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AD671 - Design Summative

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INTRODUCTION TO THE BRIEF

The primary focus of the brief was to develop between 30 and 60 social housing dwellings. Organisational strategies, patterns and movement schemas have been implemented in order to create a project that represents the idea of community. The existing built fabric that currently exists on the site (Moulsecoomb Hall and Moulsecoomb Library) as much as possible, has been saved from demolition, whether that be material or programme. An identity for the site has been developed through unity of site and programme.

CONCEPTUAL MONTAGE

Expression of ideas from an initial read of the brief. Re-working the existing site buildings into the project, so that they do not have to be demolished. Sitting new, low rise social housing on top of the existing fabric. Creating a walkable, community environment with greenery.

Housing Territories

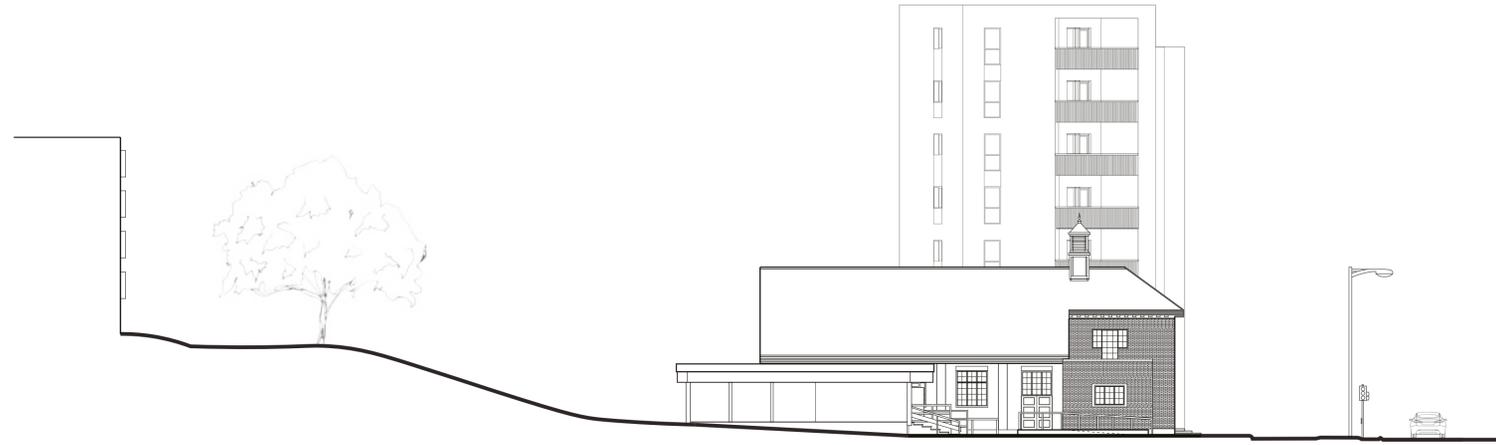


MOULSECOOMB HALL & MOULSECOOMB LIBRARY

The site as it currently exists, comprising of two buildings centrally located at the base of a steep inclined hill.

SCALE: 1:200

Housing Territories

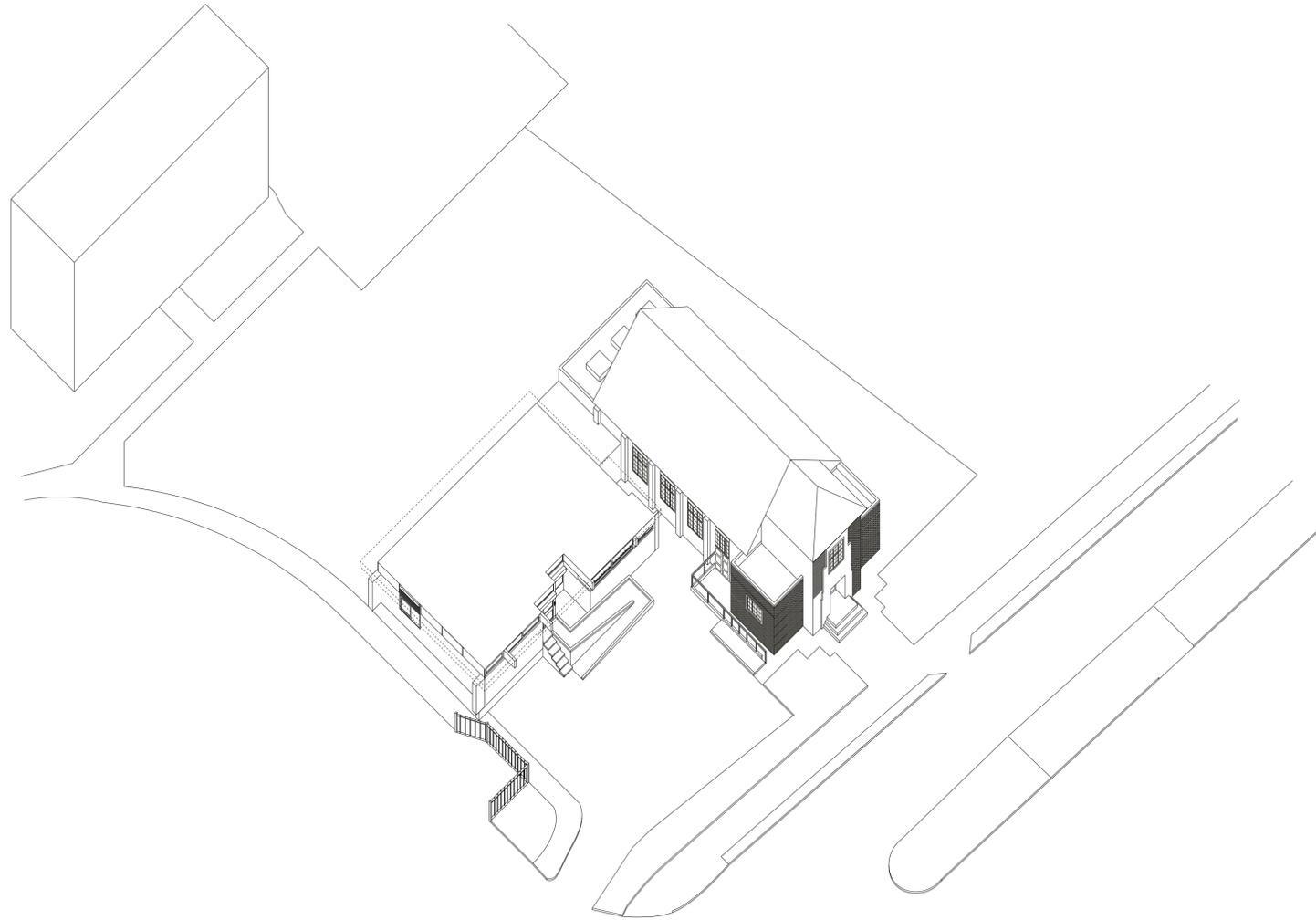


SITE PERSPECTIVE

Understanding the details of the site in the 3D form. The textures and structure of the buildings can be understood here.

Scale: 1:200

Housing Territories

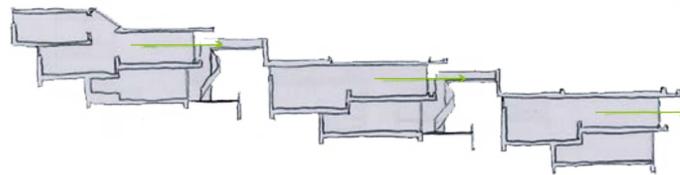
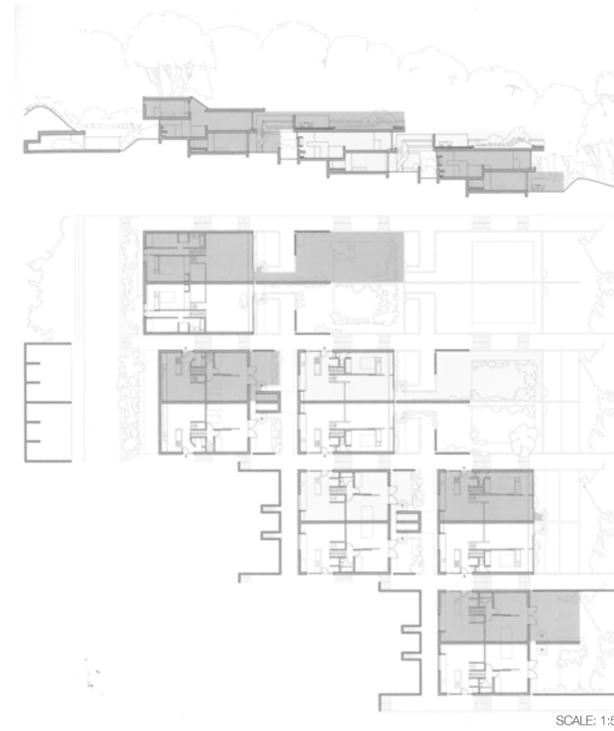


BRANCH HILL ESTATE
Benson & Forsyth

A Camden low-rise development comprising of 21 pairs of two-storey semi-detached houses. Brick pathways between the dwellings create a walkable vacinity. From the highest point looking down the roofs create the impression of an unbroken garden flowing down the slope.

Housing Territories

→
The arrow indicates the direction of the view.
The importance of the view. Directional views exist down the contour of the site providing an extension from inside to outside.



Not my images

BRANCH HILL ESTATE PROGRAMME

Section of the Branch Hill Estate on site. The extension of inside living to outside living strategically does not work at the moment with the gardens being very close, and overlooking the road. The stepped section creates an interesting visual. With this strategy the minimum number of dwellings that is outlined in the brief can not be met and so therefore, a strategy of stacking dwellings needs to be introduced.

Section
Scale: 1:200

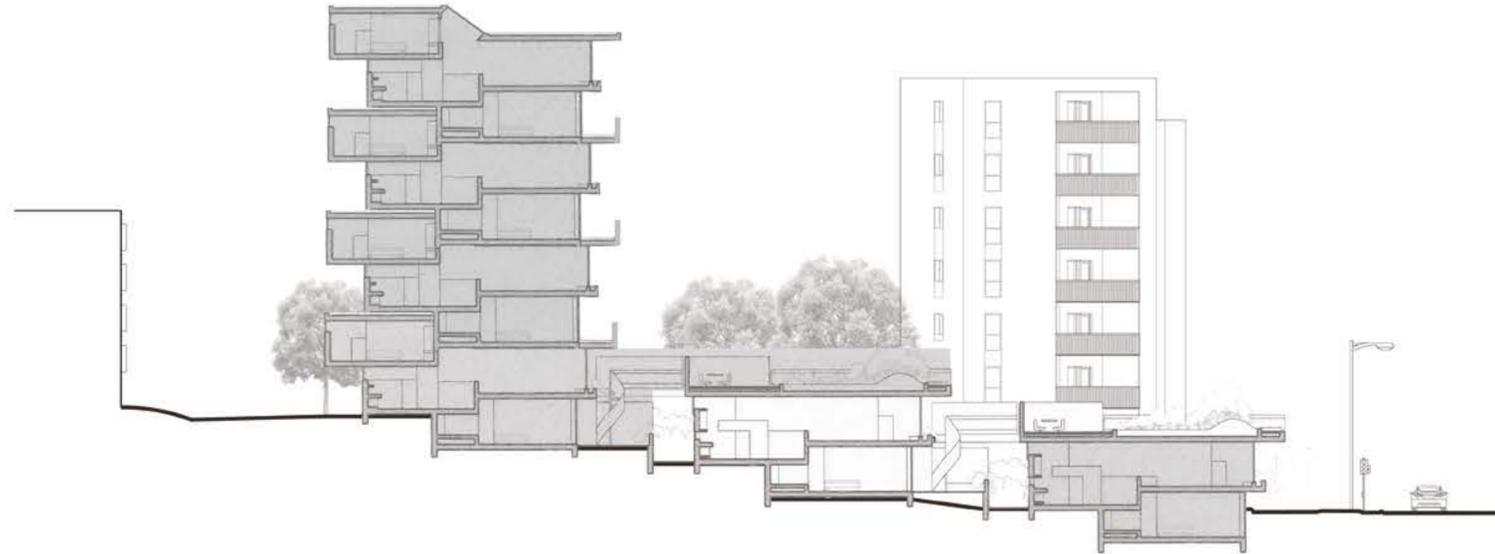
Housing Territories



STACKING PRECEDENT

This stacking strategy allows for 30 dwellings on the site. The dwellings in the tower block lose their extension of the interior space, so that is something I'd like to review and develop. The closeness of the tower block to the neighbouring building at the back of the site creates issues of overlooking and overshadowing.

Section
Scale: 1:200



BRANCH HILL ESTATE TEST

Testing the original plans of the Branch Hill Estate on my site to understand the relationship between unit types and organisation as well as, the number of dwellings that could fit on the site.

