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#### 02/21

### **Contents**

- 04 News in pictures
- 06 CIOB Quality Guide sets standards
- 07 Covid-related contract disputes
- 08 Data: Infrastructure optimism

#### Opinion

- 10 Contractors' vaccination policies
- Mace's journey to net zero 11
- Caroline Gumble on quality
- 13 Feedback: Readers' views

CLC co-chair Andy Mitchell Construction is critical to recovery

- Renovations at the British Museum 18 Curo's temporary roof construction
- Helmets and head injuries How technology can boost protection

- 26 Precast delivers in a pandemic Offsite adapts to the lockdown
- Super-skinny skyscrapers The technology behind building high
- 32 Folkestone's curvy skatepark F51's suspended skate bowls

36 Understanding asphalt paving How technology is updating practice

#### BIM & Digital

- 42 Managing projects online Digital working and productivity
- Training enters the digital age Sopra Steria's competency portal

Navigating the IR35 rule changes What construction firms need to do

- 48 Virtual visit to Alexander Stadium
- 49 Benefiting from R&D tax relief
- 50 Expert insights into MMC
- Constructing 22 Bishopsgate
- 54 Inside Birmingham's Exchange
- 55 Diary dates
- Meet a member: Sam Fowkes
- A listed Mayfair refurb project

#### **Training & Recruitment**

Quality control with Persimmon Life following a career change **EDI at Colas** 

Inclusion in the workplace









58

Switchboard: +44 (0)20 7490 5595 Editor: Will Mann

will.m@atompublishing.co.uk Associate editor:

Neil Gerrard

Tom Peardon

neil@atompublishing.co.uk Production editor: Sarah Cutforth Art editor: Heather Rugeley Community editor: Nicky Roger nicky@atompublishing.co.uk Advertising manager:

Dave Smith dave@atompublishing.co.uk Key account manager:

tom@atompublishing.co.uk Credit control: Eva Rugeley eva@atompublishing.co.uk Managing director: Stephen Quirke stephen@atompublishing.co.uk Circulation: Net average 30,887 Audit period: July 2019 to June 2020 Subscriptions: To subscribe or for enquiries, please contact: Subscription team:

32

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construction-manager@ atompublishing.co.uk

#### Editorial advisory board

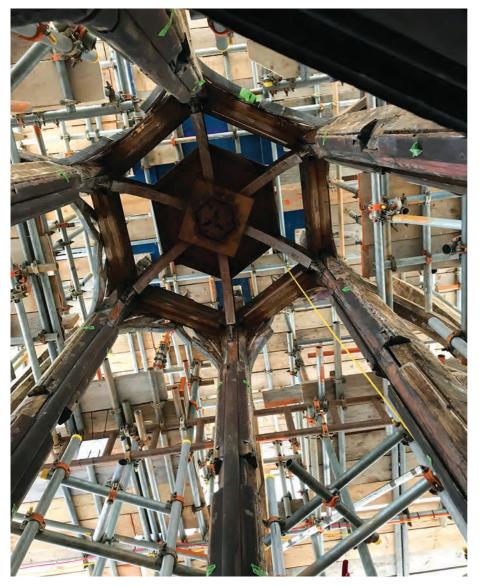
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### News



#### ► Wall-crawling robot wins Cemex award

A wall-crawling robot that can paint or inspect building exteriors, called Hausbot, was among eight UK-developed technologies recognised in the annual Cemex Ventures Top 50 ConTech Startups list. The robot's ability to climb walls is "based on Formula 1 aerodynamic principles, and carefully engineered design".





#### ▲ Foster + Partners designs landmark Qatar towers

Foster + Partners has designed the Lusail Towers in Qatar - a collection of four high-rise buildings as part of a 1.1m sq m development that will host the headquarters of the Qatar National Bank, Qatar Central Bank and Qatar Investment Authority. The project is part of a larger masterplan also designed by Foster + Partners, which is being completed ahead of the 2022 Football World Cup in Qatar. The two taller towers stand at 70 storeys, while the other two are 50 storeys high, all arranged symmetrically around a central plaza.

#### ■ Restoration of ancient **Westminster Hall complete**

The restoration of the Grade I-listed Westminster Hall, the oldest part of the Palace of Westminster, has been completed under the project management of consultancy Pick Everard. Work involved: the cleaning of the hall's 14th century hammer-beam roof; essential repairs to the roof timber trusses; repair and restoration of the lead-covered roof lantern; and the installation of fire safety equipment.



Project report: How Kent contractor Jenner built unique suspended concrete bowls for Folkestone skatepark F51. See p32



#### ► BAM in race to lay foundations for British Antarctic Survey building

A team of 20 construction workers from BAM, Ramboll and Sweco have arrived by ship in Antarctica to continue constructing the Discovery Building at the British Antarctic Survey's (BAS) Rothera Research Station. They have just weeks to finish the pre-cast concrete foundations, ground floor slab, rock anchors and stub columns, as well as drainage and the perimeter wall, before winter arrives in March.





## ▲ New construction minister appointed after just one month

Anne-Marie Trevelyan has become the latest construction minister, replacing Kwasi Kwarteng after just one month following his appointment as business secretary.



### ▲ Balfour in retrofit first to slash emissions on £1.5m piling rig

Balfour Beatty has successfully retrofitted a £1.5m piling rig in use on HS2 to bring it in line with the latest EU Stage V emissions requirement.

The six-month pilot of the retrofit solution was carried out by UK company Eminox on a Balfour Beatty-owned Junttan PM20, which was rated at Stage IIIA. It is thought to be the first EU Stage V equivalent retrofit solution in Europe.



## ■ Robertson Group to help make Edinburgh net zero

Robertson Group has joined with five other Edinburgh businesses to sign a pledge to help Edinburgh reach its target of net zero emissions by 2030. Launched by the Edinburgh Climate Commission, the **Edinburgh Climate** Compact commits firms to actions including retrofitting owned buildings and decarbonising operations, prioritising sustainable travel, and a switch to zero-emissions company vehicles.

### **CIOB Quality Guide to raise** standards across industry

New guide sets quality expectations for all parties on construction projects

#### Everyone involved in a construction

project should be intolerant of poor quality. That's one of the key messages to come out of the CIOB Quality Guide, published by the Chartered Institute of Building last month.

The guide sets out best practice for construction quality management, building upon a number of initiatives in both construction and other industries and the BS EN ISO 9000 family of quality management standards.

It explains how quality management can be integrated into company policy and the difference between quality control and quality assurance.

"I encourage everyone who works in our industry, from clients to designers, from contractors to supply chain partners to embrace the quide" Mark Beard, CIOB

The document also offers guidance on the role of the quality manager and clerk of works, the basics of construction quality management, and the actions needed to achieve it.

Split into several key sections, the guide puts quality management into context, sets out the basics of quality management systems, and establishes the principles of good practice when it comes to quality management standards, stressing the importance of ISO standards.

Paul Nash, chair of the CIOB's Quality Implementation Group, said: "By focusing on quality during the site production and assembly stage of a project, this guide aims to raise

the bar for improving quality on site. The report on the Edinburgh Schools [wall collapse] and the evidence from the Grenfell Inquiry underline why this guide is needed.

"Along with the Code of Quality Management published last year, the guide is part of the CIOB's ongoing commitment to raising standards and promoting best practice in quality management and building safety in our industry."

CIOB president Mark Beard said: "I encourage everyone who works in our industry, from clients to designers, from contractors to supply chain partners to embrace the guide and use it as a tool to improve quality across all their projects.

"Construction has a mixed profile with the wider public and I believe the best way for us to attract the next generation of school leavers to our industry is to demonstrate consistently we are an industry that delivers fabulous new buildings to the highest possible standards."

#### CIOB launches fire safety in construction certificate

New course for construction managers starts on 17 February

The CIOB is set to launch a new Certificate in Fire Safety for Construction, due to begin on 17 February 2021.

The course follows the recommendations in Dame Judith Hackitt's Independent Review of Building Regulations and Fire Safety, which outlined the improvements that the sector should make to prevent incidents such as the Grenfell Tower fire from reoccurring in the future.

It is aimed at improving fire safety awareness for managers in the construction industry and for those who are faced with managing fire safety in the workplace.

The course looks at current and future legislation, building design and building construction, fire risk assessments, fire science and human behaviour, and how to manage and implement fire safety systems.



#### **Institute offers** membership support

The CIOB has frozen its membership prices at 2020 levels with no increase in subscription for members renewing for 2021.

If you are a CIOB member and are struggling financially to keep your CIOB membership, there is a covid-19 support fund that you can access as a concession on 2021 subscriptions.

So, if you have been furloughed, are on reduced pay or experiencing redundancy, log into the members' area of www.ciob.org or call +44 (0) 1344 630 700.

The CIOB Benevolent Fund is also on hand to provide assistance when you need it. It can be contacted in confidence on +44 (0) 1344 630 780 or visit www.ciobbenevolentfund.org.uk.

IR35 Q&A: What construction firms need to know about the changes to off-payroll working, p46



## Warning over covid-related contractual disputes

CLC survey indicates an increase in notifications and claims because of the pandemic



#### Construction businesses risk getting bogged down in legal disputes related to the pandemic, the Construction Leadership Council (CLC) has warned.

The CLC urged the sector to follow guidance it has produced to ensure the "fair and reasonable administration" of contracts, cautioning that, without it, covid-19 could have a "significant and detrimental effect" on the industry.

A CLC survey indicated an increase in notifications and claims under construction contracts because of the pandemic. This included chasing issues on legacy projects to increase cash reserves, trying to recover commercial positions due to the direct impact of covid-19 on current projects.

The survey also indicated that many pandemic-related claims were



"By and large, developers and contractors have worked hard to tackle problems together" Francis Ho, Penningtons

Manches

being rejected, and while parties were inclined to settle an entitlement to additional time for completion, there was a "reluctance" to agree financial losses, costs and expenses.

The CLC said: "Commercial behaviour has changed since covid-19. In the short term, many reports indicated a positive and increased level of collaboration within Q2 and Q3 of 2020. However, in the longer term, indications were that commercial behaviour was hardening throughout the supply chain, including greater emphasis on management of existing contracts, sub-economic pricing, and protective discussions on risk allocation in new contracts."

Francis Ho, chair of the CIOB contract and procurement special interest group and a partner with Penningtons Manches, said: "The findings are consistent with our experiences. On occasions, a party has looked to take advantage of the situation, for instance, trying to pass off unrelated delays as covid-based but, by and large, developers and contractors have worked hard to tackle problems together and prioritised safe working conditions."

Trowers & Hamlins partner Clarissa Smith warned: "If the industry is to overcome these challenging times and avoid disputes escalating and damaging the very relationships which will be critical to the rebuilding of the economy, then early intervention, effective contract management and collaboration will be vital."

## CLC chair repeats concerns over fair payment

Mitchell calls for tougher action on late payers

Construction Leadership Council (CLC) chair Andy Mitchell has said he remains concerned about payment delays in the construction supply chain during the pandemic.

In an interview with CM (see p14-16), Mitchell said: "Personally, I would like to see tougher action on late payers. But I think there's a way of doing that without legislation. We need more visibility of payment league tables, from public clients all the way down through the supply chain. No one wants to be at the bottom."

Last year, the CLC urged construction companies not to invoke penalty clauses in contracts, warning such actions "will be remembered" and that "all firms should think hard about how their reputation could be damaged by not doing the right thing".

The latest Build UK 'Duty to Report' figures on construction sector payment performance show Vinci as the quickest paying main contractor, taking an average of 26 days to pay invoices, with Multiplex the slowest, at 55 days.

#### Build UK fastest paying contractors

1. Vinci	26 days
2. Morgan Sindall	27 days
3. Sir Robert McAlpine	28 days
3. Mace	28 days
5. Amey	29 days
6. Interserve	30 days
7. Willmott Dixon	31 days
7. Osborne	31 days
9. Wates	32 days
9. Sisk	32 days
9. Laing O'Rourke	32 days
9. Ilke Homes	32 days



2.8

Percentage of construction businesses surveyed in December who plan to permanently close any sites in the next three months. according to the ONS

### Infrastructure spending shores up 2021 prospects

Despite concerns about 'mutant covid', the construction pipeline offers reasons for cautious optimism, writes Kris Hudson



The construction industry ended 2020 on a relatively strong footing, with output

expanding for the seventh successive month in December according to the IHS Markit/CIPS **UK Construction Total Activity** Index. Confidence in a vaccine and the sense of a route out of the crisis - has spurred on investment in projects that were delayed or mothballed by the onset of the pandemic.

However, the new covid-19 variant and announcement of another national lockdown at the start of January may well put the brakes on an already cautious recovery. Experian forecasts construction output to remain below pre-pandemic levels in 2021, with overall output levels only fully recovering in 2022 and housebuilding activity predicted to remain below 2019 levels until 2023.

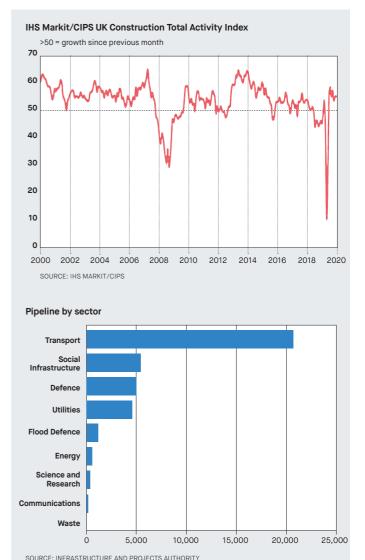
But amid the concern around this new strain of the virus and prospects for the coming months, there are also some bright spots on the horizon. Glenigan has forecasted that construction project starts are set to increase by 17% in 2021, with infrastructure expected to be buoyant.

The government's National Infrastructure and Construction Pipeline also estimates that projects with a combined contract value of £37.4bn will be brought to the market in 2021.

Transport, social infrastructure, defence and utilities are anticipated to be the big beneficiaries of this investment, with estimated maximum contract values of £20.7bn, £5.3bn, £5bn and £4.7bn respectively. This expenditure is expected to unlock 'shovel ready' schemes and to deliver broader benefits to communities in tackling social inequalities. Better road and rail links across the regions will also help improve productivity and connectivity, enhancing the multiplier effect infrastructure spend has on the UK economy.

Notwithstanding the positive role construction will play in the macroeconomic recovery, the risks associated with the new trading regime with the EU should not be downplayed. As soon as possible, contractors would do well to apply robust risk management and scenario planning to decide how they engage, collaborate with and sustain their supply chains into 2021 and beyond.

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



#### **News in numbers**

Drop in housebuilding activity - to just over £35bn - in 2020. according to Experian

Value of new Department for Education framework put out for tender in January

**Number of former Carillion** directors facing legal action from the Insolvency Service

Multiplex's expected financial hit from covid-19



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## Opinion



James Pomeroy Lloyd's Register

## Can contractors force workers to get vaccinated?

As covid-19 vaccination accelerates, businesses must decide their own inoculation policies. **James Pomeroy** explains the complexities facing the construction sector

#### The coronavirus vaccines are offering

much hope for the world, the construction industry included, but with prioritisation lying with those most vulnerable, it will be some time until all workers are eligible for the inoculation. However, the spread of misinformation – alongside religious and health concerns – has led to many taking a stance against receiving the jab.

For contractors, where many team members work within close proximity of each other, this is particularly problematic. The ethical and legal principles, including medical consent and voluntary participation, need to be delicately managed because the vaccine is not solely an issue of science. Workers have ethical and religious obligations that construction businesses need to be aware of.

With elderly and vulnerable adults being prioritised, there is time to plan an effective response before workforces are eligible. Employers considering whether to mandate the vaccine should seek legal advice and be aware that compelling employees to undergo any form of medical treatment is generally not permitted.

Employers are obliged to ensure religious beliefs and personal medical rights are considered within any policy, and this must be the case for the covid-19 vaccine. In the case of an employee who cannot be vaccinated, possible accommodations must be considered, such as transferring to a role with fewer interactions, telework or continued use of personal protective equipment. However, other avenues, such as more frequent testing, may also be implemented should workers decline the vaccine.

