THE FORT OF THE FUTURE

REDEFINING RESILIENCE: DUTCH FORTS AS INSPIRATION FOR SELF-SUFFICIENT BUILDING DESIGN

5846072
ANNE EDER

CONTENT

PROBLEM STATEMENT

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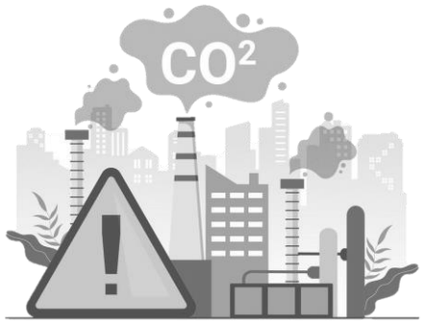

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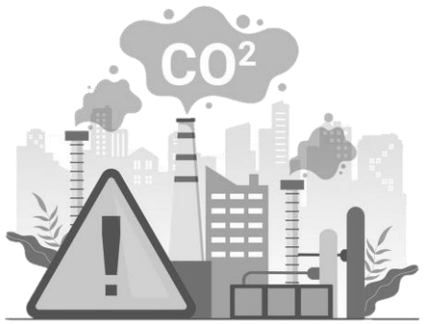

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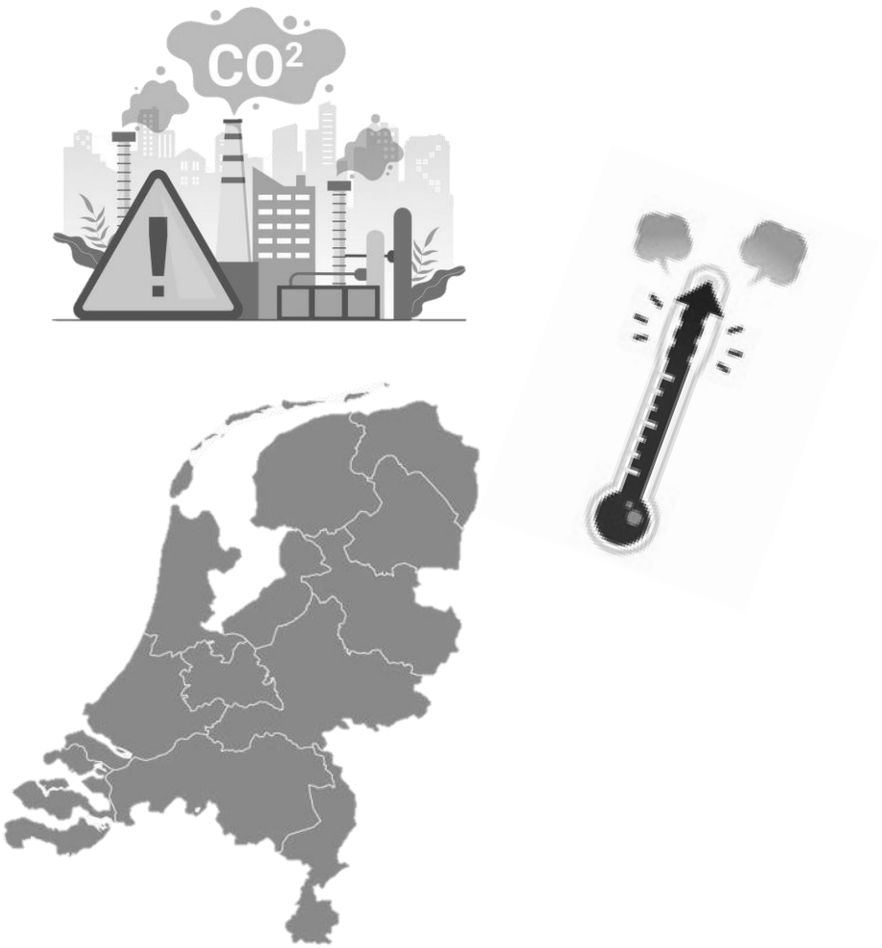

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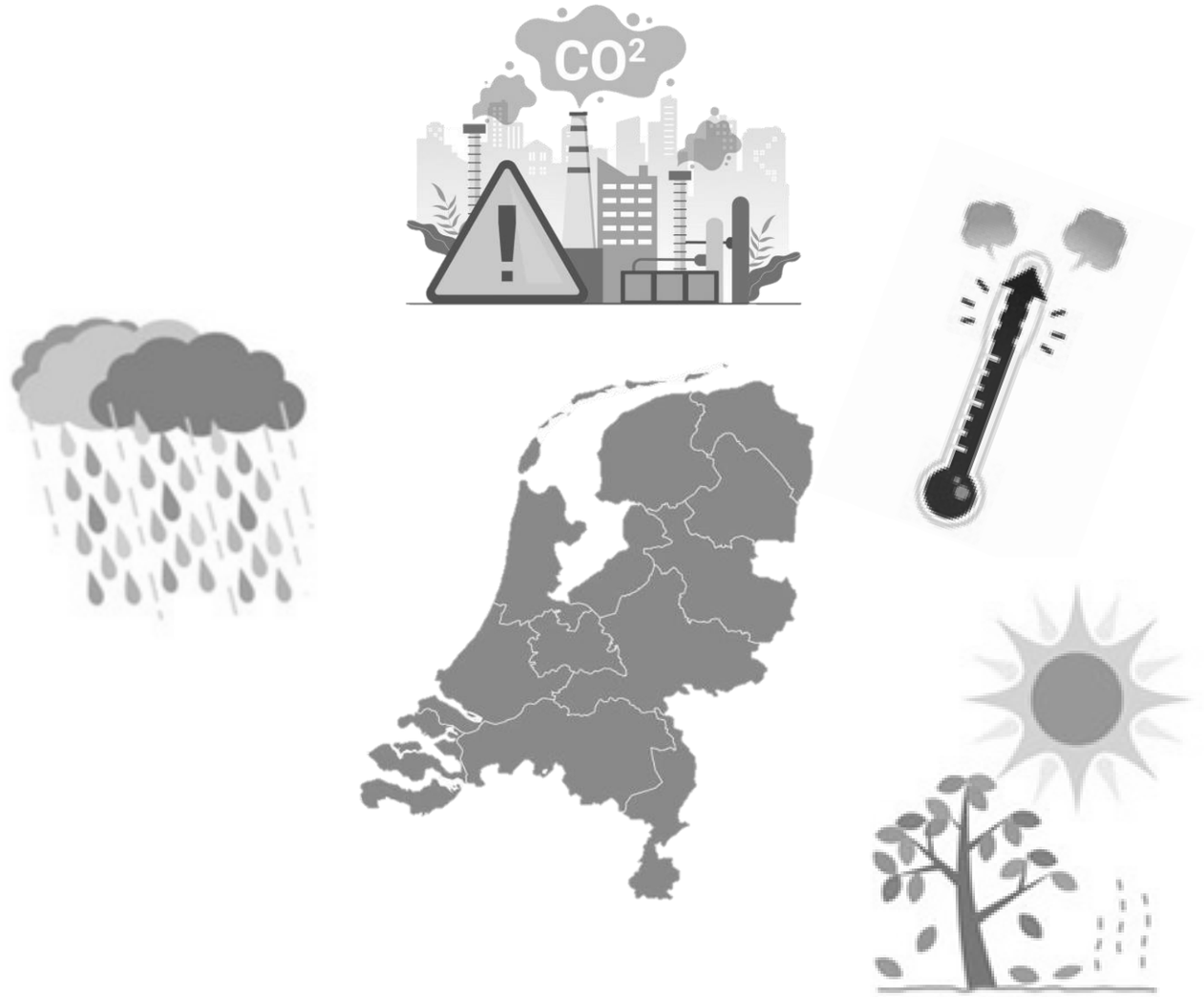

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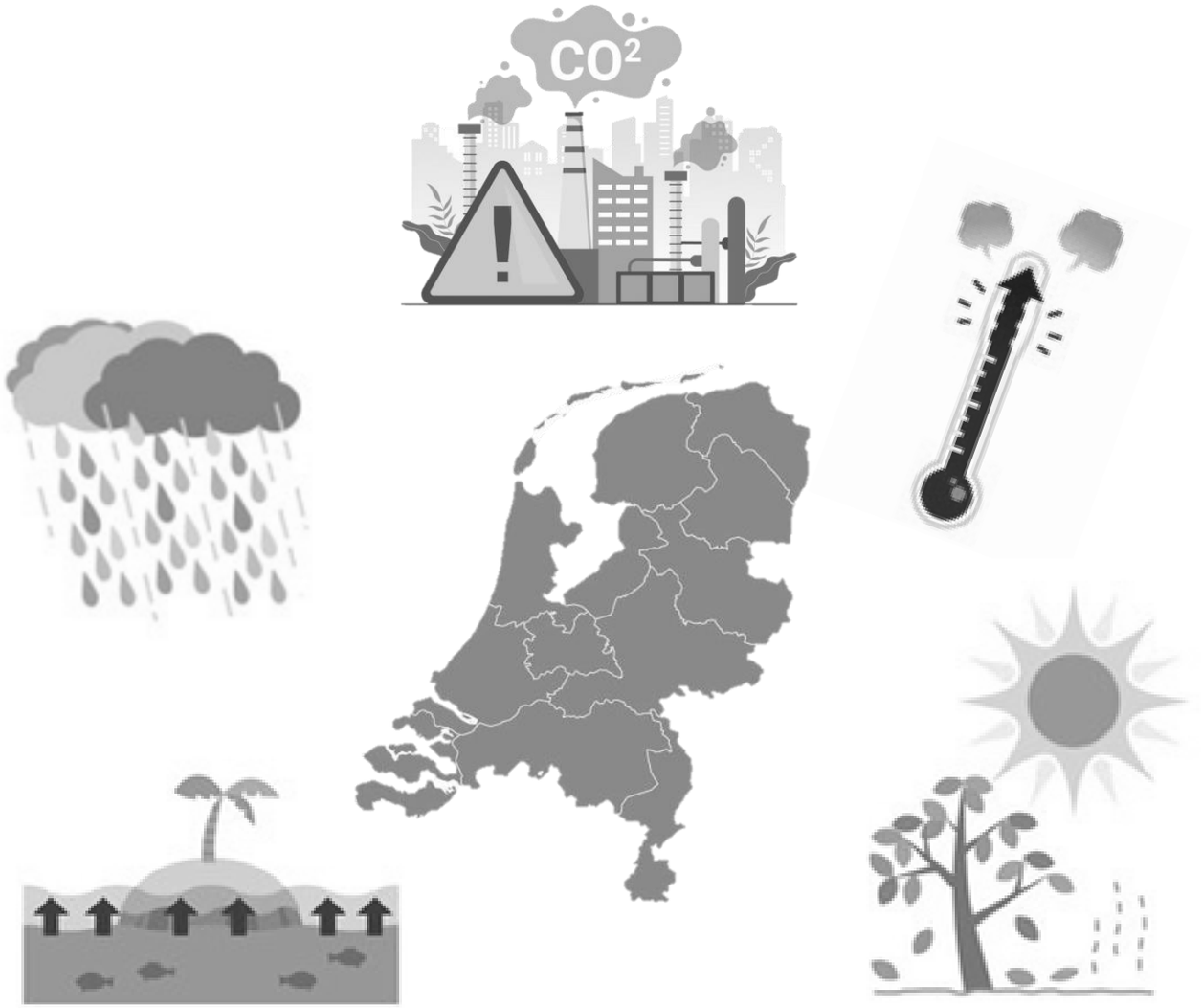


PROBLEM STATEMENT

PROBLEM STATEMENT

WATER OVERLOAD

Problem statement

Research

Implementation

Urban scale

Building scale

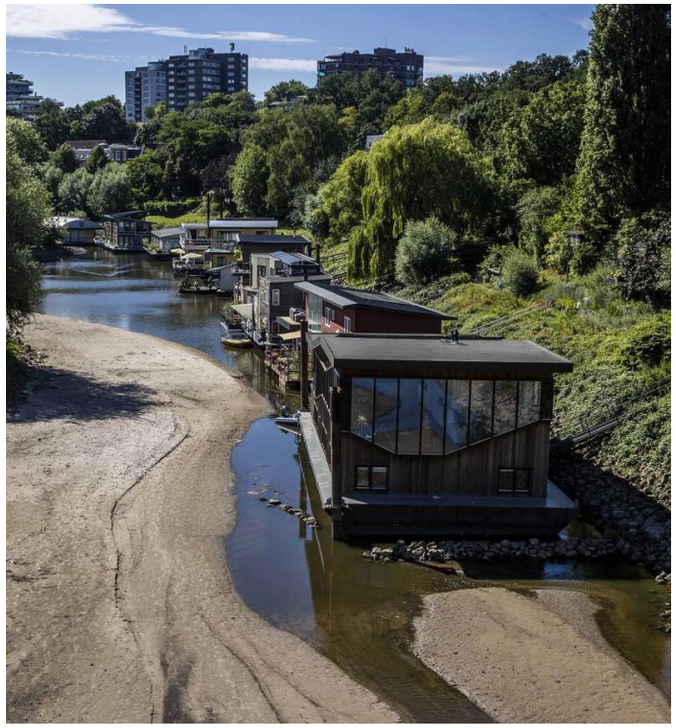
Detail scale

Use

PROBLEM STATEMENT

WATER OVERLOAD

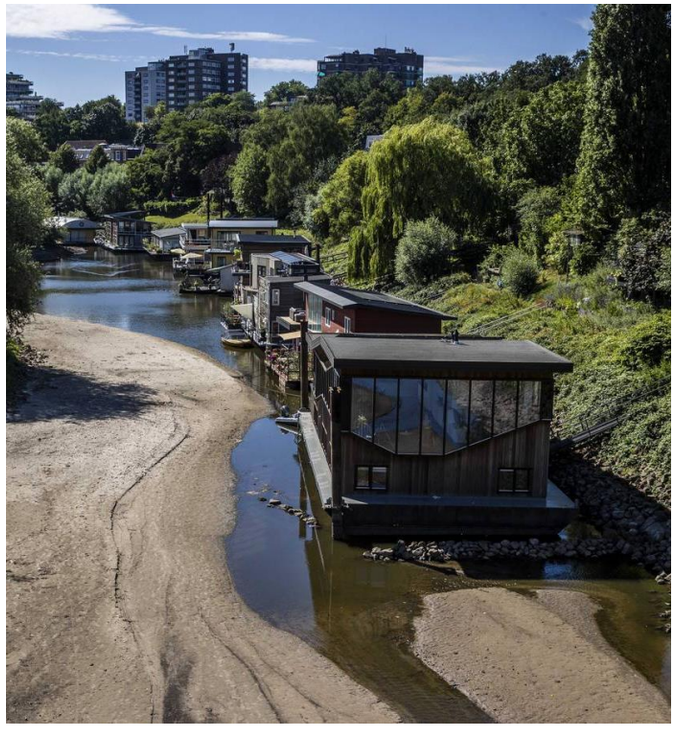
WATER SCARCITY



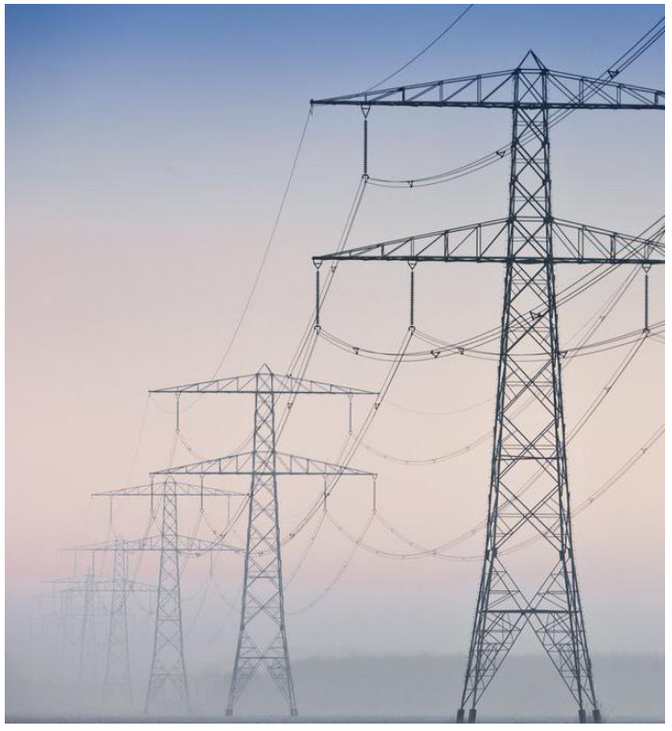
PROBLEM STATEMENT

WATER OVERLOAD

WATER SCARCITY



ENERGY OVERLOAD



HOW CAN WE MINIMIZE THOSE ISSUES ?

by meeting resource demands independently

SELF SUFFICIENCY

Water, Energy & Food

HISTORY OF SELF-SUFFICIENCY IN THE NETHERLANDS

Water as Enemy - storm surge barrier

Water as ally - Fort

HISTORY OF SELF-SUFFICIENCY IN THE NETHERLANDS

HISTORY OF SELF-SUFFICIENCY IN THE NETHERLANDS

RESEARCH

THESIS OBJECTIVE

"What design principles and strategies can be derived from the Dutch Water line forts and contemporary projects in the Netherlands to create a self-sufficient, climate-resilient building for the future?"

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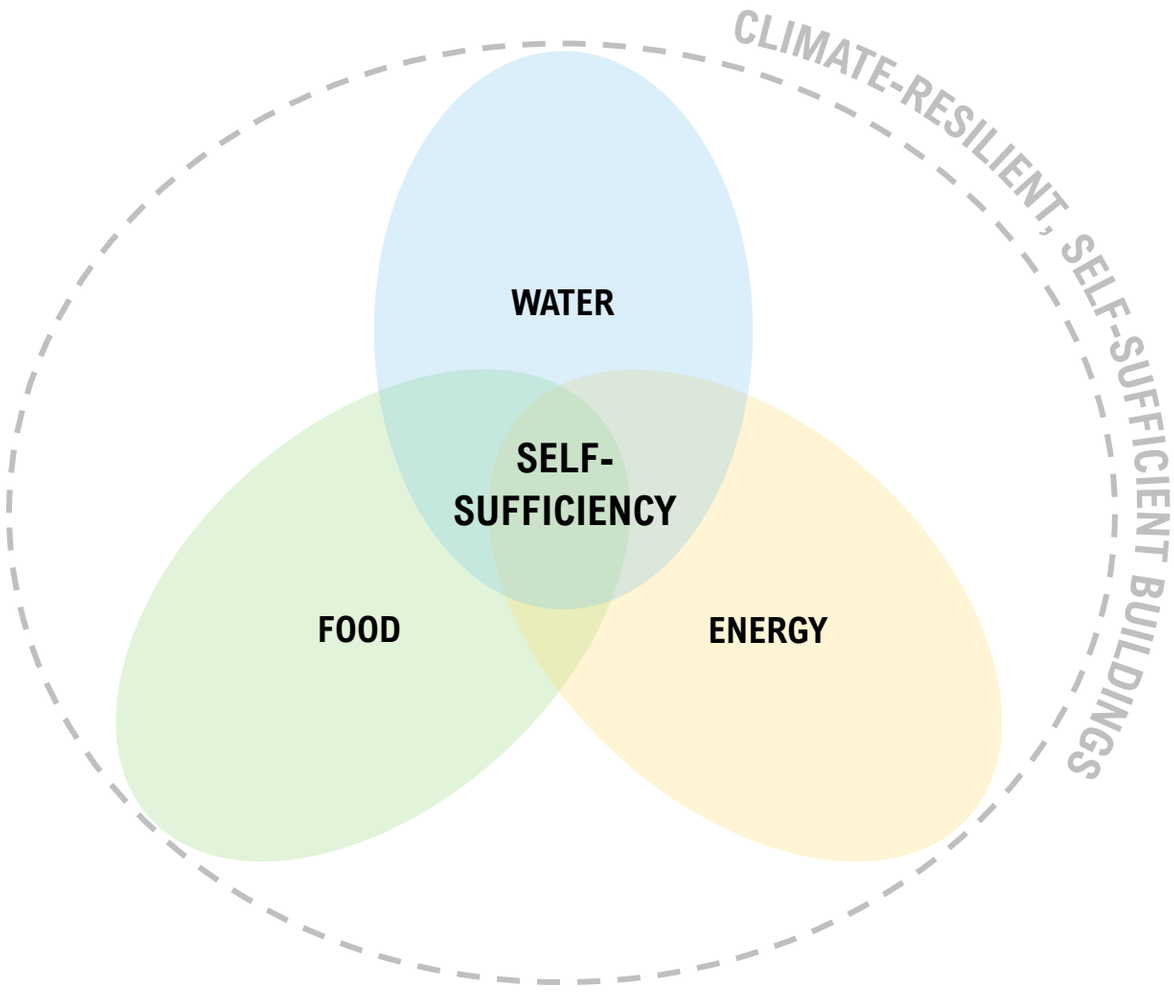
THE GOAL: develop a framework for the design of climate-resilient, self-sufficient buildings that can meet their demands for water, energy, and food.

