



# CoHuT Benwell Newcastle upon Tyne

Feasibility Study | June 2020

**mawsonkerr**

MawsonKerr Architects Ltd, 1 Charlotte  
Square, Newcastle upon Tyne, NE1 4XF

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# Design Development



## PRECEDENT STUDY - LILAC

Affordable ecological co-housing

Leeds



### Information

L - Low

I - Impact

L - Living

A - Affordable

C - Community

This plot holds 30 properties split up into three house types, varying from one-bedroom apartment to semi-detached properties. These all surround the centralised core of the development that holds a common house that is communally used.

The scheme encourages the use of outdoor spaces with furniture, softscaping and allotments, providing mixed-use spaces across the communal area. This is pulled into the heart of the plan and subsequently the community.

The break-up of buildings facilitates the free movement from the communal space into the wider community. Furthermore, this can encourage the integration of the wider community into the site, if and when invited.



- ..... Site Boundary
- Site Entrance
- — Hardscaping
- — Private space
- — Communal space
- — Parking

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## PRECEDENT STUDY - MARMALADE LANE

### Affordable Ecological Co-Housing

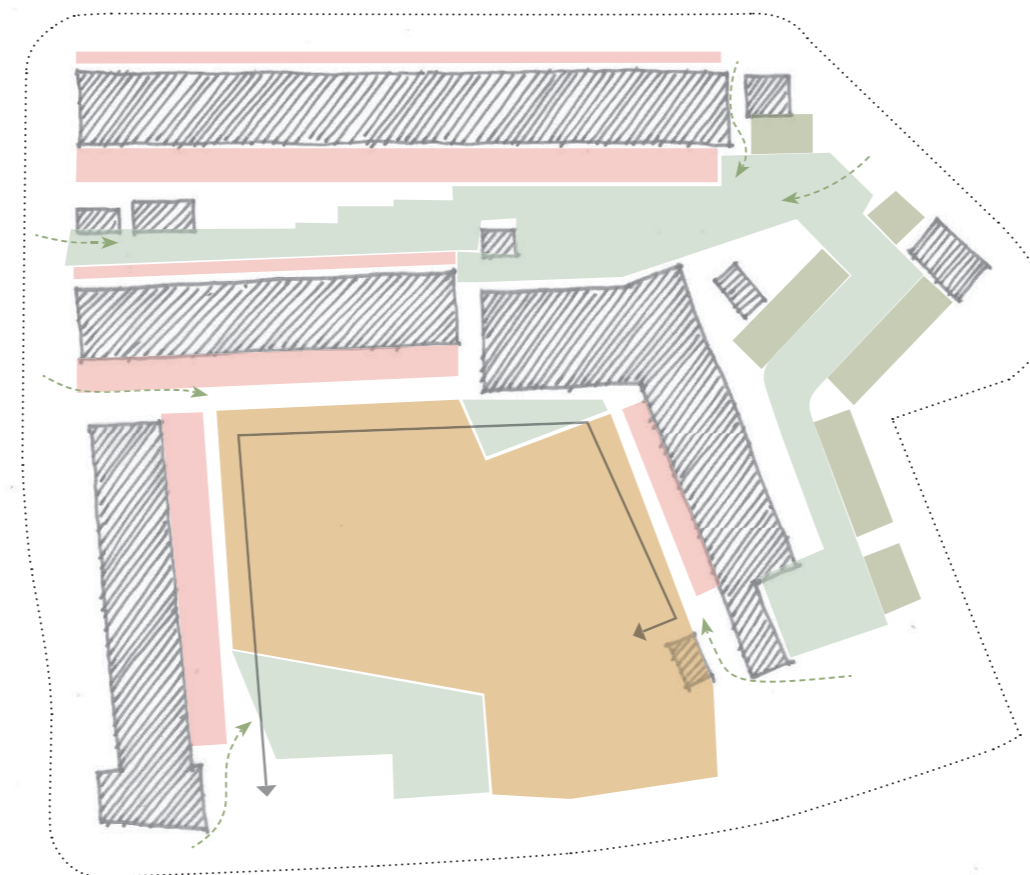
Cambridge

#### Information

This plot focusses predominantly around a central communal garden, which the community can all engage with whilst having an initial private space, which gives them immediate control of their environment.

The CoHuT proposal aims to encourage the connection to the central community space as well, enclosing a protected area for communal gathering. This can be achieved through communal gardens, which become key points within the scheme to give residents a purpose to socialise, whilst adding positively to the community through gardening and production of fruit and vegetables. Secondly, the CoHut scheme encourages private spaces which gives residents ownership of spaces in their homes' immediate context.

Protected spaces become self-policed and create safe open spaces for children to play as well. The common house is also utilised to provide inclusive spaces which are self-regulated, children and adults are encouraged to play, strengthening the community across all age ranges, through play, eating and talking.



- Site Entrance
- ..... Site Boundary
- Hardscaping
- Private space
- Communal garden
- Parking

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**PRECEDENT STUDY -  
ECOARC**

**Certified Passive House  
Co-Housing**

Lancaster  
Information

Lancaster Co-housing Project is a certified Passivhaus/CSH level 6 and Lifetime Homes, affordable community housing project. There are forty one individual households, ranging from one-bed flats to three-bed family houses, thirty five of which are within the co-housing scheme with shared community facilities.

The scheme makes the most of its location, situating itself near the river, directing views across it. Landscaping is kept rugged to suit its setting, with communal spaces being more tamed. A hardscaped path through the communal space creates an easily accessible route across the site.

- Site Boundary
- ..... Site Entrance
- Private space
- Communal space
- Parking





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## PRECEDENT - SHARED GARDENS

### SOUTH GARDENS

by Maccreanor Lavington



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## PRECEDENT - HOUSE TYPES

Examples of form



# CONCEPT SCHEME



## CONCEPT SITE LAYOUT

### Development



#### TREES AND HEDGEROW

The addition of a hedgerow and trees will provide a permeable boundary to allow the site to feel private without a harsh border.

#### OPEN SPACE

The open space will be used for a number of different activities spread throughout the site. There will be dedicated spaces for allotments to the south of the site along with a large communal space in the centre.

#### ROUTES THROUGH SITE

As well as the pavements surrounding the site, the internal access connecting the different parts of the development plays a crucial role in the site's use, allowing all of the tenants to have direct access throughout.

#### THRESHOLDS

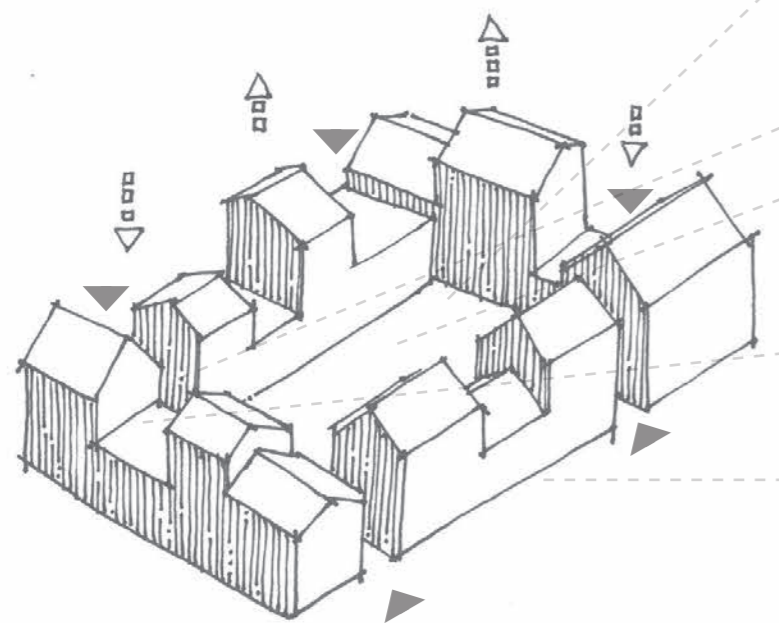
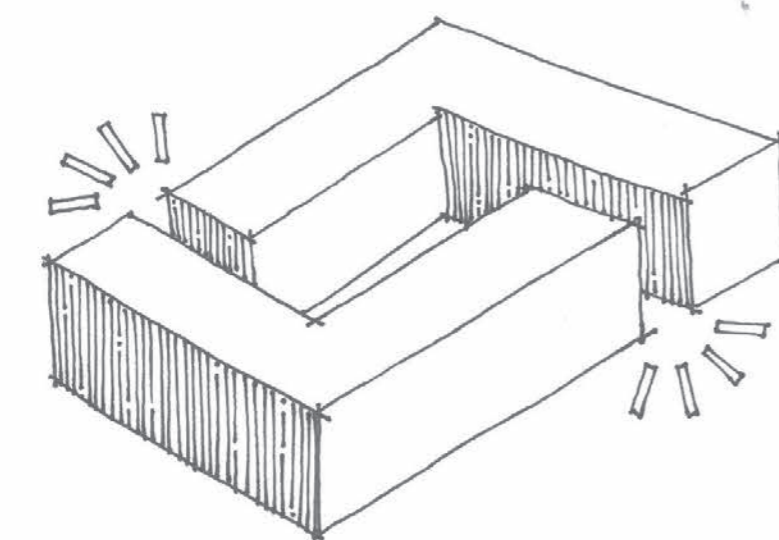
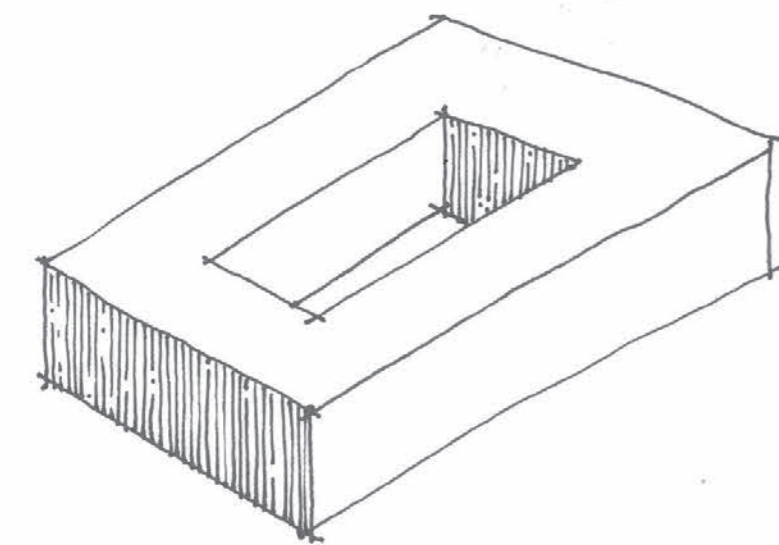
Canopies provide thresholds into the communal spaces creating a sense of ownership and arrival.

#### BUILDINGS

The development will house a number of different building types from 1 bedroom houses to 5 bedroom shared houses. The site will also include a 'Common House' facilitating a range of different activities such as communal kitchen, guest bedroom and a multifunctional space.

#### PROPOSED LOCATION

This indicative location has been chosen providing enough space for all 25 dwellings, as well as the Common House.



PROTECTED  
COMMUNITY



External Dining



Solar Shading  
thresholds



Communal  
Gardens



Communal  
Dining



Communal  
Allotments

## PASSIVHAUS METHODOLOGY

The scheme will target Passivhaus Certification which is the gold standard in low energy design. The high regard for the standard is due to the robustness of the quality assurance process. Passivhaus certified homes avoid the "design-gap" with as-built performance matching the design performance.

For the end user Passivhaus provide exceptional levels of thermal comfort. They are without drafts, condensation, mould growth, heat stratification, stale air or overheating. This is achieved by good thermal detailing, triple glazed windows, high airtightness, an efficient MVHR system and a rigorous quality assurance process.

In contrast with other low energy standards Passivhaus doesn't off-set energy demand with renewable energy production. The discipline of having to meet an energy demand figure, without the possibility of offsetting, focuses designers on exploiting good thermal design to create a high performing thermal envelope. Inefficient design can't be concealed by the addition of energy producing technology.

With a national aim to move domestic heating from gas to electric, the total national heat demand will need to be significantly reduced to avoid a shortage in grid capacity. The widespread adoption of Passivhaus would be a possible solution to that problem.

Our experience of designing and building the first certified passive house in Tyneside has helped inform the design process and will continue to be invaluable knowledge.

