

THE VOICE OF THE UK OFFSITE INDUSTRY

*build*offsite

DURABILITY

**THE DESIGN
LIFE OF
MODULAR
HOMES**

**Modern Methods
of Construction
can deliver
through the
planning system**

**It's time to make
that leap to
world-leading
construction**

**The Choice Factory:
Kier's new offsite
solutions publication**

CONTENTS

APRIL

MMC can deliver through the planning system 04

Arup looks for the first time at how the role of the planning system could adapt to facilitate the delivery of MMC

Viva la révolution 10

How New Zealand company Howick is helping shape exponential growth in light grade steel construction

Member News

McAvoy wins BIM contractor of the year 14

Elements Europe wins contract for Circle Square, Manchester 16

Caledonian awarded £38M schools project 18

Buildoffsite's Governing Forum members join skills ambassador programme for digital construction 20

Major milestone achieved for world's tallest modular towers 23

NG Bailey reaches 1M riddor free hours at its offsite facilities 30

Premier Modular give an insight into UK's largest modular council housing development 32

Technical Design Systems group formed to pave way for collaborative construction 34

Elliott supports DfE framework 36

Just in time - Thanks to Tekla and Modular Construction 38

Polypipe supports ZedGeneration students in leading affordable housing revolution 40

Collaboration between members

Berkeley Modular appoints Autodesk 42

Berkeley Modular leverages knowledge based engineering technologies 44

New Consortium launched to pioneer greater use of offsite construction for primary schools 46

Meet our New Members 48

Upcoming events 55



12

How less M&E can add value to offsite buildings

What do you need from your M&E Design when designing for offsite? Less M&E.



08

It's time to make that leap to world-leading construction

The government has long known about the crisis in construction





06

The Design Life of Modular Homes

Modular homes currently go through an assessment to allow the durability of a building envelope to be categorised as having a 60-year design life guarantee



Joe Dyde, Business Manager

Welcome to our brand new e-magazine, looking at the latest news and opinion from our members and the wider industry.

There has never been more emphasis, coverage, and discussion around MMC and offsite that we certainly feel the industry is on the cusp of significant developments. Within this newsletter, we'll be hearing about how our members, supported by Buildoffsite, are approaching the challenges facing the sector; the skills shortage, manufacturing, planning and procurement and solutions to these. Fantastic work from our members, and furthermore, the collaboration between, is helping us tackle and overcome these perceived hurdles.

The recent emergence of our digital and design focused working groups, led by our members, highlights the appetite for this continued collaboration - working together to overcome challenges as a whole rather than individually.

Internally, the team and our Governing Forum have been working hard to produce our 3-year business plan which we will be presenting and sharing a summary of to our members over the coming weeks.

It's been a pleasure to welcome so many new members over the last few months, and you will hear from them later in this edition and an opportunity to meet and network with them at our future events.

I am personally hugely appreciative to everyone who has contributed to this edition, within the Buildoffsite team and our network, and hope you find it an enjoyable and informative read.



26

The Choice Factory

Kier's new offsite solutions publication



MMC CAN DELIVER THROUGH THE PLANNING SYSTEM



Imagine a system where paper-driven planning applications are replaced with designs direct from digital platforms, selected by the buyer and pre-agreed with the local council; and once consented, designs are sent straight to the production line.”

Katie Kerr, Associate in Arup's Integrated City Planning team

With the construction industry struggling to meet the government's target of delivering 300,000 homes a year in England by the mid-2020s, it is increasingly looking towards Modern Methods of Construction (MMC) as a way of meeting this demand.

In a research paper / report due to be published this month, Arup looks for the first time at how the role of the planning system could adapt to facilitate the delivery of MMC. Here, Katie Kerr, Associate in Arup's Integrated City Planning team, shares some of the initial findings from this research.

It's well known that Modern Methods of Construction (MMC) has the potential to play a vital role in tackling the housing crisis. It can also assist in meeting numerous planning policy objectives, such as increasing the variety of houses and speed of delivery, enabling delivery on brownfield and challenging sites, improving build quality and reducing disruption caused by construction. However, there is even more potential for MMC to align with wider digital transformation of the planning system to revolutionise the way homes are planned for and delivered. By agreeing the parameters of MMC homes upfront with the local council and setting these out in a Design Code or Local Development Order, applications could be

semi-automatically determined in a matter of days rather than months, drastically reducing the decision-making process. This approach is already operating well at a limited number of sites across the country including Graven Hills in Bicester and Beechwood in Basildon.

But in order to move to this streamlined system, which not only benefits developers and manufacturers but could massively reduce the burden on an already constrained planning system, there needs to be a change in both attitudes and approach. MMC is flexible enough to respond to local vernacular and, for some sites, matching local materials and traditions will be appropriate, but elsewhere there could be a shift to a more modern design. We know from developments such as Graven Hills that there is an appetite for this. To be most adaptable and effective, MMC homes might not look the same as traditionally constructed homes. This requires local councils to be open to new designs, but also pragmatic when determining applications - local labour conditions, for example, might be challenging for developments constructed off site.

MMC also provides local councils with the opportunity to deliver not only the right number of homes to meet their demand, but also the right type of homes to best meet the needs of residents. MMC can be used to deliver adaptable homes which can be

modified over time, allowing families to stay in their units as their needs change. It also fits well with mass customisation which allows buyers to own their designs and results in more diverse developments, potentially increasing local support. It can be used to deliver social homes and Private Rented Sector properties - increasing delivery rates by diversifying products without being constrained by market absorption rates. Furthermore, with increasing pressure being put on local councils to deliver homes on their own sites, they are well placed to adopt and promote MMC themselves - developers and manufacturers should take up the mantle of promoting the wide-ranging planning benefits of MMC.

The MMC revolution is already underway, but to really allow it to become an everyday delivery method, all parts of the housing system need to align - and planning is a vital component of this. Developers, manufacturers and local councils need to work together to change attitudes and introduce a streamlined planning process to allow for MMC, which has the potential to bring about real change in the industry.

**For further information please visit:
www.arup.com**



Modular homes currently go through an assessment to allow the durability of a building envelope to be categorised as having a 60-year design life guarantee. This often involves the proof of performance of the individual components that form the building envelope, as well as a desk study assessment.

To differentiate between a traditional build and a modular build design life, there are a number of different test programmes that can be utilised to prove the performance of a modular building. These test programmes deal with the performance of the cladding as a system, rather than individual components. It's important to remember that testing each element of a system is not adequate and systems need to be tested in their entirety. There are a number of recognised test standards that allow the durability of the whole system to be proved; they examine the interaction between the components and their compatibility.

Currently, a traditional build will be considered to have a 60-year design life if the building passes the current building regulations which do not prescribe the classification of the materials. As a result, we see material failure where inappropriate materials have been used, particularly with respect to the choice of the bricks and mortar used in the outer skin; under strength mortar and bricks that do not have the correct frost classification.

Modular builds can take advantage of the different methods of proving system performance. A series of European Assessment Documents (EADs) provide test methodologies for proving a 25-year plus serviceable life, however there are still gaps as many systems fall outside of the prescribed

THE DESIGN LIFE OF MODULAR HOMES

systems to which the EADs reference. For example, the standard for claddings does not permit a wet finish to be applied so will not allow brick slips or mortars, whereas another standard allows a wet finish but insists on a drained cavity. Nevertheless, elements of the standards can be pulled together to provide a justified programme which would enable a 25-year plus assessment.

At present, to extend a plus 25-year classification to a defined 60-year design life, a desk study is required to assess all of the individual and ancillary components involved in the construction of an outer skin. This ensures that they all have their own certification and extended design life.

A real benefit would be to take this further than the 60-year design life, and perhaps extend this to 100-years. In order to do this, there would need to be agreement from certain stakeholders, including, test labs, certification bodies, insurance guarantors and manufacturers. It should be possible to extend the simulated weathering programme to show compliance to greater than 50-years, and the individual components having gone through certification, will have their own design life of plus 60-years. This, along with a maintenance and assessment schedule guaranteed by the manufacturer and insurer, could be used to generate a 100-year assessment. Moving forwards, this could be a great differentiator for the industry and finally banish the old legacy of pre-fabricated housing being poor quality, cold and temporary.



It's important to remember that testing each element of a system is not adequate and systems need to be tested in their entirety"

**For further information please visit:
www.lucideon.com/buildoffsite**

IT'S TIME TO MAKE THAT LEAP TO WORLD-LEADING CONSTRUCTION

The government has long known about the crisis in construction.

Like all of us, it's well aware of low productivity, financial problems and skills shortages, but what's new is its approach.

In one week they announced a £72m investment in the Construction Innovation Hub (CIH) and called for evidence on proposals for a platform approach to design for manufacture and assembly (P-DfMA). With this, the government will "seek to leverage its buying power to accelerate innovation and the adoption of industry best practice", according to the Infrastructure and Projects Authority.

The principle of a platform approach will be familiar to anyone who has played with Lego or assembled Ikea furniture. Sets of components that are designed to work together can form an almost infinite variety of different structures. In construction that means 'kits of parts' that can be used to build just about anything.

That in turn dramatically upscales and extends demand for the components in each platform system – giving manufacturers a much bigger prize to compete for, with substantial economies of scale.

Manufacturing is not just part of the process, but the model for it. Components are assembled on site, which is made far simpler and safer by design for assembly. A building site will never look like a factory, but all the important elements are the same – including digital design and shorter training periods for workers.

