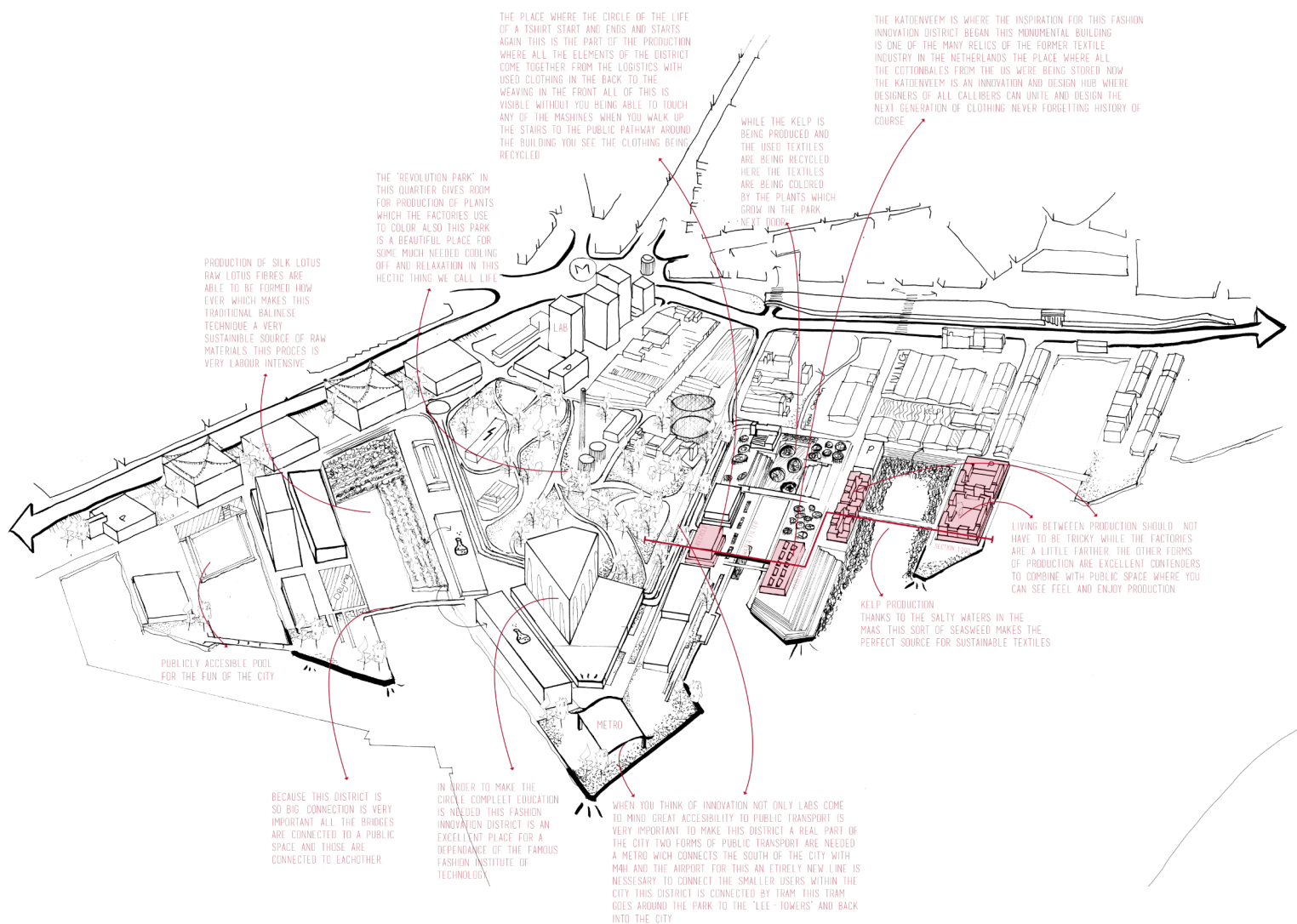


Productive City M4H

Rotterdamse Academie van Bouwkunst
Spring semester 2022



An overview of the Textile Innovation District by Marina Samveljan as a part of her project "The fifth revolution".

Productive City M4H

The studio “Productive City M4H” in the spring semester 2022 at RAvB aimed to translate the agenda of a circular economy into new concrete urban and architectural typologies within the M4H district in Rotterdam. The main goal was to propose a mixed-use ensemble with program and urban qualities supporting the goals of a circular economy and development of a lively productive city.

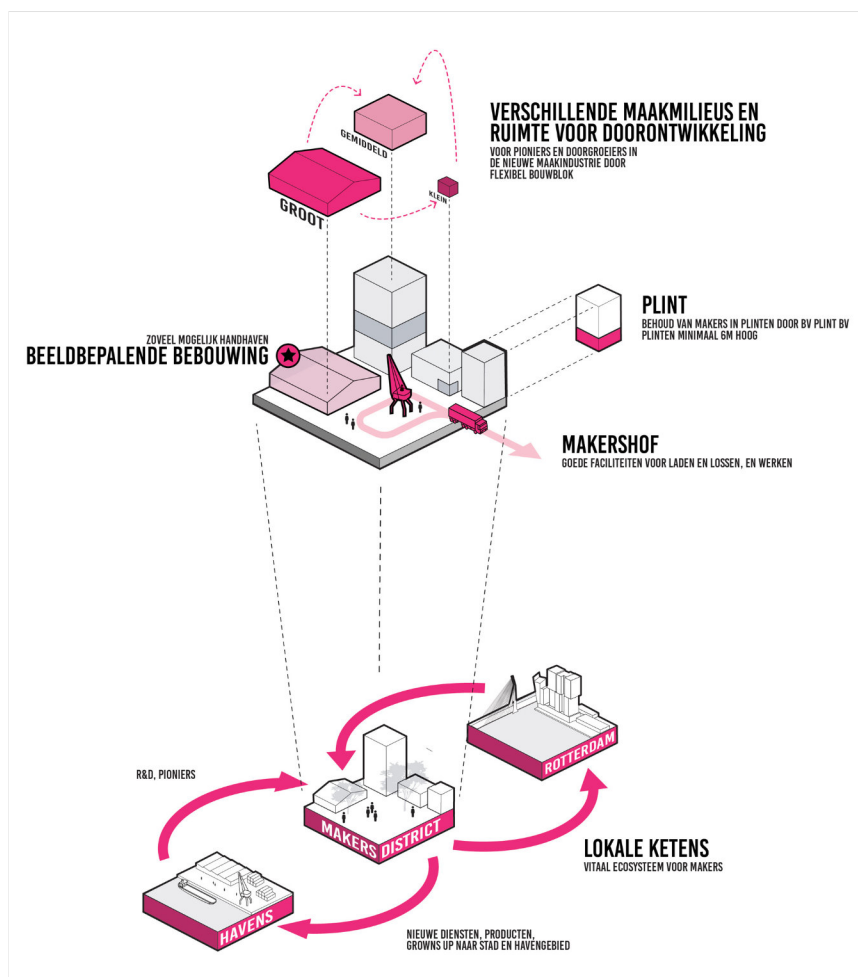
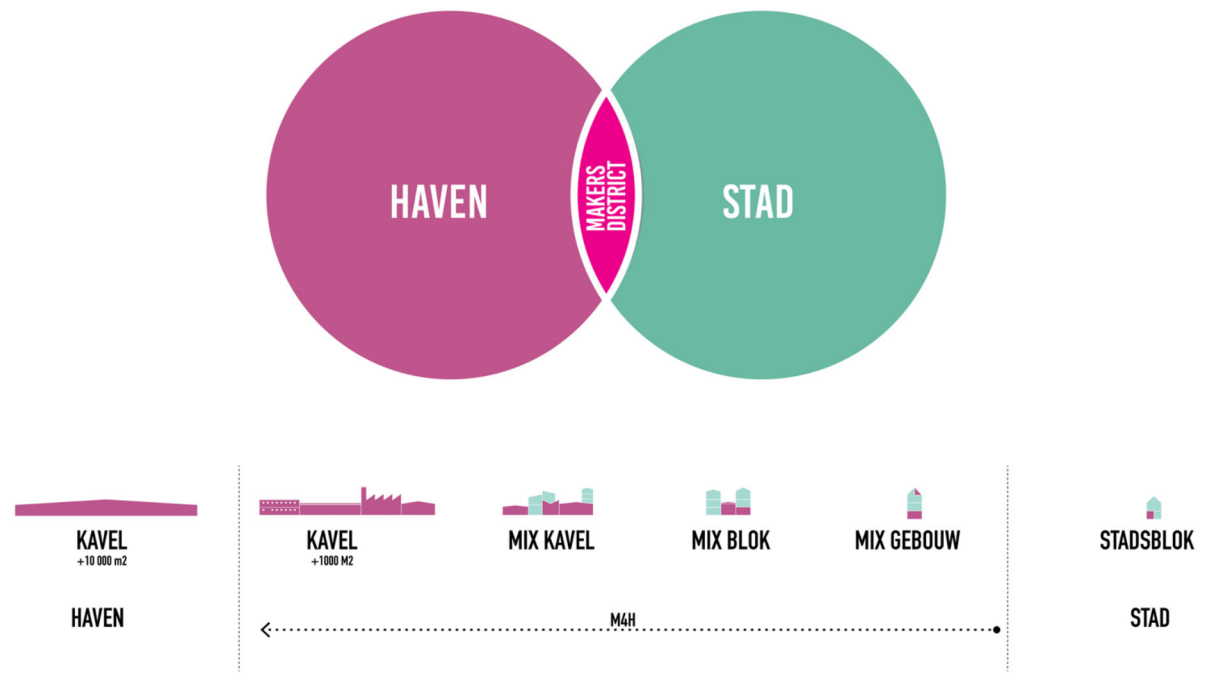
The motivation for the studio was a rising pressure on available urban space leading many industrial sites to be redeveloped into residential areas and integrated into a cities’ fabric. During this process, and in the era of climate change, it is important to focus on innovation, strengthening local economies and introducing circular solutions. Having these goals, local governments look again at the value of including urban manufacturing in new developments and protecting its presence in current locations.

Due to the energy, materials and climate transition, environmental laws will soon become stricter. This offers opportunities for shorter, closed production processes. Circular chains are most promising in places where many people live: in and around the city. This is also a chance for new employment opportunities and development of education fields. At the same time, the way in which people live and work is changing and with it the dynamics of the entire neighbourhood. In this context and with the aim of a circular economy, the question arises: what kind of productive spaces do we need in our future cities?

The task of mixing living and urban manufacturing can become an opportunity to look for concrete answers to save energy, materials and introduce circular ideas. It is an invitation to explore how different functions and users can benefit from each other. It is also a search for spatial solutions that define and enable certain activities on one hand offering flexibility, on the other protecting affordable workplaces.

The M4H district is already transforming. The district is located where the city and port meet, therefore it benefits from the best of both worlds with a huge potential for productive functions. The M4H ‘Ruimtelijke Raamwerk’ gives a framework and strategy for the new Innovation District. It was also a starting point for the studio.

During the course students created manifestos for the future productive city, which were translated into a visions and the programs for productive ensembles. New typologies were developed in order to support circular economy and synergies with other functions. Students, through research and analytical studies of the project location, specific type of manufacturing and spatial conditions of existing buildings, identified what elements, programs and typologies serve these ambitions and which ones were missing or should be modified. Personal positions towards the theme of future productive cities were be translated into physical models and drawings of the new productive mixed-use typologies.



Productive exchanges

The studio “Productive City M4H” consisted of three parts: 1. Manifesto (ambitions, research and analysis) 2. Productive Neighbourhood scheme (programme, circular flowcharts and sketch design), 3. Ensemble Zoom-in (development design and physical model). For the course we assembled a multidisciplinary team to guide students throughout the challenging topic of creating a productive city. Izabela Slodka and Hein Coumou were responsible for the overall structure of the studio and the design part. Federica Zatta was a research teacher for the manifesto and Christianna Tsigkou a communication teacher helping with the last phase: the model making.

We used the first part of the studio to create “productive pressure-cooker” with a series of conversations and lectures about production in the city and mixing living and working. We invited experts in the topic from the Netherlands and abroad:

Annette Matthiessen - senior urban designer at the Municipality Rotterdam, working on the future development plans for the M4H. She elaborated on the past studies concerning this area, elaborated on the Delva’s plan and city’s ambitions for the future innovation district.

Birgit Hausleitner - an architect, urbanist, and researcher, coauthor of the “Cities of Making” and “Liveable Manufacturing” research projects. She gave a lecture about urban strategies for including manufacturing in the city and patterns developed for the “Cities of Making”.

Mark Brearley - head of CASS CITIES and Professor of Urbanism, London Metropolitan University. Proprietor of Kaymet, London based tray and trolley manufacturer. He has worked as an architect in the urban transformation of many localities and, in particular, in matters related with wild areas and public space, the urban economy, and industry in the city. For the studio he gave a lecture “A good city has industry”, where he described various examples from London and Brussels.

Bernardina Borra - an architect, urban designer and researcher, an expert in co-operative processes in urban development. She is a co-author of the books “MensenWerk” and “Ecosystemen van Werk in de Stad”. For the studio she explained her research and various case studies in a lecture.

Junyuan Chen - Head of Superuse Studios China. She teaches research methodology at the Central Academy of Fine Art in Beijing and the FLOWS study programme at INSIDE, Master Interior Architecture at the Royal Academy of Art, The Hague (KABK). She explained the idea behind working and designing with flows.

The studio started with visiting the project location: M4H area. Existing functions and buildings like Keilewerf, Buurman, Voedseltuon or Keilepand were great showcases of combining manufacturing, social engagement and collectivity for the sustainable and circular productive city.



Fifty patterns for working with urban manufacturing developed for “Cities of Making” research.



Left: “Ecosystemen van werk in the stad” by Bernardina Borra and Gert Urhahn
 Right: Mark Brearley, architect and professor of urbanism, London Metropolitan University.

Learning from Brussels

In the studio we continued learning about a productive city from the context of Brussels. In Brussels, there has been a lot of attention paid to facilitate bringing production activities back into the urban zone, a trend supported by urban policies. We visited several locations in the various transformation areas of the city.

GreenBIZ - development consisting of workshops and offices for sustainable and innovative companies and production. Workshops units range from 120 to 550 m² and offer adaptable casco space with truck access and utilities. The project was developed by citydev.brussels specialised in affordable housing and mixed projects and is part of a large neighbourhood development: Tovoli GreenCity. It was built as a transitional space between production and living area. While there, we were shown around by Sandra Carrette from citydev.brussels.

BC materials - Project initiated by BC architects and studies with the aim to start up an urban mining process of a resource commonly considered as a waste: excavating earths from construction sites and turning them into building material. BC set up their own "mini" factory of bricks right next to their office. It is a flexible structure made of reused materials with a potential to be moved to another location. The process and final products were shown and explained to us by architects and manufacturers from BC.

Plusoffice architects - Architecture office based in Brussels. Together with Collectif WRKSHIP they conducted a research by design on the productive metropolis at Anderlecht and Brussels-North in the framework of the IABR-projectatelier Brussels in 2016. We heard about their findings and a recent project for making and living in

Biestebroekdok during a lecture by the office founder: Ward Verbakel.

Brussels Aquaponic Farm - BIGH Anderlecht - We visited a test site for aquaponic urban farming on the rooftop of Abattoir market. BIGH consists of a fish farm of rainbow trout, indoor hydroponic systems and outdoor roof gardens fertilised by rich in nutrients water from the fish farm.

We also walked through **Rue Heyvaert** full of car garages and related services.

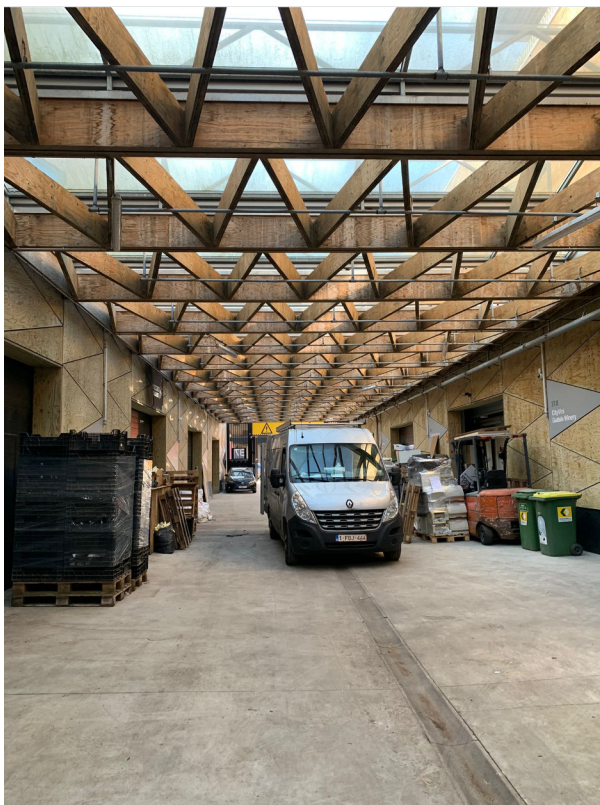
The new brewery for Brussels Beer Project (BBP) - located along the canal in Anderlecht within the rapidly redeveloping industrial zone of Port Sud. The building houses the complete beer production process, but is also open to the public. It is conceived as a compact and efficient industrial container, a rectangular box with an inclined roof that reveals its content and expresses the company's graphic identity, in the form of stripes in the characteristic colours of BBP beer labels. It was designed by OFFICE Kersten Geers David Van Severen and we were happy to see it just before the official opening.

We finished our trip by visiting **Rotor DC** - a cooperative that organises the reuse of construction materials and their open air shop.

The excursion to Brussels provided great inspiration for both teachers and students. The topic of a productive city became much more tangible and concrete and the mix of projects and solutions we saw illustrated a broad scope of the subject. Throughout the course of the studio there are several elements in students' projects influenced and inspired by Brussels' lessons.



Material Village by TETRA Architecten.



GreenBIZ logistic inner street.



Visiting mini factory by BC materials.



Brussels Aquaponic Farm - BIGH.



Brussels Beer Project's new brewery by OFFICE Kersten Geers David Van Severen.



Group photo of students and teachers at the Brussels Beer Project location.

