

COMPLEX PROJECTS **CARE AND NATURE**

Children's Hospital in Berlin

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10/11/2023

| **INTRO** |

RESEARCH

DESIGN BRIEF

CONCEPT

IMPLEMENTATION

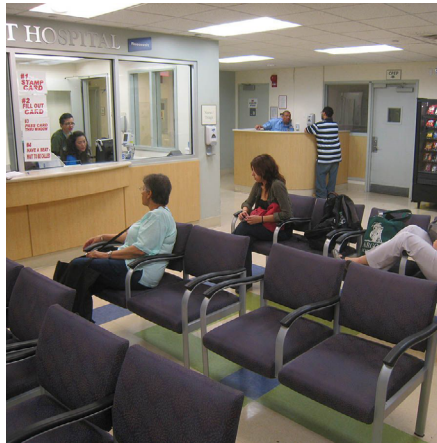
CONCLUSIONS

Intro

NEGATIVE MEMORIES



Pain & Crying



Anxious Waiting



Endless Corridor

Intro

IS THIS THAT BAD?



Delayed treatment



Longer therapeutic time

Intro

EMOTIONS MATTER!

‘Higher levels of **emotional well-being** are **beneficial for recovery and survival** in physically ill patients.’

Lamers, Sanne M. A, Linda Bolier, Gerben J Westerhof, Filip Smit, and Ernst T Bohlmeijer. “The Impact of Emotional Well-Being on Long-Term Recovery and Survival in Physical Illness: A Meta-Analysis.” *Journal of Behavioral Medicine* 35, no. 5 (2012): 538–47.

IS THIS THAT BAD?

‘Among all the patient groups, **children** are the **most sensitive** group to **environmental changes**. The alien hospital environments might easily provoke their **fear, anxiety, anger, and sadness**.’

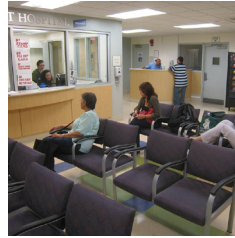
Nasab, Sara Nourmusavi, and Seyedjalal Mirbazer. "Ideal Physical Features of Environmental Design in Children's Hospital." Facilities 38, no. 5/6 (2020): 445–66.

Intro

DISCRETE METHOD



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Distracting & Comforting



Introduce Entertainment



Colorful Upholstery

WHAT'S THE PROBLEM?

There are too many **discrete solutions** in pediatric space design.

A type of design that takes care of the **holistic experience** of the children is **lacking**.

VOICE FROM THE SYSTEM

// Dialogue

Listen To The Children!

Christopp Klein + Christine Nickl-Weller

'**Germany** has **fallen far behind** on a global scale with respect to highly specialized **holistic care for children** in hospitals.'

'In Germany hospitals, we are **too focused on functional ways** of thinking. Efficient process and technological bio-engineering services are important, but pediatric care should not be reduced to those aspects alone.'

Nickl-Weller, Christine, and Hans Nickl, editors. Architecture for Health: Architektur Für Gesundheit. 1st ed., Braun Publishing AG, 2021.

Intro

A PIECE OF NEWS

Catastrophic situation at Berlin children's hospitals

Carola Kleinert, Markus Salzmann

🕒 3 October 2022

The Berlin Children's Hospitals Initiative (IBK) has sent a second open letter to Federal Health Minister Karl Lauterbach (Social Democrats, SPD) as well as to Berlin Health Senator Ulrike Gote (Greens) and the management of Berlin's children's hospitals.

Even after initial treatment, there is no guarantee of receiving a hospital bed if needed. In any case, the capital city has only 735 beds in paediatric wards, a fact that has long been criticized. But even these beds can not be occupied because many must remain vacant due to the extreme staffing shortage. Frequently, children and adolescents have to be transported to hospitals in Brandenburg, some of which are far away.

<https://www.wsws.org/en/articles/2022/10/04/lyob-o04.html>

GERMANY'S POSITION?

This is a **universal** problem in the general pediatric service.

This is also a **prominent** one in **German medical system**.

INTRO

|

RESEARCH

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RESEARCH QUESTION

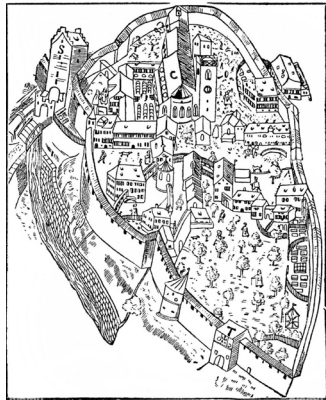
How can design approaches at different scales
help **improve the holistic experience of**
children in pediatric service?

Building Type Research

THE COMING BACK OF GREEN

0

St. Gall Monastery, Switzerland, 719



700

Early idea of **healing garden** emerged in monastery layout.

1900

Paimio Sanatorium, by Alvar Aalto, 1933



Early 1900s

Sanatorium prototype emerged for tuberculosis and mental illness.

1950

Altnagelvin Area Hospital, Ireland, 1960



1950s - 1970s

'Matchbox on a muffin'
'Floating like islands on green open space'

Middle Ages

Asylum

Religious communities with care provided by monks and nuns.

1710s

Enlightenment

Modern hospital appeared as the centers of medical innovation.

1920s

Modernity and Efficiency

Form follows **functions**.
Increasing **standards** for hospital architectures.

0

1900

1950

Building Type Research

THE COMING BACK OF GREEN

1980

2010

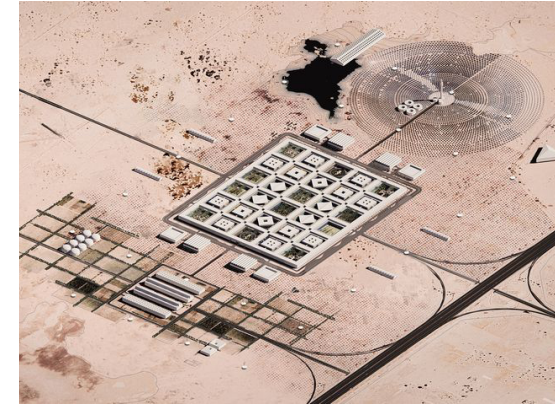
Kaiser-Franz-Josef-Spital, Wien, initiated in 2008



2000s

More hospital designs ask for **opening the ground floor to public spaces.**

Reimagination of future medical districts, OMA



Future

City as a gigantic healthcare mechanism?

1980s

Urban Integration

Hospital as **part of the city.**

2010s

Digitalization, Automation, etc.

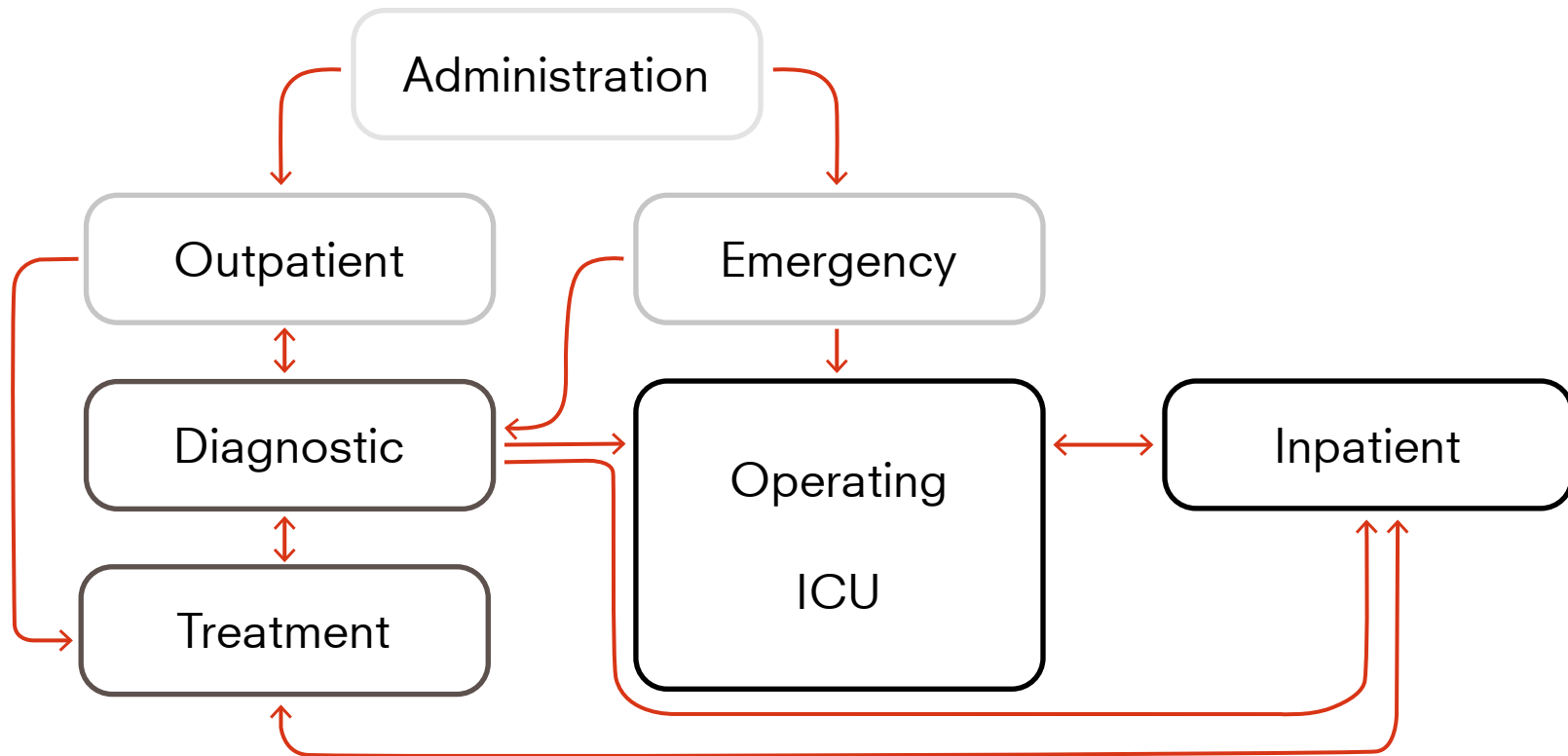
Caring is **shifting out** of the hospital.

1980

2010

Building Type Research

PATIENT'S FLOW -- SEQUENTIAL

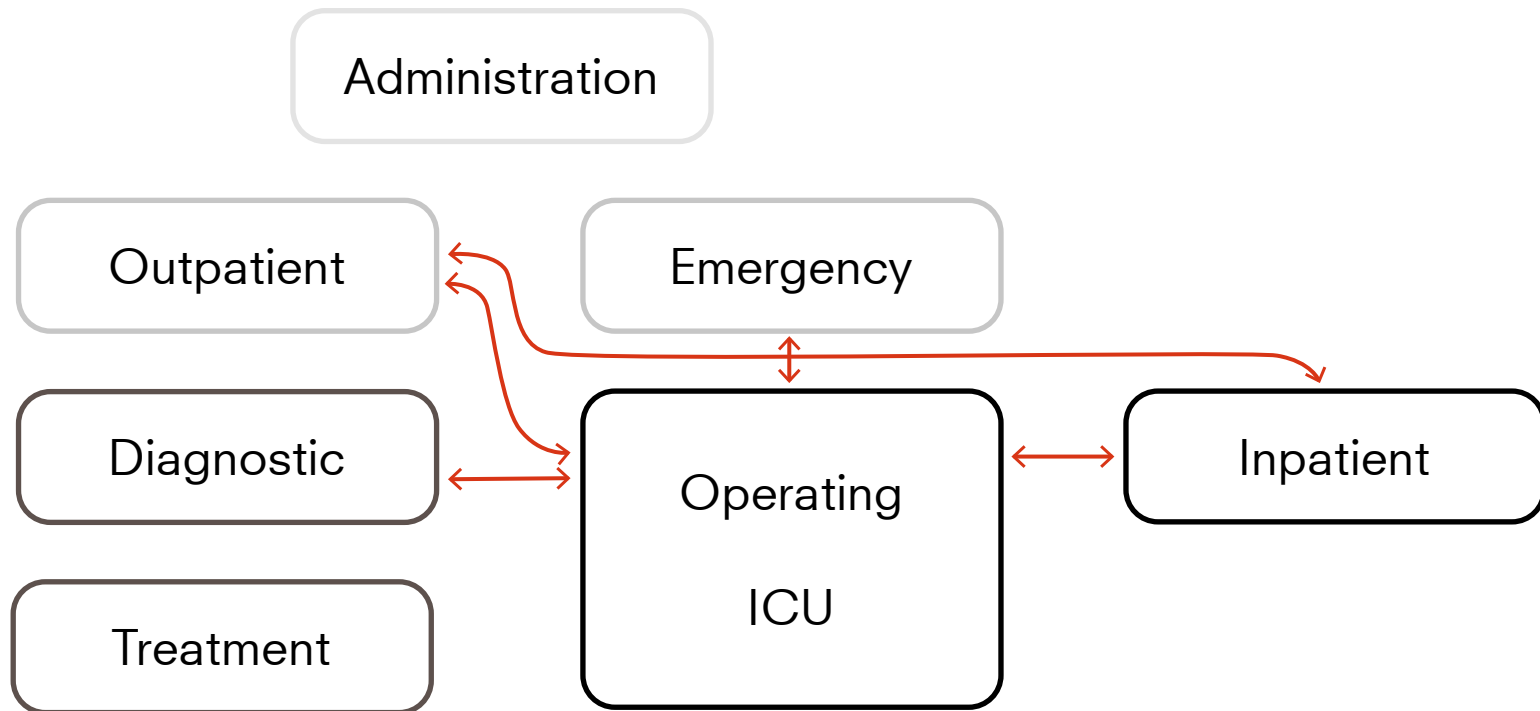


Core Flow Pattern of Patients

World Health Organization. Regional Office for the Western Pacific. District hospitals : guidelines for development. 2nd ed.. WHO Regional Office for the Western Pacific, 1992
Hopkinson, Michael; Kostermans, Cornelis P.. Building for Health Care : A Guide for Planners and Architects of First and Second Level Facilities, Washington, D.C. : World Bank Group, 1996.

Building Type Research

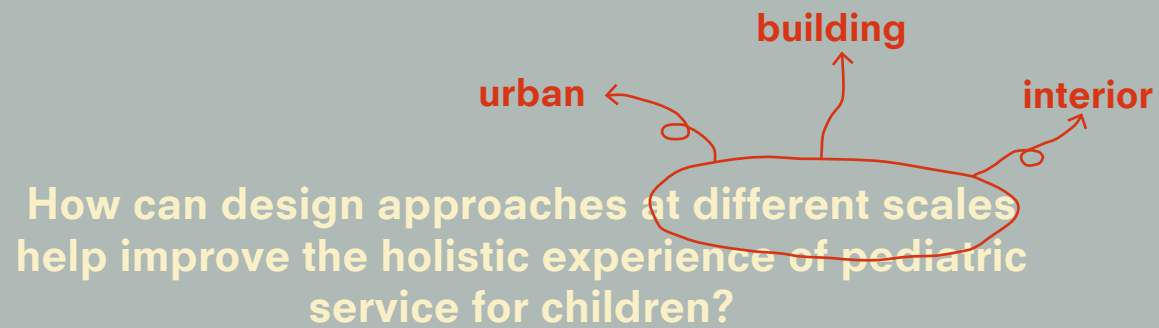
DOCTOR'S FLOW -- WEAVING



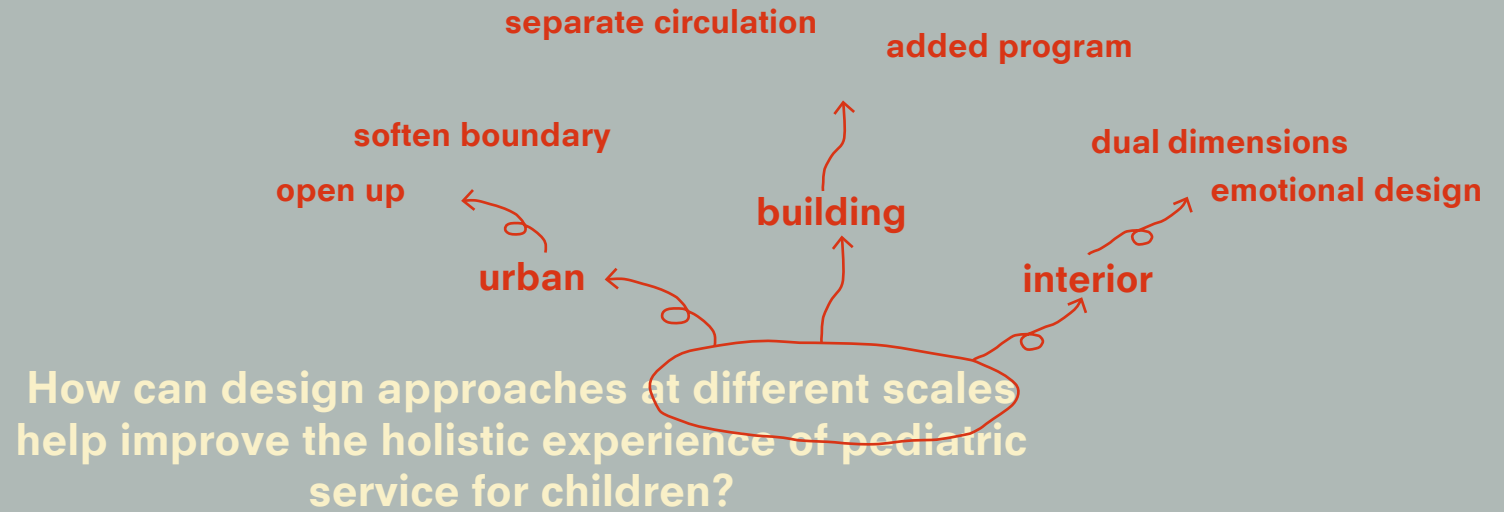
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PERSPECTIVES IN 3 SCALES



