

MASTER

Re-sourcing the Tapijn Barracks transforming military exercise hangar into contemporary university kitchen garden

Reumers, Simon

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Re-
Sourcing
the
Tapijn
Barracks

RE-SOURCING THE TAPIJN BARRACKS

TRANSFORMING MILITARY EXERCISE HANGAR INTO
CONTEMPORARY UNIVERSITY KITCHEN GARDEN.

AUTHOR: SIMON REUMERS

STUDENT NUMBER : 0722337

INSTITUTE : EINDHOVEN UNIVERSITY OF TECHNOLOGY

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PROFESSORS : DR. IR. GIJS WALLIS DE VRIES, ANDRÉ WALRAVEN ARCH. AvB, PROF. DR. IR. JOS LICHTENBERG.

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PREFACE

With my subscription to the graduation atelier 'Champ de Mars' in februari 2012, I decided to take part of this architectural design assignment, still having a rather technical focus. Like previous projects, this deals about rehabilitation. Differences with the latter projects can be found in the preliminary research and subsequent design approach.

This report covers my entire design process within the graduation atelier and therefore it contains reflections and conclusions of the preliminary reports entitled 'The Art of Transformation' and 'Secure', that are most relevant to the scope of the design process of the university kitchen garden in particular. Besides, personal interests like sustainability will be handled.

Therefore, the aim is to enlarge collective consciousness about the obsolete spot, energy usage and food origins. Furthermore, I hope to inspire people dealing with the Tapijn Barracks to transform the military base in a progressive way, still securing the typical atmospheres on the terrain.

I want to thank project tutors dr. ir. Gijs Wallis de Vries, André Walraven Arch. AvB and my third supervisor prof. dr. ir. Jos Lichtenberg for their feedback. I also want to thank my fellow students Kenny Vonk, Bas van Gils and Marcel Pruijsten for the teamwork during the preliminary research and urban plan phase.

Simon Reumers

February
2013

ABSTRACT

Champ de Mars: Re-Sourcing the Tapijn Barracks started as a study to vacant military heritage and how these spaces can be transformed, focussing on the Tapijn Barracks in Maastricht. Scope of this research is a comparative study to military bases, research to the collective narrative about the Tapijn Barracks and how artists deal by transforming object and space. This report aims to find an answer on; *How can, in a transitioning world, the former Tapijn Barracks' exercise hangar be transformed, inspired on contemporary visual artists' approaches in their transformation of object and space?*

Artworks by Matta-Clark, Wurm, López and Hofman prove art communicates a message. Additionally, artists often use only what is there at the moment, not a romanticised picture of it. The refreshing approach artists have, inspires by setting up an urban plan. This urban plan focuses primarily on the specific atmospheres to be found on the terrain before the transformation takes place. Mainly these qualities determine the new functions on those particular spots of the transformed terrain.

One of those spaces lies around the former exercise hangar. Because of its rather concealed location, right on the place where city shades of into rural and where barracks move over into green, the function will alter from garage to university kitchen garden; a contemporary interpretation of the traditional winter garden. With this function, a whole new topic within this design process arises; flora. What plants should grow inside the winter garden? Again the determined functions are of influence; the plants inside the winter garden should provide food for the university restaurant!

A short investigation to local dishes, something Limburg and the Maastricht region distinguishing their selves with, shows huge differences in how local food really is. Sometimes, vegetables for local dishes travel across the globe before they are eaten, resulting in a CO2 emission more than 50 times as large compared to locally produced food.

The university kitchen garden has to communicate this message; 'act local', driven by the university's 2011 Christmas present that promotes local based firms and services. By the addition of a large, contemporary volume, the building makes a statement towards collective consciousness about food on the one hand and the concealed original

BY THE ADDITION OF A
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CONSCIOUSNESS
ABOUT FOOD...

building on the other hand. The contrast frames the current building in its spirit of the age; as a user of fossil fuels, while the new volume is future proof and thus provides its own energy by building integrated photovoltaic foils and hydropower.

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SOURCES

INTRODUCTION

1. Already published as 'The Art of Transformation'.

2. Already published as 'Secure'.

3. After: Wikipedia (online source).

Vacant military heritage offer, next to and following on industrial heritage, new assignments for architects and urban planners. Transformation and/or redevelopment of those locations is needed and they can be found through the whole

HOW CAN, IN A TRANSITIONING WORLD, THE FORMER TAPIJN BARRACKS' EXERCISE HANGAR BE TRANSFORMED, INSPIRED ON CONTEMPORARY VISUAL ARTISTS' APPROACHES IN THEIR TRANSFORMATION OF OBJECT AND SPACE?

country. In the Netherlands alone, thanks to economising, modernising and centralising the national army, barracks are closing or are already closed in 44 cities such as Amsterdam, Breda, Ede, Maastricht and Venlo.³

Re-Sourcing the Tapijn Barracks is the result of a renewing approach that is started by involving the aforementioned research to

artists in the graduation atelier 'Champ de mars'. Goal of this research and design is to find a way how to investigate whether art can be an inspiration in an architectural design process in the first place and coming to a design on urban and architectural scale in the second place. Therefore, 'Re-sourcing the Tapijn Barracks' is an explorative design research wherein research to art¹ and an urban design² is implemented. Findings of both the research and the urban design lead to new questions, mainly about current issues like energy. Still, the main question of this architectural design report is: *How can, in a transitioning world, the former Tapijn Barracks' exercise hangar be transformed, inspired on contemporary visual artists' approaches in their transformation of object and space?*

An answer to this question will be found by reflecting to the research and urban plan and by investigating function related topics determined by the urban plan.

CHAMP DE MARS: 1. EXERCISE HANGAR

VACANT MILITARY HERITAGE. THE TAPIJN BARRACKS ARE AN EXCELLENT EXAMPLE OF THIS RELATIVELY NEW DESIGN TOPIC IN OUR COUNTRY. WHAT ARE THE CHARACTERISTICS OF THE TERRAIN AND THE BUILDING THIS REPORT FOCUSSES ON? BESIDES, CAN THEY BE SEEN AS QUALITIES OR ARE THEY THREATENING THE FUTURE OF THE TERRAIN?



1. Champ de Mars, comparative studies (2012) p. 148.
2. Woningwet; law with the objective to prevent people living in poorly built dwellings.
3. Champ de Mars, comparative studies (2012) p. 170.

The south border of the city centre of Maastricht is characterised by the presence of a ten-meter high city wall with the stream Jeker in front of it. During the middle ages, this terrain was in fact an inundation that protected the city together with the city wall and its gates. In 1876, with the neutralisation of the status of fortress, the city was able to expand again since ages. One of the first expansions was the development of 'Villapark', a dignified and spaciouly set up neighbourhood for wealthy citizens. A few decades later (in 1904) and in reaction to the threat of a new war, the ministry of war decided to built a new military base to protect the southern part of Limburg. Despite major resistance from city council and prominent citizens of the city, living in 'Villapark', building a new military base on the former inundations started in 1908¹. With filling up the small Jeker stream. Due to a higher living standard and the assumption of the Woningwet², a whole new base typology arose; the pavilion style. Therefore, filling up the small Jeker stream was necessary to create a reasonably flat terrain, suitable for this new type of military base.

1.1 Characteristics:

This pavilion style is recognisable by its wide variety of buildings that house even a wider variety of functions. The order of buildings is determined by their function and representativeness; important functions get a prominent location facing the Prins Bisschopsingel, others, often more functional, find place in the more utilitarian area in the centre of the terrain. Additionally, more domestic looking buildings like the officers houses where placed near the East border of the terrain, creating a

smooth transition between the barracks and 'Villapark'.

On the west border however, a completely different building takes care over the ending of the terrain; the exercise hangar. Despite its very functional purpose, this building forms the transition of a very representative ensemble (i.e. from east to west; the entrance building, former officers canteen and two lodging buildings that surround the 'corps de logies' together with the main building) towards the public green zone around the stream Jeker. This ensemble acts as front facade of the barracks and had to impress passers-by on the Prins Bisschopsingel. The

THIS BUILDING FORMS THE TRANSITION OF A VERY REPRESENTATIVE ENSEMBLE TOWARDS THE PUBLIC GREEN ZONE AROUND THE STREAM JEKER.

exercise hangar is built in the first building round that lasted from 1916 to 1919³. Purpose of this particular building was to foresee soldiers in a place where they could exercise military practises and strategies in order to stay well trained and prepared for war. To accommodate this function, there were two trenches in front of the building. Inside the building, there was the exercise hall at self and two gunsmith's workshops.

Image 1.1 Location. A green arm is penetrating the urban zone and touches the former Tapijn barracks.







This program changed during the barracks' third building round, in 1953 to be specific. In that year, the exercise hangar is transformed into a garage by enlarging the windows on the south-facade and replacing them for steel doors. Besides, two rather small rooms were made inside the exercise hall; most likely, these rooms function is related to the new function of the building and act as storage space and office.

As a result of the placement of steel doors, there is less natural light inside the building compared to the authentic state; the building became more closed. Nevertheless, the front facade does not look very heavy because the steel doors appear and feel much lighter compared to the masonry. Additionally, it is very imaginable that those doors are opened and the interior of the building becomes visible.

Another adaption that was necessary to transform the building into garage was lowering the floor approximately 35cm. By doing this, the original brick pavement is replaced by prefabricated concrete elements (Stelcon). A gentle ramp facing the east facade was made and the brick pavement outside the south facade was lowered to make the building accessible for vehicles.

Design decisions with regard to both of the original design and the transformation determine the current atmosphere of the building. This typical atmosphere, not the romanticised original state of the building, is something artists appreciate. The latter is researched and described more in detail in paragraph 2.1; 'The Art of Transformation' and the report 'The Art of Transformation' at self.

In the current situation the building is, despite a couple of changes that are made during the '50's, in a rather authentic state. The building consists of a blend of early 20th

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century architecture with its sophisticated decorations and the more utilitarian architecture from the 1950's. Stylish English bond masonry, already weathering white painted wooden window frames and eaves and rigid, more severe, steel sliding doors are composed into one entity. In the inside, eight steel trusses support the large gentle-sloped roof and on top of this structure, a wooden sub frame is mounted that supports the roof sheathing with on top of that anthracite coloured ceramic roof tiles. Parts of this roof became quite mossy over the past decades.

All these characteristic materials are formed into a quite simple composition of only two

Image 1.2 (previous page)
Slender steel trusses span the floor at once.

Image 1.3 Closer view of steel trusses.

Image 1.4 Replaced steel door in east facade.

Image 1.5 One of the rooms in the second volume.

Genie
1919
3^e Commandement
Maastricht.

Het Kazernement der I

Fig^o 14^o Exerci

Fig 14^e Standgezicht volgens C-D op fig 14^o.

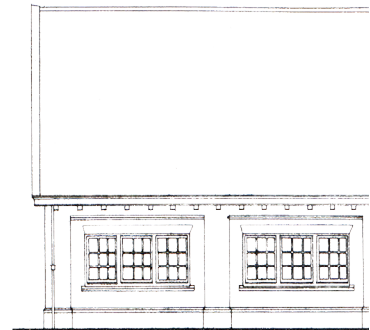
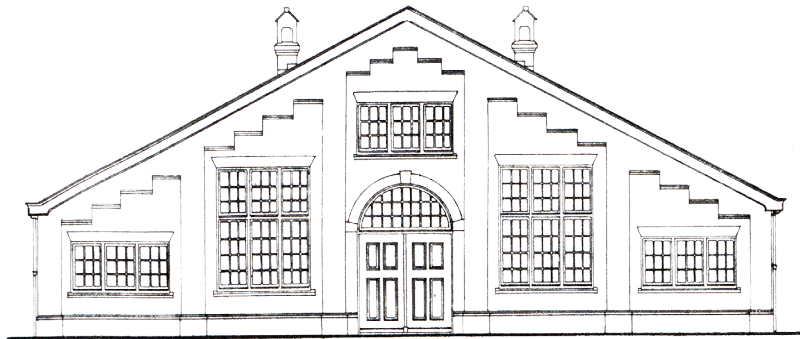


Fig 14^e Standgezicht volgens E-F op fig 14^o.



Fig^o 17^o Best-en V

Fig 17^e Platte g

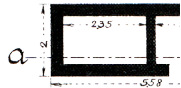


Fig 17^e Doornaa

A-B. op fig

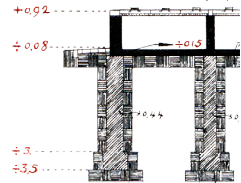


Fig 17^e Doornaa

C-D. op fig

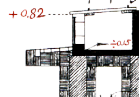


Fig 14^o Platte grond met Kapplan.



volumes. One large volume, approximately forty by twenty meters, has a pitched roof with gentle slopes and a total height of nine meters. The other volume is much smaller and is in fact an oblong box of around five by eleven by four meters. This very straightforward composition of volumes suits to the function of the building very well; no-nonsense architecture from the early 20th century for the indispensable exercising. In this building, everything has a function and this can be seen as well. The additions are, in line with the authentic building, made in a rather pragmatic way; remove or replace as less elements as possible, which results in very little restoring effort. Nevertheless, sufficient effort is made to maintain and restore small details like the stepped gable at the east facade.

This simplicity is also seen in the routing towards and inside the building. By the main entrance, which has been modified by the placement of a large steel door still being nearly at the same place, one enters the building very direct. There is no entrance hall because it is simply not necessary; one enters the spacious exercise hanger instantly. Inside this large space, two small rooms are located at the south facade; an office and a storage room. Notable is the lack of connection between the volumes mentioned before; there is only a small door in between which is probably made during the transformation of the building in the '50's. In the original state, one who would enter the gunsmith's workshop had to go round the building and enter at the west facade.

Image 1.6 (previous page)

Original drawing.

Image 1.7 North and west facade.

Composition of pitched roof volume with attached oblong box.

Image 1.8 (next page) Cross section current state (1:200).

Image 1.9 (next page) Ground floor plan current state (1:200).

Image 1.10 (next page) South facade current state (1:200).

1.2 Qualities:

The first, and probably greatest quality of the building is not the building itself, it is the location. The building is located in the core of the public park and right at the place where city centre shades off into rural. Besides, the ring road (Prins Bisschopsingel) with its side

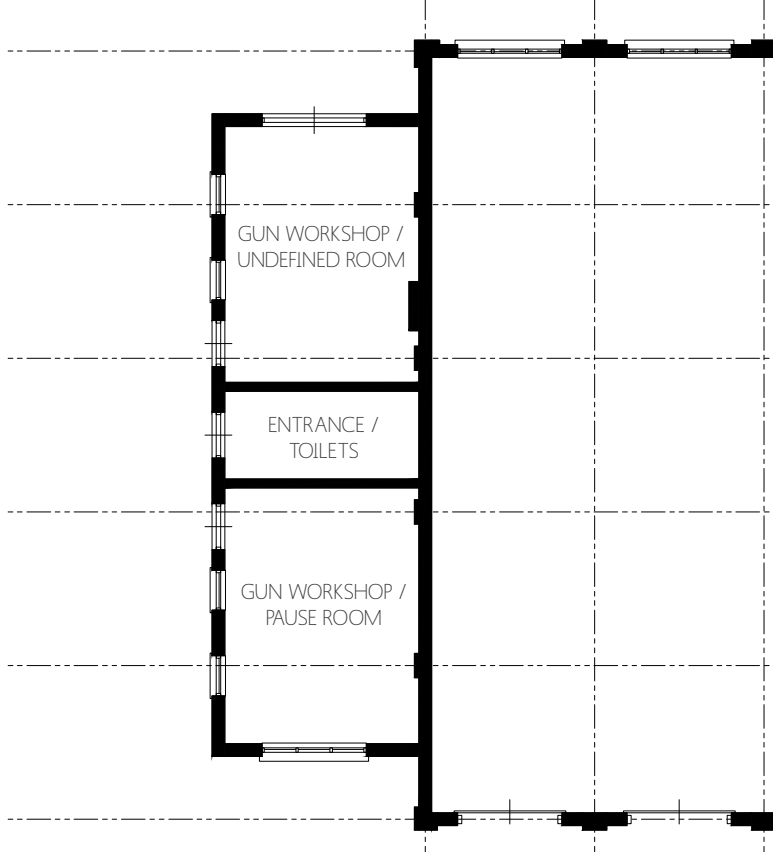
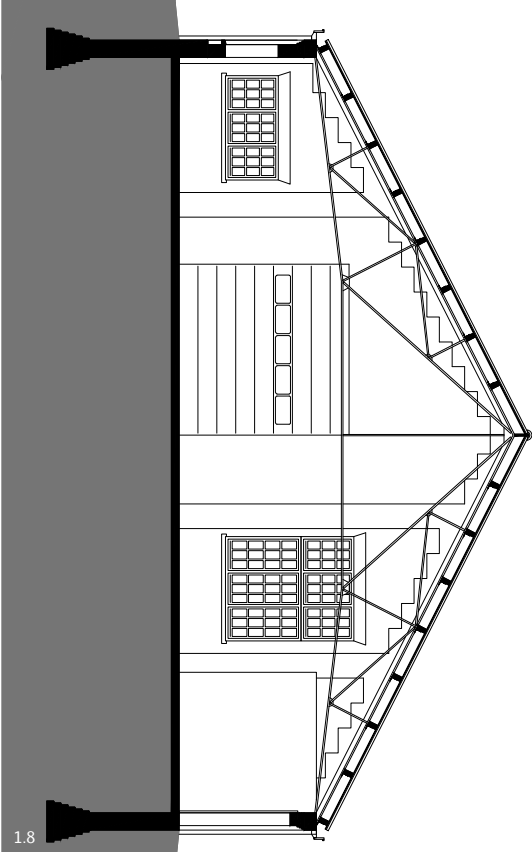
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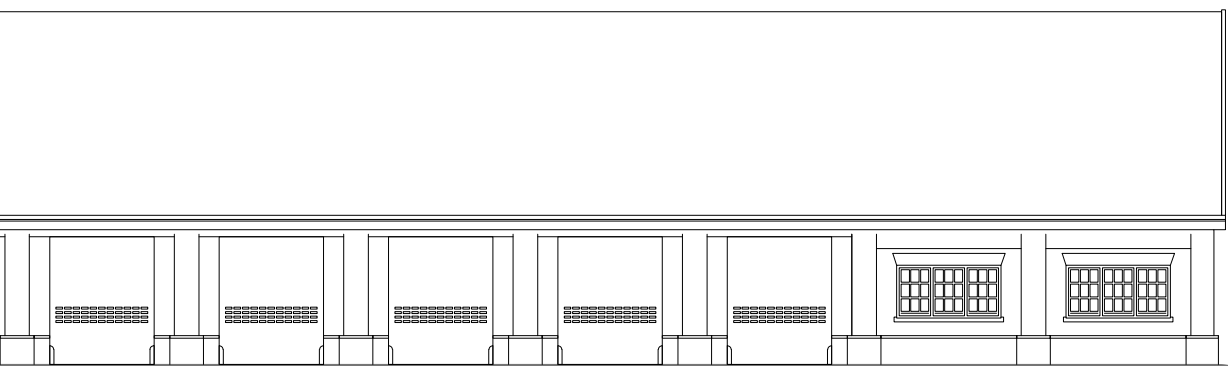
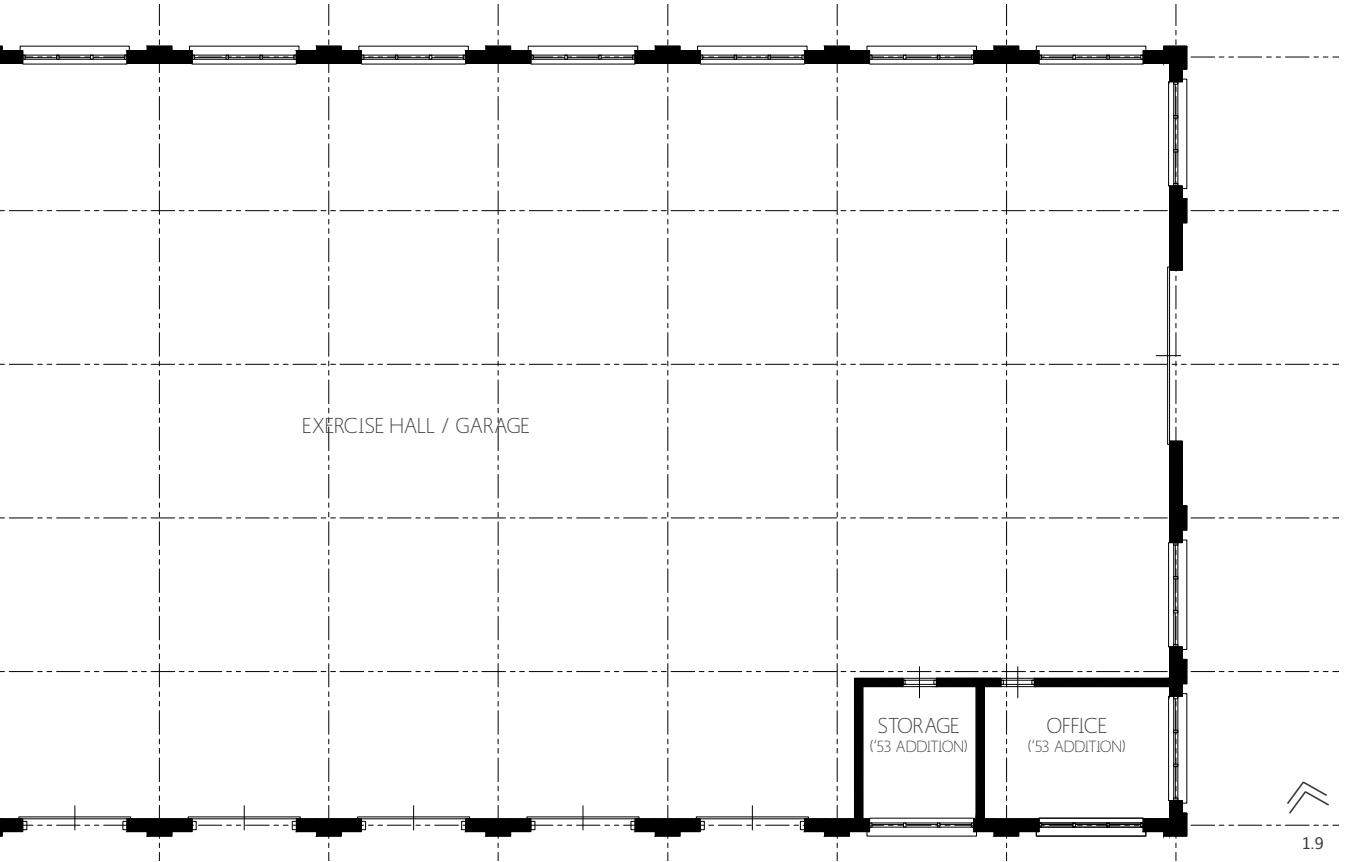
road (Hubertuslaan) offer great connections for motorised traffic, where foot and cycling paths connect the area with the city centre and other neighbouring districts for slower traffic.

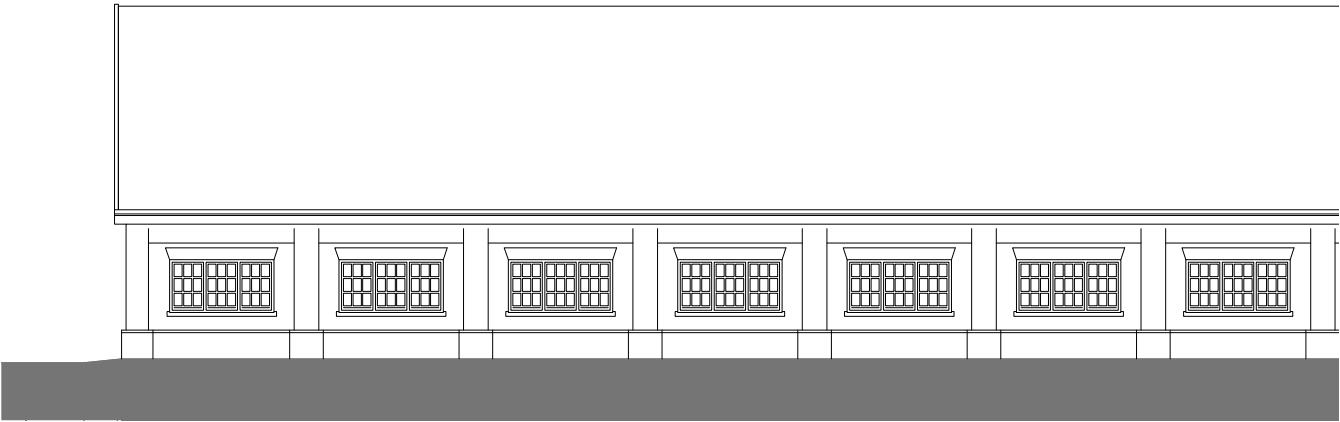
When focussing on the exercise hall at self, one of the most important features is the open floor plan. It is this particular feature that made the building easily to transform into a garage; nearly nothing was interfering, literally. The steel trusses pretend a lot of effort is made to create this open floor plan.