IDEAS FOR PRODUCTIVE CITY M4H

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Juxta/positions

By Rik Blank

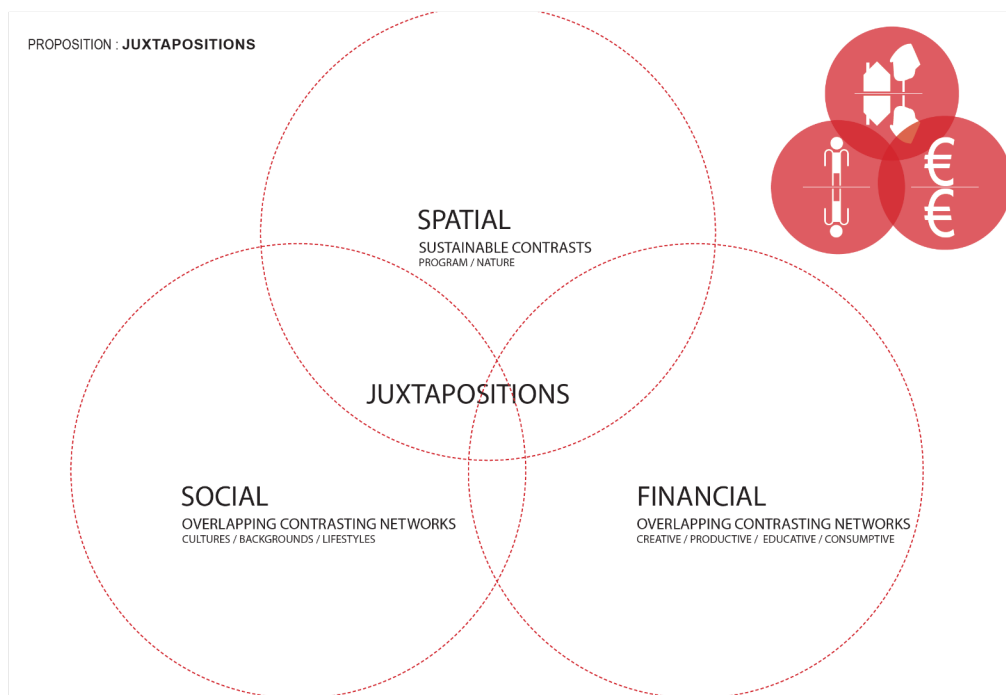
Rik Blank started his project with the site visit and an insightful observation: in the existing industrial terrains built structures are juxtaposed with nature and each of these elements is trying to dominate the other. He stated that there is an opportunity in looking closer at these coexisting contrasts and in consciously juxtaposing spatial typologies, social and financial networks in order to look for new synergies sparking cohesion and innovation.

Rik started with thorough analysis of the social, historical and spatial context in search for a circular anchor of transformation. Surprisingly: one of the most sustainable materials for the building in the new Innovation District could be recycled concrete. In M4H there is potential 314.400 m3 concrete waste, all re-usable for its cement and

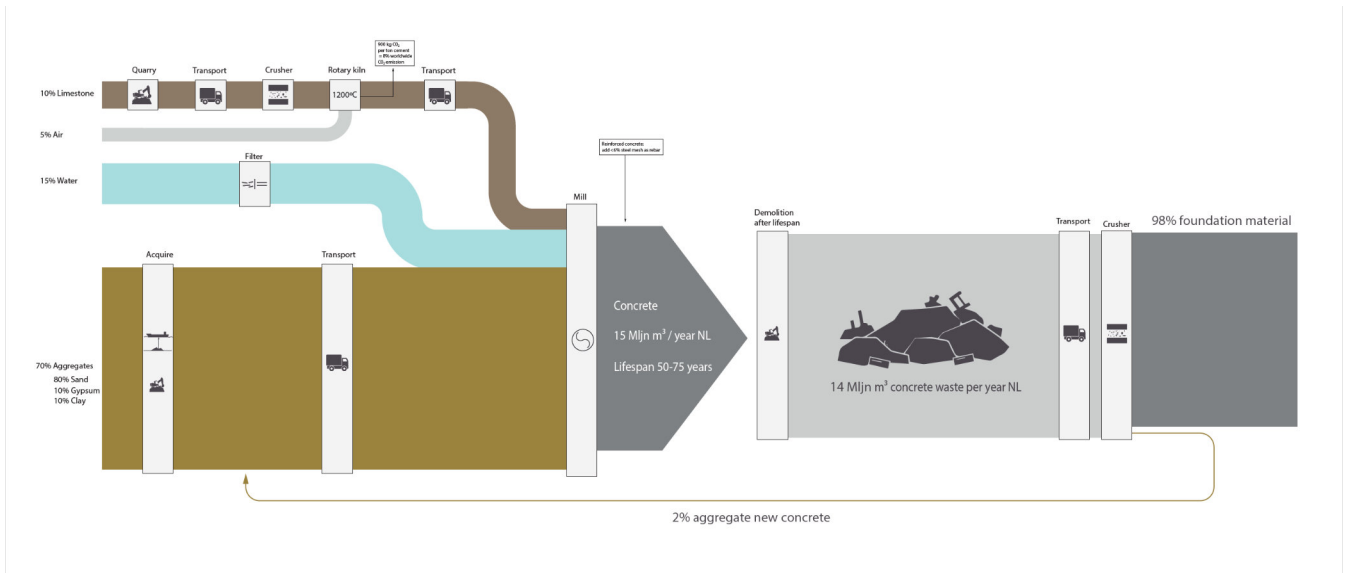
aggregates. In Rik's scenario the project site becomes an urban mine. Reused concrete will be made into modular load-bearing base grid, prefabricated in a temporary concrete recycling factory in Ferro-Dome and assembled on-site.

The grid will be added on demand and provide a flexible stable framework for secondary horizontal structures, built programs and public spaces. The project allows for the delta landscape to take over the ground floor creating space for lush greenery, animals and varied programs: sports, arts, culture and food production.

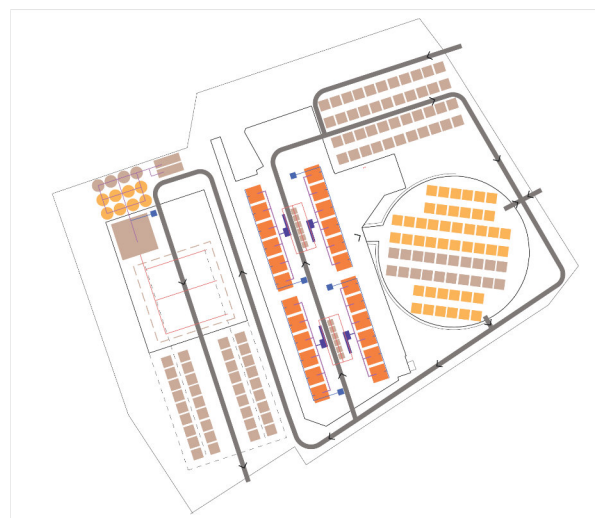
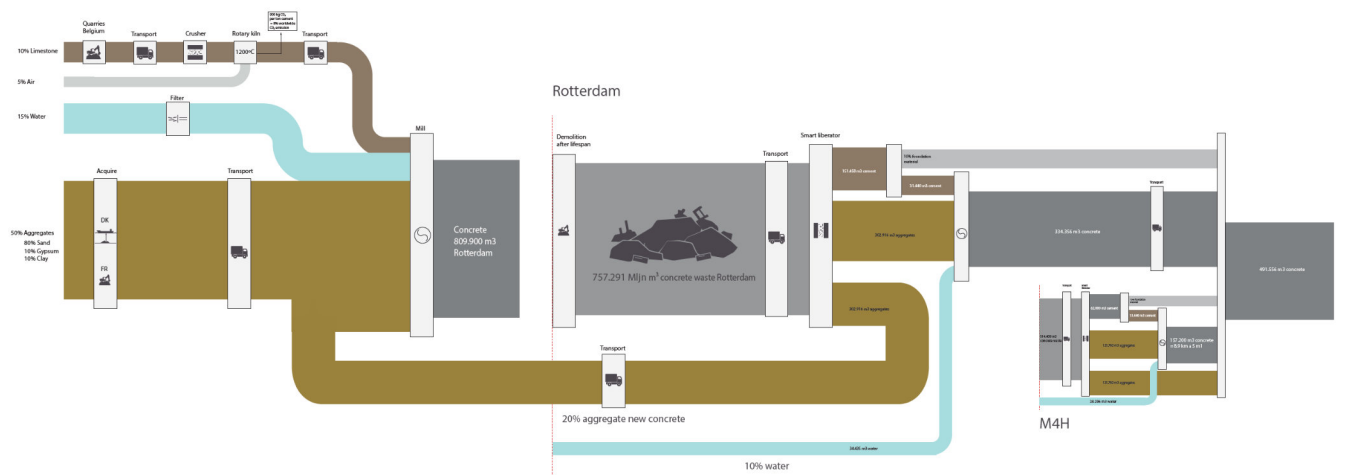
The project proposes a feedback loop of rents and profits, providing free productive spaces, free education, free healthcare and a 64% cut in housing prices in 28 years.



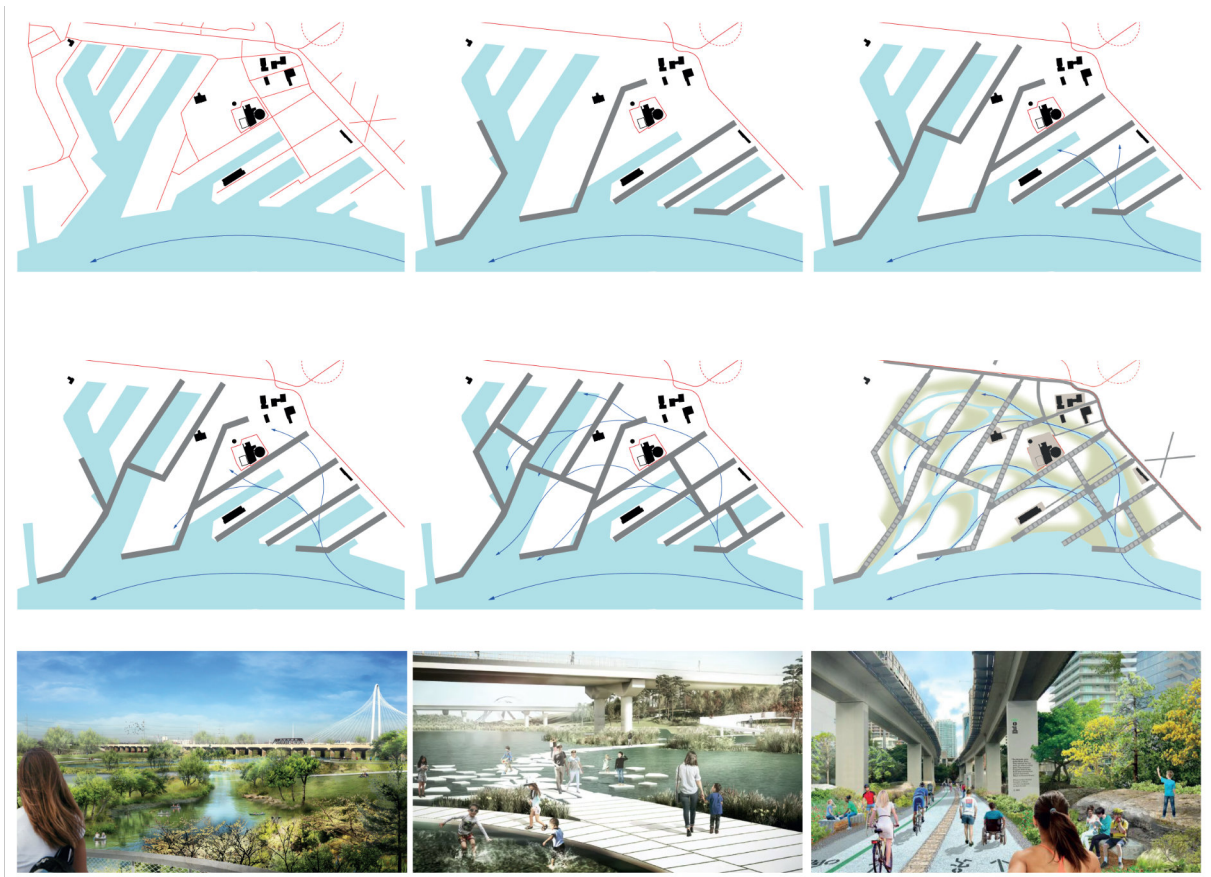
Three juxtapositions - a starting point of the project.



Above: Regular material flow of concrete factory.
Below: Redesigned circular material flow of concrete factory for M4H.



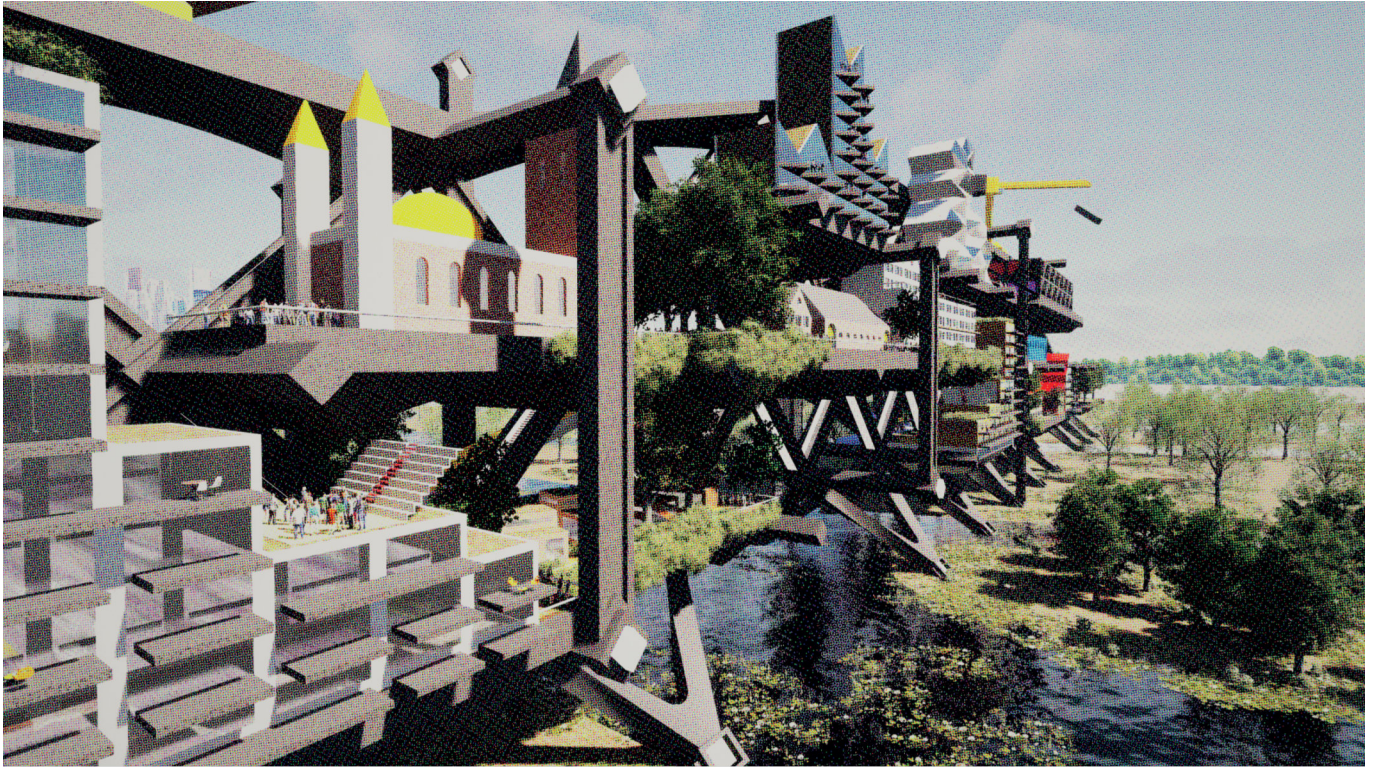
A scheme of the temporary concrete factory in Ferro Dome.



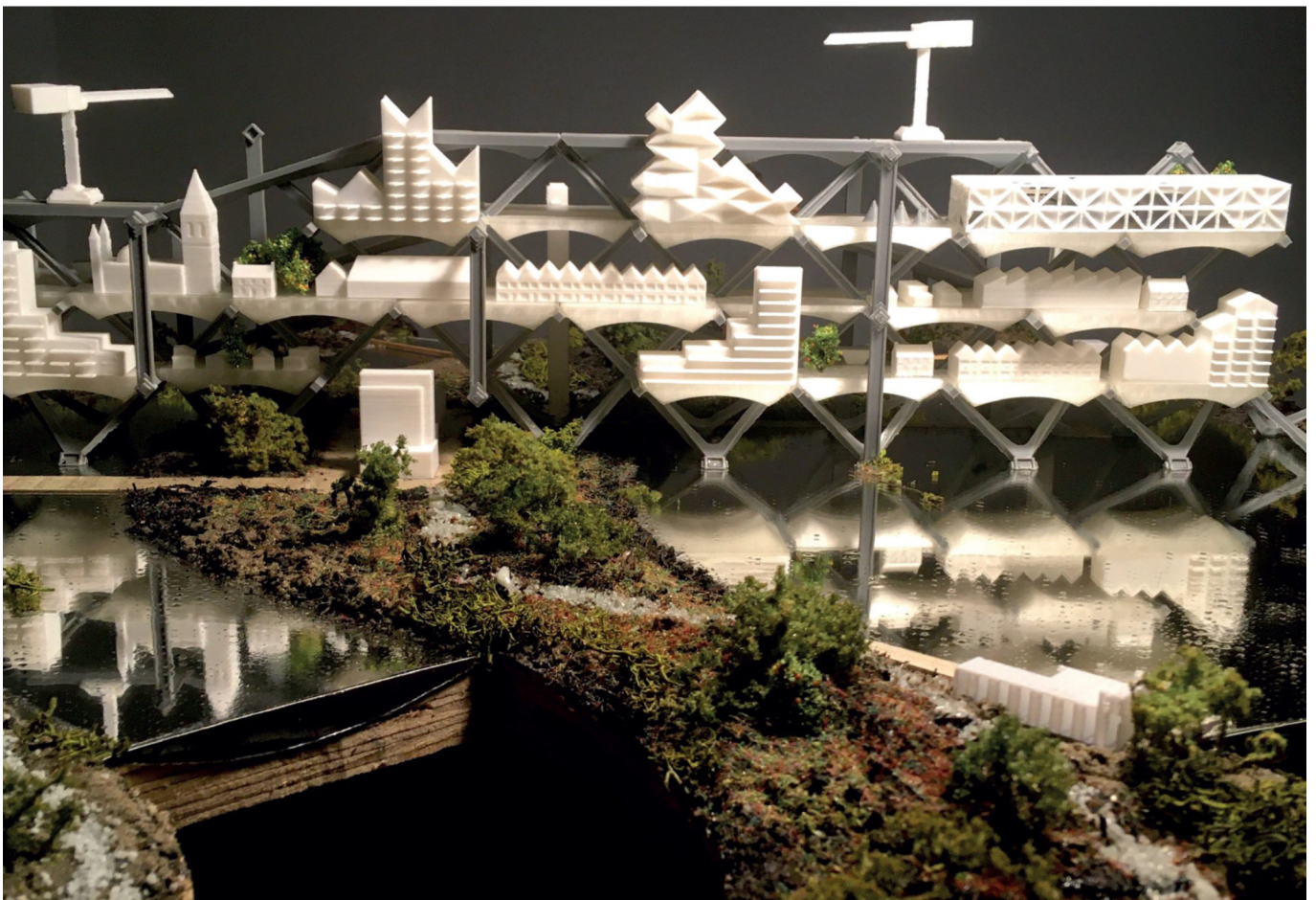
Transformation phases of the post-industrial terrain into a river delta landscape.