Now for the tricky bit

With so many benefits, there's now increasingly wide agreement that P-DfMA is the way forward. However, implementation is going to take some work.

First, P-DfMA needs to be scaled up and the Transforming Construction Alliance (the Manufacturing



*Jaimie Johnston is a director at
Bryden Wood and
design lead for the Transforming
Construction Alliance*



For Vastint UK, Bryden Wood launched a comprehensive model of their new 26-acre waterside development near Stratford, Sugar House Island. Bryden Wood were the executive architect and chief engineer and used BIM to provide a single, collaborative 3D design environment for the entire site. The work was recognised by BIM+ as moving BIM to the future.

Technology Centre, Building Research Establishment and the University of Cambridge Centre for Digital Built Britain) will lead this effort through the CIH.

We will identify design patterns across the government estate to find one really good solution to a problem, not a multiplicity of incompatible and resource-intensive, different ones.

Working with the Manufacturing Technology Centre, we will end up with agreed common standards and open-source designs that manufacturers and constructors are happy to work with. Concerns around warranties and insurances also need to be resolved with the help of the Building Research Establishment.

Everyone benefits

The huge shift to BIM shows that the industry can implement major technological change, and there's more coming. Machine learning, AI, generative design, the internet of things and 'smart' assets all need to be adopted in a coherent way - something the Centre for Digital Built Britain will lead on.

The time to make the leap forward has come, and we've got to make it together. Not everyone will get all of what they want but, overall, everyone benefits.

Government wants better value for money, productivity and certainty. Lower-carbon and high-quality jobs are also within reach. All that can come from P-DfMA and, if we get it right, the UK will become a world leader in technology-driven construction.

The state is helping us to deliver, but also challenging us to show that we can act like partners as automotive or aviation do. So let's seize the opportunity to define the industry we want to have in five or 10 years.

“

Not everyone will get all of what they want but, overall, everyone benefits”

**For further information please visit:
www.brydenwood.co.uk**

VIVA LA RÉVOLUTION!

HOW NEW ZEALAND COMPANY HOWICK IS HELPING SHAPE EXPONENTIAL GROWTH IN LIGHT GRADE STEEL CONSTRUCTION

As world leaders in light gauge steel (LGS), New Zealand based Howick Ltd has sold roll forming machines to 75 countries, so the company is particularly well placed to gauge the dynamics of the sector at a global level. Howick has experienced exponential growth in both demand for expertise and orders for their machines in recent years. That demand is coming from all corners of the world too, so it is not just region specific. What's more, it's across both the commercial and residential sectors.

LGS has been used successfully in construction for over 60 years, so what's driving the dramatic increase in interest now? Howick puts this down to increasing confidence in the sector based on clear evidence of steel's high efficiency, lower wastage and customisation opportunities.

Howick steel framing: speed and efficiency among the key benefits driving growth



Looking for LGS technical know-how? Talk to Howick today

For more information on the Howick roll-forming machines and the advantages of framing in steel, visit howickltd.com or email deon@howickltd.com

Hinkley Point C: Onsite accommodation campus in LGS completed in just 8 months.



just over 9 weeks into the build, the traditional homes had just a shell constructed. Icarus' (now re-branded to Intelligent Steel) LGS homes by contrast already had windows, doors, stairs, internal walls and first fix complete.

On the same site in Gateshead, four modular homes built by ilke Homes – constructed with LGS – are already in place. ilke Homes employ a refined production process that takes its cues from automotive manufacturing, applying LEAN principles to optimise build times without any compromise to quality.

In a further example of how quickly LGS construction can come to life, even for major builds, Caledonian completed an accommodation campus at the Hinkley Point C site in just 8 months. Opened on schedule, the campus includes 510 beds, a restaurant and a gym.

STEALING THE ADVANTAGE: BUILDING WITH LGS IS PAYING DIVIDENDS FOR COMPANIES LIKE INTELLIGENT STEEL IN THE UK

In many parts of the developed world, there are intense pressures on housing supply. Within the UK alone, it's well documented that the government is targeting 300,000 new homes each year by the mid-2020s. Targets like that make the cost, precision and efficiency of LGS construction methods particularly attractive.

Whether it is with offsite volumetric builds, pre-assembled panellised walls or offsite manufactured steel profiles to be assembled on-site, building with

LGS is helping builders bridge issues of cost, on-site labour and efficiency. And those that have already adopted LGS know that the switch to steel framing is surprisingly easy – especially given it is now an integral part of apprentice training in many parts of the world.

Howick's steel framing can be designed and manufactured in order so pre-assembled steel packages can be delivered and lifted straight from the lorry in sequence. With all framing components produced being dimensionally accurate, no rework is required, leading to faster build times.

A current development at the Gateshead Innovation Village, a live research project to build a community of homes using a mix of traditional and modern construction methods, is a powerful testament for these claims.

Simon Williams, Senior Delivery Manager for Group Home responsible for the development, recently published a progress update on YouTube. At the time of the update,

“There’s clearly a drive to adopt smarter and more efficient construction methods. We’re seeing a sizable upswing in demand for both our technology and know-how. After over 40 years of innovating and working to support the industry, we are well positioned to help as customers take advantage of the opportunities” **Nick Coubray, Howick CEO**

HOW LESS M&E CAN ADD VALUE TO OFFSITE BUILDINGS

By Brian Morris, Director at Quarantadue Ltd

At the start of the design process for an offsite project, what is the last thing anyone thinks about? Usually it's the M&E because it's always problematic, never fits first time and is problematic on site; slowing down the finishing stages of the project.

There are many reasons for that thought process. M&E designers are not seen to be user friendly, don't get involved in the detail and leave it all to the M&E contractors to sort out on site who will then take commercial advantage of any shortfalls late in the process.

It's true some enlightened manufacturers are starting to see the light and change this traditional approach but even some of those companies with the largest investments in factories are still employing traditional M&E systems. This begs the question, Why?



Why invest heavily in new modern methods of construction and then install the same traditional M&E systems which have been employed since Victorian times? The M&E system in a building is analogous to the engine of a car. These days you simply wouldn't build a car that needs a starting handle. Why do that for a modern building?

WHAT DO YOU NEED FROM YOUR M&E DESIGN WHEN DESIGNING FOR OFF-SITE?

LESS M&E.

Reduce the pipes and wires and the M&E systems become simpler and easier to integrate into the manufacturing process. This doesn't mean delivering a building with less functionality but the converse; a building that provides a comfortable internal environment and is more energy efficient.

The key to achieving that is designing to "true" Fabric First principles and not an approximate Fabric First for marketing purposes.

To achieve a Fabric First building there needs to be a detailed option appraisal of the whole building so that the optimum decisions are made, including the M&E systems. The use of Dynamic Simulation Models (DSM) are extremely beneficial at this stage as it allows the objective analysis of all the following aspects holistically:

- U values
- Air permeability
- Glazing solutions
- Heating
- Summer time overheating
- Energy consumption (& the use of batteries etc)
- Carbon emissions
- Renewable technology
- Capital Cost
- Cost in use

At this point don't even think about "pipes and wires" but invest in proper strategic design which will pay dividends at the manufacturing stage. Often, cost in use is not considered but it has a potentially significant value to the product. Incorporating technology with quantified predicted

savings can add real value. Again this is no different than selling different variants of the same car.

If the optimum solution is feasible as “all electric” (which it certainly is for housing) there is a significant reduction in manufacturing complexity.

It's assumed that detailed design is carried out in a digital BIM environment leading to 3D designs being used in the manufacturing process. It's essential that the M&E design is fully included prior to manufacture. Leaving any aspect of the M&E until later is detrimental and impacts on the quality and value of the completed building.

ASSEMBLY

By using modern modular plug and play systems the need for skilled electricians and fitters (& their cost) is reduced. Simple adjustments to design can bring huge benefits. For example in dwellings the position of the soil stack and the relative position of the bathrooms and kitchen are crucial. By optimising the distance from the soil stack to the kitchen and bathrooms can reduce the number of soil stacks. Reducing these is beneficial as they are often problematic during installation on site and can impact on the installation of the modules or flat packs.

As a result of this approach, the majority of the work can be carried out in the factory by trained installers and checked/approved by qualified personnel. Equipment and installations can be easily and reliably pre-commissioned in the factory before going to site. In the process the skills gap risks are reduced. It also avoids having to employ M&E contractors and the ensuing risk of additional cost and delays.

GOVERNMENT POLICY

The Government's Construction Sector Deal Published in July 2018 sets out many aspects which appear to encourage Offsite Construction as there is an emphasis on:

- Digital Techniques
- Offsite Manufacturing
- Whole Life Performance

However, there needs to be more actions to underpin this. The Public Sector could do more to lead on this with procurement models that consider the Whole Life Cost of Buildings.

By properly evaluating Whole Life Cost as part of the procurement process it would drive change towards offsite as it is entirely within the grasp of the offsite industry to embrace the Digital technologies which underpin this. The DSM processes can predict life cycle energy consumption (& cost) and the use of data capture can provide evidence of the performance of buildings based on key assumptions. From a regulatory perspective, Government revisions to Part L of the Building Regulations stalled as did the path to zero carbon homes. This contributes to encouraging poorly performing traditionally constructed buildings. We await the confirmation of the timetable for revision to Part L and with it the recent proposed changes to SAP which will only be implemented with the next revision of Part L.

A simple Regulatory change would be to enable Passivhaus certified buildings to be deemed to comply with Building Regulations. This would be a huge benefit to offsite construction as many offsite housing products (particularly) built to “Fabric First” Principles are already meeting Passivhaus or near Passivhaus standards. The current crude SAP compliance tool does not reflect the true operation of the building or reward offsite construction methods.

