

HERITAGE AND ARCHITECTURE GRADUATION STUDIO
HEMBRUG TERRAIN

DESIGN BOOKLET

PAVILIONS IN THE WOODS

THE UNINTENDED BEAUTY OF DEALING WITH EXPLOSIVES

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01

THE KANGAROO RESIDENCE



02

THE CONTEMPLATION HALL



03

THE FARMS



04

MASTERPLAN



05

PROCESS



CE



LL



Introduction

Hemburg military heritage

During the Heritage and Architecture graduation studio the challenge is taken upon transforming a former Dutch military base and production zone by the name of Hemburg. Where time has stood still for years, this unique location within the Stelling van Amsterdam only recently has been opened for the public,

now containing numerous historical military remnants to explore. The Hemburg district is characterised as a dense industrial area along the Noordzeekanaal, built with a high density of structures for logistic efficiency where initially ammunition and weaponry were produced. This industrial area is contrasted by the forest area around it, creating the 'green enclave' south of Zaandam.

I have chosen to develop the transformation of a former military test site and explosive storage zone within this green enclave, by the name of the Pavilions in the woods, or Plofbos. An area that contrasts tremendously to the surrounding industrial zone; under the trees, free standing structures, creating natural open spaces in between the buildings, small in scale, low-rise. Even the shape and location of the buildings were strategically designed and positioned and numerous practical military interventions were designed in order to reduce the risk of explosive accidents. Even the form of the buildings would steer an accidental explosion into the woods, and canals were laid out around the buildings acting as fire compartments. This former practical military design that acted as a strict risk management, now brought (a 100 years later) unintended qualities with it. Qualities of a natural environment, a restful ambience in the hearth of the Dutch's 20th century military base, that is filled with historical evidence.

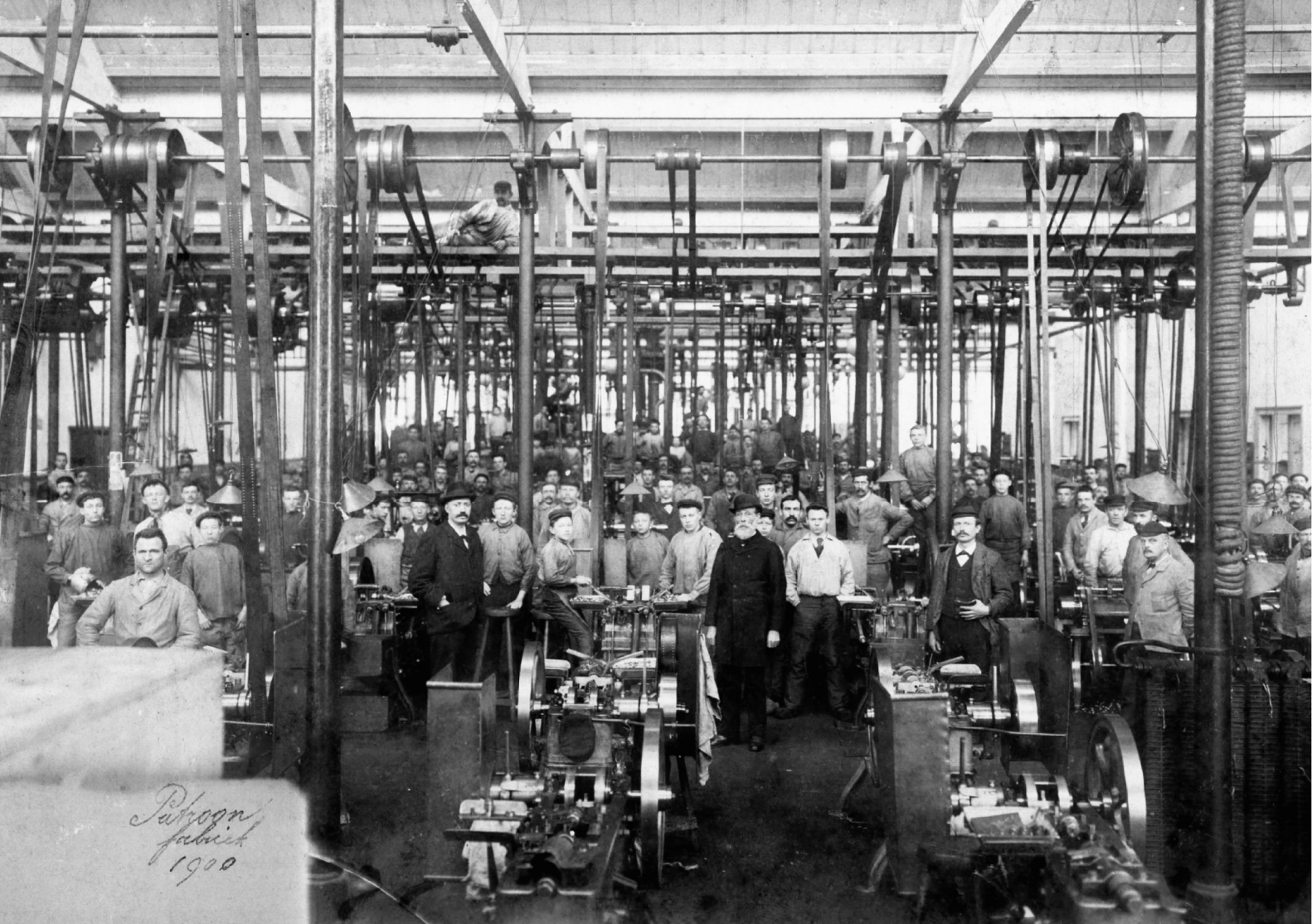
What interested me is that this unique setting is formed upon not just one single space, but the accumulation of many different types of space within this ensemble. It is the role of this experience of transition, together with the presence of historical evidence and natural qualities that makes the Plofbos so interesting and unique.

Research question

The Pavilions in the woods, characterised by its natural atmosphere offers an ideal environment for the aging elder. Living in a natural environment could improve the overall well-being of the individual, opposed to living in an urban environment. Yet, especially elderly, suffer from loneliness, fear or depression. These problems demand another solution from the transformation on a bigger scale of program that deal with the mental well-being of the individual. It can be contested by hosting communal activities for the elderly, as well as to stimulate them to exercise and to do communal activities such as gardening, bike rides or hikes through the forest. However, all these activities need to be organized and taken care of, so who is going to put in the effort? Another growing problem in the Netherlands is the huge housing shortage, especially in the Randstad. Mostly young starters are not able to afford an acceptable house. Within the two major cities Zaanstad and Amsterdam, Hembrug could offer an interesting alternative for those seeking a house. With the former mentioned elderly target group in mind, it is the idea to mix these young starters, families, and individuals together with the elderly. Together they will form a community, where people will focus on participation, hosting communal activities and help their elder neighbours. Whether it be small chores such as groceries or assistance with particular tasks, the younger generation will agree on participating in the community, having a slight responsibility for the elderly. As society brings more and more people in the world, we can only take care of less. This drives us into changing from an individual driven society to a community of solidarity, empathy, and compassion, where architecture can provide the basement for creating a bond between the individual.

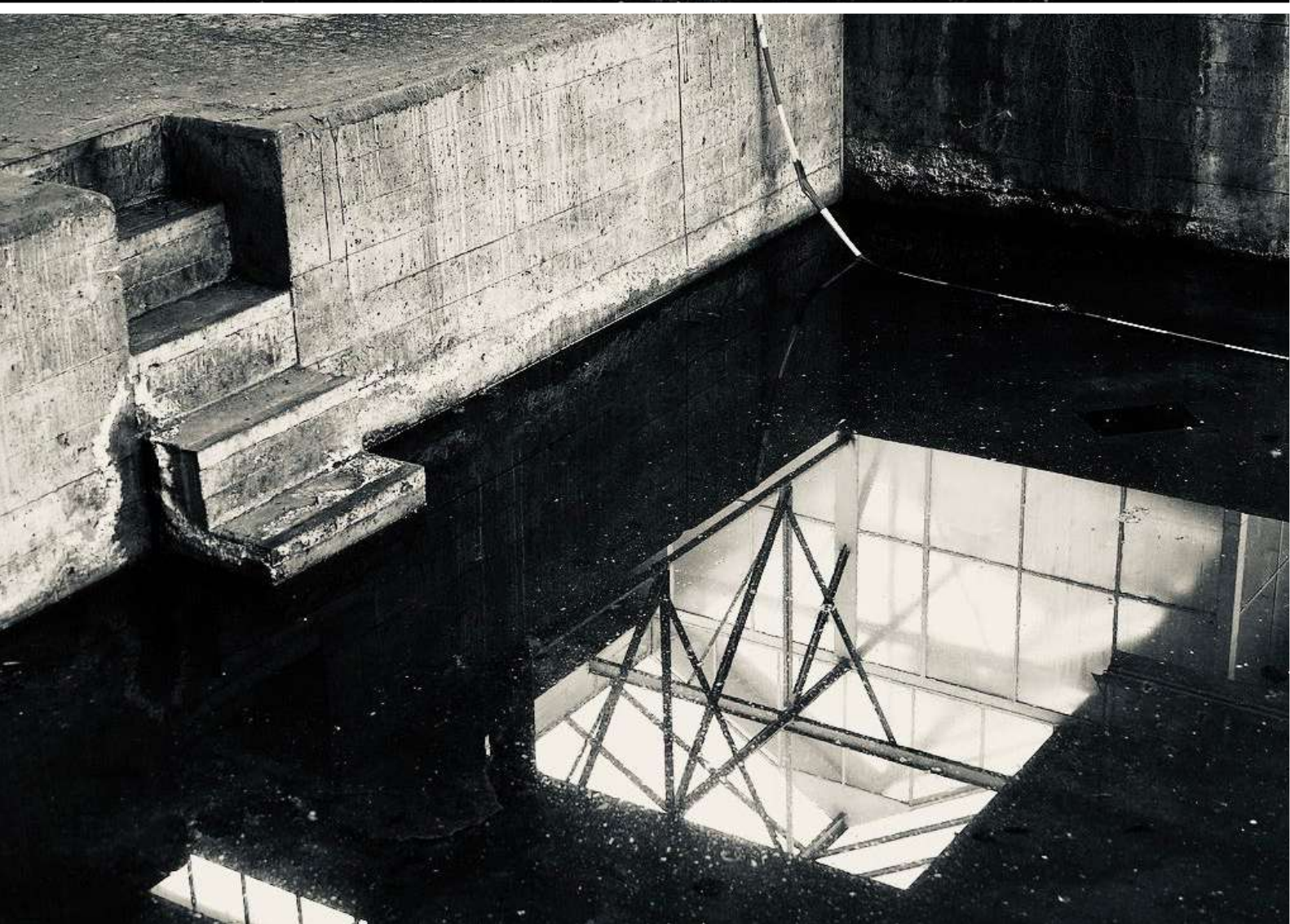
This process has lead me to raise the following design research question, that aims on how to improve the current setting by architectural transformation.

“How can the existing buildings of the Plofbos be transformed sustainably, where elderly can live more independently and which stimulates the settlement of a self-supporting community?”





MILITARY FACTORY





...DECAY





...TIMELESS



DECAY - RUINS



- WILD NATURE

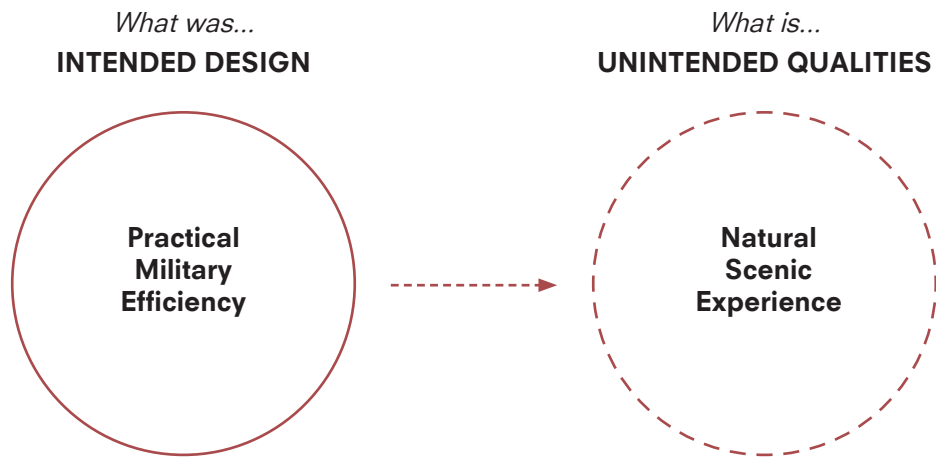
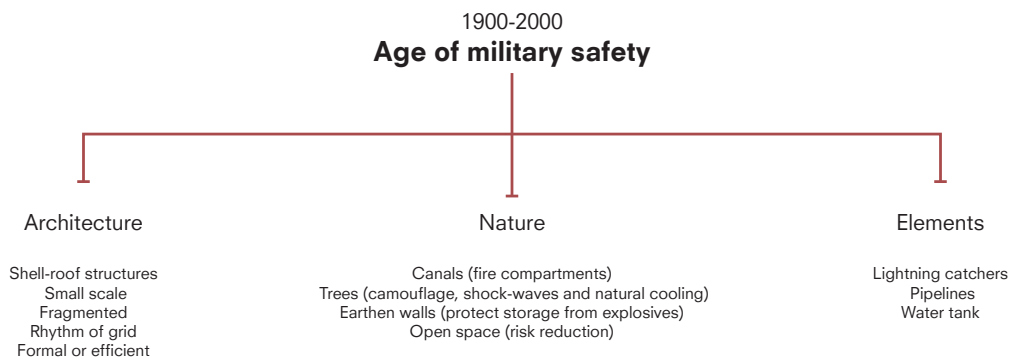


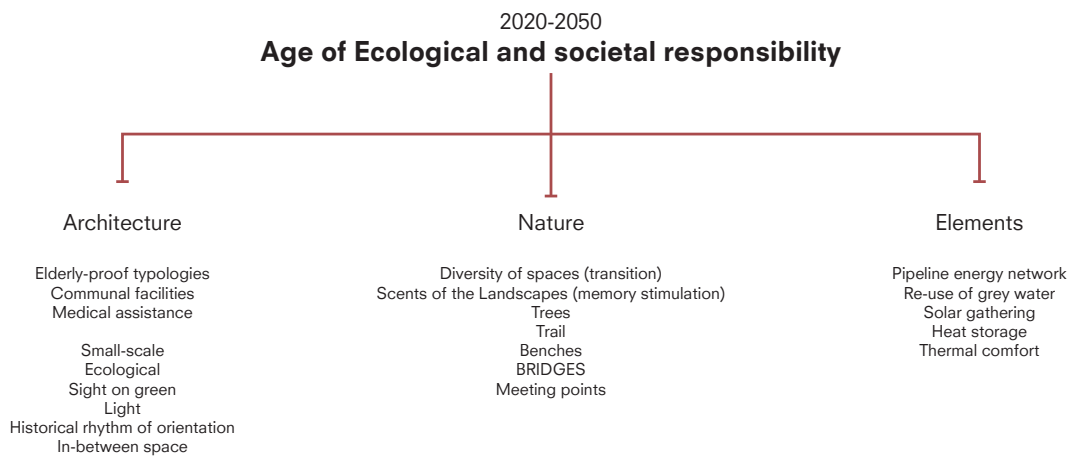
IDYLIC S

A lush green forest scene with a brick house visible through the trees and a body of water in the foreground. The image is filled with vibrant green foliage, including large trees and dense bushes. In the background, a brick house with white window frames is partially obscured by the trees. The foreground features a body of water that reflects the surrounding greenery. The overall atmosphere is serene and natural.

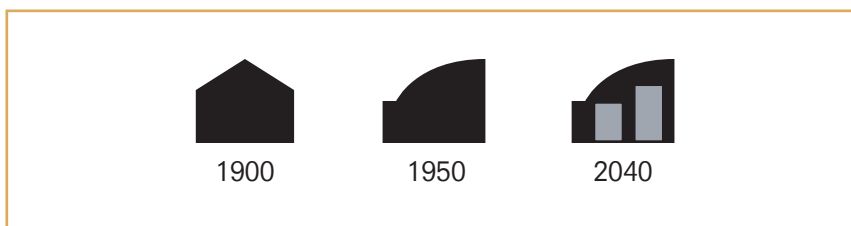
CENERIES

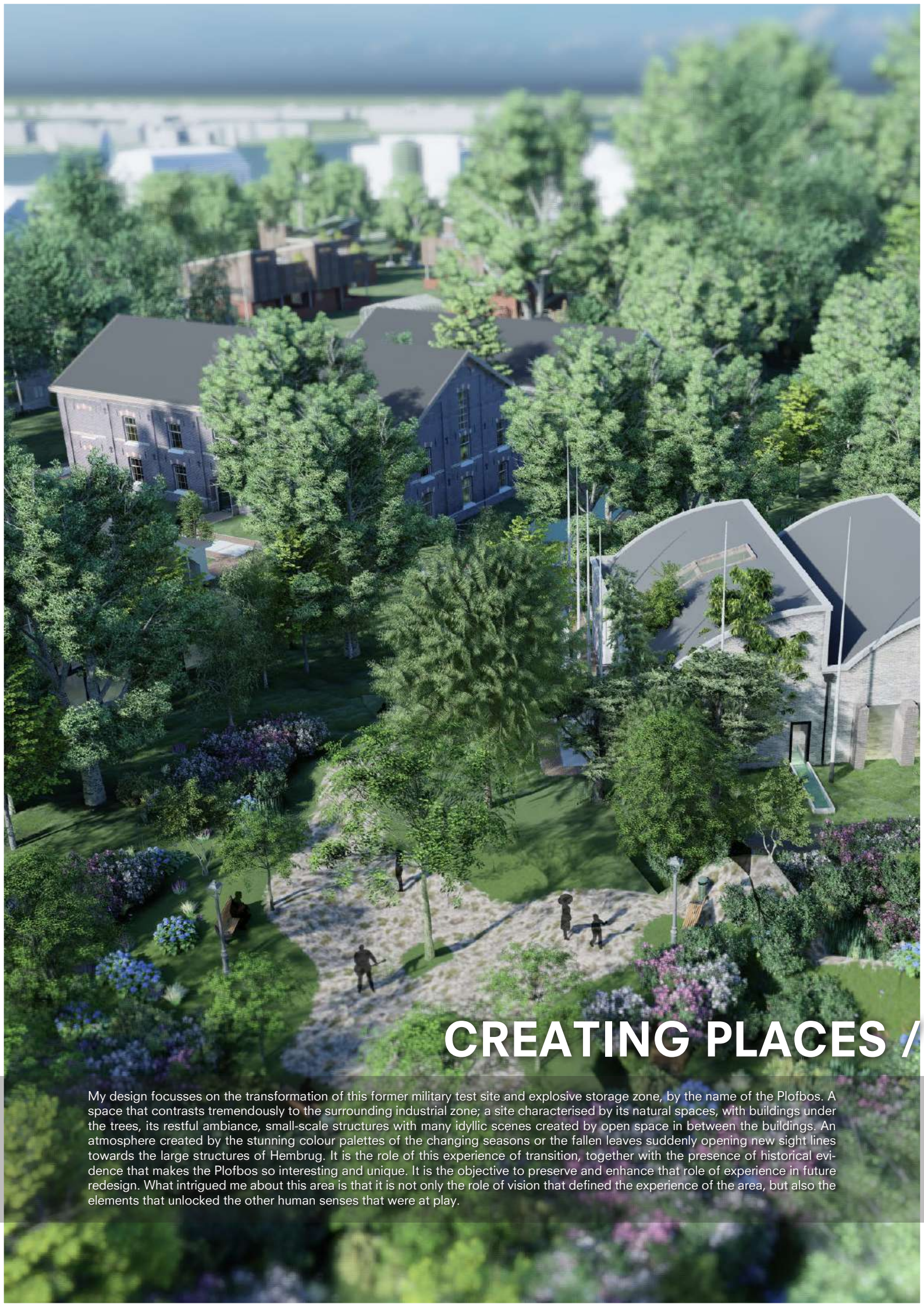
The course of Hembrug





What will be...
SUSTAINABLE INTERVENTIONS





CREATING PLACES /

My design focusses on the transformation of this former military test site and explosive storage zone, by the name of the Plofbos. A space that contrasts tremendously to the surrounding industrial zone; a site characterised by its natural spaces, with buildings under the trees, its restful ambiance, small-scale structures with many idyllic scenes created by open space in between the buildings. An atmosphere created by the stunning colour palettes of the changing seasons or the fallen leaves suddenly opening new sight lines towards the large structures of Hembrug. It is the role of this experience of transition, together with the presence of historical evidence that makes the Plofbos so interesting and unique. It is the objective to preserve and enhance that role of experience in future redesign. What intrigued me about this area is that it is not only the role of vision that defined the experience of the area, but also the elements that unlocked the other human senses that were at play.



LETTING PLACES BE

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Position

Heritage design Position

I am convinced that most of the existing structures can provide an excellent basis for adaptation. It is a good solution on a sustainable viewpoint, as the redesign of existing built structures saves money on production costs, material usage, and CO2 emissions and waste. Why demolish and rebuild while much of the existing framework already allows space and structure for new facilities? During the course of Heritage and Architecture, my position on dealing with existing architecture has changed a lot. At the beginning of the course, I've had the tendency to add "wild" new volumes to the existing, attempting to achieve an impressive contrast between the old and the new. However, during a deeper analysis of the existing buildings, I realized that the extra qualities I've tried to achieve are already present in the existing. They only needed to be unlocked in a certain way. So why spend a lot of money, material, and effort attempting to achieve the same result? Buildings proved to be spacious and contain a lot of light within it already. Therefore, I am now trying to build from within the existing, by making minimal interventions but have a strong impact on defined space, quality and light, while sustaining the existing qualities such as form, material or space by letting them be or even amplifying them. Only when the required program demands so, expansions can be made through strong argumentation. The buildings on the Plofbos ensemble proved to be very large in space already and extending the volume did not seem to be the first priority, as qualities I attempted to achieve already existed within the existing buildings. It is more about finding and then enhancing or amplifying these qualities further, instead of trying to achieve the same result with new structures. This position on heritage made me take steps back from earlier designs I've had for the Plofbos buildings.

Design approach Pavilions in the woods

Taets
Demolish

Preserve

Repair

Integrate



Strategy for the Plofbos between

fill

Intervention

Re-interpretation

Level of transformation



01 THE KANGAROO RESIDENCE



1.1 Urban Kangaroo expansion

THE KANGAROO HOUSING COM

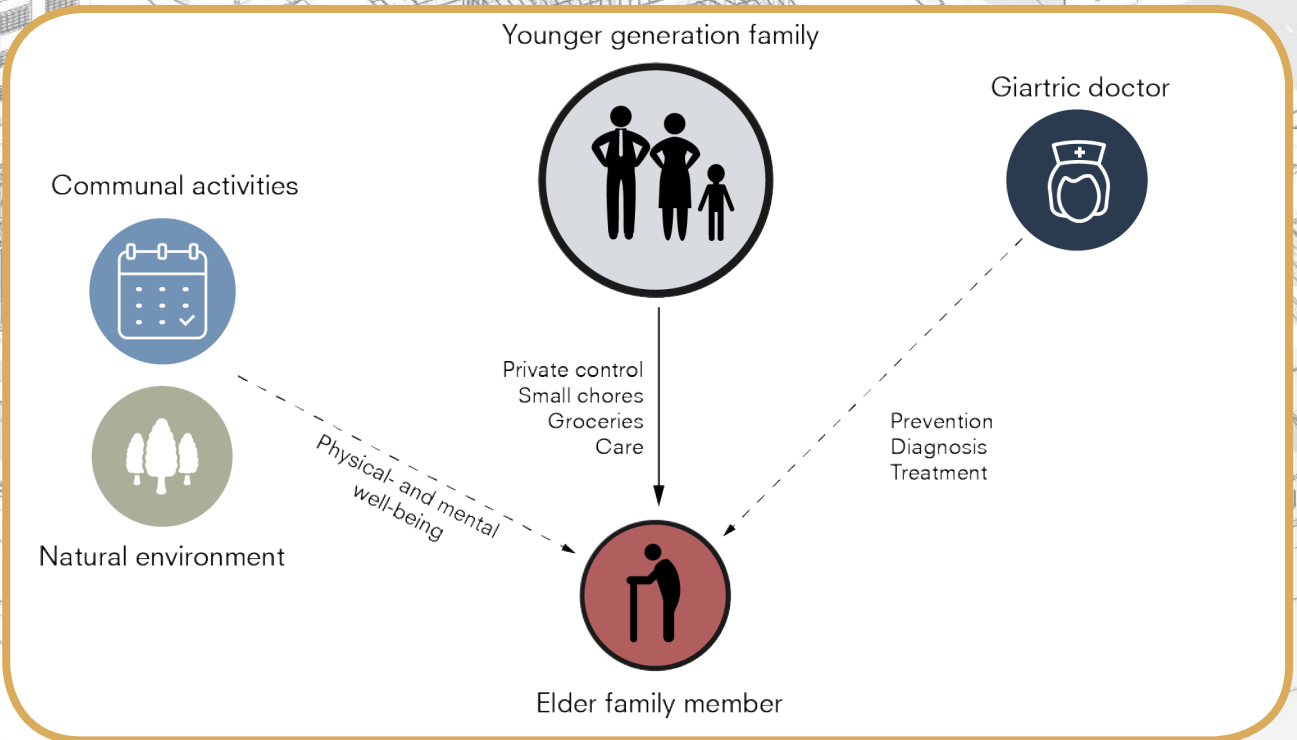
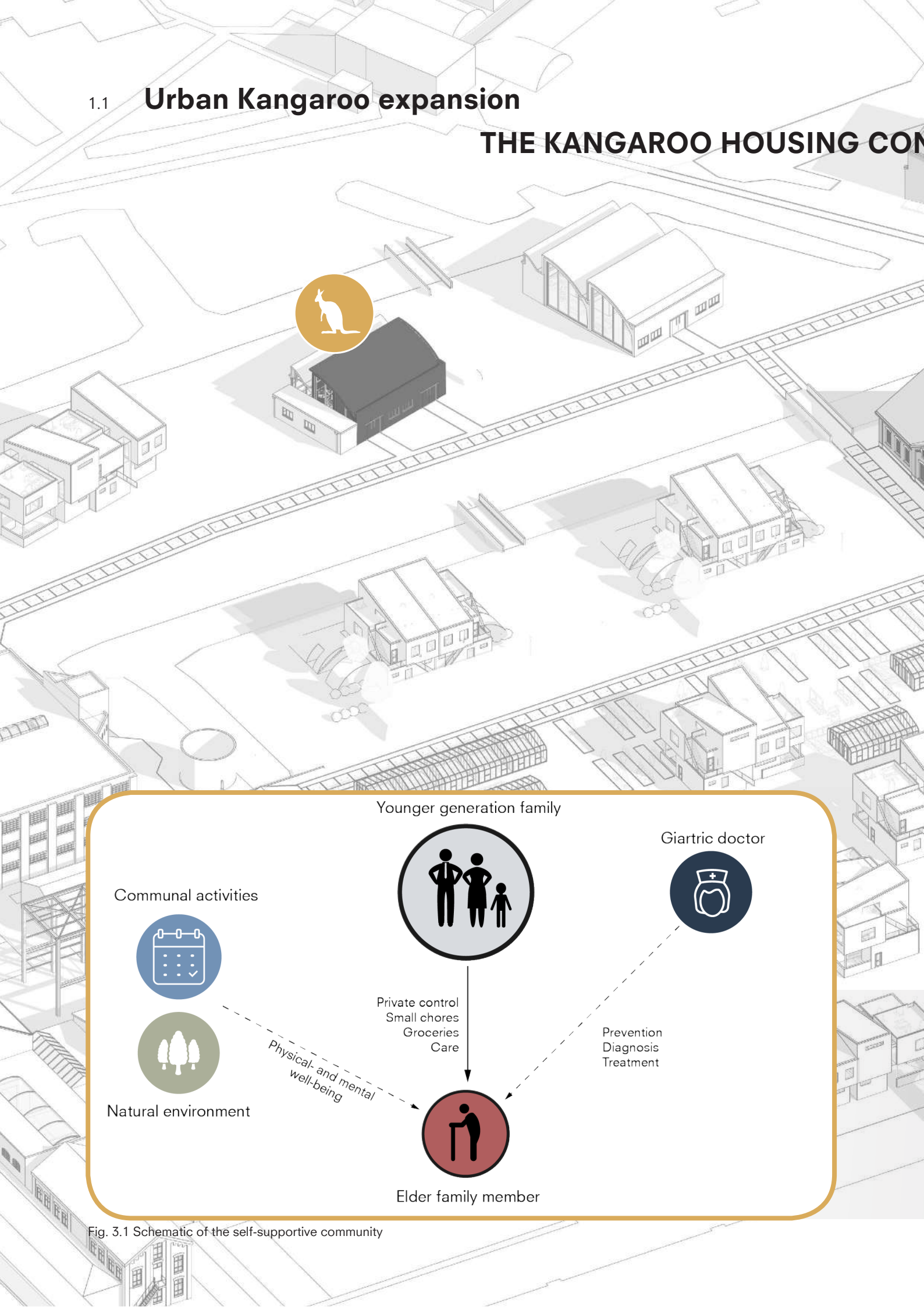
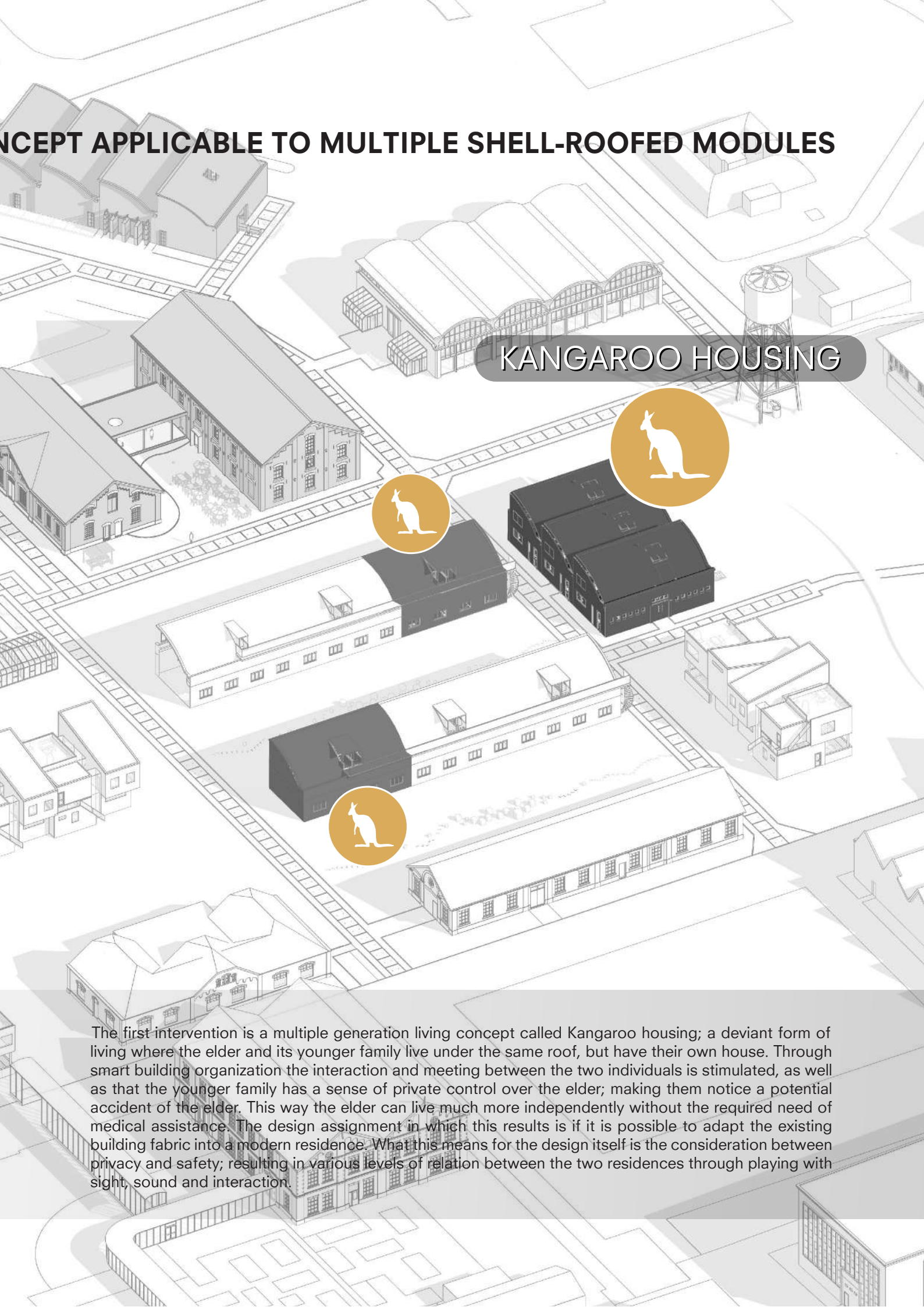


Fig. 3.1 Schematic of the self-supportive community

CONCEPT APPLICABLE TO MULTIPLE SHELL-ROOFED MODULES

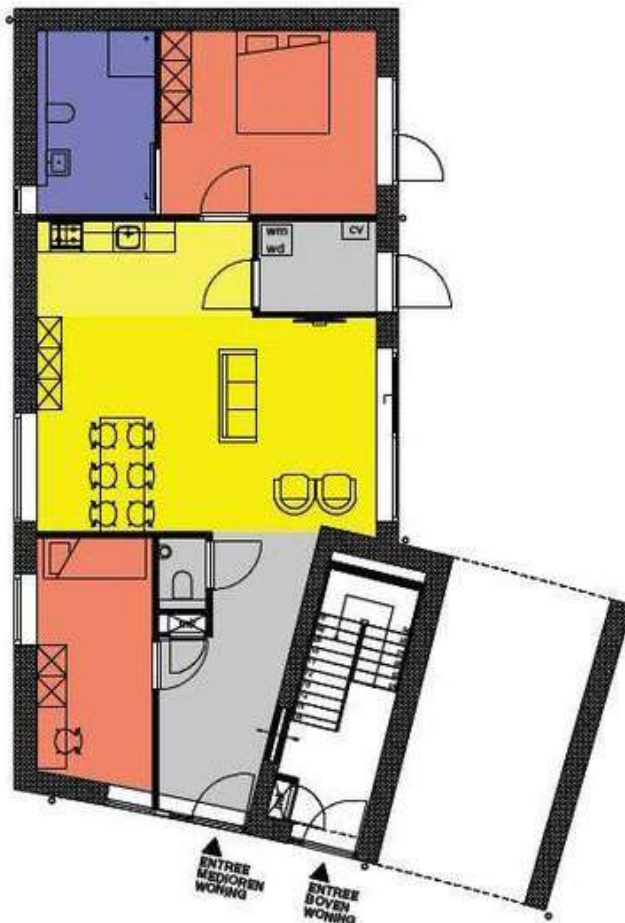
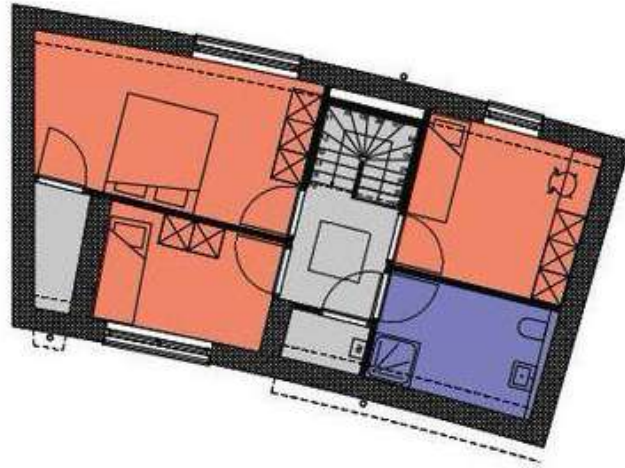
KANGAROO HOUSING



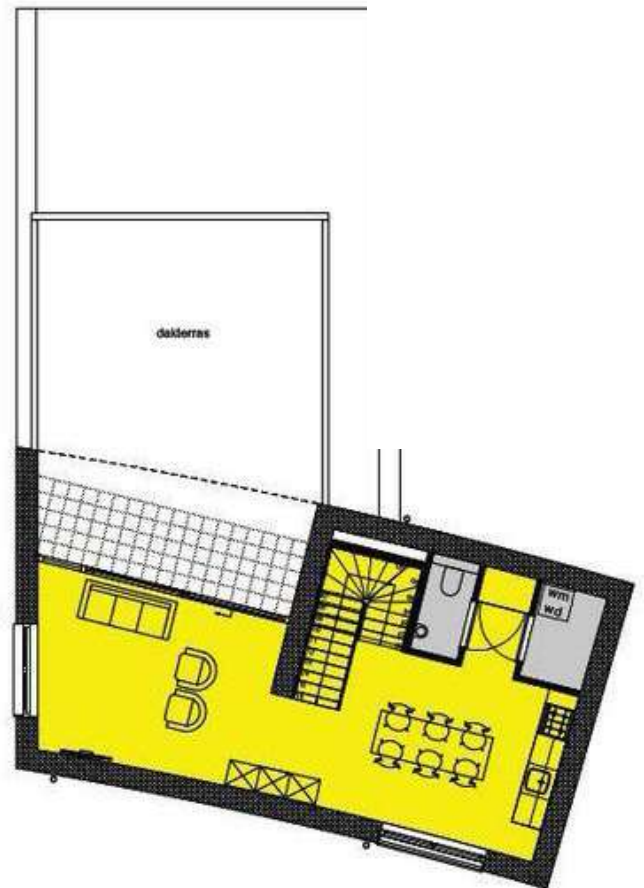
The first intervention is a multiple generation living concept called Kangaroo housing; a deviant form of living where the elder and its younger family live under the same roof, but have their own house. Through smart building organization the interaction and meeting between the two individuals is stimulated, as well as that the younger family has a sense of private control over the elder; making them notice a potential accident of the elder. This way the elder can live much more independently without the required need of medical assistance. The design assignment in which this results is if it is possible to adapt the existing building fabric into a modern residence. What this means for the design itself is the consideration between privacy and safety; resulting in various levels of relation between the two residences through playing with sight, sound and interaction.

1.2 Reference studies

Reference: Treebeek - Jo Janssen

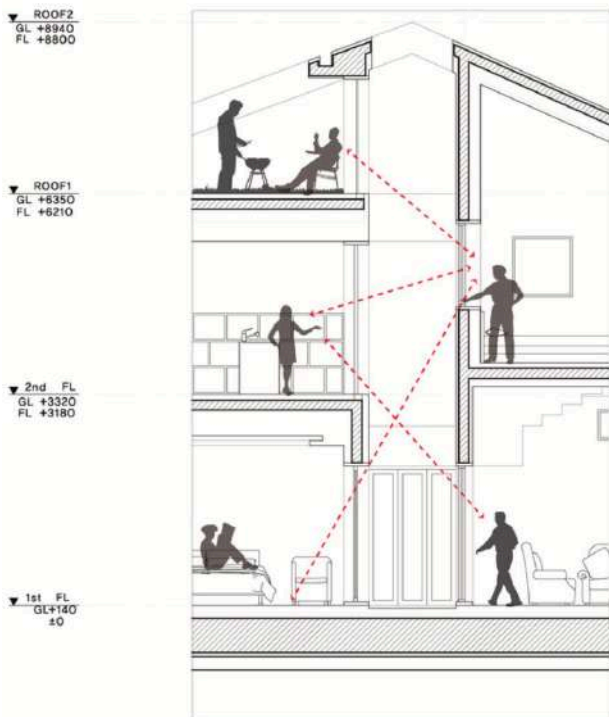


BEGANE GROND MEDIORENWONING + ENTREE BOVENWONING
entree
toilet
woonkamer
keuken
2 slaapkamers
bedkamer
berging/cv ruimte
berging tuin

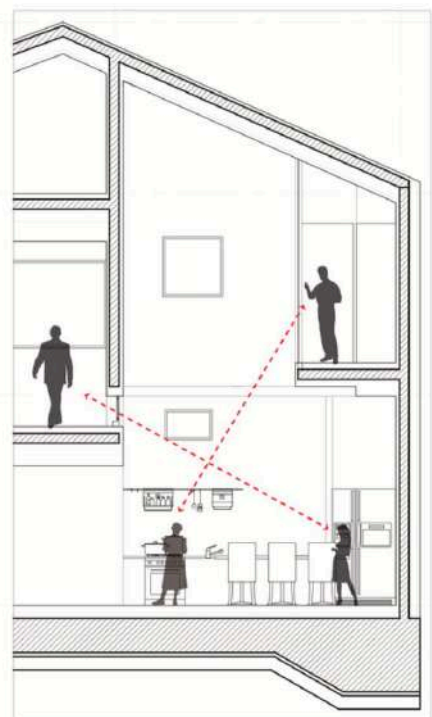


1E VERDIEPING BOVENWONING
woonkamer
keuken
berging
toilet
dakterras

Reference: Seongnam-si, South Korea. - Hyunjoon Yoo Architects



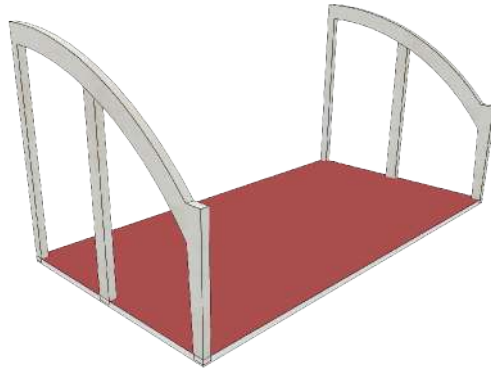
Public & Private control



0 1 2 4m

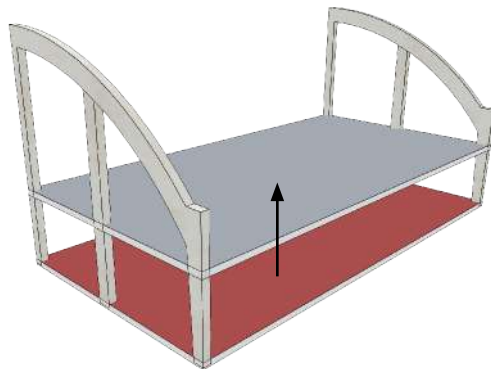
1.3 Design interventions

Base foundation of the existing structure



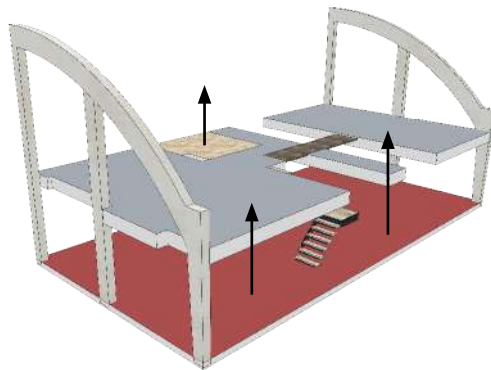
120m²

Adding a split level



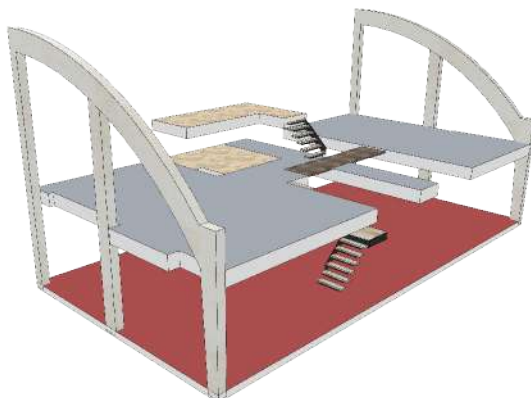
+100m²
=220m²

Voids to pass on light to the lower levels

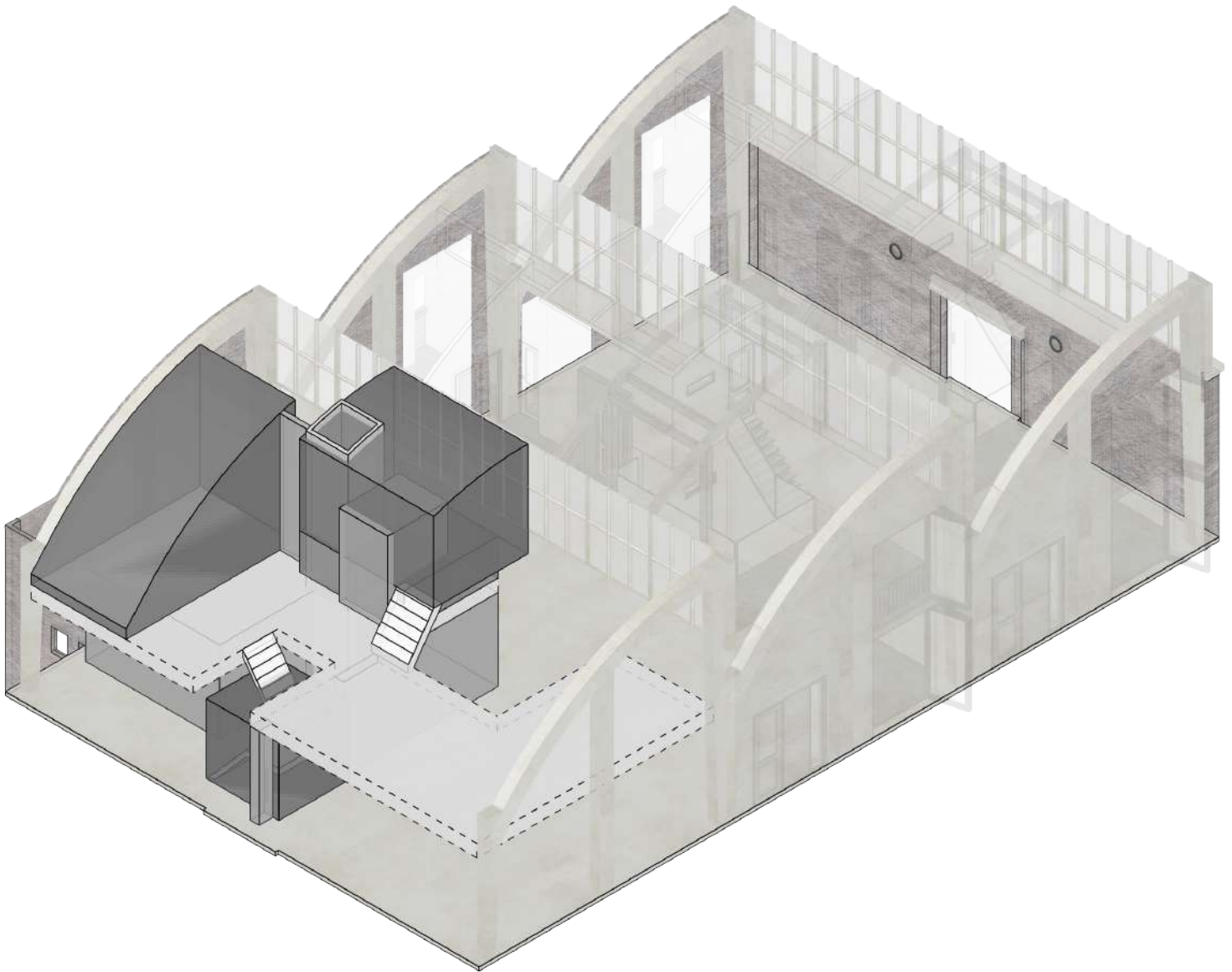


-15m²
=205m²

Further height differences for visual relations and light



Massing



Analogue elderly care

In the example projects that were studied, visual connections between the elderly residents and the younger family residence (making them able to see each other between e.g. the kitchen/living room) initially provoked ethical doubts. Would you like to live in a house where you are constantly being watched? First, it was hard to imagine that it would be pleasant living in such a house. Would this concept only work between very good relations, such as families (so a small target group). However, it proved it to be effective to rely on analog visual relationships instead of digital home automated devices, as it increases the feeling of safety for the elder knowing that somebody is there for you, able to assist you with a small chore if necessary. Therefore, I've opted to make configurations where new inhabitants can determine themselves the sacrifice of privacy, in order to gain more private control over their aging elder. This level of adaptability provides this concept to be much more flexible and even work amongst a larger target group of unrelated elderly/younger generations. Secondly, the references displayed two single houses under the same roof, without any space for interaction. In this heritage project, it was considered to create spaces that provoked both young and old unite and interact with each other by generating places of occasional meeting in the residence, such as a shared hall-way, garden, and patio.