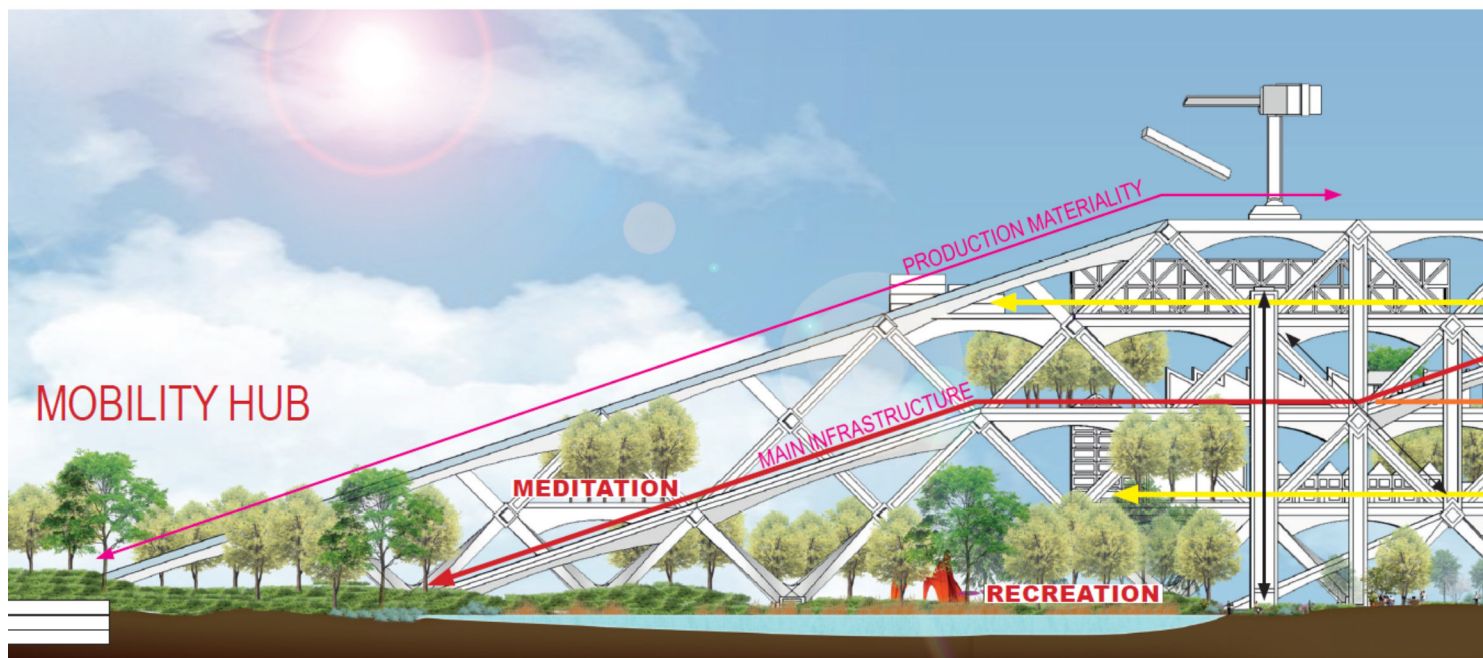
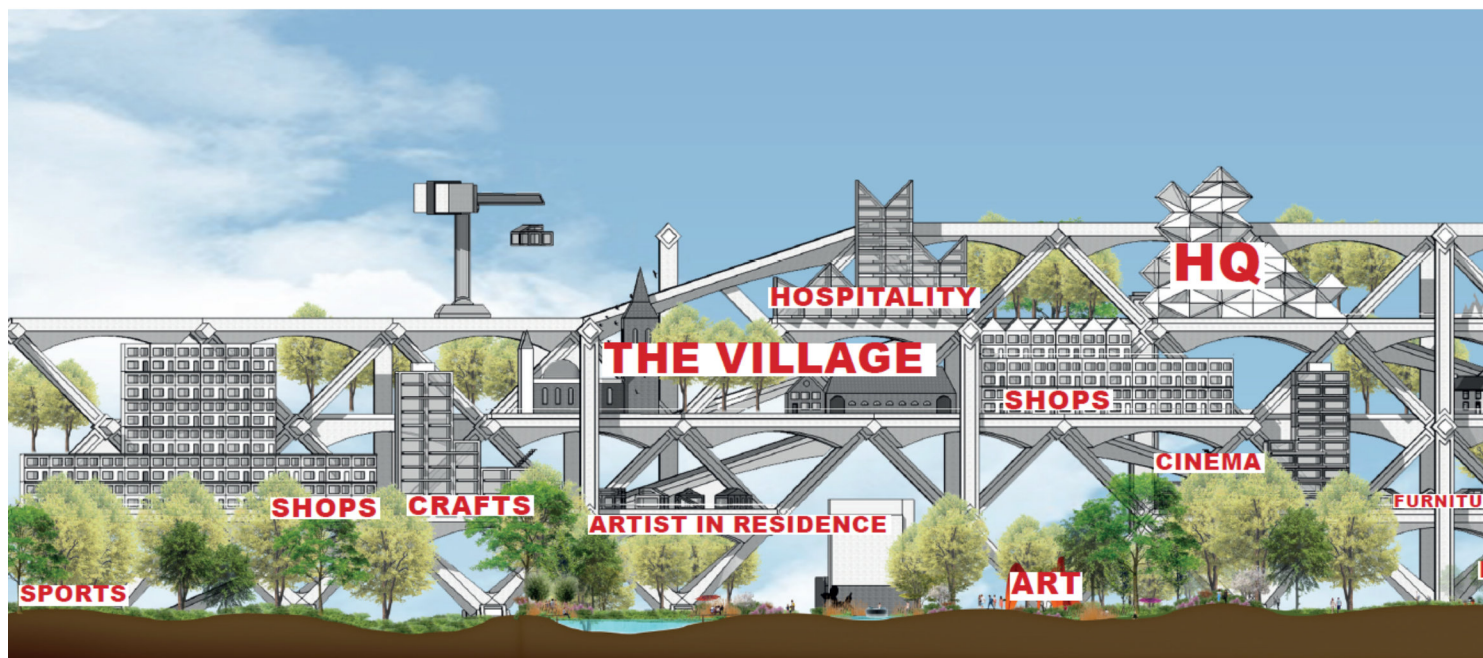
New bridge-like structures connecting M4H with adjacent neighbourhoods.



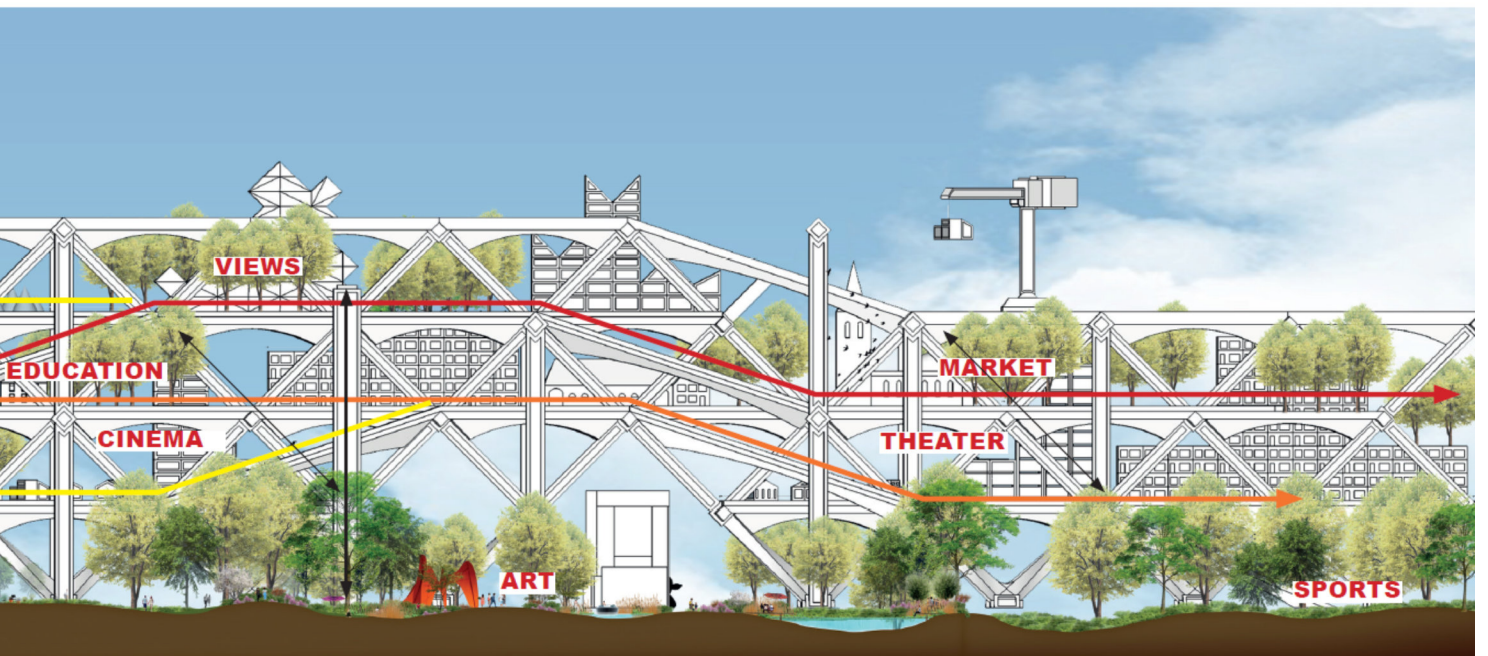
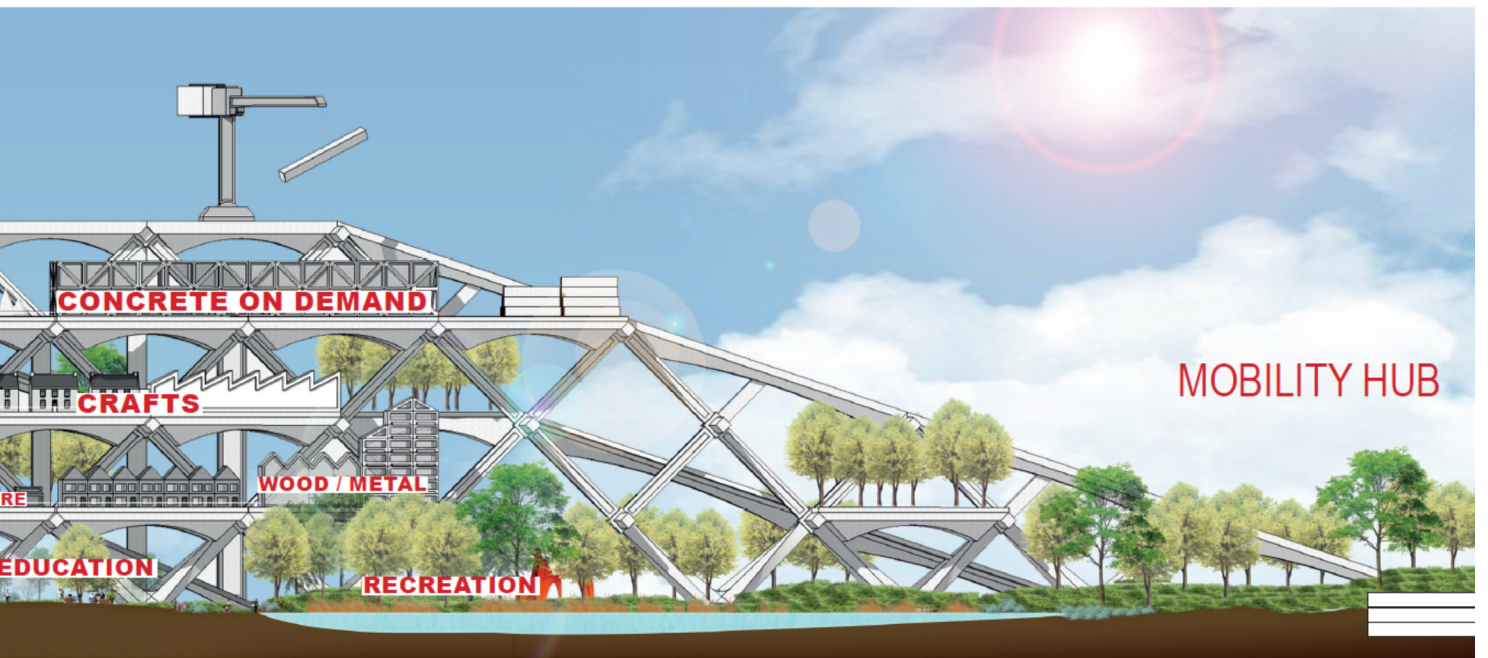
A view into the multi-level structure supporting various functions above the landscape.



A photo of the physical model of the project: main diagonal structure, horizontal beams supporting variety of building types and infrastructure.



Facade views of the new productive city.



Let's grow up!

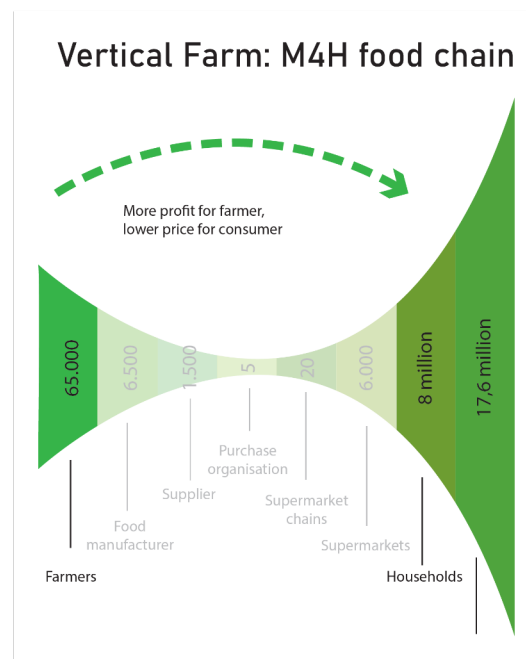
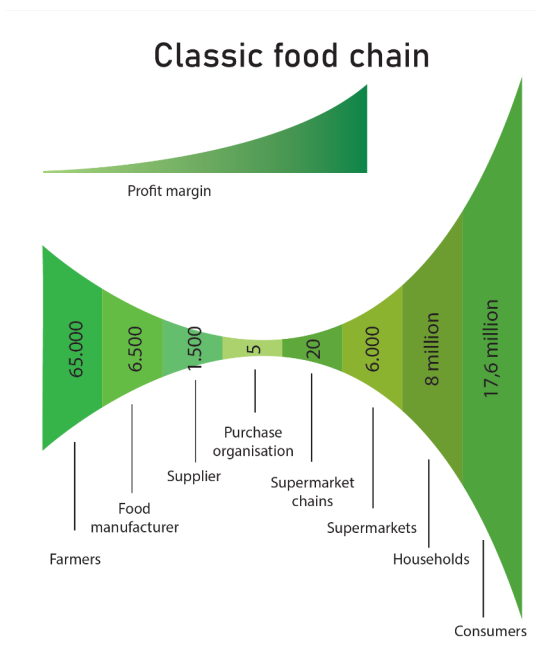
By Bart van Bragt

Bart van Bragt focused on the food industry and shortening the line between producers and customers. He looked around at his closest environment: his own fridge and nearby supermarket. Where are the basic available vegetables coming from? Bart argues that with the newest technologies, we could redefine the existing relationship to food for the benefit of the future inhabitants of M4H.

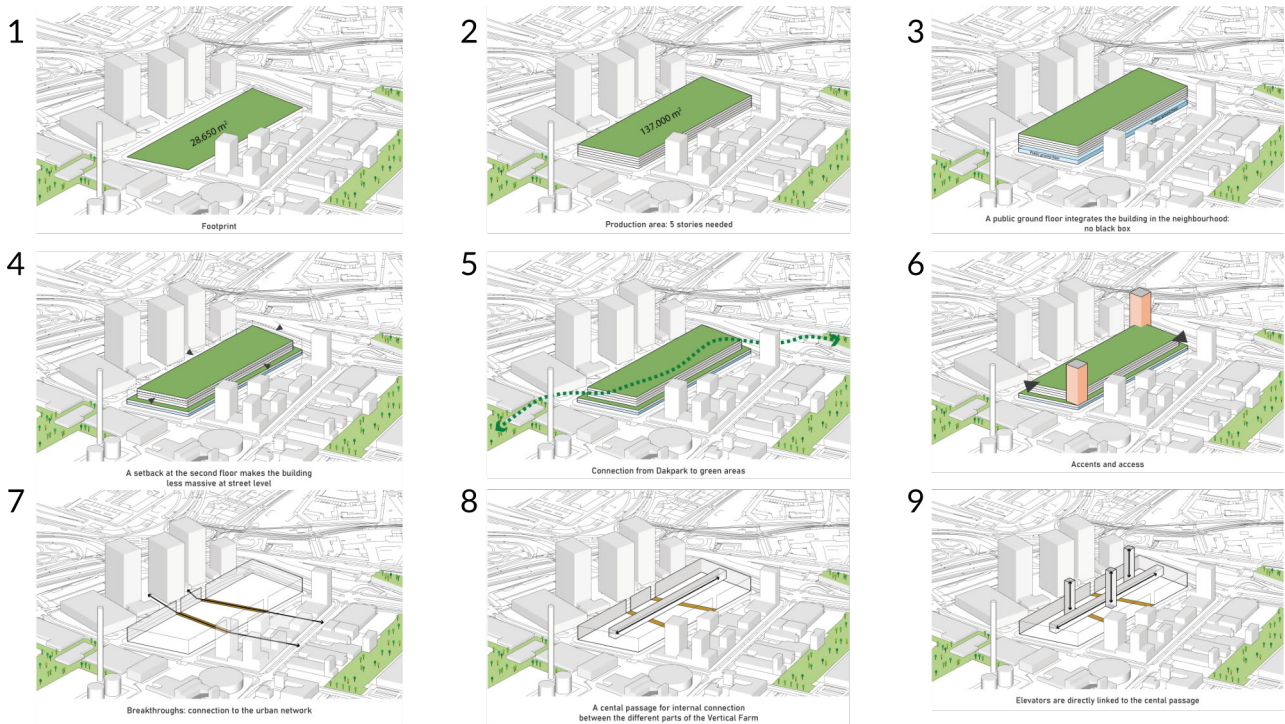
Bart looked closer into vertical farming. This new way of growing food is becoming more and more promising. Small footprint, minimum water usage and almost no product waste makes it an interesting alternative to traditional greenhouses and a technology that

could allow food production within dense modern cities. The problem remains an enormous energy requirement, but it could be offset by a smart integration of solar panels and a reuse of produced heat to warm up nearby houses.