Continuing planned reductions in carbon emissions coupled with assessing Whole Life Costs would start to drive change in favour of the offsite industry as traditional construction would find it increasingly difficult to compete.

SUMMARY

In essence the M&E can add value to the building by designing for manufacture and not construction. Investing in design pays significant dividends and it is much easier to achieve this in a factory than it is with traditional construction. Designing for Manufacture or Construction require fundamentally different approaches which need to be applied to the M&E as well as the fabric. Upfront detailed Holistic design is the order of the day.

By undertaking a true design for manufacture (which includes the complete M&E systems) significant benefits will accrue:

- Capital Cost optimised
- Optional sales options (providing added values via predicted running costs).
- Skills gaps issues addressed
- Energy efficiency/Whole Life Cost optimised
- Carbon emissions reduced

All these benefits apply across all sectors. For those targeting the Affordable Housing sector it enables truly affordable housing to be produced with significantly reduced energy bills. There is a knock on benefit of reducing fuel poverty.

All these factors build into the value of the product. Changing the approach to designing the M&E systems will have a disproportionate and beneficial impact on the value of the completed building.

MCAVOY WINS 4TH AWARD FOR DIGITAL CONSTRUCTION TECHNOLOGY

The McAvoy Group, one of the UK's leading offsite specialists, has won a fourth award in recognition of its pioneering work in applying digital technology to offsite construction. The Group has been awarded BIM Contractor of the Year at the BIM Awards.

These awards promote the digitisation of the UK building industry, recognising digital construction excellence and rewarding organisations that implement innovative technological solutions in the built environment. Innovators and pioneers of digital construction are celebrated in a number of categories, showcasing outstanding achievements from across the construction industry.

According to the judges, "The BIM Awards judging panel selected The McAvoy Group's award submission based on its thorough interpretation of its achievements in BIM delivery. There is clearly an excellent strategic-level interest in the use of BIM in its offsite operations and we saw that McAvoy is doing things differently from other contractors, which gave it the edge to winning this award. We also felt there was a future direction and forward-thinking nature to the submission. A well-deserved winner."

Eugene Lynch, Managing Director of The McAvoy Group, said, "We have invested significantly in our IT infrastructure. Our digital strategy and commitment to innovation are fundamental to achieving our

ambitious plans for growth. The benefits to our customers and supply chain partners of the new technologies are proven - from enhanced collaboration in the design process to improving communications and co-ordination at project level."

"To receive such an important industry award is just fantastic and further well-deserved recognition of the talents and commitment of our brilliant innovation, design, production and project teams who have embraced a host of new technologies."





McAvoy is now applying the digital transformation to its manufacturing operations and is looking at how virtual reality and robotics can be used to further enhance training and production efficiency.

The BIM Contractor of the Year award looked for evidence of adoption and implementation of digital construction technologies, supply chain management and data co-ordination across projects. McAvoy initiatives recognised by this award include:

- Use of a common data environment to share, control and collaborate with all project stakeholders
- Site and manufacturing teams now equipped with tablets to collect live data to manage health and safety, quality and project or manufacturing progress in real time
- 3D intelligent modelling to better

communicate, validate and co-ordinate the design of each building

- Virtual reality to enhance stakeholder collaboration in the design process and facilitate safety training of production staff in the factory
- Digital scanning of projects at handover

This latest award to McAvoy follows its success in winning the Best Virtual Reality BIM Award at the RICS BIM4SME Awards; the award for the Best Use of Technology at the British Chamber of Commerce Awards, and the Technology Award at the Northern Ireland Chamber of Commerce Awards in recognition of the Group's ground-breaking work in the digital transformation of construction.

“

There is clearly an excellent strategic-level interest in the use of BIM in its offsite operations and we saw that **McAvoy is doing things differently from other contractors, which gave it the edge to winning this award. We also felt there was a future direction and forward-thinking nature to the submission. A well-deserved winner.**”

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

ELEMENTS EUROPE WINS CONTRACT FOR CIRCLE SQUARE, MANCHESTER

Elements Europe has successfully won a contract with John Sisk to deliver bathroom pods to a residential development in Manchester.

Project Description: 1206 Bathroom Pods

Elements Europe will manufacture and deliver a total of 1206 bathroom pods for a residential scheme in Manchester's newest neighbourhood, Circle Square.

Circle Square is being developed by Bruntwood and Select Property Group, and is located on Oxford Road on the site of the former BBC building in Manchester city centre.

Elements Europe have manufactured two prototypes for the client to approve before production starts on the full order.

All bathroom pods will be manufactured floorless as a request from the client to allow for a suitable integration into their floor finishes. Elements Europe has worked closely with the client on the finish of the bathroom pods which feature bath/showers, wall hung wcs and mirrored vanity units.

Circle Square is an eight year project which is to be delivered in three phases. It has been carefully designed to create its very own community space which is active and atmospheric. When fully complete Circle Square will be home to serviced apartments, shops, multi storey car park, PRS apartments and a hotel.

**For further information
please visit:
www.elements-europe.com**





CALEDONIAN AWARDED £38M SCHOOLS CONTRACT



Haygrove and SFG are both large projects, which, alongside our other recent new business wins, underpin our future growth strategy,” said Paul Lang, Chief Executive Officer of Caledonian Modular. “We have worked closely with the DfE and the schools, as we do on all our education projects, to deliver a modern, efficient teaching spaces that will open up further opportunities for young people in the area.”

Volumetric modular building specialist Caledonian has secured two large school projects in quick succession with a total order value of £38m.

Haygrove School and The Sir Frederick Gibberd College were secured by Caledonian under Department for Education (DfE) frameworks.

Caledonian was selected for both projects because it offered a full turnkey package including lead design, planning, and installation, all the way through to hand over.

Alongside this was the company’s track record of delivering other high quality teaching facilities, including whole schools, on time and within budget using its innovative modular building system.

Caledonian will create a brand new £29m secondary school at the Sir Frederick Gibberd College at the site of the former Passmore School in Harlow, Essex. It will comprise a 1,200 place secondary school built over three storeys including a school hall, dining hall, drama studio and a 500 place sixth form teaching area as well as sports facilities and all associated external works and pitches. The design incorporates concrete floors and, being a component-based system, allows greater flexibility in design whilst delivering a DfE compliant solution as well as all the efficiency and time saving benefits of a modular build. Work being undertaken at Haygrove School in Bridgwater will





involve utilising Caledonian's component based school solutions to replace the main school building with modern and efficient teaching environments. The construction work will be undertaken while the school remains open and works will be carefully planned to ensure minimal disruption.

The three-storey building will consist of classrooms, double-height hall and studio spaces, offices, kitchen and associated rooms for educational purposes, along with enabling, groundworks and external works.

As part of Caledonian's consultative approach, the design of SFG and Haygrove School were informed by standards supplied by the Department for Education and through a series of engagement meetings with the schools and stakeholders.

Both schools incorporate factory installed concrete floors to deliver an acoustically compliant, comfortable, safe and durable environment for occupants and up to 96% of the work on each module is completed by Caledonian in its quality controlled factory facility before being delivered to site.

At the same time as the modules are being manufactured, Caledonian, operating as the Principal Contractor, will be carrying out groundworks and other works on site, meaning handover can be up to half the time it would take a traditional build.

BUILDOFFSITE'S GOVERNING FORUM MEMBERS JOIN SKILLS AMBASSADOR PROGRAMME FOR DIGITAL CONSTRUCTION

The Construction and Design Centre of Excellence (Cadcoe) recently launched a brand-new initiative to look at innovative ways to tackle the construction industry skills gap, whilst creating the best opportunities and pathways for next generation digital engineers.

Already working in partnership with Dudley College of Technology, to deliver its fast-track digital construction and design apprenticeship, Cadcoe believes that providing relevant education and skills for the industry now and in the future, can only be achieved through a collaborative approach.

The 'Future Skills Ambassadors Programme', brings together industry leaders and educational specialists, including representation from Buildoffsite. Buildoffsite's Governing Forum members, Tim Hall of Total Flow, Graham Cleland of Berkeley Modular and Tim Carey of Willmott Dixon have all joined as Cadcoe Ambassadors to help the training provider to continue moving in the right direction in terms of training and development needs for a future construction industry. Other ambassadors joining Tim, Graham

and Tim are:

- Dawn Bonfield, MBE and Royal Academy of Engineering Visiting Professor of Inclusive Engineering at Aston University
- Jennifer Bristow, Trainee 3D Modeller with the Severn Partnership, previously on the Cadcoe Apprenticeship Programme
- Vicki Holmes, Digital Manager for Multiplex
- Shaun Hunt, Assistant Principal, Curriculum & Standards for Dudley College of Technology
- Jon Lock, Director for Design4Structures

Declan McDonnell, who is heading up the Ambassadors





Programme for Cadcoe, comments:

“We’re really privileged to have such an outstanding spectrum of professionals working with us. As a company we are a hugely passionate and committed group of individuals, always striving to deliver the best service and opportunities to our clients, both businesses and apprentices. Huge change is underway within construction and as a business we’ve reached a pivotal point. Through forming the future skills ambassador’s group, we can really ensure we continue to meet those needs and beyond, via the most appropriate methods for industry.”

The launch, which was held at Dudley College of Technology, enabled ambassadors to provide their own initial views and start the conversation around digital construction education and training, careers advice in schools and current barriers present in industry when it comes to vocational pathways such as

apprenticeships.

