

Our strategic
vision for
the future of
affordable
housing



If you believe you can contribute in any way to our strategy and mission of building the most affordable, sustainable and highest quality homes in the UK then please get in touch, outlining your interest.

Low Carbon Construction plc
Faretec
Carnac Court
Cams Hall Estate
Fareham
PO16 8UY

www.lowcarbonconstruction.co.uk
Bridgette Farrow, Director
bridgette@lowcarbonconstruction.co.uk
02392 160085



© Low Carbon Construction plc.
All rights reserved. Offsite/Onsite and Onsite/Offsite are trademarks. This document's contents must not be copied or reproduced in the whole or in part without written consent of Low Carbon Construction plc. This document has been prepared by Ayre Chamberlain Gaunt Ltd for and on behalf of Low Carbon Construction plc.

Contents

	①	②	③	④
About us	The problem	Our solution	Our system	Our vision
4	10	18	34	42



About us

Low Carbon Construction plc is a national manufacturer of housing. Our prime objective is to provide affordable homes across all tenures within the UK, thus working towards achieving a balanced housing market.



Everyone deserves the security of a safe, quality home that they can afford to heat and maintain, yet millions in the UK simply do not have this as a fundamental sanctuary. Our mission is to meet the challenge faced by

first time buyers, those on low incomes, key workers, retirees, those relocating due to employment need and all those who struggle to establish a real home that they can afford, either to rent or to purchase.

LCC create truly affordable, high quality, low carbon housing via our Offsite/Onsite method of SIP volumetric house manufacture.

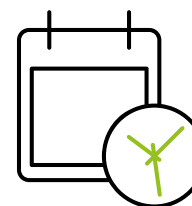
A balanced housing market is of critical importance in creating sustainable communities and we believe it should be integral to all development site planning. Creating homes where employment requires is key to well being, growth and community. We are pioneering in this and anticipate that the market will follow.

An overview

The first design sketch for a revolutionary building method was drawn by the team at Low Carbon Construction in 2010. Acknowledging the urgent need to provide affordable housing across the UK, by 2017 we had established a viable affordable housing strategy which has been further developed.



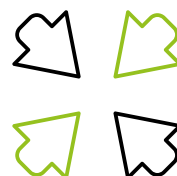
Affordable
Our homes are truly affordable



Timescales
Our homes can be constructed faster



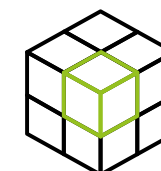
Quality
Our homes are factory manufactured to ensure quality



Communal connections
We provide places for people to come together



Fabric first
Our homes are designed on fabric first principles



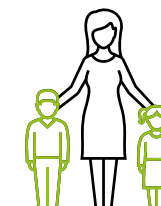
Volumetric modular
Our homes benefit from innovative volumetric SIPs



Waste reduction
Our communities and our methods are designed to reduce waste



Communal spaces
Our homes are arranged around high quality green spaces



People first
Our communities are designed around people

Our journey

Background

LCC was formed in 2011 primarily to answer the growing need for a new and innovative method of Offsite construction and since inception we have been leading the way in the use of Structurally Insulated Panels (SIPs) as a highly efficient method of construction.

From 2012 through to 2016 LCC successfully delivered ever larger and more complex types of bespoke residential and commercial buildings, which allowed us to prove concept of both design and delivery of our unique build system. During these formative years LCC has been able to pioneer many new building techniques to achieve a thoroughly tested model for the expedient delivery of bulk housing stock.

Due to R&D innovation we are able to use our unique Offsite/Onsite method of volumetric SIPs manufacture which allows us to install a 'temporary' volumetric SIP assembly factory, which we call our 'flying factory', on the development site itself – and then remove it at the end of the development cycle once all the homes are delivered for reuse on another site.

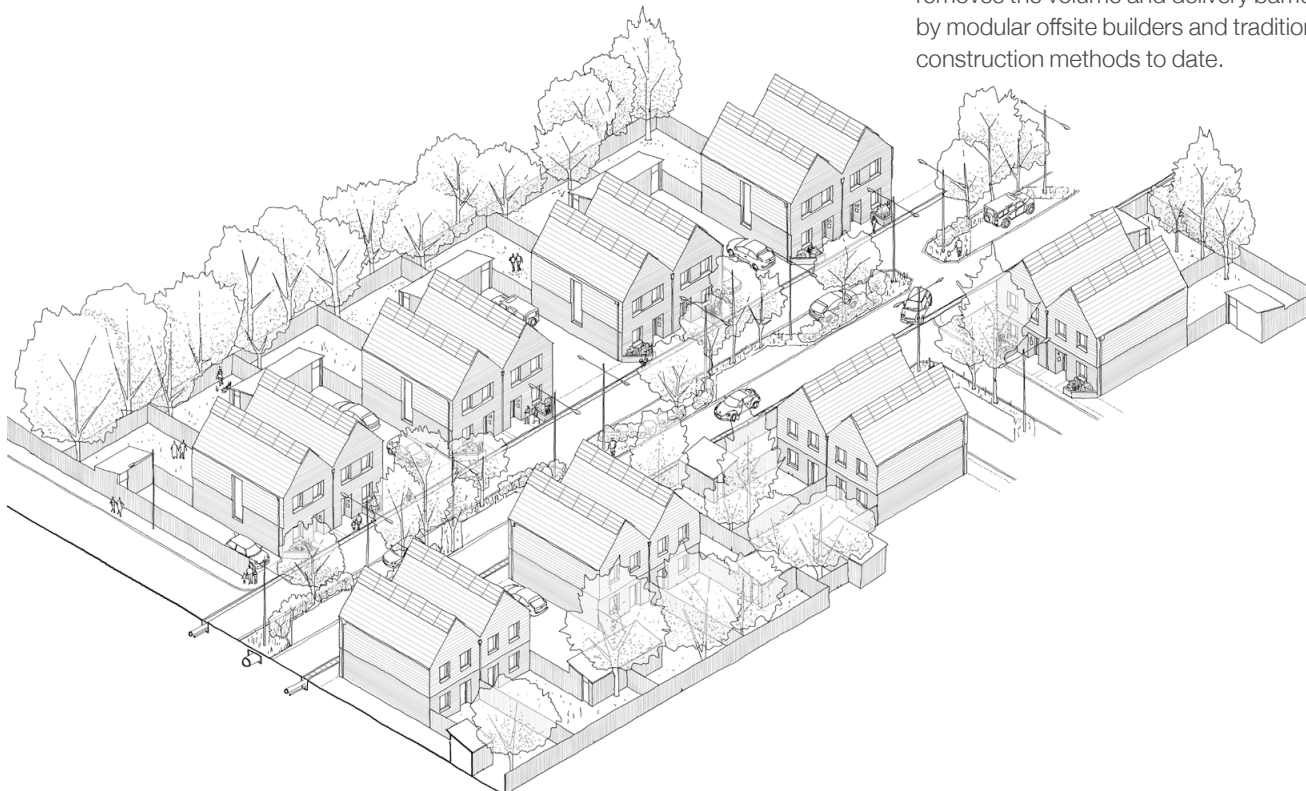
These flying factories allow us to assemble and deliver at least 250 homes per annum on each and every site we commence, and the method removes the volume and delivery barriers faced by modular offsite builders and traditional construction methods to date.

Consequently we are uniquely able, with the support of our supply partners and professional team members, to physically deliver on the government's ambitions, and are not restricted by a centralised factory.

In order to meet our aims, LCC intends to immediately advance its corporate plan to provide affordable housing across the United Kingdom by the acquisition of its own substantial freehold development sites for 500 plus homes per site, along with partnerships.

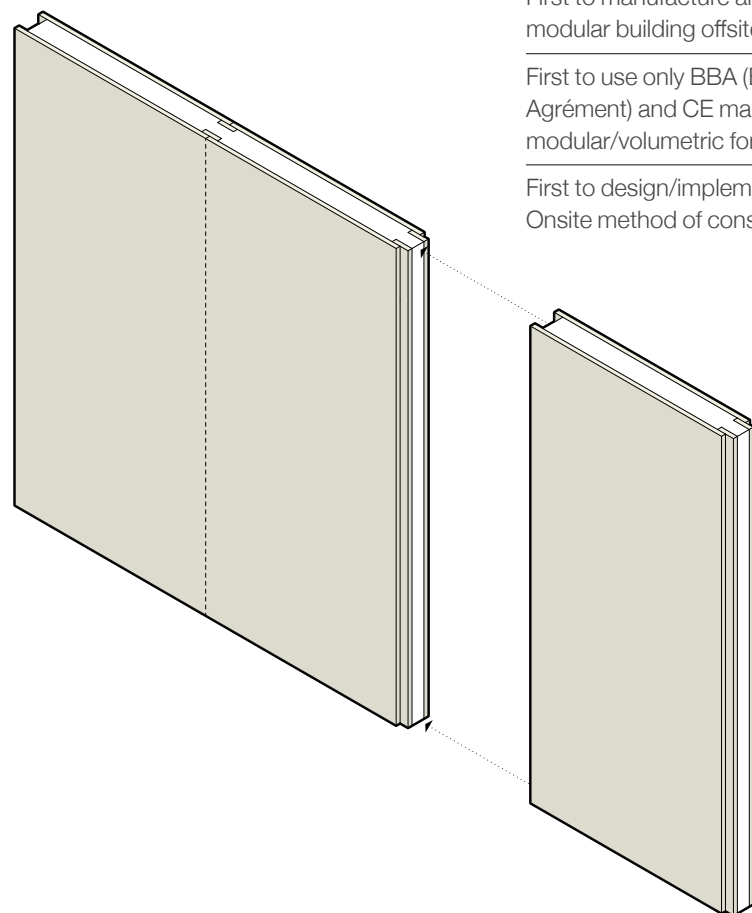
The unique Offsite/Onsite SIP house manufacture method, which LCC has pioneered, is capable of delivering five homes per week per Offsite/Onsite factory (with some sites having more than one such factory) and therefore capable of increasing housing supply in very substantial numbers to suit the scale of development.

Now the product is established, with many constructed buildings delivered over a number of years, LCC will seek to collaborate with large employers, government grant support, loan funds and other major housebuilders' collaboration to roll out our Affordable Housing Strategy throughout the whole of the UK. Specifically, LCC plc will be investing some £10m initially and some £1.5m of that is dedicated to the innovation of the first ever 2,000m² (GIA) 'Temporary Flying Factory' design and implementation.



Construction and home safety innovation

LCC has pioneered many innovations already and continues its R&D with a passion. Here we name a few of our pioneering 'firsts' to show our commitment to industry innovation:



First to use SIPs as a standard floor structure.

First to use SIPs as a standard flat roof structure.

First to use SIPs as a standard 'dormer' roof window structure.

First to manufacture and deliver a 100% SIPs modular building offsite.

First to use only BBA (British Board of Agrément) and CE marked accredited SIPs in modular/volumetric form.

First to design/implement the LCC Offsite/ Onsite method of construction.

First to be able to 100% finish a modular SIPs building within a factory environment.

First to use Polyurea ('Prokol') to water and air seal all homes as standard.

First to use solar assisted heat pump water heating as standard.

First to specify MVHR in every home as standard.

First to specify Solar PV (with battery storage) on every home as standard.

First to specify individual room thermostatic heating control as standard.

First to specify a fire suppression water mist system in every home as standard.

First to specify fire retardant underlay under all carpets as standard.

LCC has been able to pioneer many new building techniques to achieve a thoroughly tested model for the expedient delivery of bulk housing stock.

Building method innovation

The LCC method of modular SIPs Offsite/ Onsite house manufacture is unique. Our method relies on the remote production of 1200 x 2700 175mm SIP panels – manufactured by our supply partners– which are then engineered into smaller sized individual components (much like a giant 3D jigsaw puzzle) to be delivered and assembled to form a building, within the flying factory.

Once combined with Glulam beams these form large ‘modular sections’ of a building which can then be 100% completely fitted out externally and internally within the flying factory without ever having to use road transport to be installed on the plot.

General fabric specification and warranties

LCC homes are built entirely within a factory environment and are a factory engineered product accurate to circa 5mm, although in some aspects as low as 1mm is achieved.

The external walls consist of 175mm SIPs with either SIP splines or 1200 centre Glulam beams as required.

The floor(s) and roof consist of 175mm SIPs with 1200 centre Glulam beams.

The internal walls consist of 100mm SIPs with 1200 centre splines.

Polyurea sealed prior to exterior finish, or equivalent.

The above general specification contributes towards an airtight ‘fabric first’ building with a baseline ‘U’ Value of circa. 0.16 W/m²K which can have additional insulation added externally to reach further enhanced performance, aiming towards 0.10 W/m²K, and working towards an anticipated Energy Performance Certificate of A.

Our homes comply in specification with building regulation requirements so as to be treated as a standard timber frame/SIPs new home by the majority of the main new home warranty providers and UK Finance (formally the Council of Mortgage Lenders).