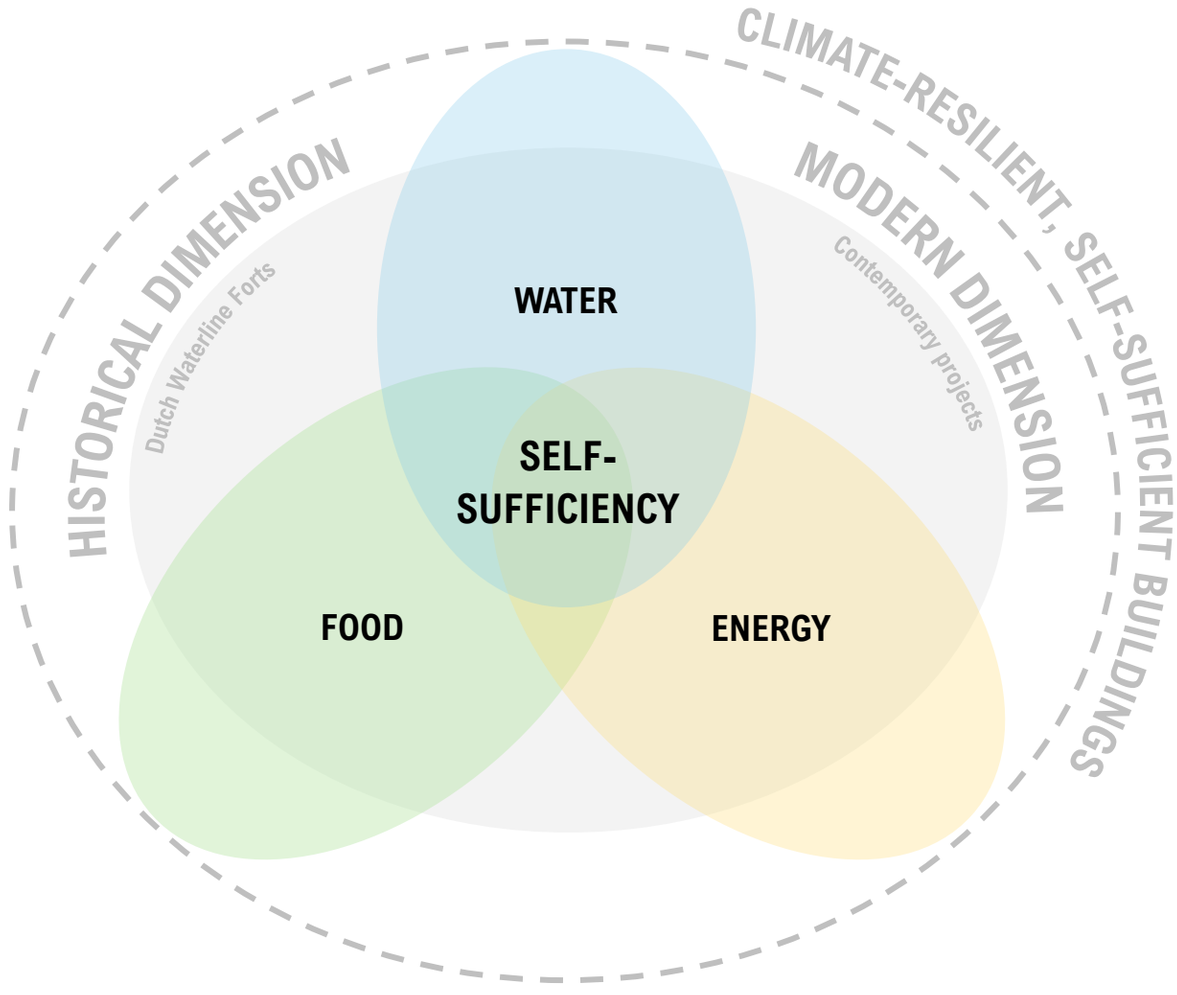


THESIS OBJECTIVE

"What design principles and strategies can be derived from the Dutch Water line forts and contemporary projects in the Netherlands to create a self-sufficient, climate-resilient building for the future?"

HISTORICAL and **MODERN DIMENSIONS** of Self-sufficient building design

THE GOAL: develop a framework for the design of climate-resilient, self-sufficient buildings that can meet their demands for water, energy, and food.



Project Analysis

Unravel the Design Principles and Strategies

Project Analysis

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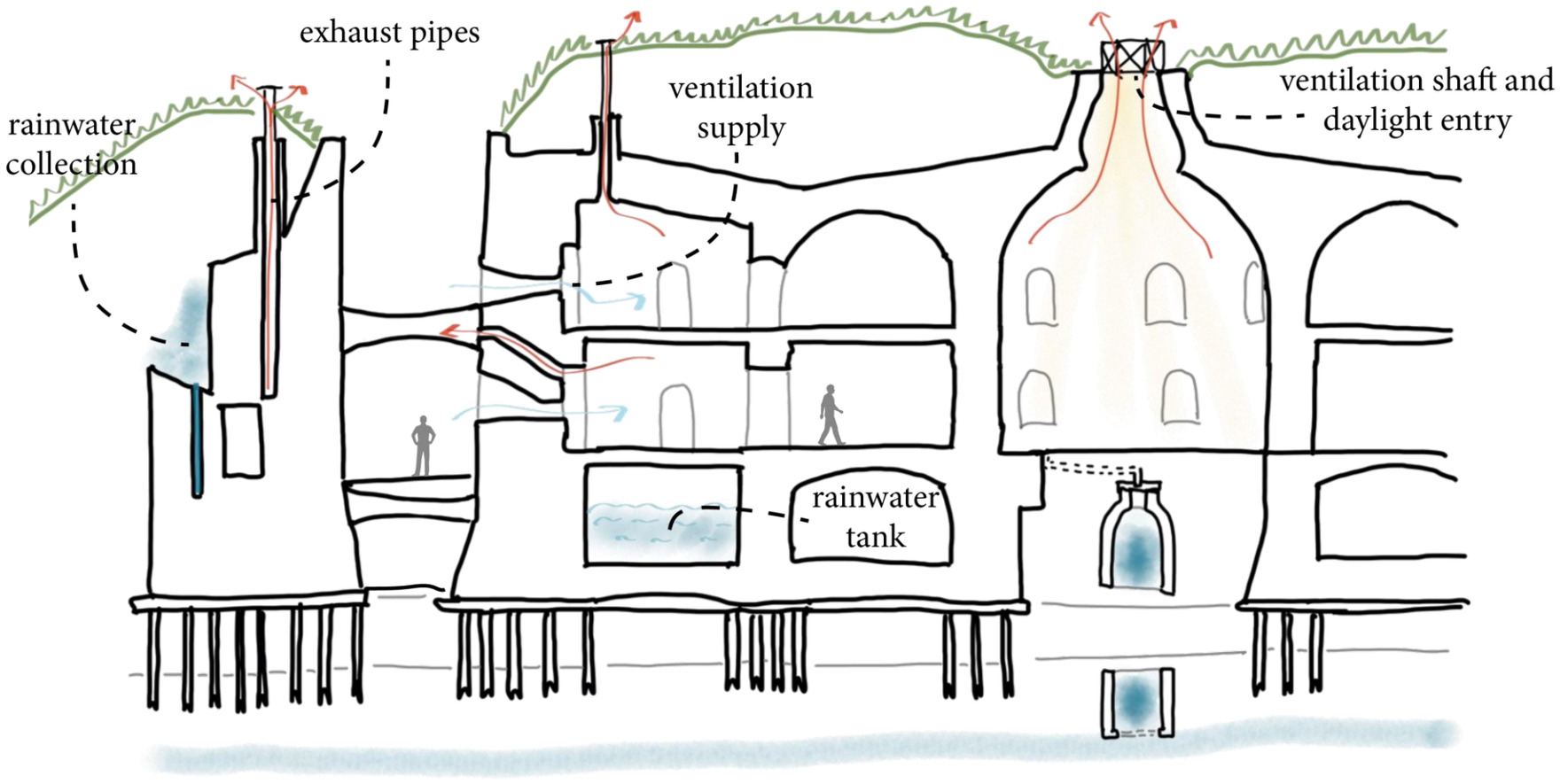
Project Analysis

Fort Everdingen

Unravel the Design Principles and Strategies

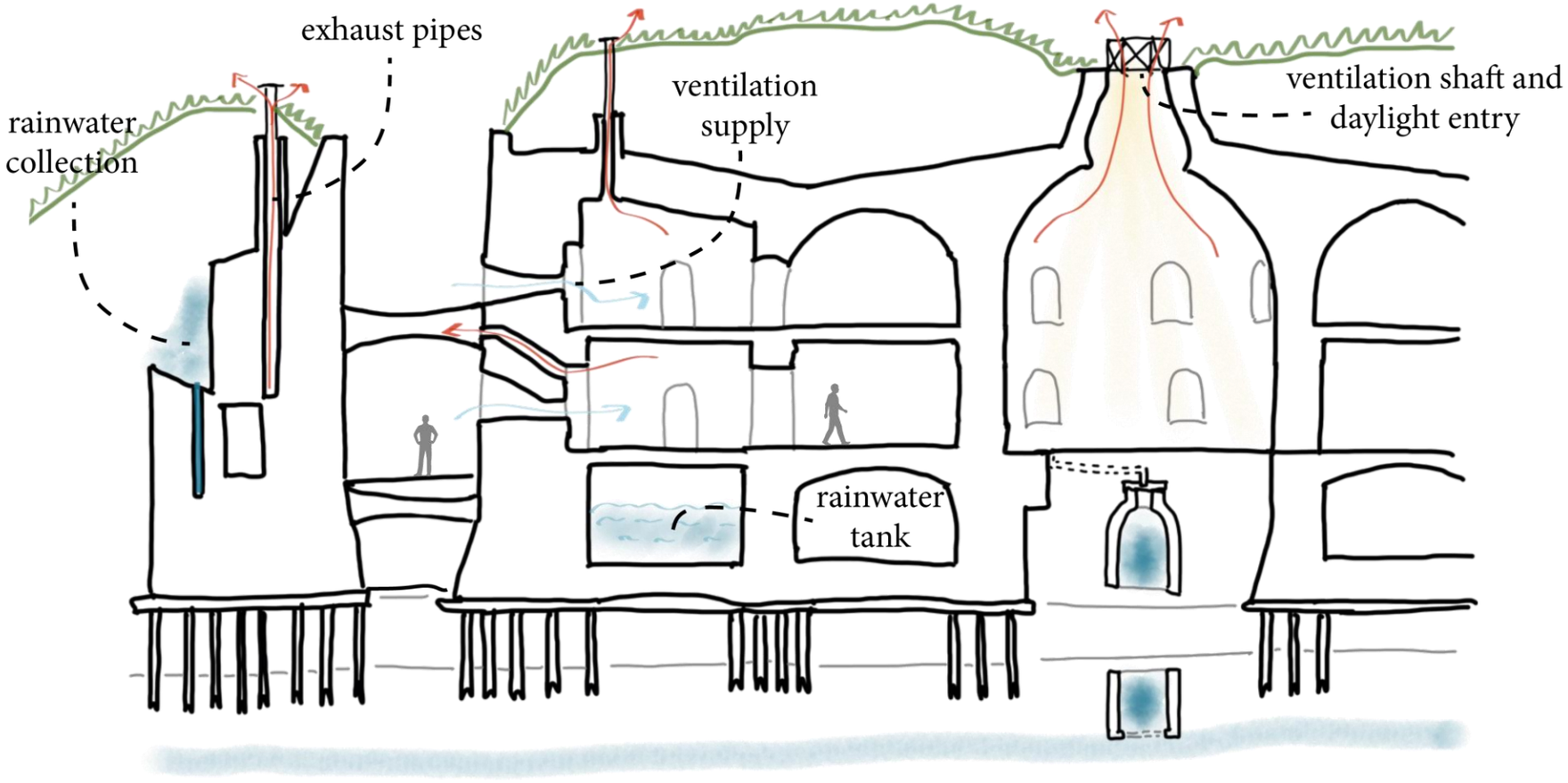
FORT EVERDINGEN



Section

FORT EVERDINGEN

Self providing

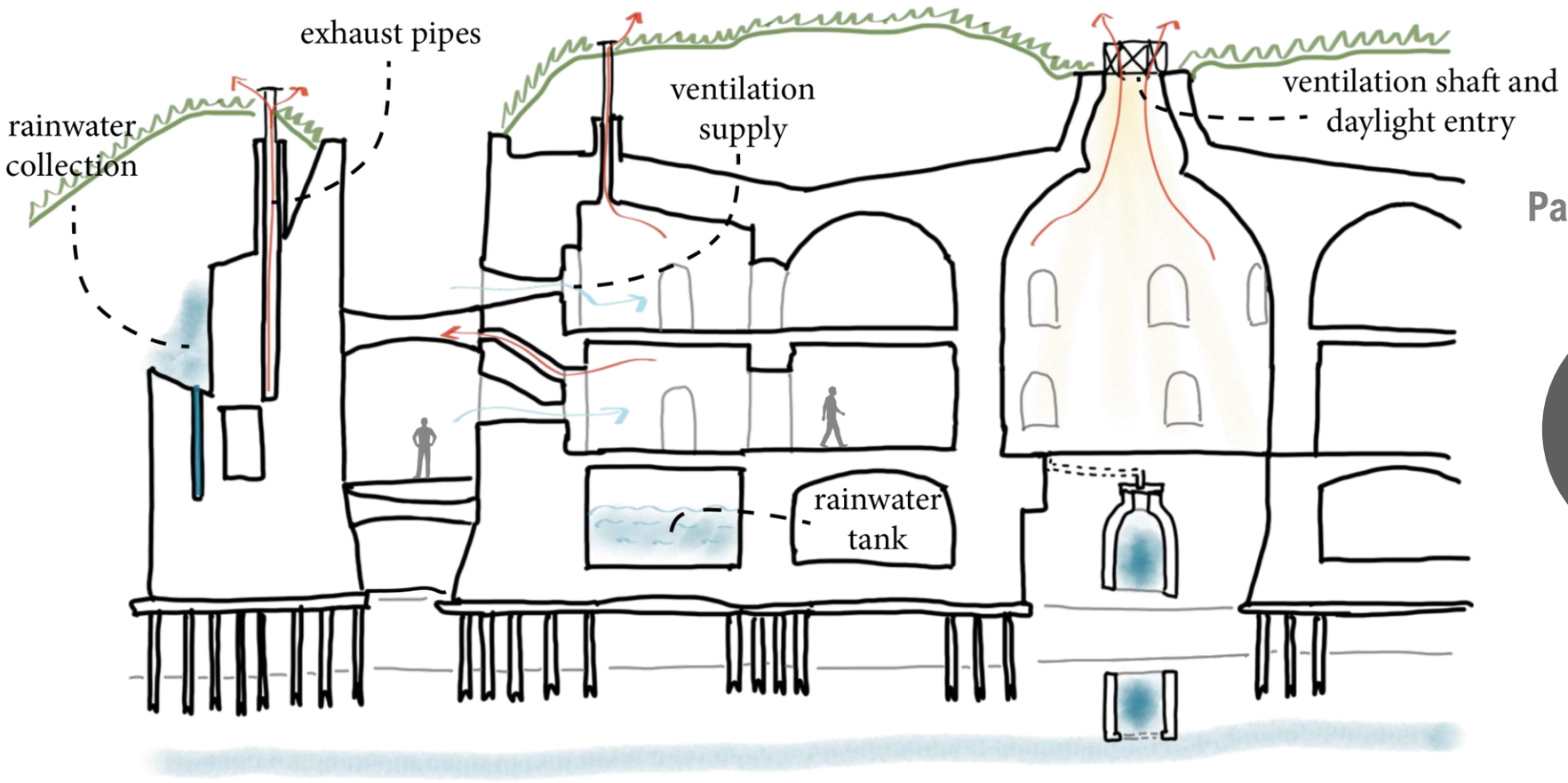


Section

FORT EVERDINGEN

Self providing

Passive & Active Techniques



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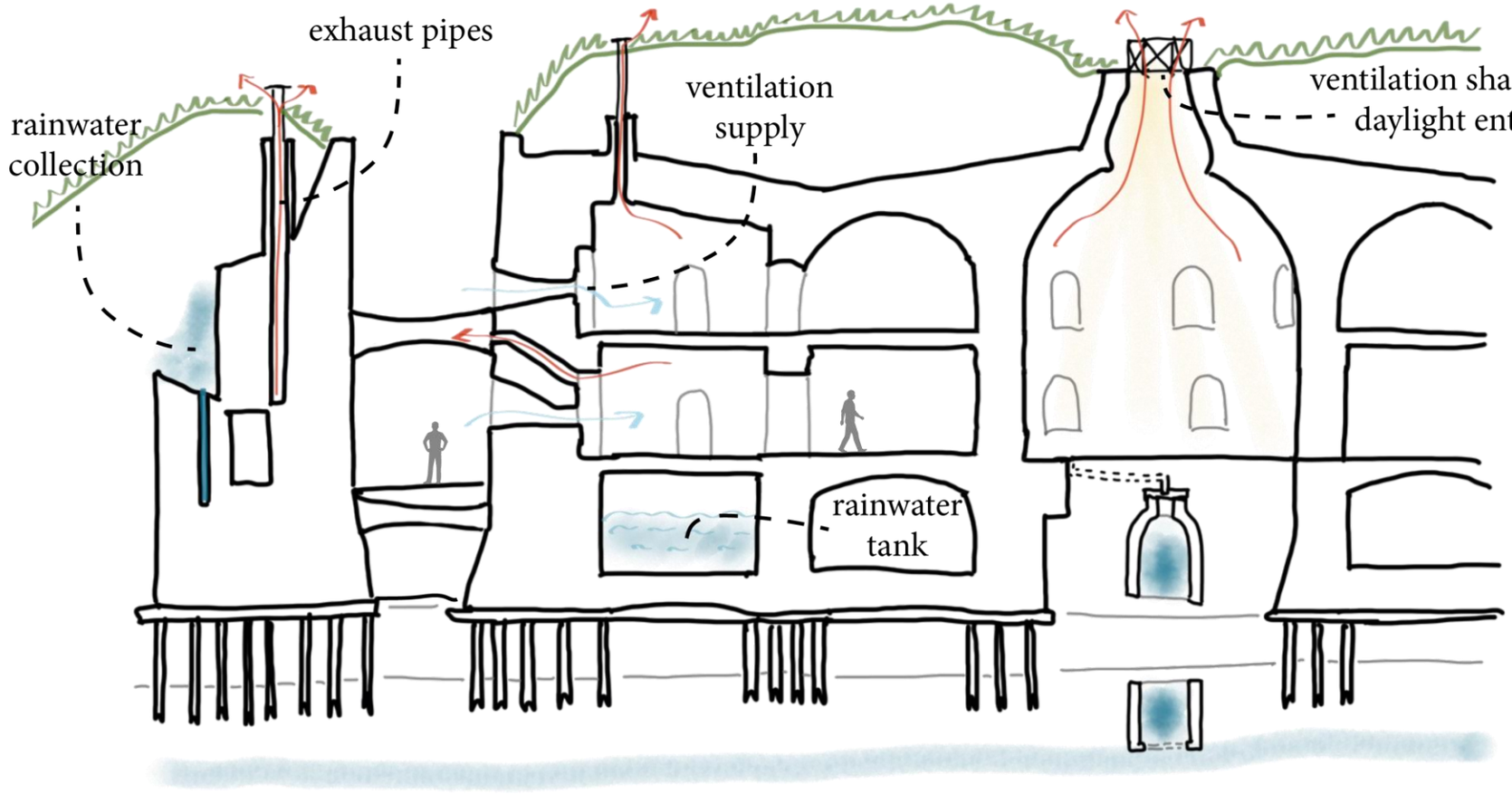
FORT EVERDINGEN



