

PRODUCTIVE NEIGHBORHOODS

TRANSFORMATION OF THE SPAANSE POLDER

INDIVIDUAL PRESENTATION P5

GROUP 4 | SUSTAINABLE THINKING

JUSTIN VERMEULEN

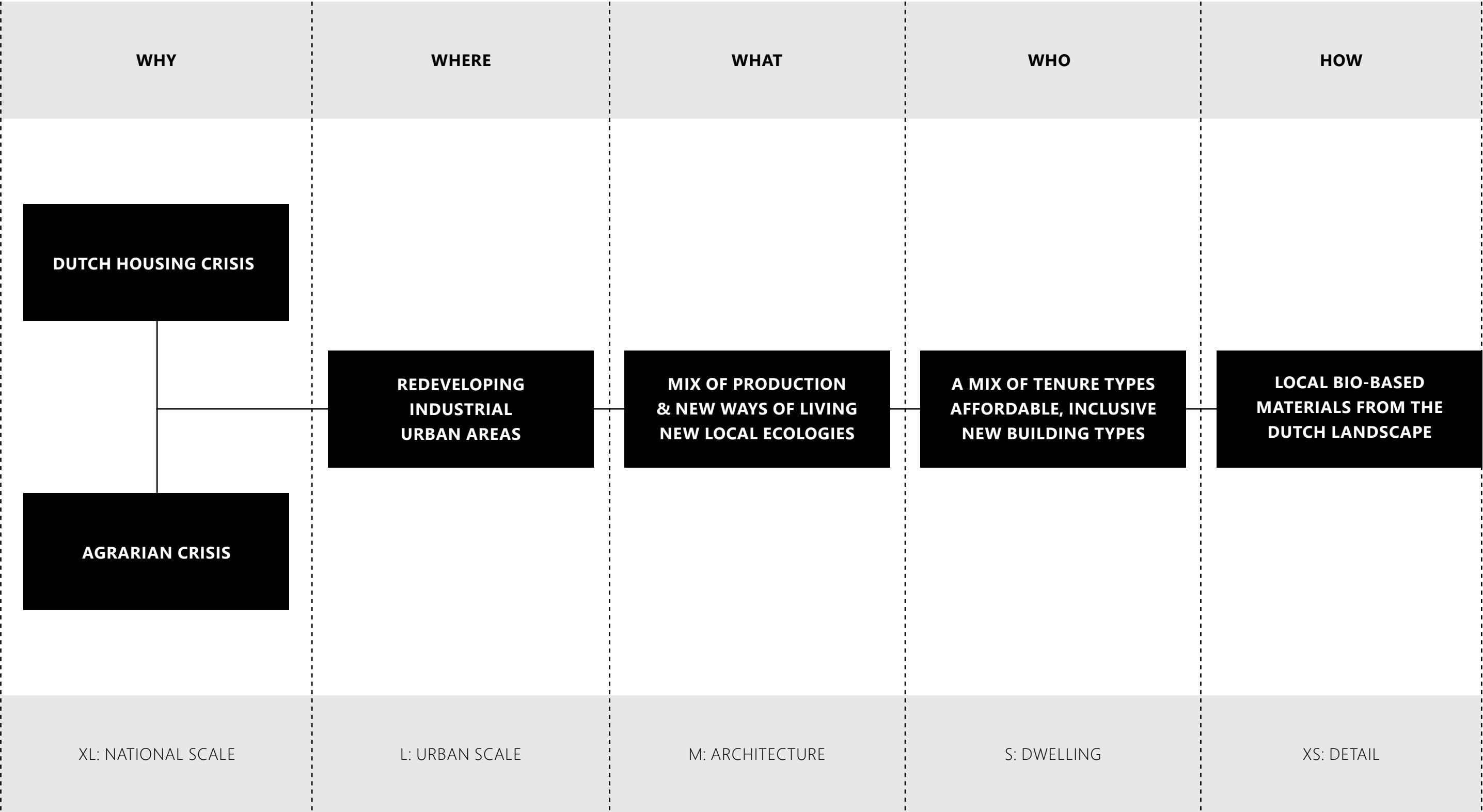
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3RD OF JULY 2024



THE RESEARCH

RESEARCH SCOPE



DESIGN BY RESEARCH

RESEARCH BY DESIGN▶

RESEARCH QUESTION

NATIONAL STRATEGIES

WHY DO WE FACE A HOUSING CRISIS AND
WHAT DOES AN AGRICULTURAL TRANSITION ENTAIL?

I

II

URBAN STRATEGIES

CAN INDUSTRIAL URBAN AREAS BE REDEVELOPED
INTO MIXED-USE NEIGHBORHOODS?

CAN **INDUSTRIAL URBAN AREAS** BE **REDEVELOPED** IN RESPONSE TO
THE **AGRICULTURAL TRANSITION** AND MITIGATE THE **HOUSING CRISIS**
WITH **INCLUSIVE, AFFORDABLE HOUSING COMMUNITIES**?

CAN INDUSTRIAL BUILDINGS BE RE-PURPOSED INTO
MIXED-USE, INCLUSIVE HOUSING COMMUNITIES?

III

IV

BUILDING STRATEGIES

DWELLING STRATEGIES

HOW TO REALIZE AFFORDABLE HOUSING TYPES
WITHOUT LOSING ESSENTIAL LIVING QUALITIES?

PROBLEM STATEMENT

HOUSING CRISIS



The Cabinet of Pierson, formulators of 'de Woningwet' (1898)



Rotterdam Blaak, a necessity for reconstruction after WWII (1945)



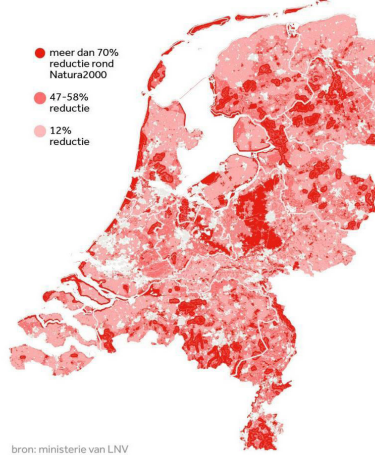
Riots during the succession day of Queen Beatrix (1980)



Demonstrations to bring attention to the need for affordable public housing (2021)

PROBLEMS

In deze gebieden moet de stikstofuitstoot omlaag



bron: ministerie van LNV

NOx Reduction chart (NOS, 2022)



Tractors blocking the highway, as a form of protest (NOS, 2022)

Uitkopen vanwege stikstof: hoe sneller een boer stopt, hoe meer geld hij krijgt

Door Stephan Koole en Marieke van de Zilver

30 maart 2022 18:30 • Aangepast 30 maart 2022 18:50



The government and municipalities buy farmlands to control the national carbon budget (RTL, 2022).



The countryside is evolving into an artificially optimized indoor production machine (AMO, 2020).

HOUSING CRISIS

"WE NEED TO BUILD 1 MILLION HOMES". (BY 2030)
- ACCORDING TO MOST DUTCH POLITICAL PARTIES

WHY?

WHO?

HOW?

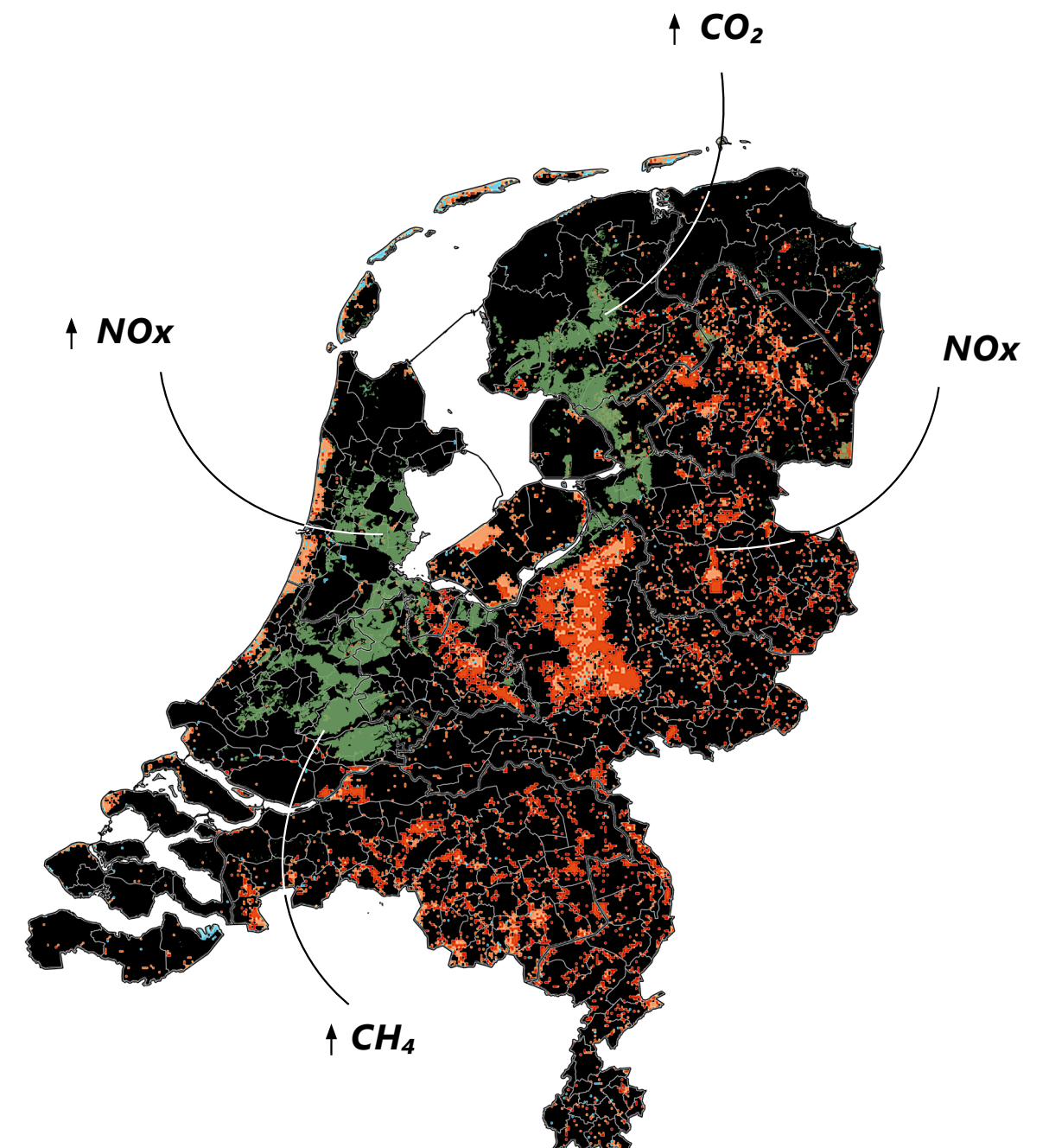
WHERE?



A confident focus on quantity instead of quality.
The 'what' is clear- but why, where, how and for whom?

PROBLEMS

NO_x, CO₂, CH₄



The correlation between the Dutch landscape,
national emissions and sequestration.

HOUSING CRISIS

"WE NEED TO BUILD 1 MILLION HOMES". (BY 2030)
- ACCORDING TO MOST DUTCH POLITICAL PARTIES

WHY?

WHO?



WHERE?

HOW?

PROBLEMS

WE NEED A LOT OF SPACE
TO ACCOMMODATE FOR
THESE TRANSITIONS

WHERE CAN WE BUILD?

NO_x, CO₂, CH₄



AGRARIAN CRISIS

A confident focus on quantity instead of quality.
The 'what' is clear- but why, where, how and for whom?

The correlation between the Dutch landscape,
national emissions and sequestration.

SPATIAL SOLUTION?

1000 KM2 OF INDUSTRIAL AREAS



Industrial estates are scattered all over the Netherlands,
could these areas offer spatial solutions?

SPATIAL SOLUTION?

1000 KM2 OF INDUSTRIAL AREAS

ALL MAJOR CITIES COMBINED

976 KM2



INDUSTRIAL AREAS

1,000 KM2

CITIES COMBINED:

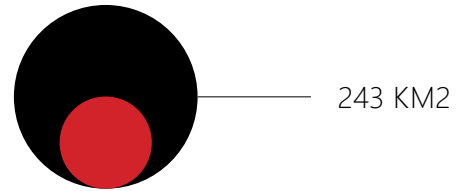
976 KM2

INDUSTRIAL AREAS:

1000 KM2

Industrial estates are scattered all over the Netherlands,
could these areas offer spatial solutions?

AMSTERDAM



243 KM2

ROTTERDAM



132 KM2

UTRECHT



99 KM2

THE HAGUE



98 KM2

EINDHOVEN



89 KM2

TILBURG



88 KM2

GRONINGEN



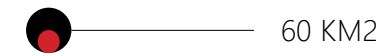
84 KM2

BREDA



83 KM2

MAASTRICHT



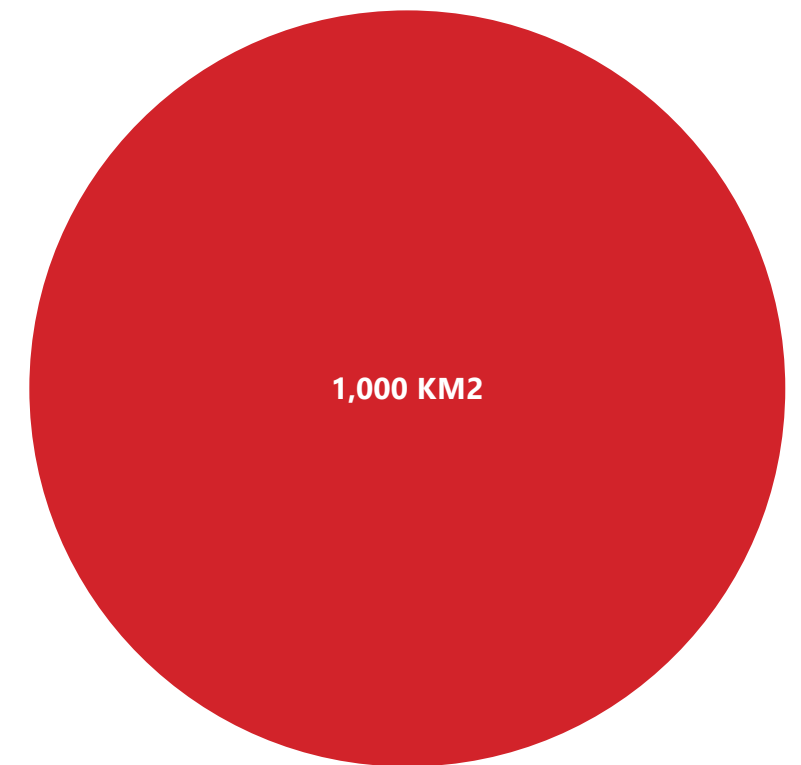
60 KM2

SPATIAL SOLUTION?

1000 KM2 OF INDUSTRIAL AREAS

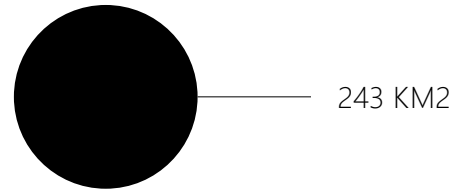


INDUSTRIAL AREAS



Industrial estates are scattered all over the Netherlands,
could these areas offer spatial solutions?

AMSTERDAM



ROTTERDAM



UTRECHT



THE HAGUE



EINDHOVEN



TILBURG



GRONINGEN



BREDA

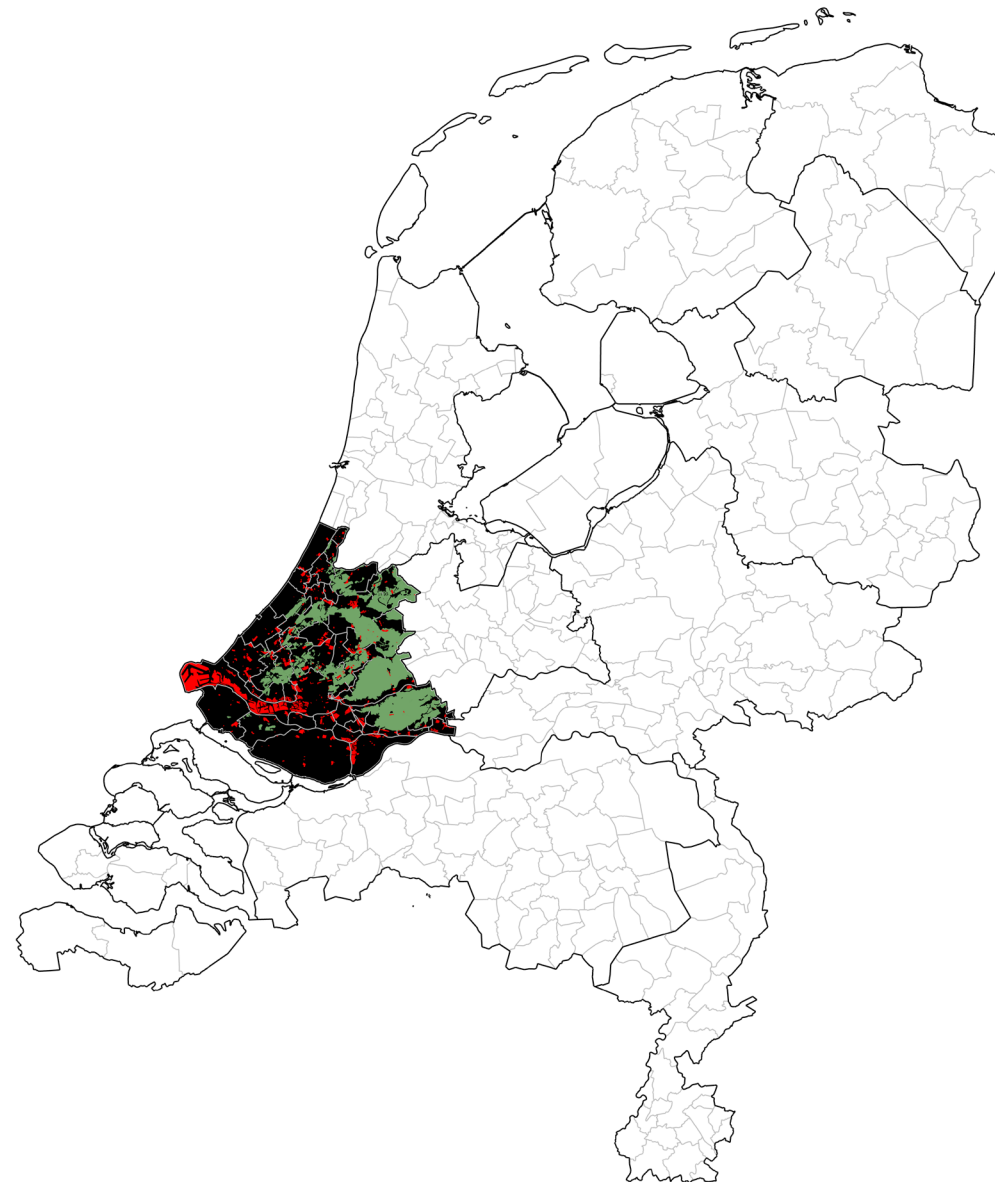


MAASTRICHT



SPATIAL SOLUTION?