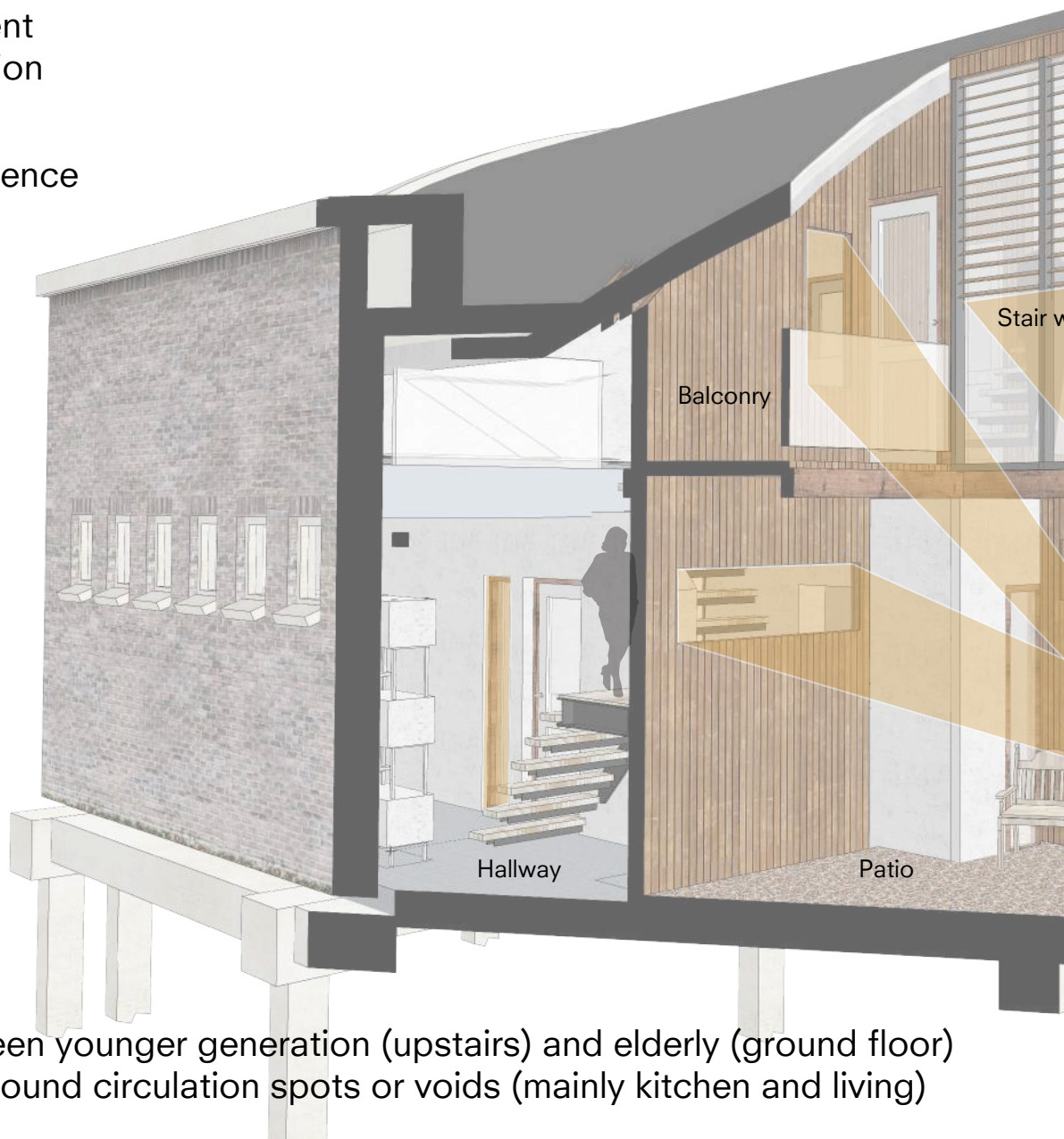
The final outcome of the Kangaroo house transformation has become sustainable as it offers a well-insulated residence, that performs according to the current building standards. It does not use gas and makes use of solar energy to perform well on the required heating ventilation and electricity standards. Through analog control between young and old the elder will be assisted by its neighbours, allowing them to live much more independently than being put in a medical care centre. The urban program within the Plofboos should stimulate the elder to participate in communal activities, exercises, and day-time activities, thus keeping them more vital and healthier individuals.

1.4 **Digital versus Analogue control**

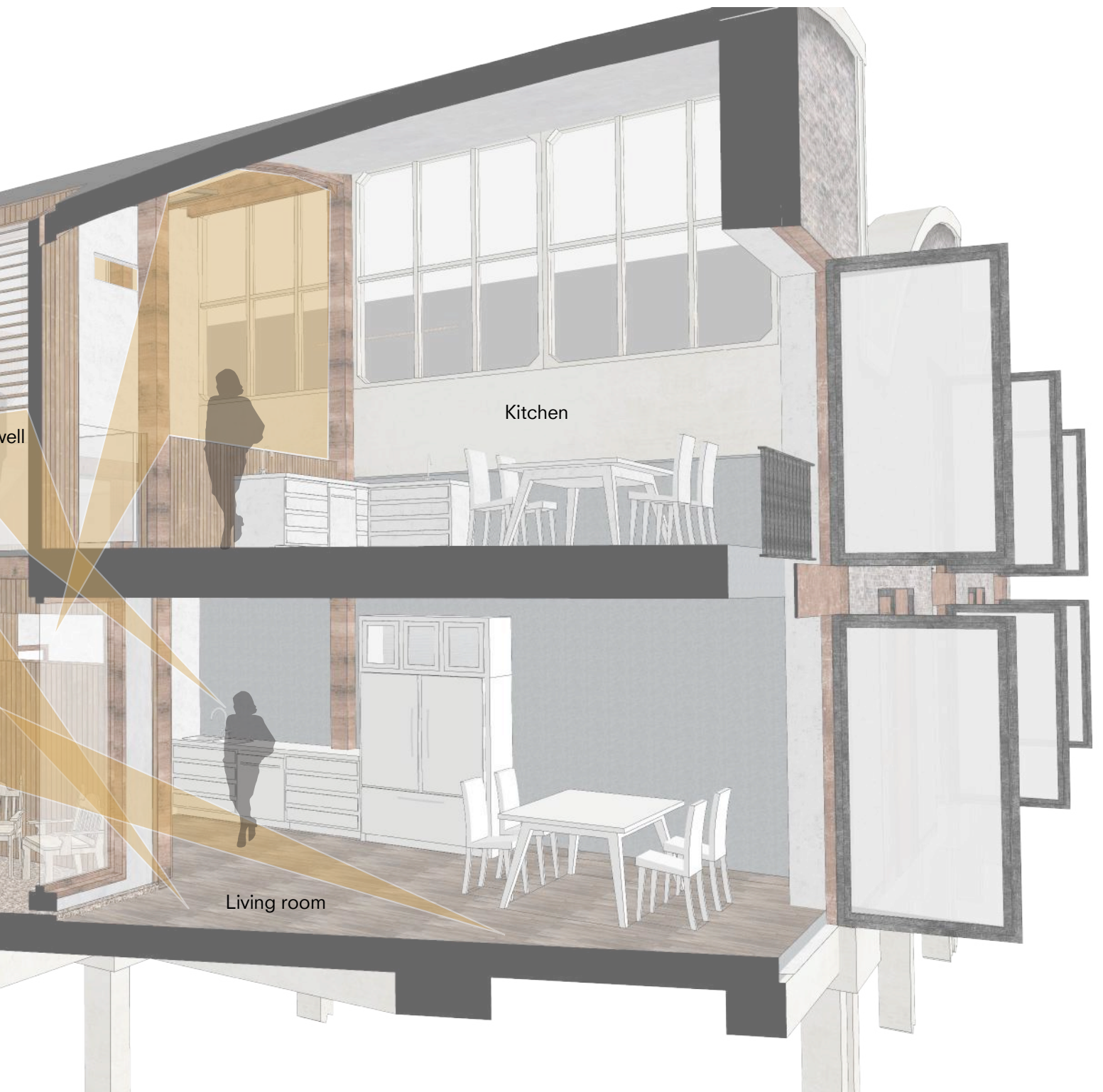
Two houses under one roof

Upper floor apartment
for younger generation
110m²

Ground bound residence
for elder occupant
100m²



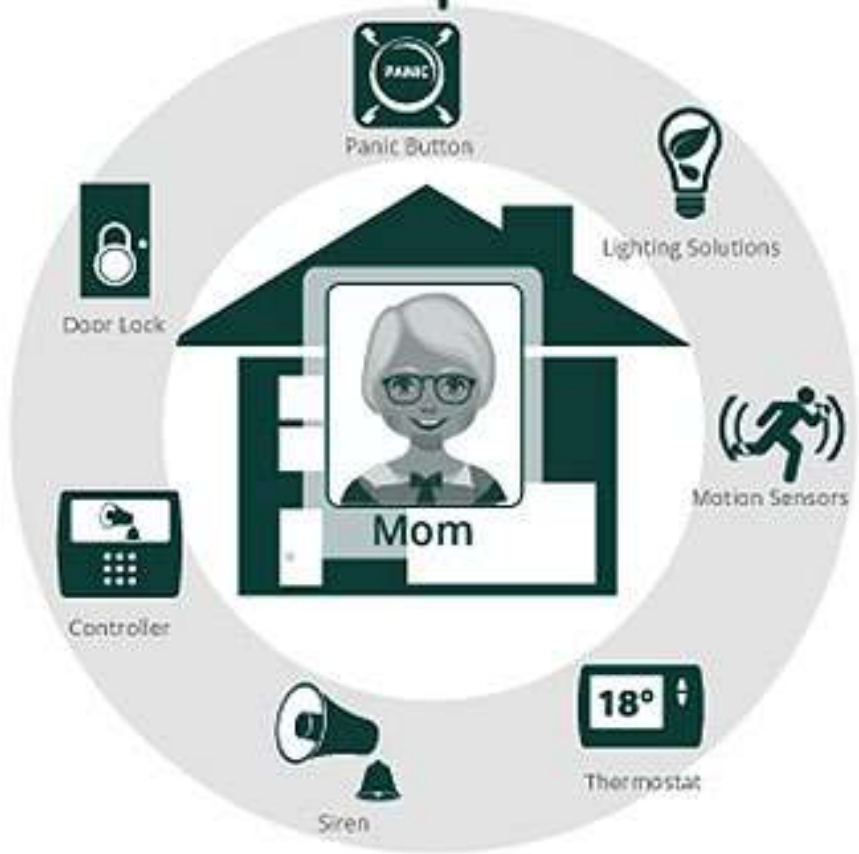
Public control between younger generation (upstairs) and elderly (ground floor) through openings around circulation spots or voids (mainly kitchen and living)



LACK OF SOCIAL INTERACTION

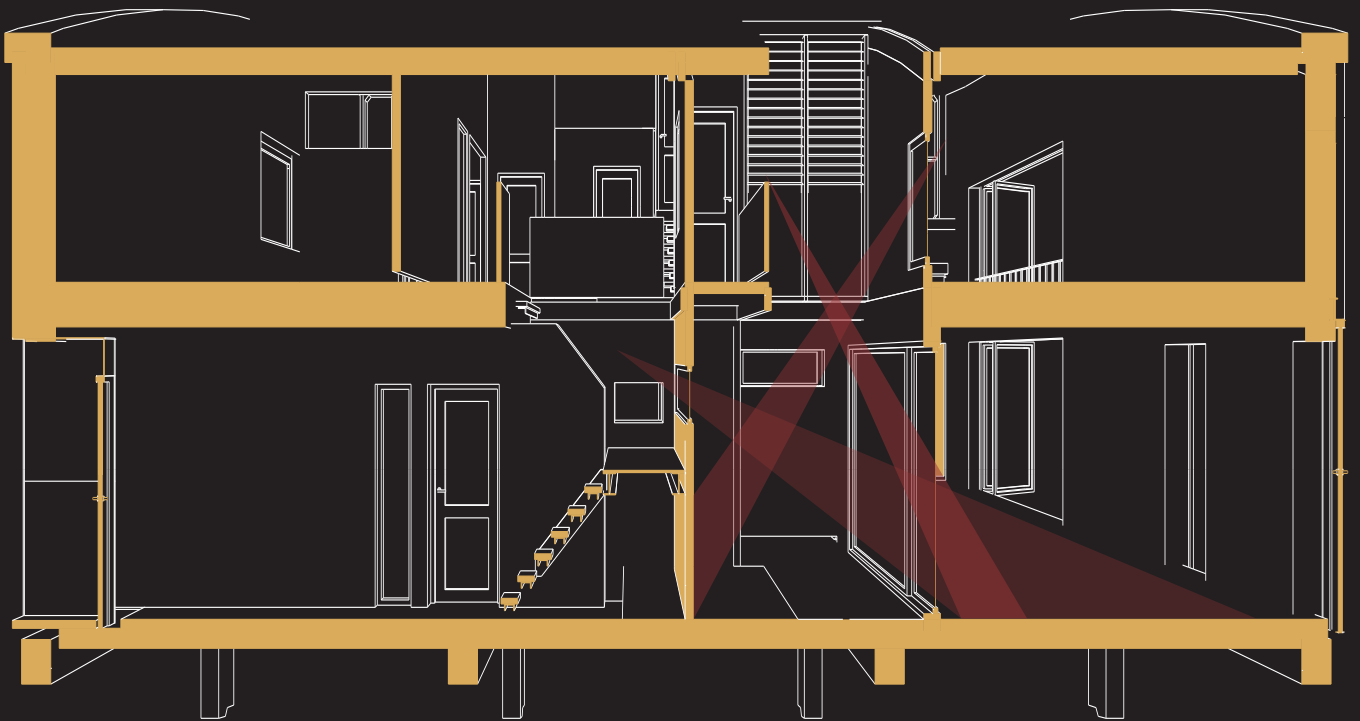


PRIVATE INFORMATION



DIGITAL CARE

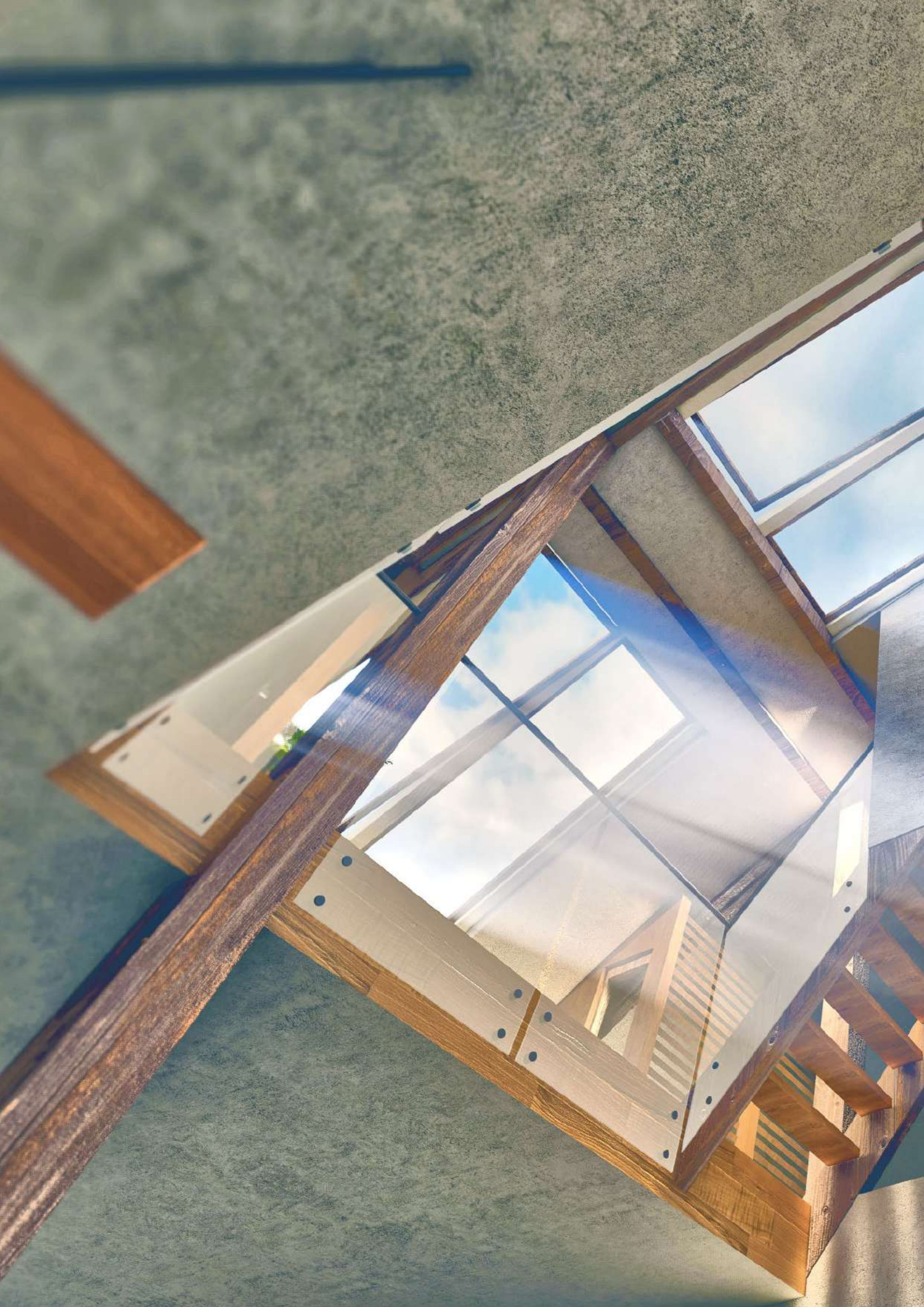
V



ACOUSTIC BARRIERS
VISUAL RELATIONSHIPS (MOVEMENT/LIGHT)
PROVOCATION OF INTERACTION

S

ANALOGUE CONTROL









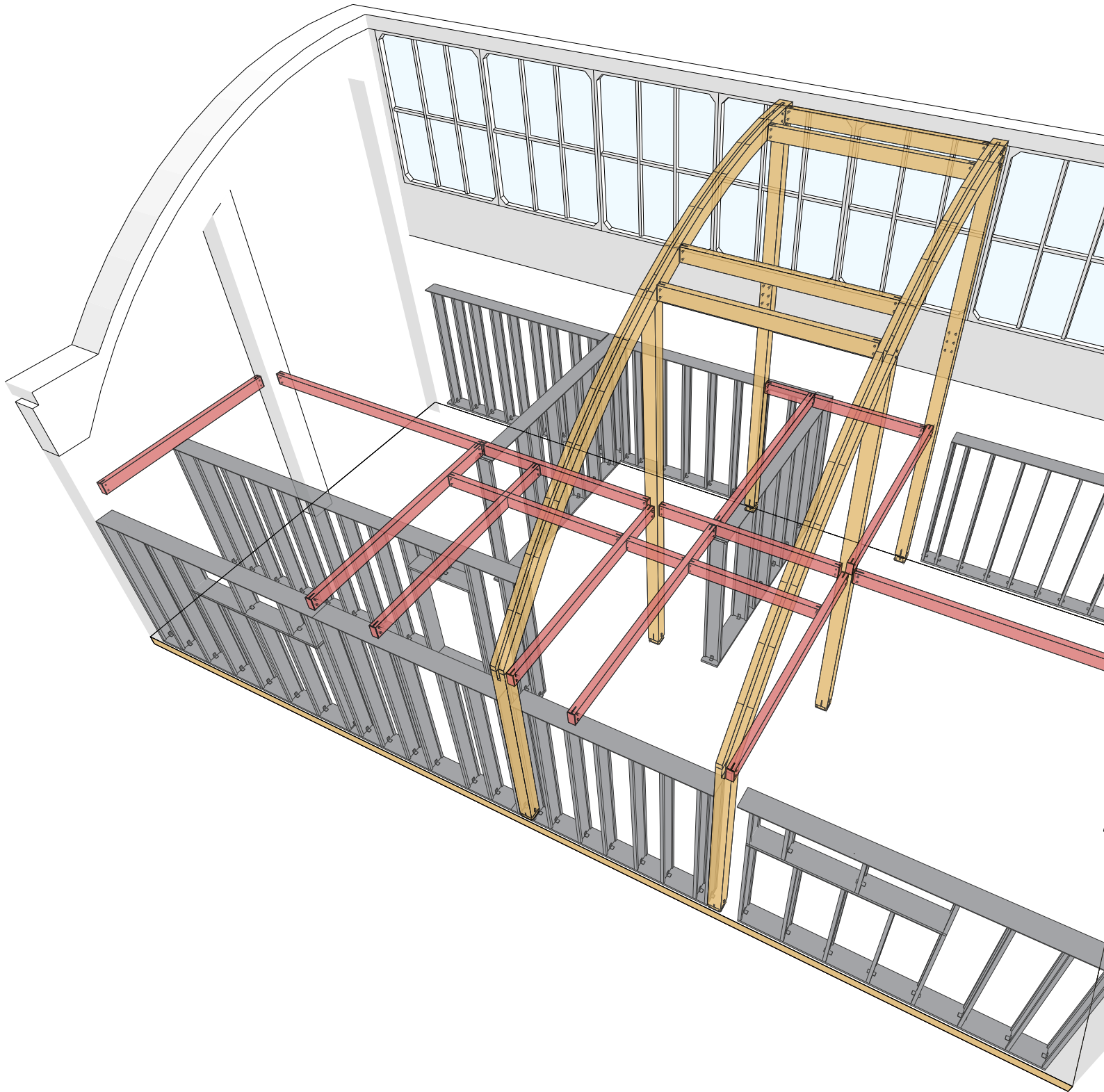


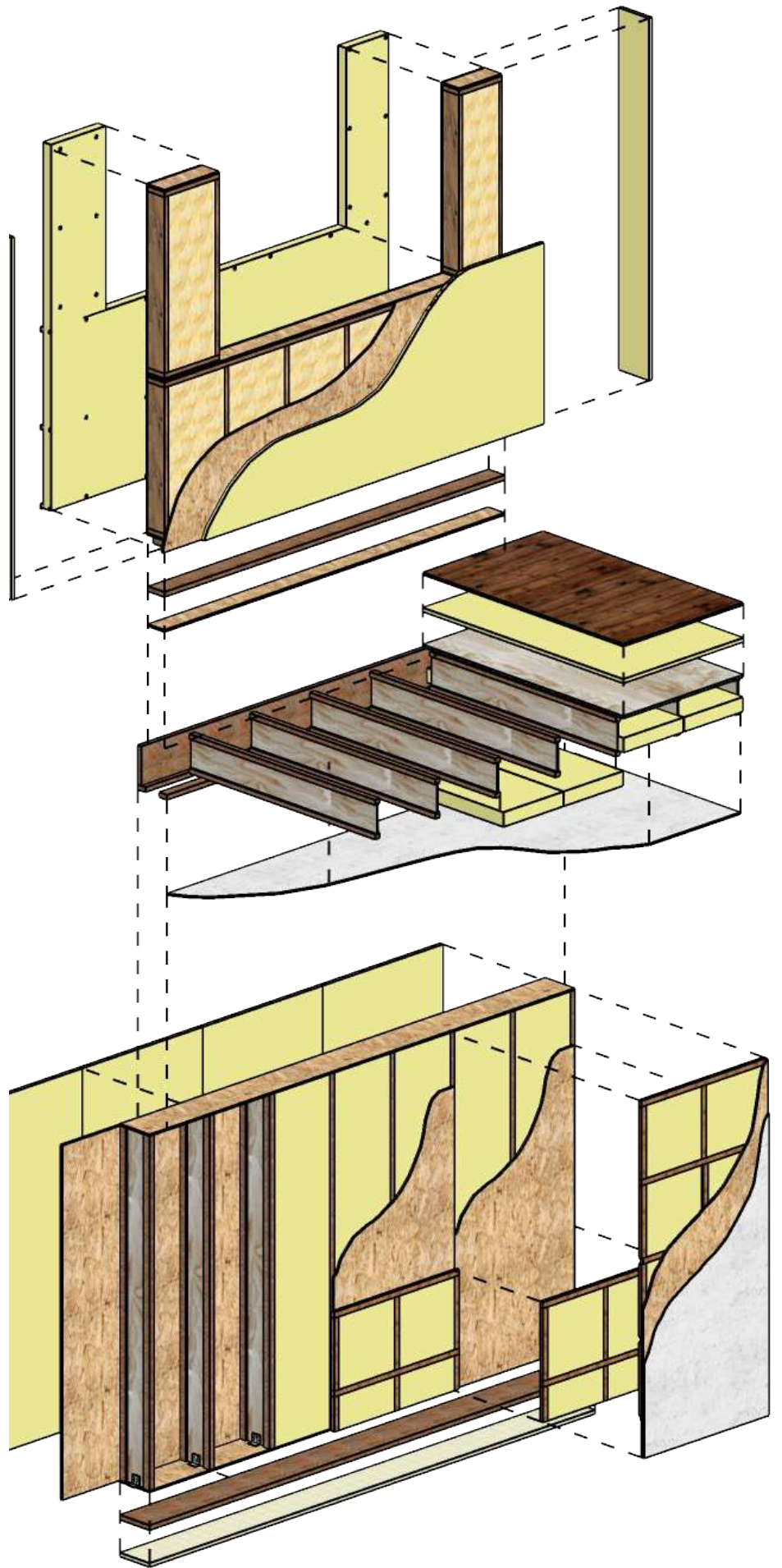
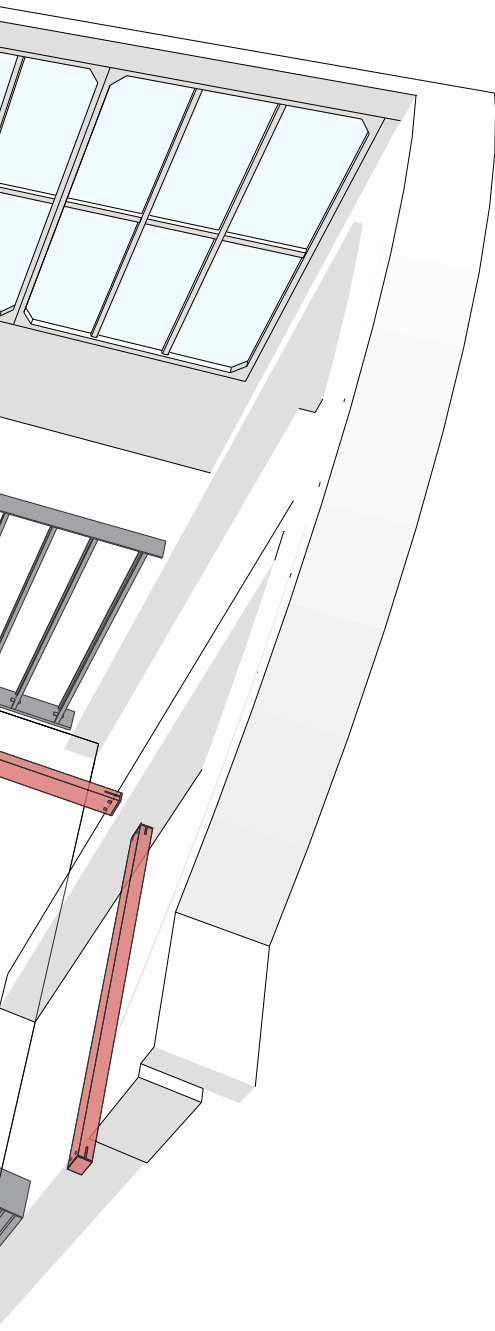