Section

Self providing

Passive & Active Techniques

User collaboration

Project Analysis

Unravel the Design Principles and Strategies

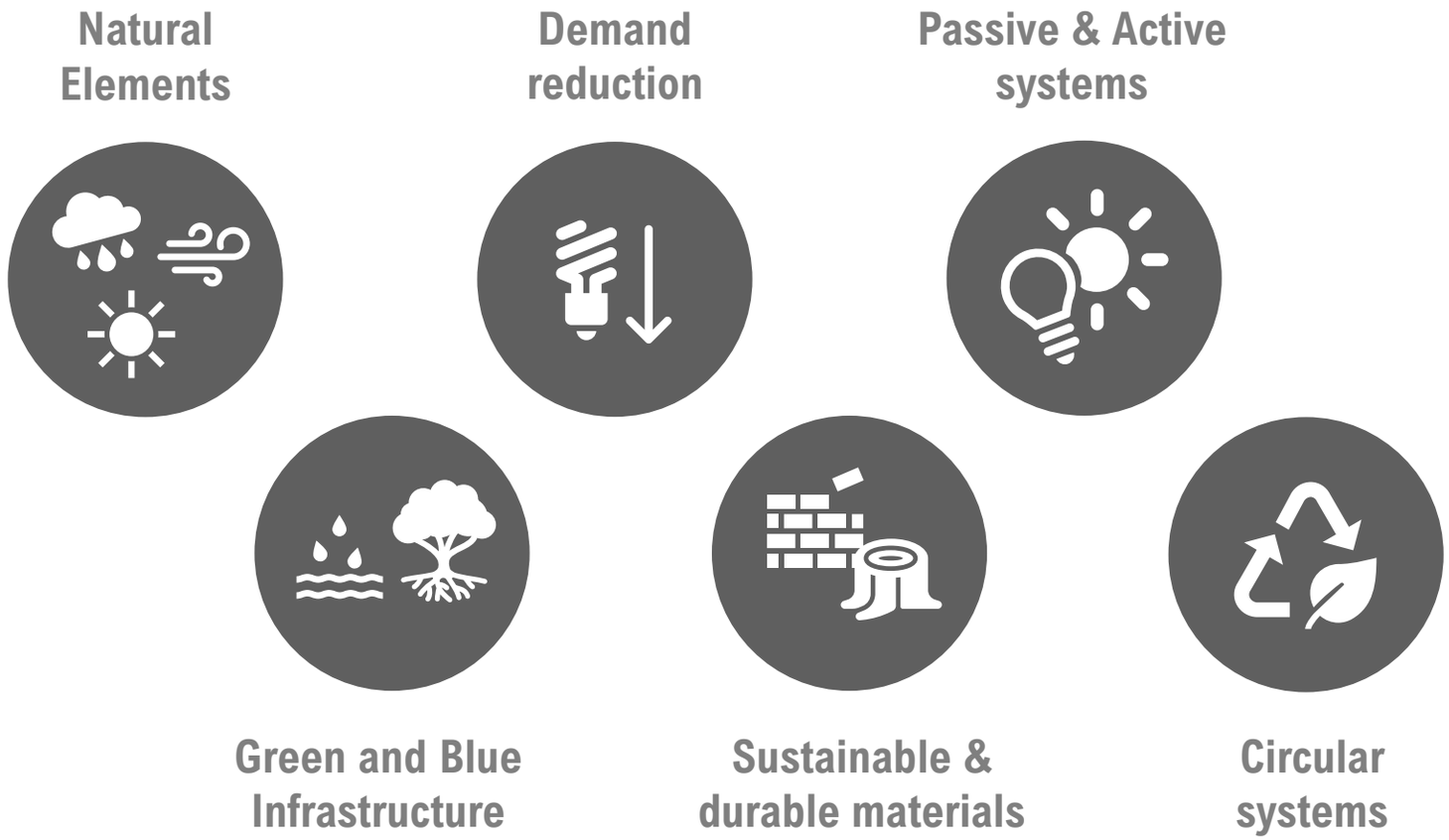
Project Analysis

Integrated in Environment

Recreation

Green and Blue Infrastructure

DESIGN STRATEGIES FOR THE FORT OF THE FUTURE



DESIGN PRINCIPLES FOR THE FORT OF THE FUTURE

IMPLEMENTATION

PROJECT LOCATION

PROJECT LOCATION

Water overload

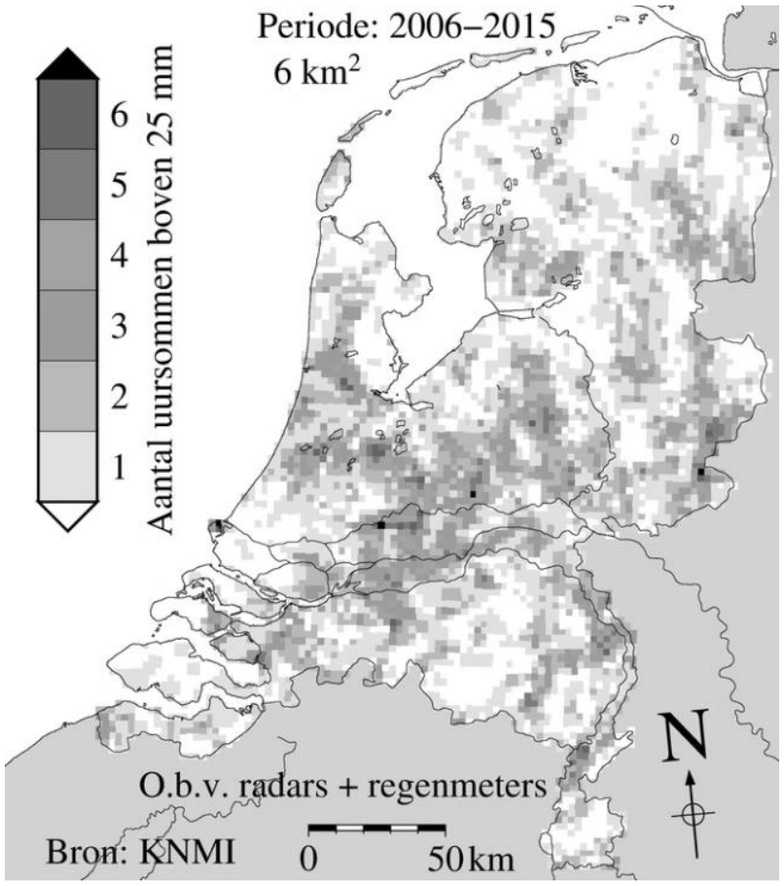


Figure 1: Radar analysis cloudbursts period 2006-2015 (KNMI, 2016)

PROJECT LOCATION

Water scarcity

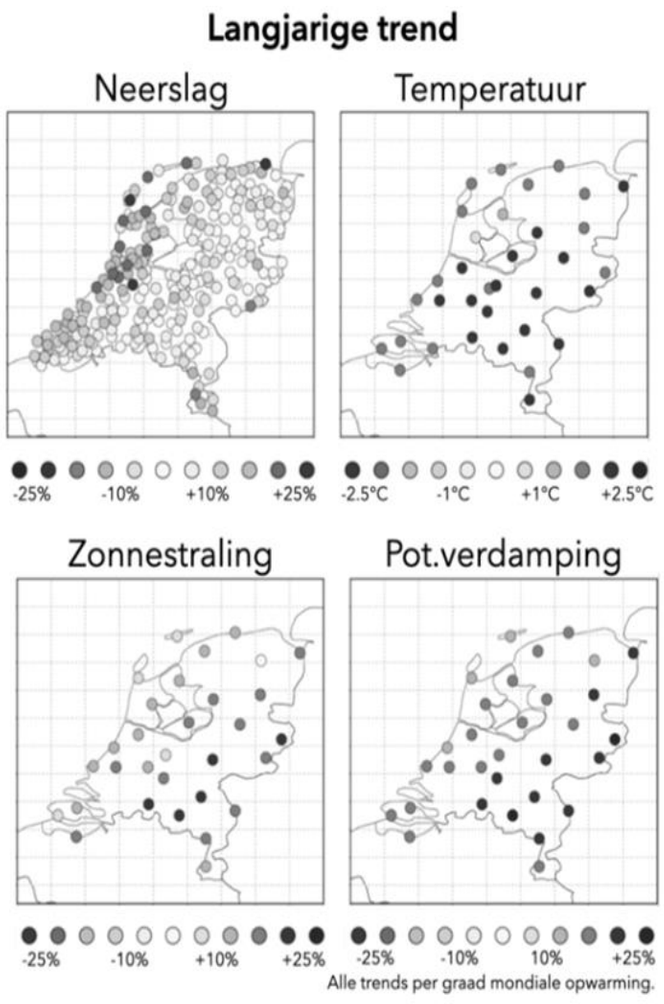


Figure 2: long-term trend of rainfall, temperature, solar radiation and potential evaporation (KNMI,2020)

PROJECT LOCATION

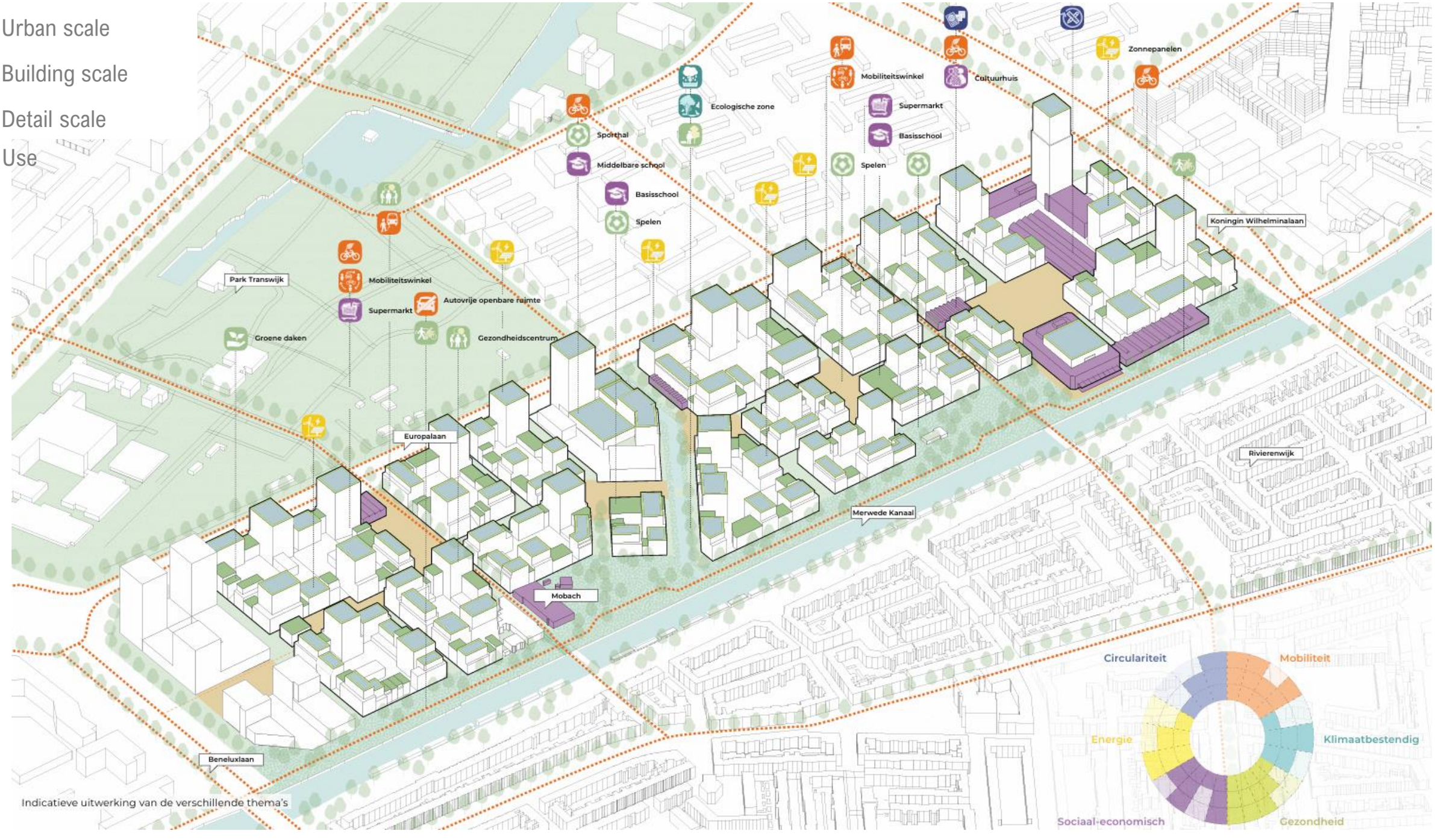
Net congestion

Figure 3: Transmission capacity map (Netbeheer Nederland, 2024)

PROJECT LOCATION

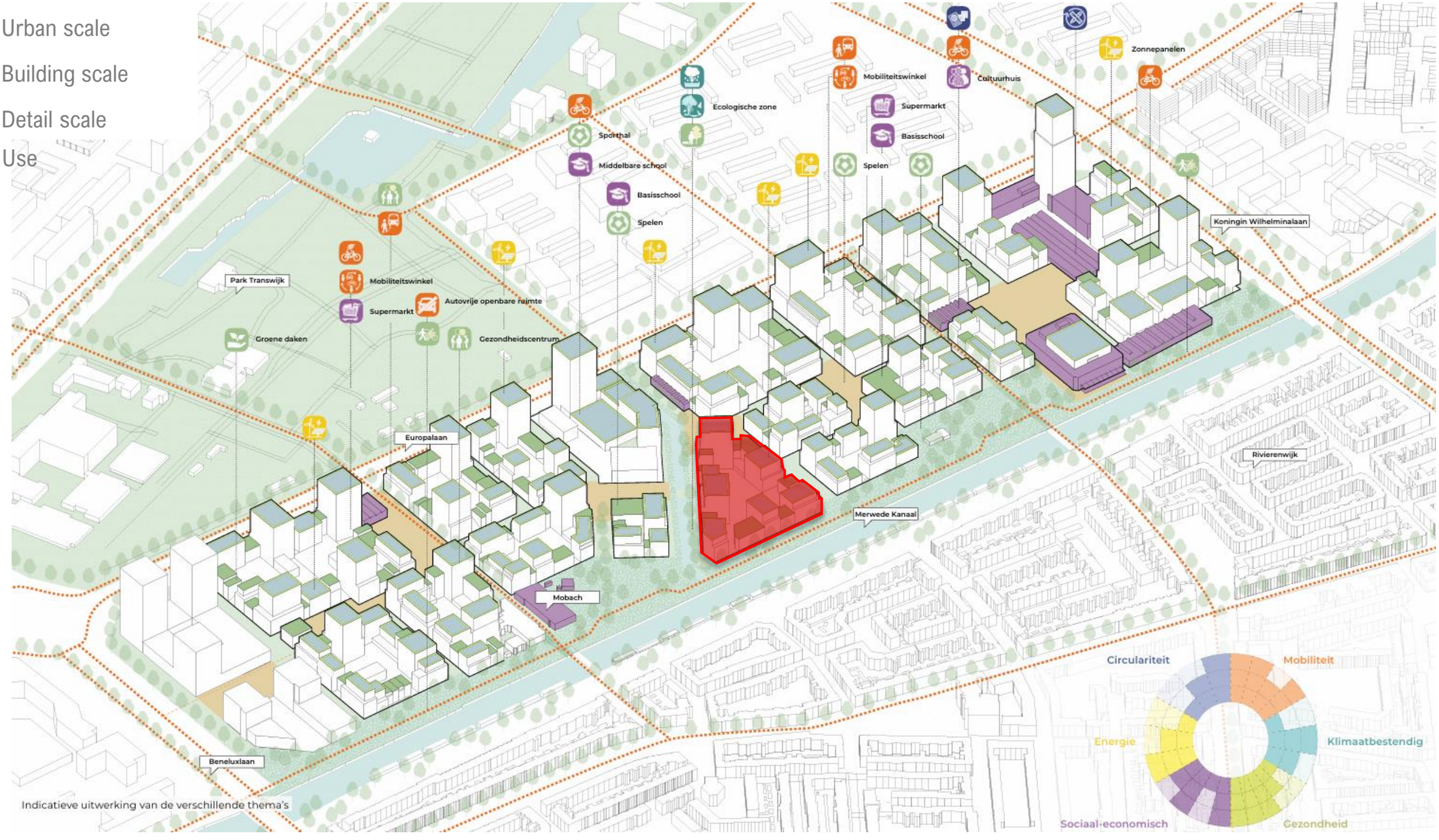
PROJECT LOCATION: UTRECHT

SPECIFIC LOCATION: MERWEDE



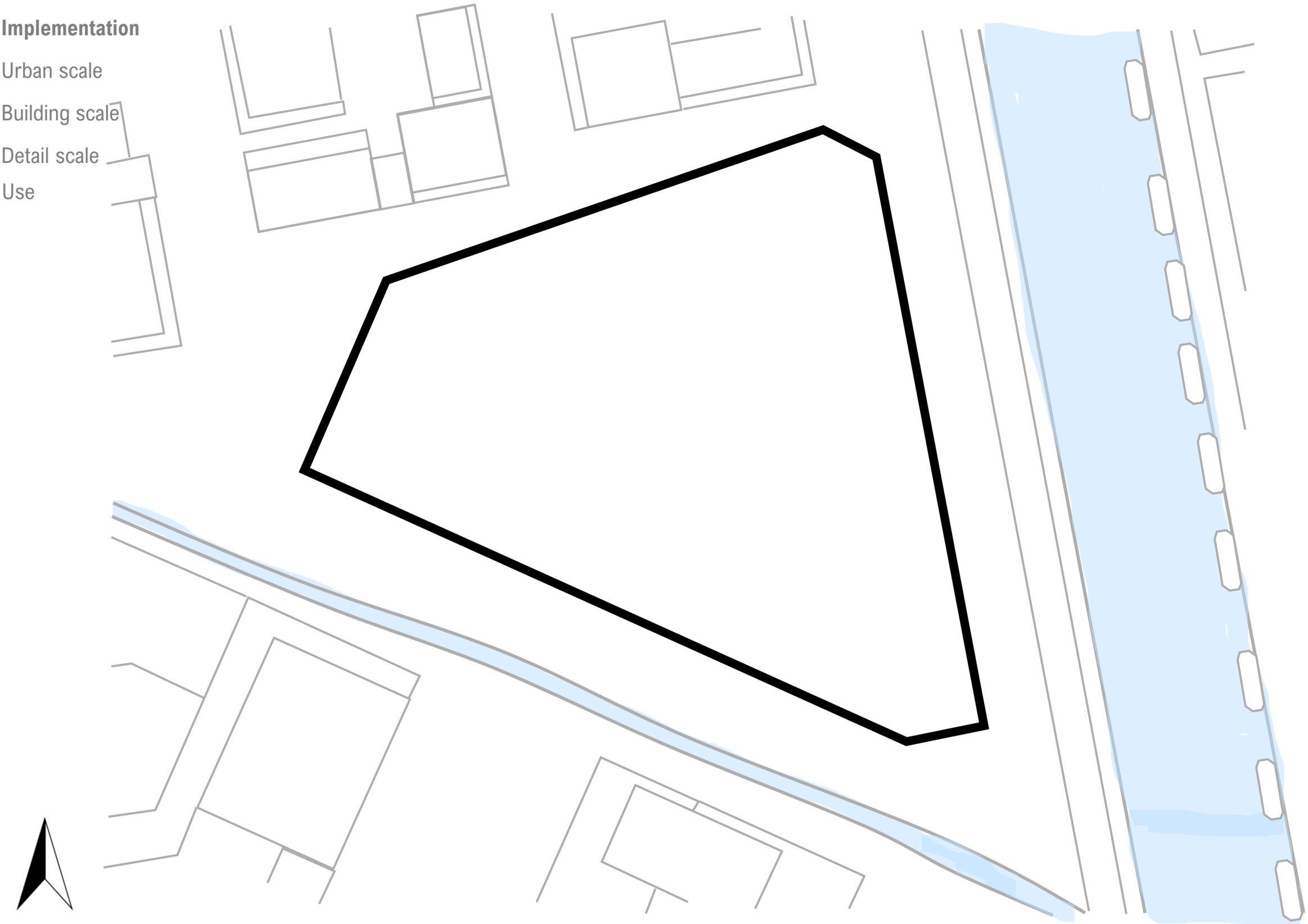
Indicatieve uitwerking van de verschillende thema's