1000 KM2 OF INDUSTRIAL ESTATES
IN THE NETHERLANDS - A LOT OF SPACE TO LIVE AND WORK



INDUSTRIAL AREAS IN ROTTERDAM



**TOTAL:
88 KM2**



**HARBOR:
73 KM2**



**URBAN:
15 KM2**

Industrial estates are scattered all over the Netherlands,
could these areas offer spatial solutions?

DEVELOP ONLY 10% OF 15 KM2 = 1,500,000 M2

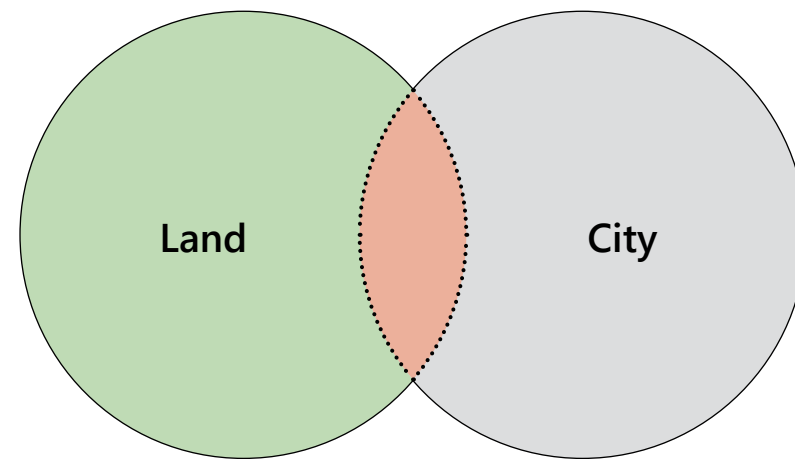
ALREADY A LOT OF SPACE TO ACCOMMODATE

01 - MIDDEN-DELFLAND

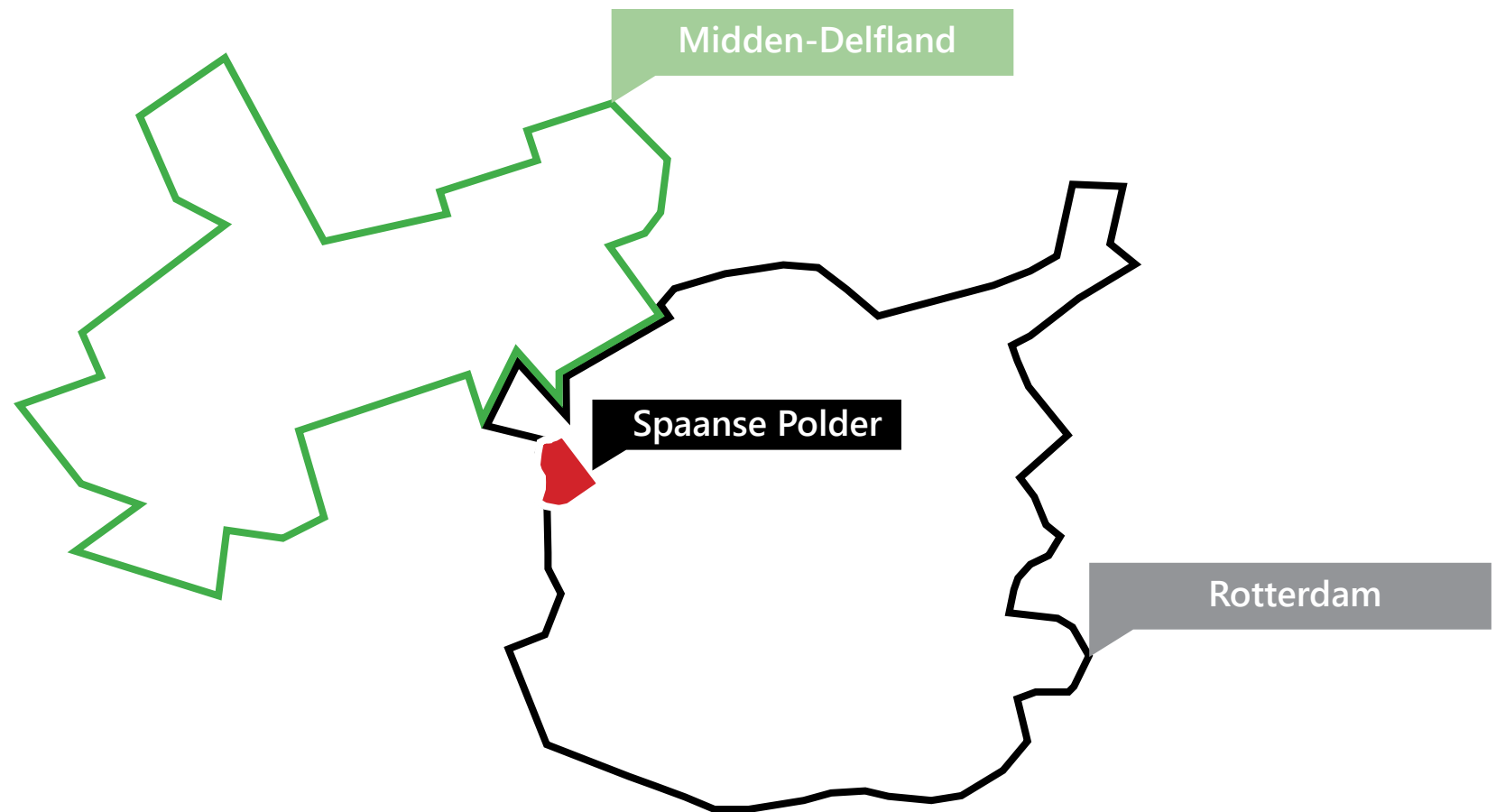


Figure X. The surroundings and situation of Midden-Delfland, enclosed by large cities and industry (GE, 2024).

Spaanse Polder



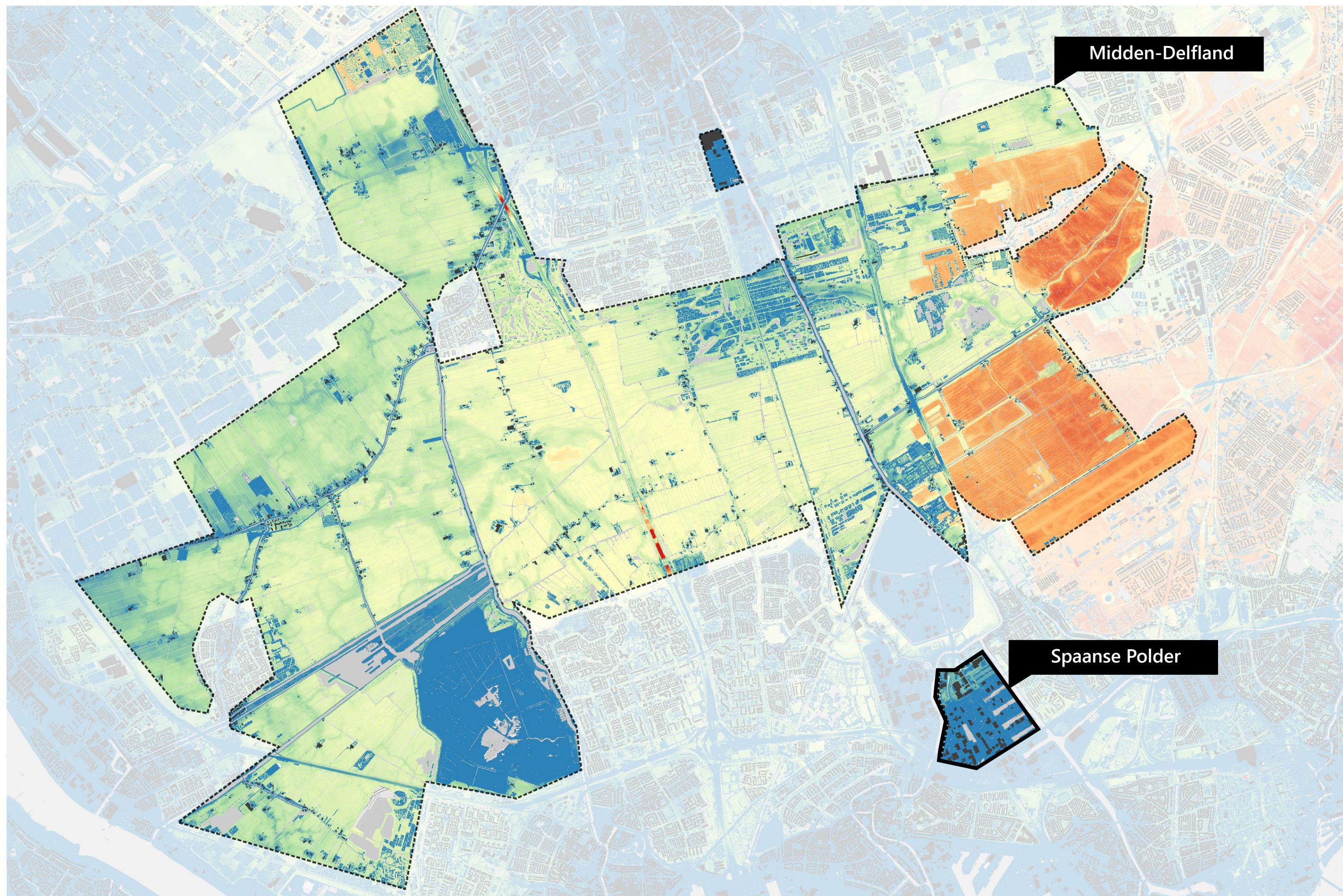
The industrial urban area is situated at the intersection of both land and city



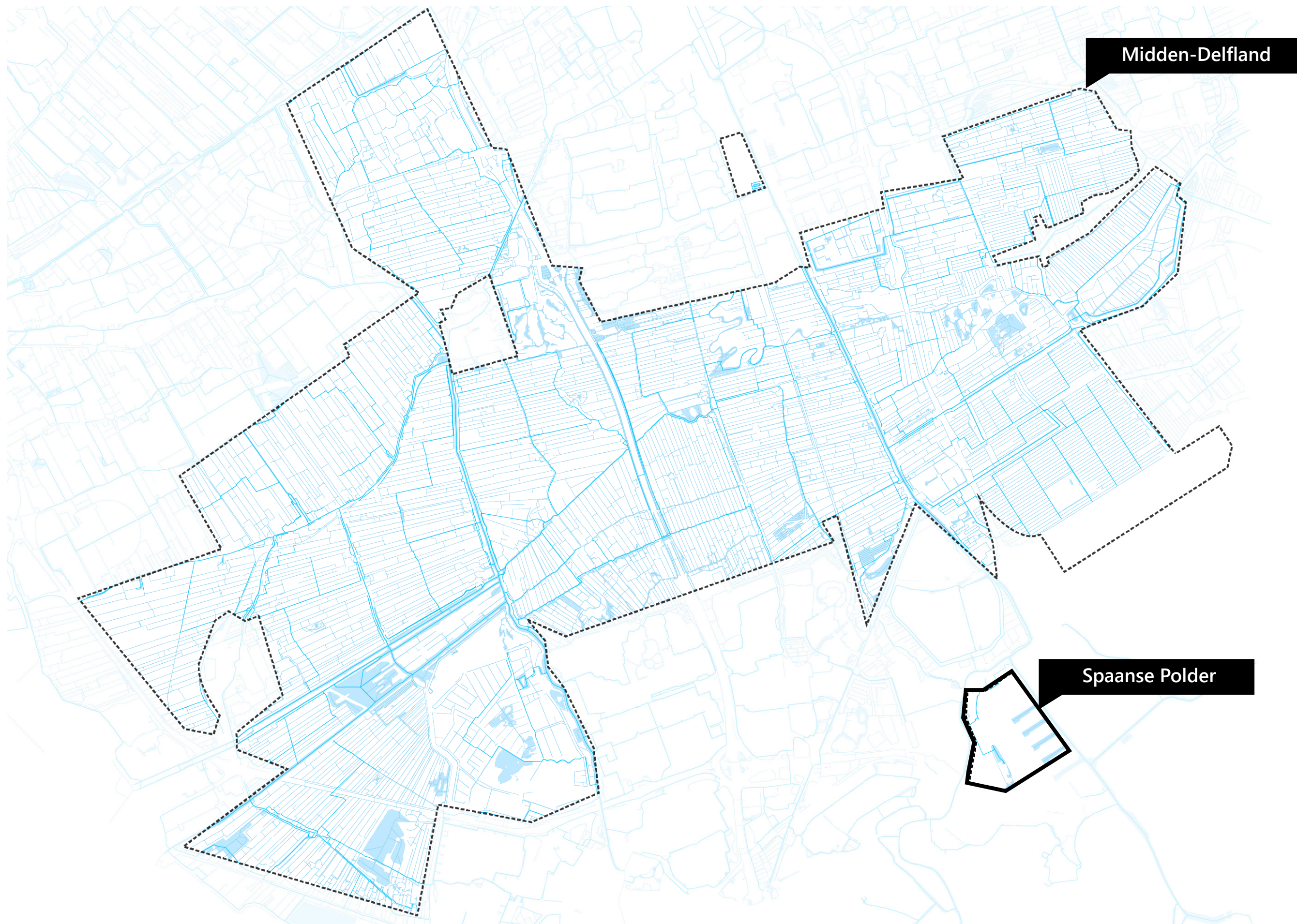


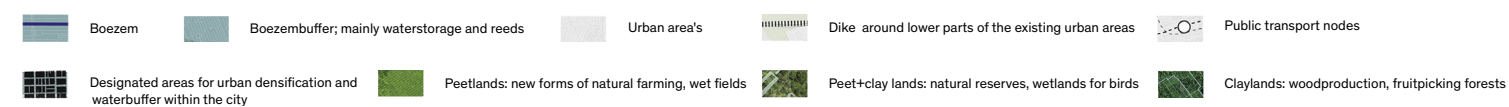
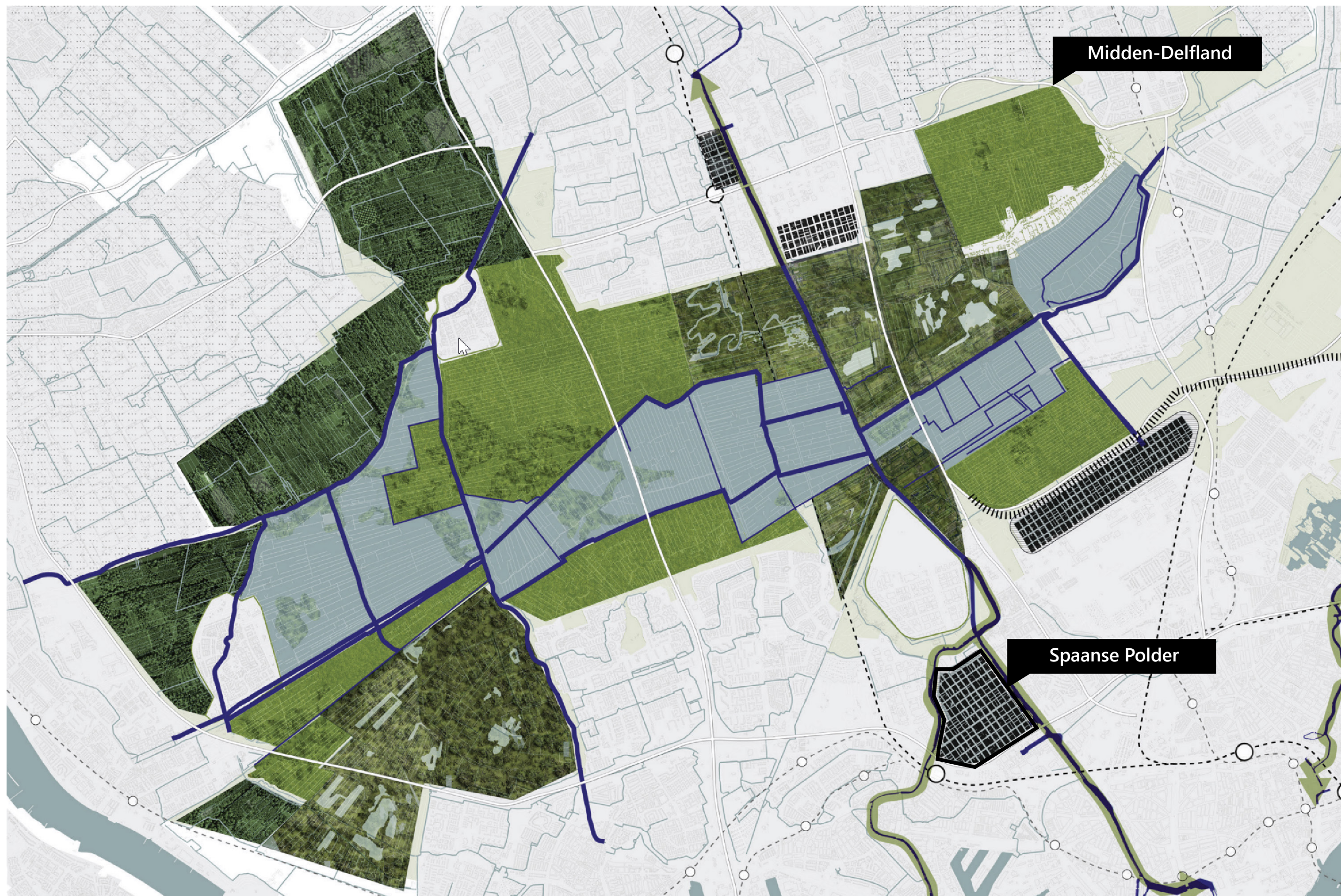
Midden-Delfland

