

BOS

BUILD OFFSITE

COLLABORATING FOR IMPACT

IS CO-HOSTING THE
OFFSITE SUMMIT

AT

**OFFSITE
EXPO**

17-18 SEP 2024

18.09.2024

BUILD OFFSITE
outputs

Join in the conversation

@buildoffsite | @CIRIAupdates | @ExploreOffsite

#OffsiteSummit | #CollaboratingForImpact



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18.09.2024 14:25 – 15:25 | Session 4

BOS Innovation Hub Challenge



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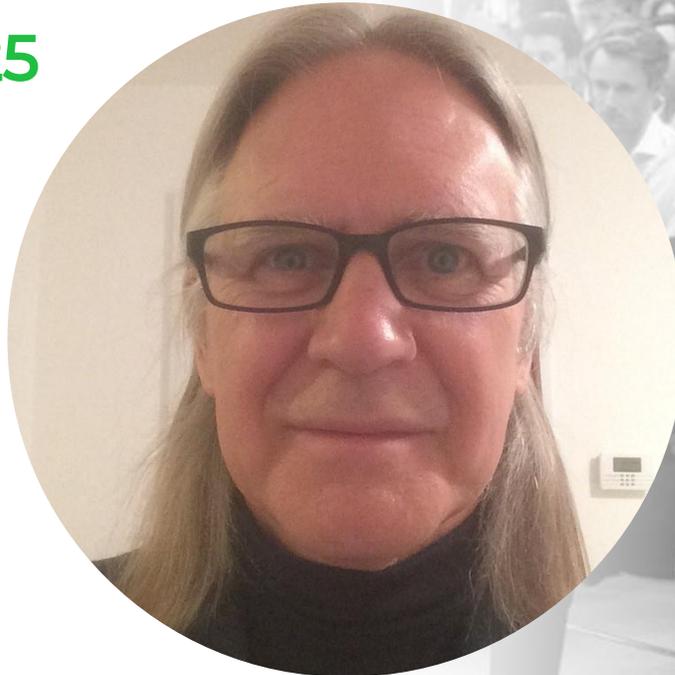
17-18 SEP 2024

18.09.2024 14:25 – 15:25

Nigel Fraser

Industry Advisor
BUILD OFFSITE

**BOS Innovation Hub
Challenge**



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#BUILDOFFSITE | #BOS | #CollaboratingForImpact
#ExploreOffsite | #OffsiteExpo | #OffsiteSummit
#InnovationHubChallenge | #Digital | #Innovation
#NetZero | #SustainableConstruction

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



APPLY

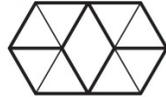


ARUP

ASDA



C-PROBE



BUILD OFFSITE guidance 2022 – 2024

C-PROBE

buildoffsite

Achieving sustainable resilience in new precast concrete structures

Taking precast concrete to a new level

A collaborative research report from Buildoffsite and CIRIA

ciria

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Offsite construction – concept design and delivery

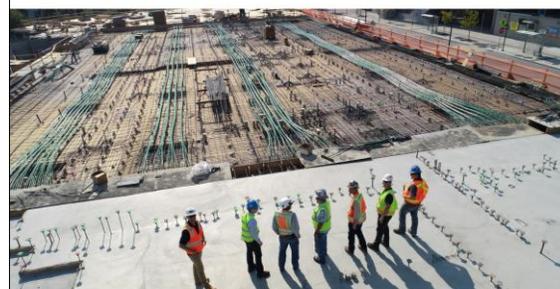
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BOS
BUILD OFFSITE
COLLABORATING FOR IMPACT

ciria

The management of IP specifically relating to MMC/offsite

CIRIA and BOS guidance 'The management of intellectual property (IP) specifically relating to MMC/offsite' which will be published later this year.



