



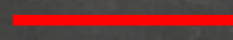
ANTHROPOCENE

HOLOCENE

PLEISTOCENE

PLIOCENE

ANTHROPOCENE



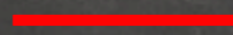
The proposed current geological epoch in which humans are the primary cause of permanent planetary change.

HOLOCENE

PLEISTOCENE

PLIOCENE

ANTHROPOCENE



Jason Moore:

HOLOCENE

CAPITALOCENE

PLEISTOCENE

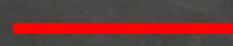
Capitalism at the basis of the adaption of nature by humans and especially the consuming of Earth's resources

PLIOCENE

CHEAP NATURE

The "unpaid work" in capitalism

ANTHROPOCENE



DESIGNERS OF THE FUTURE:

REDUCE HUMAN IMPACT

HOLOCENE

HERITAGE AND ARCHITECTURE:

PLEISTOCENE

MAKE USABLE FOR THE FUTURE
& KEEP THE PAST READABLE

PLIOCENE

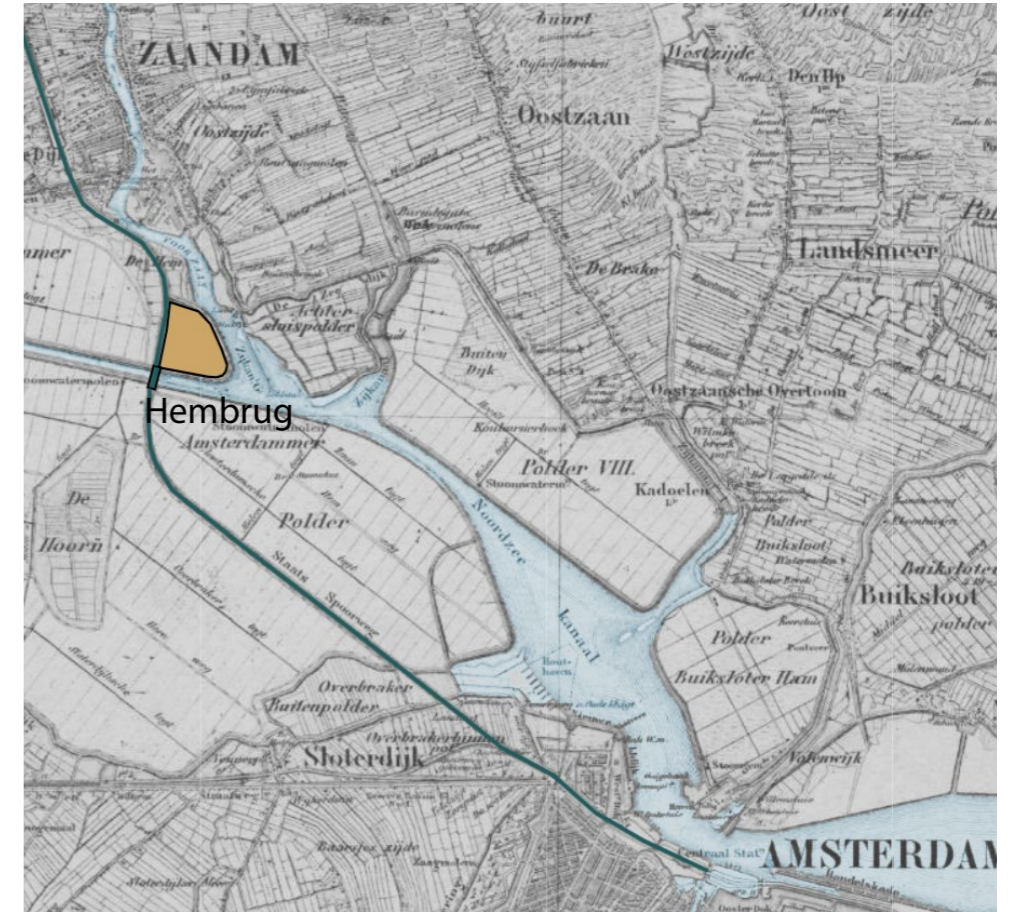
PRODUCTION OF WEAPONS IN THE NETHERLANDS



1889
Increased production of new types of weaponry. Need for larger production site.

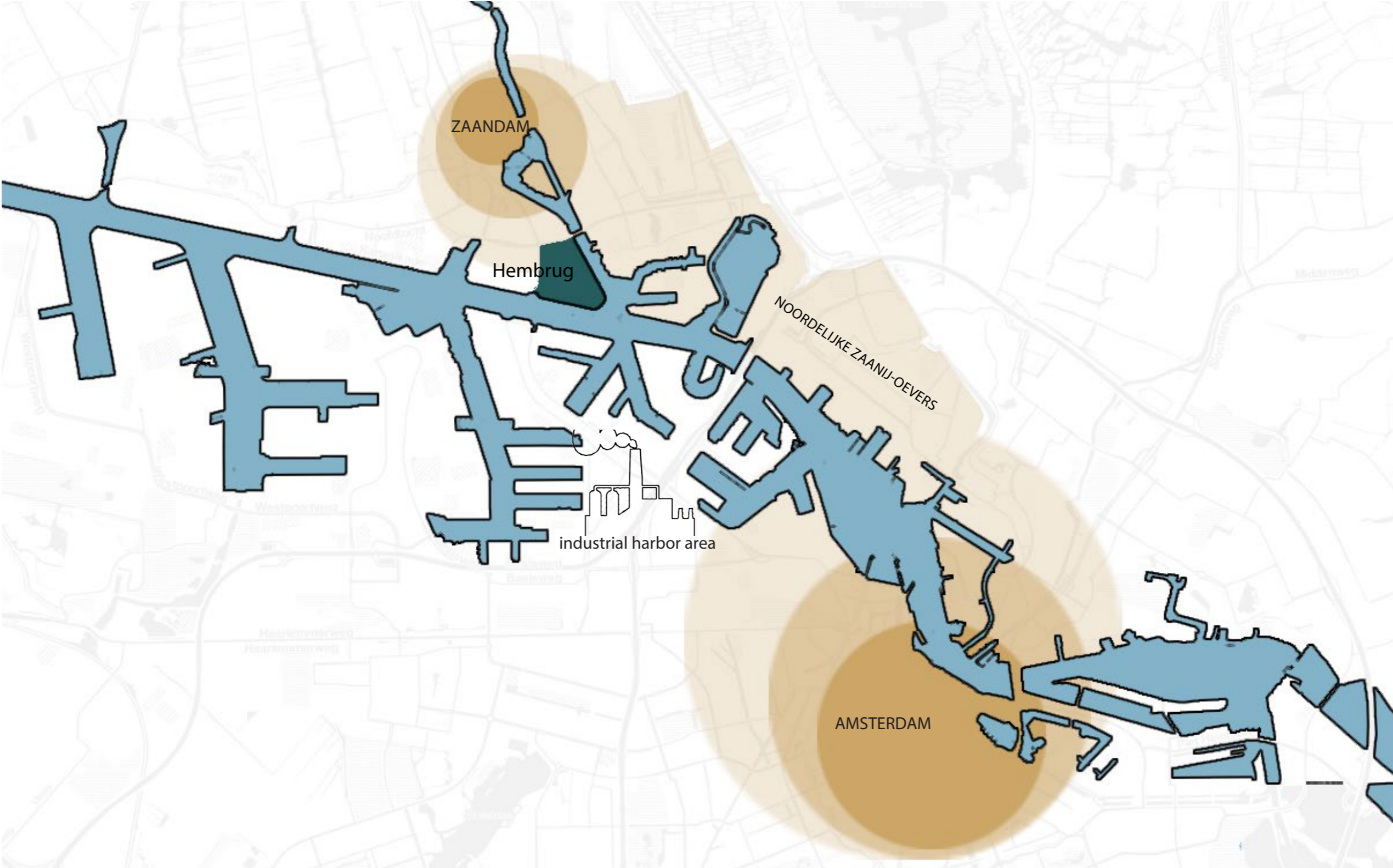


1900
Moving the Atilerie Inrichting from Delft to Zaandam.
In the centre of the Fortification line Stelling van Amsterdam

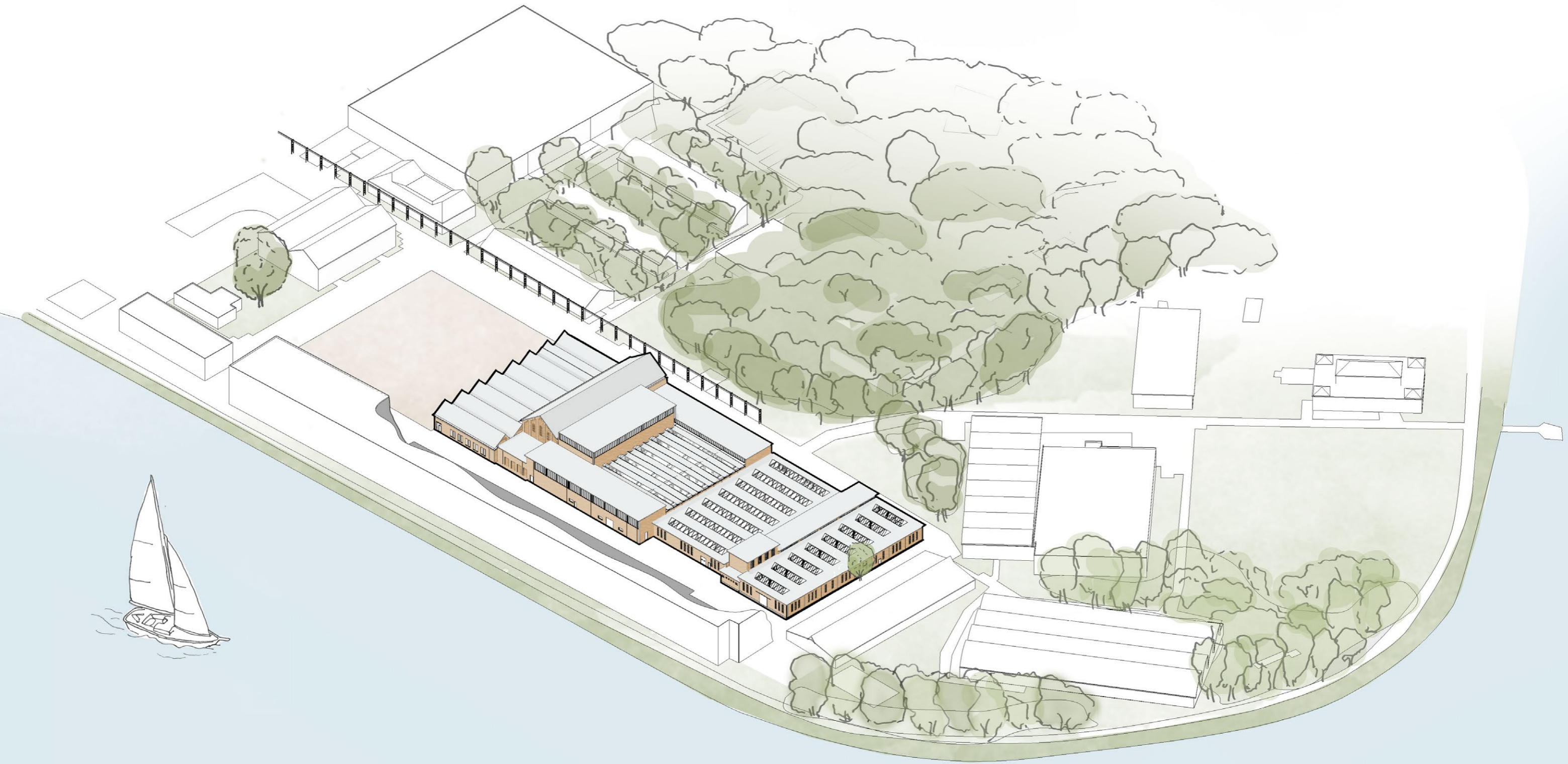


Hembrug
A polder area named after a rotating bridge across the North Sea Canal

EXPANTION OF CITIES





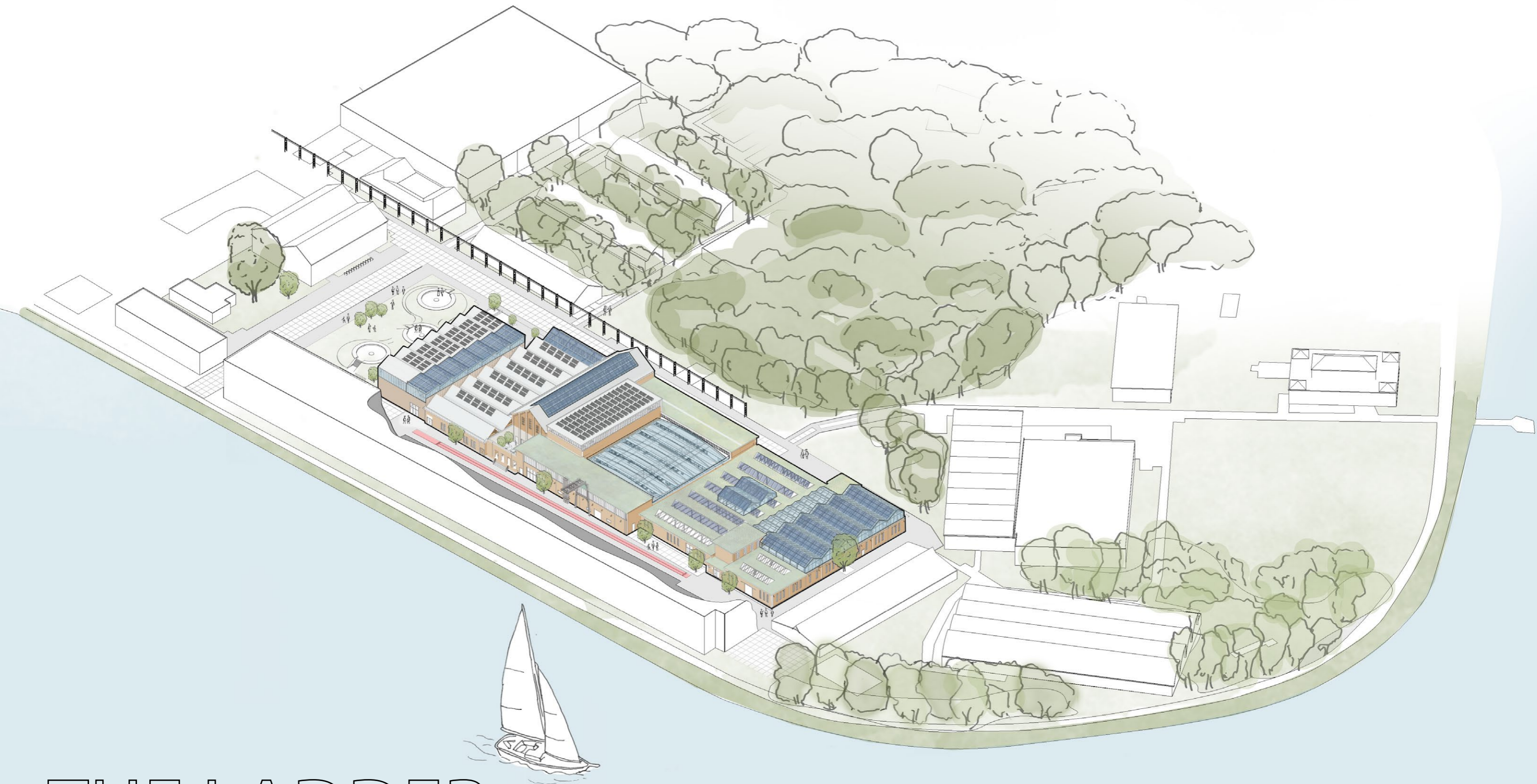


THE LADDER

a world within a world

P5 presentation
MSc 4 Graduation studio, Heritage and Architecture
Project Hembrug, Zaandam

Abel van Unen 4523113



THE LADDER

a world within a world

P5 presentation
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CONTENT

PART 1 ANALYSIS



PART 2 MASTERPLAN + PROGRAM



PART 3 TRANSFORMATION STRATEGIES



PART 4 DESIGN



BUILDING DEVELOPMENT OF THE HEMBRUG



Early period of the Hembrug



Demolishing of long Marine shed



Looting of machines by Germans
WWII



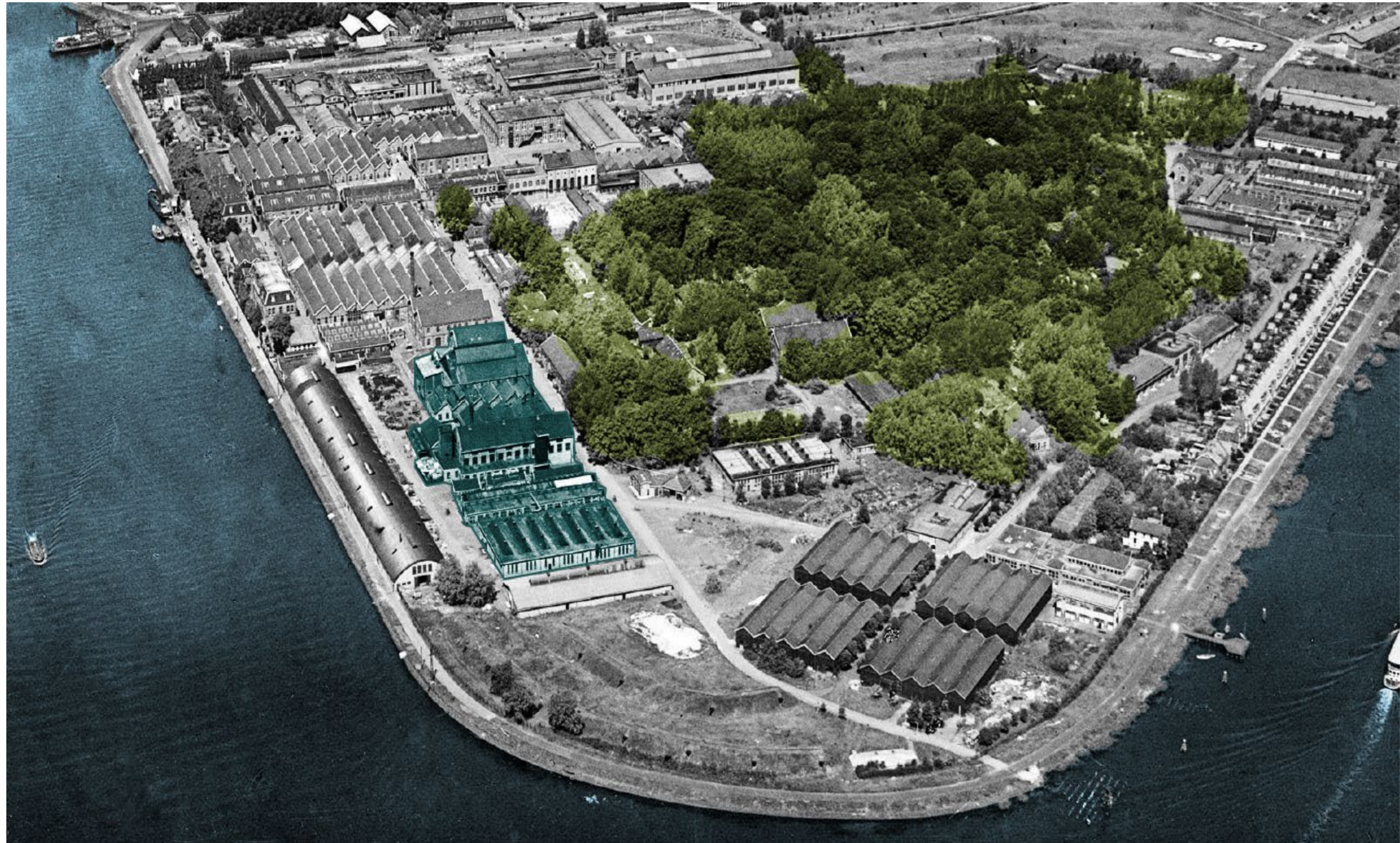
Eurometaal takes over
production



The Hembrug today



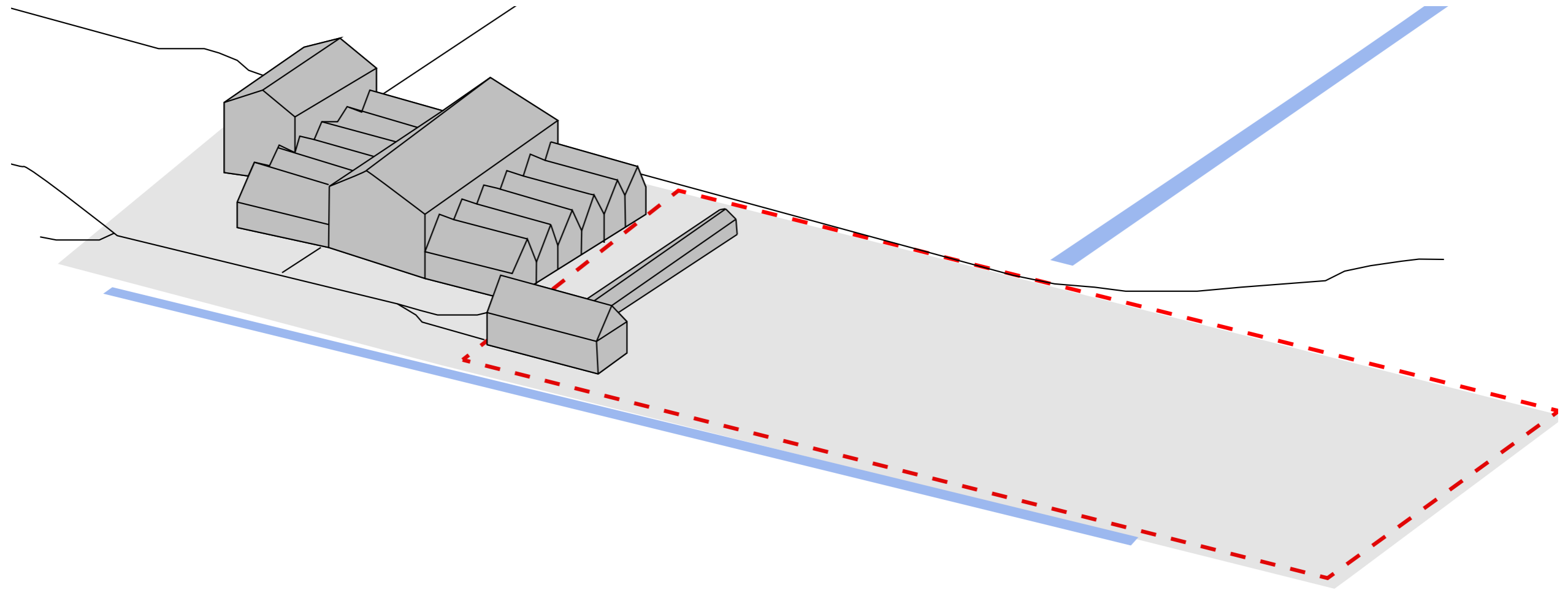
HISTORY OF THE THE LADDER



Historical view on the Ladder 1956, photo from collection Hembrug Museum, Zaandam