The Ambassadors have been carefully selected to represent a wide range of disciplines and themes within the digital construction field, including; engineering, tier 1 contractors, offsite, education, equality and work-based training. They will meet on a further 4 occasions throughout the next 12 months, whilst providing their own thought-leadership pieces.



CADCOE team



MAJOR MILESTONE ACHIEVED FOR THE WORLD'S TALLEST MODULAR TOWERS

Award winning developer, Tide Construction has reached a new milestone in delivering the world's tallest modular towers in Croydon, by completing their core structures. Their offsite company Vision Modular will install the fully-fitted modules around the concrete cores, using one of the most modern and robust off-site construction systems.

The two towers at 101 George Street will be the tallest structures to be built off-site using modular construction methods, and will reach heights of 44 and 38 storeys. The development, which has been forward-funded by Greystar and Henderson Park, will be operated by Greystar and will offer 546 high quality homes for rent within the Build-to-Rent market, providing residents with shared amenities, a professional management team and a 24/7 onsite service. The short construction process, of just over two years, is made possible through Tide Construction's efficient delivery. This is compounded with the modules being manufactured in the Vision Modular Systems' Bedford factory, and then transported onsite. Following the rapid completion of the concrete cores by Tide

Construction, Vision Modular will install the precision-manufactured modules and securely position them into place.

Designed by HTA Design, the building will also benefit residents and the local community, who will enjoy amenities ranging from winter gardens, an art gallery, an incubator hub for local businesses and an on-site café. Each tower will also contain gyms, club rooms and garden terraces.

Christy Hayes, CEO Tide Construction said: "We are very pleased with the progress we are making in building the world's tallest modular towers. We are delivering the development according to the set time scales, offering much needed project certainty to our clients. Completing the concrete cores means that we are ready for the next stage of the project, by bringing the first module onsite in Croydon. The modules are built in our factory in Bedford, undergoing strict quality controls, and will create high quality homes to rent for Londoners."

"Building with our Vision Modular System has also led to a higher quality finish, with 80 per cent less waste and construction traffic, fewer

onsite workers and greater certainty on costs and time. It is clear to see that modular is the future as this a method of construction that can quickly install units of high-quality architectural design, in a safe and controlled environment"

Tide Construction currently has 1500 residential units under construction across the Greater London area. Tide Construction and Vision Modular Systems are also working in partnership with Greystar on the first phase of the Greenford Build-to-Rent scheme in Ealing, whereby they are delivering 400 homes within an 18 months programme.

They have recently completed a 100-unit apartment building for Pocket Living in Wandsworth - Mapleton Crescent, which again was developed on a constrained urban site, and are currently delivering a 120-unit modular, residential scheme for Pocket in Ealing.

Mark Allnutt, senior managing director of Greystar UK, said:

"Modular will, without a doubt, play a central role in the future of construction and this development has been a fantastic opportunity for Greystar to become an early adopter. For Greystar it ticks a lot of boxes - it delivers a high-quality product, at speed, in a safe and controlled environment."

“

We are excited to see the delivery of the world's tallest modular towers progressing so fast, getting closer to offering much needed quality homes, including affordable properties, to rent in our borough. The two towers delivered will make a great contribution to our local economy and community, while enhancing Croydon town centre's urban landscape with great architecture and design. We are looking forward to seeing the next steps and the first modules to arrive onsite in Croydon.”

Councillor Paul Scott, Cabinet lead for Regeneration & Planning at Croydon





“

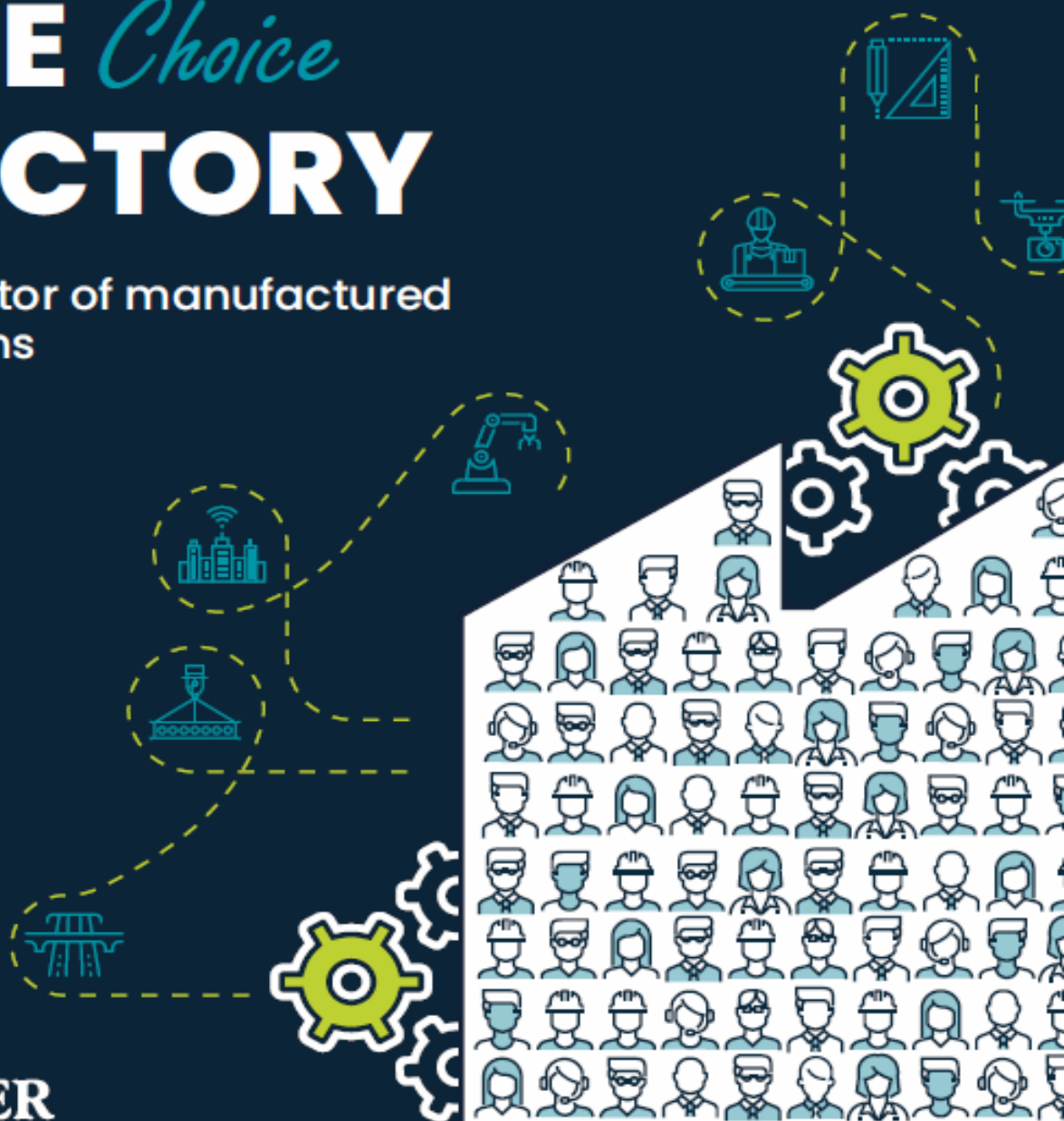
The concrete core completion marks an important milestone in the building of the world's tallest modular towers. The Vision Modular Systems product allows for a high-quality design that is not limited by the way the modules are created – 101 George Street will be testimony to flexibility in modular construction design and architectural creativity.”

Simon Bayliss, Partner at HTA

THE CHOICE FACTORY: KIER'S NEW OFFSITE SOLUTIONS PUBLICATION

THE *Choice* FACTORY

Integrator of manufactured
solutions





The benefits surrounding the economical and technological benefits of OSM have been widely publicised across the industry, however, what affords intrigue and further research is why a rationally beneficial solution, has for too long been irrationally marginalised.

For Kier, embracing innovation across their business is a strategic priority, with the adoption of offsite manufacture (OSM) and modern methods of construction (MMC) integral to their approach.

In 2018 Kier responded to the House of Lords Select Committee's inquiry into offsite manufacture for construction, advocating a review of psychological, behavioural and cultural factors, in order to achieve sustainable change in the adoption and delivery of offsite.

Having set the challenge, The Choice Factory publication responds by presenting a unique view that draws from behavioural science, marketing and different fields to encourage us to consider the way in which choice is presented 'choice architecture', and the impact that this has on decision-making.

To be released in three unique volumes, Jamie Hillier, Preconstruction Director for Major Projects Building sets the scene in our recently-published Volume 1: Status Quo, exploring offsite manufacture, why it matters and what the barriers

are to more wide-spread adoption.

The first volume also reflects on the industry's history, past calls for change and whether we are truly on the brink of fundamental revolution; taking into account a reformed context of recent advancements in technology, new materials and closer pan-industry ties. For example, Kier's membership with the Manufacturing Technology Centre is helping us to forge new pathways through the integration of manufacturing processes into construction and enabling them to develop prototypes of new offsite components and materials.

**“
In this context
we believe it is
the psychological,
behavioural and
cultural factors that
present the greatest
opportunity for
change. We do not
assume to change the
market but believe
that our determination
can and will make a
positive difference”**



*Jamie Hillier
Director for Kier*

“

We are proud to be part of an industry that can deliver outstanding and impactful results, but equally, we recognise the challenges of the contracting sector. Factors influencing choice of adoption (or not) within the industry are often borne of convention and habit, as much as considered technical and benefit evaluation.”

