COMPLEX PROJECTS

OASIS FOR VITALITY

Inpatient rehabilitation centre for the recovering

P5 | Edward Kooij
Group 7 | Health
2024



Introduction
Research
Design Brief
Concept
Implementation
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ARCHITECTURE & MENTAL HEALTH

“Endocrine systems, behaviour, and brain responses are all profoundly impacted by architecture”
(J.A. Golembiewsk, 2016).



TOPIC RELEVANCE

“Healthcare facilities are inherently environments where people face a high degree of stress”

Pain

Uncertainty

Loss of control

Work pressure



INEFFICIENT

Lenght of Stay (LOS)

Germany:	**9.0 days**
Netherlands:	4.5 days
Denmark:	5.5 days
Sweden:	5.3 days

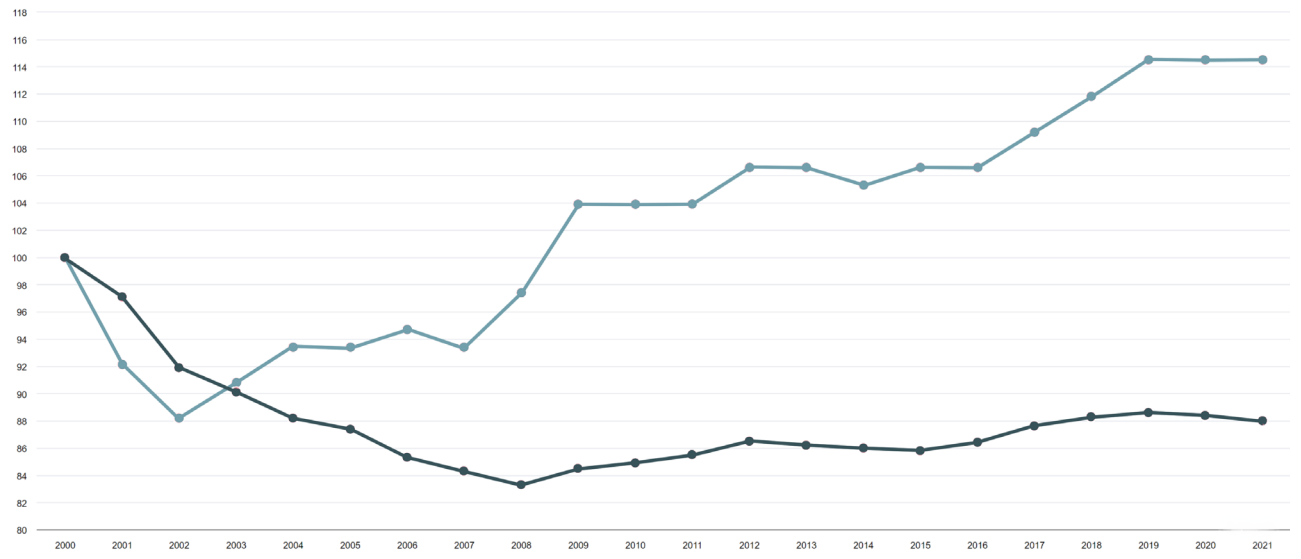
https://americangerman.institute/2021/11/challenges-for-the-german-healthcare-system-in-the-covid-19-pandemic-and-beyond/

HOSPITAL PLANNING GERMANY

Lack of coordinated hospital planning for decades, resulting in **large number of specialized hospitals** which operate **inefficient due to fractured care focus**

2000 to 2021 in Berlin, measurement number 2000 ≙ 100

Development of central hospital indicators



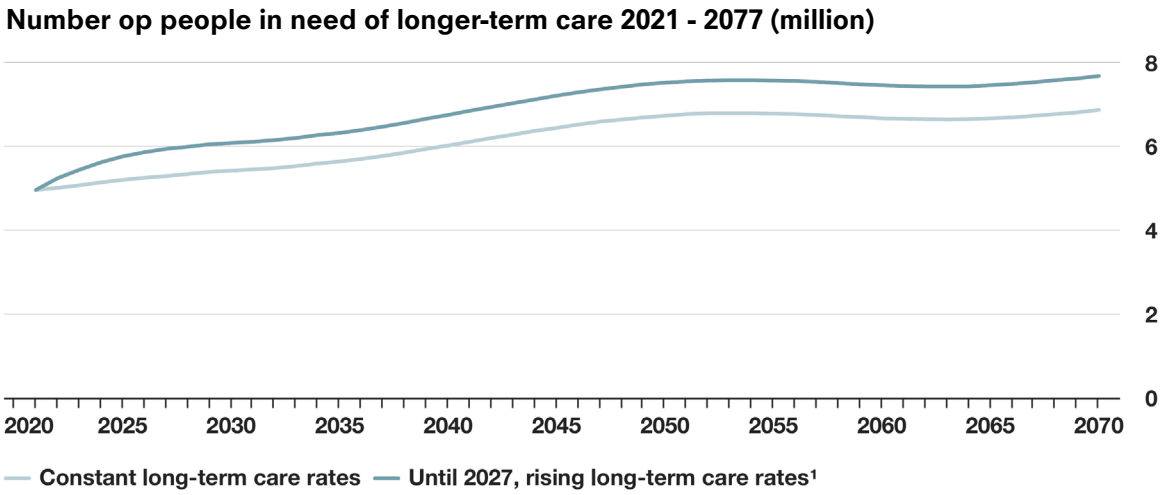
Number of specialized, clinical hospitals in Berlin

Number of available healthcare beds in Berlin

Germany-CountryHealthProfile2021/Berlin

INCREASING

up by 37%
in 2055



https://www.destatis.de/EN/Press/2023/03/PE23_124_12.html

FILLING THE GAP

Highest level of medical rehabilitation, after hospitalisation



LONG TERM BENEFITS



Higher recovery rate

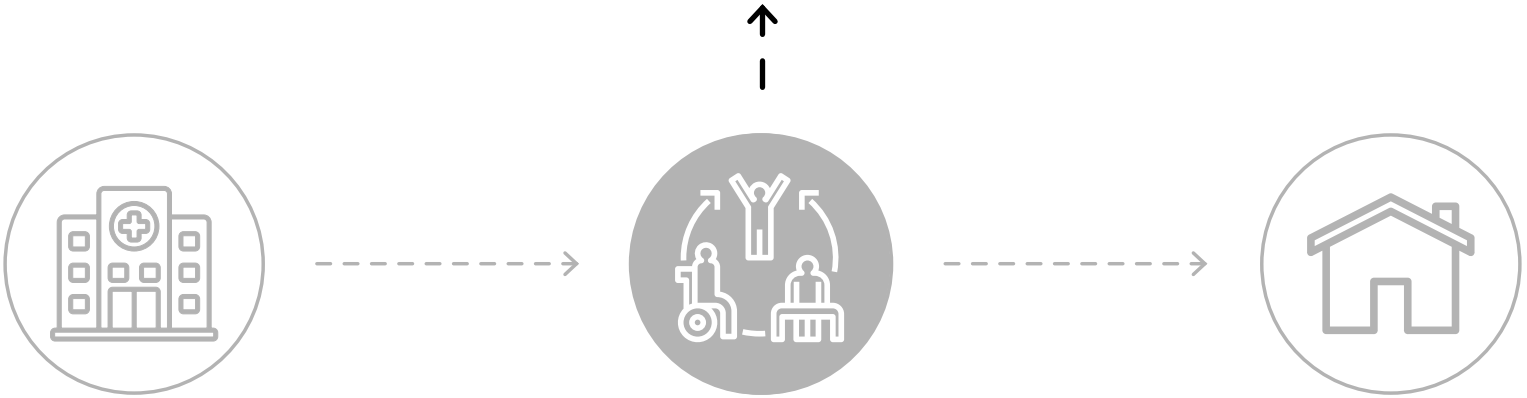
Earlier discharges

Lower rates of readmission

https://ncrh.ernesthealth.com/inpatient-rehabilitation/

RESEARCH QUESTION

"HOW TO DESIGN A HEALTH PROMOTING, INPATIENT REHABILITATION CENTRE FOR THE RECOVERING PATIENT?"



RESEARCH QUESTION

"HOW TO DESIGN A **HEALTH PROMOTING**, INPATIENT REHABILITATION CENTRE FOR THE RECOVERING PATIENT?"

1. Filling the long-term care gap

2. Provide the best recovery rate

3. Provide the best recovery experience

PREVIEW





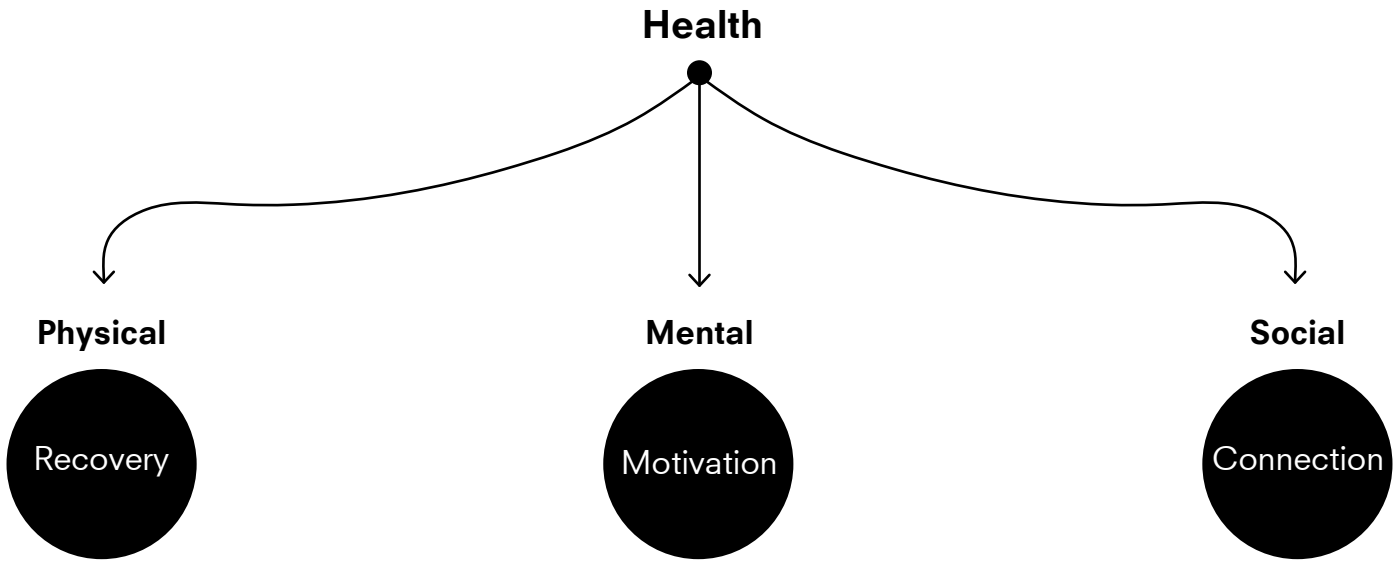


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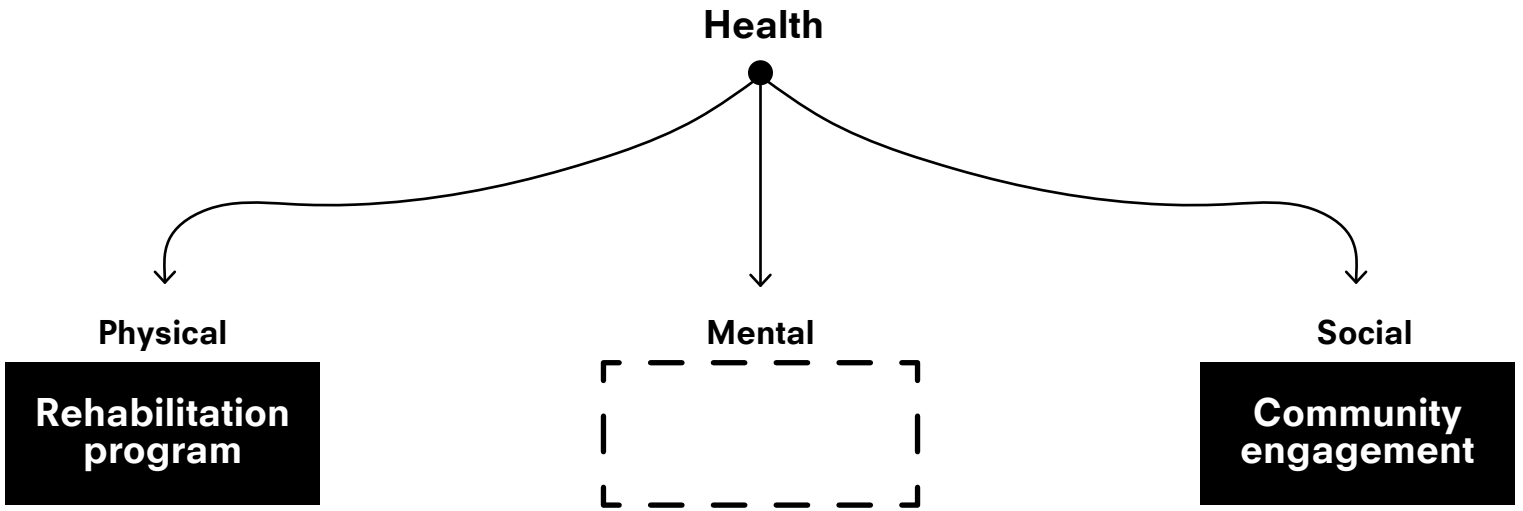
UNDERSTANDING HEALTH PROMOTING

"HOW TO DESIGN A **HEALTH PROMOTING**, INPATIENT REHABILITATION CENTRE FOR THE RECOVERING PATIENT?"

UNDERSTANDING HEALTH

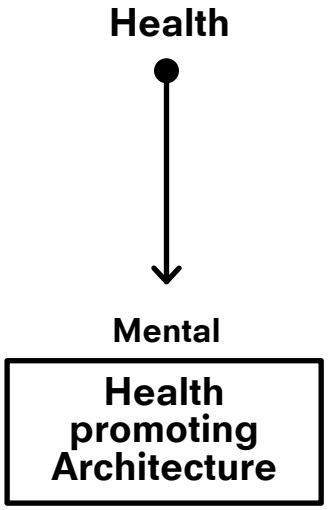


UNDERSTANDING HEALTH



Research

HEALTHY ENVIRONMENT



Research

IMPORTANCE

Life changing injury

↓

Bad mental health

https://emerylawoffice.com/suicide-is-a-common-cause-of-death-after-spinal-cord-injury/

Research

IMPORTANCE

Life changing injury

↓

Bad mental health



Longer recovery time

Longer wound healing

https://emerylawoffice.com/suicide-is-a-common-cause-of-death-after-spinal-cord-injury/

IMPORTANCE

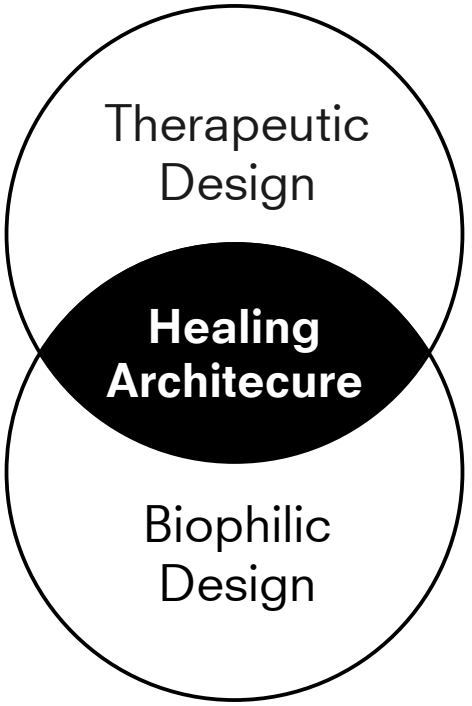


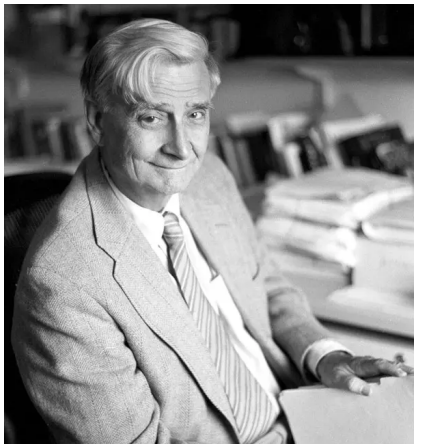
Research

DESIGN STRATEGIES



Psychologist & Architect Dr Evangelia Chrysikou - 20th century





Biologist Edward O. Wilson - the 1980s

RESULTS



Faster recovery

Physical stimuli that turn healthcare facilities into healing environments through psychologically mediated effects

(Dijkstra et al., 2006)



Lower mortality

Physical stimuli that turn healthcare facilities into healing environments through psychologically mediated effects

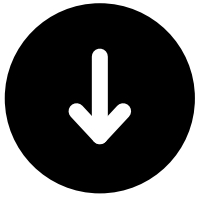
(Dijkstra et al, 2006)



Positive Distraction

Health Benefits of Gardens in Hospitals

(Ulrich, 1999)



Bloodpressure & Heartrate

Physiological effects in humans induced by the visual stimulation of room interiors with different wood

(Tsunetsugu & Miyazaki, 2005)

Research

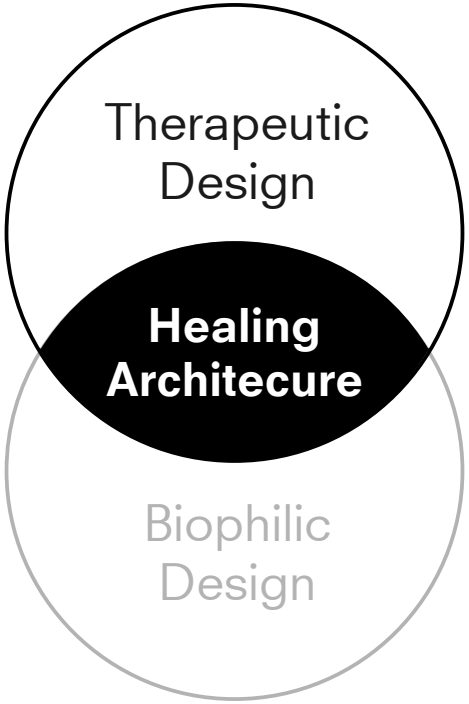
THERAPEUTIC DESIGN

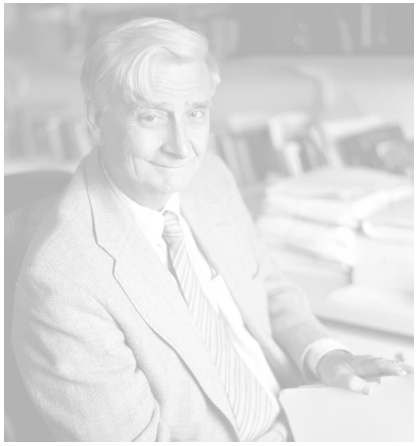


Psychologist & Architect Dr Evangelia Chrysikou - 20th century

Designing spaces according to the **individuals perception & psychiology**;

Aiming to:
1. Create an activating environment
2. Reduce stress and anxiety





Biologist Edward O. Wilson - the 1980s

Integrating nature into the built environment, **to leverage our inate connection with nature;**

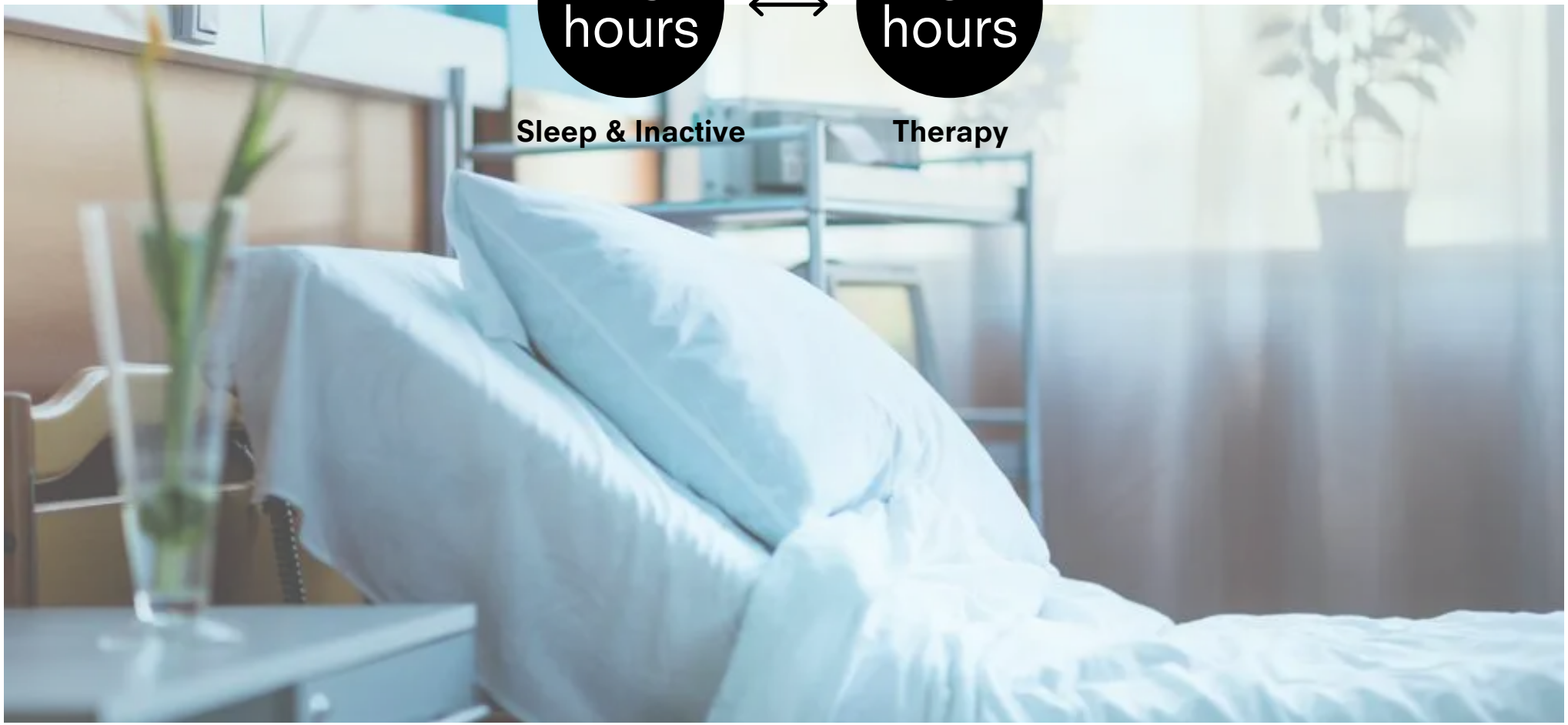
Aiming to:
Create restorative environments for both individuals & the ecosystem

THERAPEUTIC DESIGN - REACTIVATING

Bedroom

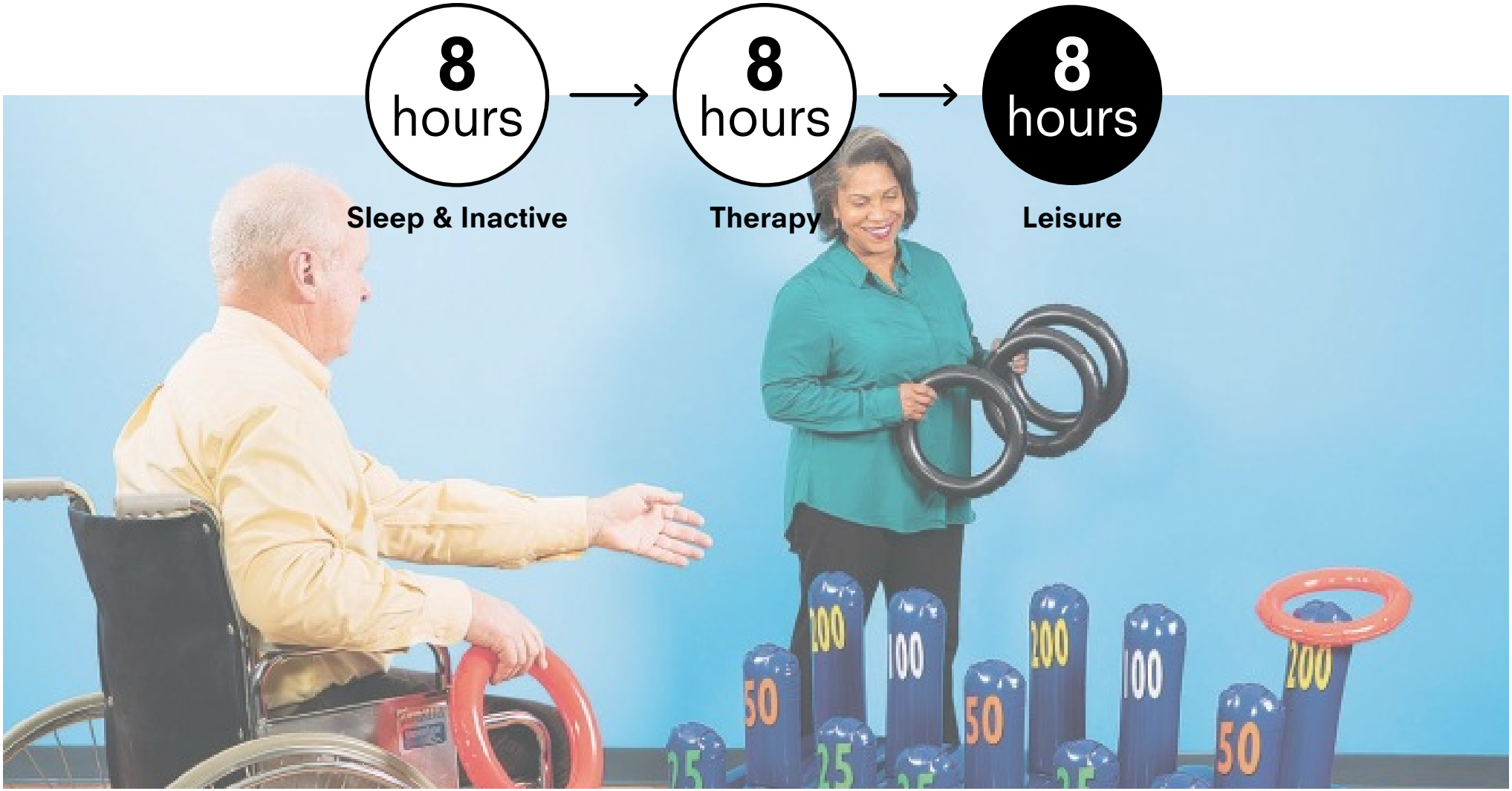
16 hours ⟷ **8 hours**

Sleep & Inactive **Therapy**



THERAPEUTIC DESIGN - REACTIVATING

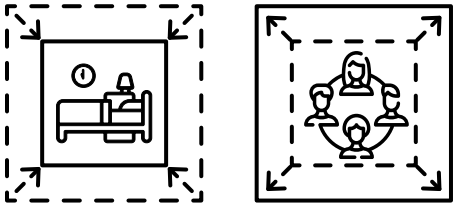
~~**Bedroom**~~



Reactivating Hospital, Active Patients Through Special Design - Femke Feenstra

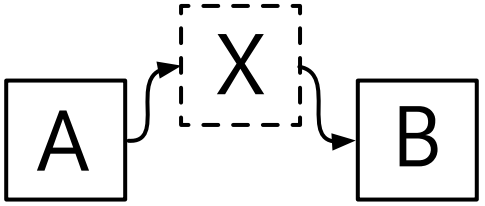
THERAPEUTIC DESIGN - REACTIVATING

"draw-out-bedroom" features



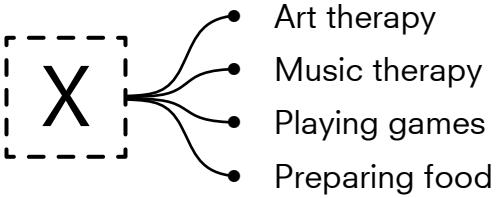
Dedicated communal (social) spaces;

Nudge: Serve meals here
(Hokstad A, et al., 2015)



Spaces for incidental activity and interaction;

Nudge: Use Circulation space
(HERD, 2018)



Provide space for engageing activities

Nudge: Therapy & Leisure
(Theorell & Konarski, 1998)

THERAPEUTIC DESIGN - REDUCING STRESS

Stimulate the Senses

Scent

Natural scents like timber, plants, and herbs.

