

# Buildoffsite members' meeting

**14 March 2023**

@Buildoffsite | #CollaboratingForImpact

# Welcome and introduction



**Dirk Vennix**

Chief Executive

CIRIA and Buildoffsite

# Programme

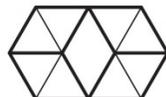
- 10:15 Trust and productivity: the private sector construction playbook
- 10:35 BSI standards development: national and international
- 10:45 Buildoffsite update: Social infrastructure hub
- 10:55 Member presentation: Kier Construction
- 11:05 Buildoffsite update: Utilities sector working group
- 11:15 Member presentation: Silotank
- 11:25 Member presentation: Aliaxis
- 11:35 Prefabricated electric vehicle charging infrastructure
- 11:45 Buildoffsite updates: Research and Transport sector working group
- 12:00 BOPAS update
- 12:10 The Offsite Show
- 12:15 Buildoffsite members' updates: Catax and Building Understanding
- 12:25 Buildoffsite events

# Buildoffsite

- Set up in 2004 as the voice of the industry, Buildoffsite has sought to promote, support and increase the adoption of offsite and pre-manufactured solutions for the built environment.
- Working in collaboration with our members and influencing government and key industry stakeholders, we seek to facilitate offsite solutions and deliver guidance, resulting in tangible change.
- By 'normalising' Modern Methods of Construction, Buildoffsite enables greater project delivery and strives to remove the perceived challenges to offsite adoption.

*“To be the trusted independent voice of the construction industry with respect to offsite and pre-manufacturing, and to provide all relevant support to our members and other stakeholders.”*

# Buildoffsite members



# Buildoffsite guidance 2022 – 2023

- Achieving sustainable resilience in new precast concrete structures – May 2022
- Offsite construction concept and design – April 2023
- Client Group proposals approved for 2023:
  - Specifying for Performance
  - IP Management guide



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# Trust and productivity: the private sector construction playbook



**Simon Gorski**

Managing Director, Construction, Europe

Lendlease



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# Introducing the Private Sector Construction Playbook

Trust and Productivity





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# Introductions

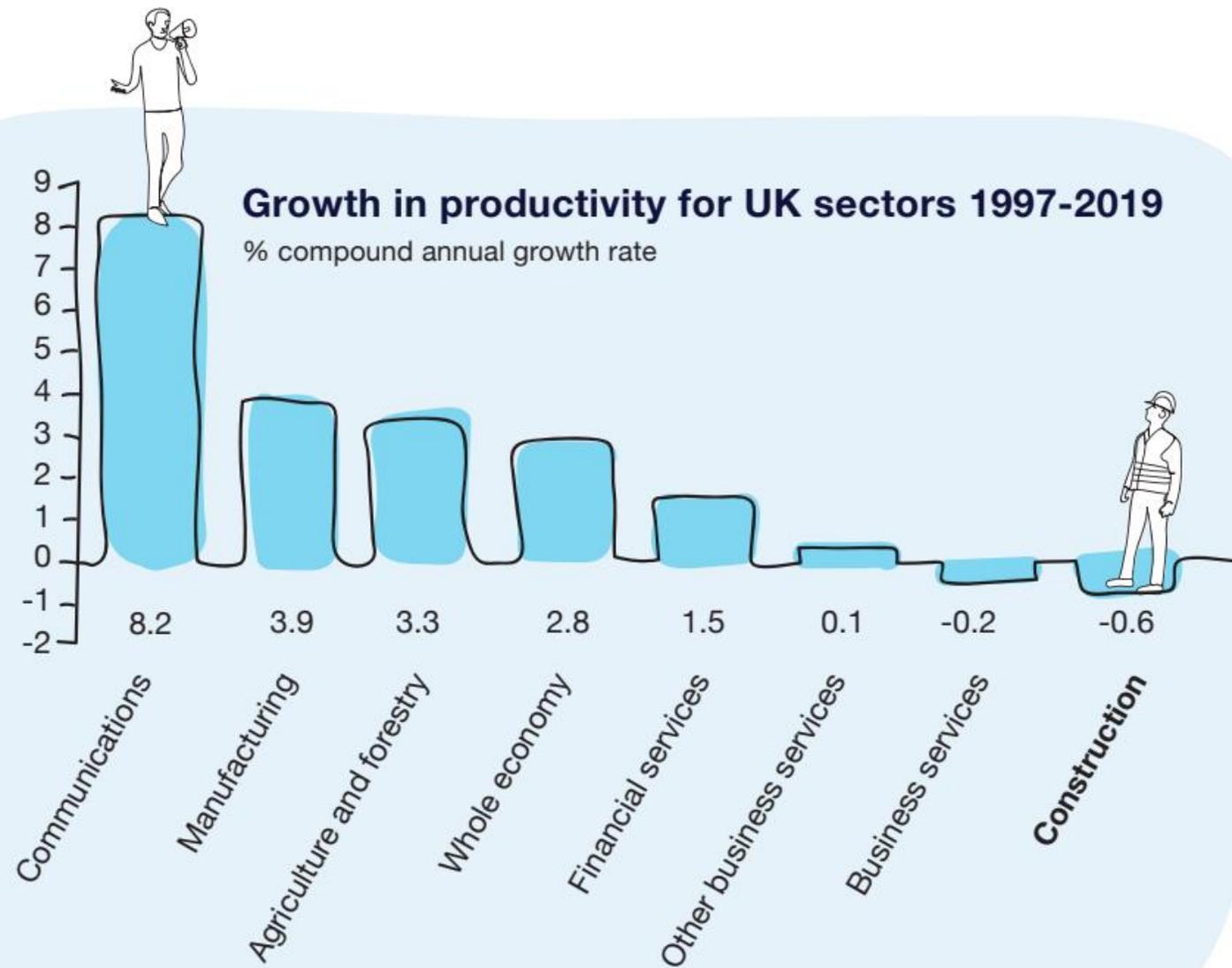


**Simon Gorski**  
Managing Director  
Lendlease Construction  
Europe



## Origin and purpose

The goal is to overhaul a highly fragmented industry that we believe lacks transparency and suffers from a lack of trust.



Since 1997 UK construction productivity growth has fallen by an average of -0.6% each year between 1997 and 2019 according to new research by Oxford Economics.



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# Be the Business

Be the Business founded the Construction Productivity Taskforce in early 2020. The taskforce is part of Be the Business' wider mission to boost productivity within the UK.

"A more productive construction sector is at the heart of rebuilding the economy post-pandemic. Through the taskforce, Be the Business has united some of the UK's most successful construction companies in a fantastic effort to combat poor productivity for the good of the nation as a whole."

Anthony Impey, CEO Be the Business





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# Workstreams

Construction Productivity Taskforce mission is to identify and trial new ways of improving the sector and then share the findings throughout the industry.

Three workstreams have been identified as productivity-boosting interventions.

## **Workstream 1** *Measurement framework*

A seven-step framework for success guide to provide a guide into how a productivity improvement programme can be planned and implemented.

## **Workstream 2** *Construction Data Trust*

A platform that enables all parts of the industry to share their own project data, enriching the data sets further and enabling advanced insight generation.

## **Workstream 3** *Private Sector Construction Playbook*

A playbook setting out the key policies and guidance for how projects are procured and delivered in the commercial sector to drive productivity improvement.





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# Workstreams

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# Workstreams

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A platform that enables all parts of the industry to share their own project data, enriching the data sets further and enabling advanced insight generation.

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*Private Sector Construction Playbook*

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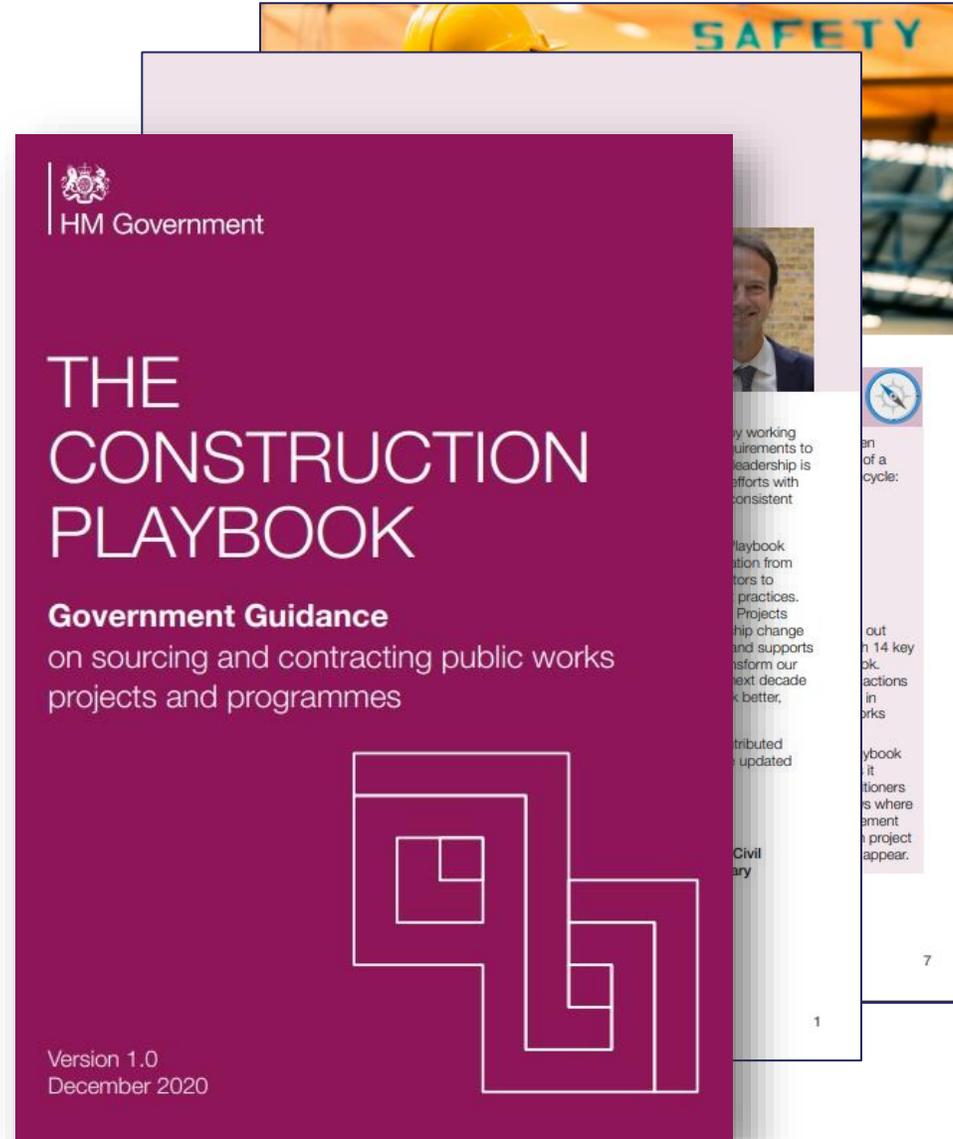




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# The Construction Playbook

The Construction  
Playbook was launched  
by Cabinet Office in  
December 2020.





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# The private sector construction playbook

The Playbook is one of three workstreams that originated from the Construction Productivity Taskforce.



The new playbook has been developed by leading clients, contractors, and consultants within the built environment to help drive a step change in the way **Private Sector** projects are commissioned, procured, delivered and operated.



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# Working team

A team of 12 industry professionals across 8 organisations.

Lead by a core Lendlease team.



