/AMSTEL
HEALTH
BASE

ENGAGING IN HEALTH IN THE FUTURE CITY

P5 DESIGN BOOK
/AMS MID-CITY GRADUATION PROJECT, OCTOBER 2019
/CHAIR OF COMPLEX PROJECTS, DEPARTMENT OF ARCHITECTURE, URBANISM AND THE BUILT ENVIRONMENT
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/ INTRO

Assignment
Society 2100
Amsterdam
Overamstel identity
Group vision
A healthy future

/ RESEARCH

Health trends
Amstel numbers
Project ambition
Strategy
Program

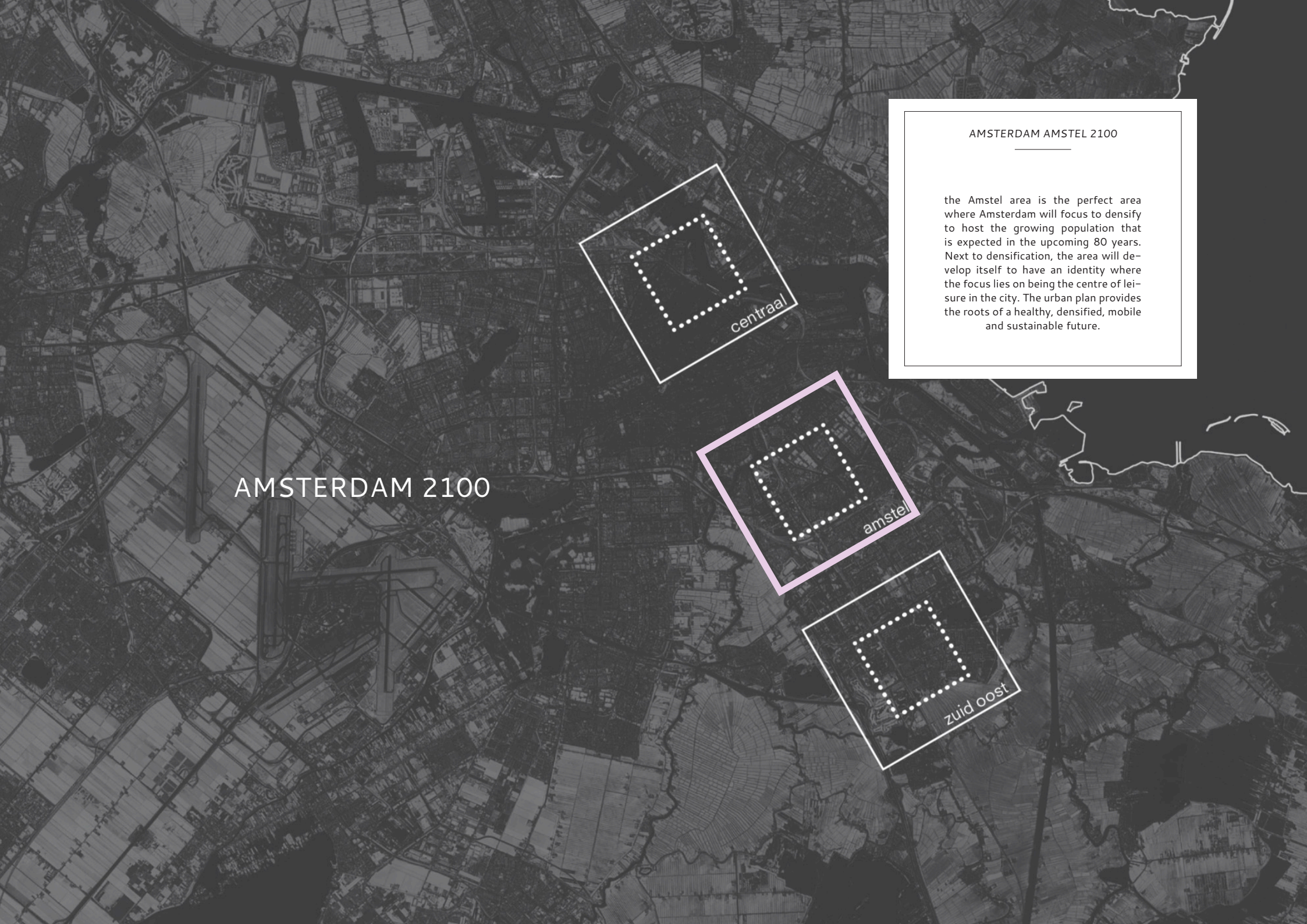
/ CONTEXT

Site conditions
Program configuration
Accessibility

/ DESIGN

Concept
Plans
Organisation
Building Technology
Sustainability

/AMSTEL HEALTH BASE



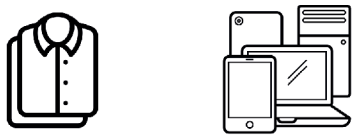
AMSTERDAM 2100

AMSTERDAM AMSTEL 2100

the Amstel area is the perfect area where Amsterdam will focus to densify to host the growing population that is expected in the upcoming 80 years. Next to densification, the area will develop itself to have an identity where the focus lies on being the centre of leisure in the city. The urban plan provides the roots of a healthy, densified, mobile and sustainable future.

SOCIETY 2100

NOWADAYS

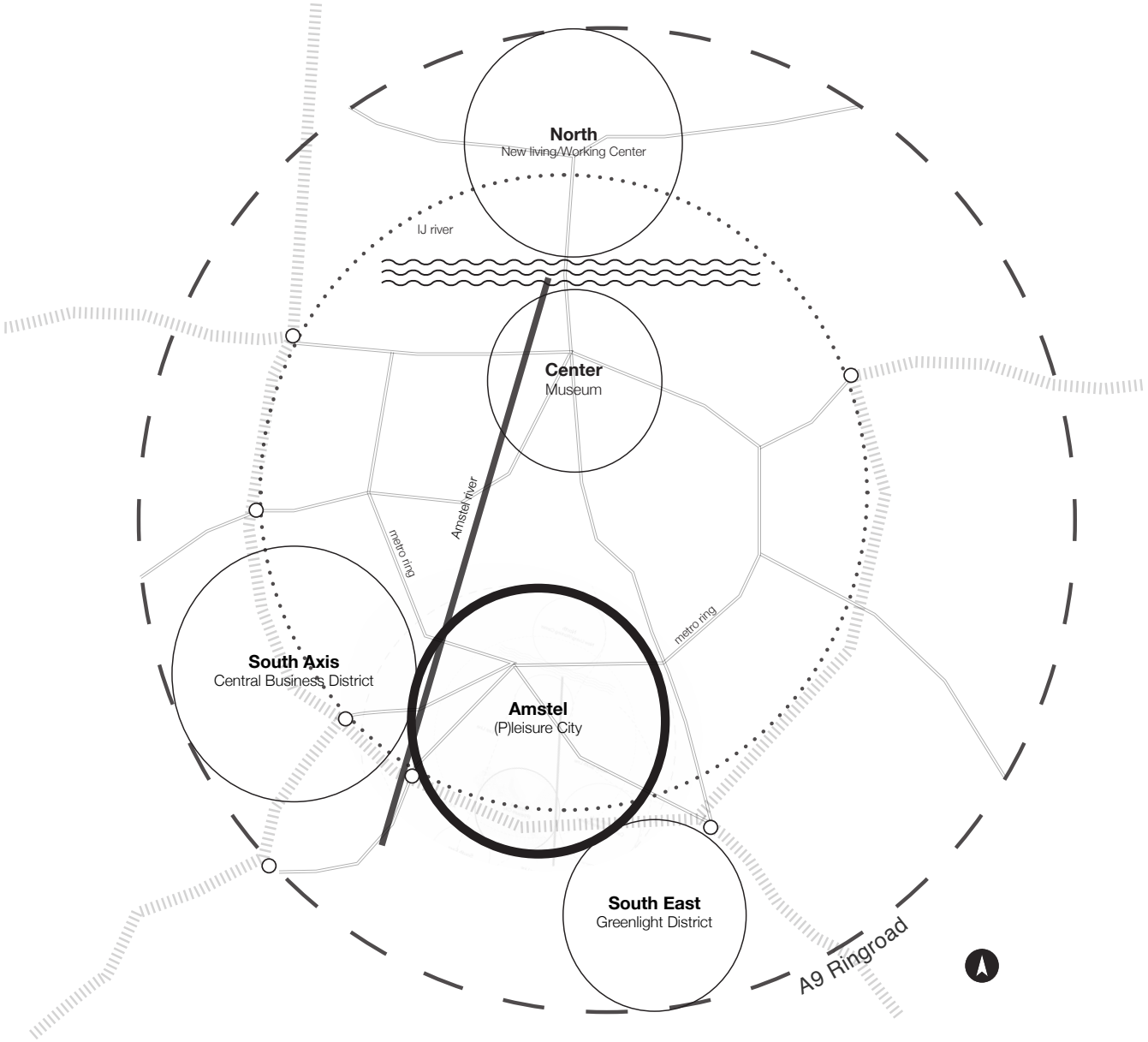


MATERIALISM

2100

EXPERIENCES

AMSTERDAM 2100



AMSTEL 2100 POPULATION TREND

Derived from the general strategy for the Amstel in 2100 there are some important developments within Amsterdam. As the city will grow, the different districts will develop along with that growth.

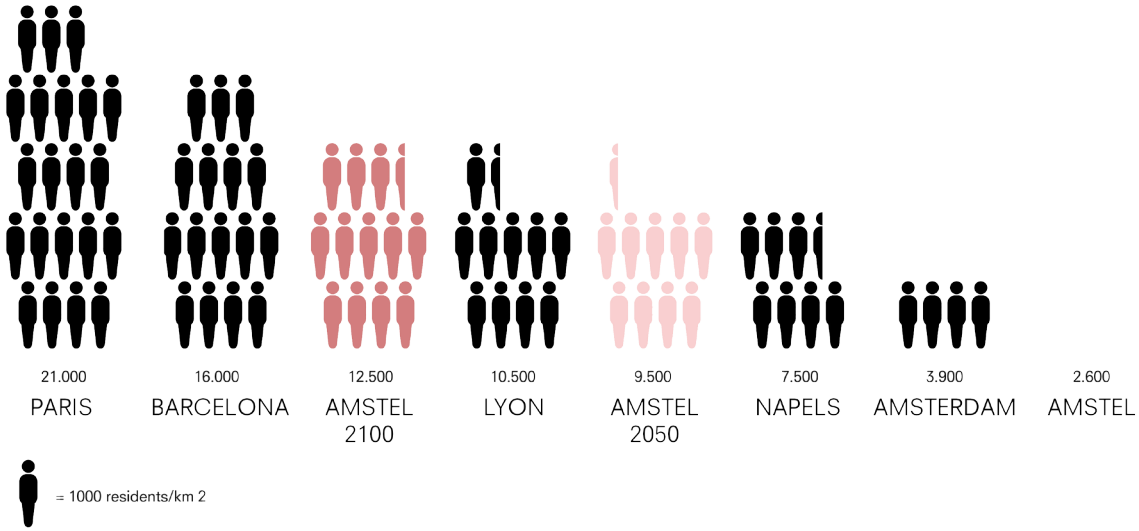
The highly densified center will have the identity of the cultural historic center with several museums, and by that known as the 'museum district'. The original trainstation is removed and does not serve as the main entrance to the city anymore.

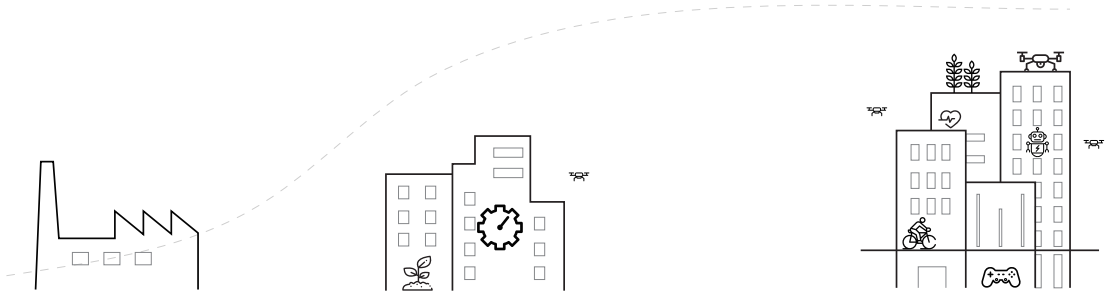
The north has developed itself very quickly into a new living and working center. It is strongly connected to the center and the south of Amsterdam through the metro.

The South Axis has grown enormously and maintains an international business identity with the largest trainstation of the city.

The South East district has densified as well and is now serving as the Greenlight area, providing a green urban environment with housing.
The original A10 ringroad is transformed into a city boulevard and the A9 has become the main ringroad of the city.

The Amstel area consists of certain site qualities that made the are develope itself towards the (p)leisure city of Amsterdam. As we live in an experience economy this will be a highly valued district in the future.





20th Century
Industrial

2050
Productive

2100
(P)leisure

The Amstel area anno 2018 knows much heavy industry and is not an attractive place for housing. In that moment there is a very low population density number and outdated infrastructure. The area is segregrated by this infrastructure causing multiple neighbourhoods who differ strongly from eachothers identity.
Towards 2050 the Amstel area makes a development of becoming a productive center. Productivity in a way of food, robotics, art etcetera all takes place wihtin the border of the location.

The relocation of the heavy industry opened space for the growing need of dwellings in the city of Amsterdam. This will be one of the major places for densification inside the city's ring. The new city will house 110.000 new residents in 2050, they will be housed in mixed function residential building combining work, living and production together.
Between all this densification public space is also preserved with most iconically the square park in the center of Amstel.

In the future 2100, Amstel strives for prosperity in the forms of health and well-being. New technologies have altered our cultural and personal values, they have shifted from the material based society to experience and social culture. Leisure is the next leading economy in future cities, by which the entrepreneurial productive attitude and servicing of the informational city (DIY, 3D printing and manufacturing, Industry 4.0) will evolve in the production of wellness (social cohesion and wellbeing, mental wellness, health is wealth, local entertainment, open air living etc.). It will be a life-embedding condition, for which different urban and architectural solutions have to be envisioned.

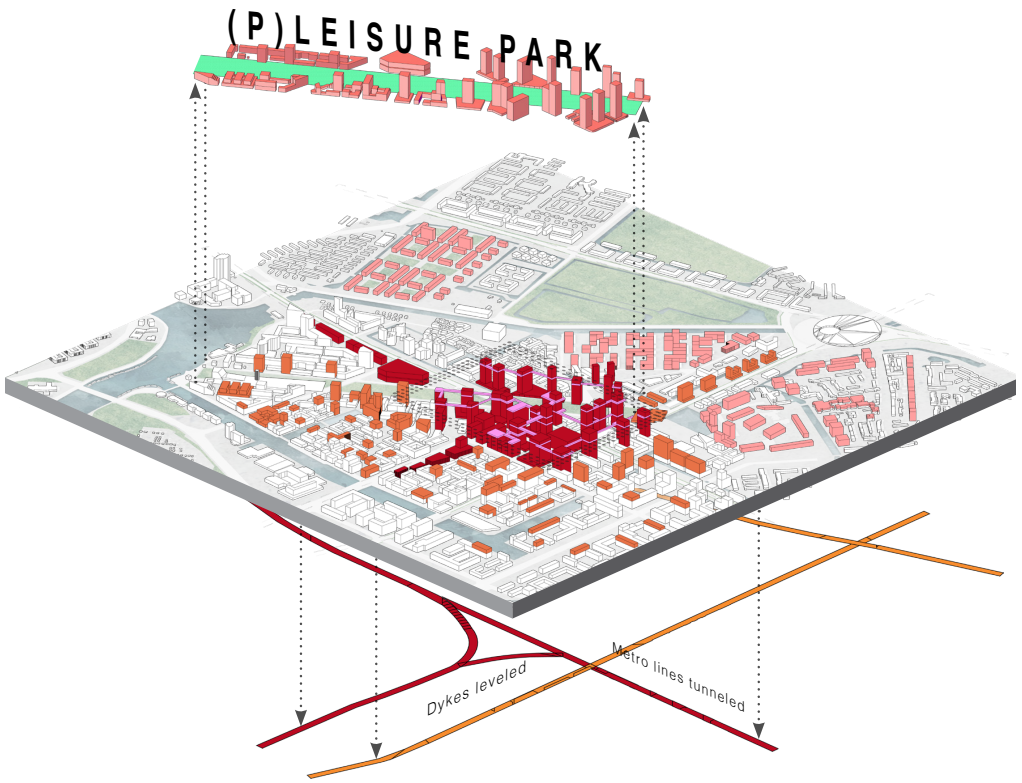
Pleasure and leisure related to the new values will be introduced in the Amstel area, evolving Amstel's productive attitude and servicing label to the production of wellness rebranding amstel as the (P)leisure city of Amsterdam. The architectural interventions(individual projects) will reinforce this brand with themes such as, healthcare centres, leisure universe, co-habilitation and working, gaming community center and a transport node that joins everything together. The projects are focused around the park which transforms the green square to a (p)leisure hotspot. Whereas the historic center has the museum park, Amstel city's green square will be redeveloped into the (p)leisure park.

AMSTEL 2100 STRATEGY

1 Deal with infrastructure in the area in order to gain space for densification

2 Reinforce existing qualities in the area in order to emphasize local identity and hierarchy

3 Prepare for the vertical city and 3D urbanism



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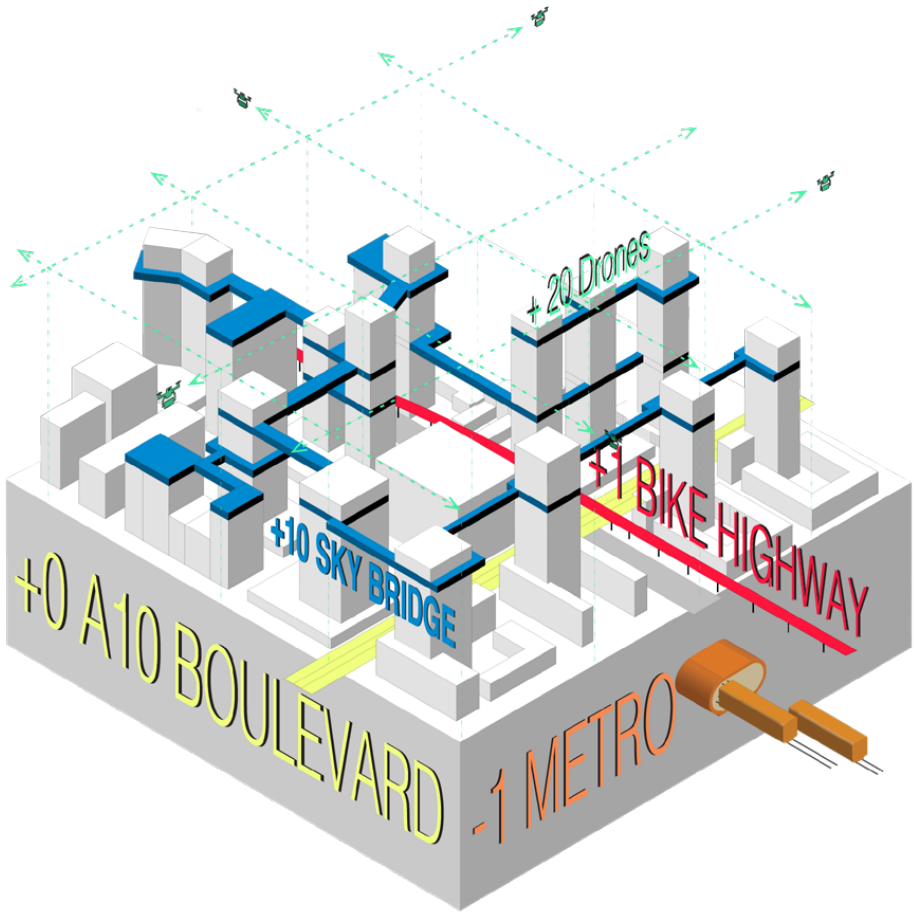
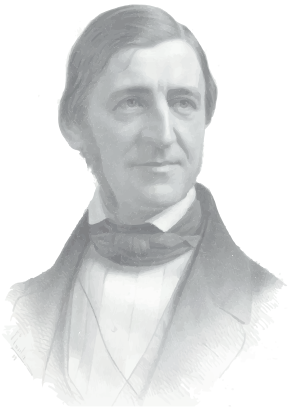


/THE FIRST WEALTH IS HEALTH



Ralph Waldo Emerson, 1860

When looking at the future we try to imagine what will be factors in life we value the most. Will it be our career? Our living conditions? Or our family size? When it comes to focussing on the main quality of life it comes down to our health. Health has been growing in it's concept. And this perception of health will continue to grasp on multiple levels. The deviation of prevention and treatment will continue to develop in the city. Health is percepted as a lifestyle and not only a clinical state. Engaging in social, mental and physical health in an everyday life will be the main focus in a growing city.

Because with all the future developments in Amsterdam and in our lives I believe that 'the first wealth is health' - said by the American philosopher Ralph Waldo Emerson. With the predicted population growth and the rise of digital technologies, such as artificial narrow intelligence, robotics, virtual reality/ augmented reality, telemedicine, 3D-printing, portable diagnostics, health sensors, wearables, etcetera health is an important foundation on which we build. Chronic diseases are growing in numbers and as the city becomes more dense, loneliness is a growing subject of Amsterdam. These circumstances result in a change in the entire structure of healthcare, as well as the roles of patients and doctors, and they will fundamentally shift from the current status quo.

Health itself is percepted in two ways: prevention and treatment. Through the past couple of decades the municipality has prioritized the prevention aspect of health by promoting and embedding physical exercise in the environment.

As the experience economy tends to grow we value experiences over material things. We live our lives to become the person who we desire to be. The self-actualization that leads from this will touch the aspect of health. Health will be used to reach this goal. More and more people are using devices nowadays like smartphones, fitness trackers, and wellness apps to stay healthy. They're showing great interest in accessing care through the digital tools they already use. Engaging in health will be an everyday life activity and will contribute in the loneliness factor, the inactivity factor and in the overall public wellbeing.

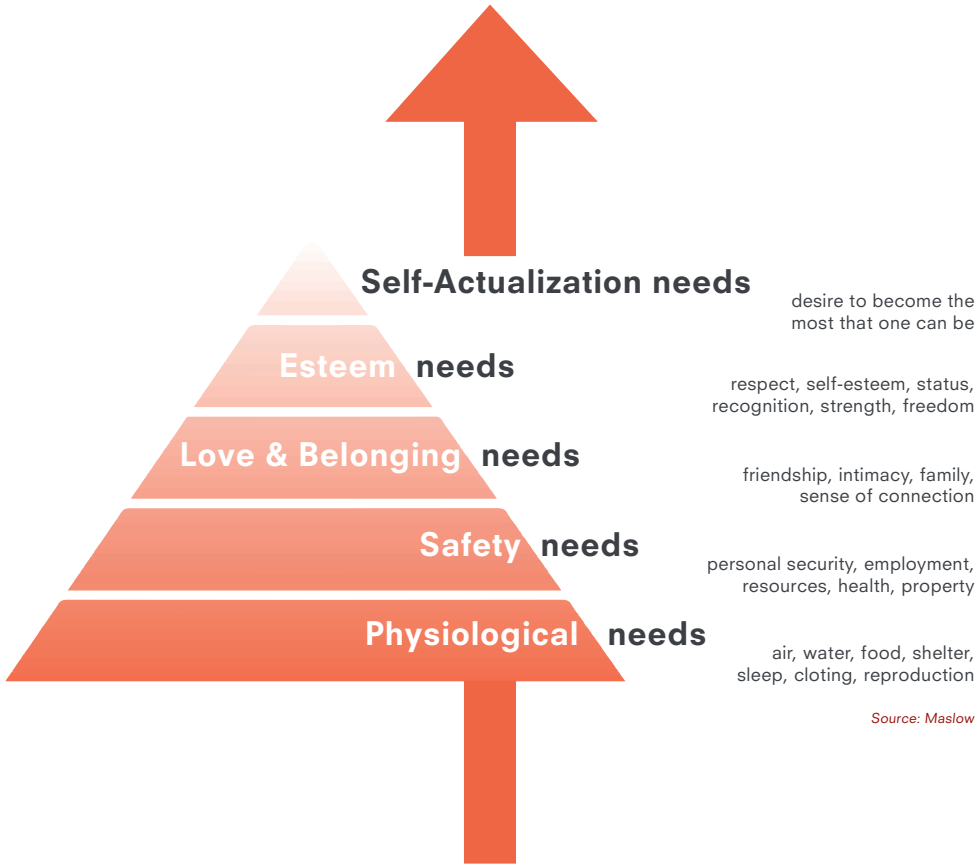
The treatment aspect of health goes deeper into the current healthcare system. There is a tendency that the ancient healing process is housed in outdated architecture but equipped with technology of the 21st century. So the centralized system of today is absolutely not sustainable when looking to the future. With the Amstel area as newly densified neighbourhood where the identity spins around leisure, it provides the ultimate location for a new typology that fits the health demand of the future. As health is seen in a more holistic way, leisure has a very strong connection to engaging in health.

Before me lies the opportunity to develop a new type of typology which could be a leading example in the future of our healthcare system. But with that comes a task to revise our current healthcare system and trends that develop with that. As the focus on health is growing and grasping multiple disciplines of life, my attention was caught to look at the future of this. Not only engaging in the prevention aspect of health but the future of treatment and care of health is a very interesting architectural research.

Treatment

Prevention

Health as self-enrichment



Health as a matter of survival

Hierarchy of needs, Maslow 1943

PUBLIC HEALTH

The shaping of cities of the future is going to become more and more important as urban areas will grow intensively in their population in the upcoming decades, Amsterdam being no different. The growth of Amsterdam will force itself to become a host of a dense livable city emphasizing several qualities. But these qualities will experience a certain pressure.

> a large number of people on a small surface puts pressure on things such as hygiene, air quality, space for green and the possibility to move

To frame the possible negative sides on these qualities is to know how to value the livability in a city. The saying 'the first wealth is health' represents precisely the key value of life independently from the environmental factors. This means that no matter in what time or circumstances we live in, good health is valuable either way. Linking this belief to the context of the future of Amsterdam it means that there are some striking issues that will influence the situation of health.

Physical and mental health issues are strong focus points within this future scenario. Current physical health issues are expected to continue to increase because of unhealthy lifestyles: the World Health Organization reveals that physical activity has been engineered out of life.

> physical activity has been engineerd out of life

Technological developments within mobility, leisure and education all create a sedentary environment causing chronic diseases rates like overweight, cardiovascular diseases and diabetes to grow.

Not only physical health will have a primary focus in our future life, also mental health issues are a perceptible occurrence in a city. Good mental health is essential, not just for our personal wellbeing, but also to achieve resilient, sustainable cities. Globally, 1 in 4 people will experience mental health problems, occurring especially in city areas. For the city of Amsterdam loneliness is a big mental health issue.

> 1 in 4 people will experience mental health problems

With the city growing in population and the technology innovating more and more (isolated) individual life possibilities the chances of having a lack of social interaction increases contributing in a growing loneliness problem.

HEALTHCARE

With a growing engagement of health - and individual health - the healthcare system is getting a closer look as well.
The centralized system we have know experiences several negative sides. Next to the outdated concept of centralizing all specialties and letting the patient go towards the service, the costs are rising, the healing experience is decreasing and the current healthcare real estate does not meet the internal facilities. The main effect we all have with healthcare institutions is that they associate with sickness rather than with health.

> healing facilities associate with sickness instead of with health

Niels van Namen leads the UPS Europe Healthcare team as the Vice President for Healthcare. He tells in his TedTalk that 64% of the inhabitants avoid going to the hospital to get care because of the costs or the trip - for the elderly. Next to that the visit to the facility often makes us sicker than when you come in. On top of that there is a 125.000 employee shortage in the Netherlands within healthcare.

> 64% of inhabitants avoid hospital care because of the costs or the trip

In the past decades we have made extremely positive innovations within healthcare but the system itself is outdated and not sustainable for the future we have ahead of us. By re-imgaining the entire system we can focus on developing a new more suitable system for 2100. Van Namen mentions that research showed that 46% of hospital care can happen at a patients home. That's mainly for those patients who suffer from chronic diseases.

> 46% of hospital care can happen at patients home

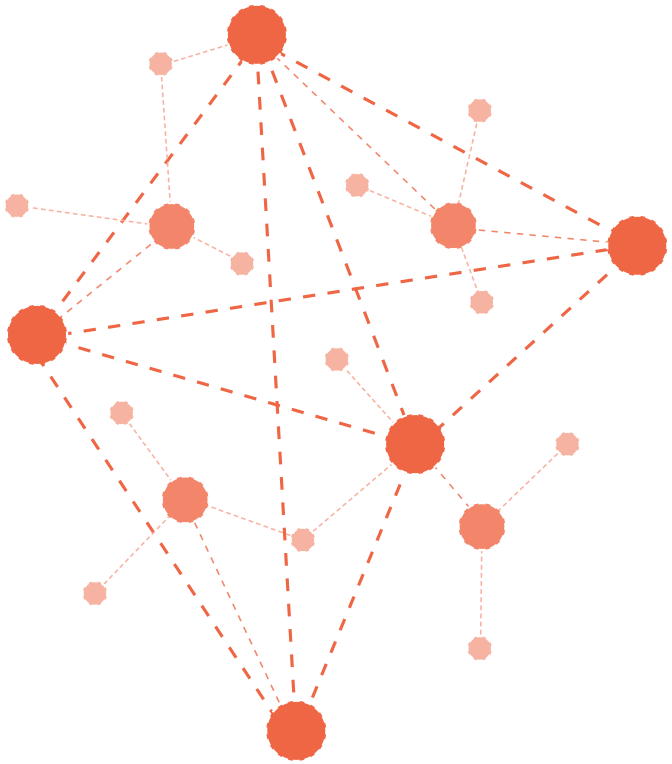
The Amstel location experiences a severe lack of healthcare functions: hospitals are a minimum of 4,0 kilometers away and there are no small scale health functions in the area. With the low density in 2018 this isn't a large problem, but with the prospected population growth in 2100 and the great demand of engaging in health, the area is very insufficient in meeting health function demands and at the same time serves as a perfect location to develop a new type of typology that fits the future.