Data privacy is likely to play an integral part in any policy. If employers are going to ask about a worker's health status, employees have the right to withhold information under data protection laws. Health is private and must be respected, and employers must ensure this is maintained when considering a vaccine policy.

During the pandemic, Lloyd's Register has worked closely with contractors across the world to audit their health and safety management systems and ensure workers are kept safe. One question that has appeared from a number of contractors is whether they should incentivise vaccination, particularly where healthcare is an employment benefit. This should be considered with caution, given the legal ramifications and prospect of discriminating an individual or protected group.

"For those refusing to take the vaccination, but not based on personal medical or religious grounds, employers have a role in promoting the vaccine and countering some of the misinformation found online"

For those refusing to take the vaccination, but not based on personal medical or religious grounds, employers have a role in promoting the vaccine and countering some of the misinformation found online. It is in their interest to educate workers so that they make decisions based on evidence, but communication must include an element of employee engagement.

Internationally recognised occupational health and safety standards – such as ISO 45001 – hold staff consultation and engagement in high regard. It is therefore imperative that contractors communicate with employee representatives and unions as a minimum requirement over any vaccination policy. 

James Pomeroy is group health, safety, environment and security director at Lloyd's Register.





Isabel McAllister

## Mace's journey to net zero – and beyond

Last month, Mace delivered on its promise of a net zero business. **Isabel McAllister** on how this was achieved, and the sustainability targets that lie ahead

It was January 2020 when Mace pledged to be a net zero carbon business by the end of the year. Just a few months later the world faced one of its greatest challenges – a global pandemic tipping many economies into steep recessions.

But during the chaos of the covid-19 crisis, we didn't forget our planet was facing another threat, the speed of climate change. With lockdowns around the world, we saw a sharp drop in carbon emissions – resulting in less air pollution – and saw what our cities would look like if we lived and worked more sustainably.

As a contractor, Mace continued to pursue net zero in 2020, reducing emissions by 50% across developments and operations. We've offset our remaining emissions through accredited standards. With the help of Carbon Footprint Ltd, we offset 13,000 tonnes of  $\mathrm{CO}_2$  through six international projects.

The reality is that climate change cannot wait decades for businesses to achieve net zero carbon. It is happening now and disregards business models and profit targets.

And as we stated in January 2020, achieving net zero carbon is not our final goal. As an industry – contractors, clients, supply chain – we need to work together to develop low carbon solutions and share knowledge.

Mace's new five-year business plan sets further targets on our carbon footprint and commits to a 10% carbon emissions reduction every year. Working as a developer we will deliver developments that we own as net zero carbon, and bring the delivery partners on the same journey,



from planning through to construction delivery. As a contractor, consultant and facilities manager we will continue to adopt low carbon solutions and delivery methods, and support our clients to reduce their scope 3 emissions.

From modern methods of construction to low carbon site plant, our ambition is to radically change the impact of the built environment on the environment.

During my time leading social value initiatives, I have never seen a greater urgency for action on climate change among clients and other partners. Our net zero achievement highlights our commitment to protecting the environment but we also hope it will inspire others.

Isabel McAllister is director for responsible business at Mace.

## Don't blame D&B for poor quality

Is the industry ditching design and build to lock in quality? This may be misguided, **Paul Beeston** argues



In the time, cost and quality 'triangle', the much-repeated adage is that you can't have all three. So, have procurement practices contributed to a

deterioration of quality achieved in construction, particularly design and build (D&B)?

At its worst, the industry in general, and D&B especially, can be a competitive race to the bottom. It encourages the (apparently) unnecessary to be trimmed and removed; "it meets code" is the backstop.

The design part of a D&B is a service and a process. Does the client just want code compliance and is the contractor's best advice that code compliance is the best solution? A D&B contractor should not be afraid of giving professional advice on design. The services required of the contractor under a well-briefed pre-construction services agreement (PCSA) should establish this requirement.

D&B is a firm favourite of clients and funders, especially in the private sector, not least for its risk transfer and single point of responsibility. A pivot towards quality may lead clients to consider a hybrid, traditional or construction management route, but they may not achieve their desired commercial or programme objectives.

But it is possible for clients to lock in quality through D&B. They could consider writing into the design consultant's scope of service an inspection regime; contractors should embrace the diligence. Clients should remember, when assessing contractor tender returns, that lower preliminaries may reflect an inappropriate level of supervision and quality management.

Where there are specialist elements, clients should ask if fire, facade or acoustic specialist inspections are needed, along with a client-side clerk of works.

It is certainly the case that quality is a symptom of culture and process and procurement is part of that process. Clients should make sure their procurement route, whatever it may be, secures the triple lock of time, cost and quality.

Quality is not something that is just achieved on a cold and wet construction site, or for that matter, in an offsite factory. Quality is the golden thread the entire project team follows from start to finish.

So clients do not necessarily need to change their preferred procurement method, including D&B, but they may need to change how they approach it. Define a project's objectives with clarity and embrace a culture that delivers quality with pride.

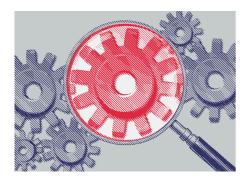
Paul Beeston is a partner at RLB.



Caroline Gumble

### Let's embed a culture of quality

As an industry, we need to go beyond the bare minimum and seek out the highest possible standards, says Caroline Gumble



#### As covered on page six, we recently

published the CIOB Guide to Quality Management in Construction: Site Production and Assembly. Most CM readers will be aware that the CIOB has made improving quality in construction a priority in recent years. Our president, Mark Beard, made it the theme of his presidential year, backing the CIOB in maintaining quality in construction as an area of focus.

His quote, when launching the guide, was that "members are the standard-bearers for quality in the industry. The vast majority of building work that takes place is of high quality, but our customers have a right to expect more. Regrettably, many parts of our industry are stuck in old ways of working, and for this reason, I urge members to champion the new guide, to embed it into

"My hope is that by embracing this new guide to quality management, we can and will achieve better"

your businesses and help everyone in our industry rediscover the pride in doing the job right first time."

As a call to action to members - and the wider construction community - I echo Mark's comment. We can't embed a culture of quality within the industry unless we all raise the issue and share the resources and knowledge we have.

As an industry, we need to go beyond the bare minimum and seek out the highest possible quality standards. My hope is that by embracing this new guide, we can and will achieve better.

This guide promotes an approach to quality management that begins by identifying issues that impact on quality on site, assessing their likelihood and impact, and proposing practical measures that can be taken to either mitigate or remove them. It is intended as a practical guide for use by practitioners working collaboratively throughout the construction supply chain.

I want to take this opportunity to thank all those who contributed to the work, including Roger Flanagan and Carol Jewell, the authors, and Paul Nash, who has led the CIOB Quality Implementation Group so effectively.

Many thanks also to Beard and the Wates Group as their support has allowed us to offer this publication free of charge to members. And thank you to our members for their generosity.

For the launch of the guide, we suggested that members could show their support for this important piece of work by donating to the CIOB Benevolent Fund, which directly assists members in difficult times. Many of you have done so and I'm very grateful. Thank you. Caroline Gumble is CEO of the CIOB.

#### Finding construction's future leaders

Innovators from other industries can teach us how to become more sustainable, says Malcolm Clarke



The traditional construction industry business model has been broken for decades and we need to make positive changes that

deliver real value for all: clients, designers, contractors, supply chain and end-users. To do this, we require leaders that will take our businesses to new levels that are sustainable.

At Baxall Construction, we are working with the Innovative Future Leaders Programme (IFLP) to develop our managers, with a view to them being able to take senior leadership roles in the running of Baxall.

IFLP gives our leadership candidates another perspective from both inside and outside the built environment. They learn from expert sessions delivered by some world-leading innovators, from government, technology, retail, sport and beyond, as well as from the construction industry. Candidates take a business challenge to the programme, so Baxall gains valuable, innovative solutions to integrate into our own organisation.

Our first candidate, Andrew Baldwin, a preconstruction manager, has gained insight and knowledge from other candidates, as well as top-class presenters and facilitators, and gained confidence in his own leadership style.

The carbon neutral agenda is Andrew's business challenge - the right thing to be taking on from a moral standpoint - and we believe it is increasingly a differentiator. We have taken up the challenge of how we can deliver a better product for our customers, that is also safer and healthier for the users of our buildings, as well as minimising the effect on the environment. Andrew is leading an application to the government's Innovate UK fund, in partnership with the University of Kent on a Knowledge Transfer Partnership, with the aim of supporting our vision of a sustainable product delivery business model.

The obvious benefit Andrew is gaining has encouraged us to put forward two further candidates for the IFLP. Each will have a different business challenge to address and we believe this will enhance both their personal development but also contribute to the Baxall business.

Malcolm Clarke is managing director of Baxall Construction.



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



#### CM 05/01

#### A collaborative role for the clerk of works

Readers respond to Mark Beard's views

#### Brian George

I wouldn't buy a BMW with three pages of snags but that's what's happens on many handovers.

I would be more encouraged with a robust signing-off system. And above all, an experienced closing-out manager who understands quality control. It's about building a relationship. And understanding what's to be expected from both parties.

#### Steve King

I found myself alternately nodding and shaking my head. A collaborative role for the clerk of works, quality being the responsibility of the contractor, sensible pricing and removal of duplication all seem good and sensible steps.

However, the analysis does not go into why we are where we are. Among many other factors, each client thinks they are paying a fair price (whether they are or not). They have made a huge investment in awarding a contract and wish to protect themselves. A contractor's clerk of works may be directly employed and if so unlikely to have their own professional indemnity insurance (PI) or be independent enough for many clients.

A clerk of works can be a helpful second pair of eyes but in the end the contractor's management team need to be able to understand what they are building and see it done correctly.

#### John McGee

As a clerk of works, I often find that contractors resent my presence on site as they see me as someone who is continually trying to stop them from working, interfering or delaying their operations on site.

My stance is that I am another pair of eyes (often seeing things from the client's side) to improve the quality or design issues which arise on site. At the end of the day, it is a game of football – with the contractors and myself scoring in the same goal.

#### CM 03/11

Do consultants amend JCT contracts just to boost their fees?

#### Paul Lomas-Clarke

The comments about amendments to JCT contracts overlook the obvious. The entire suite (save the Major Project Form) has been negotiated by representatives across the industry, including employers and contractors. They represent an equal balance in the allocation of risk between the respective parties, coupled with an acknowledgement that not every contract can address every event.

The reasons why the balance of risk is altered are twofold. Firstly, a consultant who recommends their client use an unamended standard form is at risk should the project not proceed according to plan, as the employer will seek to blame any cost or time overrun on them. Secondly, consultants generate enormous fees from amending contracts to move risk away from the employer and on to the contractor.

Why alter a contract which has been negotiated by representatives of all sections of our industry? It should be recognised as an even-handed and balanced contract. Amendments are a great way to encourage first disputes and then costs.

#### CM 05/01

Parents 'see construction as male industry'

#### Joel Gilmour

An excellent article by some female engineers from Arup last year in the *Telegraph* made two relevant points.

First, construction is one of the default choices proposed to boys if they have no strong career preference, whereas for girls it is not. This leads to a cohort of males in construction of variable motivation, and a smaller cohort of females with typically higher motivation as they are more likely to have sought out their career.

Second, A-level maths is the gateway subject to STEM at post-18,

which means if you can't enthuse girls about maths in their primary and early secondary school life, they are all but lost to construction.

#### Owen Higgins

I have been an advocate to bring women into the construction industry, especially with the shortage of skilled labour here. I would love to see more women take up positions in trades such as plastering.

#### O CM 11/01

Should non-essential work be stopped amid coronavirus?

#### Phil Webster

I agree non-essential fit-out works should be stopped whilst the rate of infection is so high. Why are we being put at risk for non-essential works?

#### Tim Jones

We should allow all construction work to continue. So many selfemployed would lose their livelihood. The sector simply can't afford to lose any more skilled labour, especially with Brexit.

#### Lee

I keep hearing of people's lives being ruined by not making money. What if one of your family dies because of a link to not closing sites for a few weeks? I am pretty sure views would change.

#### Kare

Having worked on the front line during the first lockdown for seven weeks 12-14 hours a day, for up to eight days straight, I would say keep everything open for the people who want to keep busy and active in a sensible and responsible way.

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

## Profile

## **'COVID PROVED THIS INDUSTRY CAN CHANGE QUICKLY'**

CLC CHAIR ANDY MITCHELL HAS HELPED LEAD CONSTRUCTION THROUGH THE PANDEMIC, AND DESPITE THE CURRENT LOCKDOWN, HE SEES LIGHT AT THE END OF THE TUNNEL. **WILL MANN** CATCHES UP WITH HIM



"Never has there been a time when this industry is so important to the country's future." If Andy Mitchell sounds Churchillian, it may be because the chair of the Construction Leadership Council (CLC) has just come from an event hosted by Boris

Johnson, a known admirer of Britain's

wartime prime minister.

"I believe we have a government that recognises our sector can be a motor for the economy," the Tideway CEO says. "We have shown we can continue operating safely even with the pandemic's restrictions. And everyone in construction now realises that we can adapt and change quickly if we have to.

"So let's bring that mentality to other key industry priorities. Let's turbo-charge the change that's necessary in building safety, net zero, digital adoption.

"There is a responsibility on all of us to step up."

Since the UK's first lockdown was announced nearly 10 months ago, Mitchell has gone into bat for the industry across a range of issues, gaining respect both within construction and government.

He set up the CLC's coronavirus task force, which created the site operating procedures (SOPs), giving the industry a licence to continue working during those uncertain days last spring.

The recent surge in covid-19 cases, and the spread of its more virulent strain, was still a major worry as *CM* went to press, and the SOPs have been

updated to reflect latest government guidance. Does Mitchell believe they will allow sites to stay open? "Fundamentally, yes - but we have to be absolutely sure we're following all guidance correctly," he warns.

The task force, which comprises all the major client, contractor and supply chain bodies, started with daily, one-hour sessions. Now they meet two days a week, Tuesdays and Thursdays, with 25 people on the call, says Mitchell.

"The good thing is everyone is engaged, from big civils contractors to builders' merchants, and that has led to cross-fertilisation of ideas. Mark Enzer heads our new digital workstream and says progress is much quicker because we are sharing learning from a larger swathe of the industry. Without the pandemic, I don't think we'd have got that."

The CLC recently restructured, bringing on board new members, but Mitchell stresses the council won't become "bureaucratic" as a result.

"The coronavirus task force is the same," he says. "The senior advisory group will act like 'non execs'; we are inviting critical challenge and getting a broader church of opinion. Making sure we don't get lost in our own story."

#### Professional awareness

The senior advisers include CIOB CEO Caroline Gumble, along with representatives from the ICE and now RIBA too.

Professional bodies have a "critical role", says Mitchell.

"So many industry challenges are about professional awareness. Building safety is one example. Net zero is another, but we don't have a clear vocabulary on that yet. The more ground we make with net zero innovation, the more we need the professional bodies to take a lead and Left: Andy Mitchell: 'There is a responsibility on all of us to step up'

#### **Andy Mitchell** CV

- Since 2018: Cochair, Construction **Leadership Council**
- Since 2014: CEO, Tideway
- 2009-2014: Programme director, Crossrail
- 2004-2009: Programme director Thameslink. **Network Rail**
- 2001-2005: Project director. southern power supply upgrade. **Network Rail**
- 1998-2001: Programme and controls manager, West Rail, Hong Kong
- 1995-1998: Head of programme management, Airport Terminal Building, Hona Kona
- 1990-1995: Chief planning engineer, **Kier Construction** 1987-1990: Planning manager, Nuclear Electric
- 1985-1987: Project controls engineer. Snamprogetti
- 1981-1985: Field engineer, Chicago Bridge and Iron Education
- 1989-1991: **Henley Business** School, MBA Project Management
- 1978-1981: Imperial College London, BSc (Eng) Civil Engineering

say: 'this is what we need to know'. Then the question is how we get the right standards of quality and competence rolled out."

Mitchell feels net zero is a "big opportunity" for construction.

