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Constructing the Future. Looking at two trends that will change the industry over the next 5-10 years.

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The Offsite Construction Show 50 2018 – a fantastic response from the offsite industry!

Welcome

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Front cover photo: Connect 2 Cleanrooms, supported by Kingspan Precision Panels



Welcome to our August newsletter, where we bring you news and updates on offsite projects that are making a difference to our industry and supporting the UK agenda for efficiencies in construction methods.

In this edition we note the continuation of housebuilder profitability and the investment being made into new manufacturing capacity, as we see government ambitions for the number of new homes at a level not seen for generations.

Tim Hall, Buildoffsite's Executive Director shares his optimism for an offsite enabled construction industry and tells us: "I cannot think of a time in my working life where there has been such a range of exciting and valuable opportunities to make a positive impact on an industry. At Buildoffsite, our key role is to act as a partner for industry engagement and collaboration, connecting our Members with leading UK capabilities in manufacturing, digital technology and skills development."

Funding available for construction research

Innovate UK, the Government's research funding organisation, has launched a competition to support R&D projects to transform the UK construction sector. £12.5 million is up for grabs with the possibility of additional competitions both this year and next.

This first competition was launched on 23 July and will stay open until 19 September 2018.

More information (including advice on eligibility, scope, application details and supporting information) is available from: https://applyfor-innovation-funding.service.gov. uk/competition/203/overview.

The aim of the competition is to invest in R&D projects that will improve the productivity, quality and performance of UK construction. In particular the competition is looking to support projects to improve:

- Designing and managing buildings through digitally-enabled performance management
- Constructing quality buildings using a manufacturing approach
 - · Powering buildings with active energy components and improving build quality

Proposals must be led by a UK based for-profit business with project consortia including a micro or SME entity.

The copy deadline for the next newsletter, which will be available prior to the Offsite Construction Show is Friday 12 October

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As part of our on-going development to create new opportunities for Members, we have set up the Buildoffsite Governing Forum as the steering group for Buildoffsite activities within the CIRIA community of networks, offering insight into construction innovations, and seeking and developing Member feedback on strategy, priorities and Buildoffsite activities. Read more about this on page 8.

Plus, so much more, including how drones are starting to drive the economy, the impact of low-carbon smart concrete, the increase in female apprentices, Mark Farmer's update on his work on behalf of government to coordinate manufacturer insurance for offsite homes, and examples of some of the fantastic innovations and projects being delivered by our Members.

Projects must start by December 2018 and be completed by December 2020.

This competition provides an invaluable opportunity for business to win public fundingfor collaborative R&D in support of innovative offsite enabled construction. Members of Buildoffsite who would like to discuss their proposed projects with us should contact: info@buildoffsite.com in the first instance.

Improving Industry Profitability. Don't wait... act!

"The RICS is forecasting that input prices will increase by around 2.9% over 2018, with rises of up to 4.3% by 2022." Recent industry headlines have once again been repeating the general message that if companies want to make serious money in the construction industry, then by and large the best place to be is in housebuilding. This has been the case for some years now, whereas if you are in general contracting, the odds are that achieving a decent return on your turnover and investment is an almost constant struggle – and indeed has been a struggle for decades.

The latest results from housebuilders continue to impress. Four out of the five top quoted housebuilders have returned margins of 20% plus. Compare that with the reported results of top contractors where anything around 2% would be viewed as good – indeed almost class leading. Those achieving better than this are likely to be benefiting from earnings from overseas projects or indeed from their expanding activities in the residential market.

Looking forward to the rest of the year and into 2019, the commercial prospects for the housing sector continue to impress. OK, there might be some temporary blips in parts of the London market but generally the expectation in both boardrooms and in the City is that overall the UK housebuilding sector will continue to perform in a most satisfactory way, with returns if not quite as impressive as in recent years, still likely to be good compared to other asset classes. Demand for new housing is of course at record levels. Hardly surprising, given that the population continues to grow at an unprecedented rate, with no sign of any slow-down. This coupled with government support schemes such as Help to Buy have been incredibly effective in enabling home ownership, whilst at the same time generating cash to support investment in social housing.

In non-housing markets, confidence is mixed with nervousness in sectors such as retail but with confidence and expectations starting to grow in say commercial. Sustained government and private sector support for vital infrastructure projects is serving to underpin confidence.

The big challenges that will impact on the construction industry at large will be skills shortages, and inflation in material prices and labour rates. The RICS is forecasting that input prices will increase by around 2.9% over 2018, with rises of up to 4.3% by 2022. With margins already low, it would seem that the challenges for many in the industry will not be getting easier any time soon.

The bare figures gloss over the day-to-day problems that constructors are likely to face, including how to recruit and retain quality labour to deliver projects to programme and budget in a market where local hot spots of demand are likely to create significant difficulties for some – possibly on a continuous basis.

There is clearly no easy solution to the challenges faced by many in the industry. The general problem of low levels of profitability has for decades served to hold back the ability to make a decent return and, at the same time, to justify the sort of investment needed to establish new ways of working that can re-engineer construction to finally unlock that perennial challenge of construction across the globe – that of intractable low levels of productivity. Surely it doesn't have to be this way!

The preparedness of some clients to pay way above inflation for their construction may serve to temporarily mask the fundamental problems that the industry faces but that is not a general solution, and the implications of simply spending more money on constructing and maintaining built assets is likely to have a significant impact on UK competitive performance sooner or later.

Fortunately, there are an increasing number of companies and individuals from all sectors of the industry, including housing, who recognise the need for the industry to transform the way it works, and to take those tough but overdue decisions that will start to move the industry to more closely resemble the way that other much more profitable and productive industries operate. Certainly, some of the changes require a much more integrated approach to the use of digital in supporting design, manufacturing, assembly and ongoing maintenance. Certainly, adopting a lean approach to construction processes of all types (including more effective relationships with supply chains) will support action to identify and deal with waste and inefficiencies in all its forms. Equally certainly, increased understanding and intelligent application of offsite solutions to support an industry that assembles on site rather than gets by through the constant challenge of constructing on site, will help move the industry to where it and its customers need it to be.

Buildoffsite exists to function as the 'go to' place for those who recognise and support the need for fundamental change and, by working together, act to make change happen. We will move faster if you come and join us. "The general problem of low levels of profitability has for decades served to hold back the ability to make a decent return and, at the same time, to justify the sort of investment needed to establish new ways of working that can re-engineer construction to finally unlock that perennial challenge of construction across the globe – that of intractable low levels of productivity."

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Director's Review



2018 is proving to be an exciting and highly successful year for Buildoffsite. After a focus in 2017 on stabilisation and consolidation, the Membership has grown considerably this year with 20 new Members by the end of June. This has enabled us to ramp up events and Hub activity to deliver Membership value and increase our influence across government and the wider construction sector.

To ensure Buildoffsite continues to increase its impact on construction productivity and performance, we have set up the Buildoffsite Governing Forum to steer our strategy as you will see in a separate article.

As I have shared with many Members, I cannot think of a time in my working life where there has been such a range of exciting and valuable opportunities to make a positive impact on an industry. There is a massive need for innovative thinking and, more importantly, action in our sector, so the rest of this article focuses on the opportunities for Members to get fully engaged and collaborate, to fulfil their potential to make a profitable and much-needed impact on our built environment.

The Construction Sector deal is investing £170 million of public money in construction innovation, and a key element is the setting up of a Core Innovation Hub to support the adoption of advanced manufacturing and digital processes to radically transform UK construction productivity. The Manufacturing Technology Centre, BRE and the Centre for Digital Built Britain at Cambridge University have come together as the Transforming Construction Alliance to deliver this capability. Buildoffsite is a key Alliance partner for industry engagement and collaboration. This gives us a unique opportunity to increase our activity, ahead of Membership growth, to connect Members with the leading UK capability in manufacturing, process design, digital technology, testing and skills development. All in readiness for tackling major investment programmes, including the £600bn pipeline of investment in infrastructure in the next 10 years.

"Buildoffsite is a key Alliance partner for industry engagement and collaboration. This gives us a unique opportunity to increase our activity, ahead of Membership growth, to connect Members with the leading UK capability in manufacturing, process design, digital technology, testing and skills development."



This includes our current work areas:

The Rail Hub is facilitating innovation in the HS2 bridges and viaducts packages, to ensure that the leading thinking is applied to enhance bridge design and increase the effective lifespan of assets; whilst reducing programme and cost. Buildoffsite's unique non-partisan status gives us the ability to challenge all parties in the value chain and unlock innovation. In parallel, we are working with Heathrow Airport to support their programme of developing manufacturing and logistics hubs across the UK. As if these opportunities for all of us in the offsite sector weren't significant enough, there is the ambition of the Infrastructure and Projects Authority (IPA) to ensure that not only are these individual major projects delivered successfully, but that the UK develops its construction manufacturing capability in parallel, to ensure a step-change in productivity and lasting industrial capability. No small task but the ambition and mechanisms are there - we just need to mobilise in collaboration to raise our individual and collective organisational capabilities.

Through the **Residential Hub** we are forging partnerships with the National Housing Federation, Homes England and the Housing Forum to engage ever more closely with housing developers. There is still a lot for smaller housing organisations to learn about offsite, as I found presenting at the CIH conference with our Member ilke Homes - there are a host of myths for us to bust, as well as the need to demonstrate the value of offsite. These platforms give us an opportunity to engage with housing clients, and forge partnerships between them and our breadth of Members.

Through the Water Hub we are actively engaging with water utility businesses and leading-edge suppliers to collectively address opportunities to progress offsite-enabled innovations that will deliver increased value and support ambitions to achieve enhanced project outcomes.

The UK's innovation and ambition to change has not gone unnoticed overseas. The Hong Kong Government has signed a Memorandum of Understanding with the UK IPA and now wants to create a local version of Buildoffsite as a catalyst for change.

"There is still a lot for smaller housing organisations to learn about offsite, as I found presenting at the CIH conference with our Member ilke Homes – there are a host of myths for us to bust, as well as the need to demonstrate the value of offsite."

We have been supporting this initiative, with all Buildoffsite costs covered by the well-funded programme. It will create an opportunity for Members to forge international collaborations in offsite digital design, manufacturing, construction and other enabling services. Supported by the UK Department of International Trade, we can make 2019 a year of international offsite opportunity. This also supports the UK Construction Strategy goal of a 50% increase in construction exports.

Even so, our focus and priority remain on delivering the UK-focused Construction Strategy targets of 50% shorter programmes, 33% lower costs and 50% reduction in CO² impact.

In such an environment, we must ensure that digitally enabled offsite construction finally delivers its potential. If we don't work together and grasp it, I doubt we will ever get another opportunity.

Buildoffsite Governing Forum

"A key priority for Forum Members is to be both a conduit for Member views and to represent Buildoffsite externally as advocates of construction innovation."

To give the wider Membership better insight and influence on the organisation's operation, we have set up the Buildoffsite Governing Forum as the steering group for Buildoffsite activities within the CIRIA community of networks.

