

buildoffsite



Offsite Construction Show 2018. Book now to attend Buildoffsite's free knowledge-sharing Seminars, Workshops and Conversations, hosted by leading thinkers and innovators

New robots will revolutionise the built environment. The leap in robotics has implications for design and construction

Skills shortages? Or skills opportunities?

Addressing the skills shortages that exist within the construction sector

Digital Built Britain. The next step in the digital transformation of the sector, combining emerging digital capabilities with decades of engineering knowledge

Climate change – what does Offsite

have to offer? The CombiCycle Comparator, a guide on the likely environmental impact of designs and specifications



Contents

Frontispiece	
National Housing Federation Summit 2018	4
Event Reviews	
Members get together at Arup	30
Direction Group meeting at Polypipe	30
Offsite collaboration – a view from Polypipe	31
The Buildoffsite Residential Hub meets in Bristol	32
News	
Berkeley Modular and coBuilder take decisive step towards offsite construction efficiency	33
Ilke Homes' 'Hundred House' wins <i>The Sunday Times</i> British Home Award	34
NG Bailey creates new £300m division	36
Getting to grips with transporting, storing and installing offsite components – Lucideon	37
Case Study	
Kier – Wedge House	38
News	
Northampton Waterside Student Residences – Kier	40
McAvoy announces expansion into offsite housing	42
McAvoy awarded first offsite housing scheme in Northern Ireland	43
Cleanroom specialists deliver offsite international construction presentation	44
New Connect 2 Cleanrooms website launched	44
New Members	
alineia	45
Mitsubishi Electric	46
Saint-Gobain	47
Stelling Properties	48
Techno Metal Post UK	49
Events	
Buildoffsite Events 2018/2019	50
Frontispiece	
Director's Review	6
The Offsite Construction Show (OSCS)	8
Buildoffsite events at the OSCS	10
Buildoffsite Governing Forum update	14
Hub Updates	16
A Perspective on the Skills Challenge in Offsite Manufacture	18
Skills Shortages? Or Skills Opportunities?!	20
Transforming Construction	22
New robots will revolutionise the built environment	23
The journey to a Digital Built Britain	24
Modular Wiring a viable solution – WAGO Ltd	26
Climate change – what does offsite have to offer?	28
Guide to Development Finance for small and medium-size housebuilders	29
Government Responds to House of Lords Select Committee Report on Offsite Construction	29

Welcome

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Welcome to the November newsletter, which includes an overview of Buildoffsite's programme of events for the Offsite Construction Show 2018. Now in its fourth year, the Show is hosted by Buildoffsite Member, Marwood Events and showcases the latest developments in offsite construction for all market sectors. As supporters of the Show, Buildoffsite will once again be exhibiting – visit us at stand C29. Buildoffsite will be hosting an extensive and larger than ever programme of free to attend knowledge-sharing events involving some of the UK's leading thinkers and innovators. See pages 8-13 for more, including details of how to reserve your space at the Buildoffsite events.

The frontispiece focuses on the Prime Minister's speech at a recent conference organised by the National Housing Federation to announce a plan to make an additional £2billion available to help housing associations build low-cost homes. The speech made it clear that the money would be allocated to the most ambitious providers over a 10 year period. The availability of long-term public funding is an exceptional move and is clearly a step in the right direction, as is the plan to harness the ingenuity and reserves of leading housing associations to find imaginative new ways to unlock investment capital for new home building.

In his Director's Review, Tim Hall looks at the recent House of Lords Science & Technology Committee's report *Off-site manufacture for construction: Building for Change* that consolidated evidence from Buildoffsite and many of our Members. The report made clear that the House of Lords strongly supports the Government's presumption in favour of offsite as a direction of travel for a forward looking construction industry.

This issue looks at the work of some of the Buildoffsite Hubs over the last few months, and also introduces some of the members of the new Governing Forum and includes opinion pieces on skills challenges and opportunities. There are also reviews of recent Buildoffsite events, as well as an overview of future events for this year and next.

Other features include a look at the Industrial Strategy Challenge Fund, which will help bring to market the solutions needed for transforming construction through a £420m investment over the next 4 years; the tipping point in robotics, which has shifted from being the domain of mechanical engineers to the realm of network experts; the Digital Built Britain Programme, which is the next step in the digital transformation of the sector; and what offsite has to offer in terms of climate change.

Member contributions include Berkeley Modular's new partnership with coBuilder, which aims to boost the efficiency of offsite construction; ilke Homes' success in *The Sunday Times* British Homes Awards 2018; NG Bailey's new £300m Services division; a view from Lucideon on transporting, storing and installing offsite components; a piece from WAGO looking at developments in modular wiring; a case study from Kier; an announcement from McAvoy of their expansion into offsite housing and details of their first scheme; Connect 2 Cleanrooms' new website and a review of an international presentation; plus information on our newest Members.

As always, we aim to bring you current project information, and offer insights on emerging trends and industry forecasts from our Governing Forum and Members. Thanks to all of our Members for their continued support and contributions this year. If you would like to contribute to our newsletters next year, please get in touch.

We hope you enjoy the Offsite Construction Show!

National Housing Federation Summit 2018

“The Prime Minister’s speech made it clear that the money would be allocated to the most ambitious providers, with the money being made available for a decade”

Autumn is always an interesting time of the year in the world of domestic politics. The arrival of the Party Conference Season brings with it a galaxy of policy announcements, proposals, promises and positions designed to grab the attention of those operating in the world of party politics, and if things go well also grabbing the attention of the media and the electorate at large.

Recently – and just in time for the Party Conference – the Prime Minister made it onto the podium at a conference organised by the National Housing Federation to announce a plan to make an additional £2billion available to help housing associations build low-cost homes. The Prime Minister’s speech went on to make it clear that the money would be allocated to the most ambitious providers, with the money being made available for a decade. Quite how this will work in practice will/might become clear sometime next year, as a component of the Government’s next spending review. The ambition is that this new money (and it is described as new money) will serve to enable the delivery of tens of thousands of new affordable homes. Given the relatively modest amount of money on the table that is quite a claim! The key messages to housing associations included:

- Achieving things that neither private developers nor local authorities are capable of doing
- To take the lead in transforming the way in which we currently think about delivering homes by taking on and leading major projects themselves
- A recognition that in building the homes the country needs it is necessary to have the stability provided by long term finance deals. (Note: I shall return to this theme in a few paragraphs)

This list is all good stuff, and increased public investment in new housing is both welcome and also patently necessary if there is to be any real prospect of making headroom in addressing the shortage of new homes that all political parties and all commentators describe as unacceptable. However, to put things into some sort of context, we need to be mindful of the scale of the challenge, given that the latest research has suggested that 4 million households may currently be on the waiting list for social housing.

As always, the devil will be in the detail but the availability of long term public funding must be a step in the right direction. As must the plan to harness the ingenuity (and reserves) of leading housing associations to find imaginative new ways to unlock investment capital for new home building.

That’s all to the good but the reality not always recognised by politicians and pundits is that the availability of capital will not on its own create a single new home. Homes have to be constructed, and that requires a dynamic construction industry with the capability and capacity to design and construct new homes at scale, of the right quality and providing the range of dwelling types that the country needs. It also needs to be noted that the challenge is not simply about building homes – just as important is the need for a step-change increase in the expansion of the complex web of constructed infrastructure of all types that is needed to sustain communities and to create opportunities.



“Offsite construction has made incredible strides over the last decade or so and most serious commentators now agree that traditional construction methods would be really hard pressed to come anywhere close to the right first-time quality and speed of delivery that factory production can achieve first time, every time”

Skills are already in short supply, and with the industry’s workload at a level that is already giving rise to difficulties in capacity as well as material shortages and price increases, the ability of the industry to organise itself to deliver the tens of thousands of new homes is likely to be a bit of a challenge – even without trying to predict the impact of Brexit on the availability of skilled labour.

On the basis that necessity is the Mother of Invention, it would seem entirely likely that unless there is fresh thinking on both the methods of delivery and the availability of land and development space, then making meaningful inroads to address the housing shortfall will be a real challenge.

Have we been here before? Yes, of course. The housing boom of the 1960s, which itself was a response to a housing crisis and an ambitious slum clearance programme, was to a significant extent enabled by the adoption of offsite construction methods. Housebuilding in the UK peaked at just under 400,000 in 1968. Despite some rear-view mirror criticisms of particular construction methods, this was an incredible achievement that no Government of any stripe has come anywhere close to matching in the past 50 years. The fresh thinking and the undiluted ambition that led to this

achievement is precisely what is required of current decision takers.

Offsite construction has made incredible strides over the last decade or so, and most serious commentators now agree that traditional construction methods would be really hard pressed to come anywhere close to the right first-time quality and speed of delivery that factory production can achieve first time, every time. By adopting proven manufacturing practices, the offsite industry could do even better.

Government also seems to recognise this reality, and is creating fresh commercial opportunities for the industry to perform and through the Industrial Challenge Fund’s Transforming Construction Challenge is providing funding to support collaborative research to support further technical developments and capabilities. Really welcome developments and a vote of confidence that if we are to build a UK construction industry that is much more productive and sustainable, then the use of offsite is the game-changer that the entire industry and its clients need to address. Promoting this message and enabling an innovation-focused dialogue between clients, decision takers and the supply side is the unique and essential service that Buildoffsite provides.

Finally, to return to the Prime Minister’s recent speech, it is very much the case that just as with Housing Associations, the offsite manufacturing supply side also needs to have the confidence provided by long term finance deals. The rules of the marketplace require that supportive measures are put in place if – often relatively small – manufacturing entities can with confidence make the long-term investments in product development, technology and skills. The way that the industry currently works and the way that contracts are awarded generally runs counter to the creation of long term confidence. Yet another element of a complex market but one that Government cannot afford to ignore.

Director's Review

Cinderella is on her way to the Ball



Tim Hall, Executive Director

Recent commentary and articles use the terminology ‘cottage industry’ to describe the offsite sector and I have always found this parallel rather uncomfortable. Whilst there are small, start-up offsite businesses, with varying levels of capability and ambition, you certainly can’t consider Laing O’Rourke’s Steetley, L&G’s Modular Homes, established concrete pre-casters and the rapidly growing volumetric providers as cottage businesses.

Many of you know my frequent use of analogy and I see the Offsite sector more as a ‘Cinderella industry’, as it has never quite made it to the mainstream Ball. As the audience empathises with Cinders: clients can see the virtue in offsite, but there has been little encouragement from the Ugly Sisters of construction, coupled with a lack of support (investment), meaning we only get hand-me-downs and are kept in the scullery.

We have good Buttons-like friends in many quarters, including Government, as the recent House of Lords Science & Technology Committee’s report, *Off-site manufacture for construction: Building for change* shows, <https://tinyurl.com/ydajn26z>.

The report has consolidated evidence from many Buildoffsite Members, as well as our own submission and the committee has concluded:

- That there are clear and tangible benefits of offsite manufacture (they don’t need listing here)
- The House of Lords ‘strongly supports’ the Government’s presumption in favour of offsite as a direction of travel

With such support, our Cinderella industry is on the way to the Ball, but I strongly recommend that we don’t rely on a Fairy Godmother to sustain the momentum for offsite. Remember that when Cinders’ coach turned back into a pumpkin, things could have gone back to square one.

I must admit that after she lost the slipper, I found Cinderella’s lack of ambition to find her Prince a bit passive and uninspiring. So, I encourage everyone involved or interested in offsite to seize this opportunity and invest effort in collaboration. As a sector, we need to raise our game and earn our right to play a key role in the delivery of the UK construction strategy.

There will not be a better opportunity – Government leadership has been consistent and supportive, market conditions are right, clients are looking for new approaches to delivery, and the skills and demographic agenda is driving change.

The House of Lords report reinforces 3 of Buildoffsite’s tenets; that the sector needs greater Collaboration (mentioned 37 times in the report), increased Investment (35 mentions) and new Skills (54 mentions).

“With architects, engineers, consultants, manufacturers, installers and contractors collaborating with clients, we will create compelling capability that can transform the sector and continue to improve”

The House of Lords report should be seen as a call to arms and key areas of activity for Buildoffsite are:

- ‘Government and the Construction Leadership Council (CLC) work to make sure the Sector Deal is a success’
Buildoffsite is a key contributor to the CLC and is part of the Transforming Construction Alliance to deliver the Sector Deal
- ‘Build confidence in accreditation of housing built using offsite manufacture’
Buildoffsite is working on this with the Ministry of Homes, Communities and Local Government (MHCLG), our partners BOPAS and Mark Farmer
- ‘Government provides a steady pipeline of projects for the construction sector’
Buildoffsite is working with the Infrastructure Projects Authority (IPA) and key clients to give clear visibility of projects
- ‘Presumption in favour of offsite means that Government clients must consider at least one option that includes the substantial use of offsite manufacture’
Buildoffsite will be at the core of leveraging the opportunity and the insight from this
- ‘Set out conditions needed for housing to drive the uptake of offsite manufacture’
Buildoffsite is part of the CLC, and working with the Department for Business, Energy and Industrial Strategy (BEIS) to set initiatives and metrics
- ‘Homes England to stipulate housing associations and local authorities use offsite’
Buildoffsite is working with Homes England and the National Housing Federation to build demand and confidence that offsite is a key enabler of increased capacity

The Government’s recently published formal response: <https://tinyurl.com/yde6dz4n> is less emphatic, but supports the key tenets and reinforces the commitment to investment through the Sector Deal.

None of these can be delivered with Offsite players operating in isolation. What we need is Buildoffsite’s key priority of enabling collaboration across the value chain. With architects, engineers, consultants, manufacturers, installers and contractors collaborating with clients, we will create compelling capability that can transform the sector and continue to improve.

Andrew Wolstenholme told the committee: “Unless the sector comes together around a compelling and simple agenda that attracts the attention of a very diverse sector..., we, like many others previously, will fail to get critical change across the different parts of the sector.” This sums the situation up well. My recommendation is that you read the full House of Lords report and the recently published Government response (referred to later in this piece), and act with Buildoffsite to deliver the ambition. It will take effort and resilience if we are all to thrive and ‘live happily ever after’.

