# HARVESTING HAPPINESS

Food, and how to obtain it, has been at the heart of our existence since the dawn of man, yet what food really is, where it comes from, and the consequences of food production is knowledge lost to most of us – perhaps especially city dwellers.

This diploma weaves together a modern food production facility, a housing complex, and an indoor allotment garden, and examines the borderline between urban life and local food production. Located in Moss, Norway, we have used a recently approved plan for a whole new district as a starting point for our work.

What would happen if every apartment had its own greenhouse? What if every neighborhood provided a way to enjoy gardening and food as a hobby with others? What if professional food production facilities were located right in the middle of our cities, and open to the public? Would our behavior change? Would we be happier? And what could it look like?

This project seeks, in a playful way, to combine what we think are two of the most important aspects of everyday life: Food and recreation. More precisely, how can we introduce food production into our cities in a meaningful way that caters for more than sheer production?

We believe firmly that the advancements in this area can be, and should be part of, not only the industrial aspects of a city, but should also be woven into the very fabric of our lives. Not to change them completely through a designed predetermined existence, but to enhance the urban environment, to embrace the educational possibilities it creates and to bring back the closeness, both social and physical, that the act of acquiring food has created throughout the history.

These points have been essential for us in the design process, and derive from our understanding of the underlying facts and historical assessments around food and cities. Our thoughts around these subjects therefore serves as the base for our thesis; of how to bring food production back into the dense urban areas.

Rather than giving a simple answer to a very complex question, we feel, that by doing this thesis, we have come a long way in understanding the many parallels that needs to come together when working with these questions about climate awareness, urban resilience, the three pillars of sustainability and all the other pieces that comes together to form the question; of how to address the challenges that lie in creating a better tomorrow for all of us. This must be an on going process, not limited to any one project, but a weave of the many, to piece by piece put the picture back together.


## Choice of site and urban context

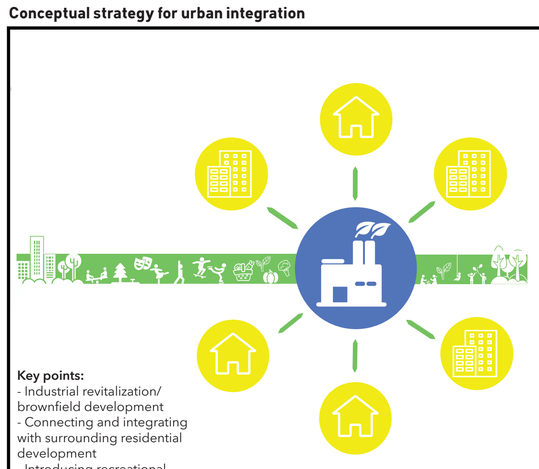
Verket in Moss is a brownfield site left behind by the closed papermill and ironworks. New plans for a massive development of the area was approved by the city council in 2015, wich will be part of the larger revitalization of Moss city center.

A core strategy in the revitalization project is the "cultural axis", connecting important landmarks and cultural sites with the city centre, running from the canal to the east through the city centre up to Verket.

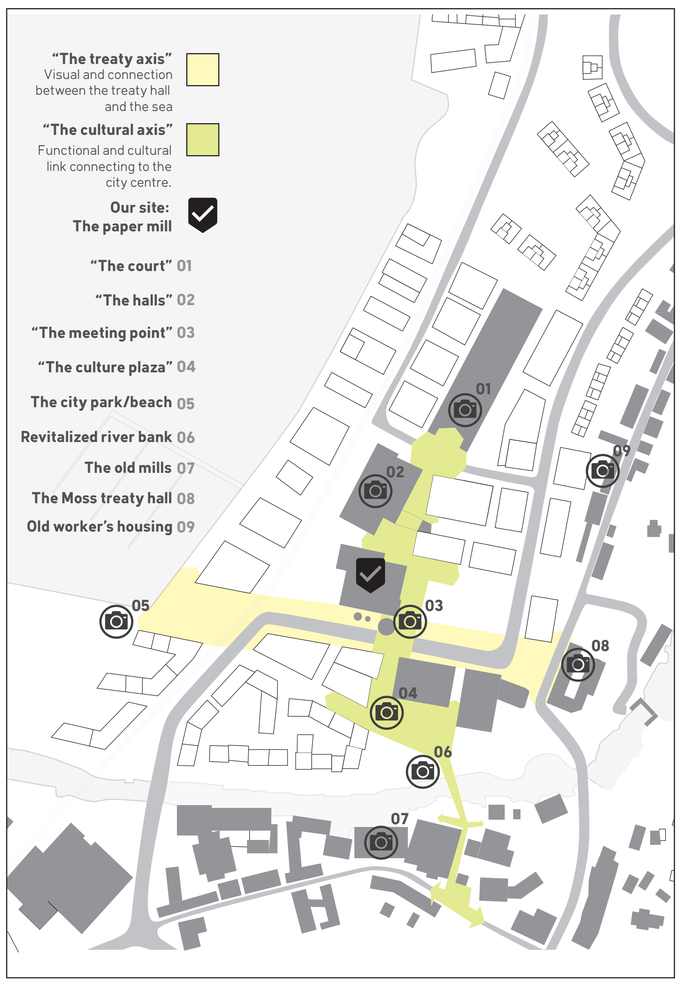
As a part of the new plan, a secondary, perpendicular axis known as the "treaty axis", running from the "Treaty hall" where the peace treaty locking Norway and Sweden in a personal union under the swedish king was signed in 1814.

Our starting point is the paper mill located in at the intersection between these two, introducing a modern food production facility into the old building mass.

**Conceptual strategy for urban integration**



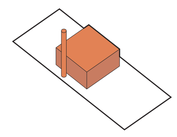
**Key points:**
- Industrial revitalization/ brownfield development
- Connecting and integrating with surrounding residential development
- Introducing recreational, collective public spaces



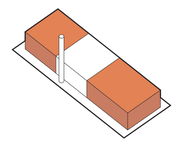


**Project organization: The four elements**
Our project consists of four distinct elements: The residential building, the new production facilities in the boilery, and the communal garden, connected by a green street.

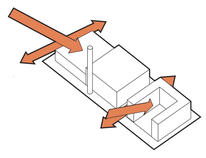
**Architectural strategy**



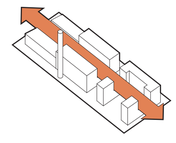
**Claiming a landmark**
The paper mill is a known landmark in the city, and a standing reminder of its industrial history.



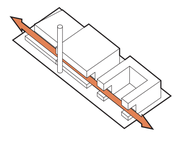
**Adding volumes**
The existing building can house the production facilities, but new volumes are added to house additional program, resulting in three distinct elements.