HISTORY OF THE THE LADDER

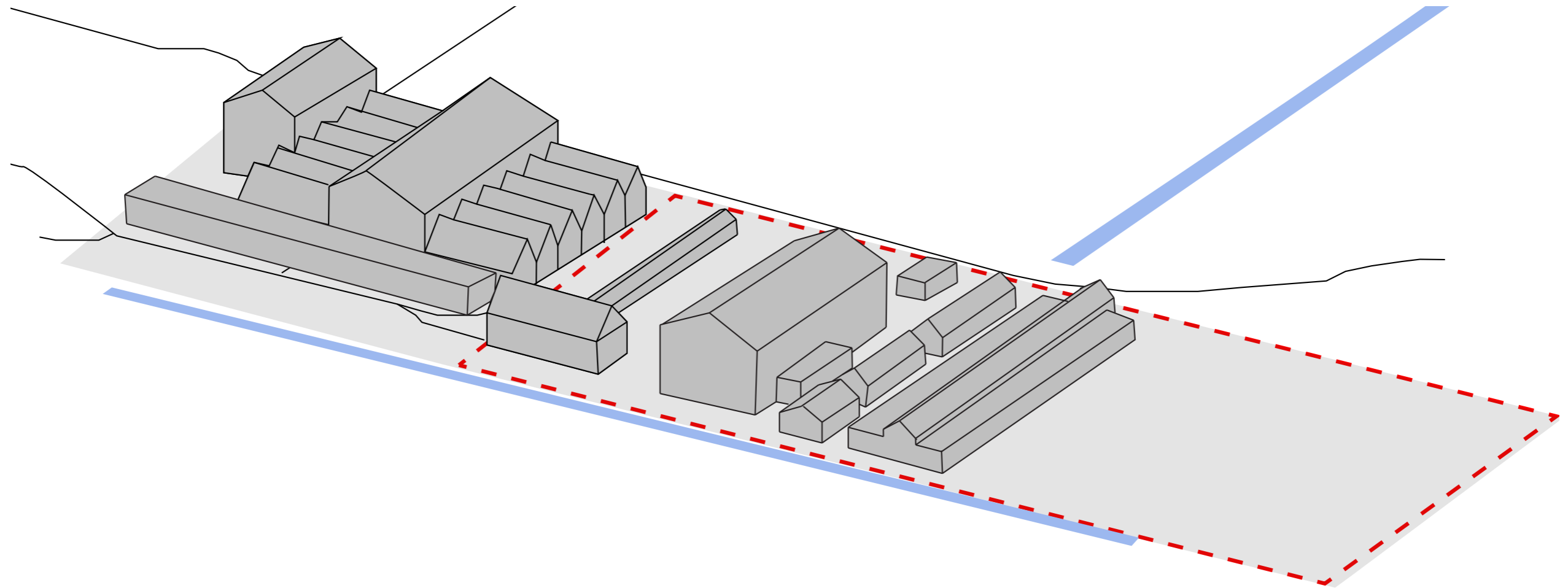
1901



- - - Current building boundary Ladder

HISTORY OF THE THE LADDER

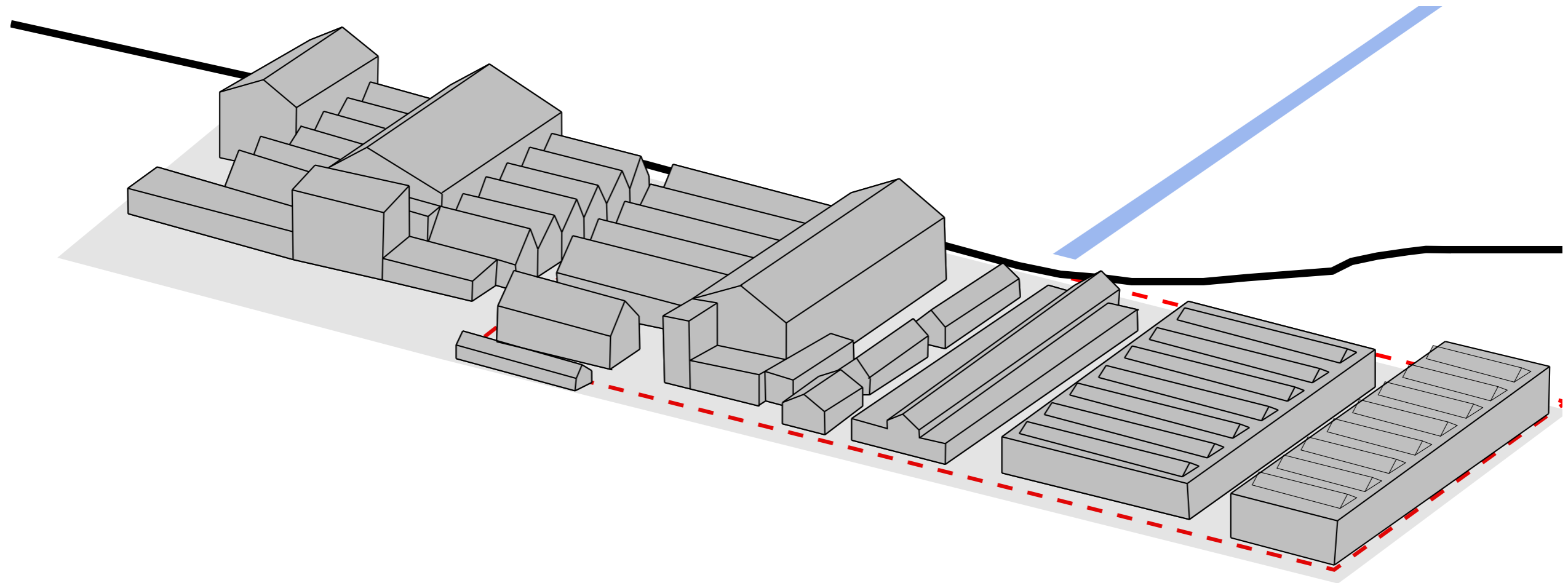
1931



- - - Current building boundary Ladder

HISTORY OF THE THE LADDER

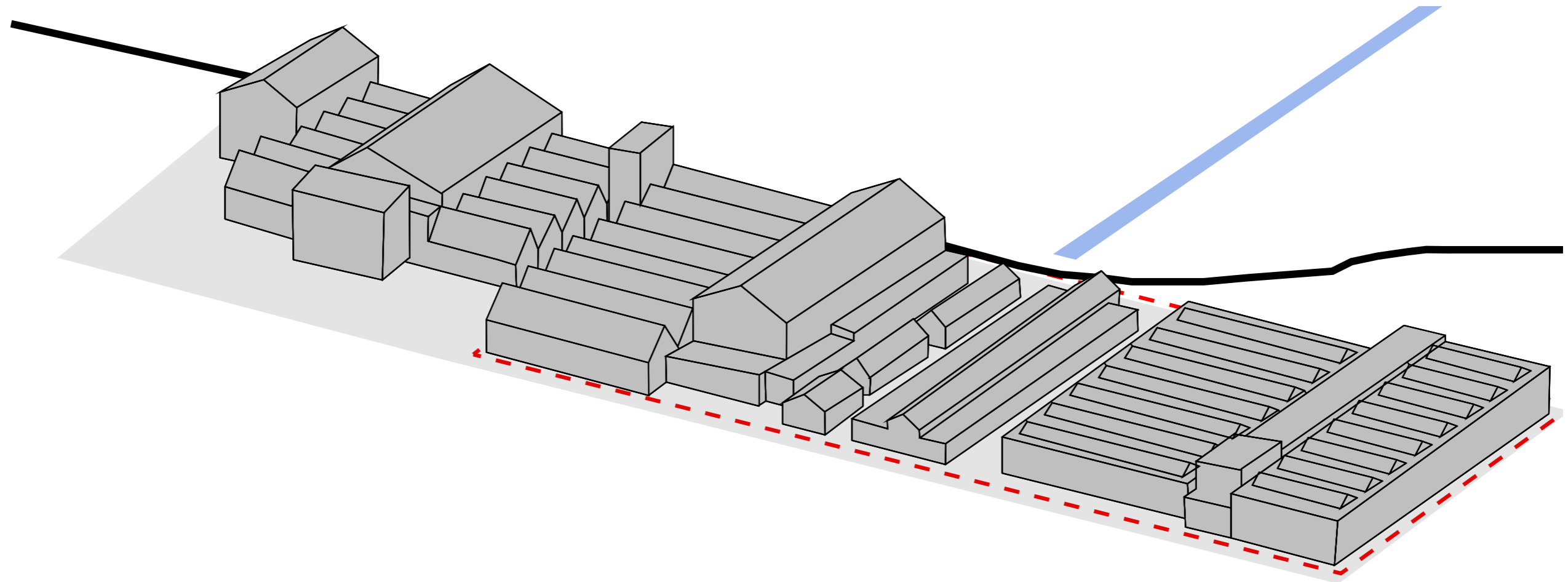
1937



- - - Current building boundary Ladder

HISTORY OF THE THE LADDER

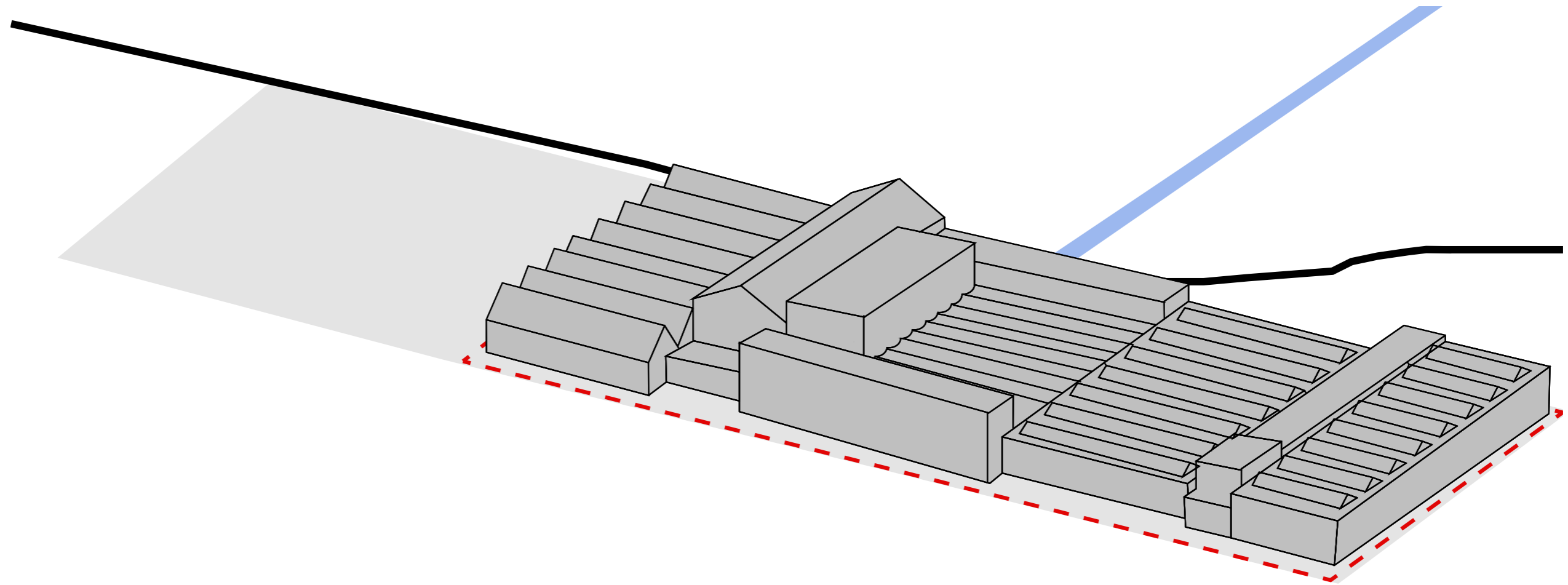
1953



- - - Current building boundary Ladder

HISTORY OF THE THE LADDER

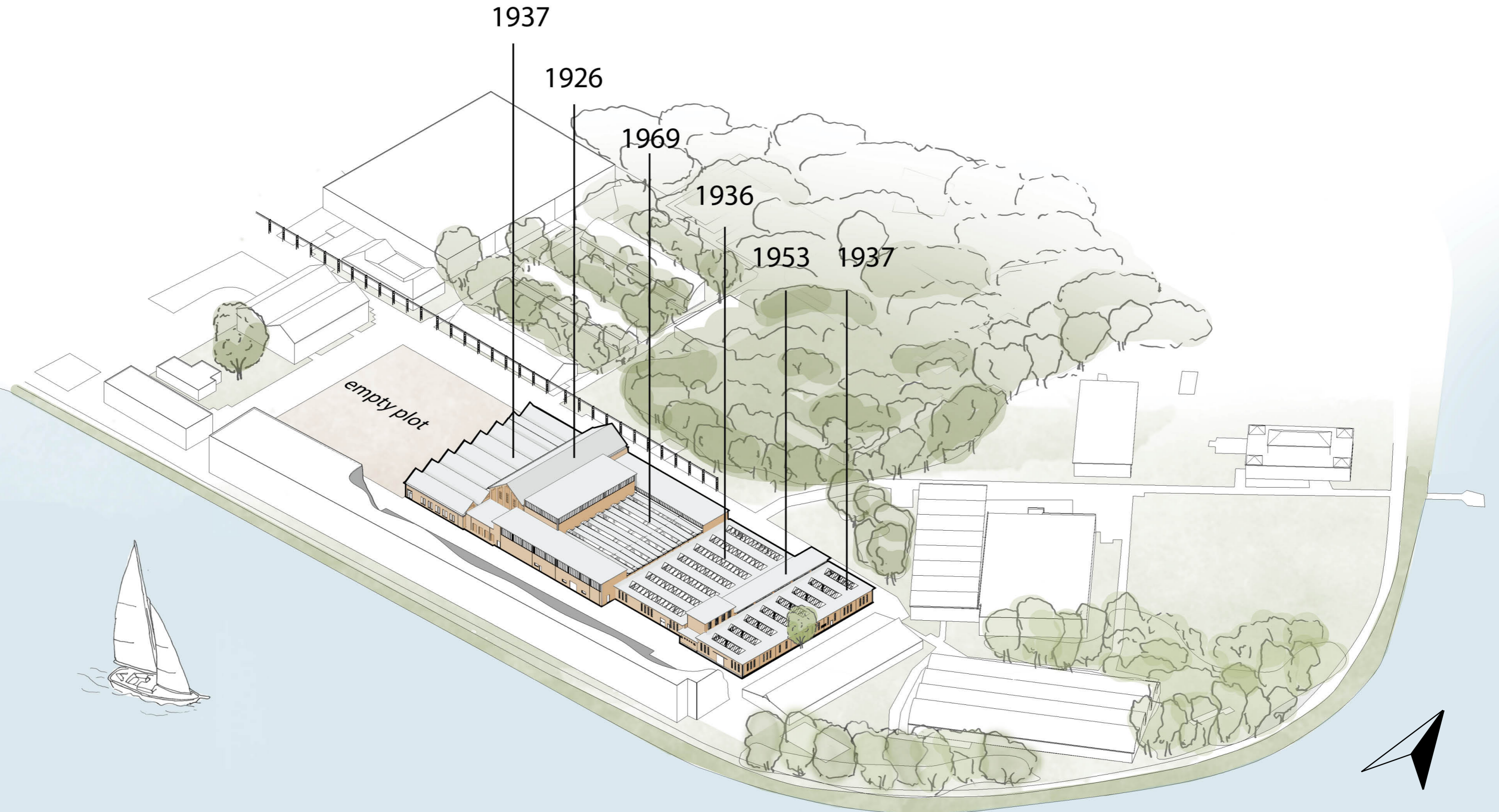
1996



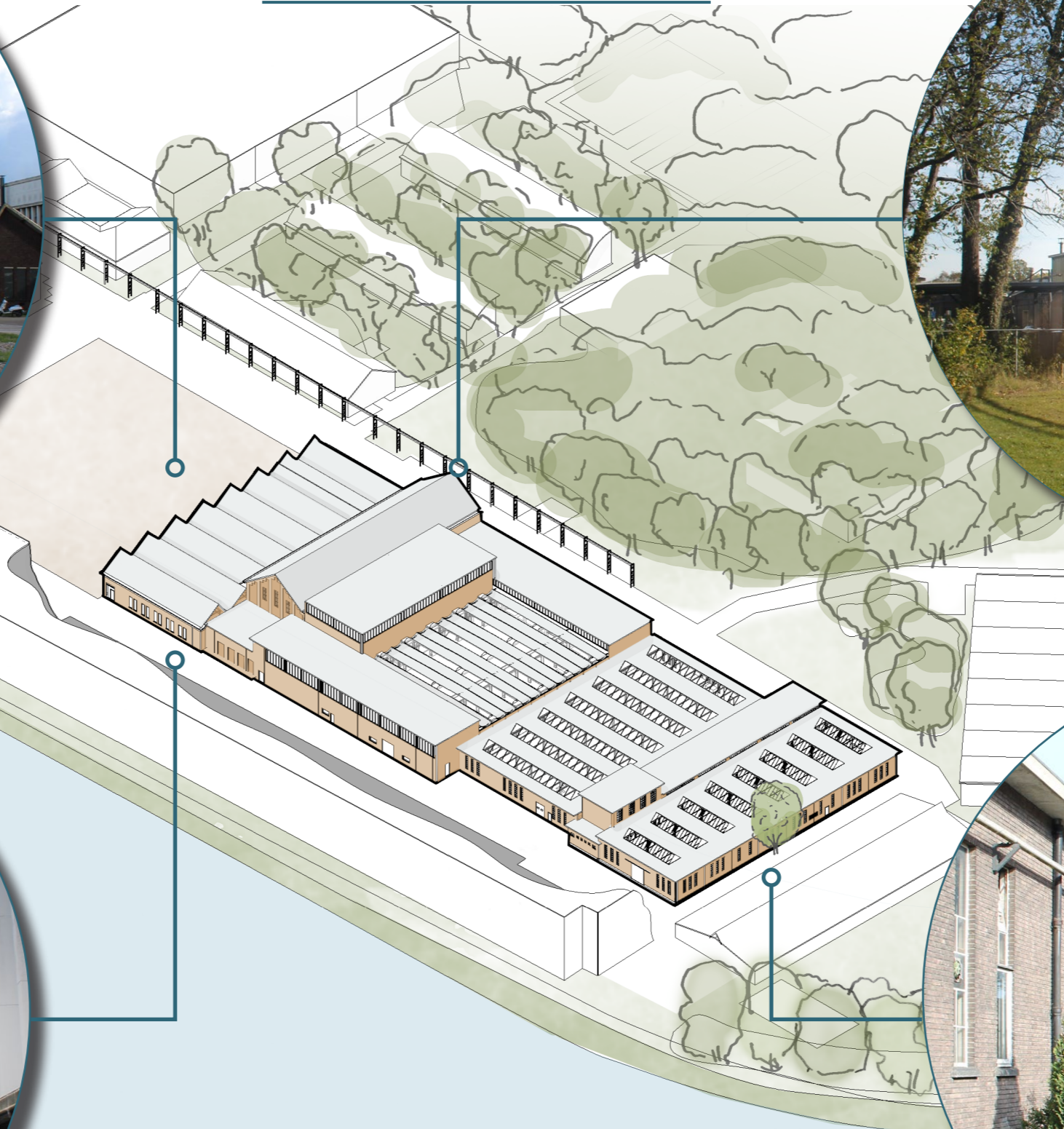
- - - Current building boundary Ladder



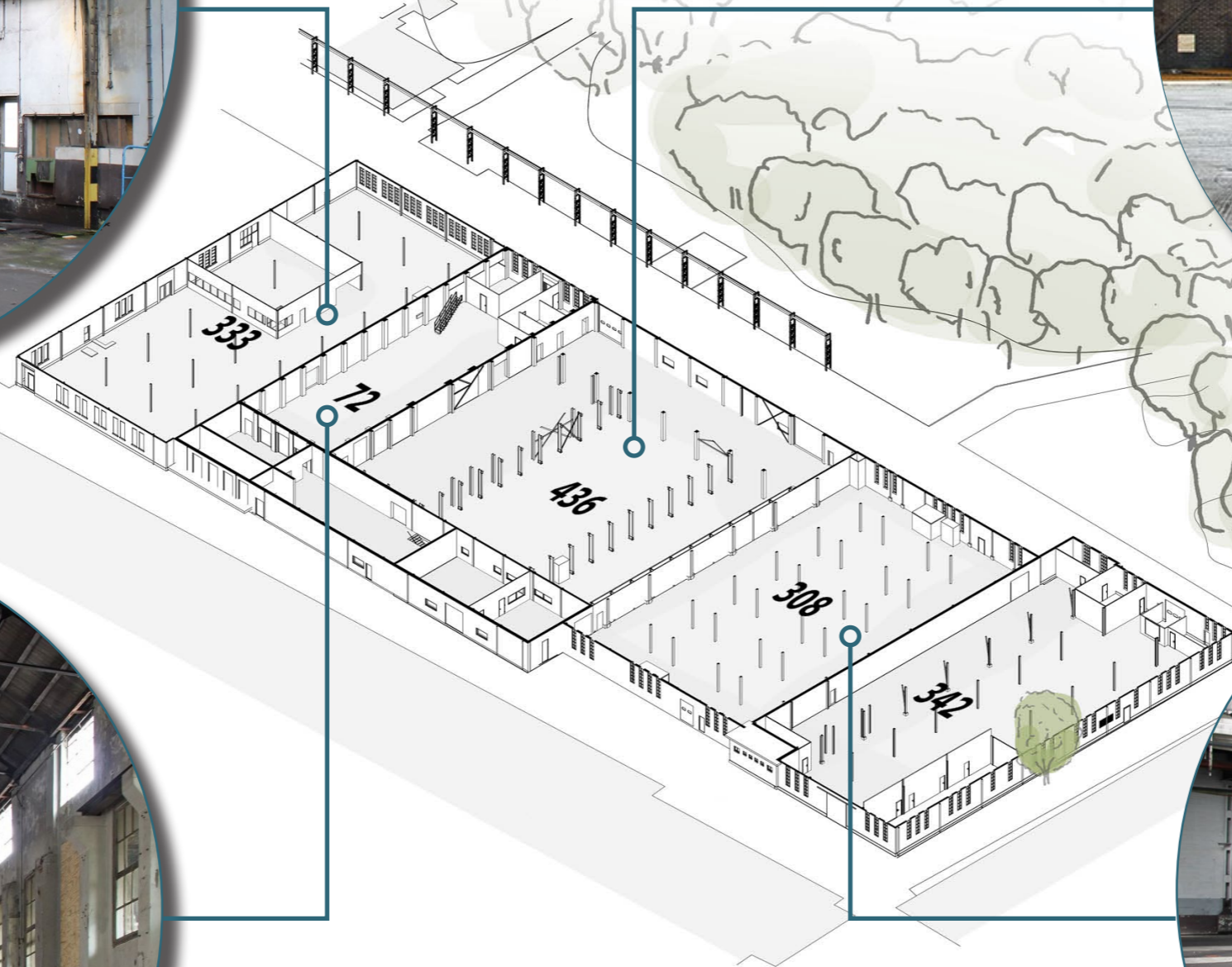
ANALYSIS OF THE EXISTING



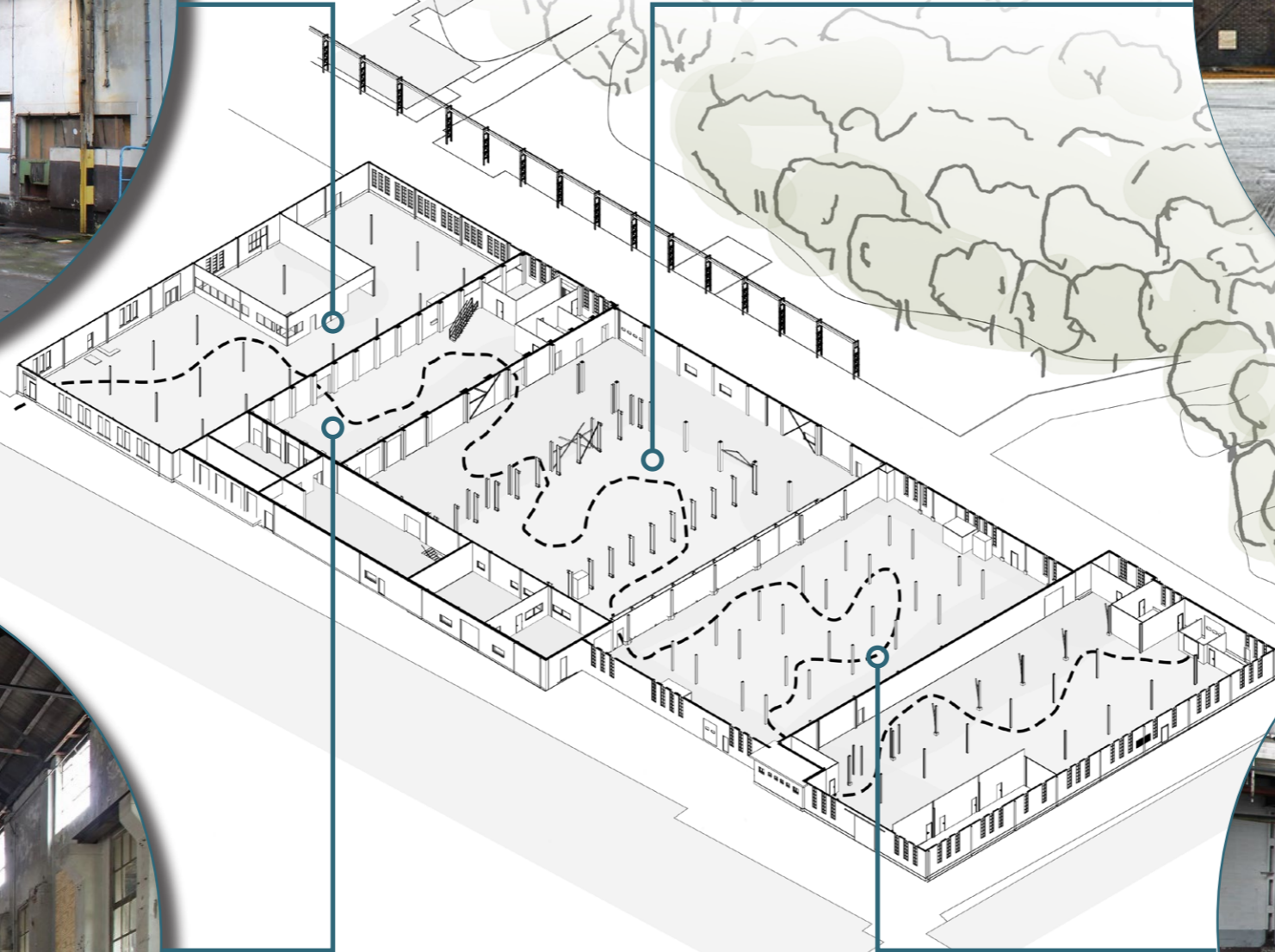
EXTERIOR WORLD



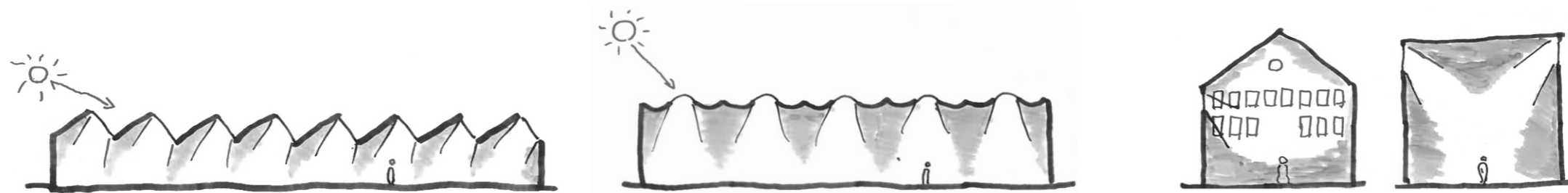
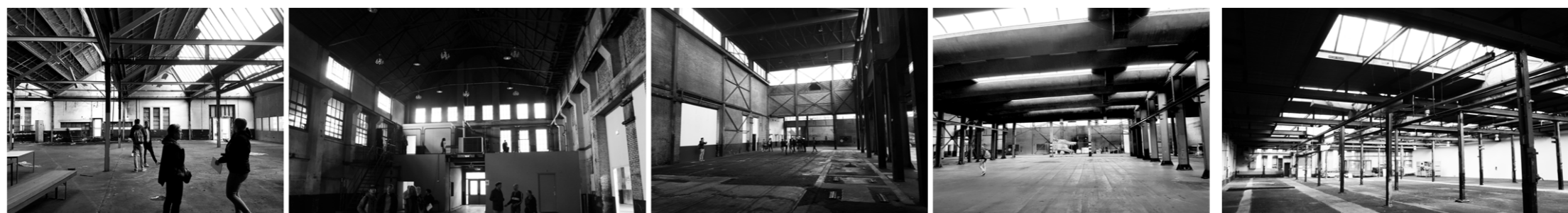
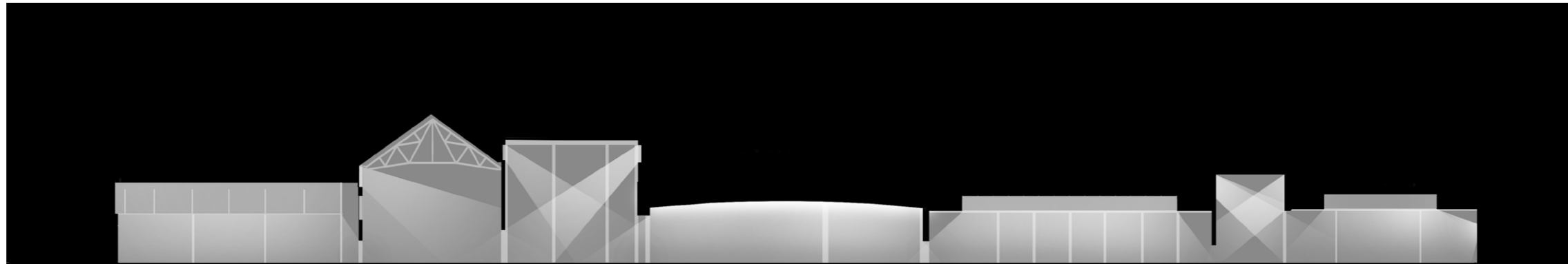
INTERIOR WORLD



INTERIOR WORLD



DAYLIGHT FROM ABOVE

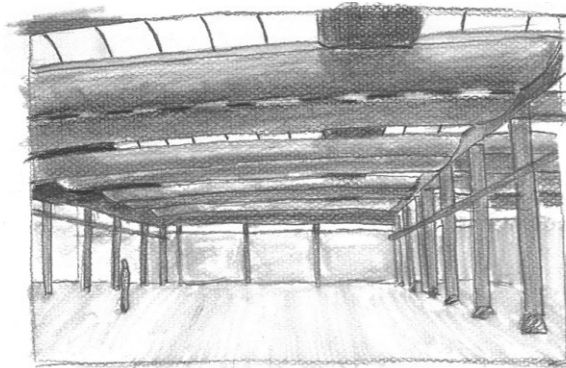


RELATION INSIDE/OUTSIDE

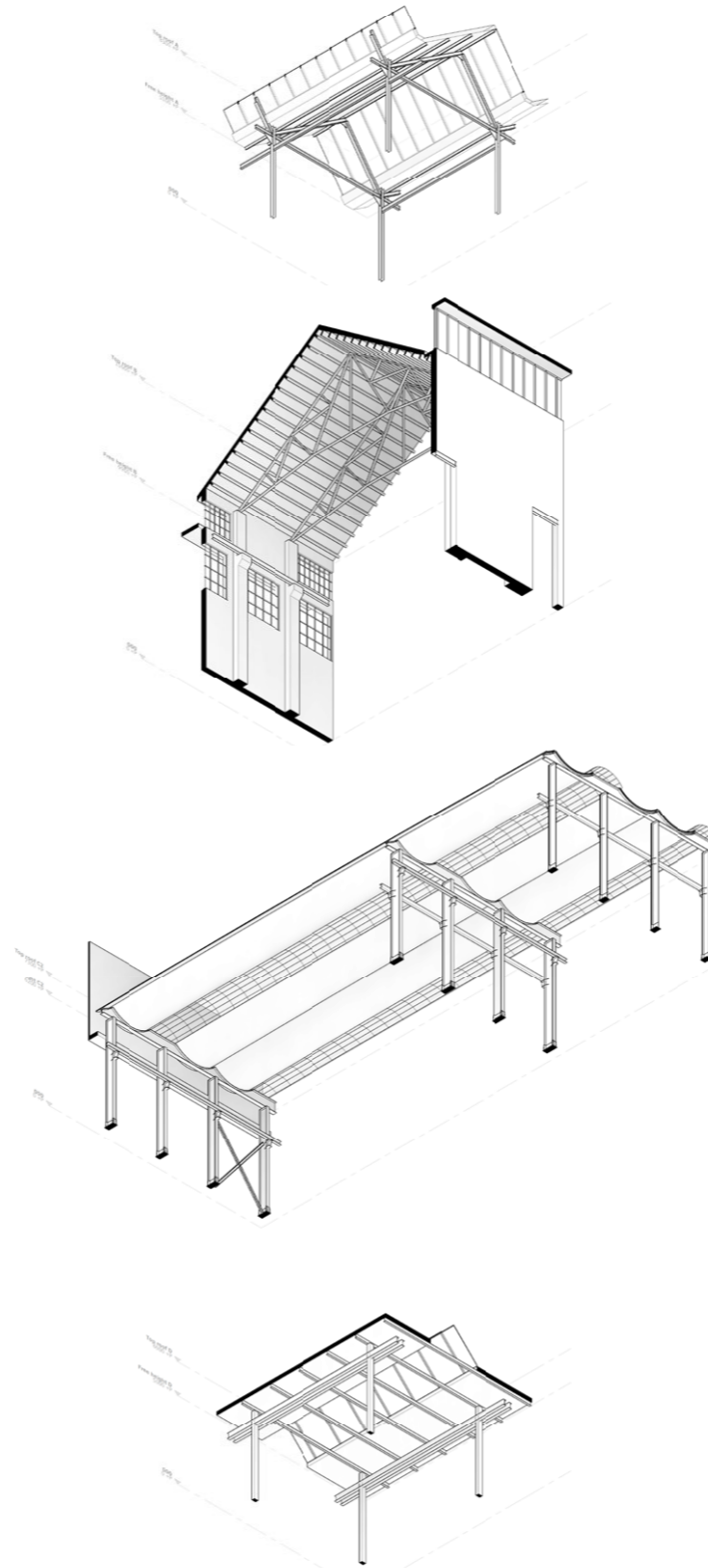


GENERAL CONCLUSIONS OF THE BUILDING ANALYSES

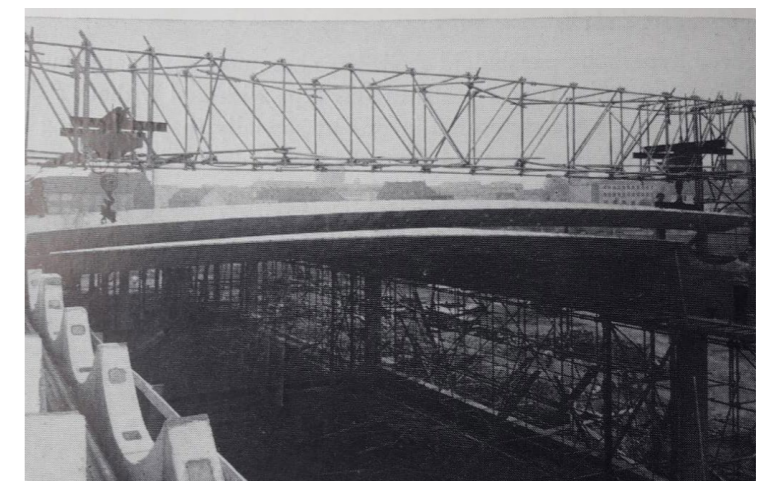
ARCHITECTURAL VALUES



BUILDING TECHNICAL VALUES



CULTURAL HISTORICAL VALUES



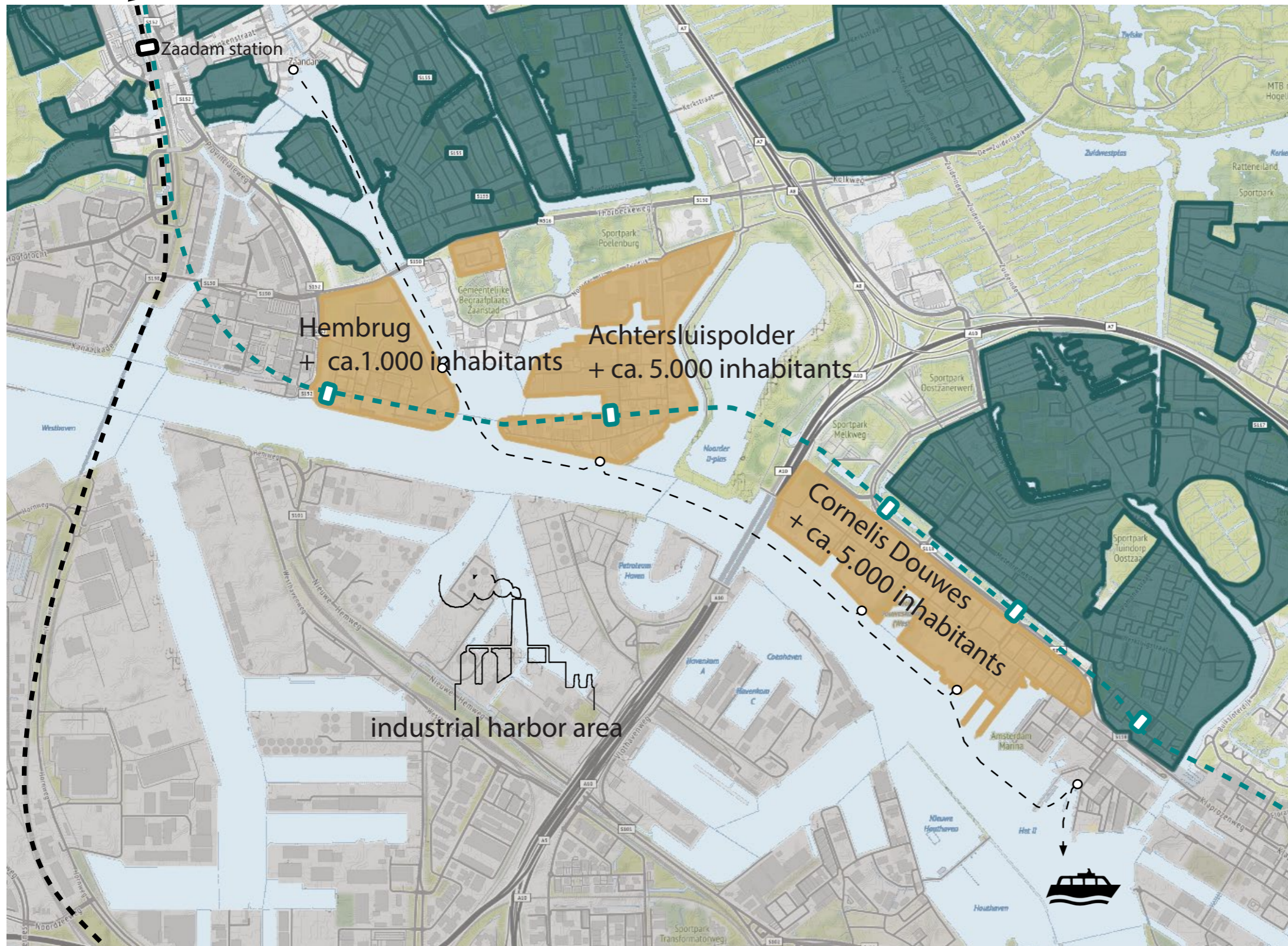
SEQUENCE OF ATMOSPHERES AND DAYLIGHT

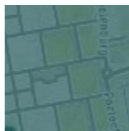

DEVELOPMENT AND EXPERIMENTATION IN BUILDING TECHNIQUES IN A SPAN OF 50 YEARS

LAYERS IN TIME AND EVIDENCE OF HISTORICAL USE

PART 2: CONTEXT, MASTERPLAN & PROGRAM RESEARCH

Zaadam 77.000 inhabitants (2017)



-  existing living / working areas
-  proposed transformation from industrial areas to living / working areas

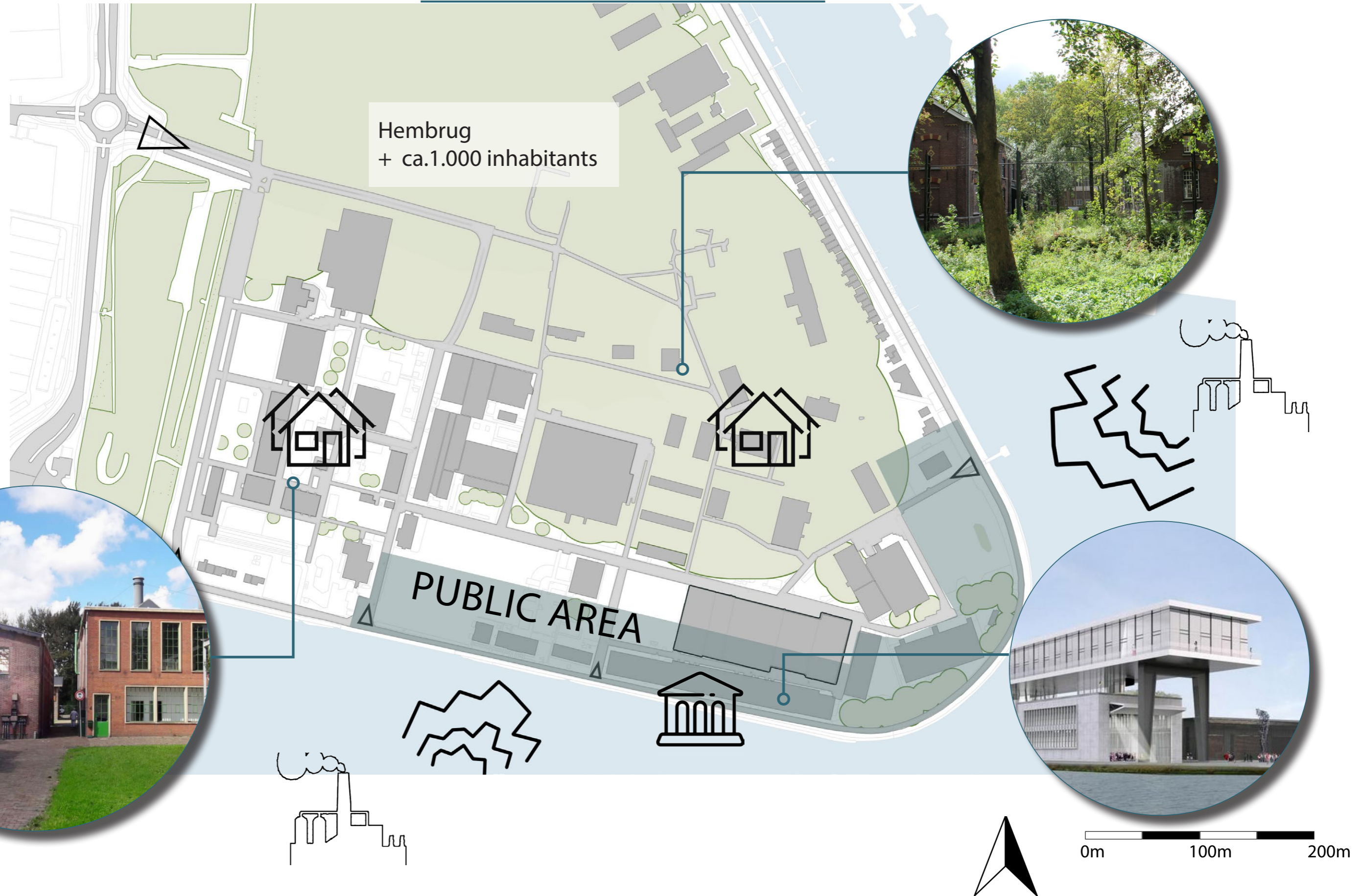
idea for new infrastructure from Amsterdam to Zaadam

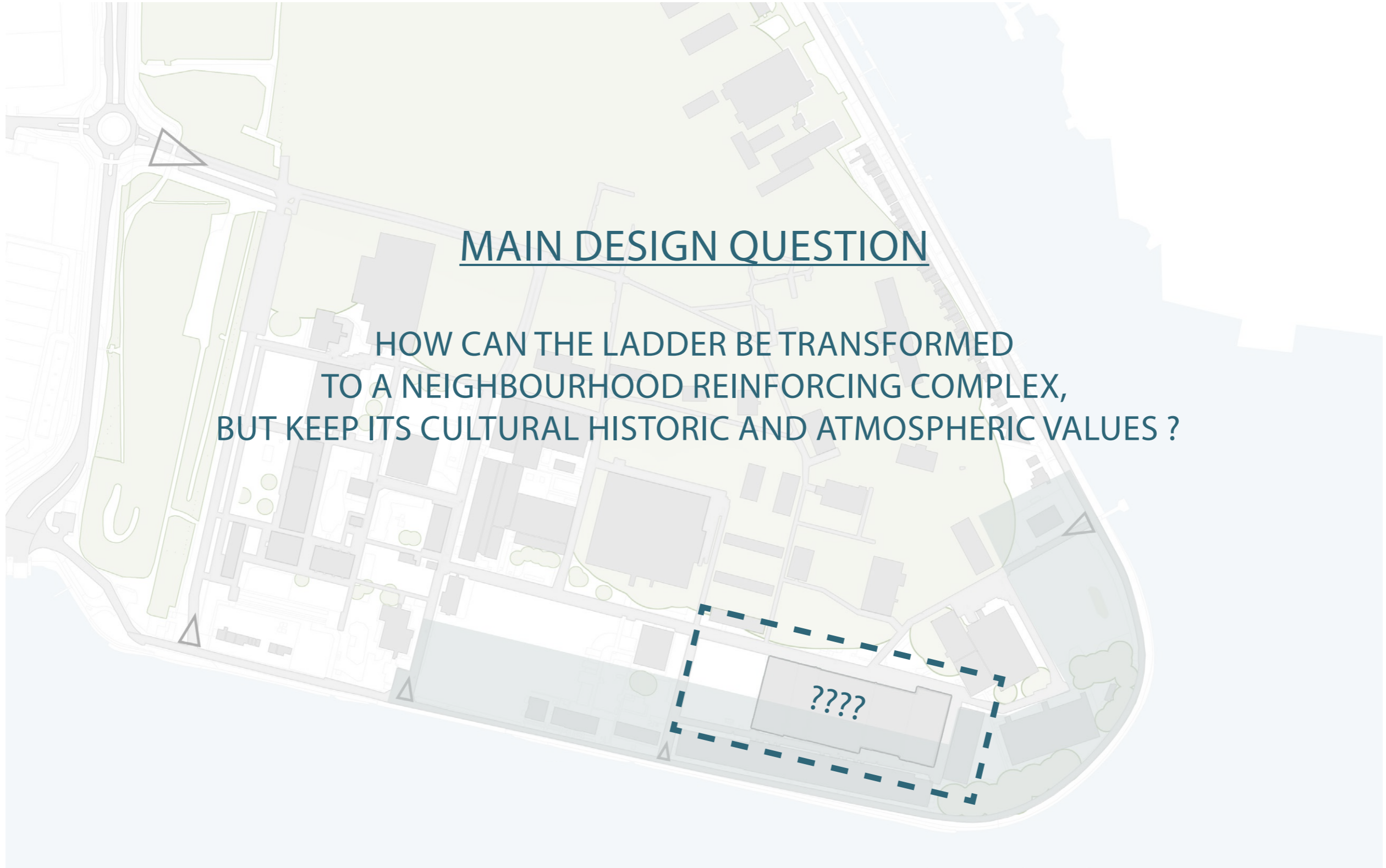


existing train track to Amsterdam

existing ferry connection between Amsterdam and zaadam

PUBLIC VERSUS PRIVATE





MAIN DESIGN QUESTION

HOW CAN THE LADDER BE TRANSFORMED
TO A NEIGHBOURHOOD REINFORCING COMPLEX,
BUT KEEP ITS CULTURAL HISTORIC AND ATMOSPHERIC VALUES ?

PART 3: TRANSFORMATION STRATEGIES

1. REACTION ON THE ANTHROPOCENE



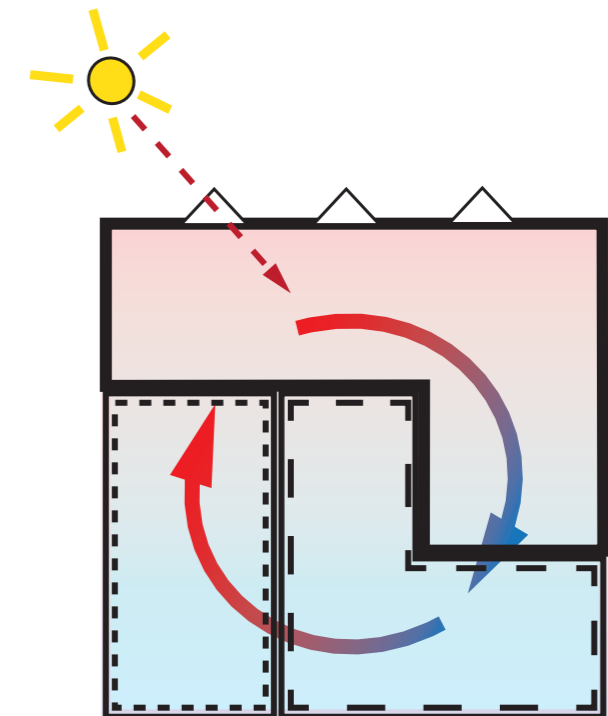
CULTURAL
+ SOCIETAL

2. INFILL & GESTALTRECYCLING



ARCHITECTURE
+ CULTURAL VALUES

3. REDESIGN SKIN & APPLYING ZONES



BUILDING TECHNOLOGY
+ USE

PART 1
ANALYSIS

PART 2
MASTERPLAN + PROGRAM

PART 3
TRANSFORMATION STRATEGIES

PART 4
DESIGN



1. REACTION ON THE ANTHROPOCENE

- consciousness of human impact
- the former function of the area
- contrast between nature and industrial landscape



1. REACTION ON THE ANTHROPOCENE



REDUCE HUMAN IMPACT

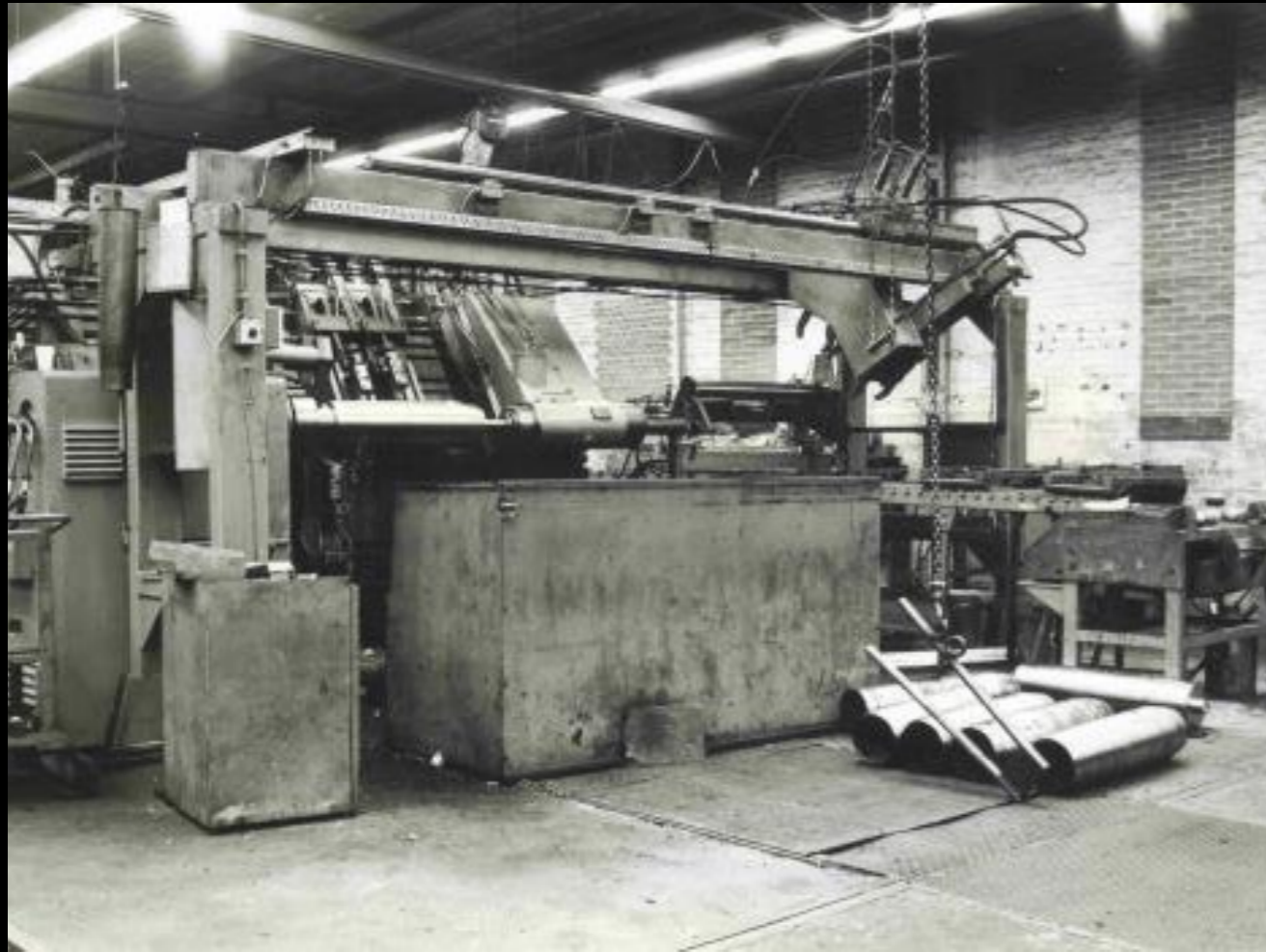
- *reuse existing structure and skin*
- *reuse energy between functions*



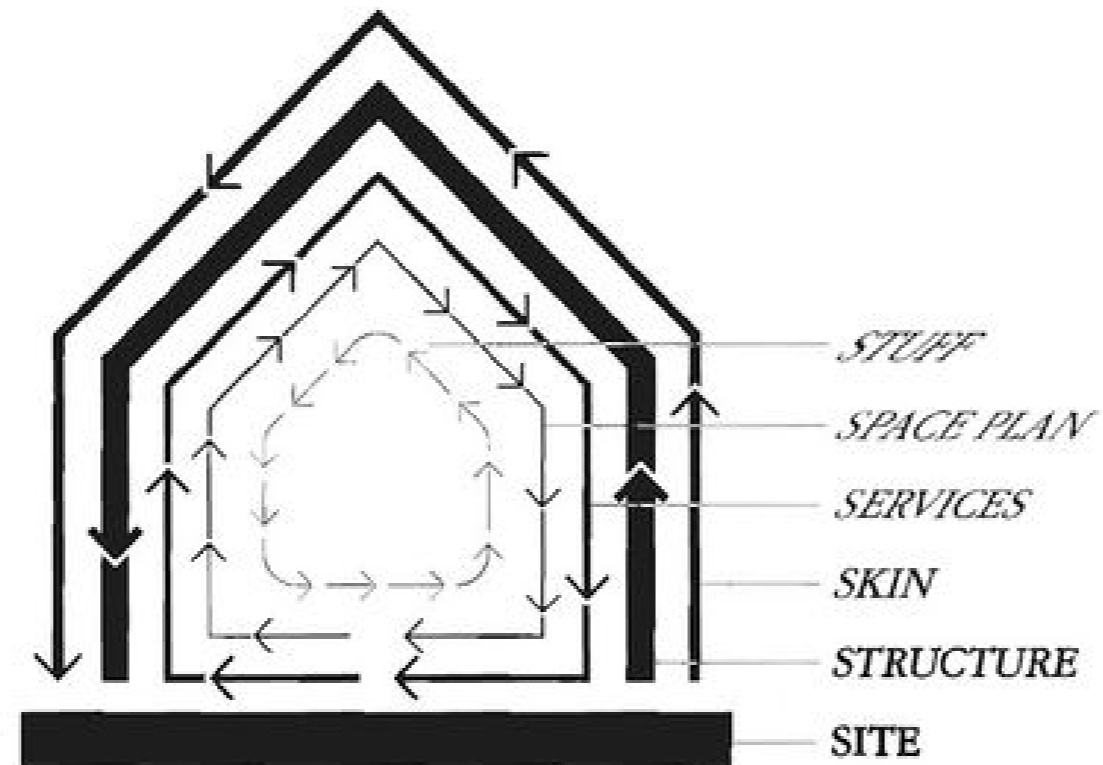
RESTORE CONTACT WITH NATURE

- *extension of the plobos into and on top of the building*





2. INFILL & GESTALTRECYCLING



SHEARING LAYERS OF CHANGE. Because of the different rates of change of its components, a building is always tearing itself apart.