"

with the future population growth and technological developments the current healthcare system is not sustainable

"

CURRENT DEVELOPMENT WITHIN HEALTH



Large healthcare facility
hospitals

Healthcare on referral
specialisms

Small healthcare facilty
general practicioner

CURRENT DEVELOPMENT WITHIN HEALTH

UNFRIENDLY CHARACTER OF HOSPITALS

lack of privacy

the farewell of friends and family

spending the night with strangers

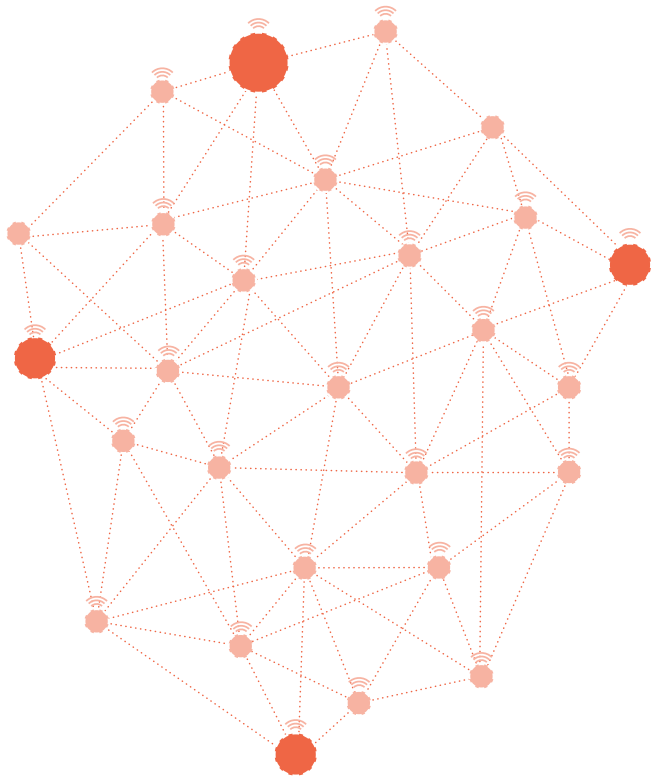
minimum contact with responsible doctors

overabundance of contact with different staff

poor acoustics

feeling of loss by logistics

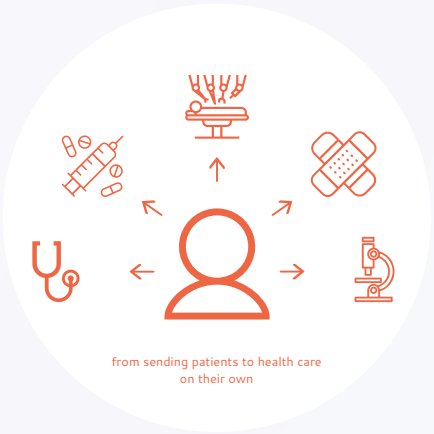
FUTURE OF HEALTH



Large healthcare facility
multi-specialty facilities

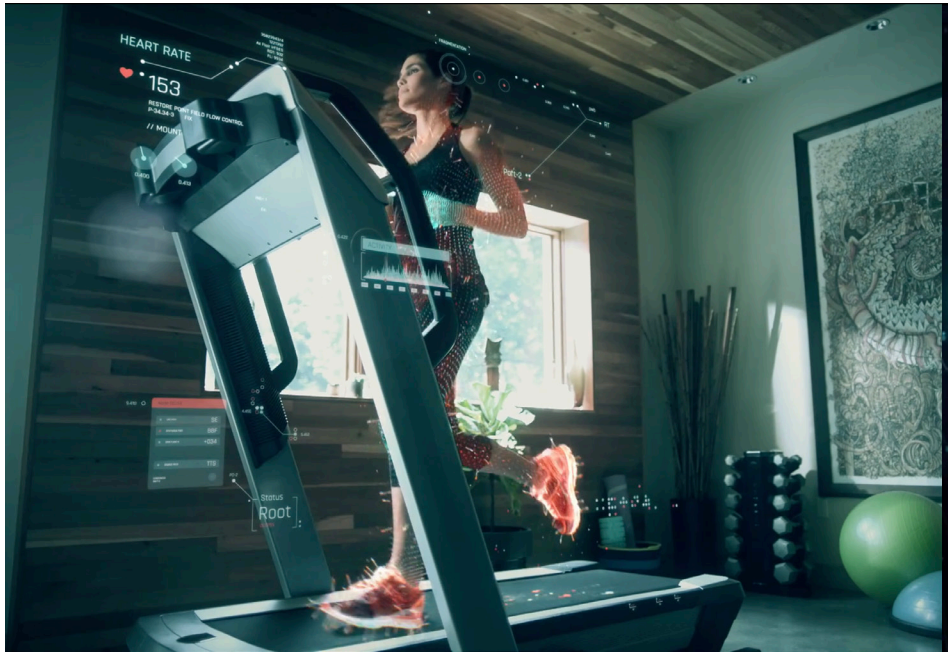
Neighbourhood health base
short term care and treatment

FUTURE OF HEALTH

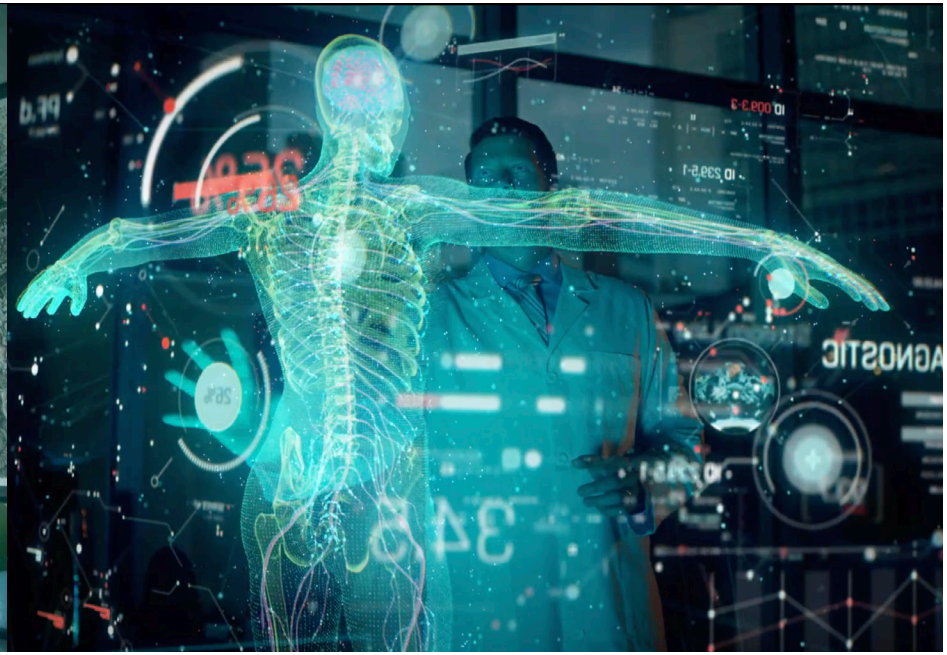


from sending patients to health care
on their own

to providing health care
to the patients



wearable health trackers



virtual and robotic treatments

FUTURE OF HEALTH

Care becomes more home-based

Telemedicine will reduce in-person visits

37%
reduction of urgent care visits

15%
reduction of emergency room visits

35%
lower hospital admissions

AMC
1002 beds
24000 admissions
16 surgery rooms

VUmc
733 beds
21000 admissions
16 surgery rooms

OLVG
748 beds
22000 admissions
25 surgery rooms

2019 — Great Amsterdam inhabitants: 1.500.000

1 clinical admission per 22,5 inhabitants

1 emergency case per 8 inhabitants

2100 — Amstel 2100 inhabitants: 150.000

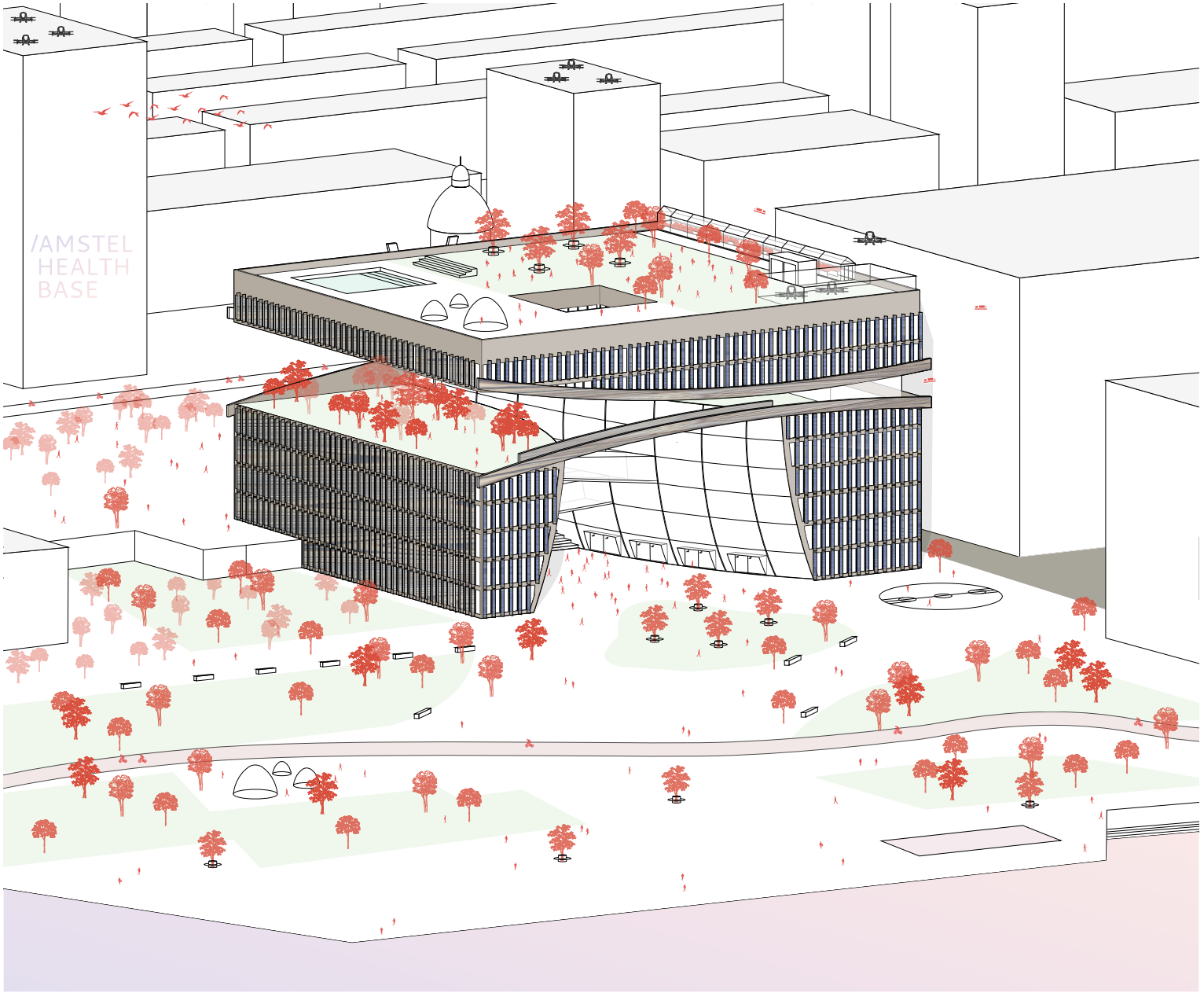
1 clinical admission per 35 inhabitants

1 emergency case per 10 inhabitants

/AMSTEL HEALTH BASE

a house of health for the Amstel community

It has same day treatments, provides medical and environmental education, serves as a social meeting place and therefore has an important public role in the urban context of the Amstel


/AMSTEL
HEALTH
BASE

PROJECT AMBITION

2100

Amstel 2100 inhabitants: 150.000

1 clinical admission per 35 inhabitants

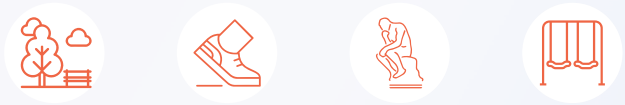
1 emergency case per 10 inhabitants

triple medical department focus

a visit to the Amstel Health Base is autonomous and ambulantory

SOCIAL AND MENTAL HEALTH PRINCIPLES

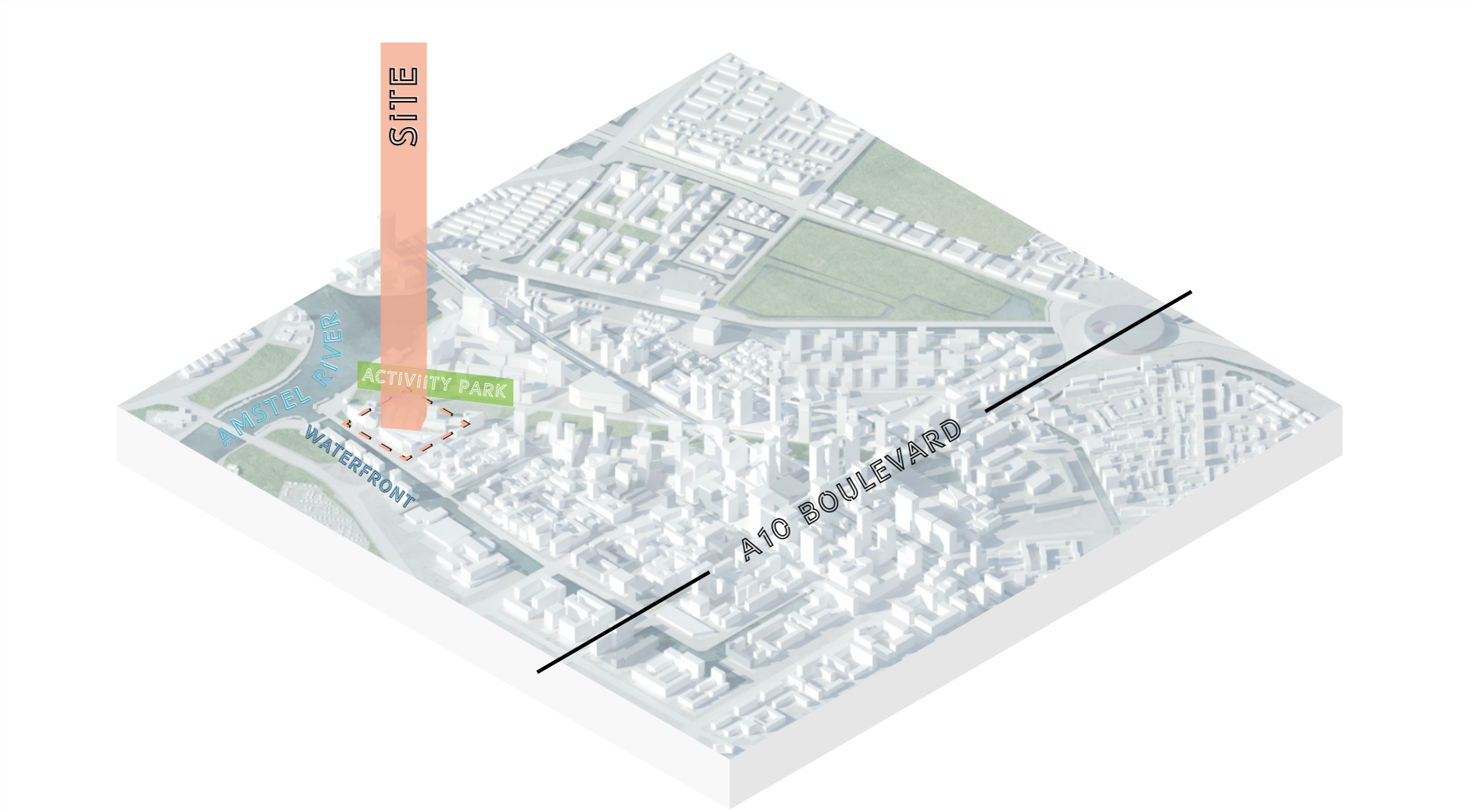
access to green, active, social and safe places



HEALING ENVIRONMENT PRINCIPLES

facilitate autonomy, privacy, personalization, social comfort and workflow

PERSONAL SITE

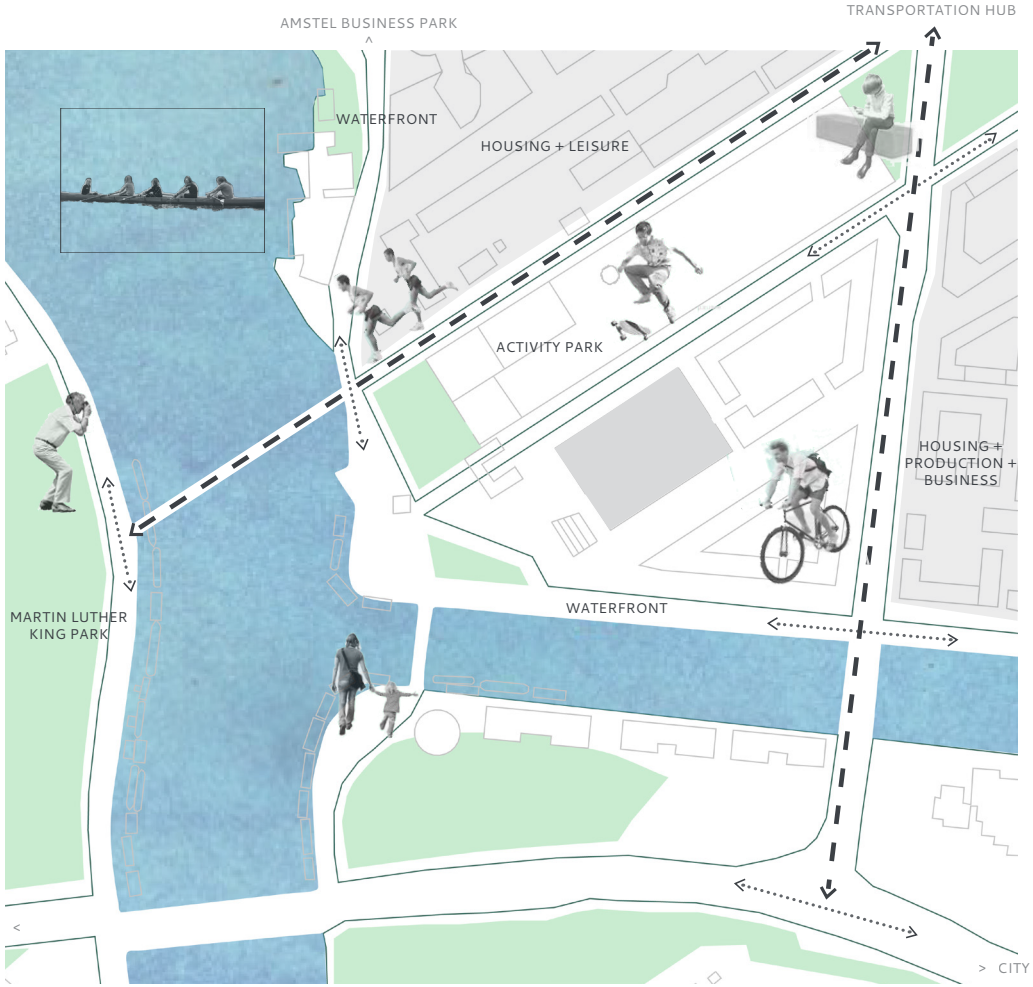


PERSONAL SITE

AMSTEL BUSINESS PARK

ACTIVITY PARK

MARTIN LUTHER KING PARK

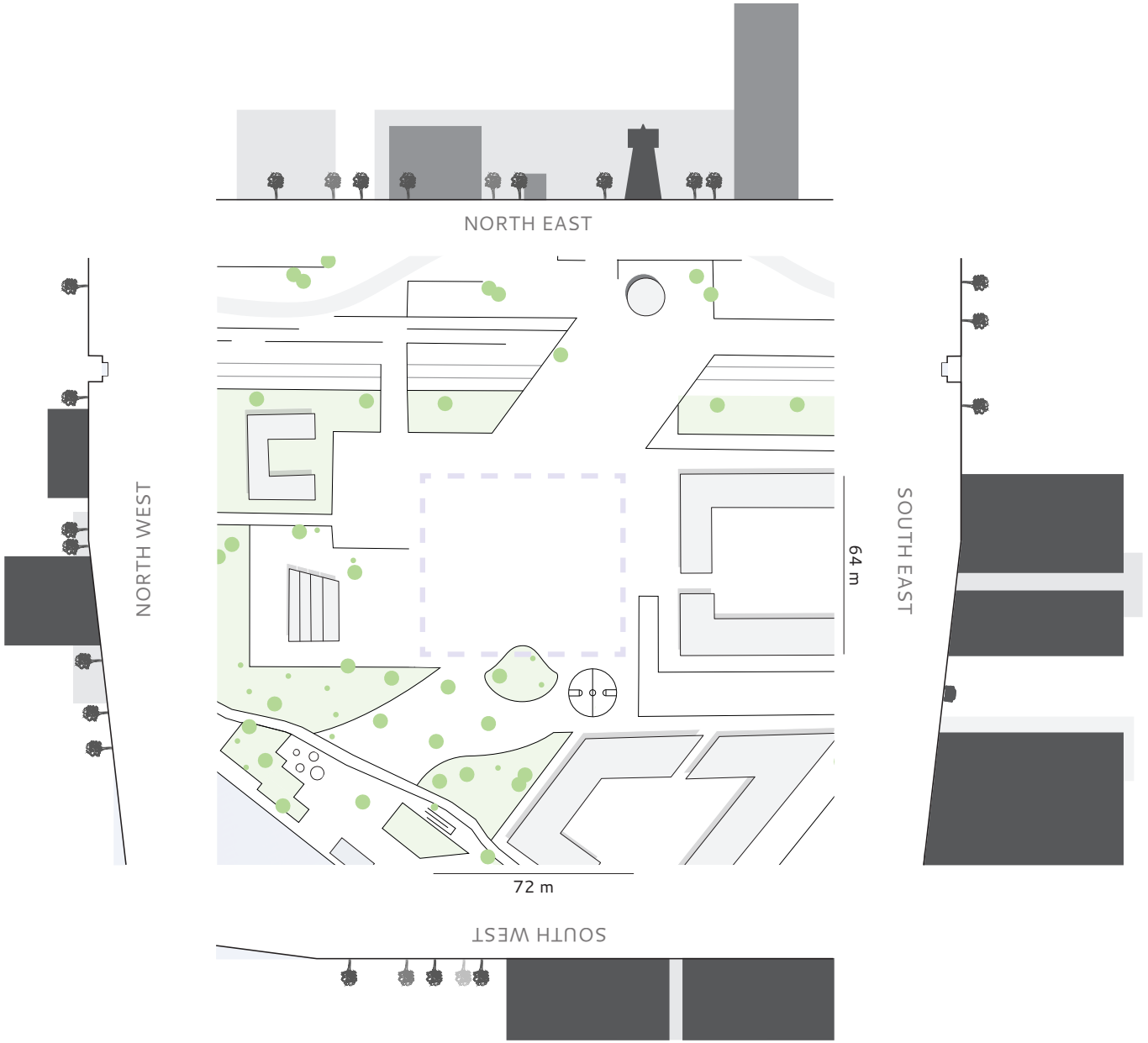


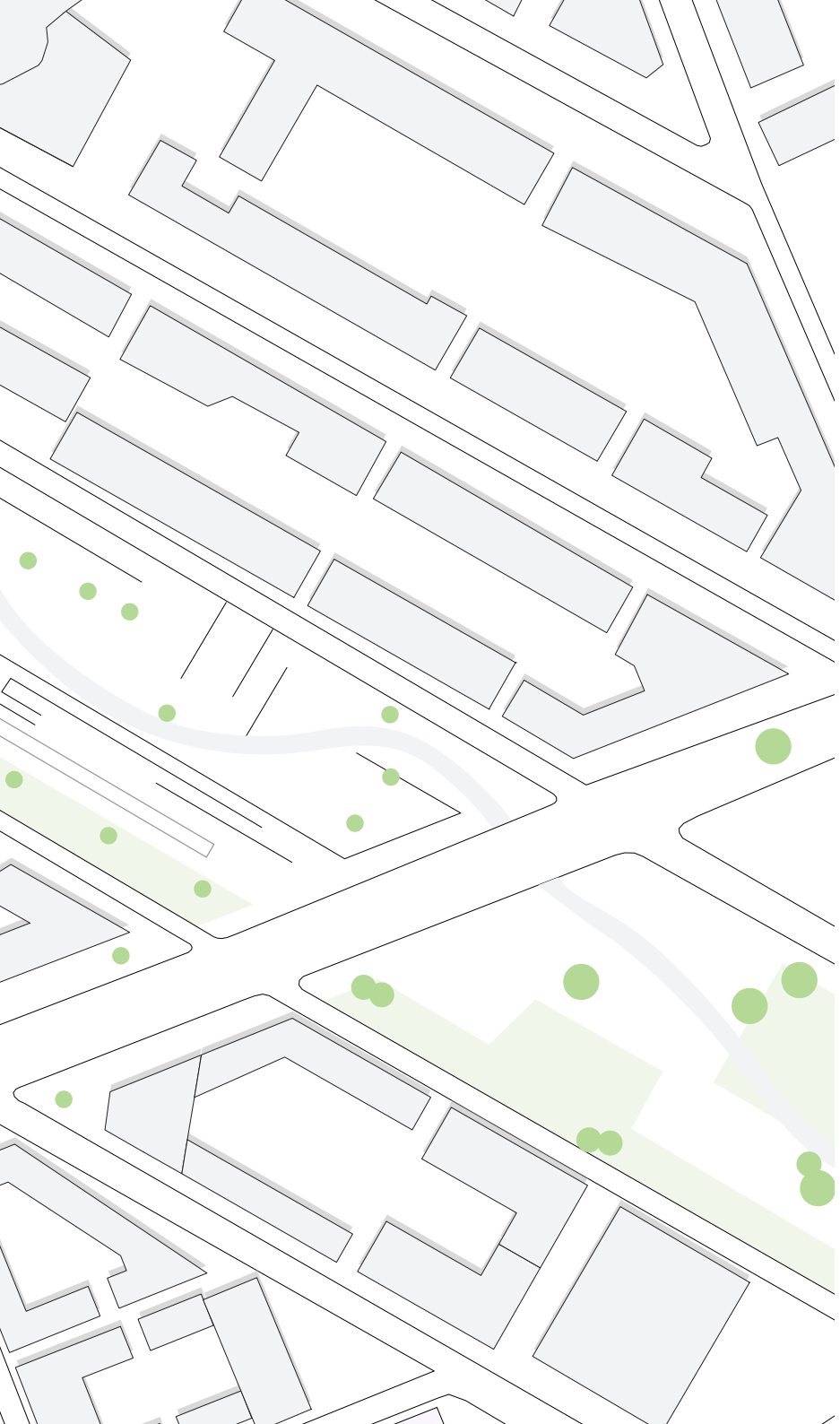
TRANSPORTATION HUB

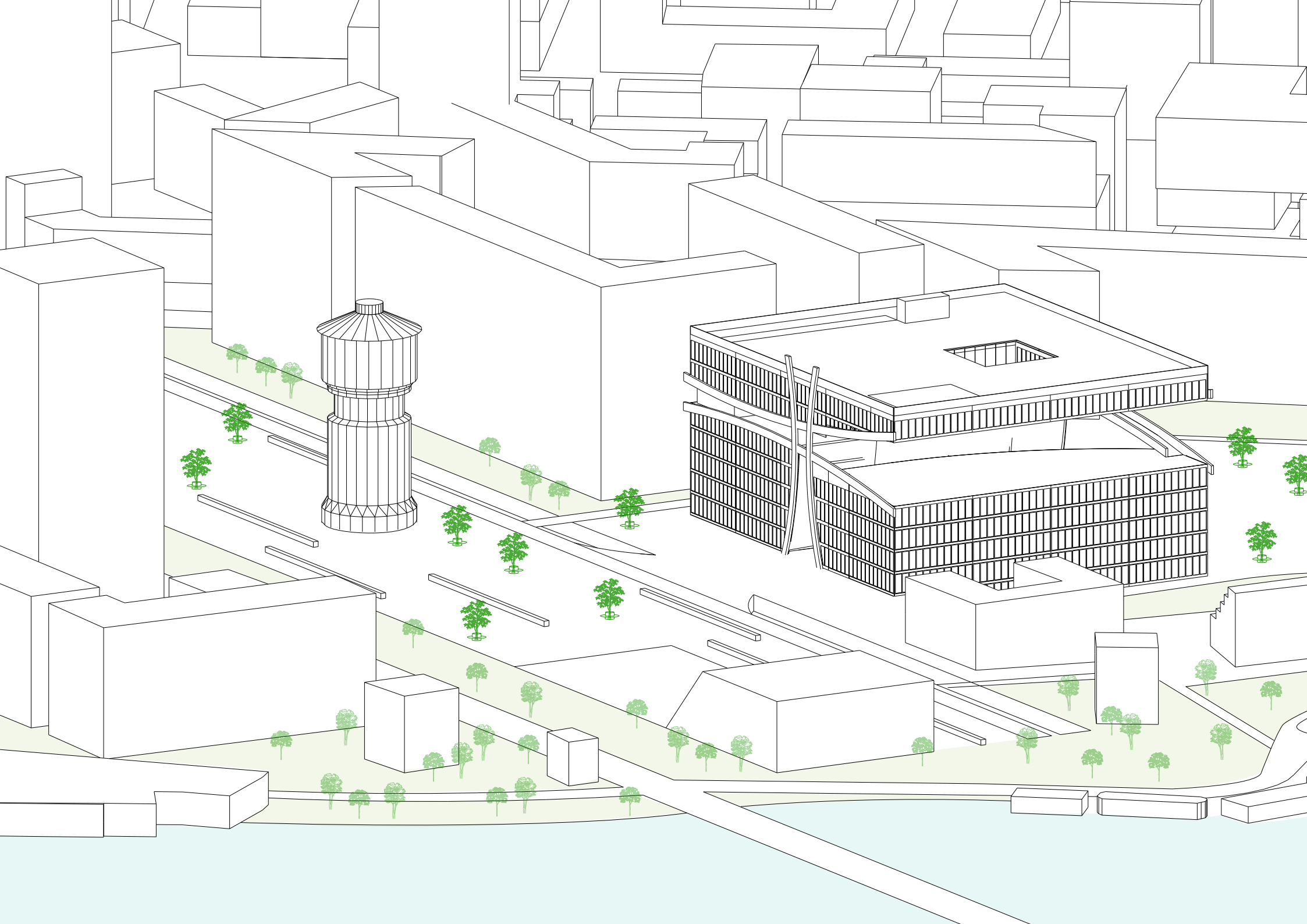
WATERFRONT

JOAN MUYSKENWEG

SITE PROFILES







PROJECT PROGRAM

General		Acute care		Outpatient care		Mental health		Public	
entrance	50 m²	trauma center	80 m²	preparation center	600 m²	exam room	50 m²	visiting area	700 m²
foyer	100 m²	operation center	200 m²	operation center	60 m²	group therapy	100 m²	food area	400 m²
pod storage	500 m²	treatment center	400 m²	recovery center	200 m²	consultation rooms	220 m²	playground	250 m²
logistic circulation	150 m²	recovery center	320 m²	employee space	50 m²	employee space	50 m²	exhibition space	400 m²
office	50 m²	employee space	50 m²	employee cafeteria	70 m²	toilets	30 m²		
installation space	100 m²	employee cafeteria	70 m²	toilets	30 m²	circulation	150 m²		
drone logistics	300 m²	toilets	30 m²	installations	200 m²				
medical supplies storage	80 m²	installations	200 m²	circulation	250 m²				
		circulation	250 m²						
20%		24%		22%		8%		26%	
1330 m²		1600 m²		1460 m²		600 m²		1750 m²	