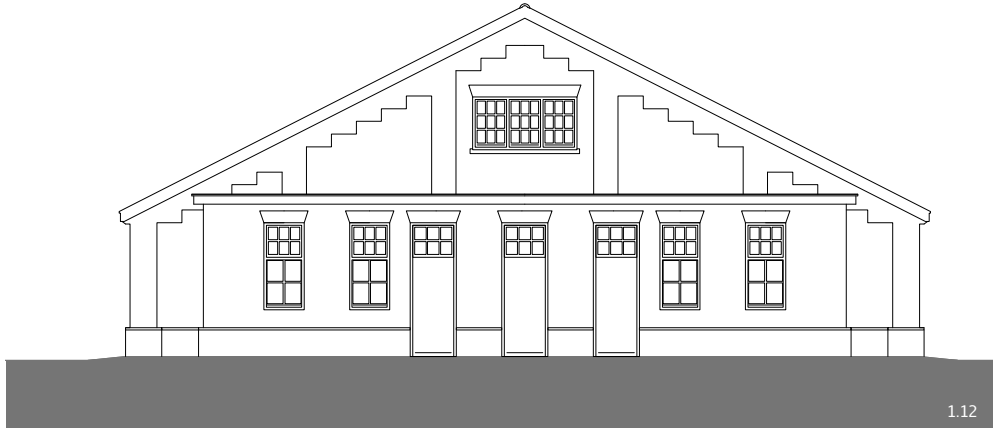
Another quality of importance is the technical state of the building. Though the state of the main structure is almost excellent, it is not necessary to remove or restore parts because of technical reasons.

1.8











1.3 Weaknesses:

Despite all weaknesses come with opportunities, as is emphasised in paragraph 2.1 'The Art of Transformation' and the report 'The Art of Transformation', there are elements that can be seen as weaknesses considering new functions of the building.

One of them has to do with the entrance. Nowadays, an unremarkable steel door in the east facade acts as entrance while smaller

LOWERING THE FLOOR
RESULTED IN RATHER
HIGH POSITIONED
WINDOWS.

wooden doors in the west facade are closed. Besides, lowering the floor turned out in ramps and several couples of steps to make all spaces accessible.

Image 1.11 (previous page) East facade current state (1:200).

Image 1.12 (previous page) West facade current state (1:200).

Image 1.13 (previous page) North facade current state (1:200).

Image 1.14 Steel doors in south facade ('53 addition). Lots of small windows let through very little light.

Image 1.15 Original windows in north facade. The high position of the windows make it difficult to look outside.

Lowering the floor resulted in rather high positioned windows as well. Looking outside is become quite difficult, especially for small people and when sitting. Due to that, the connection and interaction between inside and outside is nearly lost. This is something that is worsened by the placement of steel doors. Furthermore and despite lots of small windows in them, they make the exercise hall rather dark.

2. RESEARCH & VISION

CONTEMPORARY VISUAL ARTISTS, WHAT CAN WE (AS DESIGNERS OF THE BUILT ENVIRONMENT) LEARN FROM THEIR APPROACH IN TRANSFORMING OBJECT AND SPACE? CAN IT BE USEFUL TO SET UP DESIGN PRINCIPLES ON AN URBAN SCALE OR EVEN AT AN ARCHITECTURAL SCALE?

the
art
of trans
for
ma
tion

Research to those artists has to be done in order to investigate how their approaches can inspire designers in the built environment, to transform objects and space in their field of work. This research, part of the M3 phase of the Champ de Mars graduation atelier, is already reported, entitled: 'The Art of Transformation'. The next paragraph however, is based on this report but focuses more on the relation between architecture and art.

2.1 'The Art of Transformation':

Preceding the design process this architectural and technical graduation report focuses on, a research to contemporary visual artists is undertaken. The main

HOW CAN ARCHITECTS LEARN FROM CONTEMPORARY VISUAL ARTISTS' APPROACHES IN TRANSFORMATION OF OBJECT AND SPACE?

question to be answered in this report is:
How can architects learn from contemporary visual artists' approaches in transformation of object and space?

Since this report acts as a source of inspiration especially for architects or graduate students dealing with the transformation of object and space, it cannot be seen as a finished work. Instead of that,

it should act as a catalyst in the design process by its refreshing way of looking at transformation, specifically in the built environment.

Based on a wide variety of artworks, four categories were formed; interruption, implementation, involvement and deformation. These categories are clearly not composed by the scale or message they communicate; they are composed based on the artists' approach and his intentions. So, these categories distinguish different approaches used by the artists. Each category is set up around one single artwork, explained on the hand of various related artworks. Considering the architectural design assignment, the architects' interpretation of those categories is most relevant:

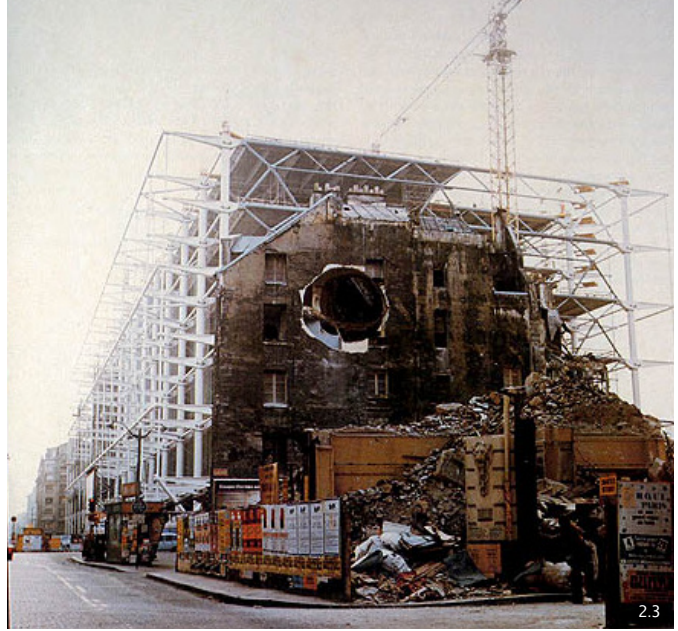
Interruption

Several approaches can be distinguished in how architects deal with transformation of object and space. In the case of both the 'Gehry house' by Gehry and the 'Military History Museum' by Libeskind, an interruption by adding new elements takes place. The interventions made within the category interruption, are not only based on new dominant objects, also by minor surgeries. As in the case of 'Conical Intersect', an ordinary house was transformed by showing the inside of the house. This intervention was based on the 'Anarchitectural' vision "*Making space without building it*"³ by Matta-Clark. This vision could also be seen in the project 'Bunker 599'. Although this intervention is more calculated and precisely performed the action is the same: making space by removing.

Image 2.1 Cover 'The Art of Transformation'

Image 2.2 (next page) Collage collected artworks.





2.3



2.4



2.5



2.6

Another important part within the category interruption is the difference between the finishing in the interventions. For example, the atrium in 'Vertigo' is an act of interruption not obvious for a layperson. In 'Vertigo', an atrium is made between the fifth to the ninth floor. The interruption has been covered up by finishing the cutouts of floors and beams. Therefore, the interruption is no longer part of the story of the building; it implicates the atrium always had been there. This is contrasting to the work of Matta-Clark. His interventions are part of the story of the building, it is clear they are added later on.

Up until now, architects were used to conceal their interventions by finishing the cut outs. Another way of looking towards interventions can be inspired by the way Matta-Clark interrupts buildings. Presenting the interventions in this way can result in a design that tells the history of the building with a recognisable interruption. Additionally, architects are used to design by adding elements to the already existing object. However, creating space without building it is a way of dealing with transformation that has potential within architecture.

Implementation

Implementation covers two types of implementing. The first one, the combination of different objects forming a new one, is about objects and space. This is nothing new to architecture; think about the implementation of a new part into an old existing building for instance. However, the approach used by architects in this case is more about the harmony and the balance of the two parts together. The audience appreciates a design from this category if it does not conflict in any way and it takes care

of a smooth transition between the parts. While the approach of a visual artist, Erwin Wurm in this example, causes a conflict: this conflict creates a moment of consciousness by the people using the objects, whatever these objects may be. The audience is woken up because they are confronted with their

THE AUDIENCE IS
WOKEN UP BECAUSE
THEY ARE CONFRONTED
WITH THEIR HABITS,...

habits, which are part of the collective image. The goal of the artist is to show that the image of reality we have is just a construction of reality, something that can be changed in any possible way.

The second one brings the objects into relation with an audience, as follows from the fact that the objects always have to face an audience in order to be meaningful. This audience, or in an architectural language visitors or users, can be manipulated in many ways. By making them part of the artwork, they get connected to it. This happens in two different ways. Firstly, the works of art are not uncommunicative towards its audience. As the works of Wurm show, the audience is attracted in different ways. And secondly, people become a part of the object thanks to the intention of the artist. However, the people are not aware of this. To translate this into an architectural point of view; maybe the architect should only indicate the use of a room, building or space, ambiguously. By this confusion people start

thinking for their selves again, and use it in their own reinvented way. In brief, *control user interpretation by confusing*. This creates not only a bigger bond between the

THE WORKS OF ART ARE NOT UNCOMMUNICATIVE TOWARDS ITS AUDIENCE.

surroundings and people, with all the benefits included. It also makes people think about their values again. At the end one could say that implementation is about the relationship between a person and the use of the objects that are around him.

Involvement

Similarly to implementation, involvement deals with the relation between people and objects. In contrast to implementation, involvement is not primarily based on the use of the objects; it is about how the objects can facilitate a situation. The future audience the artist has in mind forms the artwork; making it actually work when the audience becomes an actor in the organised situation. In 'Polder Cup' and 'Football Field', Maider López organises a new situation by arranging a conflict between two worlds. The human response to this conflicting situation is López' main theme as an artist. Would architects even think of doing something similar? Where López creates a problem on purpose, architects are trained to avoid problems. The clashes in the 'Polder Cup' and the 'Football

Field' would not have happened when an architect had the possibility to do something with the same space. It is save to assume that an architect would have scaled a football field to fit the polder landscape, or fill one of the ditches making it possible to place an official sized football field in the landscape.

Like Lopez organised a situation by combining two worlds, NL Architects created a situation with their design for the 'Basketbar'⁵. By combining a basketball field and a bar, two worlds that are usually divided from each other now come together. While the two different worlds come together, they do not clash. There is a visual relation between the basketball field and the bar, although a conflict situation is avoided by keeping a physical distance. In the case of implementing something new in an old situation, architects can learn from López' approach: *By creating a spatial conflict that disorganises the present situation*. López organises a conflict situation by letting the dogma of physically dividing functions go. Physical overlap of functions can create situations as a result of which the everyday use changes. Constraints and (unspoken) rules are altered and new rules regarding the built environment arise.

Deformation

Within deformation, the actual image of the object is more important than the function of the artwork. Additionally, the essence of deformation is about making space visible, not creating space (for instance by the addition of new parts). A single action that visualises space can be defined as 'dematerialising'. However, it is not the action but the idea behind the action that is interesting to architects. *Let object and*

Image 2.3 (previous page)
Conical Intersect by Gordon Matta-Clark. Leading artwork of category interruption.

Image 2.4 (previous page)
Drinking Sculptures by Erwin Wurm. Leading artwork of category implementation.

Image 2.5 (previous page)
Polder Cup by Maider López. Leading artwork of category involvement.

Image 2.6 (previous page)
Beukelsblauw by Florentijn Hofman. Leading artwork of category deformation.



space be reevaluated by dematerialisation. The rather simple idea behind dematerialisation leads to a strong appearance of the transformed object and space. Artists who deal with deformation are making distracting aspects less visible, which offers people new insights in what there actually is. Artists are able to create awareness amongst the audience, as well as visualising the intended message.

Architects can learn from artists who deal with deformation, especially by ignoring constraints. This can be achieved by focussing on a single design principle: to keep these constraints out of mind. The way Hofman deals with the presence of people living in his 'Beukelsblauw', clearly illustrates artists do not have the intention to adapt their vision to satisfy everyone involved. The occupants of 'Beukelsblauw' were experiencing the world completely blue when looking outside through the window. This inconvenience for the user strengthens the perception of the artwork in general, because there are no concessions that weaken the overall statement the artist wanted to make.

Learning points

Each of those categories led to one single common action or approach within that particular category; *Create space without building it, control user interpretation by confusion, disorganise by creating a spatial conflict and reevaluate by dematerialising.* These approaches are all the result of an unconventional way of thinking.

However, it is difficult to adopt this approach entirely since there is an important difference between art and architecture. This difference is the result of the architectural

design process and its complicating factors: context, expectations, responsibilities and constraints. Despite these differences, artists and architects operate in the same field of activity with corresponding players. Looking into the process of how an artist comes to an idea for a project; one often stumbles upon a constant, re-occurring theme in the oeuvre. A new project often is a re-working or evolution

EXPERIMENT AND COMMUNICATE YOUR MESSAGE!

of this artists' theme, not always with a specific end result in mind - here one finds the experimental attitude of the process. Working on or towards an artwork is the artists' 'raison d'être', it is a personal quest for the development of the artists' theme.

Perhaps, architects should let go some of the constraints and focus more on experimenting within their oeuvre. By experimenting, the architect's oeuvre could become much more interesting compared to doing the same trick ever again. Another aspect that often makes art's purpose very strong is the message the artist want to tell. Thus, this design assignment's motto should be; experiment and communicate your message!

Knowing that, setting up an urban design through an unusual approach is a matter of course. Instead of translating the characteristics of the Tapijn Barracks, researched by colleague students¹, the actual atmosphere on every specific spot on the terrain is of main importance.

Image 2.7 House by Rachel Whiteread. Visualising space and touching collective consciousness.

Se
cure

2.8

1. P. Vriens, E. Caspers, F van Gemert.

2.2 Urban plan 'Secure':

The Tapijn barracks in Maastricht are characterised by a sequence of spaces with a different character and atmosphere. Places that were once formed by a specific program with its own functions. There are very public, extrovert spaces and spaces that are more private, known by regular visitors of the terrain. Now the terrain has lost its intended inhabitants, its original program is lost too. New inhabitants lead to new functions within these old spaces. This sequence of characteristic, different spaces can be secured by specific programming. The new functions that will border these spaces will be chosen in such a way that the found qualities will be secured.

The proposed programs for the buildings are just a suggestion, they do not have to be completed right away; the flexibility of the

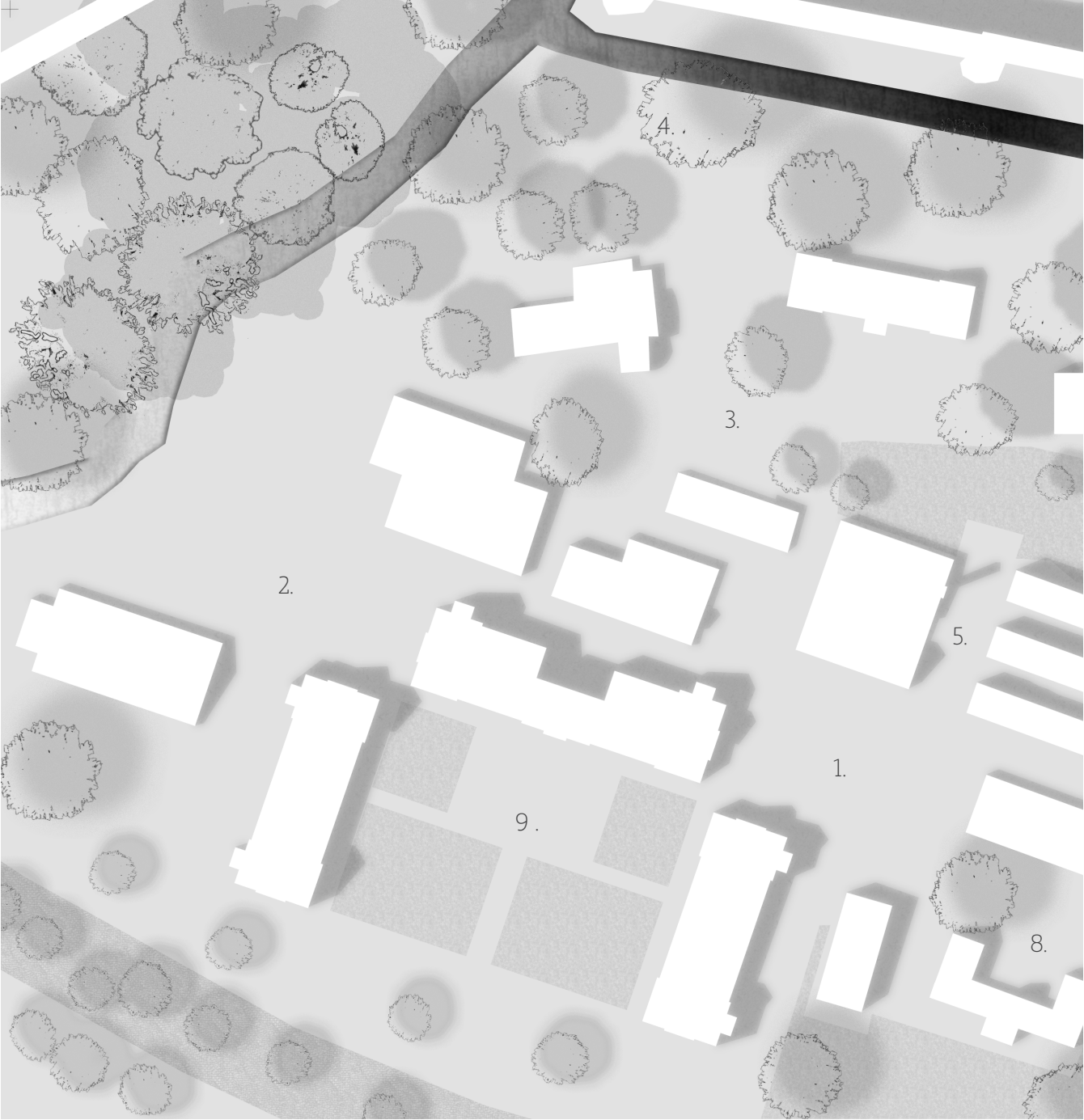
THE NEW FUNCTIONS
THAT WILL BORDER
THESE SPACES WILL BE
CHOSEN IN SUCH A
WAY THAT THE FOUND
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SECURED.

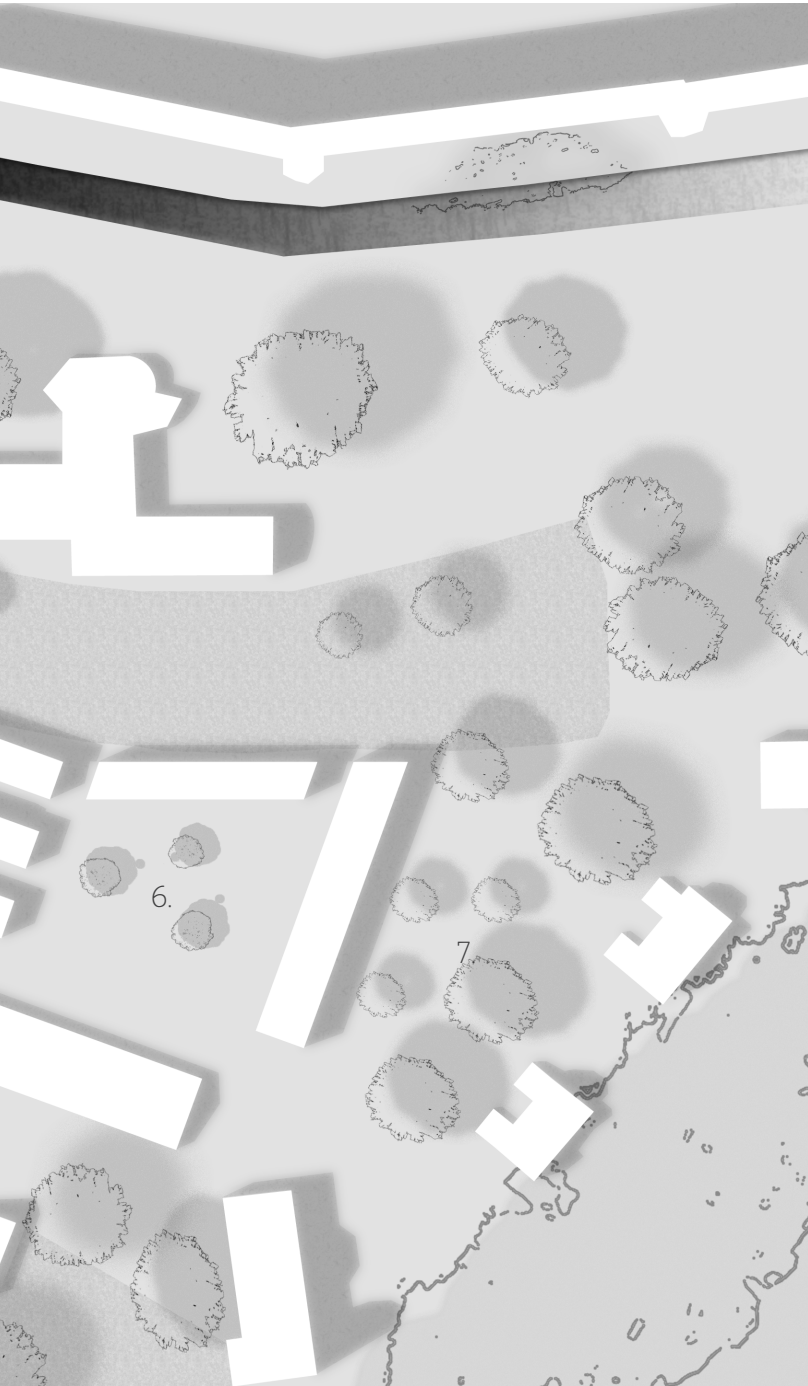
an area that has diversity in program, emptiness, crowds, urban, rural, private and public etcetera; however it has a common denominator: the spaces and buildings left by the army. Here the plan finds its balance; not by imposing inflexible rules and designs of the public space, but by assembling scattered experiences, atmospheres and events within the framework of the prevalent qualities. These frames include everything that can be found in the everyday space. They provide room for personal experiences as well as collective events, everyday functions as well as specific events that create the atmosphere of an urban landscape.

Image 2.8 Cover urban design 'Secure'.

Image 2.9 (next page) Plan urban plan.

plan is of great importance. This plan can be seen as a growth model; it is able to be flexible and to accommodate unforeseen functions or activities. The aim is to create





Squares

1. Centre Square
2. University Gardens
3. End of the Lawn
4. Public Park
5. Mews
6. Living Square
7. Communal Garden
8. Office Garden
9. Cours d'Honneur



2.10



2.11

University gardens

"It is lunchtime. I ask my colleges whether they would like to join me for a little walk through the public garden, to move out. We walk via the Tongersestraat in the direction of the 'Berenkuil', a cage where a bear was kept once. From a distance something attracts my attention. Something changed there, but what? The 'Berenkuil' seems to be much more illuminated than before. Coming closer it becomes clear what has happened; several huge trees were chopped down. The contours of the trees and buildings of the lower situated former Tapijn Barracks appear. Once arrived on top of the quite steep slope next to the Jeker, a colourful field of flowers appears. In front of this waving coloured sea, a small footpath leads to a transformed building with a gorgeous terrace in front facing the Jeker; I want to go there!"

The space in between the river Jeker and the former exercise hangar is the natural ending of the terrain of the Tapijn Barracks. The biggest qualities of this space lay in the hidden location. The exercise hangar provides a barrier to the road and the Jeker, together with the slope on the other side of the river form a barrier towards the public garden behind. As described in the introductory text above, people have an overview from this higher place; still they are not able to enter the space directly. In fact it is a hidden valley, right on the point where the city shades off into another kind of space; the rural area in the south. From a small height, it is even possible to have a visual connection between this rural area and the hidden valley. This means that the former exercise hangar has a rather important function in connecting the rural area with the hidden valley.

Those characteristics can only lead to one function that secures the (aimed) atmosphere; a winter garden. Therefore, the exercise hangar will be transformed into a winter garden with an outdoor kitchen garden. The wet border of the Jeker and its adjoining park can be seen as a facade surrounding this space. People walking on

WHAT THEY SEE ARE THE 'UNIVERSITY GARDENS'; A QUIET VALLEY A COUPLE OF STEPS FROM THE CITY CENTRE AND RIGHT IN FRONT OF THE RURAL AREA.

top of the slope mentioned before, overlook the space as if they are looking through a window in this sort of green facade. What they see are the 'University Gardens'; a quiet valley a couple of steps from the city centre and right in front of the rural area.

Between the densely built area on the terrain and the green facade of the public park, the space is enlightened by the sun like a glade in the forest. The winter garden itself is a space for contemplation and seclusion. During winter season, it will be a green oasis at the border of the public park. In contrast to the centre square and its direct surrounding spaces, there is less brick and

Image 2.10 Aerial view of the 'University Gardens'; a colourful sea of flowers in front of a tranquil terrace and winter garden.