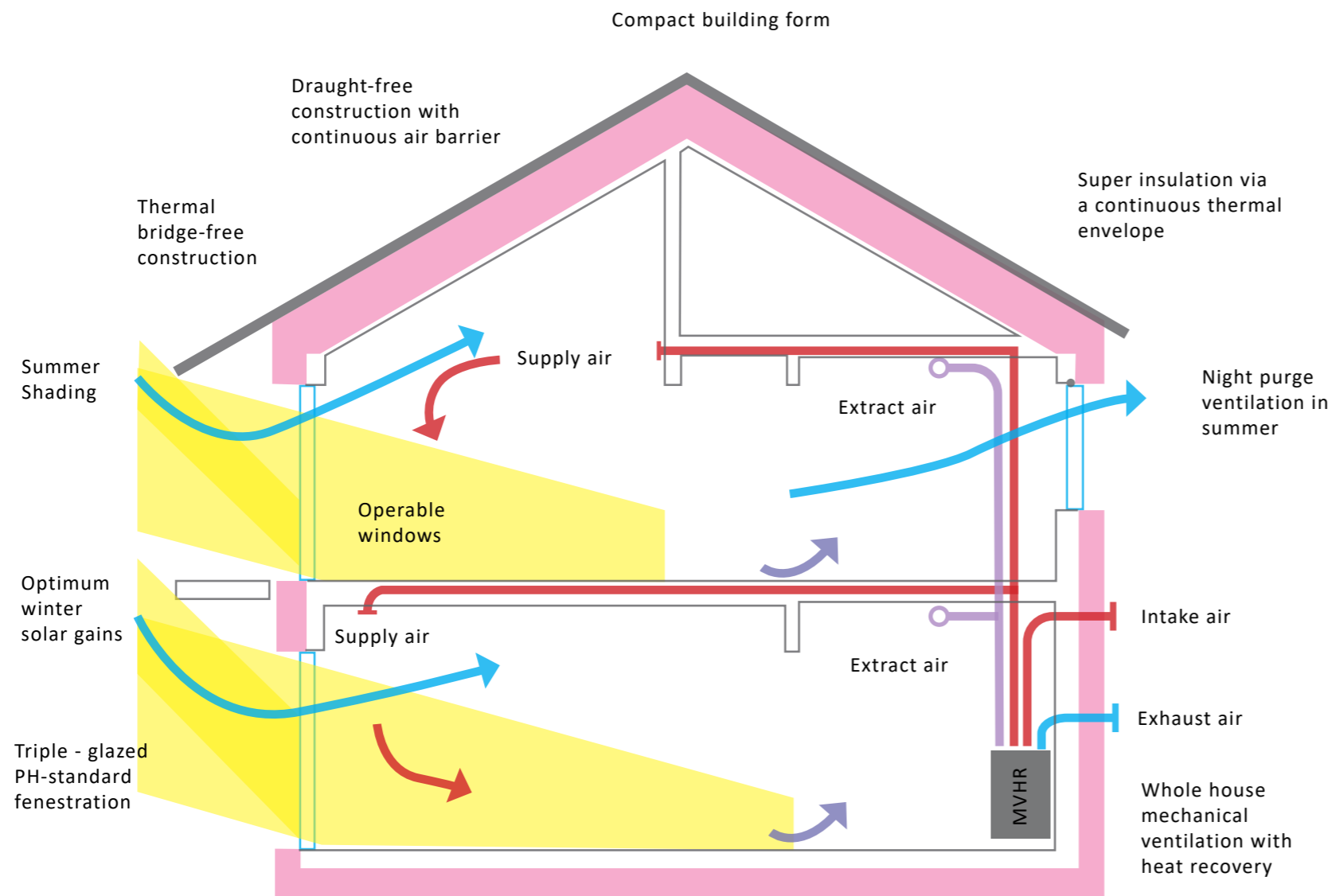
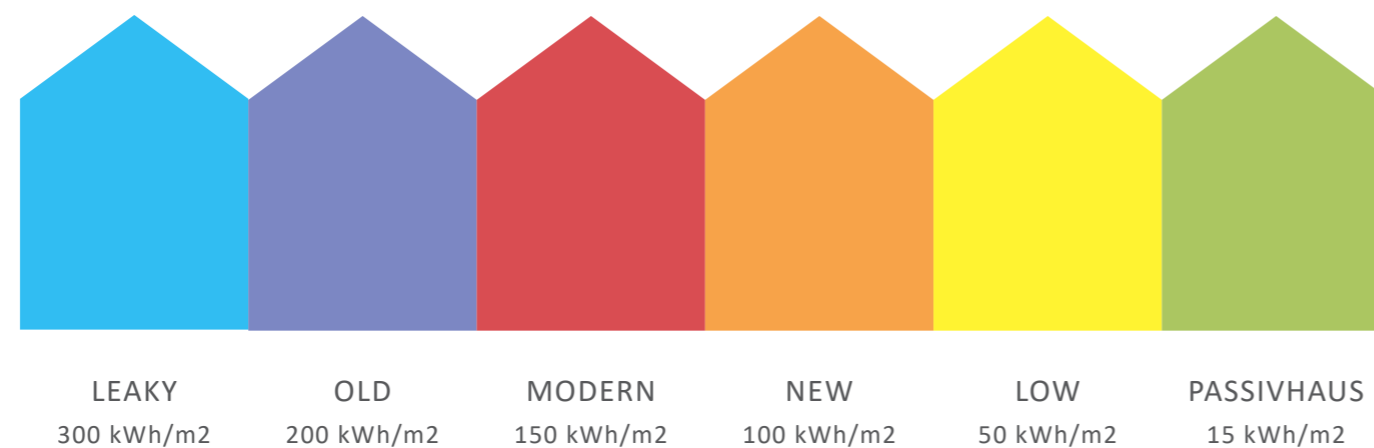


Diagram - How a Passivhaus Works

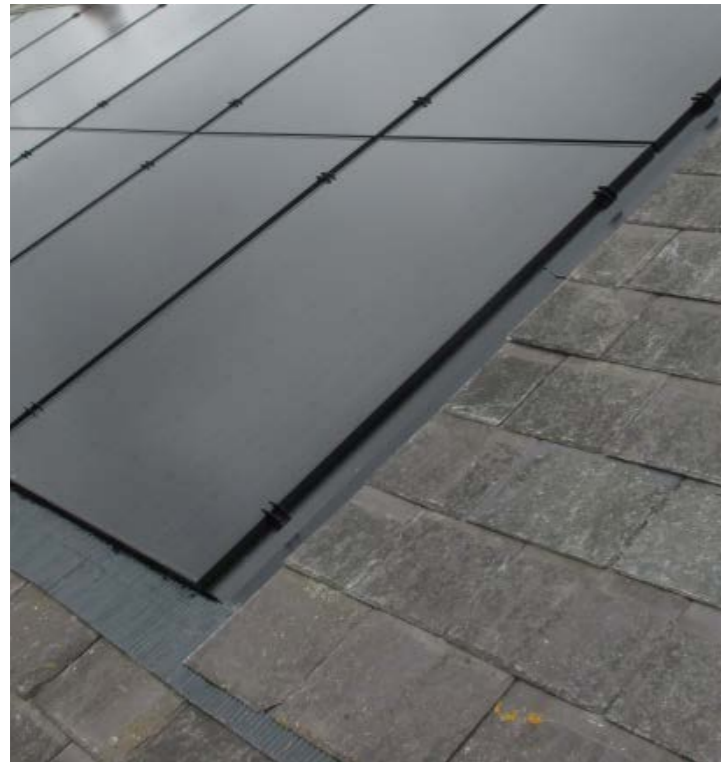


Heat demand per unit floor area



## RENEWABLE ENERGY

These precedents illustrate examples of using renewable energy sources and explains the positives and disadvantages of multiple potential options within the warkworth castle site.



Integrated Photovoltaics

### Photovoltaic Panels

PV panels, which capture the sun's energy and convert it into electricity, can be used on the south facing and flat roofs on the scheme.

Photovoltaic panels work well in conjunction with heat pumps because the electrical energy is used to create hot water which is stored in an insulated tank.

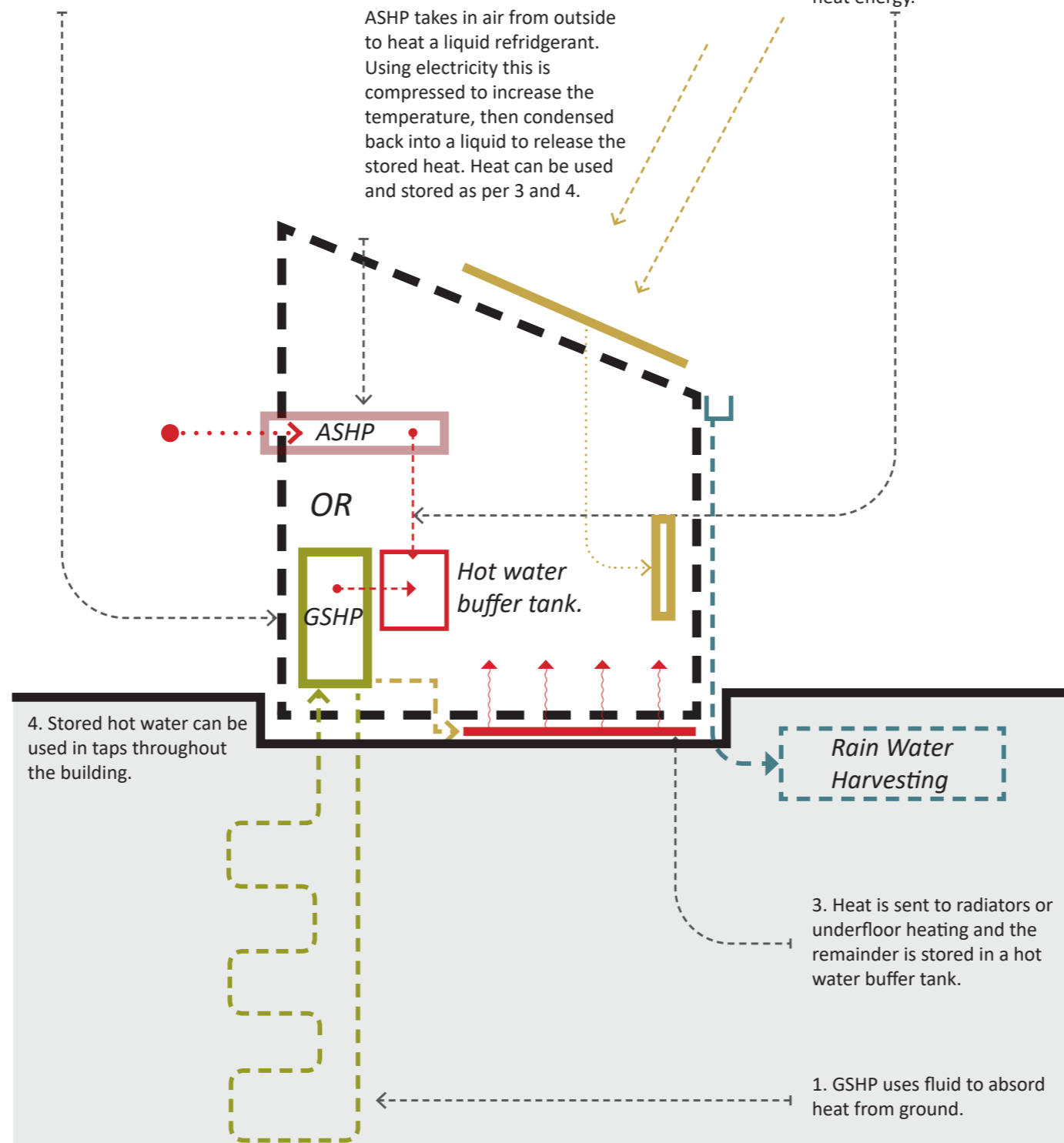
### Bore Hole / Ground Source Heat Pump (GSHP)

This is similar to the air source pump whereas with the ground source system heat is absorbed from the ground and delivered to the VAB.

- It doesn't make any visual impact to the building or surroundings once installed.
- Geothermal energy is constant and inexhaustible.
- it can provide both heating and cooling
- They don't produce carbon emissions, and if they can be powered by renewable electrical source they don't produce emissions at all.

2. Using electricity, the pump compresses the fluid and releases it at a higher temperature

Energy from PV panels can be used to power heat pumps. Converting the electrical energy to heat energy.