6740 m²

PUBLIC
visiting area
food area
playground
exhibition space
24% 1750 m²

MENTAL HEALTH
exam room
group therapy
consultation rooms
employee space
toilets
circulation
8% 600 m²

OUTPATIENT
preparation center
operation center
recovery center
employee space
employee cafeteria
toilets
installations
circulation
22% 1460 m²

ACUTE
trauma center
operation center
treatment center
recovery center
employee space
employee cafeteria
toilets
installations
circulation
24% 1600 m²

GENERAL
entrance
foyer
pod storage
logistic circulation
office
installation space
drone logistics
medical supplies storage
20% 1330 m²

PROJECT STRATEGY

CONCEPT

A JOURNEY OF PROGRESSION

PUBLIC ROLE

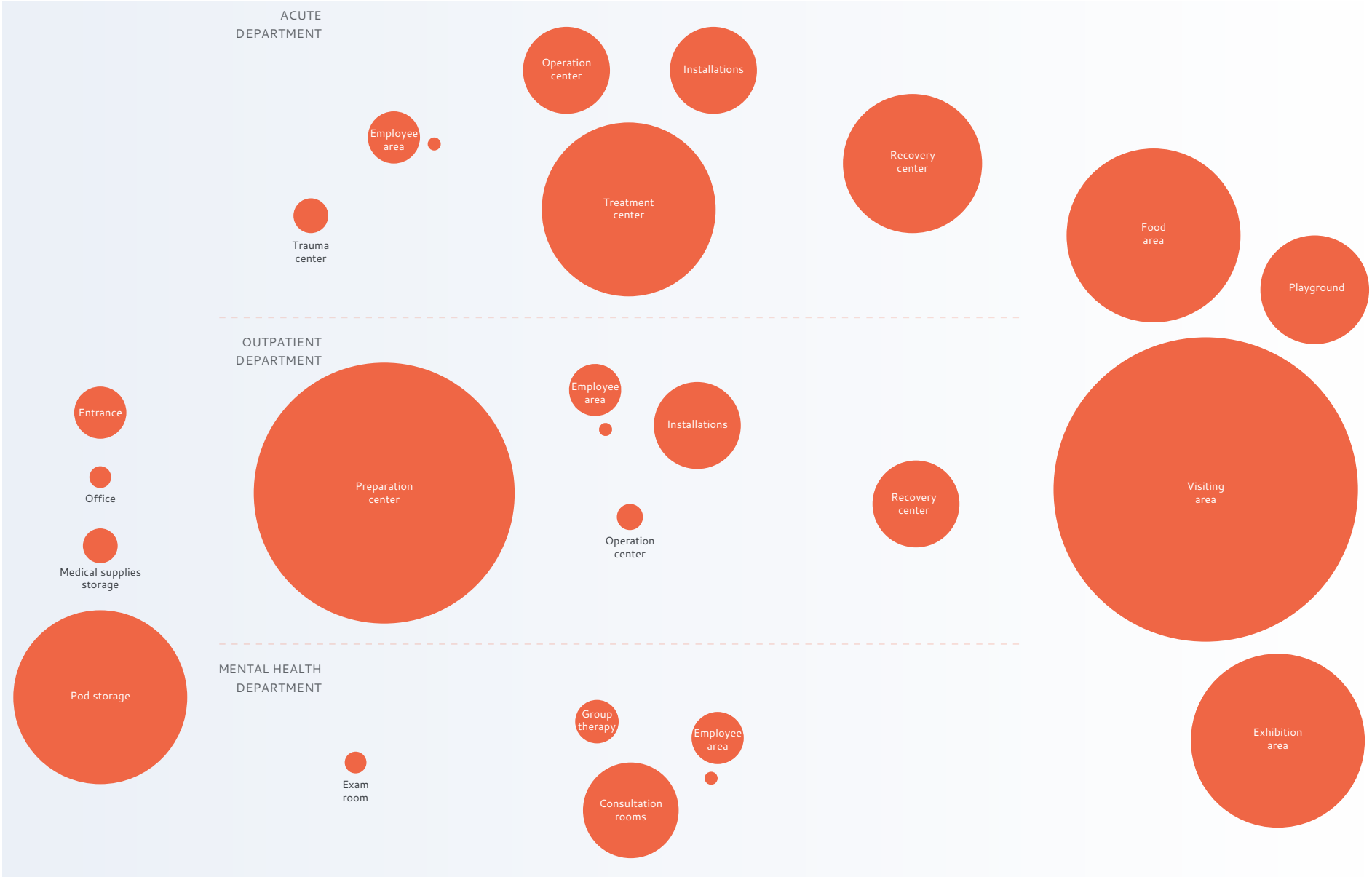
ORGANISATION

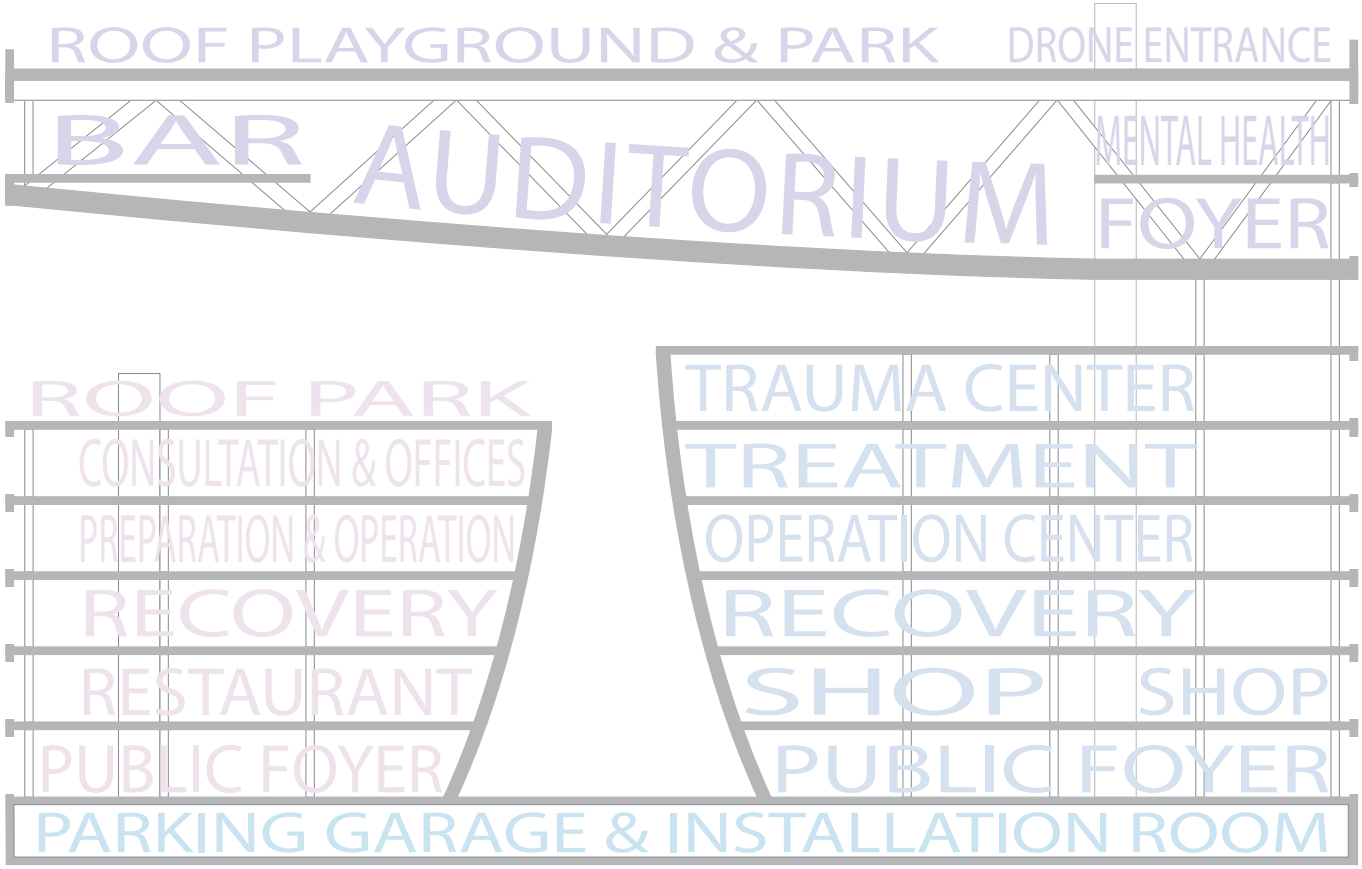
EFFICIENT PATIENT LOGISTICS

DISTINCTION IN PATIENT FLOWS

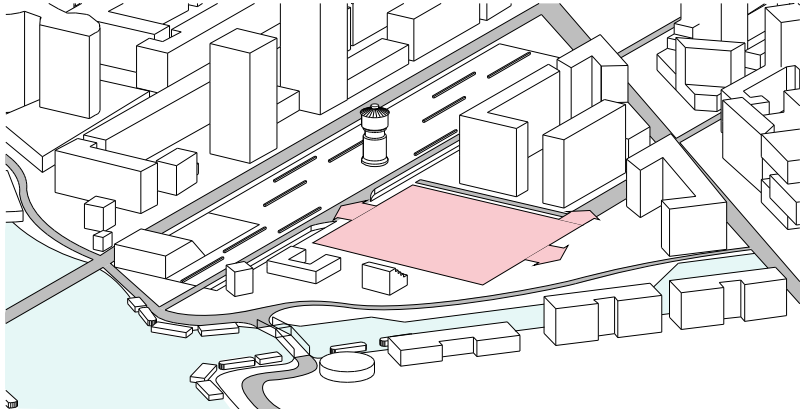
MATERIALISATION

HEALING ENVIRONMENT

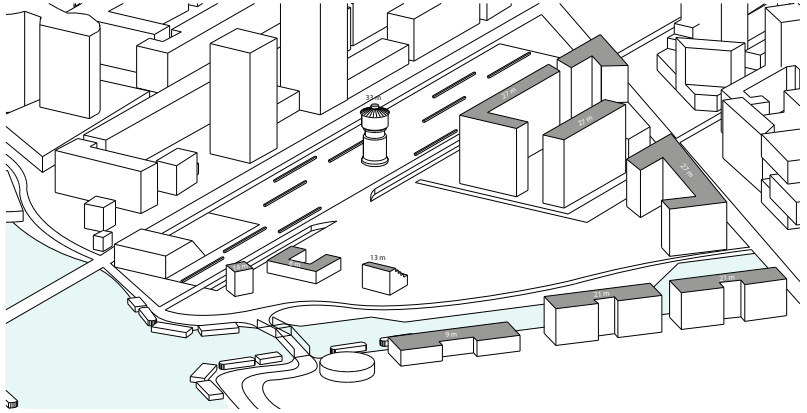

ACUTE DEPARTMENT
Operation center
Installations
Employee area
Recovery center
Treatment center
Trauma center
Food area
Playground
OUTPATIENT DEPARTMENT
Entrance
Employee area
Installations
Preparation center
Office
Recovery center
Visiting area
Medical supplies storage
Operation center
MENTAL HEALTH DEPARTMENT
Pod storage
Group therapy
Employee area
Exam room
Consultation rooms
Exhibition area
Intake
Preparation
Treatment
Recovery
Public


ROOF PLAYGROUND & PARK
DRONE ENTRANCE
BAR
AUDITORIUM
MENTAL HEALTH
FOYER
ROOF PARK
CONSULTATION & OFFICES
PREPARATION & OPERATION
RECOVERY
RESTAURANT
PUBLIC FOYER
TRAUMA CENTER
TREATMENT
OPERATION CENTER
RECOVERY
SHOP
SHOP
PUBLIC FOYER
PARKING GARAGE & INSTALLATION ROOM

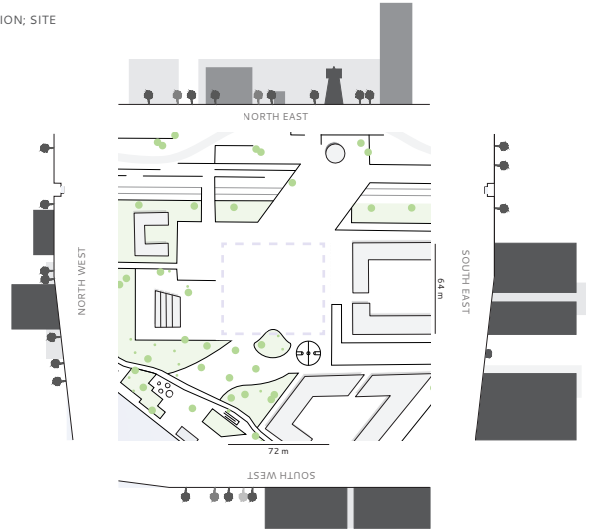
FORM GENERATION; CONNECTIVITY



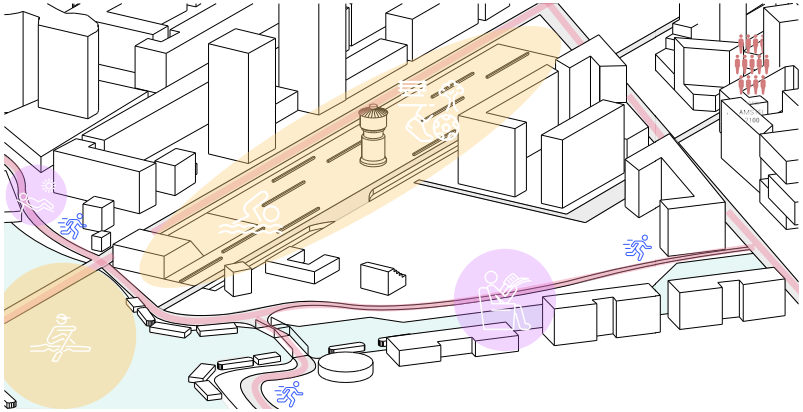
FORM GENERATION; HEIGHT



FORM GENERATION; SITE



FORM GENERATION; CONCEPT PUBLIC ROLE



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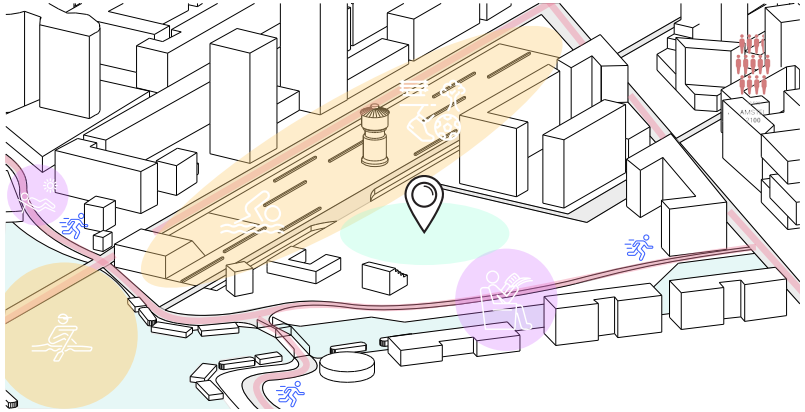

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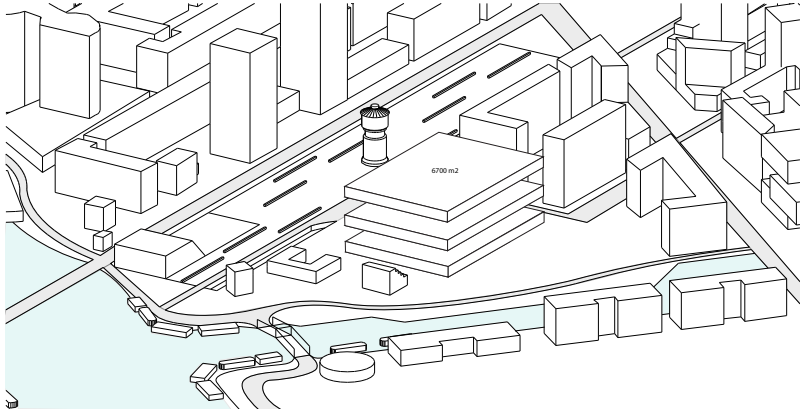

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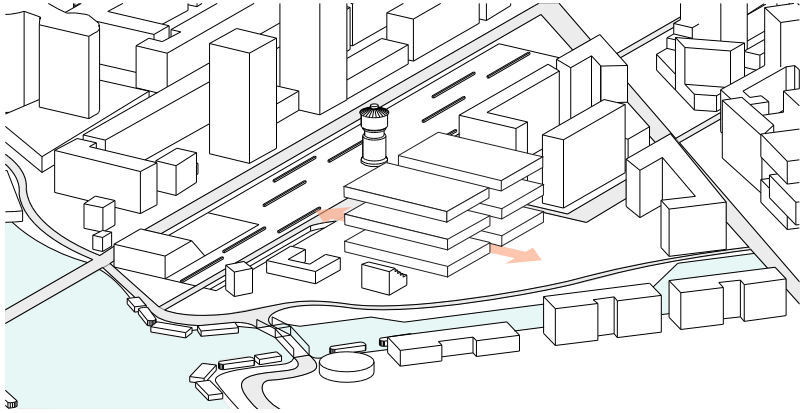

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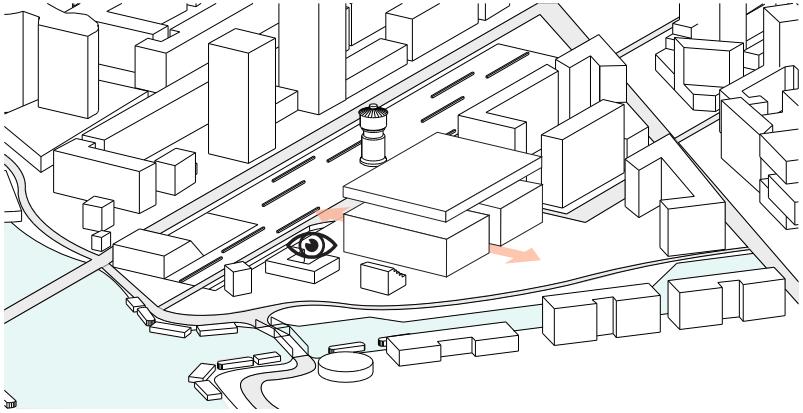
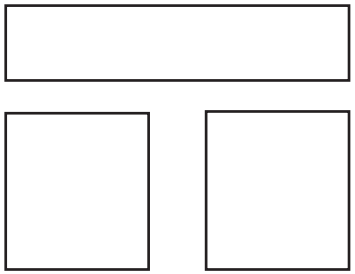
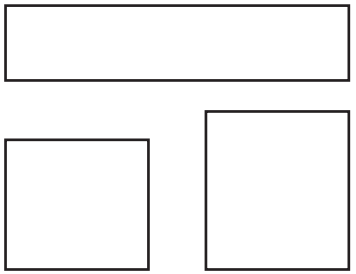


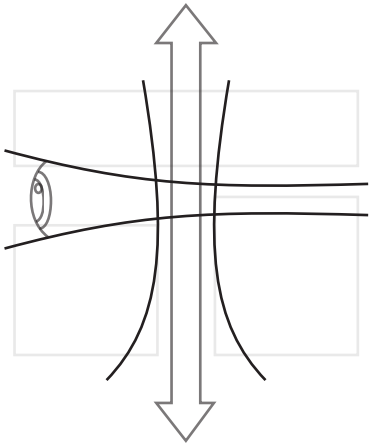


3 DEPARTMENTS



3 DEPARTMENTS

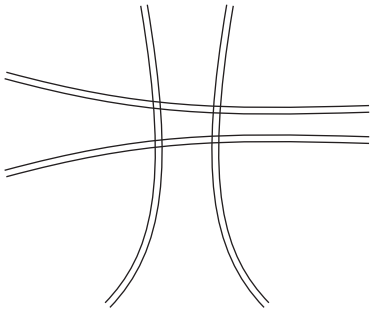
MENTAL CARE	views / public / rest
ACUTE	sensitive / private / acces
OUTPATIENT	ambulant / views



SITE OPPORTUNITIES

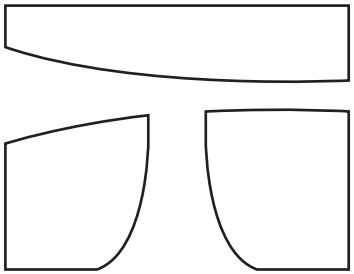
views

connection



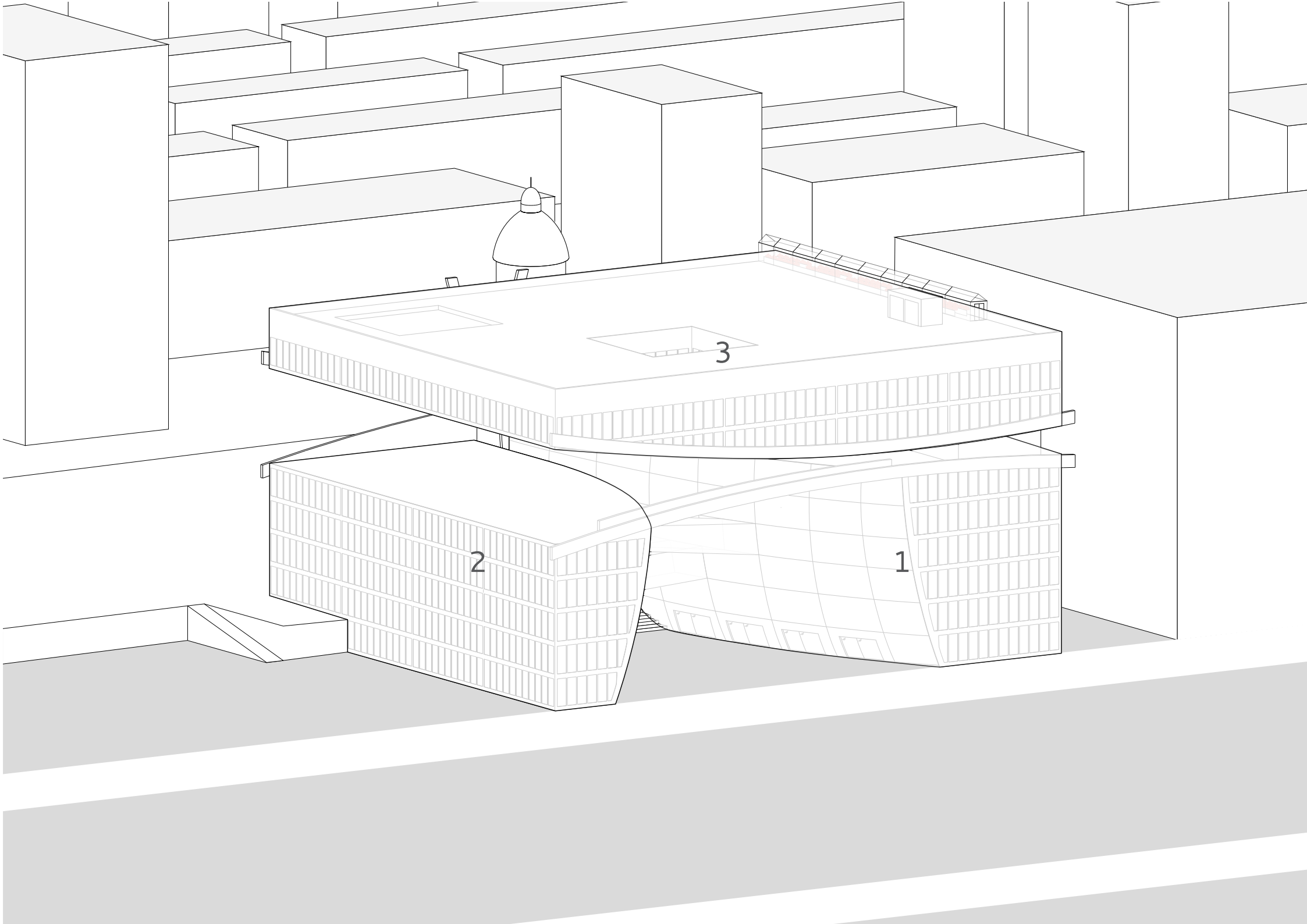
BRANDING

creating recognition in the community



A HEALTH BASE

the formal concept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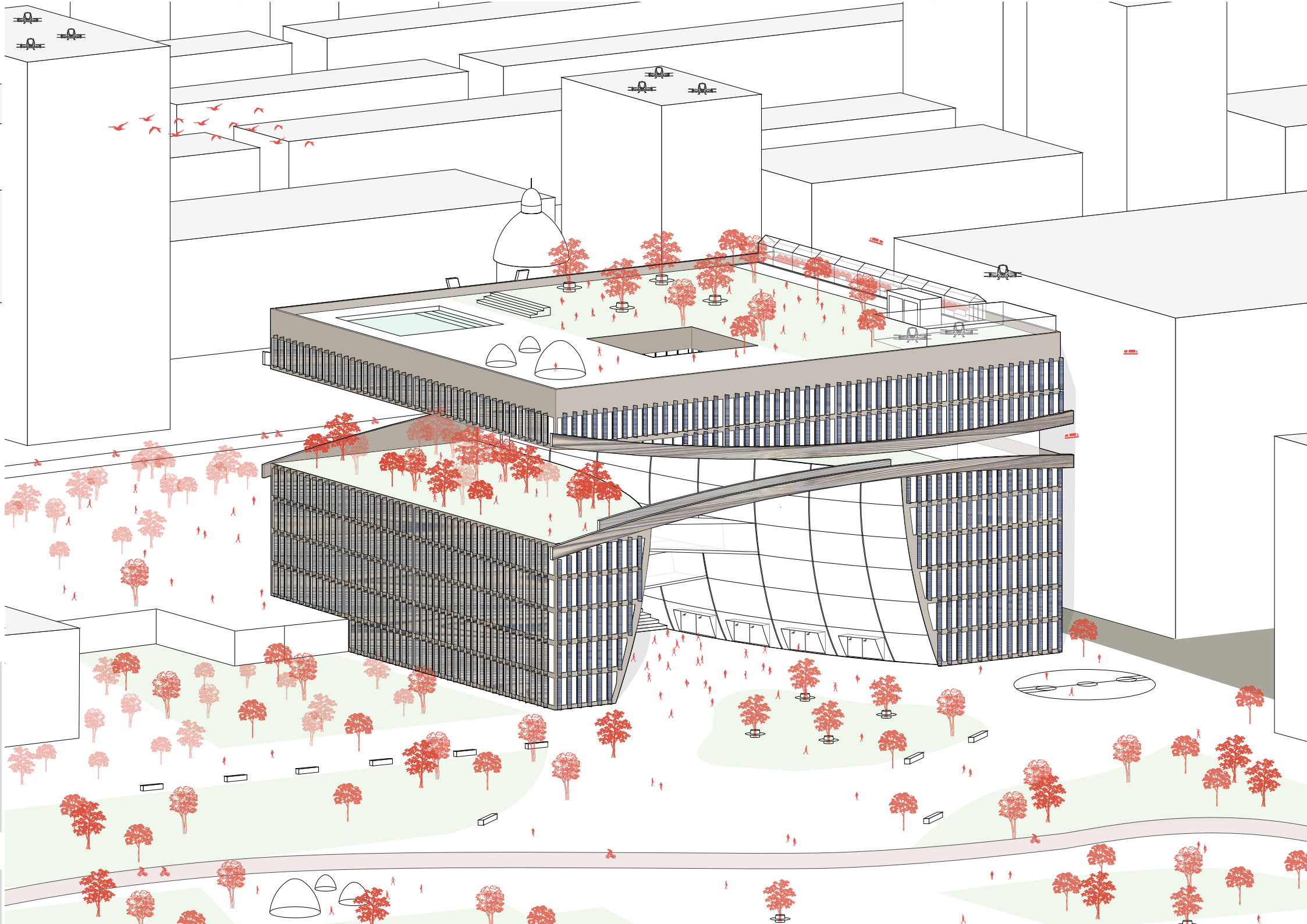