Image 2.11 Overlooking the kitchen garden's site.

Image 2.12 (next page) East-west oriented section of the 'University Gardens'; people working in the garden while others sit on the pleasant terrace in front of the winter garden.



Greenhouse / Acre



Reading spaces



Meeting spaces



Coffee

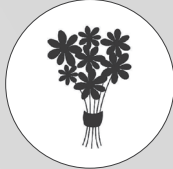




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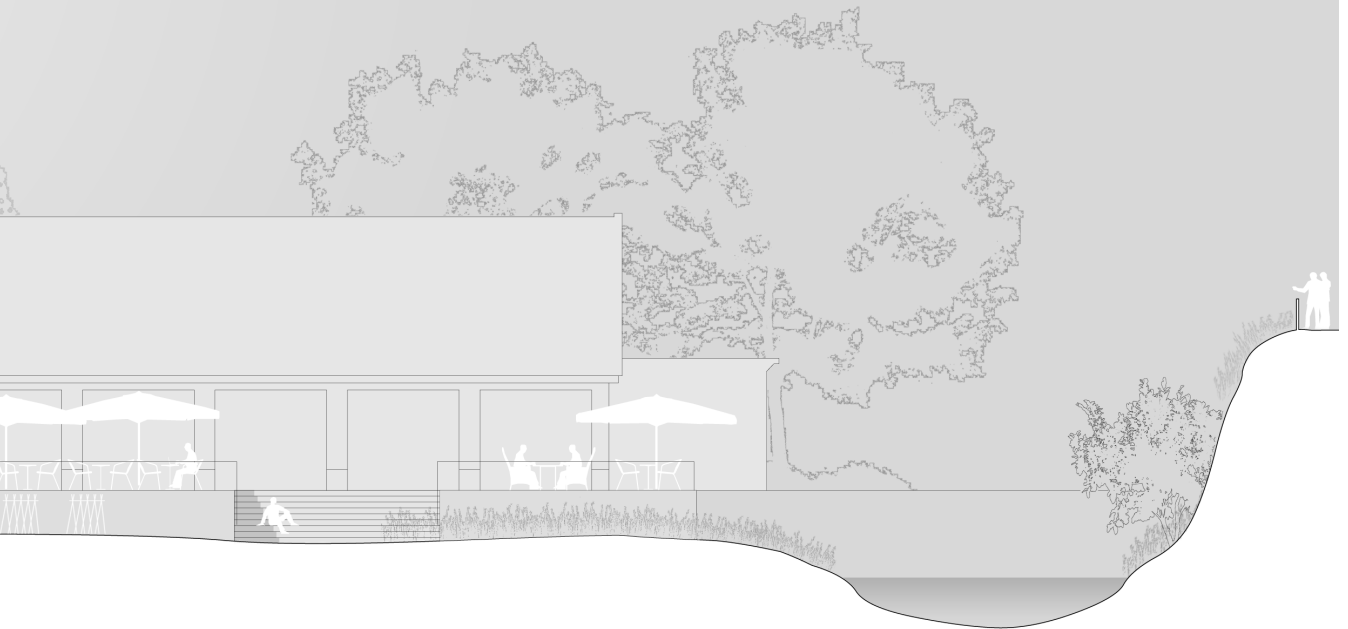
Restaurant

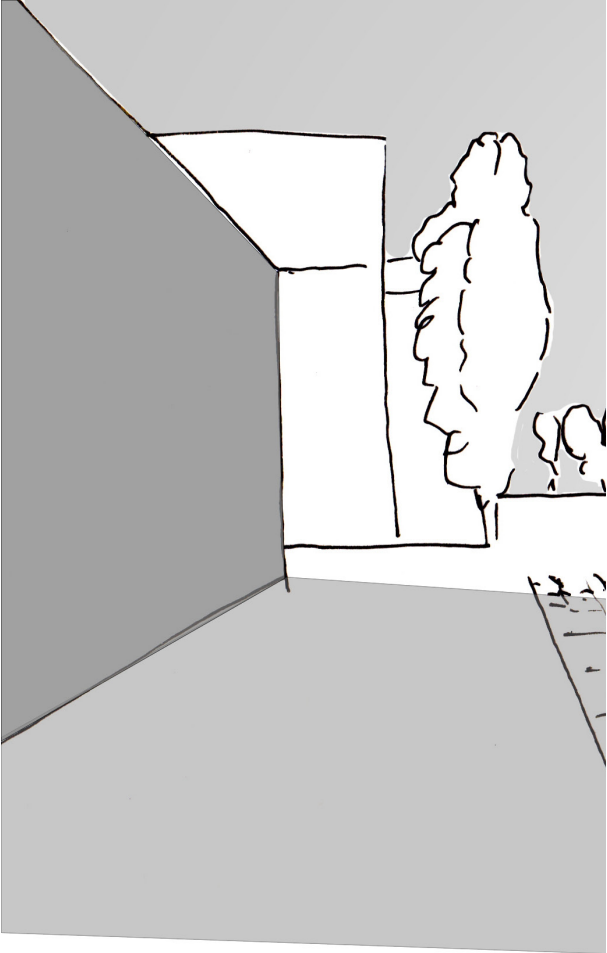


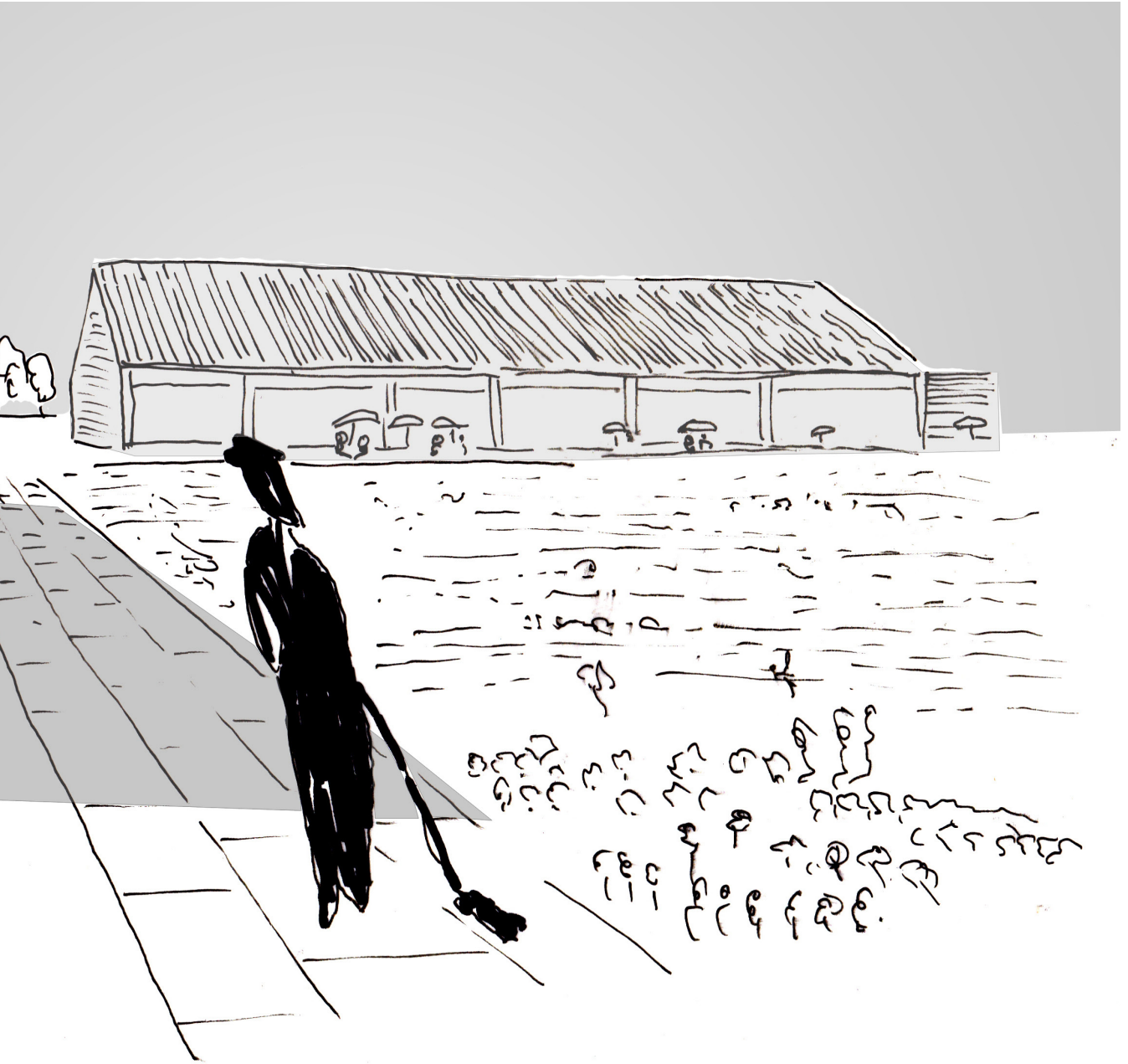
Flower shop



Parking places









more flora. As a result of that, there are less people, resulting in more tranquillity. Graduate students, professors and locals from neighbouring residential districts like Jekerdal, Sint Pieter and Wolder will definitely find this spot. It is an area where

IT IS AN AREA WHERE
PEOPLE CAN MEET EACH
OTHER IN CALMNESS.

people can meet each other in calmness and where they can enjoy their lunch while discussing their thesis for instance.

A striking example of such a place is found in Villa Augustus, Dordrecht (The Netherlands). This restaurant is located directly next to a kitchen garden that supplies the restaurant in its need of fresh vegetables. Besides this principle is very useful for the winter garden of the Maastricht University Graduate School, the atmosphere on this spot is very desirable.

Figure 2.13 (previous page)

North facade exercise hangar with large parking terrain.

Figure 2.14 (previous page)

Impression of 'University Gardens'.

Image 2.15 Villa Augustus,

Dordrecht (The Netherlands); a rather small-scale restaurant with terrace behind a kitchen garden.

3. SOURCING FOOD & ENERGY

FOOD & ENERGY, A SHORT INTERMEZZO IN DESCRIBING CHARACTERISTICS, QUALITIES, WEAKNESSES, APPROACHES, ATMOSPHERES AND SO ON. BY DETERMINING THE NEW FUNCTION AS A WINTER GARDEN, THIS TOPIC AROSE OUT OF PERSONAL INTEREST; CAN THEY BE COMBINED? AND IF YES, CAN INSPIRATION BY THE ARTIST'S RESEARCH LEAD TO A DESIGN FOR SUCH A MULTIFUNCTIONAL BUILDING?



1. Beerenbrouck, D (2009) In: City, Countryside & Food.

2. After: Brussels observatorium voor duurzame consumptie (2005).

By determining the program of the former exercise hangar and its surroundings as university kitchen garden, a whole new topic emerges in this design process. Within the Maastricht region, the popularity of slow food and local food is already rising. A slow food community is set up and there are several farmers that try to produce their yields as sustainable as possible. There are even a couple of urban farming projects to investigate whether this is an option for the city of Maastricht. One of them lies in the estate zone near 'Chateau Vaeshartelt'. However, this area is nearly as rural as rural area's can be in the Netherlands; calling this

"CONCRETELY, MOST OF THE YEAR WE GET OUR ASPARAGUS FROM PERU."

urban farming is probably not the right term. An urban farming project that is more worth calling it urban lies behind the 'Eiffel building', that is part of the former ceramics factory 'Sphinx'. Nowadays, here lays a public park in which it is possible to cultivate vegetables. Nevertheless, this is just a premature initiative that perhaps loses public interest and disappears again. Another question one could ask is; why should I bother where my food comes from? Why is urban farming a rising topic; it has been gone for several decades!

Image 3.1 Screenshot of interview with Dirk Beerenbrouck, local culinair entrepreneur.

2.1 Today's system:

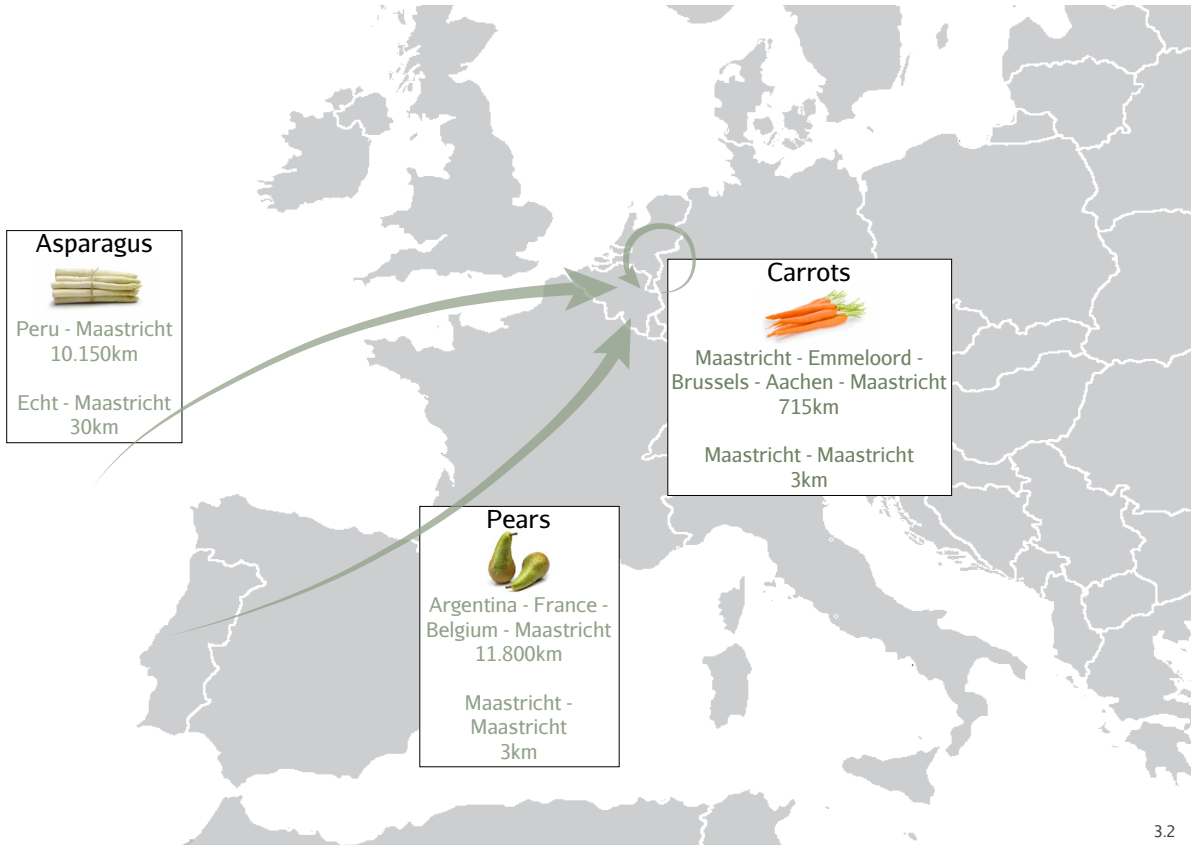
Urban farming is something that should be related to local food, local dishes and so local culture. It is obvious that urban farming offers local food, but result local products or local dishes in locally produced food?

An example: Dirk Beerenbrouck is a local culinair entrepreneur who sells local products. Despite many products grow in a limited period per year, customers can order his products online all the year round. How is this possible with real local food? It isn't. Beerenbrouck imports a significant part of his products from foreign countries. In a video interview he tells about several local dishes based on asparagus, a vegetable that grows mainly in the middle and northern part of the province and is used in classic Limburgian dishes. He says: "Concretely, most of the year we get our asparagus from Peru." ¹

This emphasises how cheap transport of goods changed agriculture and our eating culture the past decades. It connects two current public issues: (sustainable or local) food and (sustainable) energy. As a result of globalisation, people are no longer used to eat specific dishes in those parts of the year that local harvest is reaped. It is become common to eat everything all year round instead of during the harvesting season.

What does this food transportation mean for our planet? A simple comparison between CO2 emission of pear transport from several countries and by three means of transport shows huge differences in eco-friendliness². Transportation of 1 kg pears by truck and in our own country (i.e. less than 50km)

Transported by:	Distance:	CO2 emission:
	Netherlands 0 - 50km	0 - 5g
	Spain 1.900km	188g
	Argentina 12.000km	156g
	Argentina 12.000km	9588g





x2

'cost' us 5 grams of CO₂. By transporting the same amount, with the same means of transportation, but this time from Spain for example, which is about 1.900km, almost 190 grams of CO₂ are emitted into our atmosphere. Remarkably, transporting this by boat from Argentina to The Netherlands, an astonishing 12.000km(!), will be responsible for a little bit less CO₂ emission; almost 160 grams. However, transportation by plane over the same 12.000km, will emit an insane amount of almost 9600 grams of CO₂. This is nearly as much exhaust as the weight of the transported goods!

This example fits very well in the message told by geologist and writer Dale Allen Pfeiffer in his book 'Eating Fossil Fuels' ³. As many other scientists, he tries to change the current agriculture by facing them the results of their actions. Like artists, he wants to raise public consciousness and awareness.

*"MODERN
AGRICULTURE HAS
CHARTED A COURSE
FOR DISASTER."*

He says; "Modern agriculture has charted a course for disaster." ⁴ And that is what is happening at this time. After trying to industrialise agriculture for about forty years, the opposite is starting to happen right now.

Architect, writer and lecturer Carolyn Steel comes up with other shocking facts; one person in Great Britain 'eats' as many as four barrels of oil⁵, where an American

citizen eats almost the double amount of that.⁶ In other words and as an addition to the comparison of CO₂ exhaust by transporting food; for every calorie of food produced in the current agribusiness, an estimated 10 is burned in the form of fossil fuels. After which Steel writes: "*Modern farming might like to call itself efficient, but with outputs like that, it is a strange kind of efficiency.*"⁷

Some people want to see this fossil fuel consuming in a larger perspective. Jeremy Rifkin, an American economist, writer, public speaker, political advisor and activist, is one of those people. In an interview on Dutch television⁸, he states we are really asleep right now, on a crucial moment for the human race. He links aforementioned topics on the hand of three crisis that form a sort of "perfect storm"; the economic meltdown, the energy crisis and the real time impact of climate change that has huge influence on our agriculture. Cause of the first crisis is not the financial or banking crisis. Rifkin sees this as the result of a much greater problem; the failing second industrial revolution; it is on "Life support" because nearly all aspects of this revolution are old, the technology, the infrastructure and the productivity. The second crisis (energy crisis) is caused by the lack of cheap transportation; oil has become too expensive to transport goods to and from cheap labour markets. "The entire economic engine of globalisation collapsed in July." This is right exactly on the moment when the oil price peaked at 147 dollar per barrel. "What I think people need to realise is that everything is based on fossil fuels; our petrochemical fertilizers and pesticides for agriculture Power transport, heat, gas, electricity and building products." Then the third crisis Rifkin is talking about; the emitted CO₂; climate

3. Pfeiffer, D.A. in: Eating Fossil Fuels (2008).

4. Pfeiffer (2008) p. 83.

5. 1 barrel oil = 159L.

6. Steel, C. (2009) p. 49.

7. Steel, C. (2009) p. 50.

8. After: Rifkin, J (2011) in: Interview Jeremy Rifkin.

9. After: Rifkin, J (2011) in: Interview Jeremy Rifkin.

10. Pfeiffer, D.A. (2008) p. 83

11. Pfeiffer, D.A. (2008) p. 71

12. Steel, C. (2009) p. 322.

change is moving so much faster than we think and than the public is being told. That we cannot maintain our current oil usage is already become clear to many people. Knowing at what speed we need to transform our society into a sustainable one to avoid serious environmental issues is a completely different story. Despite the quite miserable scenario Rifkin talks about, sitting back and wait what is going to happen will probably be the worst thing to do. Question remains; what else can we do?

2.2 Distributed system:

Due to globalisation, food and energy have become closely related to each other, resulting in an unsustainable way of living by many people who do not even have a clue they act that harmful. Additionally, it is important to know that buildings use 30% of the energy that is used in the world; they are the number one cause of climate change. The topic addressed in this chapter in particular, transport, is the number three cause of climate change; facts that should encourage us to take action.

Local sources

Since transportation is consuming large amounts of fossil fuel and is blocking our economical growth⁹, reducing the amount of transport should be one of the main objectives within making our entire of living more sustainable.

One of the solutions Rifkin proposes is the implementation of a distributed energy network. Distributed is the key word in his latest book 'The Third Industrial Revolution' and is something we have already seen in the ICT revolution. In first instance, media was

organised top-down. The last couple of years, this changed into a distributed organisation; people are sharing everything with each other by digital networks. Suppose we use this technology in setting up a smart energy

"WE NEED TO RECONNECT OURSELVES TO THE LAND AROUND US,..."

grid, everyone is able to produce, sell and/or buy energy. Result of this smart energy grid is a more locally oriented society, which is in fact something Pfeiffer suggest as well; *"We need to redesign our society, aiming for decentralization and localization. We need to reconnect ourselves to the land around us,..."*¹⁰

Pfeiffer proposes a similar distributed system, though it functions on a smaller scale: Form community energy production cooperations that maintain and produce low-level local energy. There should also come more community gardens, local small farms and farmers markets; *"The potential of urban gardening is enormous. Community gardens would be an excellent use of abandoned inner city areas."*¹¹

Those local shops are something Steel sees as well while trying to imagine what happens if food designs a city; *"A 'sitopic' city would have strong links with its local hinterland through a lattice-like food network, with active markets, local shops, and a strong sense of food identity."*¹² Wherein 'sitopic'

Image 3.2 Food miles examples.

Image 3.3 CO2 exhaust comparison.

UM. GOES. LOCAL.

3.4



3.5



3.6

13. Kiwa Water Research & EGG Consult (2007) p.2.

14. Green Rhino Energy (2011) Europe - Annual global irradiance (online source).

15. Freely translated from: 'Wortelevlaaj' (Maastricht dialect).

16. Freely translated from: 'Poorsop' (Maastricht dialect).

17. Freely translated from: 'Reubesop' (Maastricht dialect).

18. Freely translated from: 'Keltersop' (Maastricht dialect).

19. Freely translated from: 'Bloodweurs' (Maastricht dialect).

20. Freely translated from: 'Kaw sjotel' (Maastricht dialect).

Image 3.4 Cover Maastricht University Christmas present 2012.

Image 3.5 Local dish; leek soup.

Image 3.6 Local dish; carrot pie.

Image 3.7 (next page) Spinach (Groente en fruit encyclopedie).

Image 3.8 (next page) Gherkin (Groente en fruit encyclopedie).

Image 3.9 (next page) Artichoke (Groente en fruit encyclopedie).

Image 3.10 (next page) Tomato (Groente en fruit encyclopedie).

Image 3.11 (next page) Courgette (Groente en fruit encyclopedie).

Image 3.12 (next page) Beetroot (Groente en fruit encyclopedie).

Image 3.13 (next page) Union (Groente en fruit encyclopedie).

comes from the words 'sitos', which means food in latin, and 'topos' place; bringing food and location belonging together in her new imagined city. Knowing this, the solution is in fact very nearby, literally.

Like the army, having great understanding of the location is very important. Every specific location can offer us food and energy; we only have to make use of this opportunity given by nature. In fact, something really similar to the artist's approaches; use what is

LIKE THE ARMY,
HAVING GREAT
UNDERSTANDING OF
THE LOCATION IS VERY
IMPORTANT.

already there. Sources that are available at the former Tapijn barracks are for instance solar and hydropower. With its annual average flow rate of 3m/s^{13} , the Jeker can generate a decent amount of hydro electric power while every square meter of land catches 1000kWh^{14} of solar energy a year; again a very decent source of energy.

Remarkably, Maastricht University set the first step herself with their 2011 Christmas present; 'UM GOES LOCAL'. In this present, employees could choose a gift out of various articles and activities provided by local based firms. When it comes down to food, Maastricht University has already set up policies regarding biological food. University canteens are stimulated to sell biological

food, however, they refuse to make biological food and thus food with less food miles such as local food, their core business. This is where Maastricht University's opportunities lay to excel in their intention of becoming more sustainable!

Local food

Maastricht is well known for its wide variety of cafe's, terraces and restaurants; its Burgundic character. Food belongs to the spirit of the city and their citizens. University canteens however, only have a small selection of local products and so lack in food identity. Enlarging this food identity as Steel proposes would be a great way to let university students bind with the cities habits and eating culture.

Some examples of typical Maastricht dishes that can be served are the carrot pie¹⁵, leek soup¹⁶, turnip soup¹⁷, chervil soup¹⁸, blood sausage¹⁹ with baked apple and assorted cold meats²⁰. Carrot pie for example, is one of the local dishes known by citizens of Maastricht, especially in the district of Wyck. Nevertheless, this is an excellent example of a local dish that can be served in the university restaurant as proposed in paragraph 2.2; 'Urban plan 'Secure'' and the report about the urban plan entitled 'Secure'.

