

BakerBrown

Sustainability Statement

Project
Hobdens Lane

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1551

Site Location
2 Hobdens Lane
Ardingly
BN6 8SB



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Sustainability Strategy Introduction

Introduction

BakerBrown is a practice of architects that have been committed to responding to the Climate & Ecological Emergency since they were founded in Lewes in 1993. They have practiced, taught, and researched around issues of sustainable low carbon design and associated closed loop systems for over 25 years delivering many award-winning projects including a new country house in Hadlow Down, The Greenwich Millennium Village, and The Brighton Waste House.

The practice studies projects at design, construction, operation and demolition stages, considering the whole life of a building.

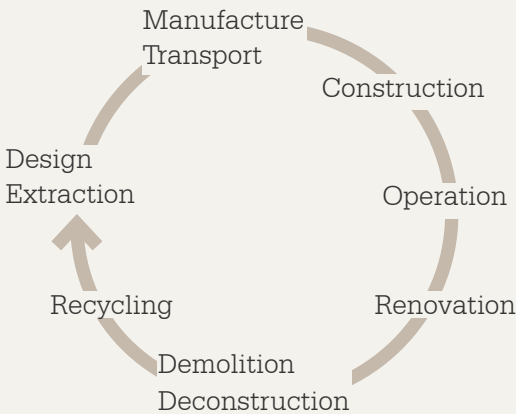
In addition to designing buildings to low carbon standards, BB employ a 'Resource Mapping' exercise to locate a pallet of local materials for each project. This can even include materials normally demolished and sent to landfill or incineration. For example fire damaged bricks from a site at Streat Hill will be recycled to create 'new' tiles formed on site for the replacement dwelling. The SDNP Planning team appreciated our Resource Mapping technique as it will radically reduce the 'carbon footprint' of developments

by reducing the amount of material arriving from across the world, whilst simultaneously reducing waste from the construction sites and utilising materials from the South Downs and Weald. This will help create a sense of place and of course support local jobs.

Principles applied to 2 Hobdens Lane

The proposal for 2 Hobdens Lane is in line with BakerBrown's ethos and intends to follow and exceed local and national benchmark sustainability standards, taking into consideration standards such as PassivHaus for principles such as optimization of operational energy and well insulated buildings.

This report outlines BB's typical approach to design and to this specific project. The practice and the client will strive to ensure the strategies noted in this document are realised if the project is approved.



Embodied Carbon Reduction

We have listed below some core guiding principles for our approach to each project. The careful assessment and reuse of existing stock (which makes up the majority of what we will be inhabiting in 30 years) is a vital part of this process, essentially helping turn the linear approach into the circular approach.

The strategy is:

- Ensure that where possible we are 'Mining the Anthropocene' (existing human-made products and materials) and protecting natural resources by using reused materials, materials with high recycled content.
- Ensure that the supply chain of materials and components have Environmental Product Declarations (EPD's), where possible, and are locally supplied from sustainable, ethical, non-toxic sources.
- Limit use of materials with high embodied carbon (Concrete, Bricks)
- Specify that high embodied carbon materials are easily removed, when and if the dwellings are demolished, so that these can be reused
- Use low carbon, organic and carbon sequestering materials such as timber, cork, earth.
- Maximise structural efficiency to reduce the quantity of materials used.
- Undertake a Resource Mapping exercise in order to