Spaanse Polder

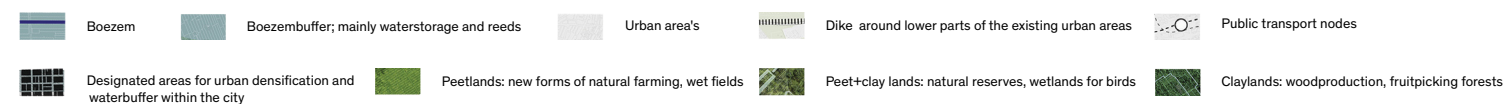
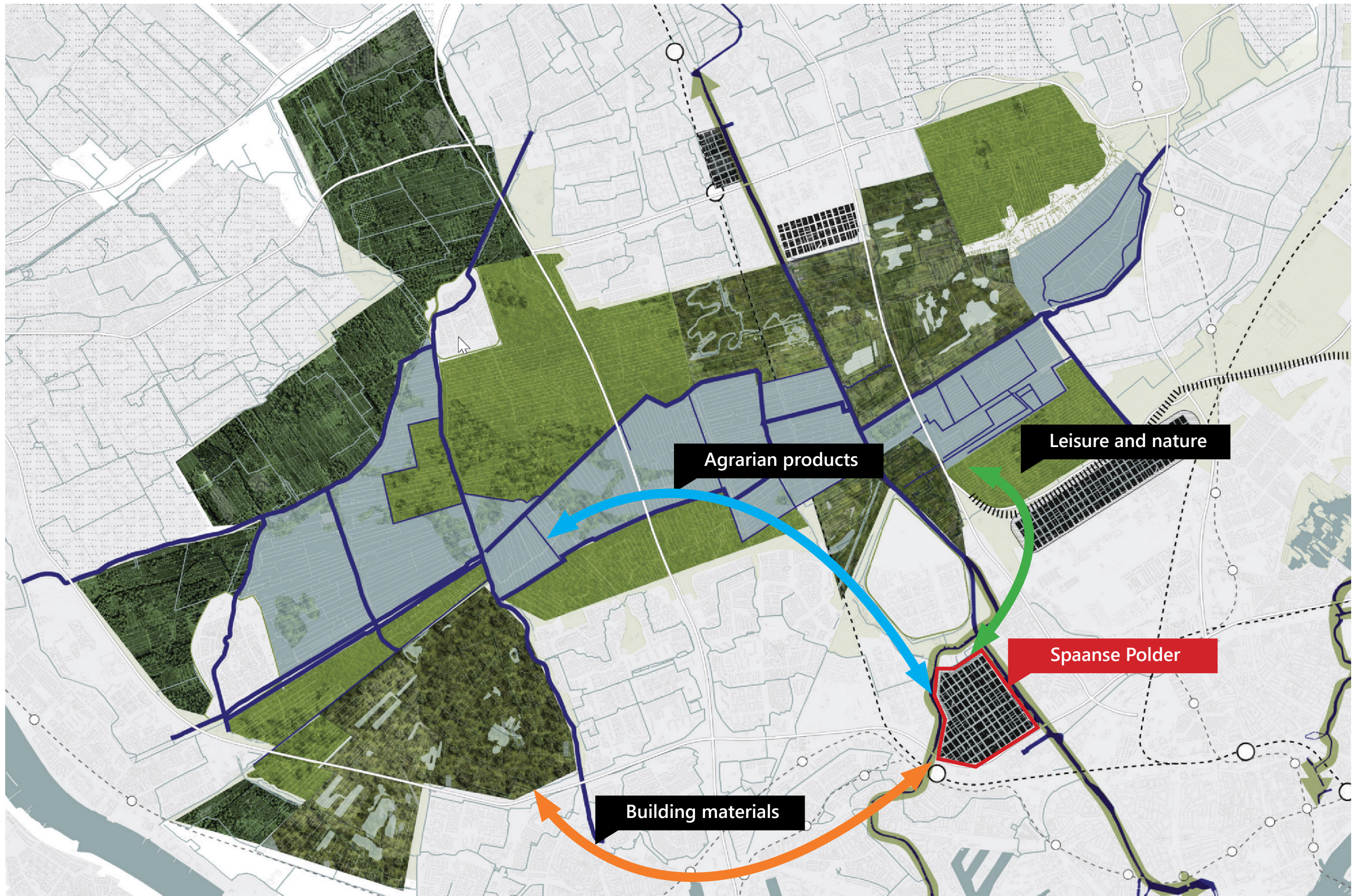


Midden-Delfland. The master plan for a new Productive Landscape of Midden-Delfland, by ZUS, Flux and Sweco (RDD, 2021).





Midden-Delfland. The master plan for a new Productive Landscape of Midden-Delfland, by ZUS, Flux and Sweco (RDD, 2021).



Midden-Delfland. The master plan for a new Productive Landscape of Midden-Delfland, by ZUS, Flux and Sweco (RDD, 2021).

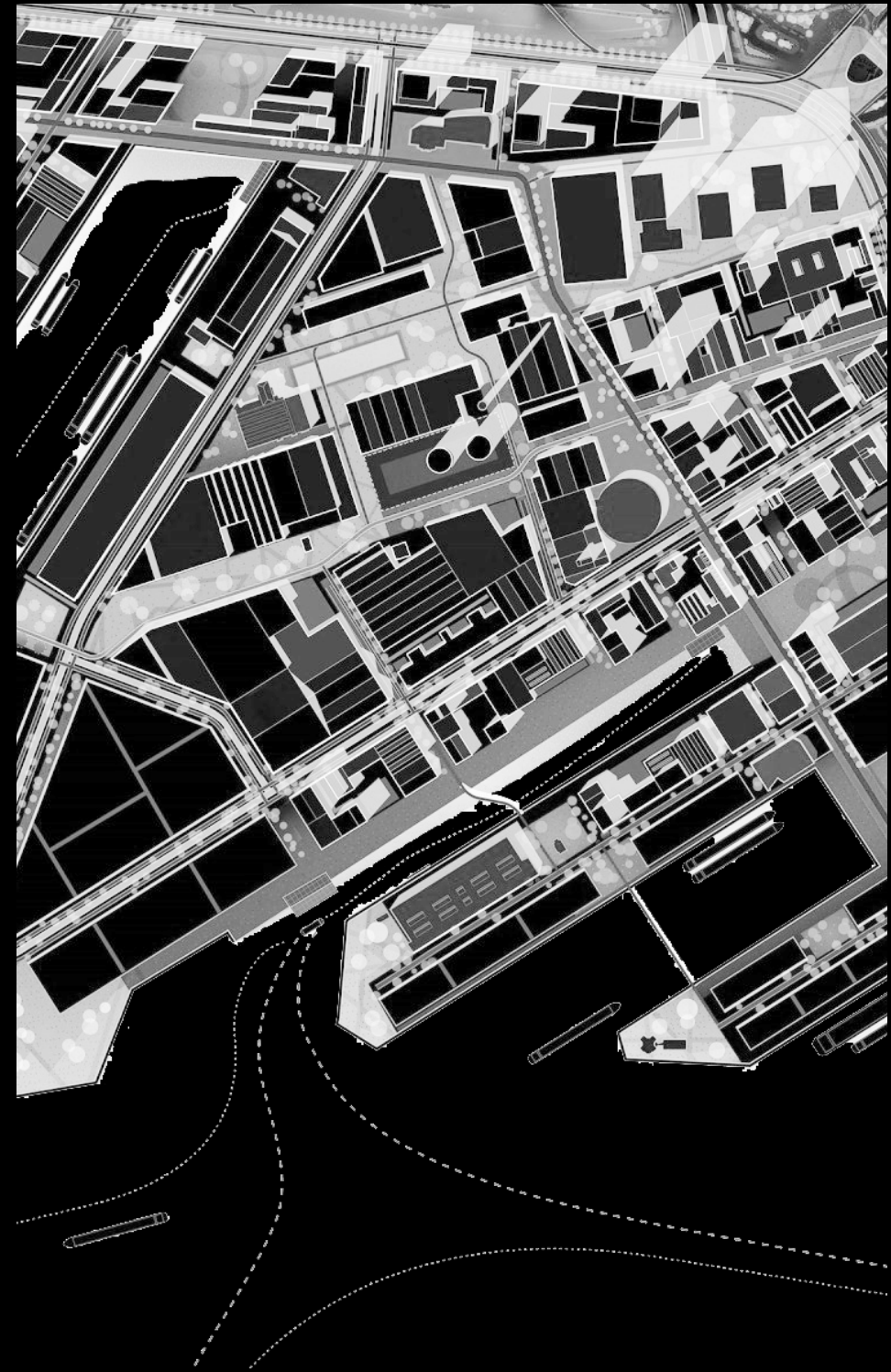
*“Can industrial urban areas be part of the solution,
and provide space for a mix of functions?”*

ZOHO AREA



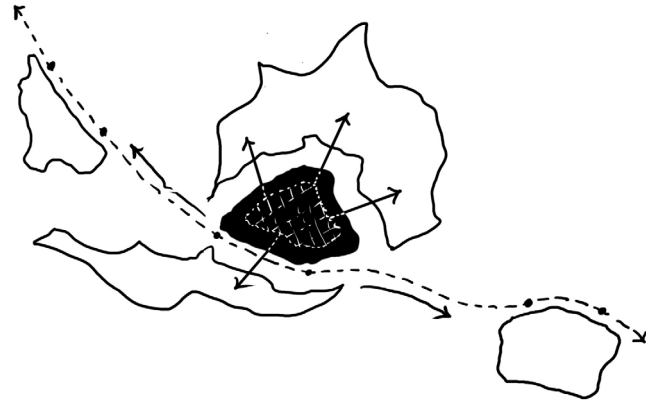
INTERVIEW AND CASE STUDY

M4H

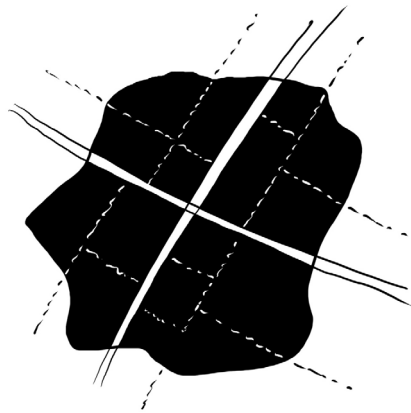


INTERVIEW AND CASE STUDY

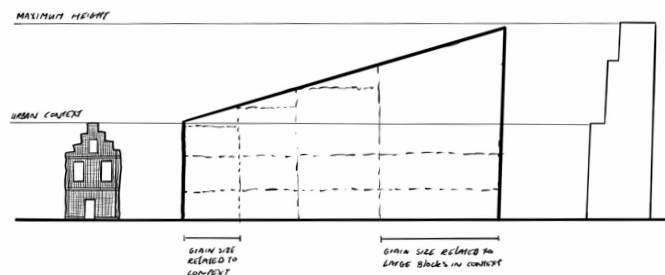
RESEARCH STRATEGIES



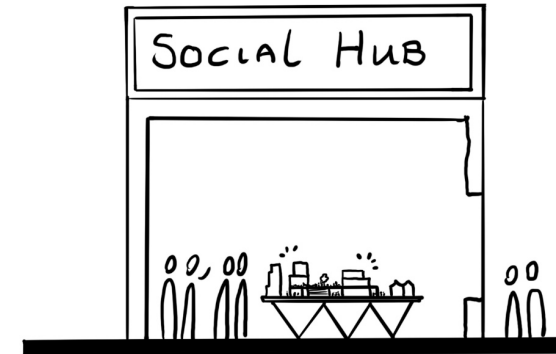
Creating a stronger regional network by redeveloping strategic areas



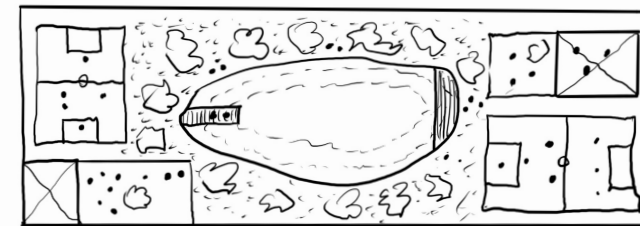
Dividing the area in districts to allow for the co-existence of various functions



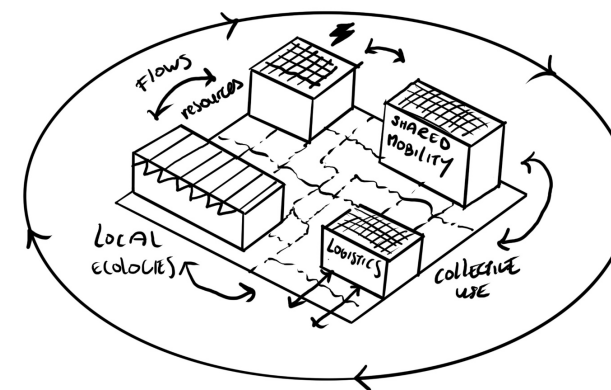
For urban integration, building heights and sizes can be derived from the urban context



A social hub provides space for participation and discussion with the neighborhood



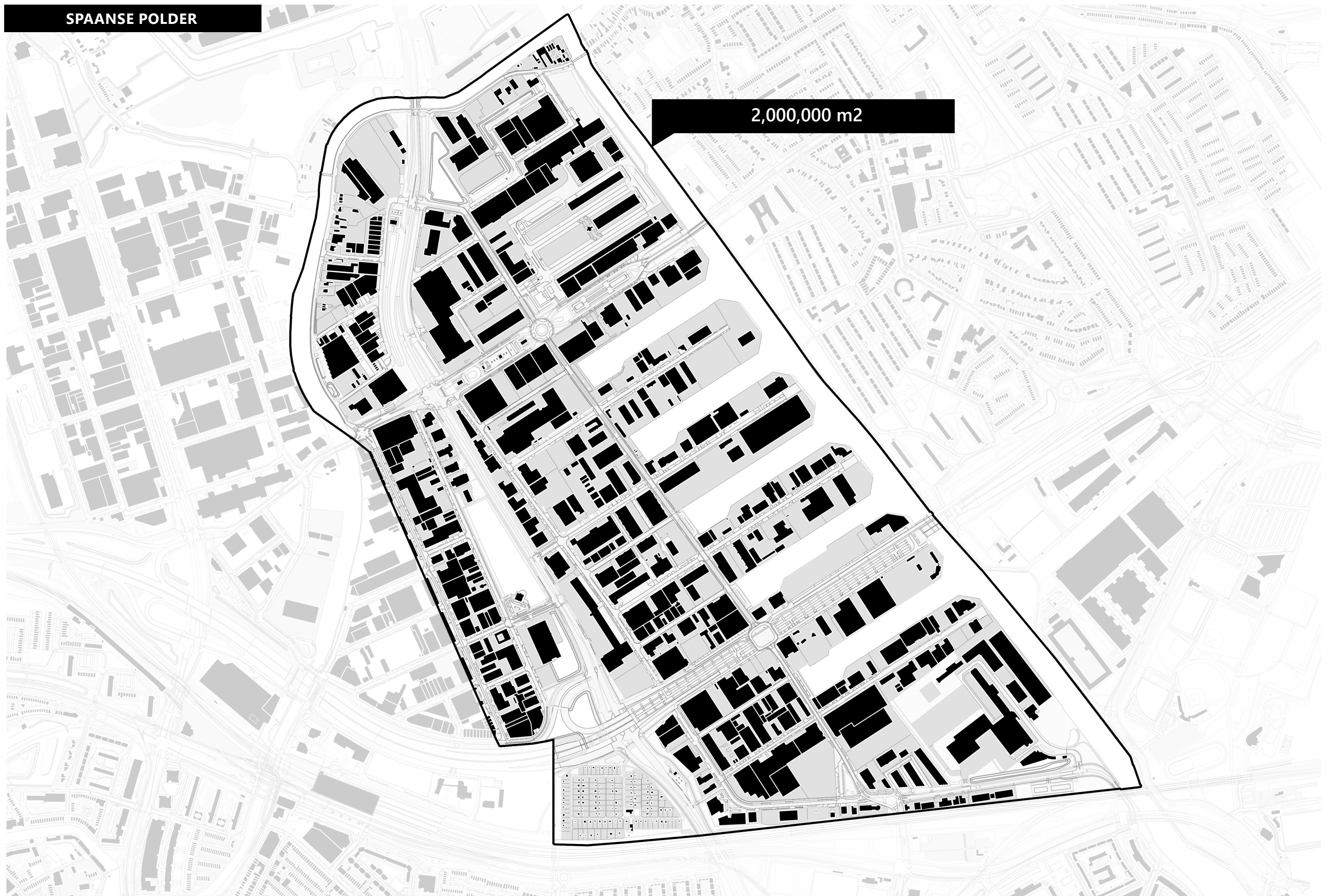
Social green spaces that improve biodiversity and foster interactions and leisure