Based on those local dishes, a wide variety of fruit and vegetables can be composed; species that can grow on the outdoor acre species that grow in the greenhouse and species that can grow in both, to extend the period of availability for instance. Besides, combining various species (typical regional species as well as species that are less regional, still often used in local dishes) in the greenhouse as well as on the acre, can





result in a colourful, pleasant and relaxing environment to walk or to stay in.

Considering the huge amount of different species, setting up an attractive greenhouse should be possible.

Answering the question; *Can inspiration by the artist's research lead to a design for such a multifunctional building?* is a bit harder. Of course, they can be interpreted rather literally, thus resulting to a design. That is however not the intention of the research and thus will not be the case in this design assignment. An important finding of the 'The Art of Transformation' is the fact that art nearly always tries to communicate a message. This is where art becomes useful regarding the determined functions and designing them. Probably, communicating 'UM goes local' is one of the main objectives of the design. Herein, the location can be very important; something fairly common in architecture.

4. THE DESIGN

VACANT MILITARY HERITAGE IN THE SHAPE OF AN OBSOLETE EXERCISE HANGAR/GARAGE, AN ART INSPIRED APPROACH AND A MESSAGE BASED ON FOOD & ENERGY; CAN IT COME TOGETHER AND FUNCTION WELL IN A DESIGN?

4.1 Approach:

As is the case for the urban plan 'Secure' (more about this in paragraph 2.2), the architectural design arose along the same unconventional approach. Instead of analysing ordinary architectural aspects like sequence, open-/ closeness, disclosure and routes, more effort is undertaken to capture the actual image of the building. Of course, a new design should take such architectural aspects into account. Nevertheless, transforming the building should be done knowing the actual characteristics of the building mentioned in chapter 1.

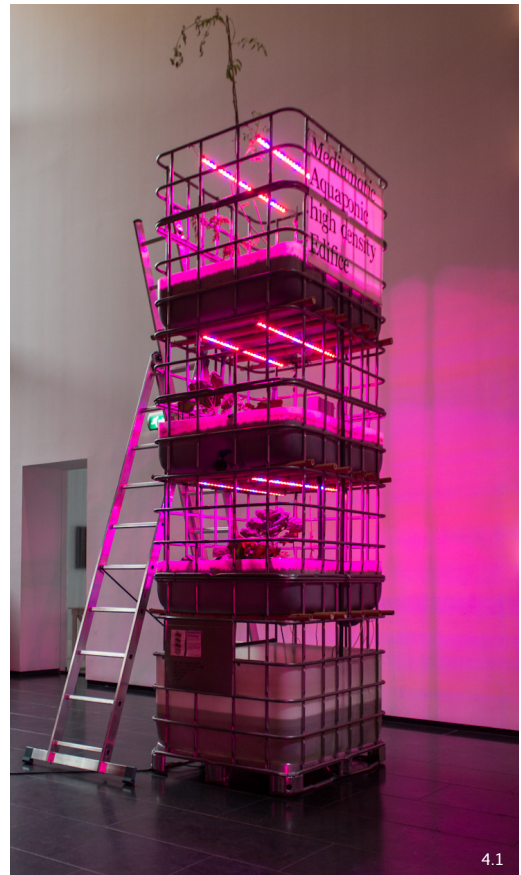
Based on the research to contemporary visual artists, within this approach the most original state of the building is less relevant compared to the current state. This because the current state says most about the building. A building is not only about the original design; it is also about what happened afterwards. Buildings can be adapted to a changed function or can even be transformed in the case of a totally new function. By these changes, a building tells its own story; a story of what happened during lifetime. Bringing back the building to its original state would renounce parts of the building's history. It can even pretend the authentic function was not changed at all. At least this romanticising approach confuses the story a building tells. Therefore it is essential to make a design that respects the adjustments that were made earlier on as much as the original design, because these adjustments are part of the changing needs on the terrain. Actually, this is a very up-to-date situation since it is the case nowadays; the former Tapijn barracks are being transformed into a Graduate School among

other functions. We are not bringing back the 20th century army to the terrain, do we? Instead of that, looking to what artists do when object or space loses or changes function, is much more inspiring. As 'The art

ARTISTS DO NOT
EVEN THINK ABOUT
RESTORING A BUILDING,
THEY WANT TO
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TO COMMUNICATE A
MESSAGE.

of transformation' concludes, artists act in an unconventional way. Think about Gordon-Matta Clark who is cutting holes in buildings thus making new connections: making space without building it. Or Florentijn Hofman, painting half of a block completely blue to show the audience the buildings faith; emptiness, they are going to disappear. Artists do not even think about restoring a building, they want to visualise their thoughts by means of their artwork; to communicate a message.

This approach, preserving the current state and atmosphere of the building, is something that is really similar to the way Erwin Wurm transformed several cabinets in his Drinking



1. Aquaponic is a stacked vegetable and fish cultivation system made of recycled barrels.

Sculptures. The preceding research to contemporary visual artists showed that many artists are showing things that are not seen by most people. The exercise hangar is an example of such an object as well. Nowadays, many people are walking, cycling or driving along the Prins Bisschopsingel, not being aware of the presence of the building at all. People ignore the former barracks; they only see things around the terrain and aspects that are already beautiful; not the ones who have huge opportunities and therefore can become even more interesting than those aspects. This is the moment to give an answer to the main question formulated in the introduction; *How to transform the Tapijn barracks' exercise hangar into a tranquil, comfortable and sustainable winter garden as a recreational area for PhD students and citizens of Maastricht?*

4.2 Concept:

As determined in urban plan 'Secure', the former exercise hangar will be transformed into a modern interpretation of a winter garden; that is the most suitable and desirable function for this particular spot. Additionally, in Maastricht University, a great user was found. Reading this report one could wonder why art, urban planning, architecture and sustainability belong together. Till now on, one could see those topics as a thing by itself.

Part of main importance within art is the message art often wants to communicate its message; this is where the connection to this design lies. The message the new user (i.e. Maastricht University) wants to communicate is to act local! This is the way we should

set up our new community resulting in less energy consumption. Nevertheless, how should this transformed building look like? Goal of this design is to reach the collective consciousness like Whiteread with her artwork 'House' tries, and make people aware of what they eat, where it comes from and what this means for our environment. The current building has been a user of sources for hundred years; it has not offered anything back to society like many modern sustainable buildings. With the new function in mind, as well as the new insights in agriculture given in chapter 2; the transformed building should consist of two

THE MESSAGE
MAASTRICHT
UNIVERSITY WANTS TO
COMMUNICATE IS TO
ACT LOCAL!

parts. The first part is the existing building at self, this can be seen as the user, the second part will be a new volume, that can be seen as the generator that actually transforms the building. It is this specific part of the building and its cooperation with the existing building that converts the building from a second industrial revolution building into a third revolution building Rifkin talked about.

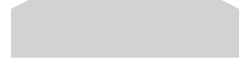
Like the aquaponic system¹, the transformed building will function as a small ecosystem. Plants are growing inside a glass volume, using the light from above (the sun) and the nutrients from below (the ground and the fish

Image 4.1 Aquaponic system.

21st Century



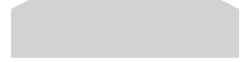
20th Century



Contemporary



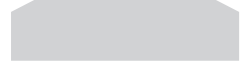
Outdated



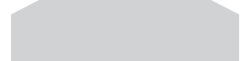
Producer



User



Contemporary and sustainable
21st century university kitchen
gardens.



pond). Fishes at their turn, use the nutrients given by the plants growing above. A large, contemporary new volume fits in the findings of the 'The art of transformation'; it attracts attention. When looking to Whiteread's 'House', one immediately sees this is something exceptional. Whiteread is fascinated of space, especially space in ordinary objects, like houses. She wants

IT CLEARLY VISUALISES
THE DIFFERENCE IN
STATE OF ART BETWEEN
THE 1920'S AND THE
2010'S AND EVEN
MORE IMPORTANT,
COMES UP TO THESE
EXPECTATIONS.

to communicate her thoughts and findings and does this by converting the space into something perceptible; concrete. This is how 'House' is made, by using casting the abandoned house as a casting for concrete. This large homogeneous object is what attracts attention; an inspiring thought regarding the design for the university kitchen garden at the Tapijn barracks.

Besides attracting attention, a large contemporary volume frames the current building in its own spirit of age. It clearly visualises the difference in state of art between the 1920's and the 2010's and

even more important, comes up to these expectations. The transition between the beginnings of globalising in the 1920's towards the early signs of a more local based society with distributed sources in the 2010's. This third industrial revolution as Rifkin is calling it, is all about the location; the third aspect that gives rise to the concept. Therefore, the new volume should say something about the location of the building. It should definitely not be something rather ordinarily, something that can be found everywhere. Furthermore, the building has to inspire new people as well, people that can accelerate the third industrial revolution by acting correspondingly.

Despite this design should focus on being part of the aforementioned transition, it is not unlikely current winter gardens and greenhouses provide huge insight in how they can function in the future. So; what can be learned from already existing winter gardens?

4.3 Typology:

Winter gardens, we probably all know them in the sense of typical Victorian buildings mainly to be found in the United Kingdom. Well-known examples are for instance Crystal Palace in Londen (UK) that burned down in 1936 and the Royal Greenhouses of Laeken (Belgium). However, there are many examples of contemporary winter gardens or comparable buildings. Sheffield Winter Gardens (UK) for example, or Hortus Botanicus in Leiden (The Netherlands).

In the late medieval, explorers and merchants from several countries around Europe travelled to many exotic places on earth.

Image 4.2 Concept explanation.

Image 4.3 (next page) Proces explanation 1.

Image 4.4 (next page) Proces explanation 2.

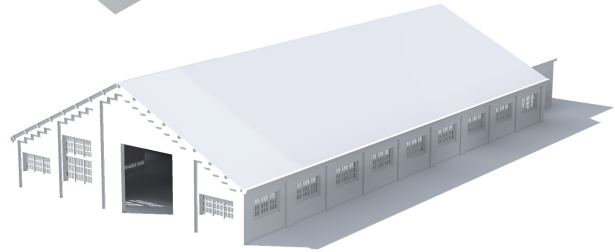
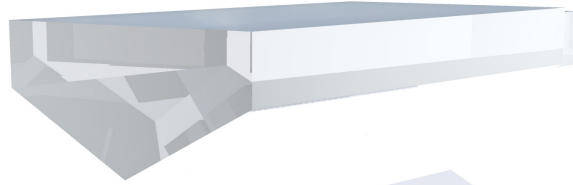
Image 4.5 (next page) Proces explanation 3.

Image 4.6 (next page) Section of composition.

1.

180 DEGREE CHANGE

REFERS TO LOCAL CHARACTERISTICS AND SOURCES.
FRAMES EXISTING BUILDING IN ITS SPIRIT OF THE AGE.
ATTRACTS ATTENTION!

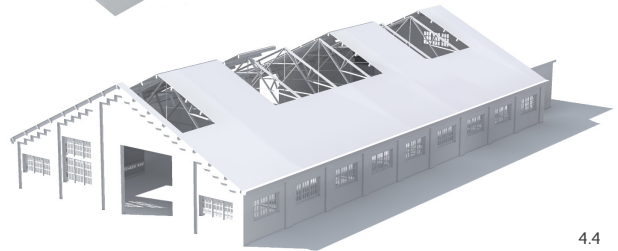
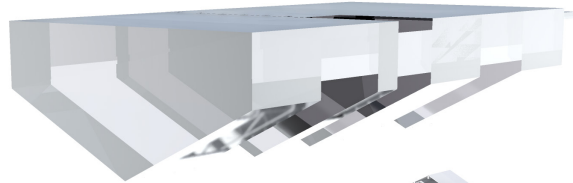


4.3

2.

INTRODUCE STRUCTURAL SEQUENCE INTO NEW VOLUME.

CREATES SPACE FOR EXPERIENCING EXISTING STRUCTURE.

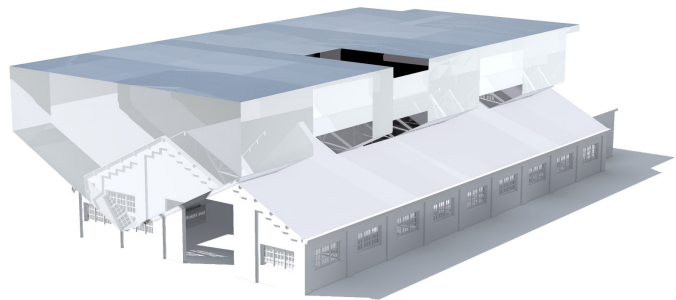


4.4

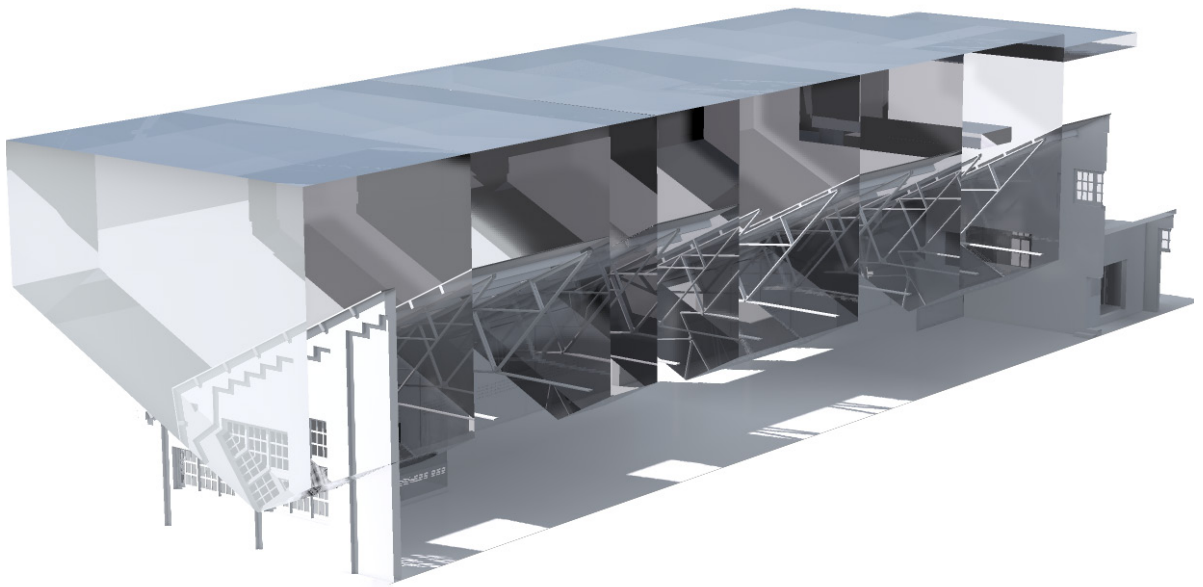
3.

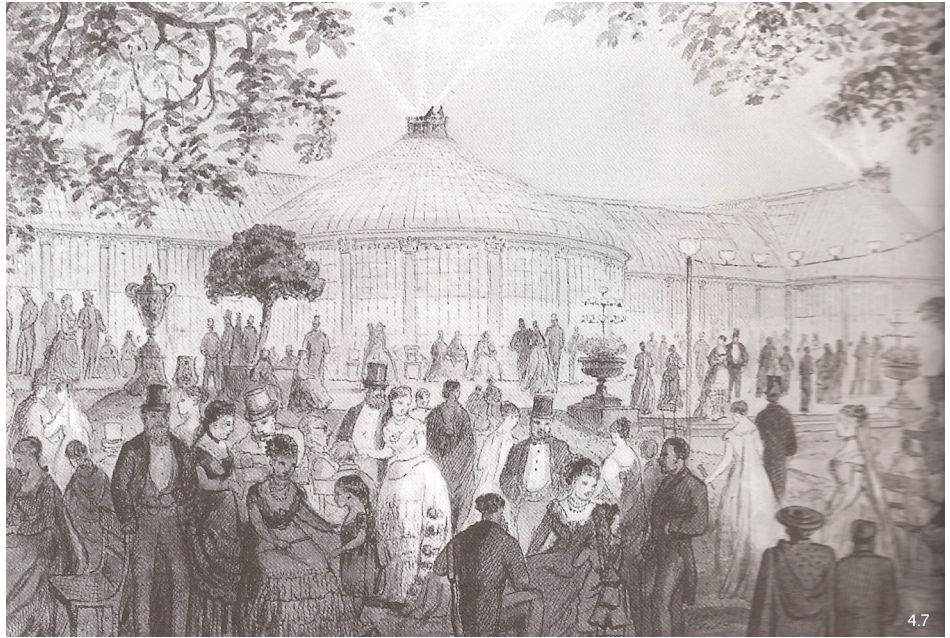
MOVE AND CONNECT OLD AND NEW.

MAKES VOLUMES WORK TOGETHER



4.5







In first instance, they brought spices to Europe because they were extremely popular among aristocrats. Later on, the trade expanded and besides spices, other goods were transported. The worldwide transportation of spices worked well because these goods were not perishable. However, bringing vegetation caused problems because they had to grow and live in a totally different climate. The solution of this problem was in fact the birth of a new building typology; winter gardens.

The first winter gardens date back to the 17th century, when nobilities wanted to have a place where their botanical collection could survive the winter. Those winter gardens, also named orangeries, greenhouses or conservatories, housed their subtropical plants and were in fact an extension of their living spaces. As a result, many winter gardens were attached to palaces and villas and as a result of the state of art in this period, they were constructed of masonry. To bring enough light into those buildings, large windows were made in the masonry and the buildings were equipped with glass roofs.²

Huge differences came along with the industrial revolution. The invention of cast iron made it possible to realise large spans without the need of large light-blocking constructions. The use of cast iron resulted in more large-scale winter gardens that were no longer restricted to private residences. The first large public winter garden can be found in Regent's Park, London (UK). The main purpose of these public winter gardens was no longer to enjoy nobilities in their flora-collecting hobby; they were used for flower shows and social gathering.³

Besides the greater technical possibilities due to the industrial revolution, this

THE MAIN PURPOSE OF THESE PUBLIC WINTER GARDENS WAS NO LONGER TO ENJOY NOBILITIES IN THEIR FLORA-COLLECTING HOBBY; THEY WERE USED FOR FLOWER SHOWS AND SOCIAL GATHERING.

revolution has another effect of influence on winter gardens. A new social class arose; middle- and working class city dwellers who had holidays and a larger spending power. As a result, these urban inhabitants sought new places to visit for amusement. Exotic vegetation was no longer reserved to nobilities; a larger public wanted to enjoy this new fashion.⁴

Unless the technical developments and the tendency of making more and more transparent buildings, preventing overheating and frost remained necessary. Ingenious mechanics were invented to open up ventilating windows and the early stoves that were used to maintain a certain temperature

2. After: J. Hix (1996).

3. After: J. Hix (1996).

4. After: J. Hix (1996).

5. Such as the Automaton Gardener by J. Kewley.

6. World horticultural exhibition.

evolved into complicated systems with steam piping systems. There were even completely automated systems⁵ that controlled the microclimate inside the greenhouse as well as glasshouses, such as Munich's Great Palm House, with double-glazing and gutters to channel away unwanted condensation. This is exemplary for the effort which was made to perfect the microclimate inside greenhouses as much.

Between the early winter gardens and the latest new ones, huge things changed, mainly as a result of the greater technical knowledge and possibilities, but also because of globalisation. The evolution in winter gardens changed them from clever users of sustainable energy towards energy consumers to achieve maximum crop. However, this evolution partly changed last several years. Remarkably, the latest view on the use of energy in general and the function of winter gardens in specific is comparable to the ideas when this building typology came into existence; make clever use of the energy that is provided by the sun. In contemporary winter gardens and greenhouses, more effort is made to reduce the energy consumption in the first place and secondly, make use of sustainable energy.

The function of contemporary winter gardens and greenhouses however, has changed very differently. During the globalisation of the agro culture as mentioned in chapter 3, greenhouses transformed into huge cultivation factories that were, and still are, primarily focussed on high efficiency and maximum production. These greenhouses therefore contribute in the amount of global transportation that is needed; their products travel across the world. Winter gardens on

the other hand, nearly disappeared except those that were linked to a university or 'hortus'. The past few years however, some old greenhouses are revitalised into small scale producers of local fruit and vegetables. In Amsterdam, nowadays 'De Kas' is a popular restaurant among business persons while 'Villa Augustus', mentioned before in paragraph 2.2, aims at a bit wider audience. Producing food is not the aim of all contemporary winter gardens, proved by the cases of Villa Flora and Sheffield Winter Garden.

The festive winter gardens like the one in Regent's Park, discussed earlier, were nearly built in the past decades probably because of lost interest within the violence of the ever larger growing greenhouses. Nevertheless, the last few years those festive

NOWADAYS 'DE
KAS' IS A POPULAR
RESTAURANT AMONG
BUSINESS PERSONS...

winter gardens are rising again. 'De Kas' in Amsterdam can be seen as such a festive, convivial new winter garden or greenhouse while Villa Flora Venlo provided the Floriade 2012⁶ a large greenhouse to promote and experience new trends in indoor greening. With the presence of a large indoor and outdoor restaurant with terrace, the festive character of the winter gardens of long times ago, made a comeback.

Image 4.7 (previous page) Fete in Regent's Park London (UK).

Image 4.8 (previous page) Villa Flora Venlo (The Netherlands).

Image 4.9 (previous page) Winter Garden Sheffield (UK).

Image 4.10 (previous page) Restaurant 'De Kas' Amsterdam (The Netherlands).

Image 4.11 (next page) Interior Hortus Botanicus Leiden (The Netherlands).

Image 4.12 (next page) Interior 'De Hortus' Amsterdam (The Netherlands).





Villa Flora Venlo is also an example of the changing energy management of new winter gardens and greenhouses. In fact, this building is designed as zero energy building and produces energy by a solar tracking system on the main roof, cogeneration system and solar cells on the wooden roof in front of the building. By use of wood in

...WALKING THROUGH THE TREE TOPS AS IN THE AMSTERDAN VARIANT PROVIDES A MUCH MORE INTENSE EXPERIENCE.

this structure, the front facade pretends this building is constructed mainly out of wood, while nearly the opposite is true; wood is only used in this structure, while the main structure of the building is made out of steel. Nevertheless, this proves that a steel greenhouse can be rated sustainable despite the used steel, most likely because the structures ability to be disassembled.

Another contemporary winter garden, 'Sheffield Winter Garden', is built with a completely other purpose. Goal of this building was to not to celebrate and exhibit new trends; its main purpose is to connect two parts of the city. There are huge differences in atmosphere compared to the winter garden in Venlo. Instead of inviting huge amounts of people, the Sheffield Winter Garden is much more focussed on small

scale visiting by passers-by. This shows winter gardens do not need a function at all, they can provide people in a place for contemplation and tranquillity.

Many winter gardens are equipped with a bridge to walk through treetops. Often, these bridges are used to take care of the plants, while some of these are particularly used to admire the collection of species. Two examples of such bridges can be found in 'De Hortus Botanicus in Leiden' and 'De Hortus' in Amsterdam. Despite those bridges seem to be quite similar to each other, there are huge differences in appearance; the Leiden variant is part of the structure of the building and positioned relatively high inside the building, while the Amsterdam variant does not have a load bearing function and thus positioned significantly lower inside the building. This results in a completely different experience in walking across those bridges; walking above the tree tops versus walking through the tree tops, whereby walking through the tree tops as in the Amsterdam variant provides a much more intense experience.

Considering the design process, several learning points can be identified based on this brief analysis of existing contemporary winter gardens. What can be learned about those cases is that the function of the building is rather flexible, varying from exhibition to no specific function at all. It is however possible to create small scale food producing buildings as proven by 'De Kas' in Amsterdam. Next to that, Villa Flora proves that an efficient energy management is possible when maximised production is not the intension of the design. Since this will be the case in the design for the Tapijn Barracks' winter garden, combining those two aspects should be possible. Nevertheless, comparing

two cases emphasised the importance of placement of fixed elements like bridges, in contrast to the growing plants.

In addition to the concept, considering the scale of the city of Maastricht, the former military terrain and the Exercise Hanger at self, it is clearly not the goal to compete with the growing scale of modern greenhouses. Furthermore there is no intention to compete with the high efficient greenhouses used in the agro industries; many offers considering the indoor climate would be necessary which would affect the ability of people inside those spaces. Instead of that and in line with the conclusions on the research to food & energy, this winter garden or greenhouse will be used to give students and professors a comfortable, tranquil, green and sustainable environment to relax, read, meet and eat.

4.4 Site:

In the current situation the exercise hangar forms, as described in chapter 1, a transition between the representative front facade of

THE RESTAURANT INSIDE THE TRANSFORMED BUILDING CAN PROVIDE PEOPLE PACKED MEALS.

the barracks and the green zone surrounding the Jeker. On an even larger scale, the building lies right on the place where city shades of into rural.