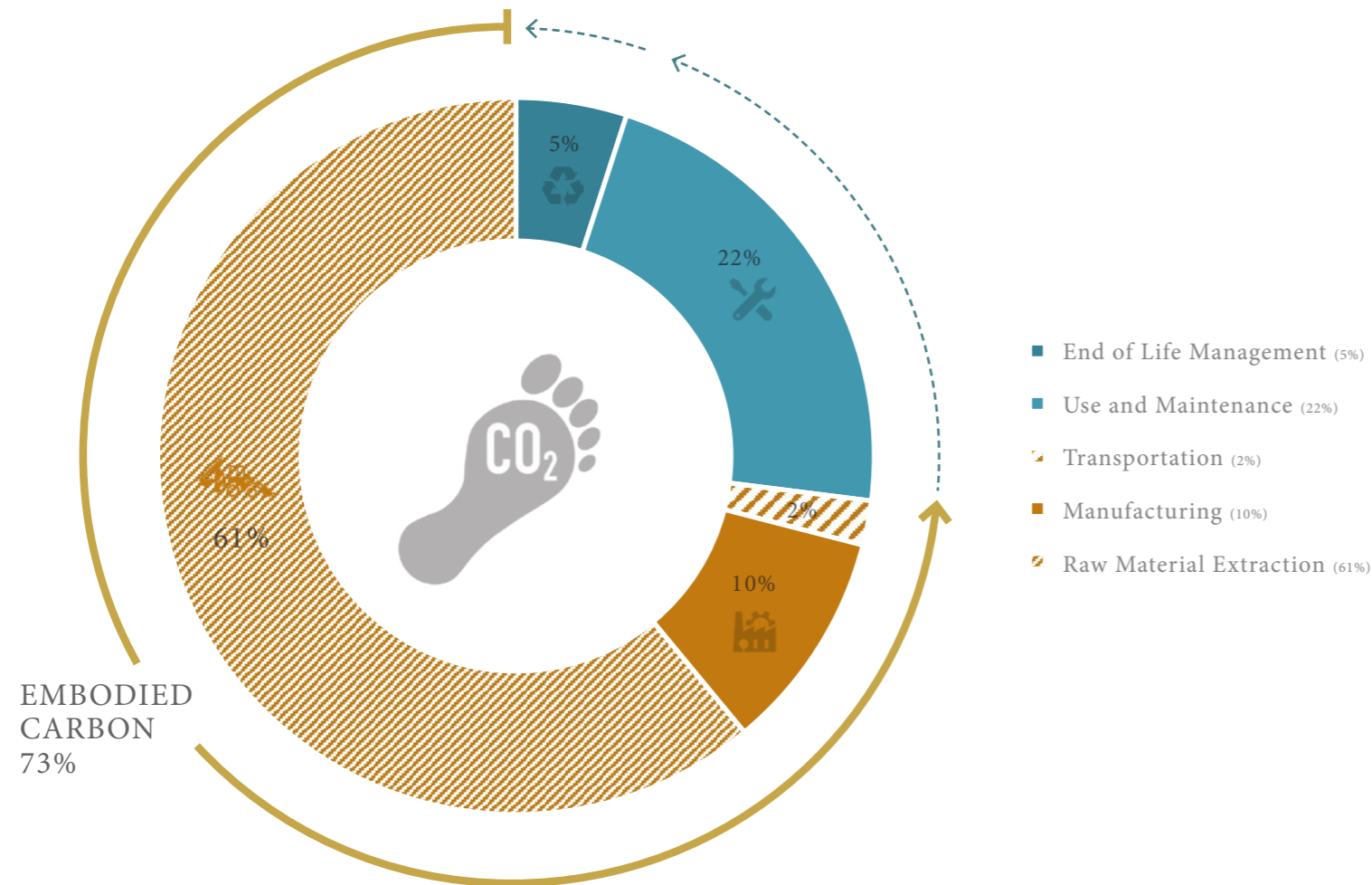
Ground / Air Source Heat Pump

Only one can be used within a system

(Form for diagrammatic purpose only)



## CARBON FOOTPRINT



The pie chart to the left generally illustrates the combination of:  
 Raw Material Extraction,  
 Manufacturing,  
 Transportation,  
 Use and maintenance  
 End of life management  
 which culminates in the total carbon footprint of a building and particularly highlighting it's embodied carbon.

Thermal modelling,  
 Carbon calculations and Offsetting

Fabric First Approach is a sustainable starting point and reduces / removes mechanical cooling, heating ventilation, lighting requirements and the need to rely on energy saving technologies which have embodied energy themselves.

Landscape and Planting  
 Planting is a great way to help sequester carbon emissions. Through photosynthesis plants absorb carbon dioxide to produce oxygen. By ensuring that the plants are native species this can help to preserve the UK's environment and biodiversity.

All of these elements are intrinsic to a lower carbon footprint building and are aspects we look to engage with throughout the design, construction and end use of the building.

### Fabric First Approach

Making a building perform energy efficiently starts with the fabric, detailing the proposal effectively to reduce the energy input into the building from the start, utilising passive techniques to reduce running cost and carbon footprint. This includes:

- Position and Orientation
- Air Tightness
- Thermal Bridging
- Fabric Improvements

### Thermal Modelling

Thermal modelling involves building a digital model of a building, we can then use it to run simulations, allowing predictions to be made around the buildings performance, in terms of heat loss and insulation.

### Embodied Energy

Approximately 50% of the UK's total energy is from construction, making embodied energy within buildings a key factor within design.

The embodied energy can be taken as:  
 Initial - Consumed to create the building  
 Recurring - Maintenance  
 Operational - Used to heat, cool and light  
 Demolition - Disposal of material

This full life cycle of cradle to grave is energy intensive so using materials which embody carbon large amounts of carbon either in the manufacturing process or naturally, this can be used positively by trapping it. Therefore, we can utilise materials which perform as cradle to cradle or embody non biodegradable substances like recycled plastic to store energy in the fabric itself rather than burning them and releasing emissions.

### Carbon Calculations and Offsetting

Carbon offsetting is an internationally recognised way to take responsibility for unavoidable carbon emissions, this can be a consideration in reducing the buildings footprint by investing in sustainable projects across the world.

By being aware of the carbon projects introduce into the atmosphere it can be allowed for and strived toward for neutrality.

Simple ways of reducing the initial carbon footprint is locally sourcing material to reduce travel emissions. Choosing materials which are less energy consumptive to produce and utilising recycled materials like aggregates also helps.



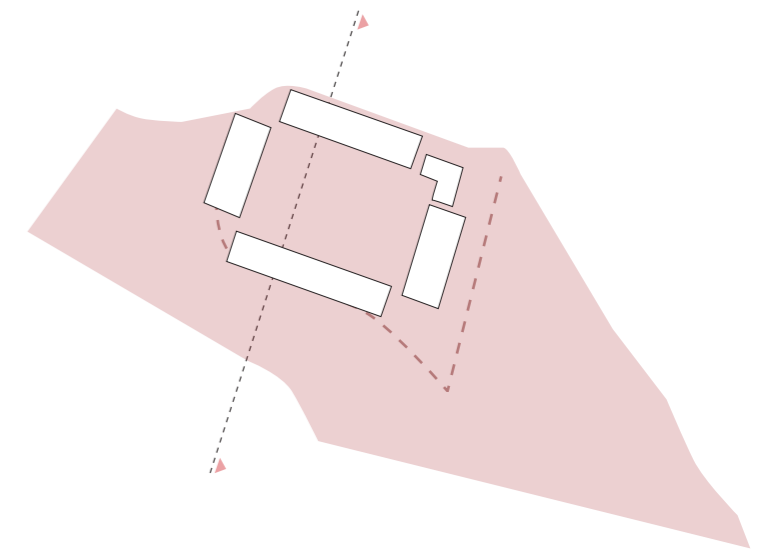
# CONCEPT SITE SKETCH

Development



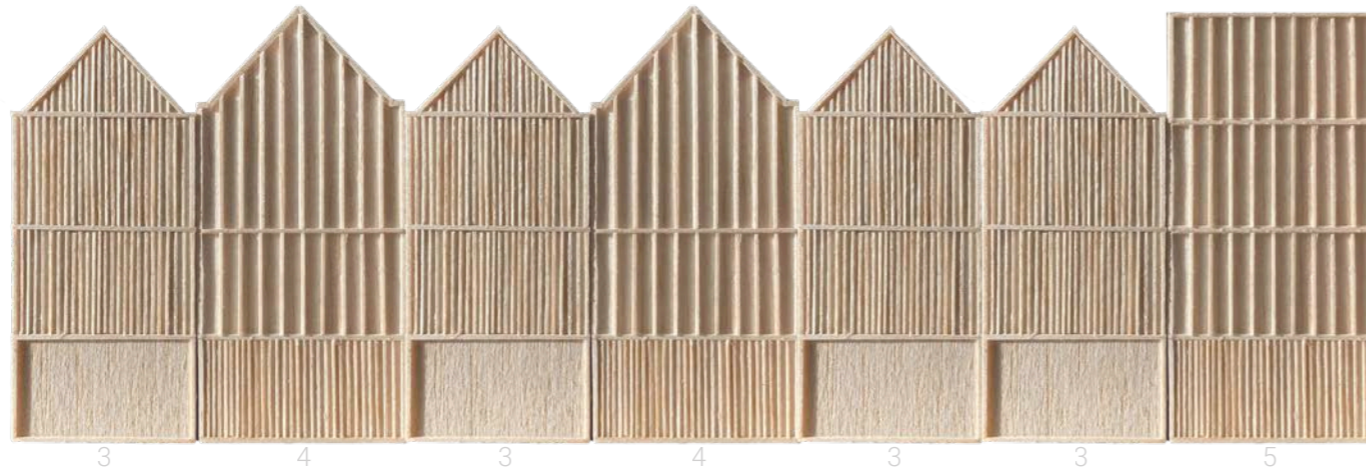


### PERSPECTIVE SECTION Development





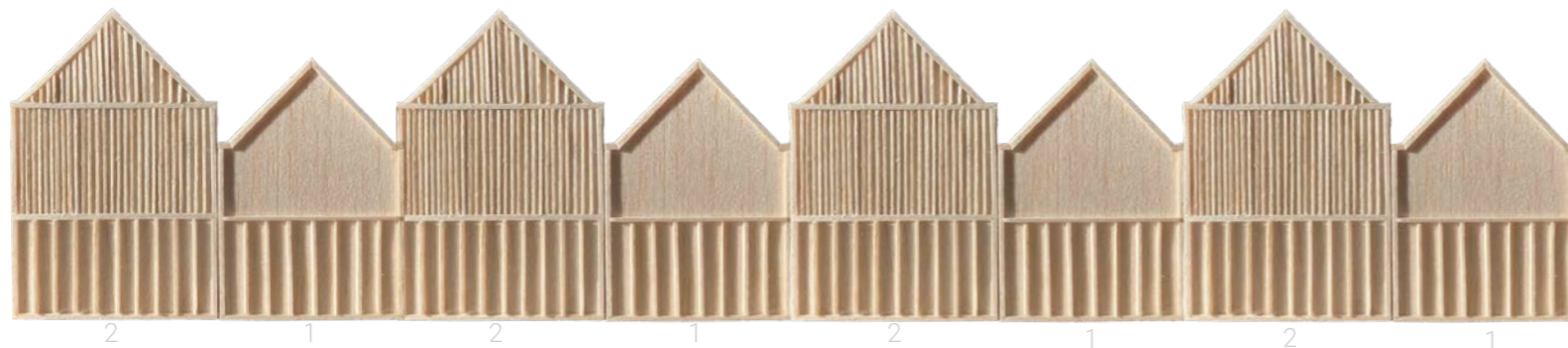
CONCEPT ELEVATIONS



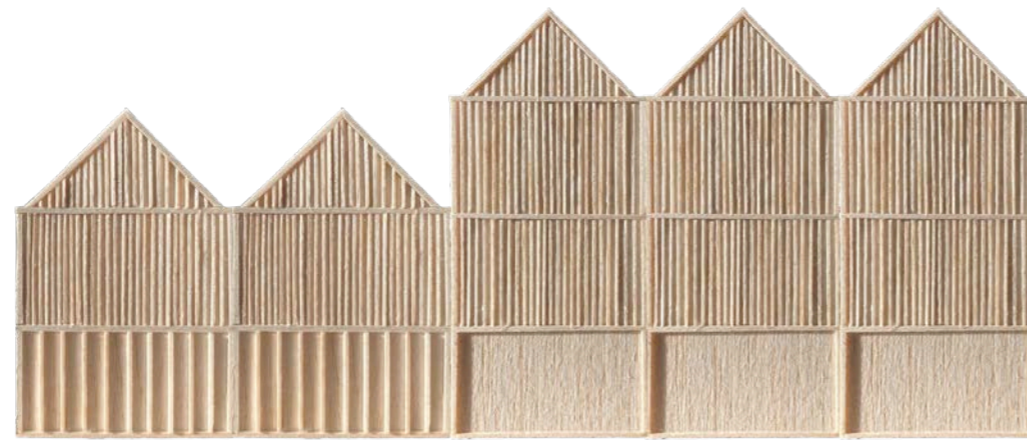
NORTH FRONT ELEVATION



EAST FRONT ELEVATION



SOUTH FRONT ELEVATION



WEST FRONT ELEVATION



## PERSPECTIVE SKETCH

View from common gardens



The connection between living spaces and the common gardens is key to the design of the scheme. The design seeks to develop different connections between the gardens and the homes. For example, a young child might move between his living room and the common garden as he plays, a woman might sit in the common garden reading a book, a neighbour might wave to her from first floor balcony, and a man may sit on his bedroom balcony. It is the activities of the residents which will bring character and energy to the common garden.