The Offsite Construction Show (OSCS)

20 and 21 November 2018, ExCeL, London



The
OFFSITE
Construction Show
20th - 21st November 2018
ExCeL, London



Another year has passed and we are nearly ready to open the doors on the Offsite Construction Show. The Show once again has a fantastic line up of exhibitors, two show theatres, the Buildoffsite workshop area, a brand new 'in conversation' arena, plus live equipment demos, making it the biggest stand-alone event in the UK for the fastest growing construction industry sector.

The Offsite Construction Show is at ExCeL, London on Tuesday 20 and Wednesday 21 November. Visitors will see over 80 leading companies showing the very latest offsite products, solutions and technologies. This year, we welcome a great group of new exhibitors, including Lindapter, Sikla, Brit Lift, Framecad, Frameclad, City Lifting, Lucideon, coBuilder, Istdama, Proctor Group, Nationwide Windows and Doors, Hants County Council, C-Probe Systems, Carnehill Contracting, Wago, Dutypoint, Ideal Standard, BRE, William Attwell Associates, Ecco Modular, O'Carroll Engineering, IPP MagPly and Emtec Products.



"Getting people in one place at a given time is never easy, but the Offsite Construction Show highlights how you can provide a focused opportunity for thousands of people to meet up, network and look at what the industry has to offer"

This is a specialist event totally dedicated to the offsite industry, not a small section of a big unfocused construction show. It is a perfect opportunity to showcase our industry to those high calibre professionals with busy schedules, who can spend a few hours having meaningful discussions or attending one or more of our comprehensive industry seminars, including those crafted by Buildoffsite.

This is truly an event for the industry and its customers. As most will agree, the best way to communicate remains face-to-face. You can see more in a few hours and speak to more people than in any other forum. The handshake still represents a unique opportunity to build relationships and eventually to do great business.

Getting people in one place at a given time is never easy, but the Offsite Construction Show highlights how you can provide a focused opportunity for thousands of people to meet up, network and look at what the industry has to offer. This year, we have assembled a really good mix of well-known industry stalwarts, who will be showing alongside an ever-growing selection of new exhibitors, some of whom are new to the offsite industry.

We look forward to seeing you at the Show. Please check in at www.offsiteconstructionshow.co.uk for the full programme.

To register for the event, visit: <https://offsite2018.smartreg.co.uk/Visitors/Visitors/register>

For more information on the OSCS, contact either:

Eddie Milton on 01327 226 412
Paul Shelley on 020 3086 9296 ext. 3

Buildoffsite events at the OSCS

Once again, Buildoffsite will be supporting the Offsite Construction Show (OSCS) that takes place in Hall N4 at ExCeL London on Tuesday 20 and Wednesday 21 November. OSCS is the only UK Show wholly dedicated to the promotion of all that is best in offsite construction and facilitating exceptional networking opportunities.

The Buildoffsite Team will be located at Exhibition Stand C29 and we look forward to meeting as many Members and other delegates as possible over the two days of the Show. As usual, the Buildoffsite stand will be the place to be for business to business conversations.

As in previous years, Buildoffsite will be hosting an extensive programme of free to attend knowledge-sharing events involving some of the UKs leading thinkers and innovators. As well as running a number of Seminar Sessions on significant themes, and Workshops on key topics that are opening up business and project opportunities for the Offsite industry, new for 2018 are a number of Conversations which will provide opportunities for small groups of delegates to talk directly to senior industry figures about important developments and opportunities. See pages 12-13 for details of Buildoffsite's Seminars, Workshops and Conversations.

Speakers and Chairs at this larger than ever Buildoffsite Event Programme will include:

- Keith Waller, Transforming Construction Alliance
- Tim Carey, Willmott Dixon
- Jon Rains, Mott MacDonald
- Graham Cleland, Berkeley Modular
- Daniel Leech, The TDS Group
- David Harris, Premier Modular
- Susan Emmett, Homes England
- Simon Leadbetter, Willmott Dixon
- Alan Clucas, Laing O'Rourke
- Pete Foster, coBuilder
- Stacey Green, WAGO
- Richard Fletcher, Trimble
- Ed Clark, IStructE
- Bill Price, WSP

Some delegate places for the Seminars, Workshops and Conversations will be available on the Show days on a first-come, first-served basis, however pre-booking is recommended in order to secure your place.

To reserve a place on:

Day 1 – Tuesday 20 November

visit: <https://kulahub.blob.core.windows.net/clients/746/campaignemails/29889.html>

Day 2 – Wednesday 21 November

visit: <https://kulahub.blob.core.windows.net/clients/746/campaignemails/29888.html>

Further details of the Buildoffsite Event Programme are available on the OSCS website: www.offsiteconstructionshow.co.uk and you can also find out more on the Buildoffsite website: www.buildoffsite.com/news-events/upcoming-events



Show Day 1 | Tuesday 20 November

Residential Theme

BUILDOFFSITE SEMINARS

Seminar 1

The Perfect Storm – Understanding residential demand
A forward look at Housing. The first of two back-to-back Seminars with the public and private sectors to examine the evidence on demand

Time: 11.00 - 11.45 am

Seminar 2

The Perfect Storm – Delivering capacity, quality and confidence in residential supply
The second of two back-to-back Seminars with the public and private sectors to examine the evidence on supply

Time: 12.30 - 1.15 pm

Seminar 3

Education and Skills to Enable Innovative Offsite
This Seminar will address some of the practical steps being taken to identify and deliver the new skills needed to build a better industry

Time: 2.00 - 2.45pm

BUILDOFFSITE WORKSHOPS

Workshop 1

Innovation in Product and Material Solutions
Innovation in materials, manufacturing and project solutions are happening all the time. This workshop will showcase innovations from C-Probe Systems and Lucideon

Time: 10.15 - 11.00 am

Workshop 2

Innovation for Existing Building Refurbishment
Opportunities are finally being found for offsite solutions to be applied to repair, maintenance and improvement, delivering enhanced outcomes. This session will showcase examples of outside the box solutions

Time: 12.00 - 12.45 pm

Workshop 3

Supporting Innovative Housing Solutions – BOPAS certification
Hear from manufacturers how BOPAS certification is de-risking their offsite investment decisions, giving confidence to lenders and supporting the rapid growth of offsite take-up

Time: 3.00 - 3.45 pm

IN CONVERSATION WITH

Conversation 1

Retail Developments – No longer business as usual
Opportunities to hear directly from thought leaders who are introducing innovations to the industry. Hear in detail what they are doing and why

Time: 10.30 - 11.15 am

Conversation 2

Is offsite really more expensive?
Traditional cost models are inadequate for assessing true project cost. Hear from those who successfully deliver

Time: 11.45 am - 12.30 pm

Conversation 3

Achieving design excellence with offsite
This session will consider the latest developments in the understanding and use of digital to deliver better project and societal outcomes

Time: 1.15 - 2.00 pm

To reserve a place on: Day 1 – Tuesday 20 November

visit: <https://kulahub.blob.core.windows.net/clients/746/campaignemails/29889.html>

Show Day 2 | Wednesday 21 November

Infrastructure & Policy Theme

BUILDOFFSITE SEMINARS

Seminar 1

The Future is Digital – but why?
The role of digital/BIM is recognised as an integral part of project delivery. This session will consider the latest developments in the understanding and use of digital to deliver better project and societal outcomes

Time: 11.00 - 11.45 am

Seminar 2

UK Infrastructure – Major projects driving innovation
The UK has a £600 billion infrastructure investment pipeline. How much can offsite deliver?

Time: 12.30 - 1.15 pm

Seminar 3

The Core Innovation Hub – Transforming UK Construction
Government's £170m investment to jointly finance the Construction Sector Deal includes funding for collaborative research. This session will explore what this means in practice and the ways in which individual construction businesses can play a part

Time: 2.00 - 2.45pm

BUILDOFFSITE WORKSHOPS

Workshop 1

Building over Rail Infrastructure
Explore how we could potentially deliver 250,000 additional homes above London's rail infrastructure. A description of the scale of the opportunity, and the application of offsite and modular solutions to achieve economic construction

Time: 10.15 - 11.00 am

Workshop 2

Offsite Collaboration – Delivering better projects faster
To deliver the full benefits of offsite construction requires collaboration across disciplines. This is an opportunity to see how three Buildoffsite Members have worked together to deliver a better, faster and more cost-effective solution

Time: 11.45 am - 12.30 pm

Workshop 3

A Perspective on the Skills Challenge in Offsite Manufacture
A closer look at how Berkeley Modular and coBuilder are working together to ensure the more effective utilisation of data to support modern offsite manufacturing

Time: 1.45 - 2.30 pm

IN CONVERSATION WITH

Conversation 1

The Industrialisation of Construction
Hear directly from thought leaders who are working to introduce innovations to the construction industry. What they are doing and why, and the opportunities and challenges that exist to build a better industry

Time: 10.30 - 11.15 am

Conversation 2

Is the Tier 1 Contractor Model Obsolete?
A thought-provoking discussion around the offsite supply chain model

Time: 1.15 - 2.00 pm

To reserve a place on Day 2 – Wednesday 21 November

visit: <https://kulahub.blob.core.windows.net/clients/746/campaignemails/29888.html>

Buildoffsite Governing Forum

Governing Forum update

Further to the formation of the Buildoffsite Governing Forum as covered in the August edition, Tim Carey, National Product Director at Willmott Dixon has taken on the role of Chairman. We will cover more on the work of the Forum in future editions.

You can find out more about some of the Forum members here, and there are also personal opinion pieces by Graham Cleland and Daniel Leech in this issue.



Graham Cleland
Director, Berkeley Modular

I have represented a number of member organisations at Buildoffsite for over 10 years now, and have witnessed it evolve and grow to suit an ever-changing political and operational climate. From a personal perspective, I can safely say my experience is that the more a Member puts into Buildoffsite the more they will get out – to the benefit of both their individual business and to Buildoffsite as a whole. I'm delighted to be a Member of the Forum, as it will provide opportunities to develop relationships across the Membership, so we can drive some key initiatives covering the following:

- Skills for offsite
- Digital to leverage productivity
- Collaboration between Members

Whilst the challenges the construction industry faces today are somewhat different to those of a decade ago, there are still plenty of them. There is no question that the Buildoffsite Membership can help to address some of these challenges but I don't believe anyone should join Buildoffsite just because they think it will provide an easy route to more business; rather because they can see the benefit of working collaboratively to leverage the collective Membership talent to deliver transformational change across the industry.



Daniel Leech
Group Director, Technical Design Services Group

Having been a Member of Buildoffsite for nearly four years, I was delighted to be asked to be part of the new Governing Forum.

We have received huge value from our Membership, and I am passionate about ensuring that Members have a platform to promote their businesses, share knowledge and advocate best practice.

We have a perfect storm in the construction market, with lots of huge challenges that create many fantastic opportunities for us all.

I hope to put my practical experiences as MD of the TDS Group to good use, and drive the agenda around both skills and digital technology/innovation.



Leanne Clowting
Membership & Marketing Services Director, CIRIA

Since joining CIRIA nearly four years ago, I have watched with interest as Buildoffsite has celebrated a range of successes and navigated a changing industry, moving from championing and educating, to adding further value in supporting and leading its members. As CIRIA Executive Director for Membership, Marketing and Commercial Activity, I have a very clear governance role within the new Buildoffsite Forum, representing the Forum and Membership on the CIRIA Executive Board, and overseeing corporate performance.

I'm excited to be part of the next phase of Buildoffsite. With a background in property, regeneration, inward investment and housing, I'm fully bought into the offsite solution and delighted to be able to support its journey to being a routine consideration for all types of development. With that in mind, I will be focused on supporting the Forum in ensuring that we leverage the collaborative benefits of being part of CIRIA, opening up opportunities for knowledge sharing and collaboration. Strategically, my focus will be to support the Buildoffsite marketing and communications efforts, with a view to growing awareness, effective engagement and value for Members. I look forward to meeting many more of you over the coming months.



Hub Updates



Residential Hub



Dennis Seal
Buildoffsite Chair of the Residential Hub

There is a lot of activity within the Residential sector, despite the Major House Builders preparing for a Brexit effect. During the period of uncertainty leading up to Brexit, there is a good opportunity for the offsite sector to showcase to the industry what it has to offer in a post-Brexit economy.

Quality and speed of construction should by now be a given, and should be recognised throughout the industry as two of the key factors to warrant changing to offsite manufactured solutions. Accreditation using schemes such as

BOPAS will ensure that those organisations registered and approved will be able to scale up their processes and delivery to meet future demand, without comprising either the quality or speed of manufacture.

Historically, the cost of supply using offsite manufactured solutions was considered by many to be a factor that prevented sector growth, especially when compared to more traditional construction methods. This is no longer the case, with many offsite options now bettering those of more traditional methods.

Buildoffsite is including a substantial programme of Residential focused events at the Offsite Construction Show on 20/21 November. Come and meet the whole team at the Buildoffsite Stand.

Watch out for the Residential Hub National event to be held in London on 19 March 2019 tackling 'the cost of offsite for different tenures' with real examples and comparators. It's a not to be missed event if you are involved in the residential sector and want to know more about the costs of supply and the competitiveness of the market.

We are building up a good residential following now amongst our existing Membership and with new Members joining after guest invites to the Hub events, we are pleased to announce the appointment of Jamie Parr as Member Engagement Lead. Jamie will provide valuable support for our Residential Hub Members and our leaders' group, and will ensure our future programmes are tailored to Members' needs and direction.

If you haven't spoken to Jamie yet he will be getting in touch with all of our Residential Hub Members shortly to catch up, however if you want speak to him now, please contact him directly to advance any conversations or discussions that you believe will add value to your Membership or the shape of the Residential Hub as we move forward.

You can email Jamie at:
jamie.parr@buildoffsite.com
or call him on: 07779 112707



Rail Hub

This year, the Rail Hub has focused on helping clients communicate with potential supply chains, published a DfMA Guide for Bridges and Viaducts, and followed Members' progress with demonstrating how concrete structures may be designed for an indefinite life.

