

The Brief

Develop a spatial design proposal for an existing building based around your culture and/or career aspirations.

My project aim is to create a zero waste environment through a closed loop ecosystem within Sellers Wheel. My research will determine how I design a waste free home, focusing in more detail on my case study of Food Future Systems.

Within my site, the main use will be for the public through access to a produce shop, a school, small fine dining experience, and access to the community garden. I aim to house min. 4 occupants in a co-living environment, they will work in the kitchen and garden.

The project will reflect my career aspirations of a community driven designer with focus of on challenging the environmental issues the world is facing.

Ecosystem | Manifesto Image



house, school, nature

Experiments in sustainable co-living

Design Development

The Biodigester

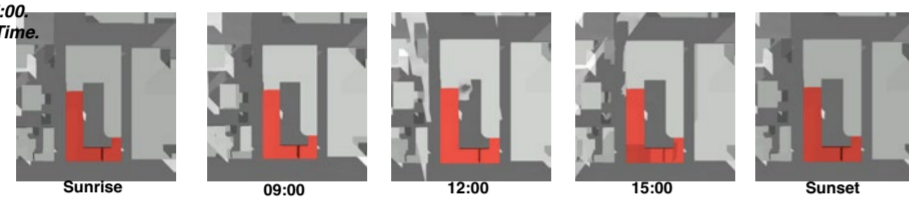


The Site
Sellers Wheel, Sheffield, UK

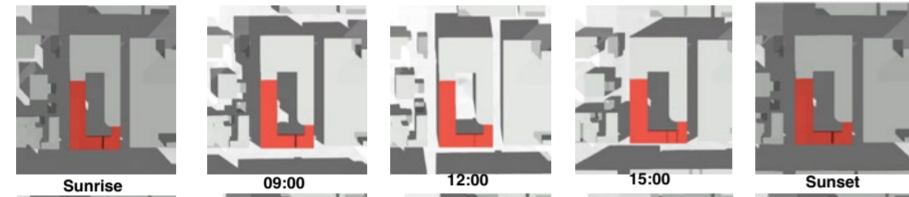
Shadow Study

The times are determined by the opening hours being 09:00 - 17:00. All times are Greenwich Mean Time.

Spring
21st March
Sunrise 06:06
Sunset 18:20



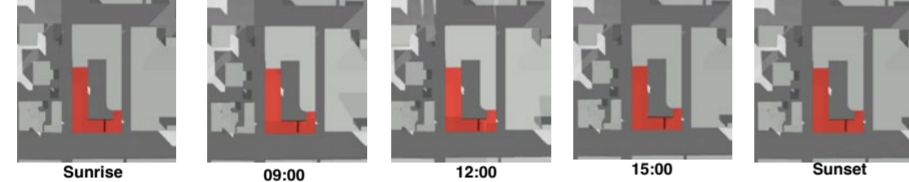
Summer
21st June
Sunrise 04:37
Sunset 21:37



