The Common Foodscape

Improving the liveability of the city through urban agriculture

Design proposal

Graduation project
City of the Future

Manon Speulman | 4532465 | 6.7.2023

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Ir. J.A. Kuijper (First mentor)
Dr. P. Medici (Second mentor)
Ir. R.J. van de Veen (Third mentor)

Introduction

The way we shape our food system, determines the form of our city. It effects our health, happiness and planet. Food flows through many different systems and disciplines of design. Its importance and cross-disciplinary is what drew my attention to this topic. Through it, I managed to develop myself further on the topics of design, urban planning, infrastructure and management. It has shown me the variety of choices related to the food system and the complexity of changing something so deeply engrained into our society. All this comes together in my graduation project "The Common Foodscape", which consists of three parts: research, design and reflection.

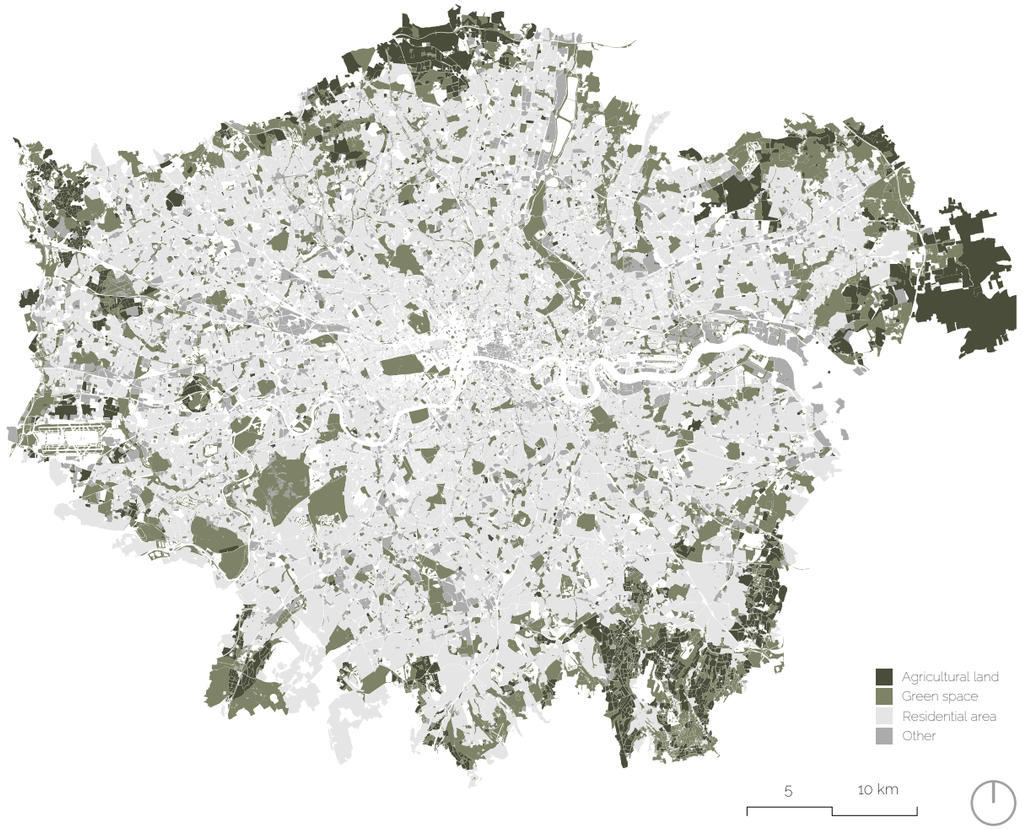
This booklet is a continuation of the research "The common foodscape". It focuses on the analysis and conceptual development of the design. The design is further explained through technical drawings which can be found in de document "Technical drawings". The research and design project interact and inform each other. Where the design proposal covers the more practical side, limitations and quality of urban agriculture, the research inventories the possibilities and characteristics as well as the concept of liveability. In relation to this project and to understand and evaluate on the choices and methods used, I reflected on the process. This can be found in the third booklet "Reflection"

This project is the conclusion of my two years of the master Architecture at the TU Delft. My graduation research confirmed my interest in cross-disciplinary design, and I would like to thank my mentors and tutors of the cross domain studio "City of the Future" for their input and help.

Content

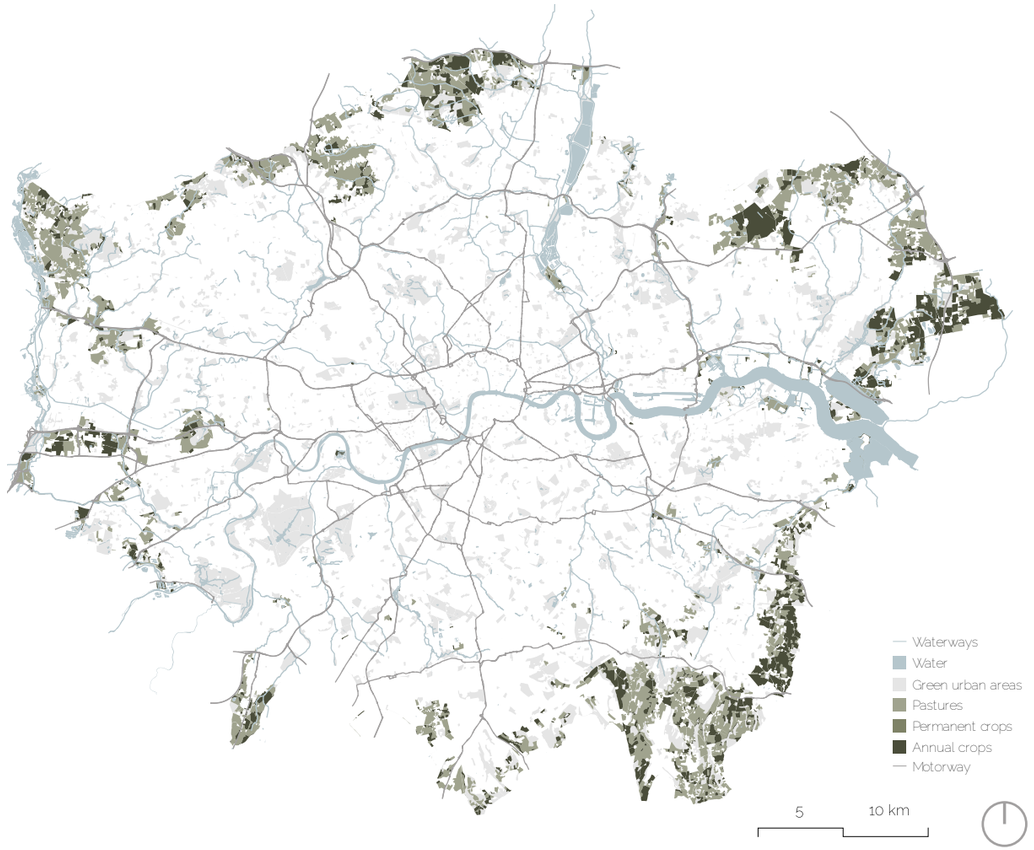
1. Analysis

London analysis

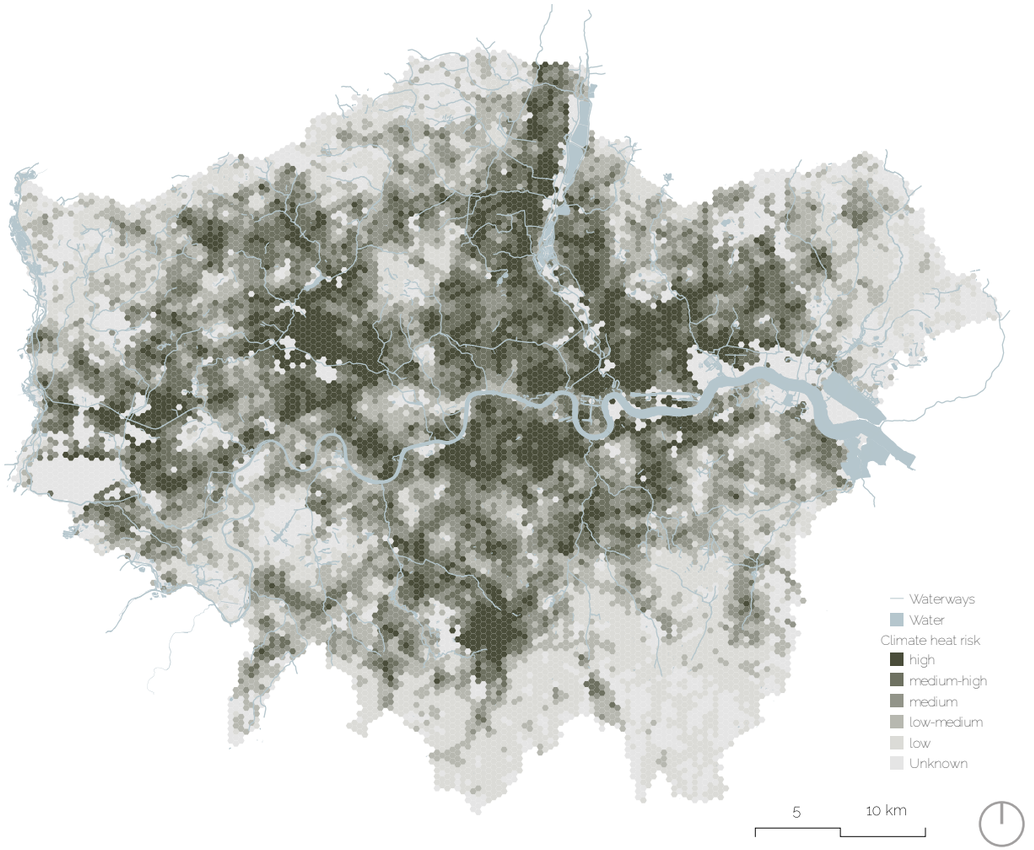


Social agricultural space

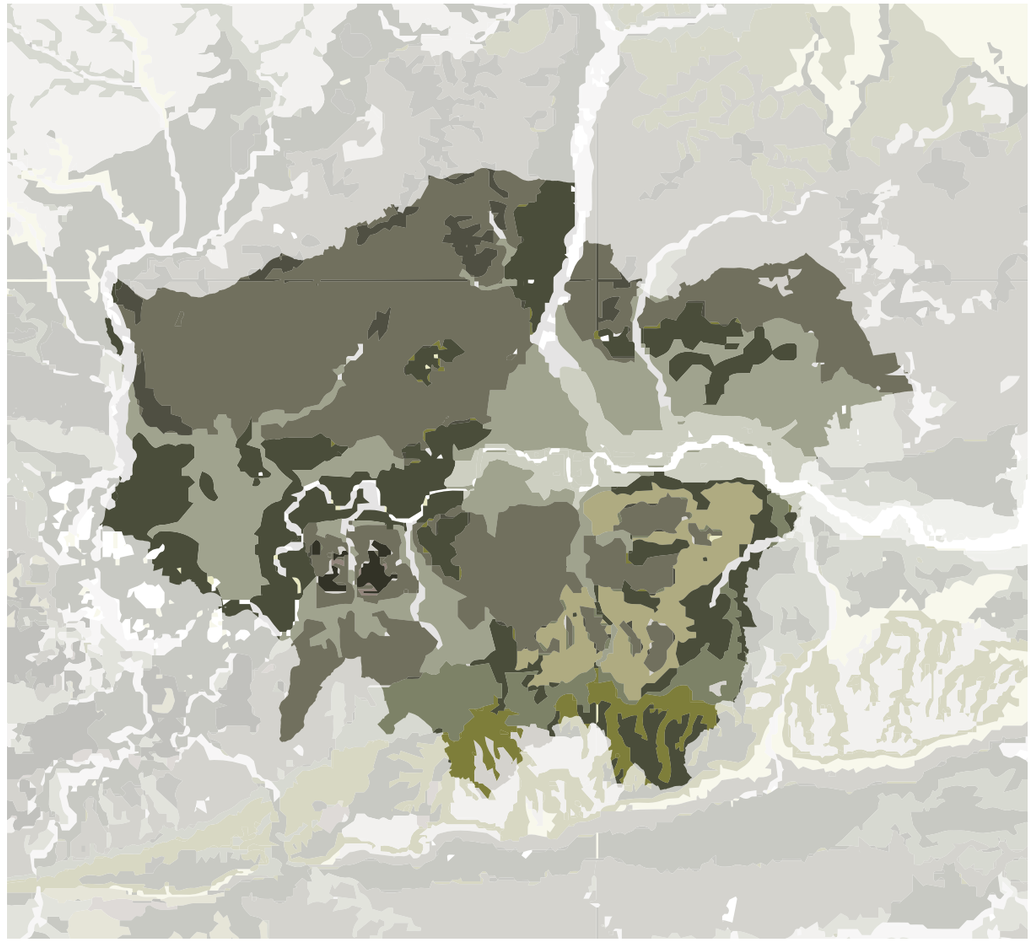
Use of agricultural space



Heat risk



Soil map



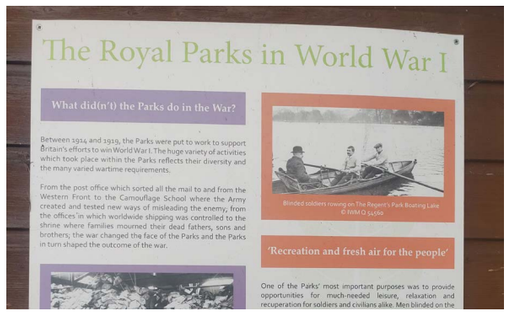
- Fen peat soils
- Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils
- Loamy and clayey soils of coastal flats with naturally high groundwater
- Freely draining slightly acid loamy soils
- Lime-rich loamy and clayey soils with impeded drainage
- Slightly acid loamy and clayey soils with impeded drainage
- Slowly permeable seasonally wet acid loamy and clayey soils
- Naturally wet very acid sandy and loamy soils
- Freely draining slightly acid but base-rich soils
- Shallow lime-rich soils over chalk or limestone
- Freely draining very acid sandy and loamy soils
- Freely draining lime-rich loamy soils
- Loamy and clayey floodplain soils with naturally high groundwater
- Freely draining slightly acid sandy soils

This collection of maps show an already clear presence of urban agriculture in London, as well as a large amount of green spaces. These spaces are often parks and recreational areas.

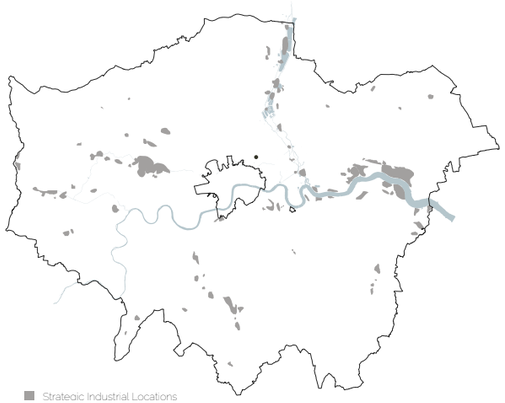
The heat stress map shows a clear problem. Central in London, there is a high heat stress risk, which reduces the quality of living in those areas.

Lastly the soil map shows that there is potential for ubrna griculture inside the ity. However, near the Thames the soil is less suitable, This is also the case for the city centre.

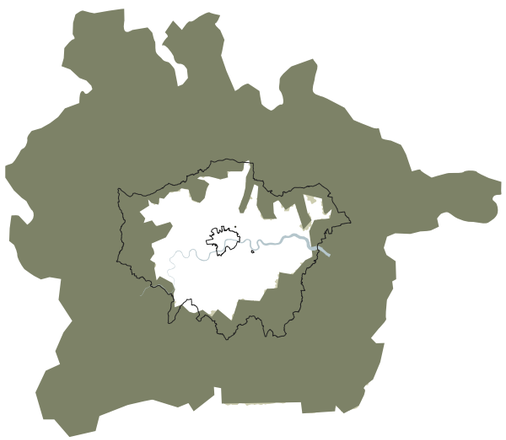
Urban agriculture has been ingrained in the life of London citizens. Most public parks have a small area for allotments or communal gardening. Most of these plots still remain from World War 1, where they were known as victory gardens to help cover the loss of food import. In this period, citizens also transformed their own gardens into agricultural land. Next to this, the city knows multiple city farms, which are recreational spaces where you can interact with food production and animals. As such, urban agriculture is in a social form already present in London



London Plan 2021 analysis



Strategic Industrial Locations



London Green Belt

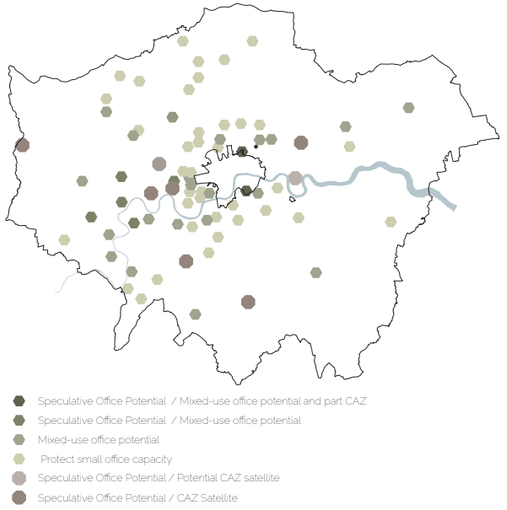
Part of understanding London, is understanding the future envisioned by its government and inhabitants. For this, I used the London Plan 2021.

The maps on the left side show the Green Belt of London and the strategic industrial sites of London. Most of these sites are situated on the water front. As such, industry related transport will often be occur over water. Next to that, these are sites where agricultural processes can take place that would otherwise damage the living quality, such as bio-energy processing.

Surrounding London, a large green belt is situated. This area is mainly used by farmers for live stock keeping and horticulture. As such, this large green area is only partly publicly accessible. Next to that, the distance between the city centre and the green belt is to large for residents to use it as recreational space. Thus creating a green recreational connection between the city centre and green belt is necessary as well as more open forms of agriculture in the green belt. The proposed site in London is situated at the regents canal, connecting it to these industrial areas. At the same time, it can also connect the already existing fingers of the green belt to the city centre.

The maps on the right focus on the economic development of the city. The government proposed different economic or employemnt cores focused on offices. The proposed site in London, does not fall under any of these, but is situated near mixed use office potential and close to a CAZ (Central Activity Zone) potential satellite.

The site is located in a large area of regeneration. As such it is an area, that is being and should further be renewed, from different perspectives such as housing and public space quality, sustainability, economic stability and residential activation and interactino. Implementing a new economy here based on urban agriculture can boost the economy and value of this site, and diversify the overall employment market. Next to that, it can also form an intensive for other developments and will drasticaly change the public space andthe way of living for residents.



Speculative Office Potential / Mixed-use office potential and part CAZ
Speculative Office Potential / Mixed-use office potential
Mixed-use office potential
Protect small office capacity
Speculative Office Potential / Potential CAZ satellite
Speculative Office Potential / CAZ Satellite

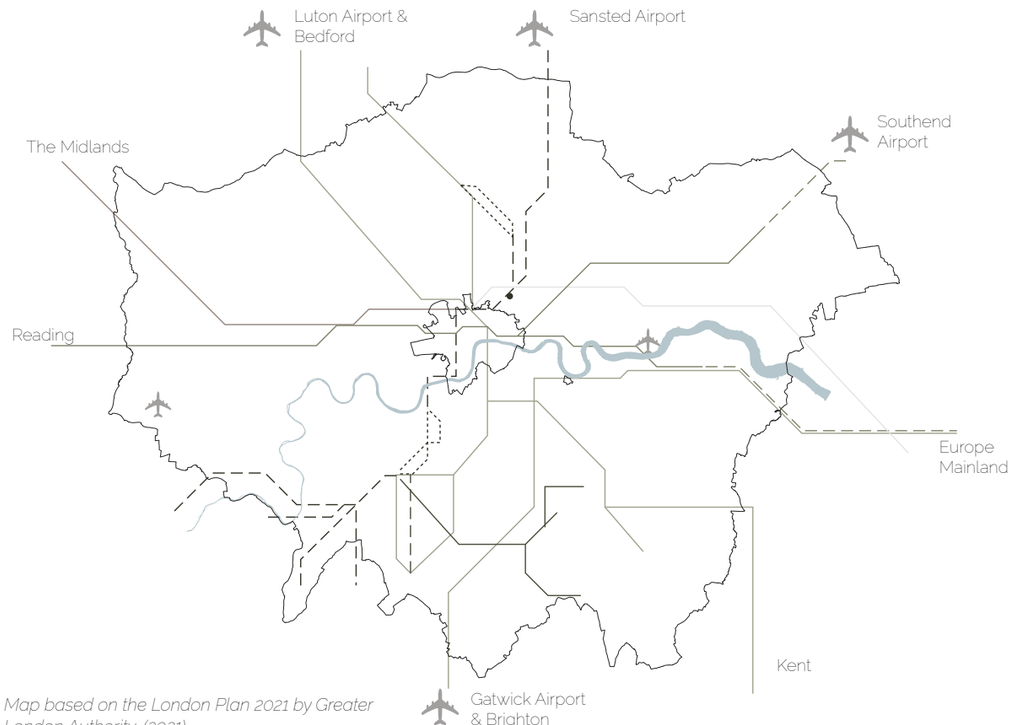
Strategic areas for regeneration

Maps based on the London Plan 2021 by Greater London Authority, (2021)

London regional plan

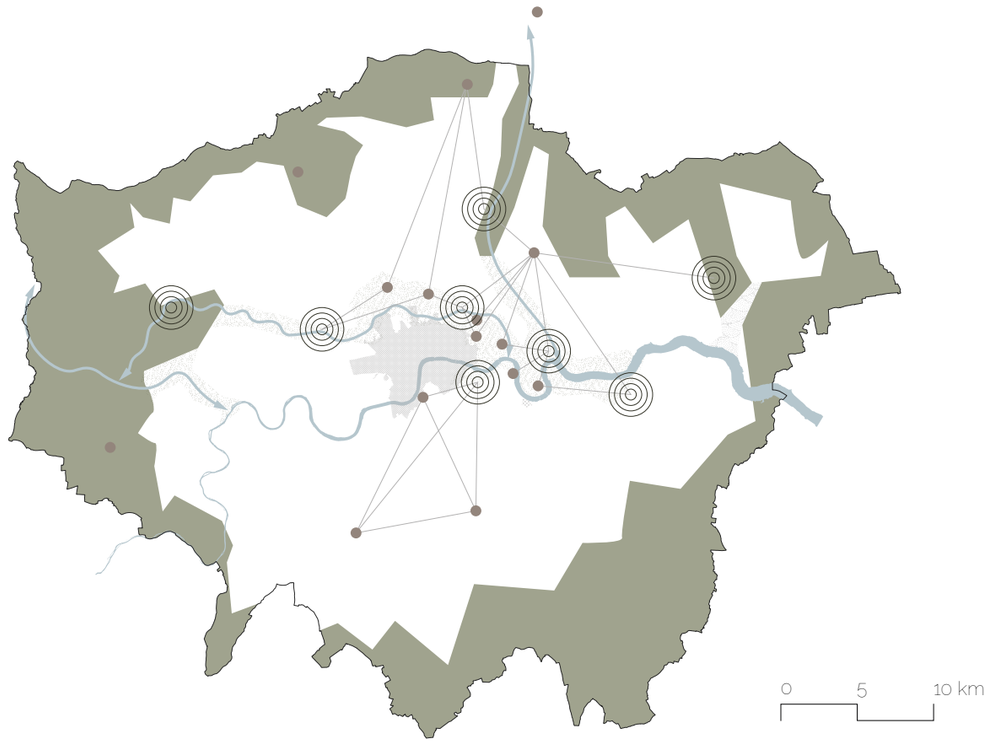
Due to the density of the city, London is highly dependent on its public space network.. This map shows the mian connections as discussed in the London Plan, It is clear there is already good public transport near the proposed site. Next to that, the network will be strengthened here, and connected to the other side of the Thames, Noticably, this map focuses on the connection to the different airports, but not to possible harbours or other means of transport.

Due to the good connection to public transport, it is possible for the site to centralize other means of transport than car, and reduce cars on site.

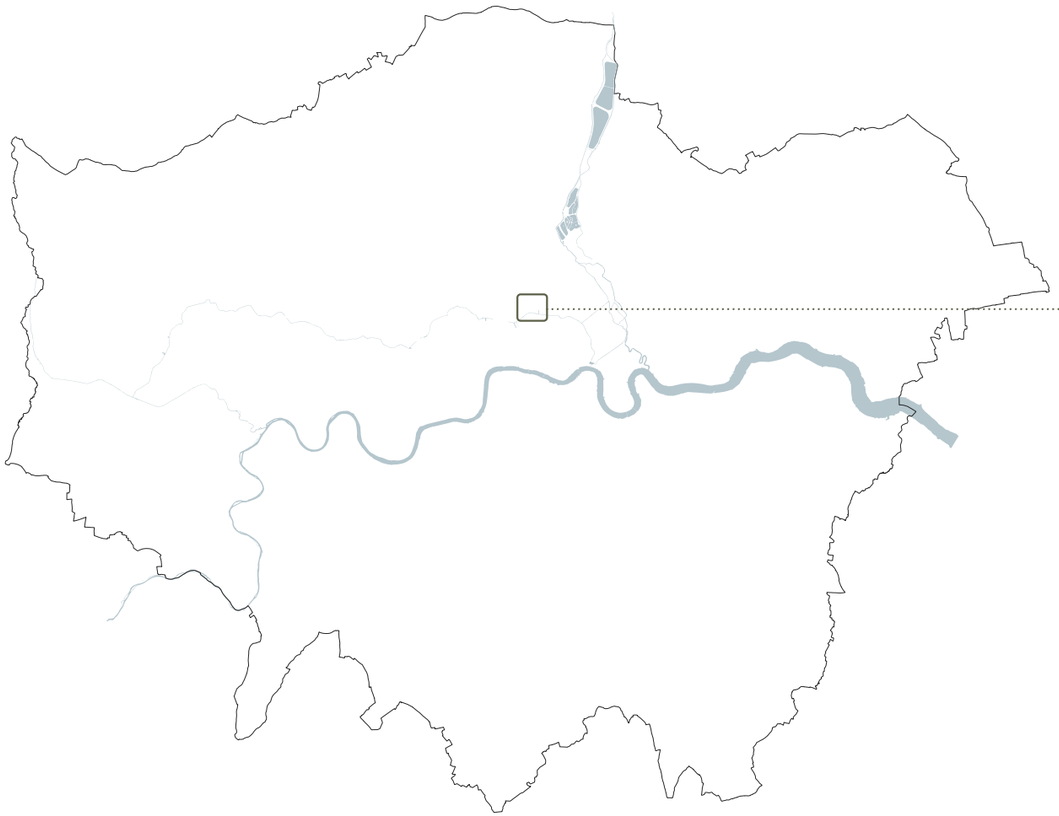


Map based on the London Plan 2021 by Greater London Authority, (2021)

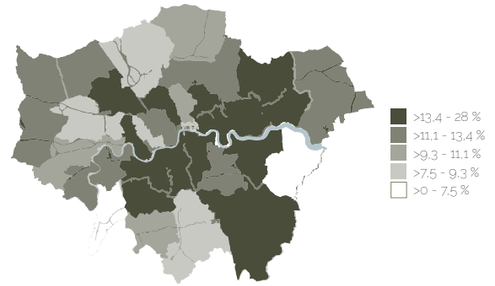
A city wide implementation of urban agriculture could look somewhat like this., It would be highly dependent on existing railway structures as well as the waterways. There would be a few main sites that have larger production centres and would also consist of important related functions such as education and research. All these sites would have interaction and knowledge exchange with existing agricultural sites such as the city farms and allotmens. Lastly the green belt is expanded using interactive urban agricultural land around the Thames. Here multi-cropping takes place to create a strong ecosystem in and imrpove the urban micro climate.

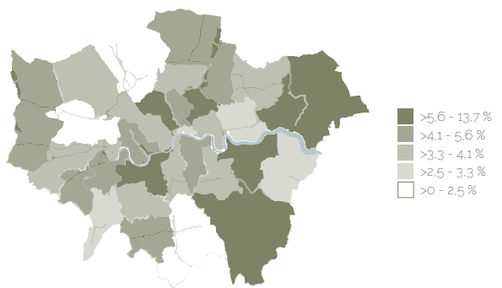


Location



Location choice





London in itself is interesting when it comes to urban agriculture due to its integrated history and existing social sites as well as the promotion of new technical sites. Thus, many different sites in London can be of interest. Therefore, I decided to focus on areas where liveability is low. I specified this area in three steps.

First I looked into the areas with low food security. As not only the potential of urban agriculture in London is good, the lack of food security also demands a change in the food system. This could be improved upon through urban agriculture. At this time 17% of children, 20% of adults, 36% of parents and 32% of people of colour are living in food insecurity (Food Insecurity - Kitchen Social, 2020). The maps on the left show the areas in London with the percentage of people who struggle for food, worry about food and live in hunger (maps based on Moretti et al., n.d.)

I further developed this choice, using the CDRC Index of multiple deprivation, which gives an overview of London and which areas are deprived of certain aspects of living. For this I focused on the aspects of liveability that were most prominent in urban agriculture and that could be improved upon using a changed food system: Health, Environmental, Housing and Income.

The Beauvoir Estate showed up as a site of interest, next to two other sites. The estate ranks the following on the deprivation indexe, with 1st being the most deprived.

Health	4th-6th
Environmental	1st-3rd
Housing	1st
Income	2nd-5th

After defining multiple sites, I searched for the site with the most potential for a new urban agricultural system. Here the Beauvoir Estate scored the best as it had a connection to the water infrastructure as well as a good connection to public transport. It has different typologies of housing which is interesting to experiment with during the research phase of this project. The amount of public space creates a variety of possibilities concerning outdoor urban agriculture, and the characteristic as a social housing complex, with a different identity from the surrounding blocks creates an important social input. Lastly the site has an interesting waterfront and two heightened platforms which could have an interesting role in a transformation process.