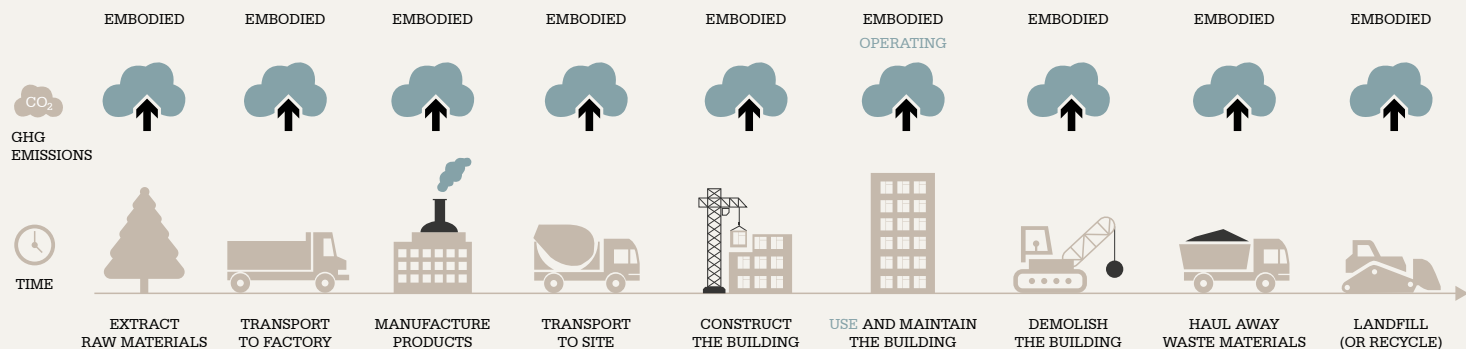
ascertain the local availability of second-hand or new material, components, technologies, services, labour, etc.

- Ensure the buildings uses/supports other Closed-Loop Systems such a rainwater harvesting, renewable energy, locally-grown zero waste food production.
- Put into action strategies to Design Out Waste to minimise waste on site and throughout the supply chain.
- Ensure that the Circular Economy principles are adhered to throughout the Design, Construction, Occupation, Maintenance, Adaption and ultimate De-Construction of the Project, i.e RIBA Stages 1-8.

Why is embodied carbon so important?

A building's carbon impact is divided into embodied and operational carbon. Embodied carbon relates to the energy before and after a building is in use. Operational carbon relates to the energy required to operate the building.

Embodied carbon is not yet covered in the building regulations, even if it constitutes a very large part of a building's footprint. BakerBrown considers embodied carbon as standard practice, and limits projects' impact by carefully selecting materials and construction methods.



Operational Carbon Reduction

Passive House Principles

When considering Operational Carbon, we are applying 'PassivHaus' low energy benchmarks which propose a 'fabric first' approach to reducing energy use.

The heating and cooling of rooms and water are the primary reasons for high energy use. The strategies here aim to reduce this while providing comfortable internal spaces.

CO₂ Emissions of the dwellings in use will be controlled by installing adequate and high performance, well insulating materials, fixings and heating systems. The strategy will not only reduce operational emissions, but also cut costs and minimise heating and cooling requirements and increasing wellbeing.

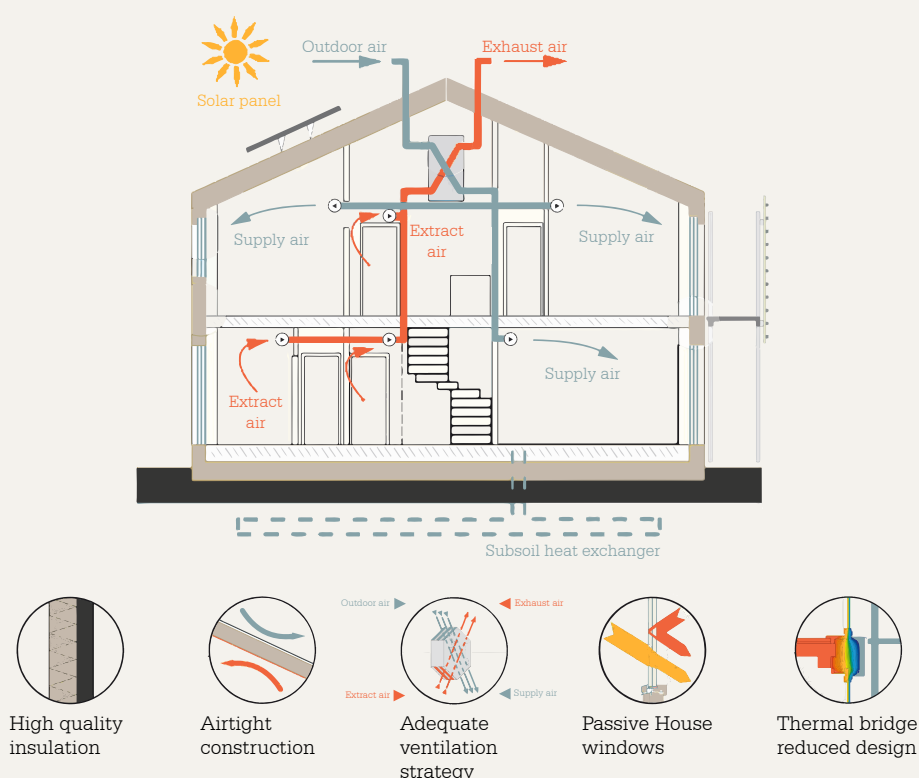
Below is a diagram of a PassivHaus system, from which the practice takes principles. Many of these are simple solutions for long term wellbeing.