"We know the built environment generates 40% of our carbon emissions. So where can we make major changes, the way the motor industry is putting investment into electric cars, that deliver a real 'bang for your buck'?

"Can we deliver zero carbon concrete or zero carbon steel? In steel, that would probably require electric arc furnaces, technology that would require a lot of investment.

"But there is a knowledge export opportunity here. The event the prime minister hosted yesterday was a 250-strong reception aimed at helping UK plc grow internationally. I think net zero is one area where the built environment can do that."

Mitchell says he didn't vote for Brexit but "we have to make the most of it" and believes there will be more trading opportunities from reduced tariffs and greater flexibility with international trade.

"We always thought there would be some short-term disruption and we're seeing it with certain product groups," he says. "There are unanswered questions around CE marks and product standards, but I think that will be short term. The skills situation is less of a concern, from what I'm hearing in the industry, than what we thought it would be a year ago."

While covid-19 and Brexit kept him busiest last year, Mitchell also found time to address payment concerns, urging companies not to invoke penalty clauses in contracts, and warning such actions "will be remembered". Last month he and the CLC repeated this message, encouraging "fair >



#### Mitchell on... ...skills

"We have to do a better job in presenting what this industry does for society. Younger generations are more altruistic. And we can present this industry as one where you can change the world. My hunch is that net zero will be a key part of that."

#### ...fair payment

"Personally, I would like to see tougher action on late payers. But I think there's a way of doing that without legislation. We need more visibility of payment league tables, from public clients all the way down through the supply chain. No one wants to be at the bottom."

and responsible" resolution of coronavirus-related disputes.

Mitchell gave an enthusiastic endorsement to the government's *Construction Playbook*, published in December. It aims to embed a new approach to procurement and delivery, which Mitchell hopes will lead to a "better and fairer industry" and he urges construction to help public clients understand its implications.

"Creating the playbook was a collaborative effort and that should apply to roll out - we know people learn from each other when you put them in the same room," he says.

It is sometimes easy to forget that Mitchell has a 'day job', as CEO of Tideway, which has faced the same challenges as the rest of construction over the past 10 months.

"There was confusion and fear back in March 2020, with most sites shut down, but some tunnelling work was in progress and had to continue or it would have been extraordinarily difficult to finish," says Mitchell.

"We lost some time, but after six to eight weeks we were back working

#### Mitchell on...

#### ...Brexit

"We have to make the most of it. I didn't vote for Brexit but there are opportunities. There are fewer tariffs and fewer trading restrictions so the UK's competitiveness will increase. I believe there is an export opportunity here for construction."

#### ...site operating procedures

"We've had calls from Australia and Japan saying we're using the CLC SOPs. For the biggest contractors, they employ enough people to think these issues through, but the guidance has been very helpful for smaller companies who didn't have those resources."



Mitchell: 'One of our site managers told me he feels safer on site than on the high street'

on all fronts, and by the summer the size of the workforce was at pre-lockdown levels."

#### Discipline with covid-19

Tideway's offices are closed now, though it opened them in the autumn – "we felt we had to offer that option to staff for mental health reasons," Mitchell says – and rented new car parks, including the site of the Chelsea Flower Show, so workers could avoid using public transport.

"What we've learnt on Tideway is about working discipline," he says. "Construction is used to working safely, with a set of rules, and we have to treat the covid-19 restrictions the same way.

"One of our site managers told me he feels safer on site than on the high street. Stand too close to someone on site and they will complain; you won't find that social distancing on the high street."

The government, Mitchell feels, "values the crucial contribution" construction makes to the economy,

as new business secretary Kwasi Kwarteng put it in an open letter to the industry in January.

"They have taken the view that rather than furlough construction workers not to do anything, they can operate safely and could create something of benefit for the country's future." Mitchell says.

"When the prime minister talked about 'building back better' and 'building back greener' last summer, I thought they were just soundbites. But he stressed it again when we met yesterday."

Reflecting on the industry's collaborative efforts during the pandemic, Mitchell again strikes a Churchillian tone: "Of course, it's easy to work together in wartime, less so in peacetime. There's a worry that we'll see a falling off as and when we get through the pandemic. But that's not happening at present.

"We have some tough months ahead, but we've got to believe by late spring to early summer things will be better."



# Plotting your digital construction journey



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

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

## Technical



### RAISING THE ROOF AT THE BRITISH MUSEUM

THE SOUTH COLONNADE AT THE GRADE I-LISTED BRITISH MUSEUM HAS BEEN UNDERGOING ESSENTIAL RENOVATION WORK, USING TRADITIONAL SKILLS AND INNOVATIVE SCAFFOLDING DESIGN. CONTRACTOR CURO TELLS **NEIL GERRARD** ABOUT THE PROJECT

The scaffolding in place, hidden by images of the original pediment

#### Anyone who has set foot in the

British Museum will be familiar with the 19th-century Greek Revival building that houses much of its collection in Bloomsbury, London.

The entrance and two wings are known for their imposing Portland stone columns and triangular pediment, or tympanum, featuring stone sculptures called The Progress of Civilisation, designed by Sir Richard Westmacott.

However, years of wear and tear have taken their toll. Inspections of the ornate lime plaster soffits along the colonnade, featuring 42 coffers, found degradation in the lime plaster. An earlier restoration which used modern paints meant the plaster could not breathe. There were also problems with water ingress, requiring replacement of the copper covering along two of the three roofs.

Berkshire contractor Curo Construction was appointed to carry out the delicate restoration work.

"One of the challenges we faced was providing a temporary roof over quite a large expanse and then trying not to tie it into the fabric of the building – it had to be freestanding," explains Rob Gordon, operations director at Curo.

The scaffolding erection for the temporary roof started in February 2020, and keeping the museum open throughout was a key consideration.

The soffits were painted over with lead paint around 60 years ago

"One of the challenges we faced was providing a temporary roof over quite a large expanse and then trying not to tie it into the fabric of the building - it had to be freestanding"

**Rob Gordon, Curo Construction** 

"We came up with a solution to hide the majority of the scaffold behind the columns and then cantilever out around the front of the pediment to pick up the front of the temporary roof," explains Gordon.

"The back of the temporary roof had to 'land' on the museum building. This was challenging as we had to agree with the structural engineer how these loads would be transferred to the existing structure.

"Instead of normal scaffold tubes, we used beams for the standards, which provided a more lean but robust structure."

#### Water butts as kentledge

The designs were produced by scaffolding subcontractor WellMax. An unusual kentledge, in the form of water butts, was hung from the scaffolds to prevent wind uplift. Images of the pediment sculptures were printed onto the scaffolding sheeting.

As it turned out, the British Museum closed due to covid-19 shortly after the scaffolding was erected. After an eight-week shutdown while the construction team came up with safe operating practices, Curo resumed on site, with greater working flexibility thanks to the absence of visitors.

Another peculiar challenge concerned the Union Jack flag, which the museum flies at all times. The client wanted the 13m flagpole removed and

#### Project team

Client: **British Museum** Principal contractor: **Curo Construction** Architect: HOK Value: Undisclosed Subcontractors: Plaster: Artisan **Plastercraft** Plaster and paint consultant: Richard Ireland Roofing: Albany Brent Scaffolding: WellMax Started: February 2020 Completion: April 2021

The scaffold offers direct access to the pediment sculptures

refurbished, so Curo was tasked with sourcing a specialist firm to supply a temporary replacement.

Further complicating this task was the size of the lorry required to transport the pole, which was too big to pass through the museum gates. Curo ended up making a bespoke cradle to take the pole down, then had to take it out of the British Museum by hand on a trolley, via a side gate, where a HIAB crane lifted it onto a bigger lorry.

To repair the soffits, Curo engaged subcontractor Artisan. "The soffits were painted over with lead paint around 60 years ago," explains Gordon.

"We know that the original lath and plaster finish was made to look like Portland stone. But over time it was patch repaired and painted so they were actually white by the time we got on board. We have had to do a chemical paint strip to the whole soffit to get back to the original plaster."

The soffits have been restored in keeping with the original finishes. The plaster uncovered



#### **Construction manager CV: Rob Gordon**



**Rob Gordon** started his career in construction at grassroots level more than 20 years ago. He was taken on by Mowlem

as a trainee engineer in 2000 and remained there until he joined McLaren Construction in 2005, where he worked for nearly 10 years as a project manager.

For the past six years, he has been working for Curo Construction, first as a contracts manager and now as operations director.

during the work was sent away for analysis to establish the correct mix required for the repairs.

Work to the roof involved the replacement of about five tonnes of copper. "It was quite an operation getting all the coils up there but fortunately with modern hoists we were able to lift up all the equipment," says Gordon. "That meant that whereas the original bays were staggered and had joints midway, we could do each bay with one sheet of copper, and it is a better finish as a result."

#### Removal of temporary roof

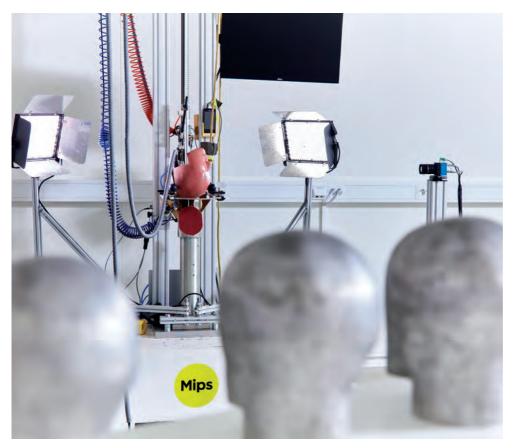
When CM spoke to Curo in December, prior to the latest lockdown, the project was nearing completion. The temporary roof was scheduled for removal by the end of January, with the central scaffold to be dismantled by the end of March.

Gordon says: "It has been a privilege to work on an iconic site like this and to work with such skilled tradespeople. We don't always get to use some of these techniques in modern buildings and it is enriching to revisit these skills."



### TAKING A LEAD ON HEAD INJURIES

NEARLY 200 CONSTRUCTION WORKERS A YEAR SUFFER HEAD INJURIES IN GREAT BRITAIN. CM, WITH MIPS, WHICH FOCUSES ON REDUCING THE RISK OF HEAD INJURIES, ASKED A PANEL OF HEALTH AND SAFETY EXPERTS HOW THE INDUSTRY COULD ADDRESS THE ISSUE, AND WHETHER NEW HELMET TECHNOLOGY COULD HELP



Will Mann: Health & Safety Executive statistics from 2016/17 to 2018/19 show that 595 construction workers suffered head injuries. Of these, 186 resulted in loss of consciousness and 79 caused concussion. What are the panel's views on how head injuries in construction could be prevented?

John Dunne: A head injury is among the worst-case scenarios on site, but thankfully I can't recall the last serious head injury that occurred on a Wates site. That doesn't mean that one couldn't happen though. Our focus is around prevention of the fall in the first place and the prevention of materials or equipment falling.

Inside the MIPS testing facility

Saying that, there is always the possibility that something will fall, so the right selection of head protection is a really important subject.

In general, we use JSP EVOLite head protection as our standard employee issue, tested to EN 397. Wates has a national agreement in place with Arco, who have plenty of options for personal protective equipment (PPE), and we choose what we feel is the right choice for us.

Many larger organisations within our supply chain are well informed and provide a good standard of PPE to their employees. However, for smaller contractors who may not have access to up-to-date information or cutting-edge technologies, there could be a concern. Therefore, it is up to all main contractors to ensure we pass on any new information that comes to light that may make our sites safer.

At present, we don't insist on the type of head protection that the supply chain use, provided it conforms to current safety standards. We could insist that anyone working on our sites use a certain type of helmet, but this could have implications in terms of cost and availability.

Andrew Hughes: At ISG, we have a helmet that has a chin strap which is different to others, and we insist on that throughout the supply chain. It was difficult at first to get people to buy into that process but

595

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John Dunne, Wates

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Health & Safety Executive statistics from 2016/17 to 2018/19 show that 595 construction workers suffered head injuries

incidents that have occurred have backed that decision up.

Yes, the hierarchy of controls should prevent accidents from happening in the first place, but when the consequence is significant – as is the case with head injuries – then using the latest technology to help mitigate the impact is definitely a good thing to do.

George Mosey: We've taken a look at some of our safety data recently and two-thirds of our small number of head injuries are impact-related. Fifty per cent are attributed to falls from height and 20% are attributed to objects falling from height onto a person. Also 15% of head injuries include contact to the face and that asks a question around what is needed to protect their face as well as their head. What this reiterates is the importance of wearing a hard hat at all times.

At Laing O'Rourke, we are actually trying to move to a position on some worksites where bump caps are appropriate, because we have de-risked the project to such an extent. However, that is not always appropriate, particularly at the start of projects.

Tethering of tools is another big area of focus for us – hand tools being used on scaffold platforms or MEWPs. They are things that have the potential to be dropped because they are often in people's hands and people's hands are fallible. PPE is the last resort.

Chin straps are not mandated across our operations but that is something we may look to do in the future.

Mark Starling: We had a crush incident at Greenwich three years ago, which demonstrated the importance of safety helmet technology. The worker was in a MEWP, but luckily he was wearing a

higher-impact-resistant helmet and he had his chin strap on. Without that I think we would have been talking about a different scenario.

Derek Rees: I have been in the industry 30-odd years and while some things have changed hugely, some things have not. The attitude when I first started was that hard hats were quite handy to carry stuff around in. Now everyone does wear them, but I am not sure how much the technology has really shifted. We should use nanotechnology or similar to highlight where and when a hard hat has been dropped and damaged making it unsafe.

**WM:** Studies have shown the human brain is six to seven times more sensitive to rotational than linear motion. Almost all head impacts generate rotational motion. What can construction do to mitigate this?

**JD:** We have got to follow the science. If we feel that mitigating rotational impact should be a key consideration with head protection, preventing more serious injuries, then we should ensure that it is part of all future safety helmet testing.

**AH:** These oblique angle impacts are particularly relevant to our industry, as experience has shown that falling objects, ranging in size from a bolt to a scaffold pole, remain a rare but critical risk. It would be useful to understand more about how those impacts vary.

**GM:** We could break down falling objects into a number of categories. If something quite sizeable comes off a building and lands on someone's helmet, I suspect there is a load or a weight limit you get to where actually

Participants



Steve Coppin Technical director, Arcadis; CIOB health and safety special interest group



George Mosey Head of health, safety and environment, Europe, Laing O'Rourke



Mark Starling Safety, health and environmental manager, Kier Construction; CIOB health and safety special interest group



Derek Rees Programme director, Construction Logistics and Community Safety; chief executive, SECBE



Andrew Hughes Global health and safety director, ISG



John Dunne Group health, safety, environment and quality director, Wates



Will Mann (chair) Editor, Construction Manager



Max Strandwitz CEO, MIPS



Peter Halldin Chief science officer, MIPS



Olof Rylander Business developer safety, MIPS

"There are two trades where safety risk is quite high; scaffolding and steel frame erection. When visiting sites during these stages of projects I wear the higher-standard impact-resistant helmet" Mark Starling, Kier Construction

no helmet will help. It could be helpful to analyse the different types of falling objects and their respective weights, then ensure the materials that constitute safety helmets can mitigate the impacts.

**Steve Coppin:** We need education around the potential scenarios. Some workers are undertaking more high-risk activities than others. There are many different types of helmet, but do our supply chain realise what the difference is between them? It is important to know which helmets are right for different tasks and work activities.

MS: Would the MIPS helmet need to be used site wide? There are two trades where safety risk is quite high: scaffolding and steel frame erection. When visiting site during these stages of projects, I wear the higherstandard impact-resistant helmet. All scaffolders in our supply chain wear the higher-impact-resistant industrial helmet from Petzl or an equivalent standard. I wouldn't have a problem turning round to the supply chain and justifying the need to make the change to a higherspecification helmet. But maybe there wouldn't be the same need for finishing trades like decorating.

**WM:** The existing standard for testing safety helmets is EN 397 which dates back half a century and involves a

5kg weight being dropped 1m onto a helmet. What does the panel think of the existing standard and how fit for purpose it is?