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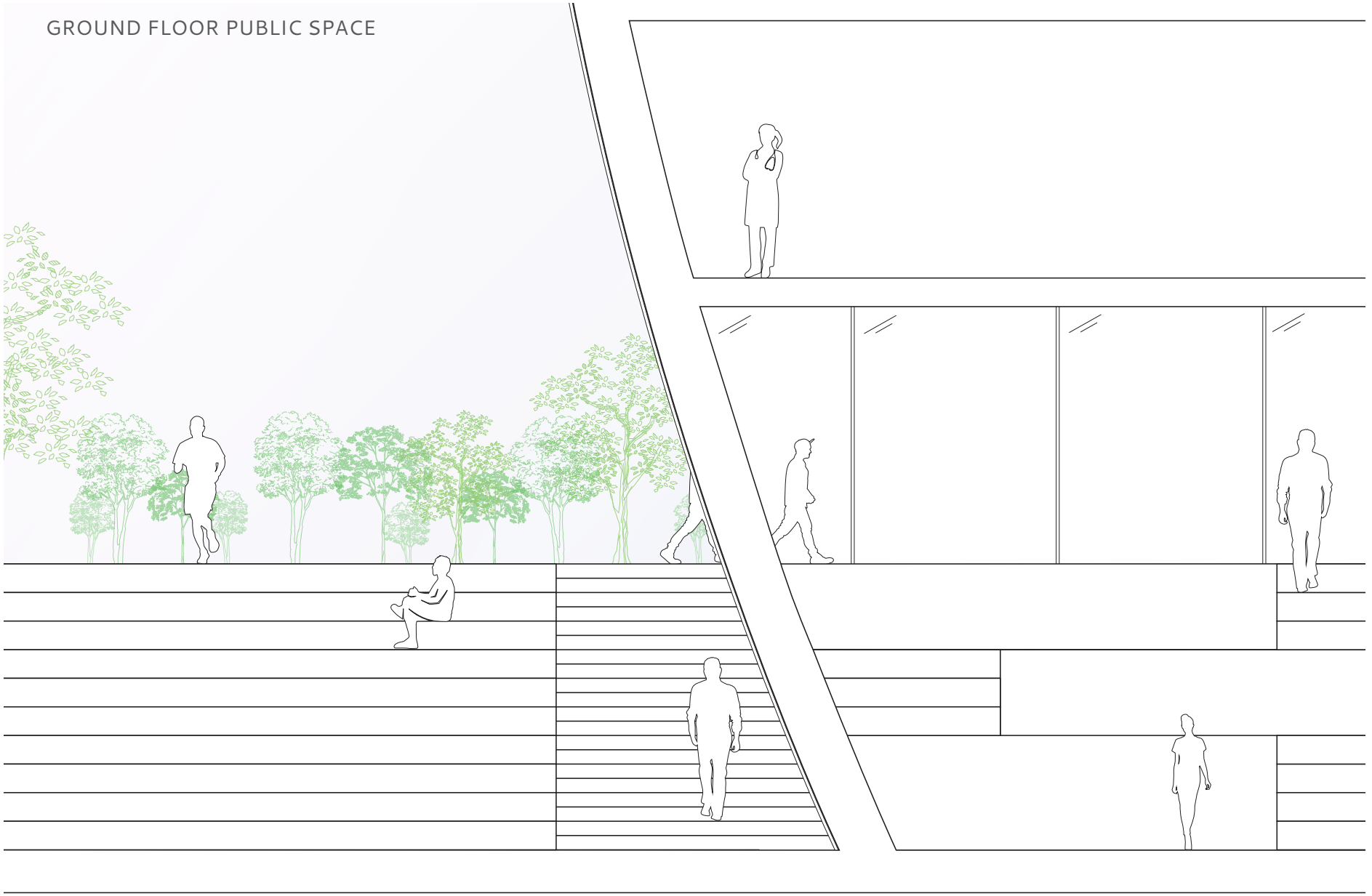

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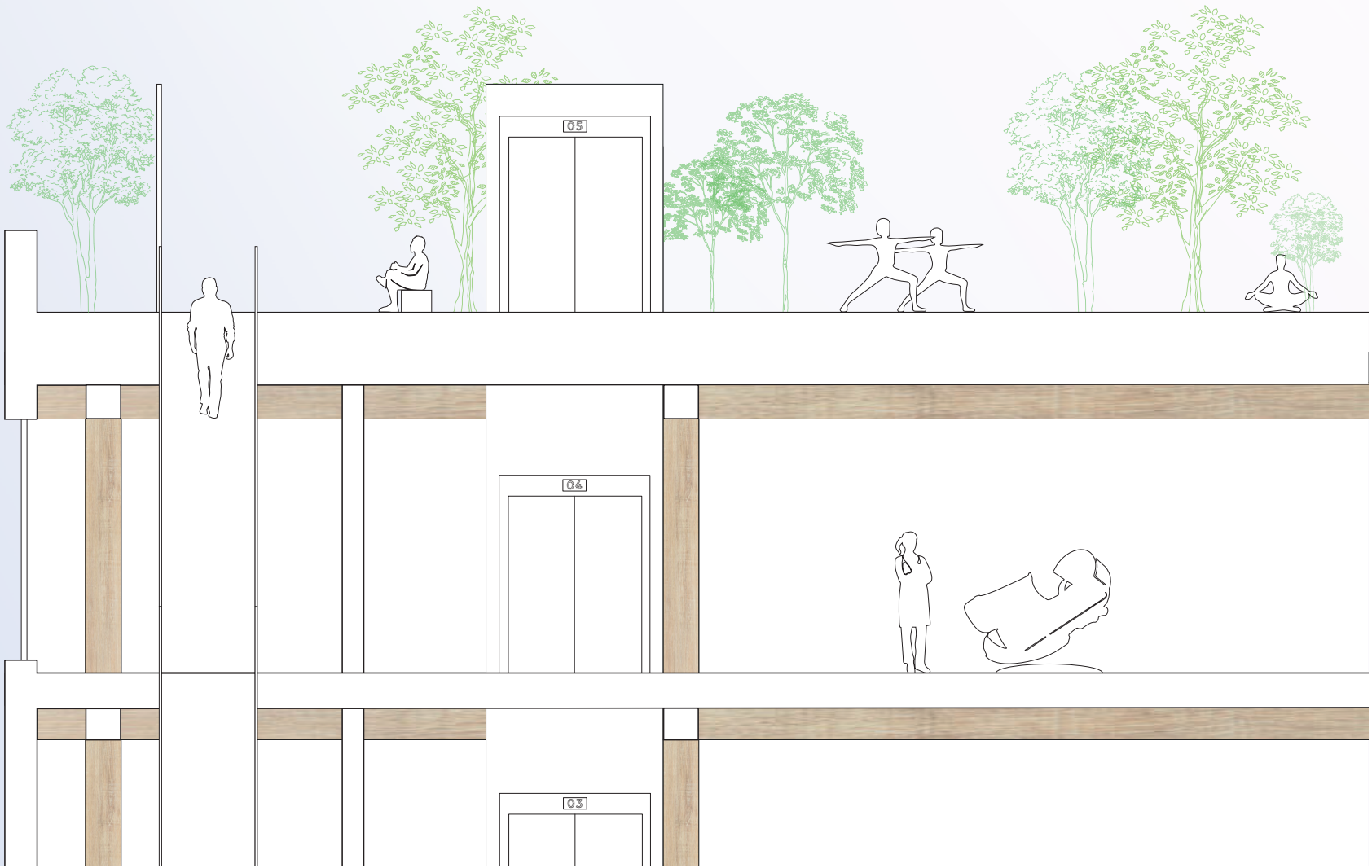

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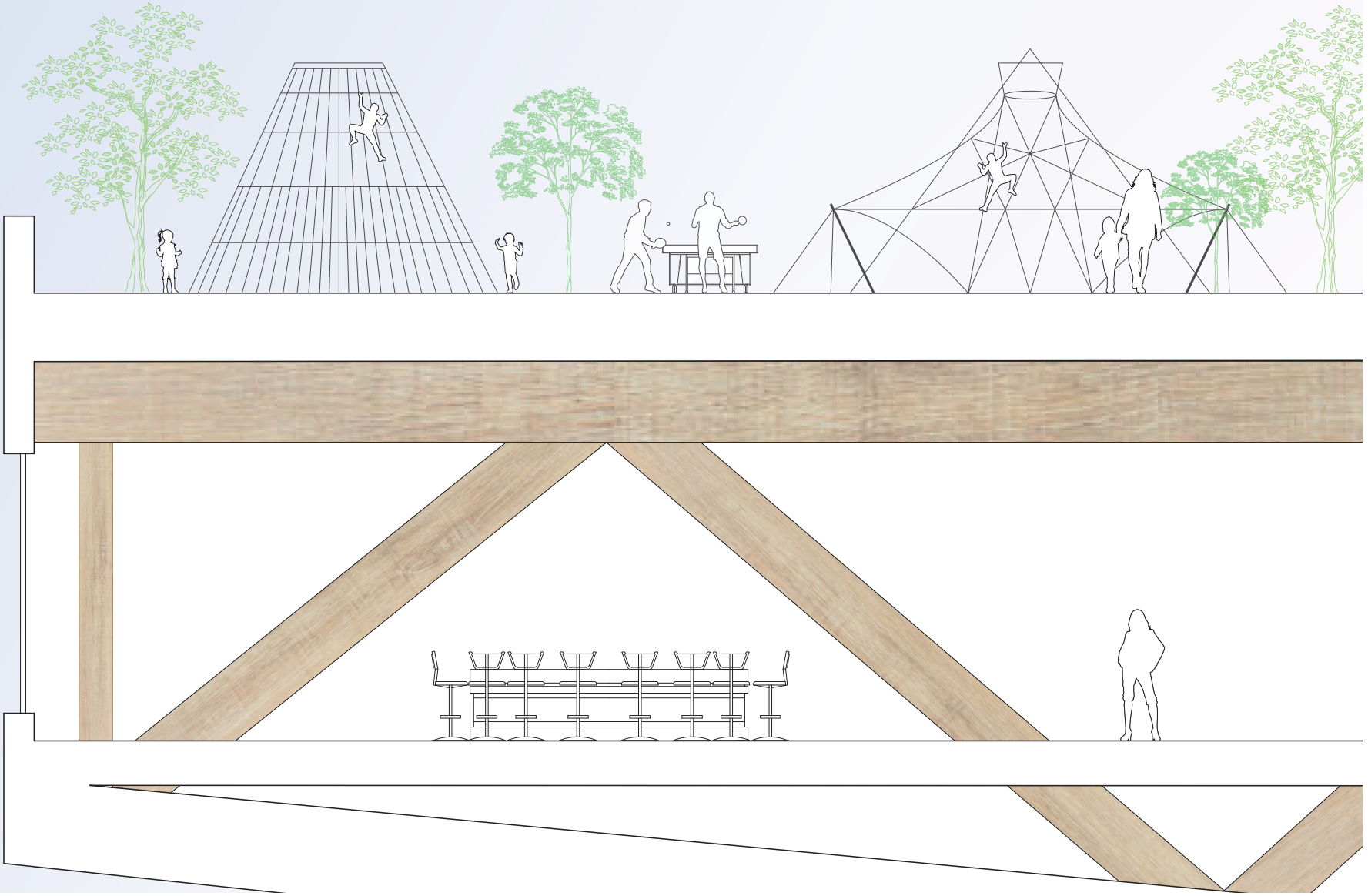

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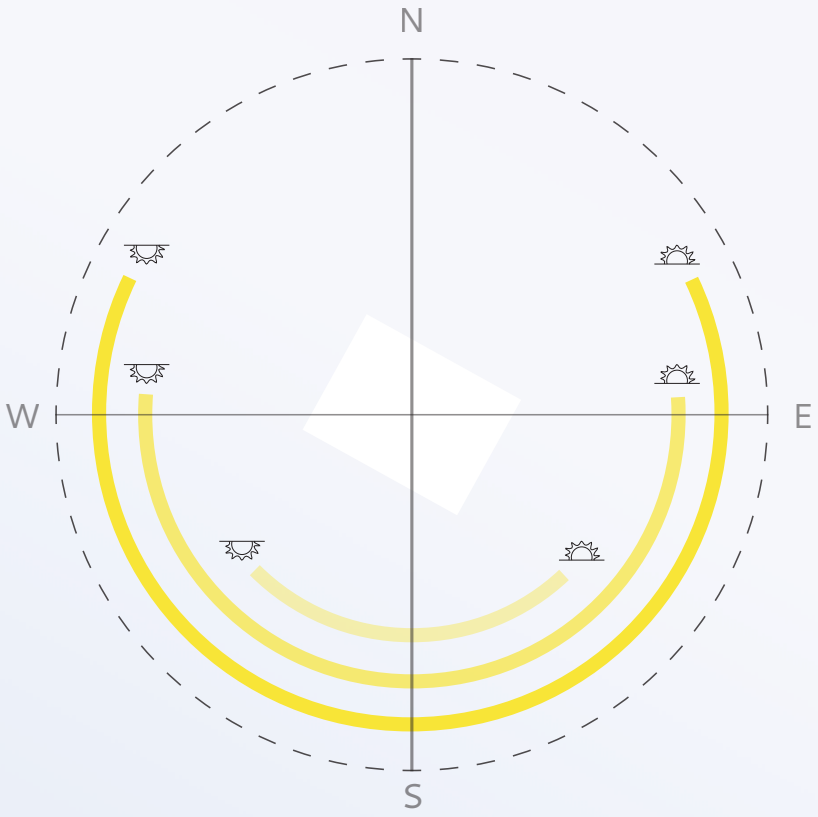
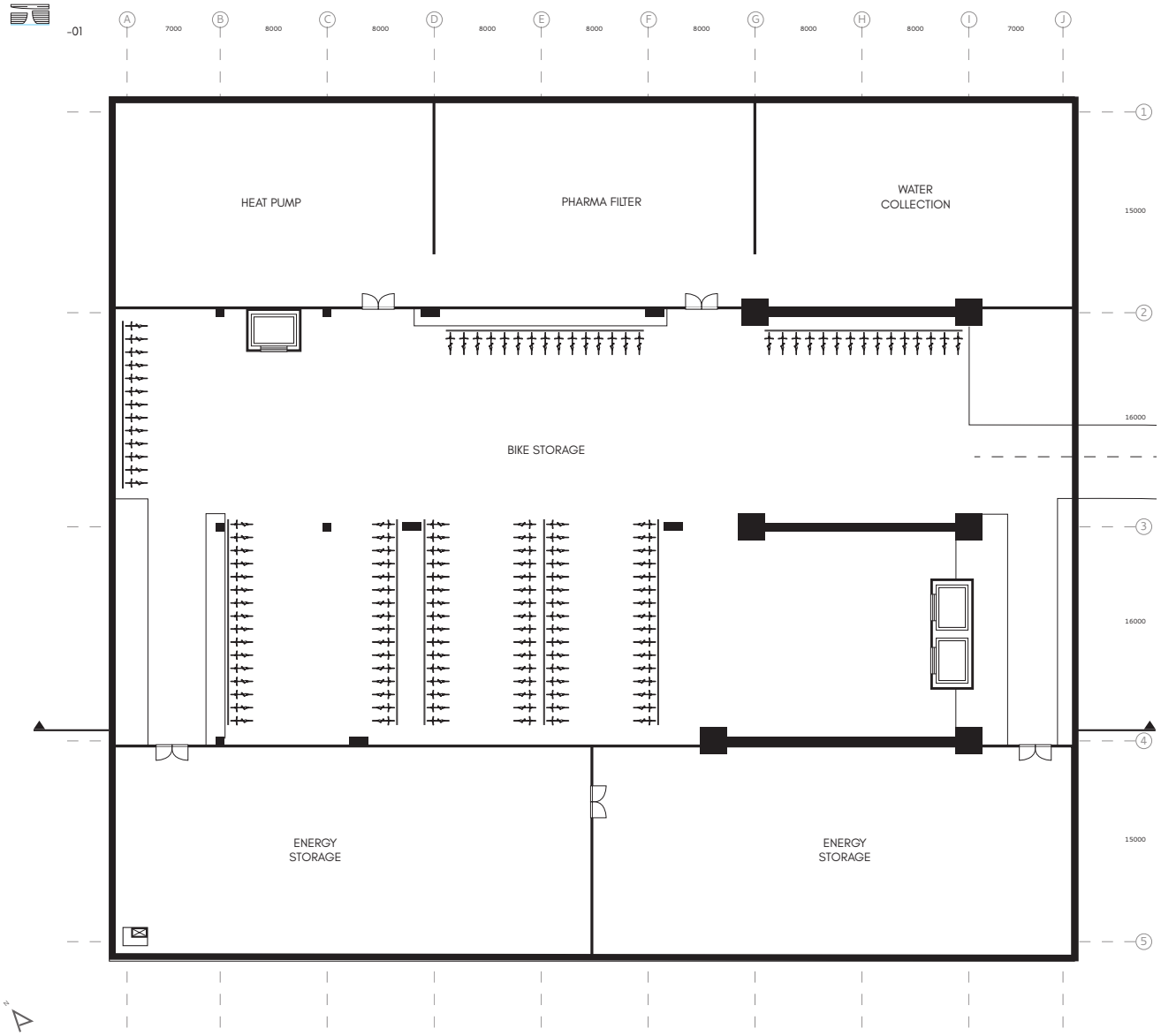


21st june
21st march/septembre
21st decembre

PLANS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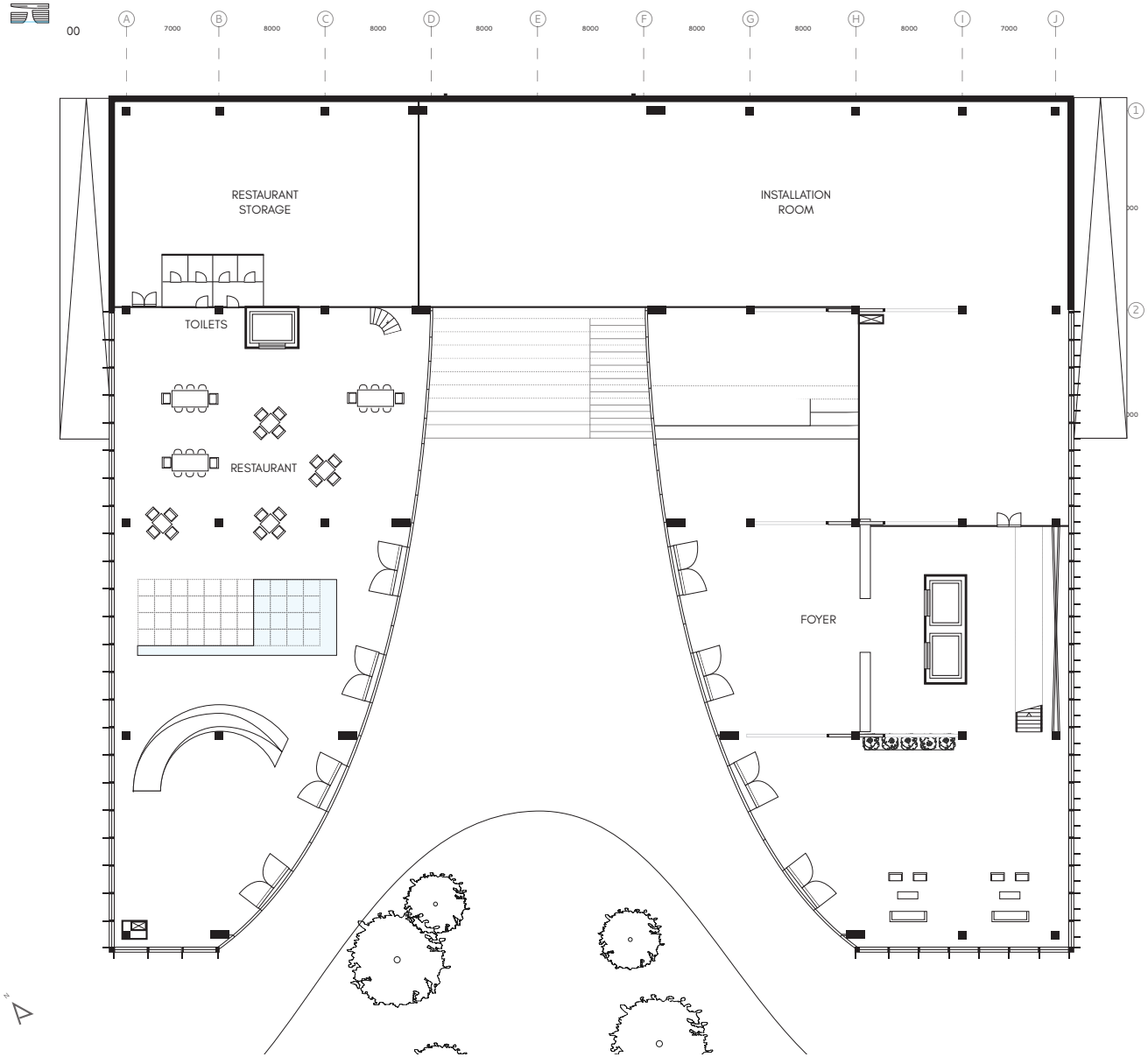
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RESTAURANT
FOYER

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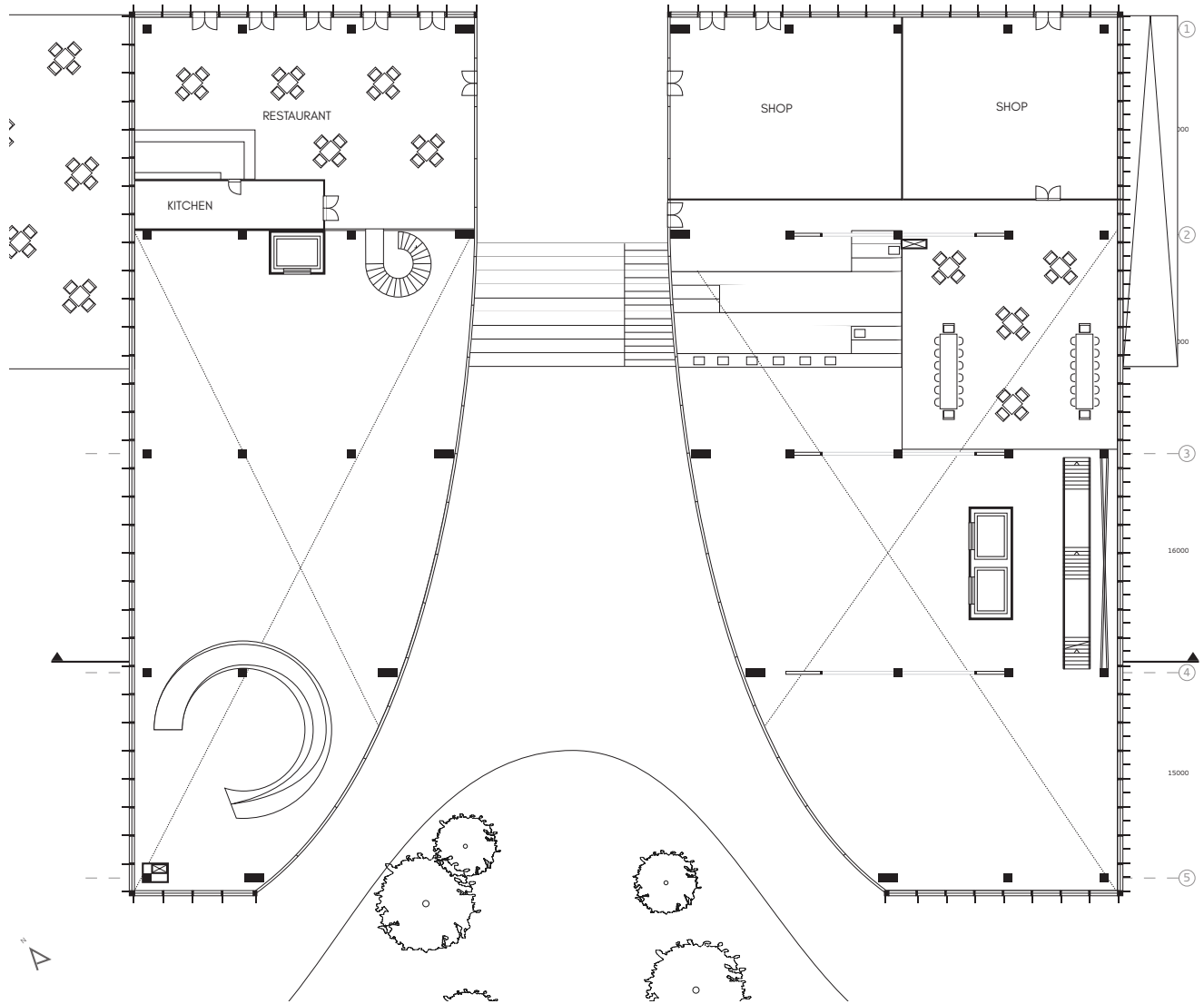