SPECIFIC LOCATION: MERWEDE



Indicatieve uitwerking van de verschillende thema's

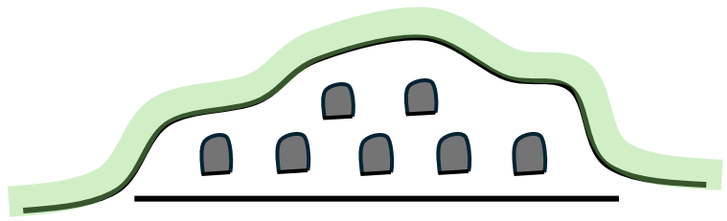
BUILDING PLOT



BUILDING PLOT

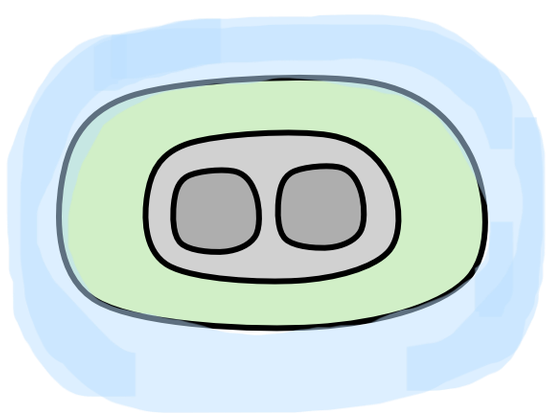
CREATIVE PROCESS

ARCHITECTURAL INSPIRATION & STARTING POINTS

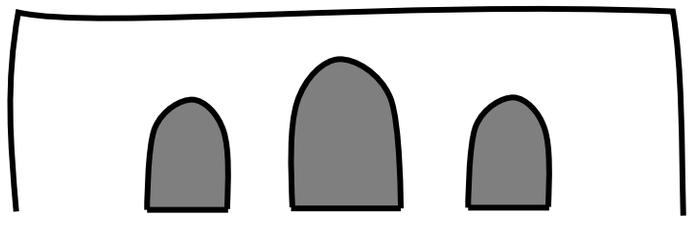


Functioning as a landscape

Thick walls

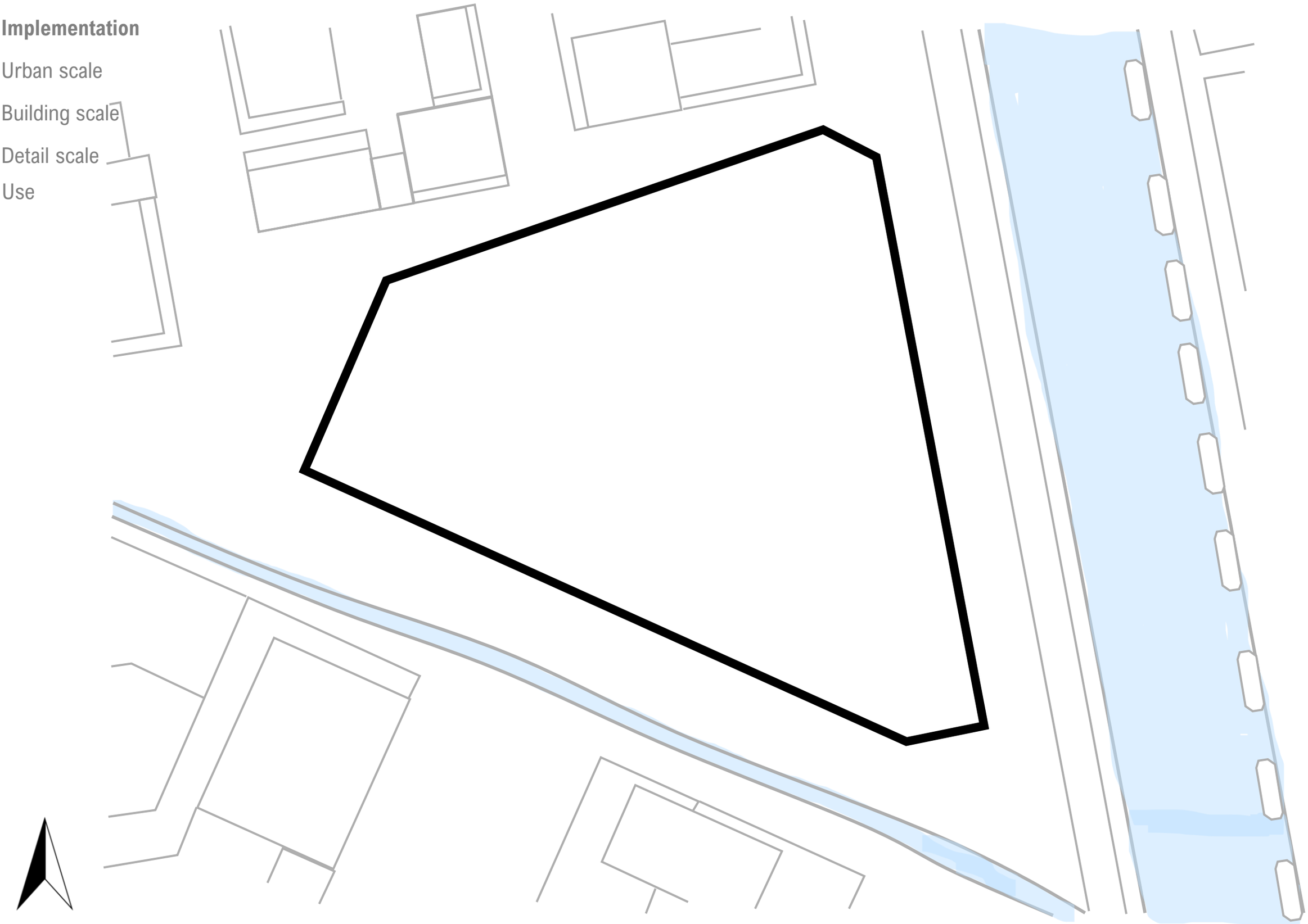


Surrounded by water

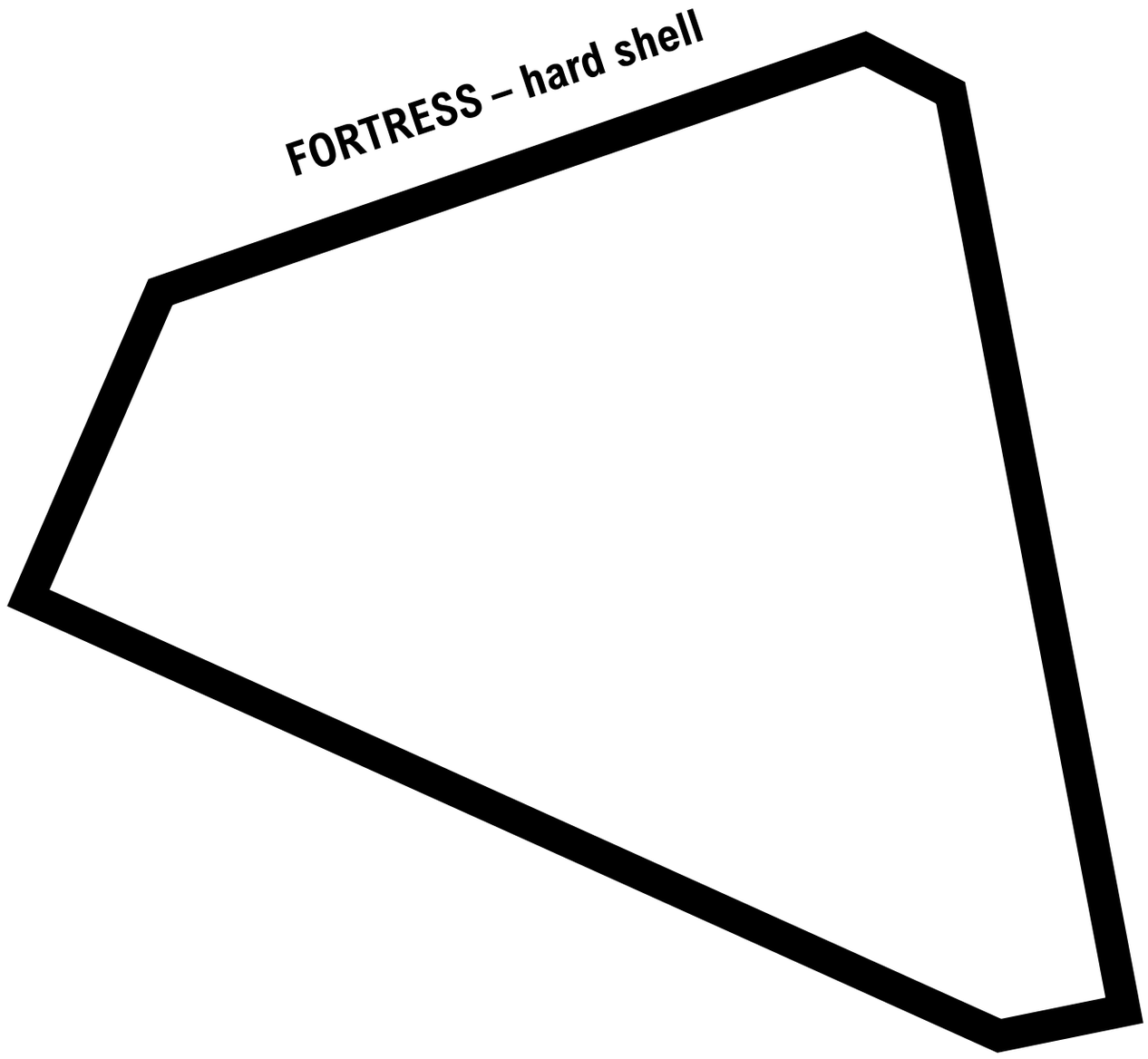


Arches & Gates

BUILDING PLOT



CONCEPT & INTERVENTIONS



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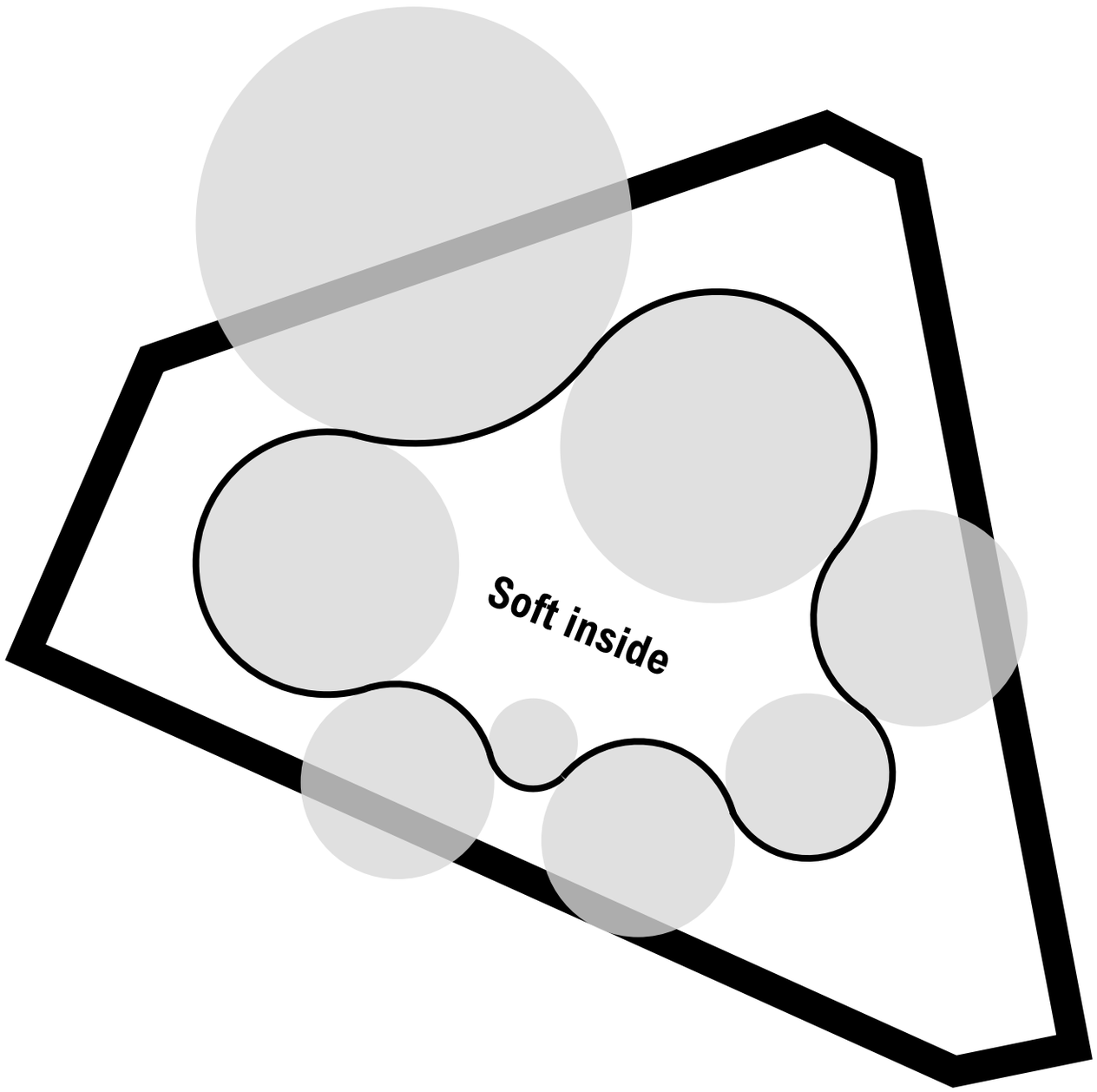

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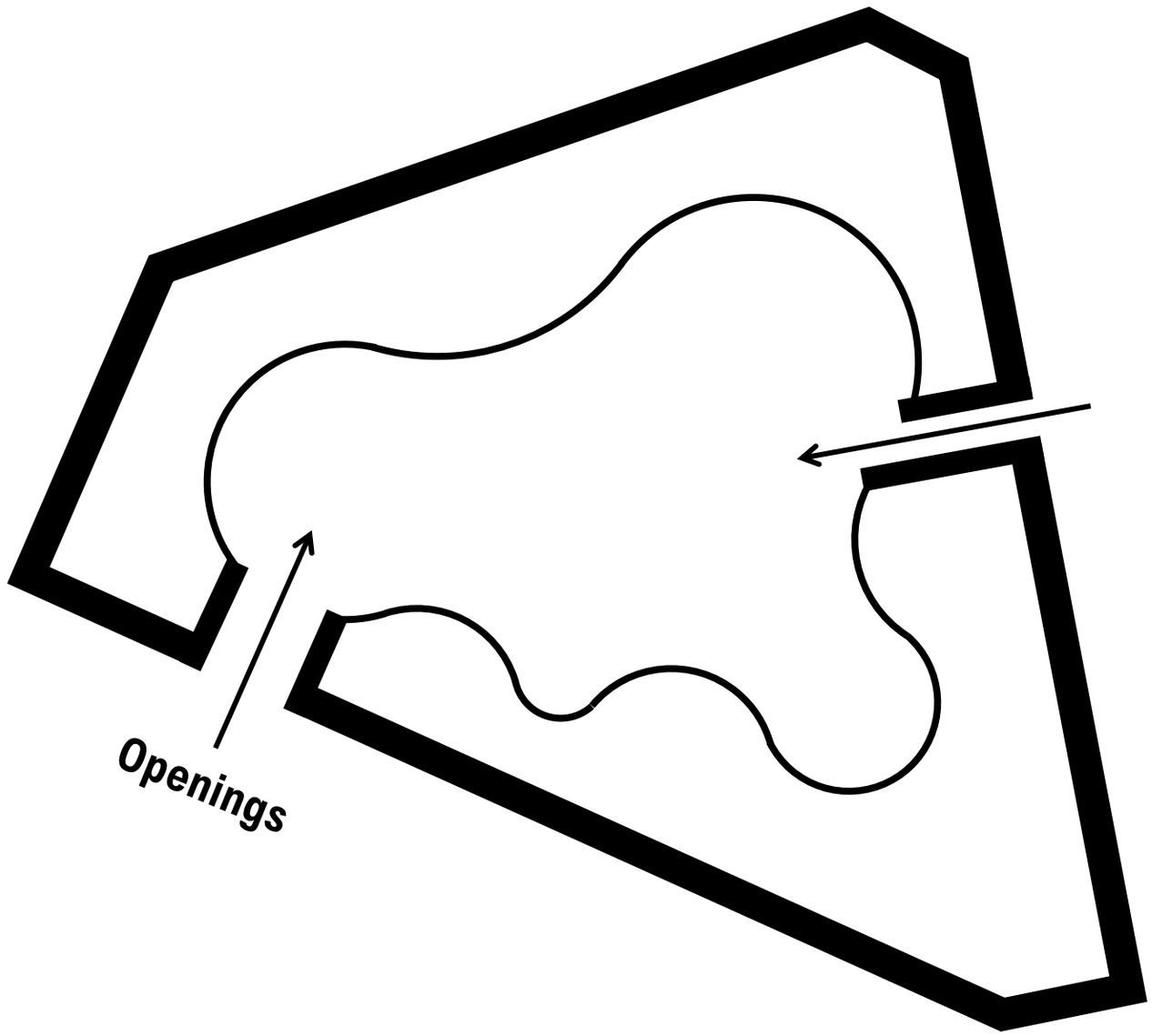

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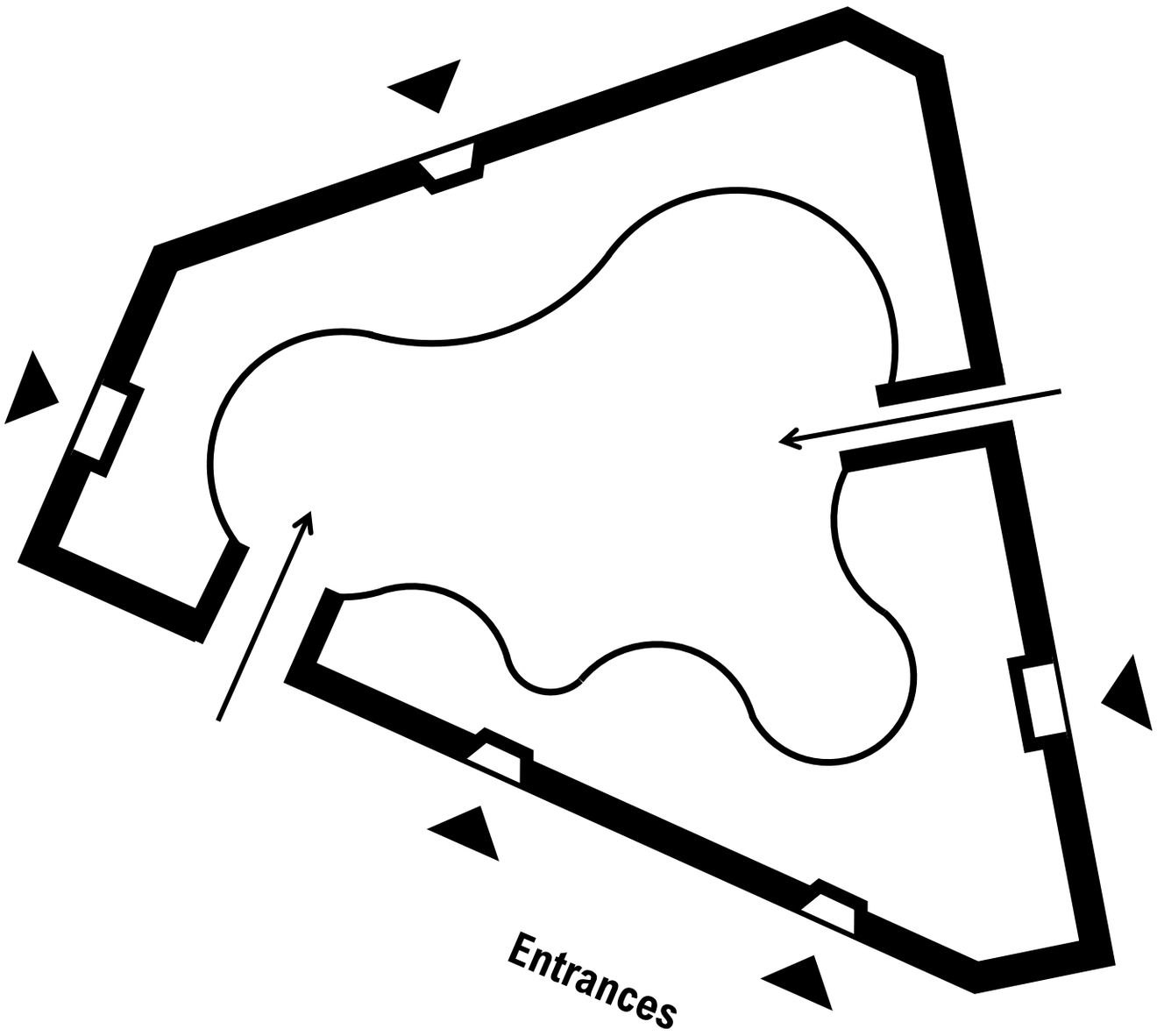