Existing foodscape

Transport


Bus stops
Public transport
10 minute walk
5 minute bike ride
10 minute bike ride
Allotments, Farmland & Farmyard
Green
Water
Buildings
Roads
Railways
0
250
500 m

Conclusion


RAILWAYS
FRESH PRODUCE
COOPERATION OVER WATER
LANDING @ THE PARK
Bus stops
Public transport
10 minute walk
5 minute bike ride
10 minute bike ride
Allotments, Farmland & Farmyard
Green
Water
Buildings
Roads
Railways
Redeveloped industrial areas
Food roads
Supermarkets
Bakeries
Markets
Greengrocers
Butchers
Restaurants, pubs, cafés & bars
0
250
500 m

Urban analysis

Buildings

Functions


Residential
Commercial
Education & Care
Food related
Transportation
Religion
Other
Social recreation & culture
Private space
Road
Water
Green space
0 1 2 km

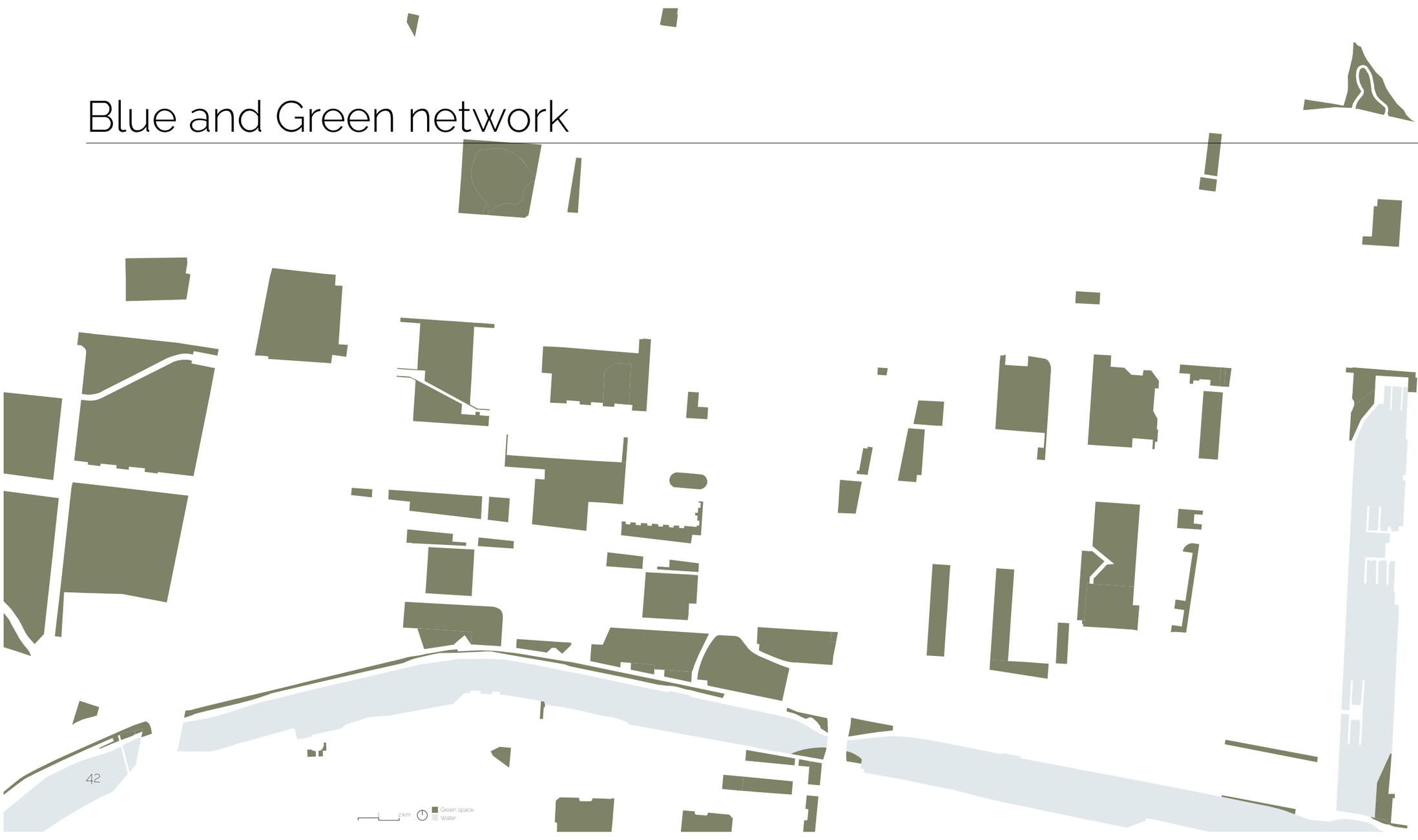
Road network

Green and paved space

Traffic speed

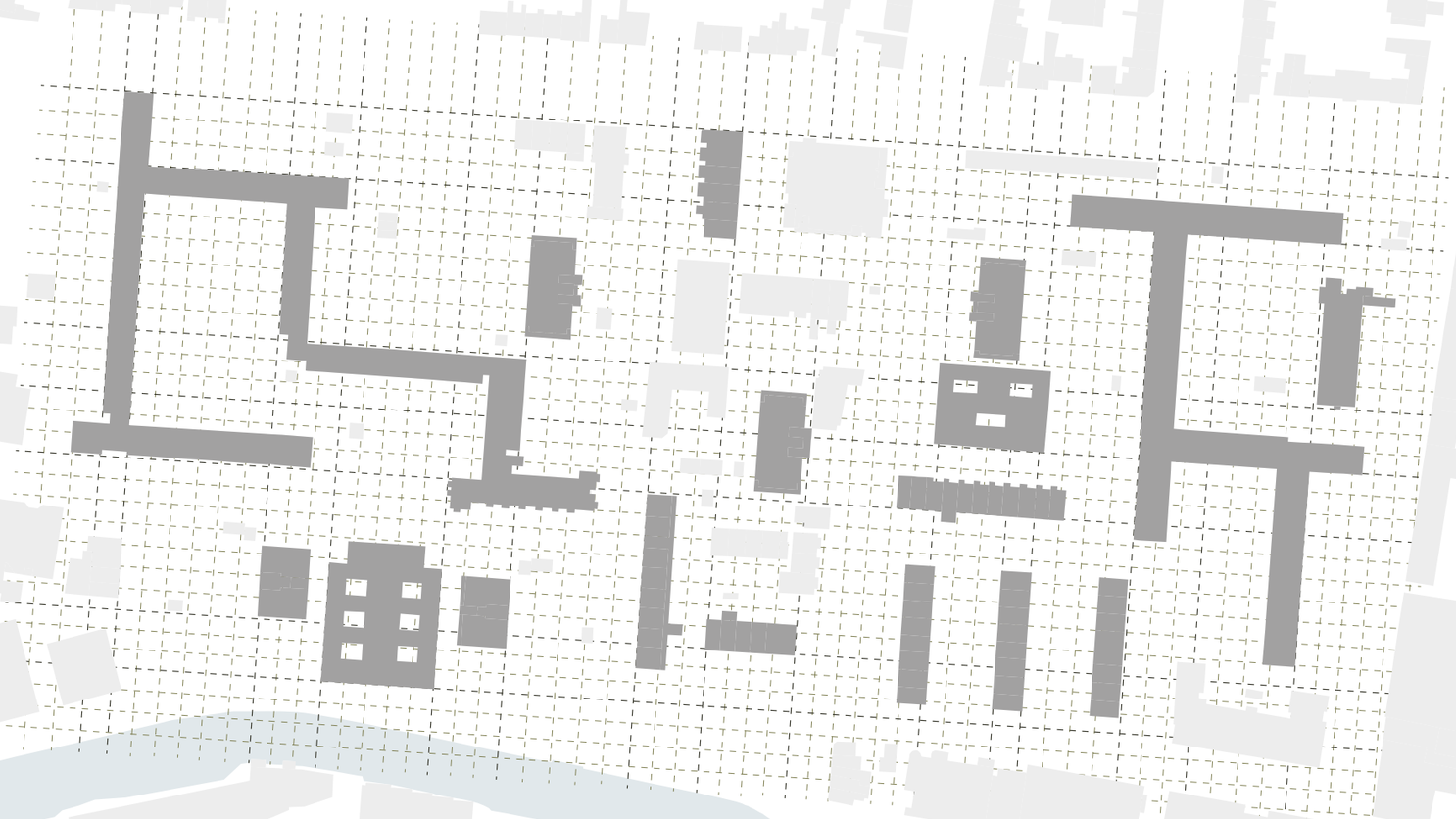
Social and movement space

Blue and Green network



Private space

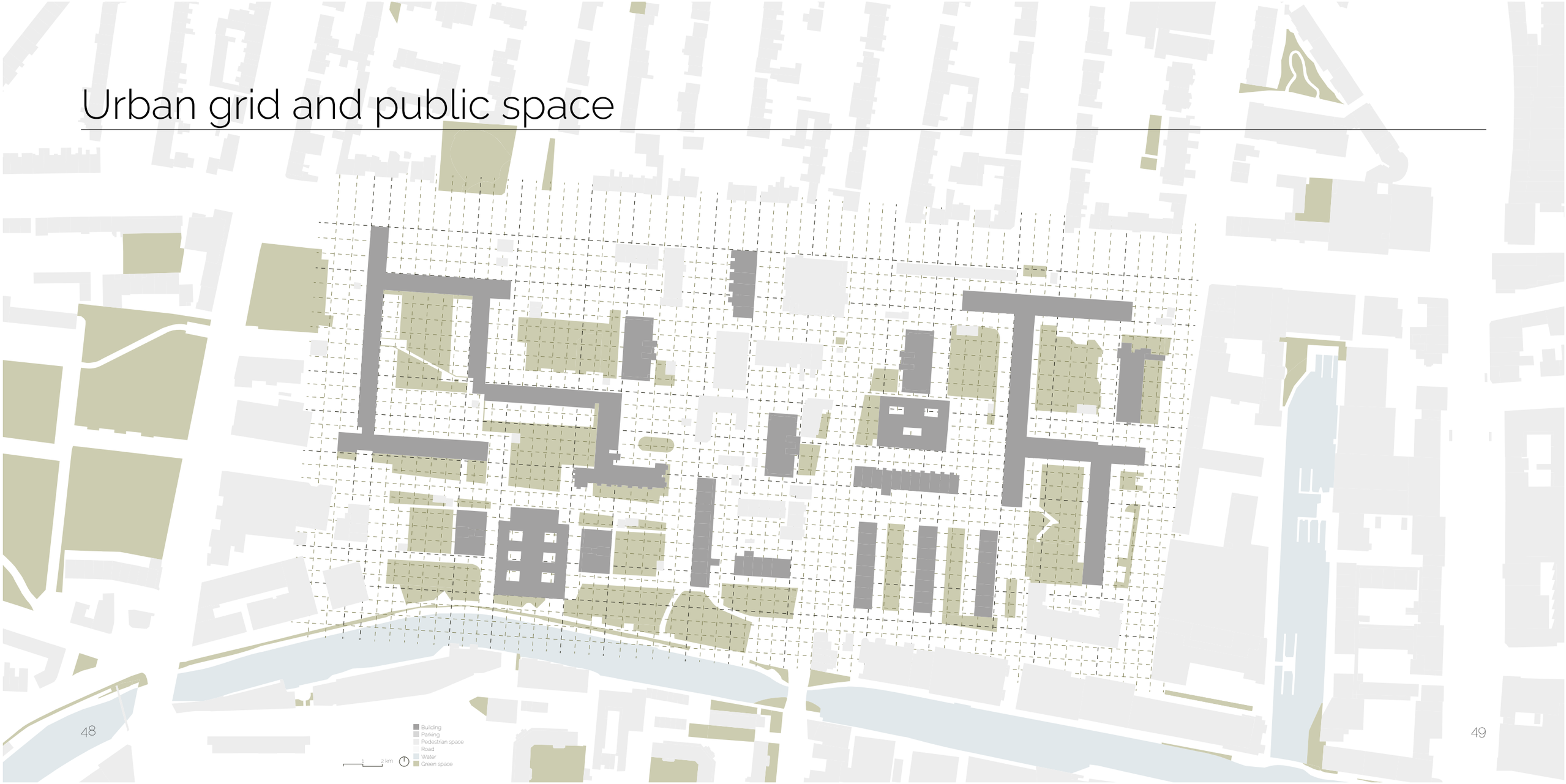
Urban grid



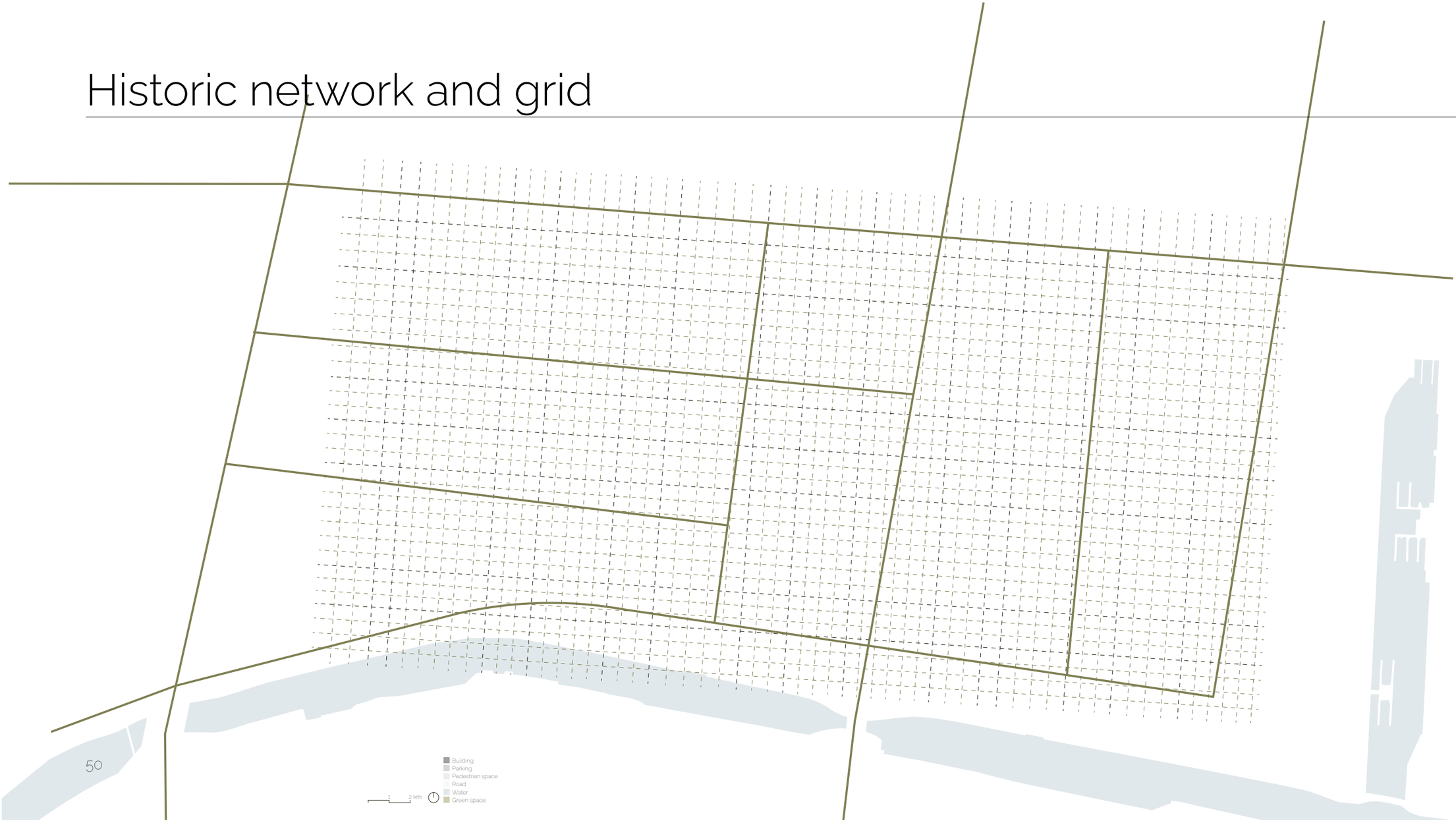
Building
Parking
Pedestrian space
Road
Water
Green space

2 km

Urban grid and public space



Historic network and grid

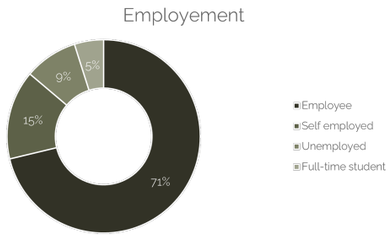


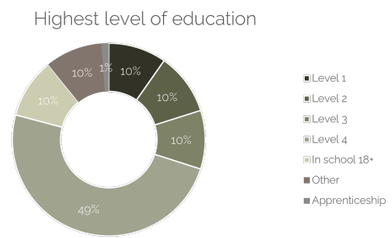
Demographics

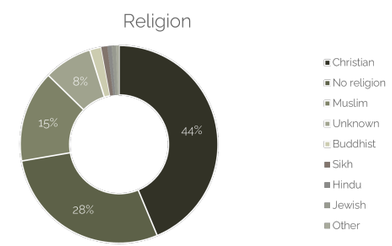
The residents of the Beauvoir Estate are relatively young with almost half of the residents being under 30. At the same time, the area hosts a lot of single house holds, which fits with this young group. However, most residences in the area are designed for families, with two or more bedrooms. Therefore, it is interesting to see what kind of housing can be added on site, to give more room to this group.

The area is very multicultural which can be seen through both the ethnicity and the religious background of residents. As a consequence, different food and eating cultures come together in this area. Creating spaces for residences to cook and eat together, could help exchange different recipies, and produce as well as give a platform for the single person households to eat together instead of alone.

Most people on site have a good education, however, unemployement is relatively high in comparison. Therefore, urban agriculture could also function as an incentive here to create job opportunities for the 15% that are currently unemployed.







Diagrams based on data from LSOA Atlas 2011 (Greater London Authority, 2014)

Social urban agriculture

Urban agriculture is very much present in the Beauvoir Esate and its direct surroundings. This can be seen in the Allotment group of Hackney and the "De Beauvoir Gardeners Club". This group organises various activities such as competitions, food tastings, cook-offs, workshops and excursion. Specifically their annual Flower and Produce show is bustling with community members and those that are not.

Echange of food through these types of activities is present in different places and through different communities in London. However, De Beauvoir Gardeners Club also actively works on more permanent forms of urban agriculture. Such as the introduction of production in the playground above the Beauvoir Estate (the Rainbow Garden).

Next to this group, the Tenntants and Residents Association (TRA) of the Beauvoir Estate also embraces urban agriculture. The recently introduced allotments on site (maintained by De Beauvoir Estate Garden Allotments), and also worked on expand and create more beds on the heightened platforms on site.

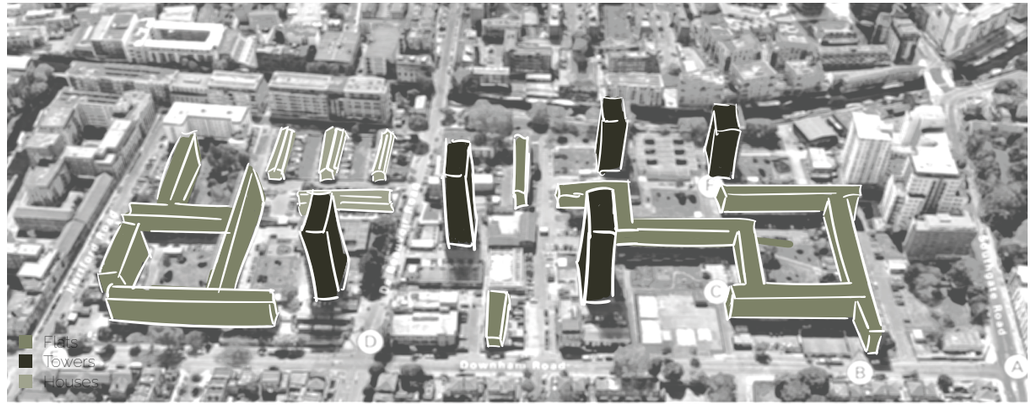
Photos made by De Beauvoir Gardeners

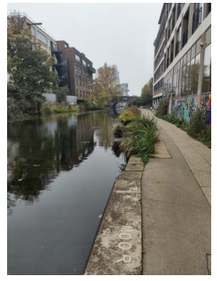
Built environment

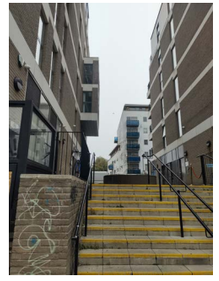
The Beauvoir Estate was founded in 1960. It replaced the existing normal housing, and in its place different flats arose, all alligned in facade and materialisation, but differentiating in heigt and form. The estate consists of social housing, and fitting with its time period, it has large, open, public spaces, which consist of grass and a few trees, but little planting or designed elements otherwise. Characteristic for the site are two heightened platforms, which do not seem to serve any purpose at this time, except for the entrance to the flats and the storage of two waste containers.

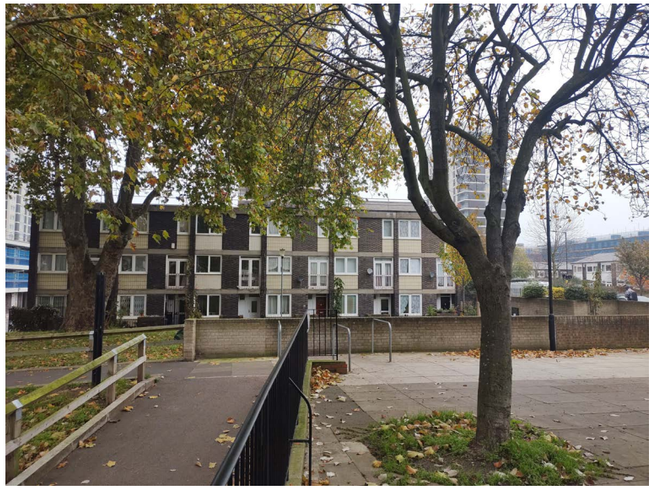
At this time, the long snake like flats are being renovated as part of a larger redevelopment strategy. The old historic structure is still partly visible in the terrain due to the roads and pedestrian ways, which extend through the buildings. As such, it is possible to walk underneath the buildings to the public spaces.

The site is located next to the regents canal, and adjecent to both sides near the waterfron old harbour terrain is being redeveloped, in some cases the existing buildings are still empty, being reused or demolished and replaced. The estate contrasts its direct surroundings due to its height, different density and overall style.

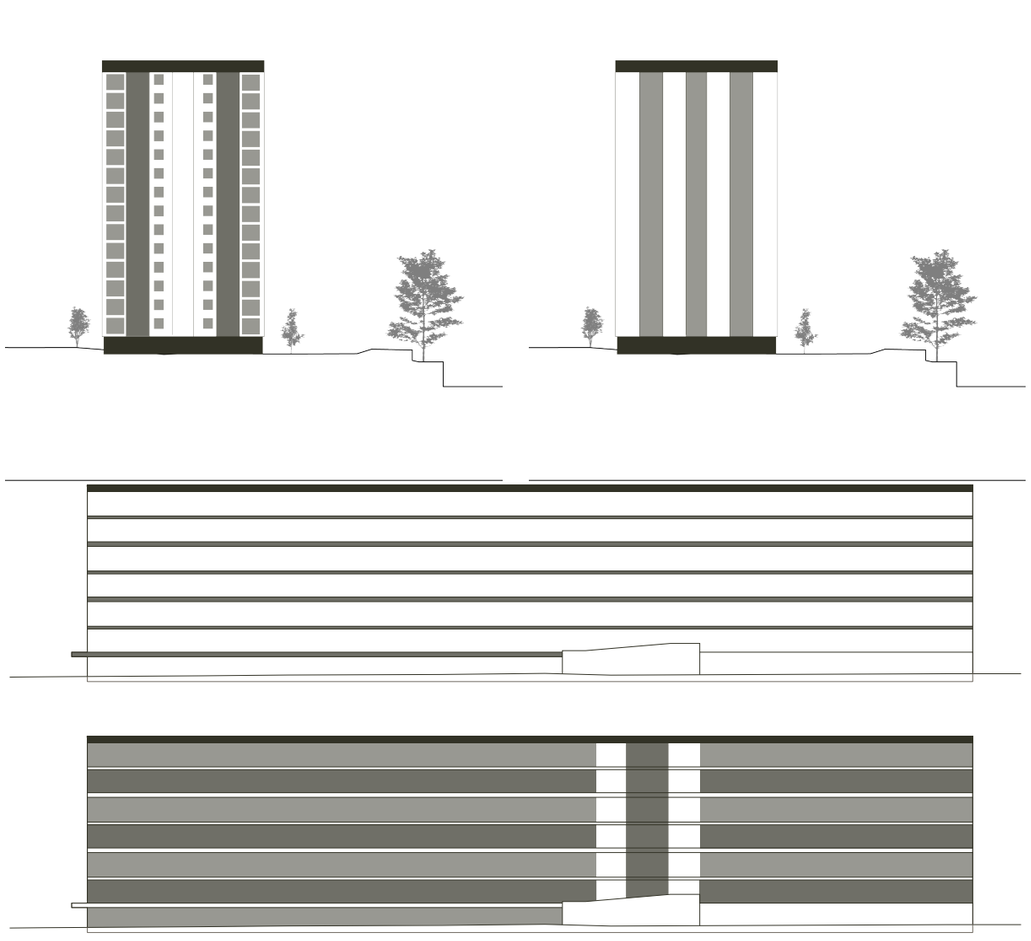


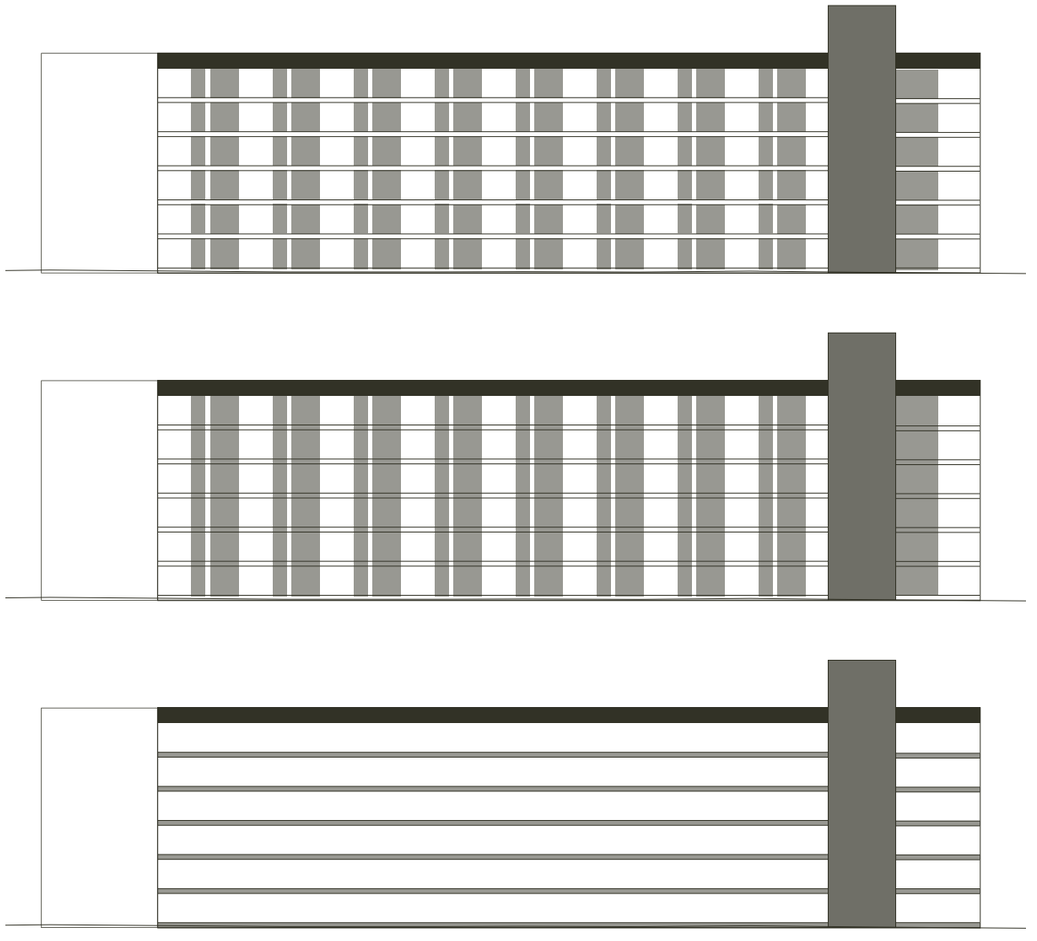






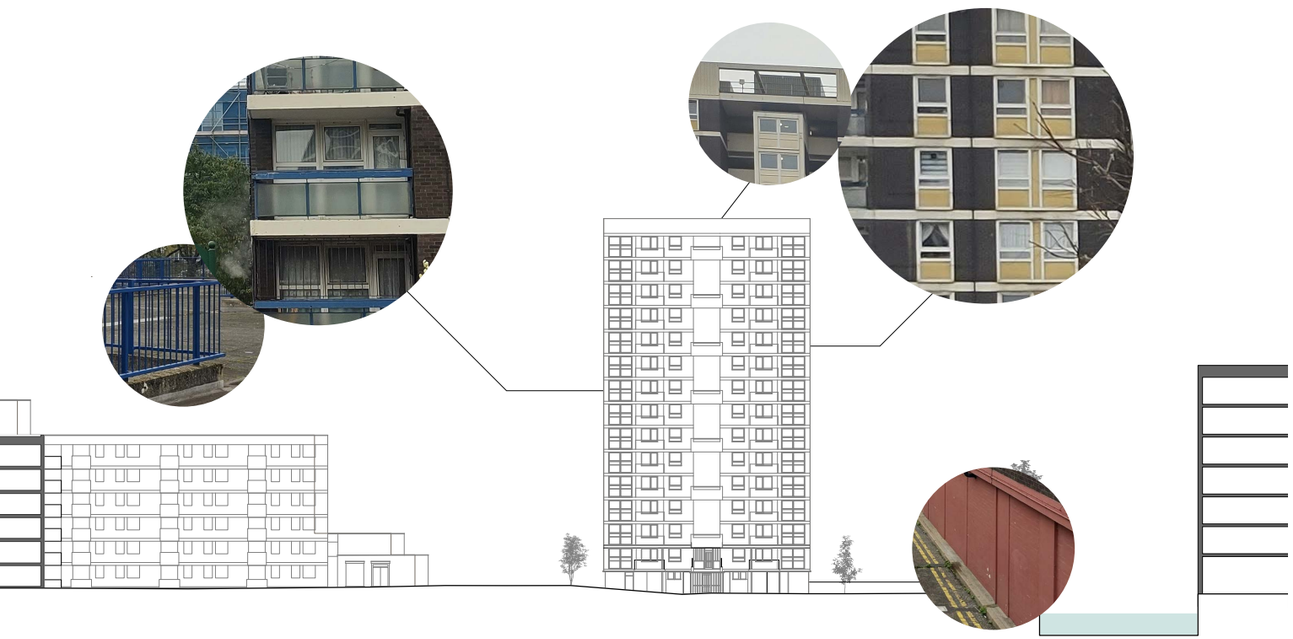
Facade analysis





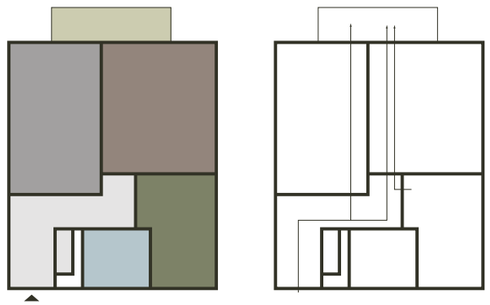
The facades of the Beauvoir Estate characterise themselves due to their horizontal lining and strict grid. Where due to the placement of the windows, and staircases all facades have a vertical lining, the horizontal lines of the floors extend over these lines and as thus are more present. This allignment wil be critical to allign the design to the existing surroundings and make sure it is integrated into the context, even with different materials.

The Estate was built in 1960 and as such, has materials and colours fitting with this time. The main material is a dark red, brown brick. The building is accented by the window panels, which are either creme coloured or yellow. Another clear accent are the blue railings, which are present all throughout the public space and buildings. In the buildings the railings are covered with glass panels. Lastly, the horizontal lines are created by the concrete floors of the building.



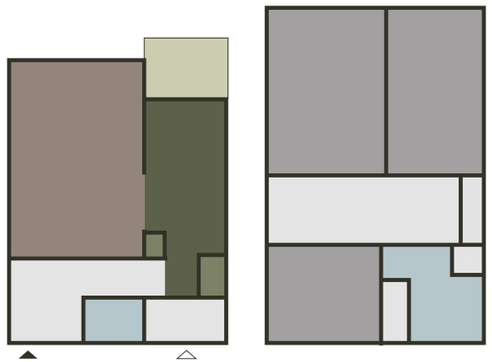
Floorplan analysis

De Beauvoir Road

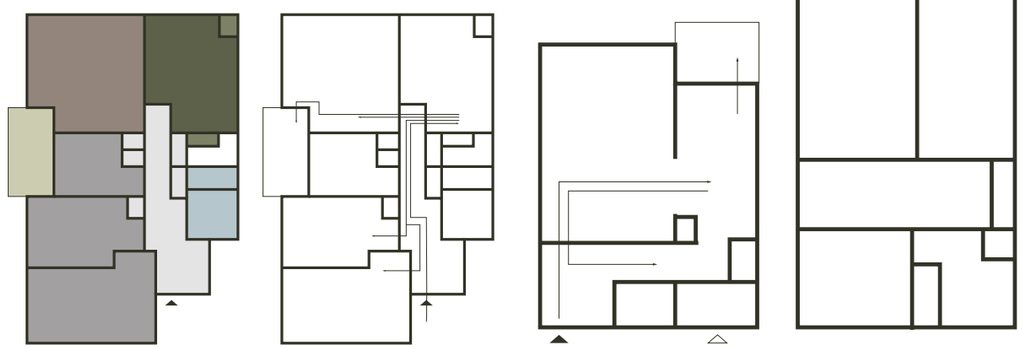


Kitchen
Living room
Bed room
Hallway
Bathroom

Fermain Court



Granville Court



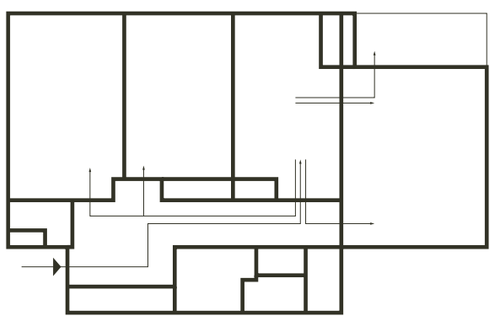
The residences on site consists of different floorplans. With Granville court and Lancresse court being two of the main tall towers, they have two and three bedroom appartments. In both cases the balcony is not connected to the kitchen, but to the living room. As such, if one does grow vegetables, fruit or herbs on their balcony, you would need to take it through the living room to be able to reach the kitchen. The amount of bedrooms show that the appartments were originaly meant for families. In both cases the kitchens are relatively big, (equal to the small bedroom), but disconnected from the main routing through the house.

The Beauvoir Road consists of small appartments for single or couple households. Here the kitchen is relatively small, and esigned efficiently, without connection to the balcony and disconnected from the main routing. The kitchen is a destination in itself.

Lastly the Fermain court, which is one of the snake like flats. These houses consist of maisonnetes, with multiple bedrooms on the top floor, and the living quarters on the bottom floor. Here the kitchen is connected both to the balcony and the living room and it seems to be part of the routing and day-to-day routine. The kitchen has a lot of storage space, and a long counter, but little space to dwell. As such, most of the eating will take place in the living room.

To allow residents of the existing housing to participate in urban agriculture, they will need more outdoor space to produce, in some case more kitchen space, and or storage space, and possibly a larger area to have dinner with guests.