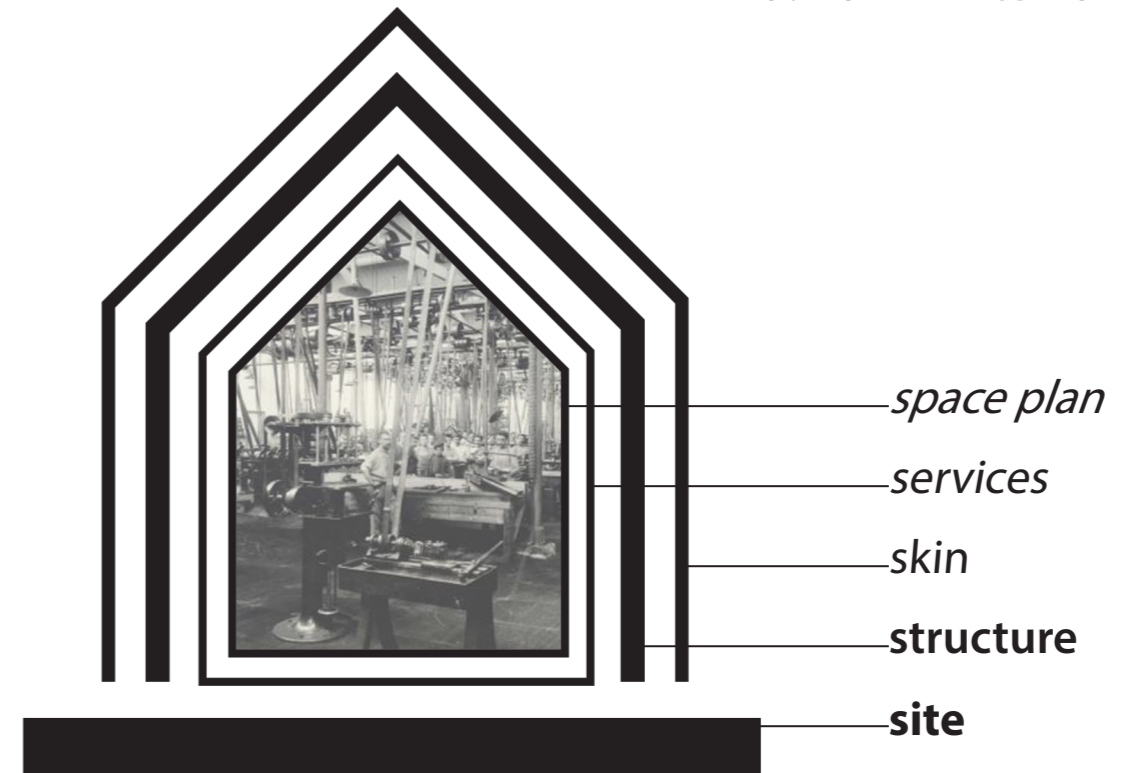
SCHEME BY STEWART BRAND

2. INFILL & GESTALTRECYCLING

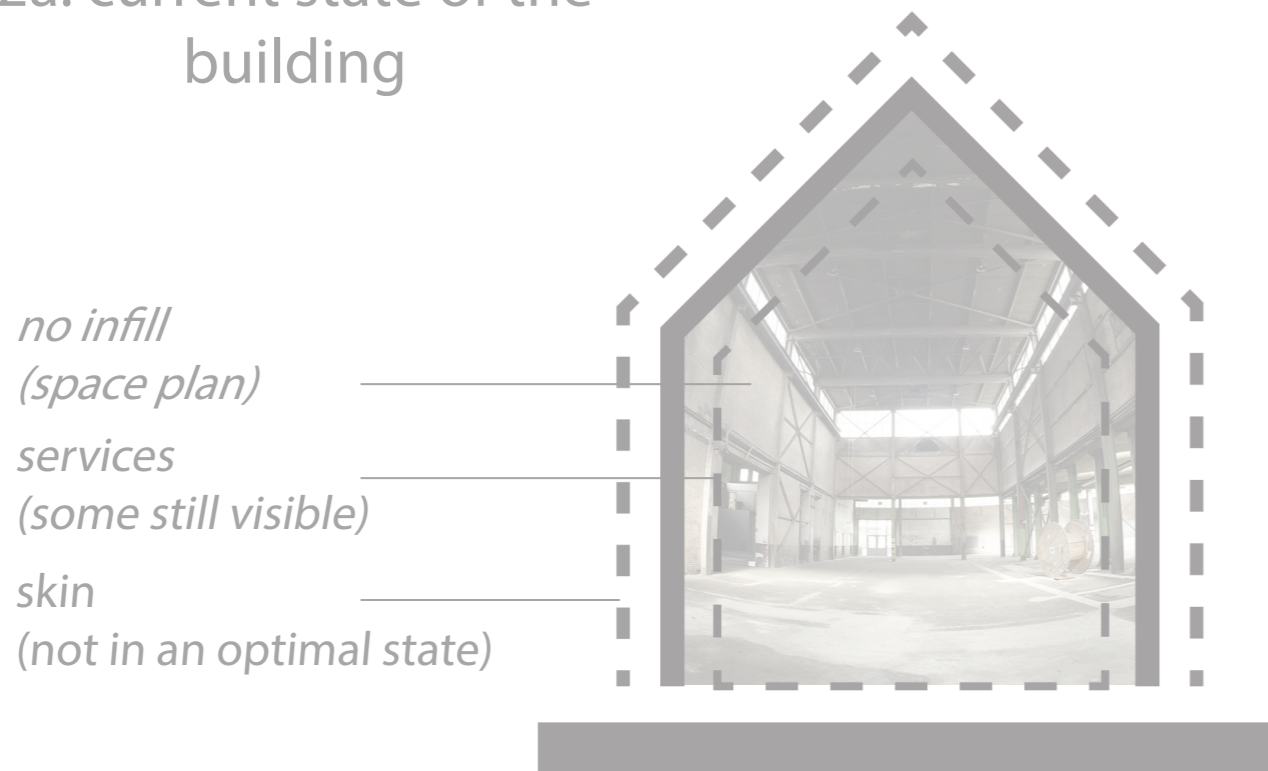
1a. new function/process/
machine needed



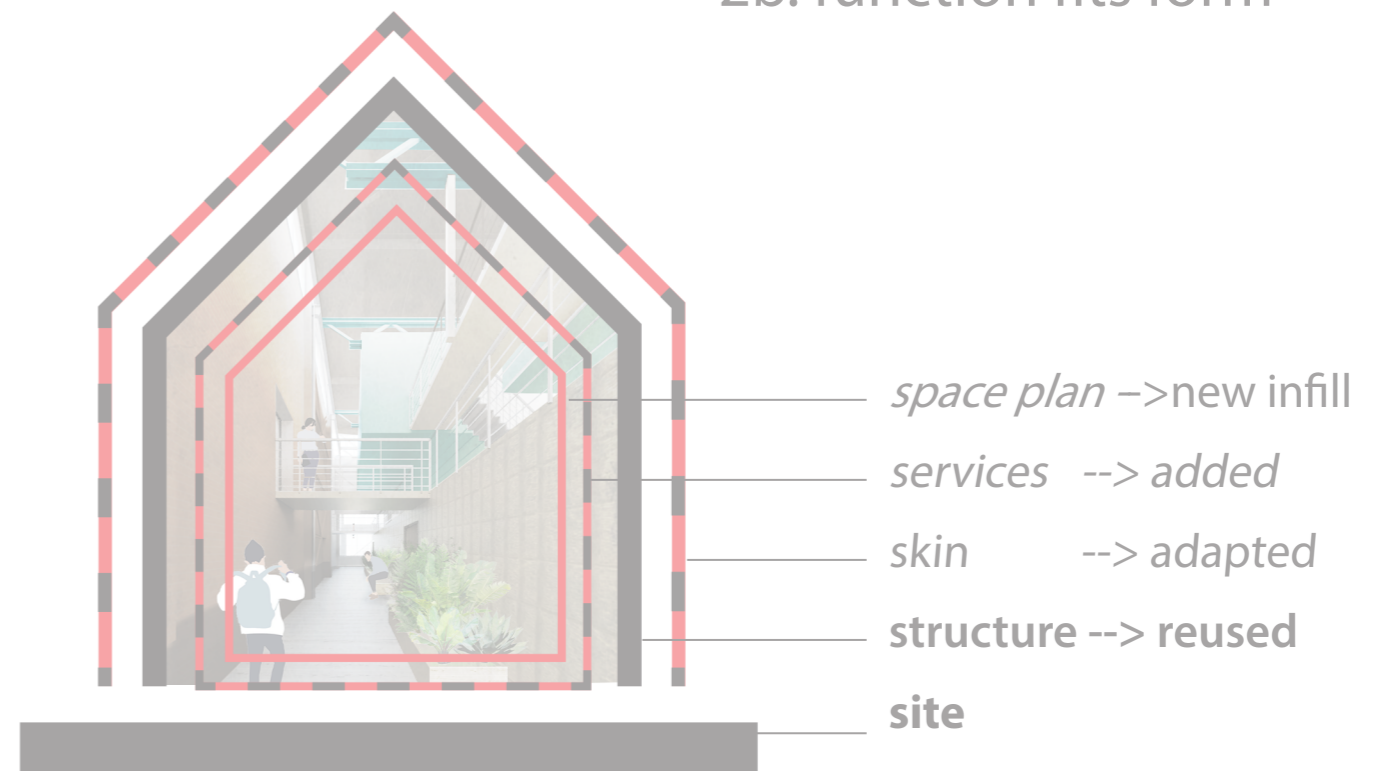
1b. form fits function



2a. current state of the
building



2b. function fits form

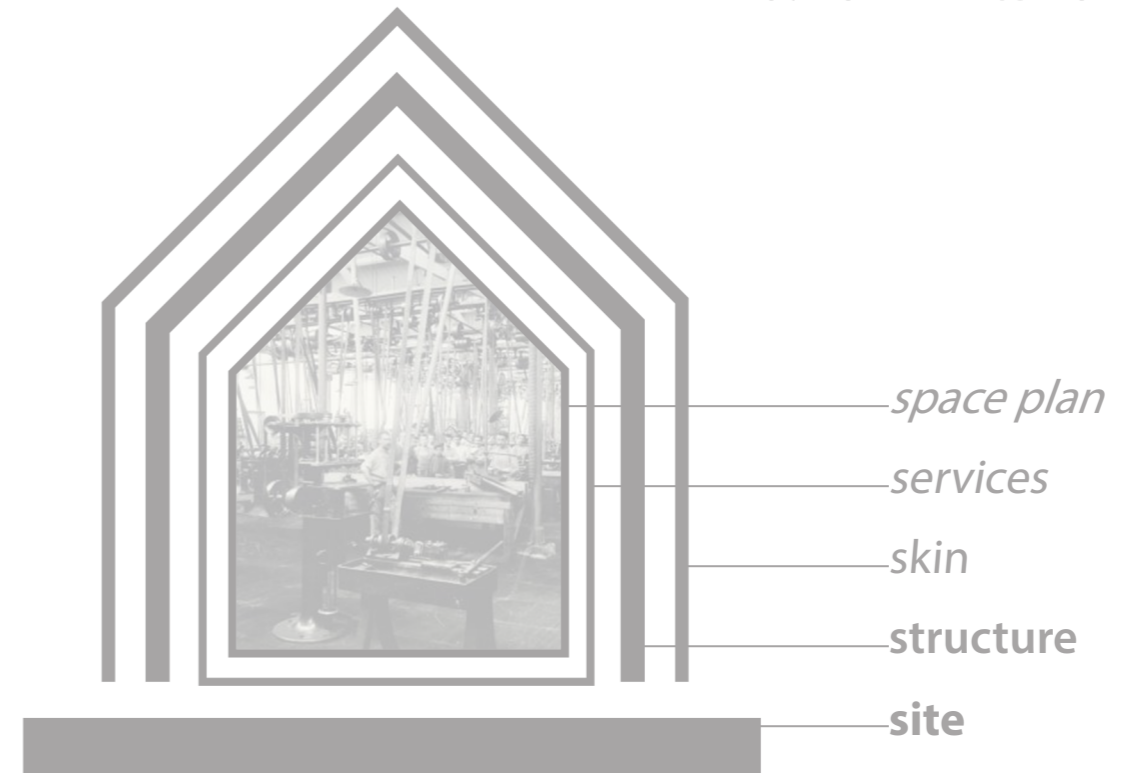


2. INFILL & GESTALTRECYCLING

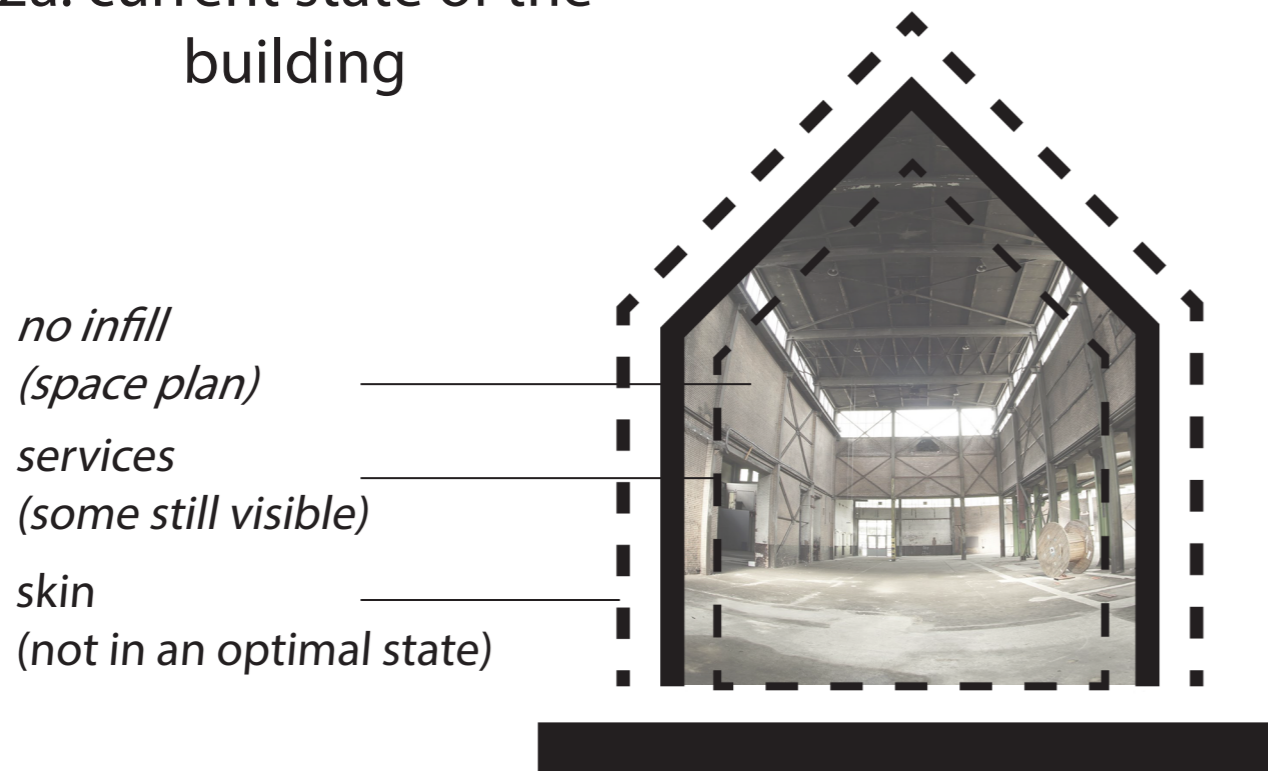
1a. new function/process/
machine needed



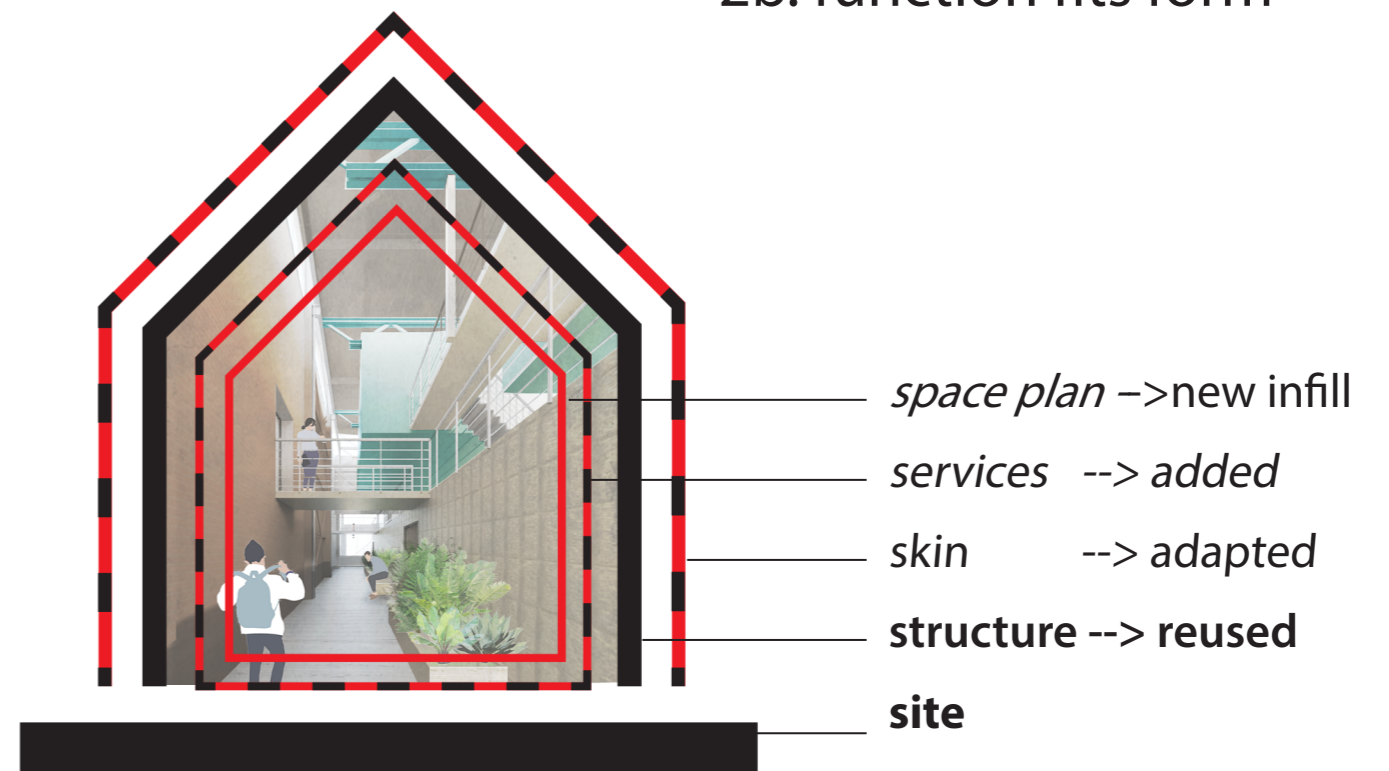
1b. form fits function



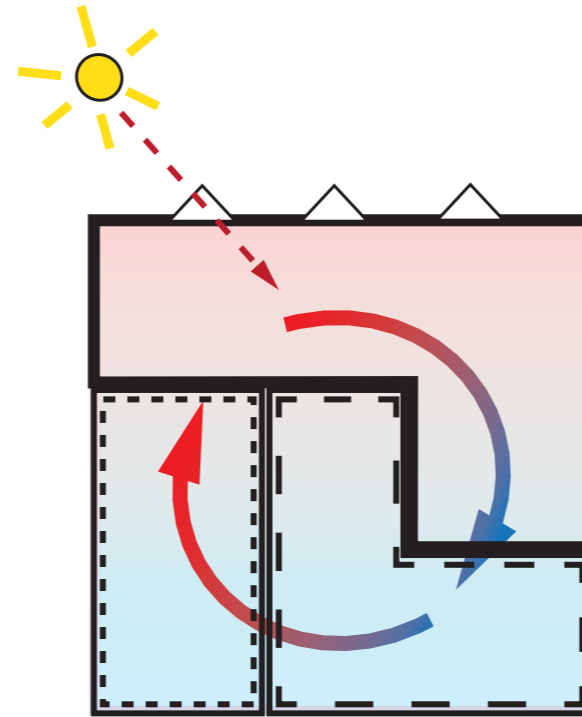
2a. current state of the
building



2b. function fits form

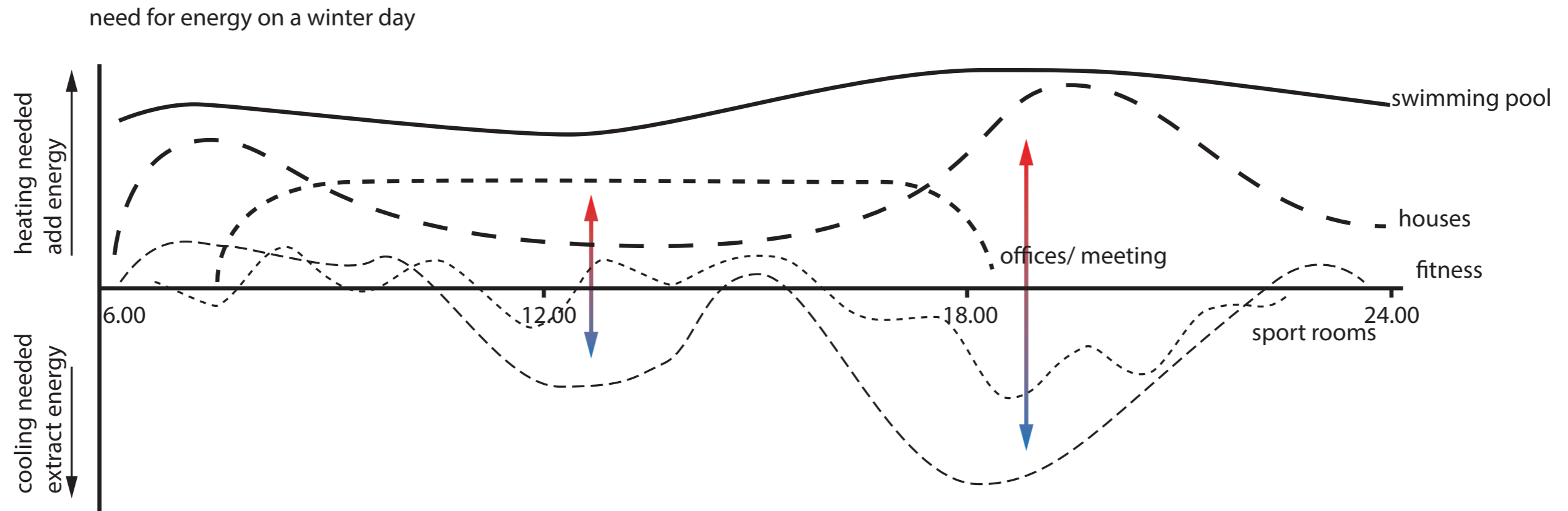


3. REDESIGN & APPLYING ZONES



- different climate zones with different impact on the existing
- shearing energy between functions during the day
- saving energy during the year

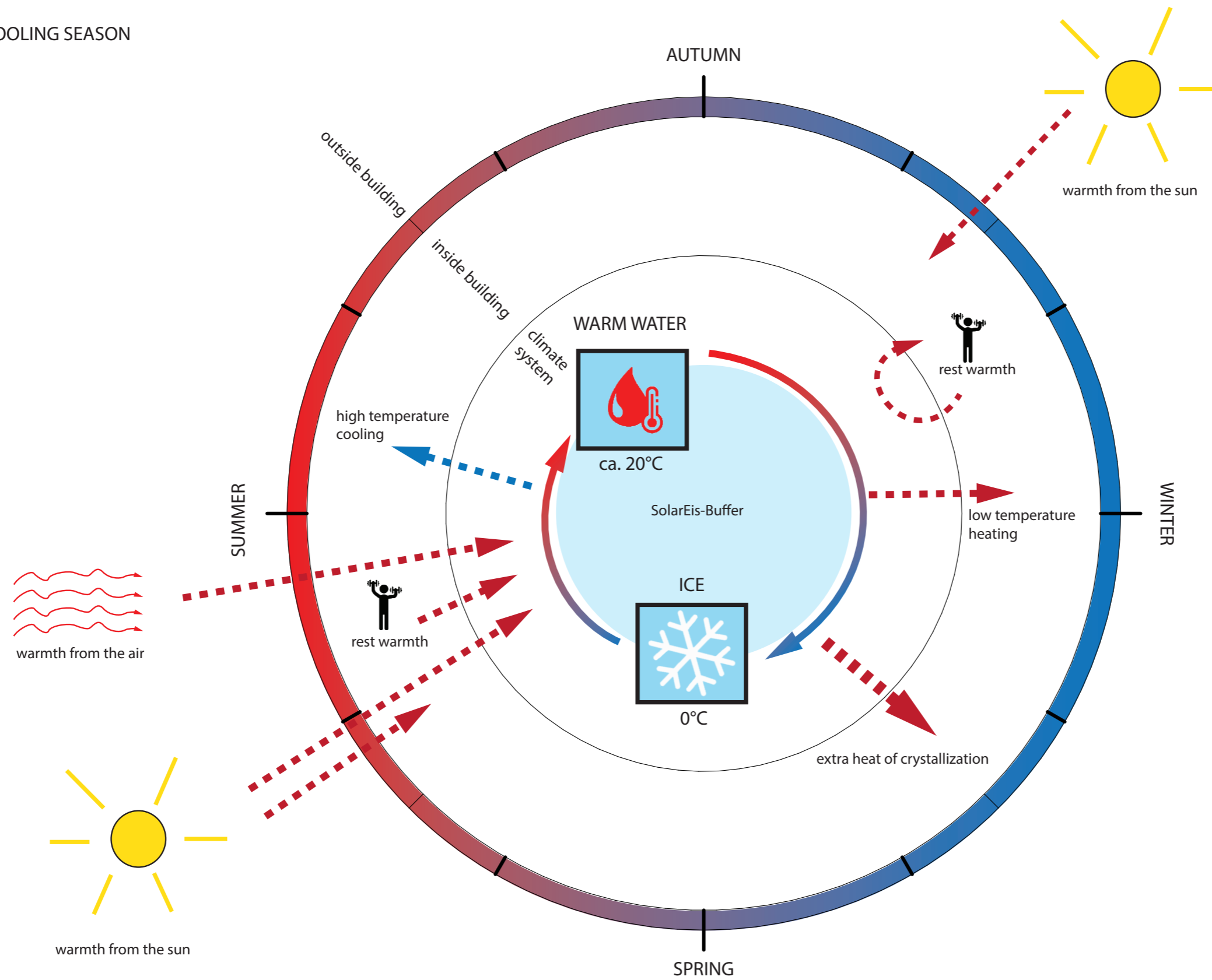
SHEARING ENERGY: DURING A DAY



SHEARING ENERGY: DURING A YEAR

COOLING SEASON

HEATING SEASON



ROOF PLAN

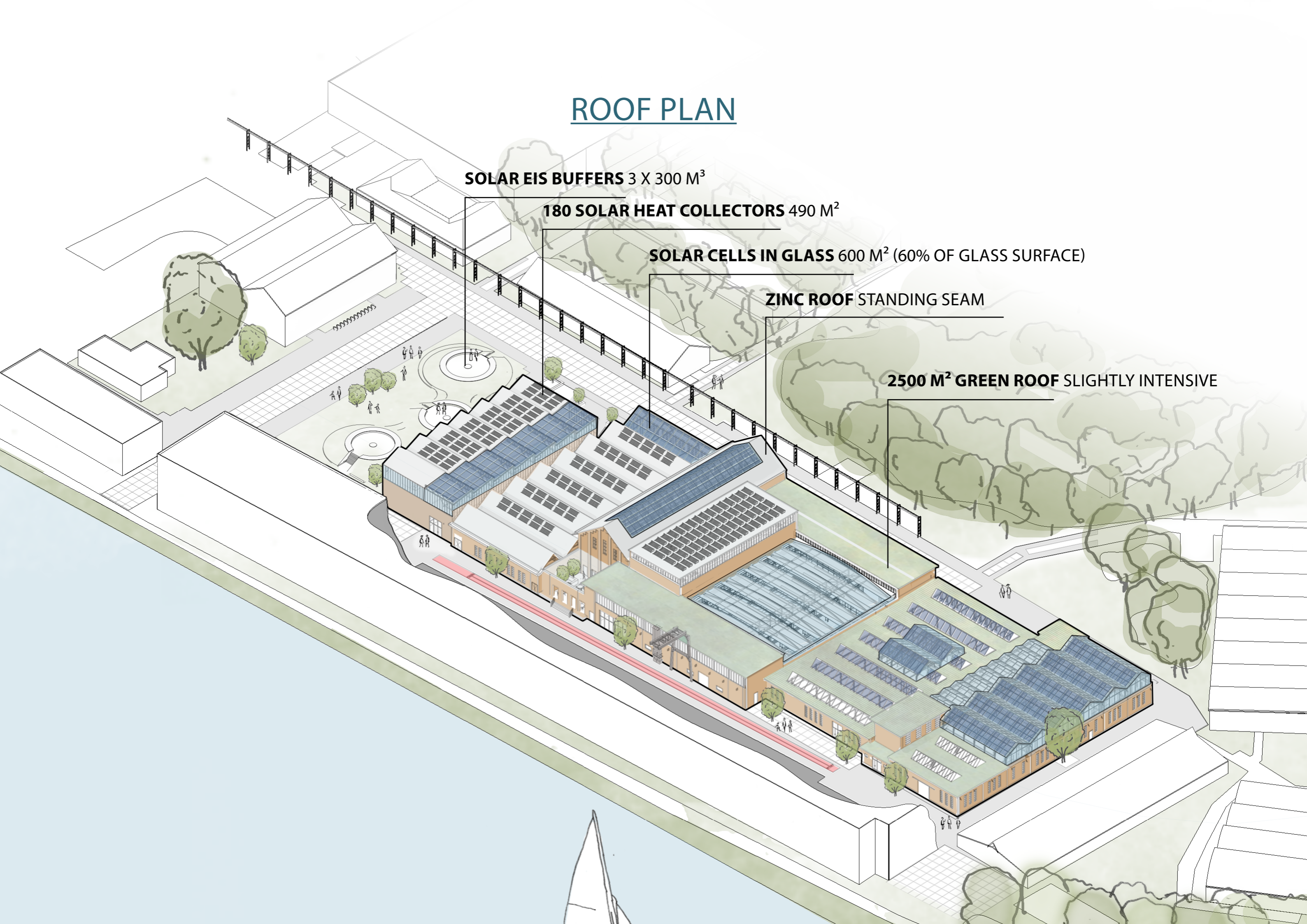
SOLAR EIS BUFFERS 3 X 300 M³

180 SOLAR HEAT COLLECTORS 490 M²

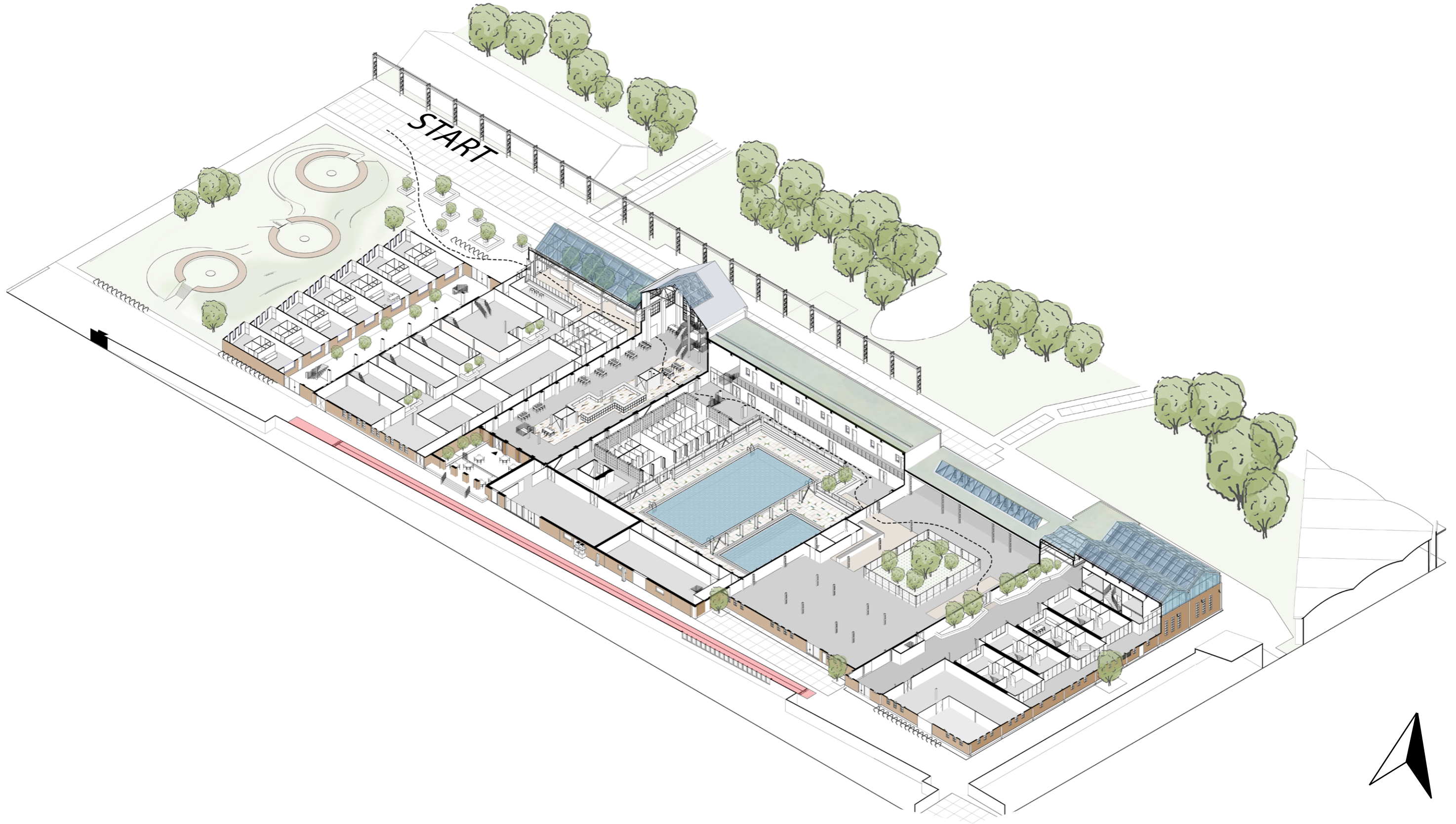
SOLAR CELLS IN GLASS 600 M² (60% OF GLASS SURFACE)

ZINC ROOF STANDING SEAM

2500 M² GREEN ROOF SLIGHTLY INTENSIVE



PART 4: TOUR THROUGH THE BUILDING



PART 1
ANALYSIS

PART 2
MASTERPLAN +PROGRAM

PART 3
TRANSFORMATION STRATEGIES

PART 4
DESIGN

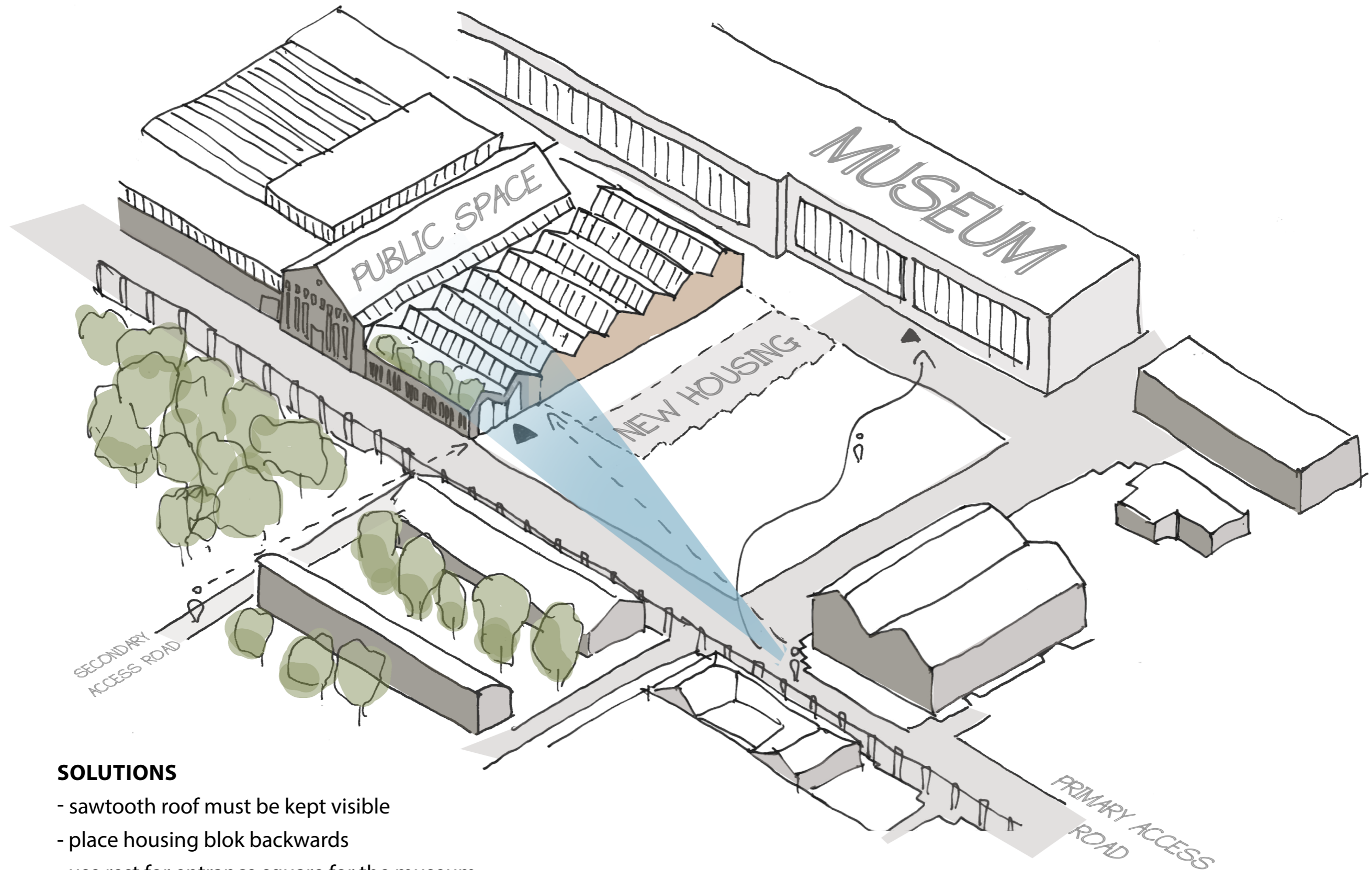
ENTRANCE



PROBLEMS

- no clear entrance for the Ladder
- large open space, without human scale
- no clear entrance towards the museum

