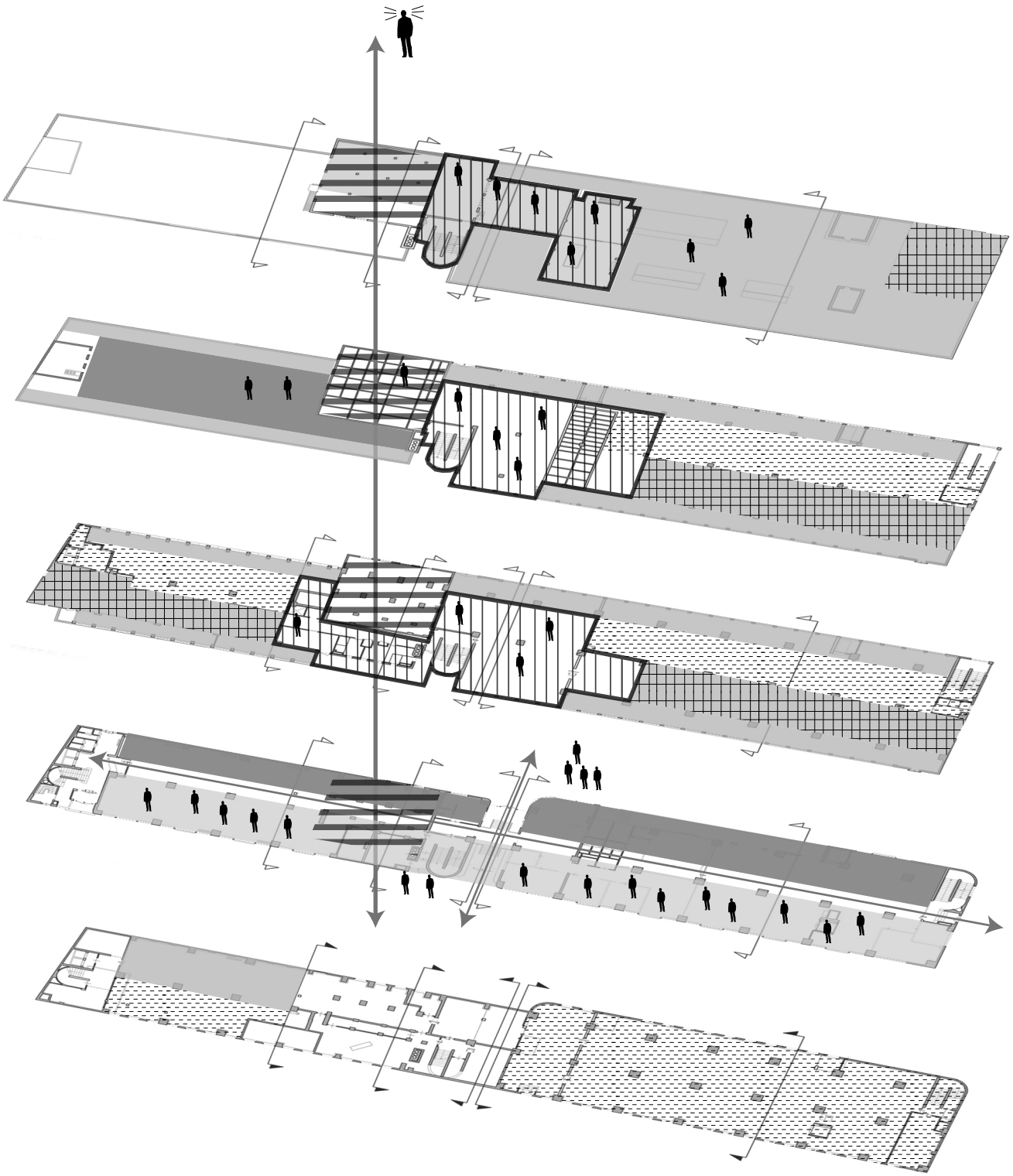
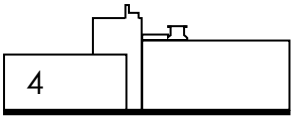


Book 4. Design Process

Heritage & Architecture Msc 2 2018
Delft University of Technology

Electra Pangalou 4691695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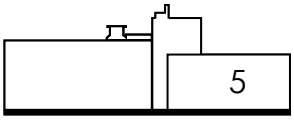
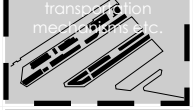
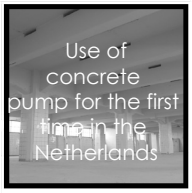
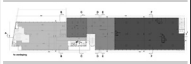
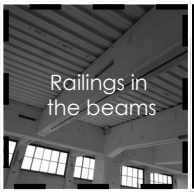
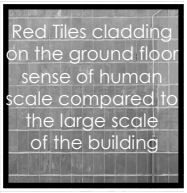
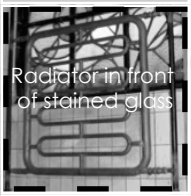


Transformation Framework

Value Matrix

	Age	Historical	Intentinal Commemorative	Non Intended Commemorative	Use	New-ness
Surroundings	Harbor Development transportation of goods Industrial services Construction, 1912	Border between two cities. Port of Delft, Delfthaven. From agricultural land to industrial heritage			 Industrial Services Rotterdam Harbor	Cultural and Scientific development 
Site	Several transfromations based on the needs of the harbor, transportation means, etc. 		Social workers factory/ low-income communities 	Food Connection Agricultural land Co-op, Food Banks		Connecting link between the residential redevelopment educational character of the area and sustainable energy solutions
Skin	Plain/flat	Repetition of facade elements (Nieuwe Bouwen)	Entrances flat in the facade or offset inwards 	Industrial qualities Cranes Elevators Ships 	Windows for light Good quality environment	Light Permeable character possibility to create a very pleasant environment
Structure	Constructed in 1932. Conrete becomes stronger with time	Use of concrete pump for the first time in the Netherlands 	Silo Factory 		Railings indicate part of the past use.	Flexible, strong structure that can be easily adapted to a new function for the building
Space Plan	Social divition Separation by circulation spaces 	Multiple functions Offices, factory, silo's.		Ground permeability was lost by extra entrance.	Flexible space Standard grid	Mixed flexible plan redevelopment
Surfaces	Wooden cladding interior offices 	Steel & Concrete surfaces. Exposed structure, material qualities. (Nieuwe Bouwen)	Stained glass windows. Social workers 	Yellow cladding tiles 		
Services	Office lift = small wooden lift 	Machines Railing packaging activity 	Character of user reflected on the entrances	Circular staircase. Industrial character 	Location of sanitary facilities	3 central circulation points
Stuff				-Equipment in bathroom. -Frames of the doors. -Radiators.	Recycling concept of current use. Waste material reuse.	City heating, general energy concept linked to the city.
Spirit of Place	Cranes "old functions" 	Silo's and machines. Factory essense. 	Connection with harbor. Ship atmosphere in the silo. A ship on the land. 	Railings in the beams 	Loading doors 	

Value Matrix

	Art	Rarity	Other
Surroundings	 Atelier Van Lieshout		
Site			
Skin	 Stained glass		 Red Tiles cladding on the ground floor sense of human scale compared to the large scale of the building
Structure			 Part of the floor (wooden) is not original
Space Plan			Closed material cycles concept of ground floor adaptation to current use.
Surfaces			
Services	 Radiator in front of stained glass		
Stuff			
Spirit of Place			

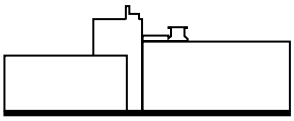
Dilemmas and Obligations

	Dilemmas	Obligations
Surroundings	Each port has to maintain its original character but at the same time provide a coherent image/ atmophere with the whole redevelopment plan.	Honour, enhance and maintain the industrial ship related character of the port.
Site	The site has various entrances for different kinds of users. However, due to the public character of certain functions some kind of hierarchy needs to be established.	The adjacent small one storey building, is also part of the story of the site consequently it needs to be integrated in the redevelopment proposal.
Skin	Great views to the city and harbour. In order to place public arctivities at the top floors, good circulation and indoor climate qualities for more private uses need to be achieved.	The different proportions and rhythms of the facade should be take into consideration when placing a new function in the same space.
Structure	The cladding of the concrete columns has been removed in many cases but could be used for specific functions that require simillar sanitary conditions or not.	The structure of the silo reflects the past of the building. It should be used is such a way that it highlights its historical significance but at the same time provides new use.
Space Plan	The silos and sanitary facilities in the middle obstruct the horizontal circulation at each floor, but at the same time represent the sequence of activities in the original situation.	Healthy, high-quality working environment was part of the original concept of the architect and it should be brought back to contemporary standards.
Surfaces	The interior surfaces of the offices represent the original atmosphere of the space. They represent a different era and should be somehow incorporated in the new design.	The stained glass reflects the construction of the building and should be treated accordingly.
Services		

Conflicts and Opportunities

	Conflicts		Opportunities	
Surroundings	Short-term plans have to take into account the current use and importance of the surrounding buildings. (artists, cold storage, urban agriculture etc.)		1. Opportunities to restore the connection with the water either for memmorial reference or for future, energy related activities. (Tide and temperature of ground water.)	2. The current artistic and urban agricultural activity offers great possibilities for attracting more people in the neighbourhood. Connecting link.
Site	Vierhavenstraat makes pedestrian mobility difficult. However, since the road is important for the whole city, smart alternative measures need to be implemented.		The backyard (south facade) of the site due to its orientation offers great possibilities both in terms of public space or renewable energy installations etc.	2. Enhance the green space of the industrial site. Possibility of establishing links with the Dakpark or the Food Garden "De Voedseltuin".
Skin	Thermal Bridges exist everywhere.Insulating the building, is of great importance. The way to do it however should be according the original concept of the building.		1. The permeable character of the building as well as the different proportions in spaces allow us to combine different functions in the new scheme.	2. The loading doors at the ground floor offer opportunities for improving circulation and transportation from inside to outside and vice versa.
Structure			1. The remaining industrial elements (crane etc.) can be either repaired and reused or be interpreted in a new way so as to maintain the "machine" identity.	2. The standard grid and the reduced size of the columns as you reach the top floors, allows the division of different functions according to their requirements.
Space Plan	The new entrance at the ground floor creates "AN Entrance" but at the same time reduces permeability and easy mobility from one side of the building to the other.	The large openings of the facades allow light to penetrate into the building but for offices, glare is not wanted, thus, shading mechanisms/devices might be necessary.	1. The roof offers great views and the possibility to create and public, horeca, space that will attract various people.	2. The building's orientation offers environmental benefits. From the installation of renewable energy devices to improving indoor climate of the building.
Surfaces				
Services	The building has 3 circulation axis for the different users. Yer none of it has the status of the main circulation area that could be used by the public, visitors of the building.		There are however, opportunities to use these circulation routes to navigate the different users and thus allow the use of the building 24/7 for different target groups.	

Overview



BUILDING

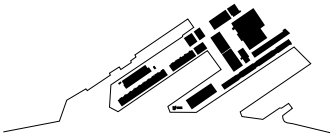
Integrity of the original building.

Expression the original material and structural qualities.

Combination and articulation of multiple functions.

Maintain the connection with food.

Take advantage of what the building has to offer and use its conflicts and dilemmas for innovative design solutions.



PORT

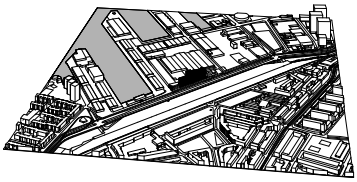
Make use of the waste space. Unlock the resources of the harbor.

Increase Accessibility and Security

Respect and honour the industrial character and harbor character of the immediate context.

Restore the connection with the river.

Enhance the cultural activity in the surrounding area.



CITY SCALE

Reflect the sustainable energy concept of the redevelopment of the area.

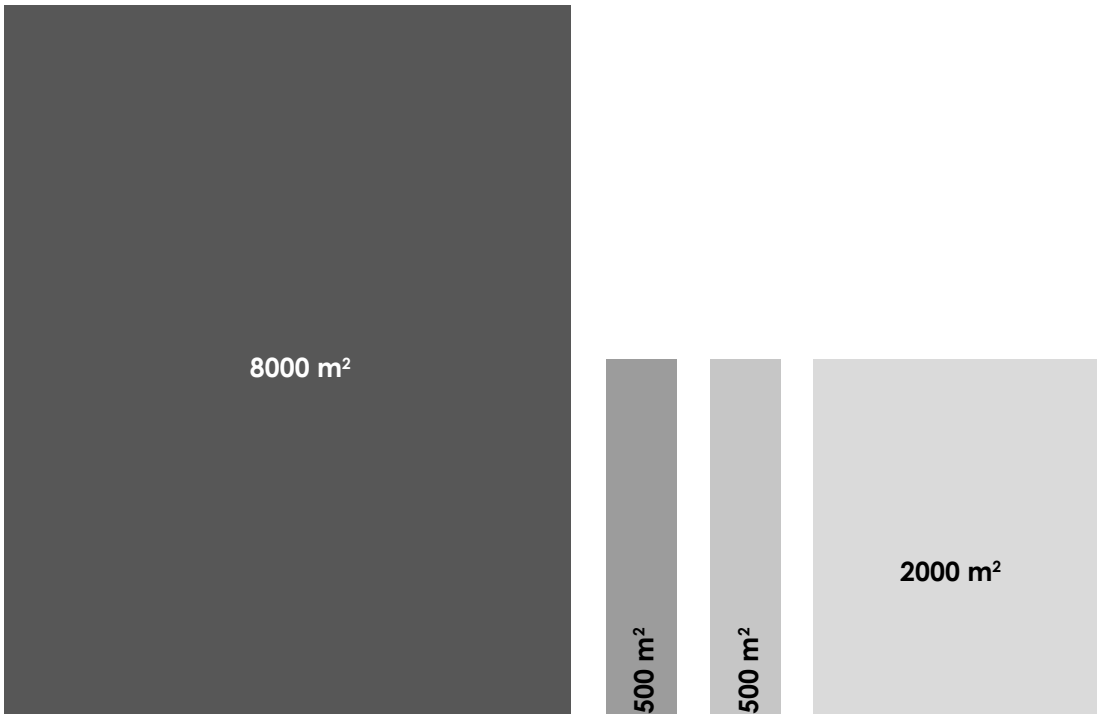
Address the needs of the future users, educational character and orientation towards the youth.

Enhance the green landscape, with parks and recreational activities as well as food cultivation and agricultural activities.