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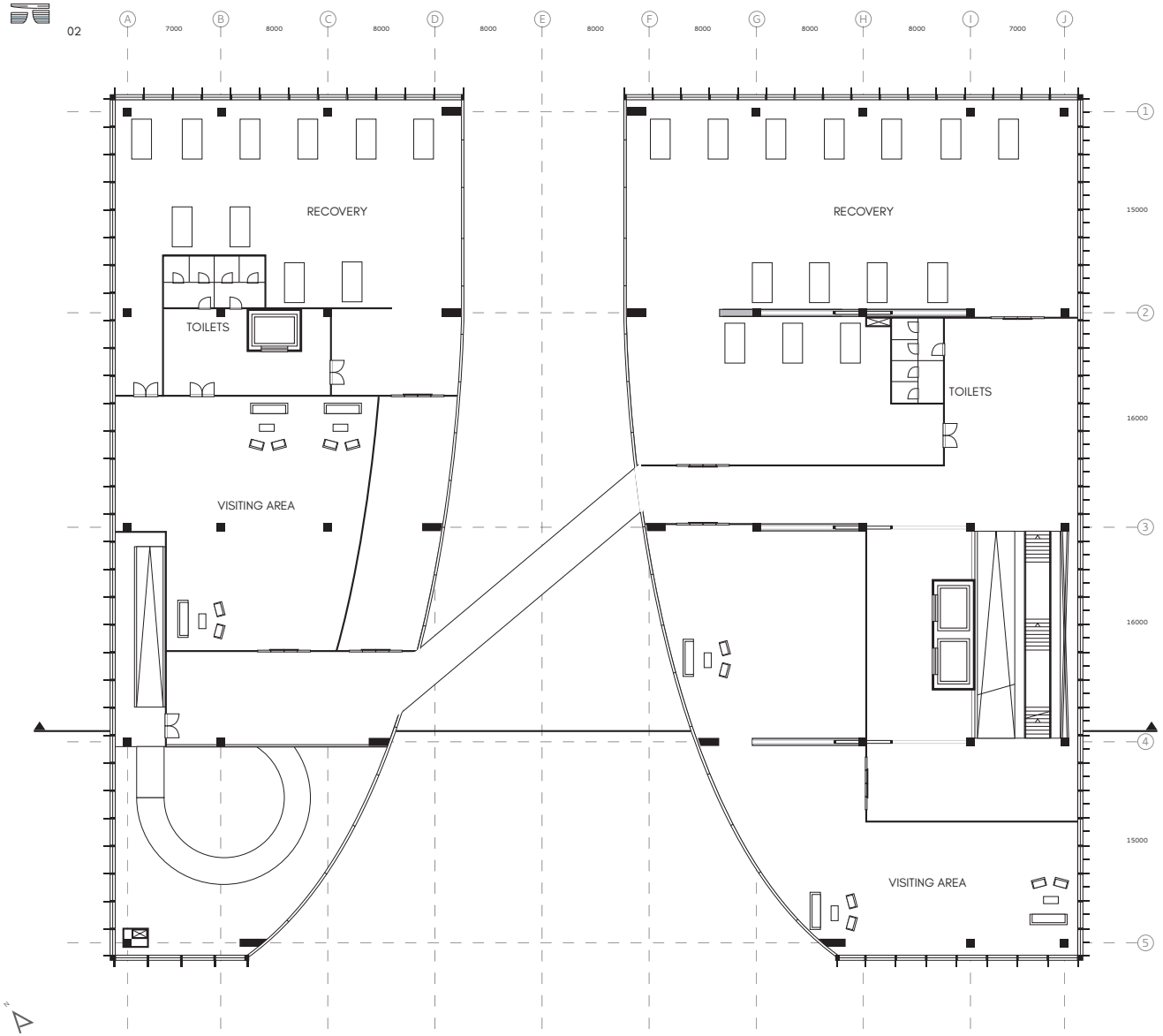
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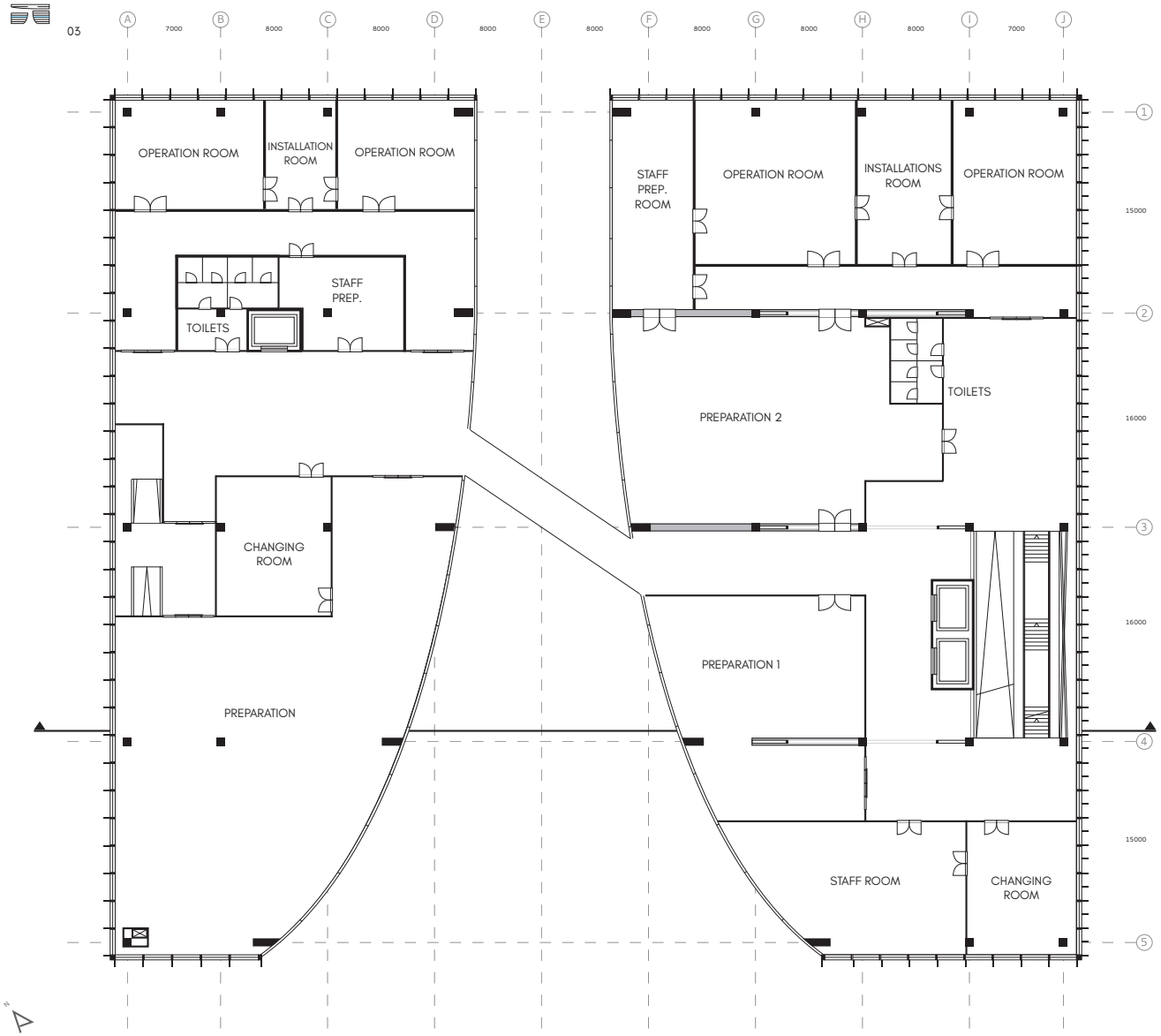
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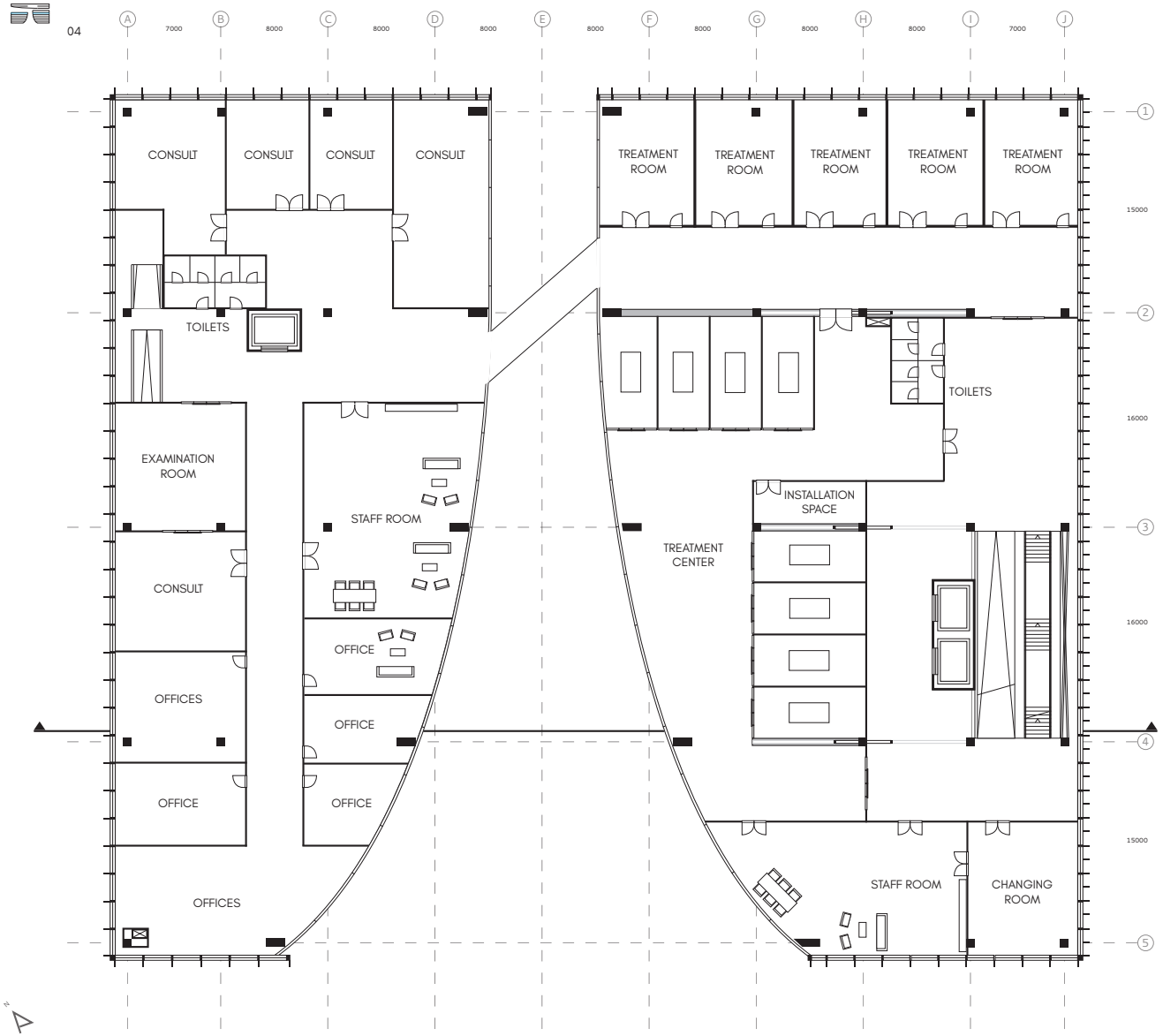
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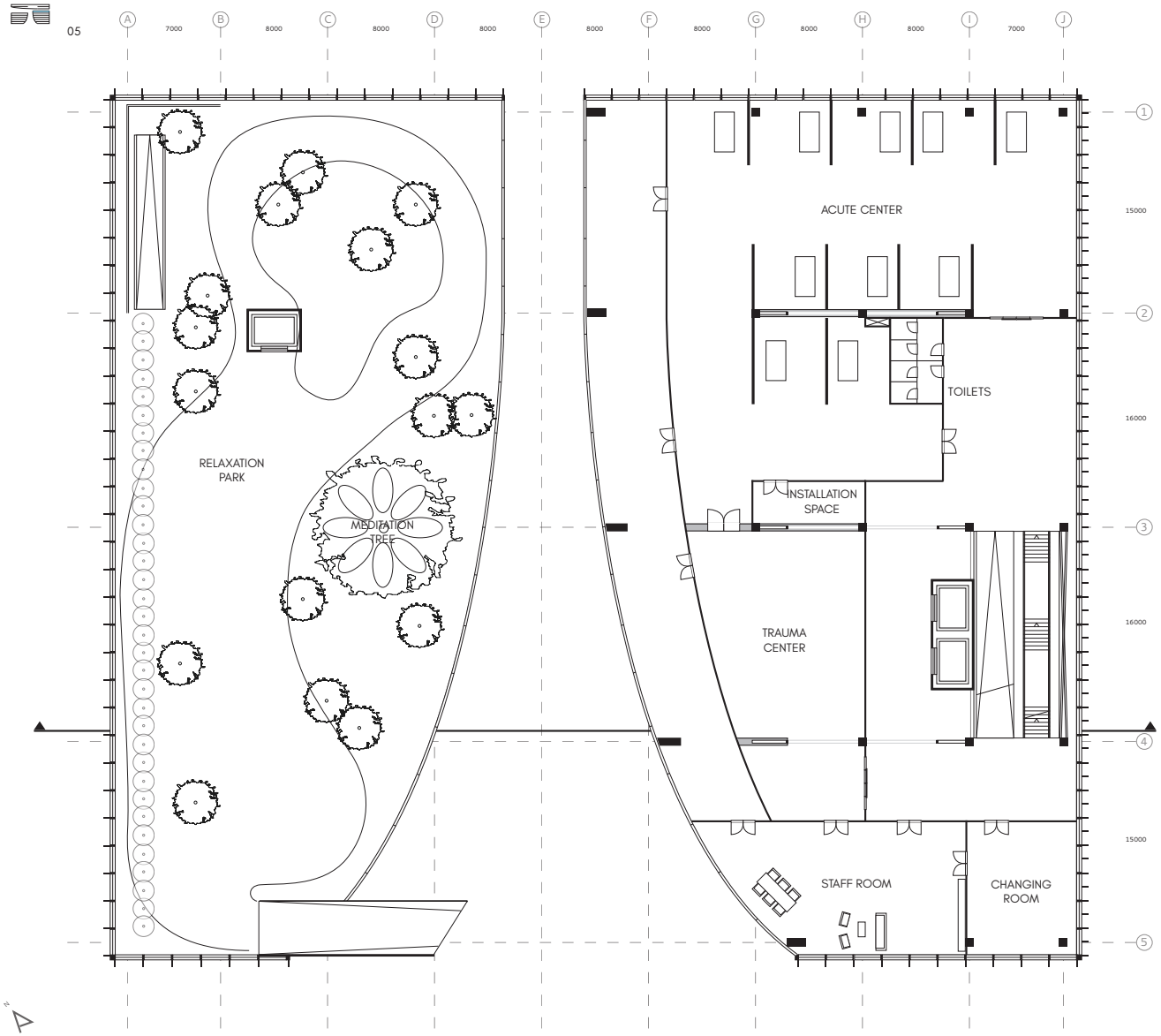
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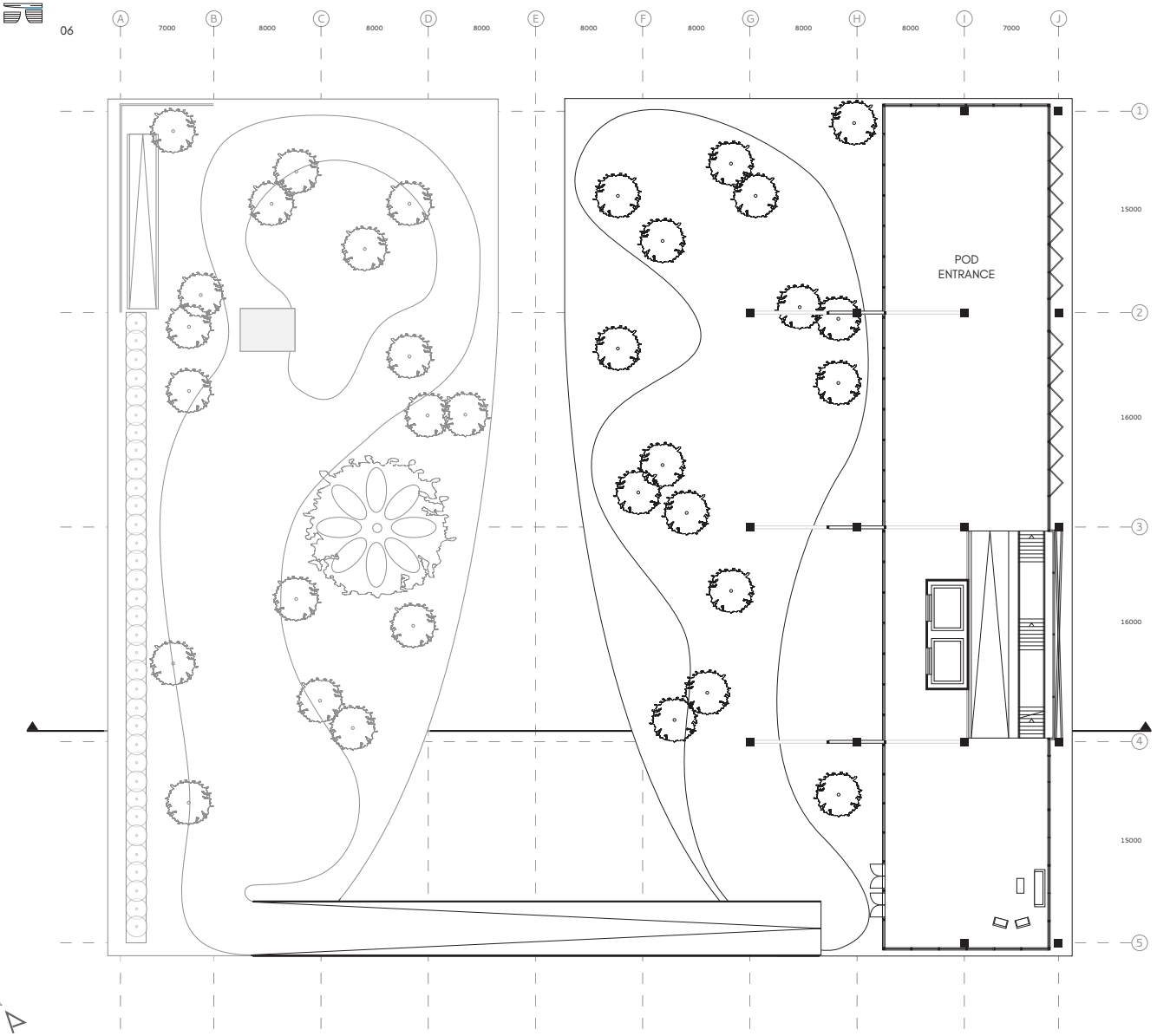
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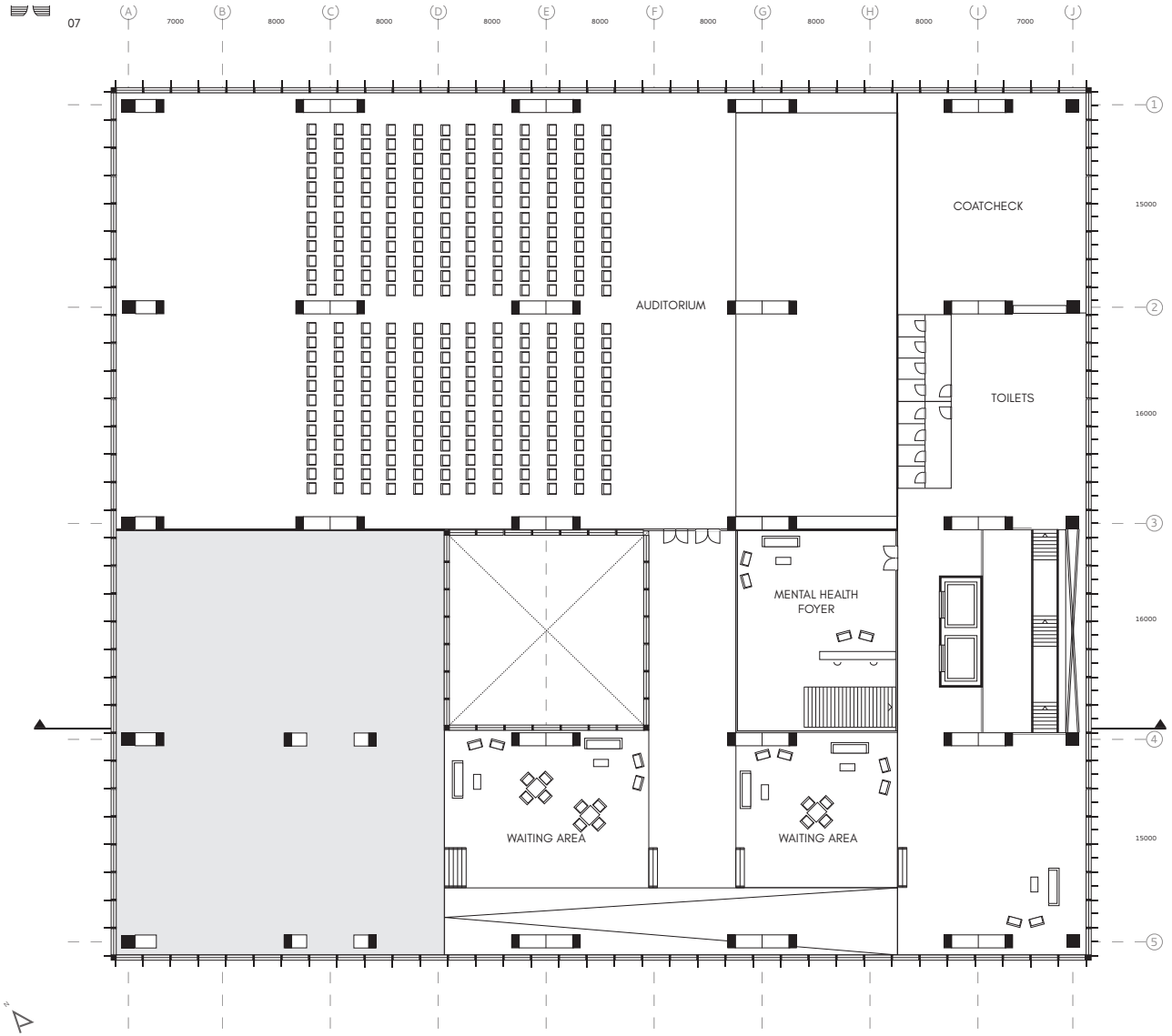
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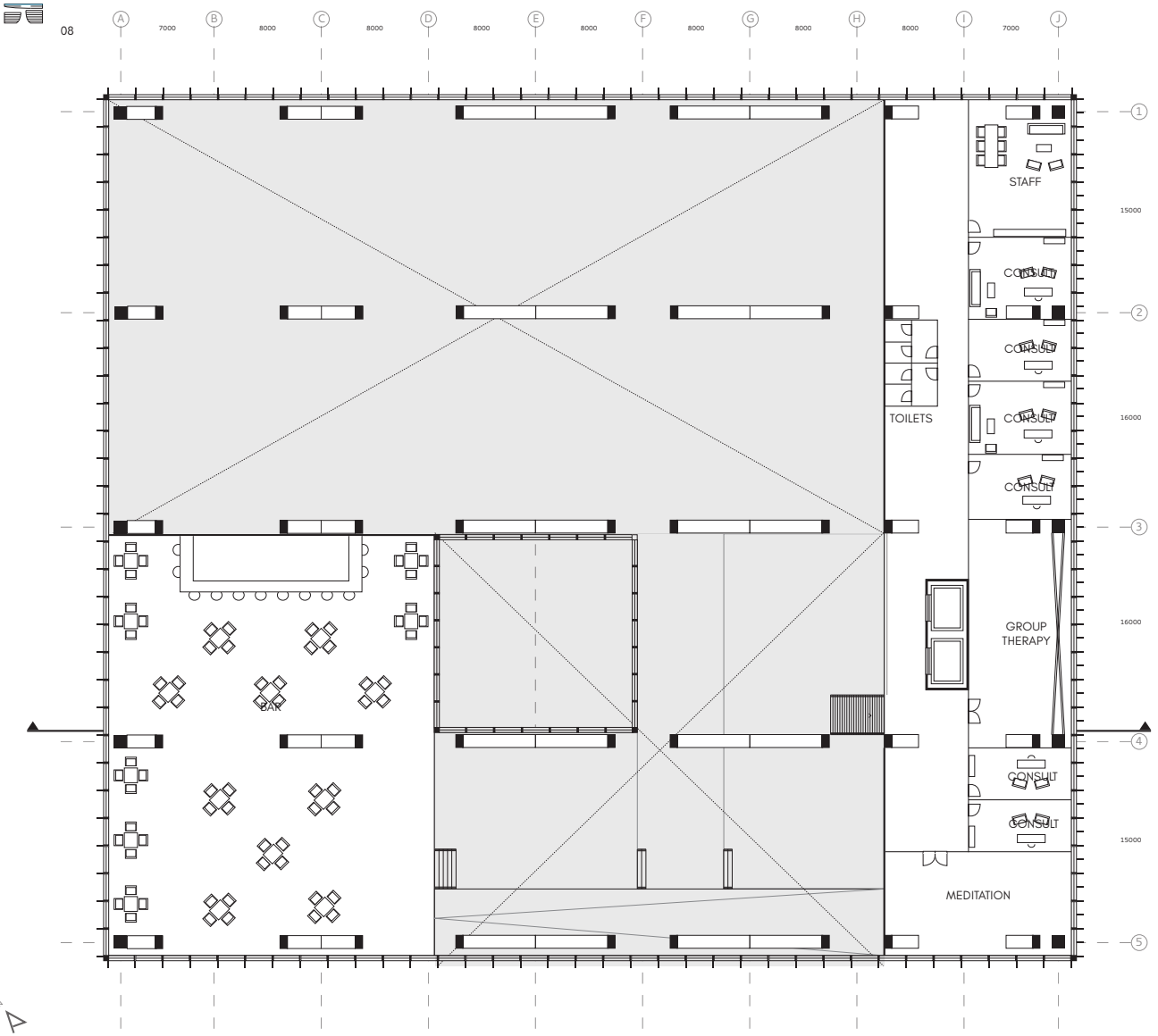
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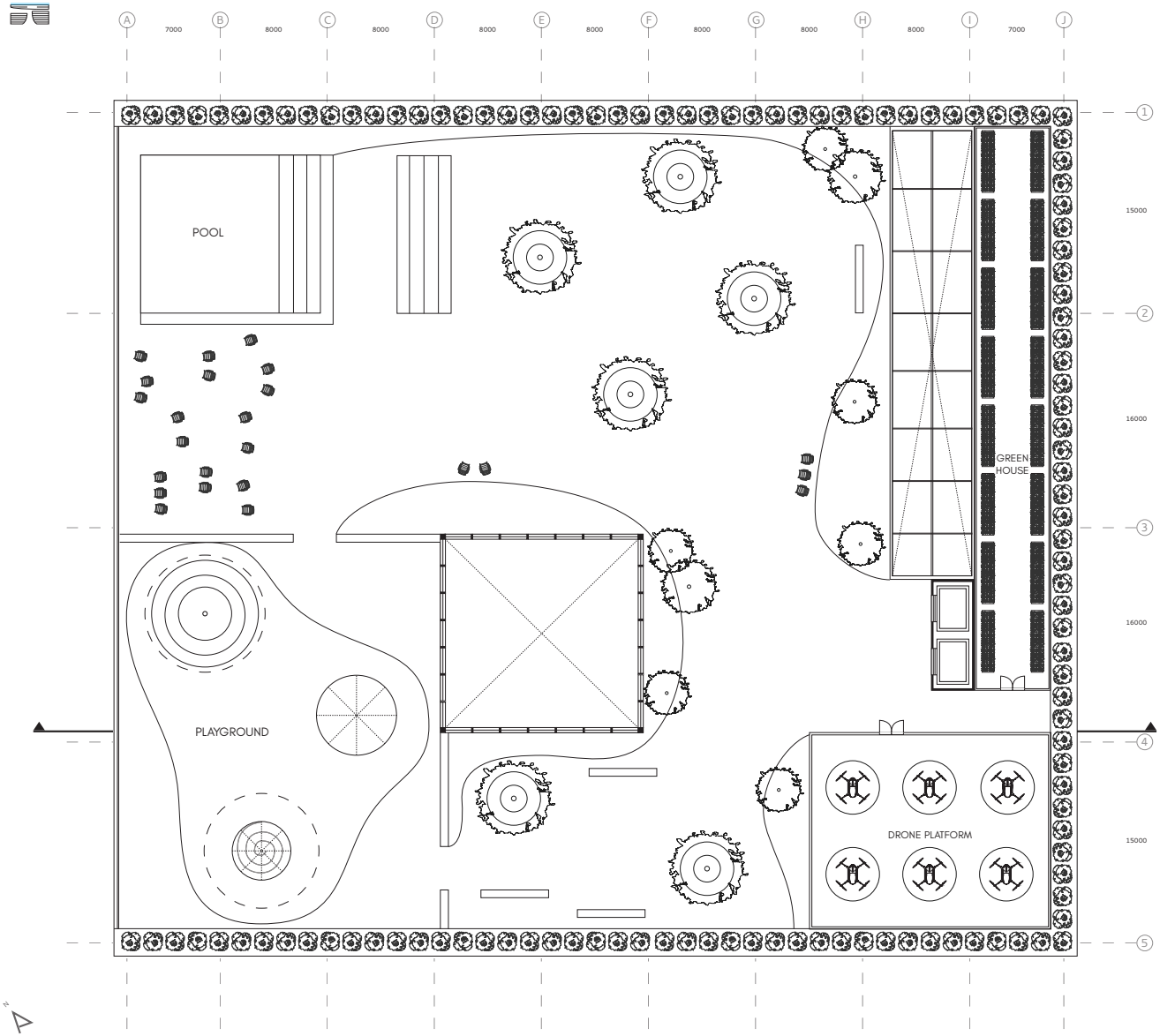
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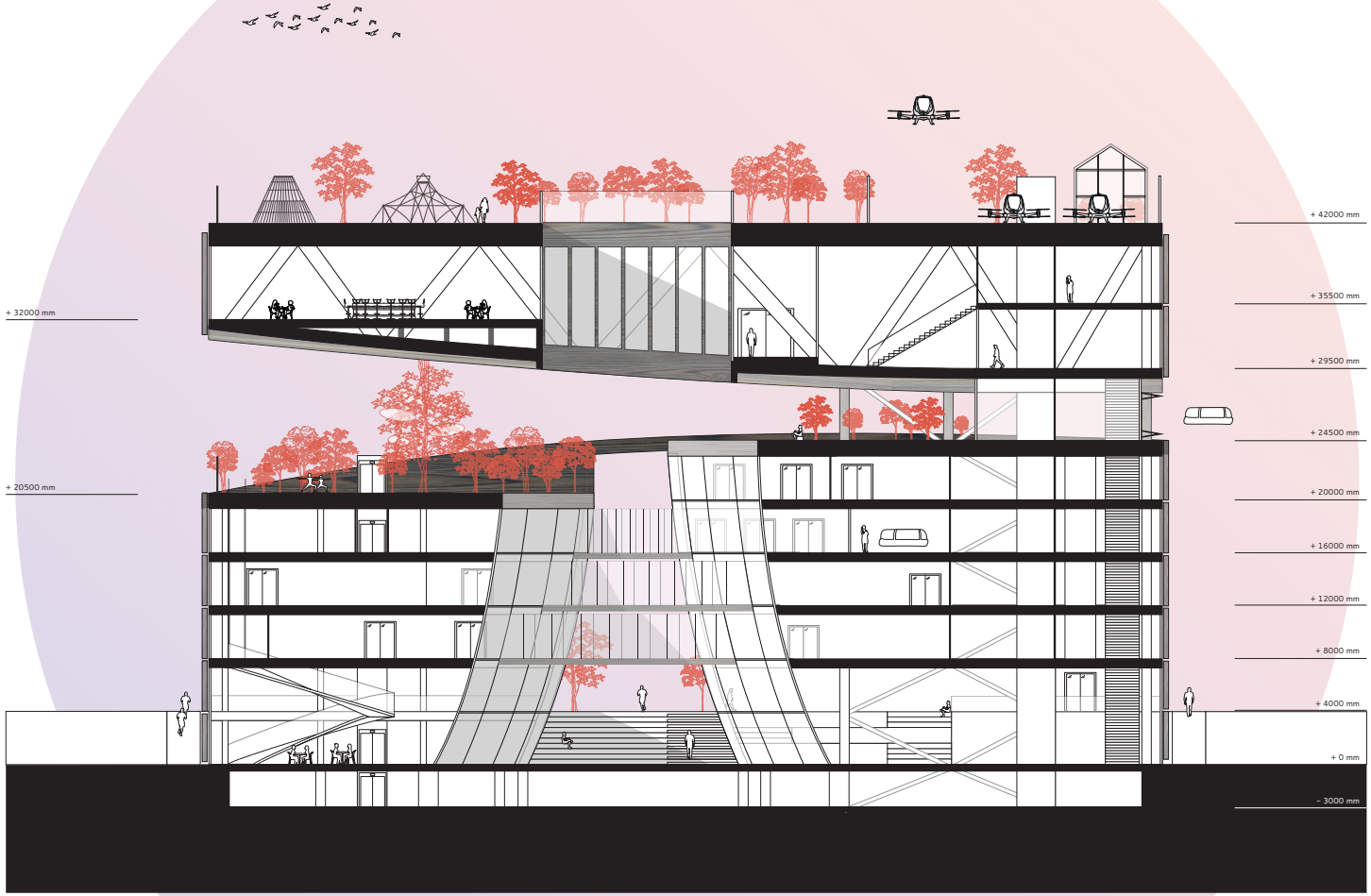
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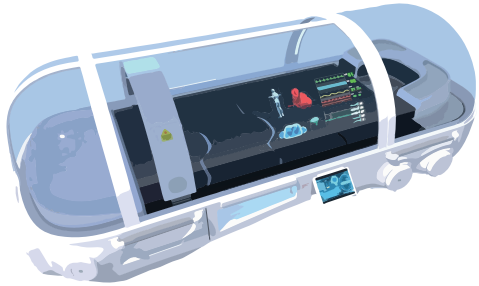
USERS