ENTRANCE

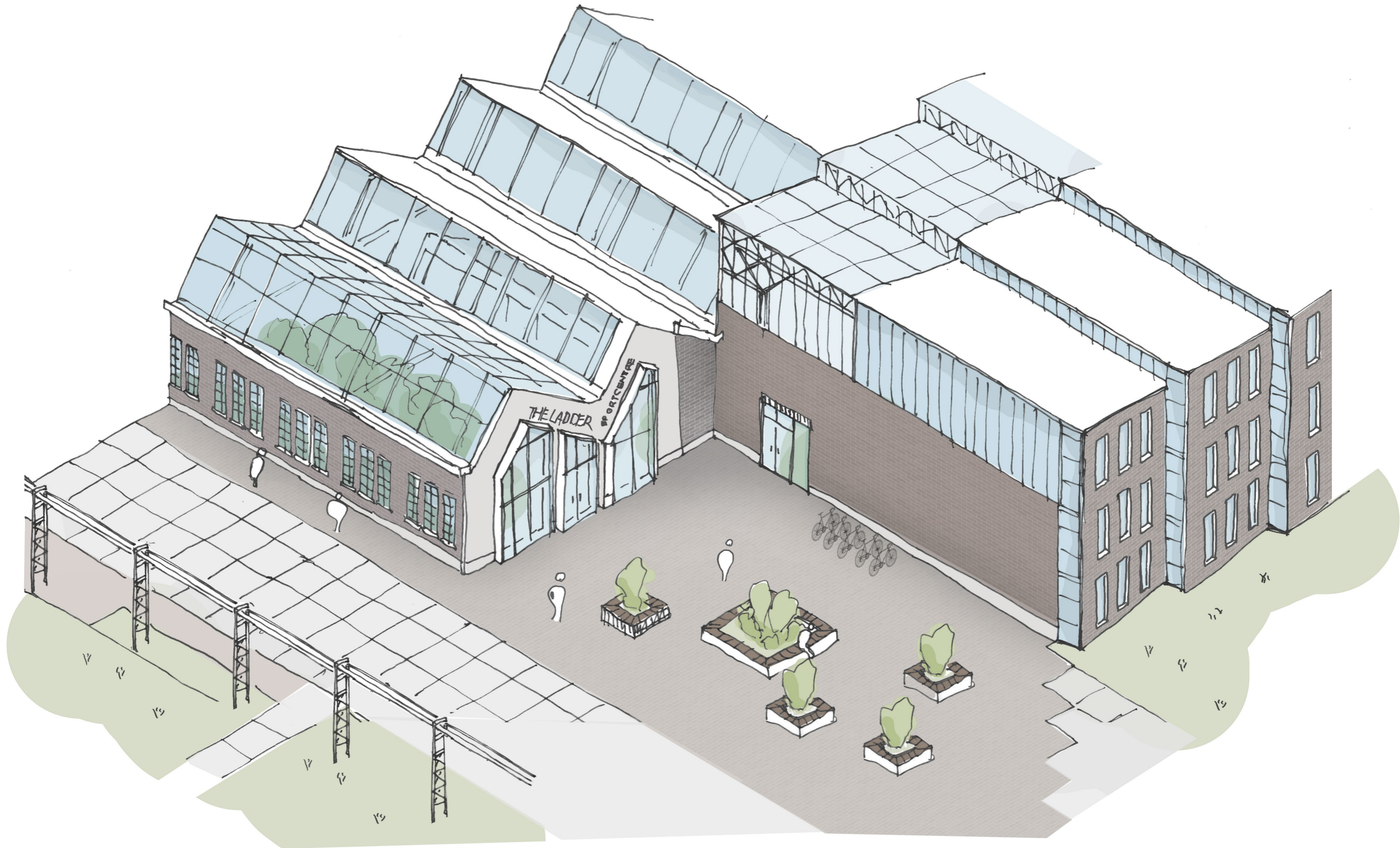


SOLUTIONS

- sawtooth roof must be kept visible
- place housing blok backwards
- use rest for entrance square for the museum







CONNECTIONS OF THE LADDER

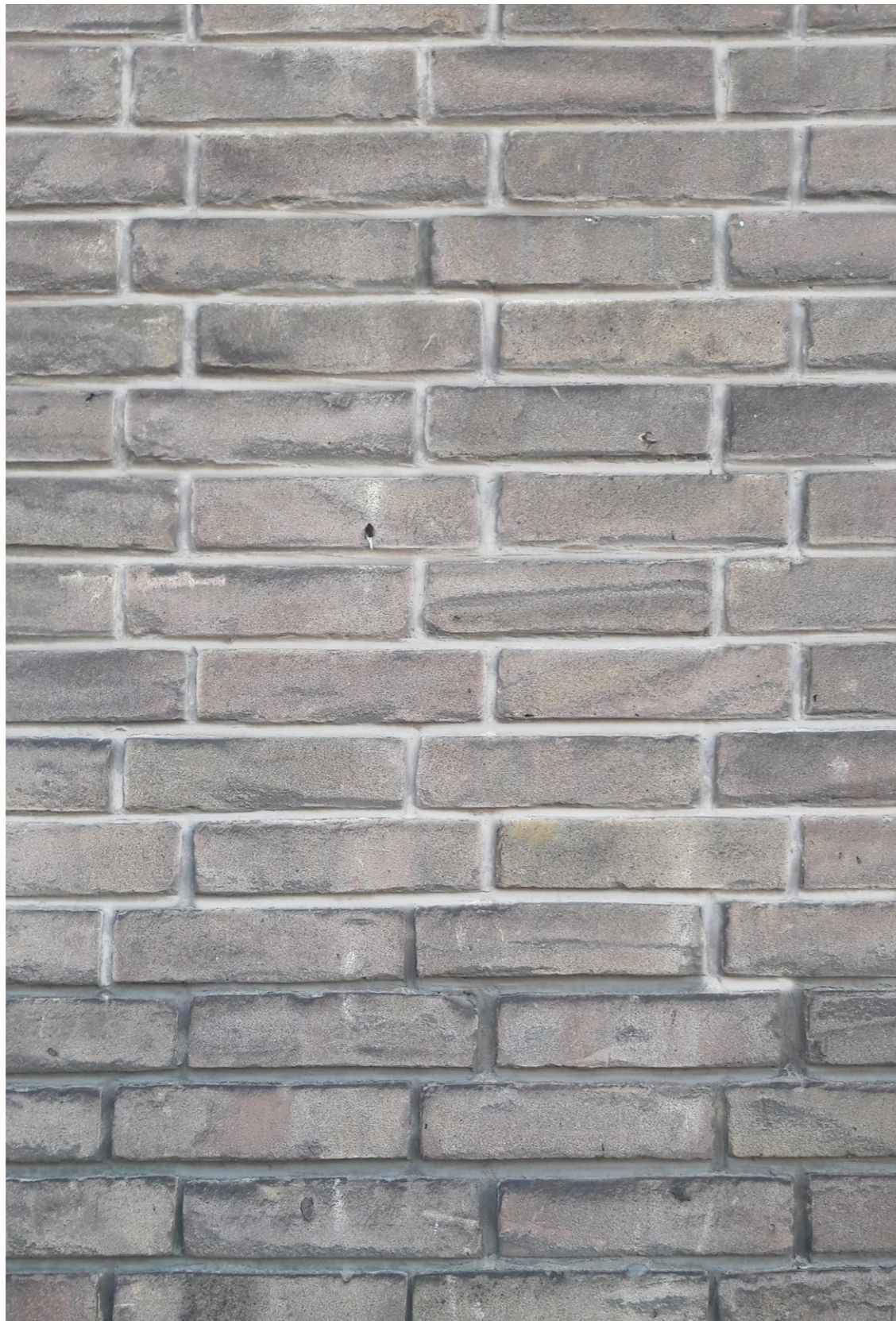




EXISTING BRICK FACADE



NEW BRICK: STONECYCLING



EXISTING BRICK: NEW JOINTS

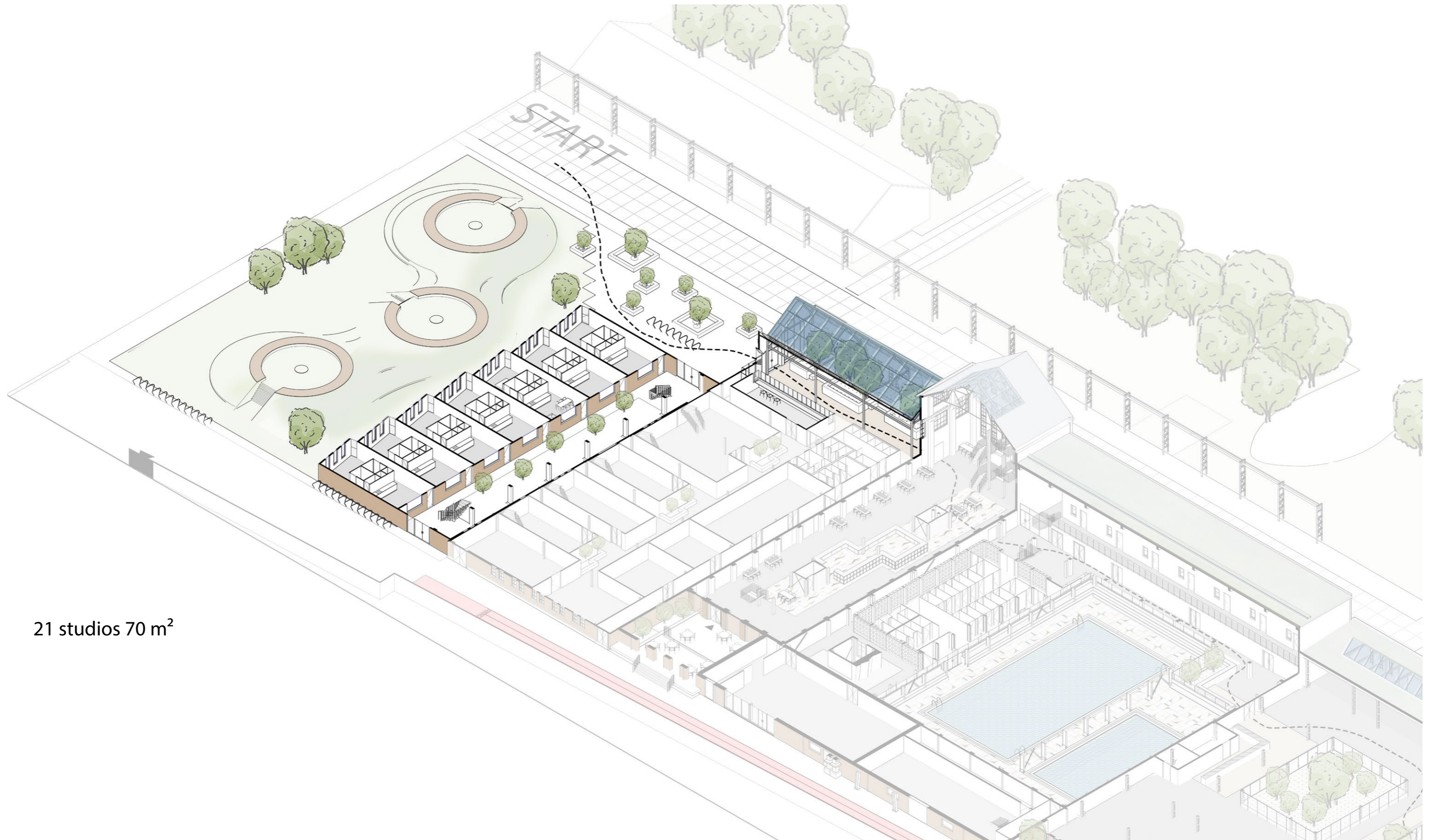


NEW BRICK: STONECYCLING



THE LADDER
SPORTCENTRE

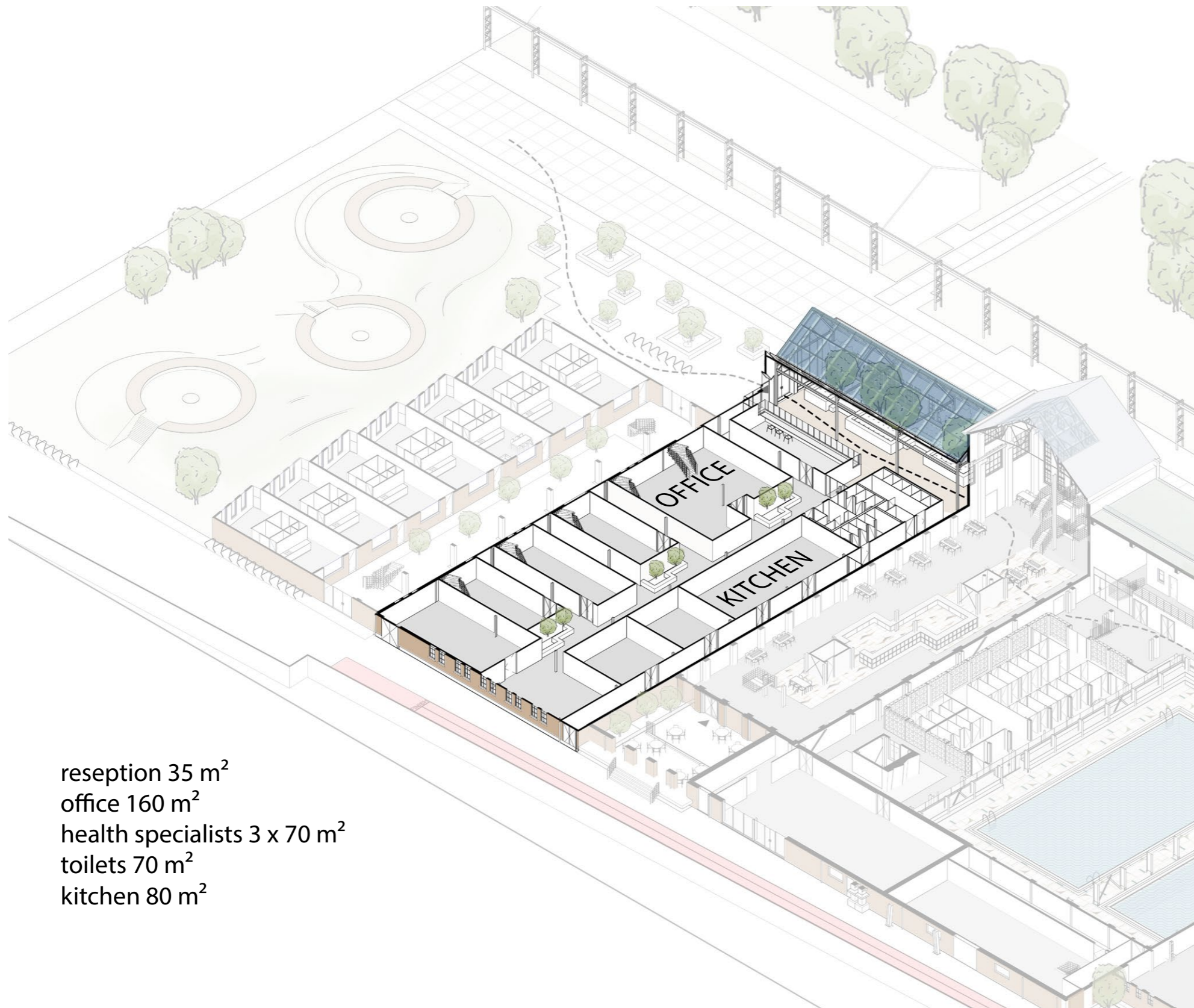
ENTRANCE



21 studios 70 m²



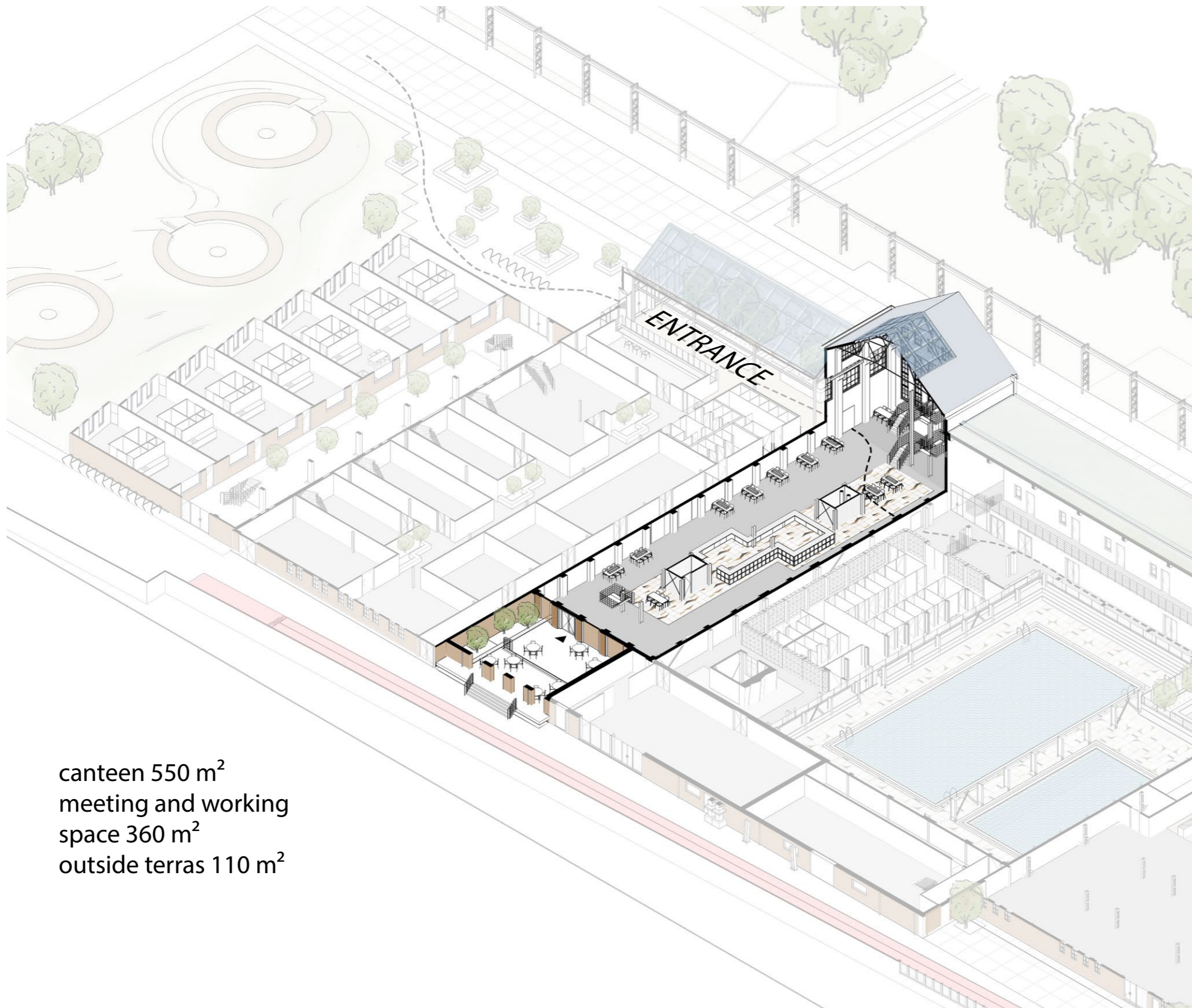
BACKOFFICE + SUPPORTING FUNCTIONS



reception 35 m²
office 160 m²
health specialists 3 x 70 m²
toilets 70 m²
kitchen 80 m²



THE CHURCH



canteen 550 m²
meeting and working
space 360 m²
outside terras 110 m²



south side 1940-1969

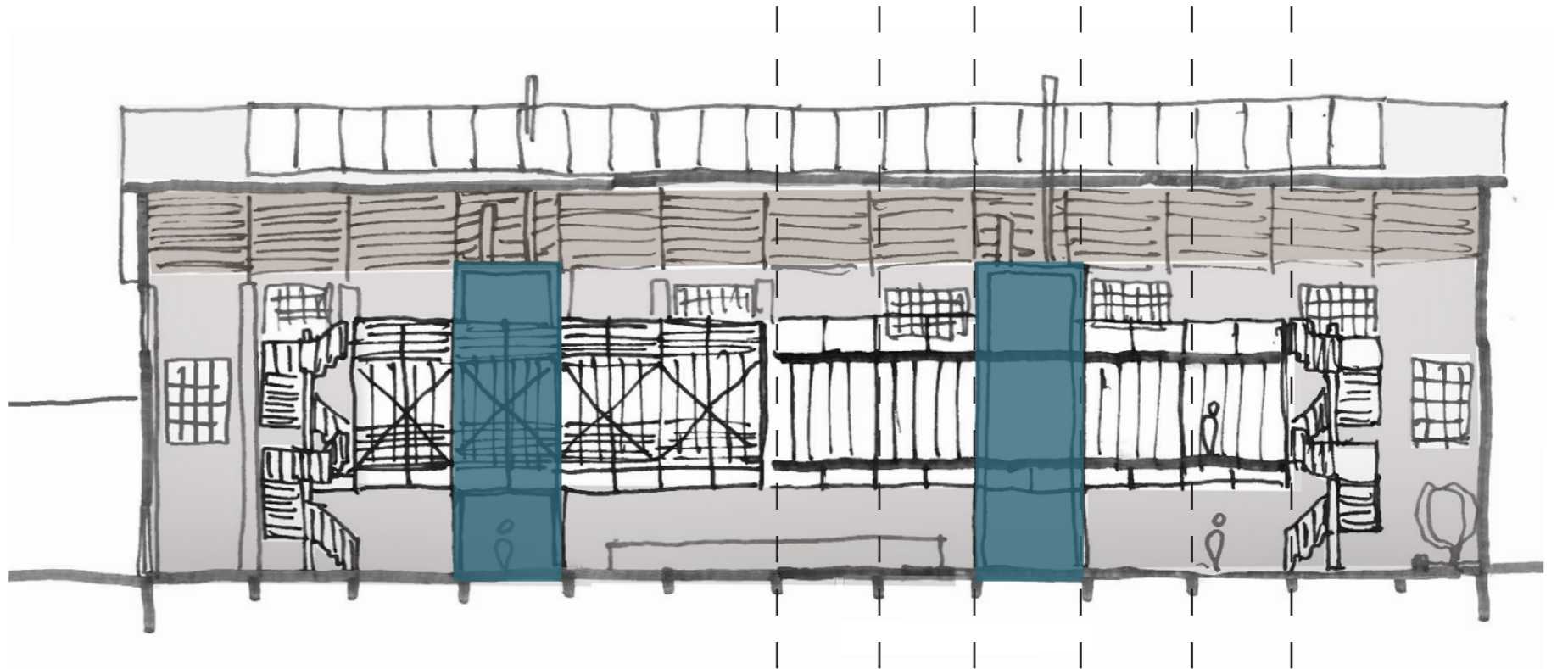




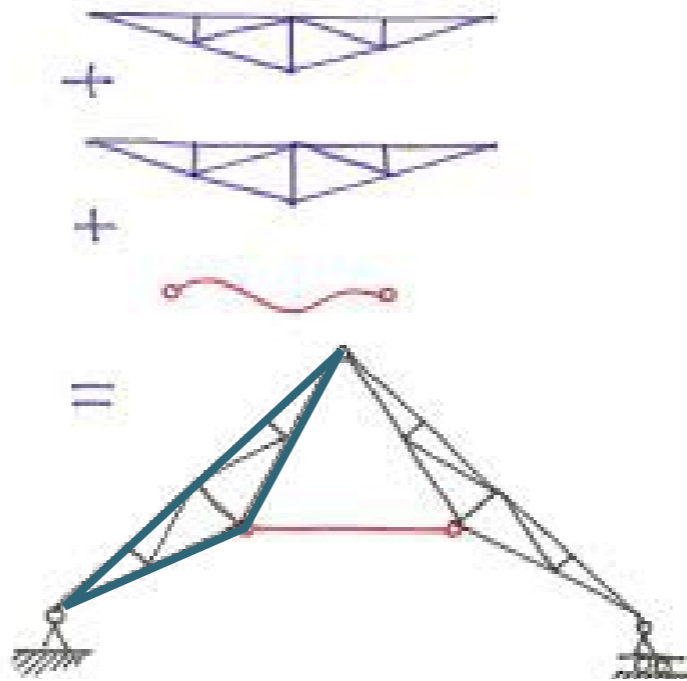




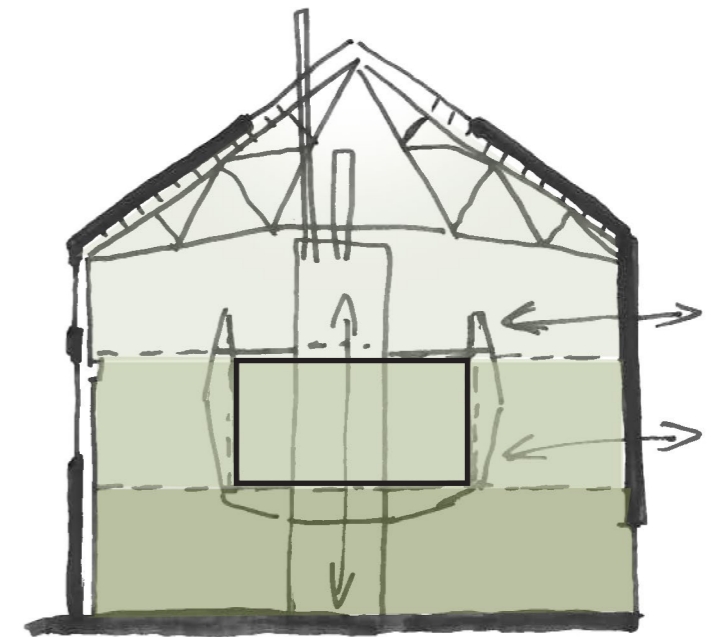
historical use



rhythm



structure



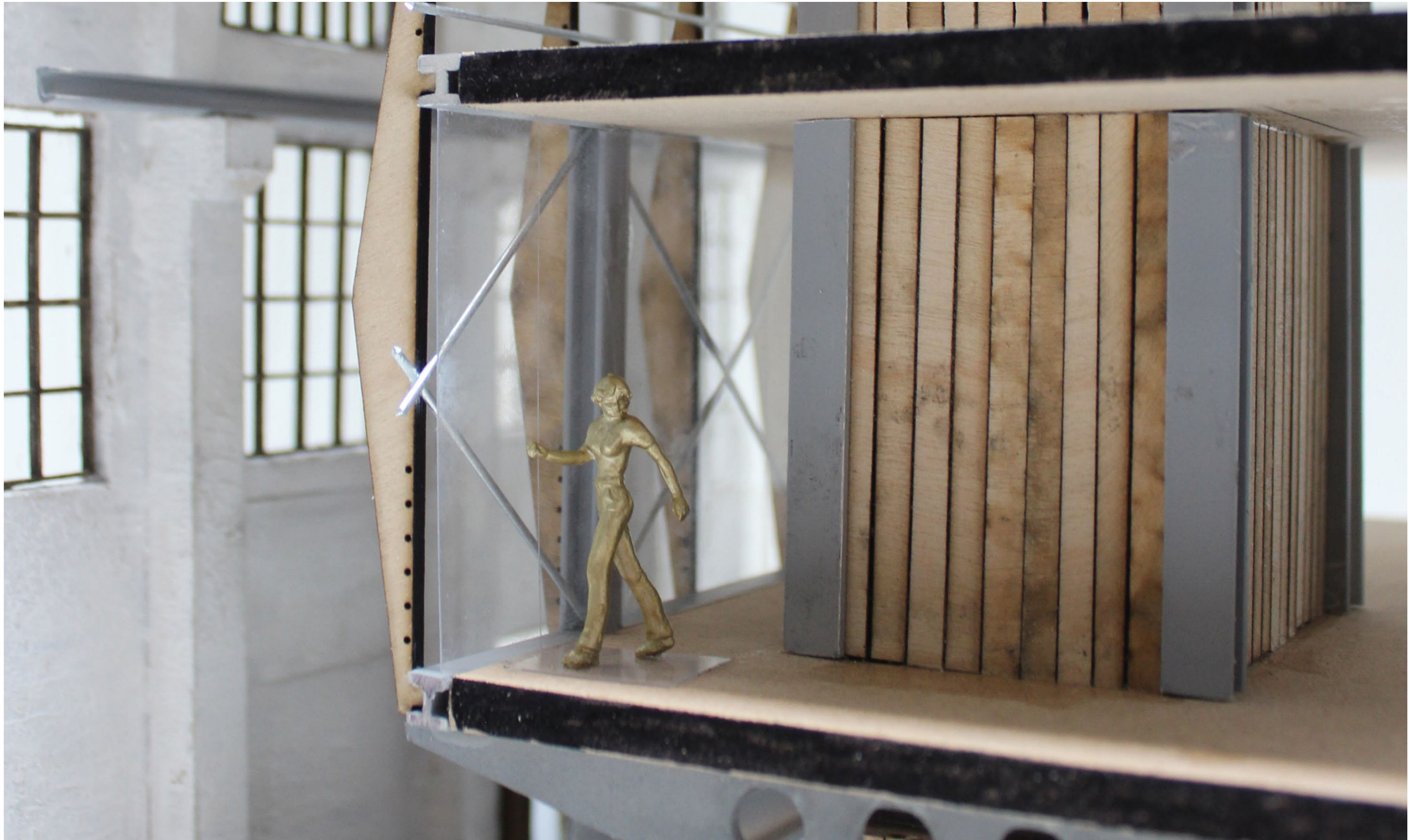
light and scale



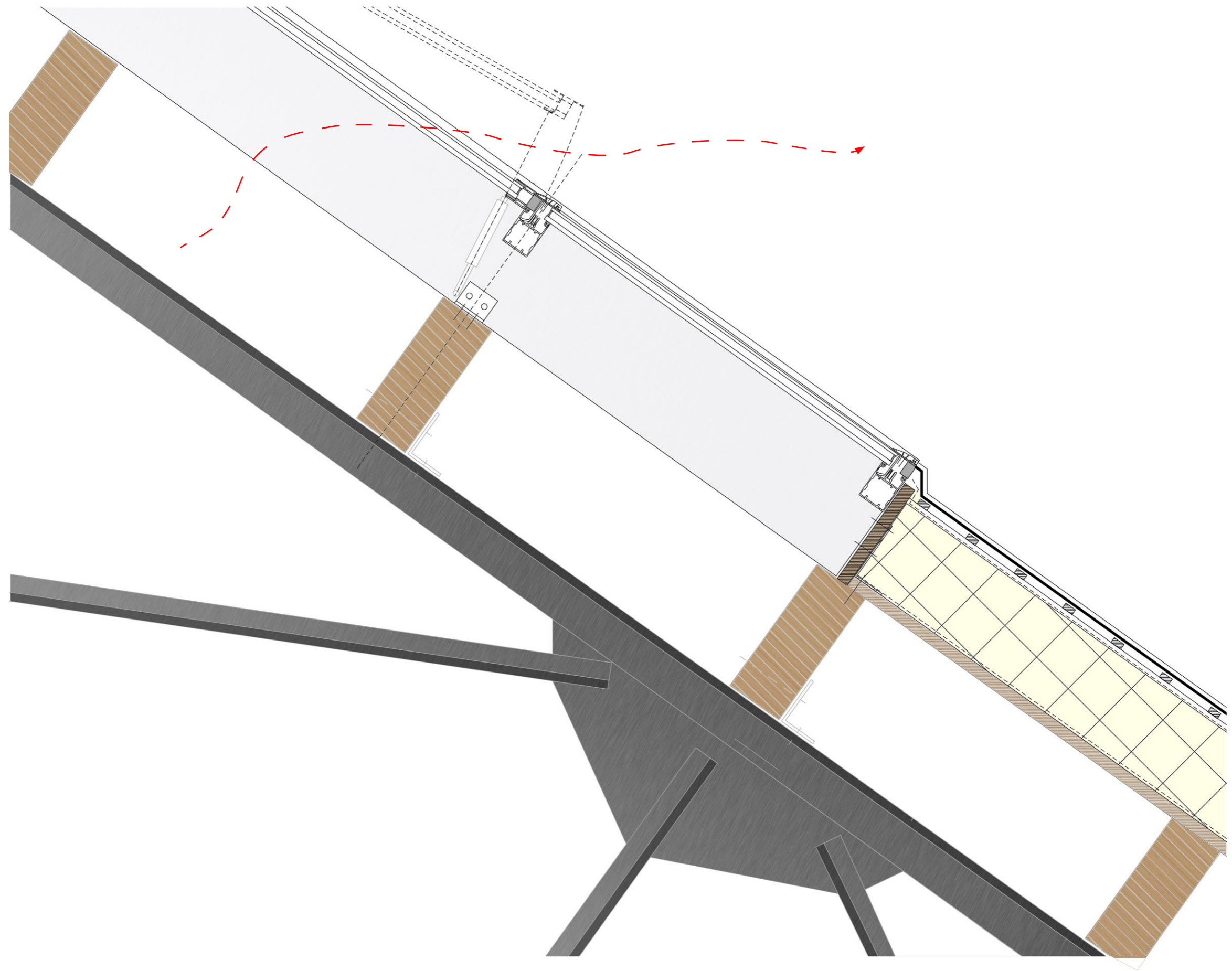
CLIMATE ZONES

CLIMATE ZONES	temperature in Celcius		humidity in %		type of ventilation
	min.	max.	min.	max.	
swimming pool	23	32	50	70	mechanical
fitness hall	16	26	40	65	mechanical
group lesson rooms	18	26	40	65	mechanical
changing rooms	24	26	40	65	mechanical
offices/workspaces	winter 20 23 summer		winter 40 60 summer		hybrid
housing	18	23	40	60	hybrid
in-between space staying	16	23	40	60	hybrid
in-between space moving	12	26	40	60	hybrid
technical/ storage space	15	26	40	60	mechanical

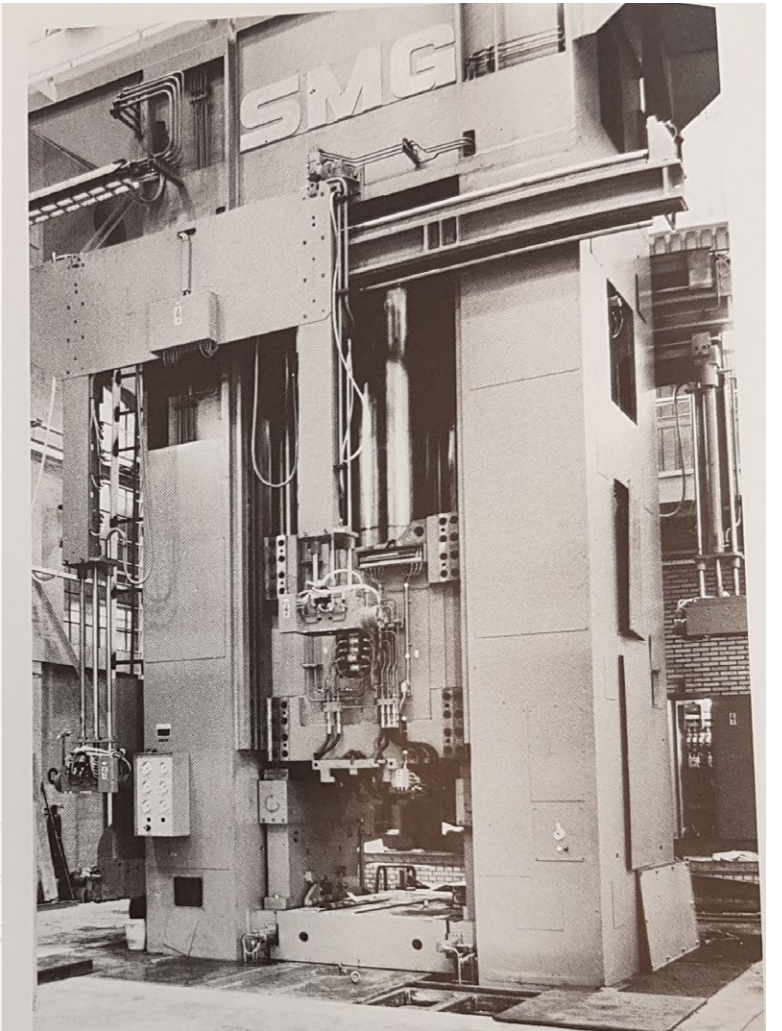
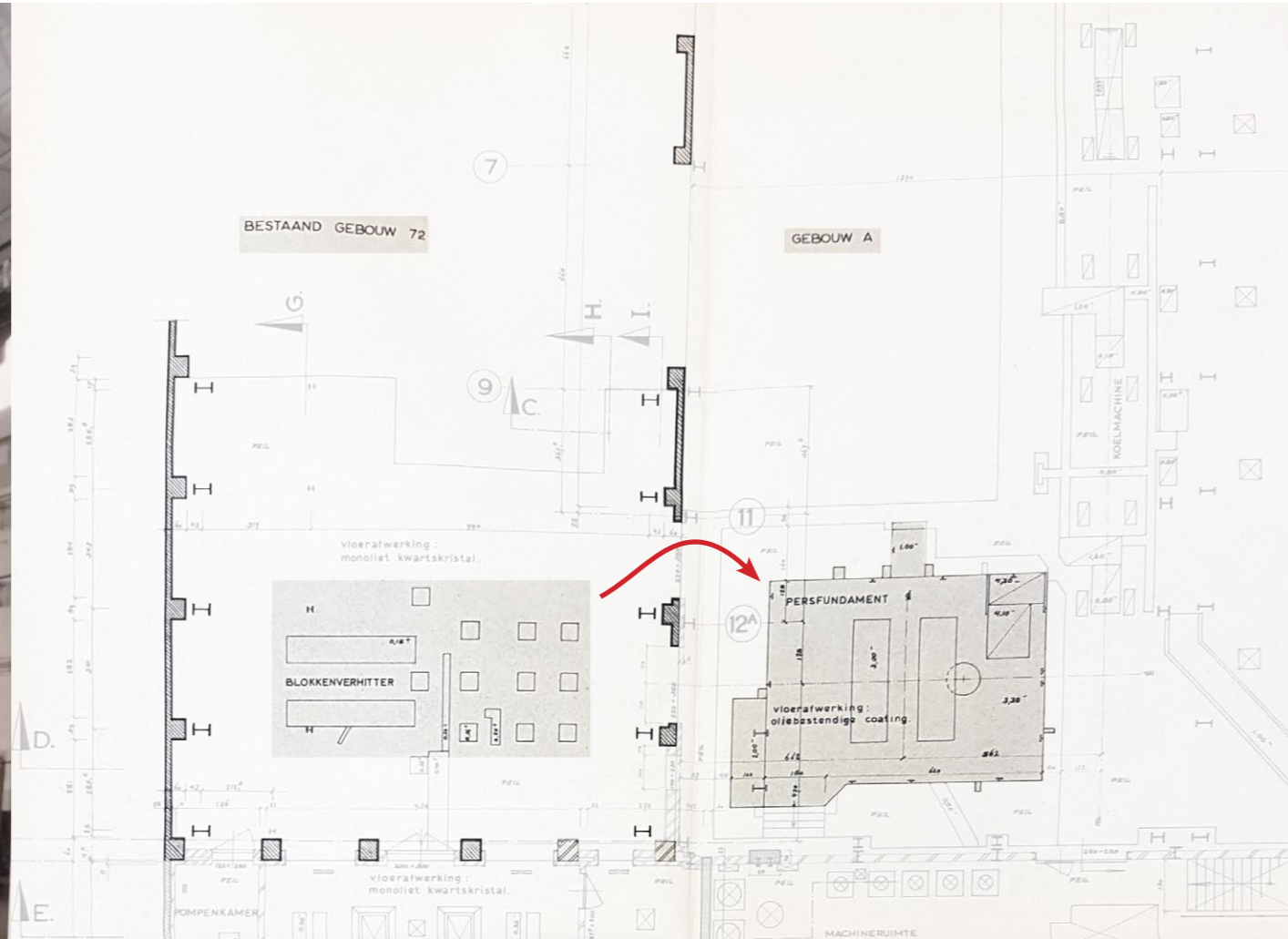