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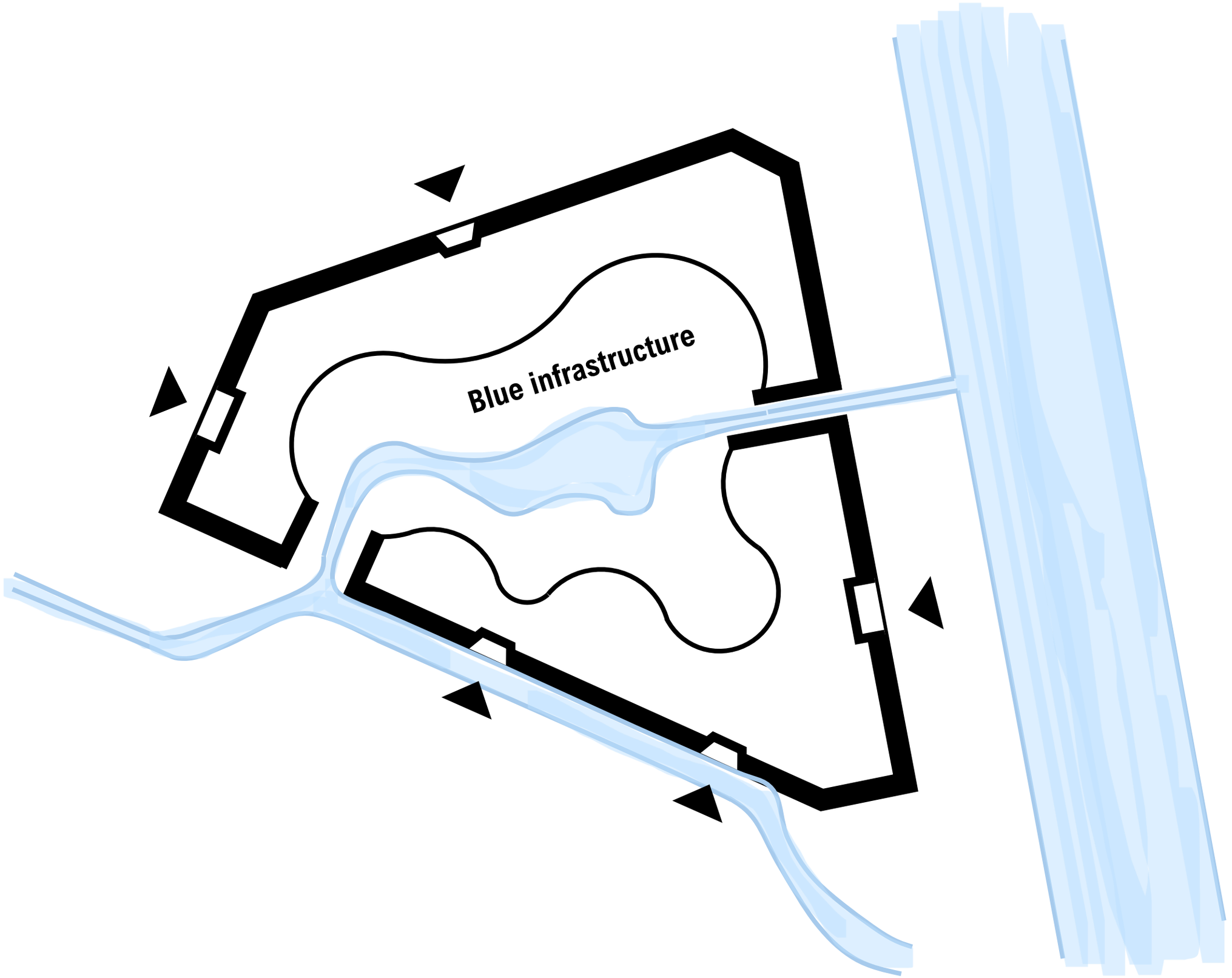


Problem statement

Research

Implementation

Urban scale

Building scale

Detail scale

Use

CONCEPT & INTERVENTIONS

Problem statement

Research

Implementation

Urban scale

Building scale

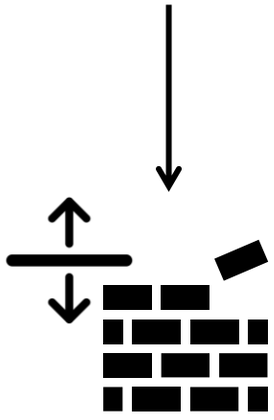
Detail scale

Use

CONCEPT & INTERVENTIONS

INTERVENTIONS AND THEIR FUNCTION

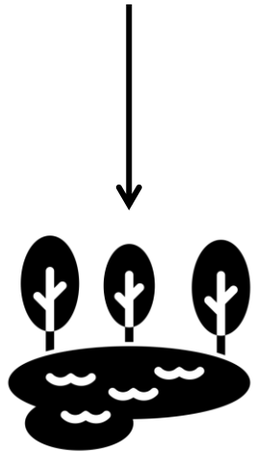
Passive & Active systems



Thick walls

Thermal mass

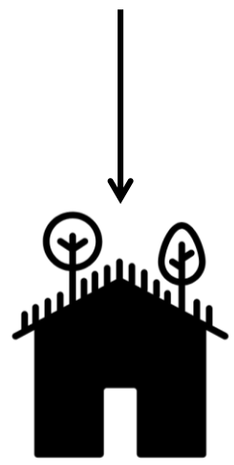
Blue and Green Infrastructure



Trees & canals

Waterbuffer, cooling & biodiversity

Integration with Environment



Roof as a landscape

Recreation & waterfilter

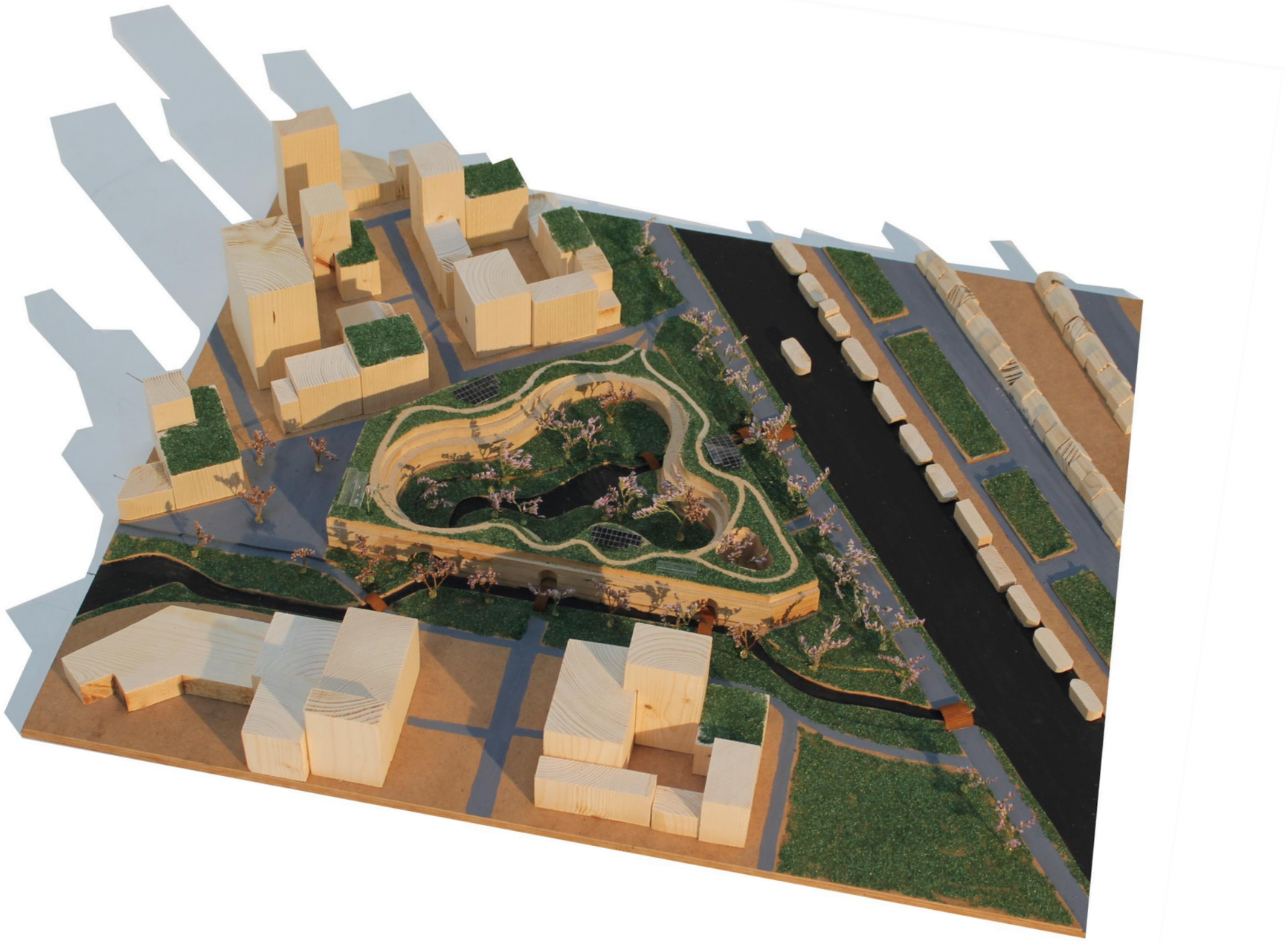
MATERIALIZATION

MATERIALIZATION

MATERIALIZATION

MATERIALIZATION

INTEGRATION IN NEIGHBORHOOD



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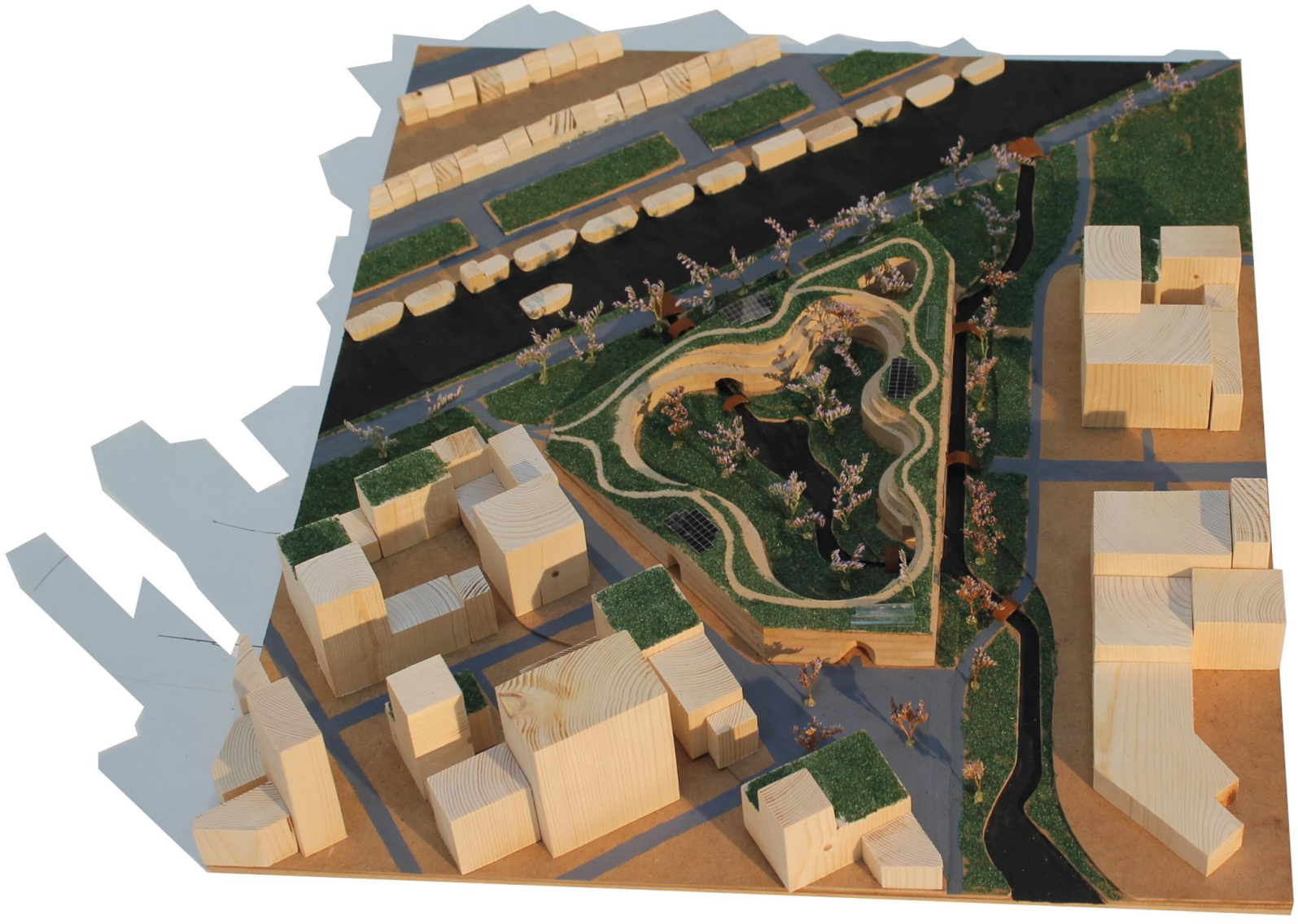

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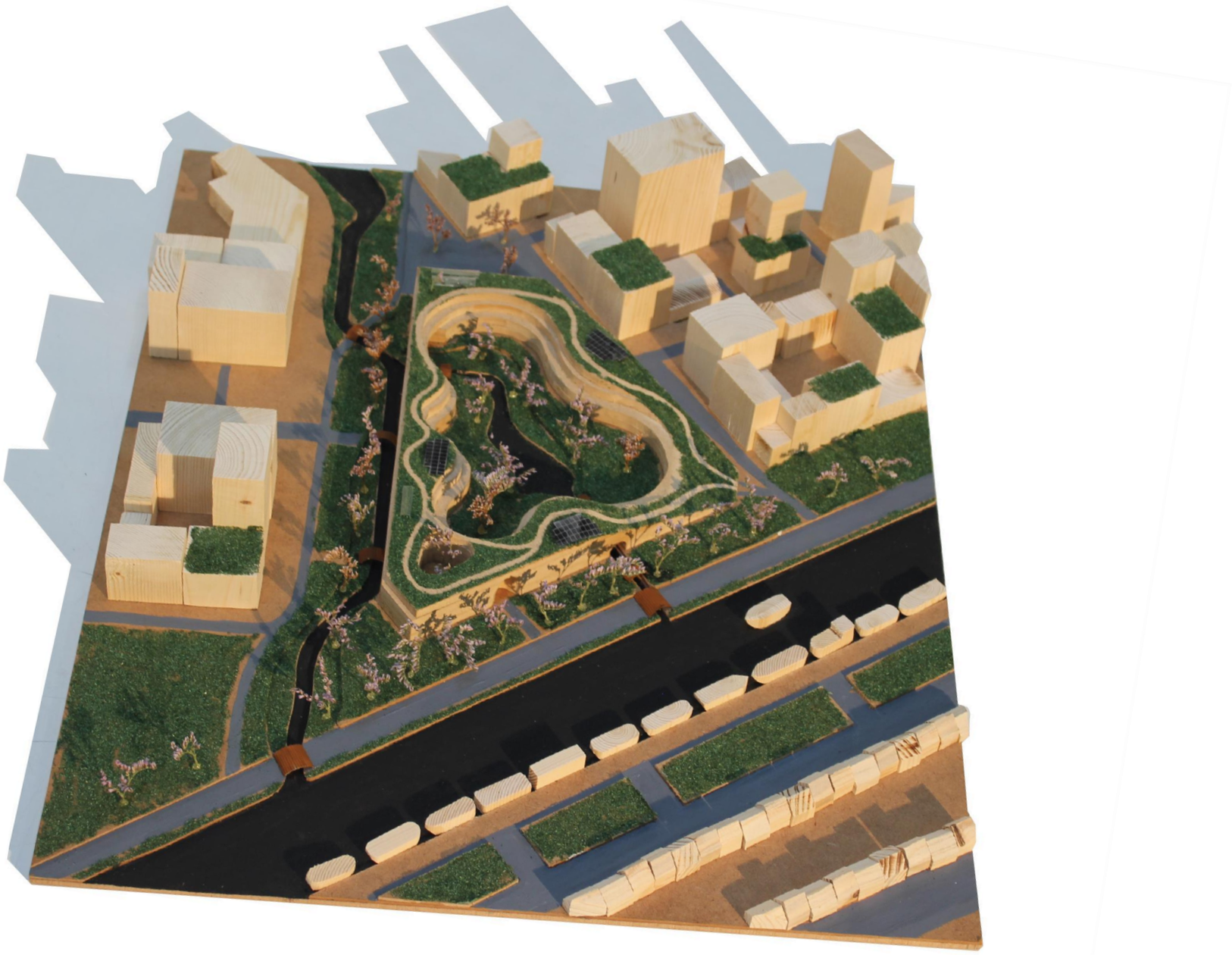
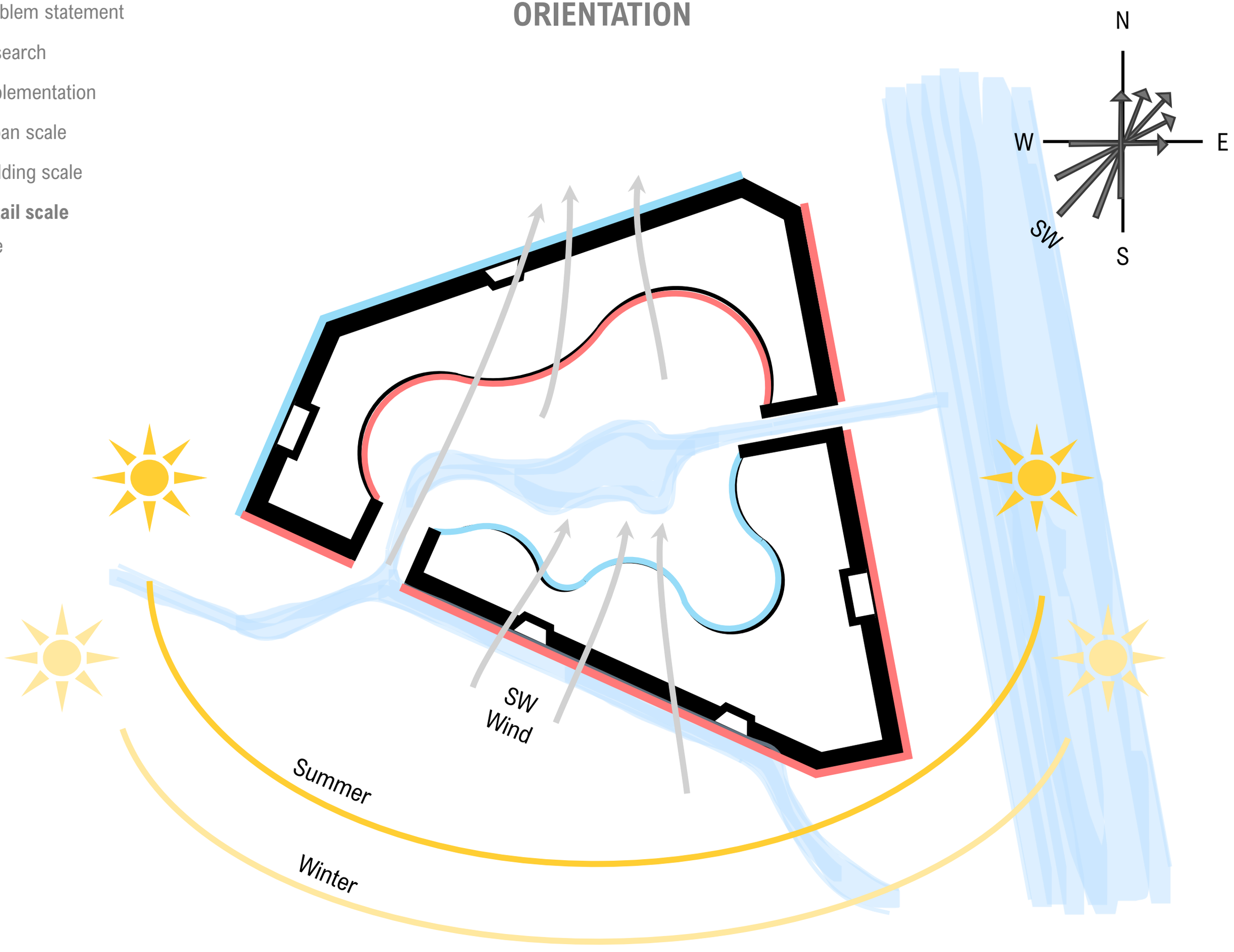