Standard home specification innovation

All our homes throughout the UK come with all the features and specification listed below as standard whether secured and occupied as a purchaser or renter:

SIPs modular structure giving airtightness and excellent thermal performance.

Very low maintenance exterior finishes.

Aluminium gutters and downpipes.

Triple glazed Argon filled A-rated windows.

Skirting heating, with every room individually controlled by thermostat.

Solar assisted heat pump water heating technology.

Fire suppression mist system in every room.

MVHR: Ventilation, humidity and heat recovery system.

Electric car charging point.

LED downlights throughout.

A choice of kitchens from our selected ranges.

A choice of tiles from our selected ranges.

A choice of flooring from our selected ranges.

A choice of bathrooms from our selected ranges.

No gas, so no servicing costs or breakdowns.

All our homes come complete with solar PV and battery storage, making an affordable home also truly affordable to run.

Full specifications can be obtained on our website at www.lowcarbonconstruction.co.uk



Our homes comply with building regulation requirements so as to be treated as a standard timber frame/SIPs new home by the majority of home warranty providers.

1. The problem

In research carried out by Heriot-Watt University on behalf of the National Housing Federation and reported by the BBC back in September 2019 an estimated 8.4 million people in England were living in an unaffordable, insecure or unsuitable home.

The research used data from the annual Understanding Society survey of 40,000 people by the University of Essex. The figures were then up-scaled to reflect England's total population of nearly 56 million. It was reported that the federation consider the 'analysis suggests the housing crisis was impacting all ages across every part of the country'.

Some people may have more than one of these housing problems, the federation said. The Joseph Rowntree Foundation and Shelter are among many other organisations who have reported on the problems faced.



The BBC article can be viewed at www.bbc.co.uk and Understanding Society Survey can be viewed at www.bbc.co.uk/news/uk-49787913



The problem with new housing estates is that typically they are designed around the car and are not close to employment or suitable infrastructure. In context, the housing crisis deepens as new build construction continues to be slow, with high interest rates and inflated cost of living.



The research estimated:

3.6m

people are living in an overcrowded home.

2.5m

people are unable to afford their rent or mortgage.

2.5m

people are in 'hidden households' they cannot afford to move out of, including house shares, adults living with their parents, or people living with an ex-partner.

1.7m

people are in unsuitable housing, such as older people stuck in homes they cannot get around in, and families in properties which have no outside space.

1.4m

people are in poor quality homes.

400k

people are homeless or at risk of homelessness – including people sleeping rough, living in homeless shelters, in temporary accommodation or are sofa-surfing.

A lack of affordable homes

What is affordable housing?

Affordable housing generally is described as housing that is provided with subsidy for people who are unable to resolve their housing requirements in the general housing market because of the relationship between local housing costs and incomes.

The UK Government's 2017 target of building 300,000 homes per annum in England by the mid 2020's, was widely publicised as being broadly agreeable as a national target, although some had called for more. Michael Gove had claimed in August 2023, as Housing Secretary, that this target was intended as optional. He insisted it would still be met, with alterations to the NPPF that would alter the way local plans are drafted, giving more opportunity to local councils.

The current Labour Government is making headway with the Planning Infrastructure Bill and Matthew Pennycook, Minister of State for Housing and Planning, is adamant that their promise of 1.5 million new homes to be built within their term is a stretch but achievable. LCC agree but are of the opinion that this will only be achievable if LCC's methodology is implemented.

The announcement to relax regulations to assist achieving planning in sensitive areas was welcomed, but rather than this benefiting those looking to profiteer from this change, LCC looks to build total communities of affordable homes.

As reported by the Independent, Gove's plans had a mixed response, with the House of Commons Housing Committee stating the plans would make the target 'impossible to achieve'. The Independent added that the majority of councils had failed to build a single social home in the past five years, with 1.2million on waiting lists.

Although the number of new homes built had recovered from a dramatic slump following the financial crisis, the UK Government's housebuilding targets were still dramatically falling short, with ONS data showing 210,070 new build homes delivered between 2021–22, within the overall 232,820 net additional dwellings reported. This followed a high in 2019–20, and the decline in 2020–21, in part because of disruption to housebuilding caused by Covid-19. How will the new Labour Government fulfil their promise to build 1.5 million homes during their term?

Fundamental to solving the housing crisis is to look at new mechanisms to producing affordable homes in volume, therefore fulfilling the supply to those most in need, including regeneration of brownfield sites, but also sensitive greenfield development.

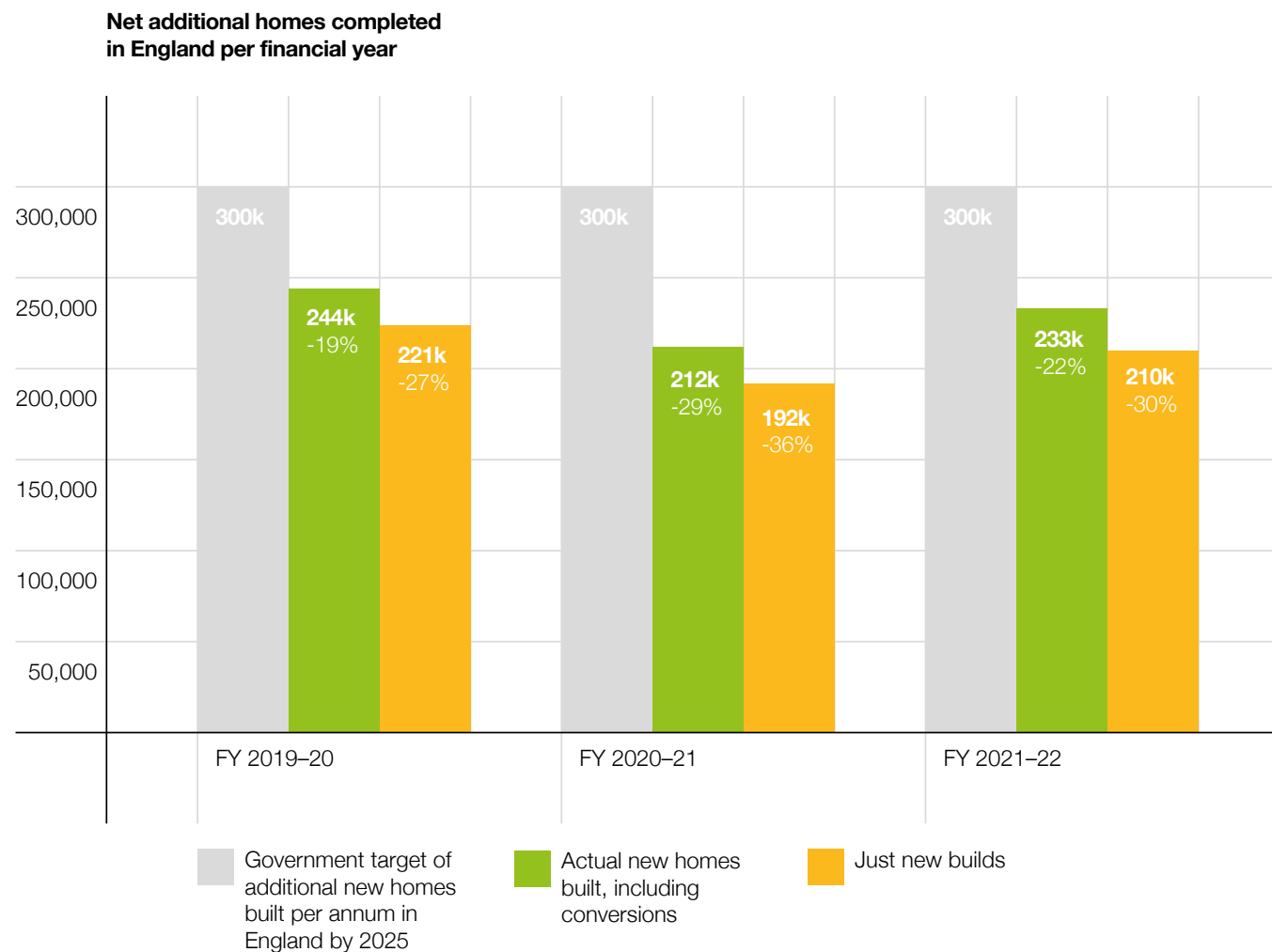
At present, affordable housing is primarily delivered through the planning system by 'requiring' private housing developers to build from 10% to 50% of their market value estates for 'social and affordable' need via existing social housing providers, putting pressure on viability for housebuilders. They would benefit from a collaboration with LCC by us building out their affordable homes requirements, therefore allowing them to concentrate on their market value homes.

According to a past report from the charity Shelter, which echoes current waiting lists, at least 1.2m affordable homes are needed for younger families who are currently unable to afford to buy and struggle through the expensive and insecure rental market. The government has made efforts to provide affordable homes, however only 59,175 were achieved in 2021–22, 52,100 in 2020–21 and 57,644 in 2019–20. These figures don't even begin to touch on the issue of affordability for actual home ownership, which is too often not addressed when reviewing the housing crisis.



London Mayor, Sadiq Khan has been facing criticism for delivery in London. Andrew Boff, Chair (2023–24) of the London Assembly which scrutinises the Mayor stated: "Before he was elected, the mayor said that delivering affordable housing would be his number one priority. Yet Khan has consistently failed to reach his own housing targets and these new figures show that he continues to fall short." Paul Smith, Group Chief Executive Officer at Elim Housing Association said: "Just building more homes will not solve the housing crisis. You have to focus on the social end of the market."

In 2017 the government announced that net 300,000 additional new homes per annum would be built in England by 2025.



Of more concern, architects, regulators, developers and buyers are losing faith in new build homes, stating problems with construction, fit out, defects and utility faults with high performance gaps.

The following can be drawn from the above:

1. Not enough attention is being given to affordable homeownership.

2. Attitudes need to change about new builds, with a focus on the reduction in performance gaps.

3. Current solutions to deal with the housing crisis are not working and things need to change before the problem worsens.

Conventional, existing solutions are not working. New, creative solutions which go beyond common ideas and practices need to be implemented in order to fix this deepening problem for new build, combined with a nationwide retrofit strategy.

James Brokenshire, when he was Secretary of State for Communities and Local Government told The Big Issue in May 2018: "There are significant issues but ultimately this comes down to building more homes. The challenge is how to get things built and how to build the affordable homes that the country desperately needs and I have to continue to listen to prepare new ideas."

In 2031 and beyond, the need is even more acute to provide affordable homes at scale.

"We don't need more reviews, press releases or empty promises, we need bold action to get Britain building."

Lisa Nandy, Former Shadow Housing Secretary, 2023

"Most people agree that we need to build more homes. Build the right homes in the right places where there is community."

Rishi Sunak, former UK Prime Minister, 2023

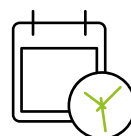
The problem in context



Procurement, cost of building and skills

Varied cost indexes have documented and predict that material and labour prices are continuing to steadily rise, through traditional methods of procurement and construction. It is well known that material costs remain a significant driver of cost inflation with labour costs also continuing to rise steadily. This is largely due to contractors having difficulty in recruiting skilled labour given the skills shortage following the aftermath of the financial crisis and uncertainty over recent years within the sector.

The rising construction costs have inflated resultant house prices or impeded completion of developments, meaning that the problems of home affordability is further exacerbated. Furthermore, variants in these prices across the country have meant further difficulties in affordable supply meeting demand for certain areas.



Speed and quality of building

Traditional on site construction methods are hampering the timely delivery of the homes and communities that people need. Delivery is often impacted by the UK weather and typically the performance gap exists between predicted and actual performance due to the limitations of control on site between various trades.



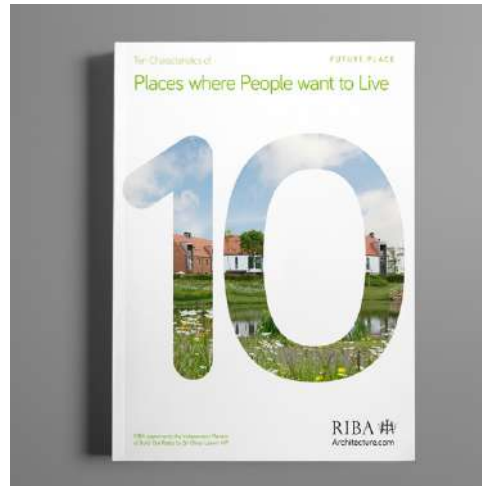
Sustainability and climate emergency

In the context of the climate emergency faced, current standards do not go far enough to address this very urgent problem. Some evolution of voluntary standards is good to see however regulated criteria needs to improve at pace. Affordable energy efficient buildings with low energy requirements and low embodied carbon materials are paramount to contribute towards lower emissions.

New build housing will continue to be essential, however this requires an active housing market inclusive of energy efficient retrofit of the existing housing stock and suitable measures to be in place for the reuse of existing stock.