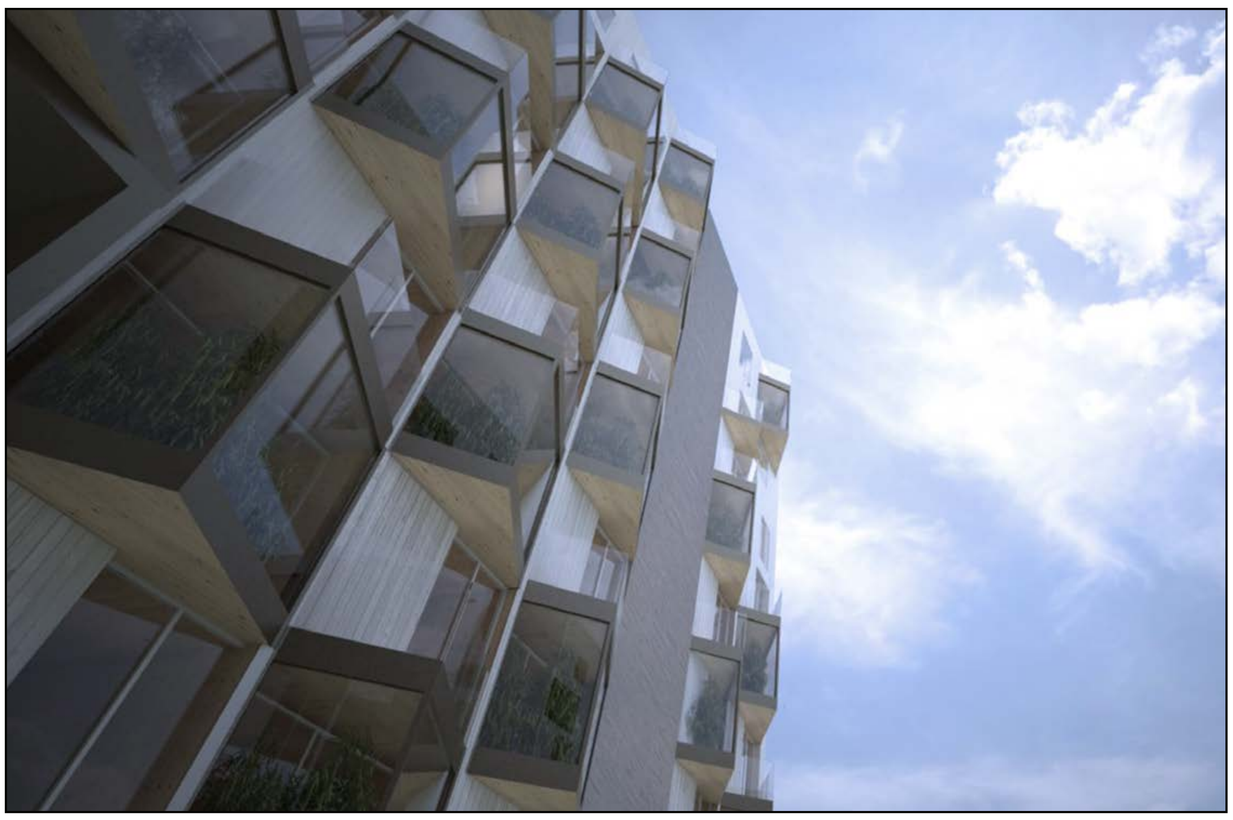
**Adjusting to context**
Volumes are lowered and opened to let in sunlight, and cut to lead traffic through and past the project.



**Programmed connection**
The three elements are punctured and connected by a wide street, leading people into and through the project.

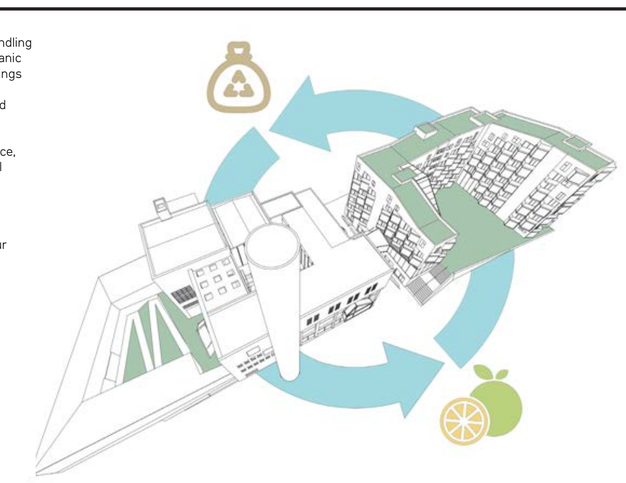


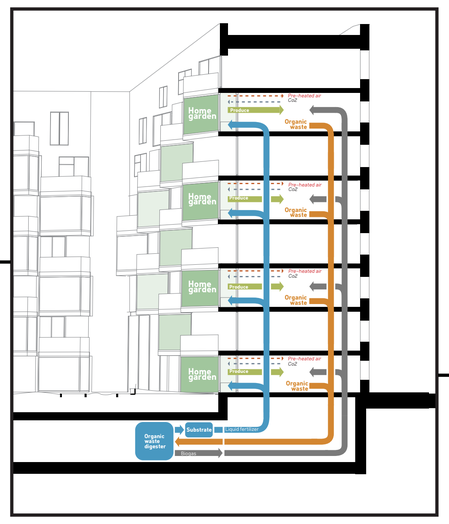
**Production on display**
The connecting element is brought out to the street facade in order to announce its presence and invite people in.


Food to waste to food: Handling food waste and other organic waste products locally brings people closer to the ecological cycles that food production depends on.

Organic waste is a resource, and integrating ecological cycles in the buildings we live and work in can both help handle a basic municipal challenge, and raise awareness about our ecological footprints.