Due to this, the building forms an ideal starting point for a lunch walk through Jekerdal. A new path starts inside the winter garden and runs on top of the Jeker towards the rural area in the south, using the existing tunnel underneath the Prins Bisschopsingel. The restaurant inside the transformed building can provide people packed meals. Students, professors and citizens can eat their lunch upstream the Jeker banks or near the acres that lay north of the building.

By adding a large glass volume on top of the exercise hangar, the concealed location starts attracting attention. The soft transition from buildings to green is altered into a powerful gesture. This new volume also provides great views on the acre, the public park and of course the rural area in the south.

4.5 Program:

Based on the concept wherein the existing building is a user of resources while the addition will acts as a generator, the placement of functions is determined. Therefore, the ground floor of the building functions acts, like the last hundred years, as the big user of sources within the building. This is the level where the university restaurant and flower shop are located. They use the sources provided by the generator. There are also several parking places equipped with chargers for electric cars, which use locally generated electricity.

The spaces in the new volume all provide resources; the cultivation floors provide fruit and vegetables while the meeting and reading area's provide knowledge and collaboration between students and professors. Entering

Image 4.13 (next page)

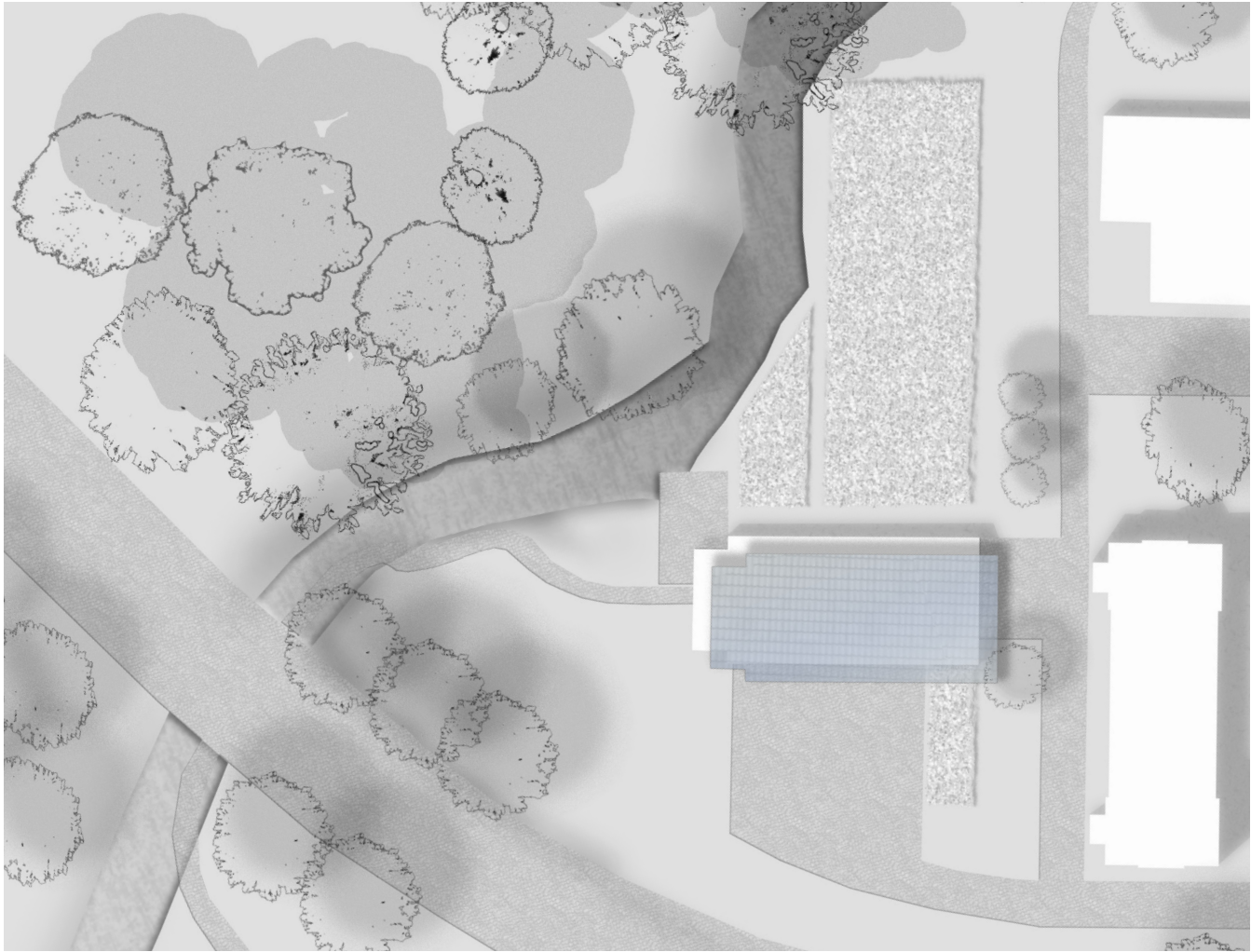
Situation.

Image 4.14 (next page) Street scene.

Image 4.15 (next pages) Plan ground floor (scale 1:200).

Image 4.16 (next pages) Plan first floor (scale 1:200).

Image 4.17 (next pages) Plan second floor (scale 1:200).

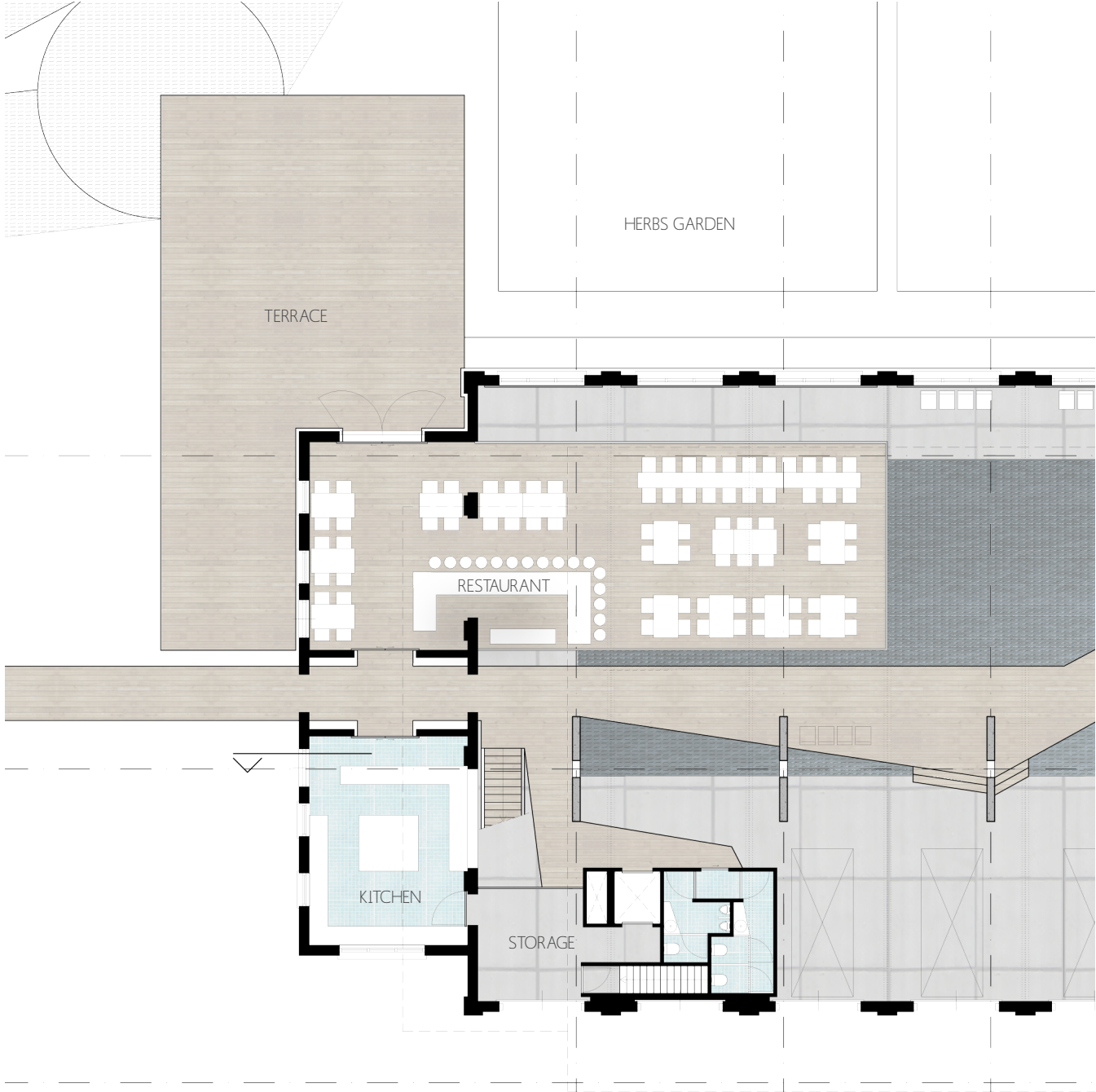




4.13



4.14



VEGETABLE GARDEN

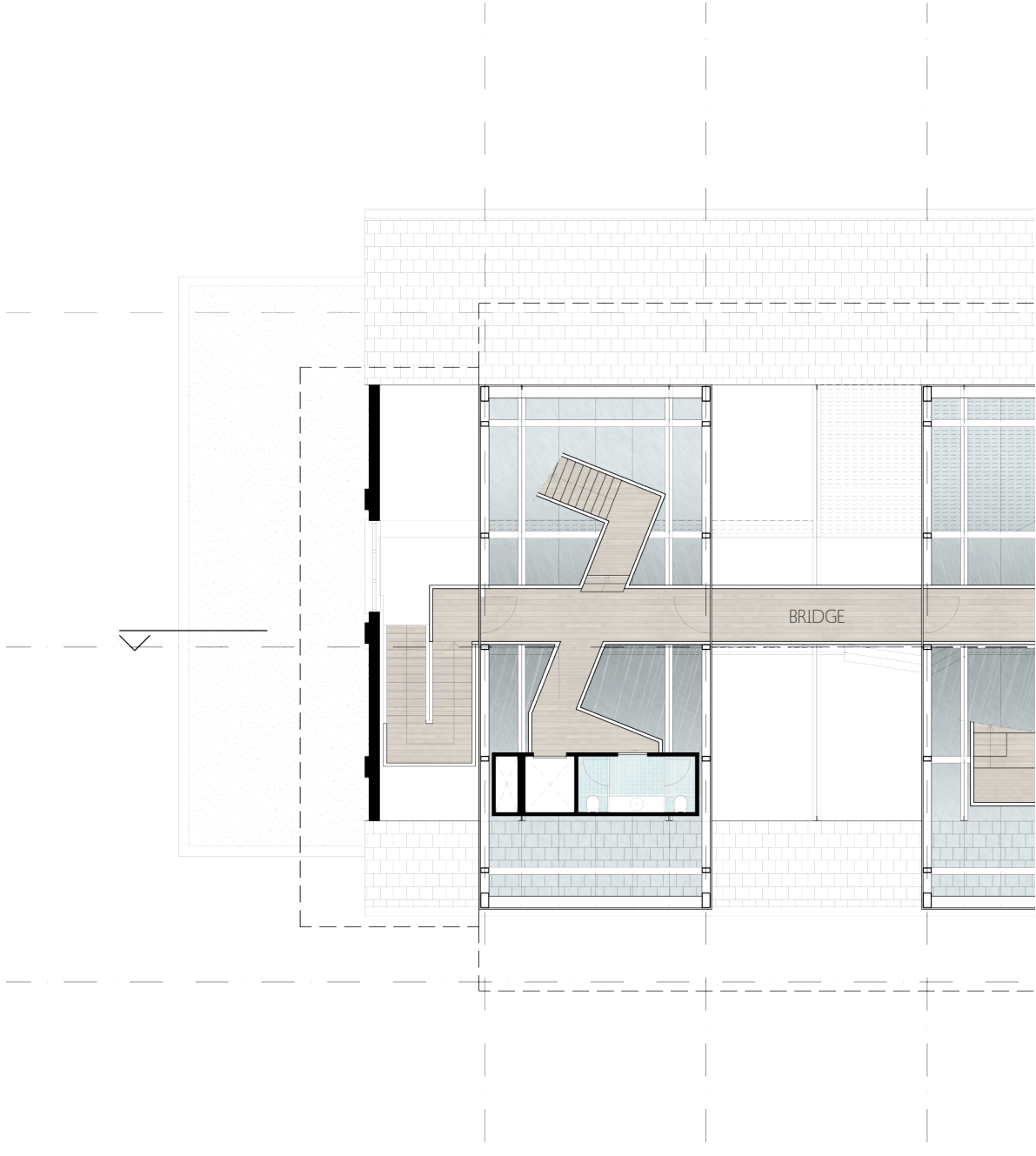
START JEKERDAL
LUNCH WALK

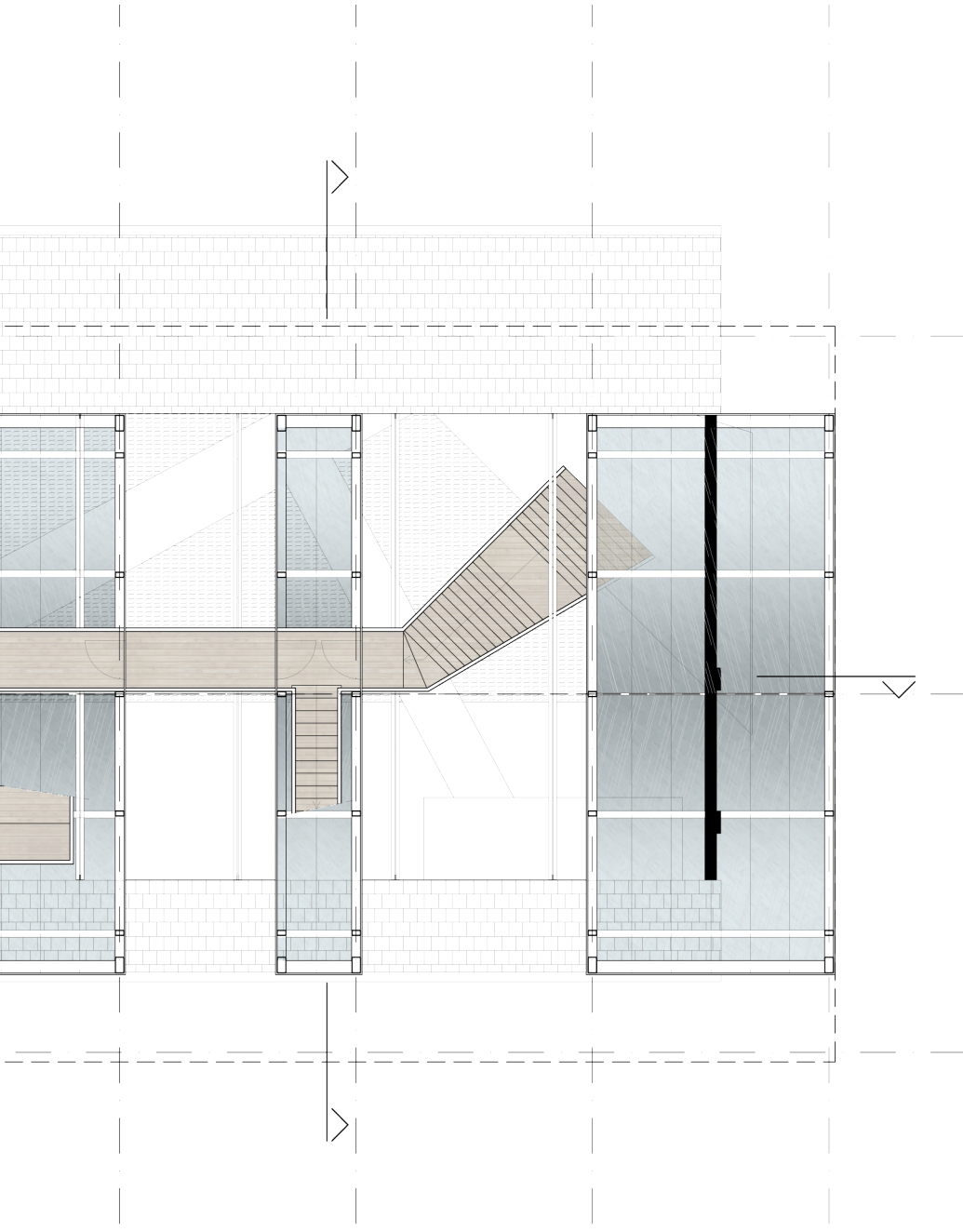
FISH POND

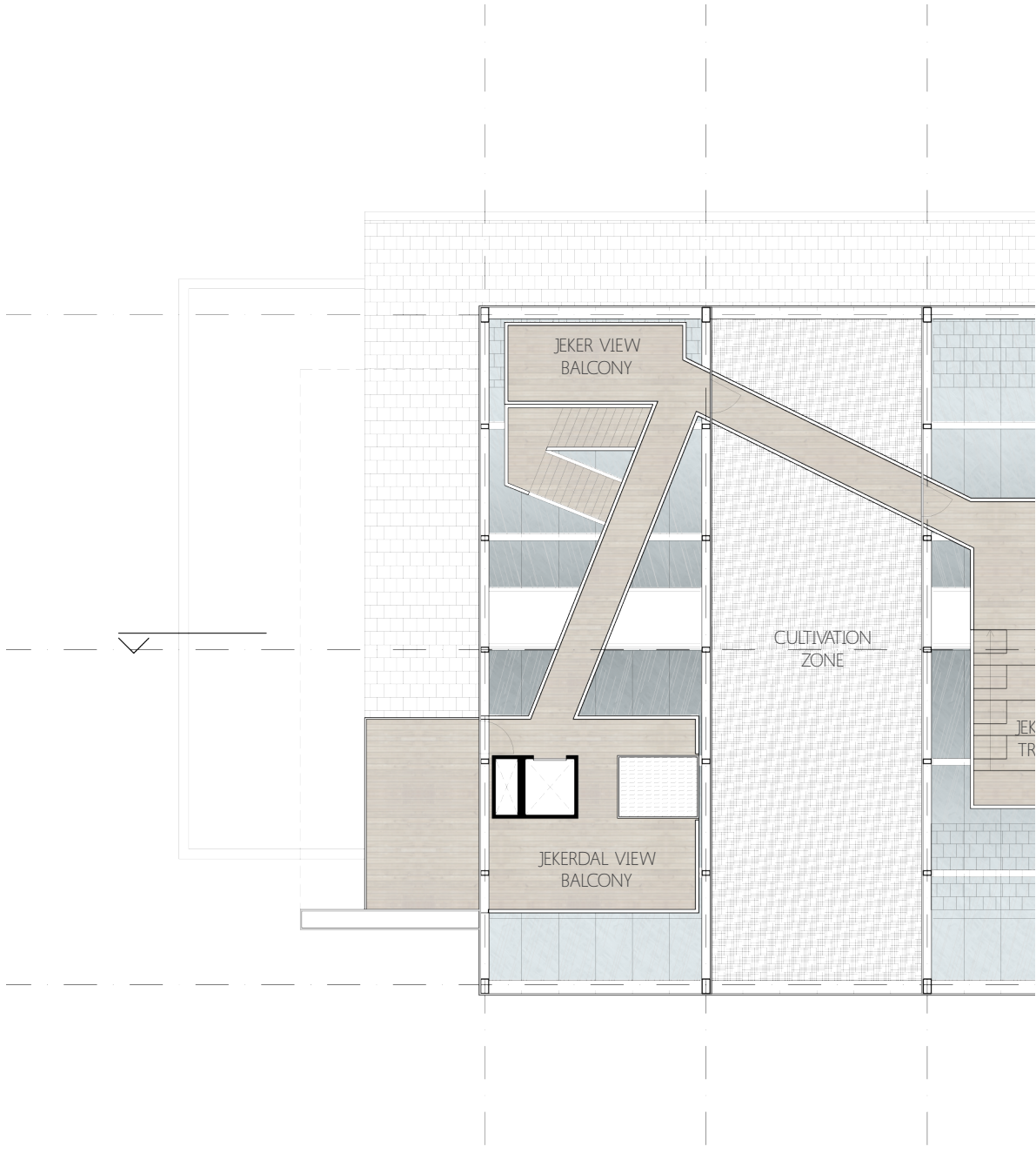
ELECTRIC CAR DOCKS

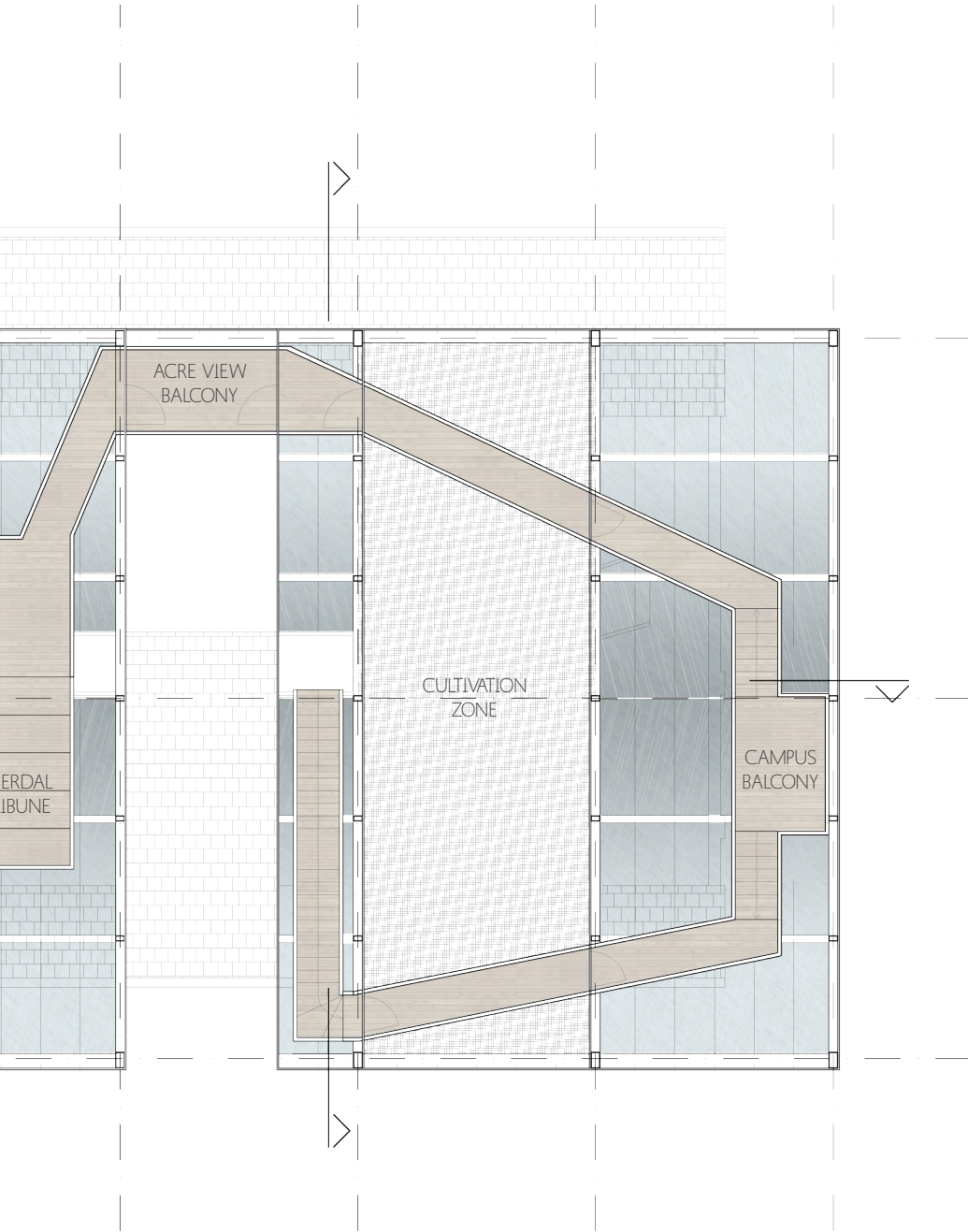
FLOWER
SHOP

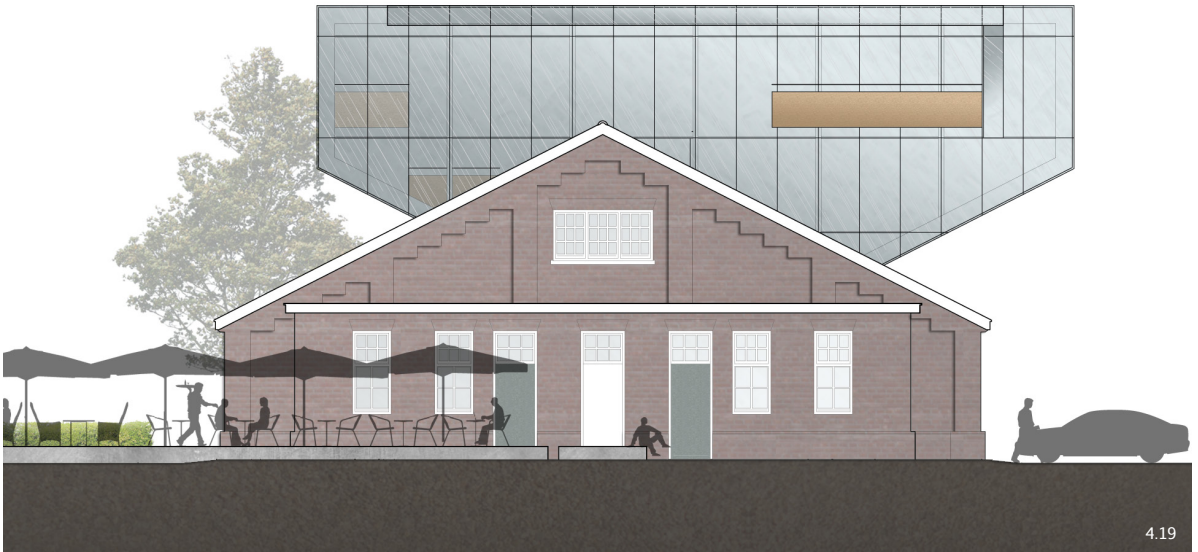
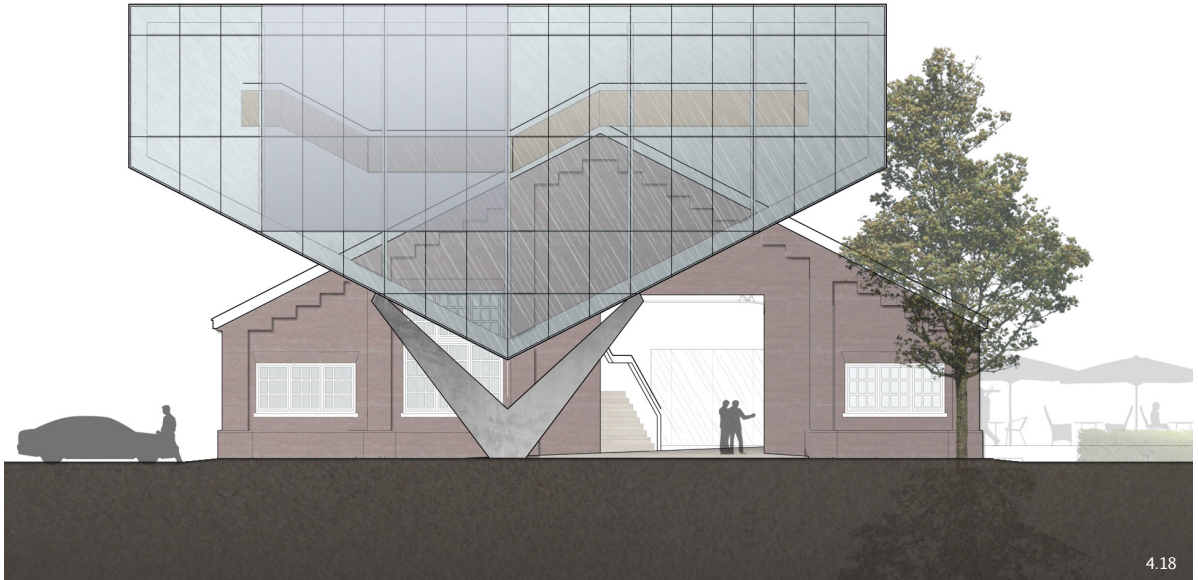
FLOWER GARDEN