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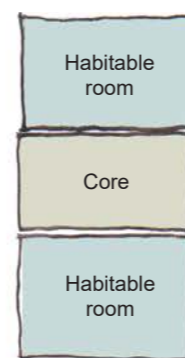


# CONCEPT HOUSE TYPES

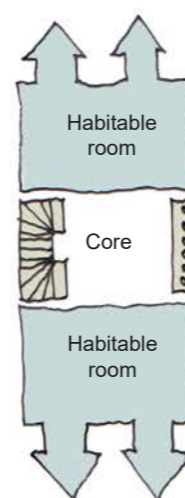




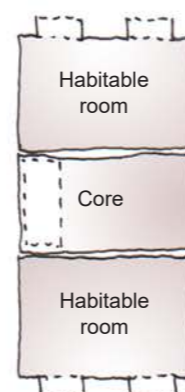
## PLAN CONCEPT



The layout has a central core with similar sized rooms to the front and back of the house.



With the staircase and services in the centre of the plan, the rooms at the front and the back of the house will have access to views.



The rooms to the front and back will be lit by windows, the core by a rooflight at the top of the staircase.



### 1 BED HOUSE

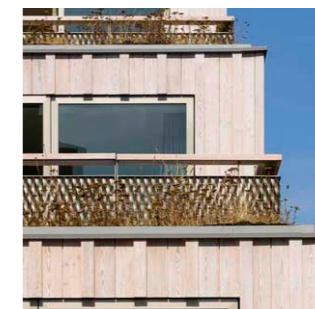
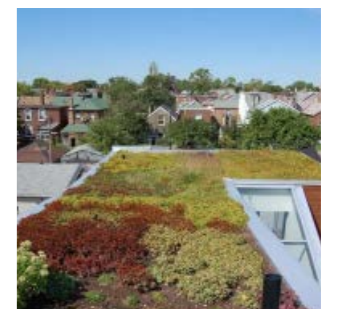
scale 1:100 @A3

59.4m<sup>2</sup>



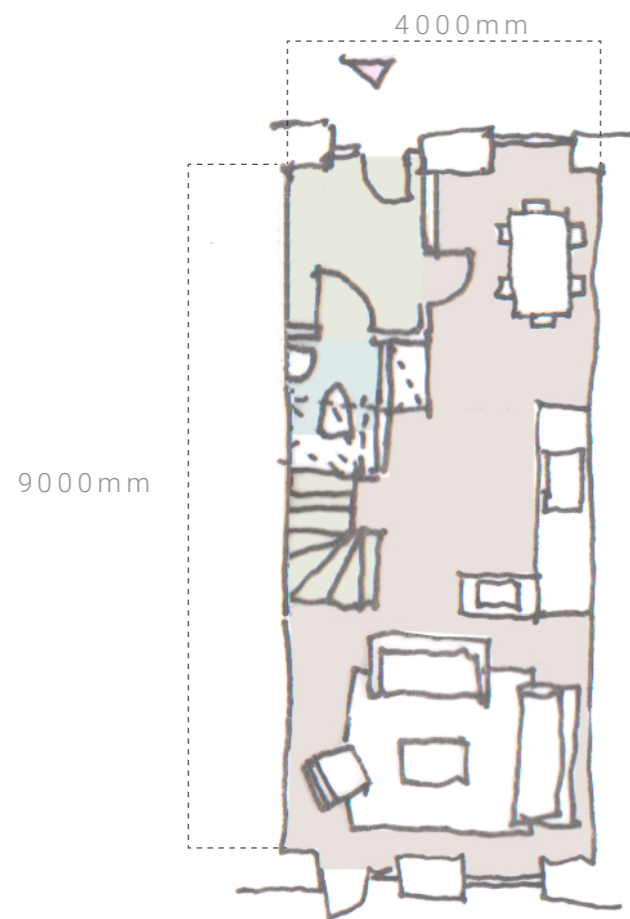
1:100 Model  
1 BED

### MATERIALITY AND ARCHITECTURAL PRECEDENT



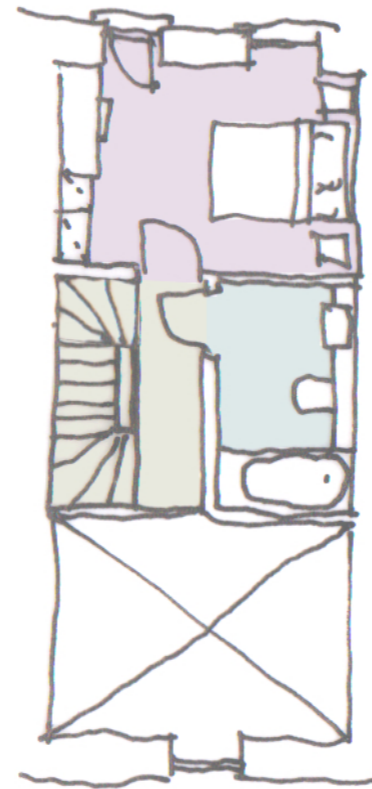
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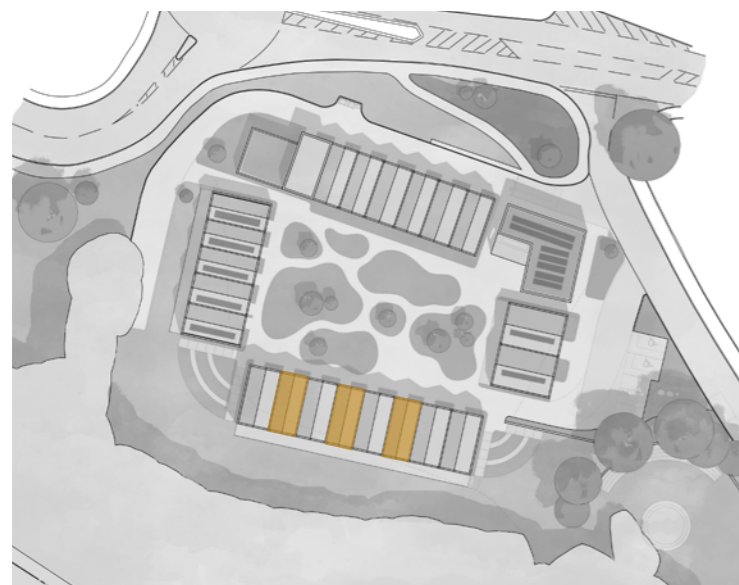
**GROUND FLOOR**

36m<sup>2</sup>



**FIRST FLOOR**

23.4m<sup>2</sup>





### 2 BED HOUSE

scale 1:100 @A3

83m2



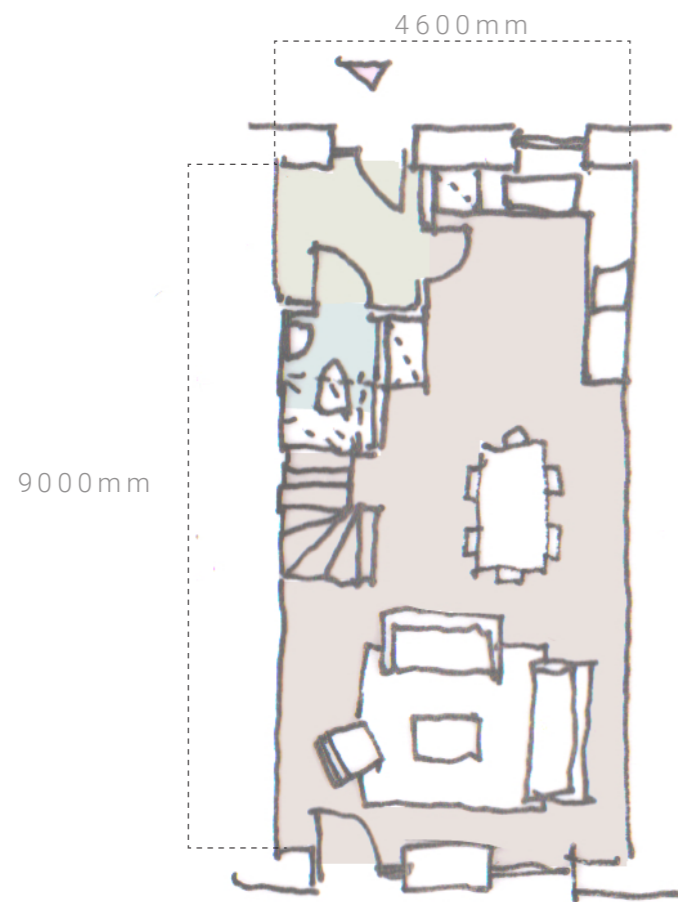
1:100 Model  
2 BED

### MATERIALITY AND ARCHITECTURAL PRECEDENT



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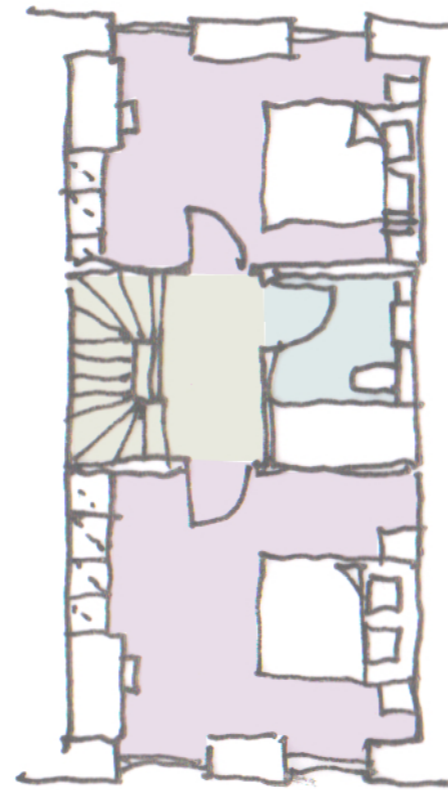


Ground Floor

### GROUND FLOOR

41.5m2

Open plan kitchen/dining/lounge.

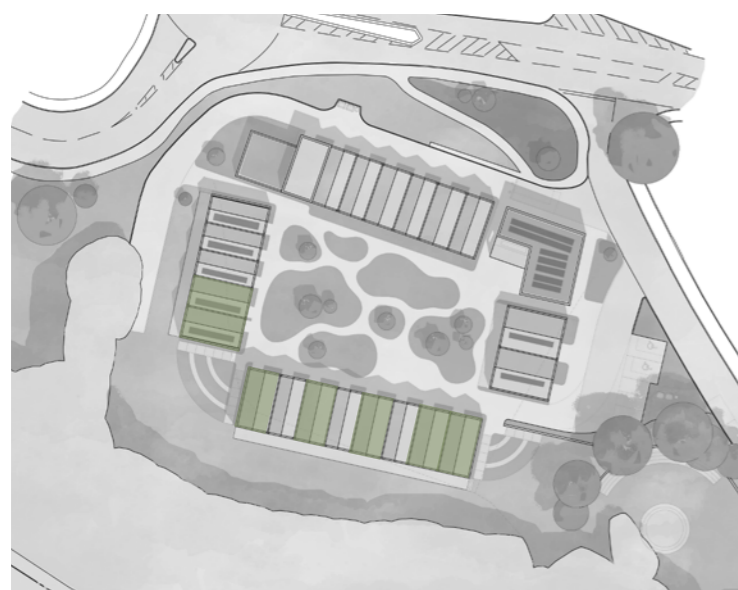


First Floor

### FIRST FLOOR

41.5m2

Master and second double bedroom separated with family bathroom.