CIRIA, as the legal entity that hosts Buildoffsite, works as our partner, with a shared ambition for improved construction. The Forum's key purpose is to steer Buildoffsite's vision, strategy and programme of activities, whilst ensuring the Executive Director and team run the organisation in a sustainable manner - financially sound, legal, ethical, and environmentally and socially responsible.

The Forum Members will reflect the views of Buildoffsite Members and Stakeholders. seeking and developing Member feedback on strategy, priorities and Buildoffsite activities.

Membership of the Forum is being kept to a manageable group of up to eight, with up to three external advisors.

We are delighted to announce that the initial Member representatives are:

Tim Carey National Product Director, Willmott Dixon

Graham Cleland Managing Director, Berkeley Modular

Dan Leech Managing Director, TDS & Cadcoe

Matt Palmer **Development Director, Heathrow Airport** We have invited these individuals as a wide representation of members across the construction value chain, including one of the largest clients and a small enabling organisation (TDS) who have an equally valuable voice on the forum.

Leanne Clowting, as a Director of CIRIA and Buildoffsite's Executive Director, Tim Hall, make up the remaining two Members of the initial Forum. There is one additional Member place open to add further diversity for an individual with a commitment to shaping Buildoffsite's future.

Keith Waller of the Government's Infrastructure and Projects Authority and Neil Rawlinson of the Manufacturing Technology Centre have been invited as external advisors to bring insight and influence from the wider construction and industrial landscape.

A key priority for Forum Members is to be both a conduit for Member views and to represent Buildoffsite externally as advocates of construction innovation; shaping our strategy and supporting Membership growth. The first meeting was held in July and there will be an opportunity for Members to contribute to the Forum's priorities in person at the Member to Member event on 6 September.

More information on the Forum Members will be available on the website in due course: www.buildoffsite.com.



News

Science and Technology Committee lines up in support of offsite construction

In a report published on 19 July, Off-site Manufacture for construction: Building for change, the House of Lords Science and Technology Committee concluded that off-site manufacture can help to increase productivity in the construction sector while reducing labour demands, improving the quality and efficiency of buildings, and reducing the environmental impacts associated with traditional construction.

Buildoffsite and a number of Members had submitted evidence to the Committee.

Launching the report, Committee Chairman Lord Patel said that there were clear and tangible benefits from off-site manufacture for construction which make a compelling case for its widespread use.

The report concluded that the construction sector's business models are no longer appropriate and are not supporting the UK's urgent need for new homes and infrastructure. The construction sector needs to build more trust and create partnerships so that companies can work together to improve the uptake of off-site manufacture, and the Construction Leadership Council should provide the necessary leadership.



The role of the government and the wider public sector is pivotal in a move to greater use of off-site manufacture. The report sets out actions that the Committee thinks the government should take, including implementation of the Construction Sector Deal, committed execution of the 'presumption in favour' of off-site manufacture and a greater move to procuring for whole-life value rather than lowest cost.

It is anticipated that in due course the government will formally respond to the Committee's report.

The report is available on the Committee's webpage: https://www.parliament.uk/ business/committees/committees-a-z/ lords-select/science-and-technology-committee/inquiries/parliament-2017/ off-site-manufacture-construction/.



www.parliament.uk

Coming soon: An industry-wide scheme to coordinate manufacturer insurance for offsite homes



Buried in the small print of the February 2017 Housing White Paper '*Fixing Our Broken Housing Market*' was a commitment by government to:

Support a joint working group with lenders, valuers and the industry to ensure that mortgages are readily available across a range of tested methods of construction. This will include encouraging industry and lenders to develop a stronger set of core data to measure the use and performance of different technologies to encourage good decision-making.

In November 2017, I was asked by the then Housing Minister, Alok Sharma MP, to chair this working group. I have for a long time recognised the importance of financing in the role of MMC, especially in the housing market. The linked issues of education, evidence and data are all things that need to be tackled in a coordinated and intelligent fashion if we are going to take valuers, mortgage finance providers, asset investors and building insurers on a journey towards embracing MMC at scale in the UK. I agreed with the Minister that the output would not be a report with recommendations but should be a tangible output or a series of measures co-created by industry to be implemented by industry.

The work that Buildoffsite has done, through BOPAS (the Buildoffsite Property Assurance Scheme) has been exemplary in terms of facing in to this difficult issue, and finally creating a standards led framework which lenders and insurers alike can get comfortable with. The recent exponential growth in BOPAS activity is testament to its role in creating a benchmark for the MMC industry.

What is also clear though is that we have not quite nailed this yet. The market suspicion of 'non-traditional construction' (or whatever you would like to term it) continues, whether openly acknowledged or not. The way in which the wider warranty market interfaces with BOPAS or addresses manufacturing assurance and design life assessments is variable and in turn potentially undermines the mortgage market confidence in the securitisation of its lending or underwriting of policies.

The working group assembled is extensive and represents all the key stakeholders who are part of unlocking the problem here. It constitutes mortgage lenders, building insurers, housebuilders, manufacturers, warranty providers, technical assurers, designers, Homes England and the RICS. There are several Buildoffsite Members around the table. The group reports to the Housing Minister and we have now seen three of those since the group's inception, which is keeping us on our toes!

It was agreed early on that the group should focus on three key themes:

- Unification of assurance, insurance, warranty and mortgage markets
- MMC terminology, definitions and data collection requirements
- Evidence building and routes to data collection

After eight months, I am glad to say considerable progress has been made. We are working towards being able to launch later in 2018 an industry-wide



umbrella scheme, which will better coordinate the process of obtaining manufacturer assurance, which in turn will be more uniformly accepted by the bulk of the warranty provider market and integrate with a set of common rules adopted by those providers in evaluating MMC and its integration into completed schemes on site. This scheme will incorporate BOPAS but will also enable a variety of different options to be pursued to connect manufacturing assurance with a warranty that will hopefully better enable mortgage offers and acceptable building insurance terms.

Linked to this, we are looking to launch a new industry standard MMC definition which will categorise the different approaches to modern methods currently being employed, as well as those likely to grow in the future. The MMC categories will link to the scheme and hopefully become accepted into wider usage.

In terms of evidence building, there has been broad agreement that we need to vastly improve our mechanisms for capturing learning, data and feedback on MMC projects. I am pleased to say that positive discussions have been held with Homes England to provide some pilot projects that can be used to capture certain information for wider sharing. I am hopeful others will offer up schemes to participate in a wider knowledge sharing initiative.

*buildoff*site

There is still a lot of work to do but the progress made so far is pleasing. If we are going to 'crack the MMC nut' then the outputs of this working group need to be successfully landed in industry and adopted. I am sure Buildoffsite Members will want to make sure they are at the forefront of embracing such positive change and market evolution, and will hopefully support this process.

Constructing the future



Jaimie Johnston Director and Head of Global Systems

That the construction industry is in need of change is a point already well made. Productivity has not increased in 80 years¹, there's a lot of waste and poor value. Buyers of infrastructure (and with £650 billion of planned investment, the government is top of the list) are looking for better value, less risk and improved use of human resources.

The question is not whether the industry needs to move forward, but in what direction. To answer that, it's worth looking at two trends that will change the industry over the next 5-10 years.

¹McKinsey Global Institute's Reinventing Construction report, February 2017

Looking at two trends that will change the industry over the next 5-10 years

Trend 1: The increasing automation of design and machine learning

We already know how automated design can carry out rules-based processes that humans find repetitive and dull. But what's emerging is a new kind of problem solving. Where a human will have a few ideas, choose the most promising and refine it, automation works in a different way. Rather than just speeding up the traditional process it can increase the search area for ideas, generating far more possible solutions. And, unlike a human, the machine will work exclusively from data. So, if we wanted a computer to find the route of a road, for example, we would give it data and assign values for the things that matter, such as environmental impact, cost and impact on population centres.

This data-driven, objective approach can produce highly unexpected solutions which the machine can subsequently improve by comparing its solutions against target values. Other computers may 'collaborate' with it, to check its algorithm or the structures that it creates.

Some companies, such as Airbus, working with Autodesk, are already using this kind of technique to generate highly optimised, weight-saving components. With enough data and the right algorithms, powerful cloud computing can 'understand' where structural material is needed and where it is not. The results look like something from a science fiction film, yet the computer is blind to aesthetics and cares only about function.

Another example is WeWork, a company that has found a new way to answer the apparently simple question: "How many meeting rooms do you need in an office?" Under-used rooms reflect wasted resource, so the company used machine learning (specifically an Artificial Neural Network) to help with forecasting. They gave the network relevant information such as the office layouts, size and number. Over time, it learnt the relationship between actual layouts and their usage, until, as WeWork estimate, 'the neural network is 40% more accurate than human designers in predicting how frequently a meeting room will be used by the building's occupants'. Although this kind of technology has not yet had much impact on architecture, it is not difficult to imagine a time when it could design complete cities.

Back in the present, there's already an increasing interaction between the physical and electronic worlds. At Bryden Wood, we're doing more and more in the digital space. Computers are becoming the whole workflow, not just electronic tools in a traditional process. An example is our work with Laing O'Rourke on tunnel linings for Crossrail. From an initial point cloud survey of the as-built tunnel, to the build of the fabrication model - through to the CNC machining and 3D printing of the moulds to suit the size and geometry of components the process was entirely digital. With no paper drawings or traditional measurements, it was a new way of delivering an asset.



Some label all these ideas as BIM, vet BIM is more a direction of travel than an end goal. In any event BIM Levels 1 and 2 are simply improvements on the traditional way of doing things. It's BIM Level 3 that is fundamentally different. If we go back to the example of planning a road route, this isn't about developing an idea with a computer. Once primed with data and values, the machine is able to generate possible solutions. That's not to say it identifies the need for a road, or decides the economic benefits, but it does solve the route planning part on its own.

In the immediate future, this could free designers for more complex tasks. Highways England estimates that only 20% of a designer's time is currently spent on complex work such as junction design. Yet this is the part of the job that requires high levels of creativity and problem solving. The other 80% goes on documenting the design and it's here that digital workflows could take the load off the designer. In the more distant future, machine learning and automated design will challenge long-held ideas about human roles.

Trend 2:

DfMA, Offsite, Modular, Pre-fabricated - the terms tend to get used interchangeably, even though they have distinct meanings. For us at Bryden Wood, platforms will become central to construction for the same reasons that they have in car manufacturing, software and transport; but platforms are not necessarily an offsite form of construction.

We've talked about a 'manufacturing-like approach' but that doesn't mean construction will look like a car plant. In modular construction, a largely complete building leaves the factory to be transported to site. Modular buildings do enjoy the benefits of manufacturing and will play a part in the future but there are disadvantages too. Without escorts and advance planning, 3.5 metres is the maximum transportable width, which constrains their size. This leads to problems scaling up from, let's say, a one-bed flat to a family home; or adapting to sites of complex and irregular shape.