Lancresse Court



2. Food system

The influence of diet

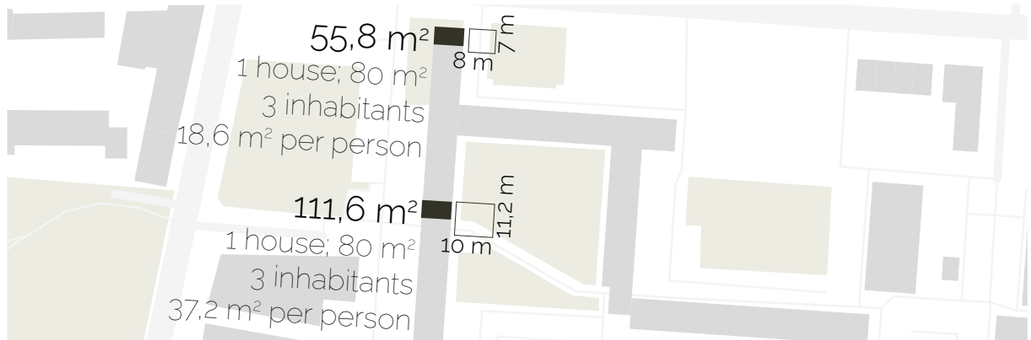
Not all food is the same, and the needs to be able to grow differ greatly per resource. Where the research focused around horticulture, this is not enough to maintain a nutricious diet. What we eat, greatly influences our environment. Transporting produce all around the globe produces green house emissions and is mostly seen as unsustainable. However, producing tomatoes in greenhouses in London, needs more energy and produces more greenhouse gases than importing tomatoes. Therefore, things are not simply black and white when it comes to sustainable food. This becomes even more apparent when reviewing the influence of diets on the amount of space they take into account.

Where our current average consumption takes up to 1000 m^2/year/person, The proposed "healty diet" only takes 650 m^2/year/person. However, a vegan diet, which is often seen as sustainable as it stops greenhouse gasses produced by livestock, takes up to 710 m^2/year/person. Which is twice as much. Thus, when it comes to urban agriculture, a vegan or vegetarian diet is not the best solution. Instead the "healthy diet" including insects is the most space efficient. Where, this asks for a large change in eating habits and diets from people. It is has the largest effect when it comes to planetary urbanization.

However, even this area. Is to large to create enough agricultural food production on site for all residents of the Estate.

	Average consumption			The healthy diet			Classical vegetarian diet			Vegan			Average consumption incl insects			Healthy diet incl. insects		
	area (ha)	percentage	m2/year/person	area (ha)	percentage	m2/year/person	area (ha)	percentage	m2/year/person	area (ha)	percentage	m2/year/person	area (ha)	percentage	m2/year/person	area (ha)	percentage	m2/year/person
Grain and cereals	10088	4%	42	4000	3%	17	4000	3%	17	4000	3%	17	10088	15%	42	4660	6%	19
Dairy	24778	11%	103	13308	10%	55	26000	18%	108	0	0%	0	24778	36%	103	19500	27%	81
Fruit	3055	1%	13	6500	5%	27	6500	4%	27	6500	5%	27	3055	4%	13	7800	11%	33
Legumes	386	0%	2	8900	7%	37	9000	6%	38	9000	6%	38	386	1%	2	10140	14%	42
Vegetables	1220	1%	5	3800	3%	16	3800	3%	16	3800	3%	16	1220	2%	5	4680	6%	20
Potatoes & tubers	1813	1%	8	4500	3%	19	4500	3%	19	4500	3%	19	1813	3%	8	5460	7%	23
Sugar & sweets	531	0%	2	0	0%	0	0	0%	0	0	0%	0	531	1%	2	0	0%	0
Fats	5272	2%	22	0	0%	0	0	0%	0	0	0%	0	5272	8%	22	0	0%	0
Eggs	3708	2%	15	4000	3%	17	8200	6%	34	0	0%	0	3708	5%	15	4680	6%	20
Fish, shell-fish & crustacean	1490	1%	6	5500	4%	23	0	0%	0	0	0%	0	1490	2%	6	6240	9%	26
Meat & meat products	173355	77%	722	85088	63%	355	0	0%	0	0	0%	0	0	0%	0	0	0%	0
Vegetable, high-protein products	0	0%	0	0	0%	0	75000	51%	313	82000	57%	342	0	0%	0	0	0%	0
Meat substitutes, nuts	0	0%	0	0	0%	0	9200	6%	38	10000	7%	42	0	0%	0	0	0%	0
Soy milk	0	0%	0	0	0%	0	0	0%	0	23000	16%	96	0	0%	0	0	0%	0
Insects	0	0%	0	0	0%	0	0	0%	0	0	0%	0	17000	25%	71	10140	14%	42
	225696		940	135596		565	146200		609	142800		595	69341		289	73300		305
Agricultural land needed	226000		942	147000		613	157000		654	170000		708	84000		350	78000		325
			1000			650												350

The need for land based on diets based on Wiskerke & Verhoeven, (2018)



Self sufficient fruit and vegetables normal diet

Self sufficient fruit and vegetables vegetarian diet

These two diagrams strive to showcase the spatial effect of these diets. As an example one of the maissonetes is chosen. This is a house for three residents and includes about 80 m². The top image shows the amount of production space needed when a resident would like to produce all their vegetables and fruits for themselves in a normal diet. The difference between the two areas is the top being only effective production space, and the bottom also including pathways.

The map at the bottom shows the area needed to be self-sufficient on a vegetarian diet. Also here, the top area is the production space and the bottom area the pratical space including pathways.

These site tests show that it is unreasonable to expect to become self-sufficient inside an urban environment. Even using hydroponics which can be up to 30x times as effective, and thus need 30x less space, not all parts of the diet can be covered using these methods and the area needed would still expand far beyond the borders of the estate.

As such it is not possible to make the Beauvoir Estate self-sufficient. Instead the focus of this design proposal will be to improve the liveability in the Beauvoir Estate by increasing the local food production and creating an interactive common foodscape.

Seasonal and local

London has a seasonal climate and as such, dependent on the time of the year, different produce can be grown. This influences the variety and amount of produce available as well as the variety of nutrients residents can gain via fresh produce.

This diagram shows the amount of vegetables, herbs and fruit that can be grown throughout the season (Team, 2021). There is a clear dip in availability in the period of November until May. Where vegetables are available all throughout the year, specificaly fruit is low in this period. With March and April having no local fruits at all. Where January and February have apples and pears, which come in a variety and are relatively filling, May only has strawberries, which are vulnerable to pests and climate and not very filling. As a conseqeunce these might need to be sourced indoors.

Seasonal production falls in line with the natural ecosystem, but prevents concumers from having all produce all year around, thus reducing variety. However, on the long term it is more sustainable due tro lower import and makes people look forward to specific seasons and their produce.

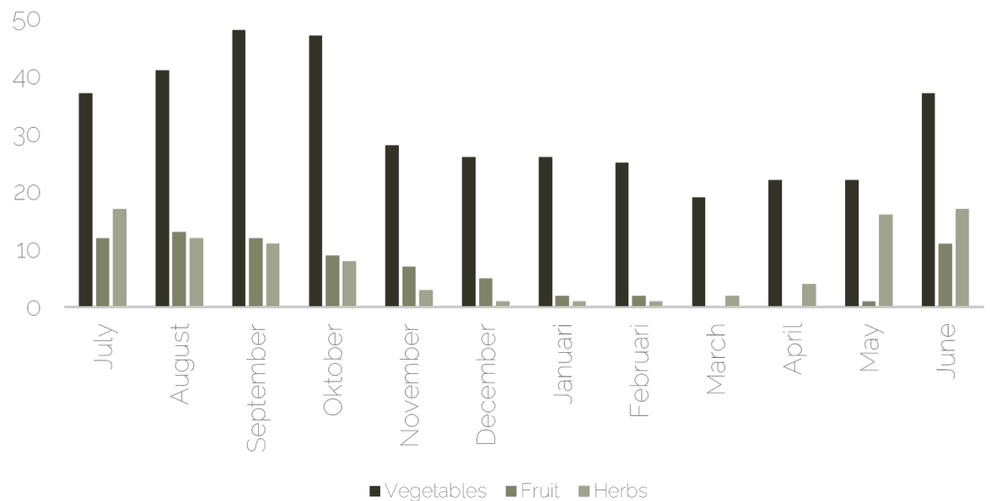


Diagram based on: What's in season when? A guide to UK seasonal eatingby Team (2021)

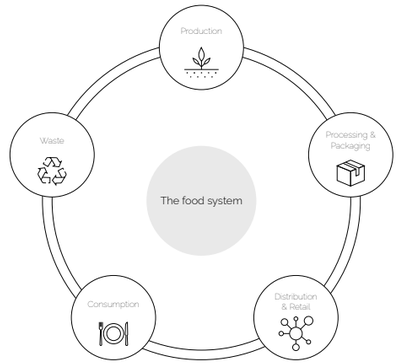
Food system transformation

To understand the change in the food system due to urban agriculture and to see which program is still missing, it is necessary to split the system up further. Processing and packaging will be split, distribution and retail will be split. Consumption will be split into preparation and consumption.

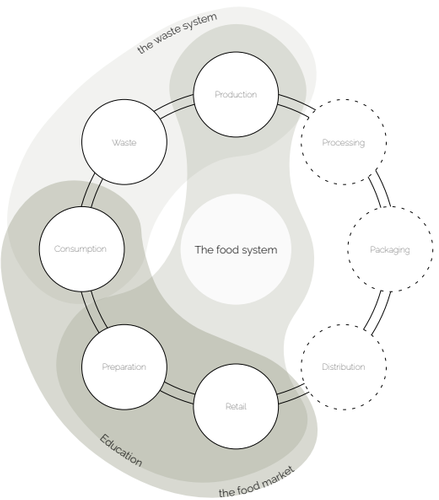
Due to the more local production system and the focus on fresh, unaltered produce. The emphasize from processing, packaging and distribution is removed. As a consequence there will be more preparation for residents at home, which is the reason the consumption step is split up. To help residents with both the production, retail (of their own produce) and the preparation of food, more education should given. This can be included in the existing education system, or introduced via workshops for children and adults.

The introduction of waste to the circular system creates possibilities for composting as well as energy production for the production step. However, for this a new waste system should be set-up, one that focuses on food waste reduction, in consumption, a clear collection and processing method and lastly brings the waste back into the system.

Lastly, by reducing distribution and creating more local production sites, more local retail points should be introduced. These food markets should form a destination and a place of social exchange where, also consumption and preparation can take place for thosed with a smaller kitchen.

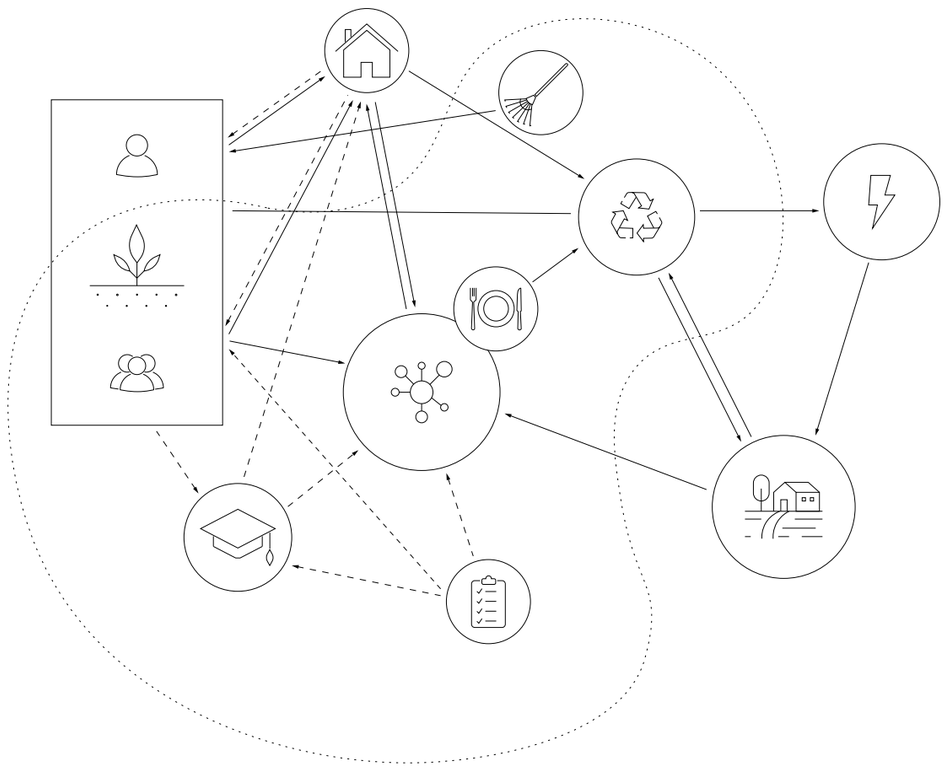


The standard circular food system



The new food system

Proposed UA system

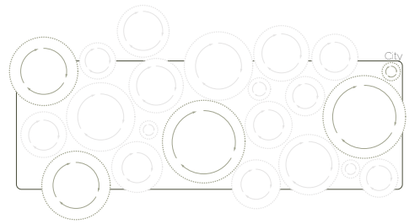


Therefore, to have a functioning local system, the following system is necessary (p.70). Here two core production entities are situate, the communal or private gardening sites, and the commercial production sites. The commercial sites interact with the system through distribution, education, waste and energy.

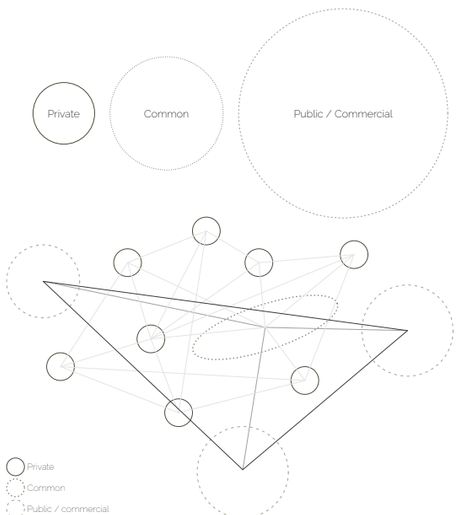
At the same time, the residents make use of a central distribution and shared dining area. To allow all residents to participate there will be shared storage and tools. All residents have access to the local education and participate in the management system.

As discussed before, due to space limitations a self-sufficient system is not possible. Not on a neighbourhood scale, nor on a city scale. However, a self sufficient system as the diagram shows, can also indicate a social system. In this case all services of urban agriculture should be present in each borough of London.

At the same time not all types of production and food groups can be tackled. Therefore there will be an exchange between scales and dependent on availability of produce. The largerst providers are the commercial or public production centres. They can have a variety of products and also cover the cultivation of insects. At the same time, the basis of residents food intake will come from their own garden, This will create a personal connection. surplus can be exchanged, sold or divided in the common scale.



Self-sufficient system



Satellite system

3. Toolbox

Introduction

The toolbox is based on the research. It is an abstraction of the reviewed case studies, examples, strategies and design experiments. These sources showed the necessary systems for urban agriculture. These interventions were collected in the toolbox. The purpose of the toolbox is to give an overview of possibilities in urban agriculture and form a source of inspiration of possible urban agricultural interventions.

The toolbox not simply a means to design urban agriculture in a liveable way, it is a method to design a common food place. The toolbox brings together processes, program and form. After this, it is in the freedom of the designer to create a fitting atmosphere and system using materialisation, local stakeholders, existing flows and an optimisation of tools. The toolbox consists of five categories:

_Function
_Element
_Architecture
_Space
_Infrastructure

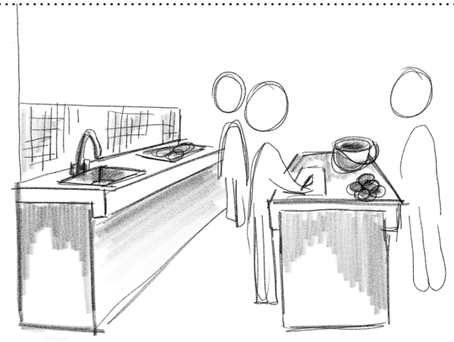
Not all tools have been used in the design proposal, as this is not necessary to come to a fitting design. When it comes to the space, architecture and elemental interventions, these can be modified, merged and implemented depending on the needs of the site and possibilities. However, when it comes to function and infrastructure, these are part of the supportive system. As a consequence the implementation of the function is dependent on the independency the designer wants to create on site as well as the relation to existing functions and nearby urban agriculture. The urban agriculture system can be seen as different enclaves in a satellite system. This means that all parts of the function should be integrated into an enclave, and at least one form of productive program (livestock, horticulture, or forestry for example). However, not all program needs to be situated in one site. It can help to bundle the social functions into one agricultural hub, but having multiple smaller markets, or one central educative centre for a larger environment can also be possible.

When it comes to infrastructure, the integration of these tools decides the sustainability of the project. It is recommended to at least touch upon one tool in the water system, one in the energy system, one in the waste system and one for overall transport. Sometimes, different tools can strengthen each other, and sometimes they battle for space (an ecological roof, or a solar roof for example). In these cases it is up to the designer to determine the best tools for the context.

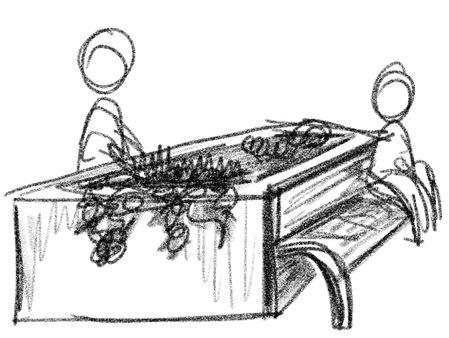
The design of the toolbox came forth from the wide range of interventions and ideas possible in urban agriculture. Where it started as a means to organise, it quickly developed in a method to explore the possibilities. As a consequence, the toolbox is a mixture of very fixed forms as well as very broad concept. Through the use of axonometric diagrams I strived to emphasize how all interventions have a physical effect and to give an idea of the key elements that would occur in these. In the development of the plan, the toolbox mainly founded the urban interventions, as well as programmatic and infrastructural interventions on site. When it comes to the architectural interventions in the toolbox, it would be possible to extend on them endlessly based on new studies, strategies and designs. However, I chose to stay with these main, and often occurring themes, as more then the physical characteristics the atmosphere and openness of the space is critical for the success. This is not only created by the main massing or shape of the intervention, but more so by the materialisation and the association users have with this. Does the building feel accessible, does it feel natural or sustainable, do I want my food to be produced here, does it feel healthy?

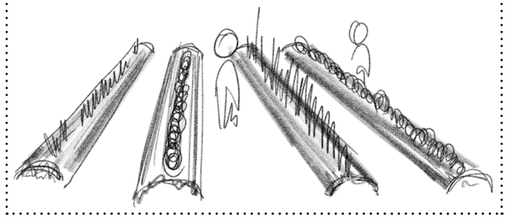
The research already showed a link between vernacular design and open site as well as high-tech design and a closed site. The choices in materialisation determine here how, messy, rigid, open or familiar the site feel.

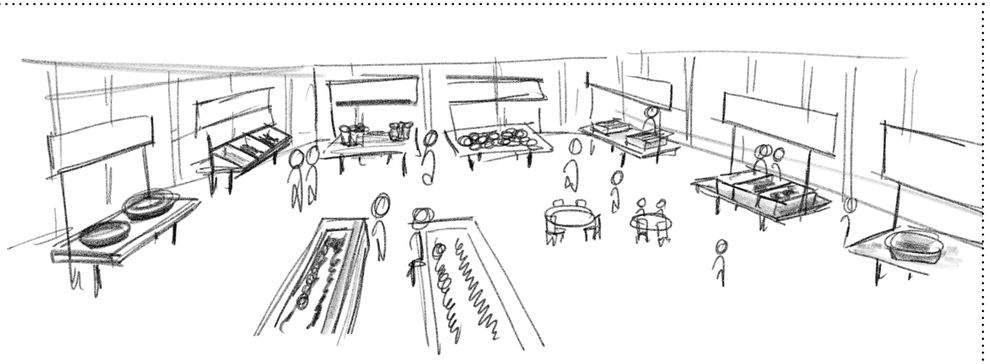
Common foodplaces

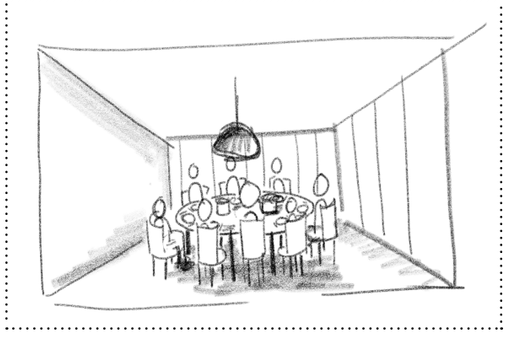


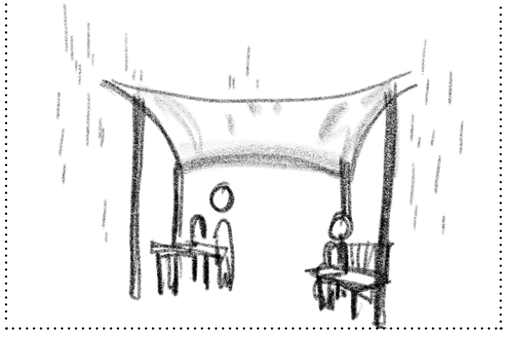
The development of the toolbox started with the development of the common foodplace. These sketches showed my idea by these communal and public spaces where food plays a role. The foodplace are not only sites where you go for food related tasks. The principle by the foodplace is that these are sites, where the food system takes place, whether you interact with it or not. As such the food system is extended through the day-to-day life of people and they experience it all throughout their day. These physical embodiment of the food system is also referred to as the foodscape. This consists of all food related functions inside the city. However, the common foodplace adds to this already existing foodscape by integrating social spaces and spaces focused on food production. Thus adding more steps of the food system into the foodscape.





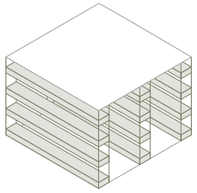






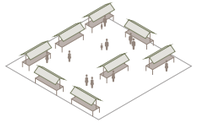
Function

The first part of the toolbox is the program, there are different production forms, and then there is supporting program based on parts of the new food system. An important addition is that of Research and education, which is necessary for the social transition as well as the integration and optimisation of new agricultural practice.



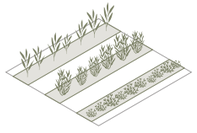
Indoor farm

The indoor production center is based on modern agricultural technologies and controlled (climate) conditions.



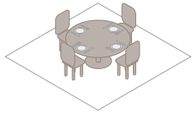
Market

The market can consist of an organised collection of commercial stands, or private stands used by residents to exchange goods or sell surplus.



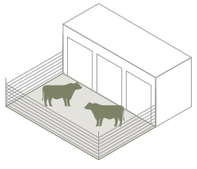
Outdoor farm

Outdoor farming sites can be maintained both by individuals or commercial parties. They consist of divers cropping.



Eating

Each home should have its own designated dining areas. However, in the case of small homes, shared dining spaces can be designed to allow residents to dine with more guests.

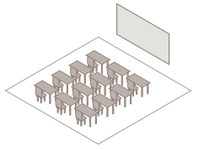


Livestock keeping

It is possible to keep small herds of cattle or small ruminants inside the city. This program is maintained by companies.

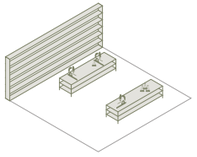
Element

Elements consist of small elements or furniture that can be placed independent of the context. They have little effect on the surroundings and can be used in most contexts. These interventions can also be interesting to individuals who would like to experiment with food production inside their home or in their garden but have limited space. Elements such as these, can also be added inside existing buildings to change their program or create new interactive environments. An example of this could be the introduction of hydroplanters into an office building to improve the physical environment but also create fresh produce for employees.



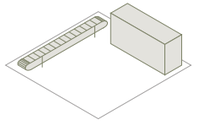
Education center

This can be designed as a training centre, cooking school, workshop space or standard classroom. The purpose of this program is spreading awareness of the food system.



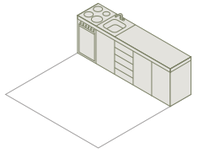
Laboratory

A program mostly integrated with indoor agriculture, but mainly used to test new sustainable agricultural methods. This should not be owned by commercial parties.



Processing

This forms a small part of the program as it centers around quality control and packaging for further transport. Key in this part of the process is keeping the food waste as low as possible.

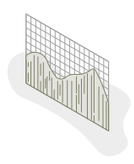


Kitchen

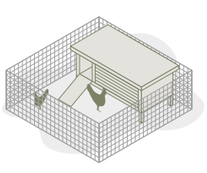
Often integrated in each individual home. However, creating shared kitchens where people can cook together also can improve exchange of knowledge and interaction.

Greenhouse
This is a small greenhouse which can be placed in any public space. It consists mainly of glass, and can be used both to produce food and as activity space.

Beehive
Pollinators are the foundation of agricultural practice. Thus creating beehives (for swarms or solitary bees) is necessary. They can also form an interesting attraction point in a public space.



Fencing/wall
Existing walls or fences can be used to grow climbing plants against, such as beans. This is a space efficient method, and can create an interesting green element as well as shelter.



Pen/Coop
The small housing of chickens and hens can be seen as a spatial element. It can be both educative and create interaction between children and animals.

Hydro planters
Hydro planters can be placed both outdoors and indoors. By integrating these in public or common space, residents gain more interaction with modern production methods.

Balcony planters
These baskets or planters can be made of any material, and can be easily added by residents. It can also form a characteristic point in a design.

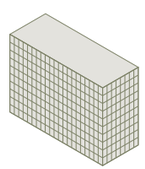
Shelter
Creating small shelters, with for example water points can create common spaces and keep residents dry when they are caught off guard by rain. Or to find some shelter from the sun in summer.

Box
The box forms a modern greenhouse based on hydroponics. It can be used as a small "fresh" shop, or as production activity.

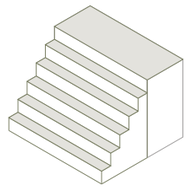
Architecture

Architecture consists of all elements off and additions to buildings. This can vary from completely optimized production towers, to in the landscape integrated interventions. Most urban agricultural interventions focus on public buildings, preferably with flat roofs. Independent housing, is often less interesting. The built program is focused on production, and little on social qualities. A lot of these interventions can be used as transformative strategies to existing buildings, which is a quality in an already dense urban environment.

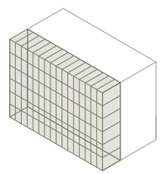
When it comes to architectural quality the diagrams are quite flat. This means that there is a lot of freedom for a designer to integrate the building into the context, or make it stick out. The choices made when it comes to architectural expression are personal and differ per architect or even purpose.



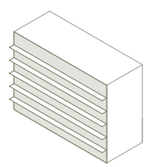
Tower
This is a building with only food production. In its most efficient form it is glass and functions as a stacked greenhouse. Due to its size and function, it will be based on steel.



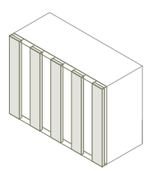
Stepped
In new design proposals, an extensive roofscape can be used to create different balconies or terraces that can be used by residents or a company.



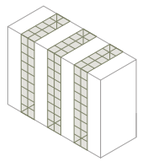
Facade greenhouse
Suitable for transformation and new buildings. The double glass facade can form both a transport space and a production space for individual, communal or commercial use.



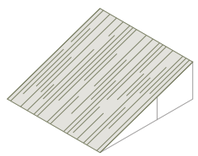
Productive facade
Instead of a standard green facade, it is possible to grow food on a facade as well. Examples of this are, leafy greens and funghi. The choice for growth substatrate and produce is critical for the design exterior



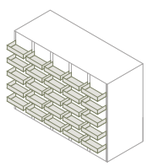
Algae facade
These facade elements are modular and can be harvested for both bio-energy as food. They give a high-tech design element to a building, and due to their clear presence, help open the conversation on the food system.



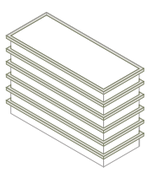
Shared functions
Staircases or other transport spaces, are often suitable for production. Creating multi-functional spaces optimizes production space, and can create intersting facade rhythms



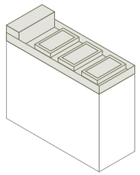
Roof extension
Extending the roof to the ground and integrating it as part of the urban space, can create more publicly accesible production space. However, it also creates inefficient indoor space.



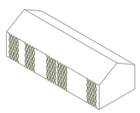
Active balconies
Creating production spaces on balconies, by adding substrate can allow residents of dense urban areas to produce food or maintain a garden. This can also be achieved with small scale furniture interventions.



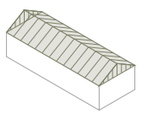
Facade elements
Creating elements in the facade, such as hydroponic, or organoponic planters can add an interesting green effect to the facade. This is mainly aesthetic and has a low yield.



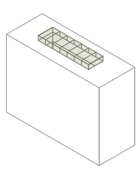
Roof allotments
These can be placed on top of public buildings. The allotments are shared by different people. The addition of the boxes, creates a lot of added weight and an access point will be needed on the roof.



Facade fencing
These small interventions can be integrated in existing residential buildings. They can be used to grow climbing produce and can give a new green exterior to a home.

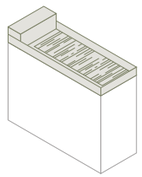


Greenhouse roof
Residential homes can have a greenhouse instead of existing attics or sloped roofs. The greenhouse also creates an insulation buffer as well as a heat source in winter.

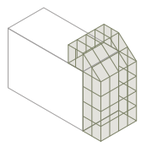


Atrium
This can be integrated as a central place inside the building, which does not only bring light to all functions, but also forms a central meeting place. As it already functions as a greenhouse, it is highly suitable for food production.

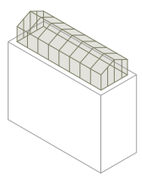
Space



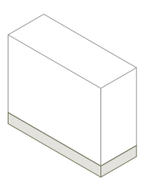
Productive roof
Flat roofs can be used to grow food on. The most efficient system is an intensive green roof system. An elevator will be needed. This can be maintained by a company on residential buildings.



Greenhouse extension
Existing buildings can have a greenhouse extension. Most efficiently this is maintained by a company. Blind facades on flats are ideal for this.



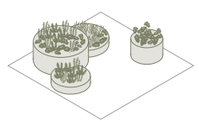
Greenhouse roof
Greenhouses can be built on top of flat roofs. They are visible from the ground and can be private or communal. The greenhouse creates an optimal climate for food production and forms a climate buffer for the building.



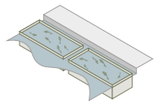
Basement
Existing basemens already have a climate buffer and hence are suitable for production. All daylight and heat will be done mechanicaly, but it is space efficient and has no effect on the surroundings.

Space are the interventions that take place in space, not enclosed on all sides by walls or a roof. This can be both public, common and private space. These interventions are very context dependent and can take place in many different forms. These sites have a more social characteristic, which is also in line with the case study analysis. Due to the variety in size, underground and openness between interventions a large variety of methods and interventions is possible.

In this also different produce can be generated such as livestock, which cannot be maintained in a vertical city farm, and aquaculture, which can form a double function in existing water structures. Space is the most experienced by people as anyone who passes by can see the activity taking place. As such it also dominates the environment and determines the identity of a larger site.

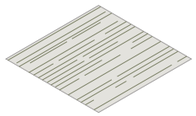


Herb garden
These can be small elements or patches. Herbs can be easily shared and form an intersting form of planting, as well as a qualitative addition to the ecosystem.



Aquaculture

Aquaculture in existing water bodies, can create a multi-use of space. This intervention is less present then the creation of ponds in public space.

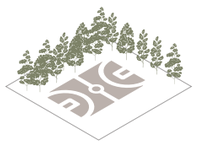


Agriculture

These are open spaces where traditional agricultural production takes place. Here regional and seasonal produce is cultivated.

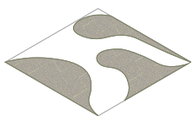
Meeting space

Not all space should consist of production. The creation of meeting spaces unrelated to urban agriculture is important to give space to other leisure and cultural activities to improve liveability.



Shelter

Forestry can take place in different forms. Instead of using normal trees, local fruit or nut trees can be used to create the same shelter effect.



Wildflowers

Wildflowers or normal planting is an important factor for pollinators. These sites should have little maintenance to optimize the ecosystem. Therefor, structuring them in design is important.

Foodpath / park

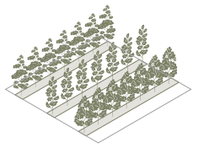
Using productive trees in parks or around footpaths creates interaction between production and inhabitants. It is a small intervention.

Livestock field

Small herds of live stock can be kept on site. These will have little effect on the food system and are more key in the biowaste process as well as the education.

Foodstreet

Using the side of roads to produce food creates multi-use of space. However, car fumes can pollute the food. Therefore, these interventions only work around electric vehicles.

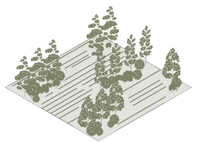


Orchard

Orchards are a form of forestry. They can be combined with communal gardens or agricultural land to give an extra dimension and diversity in public space.

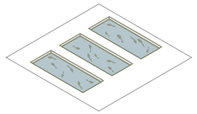
Playground

While not directly related to food production. Creating active spaces for children near production sites, creates interaction.



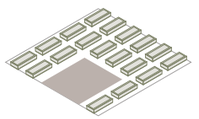
Foodforest

This public space is focused on interaction between residents and environment. It can be seen as a communal garden, focused on production in an eco-friendly way.



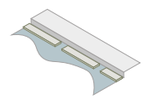
Fish ponds

Ponds are relatively self sustaining and can cool down the direct environment. These are efficient more technical ponds, maintained by companies. They can be seen by residents, but not accessed.