Funded by

 Department for Transport

Supported by
BEALE&CO



Nigel Fraser
nigel.fraser@buildoffsite.com

Client Group proposal approved for 2023 – 2024

Performance specifications guidance

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—
14:25 – 15:25

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BOS Innovation Hub Challenge
MEET OUR FINALISTS

TALO®





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MEET OUR JUDGES



Gary Taylor
GBP Estates



Eva Magnisali
DataForm Lab



Deborah Smyth
Modular Express Group



Ian Pritchett
Greencore Homes

A Mission-driven Approach to Innovation

To eliminate energy bills for low-rise housing and eradicate fuel poverty



Multi- faceted Innovation

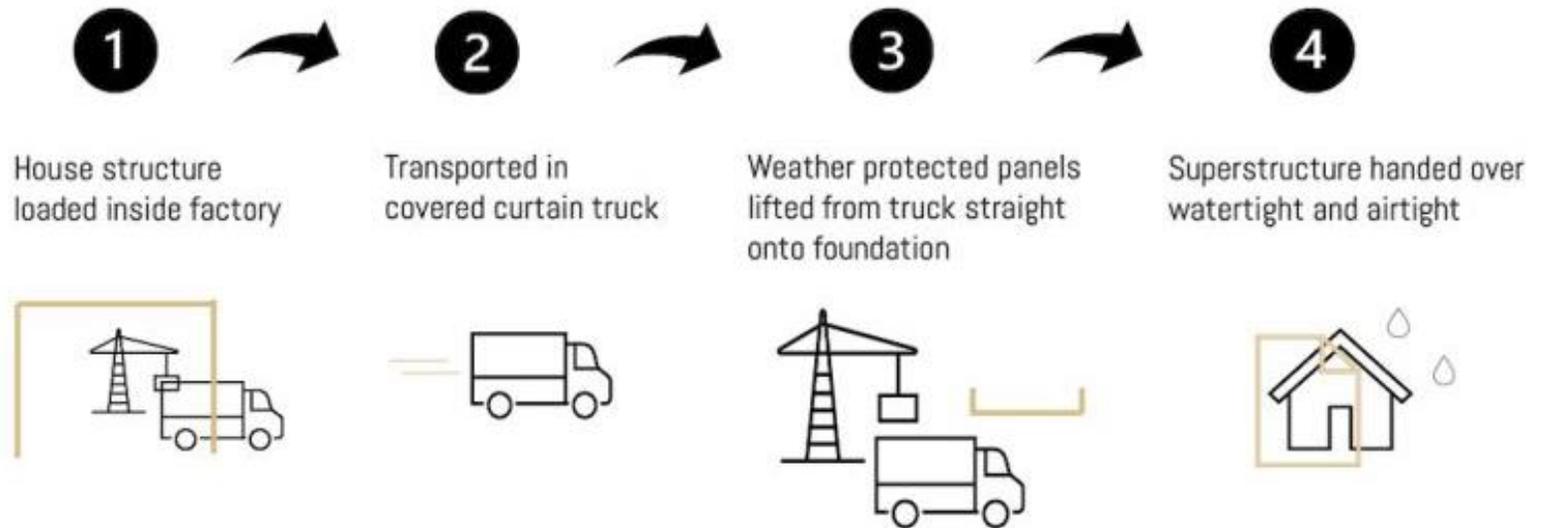
- Timber superstructure
- Standardised foundations
- Energy solution
- Regional manufacturing model
- Procurement with a shared vision

Innovation 1 – Advanced Timber Offsite Technology

- Exceed Passivhaus energy standards – *as standard*
- Reduced build time
- NO cost premium
- Unlimited design flexibility
- Improved quality | **zero snagging**
- New to the UK | widely used in Finland



Dry timber processes – from forest to site



TALO®

Innovation 2 – Standardised Foundations

- Less waste to landfill
- Reducing energy-intensive concrete
- Suits brownfield sites
- Highly cost efficient
- Less environmental impact
- Patent applied