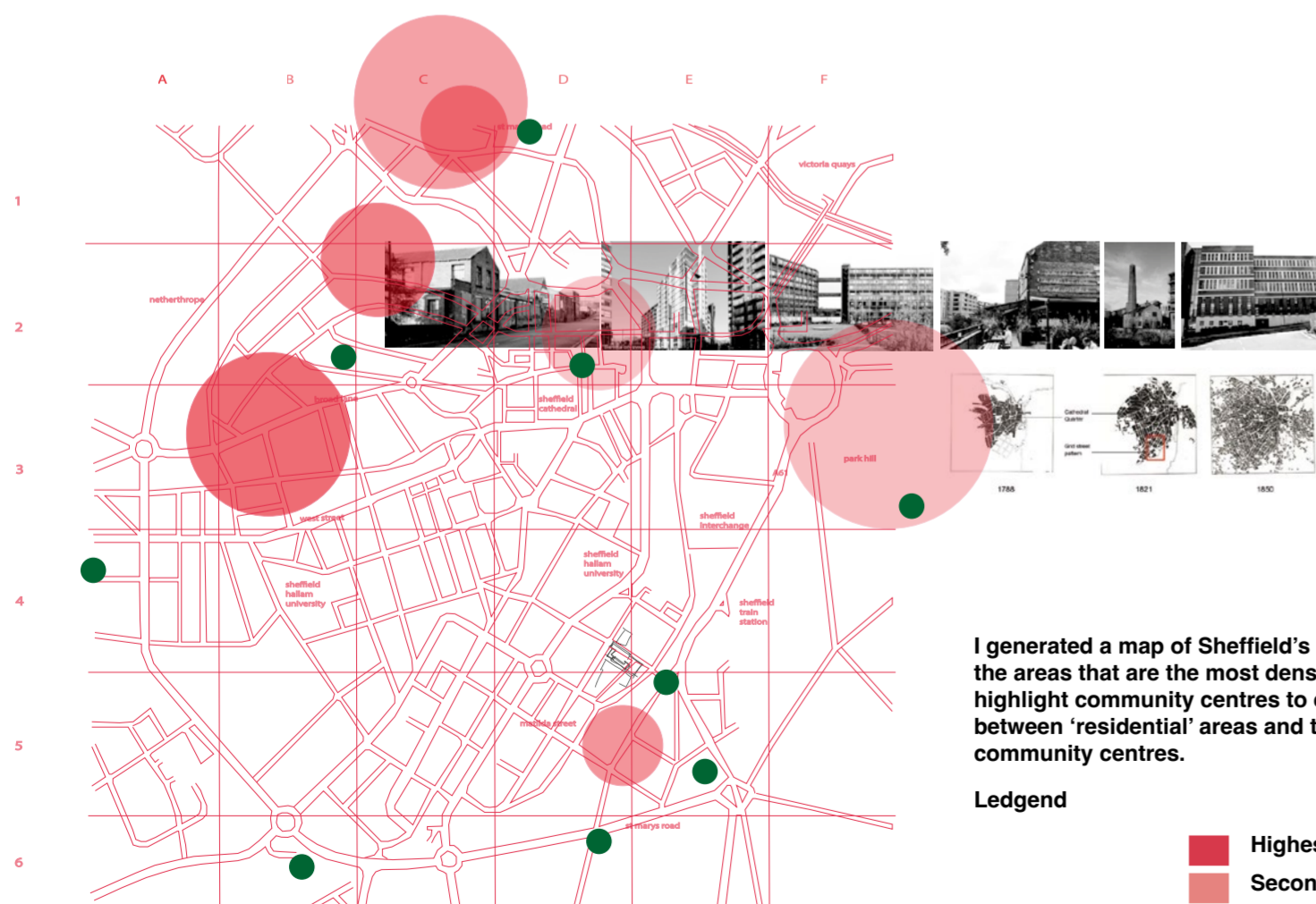
Autumn
21st September
Sunrise 06:49
Sunset 19:07