The book also illustrates Kier's evolution of MMC, charting their experience across a timeline of pioneering projects from the 1920s through to the present day.

"Our 'Journey to The Choice Factory' illustrates that adoption of OSM and MMC techniques is far from new to Kier; we have been active for almost 100 years."

The Choice Factory is illustrative of Kier's flexible approach to offsite and MMC. Rather than having a uniform solution dictated by a factory, Kier provides a choice of factory-based solutions from the extensive and diverse range of offsite solutions available. In this way, the expert knowledge and experience of their people allows them to provide clients with best value from the full spectrum of technologies available.

When released Volume 2: Opportunity, will outline the principles of habit and embedded behaviours as barriers to the wider adoption of offsite manufacture and detail Kier's action plan to effect change in our sphere of influence.

“

The book gives a really interesting and refreshing perspective on the challenges currently faced in the adoption of offsite technologies. Looking beyond the more apparent barriers such as supply chain capacity and pipeline of work and considering in more detail the underlying psychological and behavioural influences” Elizabeth Biggins, Submissions Coordinator, Kier

Kier won Offsite Pioneer of The Year at the Offsite Awards



NG BAILEY REACHES 1 MILLION RIDDOR FREE HOURS AT ITS OFFSITE FACILITIES

Last month, NG Bailey recorded 1 million RIDDOR free hours across its Offsite Manufacture assembly and weld facilities.

This outstanding achievement is a culmination of over seven years of RIDDOR free work, which dates back to September 2011, and a great example of the business's Safety First & Foremost principal in practice. The Offsite Manufacture unit, which forms part of NG Bailey's larger Engineering division, currently employs 68 people at its bespoke production facilities in Yorkshire, and this achievement has been accredited to their commitment, care and diligence. The workforce includes project engineers, mechanical and electrical engineers, welders and shop floor operatives. Together they help to design, build and deliver pre-fabricated modular building services to fulfil the requirements on a wide range of projects, which span across a number of sectors.

NG Bailey believes that some of the advantages of using offsite manufacture include; less people movements on site, less on-site waste through managed products and an overall reduction in site man hours, all of which can significantly reduce potential safety risks and hazards when compared with traditional construction site build conditions.

Since establishing its offsite facilities in 2000 and acquiring additional premises for their weld shop in 2012, NG Bailey has continued to champion the use of offsite manufacture because of the many benefits it has to offer to its customers. It also supports their overall aim as a business to work safely, responsibly and sustainably.

Mark Watkins, General Manager, Off-site Manufacture said: "This is a really great achievement and something we're very proud of. Reducing safety risks and hazards is an important element of what we do through our work here, which in turn offers a range of benefits to our projects and customers, as well as the wider business.

"A personal thank you goes to all our people that helped us to reach this milestone. We hope to continue to build on this success."

**For further information
please visit:
www.ngbailey.com**





“

This is a really great achievement and something we're very proud of. Reducing safety risks and hazards is an important element of what we do through our work here, which in turn offers a range of benefits to our projects and customers, as well as the wider business”

LEEDS CITY COUNCIL AND UNITED LIVING PROPOSE UK'S LARGEST MODULAR COUNCIL HOUSING DEVELOPMENT

A planning application for the UK's biggest fully modular council housing and apartment scheme to date, has been submitted by Leeds City Council and national building contractor, United Living.

If approved, the scheme at Leeds Meynell (in Holbeck) will see 28 homes constructed in less than nine months, with the first residents moving in by early 2020. The average construction time for a development of this size is usually almost 24 months.

United Living has been appointed as the principal contractor for the development and is working in partnership with Premier Modular and William Saunders Architects.



Manufacture of the new homes is planned to begin in late spring 2019 at an off-site facility in Brandesburton, East Yorkshire. The property mix will comprise 14 apartments across two blocks, alongside ten individual two-bedroom homes and four x three-bedroom homes. Premier Modular will produce each entire module off-site, adding brickwork cladding, roofing, and placing the finishing touches to the exterior frames before transportation to Leeds.

Leeds City Council's executive member for communities Councillor Debra Coupar said:

"We are delighted that this flagship project has reached this critical stage and are looking forward to delivering these homes on site. This project is a modern method of construction, changing the delivery of our housing and allowing for us to develop housing opportunities that our residents and communities want and need. We're looking forward to seeing the houses once they are completed."

Helen Francis, business development director (North) for United Living, said:

"We're incredibly excited to begin the construction phase of what will be our first fully modular development. Without compromising on quality, the speed of delivery will really set this project aside and - with radical solutions needed to fix the UK's national housing shortage - this could be a trailblazer for others to follow. If all

goes to plan, from concept to completion we're looking at almost halving the time it would take to construct these homes through traditional methods."

"We're also currently progressing talks with a number of Yorkshire-based schools and colleges to deliver work placements during the build phase of this project. These placements will be a great opportunity for United Living, Leeds City Council, and our partners on this scheme to introduce the next generation to modern methods of construction."

Eugenio De Sa, managing director for Premier Modular, said: "We're excited to be involved in this first prestigious pilot scheme for Leeds City Council. This project gives us the opportunity to showcase how using off-site construction can reduce programme schedules, as well as the quality of construction that can be achieved. The choice of modular housing means that the Council will have reassurance that the scheme will be delivered on time and to an extremely high quality."

"Working in partnership with United Living we look forward to meeting and surpassing the Council's expectations by providing them with a new community of housing that their residents will be proud to live in."

The first deliveries of homes to the Leeds site are anticipated as early as midsummer this year. Access to the site will be granted at the same time as manufacture begins, to allow for preliminary works including drainage and pile foundations. Filling joints, including staircases, and finishing touches will take place in-situ.

All homes and apartments are scheduled to be in place by late autumn, with the final stages of construction to include the laying of roadways, paths and driveways. Exterior works including fencing and landscaping will then be completed by February 2020.

The 28 new homes will be constructed with a 'fabric first' approach so that the construction envelope is highly insulated for each property. A key objective of this project is to ensure energy efficiency and to lower fuel bills thus reducing fuel poverty amongst Leeds City Council tenants. On completion, the properties will be managed by Leeds City Council.

The development at Leeds Meynell has been procured under the YorBuild framework. The partnership approach between United Living, Premier Modular, William Saunders Architects and Leeds City Council has enabled the accelerated delivery of this project and could result in planning permission being obtained less than 30-weeks since the original concepts were drawn up.



“This project gives us the opportunity to showcase how using off-site construction can reduce programme schedules, as well as the quality of construction that can be achieved. The choice of modular housing means that the Council will have reassurance that the scheme will be delivered on time and to an extremely high quality”

TECHNICAL DESIGN SERVICES GROUP FORMED TO PAVE WAY FOR COLLABORATIVE CONSTRUCTION

Three companies which already service the offsite sector, have come together to form a group, as part of their growth as innovators within construction. TDS, Design4Structures and Cadcoe will form the Technical Design Services Group, with a core vision of 'collaboration being key to the future of construction'.

Whilst all three companies will retain their individual brands and specialisms, the group will now move forward, as leaders in cutting-edge design processes and forward-thinking educators for the next generation.

With TDS working as a subcontract design & detailing office, D4S as the structural engineers and the Construction and Design Centre of Excellence, also known as Cadcoe, running a state-of-the-art training programme, the TDS Group will pave the way for a progressive digital construction industry. The CEO of the group, Daniel Leech, has gathered three sister companies together with a 'Design Team' ethos in mind.

This collaborative view on the industry has already proven to be effective in improving efficiency for the three companies. "Being part of a larger, multidiscipline group delivery really does make the process more efficient through accurate digital data transference and reduced information duplication," according to James McNee, Technical Director for TDS.



*Daniel Leech
CEO*



Here at TDS, we really believe that the future in delivery for engineering and manufacture design, similar to our group structure, needs to be more intrinsically linked at an earlier stage to benefit from a transparent, leaner and more accurate process."



*James McNee
Technical Director for TDS*



*John Lock
Director of D4S*

“

Bringing TDS and D4S officially under one roof will not only make this possible in a more efficient and transparent way, but it will also give us the option to expand and grow throughout in the near future...”



*Declan McDonnell,
Director for CADCOE*



*Lee Drummond
CADCOE*

“

Aligning as a group with TDS and D4S, will further strengthen our continued growth as a training provider, and will ensure that we continue to lead the way in offering training which embraces the latest industry developments and technologies for construction.”

During past years, the three companies have enabled each other to lead the forefront of innovation in construction. Embracing up-to-date methods, which facilitate their joint workings, has enabled them to overcome increasingly difficult and complex projects. By combining the unique strengths each business holds, the group aims to continue to develop and push the boundaries of innovation.

ELLIOTT SUPPORTS DEPARTMENT FOR EDUCATION FRAMEWORK

ARUNDEL PRIMARY SCHOOL

One of Elliot Group's first batch of eleven schools awarded in competition through the DfE's off-site procurement procedures.

This ground cutting ceremony was led by their Contracts Manager, Richard Senior who is delivering this 3FE facility for Arundel Court Primary Academy in Portsmouth.



HILDERTHORPE PRIMARY SCHOOL



- The new school building handed over on 18 February 2019
- A new build 2FE primary school accommodating 420 pupils with a nursery for 39 pupils
- The school has 16 teaching spaces including a practical room, a main hall, studio space, learning resource areas and administration rooms
- Floor area is 2244m² Value £5.4m
- Designed to fully comply with the DfE Facilities Output Specification and achieving BREEAM 'Very Good'.