### 3 BED HOUSE

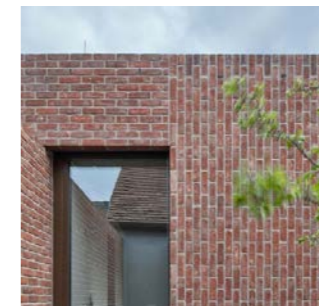
scale 1:100 @A3

108m<sup>2</sup>



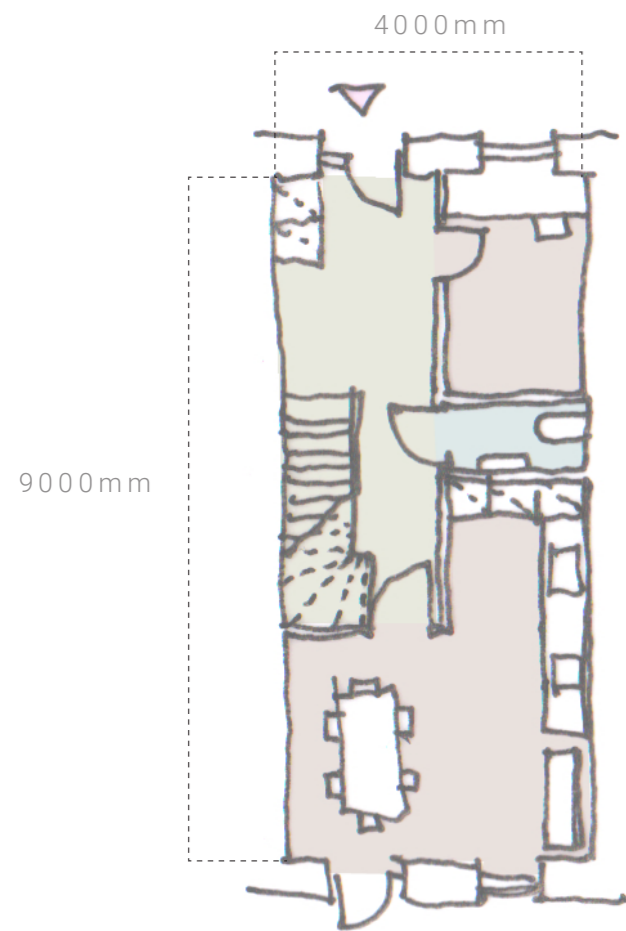
1:100 Model  
3 BED

### MATERIALITY AND ARCHITECTURAL PRECEDENT



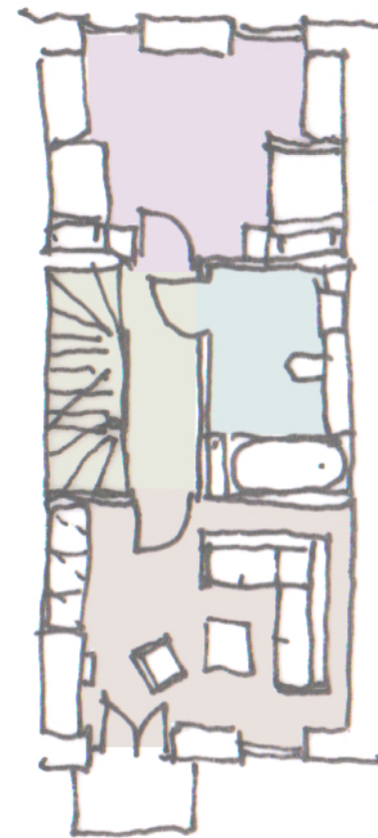
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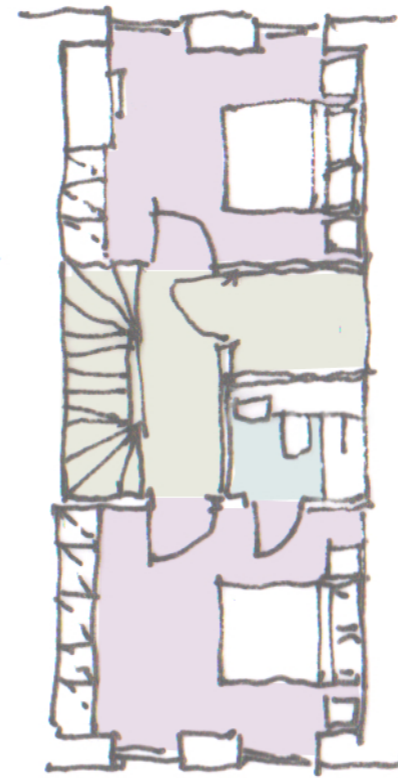
**GROUND FLOOR**

36m<sup>2</sup>



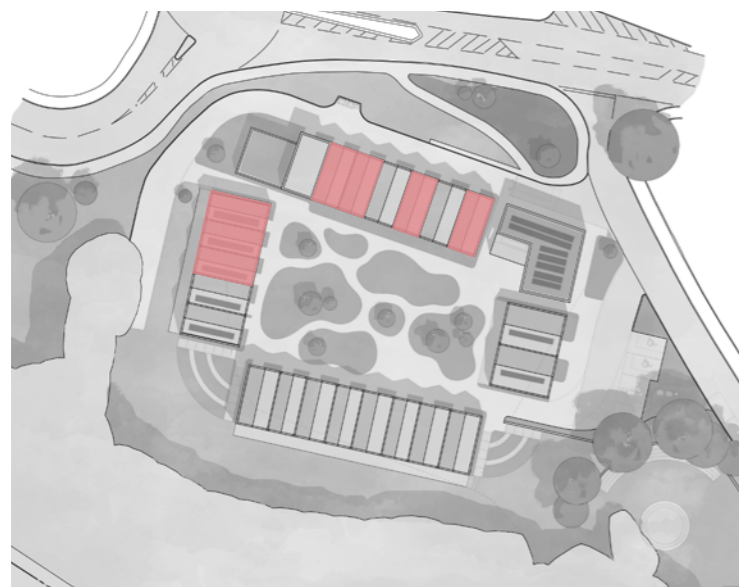
**FIRST FLOOR**

36m<sup>2</sup>



**SECOND FLOOR**

36m<sup>2</sup>

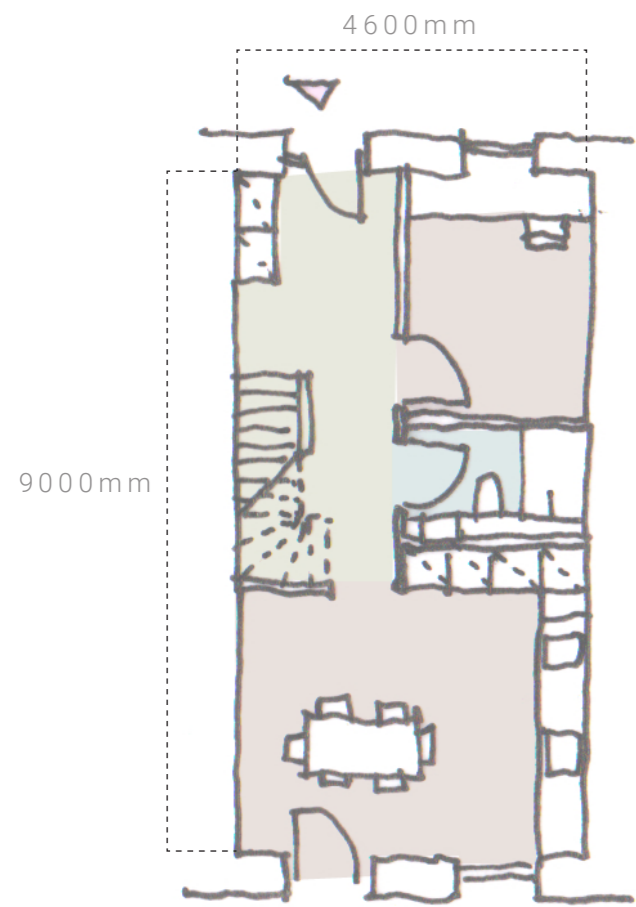




### 4 BED HOUSE

scale 1:100 @A3

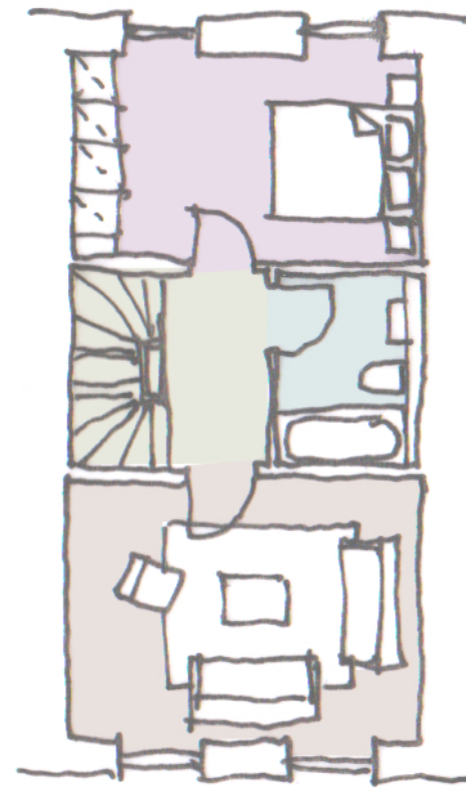
124.5m2



Ground Floor

#### GROUND FLOOR

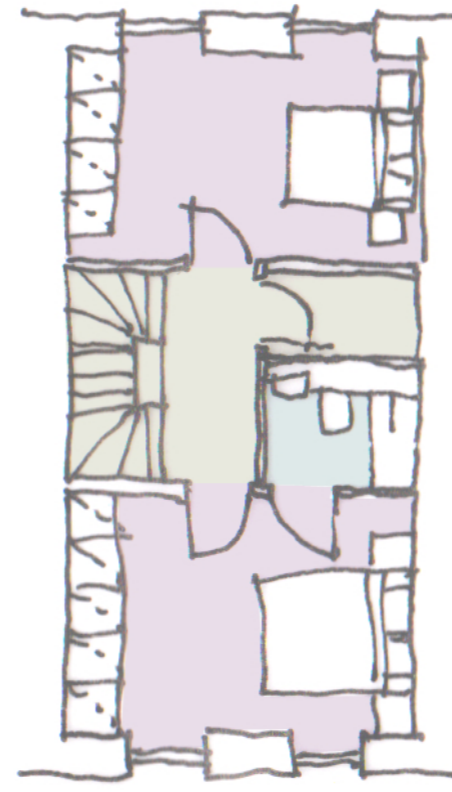
41.5m2  
 South facing kitchen dinner with doors leading onto common gardens. Ground floor shower room and study/ snug.



First Floor

#### FIRST FLOOR

41.5m2  
 First floor south facing lounge to emphasise views. Double bedroom and family bathroom.



Second Floor

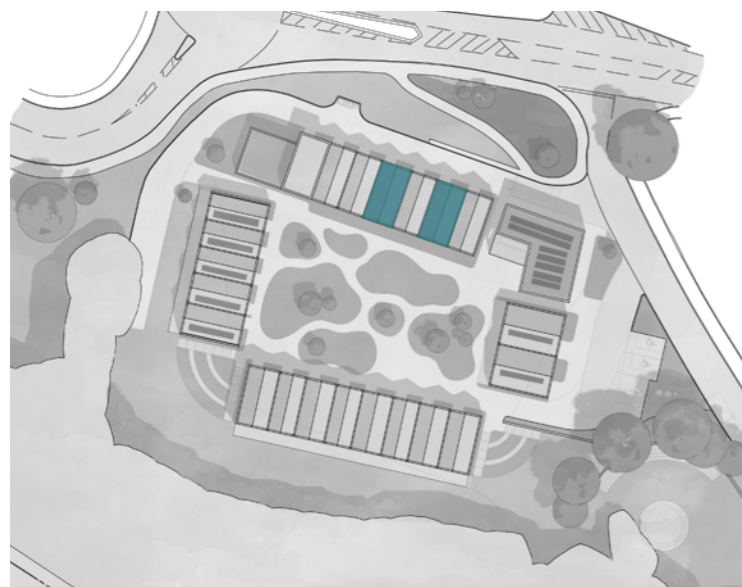
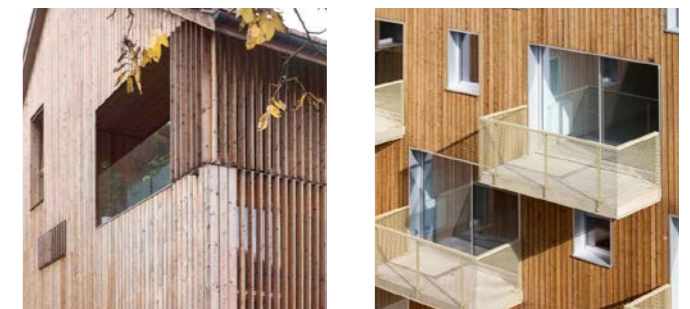
#### SECOND FLOOR

41.5m2  
 Master bedroom with ensuite overlooking the common gardens. Third bedroom and utility/plant room.