Winter
21st December
Sunrise 08:19
Sunset 15:48



Site Analysis



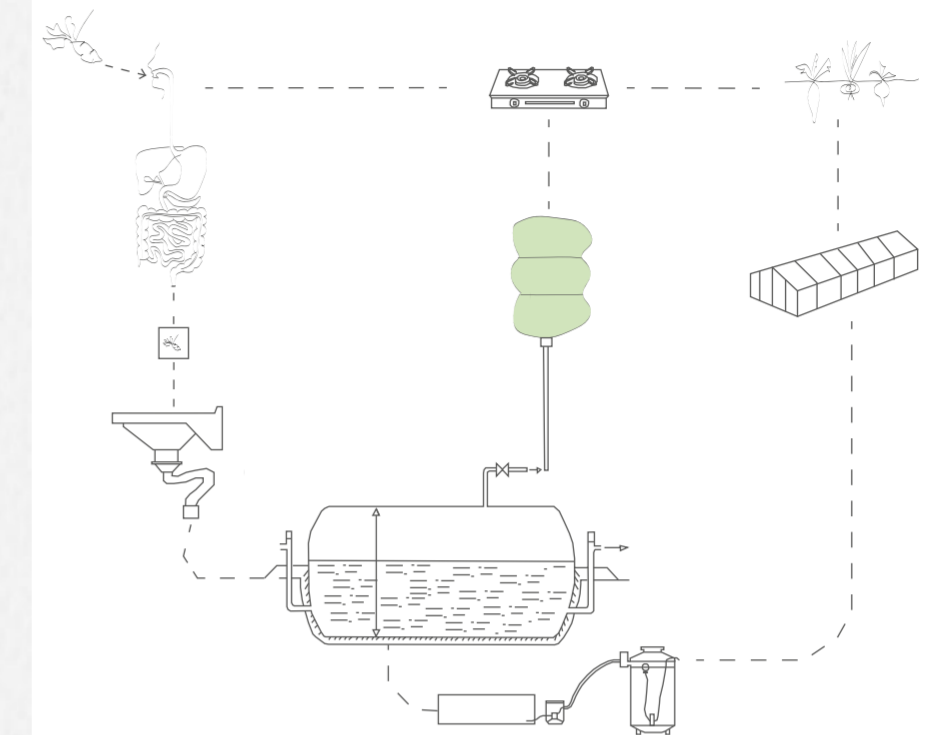
I generated a map of Sheffield's city centre to highlight the areas that are the most densely populated. I also highlight community centres to examine the relation between 'residential' areas and the placement of community centres.

Legend

- Highest Density
- Secondary Density
- Sub Secondary Density
- Community Centres

