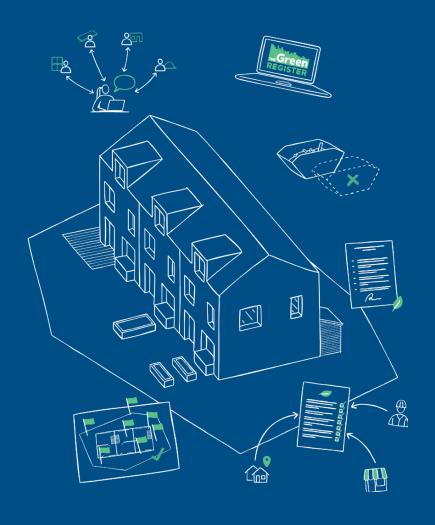
Sustainable Small Sites: A Developer & Builders' Guide









The Small Sites Small Builders (SSSB) programme was developed by GLA Housing and Land along with Good Growth, to address the need for supporting small and medium-sized enterprises (SMEs) whilst helping public landowners bring forward small sites for development. This guide was funded by SSSB to support and amplify the work of small builders and developers to improve quality of outcomes on small sites.

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Executive Summary

This guide was developed by Root and Branch Homes for The Small Sites Small Builders (SSSB) programme. The intention is to offer accessible prompts on sustainability as well as health and wellbeing for both SME Residential Developers and SME Builders/Contractors.

To understand the issues at hand a round-table of small developers, builders, and design consultants was convened to explore the challenges and opportunities for sustainability on small sites, and capture relevant advice. This discussion shaped the ideas and approach of the guide, and quotes from the round-table are included throughout.

The guide is arranged chronologically to follow a typical project from early stages of viability assessment, site acquisition and planning application through to start on site, construction, and final appraisals. Relevant Industry Resources, Business Subsidies, and Peer Networks are signposted at the end of this guide to help readers find further support and allies on their sustainability journey.







Foreword

London's future is in your hands.

If you're reading this, you're already involved in creating a better city for all Londoners. Ensuring the continued success of our city is complex but should at the very least mean building sustainably, in order to respect both our local and global neighbours. This guide provides accessible guidance on delivering sustainable housing on the many small sites in London where sustainable development is needed, but tough to deliver. By following the expert insights within, let's all help shape a greener, more resilient London.

Alasdair Ben Dixon CSO, Root & Branch Homes, Co-Founder & Architect, Collective Works



Credit: Becca Tapert

Audience

This guide has been written for the benefit of:

SME Residential Developers (and their consultant design teams), who prepare planning applications and technical design proposals;

SME Builders/Contractors; who construct residential housing schemes on small sites

By beginning the journey towards adopting the sustainable principles and actions in this guide (if not already), your organisation will be setting itself up for long term, sustainable business success.

Consultees

To understand the issues faced in the sector we convened a round-table of small developers and builders, alongside design consultants and sustainability experts to discover why shortcuts are inevitably made, and why a performance gap still exists within many of our newly built homes. This discussion helped shape the approach of this guide and you will find quotes from the round-table, to help illustrate the ideas within.

"We want to see small sites playing a bigger role in residential lead delivery in London. Our two overarching objectives for the program are to work with public landowners to release small sites in a way that supports the growth of builders and to support that SME growth in London because there's historically been a decline, and we need small builders ready to take on these sites."

Jessica Tsang (GLA) Programme Manager, Small Sites Small Builders, Greater London Authority

Call to Action

The London Plan has set a target to deliver over 12,000 homes per year on small sites up to 2030 by new-build, changes of use and conversions. The GLA ambition is there!

We are in the midst of multiple crises: housing shortages, climate emergency, increased cost of living and rising energy bills. There is a real, urgent societal need for higher quality, energy efficient homes.

Sustainable homes on small sites have the ability to address these issues and this guide will help your SME business on the journey to making a difference for a sustainable future.

Lanre Gbolade CEO, Root & Branch Homes, Co-Founder & Architect, Gbolade Design Studio



Credit: Josh Olalde

Environmental Context

We are now increasingly unlikely to remain within 1.5c of preindustrial levels as set out in the UK's net zero ambitions - a target set out by the Paris Agreement. Advanced economies have a greater responsibility for emissions to date, and so should go further in their efforts to reduce emissions, as this will support both their own citizens and the global south.

Legislation such as the Future Homes Standard is set to improve standards, but trails other European & UK nations. A significant performance gap still exists within our built environment, and this needs more effective monitoring to ensure we don't see continued under-performance.

Embodied Carbon makes up around 80% of a building's lifetime emissions, yet remains unregulated in UK. Europe has the carbon budget (under the Paris Agreement) to build around 144,000 homes a year and yet plans to build around 1.5million homes / year.

The impact of a construction firms' activity will far outweigh the impact which their employees have in their personal lives meaning everyone working within the sector has a real opportunity to effect change.

Credit: Architects Declare

Credit: Architects Declare

Large Architecture
Practice Annual Scope
1&2 - 73Tonnes CO2e

Embodied Carbon - One Large Project 2,500 Tonnes CO2e

"Harder facts would help here in terms of land value and the tradeoff for different levels of sustainability. Every company will include criteria but if you're bidding on a site they have to be clear so we can assess proposed bids evenly – if that's RIBA 2030 or something else, as long as it's consistent."

> Jessica Tsang (GLA) Programme Manager, Small Sites Small Builders, Greater London Authority

Policy Context

The importance of delivering a range of housing across the city of London and Greater London is set out specifically in the Mayor's Housing Strategy, and more broadly in the context of the Mayor's current overarching Good Growth By Design programme.

Housing Strategy
Good Growth By Design
Housing Design Standards LPG
Small Sites x Small Builders: Unlocking Land to
Support A More Diverse Housing Supply
Small Sites Design Codes

The Mayor's Housing Strategy sets a vision and proposals to provide all Londoners with a good quality home they can afford. Its aim is that every Londoner can access a well-designed, safe, good quality home that meets their needs and is genuinely affordable. Furthermore there is a desire to help make more small, publicly-owned sites available to small developers, housing associations and community-led organisations so they can play a bigger role in building the homes that London needs.

The twin goals of affordability and quality are also at the centre of the current £4bn Affordable Homes Programme 2021-2026 (AHP). It includes 19 new funding requirements focusing on design, sustainability, and building safety, alongside a renewed emphasis on Modern Methods of Construction. In addition, the Mayor has committed to trialling the use of the Delivering Quality Homes (DQH) Action Plan and Post Occupancy Evaluation through two pilot initiatives.







MAYOR OF LONDON

London Plan Guidance

Small Site Design Codes

> Consultation dra February 2022

Credit: Mayor of London

Market Context

Homes with the highest energy ratings are worth up to £40,000 more on average compared to less sustainable properties.