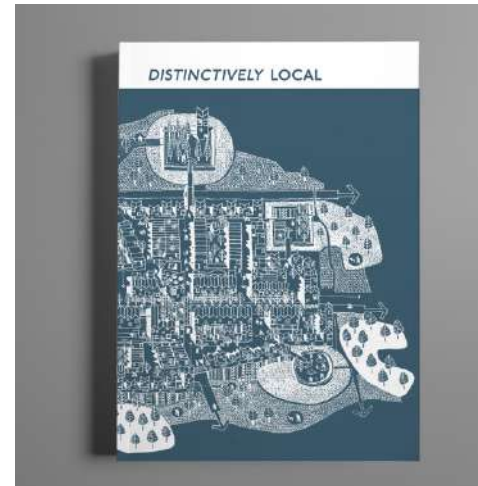
Delivery is often impacted by the UK weather and typically the performance gap exists between predicted and actual performance due to the limitations of control on site between various trades.

There are many publications which have influenced our approach at Low Carbon Construction.



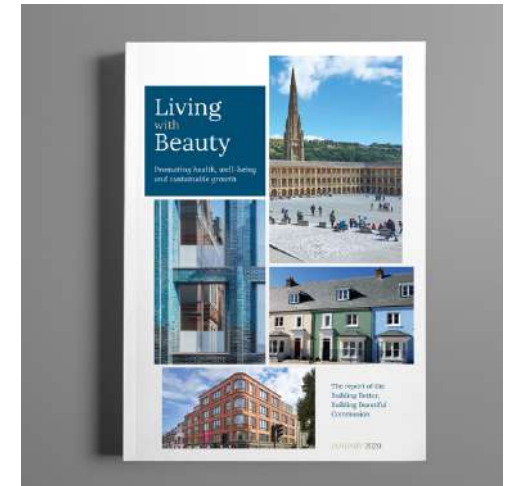
Places where people want to live

Seeks to encourage a solution to the housing crisis and lack of truly affordable homes, to provide places for people to thrive such as the RIBA's report on characteristics of places where people want to live.



Distinctively local

Great placemaking comes not only from seeing how others have done things well, but by being inspired to do them even better. The publication Distinctively Local aims to inform and inspire others to deliver distinctive and popular places, in out of town locations and has been an inspiration to Low Carbon Construction in our approach.



Living with beauty

The 'Living with Beauty' report of the Building Better, Building Beautiful Commission, led by Sir Roger Scruton, aims to promote health, well-being and sustainable growth. The report proposes a new development and planning framework, which will:

1. Ask for beauty
2. Refuse ugliness
3. Promote stewardship

**RIBA:
The ten characteristics
of places where people
want to live.**

1

The right place for the right housing.

2

A place to start and a place to stay.

3

A place which fosters a sense of belonging.

4

A place to live in nature.

5

A real place to enjoy and be proud of.

6

A place with a choice of homes.

7

A place with unique and lasting appeal.

8

A place where people feel at home.

9

A sustainable place for future generations.

10

A place where people thrive.



2. Our solution

Our mission is to provide, in volume, the most affordable, sustainable and quality homes as possible. Manufacturing of homes via our unique Offsite/ Onsite method succeeds where traditional construction and standard modular and volumetric methods fail.

By thinking in a completely different way about almost every aspect of construction with reference to manufacture, at Low Carbon Construction we have developed an achievable and relatively simple solution to reduce the chronic shortage of affordable housing.

Using a whole raft of new methods, the team at Low Carbon Construction seeks to deliver a minimum of 15,000 affordable homes per year by 2028; the construction of its first allocation of affordable homes commences in 2026/2027. However, our eventual plan is to develop 100% affordable residential developments.



We aspire to deliver:

1

Homes at a lower than market cost throughout the majority of the UK.

2

Diverse communities comprising not only those on low incomes but also first-time buyers, 'mover-uppers' and growing families needing a larger home, renters, renters-to-buy, key workers and retired people all living side-by-side.

3

Standard prices regardless of where the development is sited in the UK.

4

Affordable prices held in perpetuity.

Our affordable housing strategy



Frustrated with the continued lack of affordable housing provision across the UK, we have adopted our own direct Affordable Housing Strategy that creates new housing and communities in a way not seen before. The main aim of this strategy is to provide access to an affordable, quality and sustainable home within the means of those who are in need of such housing. Our sustainability features dramatically reduce utility bills, and we have developed numerous ways, for those who want to buy or rent. Five key objectives are set within this overall aim. Together they all under-pin our strategy, which seeks to ensure the provision of affordable housing.

All our homes are affordable homes and – in high value land areas – can be legally defined as Intermediate Affordable Homes for planning purposes available at under 80% of local market value. All are priced under 80% of the

national average price for purchase or rental for a similar size and specification new built property and within the wider general definition adopted by the government of affordable housing.

Within high value land areas, we are protecting the affordable home status for the life of the building with legally enforceable restrictions, such as covenants, as to the highest future sale price and future rental price that can be charged when disposing or renting the property in future ownership. Broadly this policy will: a) restrict the future sale price of the home to that of the original purchase price plus compounded CPIH over the period of ownership and b) restrict the highest rental charge that can be made to rent the home to that of the original rental charge defined by our National Pricing Policy plus compounded CPIH since first occupation.

We seek to ensure the provision of affordable housing...

1

Across all tenures within the UK thus working towards achieving a balanced housing market.

2

That is located in sustainable, new or existing communities within a balanced housing market that provides a mix of housing of different sizes, types and tenures to meet local needs.

3

That provides value for money and the best use of public resources where such funds have been made available in high value land areas.

4

That is well designed and of a high quality and produced using modern methods of construction (MMC).

5

That is well managed and is available long term.

Our solution

Purpose of our Affordable Housing Strategy

In May 2017, LCC adopted its own Affordable Housing Strategy following its development. The main aim of this strategy is to provide access to an affordable, quality and sustainable home, within the means of those who are in need of such housing.

Five key objectives are set within this overall aim, the first of which is:

1. To facilitate the provision of additional affordable housing across all tenures within the UK thus working towards achieving a balanced housing market.

The remaining four objectives also have direct links to the provision of affordable housing. Together they all under-pin our strategy which seeks to ensure the provision of affordable housing that:

2. Is located in sustainable, new or existing communities within a balanced housing market that provides a mix of housing of different sizes, types and tenures to meet local needs.

3. Provides value for money and the best use of public resources where such funds have been made available in high value land areas.

4. Is well designed and of a high quality and produced using modern methods of construction.

5. Is well managed and is available long term.

Our strategy also sets priorities for the future. These include:

Currently adopting an interim target of 15,000 new affordable homes per annum within five years.

Reviewing this target each year by exploring further innovative ways of providing new housing, with a view of increasing the target year on year thereafter.

We also have key objectives including:

Protecting and enhancing the environment.

Maintaining and extending the prosperity of both tenants and purchasers.

Providing a safe, affordable and healthy place to live.

Providing a balanced housing market within our developments.

Creating strong and inclusive communities.

Protecting the affordable home status.

These aims and key objectives have varying degrees of relevance to our Affordable Housing Strategy. The most significant is the achievement of a balanced housing market within our developments.

Within this key objective, we will contribute to a housing market which provides very high quality housing with a range of dwelling types to meet local needs – providing homes that are available to either rent or purchase – and ensure that there is fair and equal representation of occupiers across all our affordable housing developments between age groups, purchasers, tenants and social classes. This includes the provision of affordable housing for those on lower incomes and those who otherwise could not obtain housing easily.

Our affordable housing strategy

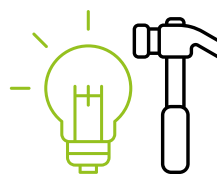
We will protect and enhance the environment by building low-energy housing, this being critical to climate change targets.

We will provide a safe, affordable and healthy place to live by ensuring that our occupiers are protected from fire, benefit from low rental costs or low purchase prices, continuing low energy costs, larger than average living areas proven to aide both mental and physical wellbeing, plus the latest technology in air quality control equipment installed within their home.

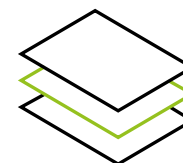
We will create strong and inclusive communities by making our developments secure with estate wide CCTV coverage to discourage crime and encourage social responsibility towards neighbours.



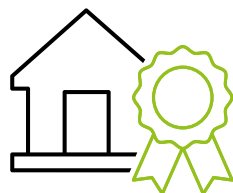
**Construction and
home safety**



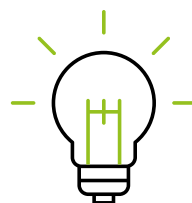
**Innovative
construction
methods**



**Fabric
specification**



Warranties



Innovation



**Development
experience**



**Nationwide
pricing**



**Financial
helping hand**



**Housing
availability**



Our solution

“Just building more homes will not solve the housing crisis. You have to focus on the social end of the market.”

Paul Smith, Group Chief Executive
Officer at Elm Housing Association



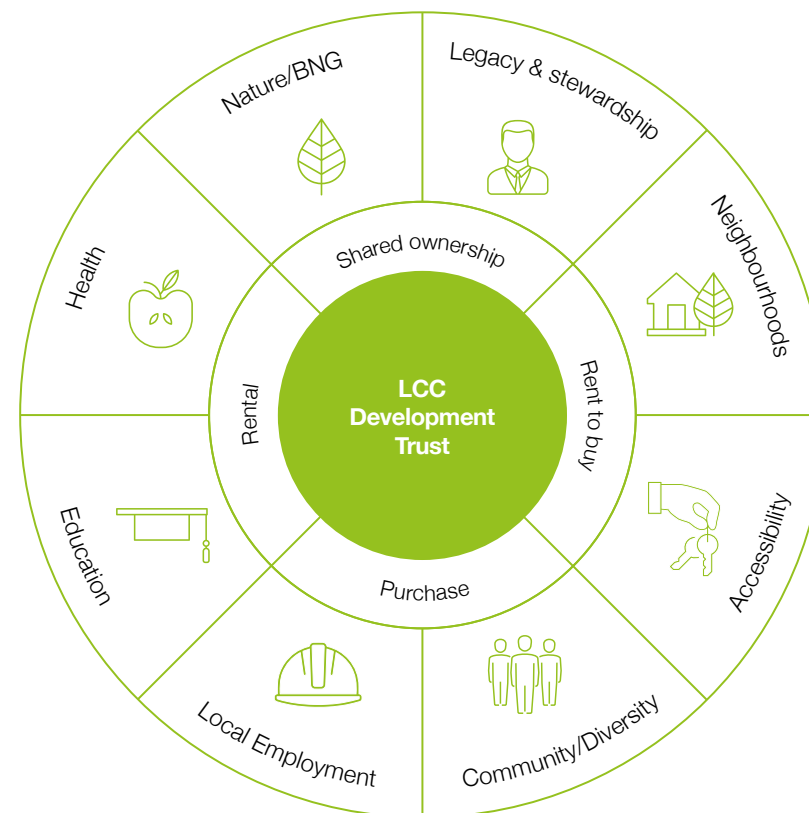
Social value: Community, employment and well-being

Whilst LCC supply all materials directly to site, our temporary flying factories will provide between 50 and 100 local employment trades roles for the duration of the site development. This is achieved by, wherever possible, using local sub-contractors for all labour requirements, providing local employment opportunity.

This is in addition to LCC's aim for all LCC homes to be close to employment opportunities, working with 'Employer Partners' as applicable, to meet the identified local need.

Having an excellent quality home and achieving social value is central to our vision. We believe that having a well-built, comfortable and efficient home within a supportive community fosters health and well-being, leading to opportunity to thrive in other areas such as education.

As part of our approach we aim to provide affordable tenures for rental, homeowners, key workers and our interpretation of shared ownership. We are invested for the long term in the developments we undertake, with a management role. We will develop a LCC Development Trust for each community with a focus on residents.



Our ongoing involvement and Development Trust provides the community with:

Legacy and stewardship

We aim to create a legacy in all developments, providing management of common areas.

Neighbourhoods

We foster place making that creates safe neighbourhoods that are distinctive, navigable and focused on the pedestrian.

Accessibility

We want to ensure our communities are accessible for all to provide opportunity and inclusion.

Community / Diversity

We orchestrate the infrastructure to allow for communities to grow and thrive where everyone is welcome.

Local Employment

We believe in providing local employment opportunities, and working with local Employment Partners.

Education

We believe that with a quality home, community and place to live, children can thrive in their education.

Health

We believe that the communities we create should enable good health and well-being.

Nature & BNG

We see nature as integral to the quality of place, and therefore include varying scales of green and open space, and BNG.

A financial helping hand



Choosing a new home is the easy part – arranging the funding however, can be the most stressful part of the purchasing process. At Low Carbon Construction, we are unique in providing affordable, sustainable, quality homes that truly are affordable in every respect. This ethos now extends to our financial assistance – arranged by Low Carbon Construction Finance – who are able to offer a vast range of residential and commercial mortgage solutions tailored to individual circumstances. See below.