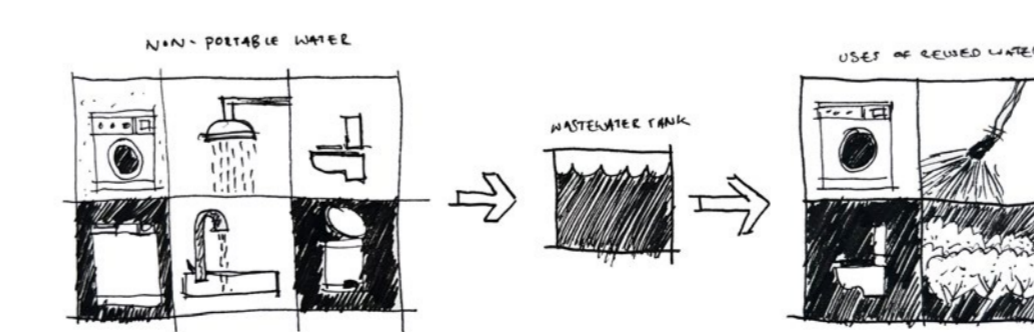


Recycling Water



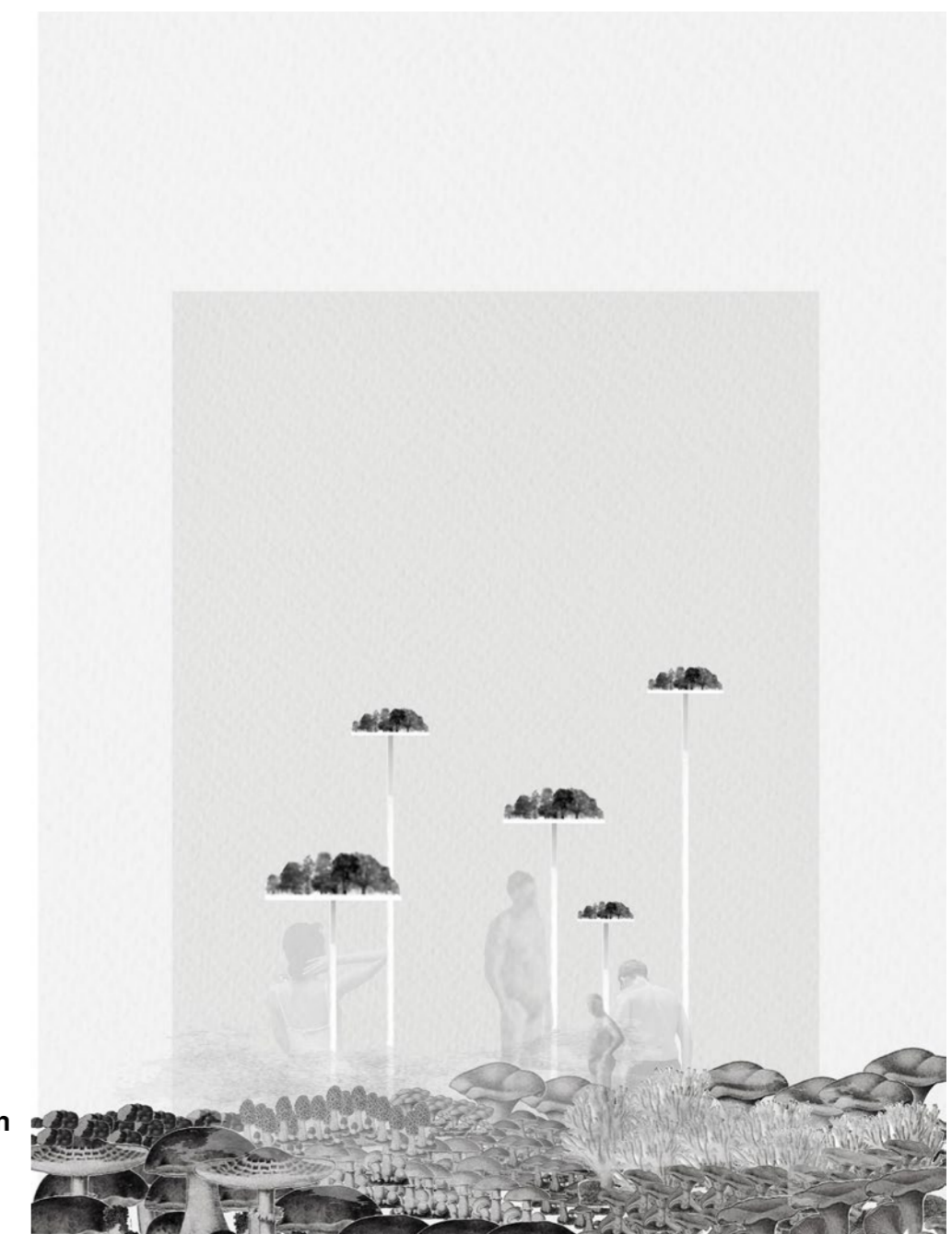
I propose the site uses a biodigester to recycle all organic waste to create a closed loop. Every human generates a kilo of organic waste per day (from using the toilet and other organic matter). Every kilo converts to an hour of flame from gas. The biodigester will have two purposes, 1. Provide energy for the site 2. Produce fertiliser for crops. As you can see from my diagram (see below) this provides a closed loop ecosystem whilst recycling all organic waste.

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My site will collect all non-portable water into a waste tank which will clean and recycle water to be reused throughout the site (see diagram above).

