



CENTER RE-GEN

A collective of Regenerative bodies

Harit Naik
17/01/2025



Introduction

Research

Design

Conclusion

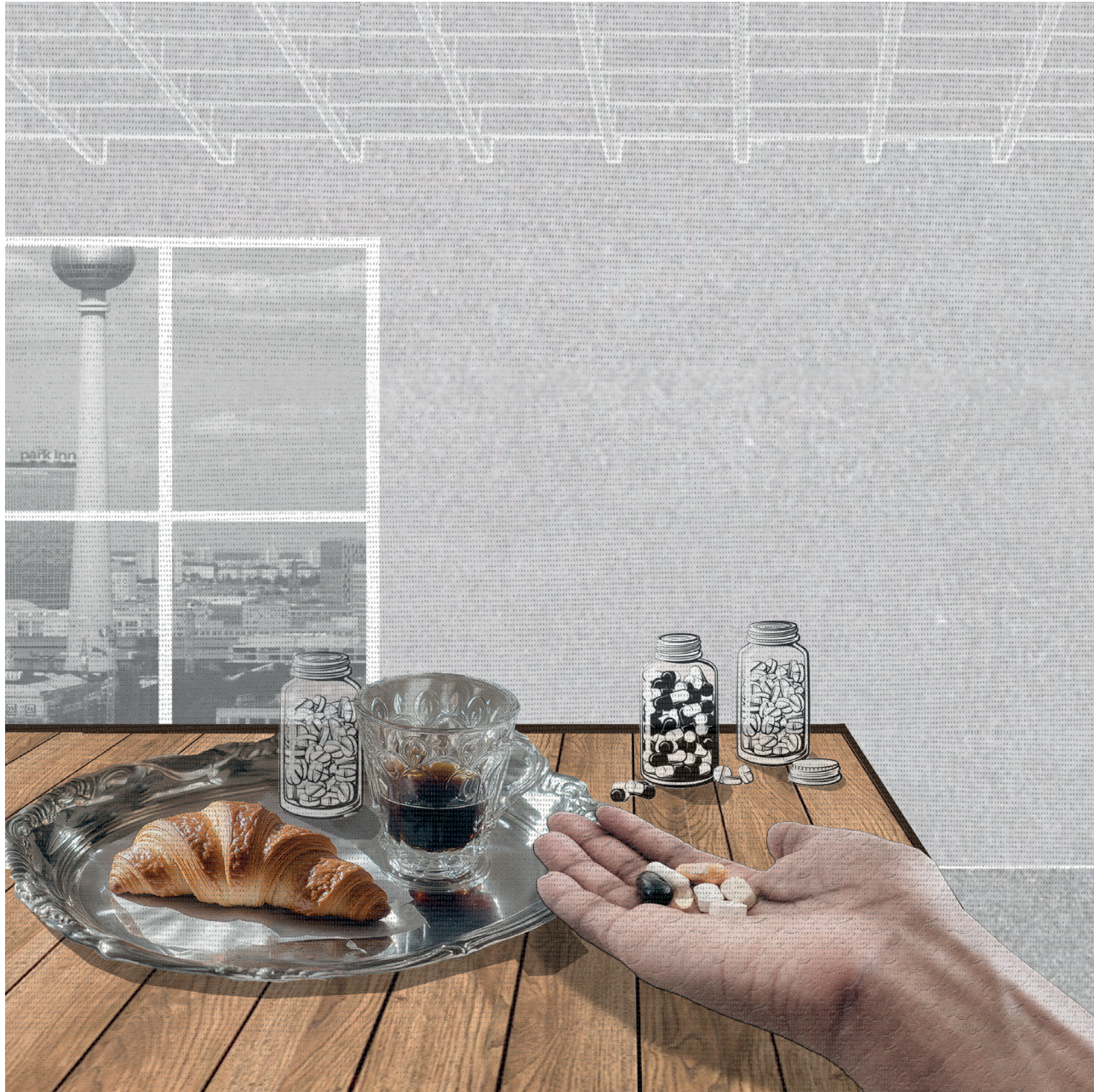


Changing Life style

complex  projects



Changing bodies



Though the life expectancy is increasing, the chronic diseases are on the rise. Our bodies simply can't keep up with the future lifestyle.



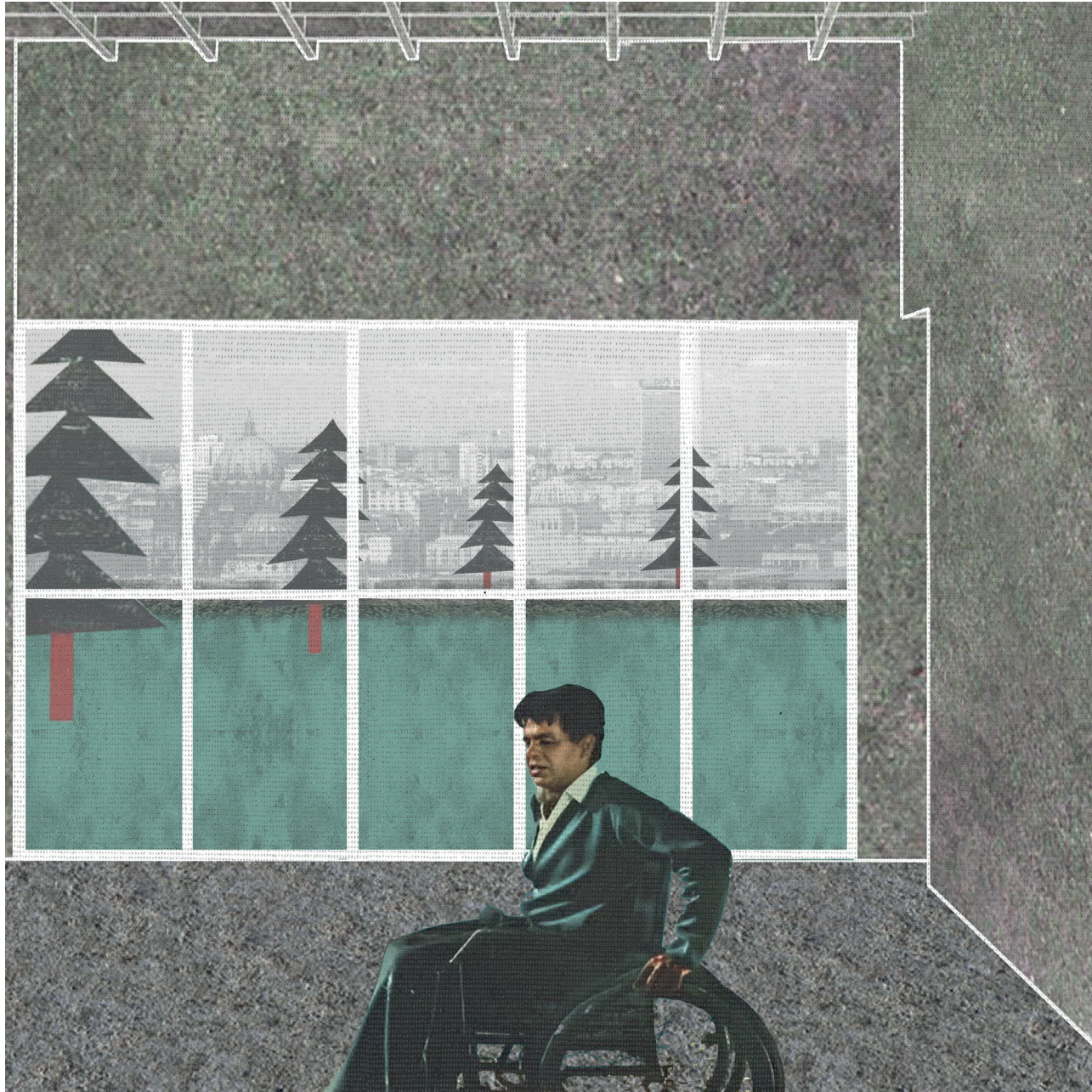
Though the life expectancy is increasing, the chronic diseases are on the rise. Our bodies simply can't keep up with the future lifestyle.



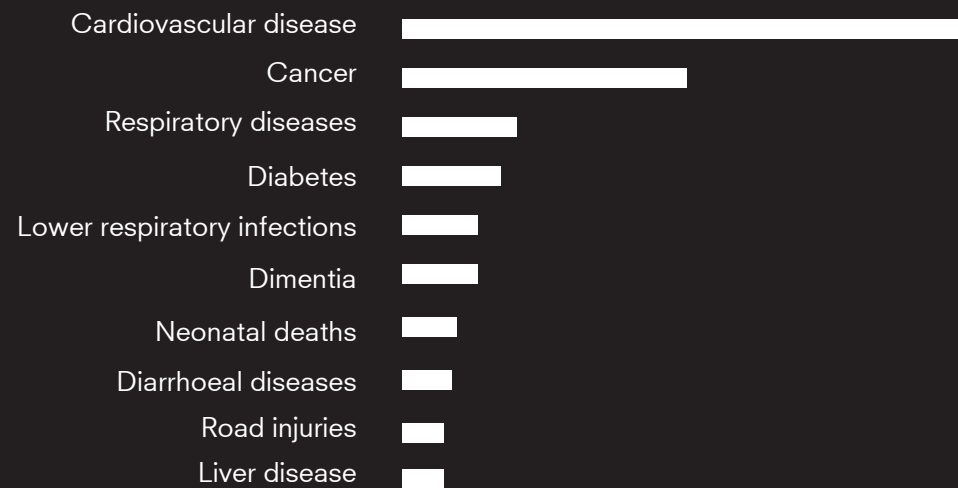
More and more people getting old



Genetic diseases



Accidents



Source - IHME, Global burden of disease

Leading casues of deaths, Worldwide

WHAT IF...?



Chronic diseases could be reversed, instead of managed?



Genetic conditions could be edited away at their source?



Severe injuries could heal fully, as if they never happened?



A future where Humans could regenerate

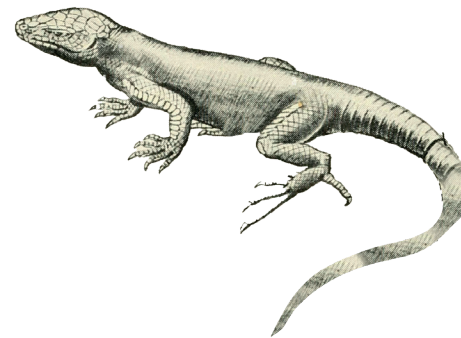
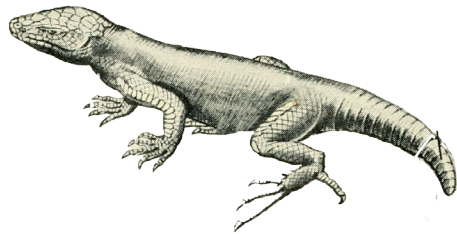


A world where diseases, injuries and inherited conditions
could be undone, collage missing

A future where Humans could regenerate

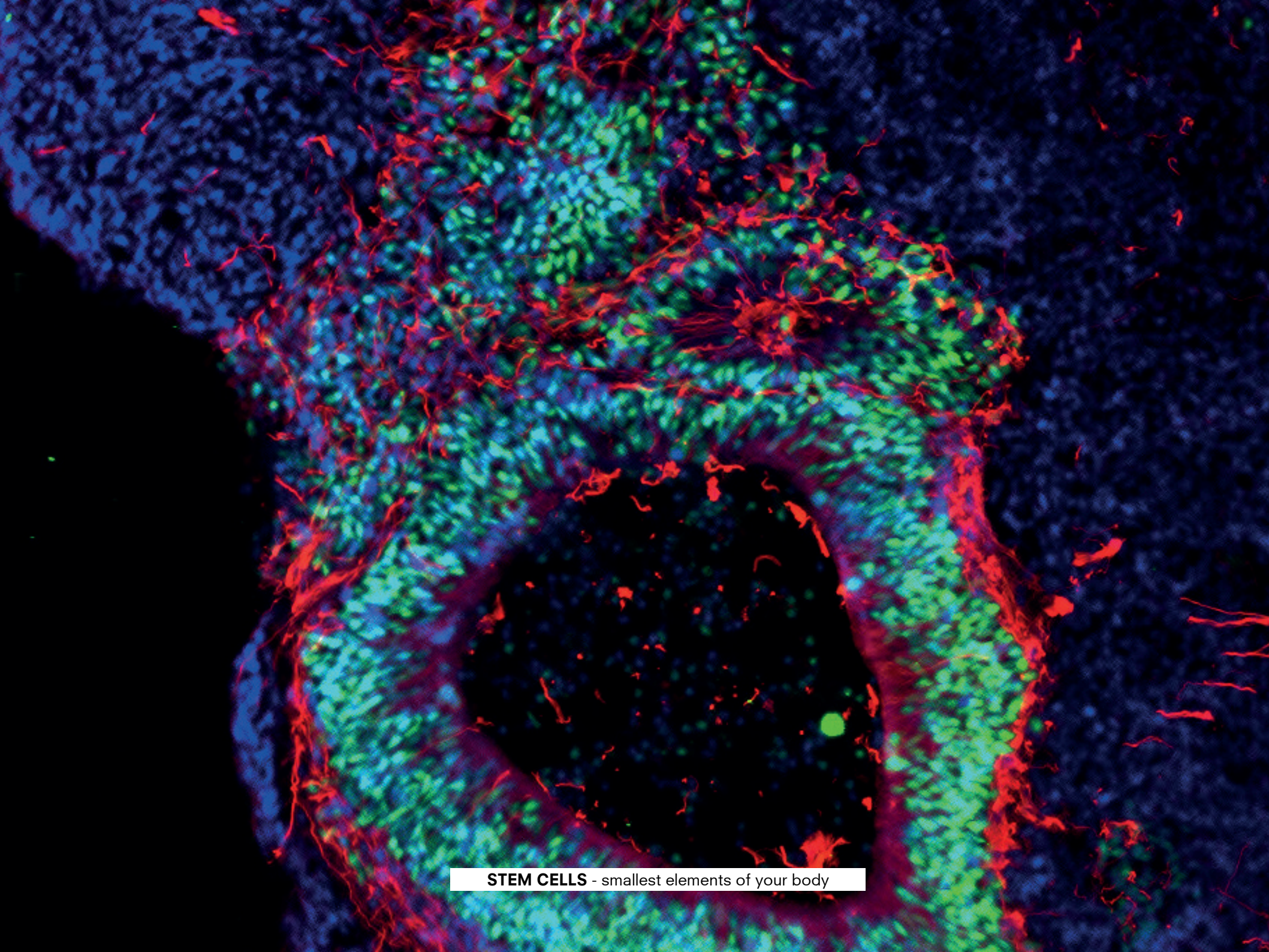


Today - Plants Regenerate

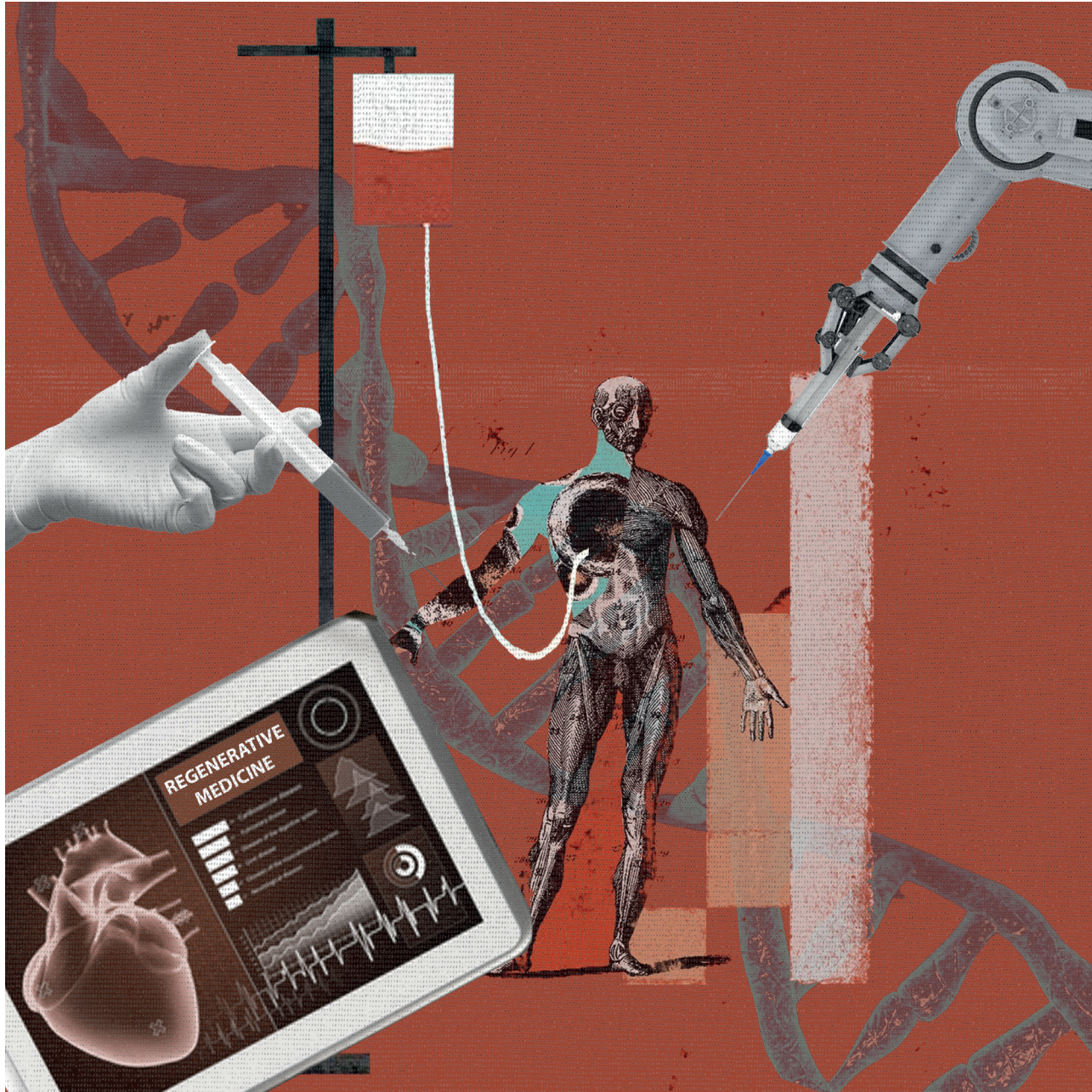


Today - Animals Regenerate

But is it a **Myth** or **Reality**?

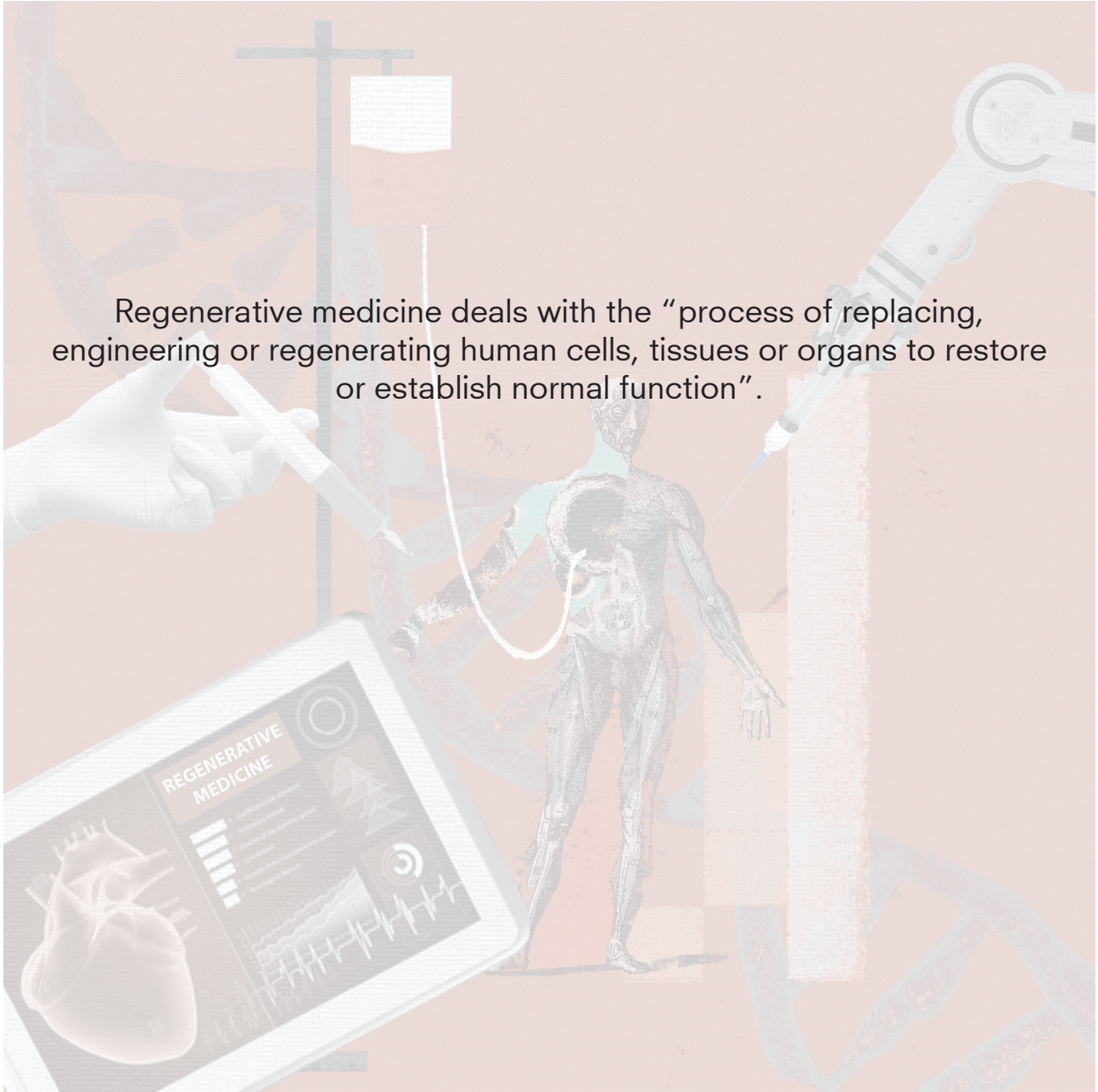


STEM CELLS - smallest elements of your body



Regenerative medicine

complex  projects



Regenerative medicine deals with the “process of replacing, engineering or regenerating human cells, tissues or organs to restore or establish normal function”.

Regenerative medicine

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precision medicine



gene based therapies

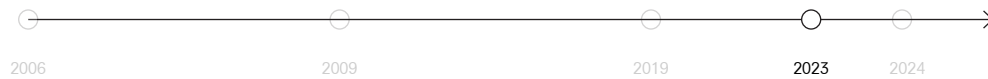
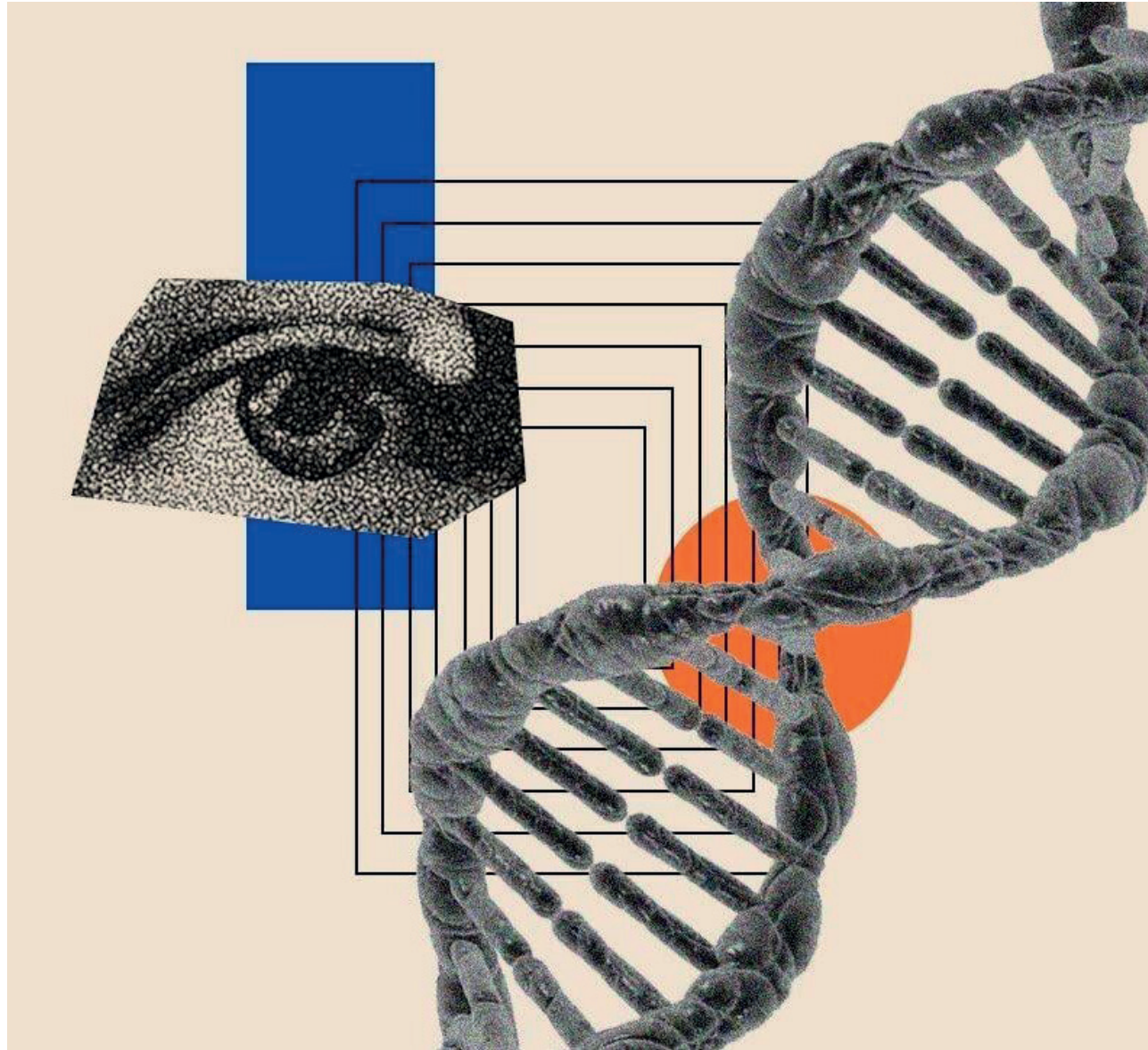


tissues and organ
production

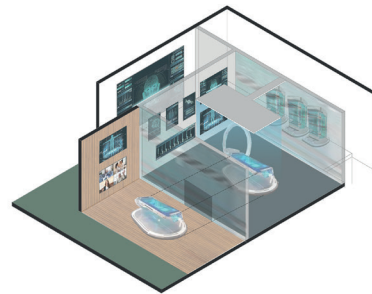
Regenerative medicine



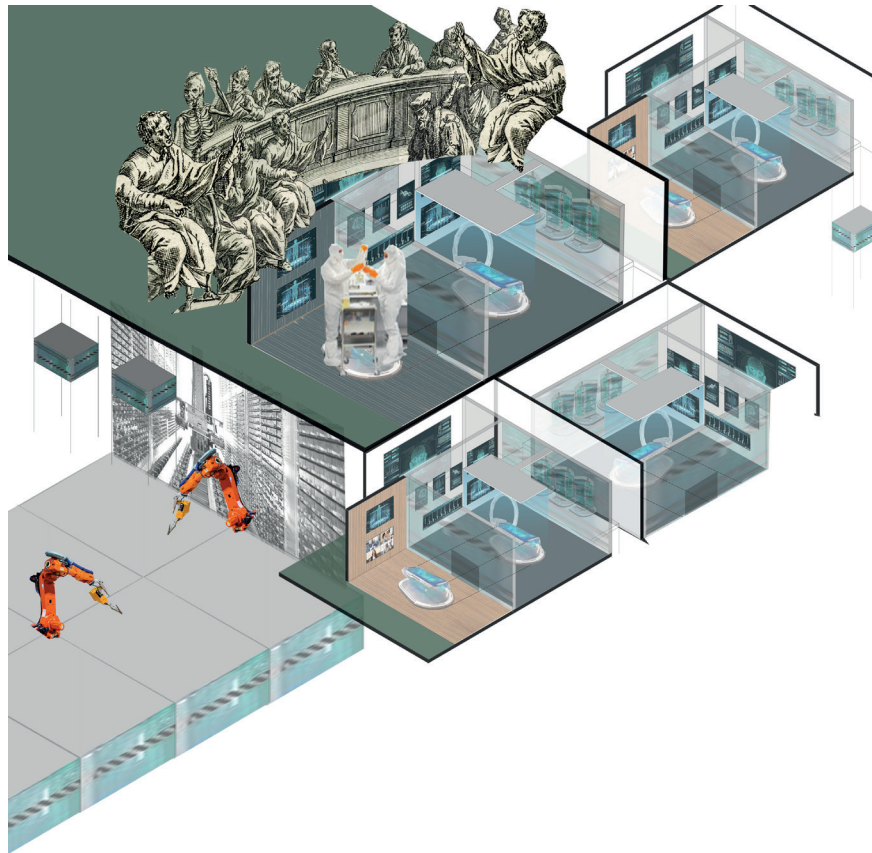
History of Regeneration and Regenerative medicine



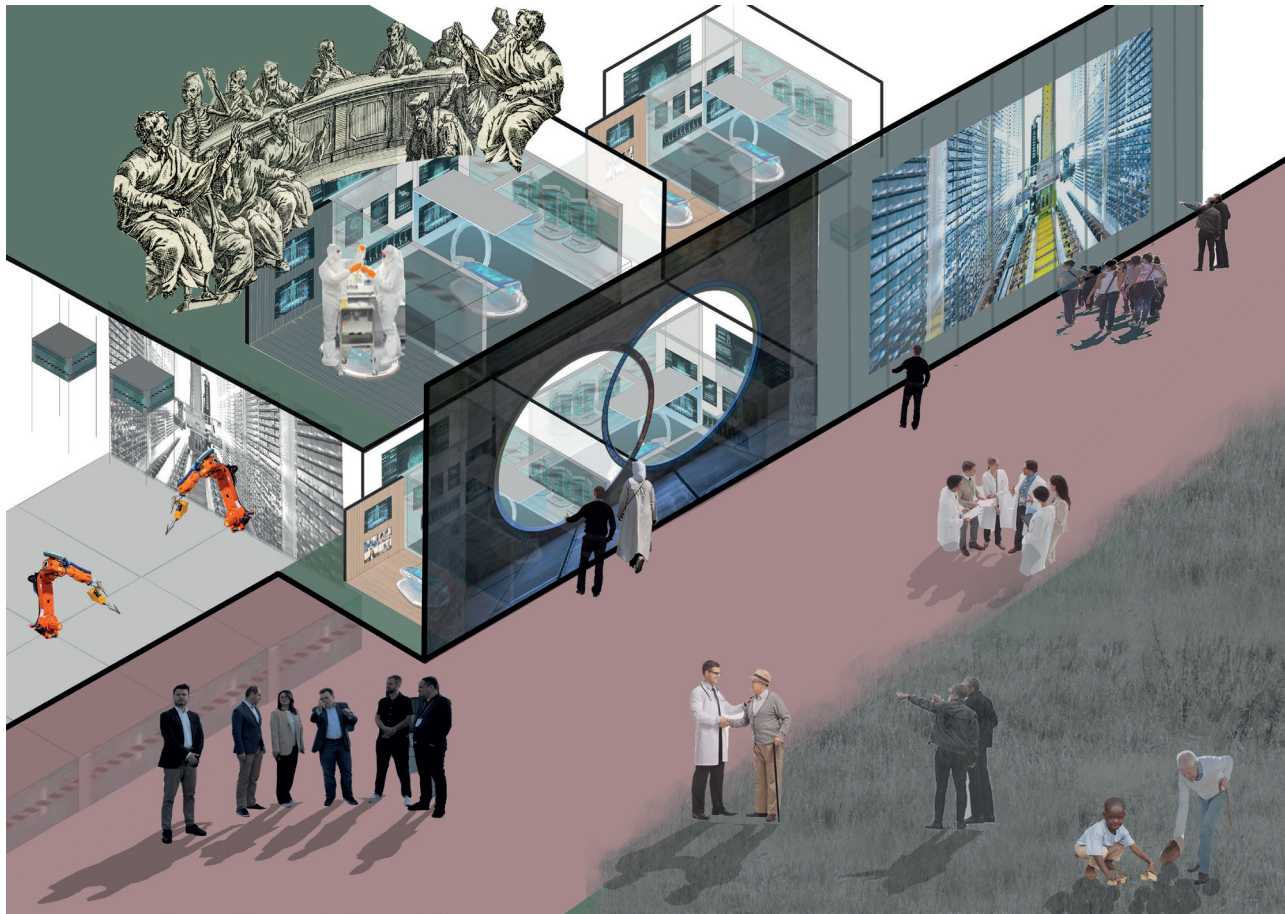
History of Regeneration and Regenerative medicine



Advancements in science and innovation

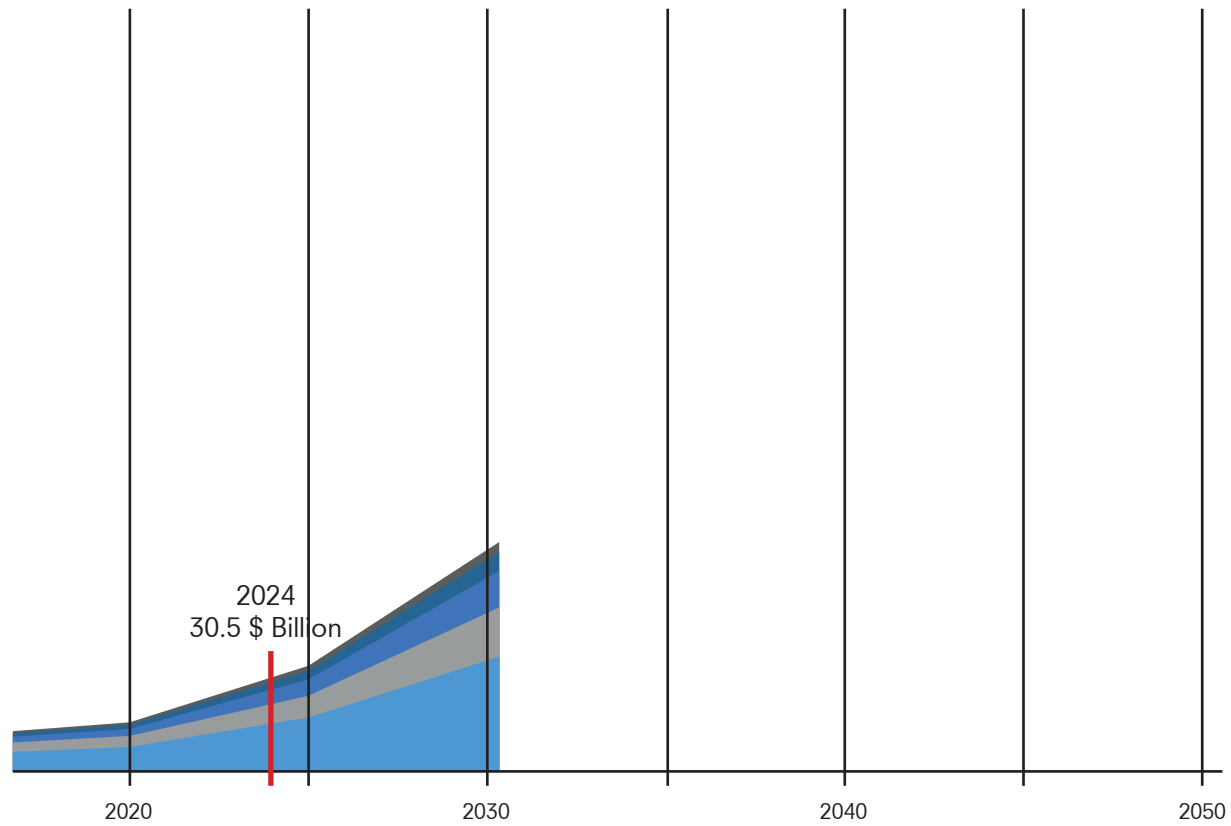


Advancements in science and innovation



Advancements in science and innovation

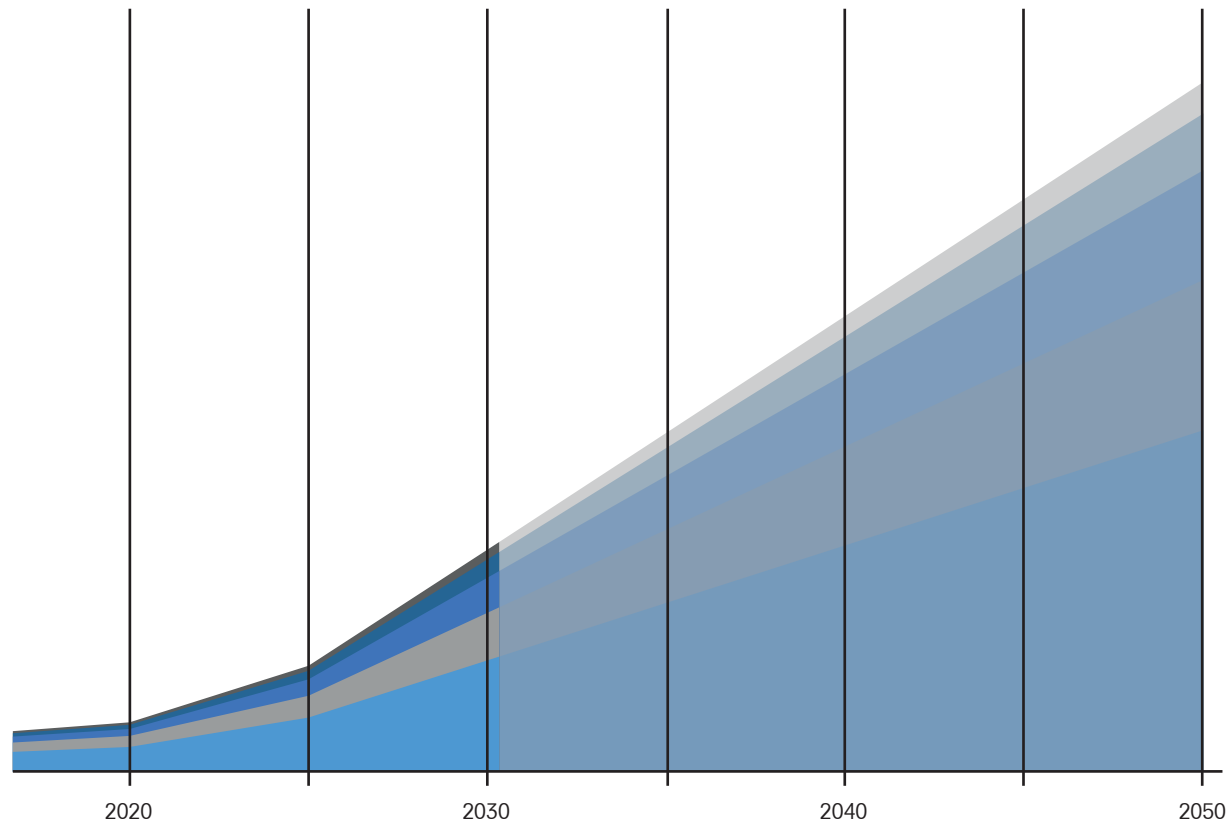
Compound annual growth rate of more than 18%



Source - Polaris market research analysis

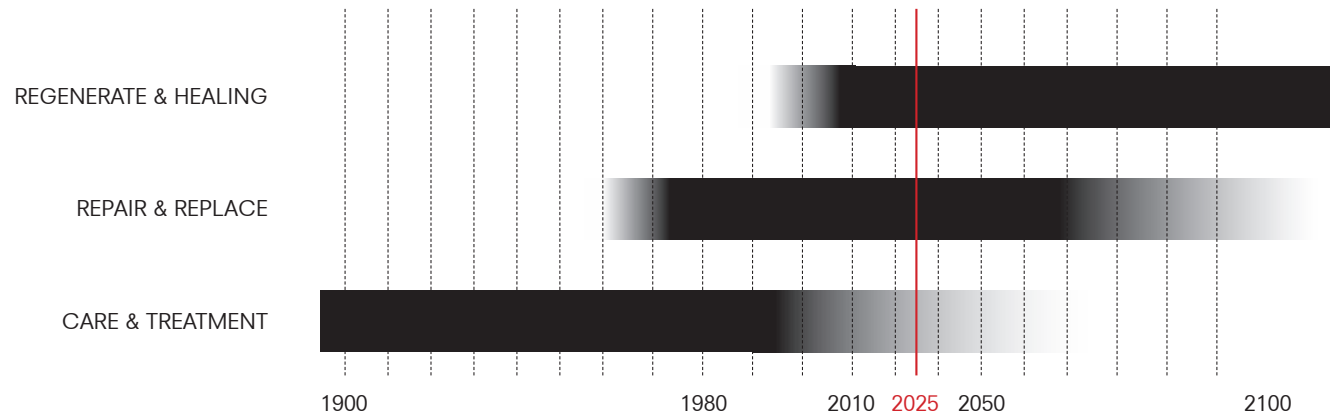
Current development

Projected Compound annual growth rate of more than 25%



Source - Polaris market research analysis

Future Development



Changing the role of Future hospital

From
bodies as entities of **Repair**
to
bodies as entities of **Healing and Regeneration**



Traditional **'One size fits all'** approach.
All patients with the same diagnosis receive
same treatment

Process of regeneration

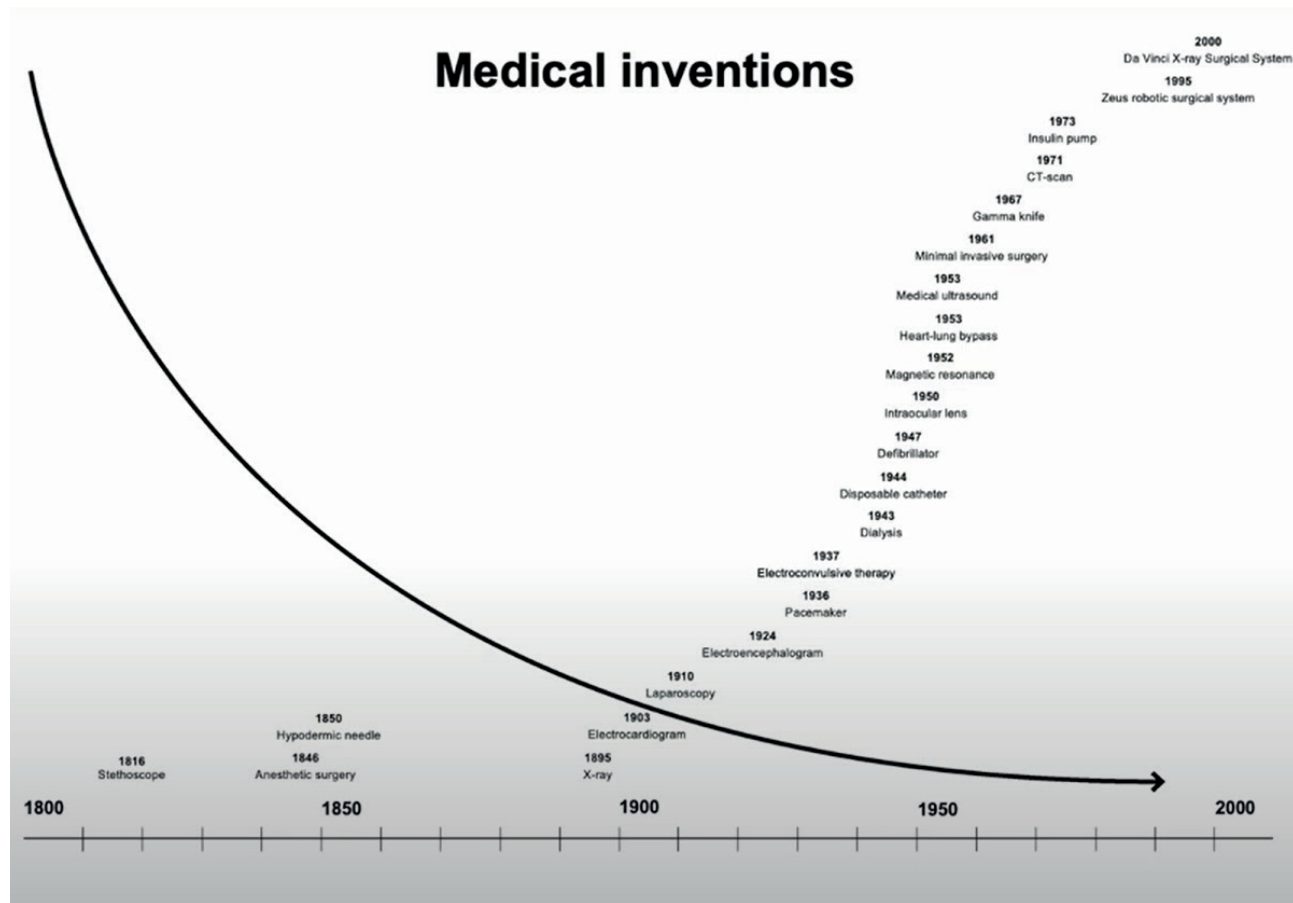


Traditional **'One size fits all'** approach.
All patients with the same diagnosis receive
same treatment

'Personalized medicine' approach
Treatment strategy based on patients
unique profile

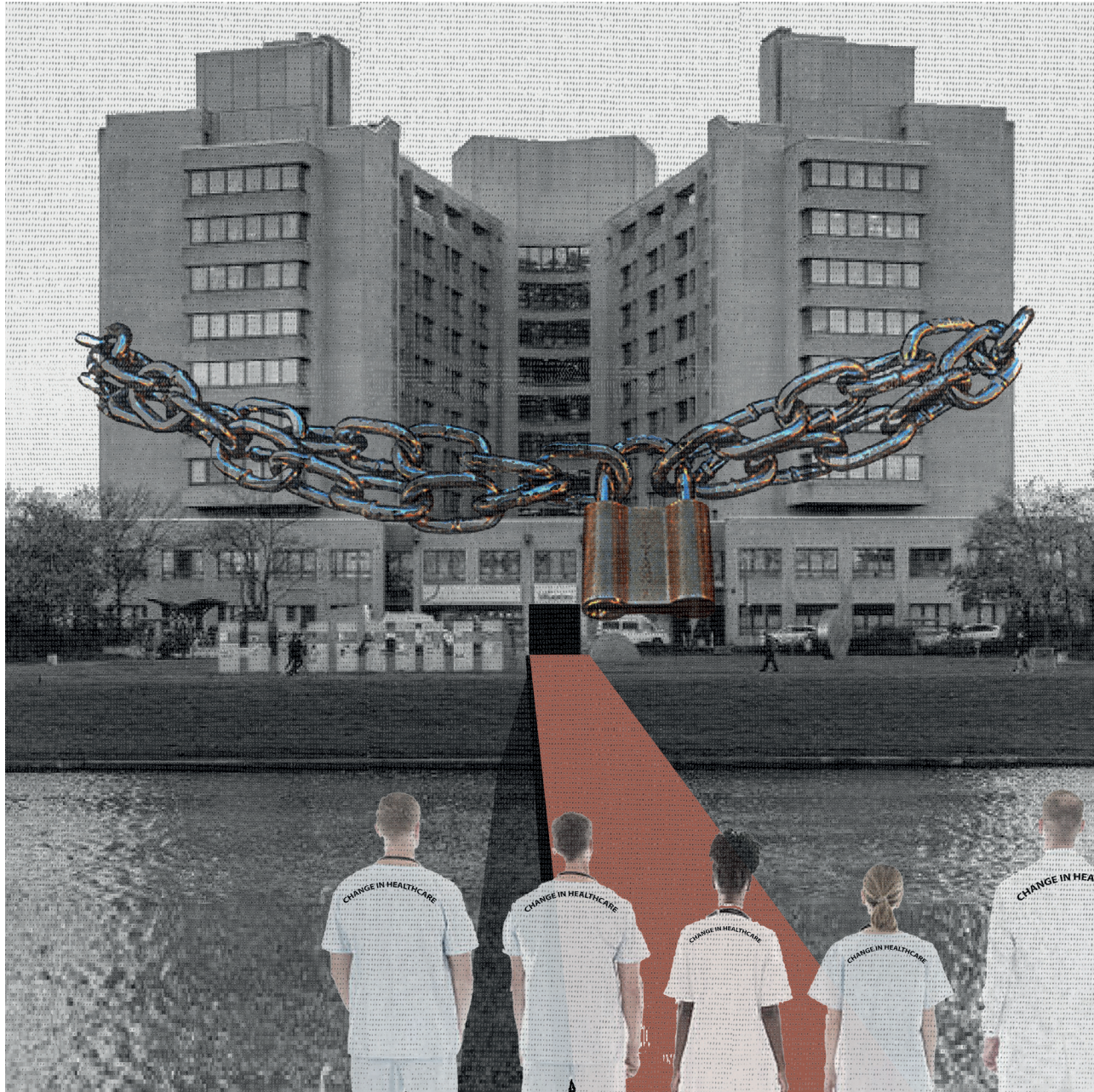
Paradigm shift

How will this affect the hospital?