A study by Halifax claimed that the most energy-efficient homes sell at a premium compared to less sustainable properties. Their analysis of the property pricing data in England and Wales found that homes with higher a Energy Performance Certificate (EPC) sell for significantly more than those with lower ratings. The study shows that properties with the highest energy ratings (A) can be worth nearly £40,000 more on average than those with the lowest ratings (G) (Your Money) (EPC For You). This premium associated with energy-efficient homes is driven by the increasing willingness of buyers to pay extra for a sustainable property. Gaining the benefits such as lower energy bills and reduced carbon footprints. (Sustainability Magazine).

- Who wants these homes? Research from Legal & General, with a respondent sample size of 2405 adults suggests almost two-thirds of UK households see more investment in energy efficient homes as an attractive or very attractive option to address the cost-ofliving crisis.
- How much they are willing to pay? Buyers looking for a new home are willing to pay a 10.5% premium for a low carbon property, with Gen Z future buyers willing to pay 20%.
- What they will prioritize? 65% of adults chose environmental factors, incl. reducing carbon footprint or helping to prevent climate change, whilst 37% of adults prioritise the cost savings that they would see from cheaper energy bills. Consumers are now rating homes with energy efficient, sustainable features as more important than the size of the property
- Health & well-being wins out over sustainability in homeowners mind.
- A green mortgage offers preferential terms if a buyer can demonstrate that the property they are borrowing for meets certain criterion, such as certain EPC ratings. The market for green mortgages is increasing with High Street banks such as Lloyds Bank, Halifax and Barclays all bringing products to the market in recent years since 2020.

"One of the fundamental challenges is meeting the demand for sustainable homes, and ensuring they can be delivered. Currently development finance will increase costs whenever an innovative system is being used, and there's not enough innovation solutions succeeding to create a safety net incase one fails. The EV market doesn't have the same problem, because all the major brands have now brought one to market. Until that transition occurs with the national material suppliers and contractors, it's going to be an uphill struggle."

Charles Proctor SME Developer (JPD Corporation)





Buyers want green homes. But the market and government need to catch up

COMMENT 11.08.22 BY NEIL GOSLING

Credit: Inside Housing



Credit: Shutterstock / Monkey Business

"The community clearly wants healthy homes, with basic fundamentals such as good access to daylight, outside space and natural, tactile materials. Developers need to ensure that these needs are balanced alongside environmental/green considerations; if not, they risk alienating those members of the community who already feel alienated from the 'liberal elite', whilst being forced to live in cramped housing - what we would call unhealthy homes.

Britain offers a free health service to all that does not discriminate on the grounds of class, gender or race; our developers need to ensure they are building healthy homes which aren't just the preserve of the wealthy, to better support the nation's mental and physical health and wellbeing."

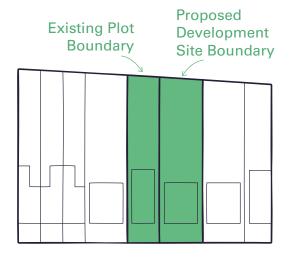
> Ekkist Community Priority for Healthy Homes

Defining Small Sites

A small site is defined as a site that is up to 0.25 hectares in area as defined in the new London Plan.

This includes:

Infill sites - Infill
 development takes
 place where new
 homes are created
 on site and have a
 frontage onto an
 existing street. This
 might be a vacant
 plot of land, or a
 bit of space next to
 an existing home.
 These sites include
 existing street-facing
 buildings and corner
 plots.



 Garage / Workshop Conversions - Land with vacant garages, workshops and yards often occupy spaces at the end/back of long gardens in urban environments, and are usually reached via constrained access points from the public highway.

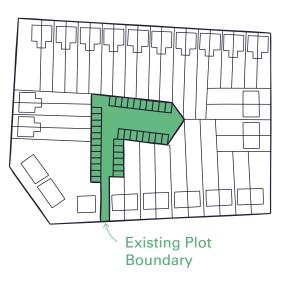


Credit: Gbolade Design Studio

"Boroughs should pro-actively support well-designed new homes on small sites through both planning decisions and plan-making..."

Policy H2 Small sites, GLA

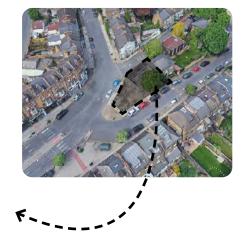
Backland sites - A
site is considered to
be backland when
its development will
result in buildings not
fronting the street. A
backland site can be
landlocked, behind
existing buildings such
as rear gardens and
private open spaces,
vacant or underused
spaces, usually
within predominantly
residential areas.



• Other sites - including awkward corner plots.

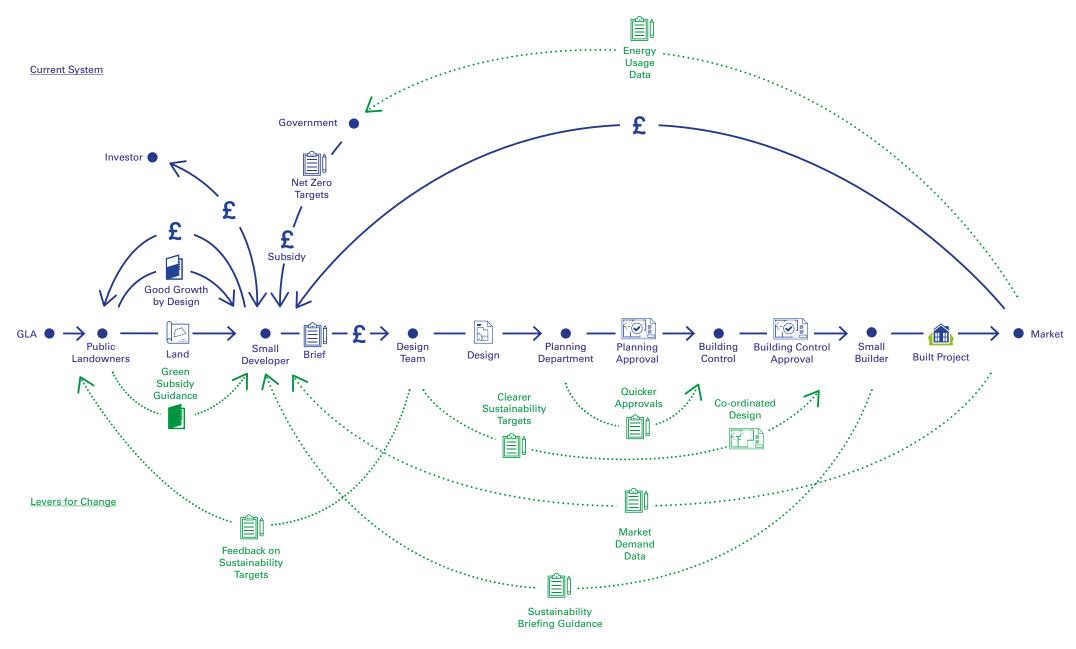






Identifying Levers for Change

Following the round-table we illustrated the current system of small sites delivery in order to better understand the flow of information, regulation, and capital. We then considered what levers for change exist within the system, and added them below.





