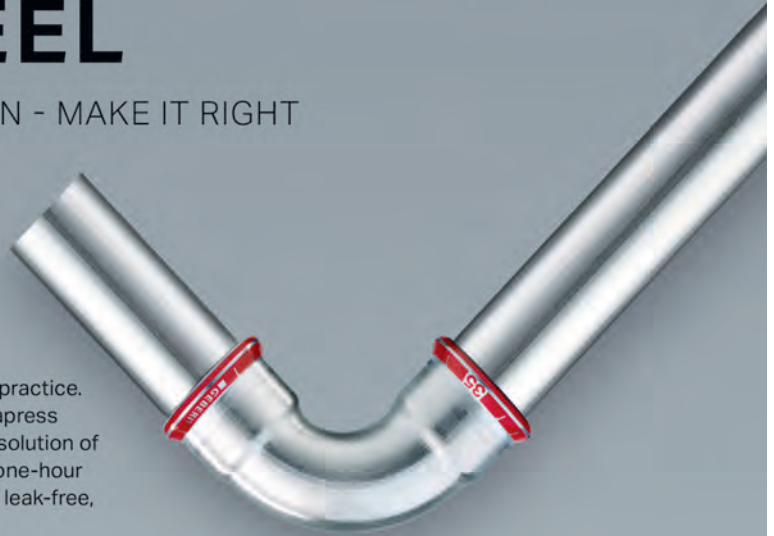
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Building Services

GENERATION GAME

WITH EACH MONTH THAT PASSES, THE UK'S LOFTY 2050 NET ZERO CARBON TARGET BECOMES MORE DAUNTING. BUT THROUGH GRANTS AND INCENTIVE SCHEMES, THE GOVERNMENT IS DESPERATE TO INCREASE THE TAKE-UP OF LOW CARBON ENERGY TECHNOLOGIES. WHICH ARE THE BEST OPTIONS THOUGH? JAMIE HARRIS REPORTS

The 'other' global emergency hasn't gone away. The climate crisis has continued its relentless pursuit of this planet during the last eight months in which the coronavirus pandemic has kept hold of our collective attention.

But with businesses, local authorities and governments alike declaring a climate emergency last year, and with the UK government enshrining in law its net zero carbon 2050 target, the focus for several industries, including the carbon-heavy built environment sector, is to continue (or begin) enacting sustainable practices.

Renewable energy generation on site is an increasingly fundamental component for individual homeowners, larger-scale housebuilders and

commercial developers alike to reduce demand on the national grid and generate clean energy that is used in the most efficient way.

The technologies range wildly in price, running costs, output and savings, from the cheaper solar PV panels to the more expensive ground source heat pumps, air source heat pumps and biomass boilers. Many are included in the tangled web of government grants available, such as the recently announced Green Homes Grant, although some technologies miss out on certain funding pots.

For the individual, it's a complex market: which technology provides best value for money? For the wider sector, it's more complicated: which technology is best value for money and is most likely to drive the UK towards net zero carbon in the next 30 years?

Solar

Solar photovoltaic (PV) panels have been around for decades, but thanks to advances in photovoltaic technology, the cost is continuously decreasing, while the amount of electricity generated is heading in the other direction. With relatively inexpensive capital costs – a typical array on a domestic property costs around £6,000 – the sight of a solar PV array on the roofs of domestic buildings is now commonplace.

Solar PVs have an incredibly long lifespan – some can provide clean energy for up to 30 years – generally do not require planning permission, and under the Smart Export Guarantee

(SEG) building owners can export electricity generated through panels to the national grid for a small sum.

"There are no running costs for this – these are just savings that can be made," explains Luke Osborne, energy and emerging technologies solutions advisor at the Electrical Contractors Association (ECA).

Despite its relative affordability, the government has decided against including solar PVs in its Green Homes Grant scheme, introduced this summer to offer £5,000-£10,000 towards low carbon technologies. Solar water heating, however, is included.

Solar water heating – also known as solar thermal – collects heat from the sun to directly heat up water using a hot water cylinder. This system is then connected to a compatible boiler, which can be used to up heat, particularly in winter months.

In relation to solar PV technology, solar thermal is – at least until the new grant impacts the market – relatively rare, says Barny Evans, head of energy, waste and sustainable places at consultant WSP. "Solar panels are so cheap, relatively flexible and easy to



"Solar panels are cheap, relatively flexible and easy to plug in"
Barny Evans, WSP



Solar

Typical installation cost:
£6,000

Average generation: 3,600kWh

Typical savings: £360 per year
Grants/funding: Roughly 5p per kWh through exporting via Smart Export Guarantee (not included in Green Homes Grant)

Planning issues: Planning not normally required – distribution network operator (DNO) should be notified post-installation (prior approval required for larger systems)

CO₂ impact: Average generation creates a CO₂ saving of 756kg per year



1m

The government intends to install 600,000 heat pumps a year by 2030, but the Committee for Climate Change recommends one million

plug in – and you can still use it to help provide hot water,” he explains.

Ground and air source heat pumps

If an energy generation technology could ever be described as being ‘in vogue’ in 2020, ground source and air source heat pumps would be the most likely candidate. Heavily backed by government funding for part of the upfront costs (see box, p31), both were covered by the Renewable Heat Incentive (RHI) scheme, are currently covered by the Green Homes Grant, and are thought likely to be included in a future Clean Heat Grant scheme.

While heat pumps require power, they generate heat using much less primary energy than other technology, such as gas boilers. Through extracting heat from outdoor air (air source heat pumps) or under ground (ground source heat pumps) and transferring it through a refrigerant, the heat is then released to the home’s central heating system.

Air source heat pumps are applicable to more buildings, as ground source heat pumps require more space, particularly if installed on an existing building. Osborne



“Current Building Regulations use energy ratings based on historic data, which are not realistic anymore”

Luke Osborne, ECA

thinks that once Building Regulations change, air source heat pumps will become the default option. He says: “The current Building Regulations are using old assessments for energy ratings of dwellings which are based on historic data, which are not realistic any more.”

This data categorised grid electricity usage as producing higher emissions than it does today, largely thanks to the decarbonisation of the national grid.

The updated methodology for calculating energy use in new residential developments will come into effect when the revised Building Regulation part L is published. Once this is updated, low carbon heating options will be more attractive. The Clean Heat Grant, which is currently in consultation, will support their installation.

Says Osborne: “The government intends on installing 600,000 a year by 2030, but the Committee for Climate Change are recommending 1,000,000.”

Ultimately the UK’s net zero carbon target of 2050 will not be met unless new buildings are designed and constructed with this goal at their heart. The sprawling existing stock



Ground source heat pumps

Typical installation cost: £15,000–£20,000

Average generation: 1kWh electricity will give around 4kWh in heat

Typical savings: Dependent on property and boiler it is replacing – ranges from £500–£1,500 per year (Source: Energy Saving Trust)

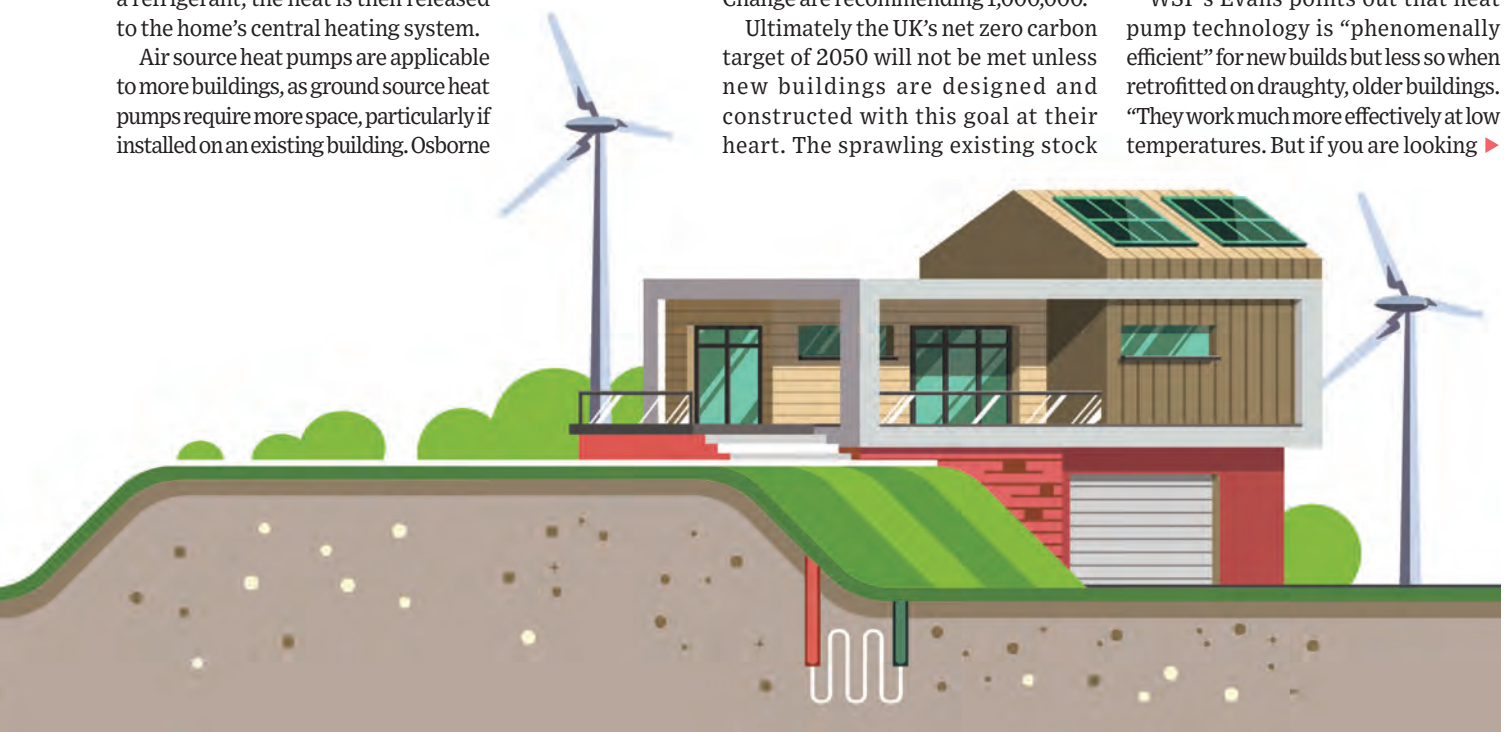
Grants/funding: RHI, GHG, CHG (£5,000 capital costs)

Planning issues: If total building demand is less than 13.8kVA, then install and inform DNO within one calendar month, if more than 13.8kVA then prior approval is required

CO₂ impact: Gives savings of 400% on equivalent electricity

in the UK – 80% of which will still be standing in 30 years’ time – also requires a radical retrofit programme.

WSP’s Evans points out that heat pump technology is “phenomenally efficient” for new builds but less so when retrofitted on draughty, older buildings. “They work much more effectively at low temperatures. But if you are looking ▶





Air source heat pumps

Typical installation cost: £8,000–£12,000

Average generation: 1kWh electricity will give around 3.5kWh in heat

Typical savings: Dependent on property and boiler it is replacing – ranges from £400–£1,350 per year (Source: Energy Saving Trust)

Grants/funding: RHI, GHG, CHG (£5,000 capital costs)

Planning issues: If total building demand is less than 13.8kVA, then install and inform DNO within one calendar month, if more than 13.8kVA then prior approval is required

CO₂ impact: Gives savings of 350% on equivalent electricity



“Onsite generation shouldn’t be installed without balancing technologies”

**Andy Sutton,
Sero Homes**

on an industrial space where there is a lot of land available.”