Josh Randall  
**Lendlease**



Nick Smith  
**Lendlease**



Paul Spiller  
**SRM**



Lee Donnarumma  
**SRM**



Simon Gorski  
**Lendlease**  
**INITIATIVE SPONSOR**



Alan Bunting  
**British Land**



Anthony Chudleigh  
**British Land**



Marissa Stenning  
**Alinea**



Mark Lacey  
**Alinea**



Neil Pennell  
**Landsec**



Martin Quinn  
**GPE**



Andrew Browne  
**G&T**



Brian Morrisroe  
**Morrisroe**

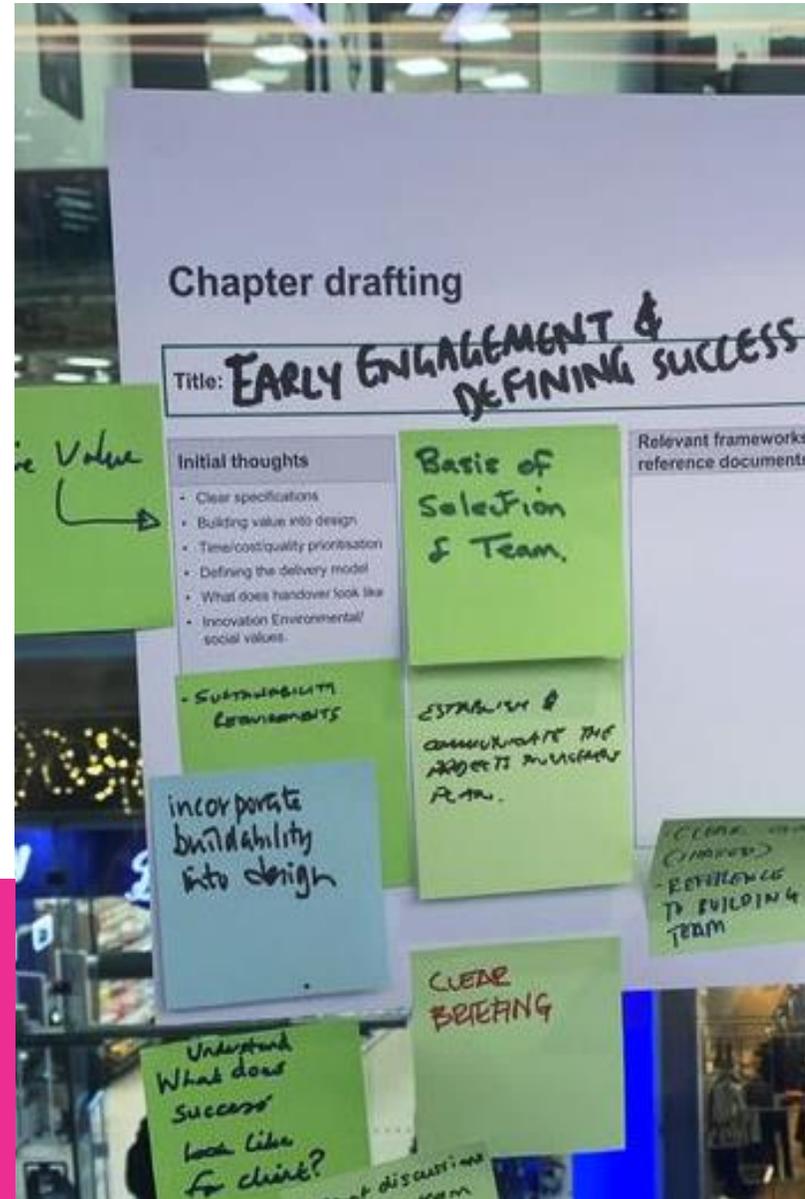




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# Bringing the content together

A series of workshops were held throughout 2021/2022 with a working team from across all businesses.





# Trust and Productivity overview

The Playbook provides a detailed introduction explaining the key elements of construction productivity.

## Foreword

## The Construction Productivity Taskforce

## Introduction

## Using the Playbook

## Summary of Key Takeaways & Toolkit

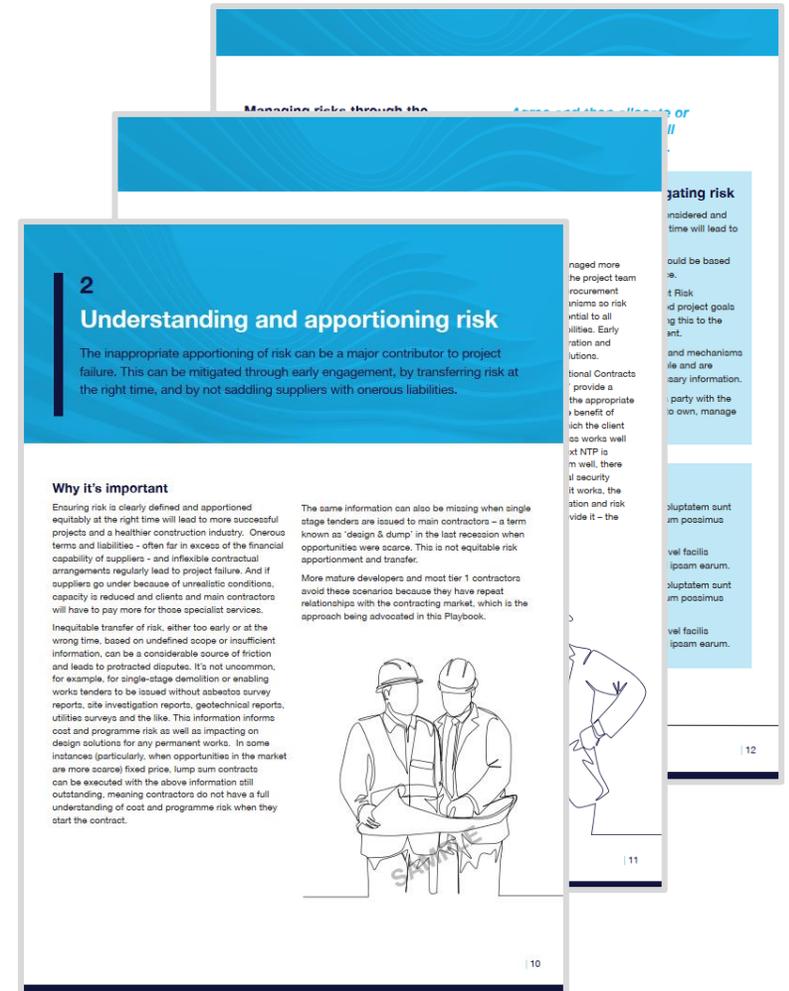
## Chapters

- 1 Setting up the project and defining success
- 2 Understanding and apportioning risk
- 3 Using modern methods of construction
- 4 Defining a procurement strategy to create value
- 5 Bid evaluation and awarding contracts
- 6 Workplace requirements on site – going beyond minimum standards
- 7 Creating a platform for ‘change’
- 8 Measuring success and checking in
- 9 Transition to handover and effective aftercare

## Acknowledgements

## Taskforce Members

## Sources containing additional relevant information





# Using the Playbook

There are nine chapters that outline the project sequence from concept through to delivery.

Each chapter provides case studies and practical takeaways and toolkits

## The playbook chapters

Typical engagement activities	Building the concept/Preparation and planning		
Chapter	1 Setting up the project and defining success	2 Understanding and apportioning risk	3 Benefitting from modern methods of construction
Typical engagement activities	Procurement		
Chapter	4 Defining a procurement strategy to create value	5 Bid evaluation and awarding contracts	
Typical engagement activities	Managing construction		
Chapter	6 Site accommodation for a modern workforce	7 Creating a platform for change	8 Measuring success and checking in
Typical engagement activities	Managing post-construction		
Chapter	9 Transition to handover and effective aftercare		



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# The non-negotiable priorities

Every project must adhere to non-negotiable priorities in the way it is designed and constructed.

## Health, safety and wellbeing

Health, safety, and wellbeing must always be the highest priority on construction sites.

## Sustainability

The construction industry in the UK is currently committed to achieving net carbon zero greenhouse gas emissions by or before 2050.

## Building Safety

We as an industry must constantly work to be positive contributors to improve building safety.

## Value to society

The construction industry should aim to maximise economic, environmental and social value on every project it delivers.



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# The 10 drivers for success

Trust and Productivity proposes 10 drivers for success that should underpin any project.



**Form effective  
partnerships**



**Benchmark  
objectives**



**Adopt portfolio and  
longer-term contracting**



**Allocate risk fairly  
and appropriately**



**Adopt an outcome-based  
approach**



**Pay fairly**



**Embed digital information  
flows and technologies**



**Assess the economic and  
financial standing of suppliers**



**Involve the supply  
chain early**



**Promote innovation and  
continuous improvement**



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# Launching the Playbook

A launch event was held on 10<sup>th</sup> November 2022 with guest speakers and a panel discussion hosted by Anthony Impey CEO of Be the Business.





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# How to Access the Playbook

The current versions were released digitally and can be found on the CLC and Be the Business websites.

Click to follow link

The screenshot shows the CLC website header with the logo and tagline "Leading Transformation Across The Construction Industry". A navigation menu includes "HOME", "ABOUT THE CLC", "NEWS", "CONTENT", "WORK STREAMS", "CO2NSTRUCTZERO", and "CONTACT". A search bar is present. The main content area features a news article titled "Private Sector Construction Playbook Published" dated "16 November 2022". The article text states: "Construction industry leaders join forces to tackle stagnant productivity". A "Read more" button is located below the text. To the left of the text is a small image of the playbook cover.

[The Construction Leadership Council](#)

The screenshot shows the "be the business" website banner. The header includes a login prompt "Login to your Mentoring or Board account (programme members only)", a "Signup to Be the Business" button, and a search bar with the text "Search topics and questions...". The main banner area has a dark blue background with white and pink text. On the left, it reads "Trust and productivity: The private sector construction playbook". On the right, there is a graphic with the text "Trust and Productivity" and "The private sector construction playbook" above an illustration of two people in business attire. The "construction productivity taskforce" logo is visible in the top right corner of the banner.

[Be the Business](#)



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## Modern Methods of Construction

Working together to improve safety and construction productivity through the adoption of offsite and MMC.

How can we work  
together to drive  
industry change?

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# BSI Standards development: national and international



**Clare Price**

Sector Lead – Built Environment

BSI



**Nigel Fraser**

Industry Advisor

Buildoffsite

# BSI offsite standards development

## CB/301 Offsite and modern methods of construction

New standing technical committee

Chair and stakeholder membership

Pipeline of work and input to ISO

## ISO TC59 SC19 Prefabricated buildings

Led by Chinese with US, UK, French on Chair's panel

Large scope of work taking a lifecycle perspective

WGs for design, production, construction, maintenance

## PAS 8700 MMC for residential buildings

Sponsored by DLUHC

Scoping workshops and questionnaire

Technical Author, Steering Group and Advisory panels

Development, public consultation and comment

# Other BSI standards activity

1. **ISO/DIS 4172 Technical drawings – Construction drawings – Drawings for the assembly of prefabricated structures (BS EN ISO 4172)** – out for public consultation until 26 March 2023. Go to <https://standardsdevelopment.bsigroup.com/> to find out more, read and comment on the standard
2. **BSI Flex 390 Value based decision making in the Built Environment**
  - Specifies requirements for implementing a consistent approach to value-based decision making within the inter-related processes undertaken in the management of a built environment project and throughout the lifecycle of an asset
  - This BSI Flex is complementary to existing processes that assist with the wider management process of a programme or project, whatever the size, complexity or chosen procurement strategy
  - Free download of latest Version02 available now:  
<https://www.bsigroup.com/en-GB/standards/bsi-flex-390/>
3. **CEN TC 350/SC1 (B/558/1) Circular Economy in the Built Environment** – gap analysis consultation

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# Buildoffsite update

## Social infrastructure hub



**Ken Davie**

Industry Advisor

Buildoffsite

# Social Infrastructure Hub

## Recent activity

- Members Dinner and NG Bailey factory visit – September 2022
- Timber webinar
- New name with new Terms of Reference
  - To be discussed and agreed by the Group

## Built Environment Working Group

# Built Environment Working Group

## Sector Focus Groups

- Residential: Houses/Homes, Flats, Hotels, Hostels, Single Living Accommodation and Prisons
- Commercial: Offices, Retail, Leisure and Industrial
- Non-Commercial: Healthcare, Education, Justice, Defence and Infrastructure
- Infrastructure: Road, Rail, Sea and Air
- Utilities: Water, Power, Communications and Gas