Ground Level Plan
Scale: 1:200

Housing Territories

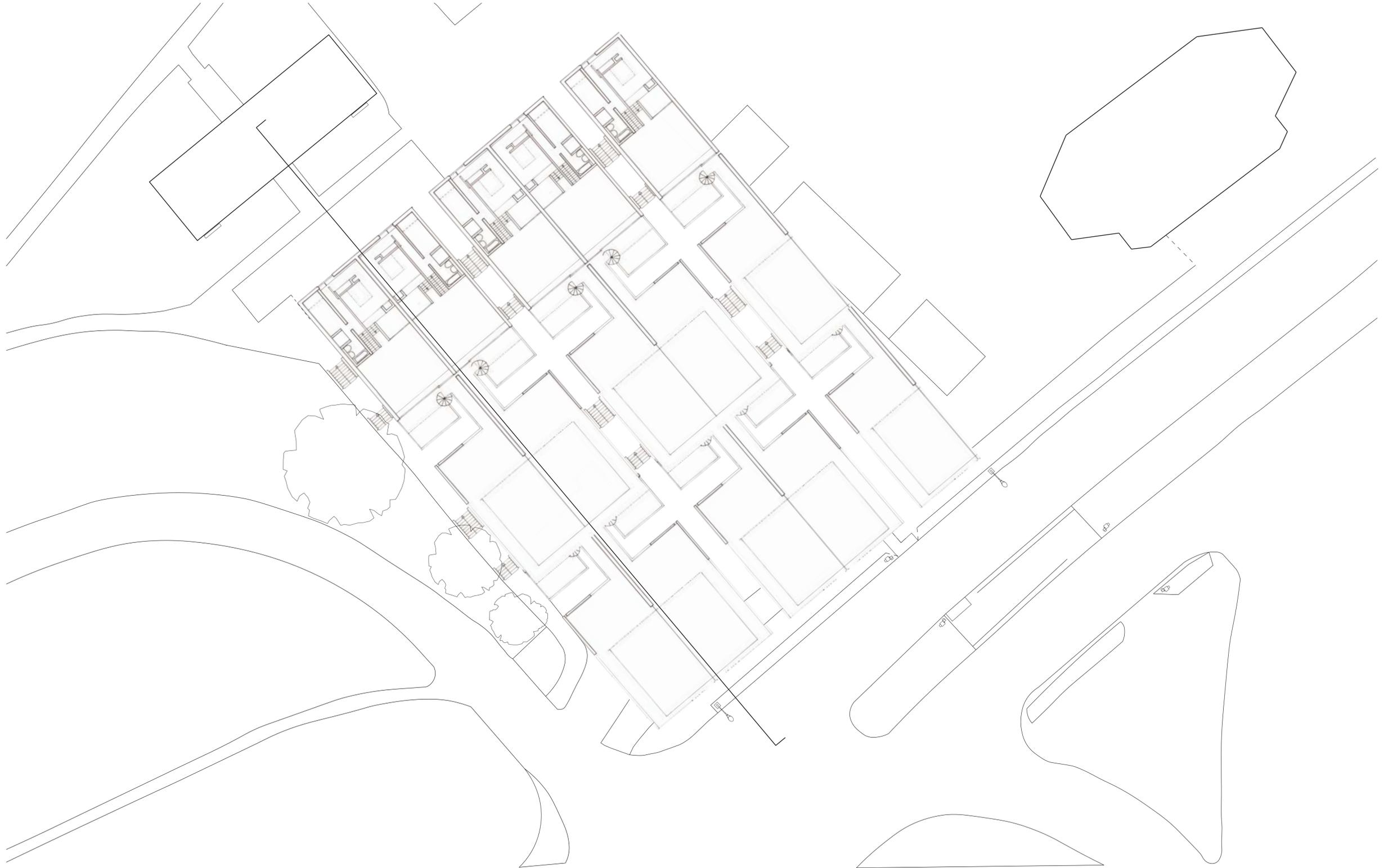


BRANCH HILL ESTATE TEST

The layout of this strategy is something I intend to take forward. The idea of rows with different dwelling types could be introduced. I want to develop the flow of inside living space to outside living space so that this becomes an extension of the inside. At the moment the circulation of the development is very linear and paired, an intentional programme for my project would be to introduce a more collective circulation.

Level 1 Plan
Scale: 1:200

Housing Territories



MANSFIELD ROAD
Benson & Forsyth

Architects heavily influenced by Le Corbusier, created Mansfield Road in Camden which comprises of 73 flats. Double-stacked dwellings are naturally well lit and represent a contextual form of modern architecture.

Housing Territories



Not my images

MANSFIELD ROAD PROGRAMME

An edited section of Mansfield Road by Benson and Forsyth placed on the site. The way in which two dwellings are stacked one on top of the other provides solutions to providing the necessary number of dwellings on the site for the client. This test section is resolved around keeping the library and hall on the site and working around and on top of them. The views from the dwellings are all faced in towards the centre of the site.

Section
Scale 1:200

Housing Territories

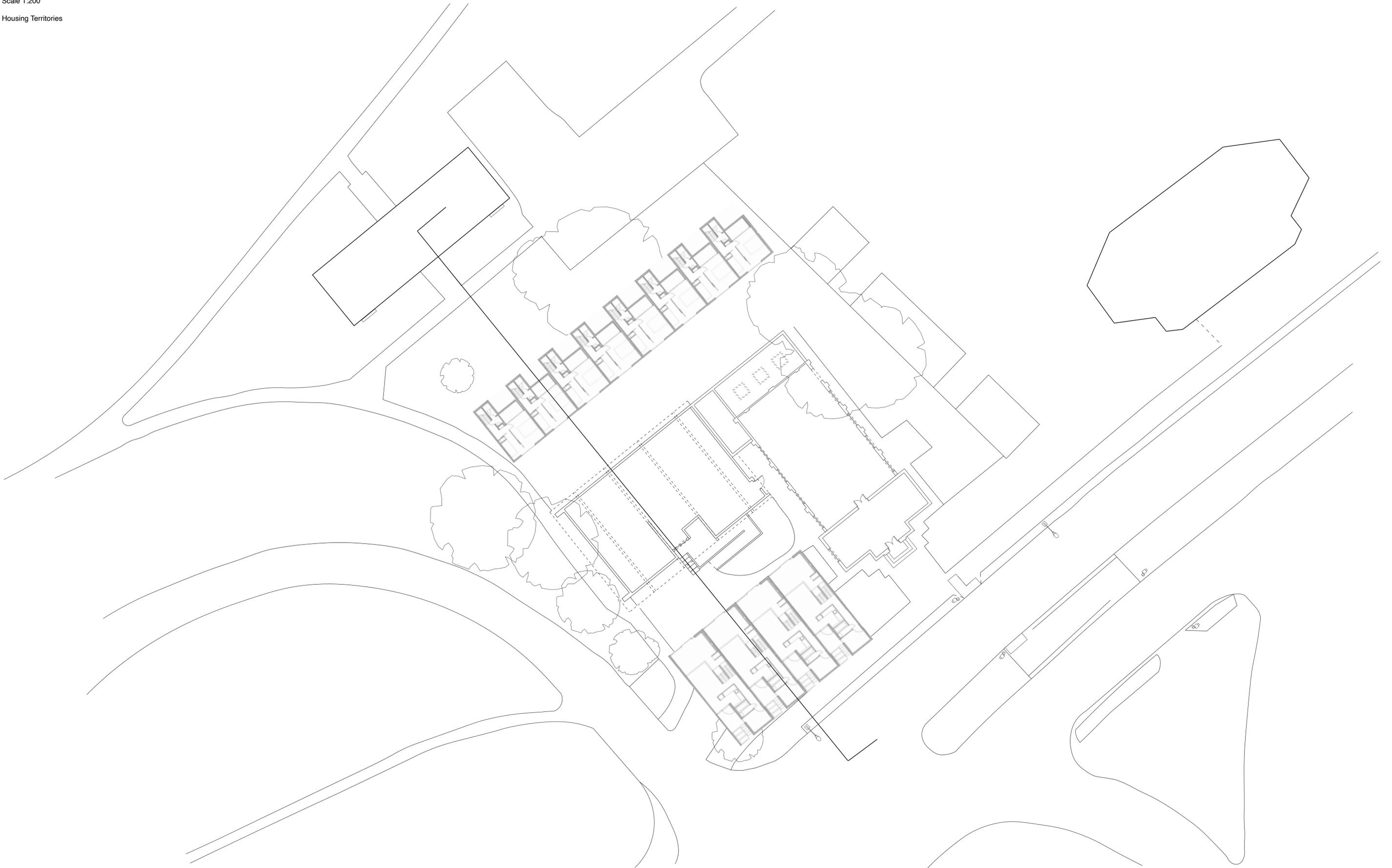


MANSFIELD ROAD TEST

Testing the original plans of Mansfield Road on the site to understand scale and organisation of dwellings.

Ground Level Plan
Scale 1:200

Housing Territories

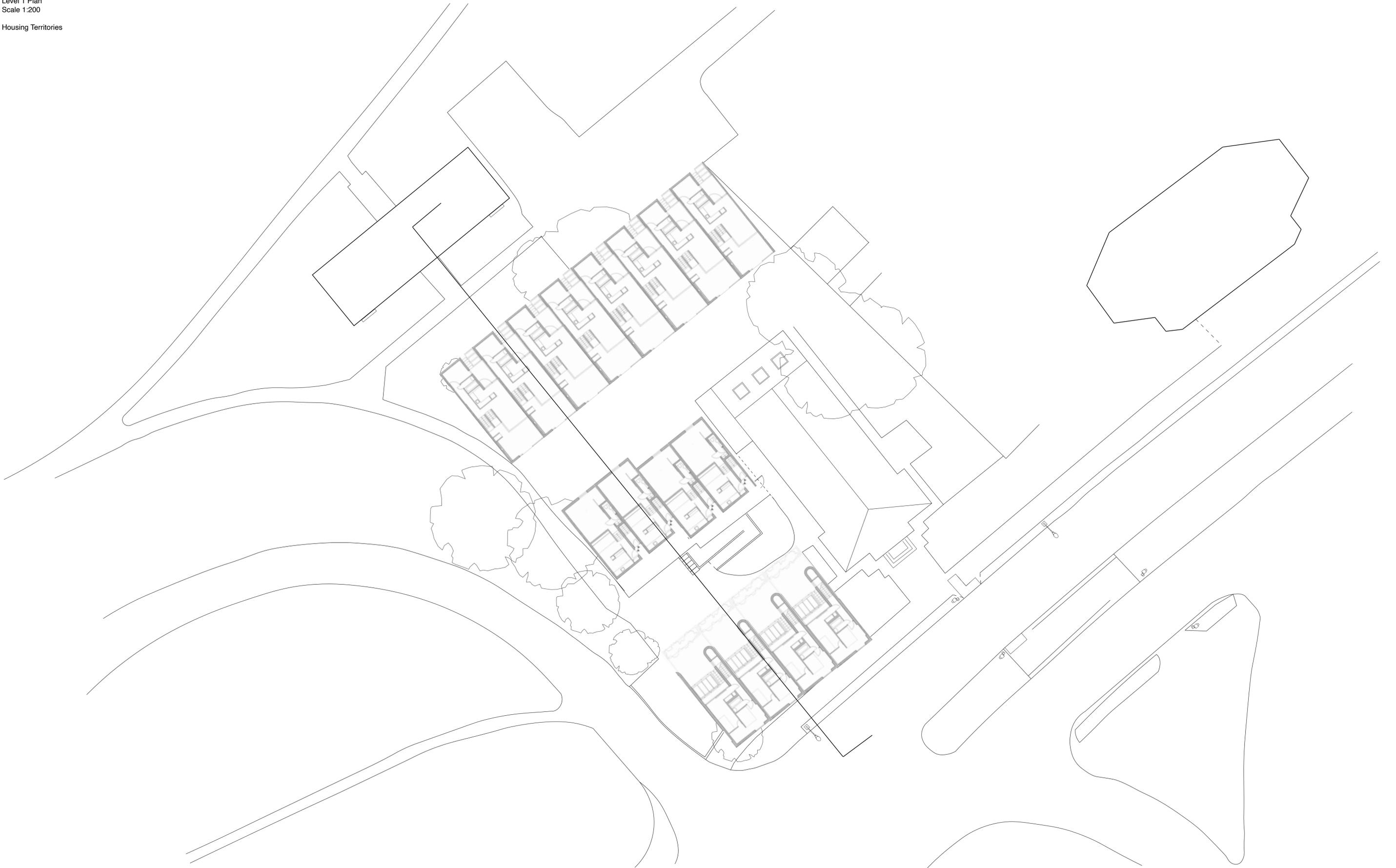


MANSFIELD ROAD TEST

This plan shows how the central dwellings would sit on top of the library and use its structure for support. There is a lot of public space left surrounding the hall which feels wasted and needs reconsidering.

Level 1 Plan
Scale 1:200

Housing Territories



PROGRAMME FOR THE PROJECT

INITIAL IDEAS: After analysing the site and understanding the structure of the existing buildings and, the build up of the hill, I was able to start to see how best the social housing could sit on the site. I understood that dwellings arranged in three rows could make-up a continuous flow that would create an appropriate arrangement for the site. The facings of the dwellings would be directed down the hill and towards the road. To ensure a target of between 30 and 60 dwellings was met on the site, a stacked method would have to be used. A re-work of the existing buildings, including fragments being taken off and moved, as well as, demolition of parts of the buildings needs to happen. The aim is to create a community. Analysis of my dissertation research on what makes a community will be used in order to design a new typography for this social housing estate.

ITERATION 1

A plan configuring the relationship between public and private on the site.
Private gardens with fences are surrounded by plentiful public space in which
every part of the site can be accessed.

Level -01 Plan (Below Ground)
Scale 1:200

Housing Territories

- Public
- Private



ITERATION 1

An introduction to the 'GROUND' level. Creates a level that is raised above Lewes Road level. Provides a coherent, flowing circulation that provides the residence access to the higher dwellings but also to be used as expansion of their individual homes.
Still utilising public and private with private gardens and balconies.