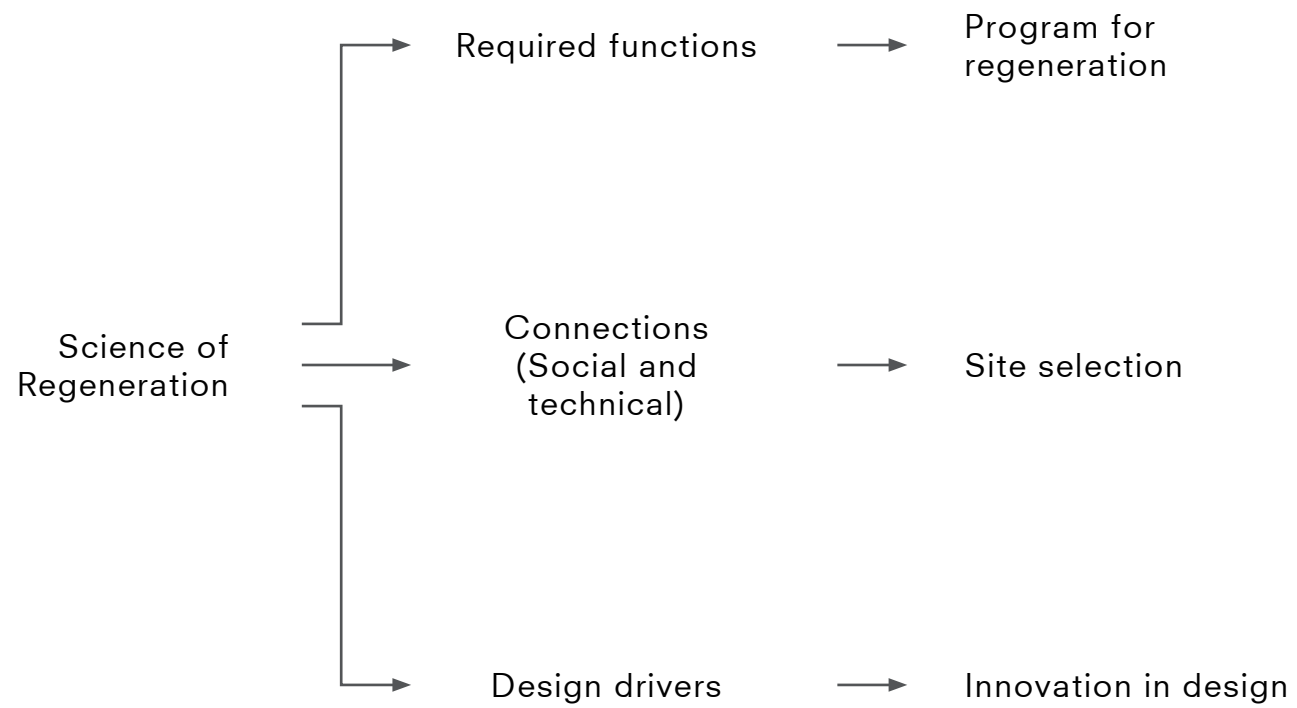
Source - OMA Hospital of the Future

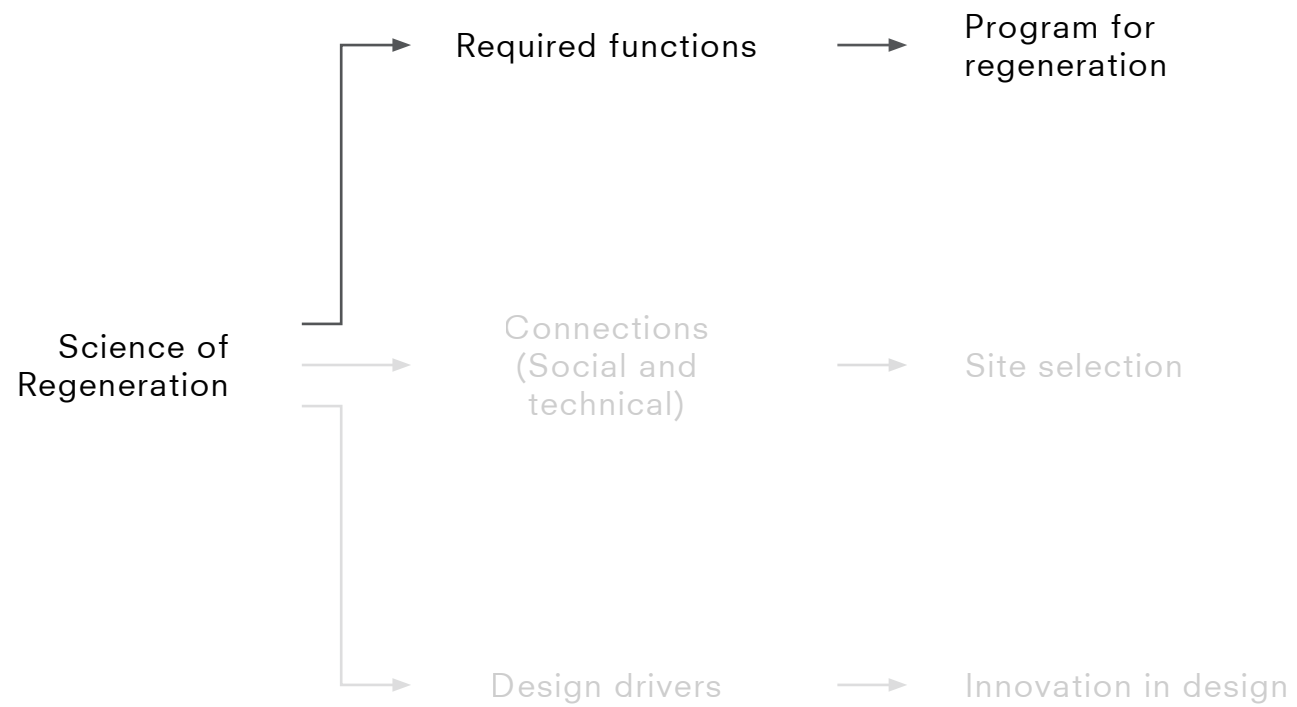
Rising innovations and decreasing hospital compatibility



No scope of change

How the design could actively participate in the
regeneration process rather than merely housing medical
functions?







precision medicine



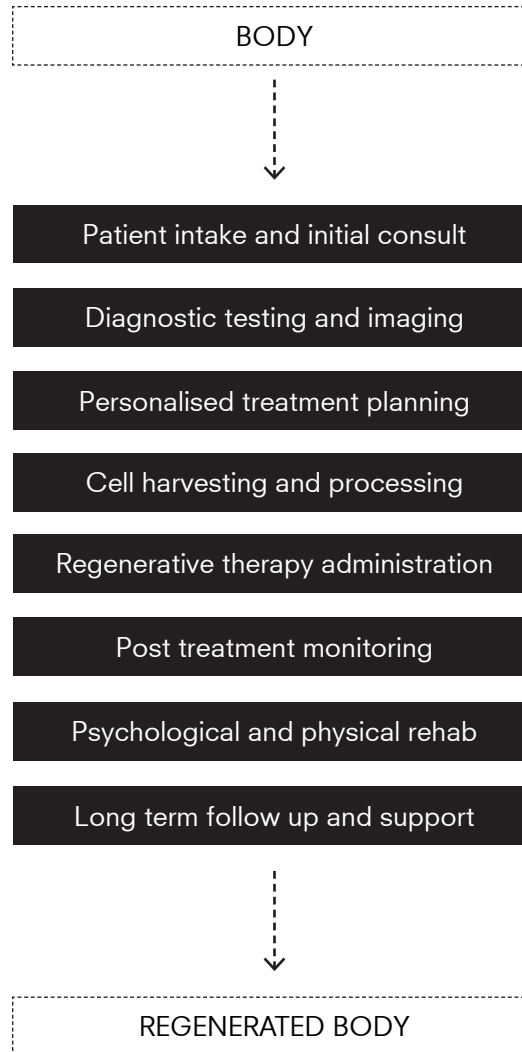
gene based therapies



tissues and organ
production

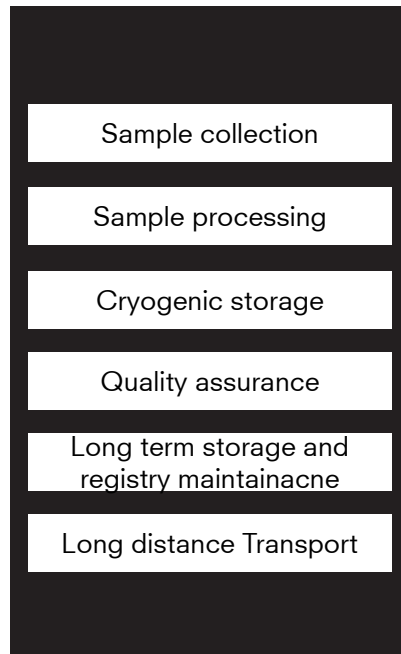
Process of regeneration

complex  projects

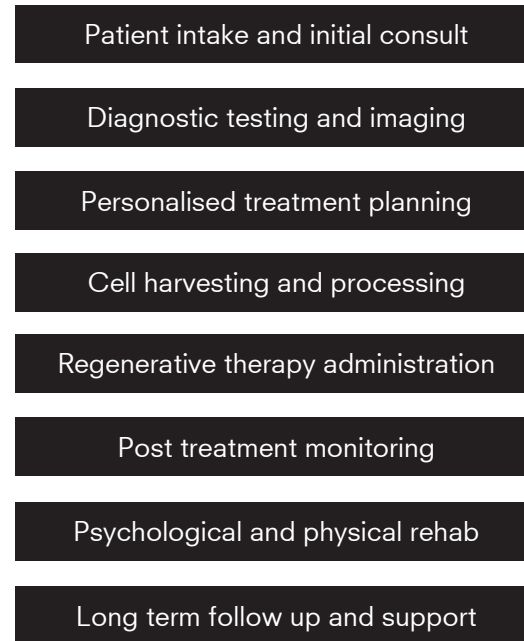


Process of regeneration

Bio banking
(storage)

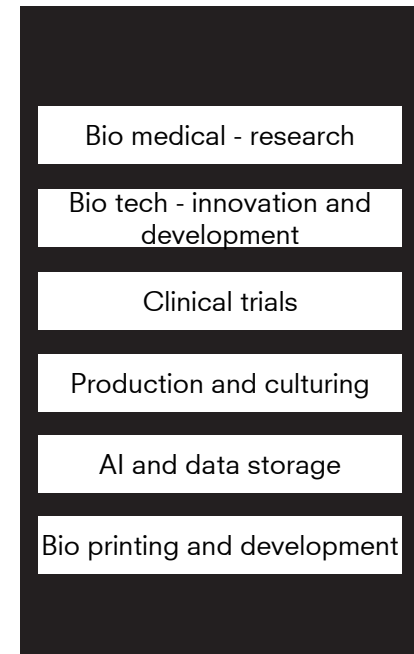


BODY



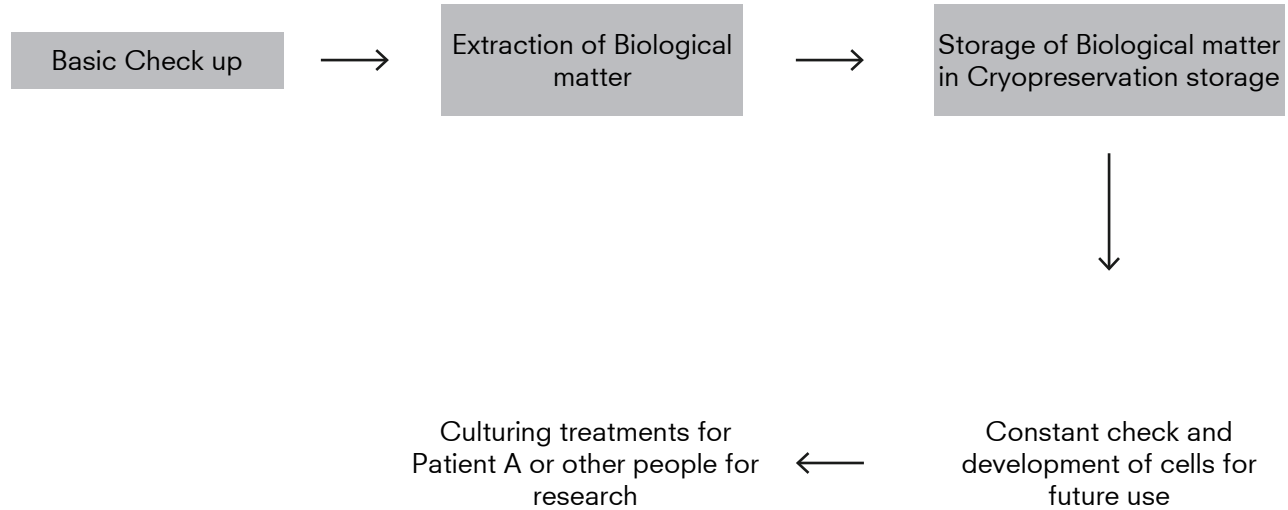
REGENERATED BODY

Bio production
(regenerate)



Process of regeneration

User A



Process of regeneration

User A



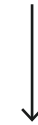
Basic Check up



Extraction of Biological matter



Storage of Biological matter in Cryopreservation storage



Constant check and development of cells for future use



Culturing treatments for Patient A or other people for research



The bio products are ready for administration

Walk in for gene based treatments

Recovery and rehab

User B



Cured and regenerated

User A (after few years)



Sick and injured

Process of regeneration

Not to forget in the spirit of ingenuity, regenerative medicine is a **collaborative effort.**

- Yannas IV. Tissue and Organ Regeneration in Adults. Springer, NY, USA (2001).

A successful regenerative medicine initiative requires the expert knowledge of **scientists, engineers, physicians, researchers and many others** in a multidisciplinary effort....

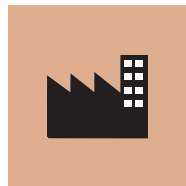
- Hutmacher, D. W. (2006) 'Regenerative medicine will impact, but not replace, the medical device industry', Expert Review of Medical Devices

The new ecosystem need to **co-locate** outpatient, inpatient, rehabilitation, wellness and prevention, ancillary support spaces, and industry (research and development) **all under one roof.**

Collaboration



Patient care



Production
Innovation

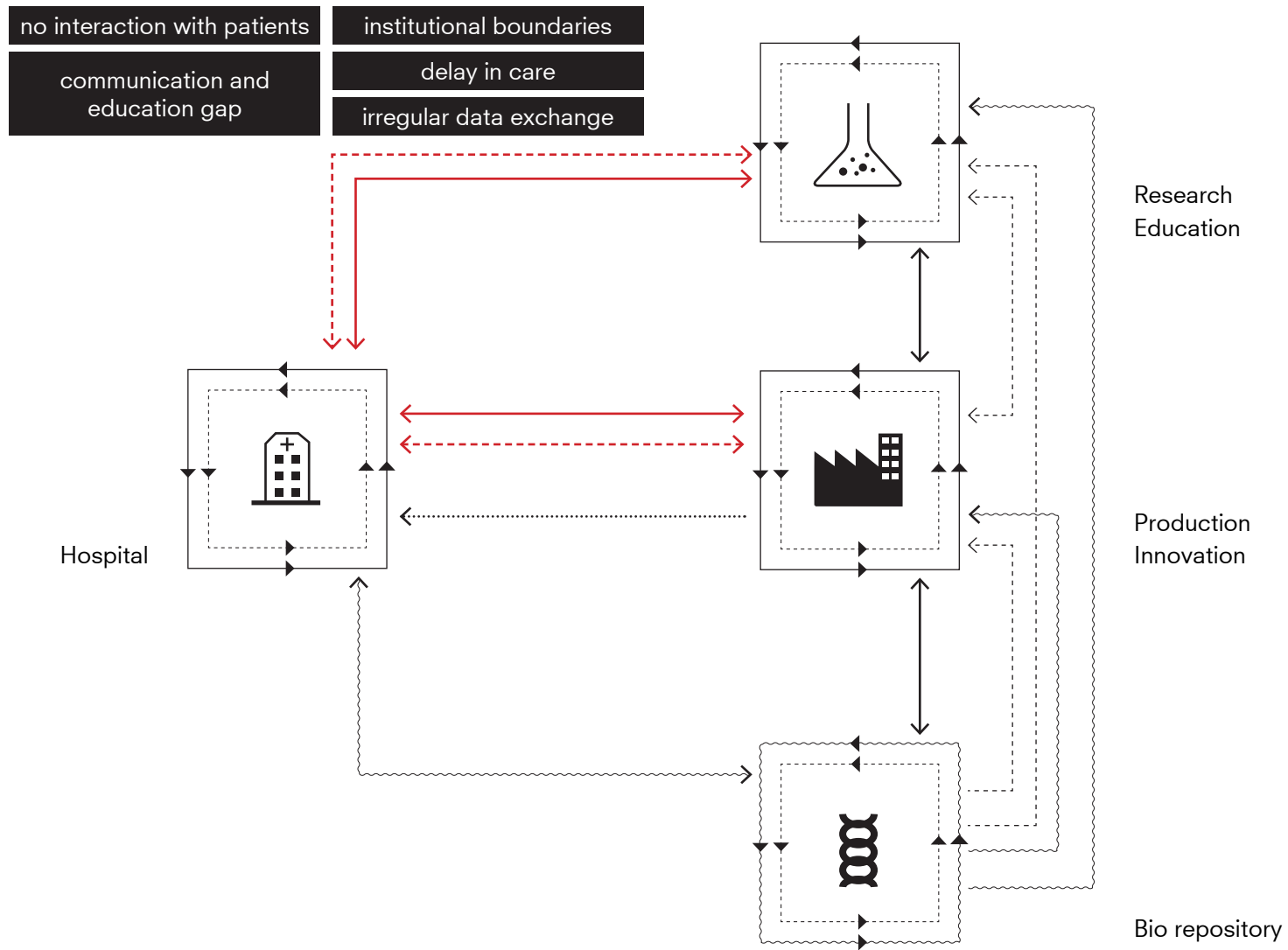


Bio repository

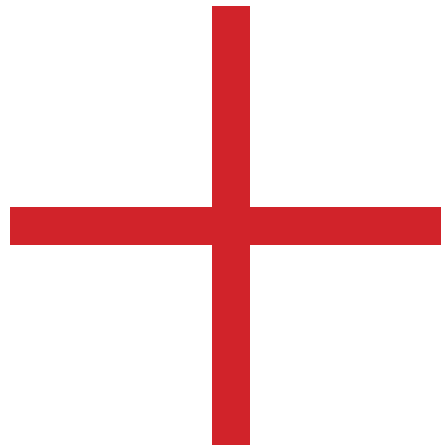


Research
Education

Collaboration



Current situation



Collaboration

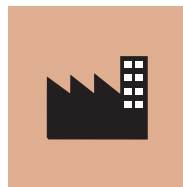
Patient care



Bio repository



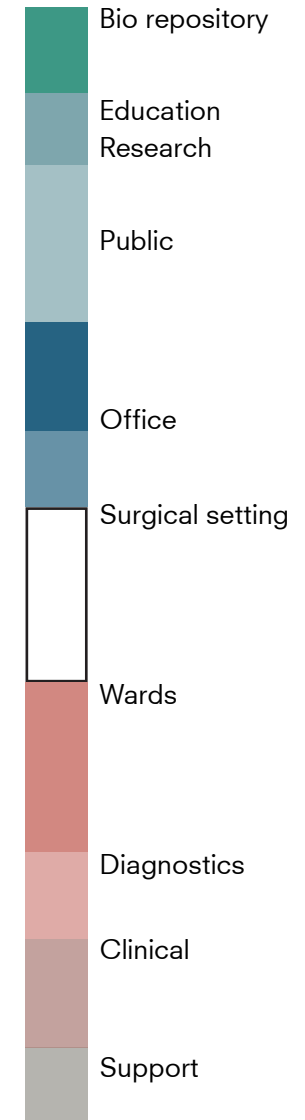
Production
Innovation



Research
Education



Collaboration



Gross floor area

50,000 sqm

Program



CENTER RE-GEN

Hospital and development center for
regenerative treatments

**“HOW DOES THE ARCHITECTURAL DESIGN
OF A HOSPITAL CHANGE TO SUPPORT
THE DEVELOPMENT AND DELIVERY OF
REGENERATIVE TREATMENTS WHILE
ENHANCING PATIENT EXPERIENCE?”**

Main research question

“HOW DOES THE ARCHITECTURAL DESIGN
OF A HOSPITAL CHANGE TO SUPPORT
THE **DEVELOPMENT AND DELIVERY** OF
REGENERATIVE TREATMENTS WHILE
ENHANCING **PATIENT EXPERIENCE?**”

1. Collaboration of different programs and its arrangements
2. Creating an environment that provides optimal care and functionality

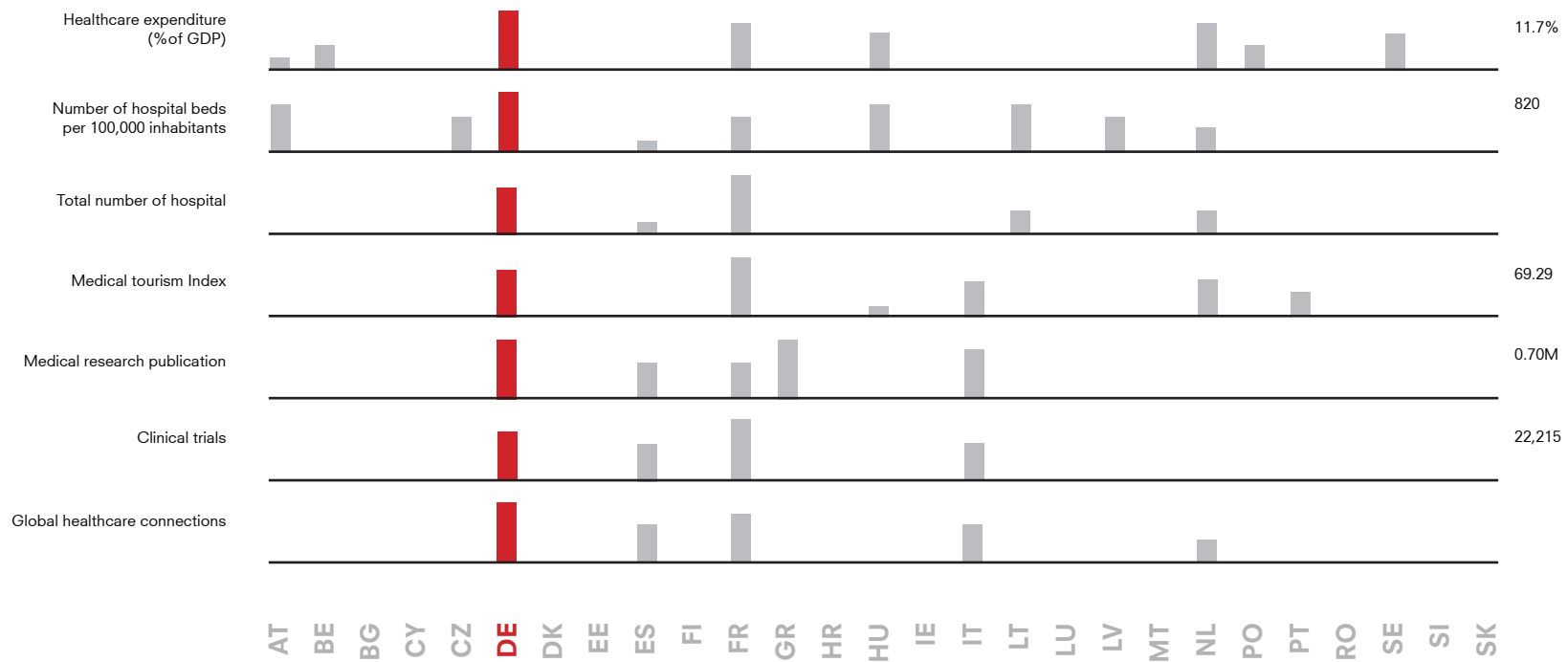
Sub questions

Who would support this change?

A minimalist world map showing the outlines of continents. A small red dot is placed in central Europe, specifically over Germany. A black rectangular box with white text is overlaid on the left side of the map, partially covering North America and Europe.

**GERMANY AS THE GLOBAL LEADER OF
HEALTHCARE INDUSTRY AND EDUCATION
WITH BERLIN AS ITS MAIN HOTSPOT**

Global Leaders



Level of German Healthcare



Berlin & Regenerative medicine



2006

2009

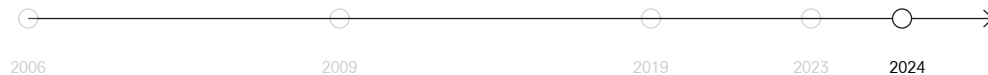
2019

2023

2024

Berlin & Regenerative medicine

Berlin Center for Gene and Cell Therapies



Berlin & Regenerative medicine

Main stakeholders
Research and Operations



Stakeholders

Main stakeholders
Research and Operations



Secondary stakeholders
Research



Administration



Global supply chain and regulations



Stakeholders

One time solution to Chronic
diseases and old age problems

Understanding the healing power of
Human body

Human and technology symbiosis
AI driven systems

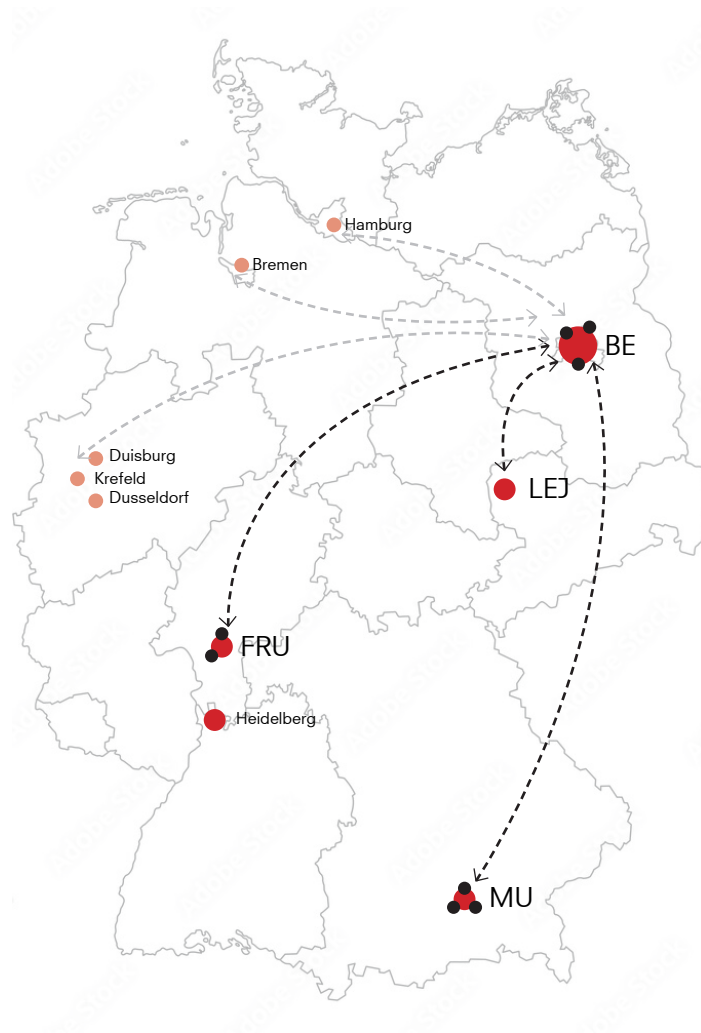
Realising the potential of
Collaborations

A holistic approach to health and well
being - more patient centric

Focus



International connections

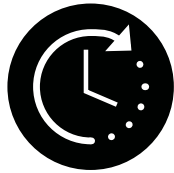


National connections

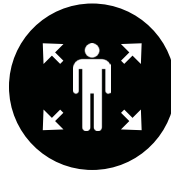
Where will it be located?



Where in Berlin?



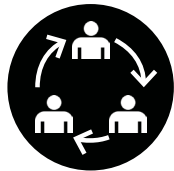
Travel time 2.0



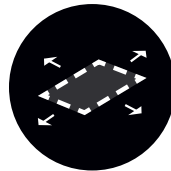
Reachability 2.0



Travel experience



Collaborative nexus



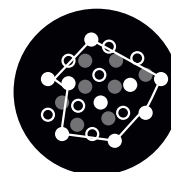
Expandability



Healing landscapes



Prominent location

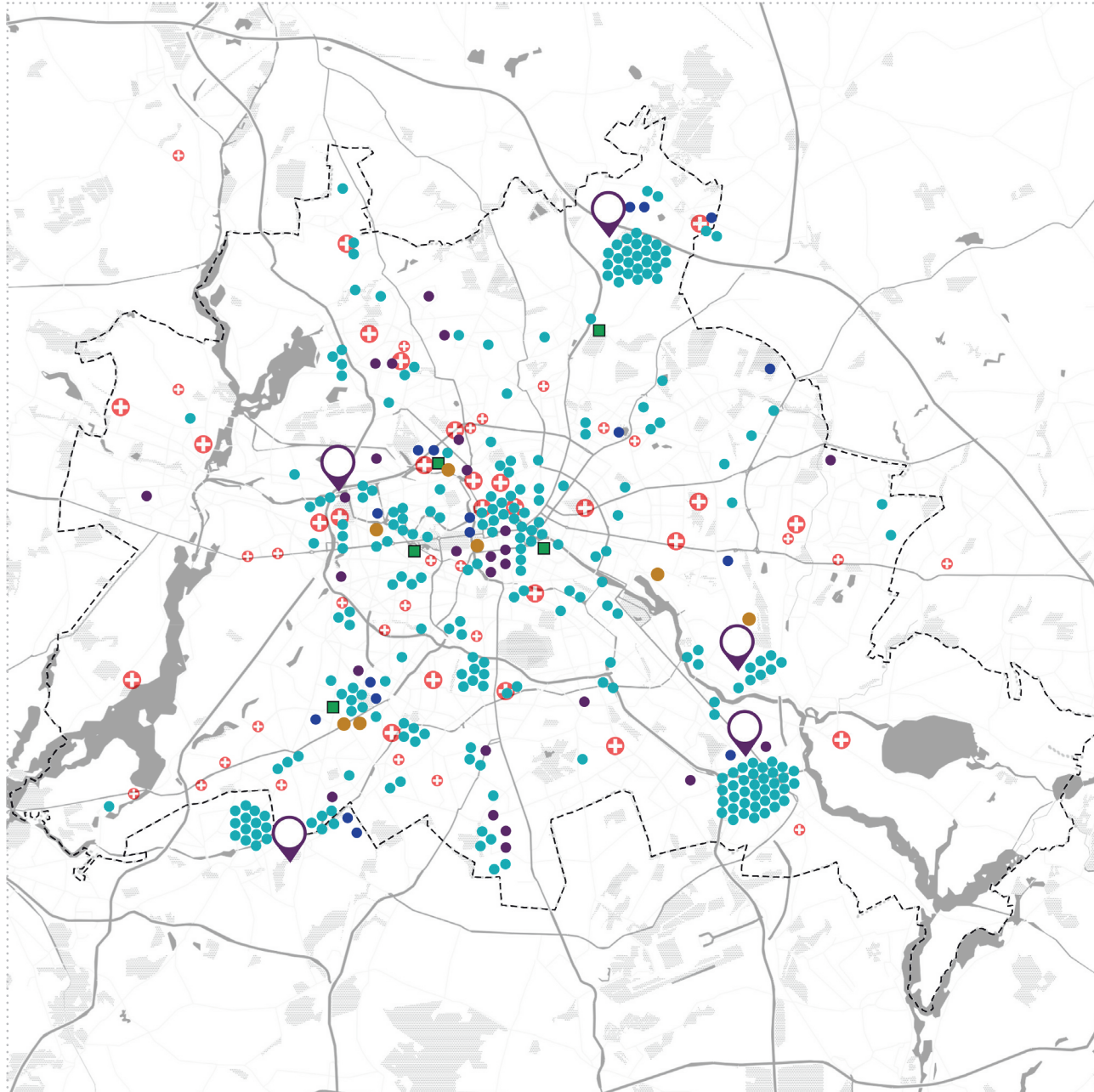


Safety



Proximity to water

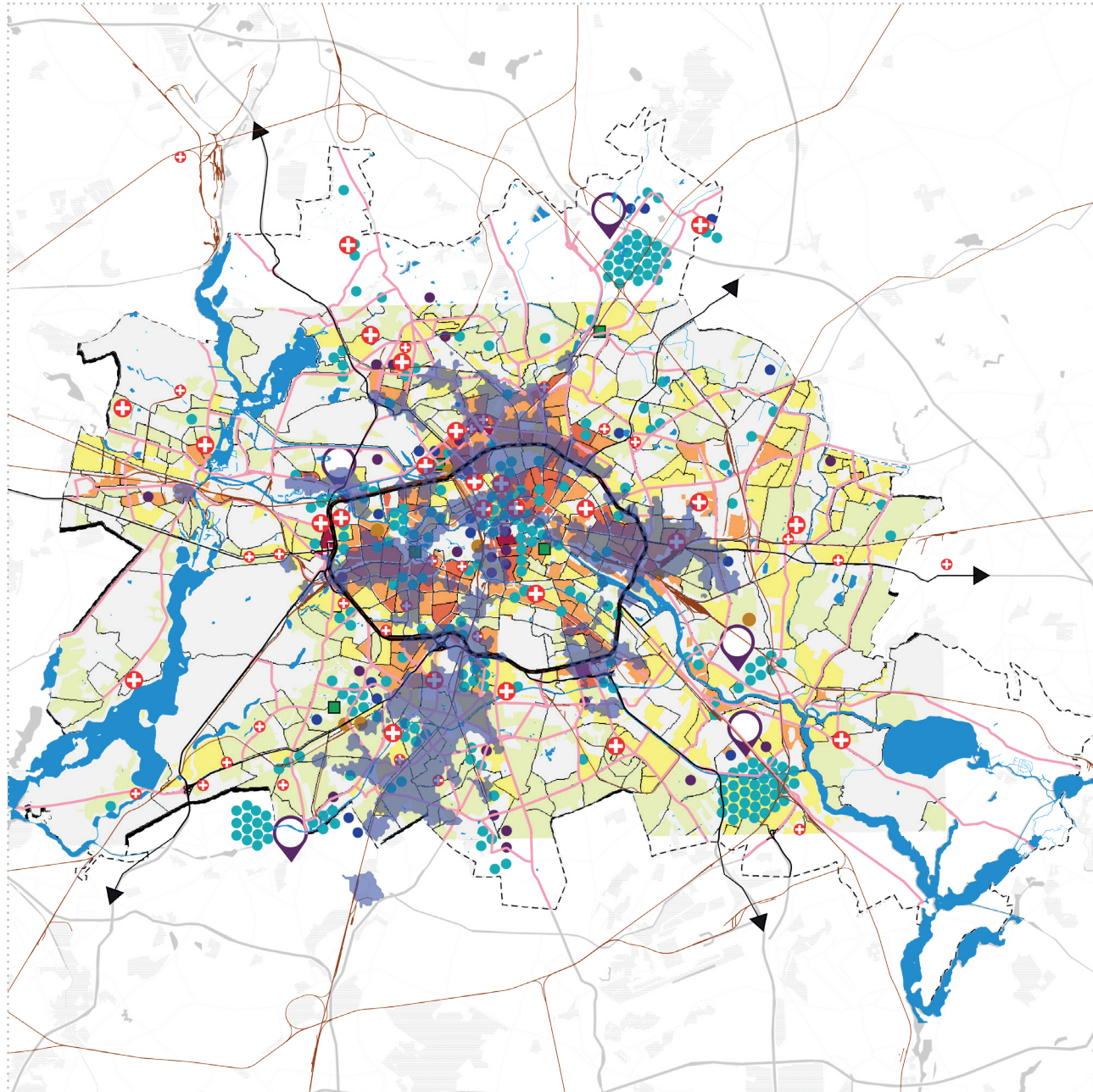
Site parameters



Bio tech cluster and Hospital Cluster

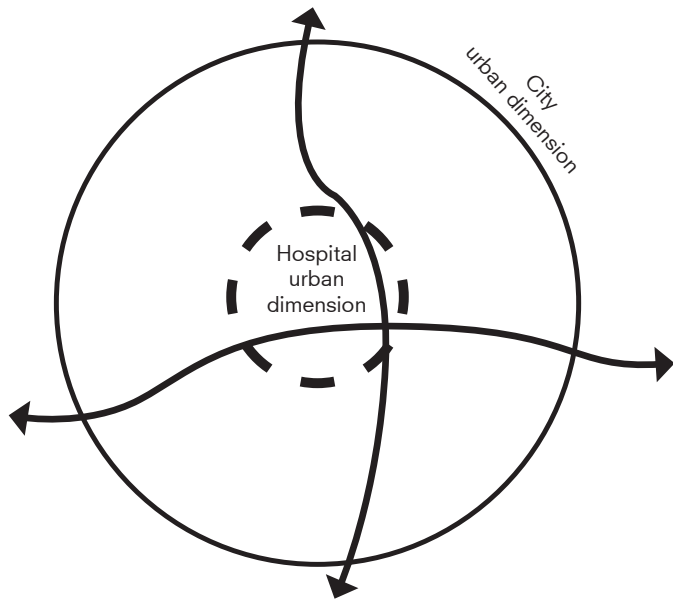


Blue and Green

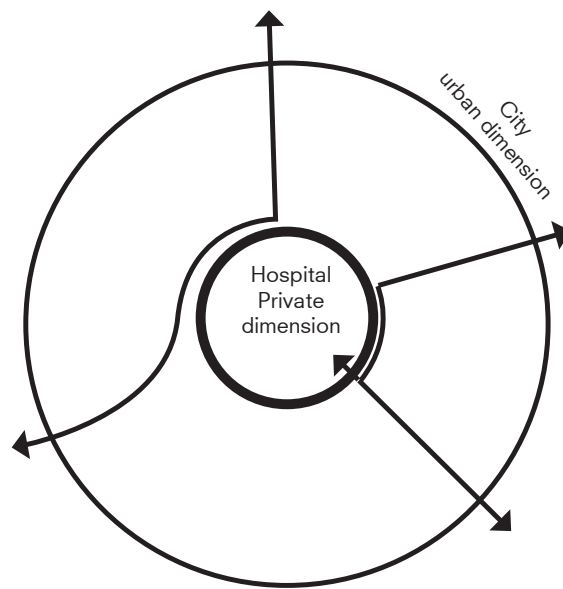
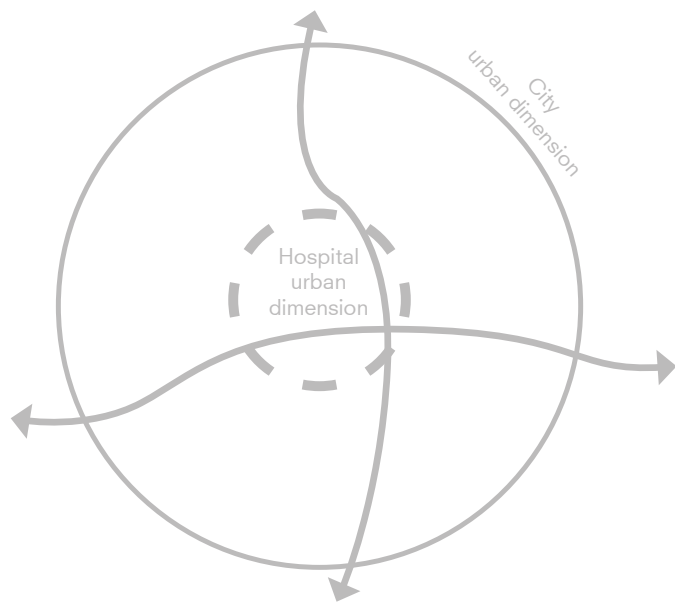