Virtual Working Group Meeting – Members and Non-members

# Built Environment Working Group

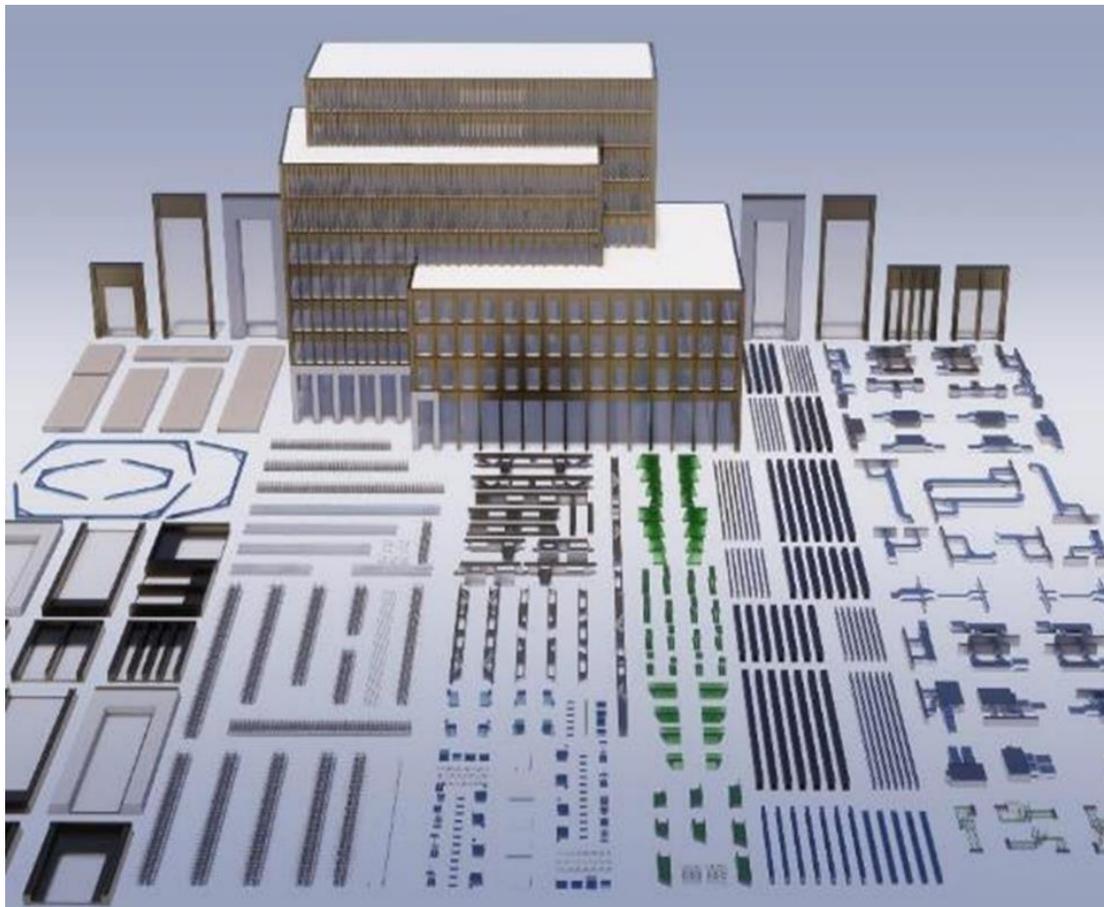
## More visits and networking events

- HMP Millsike, Long Sutton (Pre-cast Construction) – Wednesday 26 April
- Donaldson Timber, Whitney Factory (Automation) – Date TBC
- The Forge, Southwark, London (Platform Design) – Date TBC
- Energy House Project, Salford University (Net Zero) – Date TBC
- Stelling Properties, Micheldever, Winchester (Modular Homes) – Date TBC

## Webinars

- Precursor to visits with related topics
- Co-ordinated with CIRIA
- Topics proposed by Buildoffsite Members
- Featuring carbon reduction

# Built Environment Working Group



## The Forge

- OSM/MMC/Platform Design Approach
- A kit of parts can be designed by working out what buildings have in common
- The parts can be used again and again without compromising design creativity
- OSM, repetition and standardisation are eliminating waste and reducing embodied carbon
- Reduced consumption

# Built Environment Working Group

## HMP Millsike



- New prison for 1,500 inmates
- To run and be operated solely on electricity; combination of solar panels and heat pumps
- Carbon emissions significantly reduced and projected running cost savings of £1m
- Named after the adjacent beck
- Team effort by 4 Tier One Contractors pooling staff, expertise and supply chain partners; onsite in less than 16 months
- Tagging and tracking of pre-cast components

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# Member presentation



**Andrew Dewdney**

Head of Modern Methods of Construction (MMC)

Kier Construction



# Crown Commercial Service

## RM6184 Offsite Construction Solutions

£10bn / 4years  
(goes live 2<sup>nd</sup> April 2023)



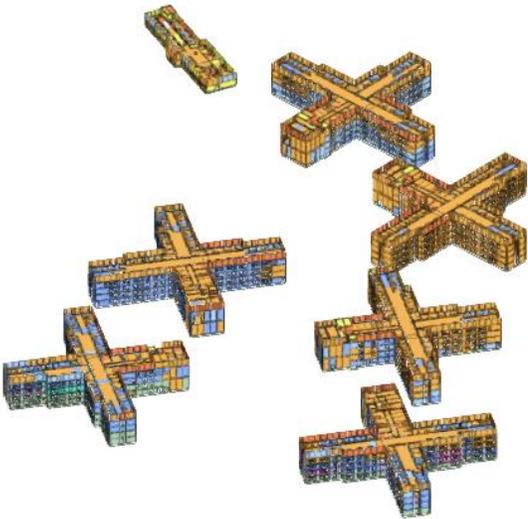
<p><b>1.0 General (inc. Education)</b> <i>(Purchase and Hire)</i></p> <p>e.g. Teaching Spaces, Offices, Welfare, Training, Non-clinical Labs, Emergency Response solutions,</p>	<p><b>2.0 Health</b> <i>(Purchase and Hire)</i></p> <p>e.g. GP Surgeries, Clinical and Non-Clinical Wards, Palliative care, A&amp;E, New Hospitals, Mortuaries, Vaccination Centres, Theatres, Urgent Care, Labs</p>	<p><b>3.0 Residential</b></p> <p>e.g. Student/ Critical Worker Accommodation, Later Living, Care Homes,</p>
<p><b>4.0 Custodial</b></p> <p>e.g. Cat D Prison, Women’s Open and Closed, Young Offenders, Secure Training, Rapid Deployment Cells, Ancillary buildings</p>	<p><b>5.0 Defence</b></p> <p>e.g. SLA for DIO, Immigration Centres, Offices,</p>	<p><b>6.0 Thermal Upgrade</b></p> <p>Thermal retrofit to existing public buildings (offsite panelised cladding)</p>



# HMP Millsike (formerly HMP Full Sutton)



Status Name	Current		Cumulative	
	%	#	%	#
NOT YET TRACKED	0.66%	77	100%	11671
UNIT DESIGN ISSUED (FOR APPROVAL)	1.52%	177	98.83%	11535
UNIT DESIGN REJECTED	1.49%	174	10.3%	1202
UNIT DESIGN APPROVED (ISSUED FOR MANUFACTURE)	48.62%	5675	98%	11437
UNIT CAST	11.38%	1328	48.79%	5694
UNIT READY FOR DELIVERY	18.67%	2179	33.81%	3946
LOADED FOR DELIVERY	1.17%	136	13.99%	1633
IN TRANSIT	1.04%	121	10.17%	1187
RECEIVED ON SITE	1.15%	134	12.83%	1497
INSTALLED	14.31%	1670	14.69%	1714



## The Fitzrovia (247 Tottenham Court Road)



Comprising eight residential apartments, 60,000sq' of CAT A commercial space with cores, five split floor retail units and flexible retail/education space with a café.



247 TCR is designed for an excellent BREEAM rating, WIRED Gold and WELL Gold.

HybriDfMA framed building, embracing a 'kit of parts' philosophy using offsite manufactured structural steel and precast concrete components, together with insitu reinforced concrete. This will allow the façade above ground to be fully closed up within 10-weeks of the frame completion.

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# Buildoffsite update

## Utilities sector working group



**Fareita Udoh**

Industry Advisor

Buildoffsite

# Utilities Engagement

- Publication in July 2022 of WIMES 8.02 after 10 full day workshop sessions facilitated by Buildoffsite in partnership with Arcadis
- Participation and sponsorship of Future Water Networks November
- New Member Silotank who were key contributors for the WIMES 8.02 review for Chemical Dosing Kiosks, tanks and bunds. Leading the way in modular prefabricated solutions for the drinking and waste water industry.
- New Member Aliaxis experts in Fluid Management Solutions, they provides high performance solutions for the transportation of sewage and stormwater through their durable and flexible PE pipe systems

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# Member presentation



**Seamus Carmichael**

Managing Director

Silotank

# Bringing Modular Innovation to the Waste Water Industry

Silotank are a leading Manufacturer in the UK and Ireland for Chemical, Liquid and Drinking Water Storage Tanks, Bunded Storage Tanks, Process Vessels, Pressure Vessels and Environmental Systems.

# Silotank deliver modular



# Key benefits of modular

- ✓ Ability to deliver a range of modular offsite tank designs up to 6 metre diameters.
- ✓ Customised dimensions based on client specification with excellent resistance against chemicals vs corrosion and degradation with GRP.
- ✓ Reduced maintenance with 'glass smooth' internal surface minimising tank internal cleaning requirements. 
- ✓ Modular #offsiteconstruction in 2 units/pieces to aid transport 
- ✓ Accredited to standards BS EN 12573-1:2000 Welded static non-pressurized thermoplastic tanks General principles
- ✓ Accredited to standards DVS2205:2016 Calculation of tanks and apparatus made of thermoplastics
- ✓ Factory spark  tested to guarantee integrity once in service

# Compare to Traditional GRP

✗ GRP **construction** timescales on average 3 weeks

✗ The traditional conical settlement tank is manufactured in GRP material or concrete. This means Operators/Installers must climb down into the tanks to fit pipework and internals.

✗ Conical Settlement Tanks are normally supplied in GRP sections and must be assembled on-site with [#cranes](#). Installers must go down inside the tank to laminate the section joints.

✗ You cannot fiberglass laminate in cold or wet weather  
 [#climateaction](#)

✗ Compare this to 3-4 weeks for GRP construction the time & cost savings are massive.

✓ Silotank delivers super-fast installation on site each tank is fitted with an external base support structure within 2 days

✓ Silotank Conical Settlement Tanks supplied fully constructed two-piece units dispensing with sectional construction and jointing upon delivery to site guaranteeing their future integrity and lengthening construction timescales.

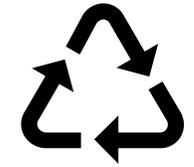
✓ During this COLD SNAP simple assembly and fitting procedure is critical to reduce time on site.

✓ Silotank Modular Solutions from arrival on site can be offloaded and installed within 6-8 hours with a 3 person team.

# CST – Assembly at Site



# Offsite offering Carbon Reductions



Silotank Modular CST V Standard Solution CST

Conical Settlement Tanks are manufactured from concrete using formworks or from GRP then reinforced externally with concrete.

We calculated embodied carbon from manufacturer of pellet to sheet to delivery to Cardiff site.

HDPE CST 5.04 tonnes

Fiberglass GRP 6.38 tonnes

**CO2 = 28% higher for GRP Construction**

Whole life cycle carbon emissions is 39.03 tonnes/CO2 for a 4m diameter HDPE CST.

HDPE product can be recycled using 're-grind' for production of other HDPE products such as decking, seats, benches, railway sleepers, fences.