SC: When we think about steel erectors and scaffolders, and the risks they are facing, I don't think that standard is sufficient.

JD: I think 50 years is a long time for any standard to survive and a lot has changed in that time. Our priority needs to be preventing things from falling and preventing people from falling. I can see a day where you shouldn't need head protection or any PPE on sites because we have all worked hard to make construction activity intrinsically safe. All of our sites are a lot safer now than they used to be, but we are not there vet so there is still a need for PPE and especially the best head protection.

AH: Everything has to evolve and standards need to evolve too. These new technological solutions should become part of the norm. But in any case, where we set the bar on safety shouldn't just adhere to the standard, but be relevant to the level of risk.

**GM:** Half our head injuries are attributed to falls from height, and clearly the standard doesn't account for that, so an upgrade is no doubt needed.

**DR:** When the standard was written 50 years ago, it was more focused on defining the physical integrity of the product, rather than the level of impact protection for the user. That needs to change.

MS: In 50 years, risk has changed. The most recent debate about helmets has been about the colour and not necessarily the impact resistance.

#### What is MIPS technology?

Swedish company MIPS made its name through cycling safety helmets; now it is taking its helmet technology system to construction. CEO Max Strandwitz explains how the technology works



A MIPS construction helmet

Developed by our team of 20 engineers, the MIPS technology is used by over 100 helmet brands in cycling, motor racing, horse riding and winter sports. We sold five million units in 2019. Now we are introducing our technology to construction.

MIPS, which stands for multi-directional impact protection system, addresses rotational motion. which happens with most head impacts and which the brain is particularly vulnerable to, Compared to linear impacts, the brain is six to seven times more sensitive to rotational force.

The MIPS technology is designed to redirect energy otherwise absorbed by the head, through a low-friction laver inside helmets, MIPS is designed to reduce energies transmitted to the head by redirecting the dangerous rotational forces that are generated during the impact. It allows a 10mm to 15mm movement between the head and the helmet during the critical first five to 10 milliseconds of the impact.

In a construction scenario, if a worker falls or is struck by a steel beam on site, the MIPS-equipped helmet they are wearing allows the helmet to move independently from the head, so the head does

not experience a sudden stop. With a sudden stop, the force needs to go somewhere and the force can be absorbed by the head - which can lead to brain trauma.

We have spent three years researching whether the MIPS technology can work in construction helmets, examining different types of accident leading to head injuries. EU data between 2014 and 2017 shows that severe impacts, which lead to fatalities, are over-represented in construction. Concussion is quite a common injury in the statistics and construction helmets' standard testing today does not represent these accident types, leading to severe injuries.

We then used finite element (FE) models to simulate how the head behaves in different accident scenarios and how the MIPS technology would protect the head. The three most common accident scenarios in construction which cause head injuries are falling objects, being struck by a moving object, and falling from height. In trying to mimic real construction site accidents, we found that MIPS helmet redirected more energy away from the wearer's head than a standard helmet



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The MIPS helmet construction features a low-friction layer that allows the head to move within the helmet, reducing rotational motion to the head

"We need to think about the psychology. I do worry that a lot of people walk onto projects and there is an assumption that they are never going to be involved in an accident"

George Mosey, Laing O'Rourke

**WM:** What does the panel think of the potential of the MIPS technology to reduce head injuries?

**AH:** I can speak from practical experience. I like to mountain bike and so before I throw myself off a mountainside, I am thinking clearly about what sort of protection I am wearing. Having fallen off a few times, I did buy a MIPS helmet. I am convinced it is a level of protection above and beyond what currently exists.

**SC:** I see this helmet as a positive, but one of the questions here will be how our supply chain can not only know about this technology, but how they obtain this helmet and maintain it properly.

**JD:** The MIPS technology seems to work very well in other areas, such as cycling and winter sports. Before now, I don't think all of us in the construction industry were fully aware of how the body and head behaves during a fall. So, it's important that we transfer any lessons from other industries and areas such as sports. and improve the technology we use. It's about continual improvement.

MS: I can't argue with the safety benefits of MIPS. But there is no point in wearing the helmet, spending the money and having that specification, if the chin strap is not done up. I don't think the site workers have that

mentality yet, but this journey has only just begun and I can definitely see a role for the MIPS technology.

**GM:** I think there are certainly applications where the MIPS technology is a huge opportunity. Comfort is a huge issue though, especially in relation to chin straps, as some of our people are wearing safety helmets for up to 10 hours a day. We should do what we can to make these important pieces of kit comfortable to wear, especially the chin strap attachment.

Max Strandwitz: Comfort is also a safety aspect because if the helmet is not comfortable to wear on your head, you will not wear it and the same applies with doing up the chin strap. We have done a lot of tests on that and we do not get any complaints on the comfort.

**Peter Halldin:** The chin strap is extremely important. It is part of the helmet and how we test its ability to protect the wearer. Without it, the helmet will fly away.

Olof Rylander: Weight is related to comfort and the weight of this no-friction layer is only 30 to 50 grammes, so it is not going to add a lot of weight to the helmet itself. One other good thing about the MIPS safety helmet is you don't need any training for your employees to use it.



The angle at which helmets are more likely to be tested (top) contrasted with the angle at which falls are more likely to occur (above)

**GM:** We need to think about the psychology. I do worry that a lot of people walk onto projects and there is an assumption that they are never going to be involved in an accident. They are asked to wear a safety helmet, but they see it as just another generic item of kit. We need to change that perception and ensure our people are risk aware and risk competent.

Perhaps a bespoke helmet is given to each site worker with their name on. The product is to an enhanced standard and there is some pride in wearing it. Yes, we might have to spend a little bit more money, but if we are talking about a product that is going to last five years not one, the money will be recouped.

DR: At CoTrain, we recharge our apprentices for the tools that we give at their induction so they take much more care of them - then give a full refund when they qualify. So the sector should also do that with the safety helmet make the whole thing more personal, so the user really wants to look after it.

**SC:** Hard hats usually have a shelf life of two years. What is the shelf life of this helmet and is there a different storage process compared to a normal helmet?

MaxS: We expect five years to be the minimum lifespan for the MIPS product. MIPS adds around €20 (£18) to the helmet, so it is quite a low premium to pay for having an added safety feature.

#### MIPS partners with Centurion

Shortly after the round table, a partnership between MIPS and British manufacturer **Centurion Safety Products** was announced. Centurion will be launching the UK's first safety helmet with MIPS in Q2 2021.

Nick Hurt, CEO of Centurion Safety Products, said: "We are constantly looking at how our products not only meet relevant safety standards but exceed them.

"We are therefore excited to become the first occupational safety brand to incorporate the MIPS cradle rotational impact protection system into our helmets. "The MIPS system will be featured in a version of our Nexus HeightMaster Safety Helmet, which is already a stand-out product thanks to its advanced safety standards."



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## Concrete



### PRECAST DELIVERS DESPITE THE PANDEMIC

COVID-19 RESTRICTIONS DID NOT STOP PRECAST CONCRETE SPECIALISTS FROM KEEPING PROJECTS ON PROGRAMME – AND THE SECTOR IS NOW LOOKING AHEAD WITH OPTIMISM. **CM** REPORTS

**Above:** Thorp's 'weave-design' panels on HMRC's new Salford hub

#### When covid-19 hit the UK last March,

the precast concrete industry was better prepared than most. Controlled factory conditions and efficient site processes meant the sector could adapt quite easily to lockdown restrictions.

Thorp Precast has operated at 100% capacity at its 8ha site in north Staffordshire. While many construction sites, particularly in urban locations, can be congested workplaces, the opposite is the case for precast manufacturing plants.

"Physical distancing is relatively easy to achieve in the factory, with plenty of spacing between each active working mould over several casting sheds," explains Steve Morgan, technical sales manager.

"Physical distancing is relatively easy to achieve in the factory, with plenty of spacing between each active working mould over several casting sheds"

Steve Morgan, Thorp Precast

When the pandemic struck, Thorp senior management consulted with all operatives on the coronavirus dangers and new guidelines for safe working. "All our staff opted to continue working in line with the new measures, which has resulted in no lost productivity and no cases of covid-19," explains Morgan.

There have been a few changes to operating procedures.

"We have one person working per mould, reduced working hours and fewer people working in concrete pouring teams," explains Morgan.

"We also have bubbles for workers when travelling to and from work in the same vehicle. They clock in at the factory gate and not on a machine, and strict one-way systems have been introduced. We also restrict access to the plant much more, with everything carefully recorded and booked in."

Away from the factory, Thorp workers have to follow social distancing requirements on delivery to site and installation of the precast units.

"They are small teams, but they all use relevant PPE, particularly if working face to face, and install panels with operatives on either side of a precast panel, ensuring that social distancing is maintained," says Morgan.

"A huge benefit of only needing four to five men on site at any one time to maintain maximum productivity is that we can install a conservative average of five to six panels per day on

## 100%

operated at 100% capacity since the first lockdown started

our projects, regardless of the wider restrictions of covid-19," he adds.

This meant programmes have been maintained across Thorp's projects, such as the new HM Revenue & Customs office at 3 New Bailey in Salford, where Thorp is working with main contractor Bowmer + Kirkland, delivering brick-faced precast panels in a 'basket and twill weave' design.

Another precast specialist, Sterling Services, won its record contract for the City of London Academy in Hackney and the adjacent Britannia Leisure Centre - just before covid-19 struck. Morgan Sindall is main contractor and Sterling is designing, manufacturing and installing Portland and brick-faced panels.

"Naturally we were anxious when the pandemic hit; would we be able to continue manufacturing?" recalls Sterling managing director Chris Bell. "Would we suffer from staff shortages? Would sites remain open and would we be able to access materials?

"However, due to our large open spaces and the nature of our processes it was feasible to continue production

Right: Creagh's Rapidres system is being used at **Chatham Waters** 

Below: Work on HMP Five Elms in Wellingborough, where 15,000 precast components are being installed by Kier, has continued during the pandemic

Below right: One of Sterling's facade panels bearing the City of London Academy logo is craned into place

at the same rate whilst maintaining social distancing and 'covid-safe' health and safety measures."

One crucial manufacturing issue for Sterling to consider was availability of materials.

"To ensure that we had the capacity to continue manufacturing, we purchased many materials in big bulk loads to insure against any future closures of supplier businesses," says Bell. "This was a foresight we came to be glad of when merchants, timber mills and sanitary suppliers started to close or run out of stock."

Work on the City of London Academy to install the facade panels, comprising large double-window, storey-height units with integral bricks, copings and cills, commenced on programme last May. One of the key stones at the front of the building contains the City of London emblem which was cast into the precast unit from a rubber mould. This unit was installed in early June. Sterling's work on the Hackney scheme is continuing into 2021.

Creagh Concrete has also stayed busy since covid-19 arrived and





managing director Noel Culbert believes this could be a watershed moment for the precast sector.

"Times of crisis can be both threatening and liberating and we see this as an opportunity," he says. "The twin challenges of climate change and the pandemic are an opportunity to transform our thinking."

He sees it as "inevitable" that offsite manufacturing will be adopted more extensively, and forecasts growth in Creagh's Rapidres system, the company's fast-track crosswall build system commonly used in apartments, student accommodation, hotels and social housing.

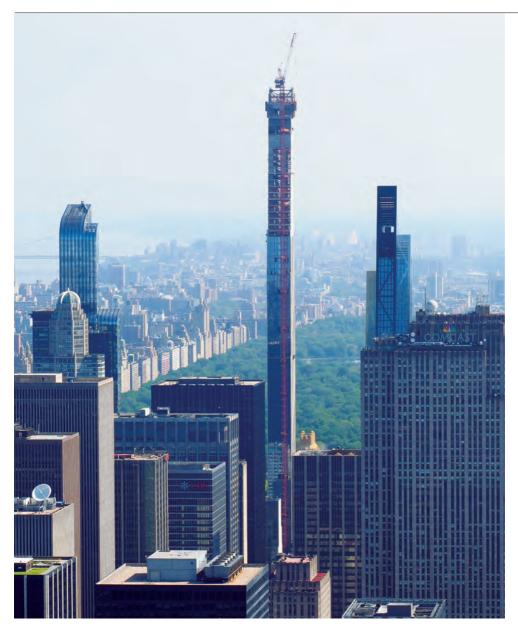
The benefits of Rapidres were demonstrated during the first lockdown when Creagh was able to deliver programme savings across many projects, says Culbert.

"A safe working environment was enhanced, with less people on site meaning social distancing was achievable," he says.

These projects included the Chatham Waters development for Russell WBHO, a two-block, sevenstorey residential development in Kent of 193 apartments. The frame comprises structural walls and solid hollowcore flooring, with a facade of white etched precast concrete with bronze panels and balconies.

Creagh's ambition is to build 20,000 apartments in the next decade, says Culbert, with further investment in its manufacturing capacity.





Left: 111 West 57th Street (middle tower) overlooks Central Park

#### Last year, Taylor Grange Developments

announced that it had obtained planning permission for 211 Broad Street in central Birmingham. What makes this building special is its dimensions. Were it to be built, it would be the UK's first super-slender skyscraper (see box, p29).

Though plans to start construction on the Birmingham site are paused while the country wrestles with covid-19, across the pond in New York a record-breaking example of this genre is nearing completion: the world's most slender tower, 111 West 57th Street (see box, p30).

It takes a particular set of circumstances to make these freakishly skinny buildings viable. They come with their own costly engineering and design challenges, which means that only a handful of cities boast them.

#### What is slender?

The slenderness of a building is expressed as the ratio of its width to its height. "Any building with a slenderness ratio greater than 1:10 is considered slender, with very slender buildings having ratios of 12 to 15 and even more," explains Giorgio Bianchi, a director at engineer Robert Bird.

Birmingham's 211 Broad Street would have a slenderness ratio of 1:12. Manhattan's 111 West 57th Street's ratio is a waif-like 1:24.

The reason to construct such unusual buildings comes down to one thing: land values. When the market price of apartments is high enough

## GOING SUPER SKINNY WITH CONCRETE

NEW YORK, HONG KONG, MELBOURNE AND NOW...
BIRMINGHAM? KRISTINA SMITH EXPLORES THE
TECHNOLOGY BEHIND THE SUPER-SLENDER SKYSCRAPER

"In addition to high strength, these concretes also have a high modulus of elasticity which increases the stiffness of the concrete elements"

Kamran Moazami, WSP

to pay for the complexity, developers and investors are interested. Superslenders are always residential, usually with one apartment per floor: commercial buildings would require bigger cores, eating up too much of the precious floor space.

Hong Kong was the first city to construct slender towers in the 1970s. Today it boasts multiple superslender buildings and can claim the highest concentration of such structures in the world. Until 111 West 57th Street took its crown, Highcliff in Hong Kong, completed in 2003, was the world's most slender at 1:20.

In New York, a crop of superslender towers has sprung up in the city's Midtown. A quirk in development rights allows New York developers to reach for the skies by combining air rights from neighbouring plots.

After the 2008 global financial downturn, super-rich investors wanted to put their money into these luxurious residential properties with views across Central Park and the city. The sales website for 111 West 57th Street is available in Spanish, German, Russian, Chinese and Arabic.

Aside from Hong Kong and New York, Melbourne has the beginnings of a super-slender collection. Phoenix Apartments, for which Robert Bird was the structural engineer, completed in 2014, has a slenderness ratio of 13.5 to 1 although it is just 88.5m high. Collins House, completed in 2019, is 190m tall with a slenderness ratio of 16.5 to 1.

#### Fooling the wind

Super-slender skyscrapers invariably have concrete frames for several reasons: increased stiffness. improved acoustic properties and the ability to provide longer columnfree spans; owners of luxury highrise apartments don't want their expensive views obstructed.

For super-slender towers it is common to use high-strength concrete, usually between 60MPa and 100MPa compressive strength, sometimes even higher, allowing the structural members to be slimmer. High-strength concrete has a lower water-to-cement ratio, containing pozzolans such as fly ash or silica fume. Advances in admixtures - superplasticizers and retarders - which allow the mixes to remain workable and pumpable with low water content, have enabled the rise in strength.