BUILDING SCALE

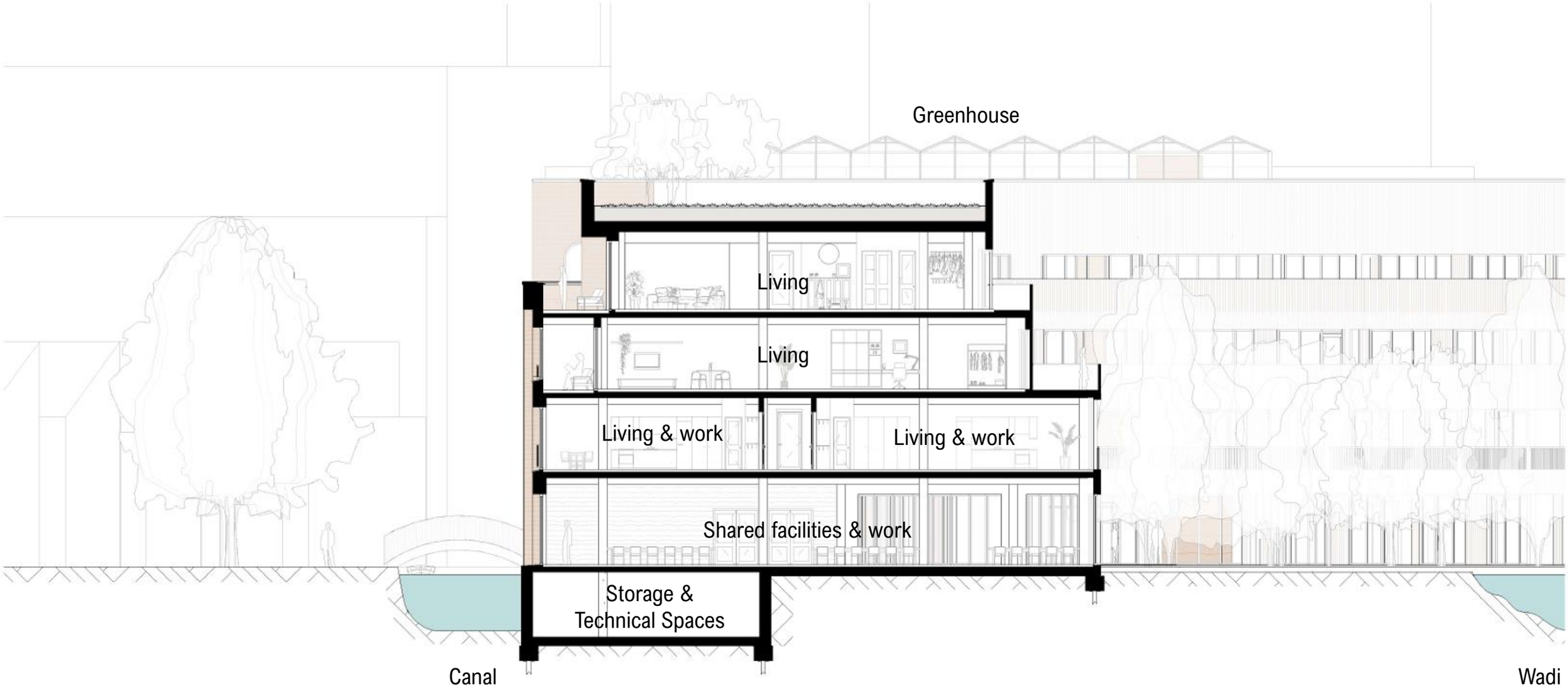
ORIENTATION



GROUND FLOOR PLAN

GROUND FLOOR PLAN

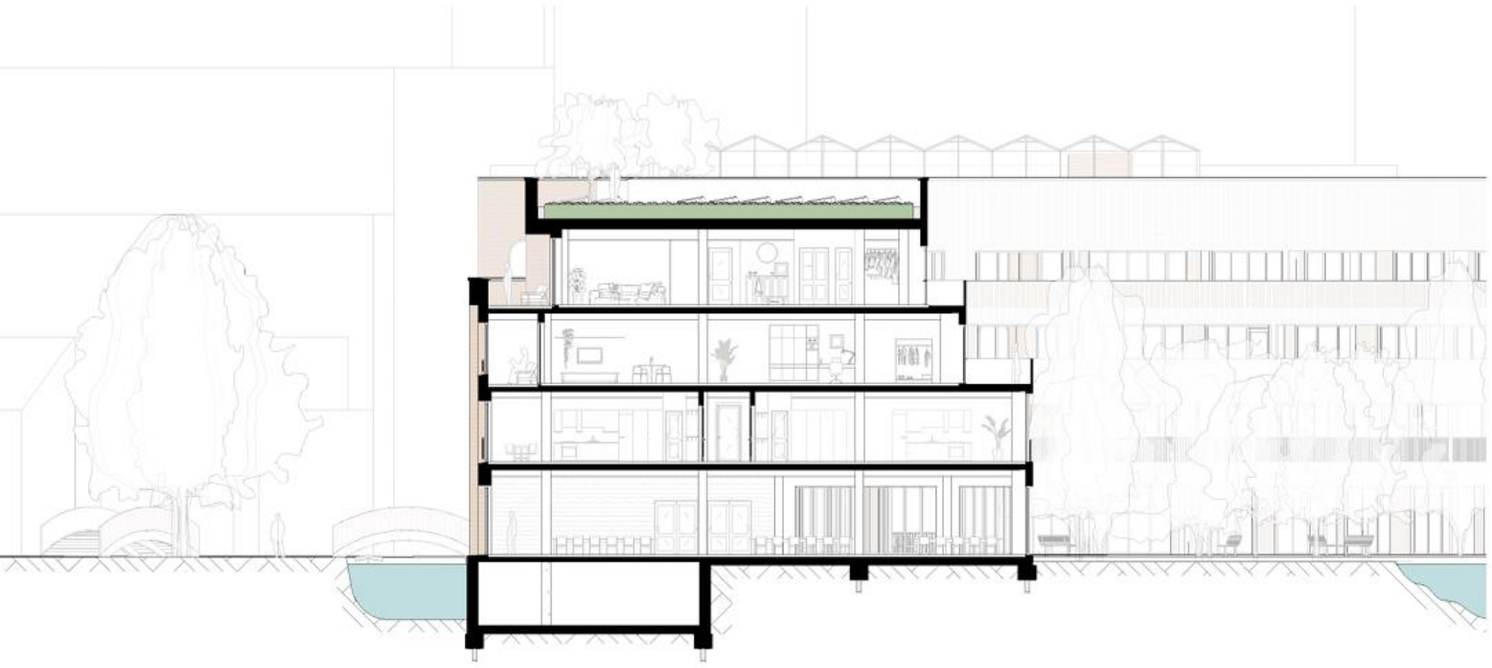
SECTION

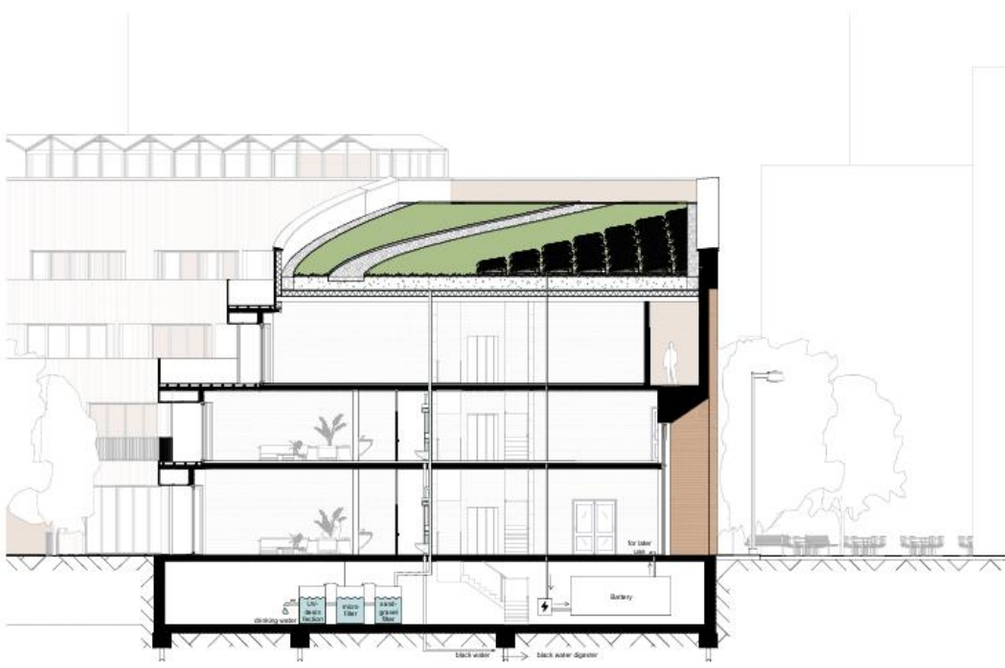


Section A
Schaal 1 : 200

GROUND FLOOR PLAN

SECTION





ROOF AS A LANDSCAPE

Problem statement

Research

Implementation

Urban scale

Building scale

Detail scale

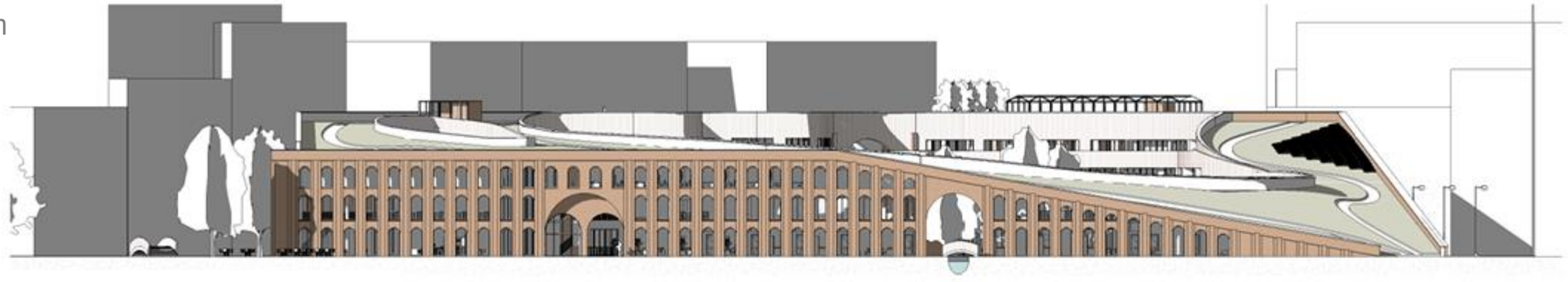
Use

Plaza

Park

0 5 10 20 30 40 50

ELEVATIONS



East side Elevation

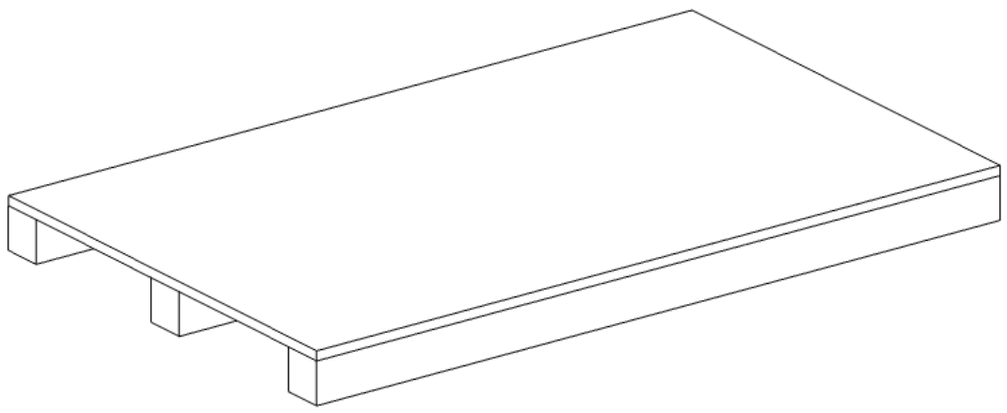
South-west side Elevation

North- west side Elevation

North side Elevation

STRUCTURE

STRUCTURE



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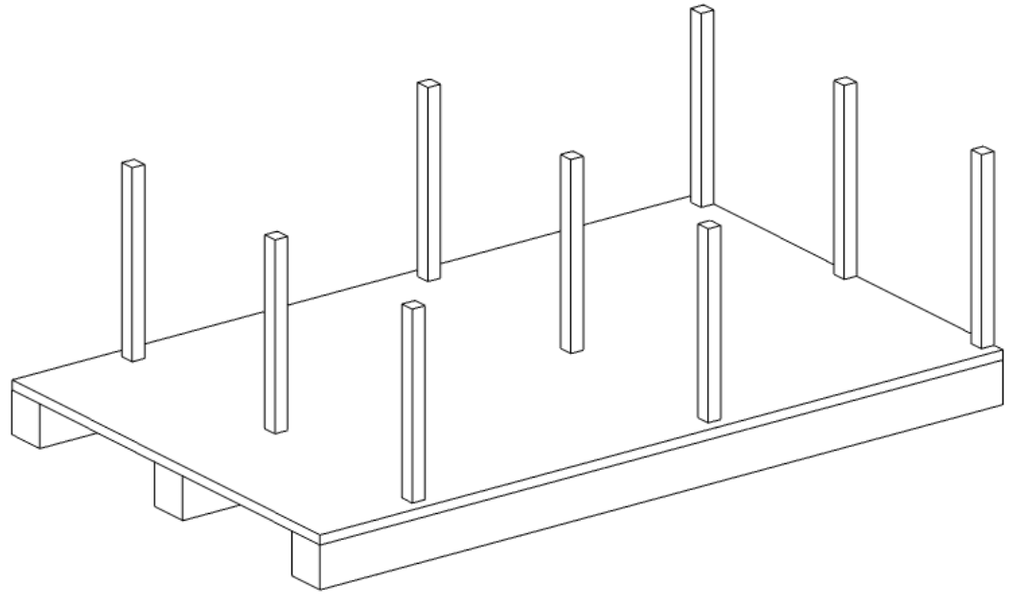

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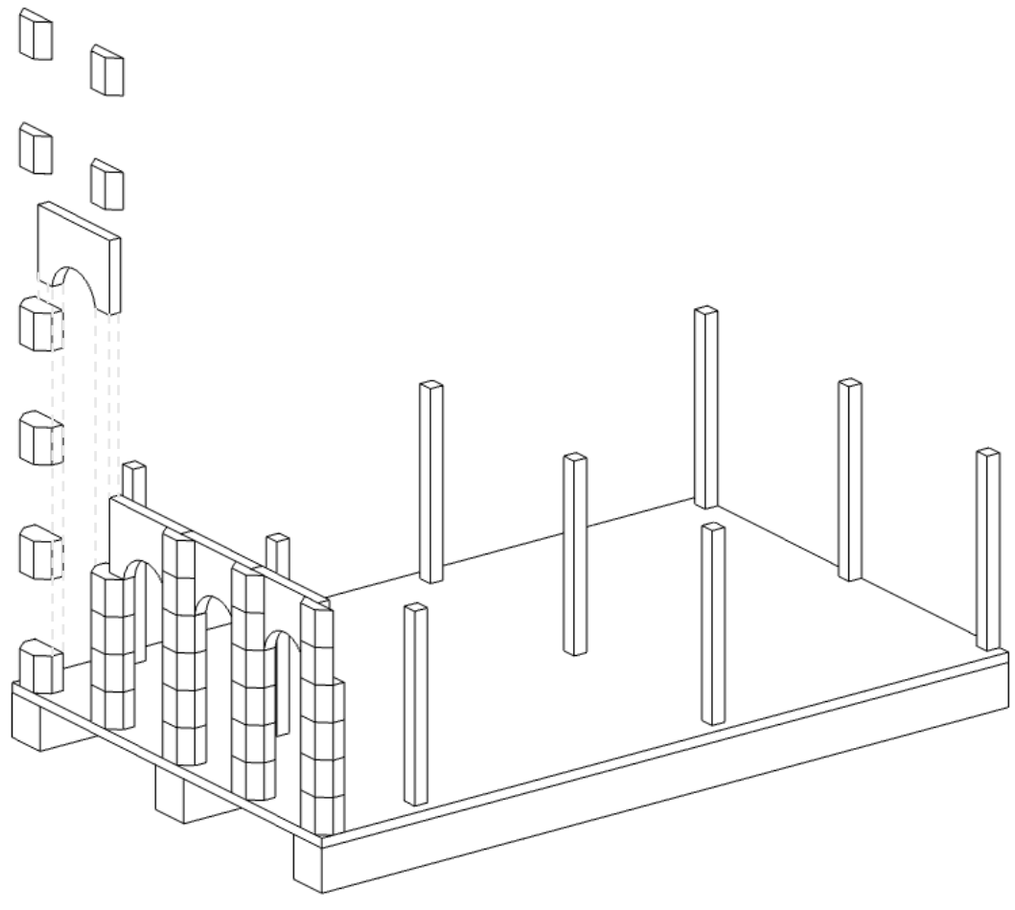

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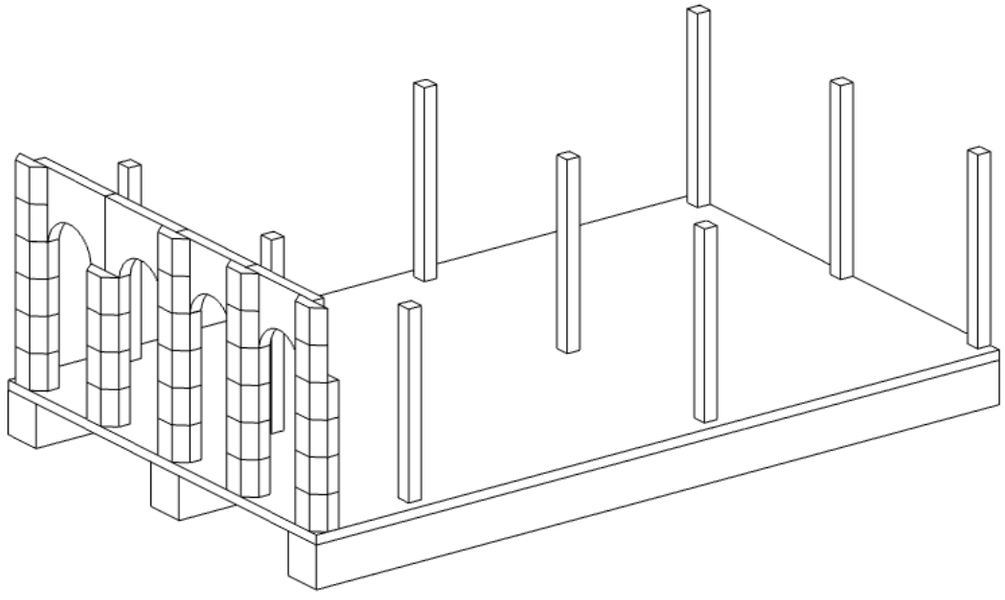

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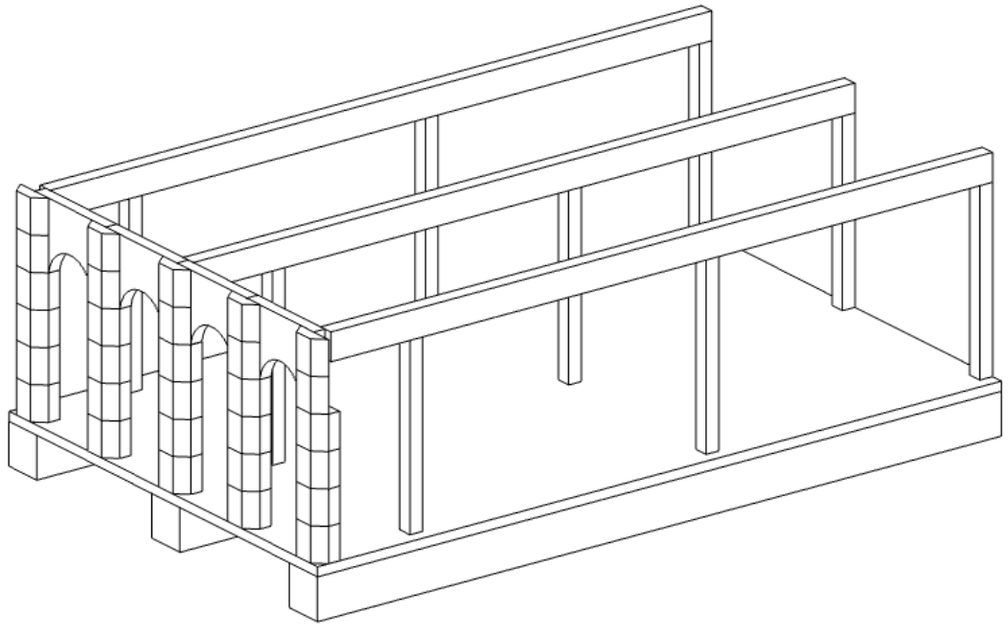

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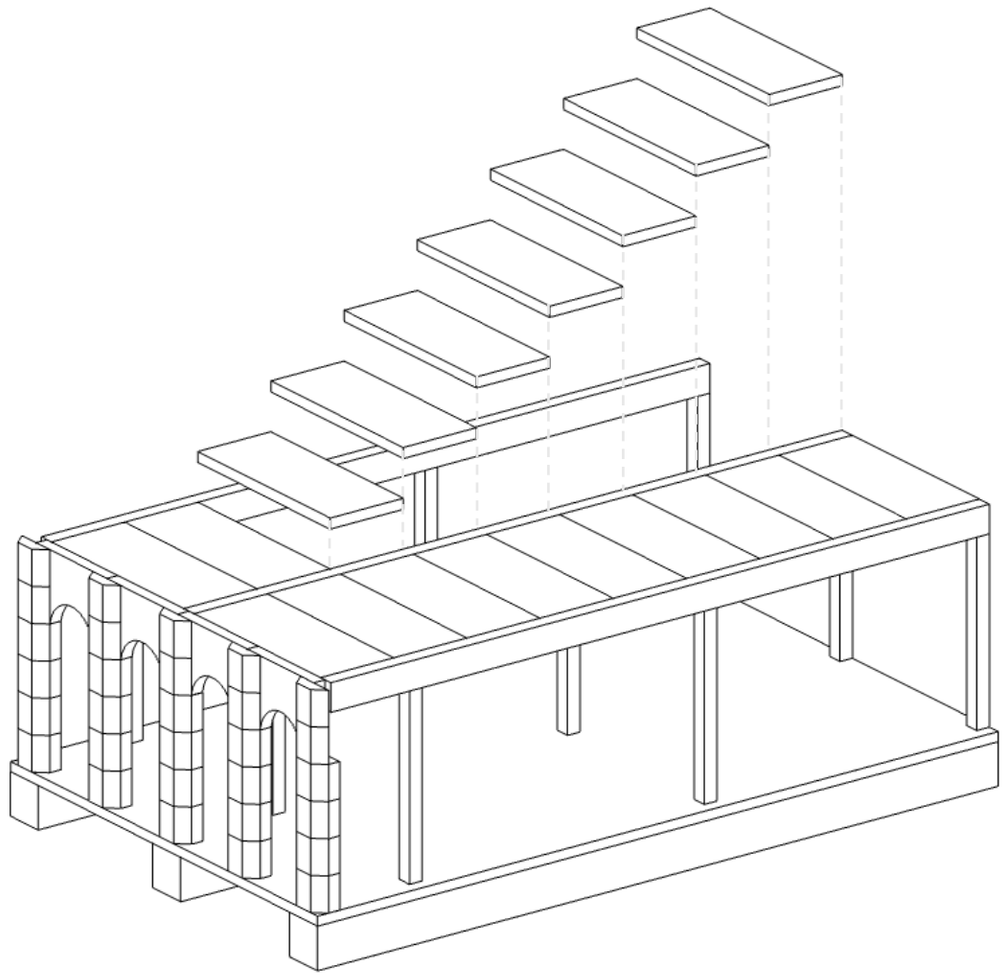