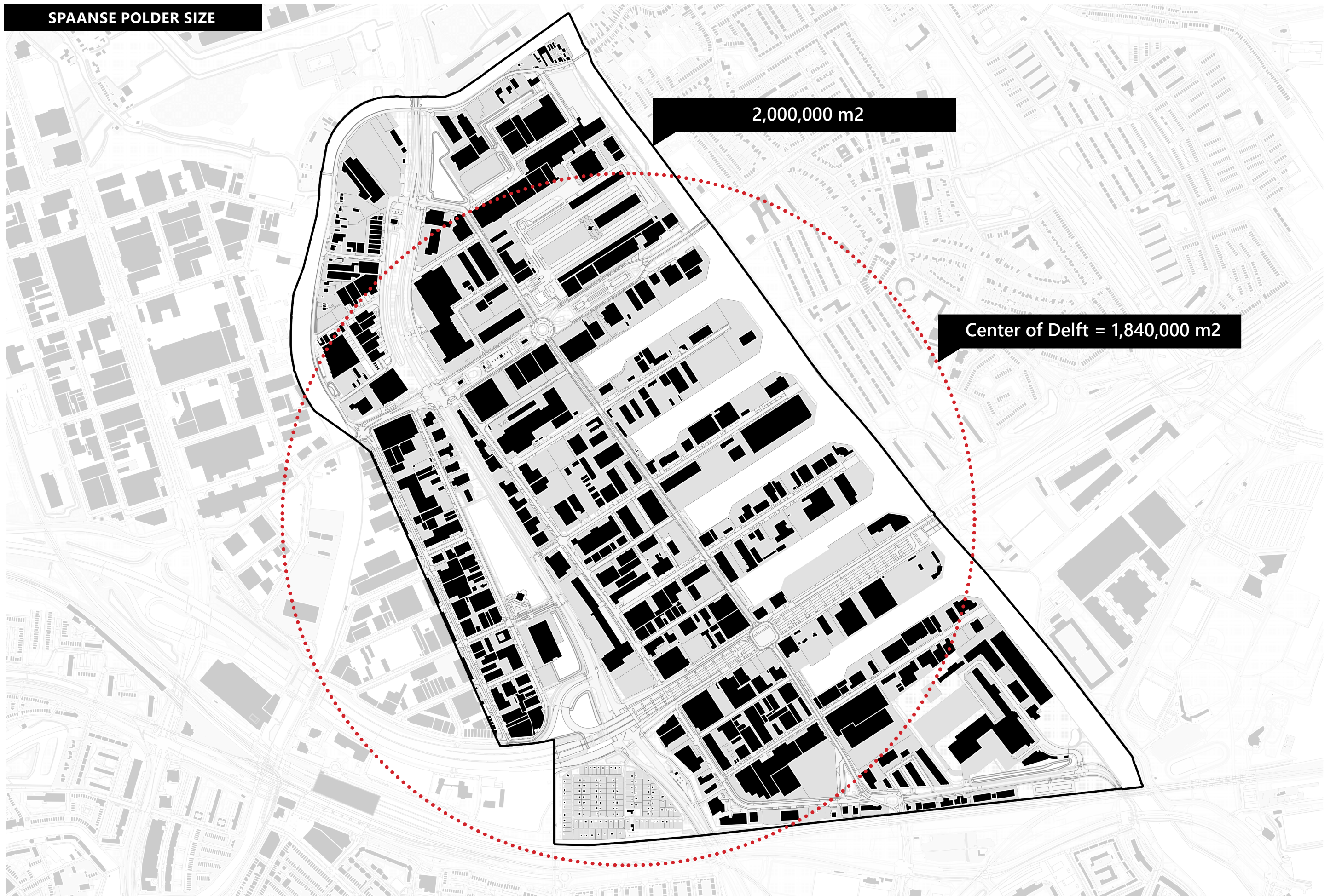
Collective use of water, energy, mobility, resources, residual flows, resulting in local ecologies