As a norm we (BB) design buildings to the low energy (in use) standards demanded by 'Passivhaus' principles with regards to airtightness, energy for heating demand, and thermal efficiency.

The five key Passive House principles are:

- Thermal insulation
- Passive House windows
- Adequate ventilation strategy
- Airtightness
- Thermal bridge reduced design

The exact specification will be determined when preparing for the Building Regulations Application. However, we have determined our energy benchmarks specific to the project in the following pages.

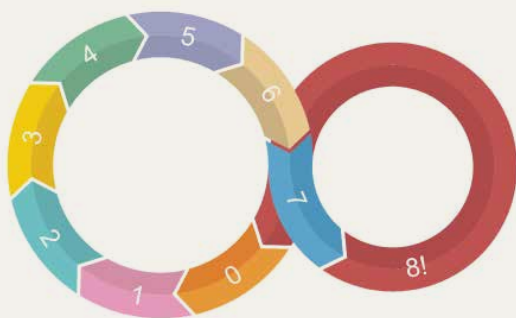


Circular Design

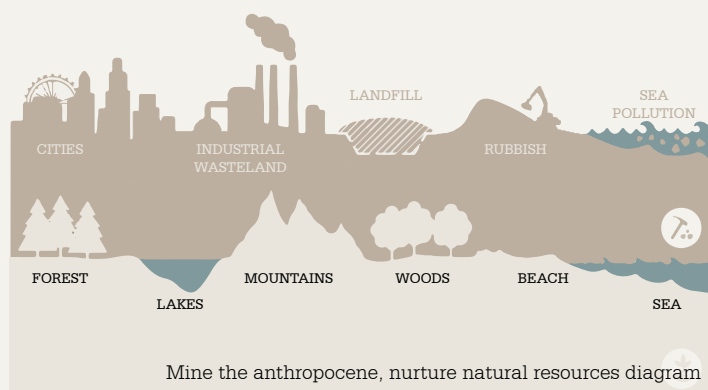
BakerBrown is renowned for its careful and intelligent interventions in sensitive urban and rural contexts around the South Downs National Park and National Landscapes such as the Sussex High Weald.

Part of this philosophy is our resource mapping, a study of resources available on and near the site. If the project is accepted, we will deliver a more in-depth study of materials available on site to be reused.

The implementation of the circular economy in construction has been explored by many and the Architect's Climate Action Network (ACAN) has launched a campaign in 2021 to encourage the RIBA implement stage 8 - deconstruction within the RIBA Plan of Work.