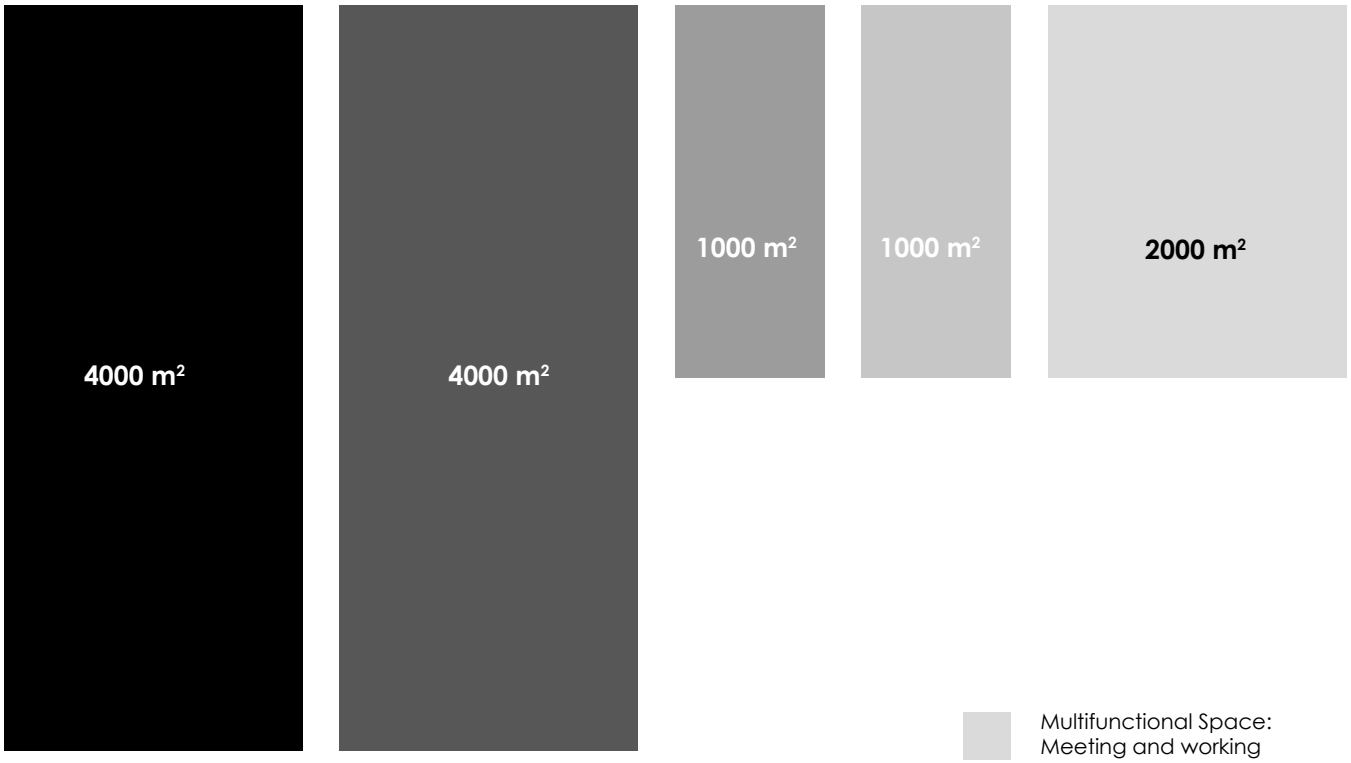
Programme

Interpretation of DUDOK Brief

Programme in m²



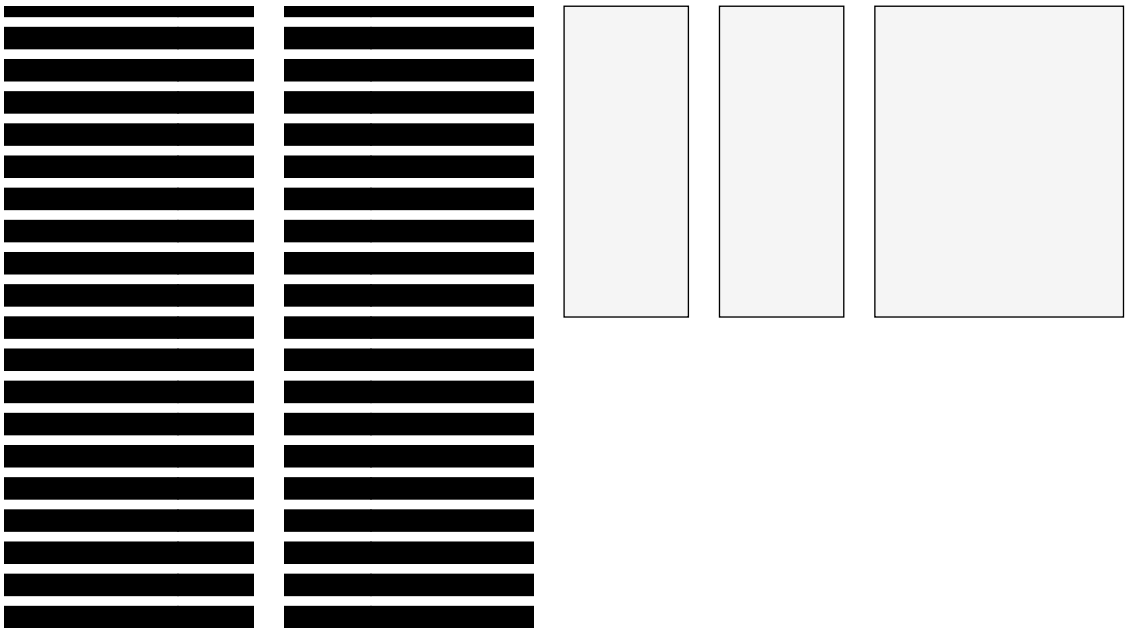
Option 1: Mainly offices with recreational facilities



Option 2: Living and working with recreational facilities

Interpretation of DUDOK Brief

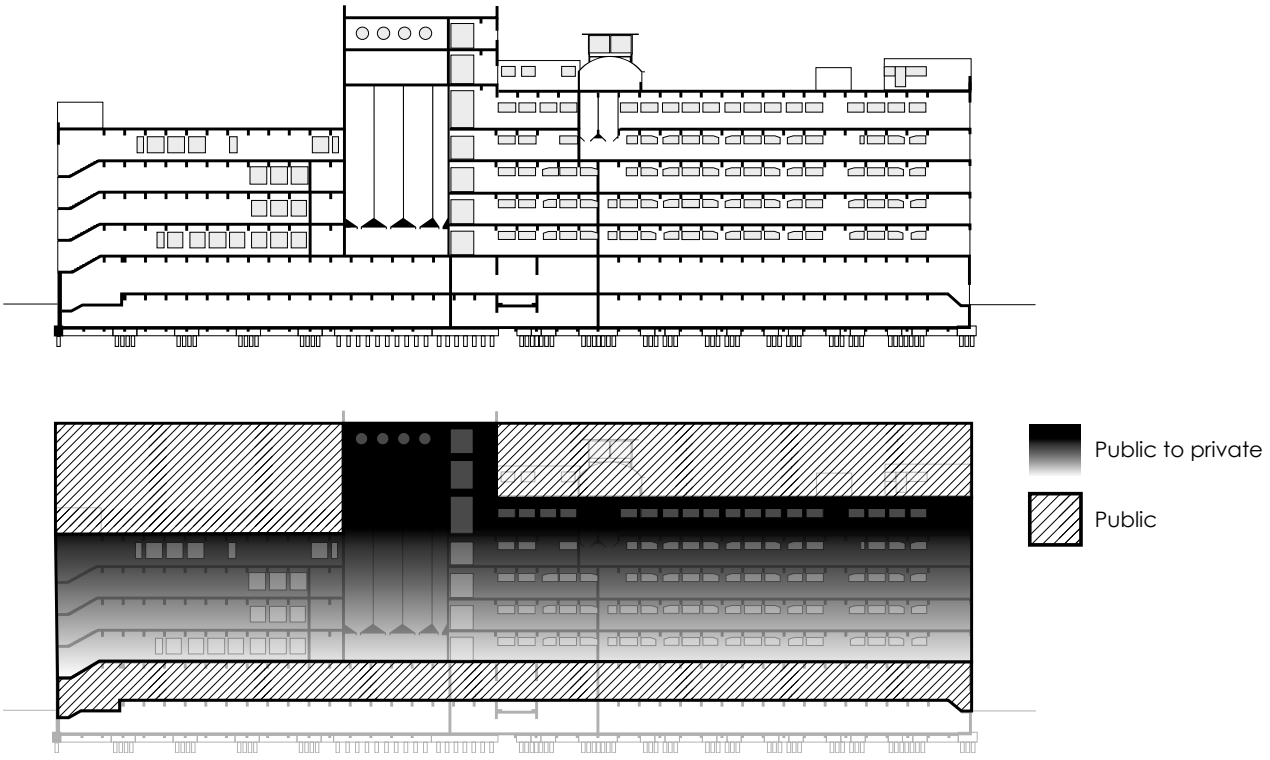
Programme - Private versus Public



Residential space and offices are mostly private with some public, communal facilities in between.

Horeca and Sports facilities are public spaces that can be used from a variety of users and throughout the day/week. Flexible working space included.

Programme - Private versus Public in Section

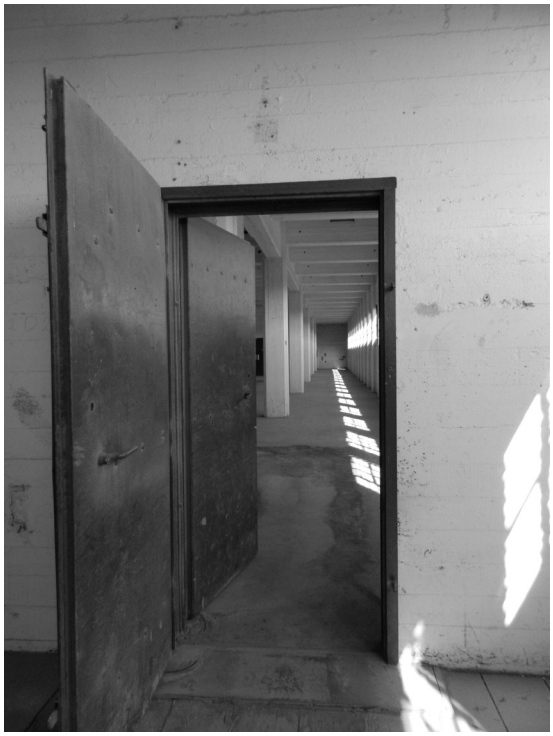


Interpretation of DUDOK Brief

Reflection

I believe that the current proposal, particularly the first alternative where 80% approximately is office space does not take into account the historical, cultural and age value of the existing building. However, the recreational activities as well as the multifunctional space and the activation of the roof reflect the contemporary needs and potential of the building in future terms.

The second alternative with the residential function as well as the working component is more closely related to the original situation of the building yet still it doesnt address the factory component which is directly related to the harbour and industrial activity of the port. Consequently, it could be a more interesting option than mere offices, yet, the combination of such different activities as well as the complexity of combining residential facilities and support spaces implies a greater degree of intervention in the current monument leading me to propose my own third alternative which maintains most parts of the brief yet changes a few based on our previously executed analysis of the surrounding context (see book 2).



Introduction

The Haka building and the surrounding area have a long history and contribution to the development of Rotterdam, Delft and Schidam therefore I believe that adapting it to a mere office building or housing does not comply with its cultural significance. Moreover given the fact that the whole port is under a period of refevelopment and reconstruction proposing something extremely drastic in terms of the required intervention can compromise the value of the building as a national monument. My idea is to give Haka a programme and thus an intervention proposal that would take advantage of the Buildings architectural quality, with minimal but bold interventions that will "unlock" the building to the public and thus could provide the developers with many future possibilities. Even housing schemes if necessary but to a later stage.
Furthermore, better connectivity with the surrounding area is needed as part of a bigger masterplan proposal.
Last but not least, in terms of the materialization of the project, primary role is given to the existing building, new materilas and structures should compliment the existing without compromising it or introducing stronger visual impact.

Guiding Themes

Green Space - Urban Agriculture

Green public space

Urban Agriculture

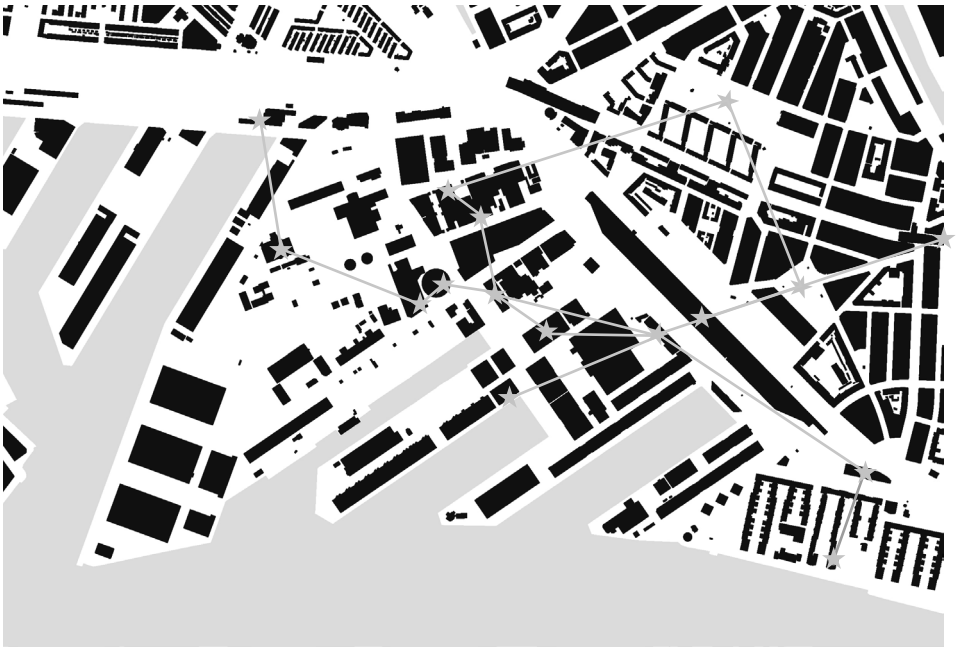
Provision of Green pedestrian street

New recreational space

1) Improve the quality of the environment and the quality of the city by enhancing green space, parks and recreational space at the river front.
2) convert waste in between space to parks and recreational space.
3) Establish a connection between the Dakpark and the food bank in the immediate surroundings.