Consolidated

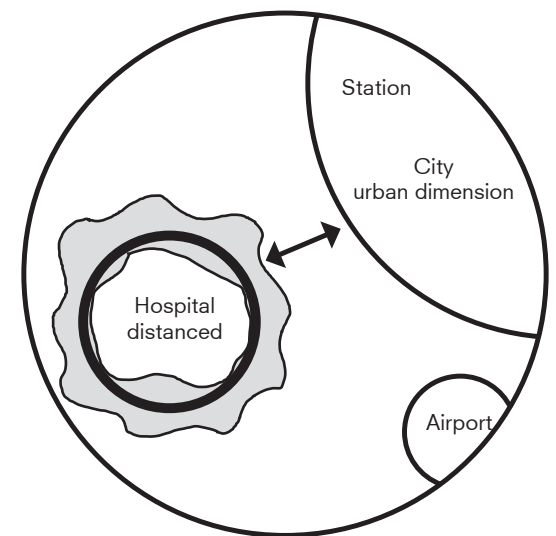
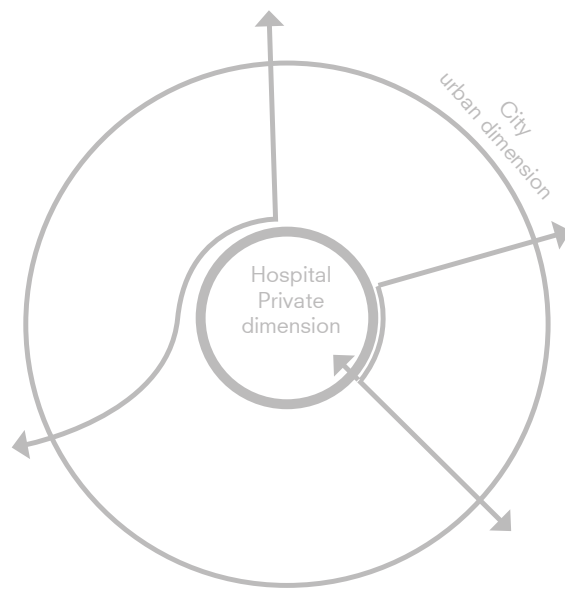
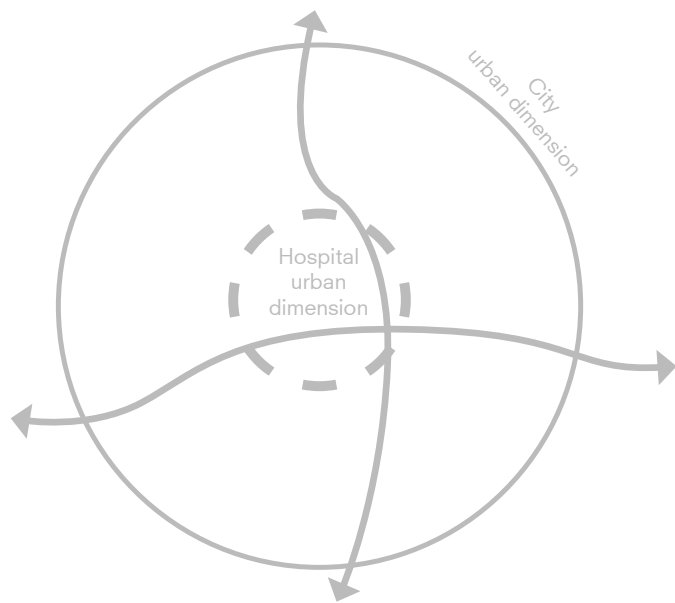
complex  projects



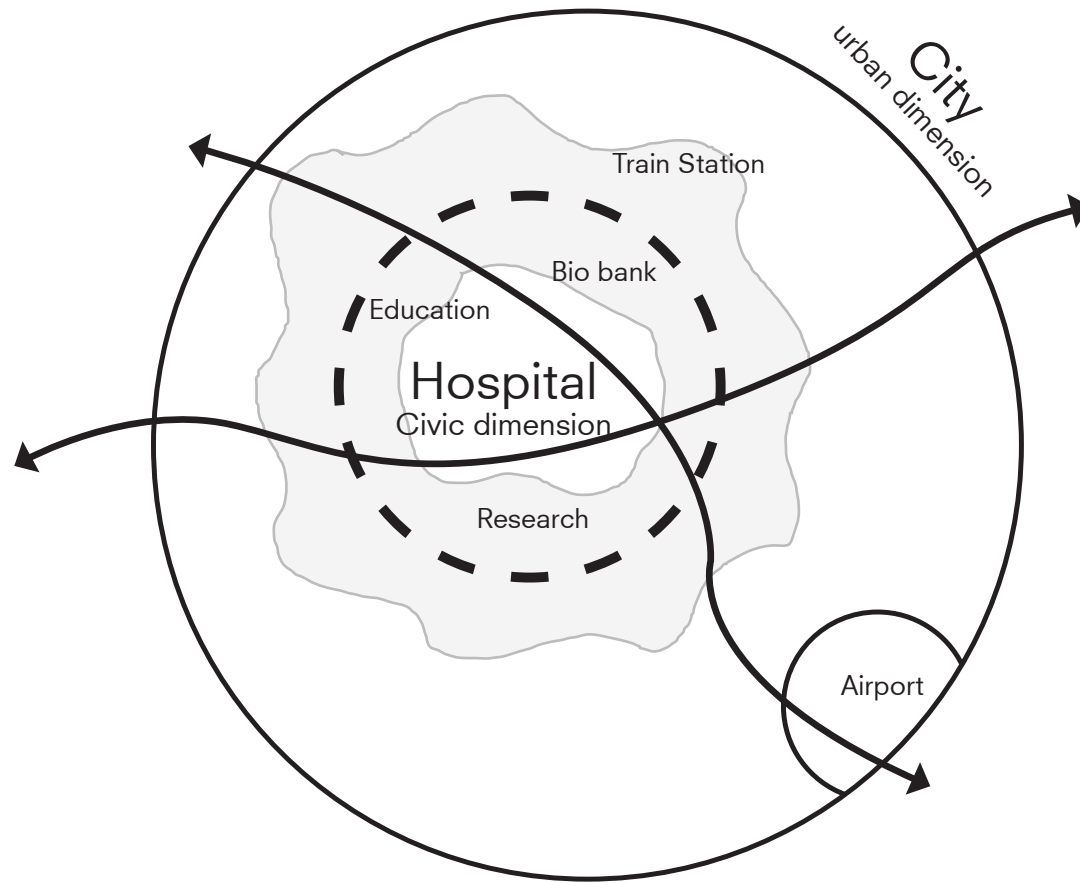
Connection to the City



Connection to the City



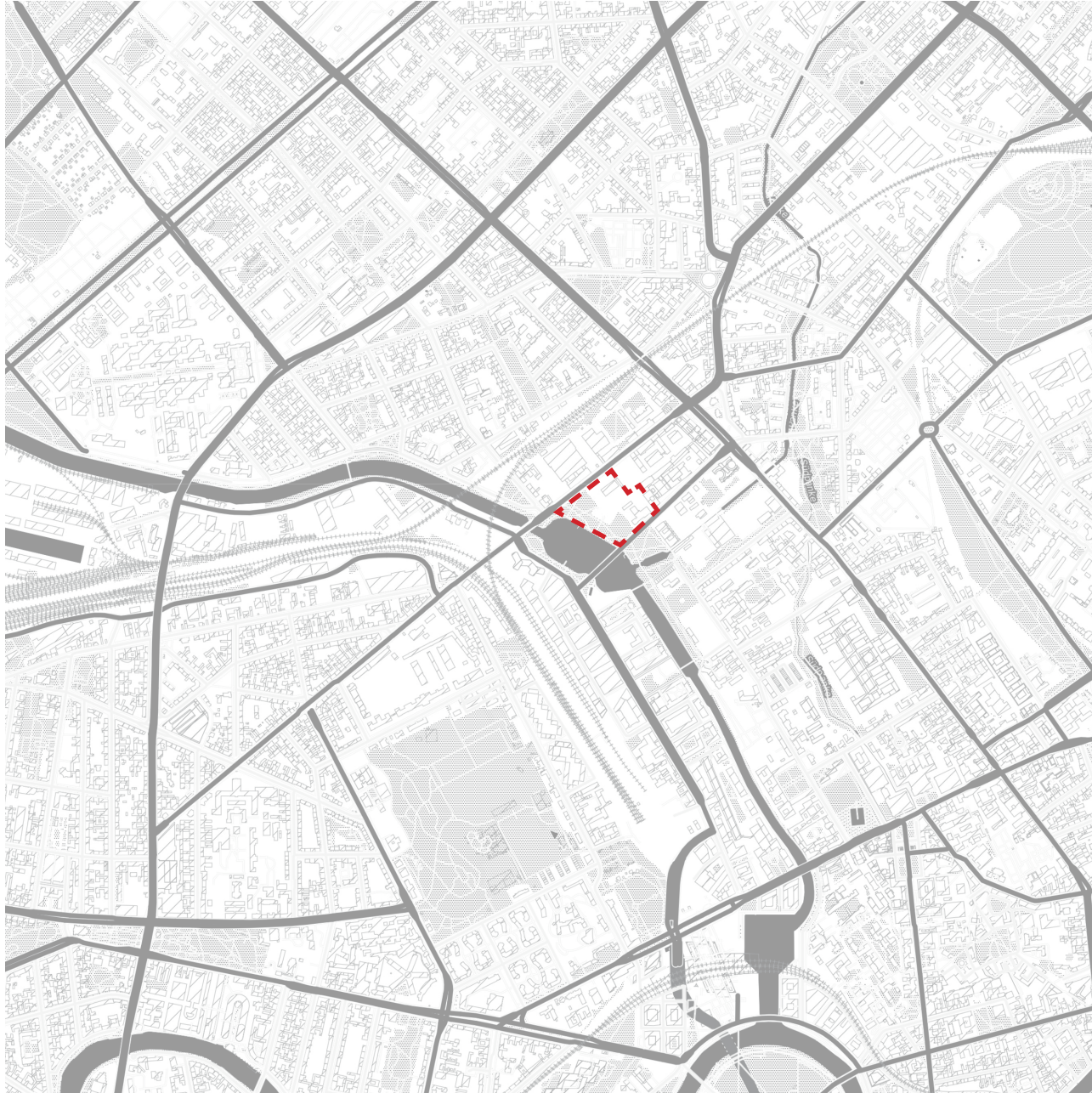
Connection to the City



Proposed urban connection



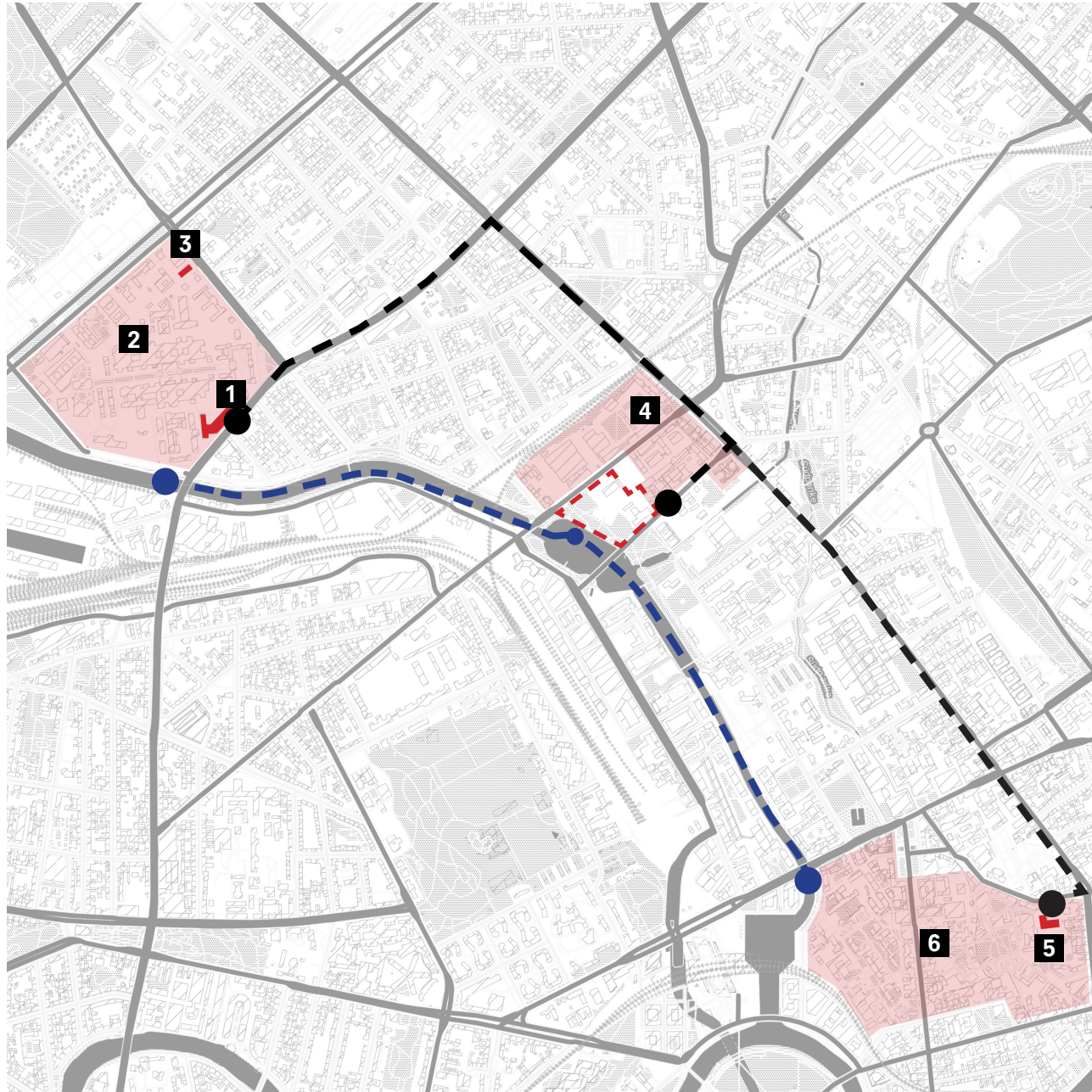
Focus zone



Nordhafen

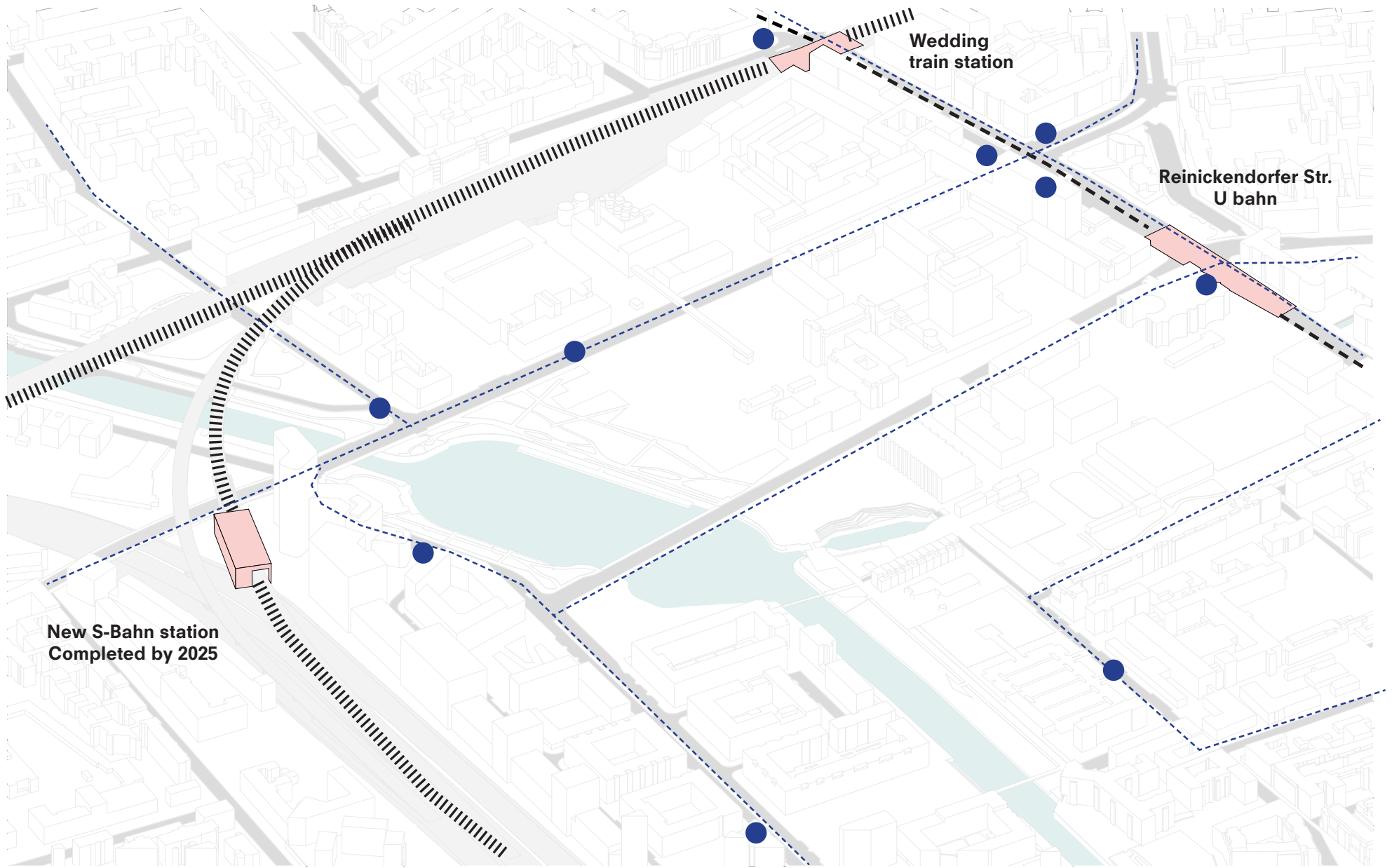


Nordhafen



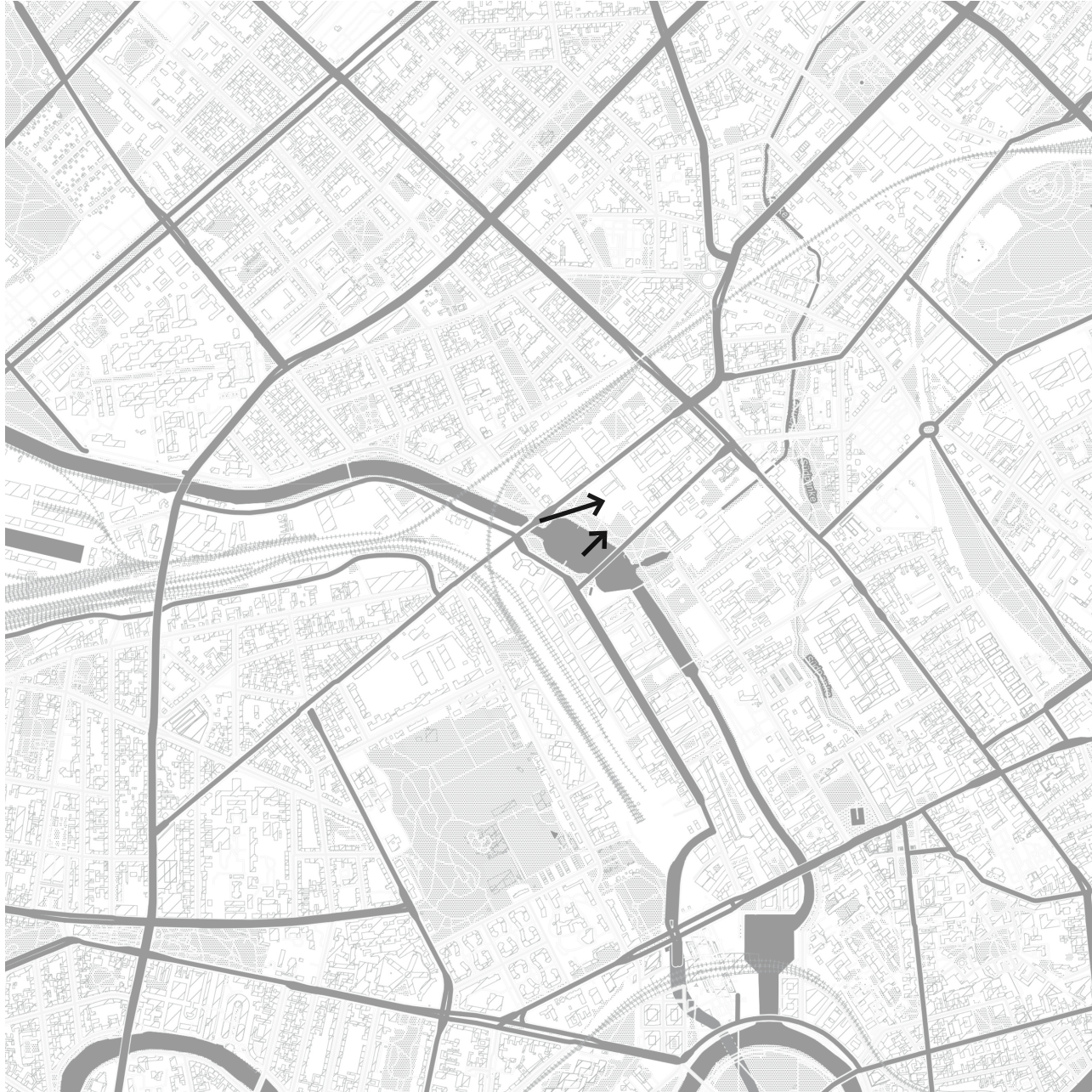
- 1** BIH center for regenerative medicine
- 2** Charite virchiow campus
- 3** Center for advanced therapies
- 4** Bayer Pharma
- 5** Max delbruck center
- 6** Charite campus Mitte

Regenerative corridor

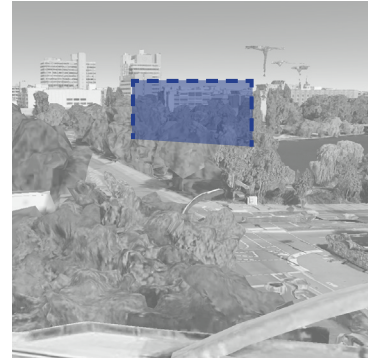


Bus station

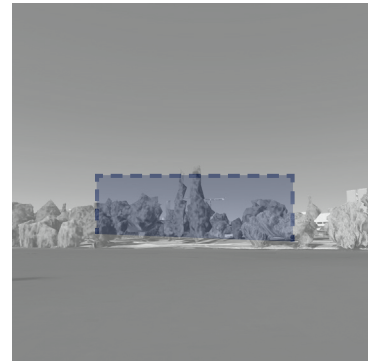
Public transport connectivity



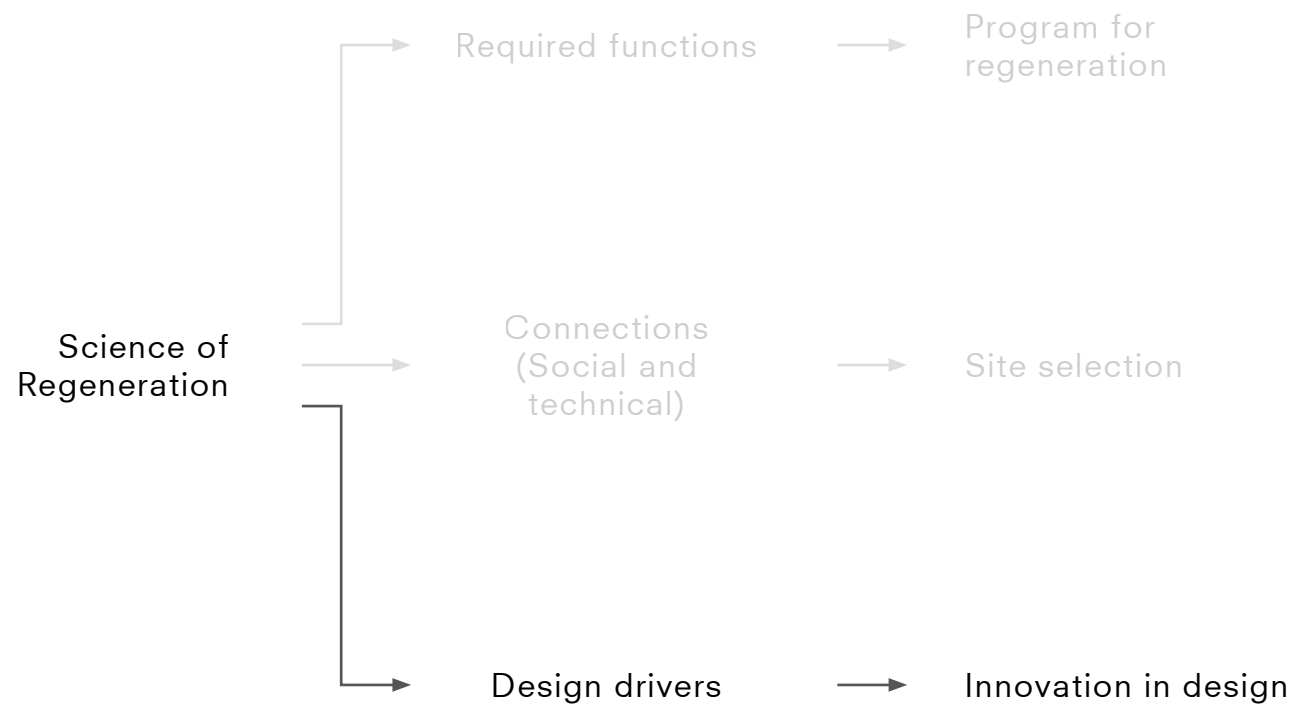
Visibility



View from train line



View from water



Enhanced
program

Healing

Enhance
recovery

Overall well
being

Science of
regeneration

Social
relations

Rapidly
evolving
needs

Personalised

Design drivers

Collaboration

Nature
connection

Encouraging
mobility

Human
centric

Design
drivers

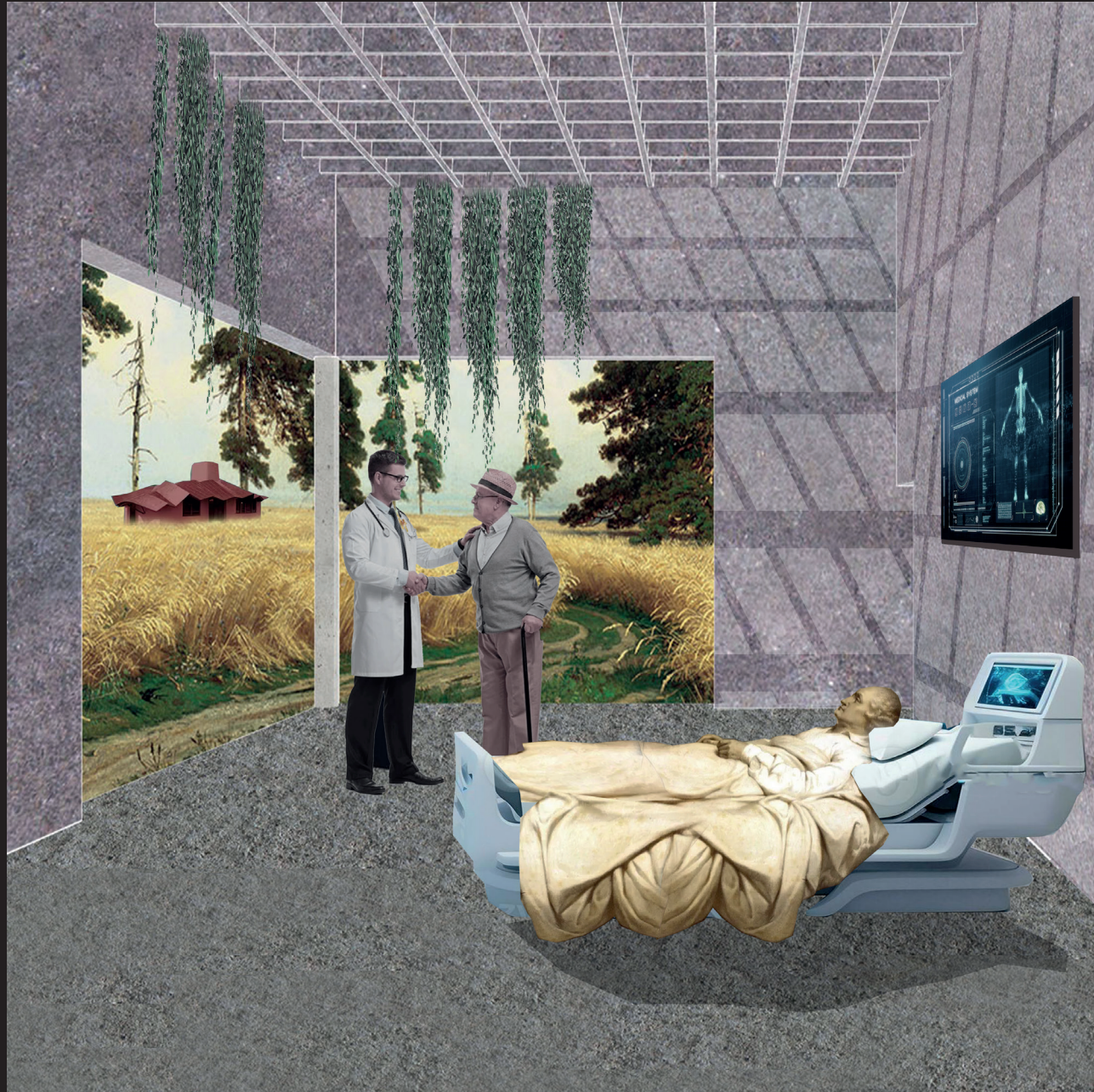
Part of the
city

Adaptable &
flexible

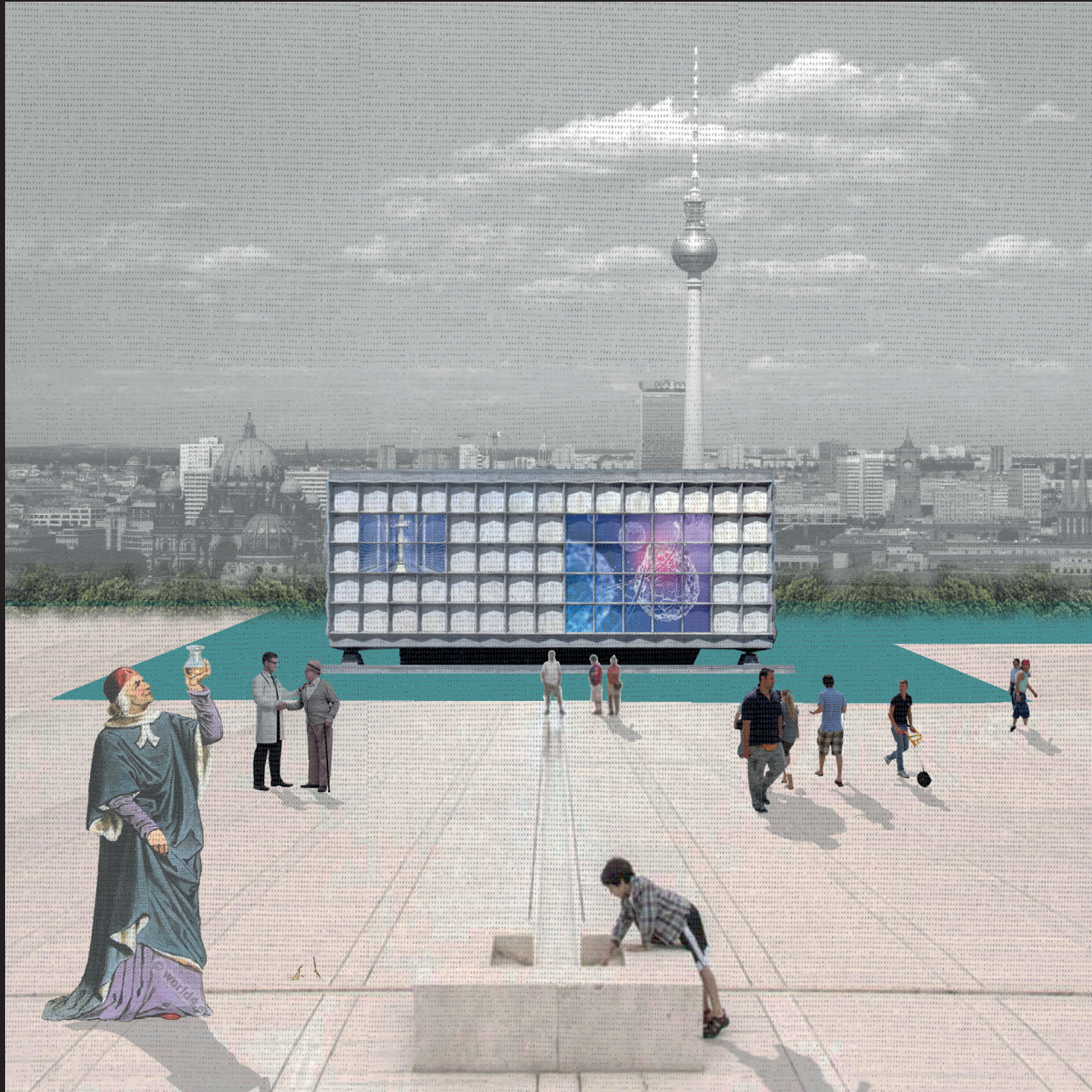
Fast &
optimised

Transparency

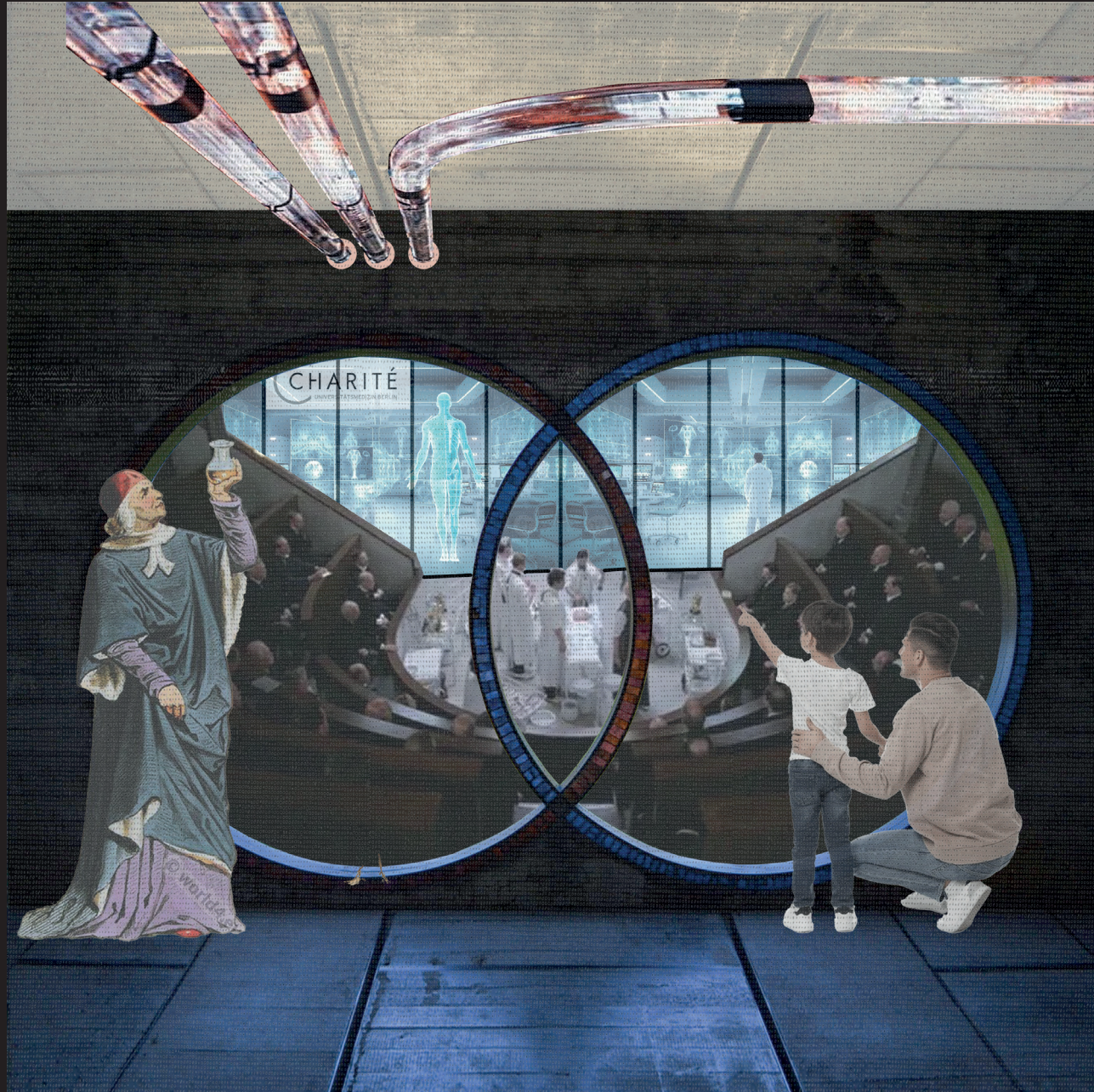
Design drivers



Patient room

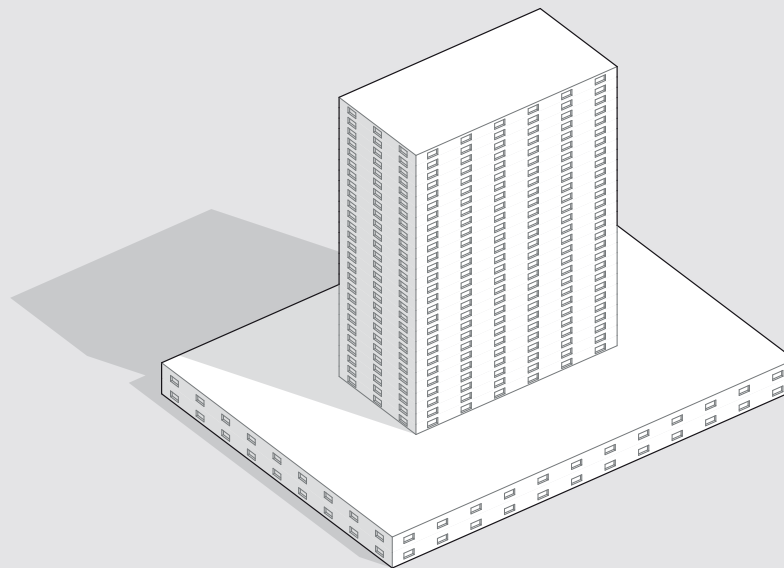


A public space

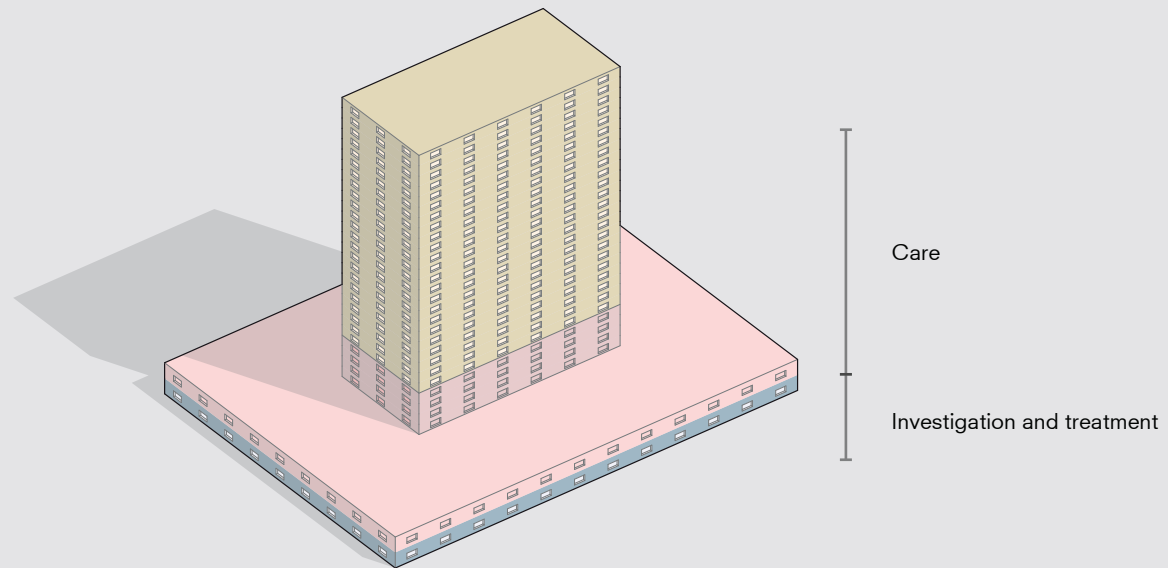


Public display - transparency and learning

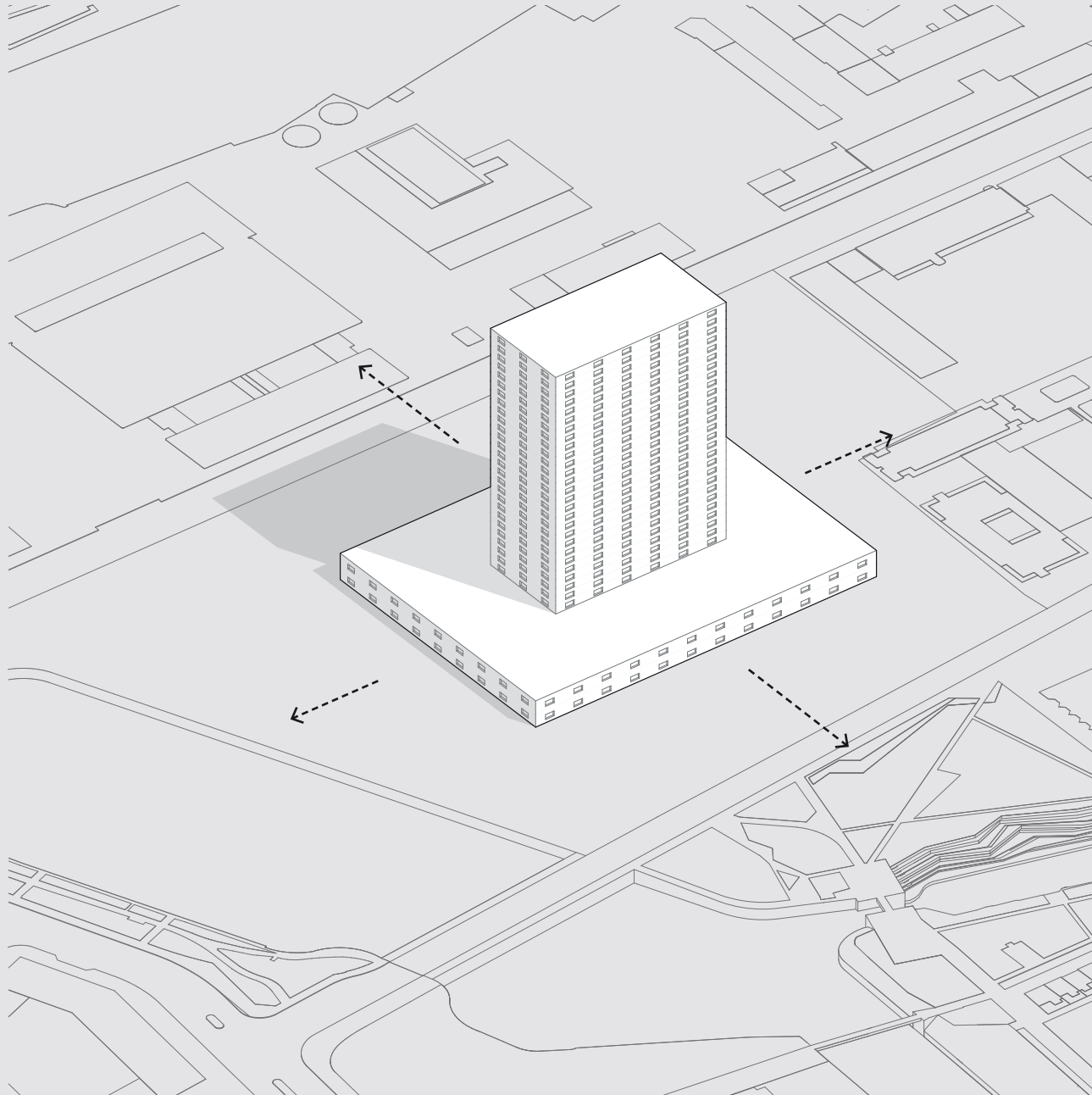
Impact on the hospital architecture



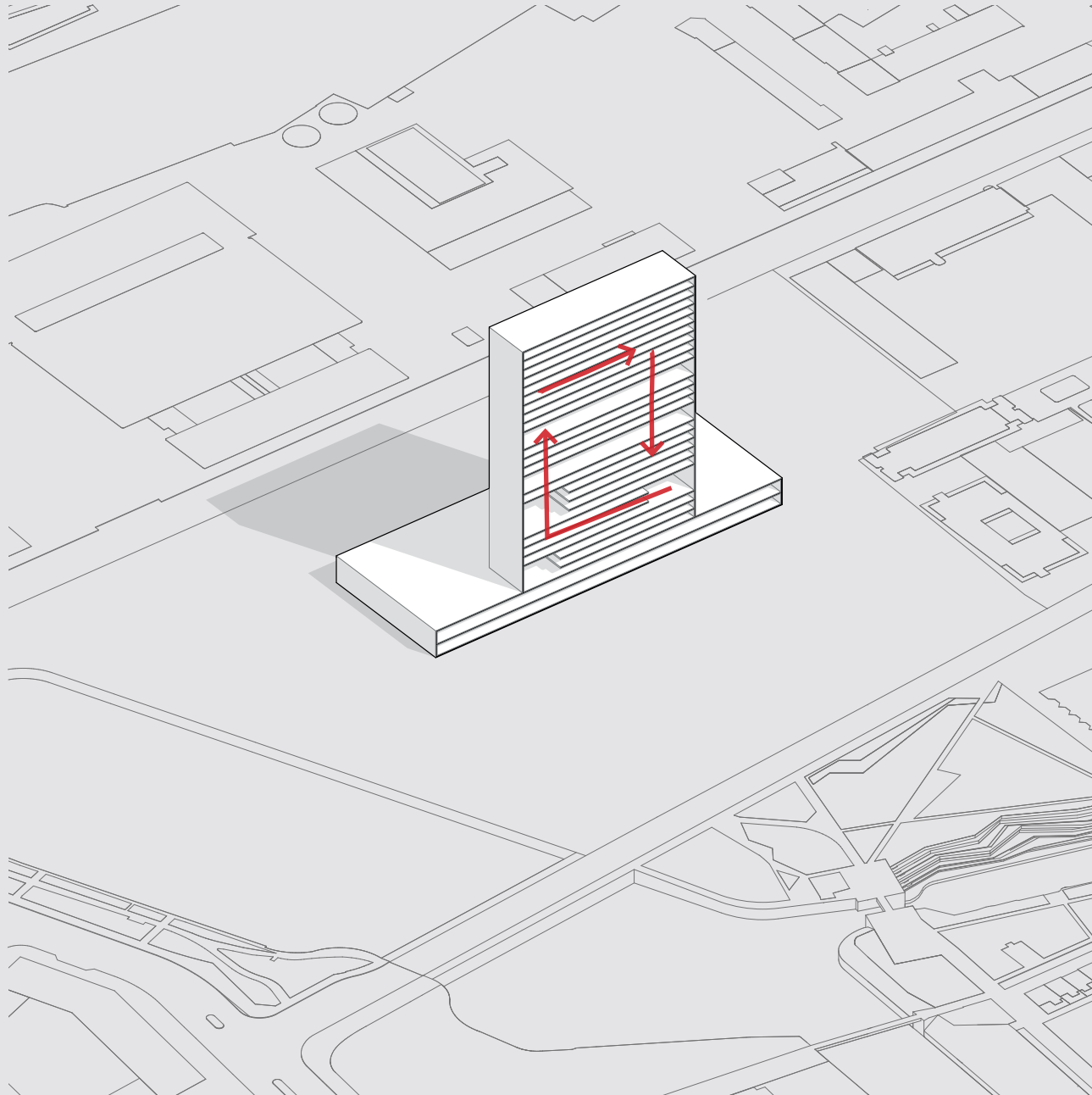
Existing typology - Mega building (Podium - Tower)