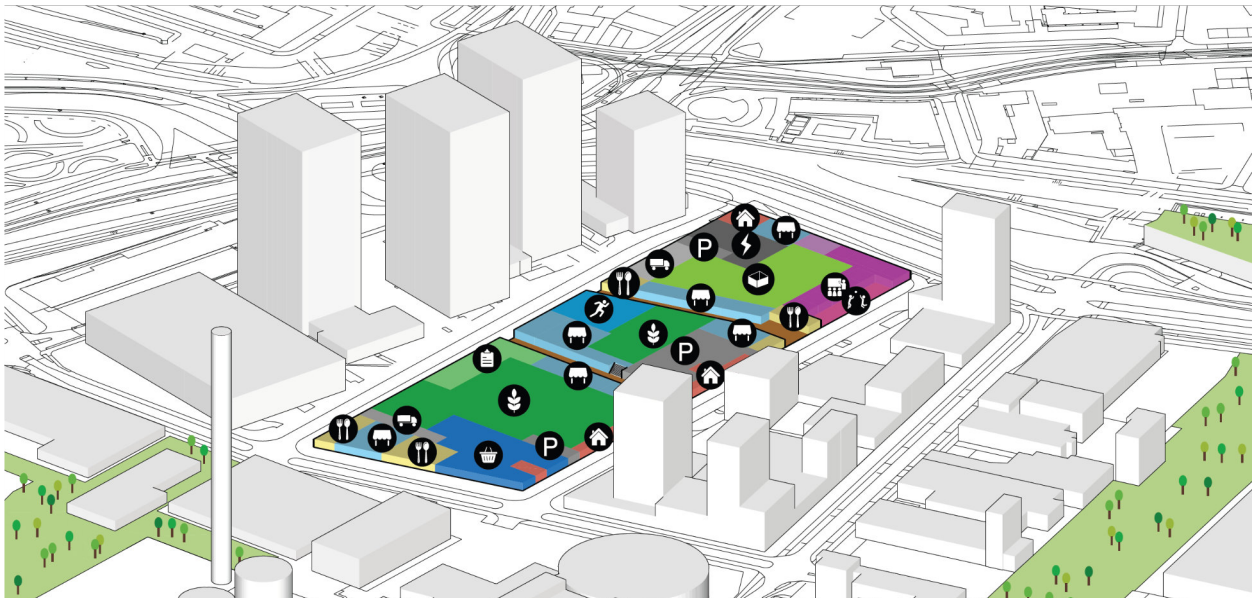
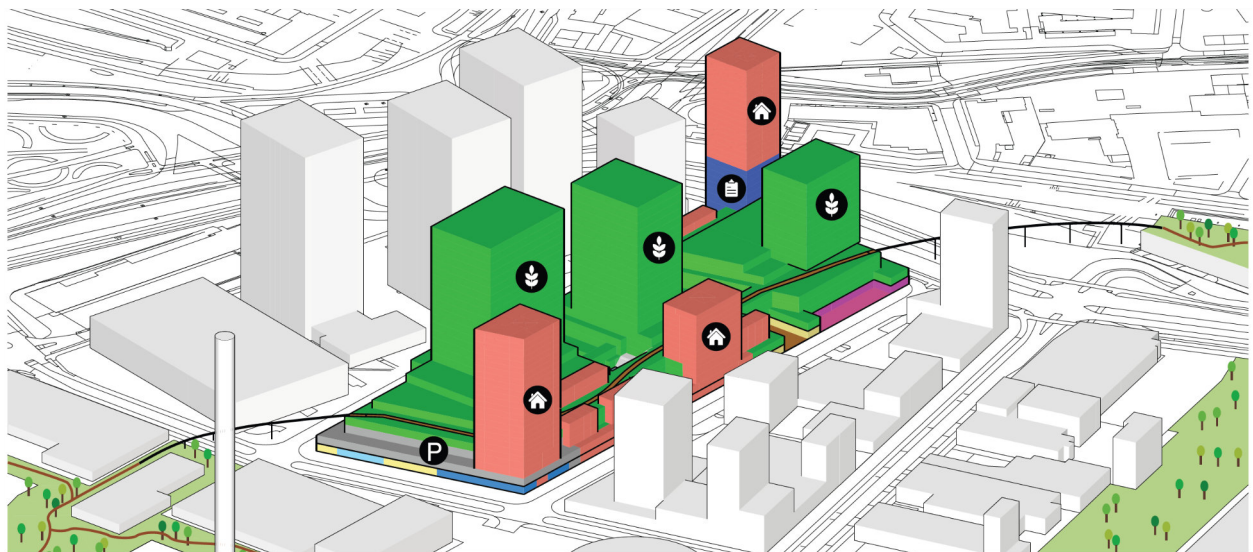
Carefully calculated square metres for different programs were placed at the site, right next to Marconitowers and, step by step, formed to respond to the context, sunlight conditions and accessibility requirements. Finally, the plinth and the towers became a mix of vertical farming, housing, services and commercial functions. The whole assembly proposed a lively and green destination in the city.



The advantages of vertical farming vs classical food distribution.

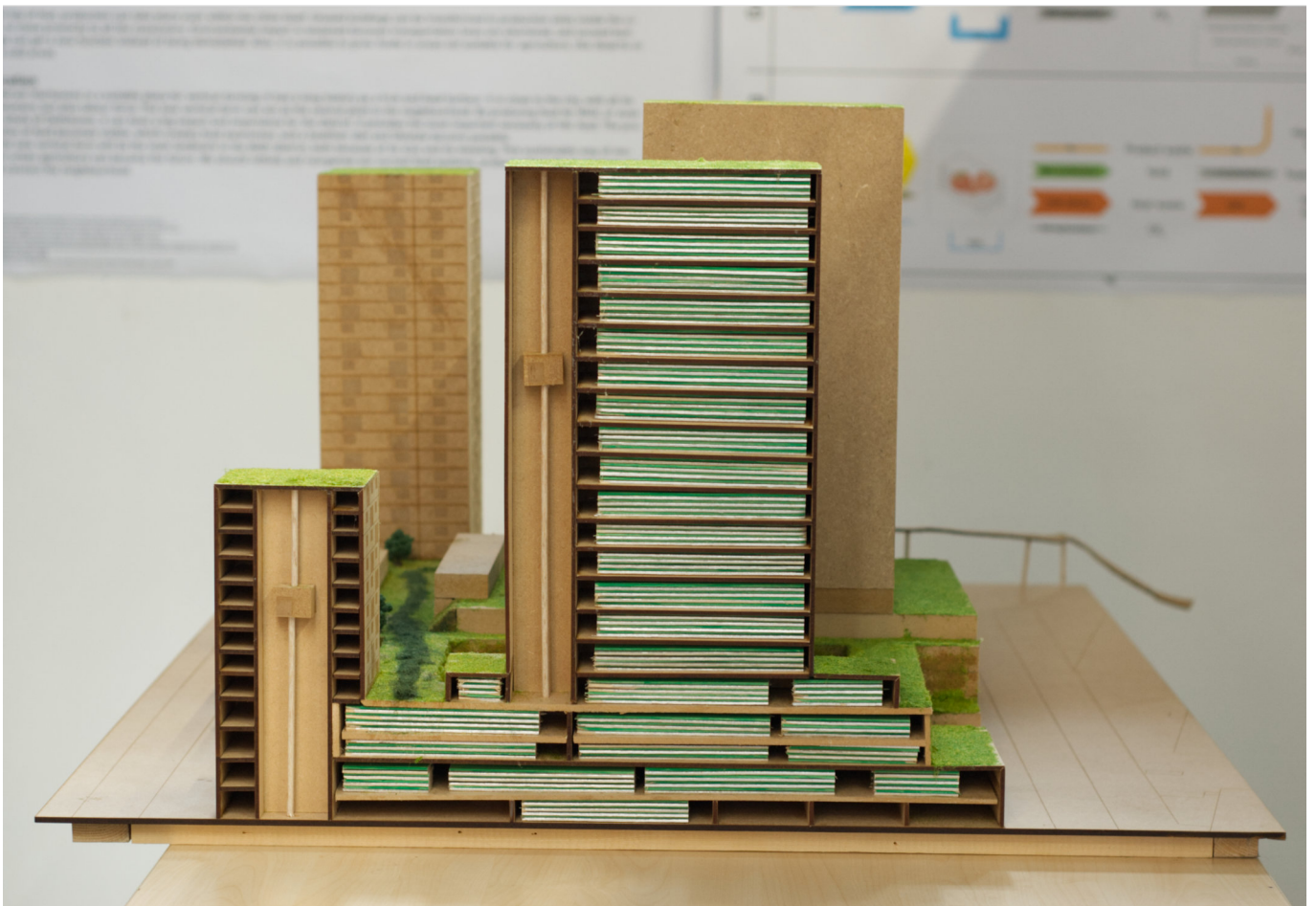


Above: step by step diagram of the new productive food quarter.
Below: functional diagram of the assembly and the plinth of the development.





Above and below: Photographs of the section model of the fragment of the proposed development. Section through the housing and vertical farm towers, scale 1:200



Soil to bricks

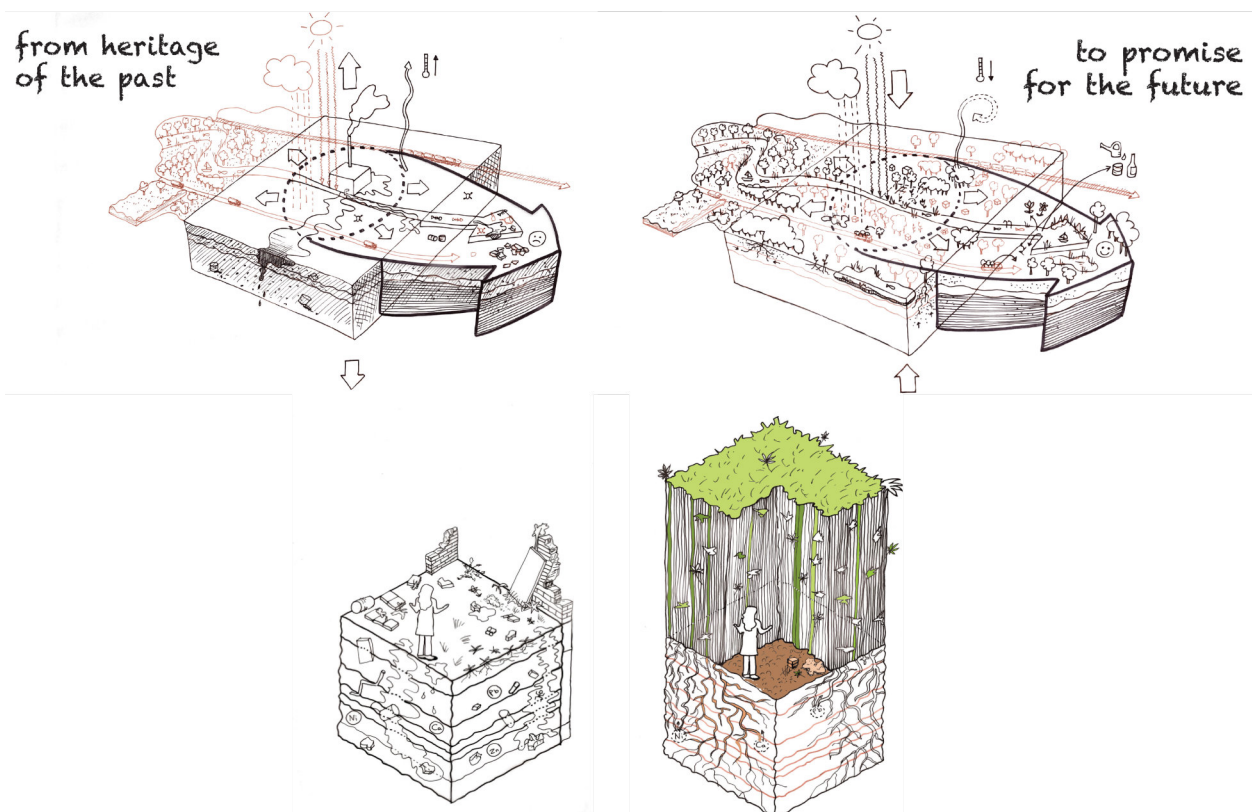
By Carla Lensen

Carla's intention from the beginning was to transform the project site into a healthy and clean environment. She wasn't fooled by a romantic decay of old post-industrial structures and empty landscapes. In her vision the transformation can't really happen if we don't start from the bottom, from cleaning the soil, only afterwards can we talk about creating a new piece of the city.

Careful research into various methods of removing pollution from the ground pointed out the plants that can help with that. The plants absorb toxins and store them in their stalks and leaves, making the soil healthier and cleaner year by

year. The problem that arises is the bio waste created in this process - is there a use for the polluted plants? Carla discovered that hemp can be a key. This fast growing plant can be used for making bricks for future M4H houses or isolation material for other Rotterdam neighbourhoods.

The space for a hemp processing factory is there, but how does it fit into the future M4H neighbourhood? Carla proposed to create the Ecotone: a zone to interface areas of working and living, with smaller-scale production buildings, education, shops and different typologies of public spaces surrounding main production zone: the Galilei Park.



The main ambitions of the project: transformation of polluted soil.

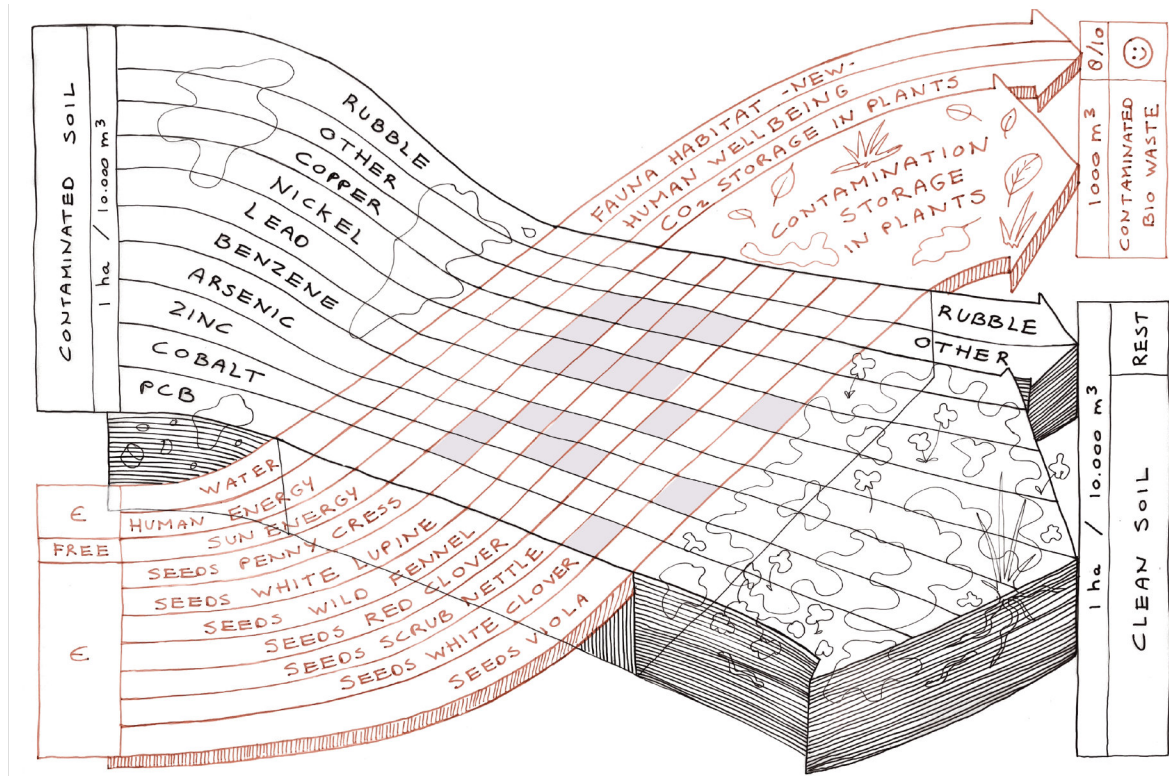
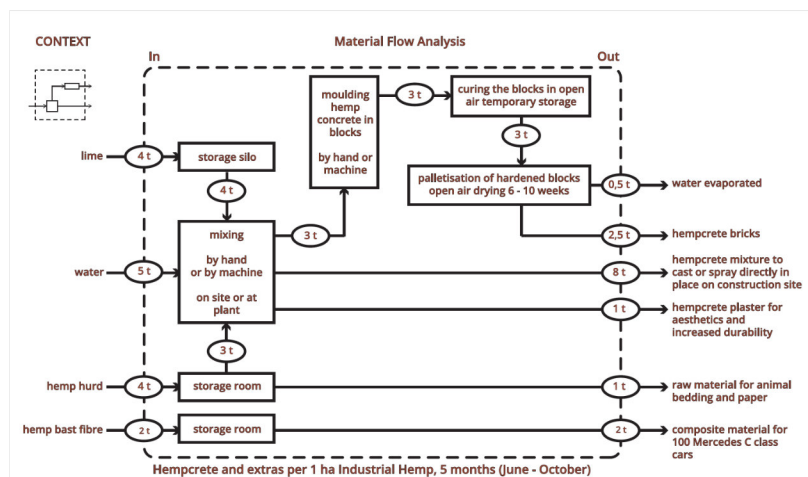
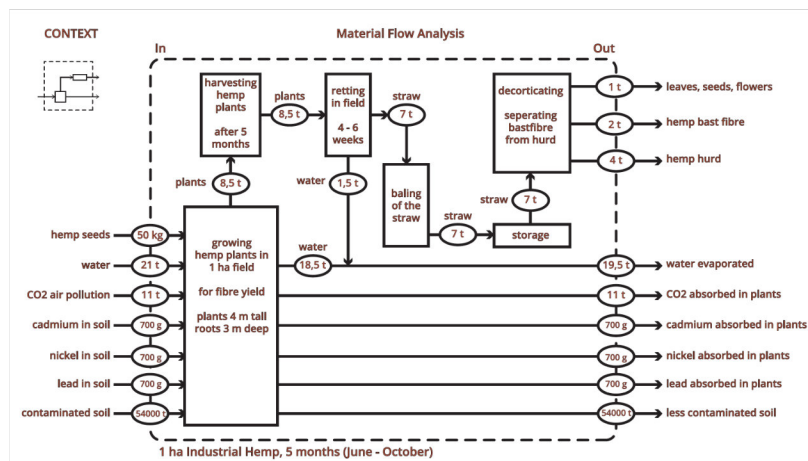
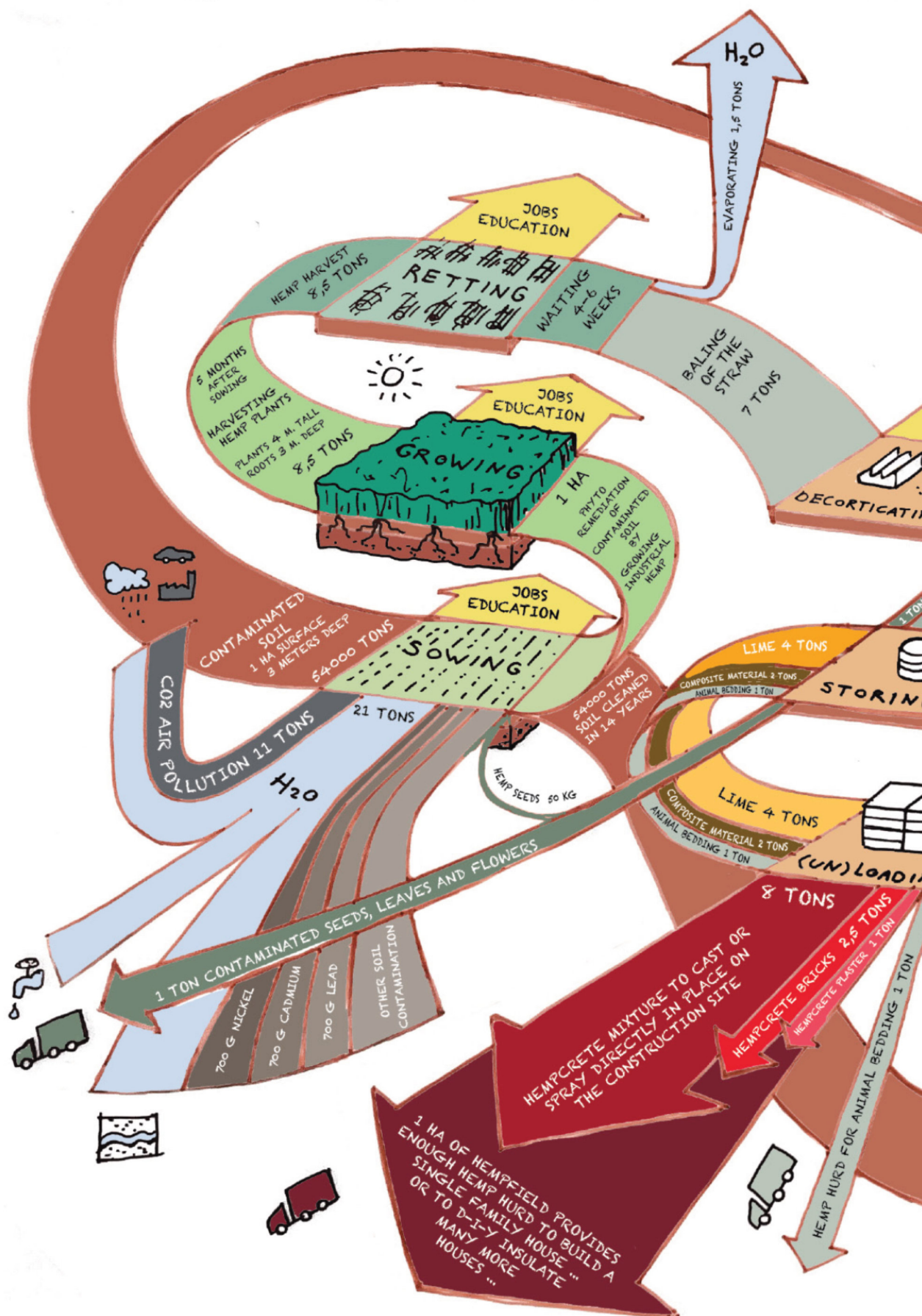