Biomass systems, which burn wood pellets to provide heat, require plenty of space, particularly for the hopper, which stores the fuel. They are typically good for off-grid and draughty buildings as they provide a higher temperature output. They are effectively carbon neutral, but there are other factors to consider, says the ECA’s Osborne.

“New trees are planted to offset those used, but often these are imported from countries such as Canada, so you then have carbon transport miles to consider,” he explains.

Biomass boilers have also caused problems on a non-domestic scale. Larger boilers were installed in schools across the country at great costs – up to £100,000 each – as part of the government’s Building Schools for the Future programme.

Austen Bates, head of building performance at Ramboll, explains that schools often installed a larger boiler than necessary in order to get low carbon funding for the school.

He says: “A large biomass boiler went in to get to your 70%-of-energy-generated-from-biomass tick. I’ve seen it in a number of schools where they are switched off because they are too expensive to run and too big to maintain.”

Combined heat and power (CHP) captures waste heat from the electricity generation and uses it for thermal energy, such as hot water.

But because of the decarbonising grid, explains Rob Barnes, energy strategy lead at Arcadis, CHP is increasingly falling down on CO₂ emissions. He says: “The government is pulling back on their support for it because it appears not to be the right option for the future.”

A holistic approach

For new and existing buildings alike, a combined approach is essential for reaching net zero carbon. Passive measures aimed at reducing energy demand through improving a building’s fabric and a whole-life focus on reducing the embodied carbon in the construction and in-use phases of a building’s life are important components in hitting the net zero target.



Domestic wind turbines

Typical installation cost: £10,000 (2.5kW) (£30,000+ for 6kW+)

Average generation: Typically 10,000kWh per year (depending on wind speeds)

Typical savings: Could save £250 per year on energy bills

Grants/funding: None. (May be eligible for SEG)

Planning issues: If mounted on a building, must be on a detached building. Must comply with micro generation certification scheme planning standards

CO₂ impact: Savings of 2.8 tonnes a year (on 10,000 kWh production)

at a Whitehall-style office built in the 1800s, with no insulation and single glazing, you need to run a much hotter heating system to maintain the internal temperature – heat pumps are less effective, and in some cases, unviable.”

Less favourable schemes

There are several other options available to domestic and commercial buildings to generate low carbon energy, but many are hampered by operational and logistical issues.

Domestic wind turbines can only be installed on a detached house and comply to strict planning regulations.

Says WSP’s Evans: “On a project level, they are pretty unusual – it needs to be a very bespoke location, such as



£5,000

The Green Homes Grant (GHG) offers up to £5,000 for individuals to improve the energy efficiency of their home

Andy Sutton, co-founder and director of design and innovation at green housebuilder Sero Homes, stresses that energy balancing – the art of managing energy demand on the national grid – is equally as important as reducing usage or generating heat on site. Energy storage solutions, such as batteries, can store the energy generated at times of low demand instead of sending it direct to the grid, and be available to meet local demands when they arise.

Says Sutton: “[Onsite generation technologies] shouldn’t be installed without balancing technologies. PVs are the culprit here; they provide generation direct to the grid at times of low demand but high grid renewable generation in the middle of the day.



Biomass

Typical installation cost:

Pellet £6,000–£12,000,
Log batch £5,000–£10,000

Average generation:

Typically 10,000kWh per year
(depending on wind speeds)

Typical savings:

Could save £1,000 per year
on energy bills (Source:
Energy Saving Trust)

Grants/funding: RHI, GHG
(£5,000 upfront cost)

Planning issues: Generally
do not require planning permission

CO₂ impact: Savings of 14.3 tonnes a
year (when replacing older systems)

“As part of an overall plan for the individual home, low/zero carbon technologies such as heat pumps, home batteries and thermal stores and PVs can support fabric measures to deliver an optimised retrofit.”

The generation technologies on the market are becoming more affordable and more viable. With the government’s funding schemes and the desire for low carbon heat to become the main player in the market rather than a niche outlier, the UK may yet make commendable progress towards becoming net zero carbon.

When considering these alongside the UK’s approach to electric vehicles, energy storage and retrofitting existing buildings, the ambition is admirable, however disconcerting the journey looks. ●

Funding options

Government incentives are encouraging the adoption of low-carbon technologies

There are now a raft of policies and incentive schemes from the UK government urging the nation to adopt these technologies already in place and more to follow.

● **The Renewable Heat Incentive (RHI):** Introduced in 2014 to incentivise the use of renewable heat. Participants receive quarterly payments across seven years for the renewable heat produced. The scheme will be ending in the next 12–24 months but it is currently still available for both domestic and non-domestic applicants.

● **Green Homes Grant (GHG):** Offers up to £5,000 for individuals to improve the energy efficiency of their home, although the offer only stands until March 2021. Low income households can claim for up to £10,000. Air or ground source heat pumps, solar thermal and biomass boilers are covered by this scheme.

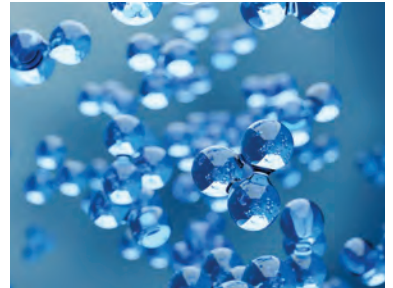
● **Clean Heat Grant (CHG):** A consultation has now closed on this scheme, set to follow on from the RHI, aimed at phasing out high carbon, fossil fuel heating. The scheme is designed to support upfront costs for heat pumps and biomass installations in households and small non-domestic buildings. Not expected to roll out until 2022.

● **Smart Export Guarantee (SEG):** Came into force in January 2020. Licensed electricity suppliers are now obliged to offer a tariff and make payments for low carbon electricity generators exporting to the national grid. Includes solar PV, wind power, micro combined heat and power (CHP) and others. The scheme replaced the Feed-in Tariff, which closed to new applicants in 2019.



IN PICTURES: SIX INNOVATIVE PROJECTS USING ONSITE RENEWABLES

CM SPOTLIGHTS GROUNDBREAKING EXAMPLES OF PROJECTS
INSTALLING ONSITE RENEWABLE ENERGY TECHNOLOGY



▲ Powering construction sites with hydrogen

A zero-emission hydrogen fuel cell capable of providing enough heat and power for an entire off-grid construction site has been installed on a project in Lincolnshire. Siemens, contractor for National Grid's Viking Link interconnector project, installed the system because the site will not have a grid connection for at least six months. The hydrogen power system was installed in August and will provide 250kVA of standard three phase, 400V of electrical power and up to 80kW of heating.



▲ Penzance's 'blue lagoon' heated by geothermal energy

The UK's first geothermal lido opened this summer in Penzance, Cornwall. The system extracts warm water from a geothermal well, drilled around 410m deep, takes heat out of the water using pumps and distributes it to the pool via a heat exchanger. The geothermal energy heats a section of the pool to a water temperature of 35°C. The well at Penzance's 85-year-old Jubilee Pool, the UK's largest lido, was constructed by Geothermal Engineering with grant support from the European Regional Development Fund.

► The world's greenest railway station?

Given planning approval in August, HS2's interchange near Birmingham is the first railway station globally to achieve the BREEAM Outstanding certification. Energy generating technology includes air source heat pumps and over 2,000 sq m of solar panels. The station's design includes use of natural ventilation and daylighting, a rainwater harvesting tank with 150 cu m capacity and 222 electrical vehicle charging points.



410

Depth in metres of the geothermal well on Penzance's lido



◀ UK's biggest heat pump system powers giant greenhouses

Two giant greenhouses constructed in East Anglia will be powered by the UK's largest ground source heat pump system, according to project manager Step Associates. The 7m-tall glass structures have been built next to Anglian Water sewage works and the closed loop heat pumps will draw in waste heat from the treatment facilities to power the greenhouses. The greenhouses, one near Norwich and one near Bury St Edmunds, have used more glass than The Shard and each one is 50% bigger than London's O2.



▶ Oxford Superhub is 'world first' smart energy system

An energy 'superhub', comprising 300 ground source heat pumps, the world's largest hybrid energy storage facility and a 10km network of electric vehicle (EV) charging points, is under construction in Oxford. Energy Superhub Oxford's partners, which describe the scheme as a world first, include the University of Oxford, the city council, and Kensa Contracting, which is installing the smart heat pumps on a Blackbird Leys housing development (pictured).



▲ Demand side response trial in south Wales

This government-backed housing pilot aims to align energy generated by renewable technology in the homes with demand on the grid, using energy more intelligently and reducing residents' bills. Dubbed FLATLINE (Fixed Level Affordable Tariffs Led by Intelligently Networked Energy), the scheme uses 3.6kW of solar PV per property, 6kW of ground source heat pumps, 5kW of battery storage plus various sensors and meters. The three pilot houses are being built by Sero Homes at The Mill development near Cardiff.



CPD: MACHINE CONTROL – THE BASICS, THE INNOVATIONS AND THE FUTURE

FROM DIGGERS THAT CAN AUTOMATICALLY GRADE TO TRUCKS THAT DRIVE THEMSELVES, MACHINE CONTROL TECHNOLOGY IS REVOLUTIONISING THE CONSTRUCTION INDUSTRY. MACHINE CONTROL AND AUTOMATED SOLUTIONS SHOULD BOOST PRODUCTIVITY AND REDUCE COSTS – BUT HOW DOES THIS TECHNOLOGY WORK, AND WHAT DOES THE FUTURE HOLD? THIS CPD IN PARTNERSHIP WITH TOPCON POSITIONING GB EXPLAINS

To understand how machine control is revolutionising the construction industry, we must first understand what is meant by the term ‘machine control’ and the reasons for its development.

Simply put, machine control hardware and software solutions were developed to determine a machine’s current position on the earth and compare it with a desired design surface. Using data from satellites or total stations and 3D models, the technology ensures that machine operators can accurately position machinery, check grade, automate equipment functions and collect data.

Through the use of various positioning sensors and a display, machine control gives operators a clear reference between the position of the machine bucket or blade and the design surface.



In association with

“The technology allows decisions to be made based on data, rather than relying on fallible traditional methods or the skill and experience of the operator”

Used by the construction industry on earthworks equipment since the late 1990s, the technology allows decisions to be made based on data, rather than relying on fallible traditional methods or the skill and experience of the operator. As a result, machine control effectively increases operators’ productivity and accuracy.

Machine control solutions on dozers and graders, like Topcon’s 3D-MC², save operators time, money and fuel thanks to the technology’s improved accuracy and enhanced performance. Through the use of software like the 3D-MC² platform, operators have access to technology that brings all standard site positioning solutions and different machine types together, meaning they have the flexibility to mix total stations or GPS with both dozers and motor graders.

History of machine control

Machine control is gaining momentum across a variety of different types of construction equipment – including graders, dozers and more recently excavators. Prior to its adoption, however, operators had to manually check grade and position machinery themselves – a process that was less accurate, time consuming and held higher safety risks due to the grade checkers’ or banksman’s proximity to the machines.

Once 2D and 3D technology began to develop, so too did early machine control technology. Providing operators with access to simple visual guides, this early

technology often used indicate systems to demonstrate how deep to cut and allowed dozer and grader blades to be controlled and kept on grade.

For this to work, rotating lasers were set up to transmit signals that could be picked up by sensors positioned on dozers or graders. This gave operators the basic information they needed for their grader or dozer. Yet, in comparison to modern-day machine control, these early systems were still very limited at providing a full and accurate picture and were also often too expensive or complex.

Present day challenges for the industry

Fast forward to the present day, and the construction industry is facing some significant challenges. It is no secret that there is a lack of fresh talent entering the sector. In particular, the sector has trouble attracting young people and, as a result, there are fewer operators entering the profession.

