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IS CO-HOSTING THE

18.09.2024 10:00 - 11:20 | Session 1

Raising the bar: creating a zero-snag culture



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IS CO-HOSTING THE J **JFFSITE SUMMIT**

18.09.2024 10:00 - 11:20

Nigel Fraser Industry Advisor BUILDOFFSITE

Raising the bar: creating a zero snag culture



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Join in the conversation

@BUILDOFFSITE @CIRIAupdates @ExploreOffsite

#BUILDOFFSITE #BOS #CollaboratingForImpact
#ExploreOffsite #OffsiteExpo #OffsiteSummit
#Offsite #Construction #Housing #Automation





Celebrating 20 years of 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.

"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."





Join BUILDOFFSITE





Networking | Events Exhibition Seminars Site visits | Advice & Guidance Knowledge Sharing | Publications Marketing & Promoting Members Influencing





BUILDOFFSITE members







BUILDOFFSITE guidance 2022 – 2024





Upcoming BUILDOFFSITE events

2-4 October

Structural Timber Awards 2024

13 November

DfMA for net zero carbon

20-21 November

London Build Expo

28 November BOPAS Forum 4 December*

BOS Christmas members' meeting

Spring 2025*

Using performance specifications to facilitate the adoption of MMC – new BOS/CIRIA guidance

*Provisional date







18.09.2024 AT 10:00 - 11:20



Eva Magnisali DataForm Lab



culture

Dr Anthony Greer TALO

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Raising the bar: creating a zero-snag



Ian Pritchett Greencore Homes

AT

OFFSITE

17-18 SEP 2024



Deborah Smyth Modular Express Group



Nigel Fraser BUILDOFFSITE



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Dr Anthony Greer Director of Corporate Strategy TALO

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Zero Snagging: Conventional Housebuilding

Quality / process improvements



Perception of minimum snagging





Zero Snagging: Conventional versus Offsite Housing

Quality / process improvements



Perception of minimum snagging





Applying a Shared Vision to Zero Snagging







How to Apply a Mission-driven Approach to Eliminate Energy Bills



Intelligent design



Offsite manufacturing



Reduced work on site





Bringing Finnish Offsite Technology to the UK







Applying a Shared Vision to Zero Snagging







How We Achieve Zero-Snag Culture: Shared Mission







The Future of Housebuilding – How to Raise Standards









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Ian Pritchett

Co-Founder and Growth and Innovation Director Greencore Homes

Raising the bar: creating a zero snag culture



Closing the Performance Gap

- One of the biggest snags in new housing is the lack of thermal performance
- Most new homes don't perform as well as predicted
- Inaccurate modelling
- Material substitution
- Poor site practices
- No monitoring
- This presentation focuses on closing the performance gap and why it is important to do so





Carbon Emissions

- An average new house is responsible for over 100T of CO₂e emissions at the construction stage
- This is its carbon footprint (up-front carbon)
- An average house emits 3 to 5T of CO₂e per year in use
- A new house built this year will be responsible for around 200T of CO₂e by 2050





We are in a Climate Emergency

PO5

"What we do in the next ten years will profoundly impact the next few thousand"

Sir David Attenborough





- Design phase
- Passivhaus methodology
- PHPP modelling
- Over-heating analysis
- Embodied carbon analysis
- Feedback from previous projects
- Set out strong targets (in line with the CCC carbon budget)





Strong Targets

Whole Life Embodied Carbon	Current Target / Design Standard	Guideline
Substructure & Superstructure	Less than minus 100kg of CO2e per m2 of GIA	Includes sequestration
Whole Home	Less than 300kg of CO2e per m2 of GIA	LETI 2030
Energy In Use	Current Target / Design Standard	Guideline
Energy in Use Intensity (EUI)	35kWh per m2 of GIA per year or less	LETI
Space Heating Demand	15kWh per m2 per year or less	LETI
Energy Performance Certificate (EPC) Rating	EPC A	
Renewable Energy Source	100% of energy required by our homes	LETI







- Manufacturing phase
- Offsite type 2 MMC
- Using bio-based materials where possible
- Strong QA processes







- Site construction phase
- Properly trained erection teams
- Emphasis on air-tightness
- Air-tightness test before plaster-boarding
- Strong QA processes







- Post completion phase
- Clear user instructions and training
- Customer support
- Post occupancy evaluation
- Feedback into designs of future projects









The Secret Formula

- Use bio-based materials to lock up carbon
- Passivhaus thermal performance standard
 - High levels of insulation
 - Design out thermal bridging
 - Excellent air-tightness
 - Triple glazed timber windows
 - Heat recovery ventilation
- Electric heating, hot water and cooking
- Use PVs to generate electricity and batteries to store it, via a Smart Micro-grid
- Post Occupancy Evaluation







The Place Around The Homes

Greencore incorporates **Bioregional's One Planet Living Framework** into our design brief.