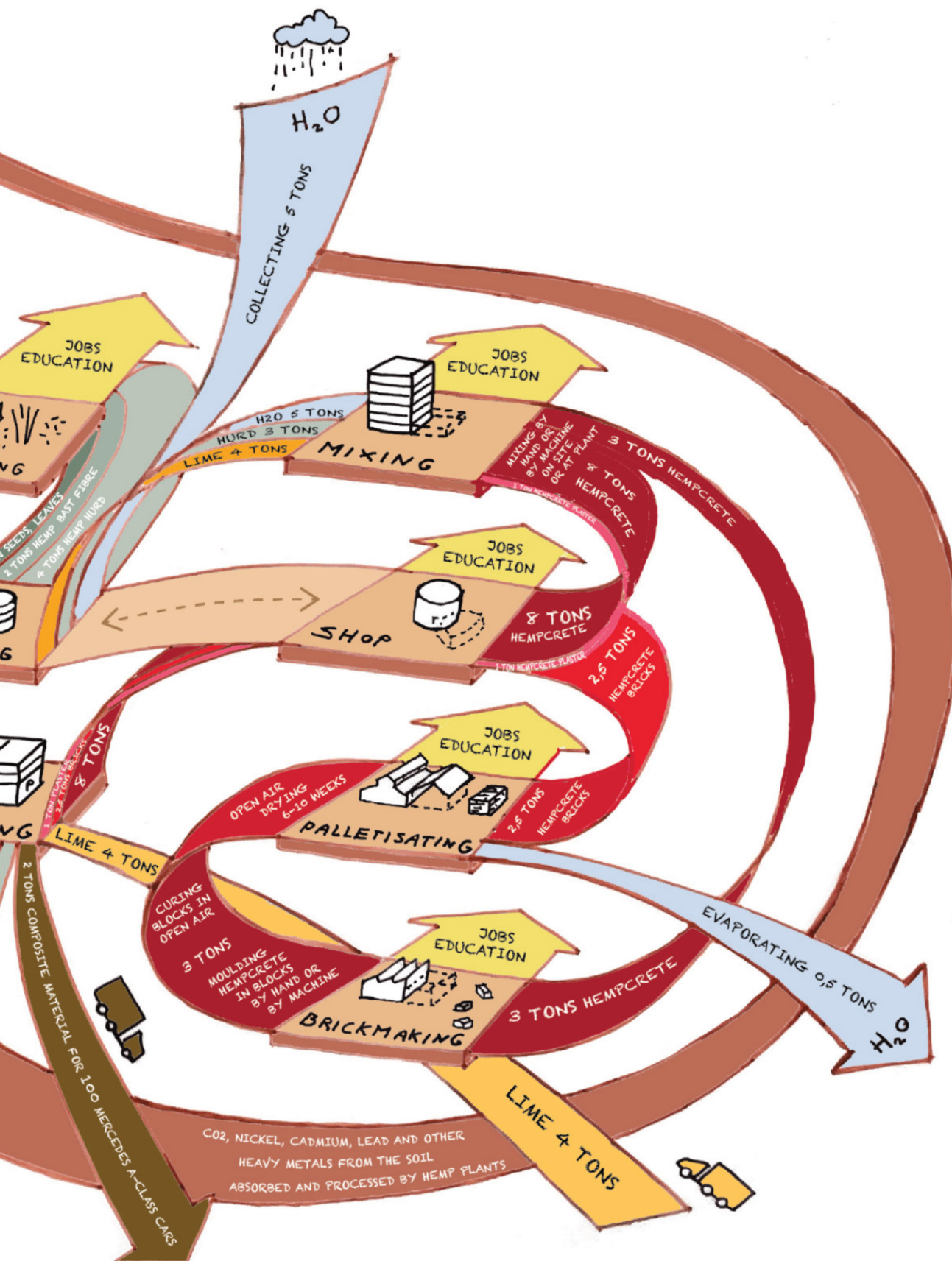
Diagram linking various pollutions with plants that are able to absorb them from the soil.



Material flow analysis of the 1 ha of industrial hemp field and hempcrete production.



Visual flowchart of hempcrete production and potential circular opportunities (calculated for 1 ha of hemp field).



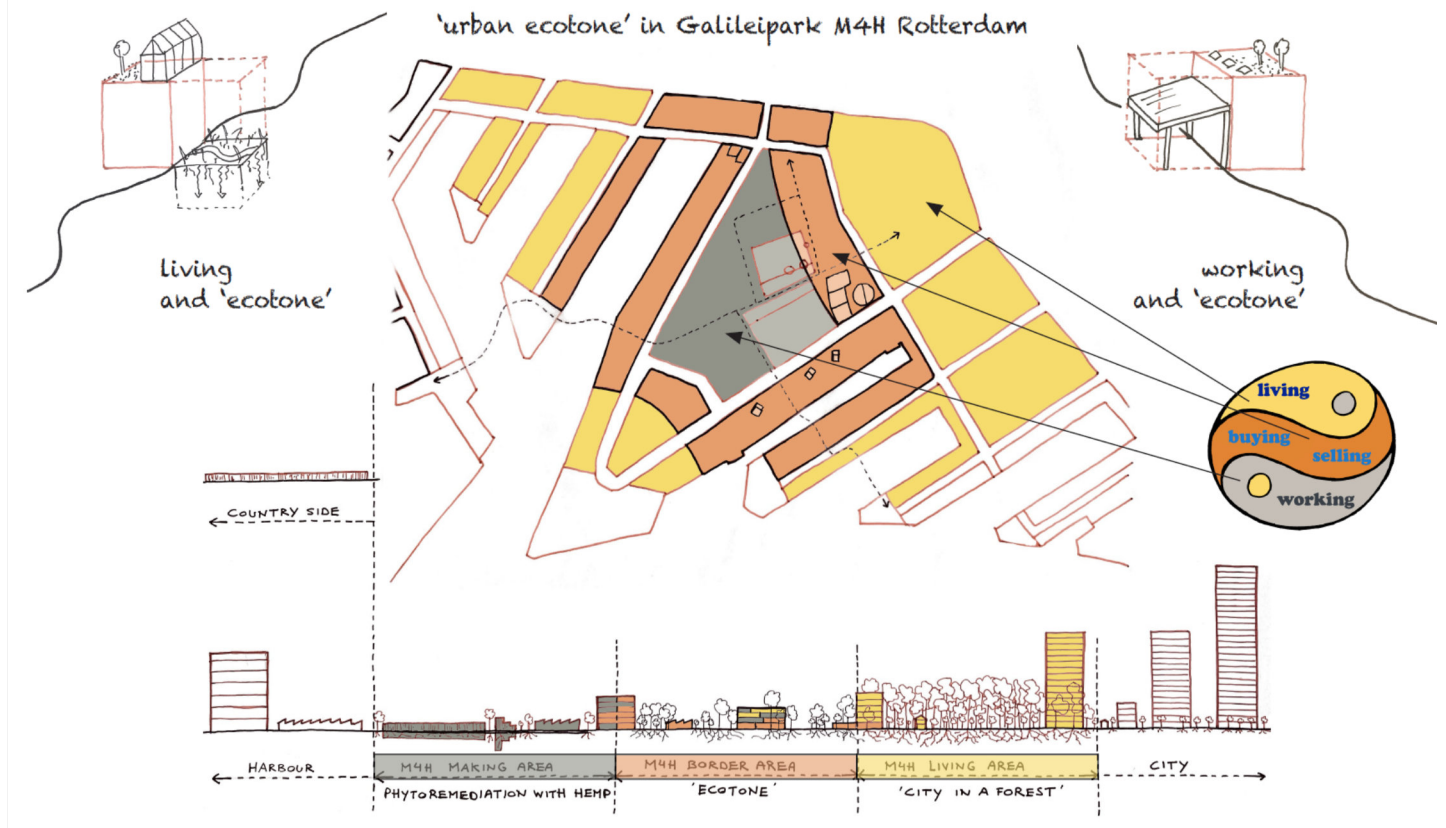


Diagram illustrating an idea for "Ecotone" : an interface zone between living and production.



Plan and section of the fragment of the M4H area, including hemp processing factory, main public plaza and housing in the park.



Idea model illustrating the timeline of hempcrete production.



Physical model of the Ecotone area between production zone and housing, 1:200 scale.

Peperhood

By Ties Kweekel

Ties Kweekel was fascinated with the overwhelming scale of industrial buildings found at the M4H site. Many of them are just big long boxes without any relation to the context or view inside the building. At the same time they are characteristic for this area, fitting perfectly into long piers of the industrial man-made landscape. At the same time Ties explored an idea of a future productive city: a city where modern values like social engagement, sustainable living or circularity will become more and more prominent and will require new vocabulary. A newly invented dictionary became a guide for designing new typologies for living and production.

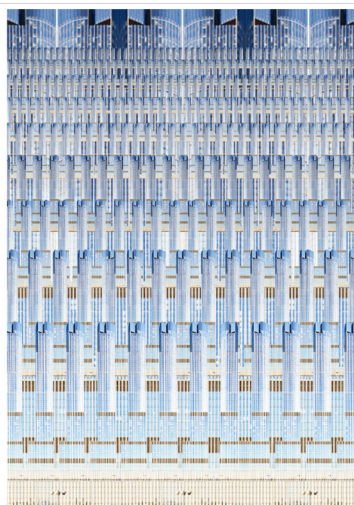
Ties made a convincing argument for designing a paper factory - linear production facility that could be combined with housing. With the

current distribution routes in the country, introducing a scaled down paper factory in Rotterdam could reduce many kilometres of transportation, could use nearby waste products from wasteland greenhouses - tomato leaves for fibre and water from Maas River. In Paperhood the bio-gas generated from anaerobic tank needed for cleaning the water is used to heat up other programs, for example a ground floor sauna.

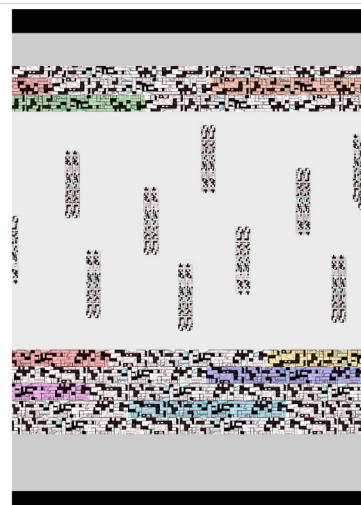
Ties' proposal consists of stripes of different typologies for mixed-use functions alternating with stripes of outdoor spaces: for public and collective, for living, logistics and commerce. Connecting different levels outdoor galleries are a reminiscence of the past cranes and machines characteristic for M4H. Production activities are displayed in the design, both in the facade and in the public space.



Industrial productive city

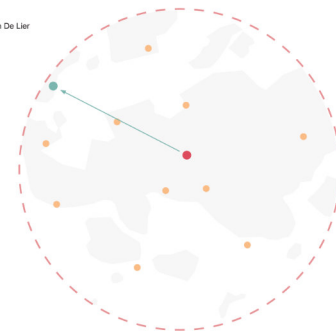
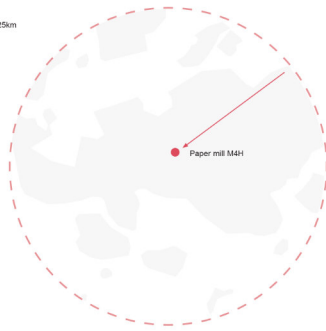


Cognitive productive city

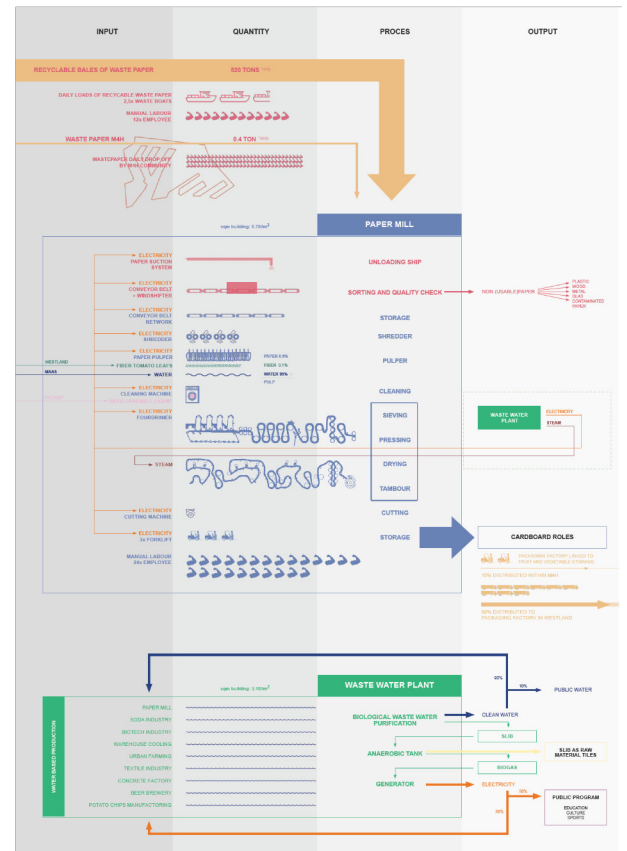
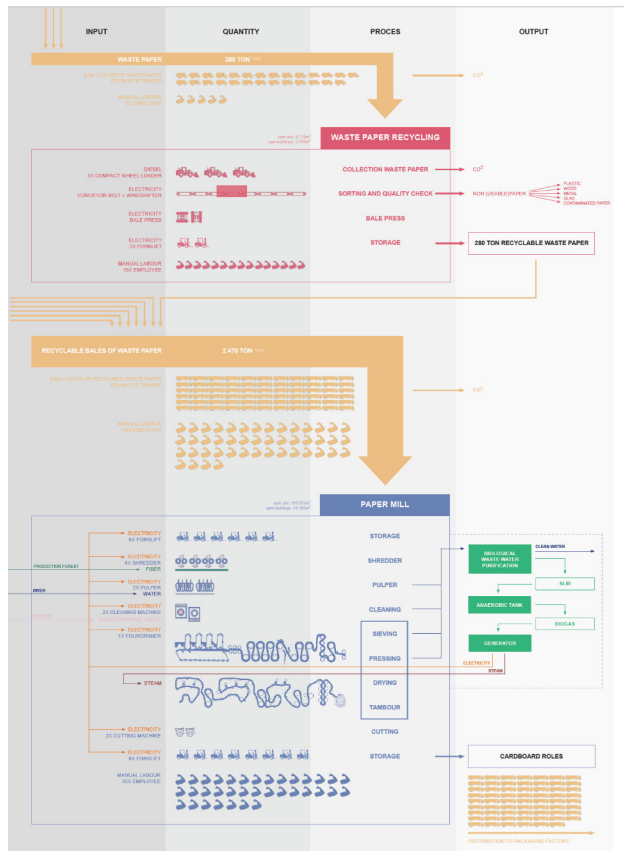


Compact Cognustrial productive city

Three types of the productive city: industrial (in the past), cognitive (current) and compact-cognitive (future).