Light

92% of patient's find sunlight pleasurable and calming.

Colour

Natural colours have calming effect on patients

Sound

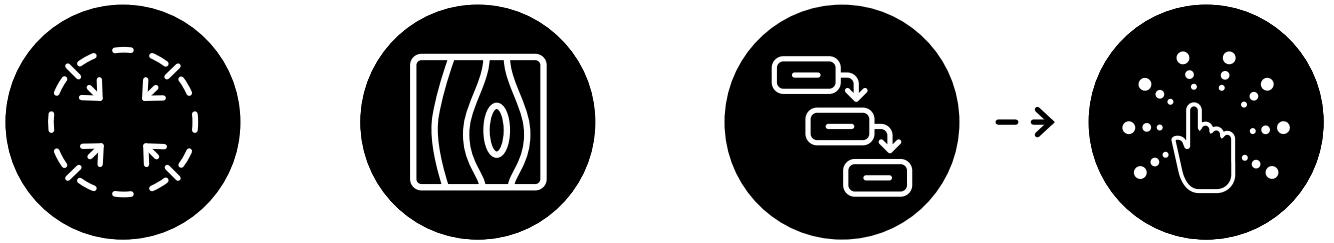
Natural sounds and classical music reduce stress





BIOPHILIC DESIGN - NATURE INTEGRATION

Plants **Material** **Water** **Garden**



Integrated Natural Moving Experiencable







BIOPHILIC DESIGN - NATURE INTEGRATION

Plants | Material | Water | **Garden**

Therapeutic garden

Therapeutic benefits derive from just being in the garden



Enabling garden

Therapeutic benefits derive from activities and exercise, led by a therapist



DESIGN AMBITIONS RECAP

Reactivating



Stimulating senses



Nature integration



Healing garden



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Design Brief

- Client
- Program
- Site

CLIENT GROUPS

Organisation

BDPK
Bundesverband Deutscher Privatkliniken e.V.

Expertise

Vivantes
Berlin's largest municipal hospital group

Federal Ministry of Health

Financing

Occational user

Citizens

Main user



Patients



Staff

www.vectorstock.com

CLIENT GROUPS

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www.vectorstock.com

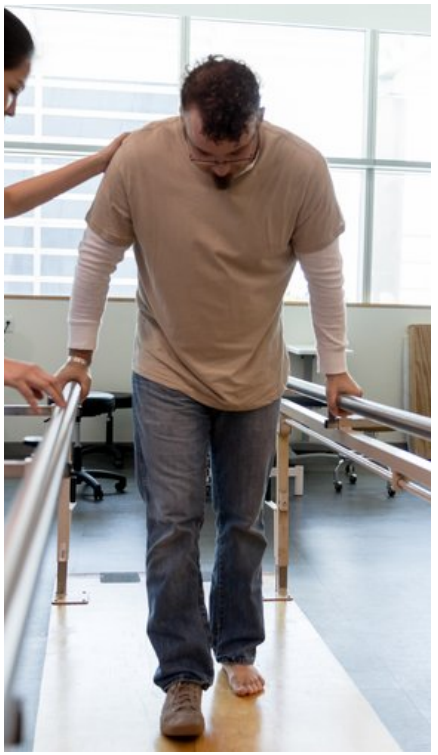
MAIN USERS - PATIENTS

Paediatric



25%

(Young) adults



25%

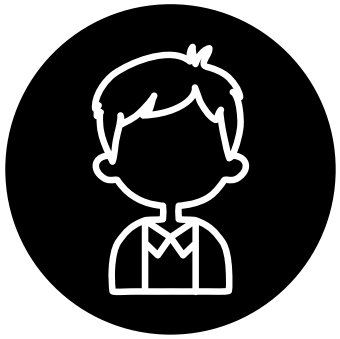
Geriatric



50%

MAIN USERS - PATIENTS

Paediatric



Intensive involvement of family

Educational support

Play and Phantasy areas

(Young) adults



Vocational therapy mimicking work environments

Additional, separated social program for motivation

Geriatric



Provide therapy based on old & known skills

Enhance wayfinding and orientation by using clear signage and colours

OCCATIONAL USERS - CITIZENS

Overstimulated

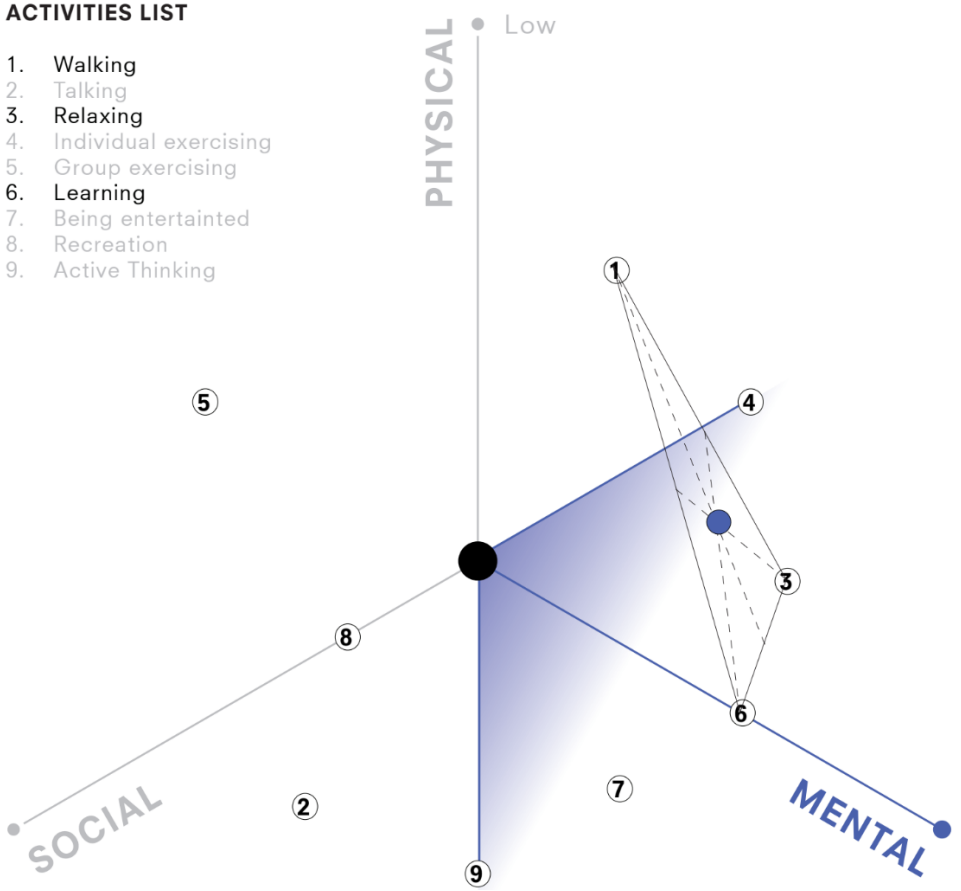


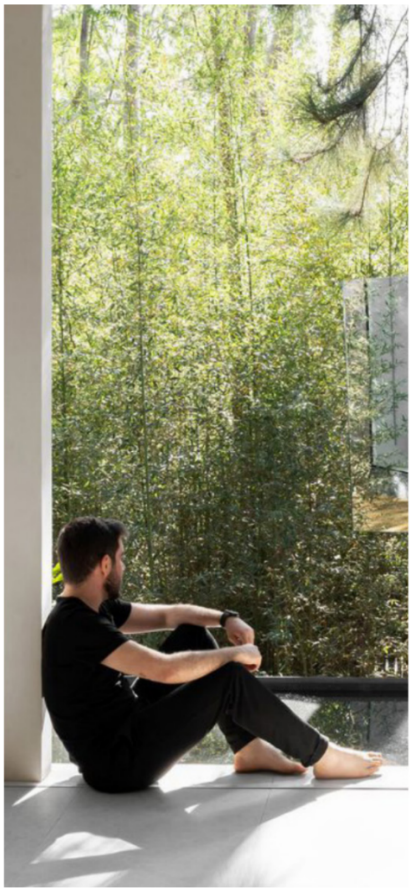
OCCATIONAL USERS - CITIZENS

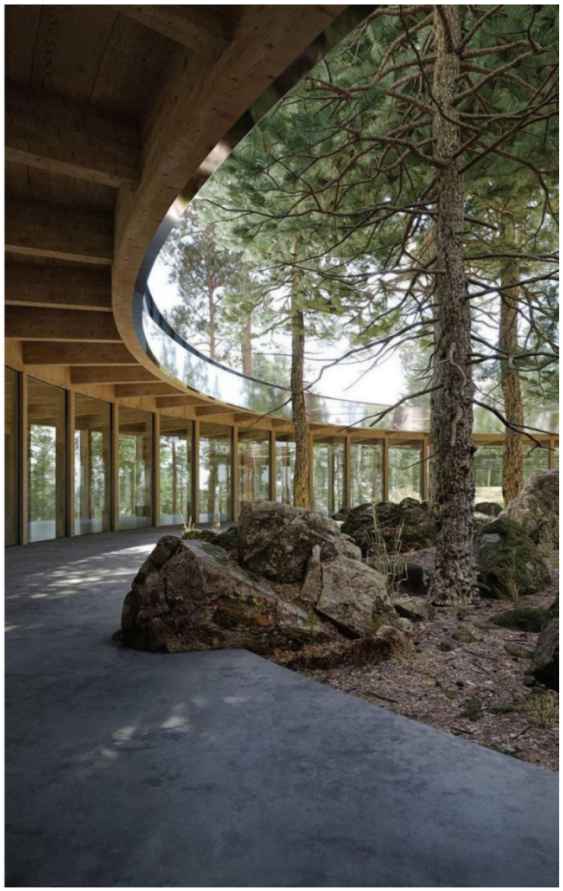
Mentally recharge

ACTIVITIES LIST

1. Walking
2. Talking
3. Relaxing
4. Individual exercising
5. Group exercising
6. Learning
7. Being entertainted
8. Recreation
9. Active Thinking

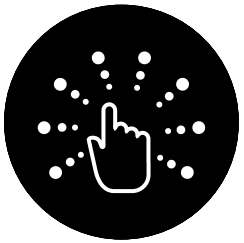






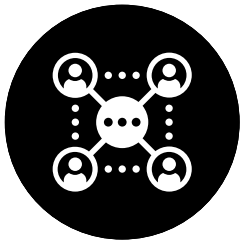
HEALING GARDEN - TAILORED

Paediatric



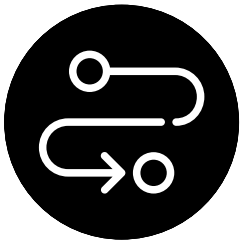
Interactive

Young



Social support

Geriatric



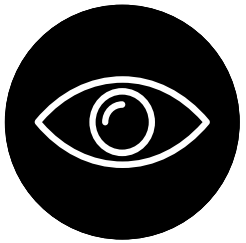
Clear layout

Staff



No-patient access

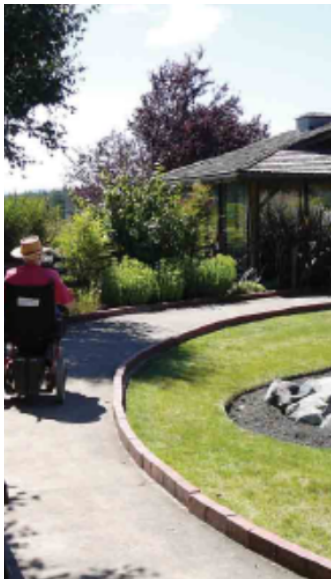
Citizens



Visual from inside











Design Brief

- Client **- Program** - Site

BENCHMARKING INPATIENT REHAB FACILITY

Xtra Large



SOCSO Rehabilitation Center
Neurological & Orthopedic Rehab

Large



Sheltering Arms Institute
Neurological & Orthopedic Rehab

Medium



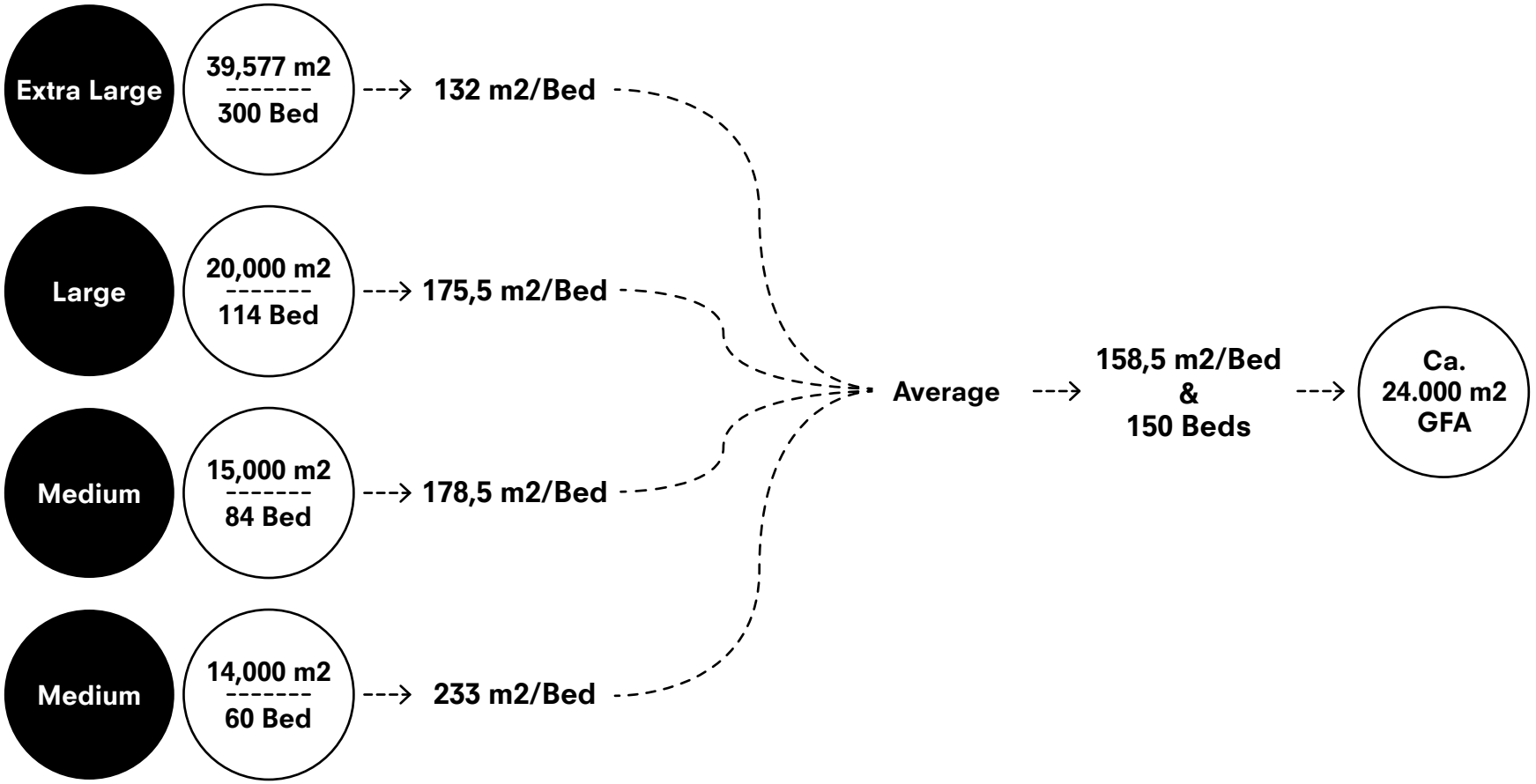
Rehab centre Groot Klimmendaal
Neurological & Orthopedic Rehab

Medium

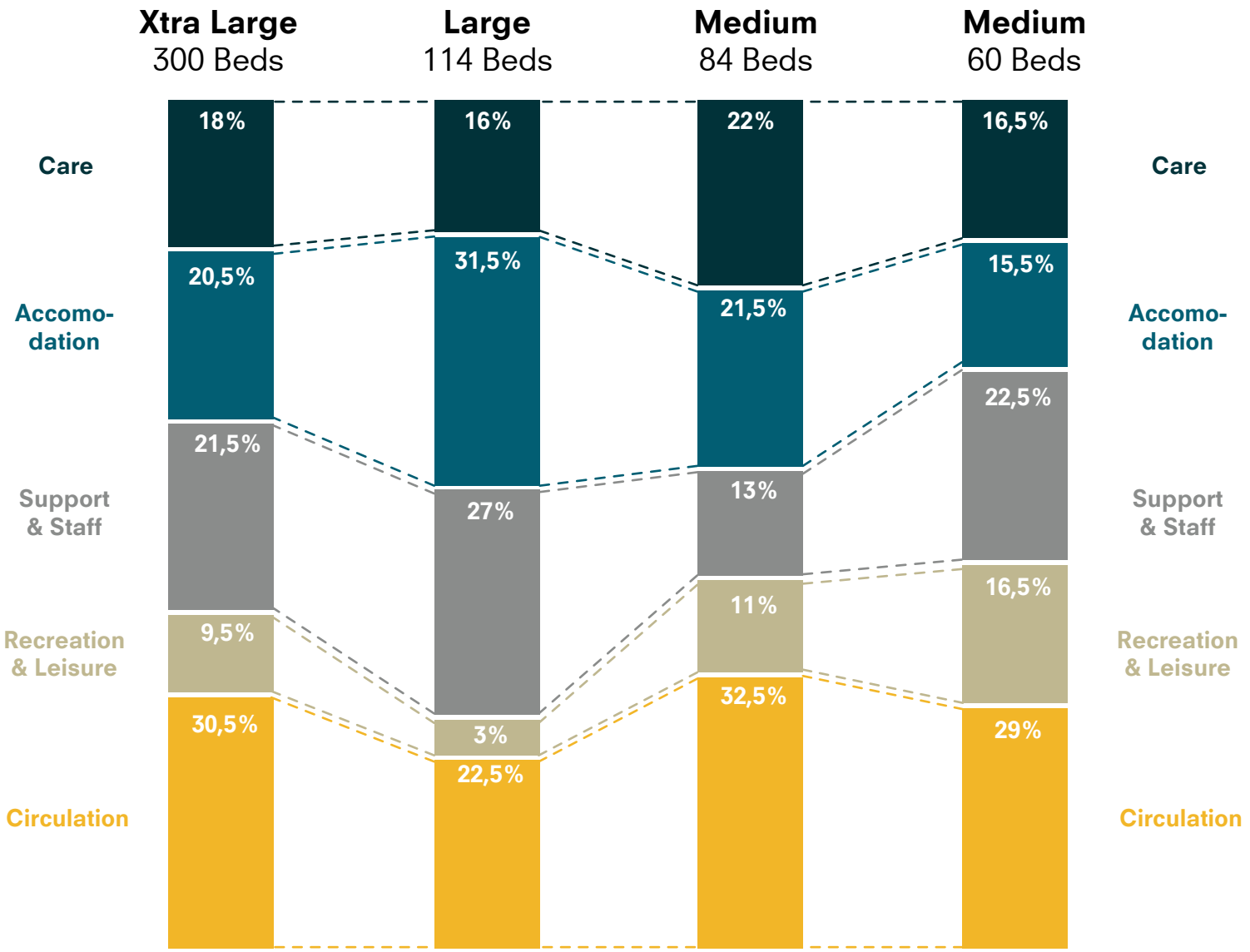


165 REHAB
Neurological Rehab

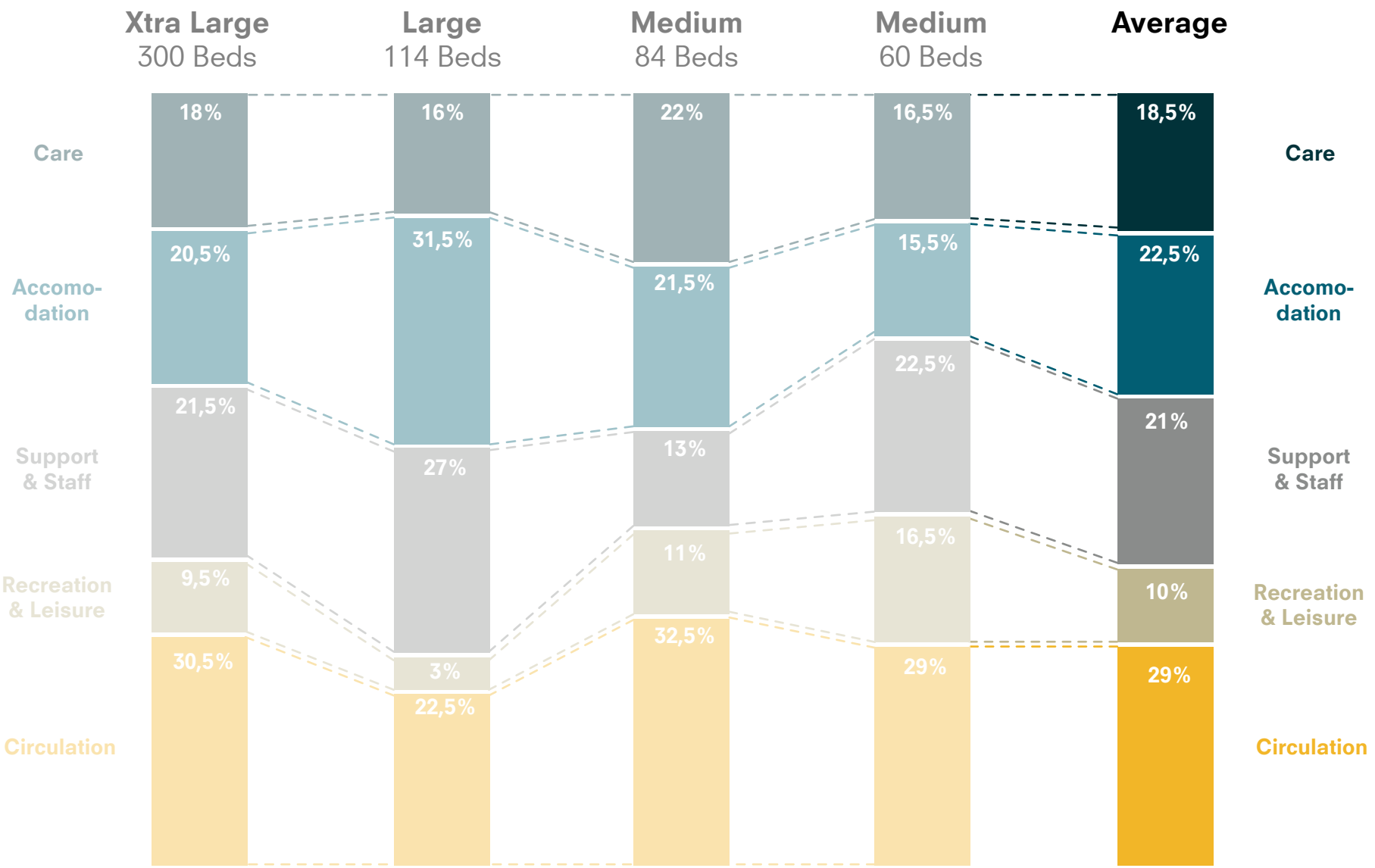
BENCHMARKING; SIZE



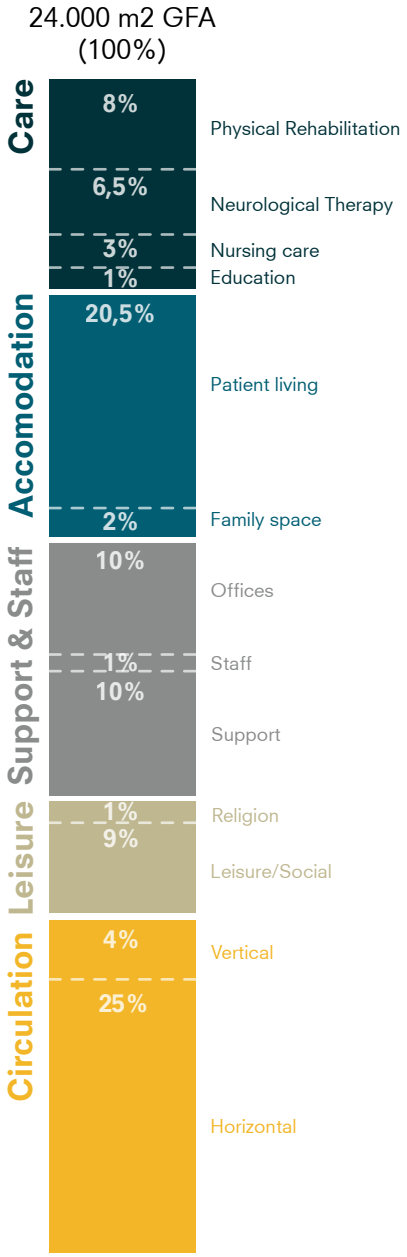
BENCHMARKING; PROGRAM



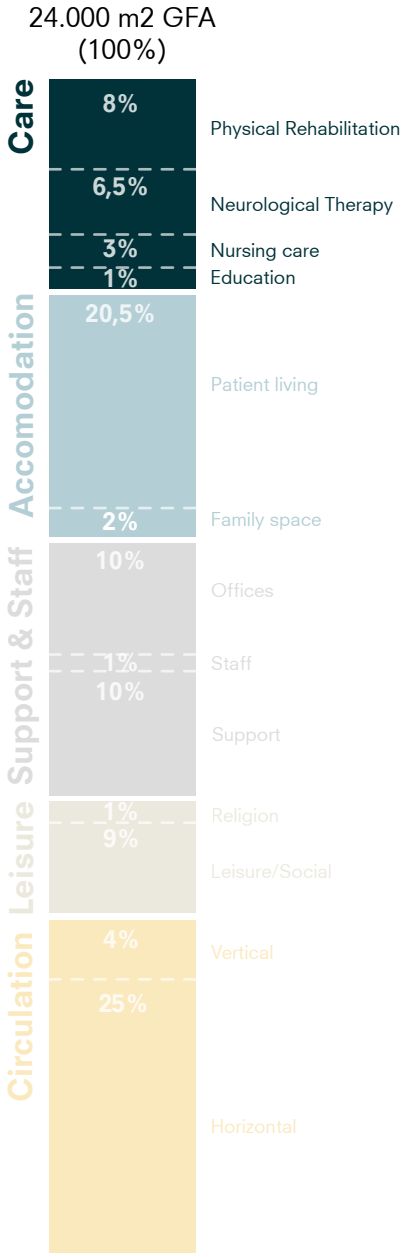
BENCHMARKING; AVERAGES

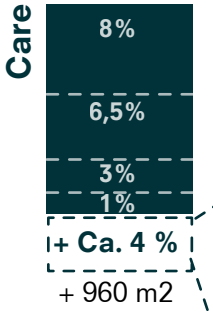


AVERAGE PROGRAM



TAILORED PROGRAM - CARE





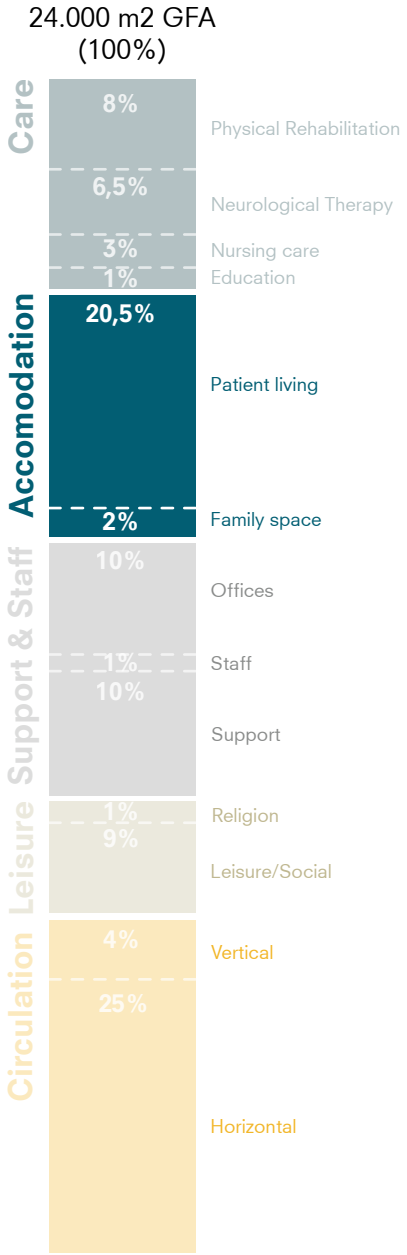
Playfull Therapypool
Smaller sized and colourfull
+ Ca. 0,7 %