We design landscape-led schemes with publicly accessible, natural green spaces.

We are **committed to biodiversity and the enhancement of wildlife** on every development.

We apply biodiversity net gain consistently on all developments, ahead of legislation.



Health and happiness	Encouraging active, social, meaningful lives to promote good health and wellbeing
Equity and local economy	Creating safe, equitable places to live and work which support local prosperity and international fair trade
Culture and community	Nurturing local identity and heritage, empowering communities and promoting a culture of sustainable living
Land and nature	Protecting and restoring land for the benefit of people and wildlife
Sustainable water	Using water efficiently, protecting local water resources and reducing flooding and drought
Local and sustainable food	Promoting sustainable humane farming and healthy diets high in local, seasonal organic food and vegetable protein
Travel and transport	Reducing the need to travel, encouraging walking, cycling and low carbon transport
Materials and products	Using materials from sustainable sources and promoting products which help people reduce consumption
O Zero waste	Reducing consumption, reusing and recycling to achieve zero waste and zero pollution
Zero carbon energy	Making buildings and manufacturing energy efficient and supplying all energy with renewables





"What gets measured gets managed."

GREEN

Peter Drucker



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Deborah Smyth Founder and CEO DME Modular Ireland by Modular Express Group

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BUILDOFFSITE – BOS

Modern Methods of Construction Zero Snagging Using MMC The Challenges and progress of our first project

- Addressing housing shortage
- Quality Homes
- Zero Carbon in use
- Warranty ready
- Digital Innovation
- Comfortable homes
- Site optimisation







Site challenges / MMC challenges

- Difficult aspect
- Overlooking issues
- Wedge shaped plot
- Optimise density of site
- Achieve minimum space standards
- Maximise outside space
- Provide development facilities
- First time 3D volumectic MMC
- New Manafactoring partner
- Invested from start to finish
- Understanding we would learn a lot and that's another presentation!







Zero Carbon – Zero Snagging

- This is Achieved through precision Engineering
- Airtight units, near Passivhaus levels
- Optimal levels of thermal insulation, and quality doors and windows.
- Minimal cold bridging
- Zero Carbon for regulated emissions, heating, hot water, lighting pumps, and fans.
- PV provides additional power for unregulated net zero carbon from plug-in emissions.
- Renewables ready for site solution or centralized source
- Irish Green Building Council Certification
- BER rating A1
- SAP A rate
- LCA approved





Our Design process

Dynamic Modelling

- Dynamic modelling involves creating detailed simulations of the construction process and the final product. This allows designers and builders to:
- Visualize the entire project before construction begins.
- Identify potential issues early in the design phase.
- Optimize resource allocation and scheduling.
- Enhance collaboration among stakeholders by providing a clear, shared vision.

Thermal Modelling – Modular Buildings

- Thermal modelling involves creating a detailed simulation of a building's thermal performance.
- This helps in predicting how the building will respond to various such as temperature changes and humidity. By using thermal models, you can identify potential thermal bridges, insulation gaps, and areas prone to condensation, which are common snagging issues.





Building for the future / Project Complete

- Fully developed demonstration of MMC potential
- Set a new standard for affordable housing
- Comfort and space prioritised
- Tackle fuel poverty head on
- Ventilation system
- Air source heat pumps
- Solar









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AUTOMATION FOR A ZERO SNAG CULTURE







WHAT IS THE CAUSE?









A CLEAR ROADMAP

DATAFORM LAB PLATFORM



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DESIGN-TO-MANUFACTURING AUTOMATION

TRANSLATE DESIGN TO PRODUCTION

CONFIGURE A PROJECT & EXPORT MANUFACTURING INFORMATION



Machine Code



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DESIGN OPTIMISATION FOR MANUFACTURING







MANUFACTURING PROCESS AUTOMATION

OPTIMISE PRODUCTION

SIMULATE EXISTING PRODUCTION LINES TO OPTIMISE THE FACTORY OPERATION









MANUFACTURING PROCESS SIMULATION

PRODUCT VARIABILITY



2**0**5



MANUFACTURING PROCESS SIMULATION

FACTORY SIMULATION - PRODUCTION OPTIMISATION









WHY IS IT IMPORTANT?









UNIQUE FEEDBACK LOOP

SEAMLESSLY LINKING DESIGN AND MANUFACTURING



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AUTOMATION TECHNOLOGIES







INTEGRATING AUTOMATION TECHNOLOGY SOLUTIONS









MANUFACTURING PROCESS AUTOMATION

INTEGRATE AUTOMATION

CREATE AND COMPARE AUTOMATED PRODUCTION LINE DESIGNS TO MATCH BUSINESS KPIs



4 times faster integration + Right First Time approach











Be part of an automated future

www.dataformlab.com eva.magnisali@dataformlab.com







Interactive discussion and Q&A



Eva Magnisali DataForm Lab



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