02 - SPAANSE POLDER

SPAANSE POLDER



SPAANSE POLDER SIZE



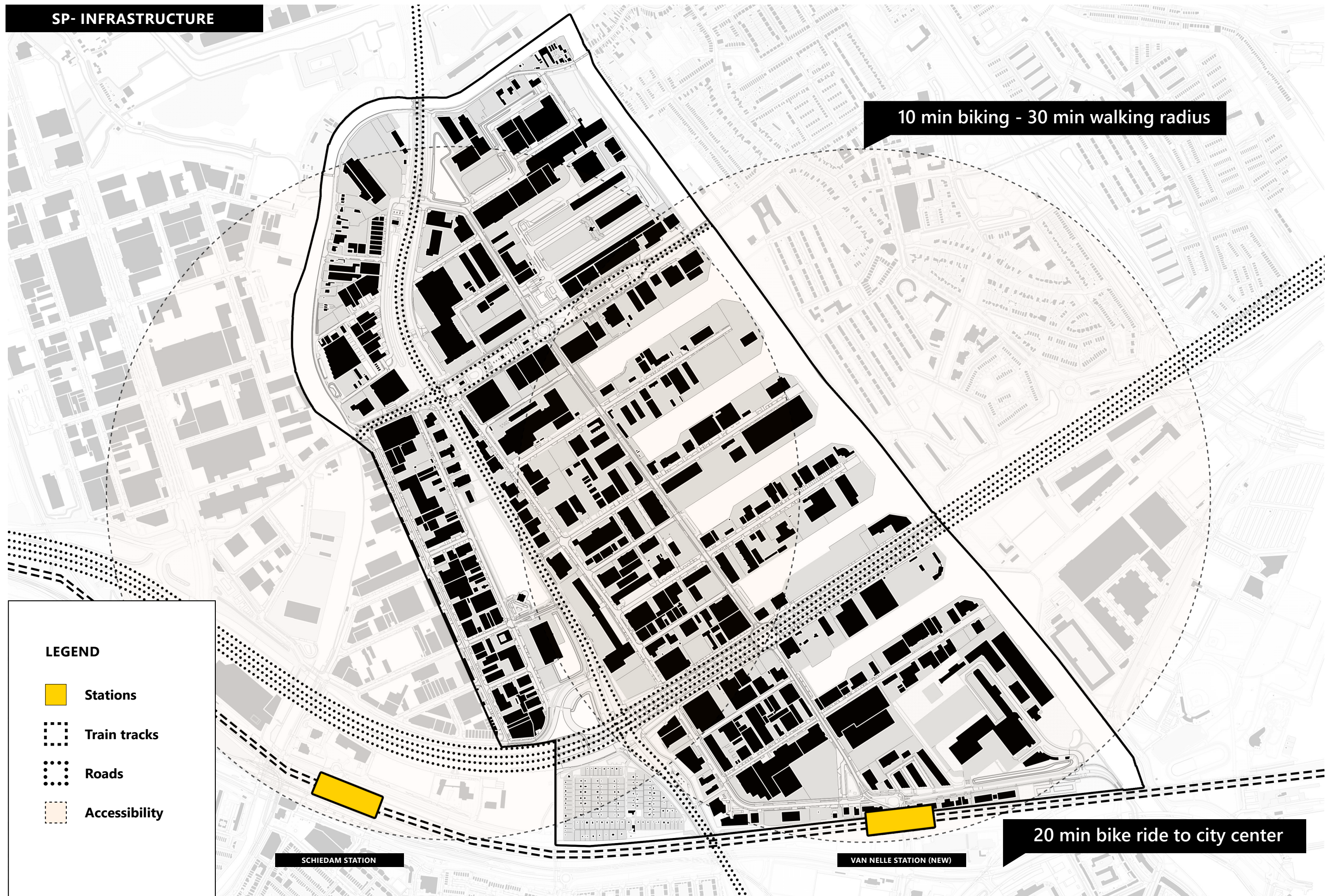
SP - HISTORICAL BUILDINGS



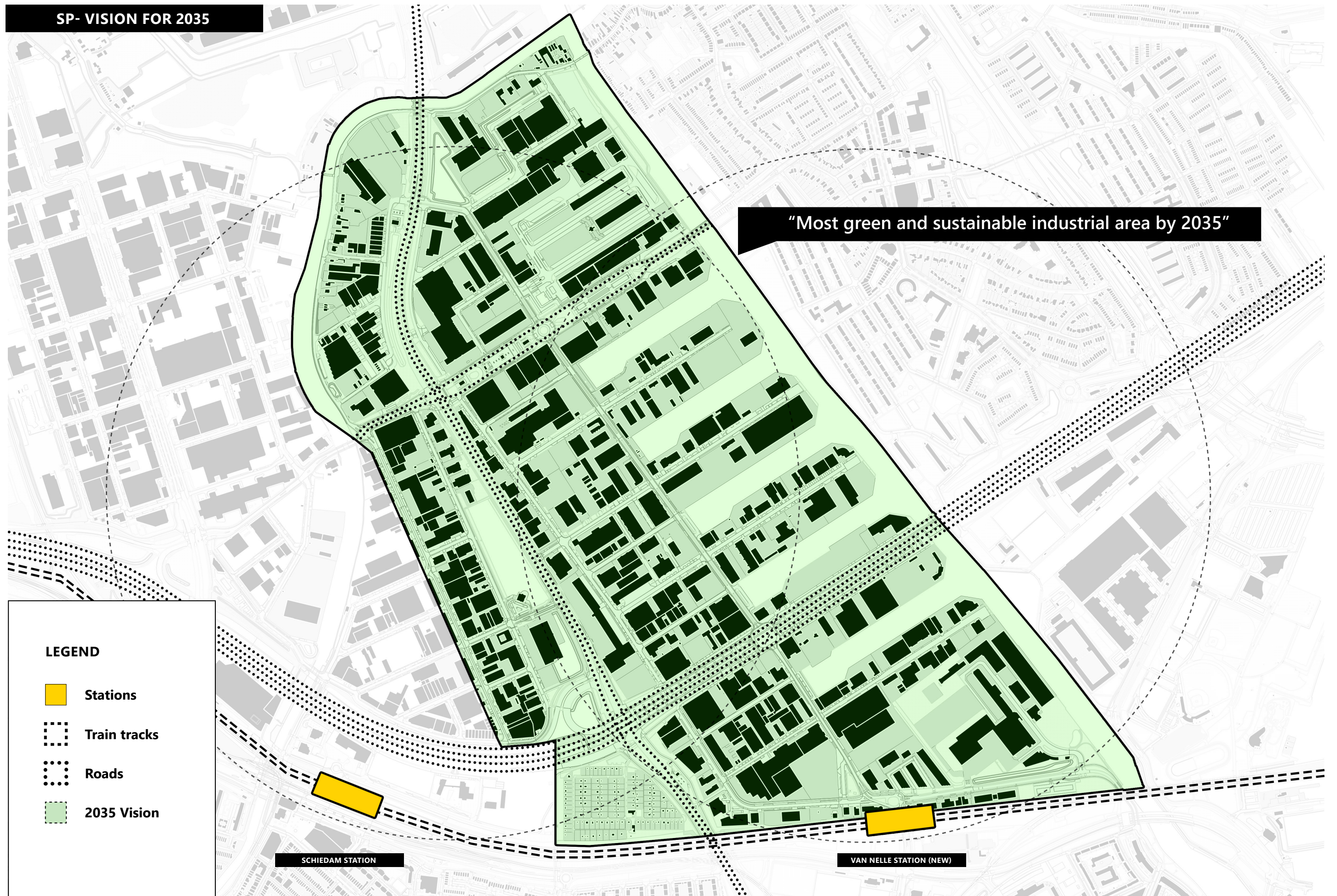
SP - FUNCTIONS



SP- INFRASTRUCTURE



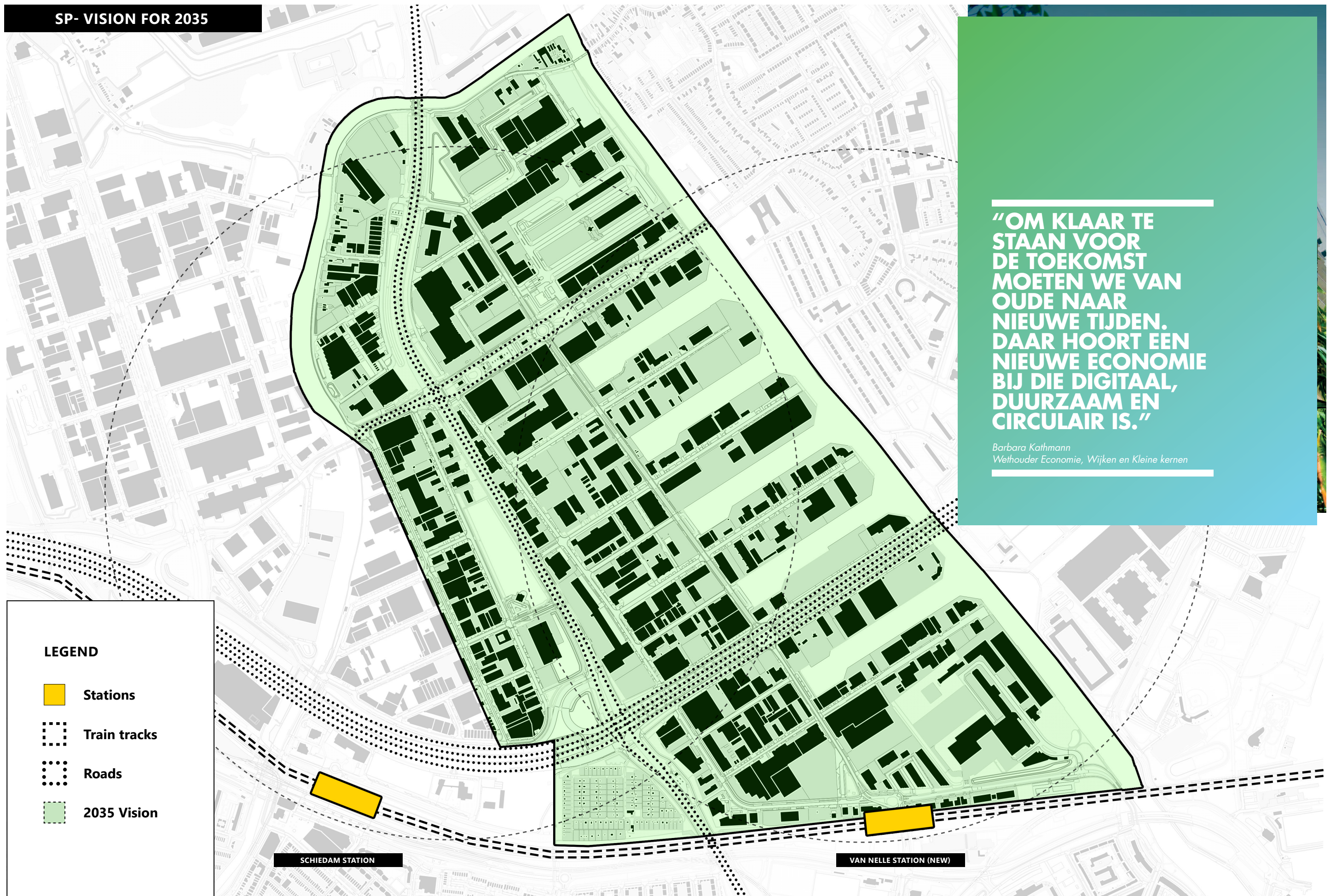
SP- VISION FOR 2035



SP- VISION FOR 2035



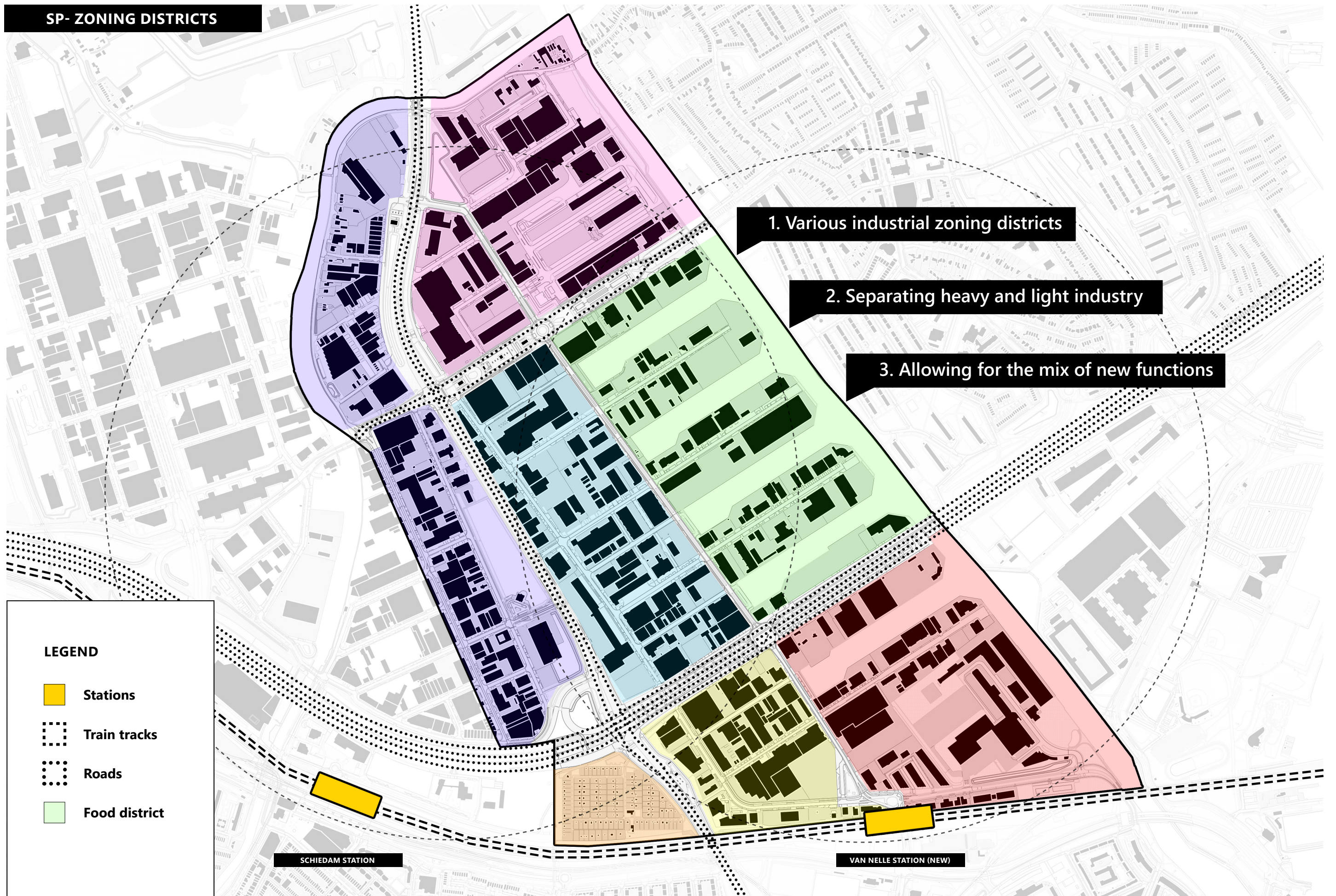
SP- VISION FOR 2035



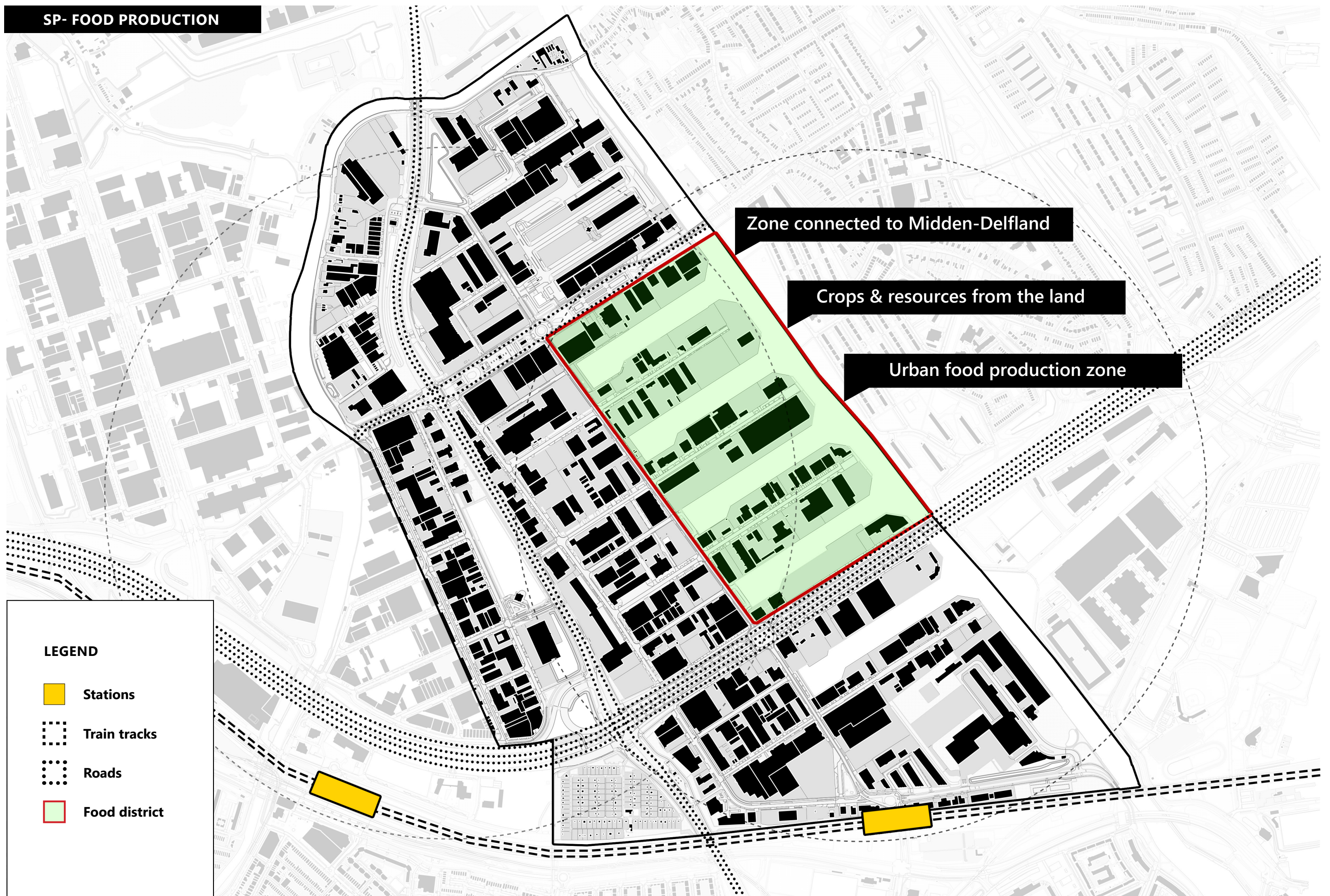
**"OM KLAAR TE
STAAN VOOR
DE TOEKOMST
MOETEN WE VAN
OUDE NAAR
NIEUWE TIJDEN.
DAAR HOORT EEN
NIEUWE ECONOMIE
BIJ DIE DIGITAAL,
DUURZAAM EN
CIRCULAIR IS."**