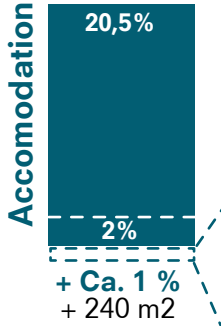
Educational support
To reduce school delays
+ Ca. 0,8 %

Vocational therapy
Therapy mimicking work environments
to simulate common life
+ Ca. 2%

Additional nursing care
Tailored to geriatric issues like delirium,
falls, immobility, and incontinence
+ Ca. 0,5%

TAILORED PROGRAM - ACCOMODATION





Additional space for family stays
Double rooms and extra living rooms
(Collab with Ronald Mcdonald House)

+ Ca. 1 %

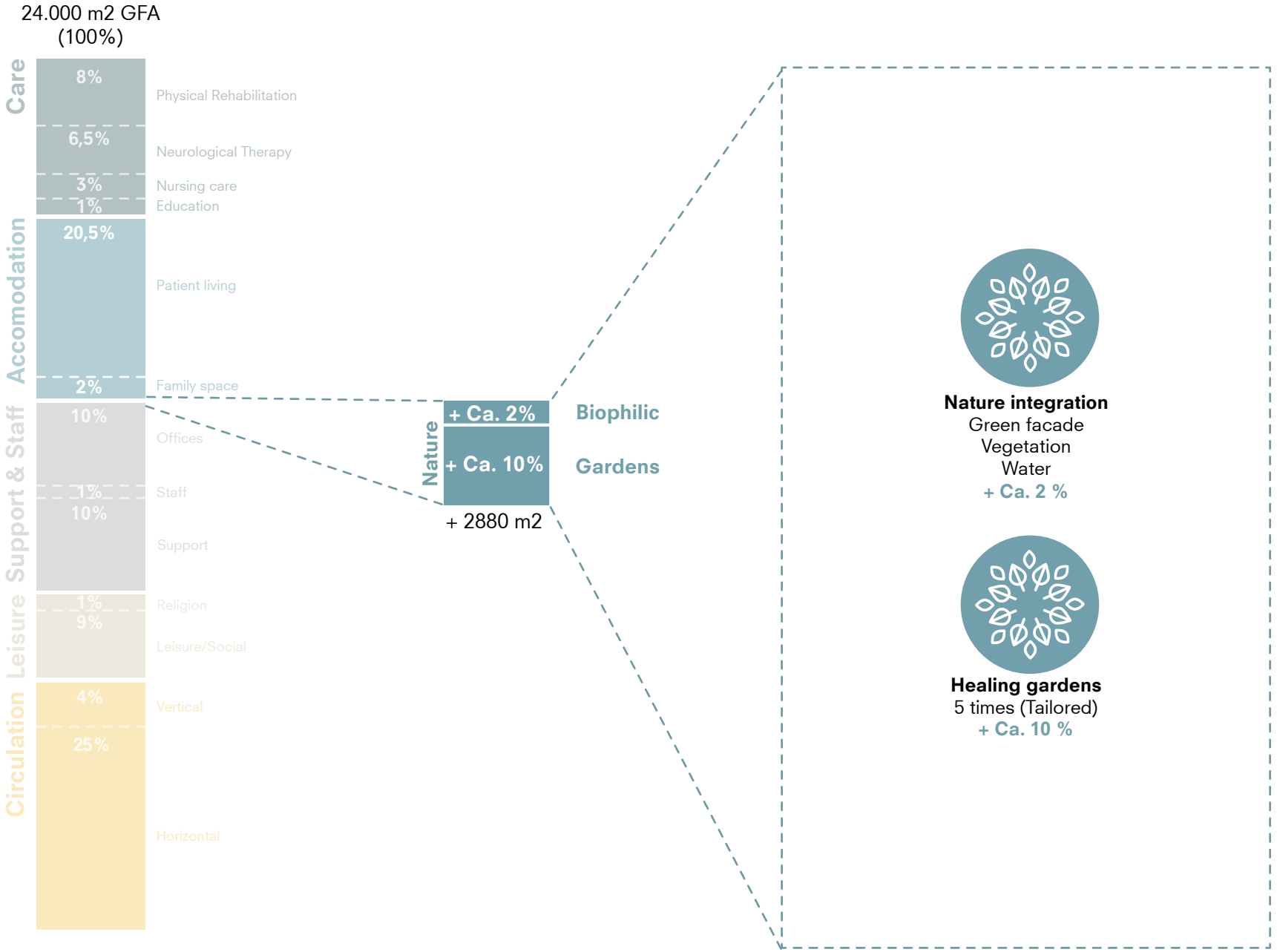
Mostly private rooms
Improved privacy and sleep quality

+ Ca. 1 %

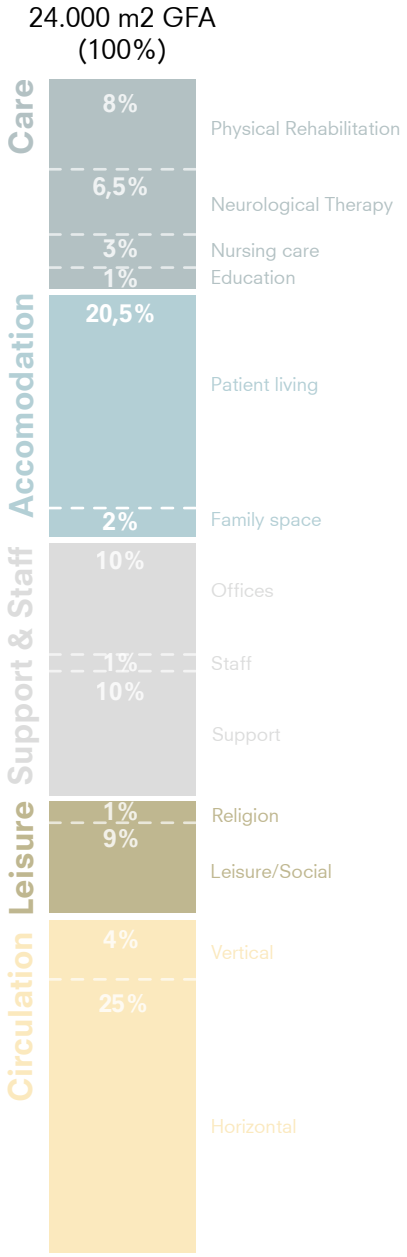
Reactivating
Smaller patientrooms due to reduced time spend there. Also to nudge the patients to take more action

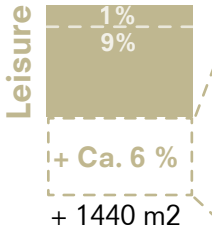
- Ca. 1%

TAILORED PROGRAM - NATURE



TAILORED PROGRAM - LEISURE



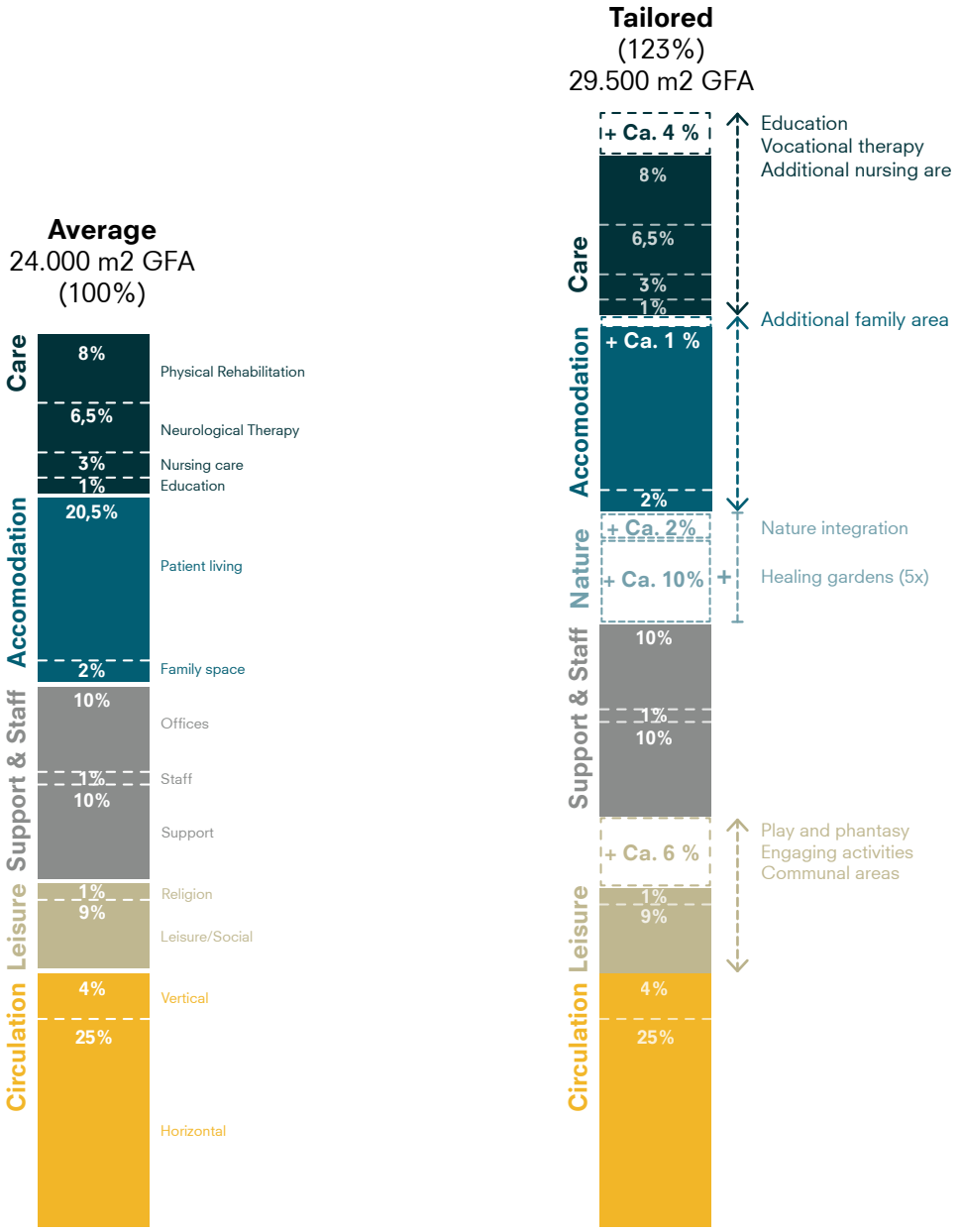


Play and Phantasy areas
Spaces are tailored to be playful
+ Ca. 0,5 %

Space for engaging activities
Tailored towards specific needs of patient groups
+ Ca. 3 %

Additional focus on communal areas
Tailored towards bringing patients together
+ Ca. 2,5 %

TAILORED PROGRAM



Design Brief

- Client - Program **- Site**

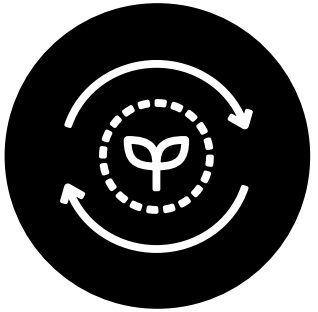
Design Brief - Site

REQUIREMENTS

Direct access to Acute Hospital

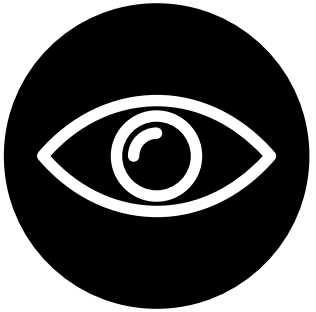


Areas

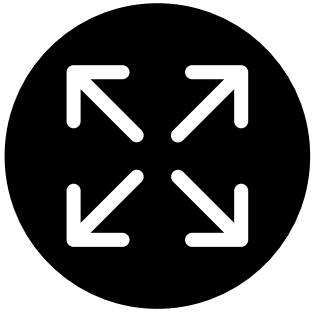


In or close to an underused brownfield

Potential for unobstructed view of nature



SITE



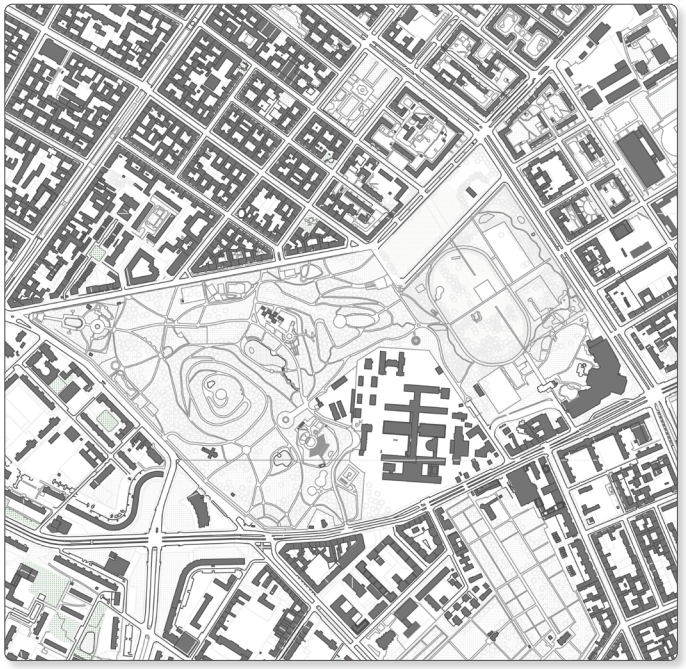
Size & interactive program allowing for therapeutic gardens

Design Brief - Site

LOCATION

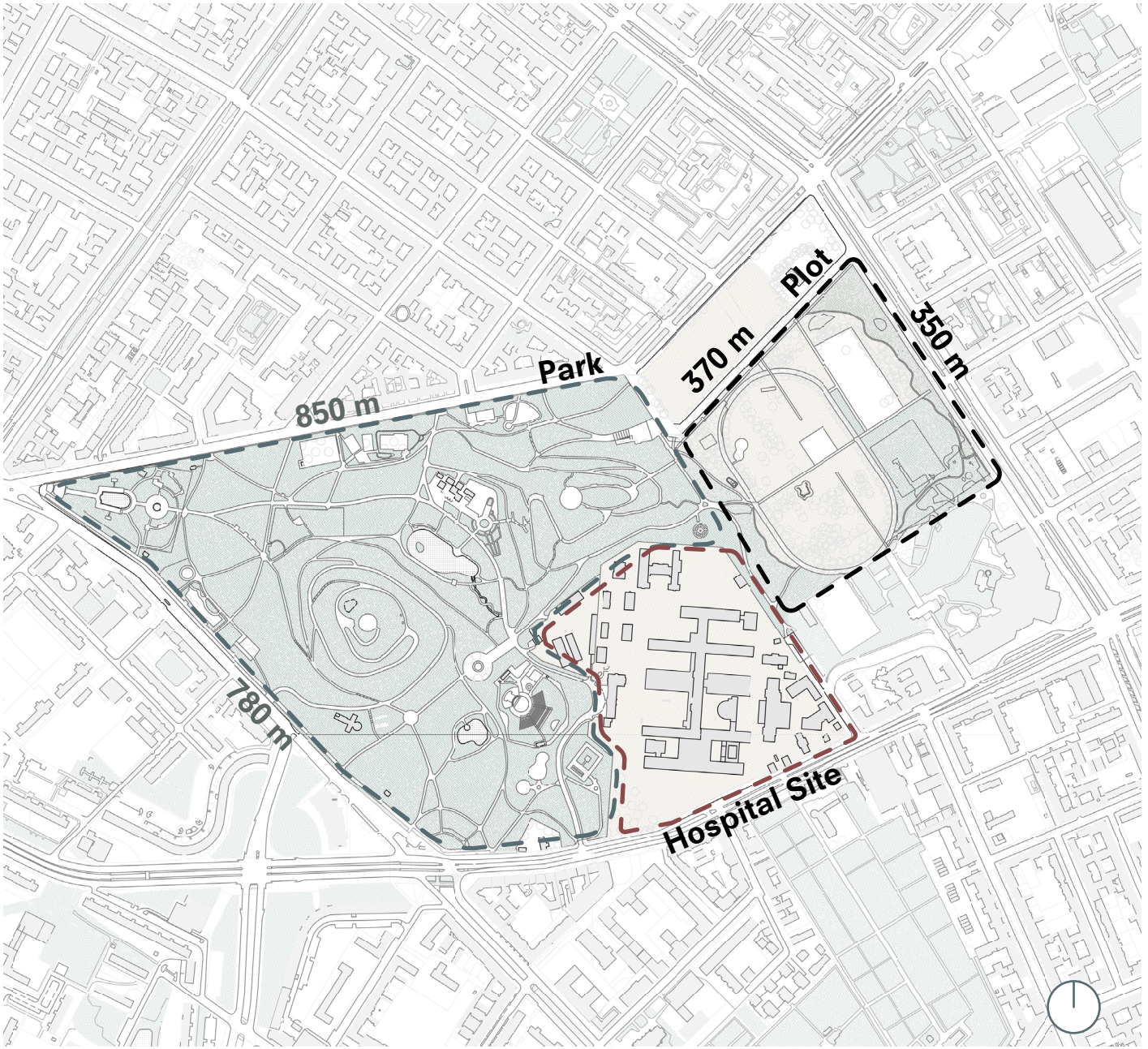
Berlin → **Site**





Design Brief - Site

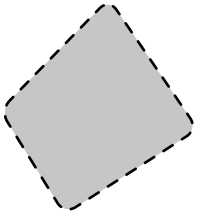
PLOT SIZE



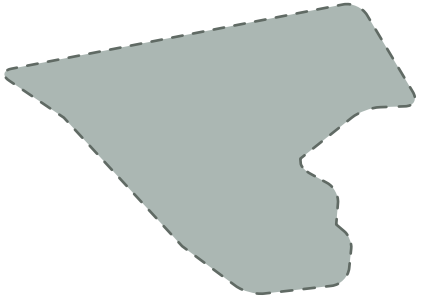
Program GFA: Ca. 30.000 m2



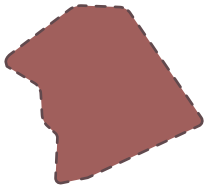
Plot size: Ca. 120.000 m2



Park size: Ca. 520.000 m2



Hospital site: Ca. 100.000 m2



PLOT HISTORY

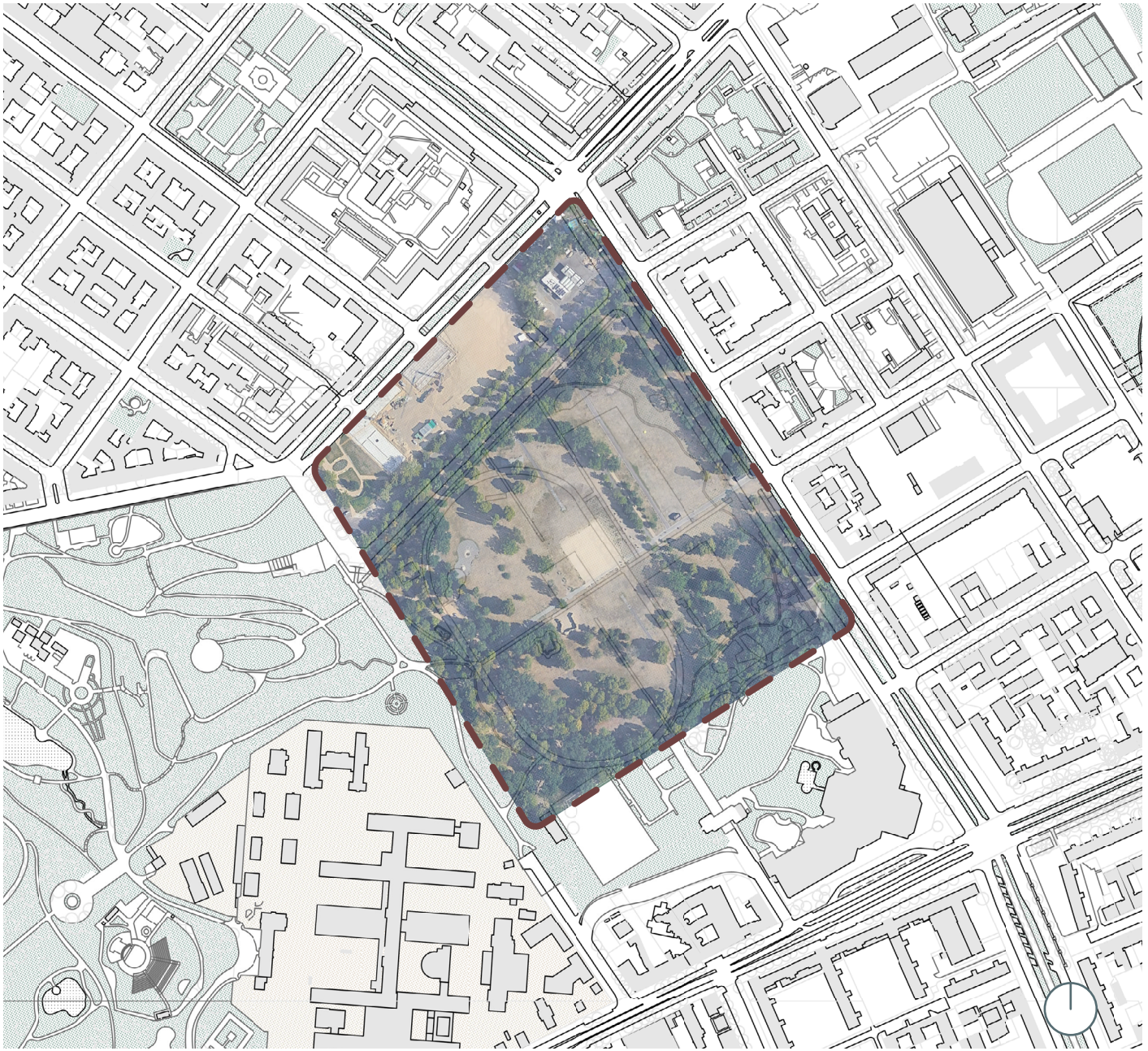


Werneuchener Wiese - Pre WW2

- Residential area with Ca. 1,500 apartments
- Large, thriving community garden
- Playground in centre

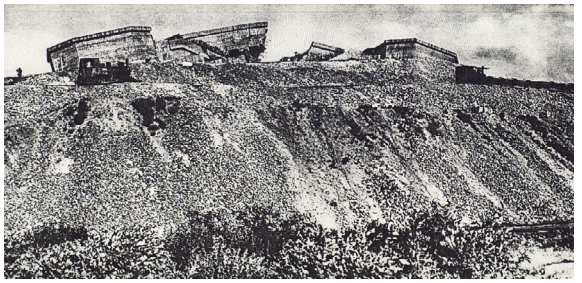


PLOT HISTORY



Werneuchener Wiese - WW2

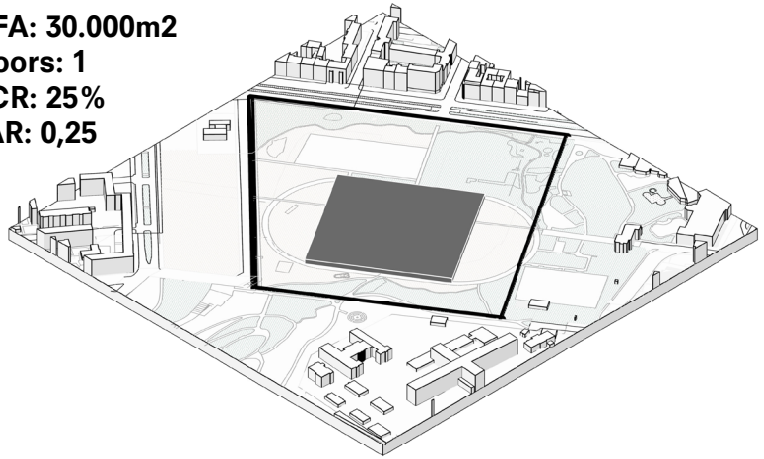
- Used for trenches and bunkers
- Bombed in 1944, resulting in huge piles of rubble.
- Currently a brownfield with still much rubble & low variety of species.