Residential finance

We also recognise that our clients, as potential homeowners, will need access to mortgage finance. We can help you choose a mortgage from any one of the many providers accessed by Low Carbon Construction Finance's 'whole of market' mortgage providers. We are sure that in most circumstances a mortgage can be obtained. As an added benefit, there are no mortgage application or legal fees if applying through Low Carbon Construction Finance for a residential mortgage on a property being purchased from us.

Whilst there will be no requirement for our clients to use the services or mortgage products offered by Low Carbon Construction Finance, we believe their expertise will expedite the whole process of borrowing and also provide new and innovative financial products such as 'Mortgage for Life' and the 'Retiree Mortgage'.

All of our financial assistance is offered exclusively via Low Carbon Construction Finance – an appointed representative of Charles Louis Mortgage Advisors (FCA No. 759660) who are authorised by the Financial Conduct Authority. Further details are available at their dedicated website lccfinance.co.uk and our website lowcarbonconstruction.co.uk lists all the various financial assistance available.

Renters and retirees

No rental deposit or security guarantee whatsoever. Up to 50% lifetime mortgage available with no monthly payments required at all.

Rent to buy

100% refund of all rent paid during the first two years of occupation towards the deposit to purchase.

First time buyers

We will match a purchaser's deposit up to 10% of the purchase price.

Moving home

We will give a 100% part exchange value for the purchaser's old home and pay their removal, SDLT, legal and mortgage application costs.

Employment partners

We will work with local partners to provide allocated homes within our developments to suit identified need.

Key workers

Will be able to borrow up to 10% of the purchase price unsecured for up to 15 years at 0% interest.

Team members and supply partners

LCC are proud to work with some of the most talented professional service providers as well as some of the most innovative material and product suppliers in the UK.

Our mission is to build the most affordable, sustainable, quality homes as possible and without the collaboration and support of our supply partners our mission would simply not be possible.

To have met the criteria to become our team member or supply partner the individuals and companies, are not only able to supply the highest quality service and products but also share our same ethos and culture in the way they conduct their business.

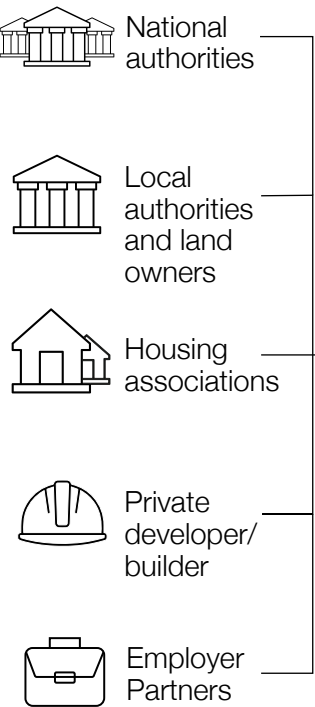
We look forward to a continuous collective learning by working together again and again. We collaborate with our partners to ensure shared R&D objectives can be achieved as the Low Carbon Building System is refined in readiness for the future. We are very excited to continue these working relationships and believe this is the only way to truly deliver on zero carbon goals.

To see our full team and supply partners, please visit our website at lowcarbonconstruction.co.uk/team-and-partners/



Land acquisition and joint venture

Whether a land owner, local authority, housing association or private builder, when an organisation allocates land to LCC, we take full responsibility for delivering 100% affordable homes. Our funding policy means that we can enter an agreement where there is no cost to our partner.



Uniquely we offer all our homes, whether sold or rented, at a Standard National Price wherever we have a development site throughout the UK, and standard pricing will be revised yearly.

The homes remain affordable in perpetuity, thus, they are not targeted by speculators, but purchased and lived in by people who genuinely require affordable homes. We aim to use a number of ways to acquire land across the UK. All houses available on our developments will be freehold, from 1 bedroom terraced houses to 5 bedroom detached houses, and are all available on the same terms.

High value land areas: Where financial assistance/subsidy is needed. Where central/local government financial assistance or land subsidy is needed in order to deliver our buildings at our standard national price.

By working with major housing developers, we can build all their statutory affordable housing for them on each of their substantial sites. By their subsidising the land cost of the affordable housing element of their site, we are able to satisfy all their LPA/S106 affordable housing requirements, whilst they are free to produce and sell purely market value homes.

Working directly with government to utilise vacant and redundant brownfield sites.

Working directly with local authorities and registered housing associations to identify and expedite planning and delivery for development sites where 100% affordable homes can be built.

Utilising government and local authority financial assistance for land purchase.

All other areas of the UK. Where there is no need of financial assistance or land subsidy.

Direct open market purchase of advertised suitable development land.

Working directly with both government and local authorities to identify privately owned development sites that, despite permission, have failed to be developed – to put forward proposals for joint venture/purchase of such land.

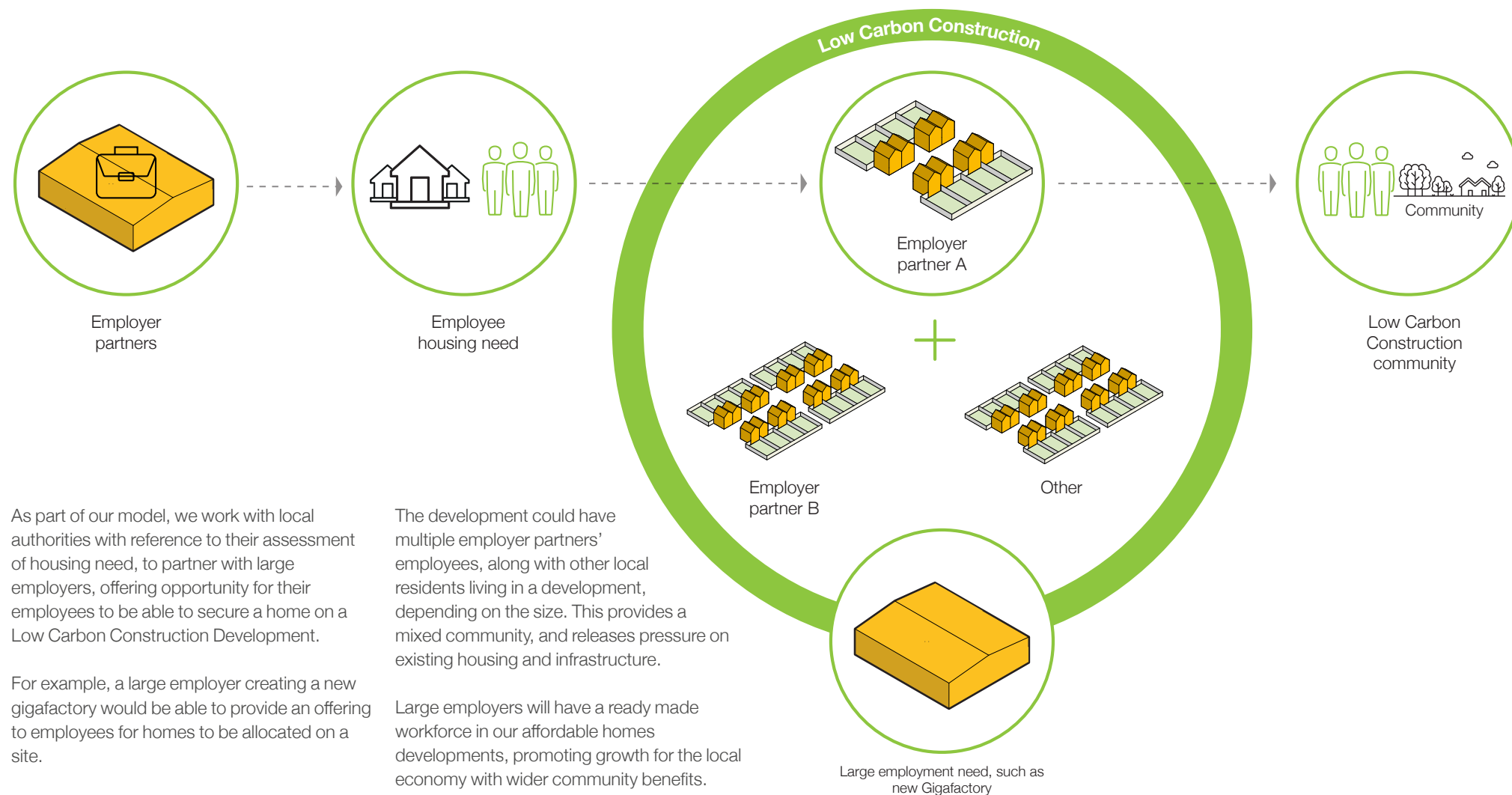
Working with redundant brownfield site owners to redevelop their sites for 100% affordable housing.

Working with registered housing associations to deliver volume affordable housing under advance purchase contracts.

Working with all the major commercial land agents to identify suitable sites.

Joint venture/purchase of land proposals, where existing land owners of substantial development residential or commercial plots are seeking to maximise their return, will always be considered with or without existing planning permission.

Employer partners



Designed for Manufacture & Assembly (DfMA) & MMC

Volumetric, modular construction, modern methods of construction (MMC) and designed for manufacture and assembly (DfMA) are not new concepts, however hold great potential as a desperately needed solution to the housing crisis, in particular in the provision of affordable housing. By using manufacturing techniques, as opposed to construction, a high level of quality assurance and production speed, previously not possible, becomes a reality.

Our vision to manufacture housing sits within Category 1, 3D primary structural systems, of the MMC definition framework, by the MHCLG Joint Industry Working Group on MMC.

According to the UK Green Building Council, approximately 10% of the UK's carbon dioxide emissions are directly linked to construction. To be able to produce buildings at a cost which competes with conventional construction methods with a resultant significant reduction in CO2 emissions and a further reduction in these emissions in the running of these buildings, gives the UK a huge opportunity of meeting its net zero targets for the future, in content with wider sustainability aims. Serious changes need to be made to how we build our homes. House manufacturing offers one of the most comprehensive solutions with cumulative long-term effects as more and more of the housing sector becomes decarbonised. Simply, the UK needs to adopt modular manufacture as an MMC as other countries already have. According to Forbes, during the 2017–18 period, only 7.5% of the homes built in the UK used prefabricated or modular elements compared to an immense 84% in Sweden.

At LCC we agree with the former housing minister Esther McVey's view that: "We must invest in this new technology. The benefits are clear. Some modular homes can be built in a factory over a week and assembled on site in a day. Industry has told us some homes built using modern methods can have 80% fewer defects and heating bills up to 70% lower. Homes built using modern methods can be of higher quality, greener and built to last. I want to see a housing green revolution." To achieve the level of new affordable homes per annum required across all sectors is an unrealistic target under the present methodology. If goals are to be achieved, then the availability of land will be a key component, particularly in areas around large employers.

At present, affordable housing is primarily delivered through the planning system by 'requiring' private housing developers to build from 10% to 50% of their market value estates for 'social and affordable' need via existing social housing providers. All the major housebuilders in the UK simply cannot afford to deliver affordable housing in this way and cannot continue to be 'forced' into building uneconomic homes. It is well publicised that these companies actively 'avoid' social housing provision wherever possible for the very real reason of economic survival.

We can see this simply does not work and we agree with Sajid Javid, former Secretary of State for Communities and Local Government, in saying that: "The housing market in this country is broken and the solution means building many more houses in the places that people want to live. Also taking action to radically increase brownfield development and to bring life back to abandoned sites. That means high quality housing for families in town centres, breathing new life back into our high streets, turning abandoned shopping centres into new communities and increasing density of housing around transport hubs to build homes that people want to live in."

It makes complete sense to concentrate this type of housing in areas where employment is available and company growth is key.

The above words echo those of the Welsh Government who set their own ambitious affordable housing provision targets back in 2016. The late Carl Sergeant (formerly Cabinet Secretary for Communities and Children) in November 2016 set out how the Welsh Government are seeking to secure the delivery of an additional 20,000 affordable homes and advised that this would be done through the following:

Supporting construction of more than 6,000 homes through the Help to Buy scheme. Phase II of the scheme will see £290 million invested until 2021.

Continuing to support the construction of social housing for the most vulnerable through tried and tested schemes including the Social Housing Grant (SHG).