Should this trend continue, the industry will be left with a shortage of experienced and reliable operators, which means that the quality and

productivity of projects will be impacted by a significant skills gap. To meet construction targets and tackle the skills gap head-on, the industry is turning towards automated machine control to enhance its workflow further.

Automated machine control

Going beyond simply providing operators with a visual guide to bucket or blade position, automated machine control moves the blade to grade by talking to the machine’s hydraulics.

Unlike with regular machine control, automated machine control technology places the responsibility for accuracy and speed firmly in the hands of performance enhancing technology. This means that through the use of this technology, new or less-skilled operators can perform like a professional and even the most experienced operators can work better and faster.

How well has automated machine control been adopted?

When looking at the current construction landscape, it is clear that, despite its ▶

Opposite and below right:
Topcon’s X-53x excavator uses GPS technology to display real-time on-screen information to the operator



 To find out more about Topcon's use of machine control technology visit www.topconpositioning.com



“The technology means that operators only move the earth required, which in turn avoids over-digging – saving additional costs of fuel and unnecessary transportation of materials”

significant benefits, machine control automation is not being adopted across all machines at an equal rate.

In fact, although automation is being embraced on machines like graders and dozers, the uptake has been much slower for excavators, with the adoption rate of automated machine control on these machines currently estimated at around 10% in Europe in comparison to a rate of over 50% for dozers.

In the past this was unsurprising, as, while the industry previously had a steady supply of skilled workers, the need for automation across excavators was not considered high. It is also harder to prove an increase in productivity on excavators, meaning that it was difficult to assess how great the need for automation was.

Nevertheless, it is clear that the industry now needs to reassess this requirement. With the demands for productivity increasing and a shortage of skilled operators, construction needs to embrace the benefits that investing in automated machine control can bring.

Topcon X-53x

There is now an opportunity for the industry to transform construction workflows by investing in automated excavation systems, taking the first step towards a fully automated site.

The Topcon X-53x Automatic Excavator, for example, uses the same components of the original machine control system with the addition of an ultra-smooth hydraulic interface. With easy-to-use finger-tip control,

Automated 3D machine control systems allow operators to check against complex designs in the cab

the technology is designed to provide automated depth control when digging to grade in flat, stepped or sloped applications. The system allows experienced operators to work better and faster, while new operators are able to perform like a professional.

By simply pulling back on the stick, operators can automatically control digging depth, boom elevation and the bucket angle – ensuring that they are on grade every time and avoiding over-digging. This saves both new and experienced operators time and money, through an estimated increase in productivity of around 30%. The technology also means that operators only move the earth that is required, which in turn avoids over-digging – saving additional costs of fuel and unnecessary transportation of materials.

Automated 3D machine control systems, such as Topcon's X-53x Auto Excavator, also provide onsite safety benefits. By using the most advanced and precise GPS positioning technology and sensors, operators receive real-time, dynamic, on-screen bucket location and design views. Access to real-time designs means that operators can cut more accurately and check against complex designs in the cab, removing the need for someone to check the grade from the trench.

Thanks to onboard connectivity, automated machine control systems like these can also be used alongside software like Topcon's Sitelink3D. ►



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This gives teams remote access to the excavators and reports can be generated from each machine and communicated to a central point.

Reports, data and even designs can be shared between the office and the in-cab display to ensure operators are being updated when changes are made in real time – reducing the need for reworks if plans change. Giving teams up-to-date information on performance also ensures that they can monitor onsite progress and make amends to designs in real time, even when working remotely.

The future of automated machine control

Automation is just the first step for machine control. Looking forward, not only will automation control machine angle and depth, but the whole excavation process looks likely to become automated – increasing productivity across the entire construction workflow.

Through the use of automated machine control technology, like Topcon's X-53x Auto Excavator and digital management tools like

Sitelink3D, machines will be able to act as sensors – monitoring the progress of projects and sharing accurate reports on productivity. For the wider construction workflow, these reports will then be used to synchronise with other functions within a project and associated equipment – such as trucks, to streamline the construction process and avoid delays to projects.

At present, deciding if more excavators are needed is a human-led decision based upon factors such as the length of the haul or the type of material excavated. In the future, fully automated construction workflows will allow project managers to accurately assess the rate of progress and resource the operation appropriately thanks to reports from the machines.

Construction professionals need to ensure they are upskilling their workforce through this technology and embracing the benefits it brings to a project, since fully automated construction workflows look set to be the answer to addressing infrastructure targets in the future. ●

Right: Designs can be updated and as-built reports sent back to the office from the in-cab display

Below left: Simply pulling the stick controls depth and bucket angle



“Looking forward, the whole excavation process looks likely to become automated – increasing productivity across the entire construction workflow”

CPD Questions

1: Machine control uses what type of sensors?

- a) Sustainable b) Positioning
 c) Ultrasonic

2: Before the development of machine control, operators had to manually check grade and position machinery themselves. This process was time consuming, posed greater safety risks and what else?

- a) Was more accurate than modern machine control methods
 b) Was equally as accurate as modern machine control methods
 c) Was less accurate than modern machine control methods

3: Which type of machinery is lagging behind in the adoption of automation?

- a) Excavators b) Dozers
 c) Graders

4: Unlike with regular machine control, automated machine control technology places the responsibility for accuracy and speed firmly in the hands of who?

- a) The operators
 b) Performance enhancing technology
 c) Special robots

5: Ensuring operators are on grade and avoiding over-digging, increases productivity by an estimate of how much?

- a) 30% b) 5% c) 25%

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

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DANIEL HOPKINSON

CPD: FIRE RESISTANCE AND ENGINEERED WOOD PANELS

FLAME-RETARDANT ENGINEERED WOOD PANELS HAVE OPENED UP POSSIBILITIES FOR CONSTRUCTION PROJECTS. BUT HOW DOES THIS TECHNOLOGY WORK AND WHAT BENEFITS DO FIRE-RETARDANT ENGINEERED WOOD PANELS BRING TO THE TABLE? THIS CPD, IN PARTNERSHIP WITH MEDITE SMARTPLY, EXPLAINS

A flame-retardant (FR) engineered wood panel is typically available as oriented strand board (OSB) or medium-density fibreboard (MDF). While one is structural, the other is used for decoration and finishing. OSB variants can be used in floors, walls and ceilings within a building – if meeting the relevant Euroclass. MDF variants are often used in sensitive environments where maximum protection is required, such as art galleries, hospitals and schools.

Flame retardant vs fire resistant

When talking about an FR product, there can be some confusion about what it relates to. Fire resistance is different to flame retardance and it's important to establish this early on.

Above: The Edge student apartments, Liverpool



In association with

‘Reaction to fire’ is the measurement of how a material or system will contribute to a fire’s development and spread, particularly in the very early stages of a fire when evacuation is crucial.

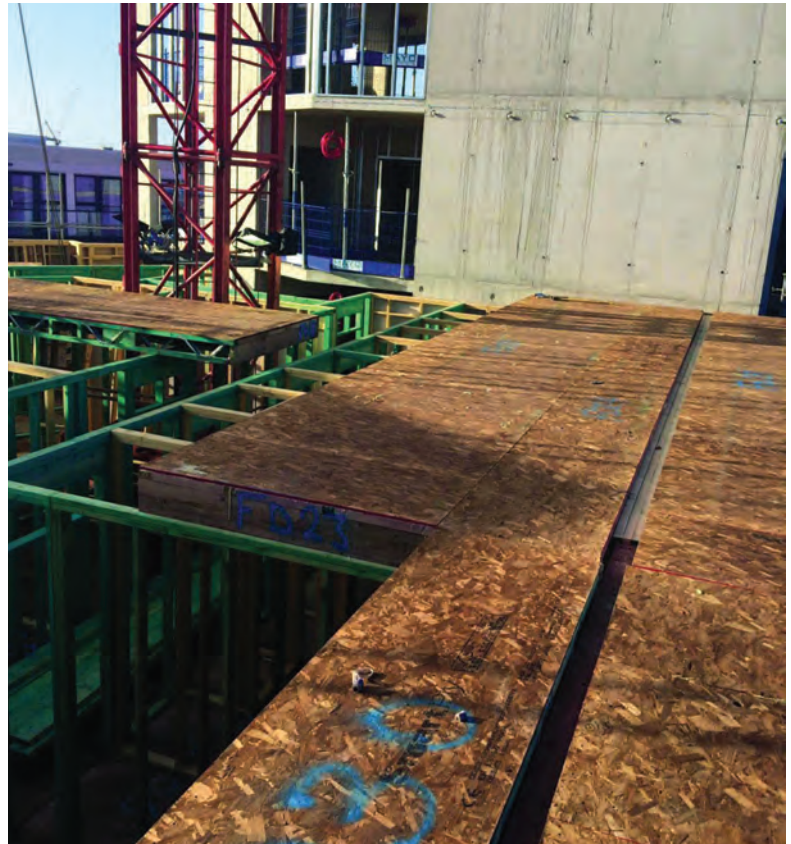
‘Fire resistance’ is the measurement of the ability of a material or system to resist, and ideally prevent, the passage of fire from one distinct area to another, e.g. from one apartment to another.

Testing the fire resistance of a building element involves determining its behaviour when exposed to a particular temperature, normally that representing a fire in an enclosed space (a room). Fire resistance is one of several properties of the structure/product, and is not simply a property of the specific materials used in the structure or product. The product or structure can then be classified in terms of the relevant fire reaction.

The classes REI 30, REI 60 and REI 90 specify the time a building element has to last in case of fire – 30, 60 or 90 minutes. The performance of a building element can be derived from this classification, i.e. load capacity (R); impermeability to smoke and flame (E); insulating effect (I). Evidence is provided in the form of a fire

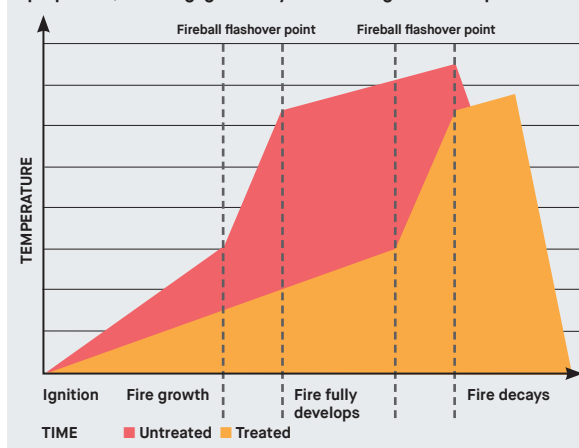
Smartply flame-retardant board is installed on site

“Flame-retardant OSB variants can be used in floors, walls and ceilings within a building – if meeting the relevant Euroclass”



Stages in a fire

Flame-retardant treatment will enhance the reaction to fire properties, reducing ignitability and slowing fire development



test conducted on the complete building element with a corresponding test certificate according to EN 13501 Part 2.

Terminology

When talking about fire in relation to buildings it is important that we use a common terminology. This terminology is used by the Wood Protection Association (WPA), Timber Trade Federation (TTF) and Medite Smartply and is something that the organisations are pushing to standardise throughout the industry.

- **Ignitability:** How readily will a material ignite and catch fire?
- **Spread of flame:** Once ignited, how quickly will flames spread across the surface of that material?

- **Heat release:** Once alight, how much heat energy will be generated?
- **Smoke development:** How much smoke and combustion gases will be generated?
- **Flaming droplets:** Will the burning material disintegrate and produce burning droplets or debris which could fall onto and ignite other surfaces?

Stages of a fire

There are four main stages of a fire: ignition, fire growth, fire fully developed and fire decay. These stages happen over a period of time and are affected by the amount of oxygen, fuel and heat.