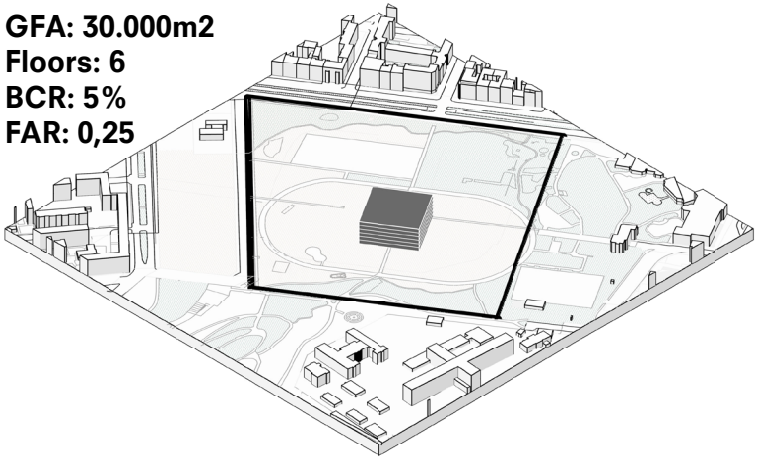


MASSING

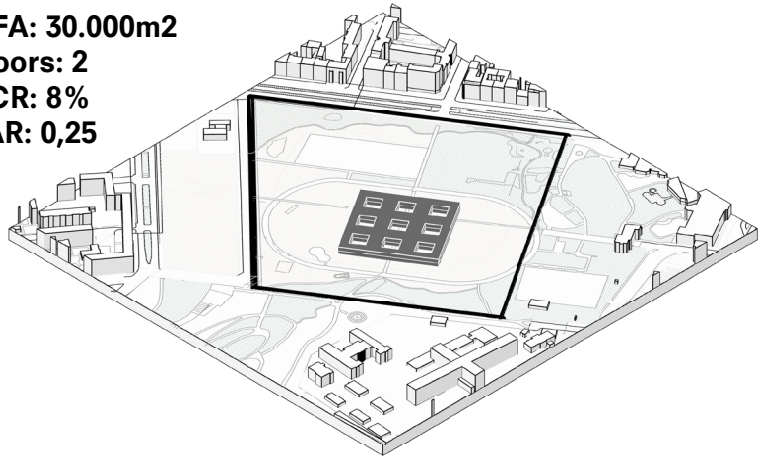
GFA: 30.000m2
Floors: 1
BCR: 25%
FAR: 0,25



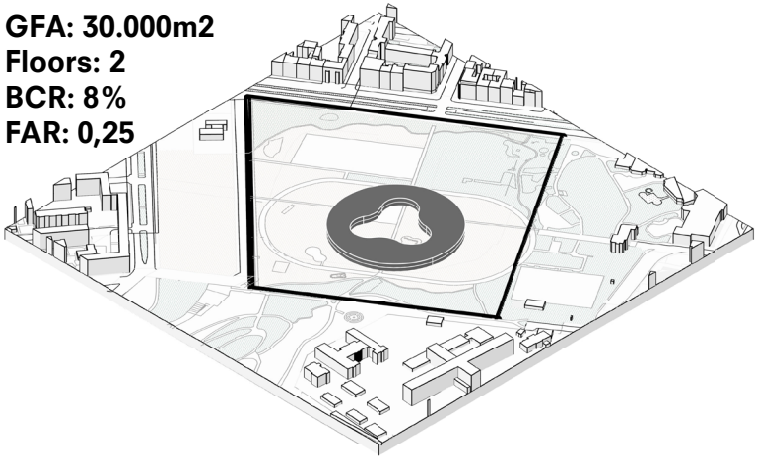
GFA: 30.000m2
Floors: 6
BCR: 5%
FAR: 0,25



GFA: 30.000m2
Floors: 2
BCR: 8%
FAR: 0,25



GFA: 30.000m2
Floors: 2
BCR: 8%
FAR: 0,25



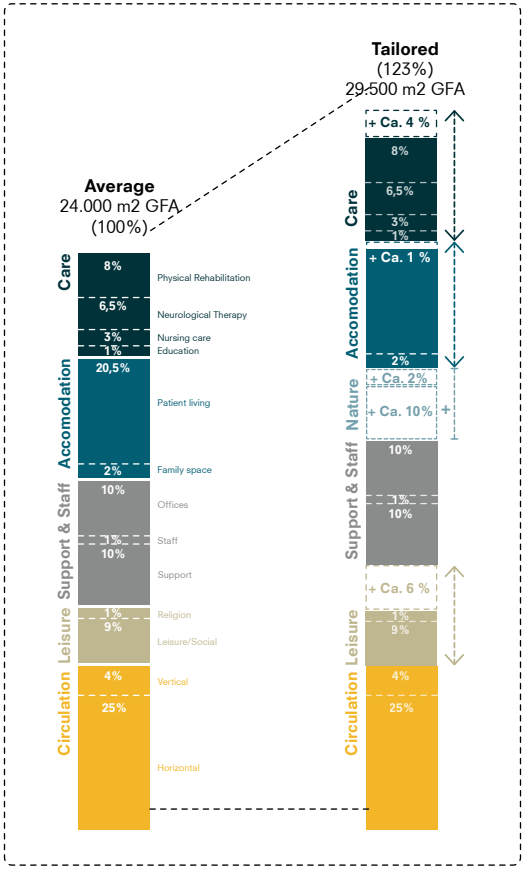
Design Brief

RECAP

Client



Program



Site



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DESIGN AMBITIONS

Reactivating



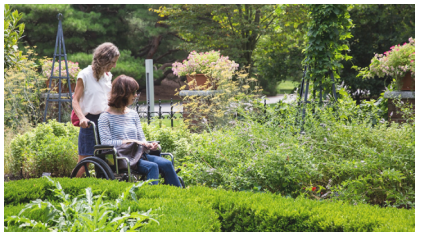
Stimulating senses



Nature integration



Healing garden



"HOW TO DESIGN A **HEALTH PROMOTING**, INPATIENT REHABILITATION CENTRE FOR THE RECOVERING PATIENT?"

DESIGN AMBITIONS

Reactivating



Program:
Provide program
to activate

Stimulating senses



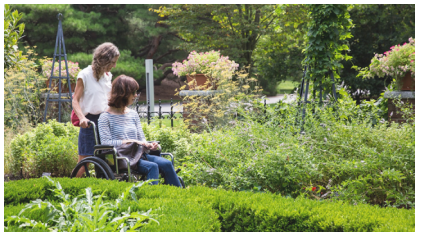
Materials:
Use Natural and
Raw materials