Enhance public green space, and urban agricultural land

Artistic Activity



Place of Cultural Activity

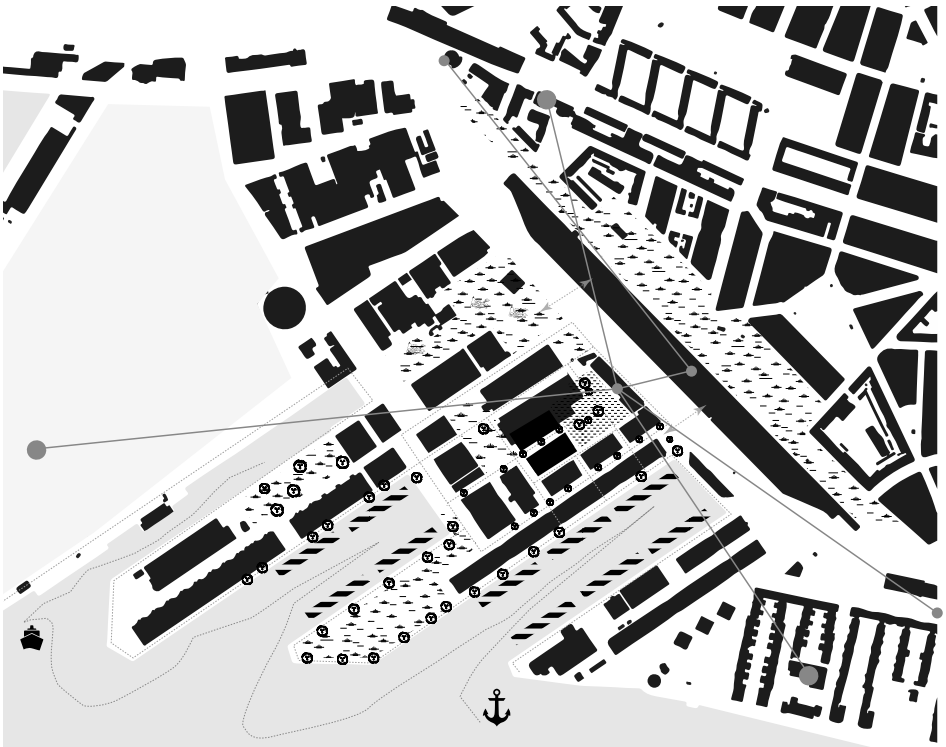
1) Address the needs of the artists, architects and craftsmen in the area by providing extra studios, meeting spaces, conference rooms, performance spaces, venues etc.
2) Maintain and exhibit the industrial character of the port with cranes, boat remains, machinery, chimneys etc.
3)Use waste space, parks, landscape for cultural events of the city.

Enhance cultural activity

Sustainable Energy

Sustainability

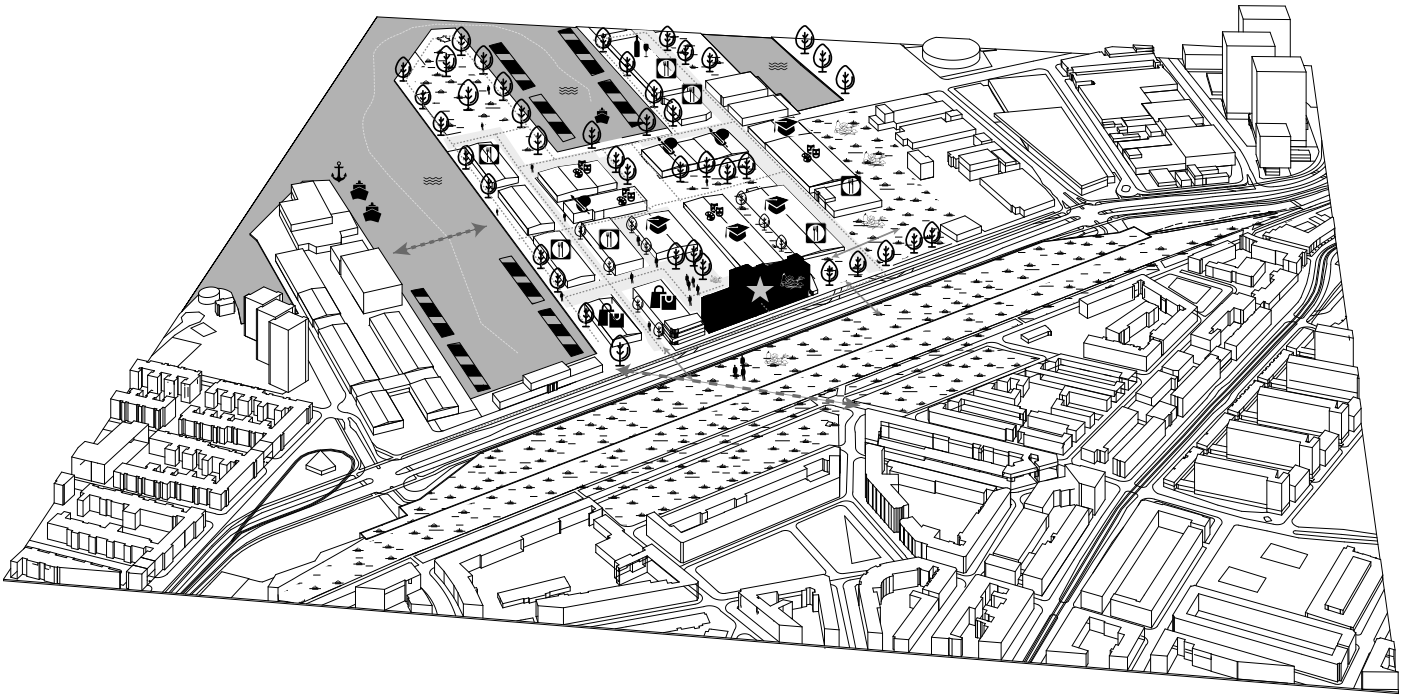
1)Common grid for the surrounding area
2) Renewable sources of energy
3) Improve quality of the environment, C02 absorption and reuse, toxic waste, water quality etc.
4) Sustainable mobility, through waterways or public transport. Pedestrian clean environment.
5) cycling routes and storage space.



Masterplan Proposal

With the creation of a "piazza" at the back side of the Haka building and transfromation of the building's scale in the surrounding environment the area becomes an more direct extention of the city centre. Green space and landscaping is push at the edge of the river front. In a way this approach is more in the line of unlocking the existing resources to a new future. New pedestrian zones are created in the existing passageways. Empty space becomes green space.
The Haka building can be linked both to the educational, cultural and business sector of the area. It can work as the starting point or the redevelopment.

Masterplan



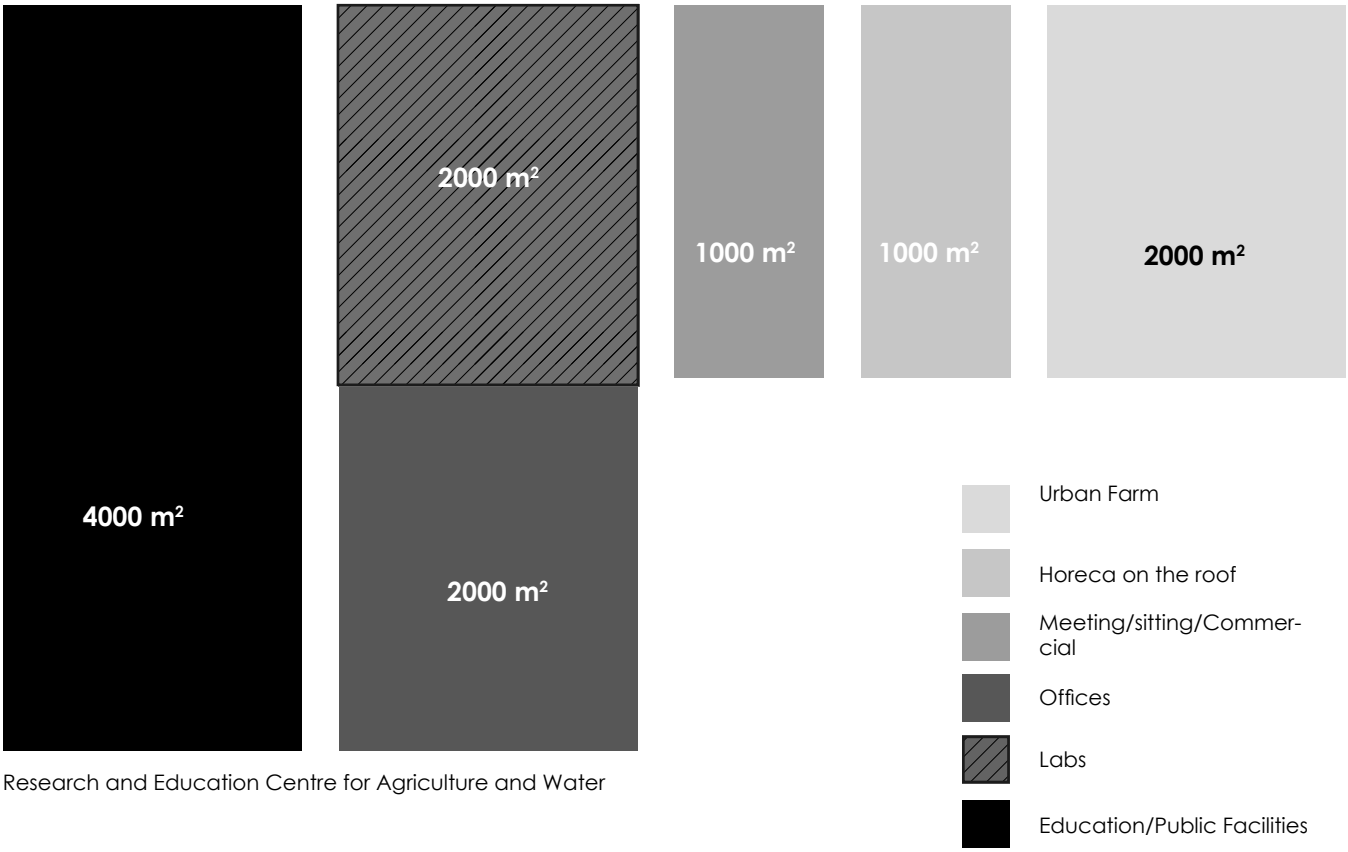
Building Scale

- Haka Building becomes a landmark.
- Warehouses and Haka builiding reminders of the past.
- Piazza of Cultural Activity and Education
- Community Centre Possibility with educational and cultural activities
- Connected with the regeneration plan of the surrounding area.
- Small scale businesses and retail.
- Meeting space. Co-working space.
- Exhibition space or performance space.

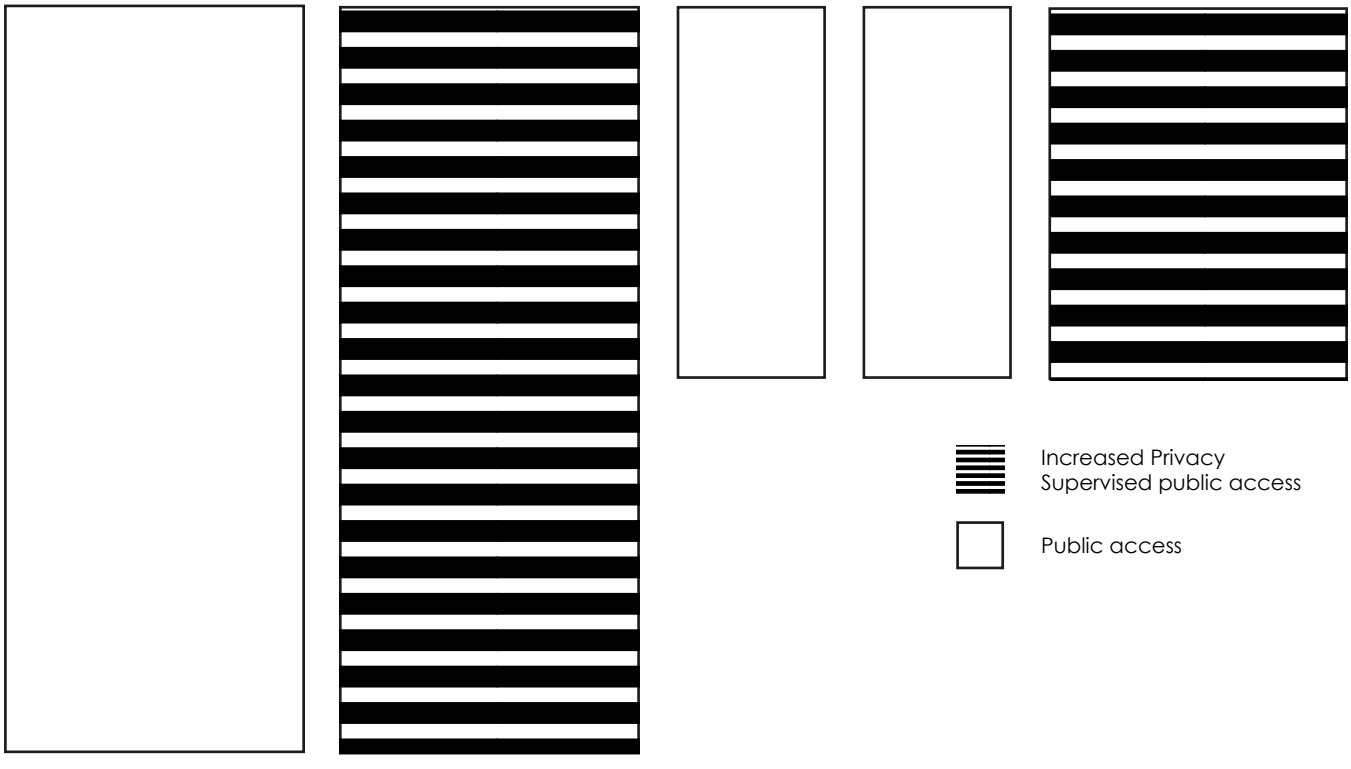
Urban Scale

- Cultural Urban Hub
- Connected to science and sustainable development
- Improve the litaracy level of the surrounding communities.
- Replace waste in between space with green public space
- Maintain the connection to water on a smaller scale
- Gentrification
- Business opportunities. Increase Employment

Programme Proposal



Research and Education Centre for Agriculture and Water



Connectivity

Food - Urban Agriculture

Besouk Delfshaven

Celebration of the multicultural influences of Bospolder - Tussendijken, together with the area's locals, while all kinds of delicious snacks and bites are cooking on the fire.