PERSPECTIVES IN 3 SCALES



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CONCEPT

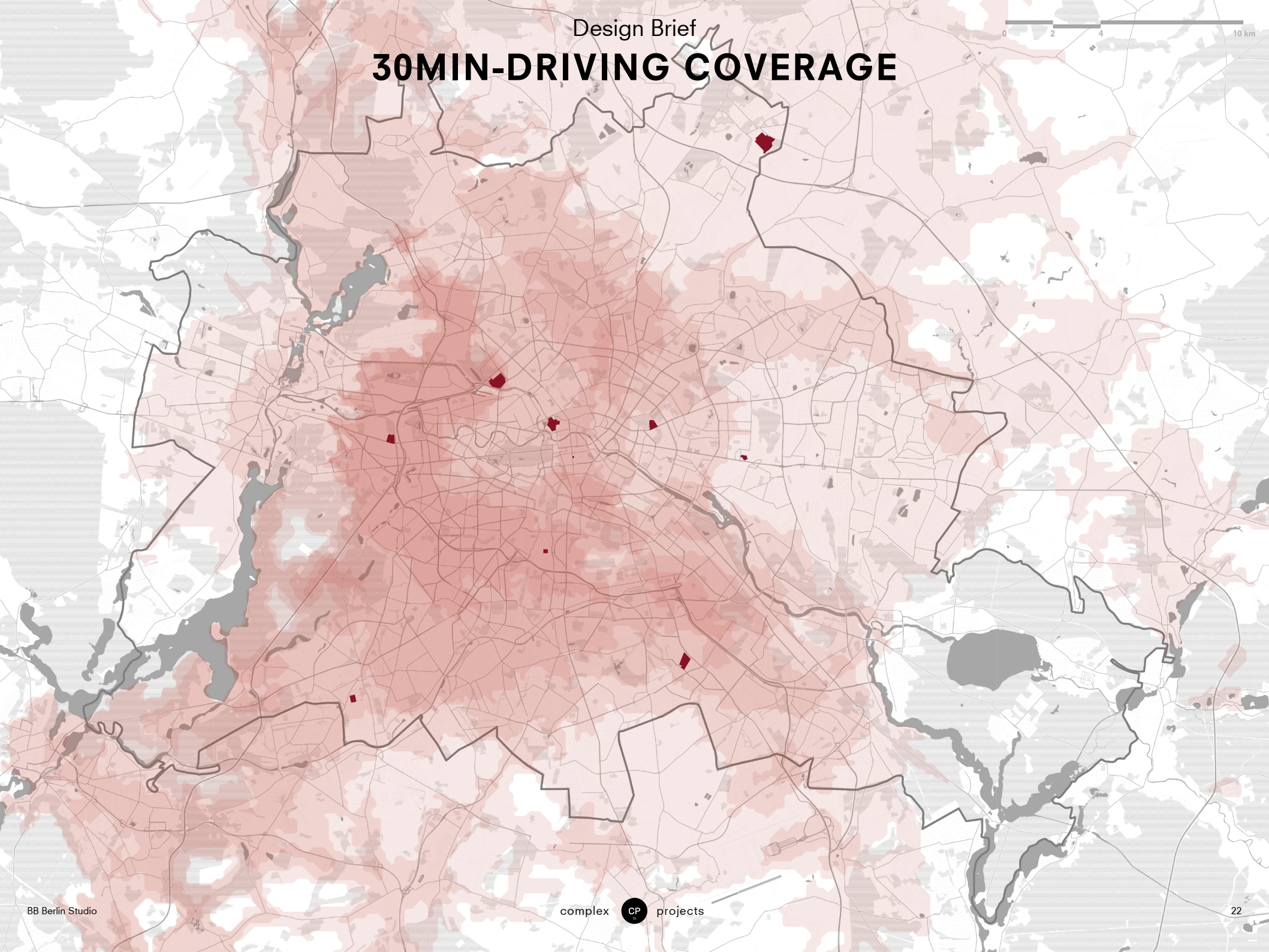
IMPLEMENTATION

CONCLUSIONS

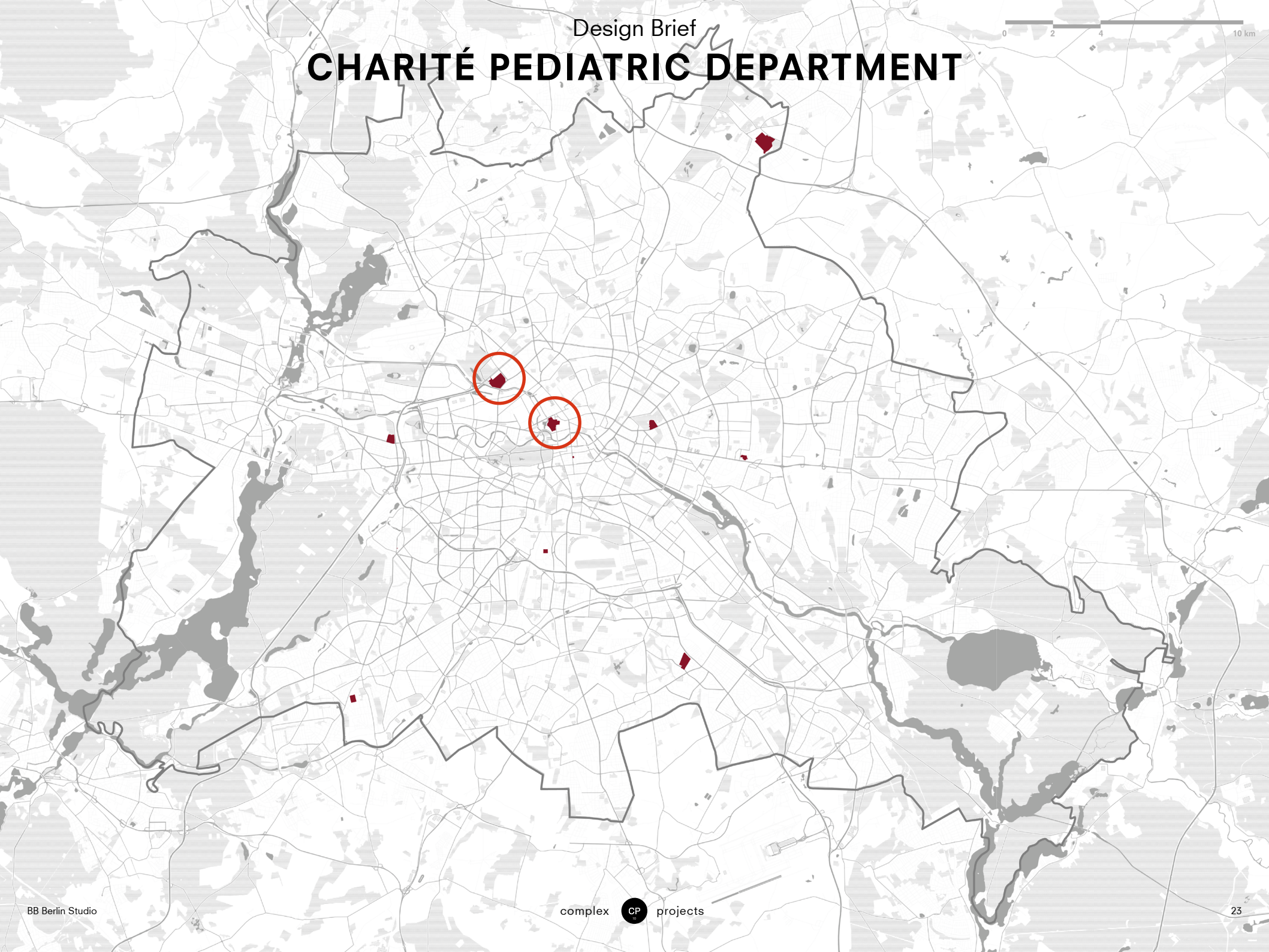
BERLIN PEDIATRIC NETWORK



30MIN-DRIVING COVERAGE



CHARITÉ PEDIATRIC DEPARTMENT



Design Brief

PROJECT STATEMENT



Charité Children Hospital



Holistic experience of children



Interaction with urban context

ESSENTIAL FUNCTION

For Gynecology, Perinatal, Pediatric and Adolescent Medicine
with Perinatal Center and Human Genetics

Charité Campus Virchow-Klinikum (CVK)

Department of Neonatology

Department of Obstetrics

Department of Gynecology

Department of Pediatrics, Division of Gastroenterology,
Nephrology and Metabolic Diseases

Department of Pediatric Respiratory Medicine, Immunology
and Critical Care Medicine

Department of Pediatric Oncology and Hematology

Department of Pediatric Neurology

Department of Pediatric Surgery

Children's Emergency

Department of Child and Adolescent Psychiatry,
Psychosomatic Medicine and Psychotherapy

Department of Pediatric Endocrinology
Institute of Experimental Pediatric Endocrinology

Institute of Medical Genetics and Human Genetics

Department of Neonatology

Department of Obstetrics

Department of Gynecology

Campus Charité Mitte

6+1+1:

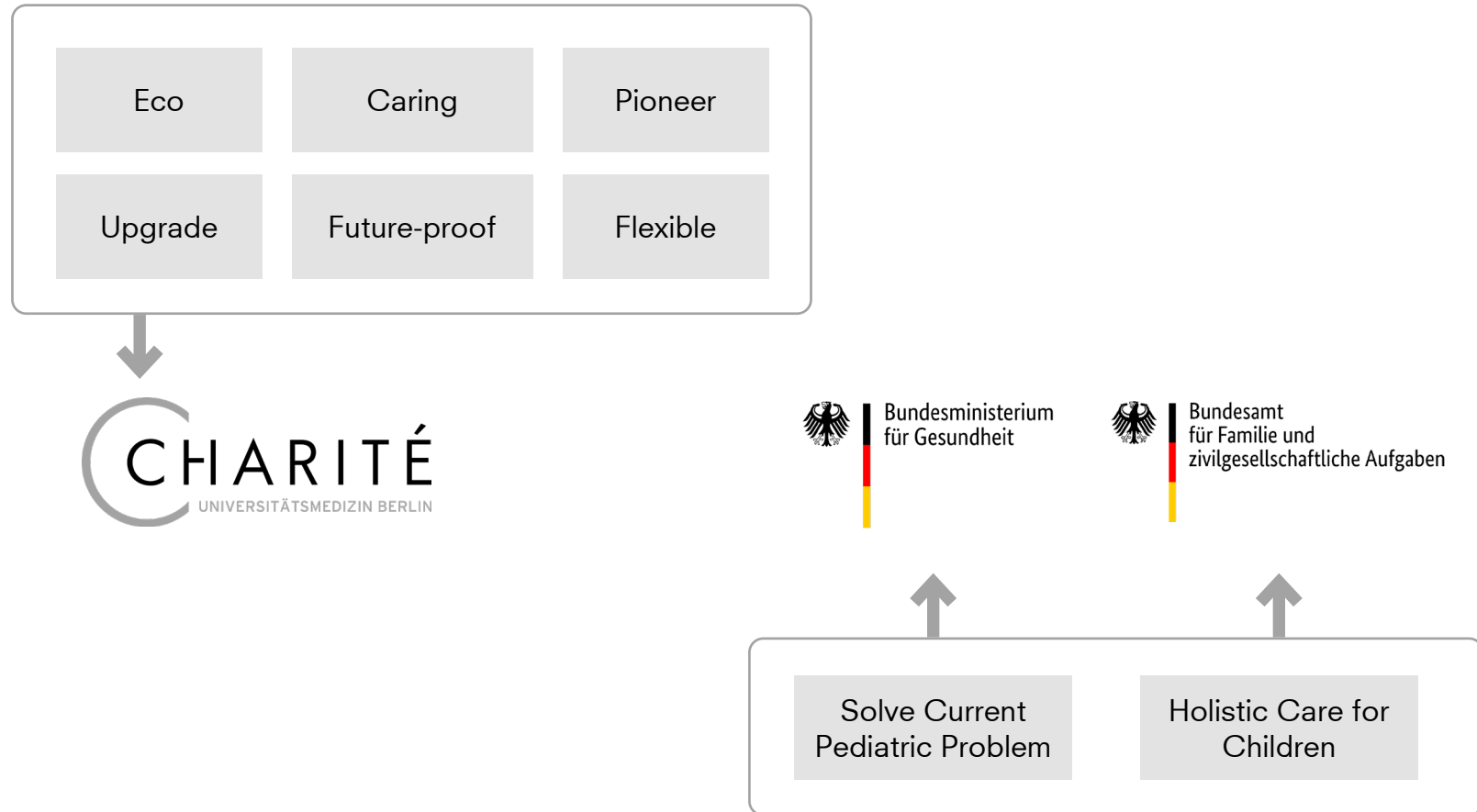
- 6 general departments

- 1 pediatric surgery

- 1 emergency

195 inpatient beds

CLIENT & USER'S REQUIREMENTS



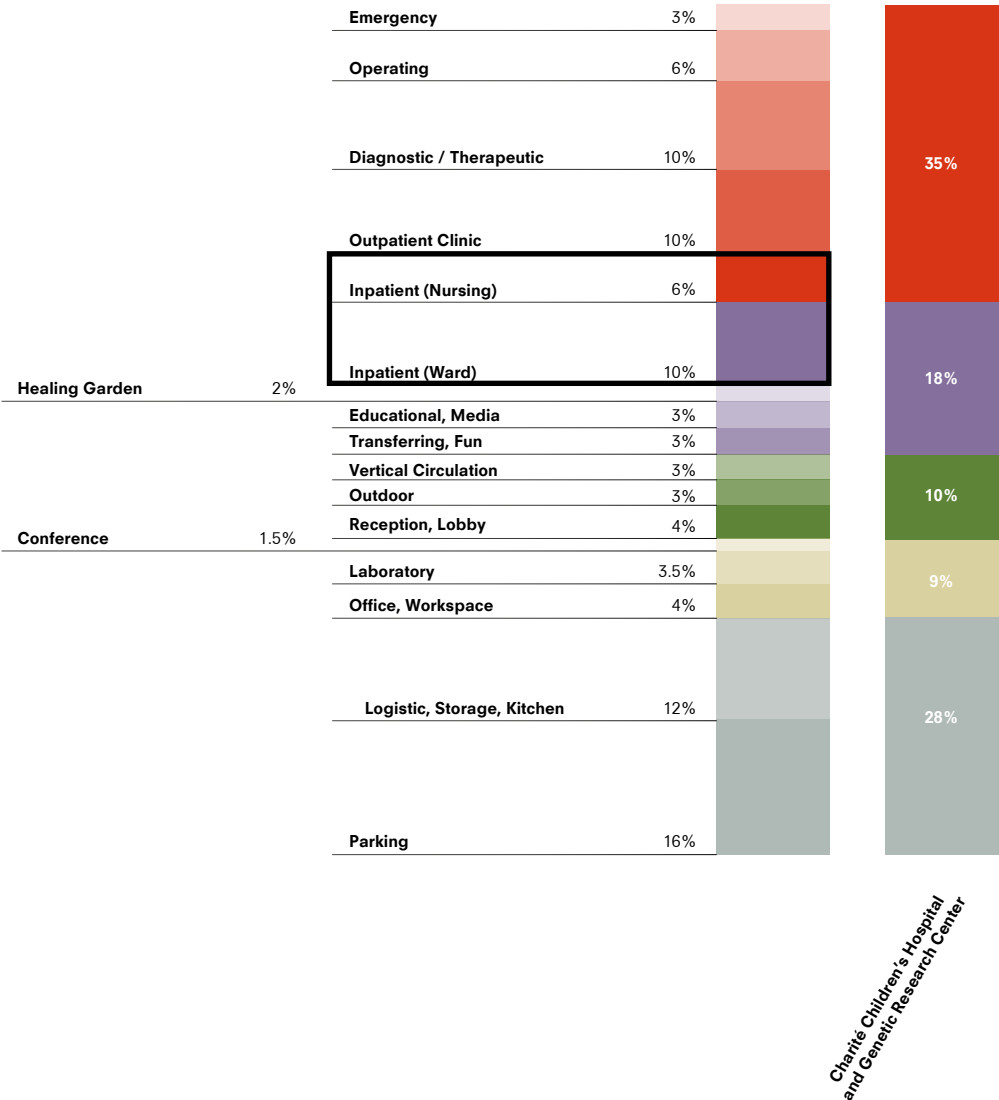
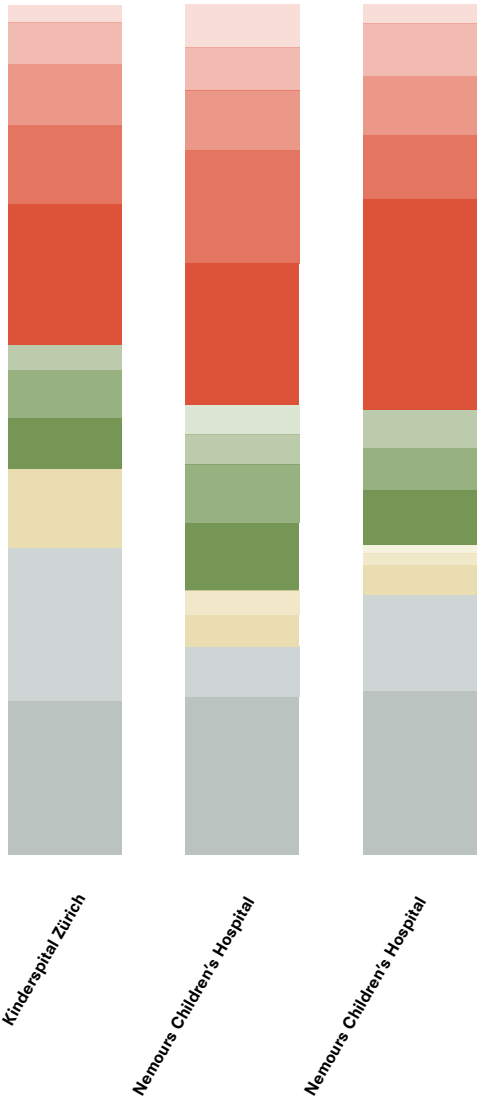
Design Brief