Publications describing our approach to Platforms and data-driven infrastructure can be found here: https://www.brydenwood.co.uk/about-us/downloads/123/

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The move to construction Platforms

Everyone can see that buildings are far more diverse than cars. They need to work at different sizes, on varying sites and serve different functions. That said, there are fundamental similarities and constants - and these relate to the human form. There's a limit to how high a ceiling needs to be, or how far useful light from a window can reach. Whether the building is a home or a hospital, these constants still apply. And that's why, for instance, using just 30 types of connector, but working with beams and columns of any length, we can create a huge variety of structures. These can then be customised to produce buildings that look completely different, even though their components and means of assembly are the same.

Construction platforms reap the benefits of manufacturing without the constraints of a modular approach. They generate high volume, constant demand for far fewer components. which creates economies of scale. Waste is hugely reduced, and assembly can be done by workers after relatively brief training.

It's also true that platforms lend themselves to machine learning. As in car making, the capabilities of each component in the platform can be understood and used by the computers to generate ever more efficient solutions. And over time, the components themselves will evolve. What's important here is the way that machine learning and platforms come together, not how much of the process is happening in a factory. In fact, some factory construction is essentially traditional building, only indoors.

Change is going to come, but it is not something we should be afraid of. The way the industry has transformed health and safety, shows what can be done. Like health and safety, new common standards need to be accepted and implemented across the industry, and that will need open debate and discussion. Government is getting behind platform construction, but the detail of how it works will be for all of us to agree.

Buildoffsite collaborate with BSI's Offsite **Standards project with Loughborough University**



Clare Price, Market Development Manager, BSI

BSI recently commissioned Loughborough University to conduct research into standards with respect to the offsite construction sector. This research, funded by BEIS, will inform the development of a road map for the improvement and creation of standards for the sector.

The project has gathered information from multiple sources, including a survey of Buildoffsite members, desk research, interviews with clients, main contractors and trade associations, and a workshop hosted by BSI. The findings of this research are currently being analysed for BSI.

The findings will identify gaps in and challenges caused by existing standards, and scope for new standards, which BSI will use to inform a programme of Standards development in this

area. Further details will be reported on in a future Newsletter Standards can enable the unlocking of innovation, as has been demonstrated by BREEAM and standards relating to new families of materials. We look forward to seeing standards develop in ways which will help offsite construction deliver benefits more widely and more guickly.

Buildoffsite has been happy to support this research and welcomes BSI as a new member of the organisation.

Education & Skills Funding Agency win Client of the Year award

The Client of the Year Award for the London and South East region has been presented to the Education & Skills Funding Agency (ESFA). The presentation took place at an award ceremony on 28 June. The award recognised the leadership shown by the ESFA in driving forward their build programme using Modern Methods of Construction.

The client provided clear pre-construction and project delivery leadership, a consistent approach across all batches, and continuity on strategic solutions and procurement matters. To date, they have 35 schools built or in the process of being built using pre-construction. They have procured three new modular frameworks with a total value of £500 million, generating significant market interest from off-site specialists and tier 1 contractors.

Darren Border, Head of Technical Services at Willmott Dixon, sponsors of the Client



(ESFA - MMC Strategic Framework Manager), Richard Crosby (ESFA - MMC Lead Consultant), Chris Dale (ESFA - MMC Strategic Programme Manager), Darren Border (Director of Willmott Dixon) presenting the award

of the Year Award, commented: "In the client of the Year category, we're looking for Construction clients actively involved in enabling the construction programme, and with strategies for encouraging and rewarding excellence. The ESFA recognise their role as a leading client and have used their influence to best effect to stimulate change in the industry."

ESFA's Commercial Deputy Director Suky Atwal said: "The Modern Methods of Construction Team are delighted to win this prestigious award in recognition of the work undertaken in this sector."

The EFSA will now be put forward to the National Constructing Excellence Awards that will take place in central London on 17 November.

News

London Housing – What Next? Ambasáid na hÉirea Embassy of Ireland Welcome to the Embassy of Irelan London Housing - Wha Next?



This year's Irish embassy event held in May focused on the London Residential market and was yet another great example of the benefit of collaboration within the industry. Through the engagement of influential speakers, the events team were able to showcase the strength of offsite manufacture and highlight to an engaged and enthusiastic audience of invited guests the level of future demand for new homes within the capital.

The event, titled 'London Housing - What Next?', was hosted by His Excellency Mr Adrian O'Neill at the Irish embassy in London, and was supported by Enterprise Ireland, Invest Northern Ireland and Buildoffsite.

A full programme of speakers including HBF, Peabody, Quintain, Liv Consult, Wates, Cast Consultancy and WSP covered a wide range of topics focused on demand and development opportunities currently underway or coming forward in London.

The event programme considered different ways of delivering new homes to meet the GLA's target of 60,000 homes annually.

"The event programme considered different ways of delivering new homes to meet the GLA's target of 60,000 homes annually."

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The challenges of delivering such an ambitious target were considered by the audience during an interactive panel debate with the speakers, which was co-ordinated by Nick Turberville, Senior Business Development Director, at Invest Northern Ireland; Anne Corr, Market Adviser at Enterprise Ireland and Donal Evans, Market Executive at Enterprise Ireland.

Executive Director of Buildoffsite Tim Hall said: "It was an extraordinary line up of speakers, who brought to the programme a wealth of knowledge and experience which made it an event not to be missed." The event was followed by a networking session, which included ice cold Guinness on tap.

Skies without Limits Drones: Taking the UK economy to new heights



"The report estimates that by 2030 as many as 628,000 people may be working in the UK drone industry. By 2030, the report forecasts that 76,000 professional drones will be in use in the UK." PwC has produced a compelling report that provides an overview of the implications of drone-enabled technologies on UK productivity, cost reduction, job creation and improvements to wellbeing and to quality of life. The report anticipates that the technology will impact significantly on the construction and built environment industries alongside other sectors of the economy.

Drone technology is evolving rapidly and is increasingly recognised as a serious and potential game-changing tool to inform rethinking construction processes and services and provide a stimulus for innovation.

Impact

The PwC team estimates that cost reductions from drone usage will contribute to a 3.2% increase in 'multi-factor' productivity across the UK economy and deliver large GDP uplifts in many industries. In the case of construction and manufacturing, this annual uplift is estimated at £8.6 billion.

The impact on jobs will be substantial. The report predicts that initially the combination of drones and automation may lead to job losses but over time the gains in terms of cost savings, productivity improvements and consumer demand generated by drones will create new jobs and have a transformational impact on how we work and live. The report estimates that by 2030 as many as 628,000 people may be working in the UK drone industry. By 2030, the report forecasts that 76,000 professional drones will be in use in the UK.

Elaine Whyte, who led the PwC Team that produced the report, commented: "Drones are taking off in the world of project management - and the potential is vast. Drones are able to do things quicker, cheaper, safer and more accurately, and you end up with better data that has multiple uses. They are already being used on projects but by 2030, there could be an even greater adoption as the commercial application benefits become more widely appreciated and taking the use to an enterprise/portfolio level. For example, a drone in flight can survey existing assets as well as tracking the progress of construction or civil engineering projects, and feed essential data quickly and accurately back to the project manager with direct input to the Building Information model. A drone software platform could become your new project management landing page the place you go to first thing to see exactly where you are on site and what is happening to gain real time intelligence to make smarter and guicker decisions. The use of drones for a project includes stakeholder management, reporting, adherence to schedule, adherence to design, cost control, resource (including contractor) management, and risk and issue management - the skies really are without limits!"

The impact on business

The report identifies that future market leaders will want to be exploring the possibilities of drone technology and setting their strategies accordingly. The report's authors have identified four questions they believe businesses of all sizes should be addressing now:

- How vulnerable is your business model to drone-driven disruption and how soon will that disruption arrive?
- What game-changing openings are there within your market and how can you take advantage of them?
- Do you have the talent, data and technology you will need to do this?
- How can you build transparency and trust into your drone platforms and applications?

Get the answers to these questions right and you'll be best placed to emerge as a winner from the forthcoming drone revolution – a seismic shift that will have major implications for UK citizens, for business, for the economy and for employment. Now is the time to explore and embrace the potential of drones, and to lay the foundations for success in the drone-enabled world of 2030.

The full report can be downloaded from: https://www.pwc.co.uk/dronesreport. Those wishing to raise points of detail with the PwC team can do so through the link to Elaine Whyte shown on the last page of the synopsis: https://www.pwc.co.uk/issues/ intelligent-digital/the-impact-of-droneson-the-uk-economy.html.

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Feedback from Members

Buildoffsite would like to get feedback from Members on their current and planned use of drones, as well as on the opportunities and challenges they are experiencing. We will share this information with other Members and arrange a discussion at a future Direction Group meeting. Your comments can be sent to us via: info@buildoffsite.com.

Comparator – all things to all users



Development Stages

The Buildoffsite-sponsored 'Comparator' model is now in its sixth iteration, having moved on significantly since completion of the UKCES-funded research project. Comparator, which is a web-enabled model, designed to compare whole-life cost and sustainability of traditional and offsite solutions from the feasibility stage onwards. It has been through six stages of development - each new stage prompted by the relentless demands of potential users for a greater degree of granularity in the data being used to generate the output.

The challenge for the developer of Comparator - Buildoffsite member IFPI Ltd, under the direction of Professor Bernard Williams - is how to address the needs of all potential users, while keeping the whole thing user-friendly.

The Potential Users

Comparator is aimed at the needs of:

- · Cost consultants charged with advising clients
- Designers wanting to better understand the economics and sustainability of their schemes
- Developers trying to decide which type of construction process to adopt
- · Offsite providers aiming to use the independent model to demonstrate the whole-life cost and sustainability of their solutions

In all cases, Version 6 of Comparator has to address the cost and sustainability of specified work items in a depth of specification and detail of measurement eschewed in the earlier versions of the model. Progress in this direction has been significant but the extent of the task has led Professor Williams and his team to the pragmatic view that further data to be entered into the model in this current phase needs to be tailored to the bespoke requirements of individual prospective users.

An immediate opportunity has arisen through the interest of a visionary young architectural practice responsible for a £7 million project in the Midlands; Comparator will be used throughout the design development stages, leading up to submission of a planning application later this year.

Action is underway to develop a Civils version of the Comparator model. To this end, a pilot study involving alternative designs for train maintenance pits commissioned by an offsite provider has demonstrated how effective the model can be for offsite providers wanting to present the business case for their wares.

A report on progress will be published in the next edition of the Newsletter.

News

Connect 2 Cleanrooms win Best Cleanroom Facility award

Cleanroom.

INDUSTRY



Connect 2 Cleanrooms picked up the award for Best Cleanroom Facility at the Cleanroom Technology Conference 2018 for its work on the offsiteconstructed, 990m², cleanroom facility for global medical products and technologies company, Convatec.

The judges praised the offsite construction and Building Information Modelling (BIM) techniques Connect 2 Cleanrooms used to deliver this cleanroom project on time, on budget and to a high specification. The Convatec medical technology cleanroom was chosen as the winning entry because of the company's comprehensive project presentation, which was not only broad in scope but also showed careful consideration of aesthetics, energy efficiency and sustainability, while meeting budget and timeline constraints, and making good use of the latest build technology and method. Connect 2 Cleanrooms' Managing Director Joe Govier said: "Winning this award is an opportunity to showcase the added value and quality that offsite construction can bring to the specialist manufacturing environments sector. It has enabled us to produce this market-leading cleanroom solution."