Existing typology - Mega building (Podium - Tower)



Existing typology - Mega building (Podium - Tower)

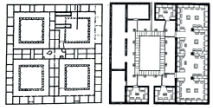


Existing typology - Mega building (Podium - Tower)

katagogion

"a hotel for visitors"

katagogion in Epidauron,
4th century BCE

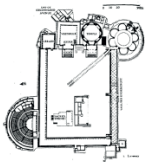


ANCIENT GREECE

asclepeion

healing temple, sacred to the god
Asclepius, the Greek god of medicine

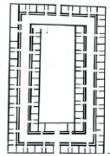
the Asclepeion at Pergamon



valetudinarium

military barracks hospital

Roman valetudinarium

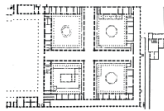


ANCIENT ROME

city hospital

air and sunlight guide the plan dis-
position

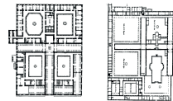
Ospedale Maggiore in Milan, 1456



the cross

big hospitals with smaller wings

Hospital de los Reyes in Santiago de Compostela, 1501
Hospital de la Sangre in Seville, 1546



15TH CENTURY

panopticum

new interpretation of patient-ori-
ented architecture

Ospedale Maggiore in Milan, 1456

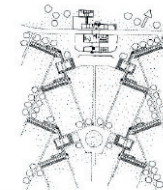


18TH CENTURY

pavillion

air and sunlight guide the plan dis-
position

Sanatorium Sonnestral, 1928

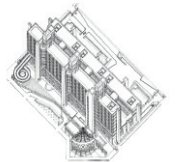


1920S

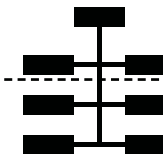
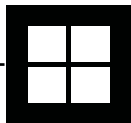
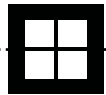
megastructure

big hospitals with smaller wings

Woodhul hospital NYC, 1968



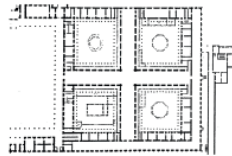
1970S



Evolution of hospital architecture

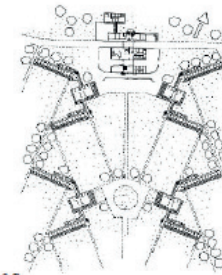
city hospital
 air and sunlight guide the plan disposition

Ospedale Maggiore in Milan, 1456

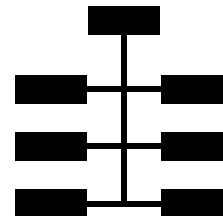
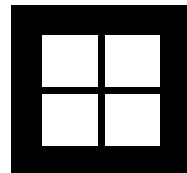


pavillion
 air and sunlight guide the plan disposition

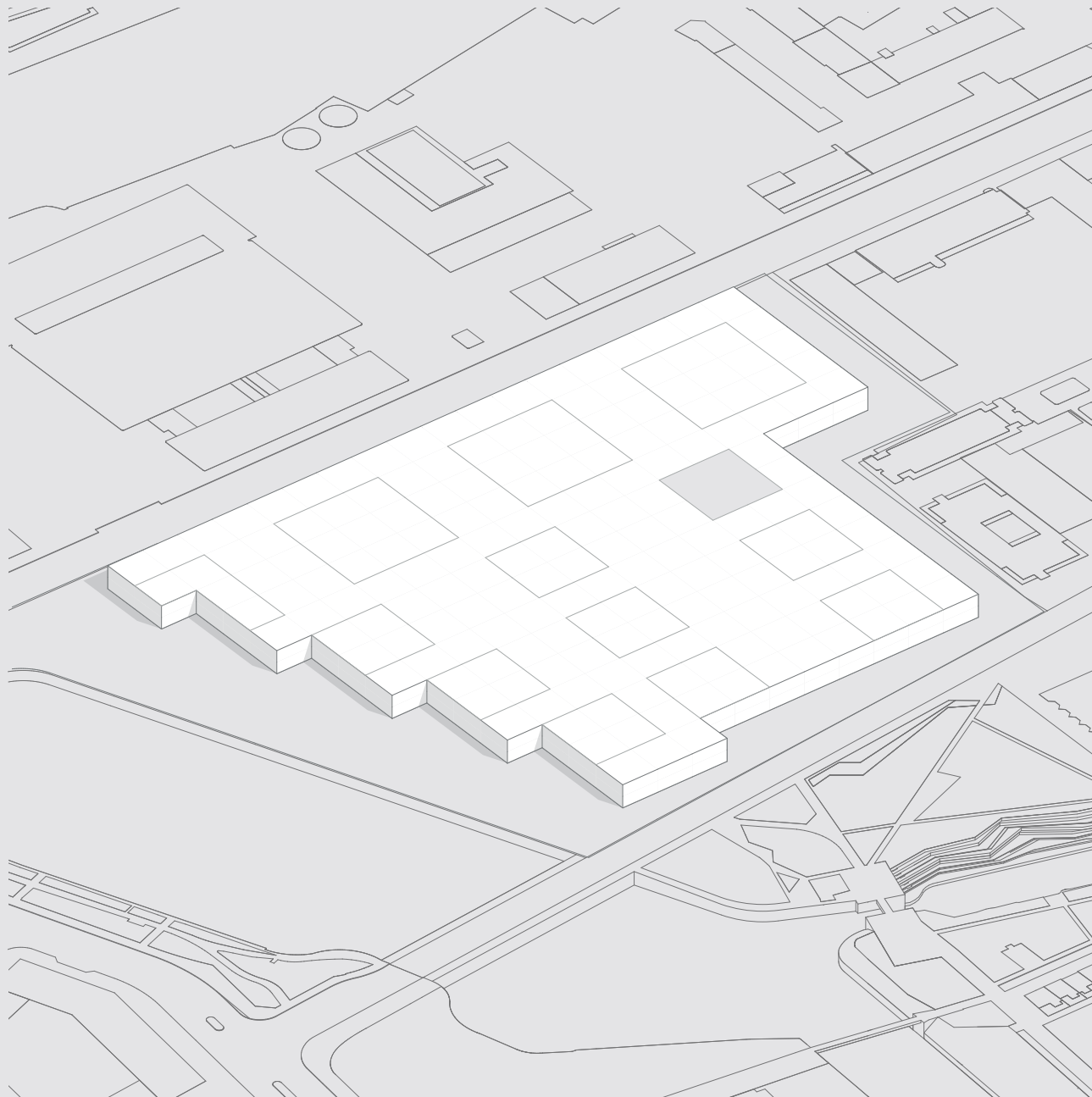
Sanatorium Sonnestral, 1928



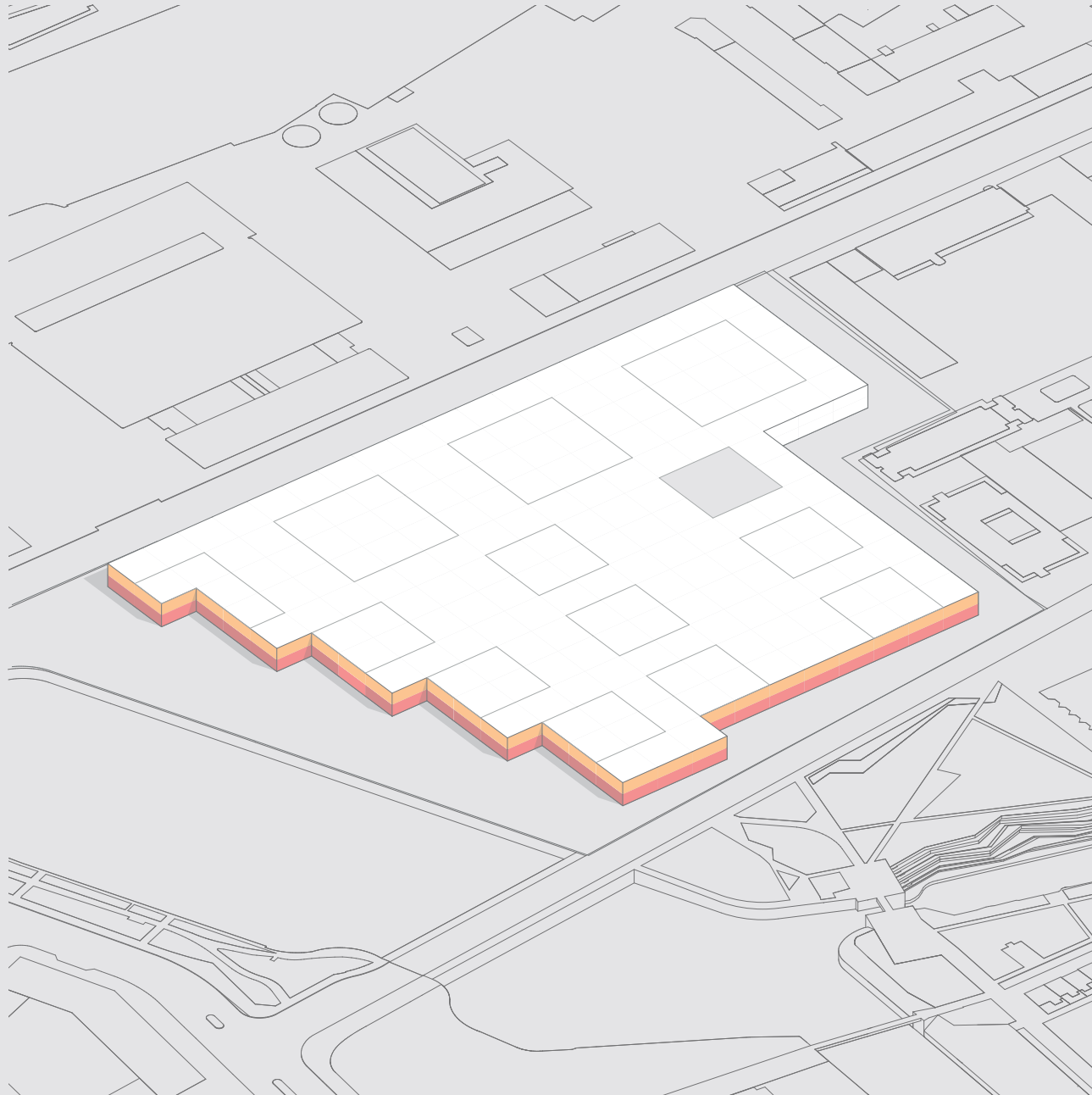
1920s



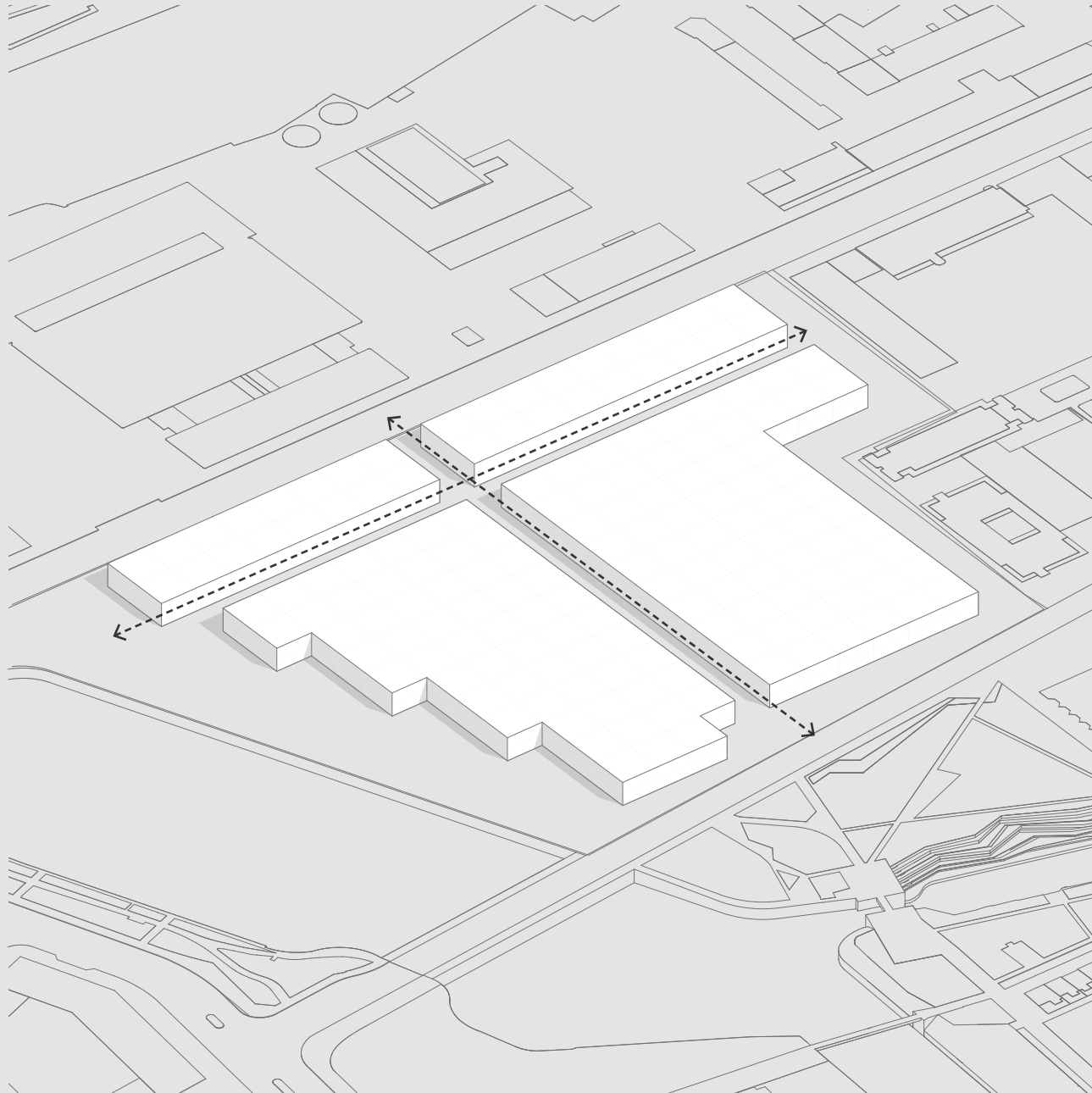
Evolution of hospital architecture



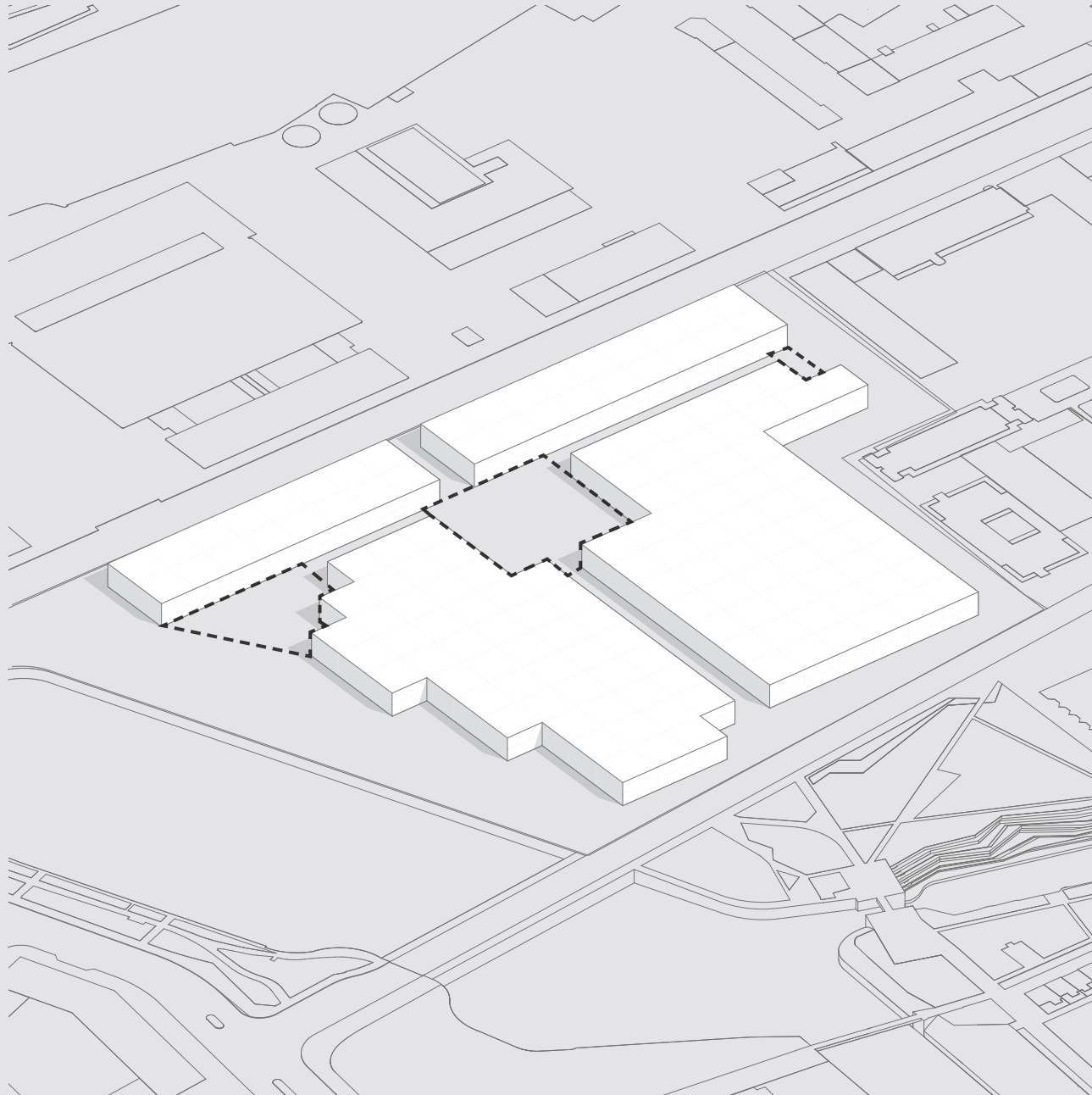
Horizontal form



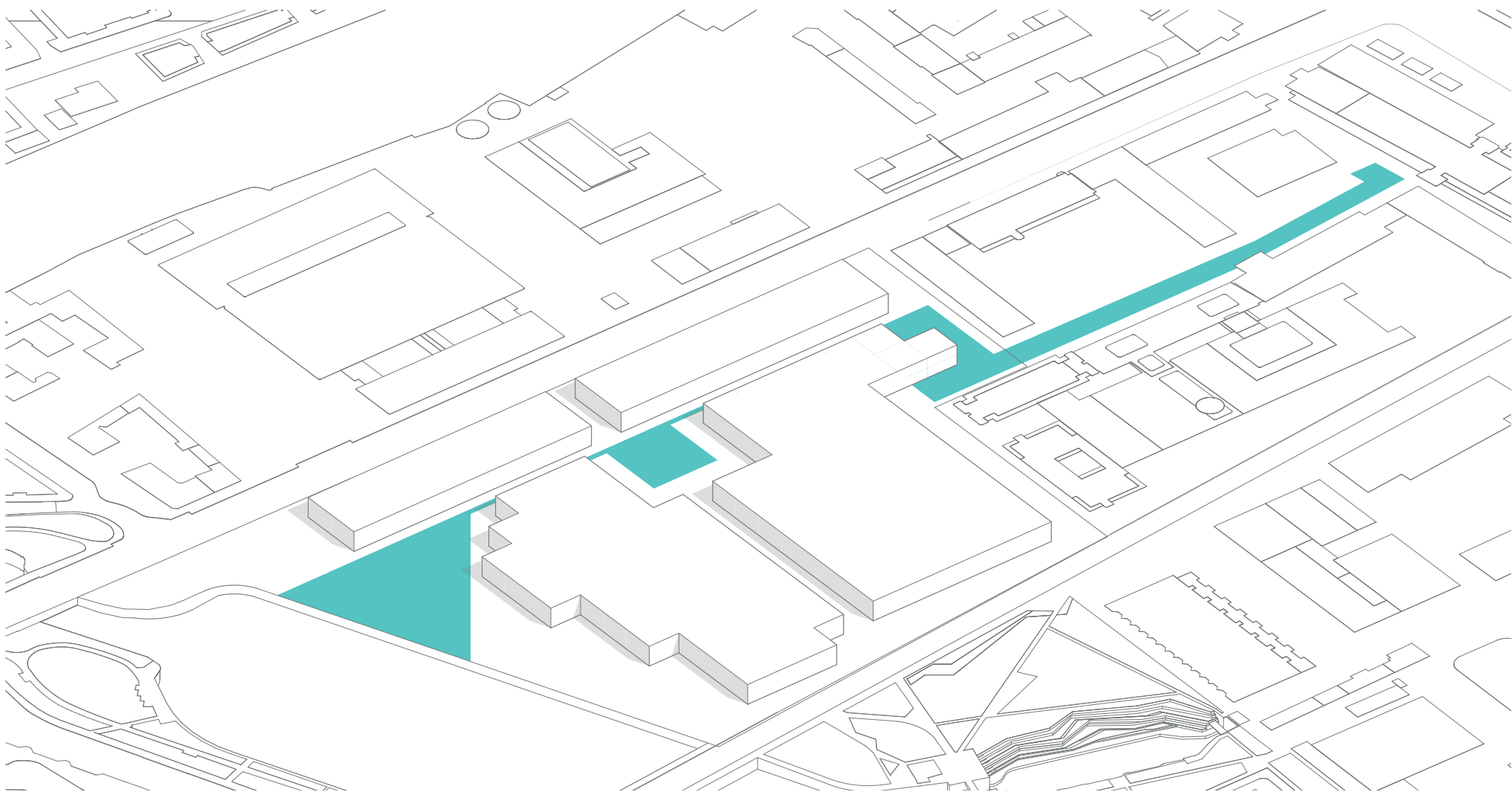
Bringing all the functions at same level



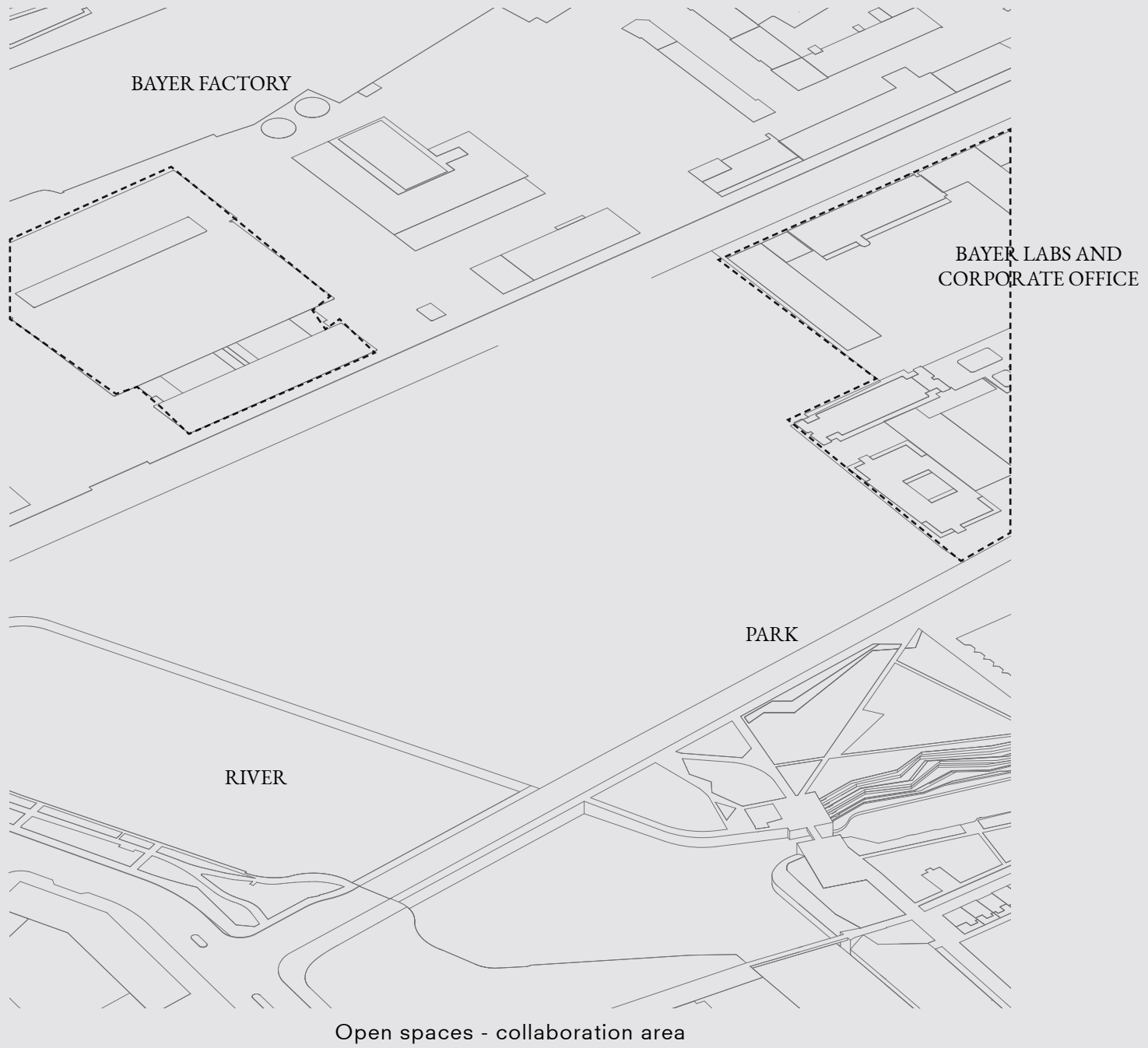
Axis

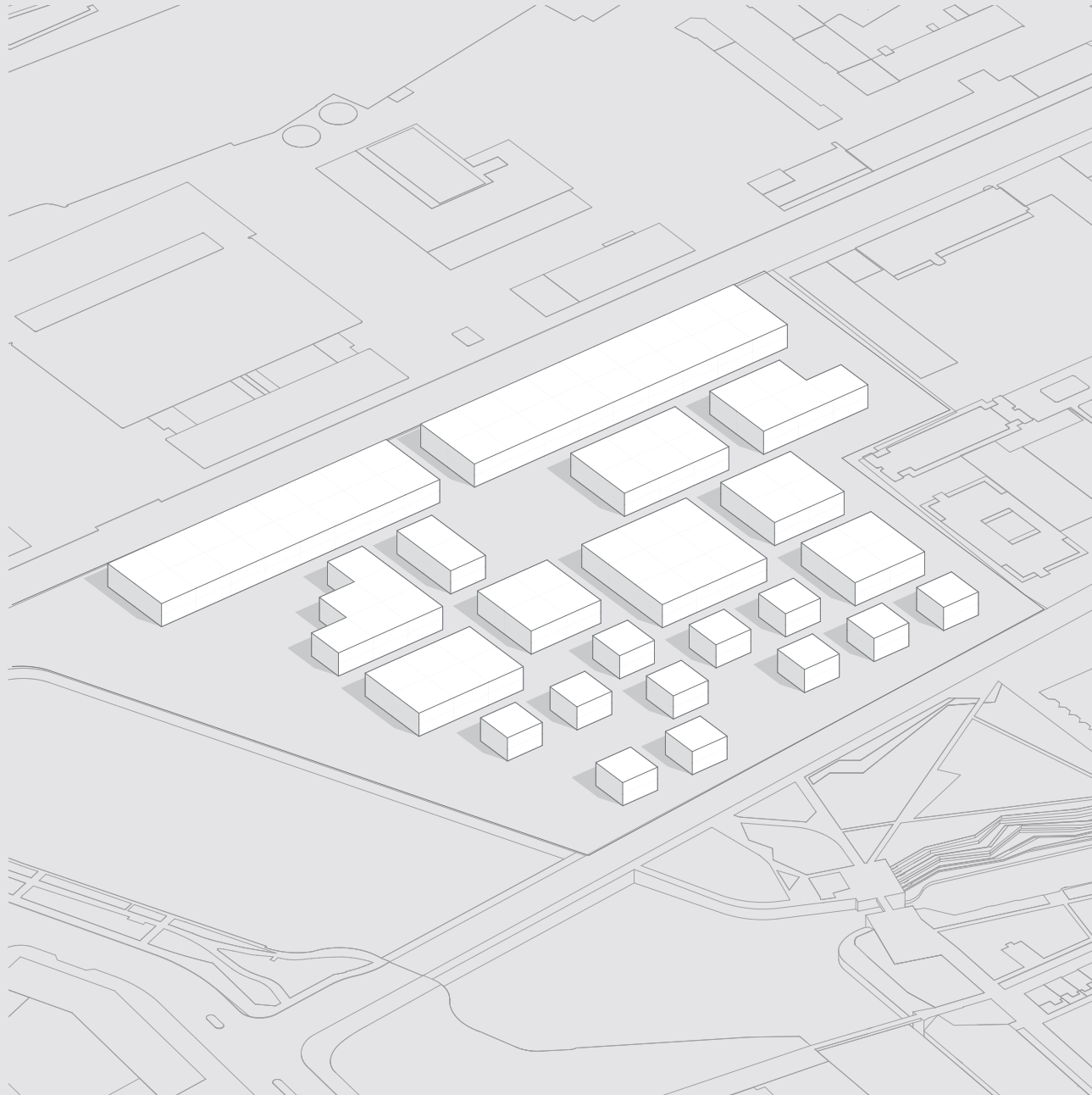


Open spaces - collaboration area

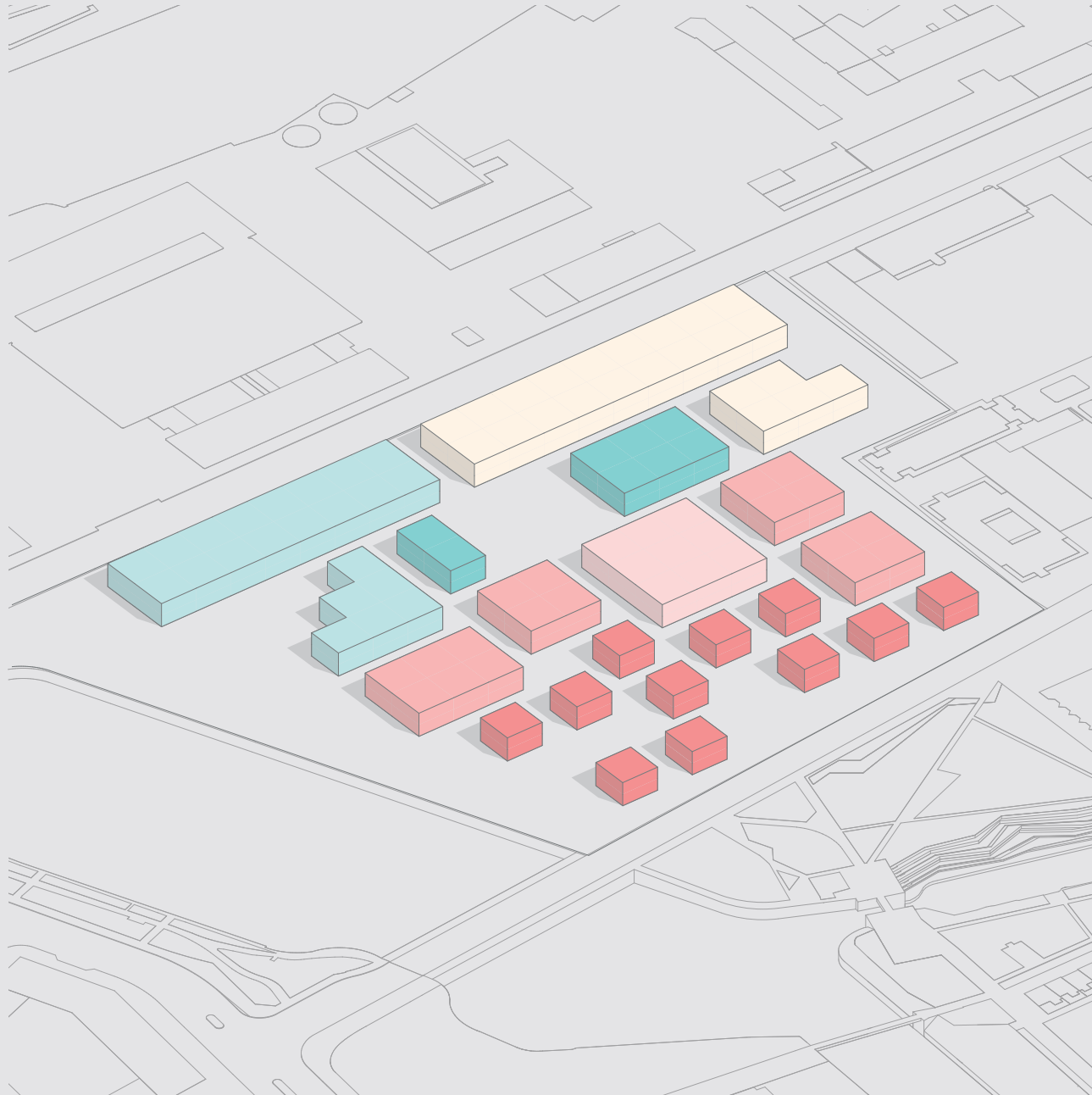


Connection of Bayer Pharma and Regeneration hospital

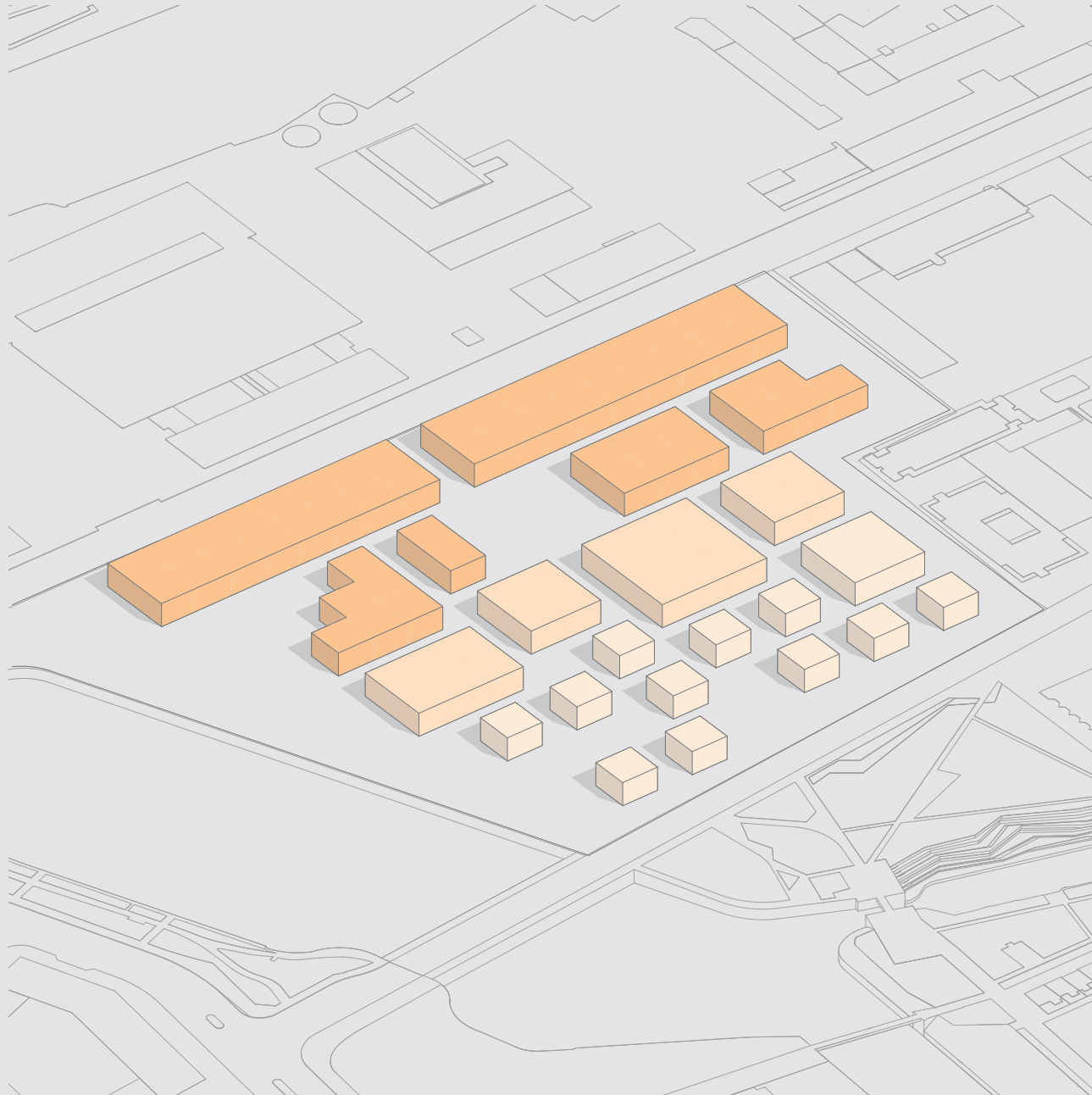




Existing typology - Mega building (Podium - Tower)

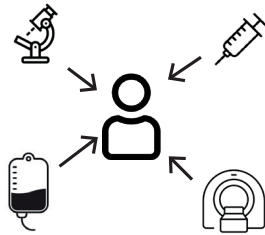


Existing typology - Mega building (Podium - Tower)



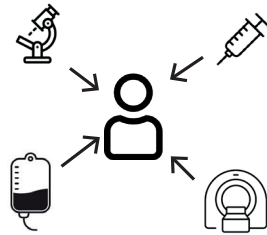
Existing typology - Mega building (Podium - Tower)