CHILDREN-DEDICATED PART



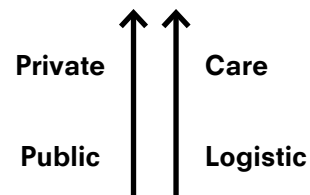
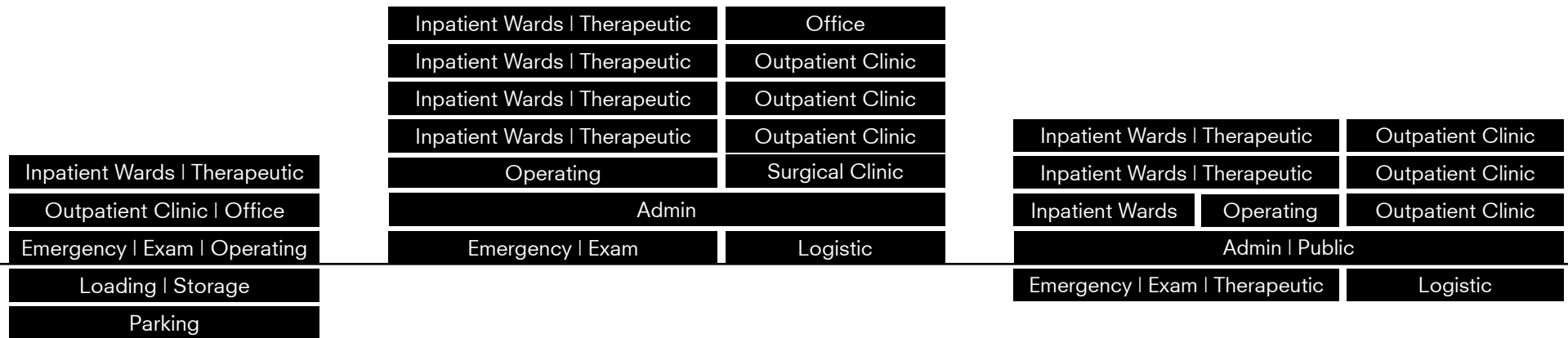
Design Brief