To ensure the cleanroom was aligned with the current facility, where the corridors incorporate windows and doors, a point cloud 3D scan of the entire building was conducted in the initial stages to provide a virtual view of the space. This resulted in the cleanroom being applied efficiently with seamless interfaces. The scan provided the accuracy required to pre-engineer all components of the cleanroom prior to installation, using off-site construction methods to optimise project management.

Connect 2 Cleanrooms used Kingspan UltraTech Precision cleanroom panels, with an ECOsafe PIR core to create a fully flush finish – suitable for the stringently regulated environment. Localised air conditioning and dehumidifier units processed the supply air to fan filter units. This approach meant a significantly lower initial investment and increased energy efficiency. There is enough resilience calculated to ensure continuous operation. Other features include a fully flush panel system, roller shutter doors, bespoke control system including 3 particle counters, BMS integration and more.

For further information on Comparator, please contact Professor Williams by email: bernardw@int-fpi.com.

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The benefits of offsite construction included:

- Accurate interfaces between existing windows/doors
- Ability to maximise window sizes to match existing structures
- · Shortened installation schedule
- Minimal on-site cutting, keeping construction dust to a minimum
- Material optimisation

Off-site construction allowed Connect 2 Cleanrooms to front-end load the project installation process, giving installation engineers more time to focus on valueadded works, saving time and money.

For more information on this award-winning cleanroom facility visit: www.connect2cleanrooms.com.

Hub Updates

















Residential Hub

It is quite common to hear the question: "Is the use of offsite manufactured solutions in housing delivery here to stay?" If you don't know the answer to this question already, then you probably need to engage with the Buildoffsite Residential Hub ASAP.

Since March 2018, Buildoffsite has signed up 21 new organisations eager to join our impressive list of existing Members. Many of these - along with over 50% of our existing Members - are focused on or have a strong interest in the residential sector. Whether client, house builder, developer, contractor, LA, HA, supplier, manufacturer or SME, Buildoffsite - the voice of the offsite sector - is the 'go to' organisation for both private and public organisations who don't want to be left behind in the rush to secure more homes. Our ability to enable housing development and collaboration across the whole tenure range means that via our Membership, we are supporting the delivery of billions of pounds worth of new homes across the UK every year (something we have been doing, albeit on not such a grand scale, for over 15 years).

The last Residential Hub event in Newcastle was a great success, with around 80 attendees. The focus was on creating supply and volume. Our latest event in Liverpool on 4 July: 'Height of Design' was equally successful, in that it looked at medium to high rise development and considered how good design could and has already been incorporated into the construction of tall buildings. Examples of what has been achieved to date and may be achieved in the future were presented by Caledonian, Tide Vision Modular Systems and Elements Europe, which included the UK's tallest residential building.

In addition, we heard from Liverpool John Moores University, Mitsubishi and Meinhardt on innovation and how their organisations are working with the offsite sector. The Panel debate considered the work being undertaken at Liverpool John Moores University, looking at how technology is influencing the increased use of offsite housing and how innovative project management research is being undertaken with support from a number of organisations including the EU and Homes England. The debate addressed the scope within Liverpool for new homes that can benefit from the use of manufactured housing solutions. The panel and delegates considered the key components needed to ensure sufficient supply of high quality homes is delivered in a lean and agile way.

Don't miss our next Hub event on 13 September: https://www.buildoffsite. com/event/home-builders-2020/ in Bristol at the National Composites Centre, which will focus on innovation in housing supply leading up to 2020.



BRIDGES AND VIADUCTS DfMA GUIDE



"Our ability to enable housing development and collaboration across the whole tenure range means that via our Membership, we are supporting the delivery of billions of pounds worth of new homes across the UK every year"





Rail Hub

The Buildoffsite Rail Hub is focused on delivering useful stuff!

Its *Bridges & Viaducts DfMA Guide* is now available in hard copy. An *Overbuild Guide* for building above railway lines (and potential other transport infrastructure) is now under development, led by WSP, who published a report on the opportunity to provide sites for housing in London (entitled *'Out of Thin Air'*) at the end of last year.

In addition to progressing with these two guides, the Rail Hub held a workshop with the HS2 Project team and a range of lower tier suppliers with a particular focus on how innovative solutions may be incorporated into the project. Further work on this is ongoing.

On 11 July a project visit was hosted by Laing O'Rourke at the Crossrail station linking the City's Liverpool Street and Moorgate stations. A fascinating presentation of technologies and design solutions used for surveying, managing dimensional tolerances and complex geometry, along with the rapid installation of a modular platform system was given by the team. The processes adopted involving far fewer people on site and avoided any safety incidents. Comparisons with and lessons learnt from the associated Tottenham Court Road and Customs House stations helped put this into context.

Before the Crossrail site visit, those present were asked to make suggestions regarding what the Rail Hub could do next. These will be discussed with rail sector clients to develop the programme going into 2019. This will be outlined in the next newsletter.

The next Rail Hub meeting will be a progress review for the *Overbuild Guide* to look at what can be done to reduce the cost of creating the structural decks required and then look at how to build on top of them, whilst retaining flexibility for different site constraints and future evolution of developments.

Creating sustainable infrastructure: Extending the service life of structures with low carbon smart concrete



Graeme Jones, MD, C-Probe Group Ltd

C-Probe is a specialist supplier of products and services that not only prolong the service life of structures but also monitor condition and performance for their whole life. Having traded in the restoration market for decades tackling concrete delamination, spalling and cracking as a result of corrosion of the steel reinforcement in various types of construction, including car parks, bridges, tunnels, piers, jetties, wharves and reinforced concrete-framed buildings, C-Probe is well placed to ask the question how can we design for the indefinite life of infrastructure?

Some perspective metrics – corrosion is understood to cost all western economies around 3-5% of GDP (source: UK Government figures, TP Hoar Report of the Committee on Corrosion and Protection, HMSO, London 1971) with the construction sector responsible for 70% of this cost. Globally, £28 billion per annum is being spent on the concrete repair sector (source: https://www.infrastructurereportcard.org).



LoCem® has also been used at Anglian Water to form a low carbon ground slab and ramp for a dosing facility

We need to get smarter with the way we design and manage our structures. Technology exists not only to react to these problems but also to be proactive at the 'birth' of a structure to protect and monitor performance permanently. Cloud-based internet management tools allow data to be accessed, analysed and reported, with management systems controlled remotely with minimal impact and maximised client outcome.

Research and development undertaken by C-Probe in collaboration with Sheffield Hallam University (SHU) and Mott MacDonald over the past eight years has culminated in new products that aim not only to tackle the legacy of disrepair but also to embrace low carbon sustainability within design and construction. The core of these developments has seen the formulation and testing of alkali-activated cementitious materials (AACM) and has seen the investment in AACM binder production facilities in St Helens since 2016.

AACMs (sometimes referred to as geopolymers) are ambiently blended powder binders with feed stocks sourced largely from recycled and industrial waste by-product. When incorporated within a typical mortar or concrete mix design -

with sand and aggregates – these mixes are alkali-activated to produce a hardened concrete that can act either as a repair or new construction build material. These processes also provide carbon emissions savings of up to 80% CO, e compared to ordinary Portland cement (OPC).

The hardening process is not the same as with Portland concrete (where a crystalline CSH matrix is formed) but instead provides an inorganic polymeric material formed through a polycondensation reaction in alkali to yield an amorphous aluminosilicate with very low or no water content. Such a hardening chemistry provides some of its durability characteristics, such as high resistance to alkali silica reaction. freeze-thaw, chemicals and tolerance to extreme temperatures (tested to harden to -5C and withstand heat up to 1200C for 5 hours once hardened).

These features and characteristics are typical and caught the attention of High Speed 2, who subsequently sponsored the development and publication of BSI PAS8820: 2016 Construction Materials -Alkali-activated cementitious material and concrete - Specification.



A unique development of C-Probe's AACMs (LoCem®) has seen their use as a mortar or concrete anode for use in a cathodic protection (CP) system either in impressed current form or in conjunction with zinc to activate as a galvanic anode for long-term corrosion mitigation. Using the LoCem® concrete anode in precast production processes offers the possibility to provide factory-built elements ready-made with corrosion control. Including embedded corrosion rate monitoring allows tracking of performance online, thereby providing management data for control and avoiding future retrofitting and disruption costs whilst retaining the structure's embodied carbon for its extended life.

With industry collaborator and fellow Buildoffsite Member, Shay Murtagh Precast, C-Probe has undertaken several demonstrator projects aimed at showing that the material can be handled conventionally whilst exhibiting normal physical and mechanical properties of strength and workability compared to Portland concrete equivalent mix designs. These have yielded precast tunnel segments constructed using Crossrail moulds to form a full tunnel ring as well as precast beams and slabs.

LoCem® has also been used at Anglian Water in Gazeley, Suffolk delivered from a ready-mix truck to form a low carbon ground slab and ramp for a dosing facility. It has also been shown in sprayed concrete form to be applied successfully using conventional spray concrete equipment.

Its anode form - applied wet-on-wet to Portland concrete substrate - has resulted in a single composite concrete material where corrosion of steel is controlled from day one. This is installed and successfully commissioned within a 25m long bridge U-beam of similar construction to those used at the Mersey Gateway project. This is the subject of a published patent application and C-Probe trademark as WoWSmart® life management technology.

Previous bond studies with SHU, published in Materials and Corrosion (2018; 1-12 www.matcorr.com) in April 2018, details test data demonstrating whole life control that is possible with these materials. According to the study, providing a small protection current density (0.18µA/cm2) from the start of construction maintains sufficient concrete -steel bond to yield demonstrable service lives of structures for over 1,000 years. The calculated operational cost for this method



WoWSmart® life management technology

of delivering CP to new structures is of the order 0.5p per annum per m² with the initial capital cost ranging from 1-5% depending on design and scope. The publication outlines the science behind such futureproofing, with a formula devised that links desired service life with operational CP current density, giving design predictability a new dimension.

Delivering low carbon smart concrete with its future health and well-being controlled from the birth of the structure is the value-added focus for C-Probe, with specific objectives to license its systems technology on a global basis with like-minded industry partners.

Buildoffsite is helping its Members discover the possibilities and opportunities with the principles of structural health monitoring and health care embraced within the recently published DfMA Guide for Bridges and Viaducts: www.buildoffsite.com/outputs/ publications/.

For more information on C-Probe, please contact Graeme Jones by email: GJones@c-probe.com or call: 01744 611555 or visit: www.c-probe.com

Specialist Engineering Training Company Sees Boom in Female Apprentices



Abbiegail Hill, voestalpine Metsec

Following International Women in Engineering Day on 23 June, a national training provider is celebrating increased growth in the recruitment of female engineers to the industry.

The Construction and Design Centre of Excellence (CADCOE) is a specialist training provider in recruiting digital engineering apprentices to the construction industry. In 12 months, the company has taken its percentage of females on programme from 2% to just over 14%.