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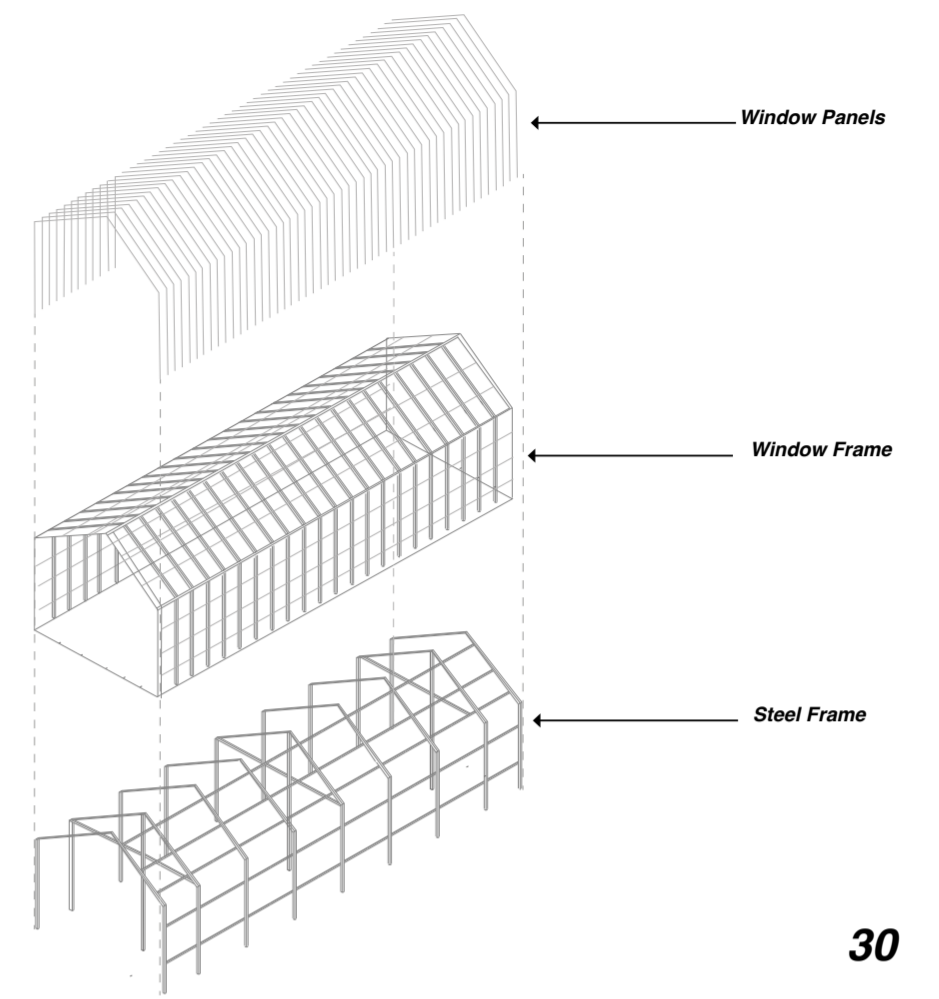




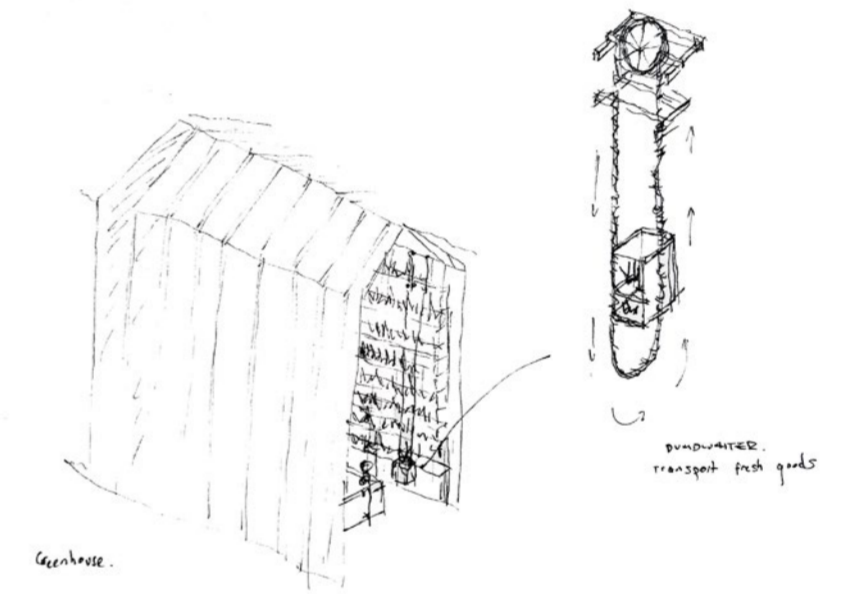
The Greenhouse

Structural Design

The axonometric drawing (see right) shows how the greenhouse will be constructed from a steel frame structure, steel frames for glass to sit on.