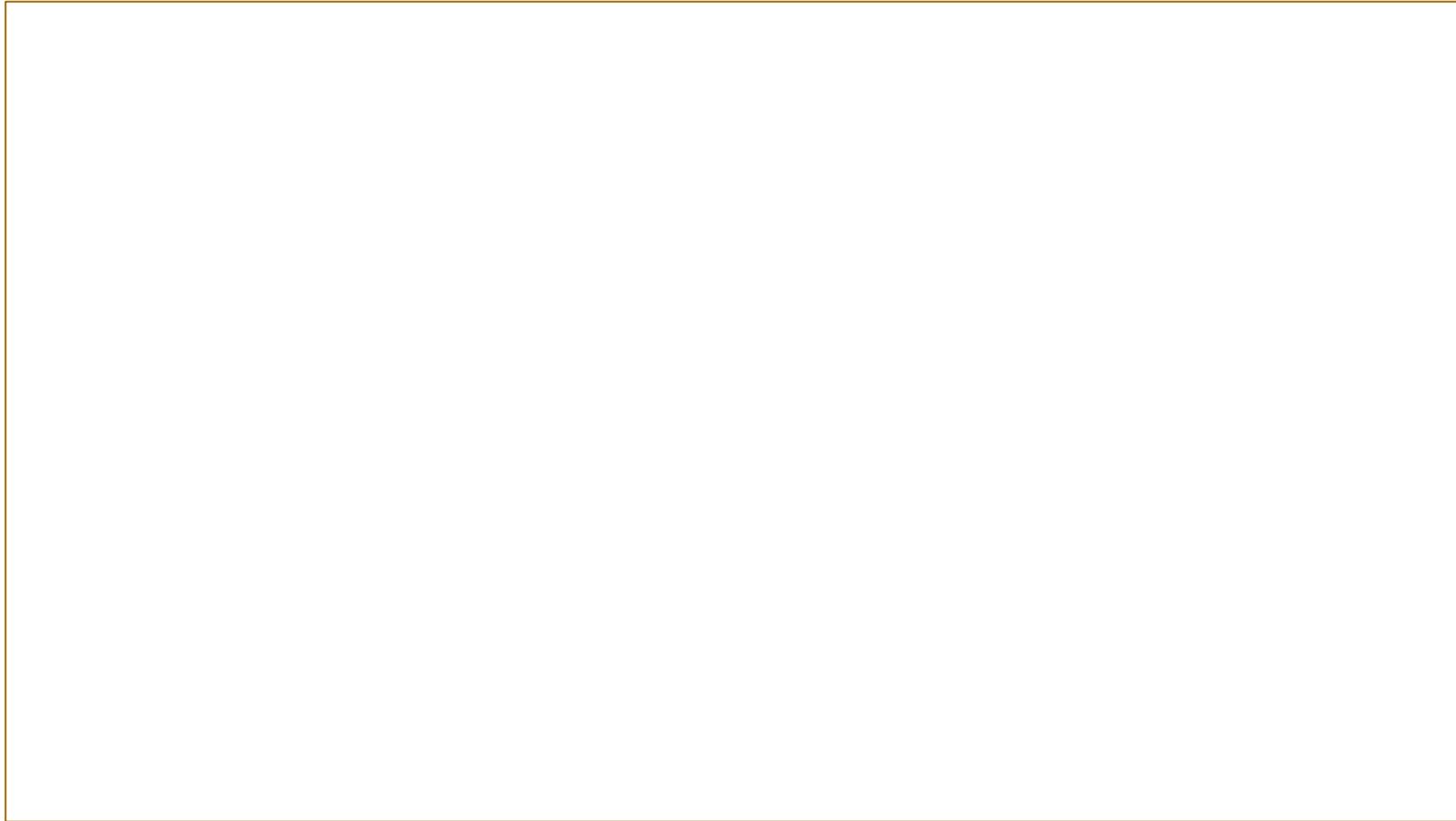


Innovation 3 – Energy Solution:

- Highly energy efficient superstructure
- MVHR
- Solar package
- Removes need for costly air source heat pumps
- **NO ENERGY BILLS**



What we did last week on site in Surrey!