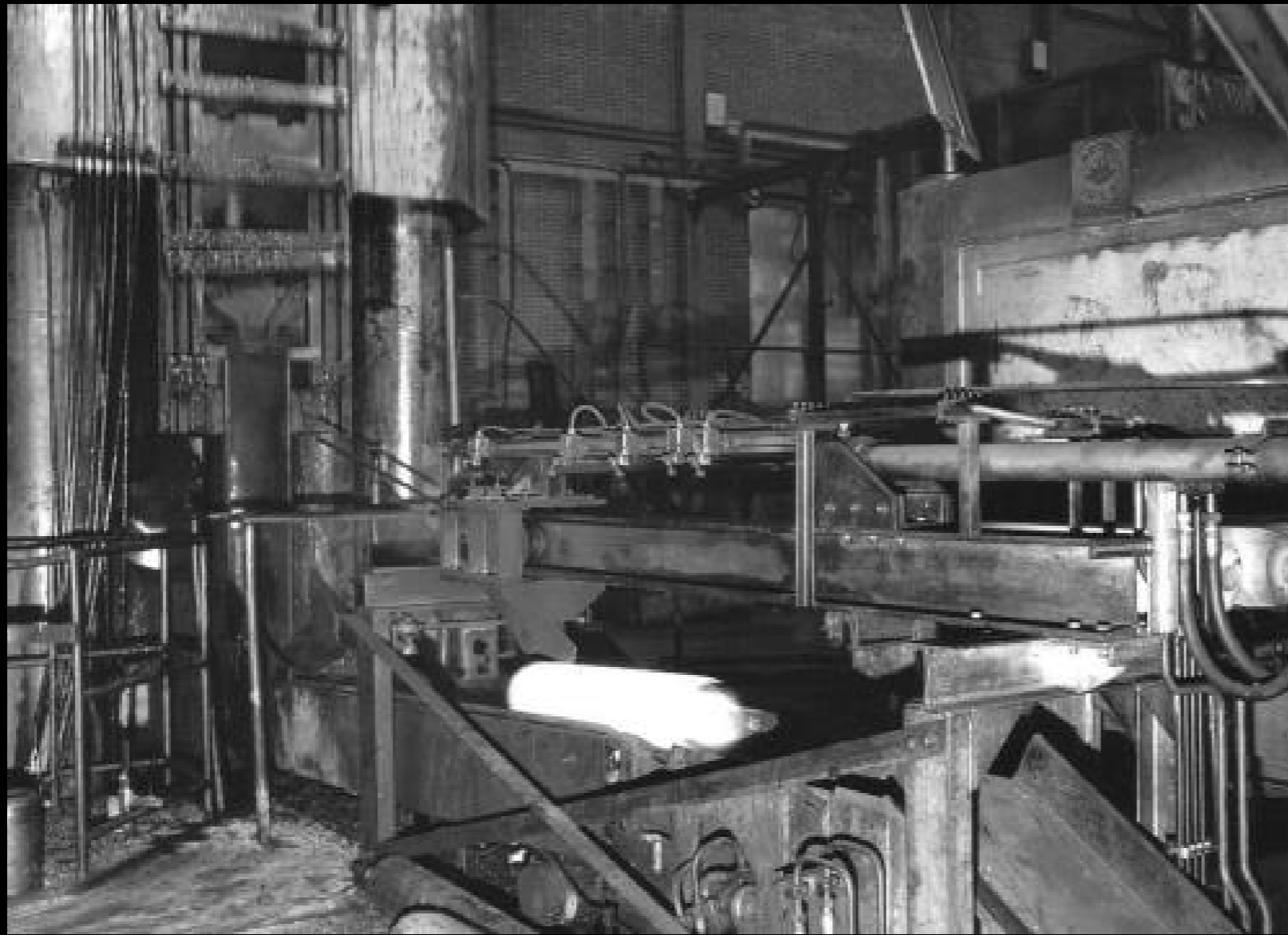




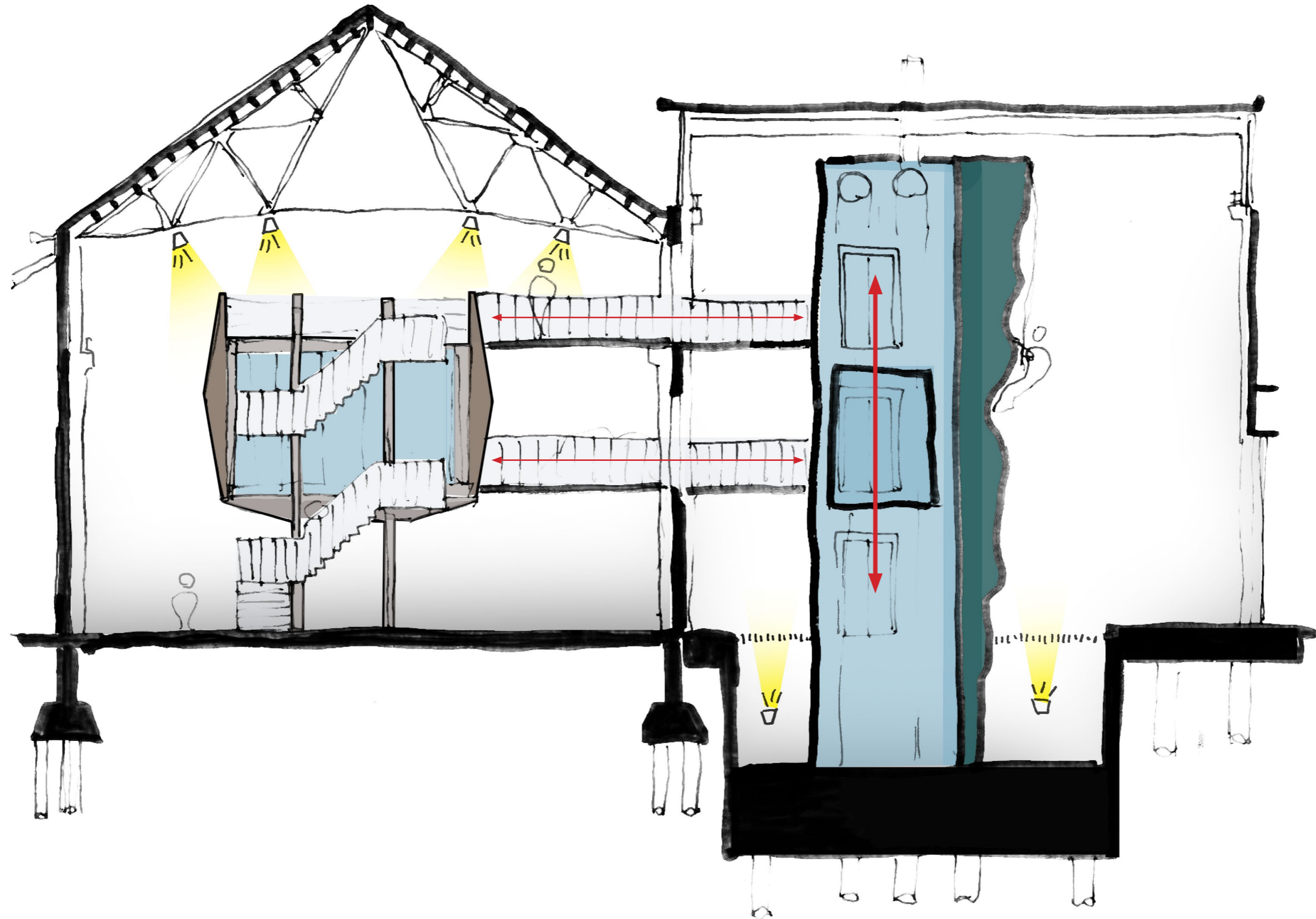


IMPROVEMENT IN PRODUCTION PROCESS



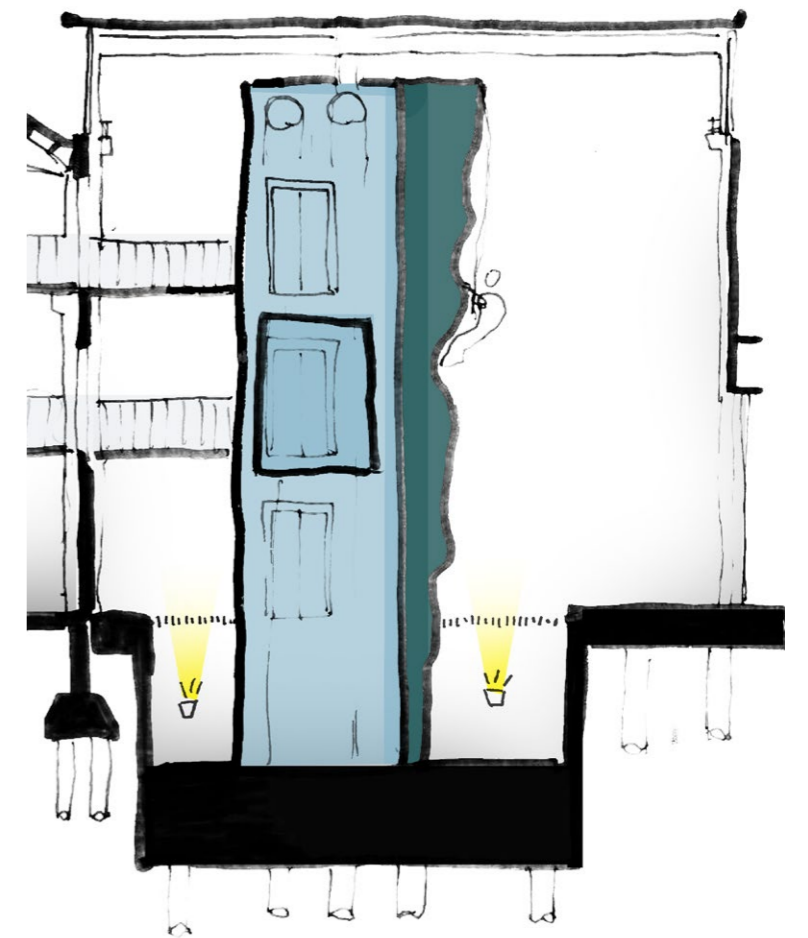
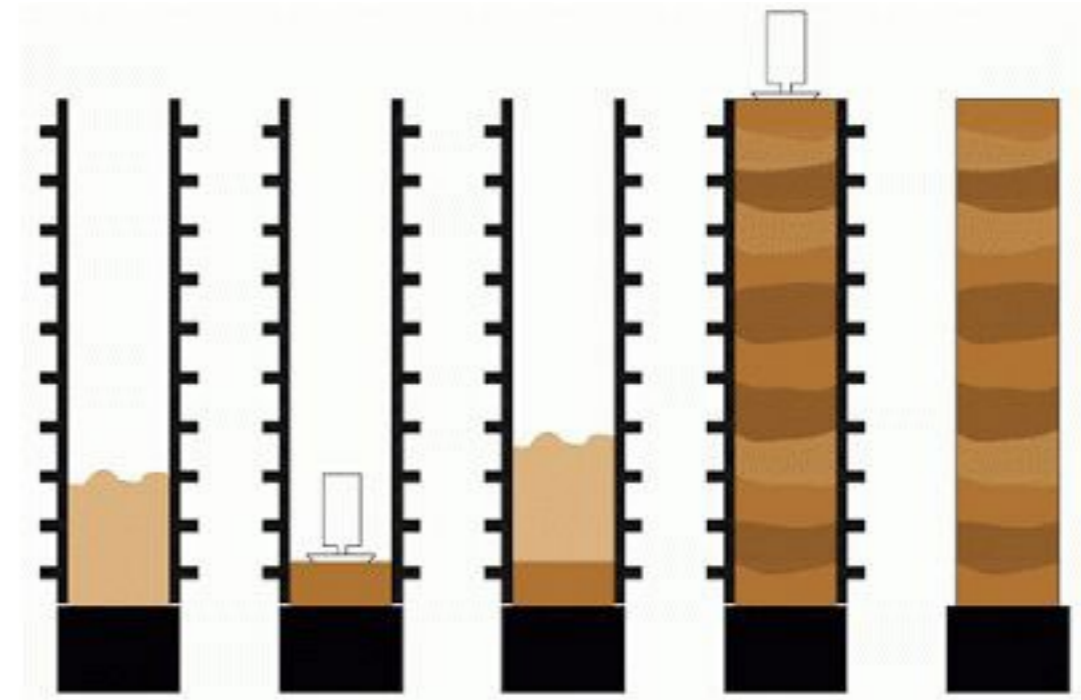


REUSE THE PIT

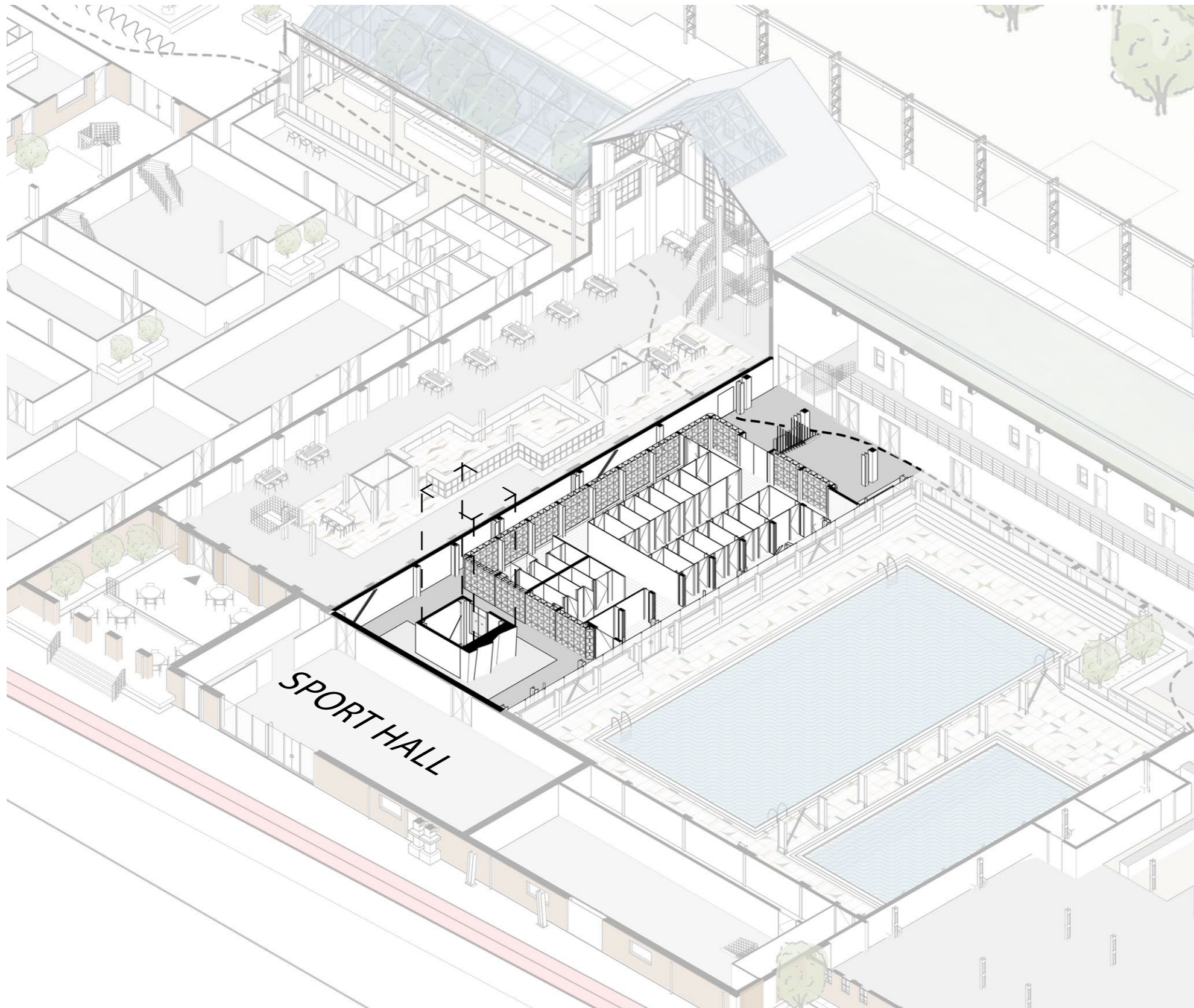




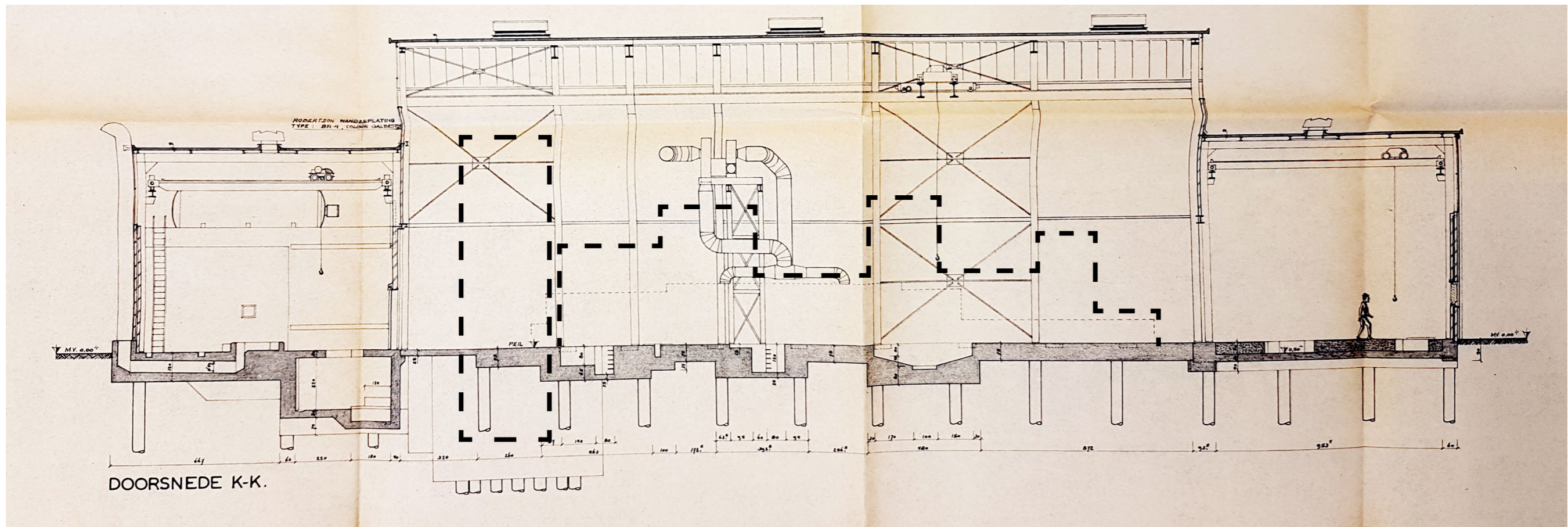
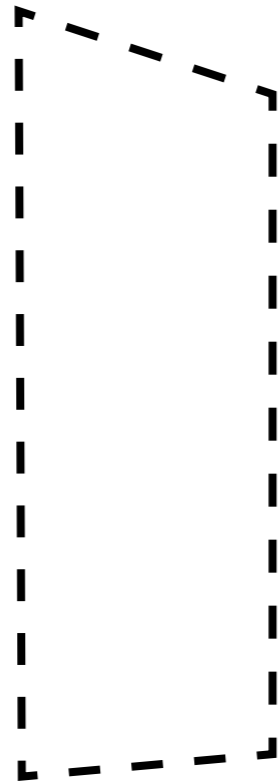
RAMMED EARTH TOWER



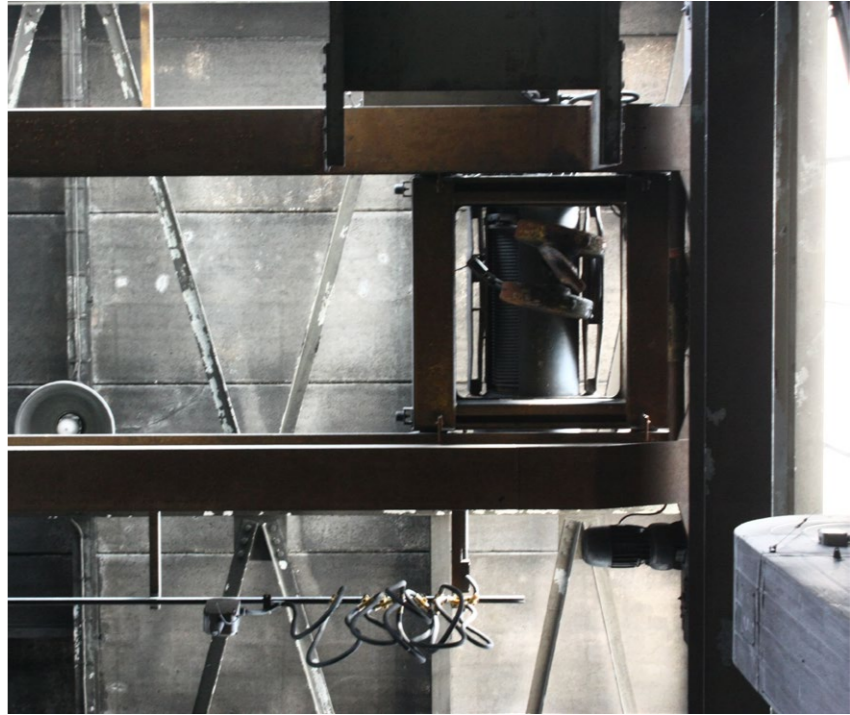
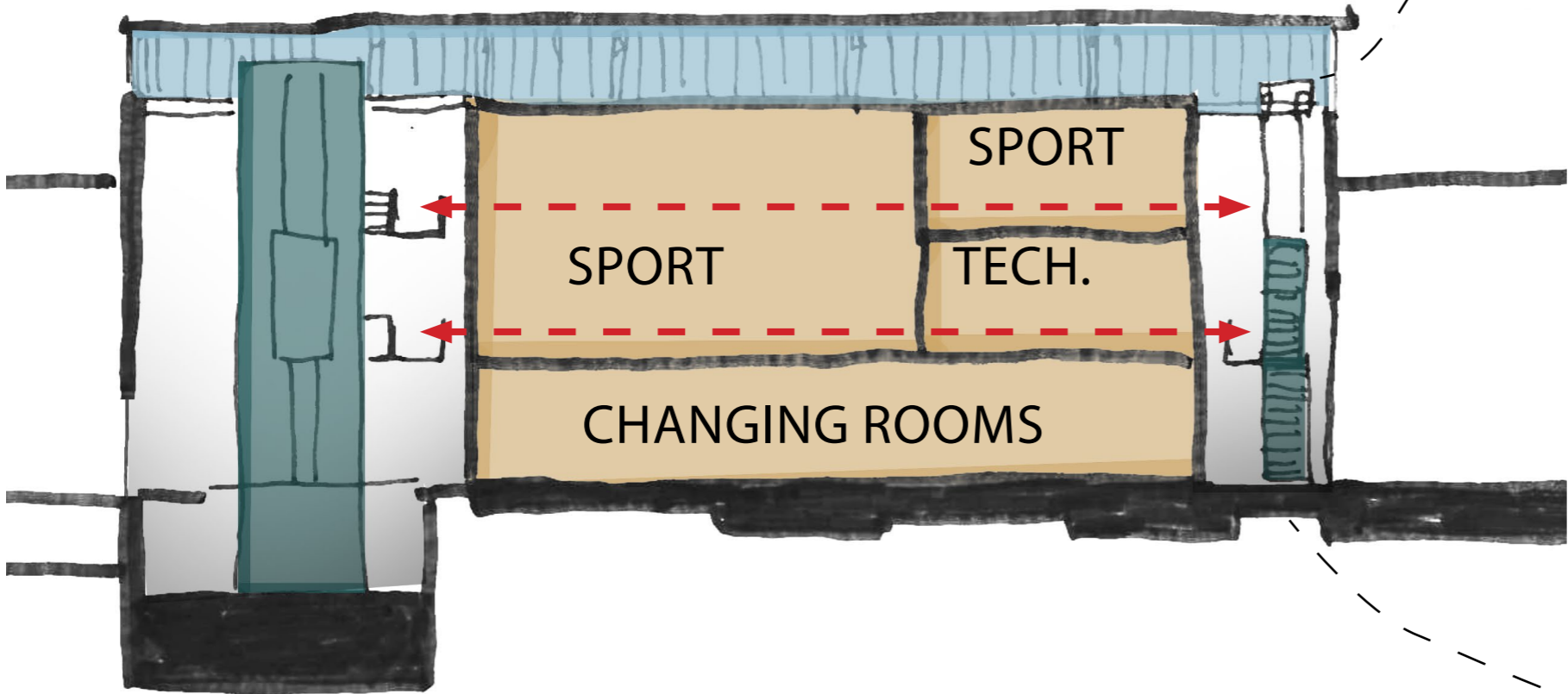
THE PRESS HALL



BEHIND THE PRESS

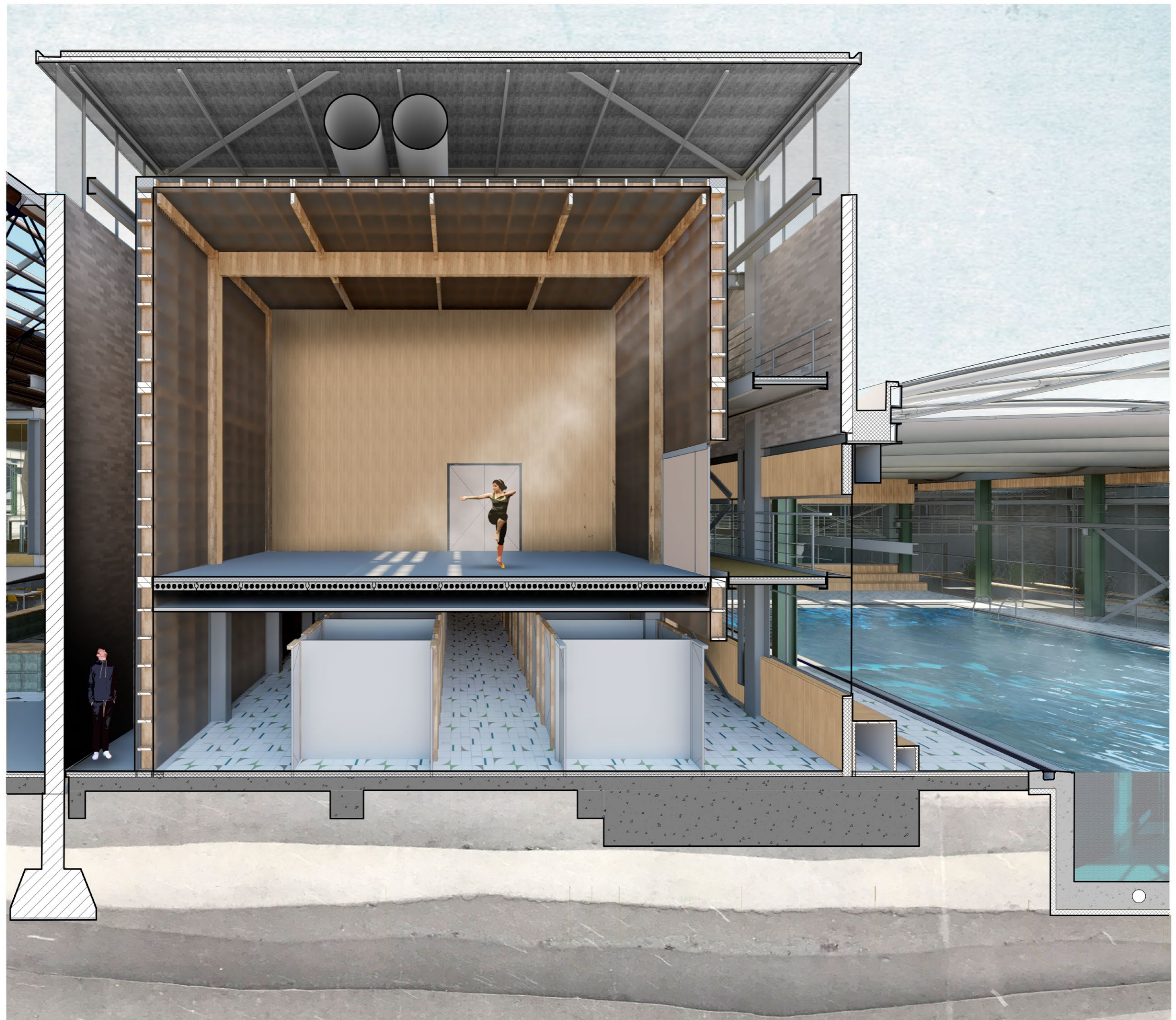


PRESS HALL



changing room for swimming pool 250 m²
large sport room 110 m²
small sport room 60 m²
technical space 60 m²

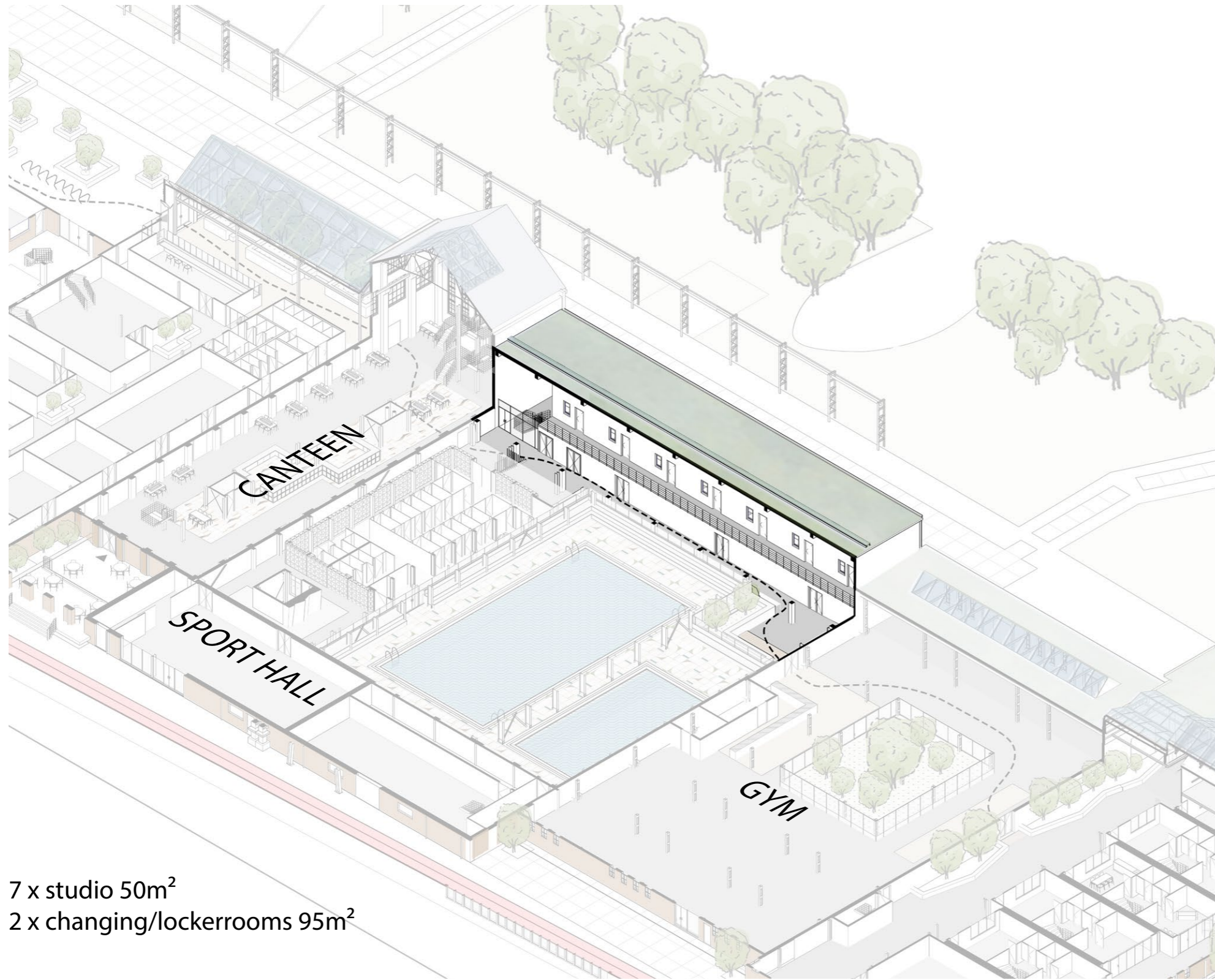








CHANGING ROOMS AND HOUSING



7 x studio 50m²
2 x changing/lockerrooms 95m²



PART 1
ANALYSIS

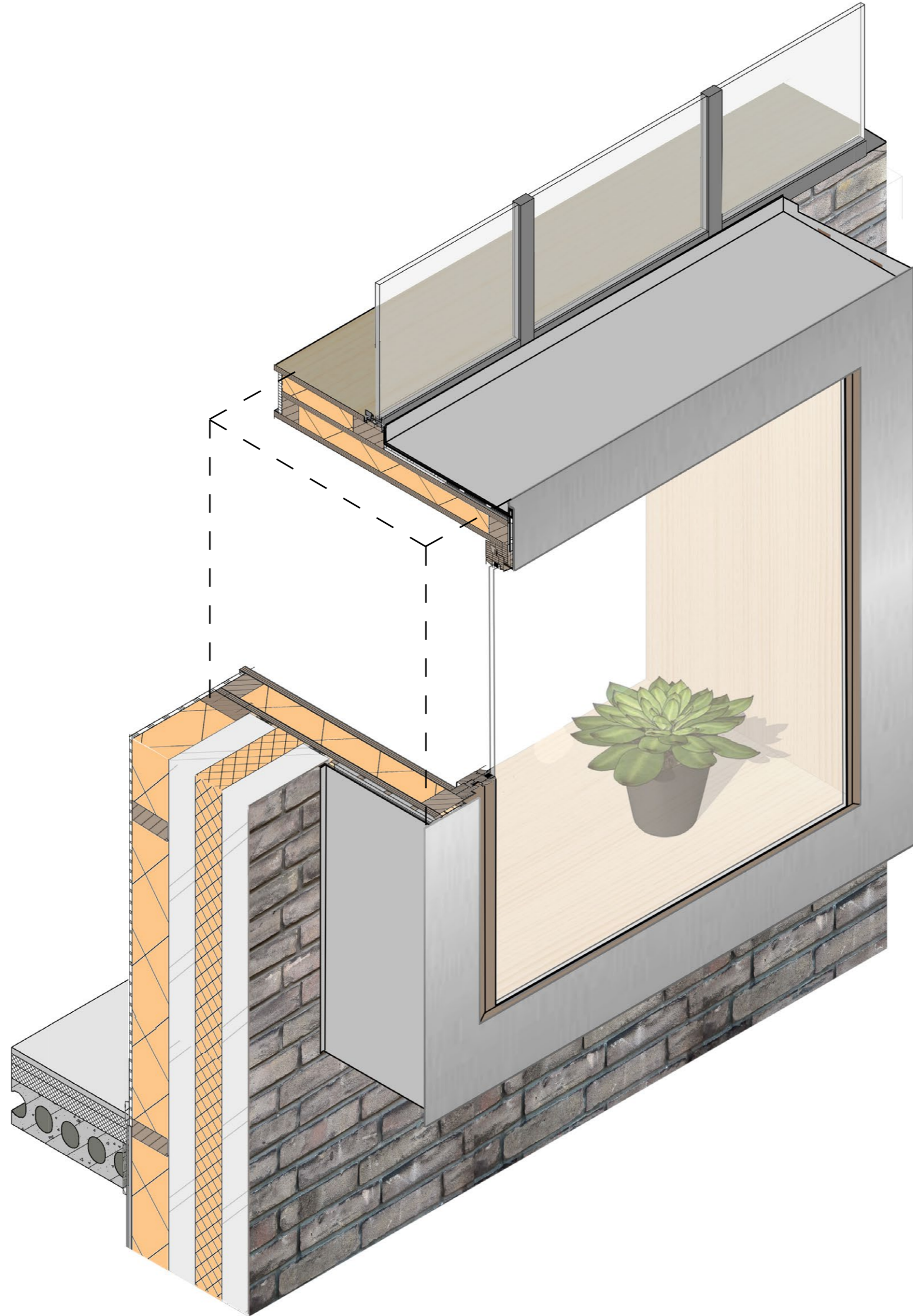
PART 2
MASTERPLAN +PROGRAM

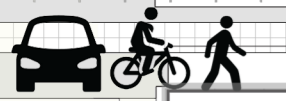
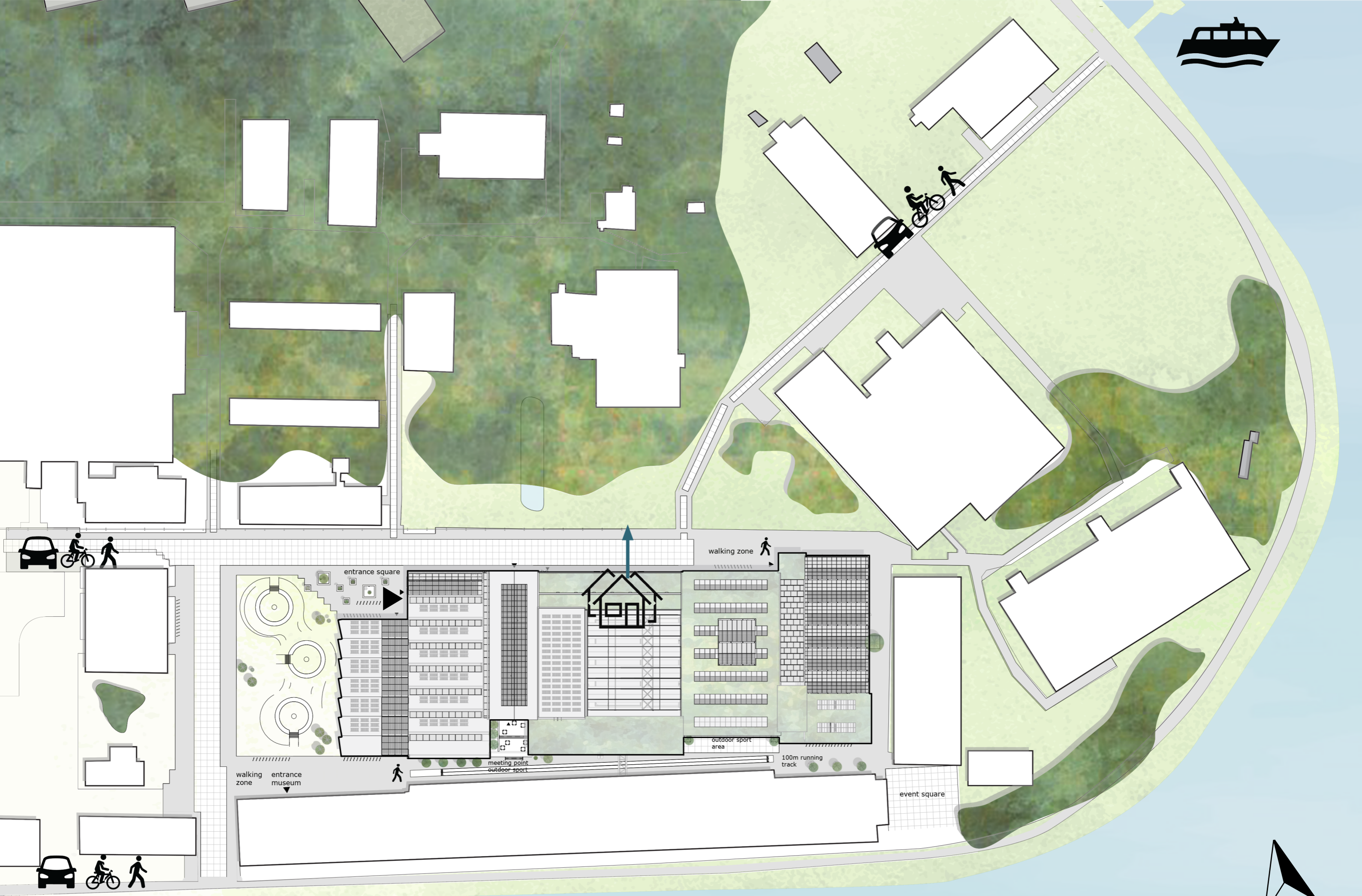
PART 3
TRANSFORMATION STRATEGIES