Customer	Tims Tanks
Enq Number	12345
Order Number	54321
Tank Number	1234





Embodied Carbon		
Material	QTY / kas.	Total CO2/kg
Plastic		
Tank Weight	500	1364.00
Bund weight	150	409.20
Pipework Weight	15	40.92
Kiosk Weight	34	92.75
	<b>699</b>	<b>1906.9</b>
Material	QTY / kas.	Total CO2/Kg
GRP		
Fiberglass Weight	785	3487.76
Resin Weight	1400	6220.20
Flow coat weight	100	444.30
Bund weight	0	0.00
Pipework Weight	0	0.00
Kiosk Weight	0	0.00
	<b>2285</b>	<b>10152.3</b>

**Transport Emissions Calculator**

<b>Road Transport</b>			
Collection Address	Silotank, Belfast		
Delivery Address	Belfast Docks		
Distance	Kilometres	163.00	
Weight	Kilograms	2984.00	
<b>Carbon emissions</b>			
	tonne.km	486.39	1.43329
		<b>697.14</b>	<b>Total kg CO2e for transport</b>

<b>Sea Transport</b>			
Collection Address	Belfast		
Delivery Address	Cairnryan		
Distance	Kilometres	113.00	
Weight	Kilograms	2984.00	
<b>Carbon emissions</b>			
	tonne.km	337.19	0.05166
		<b>17.42</b>	<b>Total kg CO2e for transport</b>

<b>Secondary Road Transport</b>			
Collection Address	Cairnryan		
Delivery Address	Glasgow		
Distance	Kilometres	390.00	
Weight	Kilograms	2984.00	
<b>Carbon emissions</b>			
	tonne.km	1163.76	1.43329
		<b>1668.01</b>	<b>Total kg CO2e for transport</b>

Total Carbon	CO2/Kg
Embodied Carbon	12059.1
Transport Carbon	2382.57
<b>Total Carbon</b>	<b>14441.69</b>
<b>Total Tonne/CO2</b>	<b>14.44</b>

# Recent Feedback

- Membership Engagement with Buildoffsite has provided a platform for Silotank to showcase their innovations.
- Introduction to Water Companies and Consultants
- Social Media profile enhanced with shared content
- Welsh Water keen to review and take forward for review
- Case study will be shared for Irish Water project with input from main Contractors on the benefits of modular.
- Any Questions?

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# Member presentation



**Shane Mooney**

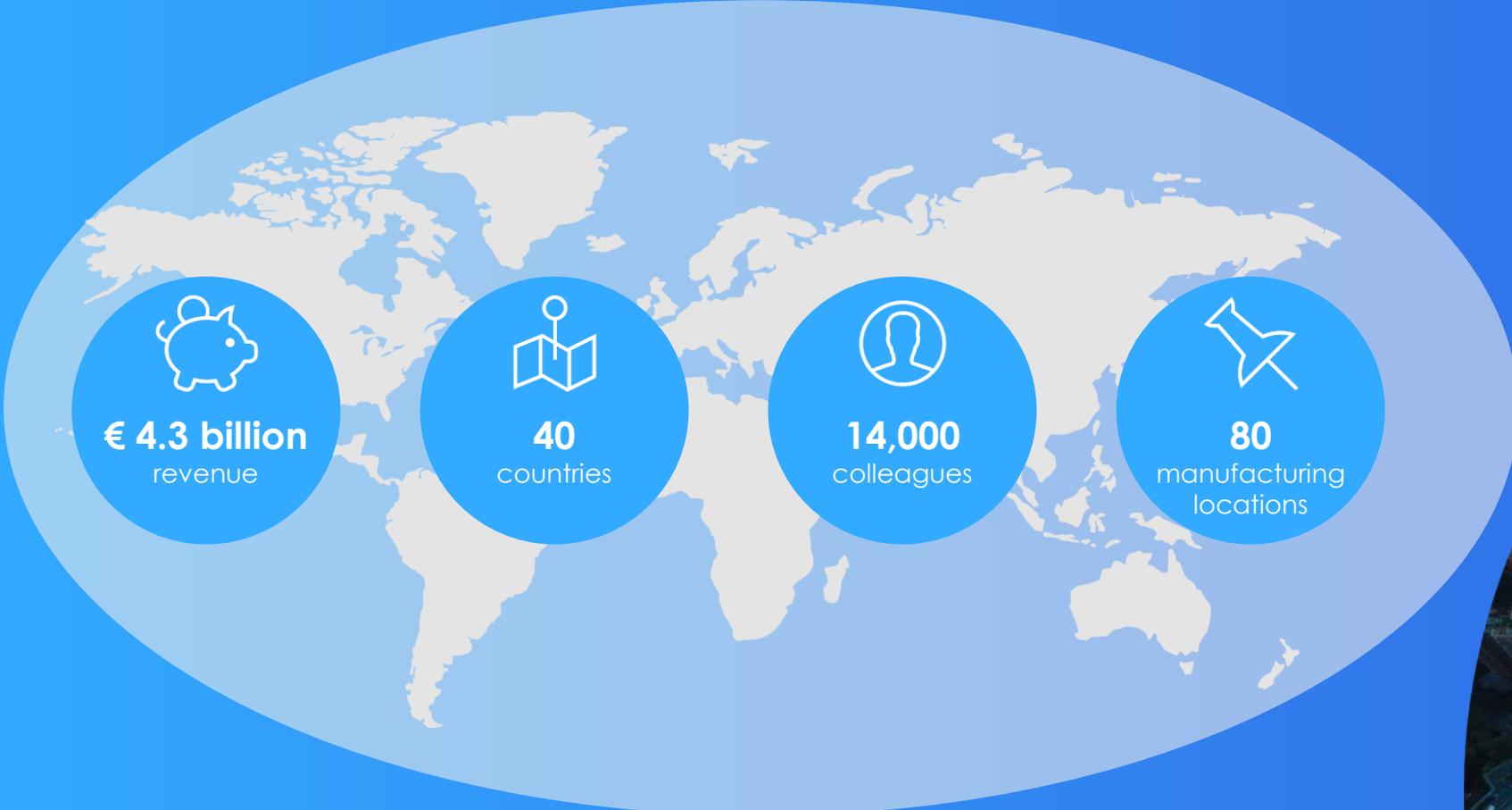
Product Manager – UK Building

Aliaxis



We are experts in fluid management solutions.

We are passionate about creating sustainable systems for water, gas and energy, leading our industry in a way that anticipates the rapidly evolving needs of our customers, ensuring peace of mind for future generations.



# Unique application coverage

## Commercial buildings



- Soil, waste & ventilation
- Hot and cold water
- Chemical drainage
- Rainwater management

## Residential buildings



- Rainwater management
- Soil and waste
- Underground drainage

## Infrastructure networks



- Potable water supply
- Gas supply
- Fuel supply
- Sewage and stormwater

## Industrial processes



- Water treatment
- Chemical processing
- Irrigation
- Compressed air

# The **aliaxis MEP** **platform**

Ensuring a better built environment  
for the future



March 2023

# The aliaxis *DfMA* MEP platform



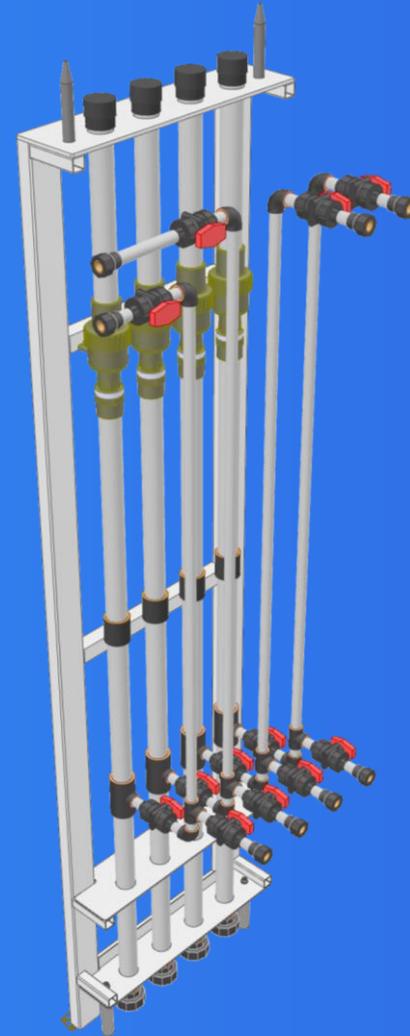
Sub assembled or material kit of parts



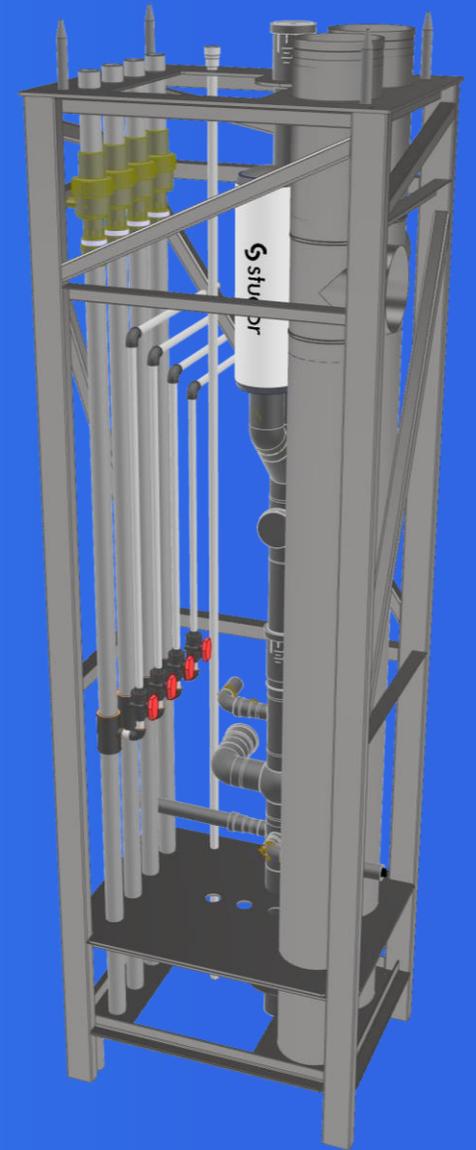
Pre-fabricated water stacks



Pre-fabricated soil stacks



Riser panels



Riser modules

# The aliaxis *DfMA MEP* platform



Lateral ceiling  
mounted cassettes

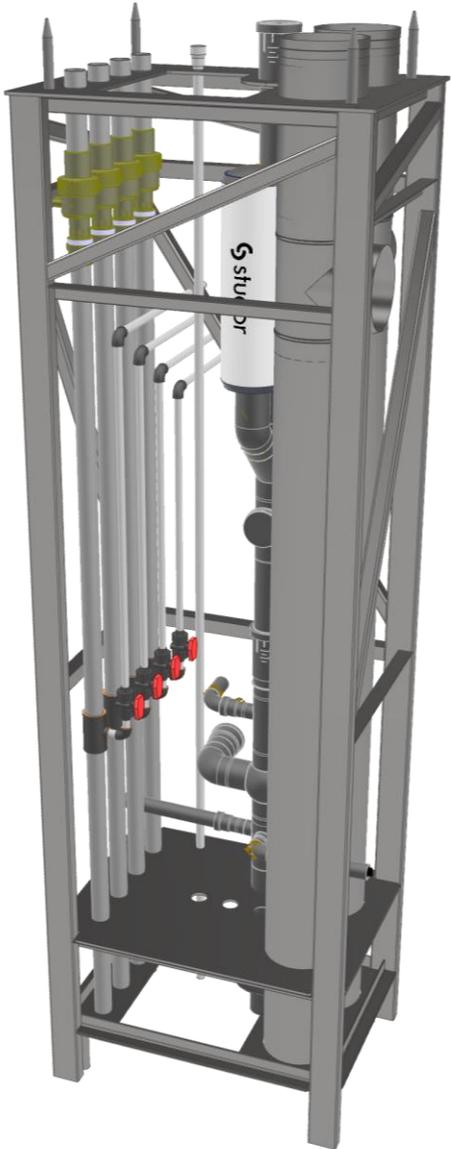


Pre-manufactured utility  
cupboards



Pre-mounted  
back panels

# How our platform approach to MEP works



Collaborative design early in a construction project

Services pre-installed in a dedicated production environment

Fully tested to robust quality procedures

Complete modules delivered to site in line with project schedule

Installation of the complete MEP package is simplified - lift, lower, click, connect

Frame alignment ensures precision connection of all services

Opportunity for a single solution warranty

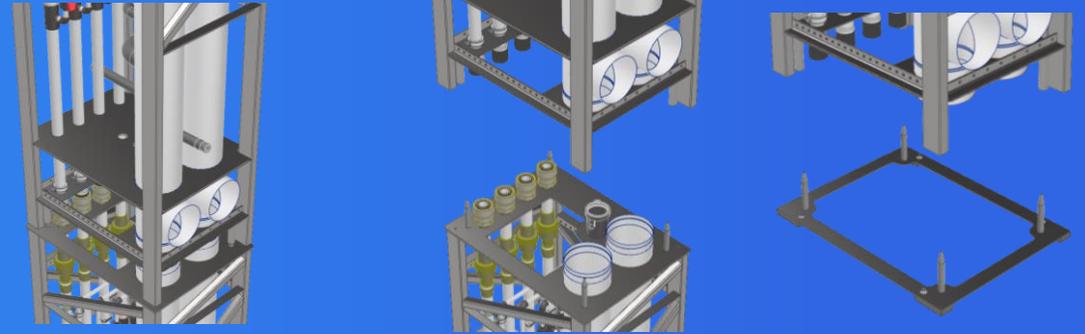
The system paves the way for standardisation between common projects

# Benefits

## Reduced reliance on crane time & increased speed of install

Foundation alignment plates are line, levelled and installed prior to riser delivery.