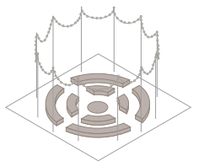
Allotments

These are individual gardens for residents to produce food, for their own households. This type already exists in London and is highly popular. Due to the different tenants, it has a messy exterior.



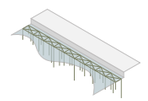
Hydroponics

Outdoor forms of hydroponics are possible in canals or in ponds, with the note that the water should be checked regularly for polution. They can be maintained by individuals or companies.



Communal garden

This space is focused on interaction. All plots are maintained by everyone, thus a central manager is necessary. The functioning of this space is dependent on the residents

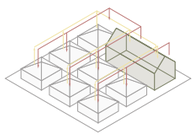


Seaweed farm

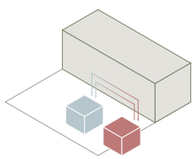
Seaweed and algae are an important nutrient dense resource. They can be produced in water bodies (or indoors). By producing in public space, they might be integrated more in diets.

Infrastructure

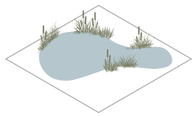
Lastly, there is infrastructure. These consist of all fundamental infrastructure to come to a sustainable form of urban agriculture. Clear in this are the traditional transport elements. However, there are also ecosystem elements, energy, waste and water systems. Infrastructure concerns all the flow surrounding the building except for the social and intangible flows such as interaction and knowledge. In some cases, a designer can pick between two strategies, for example car based or railroad based. However, most cases will not be dependent on both. When it comes to mode of transport there is still a large variety, such as electric vehicles, small vans or larger trucks. Infrastructure is part of the toolbox that can gain the most from further research and development.



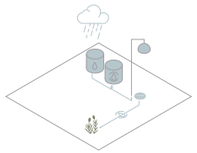
Heat exchange
In large scale production sites, it is valuable to exchange energy and heat between the production centre and surrounding residences.



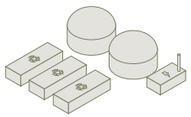
Heat storage
Heat storage is necessary in London to maintain the indoor climate of production centres during summer and winter. This can be done underground, or water can be used as a heat source in winter.



VFCW/water retention
These ponds can be sued as a method to filter water, as well as retain water on site. They also help cool down the surroundings.

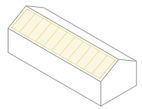


Water filtration
This is a mechanical system which can be integrated inside a building. It can be attached to the VFCW, but without it, water cannot be filtered on site for human use.

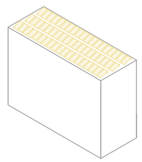


Bio energy
The biowaste can be transformed into energy using anaerobic digestion. It is possible to create smaller tanks (2x2x2m). But there are safety risks, to integrating this in a residential building.

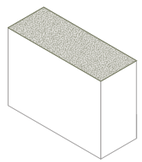
Composting
Composting can be done on a larger scale or by individual residents. By using a small tank, the smell can be minimized and it can be integrated into a residential area.



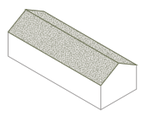
Energy roof
Adding solar panels to sloped roofs, can create a function to an otherwise unused surface.



Energy roof
Flat roofs can be used for solar panels, but will be used less in practice as these can also be easily used for production.



Eco-roof
Part of the agricultural infrastructure is the use of eco-roofs. These roofs haave an intensive green roof, which strengthens the ecosystem, and with that creates a synergy with the agricultural sites.



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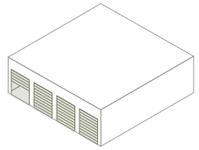
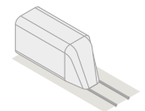
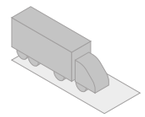


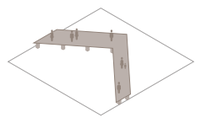
Distribution center
The distribution center is a form of program, but also key in the transport of food, materials and waste. This is the collection point and starting point of transport.



Rail infrastucture
The rail infrastructure focuses on small wagons of 2x2x4 m which work on an electric rail system. They rails can be integrated in green space or existing roads.



Trucks
Trucks (and roads) currently form the main system for transport of goods. An increase in production will increase the trucks, but using this system prevents changing the existing network.



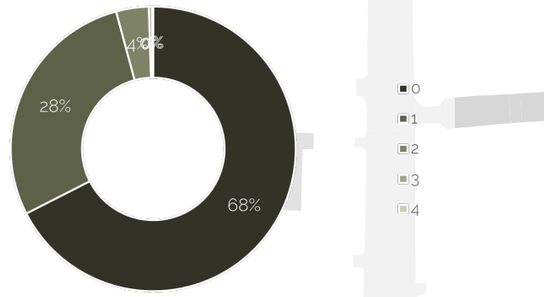
Boardwalks
These are a form of pedestrian walkways which can be elevated above agricultural fields to create a more flexible and pedestrian focused network.

4. Infrastructure

Inventarisation

The area is highly car based, even though almost 70% of residents do not own a car. Most paved space inbetween residences consist of roads and parking, with some undefined pedestrian space. As such, the cars that are there dominate the public space. At the same time, a lot of the hardened surface is not used, due to the discrepancy between car usage and car space.

Cars or vans per household



Potential

The site has a strong potential for a transformation of the infrastructure. It has a strong connection to the regents canals as well as the pedestrian walk on the waterfront. This walkway connects the area to other surrounding industrial sites, and public transport.

The regents canal itself is also an important connector to other industrial sites. On the water front three spaces could be transformed to strengthen on this ecosystem. From left to right, The old harbour buildings that are now abandoned could be reintroduced in the same transport and storage function, though focussing on food and food production. The existing heightened platform in the middle could work as a production site, or a transport centre. The right side is now open space, and can be built on in line with older developments in the area. Here height differences are also used to create an entrance to the estate, so making this a centre of distribution would make sense.

The area itself only has one road that connects through the site. All other roads are meant for transport on site, and can thus be replaced by a local system on site.

Possibilities and necessities

A new system should be electric as it will be used in a food production area, and thus exhaust gasses and heavy metals are damaging to the food produced on site. Next to that, electric vehicles would be more sustainable in the long run. To produce enough energy for the wagons, solar panels could be integrated into the wagon or added to the distribution centre or remise.

The type of wagon or system, should not be manned individually as this would create to many small jobs. It is important for residents to know where the transport will take place, so a fixed system would be suitable. A system such as in Helsinki, (bottom left) would not work as the wagons are to small and thus would not be able to transport larger batches, materials or products.

Therefore, an electric railway system is most suitable. Due to the weather, it would be good to close of the wagons, and by opening the wagons on the site, it would be possible to easily load the wagons without heavy materials.

Lastly, the wagons would need a storage space, and points on site where they can pass eachother. For the residents it is important to have a noise, to warn them when a wagon is approaching so they can swerve.

Design infrastructure

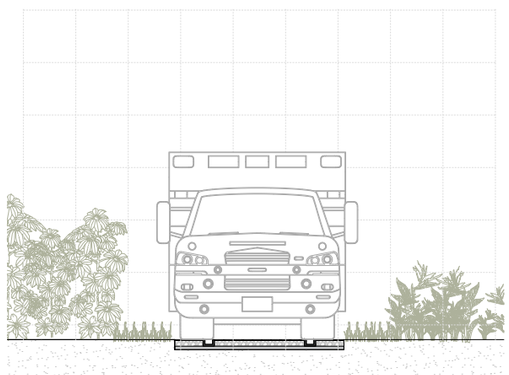
By using an electric railway system, it is possible to transfer produce, materials and waste all throughout the Beauvoir Estate. The proposal is to use unmanned wagons of 2x2x4 meters, which are monitored and manned from the managers office.

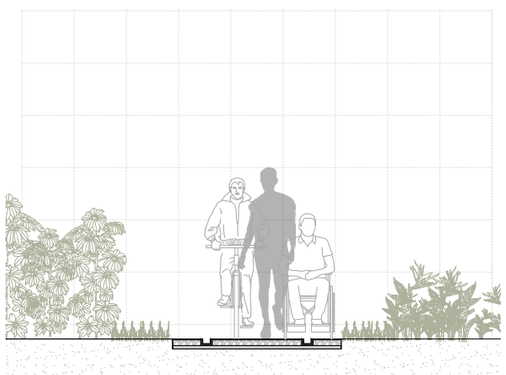
With this size and based on the average size of trucks and the needs inside the building. The wagons would need to travel about 10 times per day between the production centre and distribution centre. This distance is about 250 meters and with a speed of 30 km/h , this distance takes about 10 seconds. With the increased need of other producers in the estate, this would lead to around 40 trips for a wagon per day, Alltogether the traintracks would only be used for 5-10 minutes per day.

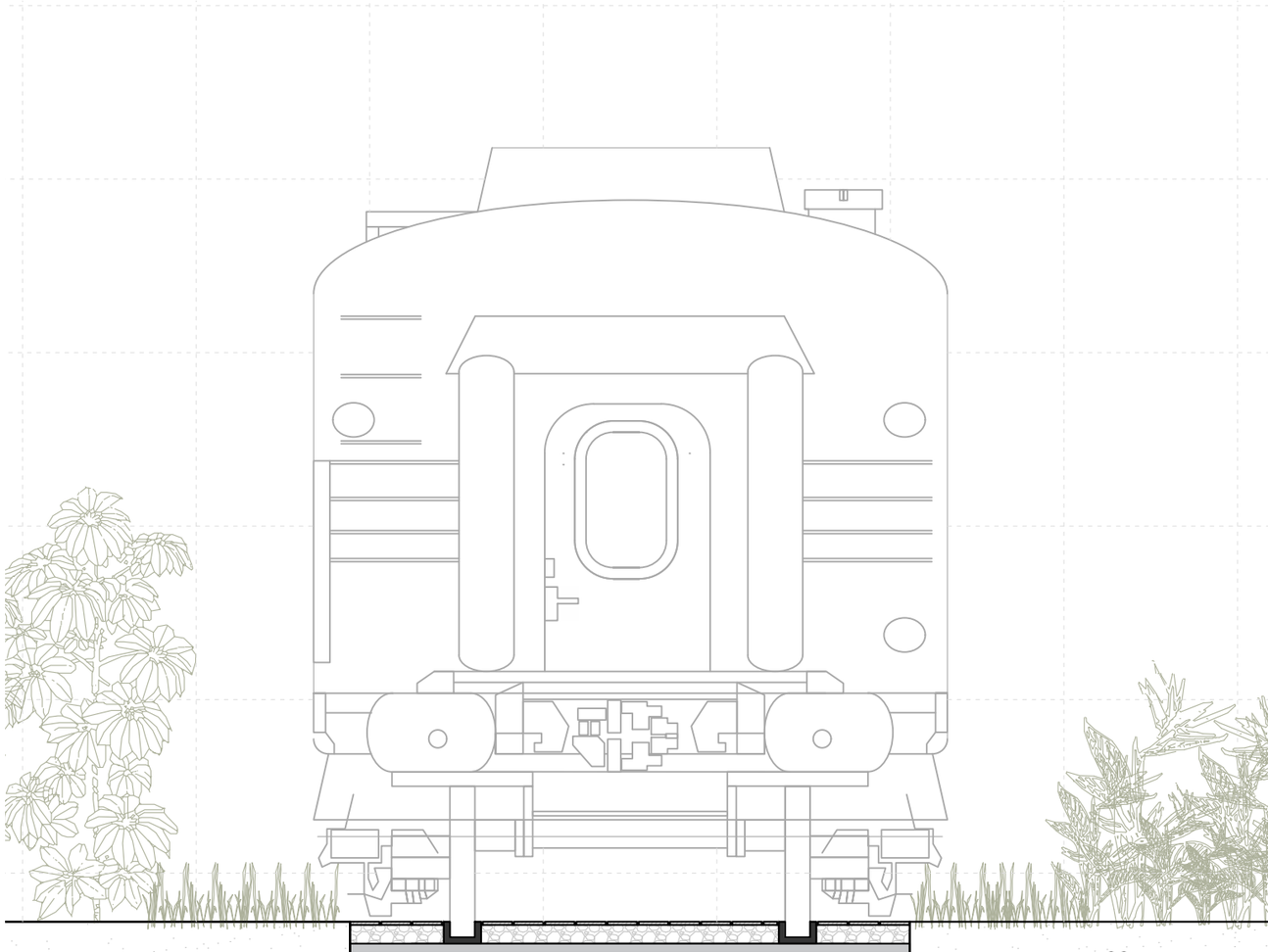
So what happens when the wagons are nog there.? By creating a hardened surface around the railways, the tracks can be used by emergency vehicles, or maybe dispensation for people moving in or out of a home.

However, most of the time the tracks will remain empty and can be used by pedestrians, cylcists or wheelchair users. As such the hardened pavement also is a means to create accessibility all throughout the terrain. To create a permeable, but even surface, larger stones are used. The railways are surrounded by small patches of grass, giving people space to dodge oncoming traffic, and make sure food production is protected.

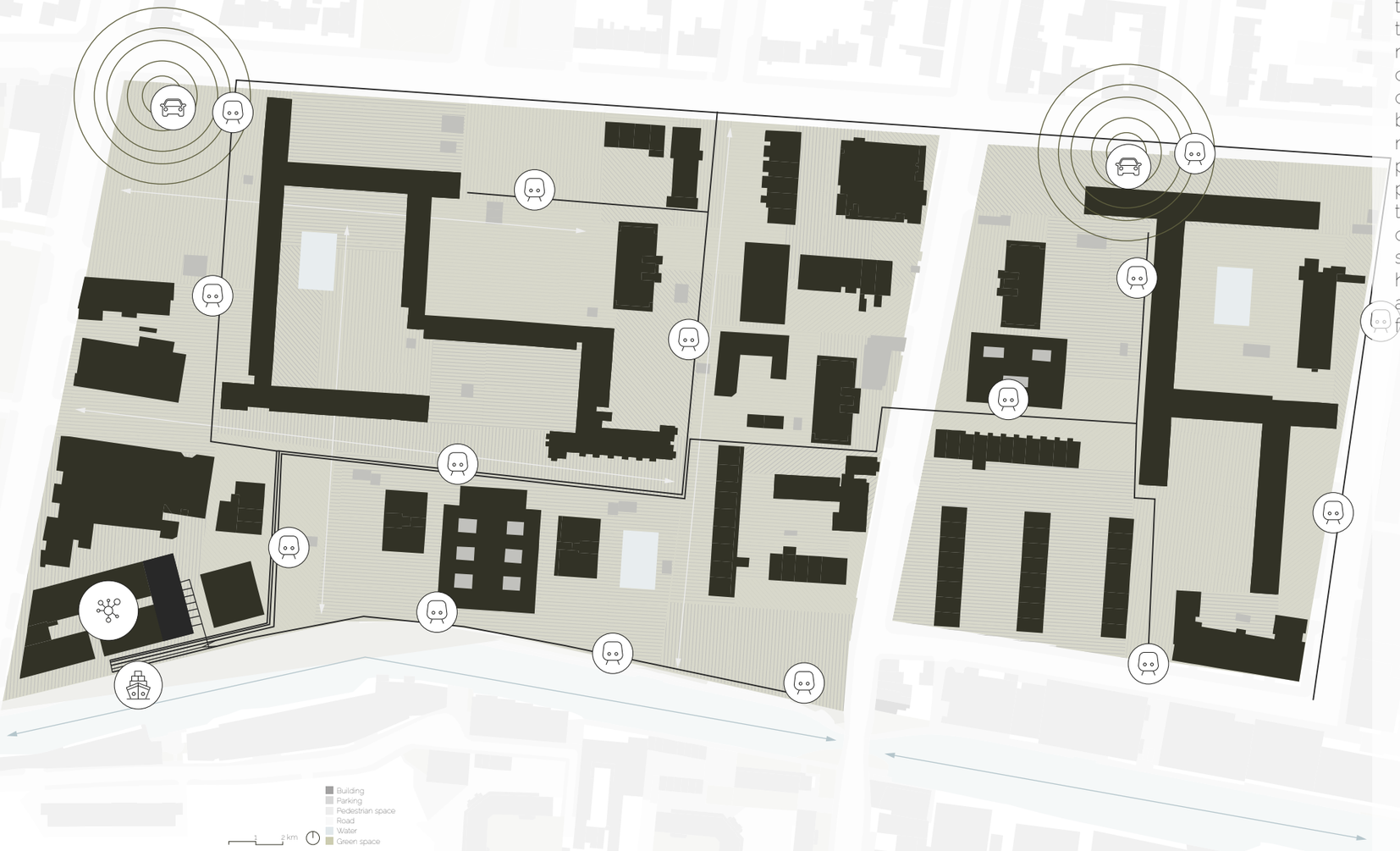
Lastly these sections also show the difference between higher growing products (corn, grain, beans), which block most of the view, and lower growing plants. (potatoes, leafy greens, root vegetables).



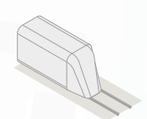


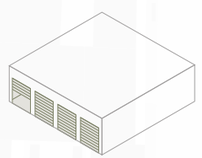


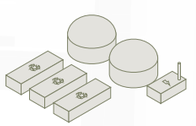
Proposed system



This leads to the following proposed system. At the top two central parking spaces are maintained to park if necessary of to use for car sharing. The railway systrem crosses over the main road to connect both sides of the Estate. On the left the distribution centre is created in the old harbour building. This is the best place to prevent the more intensive infrastructure from breaking up the public space network. This is also the connecting place to the other industrial areas. Elements from the toolbox that are used are the railway system, distibution centre and the waste management systems. Using composting on site in the old harbour buildings, where also all wagons pass by, and using this as a departure point to a bio-energy facility.



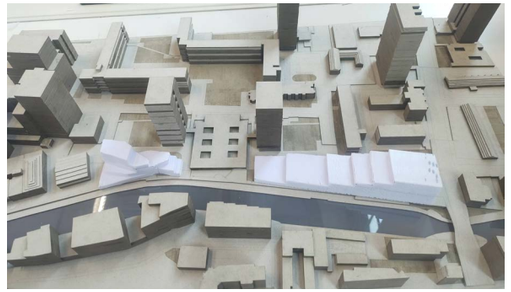




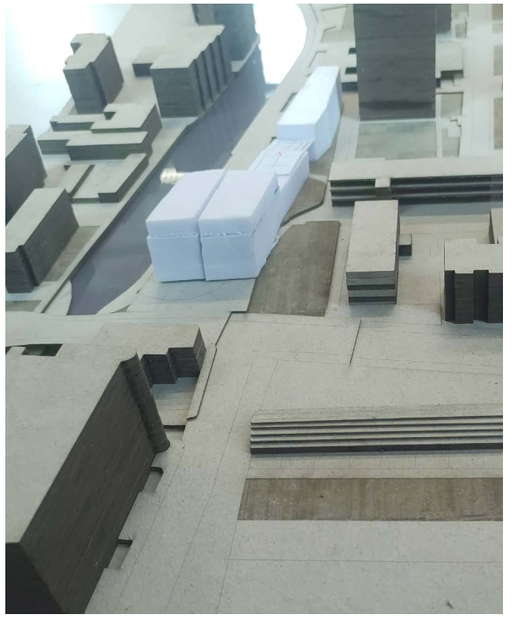
5. Mass studies

P2 Model



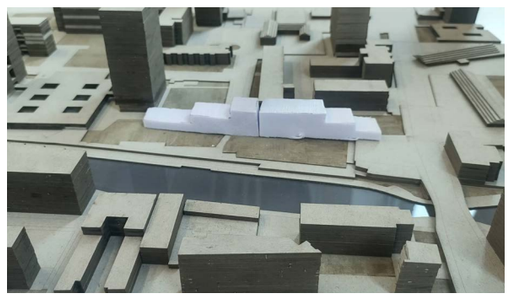


Lineair

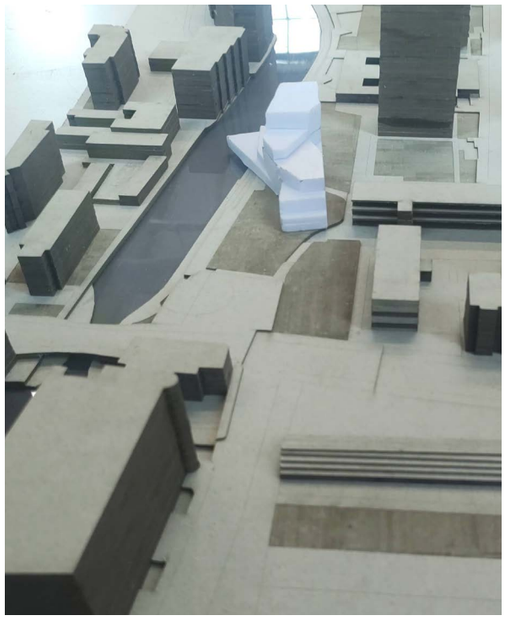

Angular

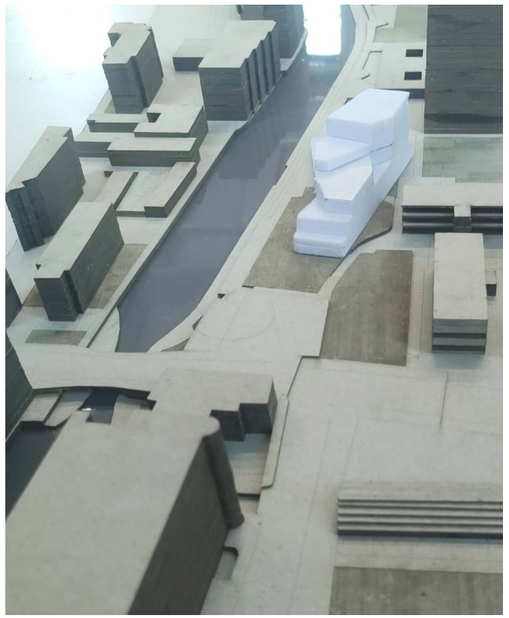




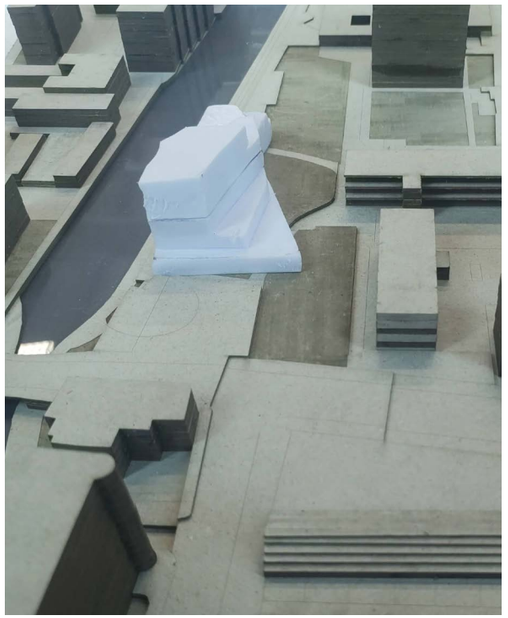


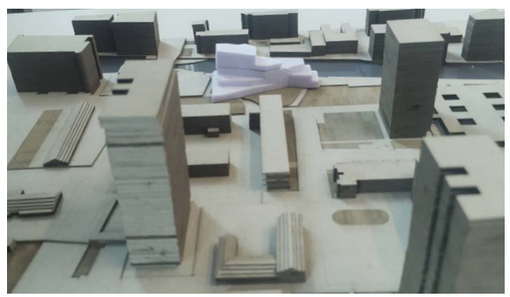




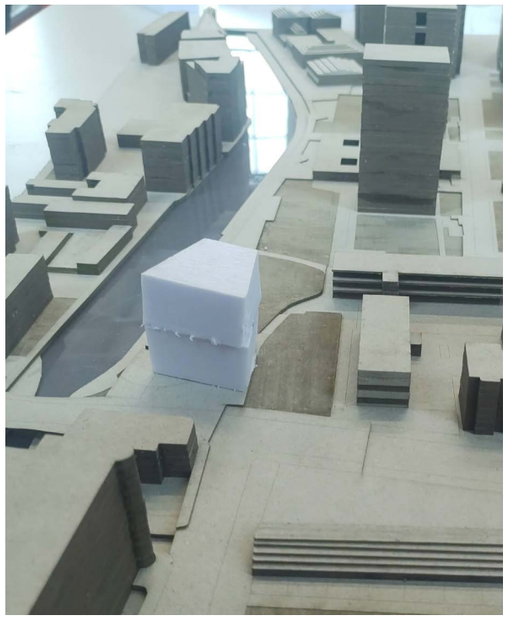


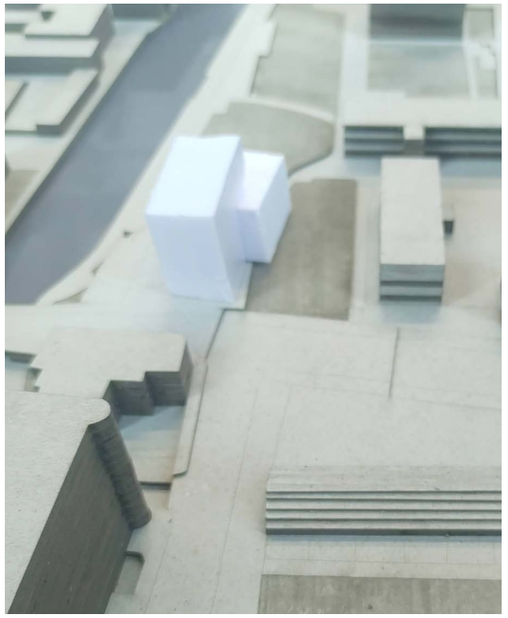
Blocks





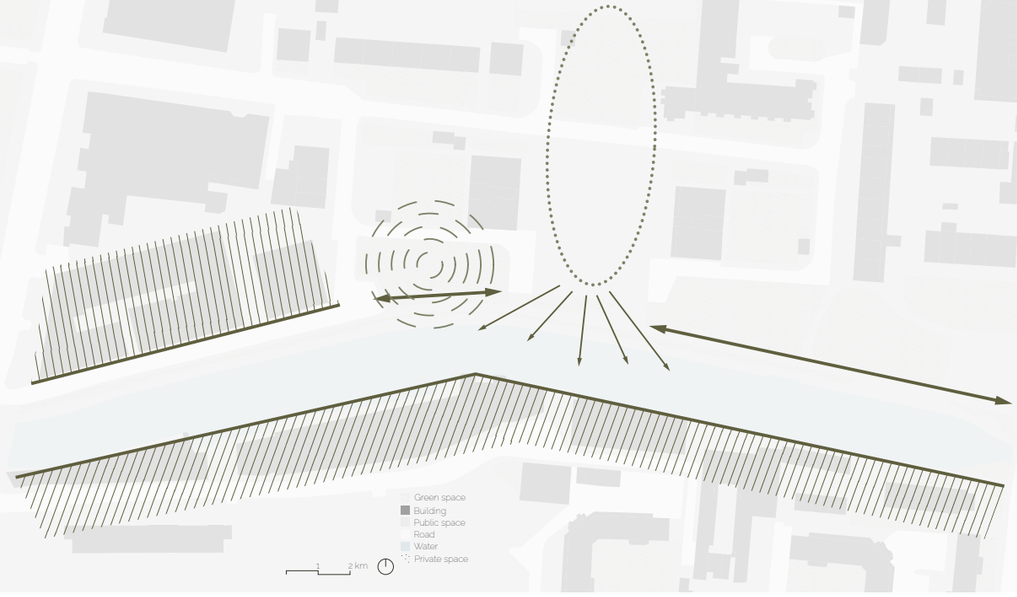


6. Masterplan

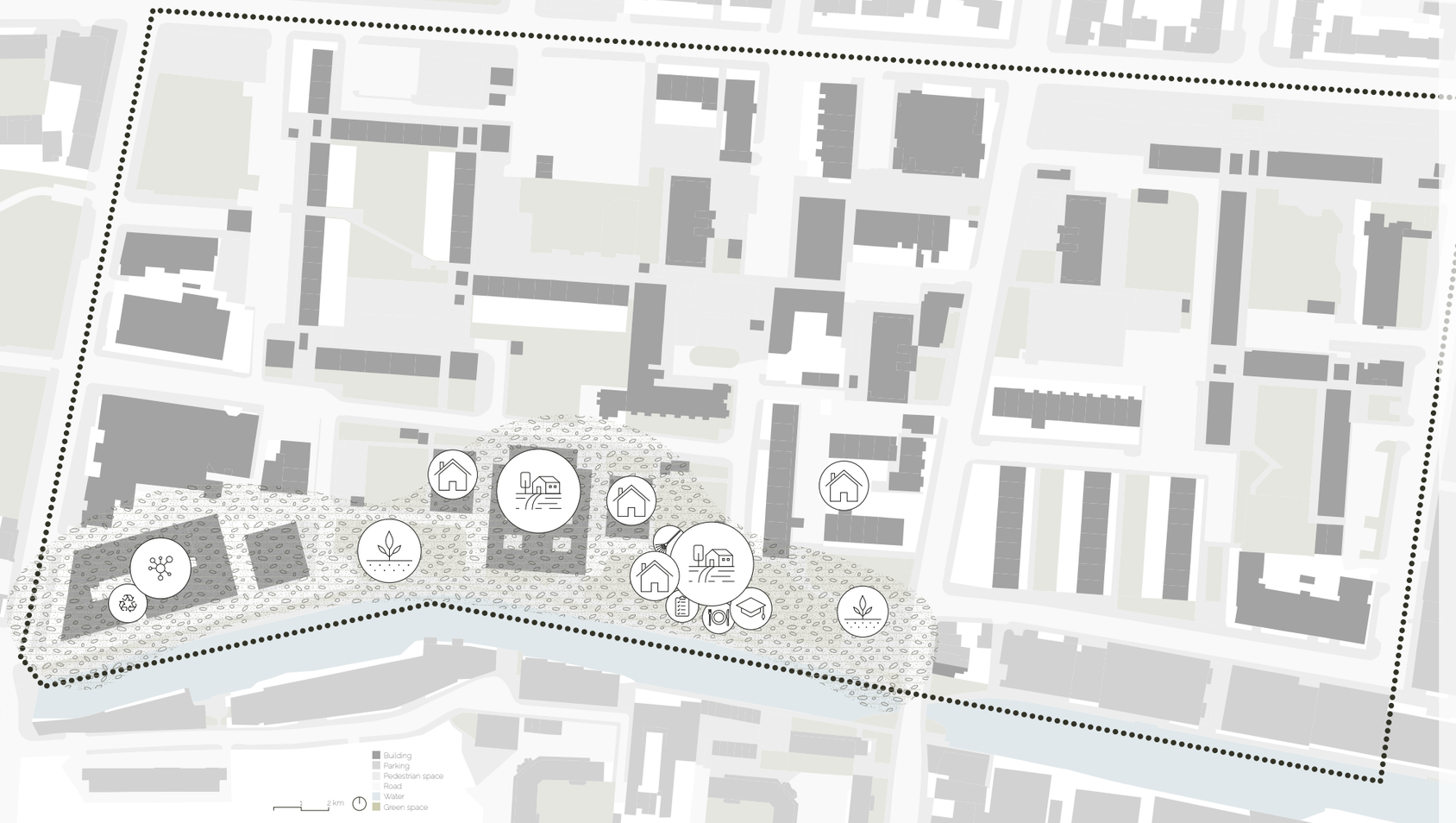
Potential

Current developments in the area take place on the water front. Here, the water line is slowely denisfied into one wall. On the water front of the Beauvoir Estate is a a lot of open and public space. As a consequence, there is space to design a new building. However, this area also forms one of the few open relations to the water. This character should be maintained. Lastly, on the waterfront, two interesting public spaces are situated. The heightened, platform that is unused as well as the allotment gardens of the Beauvoir Estate.