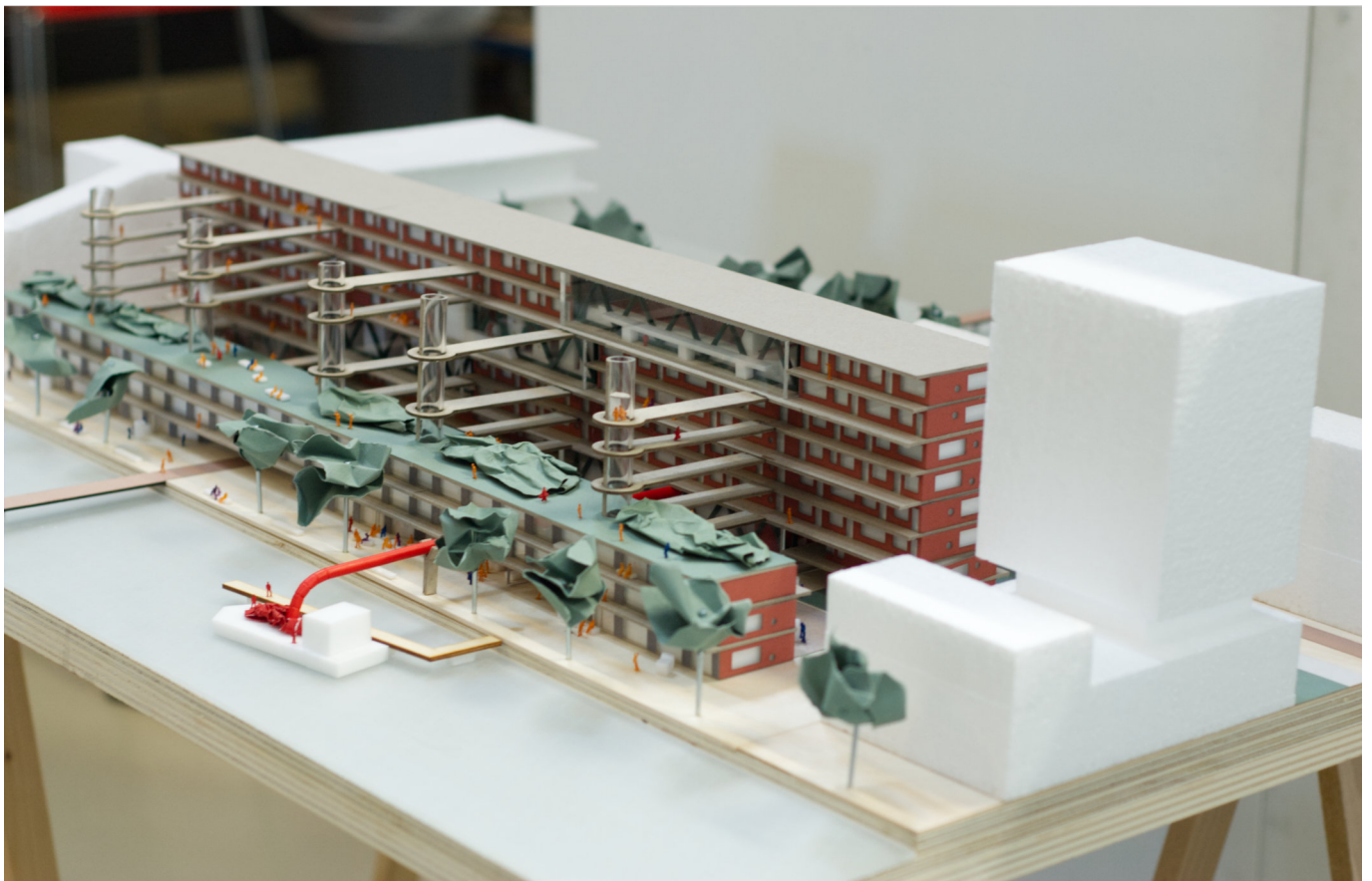
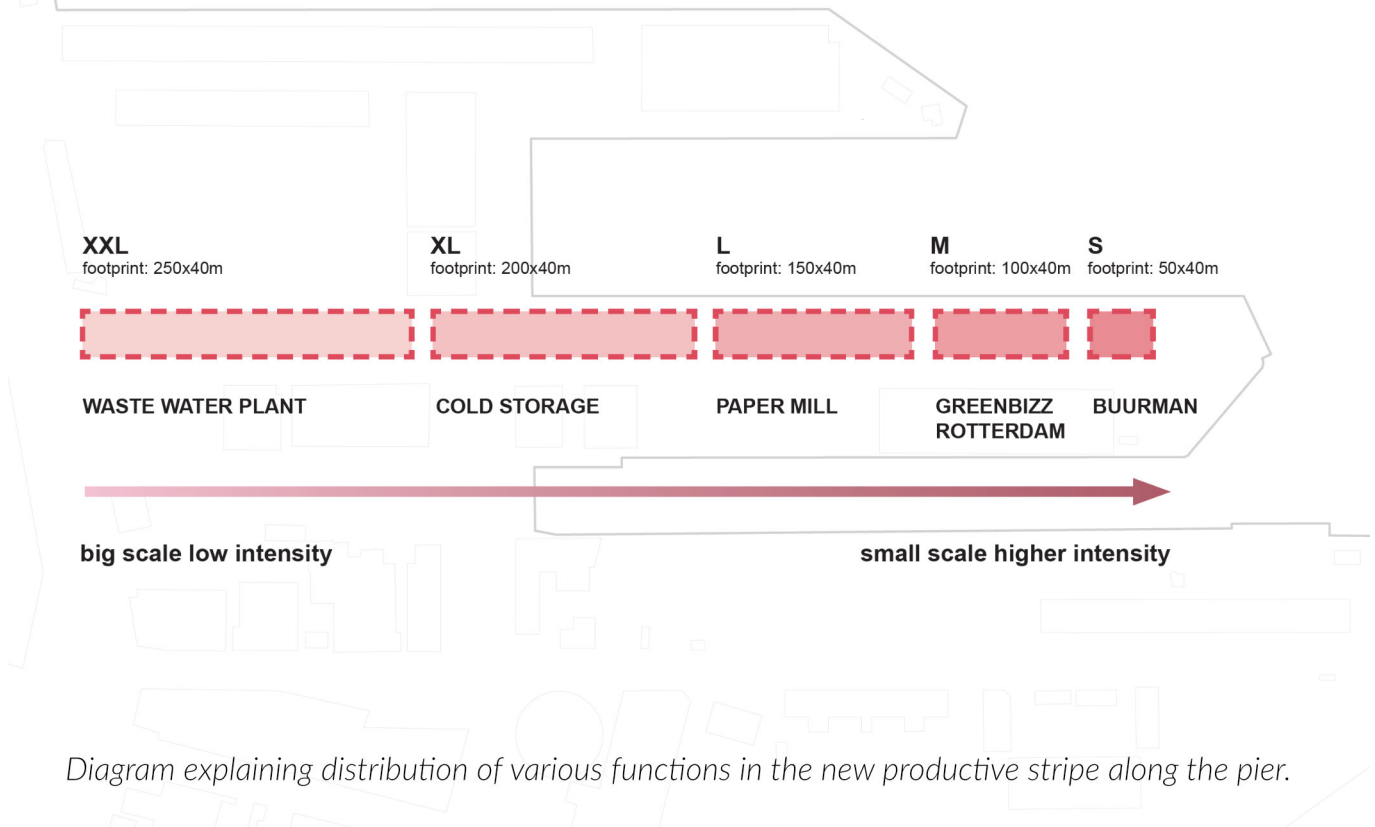
Diagrams explaining the scale of the operation of the new M4H paper recycling factory.



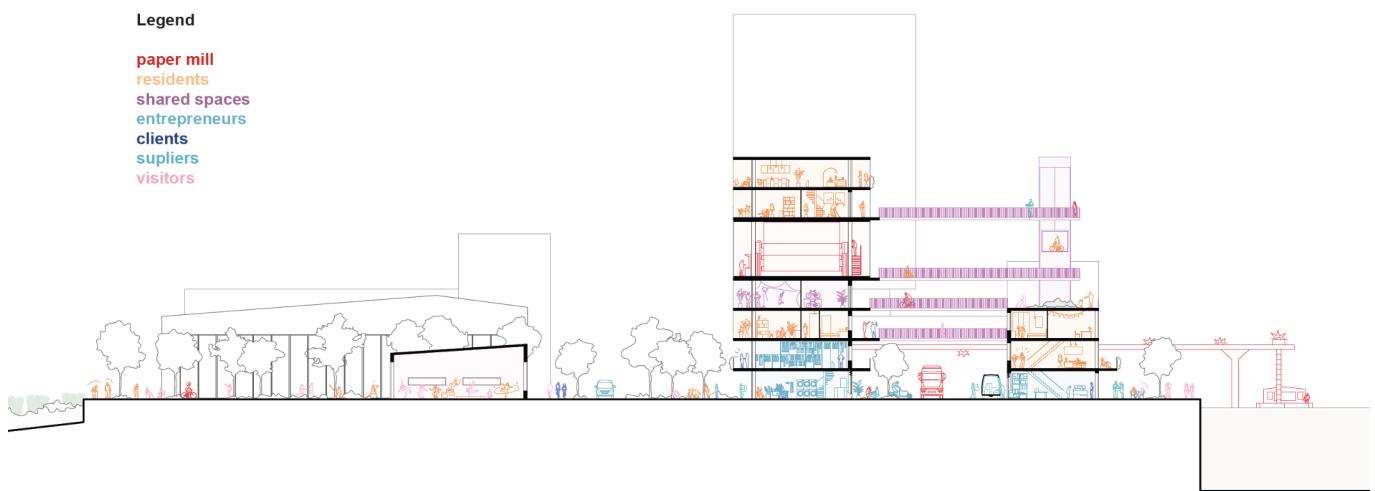
Left: Flows of materials of the regular paper factory

Left: Flows of materials of the regular paper factory,
Right: Flows of materials of the M4H circular scaled-down paper factory.

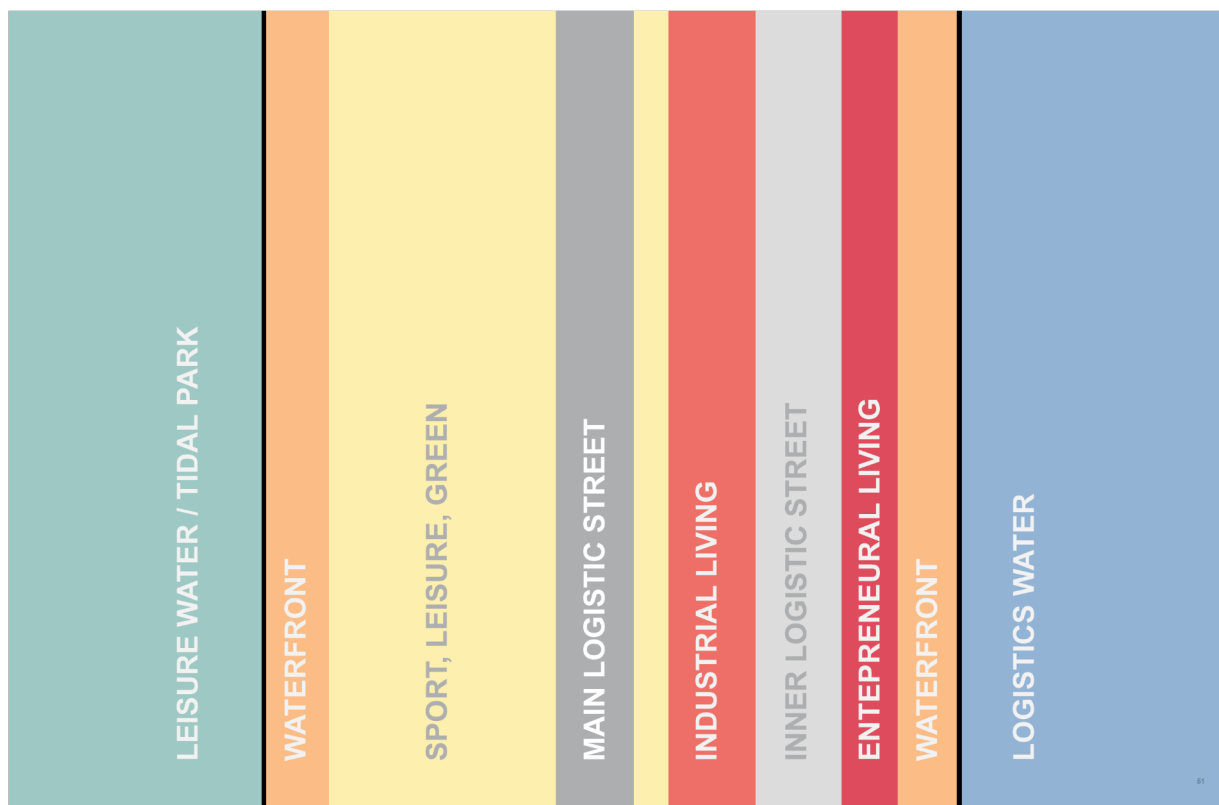
FUTURE STRIP - INCREASE INTENSITY



A model of the paper factory embedded in the housing development, scale 1:200



A cross section through proposed various typologies and public and collective outdoor spaces.



A plan-diagram of the development.

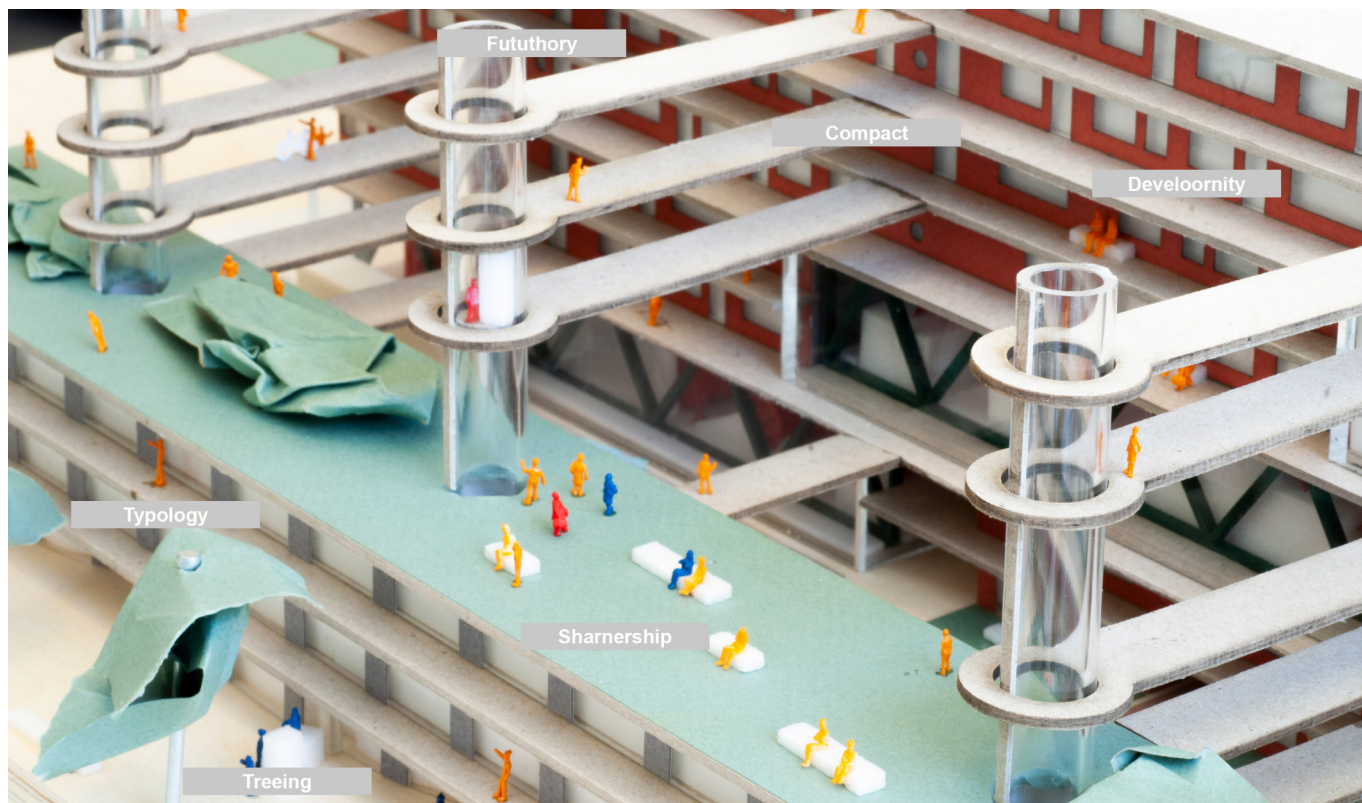
#12 DEFINITIONS TO DESIGN A FUTURE PRODUCTIVE NEIGHBOURHOOD

#1	Circular <i>Cir.cu.lar</i> Starting and returning at the same point Steam , as a part of the production process is re-used within the block for dry-cleaner and to heat the sauna and dwellings	#2	Cicomvist <i>ci.com.vist</i> Mixture of citizens, regular commuters, spontaneous visitors and/or tourists The programatic mixture allows for a specific and diverse usage attracting a wide range of people
#3	Compact <i>Com.pact</i> Elements which are positioned closely together Cutting the building in smaller units create compact neighbourhoods within the block	#4	Densiminity <i>Den.si.me.nity</i> Quantity of place changing places in an area or space between living and working Changing pace in various ways is possible within the block
#5	Develoornity <i>Deve.loor.nity</i> Equal access to development The proposal allows for various dwelling types, learning opportunities, entrepreneurial spaces and is well connected	#6	Entrepreneurship <i>En.te.pre.neur.ship</i> Skill of seeing new opportunities and therefore to start a business Specific spaces for ambitious entrepreneurs
#7	Fututhory <i>Fu.tu.thory</i> Historical awareness translated into future developments Refers to the industrial and harbour heritage in a visual way and re-activates the initial harbour function	#8	Junctability <i>Junc.ta.bility</i> Distribution through a dense network of nodes A dense network of different functions stimulates collaboration, knowledge exchange and innovation
#9	Physerve <i>Phys.erve</i> Places which support physical momentum Spaces to make are integrated in the proposal	#10	Sharnership <i>Shar.ner.ship</i> Responsibility for shared ownership Mixed spaces and shared outdoor gardens , bike storage and galleries ask for shared responsibilities
#11	Treeing <i>Tree.ing</i> Collaboration of innovating, manufacturing and trading Curated within the block	#12	Typology <i>Ty.po.logy</i> A type, or a system divided by types Dwelling typologies and workspaces allow for maximum flexibility

New vocabulary for the future productive city.



A fragment of the model illustrating various definitions for productive city.



A fragment of the model illustrating various definitions for productive city.



A fragment of the model illustrating various definitions for productive city.

The fifth revolution

By Marina Samveljan

Marina Samveljan was passionate about the topic of recycling textile. Fashion industry is one of the world's biggest polluters with the vast majority of textile being thrown away and significantly contributing to the amount of microplastic in the oceans. Marina noticed that making clothes expanded beyond the production: it includes the creative sector, designing, education, entertainment and many more. It also links to the history of the M4H and its existing buildings like Katoenveem. Moreover, the project location is surrounded by water necessary for the process of recycling textile.

All of this made it interesting to propose not only one building, but transform the whole area into the Textile Innovation District with clear identity, supporting each other's functions and gaining

national and international significance.

Marina's flow analysis led to another conclusion: textile production allows the transformation of the landscape into green and productive parks and waterfronts. She proposed one big green space in the Galilei Park with plants also used for dyeing textiles. Harbours are used for the kelp and silk lotus production. The bridge connecting different piers becomes a public passage going right through the recycling building and connecting to the open public ground floor.

These elements together create a liveable and productive neighbourhood, mixing in all the ingredients essential for successful transformation identified by Marina at the start of the studio.