We are now working on producing a Rail Overbuild Guide, led by WSP. This is aimed at demonstrating the feasibility of creating developable sites for residential units in London, following the publication of WSP's *Out of Thin Air* report. As a group, we aim to create useful, valuable knowledge for the sector, and look at ways of making it easier to use offsite solutions and meet society's challenges.

Over the next year, we aim to look at the feasibility of getting a common process for offsite product approval for multiple rail stakeholders, as many projects involve both rail network owners and train service operators. Buildoffsite is achieving success with the BOPAS scheme (Buildoffsite Property Assurance Scheme) in the Residential sector, and Members are asking if we can do something similar to simplify things and improve productivity in the Rail sector.

The Offsite Construction Show on 21 and 22 November at ExCeL London gives us a platform to promote the work to date:

- Director of WSP Bill Price will be presenting on the Overbuild Guide project, providing insights from both a site owner or developer's context and how the offsite construction sector may play a role
- Graeme Jones (MD of C-Probe Systems) will present how the company has collaborated with Shay Murtagh Precast to develop a demonstration of designing structures with indefinite life. Low carbon alkali-activated cementitious materials (AACM geopolymers) are being used in smart ways to provide controllable resilience for structures to underpin service life. Data will be presented that provides design information for the composite use of AACMs with Portland concrete in precast and in-situ placed forms that allows impressed current cathodic protection (ICCP) to be permanently available to remotely control corrosion from the birth of the structure, thereby avoiding future disrepair and maintenance. Embedded corrosion rate monitoring is used to provide continuous performance data, from which to track service life and provide a sustainable and assured future, indefinitely.



Corrosion protection with AACM on a bridge beam
© C-Probe Systems



Jamie Parr
Residential Member Engagement Lead

Buildoffsite Team Update

For those that I haven't spoken to since I joined Buildoffsite a few weeks ago let me introduce myself. I am the new Residential Member Engagement Lead. I have wide experience of working within the UK construction sector, supply side, manufacturer/contractor and specialist offsite architecture. Now I have my feet properly under the table, I have been having conversations with Members.

In order to achieve the above and to drive change I need to engage regularly with Members. If I haven't spoken to you yet, get in touch so we can book in a call or meeting.

My aims are to:

- Engage more, in order to better understand Members' needs to deliver against their requirements and expectations
- Add value through networking events
- Highlight opportunities and projects
- Lobby Government and other influential bodies regarding Buildoffsite as the voice of the offsite industry



A practical design guide for the manufacture and assembly of bridges and viaducts
© CIRIA

If you want to get involved with the Buildoffsite Rail Hub, please do not hesitate to contact us by emailing:
info@buildoffsite.com

A Perspective on the Skills Challenge in Offsite Manufacture



Graham Cleland
Member of the Buildoffsite Governing Forum
and Director, Berkeley Modular

A personal opinion piece by Graham Cleland

There has been plenty of discussion and debate in recent times regarding the sufficiency and adequacy of skills to support the general construction sector. In contrast, there has been much less discourse regarding the specific challenges of resource availability in the offsite sector, despite a growing level of interest.

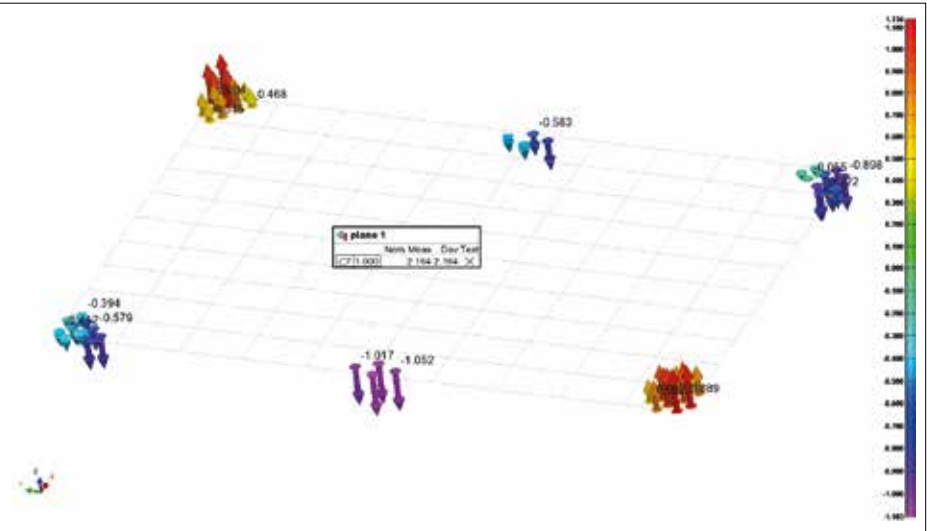
Since it would be fair to state that much of the extant capability/capacity of the offsite sector can be characterised as construction under controlled conditions though, it could be argued that offsite construction actually competes with general construction for resource in the same reducing pool of talent. Of course, there have been moves of late to try to help resolve this problem, with bodies such as the CITB publishing a useful report to highlight where focus might need to be directed to help build the skill base to support the increasing appetite for offsite, particularly in residential development. This report pointed to a number of personas that reflect six key functions covering multiple job roles that are key in offsite construction, including:

- Digital Design
- Estimating/Commercial
- Logistics
- Offsite Manufacture
- On-Site Assembly and Placement
- Site Management and Integration

Looking at the first of these personas, the CITB reasonably argues that this might be the most important to support the adoption of 3D digital models with rich data, so that designs can be robustly tested/agreed ahead of manufacture. Whilst I would not necessarily disagree with the prominence of a digital design role in offsite, what I would argue is that the proposed scope of this function might be lacking and requires to be extended. In order to radically transform productivity in the offsite sector, it is important to have a grasp of the sort of disruptive technologies/methodologies that represent the biggest levers.

Offsite manufacturing (as opposed to offsite construction) is a concept that relies on such leveraging to create highly productive, scalable factory environments that can deliver high quality, high performing product. So, the broader requirement might be to define this digital design role such that it fits more sophisticated offsite manufacturing philosophies, whereby the skill set includes modelling to quickly create fully-federated, data-rich digital designs which automatically drive manufacturing equipment/technology to produce physical product. In this way, it is easier to conceive how it might be possible to address certain of the Industrial Strategy Challenge objectives, specifically in the context of an increase in the pre-manufactured value of built assets in residential development.

Currently, whilst it is typically the case that a lot of time and effort goes into creating building information models through the various stages of the design process, the quality and robustness of these models is not necessarily fit to support the direct feed to manufacturing equipment/technology to produce physical product from a virtual design. Albeit there are lots of positive outcomes of creating building information



Above: Metrology measurements to assess dimensional accuracy for height of sample module
Below: Sample wall panel being removed from furnace after fire test



models, including the encouragement of multi-disciplinary collaboration in a shared workspace, more precise co-ordination of the digital design to facilitate early clash detection, the removal of potential discrepancies and so forth, current approaches do not support the auto-creation of physical product. Accordingly, it is common to find digital designs (or more realistically parts thereof) being re-modelled as design progresses and each of these steps effectively constitutes non-productive/time-consuming work. Whilst this reflects a somewhat inefficient, wasteful process in its own right, the real issue is that it results in built assets where there is a lack of

correlation between design intent and actual performance. Hence, the broader skill set should help in evolving a logic based on a robust and efficient process for creation of digital designs and clever modelling-machine coding logic yielding product where there is correlation, and there is a golden thread of asset information from the point of model creation to handover to end-customer. Of course, what this notion does imply is that much design development and proof testing work has to happen off-line, that is, not during a live project. There is plenty enough challenge in devising/applying a robust and efficient process for the creation of data-rich,

“Whilst I would not necessarily disagree with the prominence of a digital design role in offsite, what I would argue is that the proposed scope of this function might be lacking and requires to be extended”

fully federated digital designs, without having to worry about resulting performance across themes such as fire resistance of a structure, acoustic attenuation, dimensional accuracy of manufactured product, etc. This off-line work reflects some of the complementary skills required of the digital design role to facilitate talent being delivered into the offsite sector that understands both that something is to be made as well as what is to be made. This fuller expectation still fits with the CITB's digital design persona, but the scope the role requires to be extended and then the work to find appropriate training providers can begin in earnest.

Skills Shortages? Or Skills Opportunities?!



Daniel Leech
Member of the Buildoffsite Governing Forum and
Group Director, Technical Design Services Group

At every construction seminar I have attended over the past few years (and there have been a few), there are a number of recurring topics: BIM, the fourth industrial revolution, industrialisation, offsite, modern methods of construction, the housing shortfall, etc. However, one dominant, cross-cutting issue is the great skills shortages being experienced throughout the industry.

We can be in no doubt that the UK construction industry is buoyant, despite the impending threat that an uncertain Brexit deal provides to our wider economy. This is, in the main, great news for anyone in construction. We have some fantastic infrastructure projects like HS2 and Hinkley Point. We have the housing shortage, which is creating a surge in demand for offsite and modular housing solutions. Of course, there are still traditional construction projects flying up across the UK. When you throw everything into the mix, it looks like a healthy order book for the construction industry for the foreseeable future.

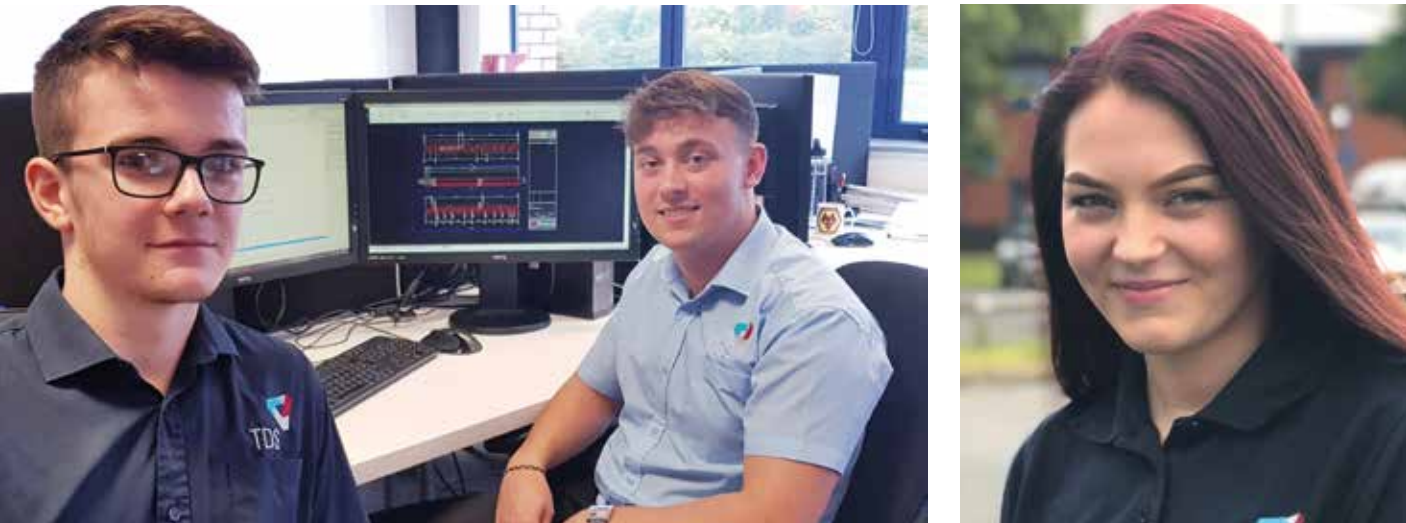
The big question on everyone's lips is going to be one of how do we deliver? How do we sustainably scale our businesses and the workforces within them? How do we capitalise on such a healthy order book? How do we innovate and take advantage of the technological advances being introduced into the industry? We believe that young people are our future. So much so, that we founded CADCOE (Construction And Design Centre of Excellence) in 2011 in order to provide a vehicle for us to attract, retain and educate young people with exactly the kind of skills our business needs.

The CADCOE model is not rocket science. We have an intensive 16-week training window at the start of the apprenticeship, where vocational skills are taught by industry experts in a professional work environment. We partner with a fantastic FE organisation,

Dudley College of Technology, which is rated as Outstanding by OFSTED and delivers all of the underpinning knowledge in a state-of-the-art classroom environment called Advance 2, that has been built at a cost of £12m.

If we are going to truly address the skills shortages that exist within the construction sector, then we need to hone in on creating more of these kinds of partnerships throughout the country. It's so easy to criticise the schools, colleges and universities by saying that 'the qualifications are too generic', or 'the students aren't work ready,' etc. But how can a school/college/university that isn't in the construction industry know what we need? How can they keep up-to-date with the latest innovations in an industry that is evolving so rapidly? How do they attract young talent into the sector if they don't truly understand it like we do? For these reasons, I have a huge amount of sympathy with the education sector in navigating the stormy seas in which they sail.

However, I think we really need to challenge the mindset within the construction industry. These skills shortages represent a fantastic opportunity for us all. They represent an unprecedented opportunity for young people across the country who are eager to be given a chance and to learn whatever it is their respective trade or career will be. They represent a fantastic opportunity for educational establishments, private training providers and employers to form collaborative



(Above) TDS Apprentices Adam, Olly and Lora were on the project team for the complex detailing of this modular apartment block in Croydon – Addiscombe Grove (Below)

partnerships to ensure the qualifications and training platforms on offer meet the needs of the industry. They represent a fantastic opportunity for the industry to bring in these young people who will start to transform the culture, the mood and the thought processes that stagnate the industry.

Within our business at TDS, I am surrounded by ambitious, confident and diverse young people who add huge value to what we do as a business. Lexi (17) is working on Manchester Airport, Lora (17) is part of our European Data Centres team, Tom (21) is now running his own teams and packages of work, and Shaun (22) is working on an innovative modular volumetric scheme in central London. These are just 4 of our 11 apprentices who make such a fantastic contribution alongside our vastly experienced team.