Innovation 4 – Regional Manufacturing Model:

- Scalable
- Reduced risk – customers/investors
- Improved carbon footprint
- Local manufacturing for local homes
- TALO Academy addresses skills shortages

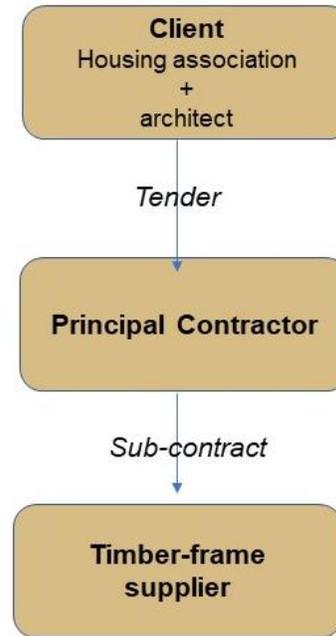
Regional factories with capacity for
a minimum 1000 homes pa

We break even at only 20% capacity

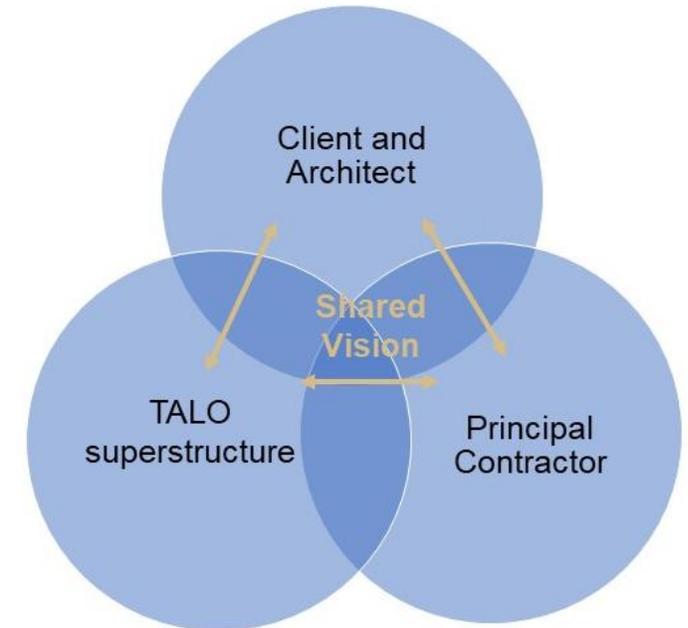
Low capital cost | low fixed costs | low risk

Innovation 5: Procurement model to deliver shared vision

Typical Procurement Practice



TALO Partnership Model



TALO – Multi-faceted innovation to make a real difference

Generating social impact:

- A mission to remove energy bills and eradicate fuel poverty
- Helping to address the national housing crisis
- Create jobs and training for local people to build local housing
- Raising standards – higher quality homes with zero snagging

Making housebuilding genuinely sustainable:

- Zero energy homes that exceed Passivhaus energy standards – as standard and with no cost impediment
- New housing with much less impact on the environment – from forest to site, foundations to maintenance



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**BOS Innovation Hub Challenge
FINALIST**

Adam Slader
Chief Executive
VundaHaus

Dr Max Bloomfield
Co-Founder and CPO
VundaHaus



VundaHaus

Making Homes Vundaful

Software-enabled low cost, high performance insulation kits for every home



Supported by:





13% of the UK lives in Fuel-poverty





13% of the UK lives in Fuel-poverty

Europe has 45m hard to treat houses – 5% CO₂



The Industry needs a scalable solution



Portfolio
landlords

"...we have some properties that will be very difficult to get to EPC 'C'.

Divestment is in its very early stages"

Asset Reinvestment Manager (1,500+ homes)



Installers

"...We are looking for innovations which can get us to 20,000 houses per year"

Company Director (1,000 homes p.a.)

"...We need solutions like this to reduce time on site and bring costs down"

Head of Zero Carbon Retrofit (5,000 homes p.a.)

Current methods are very slow and disruptive...