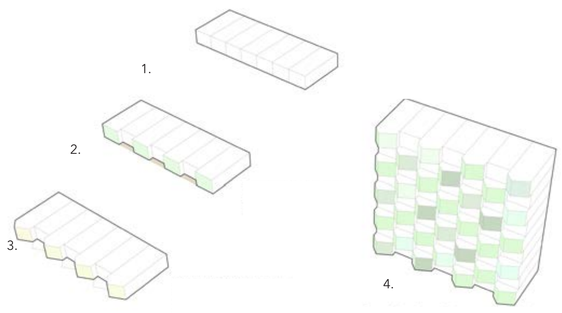


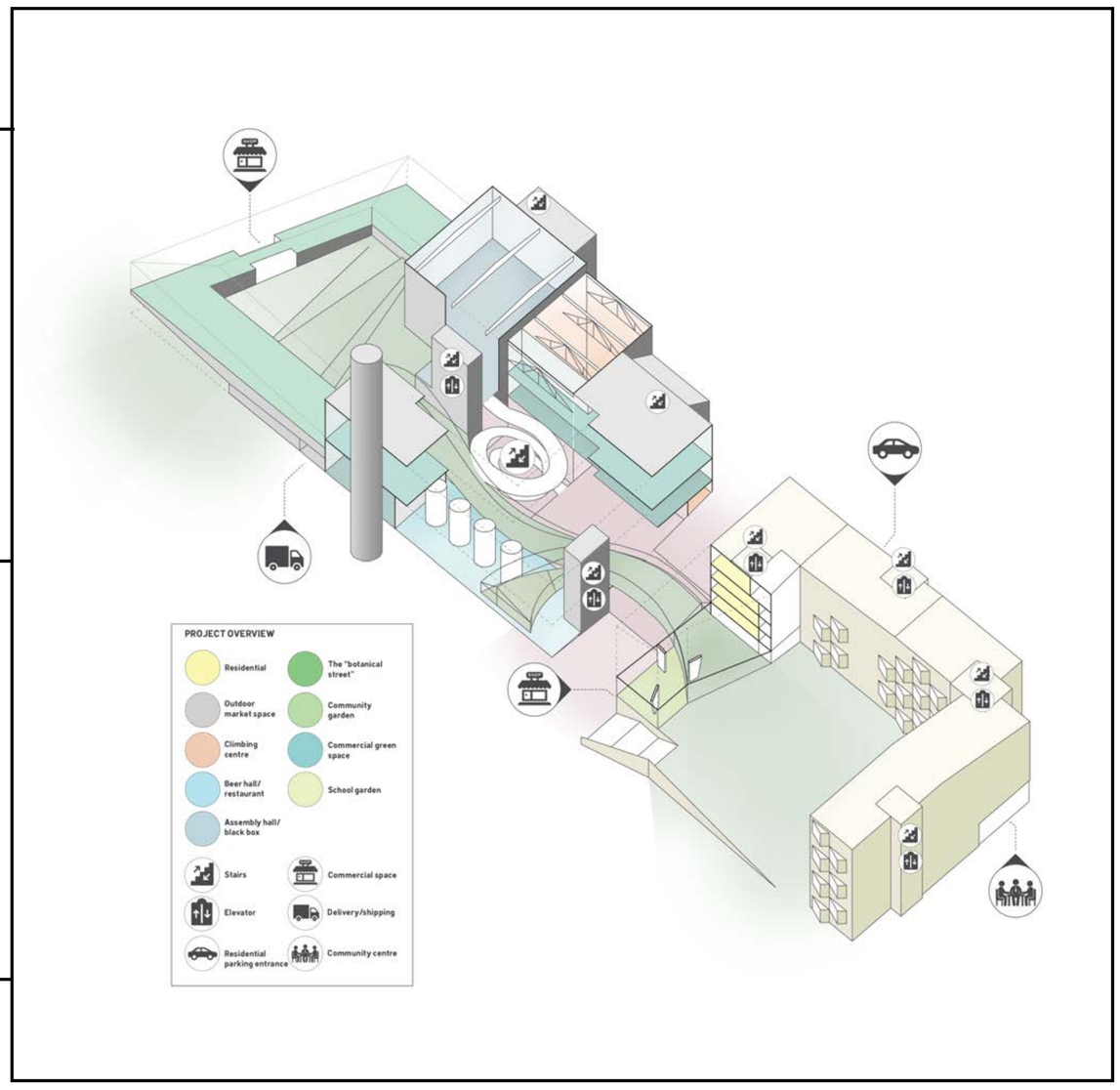

1) Basic unit: 9,5x4m

2) Retracting volumes creates space for covered outdoor balconies, allowing the growhouses to protrude from the facade.

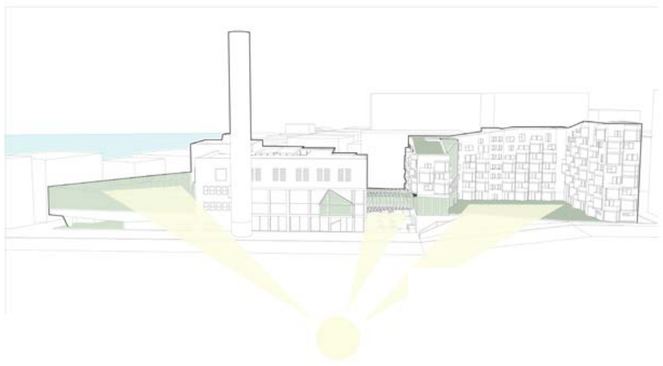
3) Optimising the angle of protruding growhouse volumes towards the sun, and minimizing shade for the balconies in between.

4) The protruding growhouses lets the greenery create the changing palette of the facade.



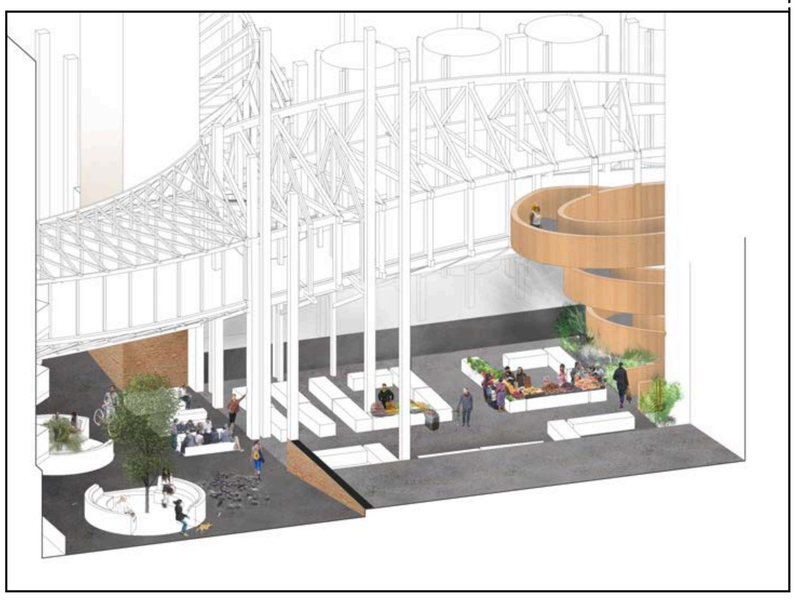




The roofscape of the residential building slopes towards the southwest in order to mirror the surrounding building mass, at the same time ensuring optimal sun conditions for the south facing backyard and view towards the ocean.



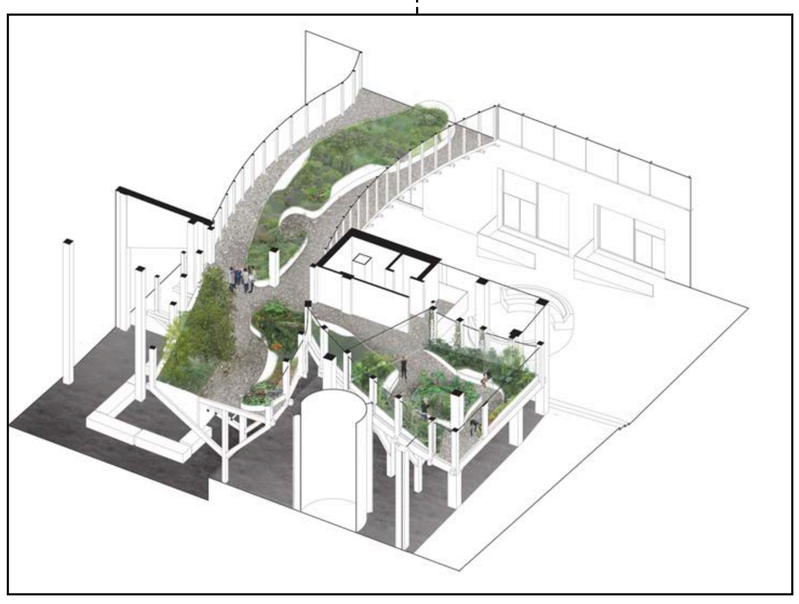
**Main section A-A 1:200**

5m 1m



Diorama showing market day at the central square, the botanical street crossing over the cultural axis, and the outdoor furniture marking the footprint of the old papermill tanks. The central square is a located in the middle of the Paper mill connecting the surrounding areas visualy and serving as a platform for the central circulation of the building.