All wood burns, this is true, but an untreated engineered wood panel would contribute to a much hotter fire, with ▶



For more details of the flame-retardant timber construction products that are manufactured by Medite Smartply, visit mdfosb.com

Case study: The Edge, Liverpool

Flame-retardant flooring from Medite Smartply was selected to prioritise safety for a seven-storey student accommodation block in Liverpool

The Edge, a 231-room student accommodation building on London Road, Liverpool, was constructed to meet the city's urgent need for student homes.

Smartply FR/FR Build OSB3 from Medite Smartply has been used as a flame-retardant flooring solution in the seven-storey building, which caters to students of Liverpool John Moores University and University of Liverpool.

The design of the concrete and timber frame building by DK Architects is clad in facing brickwork, metal cladding with UPVC windows and aluminium curtain walling. The main contractor, Bardsley Construction, worked with timber frame engineer and fabricator Datum to specify 1,000 sheets of 18mm Smartply FR/FR Build OSB3 panels to be used as the floors for all seven storeys. Datum selected the product for its consistency and flame-retardant properties.

Ross Archer, technical manager at Datum, explains: "For the developer, fire safety and quality of build were of paramount importance as they really wanted The Edge to stand out as an example of high-quality student accommodation in the city. When building the timber frame part of the structure, we looked for a flame-retardant flooring panel that wouldn't be affected when the edges were cut to the specification of each storey."

During manufacture of Smartply FR/FR Build OSB3, a water-based, eco-friendly, flame retardant from Zerolgnition is added, ensuring fire performance while maintaining structural integrity. Alternative post treatment flame-retardant technologies can have a destructive effect on the mechanical or physical properties of the panel, resulting in a tendency to crack or shatter.

"A flame-retardant panel has a much lower burn temperature initially, meaning you have a more predictable burn rate and more time to evacuate from a building"

a much earlier flash point. A flash point is the stage of a fire where it moves from the fire growth stage to the fully developed stage (see chart, p41).

A flame-retardant panel, on the other hand, has a much lower burn temperature initially, meaning you have a more predictable burn rate and importantly more time to evacuate from a building.

An FR panel takes longer to reach the flash point due to the panel treatment which has enhanced its reaction to fire, again giving greater time to escape a building, or to extinguish smaller fires. In these situations, seconds save lives.

Fire regulation for timber products

To ensure the fire safety of public and private buildings, it is vital to portray a clear understanding of flame-retardant products and how they meet the increasingly stringent requirements of Building Regulations.

Approved Document B (Fire Safety) of Building Regulations requires Euroclass C reaction to fire performance for walls and ceilings, and Euroclass B in higher risk areas such as escape routes and staircases, classified in accordance with BS EN 13501-1: *Fire classification of construction products and building elements*.

In order to comply with this requirement, wood panels for use in walls and ceilings must pass two stringent reaction to fire tests, namely EN ISO 11925-2 (ignitability test) and BS EN 13823:2002 (single burning item, or SBI test). The SBI test evaluates how the product would react in a real life 'room corner' fire situation and records the rate of fire growth, lateral flame spread and total heat release.

Reaction to fire relates to the degree to which a product will contribute, by its own decomposition, to a fire under specified conditions. Products, other than floorings, are classified as A1, A2, B, C, D, E or F (with class A1 being the





Left: Medite Smartply board drying during the manufacturing process

Right: Medite Smartply oriented strand board is moisture resistant



highest performance and F being the lowest) in accordance with BSEN13501-1.

Euroclass B is the highest fire performance a wood product can be classified as (because wood is a natural organic material). Euroclass B is described in the Euroclass system as having “very limited contribution to fire”. Standard untreated OSB achieves Euroclass D and is described as having “acceptable contribution to fire”.

Importance of a CE mark

In addition to being Euroclass graded, timber panels manufactured for use in buildings must present a clear CE mark.

CE marking of construction products (those covered by a harmonised European standard) is mandatory under the Construction Products Regulation (CPR). Harmonised standards include guidance on the minimum information that should be included with the CE mark.

The following is a list of harmonised standards for wood-based products that include provisions for fire where the reaction to fire classification may be changed by treatment.

● EN 13986: 2004 +A1: 2015 *Wood-based panels for use in construction.*

Characteristics, evaluation of conformity and marking

● EN 14374: 2019 *Timber structures – Structural laminated veneer lumber (LVL) requirements*

● EN 14342: 2013 *Wood Flooring. Characteristics, evaluation of conformity and marking*

● EN 14915: 2013 *Solid wood panelling and cladding. Characteristics, evaluation of conformity and marking.*

Testing and classification on reaction to fire

Smartply Max FR B has been tested to:

● EN 13823 (SBI test)

● EN ISO 11925-2 (ignitability test)

● EN ISO 9239-1 (radiant test – for flooring) and classified in accordance with EN 13501-1: 2007 and A1: 2009.

The product relates to the following fire classes and fields of application:

● Euroclass B-s2, d0 (wall, ceiling, roofing and free standing applications)

● Euroclass BFL-s1 (flooring applications).

The thresholds to achieve Euroclass B are higher than those for Euroclass C, so if a material achieves Euroclass B then it also conforms to Euroclass C for the same field of application. ●

CPD Questions

1: What is the term used to describe the measurement of the ability of a material or system to resist, and ideally prevent, the passage of fire from one distinct area to another, e.g. from one apartment to another?

- a) Reaction to fire
- b) Fire resistance
- c) Fire rating
- d) Fire Euroclass

2: What tests must be conducted to obtain a Euroclass classification on wood-based panels to be used in walls and ceilings? (choose two)

- a) Smoke test
- b) Ignitability test
- c) Burning test
- d) Single burning item (or SBI test)
- e) Panel FR test

3: In the Euroclass system, Euroclass B is described as:

- a) No contribution to fire
- b) Acceptable contribution to fire
- c) Very limited contribution to fire

4: The thresholds to achieve Euroclass B are higher than those for Euroclass C. Therefore if the material achieves a Euroclass B classification then it also conforms to Euroclass C for the same field of application.

- a) True
- b) False

5: How was Smartply FR/FR Build OSB3 used in the accommodation building for the Liverpool universities?

- a) Wall linings
- b) Flooring
- c) Furniture
- d) Roofing

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

BIM & Digital

L&Q PLANS OFFSITE GROWTH WITH NEW DIGITAL TOOLKIT

THE AFFORDABLE HOUSING SECTOR'S USE OF OFFSITE MANUFACTURING COULD BE BOOSTED BY A NEW TOOLKIT DEVELOPED BY AN L&Q-LED CONSORTIUM. **DENISE CHEVIN** REPORTS



A housing association-led project is aiming to speed up the design and construction of homes in the affordable housing sector by as much as 30%, with the development of a digital toolkit that will make it easier to use standard components for housing delivery.

Benefiting from Innovate UK funding, a partnership – the COLAB consortium – led by L&Q (alongside Virtual Viewing, Hawkins\Brown Architects and HTA Design) has set out to develop a digital design for manufacture and assembly (DfMA) toolkit.

The software will make it easier to deliver new homes using modern methods of construction (MMC) by creating a central database within which standard components can be stored and selected. These would include building elements such as bathroom pods, utility cupboards and balcony pods, as well as entire apartment layouts, ensuring housing associations think about how the homes will be built from the outset.

Landre Gbolade, production innovation lead at L&Q, says the toolkit could bring enormous benefits: “We anticipate

this project’s outcomes will provide an organisation like L&Q with 30% reduction in design and construction programmes and 25% increase in return on capital employed if applied across its development programme.” L&Q says that, delivered to the wider housing market and scaled, this approach could provide enormous savings.

Increasing use of MMC

L&Q is one of the UK’s leading charitable housing associations and developers and in 2018/2019 completed 2,862 homes. It has a development pipeline of 50,400 homes, with 16,000 on site.

The use of MMC is currently limited to developments outside the capital, where it is in a joint venture with Stewart Milne, explains Gbolade. But the plan is to move incrementally towards an increasing use of MMC over the next 10 years. “What we have been doing for the last two years is focusing on R&D and developing that roadmap. The DfMA toolkit is part of that transition.”

L&Q, Hawkins\Brown and HTA came up with the idea a couple of years ago. Winning government funding has

Delivered to the wider housing market and scaled, the digital toolkit could provide enormous savings

allowed them to take it forward, with Virtual Viewing coming on board to design and configure an easy-to-use graphic interface for the app.

The 15-month programme is being part-funded by Innovate UK under the recently awarded Transforming UK Construction Round 2: MMC, Digital and Whole-Life Performance competition.

The team is aiming to have the toolkit ready by June 2021. When completed in June 2021, COLAB will partner with housing associations, local authorities and housebuilders to roll it out.

The idea was forged out of the need for the sector to start thinking differently to supply the homes needed.

“We have this target of 300,000 new homes a year,” says Nigel Ostime, delivery director of Hawkins\Brown, “but there is no way we can achieve it using traditional means. On average, the UK has built around 155,000 homes per year over the last 30 years. It’s clear we need a smarter way of building, which will involve the greater use of MMC and digital technology.”

It should, he says, also overcome barriers to using MMC by encouraging



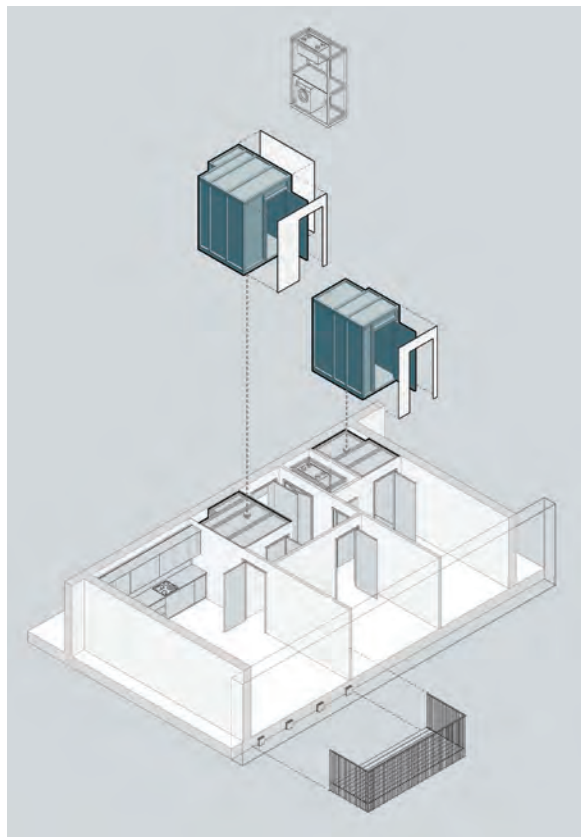
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50,400

L&Q has a development pipeline of 50,400 homes, with 16,000 on site

housing associations to think about the building process early. “Too often clients only think about using offsite construction once the design has been drawn up. Yet the benefits of offsite then can’t be realised, and it often works out more expensive than traditional construction,” he explains.

Visuals from the Virtual Viewing graphic interface. The consortium will use standard components and standard layouts but insist the homes will not all be ‘identikit’



Both men are keen to emphasise that using standardised components and layouts is not about every home looking the same. “To make modern methods of construction efficient, you need scale, but you have to strike a balance between providing a good amount of variation in the end product, but having standardisation in the core,” says Gbolade.

“It will also bring efficiency to the design process, which is important,” adds Ostime. “We did an extensive piece of research looking at around 1,700 pre-existing schemes involving L&Q and others in the team. And we discovered that across those schemes there were only very small variations in the size of bathrooms – but all were different.

“We’ve got to stop doing this: as architects, we’re adding no value by redesigning a bathroom from scratch every time, so let’s accept that there is a good bathroom model already. We can change the finishes and to some extent we can change the fittings, but we’ve got to standardise the core product.