So, this is a call to arms to anyone reading this article. Don't just complain about the skills shortages, commit to doing **SOMETHING**. It may be providing an opportunity to a young person on an apprenticeship, or it may be reaching out to your local college or university to help them to develop the curriculum – but rest assured, 'every little helps' and by embracing the skills **OPPORTUNITIES** we can all help to build a better future for the industry.

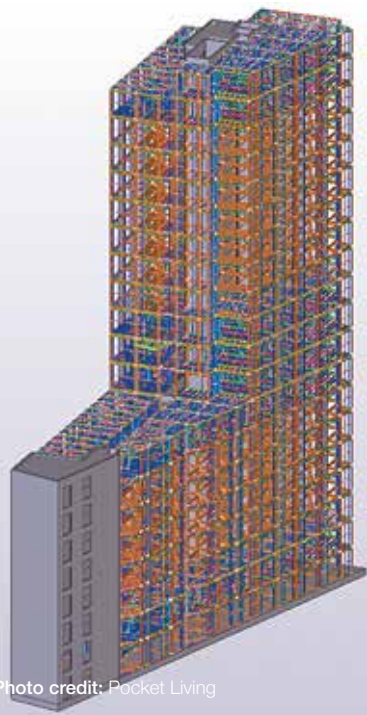


Photo credit: Pocket Living



For more information, contact Daniel by email: Daniel.leech@tdsg.co.uk or call: 01952 225 835

Transforming Construction



“Historically, construction has been held back by industry fragmentation and lack of applicable technology. Those issues are now being addressed. The prospect – and now the reality – of Government support as part of the Industrial Strategy has drawn the industry together as never before”

The UK construction industry is facing a once-in-a-generation opportunity for transformation. In achieving this transformation, the UK will set itself up as a role model and service provider for construction around the world.

The opportunity did not arise overnight – UK development of building information modelling and visibility of the procurement pipeline have been important drivers – but it is the current set of circumstances that enable a proper step-change. The UK construction industry has established strong foundations but we still suffer from problems that are globally endemic – high levels of process and material waste, variable quality, and gaps between designed and actual asset performance.

Historically, construction has been held back by industry fragmentation and lack of applicable technology. Those issues are now being addressed. The prospect – and now the reality – of Government support as part of the Industrial Strategy has drawn the industry together as never before. Orchestrated by the Construction Leadership Council, a critical mass of clients and suppliers are coming together to start the transition to a new approach that embraces digital, offsite manufacturing and whole life asset performance techniques.

In July 2018, the Government published the Construction Sector Deal as part of the Industrial Strategy. The Sector Deal describes how Government construction procurement will be mobilised to leverage change in the design and assembly of buildings, how the skills challenges faced by the industry can be addressed, and how £170m provided as part of the Industrial Strategy Challenge Fund (ISCF) will bring to market the solutions needed for transforming construction. I am proud to be leading the allocation of the £170m ISCF contribution, plus the £250m pledged by industry – a total of £420m to be invested over the next 4 years.

Investment will be focused in four main areas – two dealing with vertical integration within the industry and two dealing with horizontal

integration. The first investment in vertical integration will be to develop buildings consisting of standard product platforms and manufacturing processes. These will be aligned with Government procurement needs, with an initial focus on schools. The second vertical integration solution will be the creation of energy positive buildings – buildings that generate, store and distribute energy. Full scale buildings demonstrating the technology have been created at the University of Swansea, with the help of previous funding. We will now be investing to support the widespread market uptake of these buildings.

The first focus area in horizontal integration will be improving the information landscape across the industry – the collection and sharing of information about asset performance, building element location and status, supplier capabilities and outcomes for the end users of buildings. The availability of these data sets will pave the way for the application of advanced digital techniques to integrate the industry horizontally. These digital techniques, including artificial intelligence and geographic information systems, will lead to rapid advances in construction decision-making and control.

There is no doubt that the Construction Industry Sector Deal and the investments in solution development represent an opportunity to take the UK construction industry from one of the world's best to an absolute world-beater. I urge everyone – Buildoffsite Members in particular – to join the revolution in whatever way they can.

For more information on the work of the Industrial Strategy Challenge Fund visit: <https://www.ukri.org/innovation/industrial-strategy-challenge-fund/>

New robots will revolutionise the built environment



Alvise Simondetti, is a member of the foresight, research and innovation team at Arup, responsible for developing real-time synthetic environments which test plausible futures. Here, Alvise looks at how robotics has shifted from being the domain of the mechanical engineer to the realm of network experts.



In the past, robots were used for specialist jobs that were too dull, too dangerous or too dirty for people to do. Today, thanks to their ability to process sensor data in real time, robots do an incredible range of things. They already clean your house. Soon they'll be able to help design and build your house too.

The tipping point has come as robotics has shifted from being the domain of the mechanical engineer to the realm of network experts. They've applied smartphone technology to produce robots that can sense, process data and communicate with each other via the cloud to learn. One example is Roomba, a vacuum-cleaning robot. In its first generation, Roomba would bump around your walls. Then it learned how to sense and spare your furniture. Now in its third generation, Roomba takes a picture of your ceiling to know where it is, a technique called robotic mapping. Telecoms company Qualcomm has demonstrated the potential of this approach by taking a smartphone and adding four wheels and a motor. The power of the smartphone industry's skills and technology might enable developers to leap 30 years of development and produce a robot capable of much more sophisticated actions than anything that has gone before.

What does this mean for construction? Traditionally, building takes place onsite and by hand. In the future, according to conventional thinking, machines will perform construction offsite. But this has been proposed for years. I think there will be an alternative: robots working onsite alongside humans. This is something researchers at ETH Zürich have begun to explore. Give a robot a pile of bricks and it will build you a perfect wall. And it can achieve effects that a human bricklayer simply can't, such as turning each brick by exactly one degree to produce a very subtly curved wall. It does the same with timber cladding and tiles.

The leap in robotics has implications for design too. I don't think we'll see robots designing buildings autonomously but I do think we could see them working alongside designers. You could use a robot to help you build a physical model, for example. And companies such as Skycatch already use drones for 3D scanning to provide cost-effective, high-speed and high-quality data about an area. Should we be worried about any of this? Are machines going to take our place? I don't think so. As I heard inventor Saul Griffiths point out, robots are still blind, stupid, fat, weak, slow and difficult. They're an opportunity, not a threat.

“The leap in robotics has implications for design too. I don't think we'll see robots designing buildings autonomously but I do think we could see them working alongside designers”

The journey to a Digital Built Britain



The Centre for Digital Britain:
The Centre for Digital Built Britain is a partnership between the University of Cambridge, Industry, and the Department for Business, Energy and Industrial Strategy established at Budget 2017 as the focal point for UK ambitions to develop the foundations for a 'Digital Built Britain' of which Building Information Modelling (BIM) forms an integral enabler. The Centre's mission is to develop and demonstrate policy and practical insights that will enable the exploitation of new and emerging technologies, data and analytics to enhance the natural and built environment, thereby driving up commercial competitiveness and productivity, as well as citizens' quality of life and well-being.

Digital Construction
A general term for the advances in incorporating a digital way of working into the delivery and operation of infrastructure and built assets. It includes Building Information Modelling (BIM), Government Soft Landings (GSL), Design for Manufacture and Assembly (DfMA), Modern Methods of Construction (MMC), robotics, 3D printing, and lean design and processes.

Combining emerging digital capabilities with decades of engineering knowledge offers new opportunities to meet the challenges faced by the construction and infrastructure industry.
The fourth industrial revolution, characterised by cyber physical systems, ubiquitous connectivity, rapid development of technologies such as robotics, artificial intelligence and 3D printing and a proliferation of data can deliver high performing infrastructure as the prize of digital construction and smart asset management. Owners and operators will be able to design, build and operate better new assets and gain greater value from existing assets – increasing efficiency, safety, reliability, performance and resilience.

As adoption of Building Information Modelling (BIM) plus a client base and industrial supply chain matures and becomes more sophisticated, the UK infrastructure sector is creating a competitive edge worldwide and is laying the foundations for a digital built Britain. The transformational opportunities and benefits demonstrated through the BIM programme has allowed the UK to better align supply chains with the people responsible for operating and maintaining new infrastructure and assets, creating for the first time an integrated model of delivering infrastructure creation and operation.

The Digital Built Britain Programme is the next step in the digital transformation of the sector. It brings together the Industrial Strategy – Construction 2025, the Business and Professional Services Strategy, the Smart Cities Strategy, Transforming Infrastructure Performance report, and the Information Economy Strategy to provide a consistent vision on how Government and relevant industries can respond to sector challenges and create a market that not only delivers world class public sector services for citizens but enables the private sector to deliver value and capability worldwide.

Build

Exploit new and emerging digital construction and manufacturing technologies, processes and techniques.
Secure, shared information, enabling clients, design teams, construction teams and the supply chain to work more closely together to improve safety, quality and productivity during construction.

Design

Deploy digital techniques to design better performing buildings, homes and infrastructure.
Use good practice, secure by default, information management to get data right from the start.

Operate

Use real time information to transform the performance of the built environment and its social and economic infrastructure.
Smart asset management to predict and avoid disruption of services.
Digitisation of existing assets and infrastructure.

Integrate

Understand how spaces and services can improve citizen quality of life.
Feed that information in to the design and build of our economic and social infrastructure and the operation and integration of services they deliver.



The Centre for Digital Built Britain (CDBB) works with industry, academia and policy makers to support the digitally enabled transformation of the entire life-cycle of our built assets. This includes finding innovative ways of delivering more capacity out of our existing social and economic infrastructure, dramatically improving the way these assets deliver social services to deliver improved capacity and better public services. Above all, it will enable citizens to make better use of the infrastructure we already have. These benefits will be achieved through changing the way we design, build, operate and integrate our physical, social and economic infrastructure.

New, emerging and disruptive technologies, with the growing digital economy, will create further opportunities to extract value and efficiencies through the whole life of assets. However, technology alone is not enough to deliver change. CDBB is working to support the adoption of BIM in industry and Government through its Home Nations Working Group, Public Sector BIM Working Group, and International Programme. It is working to coordinate the wider digitisation of the construction sector and the development a national digital infrastructure framework through the Digital Framework Task Group. The programmes and working groups look at how policy development, education and training, standards, case studies, business cases, and tools together with engagement activity can remove barriers to adoption.

CDBB is located at the University of Cambridge and sits in a cross-disciplinary position across all six Schools. The Centre was created to be a national leadership body for digital in infrastructure and construction; providing neutral, technology-agnostic, fair brokerage to support the building and demonstration of UK capability. To fulfil this mission, the Centre seeks to both develop new knowledge, create networks and collaboration opportunities and to consolidate UK outputs to develop a digital built Britain.

To collaborate with the Centre for Digital Built Britain please email: engagement@cdbb.cam.ac.uk or visit: www.cdbb.cam.ac.uk

Modular Wiring – a viable solution



Stacey Green
WAGO Ltd's Design & Projects Manager

Modular (plug and play) wiring has been in existence for over 25 years in the UK. Predominately during this period, its use has been within non-residential sectors with its main application being for lighting. However, it can and should be considered more broadly than this, as it can lend itself to almost any type of installation. That said, modular wiring is still met with a lot of resistance within the industry when considered as an alternative to traditional installation methods.

There are several reasons or arguments typically put forward against modular wiring. Firstly, the claim that:

• **It's a non-compliant method of installation and that flexible cables are prohibited from use within an installation for fixed wiring.** This is a myth – BS7671 reg. 521.9 'Flexible cable shall be used for fixed wiring', furthermore regulation 521.201 states that Prefabricated (modular) wiring is acceptable as a means of installation if compliant with BS8488.

• **It's as quick to use traditional methods as modular wiring, so there is no advantage.** Simply put, modular wiring is by far the quicker installation method, as there are little and in most cases no terminations required on site. Also, due to both design and production being 'in tune', there are very limited – if any – reworks required on site as it's 'right first time'.

• **Plug and play is rubbish – it causes points of failure and high resistance.** This sort of comment is more frequent than you would imagine. Whilst any cable connections can generally be seen as a potential point of failure, to the best of our knowledge, there are no cases of such a failure or issue in the market place. This is most definitely the case with WAGO and I'm sure other quality companies who produce similar modular wiring products would concur. Our own plug and play systems have minimum (Micro Ohms) resistance between the plug, socket and/or accessories, and our sprung terminals actually give our system maintenance free connectivity.

• **And lastly, everyone's favourite, it's too expensive!** Whilst I agree modular wiring is more expensive than just buying a drum of cable, it's really not that simple. This is probably the biggest stumbling block I face when trying to secure new projects.



WINSTA® Projects Modular Wiring & Trunking System

- Modular Wiring System
- Innovative Trunking System
- Lighting Control
- Integrated System
- Additional Control Possibilities

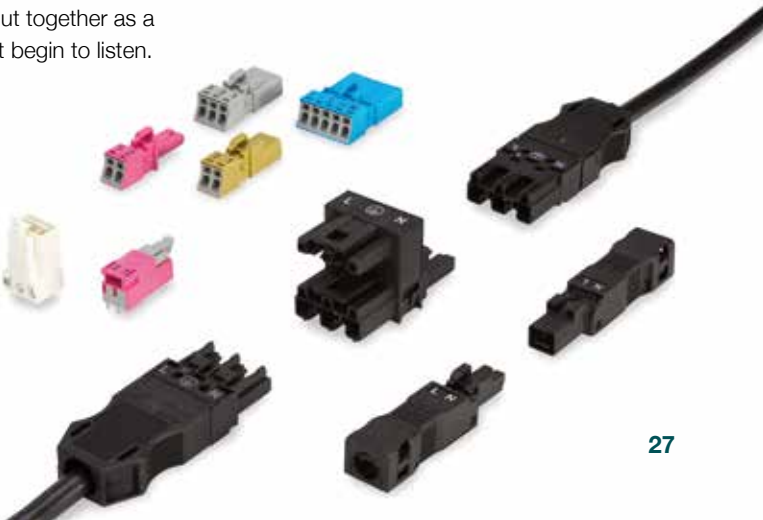


I don't need to explain the intricacies and benefits of cost and programme certainty/ reduced site times/reduced (unskilled) labour/ increased productivity and the like, which would reduce site expenditure and counter any such claims of being too expensive. But for us and, one would suspect most other suppliers of M&E offsite solutions, we do not and cannot control the labour element of the onsite works. That said, explaining cost saving becomes a little more contrived. With this in mind, WAGO Ltd has for a number of years now engaged the services of site supervisors to advise on best practice and to assist in the process of 'on time/right first-time completion', helping to deal with any potential issues or problems at an early stage and working with our clients to bring their projects to a successful and cost-effective conclusion.