PART 4
DESIGN









entrance square

walking zone

walking zone

entrance museum

meeting point

outdoor sport

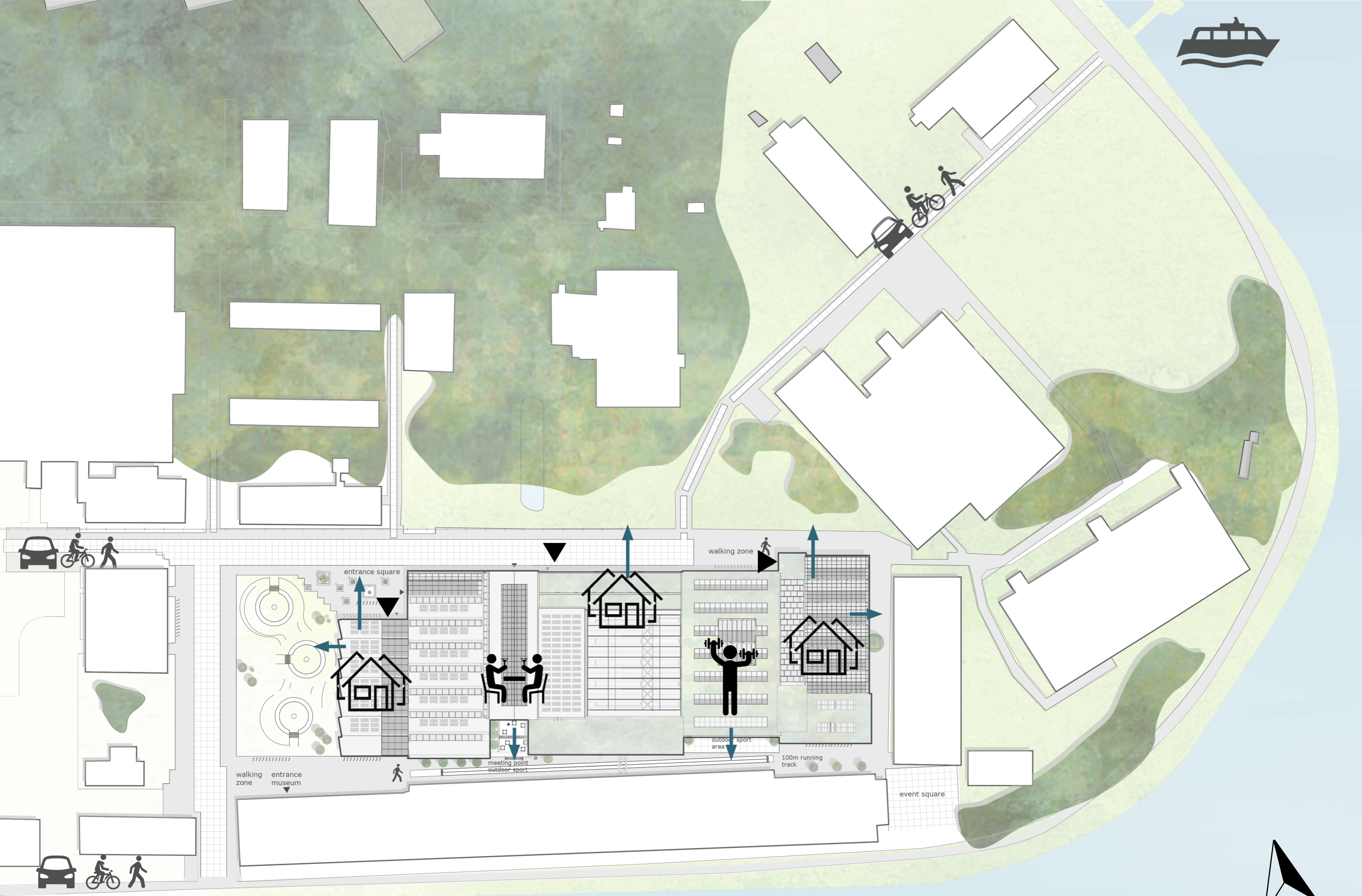
outdoor sport area

100m running track

event square

0m 25m 50m





entrance square

walking zone

walking zone
entrance museum

meeting point
outdoor sport

outdoor sport
area

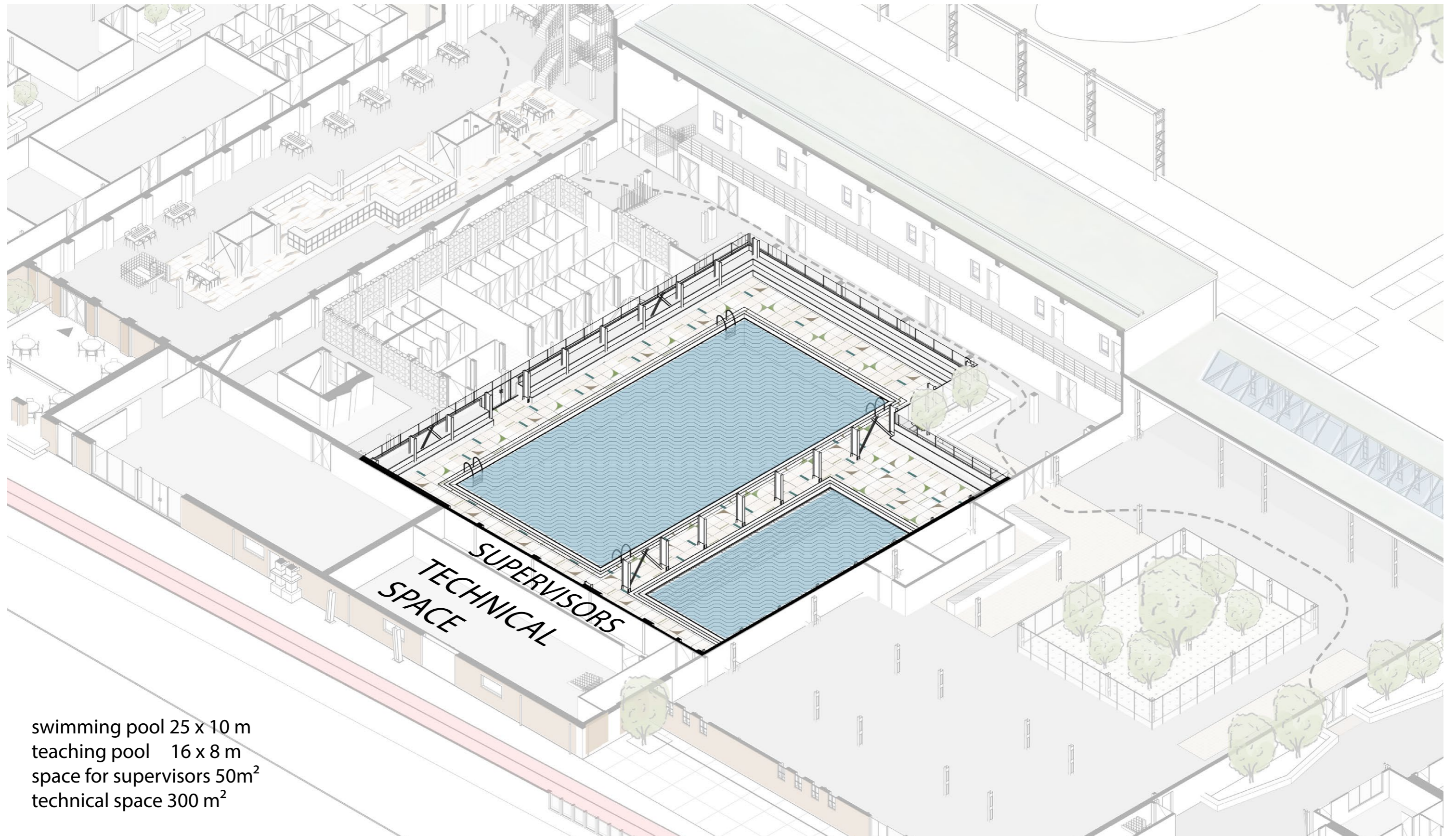
100m running track

event square

0m 25m 50m

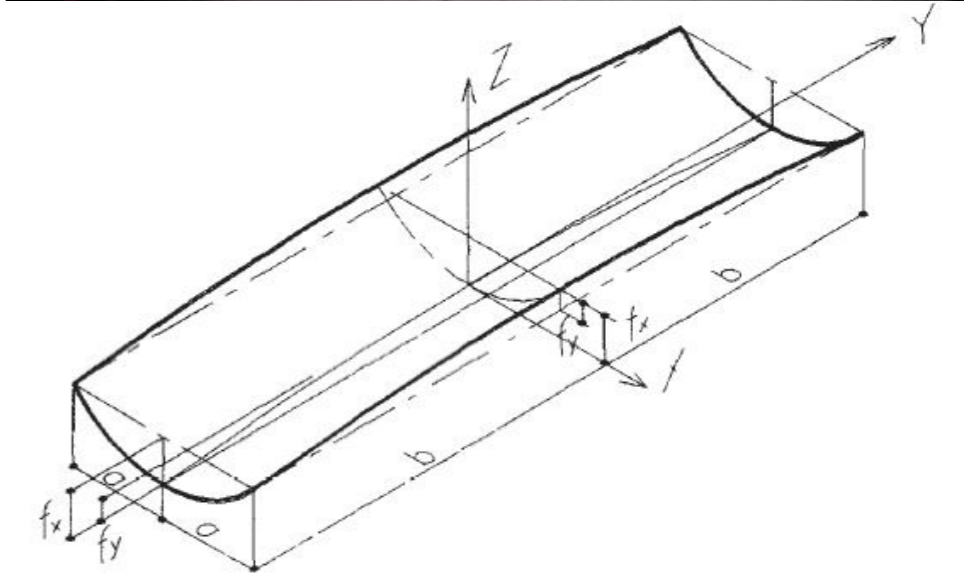


SWIMMINGPOOL

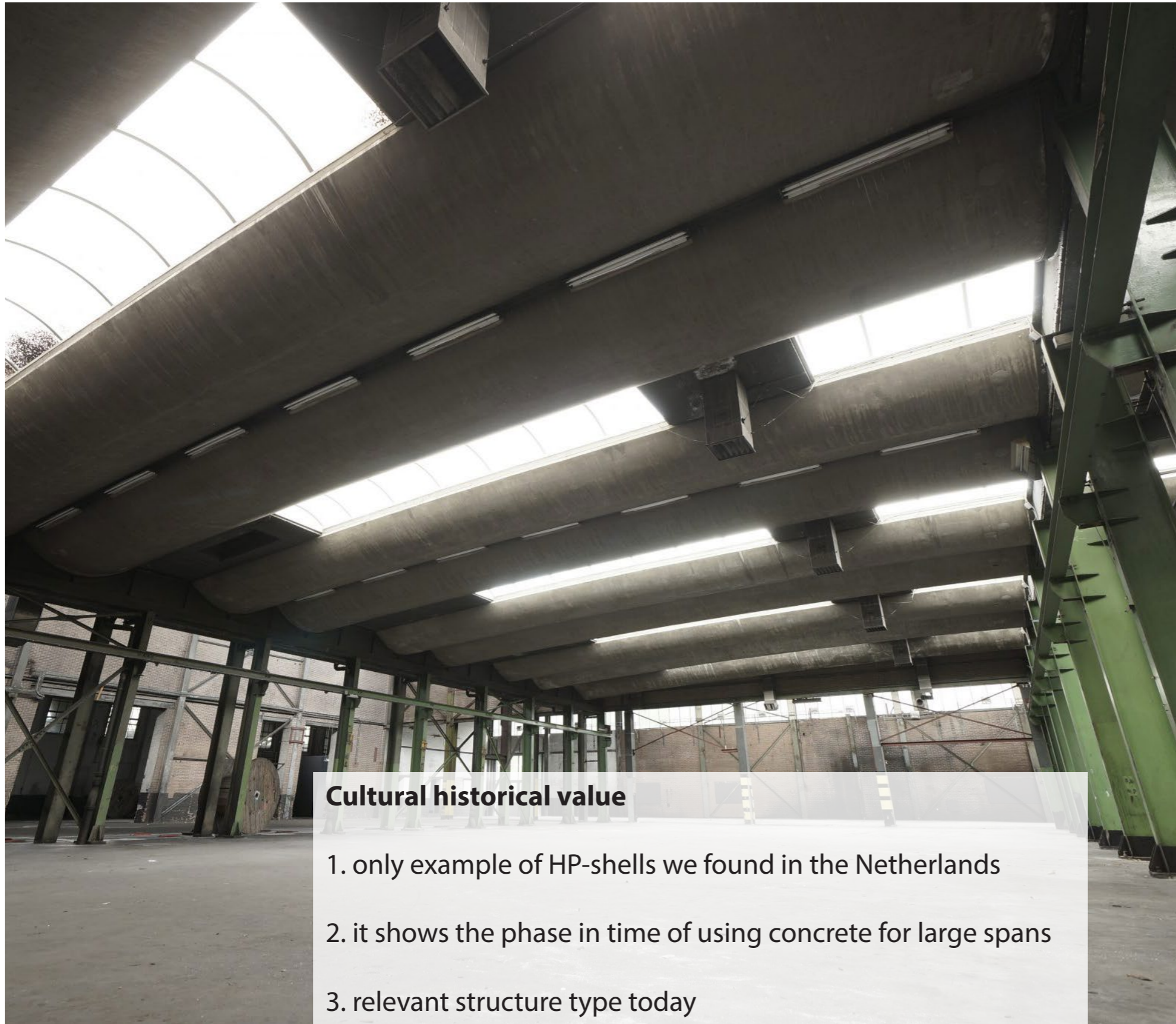


swimming pool 25 x 10 m
teaching pool 16 x 8 m
space for supervisors 50m²
technical space 300 m²

PRESTRESSED CONCRETE HYPERBOLIC PARABOLOID SHELL

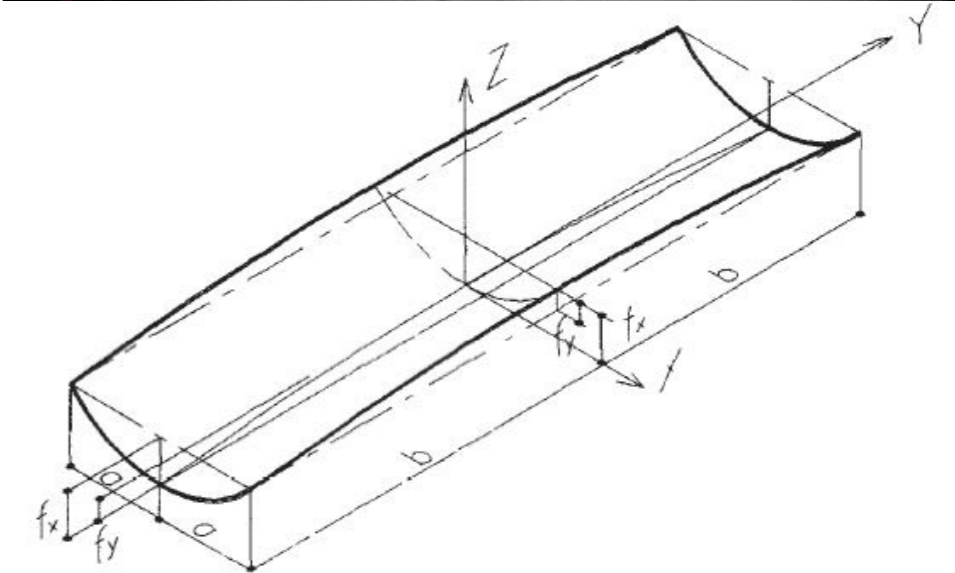


PRESTRESSED CONCRETE HYPERBOLIC PARABOLOID SHELL



Cultural historical value

1. only example of HP-shells we found in the Netherlands
2. it shows the phase in time of using concrete for large spans
3. relevant structure type today

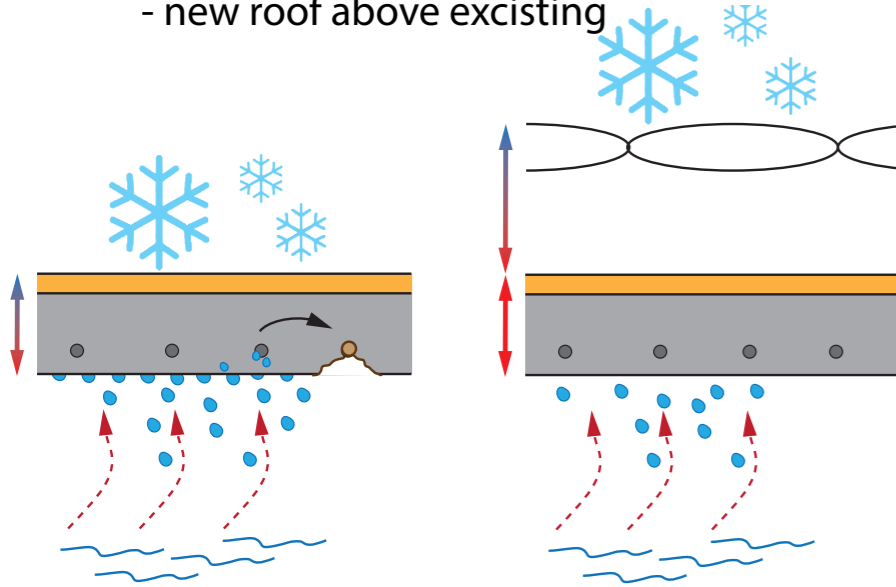




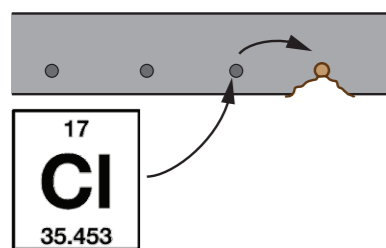
SET OF SOLUTIONS FOR SWIMMINGPOOL

PRESERVING THE CONCRETE SHELLS

condensation affecting structure (carbonation)
- new roof above existing

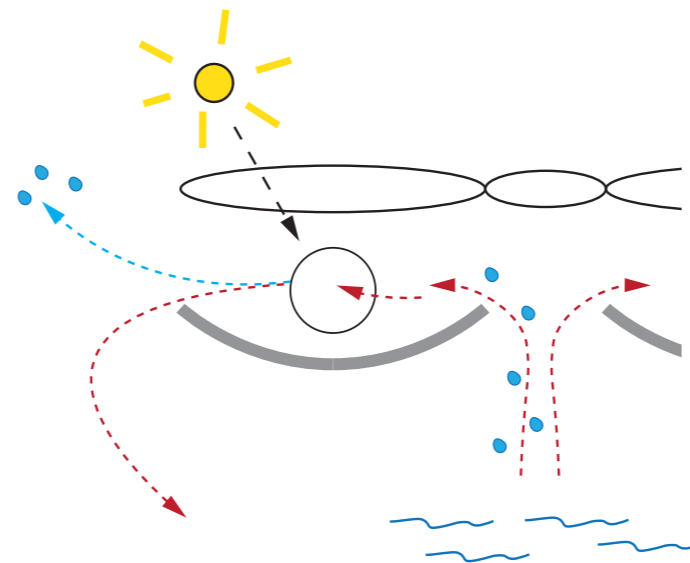


chlorine affecting structure (carbonation)
- filter with UV light

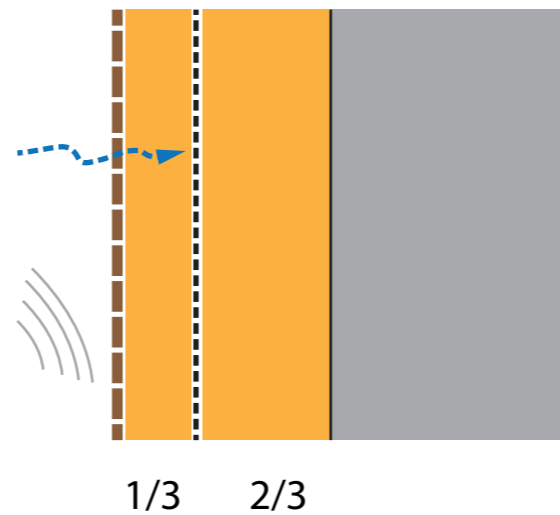


INDOOR CLIMATE

reuse heat and drainage of moisture
- exhaust of air above shell structure

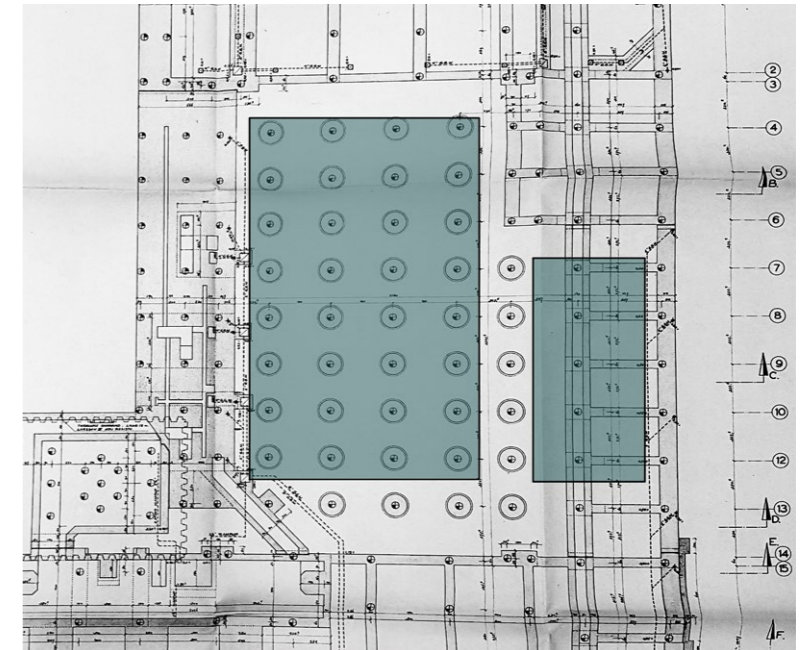


acoustics and thermal insulation
- vapor-repellent layer on 1/3

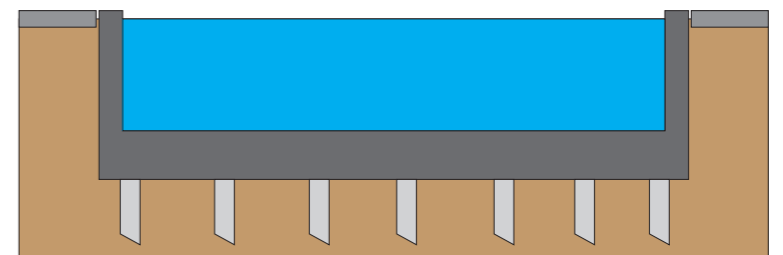


FOUNDATION

placement of pool
- on place of wellrings
- reuse foundation poles



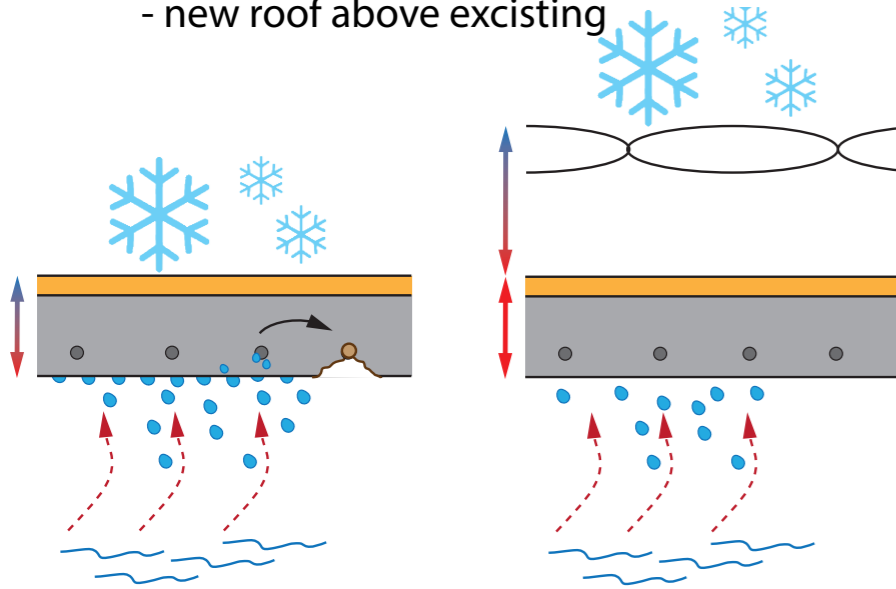
prevent floating when the pool is empty
- extra thick foundation slab



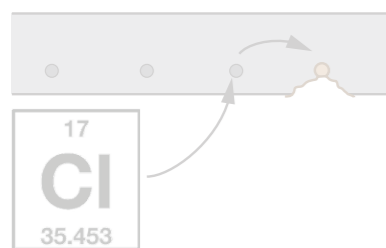
SET OF SOLUTIONS FOR SWIMMINGPOOL

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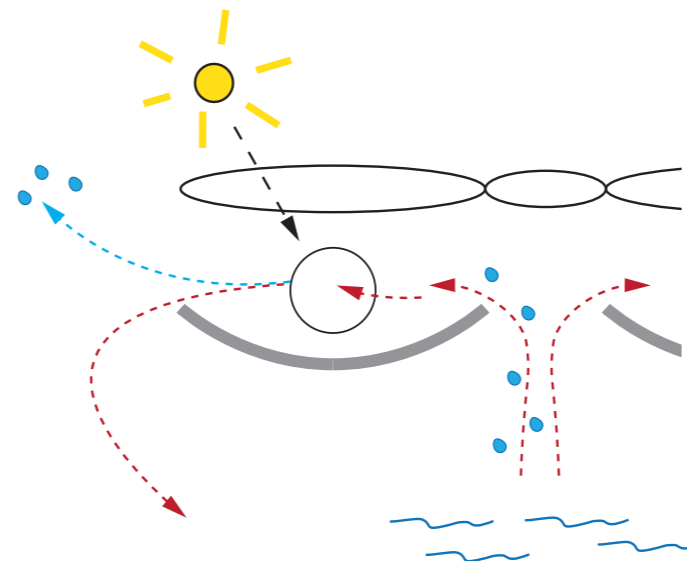


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- filter with UV light

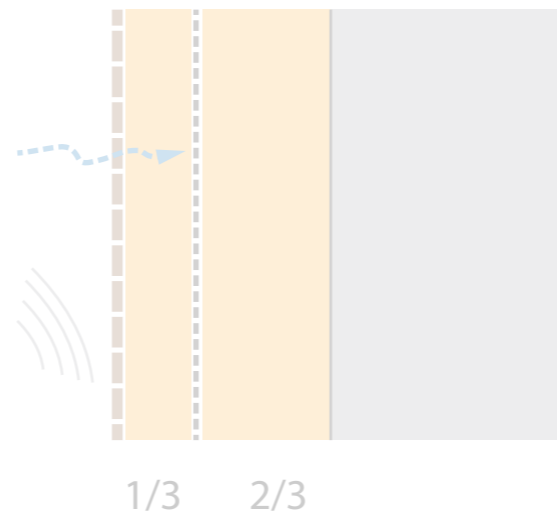


INDOOR CLIMATE

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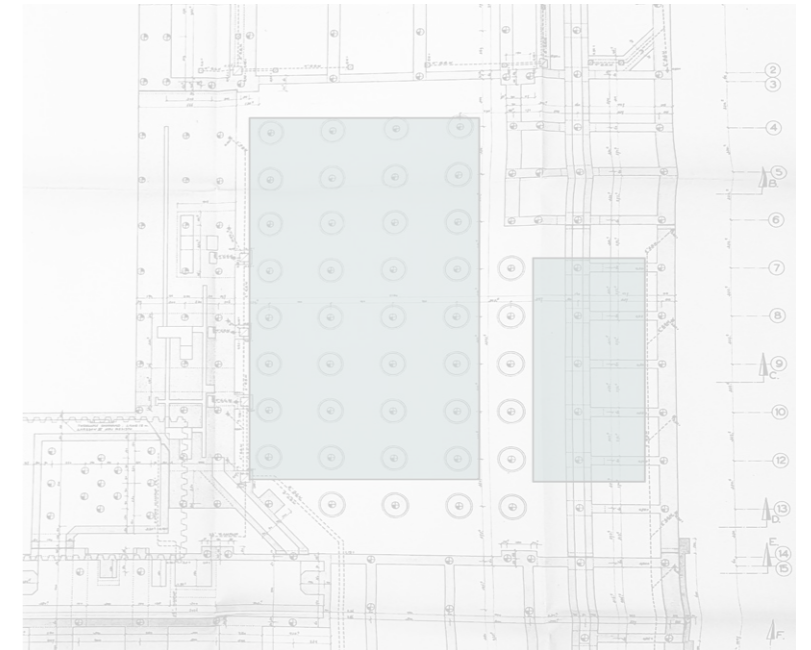


acoustics and thermal insulation
- vapor-repellent layer on 1/3



FOUNDATION

placement of pool
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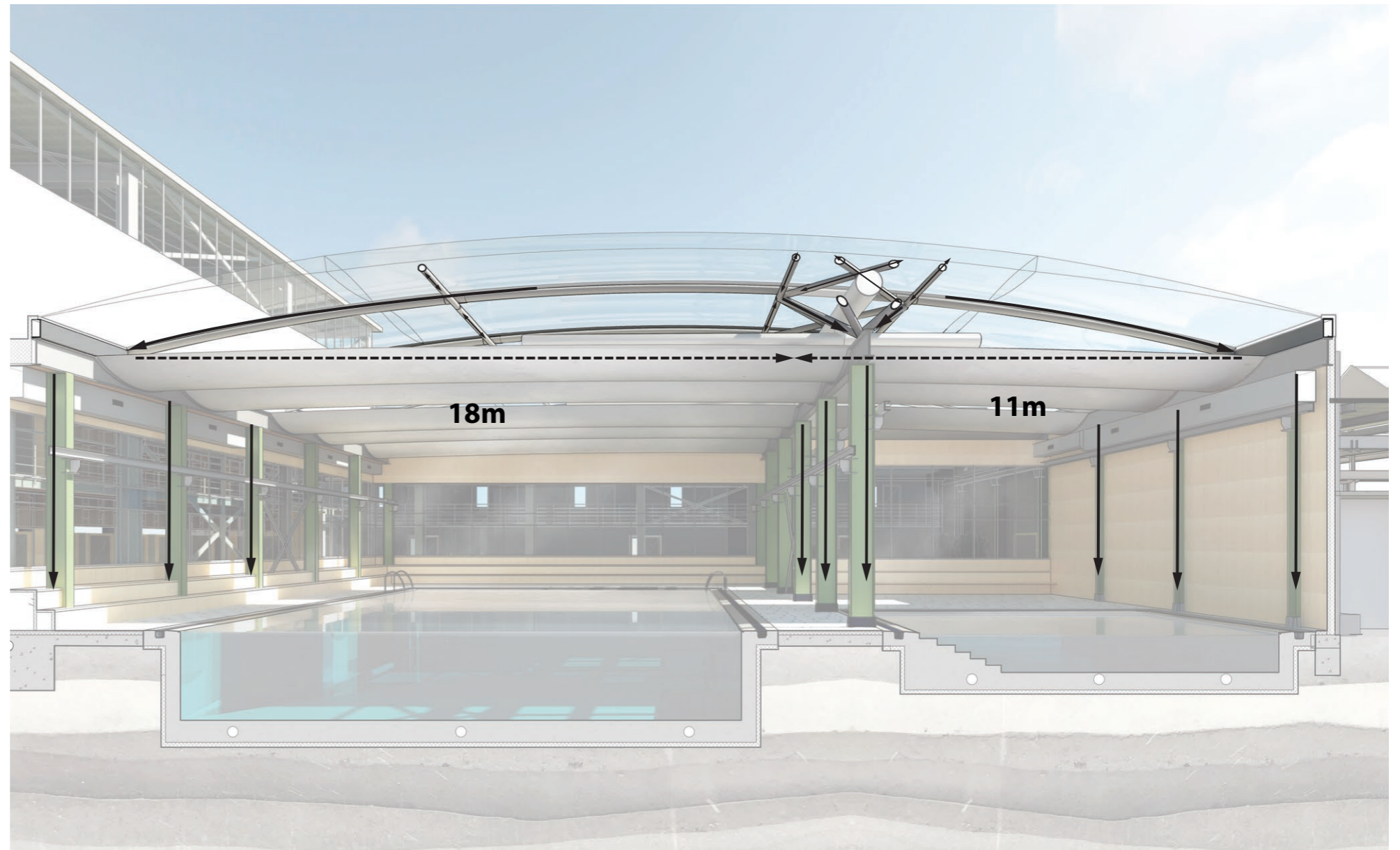
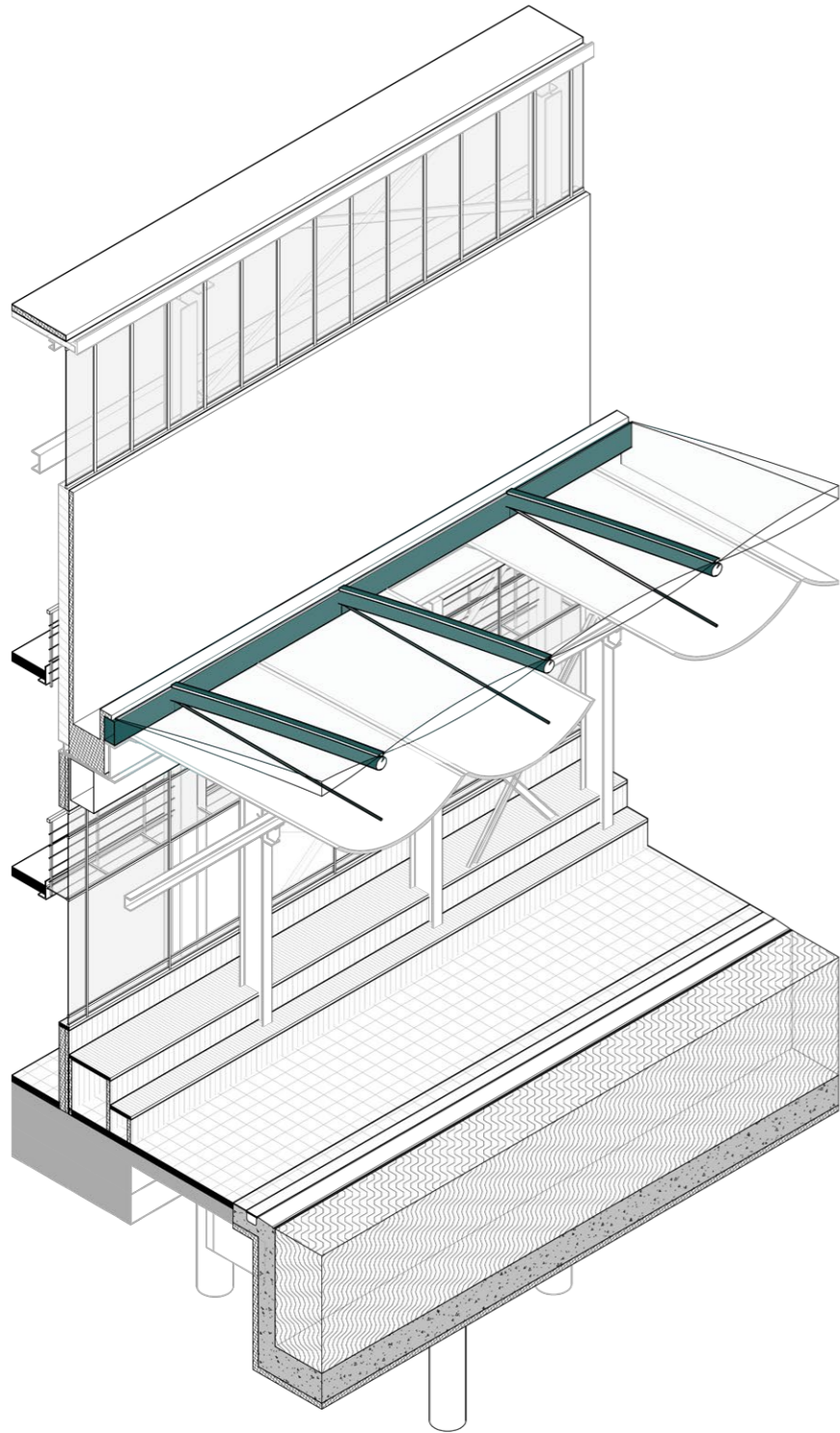