“The designer’s time is better spent producing value in terms of the user experience, which will be to do with fittings and finishes within the apartment, along with the response to the site, and of course the external materials.”

Standard layouts

HTA and Hawkins\Brown are building up L&Q standard layouts and component types drawn up in Revit models that L&Q development and sales teams will be able to call on from the toolkit’s database.

“Think of it as a central portal that gives access to design information and 3D model information that can be used by project teams in developing their design and allows them to select the products or components (balconies, bathrooms,



“We anticipate this project’s outcomes to provide a 30% reduction in design and construction programmes and 25% increase in return on capital employed”

Lanre Gbolade, L&Q

whole apartments) from a set of standard ‘products’. But its potential is far wider and could cover the whole cradle to grave process for an entire portfolio of buildings,” explains Ostime.

It will also demonstrate, through an easy-to-navigate user interface, how to go about using the tool and its components to develop the building design and then potentially to also manage the built asset.

“It could also be used for sales and marketing and for general internal communication across the organisation. This is important in itself in the drive for standardisation,” Ostime says.

The BIM families have sufficient detail and metadata to directly procure manufacturers, suppliers and contractors. COLAB is opting for RIBA Stage 4, but they could be whatever level is wanted by the organisation using it.

When completed, the consortium will engage with industry to encourage others to benefit from the toolkit, says Gbolade. Each housing provider that wants to use it will need to populate it with their own ‘products’ and manage the tool, explains Ostime. ●



Theresa Mohammed
Trowers & Hamlins



Lawrence Pearce
Trowers & Hamlins

Adjudicators and payment enforcement: WRW v Datblygau

THE JUDGEMENT IN A CASE CENTRING ON WHETHER ADJUDICATORS HAVE JURISDICTION TO ORDER PAYMENT SHOWED THE 'COMMERCIAL APPROACH' COURTS ARE INCREASINGLY TAKING.

LAWRENCE PEARCE AND **THERESA MOHAMMED** EXPLAIN

In circumstances where the adjudicator had no jurisdiction to order payment, can the court award payment of the adjudicator's valuation on enforcement? This was a central issue in the recent case, *WRW Construction Ltd v Datblygau Davies Developments Ltd (DDD)*.

The parties entered into a JCT Design and Build 2011 for WRW to carry out the design and build of nine properties in Twickenham. A number of disputes arose between the parties which resulted in three adjudications.

The second of those adjudications focused on the validity of the termination by DDD. The adjudicator found in favour of the developer that the contract was validly terminated and DDD started a third adjudication in respect of the post-termination final account.

In its notice of adjudication, DDD stated that: "DDD is entitled to and claims payment from WRW of the sum of £3,345,790.40 (or such other sum as the adjudicator shall determined [sic] is owed by WRW)... DDD invites the adjudicator to determine the sums due and payable by WRW to DDD and to order payment of such sum by WRW to DDD."

In response, and interestingly for the purposes of enforcement, WRW claimed that: "The proper valuation of the post-determination final account in accordance



"The courts are increasingly in favour of finding a balance between strict interpretation and the commercial reality of a dispute"

with Clause 8.7.4 of the contract leads to a position in which DDD is indebted to WRW. Whilst WRW accept that the adjudicator has no jurisdiction to order payment to be made to WRW, the adjudicator has been asked by DDD to value the post-termination [sic] final account the adjudicator should conclude that the sum due and payable by WRW to DDD is -£695,035.63.

On the face of it, WRW's response seemingly made it clear to the parties that the adjudicator was only to reach a decision on the value of the final account and would not have jurisdiction to order payment.

However, the adjudicator's decision was: "The total value of the account due to clause 4.7.4.1 is an amount due as a debt from DDD to WRW as is permitted by Clause 8.7.5 in the

sum of £568,597.32. I decide that WRW shall pay to DDD the sum of -£568,597.32 (negative) within 7 days of the date of my decision."

DDD refused to make payment of the sum awarded and WRW started enforcement proceedings.

Enforcement

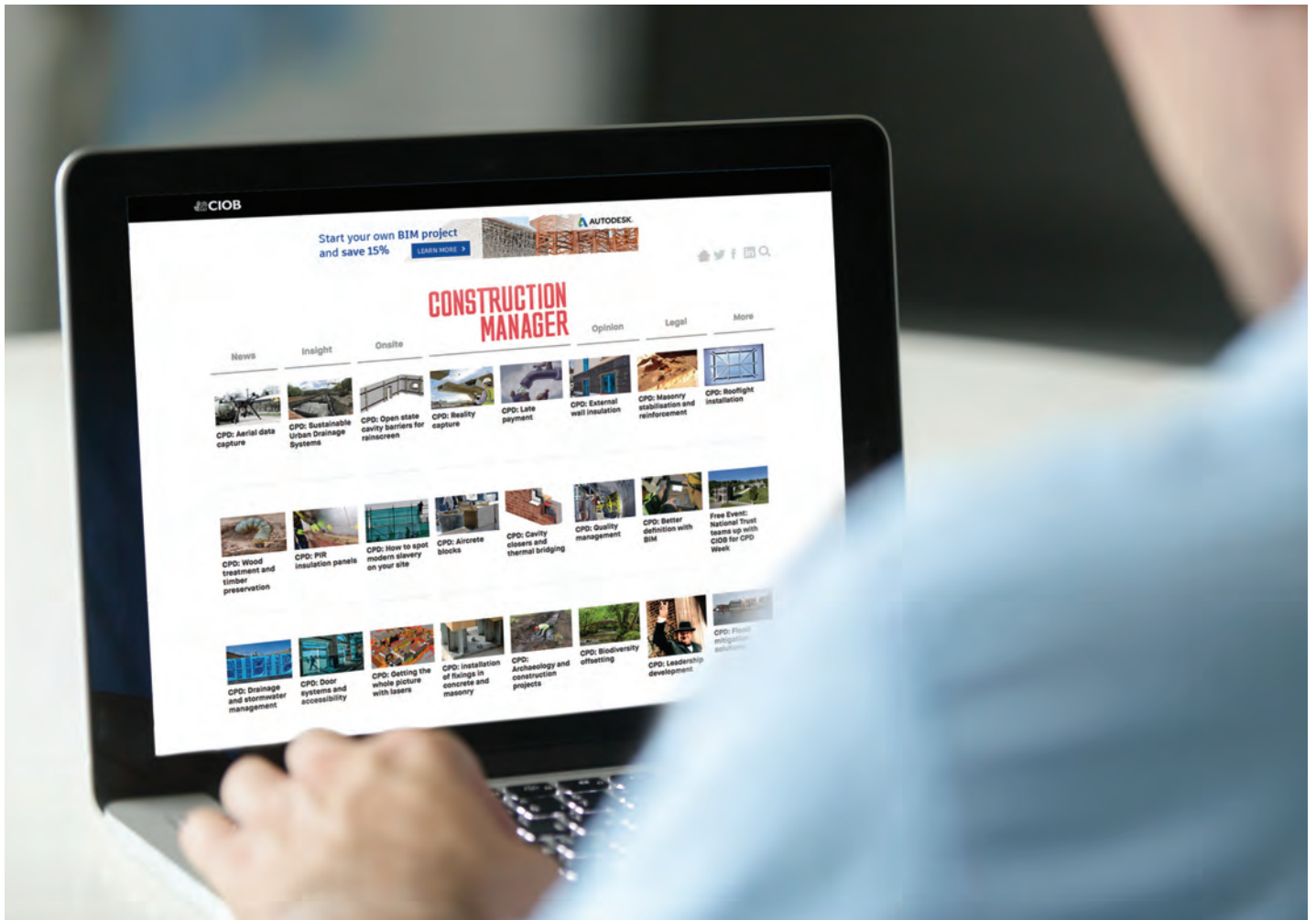
The key issue in this case is whether the adjudicator had jurisdiction to order payment, particularly in circumstances where the parties had clearly stated otherwise. DDD's argument was straightforward - there had been no valid order for payment made in the adjudicator's decision, and a fourth adjudication would be required to make such an order.

What may come as a surprise is that the recorder, Andrew Singer QC, sitting as a judge in the Technology and Construction Court, accepted that the adjudicator did not have jurisdiction - however, he took what many will consider to be the correct 'commercial approach' in his judgement. He confirmed that:

"In my judgement, there is no bar... to the court enforcing a temporarily binding valuation in an adjudication award by making an order for payment of the monies due as a result of that valuation. Indeed, in my judgement it would be contrary to principle and established authority for the court to effectively force a party who has the benefit of an award in its favour... to have to commence a further adjudication (to which there is no defence) for the purpose of obtaining an order for payment from the adjudicator, before returning to the court if necessary, for further enforcement proceedings."

The courts are increasingly in favour of finding a balance between strict interpretation and the commercial reality of a dispute. In circumstances where any fourth and final adjudication would have no defence, it would have been a costly exercise for, ultimately, the same answer the court could reach. ●

Theresa Mohammed is a partner and Lawrence Pearce an associate at Trowers & Hamlins.



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CIOB Community



Awards

Finalists announced for the Rising Star Award 2020

CIOB DEBUTS CATEGORY FOR RISING STARS WHO HAVE BEEN IN THE CONSTRUCTION INDUSTRY FOR LESS THAN SEVEN YEARS

The shortlist for the CIOB's first ever Rising Star Award has been revealed. A total of 12 of the very best construction professionals at the beginning of their careers have been named in the shortlist.

The Rising Star Award is being run by the CIOB for the first time this year, as an extension to the institute's prestigious Construction Manager

of the Year awards (CMYA). This brand new category is for rising stars who have been in the construction industry for seven years or less, and have demonstrated excellence in their work, the industry and among their peers.

The finalists have been whittled down by a panel of CIOB and construction professionals to Silver

This year's CMYA event will be held on 25 November

and Gold winners. The awards will be presented at a glittering ceremony on 25 November 2020 in London, where the Rising Star winner will be handed their trophy.

Caroline Gumble, chief executive of the CIOB said: "These awards are a wonderful way to acknowledge the hard work and dedication shown by the emerging talent in our industry. I'm thrilled that we had so many nominations for our first ever Rising Star award and I'm looking forward to finding out who takes the title this year. My congratulations to everyone who's made the shortlist." ●

Further details of the night and how to attend can be found on the CMYA website: www.cmya.co.uk.

The finalists are as follows:

Kelly Attwood	Property Consultant Ltd
Morgan Sindall	Mercy Ogunnusi
Sam Bambury	MCIOB
Barratt London	Student & part-time lecturer at Robert Gordon University, Aberdeen
Vasiliki Bowler	Lindsey Platt
Faithful+Gould	MCIOB
Ellie Carswell	Orbit Housing Association
Faithful+Gould	Benjamin Valliquette
Annabel Clark	Gillam Group (Toronto)
Faithful+Gould	Robert Watson
Cedric Fournier	NHBC
Prime Pillar Group (Mauritius)	
Nicola Hodson	
MCIOB	
Wates Group	
Graham Kinnear	
MCIOB	
Graham Kinnear	

Event

CMYA dinner to go ahead: book now

TICKETS ARE ALREADY SELLING FOR THIS YEAR'S AWARDS

The annual CMYA Awards Dinner will be held on 25 November at the JW Marriott Grosvenor House Hotel.

The CIOB has not taken the decision lightly, given the current situation, to go ahead with a face-to-face event and wants to reassure attendees it is considering every detail and level of safety.

This is a wonderful career-changing event for the finalists and the CIOB believes it is more important than ever to celebrate the construction industry and all its significant achievements.

For this year numbers are restricted, with tables of only four to maintain the social distancing

required. Specific guidelines will need to be followed, which will be shared nearer the time as we follow closely the government advice. The website will be updated with information.

Make sure you don't miss out and book your table today at: <http://orlo.uk/DdxV7>.