Nature integration



Massing:
Build porous to
optimize relation
with park

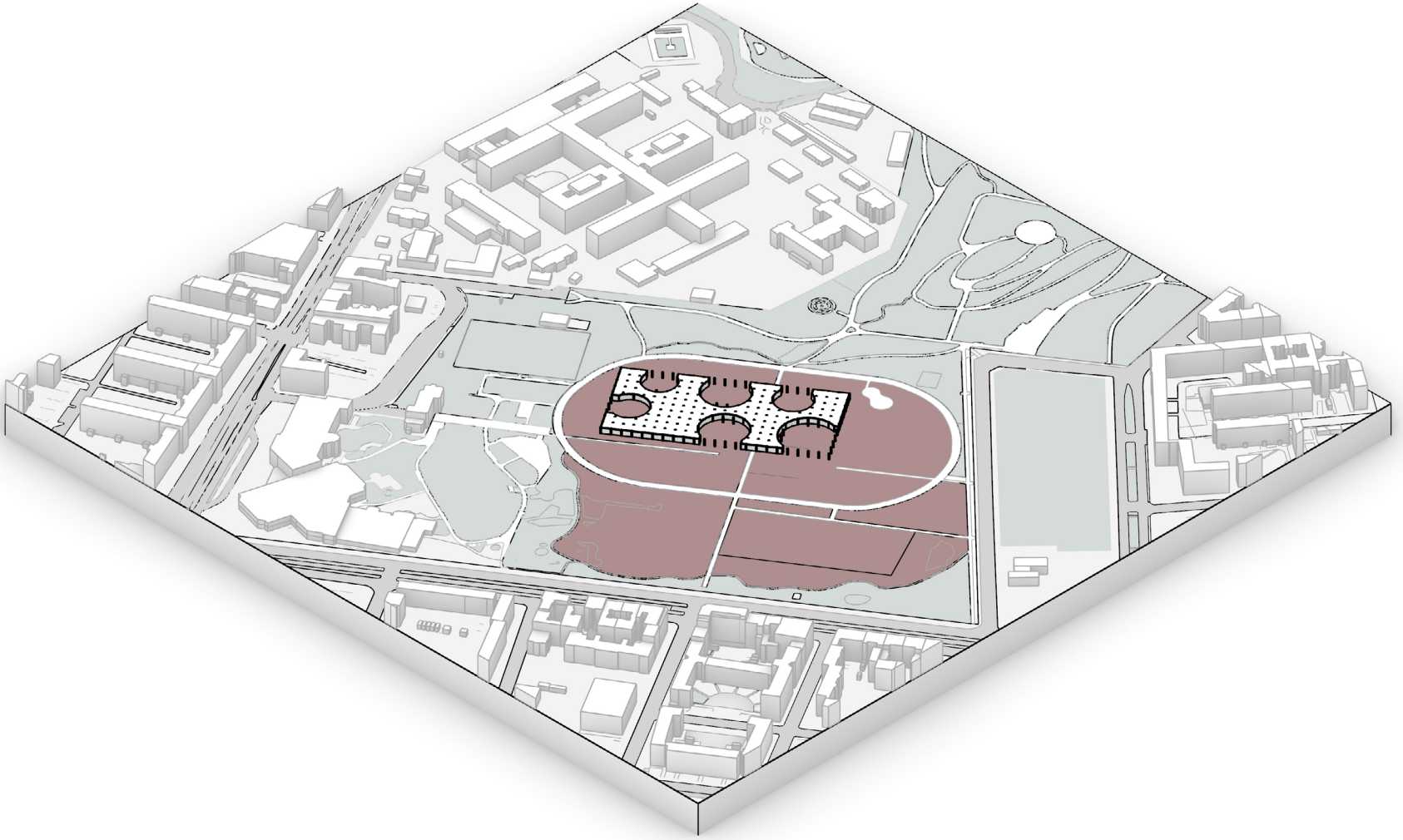
Healing garden



Massing:
Integrate &
highlight oasises

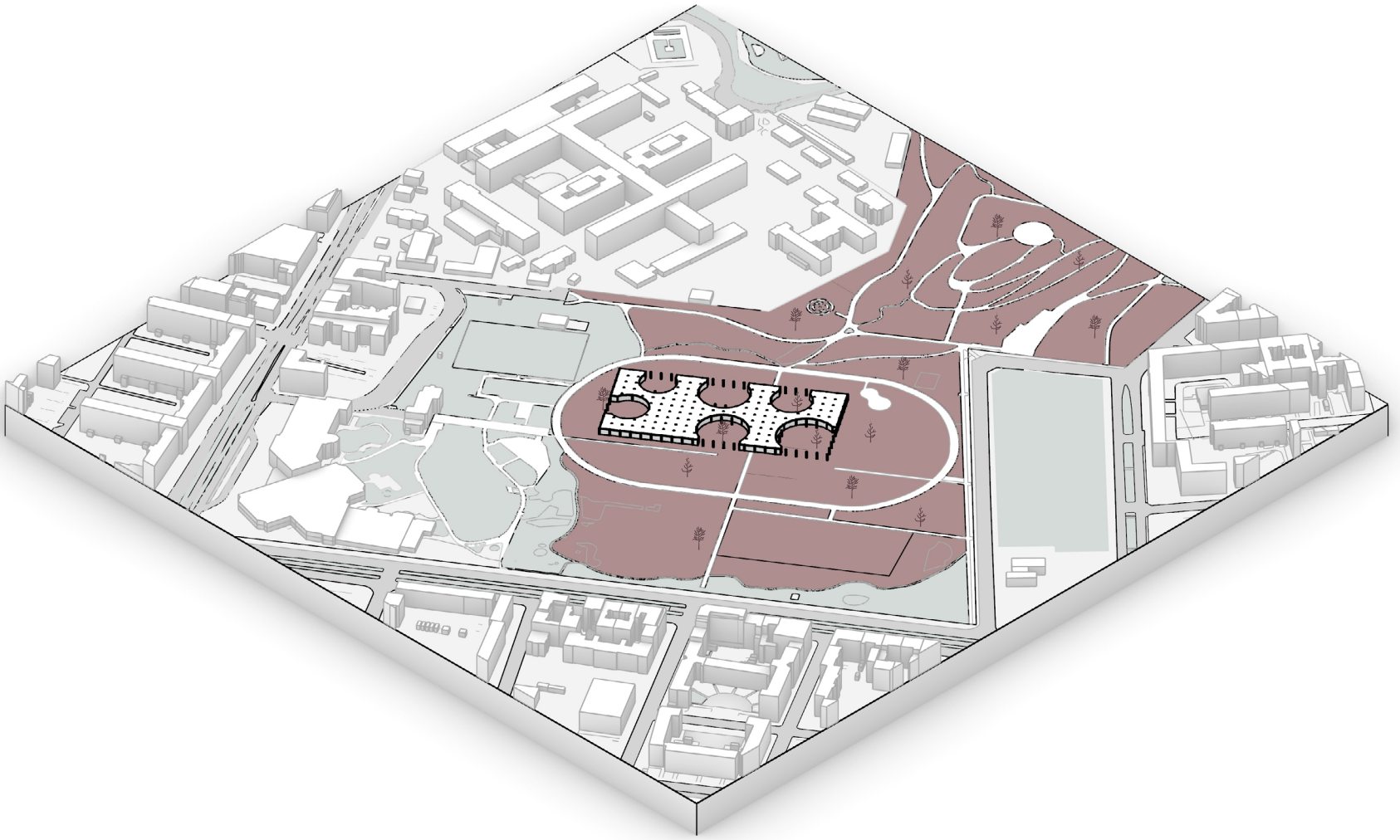
Concept

BROWNFIELD



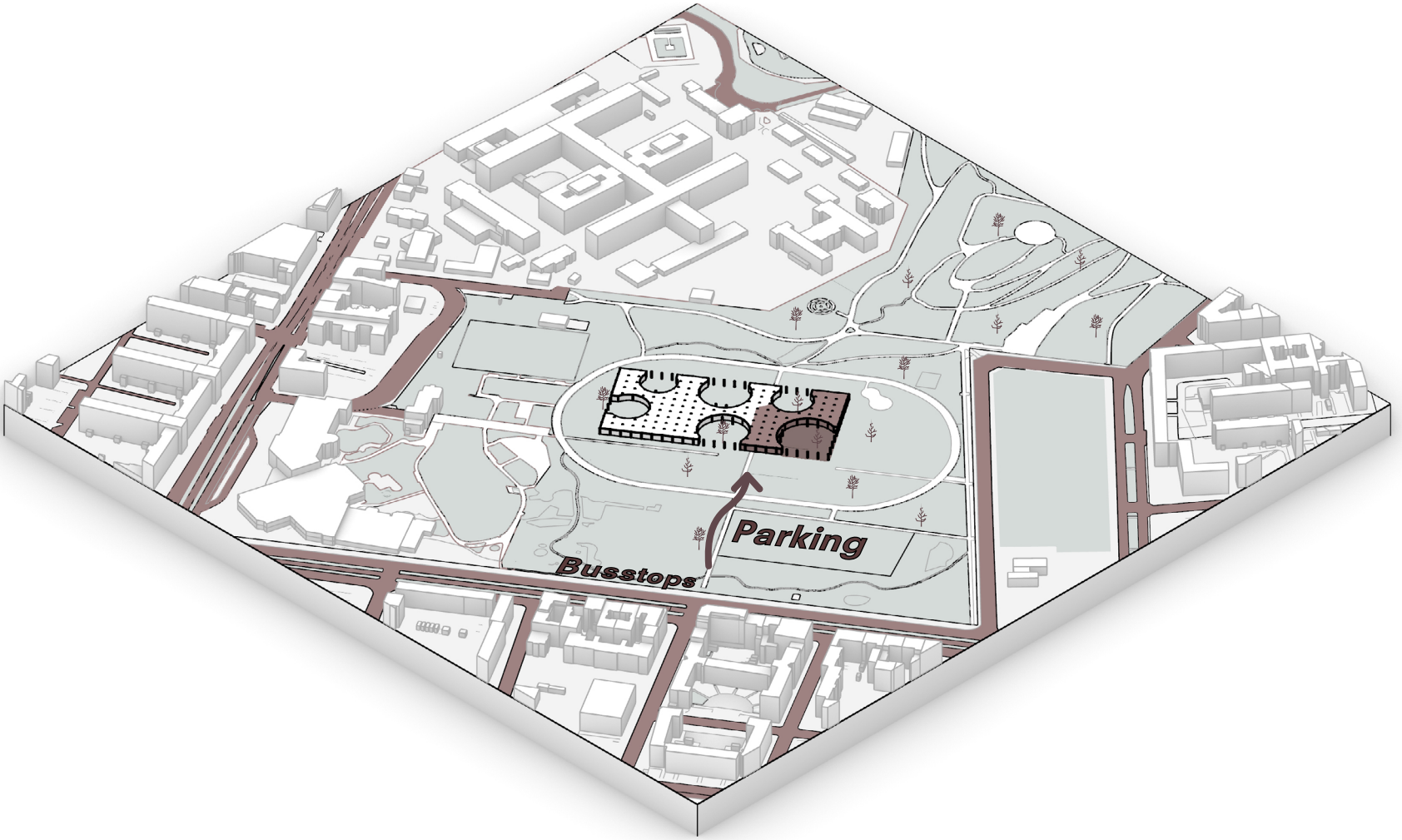
Concept

REVIVE & CONNECT



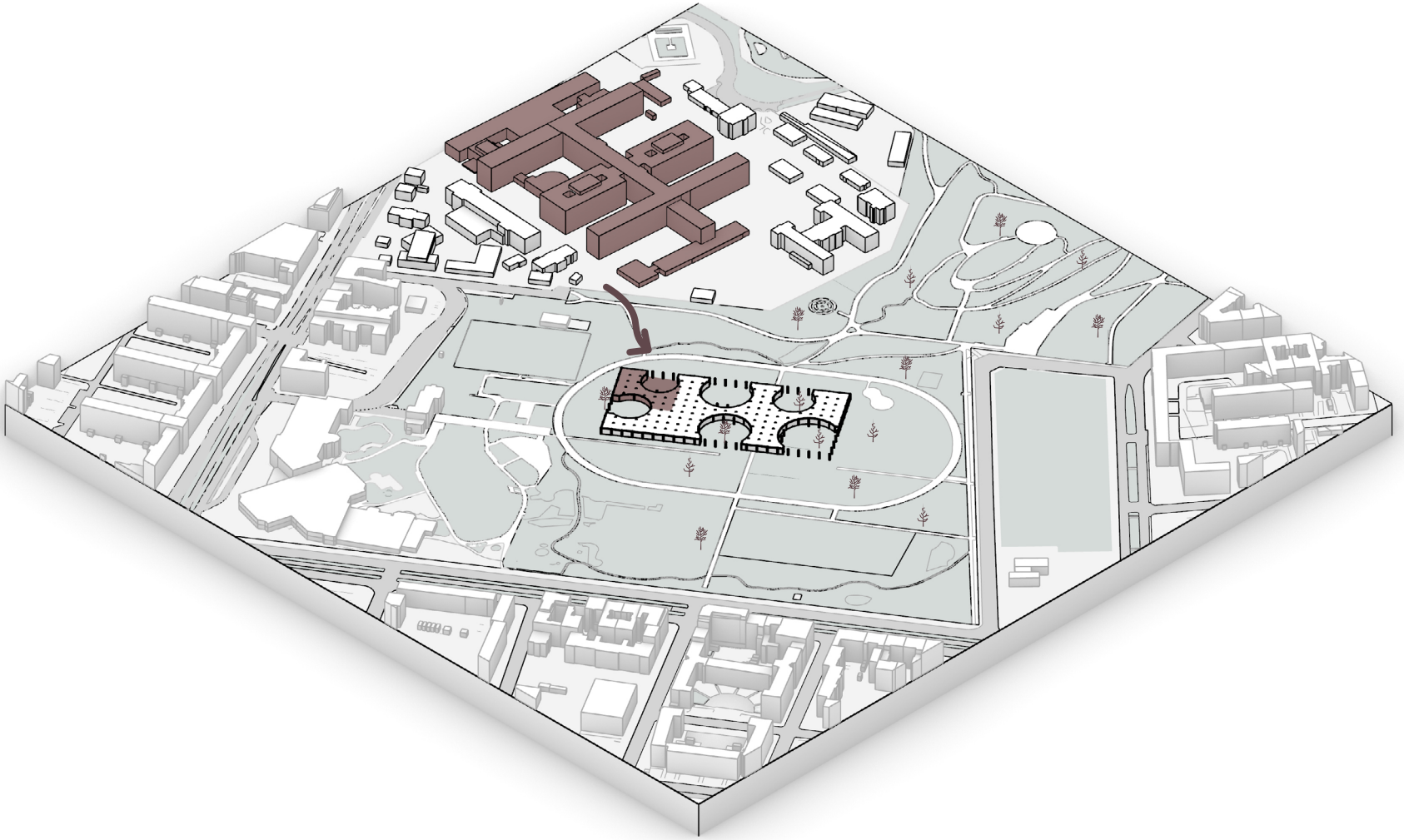
Concept

ACCESS



Concept

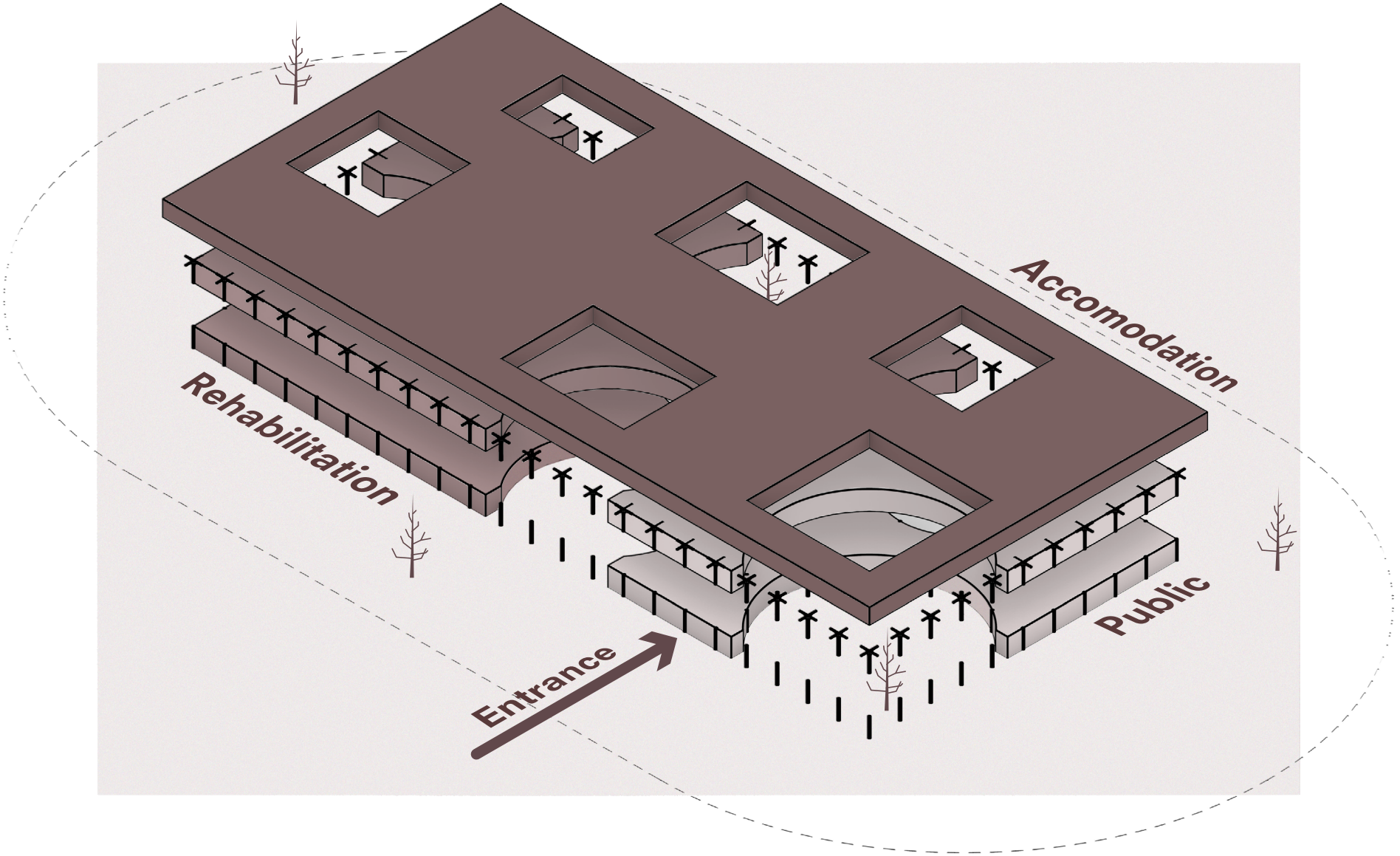
HOSPITAL CONNECTION



Concept

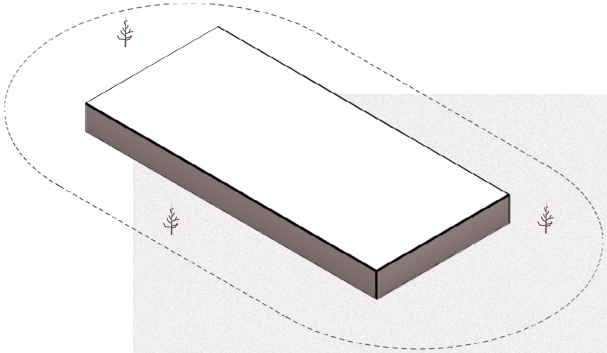
SEPARATION

Public	Semi-shared	Private
Everyone	**Out- & In-patients**	**In-patients**

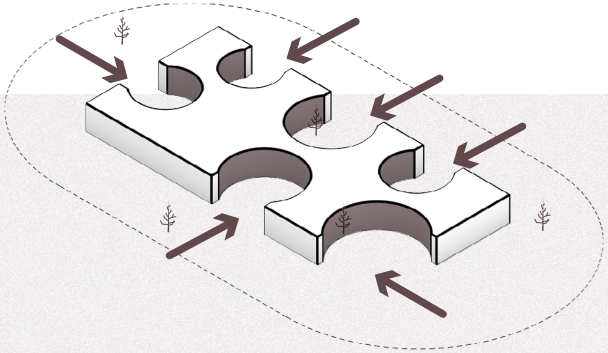


Concept

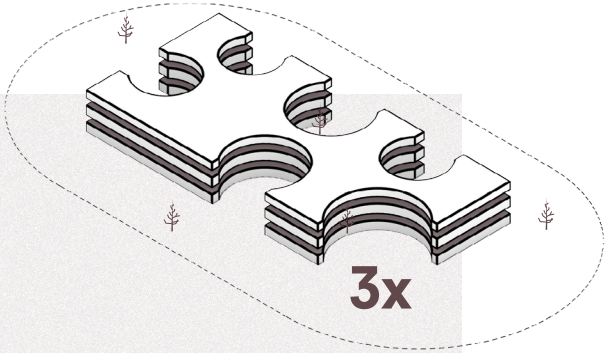
MASSING STEPS



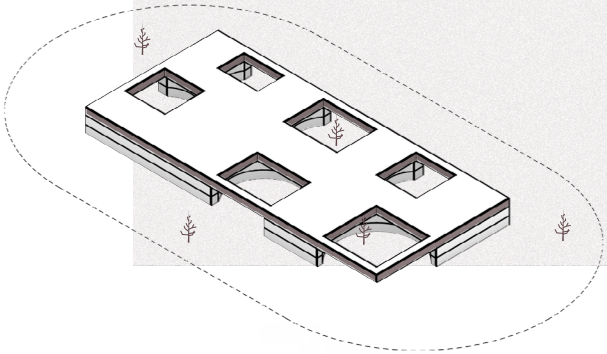
Simple massing



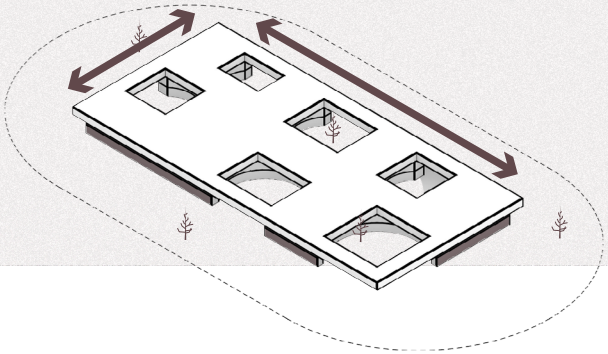
Make porous



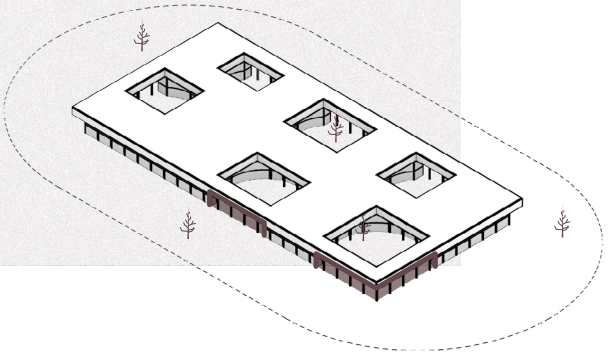
Split into layers



Add rigid rooms



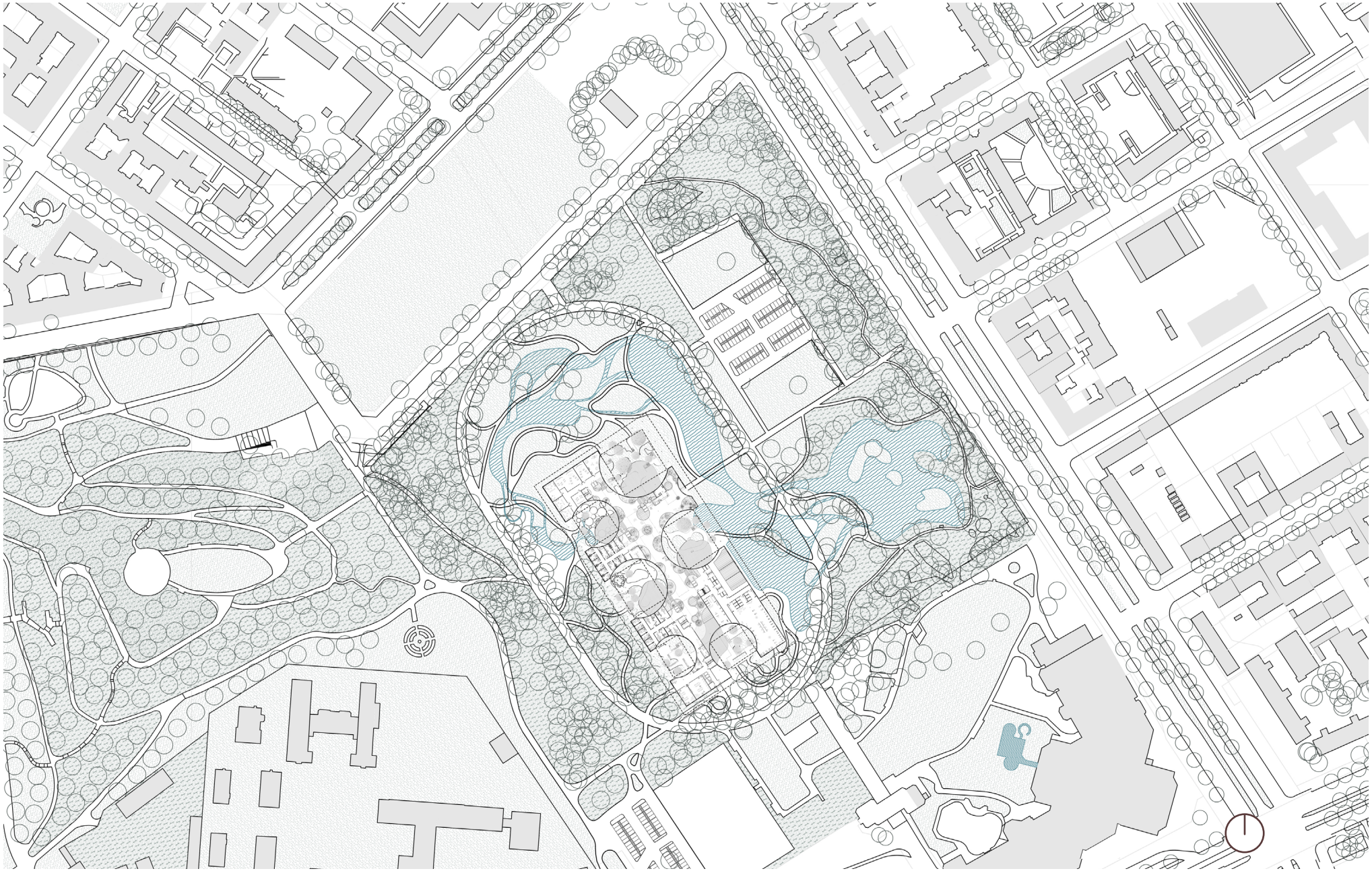
Create overhang



Highlight gardens

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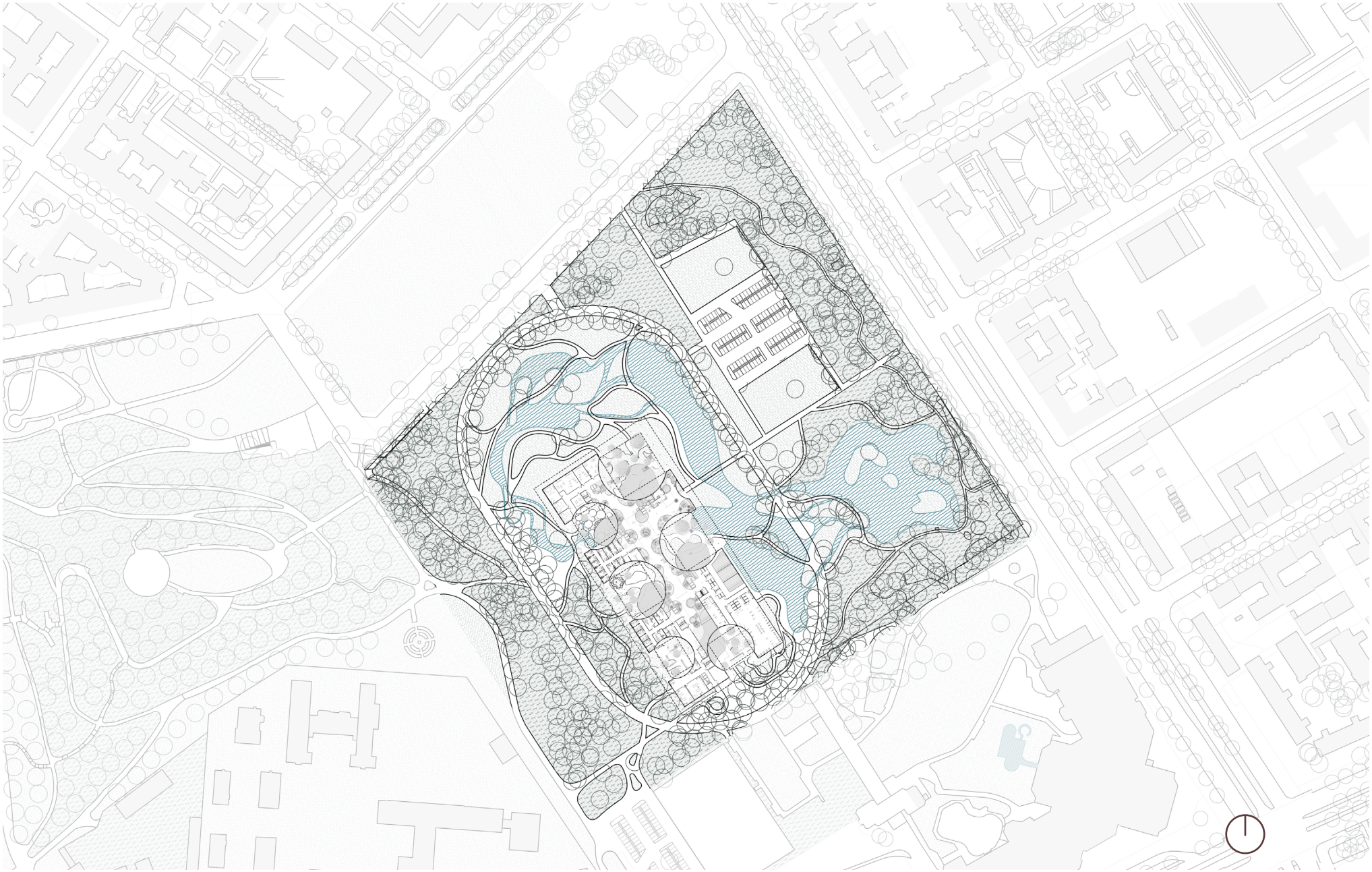
SITE PLAN - 1:1’000