So how do we overcome such negativity? Well, as I've already mentioned, WAGO Ltd are actively trying to break down these barriers, with having to hand supervisory personnel. Ultimately though, the only way

to progress offsite acceptance is via education! By engaging with electrical consultants, working with M&E contractors, QSs and Engineers to show the benefits of modular, and speaking to end users to promote the longer-term benefit of modular wiring, we are slowly breaking down barriers and cementing relationships. This is by no means an easy fix, with many hurdles having to be jumped before we get a win. That is why WAGO Ltd is proud to be a Member of Buildoffsite, as we fundamentally believe one lone voice achieves little but together as a collective, people may just begin to listen.

For more information on WAGO Ltd and on modular wiring solutions, contact Stacey Green by email: stacey.green@wago.com, call: 01788 568 008, or visit the website: www.wago.com



Climate change – what does offsite have to offer?



Professor Bernard Williams is a Chartered QS and Managing Director of International Facilities and Property Information which has developed the ‘CombiCycle Comparator’ Whole-life Cost and Sustainability Prediction programme.

The report from the UN Intergovernmental Panel on Climate Change makes disturbing reading. Construction consumes getting on for 10% of the developed world’s resources, generating a lot of damaging nasties in the process. Embodied carbon is believed to represent more than 10 times the carbon dioxide generated annually by the building in occupation, so represents about 30% of that generated by a building from cradle to grave. Given also that the operation of buildings is responsible for nearly half of the world’s energy consumption, we in the industry are smack in the firing line when it comes to reduction of carbon dioxide and other nasty emissions through the whole life-cycle of every construction we build.

The CombiCycle Comparator model developed by IFPI and sponsored by Buildoffsite is uniquely placed to be able to guide developers and their consultants on the likely environmental impact of their proposed designs and specifications right from the outset. It doesn’t use rough high-level figures on embodied carbon for compound materials like concrete, plaster and granolithic screeds; on the contrary, every constituent part (including the water) is assessed for any or all of the myriad options available for the mix in

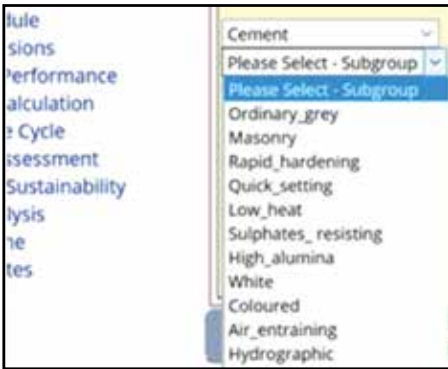
Component	kgCO2e/kg	Material weight kg/m3	kgCO2e/m3 concrete
Concrete	0.080	2329.108	185
Reinforcement	1.40	130.00	182
Formwork	0.4600	9.19	4.23
	1.939618	2468	372

terms of proportions, embodied carbon, thermal transmission and whole-life cost.

For example, cement can be problematic in environmental terms and in its various forms such as High Alumina, Low Carbon, Quick-setting, Coloured, etc has a very wide range of prices and environmental properties. When Comparator users select any option for any material in any mix, the whole-life cost and environmental impact (embodied and in use) of that selection is immediately dash-boarded, so users can make a considered judgement on whether they wish to save the planet or go to the wall!

These decisions can be taken at Feasibility Stage, before design begins in earnest.

So how does offsite fit into all of this? Well, Comparator makes the same calculations for offsite proposals as it does for traditional solutions, so it will not make an offsite solution any more eco-friendly or economical than a traditional solution – unless it is. And how will it be so? The answer is by selecting low carbon, low cost, thermally efficient materials, which are subject to less waste and lower transportation costs than would be the case with the traditional alternative, and which can be recycled on life expiry. Saving on transportation is, of course, a challenge given that offsite almost invariably involves double handling of the materials and components. Here, lightweight materials can help reduce the impact of transportation pollution on the environment. Buildings and fit-outs designed for a longer life will also help the cause considerably.



Quality of construction should be a plus for offsite, with improved life expectancy, lower maintenance and better air-tightness heading the list of perceived environmental and cost benefits over the traditional offering.

Comparator is designed to help clients and their consultants take all of these factors – and the many others which make up the environmental/whole-life cost equation – into account at square one. The web-enabled model gives instant answers to every environmental/cost/time question it is posed, so no one has to go away for a couple of days to come back with a manually produced comparison of alternatives. And of course, the model also feeds the business case with whole-life costs and finance charges.

Plans to refine Comparator as a teaching tool for use in universities and on special courses for practitioners are in the final stages of development, with access expected early in the new year.

If you would like to know more about the Comparator project, please contact Professor Bernard Williams by email: bernardw@int-fpi.com

Guide to Development Finance for small and medium-size housebuilders



UK Finance and the Federation of Master Builders have published a guide for small and medium-sized housebuilders on how to access finance.

The guide offers practical advice on how small house builders should present their finance applications to lenders to improve their chances of success, as well as listing the alternative options available if an application is turned down. The Guide also offers SME house builders advice on how to make the most of the diverse range of finance options available to them including challenger banks, private equity, crowd funding, finance brokers and government-supported funds. It follows the announcement of several schemes to increase funding for SME house builders, such as the Housing Delivery Fund and the Housing Growth Partnership, which have been backed by the finance industry in partnership with Homes England.

For more information and to download the guide, use these links:
<https://www.ukfinance.org.uk/guide-to-development-finance-for-small-and-medium-size-housebuilders/>
<https://www.fmb.org.uk/about-the-fmb/newsroom/uk-finance-and-fmb-launch-guide-to-development-finance-for-sme-house-builders/>

UK Finance is the trade association for the finance and banking industry operating in the UK. It represents around 300 firms in the UK providing credit, banking, markets and payment-related services. The organisation brings together most of the activities previously carried out by the Asset Based Finance Association, the British Bankers’ Association, the Council of Mortgage Lenders, Financial Fraud Action UK, Payments UK and the UK Cards Association. The Federation of Master Builders is the largest trade association in the UK construction industry, representing thousands of small and medium-sized (SME) construction firms.

Government Responds to House of Lords Select Committee Report on Offsite Construction

The Government has published its response to the House of Lords Science and Technology Select Committee report into Off-Site Construction. Published on 11 October, the 16-page response indicates the Government’s strong support for measures to support the development, commercialisation and growth of the offsite sector. The full response can be downloaded from: <https://www.parliament.uk/documents/lords-committees/science-technology/off-site-manufacture-for-construction/Govt-response-off-site-manufacture-construction.pdf>

Event Review

Members get together



Left to right: Tim Hall, Tim Carey, Daniel Leech, Leanne Clowting and Graham Cleland

A very well attended Buildoffsite Member to Member (M2M) event took place at Arup's Fitzroy Street Conference Centre on 6 September. Duncan White of Arup was host for the get-together. M2Ms provide a formal opportunity for Members and guests to connect, and to contribute to the development of the Buildoffsite work programme.

In addition to an update from Buildoffsite's Director Tim Hall, the meeting provided a first opportunity for Members to meet the recently established Buildoffsite Governing Forum, which has been set up to steer the development of Buildoffsite. The meeting heard from Tim Carey of Willmott Dixon, who is Chair of the Forum, as well as Governing

Forum Members Daniel Leech of the TDS Group, Graham Cleland of Berkeley Modular and Leanne Clowting of CIRIA. The meeting also marked the contribution made by the outgoing Members of the former Buildoffsite Executive Group – Roger Bayliss, Cal Bailey, Nirmal Kotecha and Ian Pannell.

Sam Stacey and Simon Hart of UK Research & Innovation (UKRI) provided an overview of the ambitions and opportunities for industry and business provided through the Government's Industrial Strategy Challenge Fund. (See page 22 for more details)

As always, the event was accompanied by a vigorous Q&A session and was followed by a fantastic networking session.

Member to Member events are a once a year opportunity for the Membership to come together to contribute to the development of the Buildoffsite work programme, to share their experiences of the big issues that are influencing the opportunities and challenges for the offsite sector in the UK market, and to make those all important business contacts

Direction Group meeting at Polypipe

The Buildoffsite Direction Group meeting on 29 August was hosted by Polypipe at their offices in Aylesford and had a theme of 'Raising our Game in the Manufacturing Supply Chain'. Polypipe's Chief Operating Officer Glen Sabin welcomed the Members and guests, and was followed by speakers including Buildoffsite's Director Tim Hall, Polypipe's Jason Shingleton, BIM Object's David Jellings and Barlo Radiators' Jamie Warren.

The meeting included information on Buildoffsite's current work programme and new Members. A proposed Buildoffsite led effort on Digitally Enabled Manufacturing and a Member feedback session completed the morning session. This was followed by a networking lunch and an afternoon tour of the Polypipe factory.



Event Review

Offsite collaboration

a view from Phil Henry, Market Development Director, Polypipe



Over many years and through numerous reports, the construction Industry has been encouraged to start collaborating more.

Collaboration and benefit sharing in the offsite sector is no exception. Many leading manufacturers have proved that they can bring forward innovation or early adoption ideas by collaborating with clients, design teams, assemblers and manufacturers to develop fully integrated systems. Whilst the conversation in some areas is around renaming terms such as 'supply chain', the principle message is to share innovation and best practice within an integrated, focused team.

I believe this philosophy works in the right environment, with the correct form of contract. Therefore, this collaborative approach must also apply to the industry institutions and member groups, on the basis that if we are asking industry to collaborate, then surely, we must do it ourselves?

The off-site manufacturing drive and industry conversations are more positive than ever before, in part due to various drivers and circumstances coming together, such as BIM, the housing crisis, growth of commercial

rented clients and so on. The formation of specific offsite industry groups is a good thing to enable lobbying of Government and regulators, and also to reflect its members' shared interests and relevance for joining such groups in the first place.

The risk may be that without industry events and working groups being open to others this may, as an unplanned consequence, lead to 'silo groups' forming in the off-site industry. This may also have the possible effect of fragmenting the important messages and benefits of off-site design, manufacturing and construction at a critical point in its developmental path.

In addition, collaboration between groups offers benefits in certain areas with regards to working groups, such as avoiding duplicating pieces of work within the offsite industry and enabling the pooling of expertise between the various members' groups which should be used to produce pieces of work that complement each other, or to add to earlier pieces of work to maximise impact and reach.

"The formation of specific offsite industry groups is a good thing to enable lobbying of Government and regulators, and also to reflect its members' shared interests and relevance for joining such groups in the first place."

Whilst off site house manufacturing will learn a great deal from the automobile industry and its process, it will also learn from product manufacturers in the sector, who are required to reduce costs without sacrificing quality, and increase efficiency through innovation and improved process management.

I believe the offsite building manufacturers will need to embrace partners in Civil Engineering and Landscape Architecture already active in developing off site solutions, in order to fully understand the effects and benefits regarding the design challenges to meet development planning requirements, such as energy, water, and the effect that place making and green infrastructure will have on modular housing design – perhaps more flat roofs for green, blue roofs and solar generation?

Many of the professional industry groups in this sector have off site groups and greater integration would, I feel, be beneficial to offer a holistic solution.

For more information, please contact Phil Henry by phone: 01622 795200, email: phil.henry@polypipe.com or visit the website: www.polypipe.com

Event Review

The Buildoffsite Residential Hub meets in Bristol



The Buildoffsite Residential Hub meeting was hosted by the National Composites Centre on 3 October. This event showcased the advances made in taking offsite manufactured solutions mainstream. The theme of the event was centred around Home Builders 2020 and Kier, ilke Homes and Southampton City Council gave rounded and well-informed views of just how engaged they are in adopting an offsite approach and how they have included this as an integral part of their housing delivery strategy.

Several matters were highlighted during the presentations which included the need to work more closely with the supply chain, the need for more companies to adopt a turnkey approach to help control the continuity of supply, and the need to keep testing and evaluating the market as things are changing quickly, especially as a result of new investment and new players who can deliver a more predictable housing supply at volume.

A key factor that emerged from the panel debate centred around Government investment into the housing markets and the various initiatives that have been put in place which strongly support the use of offsite manufactured solutions.

Whilst the sector will benefit significantly from this, a number of Members and guests felt that we should be delivering product under our own steam, which shouldn't be reliant on public sector support.

The Hub meeting concluded with a tour of the Centre, hosted by Neil Appleton. Incredible work is underway and it was compelling to have the opportunity to get a taste of the innovation that will soon be coming our way.

“There is a very positive mood in the offsite residential sector at the moment due to significant momentum built up over the last 12 months”

A positive mood

There is a very positive mood in the offsite residential sector at the moment due to significant momentum built up over the last 12 months. Delegates agreed that both offsite and traditional construction would continue alongside each other. However, as the offsite sector increases its market share, the hope is that it will become the method of choice for both public and private sectors.

What's your view? Please let us know, as we are keen to hear more from you and to tap into your valuable experience so we can improve our events and Membership value.

There is a lot going on in the Residential Hub at the moment, including a call for Members to put their names forward to join the Residential Hub leaders' group – are you interested? If you are, please email Dennis Seal: dennis.seal@me.com.