PROPOSED PROGRAM BREAKDOWN



Design Brief

STACKING STRATEGY



Design Brief

SPATIAL REQUIREMENT



INTRO

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DESIGN BRIEF

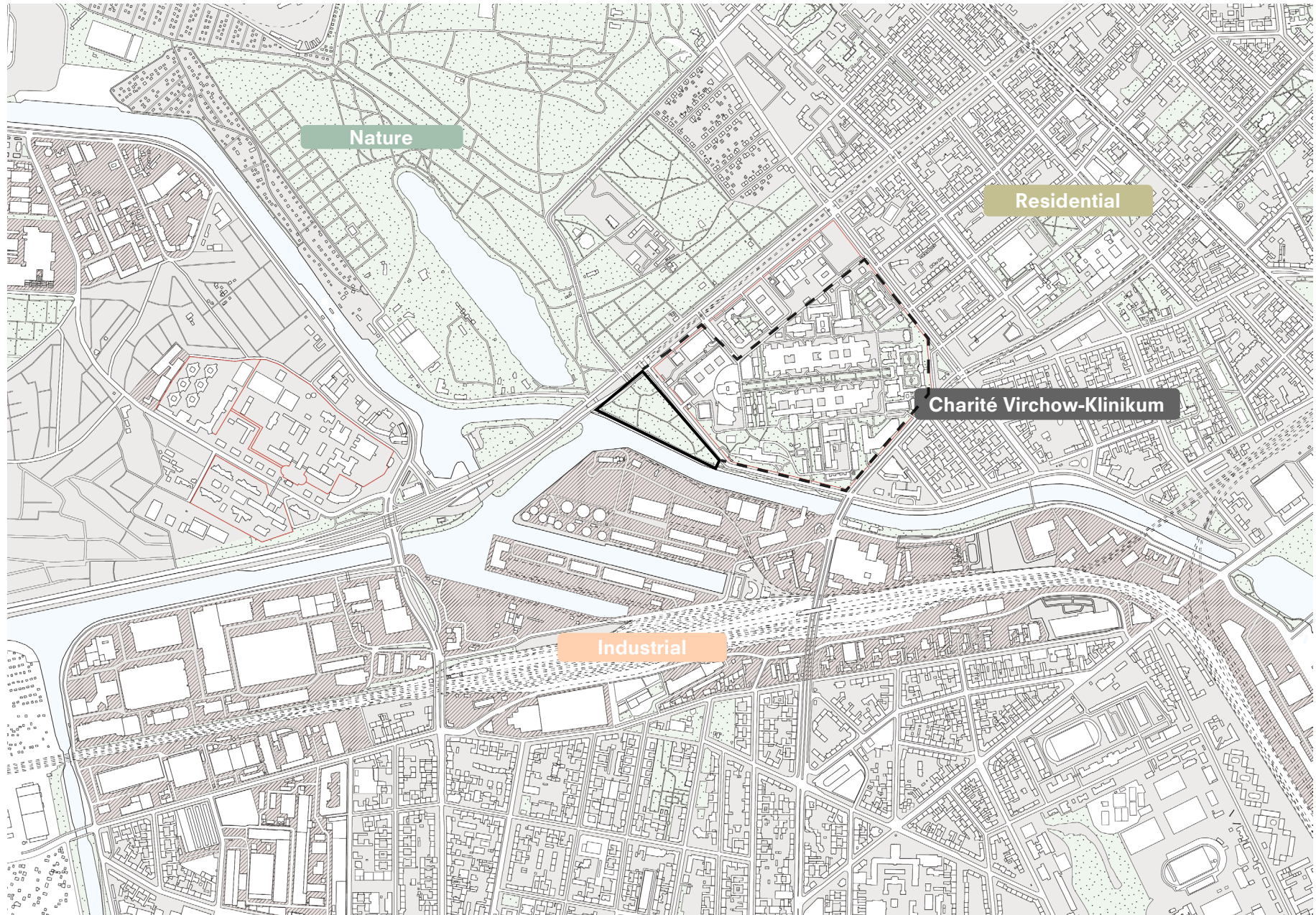
| CONCEPT |

IMPLEMENTATION

CONCLUSIONS

Concept

SITE CHOSEN



Concept
SITE INFO



Concept

CURRENT CONDITION



Inside the park



Riverside road

Concept

CURRENT CONDITION



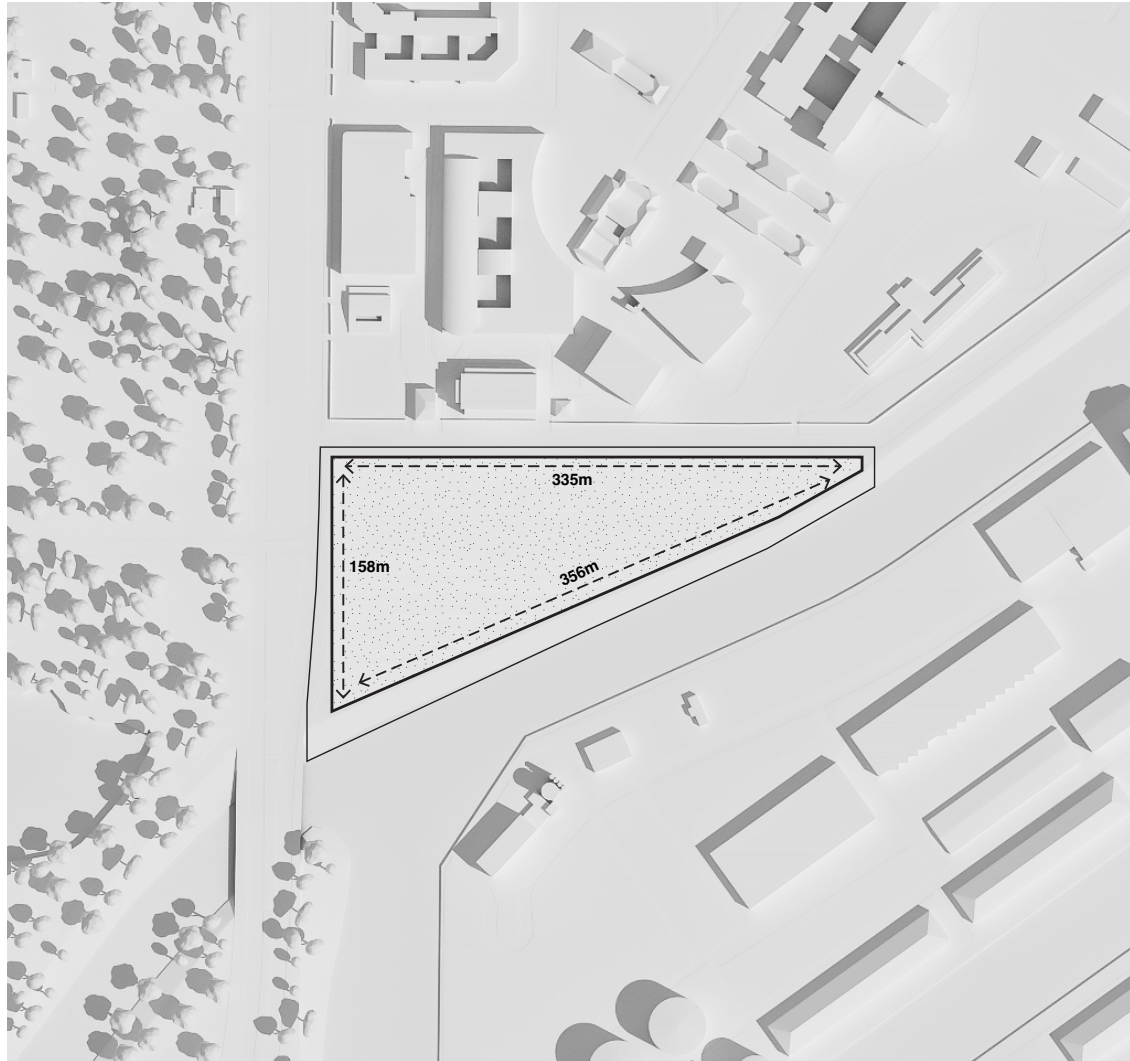
Overgrown Bushes and Weeds



Forgotten Statue

Concept

SITE INFO



27470 m²



3 floor
80000 m²

Concept

URBAN FORCE



**Road
Noise**

**Sharp
Corner**

**Tram
Operation**

Concept

URBAN IMPROVEMENT



**Statue and
More Green**

**Area to
Perch**

**More Usable
Medical Space**

Concept

LET TREES STAY, LET ROADS PASS



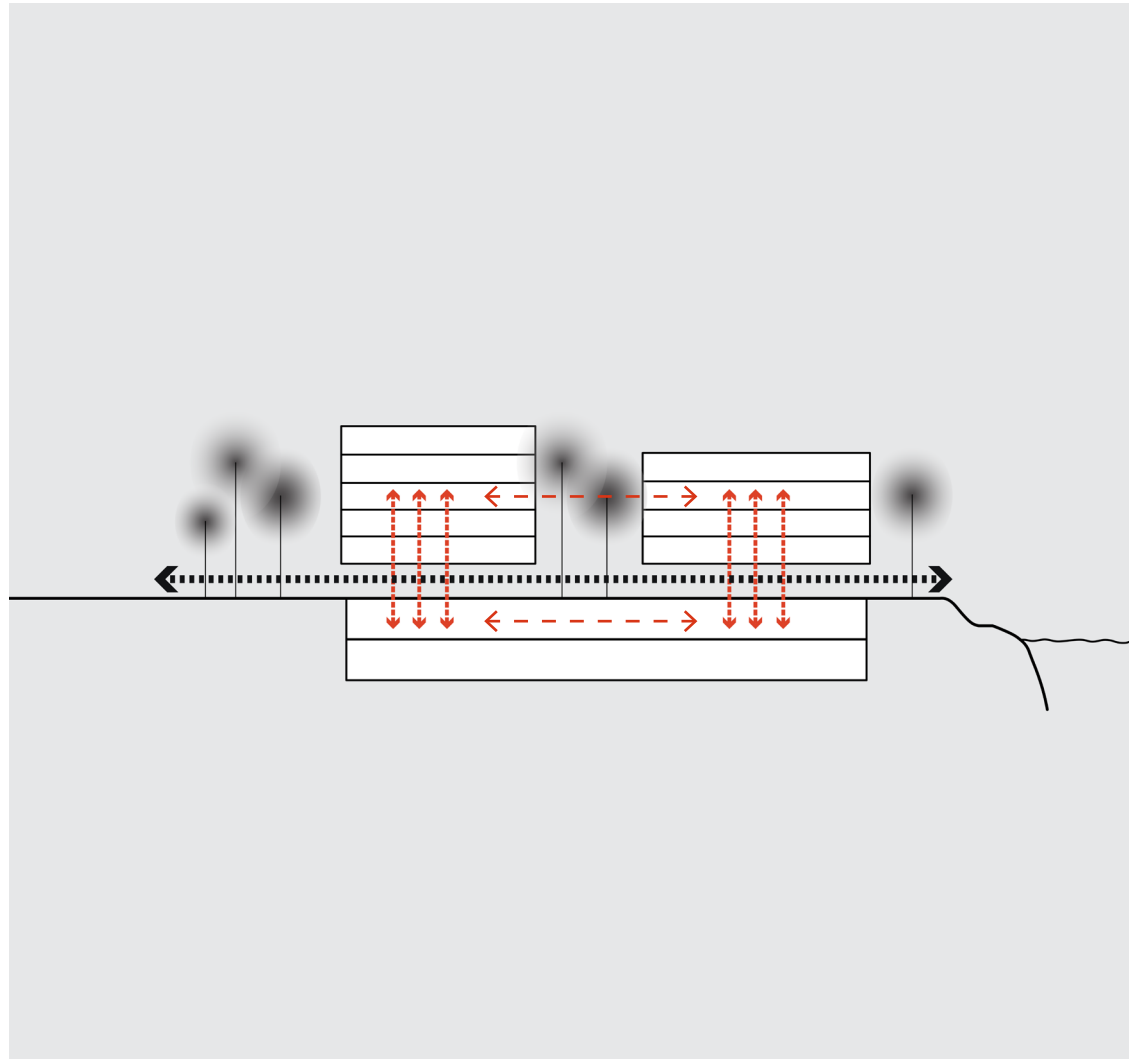
Atrium

Walking Path

**Significant
Trees**

Concept

A PUBLIC GROUND



NO Fence

**Vertically
Efficient**

**Public
Connection
to River**

INTRO

RESEARCH

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CONCEPT

| IMPLEMENTATION |

CONCLUSIONS

Implementation

SPATIAL REQUIREMENT



Implementation

SPATIAL REQUIREMENT

Often linear layout , Love windows

Favor squared space, large rooms

Distributed, Repetition of rooms

Centralized, equipments and people flow

Inpatient Wards

Outpatient Clinic

Core Medical Function

Admin | Public

Logistic

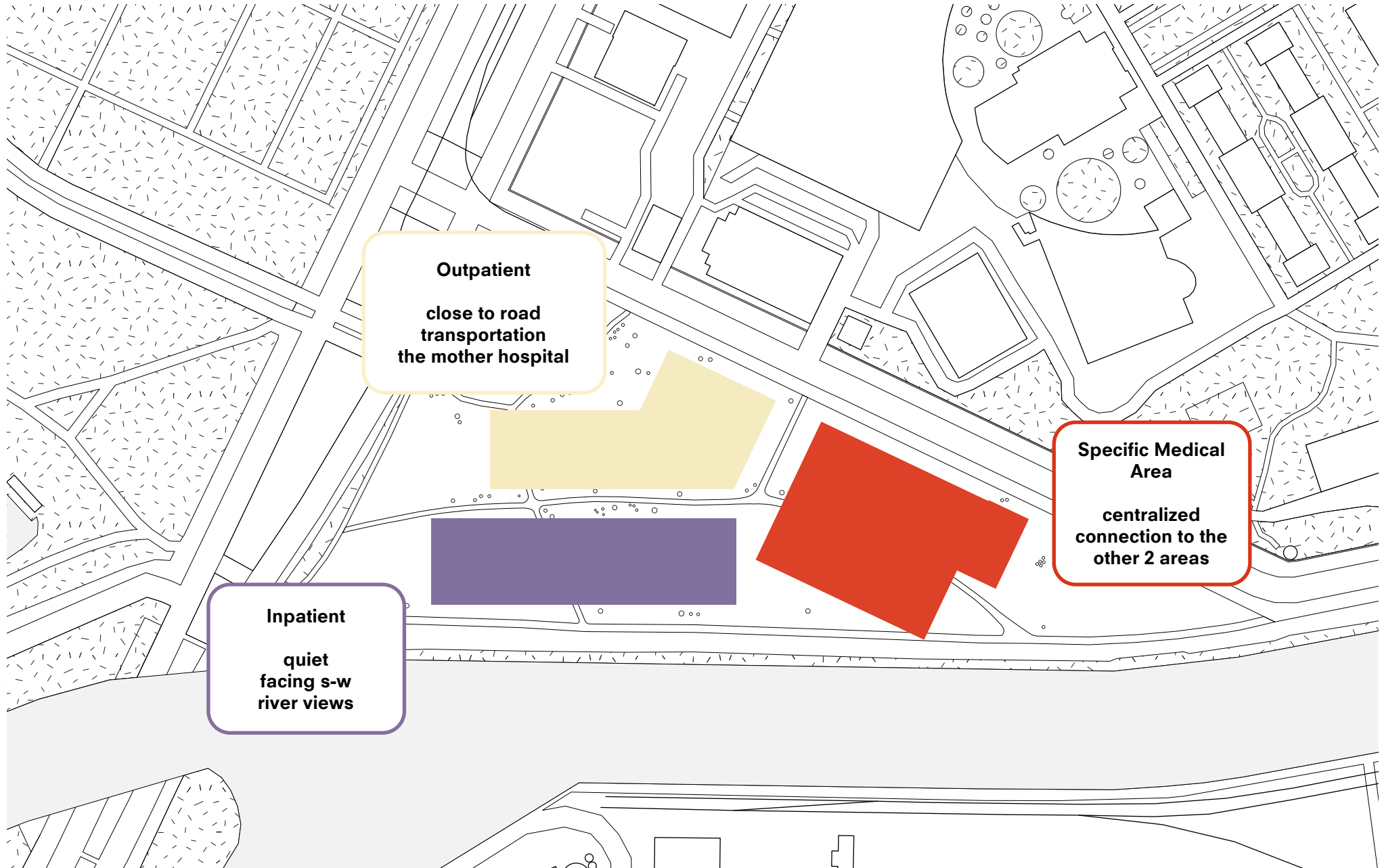
Parking

Implementation

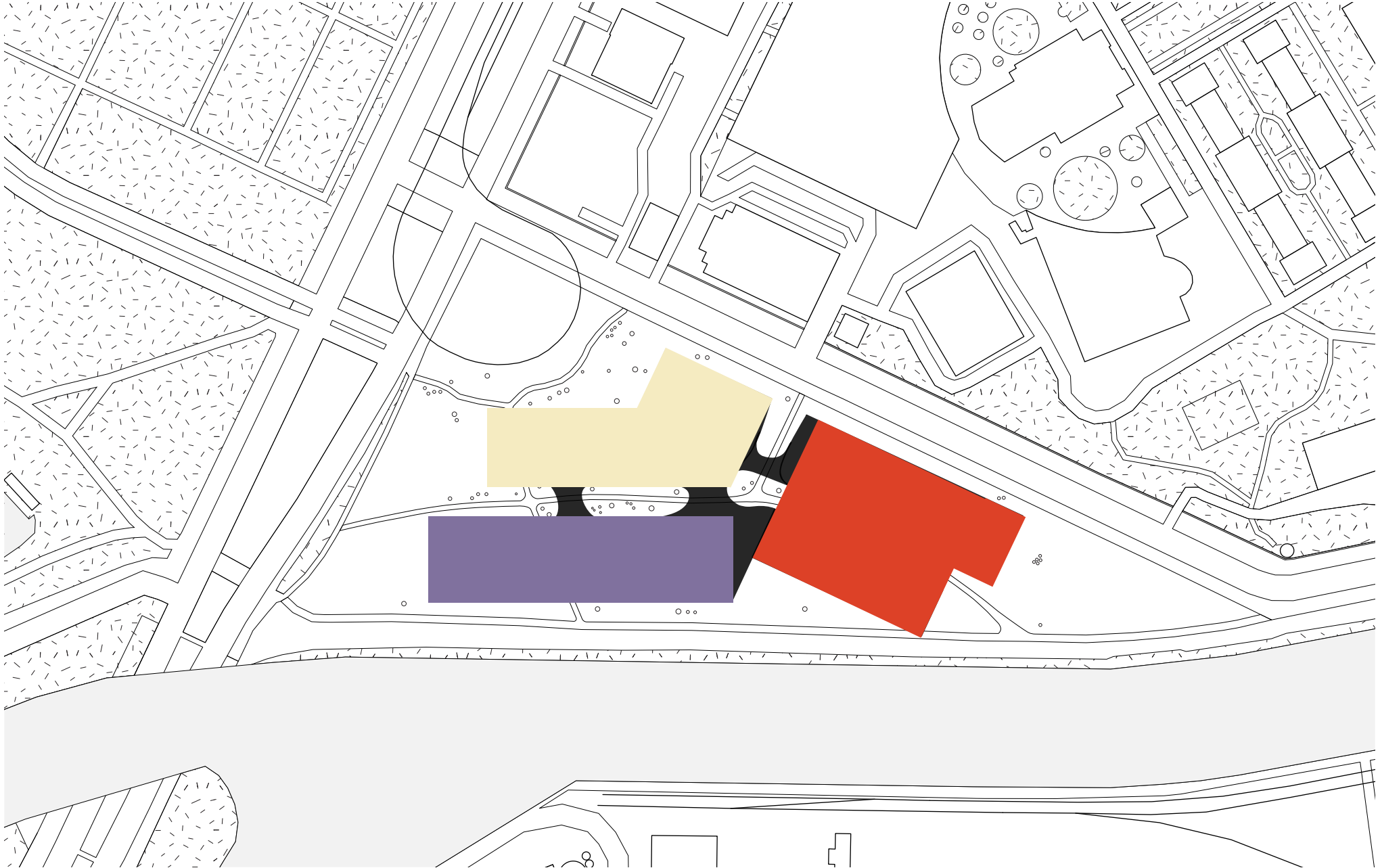