JUST IN TIME – THANKS TO TEKLA AND MODULAR CONSTRUCTION

Modular construction has been around for many years but is increasing in popularity as a preferred building method within the UK construction industry, favoured for its efficient assembly speed and cost savings. As such, this method was employed by Intelligent Steel Solutions Ltd (formerly known as Icarus LSF) during the construction of Vita Student West-gate, as well as Trimble's Tekla software to assist with the designing and manufacturing of the building.

The project, a large student accommodation scheme located in central Newcastle comprising of over 280 units, was heavily time-critical, with vital competition dates and students due to move into the accommodation at the start of the new academic year. As a result, Intelligent Steel turned to Trimble's Tekla software to assist in designing, manufacturing and constructing the six-storey building, using off-site light steel frame technology.

Crystal Williamson, Designer Manager at Intelligent Steel said: "After using other metal framing systems in the past, we now only use Tekla Structures for all modelling and data output of GA drawings, Panel drawings, CSV data and reports. Tekla is more user-friendly than any other software that we have previously used, assisting on complex projects and allowing for customisation. What's more, it is frequently updated and improved."



One of the many benefits of Tekla Structures, the 3D construction modelling software, is that it allows for the design and planning of all building elements within the one model, ensuring that all information and data is consistent, amalgamated and easily accessible. This aspect of the software was particularly beneficial to Intelligent Steel.



Crystal explained: “As both cold and hot-rolled steel were specified on the project, and due to the fabrication of each differing slightly (the hot-roll elements are outsourced), we had to process the two materials separately. However, it was vital that we were still able to design both elements concurrently within the same model, for they could not be designed in isolation - and Tekla Structures allowed us to do exactly this within the same software, saving valuable time.

“Furthermore, Tekla software is also able to work with a variety of different building materials. For example, while modelling the light steel structure and its connections to the main building, our designers were also able to see the concrete podium level at its exact location in the same model. Working in 3D in this way is far more effective than the previous 2D drawings.”

The Vita Student Westgate project also presented Intelligent Steel with various unique and complex constraints. In addition to the tight time schedule, there were many site limitations. As well as an existing building situated in close proximity and a number of local businesses, the site was surrounded by two main roads that remained open at all times and supported Newcastle’s main bus routes. These challenges resulted in tight access, as well as vehicle and time restrictions, all of which rendered traditional construction methods

unfeasible.

“As a result, the scheme needed a building solution that would deliver both pace and innovation,” said Crystal. “We phased the different elements, such as the external and internal walls and floors, and then we lotted the delivery phases based on the schedule provided, all by using Tekla Structures. This allowed us to release design data into the fabrication process in line with the delivery programme.”

Intelligent Steel have a very specific installation process for this kind of project. “Erection can be scaled and accelerated throughout the build process and the model is vital to allow this to be planned in a sensible manner,” commented Crystal.

Furthermore, by using both Tekla Structures and the Howick extension, Intelligent Steel was able to export NC files directly from the model to the fabrication machines, increasing the speed, efficiency and accuracy of the project and fabrication process. The steel-framing machines were able to accurately place all punching and fixing holes, which not only allowed for the frames and trusses to be manufactured with extreme precision but also enabled the frame to be self-locating and jiggling,

reducing the build-time on site.

This direct link between the Tekla model and the fabrication process also helped to vastly reduce the amount of construction waste produced, as Crystal explained: “Only the specified quantities of material and building elements required for construction were manufactured. In the light gauge steel frame (LGSF) form of the building, the walls are load-bearing so the external walls were provided in a pre-boarded form. By using the direct link to the machinery from the Tekla model, we were able to save both time and material, resulting in a leaner production process.

“To summarise, thanks to Tekla Structures, we were able to improve the accuracy of the build and the speed of construction by allowing early access for first fix, while also reducing the amount of waste materials produced.”

Intelligent Steel won the commercial category for the UK Tekla BIM 2017 Awards with its Vita Student Westgate project.



Thanks to Tekla Structures, we were able to improve the accuracy of the build and the speed of construction by allowing early access for first fix, while also reducing the amount of waste materials produced.”



ZEDGENERATION STUDENTS LEAD AFFORDABLE HOUSING REVOLUTION

Polypipe is one of Europe's largest manufacturers of piping systems, water and climate management systems, delivering engineered solutions that enable a sustainable built environment. Operating in the UK, Europe and the Middle East employing over 3,000 staff with an annual turnover of £412 million, the company prides itself on a range of innovative solutions.

The company was keen to support Essex's first 'green construction college' South Essex College (recently amalgamated with PROCAT), at the ZedGeneration Youth Conference at Futurebuild 2019, the UK's leading built environment event, fittingly in Apprenticeship week. Guest speaker Shaun Bailey, GLA member on the Environment and Economic committees, and Conservative prospective candidate for Mayor of London, spoke

passionately to the 120 strong FE college students about opportunities and life choices - and to grab the best of both when offered.

ZedGeneration is a social enterprise with current membership of Waltham Forest College, University of East London, schools, ZEDFactory, building partner NTDL Contracts Ltd and, of course, South Essex College. Its students helped with building an eco-friendly prototype home for multiple occupations (HMO) at a disused college building in Basildon, Essex designed by ZED-factory. Exhibited at Futurebuild, the finished version may house seven vulnerable young people for Southend YMCA.

ZedGeneration's founders community activists David and Rani Moorcroft MBE, want to encourage the next generation to 'build green, clean, faster, truly affordable homes for the community, by the community'. Rani says; 'We are hugely excited with Polypipe's interest. It opens up opportunities we could only dream of by introducing us to new partnerships'

Sweden's offsite manufacturing builds almost half of its new homes. According to the British Standards Institution only about 10%. ZedGeneration champions modern techniques that allow homes to be built faster and with fewer skilled workers.

Students involved in the HMO modular build move on to a live building site of three super- insulated family homes in nearby Wickford. 'Seeing is Believing' should encourage a stampede in orders from local authorities and housing associations to fuel more training, apprenticeships and employment. And benefit local companies including Elstead Engineering, K E Kent Ltd, Elfin Kitchens supporters of Zedgeneration. Polypipe is



involved in this scheme lending advice and state-of-the-art products.

Phil Henry, Market Development Director, Polypipe Building Systems rolled up his sleeves and worked alongside the Basildon students, said: "Polypipe is very interested in supporting this project with its teaching of new building techniques, training and the skills agenda. The use of modular systems within building services will simplify the overall manufacturing process and I look forward to developing the relationship with the stakeholders involved."

Danny Laing, Director of NTDL construction company agrees: "Young people must learn crucial new skills and handle ever evolving new sustainable materials. Construction offers good money and careers - it isn't all hard and dirty out-in-all-weather work anymore. NTDL will offer work experience and one apprenticeship place with a guaranteed job on the Wickford site."

John Baron, Basildon and Billericay's MP has the final word: "70 years ago in January, the designation order was signed for Basildon. We celebrate the past but look forward to an exciting

future. Our local College and ZEDGeneration are looking at innovative ways of improving the country's housing stock and health. Their efforts should be commended."

**“
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BERKELEY MODULAR APPOINTS AUTODESK



Autodesk makes software for people who make things. If you've ever driven a high performance car, admired a towering skyscraper, used a smartphone, or watched a great film, then the chances are you've experienced what millions of Autodesk customers are doing everyday with our software. We're excited to be bringing our expertise to the forefront of the digital construction sector."

Berkeley Modular has been clear on its commitment to creating a technologically driven, highly automated manufacturing facility to deliver high-quality homes for the Berkeley Group.

To that end, Berkeley Modular has announced that it is working with leading 3D design and engineering company Autodesk to deliver a platform of smart design capability, which will power its automated manufacturing and site-based operations.

The company will utilise the data it harnesses from Autodesk's platform to inform and power an intelligent workflow across the business, an approach which is deemed to be key to creating an highly efficient, highly productive enterprise.

Berkeley Modular has been conceived as a brand new operating company that will deliver volumetric modular housing capability to the Berkeley Group, with a state-of-the-art manufacturing facility set to eventually deliver 20 per cent of the Berkeley Group's annual output once fully operational.


Against a backdrop of rising labour costs and deteriorating skills availability, Berkeley Modular is aiming to improve the correlation between design intent and actual building performance, leading to higher levels of customer satisfaction. The new factory represents an investment that will allow Berkeley Group to create build capacity with ability to readily scale and potential to replicate to yield further capacity in due course.

Commenting on the partnership, Autodesk senior director AEC sales EMEA, Tom Edmonds, said: "I'm very happy that Berkeley Modular has selected Autodesk as a key partner to bring their vision for an offsite revolution to market.

The Berkeley Modular and Autodesk teams have been working together at Autodesk's advanced manufacturing facility in Birmingham to understand what the desired design automation workflows need to look like to enable an innovative solution which will support a target of production commencing in 2020.



BERKELEY MODULAR LEVERAGES KNOWLEDGE BASED ENGINEERING TECHNOLOGIES



“

We are seeing huge time savings with this type of approach, reducing a manual design process from a typical two weeks to just 20 minutes whilst also maintaining consistent high quality levels.” **Royston Young, Director at DAS**

*Graham Cleland, Director at Berkeley Group
Graham also sits on Buildoffsite's Governing
Forum*



We are looking to achieve world class levels of productivity at Berkeley Modular, rarely witnessed in the offsite manufacturing sector, never mind the broader construction sector.”