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The Greenhouse

My sketch shows how this space will grow plants vertically using a dumbwaiter to allow users to pass handfuls of plants down to the kitchen in a quick manner.







Community Garden

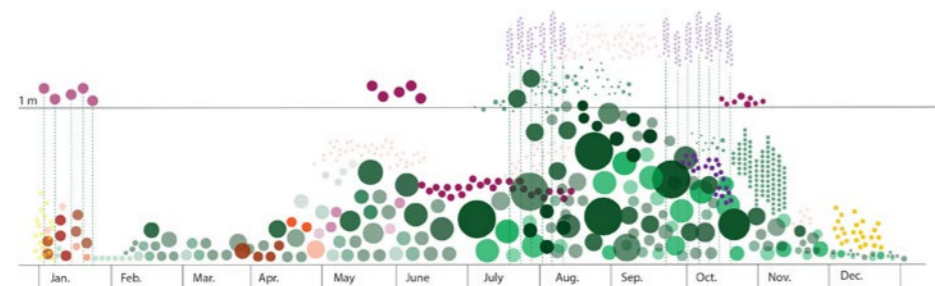
Proposed Visuals

My visuals reflect the atmosphere of the community garden whilst showing the users experience .

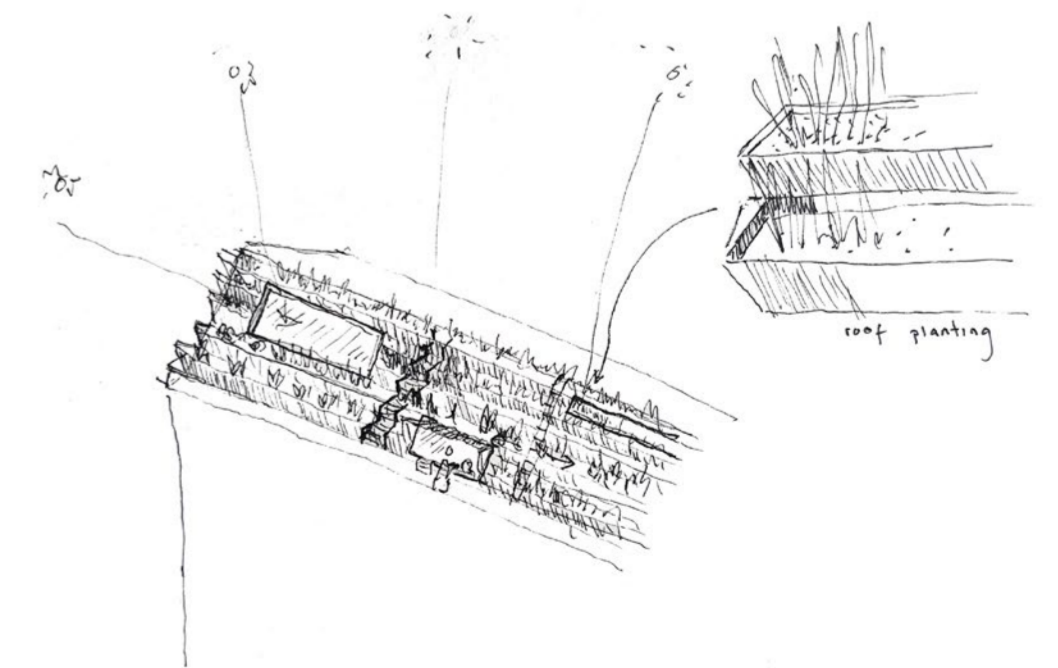


Companion planting: Best plants to grow together

-  **Mint and brassicas**
-  **Wormwood and beans**
-  **Lavender with carrots and leeks**
-  **Marigolds and tomatoes**



Graph to analyse when crops will be ready to harvest, it is important to consider what produce the garden will hold year round with a cold climate in Sheffield.