PARK IMPRESSION



URBAN IMPLEMENTATION - 1:1’000



SITE - REVIVING NATURE







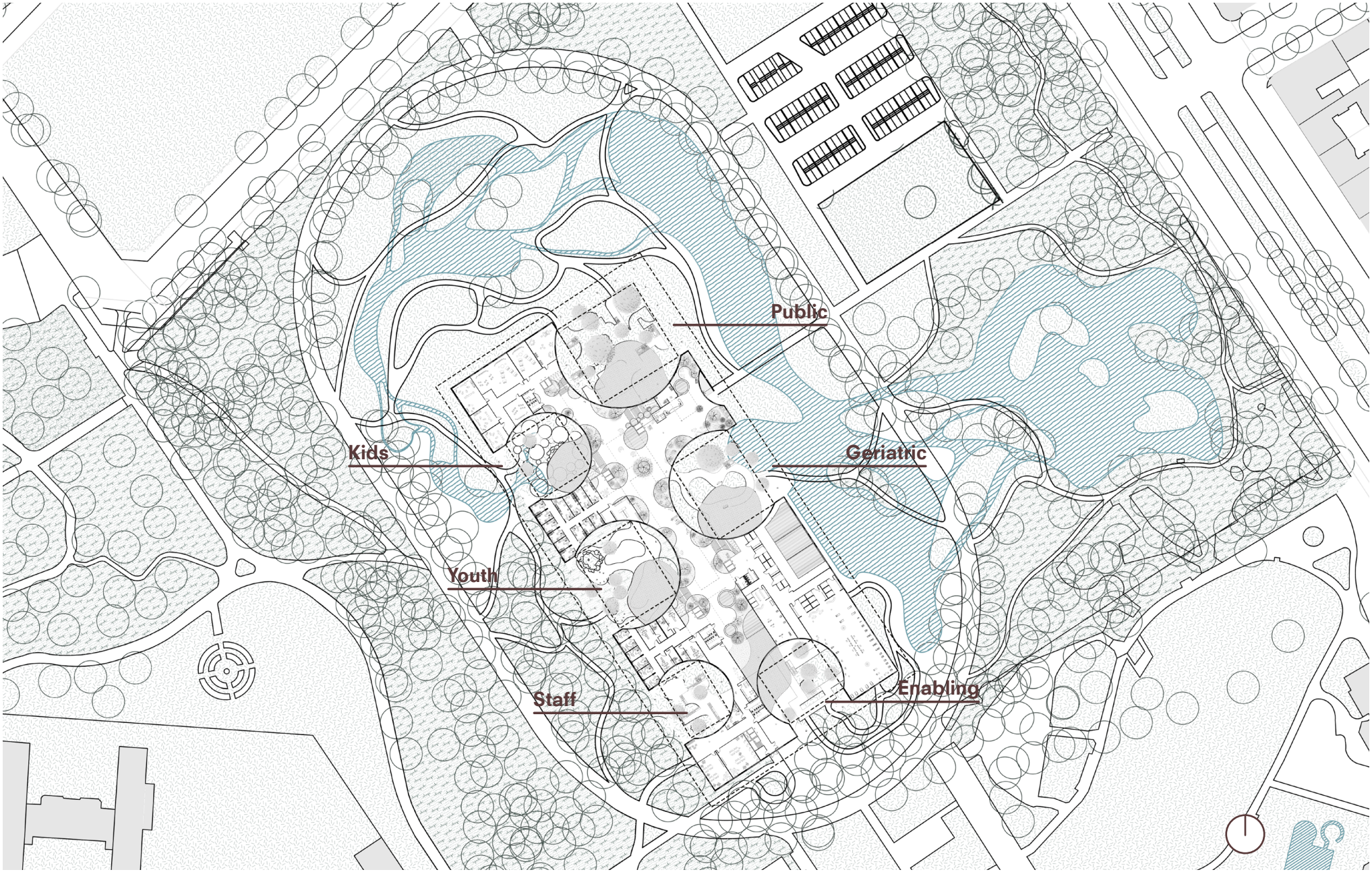


ENTRANCE IMPRESSION



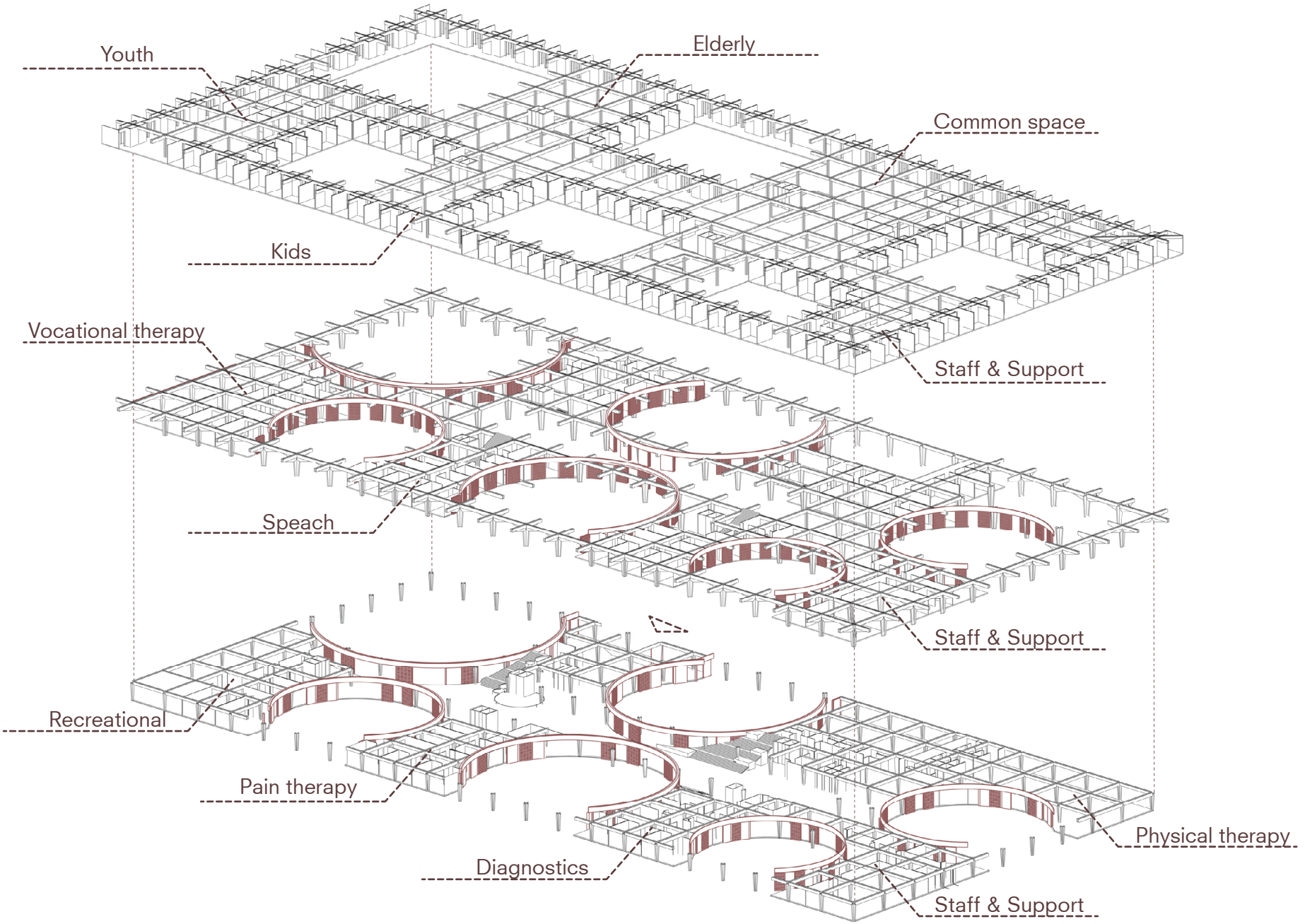
Implementation

HEALING GARDENS



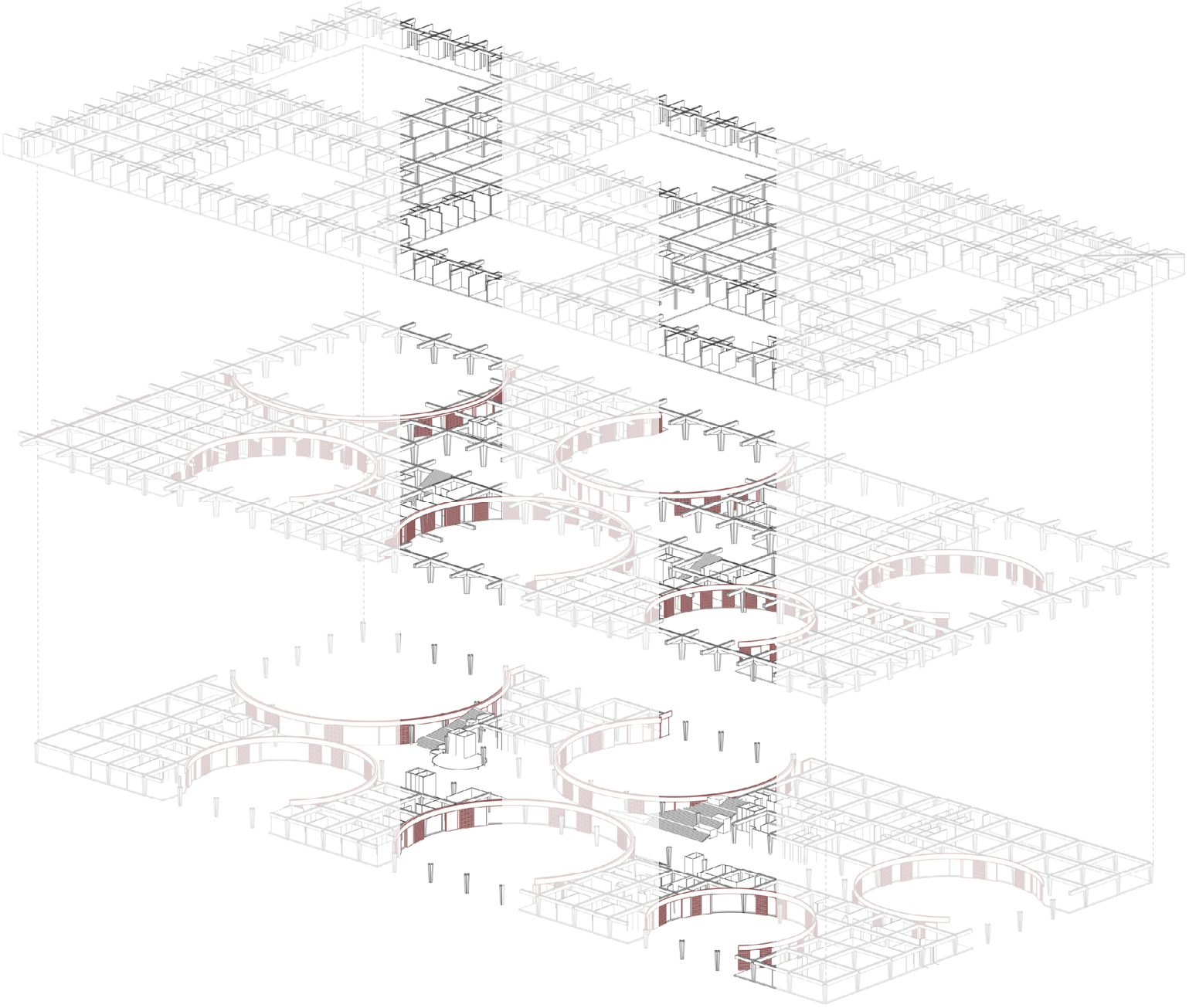
Implementation

DEPARTMENTS



Implementation

VERTICAL CIRCULATION

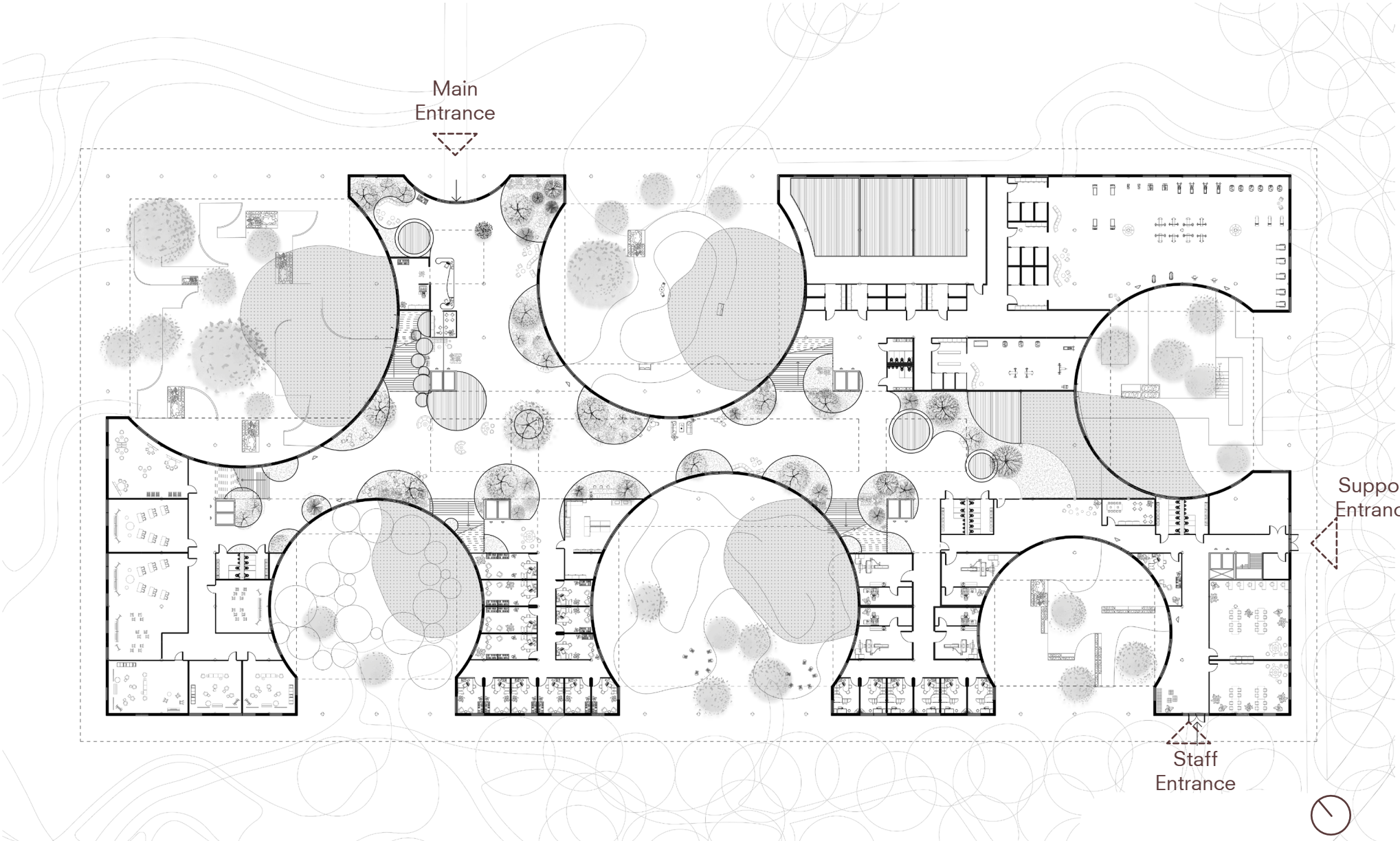


CIRCULATION IMPRESSION

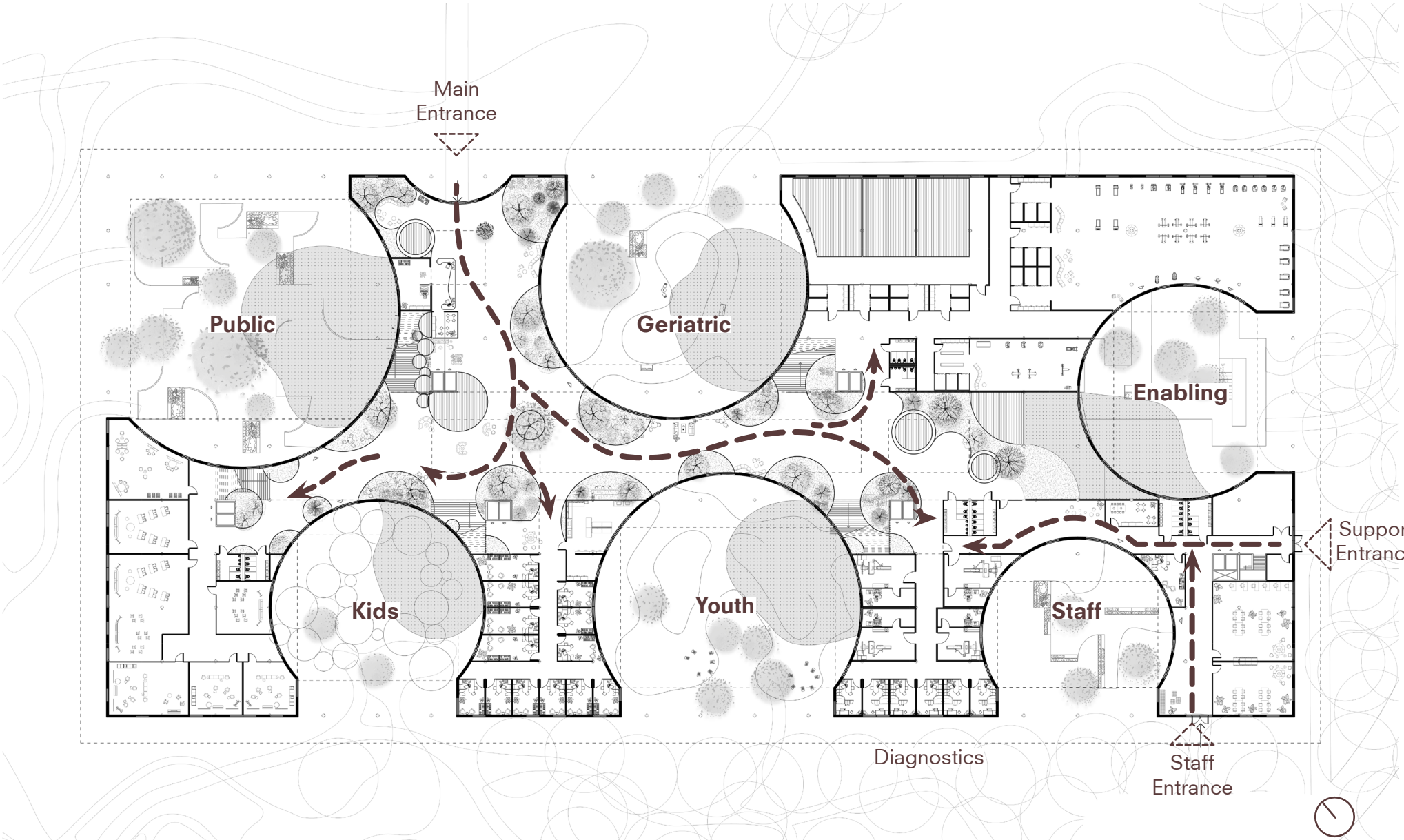


Implementation

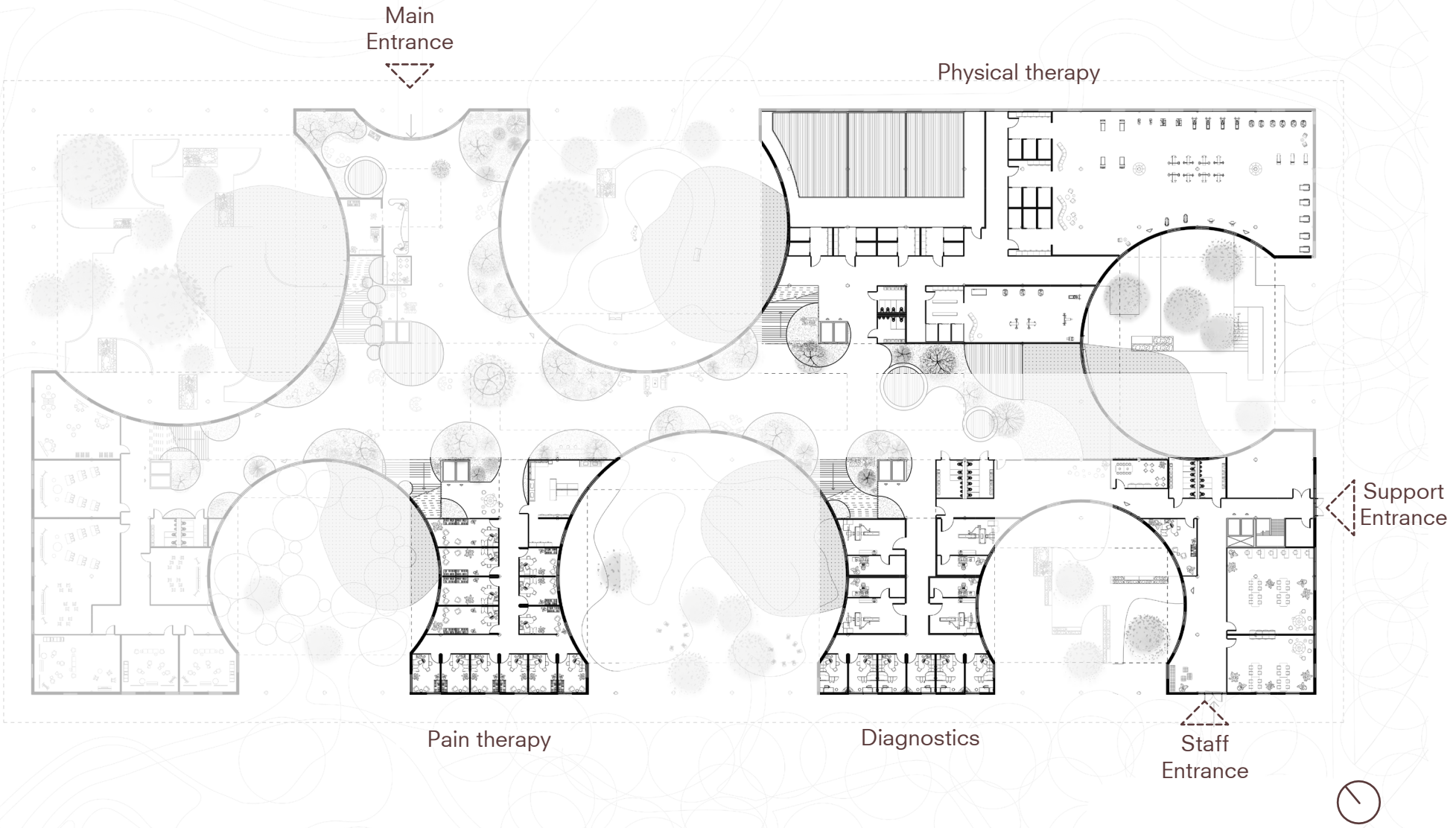
1ST FLOOR



1ST FLOOR - CIRCULATION

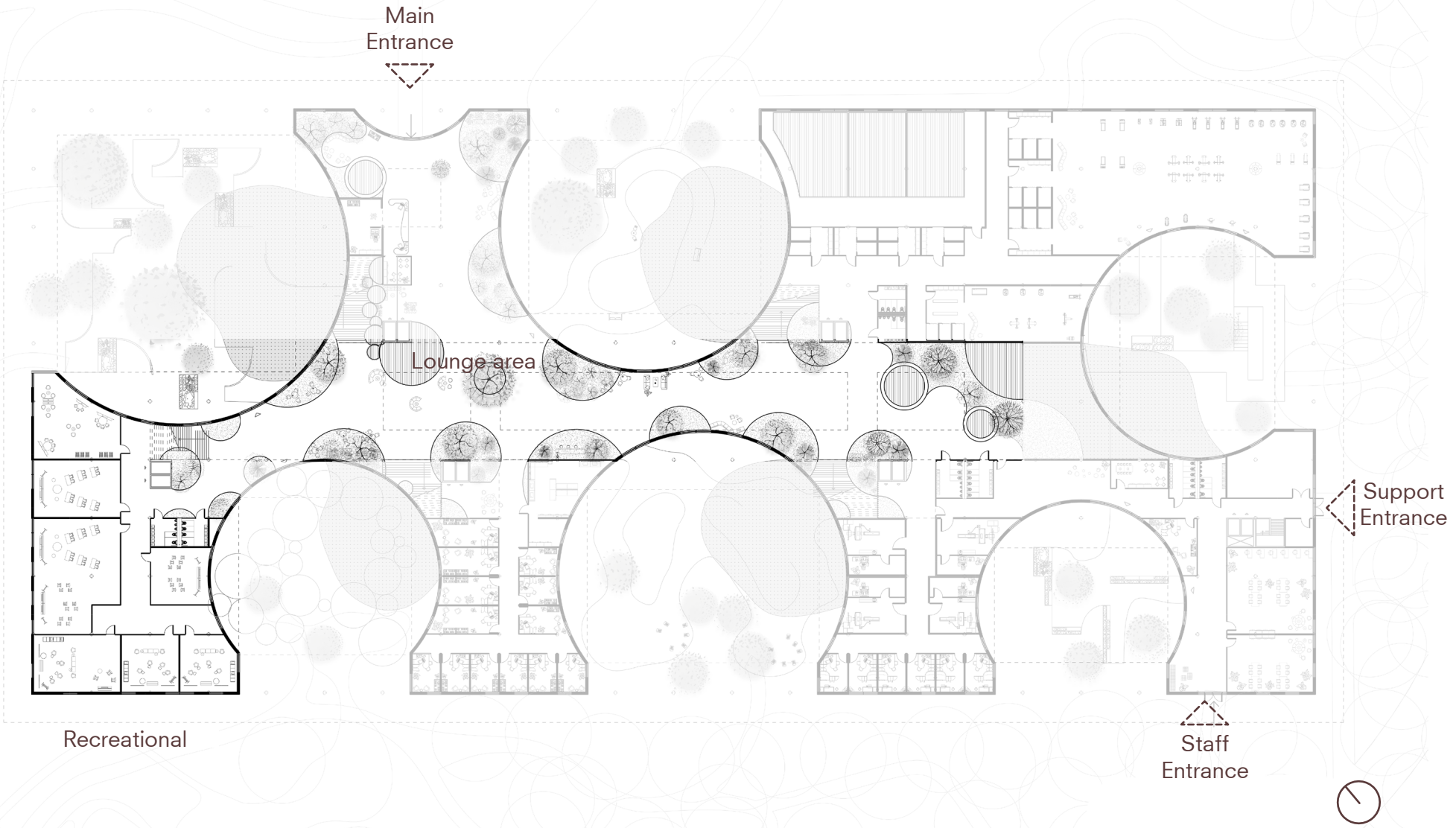


1ST FLOOR - PROGRAM



Implementation

1ST FLOOR - INTERNAL STREET

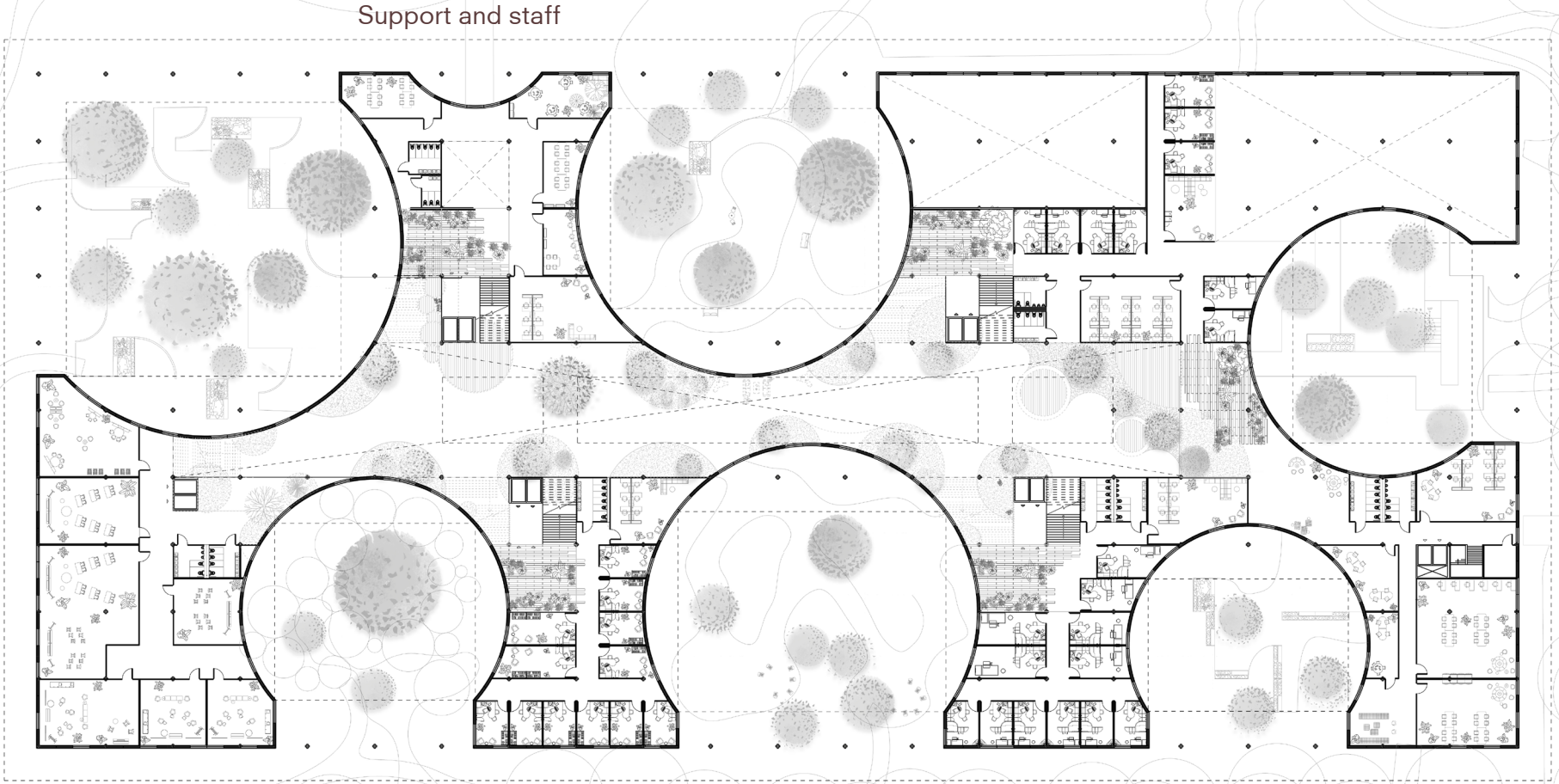


INTERNAL STREET IMPRESSION



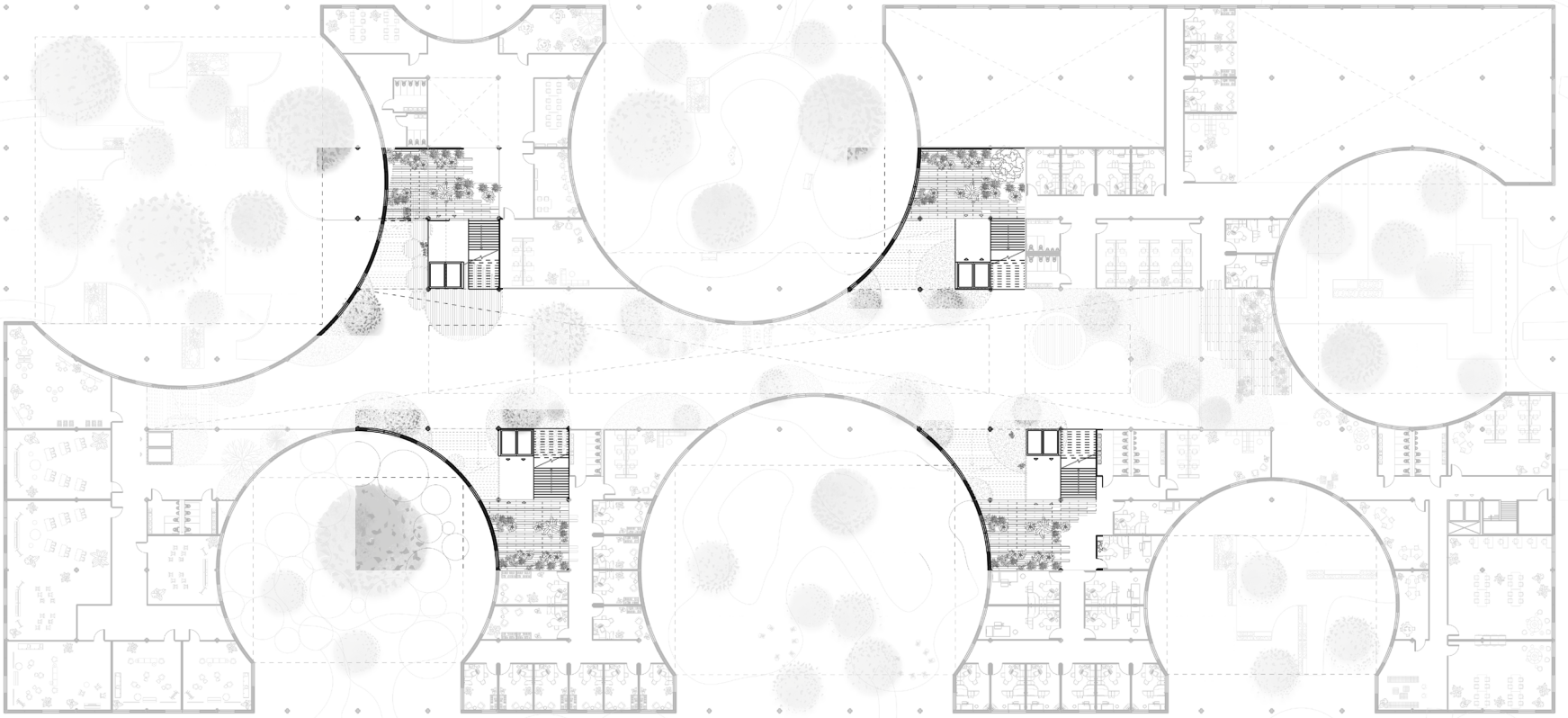
Implementation

2ND FLOOR



Implementation

2ND FLOOR - CIRCULATION

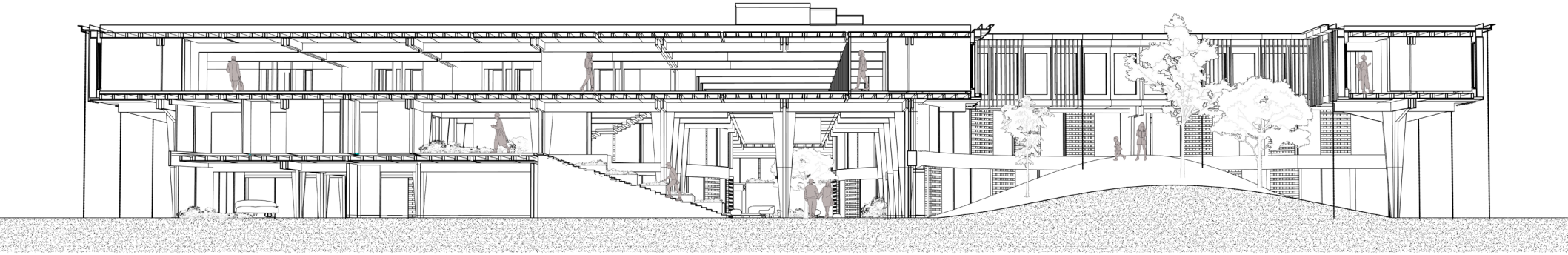


CIRCULATION IMPRESSION



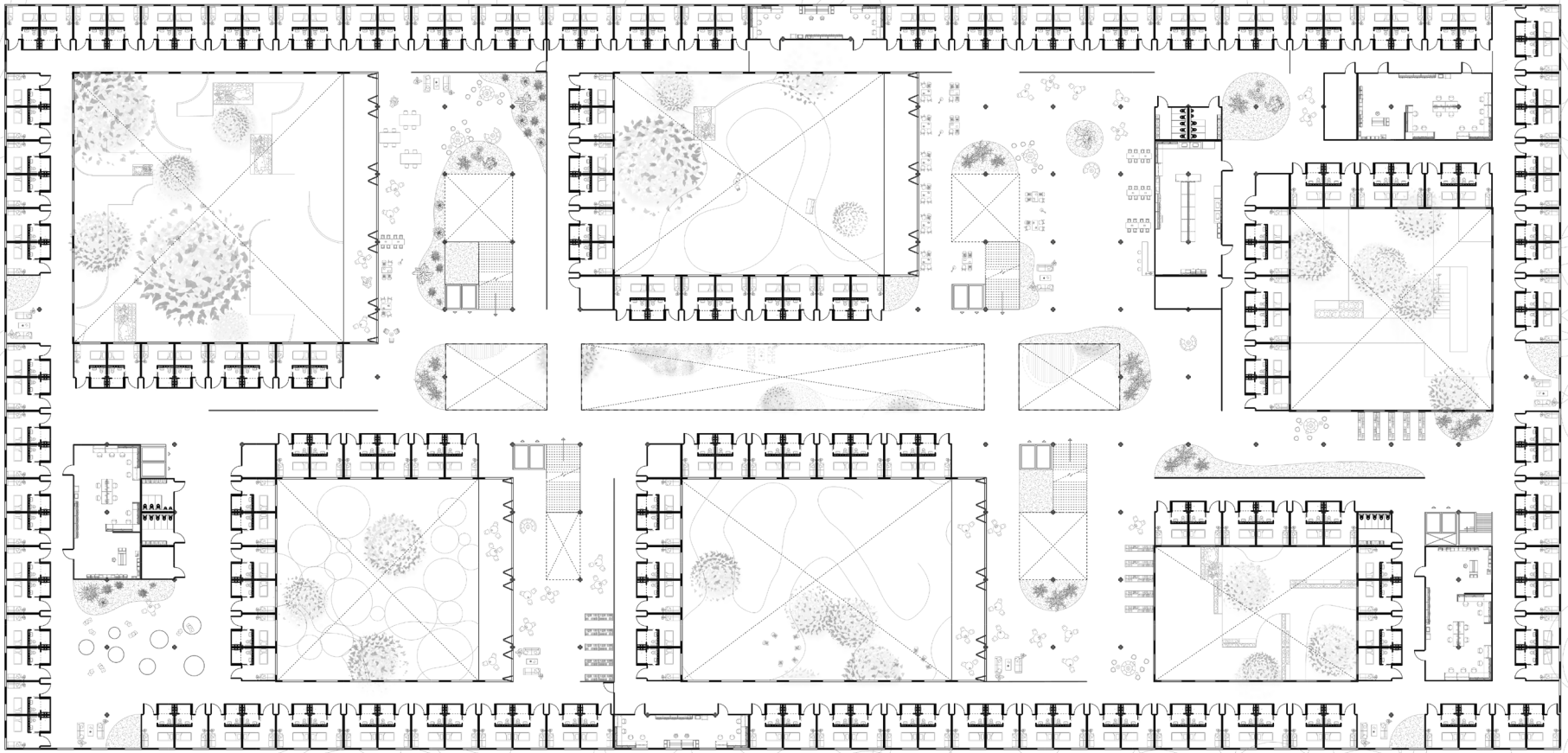
Implementation

SECTION

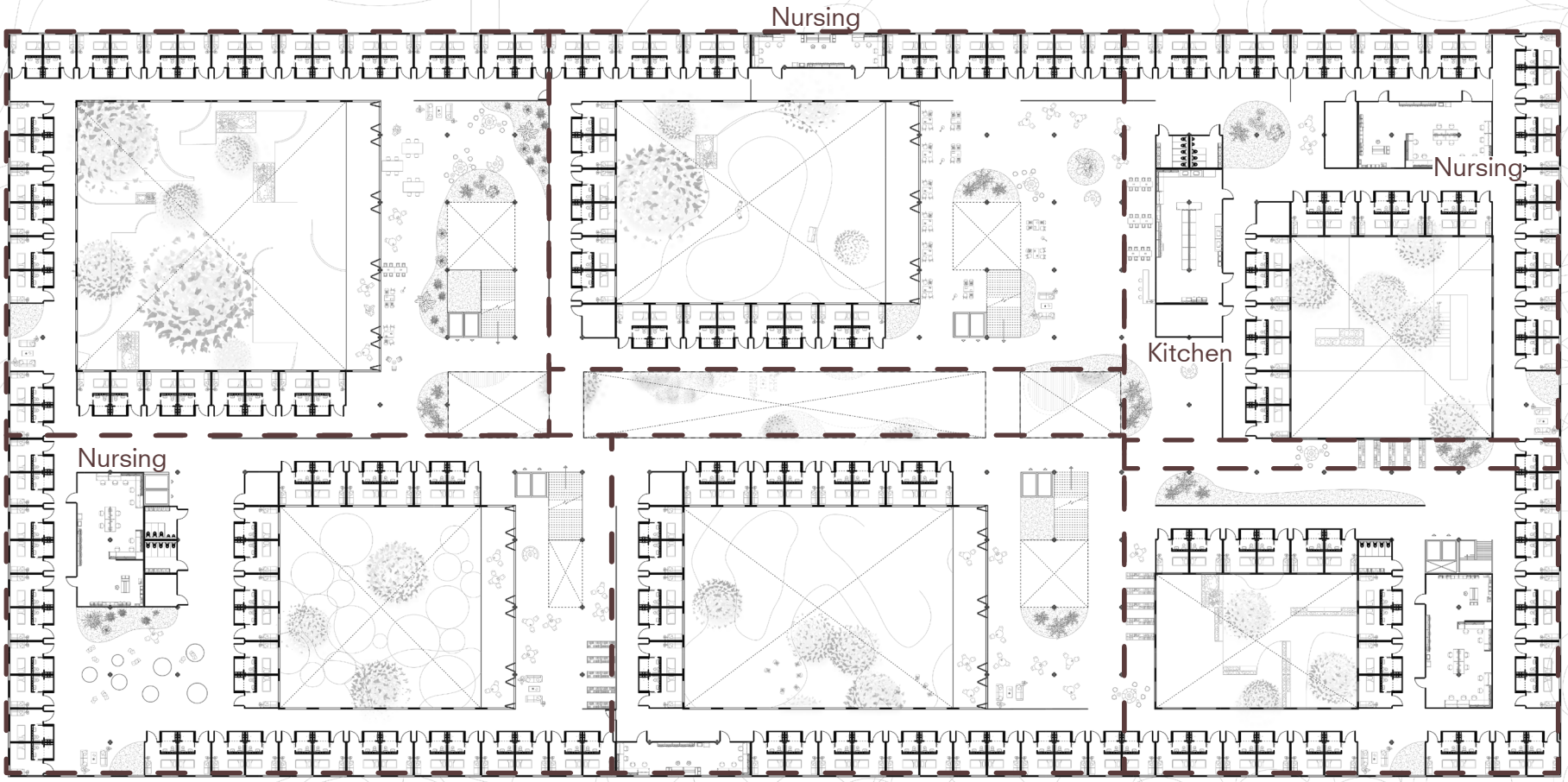


Implementation

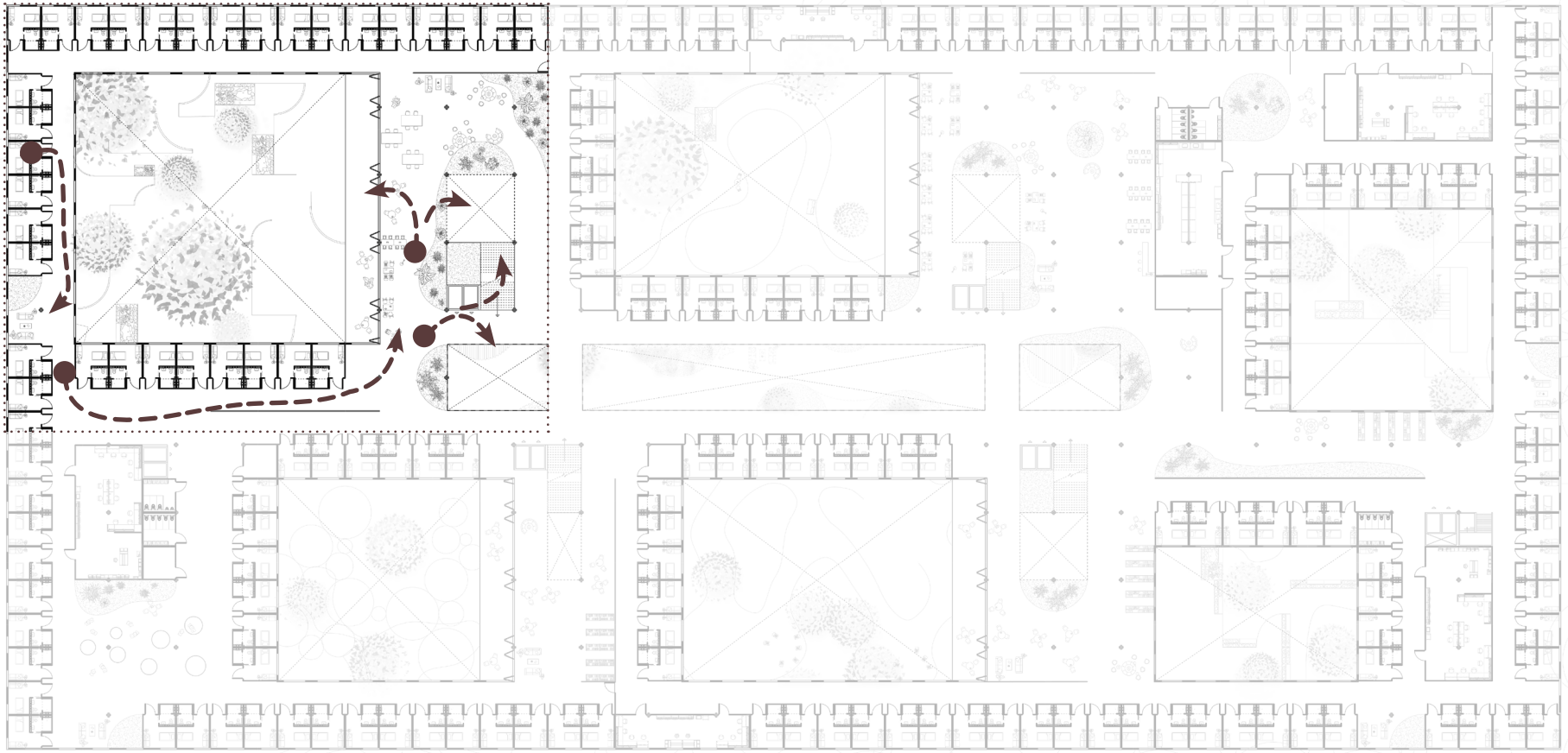
3RD FLOOR



3RD FLOOR - DEPARTMENTS



3RD FLOOR - ROUTING (REACTIVATE)