prevent floating when the pool is empty
- extra thick foundation slab

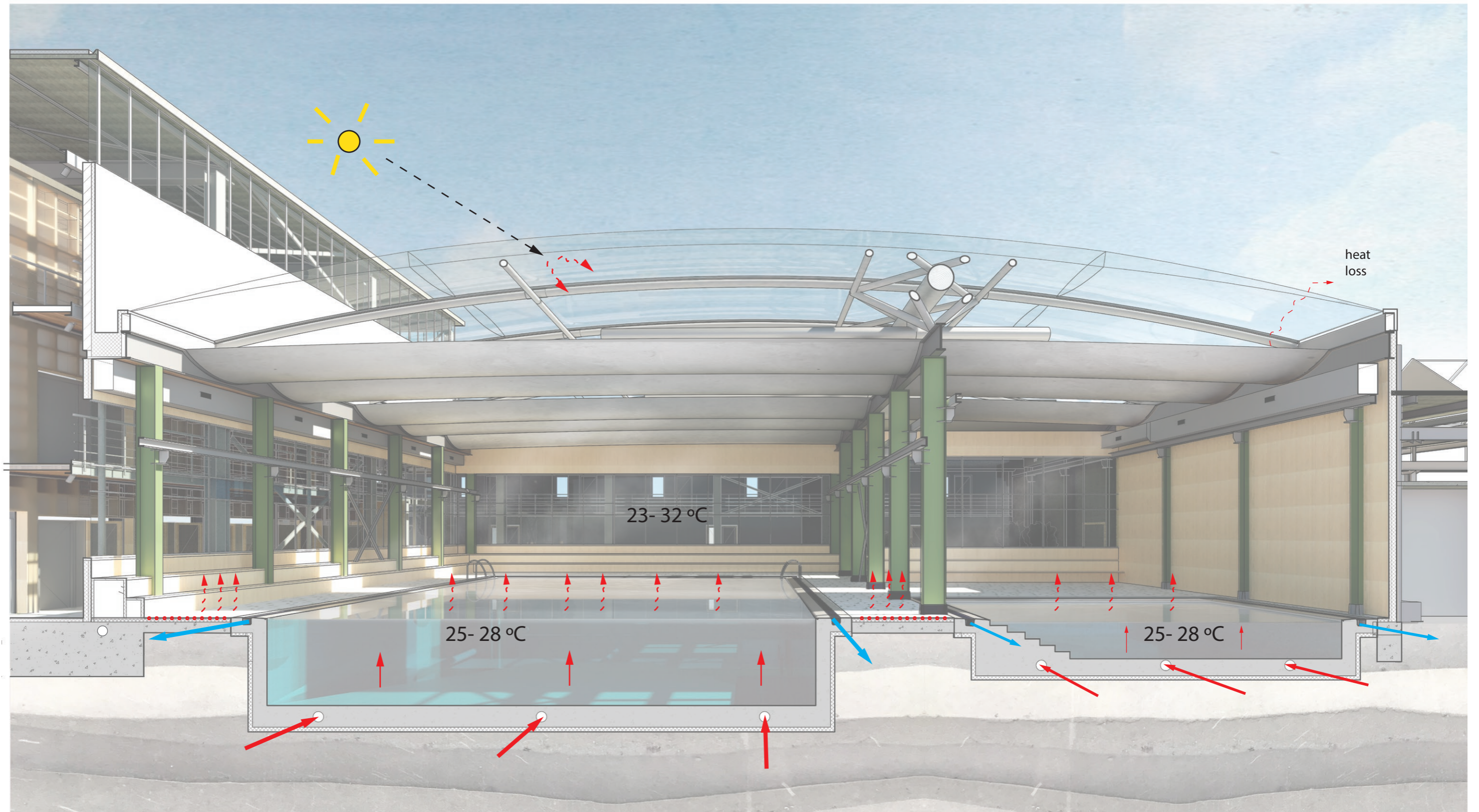




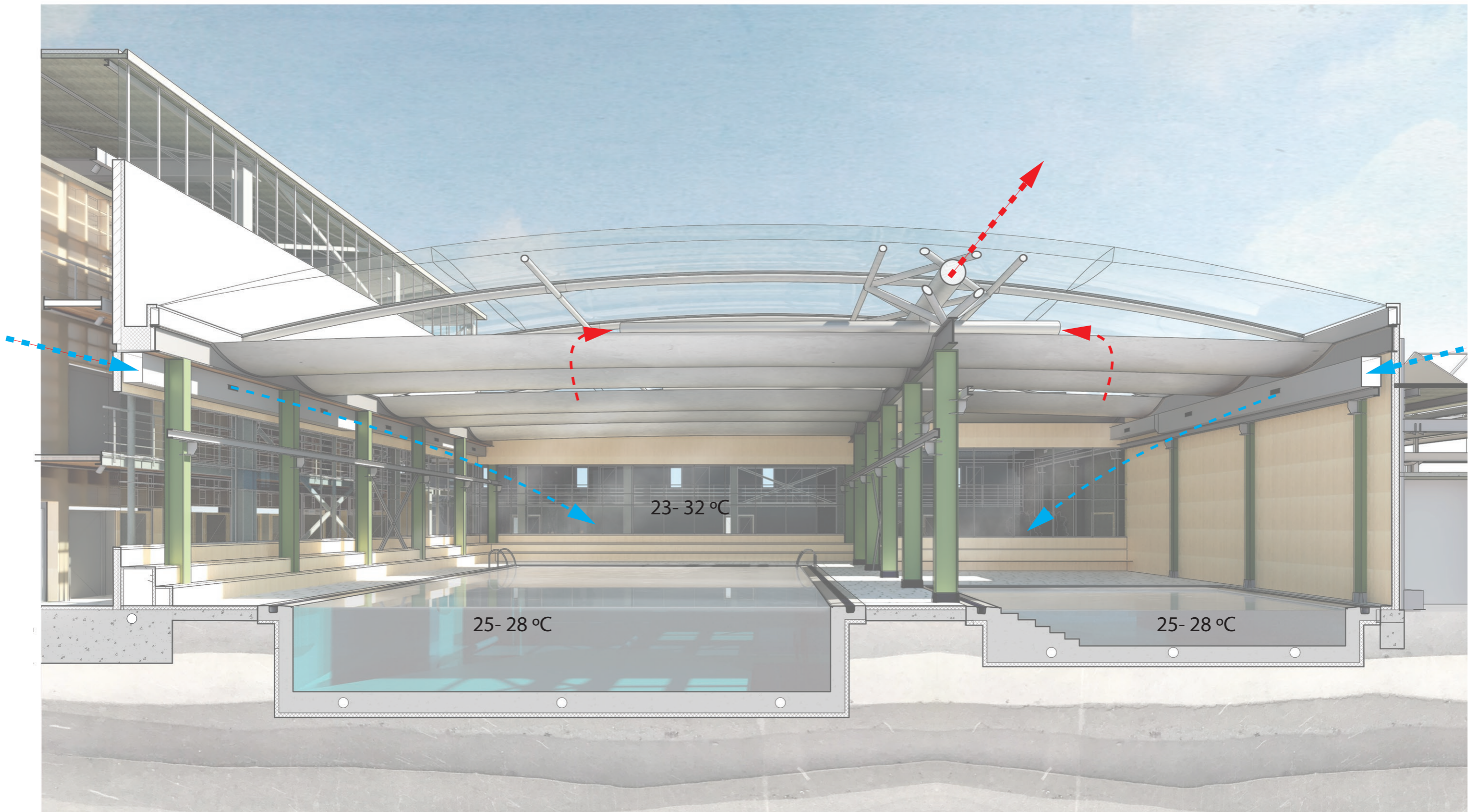
ETFE ROOF



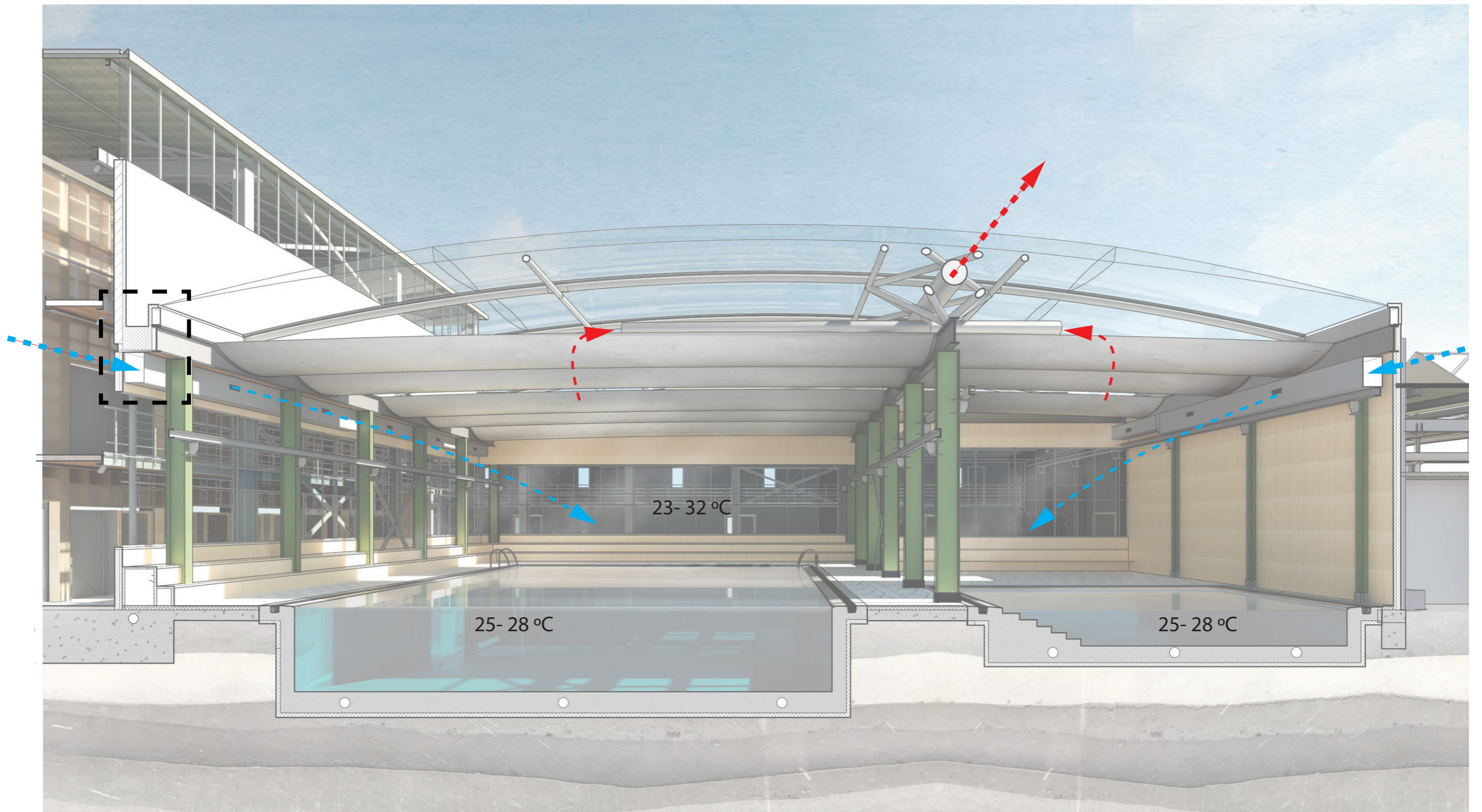
HEATING

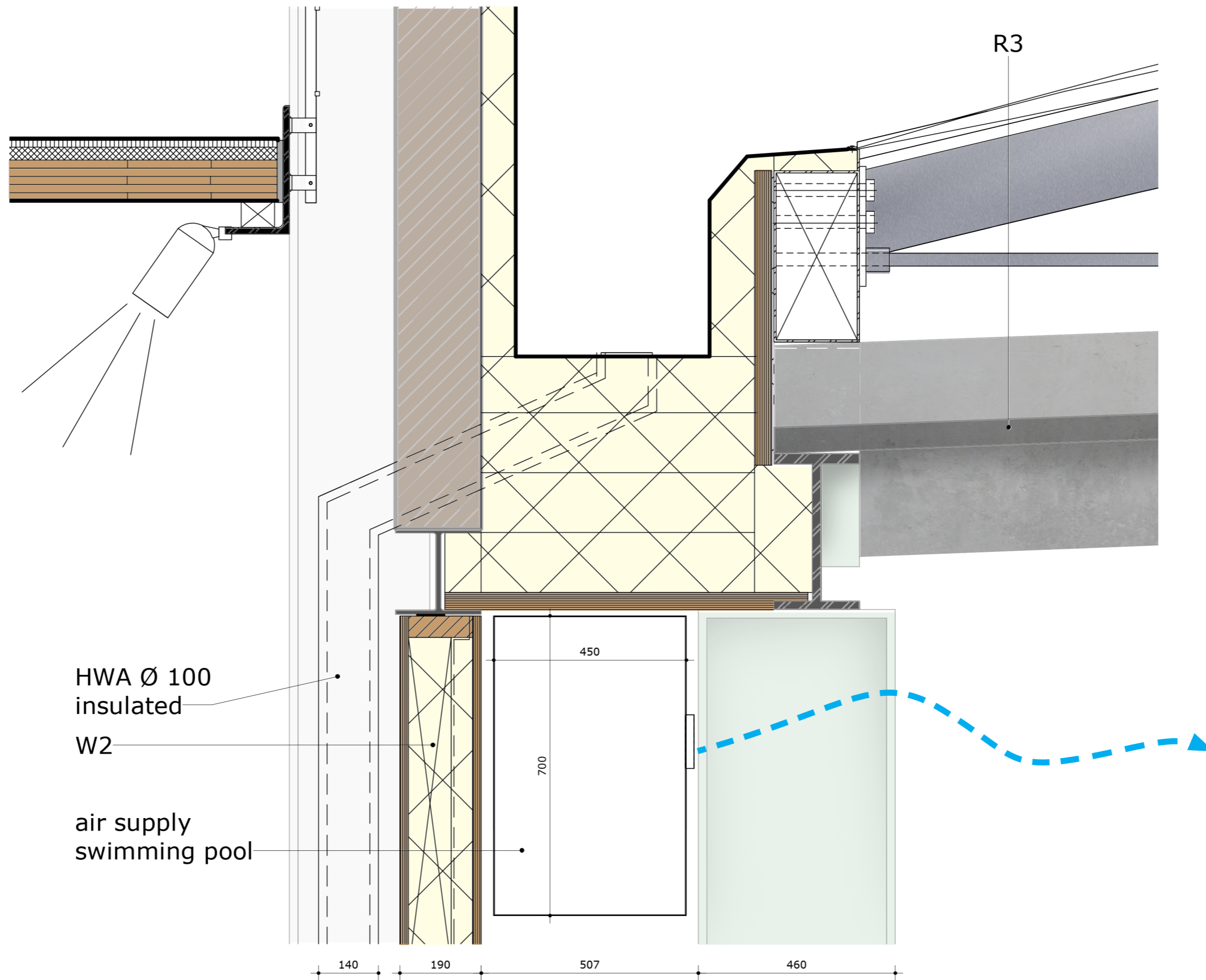


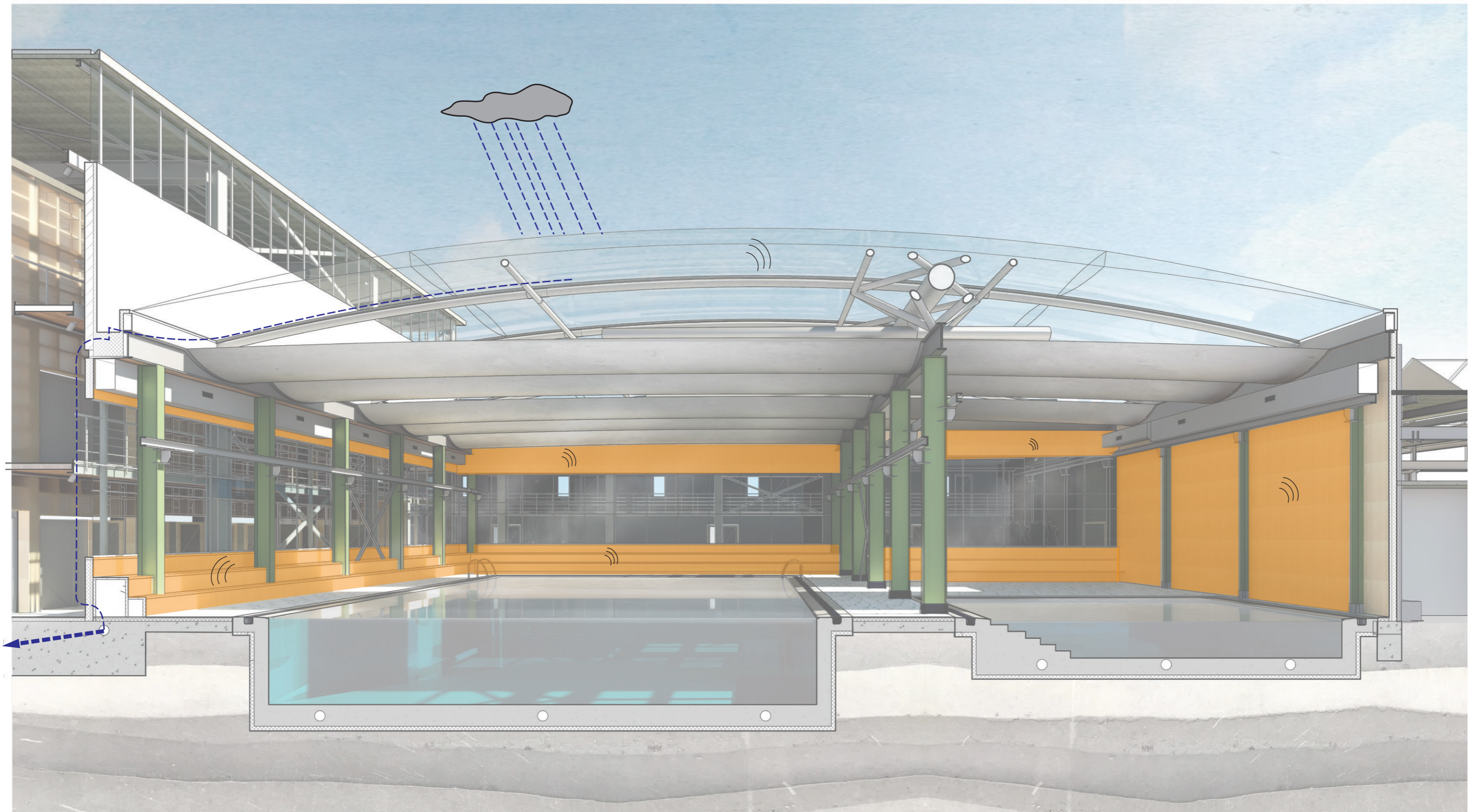
VENTILATION

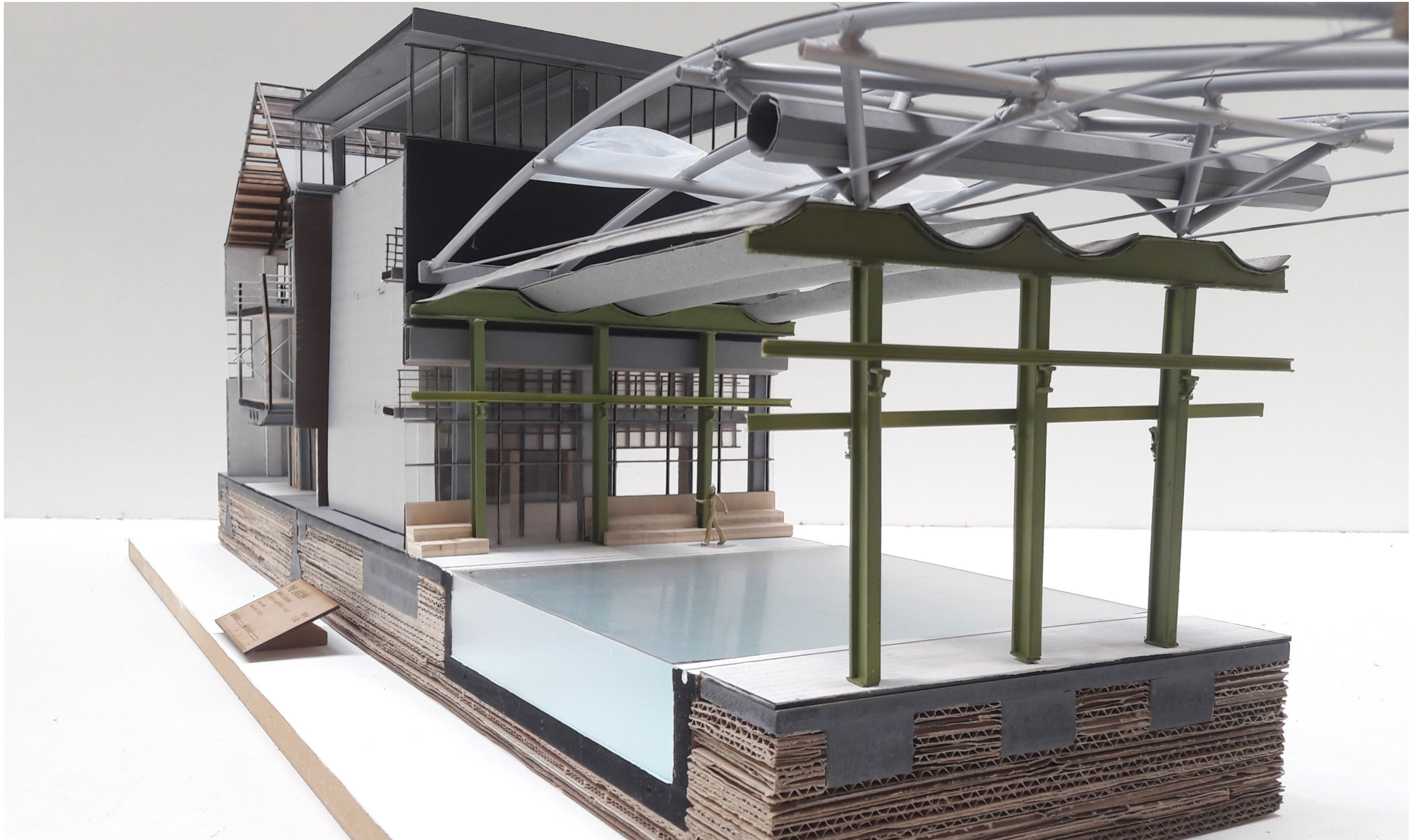


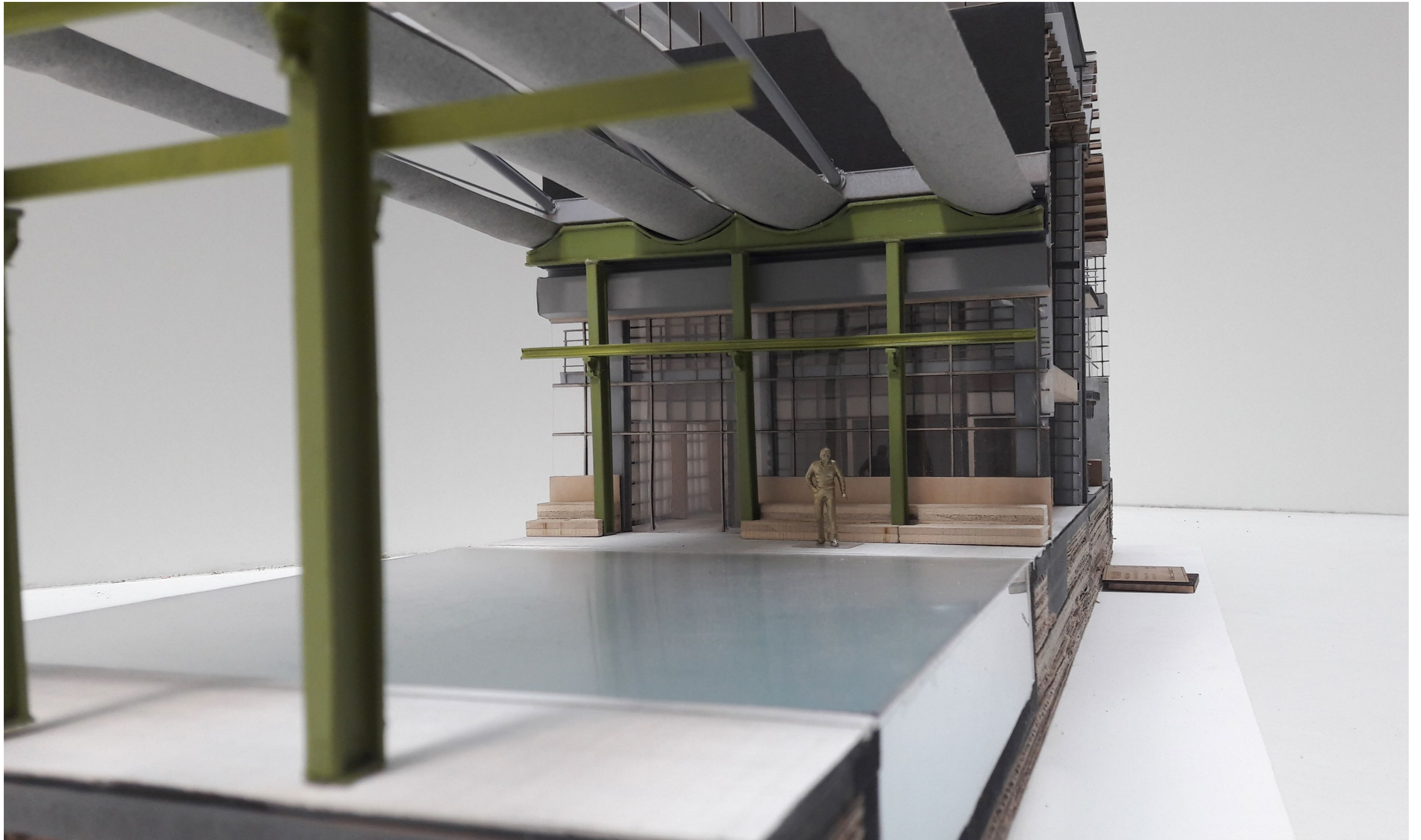
VENTILATION

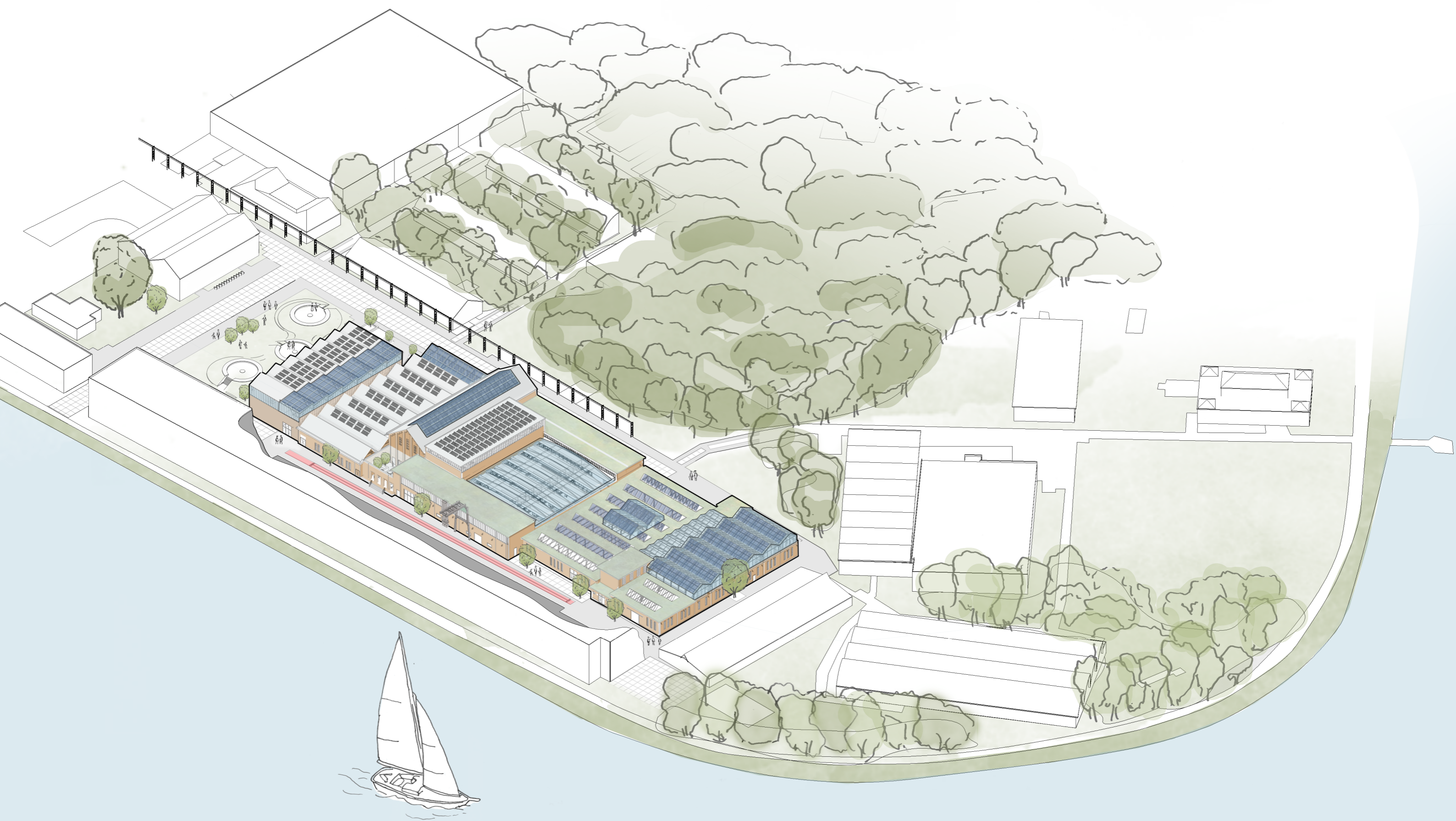












THE LADDER

a world within a world

ATTACHMENTS

HOUSING



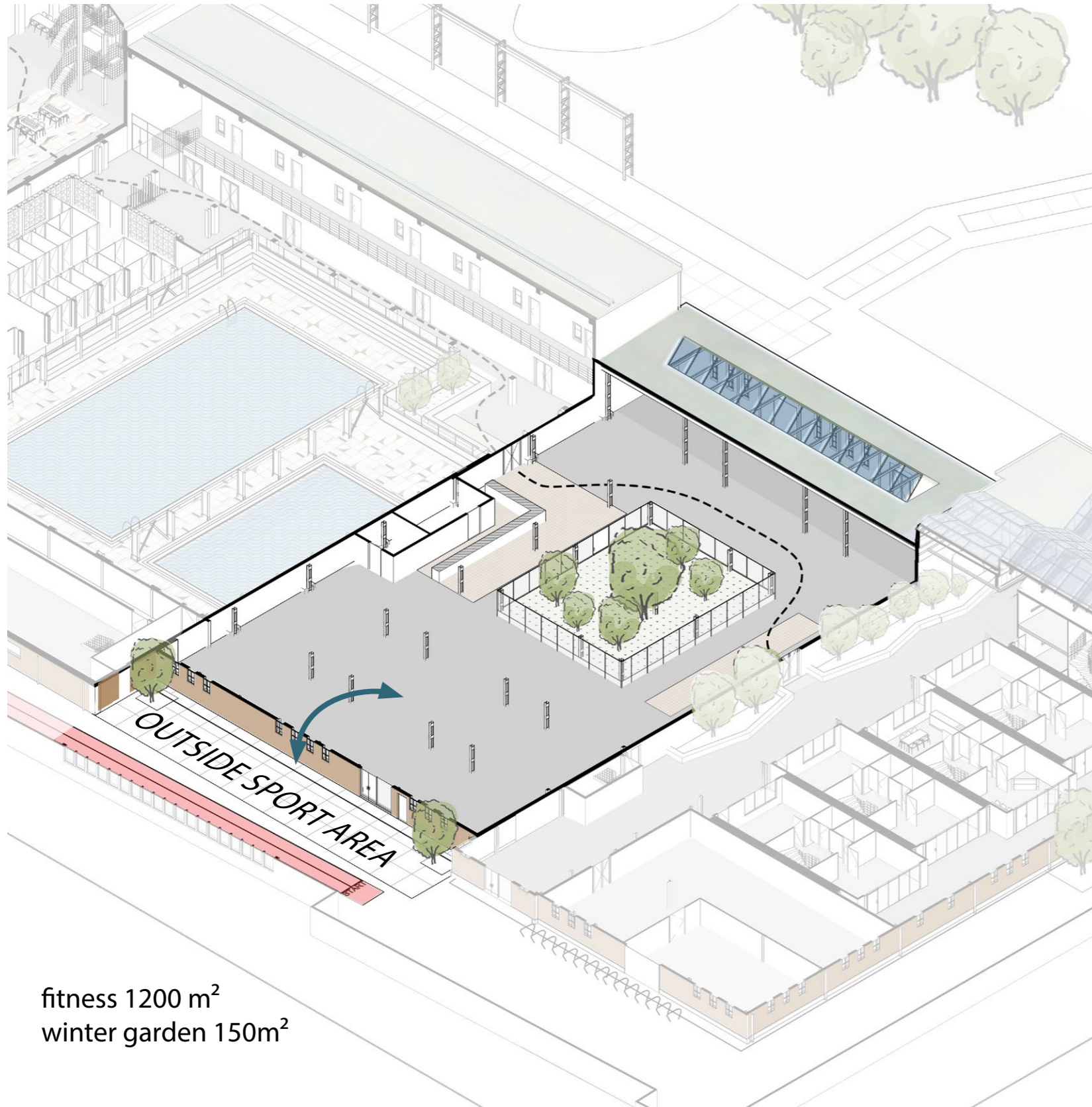
24 rooms of 14 m²
with shared living and
kitchen of 6 x 80m²

1 studio of 109 m²





GYM



fitness 1200 m²
winter garden 150m²





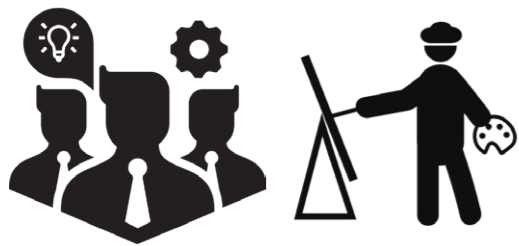
SCENARIO FOR USE

now - 2025
DESIGN AND
BUILDING PHASE

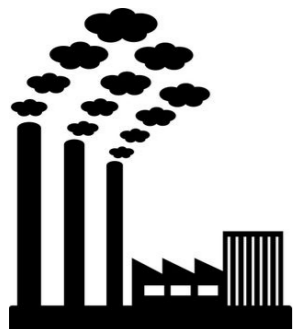
2025 - 2035
TRANSITION PERIOD

after 2035
LONG USE PERIOD

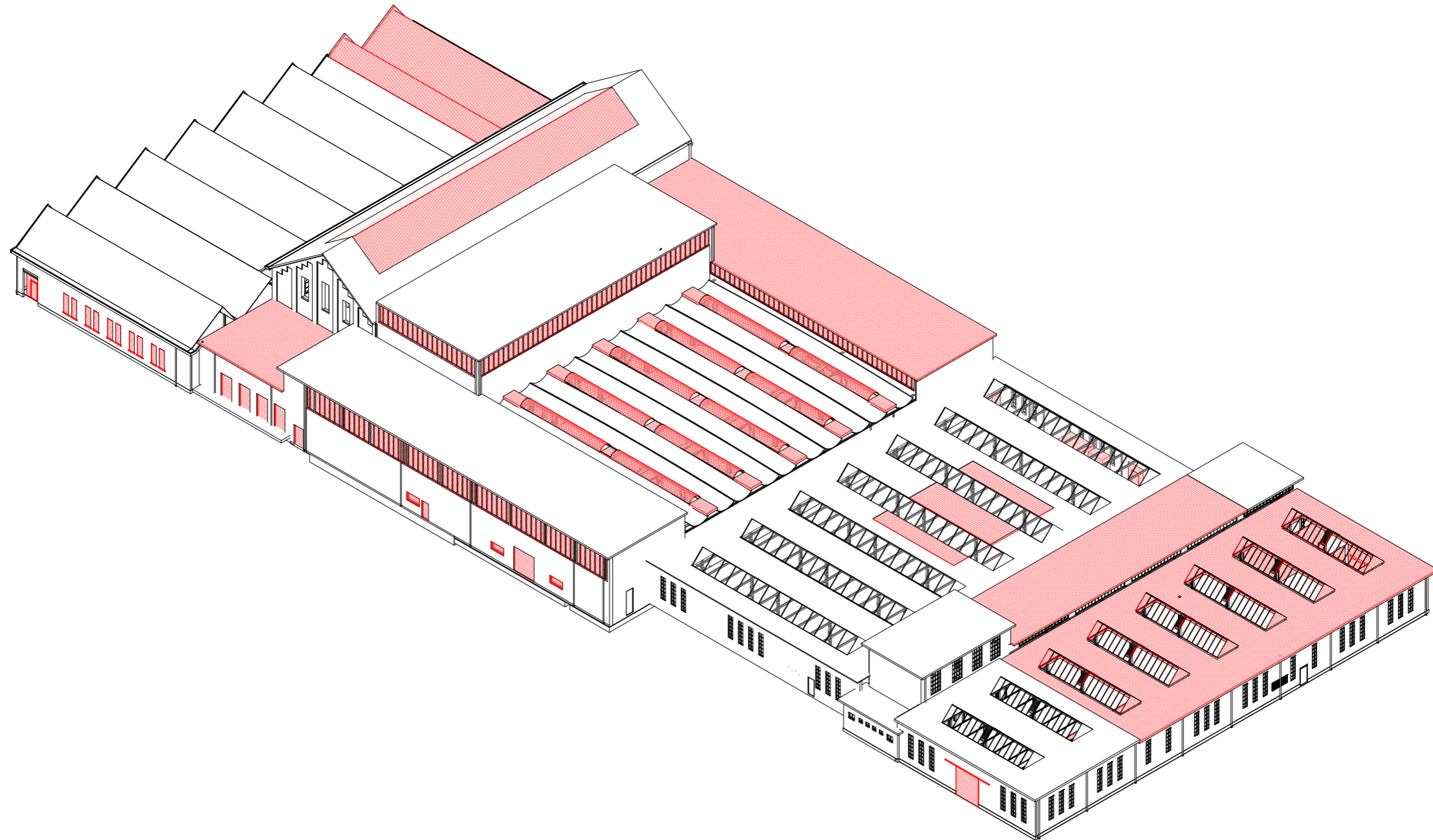
the Ladder



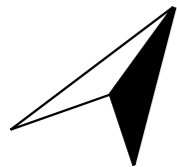
surrounding



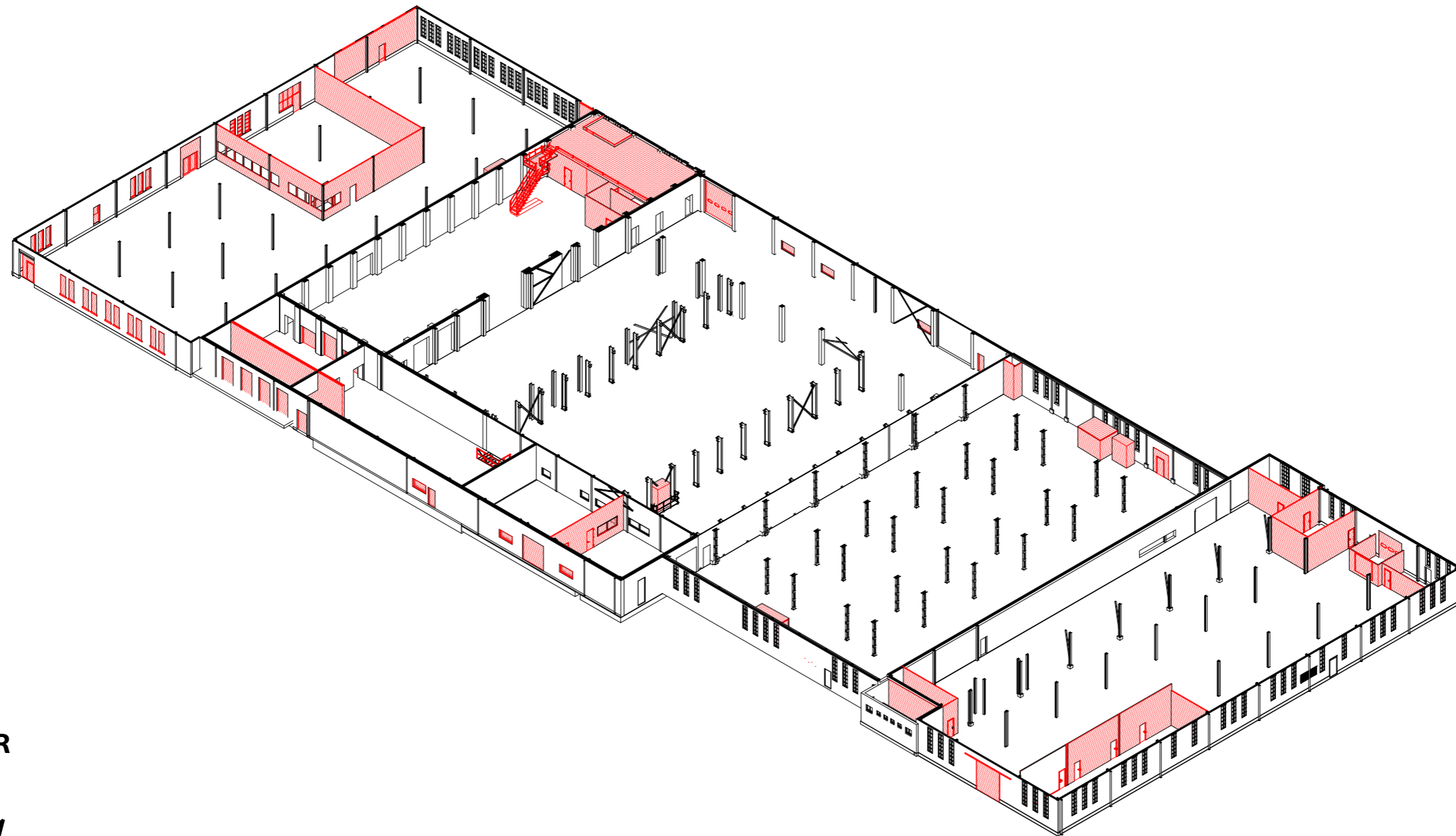
DEMOLITION DRAWING



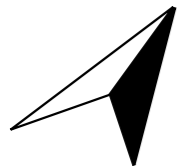
ROOF



DEMOLITION DRAWING



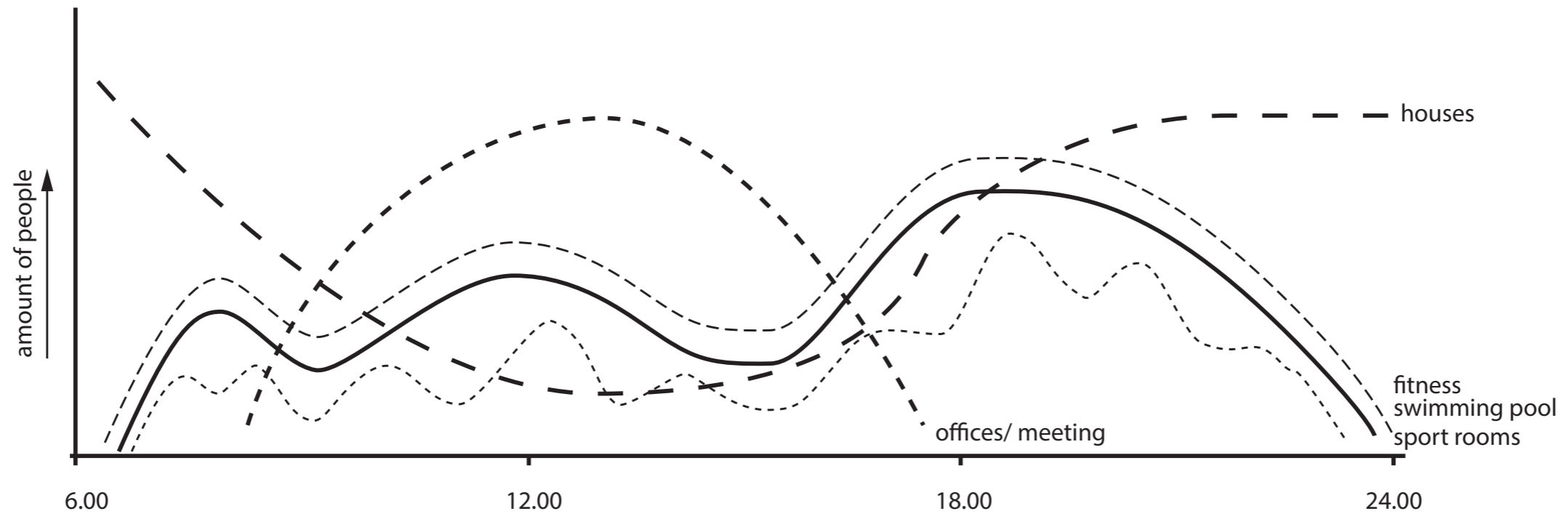
INTERIOR



USE DURING THE DAY

- swimming pool
- - - houses
- · · · · offices/ meeting
- - - - - fitness
- · · · · sport rooms

use of functions in one day

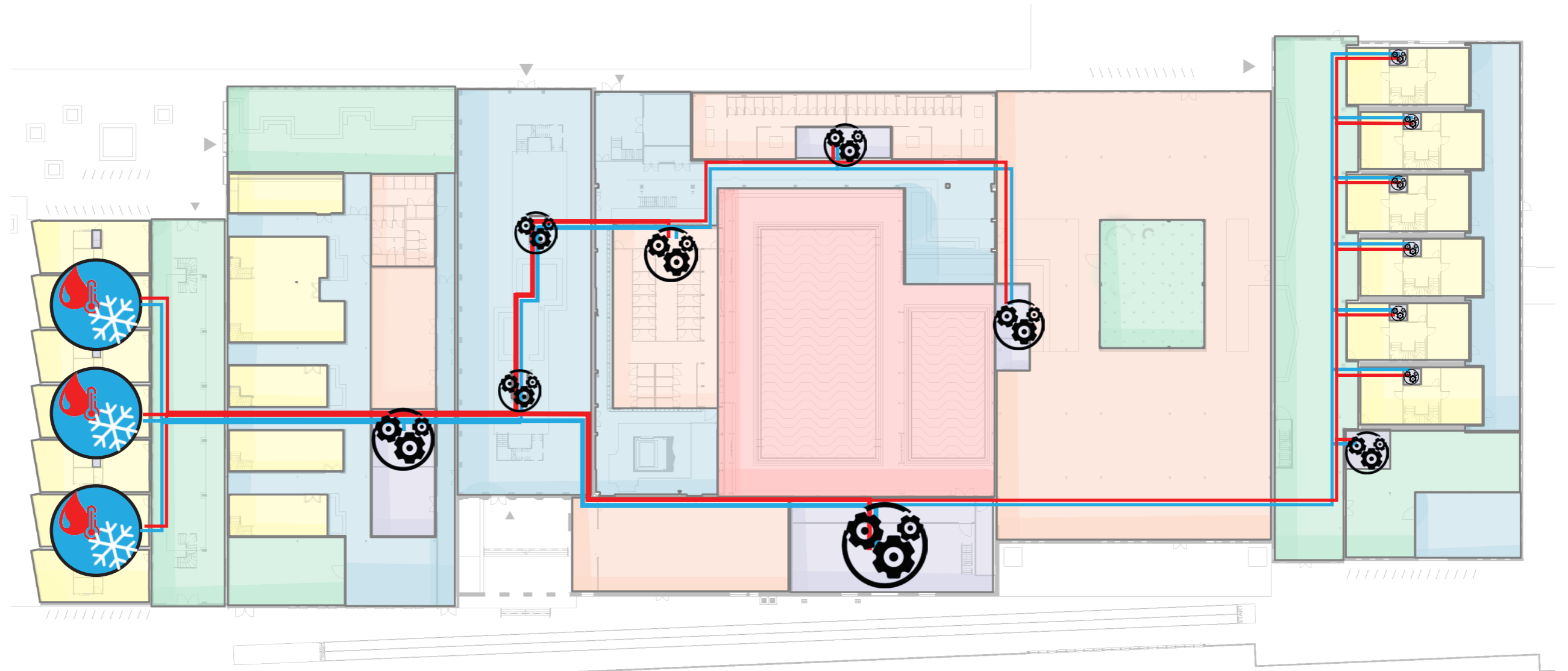


CLIMATE ZONES



CLIMATE ZONES	temperature in Celcius		humidity in %		type of ventilation
	min.	max.	min.	max.	
swimming pool		23 32		50 70	mechanical
fitness hall	16	26	40	65	mechanical
group lesson rooms	18	26	40	65	mechanical
changing rooms		24 26	40	65	mechanical
offices/workspaces	winter 20 23 summer		winter 40 60 summer		hybrid
housing	18	23	40	60	hybrid
in-between space staying	16	23	40	60	hybrid
in-between space moving	12	26	40	60	hybrid
technical/ storage space	15	26	40	60	mechanical