The Roof Garden

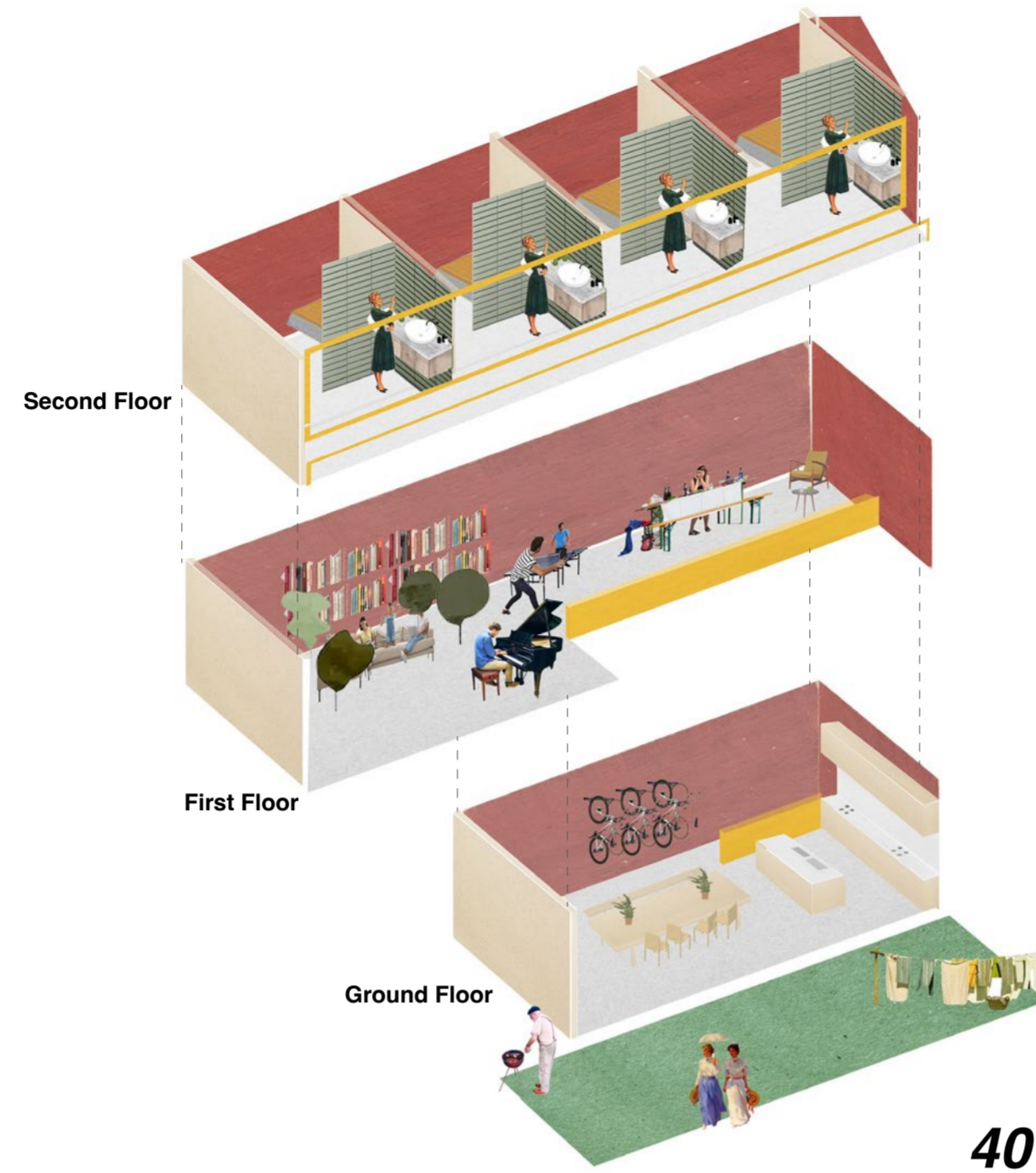
My proposal for the roof is to create a green roof with angled planting that users can access through the flat roof or skylights. I have added skylights into the roof to allow the atrium to receive moments of natural light and a glimpse to what is above them.