Module and pipes are self locating, once landed there are no secondary fixings required.

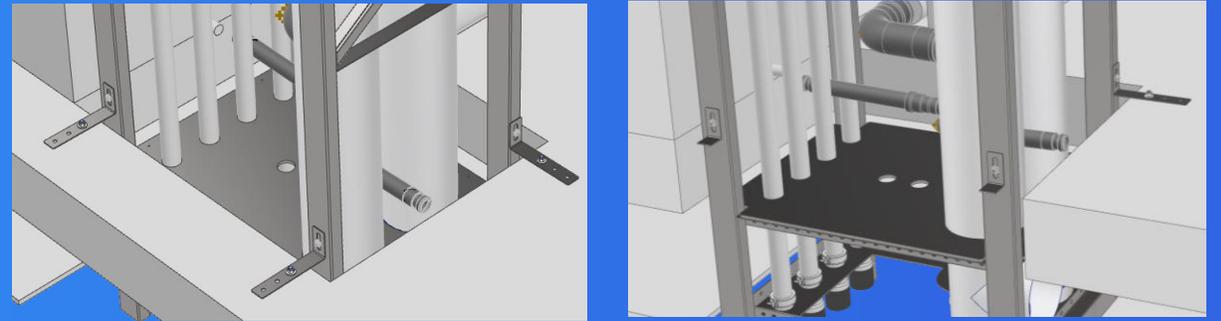


## Health and safety advantages

Each riser module and panel has a working platform/fall protection pre-installed.

Alignment pins locate the module into place during install.

No need to work in a confined space to bolt components together.

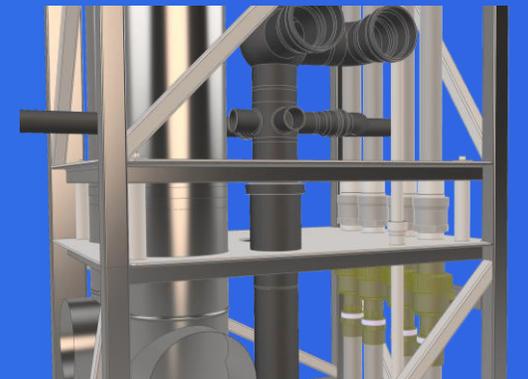


## Greatly reduced reliance on skilled labour

Aliaxis risers do not require MEP engineers to be on site during install.

Modules can be installed by an Aliaxis UK trained approved installer, who will QA check the pipe connections after each lift.

Skilled MEP engineers and installers can be prioritised onto other critical path activities.

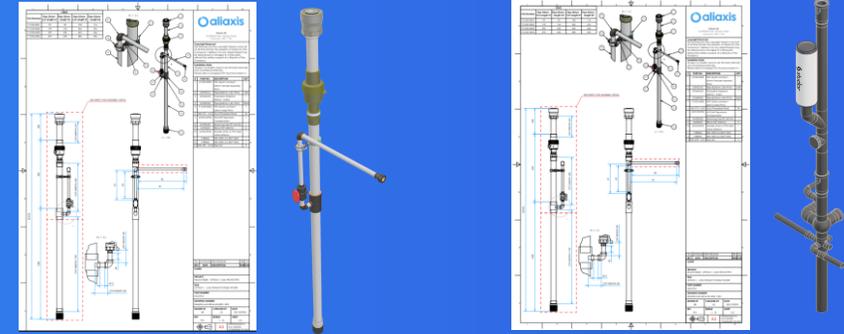


# Benefits

## Simpler and standardised facility management

What is designed is what is installed, no alterations to layout or spec.

Standard components and layouts can be used across multiple buildings, reducing the stock of components and time to maintain the system.



## No vertical loads taken into building super structure

Riser elements are self supporting and can be stacked up to 16 storeys without the need for additional structural support.

All vertical loads are taken down the corner / side columns to the foundations.

Active later restrains where required into the top of the floor slab, no need for cast in channels or secondary fixing points.



## Pre delivery commissioning – right first time

Every component is tested within the factory prior to delivery.

All pre-fabricated pipe run is pressure tested and QA passed before delivery

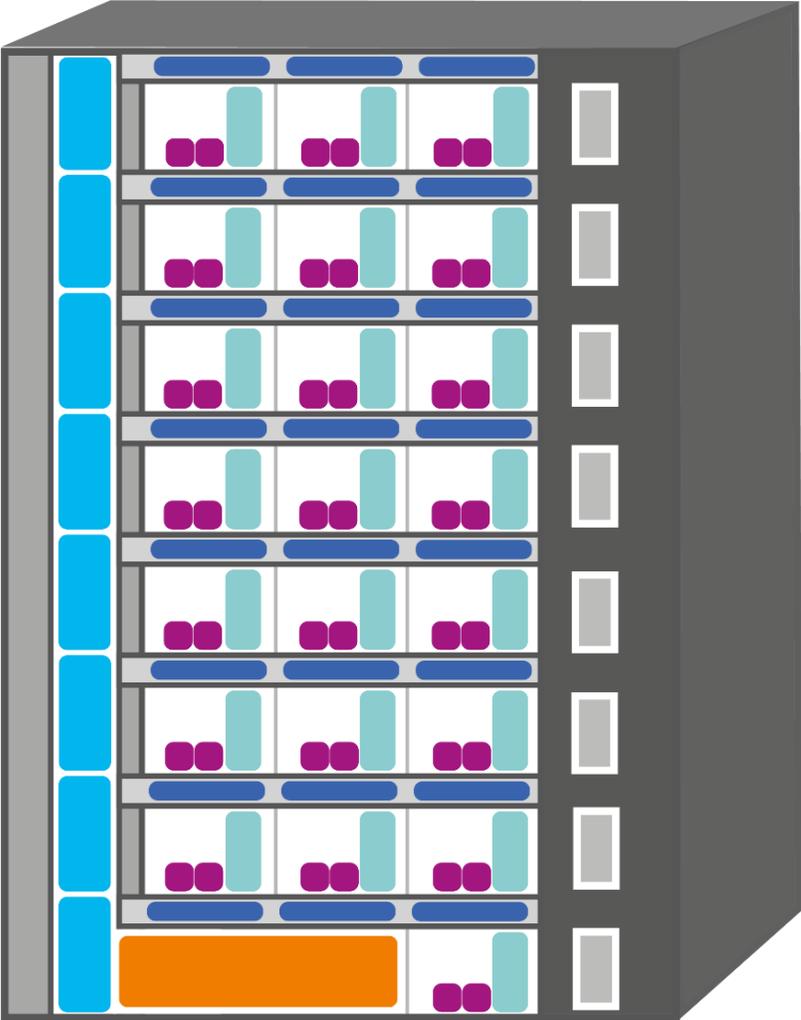
Each pre-fabricated wiring loom or board is dead load tested before delivery.

The full system can be tested on site prior to final connection being made to ensure no issues will be experienced during commissioning.



# A complete turnkey solution

Through aliaxis innovation and collaborative partnerships, an integrated platform DfMA approach to the MEP package can be deployed from pump to tap.



## How the aliaxis platform MEP approach enhances quality



All systems are specified in line with the demands of the building



Services are pre-joined in a controlled environment by system experts



What is designed is built, no more clashes, no more deviations.



All services are fully-tested before being supplied to site.



All contractors installing aliaxis modules are provided with detailed training and support

## What this means to the future of building

### Operational performance

- Systems that perform as they should, throughout the life of the building
- Reduced disruption to occupants due to system downtime

### Simplified facility management

- Services and components will always exist where the design directs maintenance teams
- Less call-outs to failed services

### Warranty

- Provides the opportunity for a harmonised and extended solution warranty
- With a promise of substance and meaning, we are right there with you

# Buildoffsite members' meeting

**14 March 2023**

@Buildoffsite | #CollaboratingForImpact

# Prefabricated electric vehicle charging infrastructure



**Paul Jewell**

System Development Manager

National Grid

**Electricity  
Distribution**

# **EV Charging & Modular Build**

**Buildoffsite Members' Meeting**

**Paul Jewell**  
14<sup>th</sup> March 2023

**nationalgrid**



# National Grid – who are we and what do we do?

Committed to delivering electricity safely, reliably and efficiently to the customers and communities we serve. Our vision is to be at the heart of a clean, fair and affordable energy future.

## Electricity Transmission

Own and operate the high-voltage electricity transmission network in England and Wales.



**4,484**

Miles (7,216 km) of overhead wires



**1,585**

Miles (2,551 km) of underground cables



**347**

Substations



**99.999984%**

Reliability of Electricity Transmission network

## Electricity Distribution

Own and operate the electricity distribution networks for the Midlands, the South West and South Wales.