ZONING



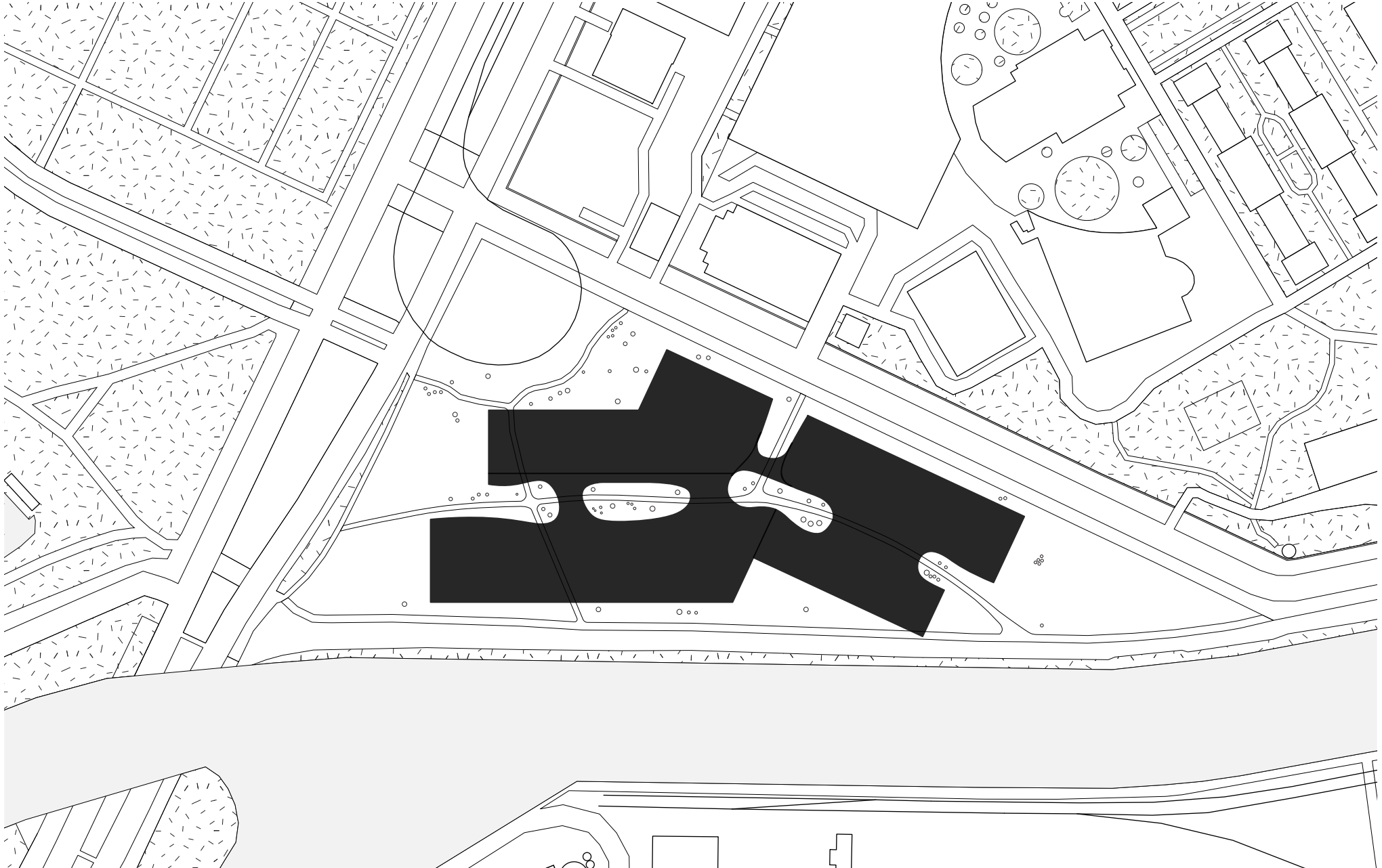
Implementation **ZONING**



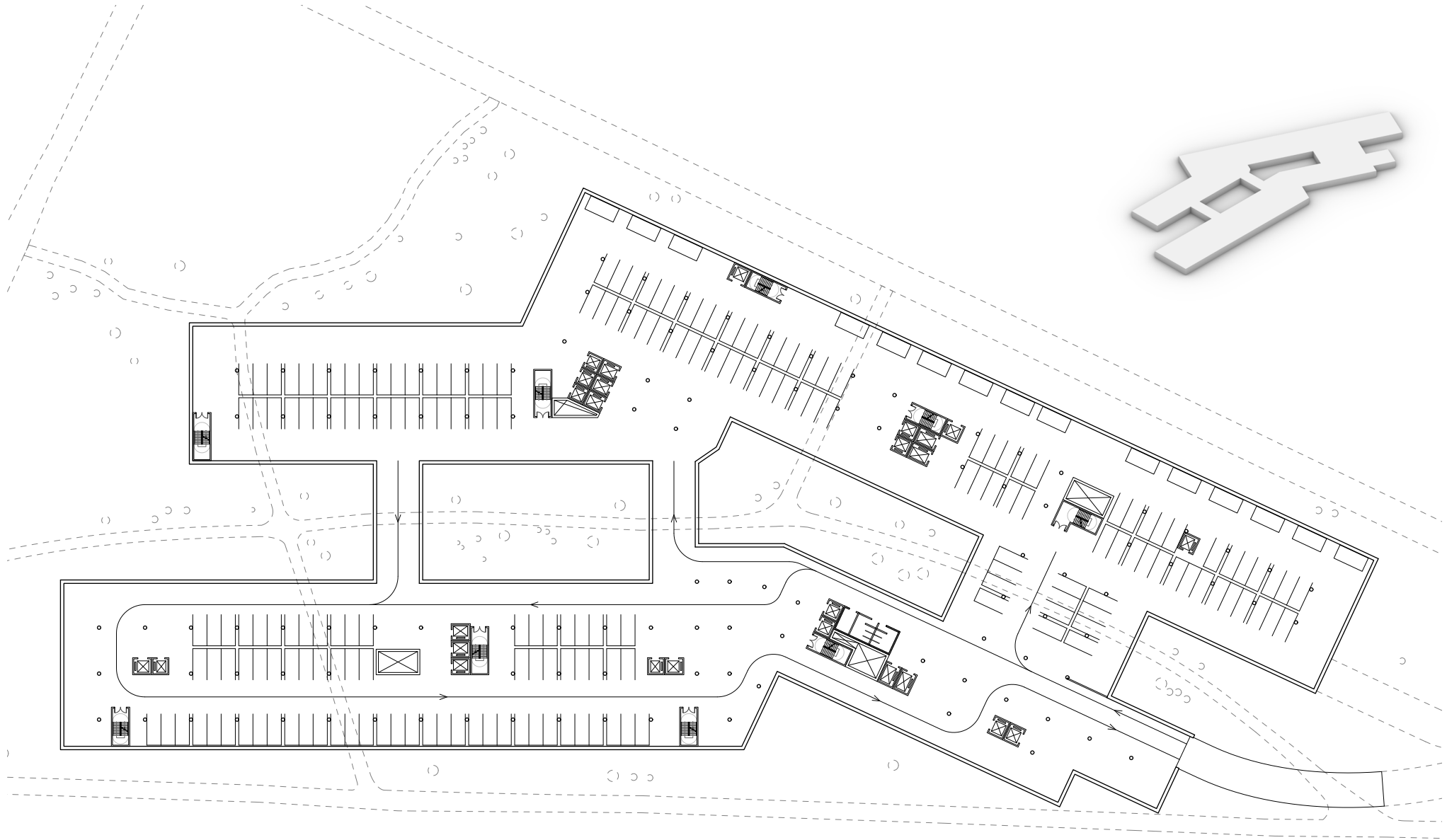
Implementation **WITH CONNECTIONS**



Implementation **WITH CONNECTIONS**

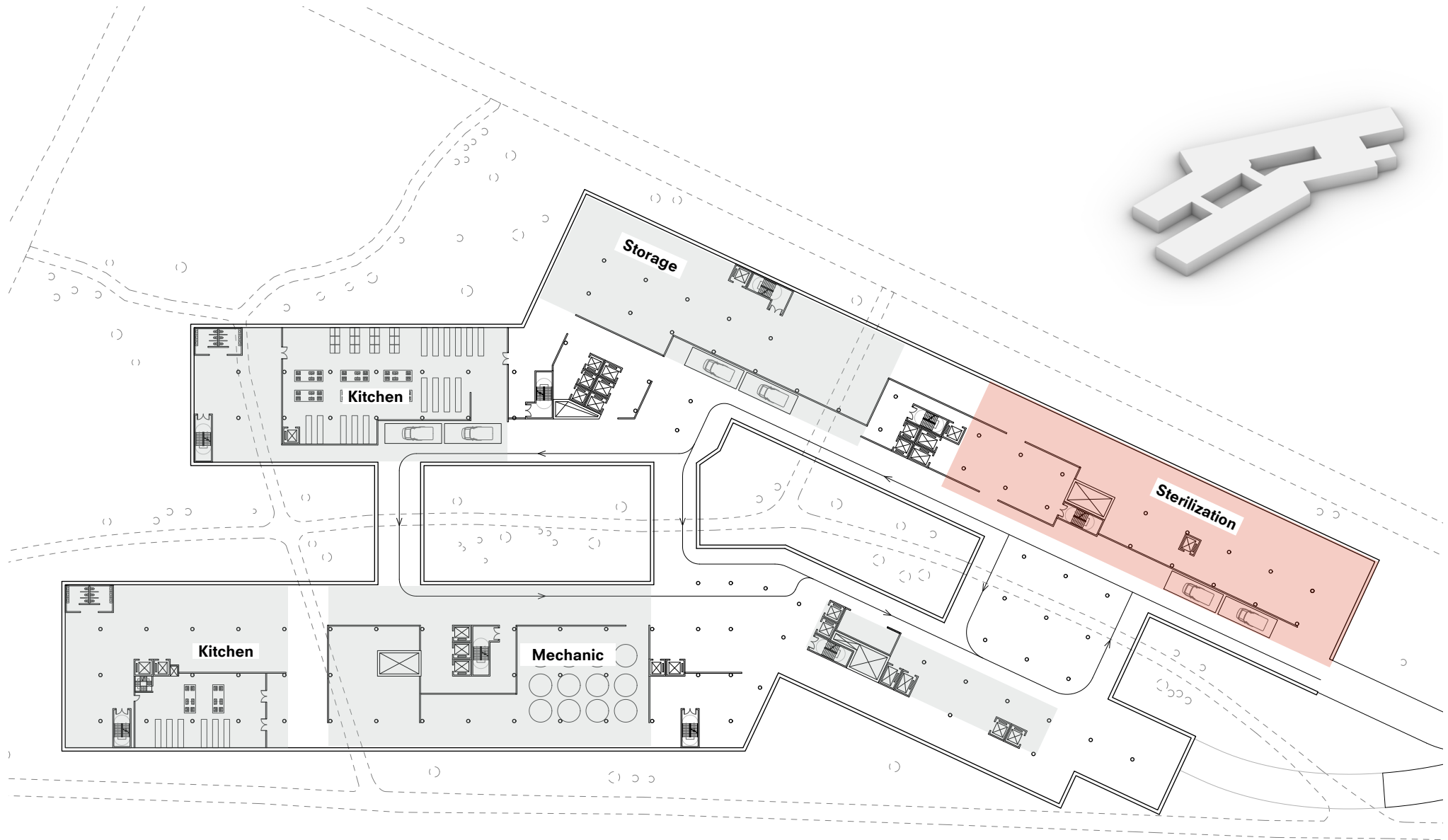


Implementation M2F PARKING



Implementation

M1F LOGISTIC



Implementation GF PUBLIC



Implementation

1F MEDICAL



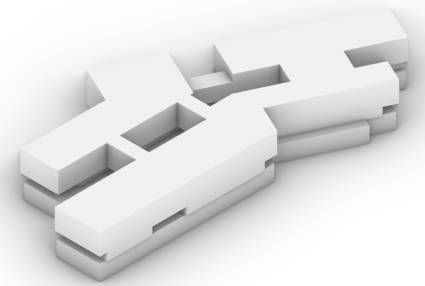
Implementation

2F MEDICAL



Implementation

3F MEDICAL



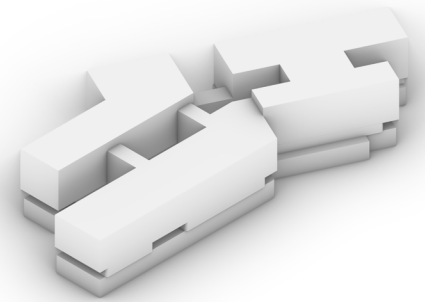
Implementation

4F MEDICAL



Implementation

5F MEDICAL



Implementation

APPROACHING THE SITE



Implementation

GF EXPERIENCE



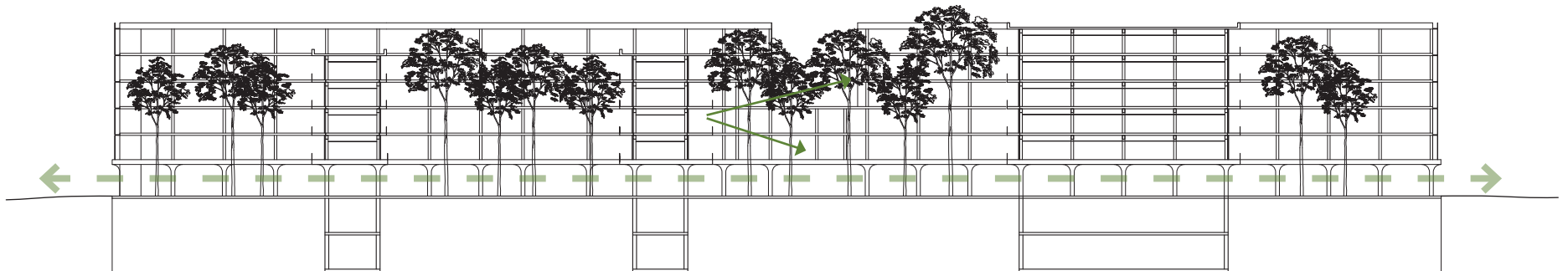
**Softened by curved
boundary**

**Permeable with no
fences**

Implementation

PUBLIC & NATURE

View connections with:
green &
public activities



Implementation

COURTYARD EXPERIENCE



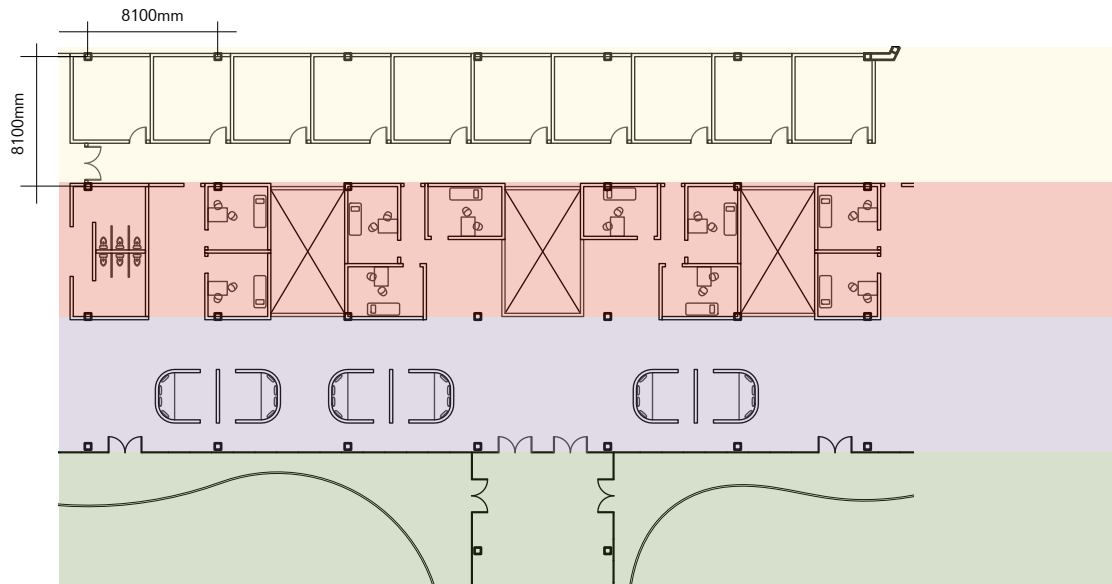
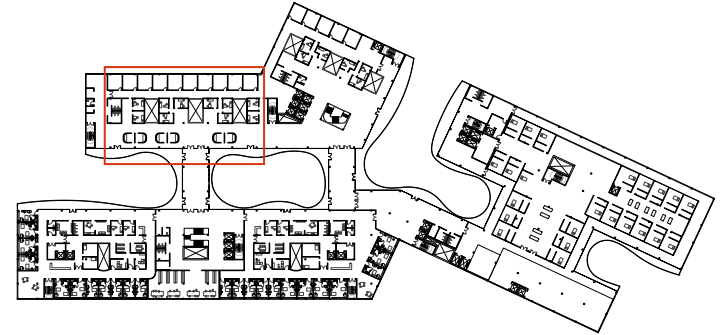
Implementation

RIVERSIDE EXPERIENCE



Implementation

OUTPATIENT SPACE QUALITY



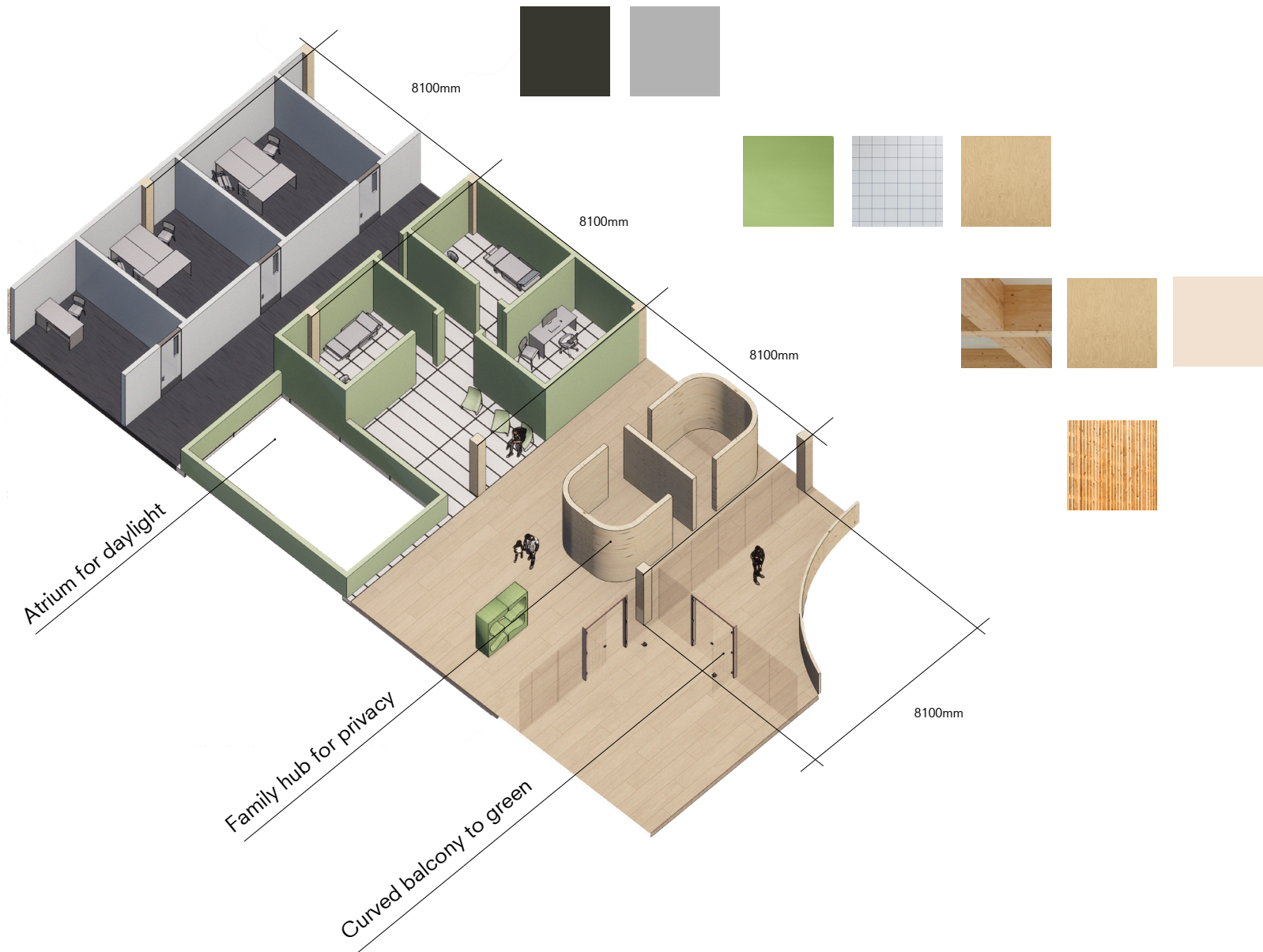
Medical Staff Zone

Mix Zone: clinic rooms + waiting

Visitor Zone: private family room + playing

Outdoor: curved balcony

Implementation INTERIOR



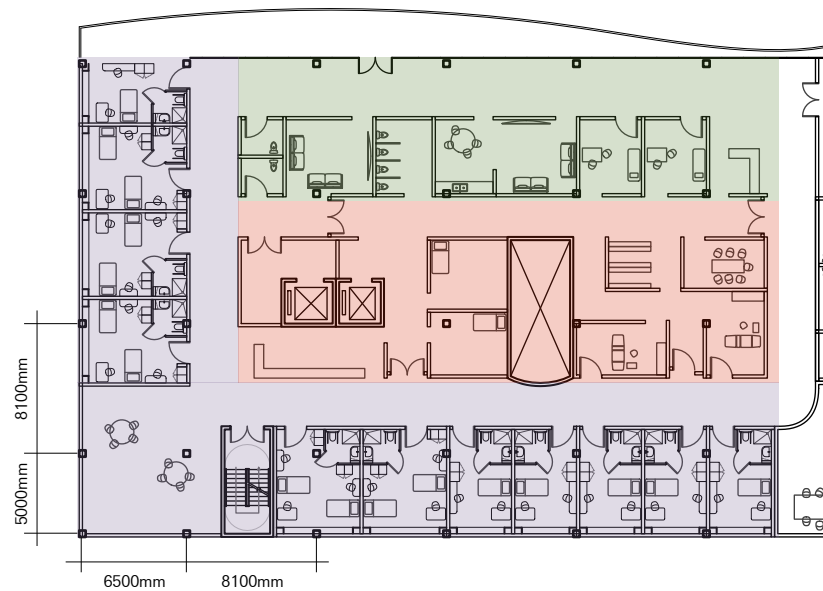
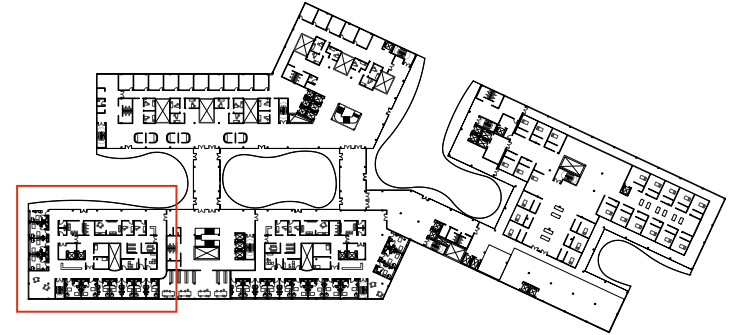
Implementation

OUTPATIENT EXPERIENCE



Implementation

INPATIENT SPACE QUALITY



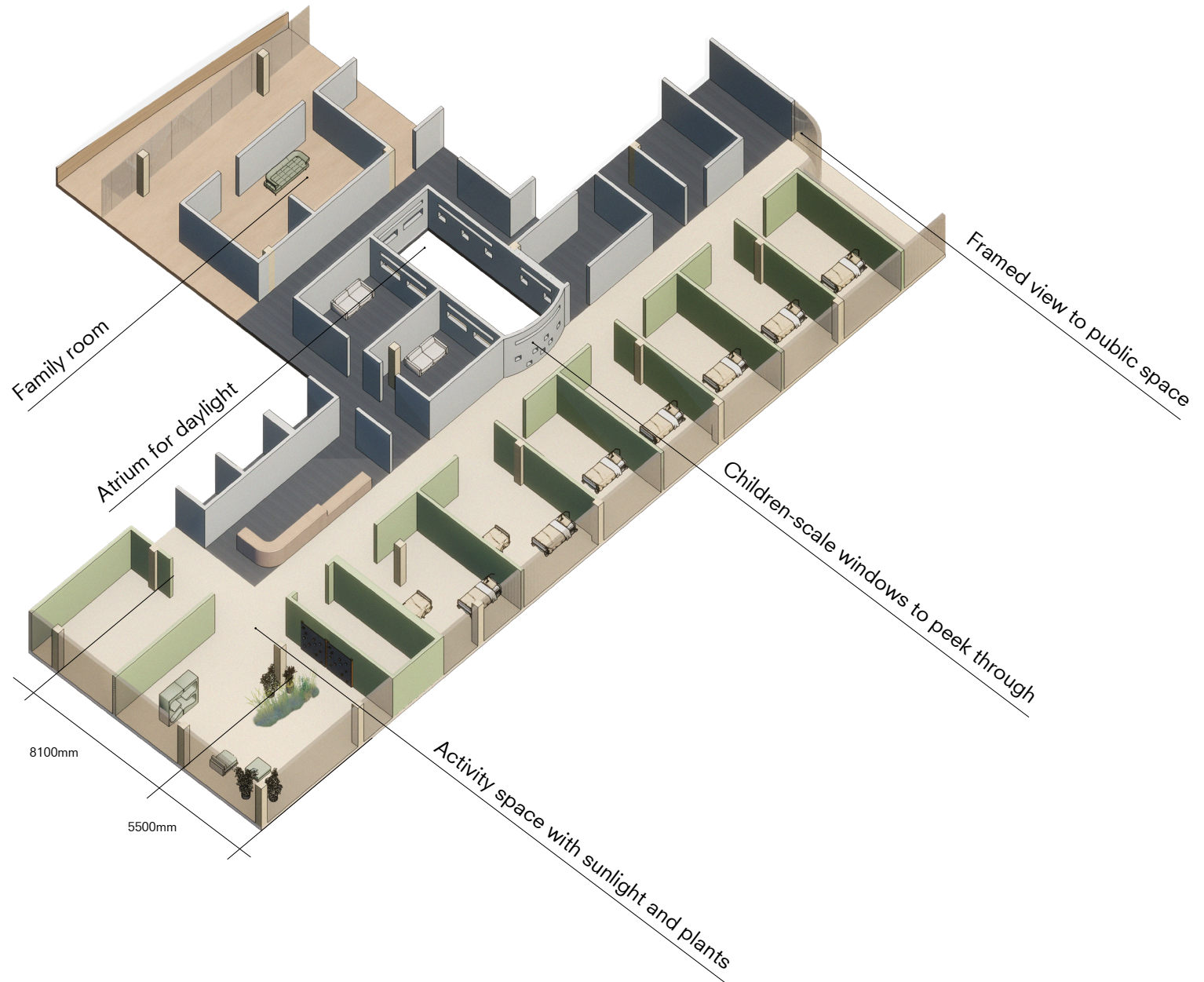
Visitor Zone: private family room + playing