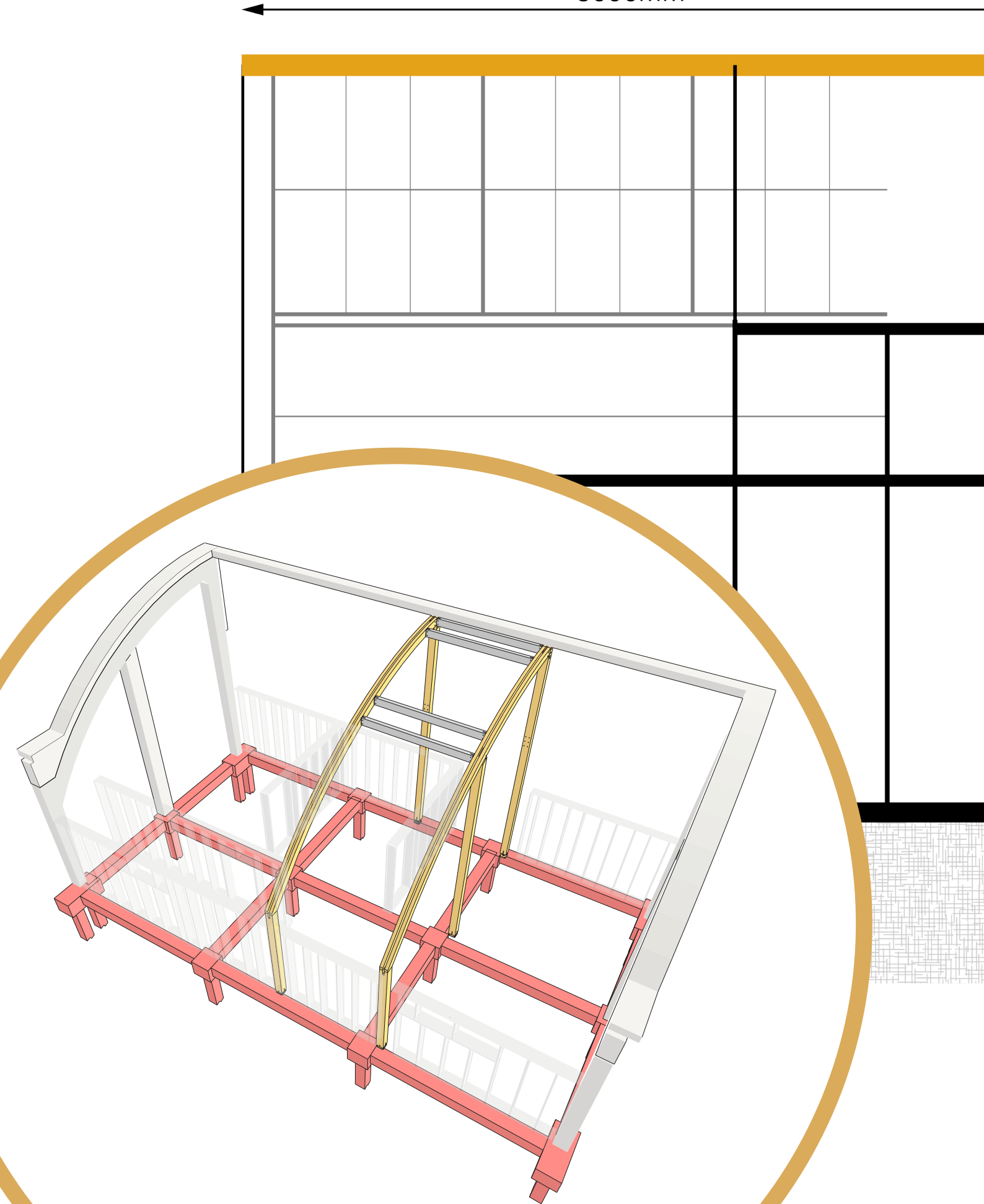
1.5 **Structure: Wooden Finnjoists**



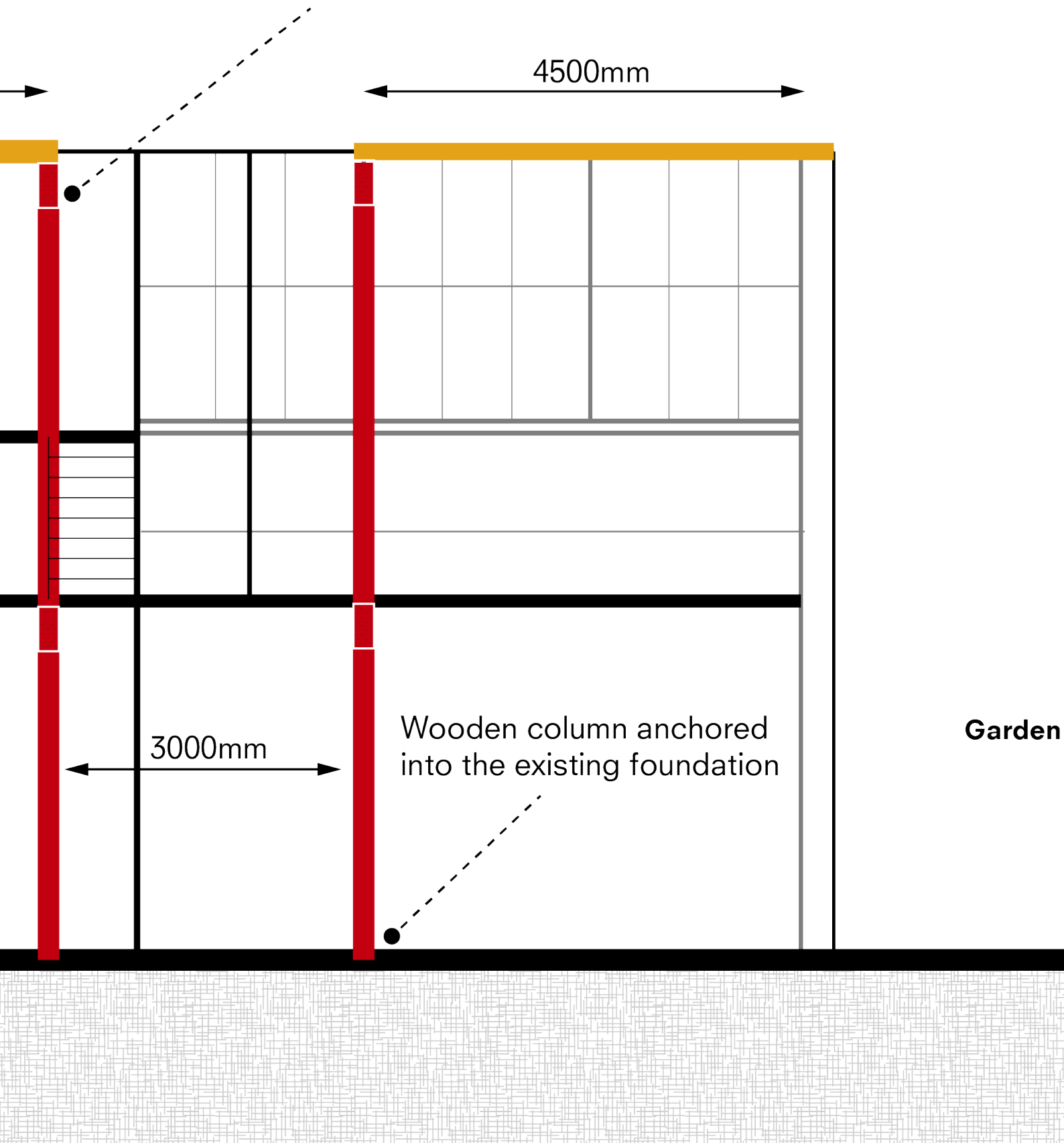


1.6 **Roof opening**

8000mm

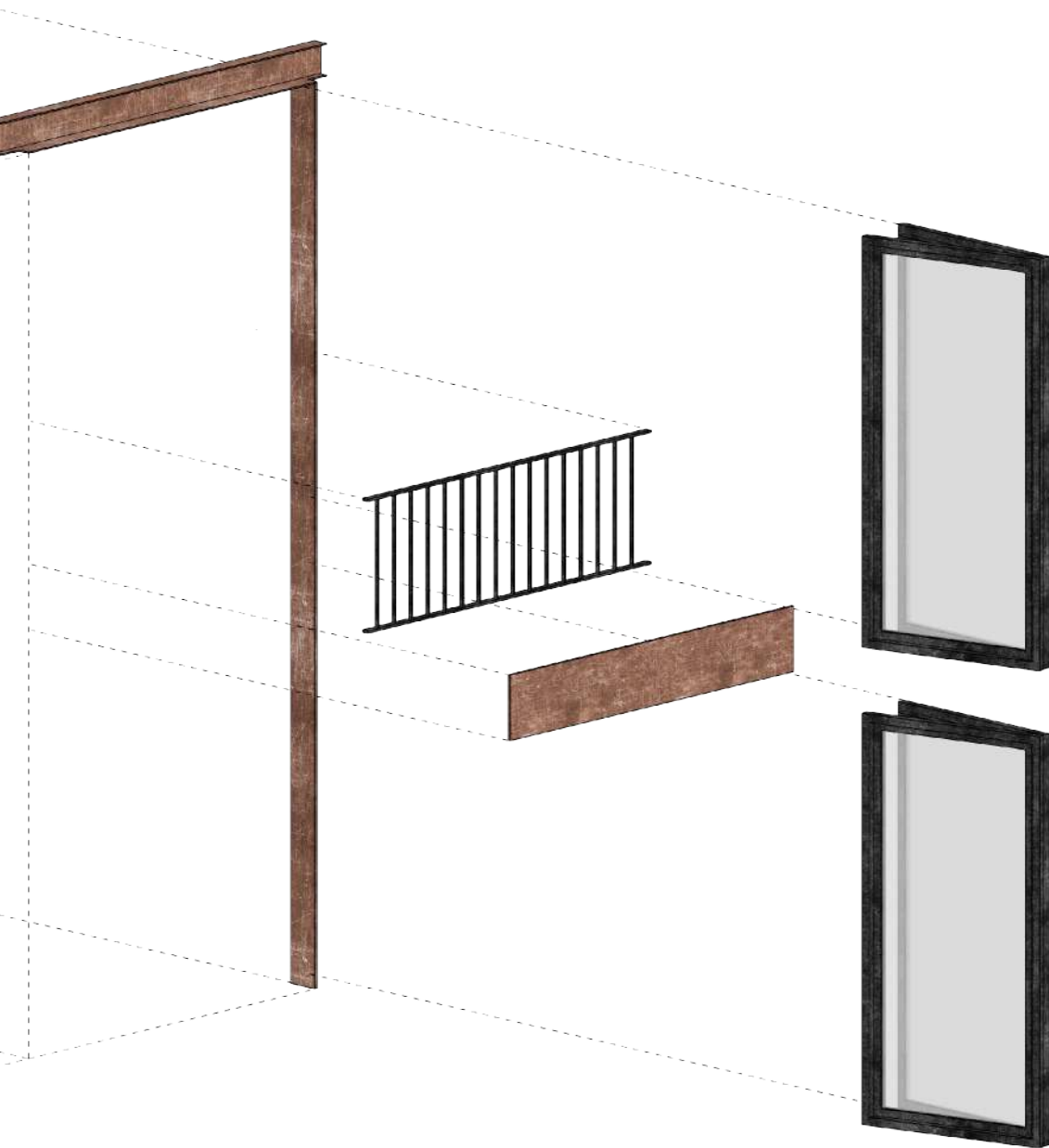


Laminated timber beam bears the new load

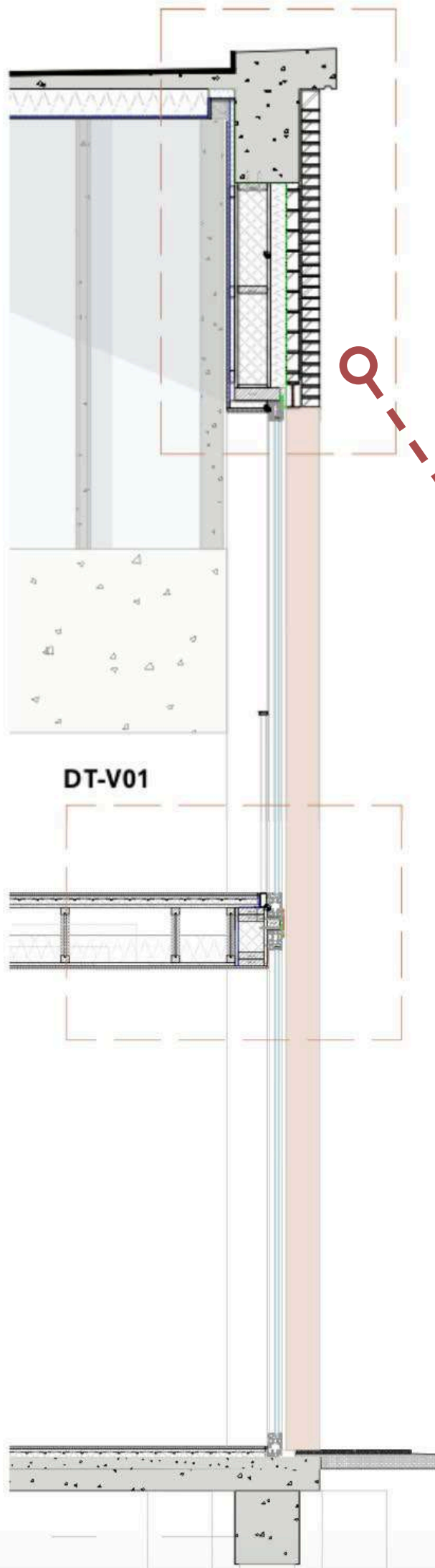


1.7 **Cutting open existing wall**

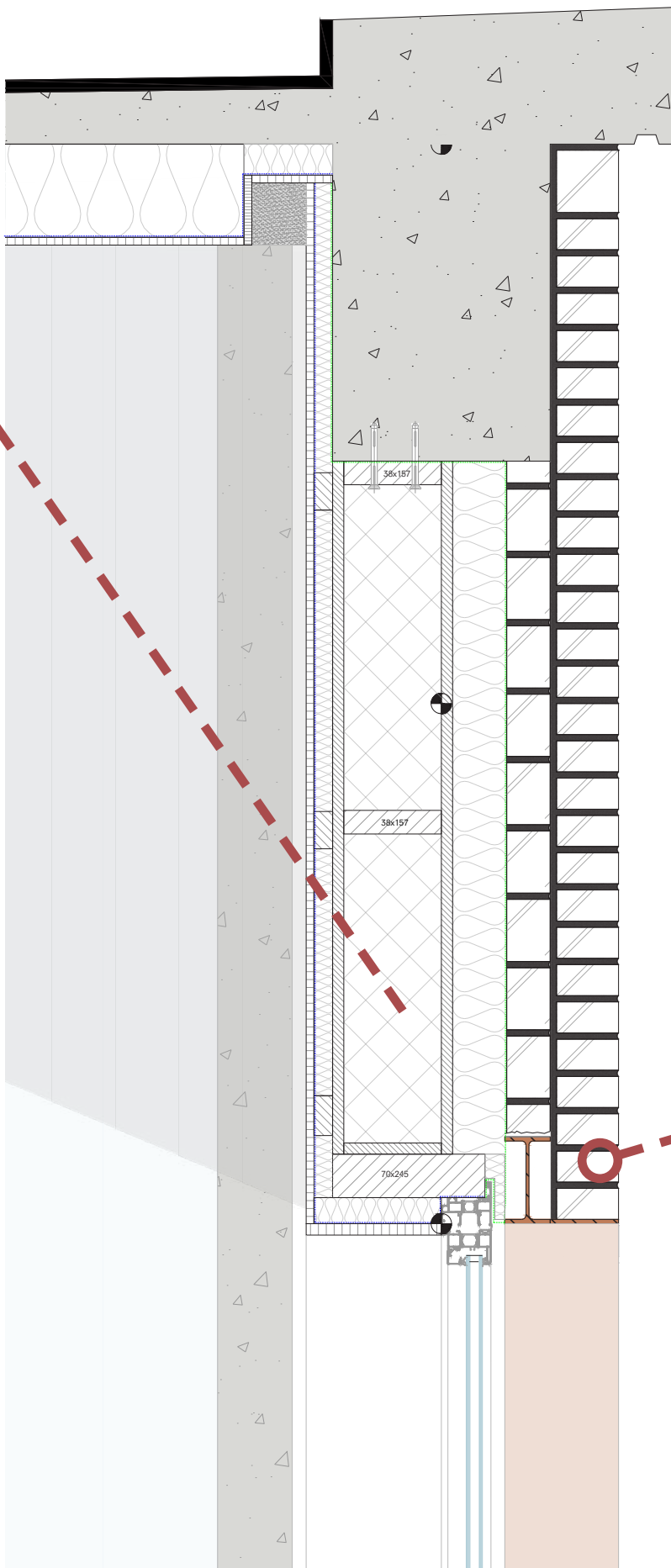




DT-V03



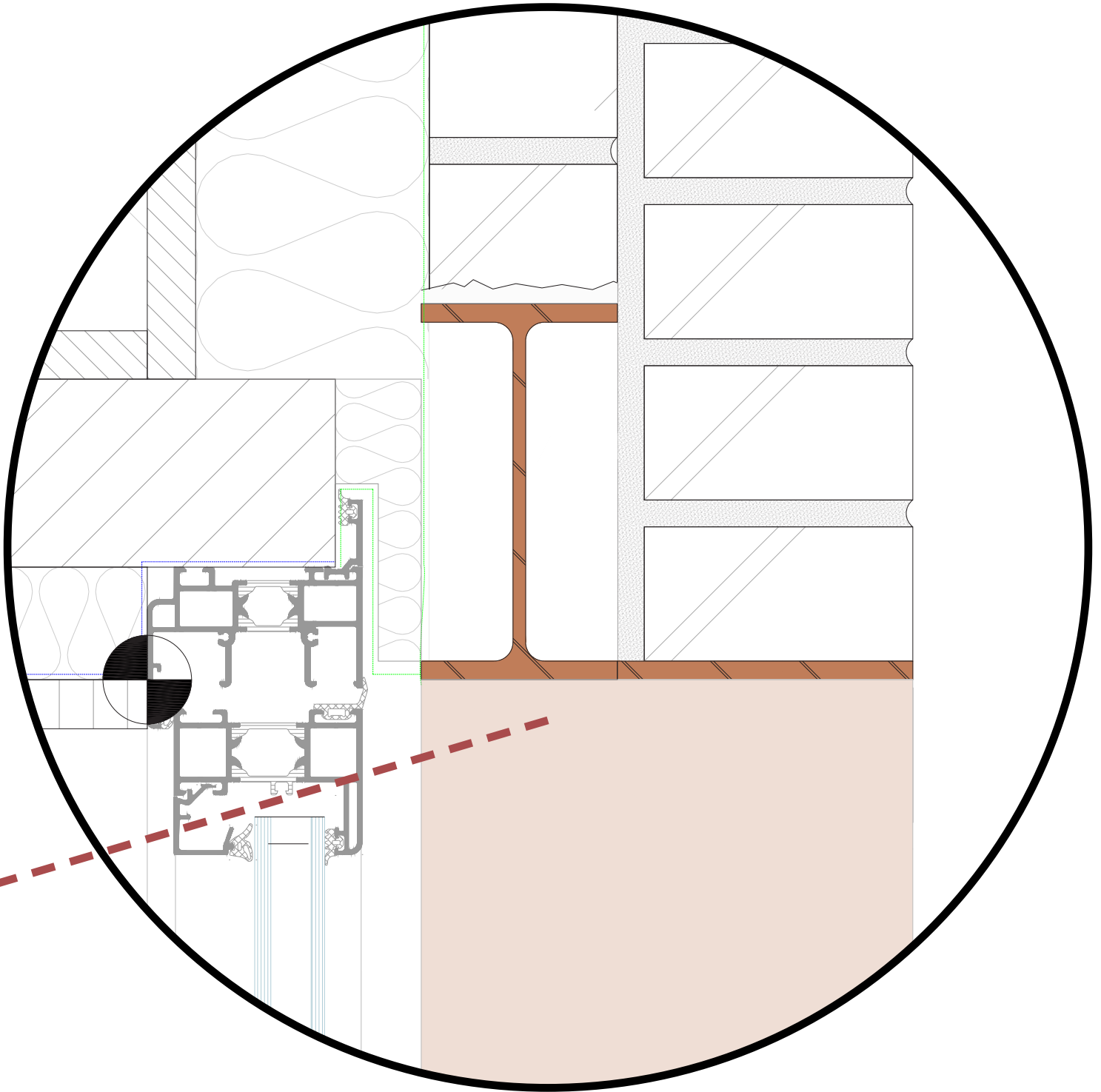
DT-V01



38x157

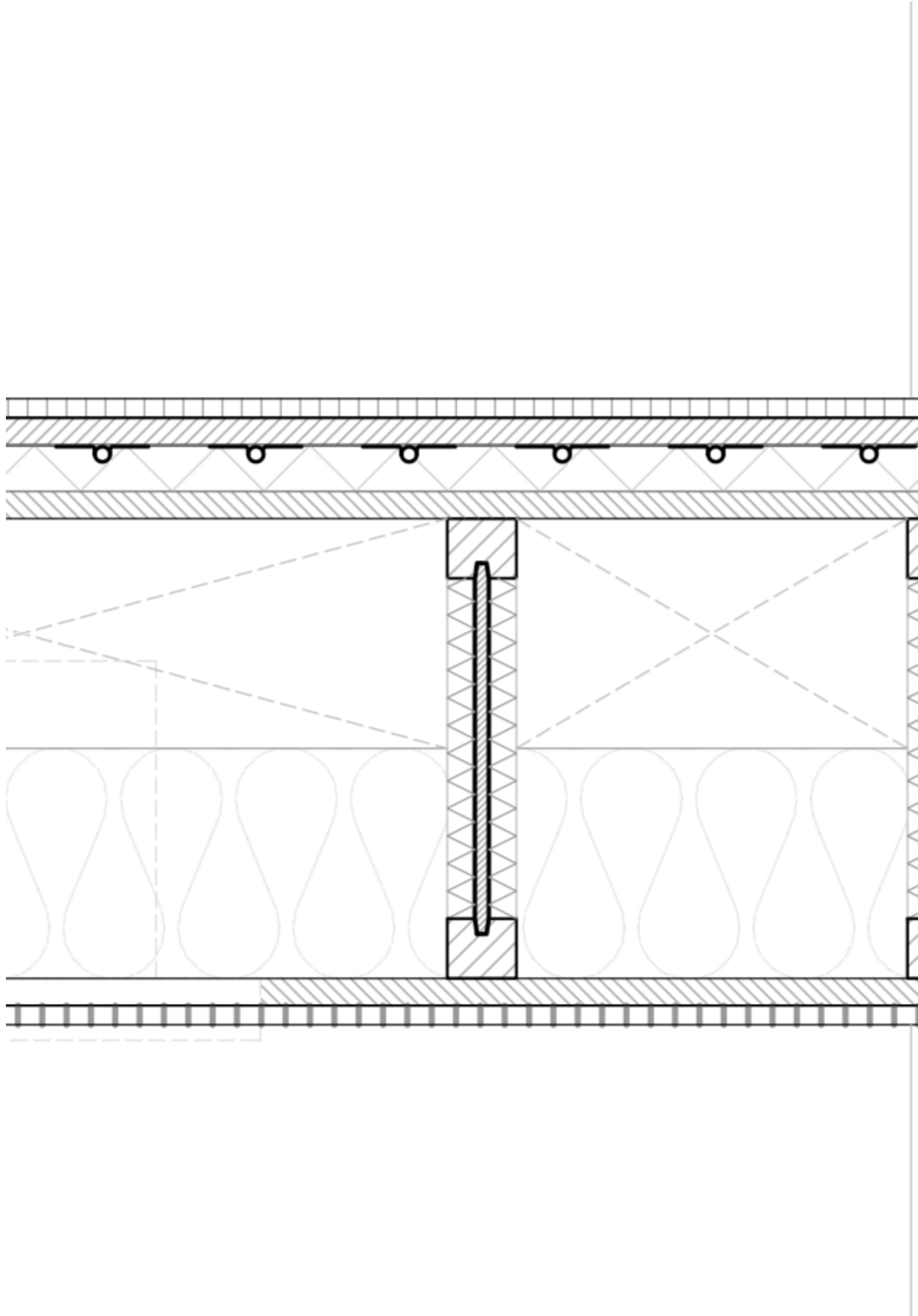
38x157

70x245

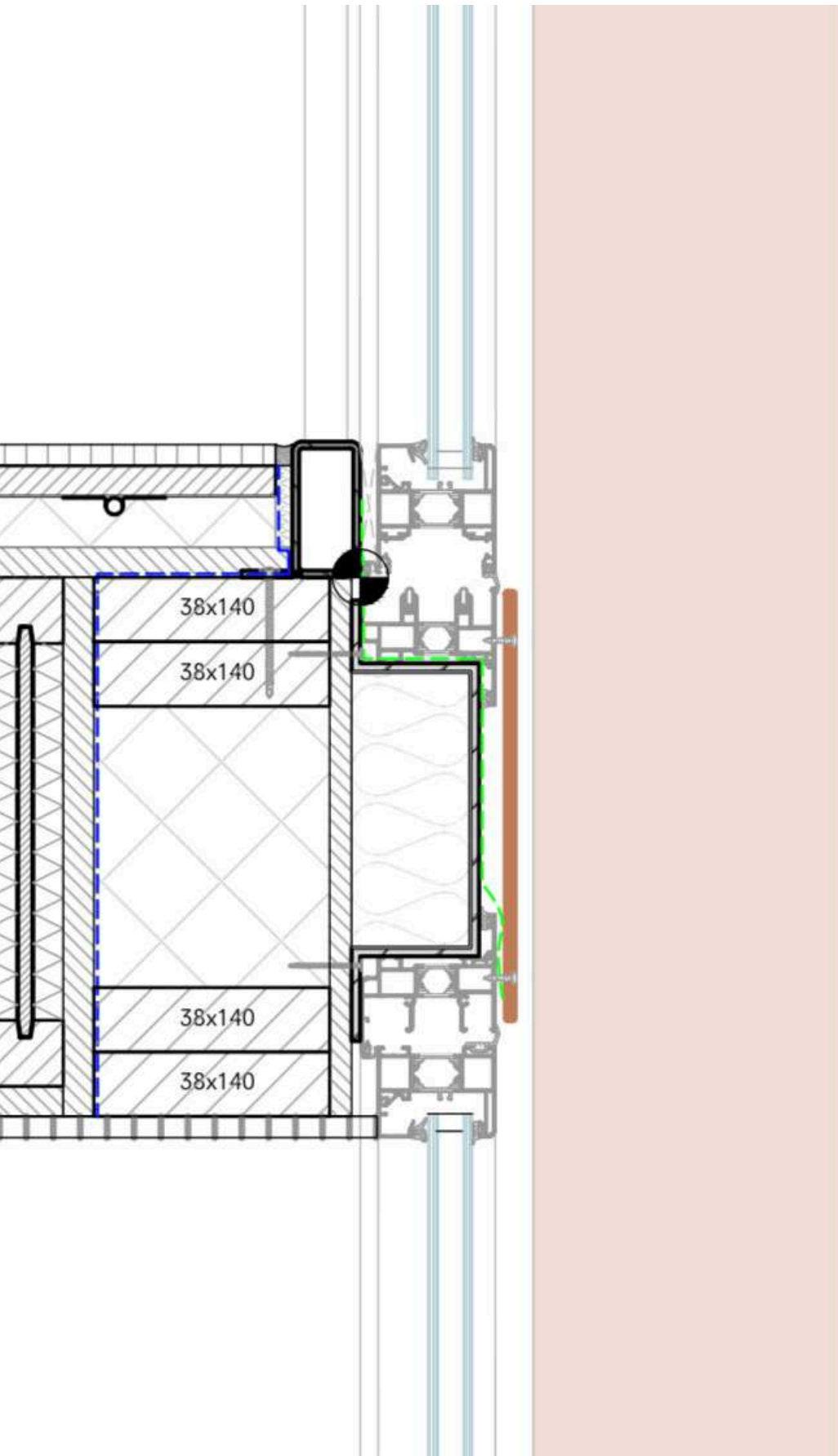


Welded flange attached to an IPE180

LARGE GESTURE BY INTERVENTION, YET SMALL IN THE DET



AILING



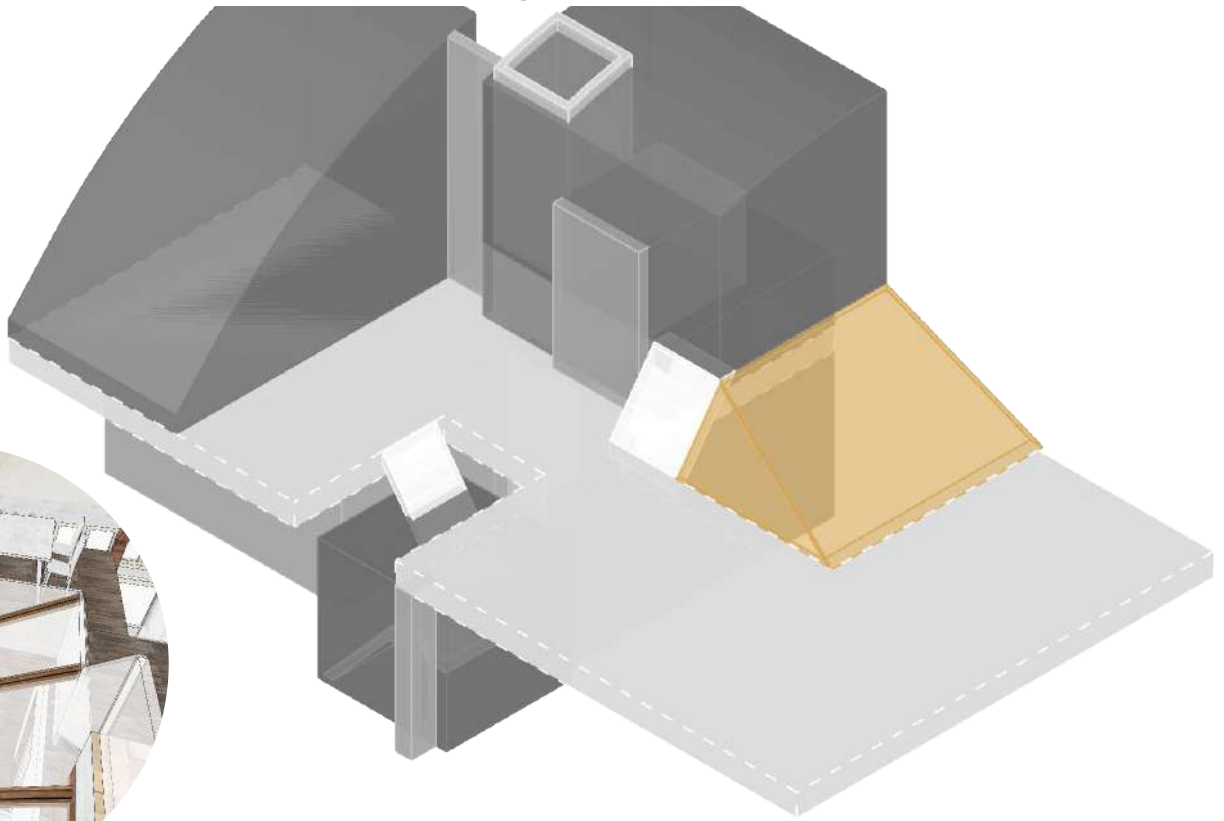




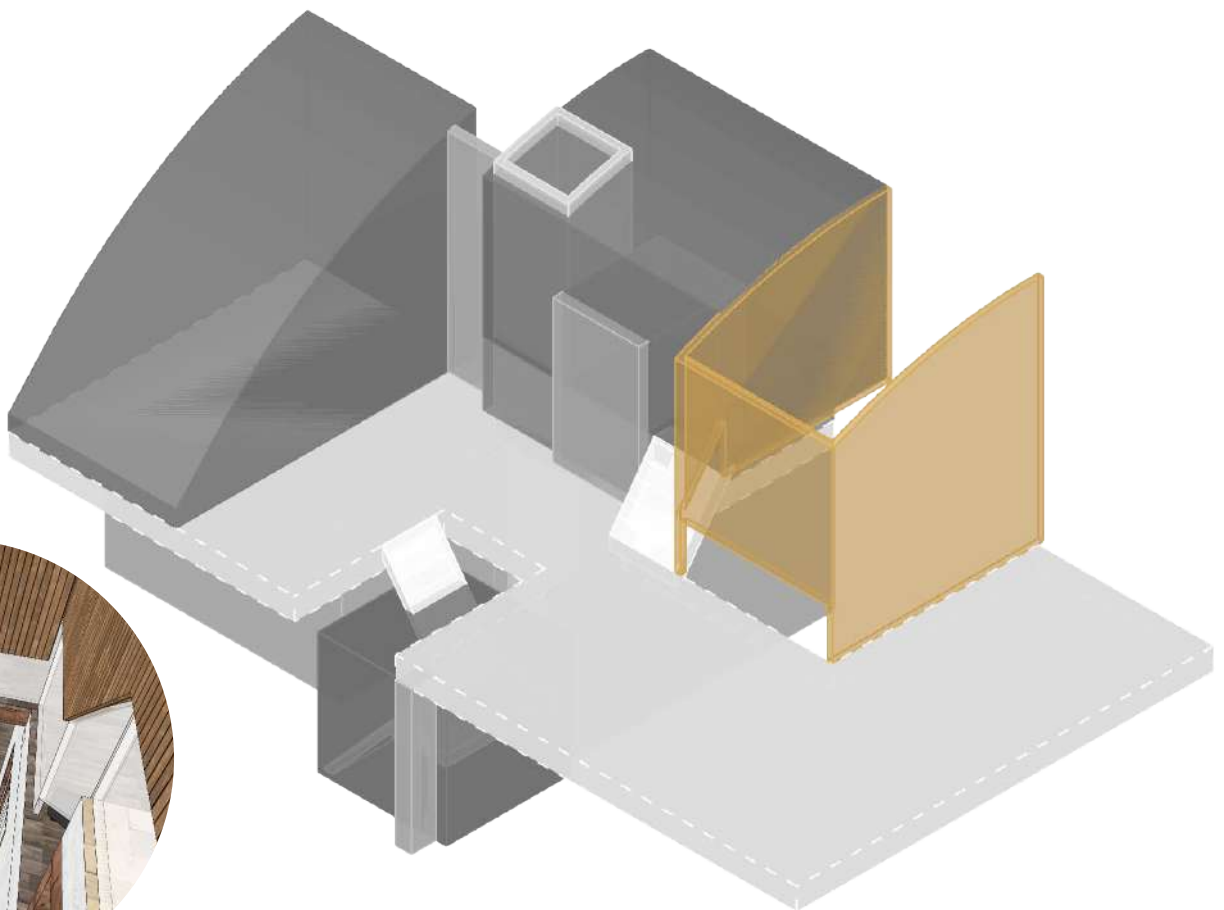




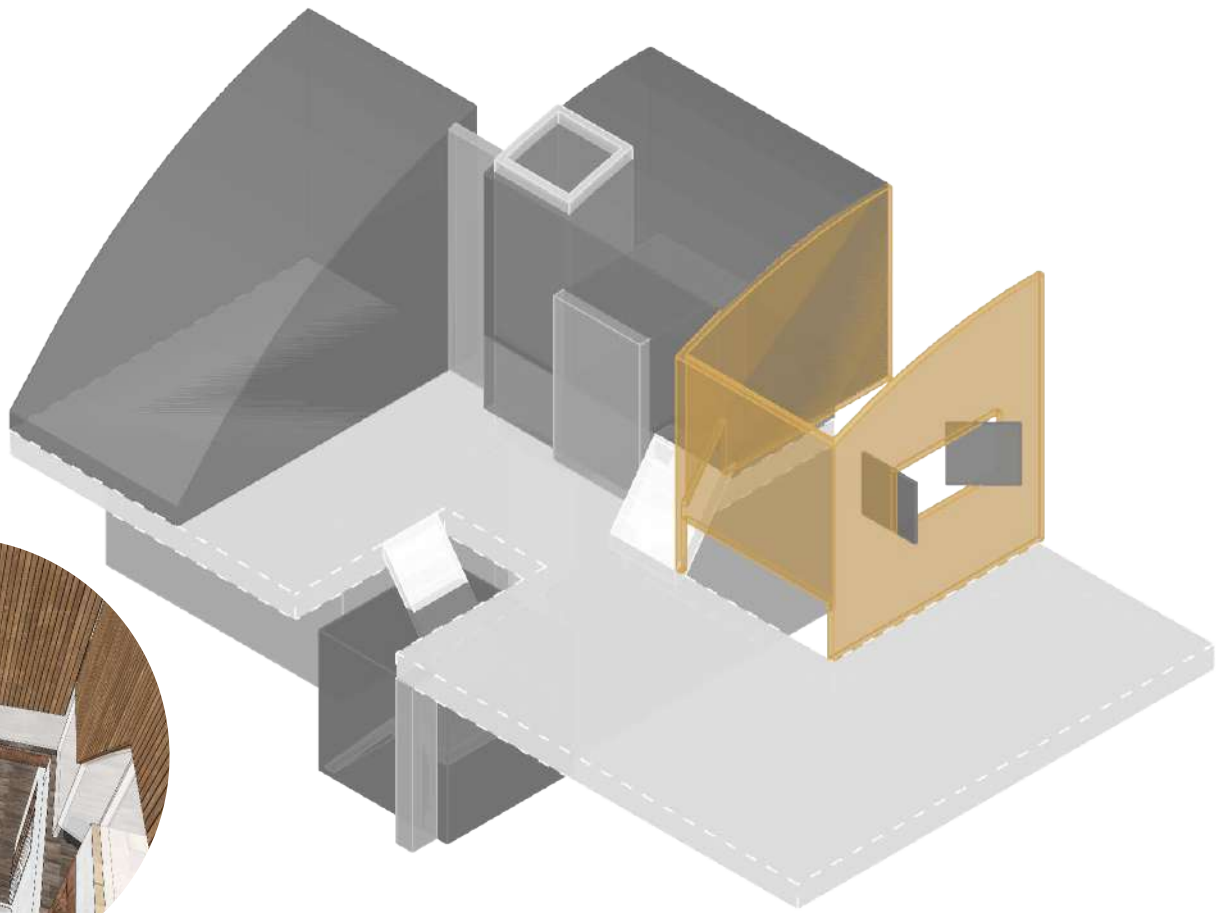
1.9 **Future Adaptable configurations**



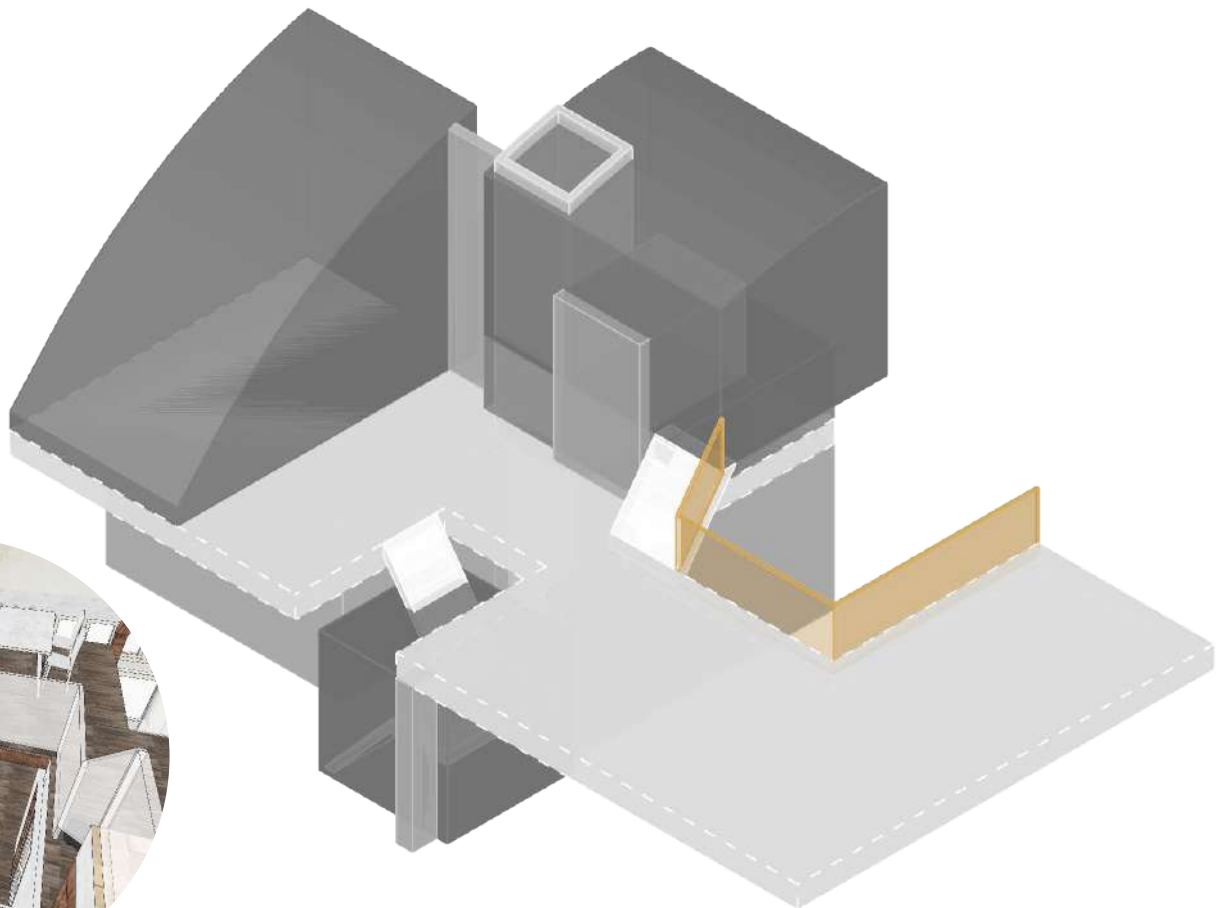
1 - FULLY CLOSED



3 - FROM KANGAROO TO STANDARD RESIDENCES



2 - OPENABLE WHEN APPLICABLE



4 - FULLY OPEN; NO BORDER BETWEEN ZONING



02 THE CONTEMPLATION HALL



2.1 Ambiances



**Contemplation Hall
along the Draaibank**



Lane of trees



Compactness



**Transition zones
“Border of trees”**

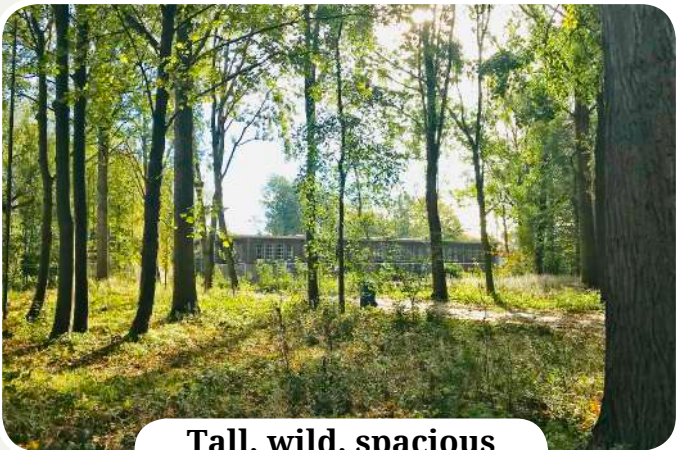




Light; Scents/colour



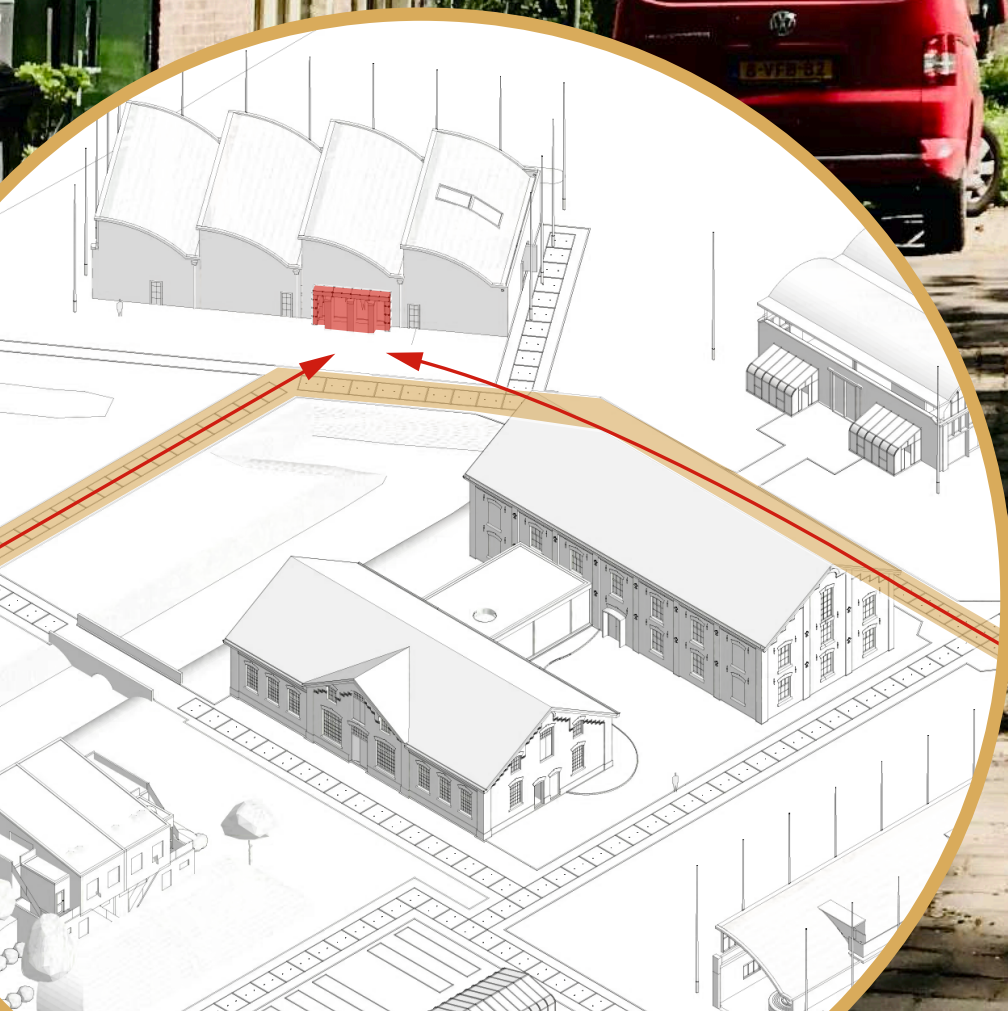
Touch; tall grasses




Tall, wild, spacious woods. Undefined trail



**“Lifted”;
Umfassungsweg**



The image shows a paved path leading through a wooded area. Tall, slender trees with green leaves line the path. In the background, a brick building with a curved roofline is visible. The scene is bright and sunny, with shadows cast on the path.

The second design will become a Contemplation Hall within the heart of Hembrug. This is an activity that becomes more and more significant in this fast-paced modern age we're living in right now. More and more we start to live a life where our mind is constantly disturbed; by the mobile telephone constantly demanding our attention. But also the increasing pressure from work, from school. Who does not find the time to contemplate and put things in perspective will remain with a busy mind. Something that could have potential negative health effects sooner or later, such as increased stress. I notice it amongst my fellow students as well, who speak about this new phenomenon called FOMO- "Fear of missing out". With social applications such as Instagram, Facebook et cetera, people are constantly witnessing the "best moments" pictures shared by their friends online, meaning they start to (unconsciously) compare it with their own boring life; putting more pressure on themselves to "fit in", but forgetting about what matters to themselves. What their own goals are. Contemplation could assist in such cases, for both young and old, to put your own life decisions into perspective and help to push forth striving for what matters to yourself. The design of the Contemplation activity will become an architectural challenge for me and is designed so that it will provide a space in the area where the visitor can rest the mind for a moment. After a long walk through the forest, the visitor can find intimate spaces created through light or dark or other architectural interventions. Here, the visitor is able to forget their daily struggles for a moment. To provoke the senses of the visitor a number of architectural instruments will be used, such as light and dark, old and new, sequences between inside and outside, material, textures, the reflection of light, acoustics; all factors that affect the senses and the atmosphere within the building. Additionally, the vast space the existing structures provide allow communal gathering and collective events to be organized that will unite the community within Hembrug. This will stimulate the sense of unity amongst the community, helps to create a bond between each other but also battles loneliness in a way. With these two redesigns on a micro scale, together with the overall visions for the master plan on the meso and macro scale, it is aimed to prove that the existing architectural heritage provides an excellent basis to form a sustainable living environment, touching upon multiple societal problems we're facing right now.

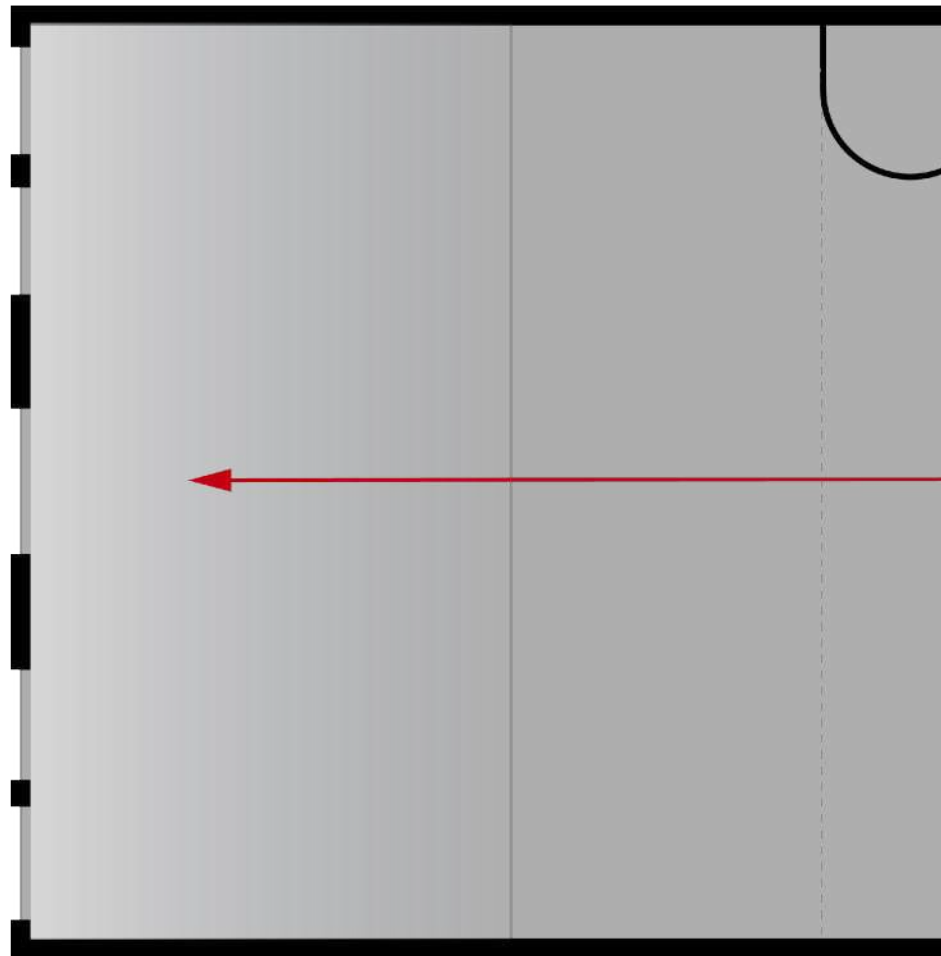
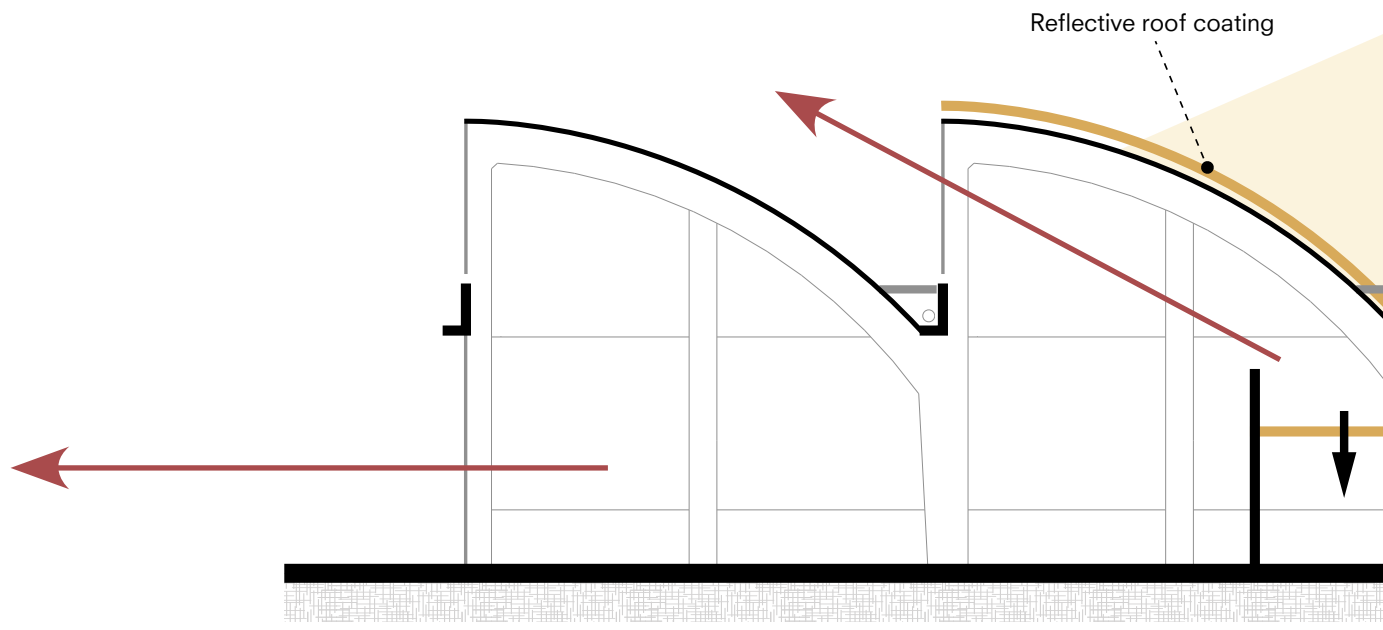




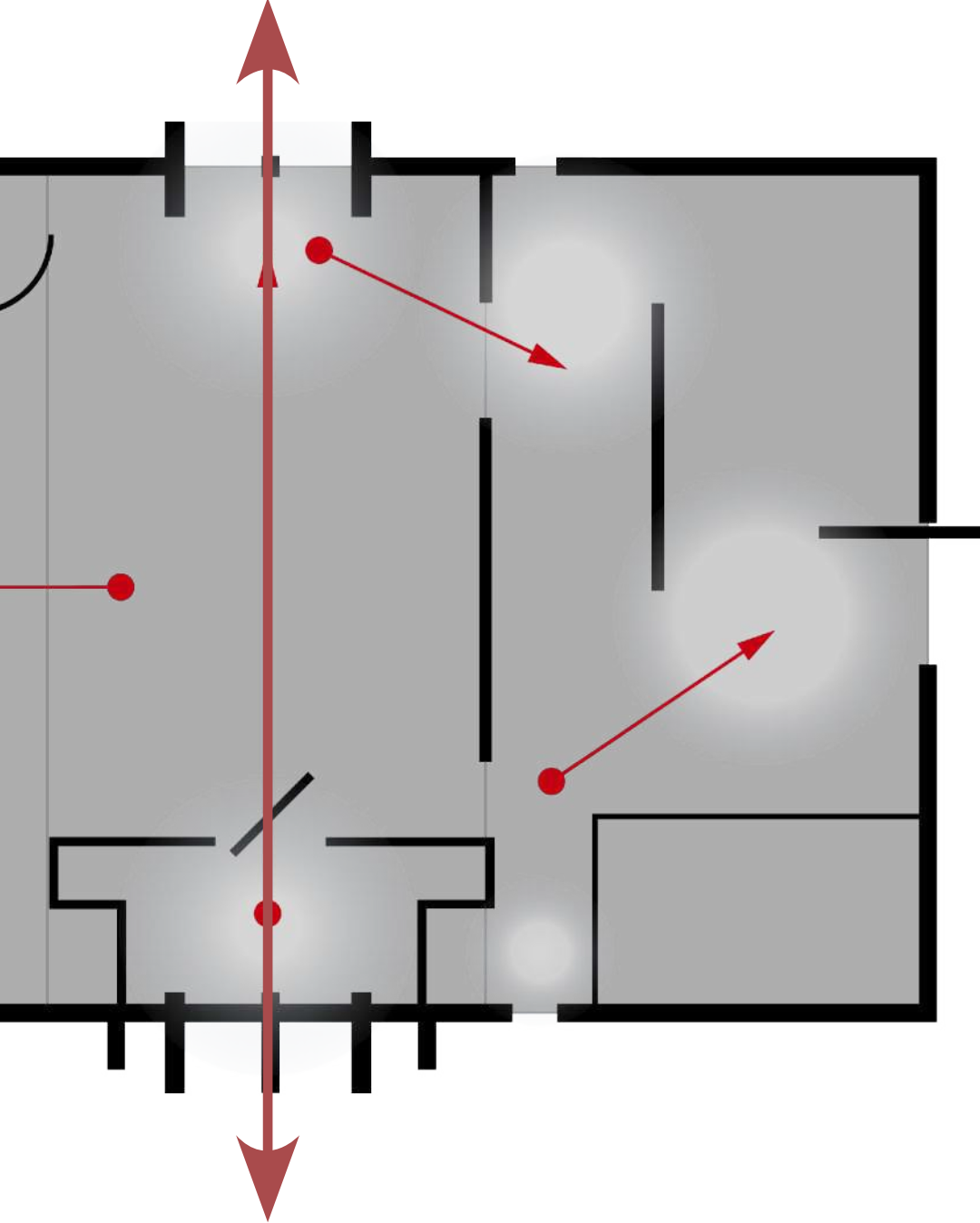
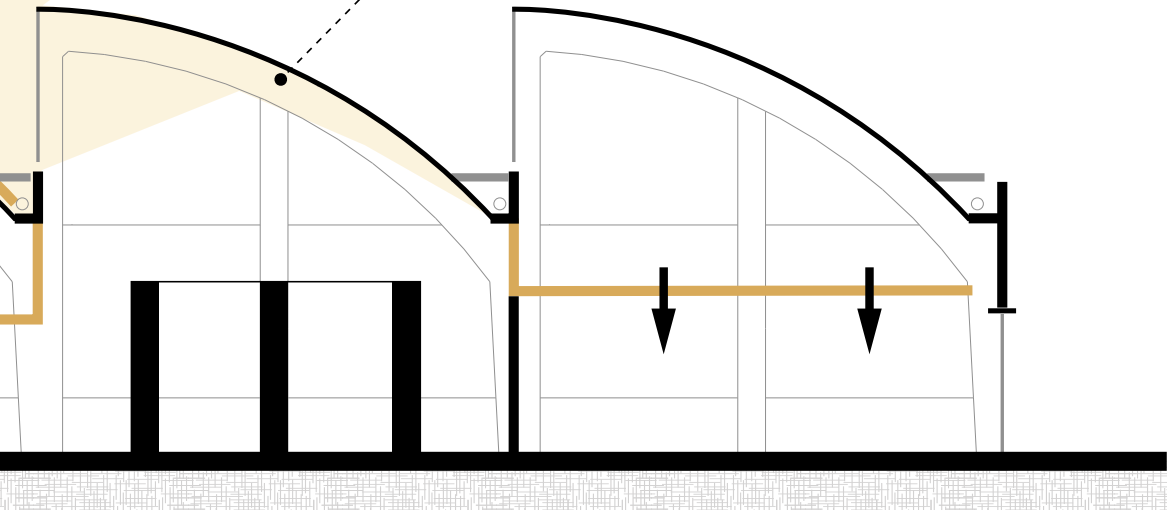