"In addition to high strength, these concretes also have a high modulus of elasticity which increases the stiffness of the concrete elements," explains WSP's building and property managing director Kamran Moazami.

Wind is the biggest challenge for designers. When air hits the building, vortices are shed on alternate side of the building, creating a buffeting effect known as vortex shedding.

The top of a skyscraper can move by several hundred millimetres, says Bianchi: "This is perfectly acceptable as long as the accelerations generated by these movements are

#### **Super-slender in Brum**

211 Broad Street faces tight site challenges



the first and second floor and connections to the core.

Plans for a super-slender tower at 211 Broad Street in Birmingham were largely down to the size of the plot, says Lisa Deering, director at Glancy Nicholls Architects, which designed the building. "Further to this, it is located

on one of the busiest and most dynamic streets in Birmingham, opposite a key junction and the new Metro line," says Deering. "Located in an area designated for highrise developments, the site provided a key opportunity to design a landmark building unlike anything else within the city."

Unlike its much taller cousins in New York, at 116.5m tall, 211 Broad Street doesn't require a damper or voids to reduce the wind load, although the prevailing wind on the longer elevations will cause the building to twist. To resist these forces, engineer Design2e has designed a three-storey-high concrete 'tube', supported on continuous pile walls down each long side and braced by stiffened floor plates at

"The very torsional stiff tube spreads the larger very significant overturning base moment, which is characteristic of tall buildings, relatively evenly along the complete length of the building," says Design2e managing director Dave Tyson. "The overturning base moment is resisted with a push-pull action shared across the piled foundations."

**Should construction** go ahead - United Living is understood to be the contractor - the challenges will be all those that a tight city site offers and then some. One possibility that Glancy Nicholls has investigated is the use of a monorail system for installing the unitised facade.

"This would move up the building as floor plates were completed, providing a quick, effective and safe method for installing the facade with no impact on the neighbouring properties," says Deering.

330m

The Magic, a 330m-high tower by architect DeciBel has been designed with a slenderness ratio of 26.2 to 1



Above: The 60-storey Magic Tower proposed by the Royal Society of Victoria in Melbourne

"Evaluation of wind-induced accelerations is normally carried out with support from a specialist wind consultant who performs a wind tunnel test"

Giorgio Bianchi, Robert Bird

below the threshold when humans may start to feel motion sickness." ISO standards set acceleration criteria for wind speeds that might happen once a year, and the Council on Tall Buildings and Urban Habitat (CTBUH) makes recommendations for a 10-year peak.

Structural rigidity alone is not enough to reduce acceleration in the highest floors. Facades may be specially designed with rounded, chamfered or notched corners; some floors may be left open for the wind to pass through; and huge masses or dampers may be installed at the top of the building to slow its acceleration.

Take the 426m-tall 432 Park Avenue in New York, designed by WSP, with a slenderness ratio of 1:15. Its concrete core is linked to a tubular outer frame at five points, with open floors at these points. Additionally, it has a double tuned mass damper at its upper end to reduce wind-induced acceleration.

Getting the combination of voids, dampers and streamlining is no easy matter. "The evaluation of wind-induced accelerations is normally carried out with the support from a specialist wind consultant who performs a wind tunnel test," explains Bianchi.

#### Super-slender horizons

Though covid-19 may have temporarily reversed the population flow from rural to urban environments, we may yet see more super-slender towers in cities where land values are high enough. But don't expect them to get much more slender, says WSP's Moazami:

"The slenderness ratio of 1 to 24 is towards the upper limit of what can be achieved. That takes into account the laws of physics, but also constructability and the economics of the building," he says.

Melbourne is challenging this statement. A 2018 design competition produced The Magic, a 330m high tower by architect DeciBel with a slenderness ratio of 26.2 to 1. However, for now, The Magic remains an aspiration.

In Birmingham, it is the economics for 211 Broad Street which are challenging. Designed to be an aparthotel, it would require high and immediate occupancy rates – which can't be guaranteed right now. "We are waiting for the market," says Lisa Deering, director at the scheme's architect Glancy Nicholls of the start-on-site date.

Birmingham – and the UK – may have to wait a little longer for a super-slender debut.

## The world's most slender

111 West 57th Street towers over NYC's Billionaire's Row

Rising up like a long exclamation mark to the south of Central Park in New York is 111 West 57th Street. Due to be completed this year, the latest addition to Manhattan's skyline is the world's most slender tower with a width-to-height ratio of 1:24 and a height of 437.5m.

Rising from the site of the historic Steinway Building, which developer JDS Development Group is renovating as part of the project, it sits on the centreline of the park in an area dubbed 'Billionaire's Row' for good reason: of 60 luxury apartments, just nine remained for sale as CM went to press, ranging from \$16.5m to \$66m.

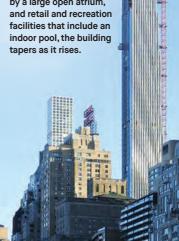
To provide unrestricted views for its high-rolling residents, and for structural stiffness, engineer WSP designed two 1m-thick shear walls along its east and west sides, made from 100MPa reinforced concrete, with reinforcement and linked to the building's core. An 800-tonne tuned mass damper near the tower's tip will

left as voids for the wind to pass through. Architect SHoP designed this record-breaker, clad in bronze and terracotta, a nod to the Steinway Hall's art deco design. With the lower floors taken up by a large open atrium, and retail and recreation facilities that include an indoor pool, the building

limit movement due to the wind, and four floors

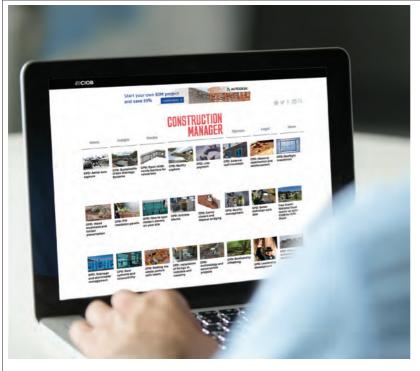
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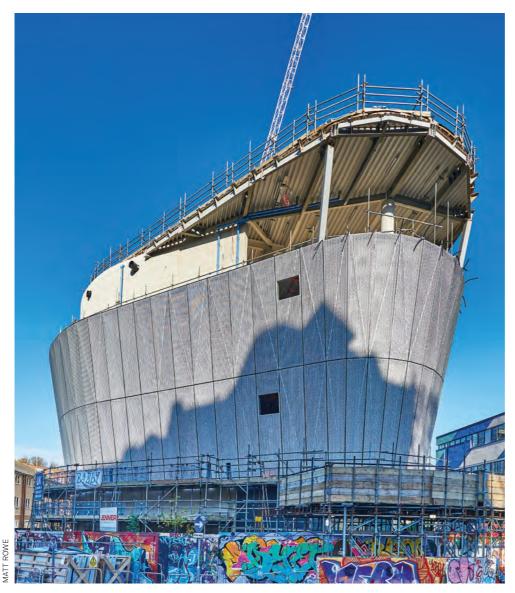
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Below: The fourstorey building is a parallelogram on plan, splaying outwards then back in at the top



**CURVY CONCRETE FORMS** FOLKESTONE'S SKATEPARK

KENT CONTRACTOR JENNER IS WORKING ON A UNIQUE SKATEPARK IN COASTAL TOWN FOLKESTONE THAT WILL FEATURE THE WORLD'S FIRST SUSPENDED CONCRETE SKATE BOWLS. SITE MANAGER NIGEL GRIFFITHS EXPLAINS THE TECHNICAL CHALLENGES TO NEIL GERRARD

"On a traditional slab we would probably pour continuously from start to finish. Because we were spraying the concrete, we marked the bowls into sections and completed one section per day" Nigel Griffiths, Jenner

The idea of skateboarding may terrify Nigel Griffiths, site manager at Kent-based contractor Jenner. but he is a self-professed concrete lover, which makes him the ideal person to take charge of F51's construction; it is believed to be the world's first multi-storey skatepark and the first to feature suspended concrete skate bowls.

F51 is the brainchild of local philanthropist Roger De Haan, former chief executive of Folkestone-based insurance group Saga, who has poured millions of pounds into the regeneration of the town.

Originally destined to become a multi-storey car park, the concept for the site on the corner of Tontine Street and Dover Street gradually morphed into a plan for a skatepark that is being funded by the Roger De Haan Charitable Trust and will be managed by the local Shepway Sports Trust.

Work on the skatepark, a short walk from Folkestone Harbour, where De Haan is backing the construction of 1,000 seafront homes (the first phase of which is also being built by Jenner), began in March 2018.

The four-storey building is an unusual shape, a parallelogram on plan, with the upper floors splaying outwards and then back in at the top. It is a concrete frame up to the first floor, then a steel and concrete composite above.

The glass-wrapped ground floor will feature an unheated 'urban'

## 1.500

In total, 1,500 cu m of concrete has been used on the project, including 200 cu m of the specialist spray mix

community cafe and a boxing gym, while the second and third floors will contain plywood skating bowls, ramps suitable for BMX and a climbing wall.

The suspended concrete skate bowls are on the first floor, their bases clearly visible from below, with one swooping above the main entrance. The undulating surfaces will be left exposed, creating a cave-like entrance hall, supported by curving concrete columns.

"The whole project has been planned around the concrete skate bowls," Griffiths says. "I have built shaped concrete bowls similar to this in the past because I have done 'rapids' in leisure centres - artificial river channels for people to slide down - but never suspended like this."

A 3D digital model helped the suspended bowls' installation. Specialist firm Cordek, which produces forms for precast concrete, manufactured polystyrene moulds that acted as the falsework for the bowls. They were delivered to site on eight separate articulated lorries and fitted together like a jigsaw.

"We used the 3D model to work out the positions of the falsework, which had to be installed at three different levels because of the different levels of the soffits," Griffiths says.

More complex was the rebar because every bar had to be positioned individually. It took six weeks to design

#### **Project factfile**

Client: Roger De Haan **Charitable Trust** Main contractor: Jenner Architect: Hollaway Value: £10m Programme: March 2018: **Construction starts** Summer 2021: Completion due Key subcontractors: Groundworks, concrete frame and structural concrete bowls: Darby Structural steel: Metalfab Engineering Facade manufacturer: Imar Facade installation: Timber skate bowls: Cambian Climbing wall: King Kong Concrete skate surface: Maverick Curtain walling and facade windows: **Sealtite Windows Electrical: PA Grant Electrical** Mechanical: **HOB Mechanical** 

Top right: Each bar of the rebar had to be positioned individually

**Below:** Visualisation of the finished concrete skate bowls





and schedule and another three to four weeks to fix into place. Once it had been installed, the concrete was sprayed on to the moulds.

"It was a P45 spray mix - basically cement and sand with a few pebbles thrown in which has to go through a spray gun and nozzle," Griffiths explains. "It is a lot drier and stays in place well, so we only needed a single-sided shutter; we didn't have to shutter the inside of the bowls.

"On a traditional slab we would probably pour continuously from start to finish. Because we were spraying the concrete, we marked the bowls into sections and completed one section per day," says Griffiths.

The concrete spraying took two weeks, with the bowls' 500mm-thick structural concrete overlaid with a 150mm layer of concrete topping on top, employing the same mix.

"We decided that this was the most economical approach; as the structural concrete was not required to be finished to such a high standard, larger areas could be completed more quickly," explains Griffiths.

"The structural bowl also gave the finishing concrete gang something to fix their levelling rails to, as a tighter tolerance for the topping was required. Standard spray concrete is usually laid to a tolerance of +/- 25mm and the topping needed to be +/- 2mm for skating on."

The structural concrete was finished with a rough trail to ensure that there was a good key for the topping. The flat areas of the topping were then finished with a power float, while a hand trail finish was applied to the slopes and radiuses of the skate ramps.

In total, 1,500 cu m of concrete has been used on the project, including 200 cu m of the specialist spray mix, plus 300 tonnes of reinforcement bar.

The plywood skating bowls were manufactured in a factory in Horsham in West Sussex before being delivered to site, lifted in and positioned. "They look like formwork, but you don't put any concrete on them, obviously," says Griffiths.

While the skating bowls' construction has progressed smoothly, the facade proved more challenging.

"The panels were lifted onto the building with a tower crane, but because the lower panels are under the overhang of the floors above, they required the use of an offset lifting beam"

**Nigel Griffiths, Jenner** 

Originally, the plan had been for the curtain wall cassette system, manufactured by Spanish firm Imar. to be made up of aluminium mesh inside and out.

But such a design would have driven rain into the structure. Rainwater in the concrete skate bowls would result in them having to be closed and the Roger De Haan Charitable Partnership decided that too many days' skating would be lost. So instead, the aluminium facade will be watertight. However, this meant increasing the weight of the facade panels, which made fixing them on the structure more complicated.

Griffiths explains: "Whereas normally you would stack your cladding from the bottom up with a

#### **Construction manager CV: Nigel Griffiths**



**Nigel Griffiths** has spent the last six years working for Jenner. He started his career at Wiltshier Construction, which later

became Ballast Wiltshier, where he trained for a Higher National Certificate (HNC). He then moved on to Denne Construction, which later became Bouyques, prior to joining Jenner.

Griffiths is a leisure specialist, having previously built Horsham Leisure Centre and Buckmore Park kart track in Kent.



Above: Watertight aluminium panels on the facade

#### Below right:

The bases of the suspended bowls are visible from below

few expansion joints, each panel has to hang from the floor above on the panel below, using a sliding spigot junction.

"The facade panels on the top level are fixed to the roof via a pin connection but they do not hang vertically. Instead, they slope out by 10 degrees, then slope back in at the same angle, and sit over the spigots on the panels below."

"These panels have two spigots coming out of the top of them, which are used to restrain the panel above horizontally in both directions, but offer no vertical support."

Lifting the panels into position has also required some careful thought by Jenner's team.

"The panels were lifted onto the building with a tower crane, but because the lower panels are under the overhang of the floors above, they required the use of an offset lifting beam," explains Griffiths.

The panels above, which slope out and then back in, have an uneven load, so Jenner needed to lift these panels in two places to ensure they engaged over the spigots at the correct angle.

Griffiths says: "We only have 2mm tolerance between the 'cut out' in the bottom of the panel and the spigot which fits into it. If the panel is not at the correct angle, the aluminium components lock together and stop the panel dropping into position. As every panel is different, the lifting chains had to be a different length for each one."

The facade is now complete on two of the floors. However, there is a delay on the panels that run from the third floor to the roof, due to covid-19 restrictions in Spain which resulted in Imar's factory shutting down.

F51 is now scheduled to complete in summer 2021. Griffiths says he might try out the climbing wall, although he draws the line at dropping into any of the bowls on a skateboard.



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### ASPHALT PAVING: CHALLENGES AND INNOVATIONS

THIS CPD, IN PARTNERSHIP WITH TOPCON POSITIONING GB, DISCUSSES THE INTRICACIES AND CHALLENGES OF ASPHALT PAVING PROJECTS, AND HOW TECHNICAL INNOVATIONS ARE CHANGING THE SECTOR

Asphalt paving projects are an essential part of road maintenance and are crucial for keeping infrastructure running smoothly.

The process involves a considerable amount of planning and designing, with issues such as environment, traffic, terrain properties, utility works, nearby residents and



maintenance costs all important considerations for new road projects.

For ongoing maintenance projects, conditions of the existing roads must also be assessed, as there can be huge repercussions if the work is inaccurate - including starting the entirety of the work over again which can double a project's costs.

Once the initial planning and design work has taken place, excavation machinery and tracked dozers are used to move and mount a variety of materials across the entire project to give it its shape. Once completed, the area must be graded to ensure a level base.

As an industry that remains traditional in its methods, this involves a combination of manual labour and machinery, such as a paver, which is crucial in the roadbuilding process since it not only lays the asphalt but also the large stonework foundation. This is then compacted to allow the laying of the hot asphalt sub-base, base, binder and finally the surface course layer that is driven on.