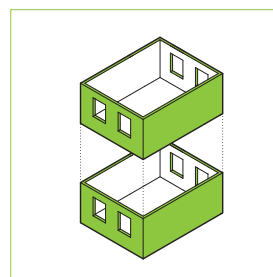
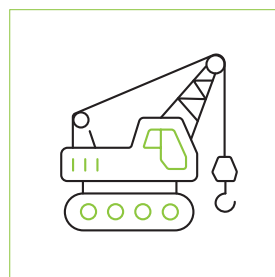
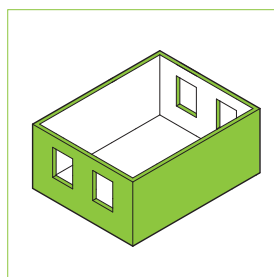
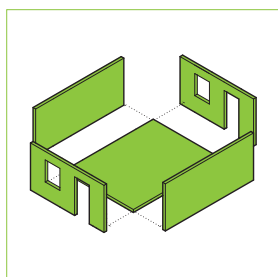
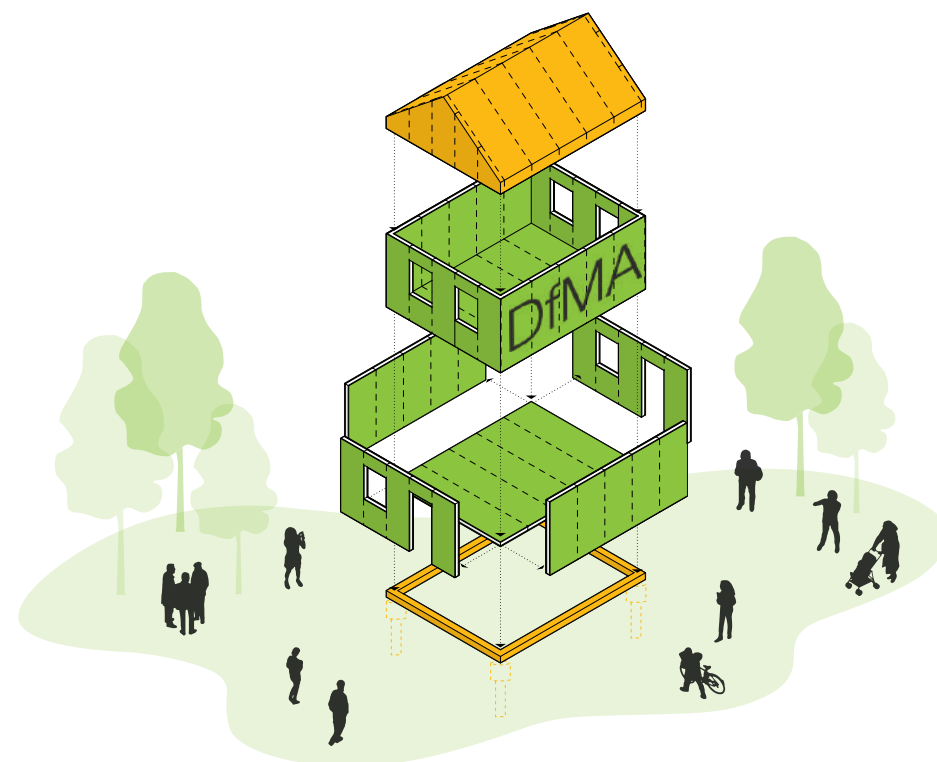
Developing a more ambitious house building programme which is ambitious in terms of the design, quality, location and energy efficiency of the homes we deliver.

Supporting a variety of housing tenures in order to respond to a wider range of housing needs.

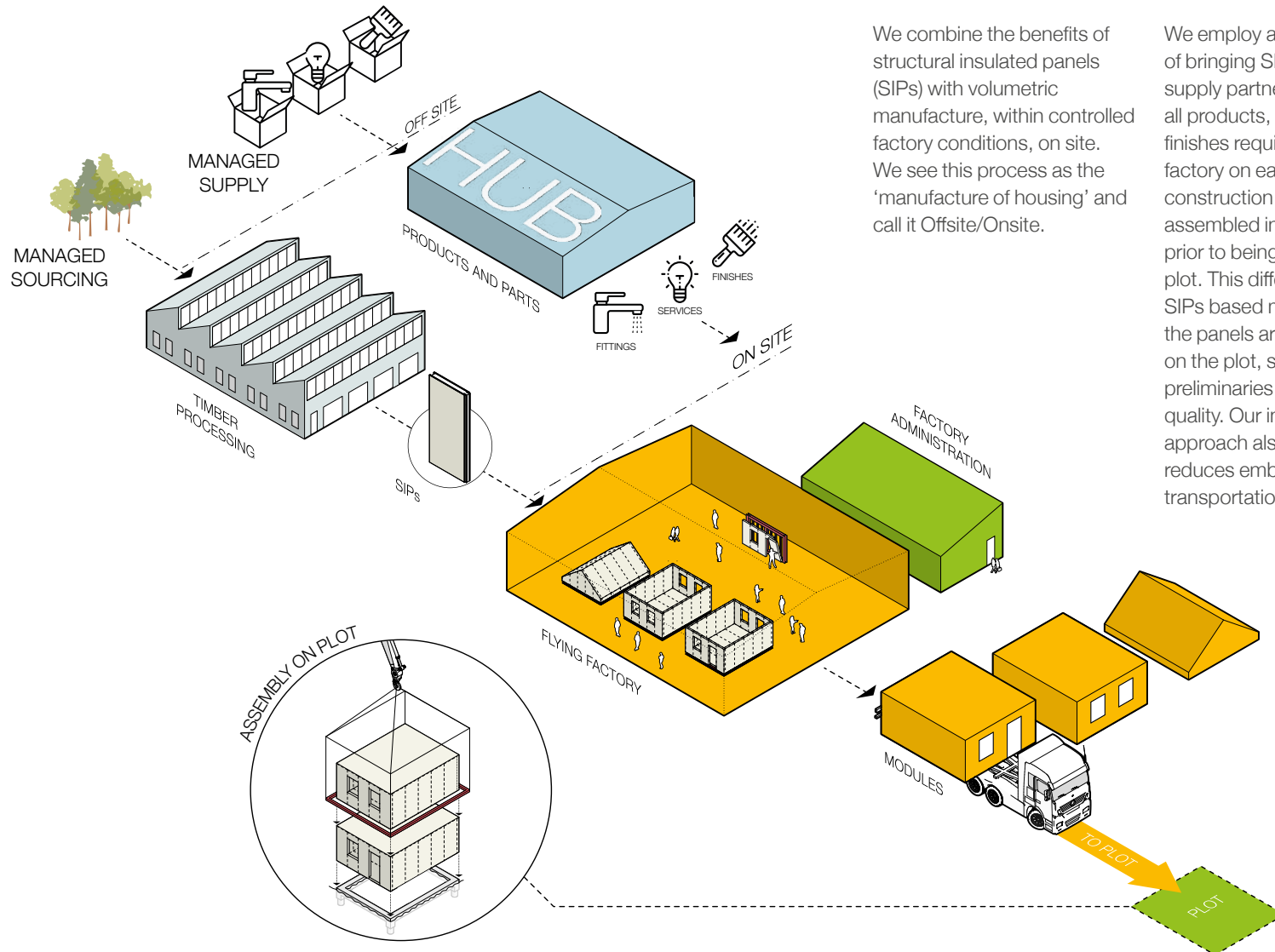
Developing a Rent to Own scheme which will support those who aspire to buy their own home but struggle to save a sizeable deposit.

Promoting a range of routes into home ownership at an affordable cost, especially for first-time buyers in areas where they are often unable to purchase a home due to high local property values.

We believe MMC and DfMA have an essential part to play in meeting the enormous challenges we have in contemporary society. We think there are great opportunities to be leading the way in the future of housing, through house manufacture rather than traditional methods of construction.



The process



We combine the benefits of structural insulated panels (SIPs) with volumetric manufacture, within controlled factory conditions, on site. We see this process as the 'manufacture of housing' and call it Offsite/Onsite.

We employ a unique process of bringing SIPs from our supply partner, as well as all products, services and finishes required, to our flying factory on each development construction site, to be assembled into modules, prior to being taken to their plot. This differs from other SIPs based methods as the panels are not erected on the plot, saving time, preliminaries and ensuring quality. Our innovative approach also significantly reduces embodied carbon in transportation miles.

Within the flying factory, we use an innovative process of assembling walls, floors and ceiling or roof components to produce a complete storey, ground, first floor and roof module.

We then fit out each module with products, services and finishes, using local trades providing a fully finished floor, inside and out.

These modules are then 'air glided' from the factory to the yard, lifted onto a lorry, which then takes them the short distance on site to the plot, which has foundations already assembled.

The modules are then lifted by crane into position, with finishing connection details completed.

Our process leads to better performing buildings that can be constructed faster, safer, to a higher standard and more economically than traditional construction methods.

Typologies

A 105m² (GIA) three bedroom house can be delivered in component form (ready for assembly in the flying factory) in as few as four individual articulated deliveries and fully built out and completed in six working days.

Currently we offer the following typologies:

1B2P House

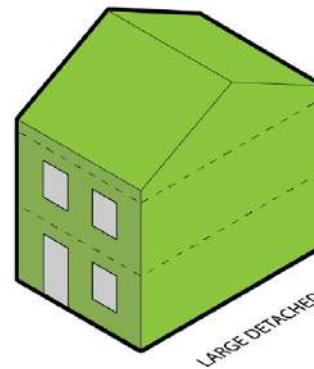
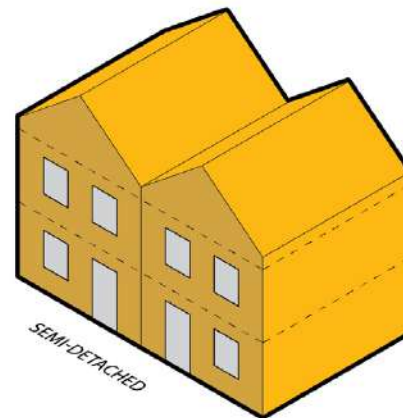
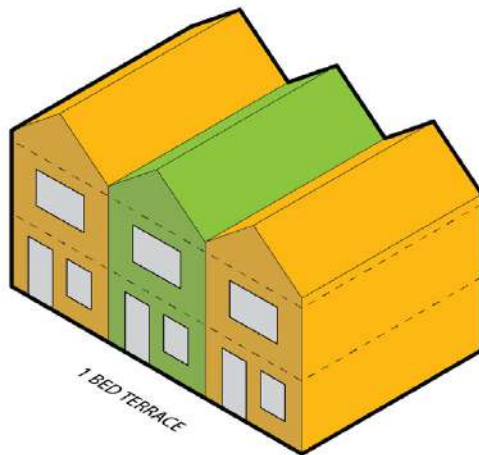
2B4P House

3B5P House

3B6P House

4B7P House

5B8P House



Our homes are designed to be tenure blind, yet affordable. They are designed to be two storey with a roof over.

Given the system build approach and panel sizes we are able to construct varied forms and configurations.

All of our homes meet the Technical Housing Standards – Nationally Described Space Standard and Part M requirements.

Our homes will meet and likely exceed future standards such as the Future Homes Standard and UK Net Zero Carbon Building Standard.

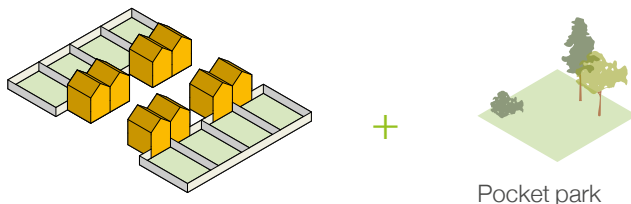
Scalability

At Low Carbon Construction we consider certain thresholds within our developments for the inclusion of other complimentary uses, to ensure the community is supported by functions required to foster a sense of place. These include health and community assets, commercial uses, and varying scales of green and open spaces.

Integrating into context is paramount to the success of the community extension and therefore a review audit is undertaken to understand the existing facilities in close proximity. This and the scale of development, will influence the offering.

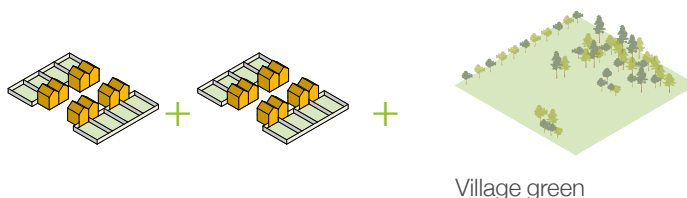
100–200 homes

Homes are supported by a pocket park.



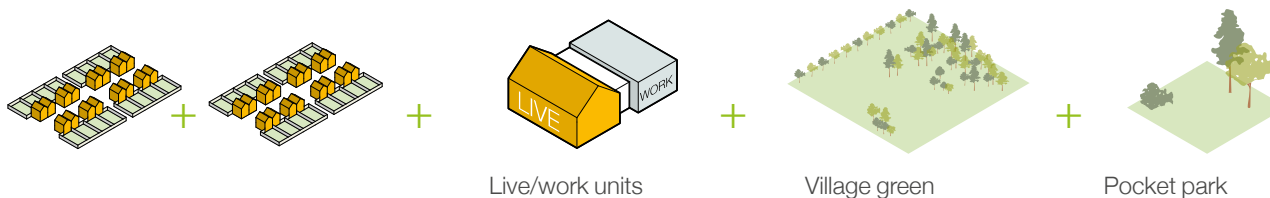
200–500 homes

Homes are supported by an enlarged green space in the form of a village green to create a sense of place, and offering opportunity for community gathering.