**"The turbine"**
The turbine is the central circulation , situated at the heart of the project, connecting the public parts of the paper mill, as well as all the parts visually.The primary stormwater basin is located under the circular ramp, where water is collected, filtered and stored for reuse in the facility.



**The bridge, the tropical garden, and the scandinavian passage**
The botanical street crosses over the cultural axis, connecting the park with the paper mill. The tropical garden extends out through the building facade.

**Managing the public and the private**
Each ground floor apartment has access to a garden, where vegetation and a low retaining wall with recessed benches clearly mark the line where the private ends and the public begins, with landscape elements such as bioswales serving av secondary buffer zones.

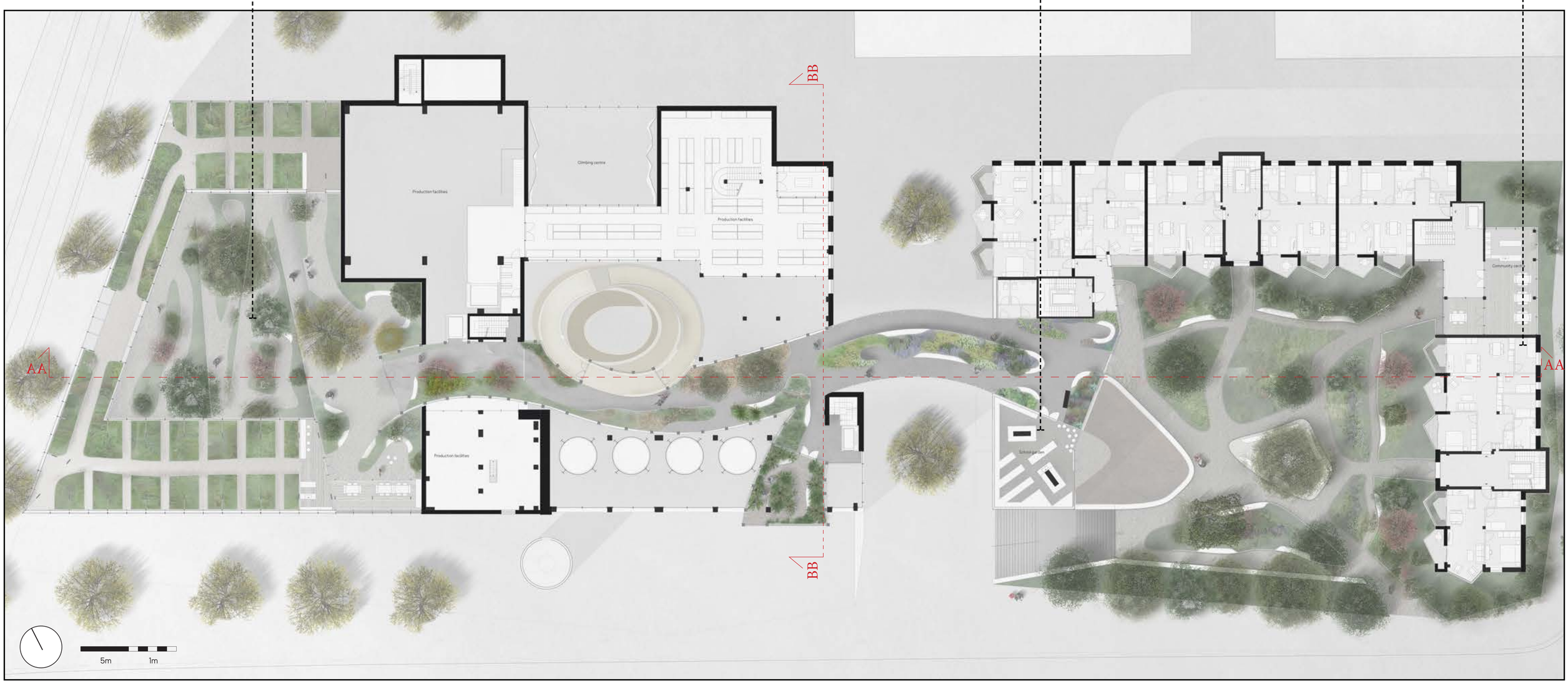
**West side community garden**

Section diorama of the west side public garden and community garden, the raised exit from the papermill ensures an ocean view upon exiting the botanical street, surrounded by the trancelucent growhouse resting on top of the commercial spaces facing the street.

**The school garden and the start of the botanical street**

Diorama showing schoolgarden and the start of the public botanical street. the outside part of the schoolgarden is divided into 4 part for seasonal growing. It is clearly visible for both residents and visitors accessing the facility both from the street to the east and the stairs to the east.

**Diorama of a typical flat**
Each apartment has a growhouse connected to the bio digester system in the production facility, allowing high yields all year round.



## OVERVIEW OF GREEN ELEMENTS

### THE WEST END

The west end public park connects the "botanical street" with street level through ramps that criss cross through a park landscape. The landscape elements here are local, and chosen to display a variety of useful plants. The top level provides access and recreational areas to the community garden.

On street level, the west end houses commercial spaces, as well as the entrance to the delivery area of the production facilities.

### THE "BOTANICAL STREET"

The "botanical street" is intended to display a selection of plants and their uses in a non-commercial public space that is open to everyone. It is climatized, allowing year-round service and a wide variety of plants.

The plants are roughly divided into themed sections that flow into eachother, and the space is arranged in order to provide for different activities: Sitting, watching, learning, socializing.