THE FUTURE TYPOLOGY

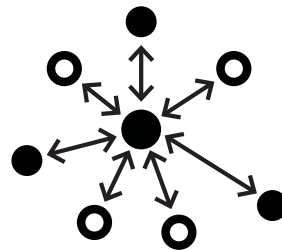


PATIENT CENTRIC

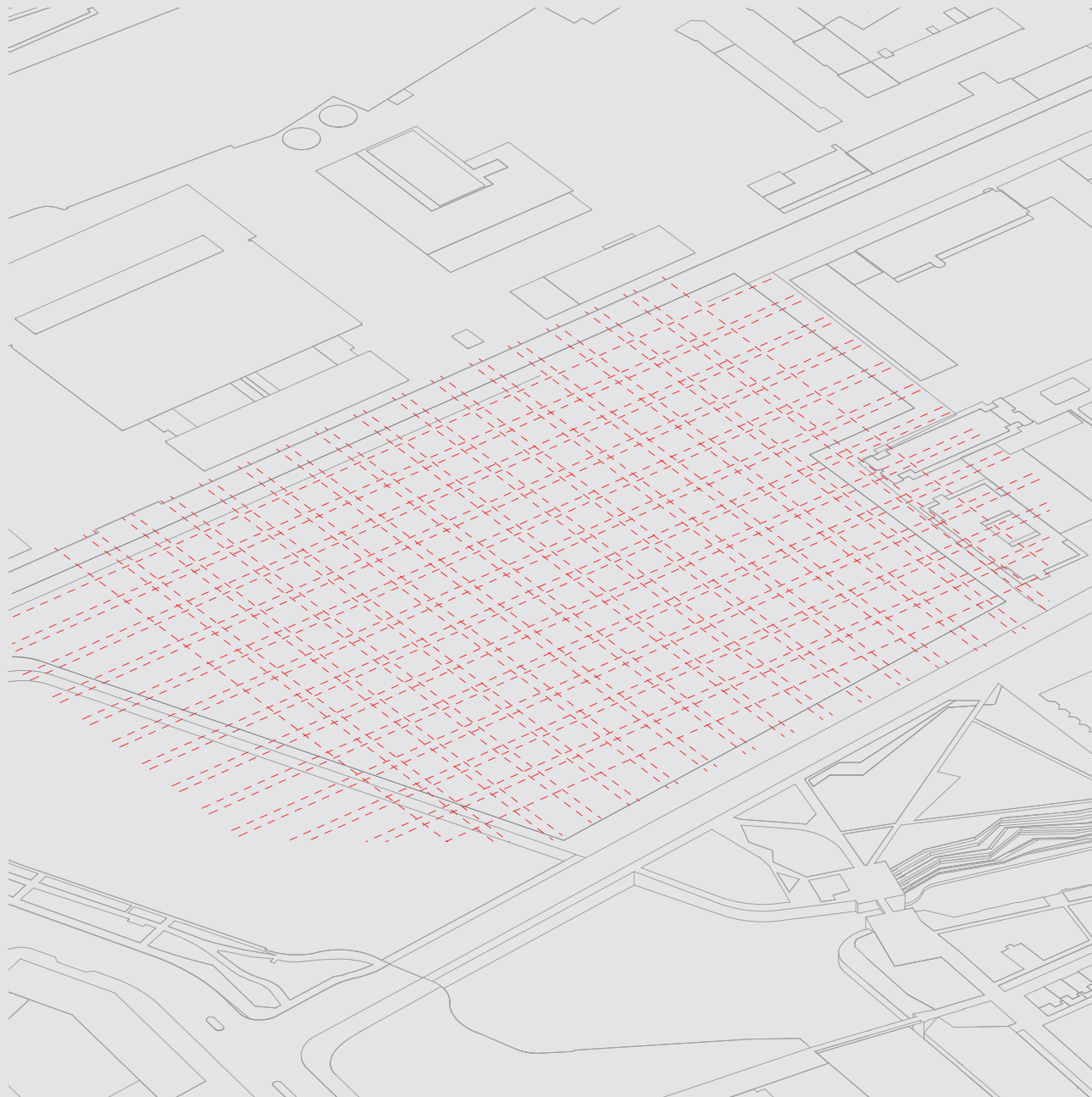
THE FUTURE TYPOLOGY



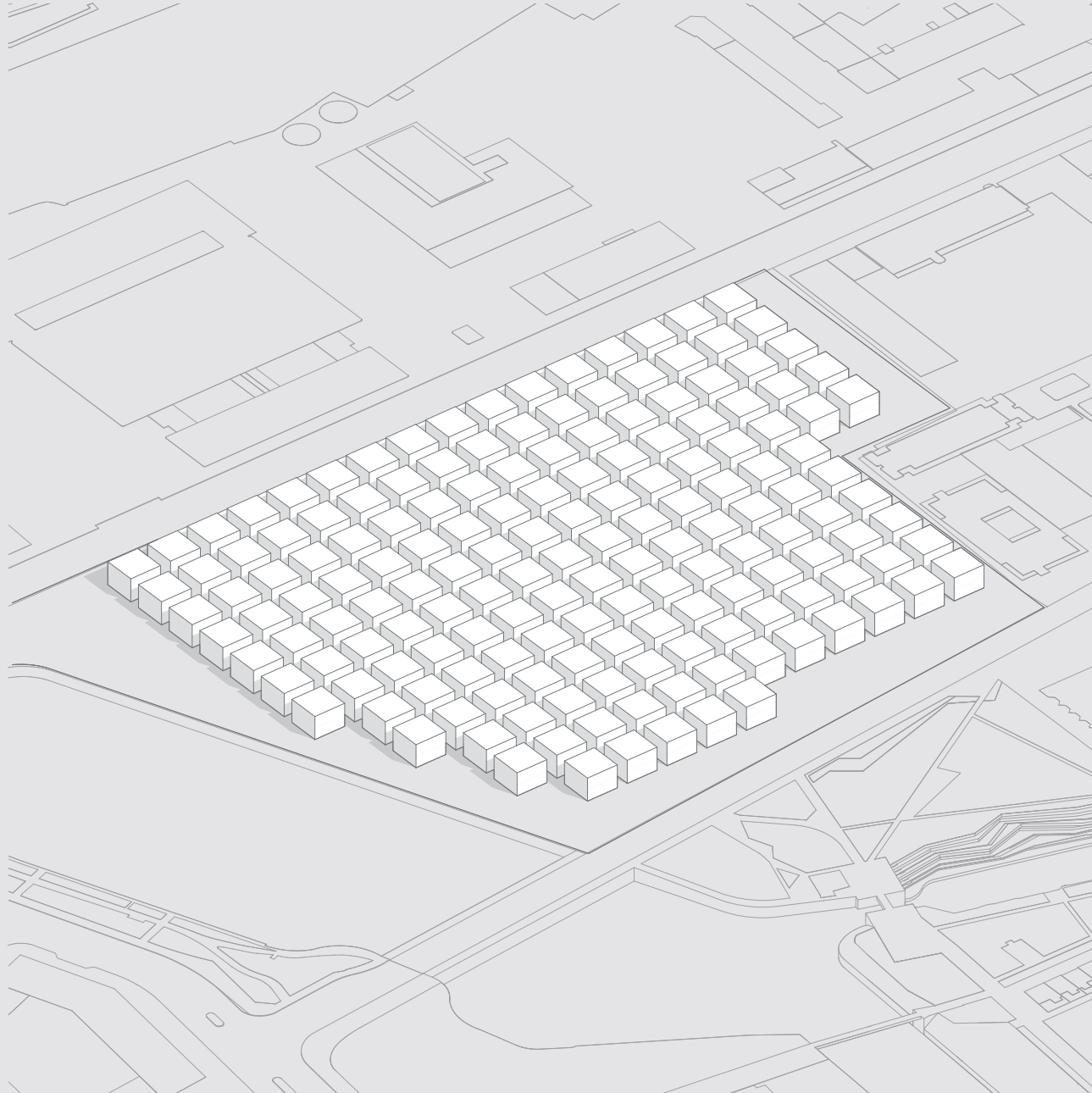
PATIENT CENTRIC



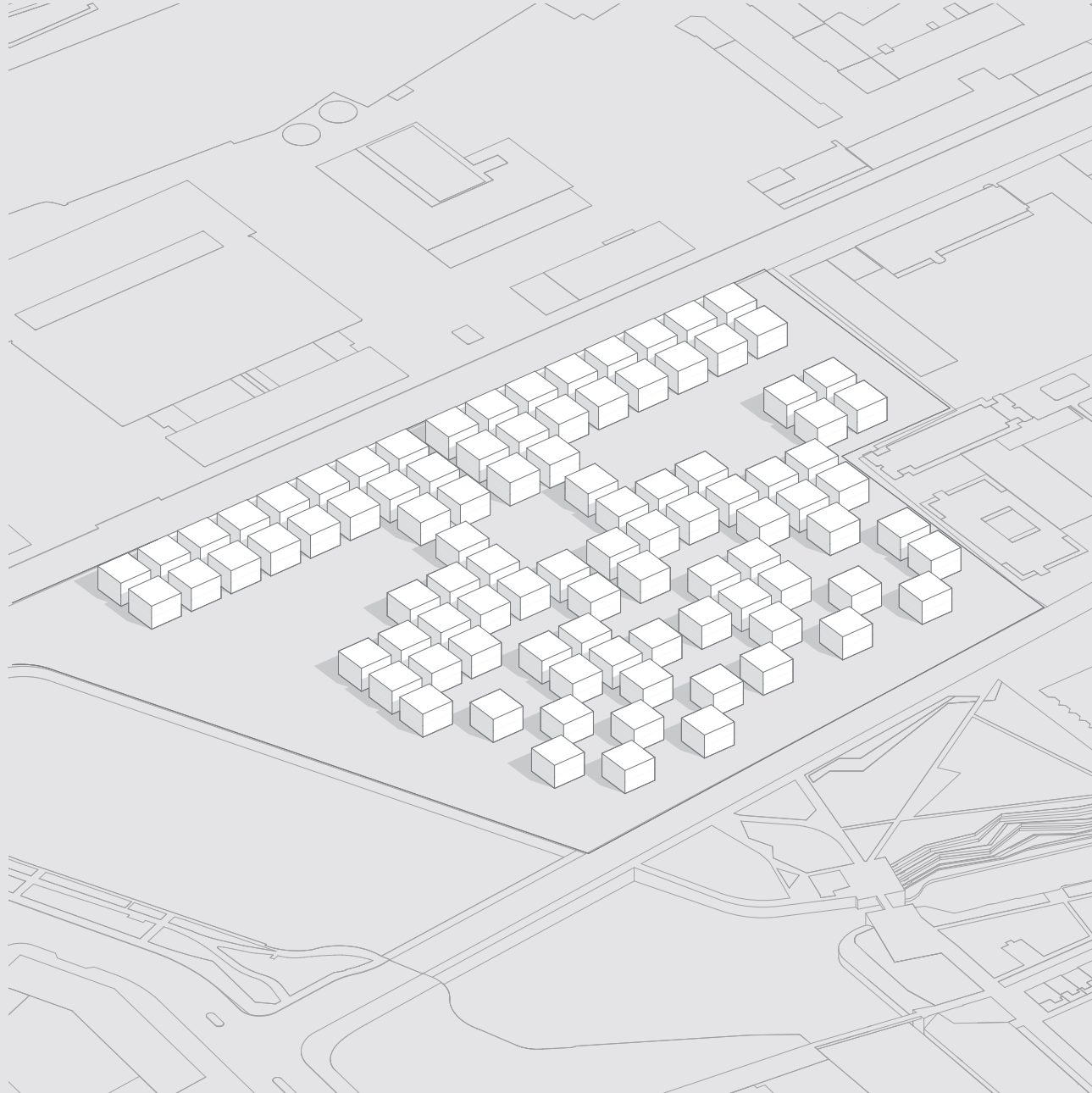
DECENTRALISED SETUP



The grid 12X12 - 4



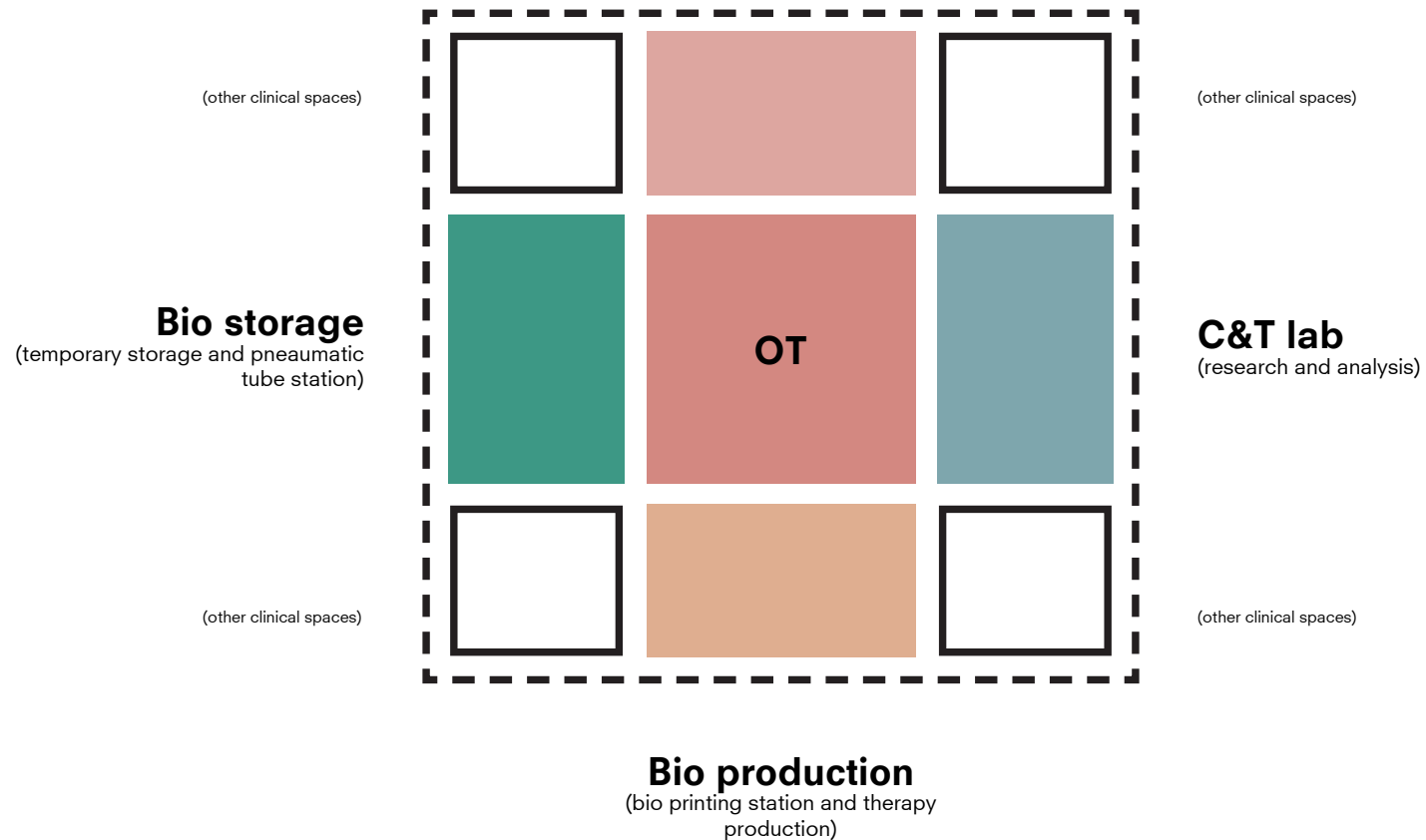
Modules



modules

Diagnostics

(real time diagnostics, control room and imaging station)



Diagnostics

(real time diagnostics, control room and imaging station)

(other clinical spaces)

(other clinical spaces)

Bio storage
(temporary storage and pneumatic tube station)

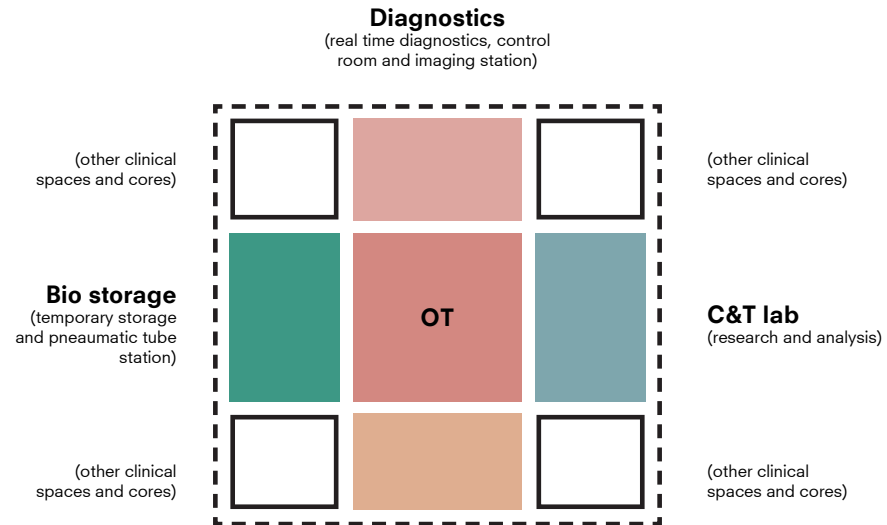
C&T lab
(research and analysis)

(other clinical spaces)

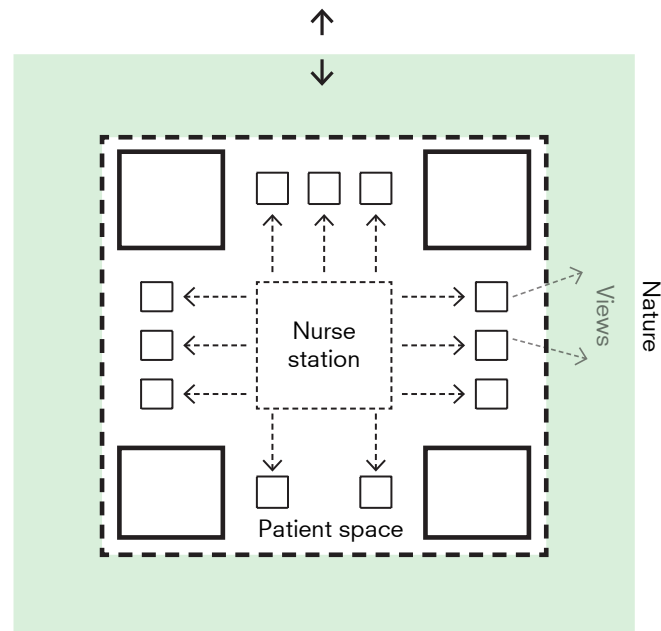
(other clinical spaces)

Bio production
(bio printing station and therapy production)



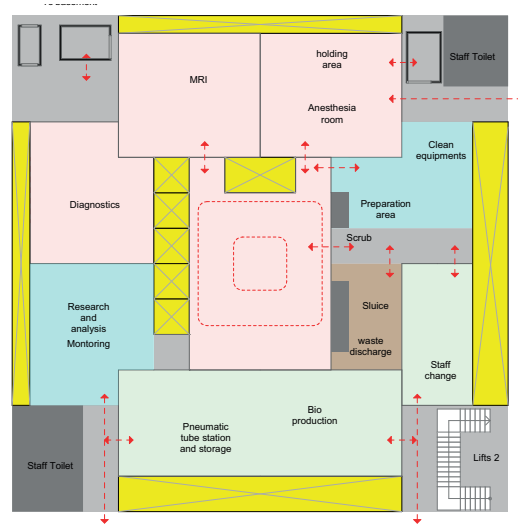
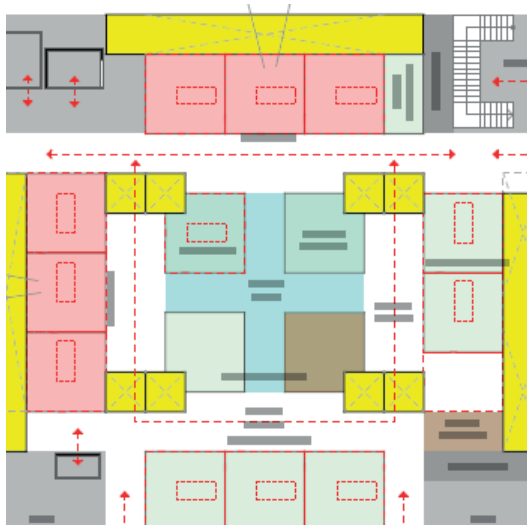


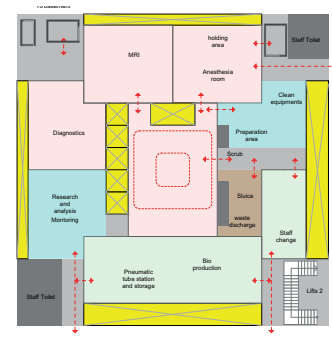
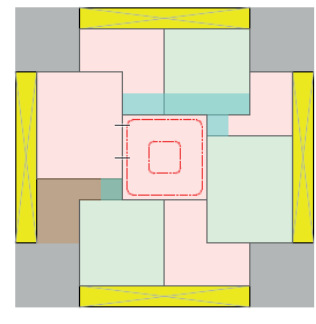
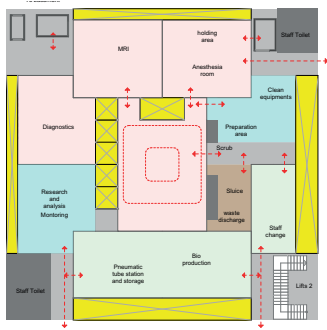
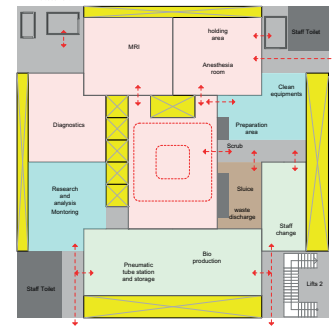
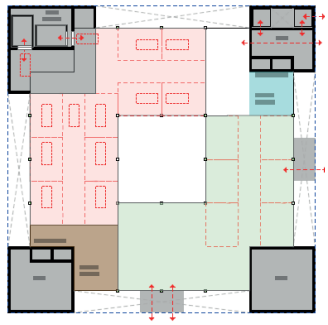
Bio production
(bio printing station and therapy production)

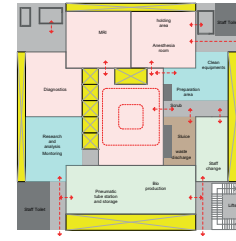
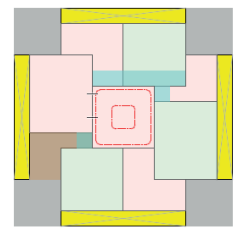
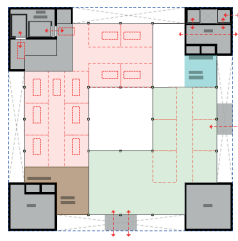
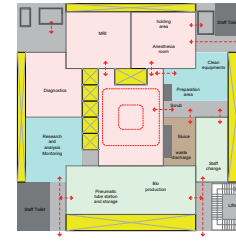
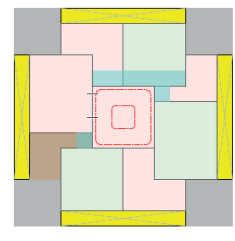
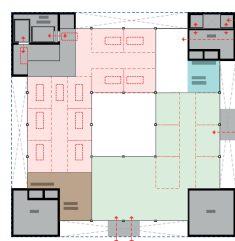
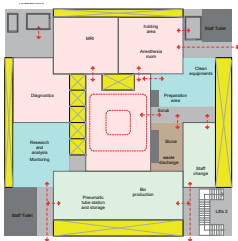
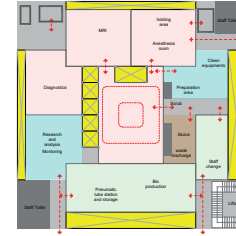
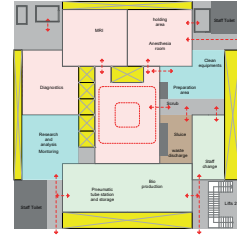
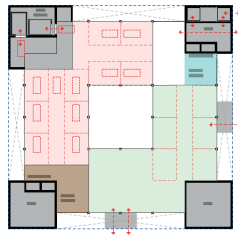




The treatment level





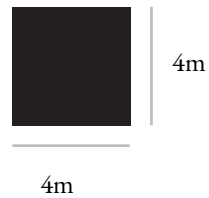


Future hospital typology -

Decentralised entity with modules as the main element

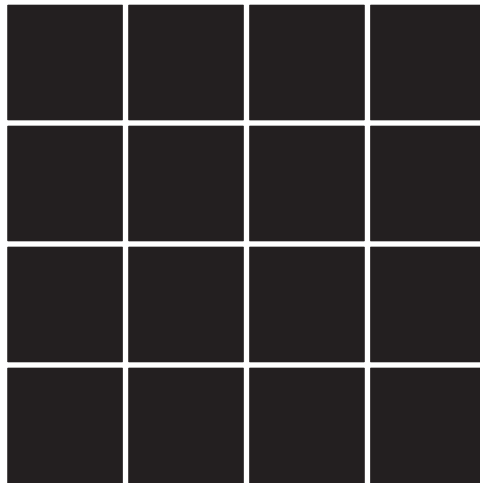
(with an ability to function independently)

THE GAME OF MODULES

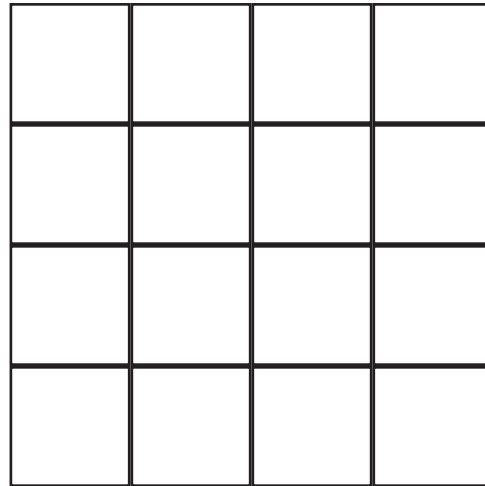


All buildings have been designed
with a straightforward grid
of 4x 4m in mind.

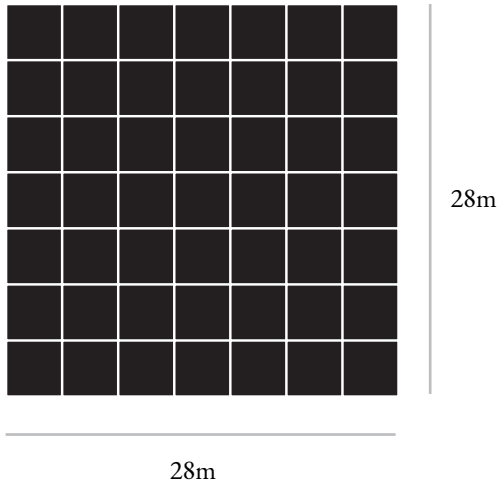
Basic width requirement for circulation
and also associates with the smallest entity
of patients room



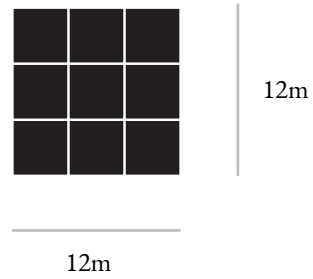
The grid



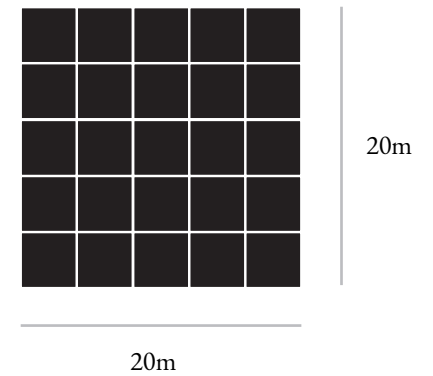
Void



Treatment module



Patient rooms



Bio bank

Hospital areas



3m wide

General corridor requirement

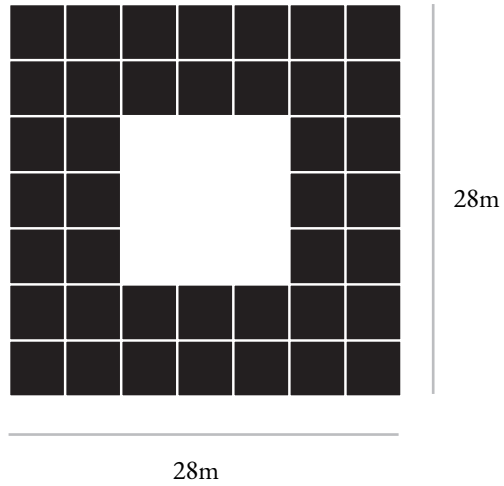


4m wide

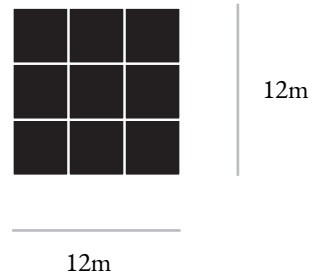
follows the grid

Adding space for AGVs or Mono rails

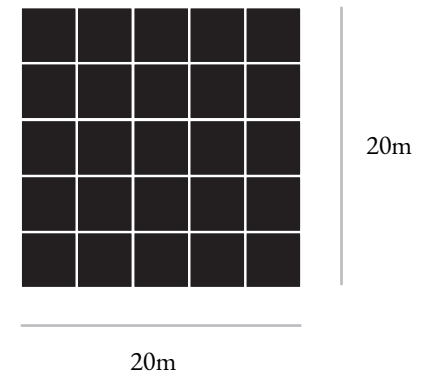
Circulation



Labs and offices



Rehab



Amenities

Non clinical modules

3m as per German healthcare
rules + 1m for AGV transport

4m wide

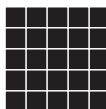
Circulation



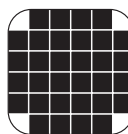
Patient rooms



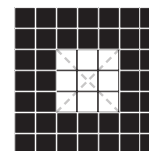
Rehab/ amenities



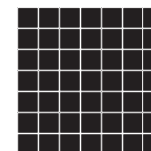
Bio Bank



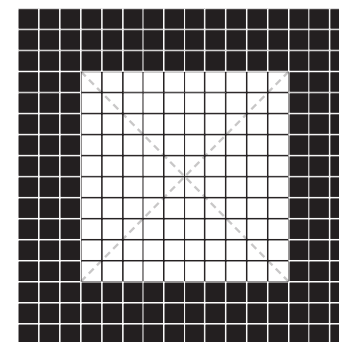
Auditorium



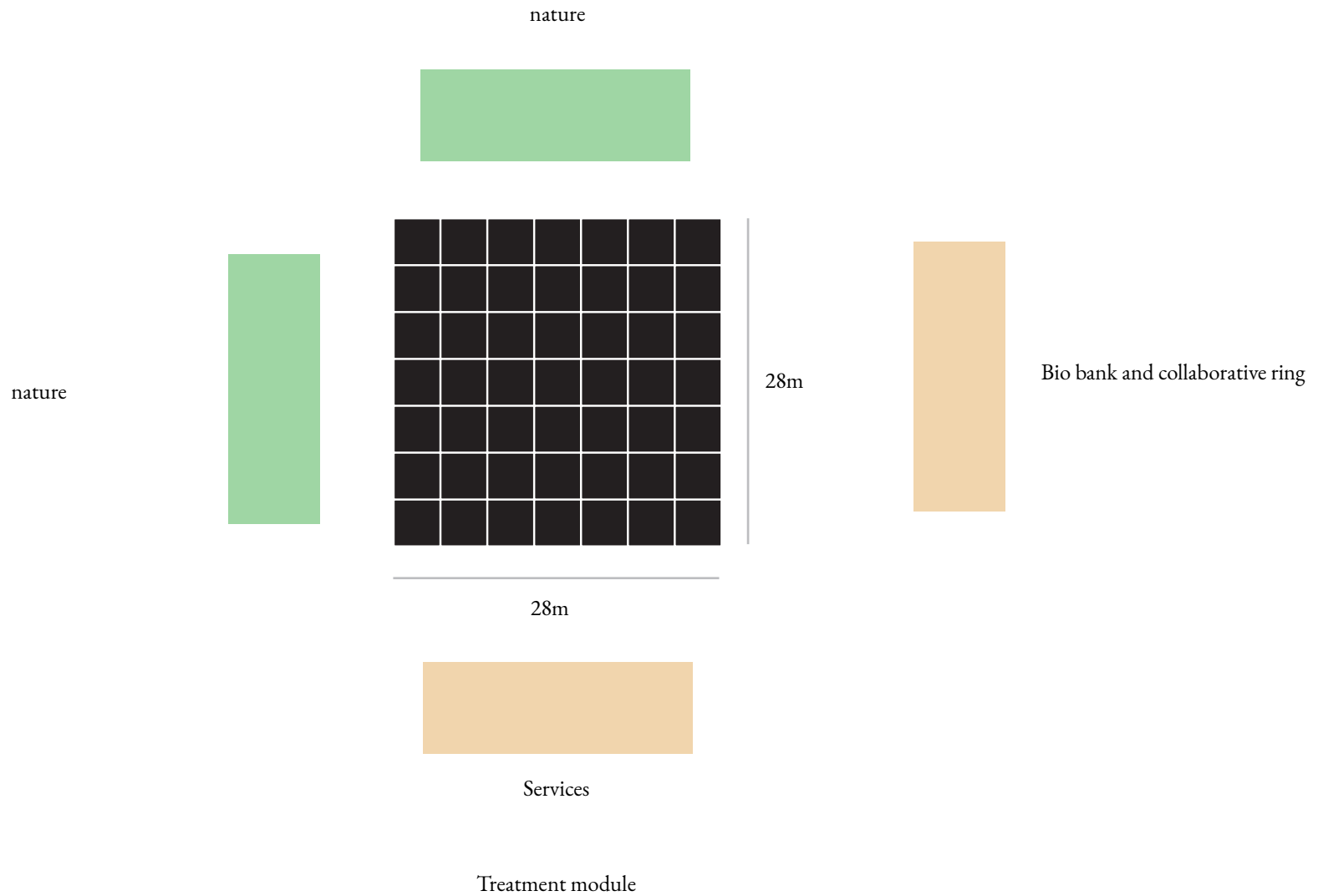
Research, innovation and
analysis labs



Treatment modules

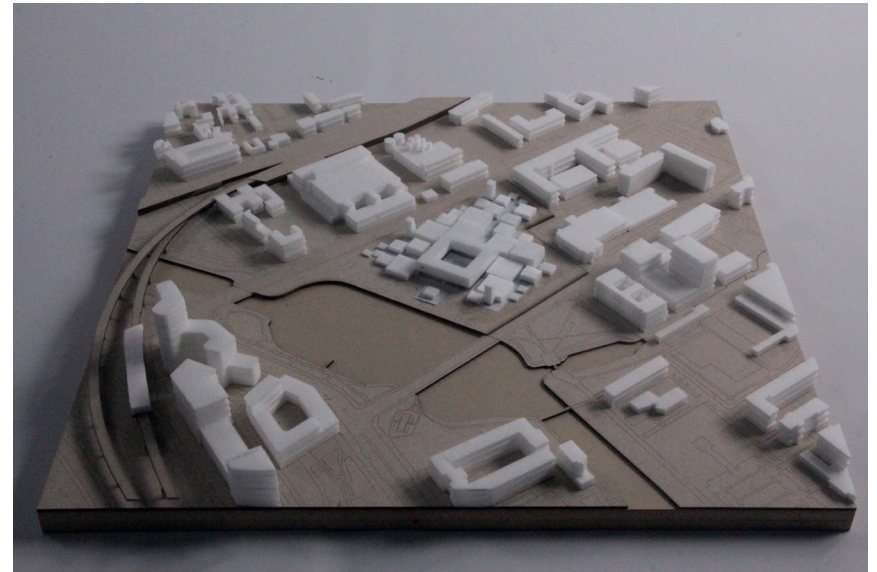
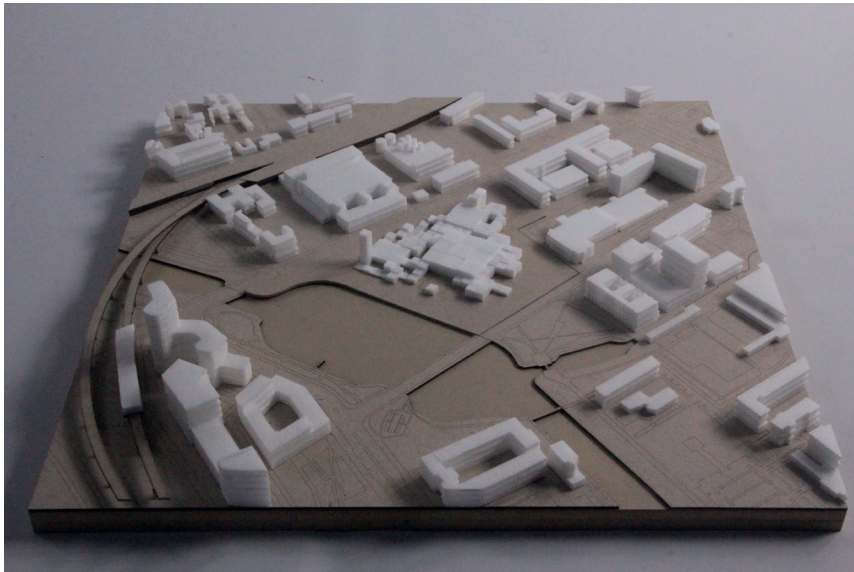


Collaborative ring

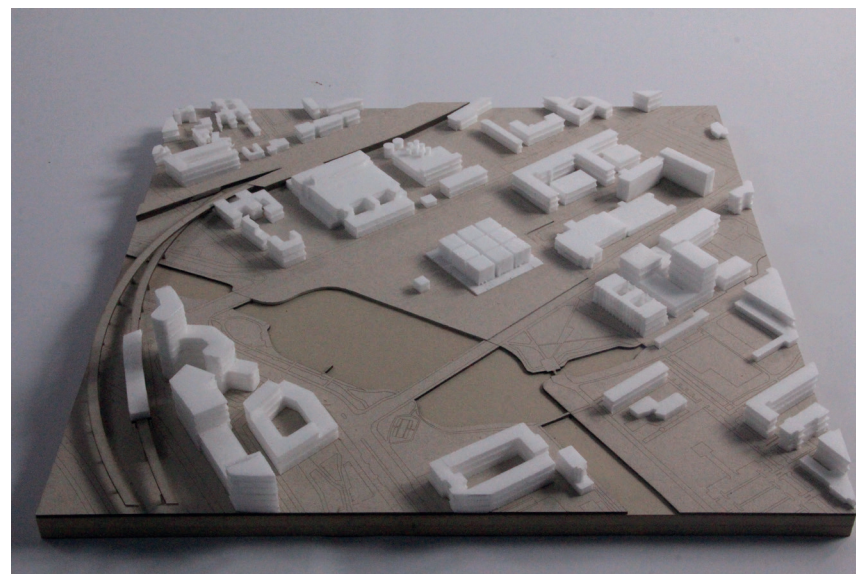
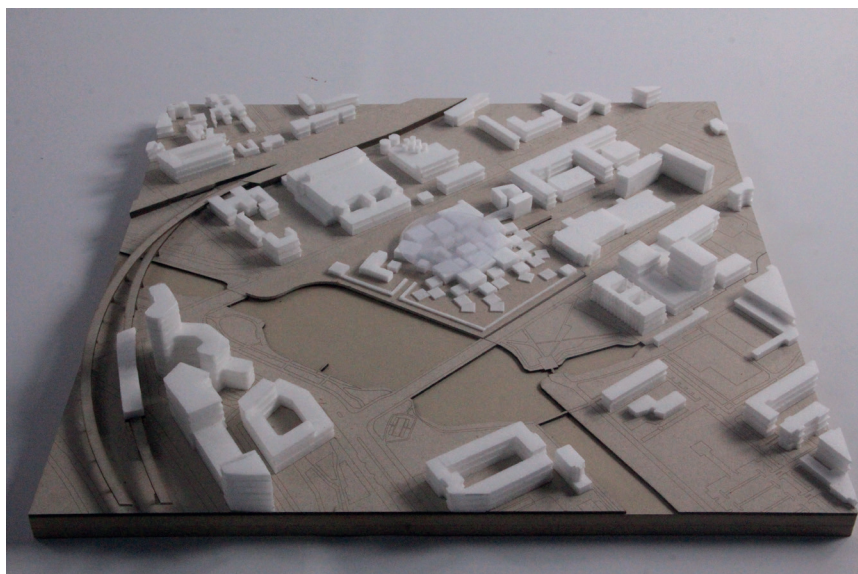




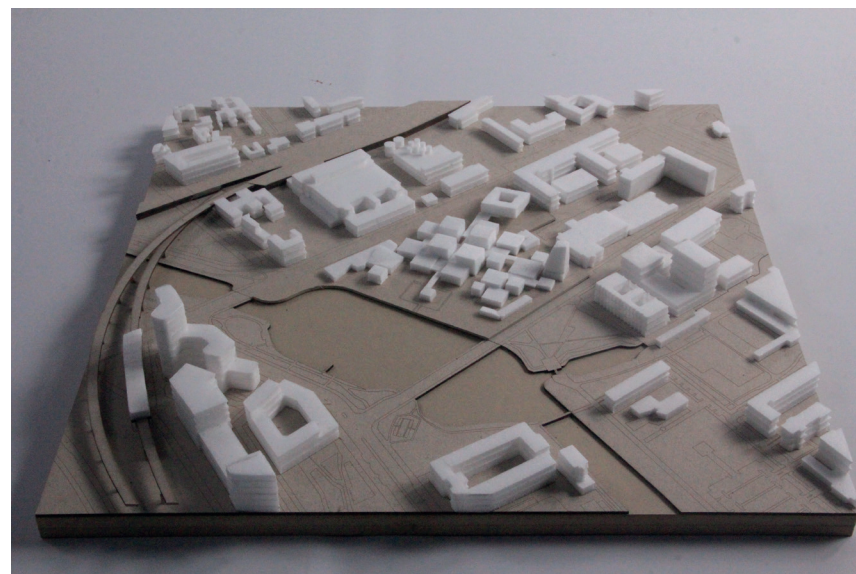
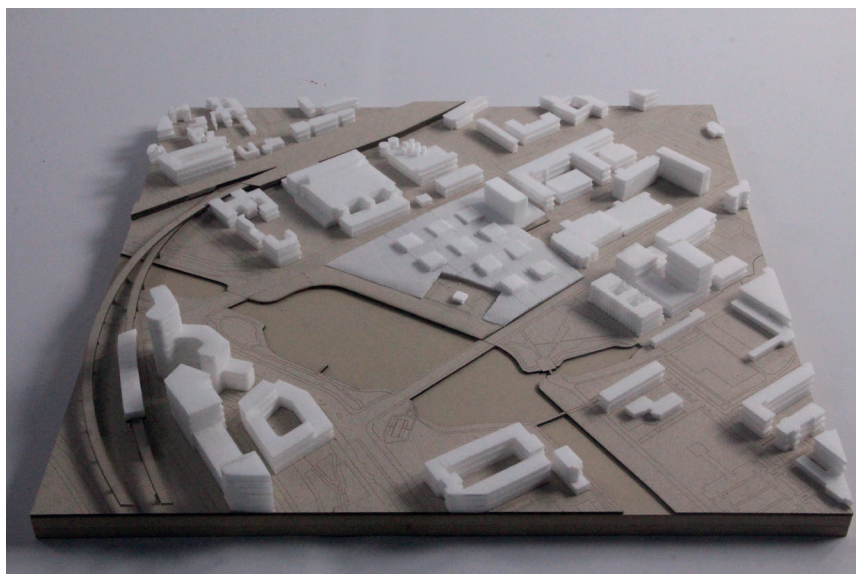
THE GAME