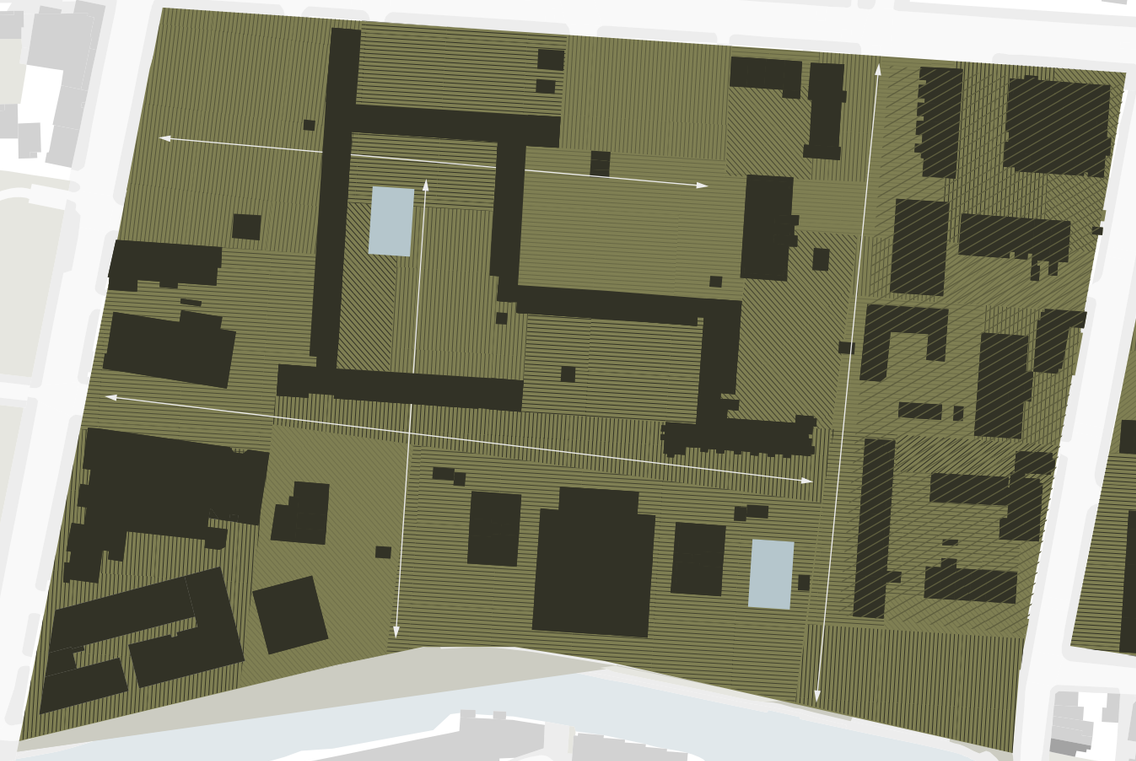
Strategy

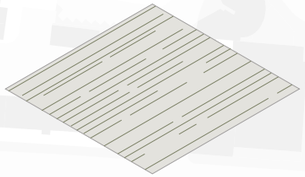
Thedevelopment will be contained to the Beauvoir Estate area. The main interventions will take place around the waterfront. here the program is split over the most suitable locations, with the distribution program on the left, the heightened platform as production centre and a new social and production meeting point on the right side of the front. As the area on the right of the road has been recently developed, this part of the water front will not be further developed.

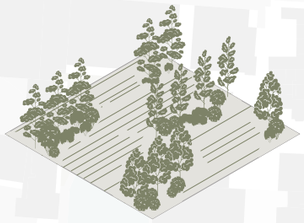


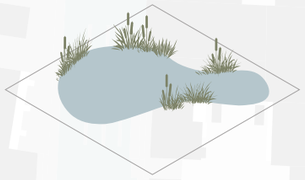
Strategy

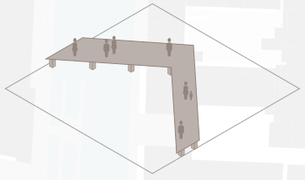
Spatial characteristics









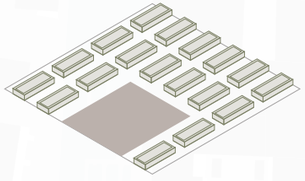


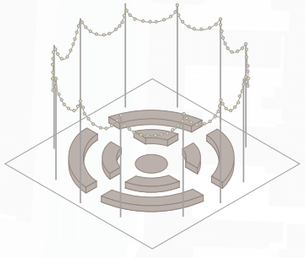
Building
Parking
Pedestrian space
Road
Water
Green space

0 1 2 km

Strategy

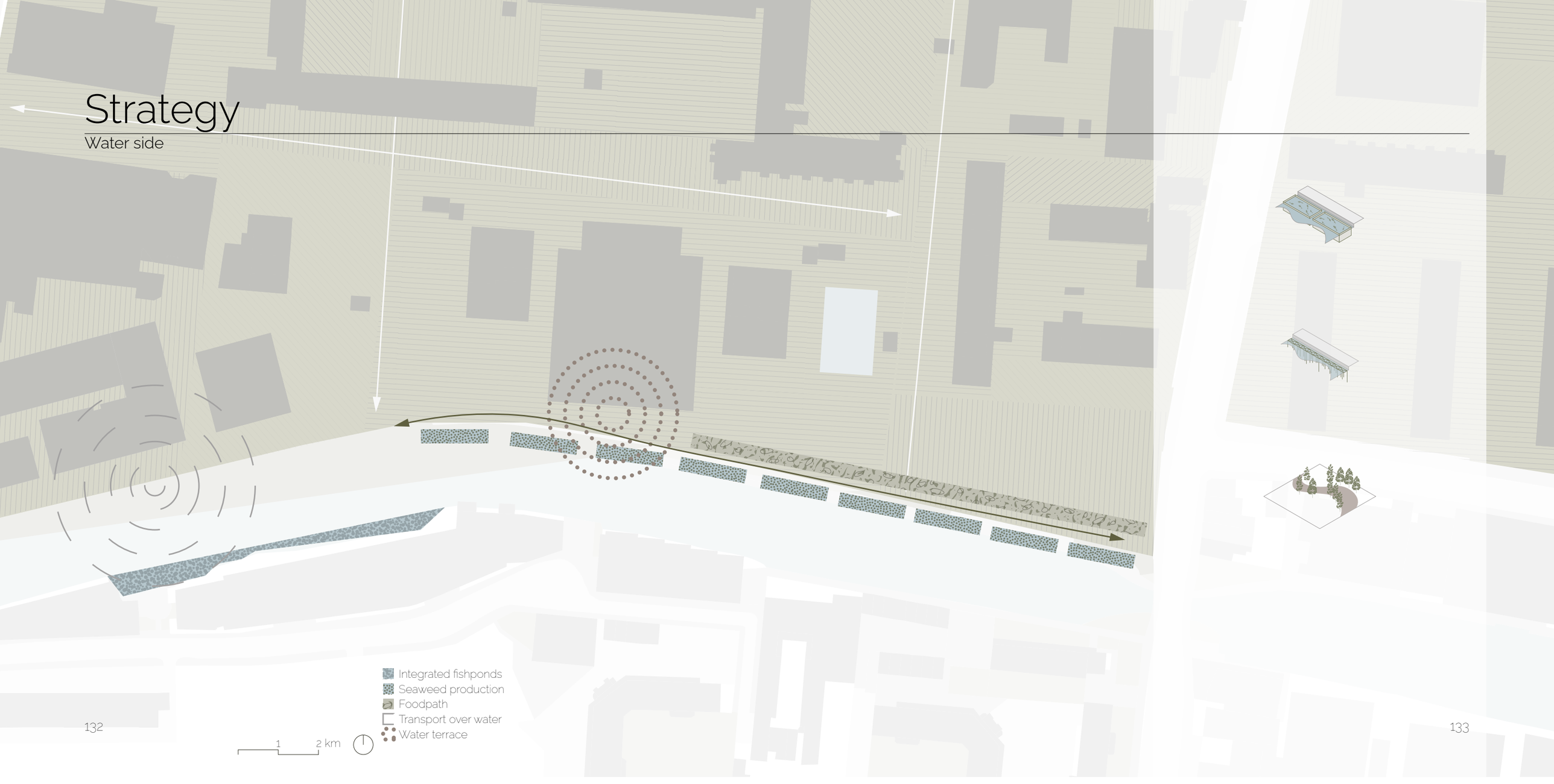
Social characteristics



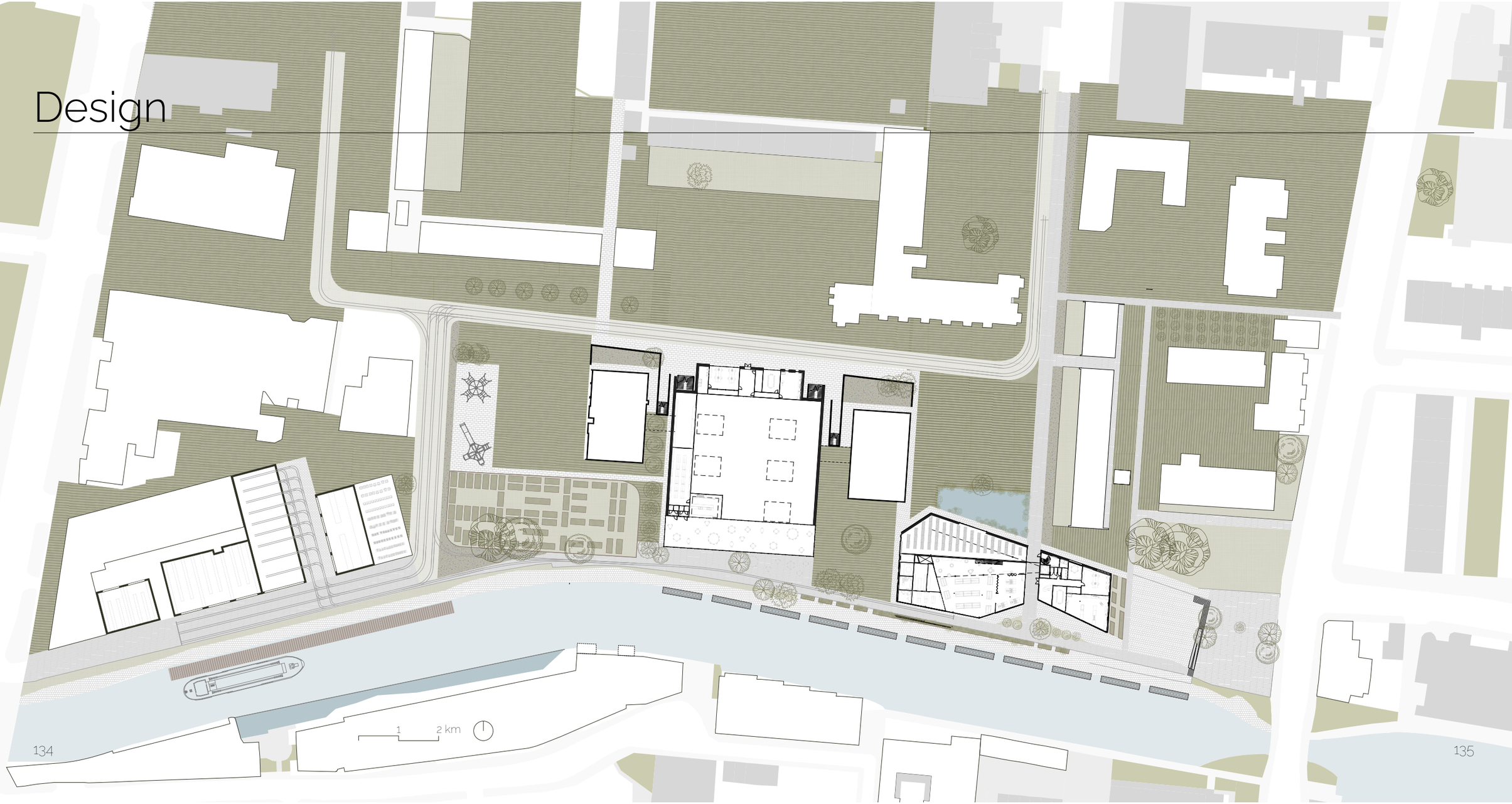


Strategy

Water side



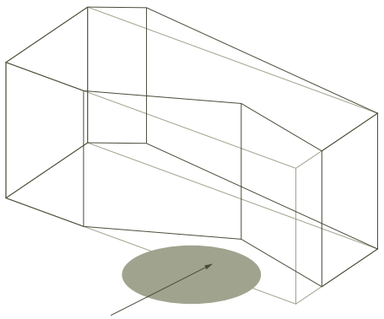
Design



7. Design concept

Massing concept

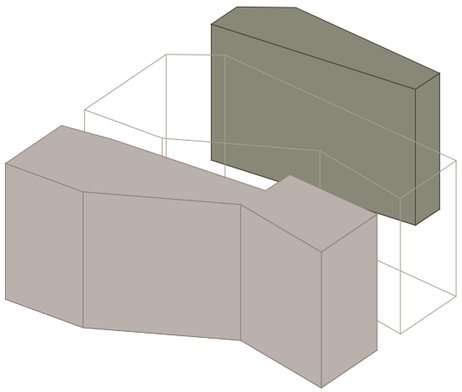
To improve the liveability in the Beauvoir Estate by increasing the local food production and creating an interactive common foodscape.

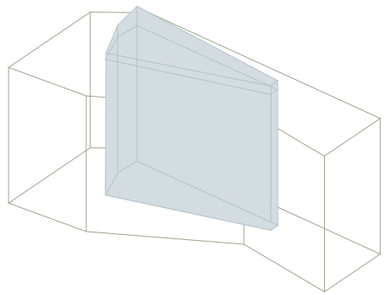


Based on the research I formulated a design goal. Here the focus is on improving the liveability. The method used for this is the introduction of new program, which has an important industrial and social characteristic:

The water front is on the south side, which is the best side for a central public space. The building is bend to give space to this space. As such, the building embraces this public space leading to a central and relatively sheltered space on the waterfront.

The bend is out of character for the orthoganal grid, but fits with the differen characteristics on the waterfront,





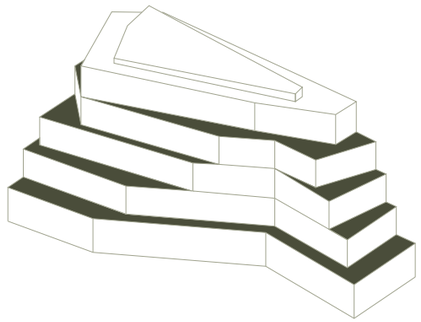
The program is split into the residences on the south side, and the production program on the north side. This way the residents can profit from the sun, and grow food on their own balconies.

The two different sides of the building and the different program is emphasized in the facade using two different materialisations. The two different characteristics also emphasize the duality in urban agriculture: natural but technological and social but economic.

Central in the building is an atrium to create a central meeting and transport space, as well as create more daylight.

The atrium can funciton as a greenhouse, playing a vital role in the ventilation of the building as well as creating an optimal and integrated production area.

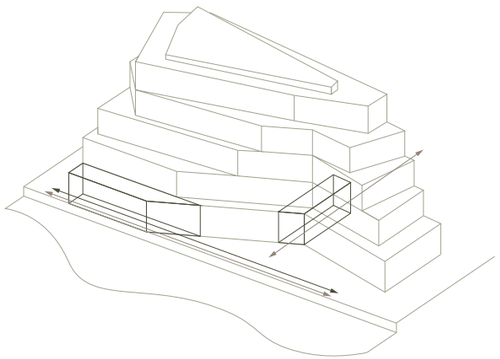
To create an efficient roof shape for ventilation and solar energy, the atrium is slanted, and sticks out above the building. Thus emphasizing the different characteristic in the centre of the building for those on the outside.



Steps are created on the building to create production spaces on the roofs for residents. This also scales the building better into the existing context.

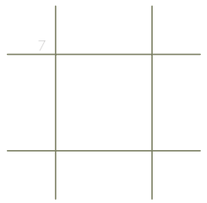
The angles of the building are dependent on the surrounding urban plan as well as the grid of the building.

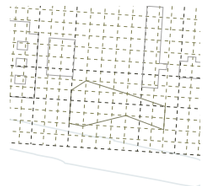
As the gardening roofs will need a lot of sun, they are only situated on the southern side. As a consequence the different identity between the North and South side is strenghtened.

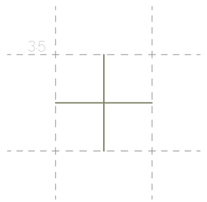


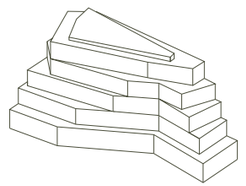
Two connections are created through the building. One, to give access to the distribution centre and create a dock for the railway. This route can also be used by residents. This archway connects the atrium and public space to the north side of the building, where the other residents of the estate live. These archways underneath buildings are characteristic on the site, hence I choose to refer to this interesting element of the existing blocks.

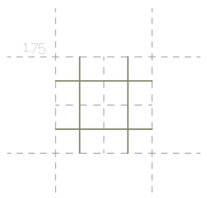
Grid allignment

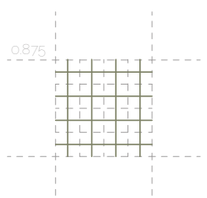












As shown in the urban analysis. The Beauvoir Estate has a clearly present orthogonal grid of 7x7m. The proposed massing and materialisation of the building is significantly different from the existing blocks, to align the building into the context this grid is used as a guiding theme.

First of the 7x7 grid is used to align the building into the urban context and determines the main massing.

From here the 3.5x3.5 grid is used to create more variety in the mass, which also helps scale the building back into the residential environment.

The grid is scaled back once again to 1.75x1.75 to create more variety and flexibility inside the building. There are a few exceptions where this grid is also used to create more variety in the massing.

Lastly, the grid reaches 0.875x0.875. This grid is the expression of the façade. It is the width of the curtain wall panels as well as the doors in the façade. Inside the atrium the open side towards the production centre is also covered with panels of this width. The opposite side contains the residences and as such has a much more closed character. However, the windows here also have the same width to connect both sides. Of this grid, only the vertical axis is used, to create a vertical expression in the façade in line with the design of the facades of the Beauvoir Estate.

8. Program

Program

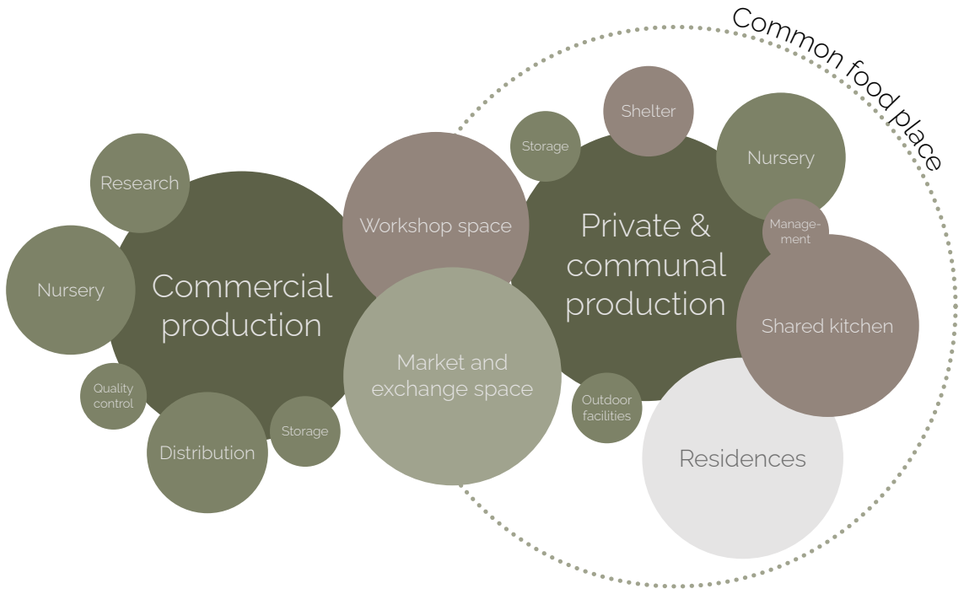
The following program is set up to cover the missing links in the urban agricultural system:

_Education space 50 m²
Should be suitable for both cooking, planting and processing workshop as well as more central training sessions. It should be partly kitchen, partly open and should be easily accessible, transparant and open.
_Communal Kitchens 20 m²
These kitchens should be situated on the residential floors and allow residents to cook more extensively or for larger groups. The Education space can also be used as communal kitchen. It should have dining space and storage space.
_Market space 100 m²
This space should be flexible and central. Preferably to be opened towards the outside of the building to extend the market outside. Part of the space should be designed as permanent stands. Part should be open to cover busier activities.
_Management office 10 m²
A small office easliy accessible by all residents on the groundfloor. Connection to traffic system as well as main flows in and out of the building.

Core of the building is a production centre with:
_Hydroponic production areas 800 m²
These spaces should have a large range of freedom to organise depending on the type of produce and production methods. The spaces should designed water tight and with strong climate control

_Nursery 100 m²
The nursery is necessary to start all produce grown in the production centre. This can happen directly inside the building or nearby. It needs strong climate control and a humid and warm environment.
_Research laboratory 75 m2
Large space, which has a lot of freedom to organise depending on research focus. Extra safety precautions should be taken, such as fire safety exist en bridge to other spaces in building.
_Food processing 15 m²
Small area to clean vegetables and sort them.
_Product control 15 m²
Small space for about two employees that check produce for pests and rot, or anything that makes it unedible. There is no easthetic sorting.
_Distribution area 60 m²
Indoor storage space to store produce before moving to market as well as station to move produce from to other locations and to import materials for the production centre and produce for the market.
_Lunch area. 20 m²
Needs daylight as well as kitchenette.
_Meeting room 15 m²
Needs daylight.
_Office spaces. 60 m²
Needs to cover around 5 employees and should have enough storage space for archive. Direct connections to meeting room and lunch area.

Supporting functions consist of:
_Entrance and reception 30 m²
_Cleaning bridge 20 m²
This area prevents pests and funghi to enter the production centre
- Utility space 15 m²
- Wet rooms 10 m²
_Storage room 20 m²
This room should be on the groundfloor and allow residents from different buildings on the estate to use materials and store food. (Can also be situated on the groundfloor of existing buildings in the estate)
-Waste storage 15 m²
_Water filtration space 10 m²



Part of the common foodscape is outside:

_Allotment garden 1000 m²

Plots rented and maintained by residents.

_Commercial agricultural land

Maintained by farmers, the grown produce is discussed with residents. The land should be divided in small parts to prevent monocropping.

_Space for activities 200 m²

Public space for a variety of activities. Hardened surface to improve accessibility and allow for big activities.

_Shelters 5 m²

These small shelters should be situated near allotments and communal gardens to shelter people caught in bad weather, rest from the sun or clean and process produce.

_Picknick tables 30 m²

Outdoor spaces to dine and rest.

_Fruit trees m²

Fruit trees are impossible to grow on balconies and should thus be maintained in the shared gardens. Can be integrated into a food forest, orchard or food street.

_Herb garden m²

Can be shared by residents as one plant creates a large harvest. They are also key in the attraction of pollinators

_Pollinator services

There should be possibilities for bees and butterflies to live on site as well as feed on flowers and herbal plants. Thus the introduction of local wild flowers and hives is important. These are not only for honey bees, but mainly to polinate vegetables and fruit trees.

The last part of the system are the residences.

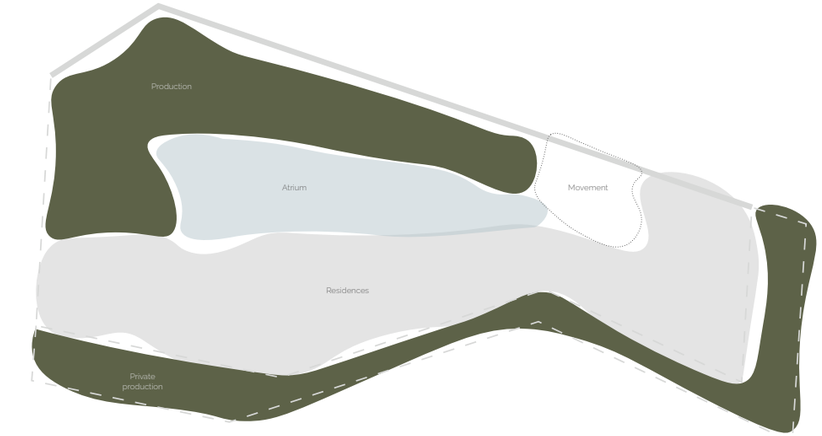
_Appartments 30-50 m²

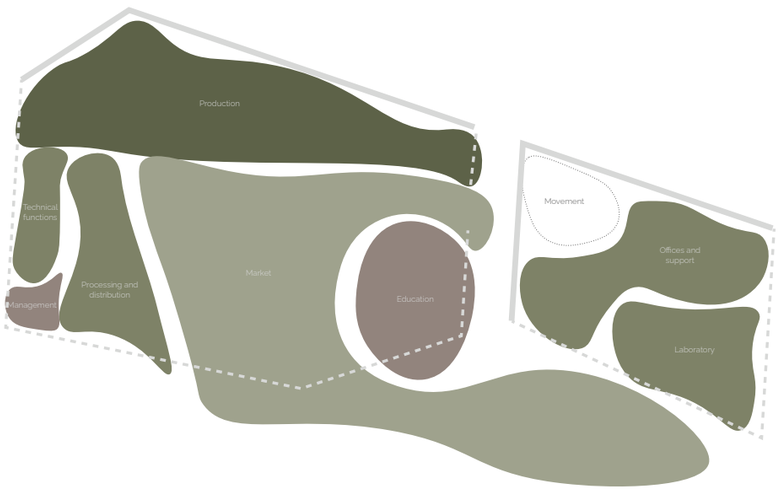
These appartments should consist of at least one bedroom, bathroom, living and dining area and connected kitchen.

_Balconies

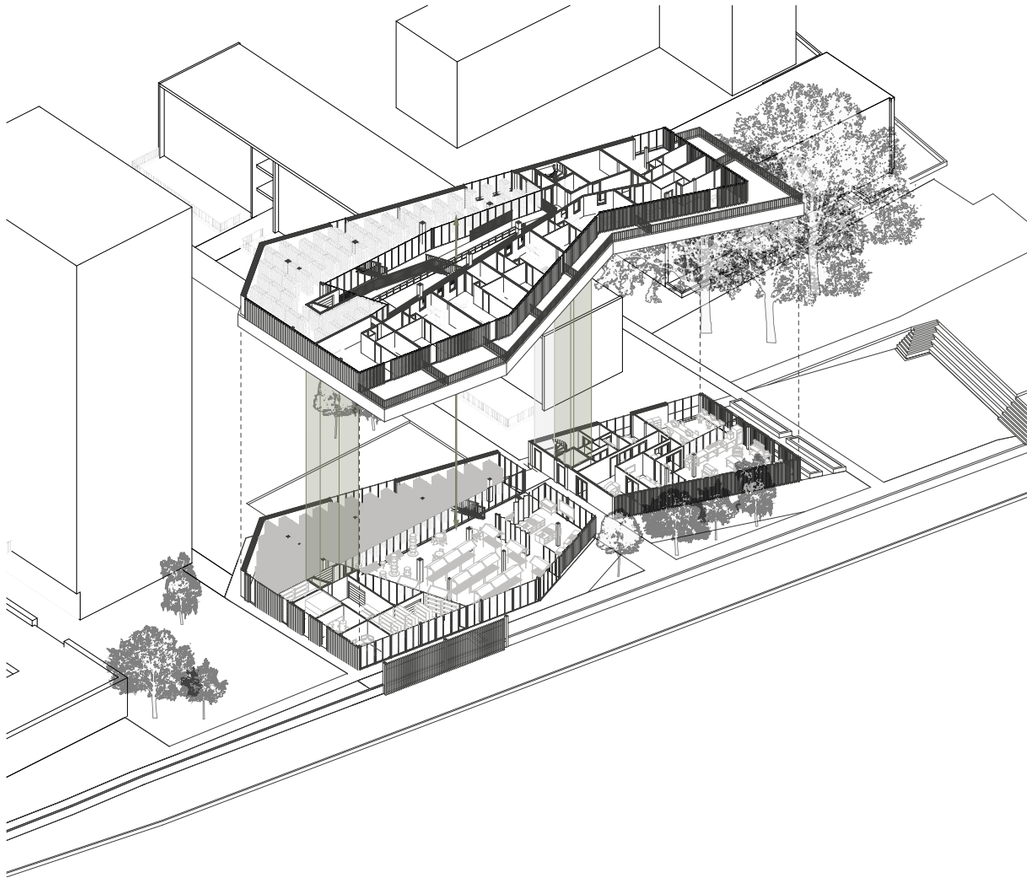
Each resident should have their own balcony which can be used to produce food, up to large bushes or small trees.