Werelds Delfshaven

Werelds Delfshaven festival is a journey of cultural exploration! One weekend, filled with music, dance, poetry, storytelling, art and culinary specialties from all over the world.

Pilgrim Harbour

Pilgrim Harbour is a new music festival that takes you through one of the oldest neighborhoods in Rotterdam.

Food and drink "Uit Je Eigen Stad"

From Your Own City

At Uit Je Eigen Stad, we want to connect city dwellers with the food that ends up on their plates every day. How is our food produced? Where is it from? Who actually determines what we eat? And what can not be produced from far away? The urban farm is the place where Rotterdammers can see, experience and taste food and its production. With the vast fields and tunnel greenhouses we bring food production back to the city! The harvest of the land goes to the restaurant on the farm and the central station . In addition, workshops, tastings, guided tours and other events and children's activities are regularly organized.

Connectivity

Food Garden "De Voedseltuin"

Food garden Rotterdam stands up for a healthy city. We are in favour of a sustainable urban society, with healthy food for everyone. Without poverty and social exclusion. With people who actively shape their own lives and take responsibility for each other and their environment.

The food garden offers sustainably grown seasonal vegetables to Food-Bank Rotterdam. In addition, it is primarily a place to meet and do something; from producing food, to being active in the green to developing skills.

From 1 September 2011, the 1st Food Garden was laid out on a vacant lot on the damped Keilehaven. The intention is to expand the project and grow it to more food gardens for more food banks. In addition, the Foundation wants to be part of sustainable developments in the Rotterdam region. The garden will be a green space with a park-like character in a district that is in full development, giving it countless opportunities as a connecting factor between the business community, idealistic organizations, local residents and nature lovers!

Rotterdam Oogst - Rotterdam "Harvest"

Place the tip of a compass on the Coolsingel and draw a circle of 50 km around the city. The food that is cultivated, processed and traded within that circle is Rotterdamse Oogst. From Westland grapes to apple juice from Rhoon. From sambal from the Cape to sheep salami from the Hoeksche Waard. From dairy from the Green Heart to the cultivation of your balcony.

As little distance as possible between farmer and plate, between maker and smaker. Why? It is good for the environment, health, feeling and taste. Little food kilometers and therefore a low threshold to what you eat: the farmer is around the corner.

Rotterdamse Oogst wants to strengthen the regional food chain by organizing events and market places. In the middle of the city, close to the consumer. Peasant understanding meets world citizens, craft meets design, forgotten vegetables meets innovation.

From the neighborhood: a radius of 50 km around the city

Fresh and healthy food: good for taste, well-being, biodiversity and the environment

Rotterdam: metropolitan, rich in contrast, open and a bit raw

Sustainability: sustainable relationships between farmer and neighbor

Creativity: experimenting with new means and approach. Surprise and amaze, positive and solution-oriented

Colorful mix: bringing people and possibilities together in an unexpected way

Products with a face: stories from farmers, artists, cooks, children, makers and creators

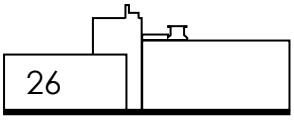
Peasant wisdom meets innovation: combining proven values with new techniques and approaches

Our Goal:

1) Develop and organize activities and events

2) Informing about and connecting various food initiatives within the region

3) Creating (new) market places and product-market combinations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Reference Projects

Fenix Sheds at Katendrecht

History

In 1923, the largest shed in the world was put into use on the site where the Fenix sheds now stand according to the municipality of Rotterdam. The enormous concrete building for storage and transhipment of goods was blown up in 1944 by the German Occupiers.

Since 1950 the warehouse has been largely rebuilt as two separate buildings.

Demolition

The first of the two Fenix sheds has been demolished and on top of the remains of the building 212 apartments are being built, better known as Fenixlofts. The former house will accomodate a mixed program of living and working along with parking facilities and recreational activities.

Adapitve Re-use

The second fenix shed has been transformed, temporarily at least, to a place maker where rotterdammers can certainly enjoy food, drinks and relaxation. It combines cultural, culinary and creative facilities. (Culture, creative business and catering). At the same time, the shed is located at the edge of the river, offering excellent views to the river and the opposite side of Rotterdam.

Fenix Sheds at Katendrecht

Fenix Food Factory, a culinary hotspot in Rotterdam

An abandoned industrial estate with warehouses and sheds is replaced by temporary or permanent programming. A popular phenomenon in the urban environment is the so-called Food Hall: a form between a market, supermarket, food stalls and restaurants.

Whether it's market halls where you can buy fresh products in stands or small shops, halls where you can sit at small eateries, or everything in between, they do it well. They are gaining popularity because many specialty shops such as bakers, butchers and greengrocers have disappeared in recent decades. Many food halls are now becoming a kind of multi-specialty store, combined with eateries.

The smaller halls are also local successes. Often stationed in the less attractive neighborhoods. A food hall can be a booster function in an area. Take, for example, the Fenix Food Factory in Rotterdam's Katendrecht, which attracted the trendy young city population to the former disadvantaged neighborhood.

In the Fenix Food Factory you can go to 12 different entrepreneurs for various local products from Rotterdam. From locally brewed beer at the Kaapse Brouwers, to fresh vegetable products from the farmer at Rechtstreex. At Jordy's Bakery you can go for freshly baked sourdough bread and at Cidercider, the first cider store in the Netherlands, you'll find the tastiest ciders in the Netherlands. Opposite is Firma Bijten, a full-fledged butcher's shop where you can buy delicious pâté, among other things. You can get cheese at Kaasboerderij Booij and coffee is roasted by Stielman coffee roasting.

Along with Artistic Activity

In the new building apart from housing also commercial spaces will be established along with Codarts Dansopleiding, Circus Rotkjeknor and Jansen Danst.

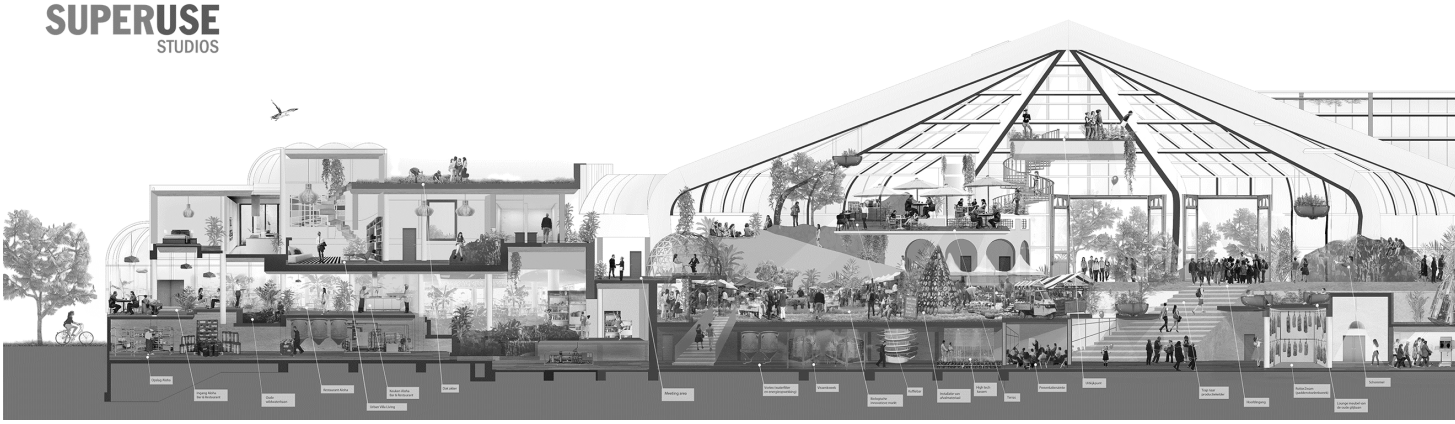
BlueCity Rotterdam, Tropicana

BlueCity is an incubator for circular entrepreneurs in and around Rotterdam. A hub situated in a deserted swimming pool with a dynamic community of entrepreneurs, researchers, neighbours, the government and education to serve as a breeding ground for 16 innovative, circular companies linking their waste-streams. This way, a much needed tangible and inspiring example for the circular economy is established.

The former subtropical swimming oasis Tropicana, a well known iconic building had lost its function and grandness but instead of tearing it down they decided to convert to a sustainable paradise. Innovative, sustainable and circular entrepreneurs are now settling down between slides and hot tubs to give new meaning, function and value to 12.000 m^2 of deserted swimming pool. Superuse Studios and COUP are transforming the building as circular as possible, re-using old elements and materials both from within the swimming pool as from other abandoned buildings, using Oogstkaart.

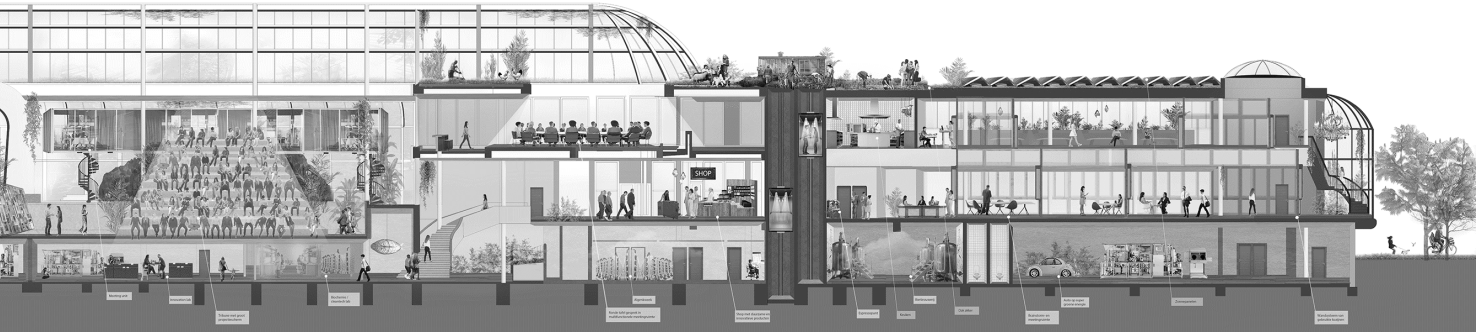
Cooperation, thinking and doing is essential. An important role in this is fulfilled by the **BlueCity Lab**. The Lab is located in the old changing rooms of the former tropical swimming paradise Tropicana and consists of a wet lab and dry lab ; in time, an experimental kitchen will also be added. Because of this unique combination, the only one in the Netherlands, materials can be grown from the cell in the wet lab and then processed into the final product in the dry lab . A packaging material of oyster mushroom mycelium, for example, or a bag made of kombucha leather, made from bacteria and yeasts, colored with bacterial ink - developed one by one in the Lab.

SUPERUSE STUDIOS



BlueCity Rotterdam, Tropicana

Rotterdam is a good base for this; a lot is happening in our city. RotterZwam , KEES , Kromkommer , Better future factory and Waste pays off concrete examples of economically feasible, sustainable concepts. The municipality and numerous public institutions and companies in Rotterdam are also giving the circular economy an increasingly prominent place. Initiatives that we like to work with are the Directorate of Economy and Management of City Development (from the municipality), Rotterdam Partners and R'damse Nieuwe , Social Enterprise NL . We also closely coordinate with other hubs in the city, such as Impact Hub, SUGU and Venture Cafe .



Pasona Urban Farm, Japan

New York firm Kono Designs created the urban farm in 2010, in a nine-storey office building in Tokyo to allow employees to grow and harvest their own food at work.

"Workers in nearby buildings can be seen pointing out and talking about new flowers and plants and even the seasons – all in the middle of a busy intersection in Tokyo's metropolitan area," Kono told Dezeen. "The change in the way local people think and what they talk about was always one of the long-term goals of the project."

The creation of the new headquarters for Japanese recruitment firm Pasona consisted of refurbishing a 50 year old building to include office areas, an auditorium, cafeterias, a rooftop garden and urban farming facilities. Inside the 19,974 square metre office building there are 3995 square metres dedicated to green space that house over 200 species of plants, fruits, vegetables and rice.

All of the food is harvested, prepared and served on-site in the cafeterias - making Pasona's Urban Farm the largest farm-to-table office scheme in Japan.

Pasona employees are encourage to maintain and harvest the crops and are supported by a team of agricultural specialists.

Inside the offices, tomato vines are suspended above conference tables, lemon and passion fruit trees are used as partitions for meeting spaces, salad leaves are grown inside seminar rooms and bean sprouts are grown under benches.

Pasona Urban Farm,Japan

Execution

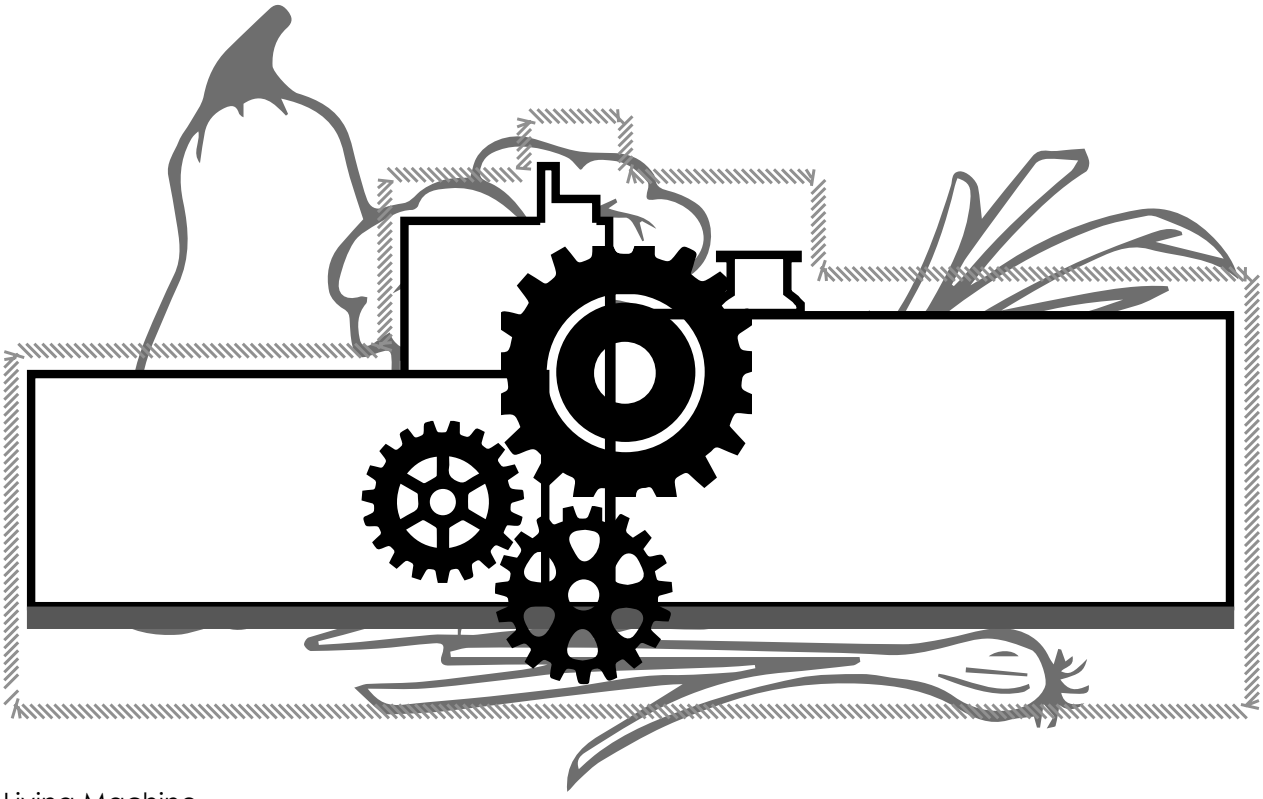
The double-skin green facade features seasonal flowers and orange trees planted within the 3' deep balconies. Partially relying on natural exterior climate, these plants create a living green wall and a dynamic identity to the public. This was a significant loss to the net rentable area for a commercial office. However, Pasona believed in the benefits of urban farm and green space to engage the public and to provide better workspace for their employees.