We have a number of planned events coming up including:

- The Offsite Construction Show on 20-21 November at ExCeL London. In particular, 20 November is designated as Residential Day, so don't miss it
- The Residential Hub meeting at the RICS Westminster on 12 December, tackling build out rates and volume.
- The Residential Hub meeting in partnership with Mitsubishi on 7 February 2019
- The Residential Hub national event to be held in London tackling 'the cost of offsite for different tenures' with real examples and comparators on 19 March 2019

News

Berkeley Modular and coBuilder take decisive step towards offsite construction efficiency



Above: Graham Cleland, Below: Peter K. Foster Jnr

Berkeley Modular, the volumetric modular construction arm of Berkeley Group, has announced a new partnership with coBuilder, which aims to boost the efficiency of offsite construction. The first-of-its-kind initiative in the residential sector will see coBuilder work with Berkeley Modular to set product data and documentation requirements for the materials, components and equipment to be incorporated into the business volumetric modular solution. The data will be collected as actual manufacturer's data and digitised through standard-based Product Data Templates.

Berkeley Modular will use this data and associated materials and equipment to construct a range of volumetric modular housing products, all designed to match the high specification and excellent build standards that customers demand from the Berkeley Group.

The partnership is part of Berkeley Modular's drive to work in harmony with supply chain partners who, like coBuilder, are willing to work collaboratively to create the right sort of data, in the correct format. Data that can be



fully integrated with the new modular factory's efficient, technology-led approach to manufacturing new volumetric modular housing products.

Graham Cleland, Director of Berkeley Modular, said: "Having detailed information on the characteristics of the components, materials and equipment we use is vitally important to both delivering high quality products and being able to support through the usable life of the same. We want to be able to specify products that ensure the comfort of those living in the homes we will manufacture, and also meet our own sustainability and build-quality requirements. Collecting data in a digital format from our supply chain will make it easy for us to control and continuously improve the quality and longevity of the homes we build."

Peter K Foster Jnr, CEO of coBuilder UK, commented: "The aim of Berkeley Modular is to deliver high-quality, high-performing and comfortable homes, with less disturbance to neighbours and using sustainable practices. We are honoured that Berkeley Modular have chosen the path of standardisation and will work with coBuilder in order to manage standard-based construction product data."

Innovative offsite construction presents an opportunity for Berkeley Modular to create consistently high-quality homes, in a fully controllable and scalable manufacturing environment that puts technology at the forefront of the build process.

To guarantee that its new facility operates at maximum efficiency and achieves the highest standard of construction and sustainability, Berkeley Modular intends to broaden the scope of its collaboration with coBuilder and its pioneering use of data in offsite construction.

For more information, please contact: Graham Cleland by email: graham.cleland@berkeleygroup.co.uk mobile: 07876 848946, or visit the website: www.berkeleygroup.co.uk

Peter K Foster Jnr by email: foster@cobuilder.com mobile: 07467 949976 or visit the website: www.cobuilder.com/en

News

Ilke Homes' 'Hundred House' wins *The Sunday Times* British Home Award



ilke Homes, the British modular homes specialist, is celebrating its success after winning the Readers' Choice Terrace of the Future Award at *The Sunday Times* British Homes Awards 2018. The award was received in recognition for the innovative design of ilke Homes' the Hundred House. Voted for by *Sunday Times* readers, the winning design costs less than £100,000 to build.

*"We want to make sure we provide quality, affordable and brilliantly designed homes that are fit for the future and *The Sunday Times* readers could see that the Hundred House absolutely achieves this"*

The annual awards are a celebration of the very best of design and architecture from across the UK property industry, and attract entries from the biggest names in architecture, housebuilding and interior design. The judging panel for the 2018 shortlist included stakeholders, housing associations and architects. ilke Homes' Hundred House design was shortlisted and the final four designs were voted for by *The Sunday Times* readers.

The Readers' Choice Award tasked entrants with shaping the towns of the future by developing an innovative, future-proofed, terraced house design. ilke Homes' winning submission, created in collaboration with HTA Design and housing association Sovereign, gets its name from its sustainability credentials, as it takes less than 100 on-site hours to build and costs less than £100 a year to heat.

CEO of ilke Homes Björn Conway commented: "It is a great honour to be shortlisted by leading industry figures and to then be chosen as winners by *The Sunday Times* readership. The Hundred House represents what ilke Homes stands for – using modern technology to produce well-priced, efficient houses for the 21st century. A great deal of work and passion goes into what we do, and receiving this recognition motivates us even further to continue delivering high-quality, modular homes to those that need them most."

The Hundred House design takes the best traditional features of Georgian and Victorian terraced housing, and enhances it, producing twice as much light as previous terraces and bringing it right up-to-date. The terrace's design features an innovative configuration, comprising of two gables with a double-height living room, study, balcony, master bedroom, kitchen/diner and a second bedroom. Additional modular units can be added when more space is required, thanks to each property's unique design.



Managing Partner of HTA Design LLP Simon Bayliss said: "We're thrilled that the Hundred House was chosen as the winner of this award. Designed to enable more flexible modes of multi-generational living than is possible in most of the UK's new build housing, the homes were developed for delivery using ilke Homes' innovative modular system that achieves higher quality and more efficiency at a reduced cost. The Terrace of the Future is inspired by some of our more successful traditional models, whilst offering unashamedly contemporary living."

Sovereign is a housing association based in the south and south west, managing around 57,000 properties and building over 1,600 new homes this year. As well as helping develop the Hundred House concept, Sovereign will be piloting modular housing technology at a West Berkshire site in early 2019. Sovereign's Executive Director of Development & Commercial Dale Meredith said: "Offsite building techniques can play an important role as housing associations expand their programmes, building more of the homes that we need, more quickly.

We want to make sure we provide quality, affordable and brilliantly designed homes that are fit for the future and *The Sunday Times* readers could see that the Hundred House absolutely achieves this. We're really excited by the project's potential, as we work towards having residents picking up the keys to our first modular home from ilke Homes next year."

The recognition of the Hundred House by both the public and the expert judging panel marks a shift in attitude towards the use of modern methods of construction, such as offsite construction techniques and how they can be applied to successfully help solve the UK's housing crisis. Founding Director and CEO of Cast Consultancy Mark Farmer commented on this important milestone for the UK's property sector: "As the construction industry slowly turns to alternative production techniques to alleviate the increasing squeeze on traditional skills, it's critically important that we build consumer confidence in modern manufactured homes. Part of this is proving the ability for such approaches to deliver high quality, durable architecture, at an affordable

price, and set in places and communities that people truly want to live in. The Hundred House's success has proved that exemplar residential design can be delivered in factory conditions, and start to challenge the traditional industry's cost, time and quality benchmarks. It sets the scene for what I believe will be an increasingly important role for pre-manufactured housing in increasing both the quantity and quality of new build homes in the years ahead."

For more information, please email: IlkeHomesTeam@redconsultancy.com or call: 020 7025 6699

News

NG Bailey creates new £300m division



NG Bailey has created a new £300m Services division to bring together its Facilities Engineering Services and IT Services businesses, alongside the recently-acquired Freedom Group. The move, which fits the overall business strategy and long-term goals of responsible and reliable earnings, will combine the company's national capabilities in facilities engineering services, IT, fabric and project management services with its power engineering services and land management capabilities.

Peter Jones, previously managing director for IT Services and the newly-acquired Freedom group, extends his remit as managing director for the combined NG Bailey Services division, reporting into chief executive David Hurcomb. Together with a new leadership team, the division will focus on key market sectors and provide clients with a single point of contact to leverage NG Bailey's integrated capabilities, whilst also offering a highly-attractive end-to-end proposition to clients across a number of markets, focusing on outstanding

technical expertise, strong values and assured project delivery. Peter, who will lead the strategic development, business growth and overall performance of the Services division, will be supported by:

- David Hartley, as chief operating officer (COO) of Freedom, who will continue to lead the Power, Networks and Professional Services business units.
- Tim Simmons, as COO of the new Facilities and Infrastructure business, combining facilities engineering services with the group's civil works, building and small works projects and property-related services, including asbestos management and grounds maintenance.
- Kelly Tedesco, previously customer business director in the IT Services division, who becomes COO for IT Services. Kelly will focus on the provision of structured cabling and ICT network design and installation projects, managed services provision and electronic security projects and services to end user clients, as well as clients within NG Bailey's Engineering division.

David Hurcomb said: "Separately, the group's three services-led divisions have established strong positions in their individual markets, so combining their strengths provides us with a very powerful and persuasive offer across the entire industry. It also underpins the delivery of our order book, which is circa £1.4bn and delivers a more balanced construction and services business. Peter has an extensive background in services and infrastructure at a national and international level, so he is the ideal person to lead this combined division and to drive its growth through innovation and outstanding customer service. I would like to say a heartfelt thanks to Stuart Linington, who retired from the business at the end of August, having overseen the growth of Facilities Services from a £30m turnover business to one generating almost £100m in sales."

Peter Jones added: "The new structure gives us tremendous opportunities to promote the benefits of a combined Services offer to customers, which I believe is unique in the market. I'm looking forward to working with David, Tim and Kelly, and everyone in our Services teams, as we continue to transform the division and provide continued excellence to our clients."

For more information, contact:
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visit the website: www.ngbailey.co.uk

News

Getting to grips with transporting, storing and installing offsite components



Modular housing can be tested during its development stage for structural and environmental performance – there are a myriad of different test techniques that will prove the modules or panels are fit for purpose when constructed in the factory. The unknown is the effects of transporting the panels or modules to site.

Transport, storage and installation issues can have a large impact on the end use of the building. Panels can be damaged during any of these stages. Inadequately stored panels can deteriorate if unprotected due to weather or fail when put under load due to poor storage and transportation techniques. Installation has the additional problem of designing suitable panel lifting points that do not impact on the way the panels join to form the building, whilst being adequate to enable safe lifting. The transport, storage and lifting techniques also impact on the costs of the overall build and hence any savings that can be made during the construction process can be factored into the overall project cost, thus providing an advantage during the initial tender process.



Finding damage sustained is not always easy. The opening up of joints can be hidden behind sheathing or plaster boards but will impact upon thermal and acoustic performance, and in more extreme cases, can affect weather tightness. Poor transportation may affect windows and doors with stresses acting at the corners which can result in cracking or damage to the window casing or glass. Panels can be damaged through placing them down, particularly if the load is not centred and the panel lands on one corner or partial edge first. This can cause extensive damage and prevent the panel being bolted down to the foundations correctly or lining up with other panels or modules, and can require repair or create areas that may not be waterproof or structurally sound.

Additional bracing or increased material thickness may be required or used to help the transportation and lifting process. These measures add further costs to the build and are quite often redundant once the panel is installed and in use.

The success of the transport and installation of the panel or module should be assessed to understand the impact of any damage

sustained. This provides the manufacturer with the advantage of keeping panels that may at first glance have otherwise been disposed of, or more importantly justifying the disposal of a panel that could fail further down the line.

Transporting modular buildings has an impact on costs. Handling techniques and storage can impact upon the carbon footprint and effect safety requirements during installation. A factory-built system creates a consistent and quality product that is not found in traditional build; however, the success of a modular building is dependent on the factory-built components arriving at site and being erected on site in the same condition as they left the factory.



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

Case Study

Kier – Wedge House



Project details

- Value: £62.5m
- Site: 32-40 Blackfriars Rd, London SE1
- Construction programme: 154 weeks
- Start: July 2016
- End: April 2019
- Client: Ennismore/Hoxton
- Total floorspace: 14,161m²
- Office space: 4,700m²
- Hotel rooms: 192
- Floors: 14

Wedge House is a 14-storey mixed-use hotel; the first new build hotel for the Hoxton Hotel group.

Above the 192 guest rooms are 5½ floors of office space. The hotel includes a Sky Bar on the 14th floor with views of the Southbank from its open-air terrace. Wedge House showcases the benefits of offsite construction with 600 brick-faced precast panels, installed in just 17 weeks. This exceptional building demonstrates that offsite construction facilitates architectural ambition and has enabled architectural intricacy and variety to the building envelope. In addition to cost and programme certainty Wedge House demonstrates considerable health and safety improvements, wellbeing enhancements and sustainability benefits, as well as reducing disruption in a highly congested inner-city site. Kier Construction London's Director

Andrew Ellis said: "The precast panel solution was the only sensible solution despite the commercial challenges. The combination of the panels incorporating the windows, with Thorp and Colorminium working together, crated an offsite production for circa £9m of works that were prepared alongside the site-based works, with quality controls achieved in a superior environment. We were able to create a second workplace. The client was involved in factory visits and approvals, and was able to see their building transformed, as panels were installed from open concrete frame to fully enclosed and glazed property that projected their project to Blackfriars Road immediately, instead of awaiting prolonged scaffold removal."

Project description

Early engagement: We worked to deliver considerable savings for our client, without reducing the specification, appearance or quality. We collaborated closely with the novated precast specialist subcontractor to re-engineer the precast cladding panels to allow for the use of fully pre-glazed units, which delivered a cost saving of £2m and also improved quality, programme and safety (zero RIDDORs to date).

Managing logistics: The busy site is within 250 metres of Southwark Underground station. The main elevation of Wedge House faces a main road and cycle superhighway. A lack of storage space required just-in-time delivery involving up to 40 wagons a day. An electronic booking system (Datascope) was implemented to ensure no unplanned deliveries or clashes. Close liaison between Kier, the specialist precast subcontractor and the logistics company ensured panels arrived as required, in sequence.

Brick-faced precast façade panels: To protect the programme and budget the structure of the building was designed to accommodate brick-faced precast concrete façade panels. Around 600 panels, each the width of two bays and weighing 7 tonnes, were fixed directly to the frame; installed complete with factory-fitted windows. Manufacture of the panels commenced while the building was still in the ground. The panels were delivered in purpose-built racks with the supplier responsible for supply and installation, ensuring seamless scheduling and coordination. Panels were fixed simply and quickly, installed straight from the back of the delivery trailer and bolted from the inside by one person.