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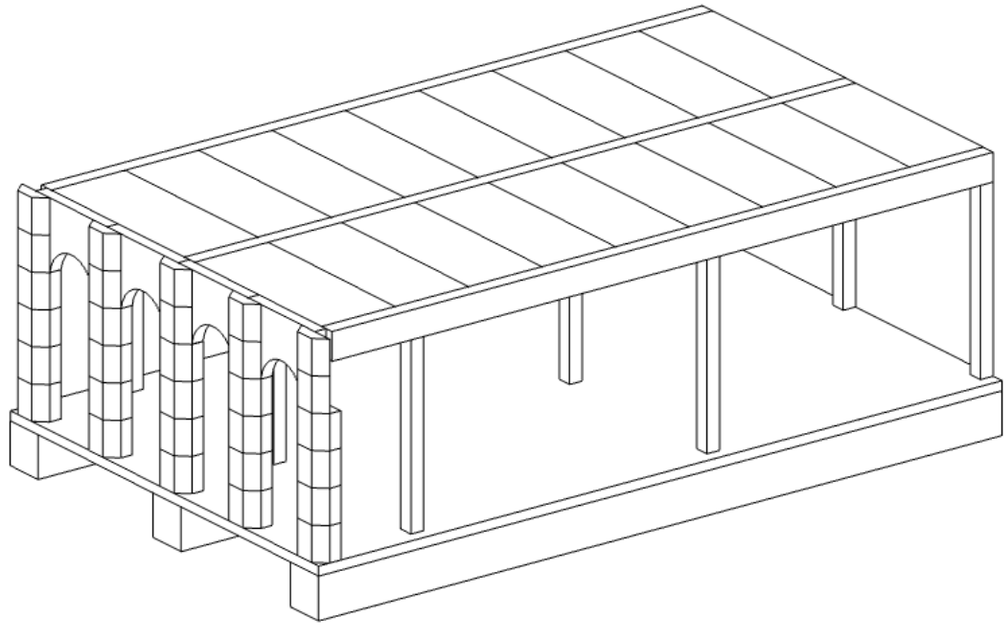

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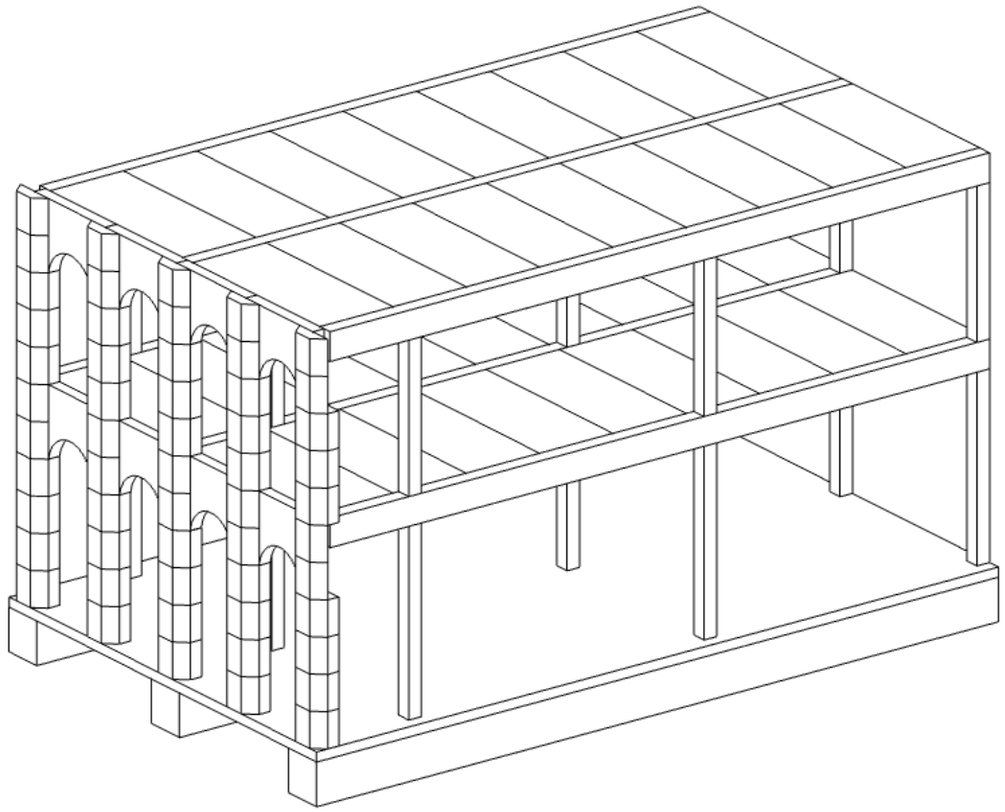

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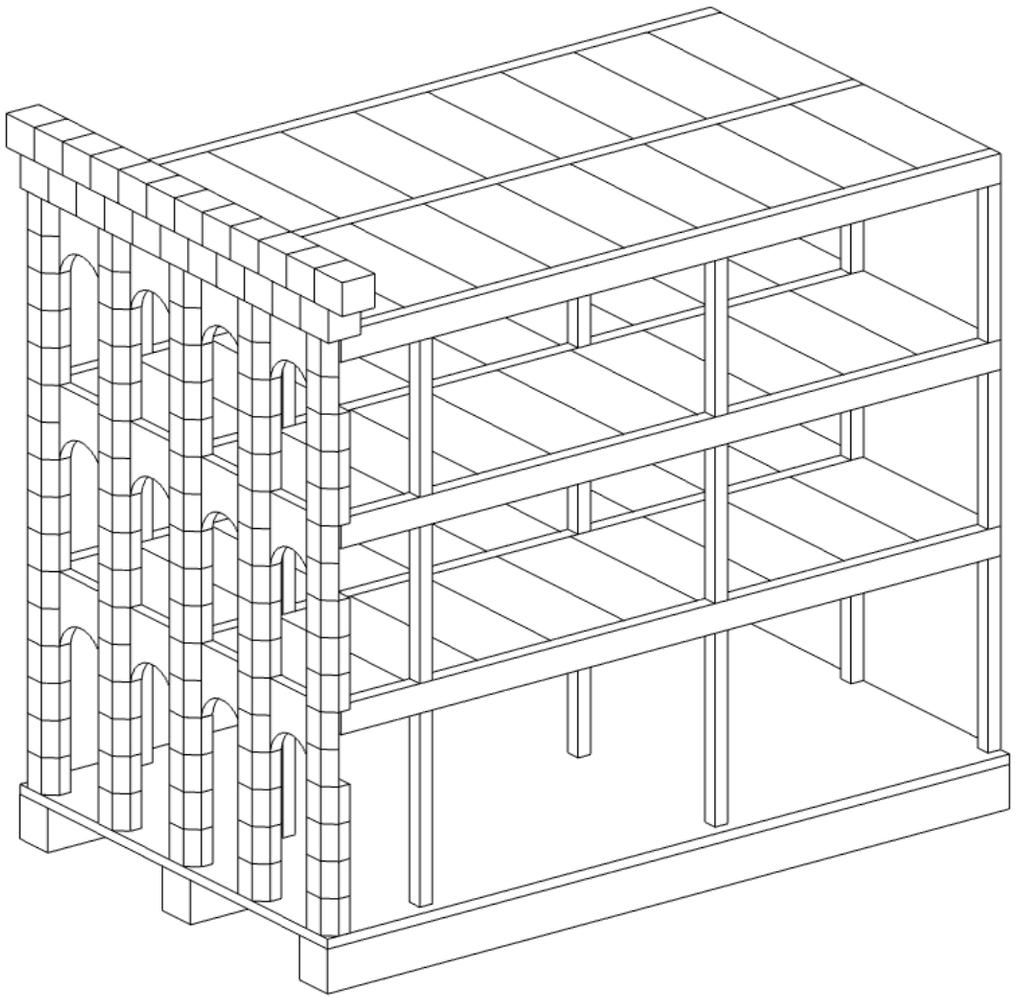

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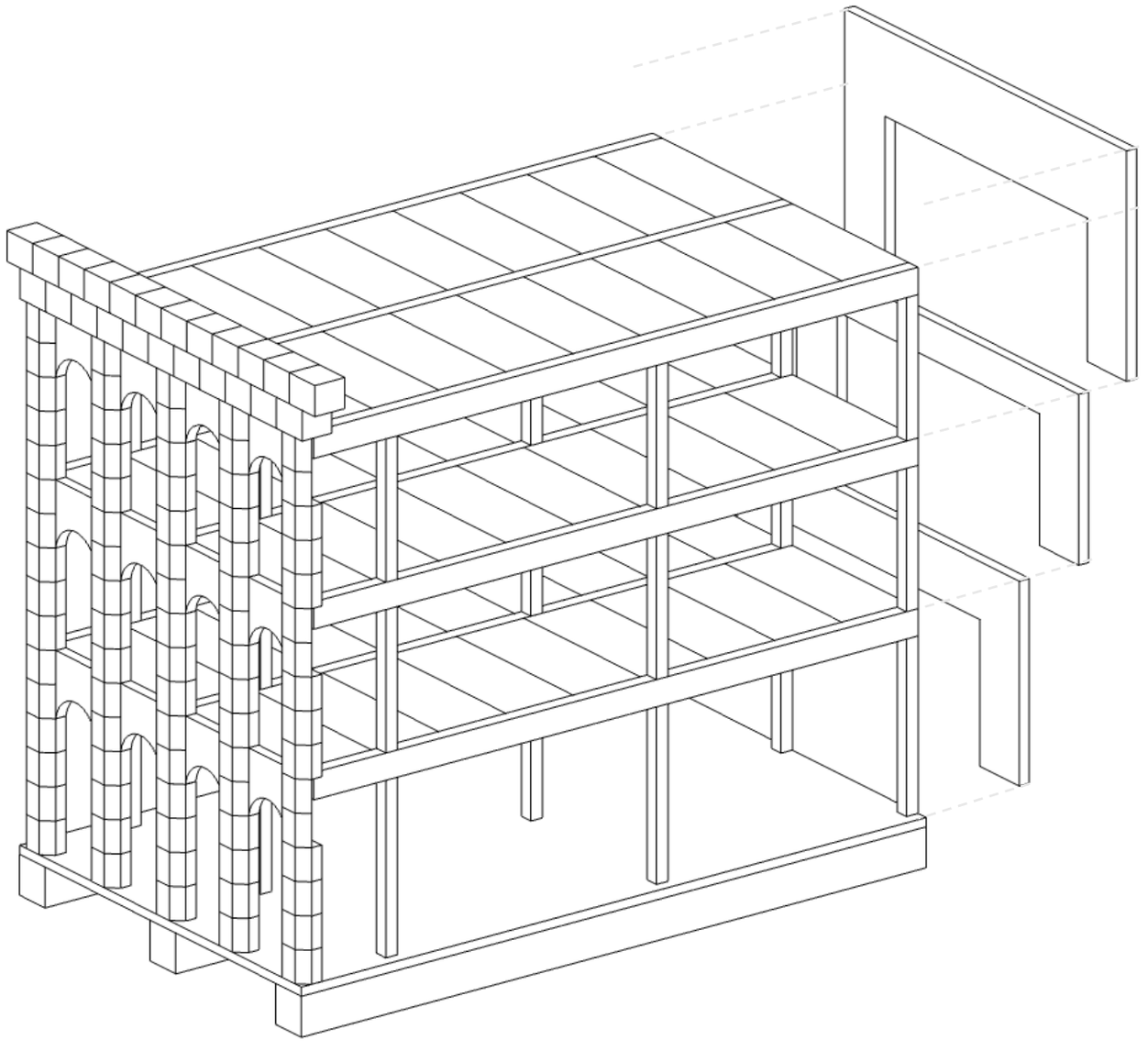
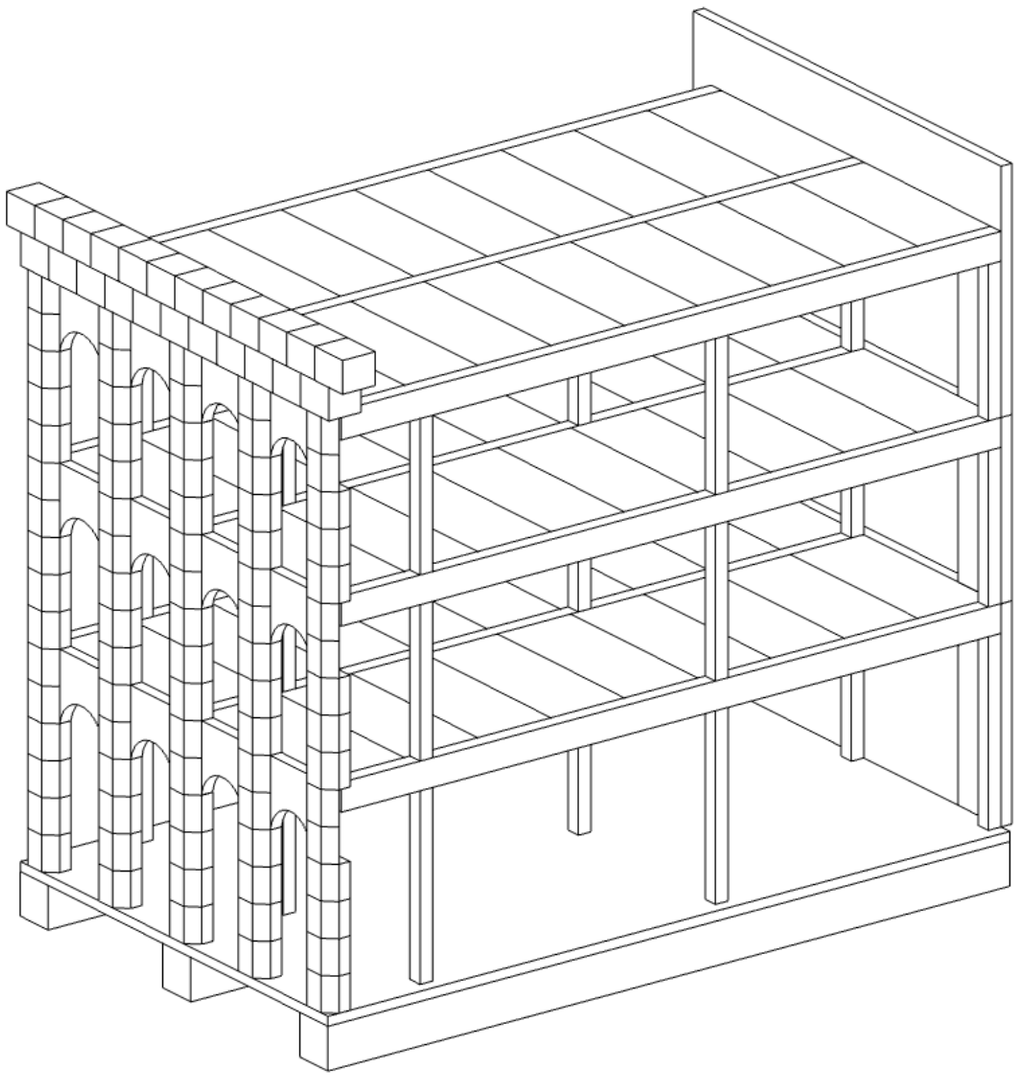
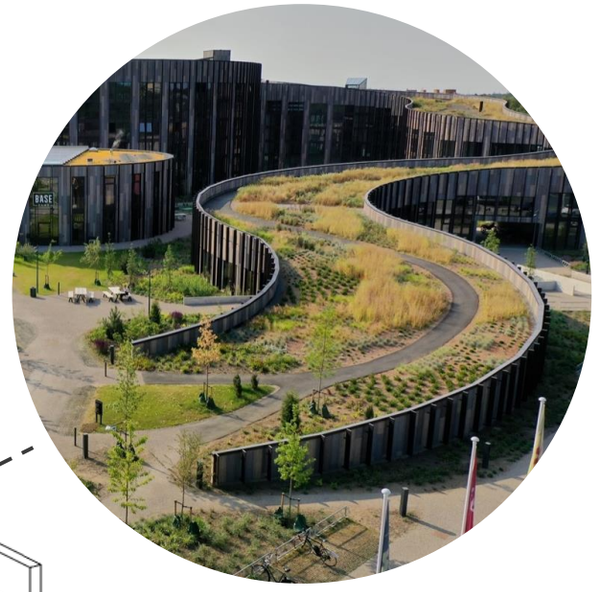
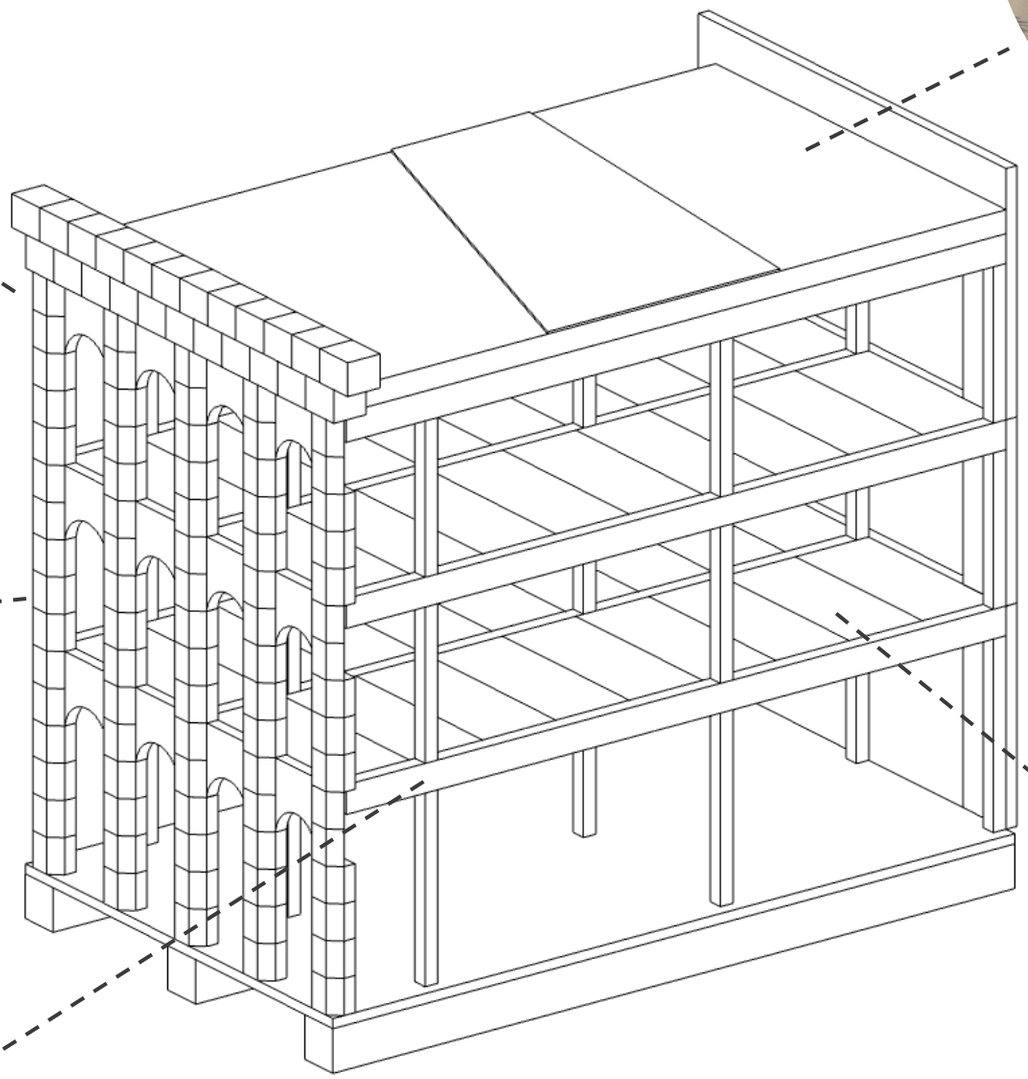