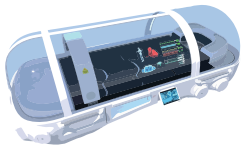


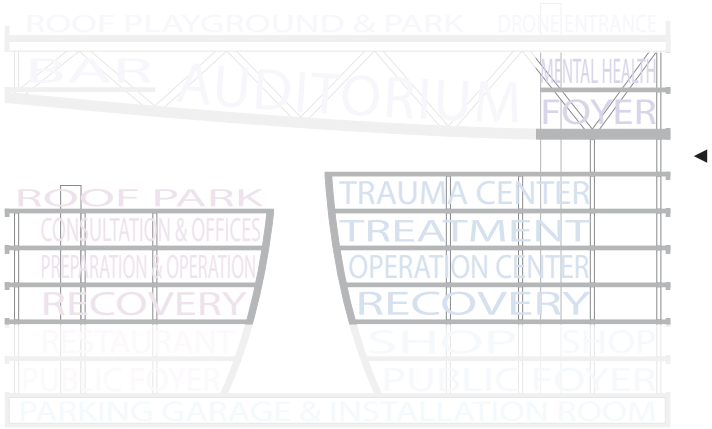
PODS

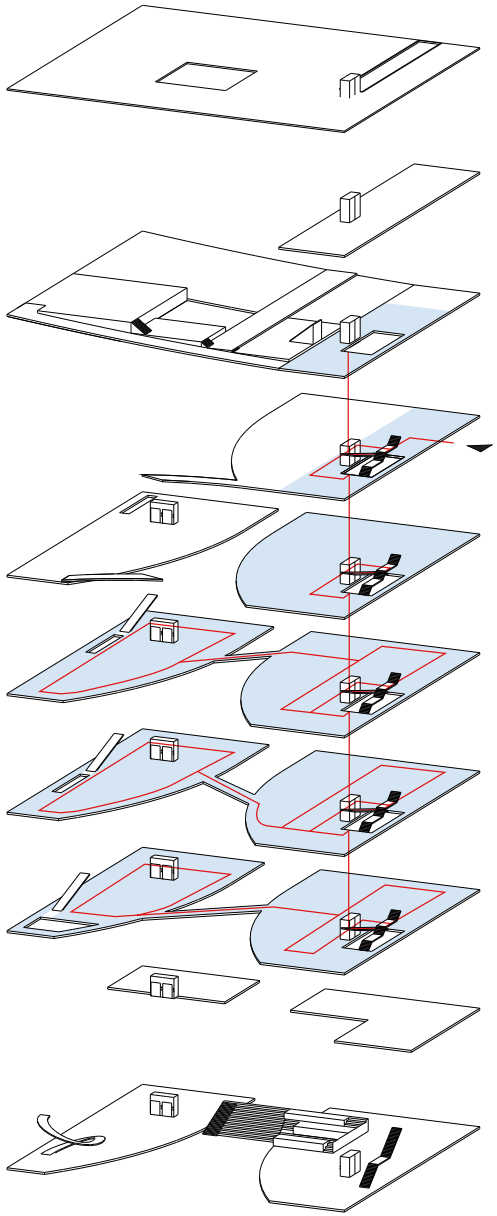
STAFF

PUBLIC

ACCESSIBILITY PODS







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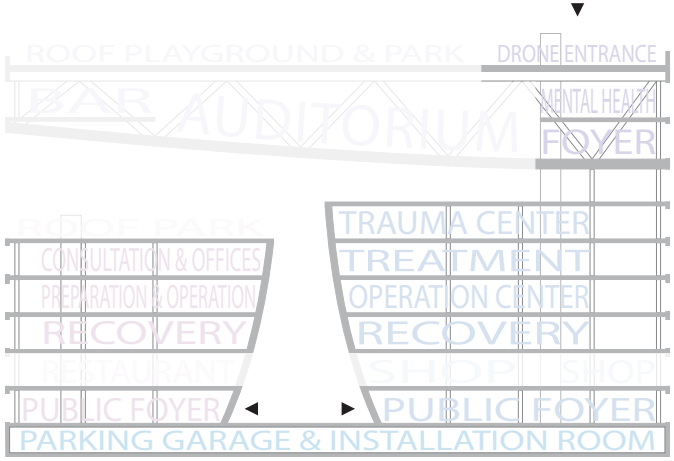

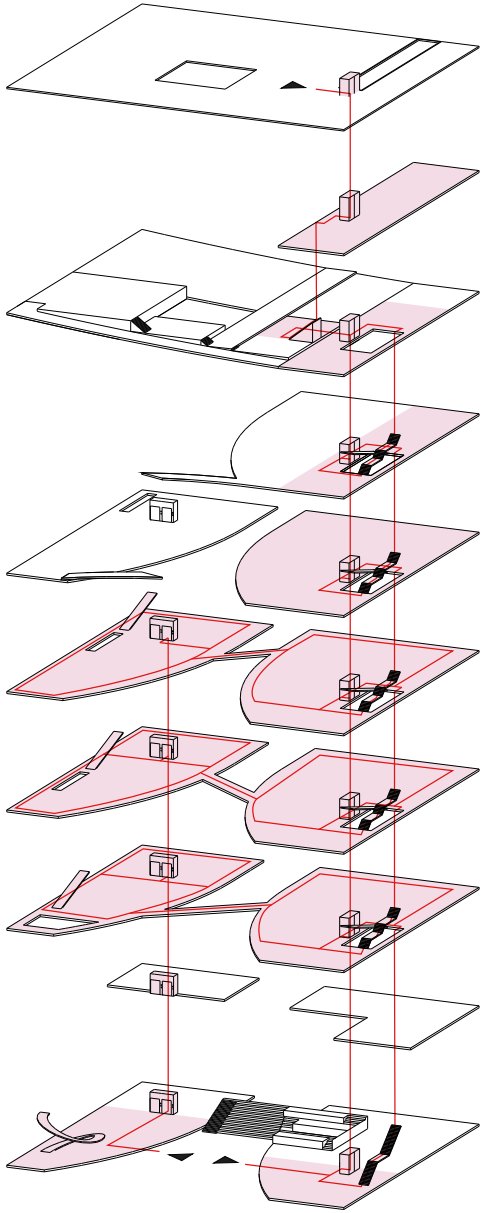

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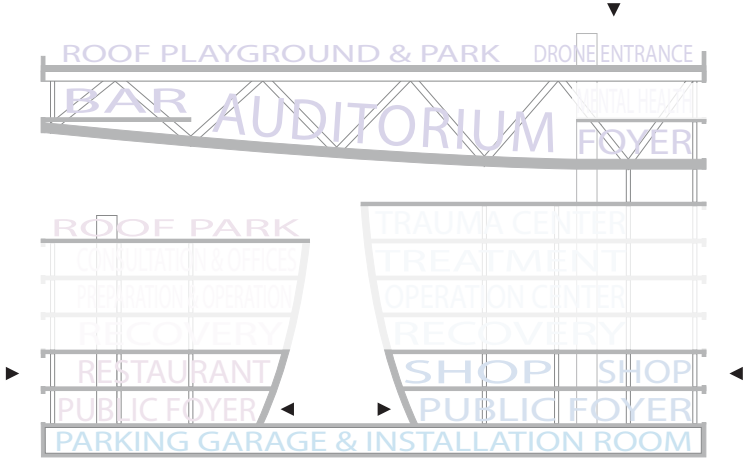

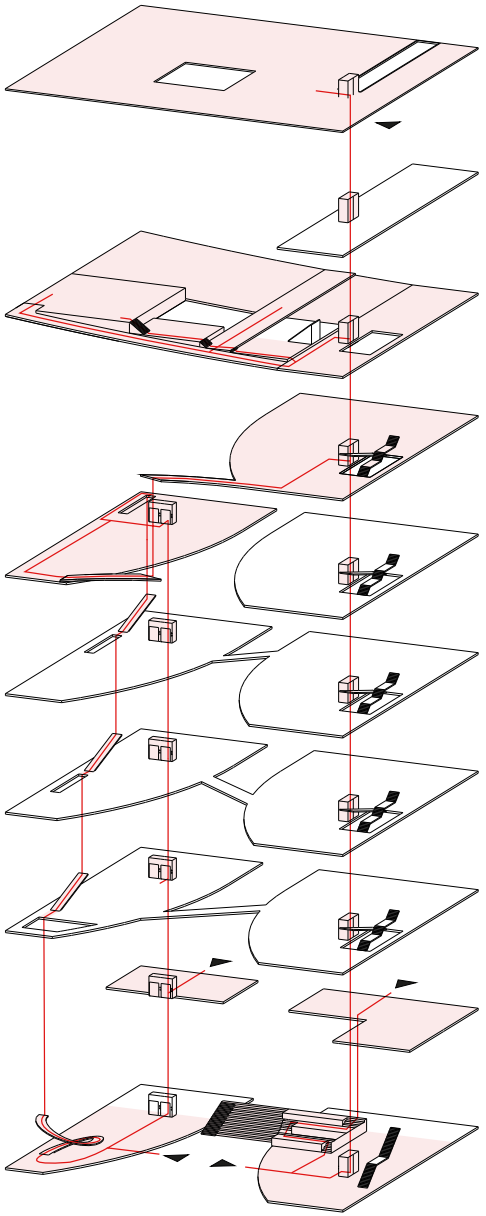

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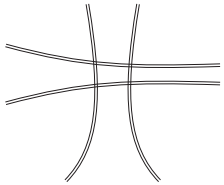

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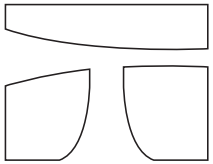

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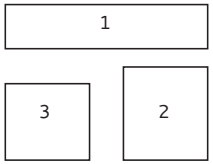

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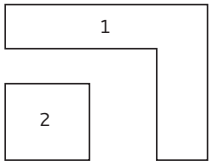

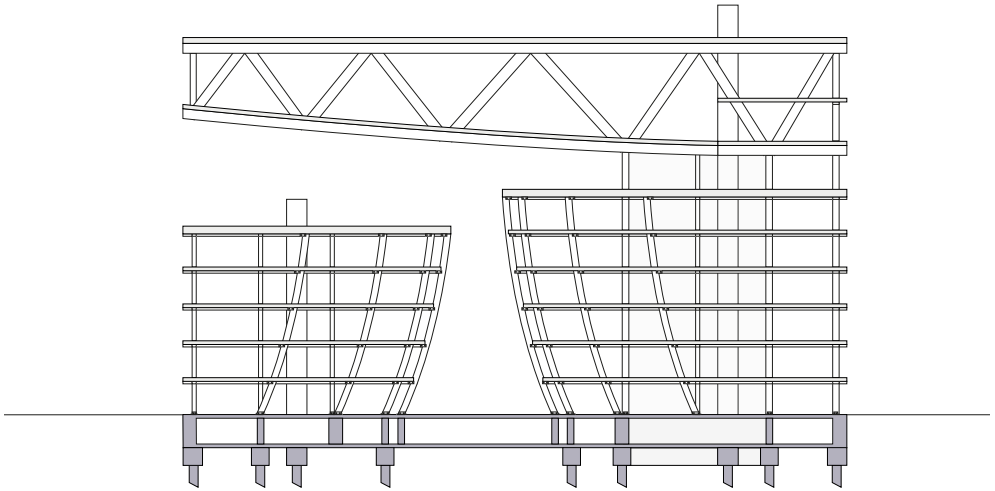

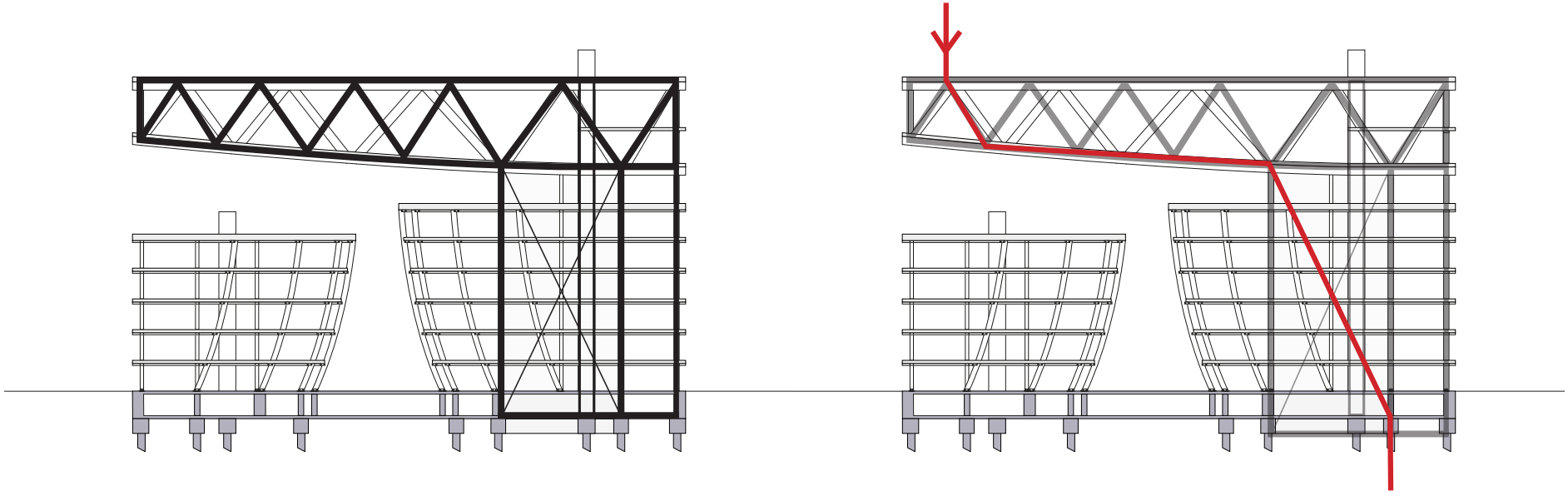

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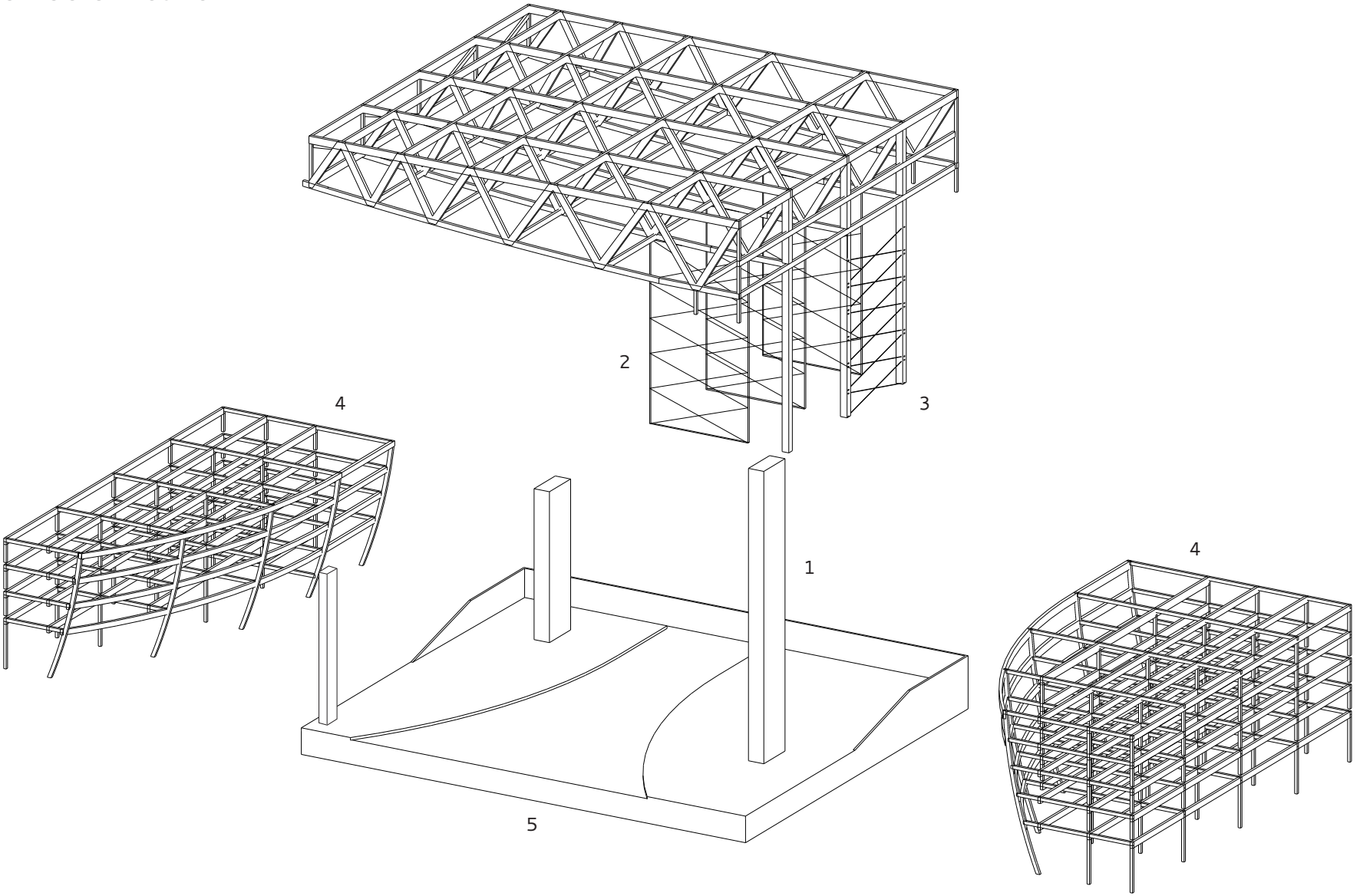
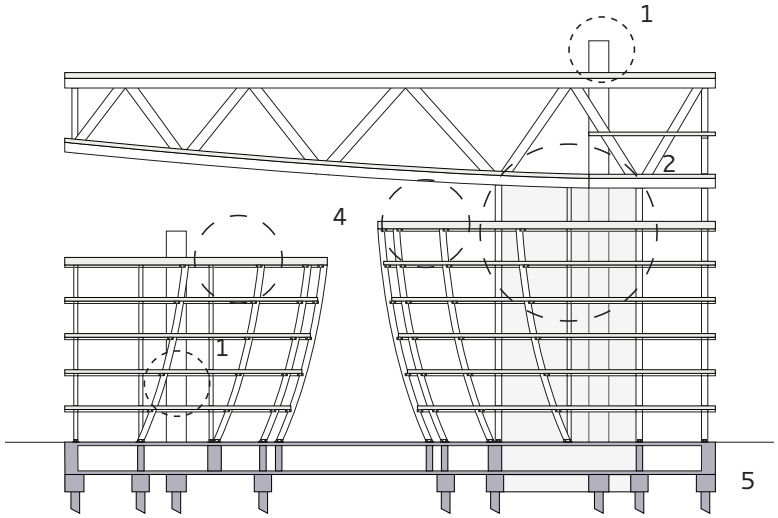
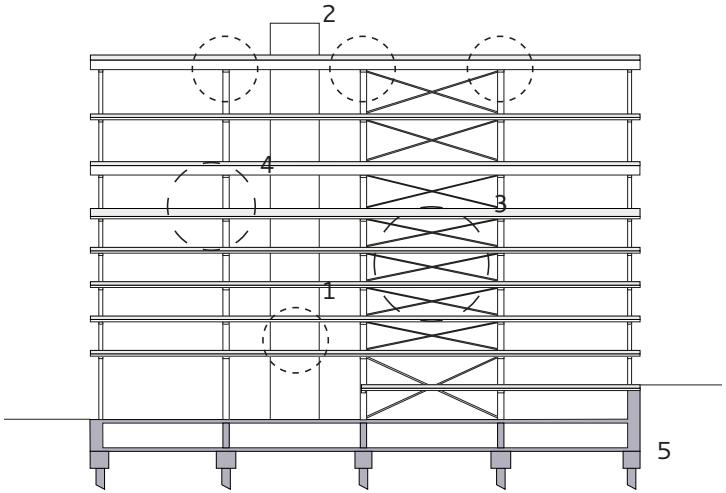


STABILITY





1 elevator cores

2 stability disks

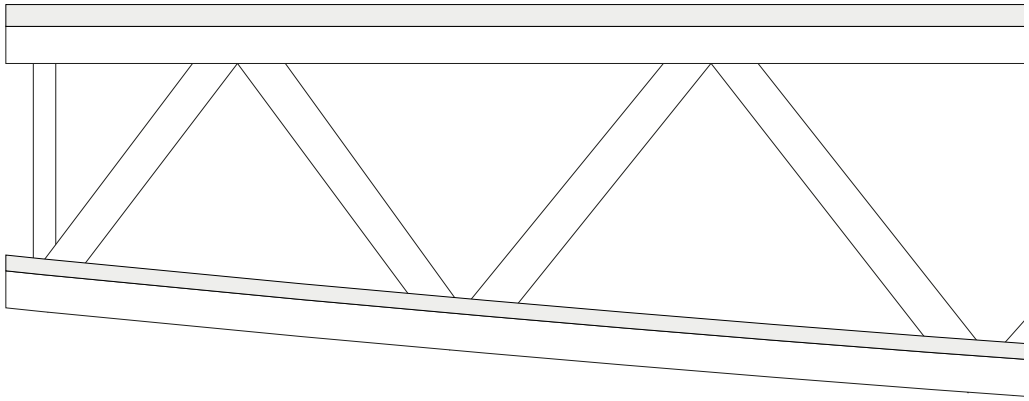
3 stability bracing

4 thickened floors

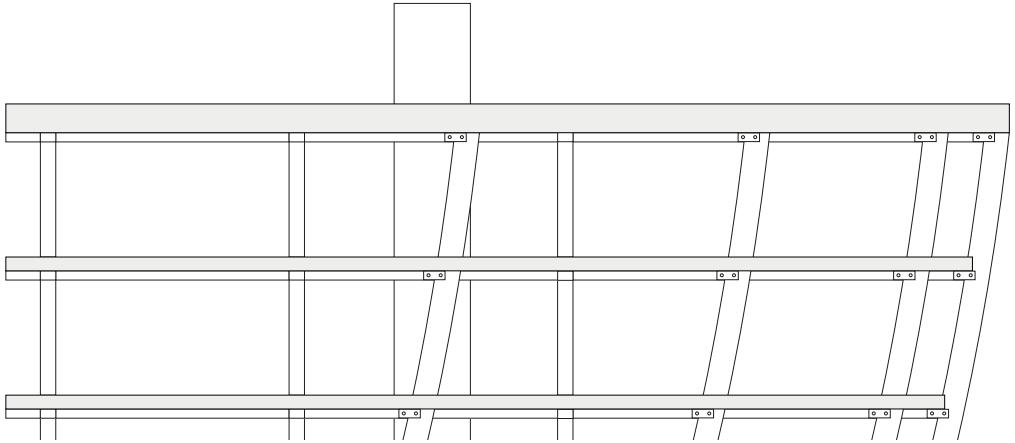
5 concrete ground floor and foundation

STRUCTURE

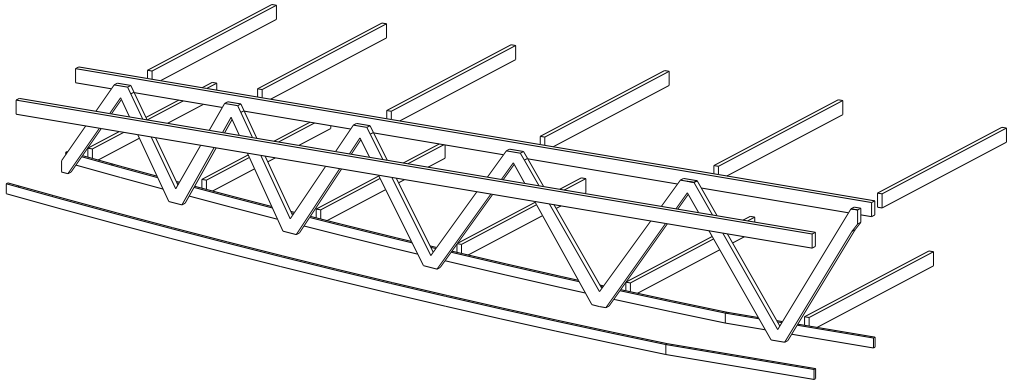
6000 mm

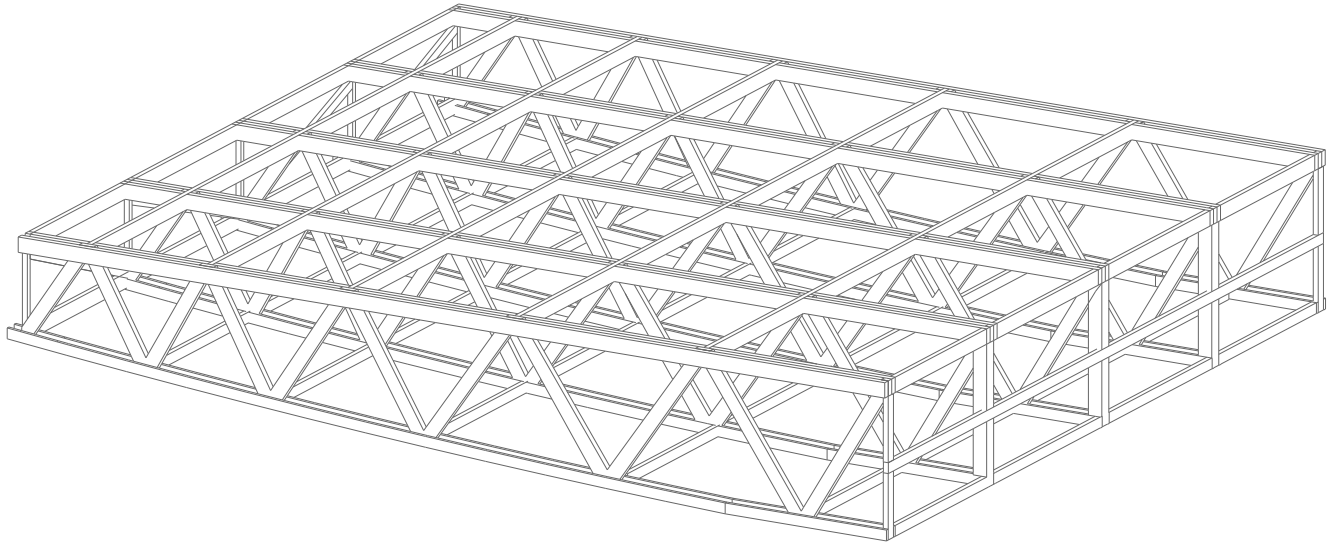


12000 mm



ASSEMBLY TOP TRUSS





ASSEMBLY ONE BUILDING PART

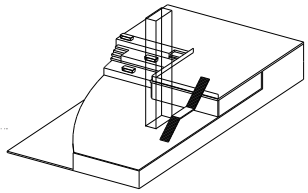
CLT flooring

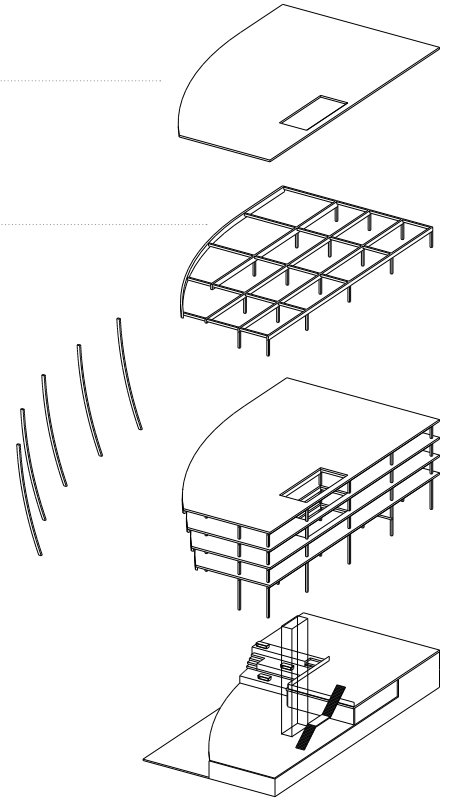
Laminated timber beams & columns

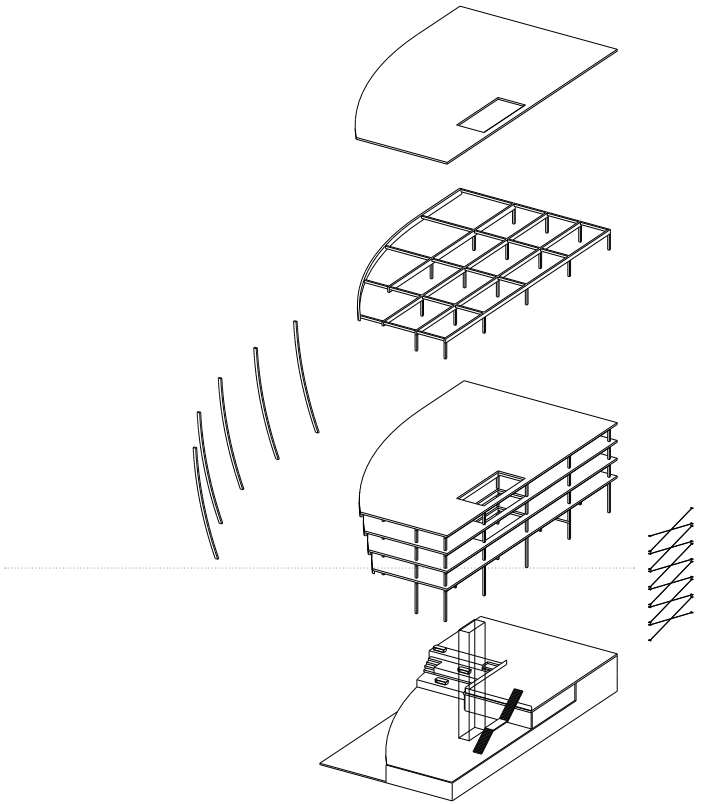
Laminated timber beams & columns

Steel stability bracing

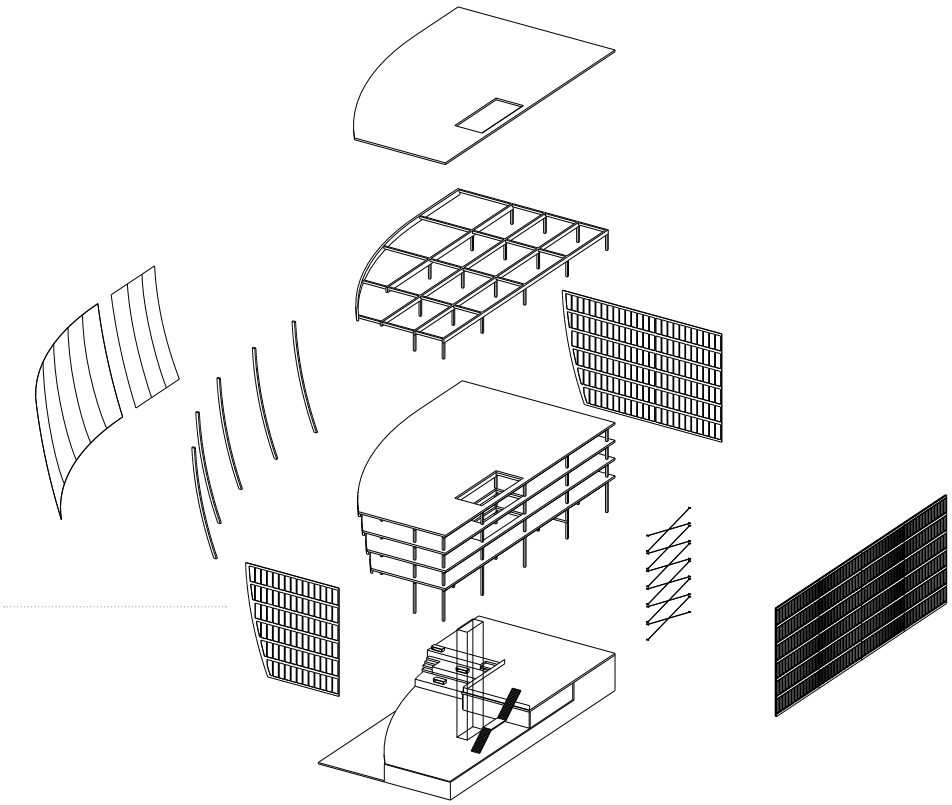
Concrete ground floor
with elevator core