ACAN stage 8 campaign



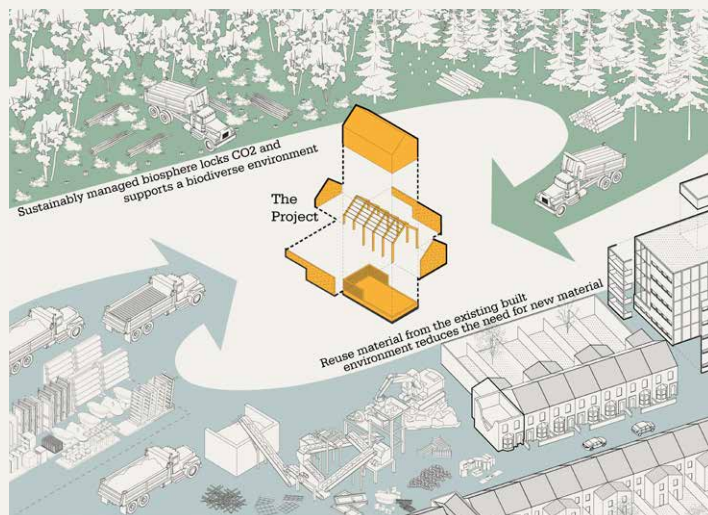
The stage is envisaged to consider a building's deconstruction and reuse, as opposed to demolition. This stage often happens both at the end and at the beginning of projects.

When we are considering a Circular Economy; we are looking at ways of designing out waste and avoiding materials, products, buildings, systems and whole cities even, that don't have an end-of-life strategy. We design things that can eventually :

- be organic compost (food) for the natural 'Bio-sphere' and/or
- technical nutrients for the human-made 'Tech-sphere'.

To use a phrase we referred to when we built the Waste House, we believe that

“there's no such thing as waste, just stuff in the wrong place.”



Resource Mapping

Baker Brown is committed to the use of local materials. Throughout the years, we have developed a resource map of materials local to the Sussex area which we try to incorporate into our projects whenever possible. A summary of which is detailed as follows:

1) Ash Die Back

Sourced locally within Sussex, ash die back can be used for structural elements, external cladding or for internal finishes and joinery.

2) Site Surplus

It is possible to reuse surplus and waste material from local/ regional sites. Specifically, as material for renders, aggregate and other finishes.

3) Local Works Studio

Located in nearby Barcombe, Local Works Studio can be utilised for forming new materials from on-site waste.

4) Waste Chalk

Can be used for internal plaster and external renders.

5) Chailey Brick Yard

Over-fired, under-fired and normal bricks can be sourced from nearby Ibstock Chailey Brickyard.

6) Surplus Site Material

Large development sites in and around East Sussex can be used as a source for ‘waste’ and surplus material.

7. Reclaimed Clay Tiles

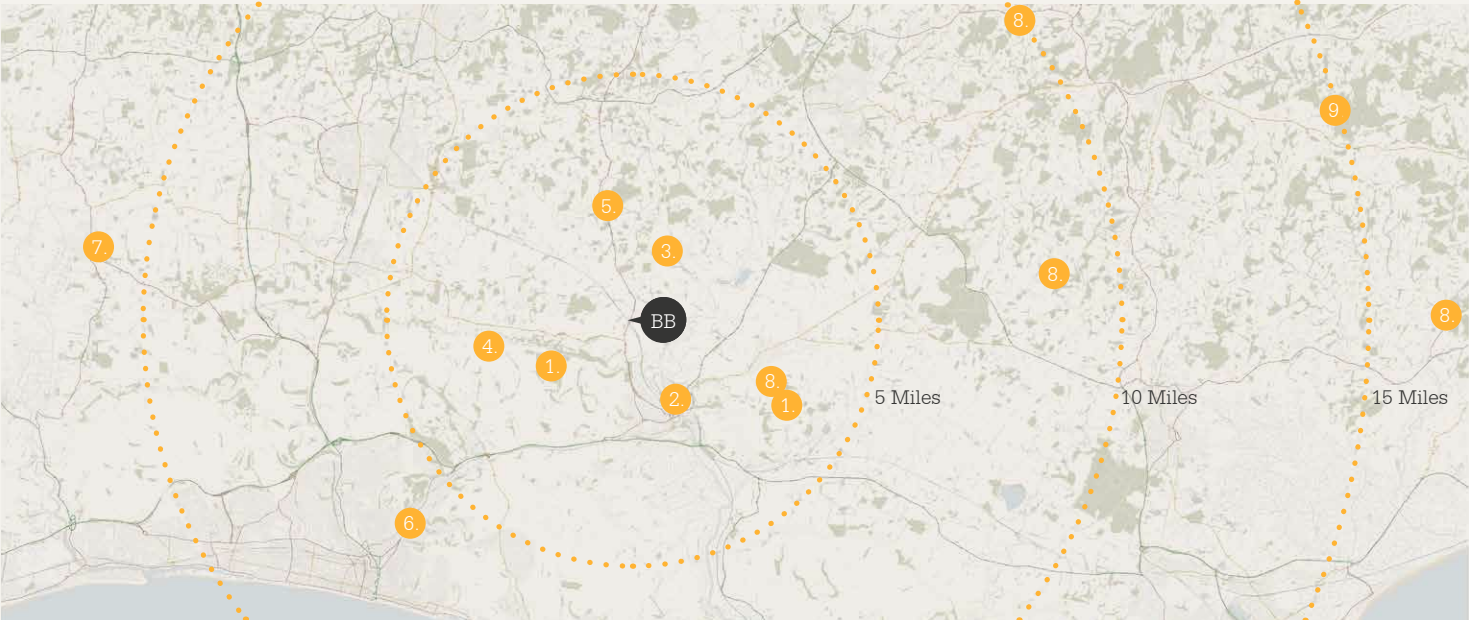
Reclaimed clay tiles sourced from multiple suppliers.