Chapter **1**Pre-Planning

RIBA Stage: 0 - 1

For small developer builders, the GLA are working hard with local authorities to present more sites for development. The opportunity for profiting on high-quality homes that use less energy is high. Consumers in the UK are shifting in every sector towards sustainability. Recent spikes in energy costs are certainly in the mind when evaluating homes. There is a huge gap in the market for buildings that exceed Building Regulations.

Sustainable design and construction principles should form part of the brief that goes to your design team. It should focus on fossil fuel-free energy, conservation of water, use of environmentally friendly and healthy materials, improving biodiversity and the health and well-being of building occupants.

"Sustainability is often not well understood within a council so unless you have a team with relevant experience to help educate others, you'll become unstuck because it just becomes one individual pushing an agenda. It all comes back to having the right team in place to champion good quality design, and sustainability."

Selasi Setufe Senior Architect & Innovative Sites Programme Manager (Be:First)

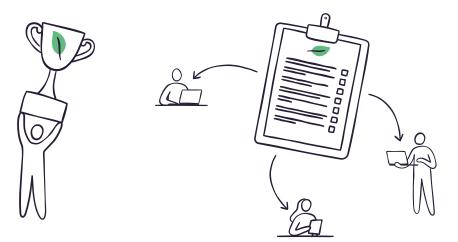
Key Stage Prompts



"Most developers I speak to want to leave a legacy, they want to leave a mark. But they've obviously got to have some money to do it."

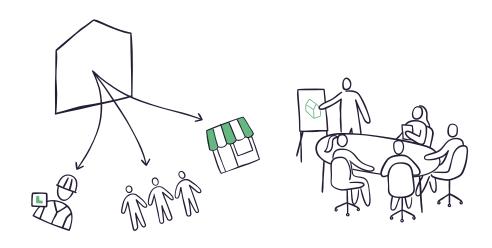
John Smedley SME Developer (Just Simple Homes)

- 1. Does the local market have an appetite for high performance homes? If so, they will sell for a higher value and should be built into your appraisal.
 - Tip Your architect or sustainability consultant can support you in developing this per project or holistically for the business.
- 2. Have you sought out sustainability-minded consultant team to support you on this project / organisational journey?
- Have you shared this brief with all consultants appointed to the project?



- ls there a project sustainability champion / lead the architect is often best placed to undertake this role?
- Has the pre-application meeting / submission clarified the local authority's position on sustainability more broadly and in reference to the project site? Architect / Planning consultant should be able to support you with this task.
- Have you considered sustainable financing options / opportunities for the project?

 (https://www.greenfinanceinstitute.com/)
- 7 Have you given consideration to opportunities to deliver social value benefits to the project locale / sites across London?



Case Study Sutton Energiesprong





Credit: BowTie Construction

Project: Sutton Housing Energiesprong Retrofit

Client: Enfield Council

Contractor: Bow Tie Construction

Bow Tie Construction were selected by Energiesprong UK and Sutton Housing Partnership to deliver an Ofgem Eco funded deep retrofit of a terrace of four and a terrace of two houses. Bow Tie's designers were responsible for all design elements and construction was undertaken by Bow Tie's builders. The residents received the retrofit at no cost to themselves.

Sustainability Credentials and Retrofit Measures include:

- Annual space heating performance of 50 kwh/m2/annum
- Airtightness of 1 air change per hour
- All heating and hot water provided by a Ventive compact unit comprising exhaust air heat pump, MVHR and thermal store
- Electricity from the PV panels would first go to the Ventive unit to charge the thermal store, then be used by the house, any surplus is exported to the grid with residents receiving the benefit
- Passivhaus Grade Triple Glazed Windows, thermal bridge free installation
- Passivhaus Grade Entry doors, thermal bridge free installation
- Cavities insulated with high performance expanding foam
- Lofts topped up to 300mm of Insulation
- YESporch (BowTie Pod) to house Air Source Heat Pump, MVHR, thermal store and ventilation manifold
- Photovoltaic Panels



Chapter **2**Design to Planning Application

RIBA Stage: 2 - 3

With a site appraisal based on a robust brief, the next focus is on navigating the proposed development through the planning application process. The NPPF and local authorities have policies in favour of sustainable development. As such, small sites designed sustainably, will already be viewed favourably by London Borough Planning Authorities.

Working in a collaborative approach, with consultant design team members willing to work on challenging sites and deliver sustainable / high performance projects is important.

"At the planning stage you're very much led by your design team in terms of what you can and can't do. That's my simple approach and to be honest with you, it's not about what you can get away with it's just what's expected in that location for the scheme you're doing."

John Smedley SME Developer (Just Simple Homes)

Key Stage Prompts

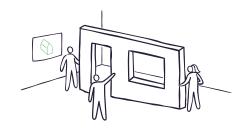


- 1. Has the local authority's policies on sustainability broadly and in reference to the project site been clarified to the project team?
- Has the Sustainable Design Brief issued at RIBA Stage 1 been satisfied during RIBA Stages 2 and 3? (Ensure project champion and consultant team provide demonstrable evidence of Brief satisfaction)
- Has the consultant design team maximised design opportunities with consideration of Off-site / Premanufactured component utilisation?

"I think PV has been the one thing that has been easy for us because it's affordable, it's improving and the ability to link to electric cars is quite handy if you're doing homes."

> Andrew Larkin SME Developer (Drewin)





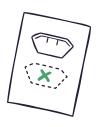
"I think is super encouraging to hear people around this table talking about being open minded and a bit non-traditional in their approach and open to collaborating with others to learn more about what others are doing and take that approach that I feel like maybe architects do a little bit."

> Selasi Setufe Senior Architect & Innovative Sites Programme Manager (Be:First)

- Has consideration been given to noise and on-site pollution 4. reducing construction methods?
- Have you considered waste minimisation through efficient design standardisation?

"Our approach is to start with the budget, if you've got a lot, we'll do natural materials, solar panels, heat pumps, and fabric efficiency. If you've got a little less the first thing that goes is natural materials. If you've got a lot less the second thing that goes are pretty things like solar panels and the green roof. What we never get rid of is fabric efficiency, and the performance of the building which needs to remain as a core sustainable value."

> Rafael Delimata SME Builder (Bow Tie)









Case Study Brockley Cross



Credit: Just Simple Homes

Project: Brockley Cross

Architect: Dowen Farmer Architects

Client: Just Simple Homes Contractor: Just Simple Homes

Situated at the junction of Geoffrey Road and Brockley Cross, the proposed new-build residential development has been designed to achieve high environmental performance standards following the Energy Hierarchy as set down by the London Plan and the London Borough of Lewisham's relevant Policy documents. The development will offer basement, ground and upper floor residential accommodation with a total of 7 new apartments.