Next, the asphalt is tipped into the paver ready for the hot paving process to begin. Traditionally, to do this, an operator drives the paving machine while two screed operators follow at the back of the machine on either side, dipping a metal rod into the asphalt and checking the depth against a ruler to ensure that the correct thickness is being laid while adjusting the levels of asphalt accordingly if it is incorrect.

A further two labourers are usually also on site, to banksman the wagons to and away from the paver, and to dig out the asphalt that has been laid on top of the plates covering manholes once the paver has passed over these, as they need to be exposed.

"It is critical that the rolling temperature is correct, and that the paver and roller are working collaboratively to avoid future road failure"

### Challenges when paving

The paving process is not without its challenges. The hot mix asphalt. which is usually a bitumen compound, not only needs to be laid at the correct height - it also to be the correct mixture of compounds.

In addition, since the material needs to be the right temperature, it also needs to arrive on time, since delays can cause the material to cool in transit. If it is too cold, the bitumen is not as malleable as it should be and starts to go hard - meaning it does not bond correctly when laid.

This is called thermal segregation and can result in water entering inside the road surface, freezing and then cracking to create potholes, which then worsen when cars drive over them. To avoid this, the paving material must be laid at the correct temperature as well as the correct level.

Compacting the asphalt on the road once the material has been laid is also an important part of the process, as the material also needs to be rolled at the correct temperature. To guarantee the right temperature, compaction systems feature an in-built temperature sensor. However, if the paver ahead is paving too fast, by the time the roller with the compaction system catches up to the material, it is unable to bond together correctly.

That said, if the material is rolled at too hot a temperature, this also negatively impacts compaction as the stones in the material get pushed below the surface, resulting in less texture and skid resistance. It is critical that the rolling temperature is correct, and that the paver and roller are working collaboratively to avoid future road failure.

### Testing the accuracy of paving

After the paving has been laid, tests must be carried out to check the accuracy of the project. The rolling straightedge test, for example, which consists of a straightedge of a fixed distance mounted on multiple wheels with a censor at the centre, is used to measure deflections in the road.

Prior to the paving being laid, accuracy requirements will be set out - usually specifying that over a 3m length, inaccuracies can be no more than 6mm. If the paving contains a depression or peak in the material that has been laid, the rolling straightedge test equipment

Errors picked up by the rolling straightedge test can be one of the largest causes of paving job failures and need to be corrected so that

Opposite: Asphalt paving requires work access to will notify the operator. precision data

Below: The RD-M1

data on the existing

scanner collects

road surface





drivers do not feel a bump in the road on their journeys.

To try to eliminate the risk of these bumps, paver operators can use 2D paving systems like Topcon's P-32. Providing precise slope and elevation information to the screw man through a high-contract control box, Topcon's P-32 paving system ensures operators have all the information necessary to guarantee accurate slope and material thickness.

### Benefits of innovations in paving

The paving industry remains traditional in its methods and increasing the adoption of innovations on site remains a challenge. However, when embraced, technology can provide operators

It is critical that the rolling temperature is correct to avoid future road failure and contractors with long-term reassurance of their works' precision and can offer protection if roads get damaged in the future.

This is because, when roads break down, if operators have the paving and rolling data from their machines to confirm their project accuracy, they can prove that they are not liable for any failings of the road in the future and avoid paying any penalties or completing any rework.

### The future of paving

The future of paving lies in the adoption of technology. By recognising the benefits of innovation, there is now a huge opportunity for the industry to transform paving workflows and increase project productivity and

accuracy by investing the latest road resurfacing solutions.

One such solution that is helping to maximise productivity and increase accuracy on paving projects is Topcon's SmoothRide technology, which saves time and lowers project costs.

Beginning with the design stage of the process, the solution uses an RD-M1 scanner, which is placed on a vehicle and driven across the existing surface at around 55mph, to collect data on the millions of points on the surface and provide a complete and accurate scan of the area.

Next, using Topcon's MAGNET Office computer software, operators can find the imperfections in the data collected by the scan – such as the depressions in the road where trucks sit, and use this



"Technology has the ability to revolutionise paving and significantly increase productivity and accuracy on projects"

information to design the changes that need to be made. These can vary from different cambers, slopes and angles to identifying where water runs off a surface. Once these changes have been identified, they can be input directly into the planer – which can then mill out and plane to the exact level and time needed.

Without this technology, the entire surface would be planed and basic equipment, like a trundle wheel, would be used to take measurements, before the different levels required for the road are sprayed onto the surface to notify the paver.

Not only is this time-consuming, it is also less accurate and efficient, as the operator doing the paving would have to keep adjusting the levels for the different material heights.

Materials can also compact differently, potentially causing issues as there are different levels of material being laid. With SmoothRide, however, the planer changes all of the levels itself using data – automatically adjusting to

Top right: Topcon's SmoothRide planer adjusts to different levels automatically Below: The Topcon SmoothRide control screen displays data to the operative



different heights so that the pavers can simply lay one set amount of material across the entire width and distance without needing to do any measurements.

As well as saving time, this ensures operators know how much material is needed for a project in advance, reducing waste and costs, and minimising the likelihood of rework.

For projects like airport runways or motorways, where time is tight and resurfacing needs to be done as quickly as possible, investing in SmoothRide can also have significant financial benefits, since the paving can be carried out at driving speed – eliminating the need for costly road closures.

### **Embracing technology**

Technology has the ability to revolutionise paving and significantly increase productivity and accuracy on projects. However, the challenge for the industry is convincing operators and contractors to embrace this onsite innovation.

When younger generations work on projects, there is a slight shift in favour of uptake of the latest innovations. Yet, still there are some operators reluctant to embrace even the easiest-to-use solutions, like SmoothRide, that could transform their efficiency for the better – reducing costs, saving time and providing reassurance against any potential future problems.

It will be down to leading manufacturers in the industry to highlight the benefits that new technology can bring to paving, to encourage operators and contractors to embrace innovation.

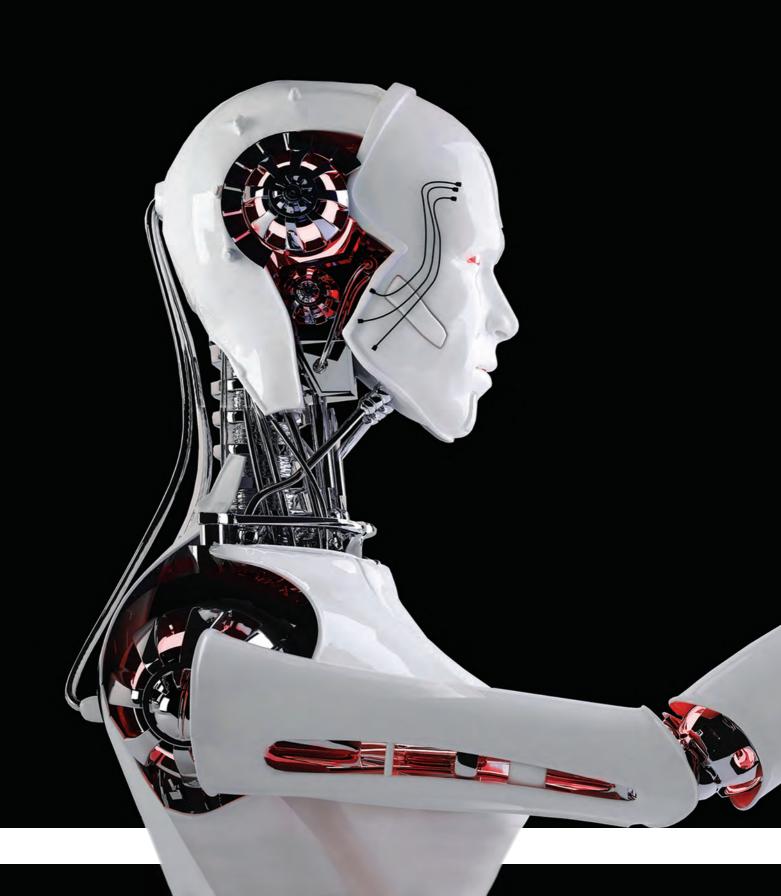
For more information about Topcon's paving technology, visit: www.topconpositioning.com/gb/paving-milling-and-compaction.



### **CPD Questions**

- 1: Which of the below does not need to be considered for new road projects?
- a) Local residents' hobbies
- b) Terrain properties
- c) Utility works
- 2: Which of the below is not a factor when laying the paving material?
- a) The temperature of the material
- b) The smell of the material
- c) The compounds within the material
- 3: Which of the below is not a benefit of Topcon's SmoothRide solution?
- a) Increases accuracy by automatically adjusting the levels of material needed
- b) Reduces costs
- c) Makes the work take longer
- 4: Which of the below is not a key benefit to embracing innovation in paving?
- a) The data collected by machinery can provide reassurance in case of any future issues
- b) It helps to improve accuracy
- c) It increases the chance for human error
- 5: What is the impact of thermal segregation in paving?
- a) It can cause cracking in the material which leads to potholes
   b) It makes the road hot so cars have to drive faster
- c) It makes the road slippery, causing crashes

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





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How digital technologies are creating efficiencies and productivity for firms across the supply chain from designers to contractors and product manufacturers.





# **BIM & Digital**



# **COVID-19 SIGNALS NEED FOR** DIGITAL TRANSFORMATION

AS THE COVID-19 PANDEMIC CONTINUES TO IMPACT BUSINESSES IN EVERY SECTOR. THIS ARTICLE IN ASSOCIATION WITH MONDAY.COM EXAMINES WHY THE NEED FOR CONSTRUCTION TO RETHINK HOW IT MANAGES PROJECTS IS STRONGER THAN EVER

# The covid-19 pandemic has forced

the engineering and construction industry to rethink how it manages and tracks projects. Despite the world's drastic shift to digital solutions, construction is still one of the world's least digitised sectors.

Productivity in the construction industry has been steadily declining over the last 50 years, and the pandemic has only made it more apparent how far behind some companies are lagging.

Manual paper-based processes run rampant in the industry, making it difficult for teams in the office and on site to operate and exchange information at maximum speed and efficiency, especially now with social distancing regulations and a reduced workforce in the field.

Having everything stored on one system online gives field workers the ability to track in real time changes made elsewhere

While activities in most work sectors around the world have continued to be under varying degrees of lockdown, the construction industry, for the most part, has been allowed to continue to operate under strict health and safety protocols.

Looking beyond the pandemic, with an ever-rising number and complexity of projects on the go, constructionrelated companies will continue to be at risk of not keeping to strict schedules and budgets due in part to outmoded workflow practices and processes.

Solving these construction challenges is now a critical necessity. The industry must embrace new workflow best practices and online technology to survive and thrive in a covid world and beyond.

## Meeting demands to execute faster

With a gradual shift of the construction industry as a whole moving to adopt state-of-the-art digital solutions to manage and track projects and processes, developers, construction companies, suppliers and trades are all increasingly under pressure to evolve and adapt or die.

Soon, there will come the point where companies that resist change and in adopting new industrywide project management norms will no longer be able to keep up and compete.

To stay competitive, construction companies must gain better visibility into their projects from ideation through to execution. Having greater oversight requires all project information to live in one central place so leaders can track progress and remove bottlenecks at any stage to keep things moving forward.

There is also a need to increase efficiency, with many construction companies looking into automation tools for repetitive tasks. With automation, companies can reduce human error, avoid missing deadlines, streamline





processes and keep everyone in the loop every step of the way.

The management team can also configure automated alerts to receive notifications when a task or process is at risk of running behind schedule or over budget, allowing leadership to make informed decisions faster and keep everything on track.

# Maintaining deep coordination with all key stakeholders

It is becoming increasingly difficult for construction teams to meet their strict standards and specifications without a proper modern construction project management solution.

Today, a digital platform solution is needed to ensure constant alignment between all project stakeholders. The involvement of multiple contractors and subcontractors, designers, supply chain managers, architects and field workers creates many intricacies to manage. Any misalignment can trigger massive disruption and costly delays.

Even non-complex construction projects require near-perfect coordination, communication and planning synergies because of the many different tasks dependent on others to complete a successful project. Without synchronisation, undesirable bottlenecks can result, slowing down scheduled progress, impacting productivity and quality control, and increasing cost overruns.

# Keeping everyone on the same page with real-time updates

With a heavy reliance on paper and so many iterations, it is very easy for workers in the field to follow outdated plans and schedules inadvertently.

To avoid unnecessary delays and wasted efforts, everyone should have access to the most current information, drawings and schedules anytime and from anywhere. Having



everything stored and managed in one system online gives field workers the ability to look up what is current on their mobile phone and track in real time any changes that are made elsewhere with each iteration.

## Bridging the gap between field and office workers

Tracking all the moving pieces and details of every project can be extremely challenging.

Imagine that specific parts arrive at your site, but they are not up to the contractor's standards. Without an efficient and timely digital system in place to quickly let the supplier know it needs to replace the parts, there could be a long delay before you get the replacements and can proceed. This issue can end up jeopardising the timeline and creating higher labour and equipment costs.

In addition to communicating across teams, it is also essential to be able to keep clients updated. Suppose clients don't receive real-time information on the ground or have the opportunity to provide immediate input and feedback. In that case, situations can arise that could lead to a hostile dispute or even litigation over miscommunication and error.

Clear and instant communication is essential every step of the way. It is critical during the planning stage when all stakeholders should be first aligning on the objectives, conditions and constraints of a project. It is also crucial through the subsequent development phases when each team needs to report on its progress, share updates, answer questions and resolve bottlenecks.

When centralising communications online via a workflow platform, you eliminate needing to sift through long email threads and floods of instant messages to stay abreast of daily updates or repeat the same information in separate conversations.

"Today, a digital platform solution is needed to ensure constant alignment between all project stakeholders"

# Finding the right construction project management solution With so many options, choosing

the right online platform for your business can feel overwhelming.

Many companies end up discovering that traditional construction project management software is often either overly complicated or limited in certain critical capabilities. And adopting a platform that doesn't quite fit your team's needs could slow, stall or even derail your projects.

Monday.com Work OS is a flexible platform offering a powerful solution tailored to construction businesses of all sizes. The cloud-based platform is easy to use and offers hundreds of ready-made templates for construction including project management, project tracking, schedules, general contractor and subcontractor management, and more.

There is also a mobile app version suitable for field workers offering instant access to all the latest project information they need and makes connecting with the team back in the office easy. Communication and coordination among all stakeholders is seamless with Monday.com Work OS, making it easier for teams to stay on schedule and within budget.

For a clear, competitive advantage over your competition, it is time to consider making the switch to a paperless system that fits your team's needs and will set your construction business up for success now, and in the long run.



# **CONSTRUCTION WORKFORCE TRAINING** ENTERS THE DIGITAL AGE

AS CONSTRUCTION COMPANIES CONTINUE TO HARNESS NEW TECHNOLOGY SOLUTIONS TO OVERCOME THE CHALLENGES OF THE COVID-19 PANDEMIC, THIS ARTICLE IN ASSOCIATION WITH SOPRA STERIA EXPLORES HOW ITS NEW COMPETENCY TRAINING MARKETPLACE (CTM) SOLUTION HELPS TO DIGITALISE WORKFORCE TRAINING RECORDS

## The past 12 months has been a

transformative year for digitalisation, and the pandemic has led us to different ways of working. Some 86% of people working from home in April this year were doing so due to the pandemic and there were 115 million active users worldwide on Microsoft Teams as of November 2020, compared to just 20 million in November 2019.

Over the last two years, construction has been taking steady strides towards a more digital future. Last year saw the construction of the first ever robot-built house in Yorkshire, while hundreds of industry events in 2020 took place online via webinars and applications like Zoom.



At the end of 2020 we saw the release of The Construction Playbook - 14 key policies for how the government should assess, procure and deliver public works, projects and programmes. The release of this game-changing document at the 11th hour is a clear indication of where the industry is headed, with its intention to allow an 'open digital marketplace for building parts'.

Offsite advocate Jaimie Johnston, director at Bryden Wood, says: "Modern methods of construction underpin the playbook." Johnston comments that "those resistant to modernisation should be left by the wayside, but for those who can see the potential and are willing to adapt, the opportunity is enormous".