During the same period, its training provision has been adapted to meet the growing demand for CAD technicians and engineers required to work on offsite related projects. With targets in place to increase this figure again over the next 12 months, Cadcoe wants to encourage more young females to consider careers within the field of engineering.

Cadcoe's most recent group of students to pass its 16-week intensive training included Ellen McCartney a CAD Engineer for M Hassons & Sons and Abbiegail Hill. Apprentice with voestalpine Metsec. Abbiegail will now continue to work towards her apprenticeship full-time with the specialist cold-roll forming company.

Cadcoe Director of Teaching, Lee Drummond spends 16 weeks with each apprentice, providing intensive training in 2D, 3D modelling and BIM, before they join the world of work full-time: "It's been brilliant to see an increase of females on the digital engineering apprenticeship. Cadcoe has been working hard, particularly during the last two years, to change perceptions of a career in engineering and construction, and this is the key to ensuring young people feel a career in this area is accessible and achievable for anyone, with amazing progression opportunities."

Cadcoe is part of the Technical Design Services Group. Its sister company TDS recruits between 2-4 apprentices with Cadcoe every year. Currently, 40% of its apprentice workforce is female. Apprentice CAD Engineers Lexxi and Lora joined TDS in September 2017 and are already on track for very successful careers. They were both employed as part of a recruitment drive to meet increasing demand for design services at TDS, on a range of modular volumetric projects.

Lexxi, 16, brings fierce determination. After being told time and time again by her peers that engineering is not for females, she set out to achieve her ambitions of securing employment and training as a CAD engineer. Working in a male dominant environment has not phased Lexxi or Lora. Lora, 17, states this is one of the most rewarding and enjoyable choices she has ever made: "The fact I'm in the minority being female at work is irrelevant.

What is relevant is the fact that I feel as though I'm part of one big family and everyone is supporting and guiding me, and genuinely wants me to succeed. No-one should ever be influenced by what history tells us males and females are best suited to."

Technical Design Services Group Director Daniel Leech echoes the thoughts of Lee Drummond, commenting: "We all have a duty to promote engineering and construction careers as being inclusive to all. There's no denying the fact that welcoming more females into the workforce brings a new dimension to our teams – all positive. Diversity plays a huge part in our success and enables us to challenge and develop new ways of working. This is a really exciting time to join a rapidly advancing industry and everyone should feel they have the opportunity to be a part of it."

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If you would like to find out more about how the Construction and Design Centre of Excellence works or how they could support you in the recruitment of some of the brightest young design engineers in the UK, contact Business Development Executive Kirsti Wells by email: kirsti@cadcoe.com or call: 01952 605549

McAvoy appoints new Head of Manufacturing and Innovation

David Clark, Head of Manufacturing & Innovation

"The McAvoy Group is an independent. family-owned business and an established principal contractor. It has been providing bespoke offsite solutions and interim modular buildings for more than 40 years."

The McAvoy Group has announced the appointment of David Clark as Head of Manufacturing and Innovation. In his new role, David will lead manufacturing excellence across the Group's two offsite production centres in Northern Ireland, implementing continuous improvement and innovation and increasing capacity to meet demand. He will take responsibility for applying new digital solutions and lean processes to further improve the efficiency and productivity of the offsite manufacturing process, which will support The McAvoy Group's ambitious plans for growth.

David joined McAvoy as Group Design and Engineering Manager in 2012. He progressed to Innovation Manager and was also responsible for the Group's award-winning BIM strategy and implementation. His successes have included leading McAvoy to become the first offsite specialist in the UK to be accredited to BIM Level 2 and spearheading the Group's pioneering use of virtual reality to improve customer engagement in the offsite design process.

Commenting on this new position, Managing Director of The McAvoy Group Eugene Lynch said: "We want to embed innovation across the business to ensure we remain at the forefront of offsite manufacturing in the UK. We are already embracing the new digital technologies such as BIM, virtual and augmented reality, which are set to transform the construction industry. We now want to apply that transformation to the manufacturing process – from the use of robotics to innovative new materials which will take the efficiency and quality of our offsite construction solutions to the next level and offer even greater benefits to our customers. This new role is fundamental to achieving those ambitions."

David has 20 years' experience in manufacturing for the construction sector which has included specialist cladding and structural steel solutions. He was recently successful in achieving an MSc in BIM and Project Management from Queen's University Belfast and also holds an MSc in Manufacturing Management.

For further information call: 028 8774 0372 or email: info@mcavoygroup.com visit: www.mcavoygroup.com

He is actively involved in a number of industry

bodies, including Buildoffsite and the Offsite

Management School, and is an acclaimed

expert in digital construction having spoken

at many high-profile construction events

The McAvoy Group is an independent,

family-owned business and an established

bespoke offsite solutions and interim modular

principal contractor. It has been providing

buildings for more than 40 years. McAvoy

delivers fast-track projects of the highest

guality and in up to half the time for the

healthcare, education, commercial and

infrastructure sectors, with less impact

on the environment and much greater

assurance of completion on time and

on budget

across the UK and Ireland.

News

coBuilder announces Peter Foster as CEO

Contact CEO, Peter K Foster Jnr by email: foster@cobuilder.com mobile: 07467 949976 visit: www.cobuilder.com/en

Pete started at coBuilder UK in April 2016 and for the last four months has held the position of Director of Digital Innovation. Pete has been involved in numerous exciting projects in the UK, most of which are yet to be announced. He is driving the use of coBuilder solutions, reaffirming coBuilder's strong foothold in the UK and working at implementing best practices in some of the most forward-thinking UK contractors and manufacturing businesses.

He is also involved in numerous offsite initiatives and has regularly attended and spoken at offsite-related events, assisting with the promotion of offsite and the use of coBuilder solutions within this sector.

coBuilder UK: Latest developments on working with the offsite industry

The response for digitised data and how it can assist businesses is rising sharply, with the offsite construction sector and Buildoffsite Members leading the way. At coBuilder, we work with all actors in the industry - from Tier 1 clients to manufacturers - and this collaborative approach is one way the offsite industry will truly start to move towards the digital world, and away from the analogue processes and factory methodology that exists in certain areas of the industry.

The recent launch of coBuilder Collaborate has been very successful, with a number of Buildoffsite Members already up and running with this solution. coBuilder Collaborate enables the clients and contractors to deliver checked data, including Asset Information Models with COBIe. Tying this in with coBuilder Deliver, a free solution that enables collaboration with the supply chain, has been vital in project delivery.

Another exciting change that coBuilder is seeing is the use of Product Data Sheets and the goBIM solution to assist in digitising businesses' product data. Using these digitised structured data sheets is enabling businesses to improve and develop their own internal processes.

Pete said: "There have been exciting times at coBuilder, building upon our strength and breadth in the UK, and the strive for standardisation and interoperability. I'm honoured and grateful for the opportunity."

Pete specialises in data solutions, software/ process and business improvements, and offsite construction and manufacturing. He has been actively involved in BIM since 2013.

Prior to coBuilder, Pete worked in the offsite/prefab modular building industry for 16 years, where he was the Head of Digital Manufacturing Implementation at Premier Modular, dealing with process and business improvements, including BIM. He has an MSc in BIM Management from Middlesex University.

Using coBuilder's free plugins to solutions such as Revit and Navisworks, the IFC integrate data into model solution, or the open API, manufacturers and offsite businesses are driving real efficiencies, removing redundant processes and duplication of work, and looking towards digital as a differentiator.

This is just the start of the use of information and digitisation to drive businesses forward; everyone can benefit from this - and the time for change is now!

Howick holds industry education event at Autodesk Build Space

Tom Reed, USA Sales Manager

Automation technologies promise increased labour efficiency, reduced waste and enhanced opportunity for construction customisation. Autodesk's Framing Automation event in Boston, MA in June explored automated digital design-to-fabrication workflows in the context of one of these technologies - Howick's automated steel roll-forming framing machines.

Autodesk invited the Howick team to deliver a short presentation followed by a panel discussion and equipment demonstration, to showcase its state-of-the-art automated light-gauge steel framing technology and, in turn, the value proposition for the adoption of such technologies.

A group of more than 30 delegates from across the USA (Northeast, Northwest, Southwest and Central US) and Toronto, Canada were able to see first-hand the future of automated computation design-to-automated framing production.

The event marked almost one year to the day that Howick introduced its FRAMA 3200 machine into Autodesk's Build Space facility, allowing visitors to experience the innovation up close.

Howick's USA Sales Manager, Tom Reed, explained the core advantages of using Howick's steel roll-forming technology in today's construction, including:

- Construction is between 30-50% faster than traditional methods
- Framing Automation maximises the efficiencies of scarce skilled labour
- Intuitive technology also enhances the abilities of non-skilled labour
- Automation speeds up manufacturing, assembly and installation

"With more than 400 machines in over 70 countries, Howick truly understands the art of steel roll-forming."

Howick shared examples of customers around the world utilising its machines in very different ways, each realising their own unique competitive advantages in their markets.

Howick's certification was discussed, as was the versatility and flexibility of Howick's open architecture software platforms, allowing customers to use the software package that best suits their manufacturing needs. This freedom of software choice means Howick's customers can avoid vendor 'lock-in' and can simply feed CSV data from any partnered CAD framing package.

Howick's innovative technology also offers Revit, BIM and 3D modelling capabilities, keeping its FRAMA machines at the forefront of best practice in modern day construction techniques.

With more than 400 machines in over 70 countries, Howick truly understands the art of steel roll-forming.

To view a short video on how design software interacts with the Howick machine to produce steel frame components, visit: https://youtu.be/VBK9JdH5Fo0.

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If you would like more information on the Howick roll-forming machines, or you would like to be notified of any opportunities to participate in future virtual participation or webinar events, please email Marketing & Export Manager Cindy Posimani by email: cindy.posimani@howickltd.com or visit: www.howickltd.com

Building a supply chain fit for offsite

Marketing and Development Manager for Polypipe

In an industry that has been under scrutiny for some time due to low levels of housebuilding, poor productivity figures and low build-out rates, offsite construction feels like a breath of fresh air, offering some hope that construction in the UK is facing the future.

While the idea of offsite construction and volumetric housing isn't new, it has taken some time to capture the imagination of the industry and the public-at-large – perhaps because of a fear of the unknown, or because of a fear of new methods within what at times is a very traditional industry. Whatever the reason, in order to achieve some of the core benefits that offsite offers, such as the ability to deliver construction in a faster, more cost-effective way, it is going to take a partnership approach from everyone in the construction sector that believes in innovation. Quite simply, we can't apply dated ways of thinking and working to offsite and expect new results.

The UK can be justifiably proud of its construction heritage but to utilise traditional materials or build methods on factory-built projects, means running the risk of removing some of offsite's efficiency benefits laying projects open to the same issues felt by constructors on a daily basis. Provided that volumetric housing producers can find

manufacturing partners that share their desire to build better homes by creating factory-quality solutions, output targets can be hit with costs and production times tightly managed.

For some time, manufacturers like Polypipe have worked to produce offsite systems that ensure consistency, quality and items that can be delivered to site 'just in time' to meet exact delivery schedules. Polypipe has been able to apply this way of working to a broad range of applications, from chambers and tanks featuring integrated benches, guardrails and safety chains, to fabricated drainage stacks, which offer a true plug and play solution for internal soil and waste systems.