Survey &
design: 1 day



Insulate: 2 days



Render
facade: 8 days



Finalising,
Waste & QA:
0.5 days

> 10 day process



Before



Before



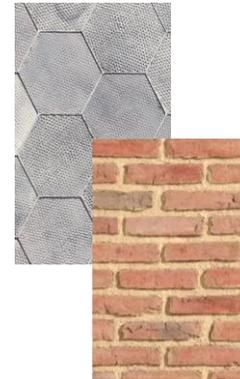
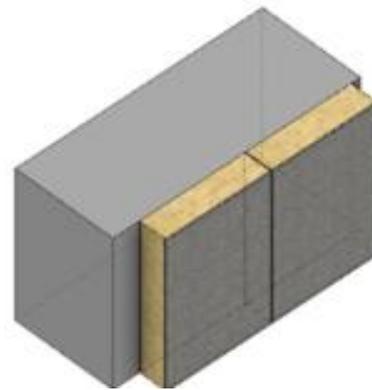
After

Tech-enabled process to streamline contractor workflow

Remote Quote

Mass-customisation

2 day install



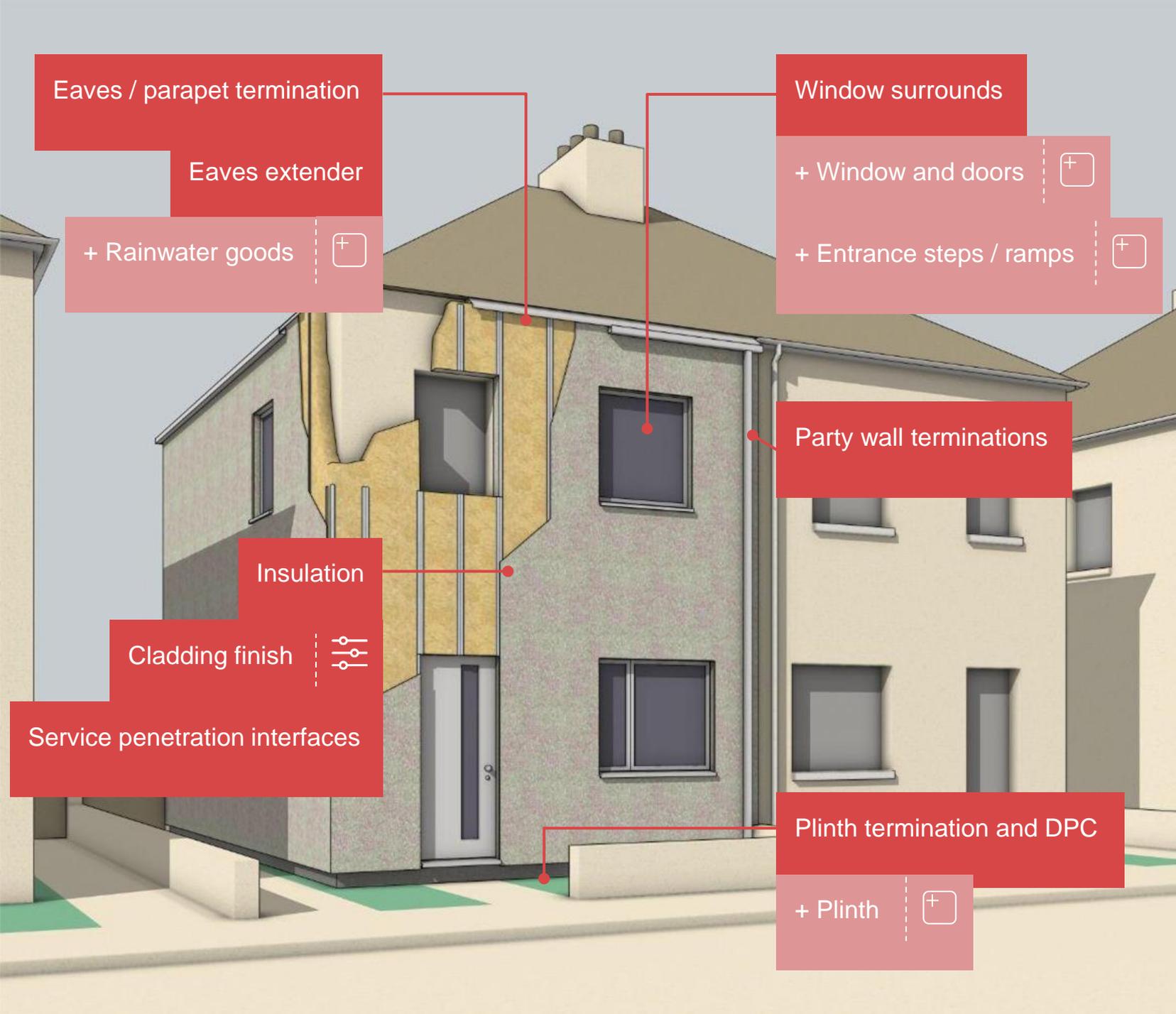
Kit-of-parts

Façades

**Visualise & Buy using
mobile App**

**Automated design
software**

**Approved installer
network**



Eaves / parapet termination

Eaves extender

Window surrounds

+ Window and doors

+ Entrance steps / ramps

Party wall terminations

Insulation

Cladding finish

Service penetration interfaces

Plinth termination and DPC

+ Plinth

The VundaHaus system

Designed to minimise disruption, opening-up, and enabling works

Associated products can be included (windows, MEVs etc)

Off-site but with tolerance built in (can 'flex on site' to avoid delays)

Non-combustible

Choice of performance (U 0.1 - 0.3)

Choice of finishes and upgrades

Built environment **productivity** challenge: Materials Science, Architecture & Software



Adam Slader
CEO (Co-Founder)

**Experienced CTO /
Product Leader**

Social rent property portfolio



Max Bloomfield
COO (Co-Founder)

Materials Engineer, PhD

**7+ years R&D in academia &
industry**



Alex Whitcroft
CPO

**Product lead & stakeholder
engagement.**

**Architect / Innovator experienced
in social housing retrofit.**



Chris Browne
Chief Architect

**Project lead, Technical design
& installer UX.**

**Award-winning architect and
retrofit expert.**

Huge Traction this year...