His opinion exemplifies how the 'new normal' includes a technologydriven future, and digitalisation is certainly the theme of the moment.

Meanwhile, the industry is witnessing increasingly complex workforce compliance requirements. With huge projects such as the ongoing construction of the HS2 rail line and Hinkley Point C power plant,

there is no doubt the industry needs a smarter way of managing workforce competencies to ensure onsite safety and keep projects on track.

Sopra Steria, which offers consulting, digital services and software development across Europe, has been working to create a solution for this: Competency Training Marketplace (CTM).

CTM has been developed to allow companies to keep track of workforce training records in real time. The simple interface means project managers can make sure that their workforce is up to date and safe to work. The platform also offers a training marketplace which, in conjunction with training providers across the UK, lists courses available to book in one location.

CTM is an example of how technological progress can help ensure the operational safety of workers. Both leaders and business owners have the responsibility to improve their business processes, making the most of this new wave of digitalisation. While *The Construction Playbook* has been called an "Amazon for manufacturers", CTM aims to provide a similar solution for training.

"CTM has the potential to deliver a step change in how training providers connect with employers" Ian Pretty.

**Collab Group** 



# Frequently asked questions:



How do I sign up to CTM?

It takes minutes to sign up to CTM and you can get going in two easy steps:

### 1. Register details

Whether you are an employer in need of training or a training provider you will input basic company information and accept our terms and conditions.

# 2. Add information

Sponsor organisations: Once registered, you can add worker data and start tracking their competencies immediately, free of charge. There is no limit to the number of workers you can track or competencies you can add. Training providers: Once

registered, you can add courses and begin taking enquiries immediately. A small referral fee is only payable once your course has been booked as per the terms and conditions.

# How much will CTM cost?

CTM's competency management tools are completely free to use and employers can book training free of charge on the marketplace. Training providers will be charged 5% of the value of the training courses booked through CTM enquiries.

The combination of a training marketplace and easy-to-use management software is an industry first which not only helps to ensure workers' safety but also allows significant savings in time for HR teams and project managers.

CTM has been developed to help keep the industry on the right track - more and more companies are turning to it as the smarter way of managing workforce competencies. Five times the number of companies have signed up to CTM since March and are reaping the benefits of a more streamlined process for managing their training.

Ian Pretty, CEO of Collab Group, says: "CTM has the potential to deliver a step change in how training providers connect with employers. It poses to simplify and streamline the training procurement process and deliver clear benefits for employers and training providers alike. We look forward to working together and welcome the many opportunities that lie ahead."

The technology world is under the same pressure to progress as the construction industry and CTM has been advancing over 2020, constantly improving its features.

Sopra Steria's CTM team has been working to make sure that the brand and website reflects the easy-to-use nature of the marketplace and portal, with a fresh new look and website which reflects CTM's connection to its parent company Sopra Steria which, along with CTM, is committed to innovation and excellence.

Check out the new website where you can also find out more about CTM or request a free demo: https:// competencytrainingmarketplace.com. Follow CTM on LinkedIn for news and updates: www.linkedin.com/ company/competency-trainingmarketplace-ctm.





Liam Tumulty

# Q&A: IR35 off-payroll working changes

THE LONG-AWAITED CHANGES TO OFF-PAYROLL WORKING – KNOWN AS IR35 – COULD HAVE A HUGE IMPACT ON UK CONSTRUCTION. **LIAM TUMULTY** EXPLAINS



# How will off-payroll (IR35) working rules change?

These changes will mean that personal service companies (PSCs) engaged by large entities will no longer be liable for IR35 taxes, but the entity paying the PSC will instead be liable. Small companies are exempt.

The policy can apply if a worker provides services through an intermediary, for instance with a contractor's PSC. The rules ensure that individuals working like employees, but via their own limited company, will pay broadly the same tax and National Insurance contributions (NICs) as individuals employed directly.

### When will the new rules take effect?

The IR35 rules for off-payroll working are changing on 6 April 2021 for contractors and consultants who work in the private sector for large entities, such as construction companies.

# Are there any other off-payroll IR35 rule changes?

Yes. Under the changes from April 2021, responsibility for undertaking employment status assessments will pass to the fee-payer using the services of the worker, while the responsibility for operating PAYE withholding will be that of the entity paying the PSC.

The legislation also introduces the concept of a 'status determination statement' (SDS), which end users will be required to provide directly to the worker. The SDS must include not only the decision of the worker's 'deemed' employment status, but also the rationale for reaching this conclusion. Deemed workers will need to be included in payroll returns and PAYE and NICs deducted as required. These rules apply to the UK.

"Construction businesses should review labour, contractors and consultant supply chains to determine where the rules apply"

# What preparation should construction companies make in the UK?

Construction businesses are familiar with dealing with a contractor workforce within the Construction Industry Scheme (CIS).

However, for IR35, construction businesses should review labour, contractors and consultant supply chains to determine where the rules apply. Firms should put in place policies and procedures for dealing with the various features of IR35. Clear communication channels will be essential and collaboration with their construction supply chains about the rule change is recommended.

# What impact are these changes likely to have on UK construction?

In addition to CIS labour, construction businesses will need to consider payments made for consultants and other professional services, for example contract surveyors, architects, engineers, and determine whether or not IR35 applies. The HRMC Check Employment Status for Tax (CEST) tool can help with this.

Some construction workers can be classified as off-payroll even though they have been operating through CIS. HMRC guidance indicates that IR35 will take precedence over CIS (see HMRC Technical Note, point 47).

# Will there be penalties if construction companies do not comply?

HMRC will initially take a 'light touch' to enforcing compliance with the new rules. Businesses should be aware of the risk of interest and penalties if not complying. 

Liam Tumulty is a consultant on compliance, finance and VAT at COINS.













# CONSTRUCTION MANAGER

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58,000

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\*ABC audited July 2019 to June 2020

# CIOB Community



# Virtual site visit to **Alexander Stadium** redevelopment

See how Birmingham's plans are taking shape



Above: Visualisation of the view from the remodelled steel West Stand

Left: The stadium will host the 2022 Commonwealth Games

Members can take a virtual tour of

the Alexander Stadium this month to see how the £72m centrepiece of Birmingham's 2022 Commonwealth Games is taking shape.

The initial redevelopment timescale was pushed back due to covid-19, with completion now delayed until April 2022 - just three months before the opening ceremony.

The stadium will be modernised. with a post-Games permanent capacity of 20,000 - up from the current 12,700. The stadium in Perry Barr is unrecognisable from its previous incarnation as work continues apace to ensure it is ready on time.

The demolition of three existing stands has been completed and the site remodelled with steelwork that will form the eve-catching new West Stand, which has started to take shape in recent weeks.

After the Commonwealth Games. the stadium is set to become a focal point of health, wellbeing, sport, academic and community activity in an improved Perry Park as part of the wider Perry Barr Regeneration Scheme - which will see well over £500m invested into north-west Birmingham in the next decade.

The live webinar takes place at 12pm on 24 February and will show how the construction works are progressing.

The one-hour event will begin with an overview of the scheme and the associated legacy benefits for Perry Barr and the wider region. This will be followed by a pre-recorded video containing drone footage of the construction works, including the ongoing steel installation.

Following this, the structural engineering design of the new West Stand will be explained, including how this is taking shape as a result of the steel installation works.

The stakeholder engagement and social value activities - which have been ongoing throughout the construction period - will then be covered, before the session concludes with a live Q&A session.

For details email sshort@ciob.org.uk.

# **Novus chair scoops** leadership prize



Truro's Callum Yeowell recognised by G4C award

The chair of Truro Novus scooped an industry award at the end of 2020.

Callum Yeowell (pictured) won the G4C Future Leader Award in **Construction Excellence South** West 2020 Awards. The awards took place virtually on 4 December.

The G4C award is open to a person with less than 10 years of experience in the construction and built environment sector (typically less than 35 years of age).

Judges look for a person that best demonstrates a positive impact on their peers. their organisation and the wider industry, against current G4C priority areas of people development, sustainability and innovation.

Yeowell, who works for Cornish construction firm Gilbert & Goode, was thrilled to win.

"I am absolutely over the moon," he said. "I've worked really hard for the company I work for, myself and to support my fantastic team so it's amazing to receive such recognition for doing so and the achievements I've had over the last few years."



# Why are only 1% of construction firms benefiting from R&D tax relief?

Specialist tax advisors can help companies to identify and claim for potentially eligible projects



### The R&D tax relief/credit scheme

was introduced by the UK government in 2000 to incentivise investment in innovation and reduce financial risk by providing a potential cost saving of up to 25p for every £1 spent on eligible R&D activity.

While there have been year-on-year increases in claims, the construction sector is still not realising the full financial and competitive benefits of the scheme.

In 2018-19, only 1% (3,340) of construction firms made a claim for research and development (R&D) tax relief, with the sector making up just 5.6% of all claims (HMRC, Research and Development Tax Credit Statistics September 2020).

It is recognised that small profit margins previously stifled progress, restricting investment in innovation. However, the sector is now being transformed by a number of factors, including:

- Regulatory/client focus on reducing energy use and carbon emissions;
- Adoption of digital technologies (e.g. BIM);

"Many companies remain unaware of the tax relief scheme or have misconceptions over which companies and what activities qualify as eligible R&D"

- Growth of offsite manufacturing and use of modular building techniques; and
- Increasing popularity of integrated design and construction procurement systems (e.g. design and build).

# So why are more companies not making R&D tax relief claims?

Many companies remain unaware of the tax relief scheme or have misconceptions over which companies and what activities qualify as eligible R&D. It is also recognised that many firms may view potential qualifying R&D activity as simply part of their usual work routine.

As a result, many companies may benefit from the support provided by specialist R&D tax advisors who can help identify potentially eligible projects, write technical reports (a requirement of an R&D tax relief claim) and determine qualifying expenditure (including staffing, subcontractors, consumables and software).

When considering the level of support (and associated cost) required, companies should consider the potential complexity of R&D activities, experience of their accountant and the time available for staff engaged in eligible activity to produce technical reports.

The information in this article formed part of a CIOB member webinar given in December 2020 by Chris Lowe, an R&D technical analyst at Haleys Business Advisors. www.haleysba.co.uk.

### Health

# Jersey-based **CBC** working on new hospital

Plans for Overdale site

Jersey-based CIOB Chartered Building Company ROK has entered into a joint venture with Spanish-based FCC Construcción to build Our Hospital Project (OHP) on the Channel Island.

The project is in a preconstruction phase until March 2022. The site at Overdale (pictured) has been approved as the preferred location for the new hospital and community consultations have taken place.

Design will start on 1 March. Construction is expected to last four years to be followed by a post-construction period of around three years.

The OHP will provide Jersey with a fully integrated, 21st century healthcare facility. The overall aim is to deliver a facility that will be an integral part of the local community and will give patients greater choice, access and provision of quality and efficient services and enhance the overall health and wellbeing of the local people.

The OHP is committed to linking every opportunity presented by this project into the needs of the local community and is focused on creating social, economic, health and environmental benefits that will have a positive impact and leave a lasting legacy for the Island.



# Gen up on modern build methods

An expert panel will compare the details of MMC systems in this Chelmsford Hub presentation



"The speakers will discuss and identify benefits of the various systems in comparison to traditional methods"

The Chelmsford Hub is staging an insight into modern methods of construction (MMC) this month.

A panel of speakers will introduce the use of i-Sip, i-FAST and Hybrid Structural Solutions. They will provide a brief overview of the product, case studies and new products in development.

Experts include Innovare director Gareth Ellison, Arthur Pescher from Bond Bryan Architects and Mid Group client solutions director Emily King.

The speakers will discuss and identify benefits of the various systems in comparison to traditional methods in terms of time, cost, safety and environmental impact.

They will look at project case studies, evaluate the results and cover the testing and certification credentials of the products.

There will also be an opportunity for a Q&A.

The talk takes place on 2 February from 12-1pm. To book visit the CIOB events page online or email hhosking@ciob.org.uk.



**Appointment** Wates offsite role for member

Dan Sadler to lead expansion of Prism manufacturing business **Wates Construction has** appointed CIOB member Dan Sadler to the role of offsite manufacturing director, to lead the expansion and development of Prism, its award-winning offsite manufacturing business in Coventry.

Sadler (pictured) was previously operations director for Wates Construction in the Midlands.

Prism has been a part of Wates Construction since its acquisition of Shepherd Engineering Services in 2015.

Its offsite MEP services have been used on projects including the Institute for Advanced **Automotive Propulsion** Systems (IAAPS) in Bristol, the Royal College of Surgeons in London and the Wellington Place development in Leeds.



### Webinar

# Behind the scenes at 22 Bishopsgate

The London Hub is hosting a webinar this month looking at the development and construction of the iconic 22 Bishopsgate in the heart of London

## 22 Bishopsgate, in the City of London,

is only second in height in the UK to the Shard, and is a development that has used cutting-edge technology to ensure a state-of-the-art building for users and the local community.

The 62-storey tower, also known as Twentytwo, will be the first of its kind to house a fresh food market, innovation hub, gym, wellbeing retreat and spa, curated 'art walk', business club, cycle hub and destination restaurant – as well as London's highest free public viewing gallery.

Twentytwo is designed to increase wellness, engagement and productivity. It is the first UK coreand-shell building to apply for the International WELL Building Institute

"It will be the first UK tower to contain in excess of 100,000 sq ft of integrated amenity and social spaces, creating an inspiring, healthy and energising workplace"

WELL Building Standard (WELL). It will also be the first UK tower to contain in excess of 100,000 sq ft of integrated amenity and social spaces, creating an inspiring, healthy and energising workplace for a business workforce of 12,000 people.

The main superstructure comprises a steel-framed tower with a central supporting concrete jump-form core. The floor slabs are composite cellular beams, providing a diaphragm action restraint to the perimeter columns. There are three column positions on either side of the core to act as outrigger stability structures, connected to the core through storey-deep trusses at two positions up the building.

The basement is three levels deep with a network of supporting columns and transfer structures taking loads down to piled foundations.

The facade is a closed-cavity glazed curtain wall system which circulates air within the cavity and allows very clear glazing while meeting environmental performance.

Due to access constraints, and the large amount of materials needed, it was decided to use an offsite consolidation centre to reduce traffic and deliveries. Materials were distributed at night to avoid traffic and to allow workers arriving on site to start work immediately.

This system was designed for the construction phase and also for the life cycle of the building, reducing delivery vehicles at peak hours and lowering cycling incidents and pollution in the long term.

The webinar will take place on 10 February with package manager Alan Williamson FCIOB and project manager Jon Pepper MCIOB, both from Multiplex. See Diary dates p55 for details on how to book or go online to CIOB Events.

### Presentation

# Working together in Kent

Collaboration is the way forward, says CBC member



CBC member
Judd Consultancy
from the
Maidstone Hub
led an online
presentation
at the end of

2020 for a local collaboration of construction management businesses in Ashford, Kent.

Mike Judd FCIOB (pictured) introduced the Zoom meeting presentation on behalf of a group of construction professionals from BNI Ashford who work in non-competing related fields and have developed relationships so they can regularly refer customers to each other.

The group focuses on commercial and residential projects in Kent and London. It consists of:

- Judd Consultancy project managers, quantity surveyors and dispute resolution;
- Hay Architects architects and designers;
- Adkins Consultants structural engineers, party wall surveyors and a CBC;
- Assent approved building inspectors;
- Oakmore Green landscape designers; and
- Potters Home Digital smart home designers.

Judd explained how the group is looking to be the local 'go-to' group for complete projects.

He said clients would benefit from "collaboration of professional services with a consistency of advice and integrity, from the conception of a client's vision to a scheme ready for issuing to tender, as well as continuing to support the client throughout the entire build process from contractor engagement to completion".

The group is aiming to expand its services and in these current times of lockdowns and uncertainty are looking for local interior designers, mechanical and electrical designers, land surveyors, kitchen and bathroom designers and energy assessors/engineers.

For further information or to attend one of their next meetings contact Mike@juddconsultancy.co.uk.

# STEP INTO THE SPOTLIGHT

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# HOW TO ENTER



The online portal for entries couldn't be easier. Register and receive your log in to the application portal.