the glass volume takes place near the large entrance door in the east facade; a stairway guides visitors to the first floor that is actually a bridge to connect the ground floor with the second floor. A long small stairway facing the south offers the first opportunity to enter the second floor. The second stairway is located near the west facade where an elevator is situated as well.

ONE OF THEM, CALLED
JEKERDAL TRIBUNE, IS
THE CENTRE POINT OF
THIS FLOOR AND ACTS
AS A LARGE TRIBUNE
THAT PROVIDES A
GREAT VIEW TOWARDS
THE RURAL AREA OF
JEKERDAL.

Image 4.18 East facade
(scale 1:200).

Image 4.19 West facade
(scale 1:200).

Image 4.20 (next page) North
facade (scale 1:200).

Image 4.21 (next page) South
facade (scale 1:200).

Image 4.22 (next pages) Cross
section (scale 1:200).

Image 4.23 (next pages)
Longitudinal section (scale 1:200).

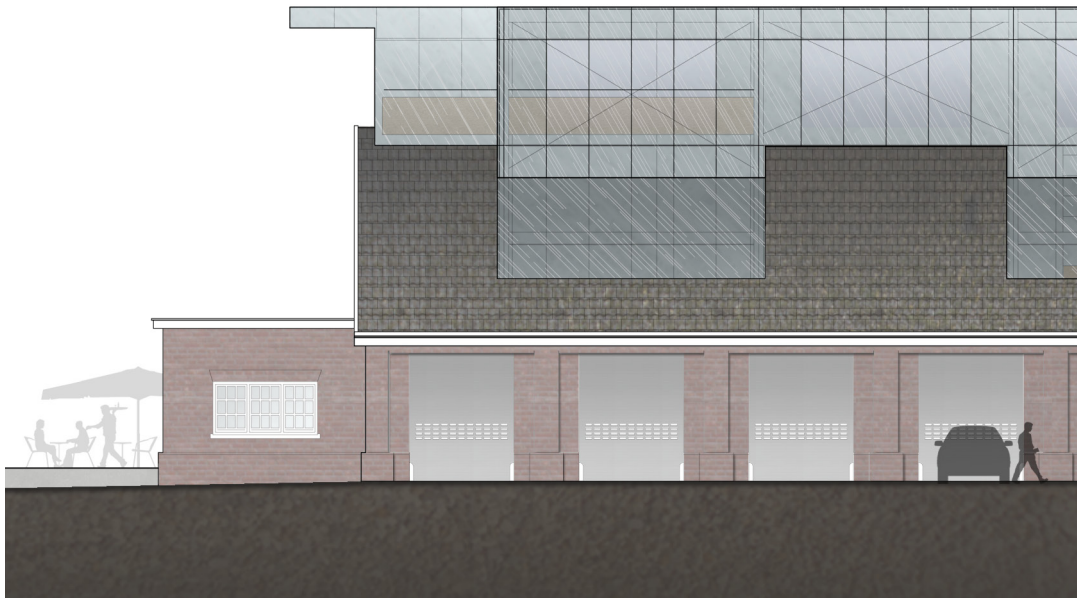
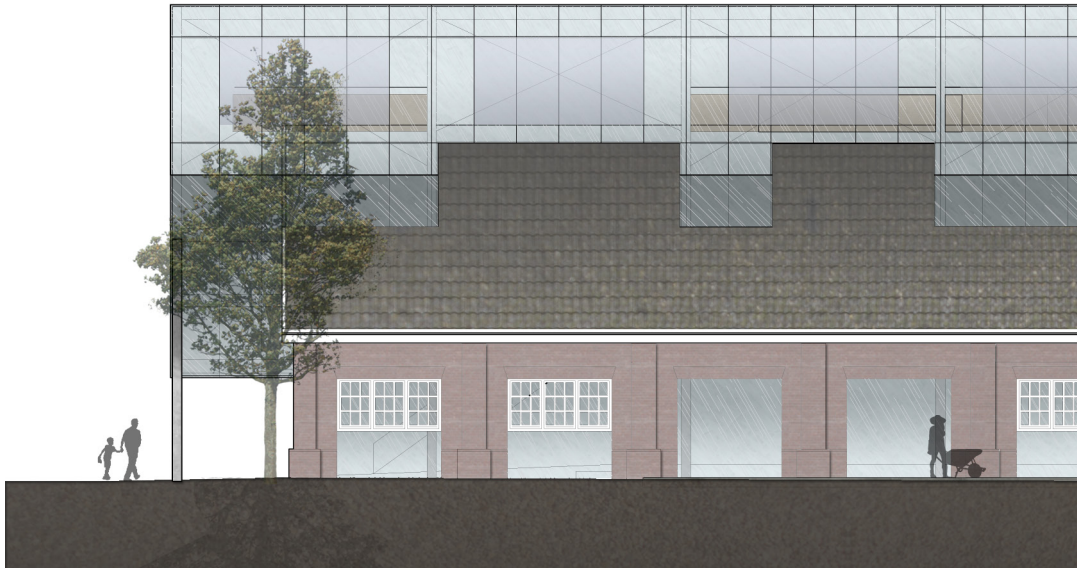
Image 4.24 (next pages)
Perspective view building
fragment.

The second floor is characterised by various bridges, floors and stairs that provide spaces to read and meet. One of them, called Jekerdal tribune, is the centre point of this floor and acts as a large tribune that provides a great view towards the rural area of Jekerdal.

Unless the great views provided by the new volume, it is the intention to be seen by passers-by as well. The addition of the glass volume changed the appearance of the

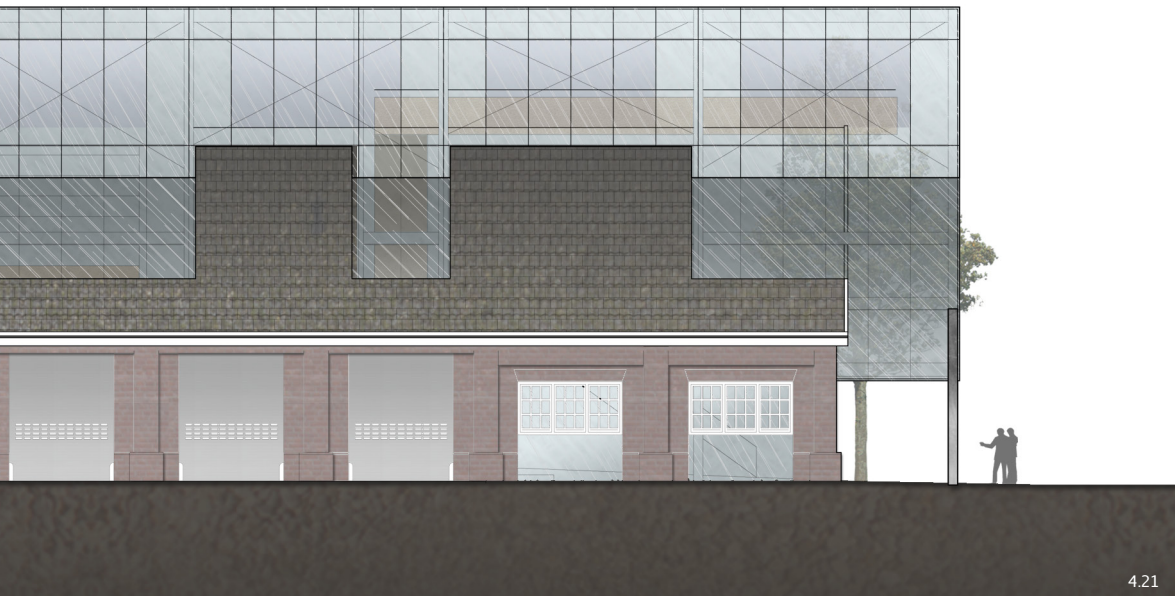
building radically. Besides, the atmosphere of the original building is kept as it is right now; no restoration work will be done.

In the east facade a large steel door, accompanied by the overhang of the glass volume, provides a large entrance to the building and the walking route through Jekerdal. The west facade on the other hand, forms the actual transition between barracks and green zone and is for that reason subtler. The glass volume is set back and the interpreted secondary volume is altered in a glass covering of the original stepped gable. In front of that, the original secondary volume together with the adjacent terrace forms the most western parts of the Tapijn Barracks. Moving west, one leaves the military base and enters the green zone surrounding the Jeker. The north facade is the one that forms the connection between the building and the adjacent acres. The original windows are enlarged to improve this connection and the visual relation between interior and exterior. In the south facade, the steel gates are kept while two windows, facing the flower shop and adjacent flower acre, are enlarged in the same way, as is the case in the north facade.

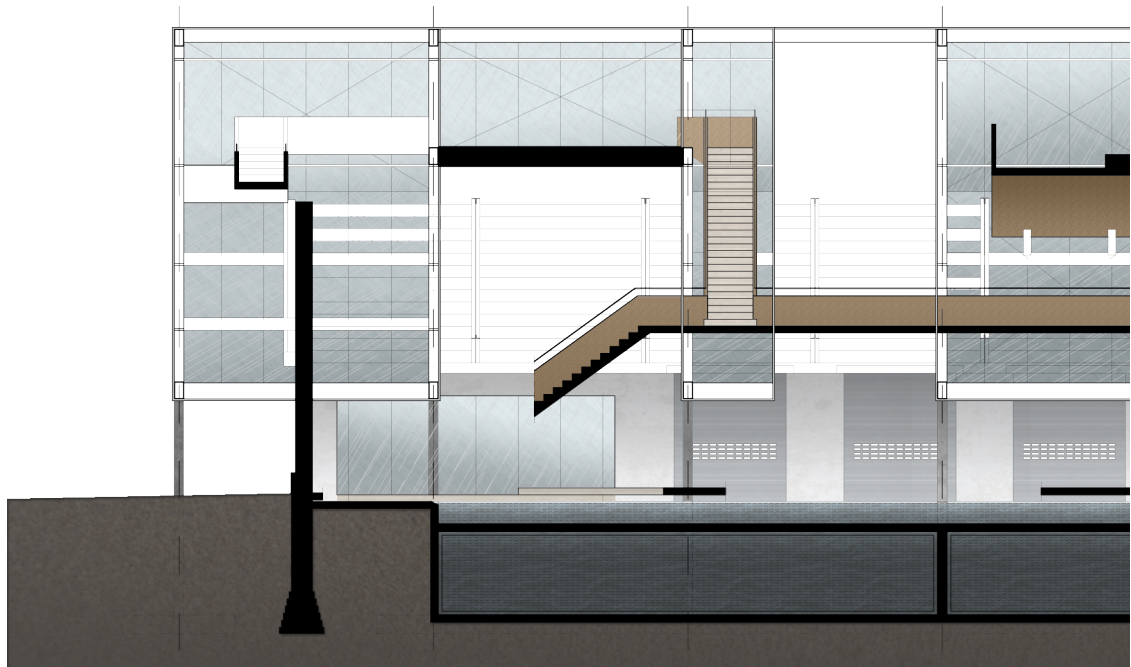
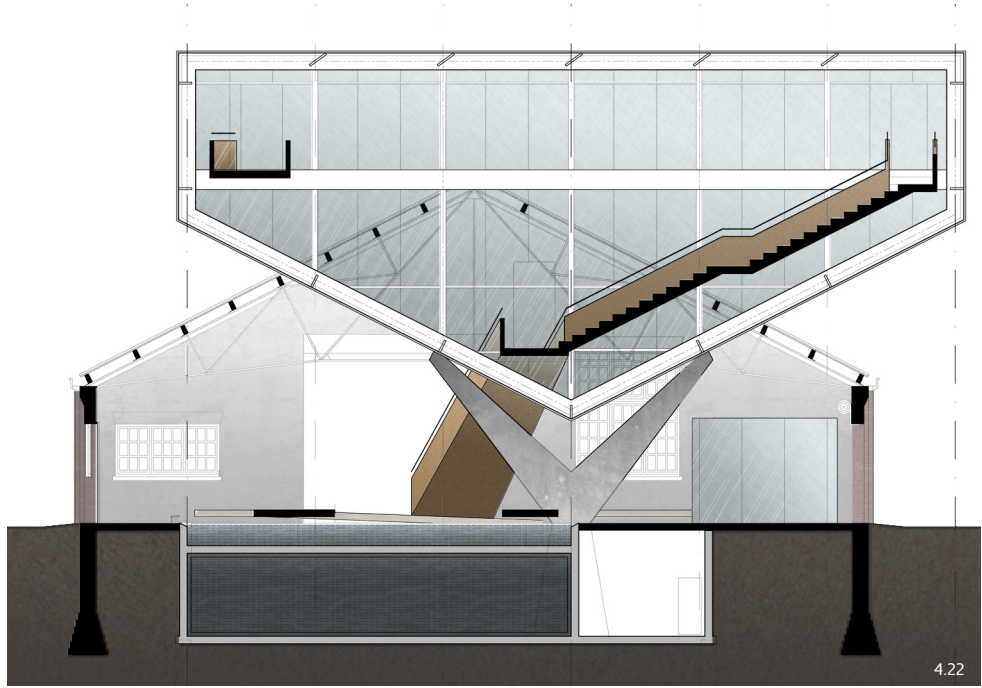




4.20



4.21







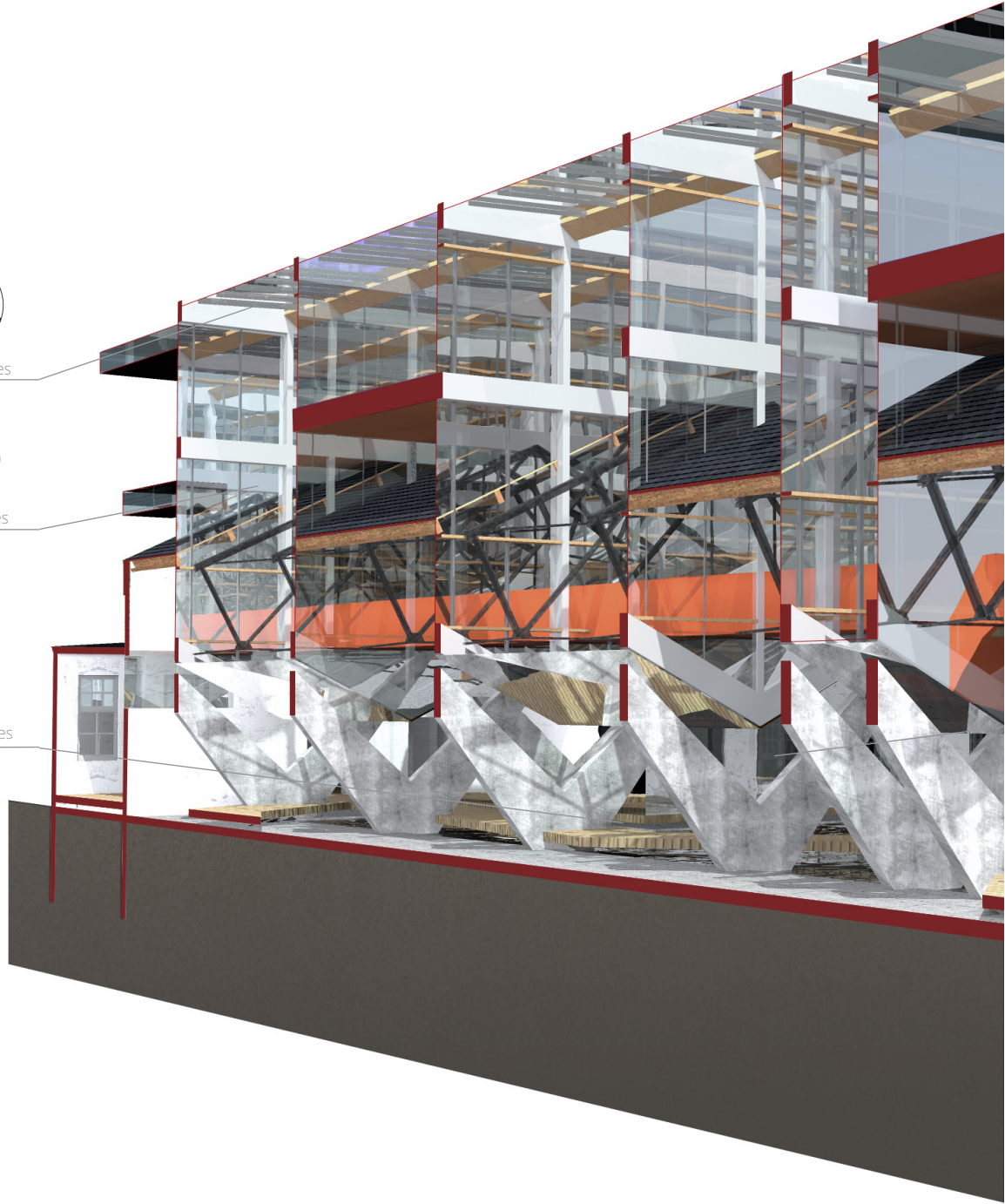
Meeting spaces

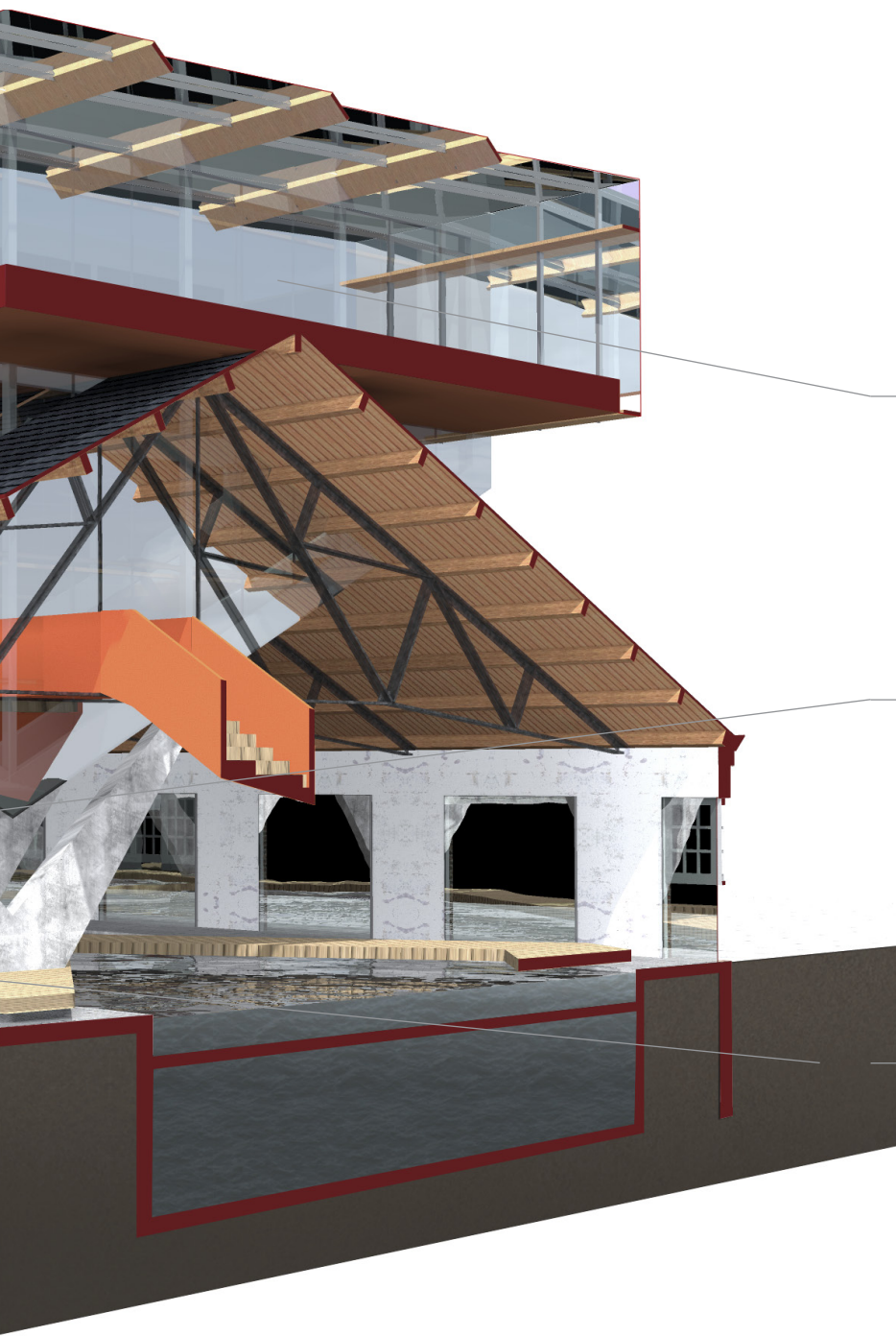


Reading spaces



6 Parking places





Greenhouse 260m²



Restaurant



Coffee counter



Acre 1960m²



Flower shop

5. TAPIJN TECHNOLOGY

TRANSFORMING SPACES, ONE OF THE MAIN TOPICS OF THE RESEARCH TO CONTEMPORARY VISUAL ARTISTS' APPROACHES. HOWEVER, A TRANSFORMATION DOES NOT DIRECTLY HAS TO BE A TRANSITION AND TO WHAT EXTEND CAN THE MESSAGE TO 'ACT LOCAL' BE IMPLEMENTED OR COMMUNICATED BY TECHNOLOGY?