Layout

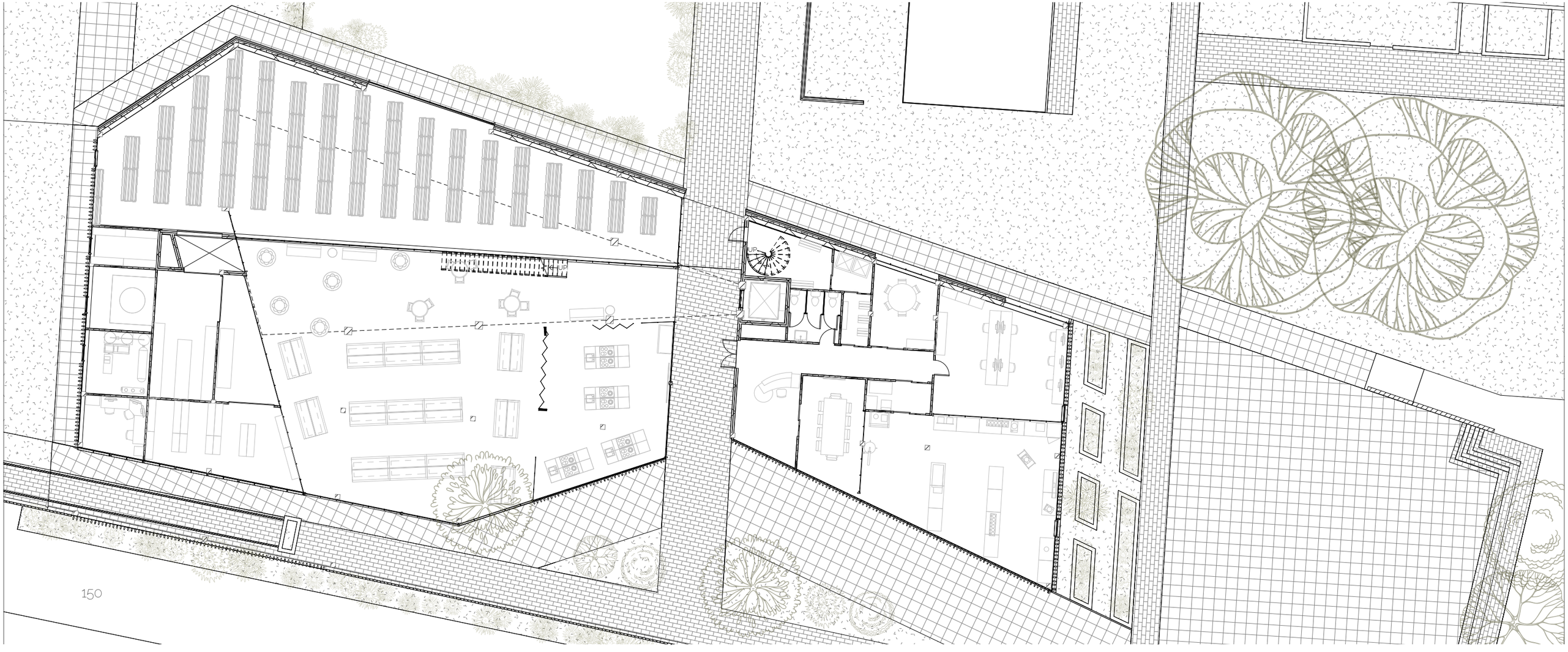




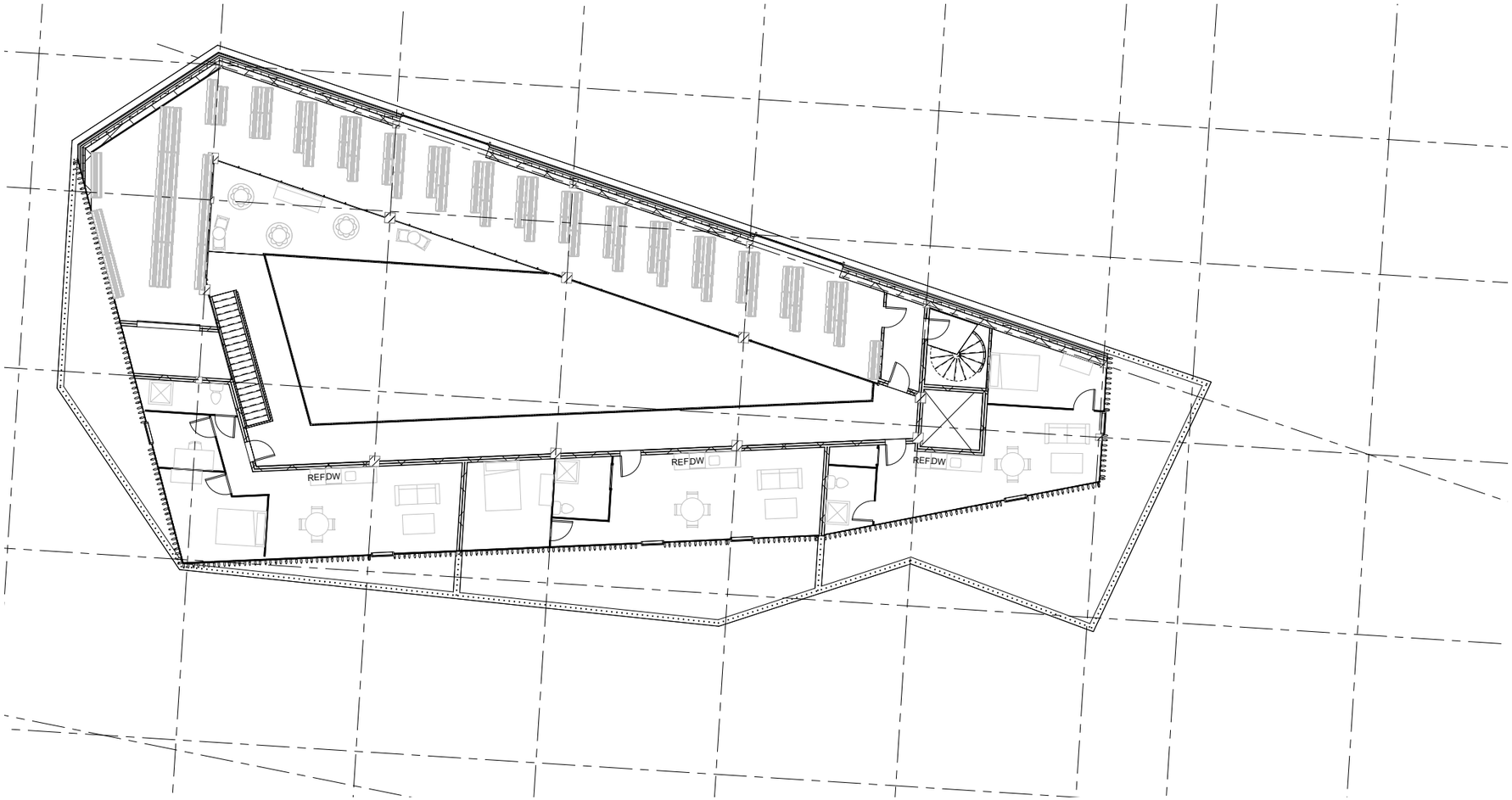
Routing



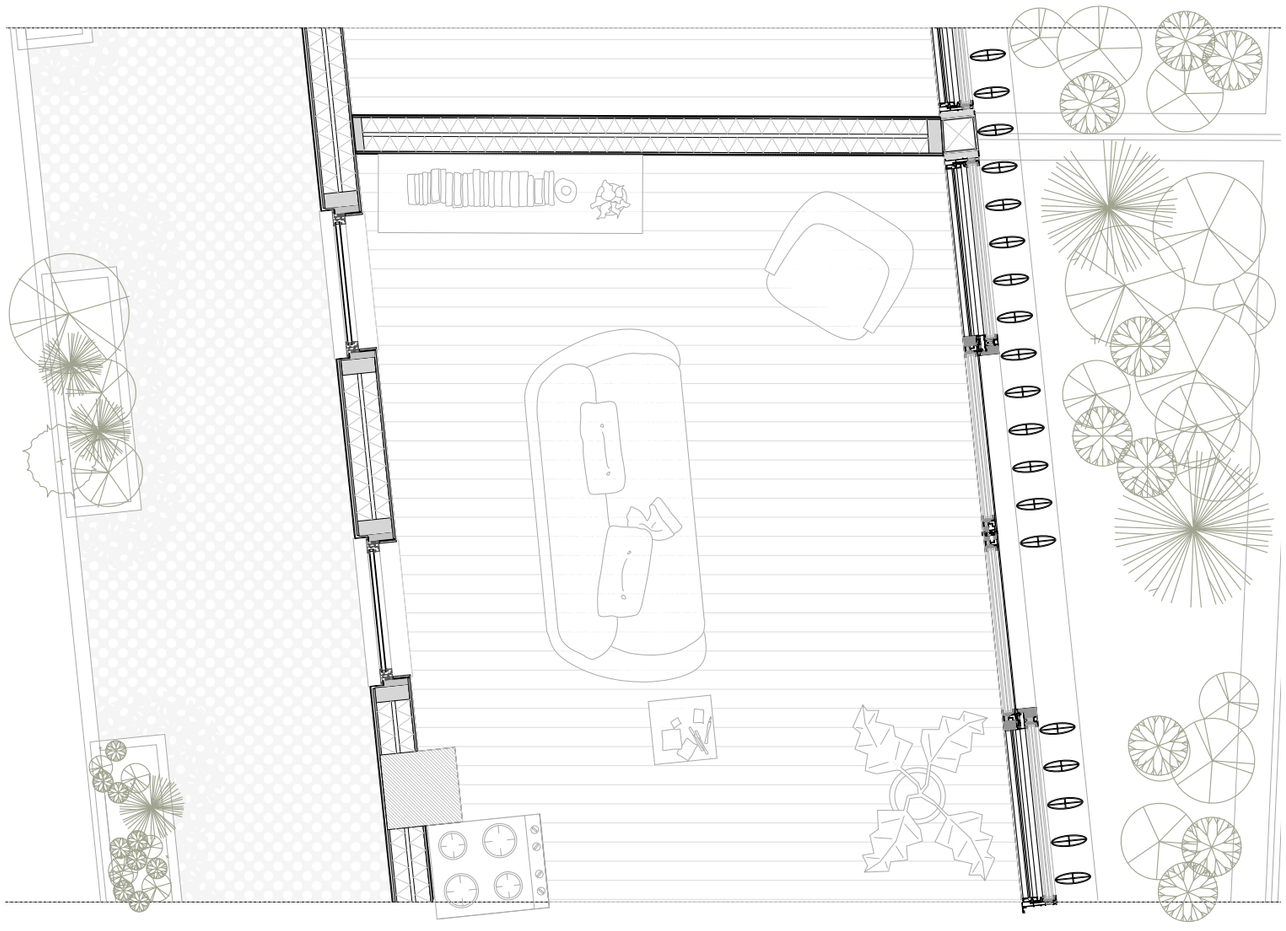
Ground floor



Top floor



Appartment



9. Materialisation

Bio-based

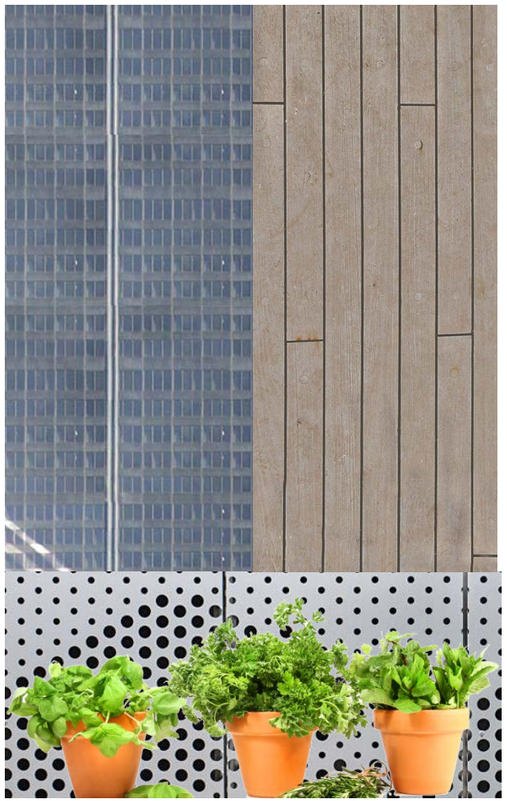
As discussed in the research, Urban agriculture can be used to both produce food as well as materials or even medicine. As such, focussing on bio-based materials, can create another incentive for the further development of urban agriculture.

Next to that, the comparison between venacular and high tech architectural form in urban agriculture showed that venacular styles much more often included bio-based and local materials such as wood, whereas the closed production centres were characterized by glass and steel. As this study showed, the more open and welcoming feeling of the bio-based materials. The project will focus on using bio-based materials to allign with the natural feeling of urban agriculture as well as the open and accessible experience.

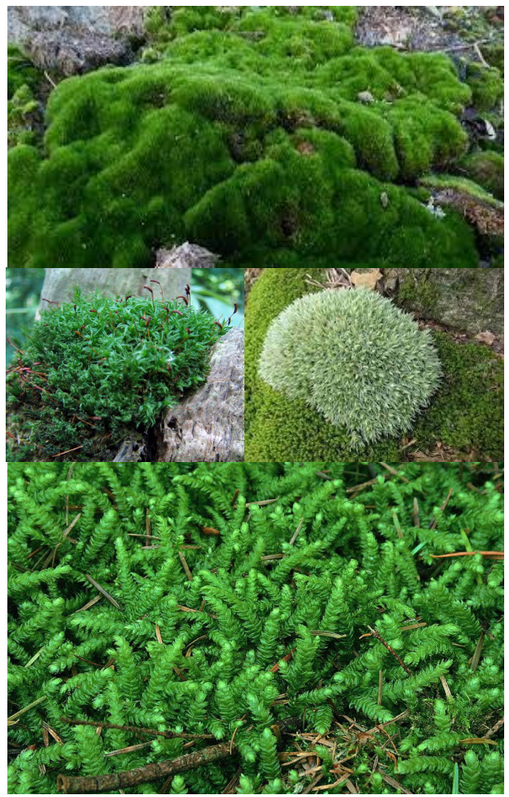
As a consequence the key material of the design is bamboo. I chose bamboo over wood as it grows quicker and has an overall lesser impact on the environment. Cross laminated bamboo has a span of 12 meters, which makes it suitable for the construction. Bamboo wil also return in the facade due to its light weight, soft and natural effect. On the north facade this will be further strenghtened by a green moss wall.

At the same time, these technological materials are also needed to create a functioning environment for urban agriculture. As such, when it comes to the production side, the materialisation will reflect on the technological side of this new production means,

Indoors



Outdoors



The expression of the facade consists of mainly natural elements. Here different forms of decorative bamboo are used: Planks for a horizontal finish of the floors and bendable fineer for the solar shading. The North facade is characterised by its moss facade., which consists of Three types of moss: Pincushion moss, wavy-leaved cotton moss and common smooth cap. These are all native to the UK, and have a dark, grey green colour instead of the more common light, or yellow green colour. This is done to align the colours with that of the bamboo, which greys over time. By using different species, the façade gains more dimension and texture, which breaks up the large spaces. The façade has arrhythmic windows, which refer to the doors on the other side of the façade and showcase the production to passer-by's.

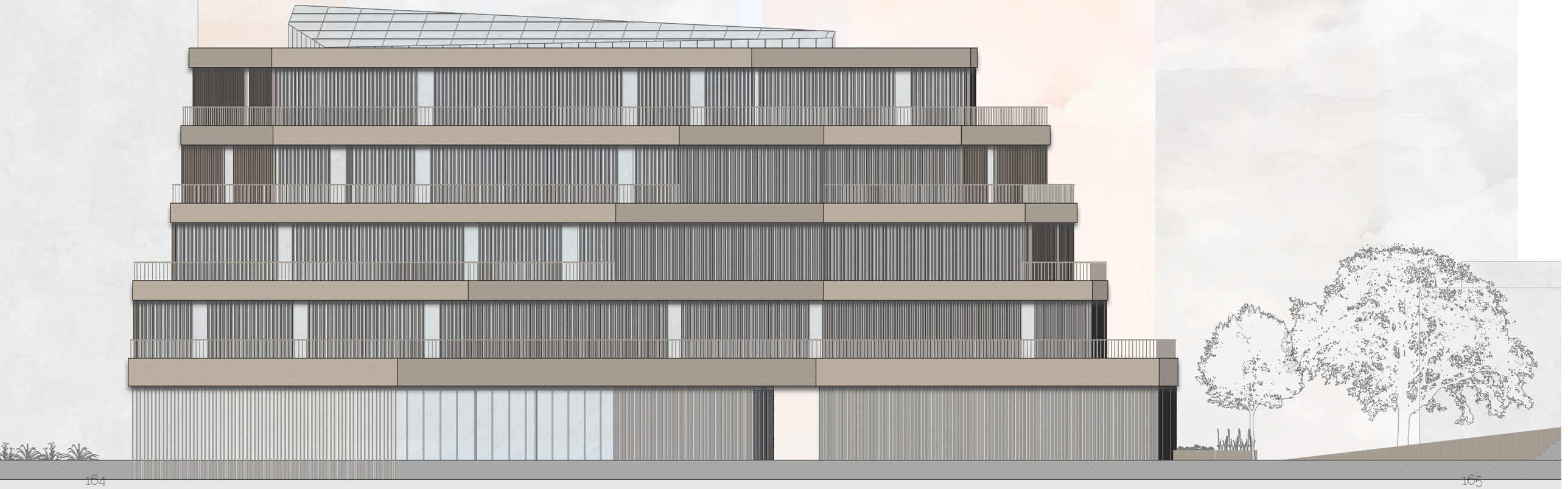
This collage shows the duality in urban agriculture as reflected in the research as well as the materialisation of the building.

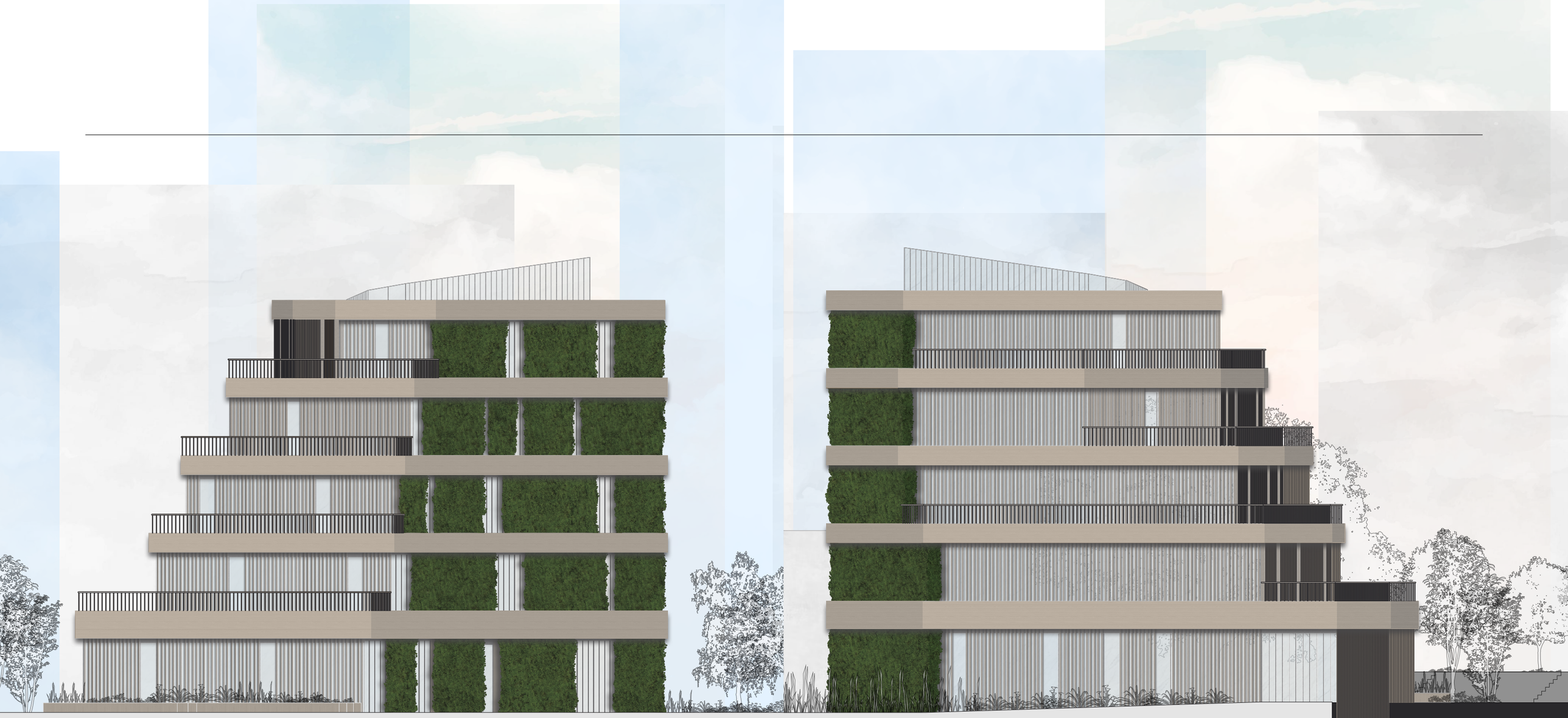
On the left the materialisation as used inside the production centre. On the right the experience of the building from the outside.

Facades

North facade 1:200

South facade 1:200

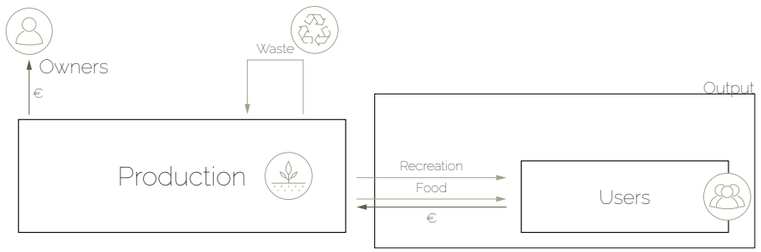




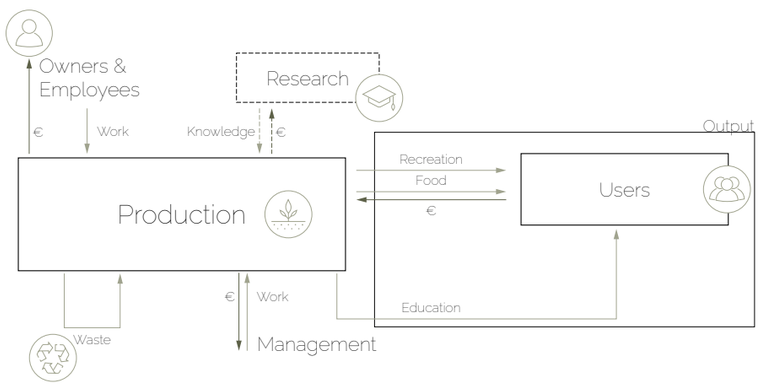
10. Stakeholders

Management systems

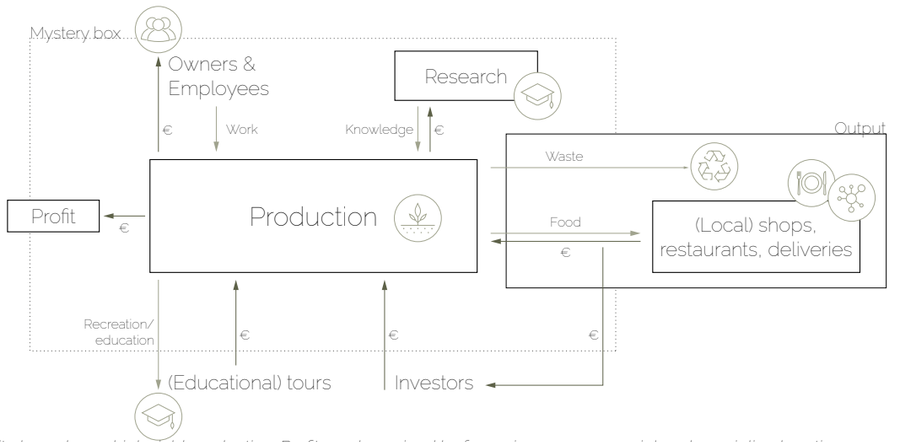
All urban agriculture sites need a form of management and of income in order to persist. The two diagrams on this page show systems for high-yield and VCF product sites. The top diagram is based on the site "Foodscape", which only uses their direct users as source of income. However, they do not just sell the food. They also sell the experience of harvesting, maintaining and growing your own food as well as an agricultural community. As such, their source of income is very simple and due to the subscriptions very well predictable. The second diagram shows a classic VCF system. As these sites are almost completely dependent on their users for income, and to fund



UA site based on a high yield, simple shop system, such as Foodscape



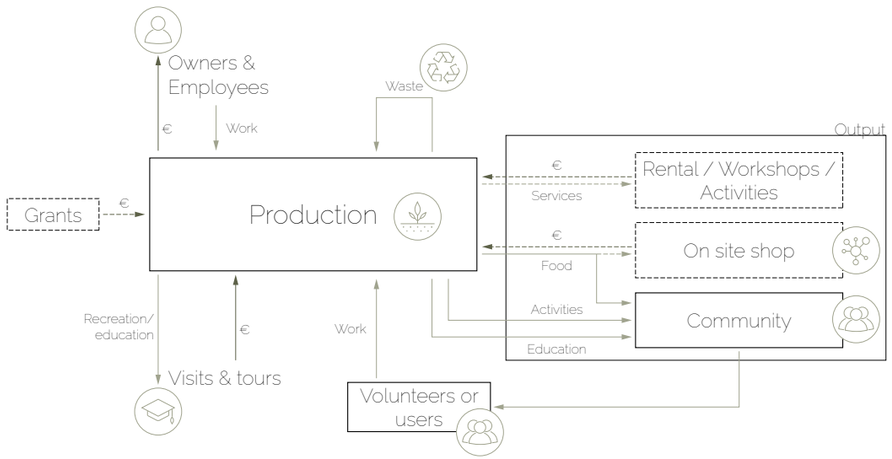
UA site, a form of technical farming such as growing underground in which a more complex system is used



UA site based on a high yield production. Profit can be gained by focussing on commercial and specialised parties

new development and research. They can only produce leafy greens as they can be sold for a higher price. As such, the focus of these sites is economic and only focuses on the richer group or users. Another option is focussing on commercial parties. These can specialize in sustainable, local or fresh foods, which allows them to charger more for the same types of produce. This system also shows an example of investors and educational tours as a source of income.

This page shows the other side of the spectrum. Sites such as Spital Fields City farm need to generate many different income sources, as all forms of income are generally small. This concerns sites that are focused on social characteristics. Their goal is to keep the site open and accessible for everyone. Next to that, their main goal is not to produce food. It is to share the experience fo growing your own food, as well as feel part of a community. Therefore, these sites offer different services. This can be teambuilding activities as at Spitalfields city farms, or renting out your barn for parties as Oasis Farm Waterloo. Some of the allotment sites gain financial backing from the government. However, most have to rely on themselves to stay in buisiness. Most social focused agricultural sites have a form of acitivties and workshops. Most often participation is free, but during these activities, participants execute volunteers work and as such give back in services to the site. The survival of these sites is incredibly dependent on the users and community.



UA site, a comparable system to Spital Fields city farm. Many different sources of income are generated.

Stakeholders

External stakeholders

Next to the stakeholders on site, multiple stakeholders outside of De Beauvoir Estate are relevant to the functioning of the site.

_Residents of London
_Governmental agencies (ao. Central agencies and councils)
_External Producers
_Supermarkets, shops, cafes, pubs and restaurants
_Knowledge Insitutes (ao. University of Greenwhich, University of London)

Local organisations

In Hackney there is already a collection of organisations that promote and organise urban agricultural interventions. They form the key to a succsfull implementations. Central in this are:

_Tenants & Residents Association (TRA)
_Growing communities
_Hackney Allotment Society
_De Beauvoir Gardeners Club

Employees of the production centre

The production centre is not only dependent on those working in the production halls. Equally important are the people working in the distribution areas, the waste management, reception, education centre or in the laboratory. The large difference between these jobs allow for people with different interests, educations and backgrounds. However, it is important that they come together, as on their own they do not have the overview of the whole system. As such they can participate in the research or education group or even represent their company in the production council. Idealy, these vacancies are filled by local residents

Employees in the production centre

Although a small group of people, they take on all tasks concerning growing and maintaining of produce. They have the best overview of what can be grown on site and as such would fit well in research and education group as well as the production council. They can use this council to determine with other producers, which products are created on site to cover different parts of the residents diet. Working in the production centre, is very dependent on hygiene and as such, these employees need to go through a barrier to access their jobs. Ideally these vacancies are filled by local residents.

Outdoor farmers

These farmers focus on the traditional agricultural production in the urban environment. They are an important key in the creation of a liveable public space. The Estate will be divided into multiple smaller sites which cannot be merged to create a larger variety in produce and crops on site. Whereas these farmers can come from the local residents, working outside could also be an intersting summer job for schoolchildren. The work of the main farmers consists of growing their food as well as connecting with the residents to create a varied urban environment

Manager

The manager forms the spill in the complete system. They chair most of the workgroups and councils and are appointed by the government. As such, they are impartial. One of their main tasks is exchanging knowledge and research with external parties and being a direct contact point for residents who experience disturbances from the agricultural sites, or who would like to produce their own food. The manager is also in charger of the railroad system. They check if wagons can pass. A manager that lives on site would be well enrolled in all pressing matters. At the same time, someone living outside of the Estate, might be more impartial.

Residents of the Urban Oasis

The residents of the Urban Oasis are the residents of the new building, they are young (starters) and most appartments are suitable for couples or singles. However, there are some residences, suitable for a family, which allows people to grow inside the Estate and the building. The focus on this age group is their overall large interest in urban agriculture, such as the allotment sites, and their need for housing.

These residents are newly introduced to the site and as such should already have an interest into urban agriculture. Living in the building allows them to grow food on their own balconies. While it is also possible to grow other plants, the residents will be motivated to focus on food production. As they live inside the building, they will use it more extensively. They pass by the market on a daily basis and due to their own gardens, might use a stall to sell or exchange produce.

Living inside the building also requests an active participation in the production council, residents could also participate in the education group, or the maintenance workgroup for communal gardens and allotments. Where these positions can also be covered by residents of the Beauvoir Estate, the residents of the building actively chose to participate in the urban agricultural system. All residents can also make use of the communal kitchens on the higher floors, the social space in the atrium or participate in workshops. .

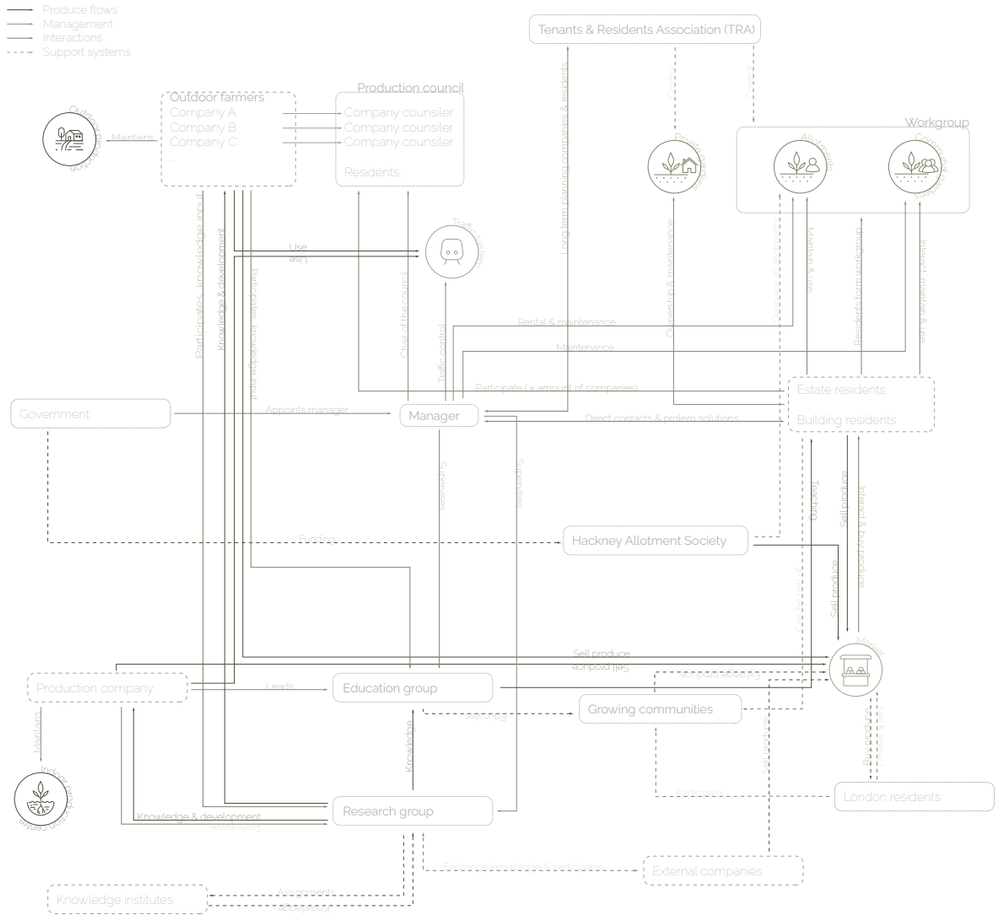
Residents of the Beauvoir Estate

These people have lived in the estate from before it was an agricultural site. For some, this new transformation might not be fitting, however, the hope is that they feel included into the system and want to participate at some points. There is already a gardening communtiy, which can be a valuable key in including the existing residents.

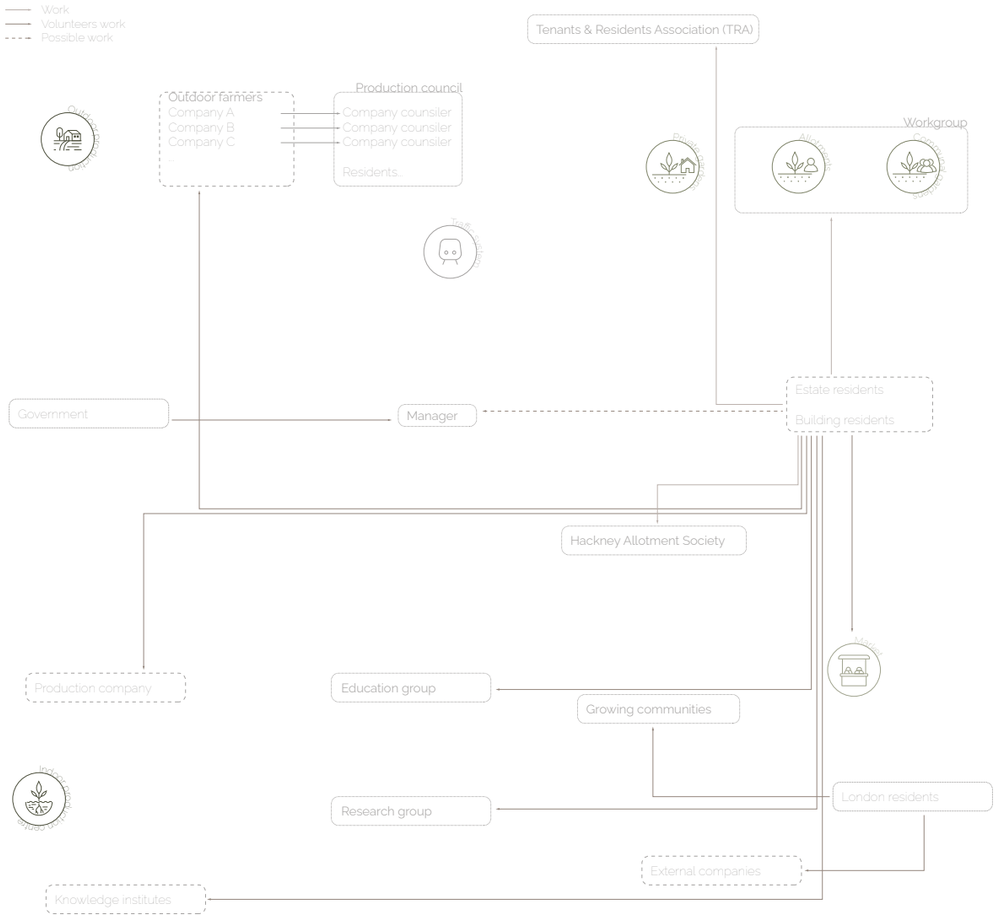
To make sure this group feels welcome in their own home, as little changes to their day-to-day life have been done as possible. For residents highly dependent on their car, the new design might be difficult, but for others it simply changes their environment. At this time, a new design is being proposed for the Beauvoir Estate, for this different input evenings and evaluations have been organised. Their minutes show, what current residents value most, which include a relatively low building to prevent shadows on the existing buildings and the preservation of the existing playgrounds. These whishes have been taken into account.

Alltogether, the life of residents of the Estate does not have to change, but can when they are included into the stakeholder system and embrace the new interventions. Their inclusion would increase the feeling of ownership and thus the care residents have for their environment. The implementation of the toolbox does not force the introduction of new residents in the place of the existing residents.

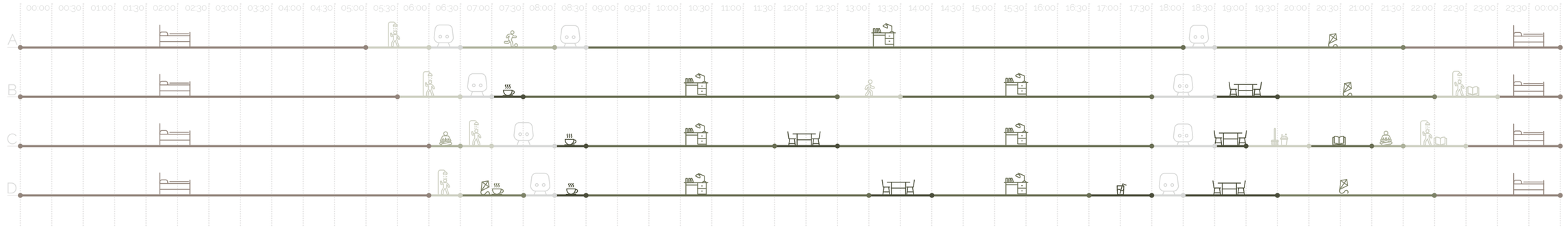
Interaction stakeholders



Employement



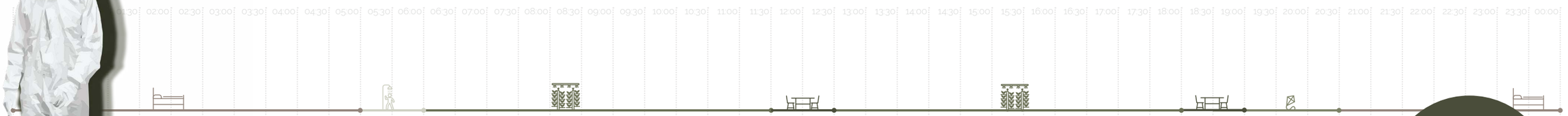
Day to day life



These top images show the day-to-day life of different residents of London (For Those Who Live in London, Can You Describe an Average Day in London?, n.d.). Where people all have some different acitivies. The largest part of their day is covered by working and sleeping. All residents travel between an hour and two hours per day.