8) Sweet Chestnut

A fast growing sustainable hard wood, Sweet Chestnut provides an abundant local source of timber.

9) Low Grade Pine

A low grade ‘waste’ material that can be used for a glue-free CLT system called Brettstapel.



Building Elements & Materiality

The proposal uses the existing structure, heavily reducing both embodied carbon and waste compared to an alternative new-build scheme. Additional proposed materials will be selected consciously and considering both the resource map and our experience of natural building materials. The aims for the project are:

- Existing structure retained
- Timber structure for new-build elements
- Re-use of materials where appropriate, including the re-use of clay-tiles for roof elements
- Brick externally at ground level to match local character, with timber cladding at first floor. This split cladding arrangement is often found locally.
- Locally sourced timber cladding, likely sweet chesnut
- Efficient aluminium composite windows and doors



Similar brick and timber cladding arrangement.



External timber cladding



Similar brick at ground level.



Aluminium composite windows and doors

Performance, Ecological design and Renewable Energy

The aims for the project regarding performance, ecological design and renewable energy are set out on this page.

Performance

A well insulated building fabric for both retrofit and new-build elements. Existing elements may achieve higher U-values due to constraints with existing build-ups. Overall the design will aim to achieve the following notional u-values:

Walls	0.15	*Units: W/(m²K) Average
Floors	0.10	
Roofs	0.11	
Windows (triple glazed composite)	0.8*	
Doors	1.08	

- Utilise natural daylight as much as possible.
- Maximising solar gain to the south whilst preventing overheating in the summer.
- Promote natural cross ventilation in clement weather and MVHR systems in colder weather.

Ecological Design

- Any new hardscaping will be permeable to reduce hard surfaces and surface water flooding.
- Use of native and diverse planting.
- Rainwater capture and redistribution will be utilised.

Renewable Energy

- Air source heat pump as primary source of energy.
- A solar array with battery storage to reduce reliance on fossil fuels and increase the home's resilience.

Water Consumption

Internal potable consumption will be limited to no more than 110 l per person per day. Any new taps will be equipped with aerators, and new toilets equipped with low water consuming units, flushing using 4.5 litres per day instead of 6 litres per full flush.

Waste

The house will remain connected to be public sewer system.

Household Waste

The existing household waste system will remain unchanged.

Adaptation to climate change

As defined in the previous pages, the project uses various measures to mitigate the impact climate change can have on the site and the area surrounding it. It in fact includes local planting enhancing local biodiversity, drainage systems such as permeable paving. The proposed building will also be constructed prioritising fuel conservation measures, including highly insulated building elements that, together with shading devices will minimise overheating risk.

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