STRUCTURE



MATERIALS





DETAIL SCALE

Problem statement

Research

Implementation

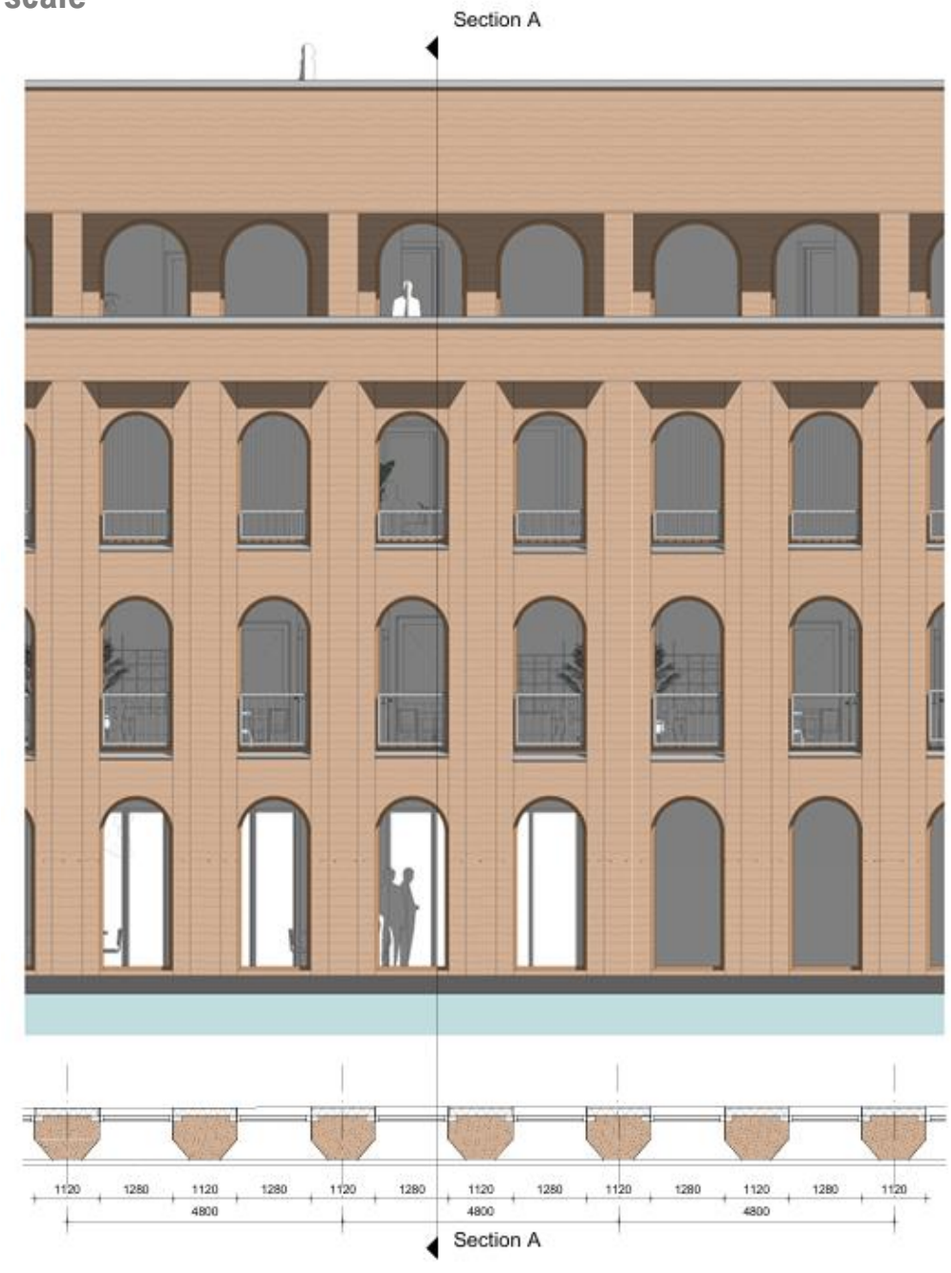
Urban scale

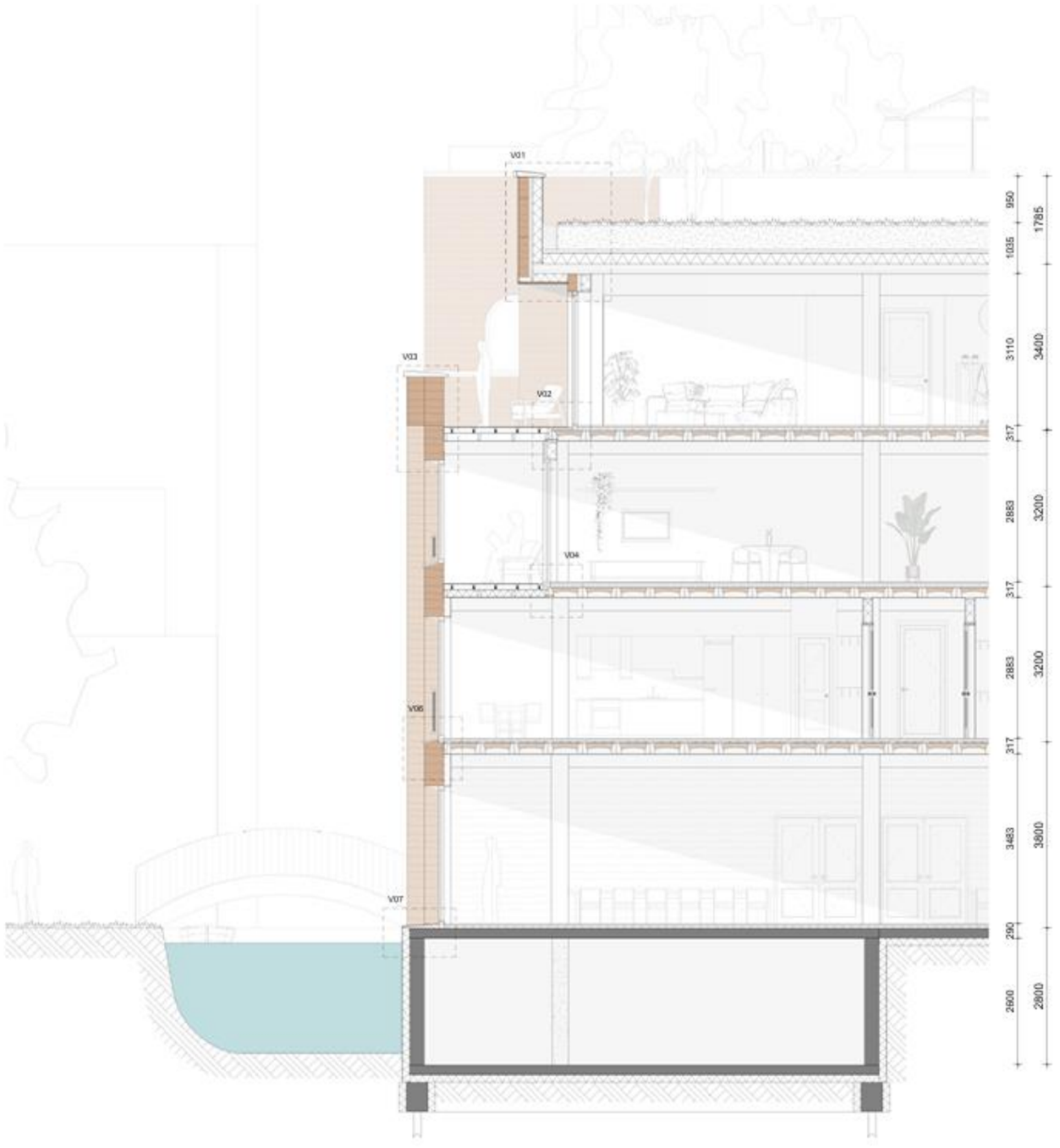
Building scale

Detail scale

Use

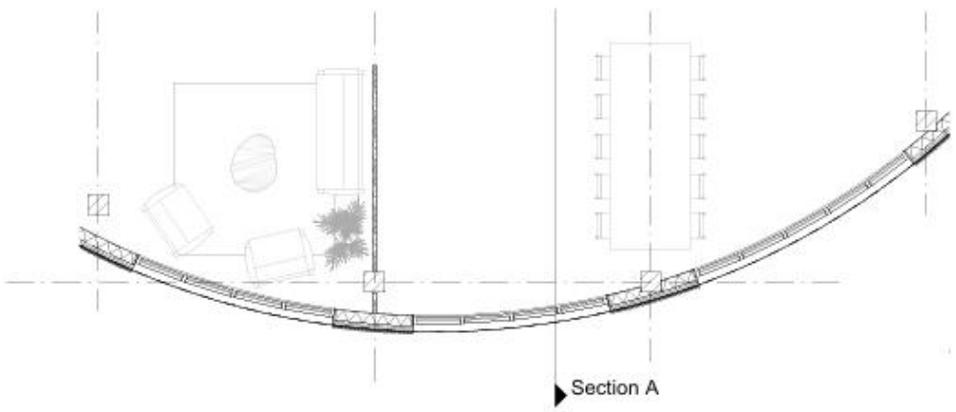
FRAGMENT FORT FACADE



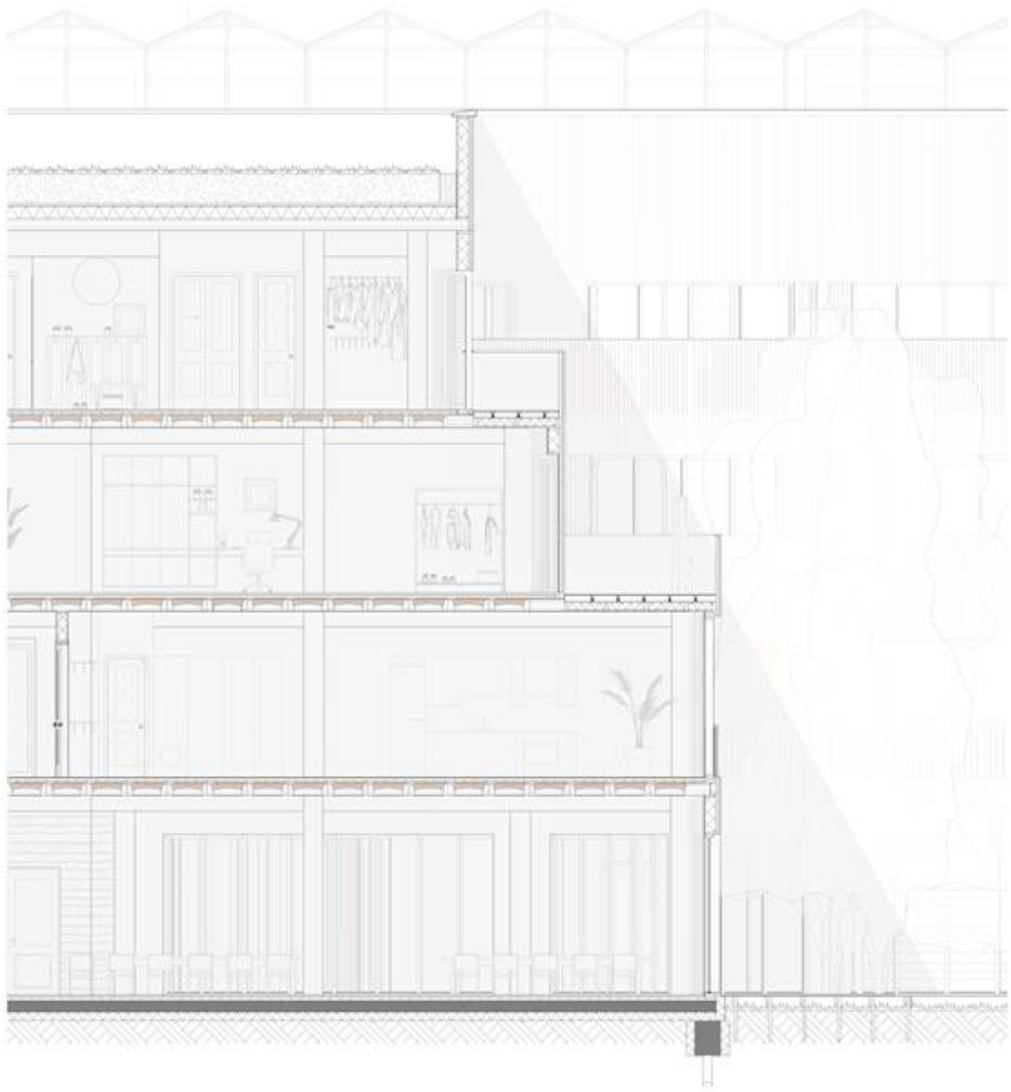


Fragment Fort-facade
Scale 1:50

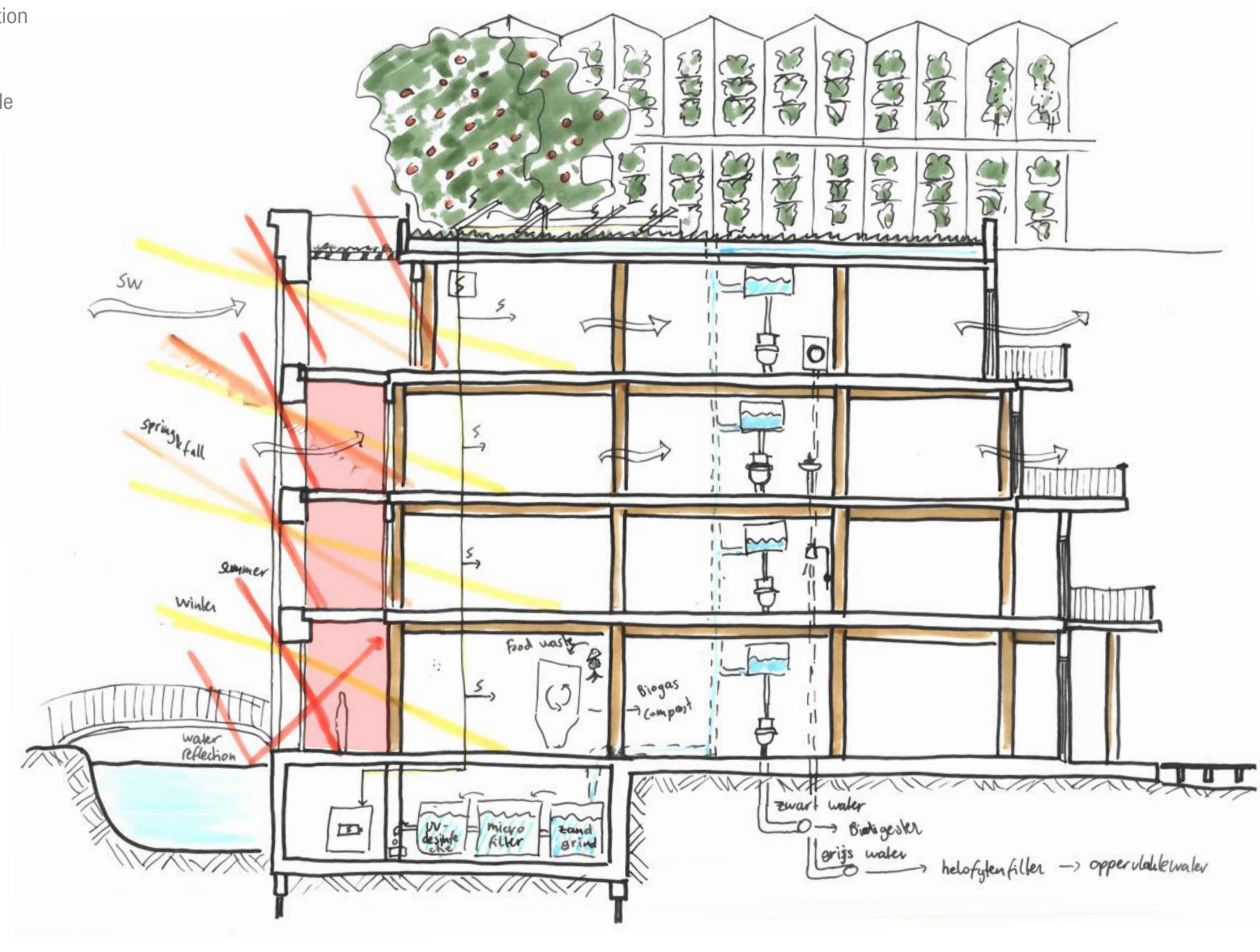
FRAGMENT WOODEN FACADE



Fragment Wood-facade
Scale 1:50



CLIMATE AND SYSTEMS



DETAILED SECTION

THE USE

SEMI-PRIVATE SPACE

SEMI-PRIVATE SPACE

SEMI-PRIVATE SPACE

Problem statement

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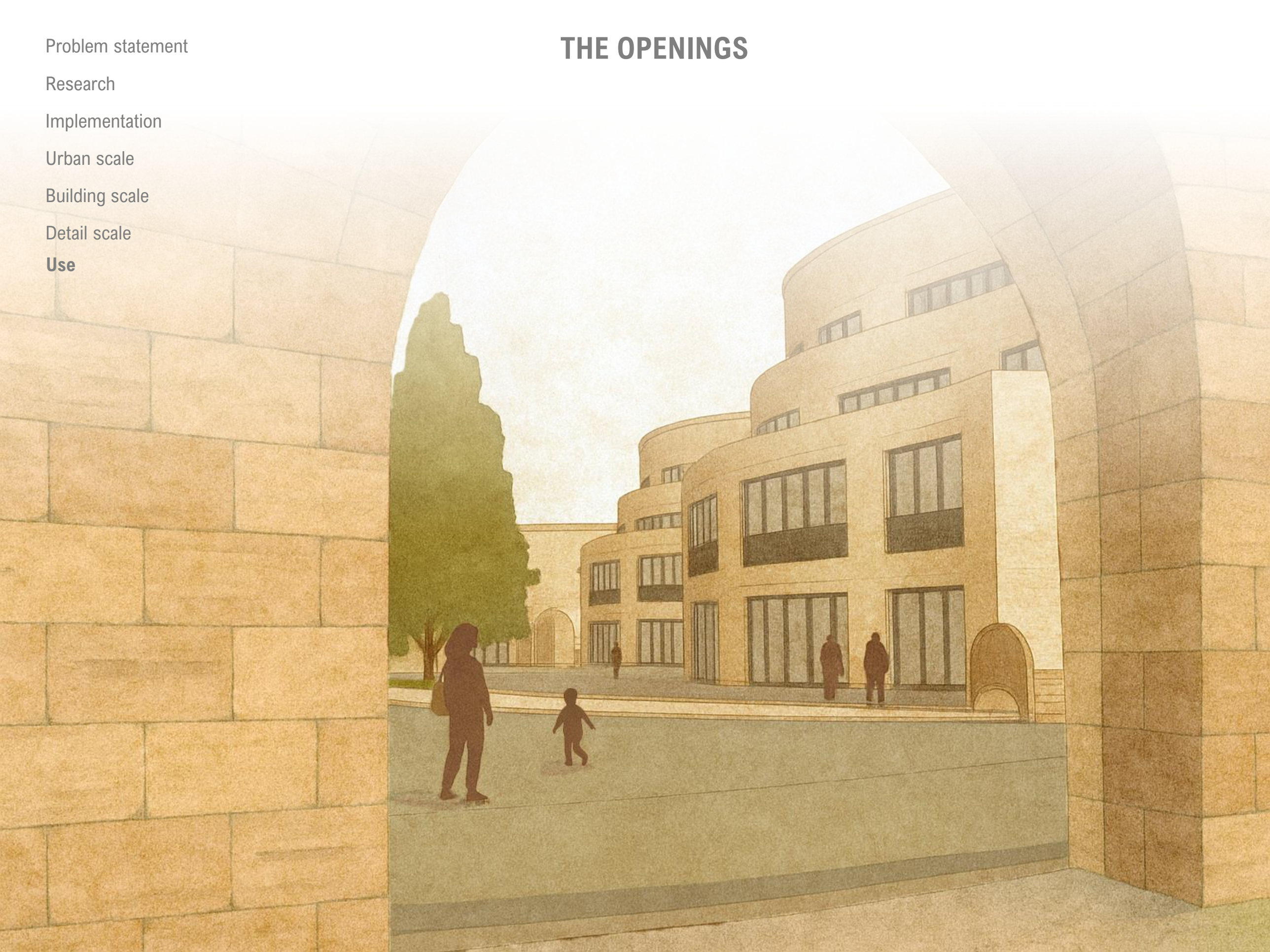
Use

THE OPENINGS

THE OPENINGS



THE COURTYARD

THE COURTYARD

Problem statement

Research

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Urban scale

Building scale

Detail scale

Use

THE NEIGBOURHOOD RESTAURANT

THE ROOF AS A LANDSCAPE

THANK YOU!