Within the interior, the deep beams and large columns of the existing structure are arranged in a tight interval causing low interior ceiling of 7'-6". With building services passing below, some area was even lower at 6'-8". **Instead, all ducts, pipes and their vertical shafts were re-routed to the perimeter, allowing maximum height with exposed ceilings between the beams.**

Lightings are then installed, hidden on the bottom vertical edge of the beams, turning the spaces between the beams into a large light cove without further lowering the ceiling. This lighting method, used throughout the workspace from second floor to 9th floor, achieved 30% less energy than the conventional ceiling mounted method.

Concept

Urban Farm



Living Machine

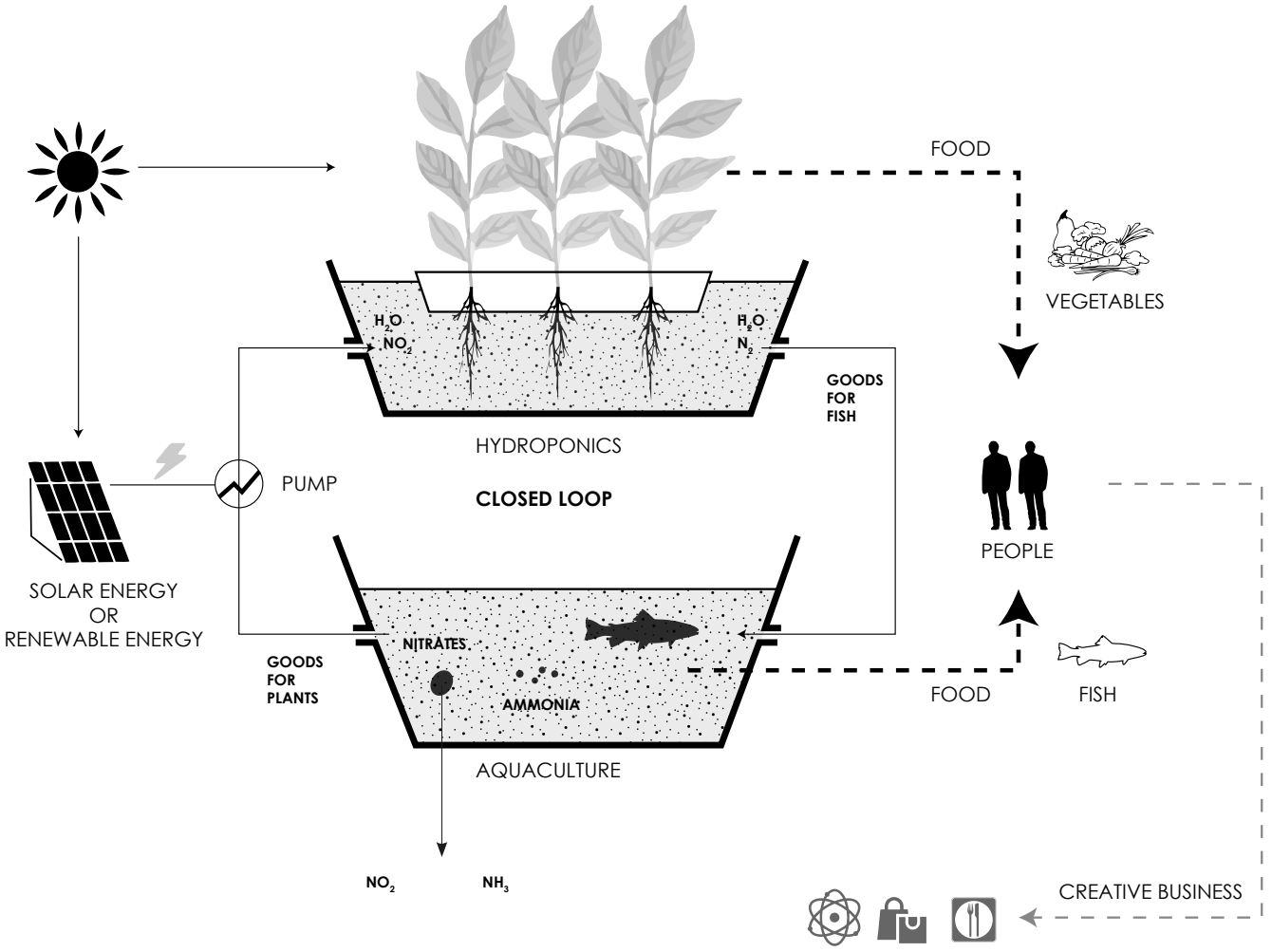
Introduction

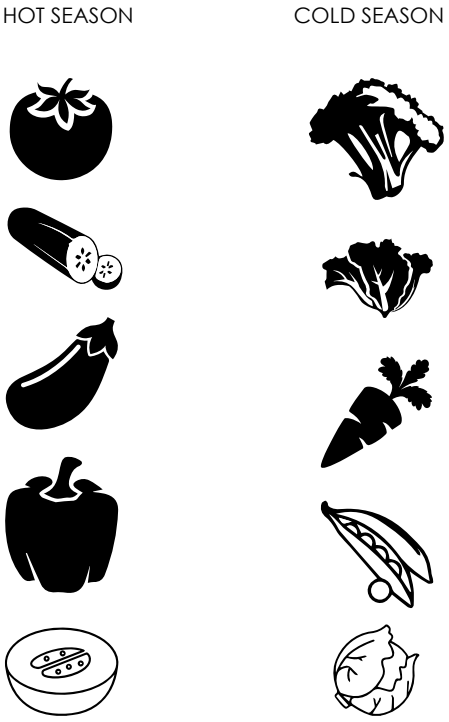
As it was shown in the previous pages, in the surrounding envrionment there is already a growing interest regarding urban agriculture, with green houses and garden established in various different spots. The idea is that by recreating a Research and Education Centre around this areas, people can be bettern infromed about the latest technological improvements, but most importantly in terms of alternative ways to produce food such as Aquaponics, Hydroponics, (soil-less agriculture) as well as innovative techniques to produces substitutes of meat and other animal exploitation-related chains such as eggs etc.

WIth the educational department and specifically designed workshops, seminars and talks the impact can be more than the revitalization of an national monument and it can influence positevely the whole society and way of living in Rotterdam and Schiedam.

The Haka building was always interpreted as a machined, for various and diffrent reasons. In this attempt to provide the building with an alternative programme and by underlining and enhancing its connection to the production and distribution of food, the idea is to convert into a living machine through the urban Farm/Argriculture Concept.

The idea is to combine different techniques in different areas of the building according to what was happening there in the past and the architectural possibilities that it has to offer. From greenhouse to acquaponics to traditional farming.





Aquaponic System

The aquaponic system is a combination of aquaculture (raising fish) and hydroponics (soil-less growing of plants) that grows fish and plants together in one integrated system.
The fish waste provides an organic food source for the plants and the plants naturally filter the water for the fish.
The third participants are microbes (nitrifying bacteria). These bacteria convert ammonia from the fish waste into nitrates. Nitrates are the form of nitrogen that plants can uptake and use to grow.
Solid fish waste is turned into vermicompost that also acts as food for the plants.

Aquaponics Research

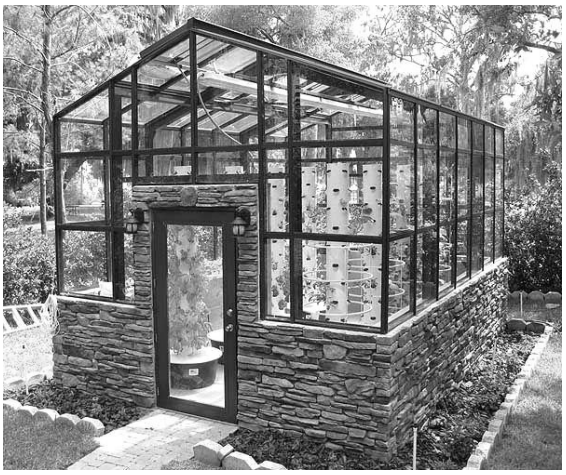
Why Aquaponics?

The history of modern day aquaponics farming systems is based on variations created in the late 1970s and early 1980s, which used underground fish tanks or floating grow beds. Since then, aquaponics farmers have become more innovative with their system setups and the locations in which they choose to farm. The most recent movement is an effort to combat urban food deserts by converting abandoned industrial facilities into working indoor aquaponics farms. Aquaponics systems do not require a large plot of land like traditional agricultural practices because the system does not require soil. Instead, aquaponics farmers can integrate vertical farming techniques to grow indoors. Vertical farming is farming done on multiple stories of a building, or in tiers to maximize grow space. Combining aquaponics and vertical farming makes the use of an abandoned industrial site the ideal location, because the site is already constructed and can be easily converted into growing facilities.

Benefits and Concerns of Aquaponics

Benefits

The benefits of the overall concept of using an aquaponics system are numerous, but there are also specific benefits for converting abandoned industrial facilities into aquaponics farms. Aquaponics produces healthy and environmentally friendly food that can feed an underserved community. These benefits, however, do not come without implementation risk. Certain factors make aquaponics an expensive and limiting farming option at this time. However, while this Article acknowledges the concerns with implementing an aquaponics system, it assumes that aquaponics farmers can overcome and reduce these concerns through technological advances and creative approaches, to make commercial-scale aquaponics a viable farming option.
As a closed-loop system, the only input required for an aquaponics farm is the food that feeds the fish. This food provides the stimulant for the plant growth, the fish's waste. Since fish food is the only input, an aquaponics system, unlike most traditional agricultural practices, requires no chemical-based pesticides or fertilizers in order to facilitate plant growth. Instead, the growth is entirely dependent on the nitrate that is broken down from the fish excrement.



The lack of pesticides and fertilizers applied to the plants means that every plant harvested from an aquaponics system is completely organic.

The lack of pesticides and fertilizers is also beneficial from an environmental standpoint. Pesticides and fertilizers help increase the yield of crops and restrict pests, but simultaneously present significant environmental risk. Their use produces disastrous effects on the landscape and surrounding waterways through runoff. Another environmental benefit stemming from the lack of chemical pesticides and fertilizers is the reduced amount of water required in an aquaponics system compared to traditional soil-based agriculture. In fact, aquaponics farms use 90% less water than traditional soil based agriculture, which is ironic considering the entire aquaponics system revolves around the use and reuse of water.

Traditional outdoor farms are limited to growing certain crops during certain seasons because of temperature and climate related obstacles. Aquaponics farmers have complete control over the climate the crops are subject to since the farms are located indoors.

Aquaponics farmers have had success in growing a variety of crops year-round. This includes crops such as lettuce, tomatoes, cucumbers, leafy greens, herbs, and spinach. The controlled environment also means the crops are not at risk of weather-related crop catastrophes, caused by phenomena like droughts or natural disasters.

Concerns

Aquaponics systems are not without their faults, however, because the aquaponics system is more expensive than traditional farming operations and are not likely to replace the need for traditional agricultural practices.
By far the largest obstacle facing aquaponics is the costs associated with constructing and maintaining an aquaponics farm. Aquaponics farms can cost millions of dollars to become and remain operational. Constructing a new indoor facility can cost anywhere between seventy and eighty-five dollars per square foot in urban areas, not including the cost of production equipment such as the tanks and grow beds.
Also added into the cost equation is the actual fish and produce that farmers grow and eventually hope to bring to market.

Aquaponics Research

Finally, in order for the plants to grow to their full potential, indoor aquaponics systems require prolonged exposure to light. Plants require between sixteen and eighteen hours of intense lighting to grow when they are not exposed to natural sunlight. The prolonged lighting leads to significantly expensive energy costs throughout the production cycle.