2

Complete your application in the format of a project report.

3

Answer a total of twelve questions in relation to the project.

# **CMYA TIMELINE**



Mid-January 2021

Online entry portal opens



19 March 2021

Entry deadline



April - June 2021

Candidate interviews



July 2021

Finalists announced



29 September 2021

Awards ceremony at JW Marriott Grosvenor House Hotel

CONSTRUCTION MANAGER OF THE YEAR AWARDS 2021

29 SEPTEMBER 2021

W MARRIOTT GROSVENOR HOUSE HOTEL





Members can take a trip around

Birmingham University's new citycentre hub, The Exchange, next month.

With Mace as project manager and Galliford Try as contractor, the university is developing Birmingham's former Municipal Bank, one of the city's best-known civic buildings, in Centenary Square.

The virtual site tour will run on 31 March, offering an insight from the client, contractor and architect. It will focus on the building's history, the university's vision for the building and the associated design and construction challenges faced when redeveloping a Grade II listed building within a city centre location.

Above: The former Municipal Bank in Centenary Square will become a research centre with a cafe and bookable spaces

The Exchange will act as the catalyst for a range of city and community-focused research, teaching and engagement activities, including exhibitions, talks, workshops and seminars, as well as providing dedicated facilities for collaboration across a number of key themes. It will also house a public cafe and bookable spaces. The webinar will take place on Wednesday 31 March, 12-1pm. Please book online or contact gfloyd@ciob.org.uk.



# Take a virtual trip to Birmingham's new university hub

The Exchange's client, contractor and architect will offer background information on the redevelopment of the Grade II-listed building

### University

# CBC moves up a degree with **Bournemouth build**

Greendale delivers refurb to schedule despite pandemic

**Chartered builder Greendale** Construction has handed over phase two of Christchurch House, on Bournemouth University's Talbot Campus, on time and to budget, despite the challenges of the pandemic.

The 20-week, £1.5m contract involved the complete refurbishment of the north wing of the second floor, as the second phase of a project to redevelop the whole second floor.

The works included the formation of new teaching laboratories, new microbiology laboratory with associated prep room and autoclave room, new toxicology laboratory with prep room and new project lab.



# Diary dates

Highlights of the CIOB Calendar for the coming month. All events are online webinars unless otherwise stated

### An Introduction to Modern **Methods of Construction**

### 2 February, 12-1pm

Join our panel of speakers for a look at the use of i-Sip, i-FAST and Hybrid Structural Solutions. You will be provided with a brief overview of the product and what it currently offers users, as well as new products in development. (See p50 for more details.) Contact: hhosking@ciob.org.uk

### Daytona Speedway Design & Build

### 3 February, 6.30-7.30pm

CIOB past president Chris Soffe will discuss the reconstruction of the iconic grandstand at Daytona International Raceway in Florida. The owner's challenge was to deliver this 101,000-seat facility by an immovable deadline for the 2015 Daytona 500 race. Construction had to take place through two hurricane seasons, and allow for two reduced-capacity Daytona 500s and other race meets to take place without interruption. The success was in the pre-planning, the design, the risk allocation and of course a fabulously committed project team. Contact: bgrange@ciob.org.uk

## **Developing 22 Bishopsgate**

### 10 February, 6-7.30pm

This webinar will take a look back at the development and construction of the iconic 22 Bishopsgate in the heart of London. A building only second in height in the UK to the Shard, its development used cutting-edge technology to ensure a stateof-the-art building for users and the local community. (See p51 for more details.) Contact: bgrange@ciob.org.uk

# **Business Continuity Planning**

### 17 February, 12-1pm

If you have never been involved in creating a business continuity plan (BCP), this will give you an insight to the challenges, as well as the commonsense approach. Also it will help you to be better prepared in the unlikely event of a disaster recovery invocation.

The event will answer questions you may have about BCPs, such as:

- Can we operate business without one?
- Does it have to be complex?
- What is the difference between a BCP and Disaster Recovery Plan?
- Is it costly to create one?
- Do I need to be an expert to create one?
- What do we need to include in my BCP?
- Have we implemented a BCP on covid-19 without knowing? If so, what lessons have we learned?
- What needs to be included in a BCP?
- Is it all about IT systems or are there more considerations?
- If we have multiple sites, can we create a template that fits all?
- Do we have to test our BCP and if so, what is involved?
- Which external agencies need to know that we have a proven and tested BCP? Contact: bgrange@ciob.org.uk

### **Negotiating Contracts with Covid and Brexit in Mind**

### 24 February, 4-5.30pm

The construction industry is resilient. Key infrastructure projects and capital works will continue to be delivered despite the uncertainty attached to covid-19 and the UK's departure from the EU.

This one-hour webinar from Quigg Golden will be delivered by William Brown, a qualified civil engineer and leading construction lawyer at Quigg Golden Solicitors. It will focus on how contracting arrangements will change in the very near future to account for these uncertainties. The following topics will be covered in depth:

- Suspension of works
- Termination
- Resolving disputes
- Price adjustment clauses
- Execution formalities
- Drafting express provisions for Brexit and covid.

Register for the event at CIOB events online.



# CIOB CEO **PRAISES** CHANNEL **ISLAND HUB WORK**

The Guernsey CIOB Hub held a celebratory lunch at the end of 2020 to mark its 26th year as an active group.

**CIOB** chief executive Caroline **Gumble (pictured)** sent the group a video thanking them for their contribution and acknowledging their achievements, including the **Guernsey Property** and Construction Awards lifetime achievement award for Peter Falla, the committee secretary for the States of **Guernsey Committee** for the Environment & Infrastructure.

She also praised the hub for its local construction industry forum, and the fundraising work members do for its local charities.

# Competition

# Still time to enter GSC

Entries close on 7 April for student teams of four

The CIOB annual Global Student Challenge (GSC) begins its first phase next month, but there's still time to register for



university teams that want to take part. The GSC is an online construction business game open to students across the world, studying an honours course within the built environment. Run by the CIOB, it provides built environment students with an opportunity to apply their learning to a real-world scenario of running their own virtual construction company.

The competition utilises MERIT, an online game which simulates the management of a construction company.

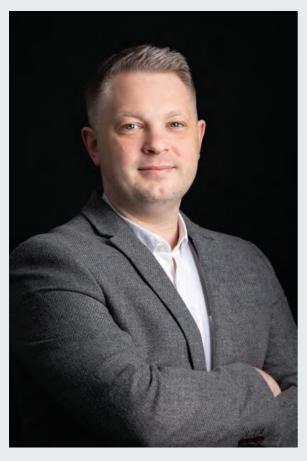
Teams of four are tasked with managing their own virtual construction company. How you organise the team is up to you - but the CIOB recommends that each team member takes a specific managerial role.

There are six weekly rounds in the Early Years stage of the competition. Each team will be scored each week against key performance indicators, and this score will determine the position with the overall competition rankings. The top six teams will become our finalists.

Entry is open now and will close on 7 April. The first phase of competition begins on 15 March when teams access the software and set strategy. Phase Three starts in April and sees six rounds of competition, taking place over six weeks.

The top six teams will be announced as finalists on 25 May. The finals week is scheduled to be held virtually in June.

Register at https://gsc.ciob.org.



Meet a member

# 'I worked on that'

Sam Fowkes, director. Selcon construction consultants

# Why did you choose construction? What else might you have done?

I've always loved construction - my grandfather was a carpenter and the idea of making and building things always drew my attention.

I've spent all of my working life in the construction industry: I started off working at a builders' merchant and then moved to be a maintenance "I've spent all of my working life in the construction industry" Sam Fowkes,

Selcon

joiner before being offered a job as a trainee site manager where I was able to gain a BSc Hons in Construction Management. I worked as a site manager before moving into planning and progressed to the position of planning manager before moving back to the operations and delivery side as an operations manager.

I've loved every bit of my career so far and wouldn't change a thing about it. Construction isn't just a iob - for me it's the only iob. I get lots of satisfaction knowing that I worked with a team of people to help build places such as homes, workplaces, hospitals, schools and more.

I love driving past places and being able to say "I worked on that", much to the annoyance of my wife: every project has a different memory attached to it.

There isn't really anything else I would have done. I had a brief foray into Law where I started a criminology degree but quickly realised it wasn't for me.

# You've now started your own business? Tell us a little bit about that experience?

Starting on my own was the most daunting thing I've ever done, which was compounded by the timing. Leaving a good secure job in the height of the covid-19 pandemic made for lots of sleepless nights, but happily things are going well. The encouragement and support I received from my wife, family and friends was a huge help.

The business, Selcon Ltd, offers various services but the core of the business is planning, programming and project management working with client and contractor alike.

The focus is on delivering the best service across multiple sectors using my own and others' experience to be able to do so. Continued work

with existing customers along with opportunities with new and existing clients puts the business in a strong starting position for 2021.

The aim is to continue to grow and develop and become a well-recognised business in the industry with the ability to offer opportunities to others.

The main takeaway from starting the business is that there is always a risk in whatever you do and you can always find a reason not to take the leap. If you have enough faith in yourself and you decide what success looks like you will achieve your goals. I'm not at the end destination yet but am determined to succeed.

# If you could change one thing about the industry, what would it be and why?

I love the construction industry and we have come a long way from the days of poor health and safety standards, lack of consideration for the environment and reliance on traditional methods of construction in a relatively short space of time. But the thing I would like to see us achieve is full collaboration.

One of the reasons for starting my business is that I think we can work together better and in a more honest way. The industry is making steps towards full collaboration between clients, contractors, designers and end users but I don't think we are at the finish line vet.

# What do you like to do in your spare time?

I spend as much time as possible with my family and am usually doing some sort of construction/DIY at home too. I like to get to the gym or boxing club in the evening and love taking my son to his sports clubs. When the pubs are open I also enjoy a good bit of socialising.

### Me and my project

# A fine art

Ken Crouch MCIOB, site manager at 39 Brook Street, tells us about demolition and decoration in a Grade II-listed building



Left: Ken Crouch is director of Nuway Construction Below: 39 Brook Street's city-centre location made site access a challenge

building itself and the close proximity of other important stakeholders. The site's location on a busy street

work, the historical significance of the

The site's location on a busy street in an affluent part of central London made access a challenge. Added to this, the 300-year-old, four-storey building needed a huge amount of structural support work, including basement excavations, while an underground river (the River Fleet) was found to be flowing very near by – so we had to closely monitor for any movement.

The most challenging aspect centred around the basement excavation. To level the complex warren of tunnels in the basement, we first needed to carefully remove 500 "We needed to carefully remove 500 tonnes of material from the basement without disturbing the neighbours or dropping any material on the pavements or on site"

tonnes of material from the basement without disturbing the neighbours (Claridge's Hotel), dropping any material on the pavements or on site, all while remaining sympathetic to the protected building interiors.

We achieved this by using a complex of eight travelators running from the basement, through the building, upstairs, out of a first-floor window, over the pavement and into the back of a truck.

Through careful management, accurately planned and timed truck changeovers and a strong team working tirelessly by hand in the basement, the whole process went without a hitch. It was a proud moment to stand opposite the site, watching this complex operation come together so silently and seamlessly.

Work to the rear courtyard involved taking up York stone slabs, relaying to new levels, and the construction of both a well-hidden HVAC system and lift shaft. The most delicate operation involved the removal and replacement of a rare 40ft Indian bean tree complete with tree preservation order from Westminster Council.

We completed our work in October 2019, handing over to the new tenant for the interior fit out. We are hugely proud of our contribution to this flagship project and look forward to seeing the end result when it opens to the public in 2021.

Ken Crouch is company director with Nuway Construction.

### It is not every day you get to

manage a project as delicate, complex and historically significant as the refurbishment of 39 Brook Street in Mayfair. The building has been described as having "perhaps the best known and most influential interior in the history of English interior decoration".

Originally built in 1720, the building had been headquarters for the interior design firm Colefax & Fowler from 1944 right up until 2016, when the lease was returned to the estate owner. The building undoubtedly enjoyed a fascinating history but needed a major refurbishment to warrant its deserved status as one of the most exquisite retail properties in Mayfair.

Before work commenced, we were engaged by the main contractor, Gaysha, for project and site management services, helping to identify the risks, create the works programme, coordinate all stakeholders and, ultimately, manage the site on a daily basis.

The key risks derived from the building's location, the nature of the



# Training & Recruitment

### Job spotlight

### **Corynne Griffiths**

Independent quality controller, Persimmon Homes Midlands

# SWAP SHOP

ORIGINALLY TRAINED IN ART AND
DESIGN, CORYNNE GRIFFITHS
WORKED IN A RANGE OF JOBS BEFORE
SWITCHING CAREERS INTO THE
CONSTRUCTION INDUSTRY IN 2006



# Why did you swap career path? How have you found life in construction?

"There are so many good opportunities to build a rewarding career in this field. I saw a chance to combine my design and analytical skills to develop an exciting new profession. I started on a Construction Management degree and then progressed onto an NHBC training programme.

"At times it wasn't easy to get taken seriously, as a woman trying to find a job in construction, and it took a little while to gain the respect of some male colleagues, but once I had proven myself capable and hard-working I became fully accepted as one of the team.

"Securing this role with Persimmon was the perfect post for me. I really enjoy

the job, being out on site and working with site managers and contractors.

"I have a daughter with a sensory disability and Persimmon has been amazingly supportive with flexible working to enable me to take her to therapy appointments. They understand that people genuinely need to balance work and home to deliver the best for the company and its customers, so I cannot speak highly enough of them as an employer.

# What do you find challenging and rewarding about your job?

Mine is a relatively new role within the site management team. Our focus is on getting things right, from the ground up. That is never an easy task when you consider every property is actually a hand-built product, crafted by a small army of bricklayers, carpenters, plasterers, electricians, plumbers and roofers.

We meet challenges every day – from weather setbacks to the pandemic working restrictions – but there is a real sense of satisfaction every time we sign off a property ready to be handed over to its new owner.

# What would you say to any women considering construction as a career?

I don't think there is enough awareness of the wide variety of jobs there are within the construction industry, both for people starting out or those looking to retrain. This is a great sector to build a rewarding and sustainable career and I would love to see more women in construction.



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# Count me in

Charlotte Baker on how inclusion in the workplace should be part of safety policy



How do we ensure our safety practices and principles are truly inclusive? In such a high-risk environment as construction, we need

our employees to be fully engaged, both physically and mentally.

As a minimum for any business, legislation such as the Health and Safety at Work Act 1974 ensures that every organisation has a legal obligation to keep people safe from injury at work. How do we, as responsible employers, create an environment that links workplace safety and employee inclusion to the benefit of both objectives?

I believe this has to start with fostering a close working relationship between health and safety, HR and equality, diversity and inclusion (EDI) teams, ensuring that policies and processes are designed to meet the needs of the diverse employees within the business.

What does that mean in practice?

- Ensure that policies, procedures and processes are published in a way that all employees can relate to and follow easily, in terms of language, content and accessibility.
- Create an environment in which it's safe to challenge. Be aware of body language and eye contact. Create spaces in which individuals can feed back – whether digital platforms, focus groups, one-to-one discussions and senior manager site visits. Be aware of those who may be less confident at speaking out.
- Cultivate a blame-free culture. Look at the process and how it can be adapted to overcome issues, rather than looking to blame individuals.
- Modify language to ensure accessibility. Resist the urge to use jargon, corporate speak or company-specific language. Ensure the language used is appropriate for the diverse backgrounds of your employees and consider presentation of materials in terms of meeting the needs of those with dyslexia and colourblindness, for example.
- Design your workspaces with a physical and psychological awareness of what is safe. Take into account sensitivities to light and noise, and the needs of those with hearing difficulties, neurodiversity or mobility challenges.
- Challenge behavioural 'norms' and your own thinking. Be aware of everyone's working style and be prepared to adapt to meet needs.

I believe that having a culture of diversity and inclusion embedded alongside a strong culture of safety provides us with the means to protect our employees and create a workplace that is safe for both the mind and the body. Charlotte Baker is HR business partner, EDI lead at Colas.

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