Combined with Polypipe Nuaire Air movement products and a complete range of plastic hot and cold and underfloor pipework, Polypipe is able to offer, design and innovate complete solutions to help answer the demand for simpler systems for the offsite agenda.

The way that Polypipe works and the processes followed mirror a lot of what is great about the volumetric approach to offsite construction, but they want to get better and ensure their offer best meets the needs of the emerging offsite housing market. The only way to do that is through meaningful collaboration. Manufacturers like Polypipe believe that offsite construction can make a real difference to the future of the UK's built environment, finding even better ways to service market demand today and tomorrow. Too often component manufacturers are involved in projects at the final stages and asked to simply supply systems that meet specification, which is fine in so far as it goes but the opportunity for innovation and project improvement is lost. With the early input of supply side experts, and the sharing of best practice and knowledge across disciplines, each offsite project could deliver real cost and time savings - further demonstrating the huge potential of this new approach to a market that so often goes for the tried and tested.

Polypipe is excited about what's to come and looking forward to partnering with businesses that share their vision.

Editor's Note

Polypipe will be hosting the Buildoffsite Direction Group Meeting taking place on Wednesday 29 August at their Aylesford, Kent manufacturing centre. The visit will include a factory tour. For Buildoffsite Members, a Networking Dinner will take place the evening before.

The Theme for the Direction Group Meeting is 'Raising Our Game in the Manufacturing Supply Chain'.

More information on this Direction Group Meeting is available on the Buildoffsite website: https://www.buildoffsite.com/ news-events/upcoming-events/ or by contacting Anna Whiting by email: anna.whiting@buildoffsite.com.

Polypipe

For more information on Polypipe please visit: www.polypipe.com

News

Digitising for modular manufacture webinar launched with Trimble

Chris Gatehouse, Regional Sales Manager at Trimble Solutions (UK) Ltd

Buildoffsite and TDS have launched a free 45-minute webinar about the benefits of Trimble's Tekla Structures software for modular manufacturing. 'Digitising for modular manufacture' showcases how the software helps to create light gauge metal framing, an emerging construction technique that is quickly being adopted in the industry. It also covers how Tekla Structures software supports DfMA and offsite construction.

Chris Gatehouse, Regional Sales Manager at Trimble Solutions (UK) Ltd and Dan Leech. Managing Director at TDS Midlands Ltd, are the webinar hosts. Chris said: "Light gauge metal framing is a product from which structures are manufactured from lightweight rolled metal, which is assembled in a factory environment and can include many of the elements that are traditionally installed on site. The element is then transferred to site as a completed unit and installed. We really want to show the efficiency of this method of panelised construction, which is still fairly new to the industry. It can really speed up the whole construction process and with Tekla Structures you can efficiently create BIM models of the project, which streamlines the design process, helping to mitigate errors and coordinate every aspect of the build."

Tekla Structures allows for the walls to be created easily, with accurate clash detection and efficient detailing, which means that when the elements get to site it can be installed quickly and accurately, without the use of heavy tools or equipment. Tekla Structures 2018 brings faster 3D modelling processes, more precise detailing, better control over changes and quicker production of drawings with less effort, in addition to workflow-related efficiency gains.

What's more, the webinar further highlights the benefits of the use of Trimble's Tekla Structures and BIM, with Dan showing examples of modular projects TDS has recently worked on using Tekla Structures.

Discover more about Trimble's Tekla Structures and how modular manufacturers can benefit from improved speed and accuracy, here: https://www.tekla.com/uk/about/webinars/ digitizing-modular-manufacture.

Caledonian secures top spot on the £300 million ESFA Batch C Modular Framework

Caledonian and its partner Architects HLM has secured first place on the modular framework to provide permanent, component-based buildings and facilities for the ESFA's new secondary schools' block replacement programme. Caledonian won this procurement competition with others from the offsite construction sector, securing top spot against 64 other bidders at PQQ stage and then against a shortlist of 5 at ITT stage. Being awarded first place immediately secures two projects with a combined value of £12 million, with potential to realise further schemes within the £250 million funding allocated to the lot

Commenting on this major framework appointment, CEO Paul Lang said: "Our success in this award comes from developing an exemplar design solution, working in partnership with Education Specialist Architects HLM, to address the needs of the ESFA within their funding envelope, whilst demonstrating our capability and capacity to successfully deliver such a substantial programme of work. An important factor in our appointment was our proven record of providing full turnkey design and build solutions, modelling our clients' requirements and managing stakeholder engagement. The Caledonian solution developed for this commission, coupled with our standard processes, systems and in-house technology helps clients to reduce risk, save time and optimise the speed and efficiency benefits of offsite construction. 2019 will see

organic growth in our business, building on exemplary performance from 2018 and we are actively bolstering our teams to support this new business growth. This is supported by recent capital investments in factory and process improvements, including improved MRP/ERP systems. Following a lengthy and rigorous selection process, we are delighted to be making a significant contribution in developing paradigm-shifting standardised building systems for permanent use within the education market place."

Caledonian

News

Caledonian begins manufacture of £14m MOD project for Skanska

Working with Skanska as part of the £300 million military training base regeneration scheme known as project Wellesley, Caledonian's £14 million contract has commenced with the manufacture of Single Living Accommodation (SLA) for students and staff studying at the new camp at Worthy Down, Hampshire, as well as military units relocating from Princess Royal Barracks in Deepcut, Surrey. Work has started on the SLA, which provides 352 rooms divided into 3 blocks to be delivered across 2 phases of work on the site at Worthy Down and also includes the manufacture and installation of a packaged plant module to serve all 3 blocks. The timetable for the delivery of the SLA is: Design – less than 40 days, Manufacturing – 170 days and Site Works – less than 500 days.

Caledonian has considerable experience working with the MOD having delivered over 14,000 bed spaces over the past 15 years, and the award of this contract continues to reinforce the company's presence in this sector. The project is one of several recently secured and maintains high levels of productivity for the business, following the manufacture of 1,500 key worker rooms for EDF at the Hinkley Point Nuclear Power Station site in Somerset. Modules will be supplied in excess of 90% complete, ensuring the client's investment in a volumetric off-site modular solution provides maximum benefit by minimising works required on site. The benefits of producing the modules off site include:

- A build schedule that has been cut by more than 50%
- Consistent quality factory assessed
- Assured levels of airtightness
- No breaks in insulation
- Large internal spans
- Less waste on site
- Less disruption around the site and for nearby residents
- Indistinguishable to an on-site build

Caledonian's CEO Paul Lang said: "We're progressing with the manufacturing phase and can report that we have a permanent team of Skanska personnel based at our offices, who are working collaboratively with our design and engineering teams, as well as overseeing quality processes from the factory."

To find out more about Caledonian's SMART construction solution visit: www.caledonianmodular.com or call: 01636 821645

Overcoming the hurdles to Offsite Construction in Infrastructure: The view from Lucideon

LUCIDEON Materials Development and Commercialization Until recently, a lot of media and other interest in offsite construction has been focused on the housing sector. However, this is not all that offsite has to offer. With the Heathrow Airport extension approved, construction soon to start on HS2 and work underway on the Thames Tideway Tunnel, offsite construction in infrastructure is starting to take centre stage.

The lack of skilled labour is always a factor in promoting offsite construction and all the usual arguments can be used in infrastructure, ie an ageing workforce, workforce safety and quality of build. Offsite construction provides a factory made, repeatable product which is of high quality, and delivered quickly and efficiently. When used in infrastructure projects, issues occur with the repeatability of numerous product designs. Bridges, tunnels, railway platforms, etc are custom designed for the environment and specific site conditions. This prevents replication during the manufacturing and production processes. There are moves within the industry and standards bodies to produce standard detailing and design interfaces, which will aid offsite production.

The Heathrow Airport expansion plan includes the development of four offsite hubs, which will produce and assemble components for delivery to site during construction; this will create a strong workforce with new skills. New production sites require full certification to prove factory production control to ISO 9001 and ensure product quality. New products will also require conformance testing and CE marking before they can be supplied to market and installed in-situ. A popular material in offsite construction projects is precast concrete, which has a range of standard requirements both for the material and product performance. Precast concrete products play a huge role in offsite construction projects, so it is essential that all products are tested to the relevant standards and that quality control systems are adhered to. Standard products will need to meet all criteria for CE marking. The systems which exist to do this are prescribed. Difficulties arise when non-standard products are produced that fall outside of recognised standards and routes to market.

If performance requirements do not exist, it is very easy to produce components that are not fit for purpose structurally or do not possess adequate physical properties, eg durability and fire and water resistance. Non-standards can be designed following Eurocodes but these tend to give quite conservative values; in reality there are differences in material attributes, especially when not using a homogenous product like concrete. A reliable test house will be able to produce a test specification, performance parameters and test regimes in order that the performance and quality of the products can be assessed at acceptable time intervals to ensure their continued quality.

There are several routes available for assessing factory produced products; the easiest is the European Standard. When products fall out of scope of these standards, a European Assessment Document (EAD) may exist. This route is not mandatory but does allow products to be CE marked. If these methods are not available, a third-party certification route can be used.

As time moves on, it is expected that the requirements for products and systems to be tested before being accepted onsite will increase, and the routes to prove product performance will need to be clear and followed.

There is frequently a lack of confidence in product quality and certification for offsite production. As more contracts include these aspects, the controls and awareness of the processes will increase, and confidence in product performance and methods will follow, thus benefitting industry. "A popular material in offsite construction projects is precast concrete, which has a range of standard requirements both for the material and product performance. Precast concrete products play a huge role in offsite construction projects, so it is essential that all products are tested to the relevant standards and that quality control systems are adhered to."

To find out how Lucideon can help at all stages of the design and construction process for offsite and modular buildings, please visit: www.lucideon.com/buildoffsite

Case Study

AMCM Group: Unlocking potential for city living

Jon Wardle, CEO, AMCM Group

Argyle Street is in a prominent location near King's Cross Station in the heart of the London Borough of Camden. This envied street, with its magnificent Grade 1 listed Georgian townhouses, blends city living with style and elegance. City Style Living came to the AMCM Group to act as their Pre-Construction Manager and Lead Designer to convert one of the townhouses into nine luxury apartments, whilst keeping to stringent English Heritage standards. Having worked on similar conversion projects on listed properties, this project stood out as not only being an exciting challenge, but also an area which perfectly matched the AMCM Group's in-house expertise and design knowledge. They were asked to create a design that considered the existing external and internal features of the building, and to maintain its charm and character, whilst placing great emphasis on sustainability and modern building methods and regulations. Sustainability was an essential element of the project and an eco-design was a required part of the brief.

"It was essential to carry out the large majority of work offsite and bring it in at the installation stages – in particular on the refurbishment of staircases and the sash windows."

In addition to the design challenge, a build-strategy was deployed to minimise disruption to the neighbouring properties: some residential and some 24-hour access hotels. After the implementation of the Construction Phase Plan, a programme of logistics was developed to ensure the impact of the building work on people, local businesses and the environment was minimal.