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

Skills

Hinkley Point C site team benefits from CIOB Training Partnership

ENERGY PROJECT BECOMES FIRST SITE TO TAKE ON PARTNERSHIP ROLE

In an industry first, a construction site rather than a company has entered into a Training Partnership with the CIOB.

The CIOB team in the South West has been working closely with EDF on the Hinkley Point C (HPC) project in Bridgwater, Somerset, over the past couple of years to assist with the professional development of the site management team.

After staging different activities and raising onsite awareness, the CIOB has now enabled Hinkley Point C to enter into a Training Partnership agreement.

The CIOB has seen the site open its Apprenticeship and Skills Hub, and now offers a streamlined electronic process for membership enquiries via the Training Partnership which can be found on the Learning Development page of its onsite web page.

Having a 'construction site' enter into a Training Partnership is a first for the institute and will provide a one-stop shop for those on site wanting to enhance their professional development.

Louise Dobson, HPC learning and development lead – upskilling, said: “We recognise the positive impact a professional qualification can have

on upskilling an individual both in their current role and in preparation for future career opportunities and aspirations.

“The Training Partnership agreement promotes our commitment to skills development and will enable us to have greater insight into how many people have benefited from a professional qualification through the project. It also provides construction professionals with direct access to advice, guidance and support from a trusted partner.”

Training Partnerships are a free service the CIOB offers to built environment organisations. Forming a joint venture with the company, the CIOB creates a bespoke training, learning and development plan for the staff, paving the way towards a fully Chartered workforce.

Individual plans are created for each employee or employee group, taking their unique needs into account. Advice is then offered on the most suitable routes towards becoming Chartered.

The training programme can be tailored to members of staff regardless of age, experience and qualifications. ●

“The Training Partnership provides construction professionals with direct access to advice, guidance and support from a trusted partner”

Louise Dobson,
Hinkley Point C

The Hinkley Point C
site in Somerset

Business

Greendale opens in Winchester

CBC EXPANDS INTO HAMPSHIRE MARKET



Greendale's Nick Child and Andy Musselwhite in the Winchester office

Dorset Chartered Builder Greendale Construction has expanded its presence in Hampshire by opening a second office in Winchester.

Greendale contracts manager/ QS Nick Child will take on the responsibility of managing the second office. Other team members will work between both offices, and a recruitment drive for Hampshire-based site managers and operatives is well underway.

The award-winning firm is one of the original CBC companies and was established in Poole in 1990. It also holds a Gold Investors in People accreditation.

The firm has secured an increasing amount of work north and east of Dorset, with projects completed recently in Andover, Whitchurch, Fawley, Aldershot and Windsor.

Greendale also remains on a framework with Hampshire County Council, delivering SCOLA recladding works to several government-funded schools across the county.

Child said: “It’s really exciting to be opening up an office within an area which has seen a real Greendale presence for over two years now. We are looking forward to growing our supply chains in the county, as well as giving us a geographical stepping-stone to deliver more work along the M3 and M27 corridors.”

Andy Musselwhite, director, added: “With a portfolio of experience spanning the commercial, education, private and NHS health sectors, as well as a dedicated in-house electrical department and small works division, our mission is to offer Hampshire the same level of excellence our clients have come to expect from Greendale.”



Bright Futures Challenge

Student winner experiences work with VolkerFitzpatrick

DESPITE THE PANDEMIC, DOMINIC HARRIS WAS STILL ABLE TO GET ON SITE AS PART OF HIS PRIZE

Earlier this year, Dominic Harris, who is studying at Brighton University, won the Outstanding Student prize at the CIOB Novus Bright Futures Challenge.

In addition to receiving a winner's cheque at this fun and challenging competition for up-and-coming construction students, Harris also won a week's work experience on a live site with VolkerFitzpatrick, the sponsor of the Bright Futures Challenge final.

Although the current pandemic took over events, VolkerFitzpatrick felt it important to ensure that Harris underwent the work experience for his career development, and the company was pleased to be able to offer him the opportunity at the UCL Pearl project, Essex, in early August.

Harris said: "The week's work experience was a great learning opportunity on a live, operational project; it has been invaluable. The team was also extremely helpful – accommodating, knowledgeable and friendly."

VolkerFitzpatrick project manager Tim Cloves, who has been mentor to many newly qualified and trainee

"Even during the restrictions surrounding covid-19, we were able to safely put in measures to allow us to offer this opportunity to bright future talent"

Tim Cloves, VolkerFitzpatrick

construction managers, said: "It's testament to VolkerFitzpatrick and our project teams that, even during the restrictions surrounding covid-19, we were able to safely put in measures to allow us to offer this opportunity to bright future talent, in order for them to gain the vital experience of working on a live site.

"Our UCL Pearl project offers a really great opportunity, particularly due to the uniqueness of the project – allowing visitors to see a project at various stages, all at one time.

"I hope that the knowledge and experience that Dominic gained during his time with us will remain with him for what, I have no doubt, will be a successful career." ●



Dominic Harris on VolkerFitzpatrick's UCL Pearl site in Essex

Scotland

CIOB sets up new Highlands hub

HIGHLANDS & ISLANDS HUB
PLANS EVENTS FOR 2021

The CIOB has formed a new Highlands & Islands Hub in Scotland.

This gives an opportunity for the institute to represent and involve members and the wider industry in the local area. It is a direct response to requests from members to deliver quality CPD, membership support and to engage with employers and

education through a recognised committee structure.

It will launch with an event in Inverness on 14 October. To keep to social distancing rules, this will be invitation-only but a recording will be available shortly after.

The hub will launch fully on 1 January 2021. It hopes to have more face-to-face events in the

New Year and welcomes interest from members and non-members.

The hub is keen to reach out to as many members as possible and is actively looking at ways to broadcast events. Please contact Lynne McKay, regional manager, at lmckay@ciob.org.uk to register your interest in attending or becoming an active member of the group.



Opinion

'The virus tested every part of residential construction'

RESIDENTIAL CONSTRUCTION MANAGEMENT SPECIALIST
GAVIN SKELLY EXPLAINS HOW COVID-19 AFFECTED HIS BUSINESS – AND HOW THE PROJECTS HE WORKED ON HAVE KEPT GOING

Like the country generally, construction wasn't prepared for covid-19. Many industries were shut down, but construction didn't know where it stood. Building a hospital was obviously 'essential work'. But what about house-building, which would at least help keep people in work and the economy going?

Our business works for residential developers and contractors, providing

consulting and construction management services, delivering projects from appraisal stage right through to completion. This gave us a wide perspective on how covid-19 affected the sector. When the general lockdown was introduced, there was utter chaos. The virus tested every part of the system – relationships up and downstream.

Some subcontractors and main contractors immediately shut up shop, seeing furlough as a way of protecting overhead costs. Other sites tried to struggle on without any idea of who would be on site from one day to the next. With manufacturers closing down, many subcontractors were left without materials. Utility companies vanished over the hill without any explanation of when they would be back. Monitoring surveyors were told to stop visiting sites, clients were demanding answers on project timescales, while banks were asking about protection of risk and not allowing a single penny to be drawn without absolute surety.

Clients in the main were sympathetic but, with the possibility of interest overrun ruining any form of success, a contractor had to demonstrate a fairly robust argument about the delay being fully related to the coronavirus outbreak – and not a smokescreen to cover off other delay issues. Protection would be afforded under a JCT contract but only for time protection and not cost, bringing into question concurrent delays on time lost before the virus struck.

Our projects programme was affected in several ways. Larger schemes with multiple subcontractors fared worse than smaller projects procured with more 'bundled-up' packages and therefore less spread of labour. The largest delay was approximately eight weeks, but some sites were not affected at all.

The only way to manage client expectations was by issuing regular and detailed information to demonstrate the

"The only way to manage client expectations was by issuing regular and detailed information to demonstrate the effect"

Gavin Skelly, Wisestone Consulting

effect. That relied on having a substantive plan in the first place to measure against: weekly reports indicating labour levels against predicted, minutely detailed programmes allowed specific tasks to be identified in a cause-and-effect analysis, as opposed to headline summary bars that were too generic to break down.

This was backed up by affected subcontractors in writing, indicating their own issues, and in turn backup from their suppliers to prove the case. If possible, a contingency plan was prepared, demonstrating how we would react and adapt to certain circumstances.

For example, we are currently experiencing a lack of UK-produced multi-finish plaster. The ripple effect of this will be a lack of labour to apply it when the demand kicks in. In one instance, we offered clients the option of a tape-and-joint finish as opposed to the contracted skim, which would, in normal circumstances, be rejected by that particular client. Weighing up the comparative finish against the potential delay and cost overrun made the concession a more palatable option.

This virus could be with us for a long time. How we plan and resource construction projects will require careful consideration and plenty of flexibility from all stakeholders. ●

Gavin Skelly is founder of Wisestone Consulting, which provides supported delivery and construction management to residential developers and contractors.



CODE OF PRACTICE FIFTH EDITION

The first edition of the *Code of Practice for Project Management for Construction and Development*, published in 1992, was groundbreaking in many ways. The fifth edition of the *Code of Practice* is now available to buy online. Find out more here: <http://orlo.uk/I2xnM>.

WHO WILL BE THE UK'S TOP CONSTRUCTION MANAGER?

After three months of rigorous judging, the 2020 CMYA finalists have been announced. The judges have decided who will contest the silver and gold medals over nine categories at the Gala Awards dinner on Wednesday 25 November. Who, from nine gold medal winners will win the **2020 Construction Manager of the Year?**

To find out and celebrate with the very best in the industry, reserve your place now!

**Visit www.cmya.co.uk
for more details and to
book your tickets.**



CONSTRUCTION MANAGER OF THE YEAR AWARDS 2020

WEDNESDAY 25 NOVEMBER 2020

THE GREAT ROOM, JW MARRIOTT GROSVENOR
HOUSE HOTEL, 86-90 PARK LANE, LONDON

THE FINALISTS

RESIDENTIAL UNDER 10 STOREYS

Tony Gallagher MCIOS
Durkan
Manor Place Depot, Southwark

Matt Hamilton
SEACON
6 Ilchester Place, W6

Dominic Jankowski MCIOS
Hill Group
Fish Island Village, E3

Paul Jeal
St George West London
Beaufort Park, NW9

Tomasz Magiera
WRW Construction
Lakeshore – Copper Building, Bristol

Michael Saunders
Lovell
Orchard Place, King's Lynn

Mark Woollen
Willmott Dixon
Winwood Heights, Nottingham

RESIDENTIAL OVER 10 STOREYS

Brendan Conway
McAlee and Rushe
Horizon Heights, Liverpool

Caroline Heraghty
Ardmore Construction
Bowery Building/ Smyth Building SW15

Terry Kirby MCIOS
Berkeley Homes East Thames
Birch House, London SE3

Alistair MacPartlin
JJ Rhatigan Building Contractors
No. 26, Dingwall Road, London

Anthony Mitchell MCIOS
ISG Construction
LIV Student, Sheffield

Patrick Phillips
Durkan
Atkins House/Benjamin House/
Concert House/Orchestra House, Ilford

Gerald Ward MCIOS
Bennett Construction
Mansbridge House (Block A),
Battersea Exchange SW8

PRIMARY EDUCATION

Laura Allison ICIOS
Morgan Sindall Construction
Hilltop Primary School, Airdrie

Mike Castle FCIOS
Knights Brown
Church Crookham Junior School

Massimiliano Crea
Mid Group
Stonebridge Primary School, NW10

Mark McElwee MCIOS
Morgan Sindall Construction
Abbey View Primary Academy,
High Wycombe