Ground Level Plan
Scale 1:200

Housing Territories

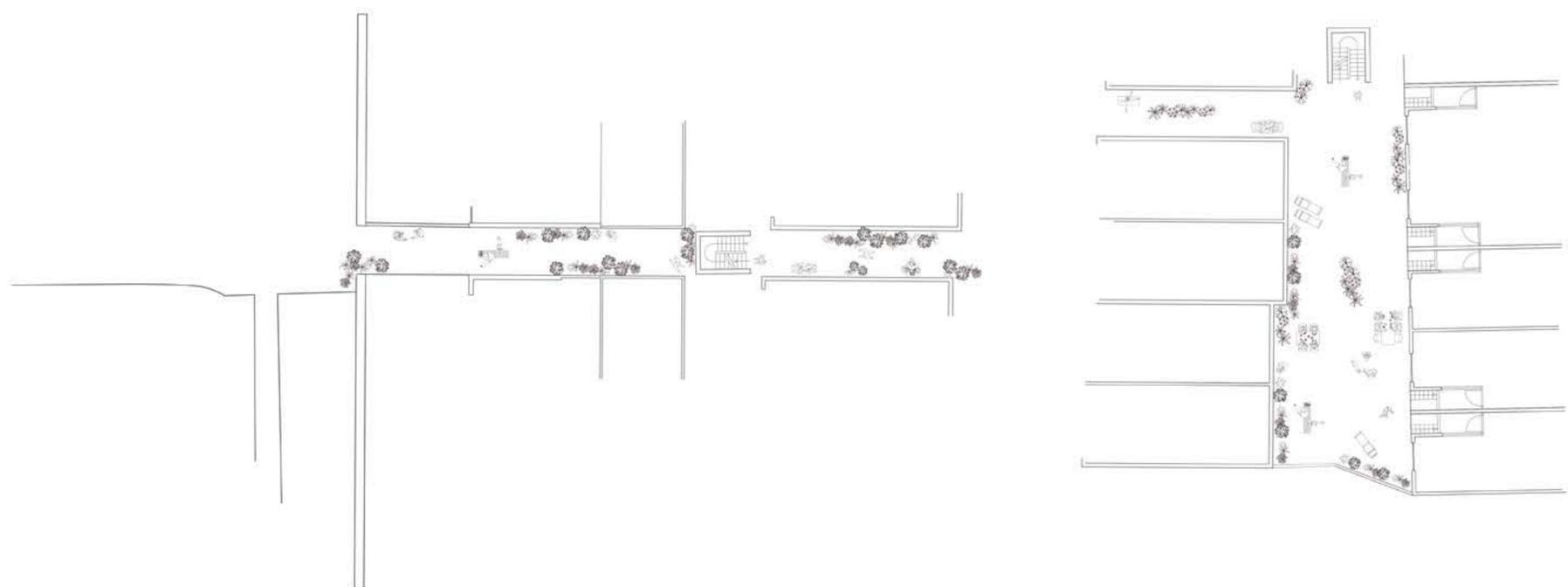
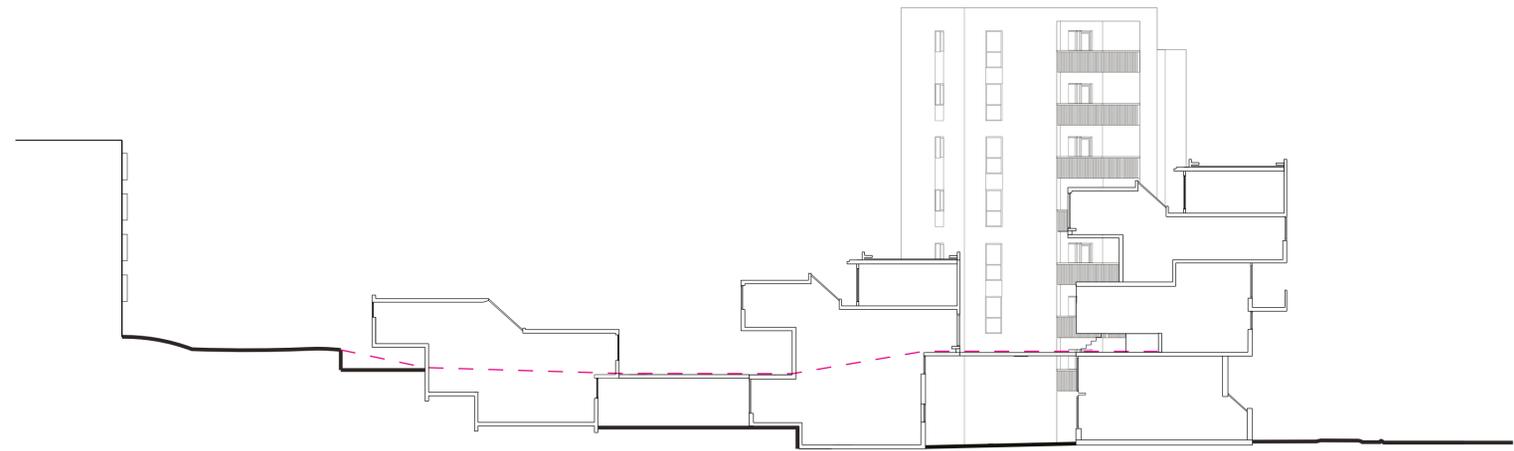


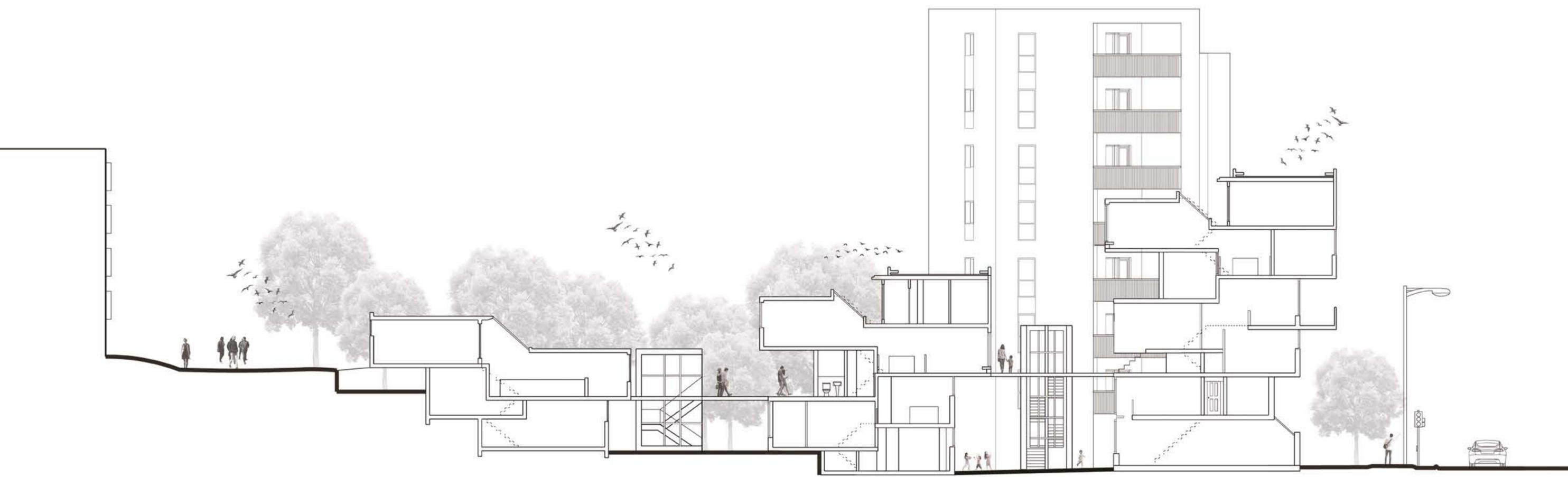
LEVEL 'GROUND' PROGRAMME

Populated drawings showing how the residence might use the 'Ground' level.
A completely public space that can be occupied with complete freedom. The
'Ground' is intentionally an expansion of the individual dwellings. It provides
walkability and a community living space.

Ground Level Section and Plans
Scale 1:200

Housing Territories





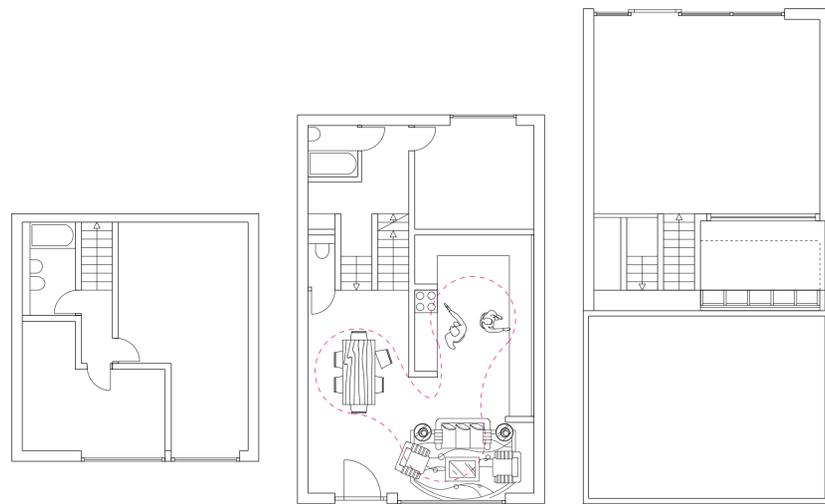
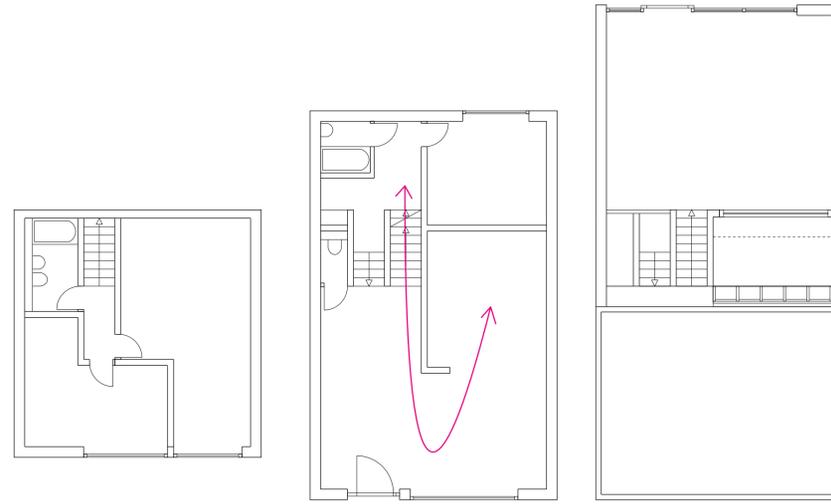
TYPE A - FLOOR PLANS

Exploring dwelling arrangements.

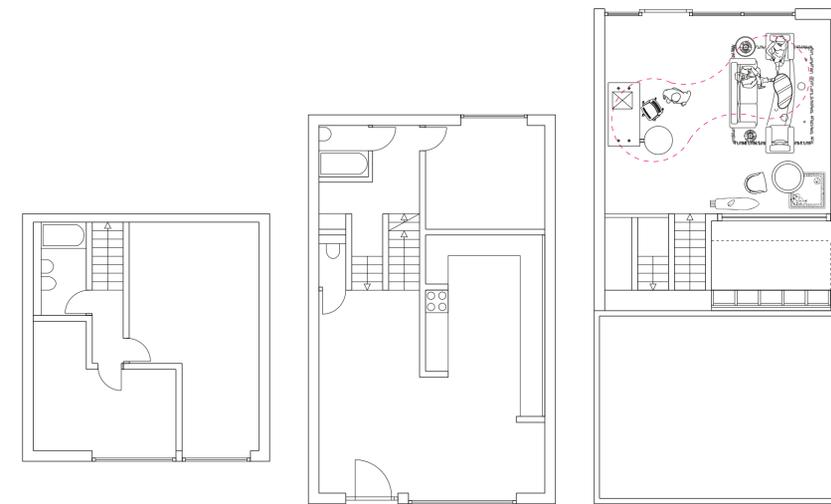
Group living - where activities at different times of the day are grouped together, avoiding constant switching between separate rooms. Here the kitchen, dining and living are grouped in an open plan manor which becomes more appropriate for family living.

Type A Floor Plans
Scale 1:100

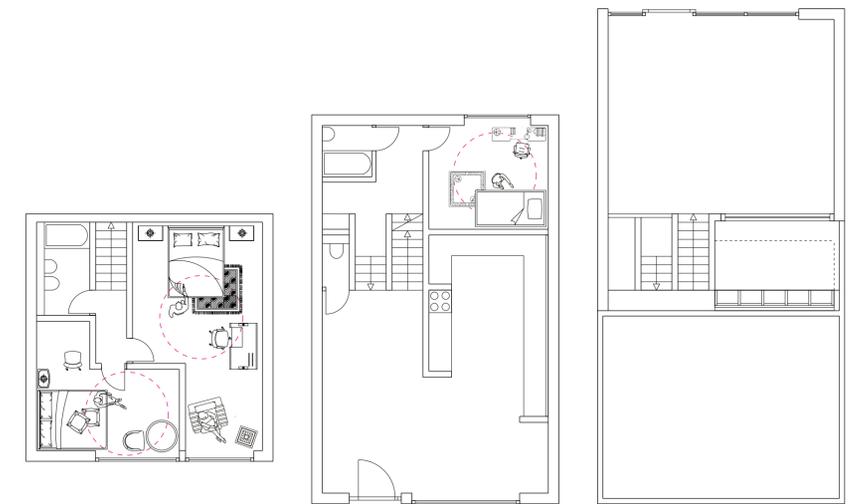
Housing Territories



12h



16h



22h

TYPE B - FLOOR PLANS

Exploring dwelling arrangements.