Berkeley Modular is currently working on the development of an innovative DfMA strategy to support the production of volumetric modules at its new factory facility in 2020.

The company has engaged Design Automation Systems Ltd (DAS), a consultancy specialising in Knowledge Based Engineering (KBE), to help deliver the technology platform which is being purposefully configured to support the mass customisation and advanced manufacturing workflow principles at the heart of the new facility.

KBE is a technology that was developed by world-class manufacturers in the aerospace and automotive sectors. It provides a platform for design automation wherein complex engineering knowledge and rules can be captured efficiently, and also supports long-term knowledge development and maintenance.

In the first instance, DAS is helping to devise an intelligent design solution that employs rule-based logic as the basis of a semi-automated process for

creating fully-federated, data-rich models for volumetric modules.

Director of DAS, Royston Young explained: “We are seeing huge time savings with this type of approach, reducing a manual design process from a typical two weeks to just 20 minutes whilst also maintaining consistent high quality levels.”

This piece of collaborative work will facilitate the efficient transformation from an architectural concept of a building through to the productionised volumetric module models of which the finished building will comprise. These productionised models are to be created using computational BIM for speed and generative logic to minimise the size of data sets.

DAS is also helping to devise an intelligent software application that captures the model-to-machine conversion logic, further automating the direct transfer of data-rich models to robotic and other automated production machinery in a seamless, efficient way.

This will ultimately allow Berkeley Modular to minimise human intervention in the process of communicating virtual model data sets to production machinery and during the manufacture of physical elements of volumetric modules - such as piece parts, sub-assemblies and assemblies.

Commenting on the collaboration, Berkeley Modular director Graham Cleland said: “This ambition is in stark contrast to many offsite approaches which place too much reliance on conventional design processes, and where product manufacture requires a mix of in-house and sub-contracted trades and labour.”

NEW CONSORTIUM LAUNCHED TO PIONEER GREATER USE OF OFFSITE CONSTRUCTION FOR PRIMARY SCHOOLS

A new consortium has been launched to transform the way primary schools are designed and built. This is managed by construction consultants Blacc and is funded by Innovate UK, the public body established to drive productivity and economic growth through innovation.



By digitising the process of designing a primary school, we believe we can deliver significant reductions in lead times and build costs whilst accommodating individual design requirements"

Jami Cresser-Brown, Director of Bryden Wood

develop a series of components to enable multiple offsite specialists to achieve unprecedented economies of scale and efficiency in manufacturing. This will bring a higher degree of stability, predictability and transparency to the procurement process – to the benefit of both the client and the supply chain. It represents a window into a brave new world for UK construction."

One of the solutions currently in development is the creation of a pioneering digital tool to accelerate the initial design phase for new primary schools. This user-friendly web-based app, which can be used by teaching professionals, will configure a primary school building on a specific site in line with DfE requirements, and using a standardised offsite solution to optimise efficiency. This will significantly reduce the time and cost of the initial feasibility and design phase and will facilitate the input of stakeholders.

"By digitising the process of designing a primary school, we believe we can deliver significant reductions in lead times and build costs whilst accommodating individual design requirements", said Jami Cresser-Brown, Director of Bryden Wood. "With the use of a digital tool, more time can actually be spent on the bespoke elements of the design of each school."

The other partners in the Seismic consortium are technology-led design practice Bryden Wood, the Manufacturing Technology Centre (MTC), and two of the UK's leading offsite specialists, Elliott and The McAvoy Group.

Around 100 new and replacement primary schools are needed every year in the UK at a cost of £5bn. This level of demand far exceeds the capacity currently available in the construction industry. The challenge is compounded by the general inefficiency of the construction sector compared to UK manufacturing. Every primary school construction project has a bespoke design, is

procured individually and is delivered by a fragmented supply chain. This process leads to varying levels of quality, low productivity and increased risk of time and budget overruns.

The new consortium has been established to carry out extensive research and development to engineer a range of standardised offsite solutions which will radically increase productivity and efficiency, drive down costs and reduce lead times in the delivery of exemplary primary schools.

Commenting on the partnership's vision, Richard Crosby, Director of Blacc, said "By applying greater use of standardisation, our aim is to

The Seismic project will also look at how standardised module sizes and steel-framed offsite solutions can be developed, costed and manufactured to achieve greater economies of scale and cost efficiencies for the construction of new primary schools.

Susan Hone-Brookes, Chief Engineer for Construction and Infrastructure at the MTC said, “This project will not only standardise different, market-leading offsite solutions for primary school construction, but it will act as a trailblazer to demonstrate the very latest offsite manufacturing technologies.”

James Cowell, Technical Director of Elliott, said, “This is a tremendous opportunity to take offsite to the next level whilst developing even more innovative solutions to meet the rising demand for primary school places. There are clear productivity issues across construction and offsite manufacture is a proven method of addressing that, as well as issues such as cost control, skills shortages, sub-standard quality and long lead times. There is also the potential going

forward to explore the standardisation of other design elements of a building, such as M&E, and how we could remove the need for many of the costly and time-intensive processes traditionally carried out on site.”



This is a truly unique partnership of visionary organisations who are demonstrating the highest level of collaboration, trust and transparency. It is fantastic to be a part of such a ground-breaking project which we think will be a catalyst for revolutionising not just school design, procurement and delivery but the wider construction industry.”

David Clark, Head of Manufacturing and Innovation at The McAvoy Group



MEET OUR NEW MEMBERS



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Autodesk makes software for people who make things. If you've ever driven a high-performance car, admired a towering skyscraper, used a smartphone, or watched a great film, chances are you've experienced what millions of Autodesk customers are doing with our software.

1. Why you joined?

The construction industry is under huge pressure to increase quality output while reducing waste. The convergence of construction and manufacturing presents a huge opportunity for the industry. Offsite construction is one of those opportunities that the industry must take advantage of. We have joined Buildoffsite to work closely with other industry members and customers driving offsite and industrialised construction.

2. What are you looking to achieve in the sector and how can the Buildoffsite network support in that?

We want to support Buildoffsite in its goal to bring about an industry step-change. Autodesk recognises the growing need to improve construction methods, with less negative impact and to take advantage of modern design opportunities. As urban populations increase, the demand and pressure on infrastructure will grow. We're looking for new insights and connections in the industry that will inform our product development roadmap. We also look forward to connecting with other members to share experiences and gain a better understanding of the business and commercial challenges in the sector, so we can work towards the change together.

3. Who do you want to connect with?

We are currently working with many Buildoffsite members, but this forum enables us to connect with individuals that have a specific Offsite Construction role. This is also an opportunity to connect with new clients and stakeholders in the industry.

4. What can you offer to Buildoffsite's network?

Autodesk is working to help solve some of the world's most complex design problems, from pressing ecological challenges to the development of scalable smart infrastructure. Designers use Autodesk tools to not only create plans for buildings, for example, but also to simulate their impact on the environment and track their performance over time. We hope to build connections within the Buildoffsite network, to collaborating on research, innovation and education projects. We want to continue to help others imagine, design and make a better world.



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BSI is the business standards company that helps organizations make excellence a habit all over the world. Our business is enabling others to perform better. BSI is appointed by the UK Government as the National Standards Body and represents UK interests at the International Organization for Standardization (ISO) and the European Standards Organizations (CEN, CENELEC and ETSI). At home our role is to help improve the quality and safety of products, services and systems by enabling the creation of standards and encouraging their use.

1. Why you joined?

BSI has joined Buildoffsite to engage with, understand, and to support an important and growing sector of the construction industry

2. What are you looking to achieve in the sector and how can the Buildoffsite network support in that?

Understand standards needs with regard to the existing regulatory and standards landscape and identifying gaps, in order to establish a new stream of British Standards tailored specifically for the offsite market needs supported by a new BSI Technical Committee made up of industry practitioners in order to establish National best practice which can be elevated to European and International standards. By working with the established specialised Buildoffsite hubs along with the broader membership to ensure input into existing standards development and to inform a standards strategy that would enable an increase in take up and supply in this area.

3. Who do you want to connect with?

All parts of the industry, including technical and strategic experts, across the different product and structural types.

4. What can you offer to Buildoffsite's network?

Engagement with existing standards makers, and participation in the development of national requirements, and working in Europe and internationally to establish and disseminate UK best practice. Help navigating through the existing regulatory and standards landscape. Working with those engaged in R&D to consider how findings and outputs can be developed in to best practice benchmarks, test methods, recommendations and guidance for dissemination to the wider industry.



DuPont™
Tyvek®

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As an innovative supplier of proven building envelope solutions, DuPont™ Tyvek® offers a full range of high-performance membranes and accessories to help prevent air and moisture infiltration and improve energy efficiency in all building types. Specially designed to support sustainable building practices, our products can play an important role in meeting and exceeding building and energy codes, standards and certifications. All DuPont building products come with the renowned service, expertise and technical back-up of a world-class science company. The technical team at the DuPont™ Tyvek® Building Knowledge Centre, based in the Bristol and Bath Science Park, is available for advice on building envelopes, to offer general technological support and guidance, to advise on building regulations, product information, or to arrange CPDs and training.

1. Why you joined?

We recognised a growth in the modular sector, and noticed a trend of synergies between our business and the volumetric industry. We believe our durable base products can help to add longevity to modular constructions and put to bed any image of 'prefab' housing. In addition, our knowledge and solutions for airtightness, energy efficiency, overheating and manufacturing efficiency can aid the growth and development of volumetric manufacturers.