**1: Herbs and vegetables**

**2: The forest**

**3. Mushrooms and decomposition**

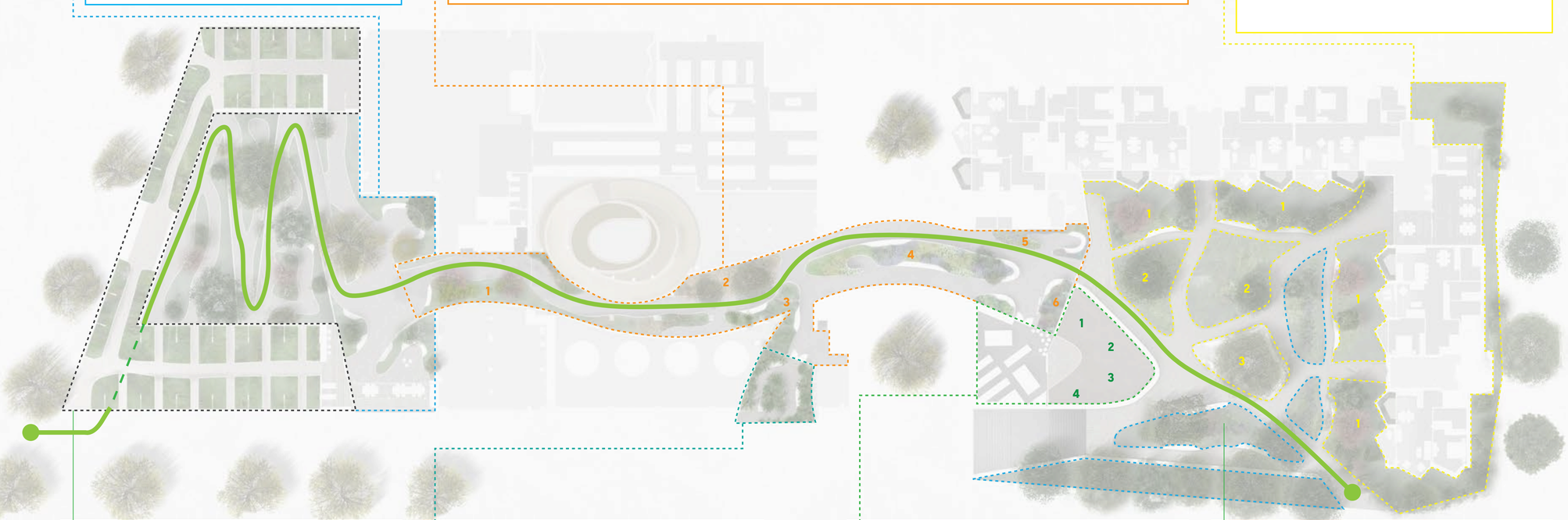
**4. Mountain plants**

**5. Flowering plants**

**6. Berries**

### THE EAST END

The east end garden serves multiple functions. It is the main eastern entrance to the "botanical street", providing direct access to the school to the east and the street to the west. It is the main learning space for the school garden, with a patch dedicated to crop rotation, and a wide variety of plants such as berries, vegetables an herbs, and the "islands" of vegetation provide a buffer between the private ground floor gardens and the central public space.




### COMMUNITY GARDEN

In later years, urban gardening has become a popular social and recreational activity all over the country, leading to an increased awareness of – and interest in – not only agriculture and the cultivation of plants, but in the ways urban gardening projects can bring people and communities together.

By providing an all-year, indoor space that is highly visible in the urban landscape, urban gardening is elevated to the status that sports and culture already holds in our cities.

Depending on the layout, the community garden can be shared by between 20 and 80 people, and includes work-benches and social space.

### THE TROPICAL ROOM

Exotic fruits and vegetables from all over the world are so common to us that we rarely even think about where they come from. Some of these plants can be found in the tropical room, where visitors can learn about their history and their origin.

**Coffea berries**
Native to subtropical Africa, these berries are now cultivated in over 70 countries. They are roasted and used to brew coffee.

**Cocoa beans**
Chocolate beans! Cocoa trees are native to the tropical regions of South- and Central America.

**Carica papaya**
Papaya fruit grows on a large, tree-like plant that is native to the american tropics.

### SCHOOL GARDEN

The school garden provides a learning space where children are introduced to agricultural concepts, such as basic four year crop rotation to increase yield and reduce insect attacks and disease.

**Rotation 1: Legumes**
Nitrogen-collecting plants such as peas, beans and cloves.

**Rotation 2: Root vegetables**
Onions, garlic, turnips, beets.

**Rotation 3: Leaf vegetables**
Lettuce, greens, herbs, spinach, brassica.

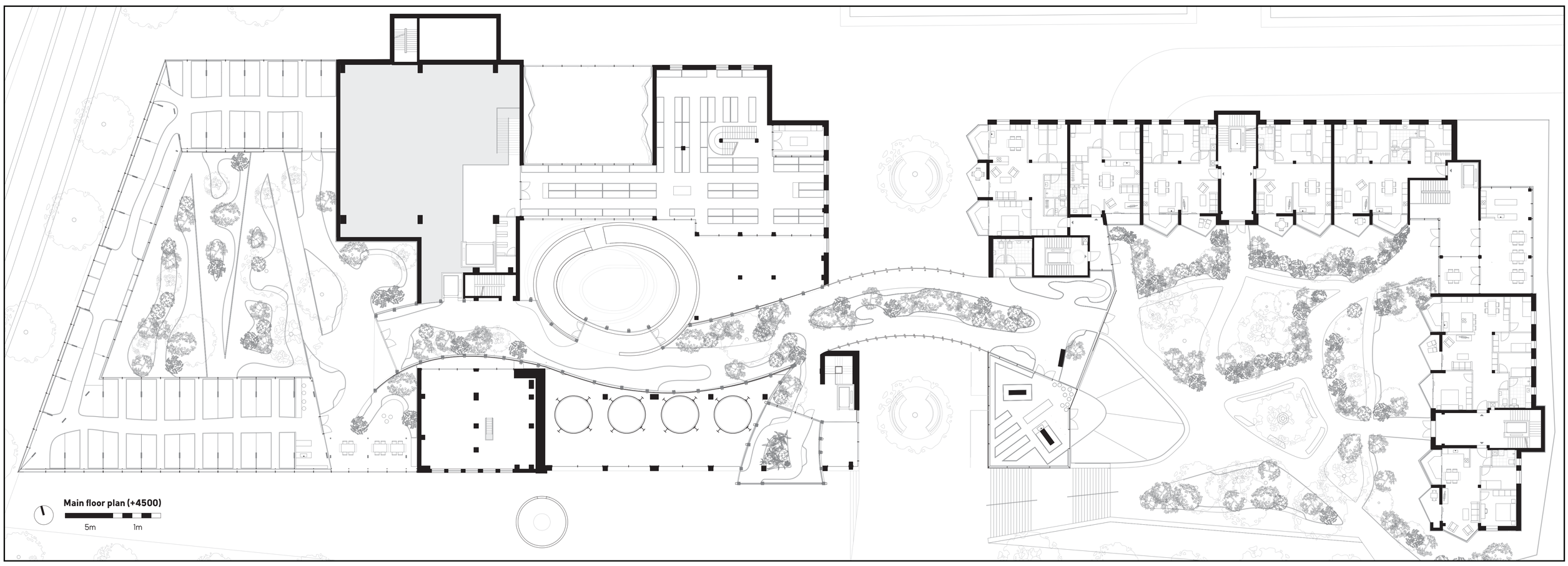
**Rotation 4: Fruits**
Tomatoes, cucumbers, peppers, squash, melon.