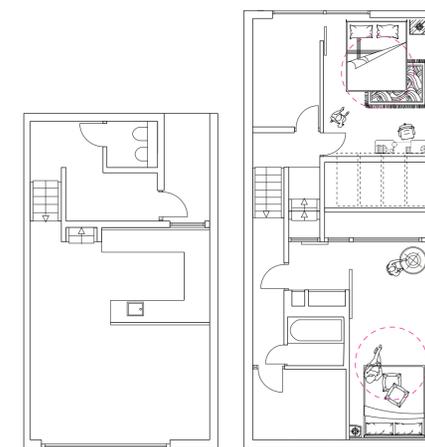
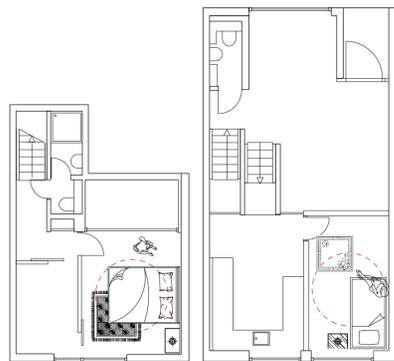
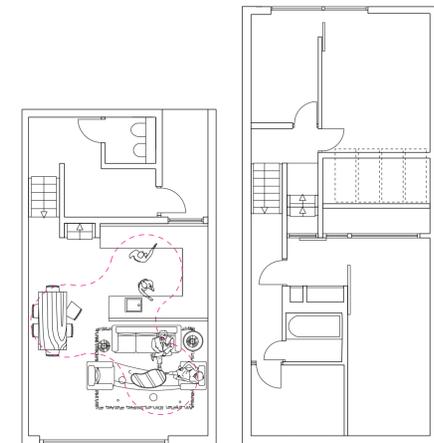
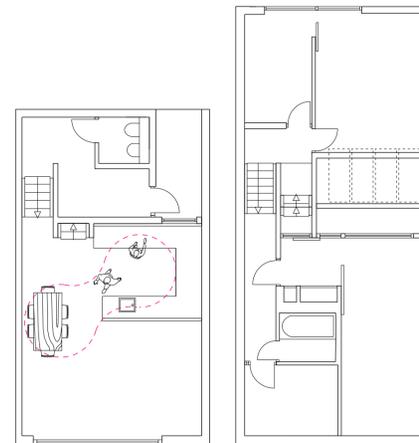
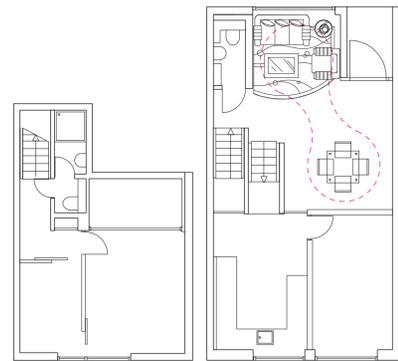
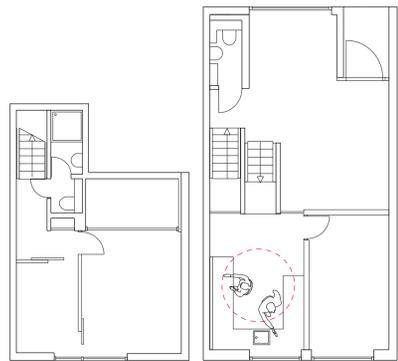
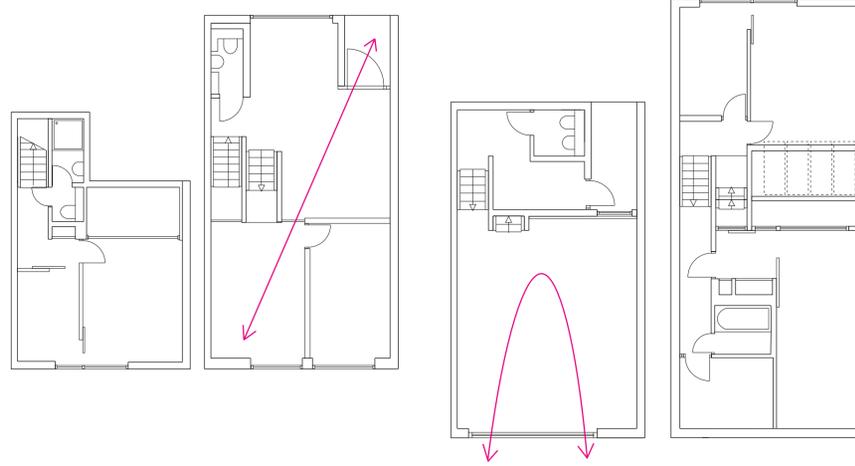
Diagonal living - the lower dwelling of this block is represented through a non-linear floor plan that exists of a diagonal path from the entrance to the living. This type of living may be more suited to couples.

Group living - the higher dwelling has a more open living floor plan with separated off bedrooms upstairs for individual space as well as group living.

Ground Level Section and Plans

Type B Floor Plans
Scale 1:100

Housing Territories



TYPE C - FLOOR PLANS

Exploring dwelling arrangements.

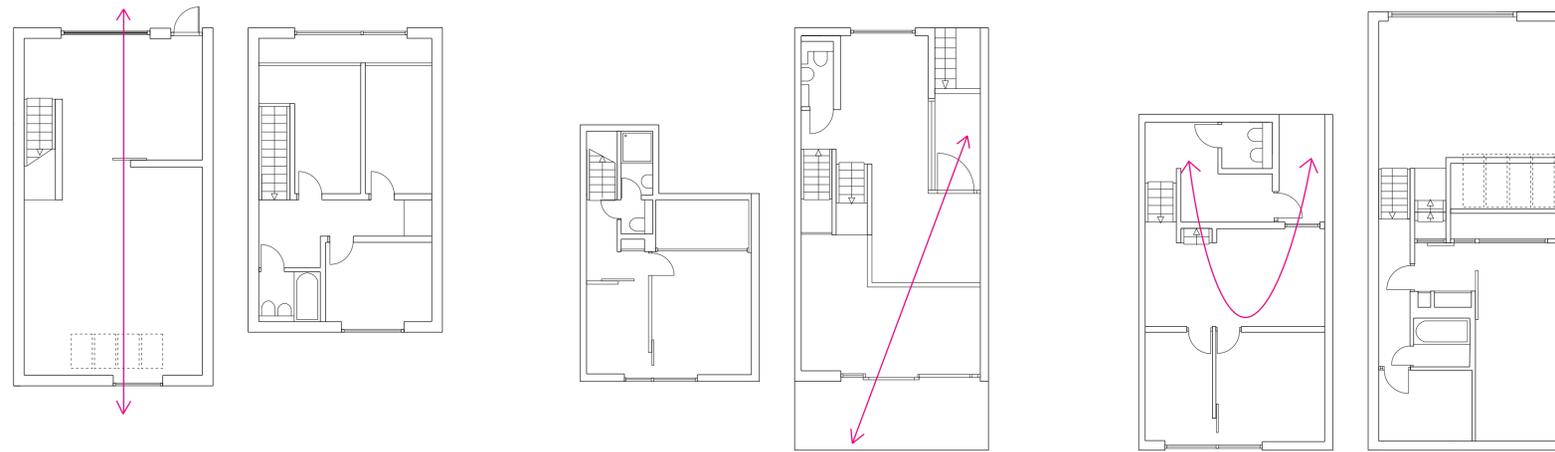
Linear living - the lowest dwelling works as a linear floor plan in which there is a direct line through the living spaces. It then has separate individual bedrooms upstairs.

Diagonal living - the middle dwelling has a non-linear path through the living areas from the entrance to the extension to outside living.

Group living - the top dwelling focuses on group living with living spaces collected close together and bedrooms separated for personal space too.