1. Fine wire heat exchanger, for instance; Fiwihex.
2. Copper Indium Selenium cells.
3. Source: JRC (online source).

By adding a large glass volume, the building attracts attention. Nevertheless, the appearance of the building is not the only aspect that contributes the message it wants to communicate. Act local is only a strong statement when the site is used as best as possible. This is the where technology comes in; the building should be transformed regarding the new distributed energy network

THE MAIN STRUCTURE OF THE BUILDING CONSISTS OF EIGHT STEEL VIERENDEEL TRUSSES,...

described in chapter 3. In other words; How can the building be transformed from a 'second industrial revolution building' into a 'third industrial revolution building' by use of state of the art technology, still communicating the message 'act local'?

Making a statement, that is where this design is about. A statement like this requires the large glass volume that is placed on top of the obsolete exercise hangar, resulting in a steel structure with and glass walls. Unless the steel structure and glass walls are not recycled local products, they are recyclable. The main structure of the building consists of eight steel Vierendeel trusses, each one placed on a reinforced concrete stand. Those trusses consist entirely of rectangular steel tubes. These are connected to each other by use of a smaller tube mounted inside and in order to get a flat surface, rawplugs are

used. Unless these trusses are not made of locally obtained resources or elements, they can be reused easily because of their ability to be disassembled.

5.1 Winter:

Nowadays, in many buildings' energy systems aquifers are used. However, this is not possible in most locations in the south of Limburg and Maastricht in particular. Therefore another method to store cold and heat (and thus energy) is used; a large water buffer filled by collected rainwater is situated right underneath the fish pond. This buffer is divided to create two different water temperatures; one for cooling and one for heating. The one for heating is, of course, used in winter together with a heat pump and fine wire heat exchangers¹. A shortcut between the heat exchangers in the greenhouse and the ones in the restaurant and flower shop are possible; heating these spaces is possible with even less energy compared to the use of the hot water storage underneath the fish pond because there are less pumps in action. Next to using stored heat, passive solar energy is another source of heat; due to the angled roof beams, the sun is able to penetrate the building very well.

5.2 Summer:

In summer, sunscreens and natural ventilation are preventing the building for overheating. Additional cooling of the building is possible by the use of cold water storage, the heat pump and fine wire heat exchangers working in opposite direction compared to the winter situation.

Image 5.1 (next page) Exploded view.

Image 5.2 (next page) Detail.

Image 5.3 (next pages)

Vierendeel truss.

Image 5.4 (next pages)

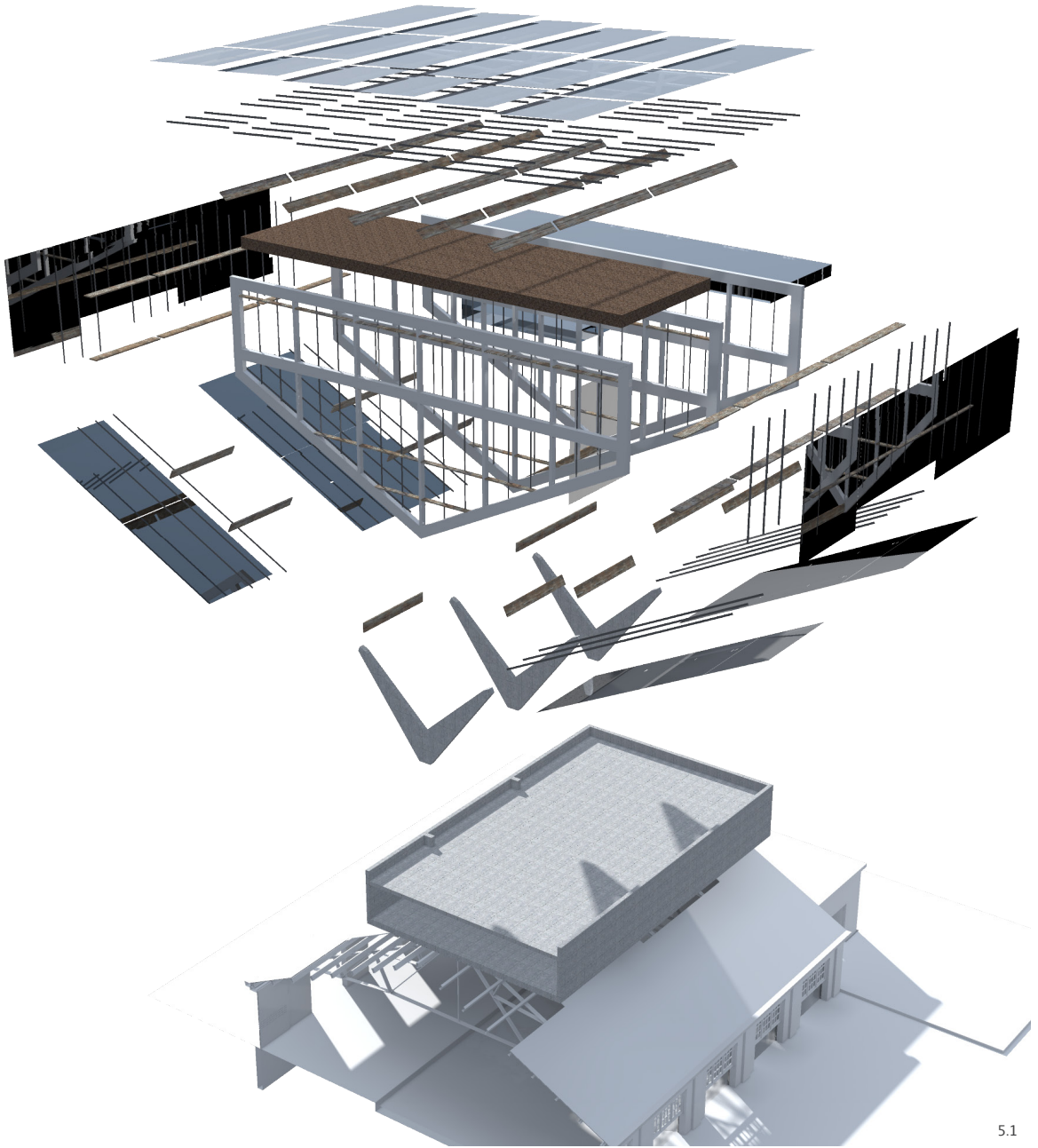
Longitudinal section winter.

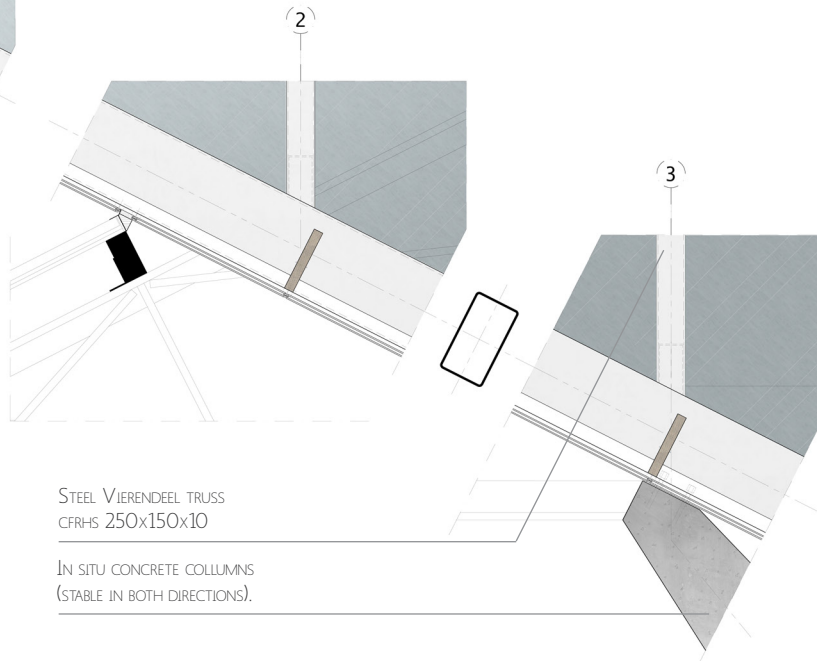
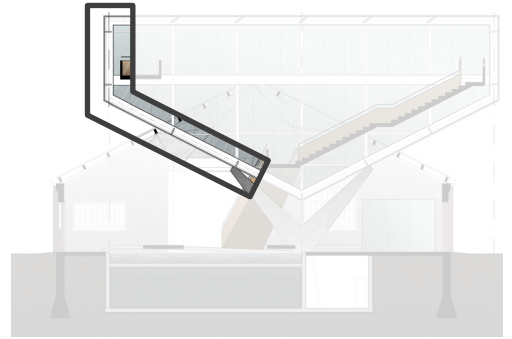
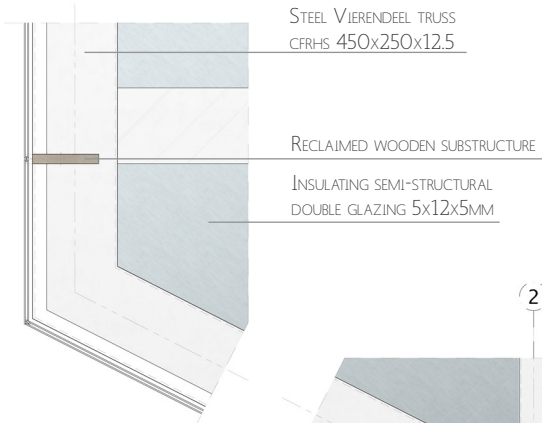
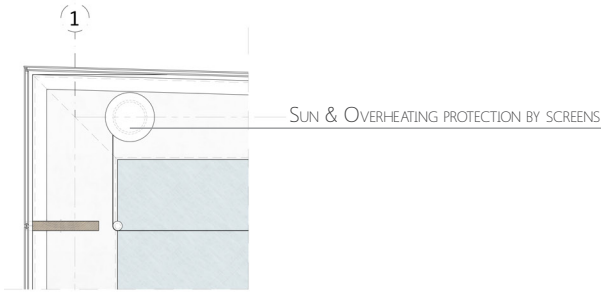
Image 5.5 (next pages) Cross section winter.

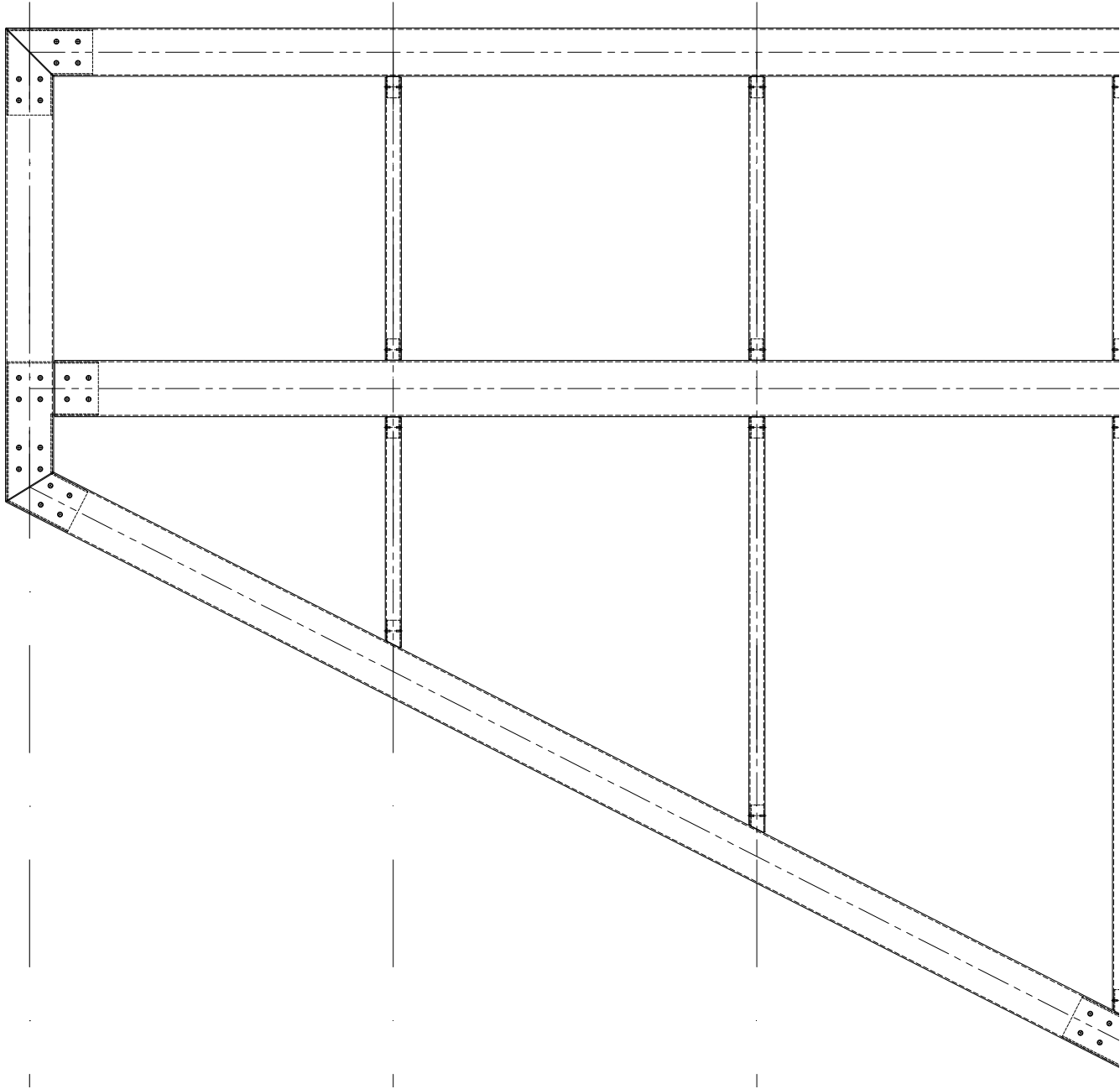
Image 5.6 (next pages) Cross section summer.

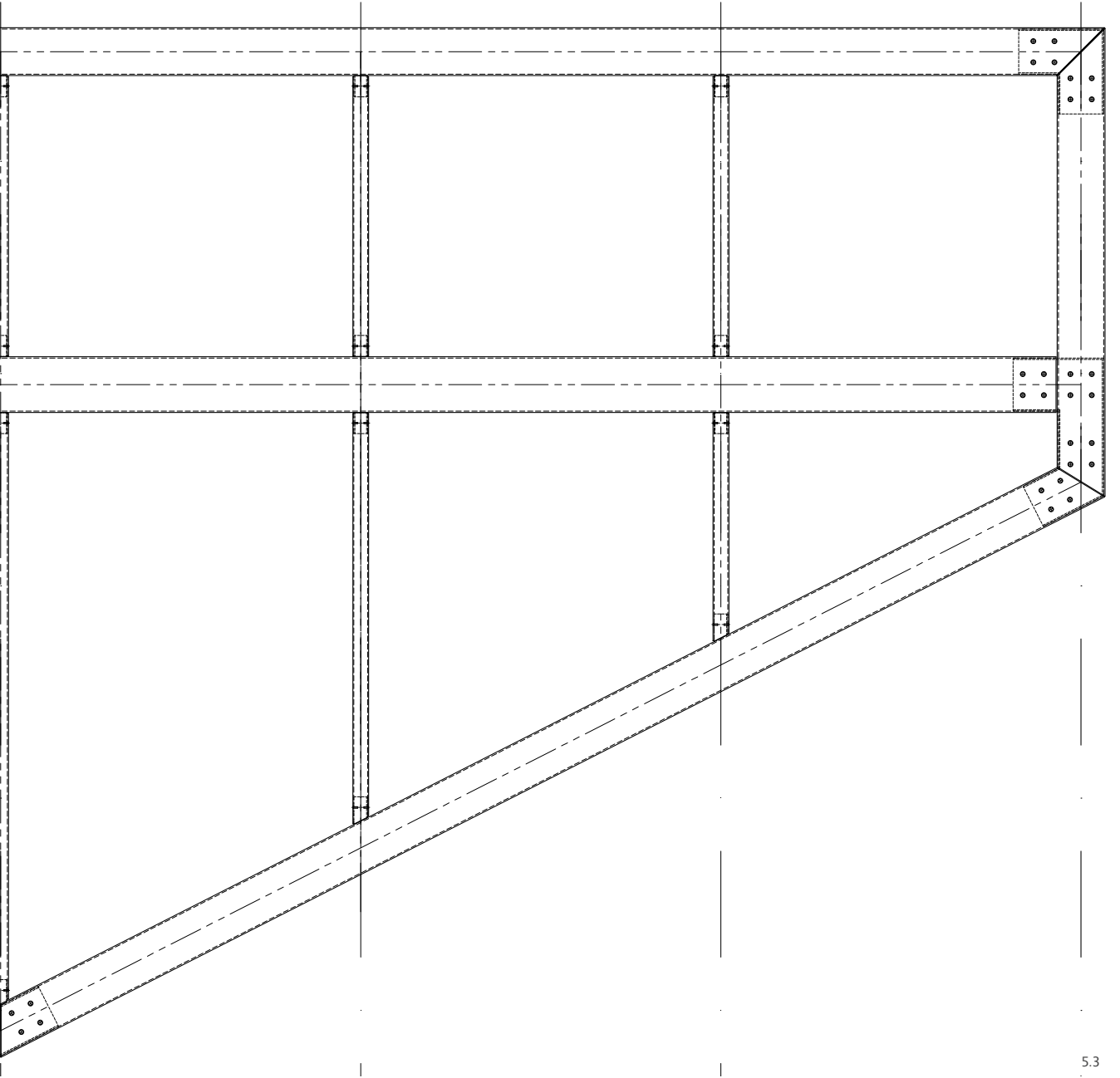
Image 5.7 (next pages)

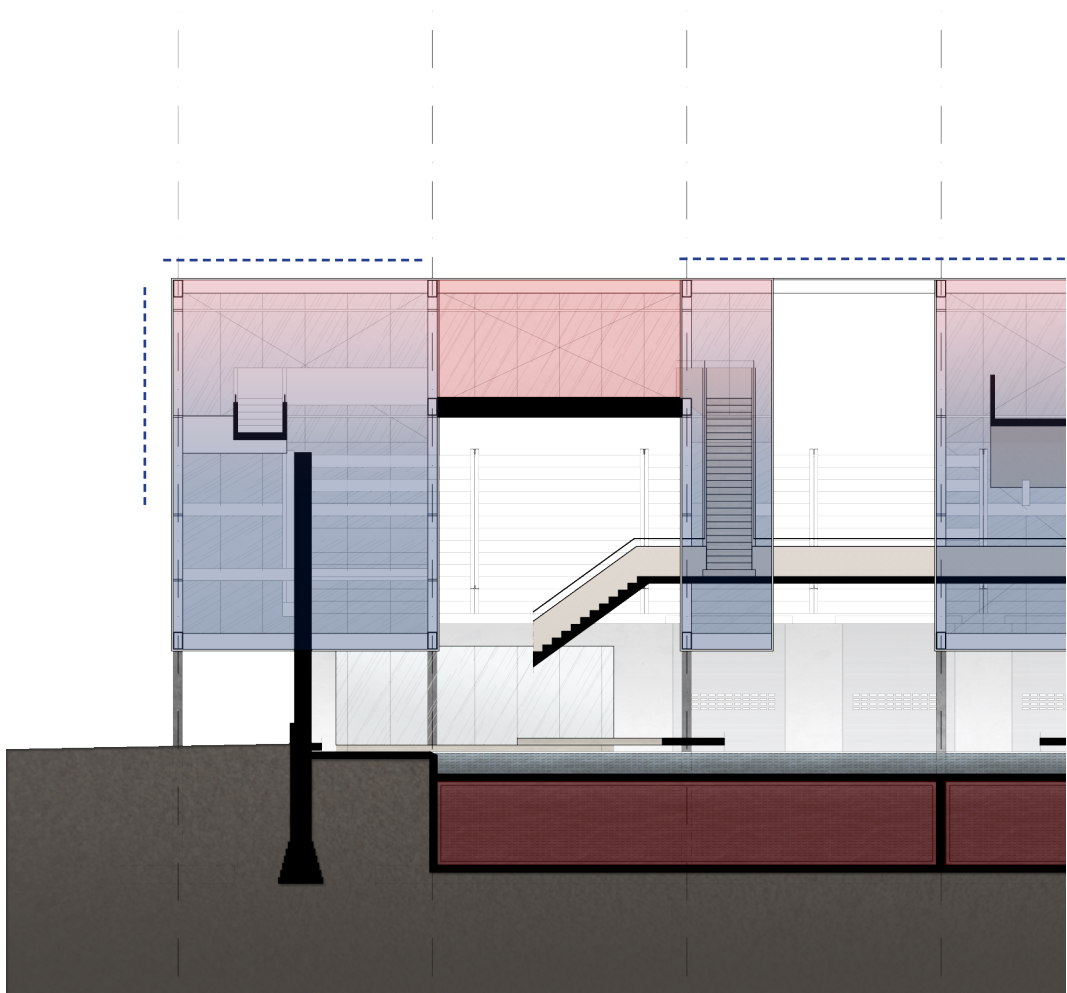
Longitudinal section summer.