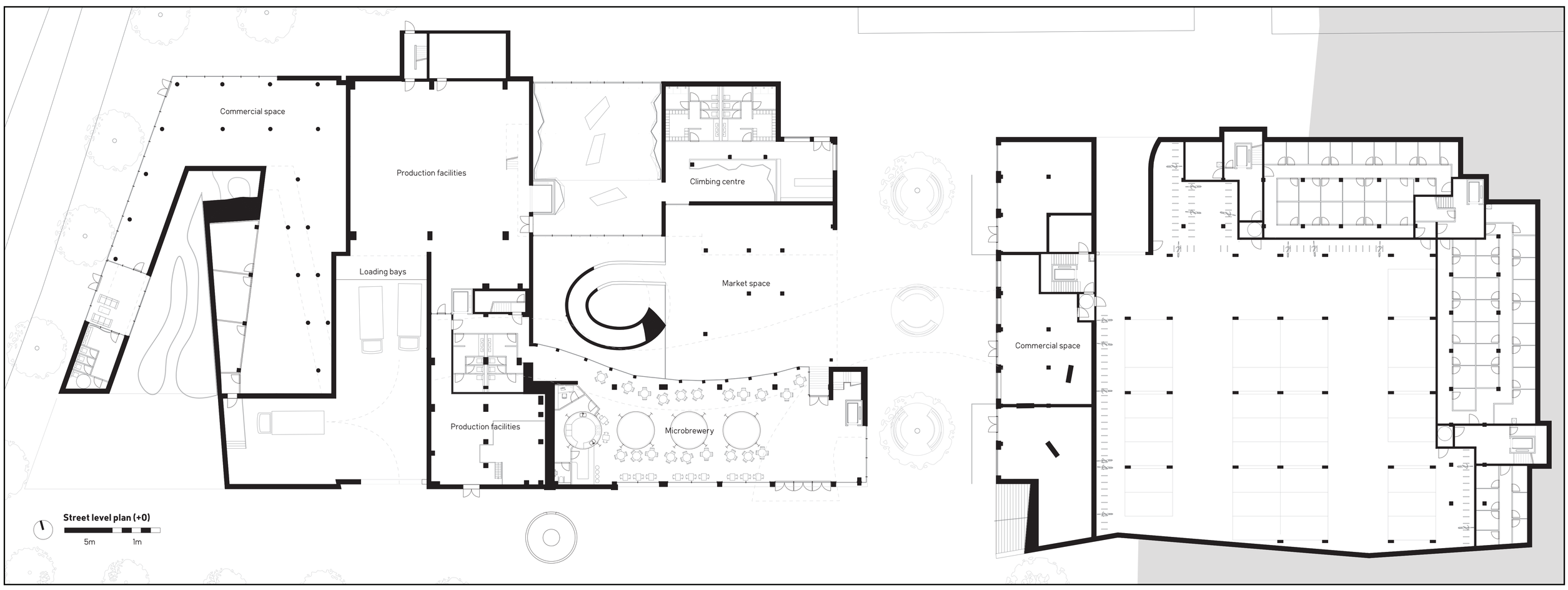
**Example rotation based on advice from Ecoteria.no and Betterhensandgardens.com*

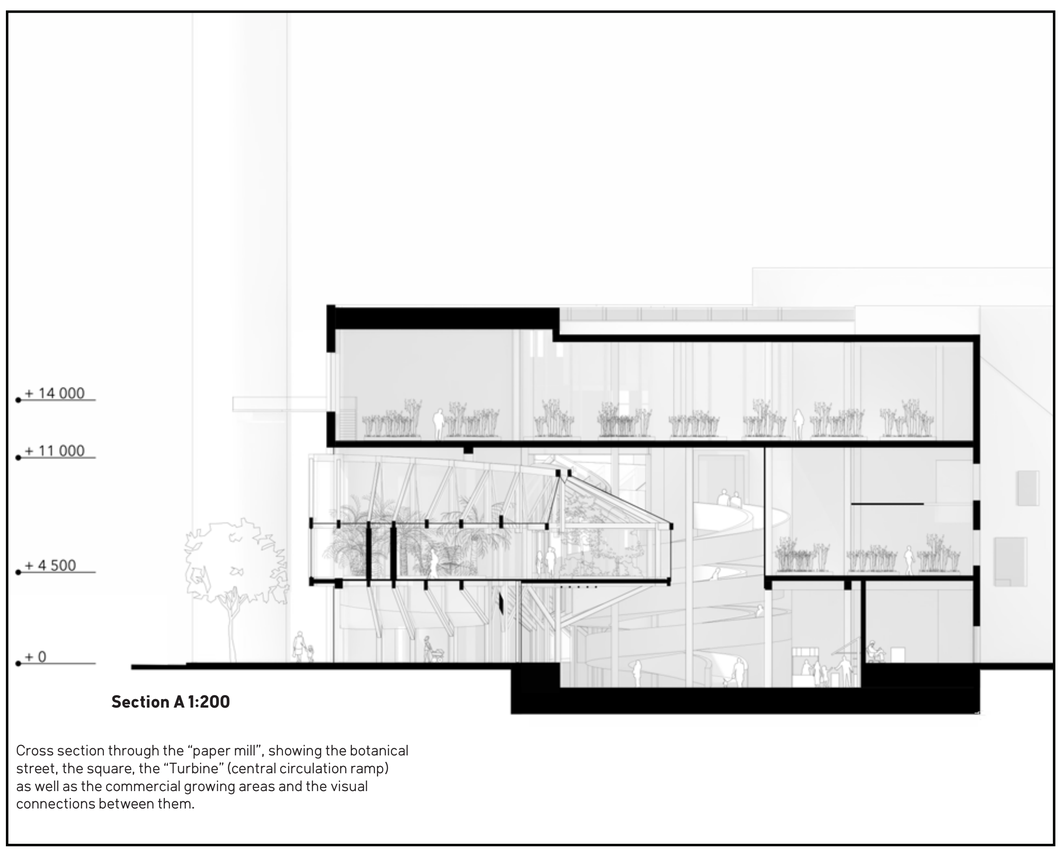
### STORMWATER MANAGEMENT

Integrated stormwater solutions, such as the bioswale below, will not only make the project more resilient to climate change and extreme weather, but are valuable ecological and aesthetic elements in their own right.