Type C Floor Plans
Scale 1:200

Housing Territories



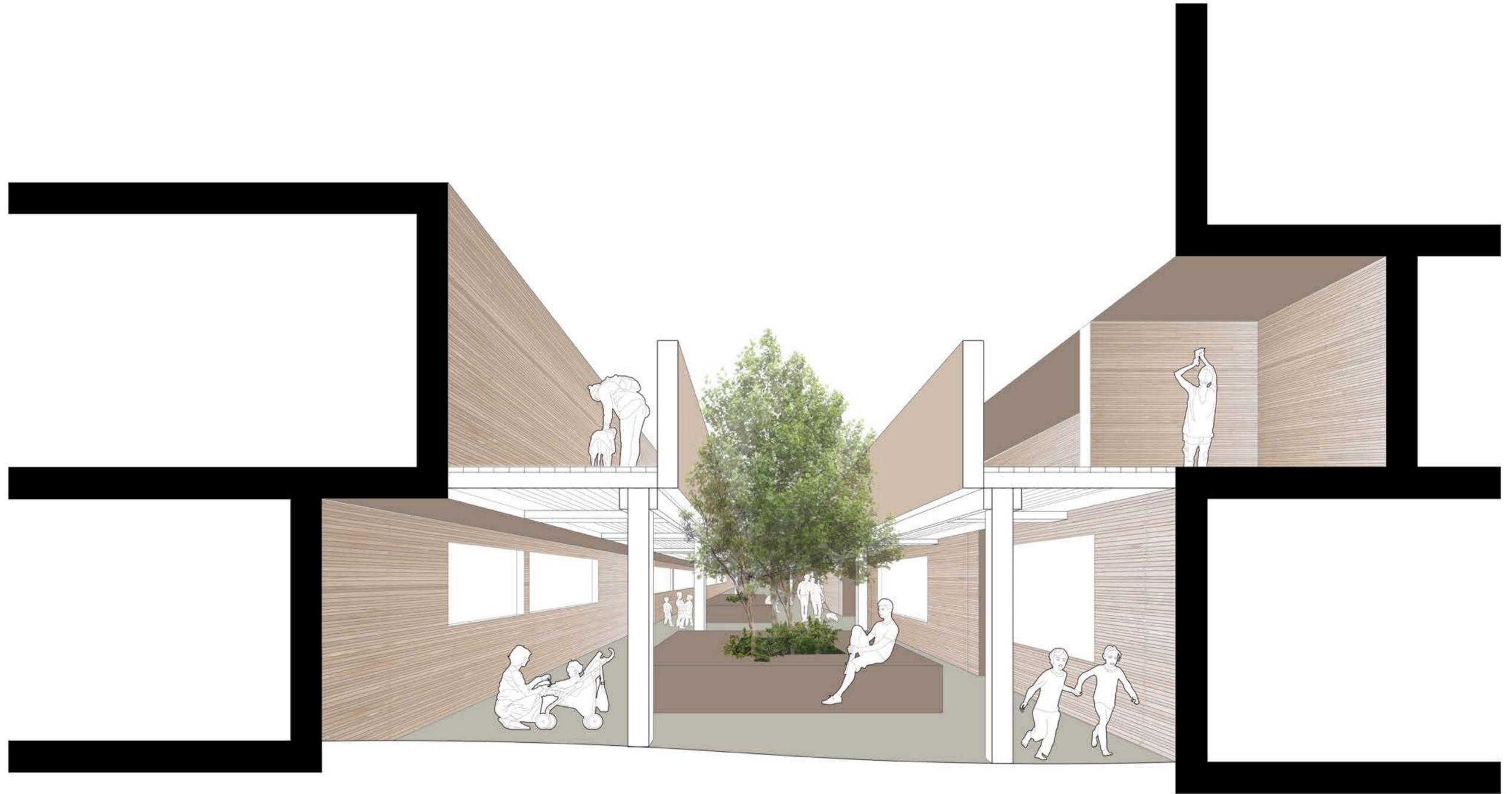
THE DESIGN

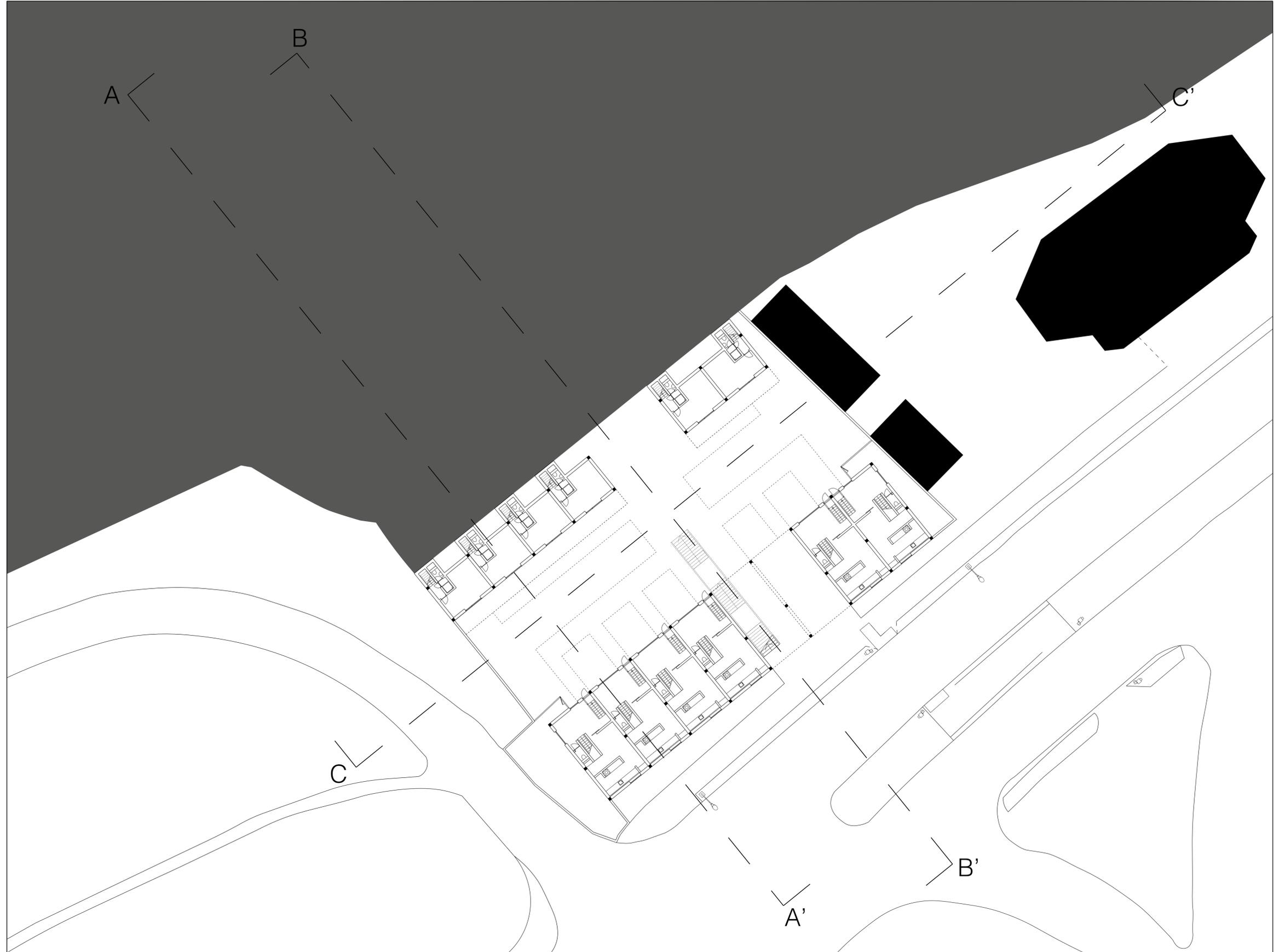
The 'New Ground' is to become the focal point of the development in which most of the community exists. The development has areas of public and private but strongly focuses on the community. Providing a vicinity that promotes walkability and open space in which the residents decide how they use it. A linear route through the site exists which provides two points of entry. The proposal encourages the idea of 'expansion of inside living space' by proving 'living' outside in a communal manor.

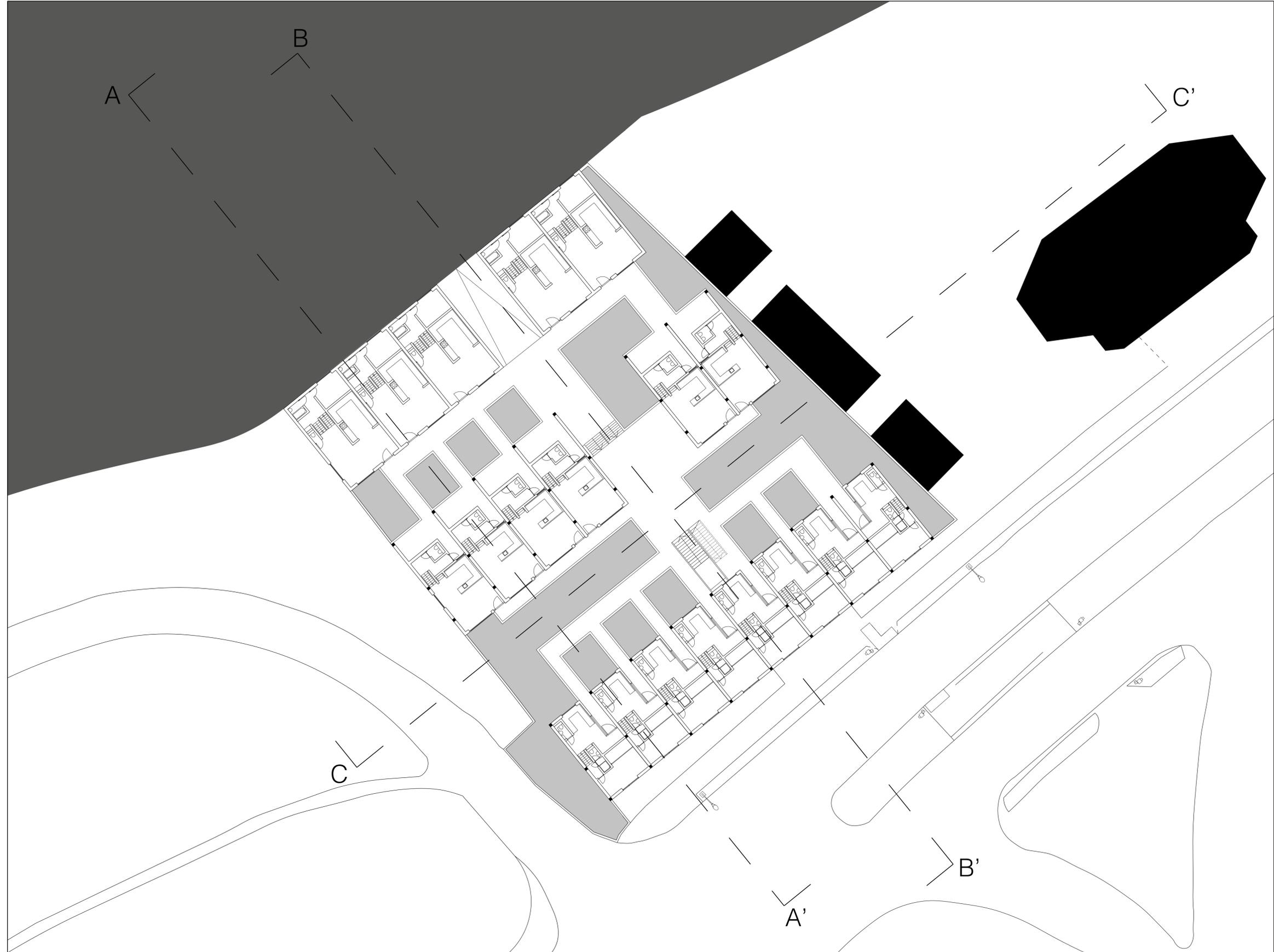
LIGHTWELL

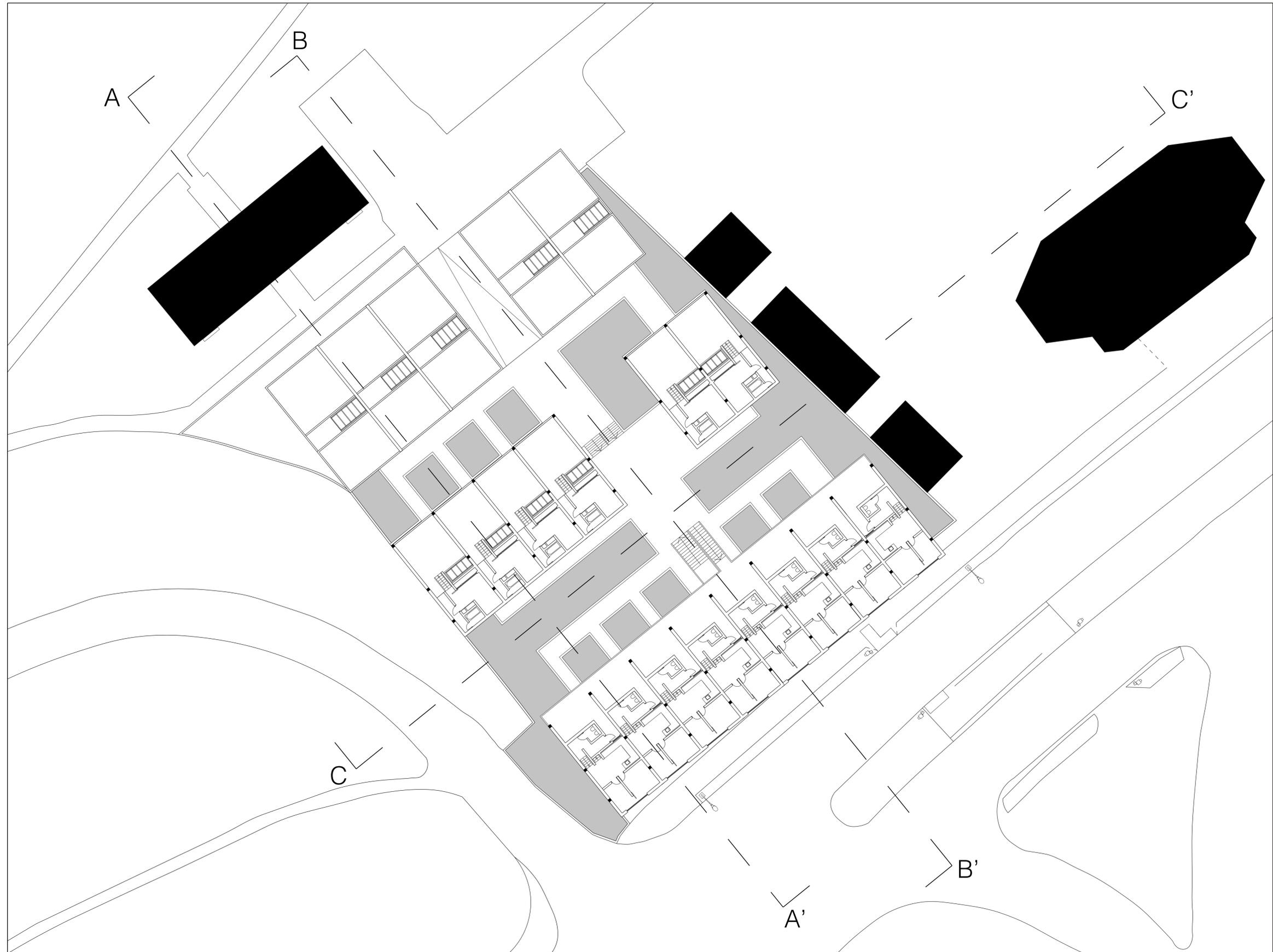
This drawing shows the idea of cutting into the ground level to provide a comfortable living area below.

Housing Territories





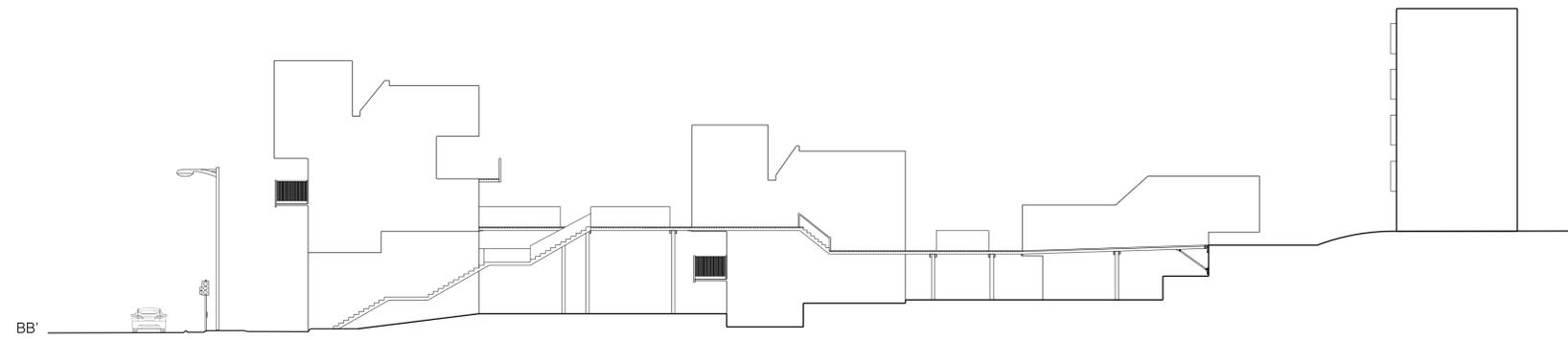
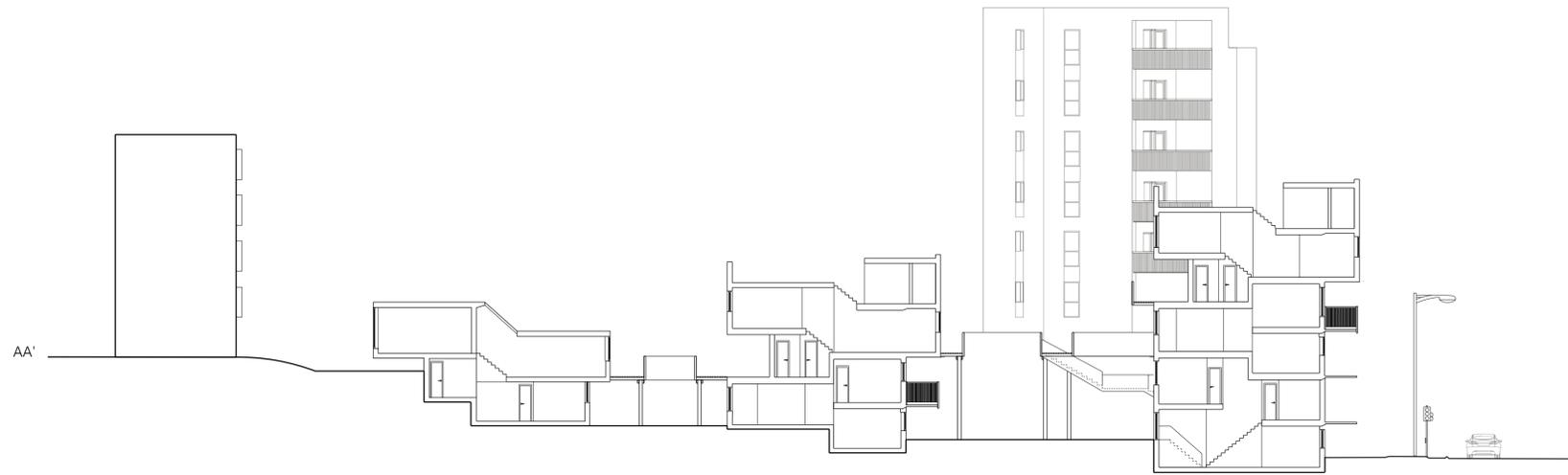