**8 million**

homes and business connected to the distribution network



**141,672**

Miles (228,000 km) of wires and cables



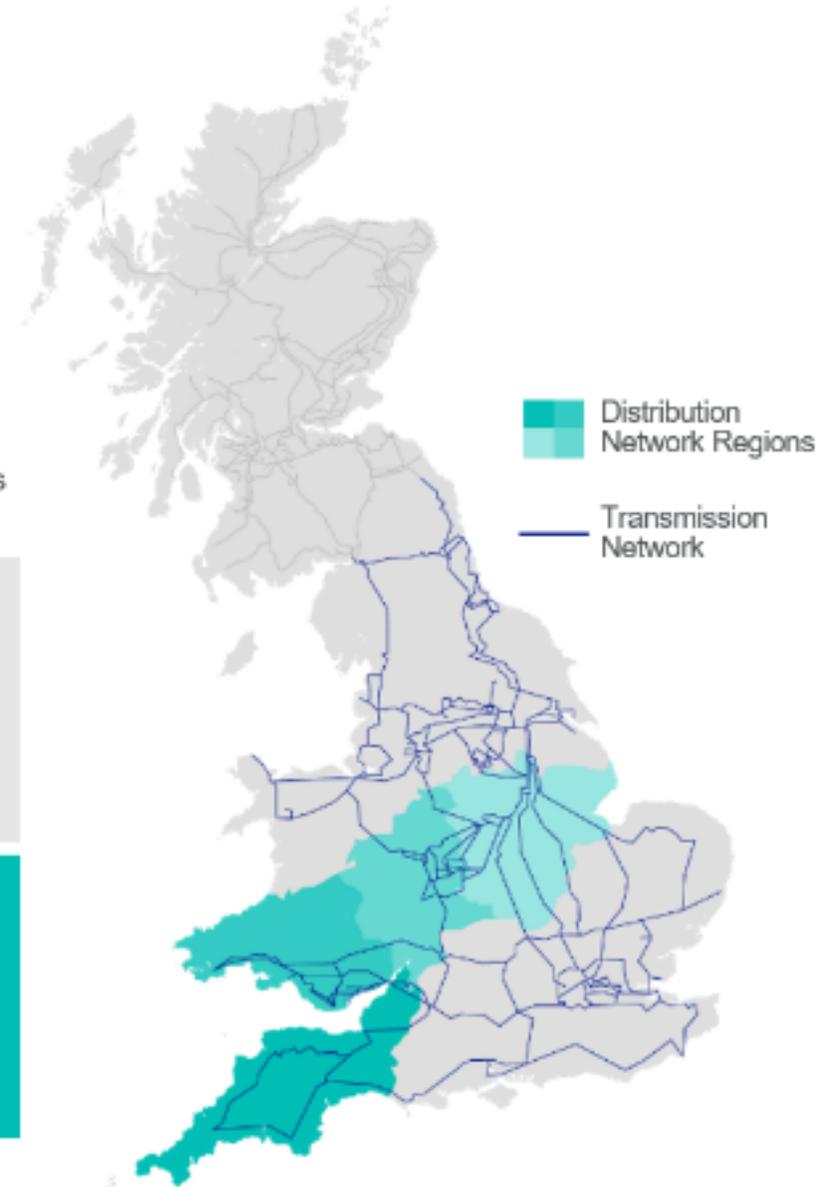
**2 million**

Poles and towers



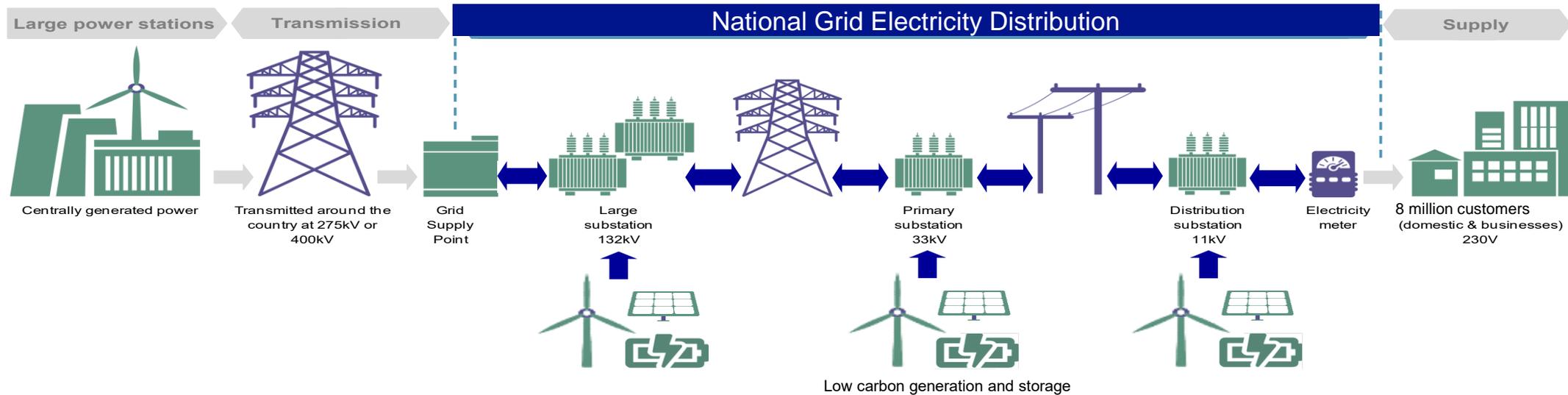
**190,000**

Substations



# The Electricity Network

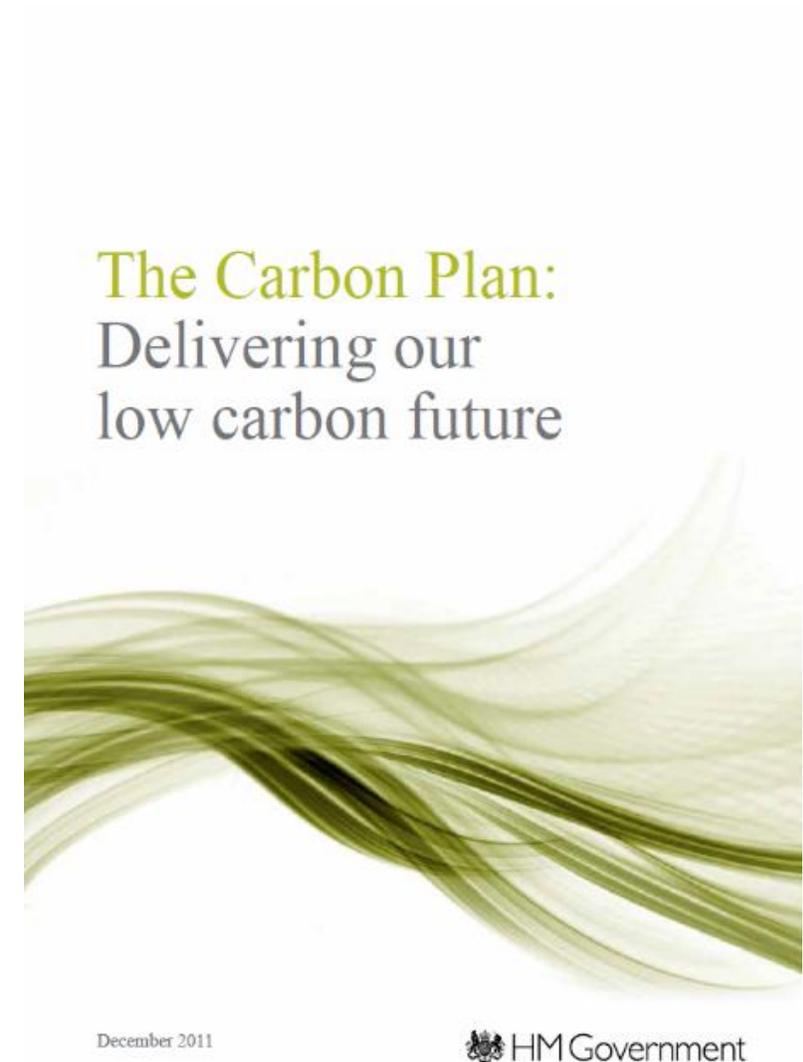
- NG Distribution, along with the other UK DNOs, take energy from the transmission network and deliver it to the doors of our customers.
- Decarbonisation has led to more generation sources being connected to our networks and we see demands increase as customers move to low carbon technologies such as Electric Vehicles and Heat Pumps



# What does Net Zero mean?

## Net Zero/Climate Change/Environment Awareness.

- Net Zero comes from a Government announcement to reach “Net Zero carbon emissions by 2050”
- Carbon emissions affect Climate Change, reducing them slows the change.
- Governments “The Carbon Plan” (December 2011) set out a long term goal to decarbonise heating and transport
- Decarbonisation is achieved by switching petrol/gas use for heating and transport to electrical solutions. Electricity generation moves to renewable and low carbon production at the same time
- More energy will be supplied via our electricity network



# Context for Low Carbon Technologies

## Volumes of LCT will grow rapidly

- Government ban on sale of ICE vehicles by 2030 will mean that all new vehicles require charge facility
- This will create over 1 million domestic EV chargers per year
- The Government Heat Pump target adds 600,000 per year
- We operate in approximately 1/3rd of the UK
- Our exposure would be roughly 500,000 low carbon connections per year
- .....or 2,000 for each working day



# Motorway Service Area (MSA) Charging

- The Government's Project Rapid predicts that Motorway Service Areas will require multiple MegaWatts of charge capacity.
- In many cases the demand will be the same as a small town
- A conventional substation will not fit in the space that is available at most
- Our "Take Charge" innovation project has developed a solution to the problem.
- We have shrunk a version of our 33/11kV substation into two shipping containers for use at MSAs



# Take Charge Innovation Project

- Funded through electricity industry innovation funding programme
- Our trial site at Moto Exeter was connected in Spring 2022 and has 12MW of capacity on site
- Learning and specifications become publically available for replication by other DNOs
- We are now working to make the specification a UK industry standard
- Exeter Services is quoted as a “game changer” by EV drivers

<https://www.nationalgrid.co.uk/innovation/projects/take-charge>





National Grid

# Modular Build themes

- Substations at this size have always been bespoke site built projects within the industry
- The provision of a matched pair of transformer and switchroom is a new innovative design. It came out of the original brief to be “two shipping containers”
- The switchgear in the cubicle can be pre-commissioned at the factory. The transformer has ancillary items bolted to it creating a single lift, unusual in our industry
- The two units can be connected together with multi-plugs allowing small wiring to be easily commissioned on site



nationalgrid

# Buildoffsite members' meeting

**14 March 2023**

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# Buildoffsite update

## Research and Transport sector working group



**Nigel Fraser**  
Industry Advisor  
Buildoffsite

# Research

## Offsite construction – concept design and delivery

- Peer review submissions have now all been received and consolidated
- Further work on digital twins has been commissioned from building Smart International and its UK Chapter
- An additional, detailed, case study has been produced on LandSec's The Forge development.

## Achieving sustainable resilience in new precast concrete structures – taking precast concrete to a new level

- Project contributor and Buildoffsite member, C-Probe has recently been:
  - Included in Build in Digital's – Top 50 Tech Partners
  - Nominated for Materials Performance – Corrosion Innovation of the Year Finalist

# Research

- Intellectual property (IP) management for MMC
  - Scope:
    - Different types of IP which can be protected and how
    - Forms of contracts to encourage exploitation of IP
    - Whether and how IP belongs to clients or designers
    - How project portfolios and programmes may benefit
    - How to encourage innovation through exploiting IP within and across different construction sub-sectors
    - How risk management is different for products than for projects.
    - How to overcome barriers and challenges
    - The role of standards in enabling the development, and exploitation of IP
    - The role of accreditation / certification in bringing suitable, trusted, products to market.
    - Lessons learnt by prior projects
    - Areas where innovation is happening through the effective control and management of intellectual property.
    - Incentivisation including possible funding sources (e.g. R&D grants)
  - Client Group has approved the proposal
  - Project team confirmed
    - Buildoffsite – Nigel Fraser
    - Beale & Co. – Andrew Croft
    - BOPAS – Terry Mundy (LRQA)
    - BSI – Clare Price

# Research

- P3279: Guidance on development of functional specifications to reduce barriers to offsite manufacturing and MMC
  - Specifically:
    - The challenges and specific differences of approach between Offsite manufacture and MMC
    - What should be framed in a functional specification and what should not be to avoid creating unintentional barriers
    - Principles for defining functional requirements.
    - The extent of detail to be included in commissioning/tender documentation so as not to constrain/lead, constructors/suppliers/designers to adopt traditional construction practice.
    - Routes for maximising the use of functional specifications across sectors.
    - Approaches to sharing of technical information and practice across industry and its sectors.
  - Client Group has approved the proposal
  - Internal team confirmed in collaboration with CIRIA
    - Led by Sarah Fray

# Research

- Benefits of becoming a research funder
  - **Help ensure that IP and new construction systems become commercially viable and procurable to:**
    - Improve productivity and quality
    - Reduce cost
    - Deliver client value in a broader sense.
  - Industry leadership – by influencing and shaping industry guidance.
  - Industry collaboration – at a strategic level to address an industry issue
  - Industry expertise – recognition of an organisation's expertise
  - Setting the standards for industry – through recognised CIRIA and Buildoffsite guidance
  - Helping us all develop our own capabilities in these areas

# Transport

- Three visits to the impressive ALLIGN JV precast plant at HS2
- Linear Infrastructure Overbuild Guide
  - Transport for London Property hosted event in Victoria House
  - Supported by Network Rail Property
  - A reminder of what the report covers
  - Insights into several new overbuild projects in London
  - An informative Q&A session with an expert panel
  - A great networking event.