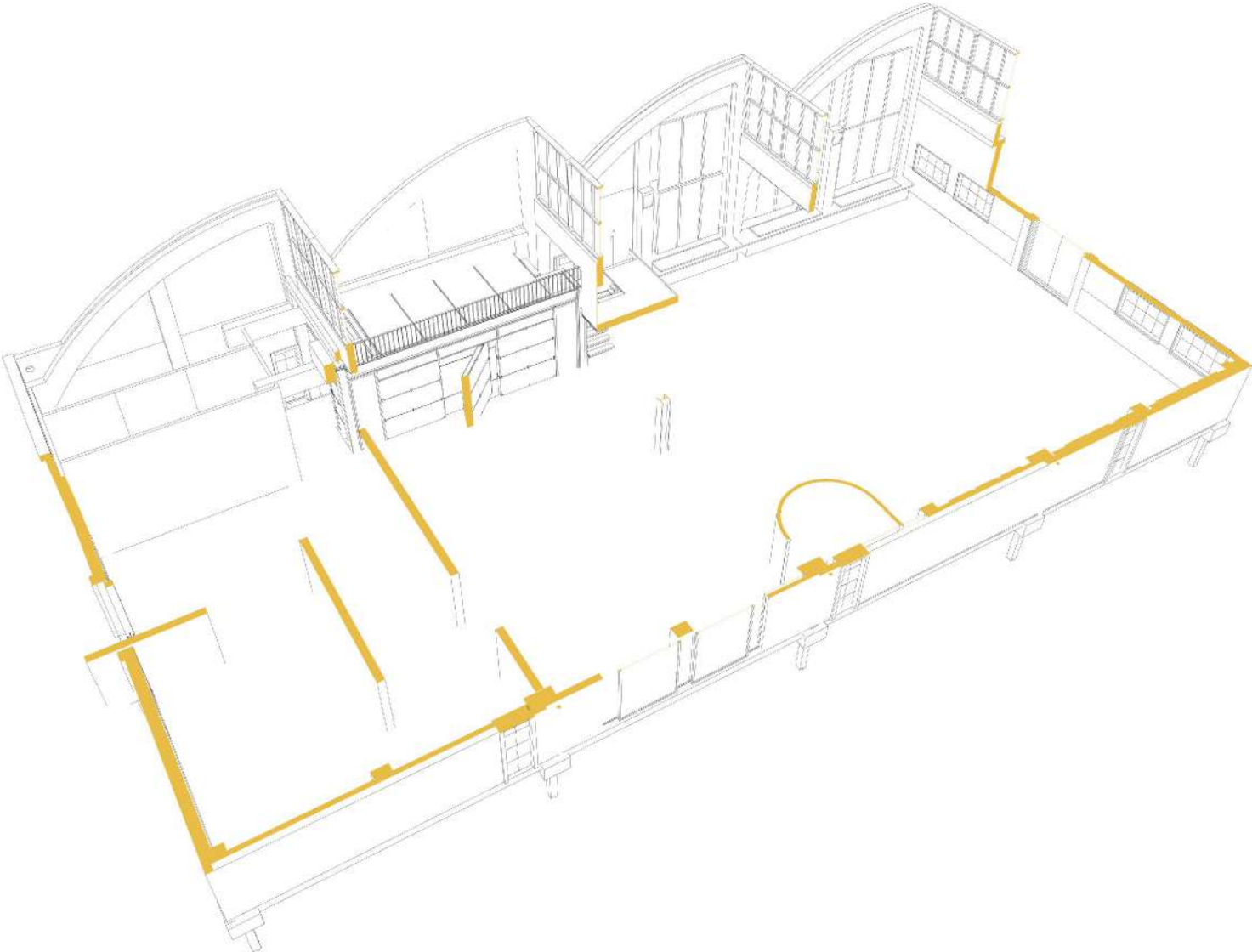
2.2 Design concept

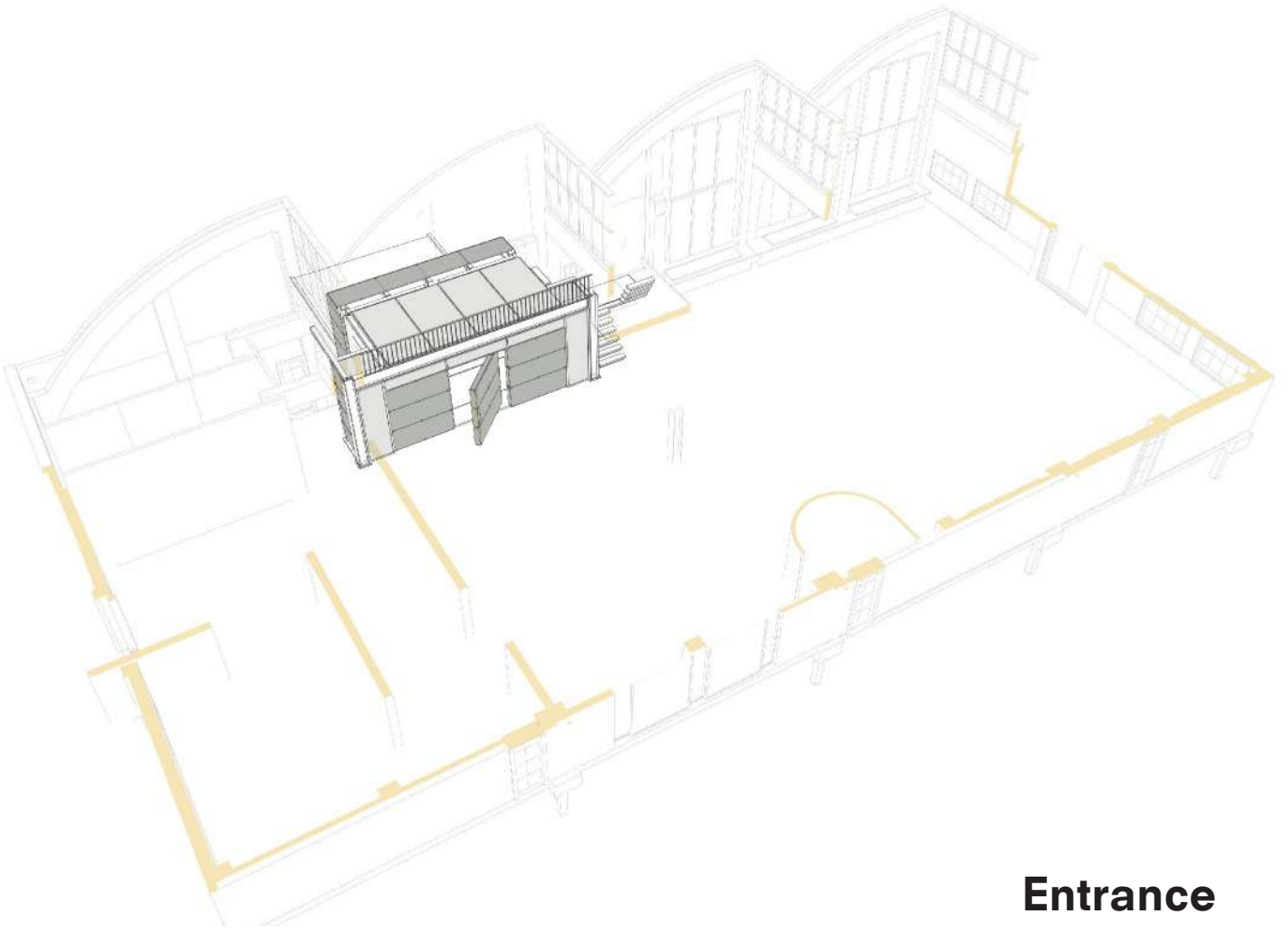


Ceiling Paint with a Granulate structure, reflecting more light particles

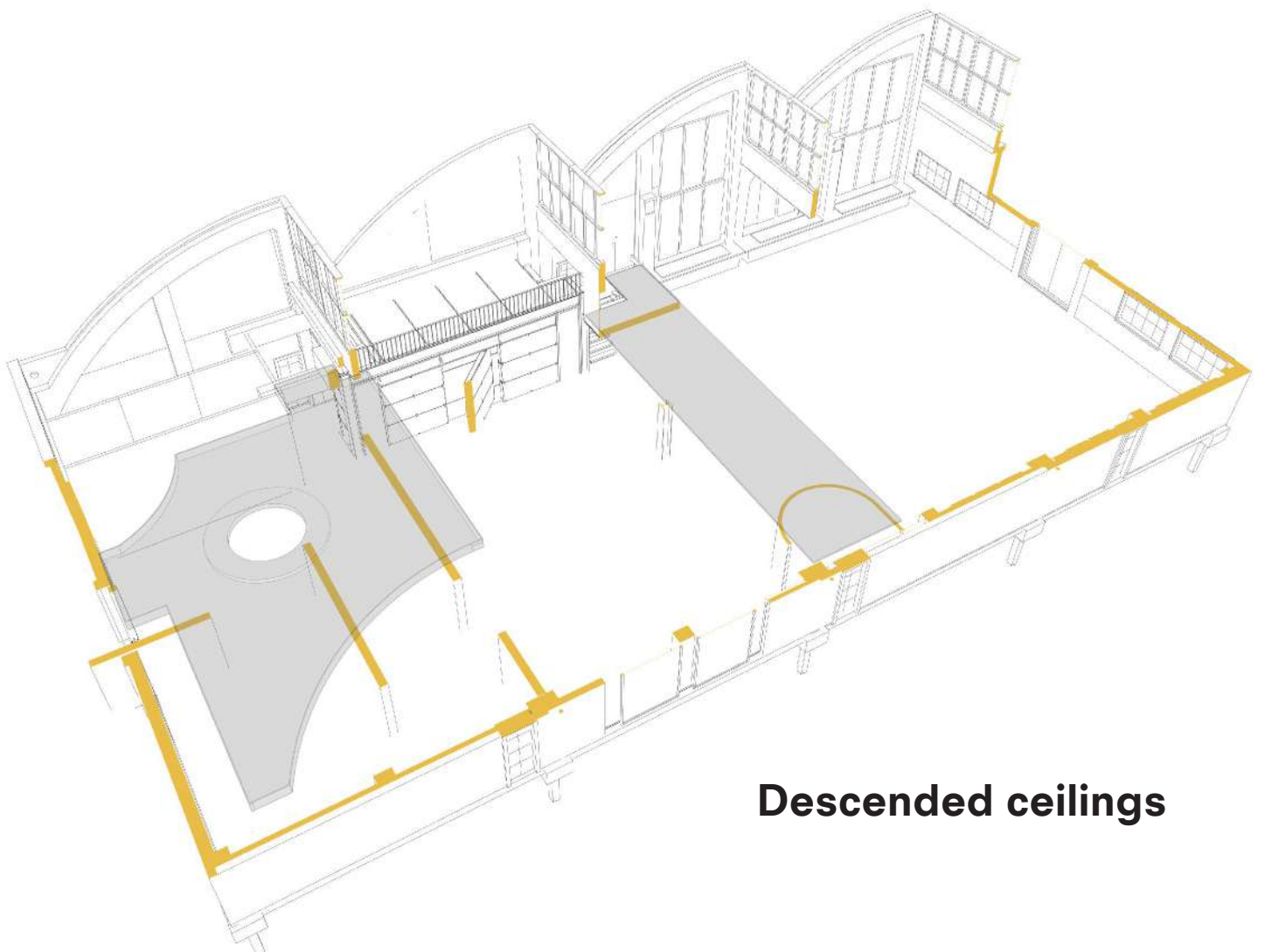


2.3 Impactful design interventions





Entrance



Descended ceilings

Configurations



Lectures



Dinner/communal

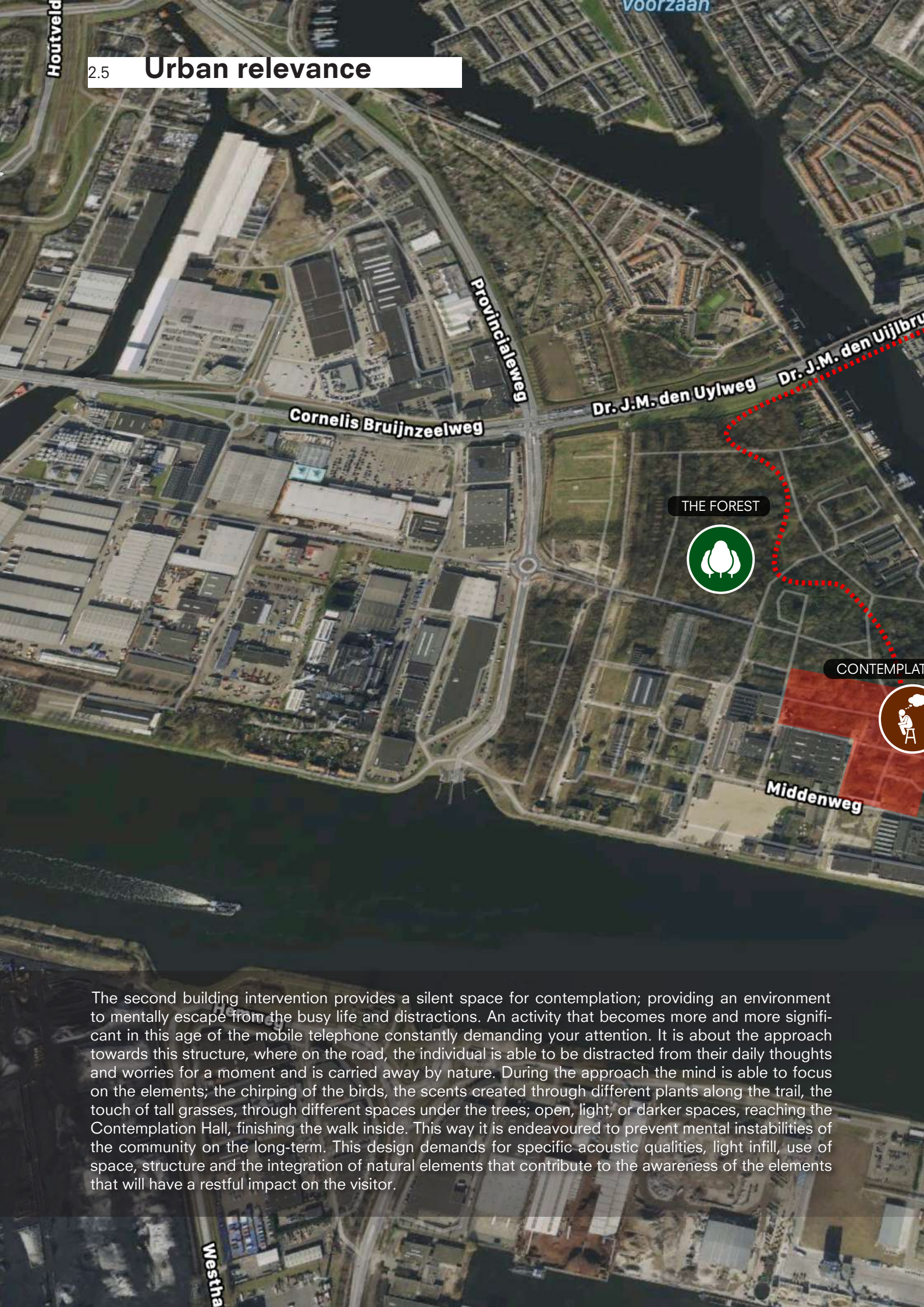


Celebration



Feast/orchestra

Urban relevance



The second building intervention provides a silent space for contemplation; providing an environment to mentally escape from the busy life and distractions. An activity that becomes more and more significant in this age of the mobile telephone constantly demanding your attention. It is about the approach towards this structure, where on the road, the individual is able to be distracted from their daily thoughts and worries for a moment and is carried away by nature. During the approach the mind is able to focus on the elements; the chirping of the birds, the scents created through different plants along the trail, the touch of tall grasses, through different spaces under the trees; open, light, or darker spaces, reaching the Contemplation Hall, finishing the walk inside. This way it is endeavoured to prevent mental instabilities of the community on the long-term. This design demands for specific acoustic qualities, light infill, use of space, structure and the integration of natural elements that contribute to the awareness of the elements that will have a restful impact on the visitor.

Zuidervaart

Zuidervaart

CREMATORIUM AND FUNERAL CENTER ZAAANSTAD

Vijfhoekpark

Zuidelijk

Wijlustrat

CEMETRY

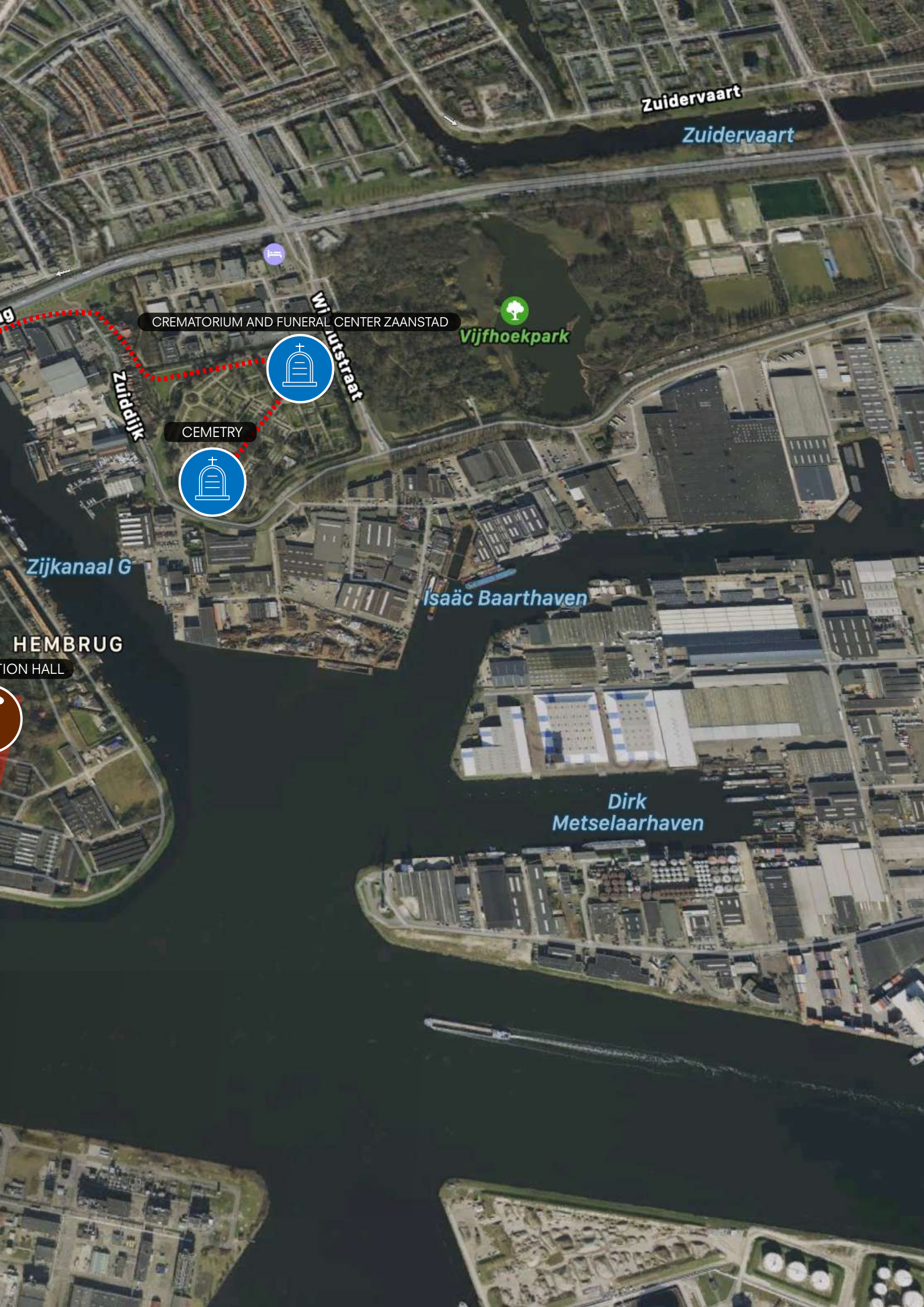
Zijkanaal G

Isaac Baarhaven

HEMBRUG

ION HALL

Dirk
Metselaarhaven







SPACE OF CONTEMPLATION

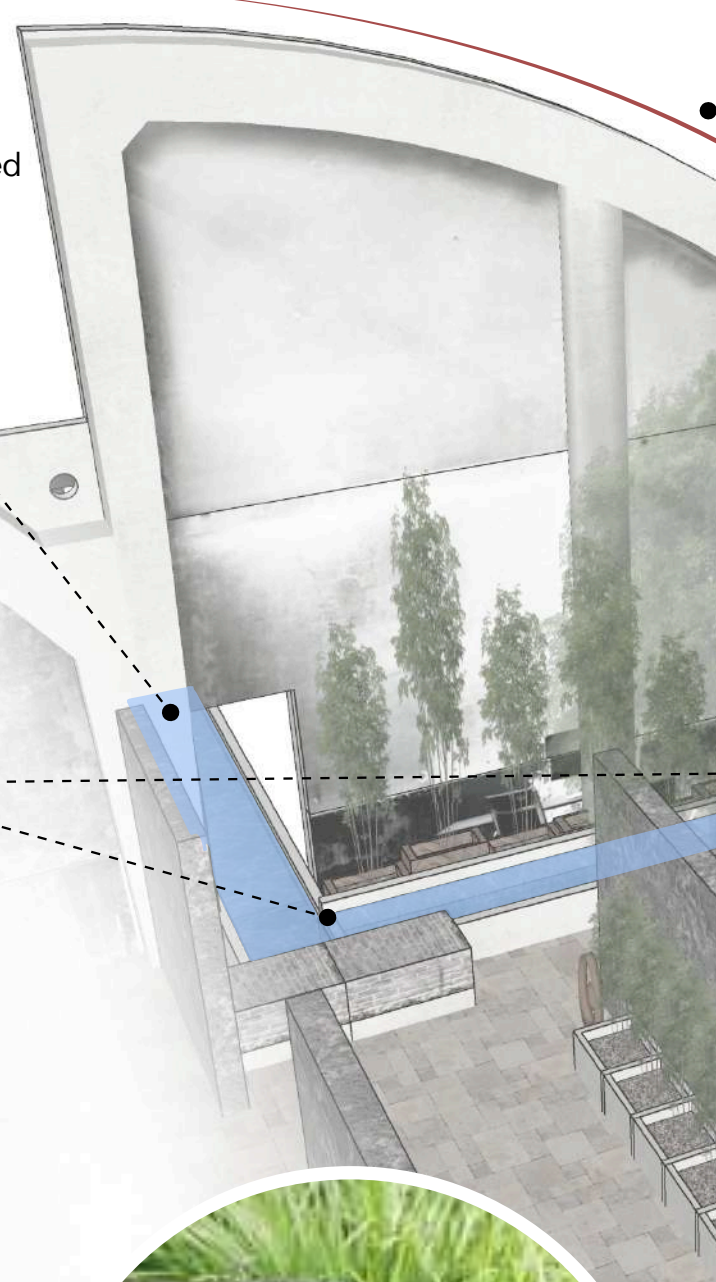
Rain water principle/ shadow vegetation

Dir
wit



Rainwater is eventually distributed back to the existing canals

Height different result in the sound of raindrops during cloudbursts



FARGESIA ROBUSTA
'PINGWU'



ACORUS GRAMINEUS
'OGON'

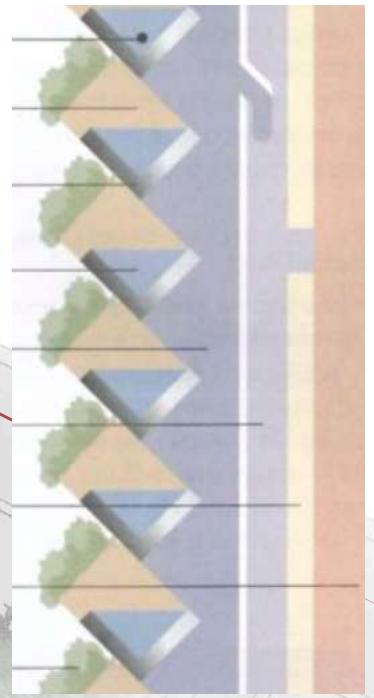


Collecting accumulated rainwater
within existing gutter



Rain water distributes equally
over the mounted green facade

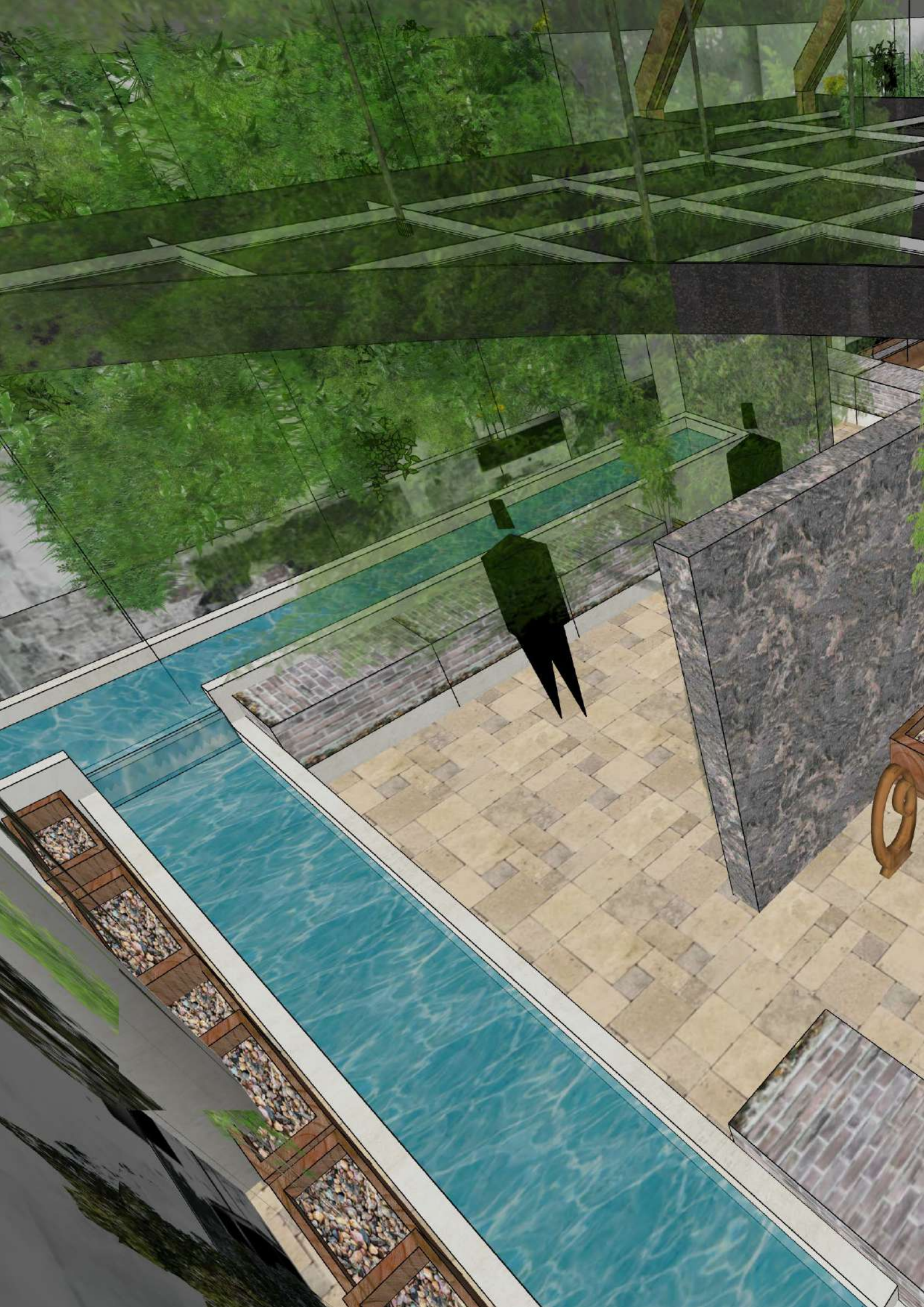
- Monnikskap (Aconitum)
- Longkruid (Pulmonaria)
- Elfenbloem (Epimedium)
- Kruipend zenegroen (Ajuga reptans)
- Gebroken hartje (Dicentra)
- Kerstroos (Helleborus orientalis)
- Varen (Polystichum)
- Hartlelie (Hosta)
- Kaukasisch vergeet-me-nietje (Brunnera)
- Salomonszegel (Polygonatum)



**ACORUS GRAMINEUS
'VARIEGATUM'**



**FERN
'POLYSTICHUM'**







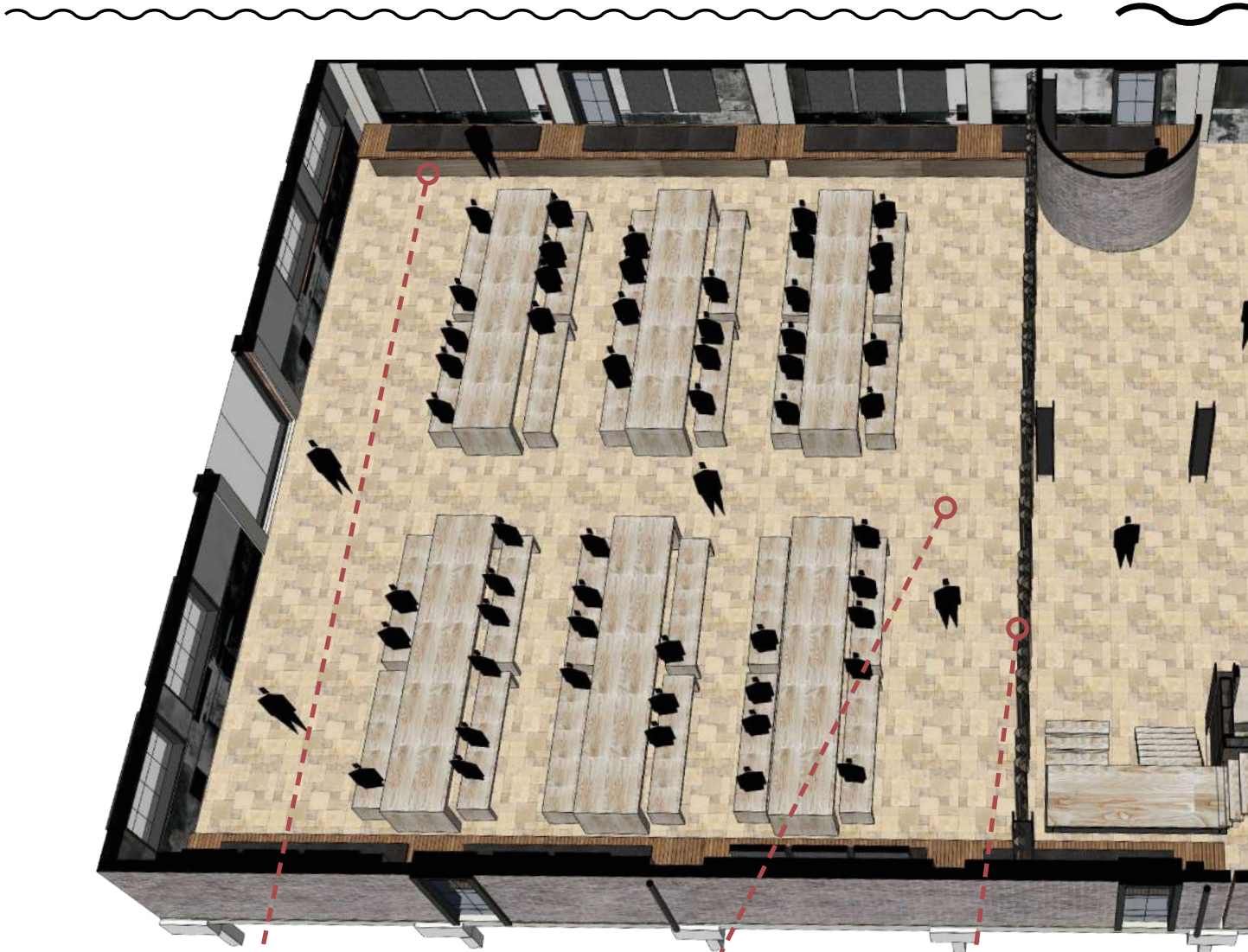




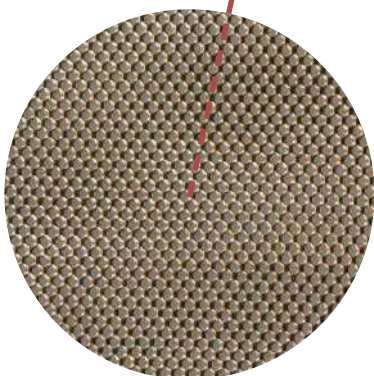


2.7 Materialisation

REDUCED ACOUSTIC REVERBERATION



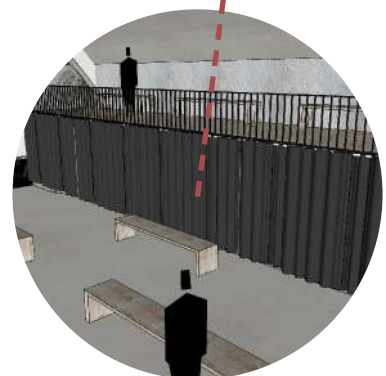
FLOOR HEATING



Stretch metal finishing

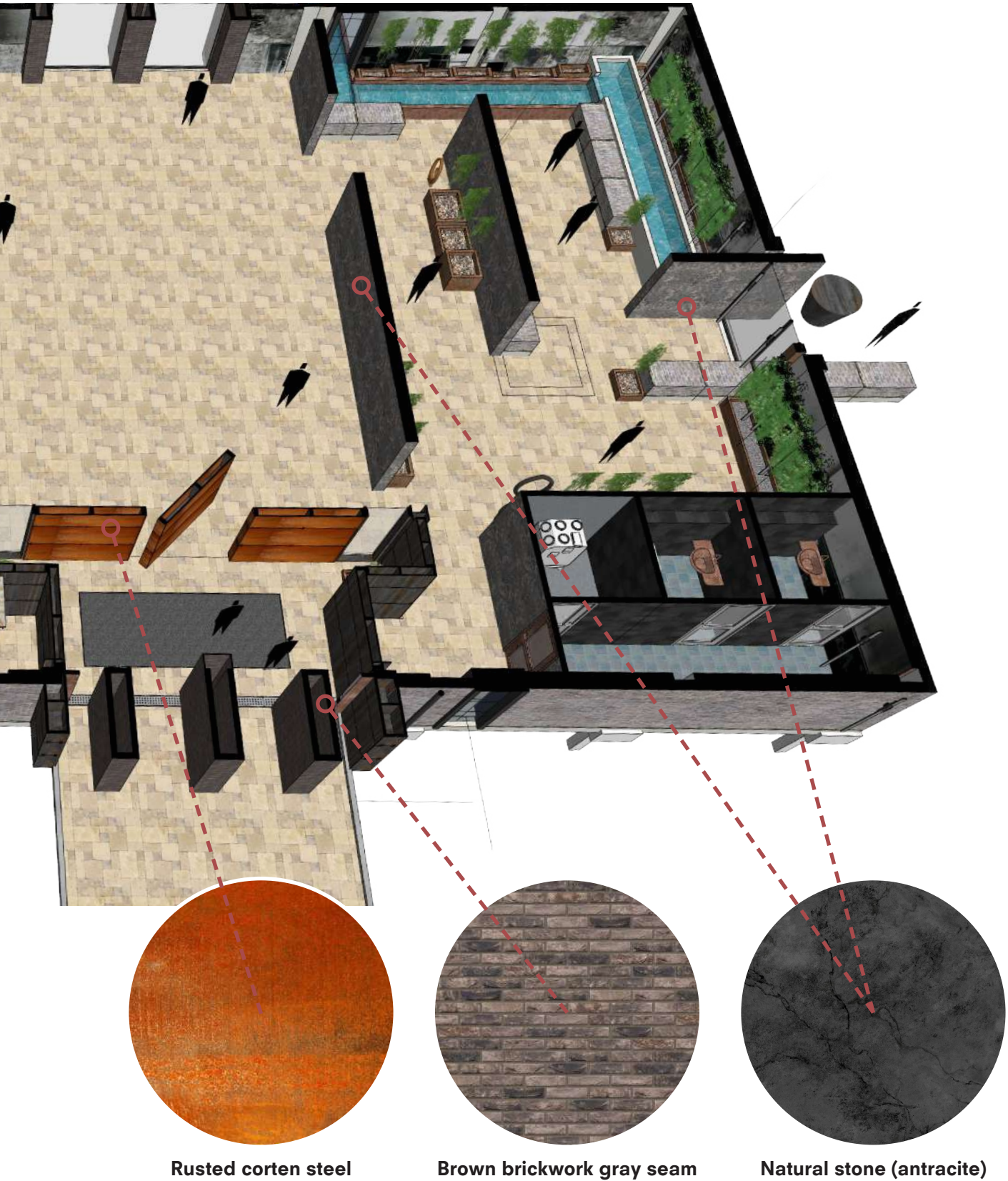


Floor heating/Stone tile finish



Room-dividing curtain

INCREASED ACOUSTIC REVERB

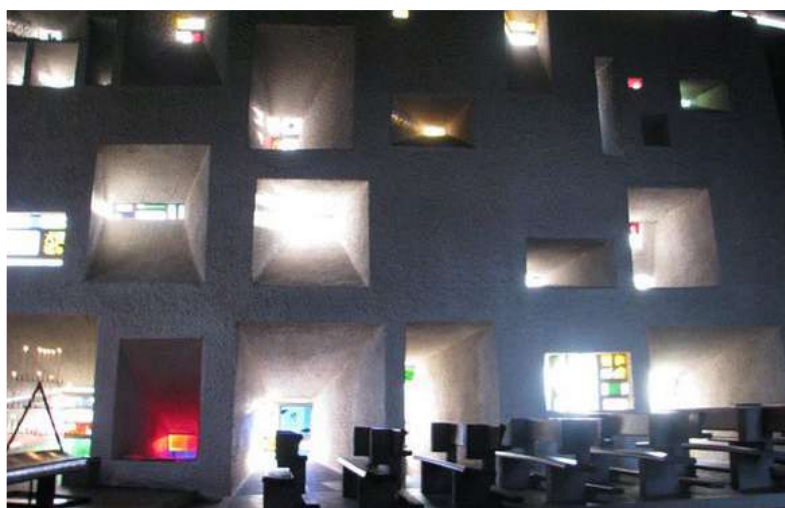


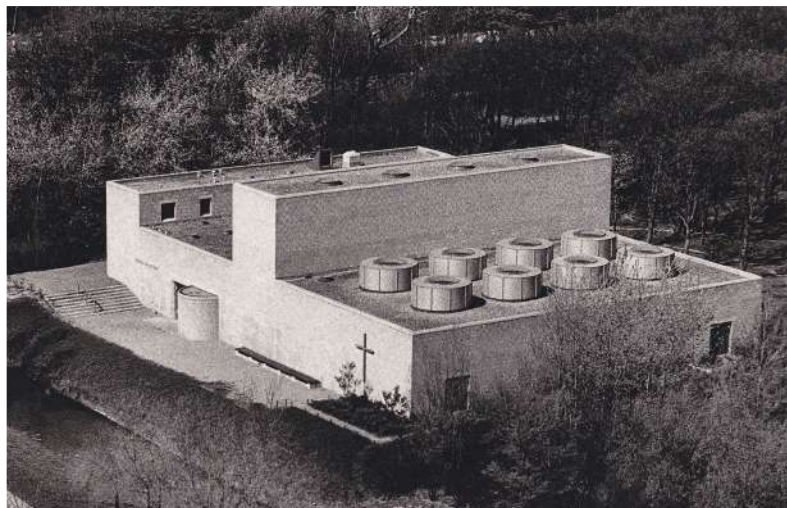
Rusted corten steel

Brown brickwork gray seam

Natural stone (antracite)

2.8 References





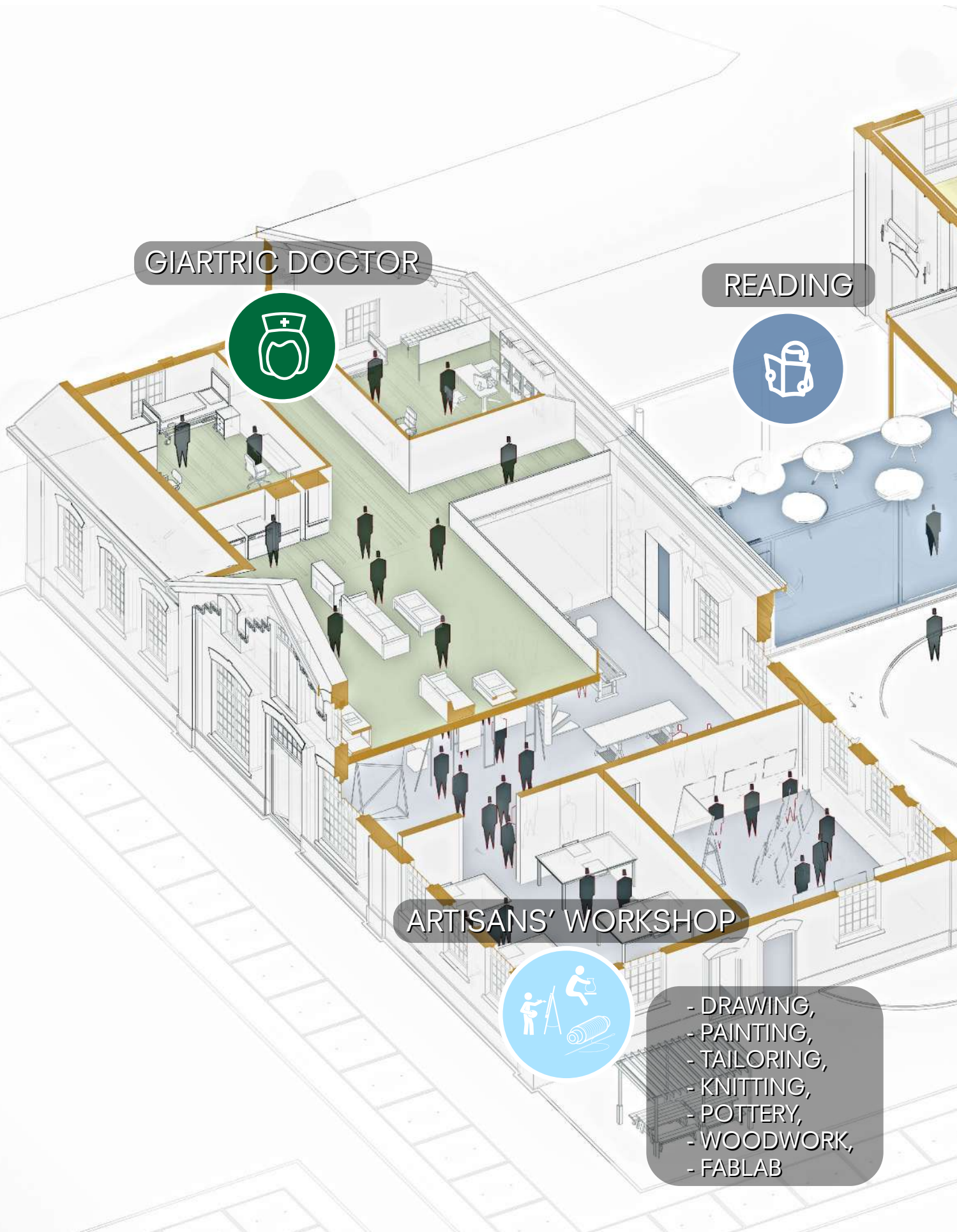


03

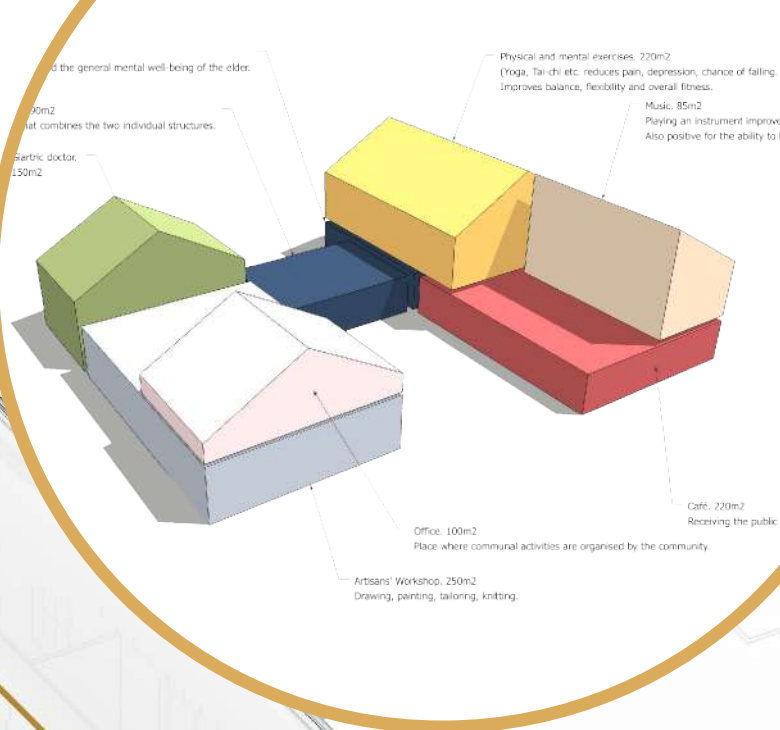
THE FARMS



3.1 Program redefinition of the Farms



PHYSIQUE



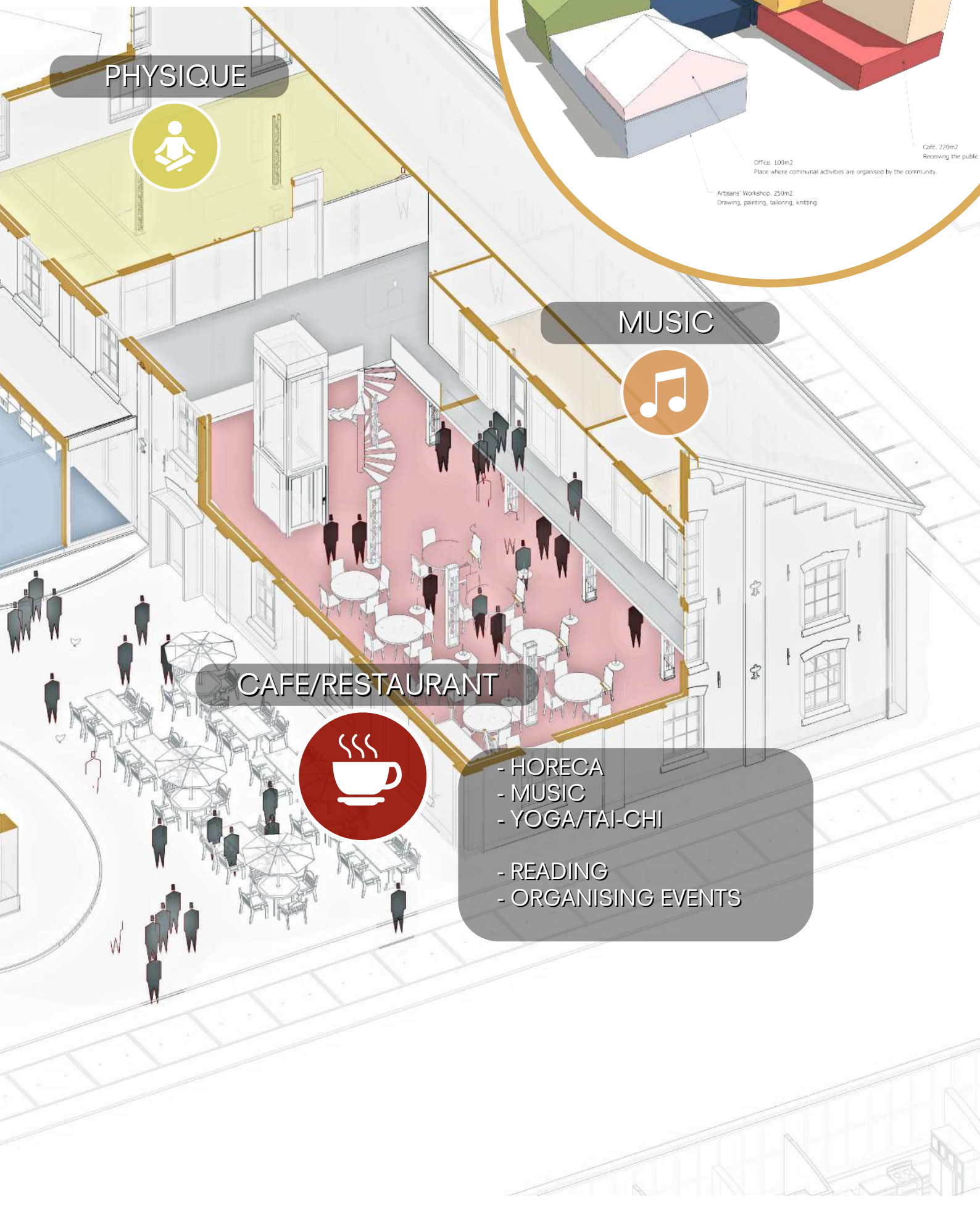
MUSIC



CAFE/RESTAURANT




- HORECA
- MUSIC
- YOGA/TAI-CHI
- READING
- ORGANISING EVENTS



Warehouse transformation to café/restaurant





An aerial photograph showing a modern residential development. In the foreground, there is a dense, lush green forest. Behind the forest, several modern buildings with flat roofs and large windows are visible. In the background, a city skyline is visible under a cloudy sky. The overall scene suggests a blend of nature and urban architecture.

Farm program definition

Especially elderly suffer from loneliness, fear or depression. These problems demand another solution from the transformation in the form of program definition that deals with the mental well-being of the individual. It can be contested by hosting communal activities for the elderly and the community, as well as to stimulate them to exercise and to do communal activities such as communal gardening, bike rides or hikes through the forest. The final master plan has been designed with public facilities where the community is able to gather and meet, spend their day and additionally; find contemplation through nature and architecture. There will be an Artisans' workshop, where people could come and craft objects from wood, tailor with cloth or craft things with clay. The other structure provides a café, restaurant, reading room and offers multifunctional space upstairs where people could do physical exercises together in order to improve their balance, fitness and overall vitality. Additionally, they can make music, which improves their cognitive functioning and coordination and has a positive influence on speech and hearing. All together the defined program should help to prevent inhabitants from developing negative health effects.

Additionally, the space of contemplation will allow the inhabitants to find their inner rest again, improving their mental well-being, reducing fear and depression and making the inhabitant more healthy overall. Besides that, the large existing structure provides such a large space where occasionally, larger collective events could take place. Activities that could differ, such as funerals, weddings, celebrations, and parties. But also a place where lectures could be given, or collective dinners could take place. This multifunctional space touches upon bringing the community together.