Accessibility
Pedestrians
Cyclist



Accessibility
Public space



Accessibility
Compact housing

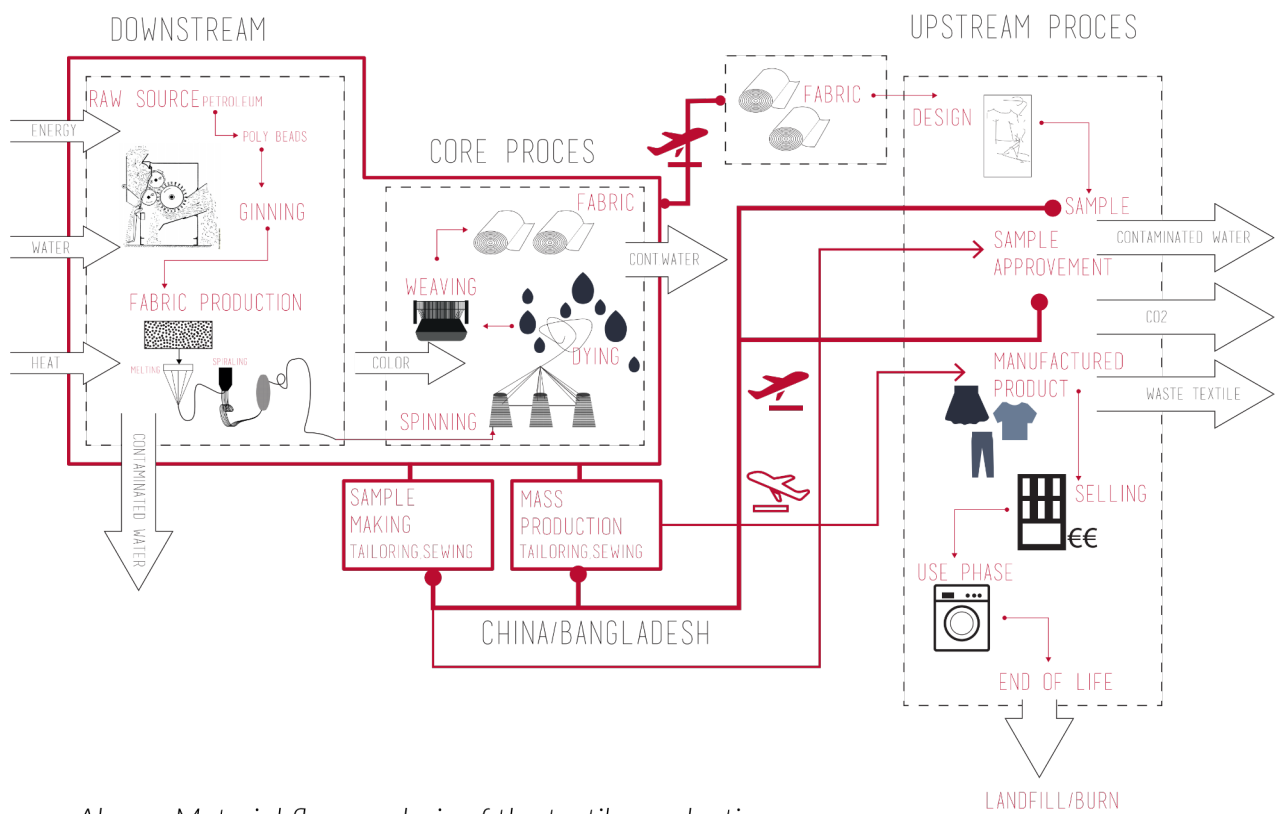


Visibility
Local economy

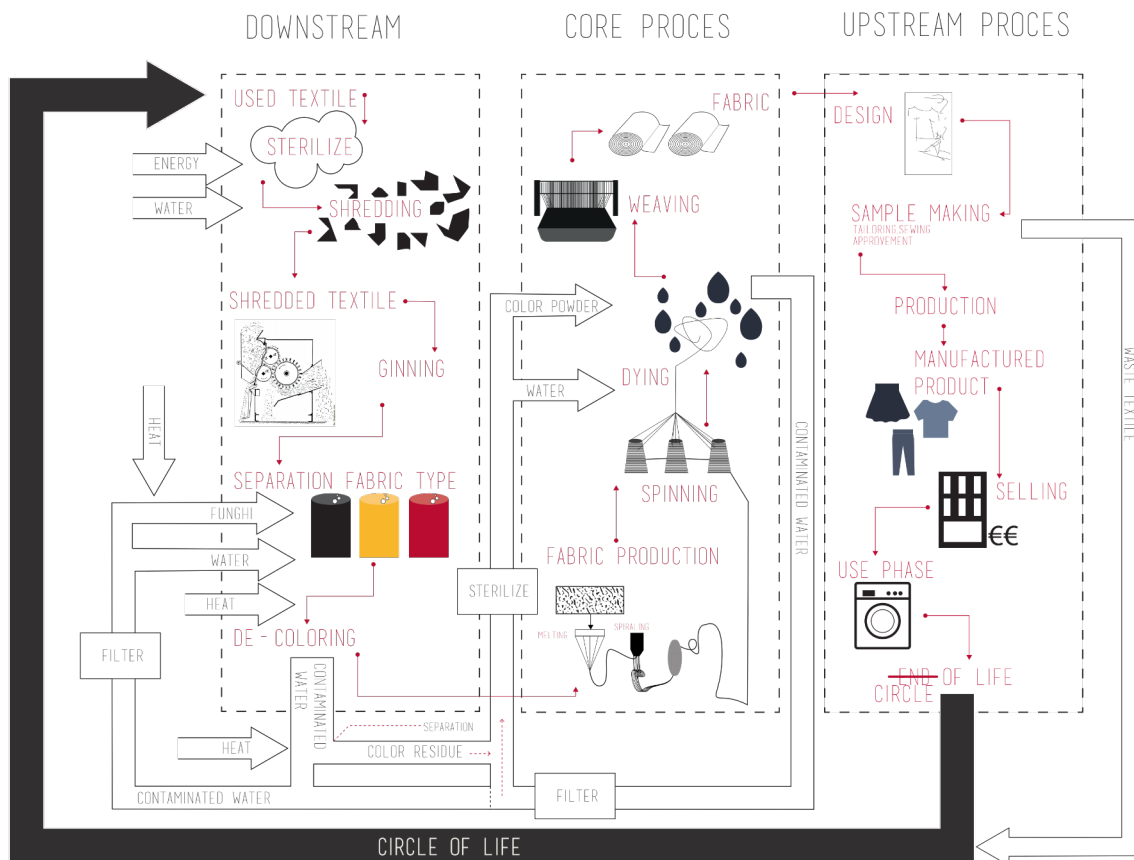


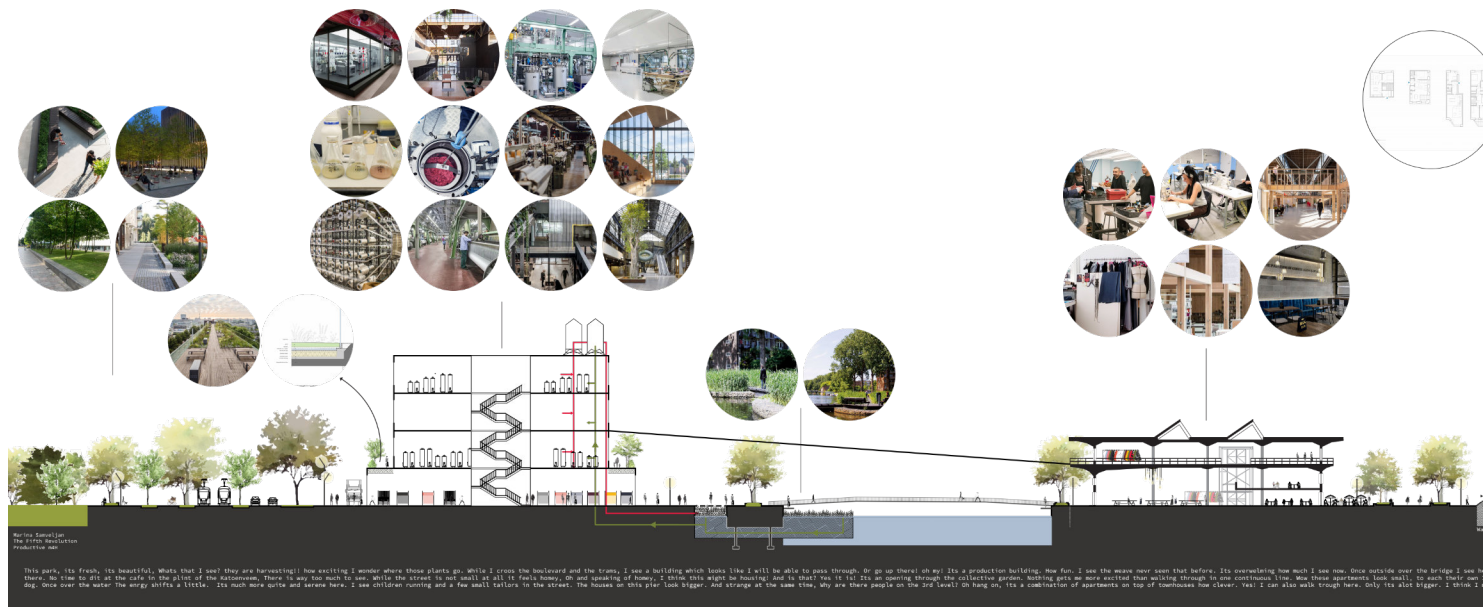
Visibility
Industrial economy

Ingredients for the successful productive city.

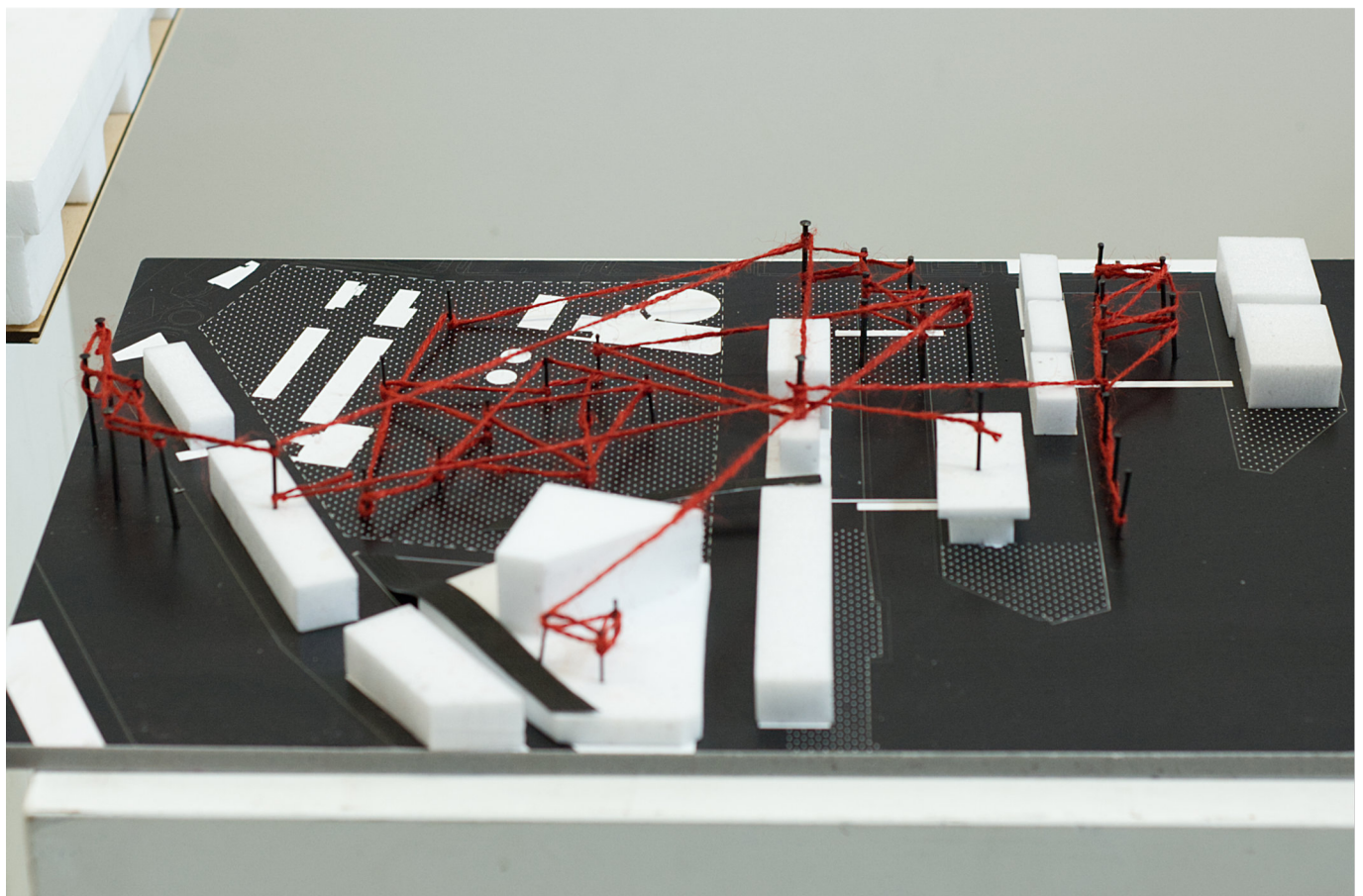


Above: Material flow analysis of the textile production process.
Below: Redesigned material flow for the circular textile production and recycling.

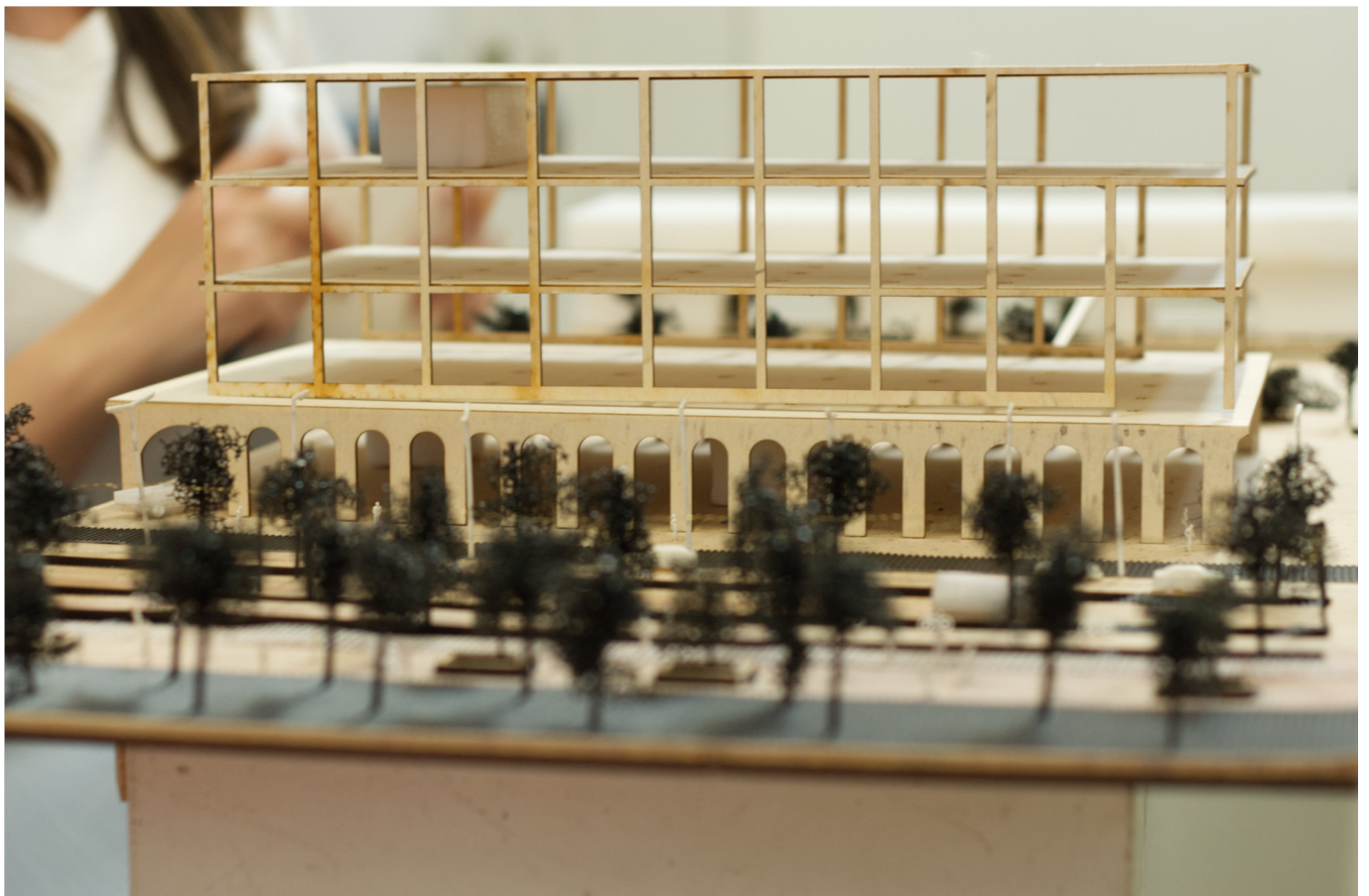




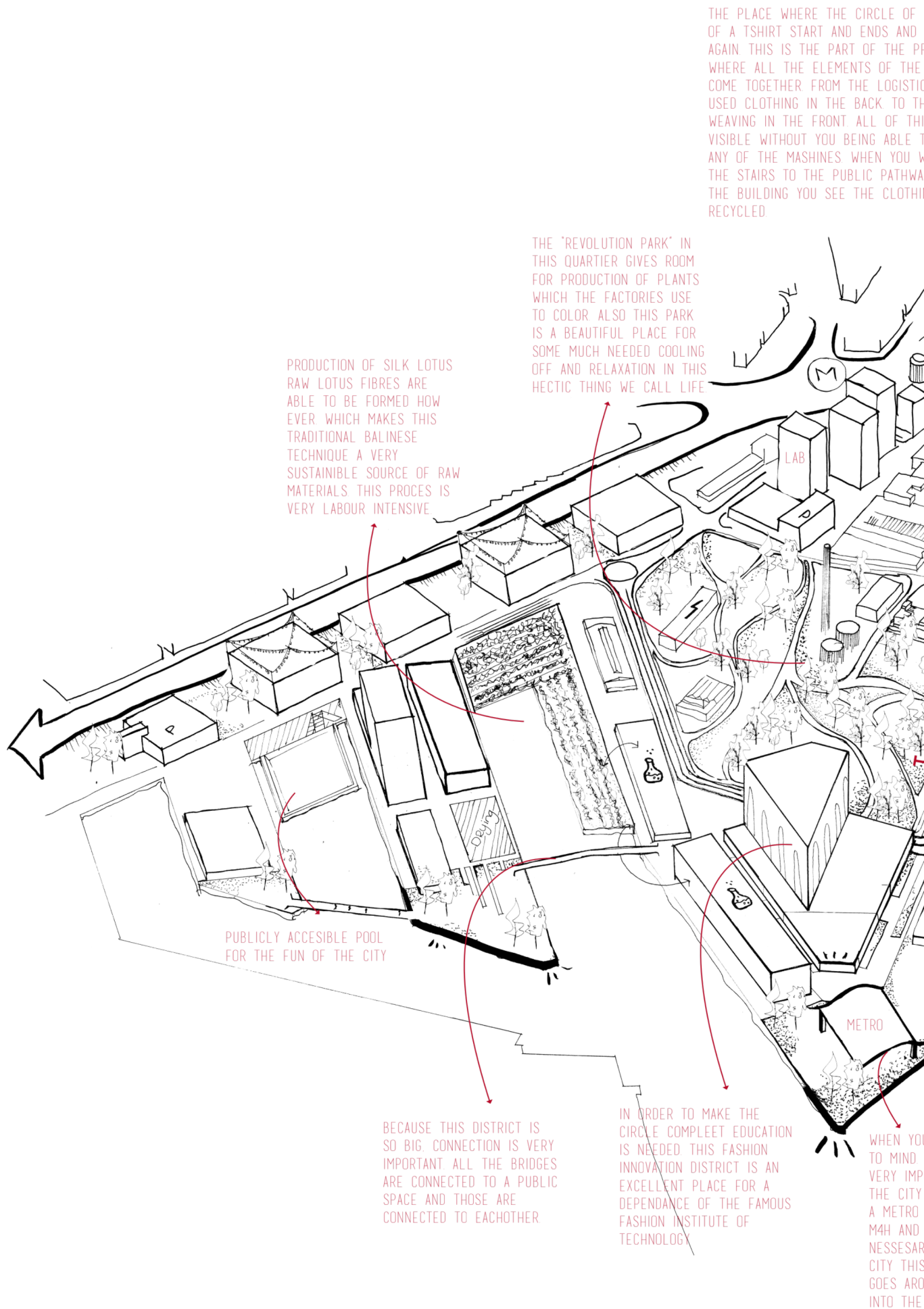
Section through the fragment of Textile Innovation District showing the public route and variety of functions.