Interestingly most residents did not emphasize having breakfast, with person A not even mentioning any meal. Due to commute times, dinner is often after 19:00, and only after this, residents take time of for recreational activities. During winter it will be dark at this time.

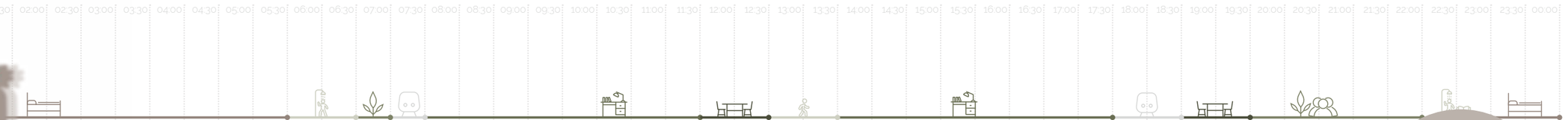
- Food
- Work
- Recreation
- Household
- Travel
- Sleep



Mark is an example of someone living inside the Urban Oasis building, or on the estate. They work in urban agricultural practice and by working in this specific production centre, near his home, he can reduce commute times, leaving more space for other recreational activities. Living in the estate, Mark always approaches the building by foot from the North side. From here he enters the production centre, gets ready, and moves up to the production halls. Here he monitors, maintains, harvests and sows. The groundfloor is partly used as nursery, meaning he spends a lot of time here, which creates an active space connecting to the market hall. After a long day of work, he stops by the market to buy fresh produce, before walking home. Here he can cook, clean and spend time on some recreational activities. Due to the production centre being indoors, it is less dependent on early hours then traditional agriculture.

Mark
43 years old
Resident Beauvoir Estate
Employee production centre

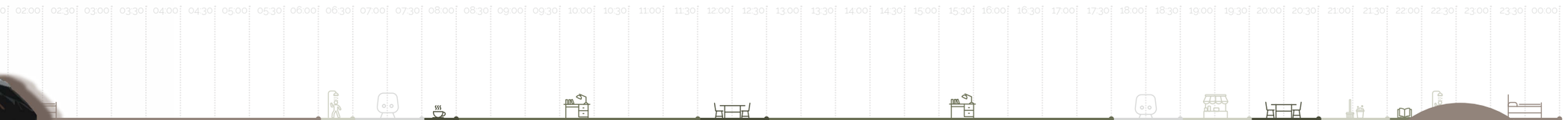
Mark has always had a passion for agriculture, but commute to the greeen belt was far. He also missed the city life on the country side



Nadia is an example of a resident of the building. She lives there, and chose to do so as she enjoys gardening and cooking. However, for her this is a recreational acitivity. As such throughout the day, she is commuting to the city centre to work there. Before doing so however, she checks on her plants to see if they need anything to start the day. During the summer she grabs some fresh berries and tomatoes to eat at her job. After a long day there, she goes back home. Sometimes she passes by the market. Other days, she will cook with what is left at home. After dinner, she will take some time for leisure activities. For her, this is watering her beans on the balcony and maintaining her herbs. Over the weekend she will take the time for extensive maintenance, but also to process some of her extensive produce. She enjoys making jam, and sourdough bread, which she sells at the market. Sometimes, she will join the cooking workshops in the education centre. It is here, that she also meets with most of her friends.

Nadia works in the busy centre of London. She loves gardening as well as cooking, thus the ability to produce her own food attracted her, to the Urban Oasis.

Nadia
25 years old
Resident Urban Oasis
Works in CAZ, tourism



Nelson is an example of the current residents of the Beauvoir Estate. They have been living here for a while and are not perse focused on urban agriculture. Throughout the day, Nelson will wake-up and commute to his job via public transport. He spends here most of his day, until he returns home hear dinnner time. Even though he himself does not enjoy gardening. He does like the services inside the Urban Oasis. Most of the time, when he returns home from work, he will pas by the market for fressh vegetables for his children. As a parent, he also needs to make time in the evening for household tasks and his children. In the weekends you might find him near the playground with his children. And sometimes, when he needs a break, will spend his time checking his students work at one of the tables in the atrium.

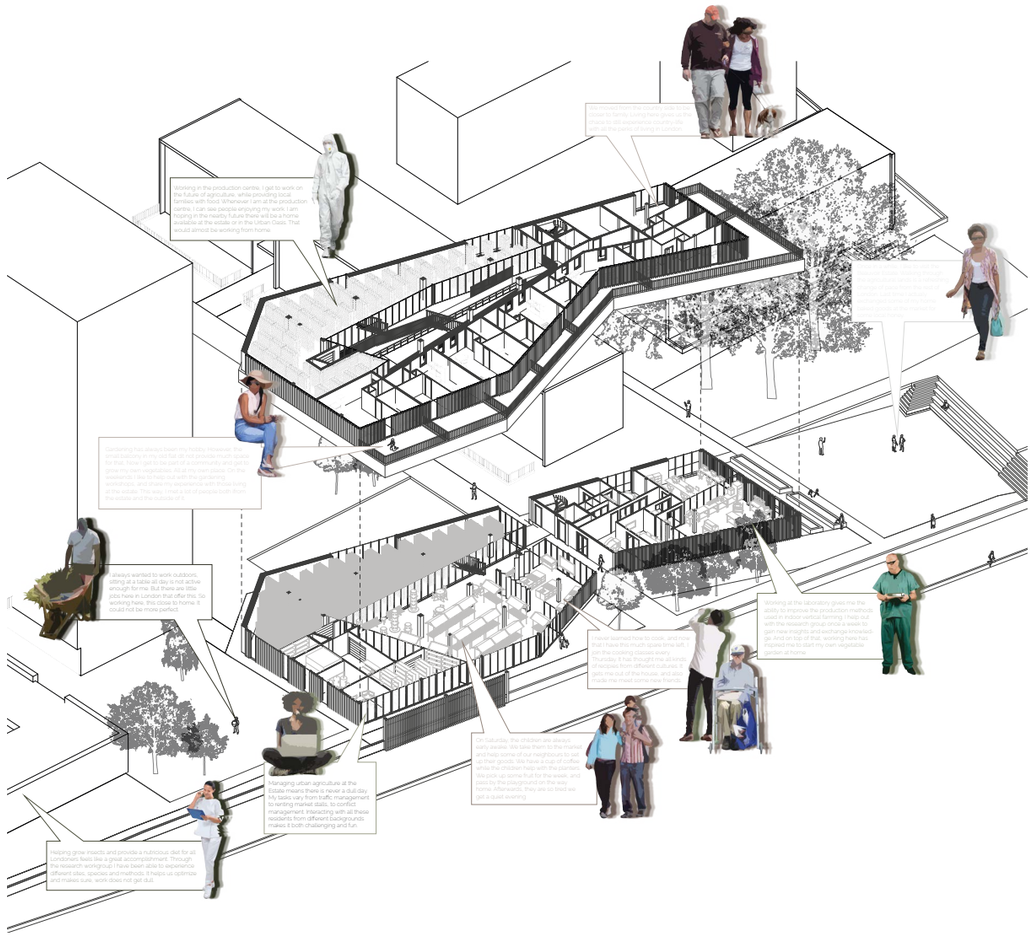
Enjoying the space.

Nelson has lived in the Beauvoir Estate for the past five years. He has a young child with his wife and, with his job as a teacher, he makes long days.

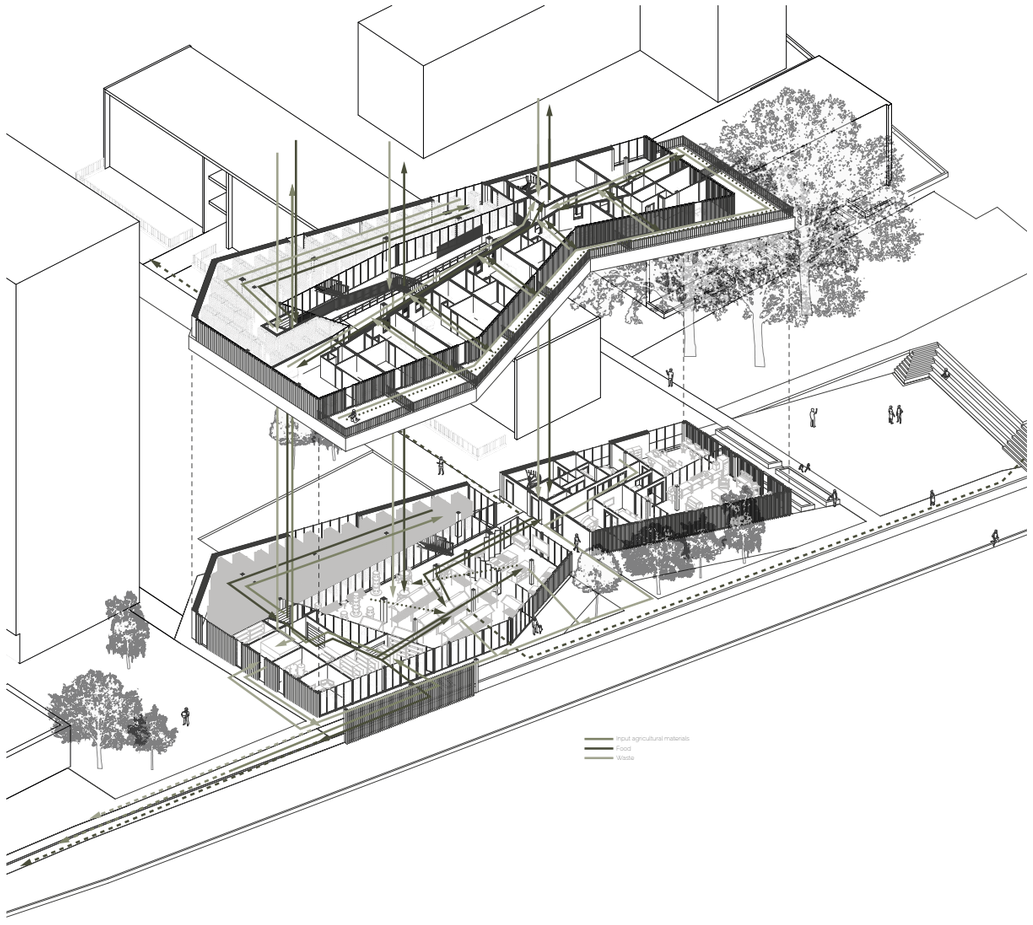
Nelson
29 years old
Resident Beauvoir Estate
Teacher, public school

11. The local ecosystem

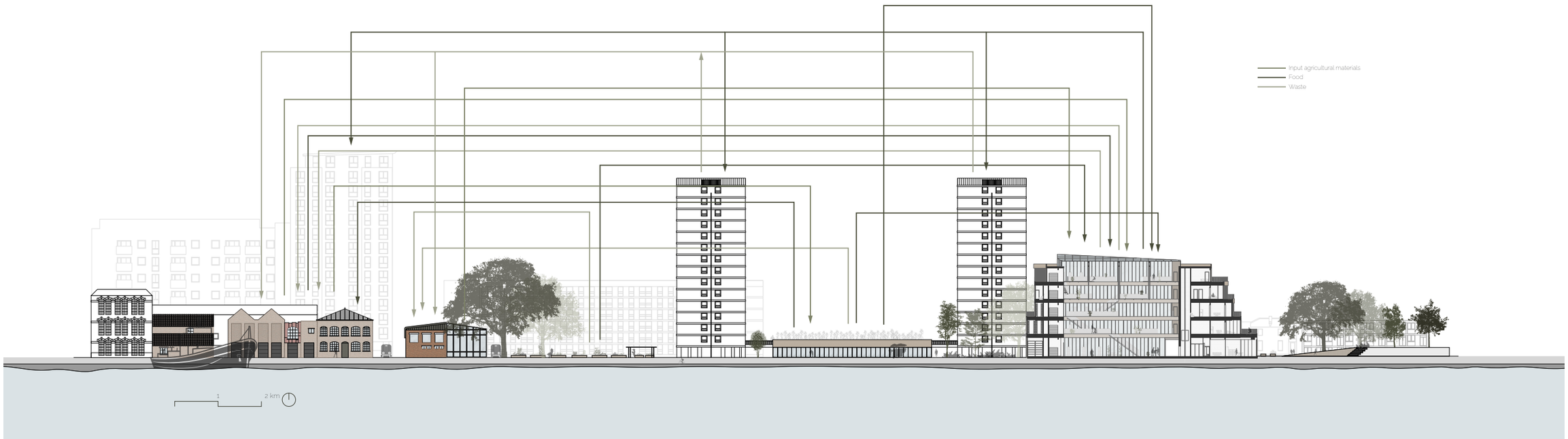
Social Interaction



Flows

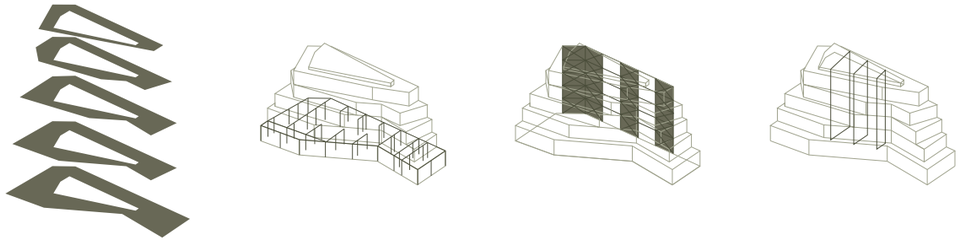


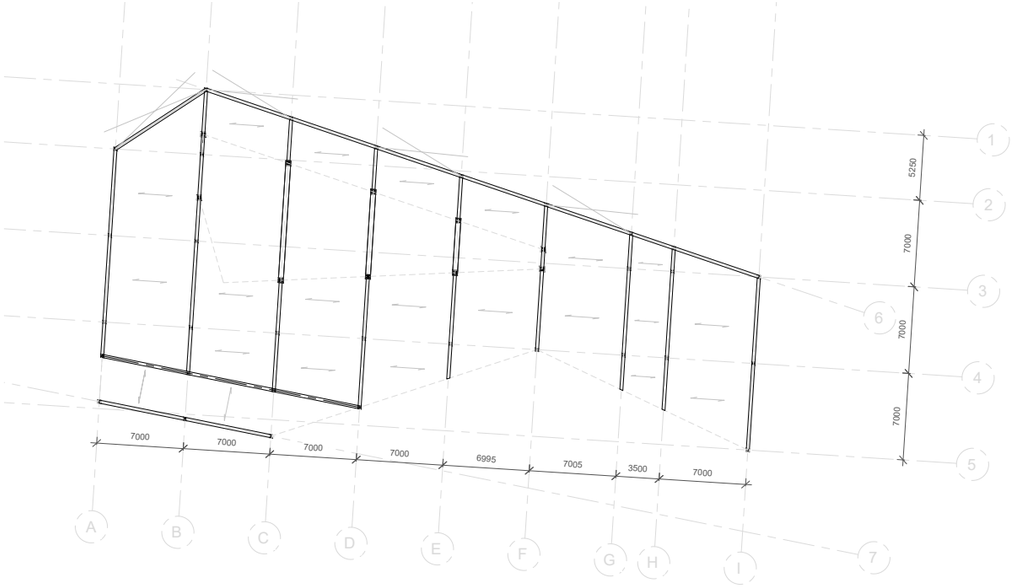
Food system

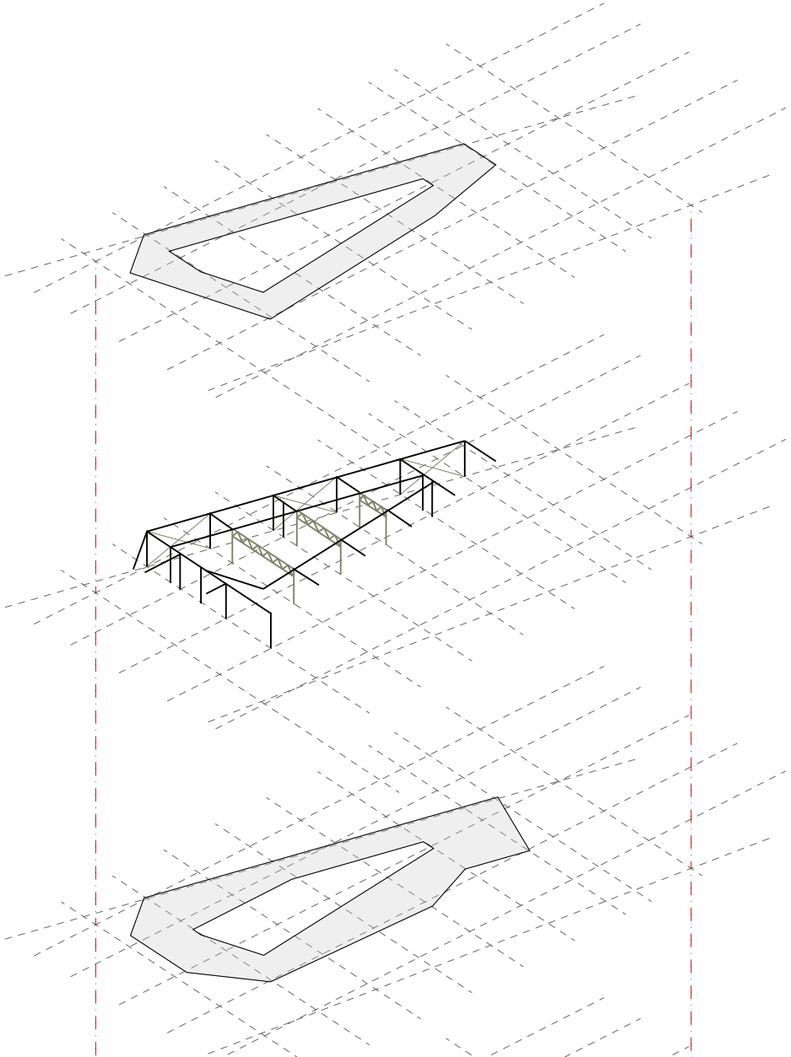


12. Technical elaboration

Construction







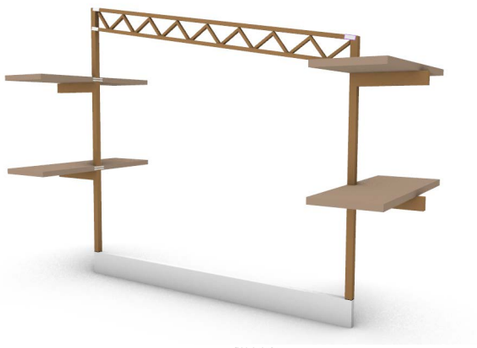
Roof

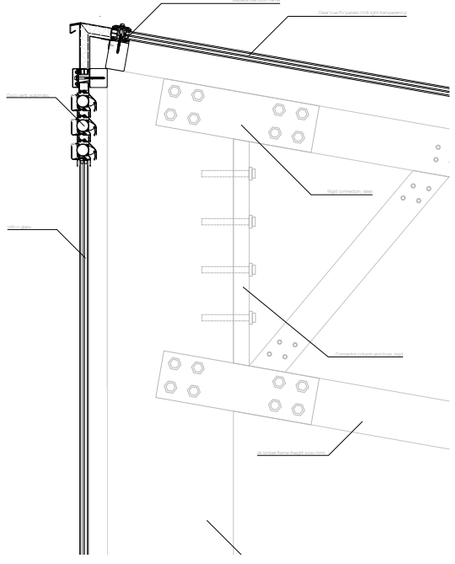
4th floor

The construction consists of cross laminated bamboo (CLB), as such it has about the same construction qualities as CLT. The structure of the building consists mainly of a column structure with CLB floors inbetween. These floors can distrubute force in all directions, but have a main span direction.

The stability in the building is created through braces in the North facade and three rigid portals inside the atrium. These consists of a CLB truss as well as a concrete beam in the foundation to finish the portal. The trusses are connected to the columns using a rigid steel connection. To optimize the use of steel in the truss, the beams inside the truss are connected through bolts instead of plates.

To prevent the columns in the atrium from buckeling, they are connected to the floor using steel plates. This makes it possible to dimension the columns thinner.



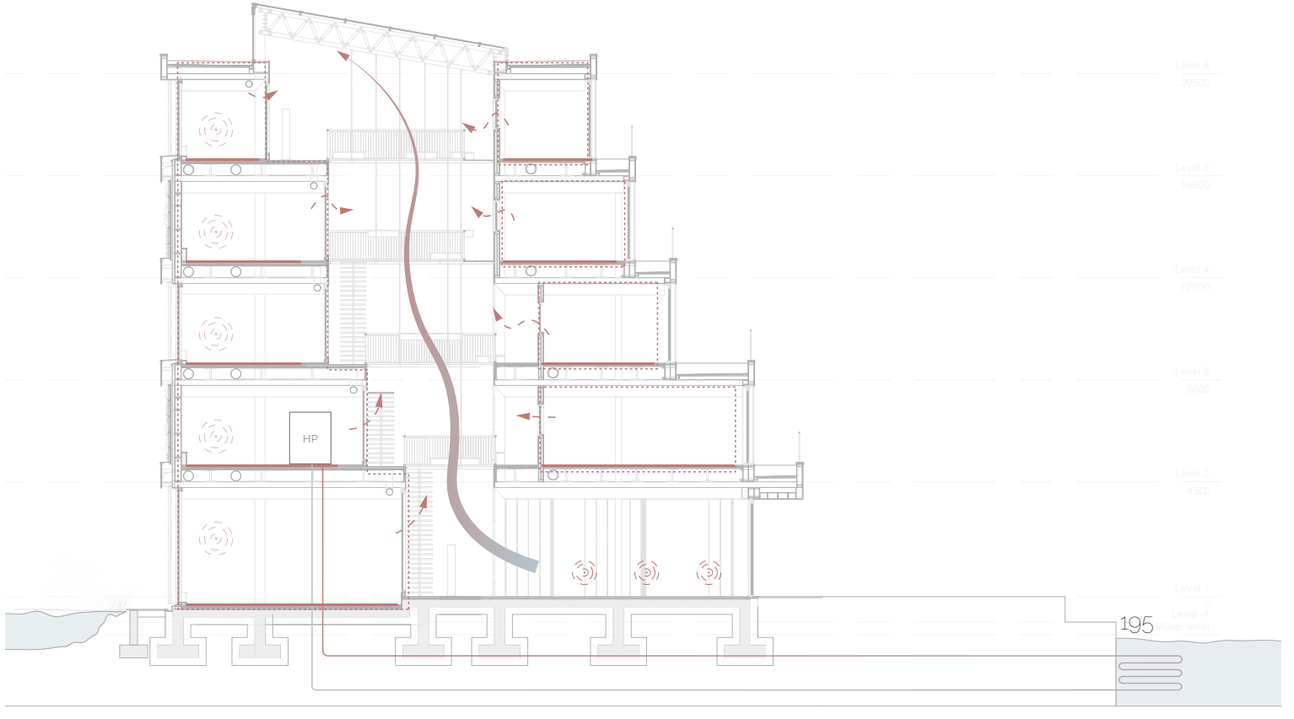


Climate design

Heat system

The building is through floor heating, based on a water based heat pump. As a foundation temperature, heat is substracted from the Regents Canal. Since the water is overheating, this will cool it down, restoring the temperature and thus the ecosystem.

The atrium is not heated. Instead in the market stalls, local heat sources are created. Most heat in the production centre is generated via the production stands, but for a basis and to allow more flexibility in the future, a floor heating is added here as well. The centre functions as one system, while the appartments all have their own system.

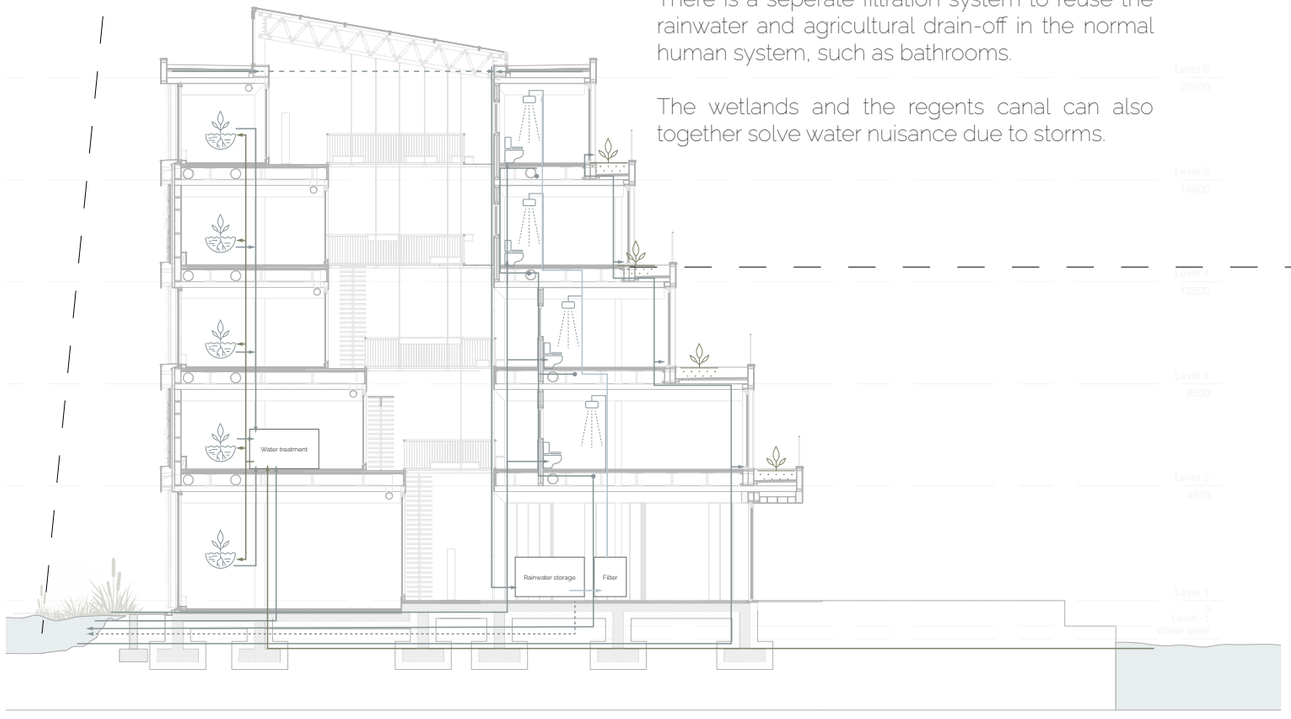


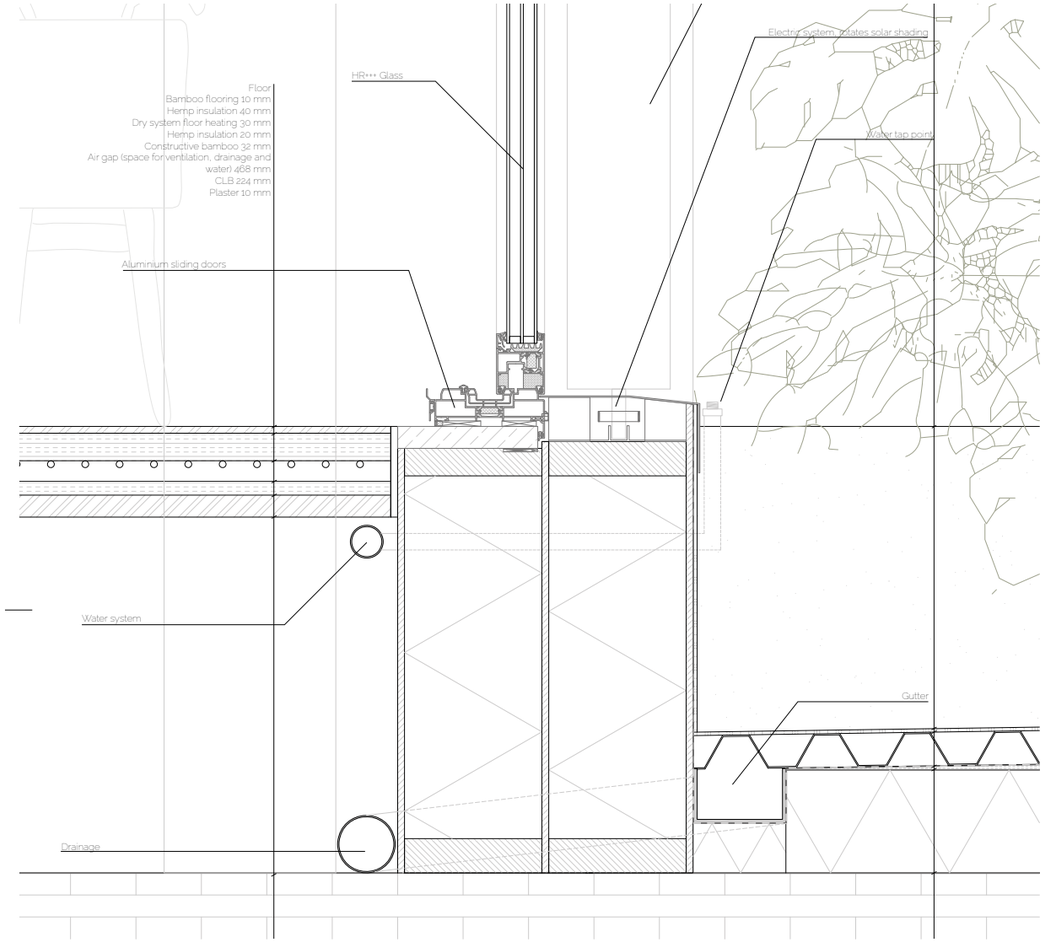
Water system

The building has its own integrated water purification system. This is necessary to cover the large water need for urban agriculture. Rainwater is collected and stored in constructed wetlands near the building. This water can be reused in to water the gardens on the balconies or, after treatment for more nutritients and additional filtering, in the production centre. All balconies have their own water points to make maintenance easier.

There is a seperate filtration system to reuse the rainwater and agricultural drain-off in the normal human system, such as bathrooms.

The wetlands and the regents canal can also together solve water nuisance due to storms.