1:100 Model  
4 BED

#### MATERIALITY AND ARCHITECTURAL PRECEDENT



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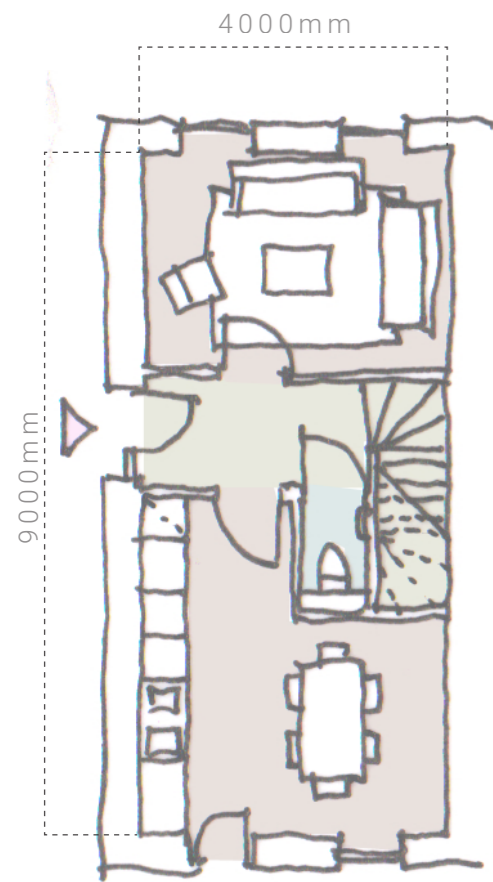
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### 5 BED SHARED HOUSE

scale 1:100 @A3

131.7m2

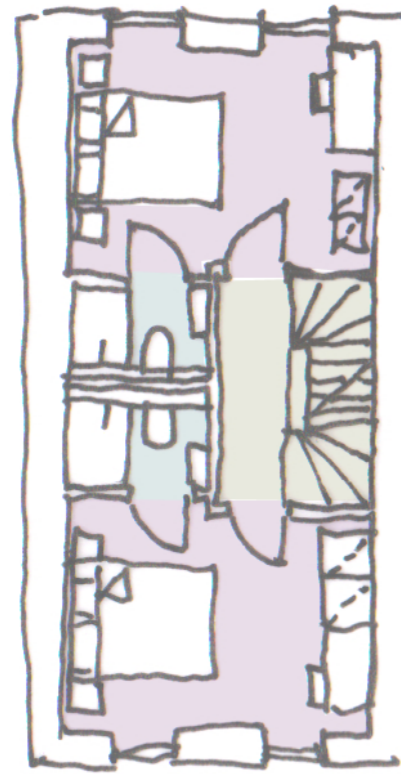


Ground Floor

#### GROUND FLOOR

36m2

The ground floor houses the internal shared spaces with the kitchen opening out onto the common gardens.

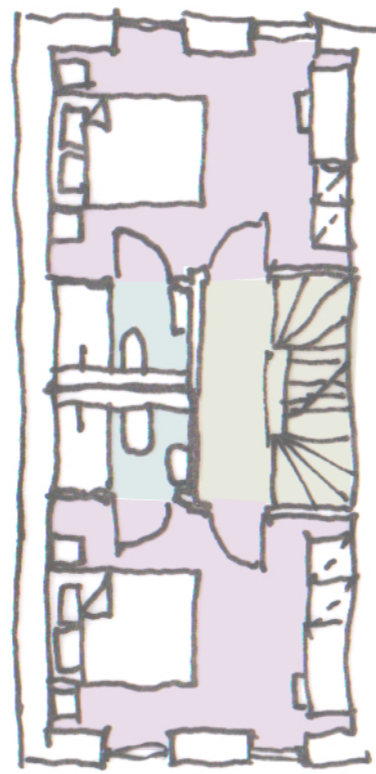


First Floor

#### FIRST FLOOR

36m2

Two equal sized double bedrooms with ensuists.

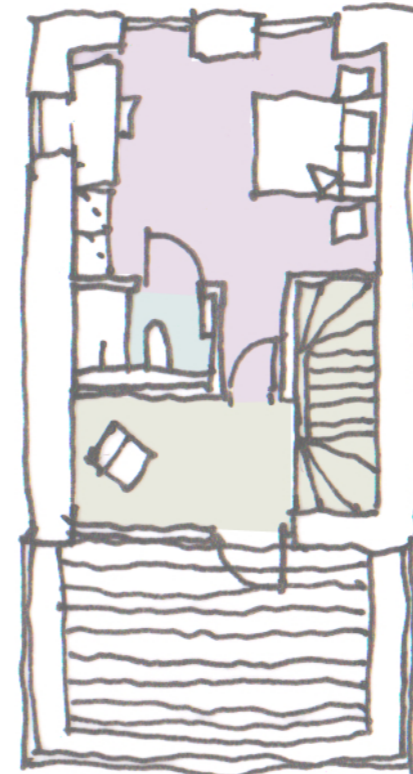


Second Floor

#### SECOND FLOOR

36m2

Two equal-sized double bedrooms with ensuists.



Third Floor

#### THIRD FLOOR

23.7m2

Fifth double bedroom with ensuit. Communal snug area and terrace facing south to embrace the daylight and overlook the common gardens.



1:100 Model  
5 BED

#### MATERIALITY AND ARCHITECTURAL PRECEDENT



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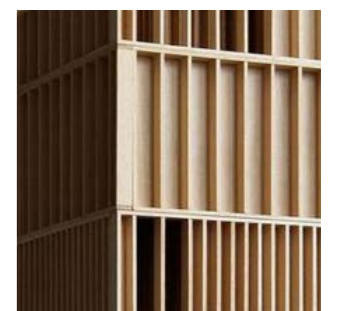
### 1 AND 2 BED FLATS

scale 1:100 @A3



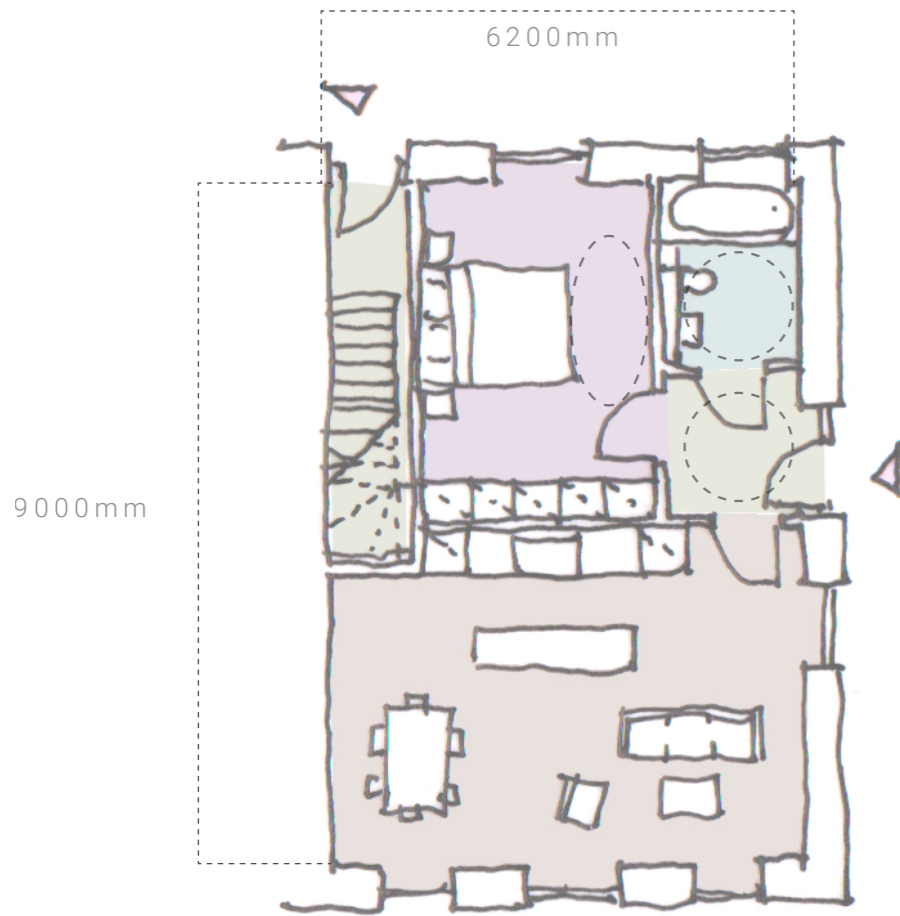
1:100 Model  
FLATS

### MATERIALITY AND ARCHITECTURAL PRECEDENT



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Ground Floor

### 1 BED ACCESSIBLE GROUND FLOOR FLAT

1 Bedroom flat 50.7m<sup>2</sup>

A spin on the Tyneside flat layouts found throughout Newcastle. The lower flat has one bedroom and will be suitable for a wheelchair user.

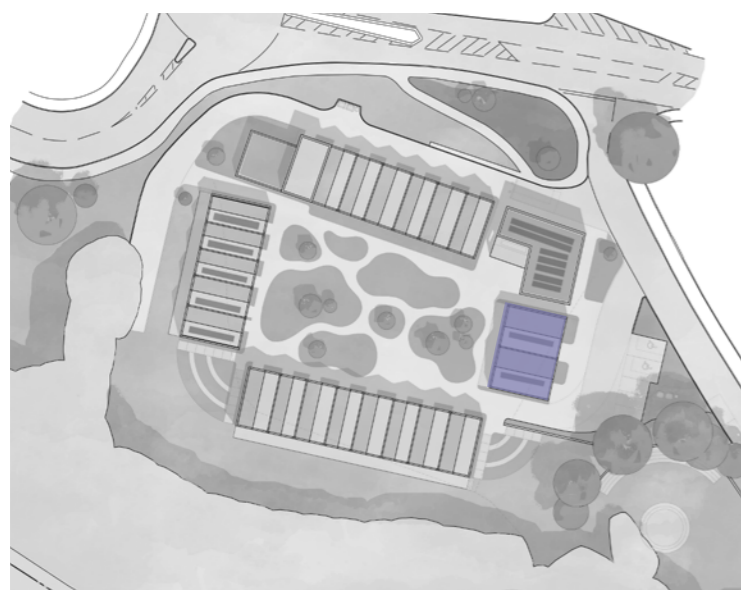


First Floor

### 2 BED ACCESSIBLE FIRST FLOOR FLAT

2 Bedroom Flat 56.7m<sup>2</sup>

The upper flat has two bedrooms emphasise the dual aspect views from the corner plots. The habitable spaces look south over the common gardens.





# INDIVIDUAL UNIT SIZES

scale 1:200 @A3

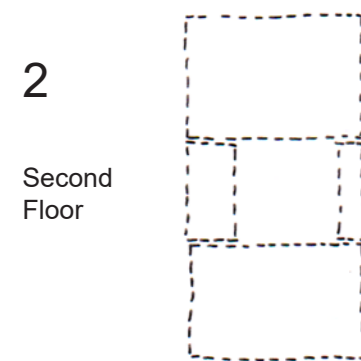
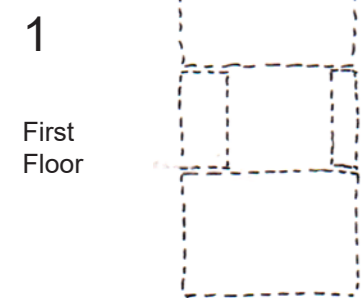
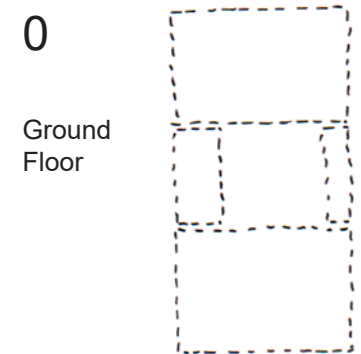




## CUSTOMISATION FLOOR PLANS

The houses are adaptable so living spaces and bedrooms can be on whichever floor the end user would like.

As an example here are 3 ways you could lay out the 4 bed home.





## MATERIALITY PRECEDENTS



Coloured timber examples -



Examples of different elevational treatment



Prefabricated House - Marc Koehler Architects - available dezeen.com

Haus Holler - Architekten Innauer Matt - innauer-matt.com



**DURABLE UNTREATED TIMBER**

Shawm House



**COATED TIMBER**

Parker Avenue



**MATERIALITY PRECEDENTS**

**Timber Cladding**

**ACCOYA**



**THERMAL TIMBER**

Weathered Brimstone ash cladding



Brimstone ash cladding





**BRICK**  
Marmalade Lane



**NATURAL HUNG SLATE**  
Mount Grace Priory



**MATERIALITY PRECEDENTS**

Masonry and Other

**ZINC**  
House Lessans



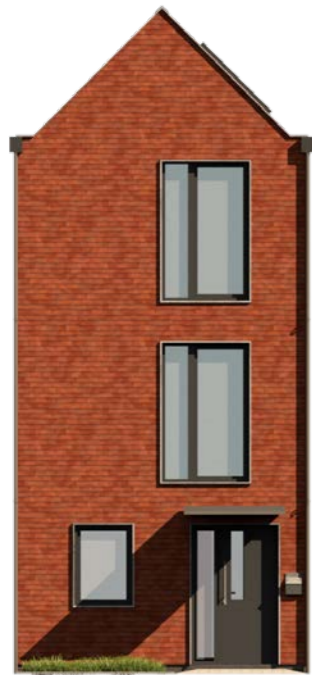
**RAINSCREEN CLADDING**





### OPTIONS FOR ELEVATIONS

The external facing elevations of the houses will be clad in reclaimed slate and tiles. Residents will be offered a choice of cladding materials from the local supply of reclaimed materials. This will give a individual feel to each unit. The use of reclaimed materials is extremely sustainable as it reduces landfill and prevents further carbon emissions from the manufacture of new materials.