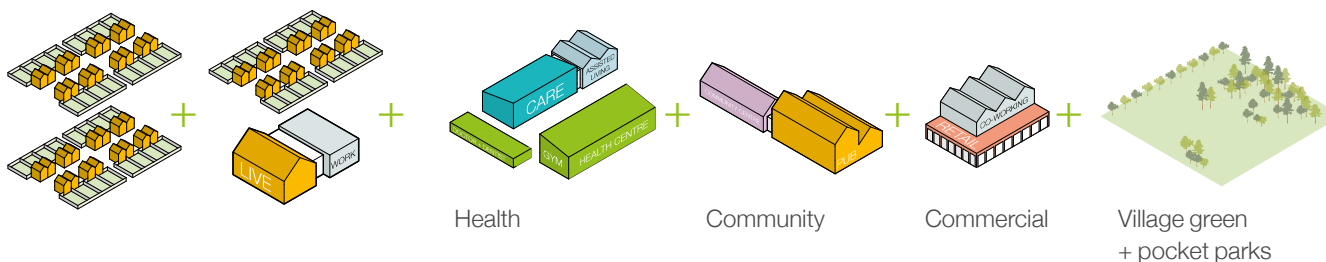
500–600 homes

Within this threshold all of the benefits of the smaller developments are included, however the additional homes are supported by live-work units and a combination of green spaces interspersed through the community.



600–800+ homes

All of the previous benefits are offered as described in the smaller developments, however the additional homes are supported by health, community, commercial uses and more green spaces.



Non-residential uses

Community, health and well-being, mixed demographics and uses are fundamental to the success of creating a sense of place. In support of the homes within our communities, non-residential uses are introduced. We believe that these uses should come together around the community heart; the village green. This offers opportunity for spontaneous interaction and complementary integration.

Live/work: The living and working delineation is becoming ever more blurred to suit busy lives. We believe for those where a home office isn't enough space or where co-working or office space is too much, that purposely designed live work units should be offered, to foster an entrepreneurial culture.

Village pub and community centre: The heart of the community in the UK has been the village green and village hall, for generations. We see a reinterpretation of this typology to bring together into a flexible and community focused asset which benefits from its proximity to other complimentary uses.

Retail (shops) and co-working: Small complimentary retail offerings are provided, not to detract from existing in proximity, but to compliment with the essentials, for example no

takeaways would be provided, but a local shop. Co-working spaces build on the principles of the live/work offering but provide additional space and flexibility.

Assisted living and care:

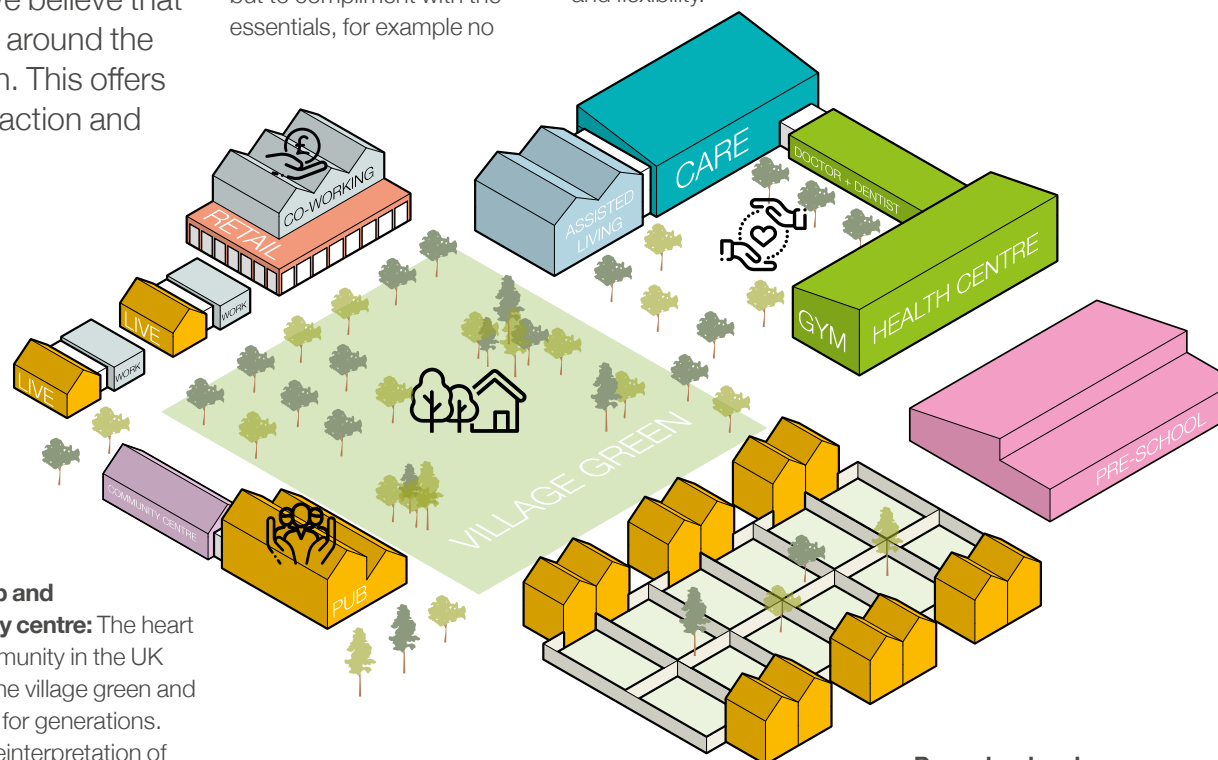
A range of provision for those with varied needs would be integrated, including later living homes for those who have their independence, assisted living for those who require some assistance, and care for those with greater needs. Fundamental to these uses are their proximity to complementary uses and the community, offering potential for health and well-being improvements through connection.

Health centre and gym:

We believe that health and well-being should be central to any local community. The doctors and dentist provision, would be linked with the gym and the care provision.

Pre-school and nursery:

Dependant upon the scale of development and existing provision, pre-school and nurseries will be integrated.



3. Our system

LCC homes are manufactured entirely within a factory environment in accordance with the Low Carbon Construction Building System.

General specification

External walls: 175mm SIPs with either SIP splines or 1200mm centre Glulam beams as required.

Floors and roof: 175mm SIPs with 1200mm centre Glulam beams.

Internal walls: 100mm SIPs with 1200mm centre SIP splines.

Polyurea, or equivalent, sealed prior to exterior finish.

The above general specification results in an airtight high performance 'fabric first' building with an anticipated energy performance certificate of A.

Very low maintenance exterior finishes, with aluminium gutters and downpipes, and triple glazed argon-filled A rated windows.

Skirting heating, with every room individually controlled by thermostat and solar assisted heat pump water heating. No gas, means no servicing costs or breakdowns.

Solar PV (with battery storage) on every home, wired for electric car charging point and LED downlights throughout.

Fire suppression mist system in every room, and MVHR ventilation, humidity and heat recovery system.

Personal choice of fittings and finishes, such as kitchen units and worktops, wall tiles, bathrooms and flooring including fire retardant underlay as standard.

Technical performance/ warranties

Our SIPs system has been developed with our supply partners. The lifespan of our system is comparable to any traditional building method, with loadbearing and non-loadbearing structures to BBA, CE and BM Trada certification. We provide a 10 year insurance backed new home guarantee.

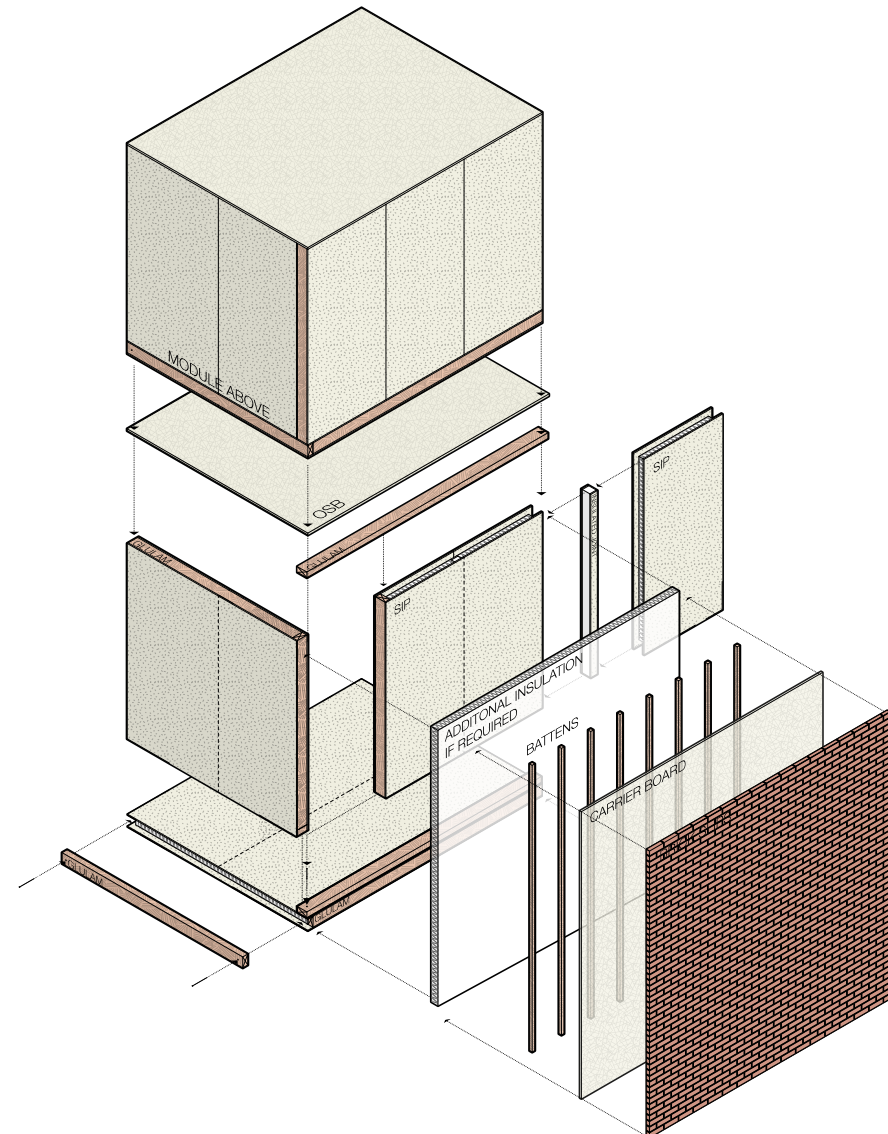
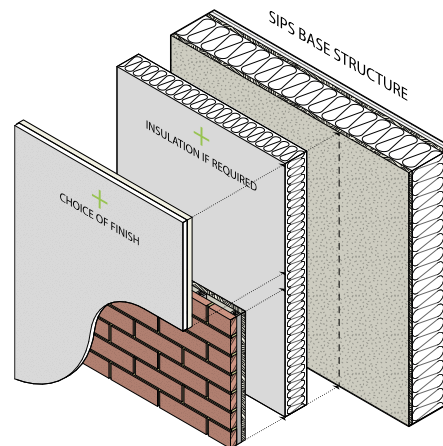
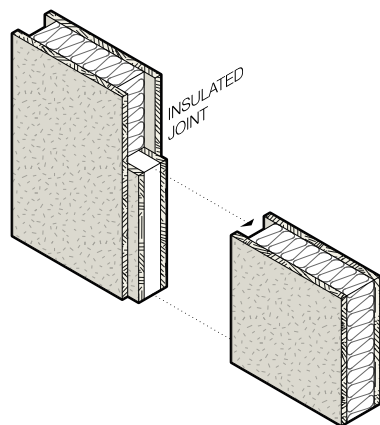
Structurally insulated panels (SIPs)

Our SIPs are developed with our supply partners, who have over 85 years of experience and innovation, which will continue as R&D solutions develop further to balance with embodied carbon reductions.

The Low Carbon Construction building system panels are faced on both sides with high-density 15mm OSB/3, bonded to the polyurethane insulation core during manufacture. Our panels can be used for floors, walls and roofs and can be either loadbearing or non-loadbearing, and have BBA, CE and BM Trada certification. Our SIP system is Formaldehyde free and our selection of materials and finishes follow the principle of cradle to cradle where practical.

During manufacture the insulation core is autohesively bonded to the facings, providing a more reliable adhesion than traditional bonding processes. Our system includes an innovative junction detail improving psi-value and airtightness performance, with as low as 0.08m³hr air changes possible in the panel itself.

Our panels come in sizes of up to 1,200mm (w) x 6,000mm (l), with a range of thicknesses to suit required elemental performance, however typically 175mm thick 1200 x 2700mm panels are used which achieves 0.16W/m². Additional insulation applied as required to achieve as low as 0.10W/m²k. All traditional types of coverings and claddings, can be used on SIP structures to suit the project specific requirements.