LOW TEMPRATURE HEATING SUPPLY



Solar Eis tank in basement of new addition

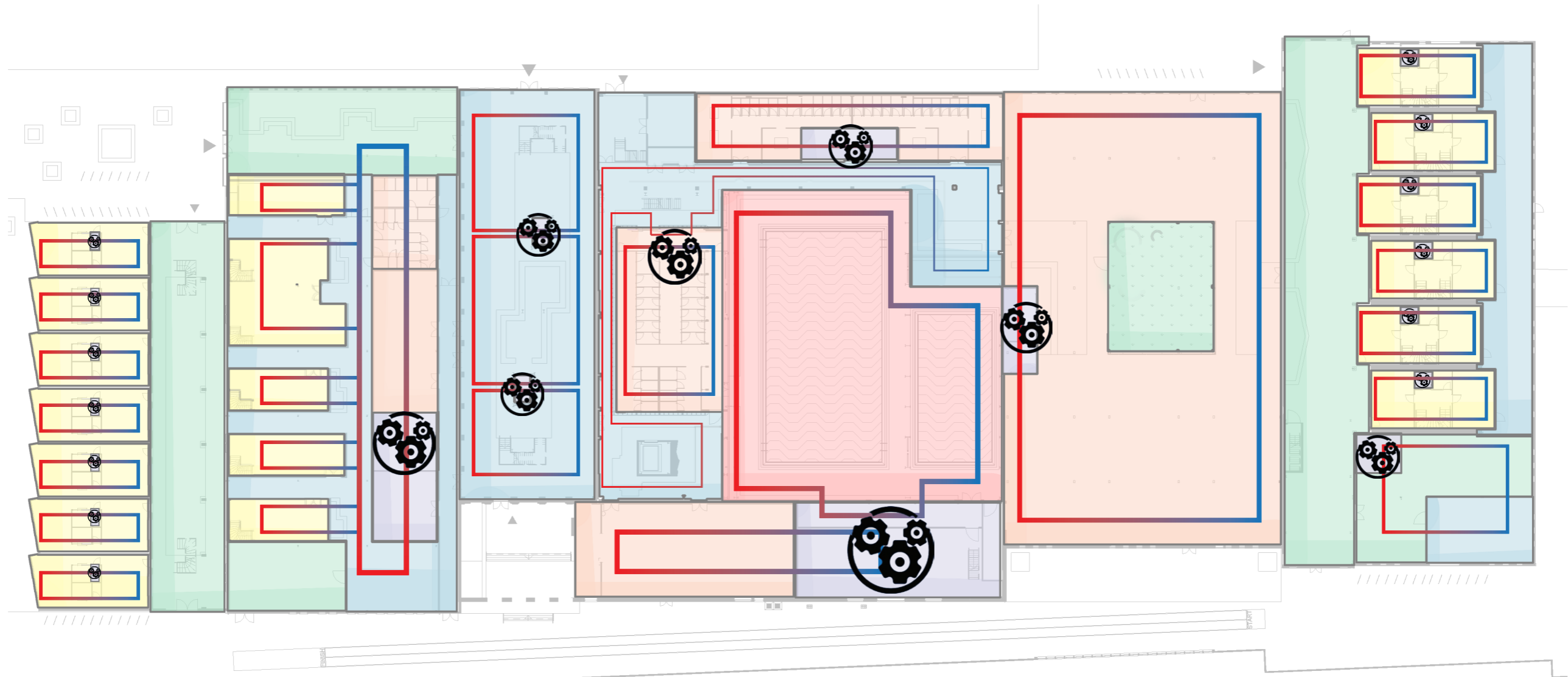


local technical space



supply and exhaust of low temperature heating

LOCAL HEATING

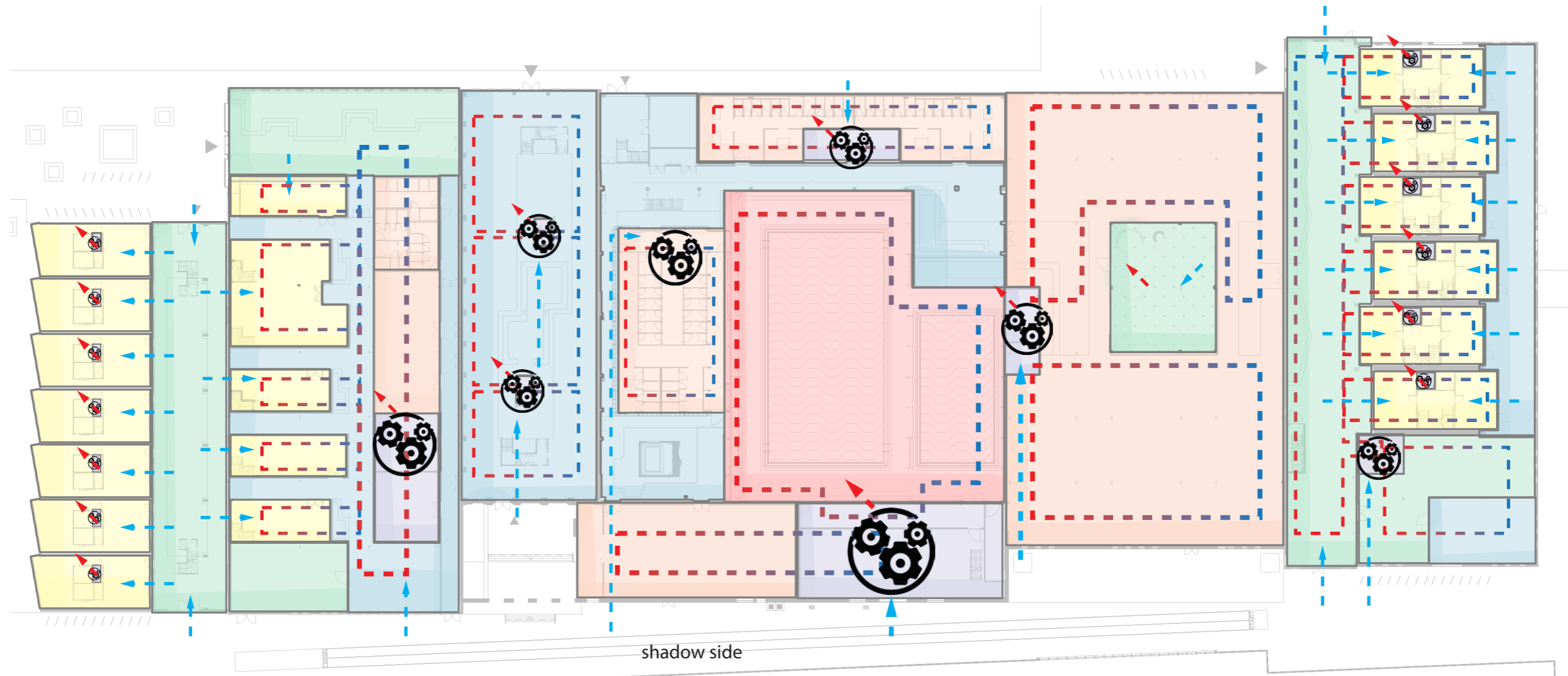


local technical space



schematic field of low temperature floor heating zone

LOCAL VENTILATION



local technical space



fresh air supply (from shady south side)








ventilation zone

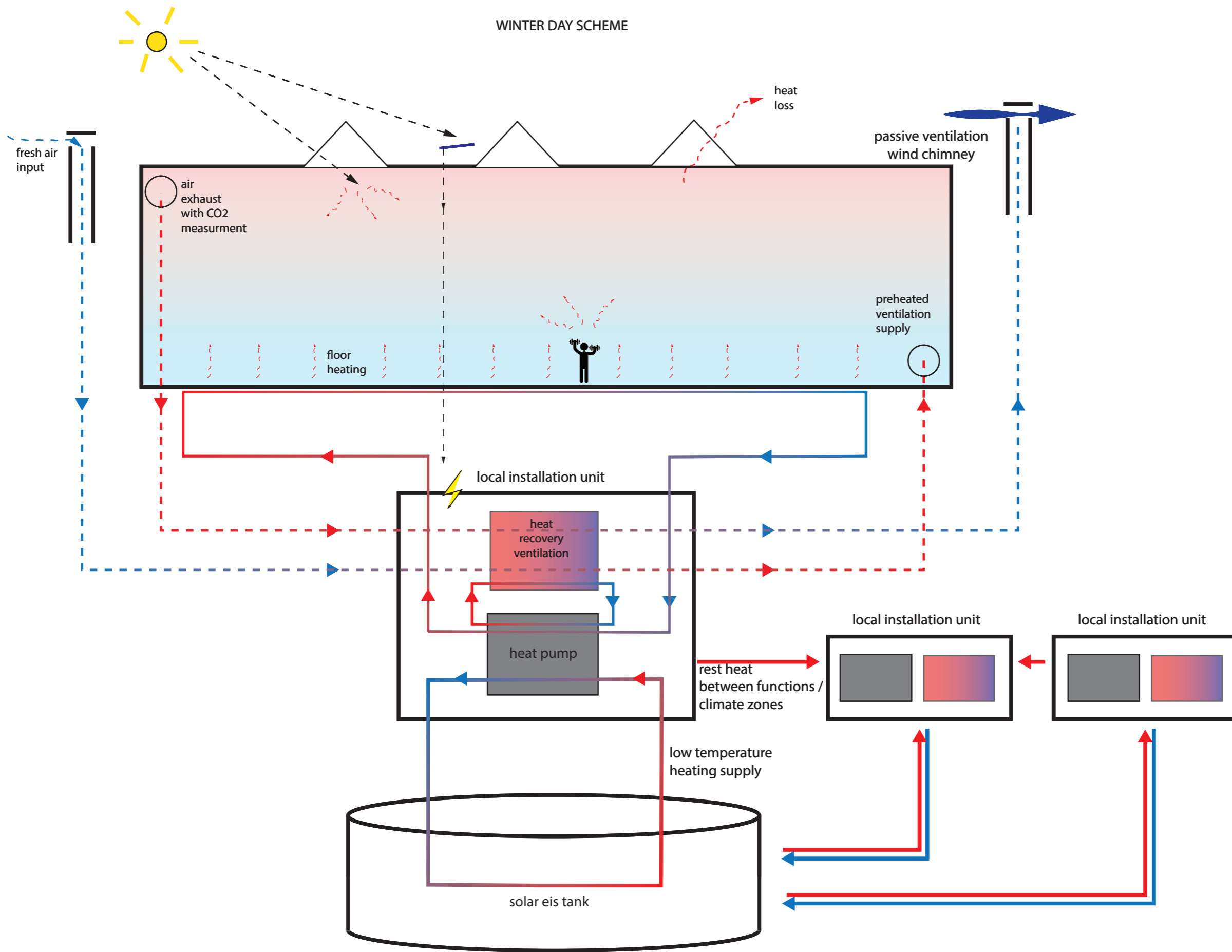


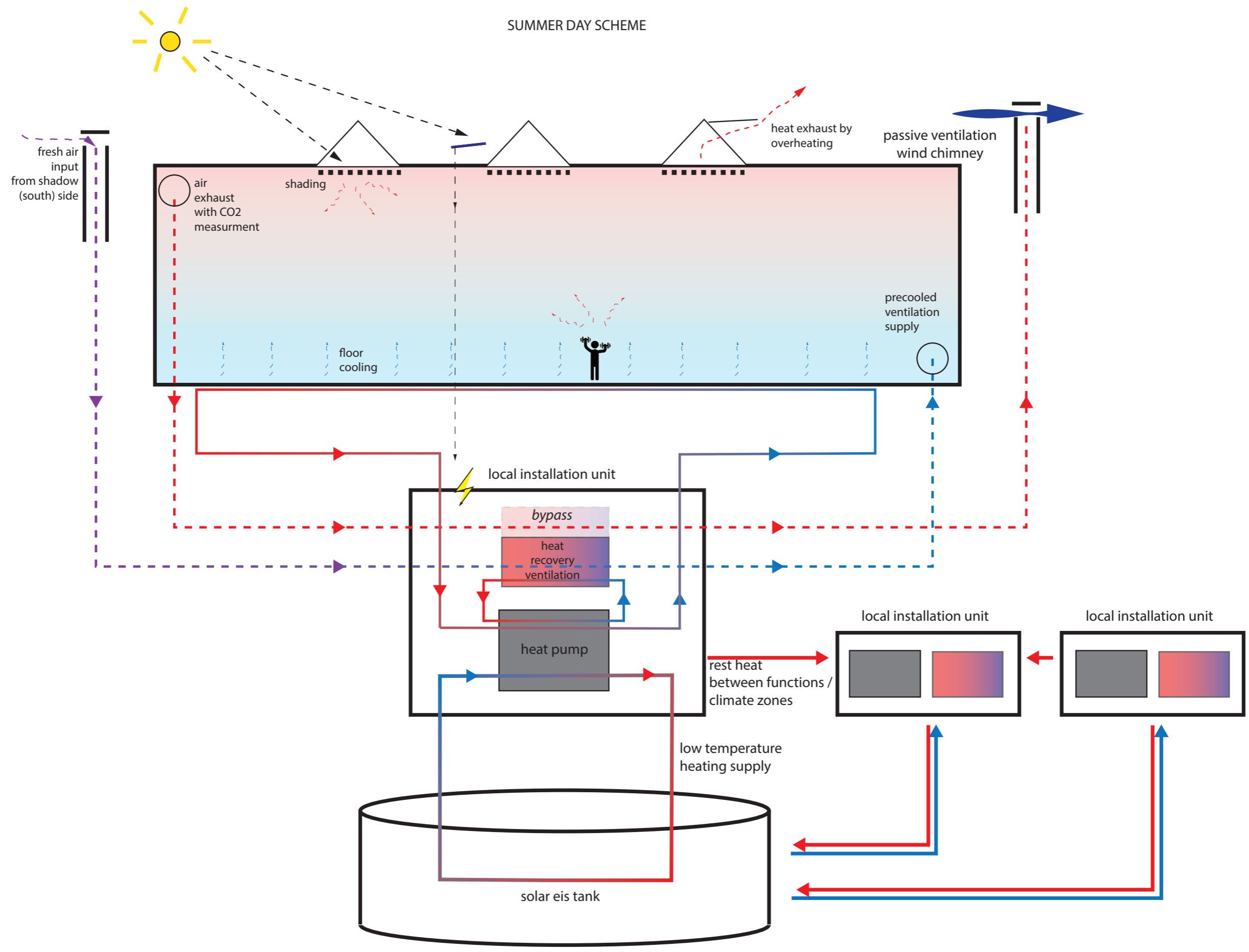
air exhaust (via roof)

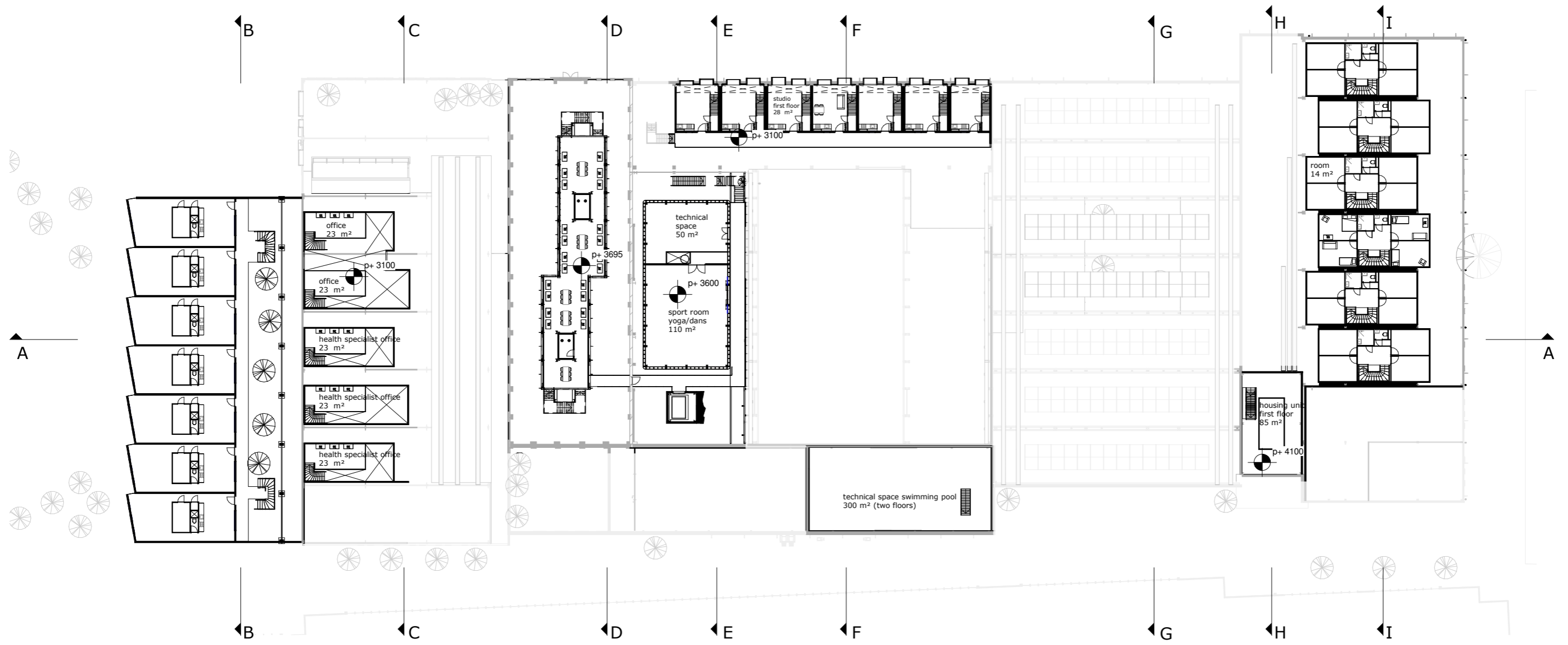
INSULATION STRATEGIES



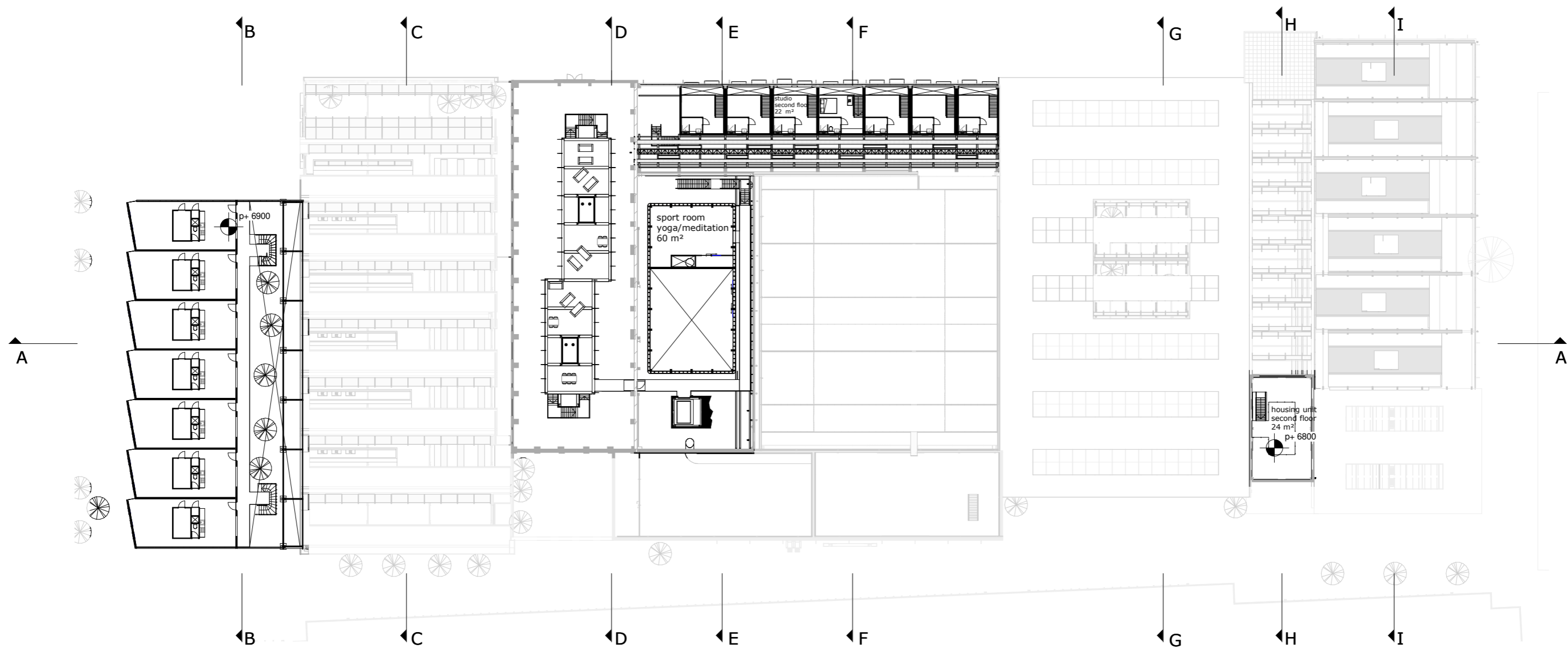
-  insulated space inside bigger space (box in box)
-  small adaptations of the existing (semi climated spaces)
-  insulation of space on the exterior side
-  insulation of space on the interior side
-  new insulated space, independent from existing building







FLOORPLAN 01 - 1:500



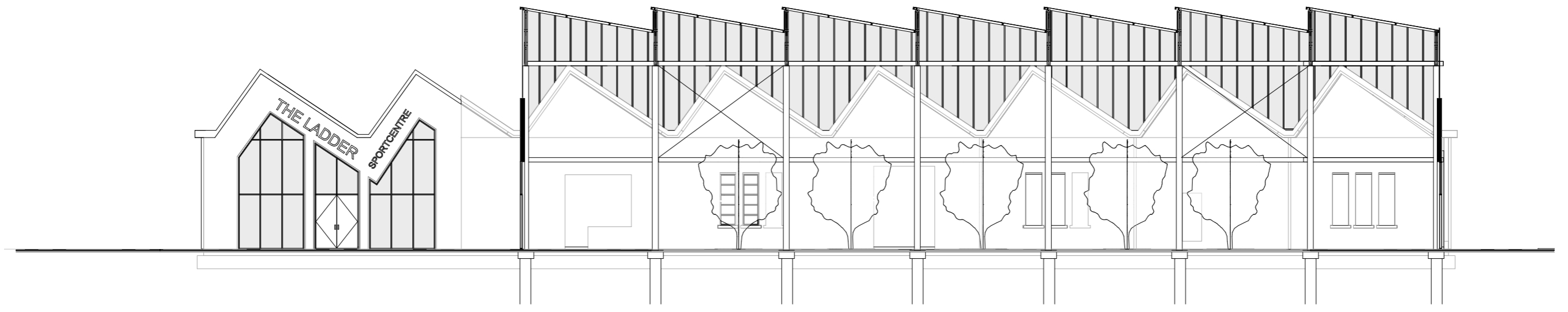
FLOORPLAN 02 - 1:500



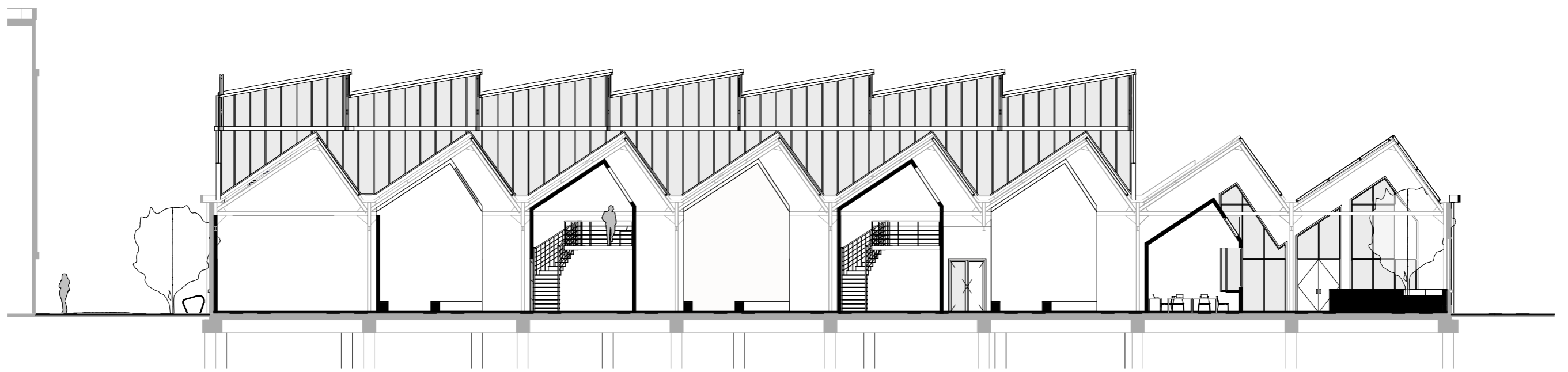
WEST FAÇADE - 1:200



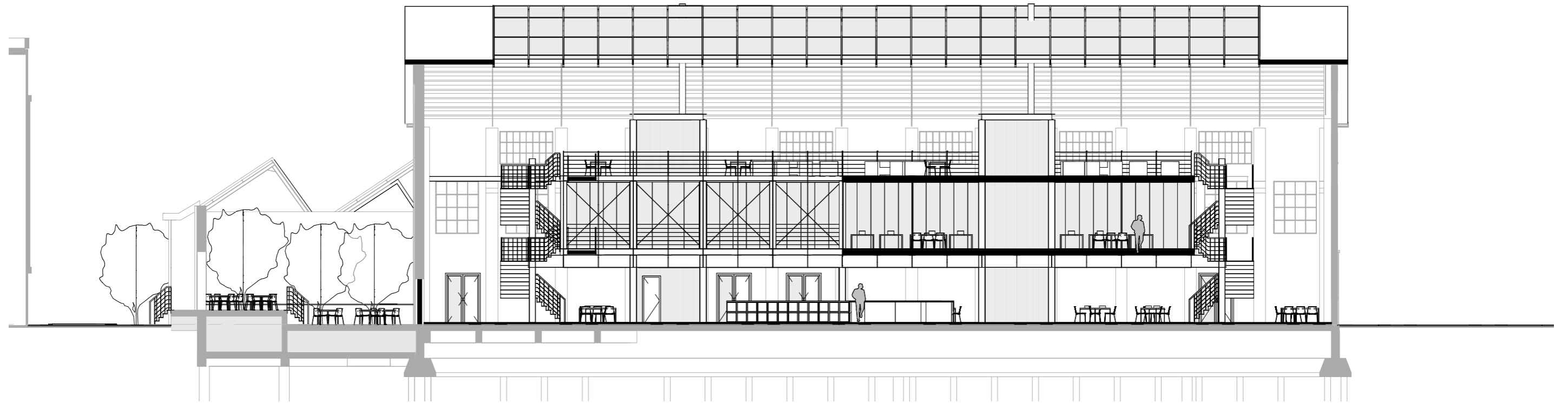
EAST FAÇADE - 1:200



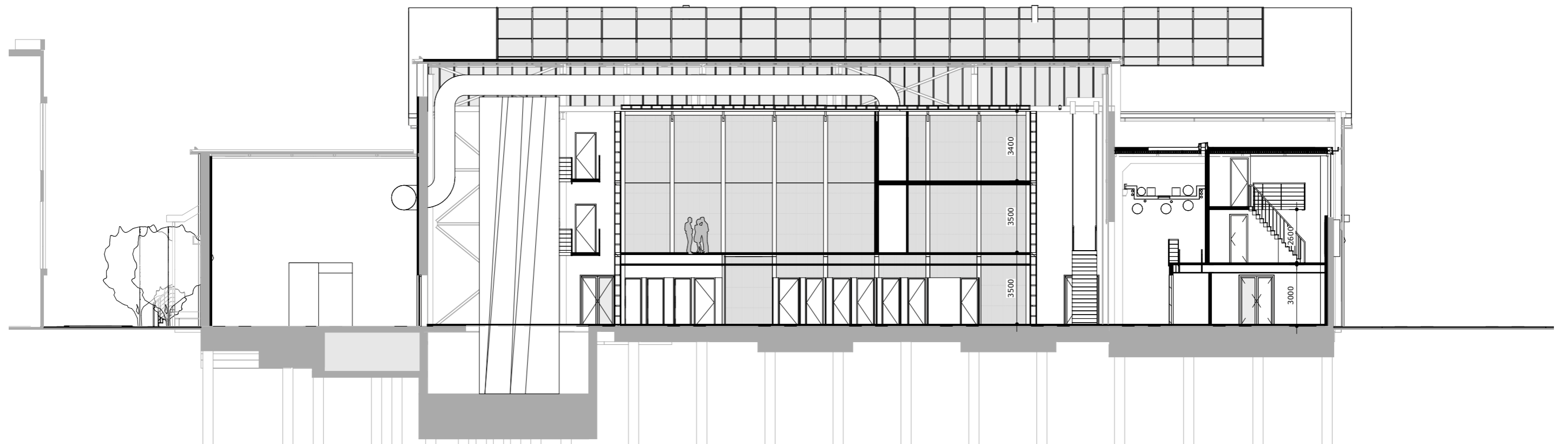
SECTION BB - 1:200



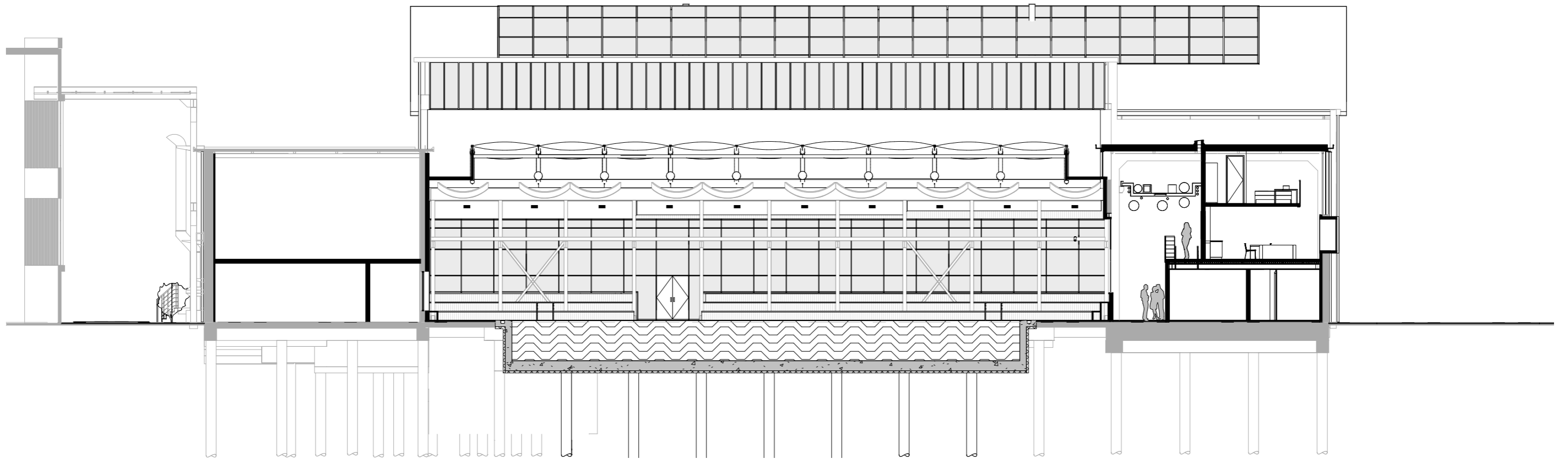
SECTION CC - 1:200



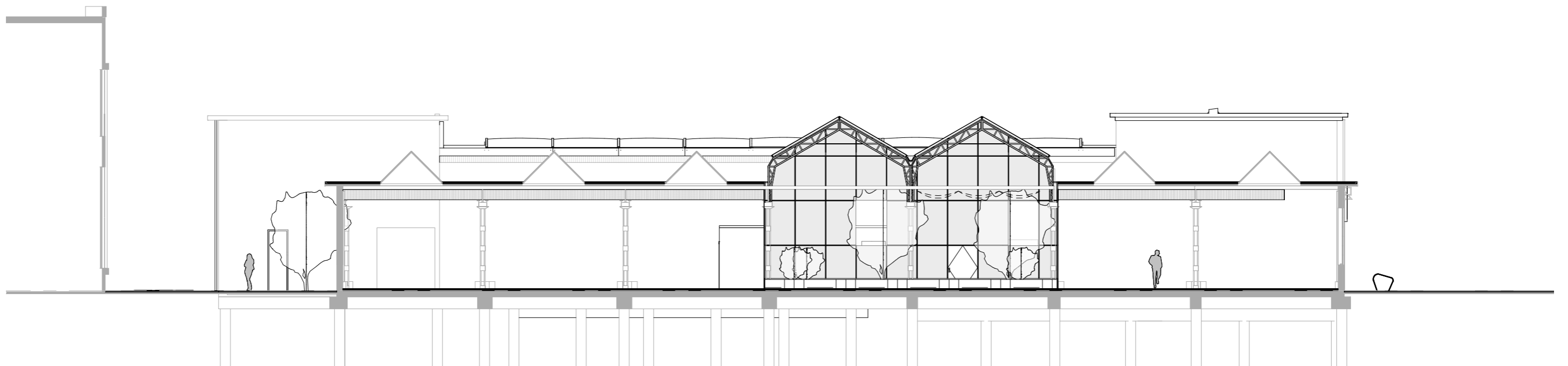
SECTION DD - 1:200



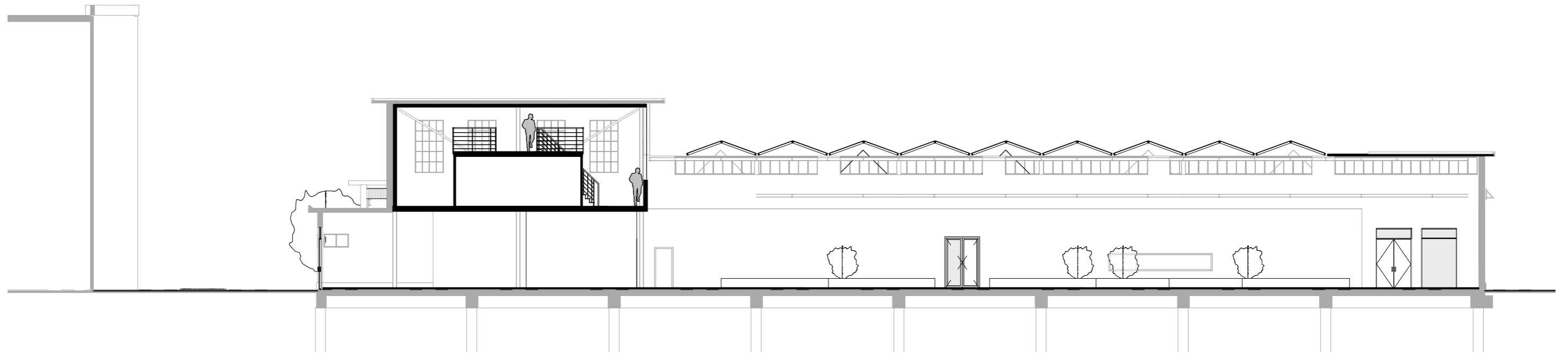
SECTION EE - 1:200



SECTION FF - 1:200



SECTION GG - 1:200



SECTION HH - 1:200



SECTION II - 1:200