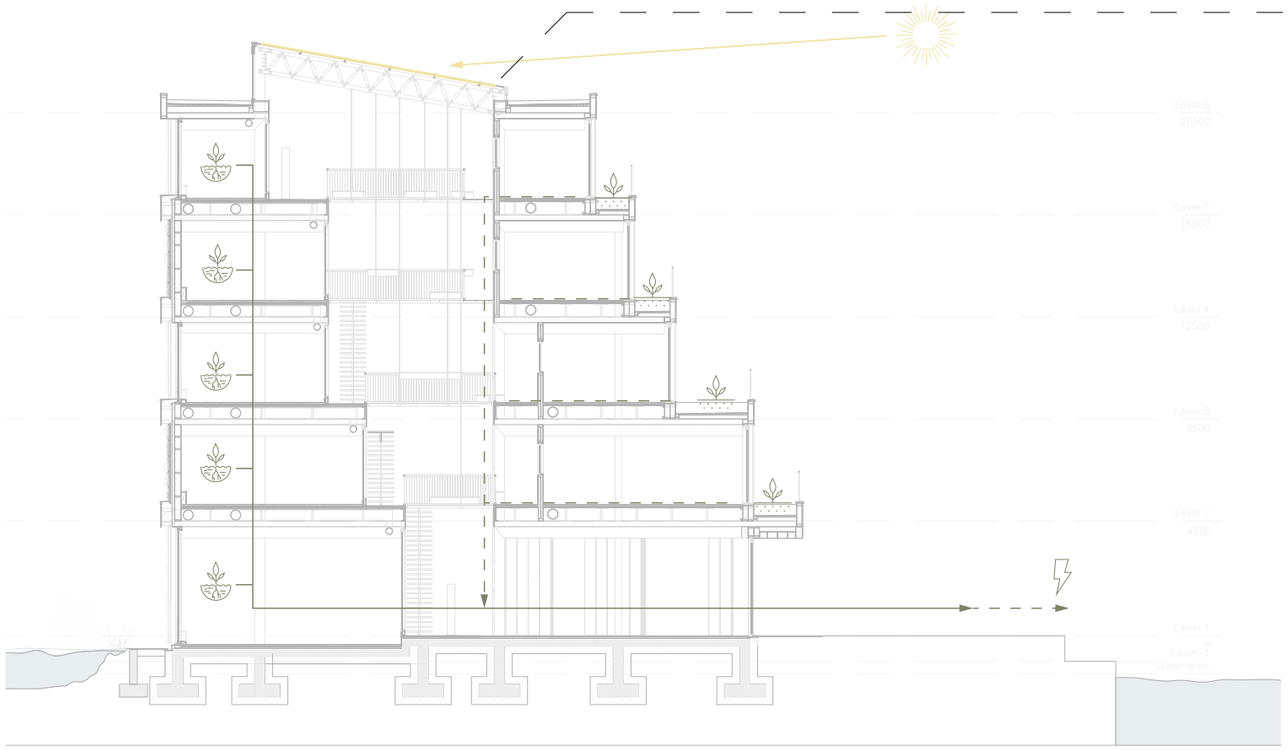


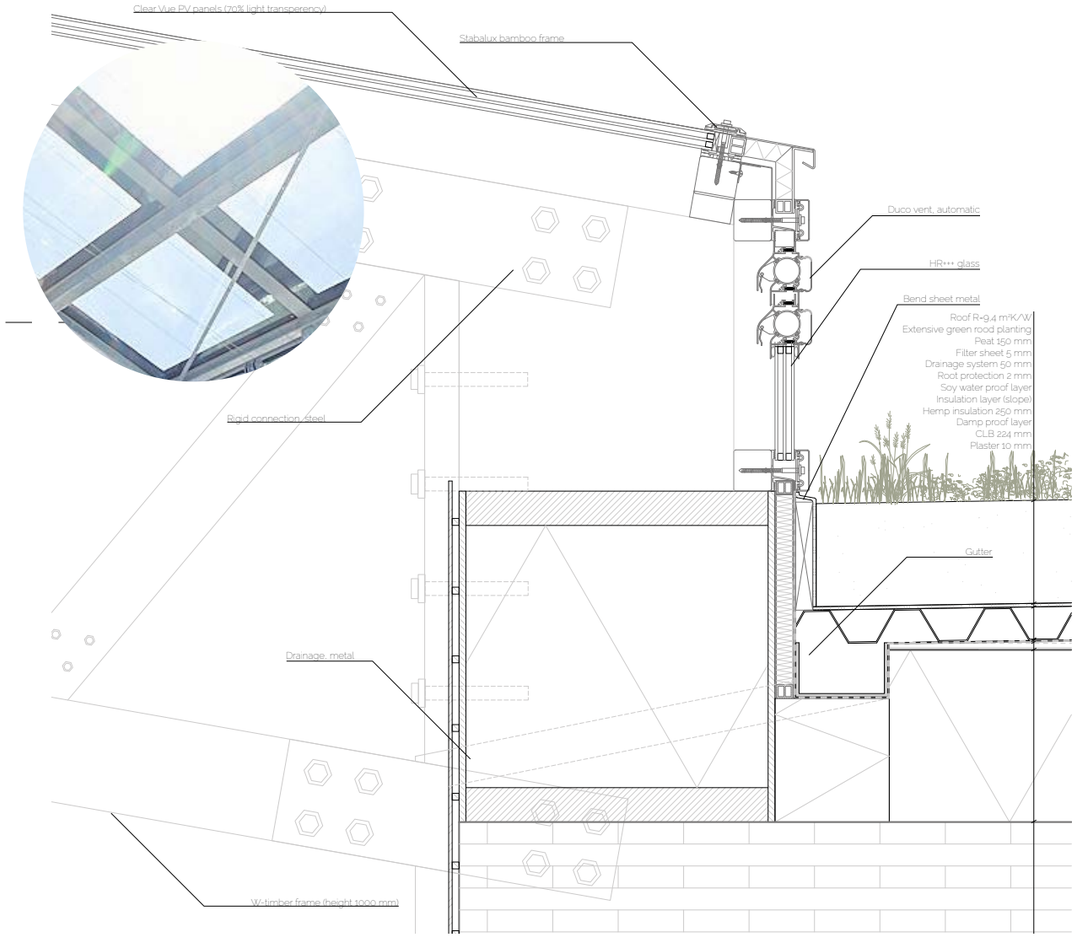


Energy system

The energy system consists of two parts. Part one are the integrated solar panels in the atrium. These solar panels provide direct energy to the building. The rest of the energy is provided through the anaerobic digestion of the bio-waste on site. This waste is moved to different industrial area, processed there and the energy can be used on site and put back into the food system.

To make sure the energy use of the building is as low as possible, the atrium can be used for extra daylight, but is not heated. Next to that the facades and roof of the building have insulation values of around 9,5 m2K/W

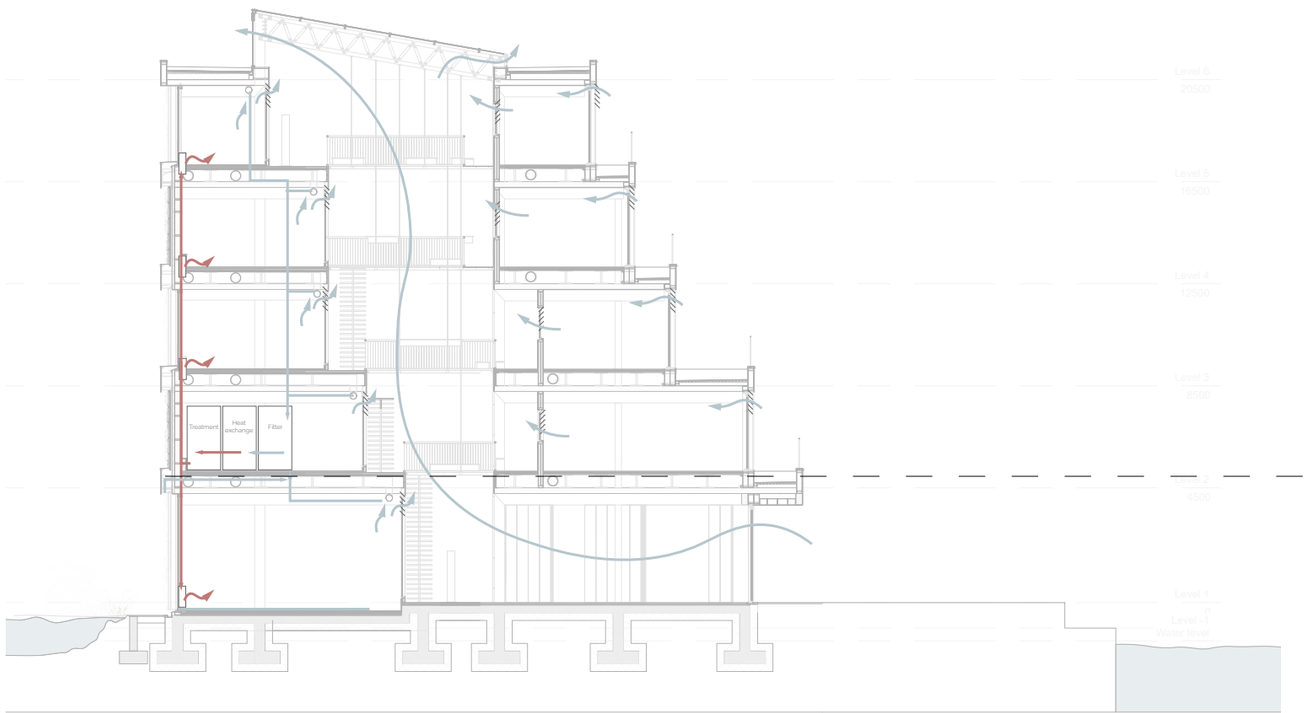


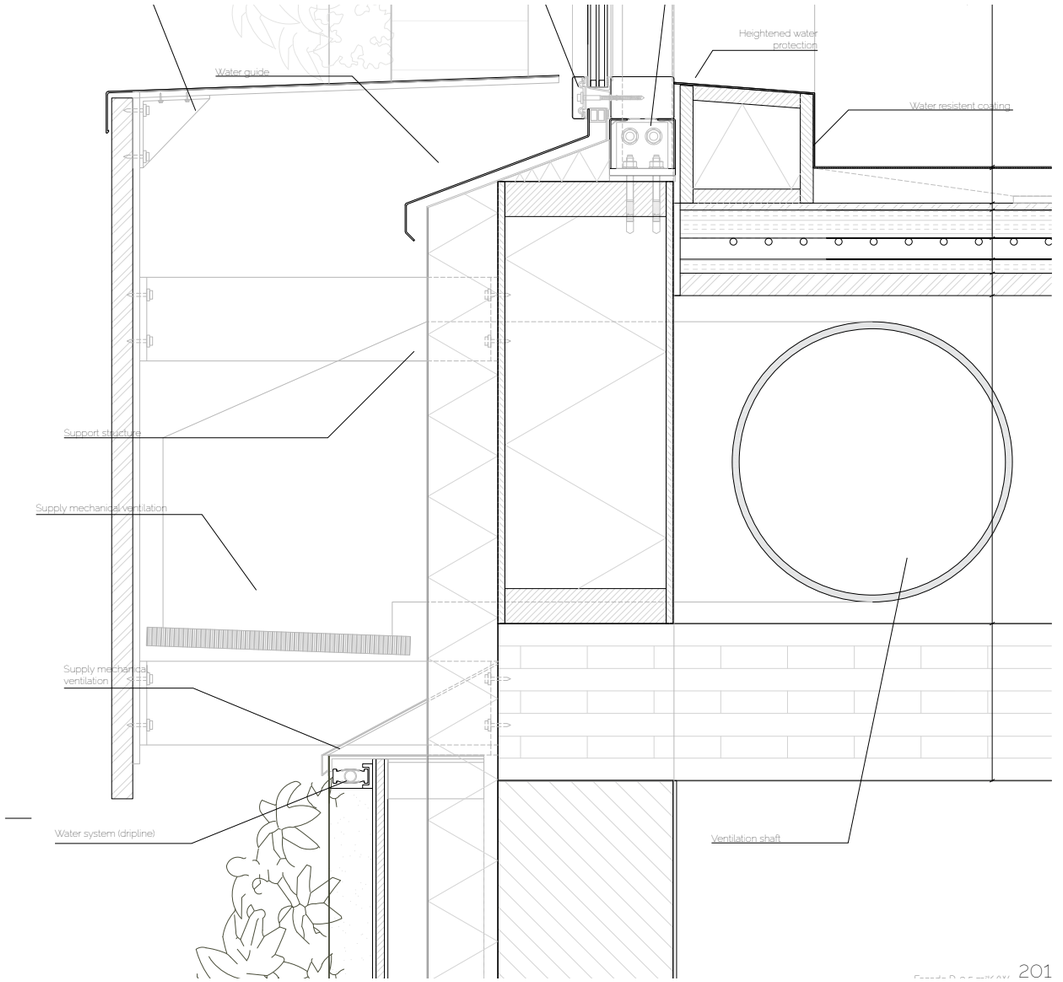


Ventilation system

When it comes to ventilation, the building is split into two different systems. The production centre has a mechanical in and output, with heat re-use. In case of quick changes in humidity or temperature ventilation vents towards the atrium can be used.

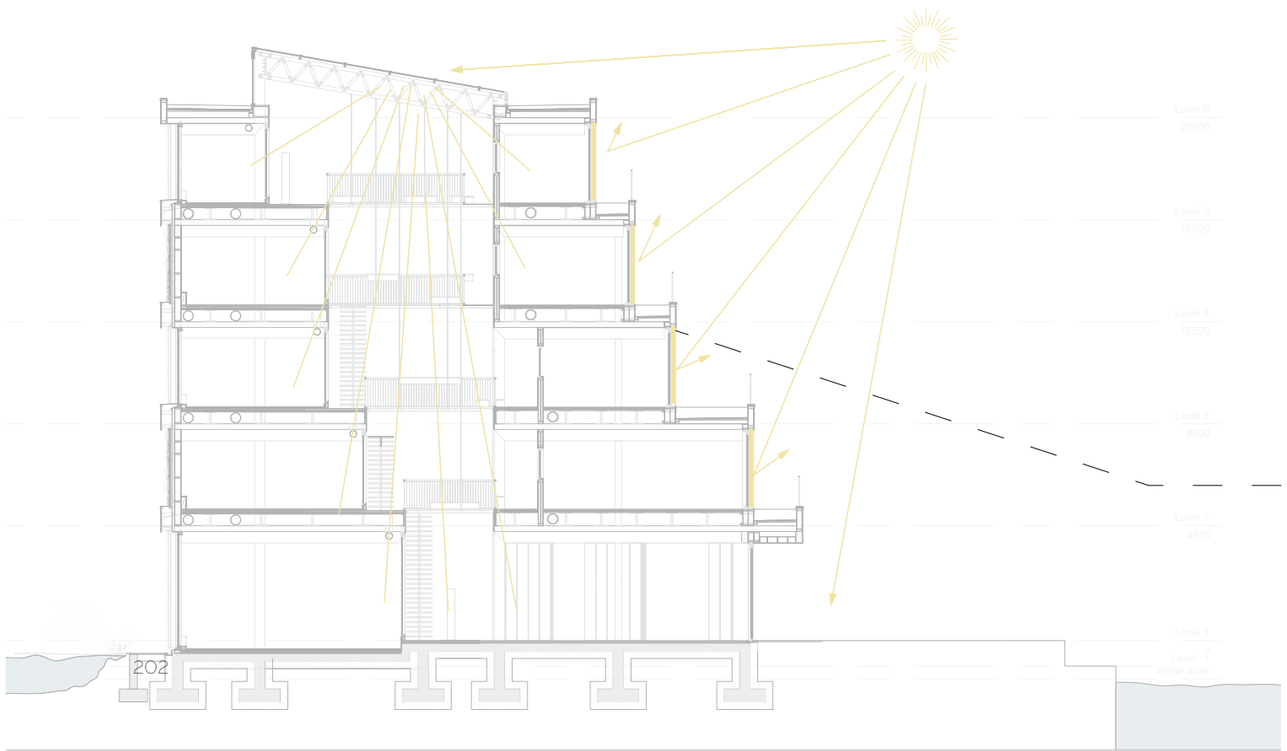
The apartments have a natural system with mechanical exhaust for the kitchen and bathrooms. Through the windows in the atrium, residents can create draft throughout the house if necessary. In the façade, behind the solar shading, ventilation grills are integrated. By using a matte, dark grey colour, the vents are integrated into the shadows of the façade.

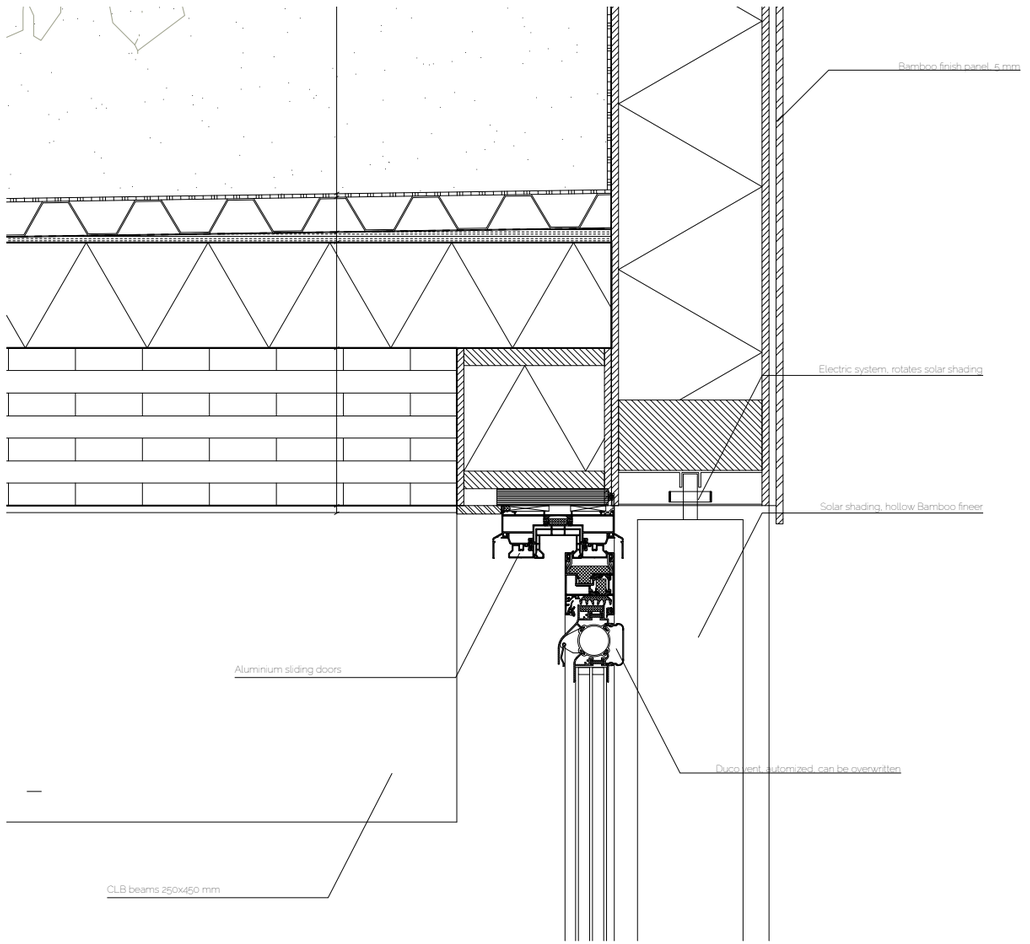




Daylight system

The atrium does not only function as an important social space. It is also key in creating enough daylight throughout the building. All functions also have windows to the atrium to profit from this daylight and activate the space.
On the East, South and West side of the building, summers will give to much solar heat for the building. To prevent this, outside solar shading is necessary. However, screens are very valuable to dirt and water, which will be present on the balcony gardens. In stead vertical shading is used. To create flexibility, the solar shading can be rotated. Throughout the day, the shades will rotate automatically with the sun. However, on clouded days, the shades can be overruled to allow more daylight inside the building. This can also be done during the winter, to optimize the use of solar heat.

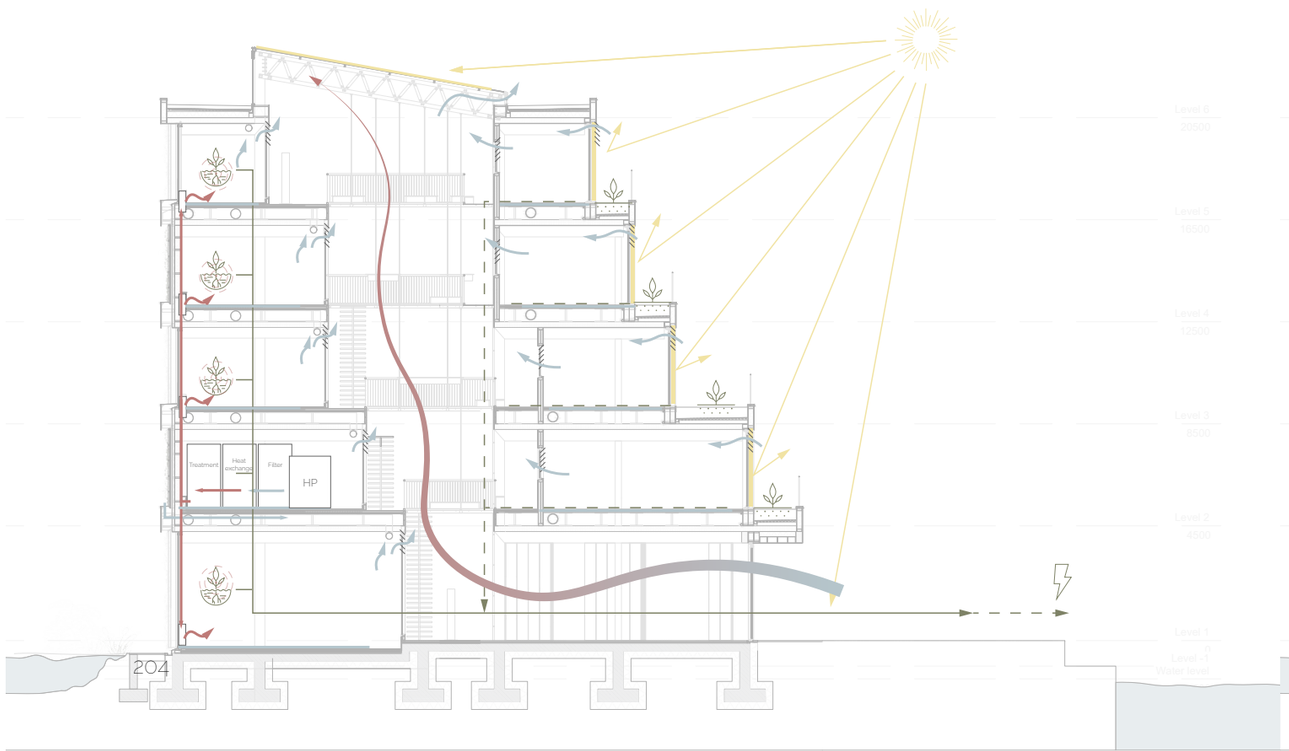




Summer system

The climate system of the building adapts throughout the seasons to optimize energy use and create the most comfortable environment. As discussed before, the use of the solar shading changes throughout the season, with the shades blocking heat gain in the summer and allowing solar gain in the winter.

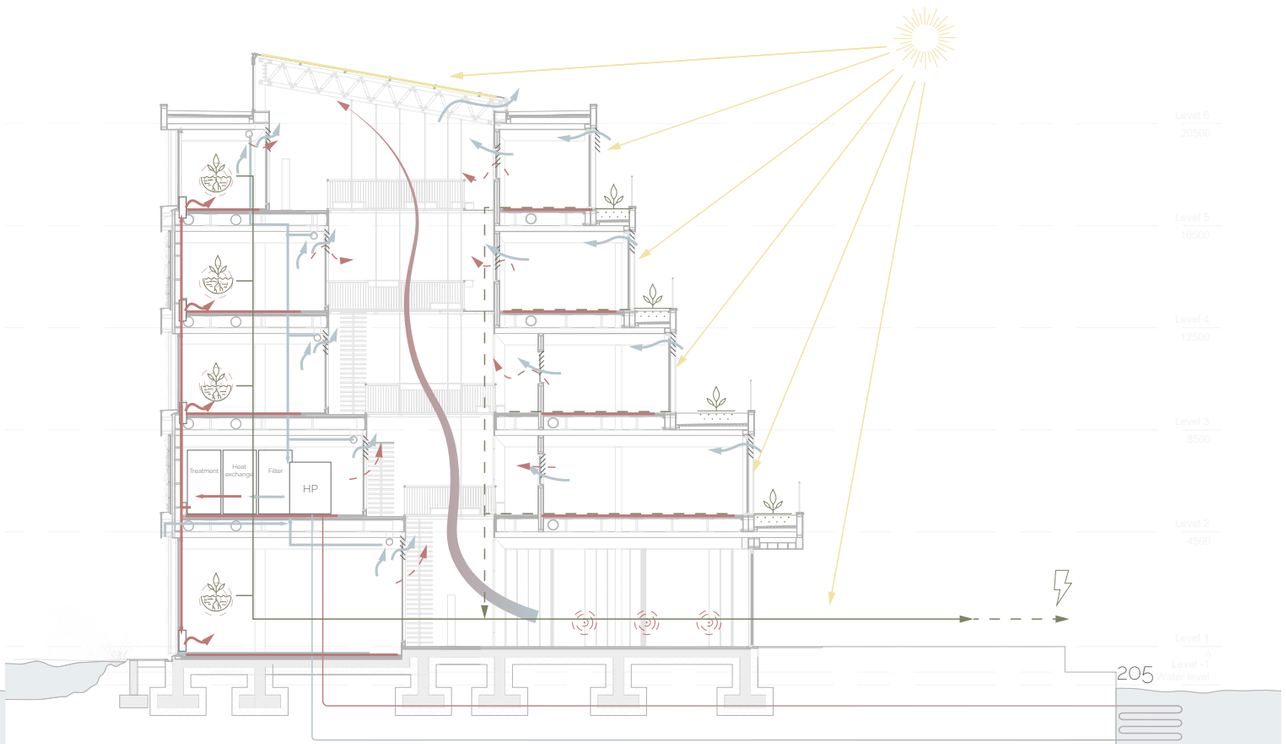
However, the main change is the usage of the atrium in between the seasons. During the summer the sliding doors in the education centre and market can be opened to create a strong draft through the atrium which will pull up the heat out of the building. By using the windows and sliding doors in the residences, these spaces can also be ventilated. In case of overheating in the production



Winter system

centres, in this case the mechanical exhaust of the production centre can also be turned off, and instead vents can be used to cool down and ventilate the production site. In the winter, these sliding doors are kept closed. However, the entrance to the atrium is still open. Therefore, instead of heating the whole atrium and losing this heat to the top of the atrium, the market stands contain localized heatpads, which will keep the users warm, with as little energy as possible.

Lastly, where the dry system in the floors is used to heat during the winter, in summer these can be used to cool down the building.



13. Reflection on liveability

Start evaluation

1. Stability	
Violent crimes	There is a relatively high rate of violence for London, but this has been going down over the past years
Destruction	Relatively high rate for London, but has been going down.
Disturbances	Relatively high rate for London, but has been going down.
(Experienced) nuisance and insecurity	Relatively high rate for London, but has been going down.
Threat of terror and conflict	In line with the rest of London, Overall good
Level of political freedom	In line with the rest of London, Overall good
Natural hazards (flood, fire earthquakes etc.)	Little natural hazards, possible water nuisance, due to rain.

2. Healthcare	
Availability of healthcare	Healthcare is accessible to residents
Quality of healthcare	Unknown. Estimation: good
Availability of over-the-counter drugs	Unknown, Estimation: good
General healthcare indicators	Healthcare is overall good. There is an increase in obesity, as well as an increase in food security leading to issues of people being malnurished as well as weight related health issues.
Distance to health care	Very good. There is a surgery next to the estate and a hospital within 15 minutes walkin distance

3. Education	
Availability of private education	Two schools within 20 minutes walking
Quality of private education	Unknown, Estimation: neutral
Public education indicators	Education level on site is good.
Distance to education	Three schools within 20 minutes walking

4. Facilities	
Quality of road network	Overall good. Residential roads are being sheltered, quality asphalt main roads is relatively low.
Quality of public transport	Main connection is busstop, currently overground is being improved.
Quality of international links	Direct public link to airport, about 45 minutes travelling from international train link.
Availability of good-quality housing	Low quality housing, little insulation, small residences.
Quality of energy provision	Present, partly gas. No sustainable or reusable energy sources on site.
Quality of water provision	Unknown. Estimation: Reasonable
Quality of telecommunications	Telecommunications are present, quality unknown.
Job possibilities	Reasonable. There are some office blocks and shops next to the Estate. However, there is a hight unemployement rate, thus there is a mismatch between residents and employement possibilities
Accessibility of nutricious food and drink	Nearby supermarket, but with limited supply and little fresh produce. Access to cafés and pubs. Bakery, butcher, market and greengrocer within 15 minutes bike ride.
Leisure and culture	Artist centre on site as well as Rose Lipman Building for exhibitions and theather. Playgrounds for children. Sport facilities are missing. Allotments on site for recreational use.

5. Social cohesion	
Diversity life phases	Overall present, majority residents under 30.
Population density	Relatively dense due to high rise.
Mutation rate	Unknown
Development households	Households are educated, and consist of both families, couples and single households. However, there is a relatively high rate of single parents and single perons and single person households.
Social cohesion	Unknown. Estimation: can be improved. Based on general interaction with neighbourhood based on TRA minutes as well as demolishment and incidents in neighbourhood.
Tolerance	Unknown. Estimation. Neutral
Social or soft spaces	There is an extensive amount of public spaces, they are however little used. Most used areas are the playgrounds.

6. (Physical) environment	
Mixing of functions	Area is focused on residences. There are no heavy industries, nearby is a main street with public functions, Some work-from-home offices.
Green space (quality, proximity and accesibility)	A lot of green space is present, but with low quality. Consisting mainly of gras. There are some large threes which are valuable. Green spaces are well accessible, but sometimes very sheltered by buildings and thus feel inaccessible and private.
Water (quality, proximity and accesibility)	Site is situated next to the regents canal. Due to height difference, this is not really experienced.

(Micro) climate (heat stress, noise, air quality, wind, sun and shadow humidity)	Not good. High risk of heat stress. Low air quality (according to London Plan 2021).. Little trees around streets, create little shadow. Overall, stone heavy area, thus water nuisance and, sun/heat reflection.
Accidents	Unknown. Estimation: Good. Most of the streets are low-speed ans sheltered. Due to the combination of roads, pedestrianwalks and parking all mixed in the estate, people drive slowly. However, this might also cause confustion.
Car density	Very few residents own cars. However, public space is very car oriented.
Abandoned buildings and waste space	In old harbour areas, part of the building is abandoned. The two heightened platforms are wasted or unused space.
Pedestrian acces, routes, conflicts	The space is confusing for pedestrians. Pedestrian walk is often small and often spaces is shared with cars.
Bicycle access	Proper, though little parking spaces
Maintenance	Good. Area is clean, but overall old.
Proximity & quality of public or shared space	All buildings are surrounded by public space. Quality is okay, but can be improved upon when it comes to activation of space and diversity.,

Design test

1. Stability	
Violent crimes	No direct results determined
Destruction	Expectation is reduced due to increased influence of residents and thus increased feelings of ownership and responsibility
Disturbances	Expectation is reduced due to increased influence of residents and thus increased feelings of ownership and responsibility
(Experienced) nuisance and insecurity	Expectation is reduced due to increased influence of residents and thus increased feelings of ownership and responsibility
Threat of terror and conflict	No direct results determined
Level of political freedom	No direct results determined
Natural hazards (flood, fire earthquakes etc.)	Water nuisance reduces due to increased permeability
2. Healthcare	
Availability of healthcare	No direct results determined
Quality of healthcare	Unchanged
Availability of over-the-counter drugs	Unchanged
General healthcare indicators	Improved, due to more balanced diets and improved food accessibility. Reduction in weight related diseases and malnurishment.
Distance to health care	Unchanged
3. Education	
Availability of private education	Unchanged
Quality of private education	Unchanged
Public education indicators	Unchanged
Distance to education	Introduced nearby agricultural education.
4. Facilities	
Quality of road network	Overall car access reduced. Thus quality of network as we know it reduced
Quality of public transport	Unchanged. However, residents are more dependent on it.
Quality of international links	Unchanged
Availability of good-quality housing	Introduction of toolbox elements such as green facade or green house roof, can improve overall insulation. To truly improve residences more attention is needed.

Quality of energy provision	Improved. Introduction of sustainable energy sources on site, such as solar panels for residences and bio-energy.
Quality of water provision	Improved. Introduction of a more sustainable system. Water is processed on site, thus site becomes more independent. Water re-use is the norm
Quality of telecommunications	Unchanged
Job possibilities	Improved. Introduction of jobs concerning agriculture, transport, management, education and research.
Accessibility of nutricious food and drink	Highly improved. Residents can gain produce on site, as well as sell and exchange their own produce. Introduction of cooking workshops and activities also helps residents improve upon their diet.
Leisure and culture	Increase of agriculture, cooking and eating as leisure. Maintained all existing culture and leisure sites. Introduction of versitile open outdoor space, (bootcamps, theather, market or exhibitions)

5. Social cohesion

Diversity life phases	Focused on young adults, thus still slightly of balance.
Population density	Increased
Mutation rate	Unknown
Development households	Expectation is that young adults on site move to new building to give space to families or couples in existing residences.
Social cohesion	Expectation is improved. Activation of social and soft spaces as well as introduction of common care and activities should help residents connect over a topic close to us all: food.
Tolerance	Unknown. Expectation, slight improvement, due to social cohesion.
Social or soft spaces	Reduces amount of social space to give way for agriculture, but reïntroduced versitile public spaces. Maintained, core active spaces.

6. (Physical) environment

Mixing of functions	Introduction of a new function. However, area is not highly multi-functional as all focus is on agriculture and residential. Small mix of functions.
Green space (quality, proximity and accesibility)	Diverse green space, varies between type of produce grown as well as introduction of eco-system axises. Pathways make all spaces accessible.

Water (quality, proximity and accesibility)	Improved connection between canal and building in new design. Edge of waterfront is also used for food production.
(Micro) climate (heat stress, noise, air quality, wind, sun and shadow humidity)	Highly improved due to increased green. Air quality can be filtered via moss facade, but also by other plants in eco-system axis. Improved permeability reduces heat stress. Humidity will increase due to increased evapotranspiration, However, this is also what cools the area down. Elements such as food forests or fruit trees function as shadow patches in public space.
Accidents	Expecation is reduced due to lack of cars. However, possible increase due to unexpected railway incidents.
Car density	Reduced. There are no more cars in the area.
Abandoned buildings and waste space	All unused buildings have a new purpose. However, the old harbour building will not be actively visited by residents, due to its transport functions.
Pedestrian acces, routes, conflicts	There are clear routes for pedestrians, though the walking freedom has been limited to give as much space as possible for agricultural space.
Bicycle access	The area is accessible by biking over the raillines, but public transport and walking are more accessible.
Maintenance	Was already good, but system has changed. With more ground private, there is a possibility of relatively messy agricultural lands.
Proximity & quality of public or shared space	There is a variety of public spaces nearby. Here there is variety in grass fields, plaza's, playgrounds, or food related public spaces. The introduction of the new building also creates indoor public space, which is not only to go shopping but also to reside.

Overall there is a clear improvement in liveability in the area. However, there are also some norms that have changed such as the reduction of cars. These I see as an improvement in liveability and a necessity for our new cities. Though I can imagine that this is not for everyone suitable, specifically for people with a lower mobility. Thus for them the liveability in this area has reduced.

This emphasizes how context dependent liveability is. In this research and design proposal I focused on existing indexes, to go through the idea that urban agriculture is a "perfect" solution that only improves life for everyone involved. In reality, it is a possible solution with a lot of qualities, that should be implemented with care and embraced by those involved. Otherwise, no social improvements will occur.

Lastly, the design could further improve the liveability of the area, by implementing the toolbox thoroughly into the existing buildings, as this is now only done superficially.

14. Atmospheres

South side

Waterfront

North side

The Food forest

Atrium

Residences

Central space

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