The flying factory

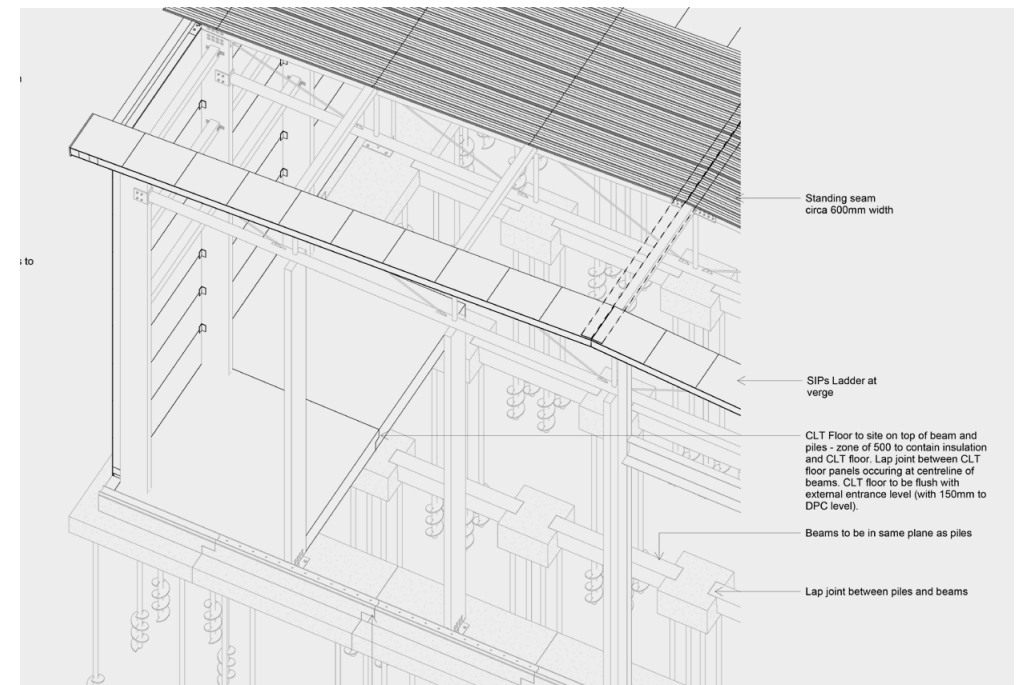
Due to our R&D innovation since 2011 we are able to use our unique Offsite/Onsite method of volumetric SIPs house manufacture which allows us to install a flying volumetric SIP assembly factory on the development site. We then dismantle the factory leaving no trace at the end of the development cycle once all the homes are delivered for reuse on other sites.

The volumetric Offsite/Onsite building method employed by LCC is based on the use of all materials being delivered from a central location in as few deliveries as possible.

These flying factories come in two sizes, allowing us to deliver up to 250 homes per factory, per annum, on each site we commence and the method removes all the

volume and delivery barriers faced by modular offsite builders and traditional construction methods, to date.

Where demand requires, multiple flying factories can be used on a singular development site to increase the volume of delivery even further.



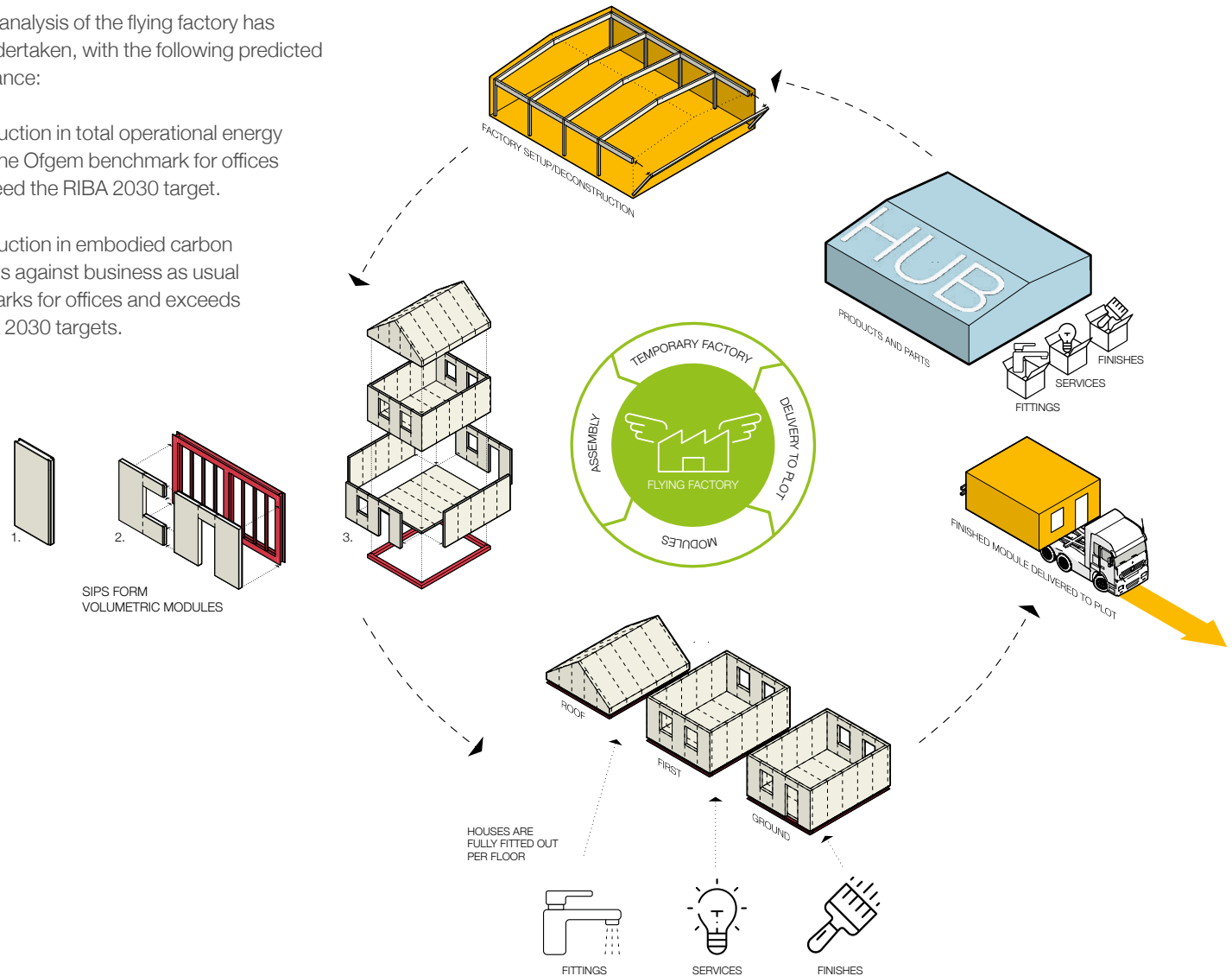
The flying factory walls and roof sections are constructed from our SIPs system incorporating metal and Glulam beams and sprayed in polyurea. These are then slotted and bolted to each other and to piled metal frames. The factory is designed to accommodate machinery which is used to bring the SIPs together to form our unique volumetric homes which can then be 100% completely fitted out externally and internally.

Whilst LCC supply all materials directly to site, our flying factories will provide between 50 and 100 local trades operatives with employment for the duration of the site development. This is achieved by, wherever possible, using local sub-contractors for all labour requirements.

Detailed analysis of the flying factory has been undertaken, with the following predicted performance:

82% reduction in total operational energy against the Ofgem benchmark for offices and exceed the RIBA 2030 target.

64% reduction in embodied carbon emissions against business as usual benchmarks for offices and exceeds the RIBA 2030 targets.



Standards, sustainability and skills

A high performance fabric is essential, however efficient form factors, optimised orientation to capture solar potential, and overheating mitigation strategies are required to reduce energy demand for space heating and cooling.

We are in a climate and biodiversity emergency and take our responsibilities as a house manufacturer very seriously.

Therefore sustainability, energy and comfort standards such as Passivhaus and BREEAM provide a baseline influence for us, combined with reference to the work by LETI, targets set out under RIBA 2030, and the evolving UK Net Zero Carbon Building Standard.

We are looking to meet and exceed these requirements, with the development of our own Low Carbon Construction Standard. We are planning for the future and therefore were an early adopter of removing the need for gas boilers, focusing on electrification which accords with SAP, evolving UK standards and building regulations.

As our high performance building system is manufactured in controlled factory conditions, thermal bridging details, airtightness and moisture tightness can be controlled.

We utilise a kit of parts approach to simplify detailing, deskilling aspects of the process, and to improve the ease of the build and to achieve high performance psi value junctions.

Combined with triple glazing as standard, we are able to utilise the benefits of MVHR to recover heat from air which would otherwise be wasted, expelling moisture, reducing energy demand and creating excellent indoor air quality, whilst balancing with required overheating mitigation for future weather files.

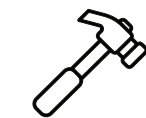
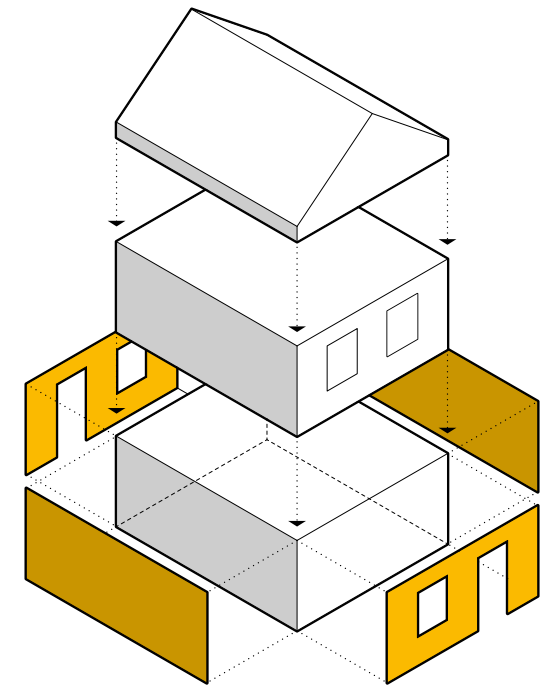
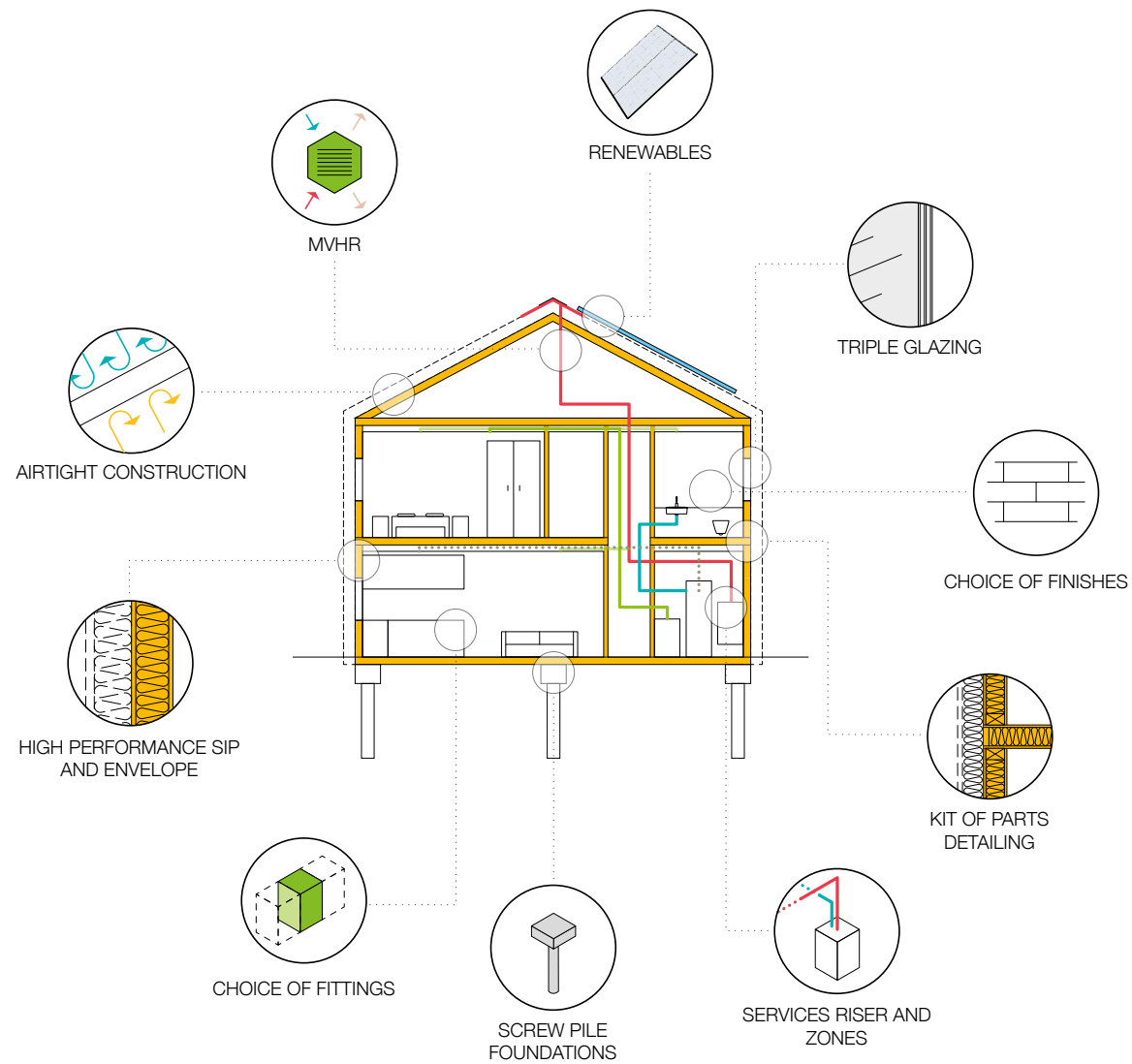
Although minimal heating is required, as we integrate solar PV and battery storage as standard we can provide the small amount of space heating required through skirting heating, meaning no radiators are required.