# Buildoffsite members' meeting

**14 March 2023**

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# BOPAS update



**Terry Mundy**

Consultant

LRQA

# BOPAS Update

Listed MMC Providers: 93

New Applications ( 2023): 21

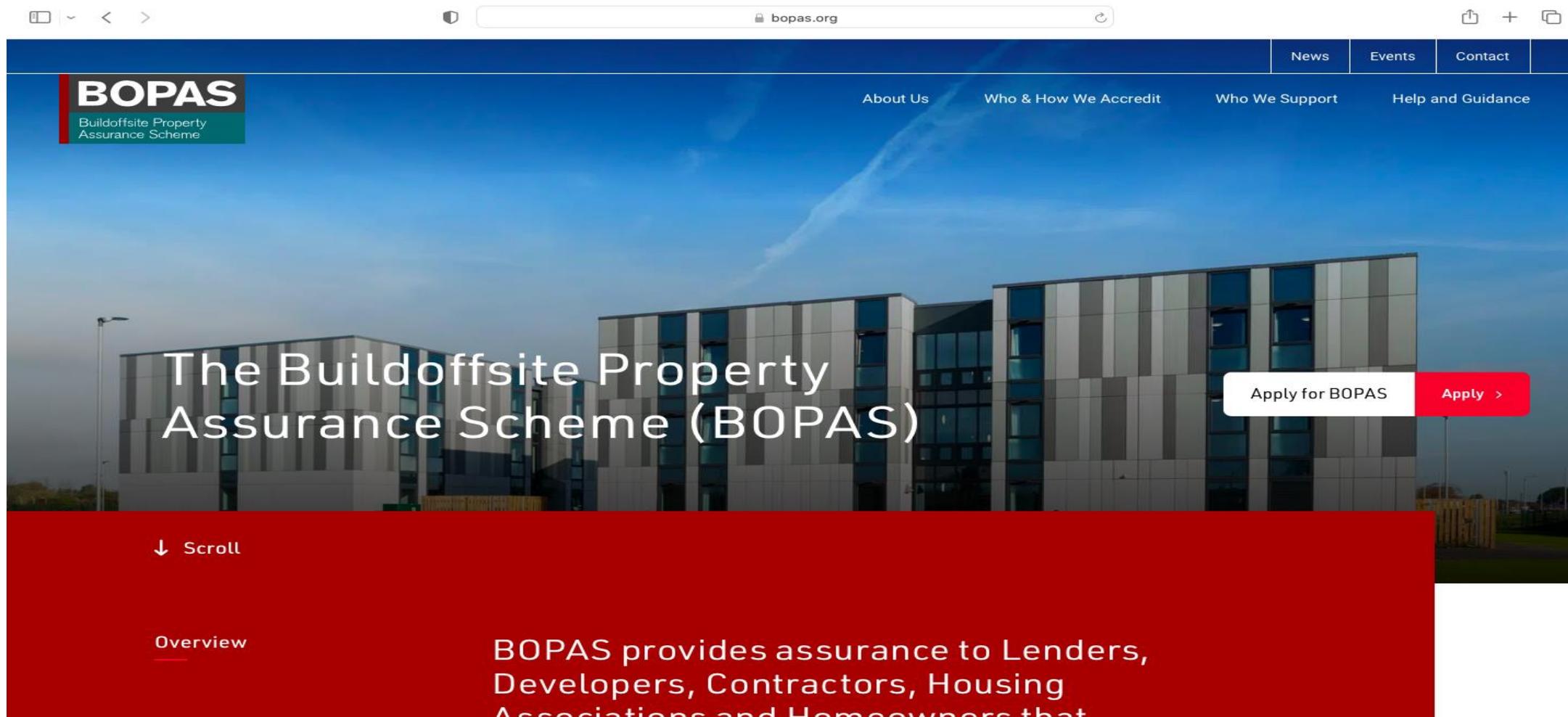
BOPAS Forums:

May 2022: Launched BOPAS +

December 2022: Launched new BOPAS website

May 2023: Focus on Finance and Lending Policy

# New BOPAS Website – home page



Status key: ● BOPAS+ ● Approved ● Under Assessment ● Not Assessed ✔ Approved ✘ Under Assessment

**View →**

- Manufacture
- Construction

System

**CIMC MBS**

**Type**

- Design
- Manufacture
- Construction

**Technology**

- ✔ CIMC Modular Building Systems Modular V-System Volumetric Building System

**View →**

**Citu**

**Type**

- Design
- Manufacture
- Construction

**Technology**

- ✔ Citu Group Ltd Closed Panel Timber Framed Building System

**View →**

**Claritas Four Zero**

**Type**

- PM Design
- PM Manufacture
- PM Construction

**Technology**

- ✔ Project Management



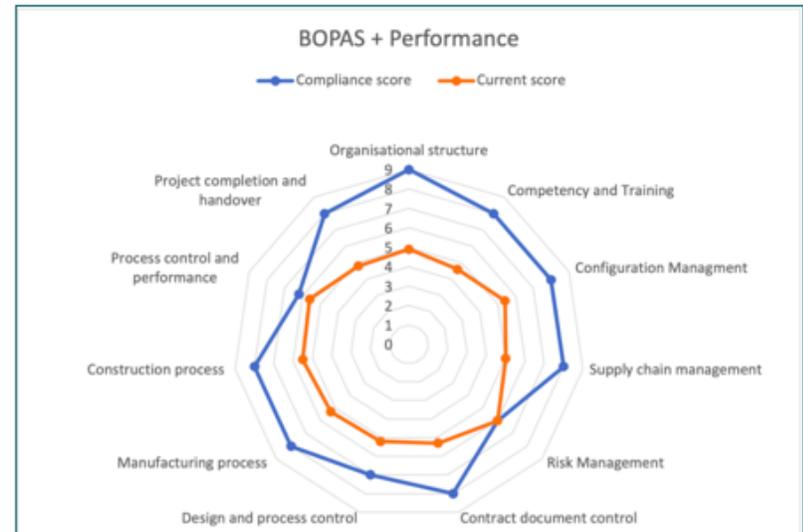
Status	Type	Technology
<ul style="list-style-type: none"><li>● BOPAS+</li></ul>	<ul style="list-style-type: none"><li>● Design</li><li>● Manufacture</li><li>● Construction</li></ul>	<ul style="list-style-type: none"><li>✓ Citu Group Ltd Closed Panel Timber Framed Building System</li></ul>

Citu's flagship tenet is simple – we exist to tackle climate change. From the ground up, everything we do is part of that mission. Since 2004, we've been helping people live more sustainably. Our expertise lies in combining great design, innovation and cutting edge technology to create modern, aesthetically beautiful homes that make it easy for you to reduce your carbon footprint and help accelerate the transition to zero – carbon cities. We're leading the change- we are challenging conventions and creating amazing places where people and nature can live, grow and thrive

## Citu Group Ltd Closed Panel Timber Framed Building System

The system uses engineered timber and steel composite I-beams as the basic structural

Radar Map



# Is the development of DLUHC sponsored MMC standard BS PAS 8900 misconceived?

**Are top- down standards effective?... BPS 7014**

**What message does a plethora of standards for MMC indicate to stakeholders such as lenders?**

**Does it feed or dispel the risk narrative?**

# Media fed Risk Narrative

constructionenquirer.com

Offsite specialist Eco Modular Buildings Ltd has filed a notice of intention to appoint an administrator.



Profit for people

The Hull based manufacturer and contractor has been in business since 2011 and has worked with a series of major contractors specialising in the education sector.

Latest accounts for the company for the year to December 31 2021 shows a turnover of £33.5m generating a pre-tax profit of £244,000.

During the year the firm employed 77 staff and owed £5m to trade creditors.

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The power to deliver a better future  
Request a quote

Certain  
MORE INFO

to help them save more

Better for society

constructionenquirer.com

## L&G modular homes hit by mould problems

Grant Prior 2 days ago

Share

Mould problems have hit L&G modular homes sites currently under construction.



The offsite firm has confirmed issues at its 154-home development in Selby, North Yorkshire and a 185-home scheme in Bristol.

UK'S NO.1 SCAFFOLDING TRADE BODY EST.1945

Safety  
Quality  
Knowledge

Vp Groundforce Shorco  
Excavation Support

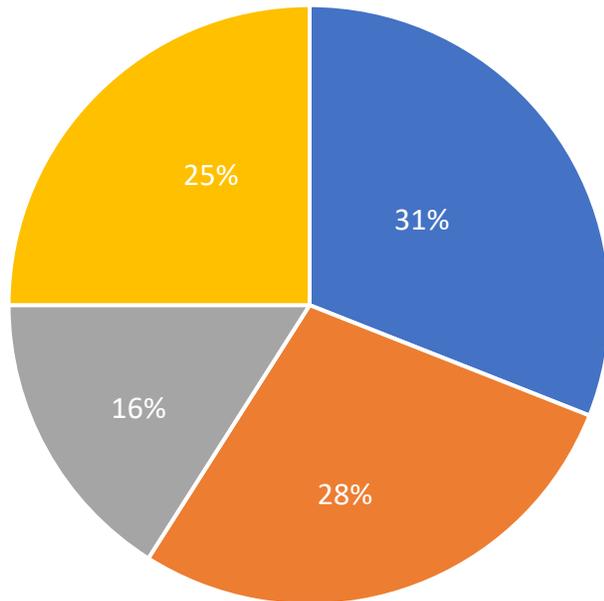
AGD  
Telescopic Crawler Cranes  
From 5t to 130t Capacity  
See Our Range

to help them save more

Better for society

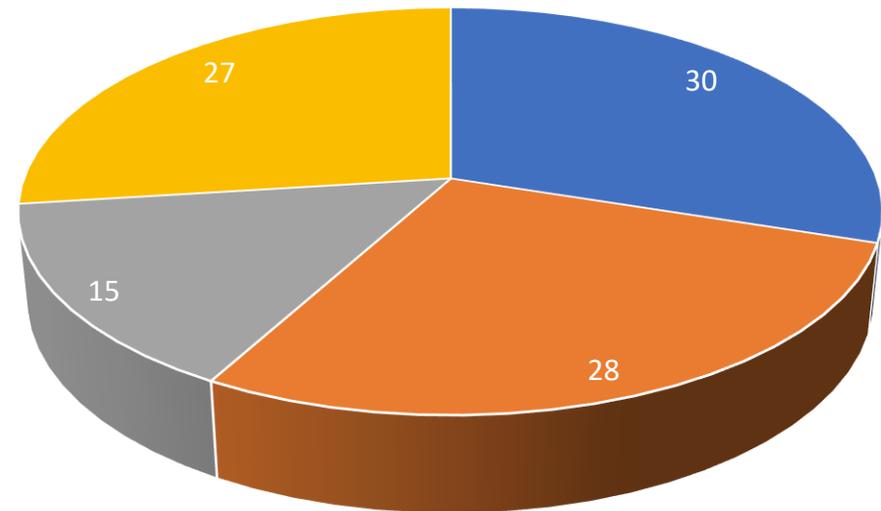
# HBF Satisfaction Survey Results

Post Occupancy Reported Defects 2019



■ 1 to 5 ■ 6 to 10 ■ 11 to 15 ■ 16+

Post Occupancy Reported Defects 2022



■ 1 to 5 ■ 6 to 10 ■ 11 to 15 ■ more than 16

**Thank you for your attention**

# Buildoffsite members' meeting

**14 March 2023**

@Buildoffsite | #CollaboratingForImpact

# The Offsite Show



**Jamie Smith**  
Sales Manager  
Media 10



**Fareita Udoh**  
Industry Advisor  
Buildoffsite

# Are you ready to catch the growth in construction output?

Meet construction buyers: 2-4 May 2023 ExCeL London

**The Offsite Show** 2-4 May 2023, is getting record-breaking registrations. In 7 weeks **The Offsite Show** will open it's doors at ExCeL London, and is set to catch the wave as construction output and demand returns.

What can we tell you about the 8,000 already registered?

- We are now expecting over 25,000 attendees over 3 days
- 77% of attendees will have direct purchasing responsibility
- 90% of the top 100 Housebuilders are sending representatives
- 85% of the UK's top 100 Architectural practices are already planning to attend
- 95% of the top 10 Tier one contractors are sending decision makers to UKCW London
- Over 10,000 SME's are forecast to attend

**THE OFFSITE SHOW**

2 - 4 MAY 2023 EXCEL | LONDON

**UK Construction Week LONDON**

2 - 4 MAY 2023 | EXCEL



Press from March 2023

**Bloomberg UK**

Switch Editions

• Live Now Markets **Economics** Industries Technology Politics Wealth Pursuits Opinion Businessweek Equality Gree

Economics

## UK Construction Output Rises Unexpectedly to Strongest Since May



FINANCIAL TIMES

HOME WORLD UK COMPANIES TECH MARKETS CLIMATE OPINION WORK & CAREERS LIFE & ARTS HTSI

Construction sector

+ Add to myFT

## UK construction hits highest growth rate in 9 months

Index measure beats analyst forecasts and 'paints bright picture of progress', says survey compiler

**The Offsite Show London**, represents your opportunity to meet with serious decision makers whose number one reason to attend is to seek out new innovations and products.