Thomas Prince MCIOS
Willmott Dixon
Water Orton Primary School,
Birmingham

Michael Pyatt MCIOS
Morgan Sindall Construction
Abertillery Learning Community –
Six Bells Campus

Stephen Sear
Morgan Sindall Construction
Hailsham Primary Academy

SCHOOLS

John Blundell MCIOS
T J Evers
Teaching Block & Amphitheatre,
Dame Alice Owens School,
Potters Bar

Andrew Miles
Kier Construction
Croesycellio School, Cwmbran

Daniel Morrish MCIOS
Morgan Sindall Construction
Lexden Springs School, Colchester

Mark Prince
Eric Wright Construction
Queen Elizabeth Studio School,
Kirkby Lonsdale

Graham Thompson
Willmott Dixon
Harris Academy, Sutton

HIGHER EDUCATION

Neil Adams
Willmott Dixon Interiors
London Screen Academy, Highbury

David Clarke MCI0B
Wates Construction
Quarry Hill Campus,
Leeds City College

Frank Connolly
Mace
Centre Building, Holborn

Anthony Cooper
Interserve Construction
Heartspace, Sheffield

Karl Crisp
Willmott Dixon
The Kennedy Building, Canterbury

Glyn Jones MCI0B
Willmott Dixon
Student Life, Teeside University

Lee Mullett
Willmott Dixon
Teaching and Learning,
University of Birmingham

Adam Price
Beard
Catherine Hughes Building,
Somerville College, Oxford

Ian Rainbow MCI0B
BAM Construct UK
Advanced Wellbeing Research Centre,
Sheffield

Lee Wayper MCI0B
Sir Robert McAlpine
The Frederic Douglass Centre,
Newcastle University

Richard White MCI0B
ISG Construction
The Richmond Building, Twickenham

OFFICE

Kevin English MCI0B
Lendlease
2 Redman Place, Stratford E20

Paul Epton MCI0B
Robertson Construction
Central East
10 George Street, Edinburgh

Richard Kirkpatrick MCI0B
Skanska
The Marq, 32 Duke Street, St James's

Daniel Miller
Wates Construction
7&8 Wellington Place, Leeds

Ian Rowe
Oakmont Construction
LONI Data Centre, Dagenham

Craig Stokes MCI0B
Laing O'Rourke
The Brunel Building, Paddington

PUBLIC & INFRASTRUCTURE

Kevin Alden
Sir Robert McAlpine
Newcastle Civic Centre

Kristian Cartwright MCI0B
Willmott Dixon
The BOX, Plymouth

Paul Clarke
Willmott Dixon
Liverpool Echo Arena Car Park

Brian Hanlon MCI0B
Willmott Dixon
Merseyside Police Patrol Hub,
Liverpool

Russ Parks MCI0B
Willmott Dixon
The Futurist, Demolition and
Stabilisation, Scarborough

John Stedman MCI0B
Morgan Sindall Construction
and Infrastructure
West Suffolk Operational Hub,
Bury St Edmunds

Simon Whittingham
Willmott Dixon
Exeter Police Station

HEALTHCARE

Lewis Blake MCI0B
Willmott Dixon Interiors
Nursing and Midwifery Council
Headquarters, London E20

Matt Gavin
Kier Construction
University Hospital Of Wales,
MRI Building

Tom Millard
Willmott Dixon
Cardiff Royal Infirmary Block 14

Robert Palmer MCI0B
Kier Regional Building London
and South East
Southwood Courtyard Building,
Great Ormond Street Hospital

LEISURE

Jamie Beard
Willmott Dixon
Tameside Wellness Centre – Denton

Theresa McErlean MCI0B
Heron Bros
Ards Blair Mayne Wellbeing
& Leisure Complex

Danni Oliveira
WRW Construction
Travelodge, Chippenham

Jonathan Roberts MCI0B
VINCI Construction UK
Barton Square, Manchester

Nick Stoyles
Willmott Dixon
New Addington Leisure
& Community Centre

Paul Turner
VINCI Construction UK
Warrington Time Square

RISING STAR

CIOB RISING STAR AWARD 2020

Join us as we shine a global spotlight on the best emerging talent in our industry, with finalists competing in a brand-new category, the CIOB Rising Star Award. **Who will be our first ever winner?**

★ **Kelly Attwood**
Morgan Sindall

★ **Sam Bambury**
Barratt London

★ **Vasiliki Bowler**
Faithful + Gould

★ **Ellie Carswell**
Faithful + Gould

★ **Annabel Clark**
Faithful + Gould

★ **Cedric Fournier**
Prime Pillar Group,
Mauritius

★ **Nicola Hodson MCI0B**
Wates Group

★ **Graham Kinnear MCI0B**
Graham Kinnear Property
Consultant Ltd

★ **Mercy Ogunnusi MCI0B**
Student & part-time
Lecturer at Robert Gordon
University, Aberdeen

★ **Lindsey Platt MCI0B**
Orbit Housing Association

★ **Benjamin Valliquette**
Gillam Group, Toronto

★ **Robert Watson**
NHBC

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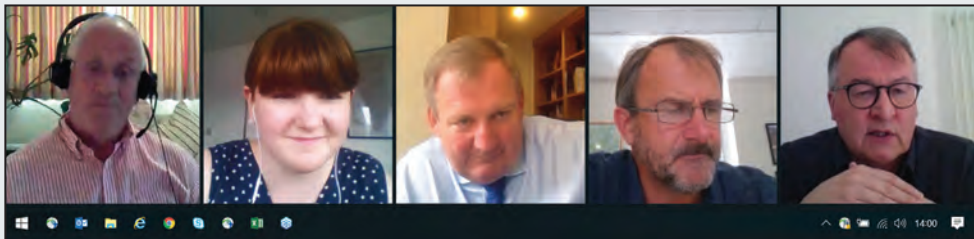

Roomex

UK Construction Week

Webinars

Beard, Nash and Hodder at Manchester quality events

HUB DISCUSSIONS FEATURING BIG NAMES IN CONSTRUCTION NOW AVAILABLE TO VIEW ONLINE



The Manchester Hub held a series of events during August focusing on the issue of quality.

Its key event was a panel discussion on quality in construction. The virtual event was introduced by Mark Beard, CIOB's president who is known for his passion for quality and 'right first time', with presentations from: Paul Nash, on the new Building Safety Bill; Stephen Hodder MBE, CIC chairman, on the revamp of CIC Design Quality Indicator (DQI) to Project BEQueST (Built Environment Quality Standard and Tools); and Tom Barton, executive director of Get it Right Initiative (GIRI), on the importance of right first time and driving a quality culture.

The presentations were followed by discussions on clerk of works, the role

From left: Tom Barton, Nicola Hodson, Mark Beard, Paul Nash, Stephen Hodder

of the commercial team in quality, value engineering and how professional bodies can drive industry culture change.

This main event was followed by two further events on quality. Andy Almey from Red Jam, business and process transformation and change management specialist, presented on continuous improvement, how to use technology to improve quality processes, and opportunities for training – including Red Jam's one-day continuous improvement session and Six Sigma apprenticeships.

The final event was from Perry Shard, head of operational excellence for Balfour Beatty and GIRI trainer, discussing behavioural quality – an insightful presentation on how he drives quality in

“This sparked a lot of discussion around driving a positive improvement culture rather than a blame culture”

highways and the importance of the right culture and behaviours. This sparked a lot of discussion around accepting that quality is everyone's responsibility and driving a positive improvement culture rather than a blame culture.

All the events were chaired by Nicola Hodson, standards advisor for Wates Group and chair of CIOB Novus Manchester, due to her passion for quality in construction. In total the events were attended by over 400 people, and the Manchester Hub and Novus plans follow-up events to keep the discussion going. Recordings and slide decks from the webinars are available. ●

View the recordings:

Quality in Construction, panel discussion with Mark Beard, Paul Nash, Stephen Hodder and Tom Barton of GIRI (Get it Right Initiative):
<https://lnkd.in/d3ec6BD>.

Continuous Improvement with Andy Almey:

<https://lnkd.in/d3XjPzX>.

Behavioural Quality with Perry Shard:
<https://lnkd.in/dJWc8vZ>.

Training

Hub helps students with employment marketing

CHELMSFORD COMMITTEE AND NOVUS HOST WORKSHOPS

During October, Anglia Ruskin University (ARU) and the CIOB will host a series of workshops to support students in a competitive market for placement and employment.

These will start with 'An Introduction to the CIOB', focusing personal and professional development and an opportunity to network with key employers.

Following this, Helen Clements, community investment advisor at Morgan Sindall Construction will host a CV and interview techniques workshop, showing students how to make their applications stand out from the crowd.

The final workshop 'Identifying Opportunities' will be facilitated by Steve Drury, CIOB Chelmsford

Committee chair and vice chair of the Employer Engagement Committee, who will discuss the importance of engaging with employers, placement opportunities, graduate selection and the value of networking.

Among others, Drury will be joined by Clare Friel, director of Friel Marketing.

Diary dates

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

Young Industry Perspectives on Mental Health

8 October, 6.30pm-7.30pm

A huge topic facing the industry is mental health and wellbeing. It affects the construction sector on an alarming scale, with suicide rates among some of the highest of any profession. The CIOB London Novus group has asked young industry professionals to tell us about their own experiences surrounding mental health while working in the built environment. Because of social distancing this CPD will be held as a webinar. Secure a place by visiting the event on the CIOB website.

Net Zero Carbon

15 October, 12pm-1pm

In May 2019, the UK government declared a climate emergency and set a target for carbon emissions in the UK to reduce to net zero by 2050. Net zero carbon requires us to rethink all aspects of planning and placemaking: not just how buildings are designed and constructed, but also siting development where it will be well served by public transport, cycling and walking, as well as renewable and low carbon energy. This presentation will consider some of the ways in which planning and the built environment can address net zero carbon.

Welcome to Construction – Your First Years in the Industry webinar

15 October, 6pm-7pm

Join our panel of young construction professionals for a look at what to expect in your first years in the industry. We'll explore both the good and the bad of starting out in construction and provide a few tips on how to give yourself the best start on your career path.

Our panel are at different stages of their professional journey: Jake Morrish is chair of Novus Leeds and assistant site manager at Redrow Homes; Lydia McGuinness is co-chair of G4C Yorkshire and Humber, and trainee site manager at Henry Boot

Construction; and Danielle Fleming is senior building surveyor at East Riding of Yorkshire council.

Code of Quality Management Building Safety and Quality in Construction

16 October, 2.30pm-4pm

The Bristol Hub is hosting a live webinar on building safety and quality in the construction industry followed by a Q&A.

An opening address will be given by Mark Beard, CIOB president 2020, while past president Paul Nash, the chair of the Quality Commission, will deliver an update on quality and building safety. Eddie Tuttle, CIOB director of policy, research and affairs, will present the work of the quality implementation group as well as the new building safety bill.

An update on education standards for quality and building safety will come from Rosalind Thorpe, CIOB director of education standards, on the new CIOB building safety training modules and work on competency. The event will be hosted by Bristol chair Trevor Drury.

PR Workshop Northern Region

20 October, 1pm-2.30pm

This online workshop will provide more information for those looking to complete the Professional Review (PR), the final stage in gaining the CIOB Chartered qualification.

Successful candidates are entitled to use the designation MCIOB and the title Chartered Construction Manager or Chartered Builder. To be eligible, candidates must have met the CIOB academic and experience requirements and be applicant members of CIOB or hold ACIOB or ICIOB grades. Full details of eligibility can be found at www.ciob.org/membership/becoming-chartered-member.

Using social media to effectively support your career – CPD

3 November, 7pm-9.30pm

With a wealth of experience helping businesses of all shapes and sizes to bloom and grow, Pillory Barn's Miranda Chapman presents her essential formula for social media success. Sharing top tips on how to effectively use different platforms to engage your audience, build your brand and evolve your business, she will show that for the construction industry, social media is a tool too valuable to be left in the box.