Medical Staff Zone

Patient Zone: wards + living space

Implementation

BREAK THE LONG CORRIDOR



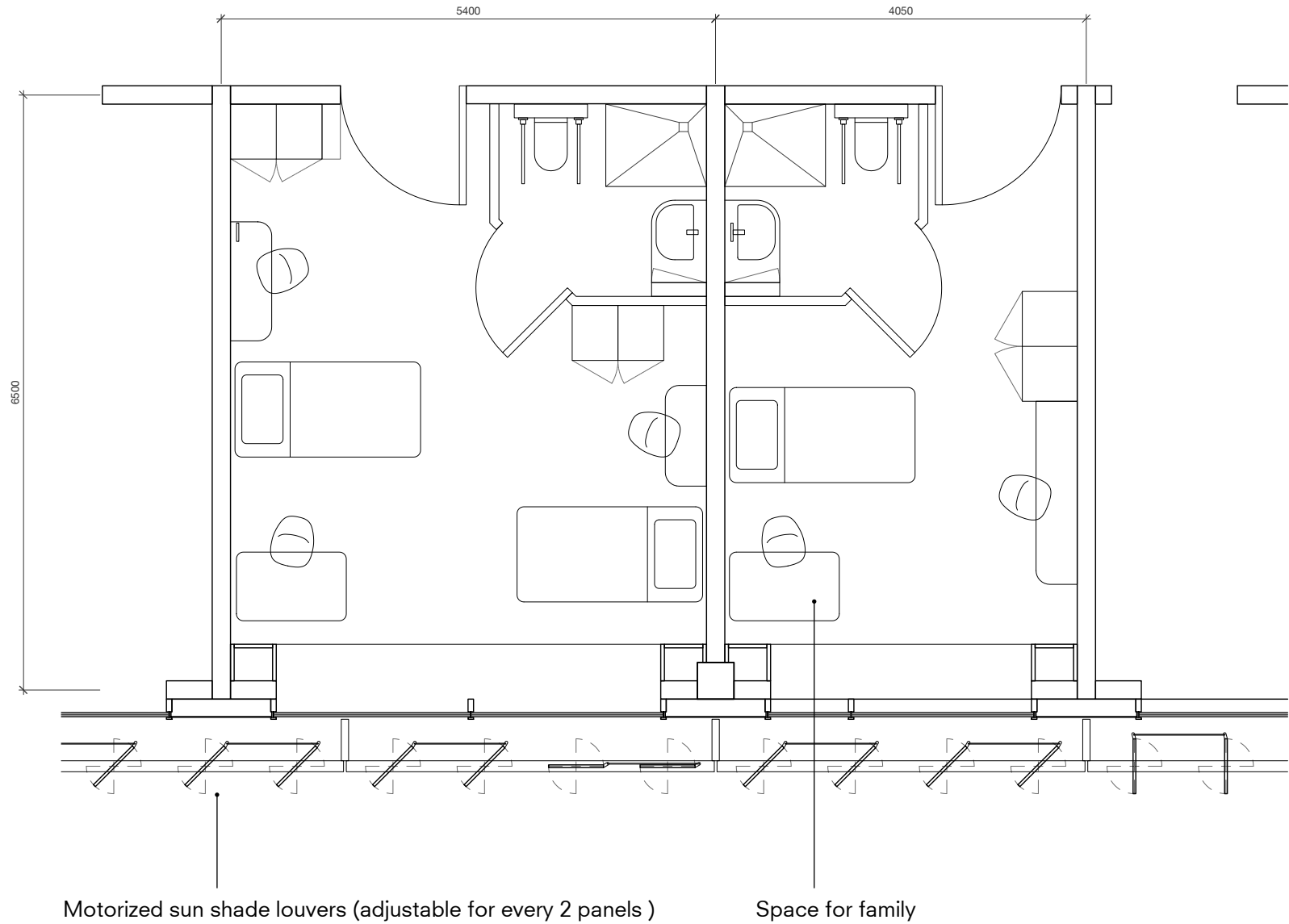
Implementation

INPATIENT EXPERIENCE



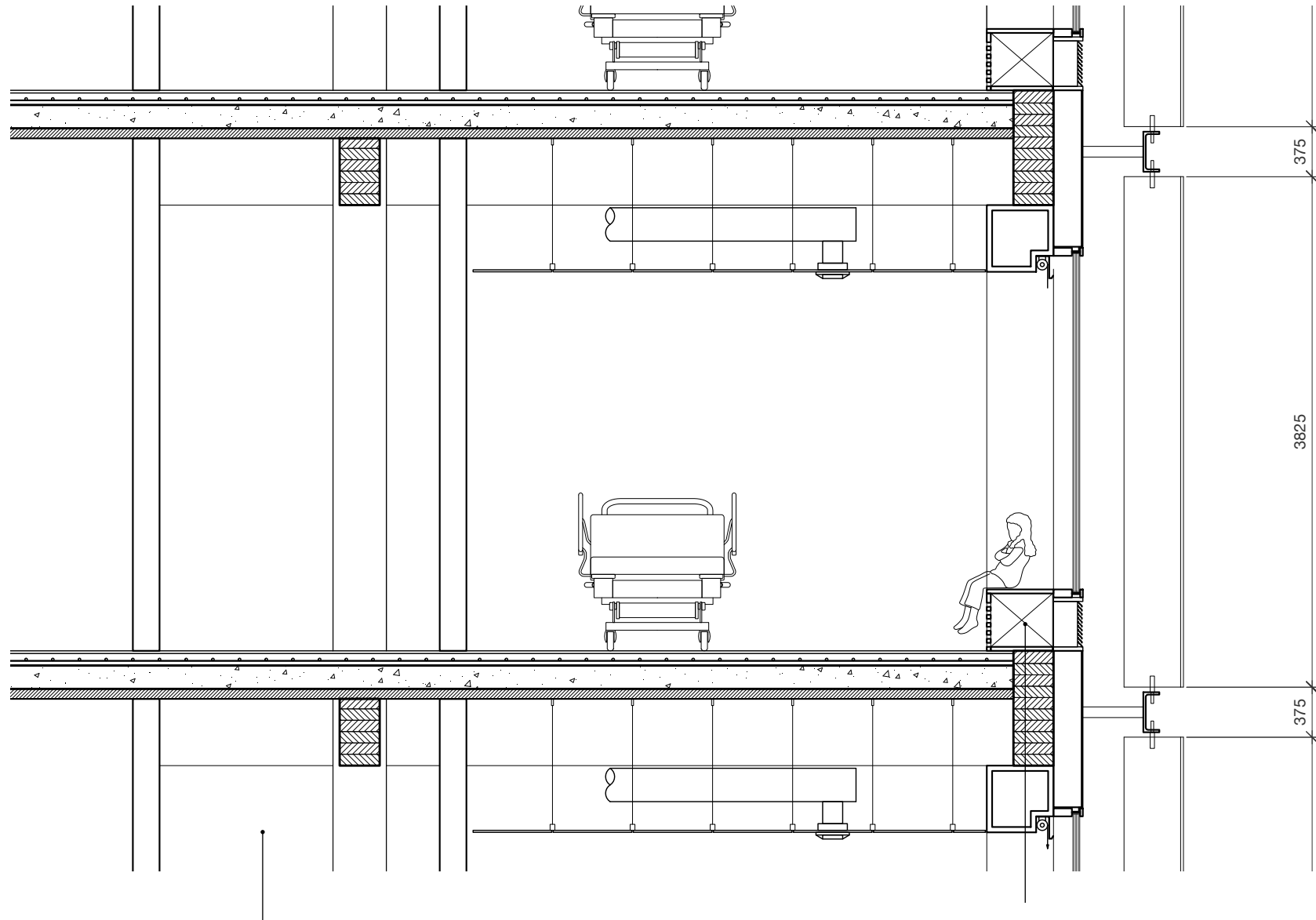
Implementation

PATIENT ROOM COMFORT



Implementation

PATIENT ROOM COMFORT

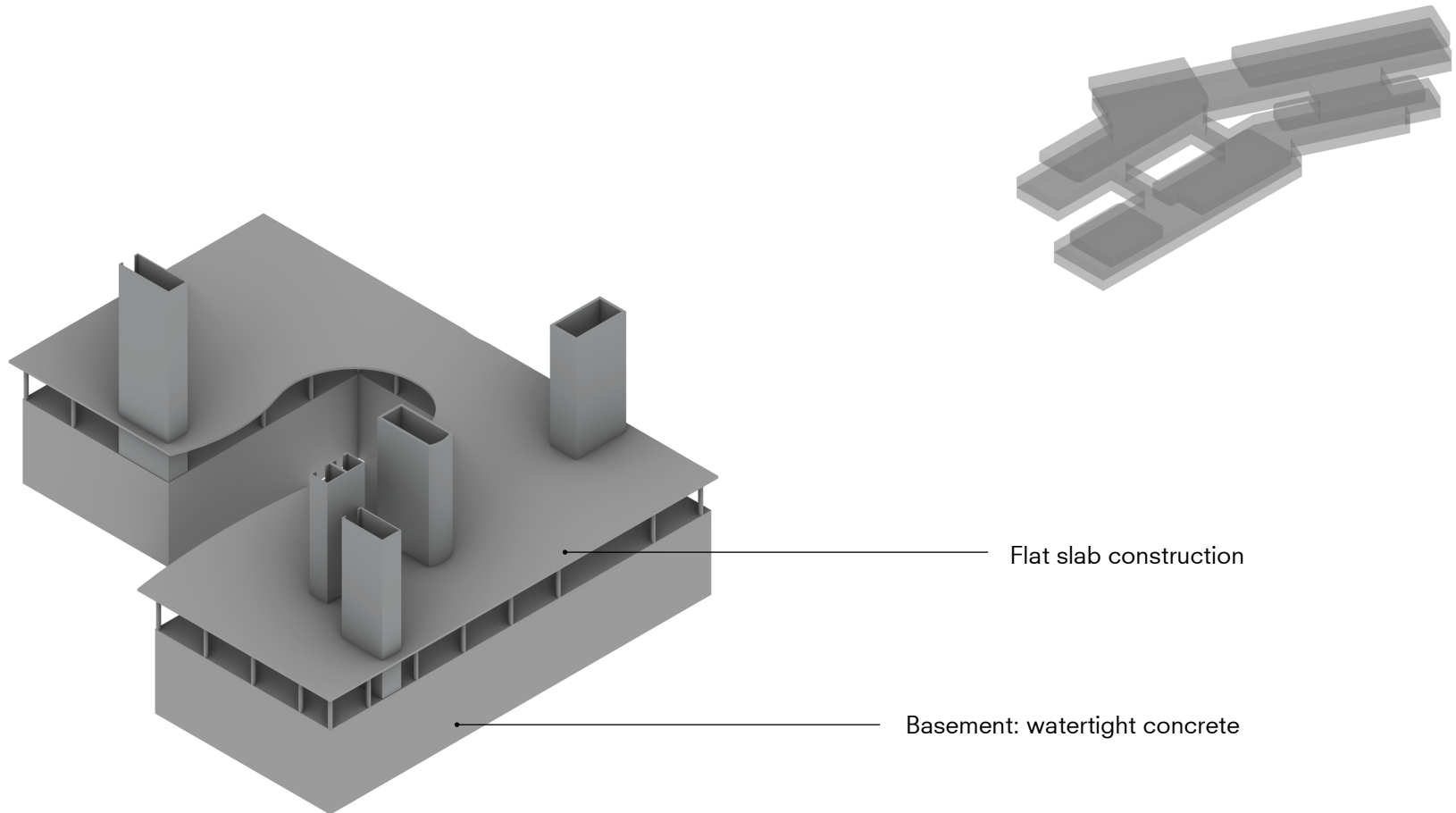


Sufficient floor height (2.84m)

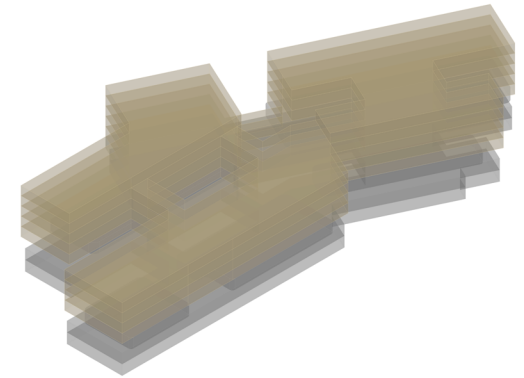
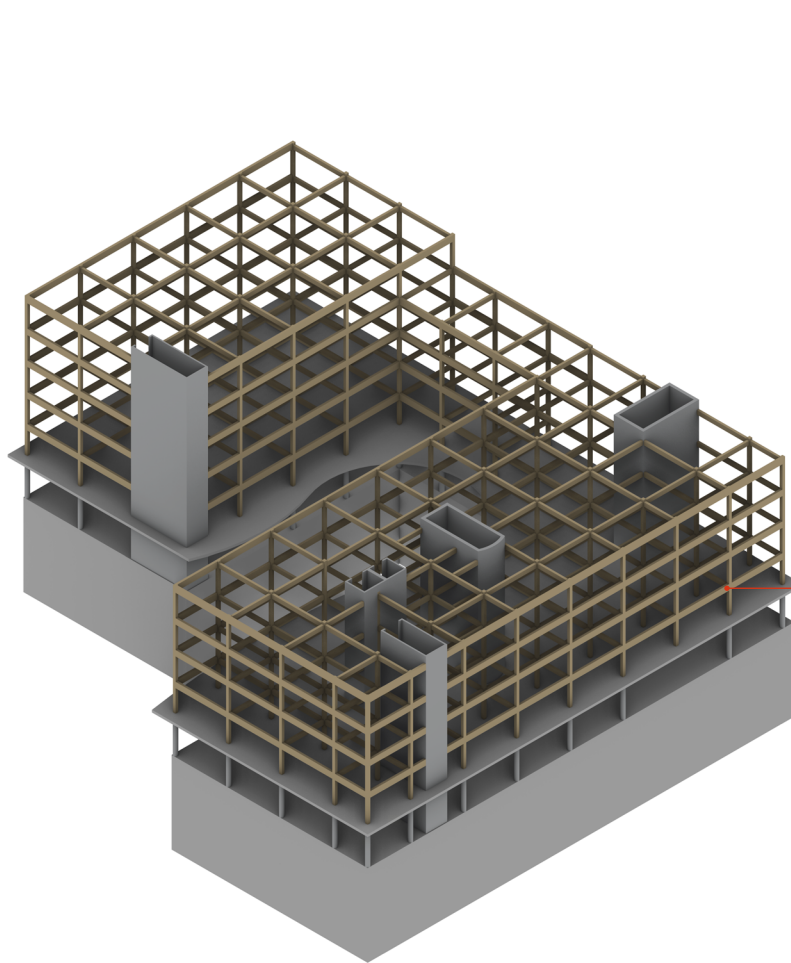
Window seating with natural ventilation inlet