It was essential to carry out the large majority of work offsite and bring it in at the installation stages – in particular on the refurbishment of staircases and the sash windows. The windows were key to the design and many English Heritage restrictions had been placed on the window frames. Other core areas of the design were fire safety standards – especially those relating to the ceilings and feature cornices to ensure they adhered to current standards. When working with original materials in old buildings this is often problematic. The AMCM Group's approach was to work with the client and English Heritage to ensure the fabric of the building satisfied the strict list of criteria, whilst delivering the energy efficiency and spatial requirements suitable for the end user - not only to unlock the potential of the building, but also to sympathetically restore its grandeur. They applied both 4D and 5D processes to the building models, mapping both cost and time delivery to the project for fully integrated and coordinated logistical delivery throughout the supply chain. Digital booking and a tracking system managed all deliveries to site, reducing time wastage and minimising any re-work.

buildoffsite

For the overall project, the AMCM Group started by thinking about the potential residents of the apartments, working hard to understand their needs and aspirations whilst creating a design to keep the integrity and style of the property. Understanding both the clients' and the end occupiers' needs ensured the delivery of a building that will stand the test of time and offer that perfect blend of city living with a touch of luxury.

For more information about AMCM Group, call: 020 8663 0662 email: info@amcm-group.co.uk or visit: www.amcm-group.co.uk

Case Study

McAvoy completes largest single span modular building at Dublin Airport

The McAvoy Group has handed over a new passenger facility at Dublin Airport which was built offsite and, at over 19m wide, is believed to be the largest single span modular building delivered to date in the UK and Ireland.

The new €22 million South Gates passenger boarding area has been developed to meet the huge growth in passenger numbers at Dublin Airport and will be used mainly by Aer Lingus for flights to the UK and continental Europe. It provides seven boarding gates to serve nine aircraft stands and is designed to accommodate around 8,000 passengers.

The management contractor for the project was Flynn Management & Contractors and the lead consultants were Arup. The building was designed by concept architects Kavanagh Tuite and delivered by project architects Blue Sky. The 2,200m² facility was constructed offsite at the McAvoy production centre in Lisburn, Northern Ireland to reduce time on site. It was craned into position in 16 days as 77 steel-framed modules. The building system was engineered to

achieve over 19m wide uninterrupted clear spans, which is believed to be an industry first for modular construction. Hot rolled steel beams were used to remove the requirement for internal columns. The building, which is around 120m long, has the flexibility to accommodate departing flights in the busy early morning period and flight arrivals in the evening. It can also be segregated, so around 1,000 departing and arriving passengers can be processed at the same time. Facilities include boarding gates, a café, toilets, baby changing, and a workstation area with plugs and charging points.

Dublin Airport has experienced a 6% increase in passenger numbers in the past year and a record 29.6 million passengers used the airport in the last year. Commenting on the new facility, lain Heath, Project

Manager at Dublin Airport said: "This is one of the fastest projects we've ever completed at the airport – from planning to the first flight in just 18 months. The finished building speaks for itself. It is a handsome new facility with high quality finishes and clean architectural lines. We were working to a very constrained programme to have the building operational ahead of the busy summer season. The project and its innovative use of offsite construction is a fantastic achievement for the whole team. We were impressed with how McAvoy used BIM and virtual reality. As an airport we have a complex approvals process, but the digital techniques allowed the senior management team to 'walk through' the building and to experience the facility, which facilitated design sign off. In addition to the programme benefits. offsite construction also meant fewer trades working on site and a smaller site footprint. This approach had far less operational impact for the airport and the closure of fewer aircraft stands with reduced timeframes."

Brian Looney, Contracts Manager at Flynn Management & Contractors said: "The principal driver for offsite construction was to reduce the programme. The McAvoy solution allowed the building to be delivered to site within weeks of planning approval. Having fewer trades on site is also a benefit for airport projects such as this where the site is very constrained and the highest standards of security have to be maintained at all times. This project has pushed the boundaries of offsite construction to create a valuable infrastructure facility. The quality of the finished building is excellent and you would never know this is a modular building. The McAvoy Group's production facilities are impressive and their systems are robust. We would welcome the opportunity to work with their team again."

Eugene Lynch, Managing Director of The McAvoy Group added: "This project successfully demonstrates the potential for offsite to improve the efficiency of airport construction, particularly in the development of airside facilities where it is so critical to minimise any impact on existing operations. We can reduce work on highly secure and constrained sites and rapidly install the buildings in a fast and efficient process, with no compromise on design."

McAvoy has already been shortlisted for two industry awards for the Dublin Airport project and its innovative use of BIM and virtual reality.

"The building, which is around 120m long, has the flexibility to accommodate departing flights in the busy early morning period and flight arrivals in the evening."

The Dublin Airport scheme was designed to meet stringent fire safety regulations that exceeded Building Regulations. All mechanical and electrical services including data communications, fire and security - had to link into the existing live airport terminal systems, which was a hugely complex operation undertaken by McAvoy. A specially-designed ceiling solution provides a high standard of acoustics and its chequerboard appearance has created a strong visual feature. Externally, the highly glazed building is finished in two shades of anthracite grey aluminium cladding to complement the other passenger terminals. A screen of grey louvres wraps around the roof to conceal services and the plant rooms.

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AMCM GROUP

At AMCM Group, we provide collaborative construction solutions for the built environment.

We have the in-house skills, systems and expertise to act as Turnkey/Principal Contractor, Pre-construction and Construction Manager, Fixed Price Contractor, JV Partner and Strategic Advisor for all forms of offsite construction.

We have the capabilities and professional talent to offer our clients fully-integrated project delivery services, setting standards in quality, value and time efficiencies from project inception to completion.

Our experienced teams are focused on delivering creative solutions and an unwavering commitment to the highest professional standards, ensuring that our clients gain genuine competitive advantage and quality from design to asset management.

Our aim is to be the Principal Contractor of choice whether you are a manufacturer, supplier or end user, looking to procure an offsite solution for the delivery and maintenance of your assets.

This is supported by a vision which underpins our innovation and commitment to collaboration and we continually seek out new ways to improve our services, whilst providing exceptional value for our clients.

New Member

Alex Johnson **Associate Director** T: 020 7736 7744 E: alexjohnson@assael.co.uk W: www.assael.co.uk

Assael Architecture is an award-winning practice providing urban design, architectural, landscape and interior design services to a range of developers, investors and institutions in the UK and overseas. Based in design studios in London, we work across a variety of sectors including hotel, leisure, mixed-use and master planning, and specialise in residential design across all tenures.

Assael has been closely involved in the evolution of Build to Rent in the Private Rented Sector in the UK since 2008, with in-depth research into the US multi-family model, producing design guides and advising clients, investors and government institutions. Most significantly, Assael alongside a multi-disciplinary team, co-authored the two editions of the Urban Land Institute's 'Build to Rent: A Best Practice Guide' in association with the DCLG's taskforce. We are now one of the leading architects in the sector, delivering developments that have been designed specifically for rent.

"Our experienced teams are focused on delivering creative solutions and an unwavering commitment to the highest professional standards."

With a commitment to providing a professional service that suits our clients' individual requirements and project timescales and recognising the strong synergies between Build to Rent design and offsite solutions, we have refined our design approach to embrace offsite construction and promote its deployment through our residential projects. Applying DfMA principles from the outset of a project enables our clients to opt for an offsite build from an early stage, and Assael's schemes, including award-winning Union Wharf for Essential Living and Blackhorse Mills for Legal & General, showcase the compatibility between our design approach in the rental sector and modular design.

"Assael has refined their design approach to embrace offsite construction and promotes its deployment through

For more information, please contact: Wayne Yeomans Head of Sales & Marketing T: 01773 853 400 (ext 4886) E: w.yeomans@bkstructures. co.uk

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B&K Structures is the UK's leading sustainable structural frame contractor, specialising in the design and delivery of hybrid structures. We create ground-breaking multi-award-winning structures with outstanding green credentials for some of the UK's largest construction companies.

B&K Structures' use of sustainably sourced timber and offsite manufacturing methods reduces the weight of the superstructure, proves betterment to foundation designs, reduces the number of people required for on-site operations and can aid with reduction on the number of deliveries to site.

Working across some of the UK's most forward-thinking construction projects, including residential developments, commercial buildings and the public sector, B&K Structures improves build quality and building health as well as increasing the speed of construction and reducing environmental impact. Previous high-profile projects include SKY's Believe in Better Building, SKY Central, Dalston Lane Residential Development, Center Parcs Woburn and Glaxosmithkline's Zero Carbon Laboratory Building at Nottingham University. Whatever the project, B&K Structures can provide a tailored solution, using cross-laminated timber (CLT), glulam or hybrid structures.

While engineered timber has been established as a realistic option for large, structurally challenging projects, the demands of these projects often require timber to be married with more traditional structural components such as steel and concrete to meet budgets, schedules and architectural constraints.

As the UK's leading hybrid frame construction business, B&K Structures' hybrid buildings offer unrivalled versatility when compared to any other design concepts.

New Member

please contact: Jamie Warren **Business Development** Director M: 07824 510264 E: jamie.warren@barlo.co.uk W: www.barlo.co.uk

barlo RADIATORS

Barlo Radiators has been designing and manufacturing market-leading, Great British radiators for 50 years. From domestic panel, design and low surface temperature (LST) radiators through to tailor-made commercial models, radiant panels and electric systems - our extensive range means there's something to suit any space, budget or application.

Made in Newport, Wales, at Europe's most modern and efficient radiator manufacturing facility, our independently certified Barlo Panel, Barlo Design and Barlo LST ranges push the boundaries of heating performance. They also provide the ultimate selection of shapes, sizes, colours and styles to suit all tastes and décors - from trusted panels and premium feature emitters to sleek vertical models and stylish towel radiators. Barlo panels are the most efficient on the market, using unique third-generation technology. Not only do they boast the lowest water content and highest heat output per square metre, they deliver the biggest energy savings - meaning lower running costs for end users and a reduced carbon footprint.

"Working across some of the UK's most forward-thinking construction projects, including residential developments, commercial buildings and the public sector, B&K Structures improves build quality and building health as well as increasing the speed of construction and reducing environmental impact."

"Barlo panels are the most efficient on the market, using unique third-generation technology. Not only do they boast the lowest water content and highest heat output per square metre, they deliver the biggest energy savings."

For bespoke heating requirements, Barlo Radiators' sister brand Merriott offers highly efficient, premium-quality radiators and radiant panels, which are tailor-made to meet the exact needs of individual projects - for absolute flexibility of specification. Merriott's high-spec commercial heating solutions are renowned for their unrivalled performance, versatility, safety and durability.

In addition to its leading product portfolio, Barlo Radiators offers the industry's fastest delivery times and our expert team provide the very highest level of customer service for ultimate peace of mind.

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bimobject

BIMobject was founded in 2011 in Malmo, Sweden, where it still has its corporate HQ. In 2013, the company won the prestigious Global Red Herring award for innovative technology. At the beginning of 2014, BIMobject became a PLC and is reported via the public company list on the NASDAQ OMX.