With a PTAL rating of 4, the site is well located within a short walk of Brockley Station and several bus routes, which will help promote walking, cycling and using public transport instead of travelling by car. On completion, the provision of cycle storage will further support and encourage cycling. A 'Lean, Clean, Green' approach has been adopted and the development achieves an improvement in building fabric at over 14.07% at the "Be Lean" stage and an overall improvement (DER/TER) in regulated emissions by over 86.23% above Part L 2021 standard.

Sustainability Credentials and Retrofit Measures include:

- 100% dual aspect units to maximise natural daylight
- High standards of insulation; Fabric first approach with new walls at < 0.15W/m2k U-Value, Roof structures at < 0.12W/m2k
- Roof mounted PV array generating up to 5300kWh/annum of electrical power
- Mechanical Ventilation Heat Recovery (MVHR) Systems for continuous fresh air and heat recovery rates in excess of 85%
- Smart thermostats & LED low energy lighting
- Dual flush toilets and flow regulated showers/taps
- High performing external doors both thermally and air tightness

Chapter 3 Pre-Contract (+ Procurement)

RIBA Stage: 4

Achieving the high-quality, high-performance homes that the market is looking for requires an experienced design team at precontract stage. This team will work alongside the developer-client in identifying the right / appropriate sustainable systems and supply chain members that will support delivery of the project.

Consideration should be given to how to support local economies and deliver true and impactful socio-economic benefits to the surrounding locale.

Appropriate selection of procurement methods and contracts and mechanisms to ensure delivery of anticipated outcomes must be prioritised to achieve sustainable performance.

"On our recent scheme no one could tell me the quantity of bat boxes, bird boxes, or bee bricks we had to include. They're not expensive to do and we wanted to, the problem was just communication - a 10 minute phone call or clearer brief could've sorted it."

John Smedley SME Developer (Just Simple Homes)

Key Stage Prompts

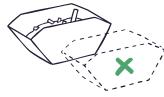


- Have you engaged your supply chain to ensure they are in alignment with your project's / organisation's sustainability ambitions?
- 2. Have you considered sourcing supply chain partners from the <u>Green Register</u> or other forums that promote sustainable contractors?
- Have you considered waste minimisation through efficient design standardisation?
- Do your contracts incentivise supply chains to be more sustainable?

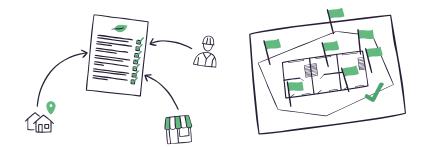
"On a constrained site if you're talking about building fabric you're going to increase the depth of insulation and make it a lot larger, which then makes the room smaller, which comes with it's own challenges."

> Andrew Larkin SME Developer (Drewin)









- Has the planning consent flagged up any additional impacts / opportunities on your ability to deliver a sustainable project?
- Have you re-confirmed the sustainable commitments / criteria / brief, post-planning approval?
- 7 How can this project provide socio-economic benefits to the local community / labour market / businesses?
- Can the consultants deliver?

"70% of the design work goes into convincing the planners, and then there's very little time left to properly co-ordinate the scheme with the developer and the builder. What works for me is sending designers to our sites to have a look and then ensure the drawings reflect closely what happens on site. Everyone complained at first but the next time everyone knew why that was important."

Rafael Delimata SME Builder (Bow Tie)

Case Study Hermitage Mews





Credit: Gbolade Design Studio

Project: Hermitage Mews

Architect: Gbolade Design Studio Contractor: Crystal Management

Hermitage Mews in Crystal Palace, London, is a series of 8 high-quality townhouses designed and constructed to achieve Net-Zero targets. The development features a mix of 3 and 4 bedroom terraces and semi-detached houses on a narrow, sloping plot. These dual and triple-aspect homes offer privacy while engaging with the surrounding context through front gardens addressing Beulah Hill.

Sustainability Credentials:

- Operational Energy Demand: 34kWh/m2/yr
- Embodied Carbon (A1-A5,B1-B5,C1-C4): 437kgCO2e/m2
- Wall U-Values 0.11 W/m2K; Roof U-Values 0.10 W/m2K, Ground Floor 0.11 W/m2K
- 40% roof coverage with Photovoltaic Cells generating 14 kWh/ m2/yr
- Air Source Heat Pumps for space and hot water heating
- Timber frame construction elements including Glulam beams and timber internal skin studwork
- Woodfibre Insulation
- Off-site manufactured Posi-joist floor structures and roof trusses
- Triple-glazed windows for acoustic and thermal performance;
 with 0.9W/m2K U-values



Chapter 4 Construction (+ Procurement)

RIBA Stage: 5 - 6

To deliver on all the hard work put in pre-construction, it is important to ensure full design and construction team alignment going into the construction phase of a project. Allocation of responsibilities, understanding of outcomes and quality standards must be set out from the start and repeated throughout the project.

Commitments must be made to ongoing monitoring and reporting of quality and performance during the construction process.

The commissioning of the homes must be prioritised to ensure all systems are working efficiently (optimally) and the homes have been constructed as designed.

"By setting up our own contracting company, and developing our own modular system, we've been able to find improvements, synergies and cost certainty. We use CNC cut plywood, and it's designed around inclusivity – bringing people into construction who hadn't been involved before. Off site manufacturing means tools on site are very simple, allowing us to facilitate safe, sustainable community builds with people who've had no experience before."

Nick Newman SME Builder (U-Build)

Key Stage Prompts

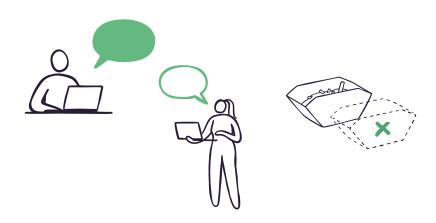


- 1. Are your team aligned on the targets set out at the planning stage?
- 2. Is the programme realistic?
- Are your preferred subcontractors on board with the sustainability targets?
- Have you got champions in place to monitor waste on site and biodiversity?
- Have you got champions in place to monitor fabric efficiency and airtightness?

- Are you on top of delivering what you've set out? Check you're still on top of market / appraisal.
- 7 Are off-site components being carefully coordinated?
- Do you have a commissioning checklist?

"It's so difficult to explain to a client how much time co-ordination takes, we struggle with this regularly; the junction details, SAP calculations, mitigating cold bridges and making sure service runs work seamlessly with interiors."

> Siri Zanelli Architect (Collective Works)







Case Study Mid Terrace Dream

Architect: Collective Works
Contractor: Oasis Construction

After a year of design and planning hurdles, the terrace took six months to transform into a highly sustainable, healthy, spacious and modern dream home at the hands of an ambitious client, architect and contractor team. The house was stripped back to brick and stud walls, and 50m2 of extensions added – a large ground floor garden extension and a full loft dormer.