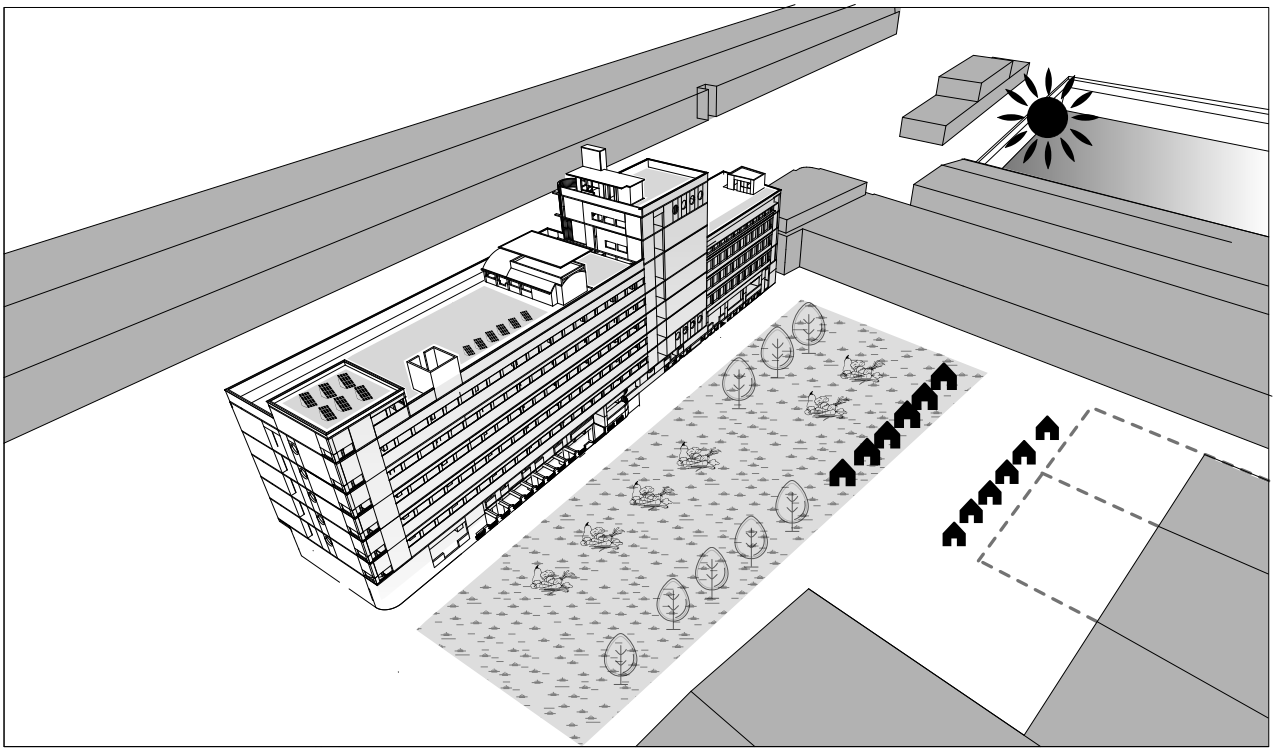
Possible Solutions

By using existing abandoned structures, farmers cut down on the cost of construction and reuse materials found within the structure or donated from other organizations. They are also retrofitting the structures with renewable energy systems to mitigate the environmental damage caused by the required energy use.
Aquaponics can produce 22,000 kg of fish and 45,000 kg of vegetables per year in 4000.00 m2 of space.
By contrast, one grass-fed cow requires 42.000.00 m2 of grassland. Another way of looking at it is that over the course of a year, aquaponics will generate about 12 tons of edible flesh per 4000 m2, while the grass-fed beef will generate about 34 kg in the same space.

Sources:

- *https://innerself.com/content/living/home-and-garden/gardening/8654-aquaponics-vs-traditional-agriculture.html*
- *https://www.sciencedirect.com/science/article/pii/S0044848614004724*
- *https://www.leaffin.com/aquaponics-sustainable-profitable/*
- *http://www.onecarenow.org/pros-cons-aquaponics-system/*

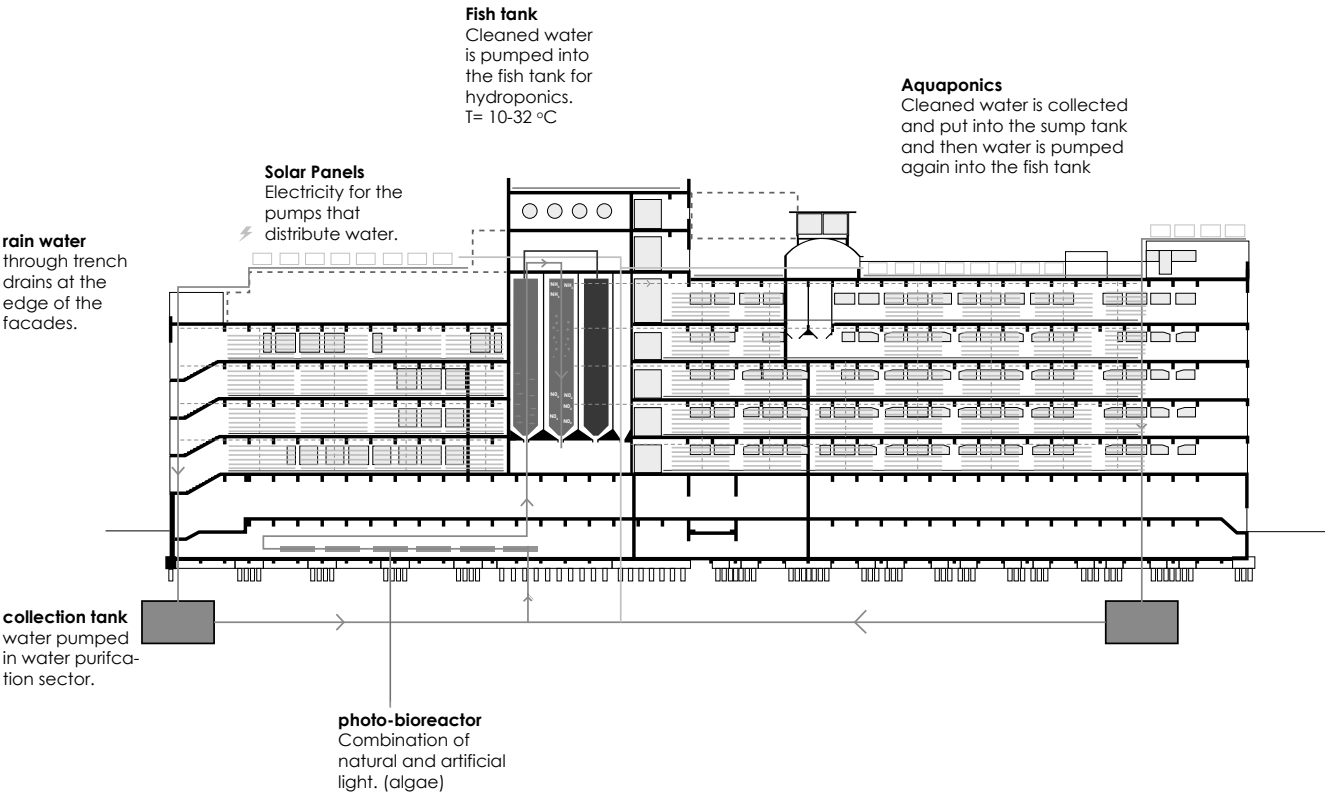
Urban Farm



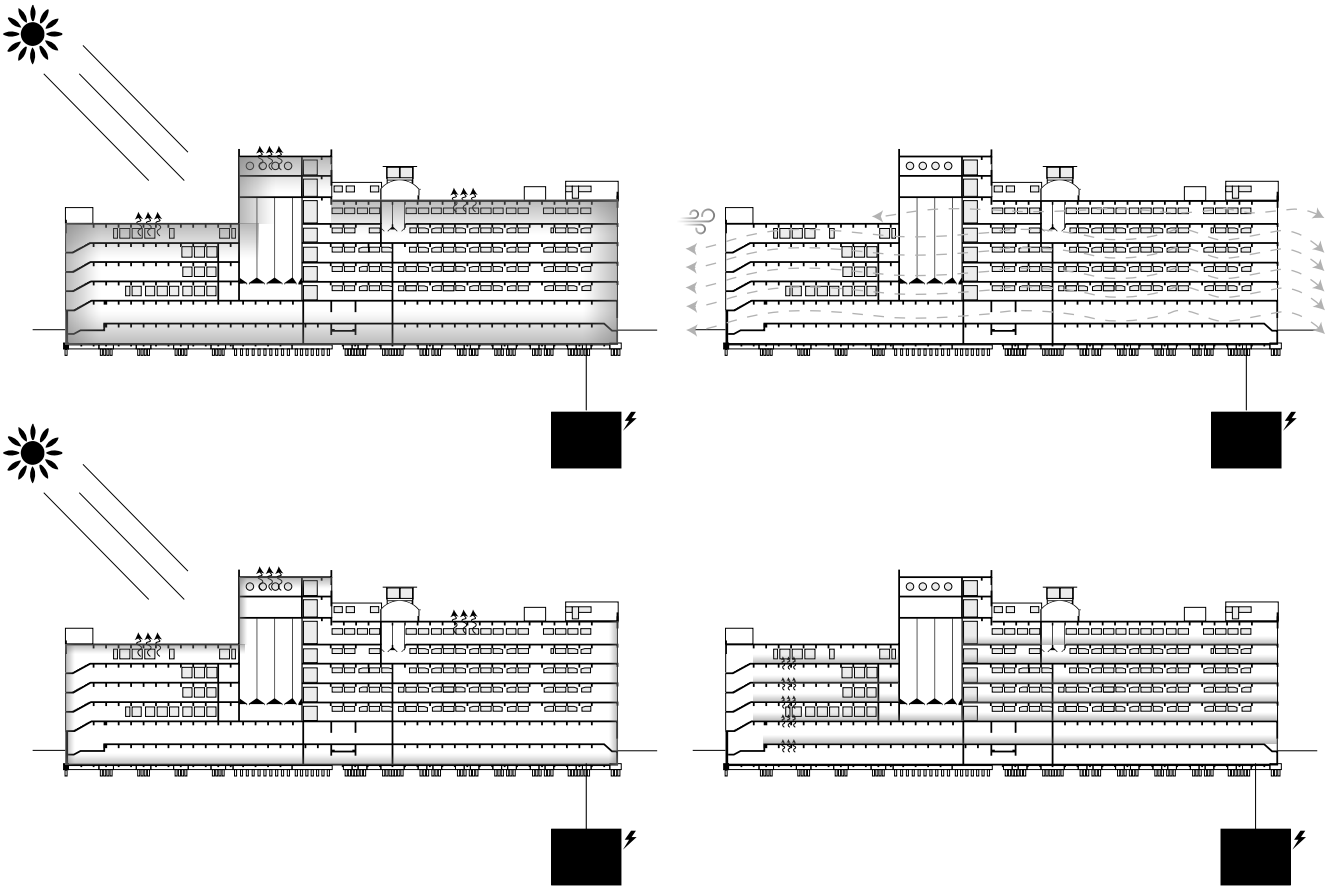
The buildings orientation relatively to the sun allows not only the building to receive a significant amount of daylight for the plants but also the empty plot in front of it. This creates opportunities for improving the environment of the city in general. The cultivation of the land, as well as the establishment of a market. In addition the empty in the future warehouse could transform along the same lines so as to increase the facilities and thus production.

Vegetables/fruites and Herbs	Growing Sizes	Light and Water Requirements
Coriander	203-457 mm	
Tomatoes	203-548 mm	
Lettuce	457-914mm	
Cucumber	50-304 mm	
Kale	152-304 mm	
Strawberry	<304 mm	
Basil	50-304 mm	
Mushroom	50-150mm	

Daylight and Water



Thermal Mass



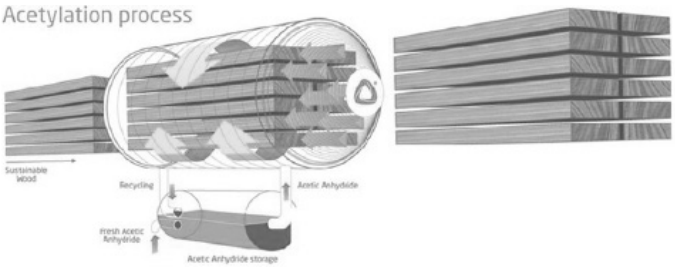
Sustainability

Materialisation

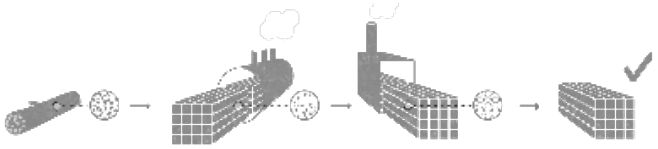
Following the same principle as with climate control the materialization of the new structures will be in a complementary manner as well. Following on Kengo Kuma's "A return to Materials" article that was part of our theoretical analysis in the beginning, the new structure will be made out of wood.

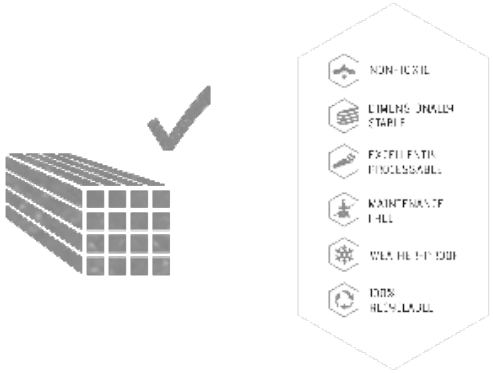
Given the high moisture content in the activities of the building according to the proposed scheme, special attention is required. An investigation was conducted in terms of Accoya and Frake Woods and the later was chosen due to the fact that is netherlands based and thus transportation costs will be reduced to minimum.

Furthermore, for the interior walls and partitions CLT walls are chosen for their multiple advantages. First of all, prefabricated elements will reduced the costs and time of construction especially since the most parts are quite repetitive in the various floors. Additionally, the outer finish layers of the wall can take various finishes according to the requirements of each space, be it increase accoustic insulation, fireproof treatment or water resistance.