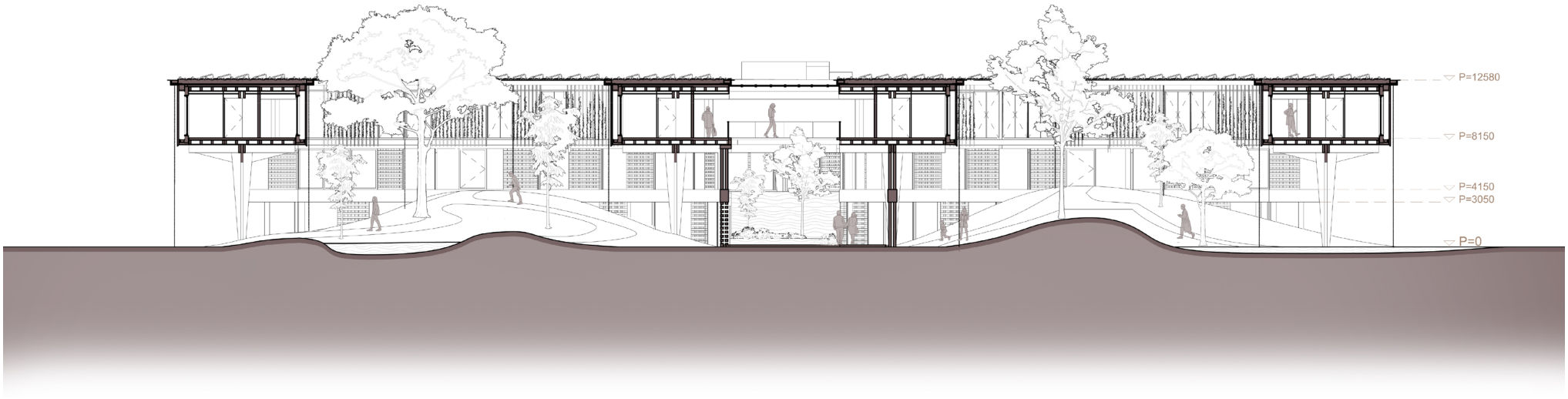


COMMON SPACE IMPRESSION



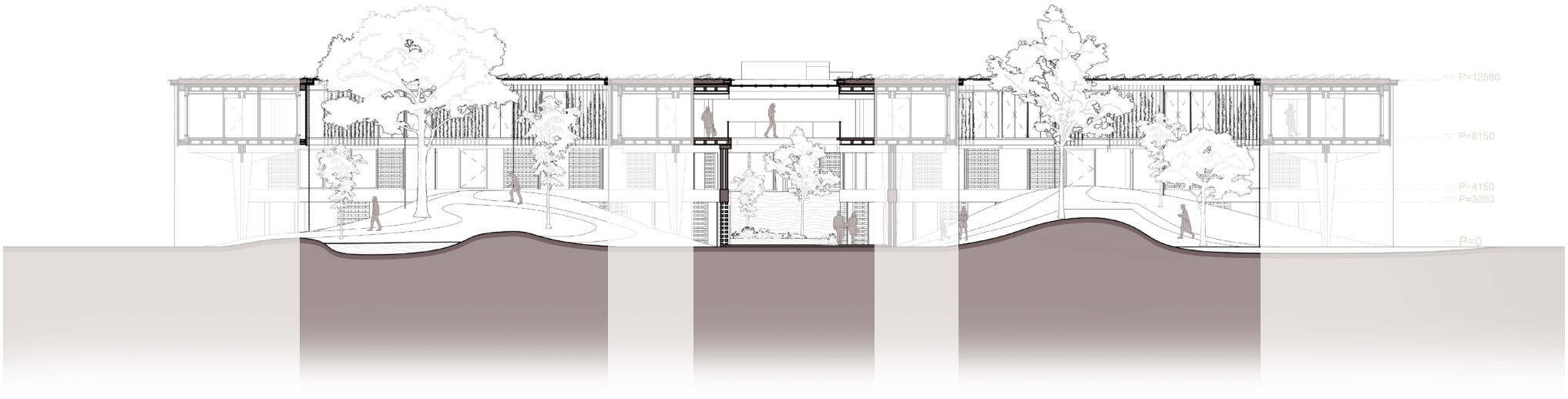
Implementation

SECTION



Implementation

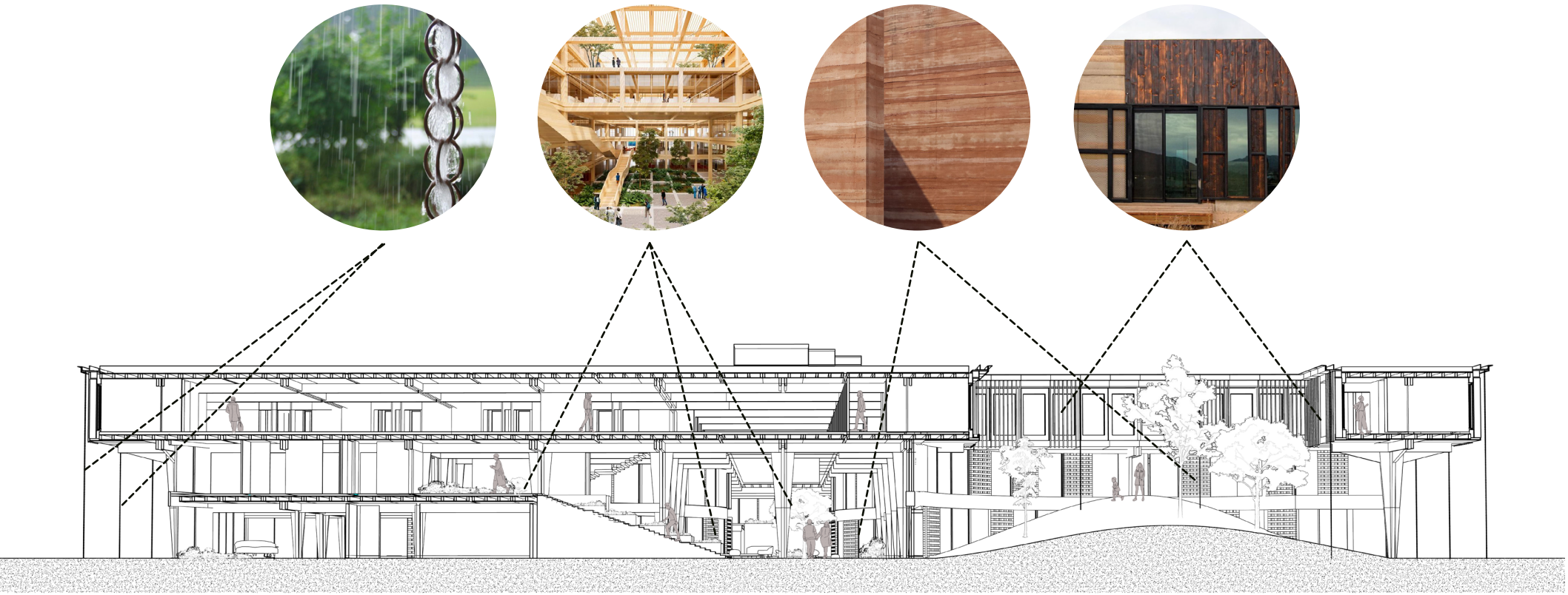
VERTICAL OPENNESS



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MATERIALISATION

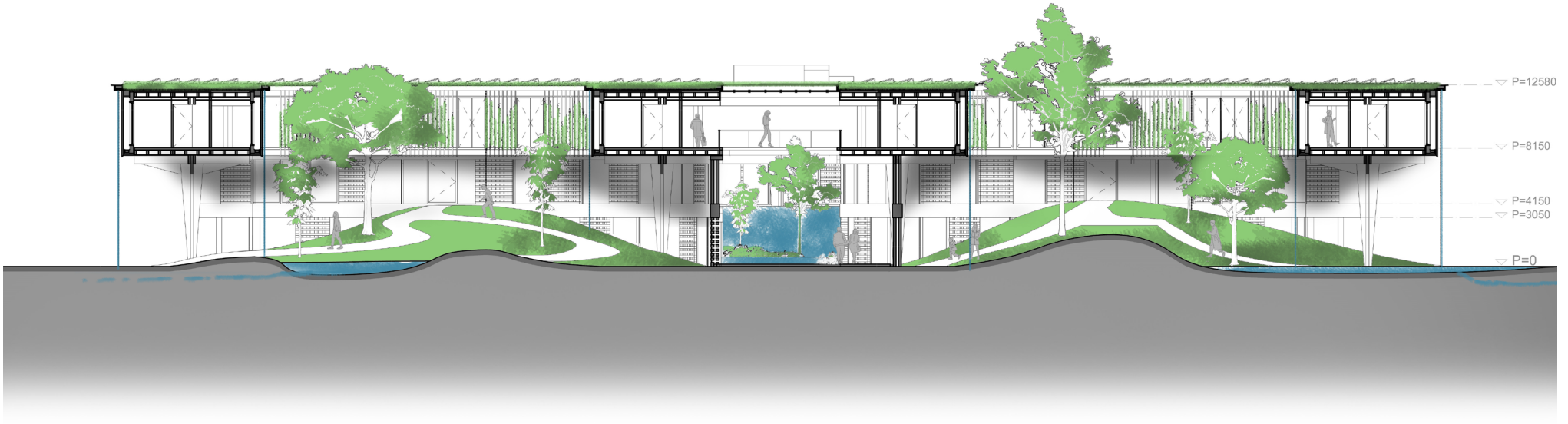


ENTRANCE IMPRESSION



Development

PASSIVE CLIMATE PRINCIPLE



Development

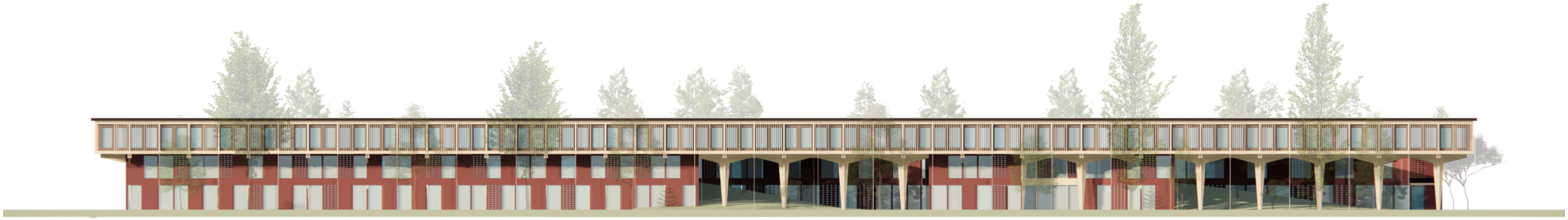
ELEVATION NORTH & SOUTH

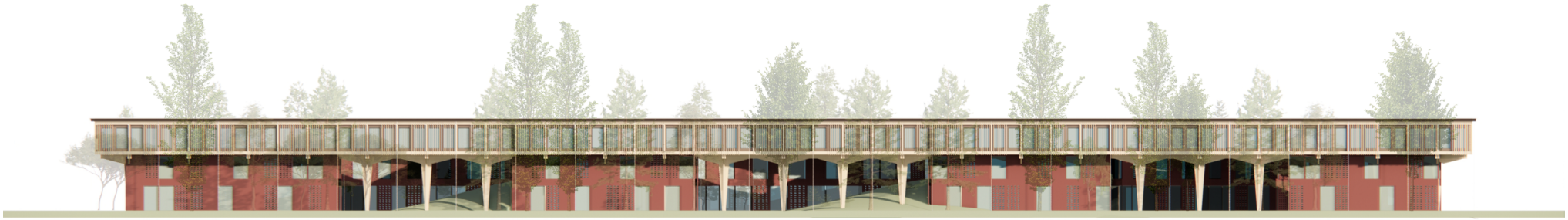




Development

ELEVATION NORTH & SOUTH

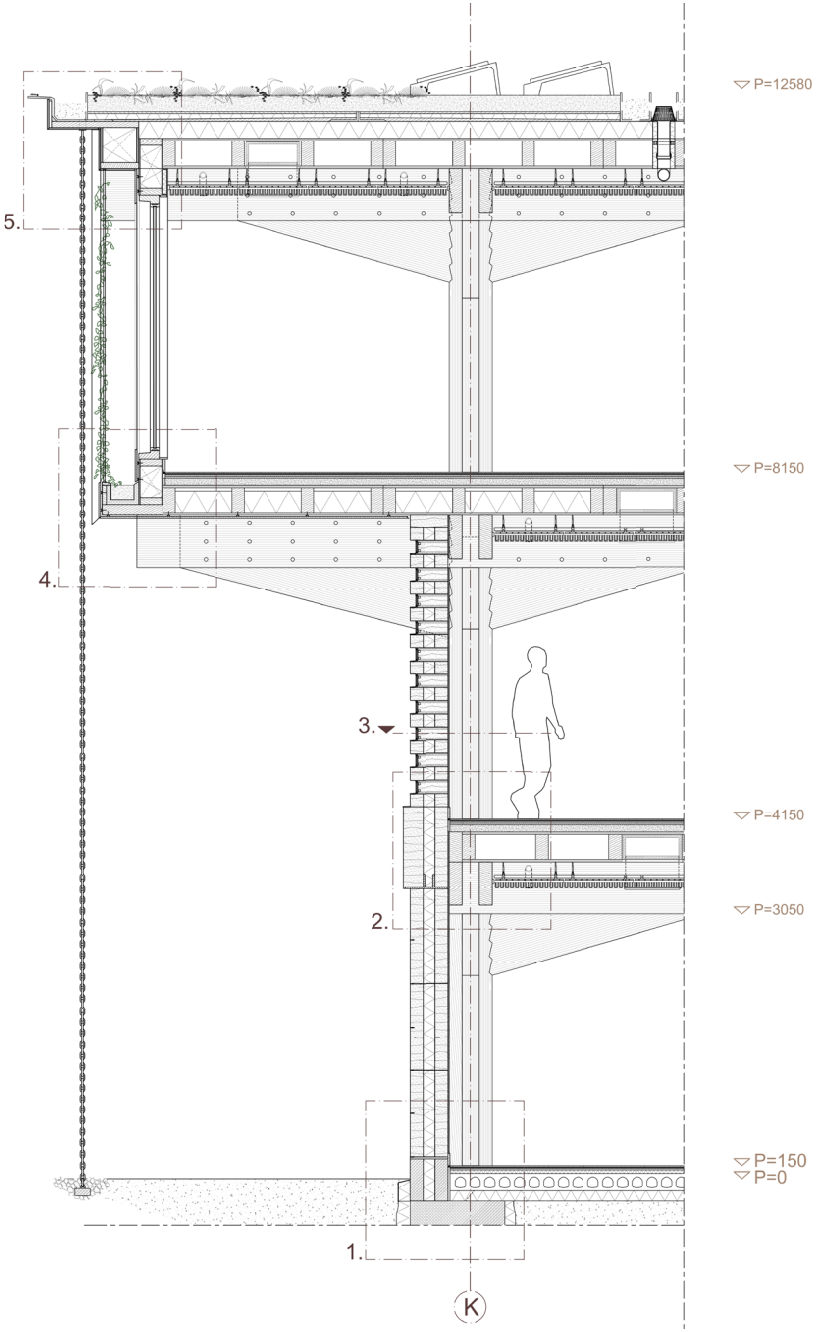




Development

FACADE SECTION

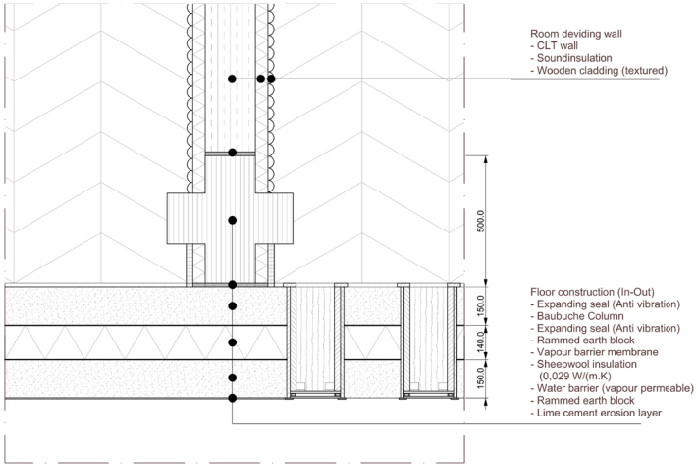




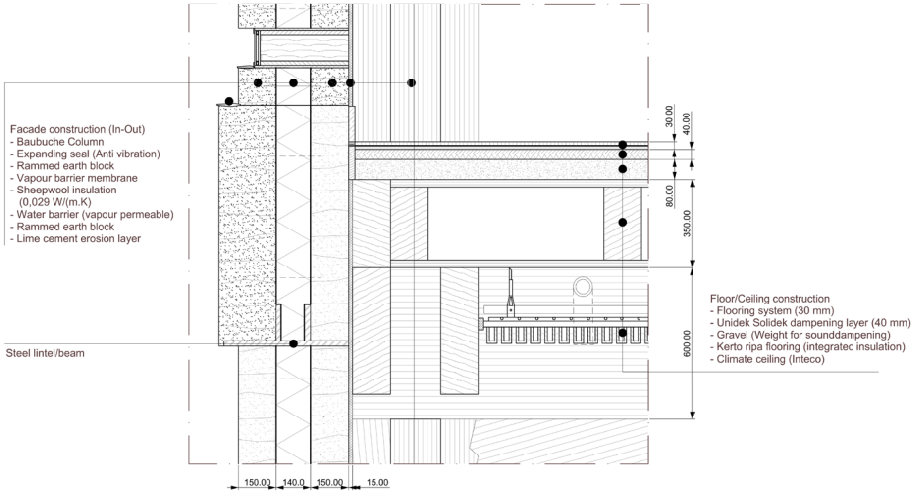
CONNECTION DETAIL



3. Horizontal facade connection



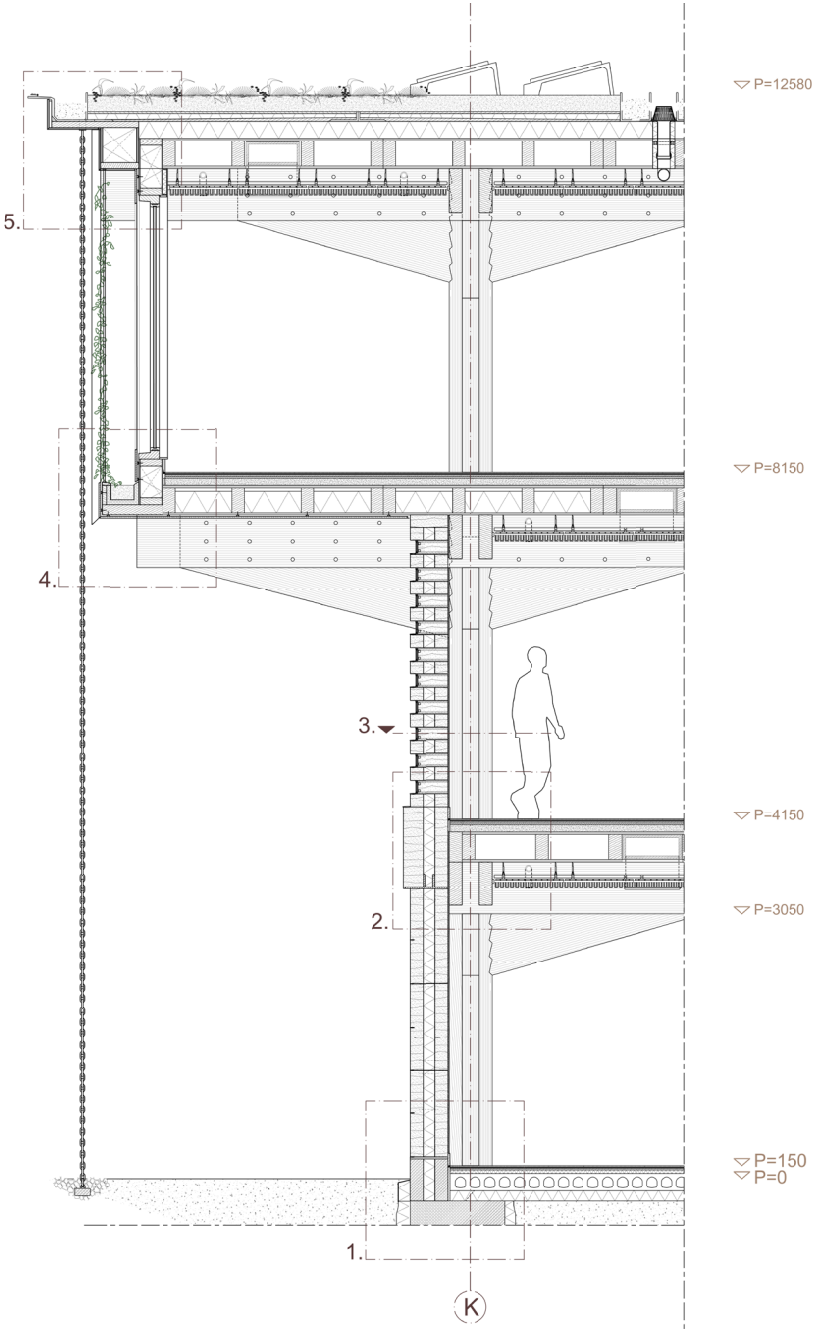
2. Vertical facade connection



Development

FACADE SECTION



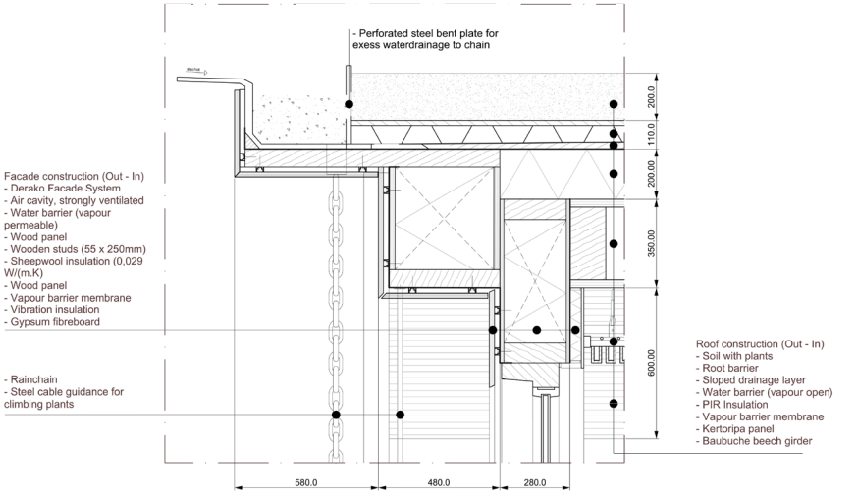


Development

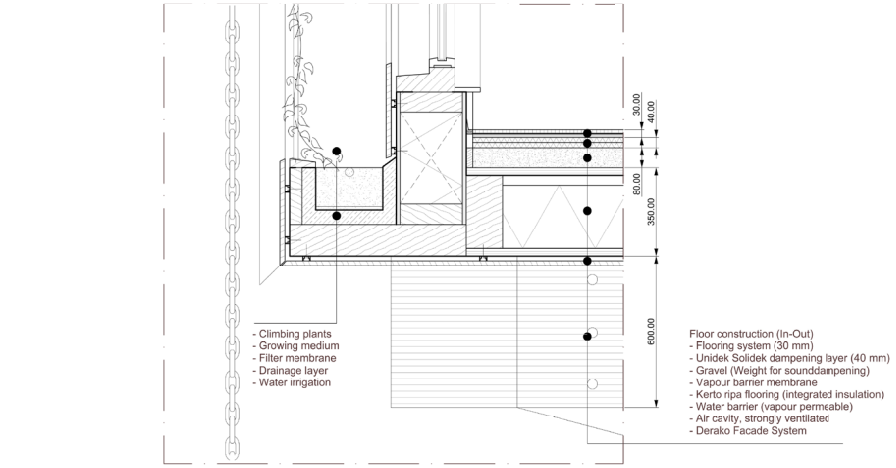
EDGE DETAILS



5. Roof Connection

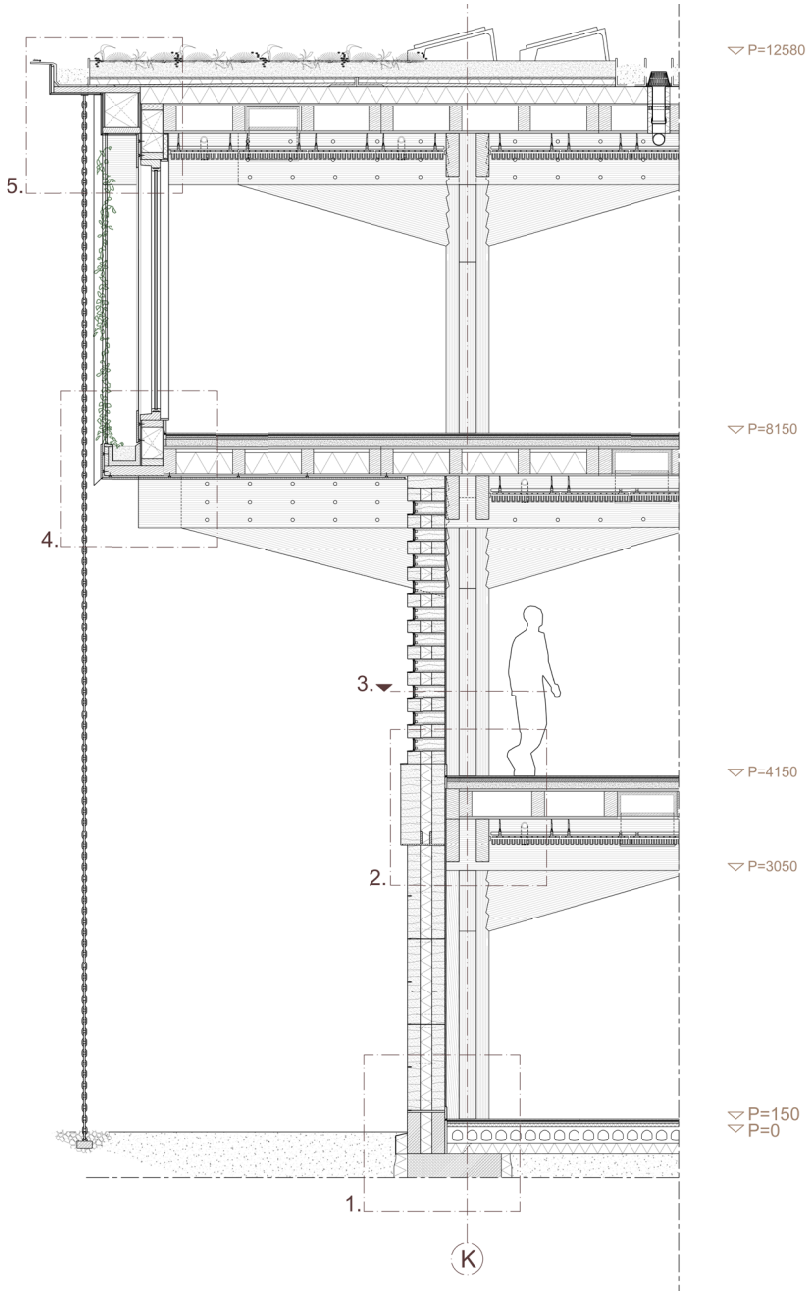


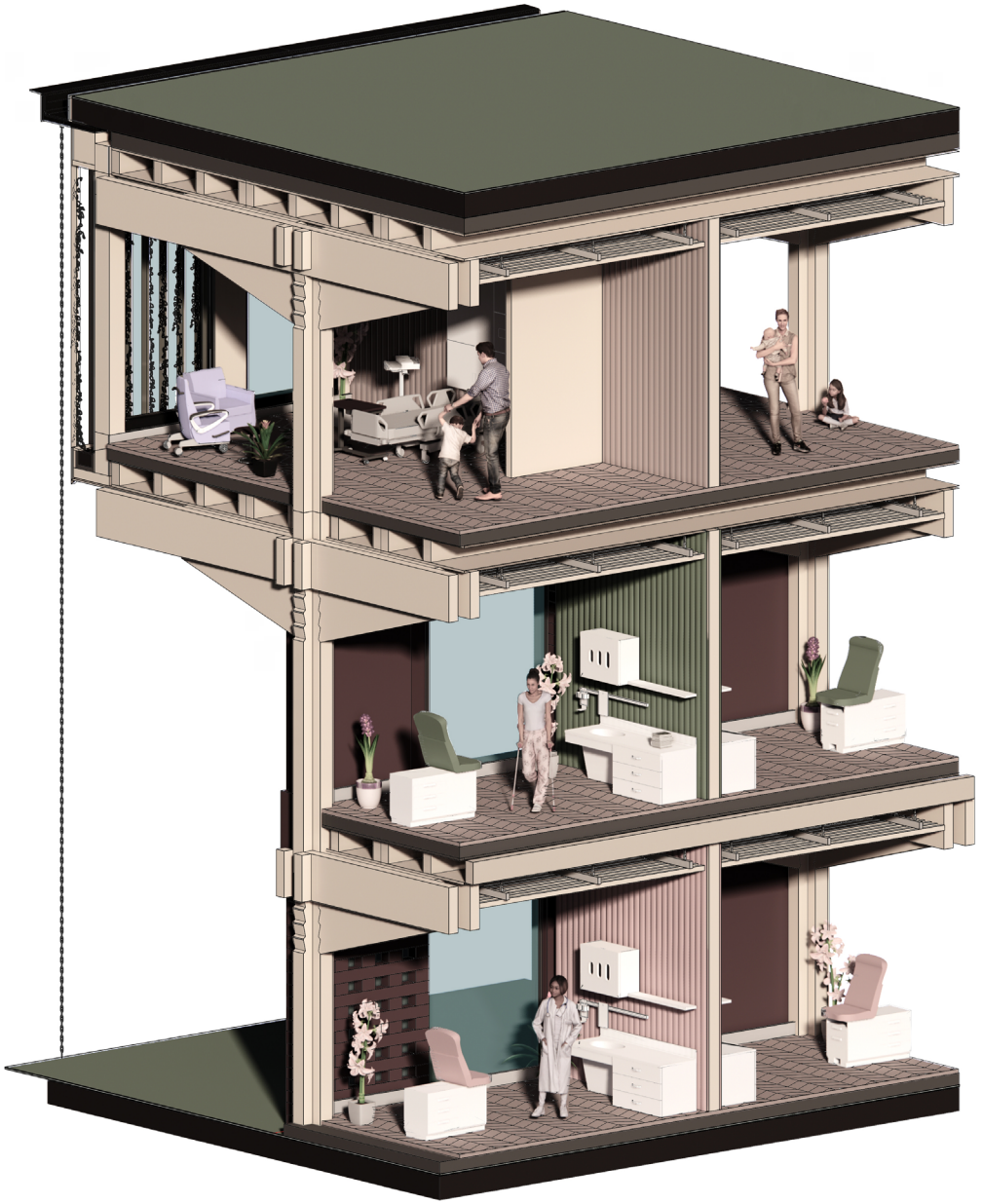
4. Cantilever Edge Connection



Development

INTERIOR SECTION





IMPRESSION



COMPARISON





Introduction
Research
Design Brief
Concept
Implementation
Development
Conclusion

DESIGN AMBITIONS

"HOW TO DESIGN A **HEALTH PROMOTING**, INPATIENT REHABILITATION CENTRE FOR THE RECOVERING PATIENT?"