We use solar assisted heat pumps (SAHP) for water heating system, with electric feed to provide a home's hot water requirements. This means that our homes are very energy efficient, with low running costs and are comfortable.

With a digital twin, and controlled factory conditions we are able to design out waste, and are able to plan for connections of the modules to ensure efficient erection on the plot. An example of this are our wiring looms which are based on a 'plug and play' principle.

Efficient services risers and zones are meticulously planned to ensure there are no surprises when being installed within the factory.

We continue to invest in research and development with our partners, to find ways of enhancing our build system during manufacture, its life cycle, but also considering end of life disassembly to further reduce remaining embodied carbon. An example of this is shown in our foundations which are screw piles that could be removed and reused.



Deskilling
construction to
manufacturing



Pre-tested and
approved
system



Connecting
service loops
between modules

BIM and customisation

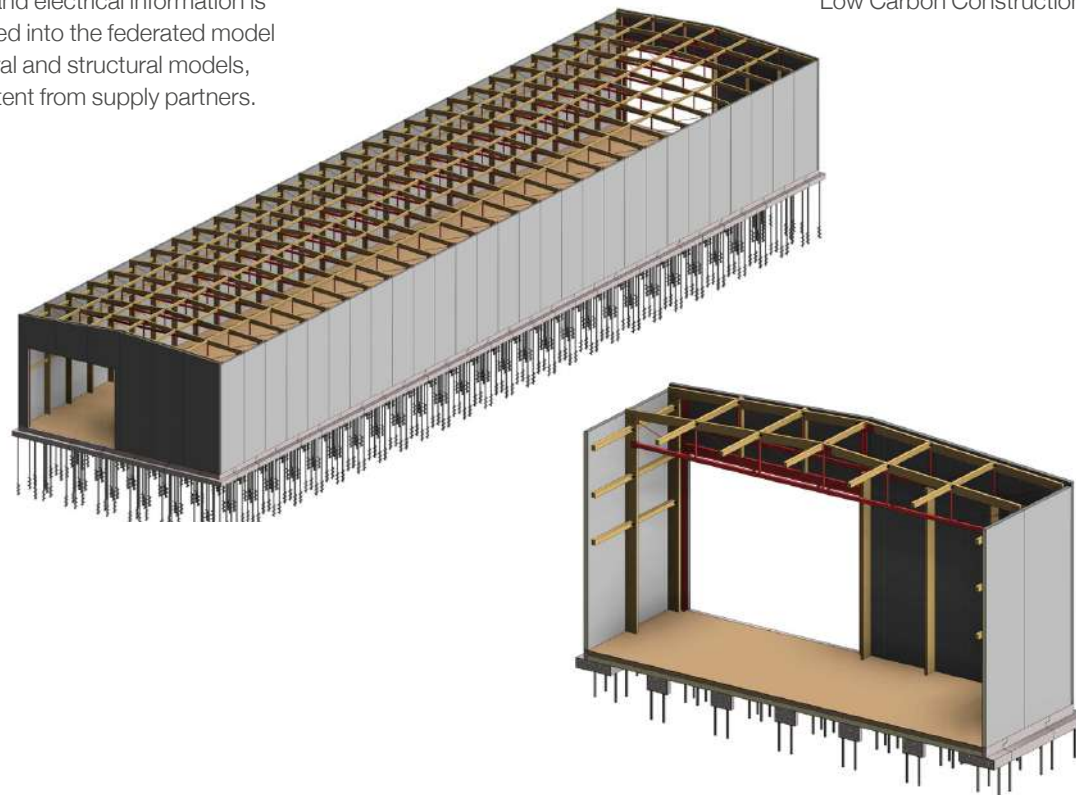
Digitalisation of the design and manufacture process enables efficiency, combined with the opportunity for some customisation within homes.

At Low Carbon Construction we understand the benefits that building information modelling (BIM) provides, and our consultants work to ISO 19650 standard (BIM Level 2, as a minimum). As demonstrated with our Flying Factory development, we create digital twins of our homes to meticulously plan every detail, enabling efficiencies within the manufacturing phase, reducing potential for errors and waste. Mechanical and electrical information is modelled and inserted into the federated model including architectural and structural models, as well as other content from supply partners.

This enables us to tag elements in the model and building, creating a linked digital twin for use during the lifecycle of our buildings. Use of these models enables detailed analysis including operational and embodied carbon performance analysis.

With the use of BIM models we are able to offer residents customisation on certain aspects such as fixtures, fittings and finishes.

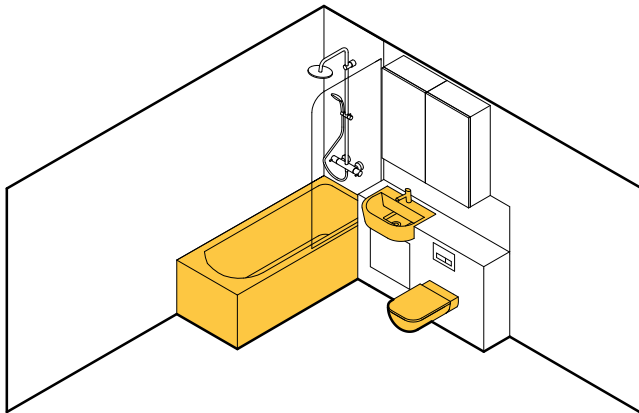
Although this customisation is limited within the overall build, by providing this opportunity to select from options, provides residents with a home that they can tailor to their taste, whilst achieving our goals for efficient delivery of the Low Carbon Construction Building System.



Customisation examples

Bathrooms

Example shown: Selection of sanitary ware from choices available.



Fixtures:

Sanitary ware



Fittings:

Lighting

Ironmongery

Electrics



Finishes:

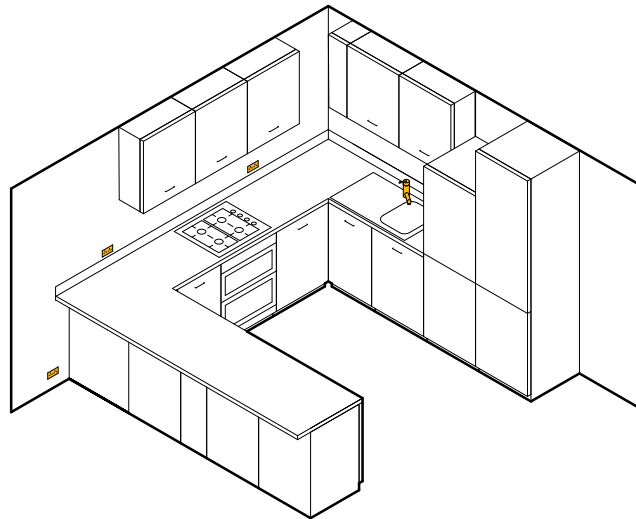
Tiling

Floor

Wall and timber

Kitchens

Example shown: Selection of socket and tap from choices available.



Fixtures:

Cabinets

Appliances

Worktops



Fittings:

Lighting

Ironmongery

Electrics



Finishes:

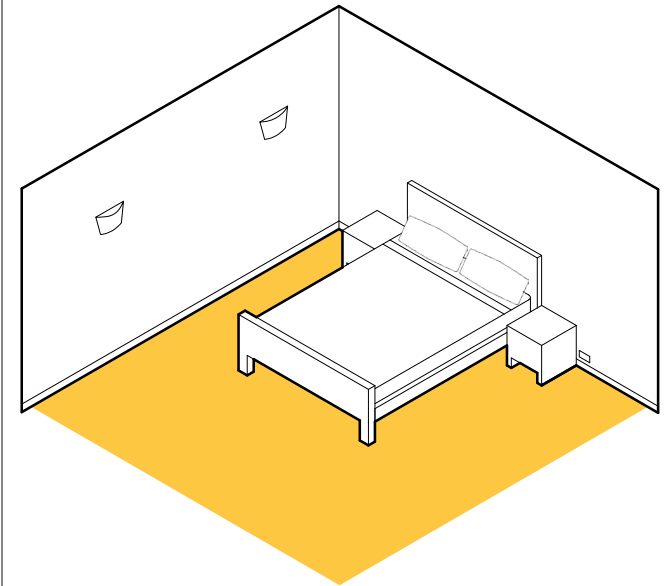
Tiling

Floor

Wall and timber

Bedrooms (and other rooms)

Example shown: Selection of carpet from choices available.



Fixtures:

Wardrobes



Fittings:

Lighting

Ironmongery

Electrics



Finishes:

Floor

Wall and timber

4. Our vision

Our conceptual masterplan demonstrates how the components come together to create an exemplar of high quality affordable housing and placemaking, centred around people, community, nature and well-being.



The village green and pocket parks

Functional landscaped spaces are provided for community gathering including smaller pocket parks and larger communal village greens. Integrated within these spaces will be Public Open Space (POS) and Biodiversity Net Gain (BNG) provision, further enhancing the benefits to health and well-being for the community.

Bio-retention basins, raingardens and swales, combined with rainwater harvesting would capture water, providing opportunity for an active and resilient public realm. Integration of different scales and types of functioning landscape enables residents and the wider community to enjoy these spaces whilst providing important infrastructure.

Pedestrian friendly navigation through the community offers opportunity for spontaneous interaction, creating active well-being and access to green space.



Site topography and road strategy

We believe residents should have their own driveway. By rethinking road layouts and having shared surfaces, central landscaping and lighting can be provided, with traffic calming via junction planning and one way lanes.

Typical road
and junction
layout



Our approach to topography and laying out streets, is that where practical we level sites to ensure minimal or no gradients. If required, based on street layout we will terrace banks of dwellings to ensure services and roads are accessible.

We see our shared spaces as being accessible to all. We do not have traditional kerbs, instead we use level surfaces with different textures and colour to provide visual difference and zoning on the shared surfaces, creating defensible space in front of homes with landscaped planters.

Functional landscaped SUDS provide separation between passing cars on one way carriageways, and visual enhancement between homes and passive traffic calming measures. These spaces integrate visitor parking and are broken to provide passing spaces and two way traffic movements. These spaces are also future-proofed with service ducts for street lighting in the centre of the roads.

1

Unadopted shared surfaces: One way.

2

Unadopted shared surfaces: Two way/ passing place.

3

Visitor car parking spaces integrated into landscaped SUDS zones, connected to services below.

4

Easily accessible service trench.

5

Driveways to all houses.

6

Street lighting in centre of roads, with services trench.

7

Storage including bikes, bins and recycling.

8

Planters and defensible zone.

Services and future proofing street scene

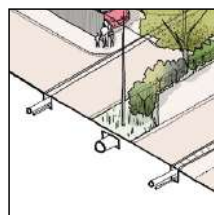
Technology offers great opportunities for the future. We have planned for it with easily accessible services trenches to enable upgrades in the centre of streets.



PV and battery storage



Driveways between houses



Future services adaptability



Integrated parking

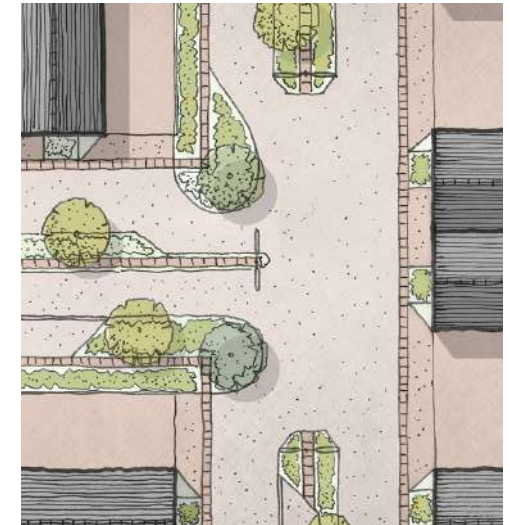


SUDS



LED street lighting in centre

Homezone and street hierarchy



Shared surfaces with integrated central street lights and services conduits, are enhanced by tree lined avenues with integral visitor parking and SUDs.

Future vision

We are truly excited by our vision and its implementation across the UK, to be the manufacturer of choice for the delivery of truly affordable and sustainable homes. We welcome others to share in our vision for new communities, where people come first.