As of January 2018, BIMobject has subsidiary companies across Europe, the USA, Hong Kong and Japan – with around 150 direct employees, 50% of whom are focused in development. In addition, there are development and commercial partners in European, EMEA and Pacific Rim locations.

Our core service is to provide a secure hosting platform in the cloud, for BIM models of manufactured items from building product manufacturers in the Construction Industry. Development of this unique platform and associated tools has enabled BIMobject to become the global leader in its field, with a market position close to 10 times its nearest competitor.

This core service has been adapted to produce project clouds (with controlled access to client or project specific data). Bespoke configuration of project clouds is the basis of the BIMobject Hercules solution for Construction Industry clients, consultants and contractors.

Hercules is a unique Platform as a Service (PaaS) cloud-based Content Management System. Content is a mix of geometric, structured and unstructured data, and the solution provides a means of creating and storing this to specific client requirements. Management is the way by which access to the content is controlled, along with an understanding of how the content is being used and by whom.

New Member

Ideal Lifts specialise in passenger lifts designed for modern methods of construction. Established in 2003, we have many years' experience in the lift industry, with people who want to 'do things differently'.

People are the core of our business and we believe in the value of collaborative relationships. At Ideal Lifts, we pride ourselves on offering a partnership approach, in which we view ourselves as part of the build team rather than an external supplier. We appreciate the benefits of long-term supplier relationships, in order to reduce overall costs, increase efficiency and communication, reduce pricing volatility and ensure supply chain consolidation.

"Our core service is to provide a secure hosting platform in the cloud, for BIM models of manufactured items from building product manufacturers in the Construction Industry."

Ideal Lifts provide complete solutions, including our innovative Ideal Lift Frame System which:

- Speeds up construction to deliver the project earlier to the market
- Removes reliance on expensive skilled labour on site
- Provides cost certainty, with no waste
- Is 95% lighter than pre-cast shaft construction
- Enables our clients to provide a much-simplified lift shaft which is designed for offsite manufacture, with fire lining that can be completed prior to site assembly - no on site cutting and patching required

We work with clients from the very start of the process, offering a design and technical support service. Our team can then assist with 'freezing' the lift design details, providing them to the professional team and, with continued technical support, ensuring a successful completion to what is usually one of the most complex parts of a build project.

"At Ideal Lifts, we pride ourselves on offering a partnership approach, in which we view ourselves as part of the build team rather than

- For more information, please contact: **Bjorn Conway** CEO
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HOMES

At ilke Homes, we build and supply modular homes to the UK's housing market using the latest offsite manufacturing techniques.

We operate independently and work with our partners to help them create sustainable communities they can be proud of.

With an ambitious and keen sense of social purpose, our mission is to build better homes and to build them in a better way. Our offsite manufacturing techniques bring additionality to traditional construction methods, enabling us to deliver homes on a national scale.

With a focus on inspiring design we create beautiful, energy-efficient homes, quickly and efficiently, with real families in mind.

Working in partnership with a diverse range of the UK's leading suppliers, housebuilders, developers, RPs and local authorities, we are committed to delivering desirable, affordable and quality homes the UK needs.

New Member

For more information, please contact:

Patrick Hayes **Structural Director** and Offsite Lead

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Meinhardt Group is an international multi-disciplinary engineering design consultancy of 4,500+ consulting engineers, planners and managers across more than 40 offices worldwide. Founded in 1955, Meinhardt has an impressive track record of designing some of the world's most notable buildings and infrastructure.

Established in 2000, our London office provides hands-on multi-disciplinary integrated engineering services delivered seamlessly in the areas of Civil, Structural, Building Services, Façade and other related engineering disciplines.

Our master-planning and urban design capability has developed through the design and implementation of a number of significant multi-disciplinary projects on behalf of a range of clients, which has enabled extensive experience to be gained in offsite construction through a number of recent high-profile projects in both the UK and Singapore.

built environment."

"With an ambitious and keen sense of social purpose, our mission is to build better homes and to build them in a better way."

MEIN-ARDT

Meinhardt UK delivers innovative design solutions for every phase of a project's construction cycle across all sectors of the built environment. Our clients enjoy a personal consultancy service delivered by expert engineers, with hands-on director management and the latest technology to enhance delivery and including the ability to Design for Manufacture and Assembly (DfMA). We are working on some of the most notable projects in London and the wider regions, and operate at the forefront of developing trends in the industry.

"Meinhardt UK delivers innovative design solutions for every phase of a project's construction cycle across all sectors of the

For more information, please contact: **Stacey Green Design and Projects Manager**

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WAGO GmbH is a global company with thousands of products. We are known for the invention of the spring/cage clamp terminal.

WAGO Ltd is the UK and Ireland division of the organisation, with the projects division being part of WAGO UK.

WAGO Ltd has been a direct market player in modular wiring in the UK since 1994.

WAGO launched the 770 Winsta range in 2003. Since then, we have been active within the modular wiring sector, not just producing our own range of products but supplying our plugs to other leading, well known, independent wiring manufacturers.

In 2011, WAGO Ltd launched the WAGO trunking system to a select market and have to date supplied over 50km of trunking to 4 different business sectors:

- Healthcare
- Education
- Retail
- Commercial

Coinciding with the launch of the trunking system was the formation of the WAGO UK Project Division. We are a team made up of construction/engineering biased individuals, who together provide a strong support system for our clients.

We have recently, due to an opening within the market place, developed a residential offering suitable to all types of installation, whether it is offsite or traditionally built, reducing the necessity for skilled labour.

All solutions are fully scalable, from single builds to large hospitals.

We are proud to launch our Modular Solutions nationally to the UK market place, knowing full well that they are tried and trusted products, which have been endorsed by all that have utilised the systems.

Events

Buildoffsite Events August to December

The following is a brief overview of forthcoming events. For more information and to register, please visit the website: www.buildoffsite.com/news-events/upcoming-events/

EVENT:	EVENT:
Direction Group dinner	Direction Group dinner
DATE:	DATE:
Tuesday 28 August	Tuesday 30 October
LOCATION:	LOCATION:
Aylesford	Steetley

EVENT: **Direction Group meeting**

DATE: Wednesday 29 August

LOCATION: Polypipe, Aylesford

EVENT: Member to Member event

DATE: Thursday 6 September

LOCATION: Arup, London EVENT: The Offsite Construction

LOCATION: ExCel, London

EVENT: Homebuilders 2020: Who are the players and innovators?

DATE: Wednesday 3 October

LOCATION: The Composite Centre, Bristol

EVENT: The Offsite Construction Show

DATE: Wednesday 21 November

LOCATION: ExCel, London

"We have recently, due to an opening within the market place, developed a residential offering suitable to all types of installation, whether it is offsite or traditionally built."

buildoffsite

EVENT: Direction Group dinner	EVENT: Large Scale Developments: Will low build rates restrict housing growth?		
DATE: Tuesday 30 October	DATE:		
LOCATION: Steetley	Location:		
EVENT: Direction Group meeting	EVENT:		
DATE: Wednesday 31 October	DATE:		
LOCATION: Laing O'Rourke, Steetley	Wednesday 19 December LOCATION: London		
EVENT: The Offsite Construction Show			
DATE: Tuesday 20 November			
LOCATION:	—		

Events

The Offsite Construction Show 2018 – a fantastic response from the offsite industry!

Following a record-breaking third Offsite Construction Show in 2017, the event has firmly established itself as Europe's largest specialist event for offsite and modular construction. It has become the place to be to do business, for industry professionals to meet and generally to bring this new industry together.

Buildoffsite will be delivering a substantial programme of Seminars and Workshops over both days of the Show to provide invaluable opportunities for delegates to get to grips with the latest developments in offsite solutions and other innovative technologies across all markets.

Tuesday 20 November will be themed as Housing Day, with event speakers drawn from client and supply side organisations to address the challenges and opportunities for offsite solutions to deliver at scale the quality, high performing homes that are urgently needed in the UK.

Wednesday 21 November will be themed as Infrastructure Day, with a corresponding programme of Seminars.

The Seminars will be reinforced by a Programme of Workshops that will demonstrate how offsite and other innovative technologies and practices are being combined to transform the productivity and performance of the UK construction industry.

We can be confident that the next Show taking place on 20-21 November at ExCel, London will be better than ever.

Events

This is what some of our exhibitors thought about the highly successful 2017 Show:

"It's been a fantastic show this year - we've met lots of architects and developers"

TDS Midlands

"Our first time at the Offsite Construction Show and it's been absolutely fantastic for us"

Creagh Concrete

"We've got some fantastic leads and it's been very worthwhile"

Poppers Senco

"We've been able to present our brick slip system to a lot of very interested potential customers, so we've been really busy for the two Show days"

Modular Building Automation

There will be lots of new companies and initiatives at the 2108 event, so come along and see many first-time exhibitors showing their offsite products and solutions. This will include companies such as Lindapter, Sikla, Britlift, Frameclad, City Lifting, Lucideon, coBuilder, Istidama, Proctor Group, NationWide Windows, Hampshire County Council, C-Probe, Carnehill Contracting, WAGO and Emtec Products - and there are many more still to come ...

Find out more about Structural Timber in our new STA-sponsored Structural Timber Zone.

There will also be a new series of case studies and presentations in the Offsite Show Theatre, presented by companies such as WAGO, the Offsite Academy, Lucideon, Tekla, Envirobuild and StrucSoft.

we've been very busy for two days" Extraspace Solutions

- "The level of interest in our systems and the services we can offer has been very encouraging. It was well worth coming" Modulek
- "The volume and quality of contacts has been absolutely superb. We've had many domestic enquiries but also interest from abroad, including Brazil, USA and Russia" Knauf
- "It's been very productive and we've got a lot of valuable, meaningful leads" Yara

OSCS is the only UK event that brings together the client and supply side for all sectors of the rapidly expanding offsite construction sector. The OSCS is a show for all sectors and provides a business to business networking opportunity for those funders, clients, designers, constructors and suppliers who wish to improve the quality, performance in use and value of construction - both building and civil engineering.

The Offsite Construction Show is the show for professionals working in or with the construction industry and delivers a really high-quality audience who are all either using or looking to use offsite construction in their latest projects.

We look forward to seeing you at the show. Please visit the website: www.offsiteconstructionshow.co.uk for the full programme in the coming weeks

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"It's been a great experience for us and

TO REGISTER FOR THE EVENT: https://offsite2018.smartreg.

co.uk/Visitors/Visitors/register

TO VIEW THE LATEST PLAN:

https://floorplan.live/interactive/ shows/546/views/3/plan

FOR MORE INFORMATION ON THE OSCS, CONTACT:

Paul Shelley: 020 3086 9296 ext 3

Eddie Milton: 01327 226412

The only Show in the construction industry calendar wholly focused on addressing the information and product needs of the fast-developing offsite construction market

A must-visit for anyone involved in any aspect of the construction industry

Visitors can see what is new in the market and demonstrate why offsite is the UK's fastest growing construction method

Make sure you put 20/21 November at ExCel London in your diary!