Model-diagram of the fragment of the new Textile Innovation District with links between various functions.



Model of the proposed textile recycling building with public ground floor and a public passage cutting through the public, 1:200 scale.



An idea sketch for the M4H Textile Innovation District.

THE LIFE
STARTS
PRODUCTION
DISTRICT
S WITH
E
S IS
TO TOUCH
WALK UP
Y AROUND
NG BEING

WHILE THE KELP IS
BEING PRODUCED AND
THE USED TEXTILES
ARE BEING RECYCLED
HERE THE TEXTILES
ARE BEING COLORED
BY THE PLANTS WHICH
GROW IN THE PARK
NEXT DOOR.

THE KATOENVEEM IS WHERE THE INSPIRATION FOR THIS FASHION
INNOVATION DISTRICT BEGAN THIS MONUMENTAL BUILDING
IS ONE OF THE MANY RELICS OF THE FORMER TEXTILE
INDUSTRY IN THE NETHERLANDS THE PLACE WHERE ALL
THE COTTONBALES FROM THE US WERE BEING STORED NOW
THE KATOENVEEM IS AN INNOVATION AND DESIGN HUB WHERE
DESIGNERS OF ALL CALLIBERS CAN UNITE AND DESIGN THE
NEXT GENERATION OF CLOTHING NEVER FORGETTING HISTORY OF
COURSE

U THINK OF INNOVATION NOT ONLY LABS COME
GREAT ACCESIBILITY TO PUBLIC TRANSPORT IS
ORTANT TO MAKE THIS DISTRICT A REAL PART OF
TWO FORMS OF PUBLIC TRANSPORT ARE NEEDED
WICH CONNECTS THE SOUTH OF THE CITY WITH
THE AIRPORT. FOR THIS AN ETIRELY NEW LINE IS
Y. TO CONNECT THE SMALLER USERS WITHIN THE
DISTRICT IS CONNECTED BY TRAM THIS TRAM
UND THE PARK TO THE 'LEE - TOWERS' AND BACK
CITY

KELP PRODUCTION
THANKS TO THE SALTY WATERS IN THE
MAAS. THIS SORT OF SEASWEED MAKES THE
PERFECT SOURCE FOR SUSTAINABLE TEXTILES

LIVING BETWEEN PRODUCTION SHOULD NOT
HAVE TO BE TRICKY WHILE THE FACTORIES
ARE A LITTLE FARTHER. THE OTHER FORMS
OF PRODUCTION ARE EXCELLENT CONTENDERS
TO COMBINE WITH PUBLIC SPACE WHERE YOU
CAN SEE FEEL AND ENJOY PRODUCTION

Productive Synergy

By Joël van der Tak

Joël van der Tak in his project focused on the brewing industry. He noticed that it could become a connector between Rotterdam and Schiedam with many breweries, distilleries and pubs around Schiedamseweg street. In his vision, the future productive city relies on resilient solutions, accessibility, sharing resources, sustainable productions, mixing, participation and new synergy flows.

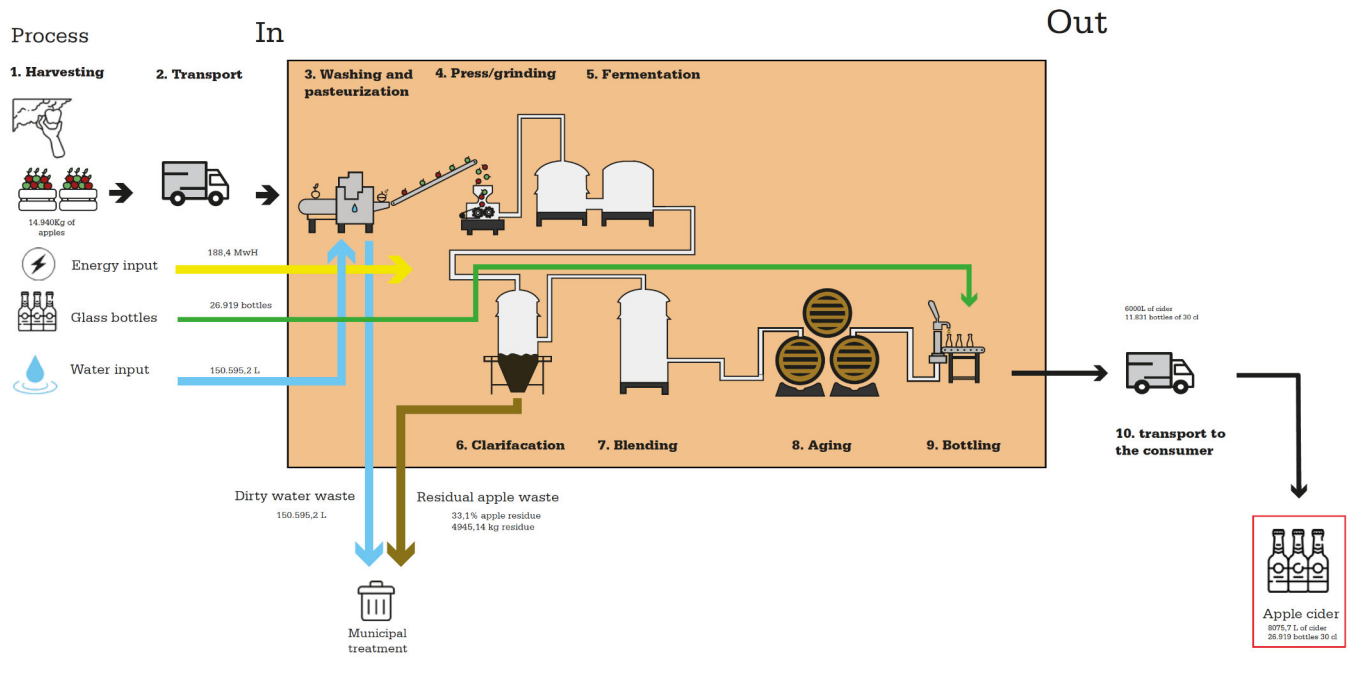
He uses these aspects as guidelines for his design. Joël proposes to transform Schiedamseweg into a high and dense street with production, services and housing. To complement existing functions he decided to focus on apple

cider production. This new facility can benefit from the proximity of other breweries, share resources and spaces and create new circular connections in the area.

In his design Joël proposed a combination of housing and production with green buffer space in between. Another outdoor yard, perpendicular to the green zone, is used for logistics and collective functions for cider production, offices, startup companies and cafe. The whole assembly is designed as a modular and flexible grid in order to accommodate various space demands of production and its related functions.

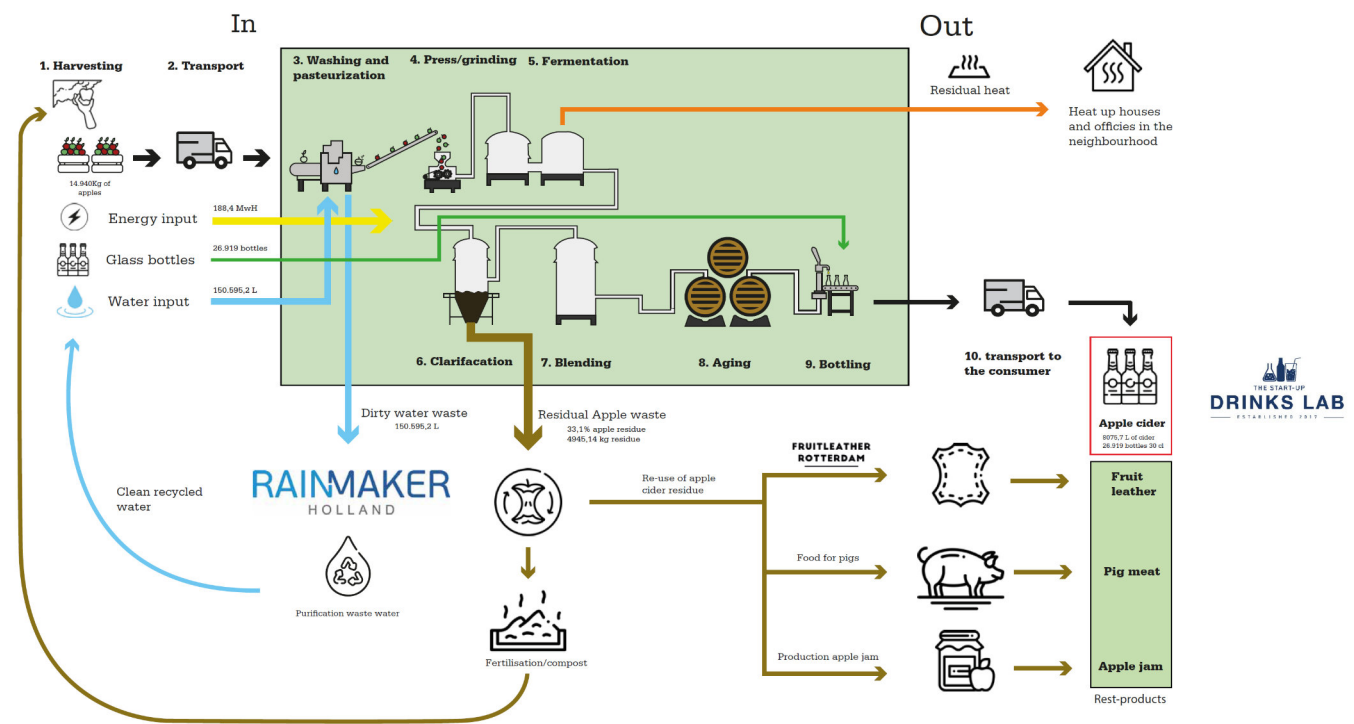


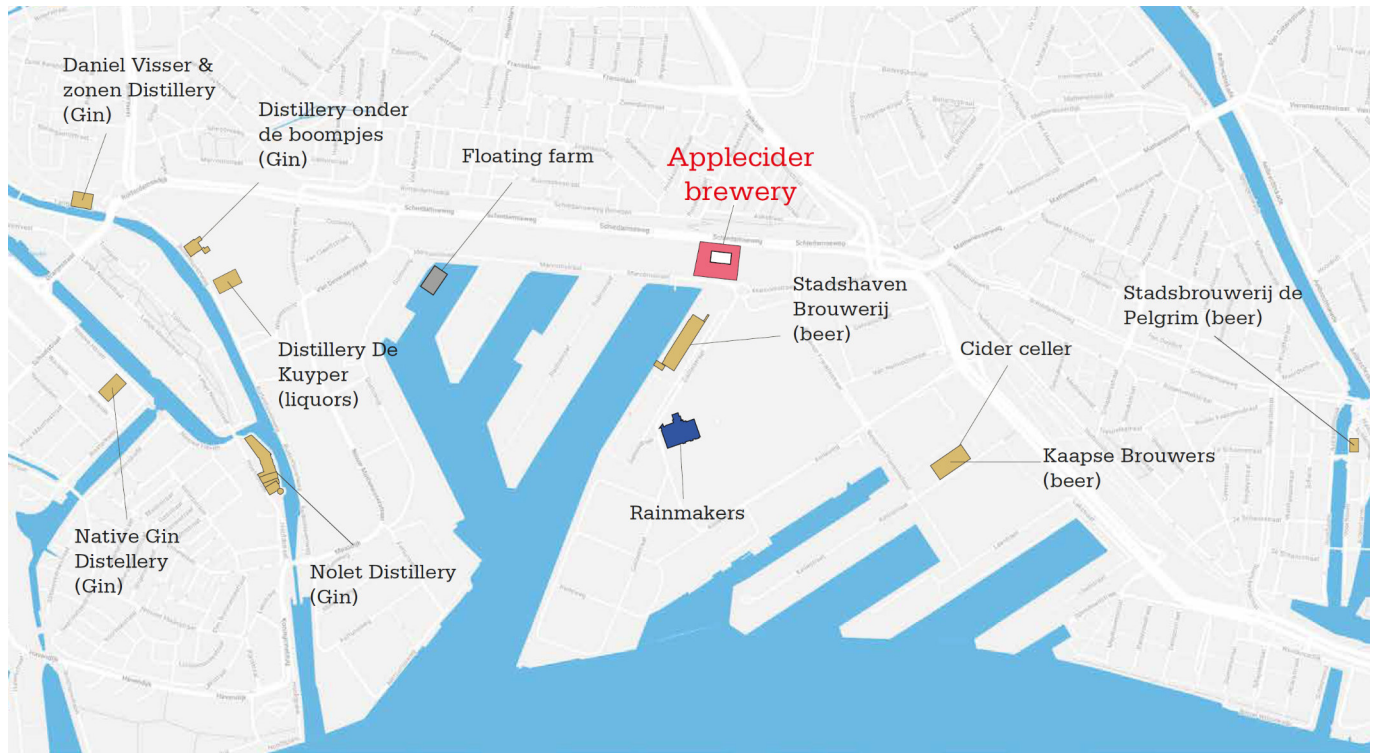
Manifesto for the productive city.



Above: Resources flow analysis of the typical brewing production.

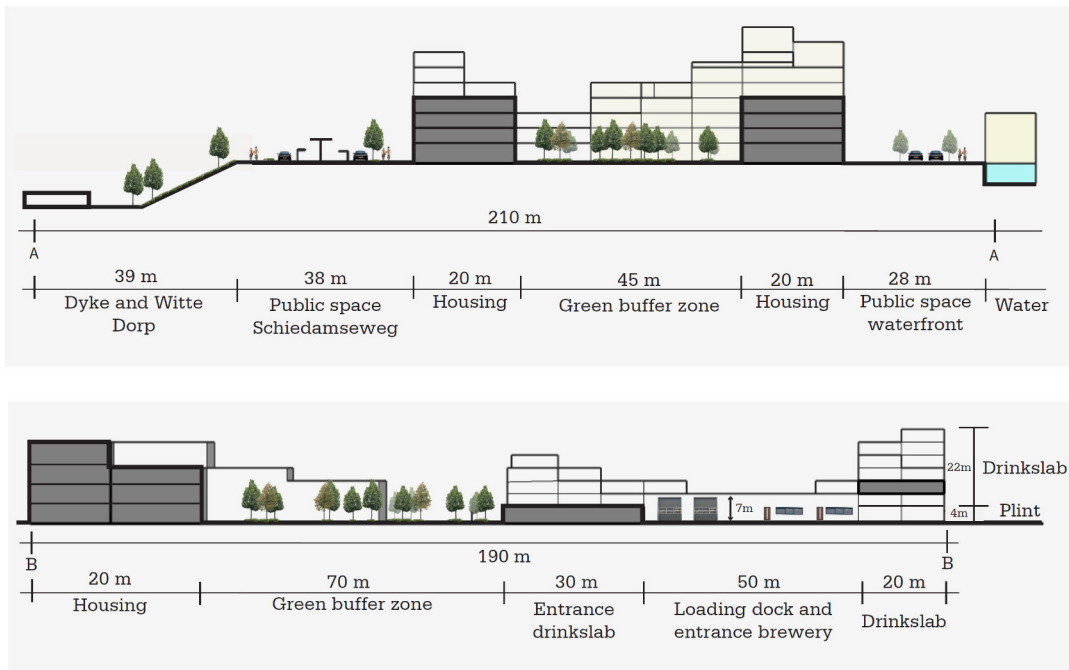
Below: Resources flow analysis of the proposed apple cider production facility in the M4H.





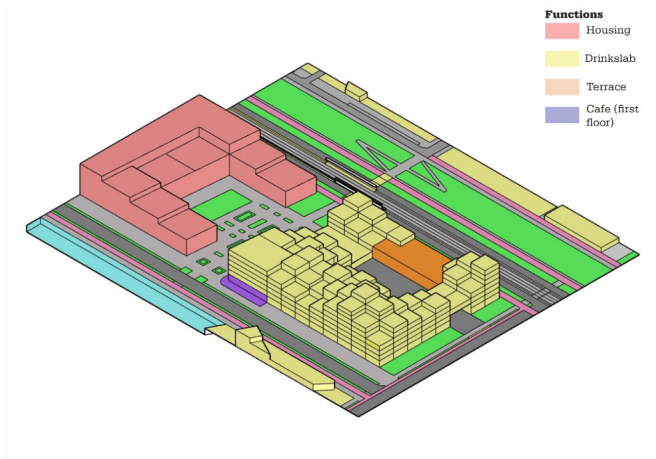
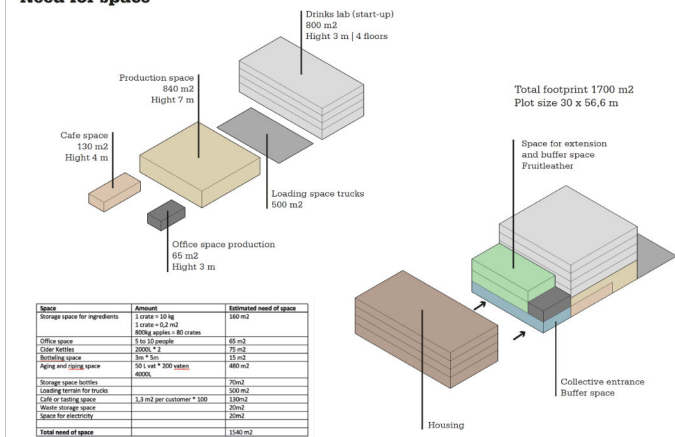
Location of the proposed apple cider development and other relevant functions in M4H and Schiedam.

Sections



Main sections of the project showing buffer space between housing and production and logistics yard with loading dock and entrance for the brewery.

Need for space



Left: Program analysis

Right: proposed configuration of housing and cider production.



Model of the modular flexible grid for production, 1:200 scale.

Colophon

Booklet layout and text:

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