Barbara Kathmann
Wethouder Economie, Wijken en Kleine kernen

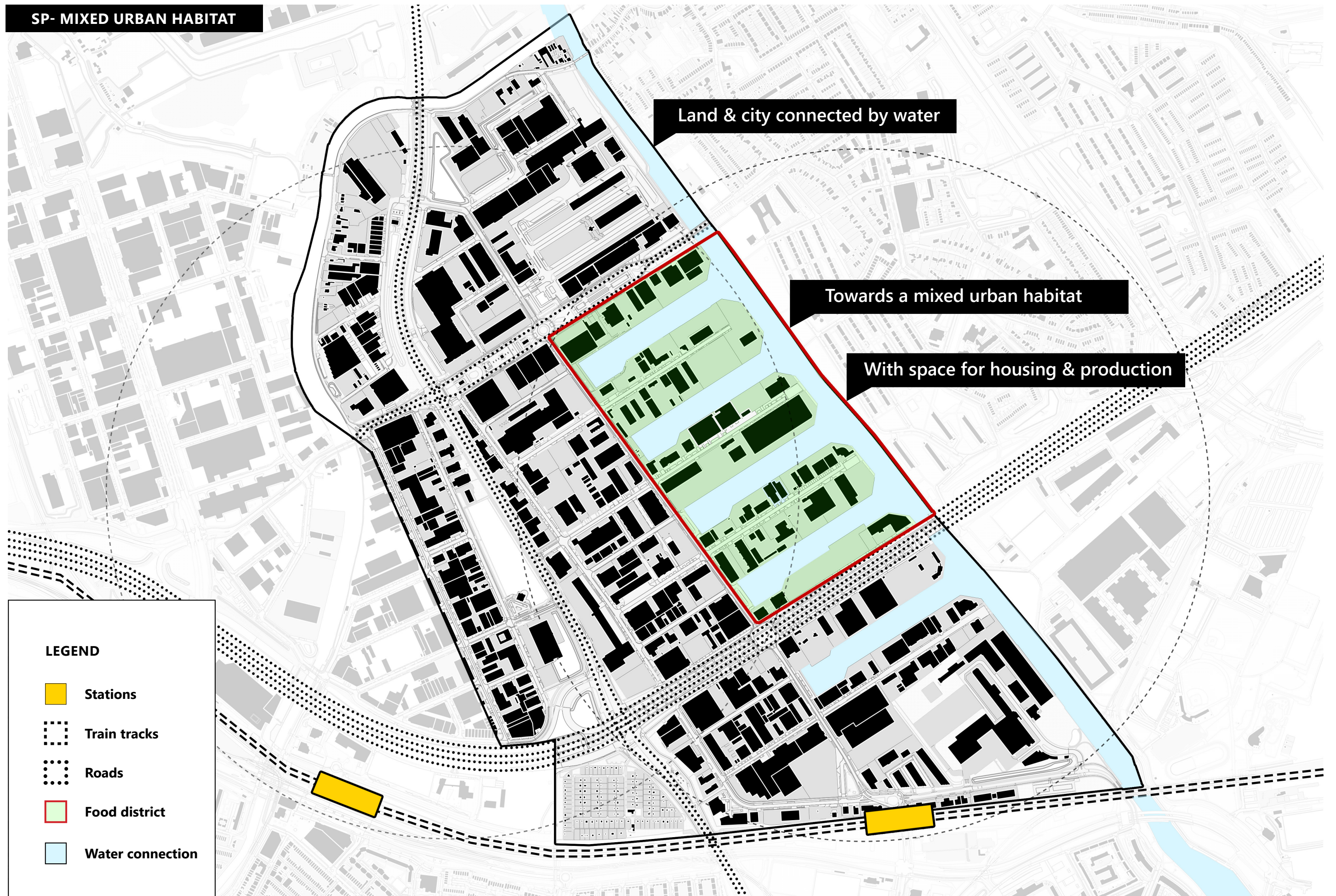
SP- ZONING DISTRICTS

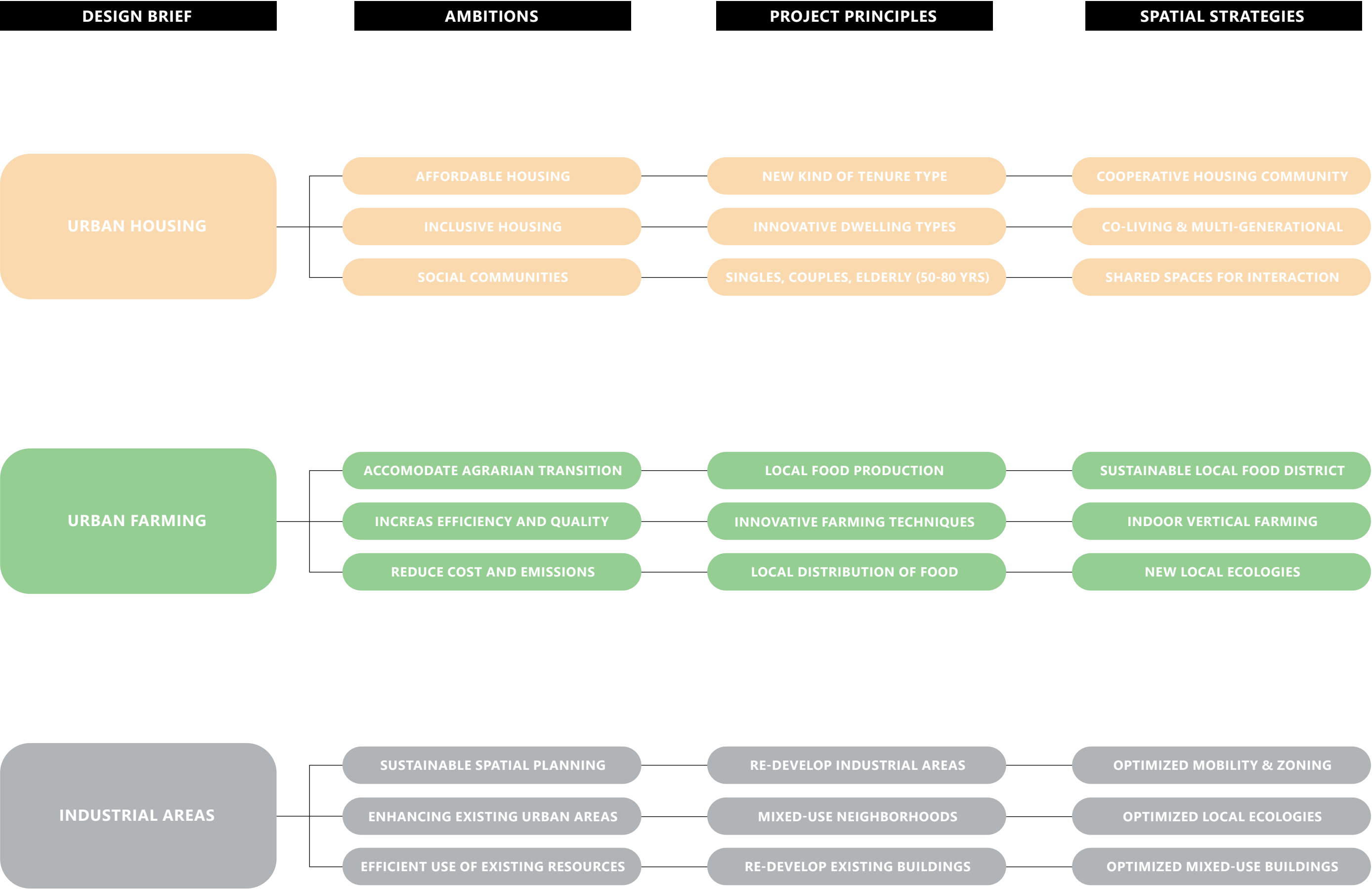


SP- FOOD PRODUCTION



SP- MIXED URBAN HABITAT





03 - SITE ANALYSIS

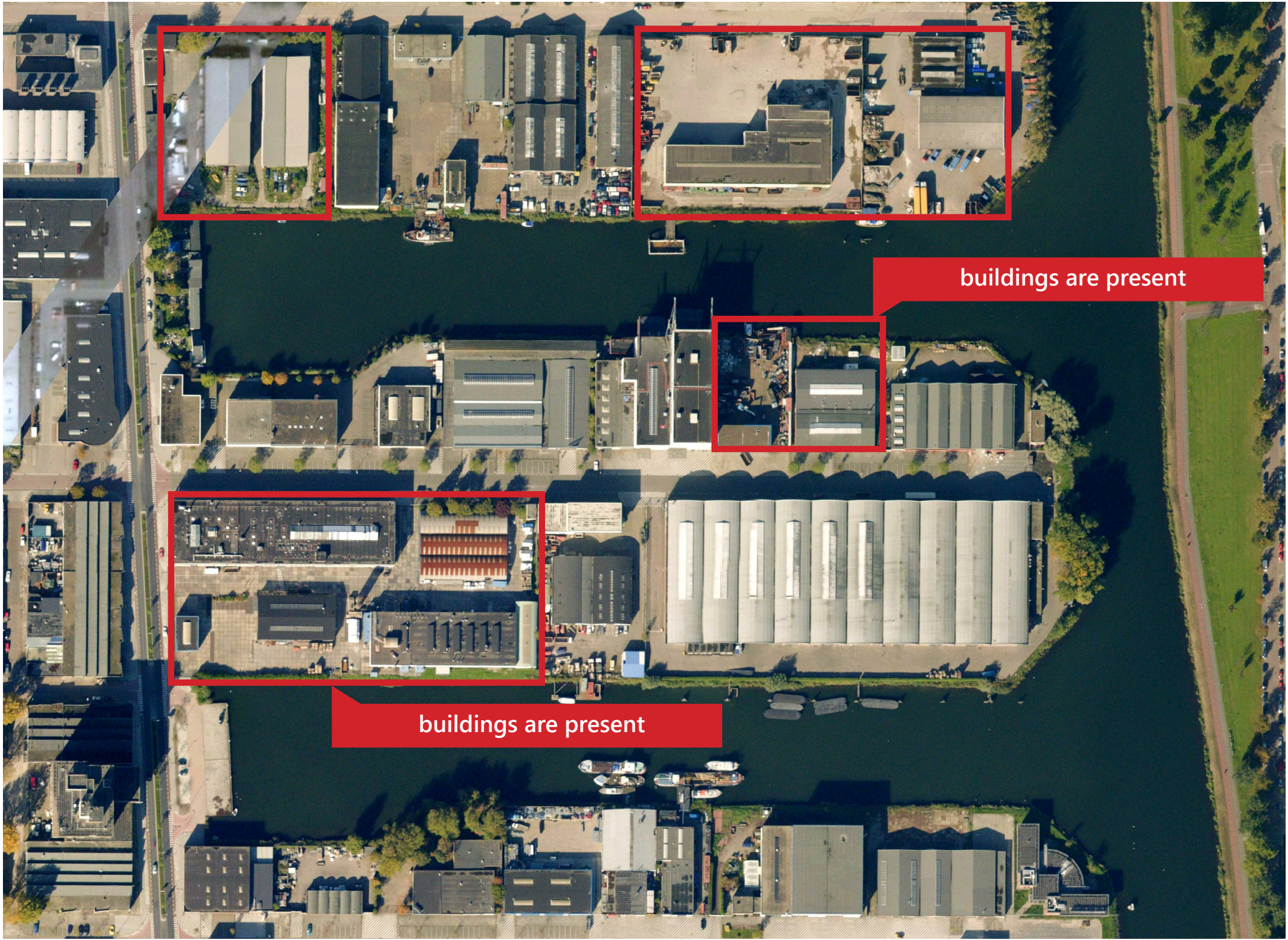


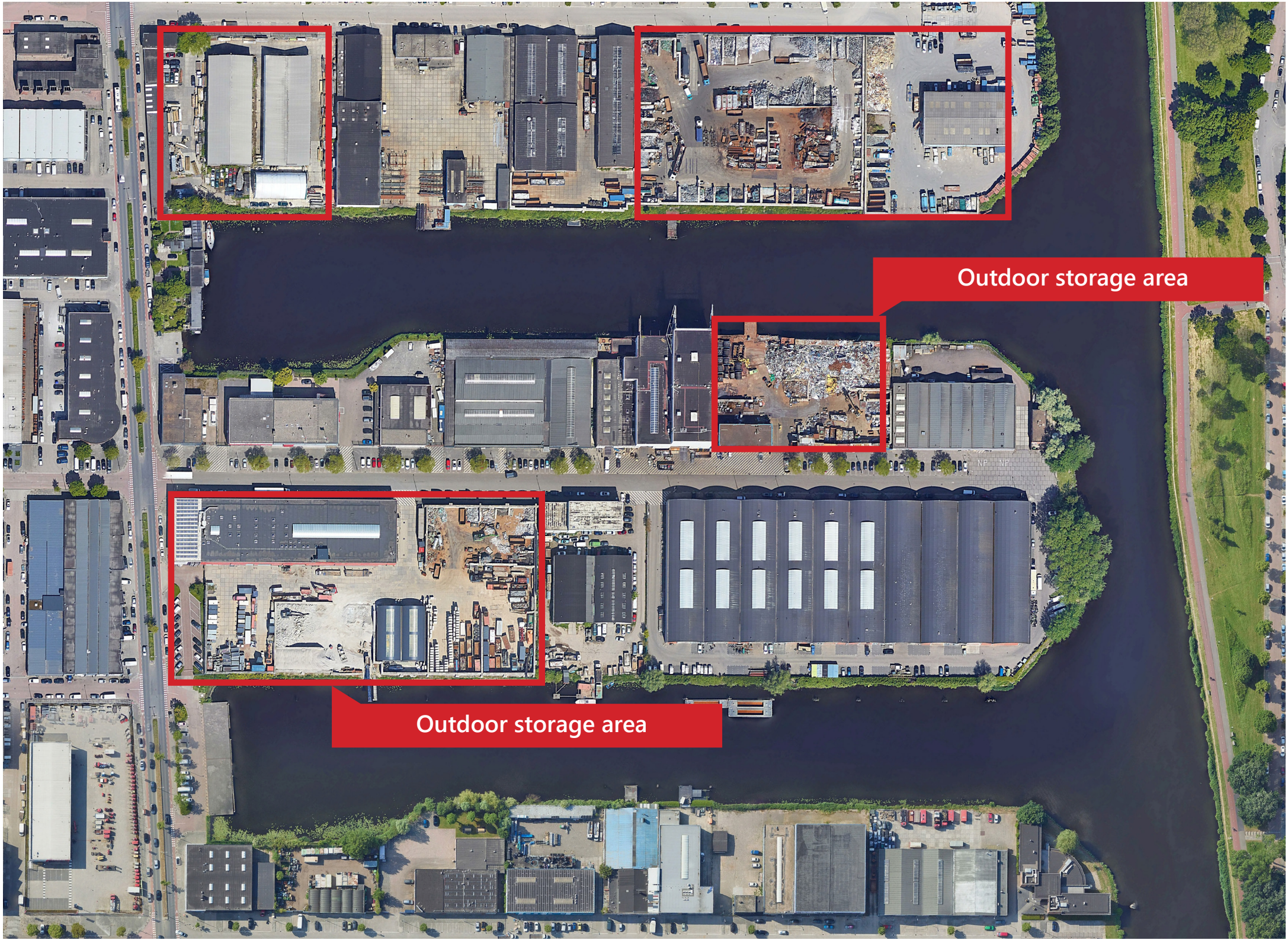
SITE - VIEWS CONTEXT

VIEW TOWARDS MIDDEN-DL

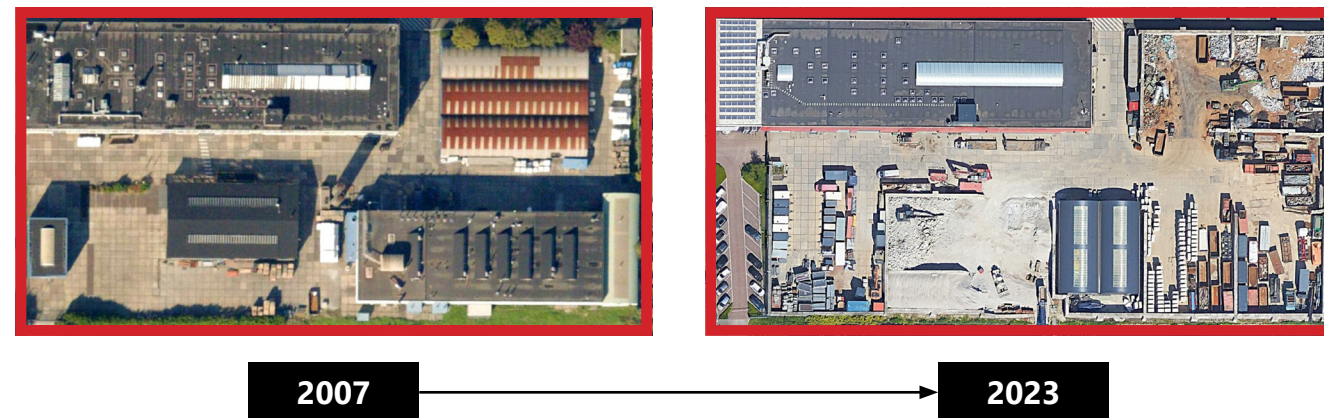
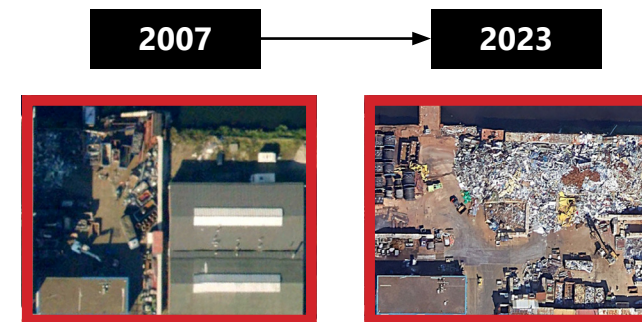
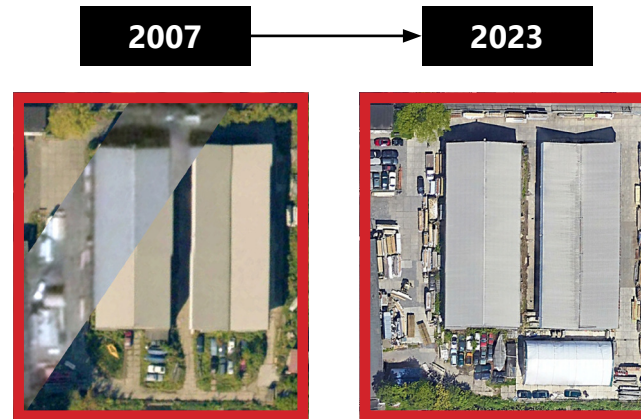