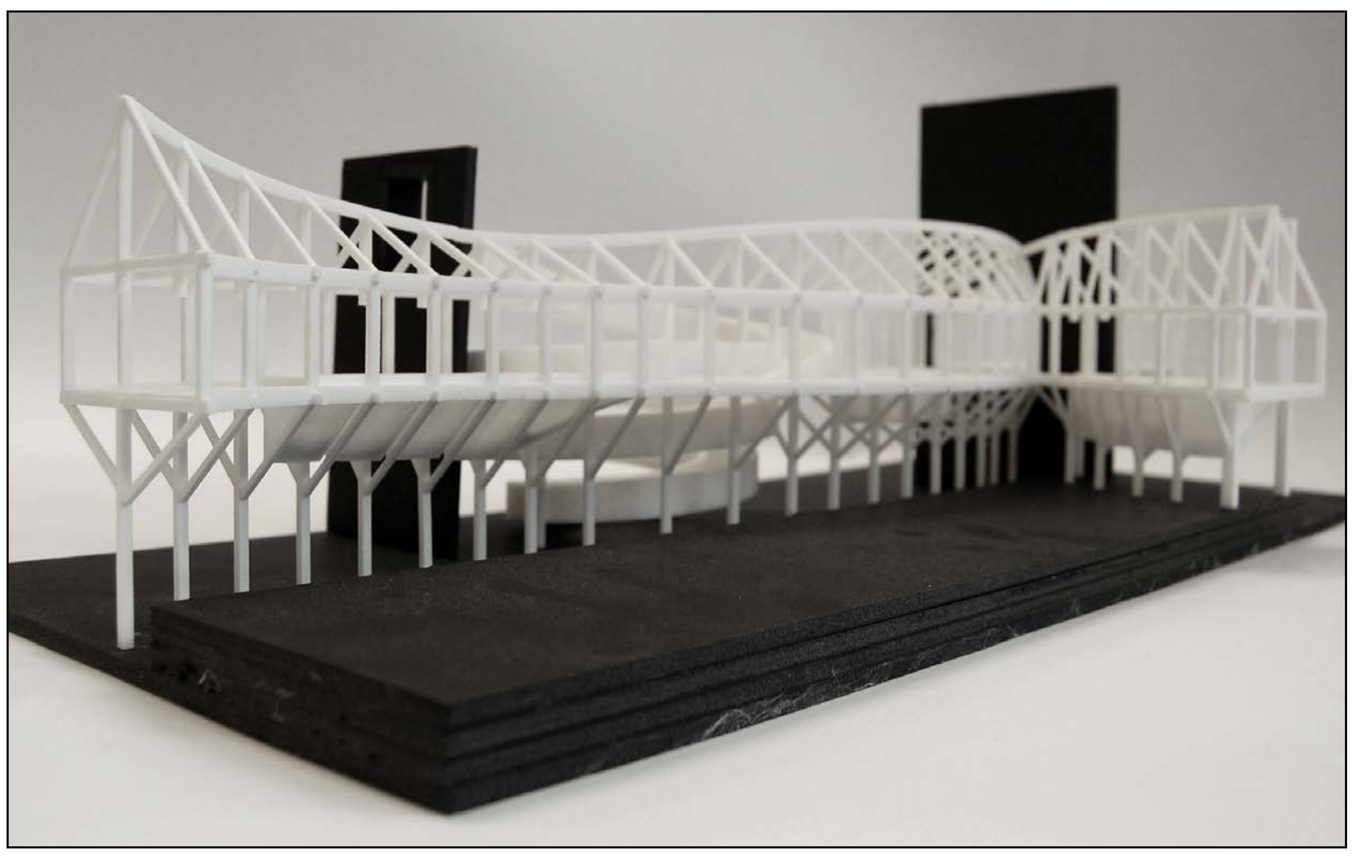
Water which is not filtrated into the ground is channeled through a series of bioswales, before finally being stored, filtered and reused in the production facility.




Cross section through the "paper mill", showing the botanical street, the square, the "Turbine" (central circulation ramp) as well as the commercial growing areas and the visual connections between them.



**CONSTRUCTION**

The ideology behind the construction of the botanical public street and the way in which we chose to approach the aspect of restoration within the old industrial structure, derives from, and is, an analogy taken from the roots finding the path of least resistance through the remnants and the ruins of old.

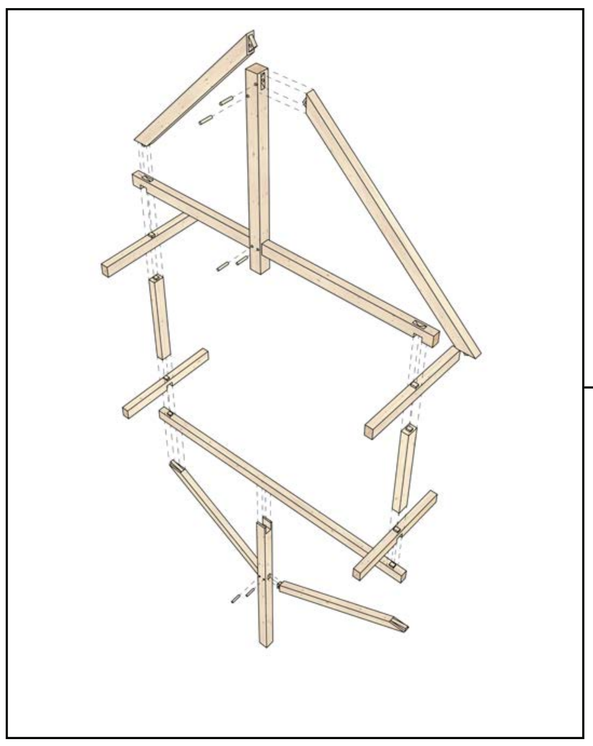
The idea to use traditional a norwegian massive wood studwork as a basis for the construction therefore came naturally.

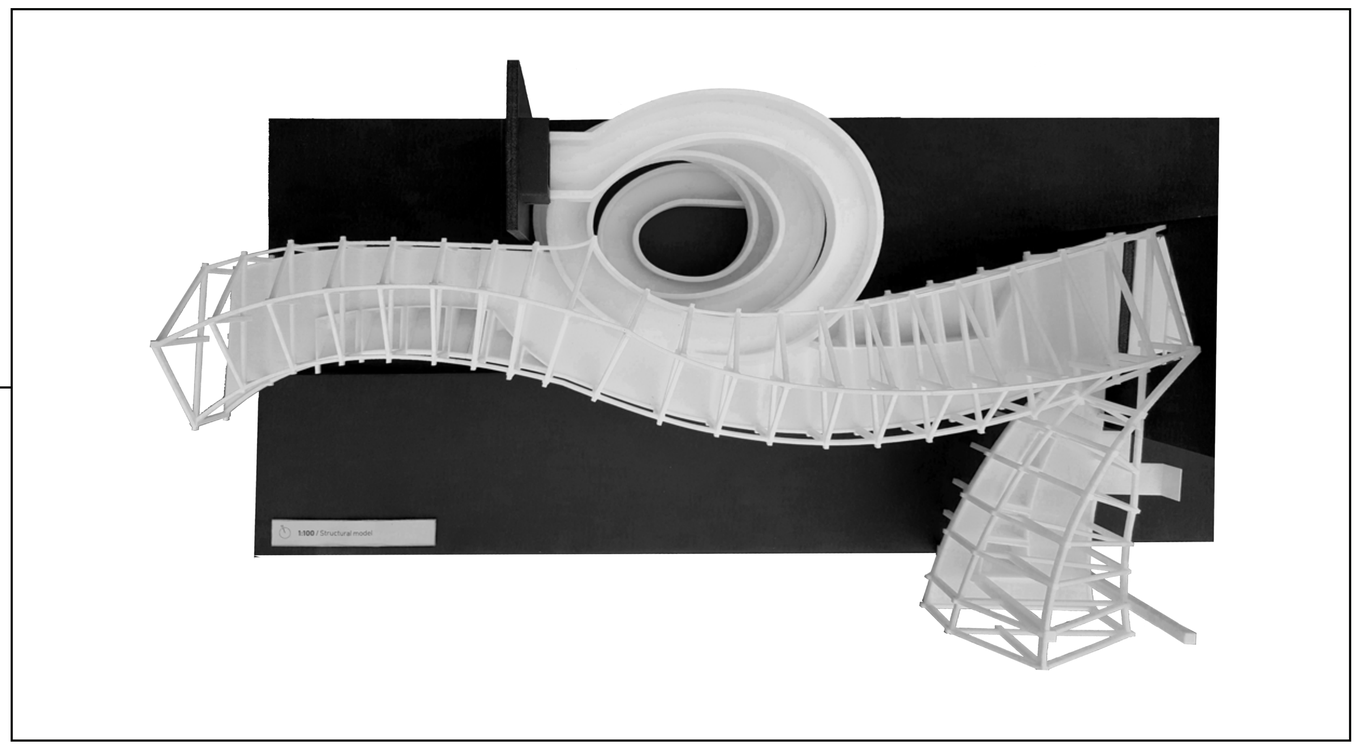
By varying the height and central line of the roof ridge, the construction is able to create the double curved geometry, still using the traditional straight section of the studwork. Letting the connecting beams highlighting the shape by curving them.