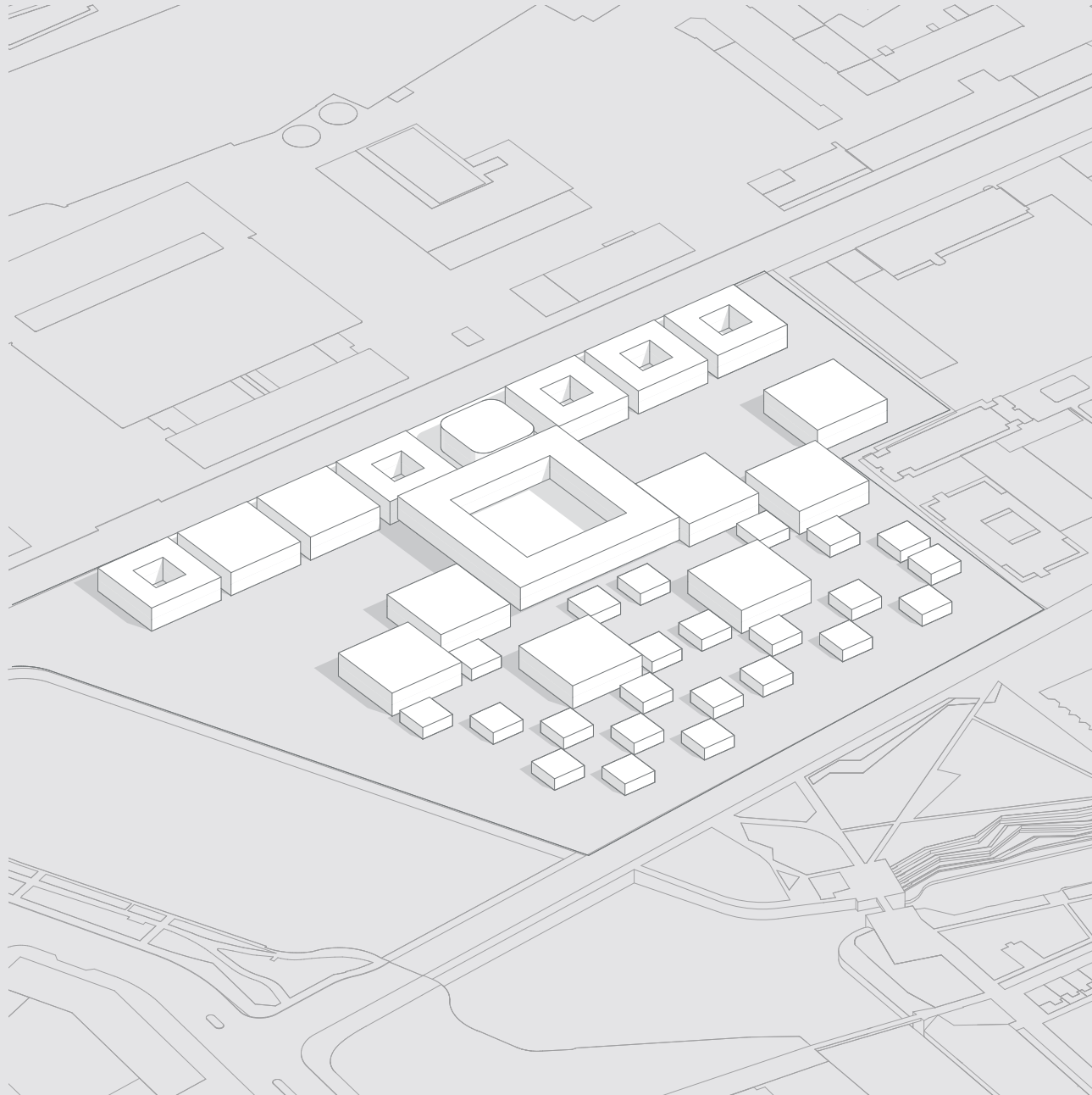
Massing options



Massing options



Massing options



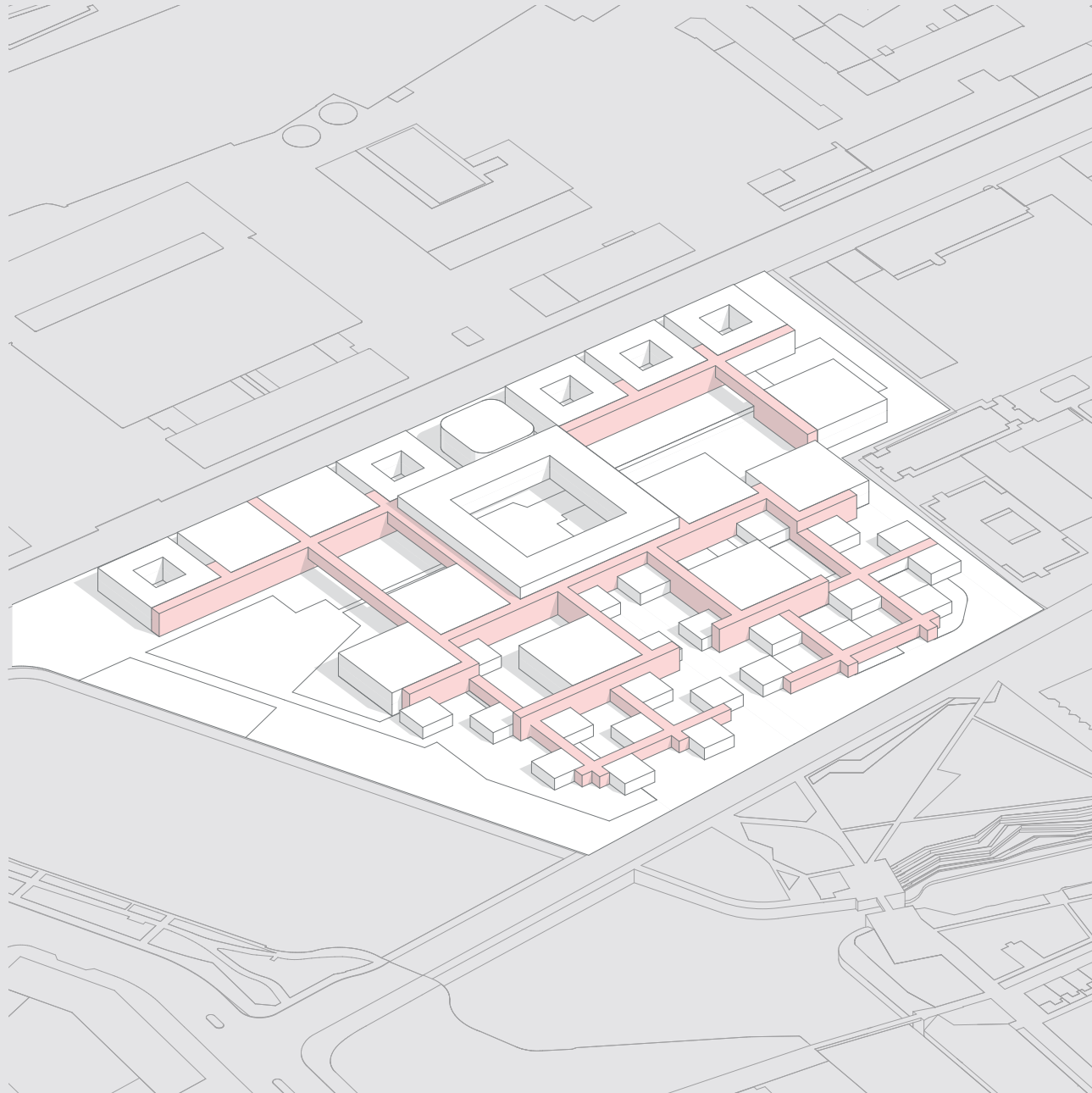
Existing typology - Mega building (Podium - Tower)



Green spaces



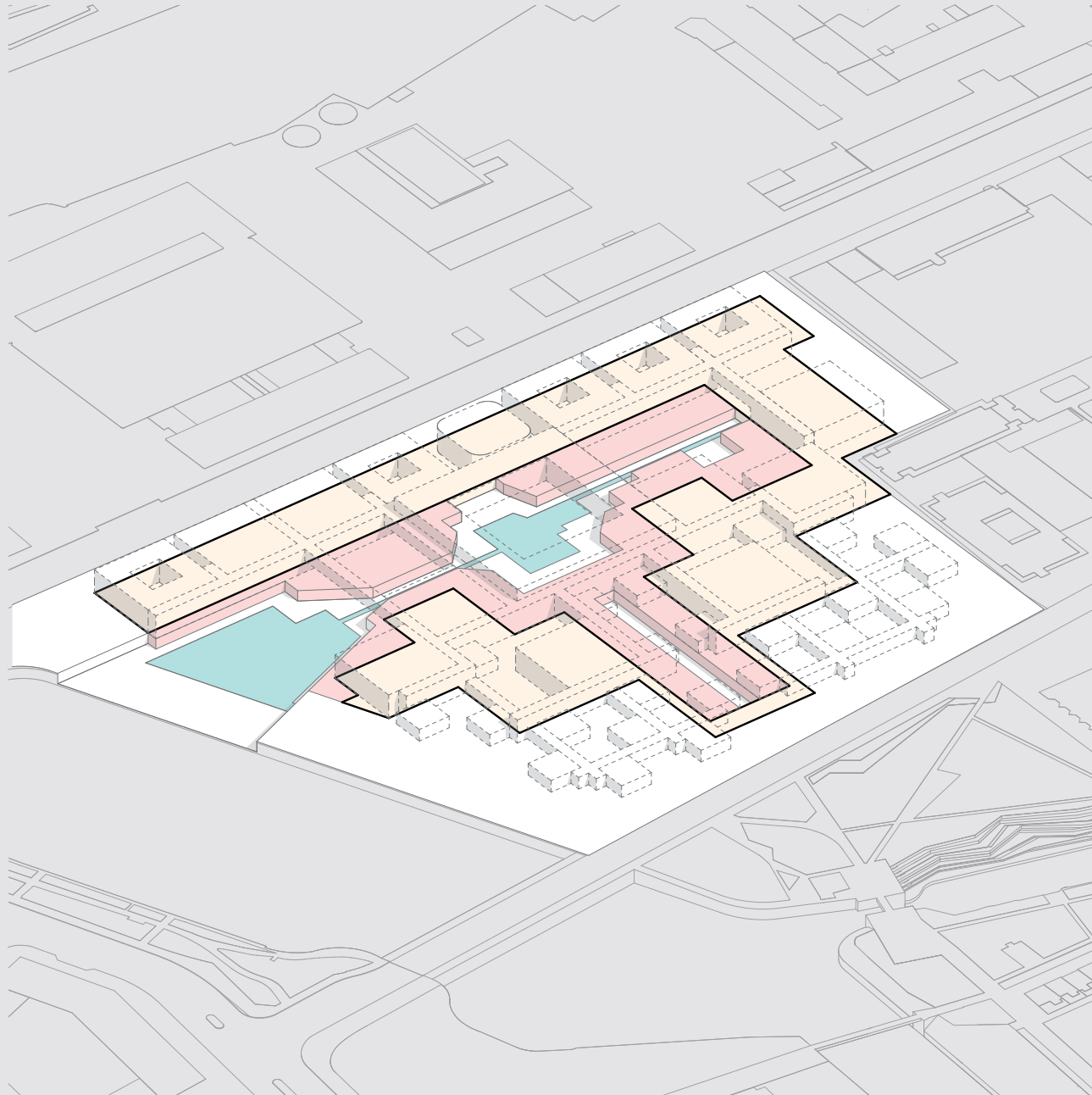
Historic importance of nature in hospital



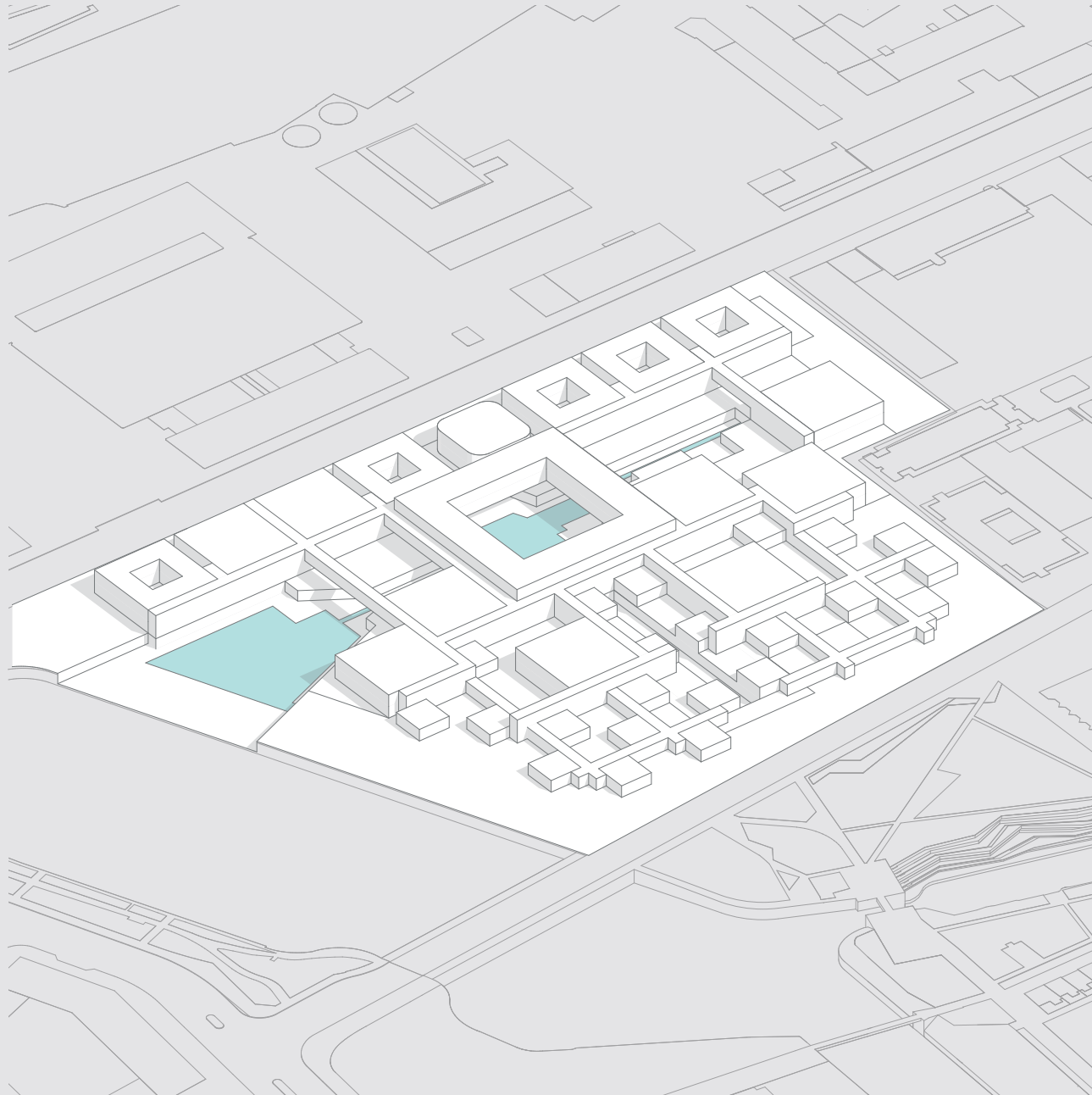
Corridors

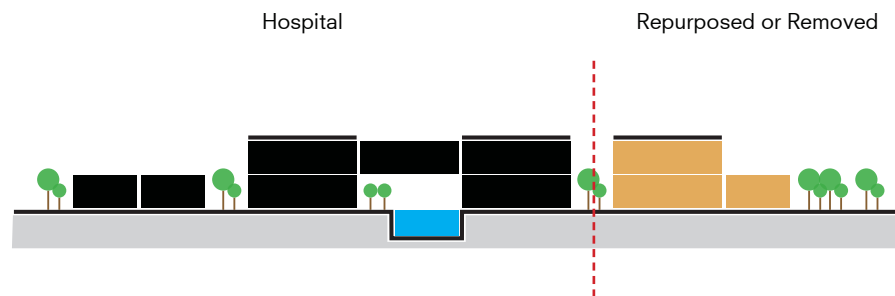


model

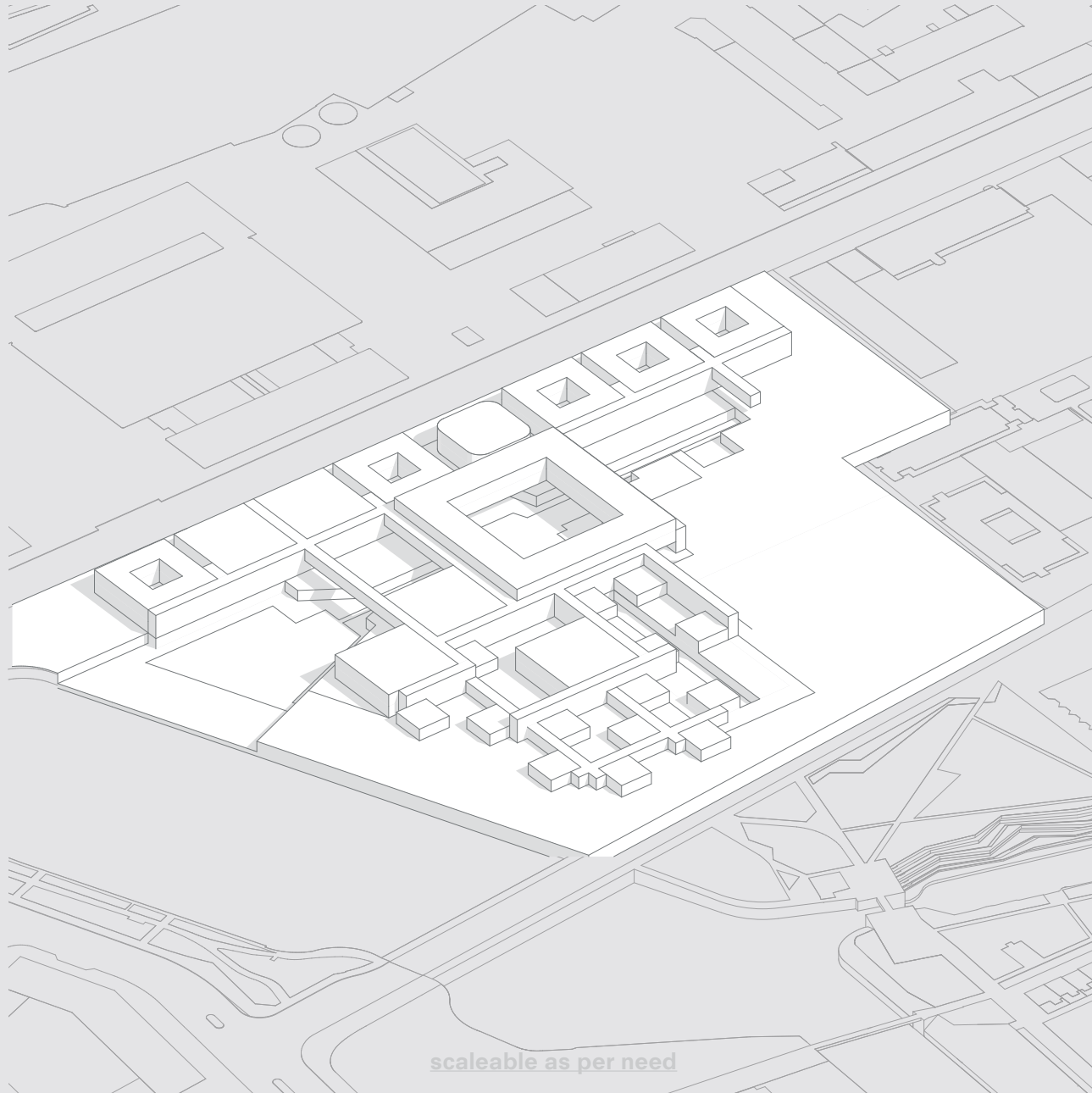


Existing typology - Mega building (Podium - Tower)



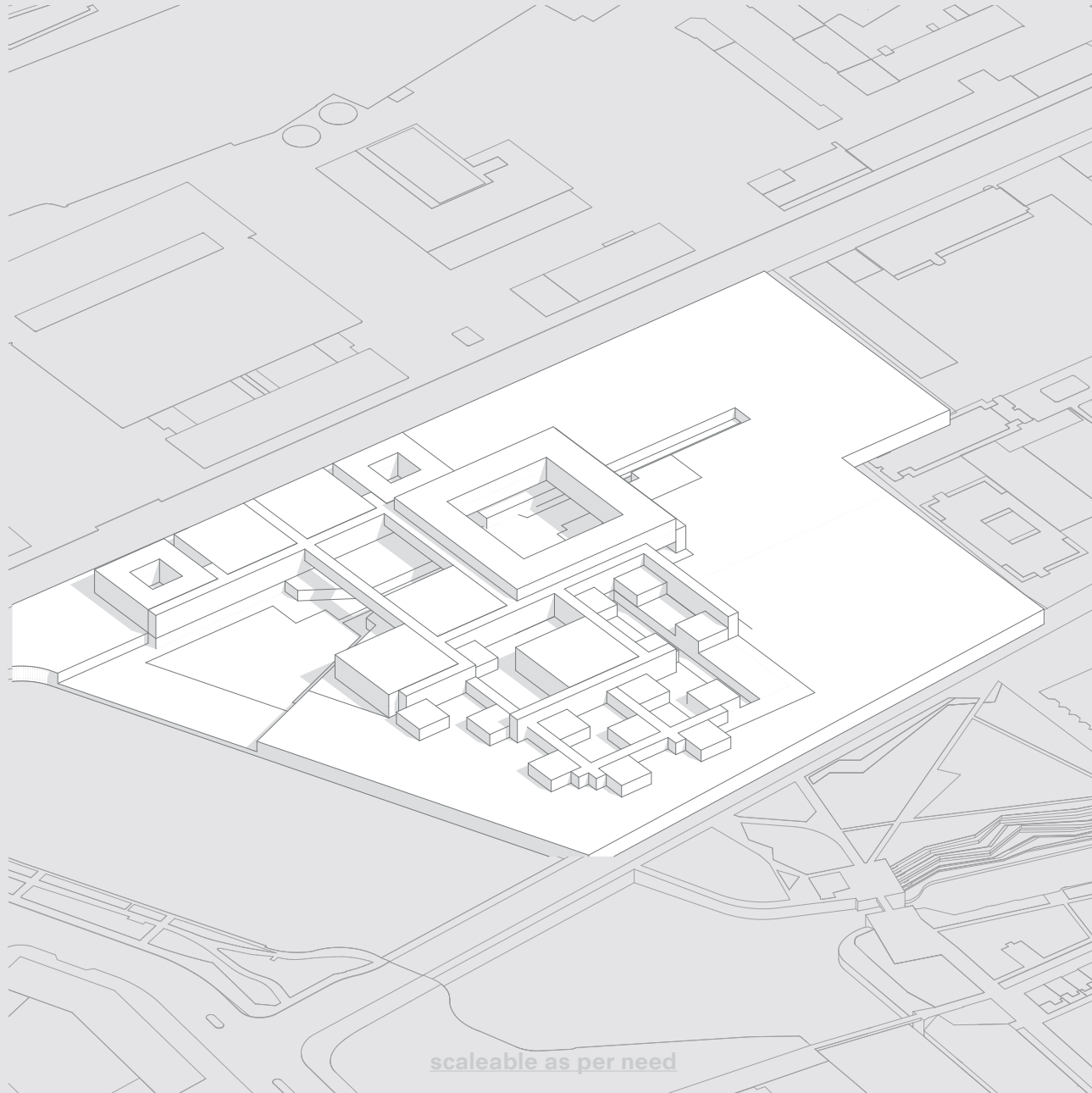


regenerative - flexible - adaptable



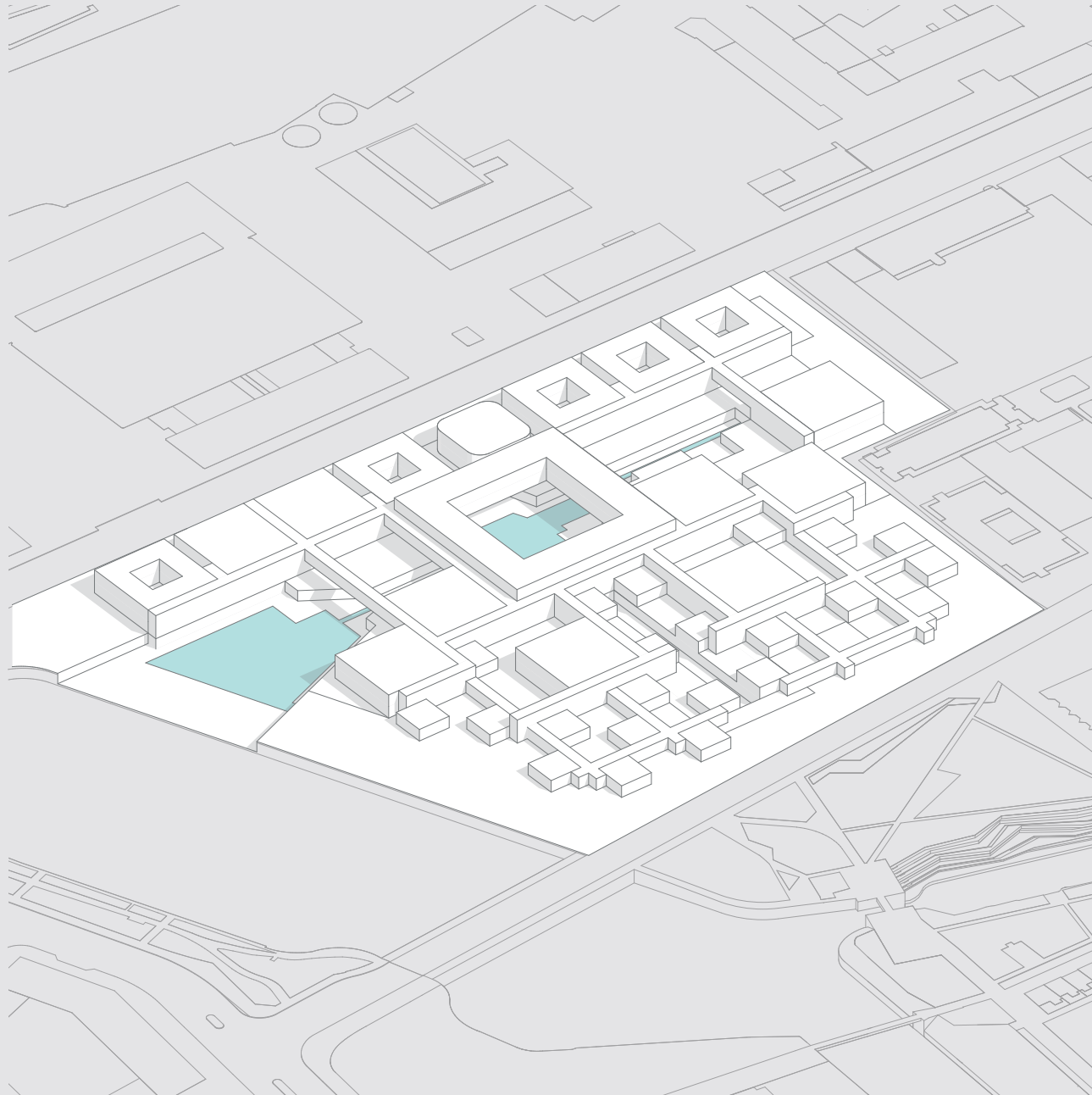
scaleable as per need

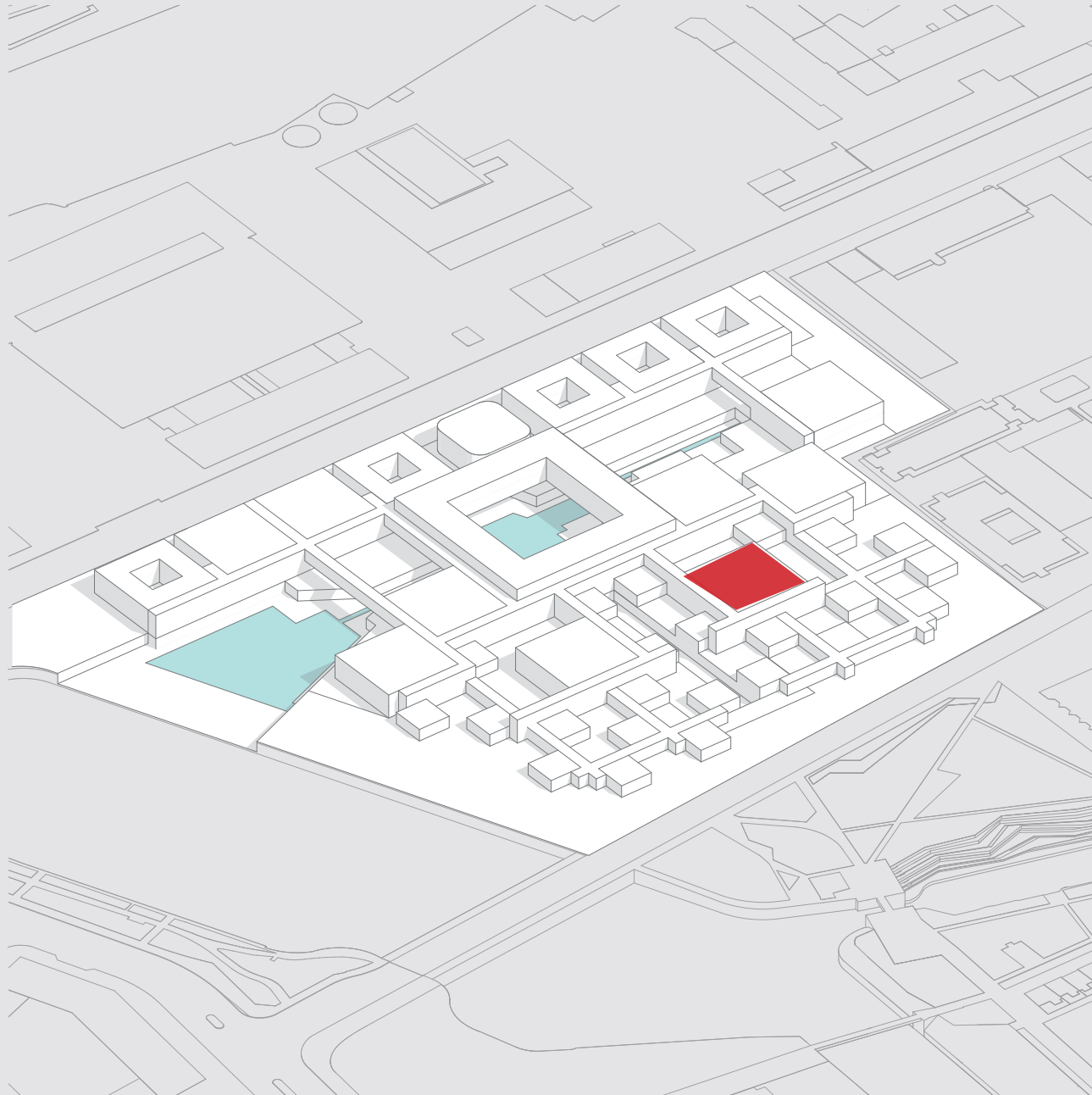
Modules



scaleable as per need

Modules



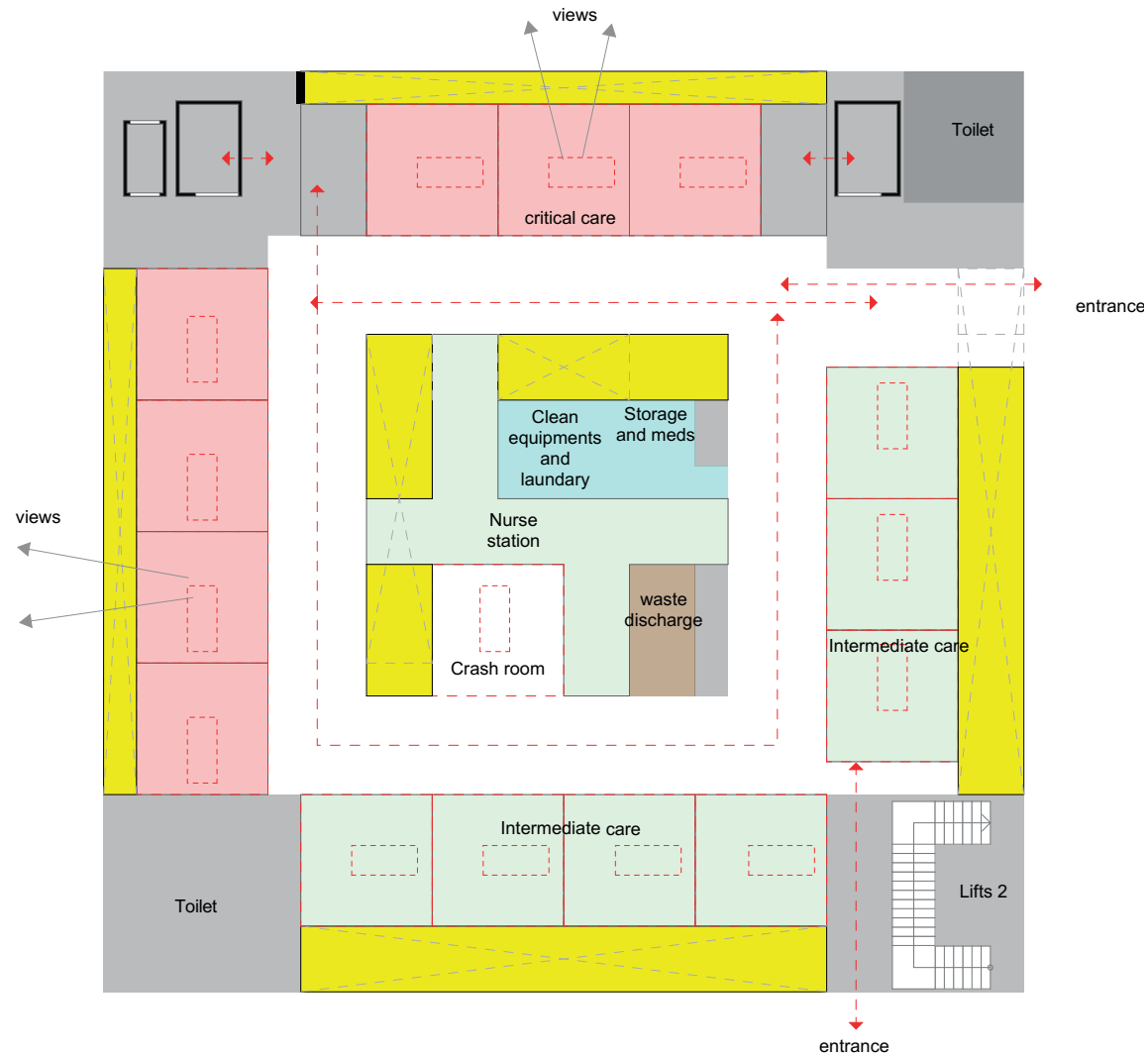


THE MODULE



The treatment level

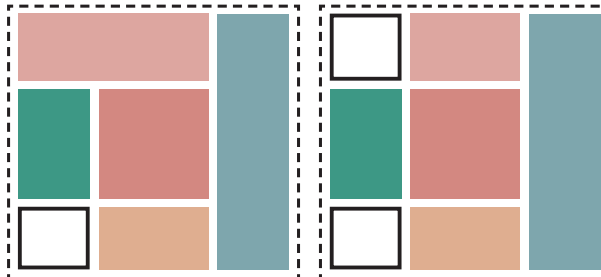
THE MODULE



The patient level

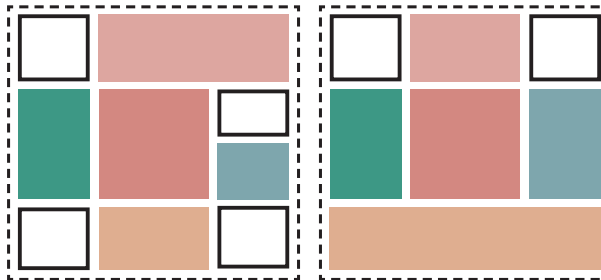
THE MODULE

More focused on
both research and
monitoring



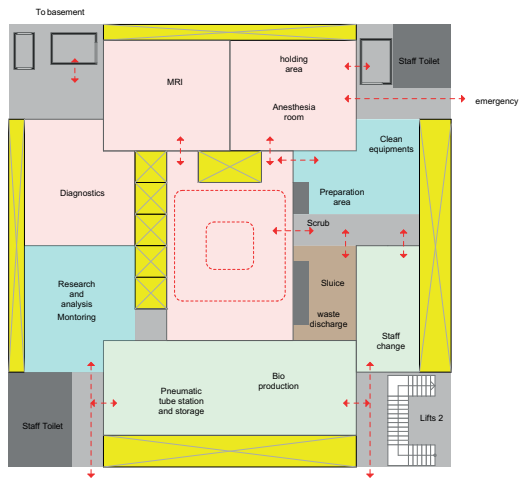
More focused on
research

More focused
on imaging and
monitoring

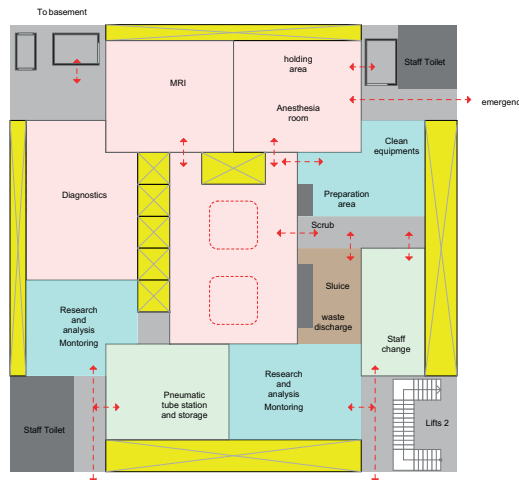


More focused on
production

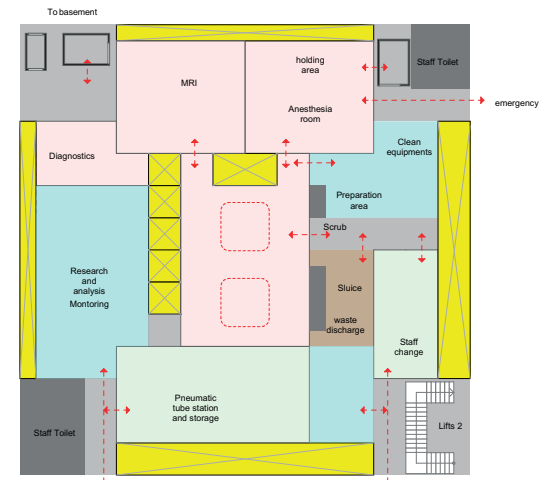
VARIATIONS



Surgical

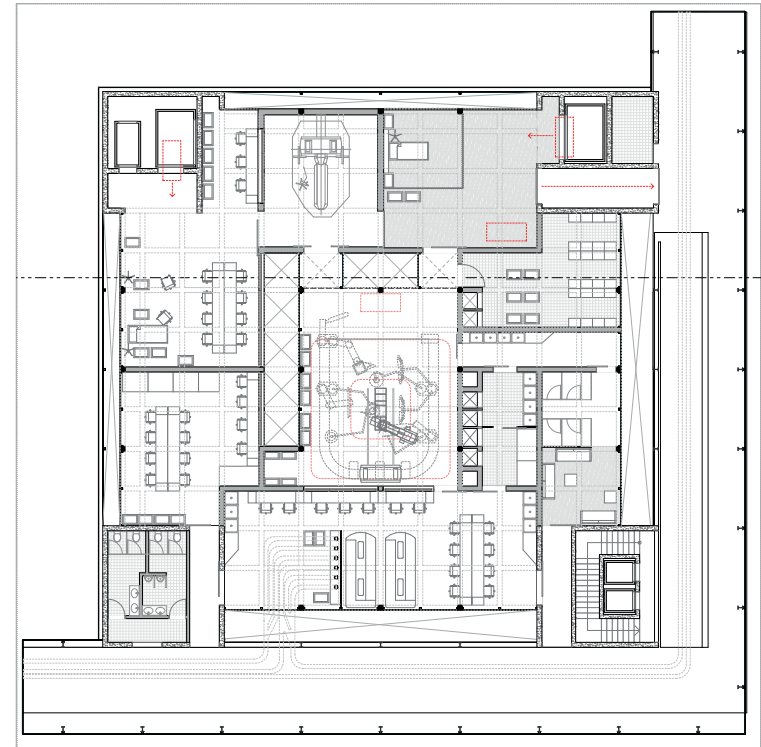
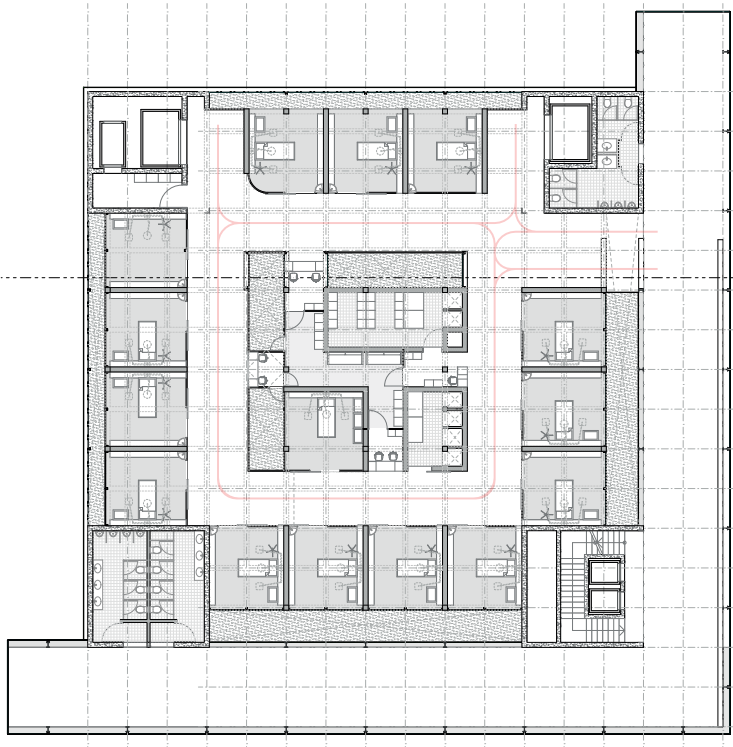