Behind the warm terracotta colour palettes, textured tiles and various natural timber finishes is a high performing building. Large new windows, mechanical rooflights and framed views welcome the sun, daylight, and garden views. This north London home shows how sustainable extensions, and a deep retrofit of the original building, can add another hundred years of life to an existing house.

Materials from the demolition were reused on site and used a Steico timber construction system employed. The thermal performance of the existing terrace was upgraded by adding insulation to roof and floor, and the walls were clad in external insulation limiting cold bridges.

The completed retrofit achieved airtightness of 1.8 m3/(hr*m2) – the home is mechanically ventilated and include an air source heat pump, underfloor heating and solar panels. It achieved EPC B, and used Low VOC paint, wool insulation, and exposed timber, stone and textured interior finishes to mimic nature.





Credit: Collective Works



Chapter **5**Post-Occupancy Guidance

RIBA Stage: 7

Supporting homeowners' post-completion with useful information about how to operate their low-energy demand homes from the outset will be beneficial to not only them but your future developments as well. It can provide positive insights where things have gone well, and useful lessons learnt feedback on items to address going forward where they haven't.

Monitoring and reporting of quality and performance while in occupation will provide evidence of a superior low-energy performance with real, in-use data.

"We focus on long term maintenance because we've visited a lot of eco homes which went wrong - rotten timber frames, neglected mechanical equipment maintenance, leaking green roofs and more. For us sustainability is something built well which will last so that you can spread out that one expense over a very long period of time."

Rafael Delimata SME Builder (Bow Tie)

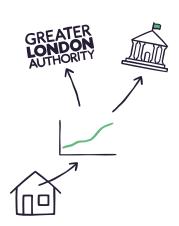
Key Stage Prompts



- 1 Did you know about the performance gap in London homes?
- Do you provide user manuals for your homes?
- Do you stay in touch with your customer and request structured feedback once a project is complete?
- Do you carry out Post Occupancy Evaluations or Building Performance Evaluations?

- 6. How could you learn more from your completed projects?
- 7 Do you get certification for the green features within your projects?
- How could you better share the data collected during and after your projects?









Case Study Nest House

Architect: Studio Bark

Contractor: Studio Bark Projects

Nest House is a single-storey eco-home, designed to respond to the client's specific accessibility needs. Constructed using Studio Bark's modular and demountable U-Build system, the house delivers on their dreams for a low carbon eco-home that celebrates the surrounding countryside.

The fully accessible eco-home is free of concrete and structural steel and instead uses reclaimed timber foundations, and timber floor and roof beams created by U-Build. These design decisions, alongside many others, have created a 'circular' home which is fully dismountable at the end of its useful life.

Nest House is built using natural and local building materials wherever possible. The retaining walls use reclaimed railway sleepers foundations, and the home itself sits on 100% recycled and recyclable jackpad foundations, meaning the structure is free of concrete and structural steel.

Above ground, 300 mm wool insulation combined with green roof and solar shading, limit the likelihood of overheating and the need for mechanical cooling. A central light-well terrace maximises natural light and passive cross-ventilation.

The scheme is fossil gas free and has a low operational energy, running on electricity collected by solar panels and using user-responsive infrared heating.





Credit: Studio Bark

Chapter 6 Health & Wellbeing



Research in 2021 found that the annual cost to the NHS of people living in unhealthy housing was around £1.4 billion. In addition, when wider societal costs are included, it was estimated that the full cost to society of poor housing was £18.5 billion per annum. However, many issues associated with poor quality unhealthy housing are largely preventable.

Regardless of size, small sites present an opportunity for SME developers to deliver healthy homes. There are measures that can be taken at each design stage, and even from the point of acquisition, to ensure that the best choices are made in regard to health and well-being. These considerations are predominately centred on planning ahead, carrying out the right investigations on site, and making informed design decisions, which do not necessarily have to impact costs. In instances where healthier decisions do add to build costs, this is often below 2% of the total sale value of the property. However, research shows that healthy buildings and healthy homes can command a value premium as high as 7%, sell faster, and are increasingly top of renters' and buyers' agenda.

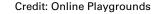
Active Design

Can your projects promote physical activity?

disease, type 2 diabetes, depression and cancer.

Research shows that people typically carry out 90 minutes more exercise per week in activity-friendly neighbourhoods and that being active helps to prevent and manage over 20 chronic conditions, including heart

Active design can be encouraged on small sites through connecting access to any existing walking routes or parks, providing additional high quality external storage space for bicycles and outdoor sports equipment and maximising the size of gardens to allow for more space to exercise and play. Providing small pocket parks or playgrounds or outdoor gym equipment can also be an effective tool that is inexpensive. On apartment sites, providing attractive well-designed staircases can encourage stair use and neighbourly interaction. Additionally, providing high quality private and communal terraces and deep balconies that allow space for adults to exercise and for young children to play (e.g. on toddler slides, with sandpits or paddling pools) can provide major health benefits.





Biophilic Design



Can your projects make space for plants and people?

Biophilic design is the practice of creating a connection between people in the built environment and nature. Elements can be direct (such as the inclusion of plants) or indirect (such as views of nature) or representational (such as using natural colours and materials in interior finishes). The benefits include improving recovery from stressful events, supporting a positive and relaxed mental state, increased attention capacity and reduced levels of anxiety.

On small sites, developers can consider planting small trees and shrubs in direct views of windows, creating landscaped courtyards or driveways and entrances, and the use of natural finishes such as wood floors, clay plasters, exposed beams or joinery, CLT, and stone finishes.





Food Provision



Can your projects encourage local growing, or support nearby producers?

Access to healthy, fresh food can significantly influence eating choices and behaviours. While small sites may not necessarily have the opportunity to provide features such as a farmer's market or grocery stores, small design decisions can support healthier eating behaviours.

Outdoors, providing built in raised beds for fruits and vegetables in gardens or as shared communal space can be one strategy, or, alternatively, planting a row of orchard trees to a perimeter or between housing, such as the apple trees on this small terraced street in Cambridge Accordia. An outside tap in both communal spaces and private gardens can also encourage and support food growing, as well as providing a small tool shed or storage area as standard.

Indoors, ensuring that fridge and freezer space, kitchen worktop space and cupboard space is maximised can encourage more home cooking. Providing sufficient dining seating space for both the home occupants and visitors can also encourage healthier, family style eating.

Credit: Fielden Clegg Bradley



Air Quality, Ventilation & Materials



Can you use Air Quality monitors, and MVHR as standard?

Air quality is a major global health issue. 99% of the global population breathes air that exceeds WHO guideline limits and indoor air quality can often be 5 x as bad as outdoor air quality, highlighting the importance of good ventilation. Indoor air quality greatly affects our overall health and wellbeing: according to the British Lung Foundation, those with asthma or any other lung condition are much more likely to be affected by poorer air quality. Furthermore, short- term exposure to poor indoor air quality has been shown to cause irritation of the airways, coughing and cardiovascular problems, while long-term exposure can even cause heart and lung disease and cancer.