Why offsite? The main driver for the selection of offsite cladding panels was to reduce the programme coupled with a lack of space on site. During pre-construction, we collaborated with the novated specialist subcontractor to re-engineer the precast cladding panels to allow for the use of fully pre-glazed units. This design change and the elimination of the need for scaffolding gave a cost saving of £2m and significantly reduced working at height over a public footpath. Our collaborative relationship with our specialist contractor meant we were able to meet the condensed 145-week programme. On a like-for-like basis, the cost of the precast panels was higher than traditional brickwork. However, traditional construction methods would have been unfeasible because of a lack of storage and set-down space. Offsite manufacture also removed the risk of non-availability of skilled trades people.

Minimising the environmental impact: Sustainable aggregates were used for the precast panels. Production control ensured little waste and no use of landfill. The timber moulds used to produce the panels were from sustainable sources (FSC) and recycled after use. Up to 50 casts were achieved from each mould. All units were delivered to site without packaging and the timber blocks used to restrain the units were returned for re-use. Efficient on-site installation methods meant very little waste on site. Only a crane and mobile elevated working platform were required to install panels straight from the back of the delivery trailer, eliminating any double handling, minimising energy use and risk of damage. The precast units were designed to be installed without using power tools.



An exceptional quality solution: The fully warranted air/water tight external envelope (u-value 0.2 w/m²K, air-tightness 3) guaranteed a consistently high level of quality; a key client requirement. The bespoke precast concrete was designed and manufactured for Wedge House and produced under strict factory-controlled conditions. Offsite manufacture removed the tolerances and risk of colour variation of traditional brickwork and ensured a consistently high-quality product. The use of prefabricated panels allowed for safe construction. The use of Self-Compacting Concrete (SSC) for the manufacture of the panels eliminated the need for vibrators, shakers and pokers during the pouring and casting process. Site waste and dust produced by on-site cutting and cleaning was eliminated.

"Wedge House showcases the benefits of offsite construction with 600 brick-faced precast panels, installed in just 17 weeks. This exceptional building demonstrates that offsite construction facilitates architectural ambition and has enabled architectural intricacy and variety to the building envelope"

News

Northampton Waterside Student Residences



The Waterside Student Residences scheme forms part of the University of Northampton's campus relocation programme, and is the largest student residential scheme in the United Kingdom to utilise a Light Gauge Steel (LGS) construction system.

Appointed as main contractor, Kier began on site in August 2016, working to deliver 1000 student bedrooms in two distinctly different building types; a more traditional cluster flat arrangement coupled with townhouses. The £54m scheme was designed to provide a high proportion of quality student bedrooms and forge an important aesthetic link with the city centre and the retained listed buildings on the new campus site and beyond.

A Light Gauge Steel (LGS) framing system, supplied by Metsec, was used as the predominant structural building material across the scheme. In some instances, the steel frame was built from the ground floor slab up, to the full height of five storeys.

Elsewhere the LGS at ground floor was substituted for a concrete frame construction with a transfer slab at first floor to allow for more open plan areas, or areas that did not follow the repeating module above.

Why LGS?

For Kier, the main benefit of LGS system was that it lent itself to the rapid, complex programme requirements and the consistent, modular nature of student residential building design employed on the project. It also negated the need for on-site storage. Panels came to site in large wall sections and were erected swiftly, which allowed each storey of the building to be constructed in 7-10 days, compared with 5-6 weeks for traditional brick and block construction. The build time of less than two weeks per floor, meant as each floor was completed, finishing trades could access these to commence further works. The LGS frame also meant that windows could be fitted ahead of the brickwork, thus getting the building watertight sooner. The repetitive, cellular nature of the scheme, coupled with

the approximate 14-month construction programme meant that an LGS frame solution allowed the circa 1000 bedrooms and related ancillary spaces to be delivered up to 40% faster than traditional, site-intensive construction methods. Joe Coyne, Associate Director at Turner & Townsend said: "Kier has delivered a great project and the LGS frame was quite a challenge and seemed impossible when first proposed. Turner and Townsend and Kier agreed the final account 4 weeks post PC, which demonstrates a collaborative team effort on a project that had minimal change."

LGS was also selected to reduce loads onto the foundations, enabling the use of precast concrete piles. This reduced project risk as less groundwork was required. The challenge was then to clad the structure with brickwork. The solution ensured an economic and sustainable solution, which wouldn't have been achievable using more traditional construction methods; minimising waste and cutting carbon emissions through reduced deliveries as a result.

How offsite was used at Northampton

Rolled and punched, the steel frame sections were delivered to a production facility in Manchester. Panels were fabricated to strict factory-controlled tolerances to guarantee accuracy and quality, with external panels being supplied with cladding. These were then delivered to site working to a carefully considered logistics plan.

Other offsite elements included Glass Reinforced Plastic (GRP) dormer windows and prefabricated timber roof trusses, as well as 769 bathrooms pods, constructed using GRP giving a one-piece seamless construction that is leak-free, strong, durable and low maintenance. In addition, the inner wall finish of the pods has an anti-bacterial and anti-fungal finish.

Fully coordinated design

Kier's BIM team worked closely with our supplier, Metsec, to utilise BIM for the design of the LGS frame, assisting with 3D design coordination workflows and enabling fully co-ordinated service installations. The steel frame solution utilised full BIM Level 2 capabilities, including a complete 3D model of each building to allow full coordination with other designs, such as the façade and M&E installations.

This design was broken down into panelled arrangements, which were bolted together offsite, then delivered and craned into position panel by panel. This not only allowed for a much quicker erection and also ensured that factory quality workmanship was maintained throughout. The versatility of the system allowed for the incorporation of other items constructed offsite, such as dormers and roof trusses, to further enhance the quality associated with offsite construction and to give a bespoke nature to the buildings themselves.

The BIM model for the scheme forms a substantial part of the O&M manual, which will be passed on with the building at hand over. Repairs, alterations and possible re-purposing of the building will all be possible, and the client will have a full set of drawing information to work from.



Collaborative construction solution

Due to the bespoke nature of the system, Kier worked closely with our supplier and the two installers to ensure a customised approach. This cooperation enabled us to share offsite best practice between the supplier's design team and the installers, consequently achieving a bespoke methodology for each building and a higher quality end result. This ensured that the client's expectations of quality, budget and speed were met.

The townhouses in particular, required bespoke steel frame details, coupled with the installation of other offsite manufactured elements in the shape of GRP dormers and timber roof trusses. A pairing of hot and cold rolled elements allowed for greater spans and bespoke details to be created within the townhouses, such as corner windows to certain floors, affording them an architectural divergence and variety not usually achievable when using LGS or other pre-panelised solutions.

Project Outcomes

Completed in March 2018, the Northampton Waterside Student Residences scheme was delivered within budget, utilising a rapid construction programme that enabled the University to relocate to the new Waterside Campus by August 2018. Reduced building weights allowed for a building that is more sustainable to run. A high level of thermal efficiency was achieved, coupled with a low air leakage rate, facilitating the building to work in a more efficient way, despite its lightweight nature.

Kier Construction Eastern Managing Director Mark Dady commented: "Being awarded this scheme is testament to the good relationship we've built with the University over the past few years and we're pleased to see this continue. Kier has committed to investing in new technologies that will benefit and improve the delivery of the projects we undertake. The Kier team worked closely with Metsec on this project to utilise BIM for the design of the Metframe, and 3D design of the service installation, which all assisted us to deliver the project on time."

For more information on offsite construction at Kier, please contact Submissions Coordinator Elizabeth Biggins by email: elizabeth.biggins@kier.co.uk or phone: 01767 355837, or visit the website: www.kier.co.uk/what/off-site-modern-methods

News

McAvoy announces expansion into offsite housing



The McAvoy Group announced its expansion into the residential sector with the launch of a new modular solution for all housing tenures – affordable homes, market sale, build-to-rent, student accommodation, and emergency housing. Following extensive product development and collaboration with Queen’s University Belfast, McAvoy has developed a steel-framed offsite housing solution for multi-storey apartments, detached, semi-detached and terraced family homes. An entire house can be assembled in a single day – and from foundations to occupation in just seven days.

According to a report published by Shelter, we need to build 250,000 new homes a year in the UK to keep up with demand, yet only 163,000 new homes were delivered in 2017. The severe shortage of affordable homes and homelessness continues to increase year on year. There is a lack of skilled labour in construction, compounded by Brexit and the building industry has a poor delivery record. In response, the Government has set a target to build 300,000 new homes annually by the mid-2020s and has pledged its support to increase the use of offsite construction.

The McAvoy approach to housing will reduce programme times by at least 50% compared to site-based construction. This will allow

earlier occupation for public sector housing providers and generate a faster return on investment for private developers. It will use highly efficient and proven factory processes to deliver greater certainty of completion on time, on budget and to higher quality standards. Eugene Lynch, Managing Director of The McAvoy Group, said: “We have a proven track record, strong project management expertise and highly transferrable skills in the successful delivery of offsite solutions across a range of other sectors. These factors, combined with our financial stability and pioneering work in digital construction technology, mean we are well placed to become a significant player in the provision of high quality family housing

manufactured offsite. We are an established principal contractor offering a single source procurement solution which integrates the manufacture of homes in a quality-controlled factory environment, for the delivery of new housing to shorter programmes and to higher standards. We have ambitious plans for growth in the residential sector and have capacity already in place to meet demand using our highly skilled labour and flexible production facilities. We are also advancing plans to further expand capacity to meet the anticipated growth in demand.”

Features of the new offsite housing solution engineered by McAvoy include:

- An innovative floor construction created using highly sustainable recycled material – an alternative to energy-intensive concrete – and offering excellent thermal performance and acoustic properties
- A highly flexible building system with a wide range of façade treatments, roof options and module configurations
- A roof module pre-tiled in the factory, which is safer, faster and avoids work at height and in poor weather conditions
- Bespoke housing designs can be developed and there is a library of standardised layouts to reduce design time for planning and cost
- BOPAS accreditation for reduced risk and the assurance of durability for a 60-year design life to ensure mortgageability

McAvoy will work as principal contractor on its housing projects – taking responsibility for design, manufacture, fitting out, installation and external works. This will mean easier procurement, fewer management resources, greater cost efficiency, and improved quality control for developers and housing providers.

News

McAvoy awarded first offsite housing scheme in Northern Ireland



The McAvoy Group has been awarded its first contract in the residential sector following the announcement of its expansion into offsite housing.

The £4.7m contract for Clanmil Housing Association will be the first offsite housing scheme to be built in Northern Ireland. The use of the McAvoy offsite housing solution will reduce the build programme by around 60% to just 40 weeks. The development in Carrickfergus will provide 40 homes to help address the severe shortfall in social and affordable housing in Northern Ireland. It will feature 8 one and two-bedroom apartments for couples and families; 17 two-bedroom apartments for active older people, 12 two-bedroom houses for families and three detached bungalows designed for families with complex needs. The scheme is due for completion in spring 2019.

The homes will be manufactured and fully fitted out offsite at The McAvoy Group’s production centre in Lisburn, Northern Ireland. This will improve the quality of construction and allow earlier handover to move people from the housing waiting list.



McAvoy will manufacture 111 steel-framed building modules and the homes will be installed on site, complete with bathrooms, kitchens, partitions and glazing.

Carol McTaggart, Group Director of Development at Clanmil, said: “We’ve been exploring different delivery models for social housing to help address the rising cost of building materials, the shortage of skilled labour in the construction industry and the uncertainty created by Brexit. There are currently 24,000 households in housing stress in Northern Ireland. We want to deliver new homes more quickly for people on the housing waiting list, whilst maintaining high standards of design and build quality. We also need a solution that will deliver a range of energy-efficient homes with affordable running costs for our tenants. Significant time savings can be achieved with offsite construction – it avoids delays caused by poor weather, and improves quality and health and safety,

all with less impact on the environment. By partnering with McAvoy, we believe we can reduce the build programme for 40 new homes by around 56 weeks, which is crucial to reducing waiting lists.”

The scheme is located adjacent to a Conservation Area, close to the 12th century Carrickfergus Castle. A historic wall forms one of the boundaries to the site, which McAvoy will undertake works to preserve. The design of the scheme reflects its location and draws inspiration from the historic buildings nearby. Materials such as slate roofing, white render and timber windows have been selected as in keeping with the area. The homes are designed in accordance with Lifetime Homes and Secured by Design standards, and will benefit from timber-framed double glazing, more precise factory construction processes, and high levels of insulation to help reduce heating costs and energy consumption.

For further information, visit: <https://www.mcavoygroup.com/sectors/housing/> or call: 028 8774 0372, or email: info@mcavoygroup.com or visit the website: www.mcavoygroup.com

News

Cleanroom specialists deliver offsite international construction presentation



The Dutch contamination control society VCCN hosted the International Symposium on Contamination Control and cleanroom technology in the Hague in September.

The programme included tutorials and workshops, as well as technical visits to companies such as Philips, ASML and ESA/ ESTEC/Space-Expo. Rowin Vos, General Manager BV at Connect 2 Cleanrooms delivered a presentation on the hot topic of offsite construction in the cleanroom sector. Rowin said: “Outside of the cleanroom



industry, offsite construction methods are really gathering pace and today equate to a meaningful contribution to the construction industry. C2C won the Best Cleanroom Facility Award at the Cleanroom Technology Conference this year, for a cleanroom where we pioneered these offsite methods, allowing us to deliver the comprehensive project, within budget and on time.”

Rowin’s presentation featured the history of offsite construction, along with the

fundamentals of the differing approach from the design process to delivery within the cleanroom sector. The audience was extremely receptive to the presentation and the advantages of offsite were clearly recognised – that it is cost-effective, flexible and fast. Other benefits of offsite presented by Rowin included that standard modules can be combined in a 100% bespoke solution and the adaptability of the services, which can be allocated in interchangeable panels.

New Connect 2 Cleanrooms website launched

Connect 2 Cleanrooms (C2C) has launched a sleek new website with revolutionary design to help keep clients compliant to Cleanroom Standards within ISO 14644.

This new website communicates C2C’s passion for innovation within the cleanroom sector and provides a clear message of how



it supports clients through the entire cleanroom lifecycle with four core services: Cleanroom design and build, Cleanroom consumables, Cleanroom validation and Cleanroom training. The website details how this holistic approach to contamination control will drive long-term efficiencies for its clients – new and old.