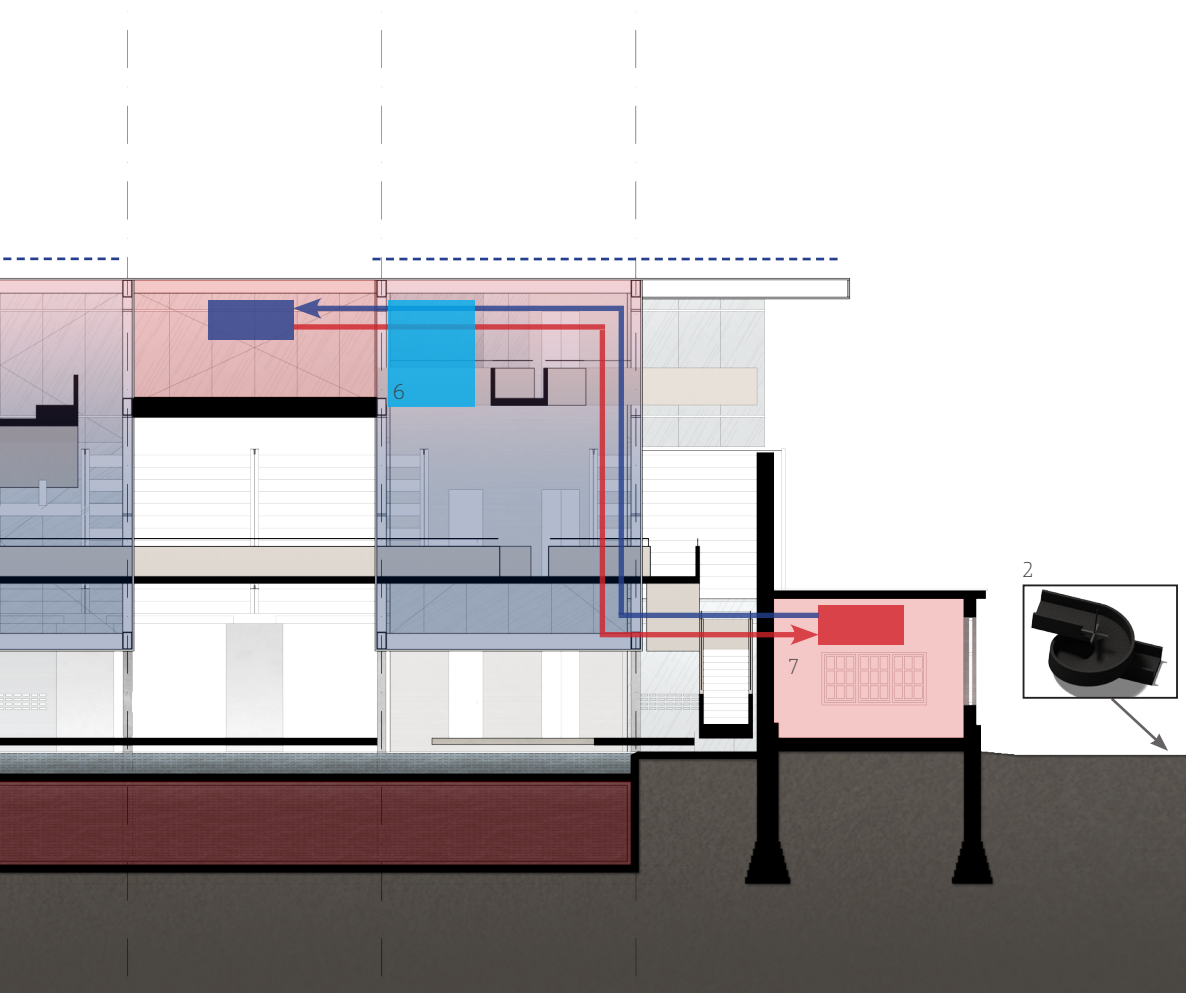


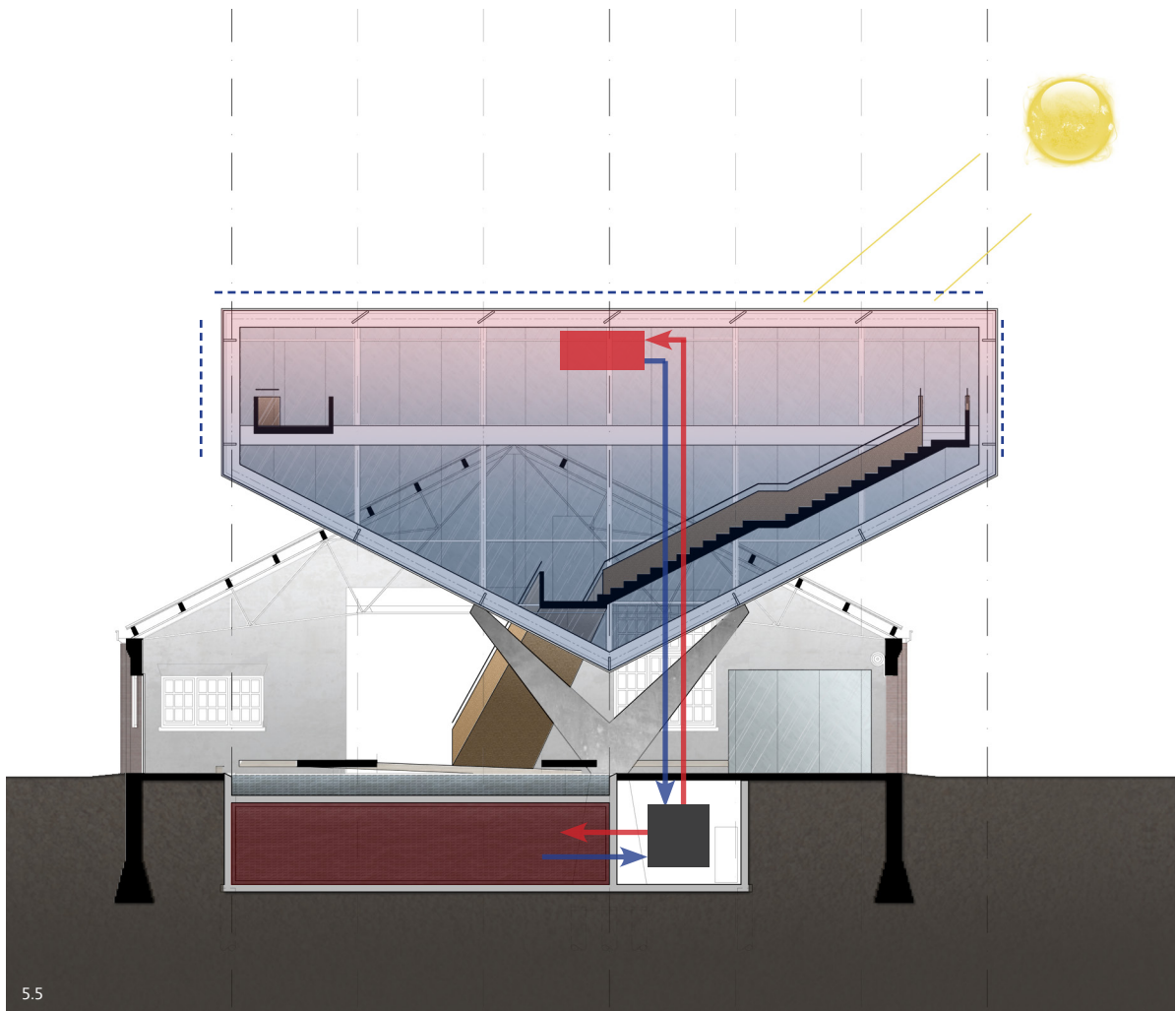


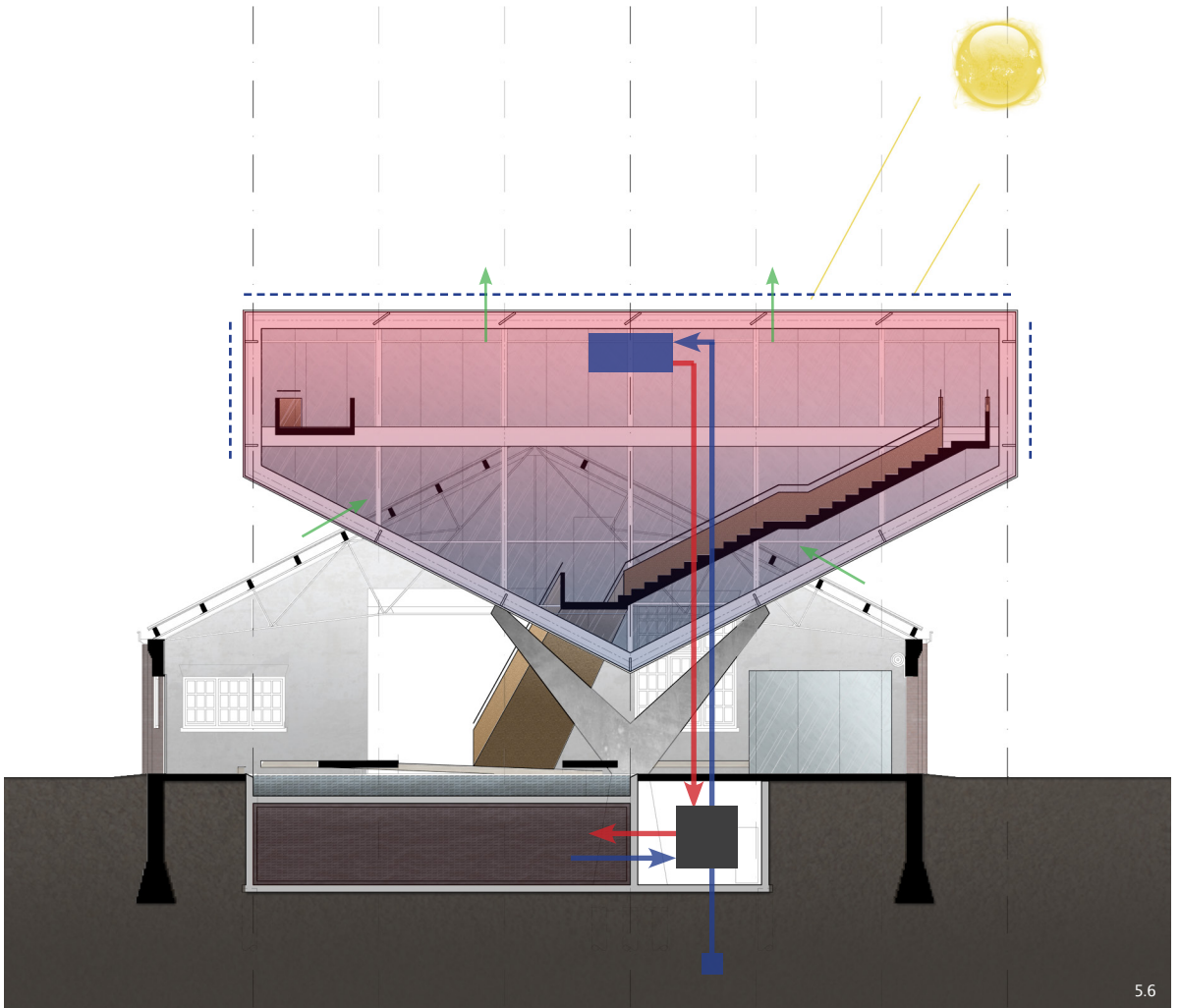


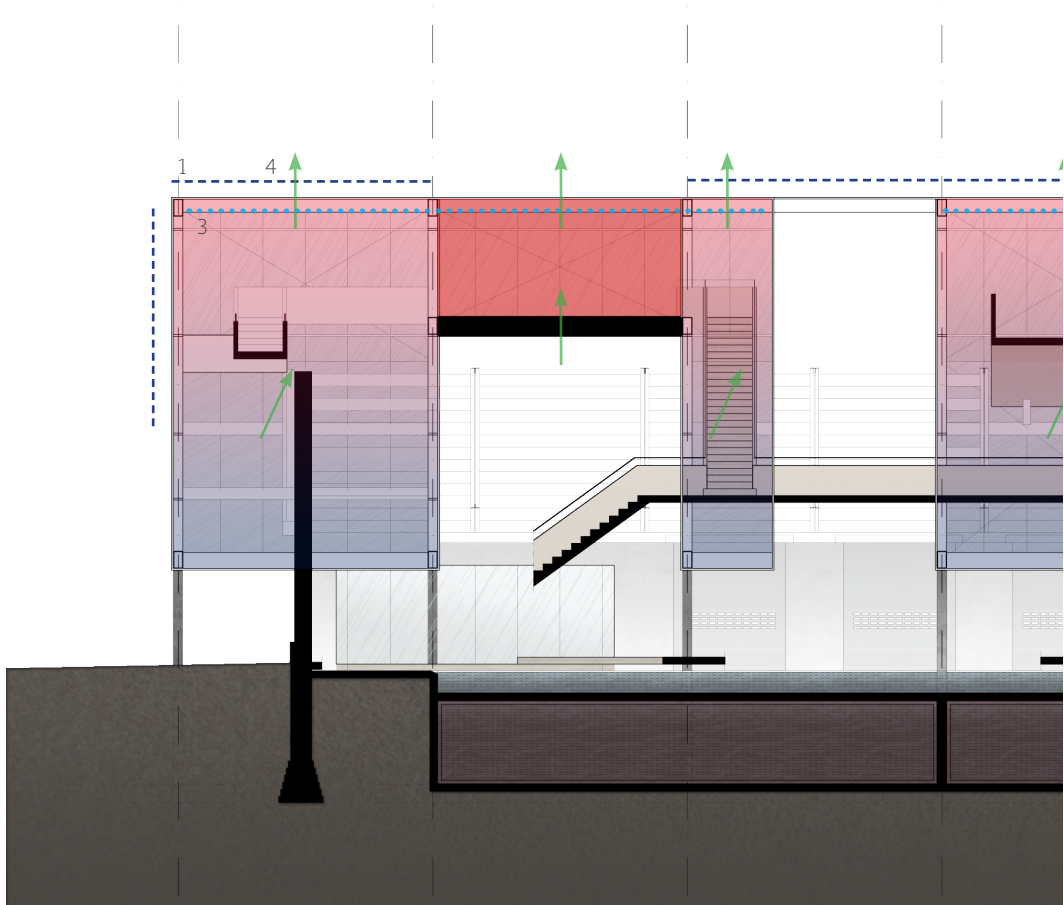


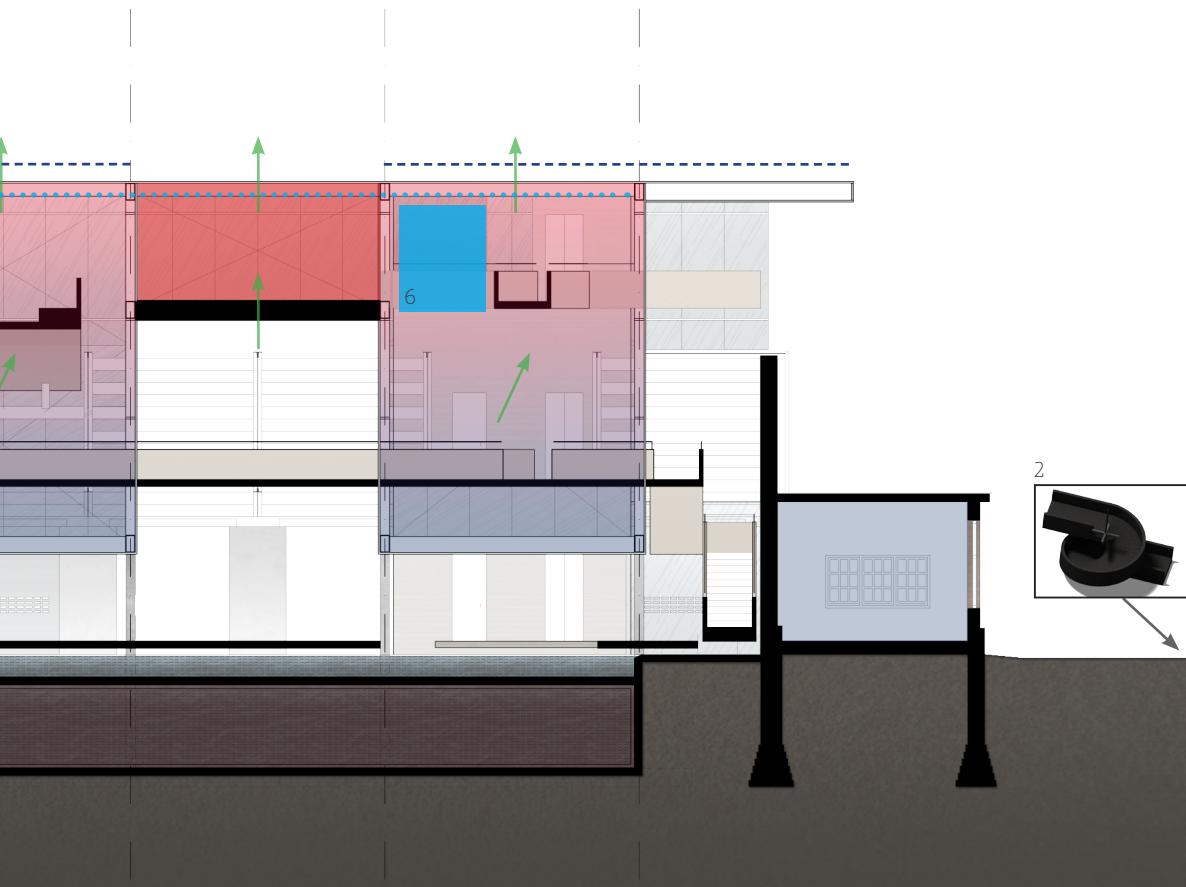














4. Zotloeterer. Production determined based on reference GWVPP's (online source).

5.3 Electricity:

Next to heat, electricity is another important element within the device; act local'. As written in chapter 3, the Tapijn Barracks can generate electricity from two sources. Firstly, when the winter garden is equipped with translucent thin foil solar cells², nearly

THOSE 67 MWh/
YEAR CAN BE USED FOR
COOLING, HEATING,
ENLIGHTING AND
OTHER PURPOSES IN
THE BUILDING AS WELL
AS THE ADJACENT
GRADUATE SCHOOL.

17 MWh/year will be generated³. Placement of these foils can refer to existing openings in the facades like the large steel door and smaller, authentic windows. Secondly, a micro hydro generator can be used to take advantage of the presence of the Jeker. This small stream can generate approximately 50MWh/year⁴. Those 67 MWh/year can be used for cooling, heating, enlighting and other purposes in the building as well as the adjacent graduate school. The electricity can also be used to charge electric cars that park inside the building.

and next to the terrace, the transformed building suits in a distributed energy network and moreover communicates its message; it acts local by sourcing its energy very nearby.

Image 5.8 Gravitation Water Vortex Power Plant.

By use of building integrated photovoltaic systems and hydropower in the new volume

6. BARRACKS TRANSFORMED

ADDING A CONTEMPORARY VOLUME TO A ONE HUNDRED YEARS OLD EXERCISE HANGAR; HOW DOES THIS LOOK LIKE IN REALITY? IS IT THEREUPON POSSIBLE TO ANSWER THE MAIN QUESTION WITHIN THIS DESIGN PROCESS AND ADDITIONALLY; DOES THE DESIGN PROCESS WITH ITS VERY DIVERSE TOPICS CONTRIBUTE THE STUDY IN HOW TO DEAL WITH THE TRANSFORMATION OF VACANT MILITARY HERITAGE?



6.1 Result:

By combining very diverse topics into one design process, a design arose that tries to unite this complex entity. Art related issues like communicating a message by means of an artwork are applied on an architectural

...THE COLLECTIVE
CONSCIOUSNESS
ABOUT FOOD &
ENERGY WILL BE
ENLARGED AIMING ON
A SOCIETY THAT IS
MORE AWARE OF THEIR
ENERGY USAGE.

scale. Instead of communicating the artists' vision, the users device is shared; act local! This will enlarge the collective consciousness about food & energy aiming on a society that is more aware of their energy usage.

In the end, communicating the message to act local, facilitating message-related functions and reducing the energy usage are brought together in a design for the transformation of the former exercise hangar of the Tapijn Barracks in Maastricht, inspired by the research to contemporary visual artists and supported by a short investigation to food & energy.

6.2 Reflection:

Unless this design should be an exemplary case in dealing with vacant military heritage, the location specific aspects within this design restrain this for applying similar design decisions in a comparable case. Nevertheless, finding inspiration in the way artists deal with transformation of object and space is a very valuable addition to the design process and thus can be recommended to almost every designer dealing with transformation of object and space. Besides, determining the functions on an urban scale by the actual atmosphere of different spaces, results in an urban plan that is highly influenced by found characteristics. This will anchor the design in its surroundings and form distinguishing starting points for the architectural design process. On architectural scale, these starting points can be treated in an art inspired way leading to an integrated building design.

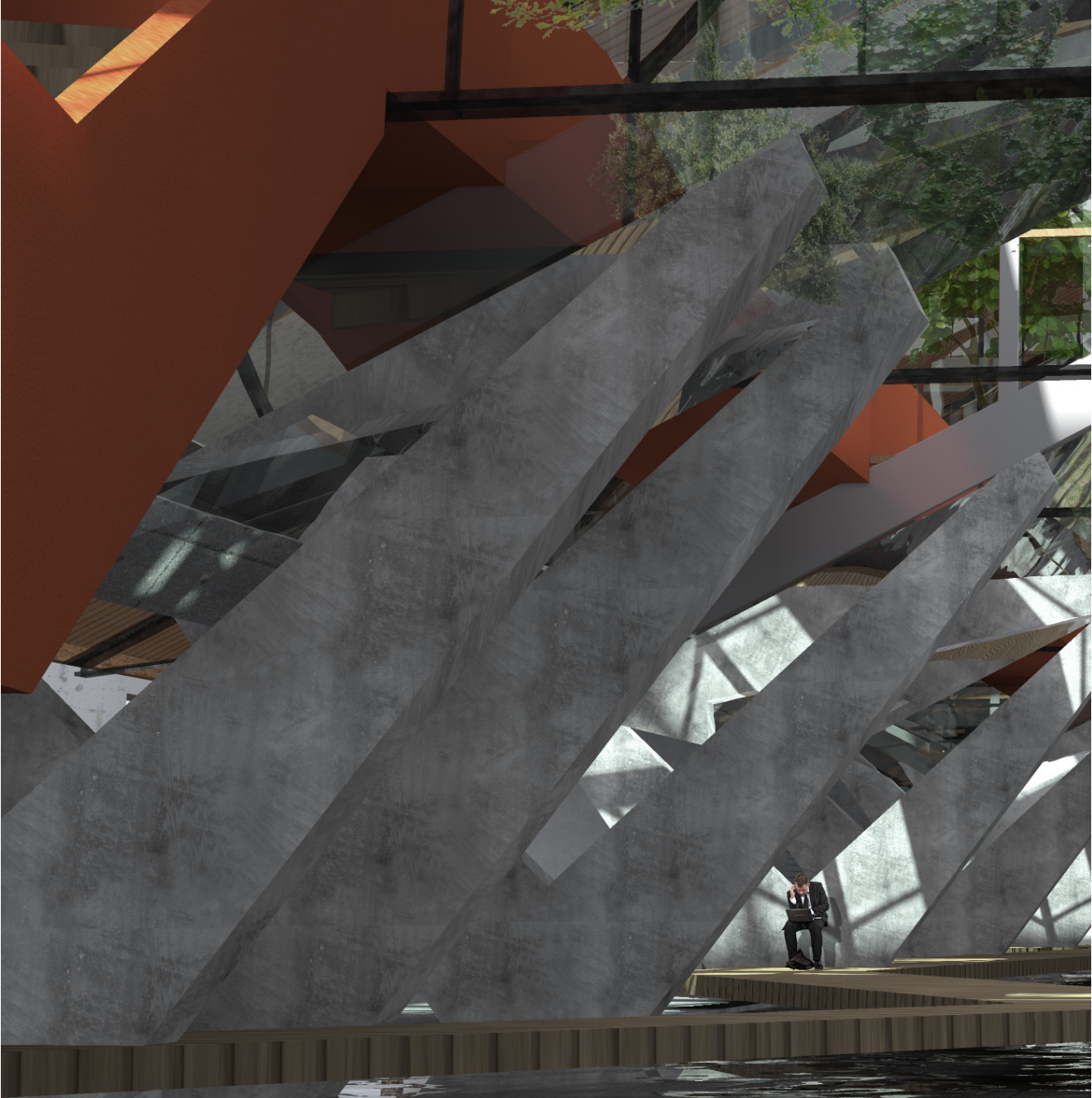
Image 6.1 Birds eye view on transformed terrain.

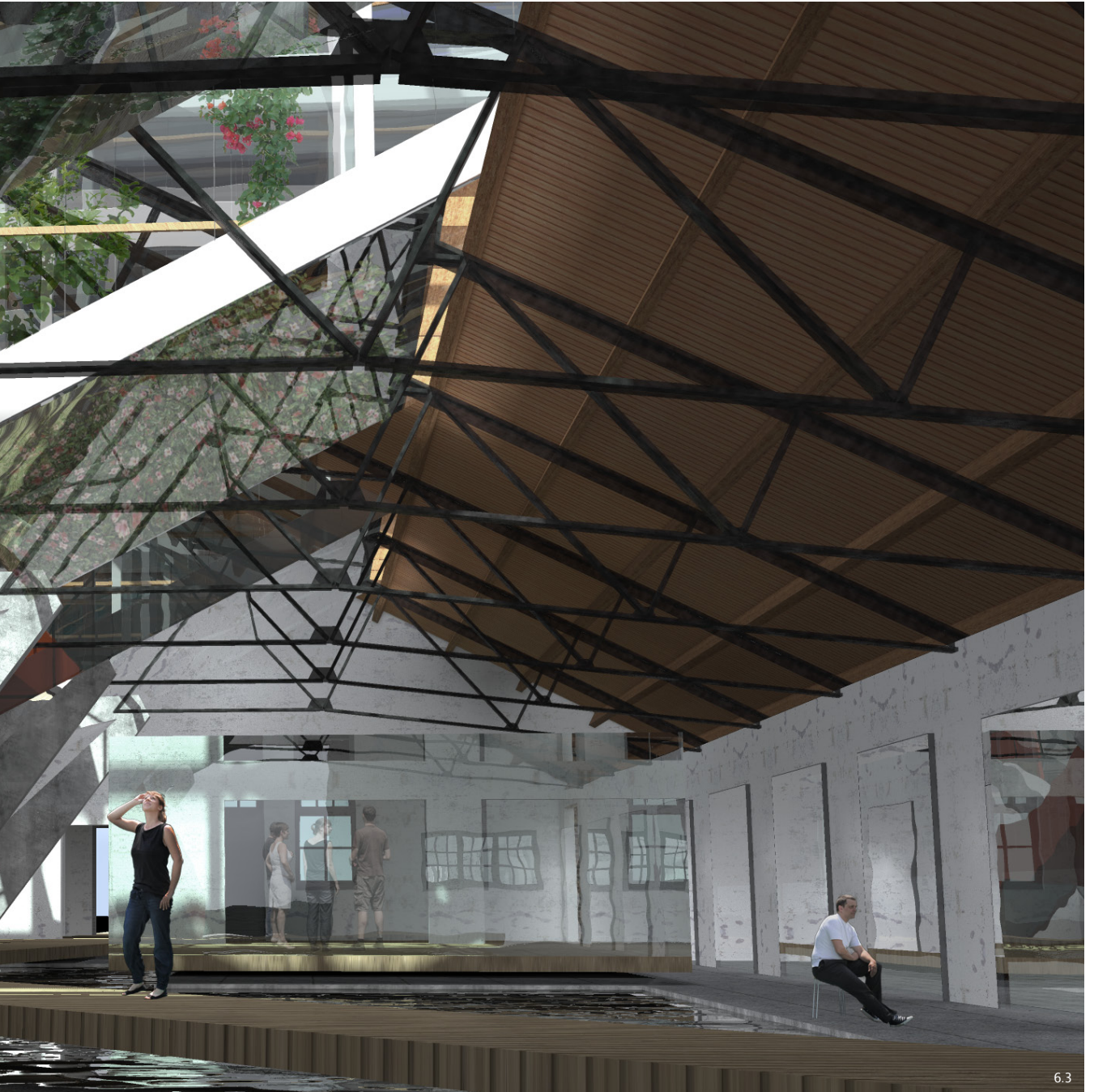
Image 6.2 (next page) Artist impression seen from Prins Bisschopsingel.

Image 6.3 (next pages) Artist impression interior ground floor.









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Images:

Image 1.6

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Image 2.3

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Image 2.4

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Image 2.5

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Image 2.6

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Image 2.15

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Image 3.1

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Image 3.7 t/m image 3.13

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Image 5.8

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