Accoya Wood





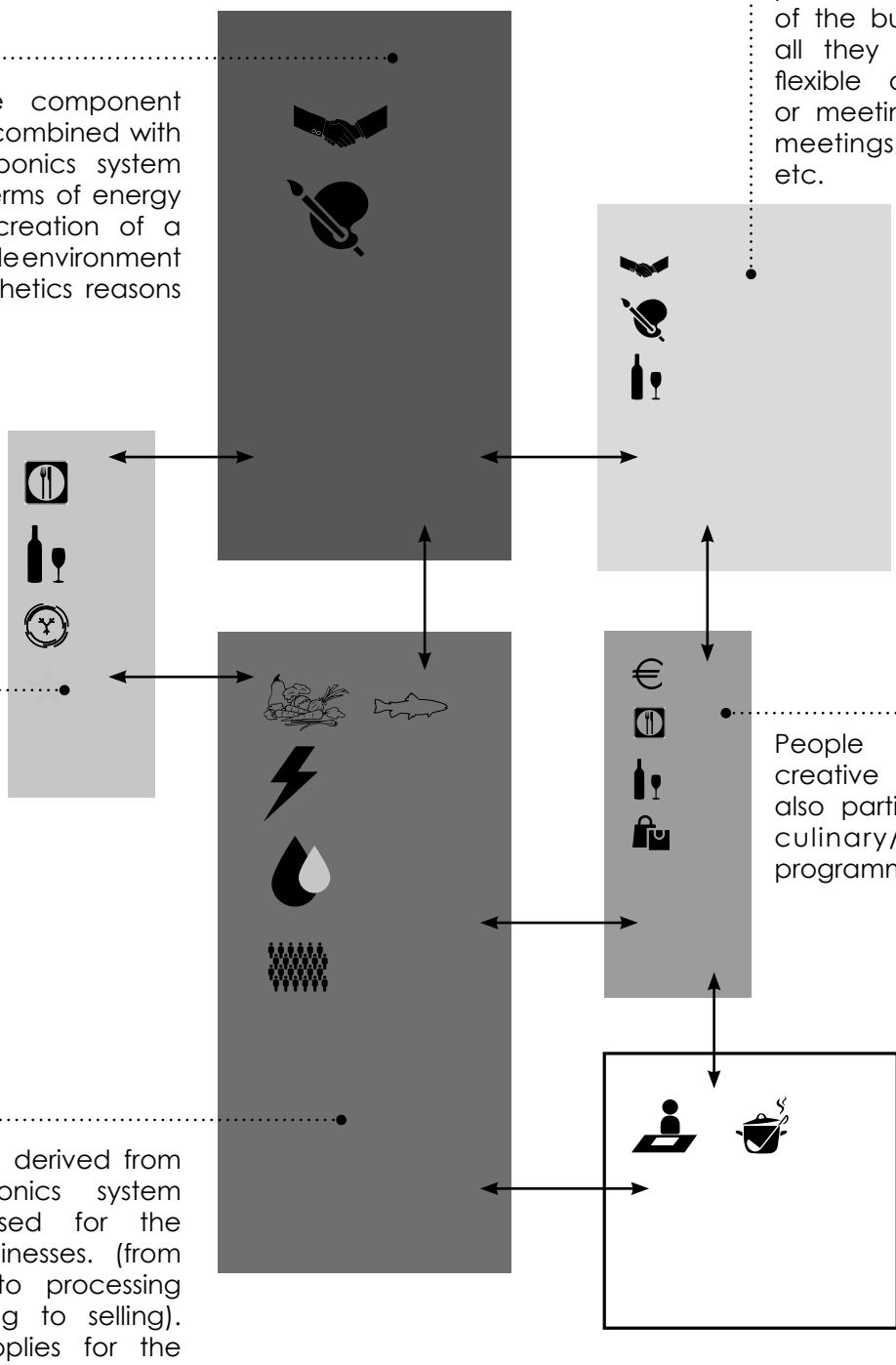
Frake Platowood

Programme

Possible Links Between the different functions

Local Artists, Architects, Designers etc. would be attracted to both the public and private componens of the building. First of all they can use the flexible office spaces or meeting spaces for meetings,presentations etc.

The office component could be combined with the aquaponics system either in terms of energy and the creation of a comfortable environment or for aesthetics reasons as well.

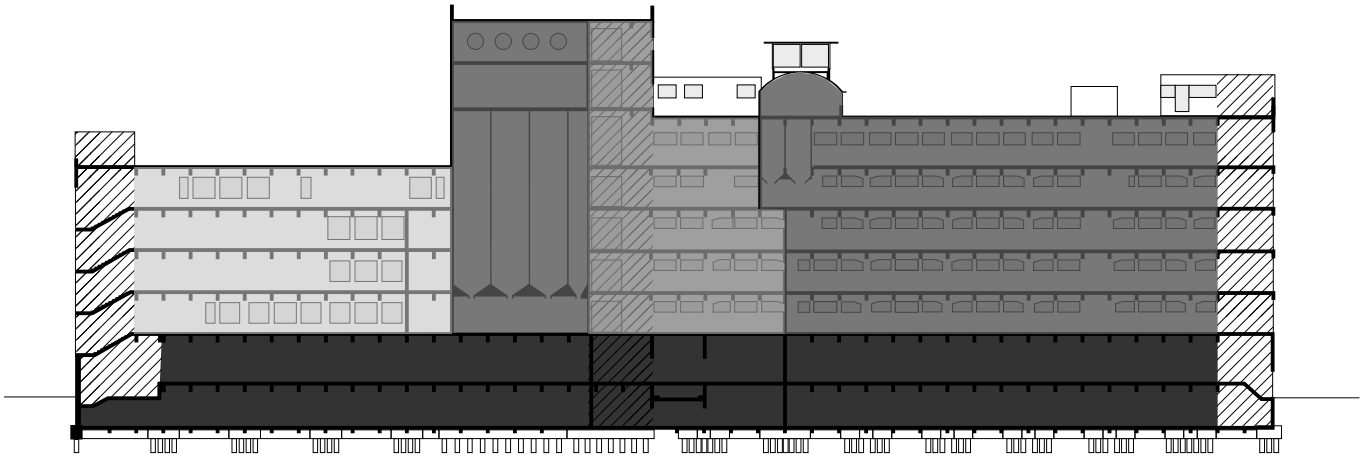


The roof and the great views towards the harbour can be a landmark for both visitors and business people working in the building.

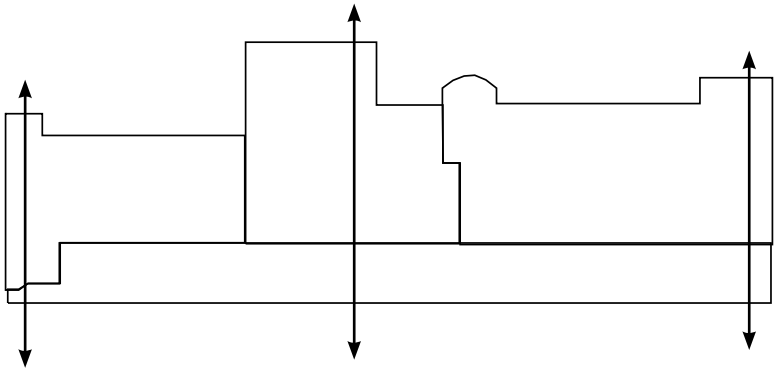
People from the creative business can also participate in the culinary/educational programme

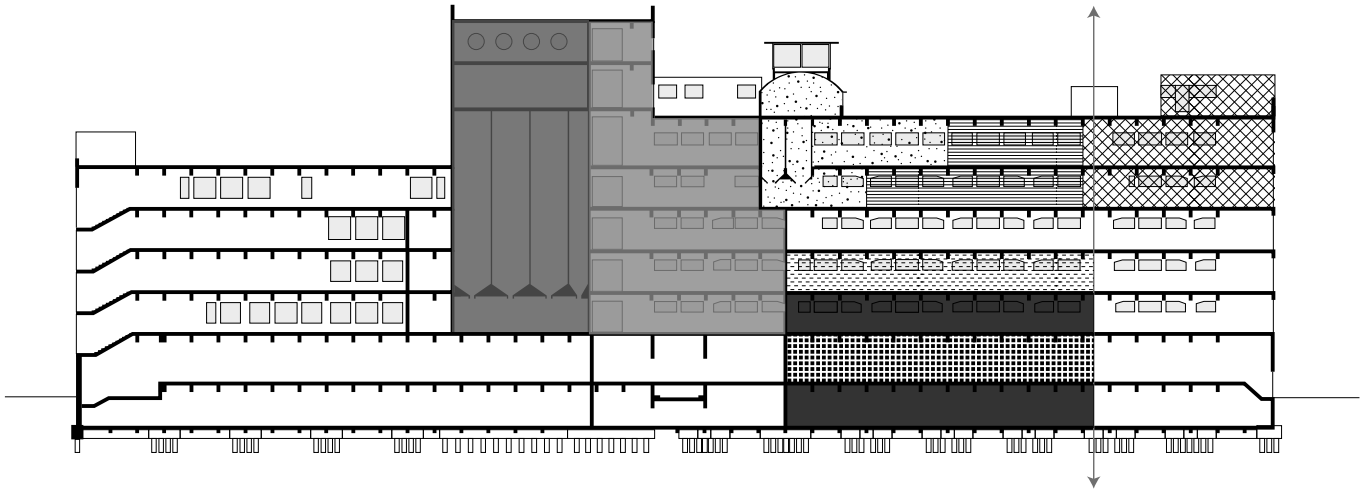
The products derived from the aquaponics system can be used for the creative businesses. (from production to processing to packaging to selling). This also applies for the restaurant on the roof.
Moreover aquaponics can be combined with culinary lessons for kids or adults. As well as with lectures on urban agriculture.

Original Situation



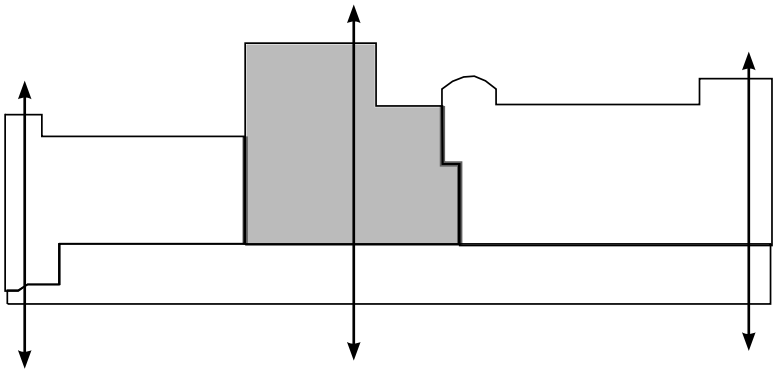
Section Diagram



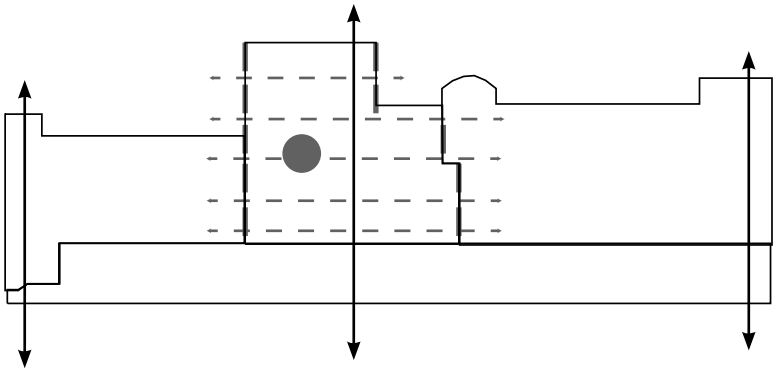


Programme

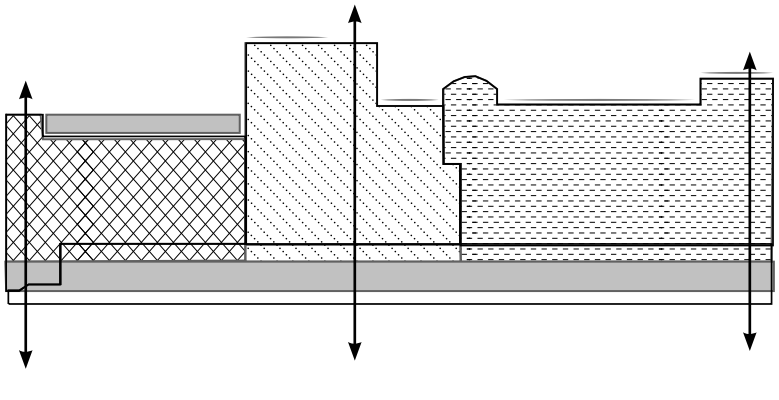
Proposed Scheme



The heart of the building was always the core part with the silo, and everything around it was there so as to ensure its functioning. However it is also the most excuded part of the building.



The ambition is to unlock the old silo and "fabriek" to the public so they can enjoy the various "hot spots" and the view of the harbor or the city.

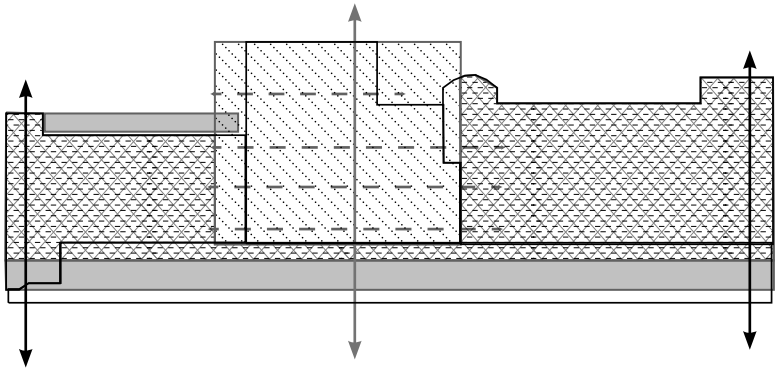


Urban Farm + Research/LAB

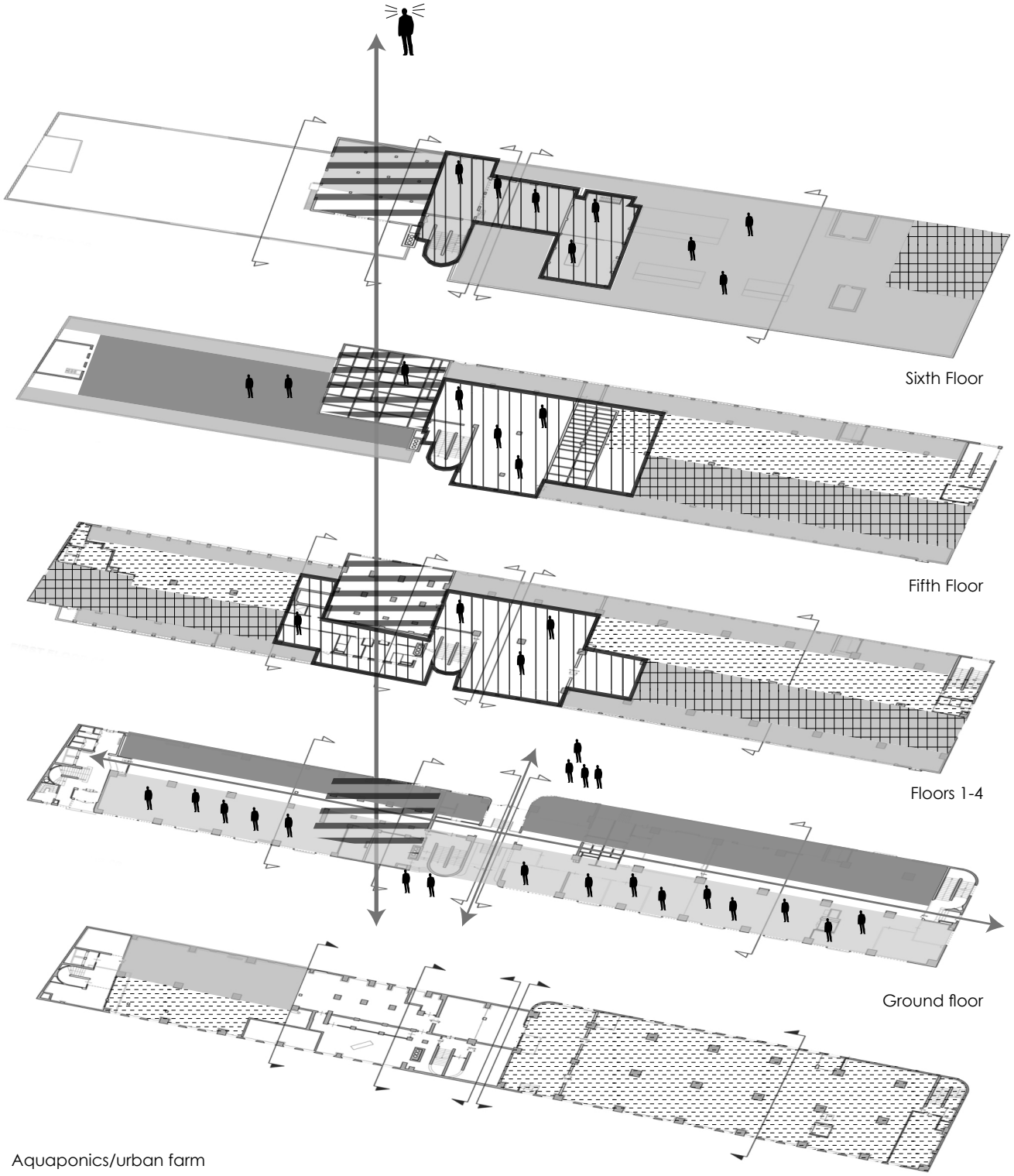
Education Department

Offices

Horeca/ Creative Business



Alternative arrangement so as to ensure that the public has access to all the important parts of the building.