Proof-of-Concept



£500k in IUK Funding



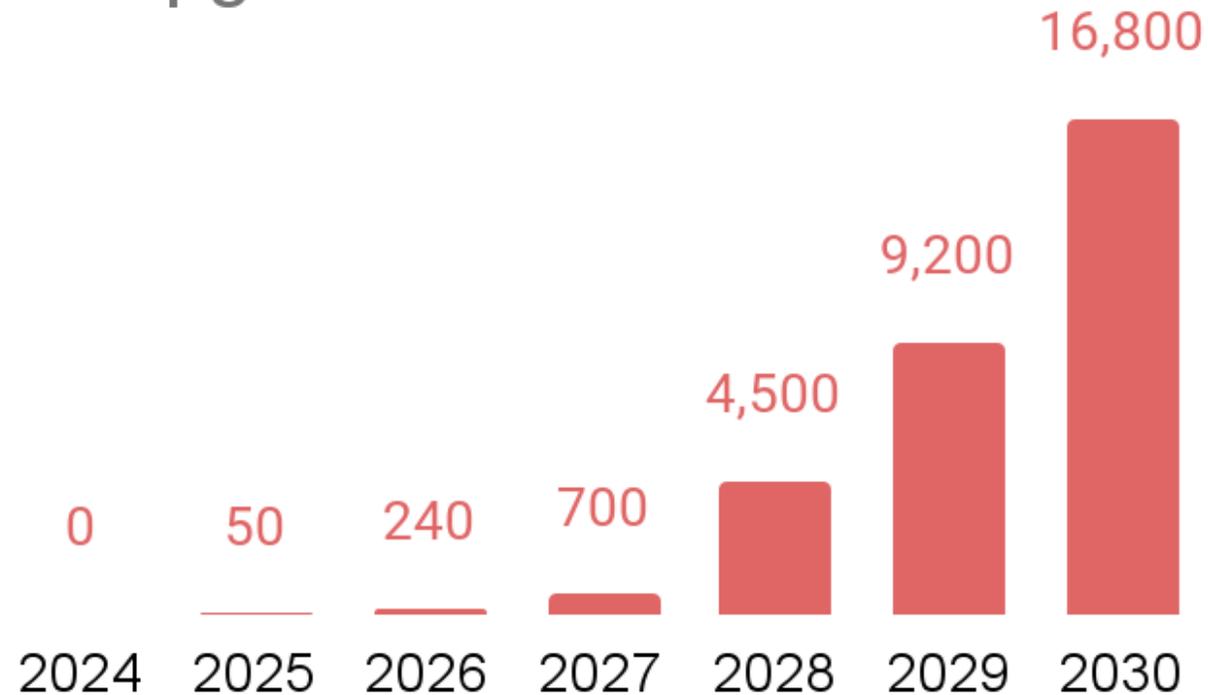
LOIs for 3,000+ homes



Pilot discussions underway

Scale-up ambition

Homes upgraded



- Go-to-market
 - UK Social Housing
 - Private market
 - Northern EU
- Price
 - Price parity with conventional EWI by 2026

* Projection assuming raise by Dec 24

We are seeking investors **to join us**



Raising £700k to enable this

SEIS / EIS approved



Let's make homes
Vundaful



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'Dragon's Den Style' Questions

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Joe Walsh
Chief Executive
Qube Buildings

Justin Murray
Chief Operating Officer
Qube Buildings



Bio-SIP™

Building Tomorrow

Building A Greener Future with Sustainable Bio-SIP™

Bio-SIP™ is on a mission to **revolutionise** the construction industry by offering sustainable building materials that combine the power of **natural fibres** and **plastic bottles**. Our purpose is to provide eco-conscious builders and developers with innovative solutions that minimize environmental impact without compromising on quality or performance.





"In

The Problems with Traditional Building Materials

The Build sector contributes **39%** of global Co2 emission as needs to work towards to a NET zero building standard in **26 years**



39% > 0%



Skill shortage



Aging workforce



Post-consumer waste



Speed of construction

Introducing the Bio-SIP™

Bio-SIP™ (biological-based Structural Insulated Panels) are eco-friendly building materials that use post-consumer waste (recycled plastic bottles)(PET) for the insulating core, and natural fibre skins for the structural facings.

They provide an environmentally friendly and energy-efficient alternative to traditional SIP panels and can be used in various construction applications for a minimum of 60 years.



WWMG
THE UNIVERSITY OF WARWICK


CorporateLiveWire
INNOVATION
& EXCELLENCE AWARDS


**UK
GBC**
Member

Sustainable by design



2000

bottles per panel



Plastic Bottle Recycling

We repurpose post-consumer plastic bottles into strong and resilient construction materials, leading the way in sustainable building practices. This innovative approach helps reduce plastic waste and supports a circular economy.

300mm x 1200mm x 2400mm panel

87%

reduction in Co2 vs traditional panels



Natural Fibre Materials

Our Natural Fibre materials are durable, lightweight, and environmentally friendly. They offer a versatile solution for construction projects, contributing to a reduction in carbon footprint by embedding Carbon into the structure.

13.4kg embedded Co2 per panel

88%

Of Bio-SIP™ is made from waste material



Waste materials

The Bio-SIP™ modular building system is a necessary step towards re-purposing eco-damaging waste. By transforming several waste products into high performing building material, Bio-SIP™ offers practical and sustainable use that has a significant impact on our planet.

Energy

37% more efficient

Our engineering process means that our Bio-SIP™ panels achieve passive house standard with 37% better thermal performance than EPS SIP Panels reducing heating and cooling costs.

Bio-SIP™ also has market leading sound and thermal performance to keep the noise out and the warmth in.