Therapy

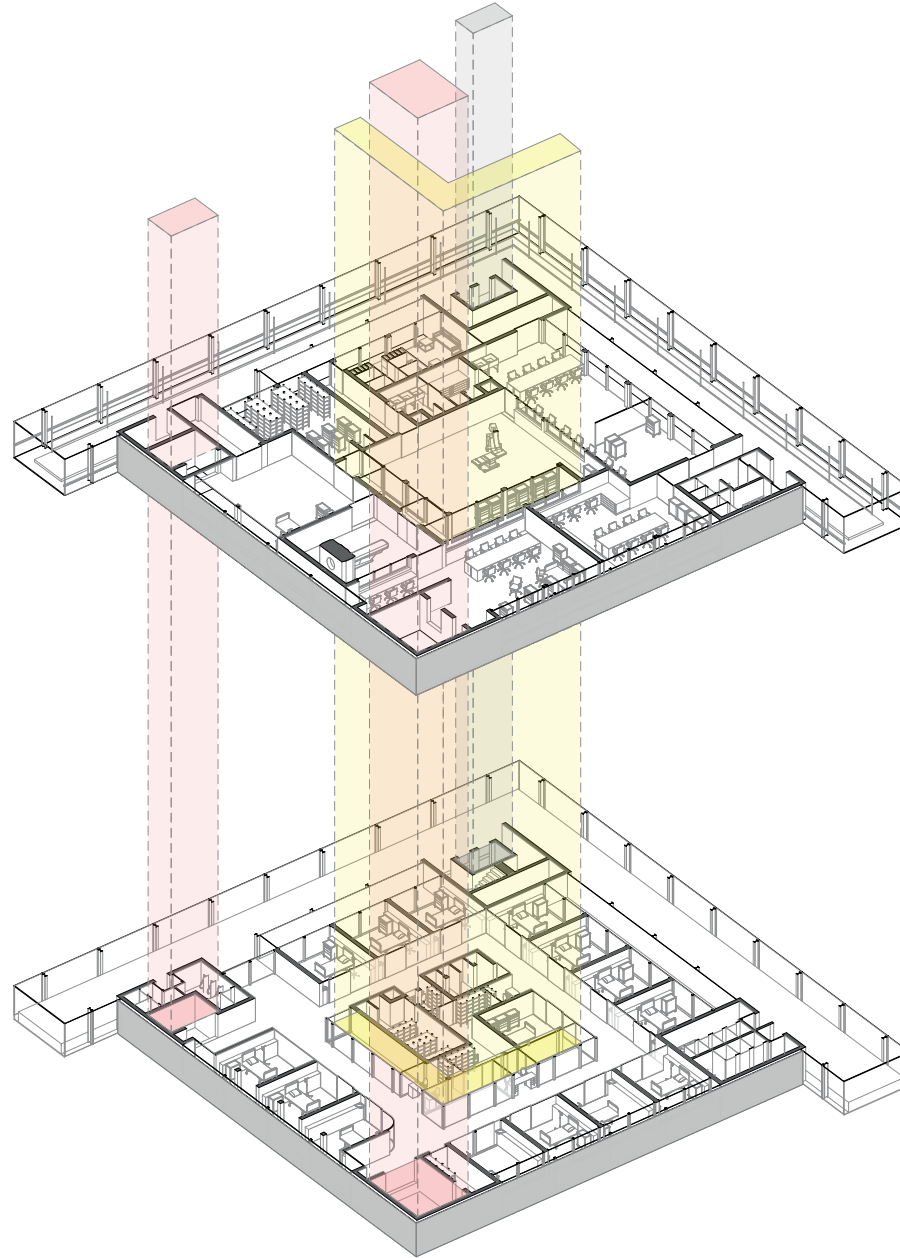


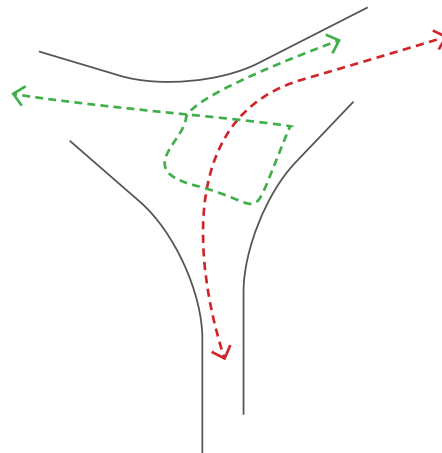
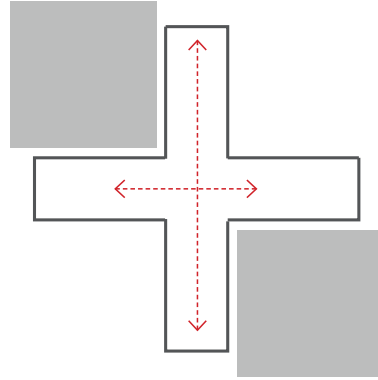
for bio sample
collection

THE SURGICAL MODULE



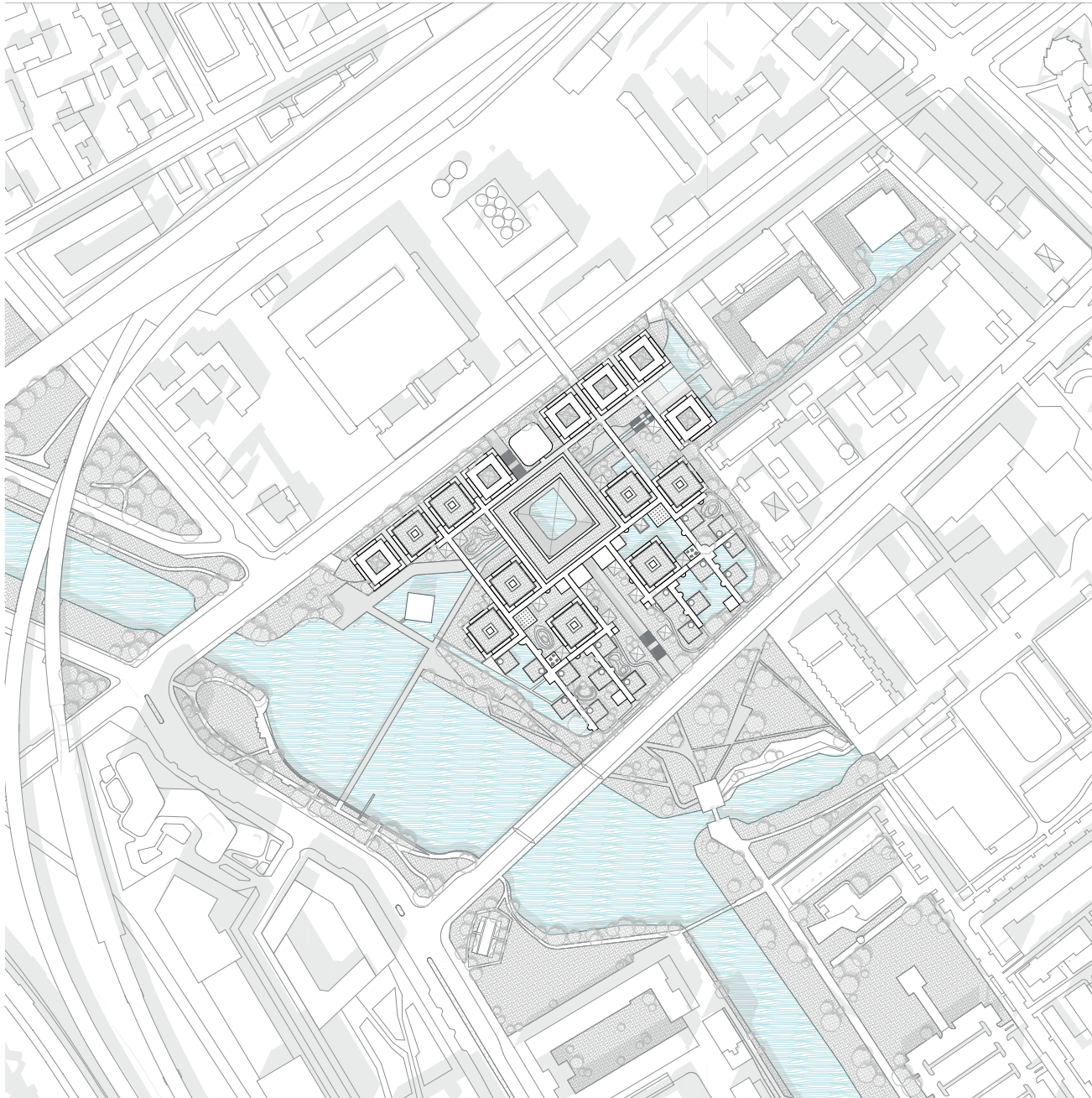
THE COLLECTION MODULE







The regenerative village

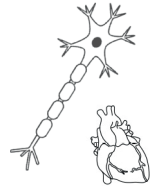




Patients



Medical staff



Bio matter



Family



Visitors



Locals



Researchers



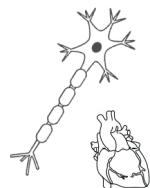
Engineers and
innovators



Patients



Medical staff



Bio matter



Family



Visitors



Locals

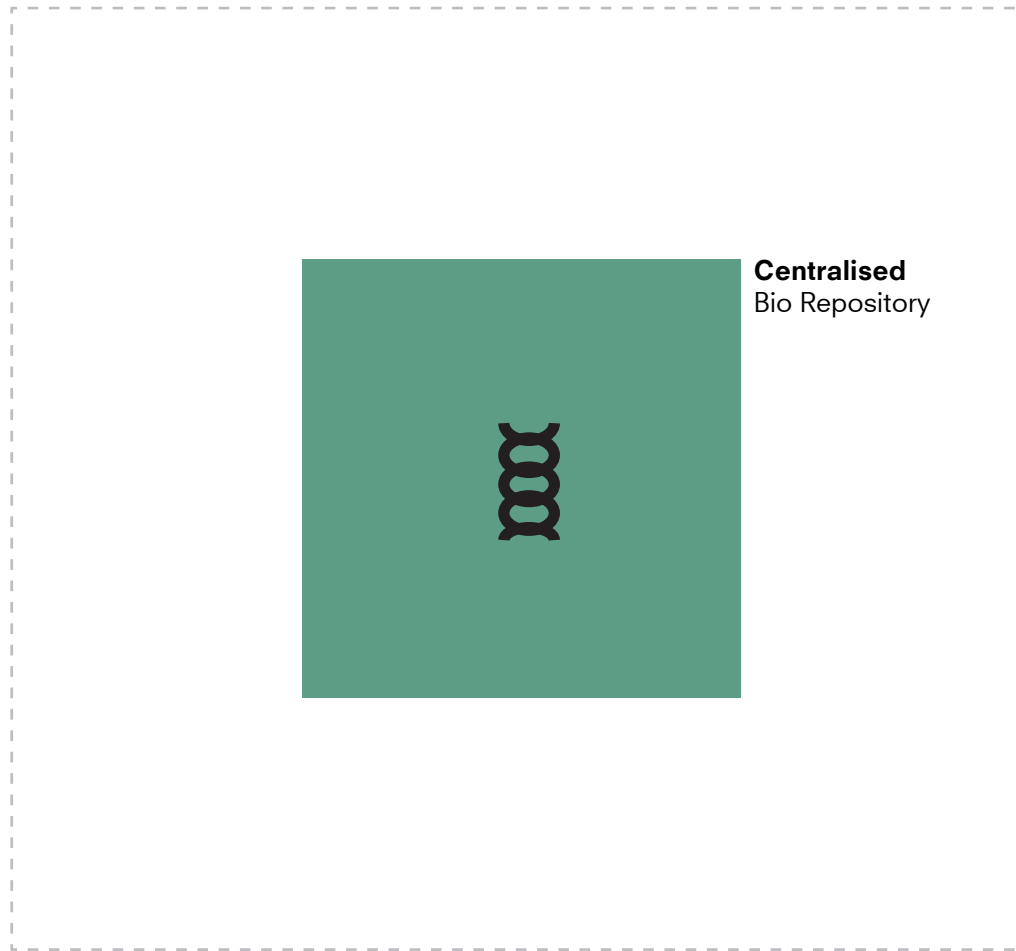


Researchers



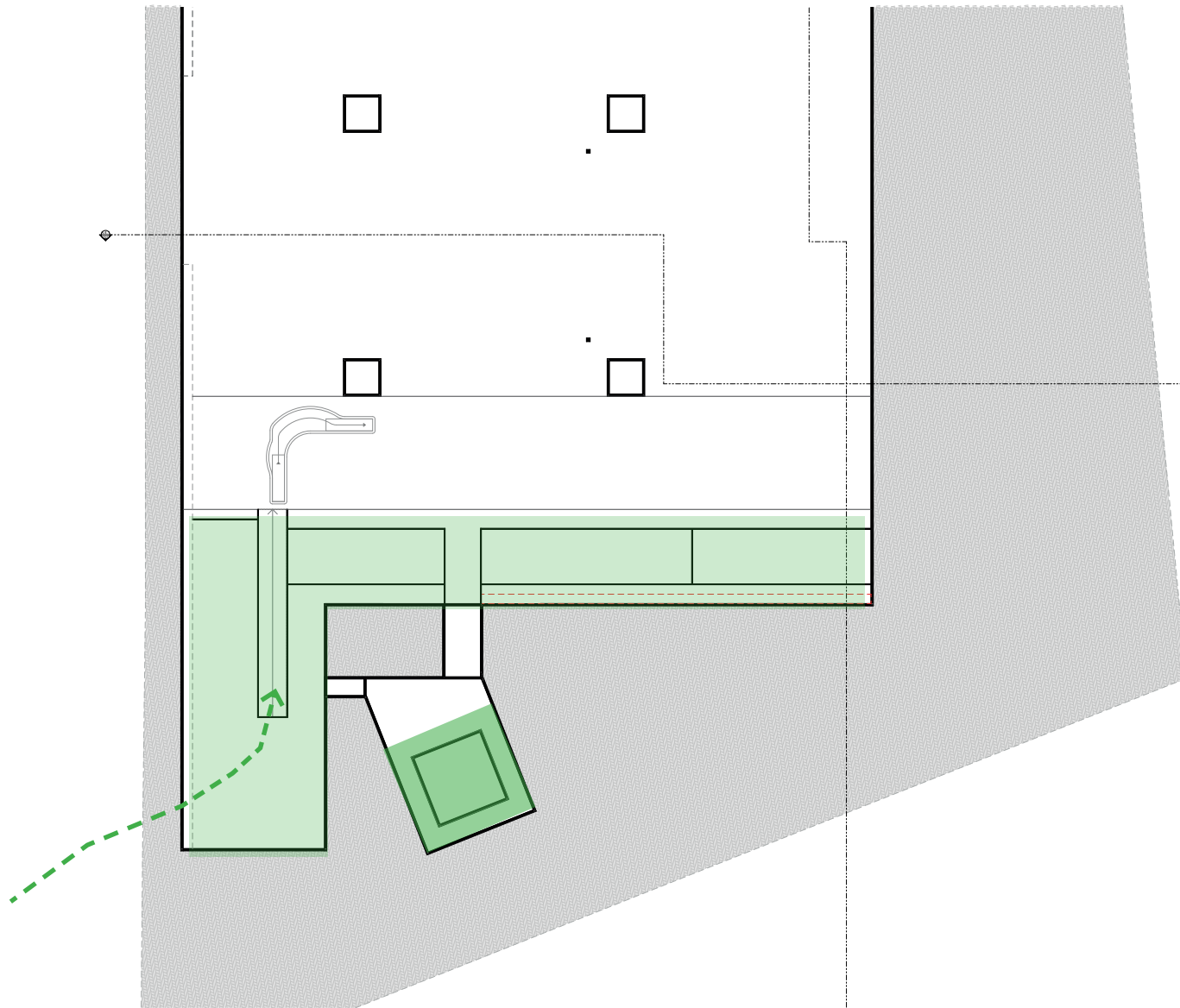
Engineers and
innovators

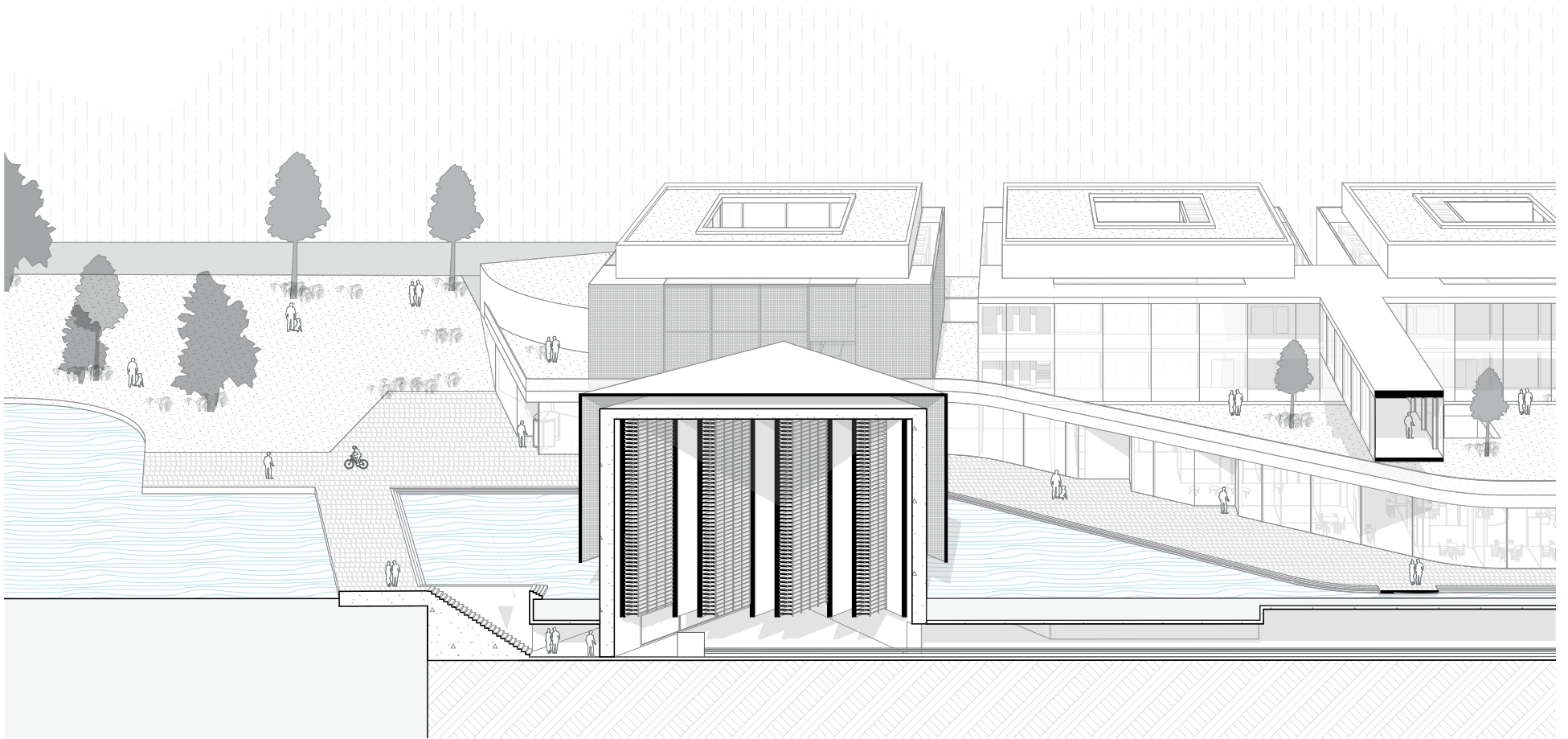
Functioning and interrelation

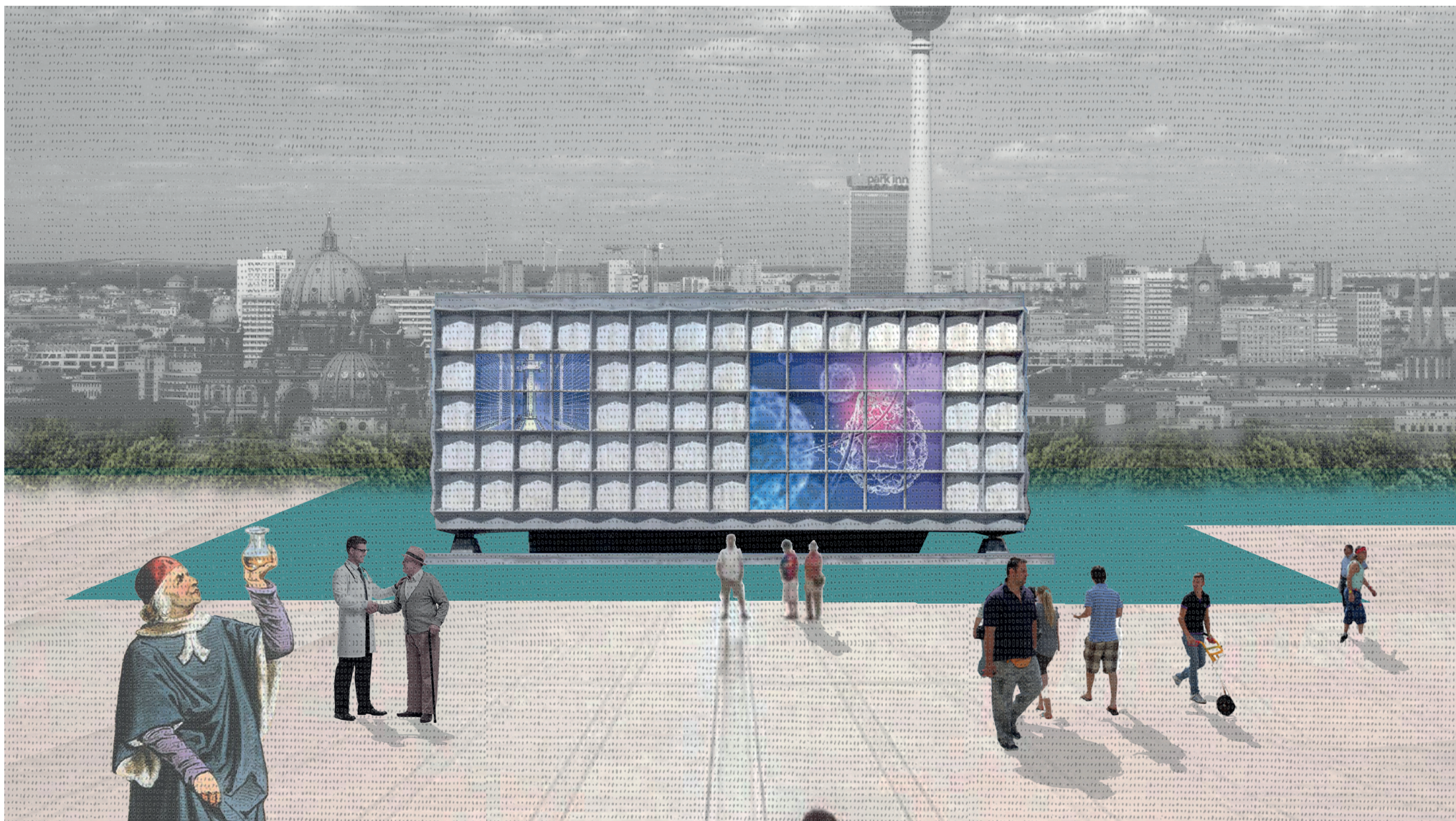




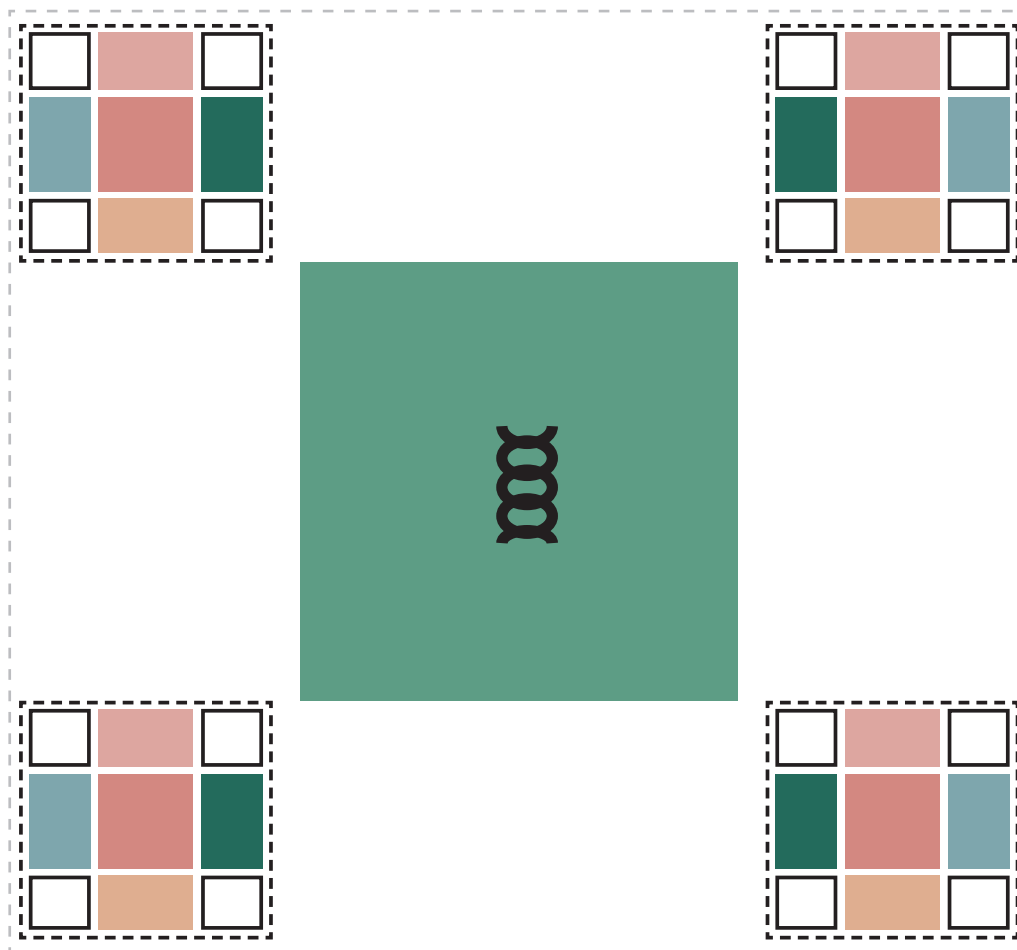


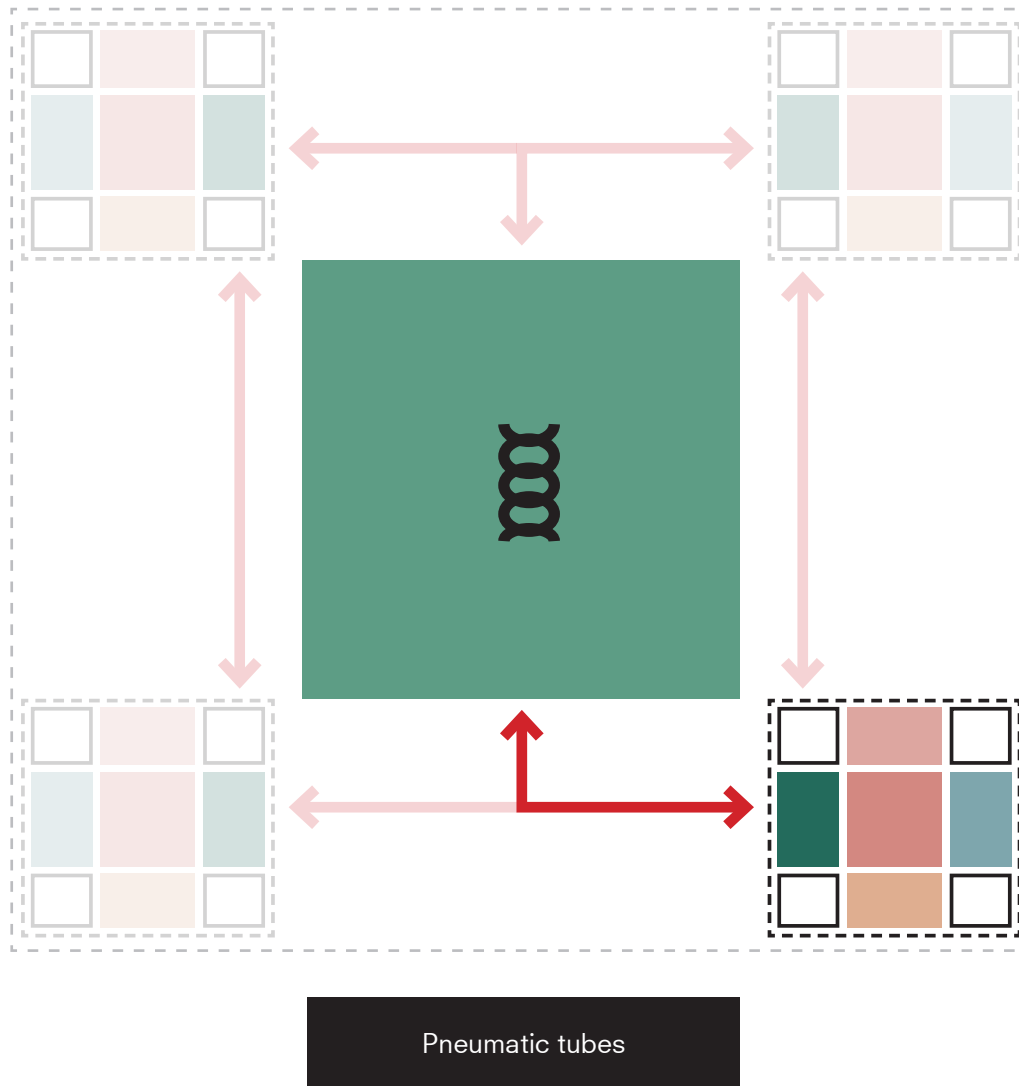












PNEUMATIC TUBES

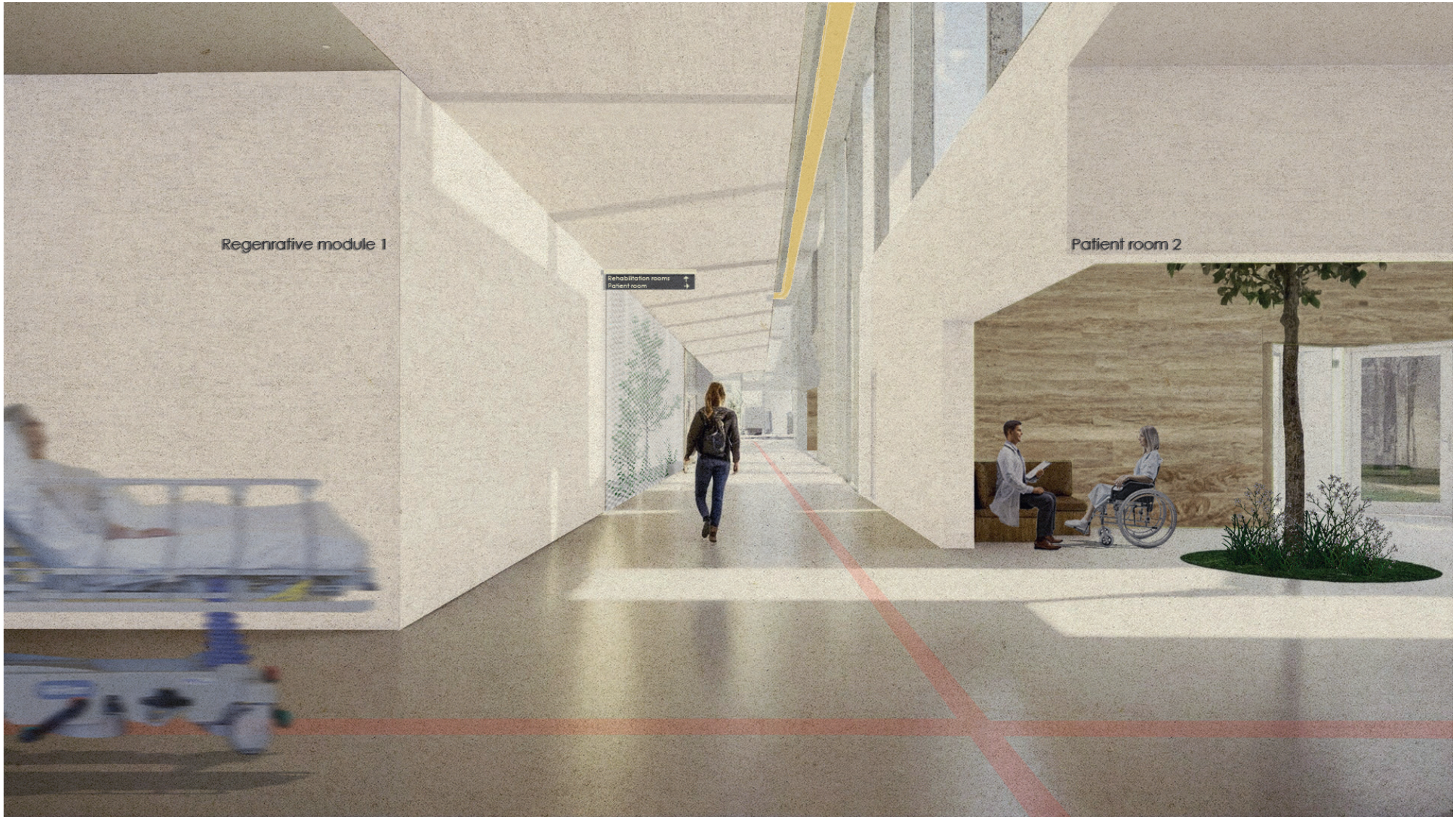


Hospital corridors

PNEUMATIC TUBES



Hospital lobby

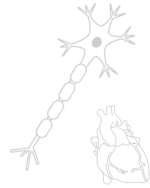




Patients



Medical staff



Bio matter



Family



Visitors



Locals



Researchers



Engineers and
innovators



Researchers



Engineers and
innovators



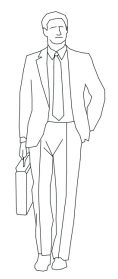
Visitors

- Legend
- 1. Bio repository
 - 2. Corridors
 - 3. Surgical Module
 - 4. Therapy module
 - 5. Bio deposit module
 - 6. Labs for Bio repository
 - 7. Auditorium
 - 8. Teaching spaces
 - 9. Staff rooms
 - 10. Collaborative discussion spaces



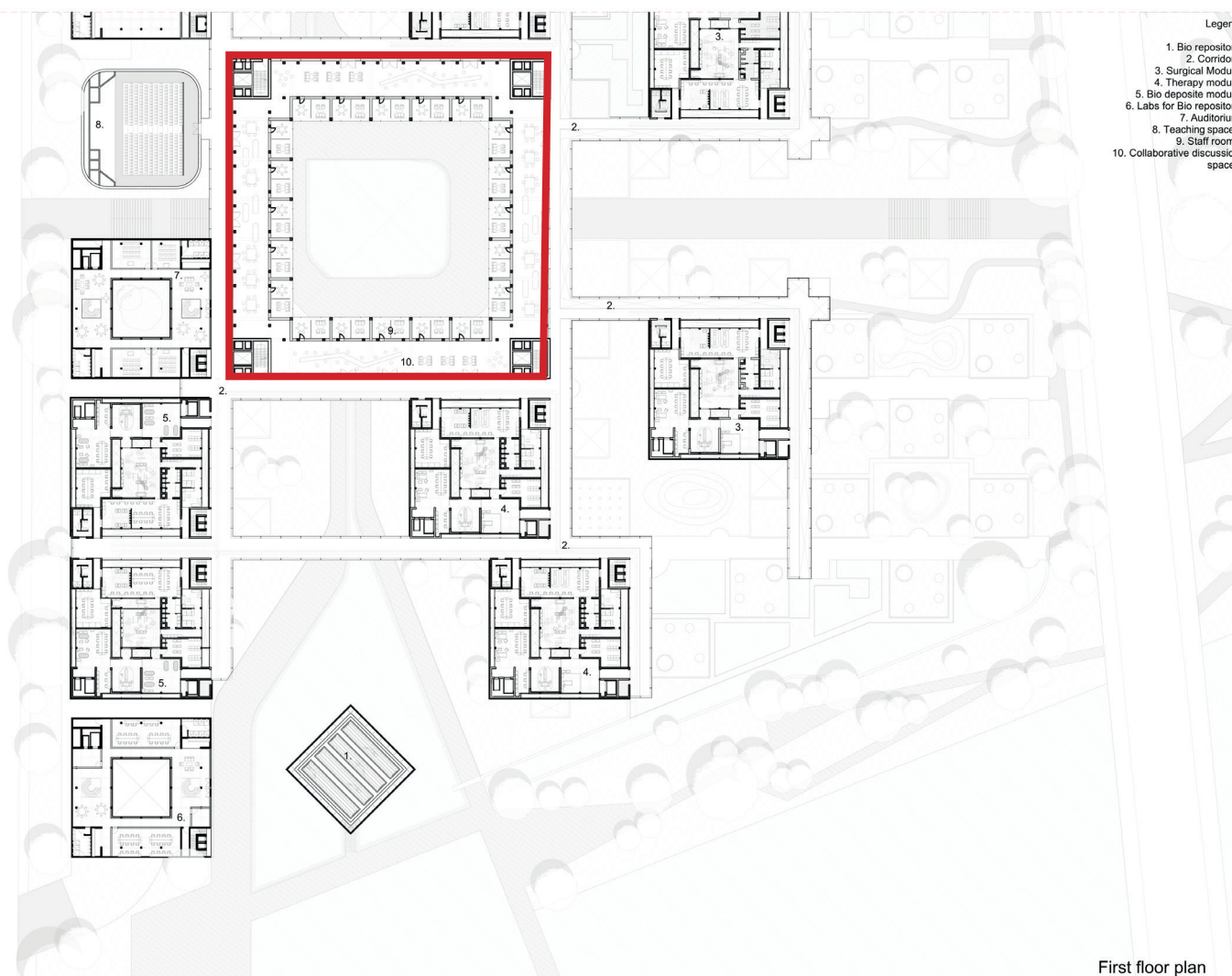
Researchers

Engineers and innovators



Visitors

First floor plan





Patient 1



Patient 2



Patient 3

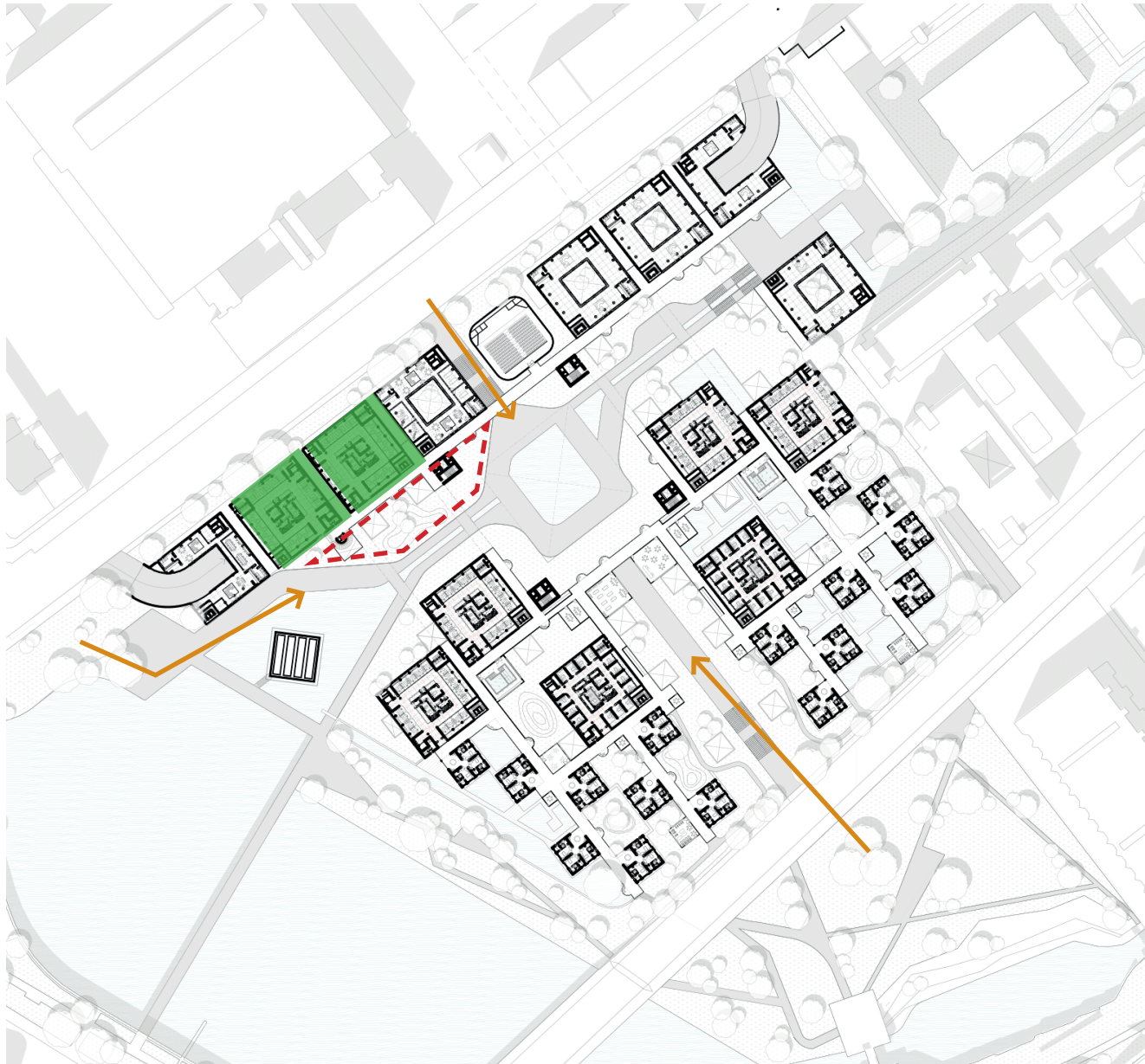




Patient 1



Patient 2



Patient 3





Patient 1



Patient 2

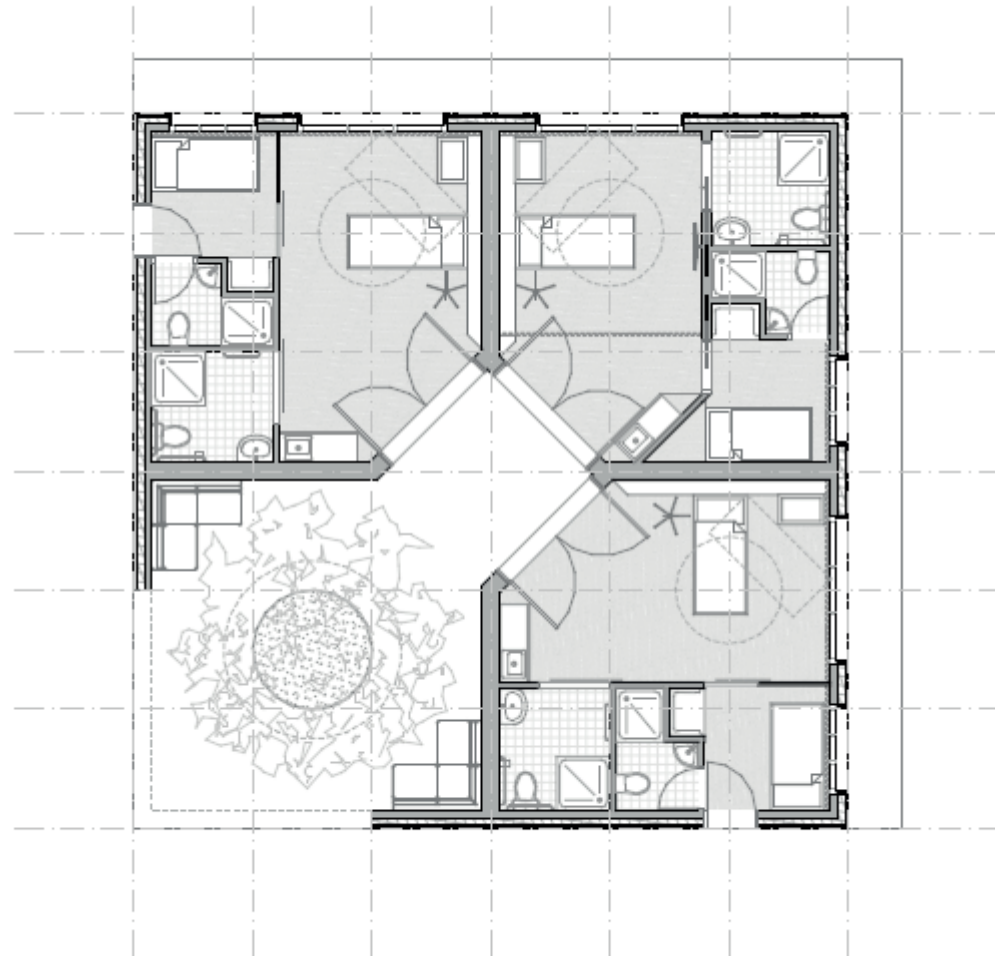


Patient 3





Patient 3







GIVING THE HOSPITAL AN IDENTITY

Inside the modules



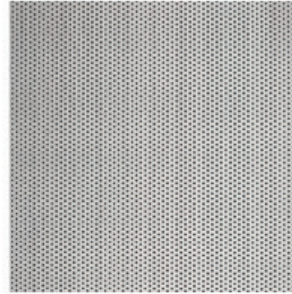
warm interiors, difused light,
wood texture