Implementation

TECTONIC



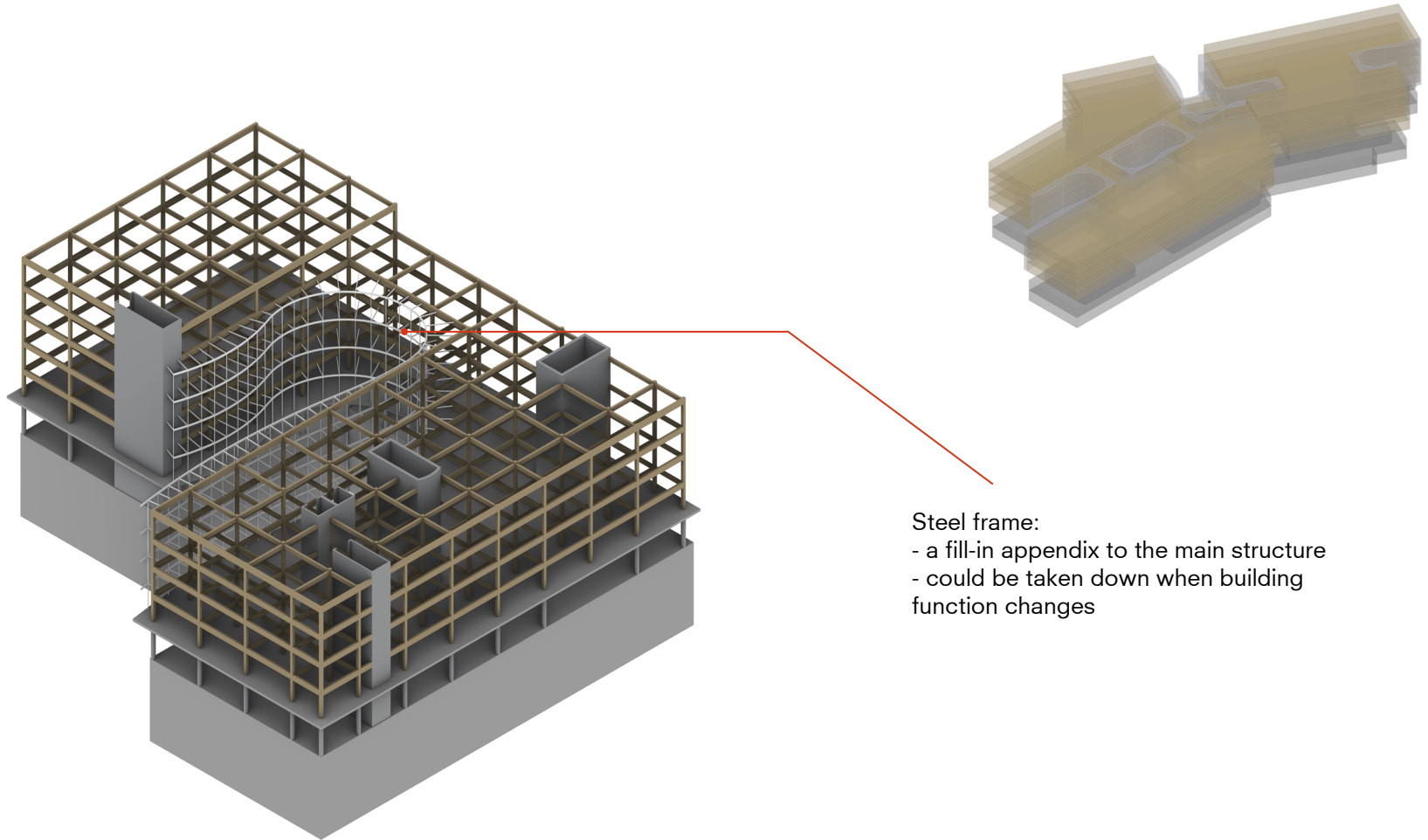
Implementation **TECTONIC**



Glulam load-bearing frame
Main grid: 8.1 x 8.1, 8.1 x 6.5
Potentially extendable

Implementation

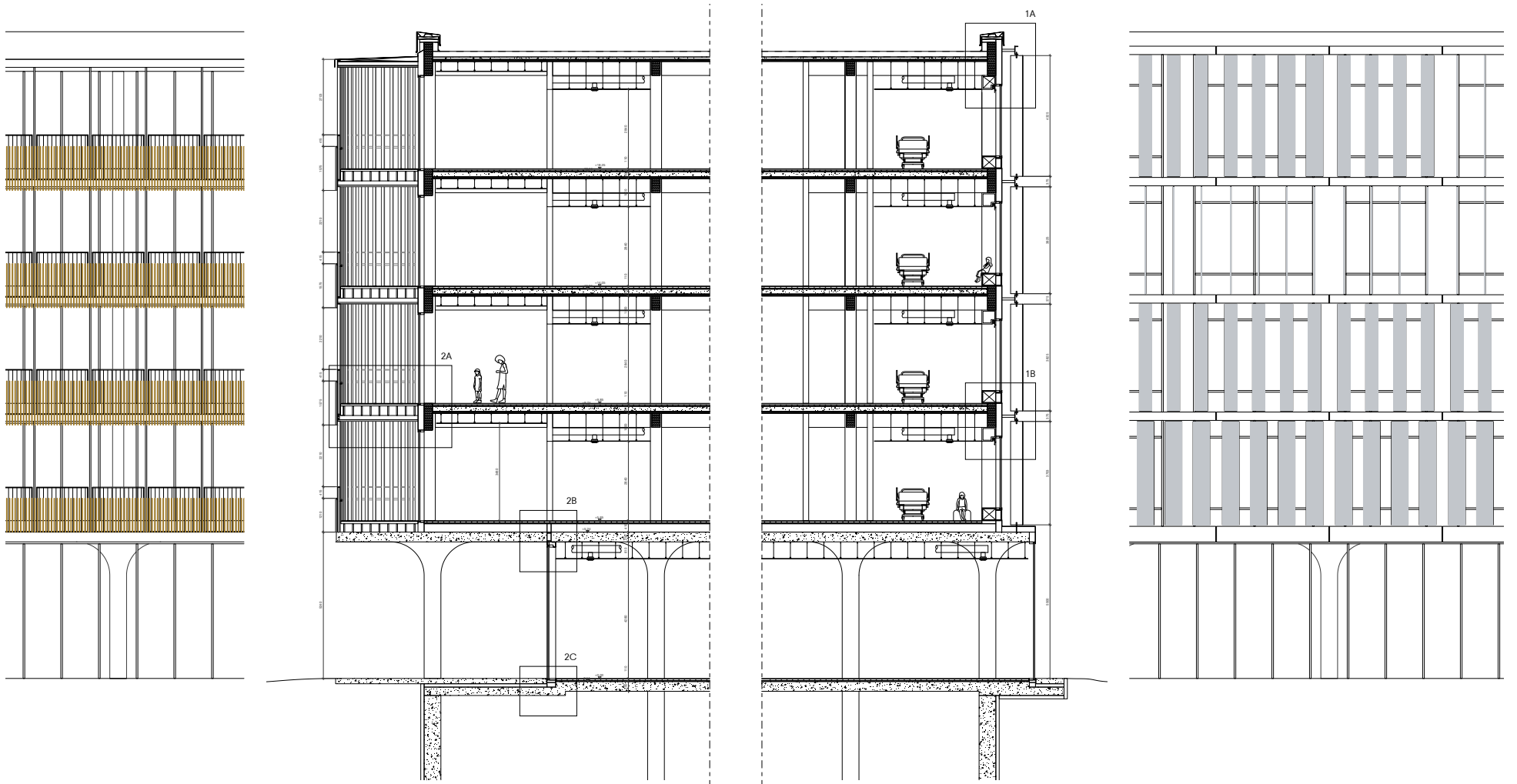
TECTONIC



Steel frame:
- a fill-in appendix to the main structure
- could be taken down when building
function changes

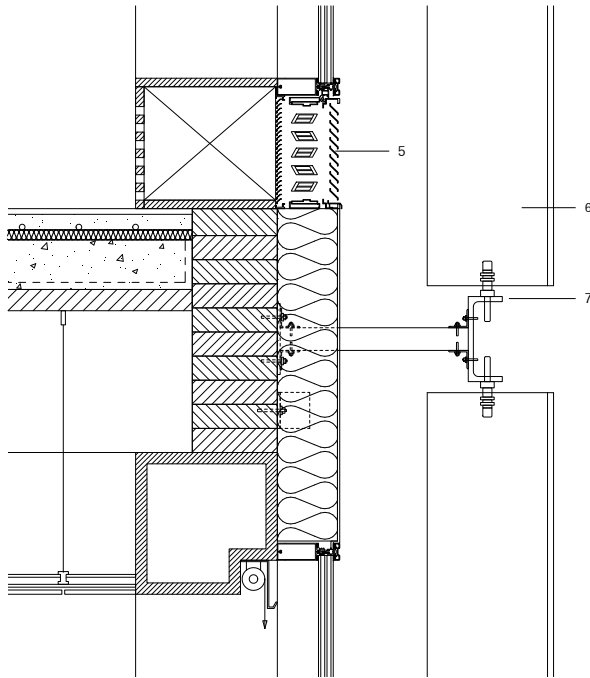
Implementation

TECTONIC

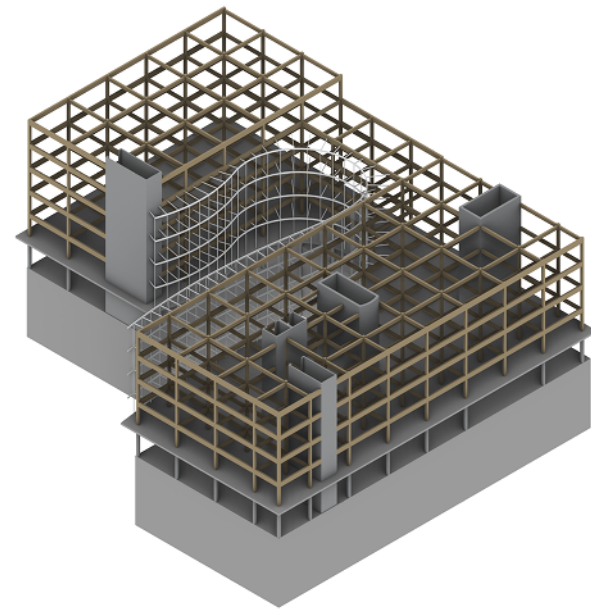


Implementation

CIRCULARITY



Materials: dry connections



Building: possible to switch program

Implementation

CIRCULARITY



on site recycle:

approx. 110 trees
(15-20m high, average diameter 300mm)

0.28m³ per tree
75% usage

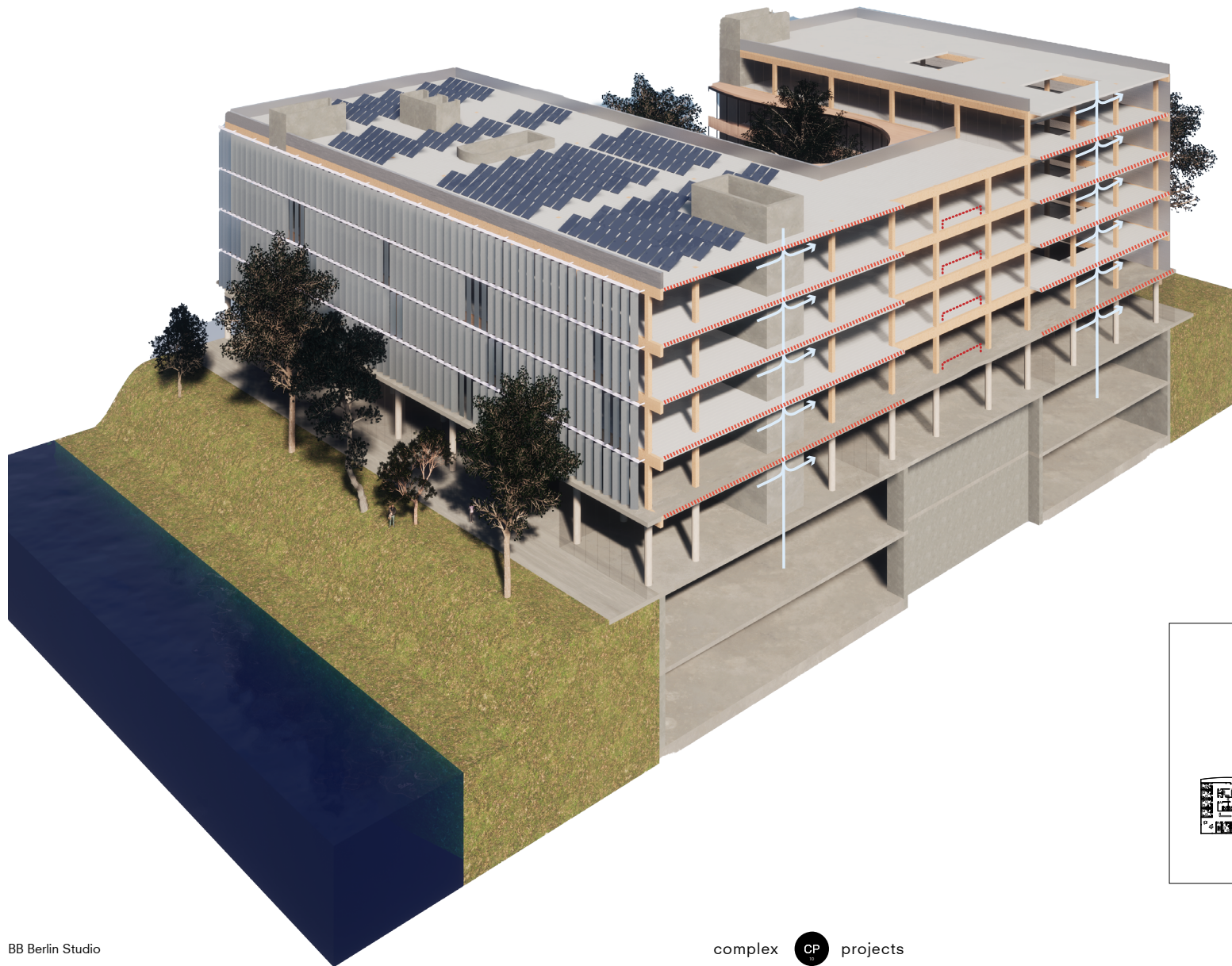
23m³ in total
-14030 kg CO₂

For the whole structure:

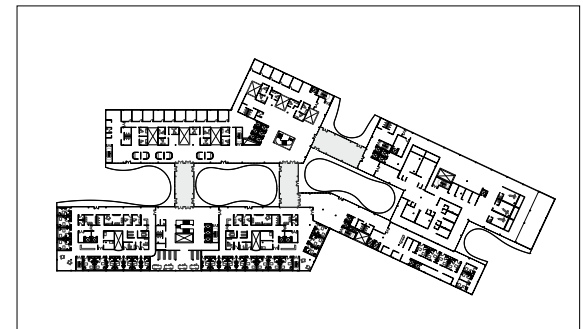
By using glulam (-610 kg CO₂ / m³)
Volume: 3500m³
In total: -2135000 kg CO₂

Implementation

CLIMATE AND COMFORT



- Main building: mechanical ventilation + floor heating
- Connecting passage: natural ventilation + heating
- Ground water heating & cooling