C2C’s MD Joe Govier said: “Our websites have always been pioneering, putting the user’s needs first. This new website has been the most researched ever, with extensive new features including a new Knowledge Base featuring a range of industry terms. The aim for the website is to help educate and share best practice, allowing a broad interaction from novice to expert.

Explore: www.connect2cleanrooms.com for the full C2C experience. For more information on C2C, contact MD Joe Govier by email: joe.govier@connect2cleanrooms.com or phone: 01524 812 899

New Member



For more information, please contact:

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alineacostconsulting was born on 9 May 2013, based on a firm belief that there is a better and more personal way to help clients deliver projects, with a strong and unencumbered focus on costs.

Located in the centre of London but with an ability to work anywhere in the world, we trade as a Limited Liability Partnership, with a philosophy of equality between the seven partners. It is fully self-funded and independent, with a robust business plan. We have made significant investment in people and infrastructure, with a vision to create a stable and long-term proposition.

We have a culture of inclusivity and respect – this means we will attract, choose and retain the best, developing our community to become a firm where everyone represents the brains of the business. We are concentrating on our core service: cost consultancy and making sure we become the best in that field.

Our focus is on clients and projects – we deploy senior, experienced people who really care! We have an established infrastructure which includes technical manuals of best practice, cost planning/BIM measure capability and a staff handbook.

We are already at a critical mass of 95 people, including 21 Partners and are growing in accordance with our business plan. However, our focus is on quality of service, with repeat work and growth a by-product of this.

Our three core values are simply:

- Excellence | clever solutions from innovative thinking and smart systems
- Teamwork | the best people working together and with our clients
- Trust | through an evident integrity and an eagerness to exceed expectations

“We have an established infrastructure which includes technical manuals of best practice, cost planning/BIM measure capability and a staff handbook”

New Member



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Reliable, renewable heating from Mitsubishi Electric

Rising energy bills, the need to reduce carbon emissions and challenging legislation are driving the demand for alternative forms of heating to improve energy efficiency and lower running costs. At Mitsubishi Electric, we have used our expertise to develop renewable solutions to address these issues head on, with our advanced range of Ecodan air source heat pumps. The MCS approved, award-winning Ecodan has been specifically designed and optimised for the UK's conditions.

Suitable for almost any type of home, old or new, there's a renewable Ecodan to suit just about any situation. With a UK-built cylinder, the system is optimised to provide all the heating and hot water a home needs – whatever the weather.

Ecodan qualifies for the Renewable Heat Incentive (RHI), which makes it viable for the majority of homes. Ecodan also remains the only heat pump to come with in-built Metering, Monitoring and Service Packages (MMSP), making it eligible for additional RHI payments.

With in-built intelligent smart controls, homeowners can monitor, change and control their heating from anywhere in the world.

Ecodan delivers efficient, renewable heating to homes all year round and it can also work in conjunction with traditional heating systems, with the controller deciding when it is most efficient to use the renewable heating or the existing system.

Mitsubishi Electric has manufactured Ecodan in Scotland for over a decade and the range includes:

- The Ultra Quiet Ecodan is innovative, stylish and whisper quiet. The unit is designed to satisfy permitted development standards (MCS020) and virtually eliminates the need for planning permission, whilst maximising installation options
- The Ecodan QUHZ 4kW unit is designed specifically for new-builds, which have a lower space heating requirement, making hot water production the dominant load
- The rest of the Ecodan range is also exceptionally quiet and designed to offer a viable solution for the varying requirements that different homes need

With the government backing the transition to renewable heating and predicting sales of air source heat pumps of over a million a year by 2030, the Ecodan range is perfectly placed to future-proof any home.



The Ultra Quiet Ecodan is innovative, stylish and whisper quiet. The unit is designed to satisfy permitted development standards (MCS020) and virtually eliminates the need for planning permission, whilst maximising installation options

New Member



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In 2015, Saint-Gobain celebrated its 350th anniversary, and redefined its core purpose to create great living spaces and improve daily life.

As a business, Saint-Gobain designs, manufactures and distributes materials and solutions, which are key ingredients in the wellbeing of each of us and the future of all. They can be found in our living places and our daily life: in buildings, transportation, infrastructure and in many industrial applications. They provide comfort, performance and safety, while addressing the challenges of sustainable construction, resource efficiency and climate change.

Saint-Gobain is present in 67 countries and employs over 180,000 people worldwide. It was founded in 1665 to deliver a world first – the production of glass on an industrial scale – and has continued to grow its business through adapting and innovating to provide new services, products and ways of working with customers.

- Saint-Gobain has:
- 34 brands in the UK and Ireland
 - 400,000 products
 - 1,100+ retail sites
 - 45+ manufacturing plants
 - Over 17,000 employees in the UK and Ireland
- Saint-Gobain has a series of increasingly advanced off-site solutions combining 'best in class materials' from some of its trusted and respected brands including British Gypsum, Celotex, Isover, PAM, Pasquill, Saint-Gobain Glass, Saint-Gobain Performance Plastics and Weber.
- Saint-Gobain works collaboratively with key partners to establish how it can add value to the supply chain through Saint-Gobain solutions which can reduce waste, risk and uncertainty whilst improving quality, building performance and overall efficiencies.

As a business, Saint-Gobain designs, manufactures and distributes materials and solutions, which are key ingredients in the wellbeing of each of us and the future of all. They can be found in our living places and our daily life: in buildings, transportation, infrastructure and in many industrial applications

New Member



Through fully integrating all the component parts of real estate, Stelling Properties is able to optimise what we do and how we do it. We can:

- Find and acquire land opportunities
- Work with others to optimise planning consents across various sectors
- Design buildings which enable the high level of comfort and convenience our customers require
- Deliver projects through in-house construction and manufacturing expertise
- Operate buildings long-term to ensure a genuinely excellent experience for whoever lives or stays in them

We manufacture state-of-the-art modular systems in our dedicated factory in the UK. Modular design allows our team to be creative and flexible with the architecture of the property. We see huge benefits in bringing off-site manufacture to the development process. We can bring precision to our product, and a control over materials and the quality of finishes, which is not always possible in traditional construction.

By having all of this expertise within our company, we are better able to control the entire process, and can be agile, efficient and responsive in everything that we do.

For more information,
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“Modular design allows our team to be creative and flexible with the architecture of the property. We see huge benefits in bringing off-site manufacture to the development process”

New Member



The world leader in Helical Piles

Techno Metal Post UK has recently joined the UK's offsite Housing market to offer their accredited foundation screw piles for all types of residential and commercial buildings. TMP Screw Piles are the ideal substructure and foundation solution for the offsite housing market.

Since 1993, Techno Metal Post has been developing, designing, engineering and testing Helical Screw Piles to the highest standards, ensuring they can support and withstand the heaviest loads and conditions possible. The TMP Helical Screw Piles are formed of structural steel according to ASTM A500 grade C and by BSI to meet the EU CE EN9001 Regulations, which the company guarantees and certifies through its many accreditations, to ensure installations will meet all current recognised building codes and standards.

The key USP of a Screw Piles is the speed of installation; undertaken by remote controlled robots, each robot has an on-board calibrated computer that provides valuable confirmation pile data, and a hard copy print-out, that confirms each pile's status, depth, and torque with the load capacity of each pile.

Prior to installation there's no need for any ground excavation, concrete is not required, and in many instances a levelled site is also not required, and as soon as the CE screw piles are installed, by licensed Installers, the structural steel is ready to take the imposed loads and is immediately ready to build on.

They have a minimal environmental impact, and are the greenest and most sustainable foundation piling system in the world, indeed; they can also be used for short term temporary structures, and subsequently can be removed when the structure is no longer required.

For more information,
please contact:

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Chairman/Managing Director

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Since 1993, Techno Metal Post has been developing, designing, engineering and testing Helical Screw Piles to the highest standards, ensuring they can support and withstand the heaviest loads and conditions possible

Events

Buildoffsite Events November to December 2018

MONTH	EVENT	DETAILS
November	Buildoffsite Residential Hub Key issues for UK construction	Location: Central London
	How data can define your BIM strategy – an interactive workshop	Location: CIRIA, Griffin Court, 15 Long Lane, London EC1A 9PN
	Buildoffsite Water Hub	Location: The Manufacturing Technology Centre, Coventry
	The Off Site Construction Show, in association with Buildoffsite	Location: ExCeL London
December	Buildoffsite Residential Hub Large Scale Developments – Will low build-out rates restrict housing growth?	Location: RICS, London
	Direction Group Meeting, followed by Christmas lunch	Location: London

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



Buildoffsite Events During 2019

MONTH	EVENT	DETAILS
January	BOPAS (Buildoffsite Property Assurance Scheme) Workshop	Location: London
February	Buildoffsite Residential Hub	Theme: Whole Life Costs Host: Mitsubishi Electric
	Digital Workshop (TBC)	
	Direction Group Dinner	
	Direction Group Meeting	Theme: Digital Host: Trimble
March	Buildoffsite Residential Hub National Event	Location: London
	Buildoffsite Rail Hub	
April	Direction Group Dinner	Theme: Brexit
	Direction Group Meeting	Theme: Materials Host: Saint Gobain Location: London
May	Buildoffsite Residential Hub	Theme: Student Accommodation
	Ilke Homes Workshop	
June	Direction Group Dinner	Host: Eurobond
June	Direction Group Meeting	Host: Barlo Homes
July	Buildoffsite Rail Hub	
	Buildoffsite Residential Hub	Theme: Social Housing
August	Direction Group Dinner	Host: Berkeley Homes/Protrade
	Direction Group Meeting	Theme: Manufacturing Host: Encon
September	Member to Member	Host: Arup Location: London
	Buildoffsite Residential Hub	Theme: Build to Rent
October	Direction Group Dinner	
	Direction Group Meeting	Theme: High Performance Materials Host: Lucideon
	Buildoffsite Rail Hub	
November	The Offsite Construction Show	Venue: ExCeL London
December	Direction Group Meeting and Christmas Lunch	Location: London

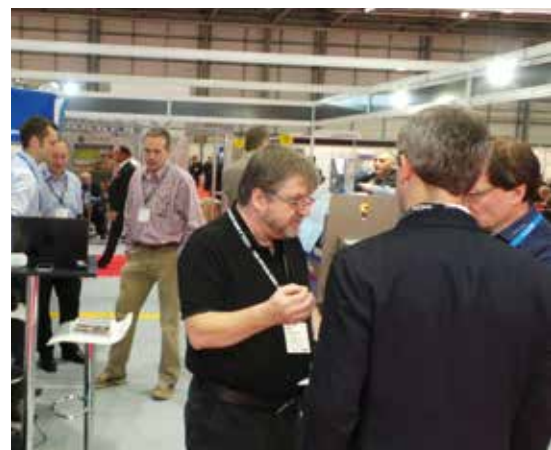
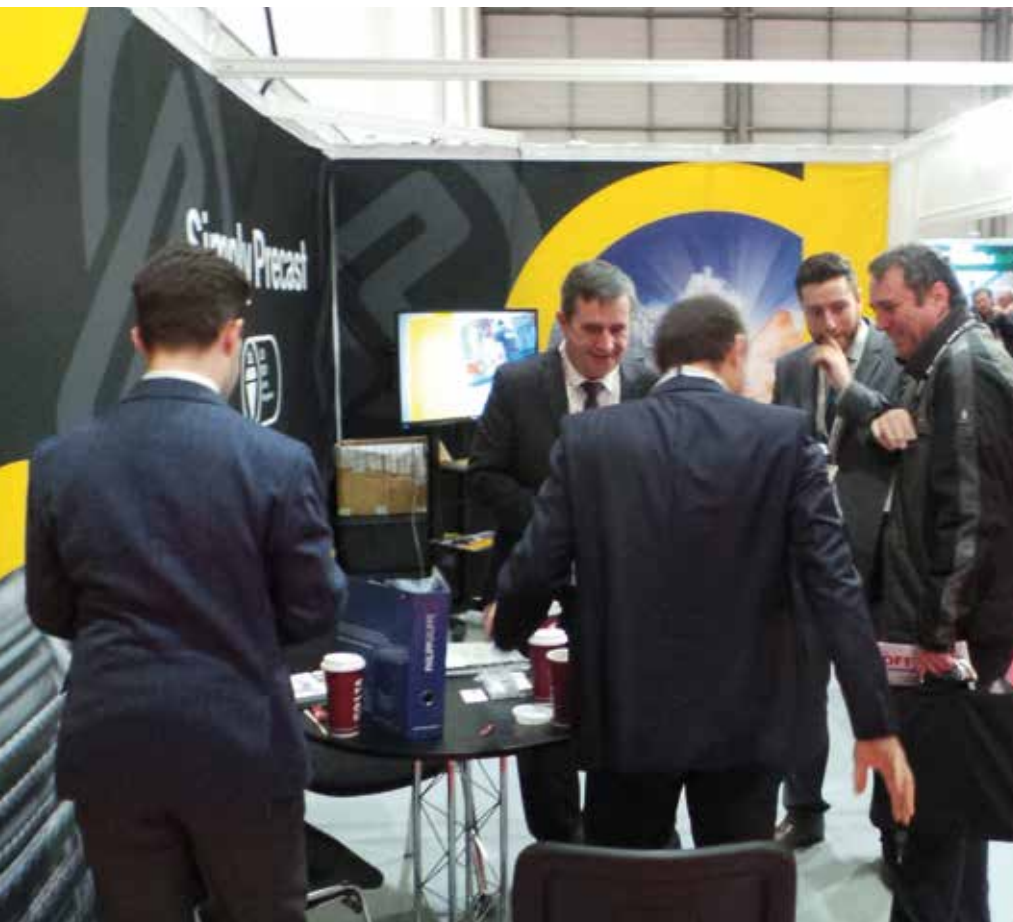
The
OFFSITE
Construction Show
20th - 21st November 2018
ExCel, London



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

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

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



To find out more visit: www.offsiteconstructionshow.co.uk