Aquaponics/urban farm

Research/Lab facilities

Offices

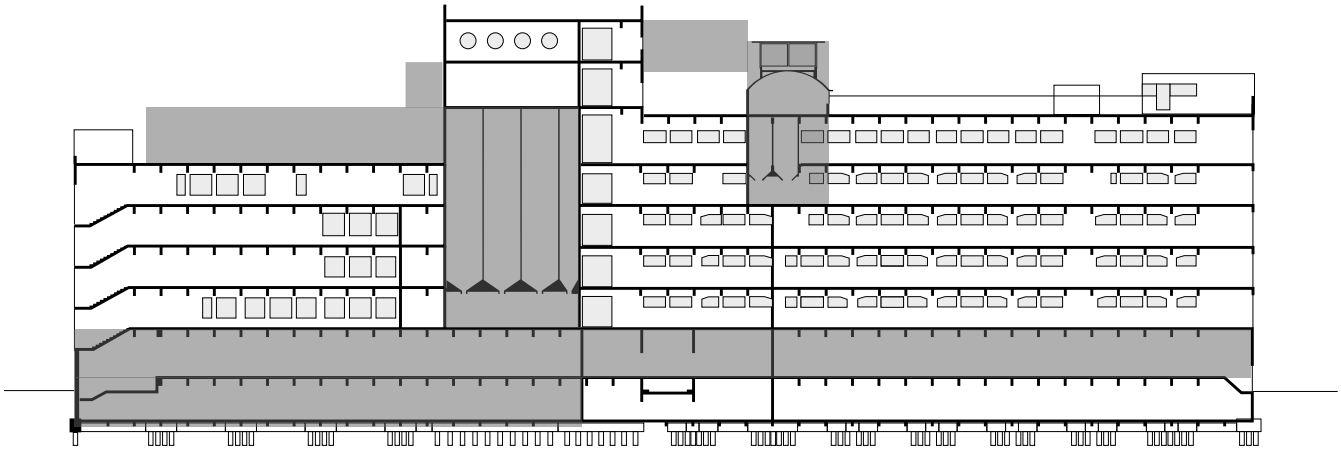
Education facilities

Education/Exhbition Space

Creative business/Shops

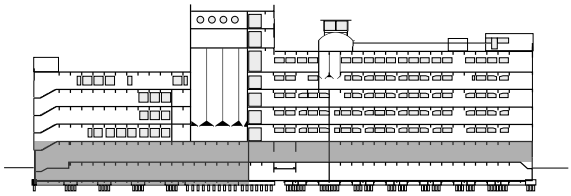
Flexible office/meeting space

Design

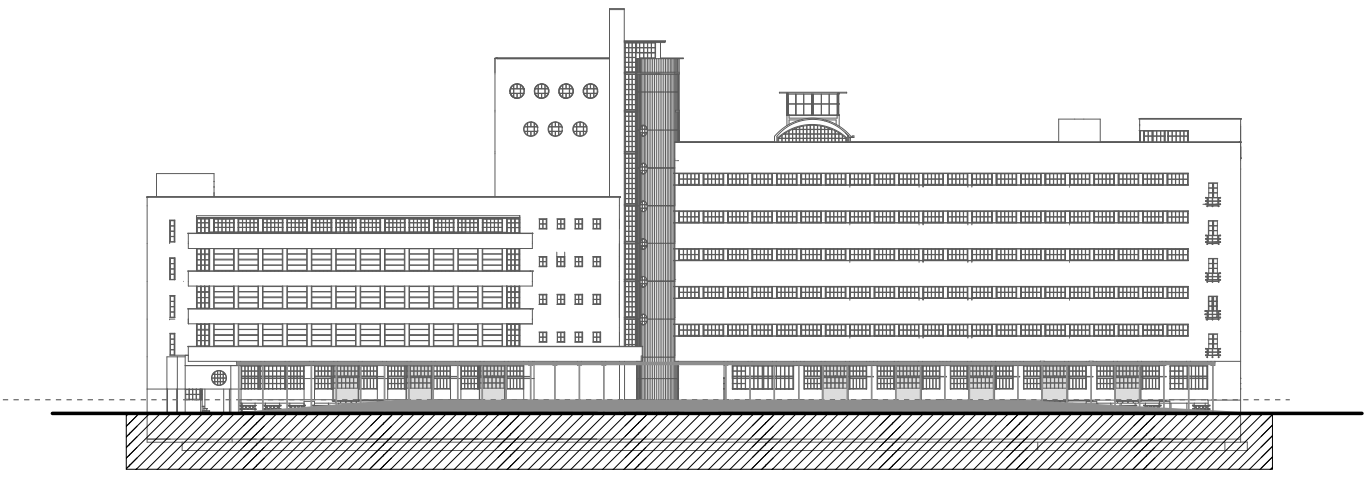


Main intervention zones

Ground Floor - Basement

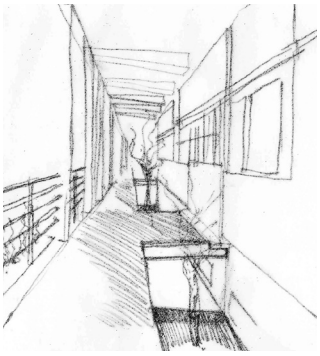


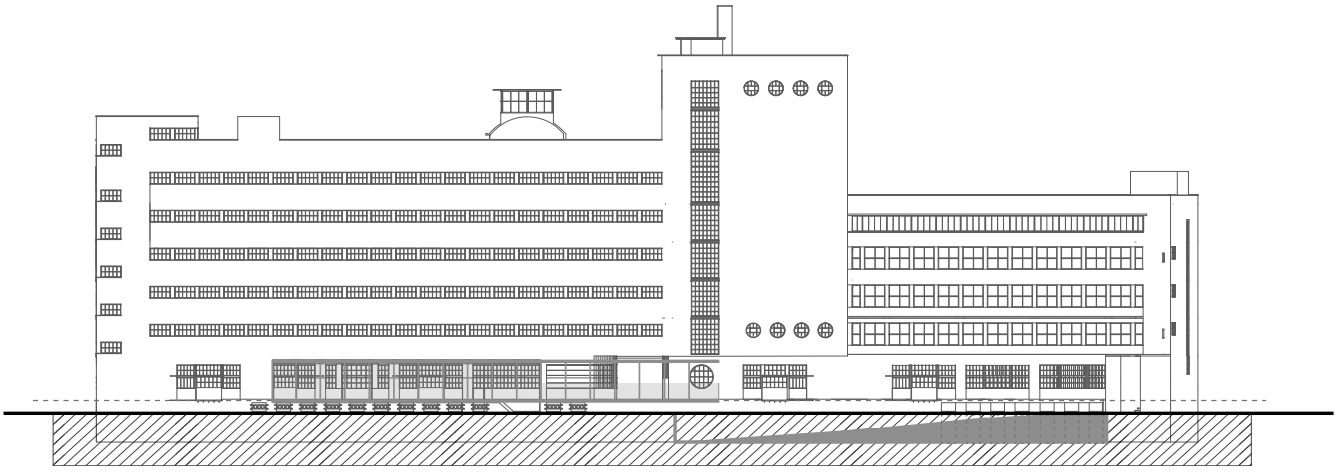
At the moment the north facade, along the Vierhavenstraat, opposite to the Dak park is of no use. Not even pedestrians choose to walk from this side of the street. In order to change than and enhance the architectural qualities of the architect I propose to create a raised corridor at 1.30 m above the ground level. (Current ground floor, floor level) This way the unique sliding doors of the facade will acquire use again and can serve the start-ups or shops of the commercial zone.



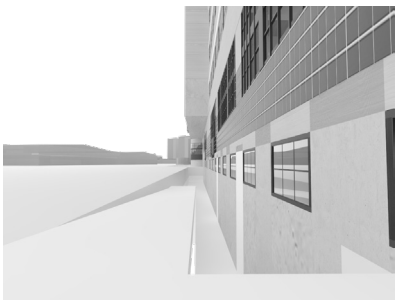
North Facade

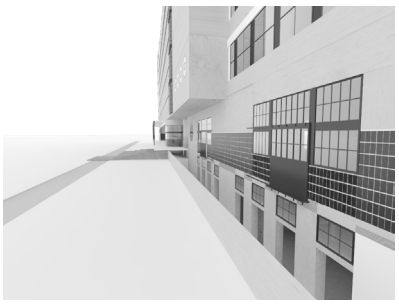
The windows of the basement however which are above ground will be completely obstructed from daylight and this creates various problems. In order to solve that various alternatives where test. With different geometry, materiality etc.
Furthermore, the images below show an additional steel structure. Reflection on the result and the degree it distructs the visitor from the original elements of the building lead to the decision to experiment more and considere the use of timber as an alternative.

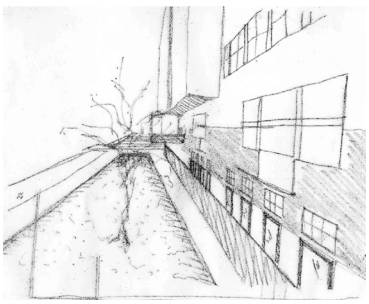




South Facade



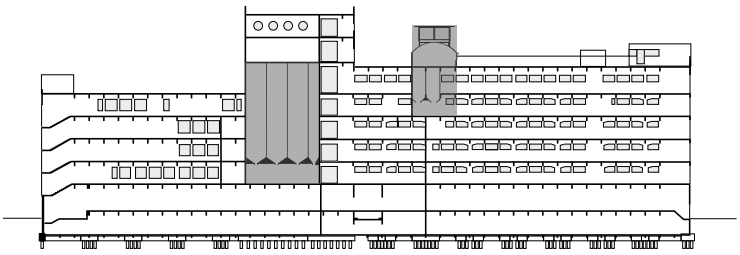




On the south facade, where daylight reaches the building directly the problem is even greater therefore instead of a continues raised platform the proposed design includes a small extension of the sitting/ meeting area at the already exterior corridor. Materials such as glass can be used in the floor finish so as to allow light to reach the research facilities on the basement. On the otherside, were thereis no exterior corridor already, additional ramps are proposed so as to "unlock" the basemet and allow direct light for the algae purification system. Similarly the public will be able to see the process (educational character).

Design

Silo - Water Tanks



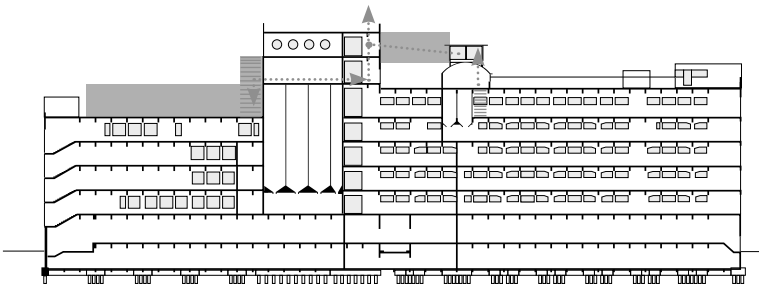
Current Situation

In terms of the existing silo structure the idea is to expose again to the visitor the whole range of their qualities. First of all the functional part with the introduction of the fish/ water tanks for the aquaponics systems.
The second layer becomes the current situation with a dark environment and hidden lights to experience the dramatic character of such spaces. The third and final layer is that of the new circulation, with lifts, and glazed flooring so as to allow light to penetrate into the various floors and thus creating a contrast of experiences that both underline the existance of the silos, intervening too much to alter their character.

Similarly in the smaller silo, existing staircases that are not functional anymore nor according to regulation standards are replaced with new as so as to allow the public to follow similar paths as the former workers in the original situation.

Development of proposed idea

Roof extension - Bridge



The last important area of intervention is the roof extensions for the restaurant/cafe facilities of the programme. One of the most interesting aspects of the building there, was the exterior staircase which however is not really a staircase therefore, i decided to enhance that element by providing a new staircase which will be the pick point of this route architecturel leading to the iron round staircase and from there to the top 360 glass box where people can have a drink and enjoy the view.

Reflection

Reflection

This project developed to be a project with a strong and demanding programme while the architectural approach in terms of the interventions was that of minimal invasions so as to unlock the various hidden spots inside the building. I believe that programmatically its a conceptual but fitting scheme for the particular building that could create a new layer in its history of equal importance as the old. In terms of the design development and architectural approach, it was difficult to combine such a programme with minimal invasions to the existing building so as to respect both its tangible and intangible values as well as the former architect. Furthermore, the fast pace of this semester and the reduced time that I had to spare for this project as well as its massive scale made it even more difficult to make decisions that could allow perhaps a better structured intervention approach. In the end, I believe that the attempt to make a sustainabe design dominates the architectural interventions or spatial quality of the building with the exception perhaps of the attention that was given in the circulation and movement of the public as well as the permanent users of the building. There is always room for improvement and in this particular project I believe that a lot could be improved and developped.

Thank you.