On small sites, regardless of size, a robust ventilation strategy must be implemented. Best practice involves undertaking outdoor air quality testing to understand typical background levels of air pollutants and to specify a mechanical ventilation system that can deal with filtering the required local levels of pollutants. MVHR is an ideal solution, which is both sustainable and can support good indoor air quality, by removing pollutants while keeping indoor air warm, providing a constant supply of fresh air. At times, additional filters may need to be specified, especially in urban areas or those with poor background air quality. Educating residents with an easy step by step guide on how to use the systems properly, filter replacement requirements and maintenance is also paramount.

Using non-toxic building materials can also support indoor air quality. Developers can brief architects to specify materials that are independently accredited as low or free from VOCs, have material health certificates, or are entirely natural, such as clay plasters. Developers and contractors need to be particularly mindful of paints, carpets, glues, sealants, and finishes such as lacquers, which can often be toxic to the body and detrimental to indoor air quality.

Temperature & Humidity



5 Do you take into account the impact of overheating and humidity in your homes?

The impact of overheating in our homes on our health and wellbeing is often overlooked in contrast to the environmental considerations. An estimated 2,000 heat-related deaths occur each year in England and Wales and there are estimated to be 75 extra deaths per week for each degree of increase in temperature over 25°C. Designing our homes to mitigate the risk of overheating is paramount for future climate resilience planning. However, it is important to achieve this without compromising other key factors, such as access to daylight and views that also support our wellbeing. When designing homes on small sites, it is best practice to carry out a detailed analysis of orientation, solar gain and potential overheating to try to mitigate this (without comprising daylight or views). A number of strategies can be used, such as the use of light-coloured building materials and landscaping. Dark brick can be 20-30 degrees hotter than the surrounding area and is best avoided. Green façades and mature planting and greenery can reduce what is known as the urban heat island effect and mitigate some risk of overheating and make the building cheaper and easier to cool.

Dealing with humidity in homes is also an important health consideration and building regulations can often fall short of creating homes free of damp and mould due to inadequate ventilation requirements for kitchens, bathrooms and areas of high use. Using ventilation systems in kitchens that move air directly outdoors rather than recirculating it can be more effective at managing moisture in homes. Similarly, providing clothes drying areas or utility areas with ventilation can prevent mould from building up indoors. Using an MVHR system or similar can help to remove excess moisture without the need for opening windows, which is especially effective in colder months. Some building materials such as clay plasters can also help to absorb excess moisture from the air, and release it in dryer periods, preventing excess moisture. Indoor air quality monitors can also be provided as standard to help home occupiers better understand indoor conditions.



Credit: Velux



Daylight & Electric Light



Do you consider the balance of daylight & electric light in your homes?

Good access to sunlight during the day supports our natural circadian rhythm, improves mood, concentration and helps us to sleep better at night. Due to recent changes in regulations and publications such as the Future Homes Standard, alongside build cost pressures, window sizes are at risk of getting smaller and not providing sufficient daylight to homes to support health and well-being. Increasing ceiling heights, using larger windows or doors, reducing the bulk of frames and using skylights on small sites can all encourage better access to daylight in homes.

To mitigate overheating, rather than reducing window sizes, building orientation could be considered more carefully, as well as other mitigation measures such as removable exterior shutters that can be closed in very hot weather, or reflective window films and treatments. These design considerations can prevent overheating without significantly reducing access to daylight.

The specification of electric lighting can be as important as daylight in the home for our overall health and well-being. Specifying high-quality electric lighting that has a good CRI rating, is non flicker, and is ideally adjustable or dimmable so that warmer tones can be used at night is best practice.

Water Quality & Provision



7 Do you consider the water quality in your new homes?

UK water quality can be variable and does not remove certain contaminants such as pharmaceutical residues and PFAs. PFAs are a family of about 10,000 widely used chemicals that do not break down easily in the environment. They have been linked to cancers, liver and thyroid disease, immune and fertility problems, and developmental defects in unborn children. According to the Royal Society of Chemistry the permitted PFA level in UK drinking water should be 10 x lower than the current limits. There are also a number of places that contamination can also occur on route to your tap, so it is best practice to install water filtration systems into homes. This can be achieved by using a reverse osmosis system and/or carbon filtration. This can either be fitted as a whole home system or directly in areas with access to drinking water, such as kitchens.

Credit: Metro Water Filter



Sound



Can you consider or mitigate excess sound around your sites?

Excess noise can be extremely detrimental to human health and this is something that small sites must consider and overcome, particularly in urban or dense settings. The key things to consider are noise transfer and disturbance between homes, and within the home.

People living in areas with high levels of traffic noise are 25% more likely to develop depression than those living in quieter areas and it was found in one study that every 5dB increase in the average 24-hour noise level was associated with a 34% increased risk of heart attack, stroke and other serious heart-related problems.

Developers of small sites can mitigate these issues by providing acoustic barriers in areas near high traffic volumes, ensuring walls and floors have additional sound insulation (beyond the typical requirements of the building regulations) and that high quality doors are specified to limit noise transfer.



Credit: Gramm Barriers

Building Management



Can you consider building management & social connectivity?

If developers are managing sites beyond completion, such as in small apartment schemes, they can consider a number of additional factors in relation to health and wellbeing. Building management is an important aspect that is often overlooked in this regard. Ensuring that buildings continue to operate in the way that they are designed, are properly maintained, and that residents are supported has a large impact on people's health.

Measures can be taken such as regular damp and mould checks, prompt repairs of services, ongoing indoor air quality and water quality monitoring, and access to shared information and notices is provided. Building managers can also help facilitate a sense of community through apartment notice boards, facilitating resident groups and in some cases use technology to connect people, such as through building or neighbours apps.

Case Study Italian Building







Credit: Masion + Fifth

Project: The Italian Building, Bermondsey, London

Architect: Stiff + Trevillion Developer: FORE Partnership Operator: Mason & Fifth

The Italian Building offers a way of living centred around healthy design and human connection. A boutique co-living scheme in the heart of Bermondsey, it was one of the first schemes in the UK registered for WELL certification. The property was originally built in 1905 and was refurbished to create 28 studios and an entire floor of communal living space. The scheme is owned by the purpose driven investor-developer, FORE Partnership, with Mason & Fifth as the operator, responsible for championing the well- being focus of the scheme, from design through to delivery and management. Every design and operational detail of this building is centred around the health and happiness of its residents.

Sustainability Credentials:

- WELL building certified
- Biophilic design through extensive planting both internally and externally, as well as the use of natural, non-toxic, low VOC materials known for their evidence-based benefits for lowering stress and improving air quality.
- Ongoing air, water and thermal monitoring and well-being focused programming
- Furniture has been made by Goldfinger Factory using up-cycled materials.
- 156 trainee hours throughout the project, with Goldfinger's profit from the project funding
- Air and water parameters are regularly monitored to ensure healthy levels are maintained.
- Cutting edge non-toxic cleaning practices are in place using a harmless liquid Ozone, and natural pest control measures are used for plant maintenance, removing the requirement for any chemicals.