Living Quarters

Proposed Isometric Visual

My conceptual isometric capture key interior elements and layouts. The ground floor and first floor will be an entirely shared space with the second floor having four private bedrooms and washrooms.

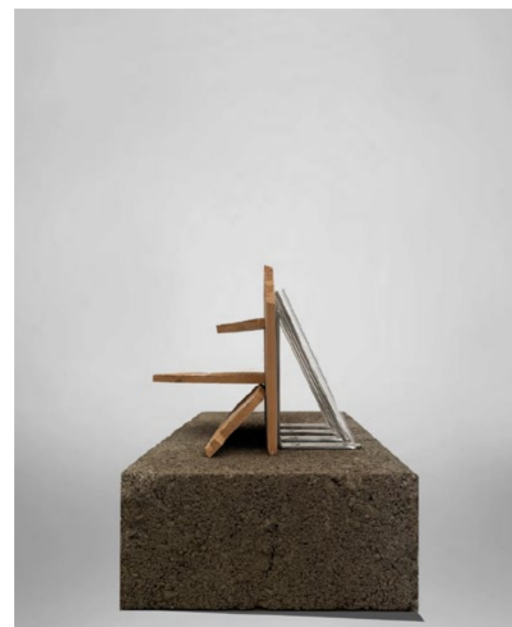
Material Board



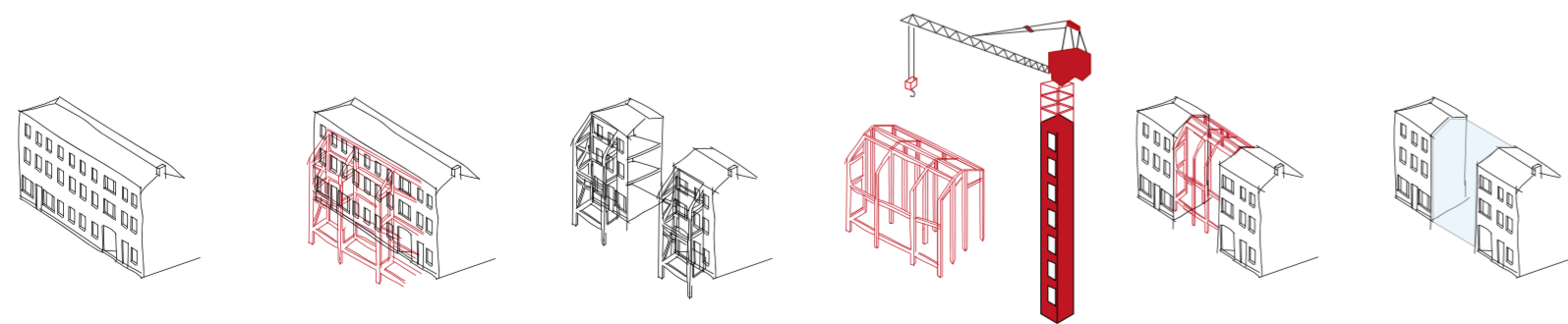
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Under Construction

Piece by Piece Demolition



The construction for inserting the green house structure and removal of the front left floors considers piece by piece demolition. Using temporary bracing allows external structure to be removed while keeping the existing facade in place.



An illustration to show the process of intended demolition work and proposed alterations.