For more information, to register and find more events, visit the CIOB website: ciob.org.

Chukwudi Ononogbu MCIOB

Meet a member

CHUKWUDI ONONOGBU, SCHEME INTERFACE MANAGER, NETWORK RAIL, AND EVENTS CHAMPION ON THE LONDON HUB COMMITTEE

How did you get into construction and why? What else would you have done?

My journey into construction started at quite an early age, with my keen interest in the art to create – and also destroy – that awakened the 'build and construct' in me, which eventually led me to study civil engineering at the University of Nigeria Nsukka.

Before I graduated, my father got me a placement to work with a firm (Hapel Nigeria) on the Umuahia-Ikot Ekpene road project – and after that experience I was hooked.

Coming to the UK, I worked on projects like Heathrow Terminal 5, Crossrail, the DLR and London City Airport – to name a few – so construction has become part of my DNA. I suspect I would have gone into architecture if I hadn't gone into construction – though both are very closely related.

What do you love about your job? Is there anything in the industry you would change?

My role appeals to me greatly because I work with an array of internal and external stakeholders, who I engage with collaboratively, while managing their expectations at the same time. That monumental feat of continuously ensuring our infrastructure is never at risk or compromised is something that excites me always.

The industry obviously has a number of things I would like to change, but one that is close to my heart is that racism MUST be stopped, by awareness, education, enlightenment, open and fair dialogue and finally proactive and sincere willingness to make changes and be that change.

Why are you actively involved with the CIOB?

I joined the CIOB because I wanted to be part of the world's largest and most influential professional body for construction management and leadership.

After I became Chartered I enjoyed the support, engagement with like-minded professionals, the knowledge from CPDs and the impact it was making in the building industry. That led me to participate a lot more in CIOB events, and since then I have played a number of roles which gives me a lot of fulfilment and satisfaction in many ways.

What do you do in your spare time?

I like to relax and spend time with the family, play football (before the pandemic struck), volunteer with the charity Shaw Trust and read books. I do spend considerable time focusing, understanding and participating in discussions and works on infrastructure projects in Africa.



Me and my project

Back to school

JAMES WOOD OF MORGAN SINDALL CONSTRUCTION IS MANAGING TWO SECONDARY SCHOOL BUILDS IN BEDFORDSHIRE



I am overseeing the delivery of two major education projects worth a combined value of £16.7m in Leighton Buzzard, Bedfordshire, which will see an additional 480 new school places created to serve the growing population.

Morgan Sindall Construction's Northern Home Counties team has been appointed to expand and refurbish Vandyke Upper School and Gilbert Inglefield Academy, which sit along the same road. These projects build on our established relationship of delivering successful projects for Central Bedfordshire Council.

We started work on site back in January to remodel and expand the two buildings to create an additional 240 places at each school. Vandyke Upper School was handed over in time for the

start of the academic year in September, and Gilbert Inglefield Academy is on track to complete in December.

Both projects were procured through the Southern Construction Framework (SCF), a collaboration between Devon and Hampshire County Councils, which offers public sector organisations support with construction procurement.

The framework has enabled us to create a very open and collaborative process with the client from the outset. SCF promotes regular gatherings around the table. These are an opportunity to raise items that have been successful and learnings that can be built upon.

Teamwork has been paramount to the success of both projects and we've been fortunate to build excellent relationships with the head teachers and senior leadership teams, as well as AMR Consult, the project management partner for the two schemes.

At Vandyke Upper School, the £10.2m scheme involved the construction of a modular three-storey block of 12 science labs, 10 maths classrooms and a sixth form centre. The current science labs have become new teaching rooms, while the existing sixth form area is a new cafe and social space for students.

Our team used offsite manufacturing to construct the new build with our supply chain partner Eco Modular, which is based in Hull. In total, 94 prefabricated steel frame modules were delivered to the site in two phases and bolted into place by a 200kg crane.

Across the road, the £6.5m project at Gilbert Inglefield Academy includes a new teaching building, providing 10 classrooms, a three-court sports hall and two IT labs, as well as remodelling the existing building to provide a kitchen and dining area. In addition, the project will introduce new special educational needs and disabilities (SEND) therapy spaces and an external multi-use games area (MUGA).

"Teamwork has been paramount to the success of both projects and we've been fortunate to build excellent relationships"

James Wood,
Morgan Sindall Construction

Both projects have been challenging but highly rewarding – particularly working through the covid-19 pandemic. Safety was paramount, and we adopted a proactive approach by implementing a range of comprehensive safety measures to ensure work was able to continue throughout lockdown in adherence with government guidelines.

The support of our supply chain partners – in particular, our relationship with partners such as Eco Modular and furniture manufacturer Papworth Furniture – has been particularly important in allowing us to work efficiently and on schedule.

Working closely with our partners, we introduced detailed phasing plans to relocate students into their new classrooms, and site deliveries were planned to ensure minimum disruption to students and the community.

In what has been an incredibly challenging time, I'm very proud to be leading the team delivering this transformational investment. ●

James Wood is project manager at Morgan Sindall Construction.



Top: Vandyke Upper School

Above: Project manager James Wood

Right: Gilbert Inglefield Academy



Below left: Project RECCE is working to link veterans to roles in construction

Below: Project RECCE co-founders Laurence Moore and Neil Houlihan

Training

Veterans' day

PROGRAMME FOR EX-ARMED FORCES
SECURES TRAINING PROVIDER STATUS



A Community Interest Company that delivers a career transition programme for ex-armed forces personnel has become a CIOB Training Provider.

Project RECCE – which works with the support of Balfour Beatty – is a course that allows leavers to gain full-time employment within the construction industry in order to support veteran transition and reduce construction skills shortage. For those with existing construction experience, whether gained in the military or construction industry, there is a fast-track scheme to assist with employment opportunities.

The course is led by operations director and co-founder of Project RECCE, Laurence (Loz) Moore, a retired officer of the Mercian Regiment, and is overseen by clinical director Susan

McCormack, who takes measures to produce demonstrable evidence that the course is beneficial and identifies and reduces any potential risks.

The course finishes with a work trial where the individual has the opportunity to demonstrate what they have learnt and promote experience, transferable skills, and themselves, to potential construction industry employers.

The Project RECCE programme develops veterans in various areas:

- Veterans complete a 'Resilience to Civilian Life' programme delivered by the clinical team.
- They learn about the industry and develop employability skills.
- They gain qualifications in health and safety and construction, including the CSCS test.



- They secure employment and join an online community network for ongoing mentoring and support.

This programme combines remote learning and engagement with group delivery on live construction projects.

Based in the north west, Project RECCE has garnered much support from national contractors and organisations. Balfour Beatty partners the programme and has recruited Project RECCE 'graduates' as has Morgan Sindall, which championed the cause in Liverpool and Wirral and is looking to provide employment opportunities at University of Salford. One recent Balfour Beatty recruit is now working towards MCIOB.

Those leading the course are also on their own professional journeys with the CIOB. Having passed Level 6 in Construction Contract Management, Moore has also been accepted onto the route to Chartered Status MCIOB and Project RECCE co-founder Neil Houlihan, director of Nomad Construction Training, is working towards his Fellowship.

Project RECCE is currently on the planning journey to secure a permanent base providing a venue for hands-on training and a drop-in centre in Stockport.

During the lockdown period courses have been running online. The next two-week courses start on 5 and 16 October. ●

To learn more about Project RECCE and how to support the organisation, visit <https://projectrecce.org>.

"Balfour Beatty partners the programme and has recruited Project RECCE 'graduates' as has Morgan Sindall"



Training & Recruitment

Job spotlight

Susan Hudson Learning and development manager, Stewart Milne

A VIRTUAL SUCCESS

WHEN LOCKDOWN HIT, SUSAN HUDSON HAD TO FIND NEW WAYS TO TRAIN STAFF AT SCOTTISH HOUSEBUILDER STEWART MILNE



How did you arrange training when the lockdown forced you to take a different approach?

When lockdown began we knew we wouldn't be able to undertake training the way we usually do. We'd no longer be able to have everyone in one room together. The initial reaction was: training won't be happening – but we weren't having that!

We worked with other housebuilders to support employees with training needs during the lockdown. We were all in the same boat, so being able to bounce ideas off each other really helped. We created spreadsheets and online portals with links to free training. From Open University courses to learning a new language, from cooking to IT skills, we encouraged employees to look beyond construction and consider personal development and wellbeing.

How did that go?

What we accomplished in a three-month period was quite phenomenal. Around 85% of employees have completed free online learning for their own personal development or mandatory H&S training. We've administered 1,678 hours of training, which equates to an impressive 44 weeks.

To boost morale during furlough, newsletters and Zoom chats informing employees of important safety measures were shared, as well as fun virtual activities to participate in.

There's been a lot of positives to come from this, from how we will deliver training going forward and the efficiencies that can be made. As well as being effective in terms of the learning outcomes, we have saved around £80,000 during the period. Eliminating commuting time, accommodation requirements and course material costs are a few benefits of learning remotely.

Our employees understand the value of personal development to expand their skillset and knowledge. It also showed our continual investment in staff during this time, which meant a lot to people. The uptake was great; we had people asking for more online courses too.

How will things work now that employees are returning to the workplace?

Over the next few months we'll be able to compare the e-learning with face-to-face training through feedback from employees and observing behaviours on site. I'd like a bit more time before I say virtual learning is the future but, reflecting on the booking, coordinating and current feedback, online training is 100% positive. ●

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Quality needs skill

Professor John Edwards

calls for skills to be a part of reforming standards



I last wrote an opinion piece for *Construction Manager* some five years ago on the subject of quality in construction. At that time, I may have been ahead of the curve; it was in 2015, before the problems of poor quality construction of Scottish schools were revealed in 2016 and the Grenfell Tower fire of 2017. How times have changed: quality in construction is now on top of the agenda and quite rightly so.

In my experience of inspecting and surveying buildings, I often found it was the more recent work that was at fault for quality rather than original construction. In managing many projects I also witnessed the difficulty in achieving the required quality standards.

If we join the dots, we can see the obvious link between quality and skills, and if we go further we can see the influence that these have on the health, safety and wellbeing of society – and also climate change.

Regulatory reform is long overdue and it's pleasing to see this is now taking place. However, unless we have the right skillset at all stages, from design to implementation, we will struggle to ensure that any regulatory reform intended to improve standards and quality will be consistently implemented.

The climate change challenge means that we will have to make better use of existing buildings and not construct so many new ones. Those involved, therefore, need to have better skillsets in how to work with existing buildings. At the craft end we currently only teach those activities involved in new construction, so this needs to change.

The need for high skill levels and accuracy is essential, and craftspeople need not just understand what tasks they've got to do to reach the required standards, but also understand the implications of not achieving them. Craft apprenticeships need to be longer and more comprehensive, to include education and not just task activities. Those undertaking the design need to properly understand how to improve and adapt existing buildings.

Deploying the requisite knowledge and skills is so important that it should be part of regulatory reform. Perhaps this is where the licensing of individuals and companies comes in, backed by robust competency certification schemes supported by training in areas where knowledge and skill improvements are needed.

Professor John Edwards is director of Edwards Hart Consultants and professor of practice at University of Wales Trinity St David (and Construction Wales Innovation Centre).

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architectural acoustic finishes

Crossway, Birmingham (formerly Civic House).

SonaSpray fc applied to the ceiling throughout the impressive foyer area of Crossway, Birmingham. Chosen for its attractive, lightly textured & seamless finish, SonaSpray fc achieves superb acoustics without design compromise.

Credit to Associated Architects.



OSCAR
acoustics