Red Tile



Light Red Tile



Green Slate



Blue Slate



Grey Slate



Hung Tile



Hung Slate

### 3 Bed House Rear Elevation



Timber Clad



Reclaimed Tile



Reclaimed Slate





2 Bed House Front Elevation

OPTIONS FOR ELEVATIONS



Light Red Tile



Red Tile



Blue Slate



Green Slate



Grey Slate



Hung Tile



Hung Slate

2 Bed House Rear Elevation



Timber Clad



Reclaimed Tile



Reclaimed Slate





STREET ELEVATIONS





STREET ELEVATIONS





# THE COMMON HOUSE



**PRECEDENT**

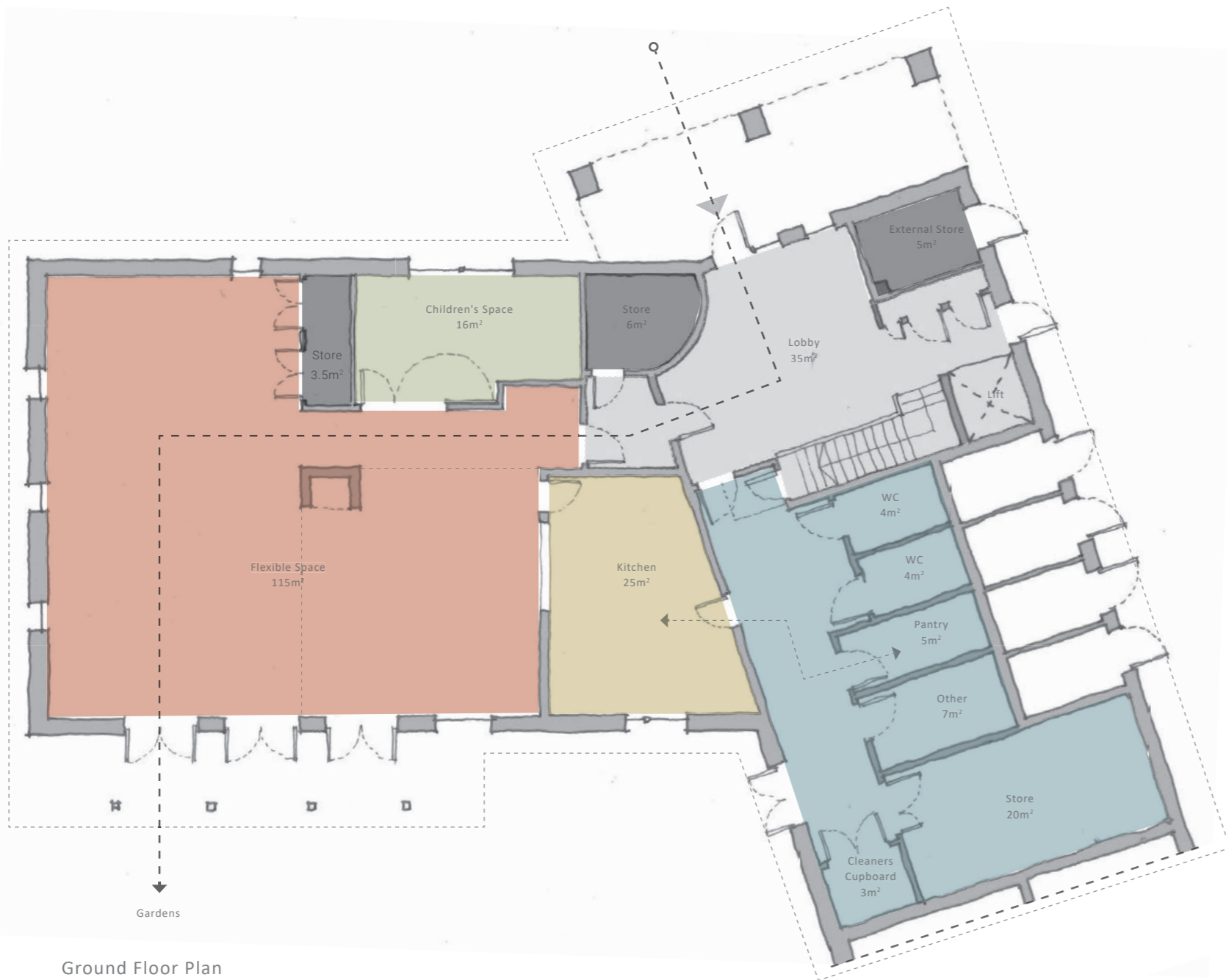
**MARMALADE LANE**

**The Common House**  
 Not to Scale

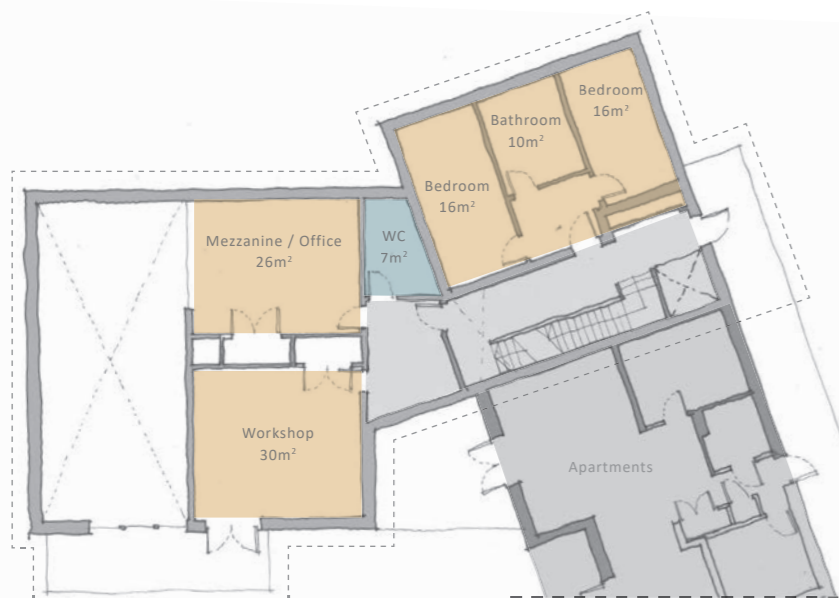
'Houses' on Site - 42  
 Residents - 100 Approximately

**Total Floor Area (Gross Internal)**  
 Ground Floor - 300m<sup>2</sup>  
 First Floor - 160m<sup>2</sup>  
 Second Floor - 80m<sup>2</sup>  
 +  
 Stores, Amenity & Circulation - 185m<sup>2</sup>

**KEY AREAS**  
 Flexible Space - 115m<sup>2</sup>  
 Kitchen - 25m<sup>2</sup>  
 Workshop - 30m<sup>2</sup>  
 Office - 25m<sup>2</sup>  
 Accommodation - 100m<sup>2</sup>