Timber facades



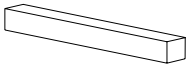
STRUCTURE FLOORING

Beams

Grid: 8000 x 8000 mm
16000 x 8000 mm

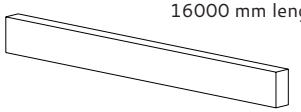
500 mm width
500 mm thick

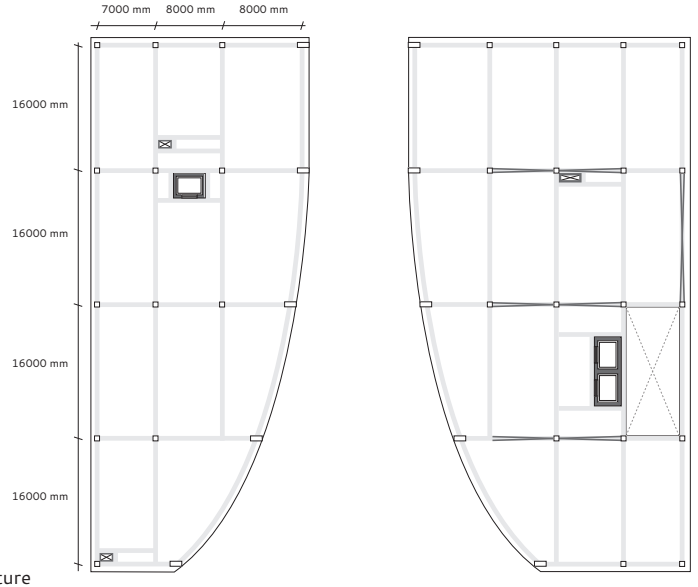
8000 mm length



500 mm width
950 mm thick

16000 mm length



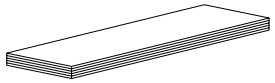


Beam structure

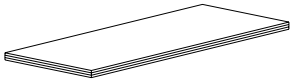
CLT floor panels

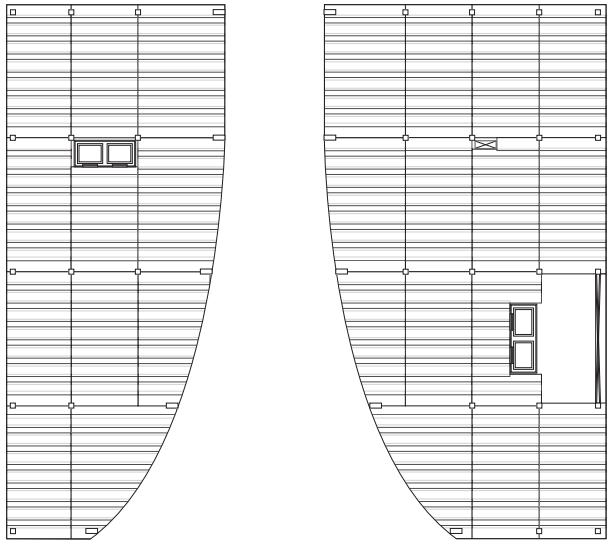
Grid: 8000 x 8000 mm

1200 mm width
170 mm thick



1600 mm width
120 mm thick

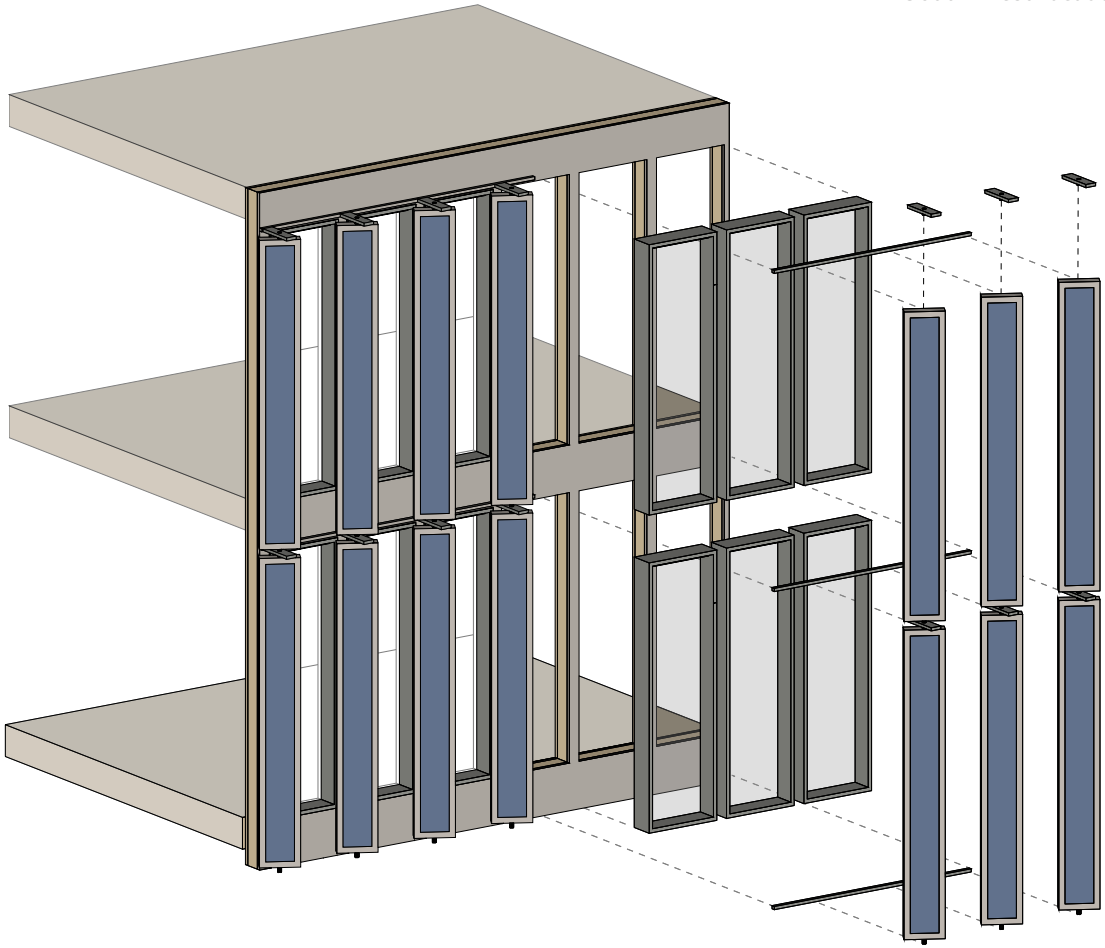




Floor structure

FACADE PRINCIPAL

South West facade



Interior timber wall finish

Insulating layer of nanowood

Exterior layer of burned wood

Window frames

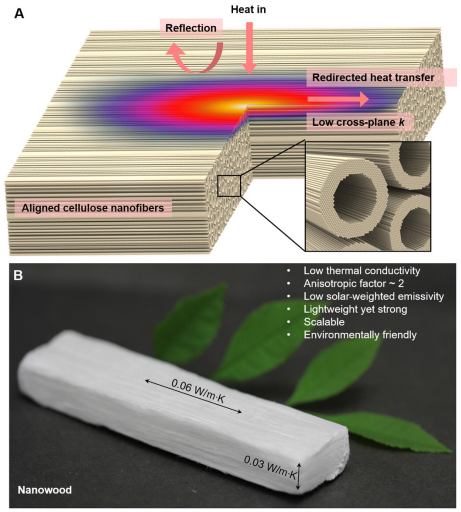
Louvres fixing

Louvres – variable per facade orientation

FACADE MATERIAL

Interior

Insulating nanowood

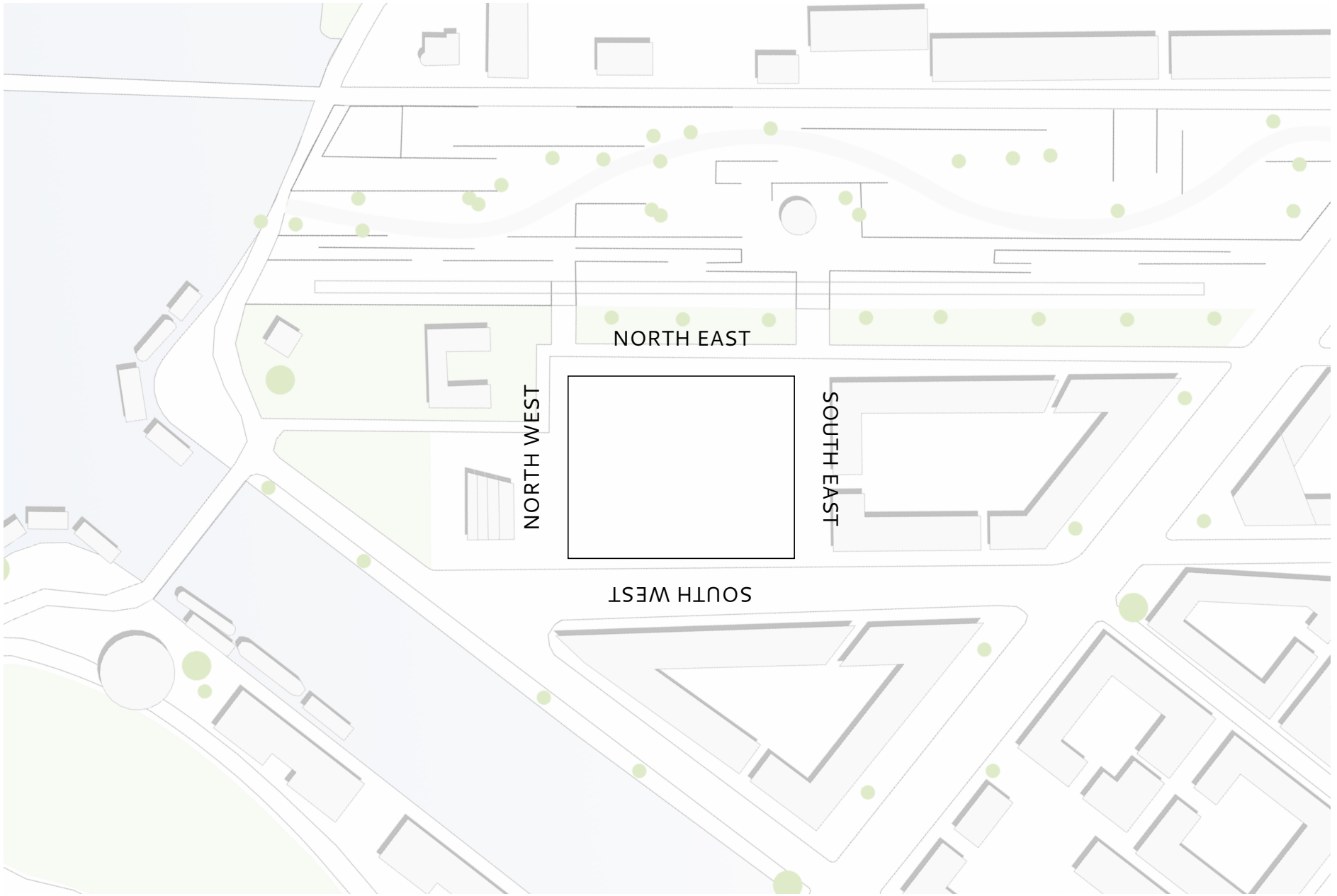


- excellent thermal insulation properties; 0.03 W/m·K
- high mechanical strength
- sustainable

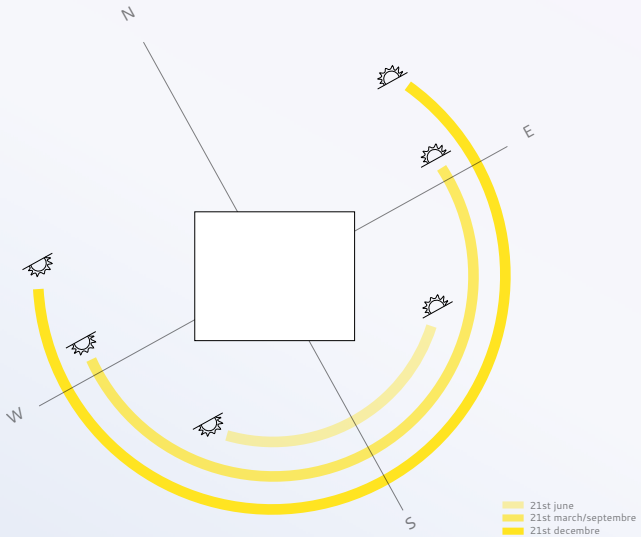
Exterior

Burned wood – shou sugi ban

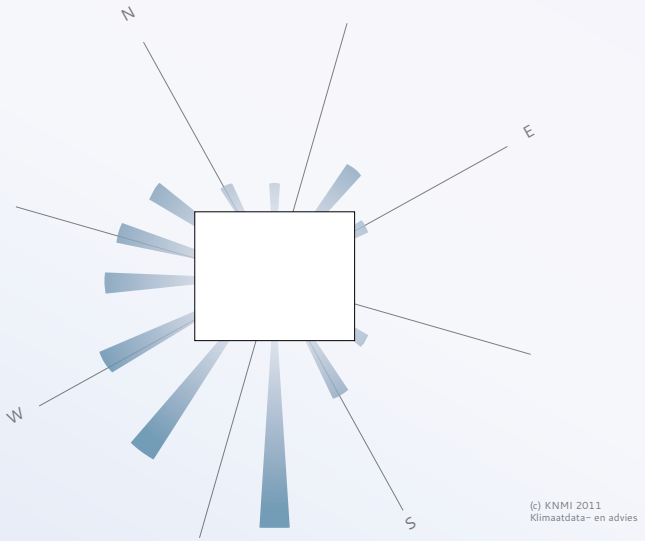
- durability (repel insects, prevents fungal implantation and water infiltration)
- stability
- fire resistance


NORTH EAST
NORTH WEST
SOUTH EAST
SOUTH WEST

SUN ORIENTATON



SUN ORIENTATON



FACADE PRINCIPAL

SITE
Sports recreation – Activity Park

CONDITIONS
low wind & sun exposure – much daylight

GREEN

NORTH EAST

SITE
Amstel river – views

CONDITIONS
much wind & sun exposure – passive opportunities

WIND ENERGY

NORTH WEST

SOUTH EAST

SOUTH WEST

SITE
Housing block – closed facade

CONDITIONS
shadow & high sun exposure

DENSE

SOLAR ENERGY

SITE
Square with green – waterfront

CONDITIONS
much wind & sun exposure – passive opportunities

FACADE PRINCIPAL

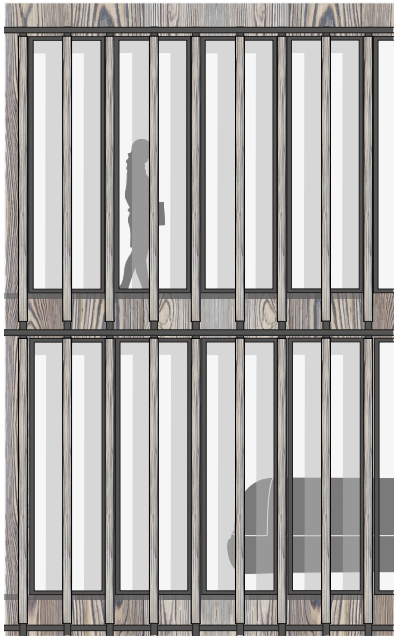
NORTH WEST

WIND ENERGY

NORTH EAST

GREEN

SOUTH EAST



DENSE

SOUTH WEST

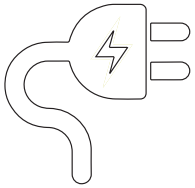
SOLAR ENERGY

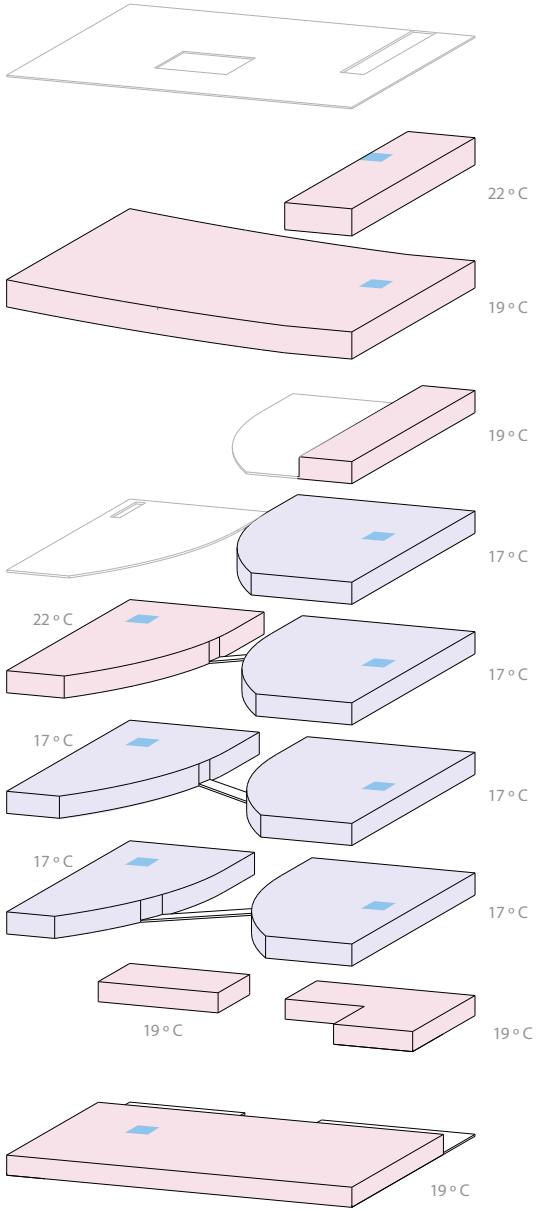
CLIMATE DEMAND

MEDICAL FUNCTIONS;
Require clean and cool air

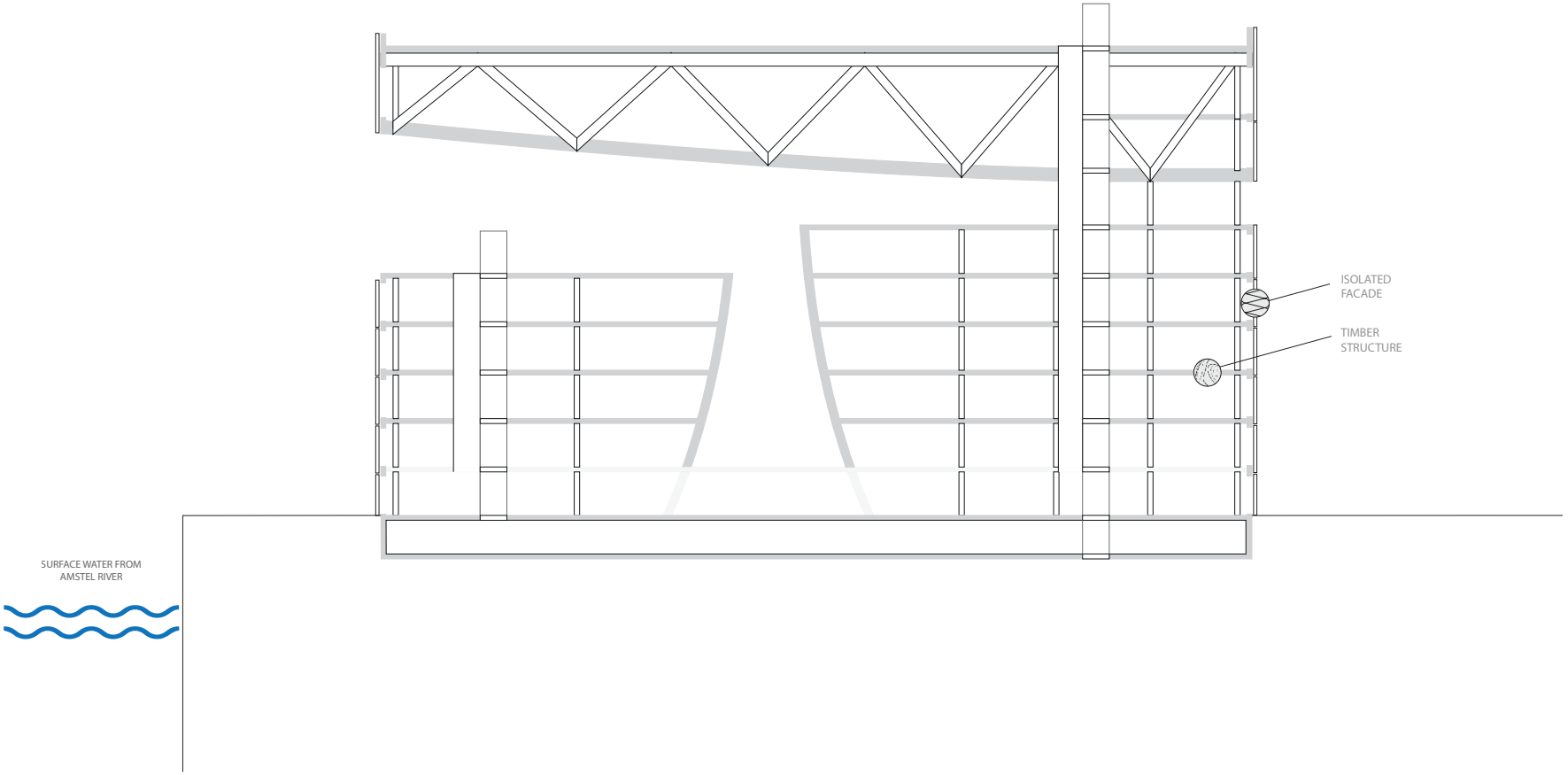
PUBLIC AND OFFICE FUNCTIONS;
Require steady temperature and good airconditioning