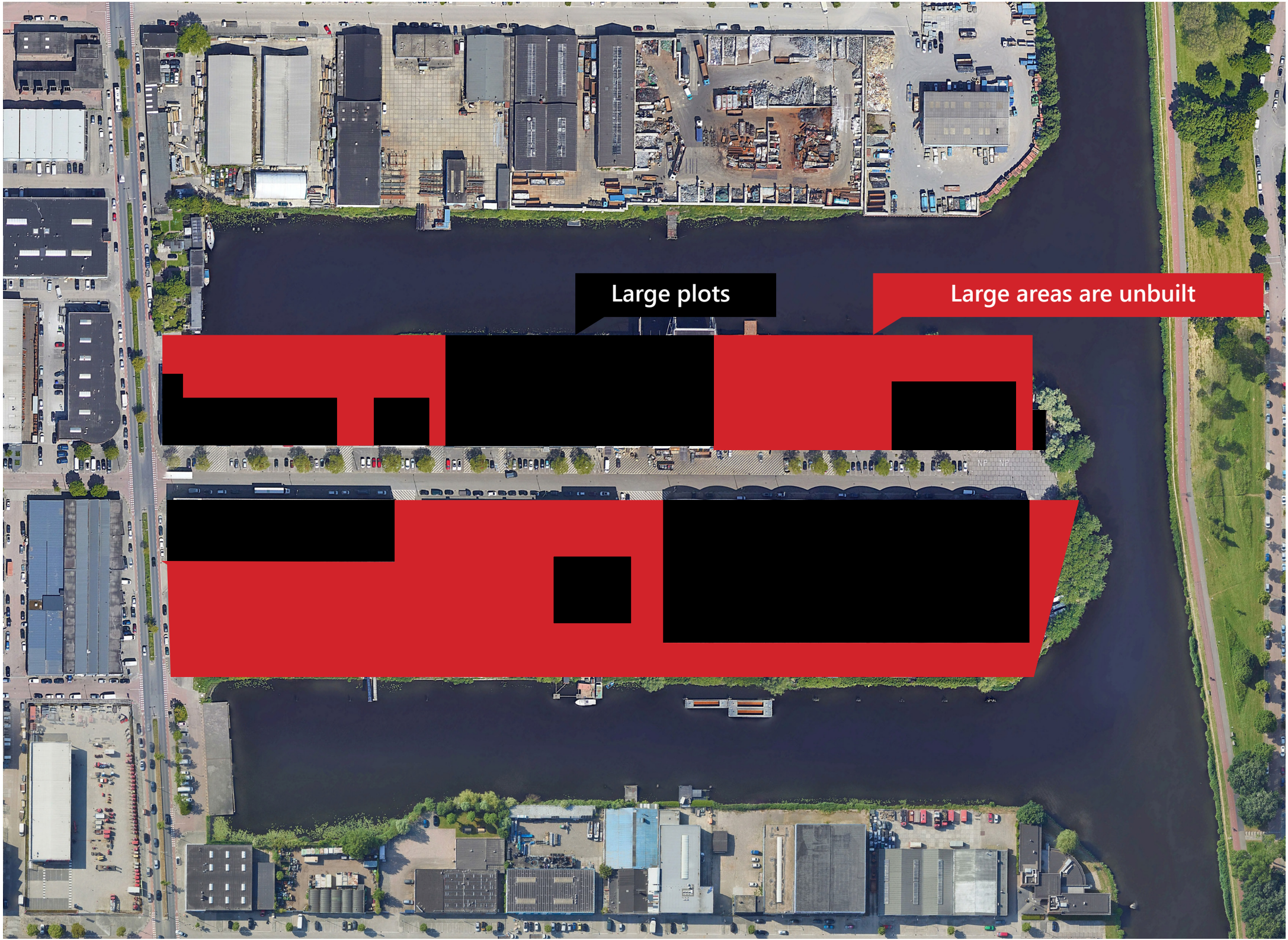
SKYLINE OF ROTTERDAM



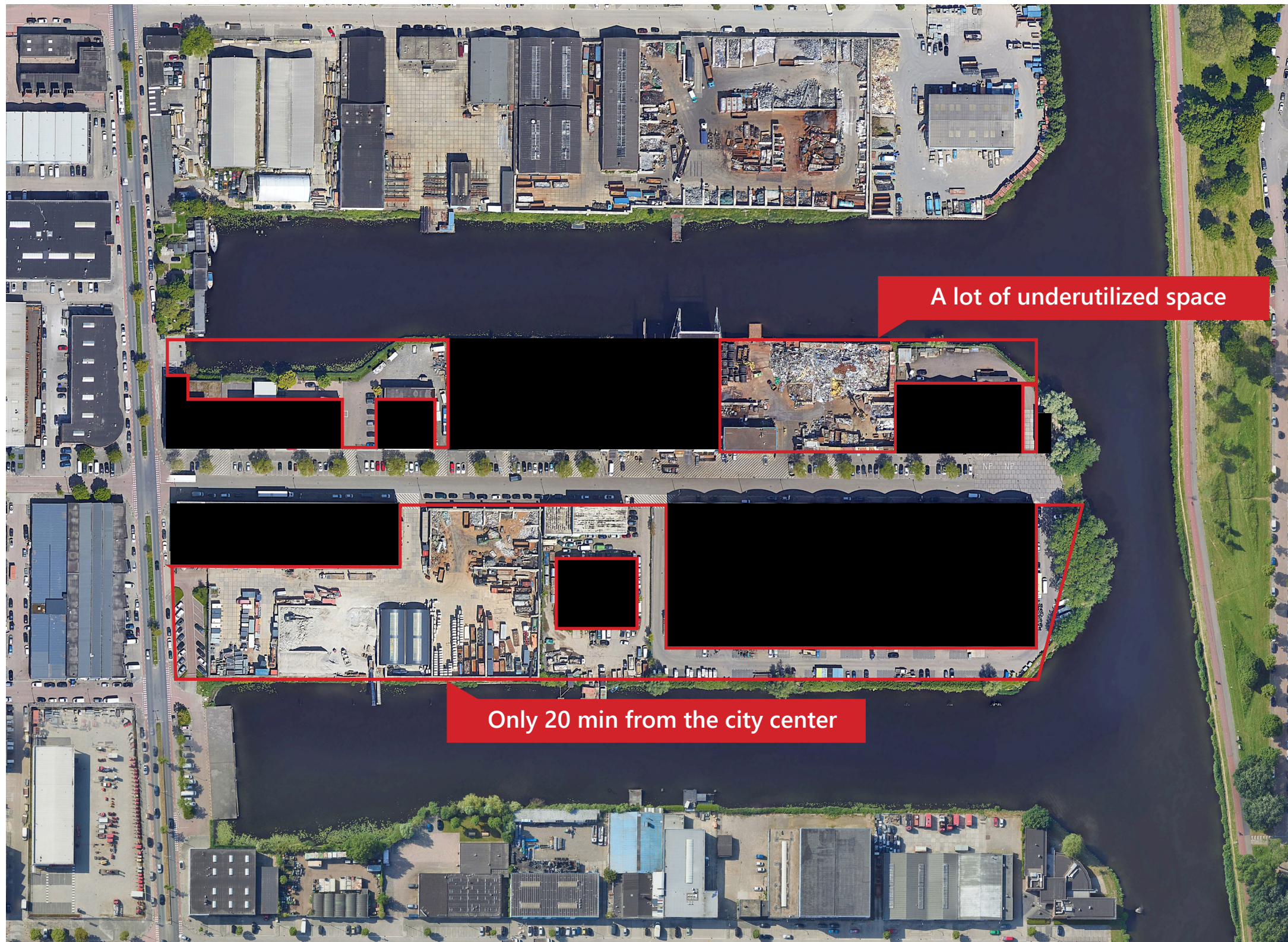


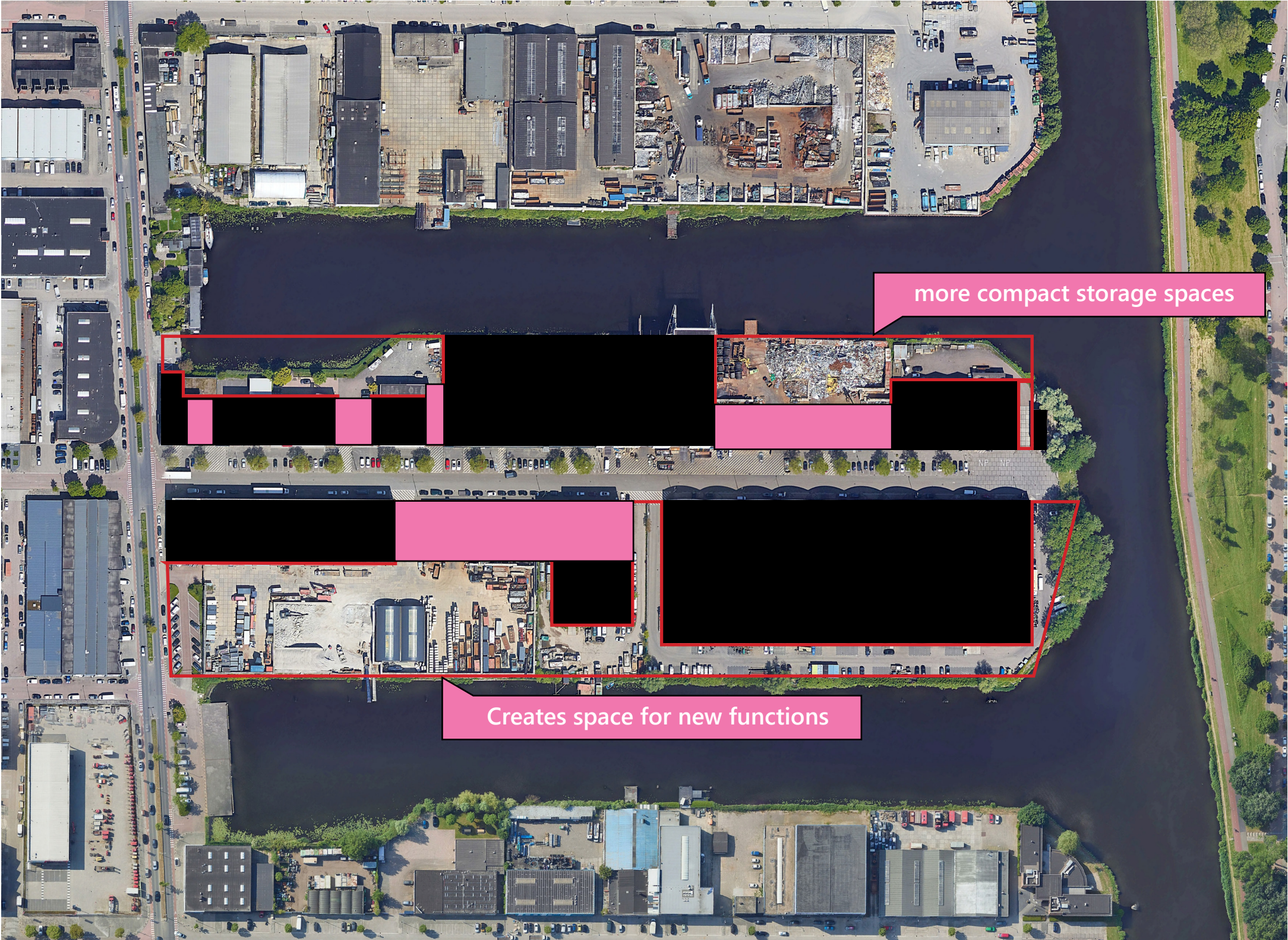
SITE - 2007 VS 2023



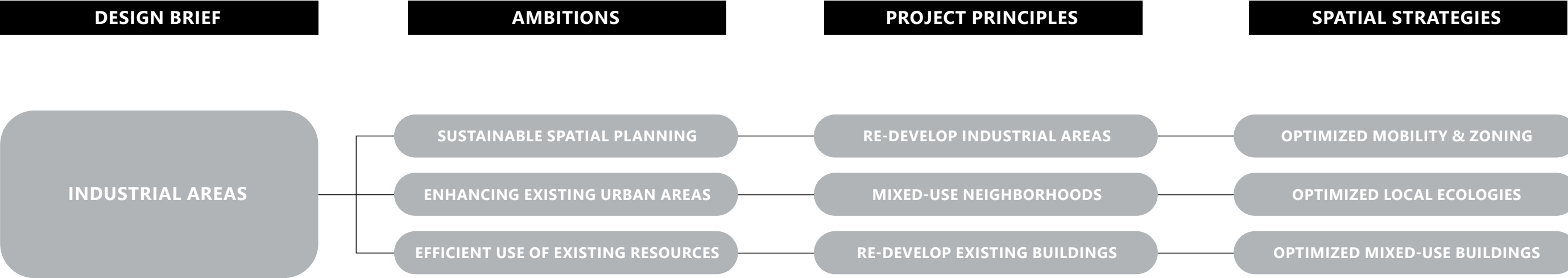


SITE - UNDERUTILIZED LAND

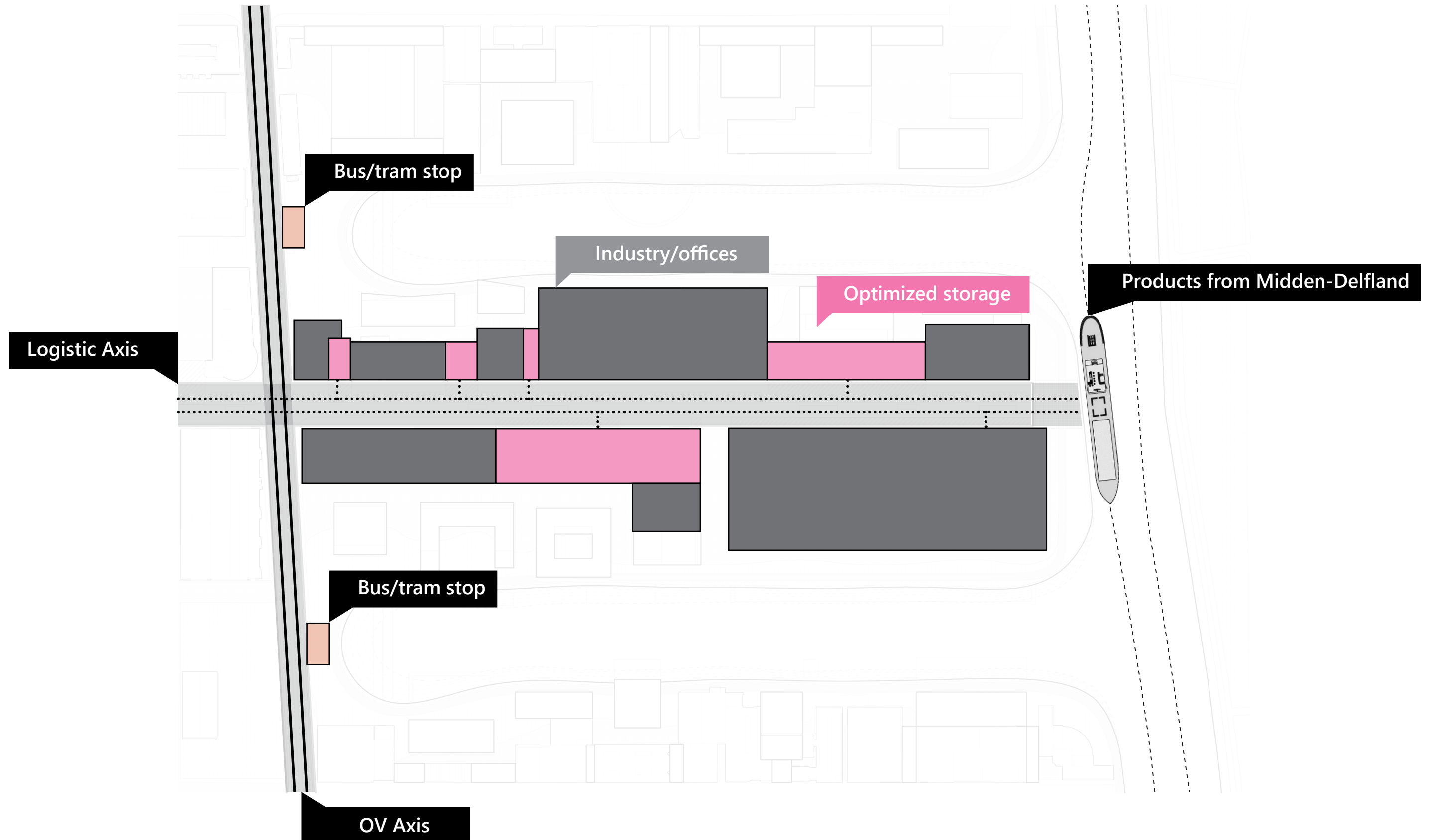




03 - URBAN MASTERPLAN

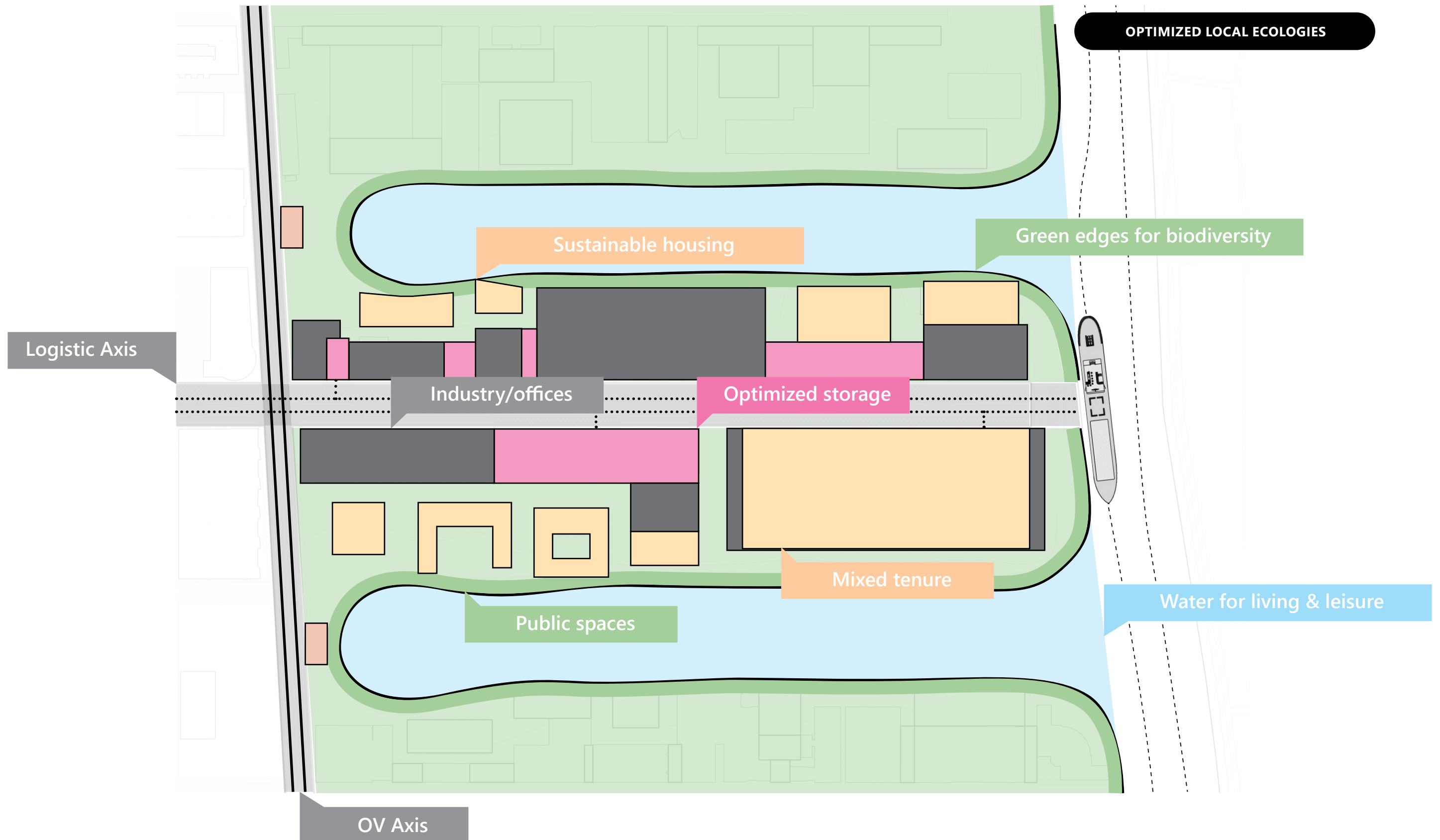


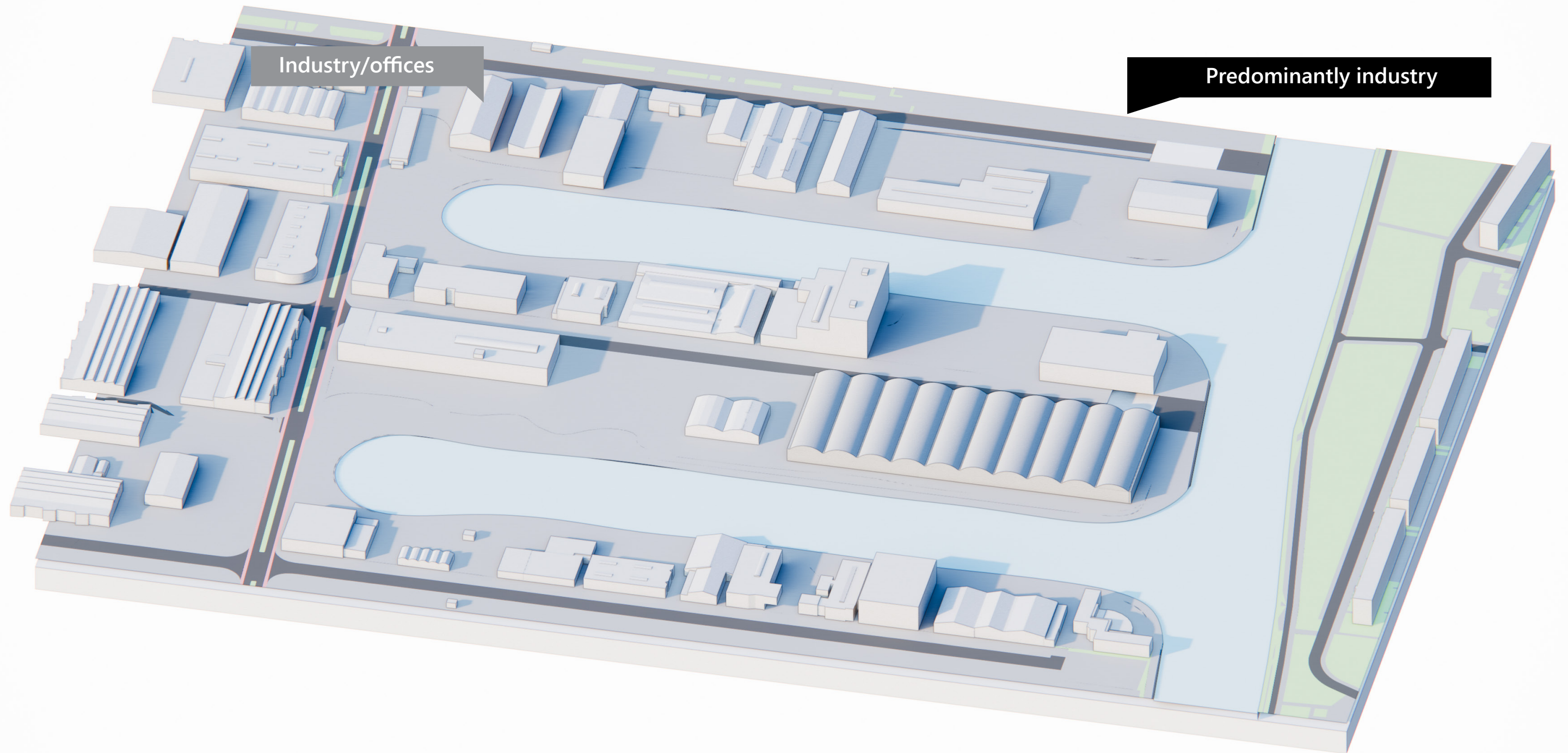


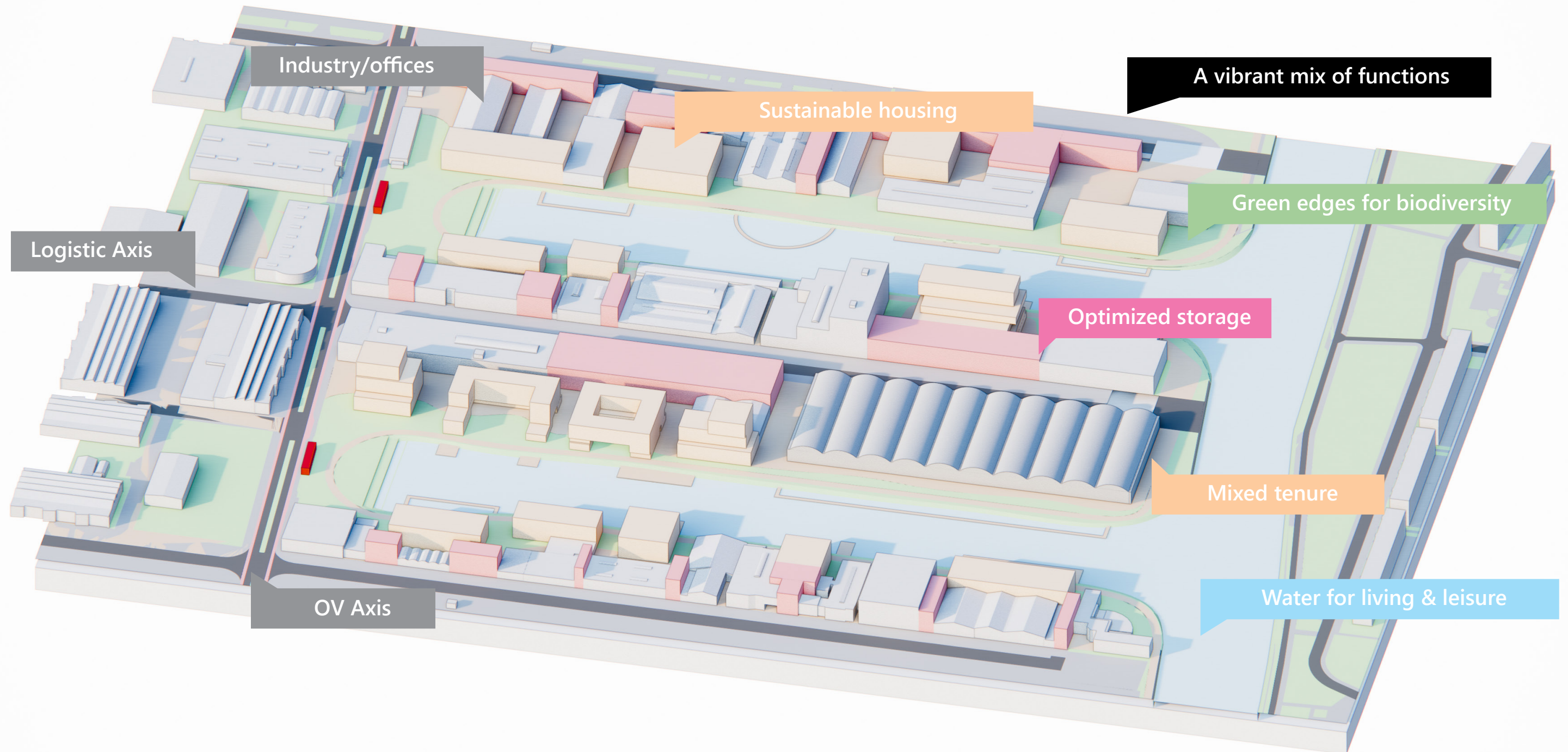


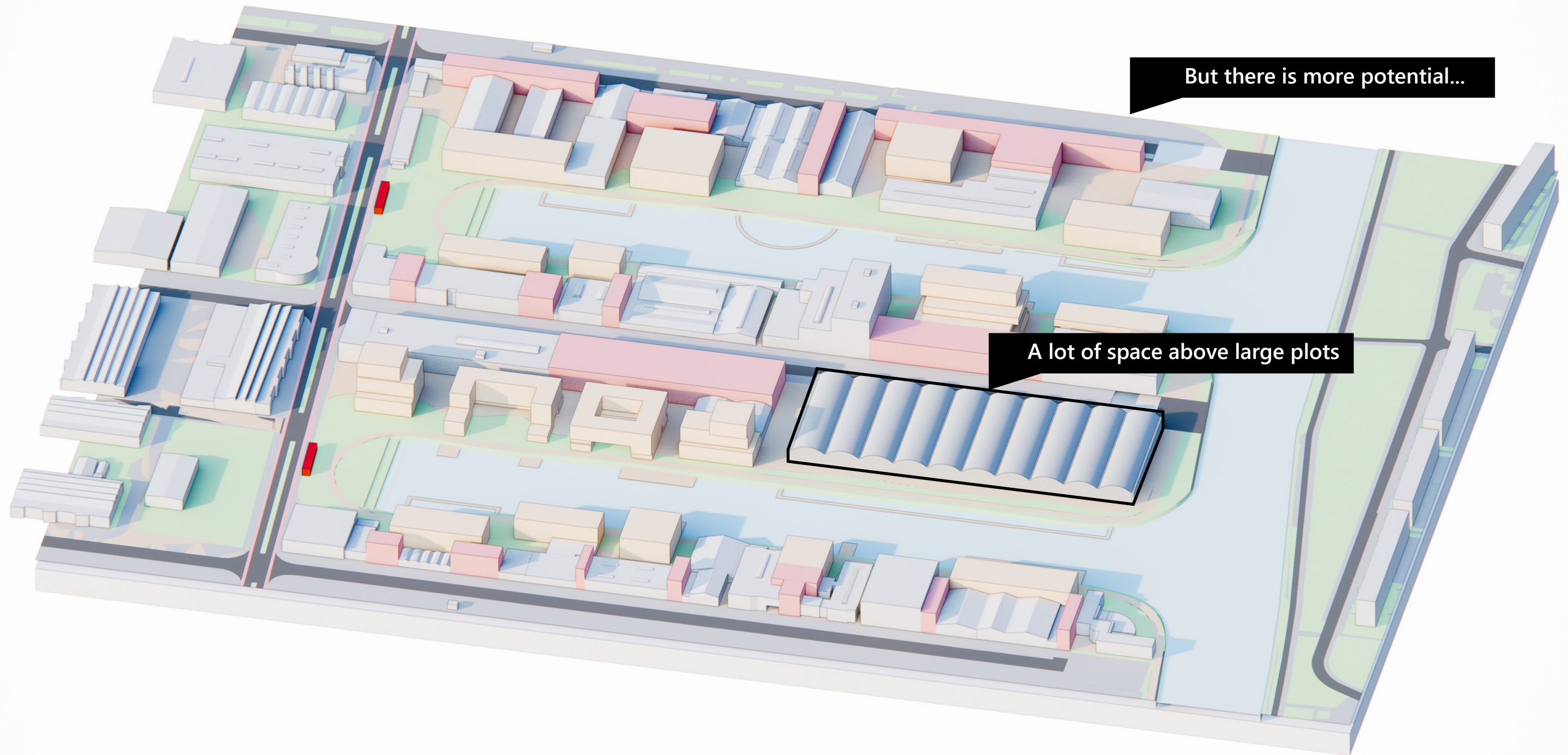
OPTIMIZED MOBILITY & ZONING

OPTIMIZED LOCAL ECOLOGIES



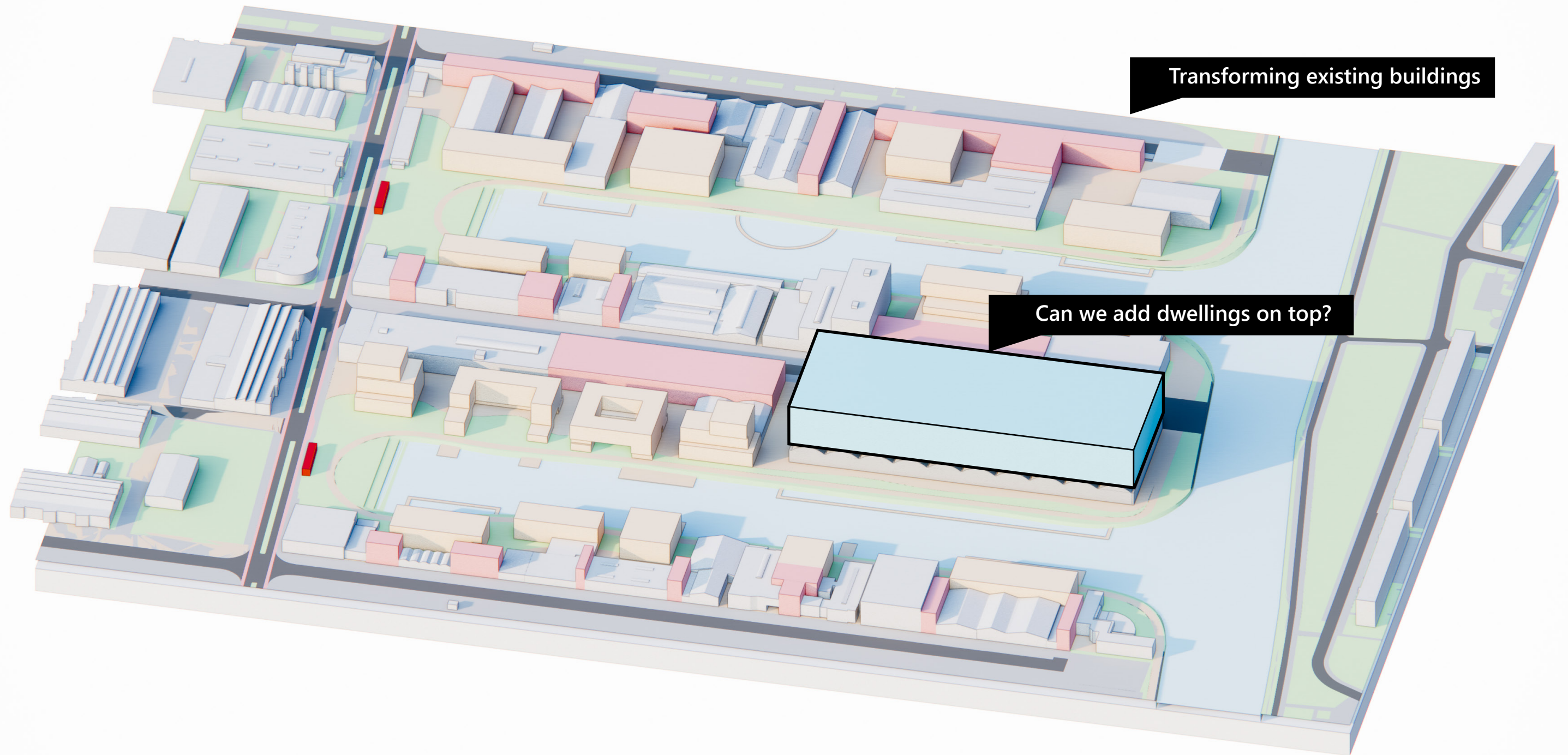






But there is more potential...

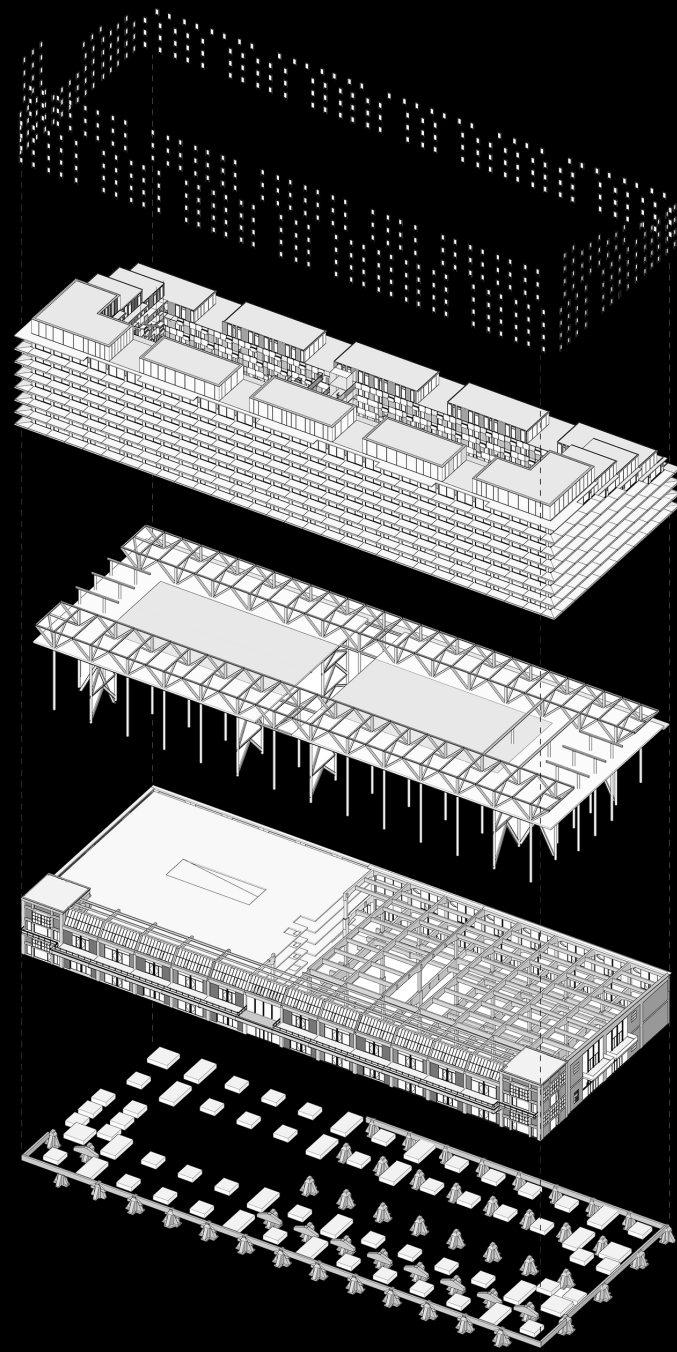
A lot of space above large plots



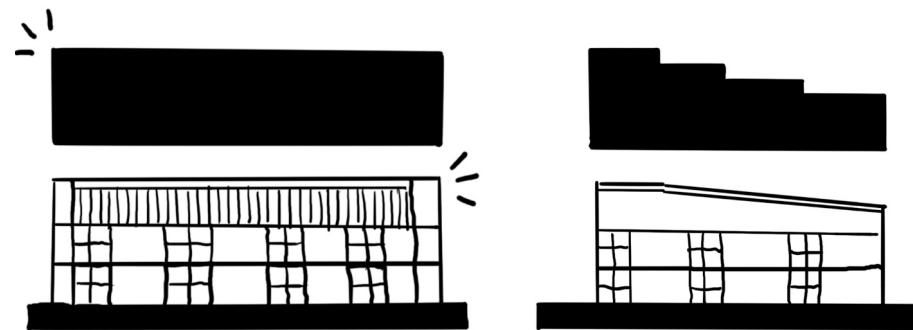
04 - THE BUILDING

*“How can industrial buildings be transformed
into mixed-use housing communities?”*

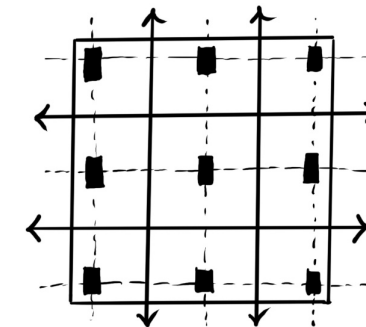
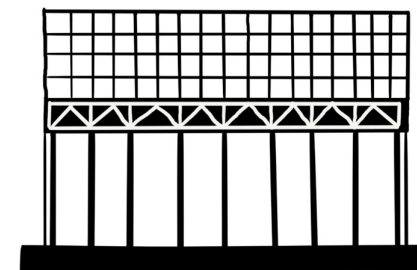
THE TRANSFORMATION OF FENIX I