- ✓ **Acoustics rating**
- ✓ **37% improved insulation** (U-value 0.1)

Bio-SIP™

All weather

All protection

Our Bio-SIP panels are durable and water-proof. Ready for anything that that nature throws.

BIO-SIP has also have passed fire testing and come with a 25-year structural warranty.

- ✓ **Water-proof**
- ✓ **Fire Resistant** (EN-1365-1 to 53 minutes*)
- ✓ **25-year structural warranty**

As part of Bio-SIP building solution

Installation

Fast Made Easy

With our kerbside delivery, say goodbye to heavy machinery like cranes and forklift trucks. Each panel is designed to be carried by 2 people through a door width.

Installation is simple with small buildings taking on average of two days to build.

This reduces installation time by **87%** compared to comparative materials.

- ✓ **2-day average installation**
- ✓ **Kerbside delivery**

Re-usable

Take your asset with you

We understand the investing in a building material might seem like a sunk cost.

But what happens if that building needs to move?

With Bio-SIP, simply dismantle each panel and then re-use adhesive free Plus, the ground will be returned to its natural state.

- ✓ **Easy to dismantle and move**
- ✓ **Adhesive free**

Bio-SIP™@work

Discover the wholesale range of customisable structures built to suit our partner channel's requirement. Each design is customisable with colour and finish.

Sustainable workplaces

- Office Pods
- Collaboration areas
- Space dividers
- Retro-Instillation



Temporary buildings

- Temporary Storage
- Workshops
- Sport Halls / scout huts
- Commercial retail



Holiday accommodation

- Forest lodges
- Park Homes
- Agriculture buildings
- Data centres



Bio-SIP™@home

We offer at wholesale range of customisable structure built to suit our partner channel's requirement. Each design is customisable with colour and finish.

Garden offices

- Garden offices
- Gyms
- Outbuildings



Home structures

- Retro-instillation
- Workshops
- Music rooms
- Living annex



Temporary accommodation

- 1 – 4 people homes
- Shelters
- Holiday homes





Indicative pricing



| Building material | Cost per M2 (based on 79M2 wall build up with foundations) | Total cost Ex VAT | Time to install |
|------------------------------|--|-----------------------------|------------------------|
| Bio-SIP with render | £427 | £33,770 | 240 hours |
| Brick and block | £443 | £34,948 | 305 hours |
| Timber frame with render | £448 | £35,454 | 504 hours |
| Timber frame with brick face | £478 | £37,790 | 409 hours |

Co2 difference

| Panel | Total (kg CO2e per kg) | % decrease |
|--------------|----------------------------------|-------------------|
| Bio - SIP | 1.46 | - |
| EPS - SIP | 3.74 | -61% |
| PUR - SIP | 11.4 | -87% |

Based upon 30 M2 footprint for a fully installed building

★★★★★ Testimonials from satisfied customers ★★★★★



Julia Fidler, Eco-friendly Homebuilder

"Using Bio-SIP materials was a game changer for our projects. The sustainability factor and durability of the material exceeded our expectations."



David Storey, Sustainable Construction Project Manager

"We chose Bio-SIP for its eco-friendly credentials and were impressed by the ease of installation and superior insulation properties."



Our decisions today make a difference to tomorrow

We are privately funded, and we are looking to make a difference.
We hope you are too.

Our partners who also think so are:

Innovate UK

Composites  Trade Association





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Innovative and impactful solutions that have the potential to shape the future of sustainable construction



Gary Taylor
GBP Estates



Eva Magnisali
DataForm Lab



Deborah Smyth
DME Modular Ireland by
Modular Express Group



Ian Pritchett
Greencore Homes

Which pitch offers the most innovative and impactful solution that has the potential to shape the future of sustainable construction?

Scan the QR code to cast your vote!

BOS INNOVATION HUB
CHALLENGE



BOS INNOVATION HUB CHALLENGE

Innovative and impactful solutions that have the potential to shape the future of sustainable construction

And the winner is...

BOS Innovation Hub Challenge WINNER



BOS

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