2. What are you looking to achieve in the sector and how can the Buildoffsite network support in that?

We would like to offer our knowledge, services and product portfolio to aid the development of the modular industry whilst highlighting differentiation of market available membrane products and ancillaries to ensure quality, durability and longevity are a prime concern.

3. Who do you want to connect with?

Volumetric manufacturers and developers with an emphasis on quality products. We see this as being important across the sector and particularly for the build to rent developments, where quality and longevity will be a prime concern for those retaining assets.

4. What can you offer to Buildoffsite's network?

Initially, the technical team at the DuPont™ Tyvek® Building Knowledge Centre in Bristol would offer a good ear to learn more about the relevant obstacles faced by developers and volumetric manufacturers. We would then look to apply our global knowledge and experience, along with a tailored portfolio to improve the sectors image, products and future.



W: www.ideal-standard.co.uk

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A British manufacturing institution, Ideal Standard and our brands have been furnishing homes, hospitals, offices, pubs and more for over 200 years. Our name is synonymous with craftsmanship, quality and tradition, yet we remain at the leading edge of developments in both domestic and commercial bathroom technology, pushing the boundaries of design in terms of aesthetic and technical accomplishment. Our factory in Armitage, Staffordshire remains the only large scale ceramics manufacturing operation in the UK, producing millions of toilets and basins annually, each proudly bearing the name Ideal Standard or Armitage Shanks. Our expertise encompasses the full range of development type, from traditional house building to modern methods of construction and the recent urban high-rise boom.

1. Why you joined?

We have joined as spent the last 12-18 months focussing on Offsite Manufacturing rather than it just being BAU supply-chain with this continuing to be an emerging trend. With our strength through the specification market, both Commercial & Residential and the widely discussed UK Housing & Skills shortage we need to understand more regarding all underlying trends - our hope is Buildoffsite can help us advance our learning and market position through gaining additional insight in Offsite Manufacturing.

2. What are you looking to achieve in the sector and how can the Buildoffsite network support in that?

Build Insight - greater understanding of why, how and where offsite manufacturing is being adopted in the market.
Broaden network - work with like-minded organisations where we can potential partner to find innovative solutions to better our mutual position in offsite manufacturing.
New Business Opportunities - Increase our business through new or existing customers.

3. Who do you want to connect with?

All parties where we can add mutual value.

4. What can you offer to Buildoffsite's network?

A wealth or experience in the Sanitaryware market offering the full bathroom and washroom solution. Being a UK manufacturer it should give us and our clients an advantaged supply-chain. An open door to discuss innovation through offsite solutions.



Hawkins\
Brown

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Hawkins\Brown is an architectural practice of 275 people based in London, Manchester, Edinburgh and Los Angeles, working principally in the residential, education, commercial, transport infrastructure and cultural sectors. We also provide urban planning, interior design and R&D services.

1. Why you joined?

Hawkins\Brown joined Buildoffsite to develop a better understanding of the offsite supply chain and to meet like-minded companies who want to promote good design using modern methods of construction. We also see membership of Buildoffsite as a way of demonstrating our commitment to improving productivity and delivering value to our clients. We are a forward-thinking practice and consider increasing pre-manufactured value across the construction industry as mission-critical. In particular we want to promote high quality design and demonstrate that offsite does not (or need not) suppress creativity and placemaking.

2. What are you looking to achieve in the sector and how can the Buildoffsite network support in that?

We want to develop our knowledge of the various offsite systems and suppliers and communicate that consistently across the whole practice. We want to innovate and combine our investment in digital technology with broad capability in MMC. Ultimately we want to be seen as leaders in offsite design.

3. Who do you want to connect with?

We want to connect with other like-minded architects, engineers and cost consultants, as well as contractors and fabricators with a view to better informing our clients and helping to develop the offsite market.

4. What can you offer to Buildoffsite's network?

We offer a people-focussed, open and collaborative approach to everyone we work with. We regularly collaborate with other architects and enjoy close working relationships with others in our project teams. We have significant experience in a range of offsite systems, including volumetric, panel systems, CLT, precast and so on, as well as more specific items like pre-cast balconies, pods, and so on. We have been undertaking research into standardisation that when completed will have a significant effect on productivity.

Levitt Bernstein

People.Design

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When Levitt Bernstein was founded in 1968, it was done so with the aim of devoting the same level of detail and attention to designing a building, as to those who use it. This philosophy, together with an emphasis on problem solving and innovation rather than simply applying unchallenged trends or traditions, still holds true and underpins our approach to all projects that we are involved in. From our design studios in London and Manchester, we use our skills in architecture, urban design and landscape architecture to work on housing, education, health, arts and commercial projects of all shapes, sizes and budgets across the country.

1. Why you joined?

We believe that the construction industry's adoption of offsite construction methodologies is inevitable. There is a perfect storm brewing of construction skill shortages, intolerable levels of material wastage, rising costs and program overruns that will see most projects built using industrialised methods in the near future. We have been advocates of collaborative working since the practice's founding and strongly believe that all can benefit by working together and sharing knowledge. By joining Buildoffsite, this can be extended to all stakeholders in the design and construction process, from clients through to manufacturers.

2. What are you looking to achieve in the sector and how can the Buildoffsite network support in that?

We decided to join Buildoffsite as we felt it would be the most appropriate mechanism to further both our aims and that of the Professional Practice Group. These include: Knowledge sharing; The promotion of DfMA; The promotion of best practice methods; Developing a shared perspective; Lobbying. To avoid those mistakes made in the past, we believe that knowledge sharing, research and contribution to industry standards are all essential.

3. Who do you want to connect with?

Engaging with clients who are keen to implement offsite solutions is of particular interest to us. We think that it would be beneficial to discuss the issues around offsite with those who understand the advantages; that it is not just a numbers game, and are determined to maintain quality. We are more likely to establish relationships with those informed clients through their membership of Buildoffsite.

4. What can you offer to Buildoffsite's network?

Our long tradition of research and advocacy also means that we encourage others to follow our lead in creating better spaces. In recent years, one of the main focuses has been on offsite innovation and education in Design for Manufacturing and Assembly (DfMA) as a mechanism to design better buildings. We have been working closely with the Supply Chain School to develop their DfMA training material for designers and were a founding member of the Design Offsite Professional Practice Group.



SOLIBRI
A NEMETSCHEK COMPANY

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Solibri develops and markets software solutions that improve the quality of building information models (BIM) and included datasets for building owners, designers and constructors. Solibri Model Checker is a tool that analyses and validates the integrity and quality of the design, constructability and handover information using logical rulesets to check against building codes, industry, company or project specific standards.

1. Why you joined?

When I ran Tekla's operations in the UK I joined them up with buildoffsite and we saw benefits straight away by making connections with likeminded people who wanted to advance construction processes and work in smarter ways. When I joined Solibri it was a natural thing to do by also joining over time, already there are several of our clients that are members of buildoffsite. As offsite processes gather traction in the industry we feel it is the right time for us to join, Solibri's unique offering bringing quality control to BIM are a natural fit for companies that want to assure the quality of the work they do and also the quality of those working on their projects.

2. What are you looking to achieve in the sector and how can the Buildoffsite network support in that?

Solibri, with their model checking software are trying to improve the quality of designs and data flowing into operations. Having worked in construction on the software side of things for many years it has been interesting to see the transition from drawing board to CAD to BIM. The Buildoffsite network supports what we are trying to do by bringing an immediate audience of asset owners, construction companies, manufacturers, engineers and designers together under one roof and with one aim to improve construction. In my view the very fact that you are participating in Buildoffsite means that you are the forward thinking type of person that we want to engage with. My experience at Solibri so far has highlighted again that people don't like change, especially if affects what they do on a day to day basis. That can be a frustration but hopefully being involved with the network again will see the opportunity to put some focus back on improving quality in construction

3. Who do you want to connect with?

Anybody that wants to improve the way they work and improve quality on their BIM projects.

4. What can you offer to Buildoffsite's network?

Solibri brings a small team of passionate people who believe strongly in what we do. We have a niche and unique software solution that can improve quality on any BIM project. I have yet to see an error free building in design or construction, Solibri can help highlight problems that won't be found until it's too late. Our customers are already members of buildoffsite and this brings another opportunity to engage with them in a different type of forum.

UPCOMING EVENTS 2019

**23 - 24
Apr**

Direction Group Dinner & Meeting

Griffin Court | 15 Long Lane | London | EC1A 9PN

**23
Apr**

Rail Overbuild Guide Workshop

Griffin Court | 15 Long Lane | London | EC1A 9PN

**29
Apr**

Design Offsite Group Meeting

Griffin Court | 15 Long Lane | London | EC1A 9PN

**08
May**

Accelerating Project Delivery Briefing

Griffin Court | 15 Long Lane | London | EC1A 9PN

**13
Jun**

Offsite Manufacture Conference & Exhibition

Harrogate Convention Centre | Yorkshire | HG1 5LA

**18 - 19
Jun**

Direction Group Dinner & Meeting

Encon | Binary Park | Choats Rd | Dagenham | RM9 6RG

**27 - 28
Aug**

Direction Group Dinner & Meeting

Autodesk | Small Heath Business Park | Talbot Way | Birmingham | B10 OHJ

**04
Sep**

Buildoffsite member event

Arup | 13 Fitzroy Street | London | W1T 4BQ

**29 - 30
Oct**

Direction Group Dinner & Meeting

Lucideon | Queen's Rd | Stoke-On-Trent | ST4 7LQ

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PLEASE CONTACT sara.kotsani@buildoffsite.com

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