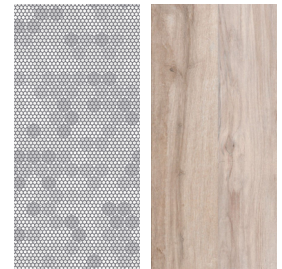
Implementation **SAVINGS**



■ Rain water collected on roof: potentially be used for irrigation and heating

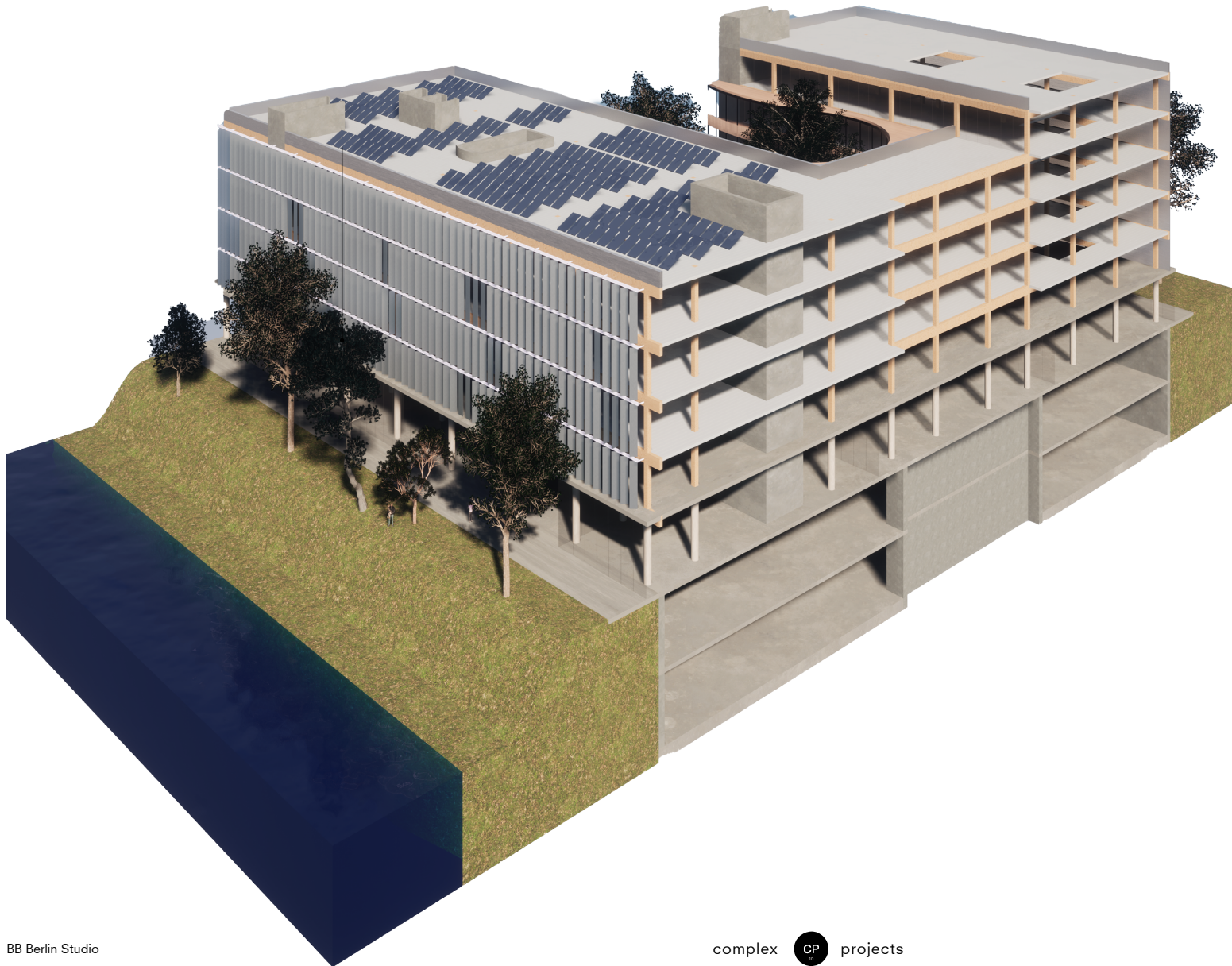
■ Solar panels on the roof

■ Motorized sunshade louvers with colored solar panel integrated



Implementation

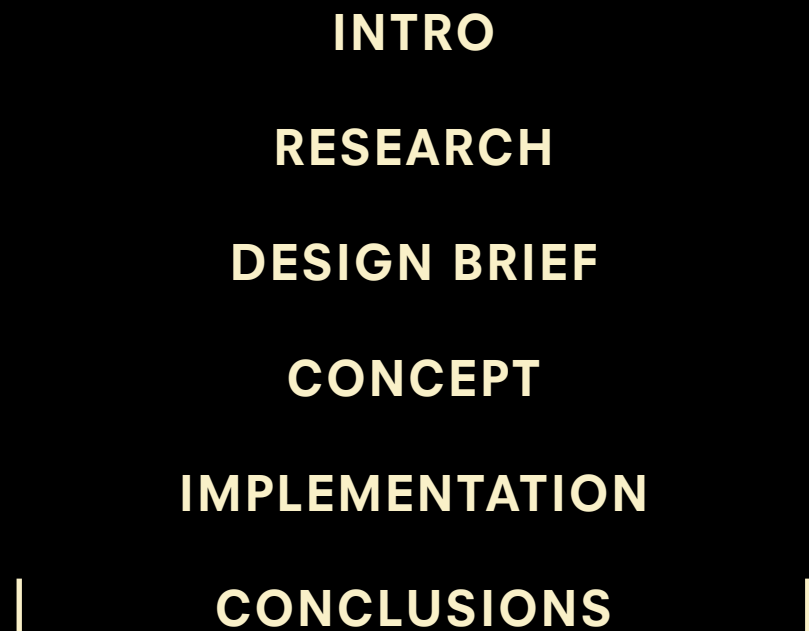
SOCIAL SUSTAINABILITY



■ Easy transportation of materials during construction via water

■ Working and living comfort with adjacency to nature

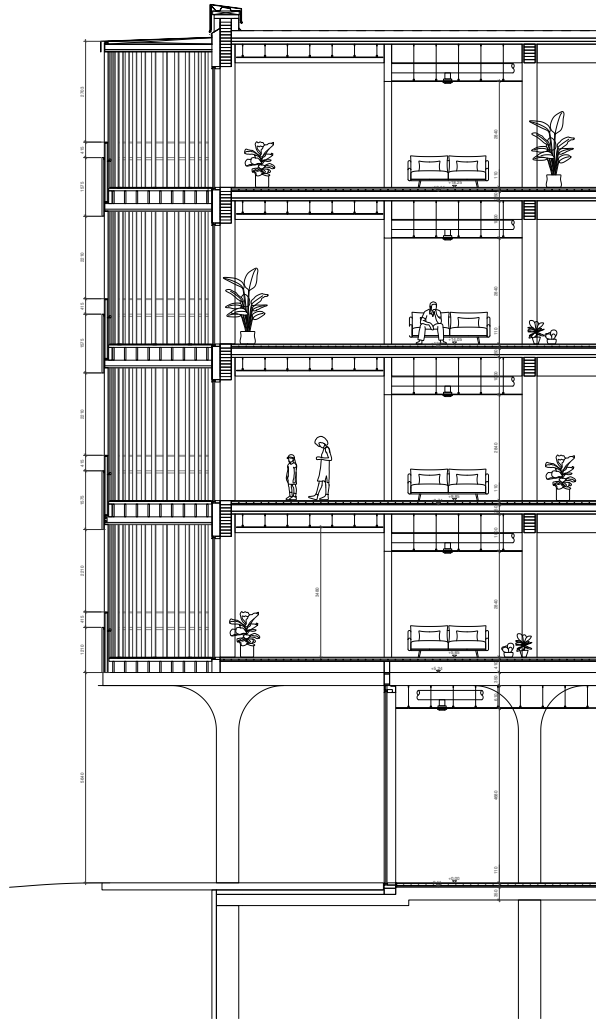
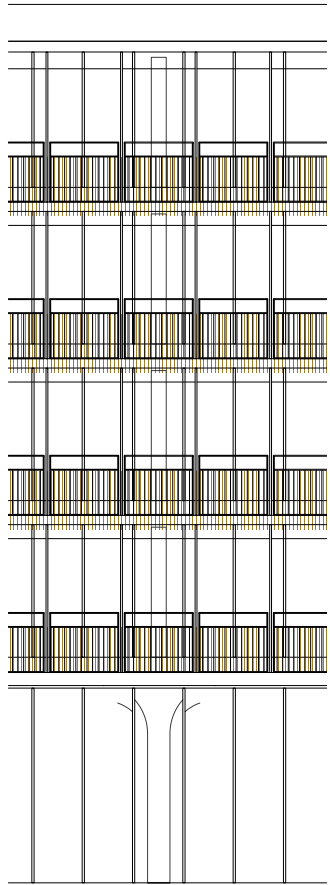
■ Activated ground floor that benefit the greater public



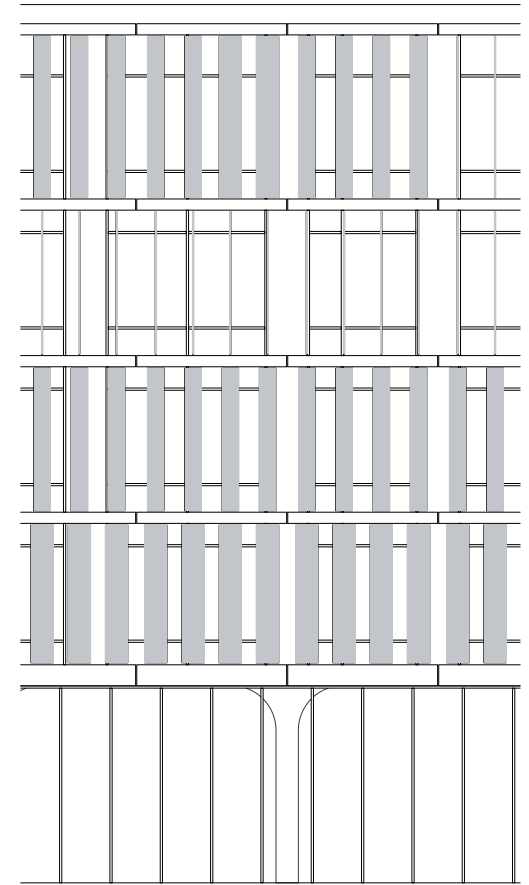
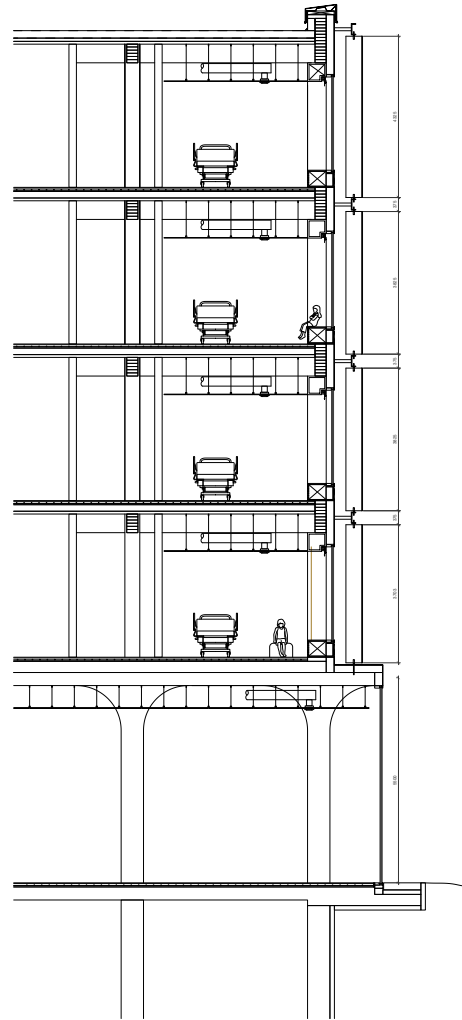
Conclusion

A 2-SIDE BUILDING

Inward, Gathering, Public, Open



Outward, Distributed, Private, Enclosed



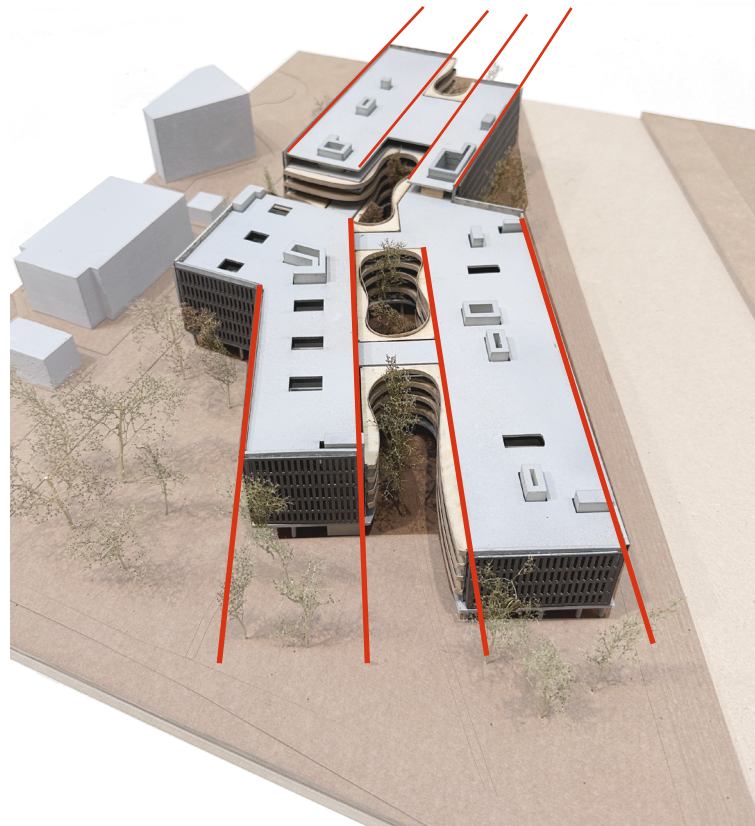
Conclusion

GRID & SOFT FILL-IN



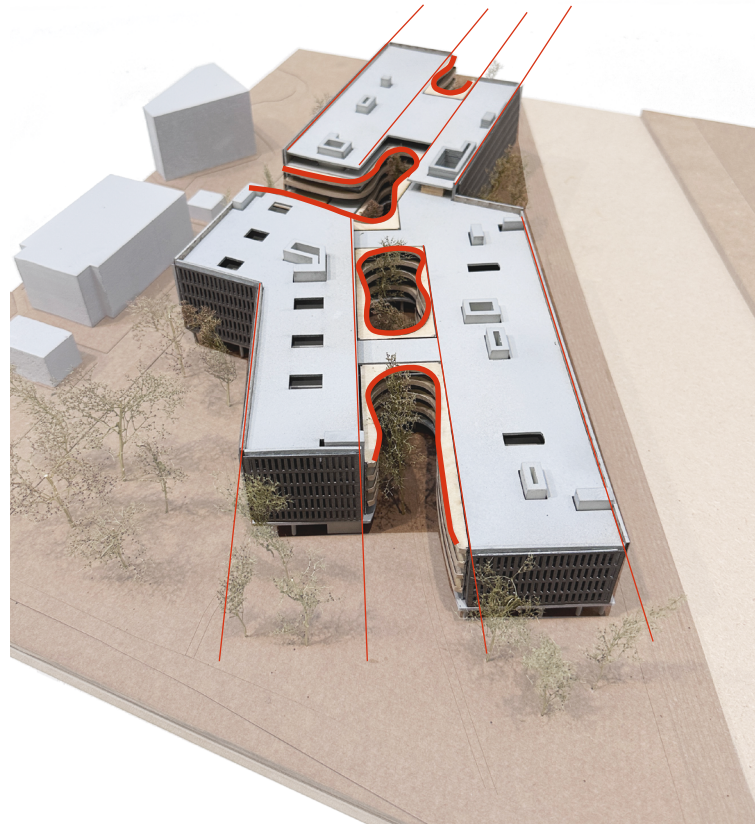
Conclusion

GRID & SOFT FILL-IN



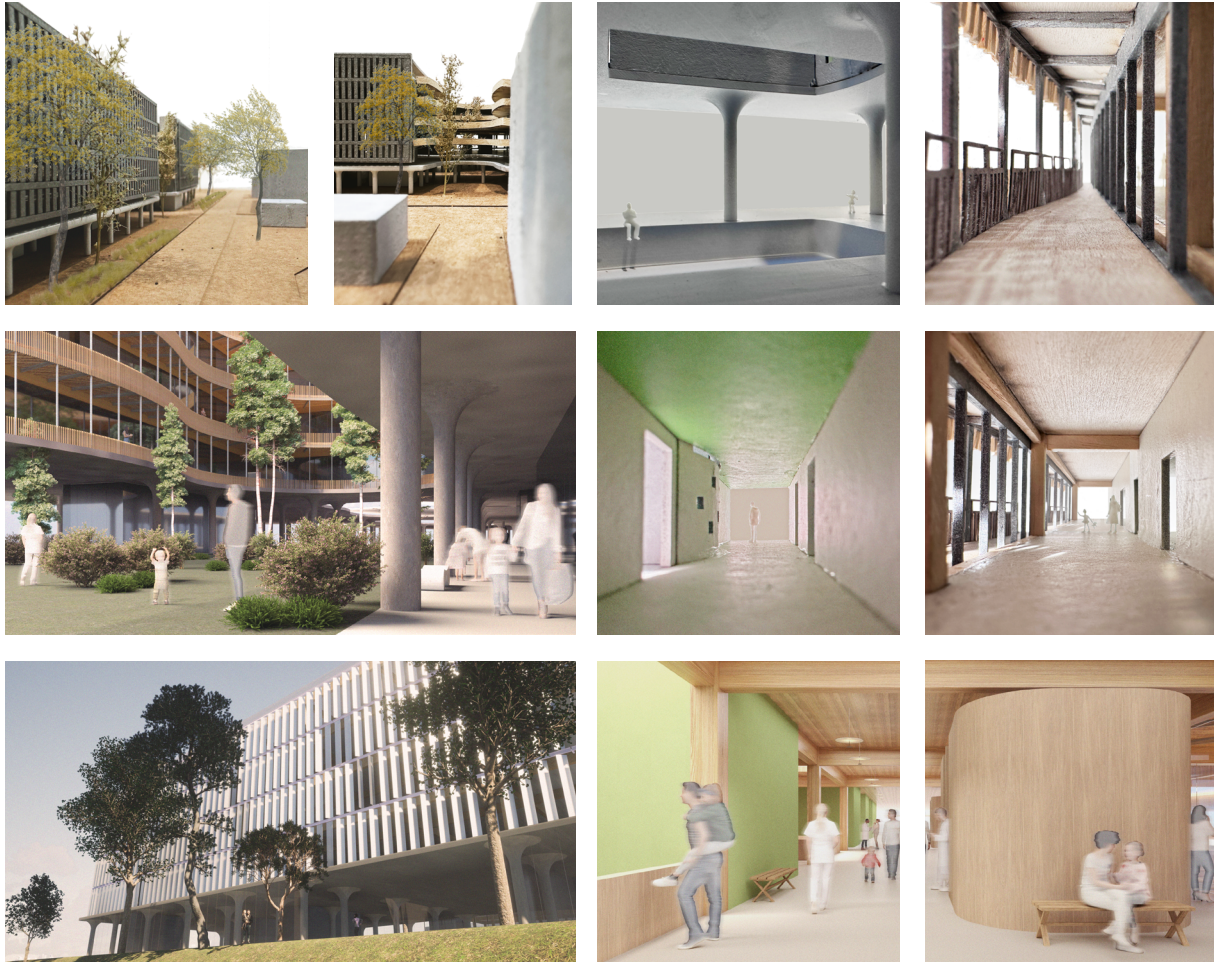
Conclusion

GRID & SOFT FILL-IN



Conclusion

HOLISTIC CARE!



Thank You