Most sought after products for May 2023:

- Offsite Solutions & Modern Methods of Construction
- Building materials (Timber, Brick, Concrete, Steel & Aluminium frame)
- Digital Construction Software & Technology Solutions (AI/AR & Robotics)
- Cladding & Facades
- Roofing & Insulation



# Buildoffsite - A New Stage of Enlightenment for Construction

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# Buildoffsite Stage

Strapline for the Event



Buildoffsite - A New Stage of Enlightenment for Construction

Day 1 Session 1 Title 11-12.30

Can Offsite make a Concrete Change with Low Carbon Precast?

Day 1 Session 2 Title 2-3.30pm

Can One Standard be Created for Cradle-to-Grave to Achieve Net Zero?

Day 2 Session 1 Title 11-12.30

Can Offsite Provide Faster Optimisation for the Construction Industry through Standardisation, Platform Design and Digitisation?

Day 2 Session 2 Title 2-3.30pm

Should Offsite be a Philosophy, not just a Methodology? A session debate.

3.30-5.30pm

Invite Only Drinks Reception in the Buildoffsite Arena with a live band from Construction Rocks

6pm-8pm

Invitation Only Dinner @ Nakhon Thai Restaurant

Day 3 Session 1 Title 11-12.30

Can Offsite Address the UK Housing Crisis Sustainably & Effectively?

Day 3 Session 2 Title 2-3.30pm

Can we futureproof Offsite by demonstrating a business case?

# Buildoffsite Innovation Hub

- Six Sessions over the 3 days highlighting MMC across all sectors
- 45 Minute Sessions
  
- National Grid
- NG Bailey
- Roger Bullivant
- Silotank

# THE OFFSITE SHOW

2-4 MAY 2023 EXCEL | LONDON

IN PARTNERSHIP

*buildoffsite*

@TheOFFSITES

REGISTER FREE

## Sponsorship Offsite Show & UK Construction Week

- Gold
- Silver
- Bronze
- Packages start from £550.00 for one show
- Contact me to secure your package
- 2<sup>nd</sup> -4<sup>th</sup> May 2023 and 4-6<sup>th</sup> October 2023

# Buildoffsite members' meeting

**14 March 2023**

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# Buildoffsite members' updates

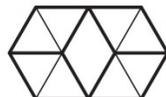


**Dirk Vennix**

Chief Executive

CIRIA and Buildoffsite

# Buildoffsite members



# Buildoffsite members' updates



**Thomas Ferguson**

Group Development Director

Catax



# Research & Development Tax Credits – Upcoming changes for April 2023

Thomas Ferguson, Group Development Director, Catax, a Ryan Company.



# About Catax.

---

- Catax are specialists in tax relief and innovation funding.
- We have been helping clients to secure tax relief for over 14 years and have identified nearly half a billion in tax benefits for our clients to date.
- Headquartered in Manchester, with specialists supporting SMEs nationally and throughout Canada.
- A team of in-house experts including consultants, tax technicians, chartered accountants and case managers.
- Proudly acquired by Ryan in early 2022, the largest firm in the world dedicated exclusively to business tax services. From May 2023 we will rebrand to Ryan.
- We recently acquired, Granted Consultancy Ltd – to expand the grant service offering to our clients.

# Upcoming Changes – 1<sup>st</sup> April 2023

---

- All changes begin on or after 1<sup>st</sup> April 2023, for both; SME & RDEC scheme
- Changes are built around four critical aims:
  - 1. Reducing abuse and increasing compliance.*
  - 2. Alterations to rates of return.*
  - 3. Refocusing reliefs towards innovation in the UK.*
  - 4. Extending eligible activity & expenditure to reflect modern industries.*

# Reducing Abuse and Increasing Compliance

---

## Changes to Claims

**01.**

To be made digitally.

**02.**

To include more detail on the project advances, uncertainties and qualifying costs.

**03.**

To be endorsed by a named senior office of the company.

**04.**

To include the agent who advised the company on compiling the claim.

**05.**

Companies need to inform HMRC in advance when they plan to make a claim\*.

**06.**

\*Subject to them making a claim within the last 3 calendar years.

# Alterations to Rates of Return

Rates applied to expenditure on or after 1<sup>st</sup> April 2023. If an accounting period bridges this date, expenditure in the year will be pro-rated accordingly.

SME		RDEC	
Qualifying costs	£100,000	Qualifying costs	£100,000
<b>Costs incurred now</b>		<b>Costs incurred now</b>	
Benefit: as CT reduction (profitable company, 19% CT)	£24,700	Gross RDEC (13%)	£13,000
Benefit: as enhanced tax credit (loss making company)	£33,350	Net RDEC (after 19% CT)	£10,530
<b>Costs incurred on/after 1 April 2023</b>		<b>Costs incurred on/after 1 April 2023</b>	
Benefit: as CT reduction (profitable company, 25% CT)	£21,500	Gross RDEC (20%)	£20,000
Benefit: as enhanced tax credit (loss making company)	£18,600	Net RDEC (after 25% CT)	£15,000

# Refocusing the Reliefs

---

## Refocussing the reliefs towards innovation in the UK

- Exclusion of expenditure towards activities undertaken by subcontractors and externally provided workers overseas.
- Provisions:

*Material factors such as geography, environment, population and other conditions that are not present in the UK and are required for the research – for example, deep ocean research.*

*Regulatory or other legal requirements that activities must take place outside of the UK – for examples, clinical trials.*

# Extending Eligible Activity

---

## Extending eligible activity and expenditure to reflect modern industries

- Inclusion of research into pure mathematics as an eligible activity.
- Inclusion of data and cloud computing costs.
- Can include purchased data sets:
  - Only if solely for R&D and not resold or with lasting value.*
  - Also includes staff time to create data sets.*
- Cost of cloud computing, hosting and storage services used directly for R&D.
- Legislation includes provision of access to and maintenance of remote data storage, operating systems, software platforms and hardware facilities.

# Thank you

---

*Is your business looking for the funding to kickstart an innovation project?*

*Are you already innovating and want to know more about the options available?*

**Contact our specialist team:**



**Thomas Ferguson**

**Group Development Director**

[Thomas.Ferguson@Catax.com](mailto:Thomas.Ferguson@Catax.com)

07719 535 209

## Get in touch!

 0300 303 1903

 [enquiries@company.com](mailto:enquiries@company.com)

 [www.catax.com](http://www.catax.com)

# Buildoffsite members' meeting

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# Buildoffsite members' updates



**Sarah Mather**

Managing Director

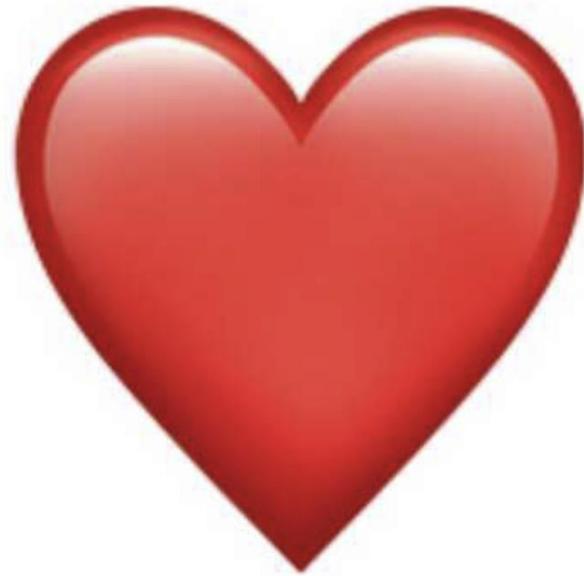
Building Understanding

# Introducing Building Understanding



14<sup>th</sup> March 2023





We believe that successful companies put the customer  
at the heart of their business.

# Introducing Building Understanding

- ❑ Specialist independent qualitative research agency.
- ❑ Highly experienced in the construction and development sectors.
- ❑ Company Partner of Market Research Society.
- ❑ Fully compliant with latest GDPR legislation.



The Market Research Society (MRS) is the professional body for market and social researchers.

This project is being conducted by an MRS Company Partner. You can verify this by calling MRS Freephone **0500 39 69 99** and giving the name of the organisation that interviewed you.

Under the MRS Code of Conduct, you have the right:

- To know the purpose of the interview
- To know who is interviewing you
- To end the interview at any point
- To know that any personal information provided will only be used for the purposes about which you have been told

[www.mrs.org.uk](http://www.mrs.org.uk)

# What we do

# Our services



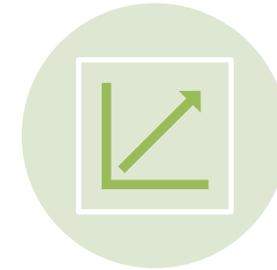
CLIENT PERCEPTION  
STUDIES



TENDER INTERVIEWS



POST OCCUPATION  
AUDITS



CUSTOMER SATISFACTION  
STUDIES

# Our services



CRISIS INTERVIEWS



PROJECT REVIEW WORKSHOPS



ANNUAL CUSTOMER SATISFACTION  
REPORTS

# Benefits for Building Understanding's clients



THE CUSTOMER IS PLACED AT THE HEART OF  
THE BUSINESS



ACCESS TO A WEALTH OF KNOWLEDGE ABOUT  
WHAT CUSTOMERS REALLY THINK ABOUT YOUR  
BUSINESS



THE BUSINESS WILL BE EQUIPPED WITH  
CRITICAL INSIGHTS, TO HELP YOU ADAPT TO  
BEST MEET THE NEEDS OF YOUR CUSTOMERS

# Benefits for Building Understanding's clients



RELATIONSHIP



RETENTION



REPUTATION

# Benefits to your customer



The customer feels your organisation is listening to them



They feel valued



Customer sees actions taken in response to their feedback



This improves the customer experience

How we do it

# Process and methodology

## Face-to-Face

- Best quality feedback
- Ability to probe
- The interviews are audio recorded (with permission)
- One-to-one interviews/focus groups

## Independent

- Professional interviewers
- Respondent feels able to speak freely
- Ability to collect information on competitor performance

# The Building Understanding Portal

# The Building Understanding Portal



EFFICIENT HANDLING AND  
DISTRIBUTION OF ACTIONABLE  
CUSTOMER SATISFACTION DATA



DAILY BACKUPS



SECURE – DATA IS ACCESSIBLE ONLY  
TO USERS OF THAT ACCOUNT



INTUITIVE AND EASY TO USE VIA A  
BROWSER

*“If you don’t listen to your customers, someone else will.”*

Sam Walton

# Introducing Building Understanding



14<sup>th</sup> March 2023



# Buildoffsite members' meeting

**14 March 2023**

@Buildoffsite | #CollaboratingForImpact

# Buildoffsite events



**Dirk Vennix**

Chief Executive

CIRIA and Buildoffsite

# Upcoming Buildoffsite events

**19 April 2023**

What is the path to sustainable infrastructure?

London

**24 May**

BOPAS Forum

Norwich

**26 April 2023**

Site visit to new prison development HMP Millsike

York

**27 June**

Buildoffsite MMC conference

Online

**2-4 May**

The Offsite Show in partnership with Buildoffsite

London

**3-5 October**

UK Construction Week

Birmingham

# Upcoming Buildoffsite events

## More visits and networking events

- Donaldson Timber, Whitney Factory (Automation)
- The Forge, Southwark, London (Platform Design)
- Energy House Project, Salford University (Net Zero)
- Stelling Properties, Micheldever, Winchester (Modular Homes)
- Member lunch winter 2023

## More webinars

- Precursor to visits with related topics
- Co-ordinated with CIRIA
- Topics proposed by Buildoffsite members
- Featuring carbon reduction

# Closing remarks



**Dirk Vennix**

Chief Executive

CIRIA and Buildoffsite

# Buildoffsite members' meeting

**14 March 2023**

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