Chapter **7**Subsidies & Support

The development industry is learning and developing its skills and capabilities with regards to sustainable performance and delivery, and specifically more so for the SME sector within it. This is both for newbuild housing and retrofits/conversions of existing buildings into new homes.

SME businesses can often struggle with visibility of marketplace activities and emerging policy changes, so it is important to develop and engage with networks to be as prepared and informed as possible to maintain a long-term profitable and sustainable business.

There are numerous bodies and organisations providing SME organisations with business development, upskilling, training support and grants, with respect to addressing the climate emergency, housing shortages and fuel poverty crisis through the delivery of more sustainable housing.

"I joined a small developer's group and each month we meet to talk challenges and new techniques. It's great to be exposed to others delivering different project types to broaden your horizon and have that exposure which enables you to see things from a different angle. You see their challenges on different schemes and realise they're all pretty similar in reality."

Charles Proctor SME Developer (JPD Corporation)

Key Stage Prompts









- Do you have someone to talk casually about green issues?
- Do you have a technical advisor on hitting climate targets?
- Have you engaged with your wider network around green issues?
- 2 Do your team regularly up-skill on green issues?
- Are there knowledge gaps within the team about your approach?
- 6. Do you have a sustainability champion?

"Reducing council tax for sustainable homes could be an interesting idea – giving council tax some relation not just to property value, but also to the performance and your EPC, that could really improve things."



Andrew Larkin SME Developer(Drewin)

"Better financial instruments could really drive change. People clearly understand the benefit of massively reduced monthly energy bills so if mortgage companies allowed you to borrow against those improvements you might see better uptake."

> Nick Newman SME Builder(U:Build)

- 7 Do you publicise annual carbon footprint results?
- Has your business signed up to the UN Race to Zero?
- Does your company hold a certification such as BCorp, Trustmark, IS014001?
- Are you applying for business support grants or programmes?
- **11.** Are you applying for business support programmes?
- 12. Are you taking advantage of R&D tax credits for research into sustainability?







"One thing that our clients grapple with, of course, is the cost. Retrofit and refurbishment should be zero rated in line with newbuild. Further fiscal benefits for sustainable construction - such as hitting the RIBA 2030 targets - would make a huge difference for a lot of our clients."

Siri Zanelli Architect (Collective Works)

Subsidies & Business Support

Better Futures Programme

"Supporting everyday businesses on their journey to net zero." https://betterfutures.london/

Community Energy Fund

"A £10 million programme that helps communities in England to develop clean energy projects to benefit their local areas."

Social Housing Decarbonisation

"Funding to improve the energy performance of social homes in England." https://www.gov.uk/government/publications/social-housing-decarbonisation-fund-wave-3

Green Mortages

"Better lending rates for buildings that meet environmental standards." https://programmes.carbontrust.com/ieea/

• The Industrial Energy Efficiency Accelerator

"Provides funds for companies willing to trial novel low carbon technology." https://programmes.carbontrust.com/ieea/

• Green Economy

"Enables small and medium-sized enterprises to purchase and sell environmentally friendly products and services to other companies." https://www.greeneconomy.co.uk/

• UK Research & Innovation's List of Business Competitions

"List of funding opportunities for green projects". https://www.ukri.org/opportunity/

• Boiler Upgrade Scheme

"Heat pump grant."

https://www.gov.uk/apply-boiler-upgrade-scheme

Grow London Local

"Expert support and advice for small businesses in London." https://www.growlondonlocal.london/

Heart of the City

"Training for SMEs to help them on their journey to reach Net Zero." https://theheartofthecity.com/programmes/climate-for-smes-4-steps-to-action.

• Levelling Up Home Building Fund

"Funding for developments for sale or rent."

https://www.gov.uk/guidance/levelling-up-home-building-fund-development-finance

Industry Resources & Training

Retrofit Academy

"Award-winning qualifications, training and support in Retrofit." https://retrofitacademy.org/training/

National Retrofit Hub

"A nonprofit organisation working to enable the delivery of housing retrofit across the UK."

<u> https://nationalretrofithub.org.uk/</u>

Chartered Institute of Building

"Leading international professional body for those working in the construction industry".

https://www.ciob.org/

Construction Industry Council

"A platform for professional organizations, research institutions, and specialized business groups within the construction sector."

• Client guide to MMC

"MMC guidance by Gbolade Design Studio." https://www.gboladedesignstudio.com/09-mmc

Passivhaus Trust

"The official UK affiliate of the International Passive House Association." https://www.passivhaustrust.org.uk/

The Skills Centre

"Community-focused training and apprenticeships provider." https://theskillscentre.co.uk/

• The Sustainable Renovation Guide

"Retrofit guide by The Pebble Trust." https://www.thepebbletrust.org/sustainable-renovation-guide

RIBA bookstore

RIBA published books on sustainability. https://www.ribabooks.com/sustainability

Civic Square

"Research that seeks to understand the current risks UK urban neighbourhoods face over this century due to climate and ecological breakdown under a high emissions scenario."

https://medium.com/neighbourhood-public-square/3%C2%BAc-neighbourhood-582903b050b2

Ashoka

"A collection of strategies and tactics for how to move people from caring, which so many do, to acting."

https://www.ashoka.org/en-qb/climate-changemaking-playbook

Green Register of Construction

"Here to help you find construction professionals skilled in sustainable building practices."

https://www.greenregister.org.uk/the-register

Networks

Meshwork

"A hub for sustainable building design professionals." https://meshwork.mesh-energy.com/

Builders Declare

"UK contractor branch of Declare." https://uk.buildersdeclare.com/

Association for Environment Conscious Building

"Local groups and forum for professionals in the construction industry." https://aecb.net/

UK Green Building Council

"Construction industry network with over 700 organisations." https://ukgbc.org/

Federation of Master Builders

"The largest trade association in the UK construction industry representing the interests of small and medium-sized building companies." https://www.fmb.org.uk/

Net Zero Developer Network

"Good Homes Alliance network for private sector housing developers." https://goodhomes.org.uk/net-zero-developer-network

House Builders Association

"Trade body for small and medium-sized house builders." https://www.builders.org.uk/membership/house-builders-association/

HOMES UK

"Annual free-to-attend conference and exhibition on buildings." https://homesevent.co.uk/

Futurebuild

"An annual event focused on sustainable innovations and solutions in the built environment industry."