DESIGN AMBITIONS

Reactivating



Stimulating senses



Nature integration



Healing garden

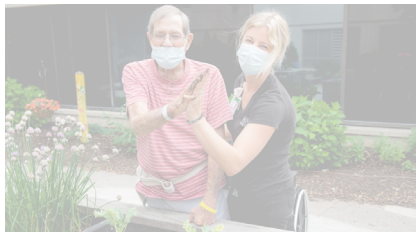




Conclusion

DESIGN AMBITIONS

Reactivating



Stimulating senses



Nature integration



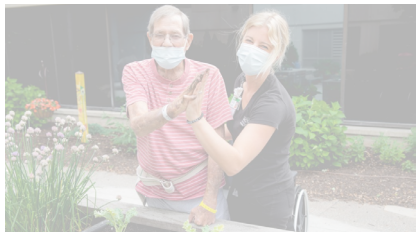
Healing garden





DESIGN AMBITIONS

Reactivating



Stimulating senses



Nature integration



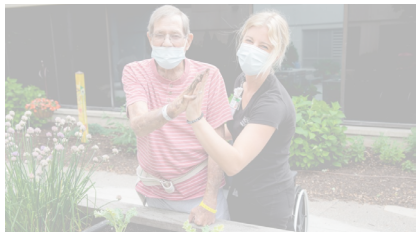
Healing garden





DESIGN AMBITIONS

Reactivating



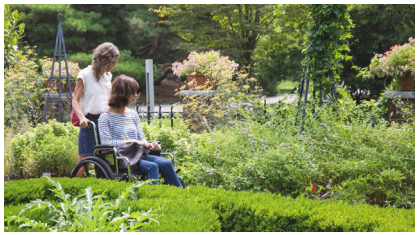
Stimulating senses



Nature integration



Healing garden





THANK YOU!

RENDERS

PARK IMPRESSION



ENTRANCE IMPRESSION



MAIN STREET IMPRESSION



CIRCULATION IMPRESSION



VOID IMPRESSION



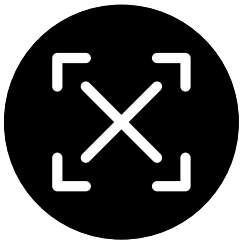
COMMON SPACE IMPRESSION



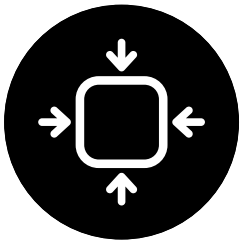
EXTRA

HEALING GARDEN - TAILORED

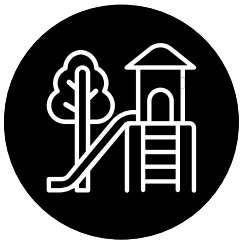
Paediatric | Young | Geriatric | Staff | Citizens



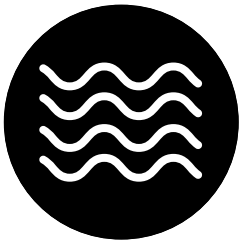
Closed off



Small scale



Separated play



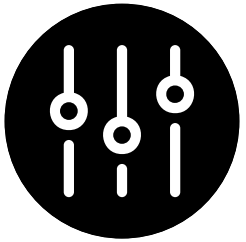
Interactive





HEALING GARDEN - TAILORED

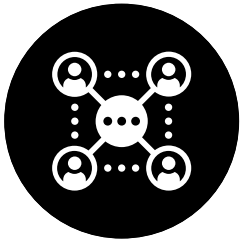
Paediatric | **Young** | Geriatric | Staff | Citizens



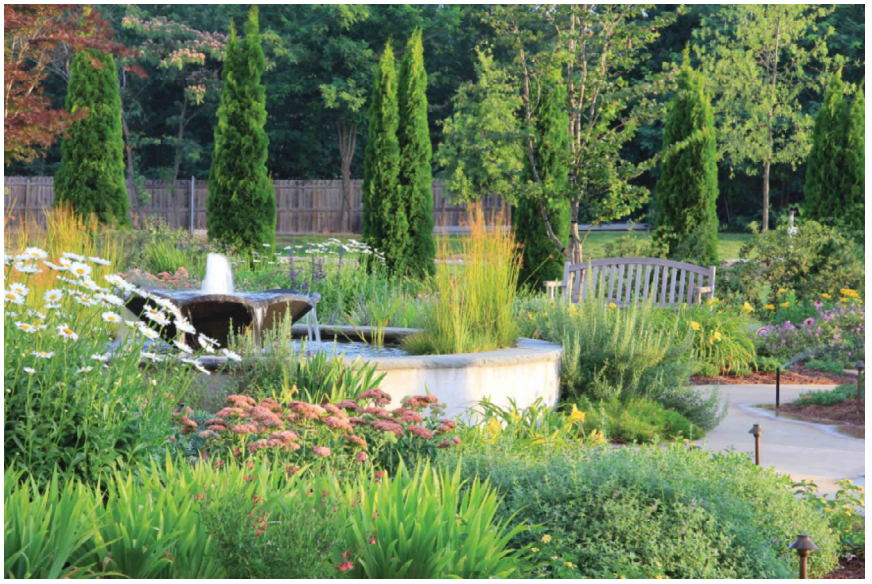
Regain control



Self conscious



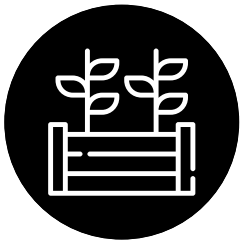
Social support



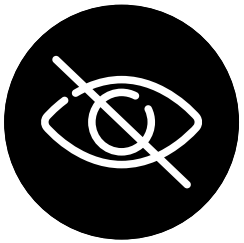


HEALING GARDEN - TAILORED

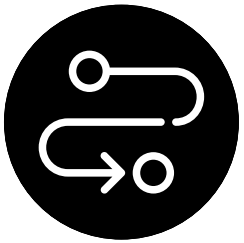
Paediatric | Young | **Geriatric** | Staff | Citizens



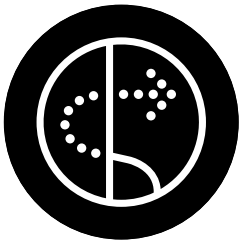
Raised beds



Privacy



Clear layout



Entry transition





HEALING GARDEN - TAILORED

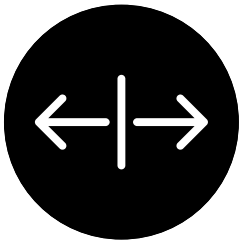
Paediatric | Young | Geriatric | **Staff** | **Citizens**



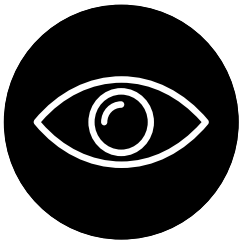
Near breakroom



No patient access



Separated



Sight from indoors





BIOPHILIC DESIGN - THERAPEUTIC GARDEN

Sense of Control

Accessible
Always same floor and accessible from main spaces!

Social support
Allowing for a variety of interaction

Physical movement
Provide varying lenght exploring incentives

Natural distractions
At least ratio of 30% - 70% pavement to nature





BIOPHILIC DESIGN - ENABLING GARDEN

Therapy potential

Physical;
Weeding, watering, and repotting plants

Physical;
Walking on a variety of surfaces and grades

Cognitive;
Picking, holding and releasing different plants

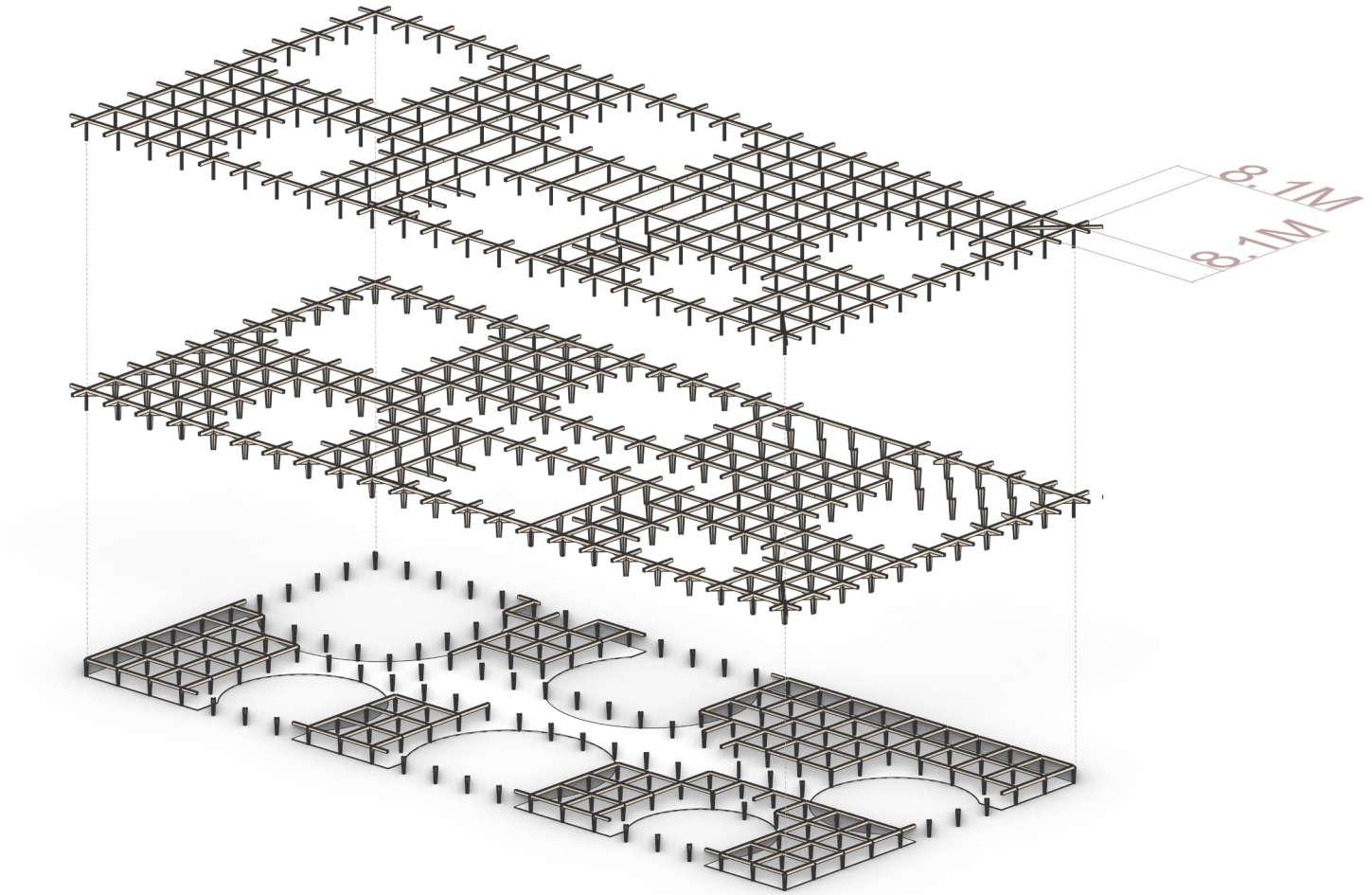
Cognitive;
Scanning for plants, describing and comparing them





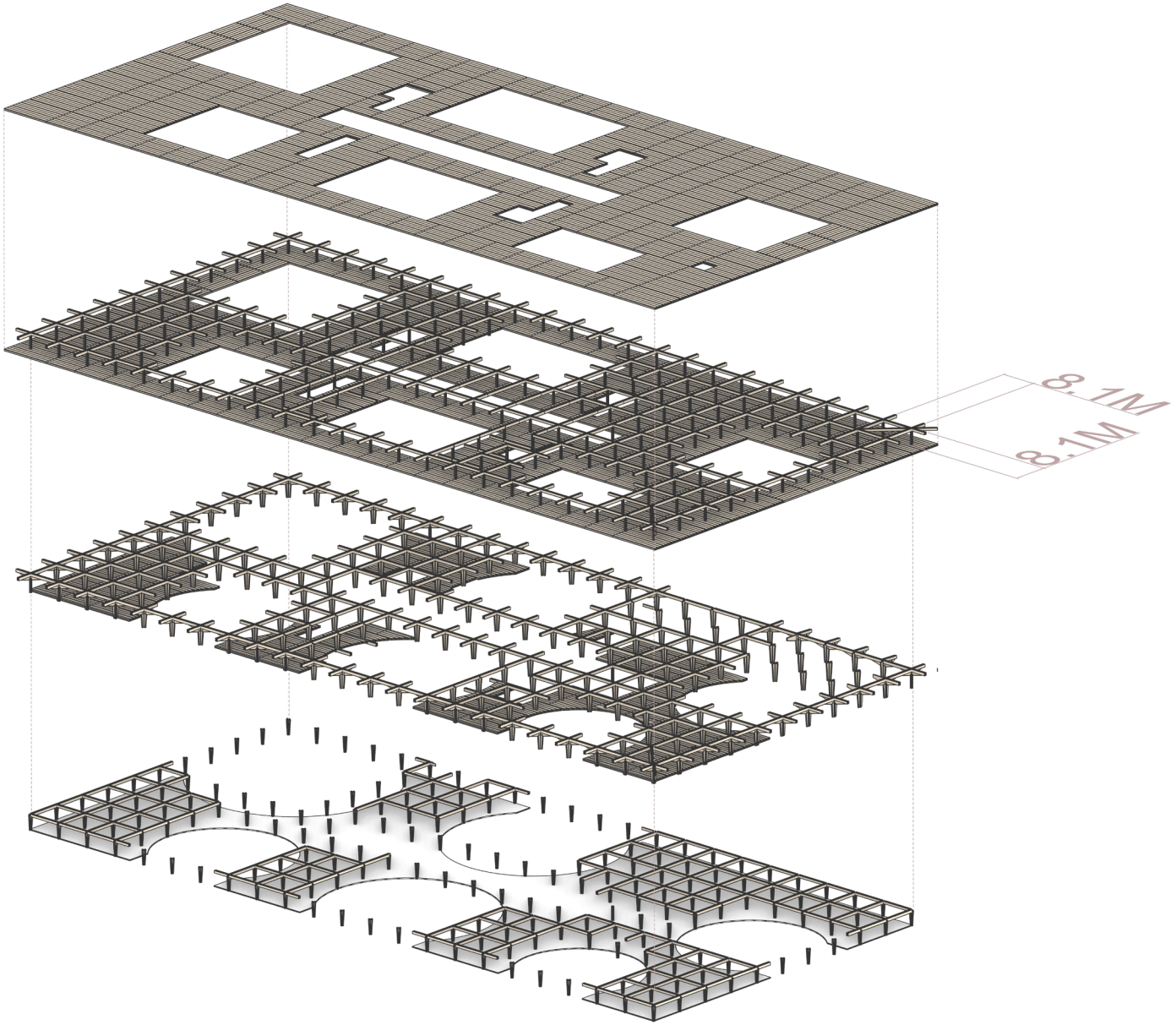
Extra

3D CONSTRUCTION PRINCIPLE



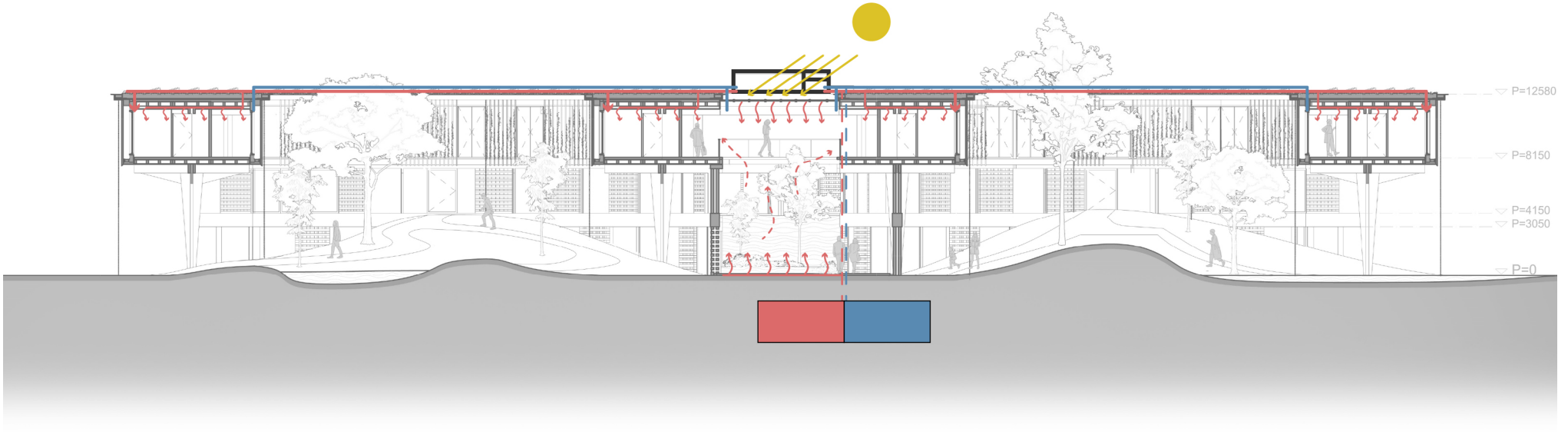
Extra

3D CONSTRUCTION PRINCIPLE



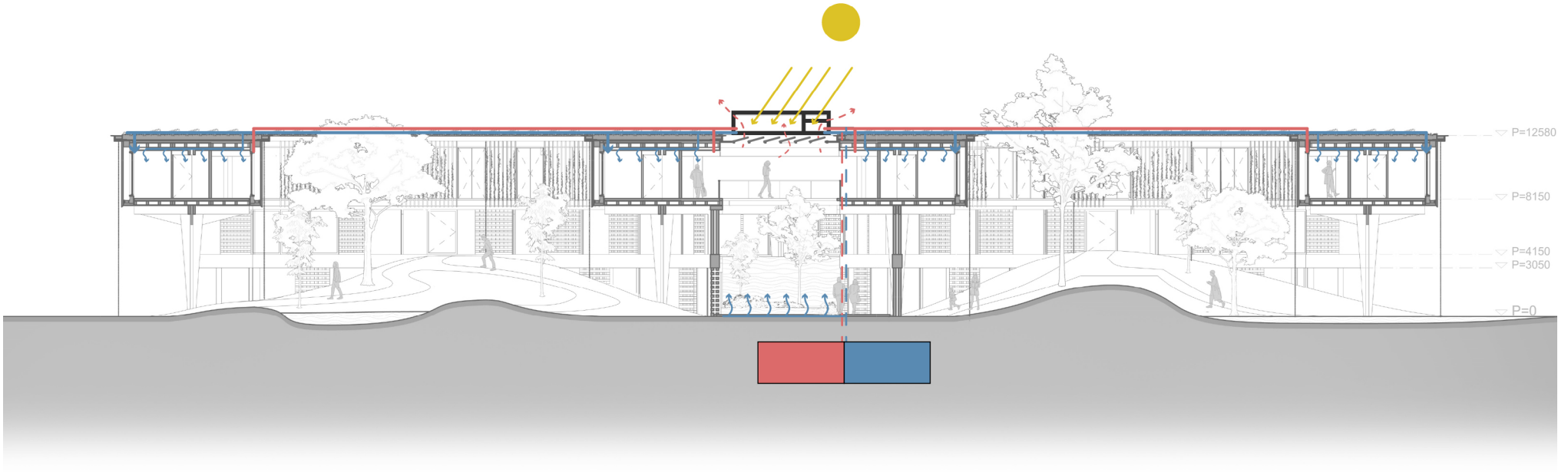
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CLIMATE PRINCIPLE WINTER

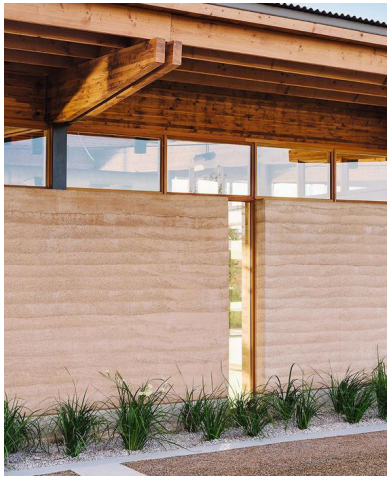


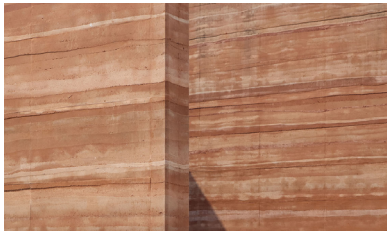
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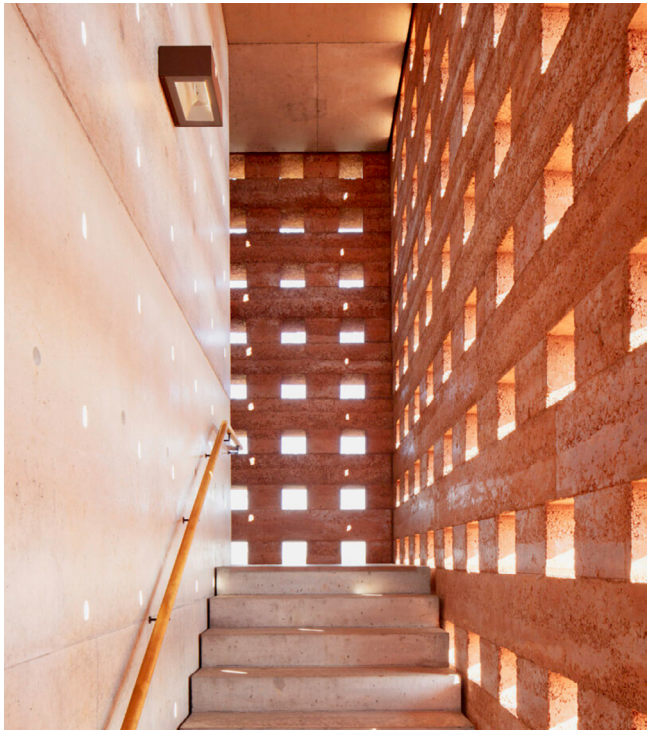
CLIMATE PRINCIPLE SUMMER

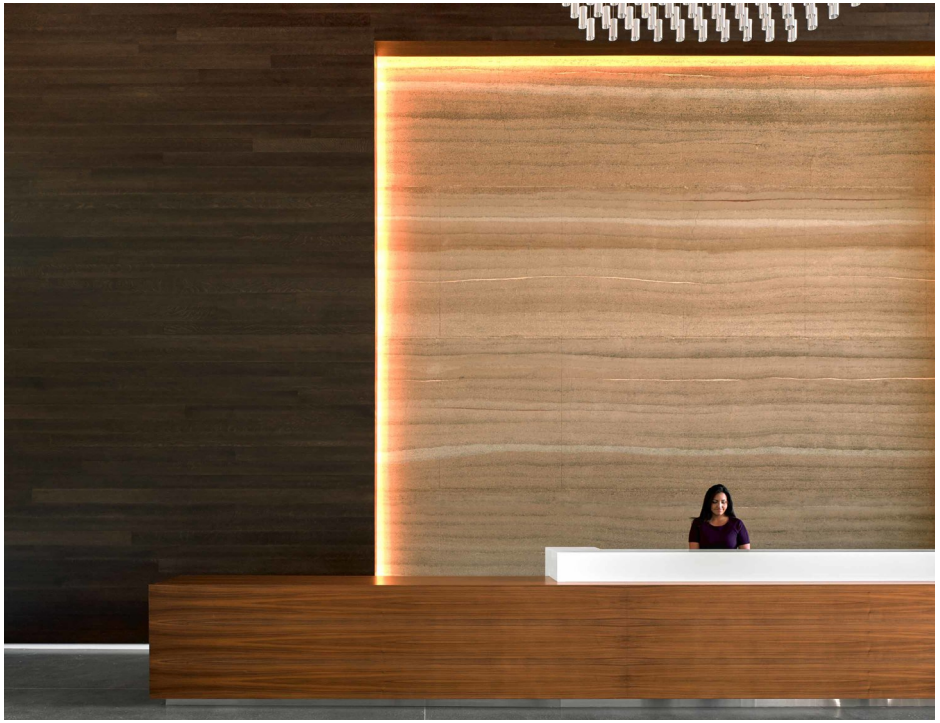


MATERIAL REFERENCES













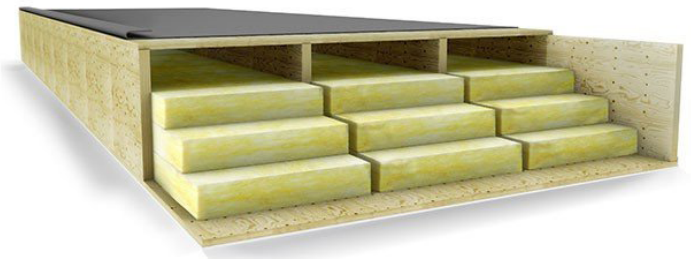
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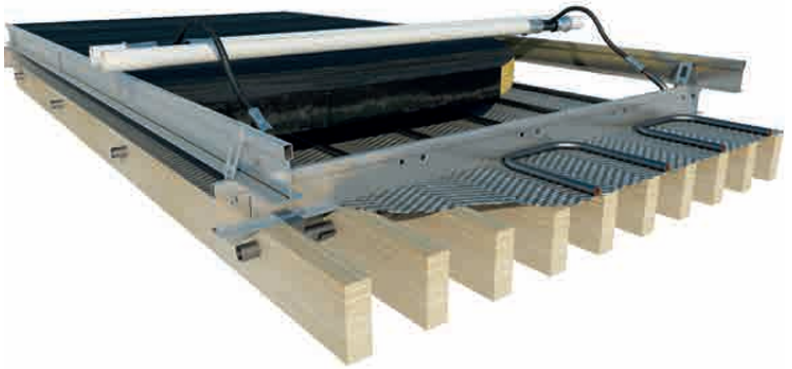














Extra

ORGANISATION

Expertise & Knowledge | Financial Backing

BDPK
Bundesverband
Deutscher Privatkliniken e.V.

Vivantes
Berlin's largest municipal hospital group

Federal Ministry of Health

Die Techniker
Krankenkasse
(Health insurance)

Federal Ministry of Health, Germany