OVERVIEW SECTIONS

Scale 1:200

Housing Territories

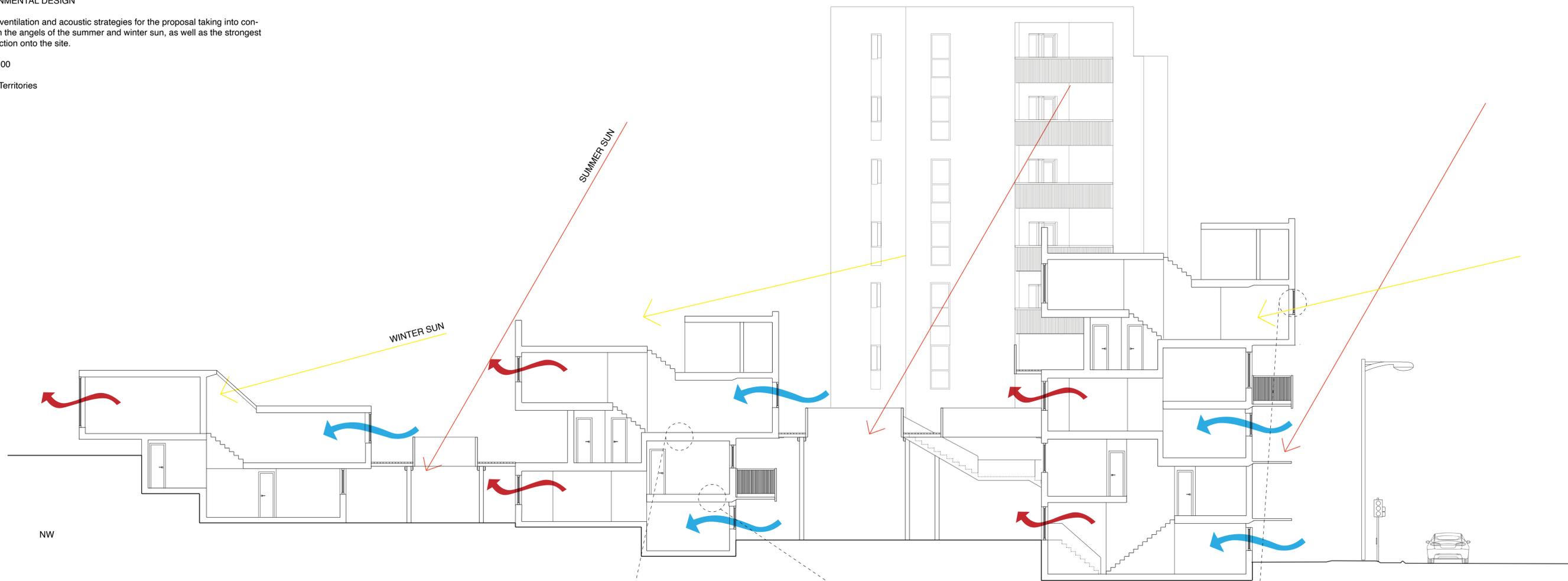


ENVIRONMENTAL DESIGN

Lighting, ventilation and acoustic strategies for the proposal taking into consideration the angles of the summer and winter sun, as well as the strongest wind direction onto the site.

Scale 1:100

Housing Territories

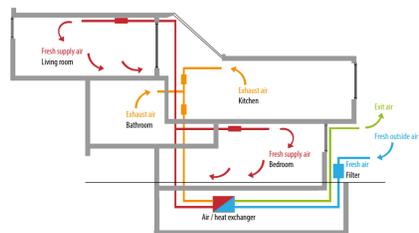


VENTILATION

To provide the desired amount of fresh air entering the dwellings, both natural and mechanical ventilation systems are required. Natural will be used to prevent summertime overheating, whilst mechanical will properly ventilate the spaces by drawing in fresh air from the outside and removing stagnant air from within the dwellings. For dwellings, the required amount of fresh air needed to enter the building is 8 to 10 litres/per second.

Mechanical Ventilation

- Advantages:
- Provide positive ventilation at all times, irrespective of outside conditions
 - Ensure a specified air change rate
 - Forces air through filters
 - Ventilation rate is controllable
- Disadvantages:
- Energy is required to run system
 - Can cause undesired noise

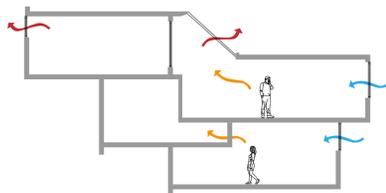


Passive Housing - Mechanical MVHR System

To ensure a healthy, well ventilated home that is energy efficient. The air-tight dwellings can be fitted with MVHR (Mechanical Ventilation with Heat Recovery) systems that extract warm, damp air from the home and draw in fresh air from outside. The warm, extracted air is passed through a heat exchanger to recover the heat before being expelled outside. The cool, fresh outside air is also passed through the heat exchanger, without coming into direct contact with the pollutant air where it is pre-warmed before being pumped in to the property. Because the fresh air is pre-warmed, heat loss from ventilation is largely avoided.

Natural Ventilation

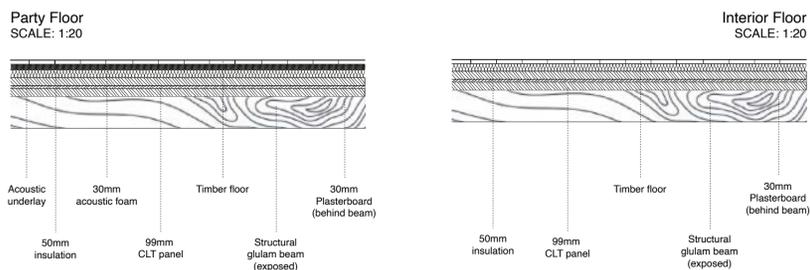
- Advantages:
- Requires little or no additional energy to run
 - Quiet and Healthy
- Disadvantages:
- Airflow rate is affected by temperature difference, height and flow resistances
 - Limited control



Passive Housing - Stack and Cross-ventilation

The dwelling blocks are dual aspect and so a cross-ventilation strategy is the most suitable way air can transfer through for summertime cooling. Due to warm air being less dense and more buoyant it rises. By drawing in fresh air from low openings on one side of the dwellings, it is then heated within the building by sources such as people, equipment and heating. It then rises and can therefore be vented out at higher levels. Passive stack ventilation uses a combination of cross-ventilation, buoyancy and the venturi effect.

ACOUSTICS

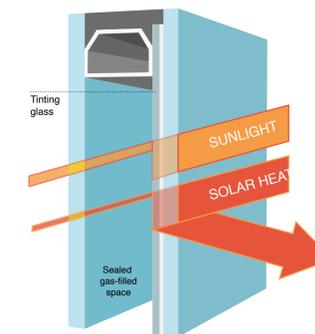


Due to the proposal containing dwellings that are stacked, the acoustics in Blocks B and C must be considered. This is to ensure that there is a strategy in place that creates the correct acoustic levels for the dwellings, but also for the different rooms in the dwellings that have different requirements. Because the individual dwellings contain a split section and therefore have multiple levels, there can be two different floor types. The first floor type is the interior floor that will create the different levels inside the individual dwellings. The use of cross-laminated timber floor panels improve the sound insulation between the floors of the dwellings, this is due to CLT having a density of between 480 - 500 kg/m³. The other floor type is a party floor that contains acoustic foam that can dissipate the sound energy to heat, increasing the transmission loss between floors and creating an improved quality of living for each of the residents.

LIGHTING

Electrochromic Glass

Due to the proposal sitting on the site plane NW to SE, if the SE facade is too heavily glazed there will be too much solar gain. Electrochromic glass is a tintable glass that can be directly controlled by the residents. With this ability it can improve occupant comfort by limiting the amount of direct sunlight that can enter the building and create solar shading. Therefore, due to the dwellings only being dual aspect, they can have glazed facades on both ends without overheating the dwellings. This type of glass would only be used on the SE facades as the NW facades do not receive direct sunlight.



A detail showing the structure and materiality used for the proposal which includes all locally sourced materials.

Housing Territories

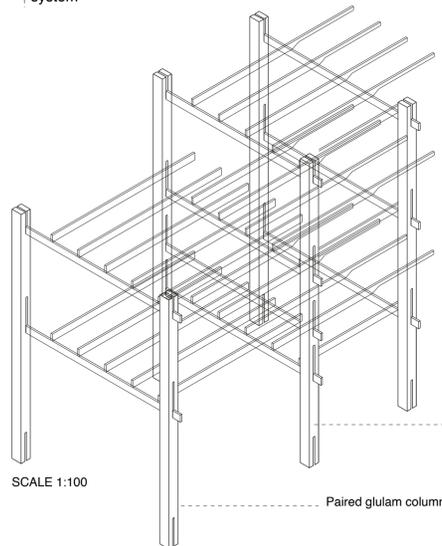
50x200mm Structural Glulam beams
100mm CLT floor slab
50mm Wood fibre insulation
Acoustic underlay
30mm Acoustic foam
15x75mm Timber flooring

Double glazed, sliding CLT window
u value: 1.2 W/m²K
g value: 0.7 W/m²K

20mm Sweet Chestnut Cladding
30x75mm Timber battens
8mm Air gap
Breathable membrane
120mm Wood fibre insulation
100mm CLT slab wall panels
20mm Plasterboard wall linings

NW

ACO Drain system with a 200mm internal width and a concrete upstand to support drainage system

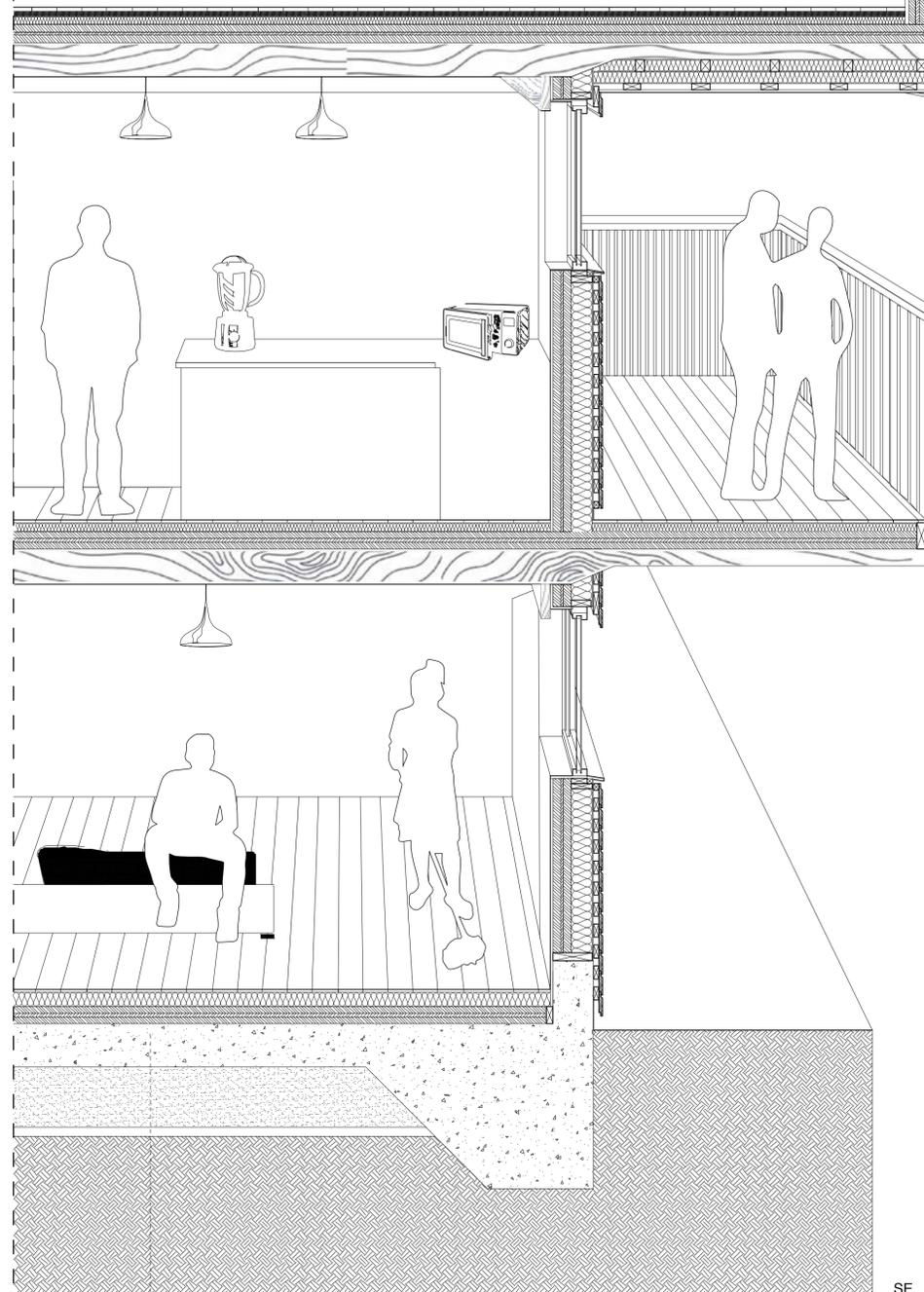


SCALE 1:100

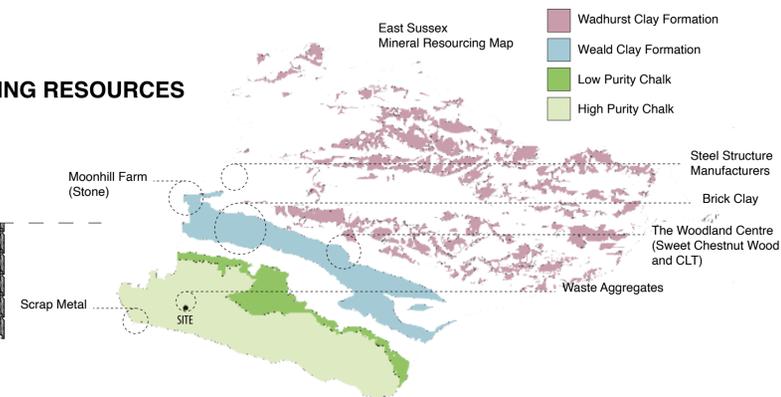
STRUCTURE

Locally sourced glued laminated timber that arrives to site ready to be bolted together and erected with slots in the columns already pre-cut. The connections between columns and beams are made using all steel plates and bolts. The structure comprises of three parallel 'H' frames of paired glulam columns that are then spanned by secondary beams. Raised floor and ceiling systems will create the interior spaces with non-structural partitioning walls. The exterior walls can then be clad with sweet chestnut cladding to keep the interior spaces light. This structure provides flexibility in terms of the final design. The versatility and strength of the glulam allows for cantilevering beams that can create interest within the design.