https://www.futurebuild.co.uk/

• London Build Expo

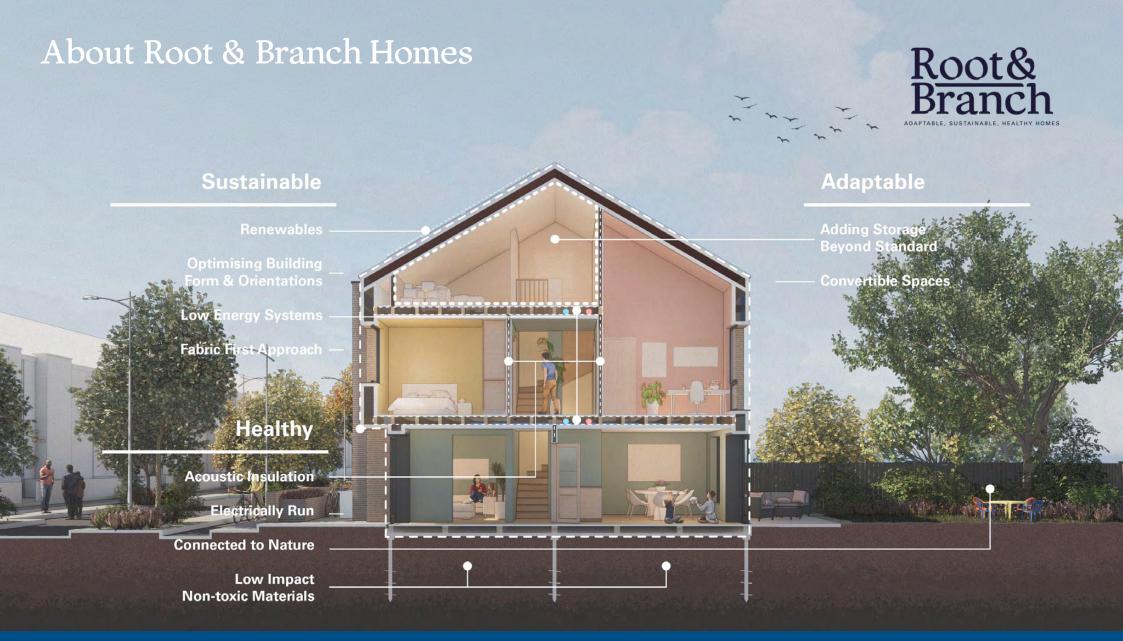
"UK's largest annual construction show."



Credit: Jeriden Villegas



Credit: Collective Works



Root & Branch Homes Ltd is a London-based SME residential developer; established in 2023 with an aim to develop small sites that deliver affordable, sustainable and high quality homes, that owners can grow into over a lifetime and thrive within a long-standing community. We are a private company with a social mission at our heart.

Our homes have three tenets:

- Adaptable homes that flex and adapt with lifestyles
- Healthy homes that provide optimum conditions for sleep, energy, immune system and mental well being
- Sustainable homes that are low energy, low carbon and built with natural materials

Authors & Contributors

Lanre Gbolade, CEO, Root & Branch

As an architect and Co-Founding Director of Gbolade Design Studio, Lanre brings his expertise on small to large scale residential architecture, property development and design management. He has worked with leading developers in the South East and led industry transformation on residential DfMA & Off-site construction, for which he was awarded Pioneer of the Year 2022 by Off-site Awards.

Alasdair Ben Dixon, Chief Sustainability Officer, Root & Branch

Alasdair is a strategic thinker bringing wide-ranging research to his work. His long-held commitment to the needs of the wider community alongside clients and stakeholders has led to roles within charities & action groups. He contributed to the RIBA Ethics and Sustainable Development commission, and regularly speaks publicly on such topics.

Olga Turner, Chief Development Officer, Root & Branch

A Chartered Surveyor, WELL Building Standard™ Accredited Professional, and listed in 2019 Forbes 30 under 30, Olga has a strong consultancy track record of UK and international projects, ranging from small boutique residential schemes to large master-plans. She has a strong interest in design for health and wellbeing in the built environment.

Jenny Leahy, Chief Operations Officer, Root & Branch

After 12 years in corporate PR and marketing, Jenny's more recent experience is in operations, having established two small businesses in the last decade. At Root & Branch she combines her attention to detail, resourcefulness and personal passion for engineering and sustainability.





Credit: Root & Branch

Roundtable Attendees

Lanre Gbolade & Alasdair Ben Dixon (Root & Branch) +

Jessica Tsang, Senior Project Officer, Community Led Housing

Jessica is an experienced projects director and programme manager driving delivery to create socio economic and placemaking benefits in the built environment sector. Previous experience includes working for Meanwhile Space Community Interest Company delivering and operating many award-winning affordable workspace and community hub projects. Jessica is a board member of Meanwhile Foundation, a charity that supports meanwhile use activities nationwide

Nick Newman, Director, U-Build

Nick's experience spans environmental architecture, climate activism, building performance evaluation and deep energy retrofits. He is a Passivhaus designer and has contributed to a number of journals and publications, including the Environmental Design Pocketbook and the Passivhaus Designer's Manual. He was named a 'Rising Sustainability Star' by Building magazine in 2015.

Rafael Delimata Managing Director, Bow Tie Construction

Rafael is an extremely experienced professional who has spent many years project managing a wide range of construction contracts. He is proud to specialise in low energy, sustainable housing, and in bringing innovation, imagination and technical excellence to your dream home He is an insulation and Passive House specialist and heads up BowTie's R&D projects.

Andrew Larkin, Director, Drewin Ltd

Andrew founded Drewin after being around the family property development business from a young age and doing a number of his own projects. His previous experience has given him a comprehensive understanding of development finance options, alongside development appraisals and a full understanding of each development's risk return trade off.

Selasi Setufe MBE, Senior Architect, Be First

Selasi is a Senior Architect and Innovative Sites Programme Manager at urban regeneration company Be First. She is one of the founders of social enterprise network Black Females in Architecture, and she was awarded an MBE for her services to diversity in architecture in the Queen's 2022 New Year's Honours.

John Smedley, CEO & Founder, Just Simple Homes

John founded Just Simple Homes in 2020 following the establishment of his commercial consultancy business, JS Homes and Lettings, in 2017. John has been involved with construction and property since a young age, having over 20 years professional experience in the Commercial function and making his first property investment at the age of 19 (when you could get a 110% mortgage).

Charles Proctor, Director, JPD Corporation

JPD Corporation provides a full range of building services for all stages and aspects of construction work and has a great deal of experience in dealing with both domestic and commercial projects. It has an eye for contemporary and innovative design and is keen to demonstrate that it is not an average building company and strives for excellence and superior design in every project.

Siri Zanelli, Chief Design Officer, Root & Branch

Siri is an architect and founding partner of Collective Works. She has 20 years of experience focusing on compact housing and unexpected design solutions. Her passion is design that supports physical and mental health, and beauty in process as well as outcome. Siri lectures on work life integration and how small design led practices can adapt to tackle climate change. Her work is regularly published internationally.

Acknowledgements

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