04

MASTER-PLAN



Urban program redefinition



KANGAROO-HOUSING

ARTISAN

MIXED RESIDENCES

CONTEMPLATION HALL

Program definition



ELDER, 65+



FAMILY



SINLE ADULTS

ARTISANS' WORKSHOP



- DRAWING,
- PAINTING,
- TAILORING,
- KNITTING,
- POTTERY,
- WOODWORK,
- FABLAB



- CO
- ME
- LE
- WE
- ME
- AR



GIARTRIC DOCTOR



CONTEMPLATION HALL



READING



ARTISTS' WORKSHOP



GARDENING



CAFE/RESTAURANT



KANGAROO-HOUSING



FAMILY RESIDENCES



COMMUNAL GATHERING
MENTAL REFLECTIONING

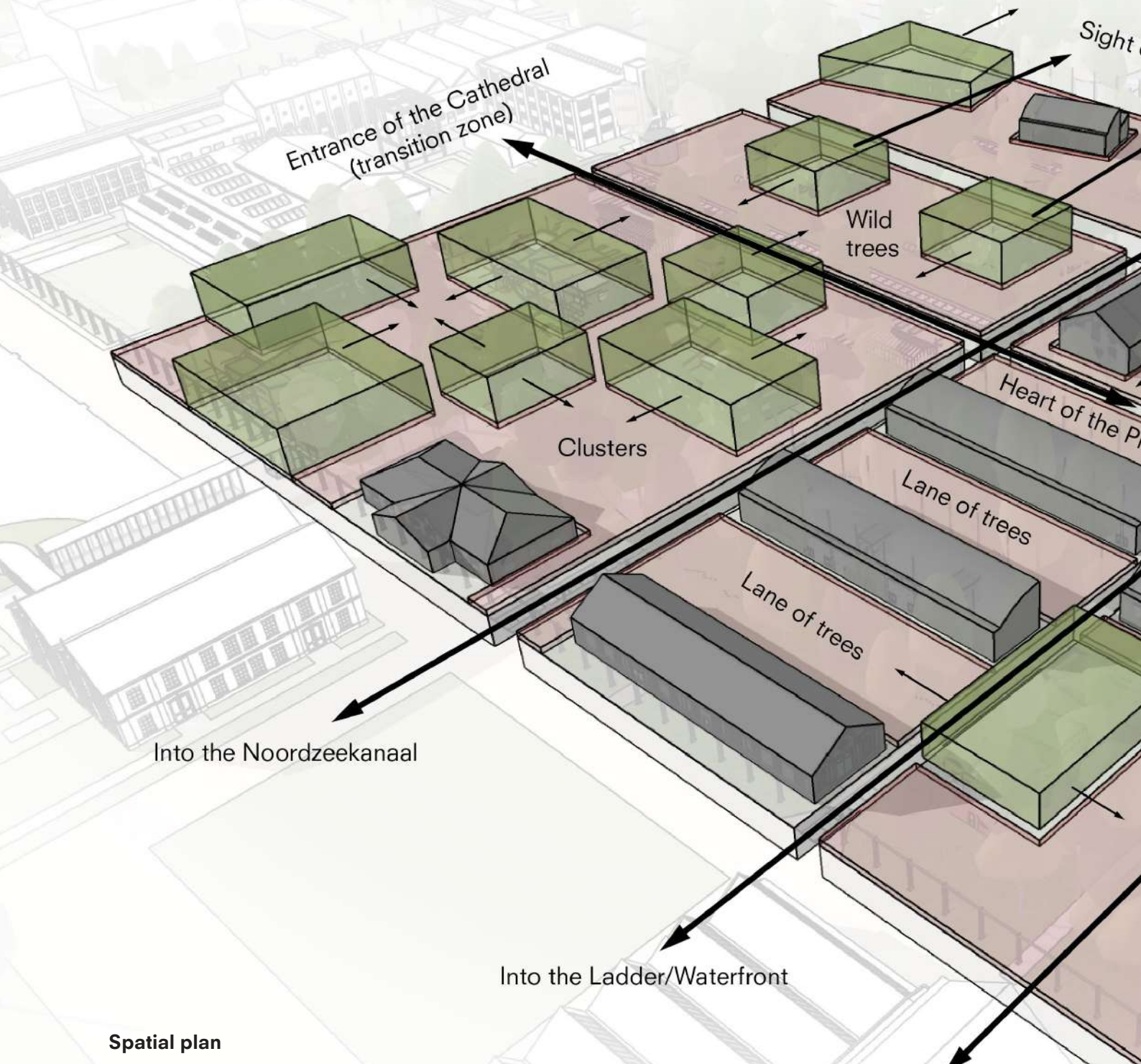
CAFE/RESTAURANT



LECTURES
WEDDINGS
MEMORIAL SERVICES
ART EXHIBITIONS

- HORECA
- MUSIC
- YOGA/TAI-CHI
- READING
- ORGANISING EVENTS

4.2 Space strategy



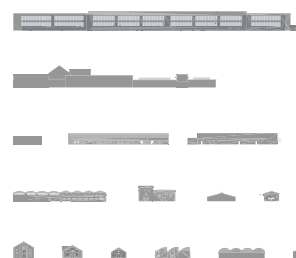
Spatial plan



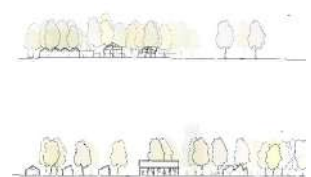
Open space



Rhythm



Scale



Transition



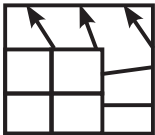
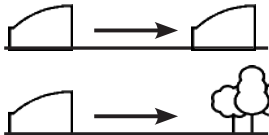
Living in a natural environment could improve the overall well-being of the individual, as opposed to living in an urban environment. It reduces stress, provokes physical activity (go for a stroll through the woods), breath cleaner air and thus making the inhabitant a healthier person overall. This is an offered quality that is already there. The challenge for the redesign was how this could be preserved while transforming the site to contemporary requirements. This has mainly been answered in the layout of the redesign of the ensemble. There have been masses added, sacrificing nature but only through very thorough consideration. Making sure the genius loci; the scale of the buildings, the rhythm, height, and in-between space character were preserved so nature could manifest accordingly, or even concluding to leave certain natural places untouched!

- Diversity of spaces
- Relation to nature
- Sight on green

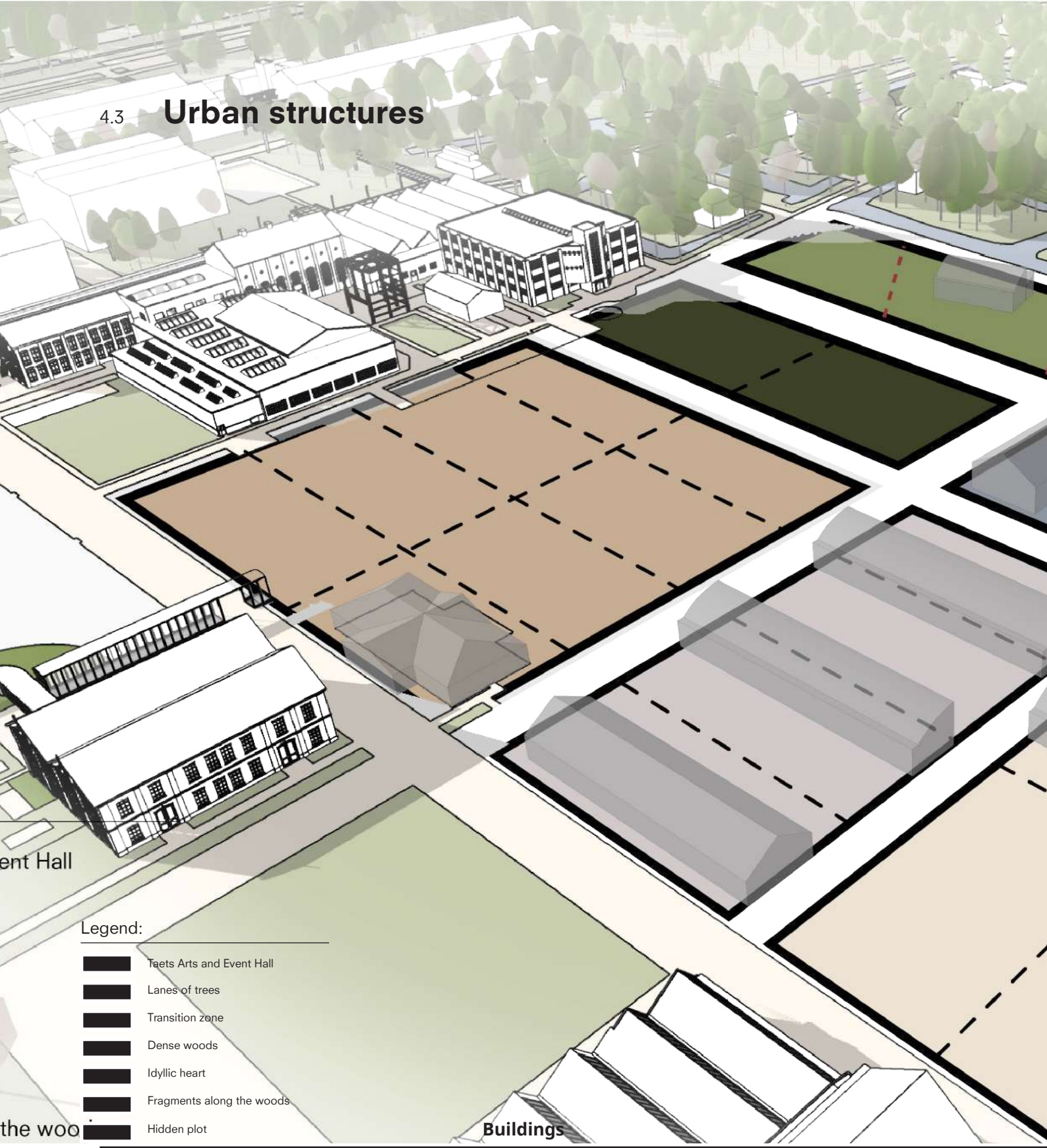
- Orthogonal
- Rotated off-grid

- Low
- Small-scale
- Free-standing

- Contrast industry
- Transition
- Unexpected



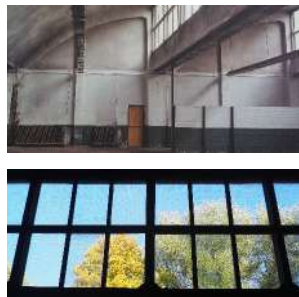
4.3 **Urban structures**



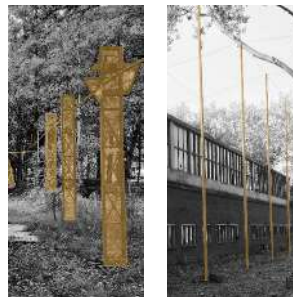
Ornamented facades



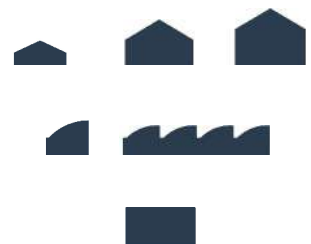
Shell roofs

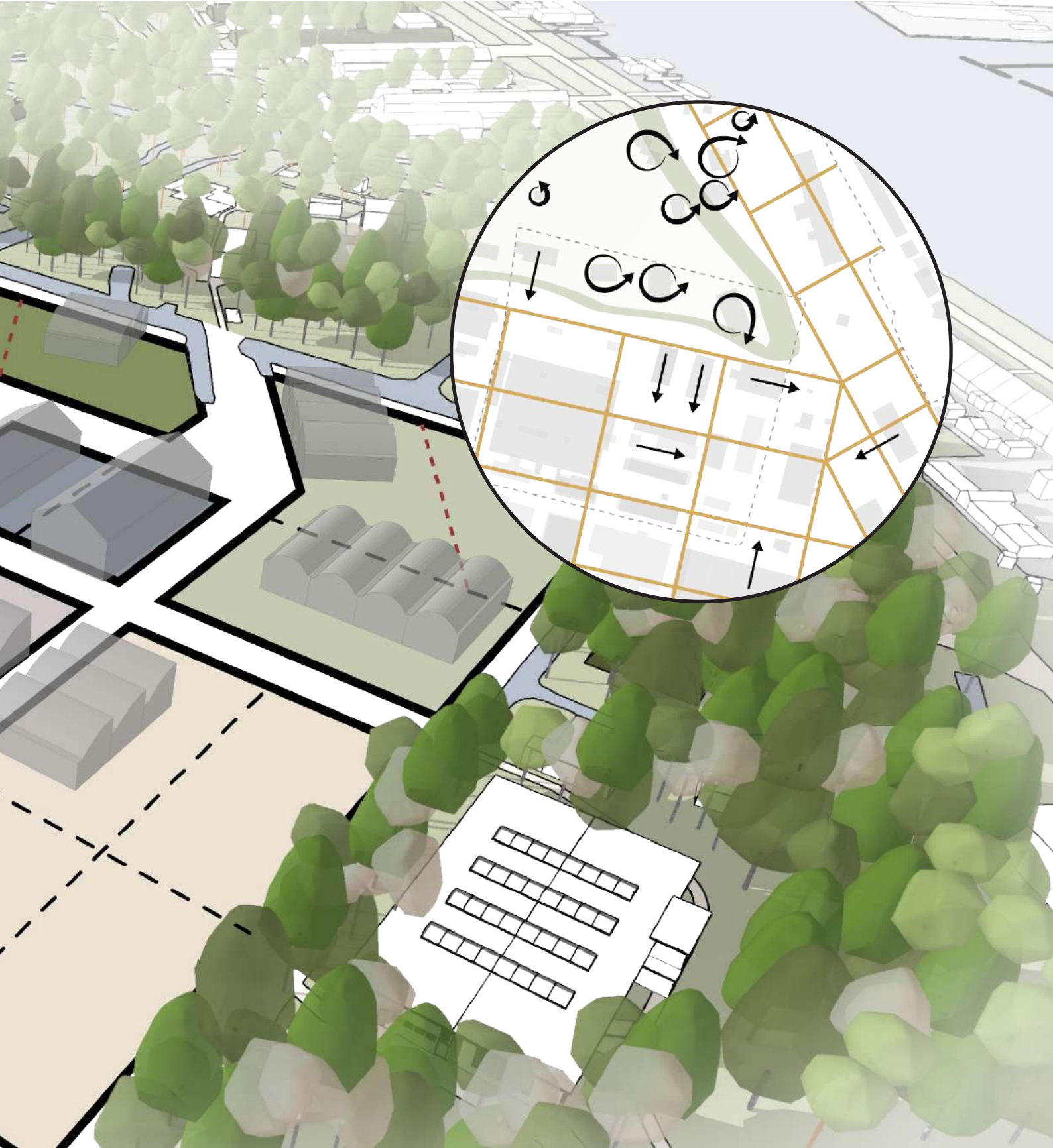


Elements



Generations



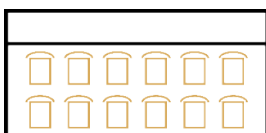


exterior
details
roofshape

structure
light + space
nature extension of interior

military evidence
story of Plofbos
remnants

continuity
typology
unity by generation



1900

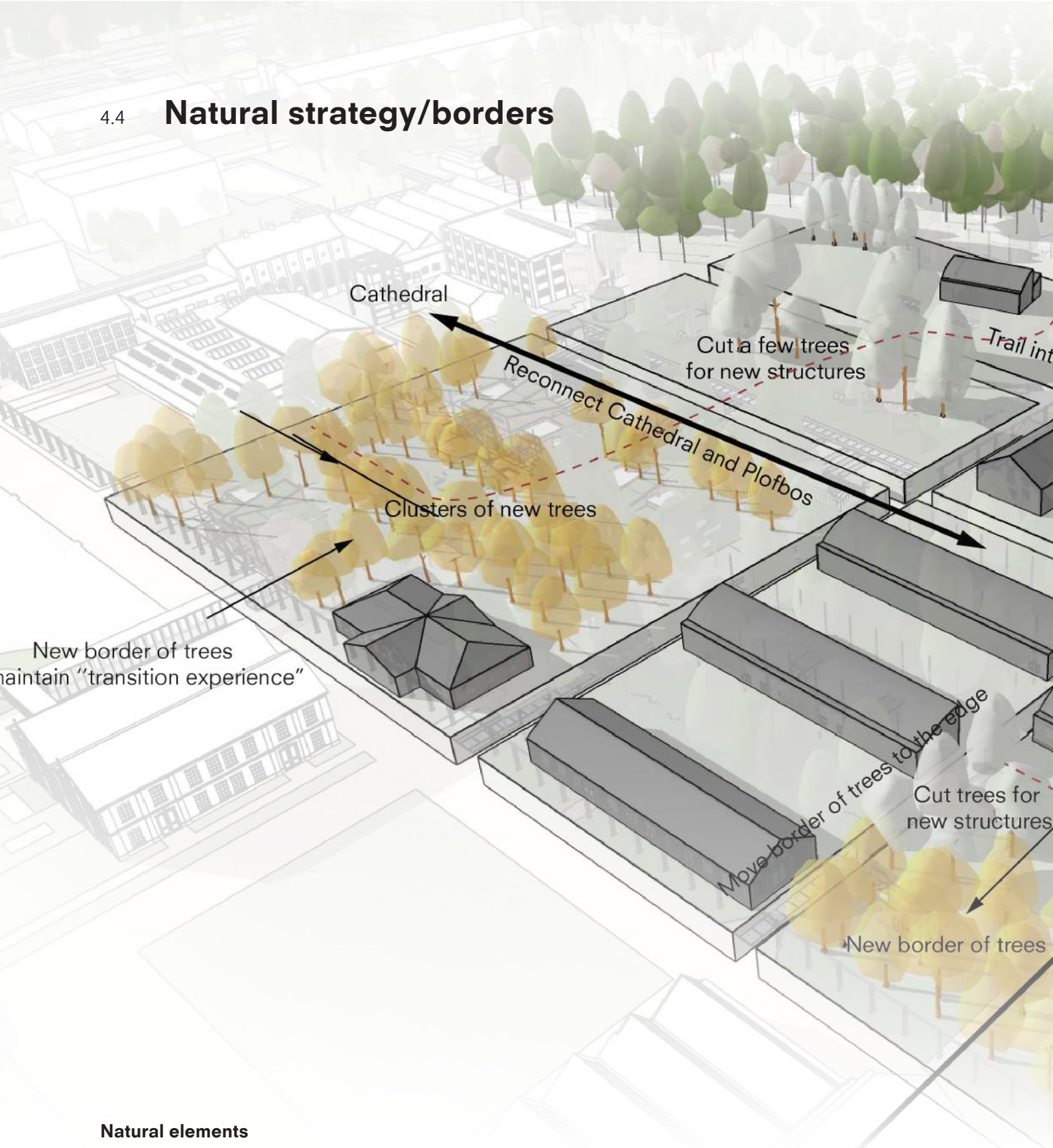


1950



2030

4.4 Natural strategy/borders



Natural elements



Forest



Earthen walls



Canals



Trees

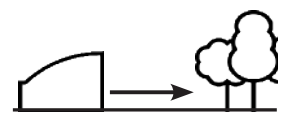
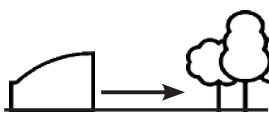


- Enclosing border
- "sight"-green

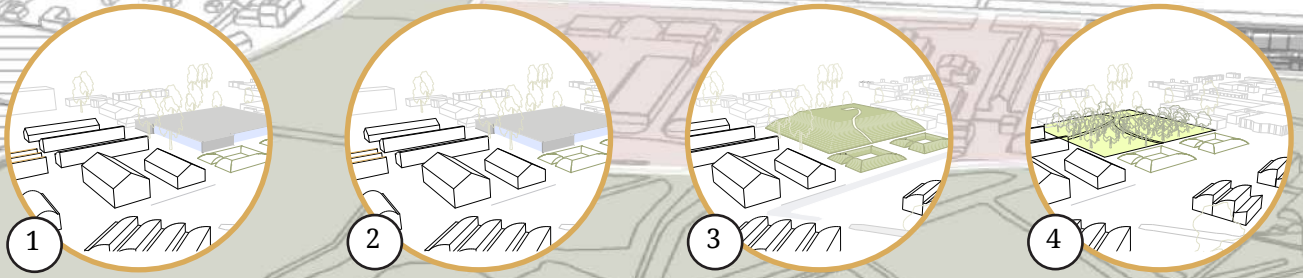
Hidden
Military history

Idyllic scenes
Borders

Patterns
Wild-growth
Functional-growth



Reclamation of the Taets Art and Event Hall land



POTENTIAL REDESIGNS

METRO



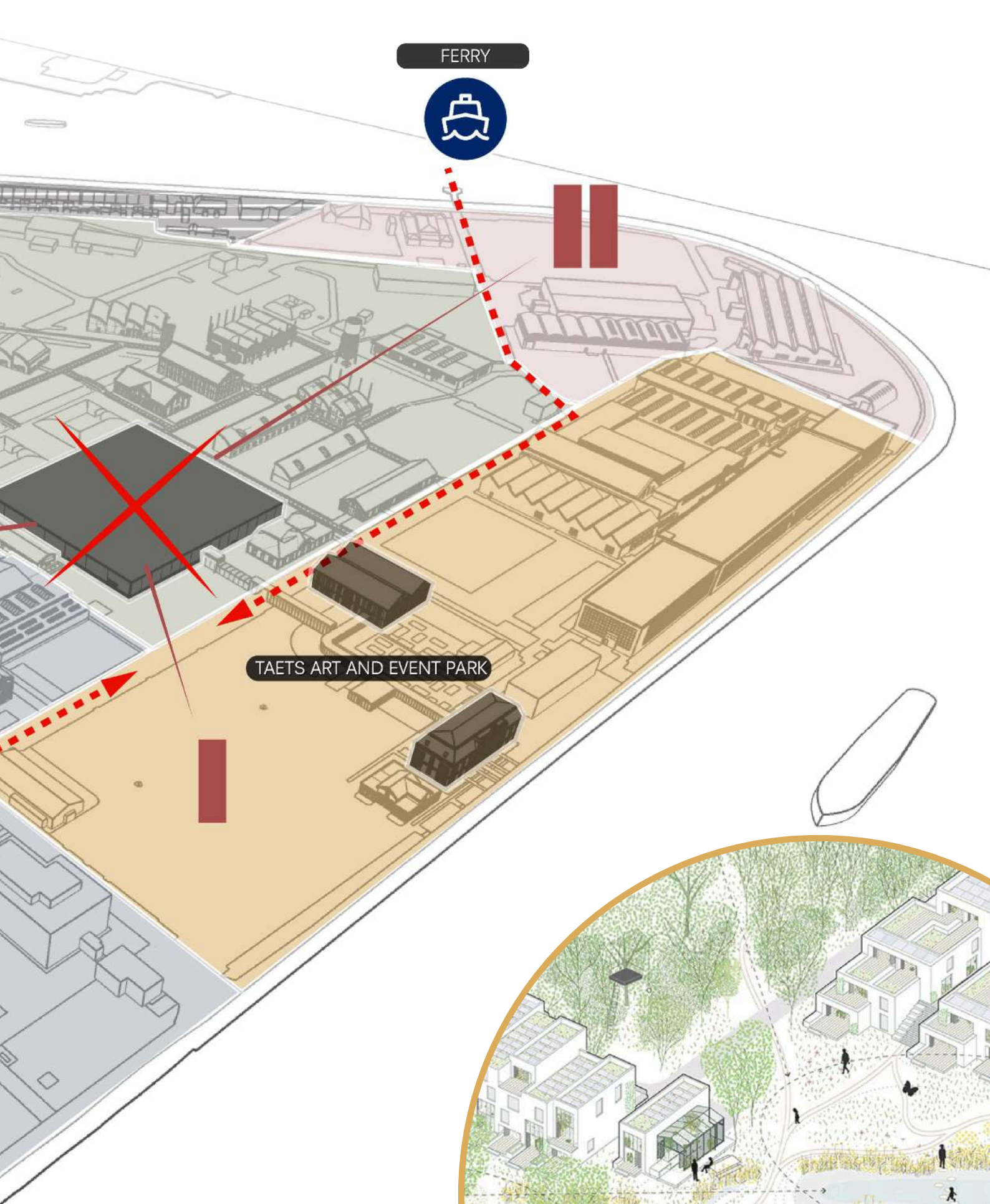
CAR/BUS



PARKING



FERRY



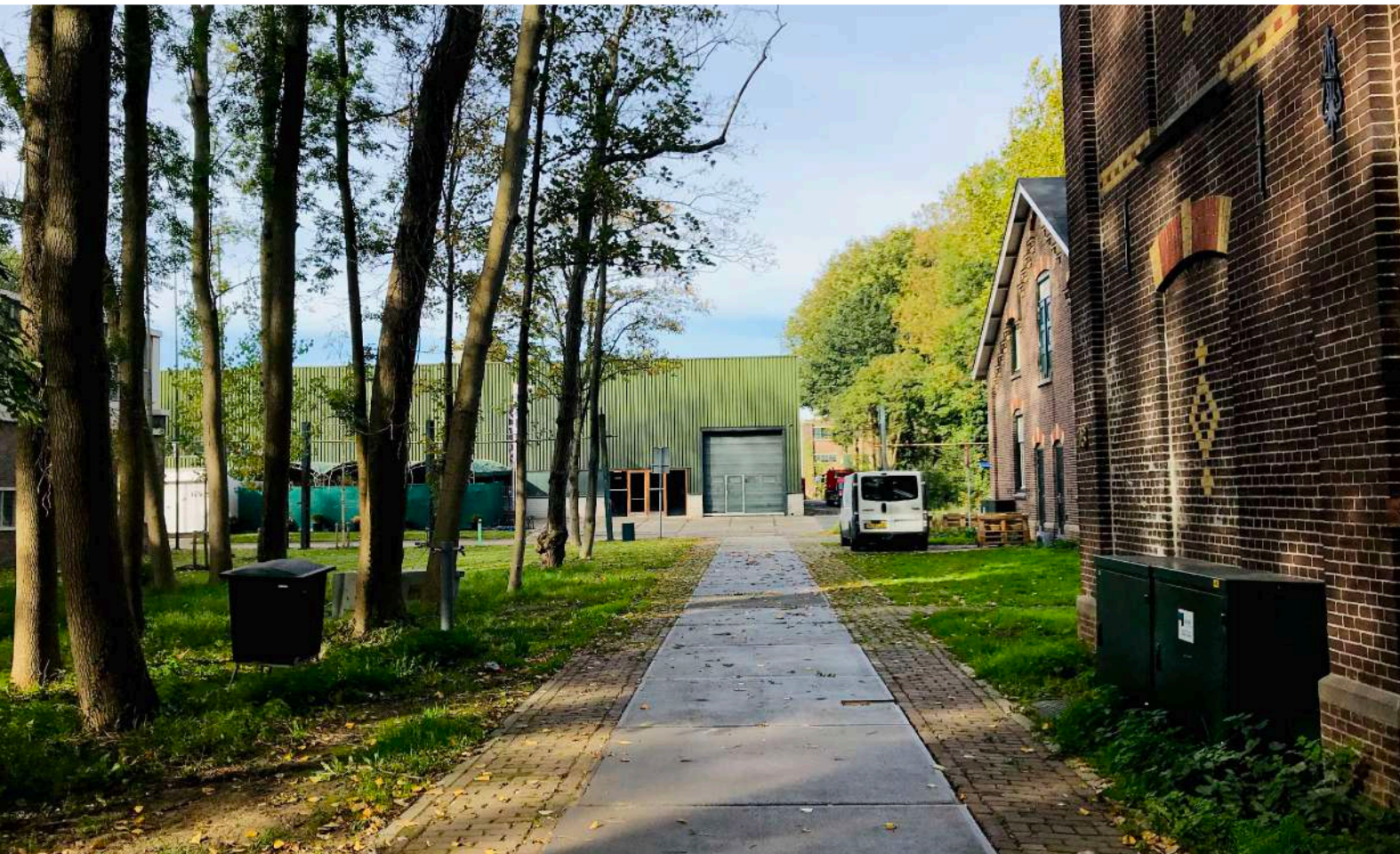
TAETS ART AND EVENT PARK

**CLUSTERS OF FREE-STANDING
STRUCTURES INTERTWINED
WITH NATURE**
(REFERENCE: MARC KOEHLER)



Reclamation of the Taets Art and Event Hall land

IMBALANCE OF SCALE, HEIGHT, PROPORTION, ARCHITECTURE AND MATERIALITY



Taets Art and Event Park, 6000m².

A site that initially acted as a production zone of explosive material and military test location, now houses a large Black box in the hearth of the Hembrug terrain. During the construction in 1991, earthen walls, canals and trees were replaced for a practical production hall. However, the activity in this building only operated until 2003, when the Hembrug terrain closed its operations. The building has not been in use until January 2014 when a variety of project developers transformed the former production hall into an Art and Event Hall. Up to today the building facilitates the most diverse events, from design fairs, multi-day company events, product presentations, car shows, conferences, fashion shows, and staff parties, to intimate get-togethers, atmospheric dinners, meetings, lunches, concerts and television recordings. Divided over three unique buildings that are connected through a glazed walkway, the Taets Art and Event park totally combine 10.000 square meters of floor space area. Combined with the open space in between the three units, Taets offers the opportunity to provide event space for up to 7.000 to 12.000 persons.

NATURE VS METAL FACADE

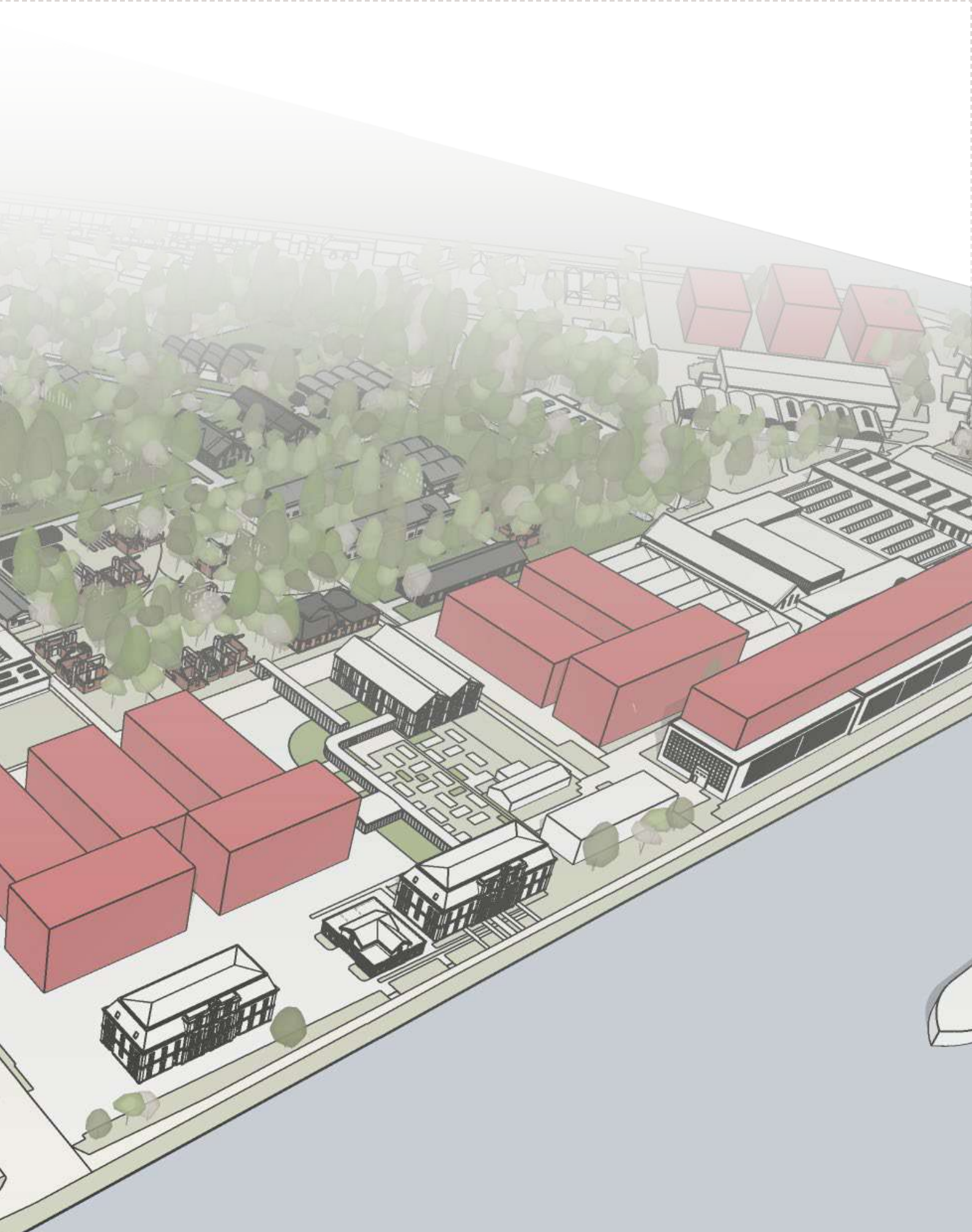


Observations Taets Black Box (building 1).

- Spacious interior, therefore highly practical for event based activities.
- Steel load bearing structure and metallic façades material potentially re-useable.
- The Black Box disturbs the structure of the northern part of Hembrug (free standing buildings at a distance from each other, surrounded by forest and sometimes earthen walls).
- Both scale and architecture do not fit in with the context.
- Architectural layering of the Black Box is incoherent with the surrounding ensembles.
- Low cultural historical significance.

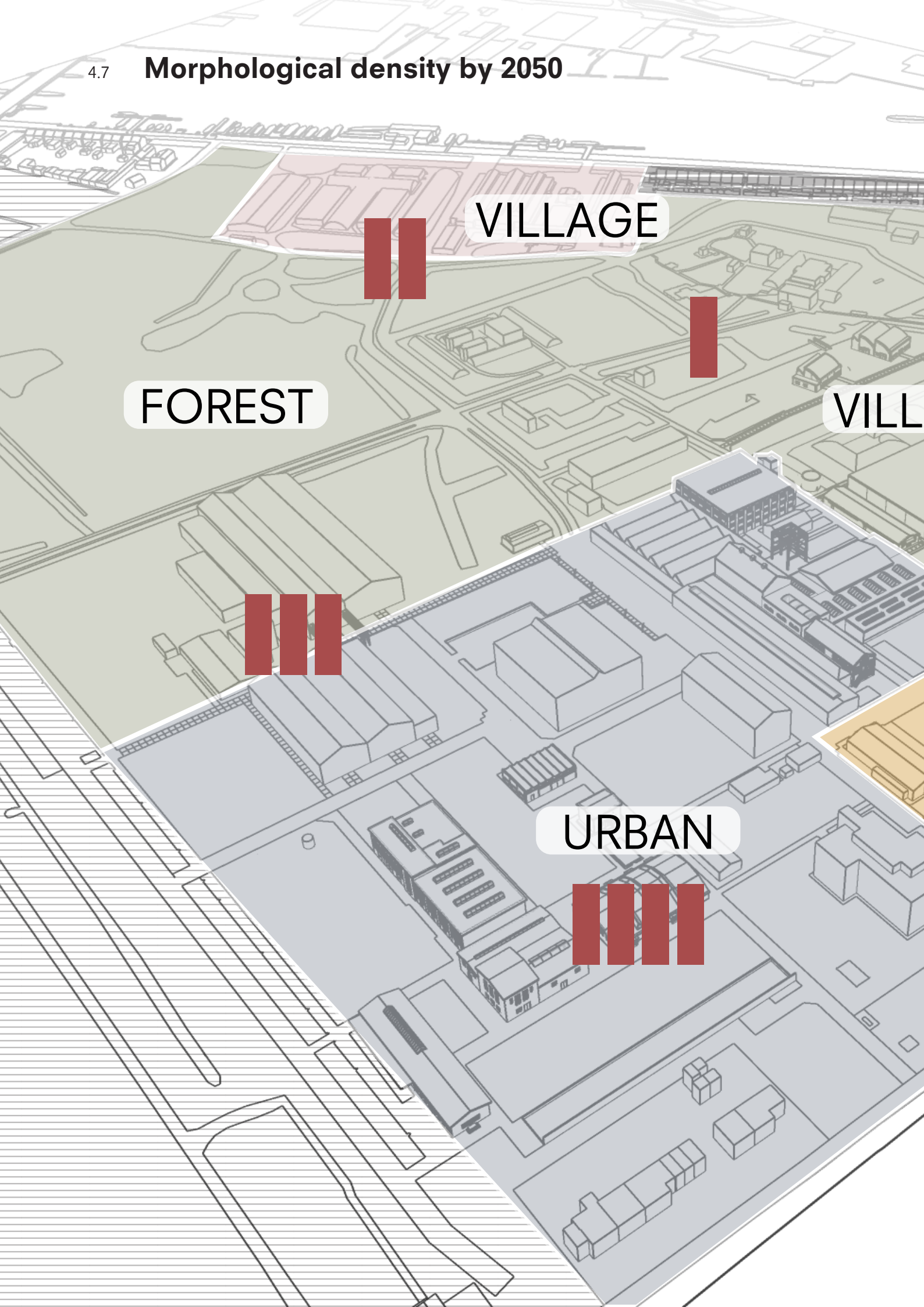


DENSIFY MORPHOLOGY WHERE IT IS ALREA



BY DENSE IN ORDER TO MAINTAIN NATURE

Morphological density by 2050



CULTURE/ EVENTS



AGE



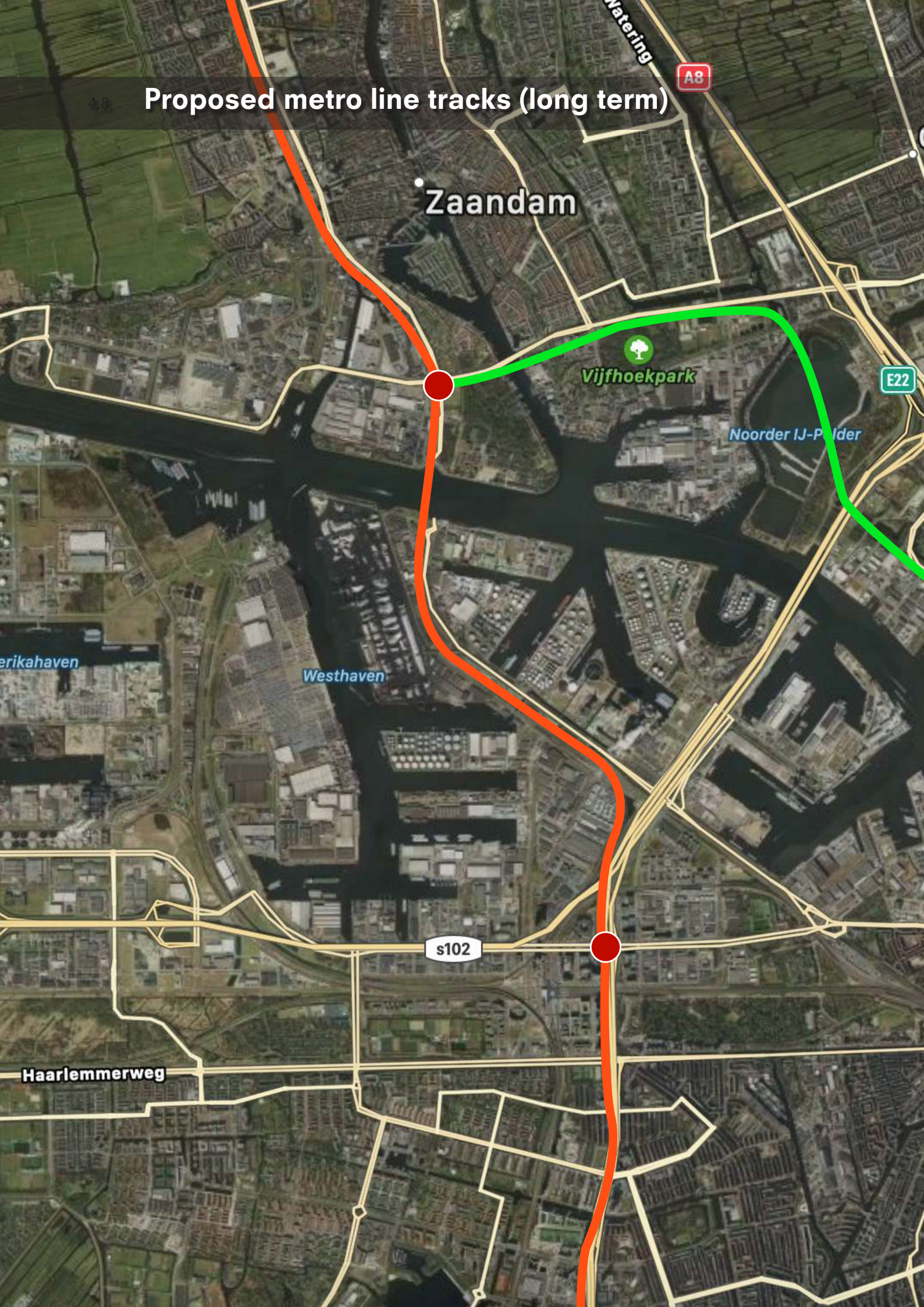
EVENTS/ LEISURE



URBAN



Proposed metro line tracks (long term)