This example is of the structure of Block B.



LOCAL SOURCING RESOURCES



ENGINEERED TIMBER
Cross Laminated Timber (CLT) or Glued Laminated Timber (Glulam) provides excellent structural properties and low environmental impact. Sourced from The Woodland Centre at Whitesmith. Providing dry, fast onsite construction with the benefits of the building material being fire resistant.



STONE
This material will be used for finishes such as paving and exterior landscaping. Sourced from Stone Republic at Moonhill Farm. Stone is a more sustainable material than concrete due to it being able to be reused in the future. It also can have a quality that introduces beauty into design.



WASTE AGGREGATES
Concrete excavated from the site from the existing car park. This concrete can be crushed and combined with virgin aggregate to make new concrete. Can be used for concrete foundations. This ensures a reduction of construction waste ends up in landfill.



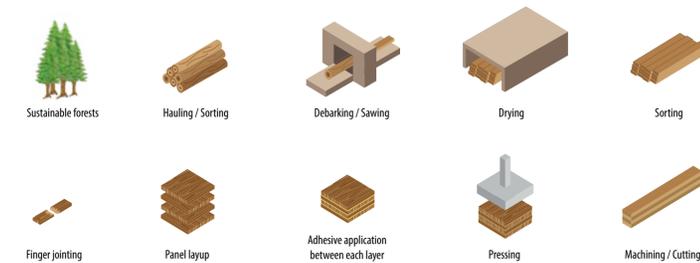
SWEET CHESTNUT WOOD
The woodland Centre at Whitesmith creates the highest quality engineered timber from well managed and sustainable UK forests. The sweet chestnut panels are hard and strong and require minimal maintenance.



REUSED STEEL
Steel can be used for small structural elements but its use will be limited. This is due to timber being the more sustainable material. However, where absolutely needed reused metal that is collected in Shoreham can be used to ensure a circular economy. Where already extracted metals can be used over and over again.

HOW THE STRUCTURAL TIMBER IS MADE

THE WOODLAND CENTRE (17 MILES)
Cross Laminated Timber
Structural elements in the form of CLT wall and floor slab panels.



CLT is an engineered wood panel product that is strong when manufactured into solid wood panels which can then be used as walls, roofs and floors. For the low-rise strategy it can be used to create the building envelope that can then be clad with other materials. A structure comprising of this material allows for large sections of the build to be pre-fabricated and then assembled on site allowing for a reduction in assembly time and labour. Using CLT means that if the dwellings needed to be removed the structure could be disassembled and reused or recycled into something else: fuel, chippings, wooden flooring or decking.

THE WOODLAND CENTRE (17 MILES)
Glued Laminated Timber
(Same initial process as above)
Structural elements in the form of a Glulam grid frame.

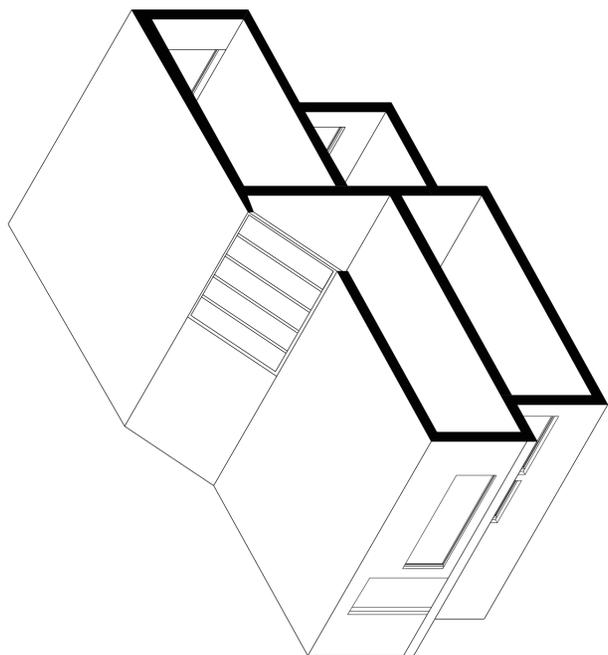
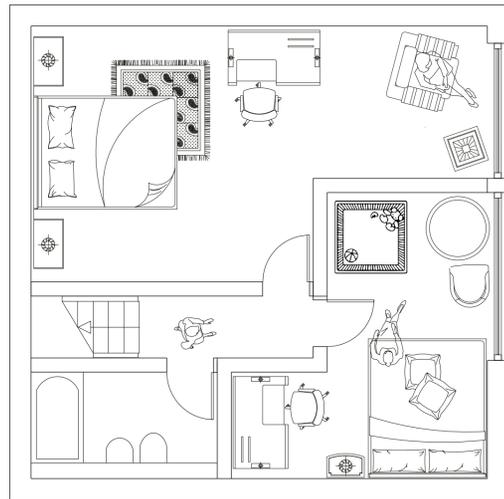
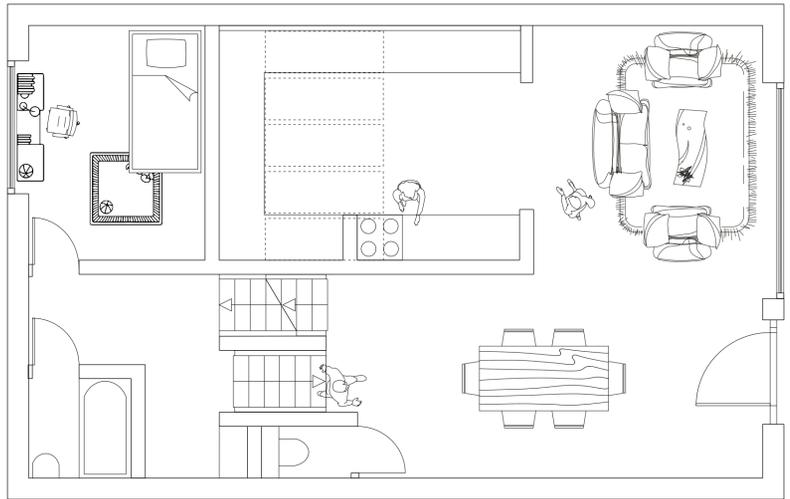
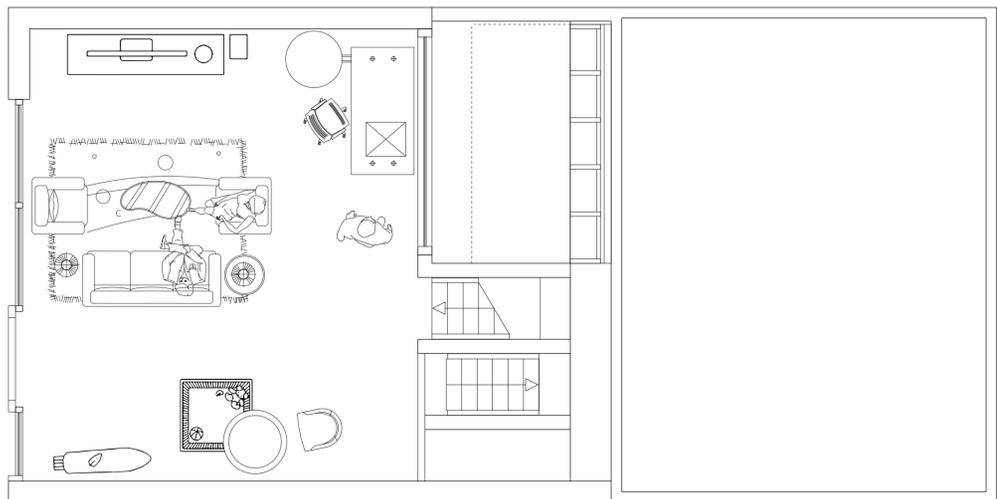


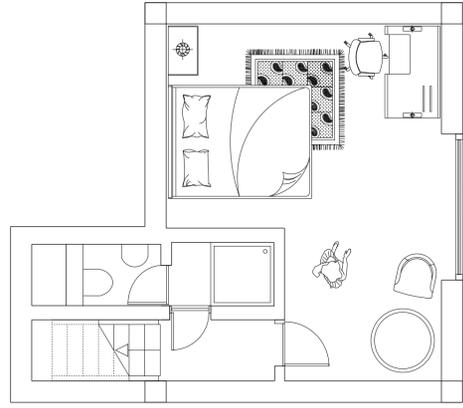
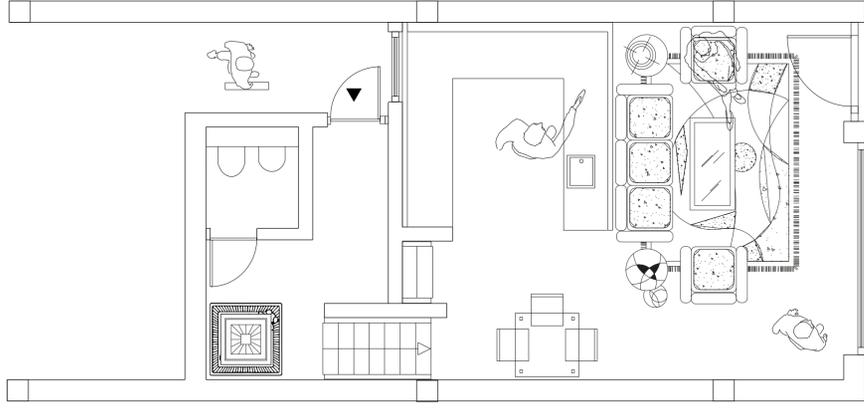
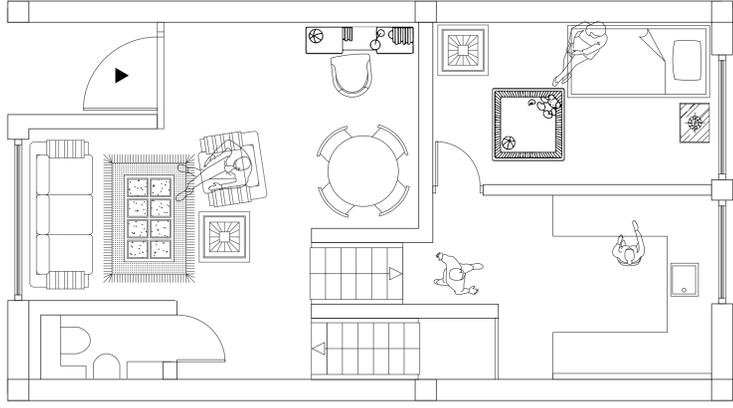
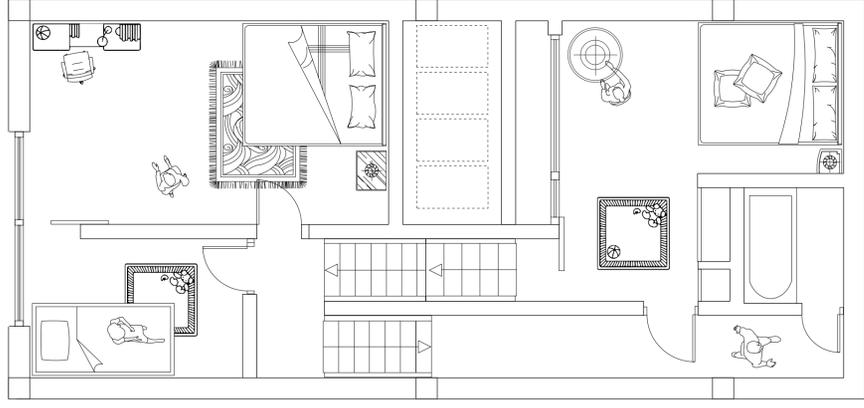
Layers of parallel timber laminations create a very versatile material that can be manufactured into a wide variety of shapes, sizes and configuration. Glulam has high load bearing capabilities and high dimensional stability which can be manufactured up to 50 metres in length. This makes it ideal for use to create a grid frame structure for the high-rise strategy due to its capability to create large open spaces. The manufacturing process of Glulam is not a high energy one and therefore means it is a less environmentally impactful material than the traditional construction materials such as concrete and steel. Large sections of Glulam perform very well in fires due to the rate they char being known and the way the timber does not twist, buckle or deform and so therefore creates a safer construction.