Outside the modules



Glass, white, direct light

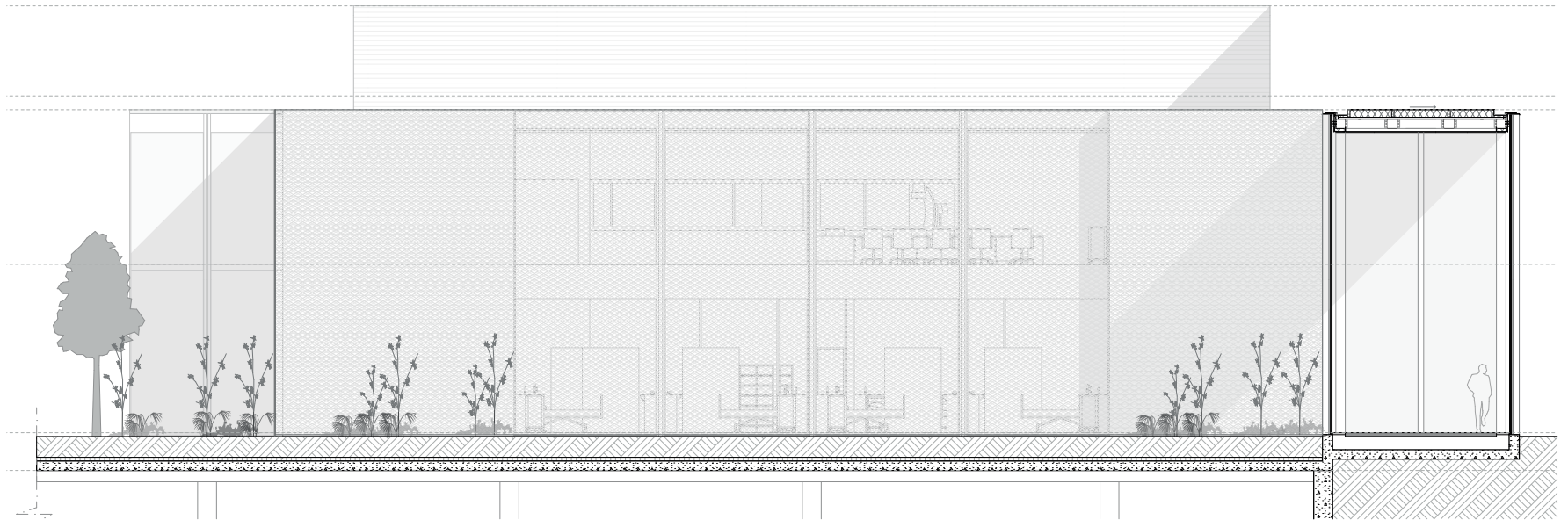
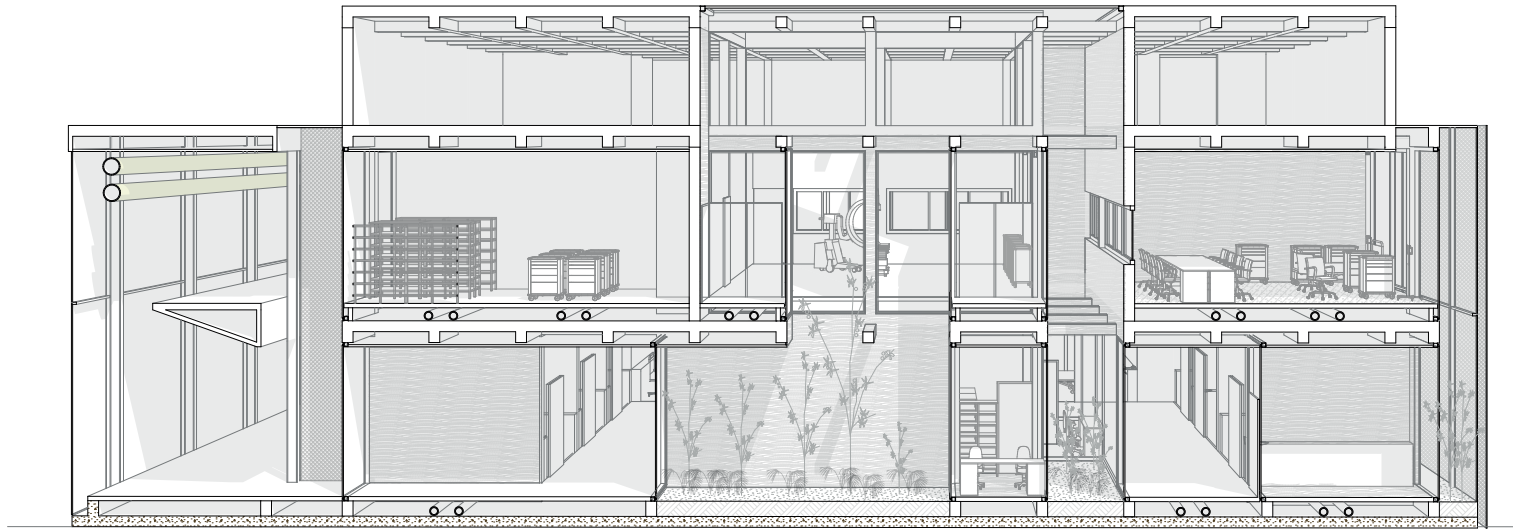
USE OWN RENDERS



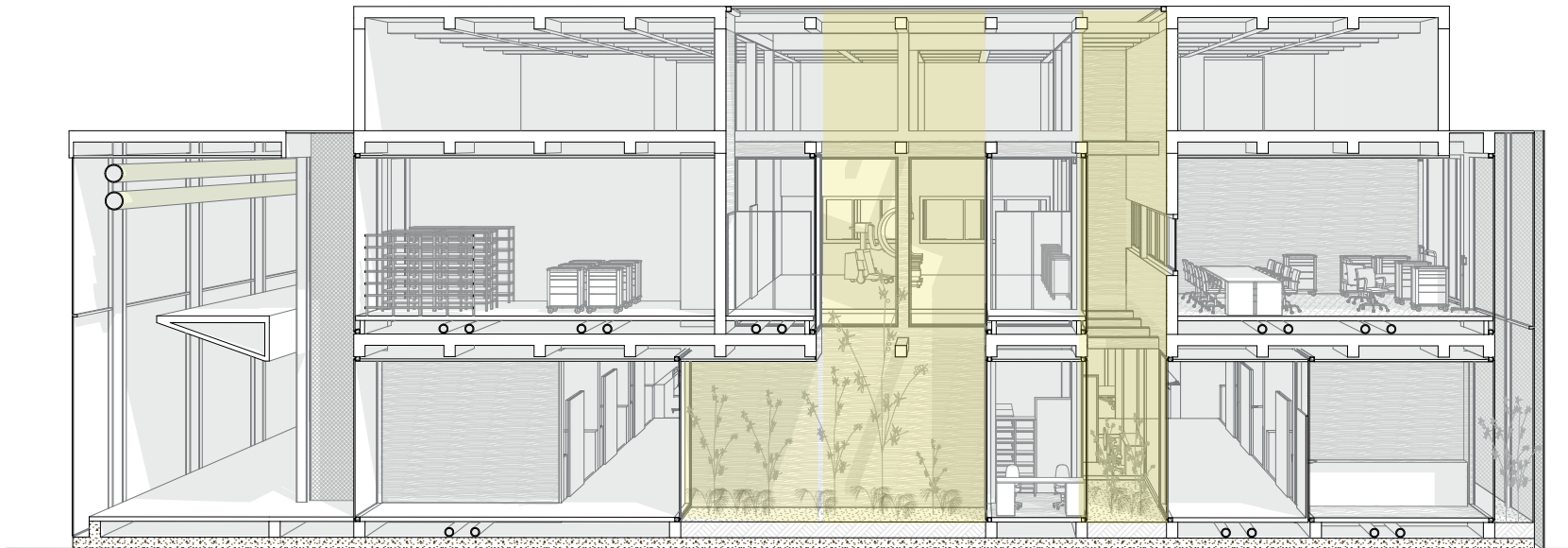


MATERIALS - INTERIOR

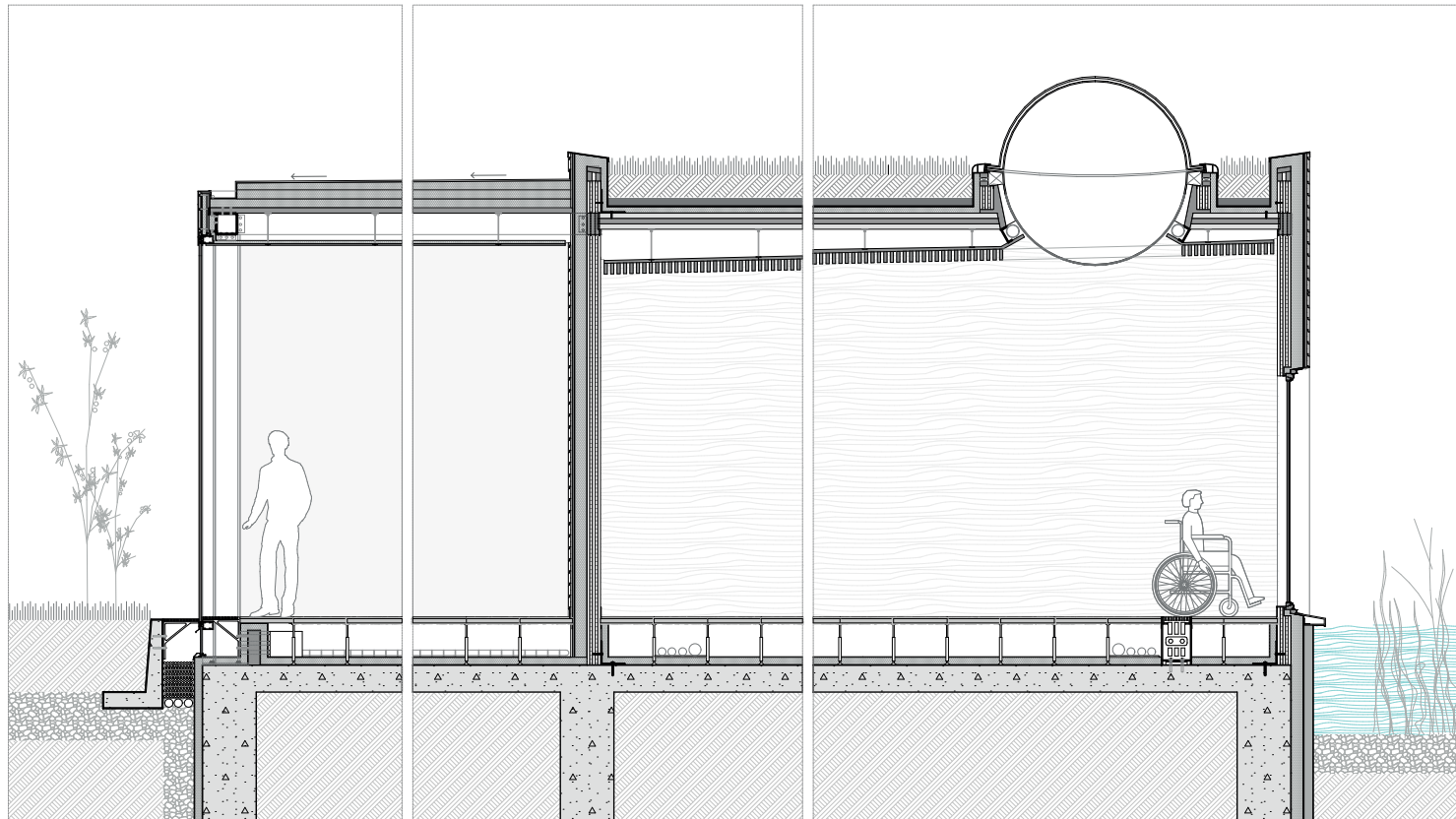


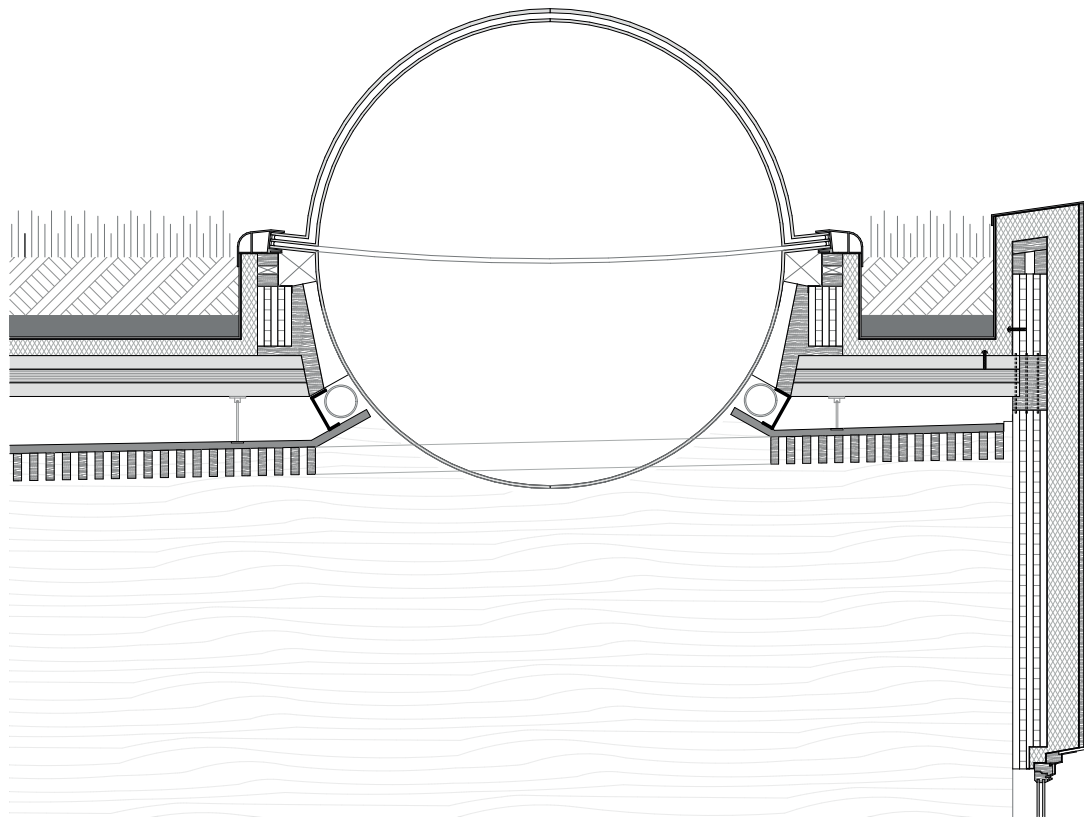


LIGHT WELL

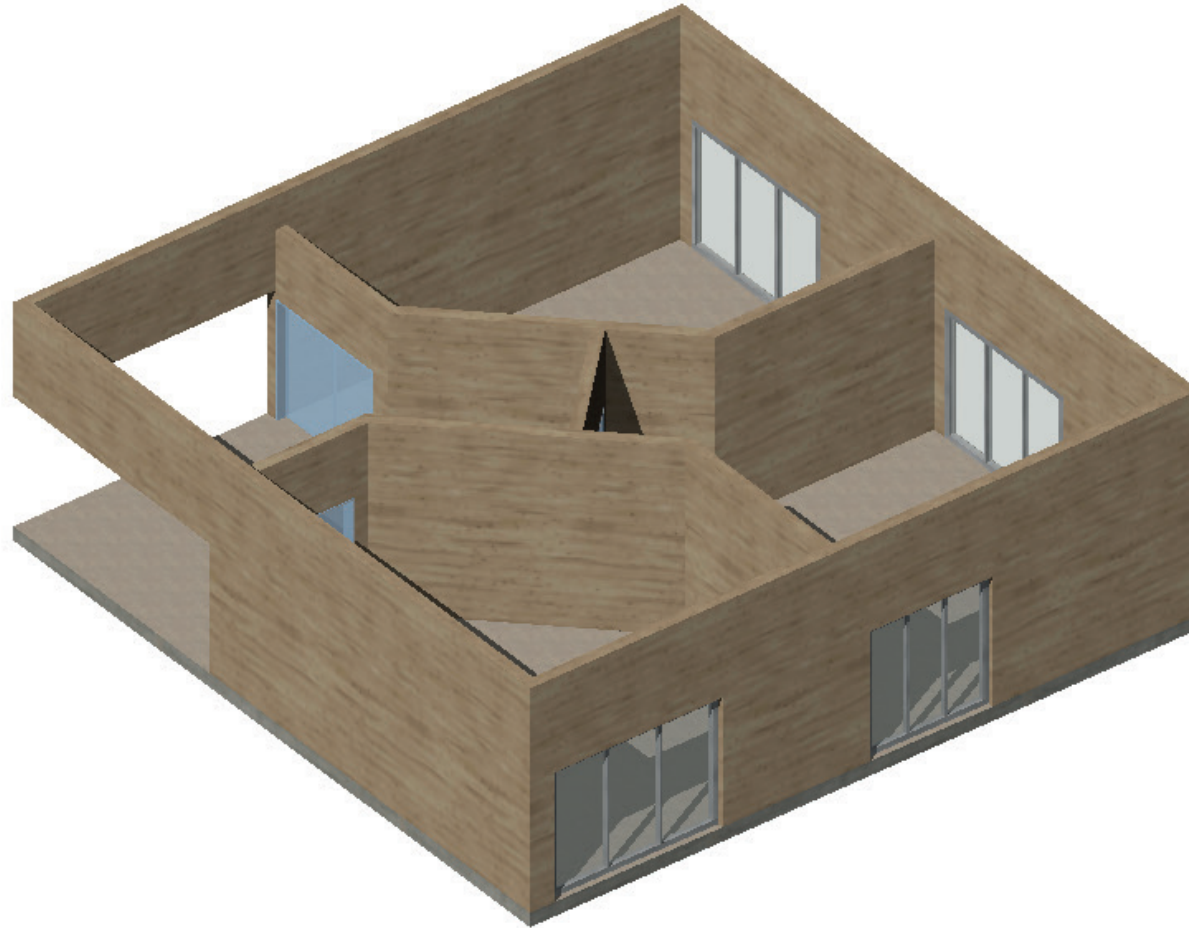






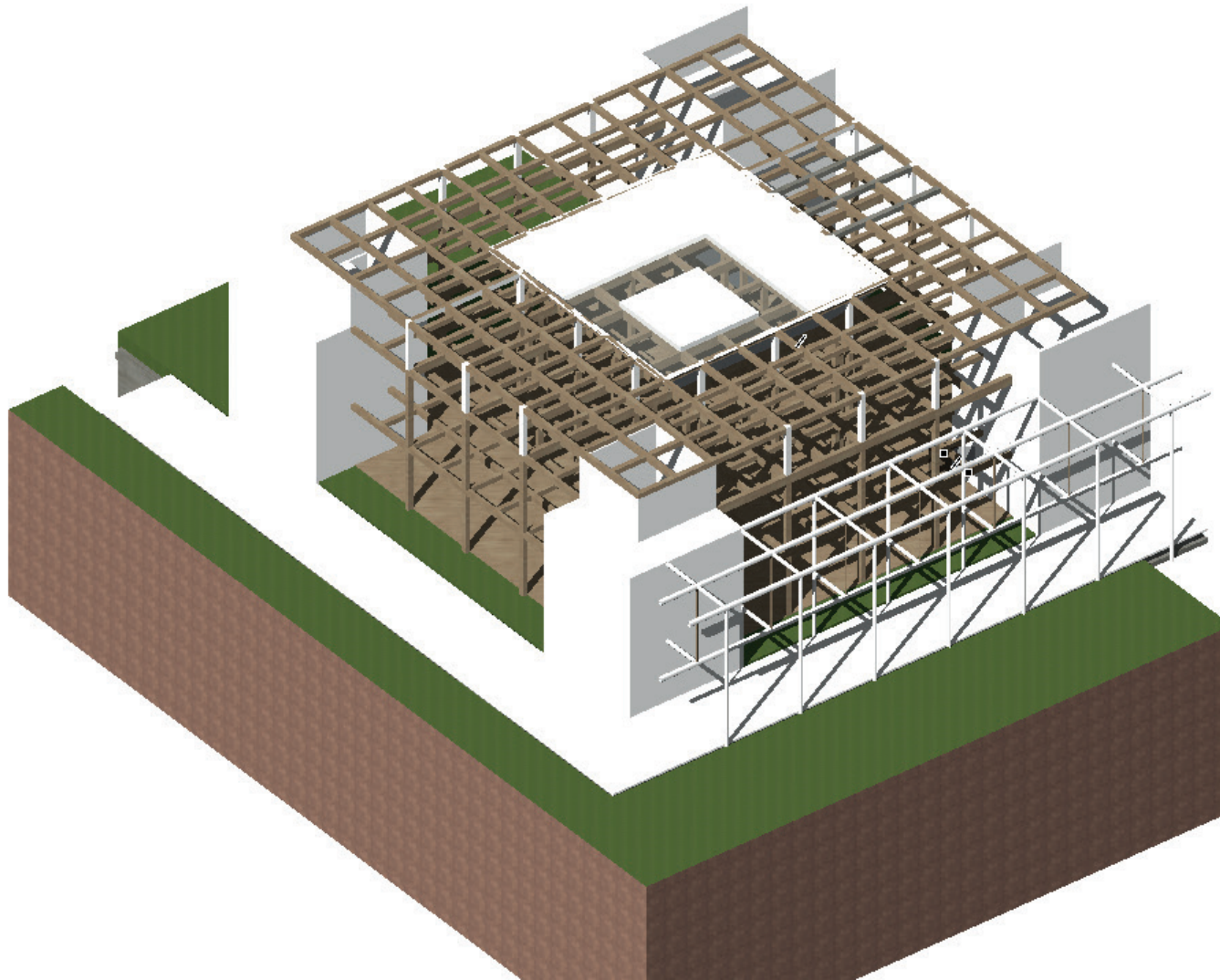


STRUCTURE - PATIENT ROOM

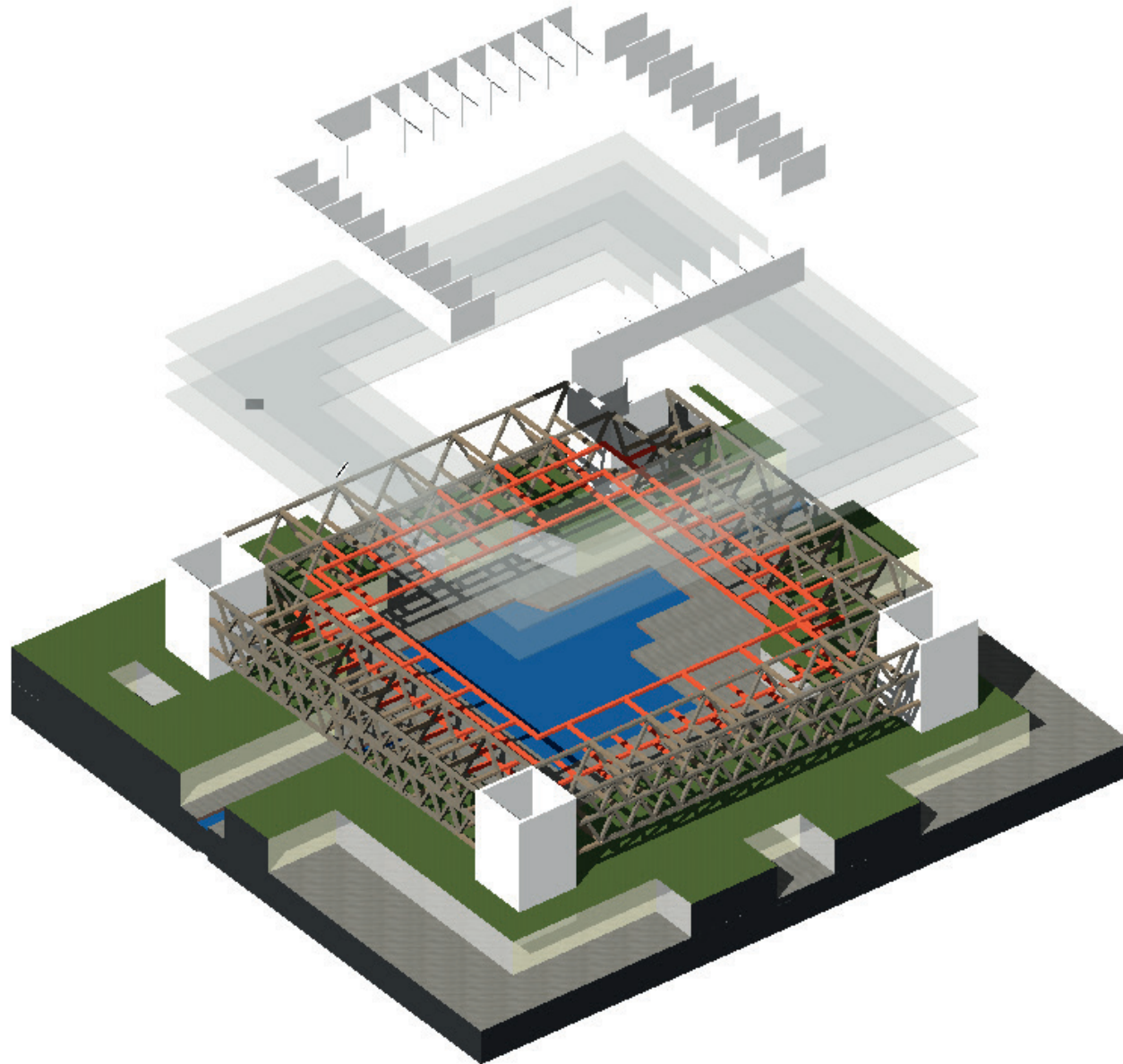


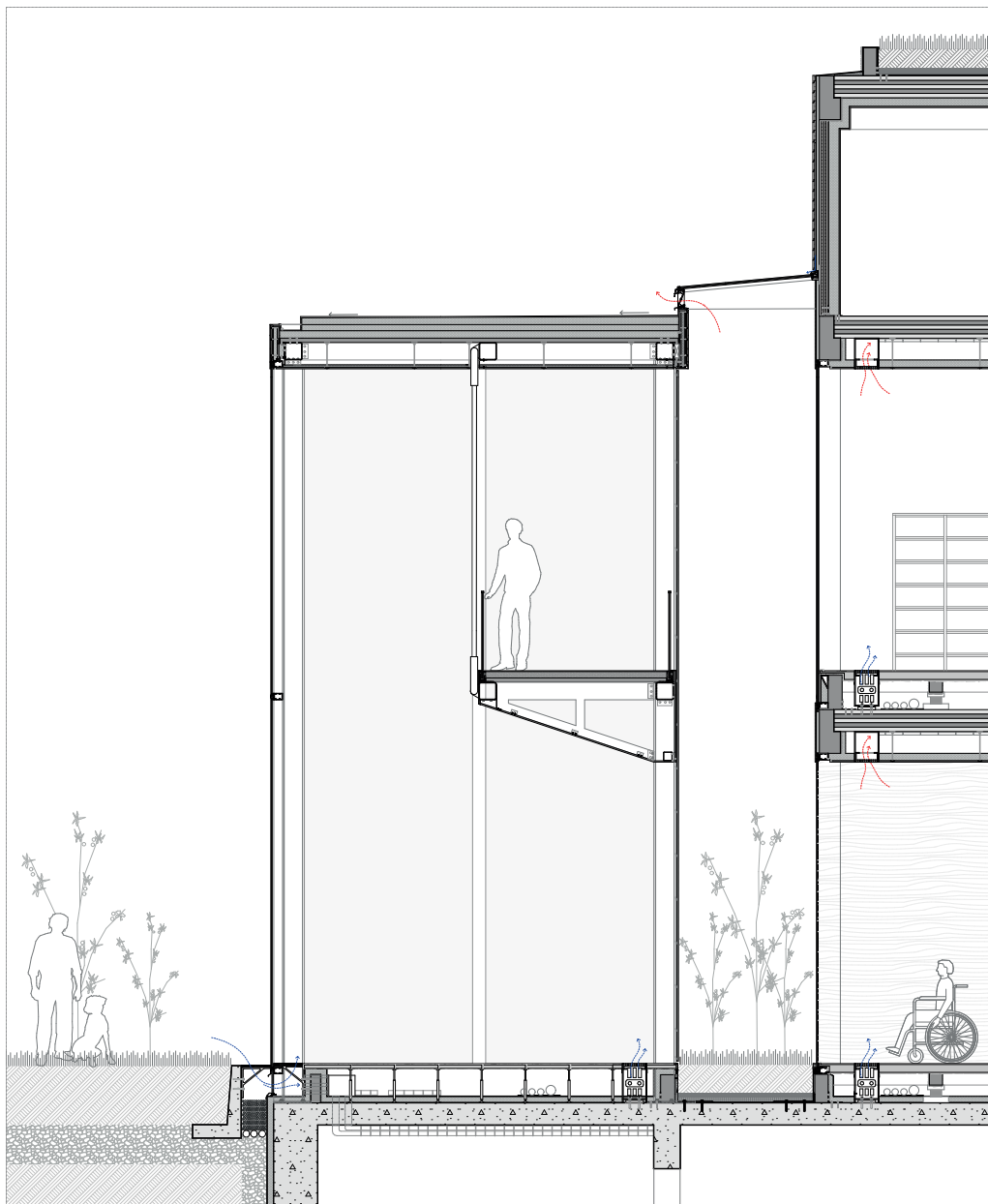
MAKE THEM SIMPLE WITH A MATERIAL PALLET ON ONE SIDE

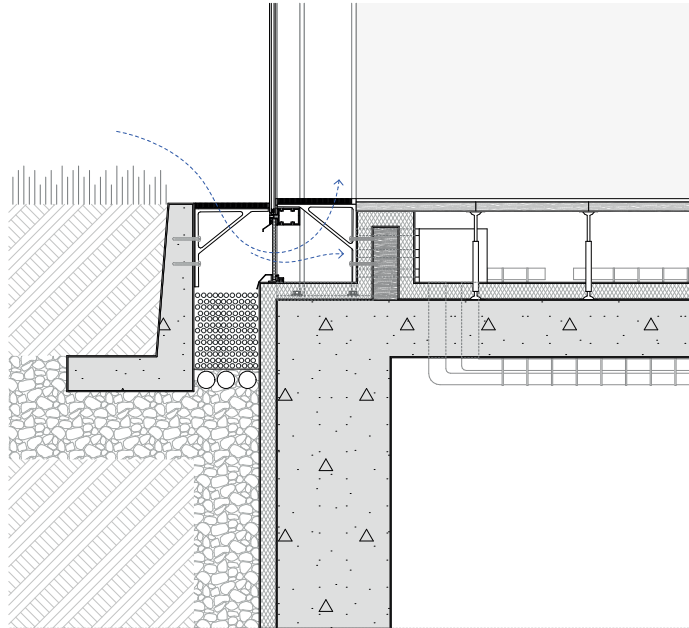
STRUCTURE - CLINICAL MODULE

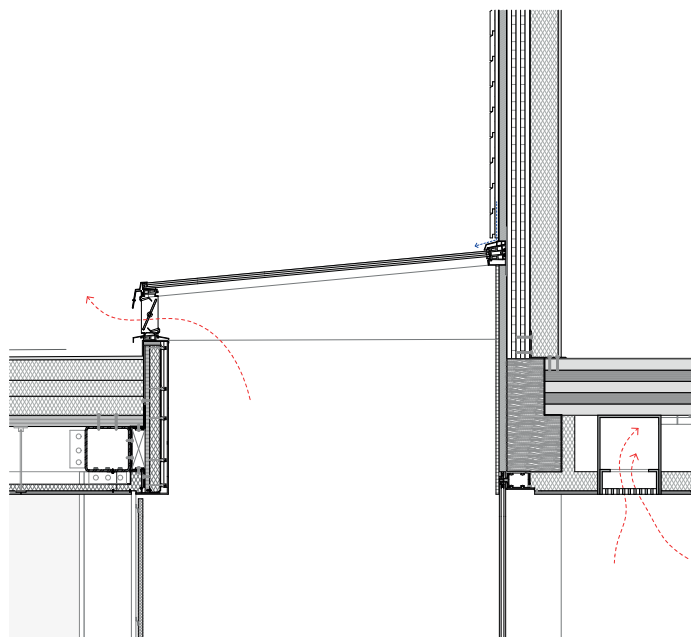


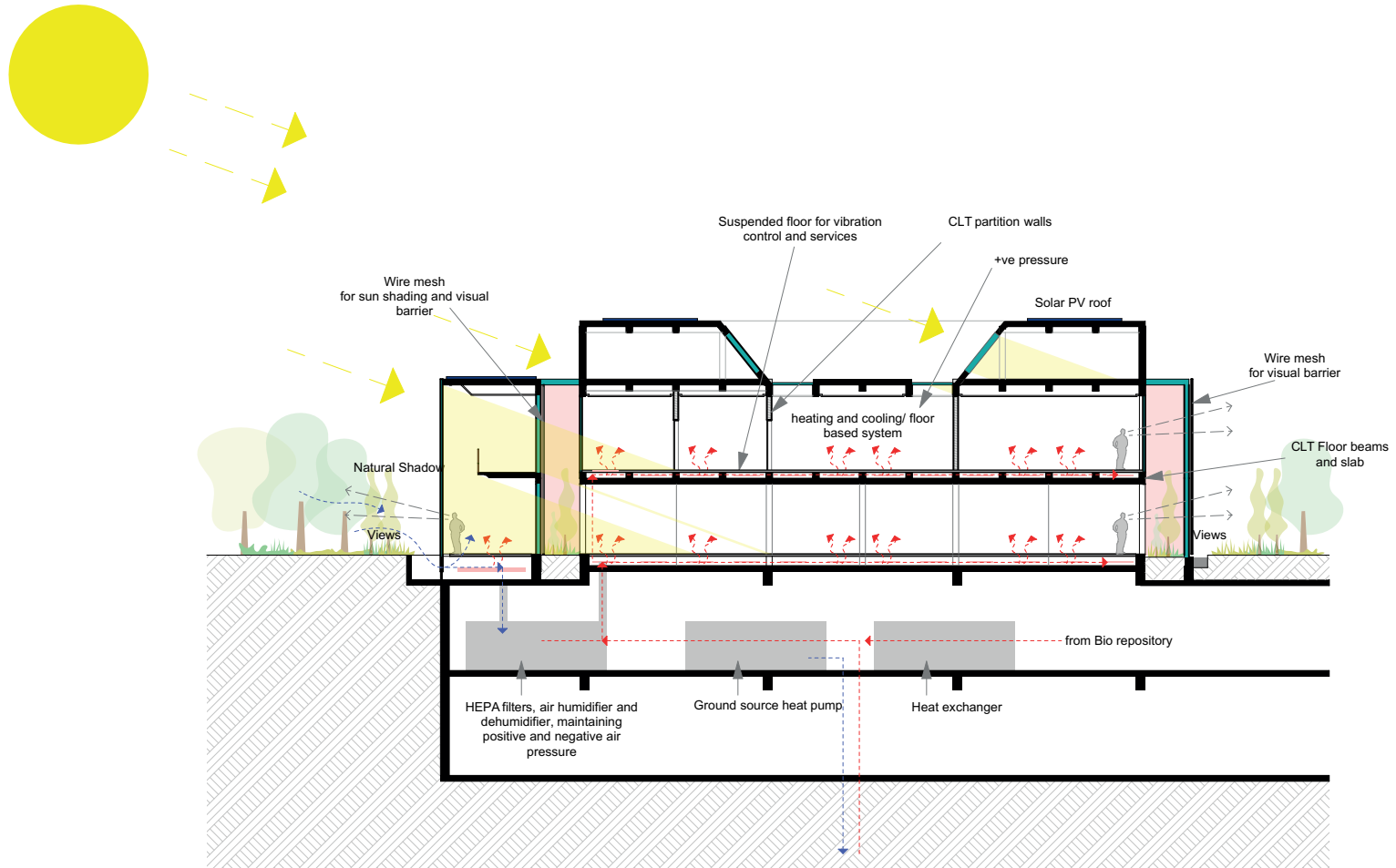
STRUCTURE - THE RING

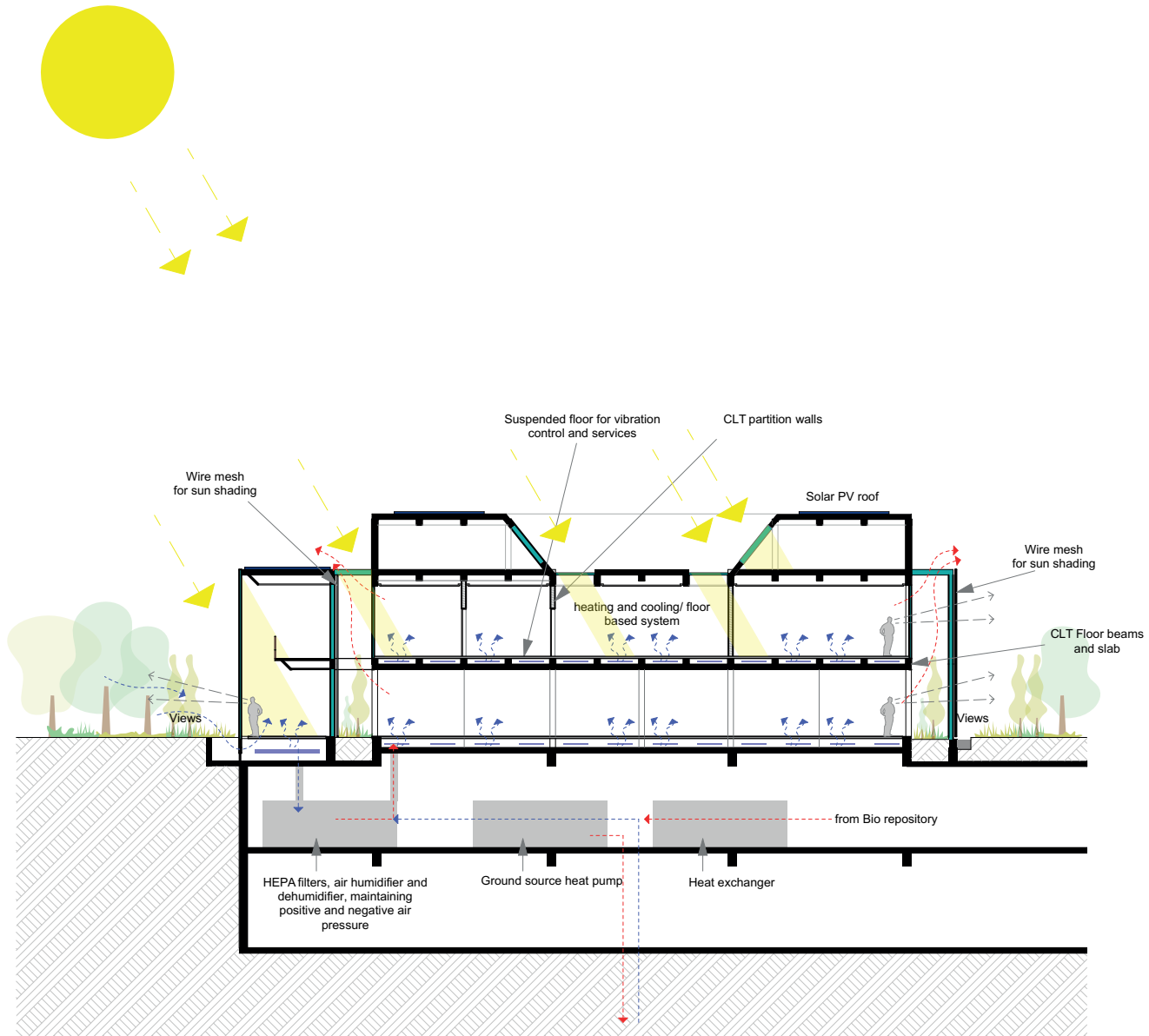


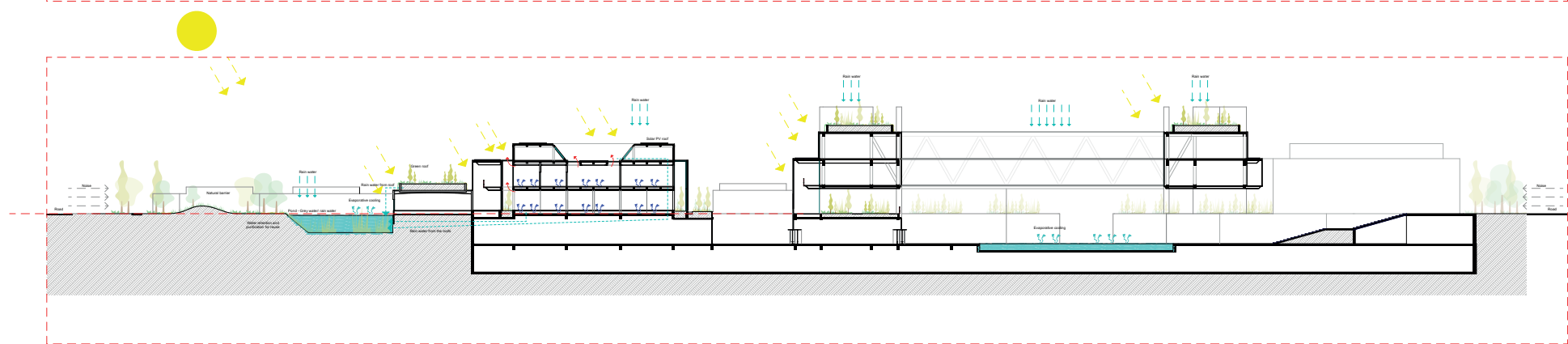
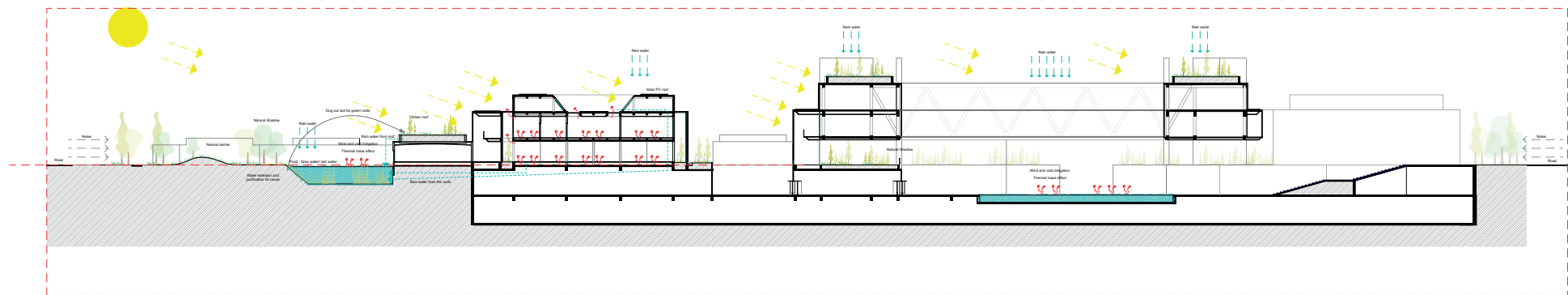












**“HOW DOES THE ARCHITECTURAL DESIGN
OF A HOSPITAL CHANGE TO SUPPORT
THE DEVELOPMENT AND DELIVERY OF
REGENERATIVE TREATMENTS WHILE
ENHANCING PATIENT EXPERIENCE?”**