WET AREAS;
Require air supply and exhaust

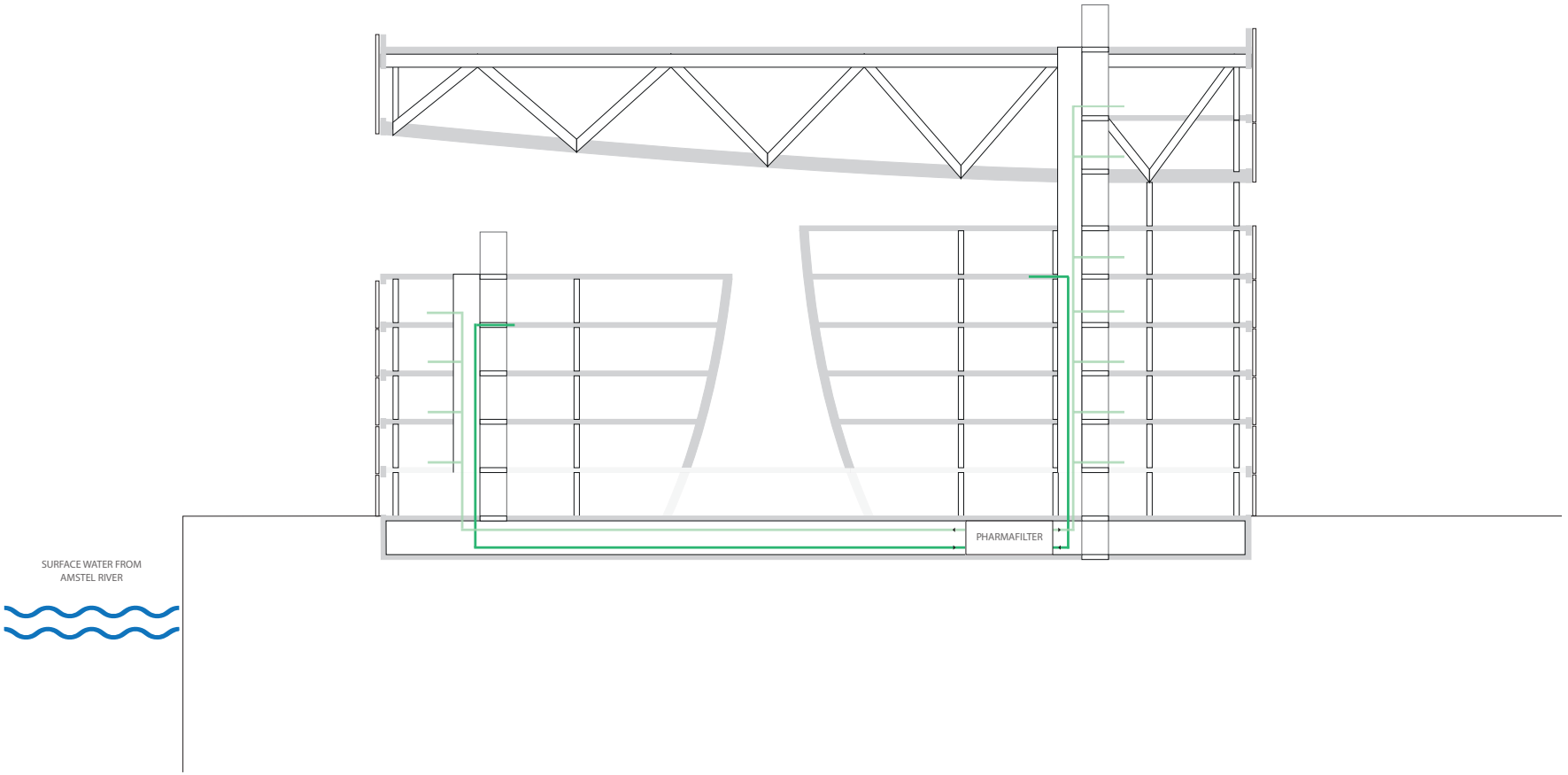




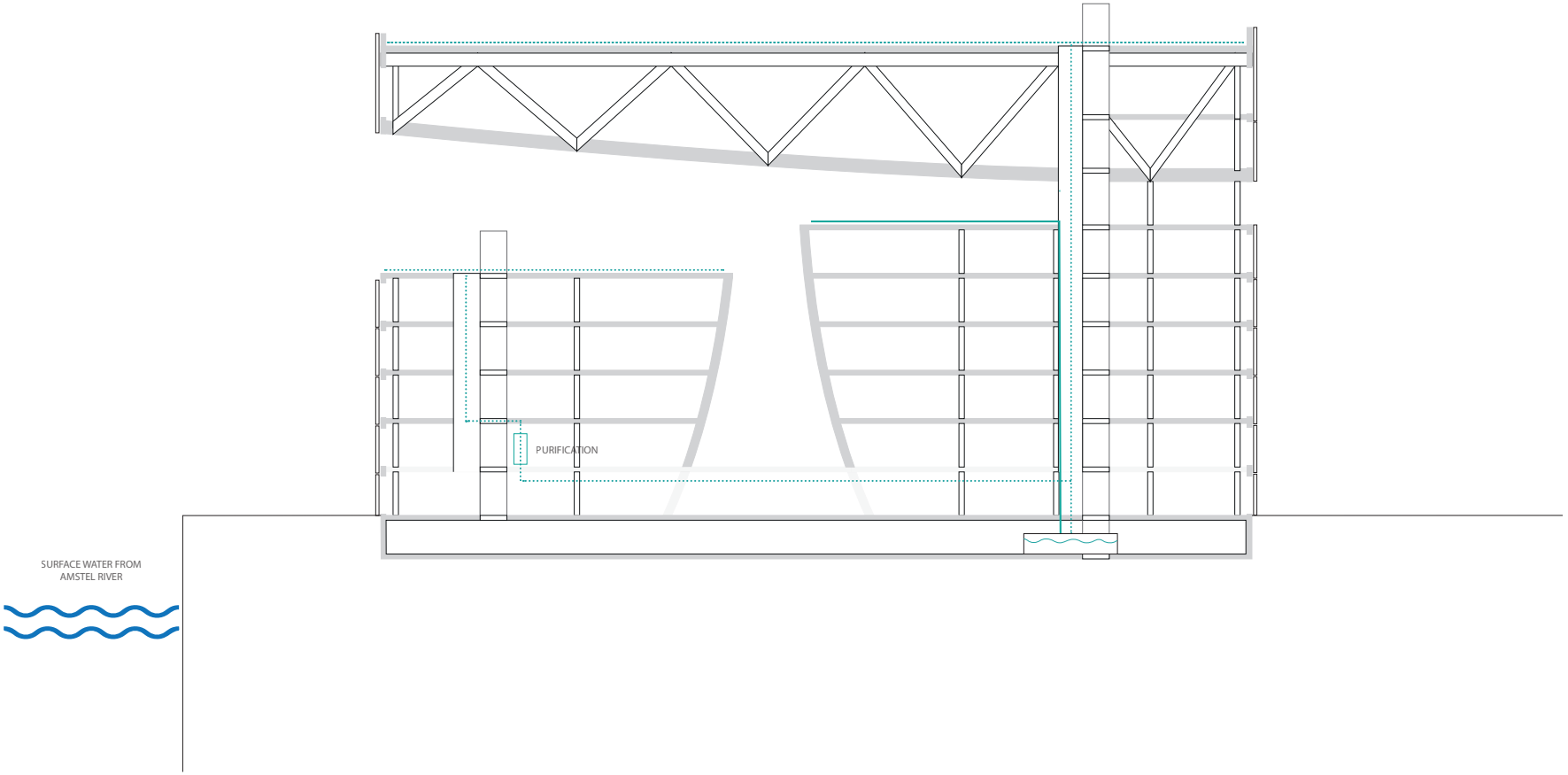
CLIMATE SUSTAINABILITY



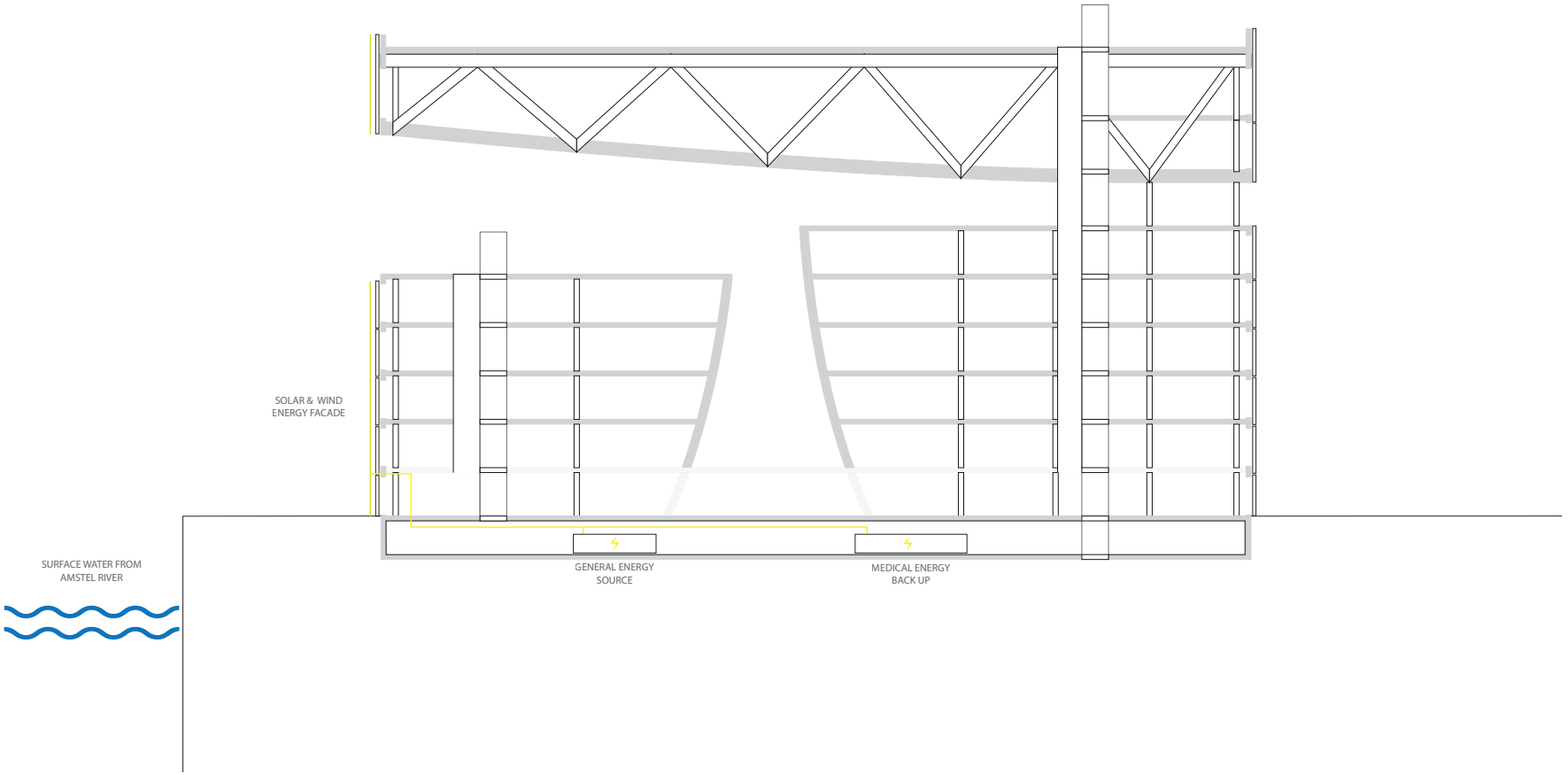
CLIMATE SUSTAINABILITY



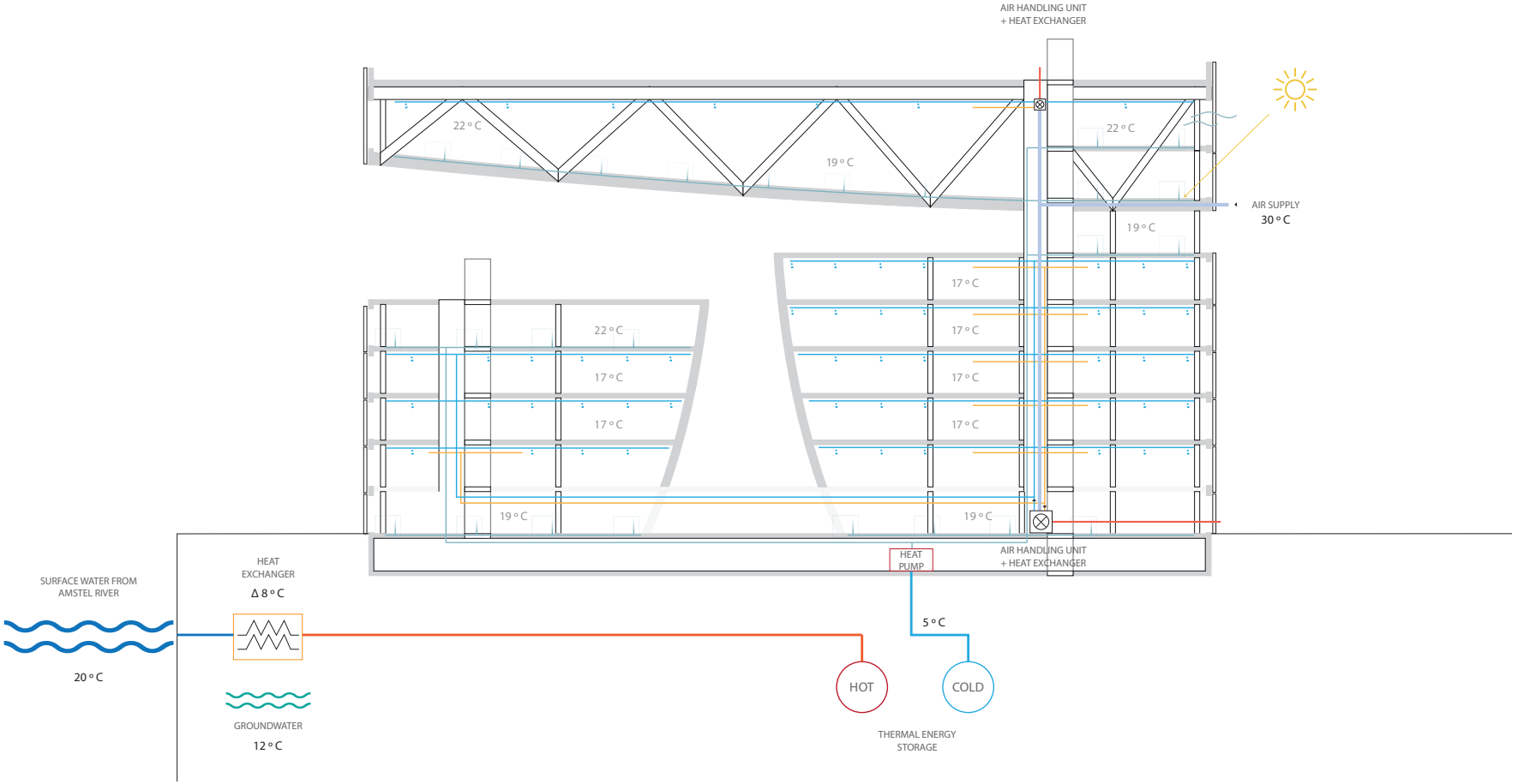
CLIMATE SUSTAINABILITY



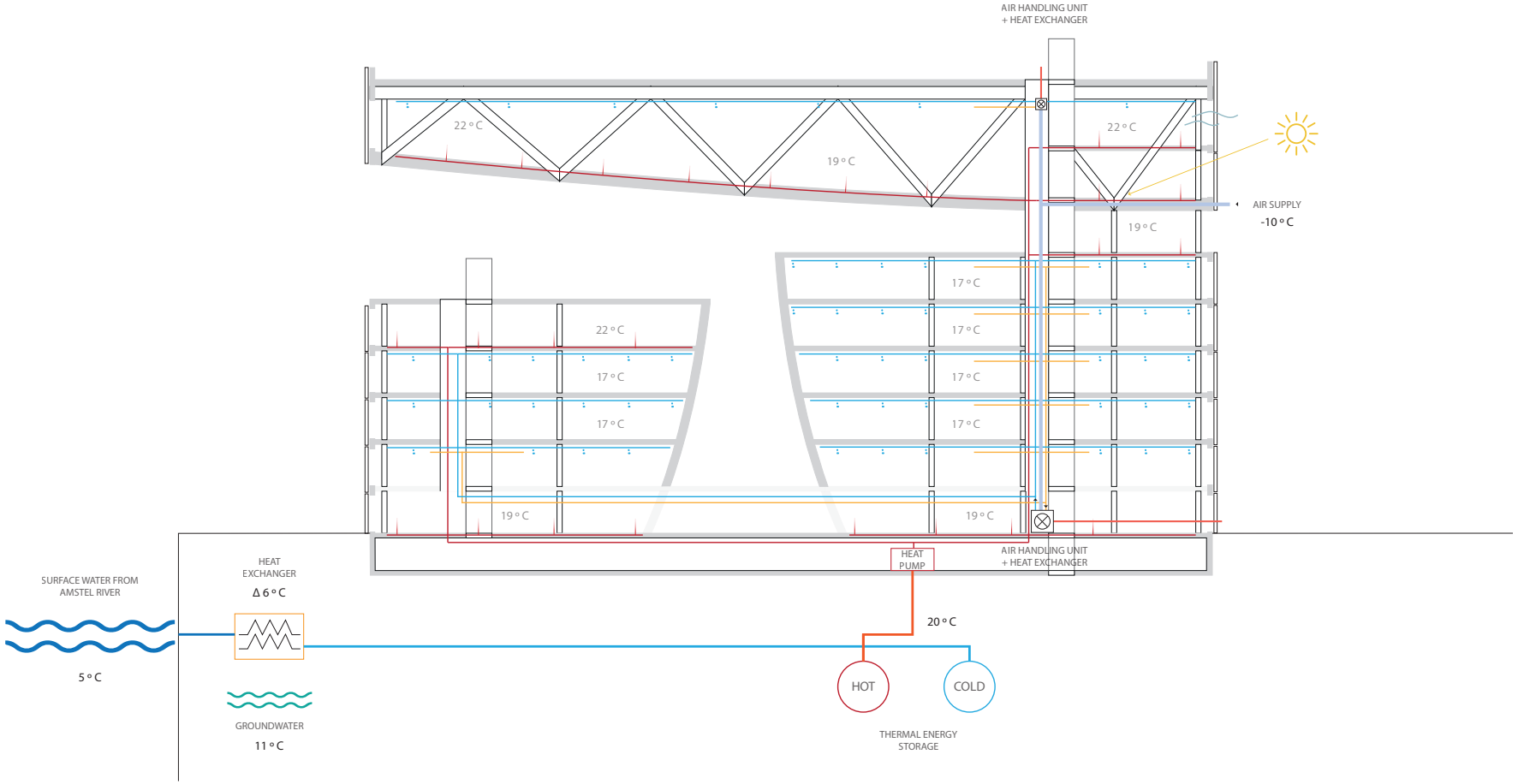
CLIMATE SUSTAINABILITY



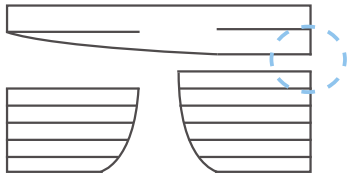
CLIMATE SYSTEM SUMMER

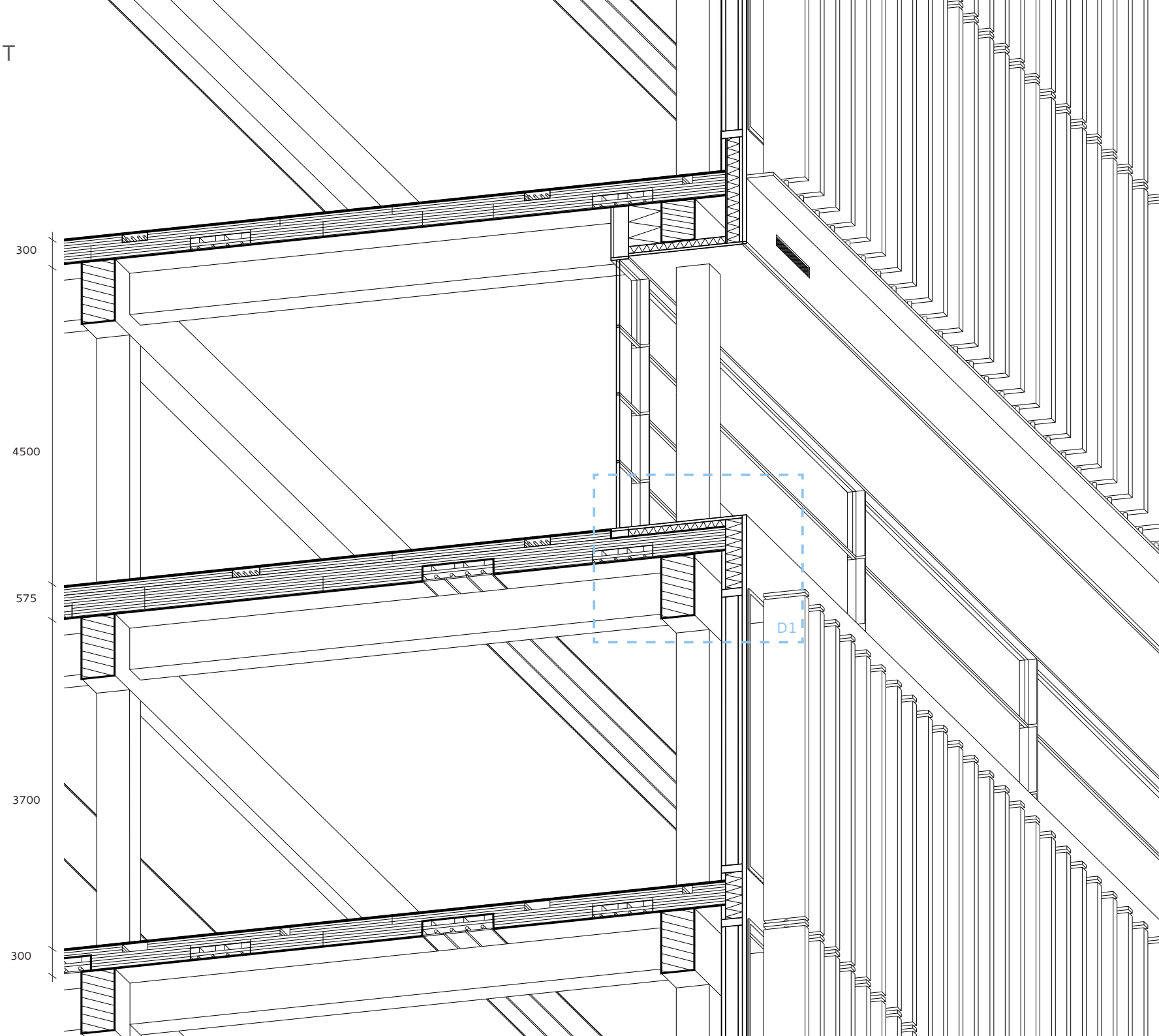


CLIMATE SYSTEM WINTER



1:20 FACADE FRAGMENT





SOUTH EAST FACADE

Public foyer
Pod entrance
Acute floor

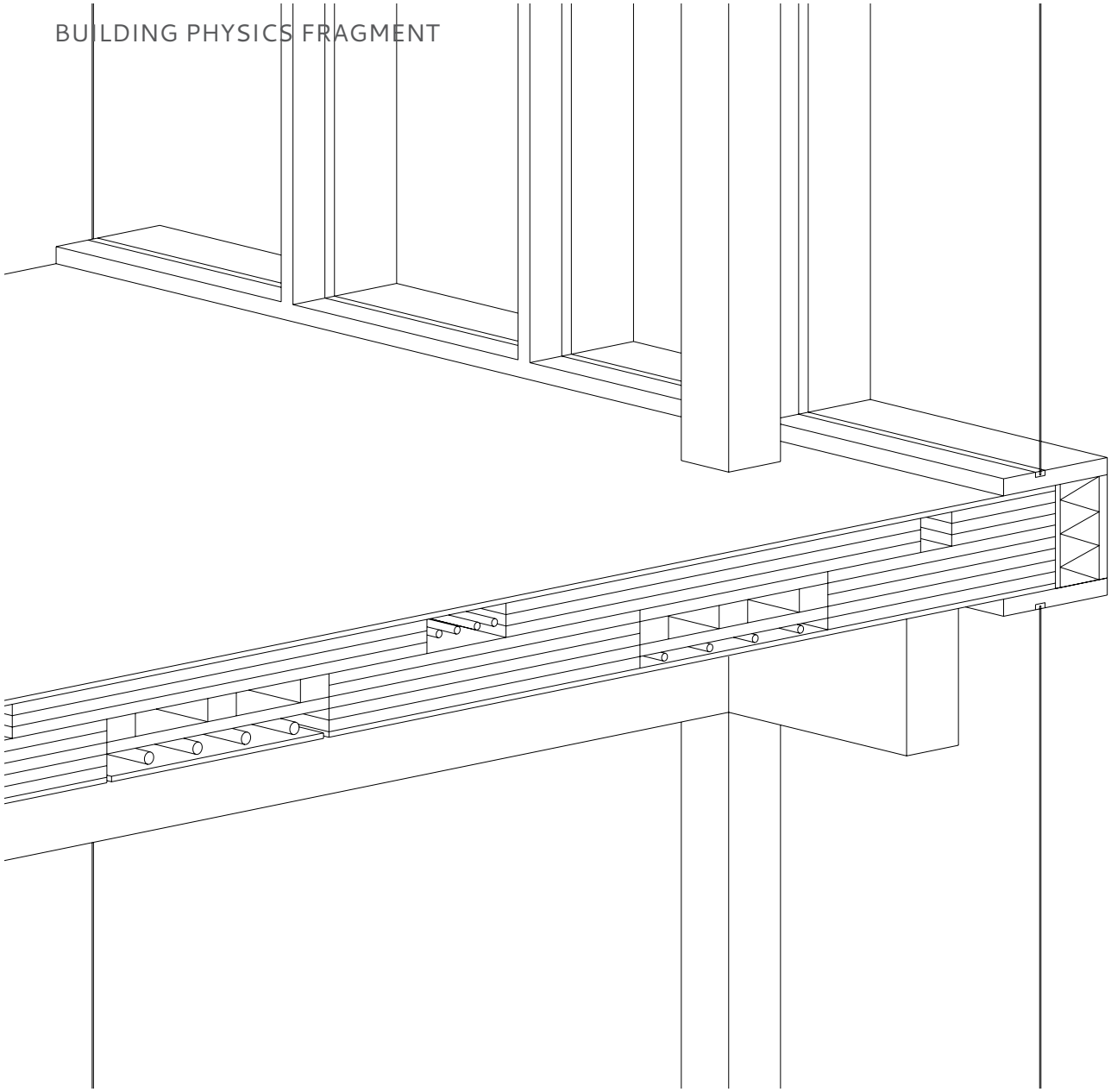
Recessed glass facade for Pods

Difference in floor thickness

Difference in climate system

Fresh air supply

BUILDING PHYSICS FRAGMENT

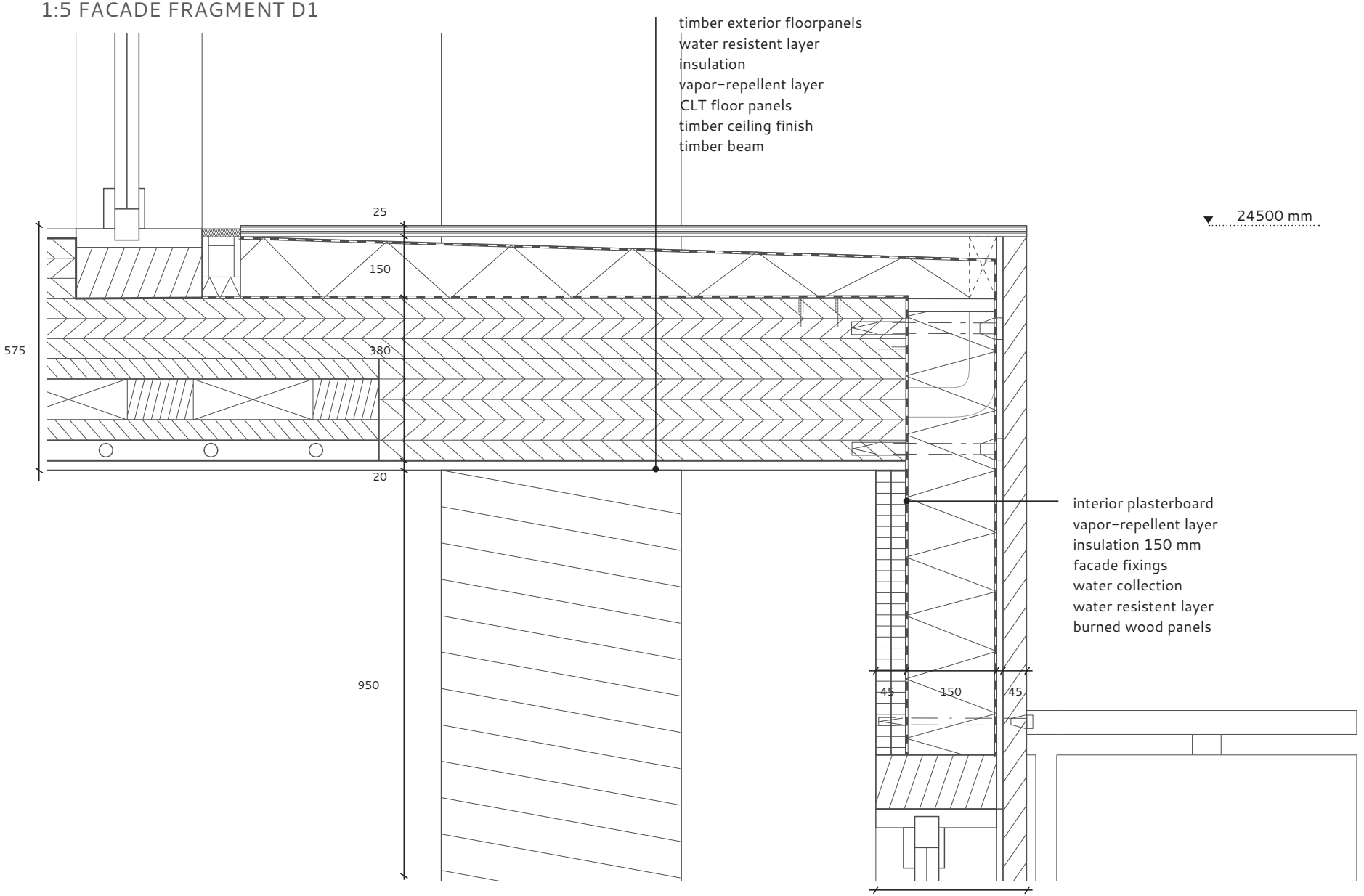


CLT floor panels
1200 x 170 mm
1600 x 100 mm

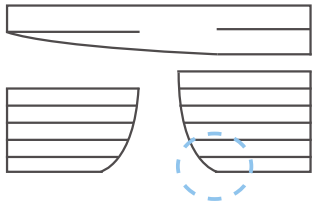
Floating screed with acoustic layer

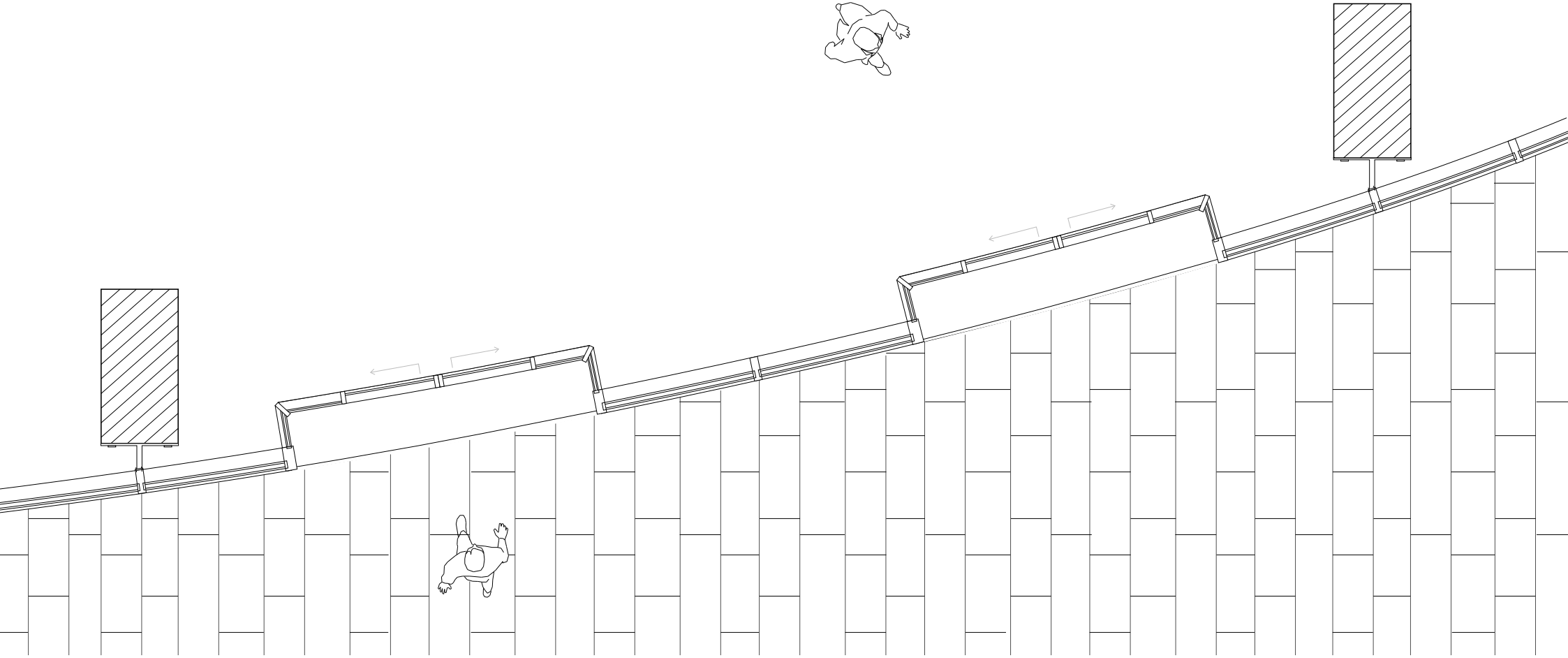
Cavities for installations, light, ventilation and floor heating

1:5 FACADE FRAGMENT D1



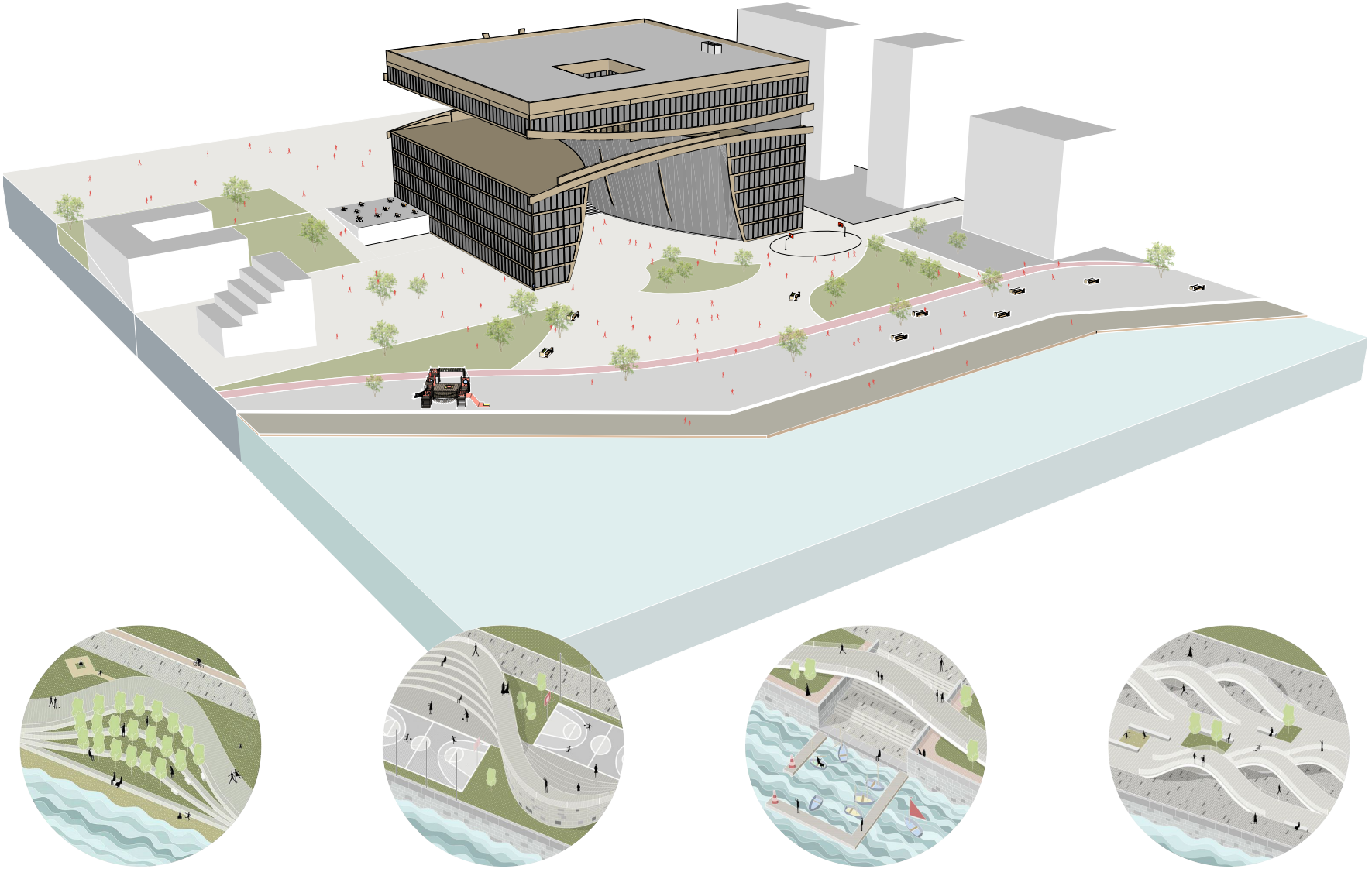
1:20 FACADE FRAGMENT D2





8000 mm

WATERFRONT



/AMSTEL HEALTH BASE