Oostzaan

Watergang

Landsmeer

N247

A10

Buikslotermeerpark

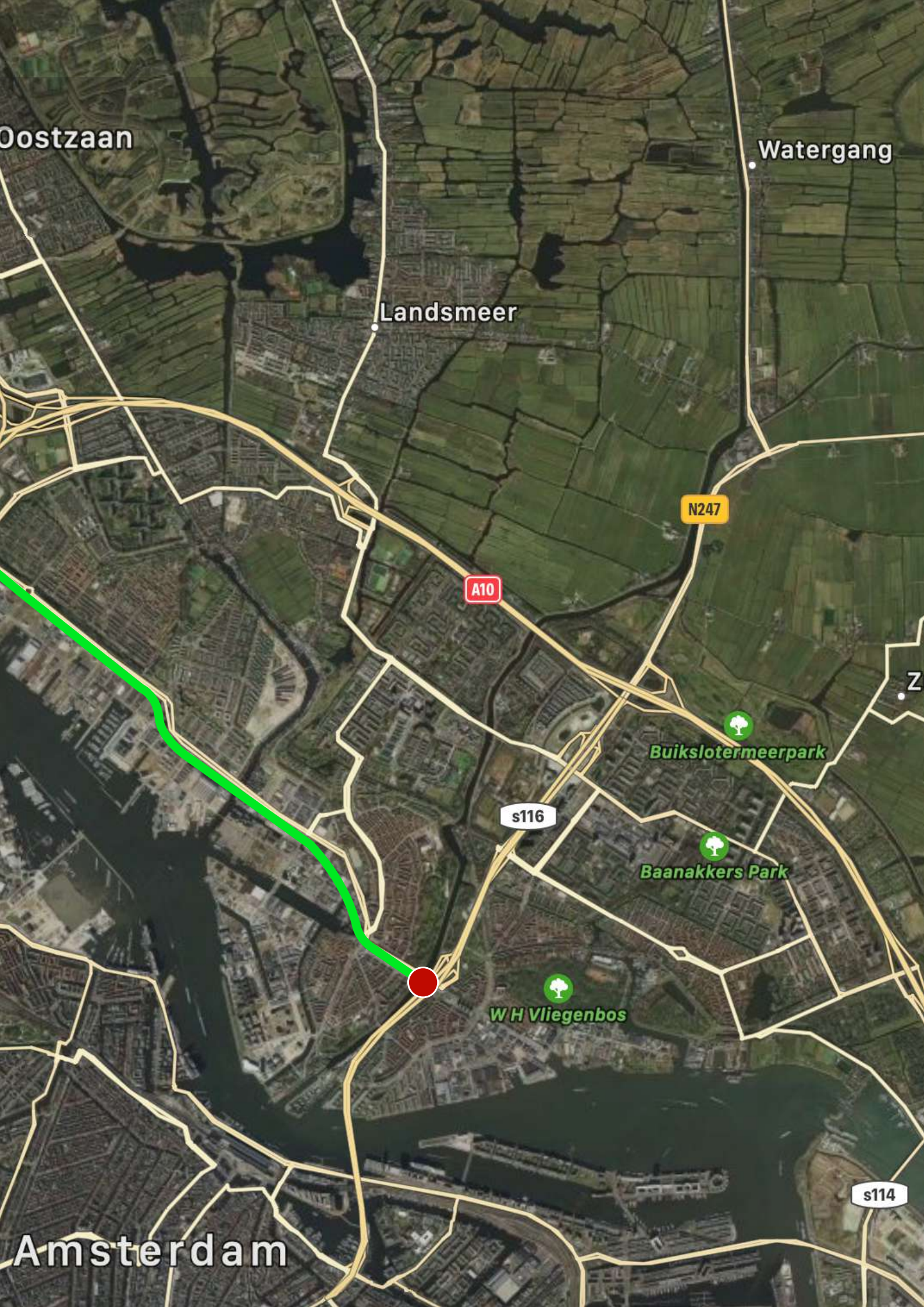
s116

Baanackers Park

W H Vliegenbos

s114

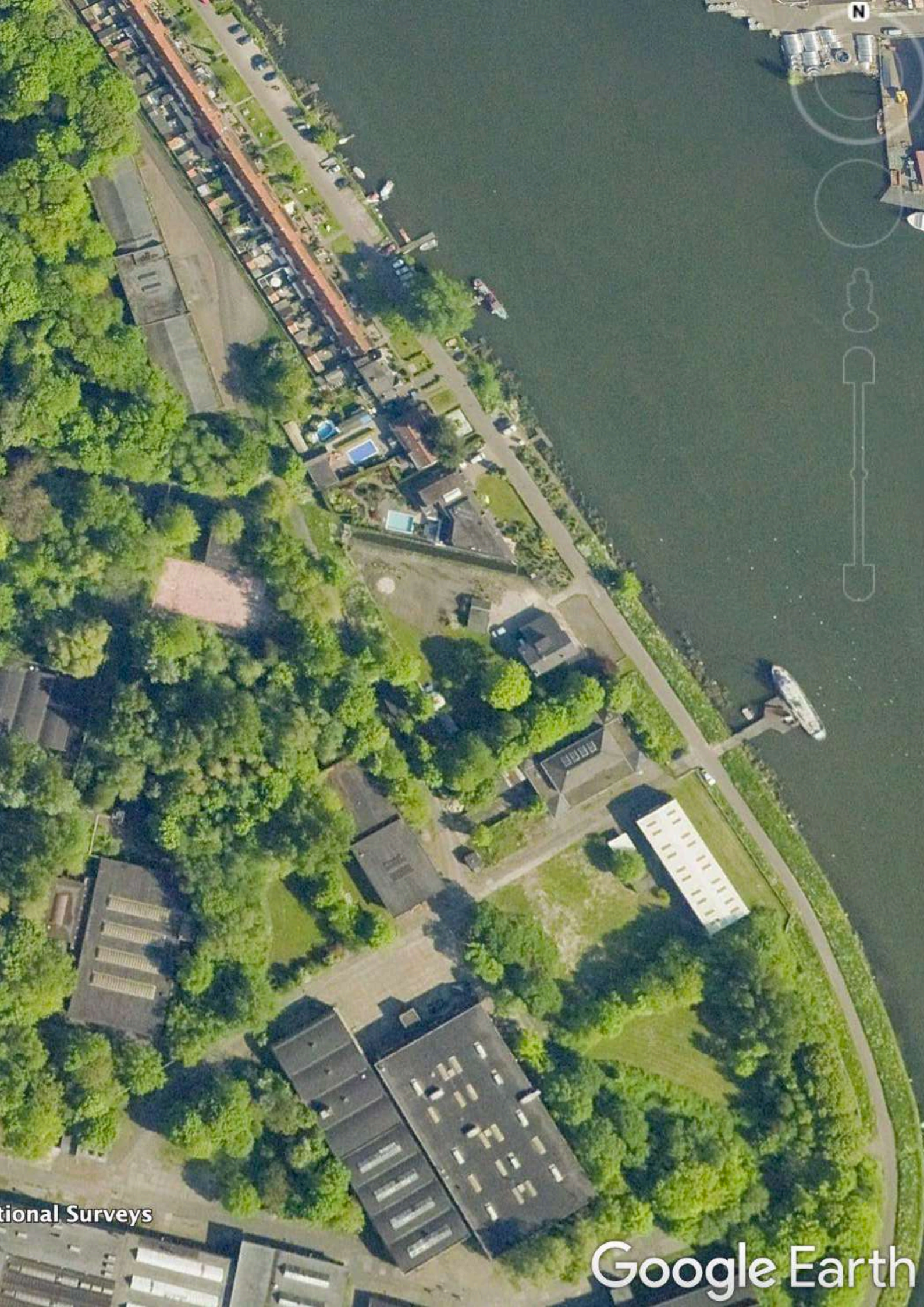
Amsterdam



8-5-2008

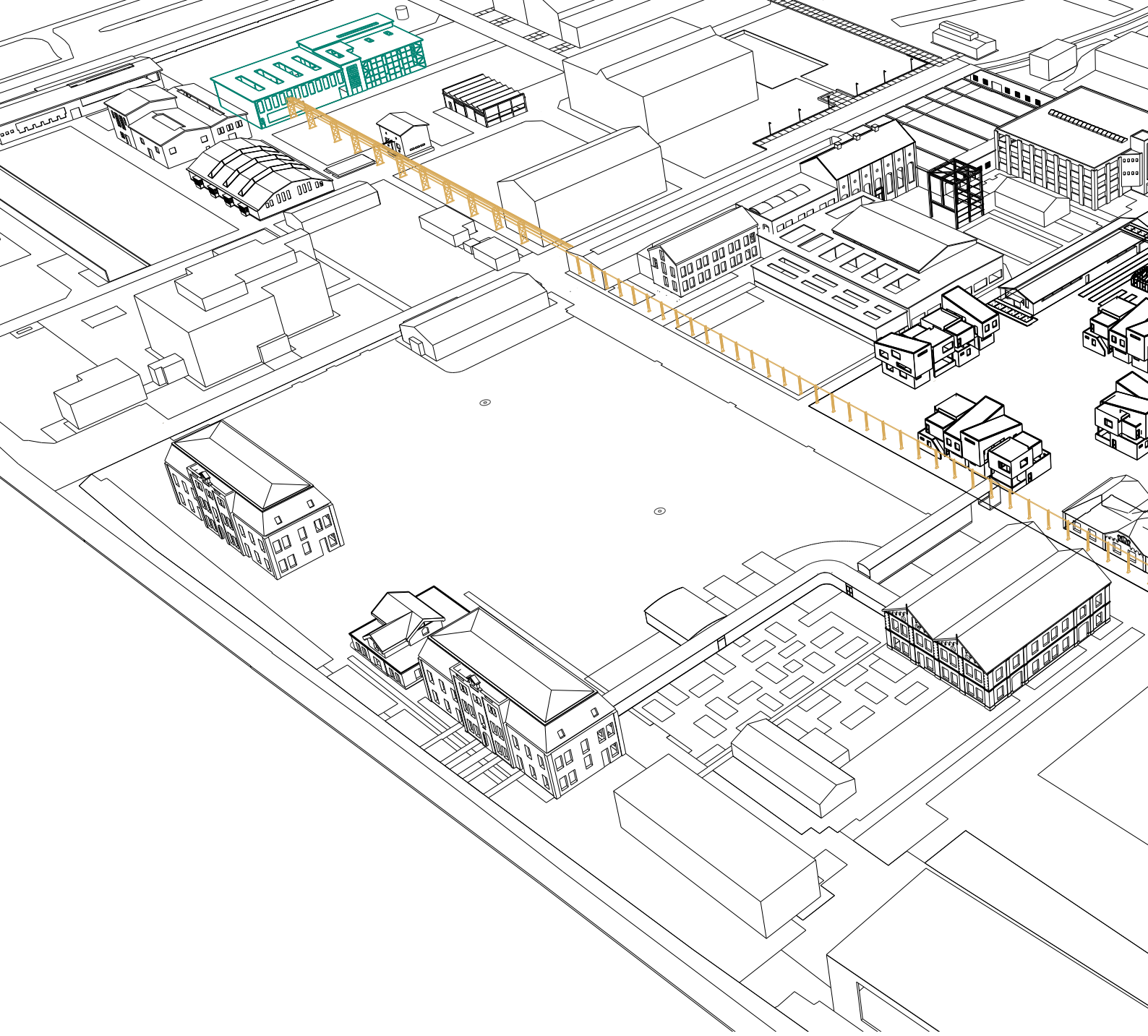


Image © 2019 Aerodata Internat



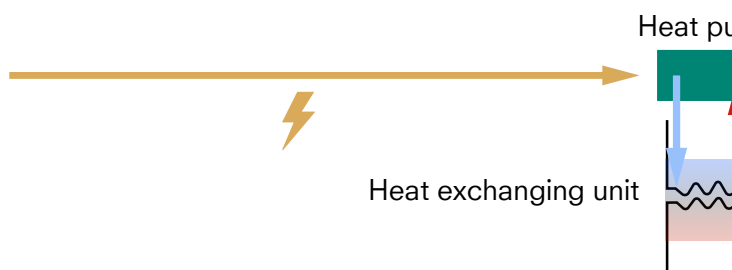
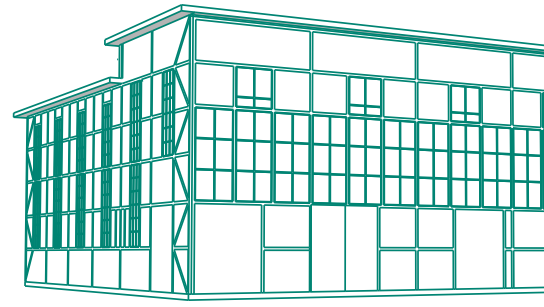
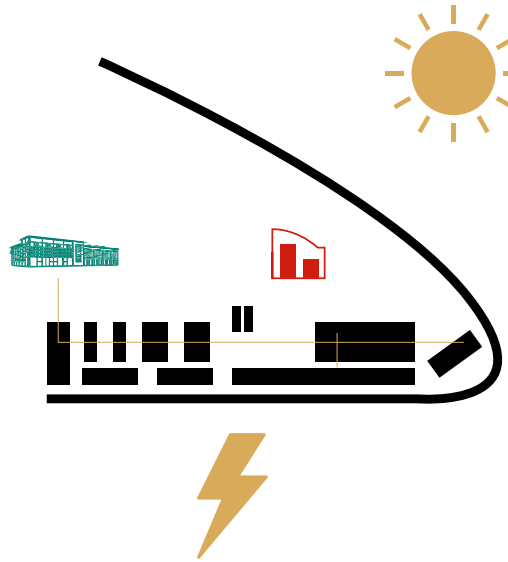
itional Surveys

Google Earth

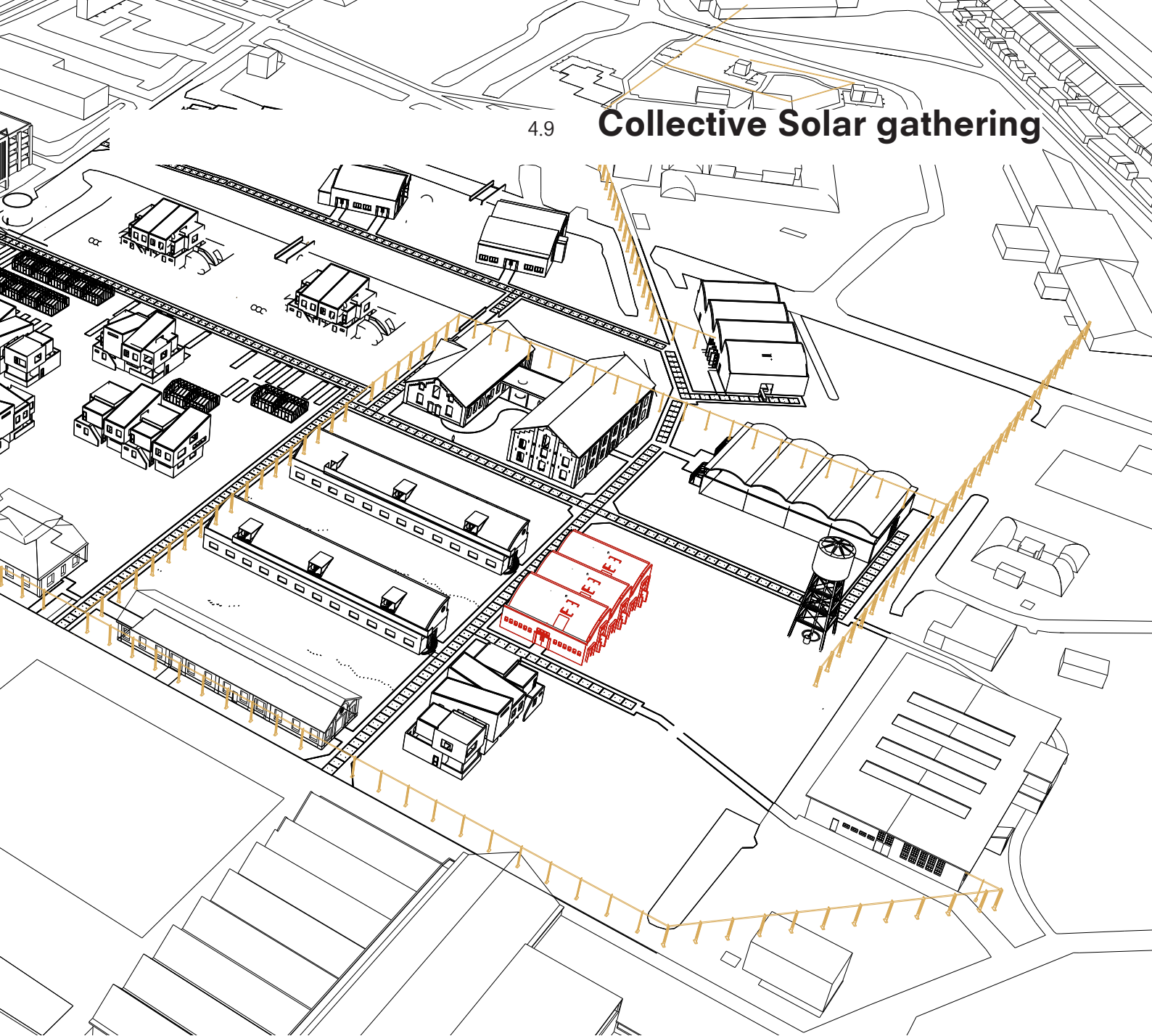


Collective solar gathering

Central Heat pump installation (K)



Collective Solar gathering



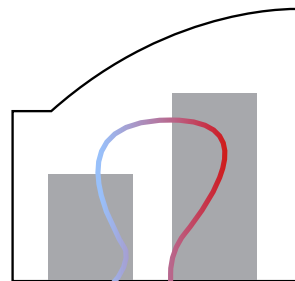
Metelcentrale Hembrug)

Kangaroo residence



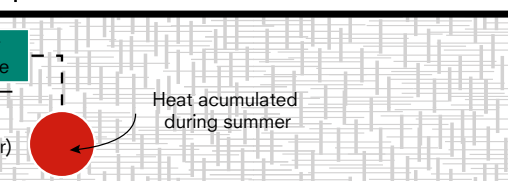
ump

Insulated
water network
trough Hembrug
Ø200mm



Heat
exchanger

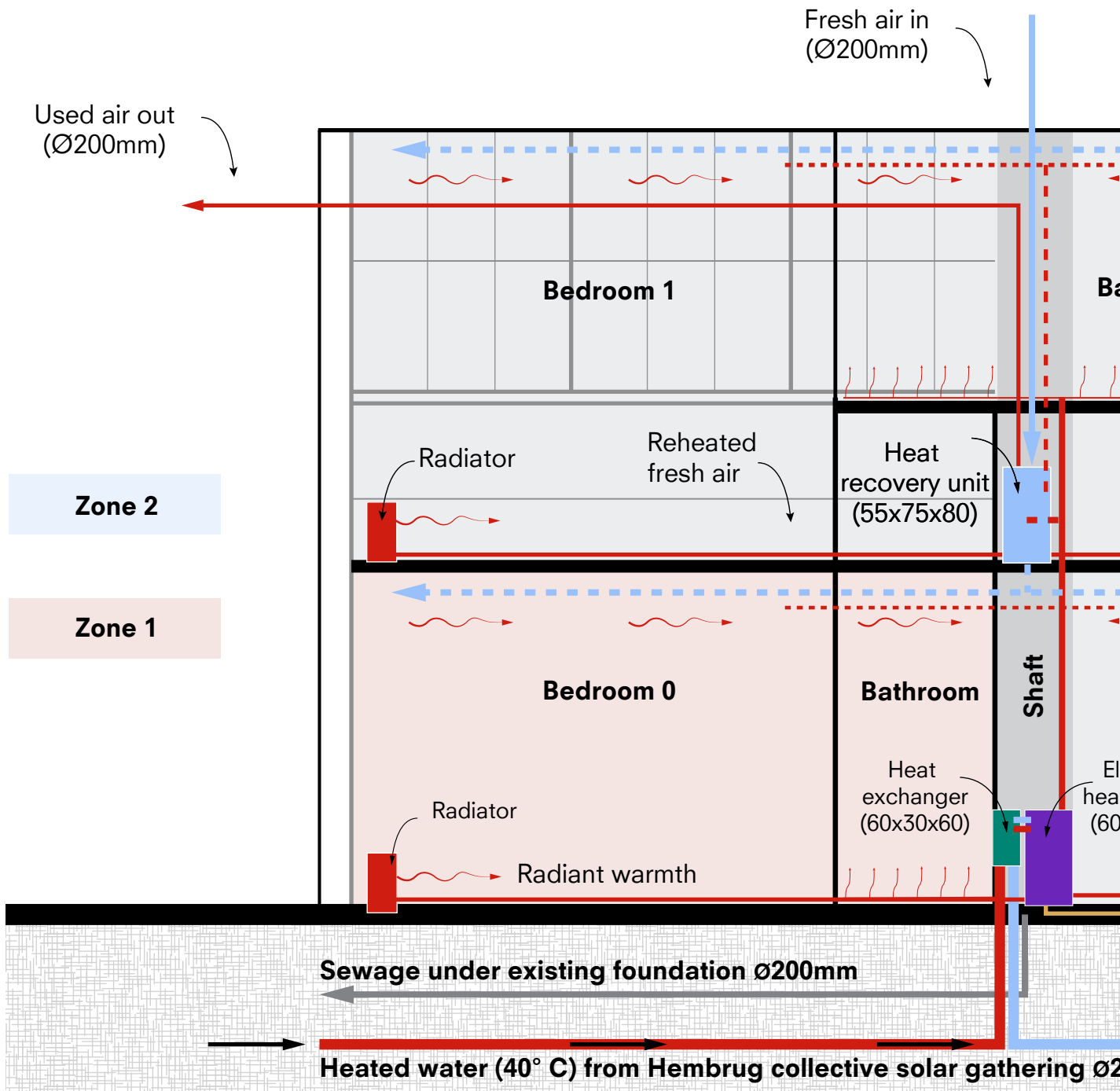
Electrical
heating boiler



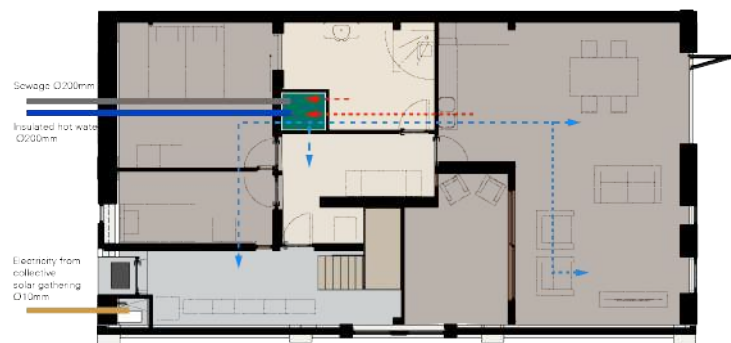
Heat accumulated
during summer

Hot water used by
Floor heating + radiators

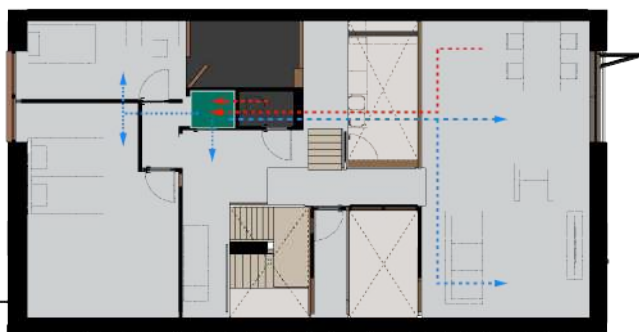
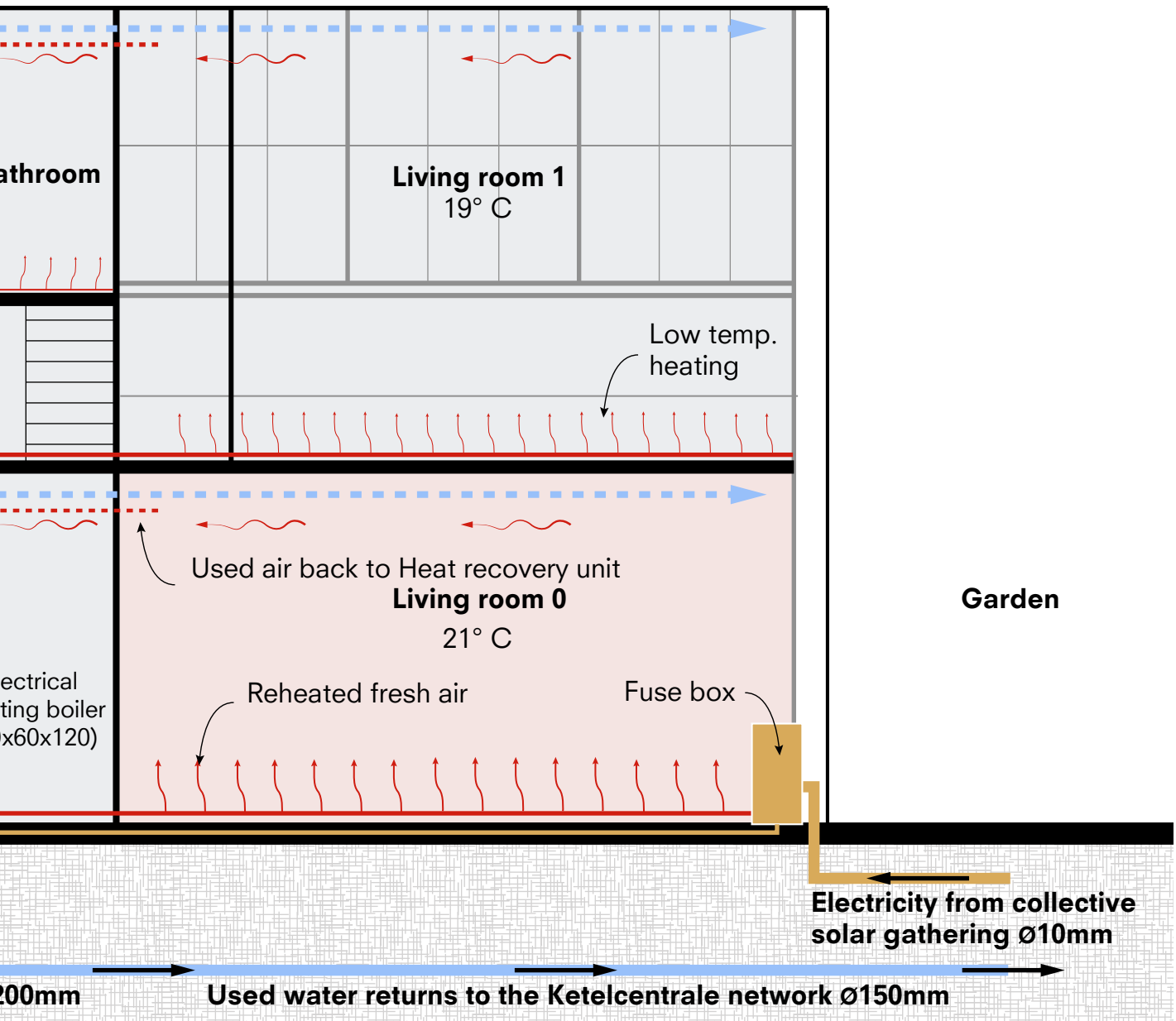
4.10 Heating and ventilation scheme Kangaroo Residences



Insulation from the inside. Target: R_c between 4/5 $m^2 K/W$

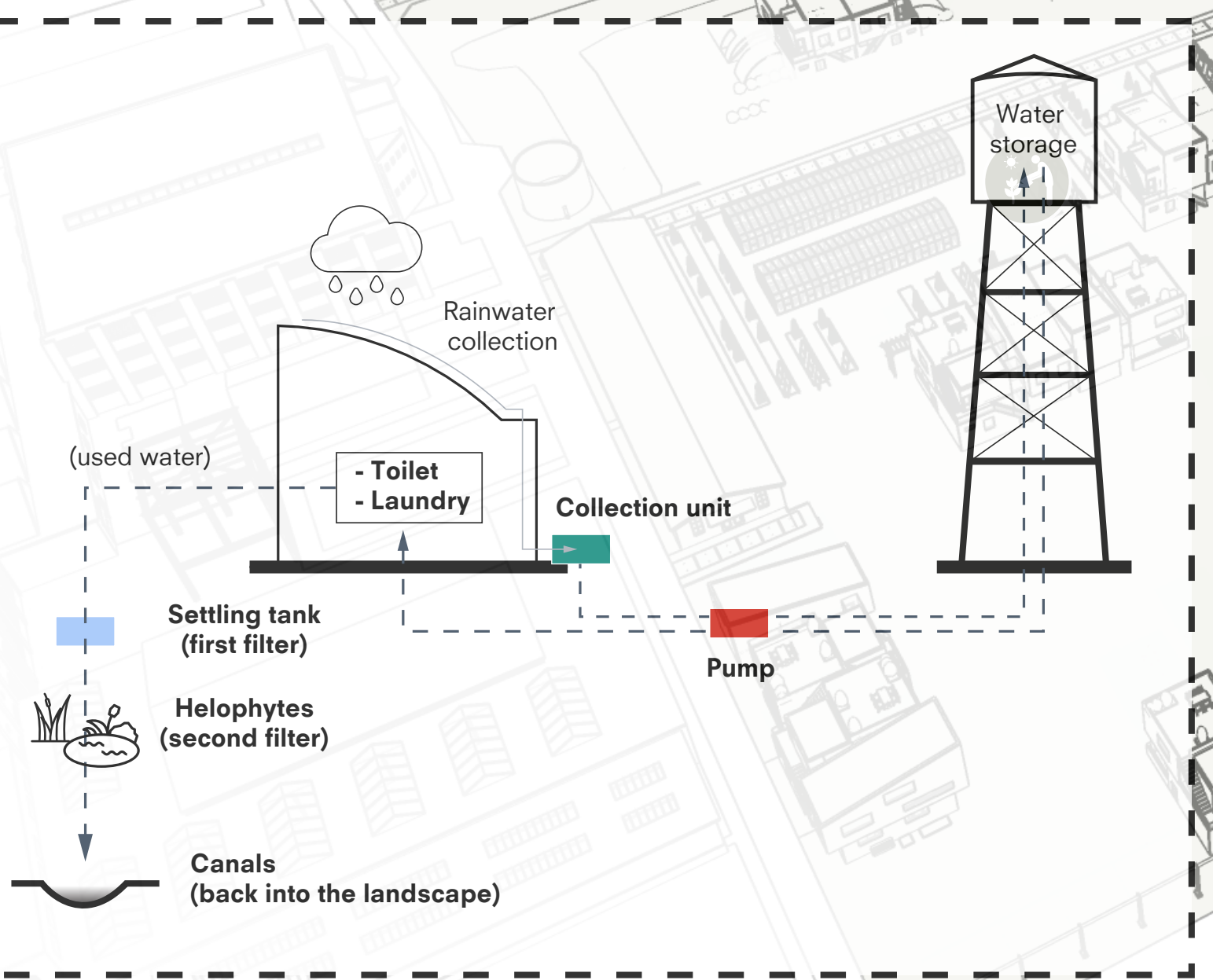


Ground floor



First floor

4.11 Potential grey-water management

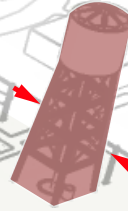


COMMUNAL GARDENING



RAIN COLLECTION

WATER TOWER



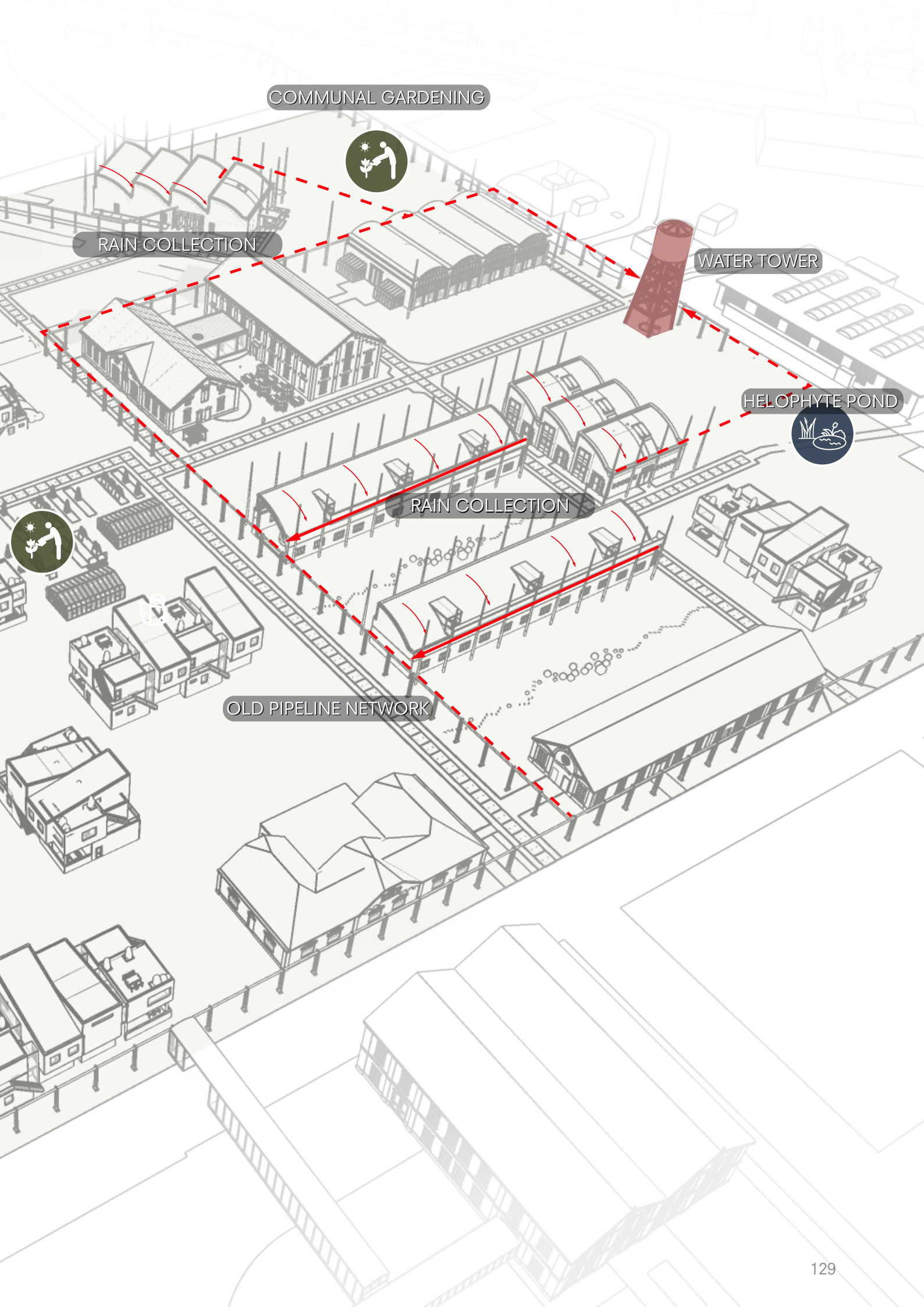
HELOPHYTE POND



RAIN COLLECTION

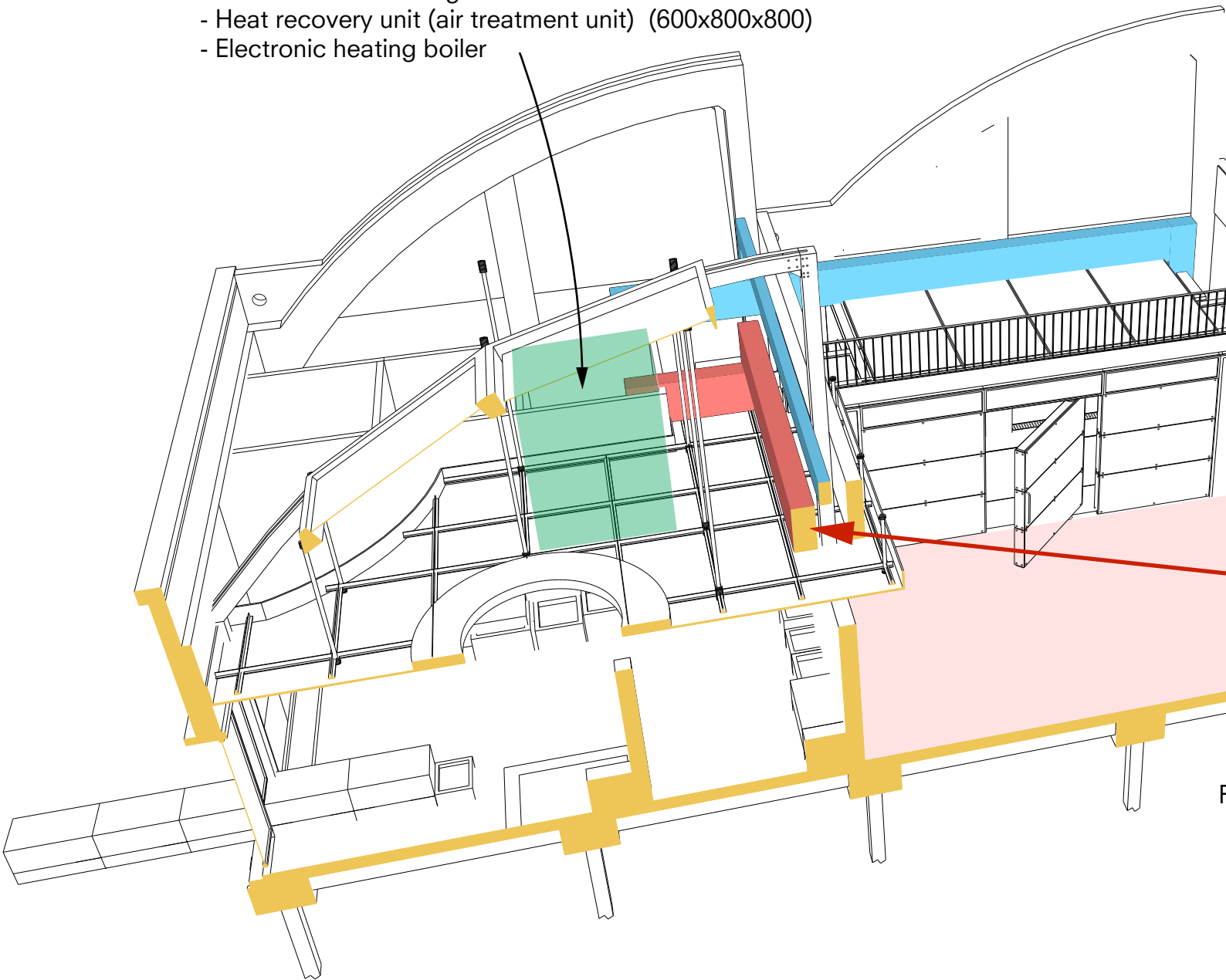


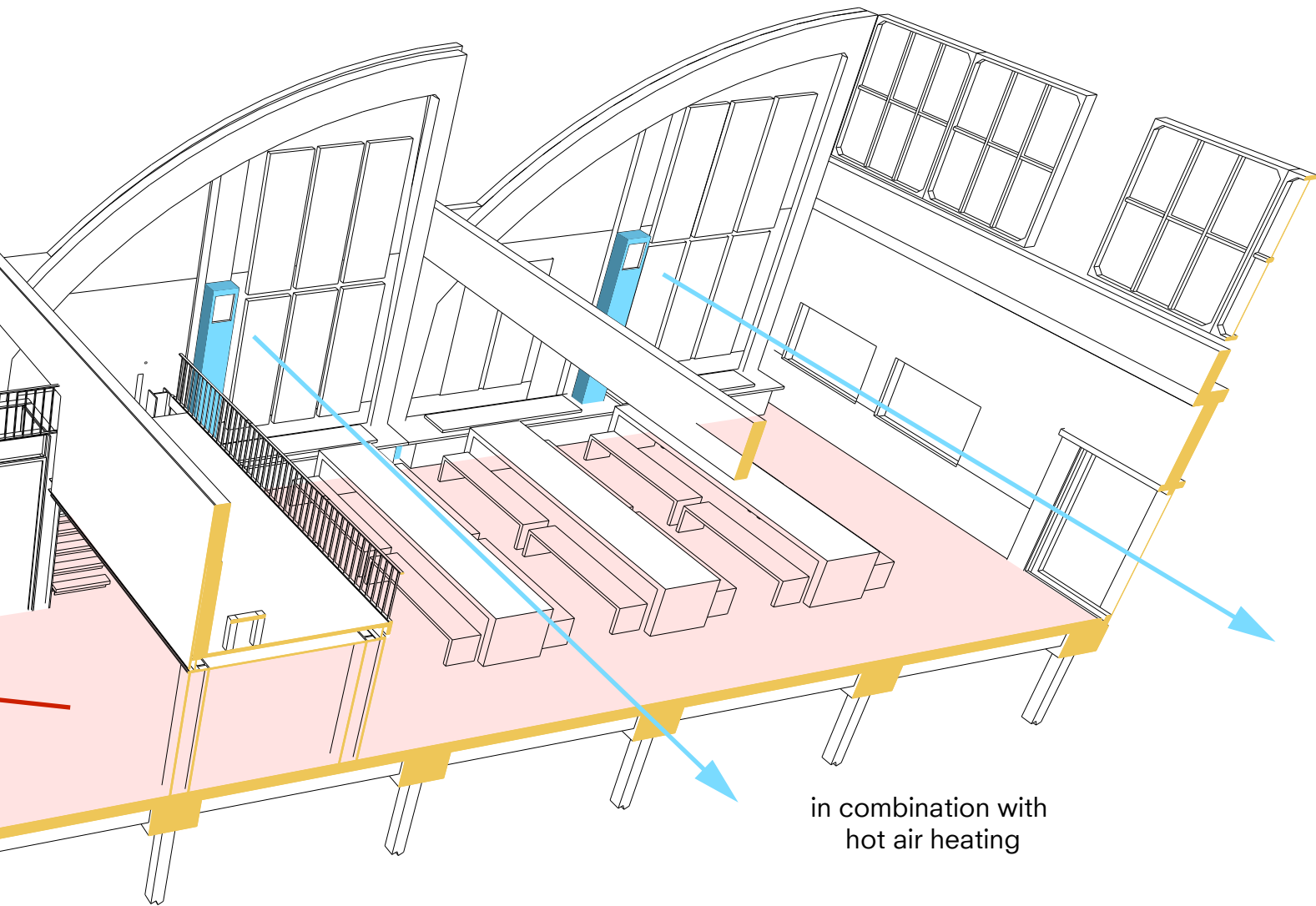
OLD PIPELINE NETWORK



4.12 **Ventilation principle of the Contemplation Hall**

- Service block including:
- Heat recovery unit (air treatment unit) (600x800x800)
 - Electronic heating boiler





in combination with
hot air heating

Floor heating

Communal gathering (toevoer):

Bezettingsgraad	180m ² / 3,3 = 54 personen
Ventilatieluchthoeveelheid:	216 dm ³ /s
Toelaatbaar geluidsniveau:	2 m/s
omzetten naar m ³ /s	0,216 m ³ /s

$$0,216 / 2 = 0,108 \text{ m}^2$$

$$= \mathbf{1080\text{cm}^2}$$

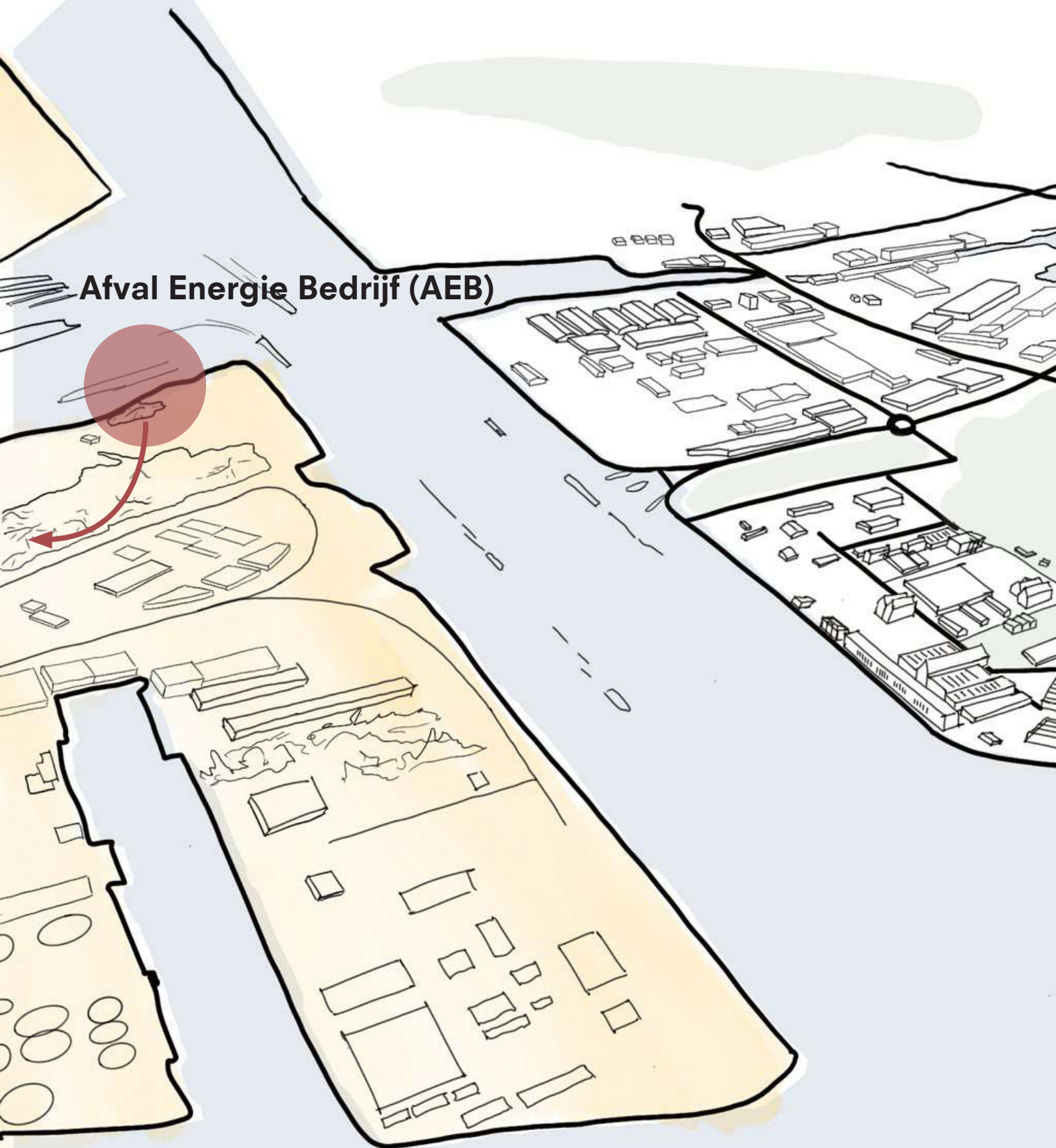
$$\pi \times \text{straal}^2 = 1080$$

$$1080 / \pi = 344$$

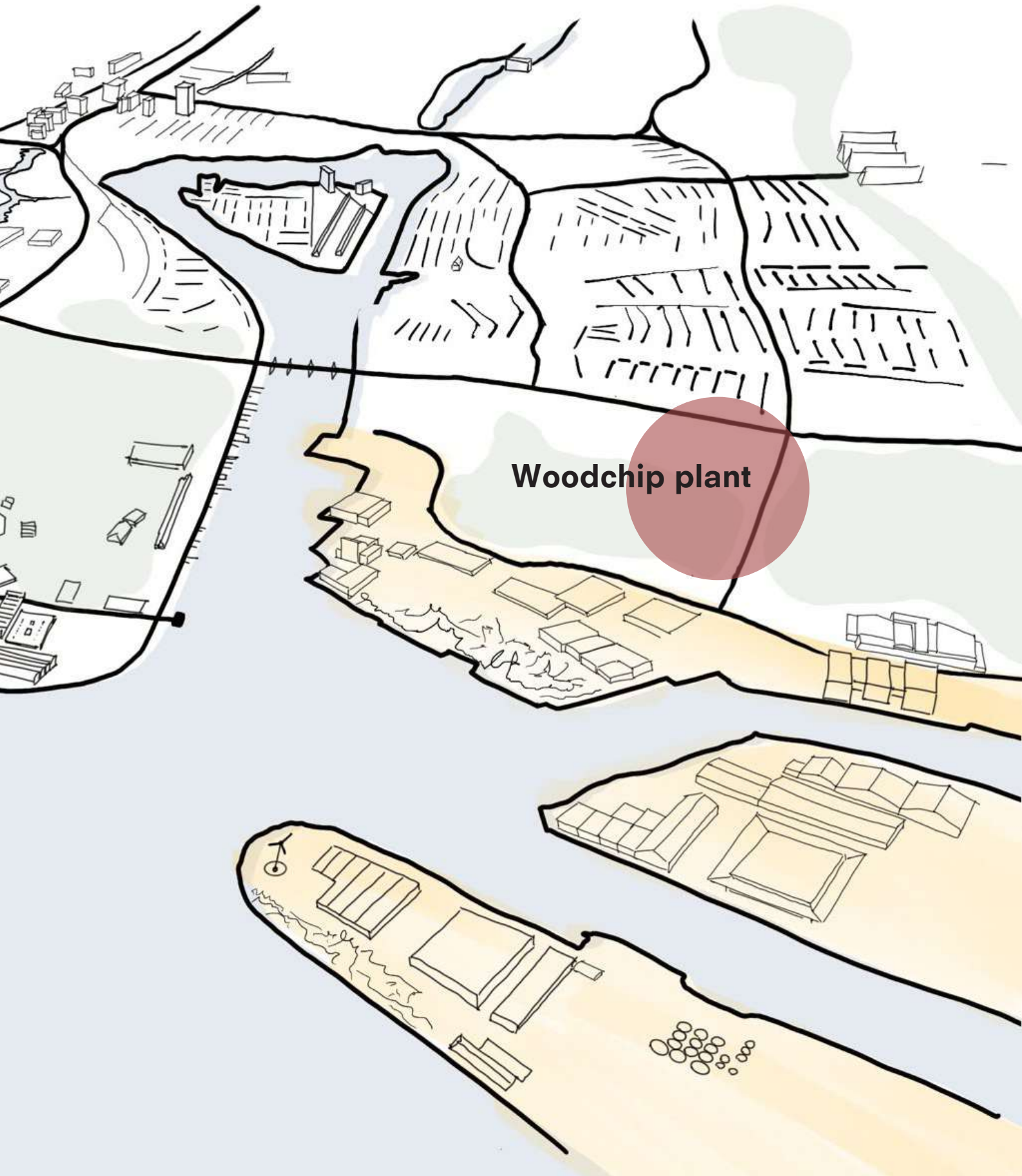
$$\text{Straal luchtkanaal: } \sqrt{344} = 18,5 \text{ cm}$$

$$\mathbf{\text{Diameter: } = 37 \text{ cm}}$$

Potential city heating



Afval Energie Bedrijf (AEB)