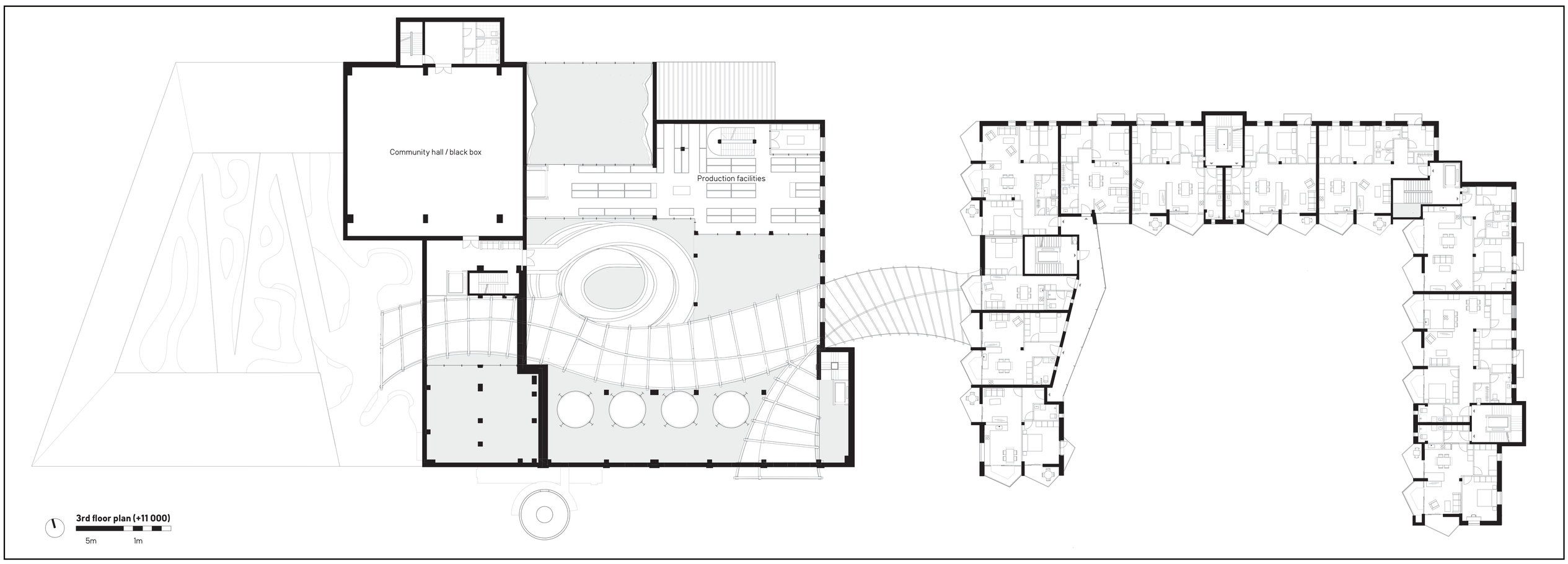
The frames are spaced 2 meters apart to ensure stability and sufficient loadbearing capacity within the dimensional limitations of massive wood.

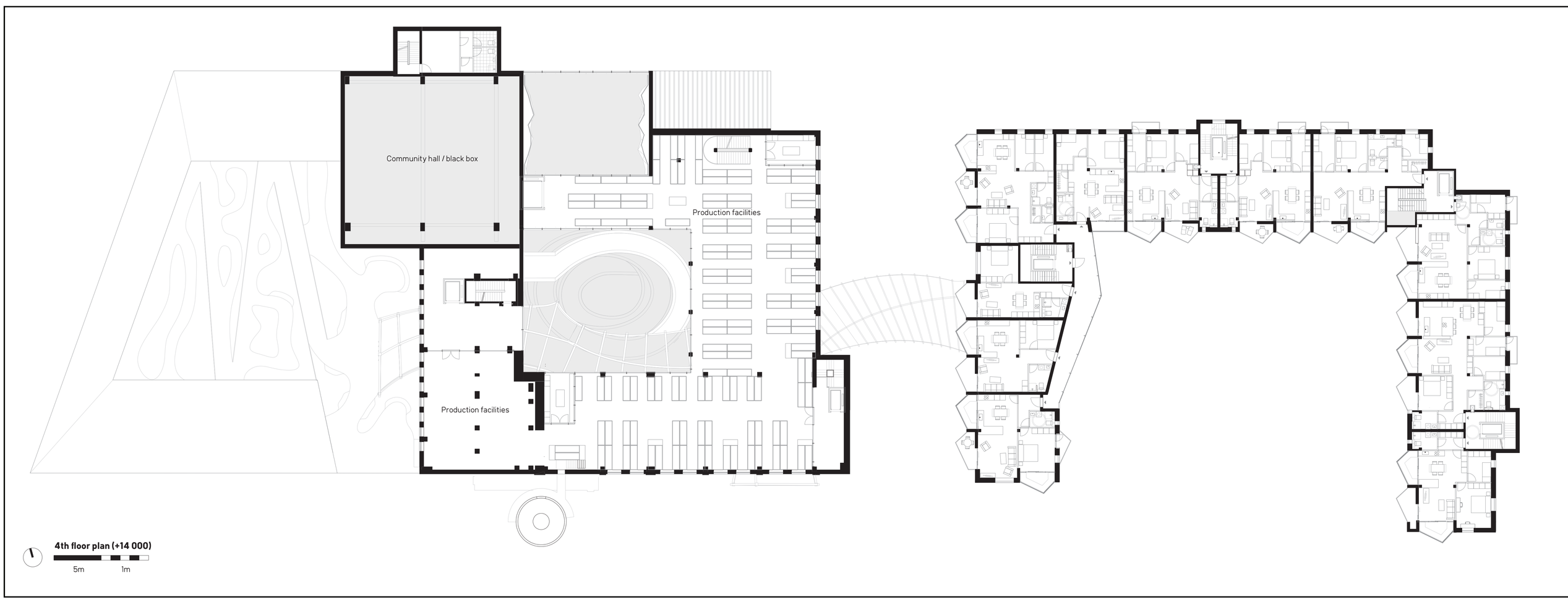
The dimension of the columns is set to 400x400mm while the beams of the roofs varies in dimension due to different spans. From 300x200mm to 200x100mm

The spiraling main circulation is constructec by 1200x300 mm glulam beams that connects to the walls and the wooden structure for stabiliyt and support, both for itself and the structure of the of the botanical street.






Community hall / black box
Production facilities
3rd floor plan (+11 000)
5m
1m


Community hall / black box
Production facilities
Production facilities
4th floor plan (+14 000)
5m
1m