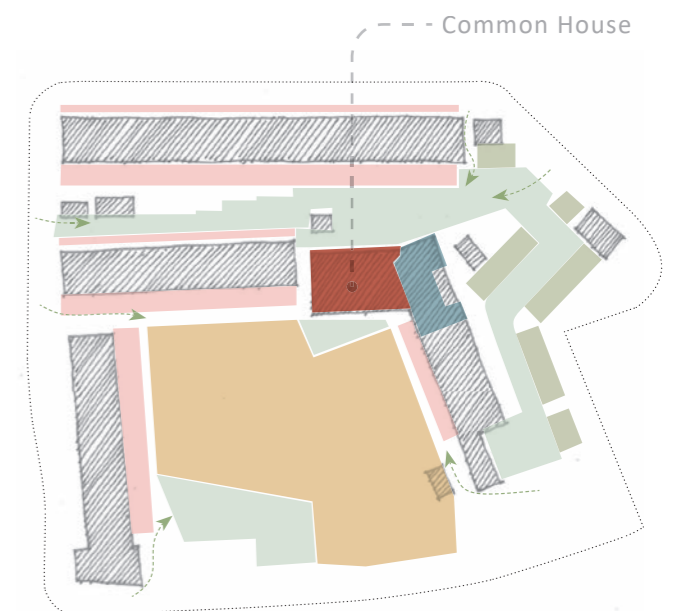
Ground Floor Plan



First Floor Plan



Second Floor Plan  
 Contained Apartment



**mawsonkerr**

MawsonKerr Architects Ltd, 1 Charlotte Square, Newcastle upon Tyne, NE1 4XF



### PRECEDENT

#### LILAC

LOW IMPACT LIVING AFFORDABLE COMMUNITY

#### The Common House

Not to Scale

Houses on Site - 20

Residents - 42 + Guest Room & 2 Spare rooms

Total Floor Area (Gross Internal) 150m<sup>2</sup>

Ground Floor - 93m<sup>2</sup>

First Floor - 57m<sup>2</sup>

Phase 2 Room in Roof - 12m<sup>2</sup>

+

Stores, Pantry, Laundry &

Circulation - 60m<sup>2</sup> Approximately

#### KEY AREAS

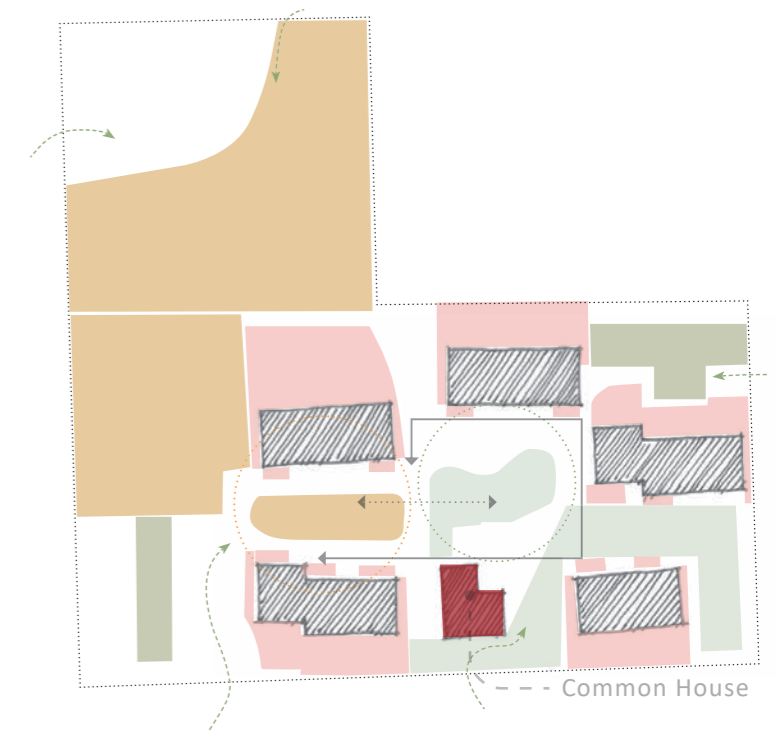
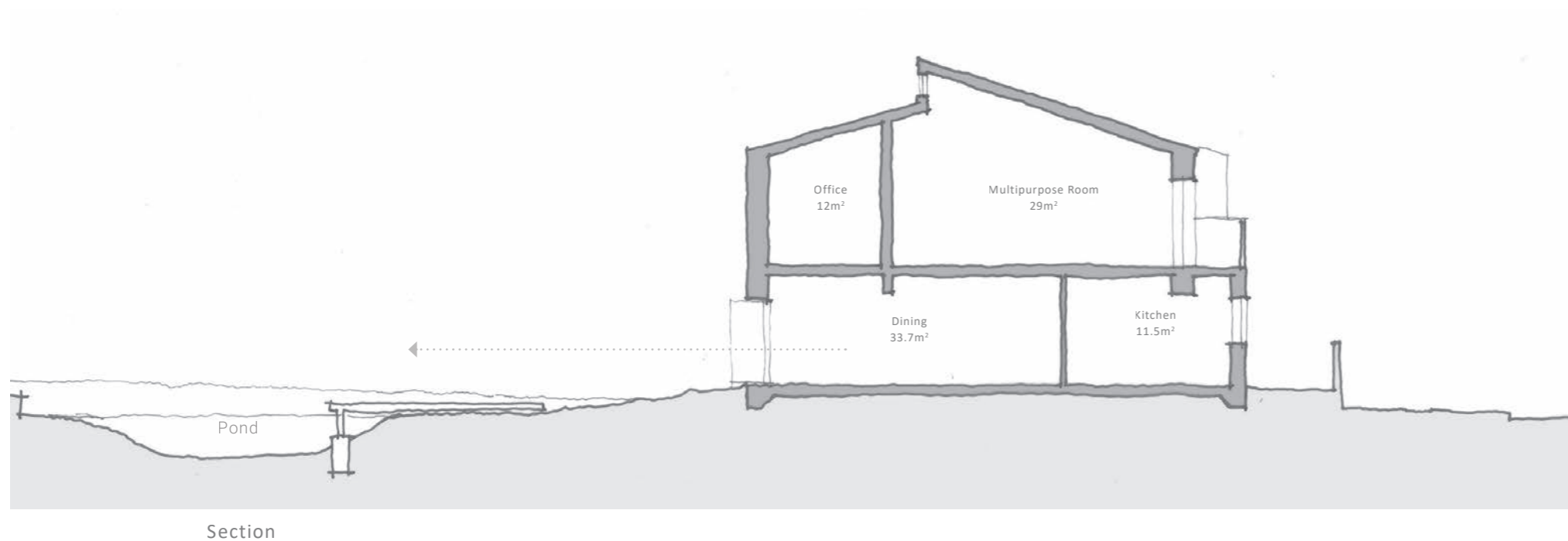
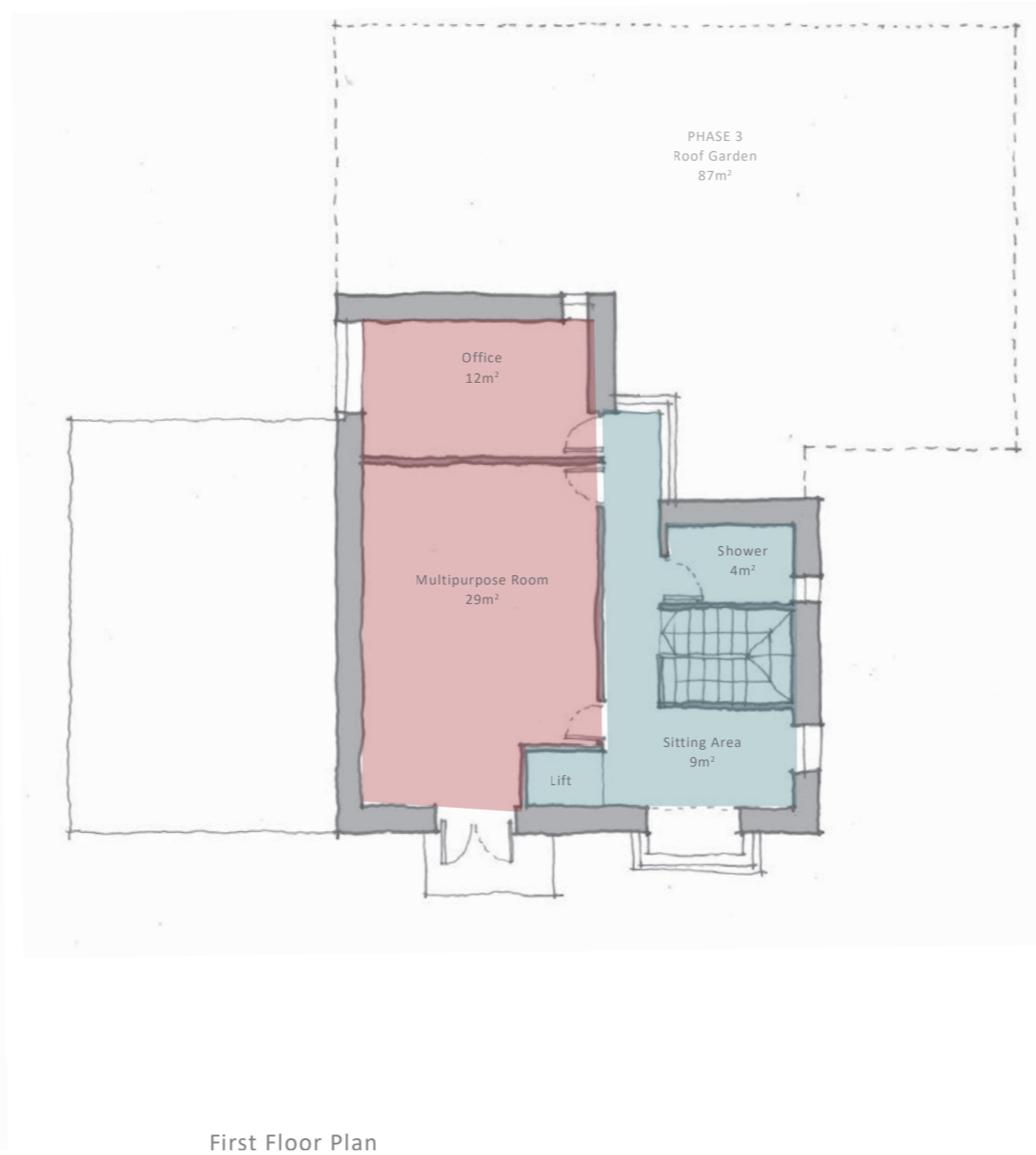
Multipurpose Space - 29m<sup>2</sup>

Office - 12m<sup>2</sup>

Dining - 33.7m<sup>2</sup>

Kitchen - 11.5m<sup>2</sup>

Workshop - 18m<sup>2</sup>



### mawsonkerr

MawsonKerr Architects Ltd, 1 Charlotte Square, Newcastle upon Tyne, NE1 4XF

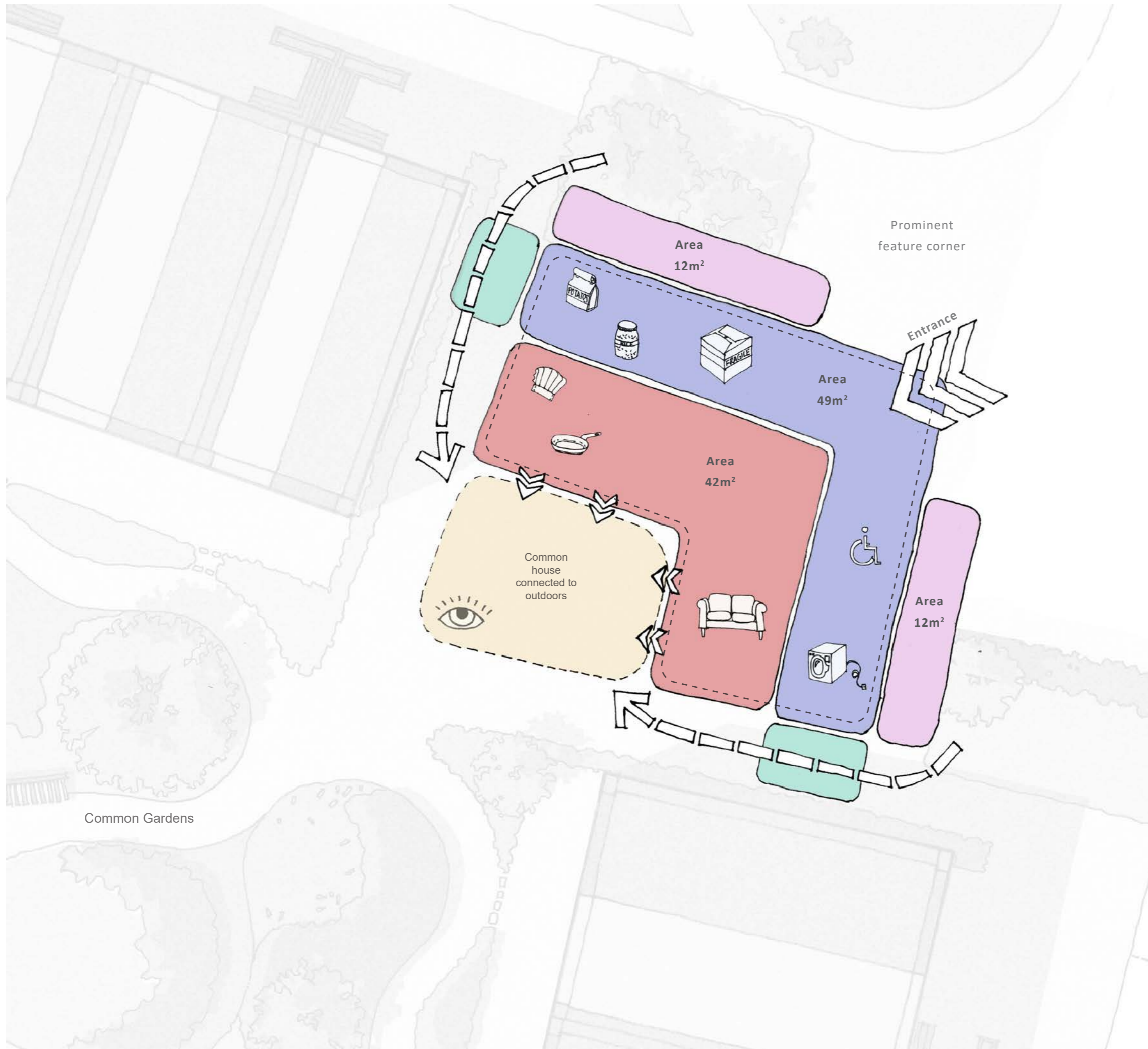


# COMMON HOUSE CONCEPT

## Development



- Spill-out space
- Social spaces
- Ancillary spaces
- External stores
- Threshold canopy



Common Gardens



# COMMON HOUSE FLOOR PLANS

1:100 @ A3

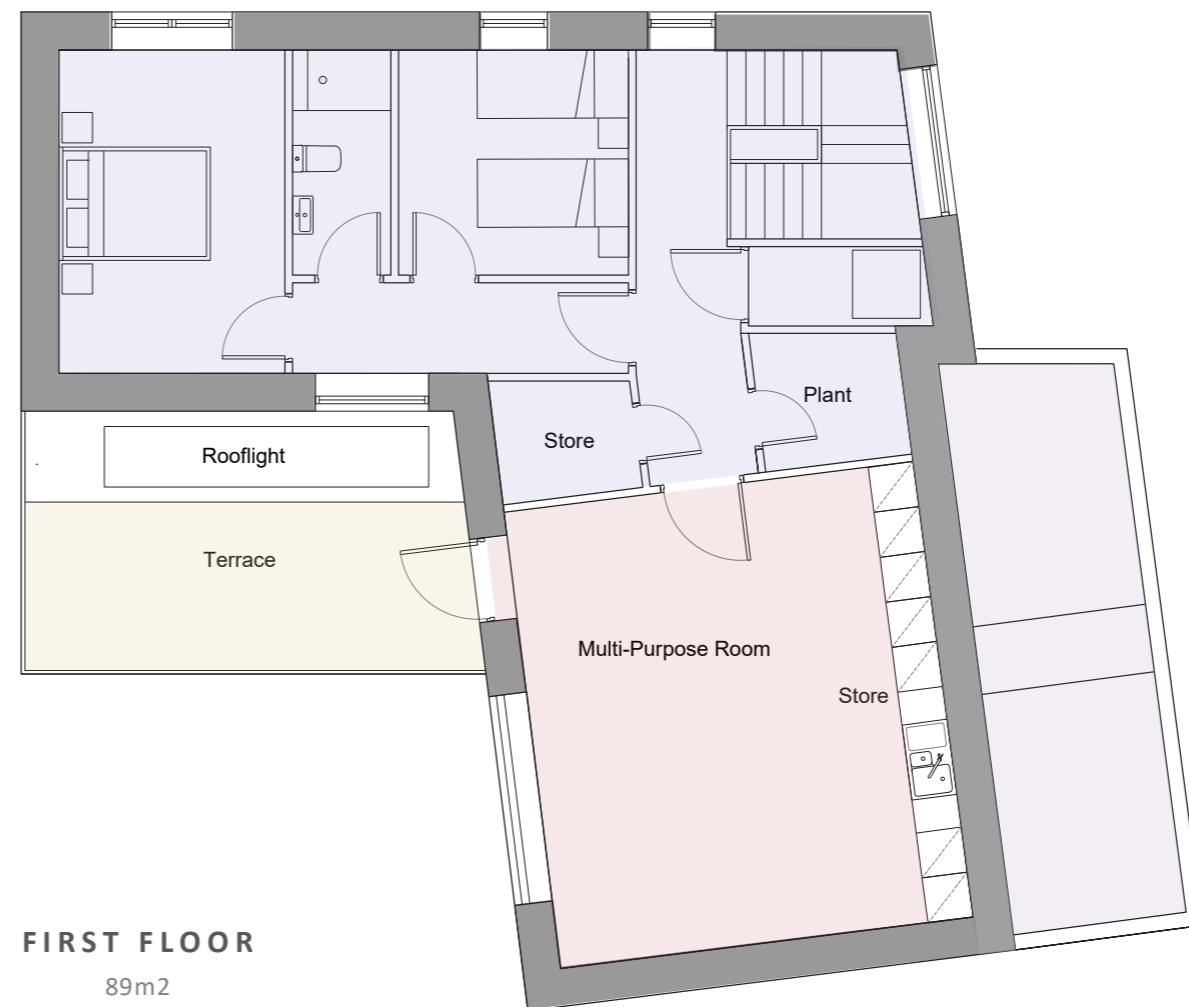
Ground Floor - 110m<sup>2</sup>

First Floor - 89m<sup>2</sup>

199m<sup>2</sup>

Stores Ground and First Floor - 26.2m<sup>2</sup>

- — Spill-out space
- — Social spaces
- — Ancillary spaces
- — External stores





# SITE VISUALS