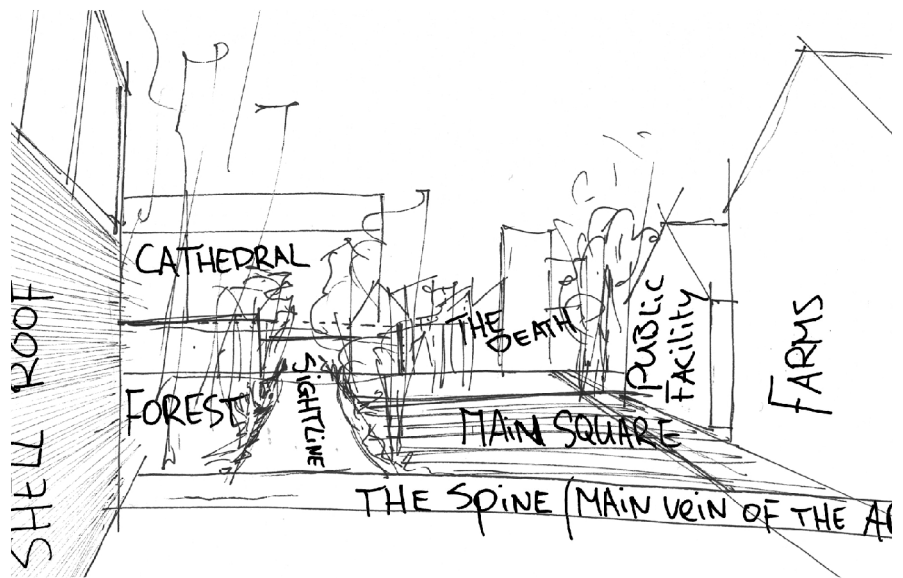
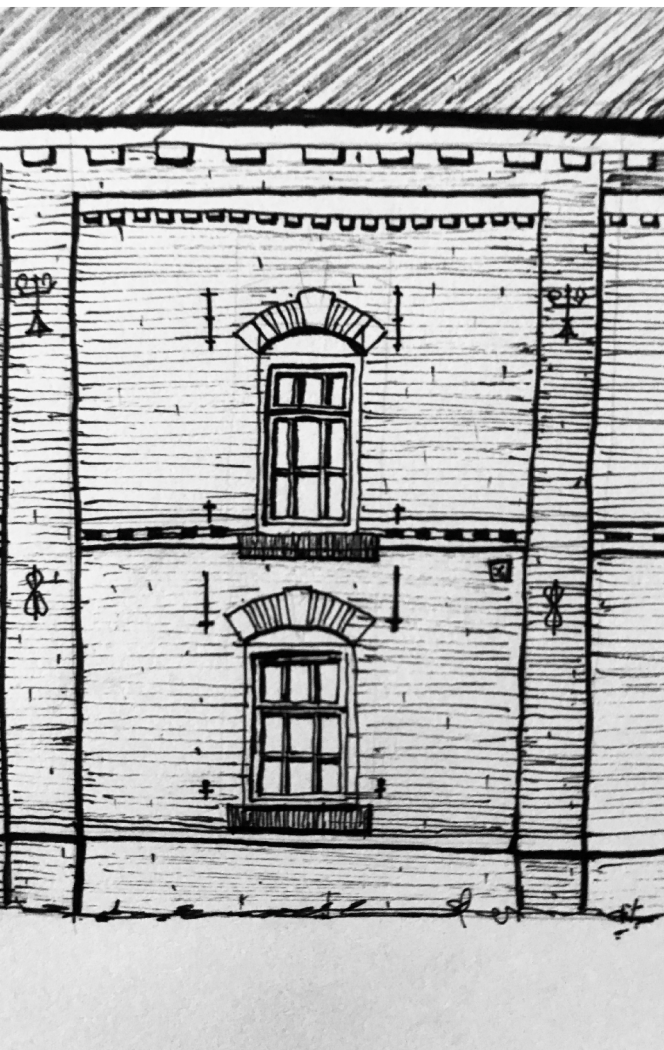
Woodchip plant

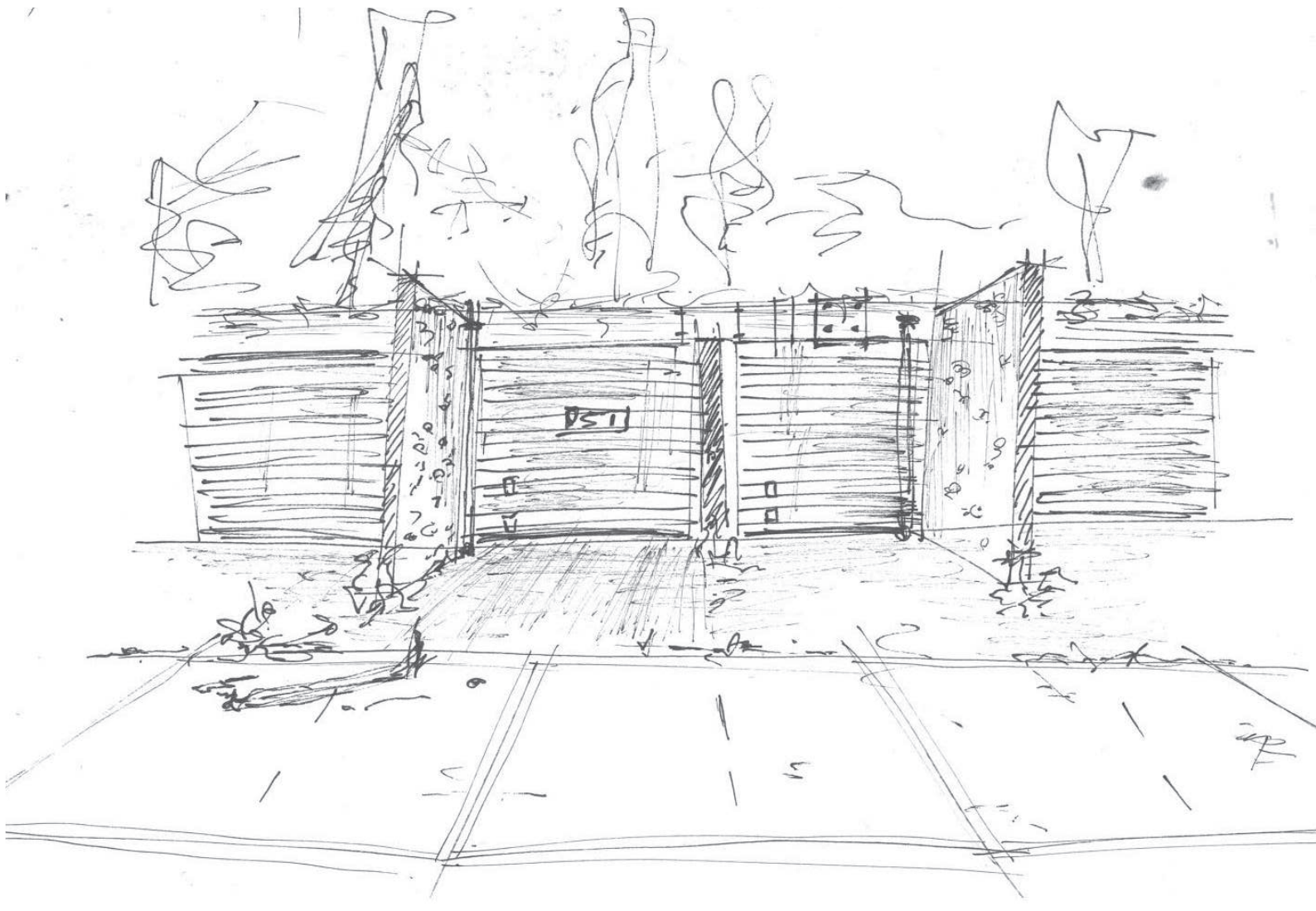
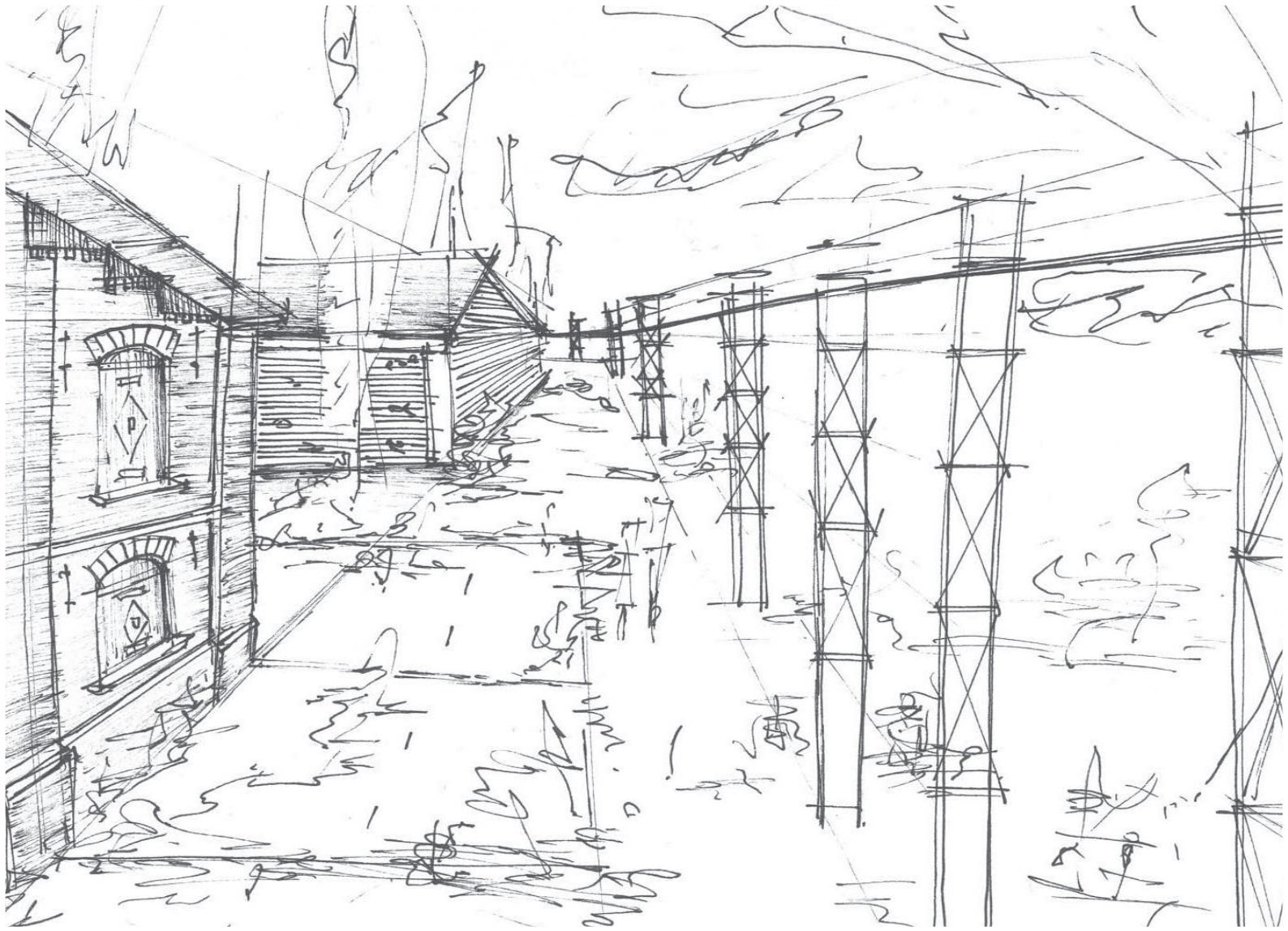


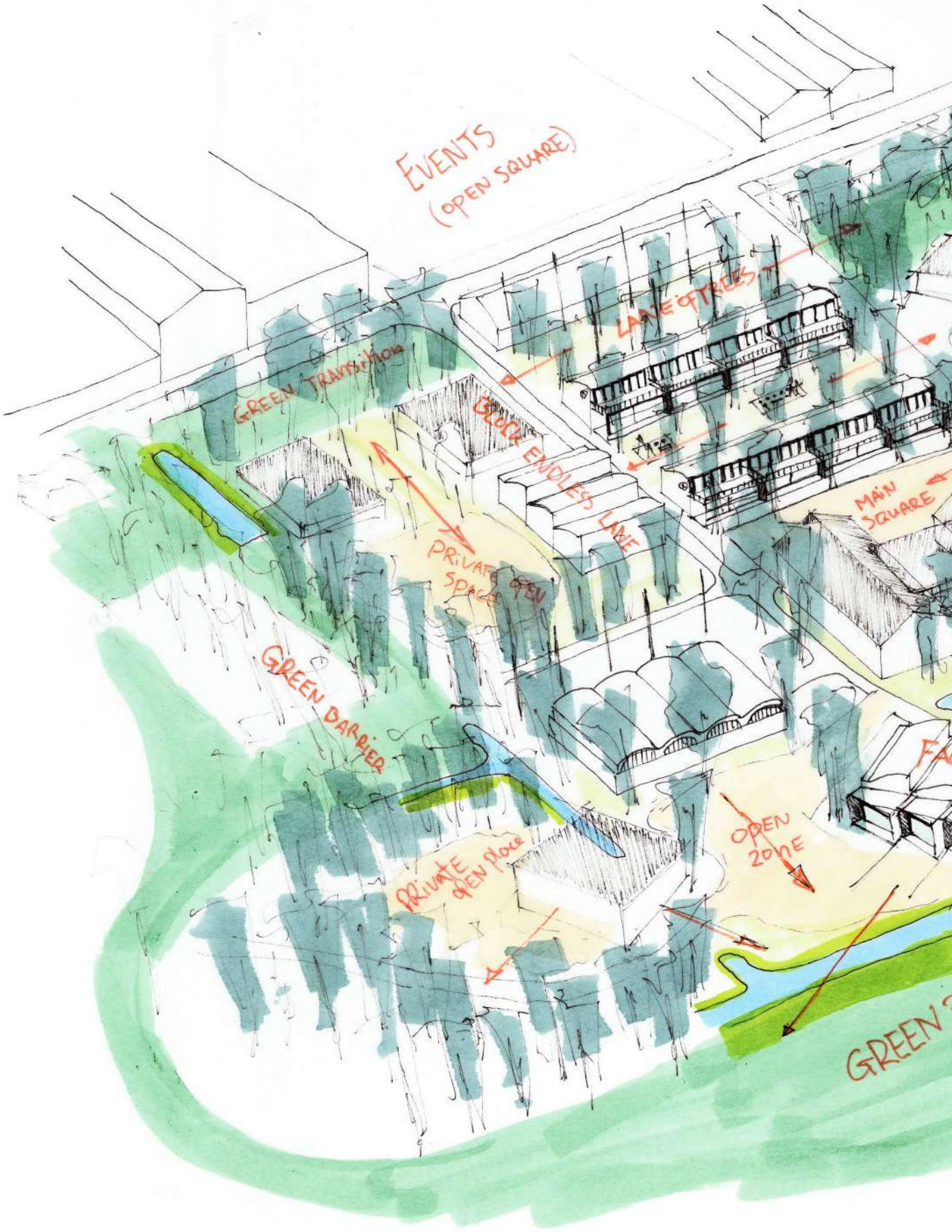
05

PROCESS









EVENTS
(OPEN SQUARE)

GREEN TRANSITION

LANE OF TREES

BLOCK ENDLESS LANE

PRIVATE SPACES

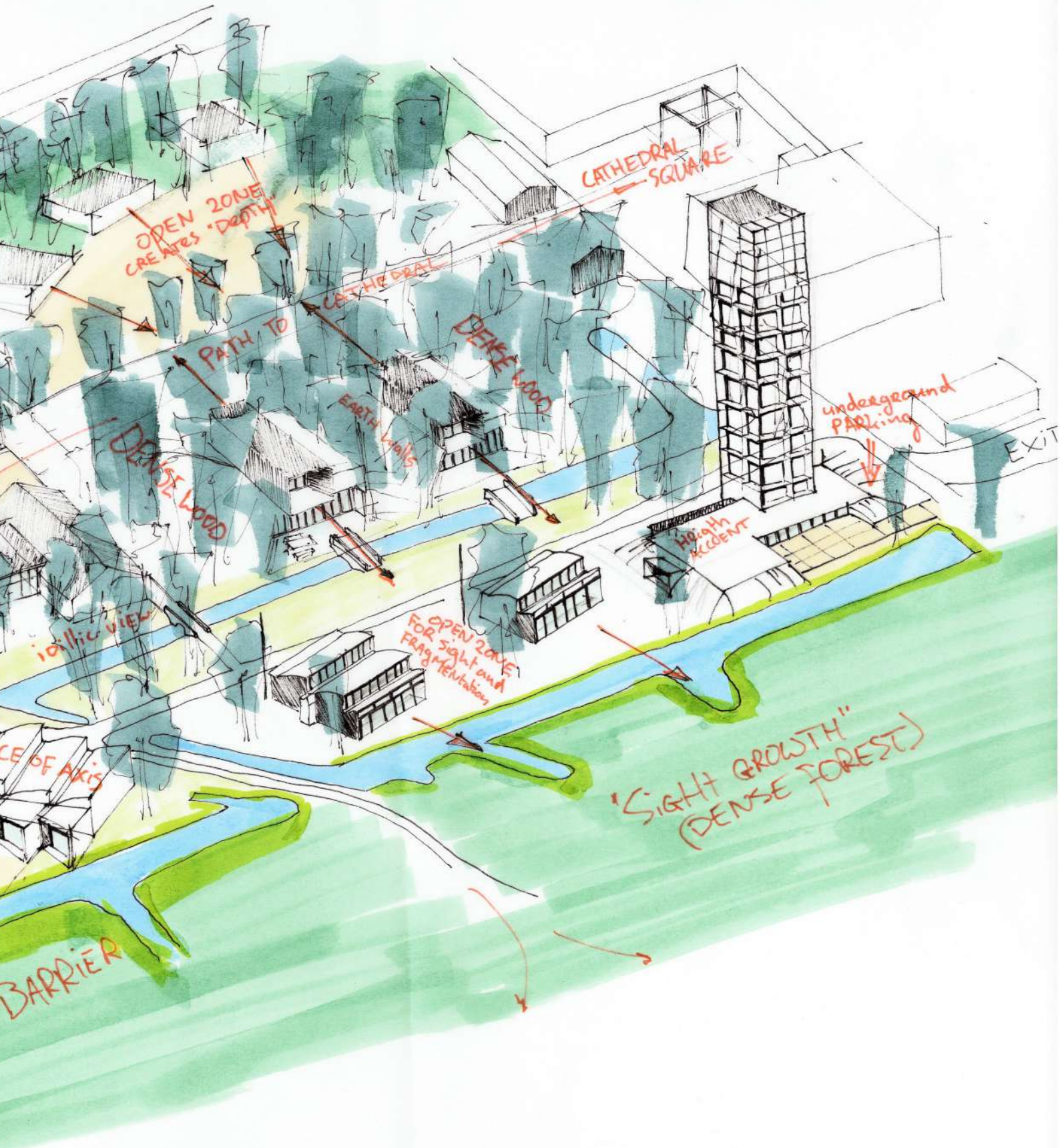
MAIN SQUARE

GREEN BARRIER

PRIVATE OPEN PLACE

OPEN ZONE

GREEN



OPEN ZONE
CREATES DEPTH

CATHEDRAL
SQUARE

PATH TO
CATHEDRAL

DENSE WOOD

DENSE WOOD

EARTH WALLS

underground
parking

HEIGHT
ACCENT

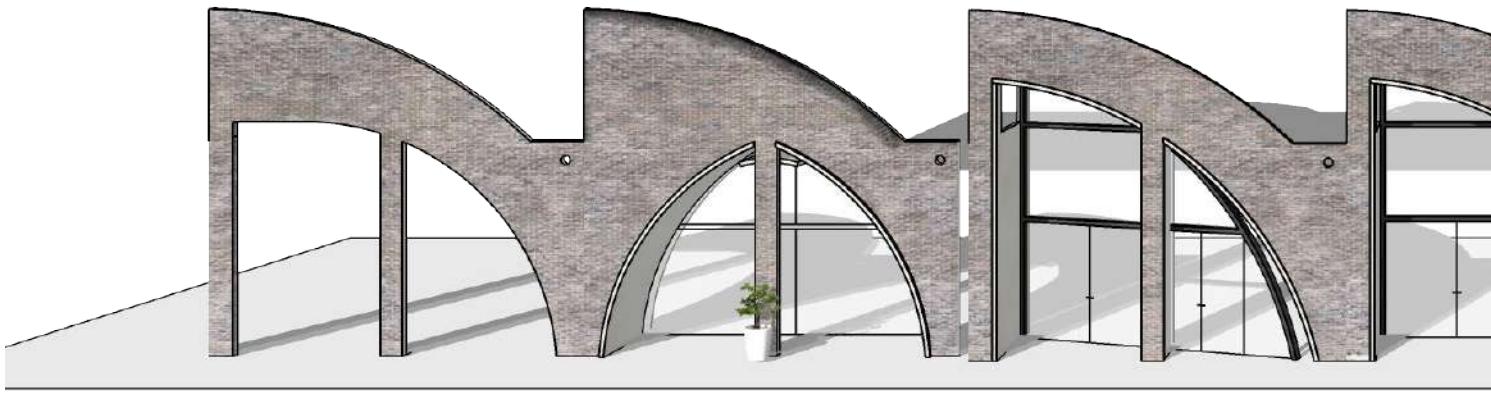
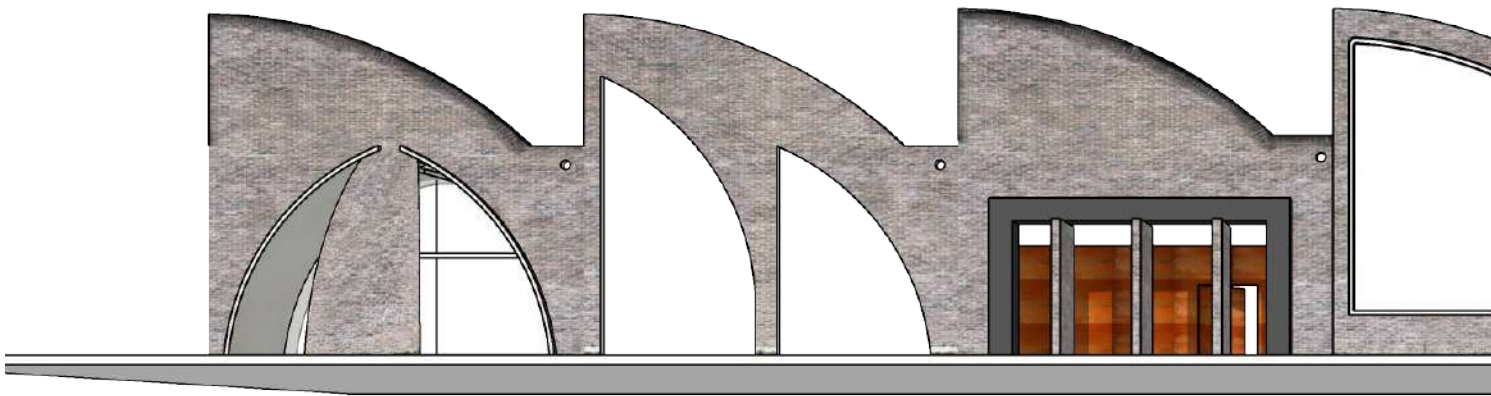
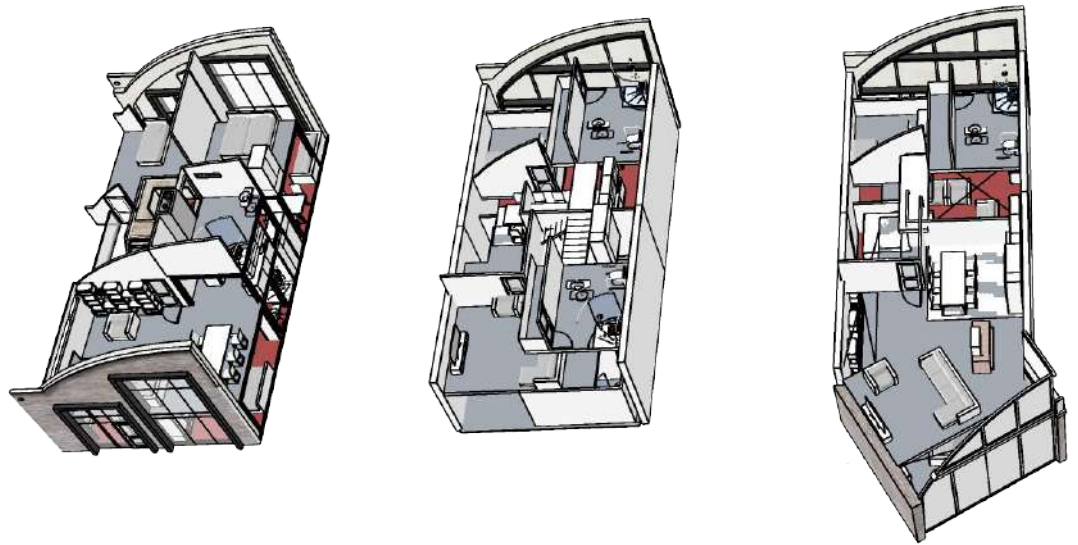
idyllic VIEW

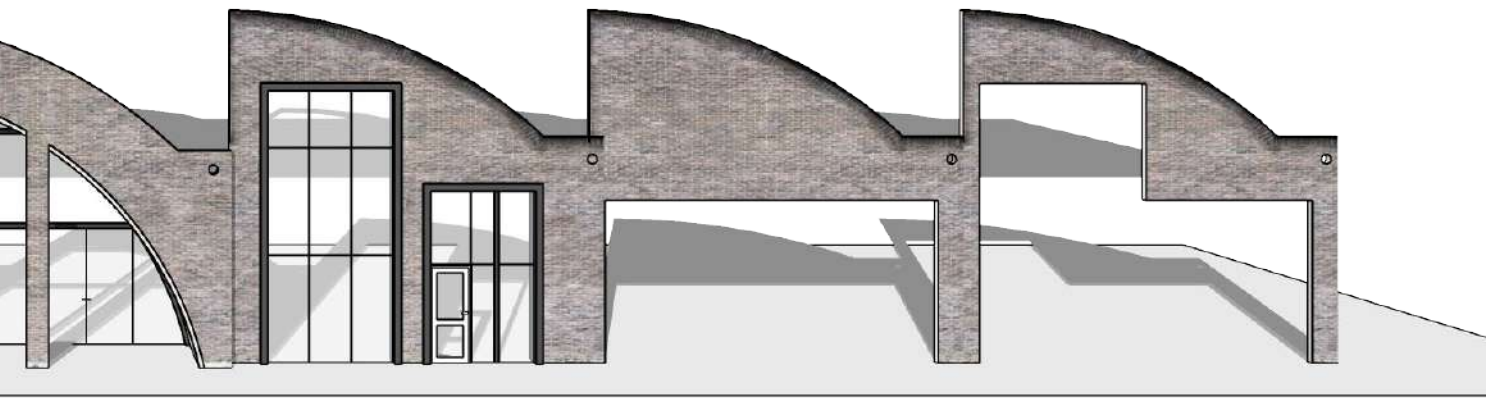
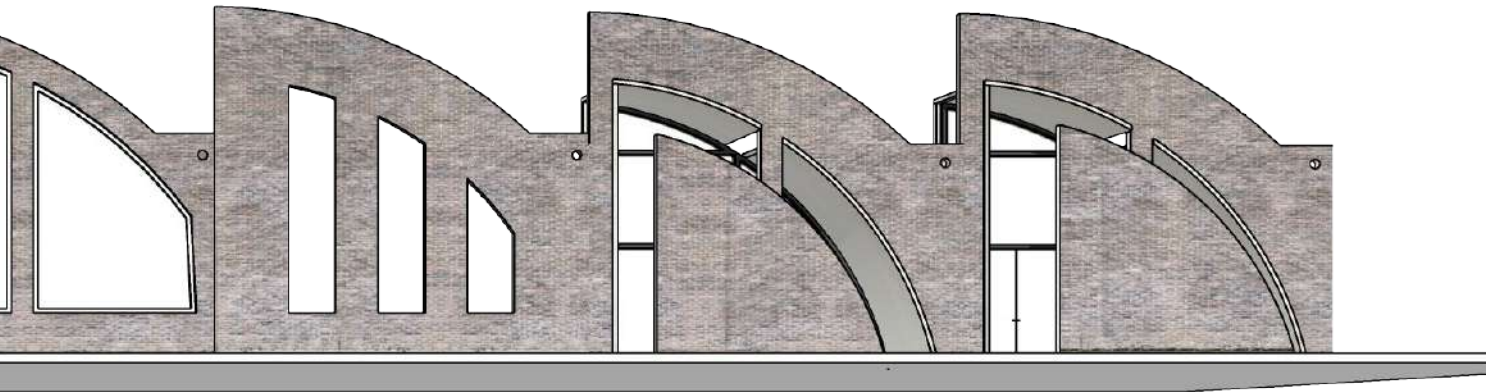
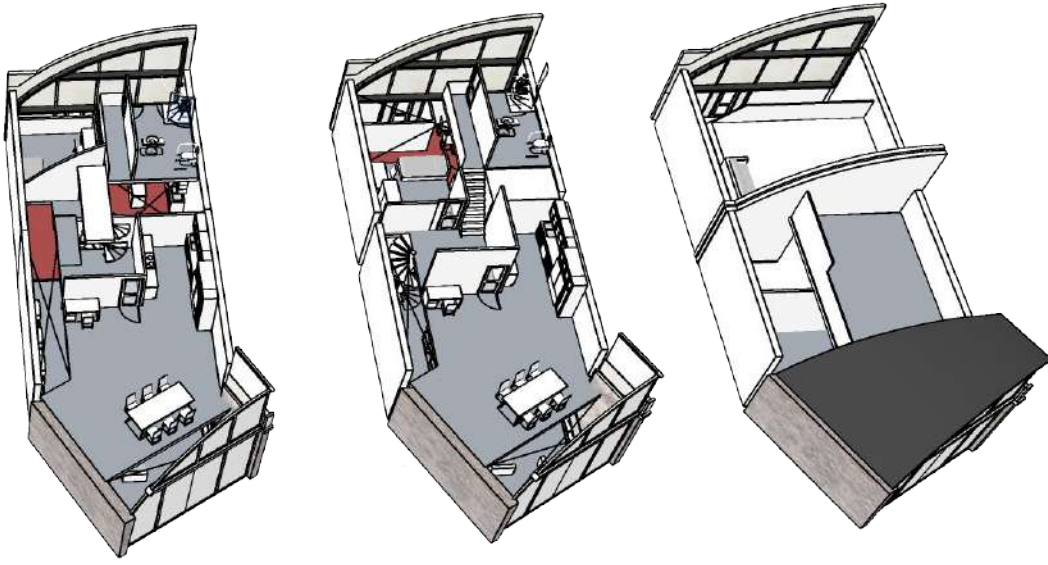
OPEN ZONE
FOR SIGHT AND
FRAGMENTATION

"SIGHT GROWTH"
(DENSE FOREST)

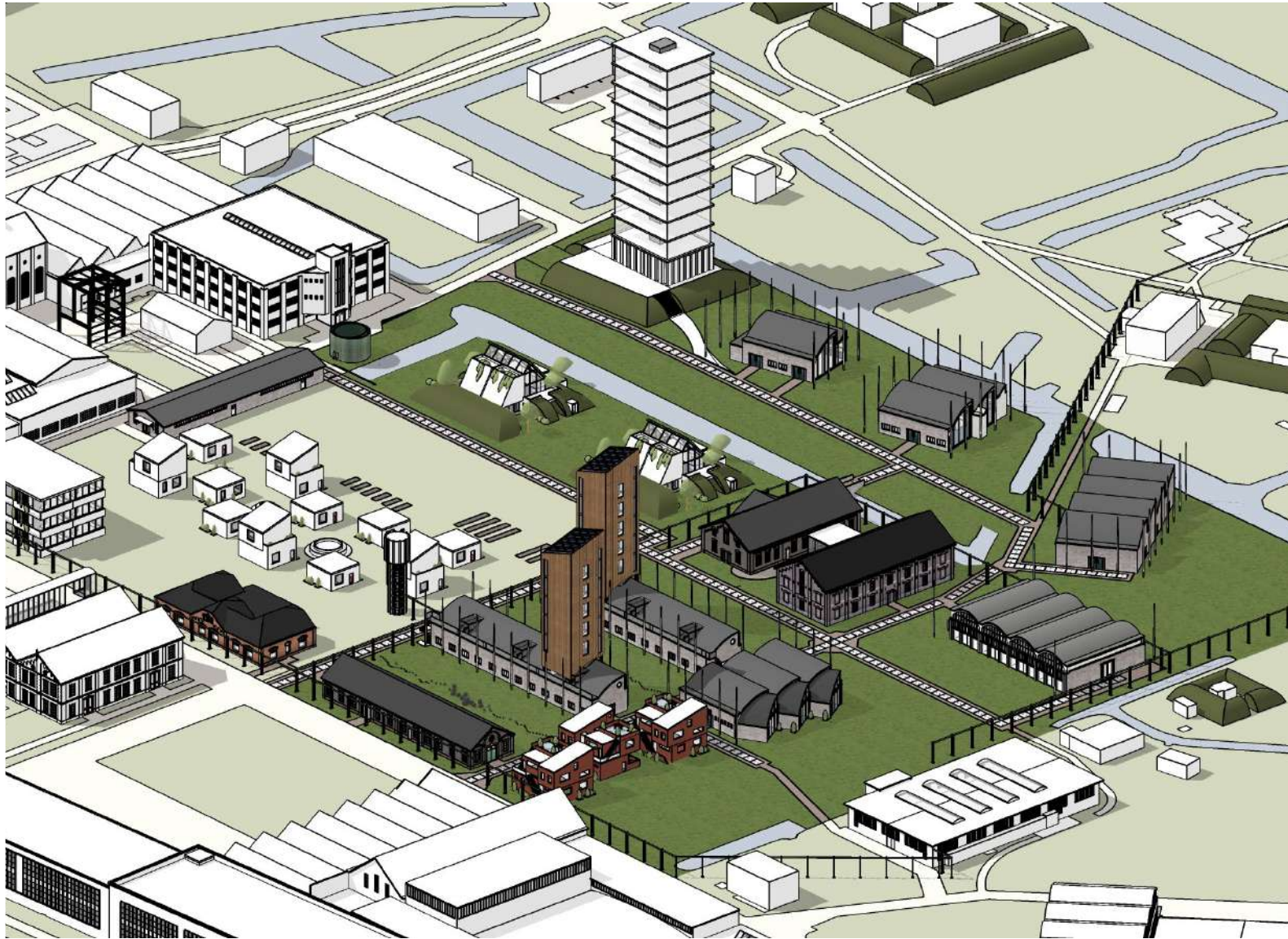
CE OF AXIS

BARRIER





OLD POSITION



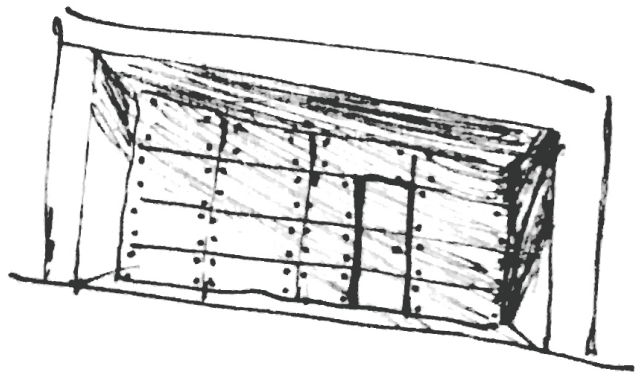
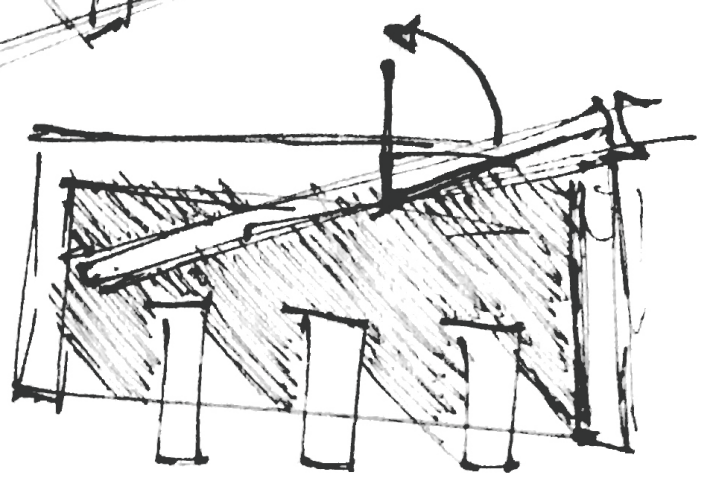
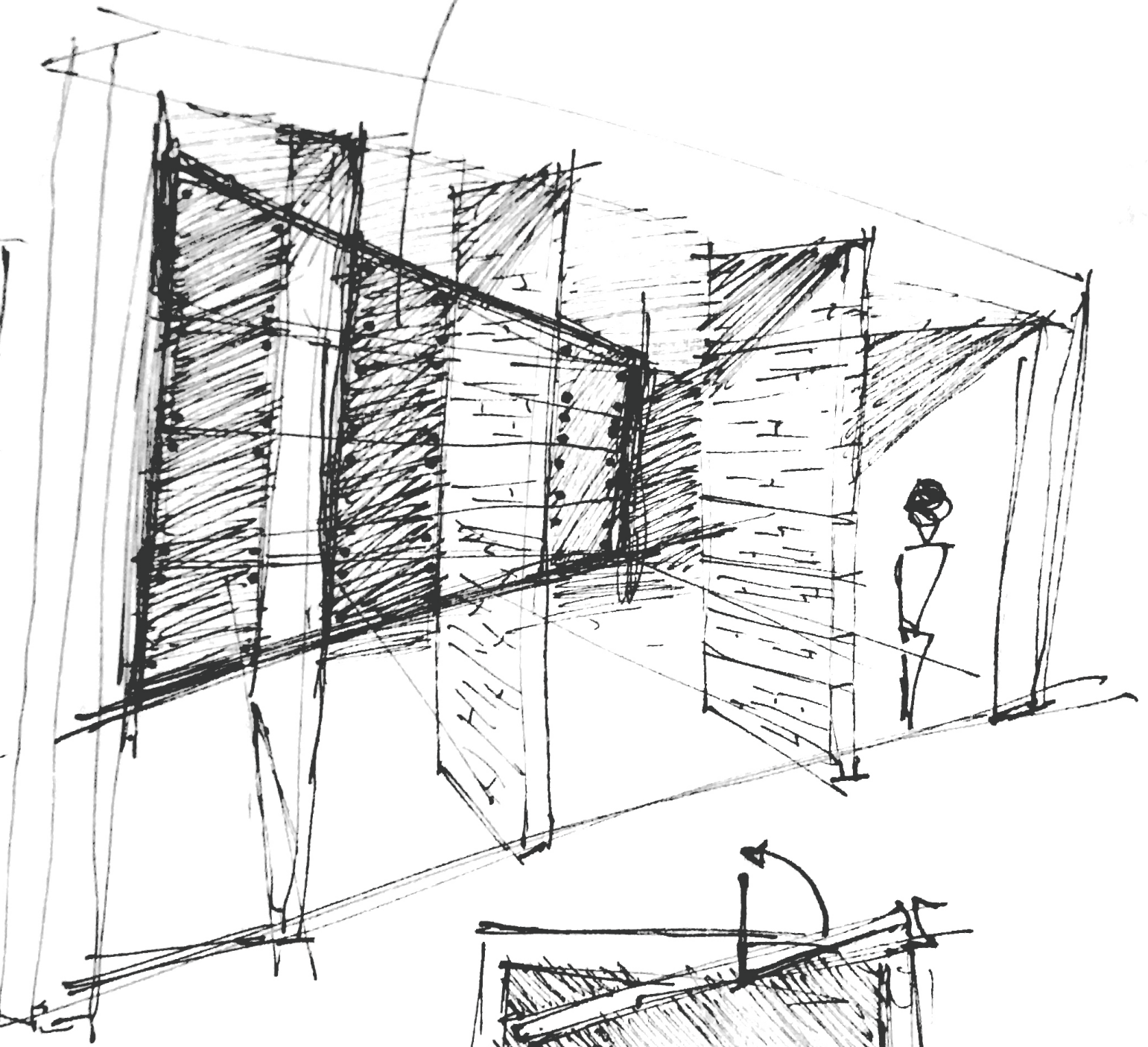
**HEIGHT ACCENTS, VERTICALITY TOOK AWAY
THE SENSE OF HUMAN SCALE**

NEW POSITION

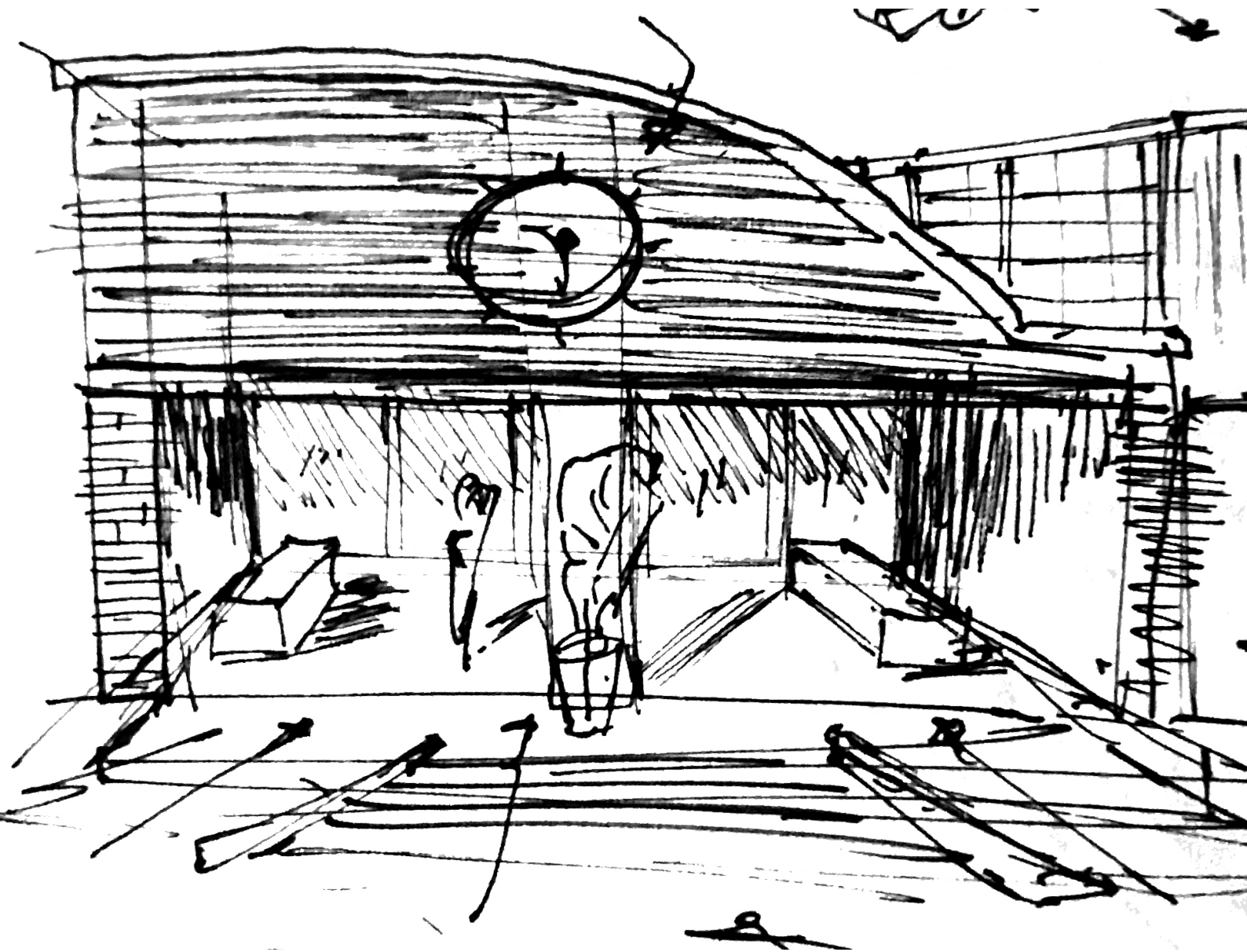


SMALL-SCALE, FREE STANDING MODULES

CORROE N SEEZ



STRijklcht

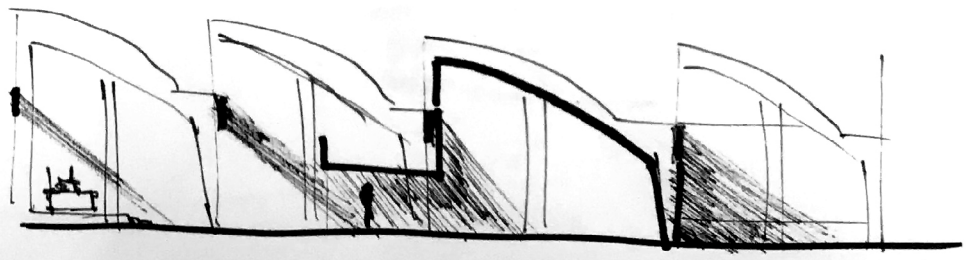
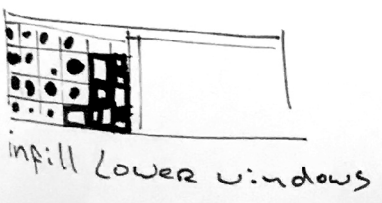
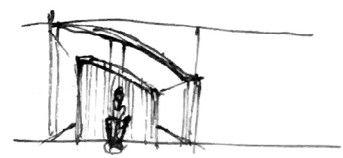
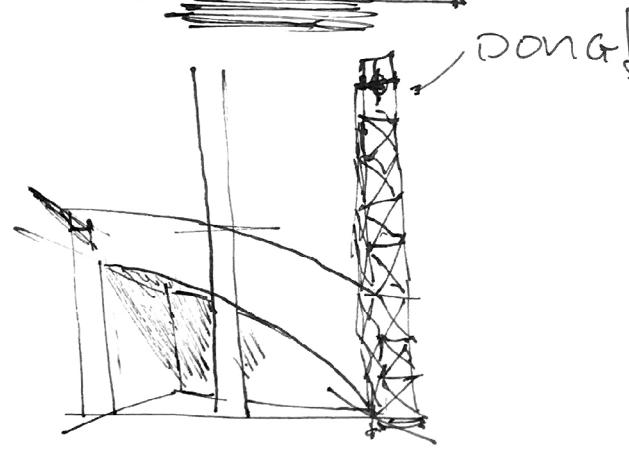
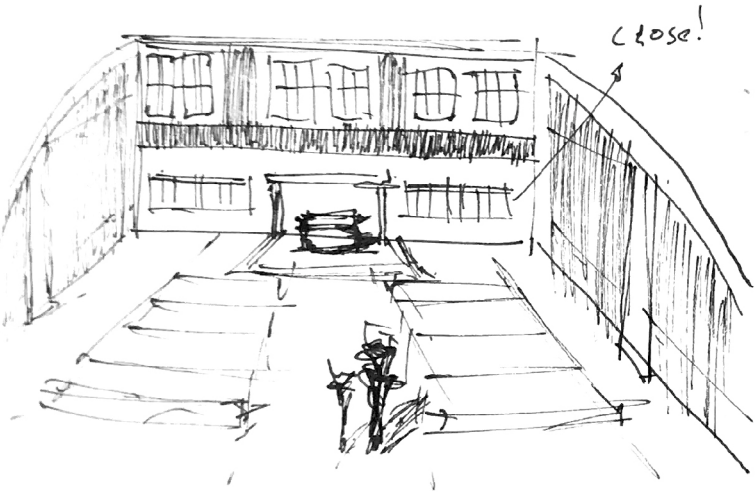
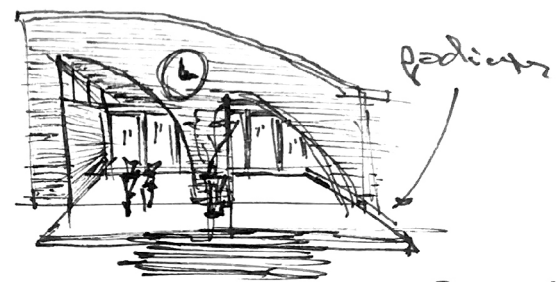
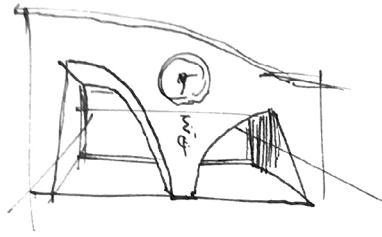
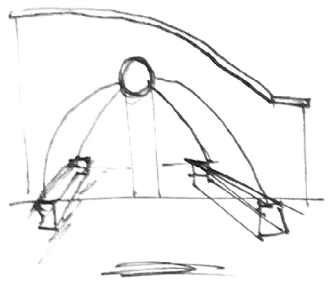
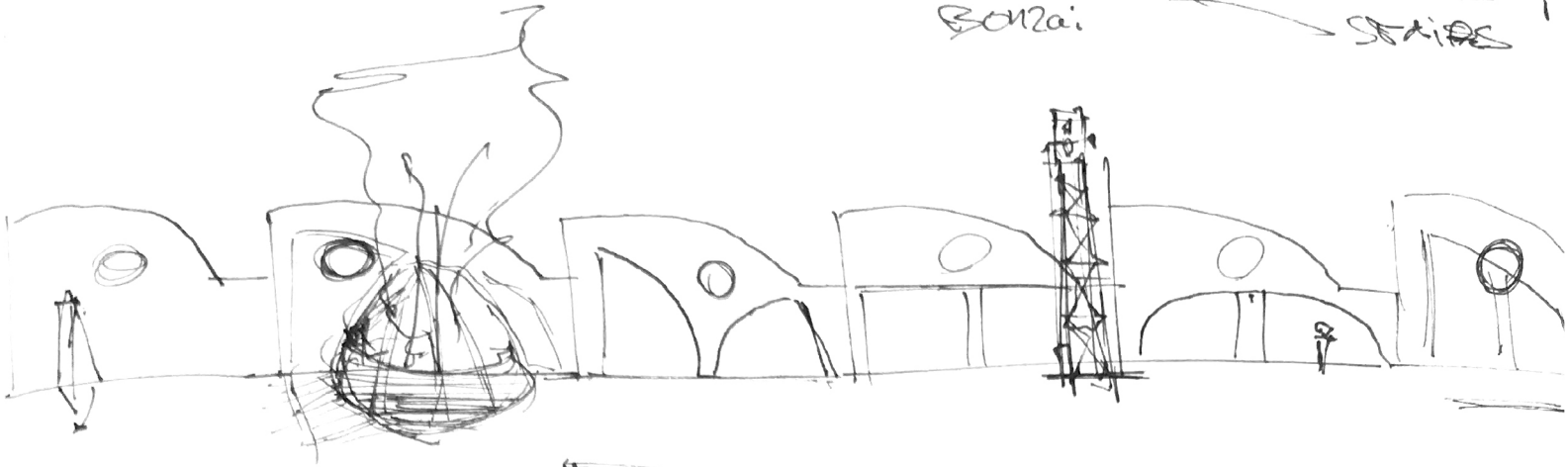
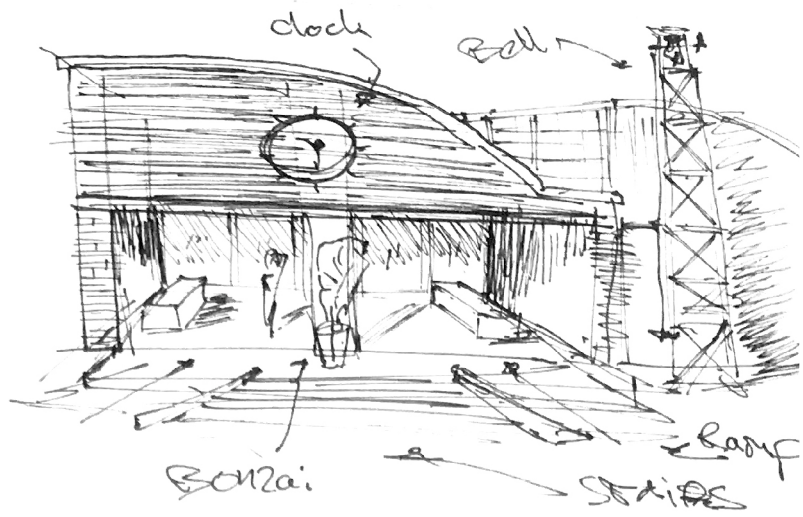
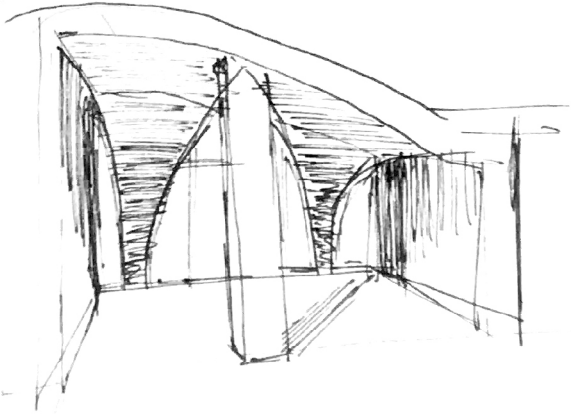