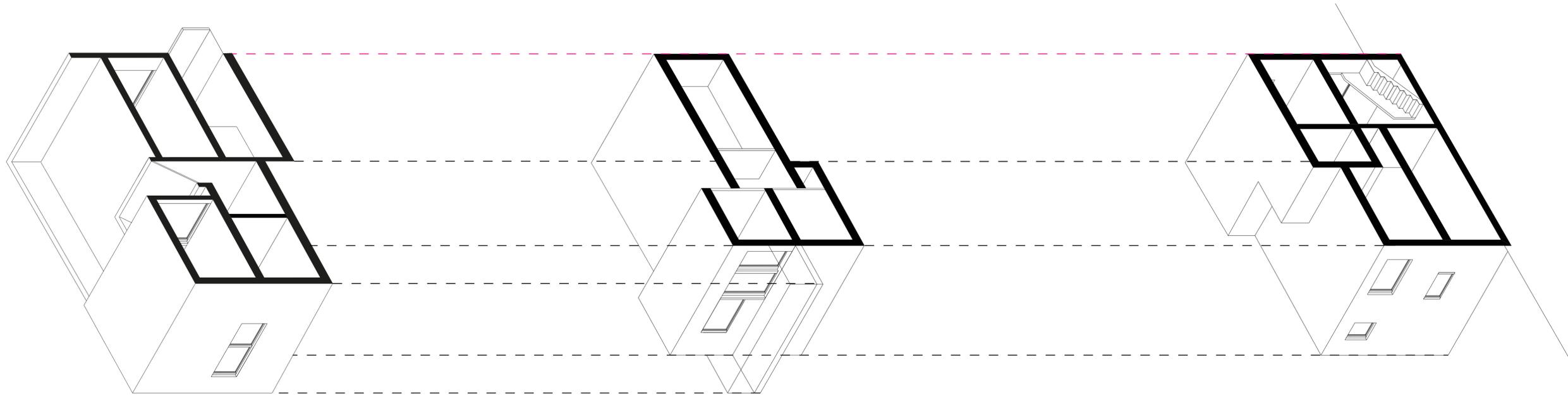
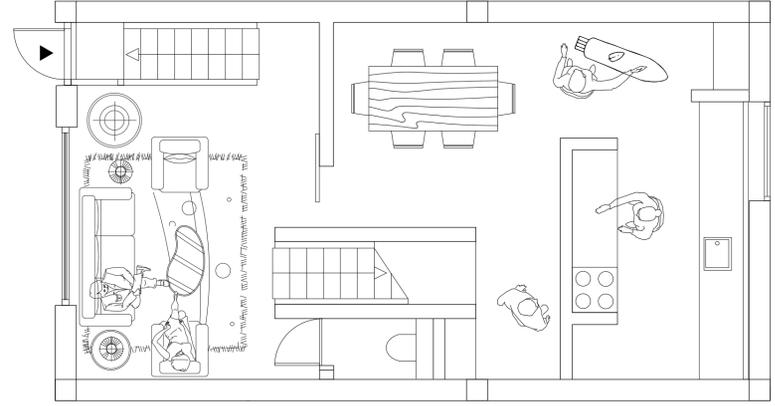
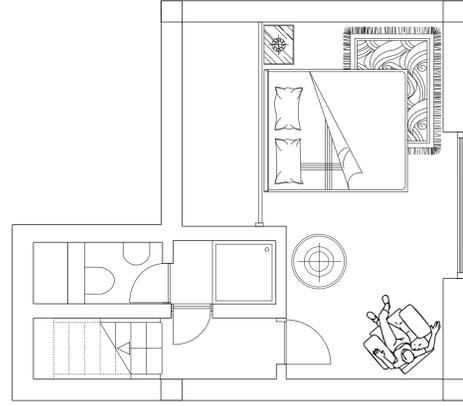
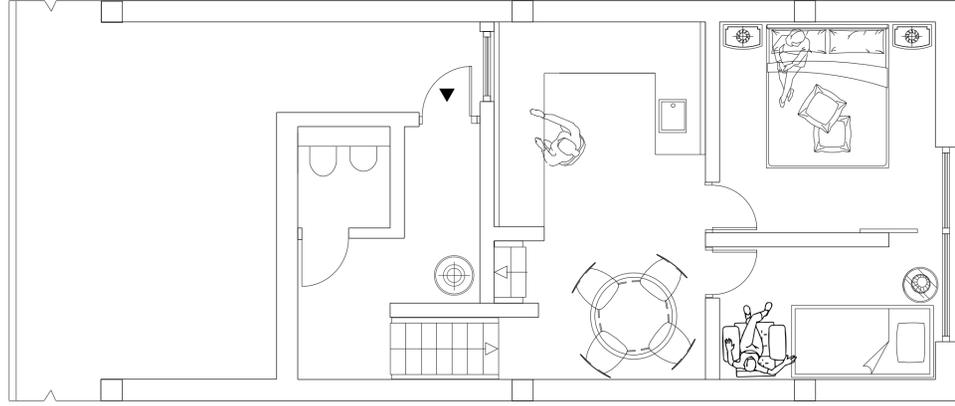
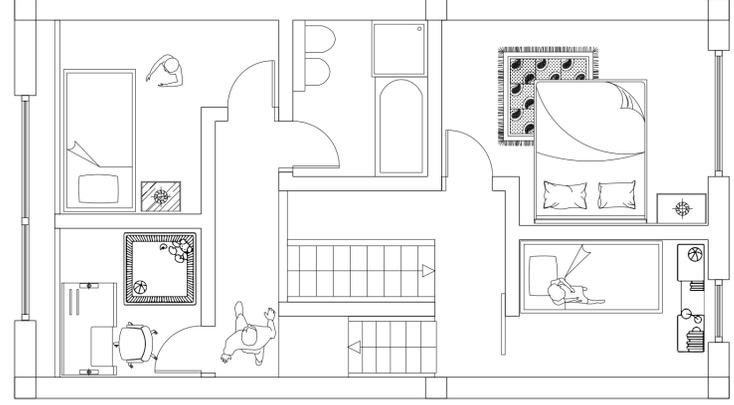
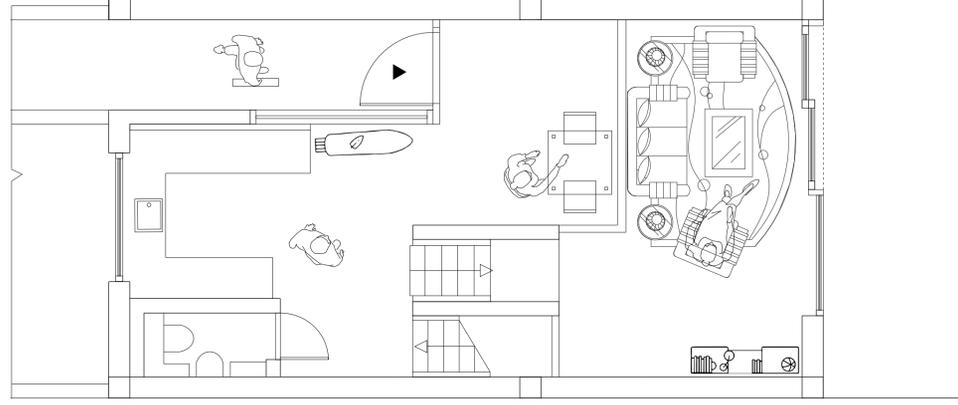
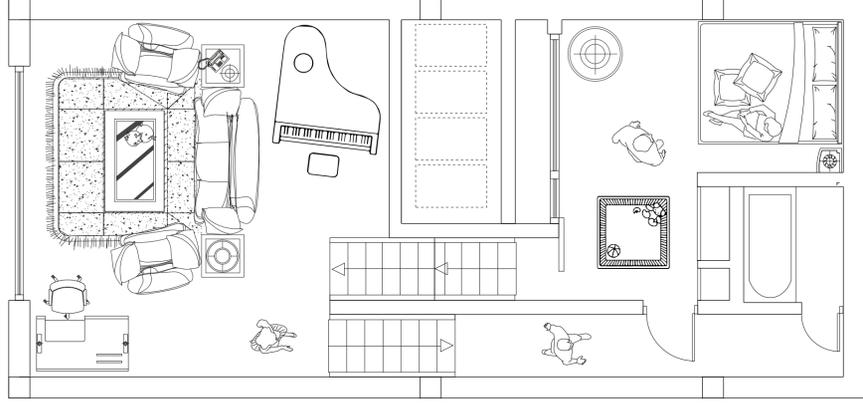
15x75mm Timber flooring
80mm Rigid insulation
100mm CLT structural floor slab
250mm Concrete connected to slab foundations with 400mm high concrete upstands
350mm Sand
50mm Gravel
Earth

SCALE: 1:20

SE







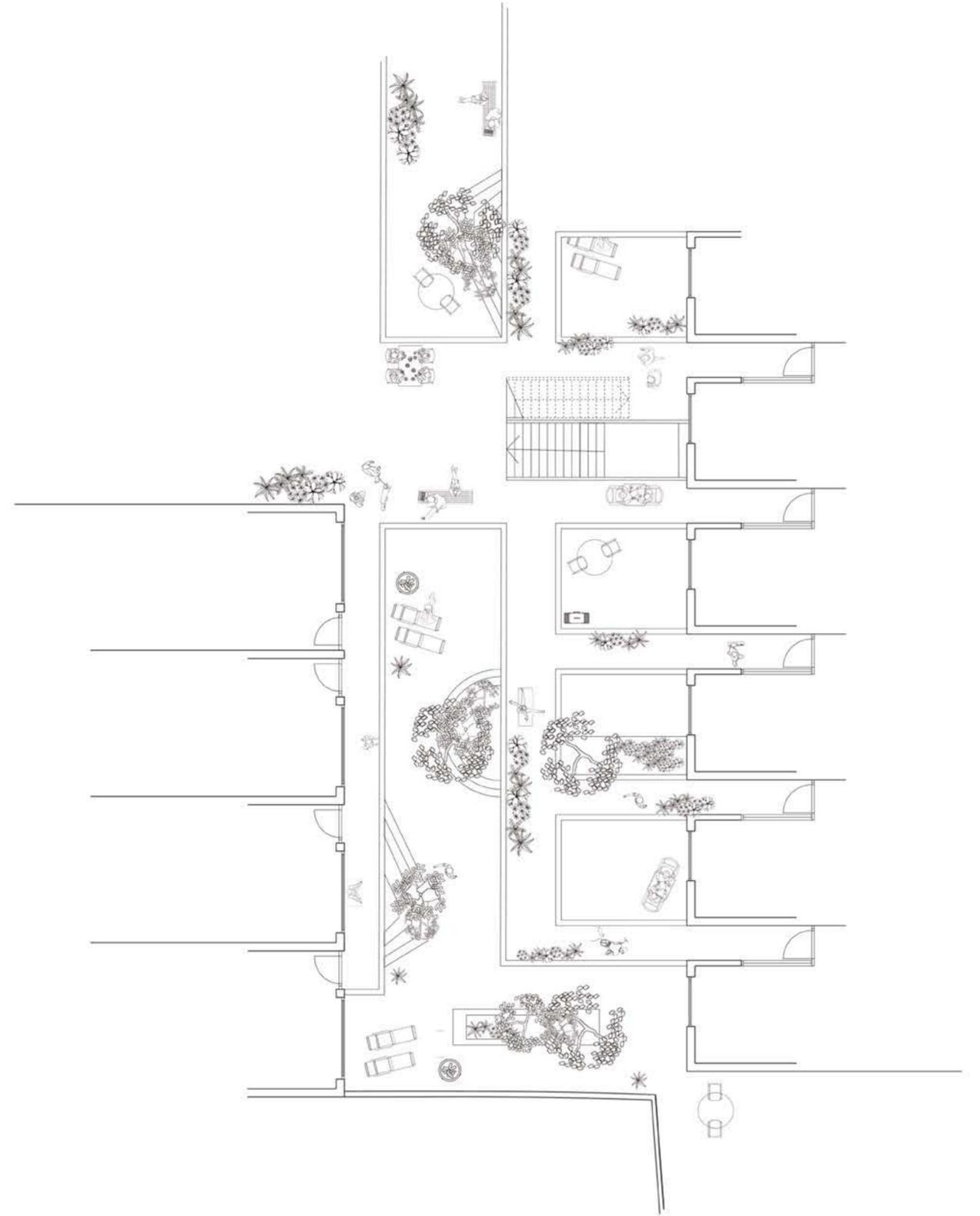
TYPE C
 Isometric: Scale: 1:100
 Plans: Scale: 1:50
 Housing Territories

THE GROUND OCCUPATION

Detailed drawings showing how the ground might be used by the community.
The ground is an expansion of the inside living to the outside.

Scale: 1:100

Housing Territories



GROUND PLAN
The materiality of the 'Ground' level and below. Showing where the
lightwells are situated and how the paths inter-connect to the individual
dwellings.

Scale: 1:50
Housing Territories



FINAL PERSPECTIVE SECTION

A final section showing how the development works as a collective and sits on the site within the neighbouring buildings. A social housing development that focuses on the sense of community.

Scale: 1:100

Housing Territories