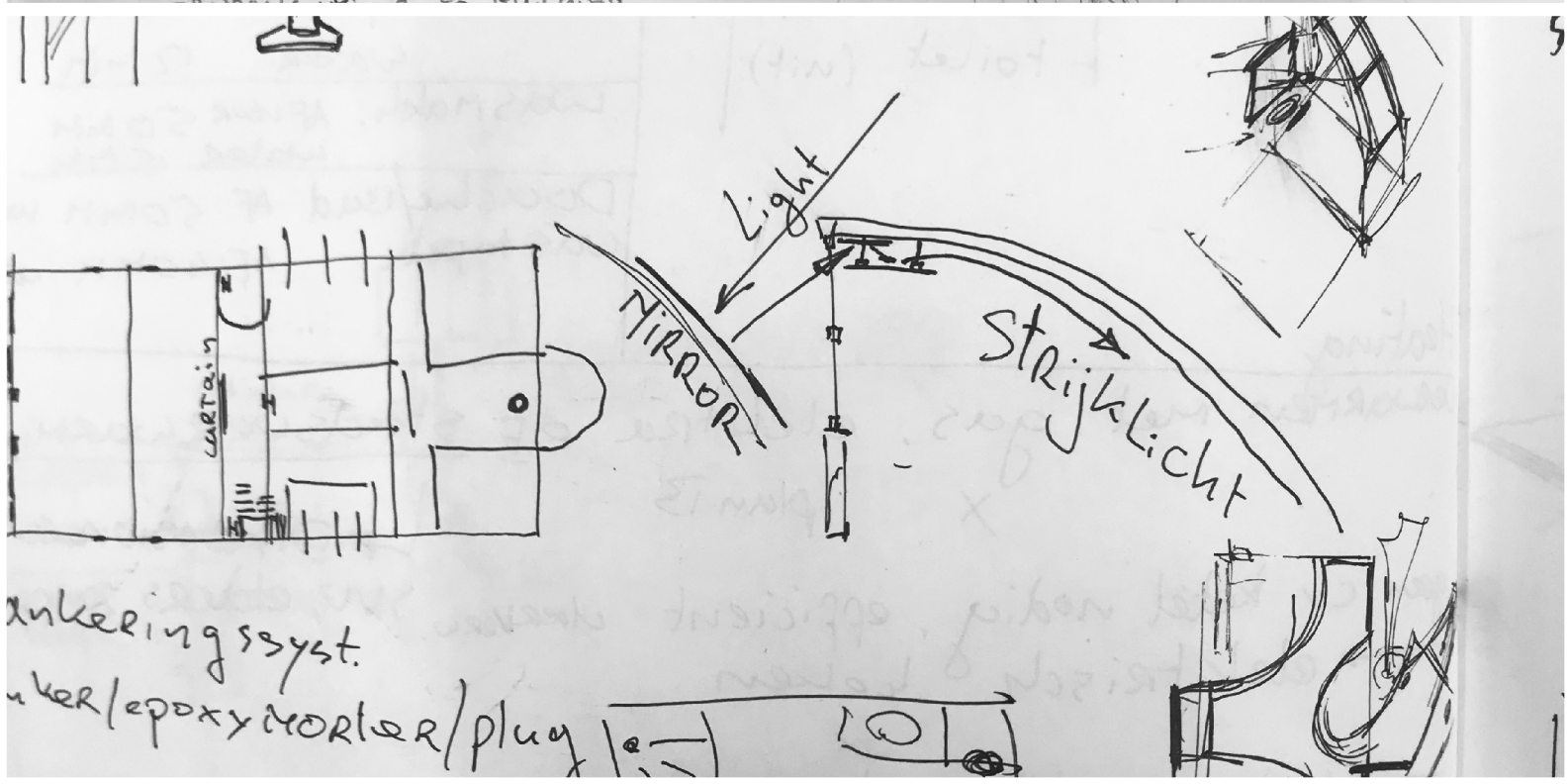
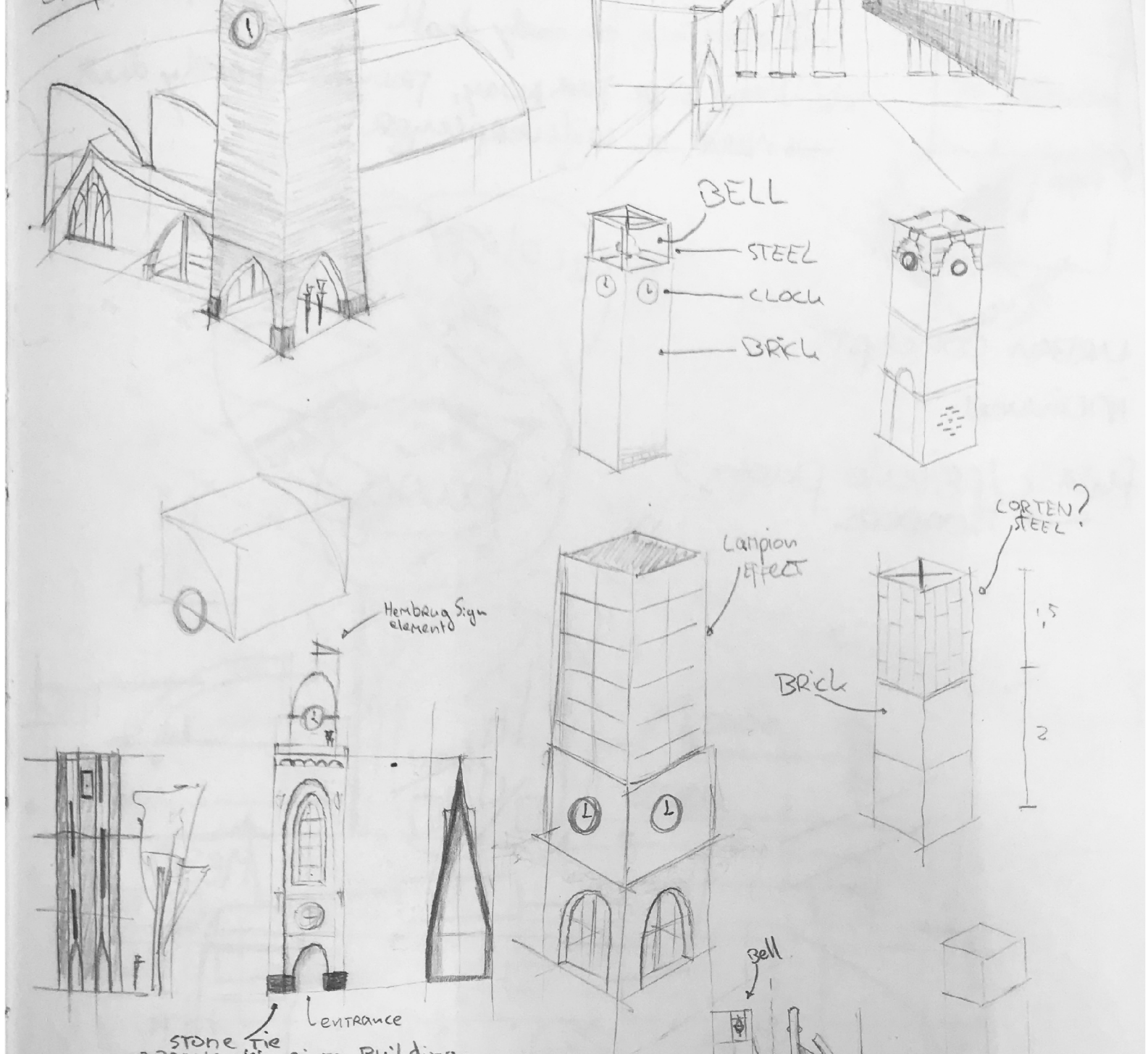


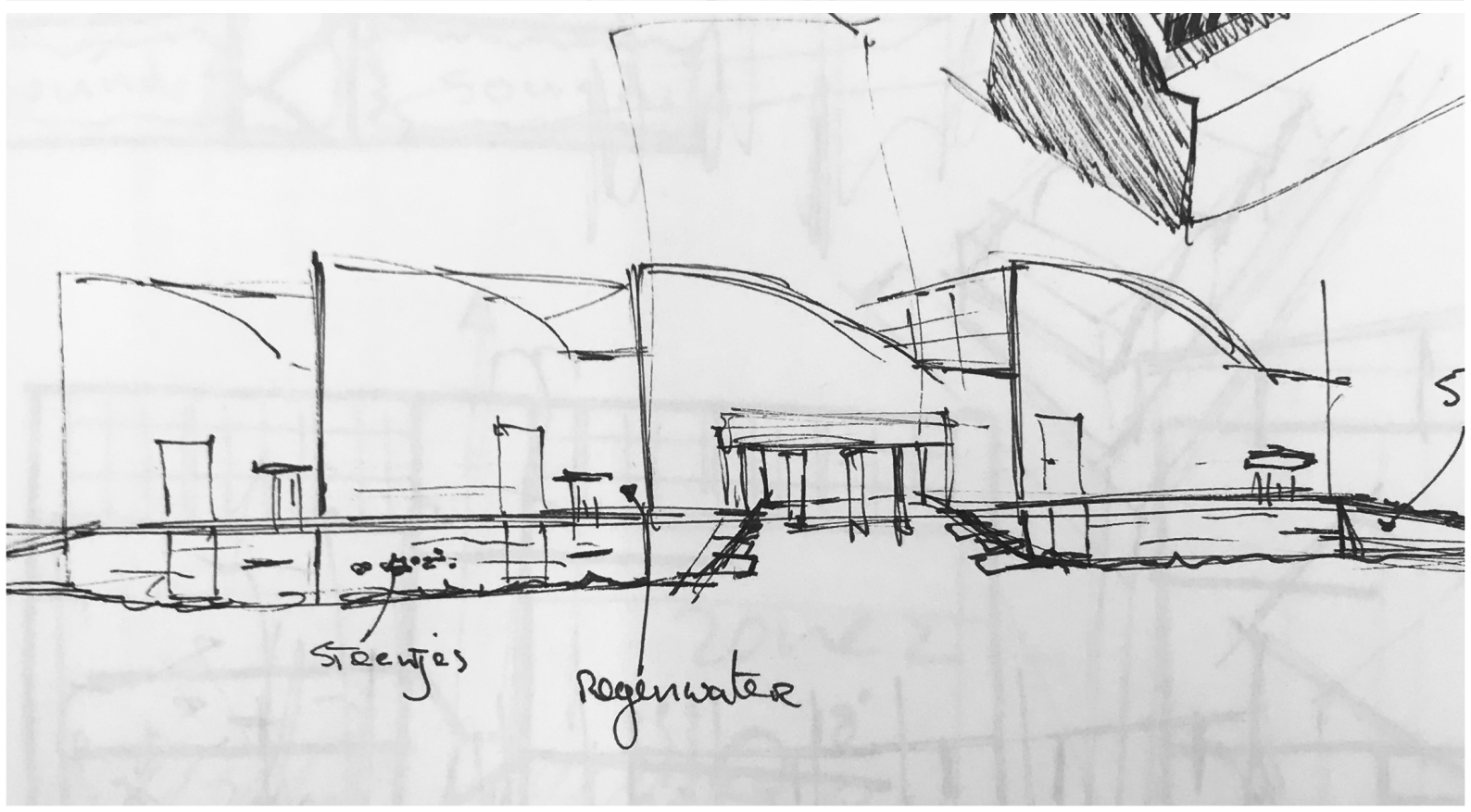
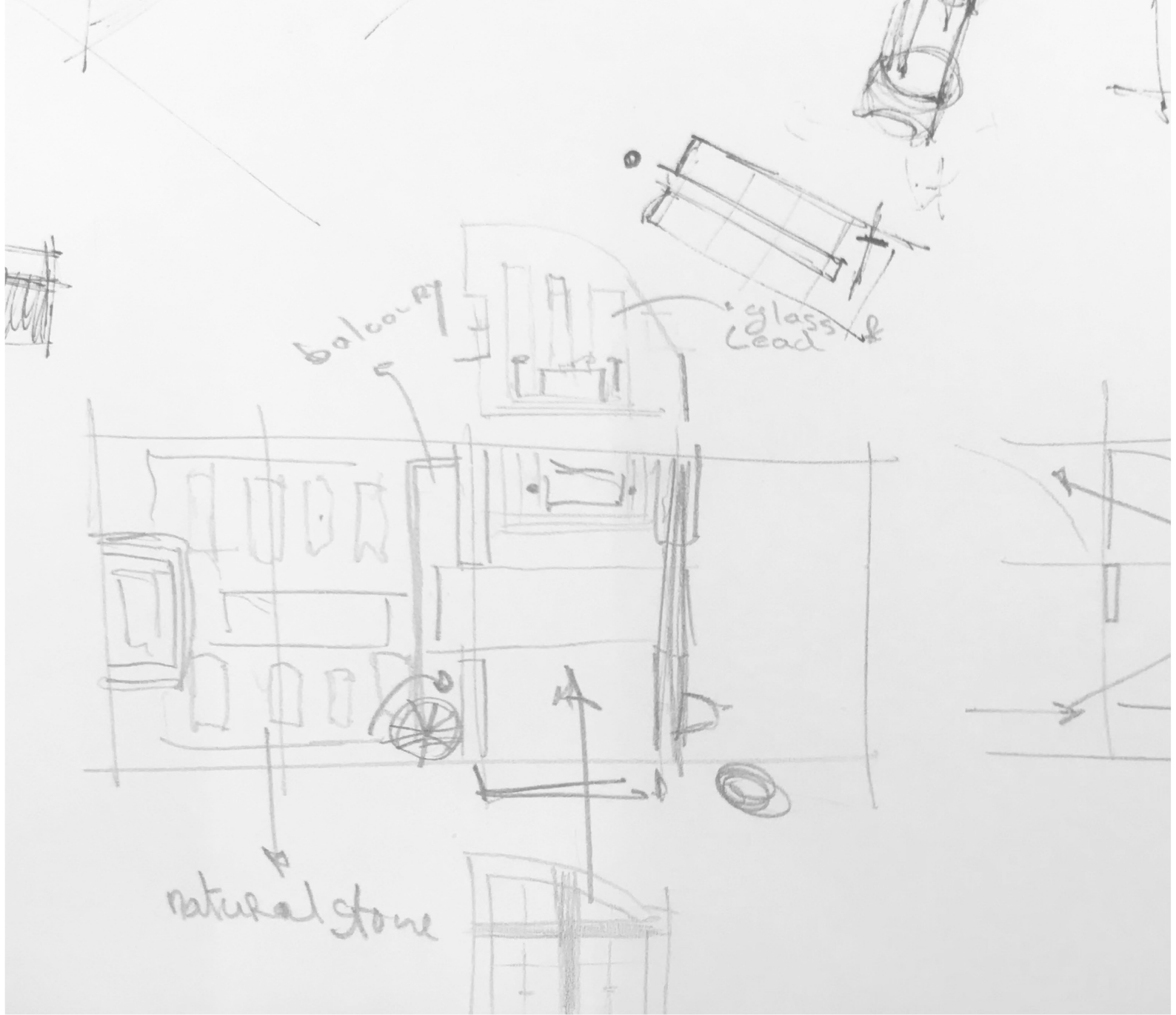


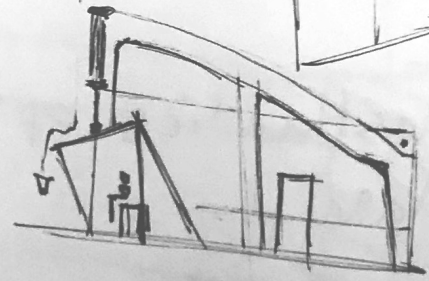
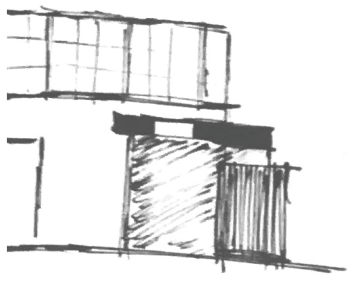
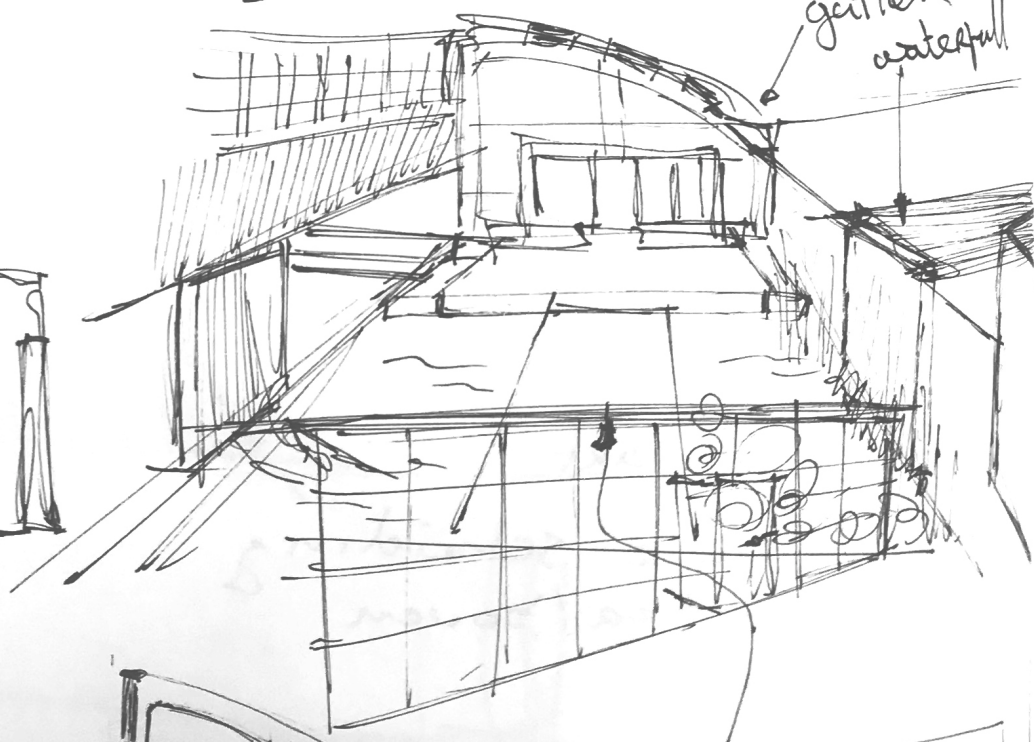
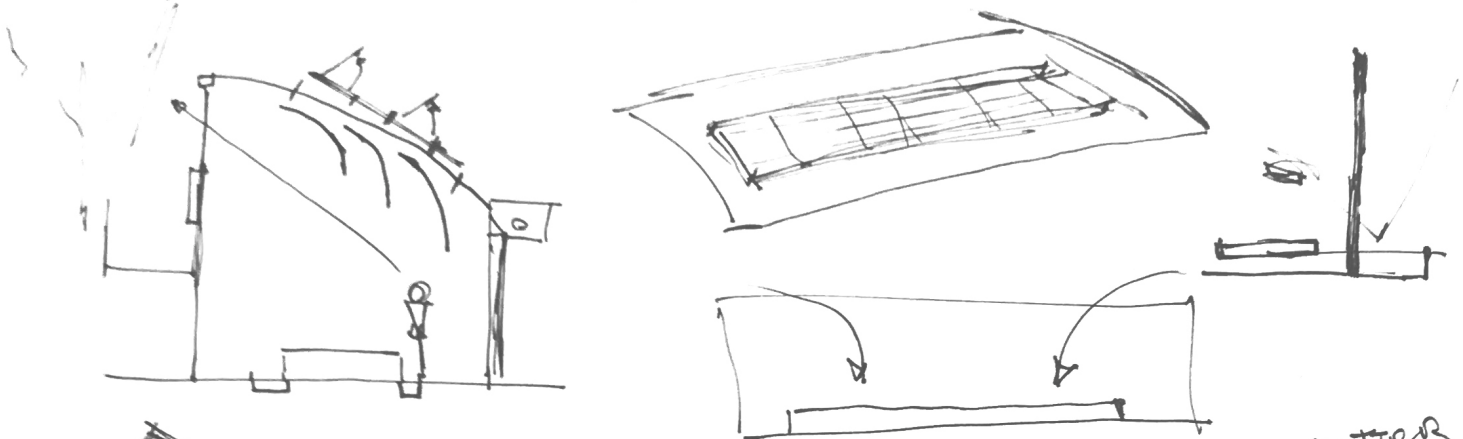
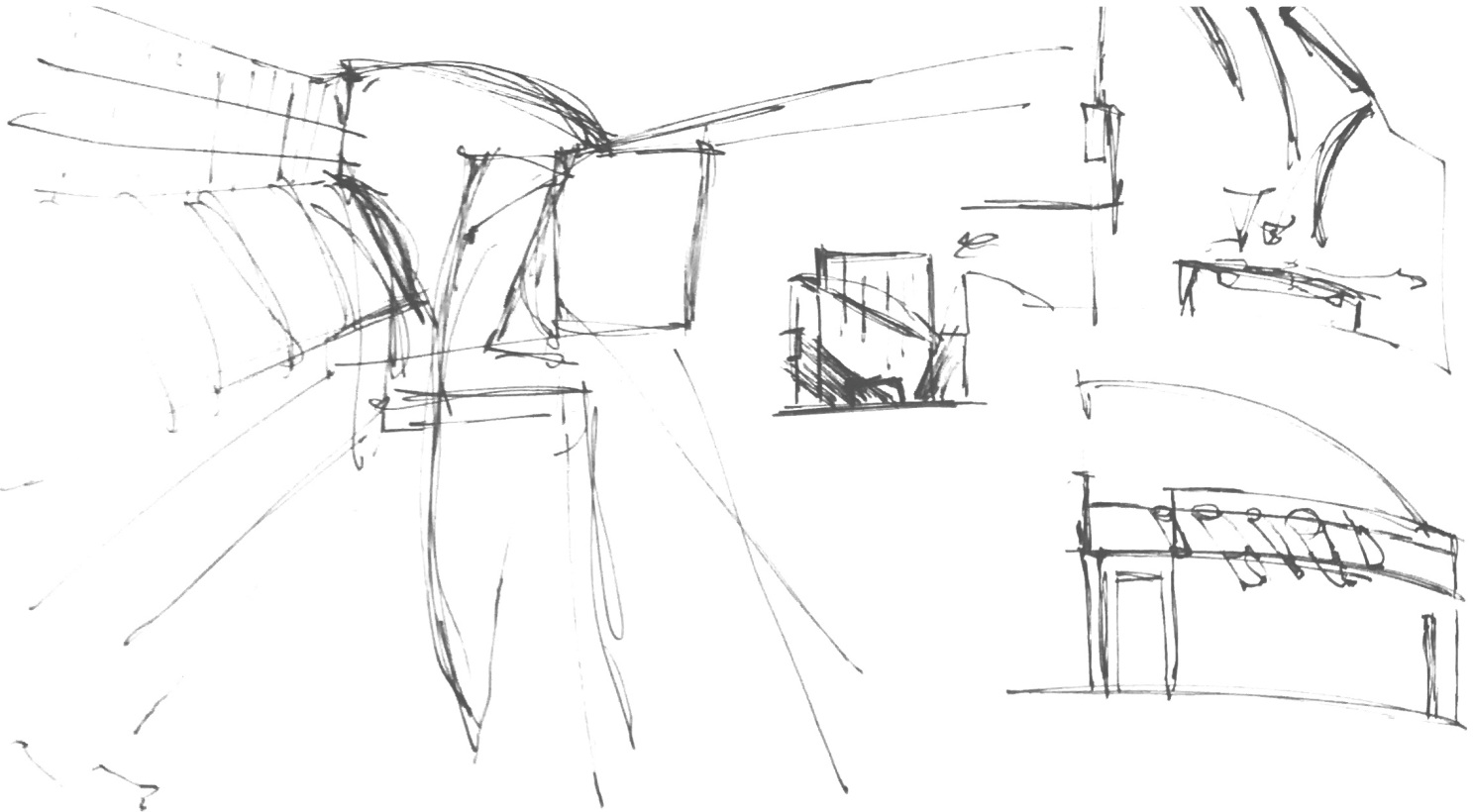


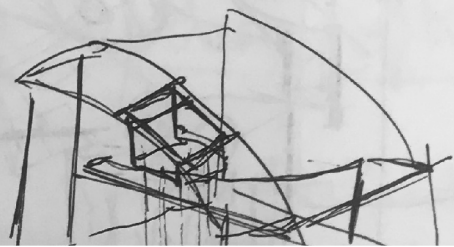
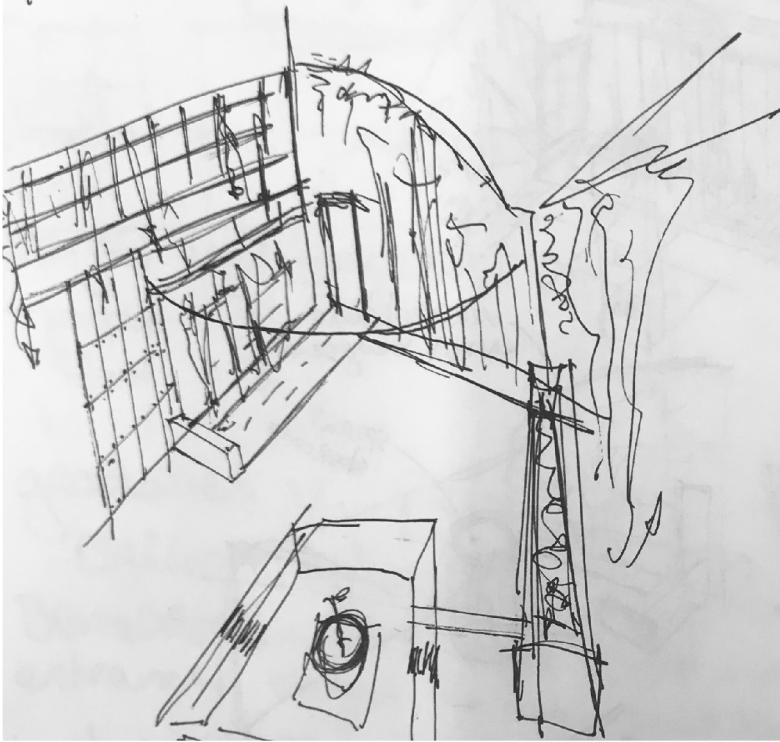
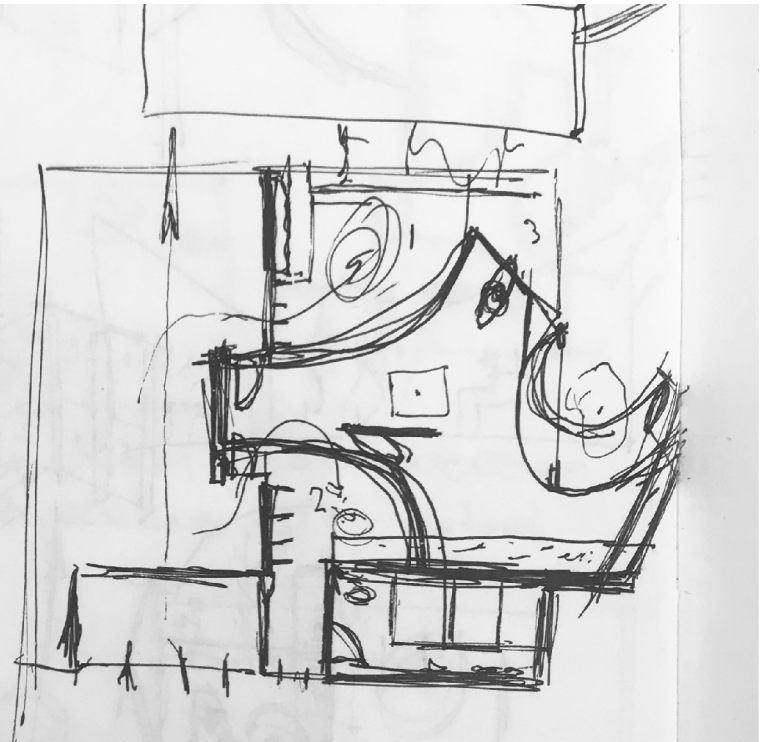
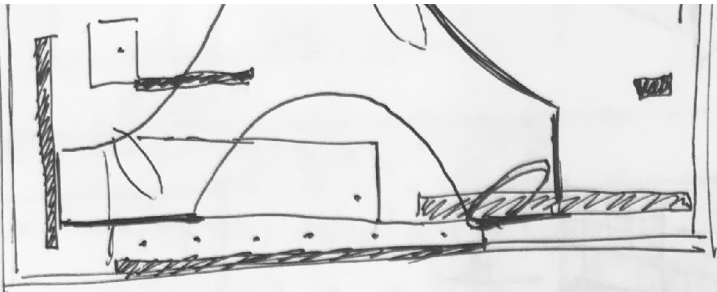
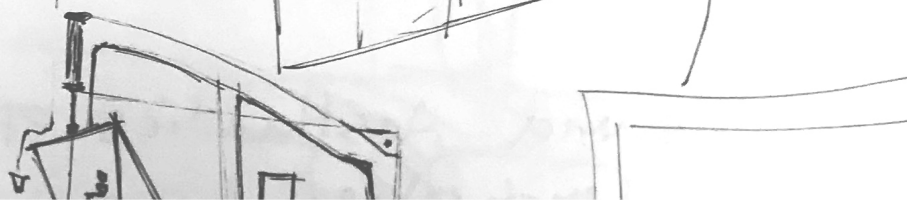
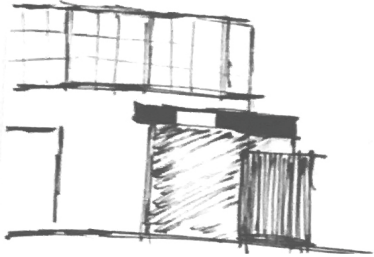
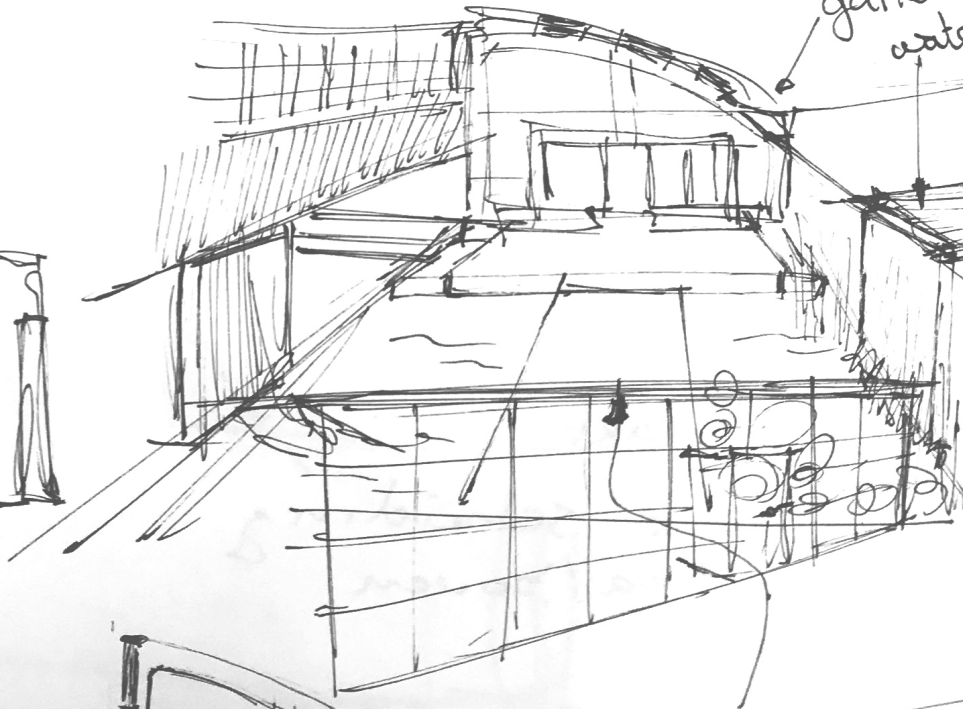
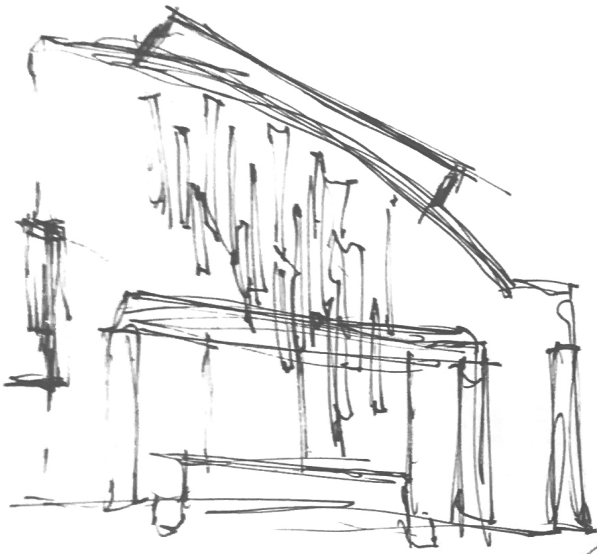
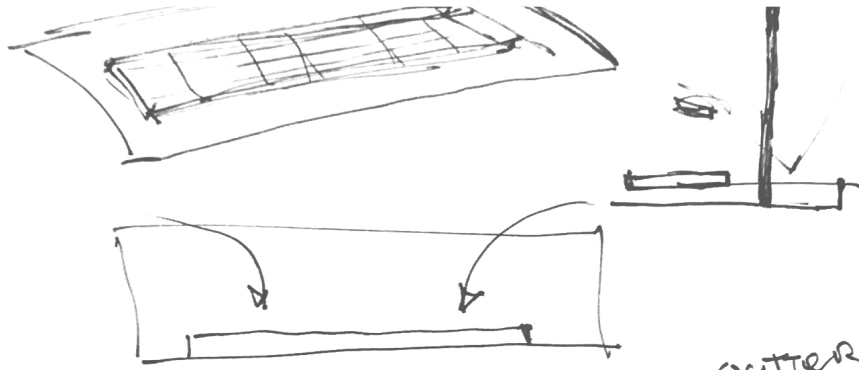
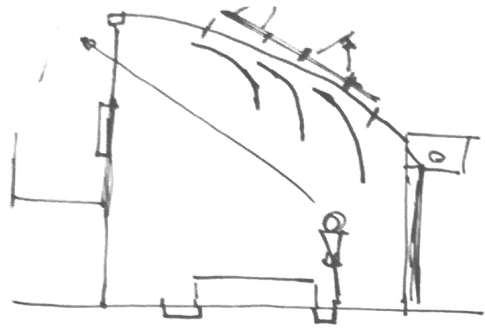
loop van Stigt

... Kolomba

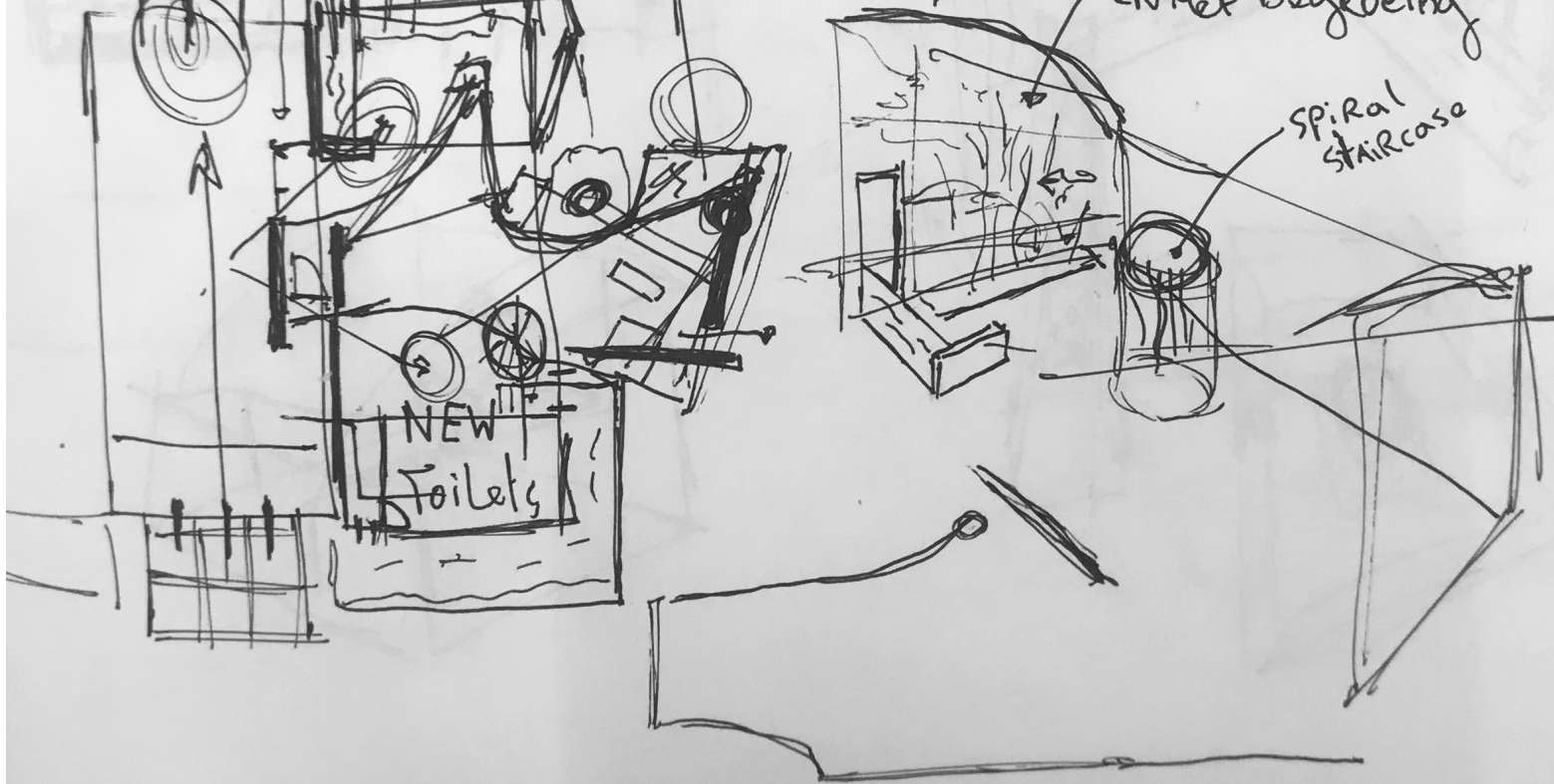
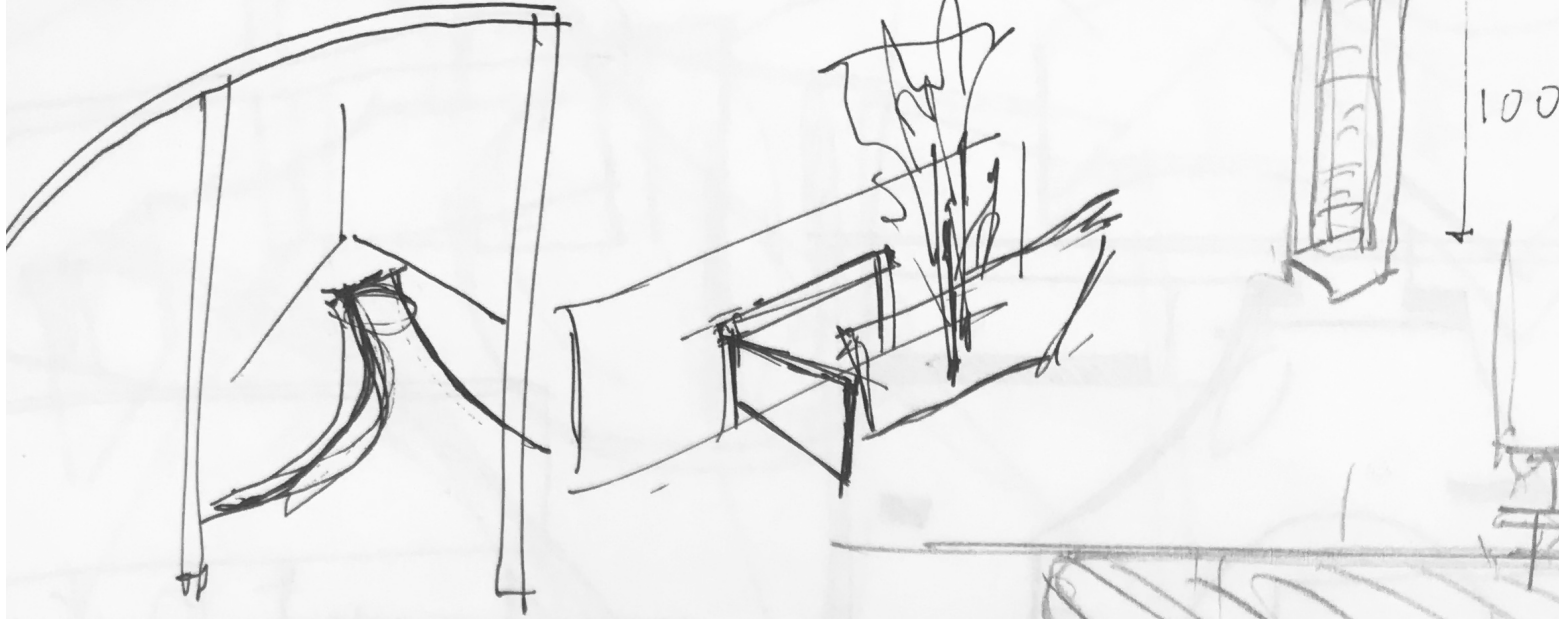








gebogen gelamineerde balk









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