INTERVIEW AND CASE STUDY



Urban integration: preservation and accentuation of old and new, while adding new spatial qualities



Self-supporting, minimizing perforations and optimal structural flexibility

OPTIMIZED MOBILITY & ZONING

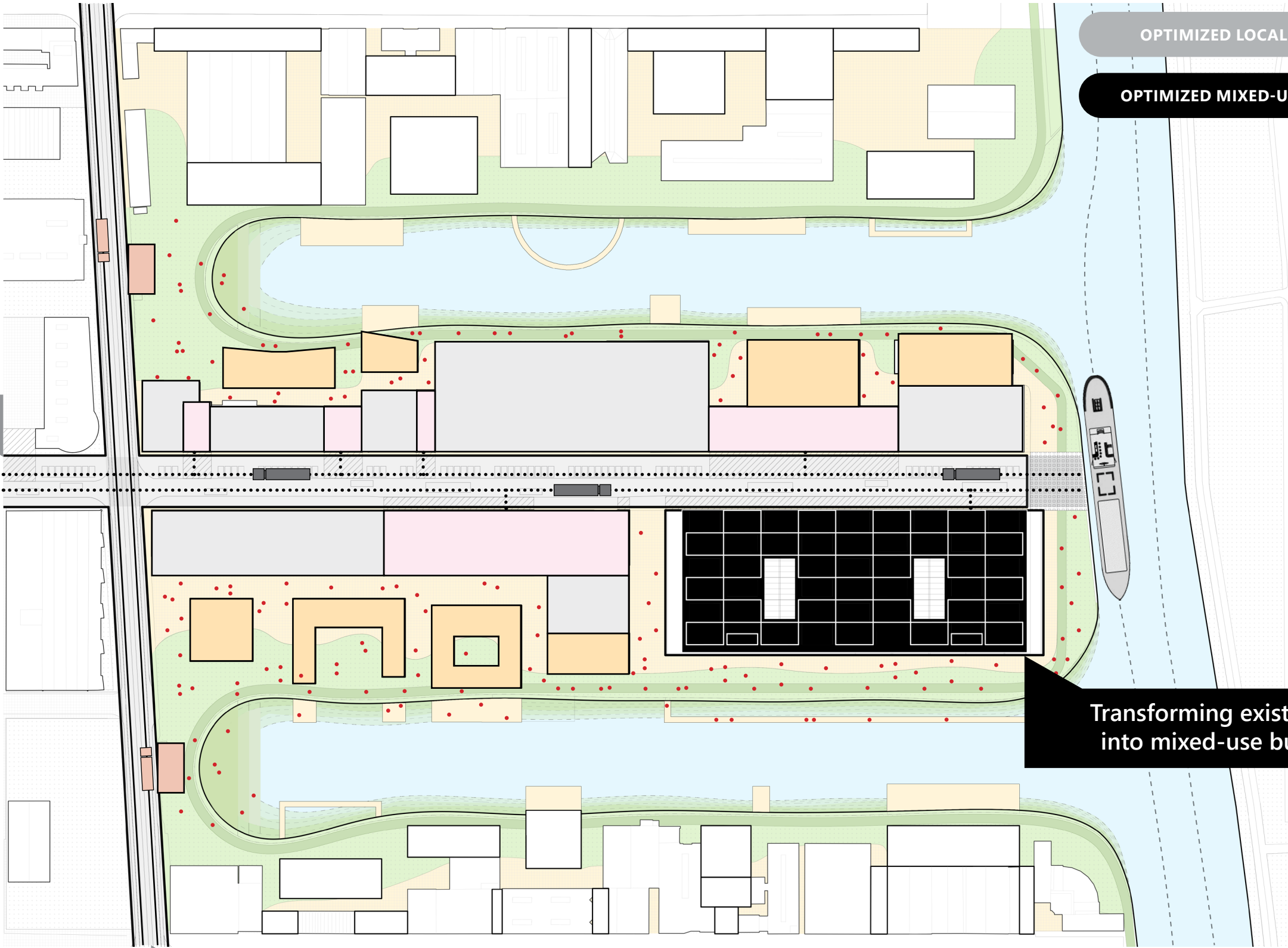
OPTIMIZED LOCAL ECOLOGIES

OPTIMIZED MIXED-USE BUILDINGS

Logistic Axis

OV Axis

Transforming existing hall into mixed-use building



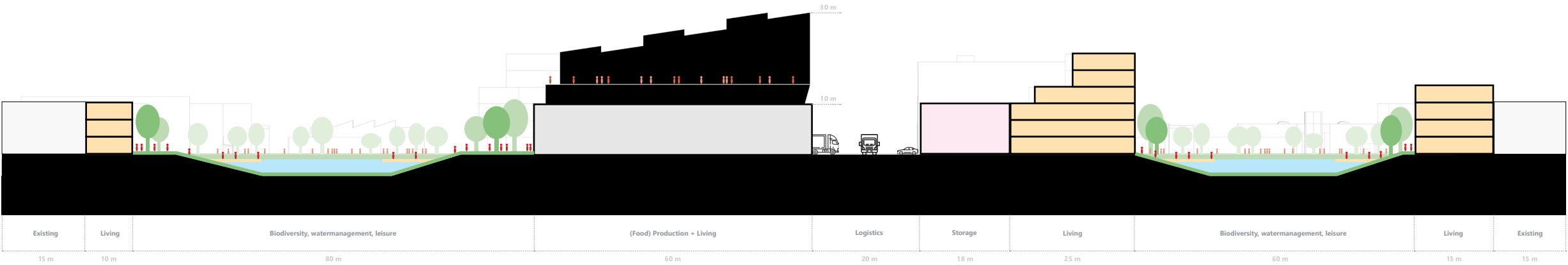
URBAN SECTIONS 1:500

SPATIAL STRATEGIES

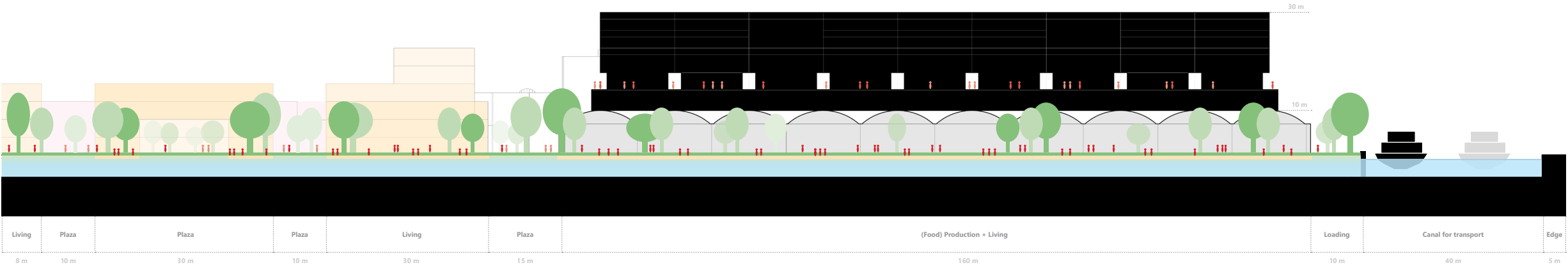
OPTIMIZED MOBILITY & ZONING

OPTIMIZED LOCAL ECOLOGIES

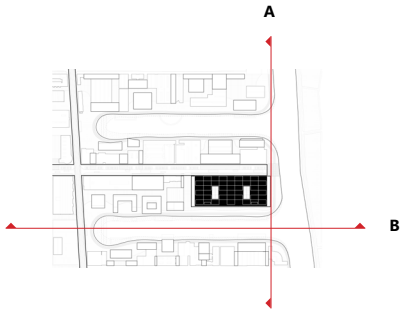
OPTIMIZED MIXED-USE BUILDINGS



Cross Section A. Urban Masterplan Spaanse Polder.



Long Section B. Urban Masterplan Spaanse Polder.



GREEN RESIDENTIAL BAYS



Type of Urbanity. *The existing urban fabric can be developed into green lush residential bays, activating the waterside and context.*

AN ICON FOR THE CONTEXT



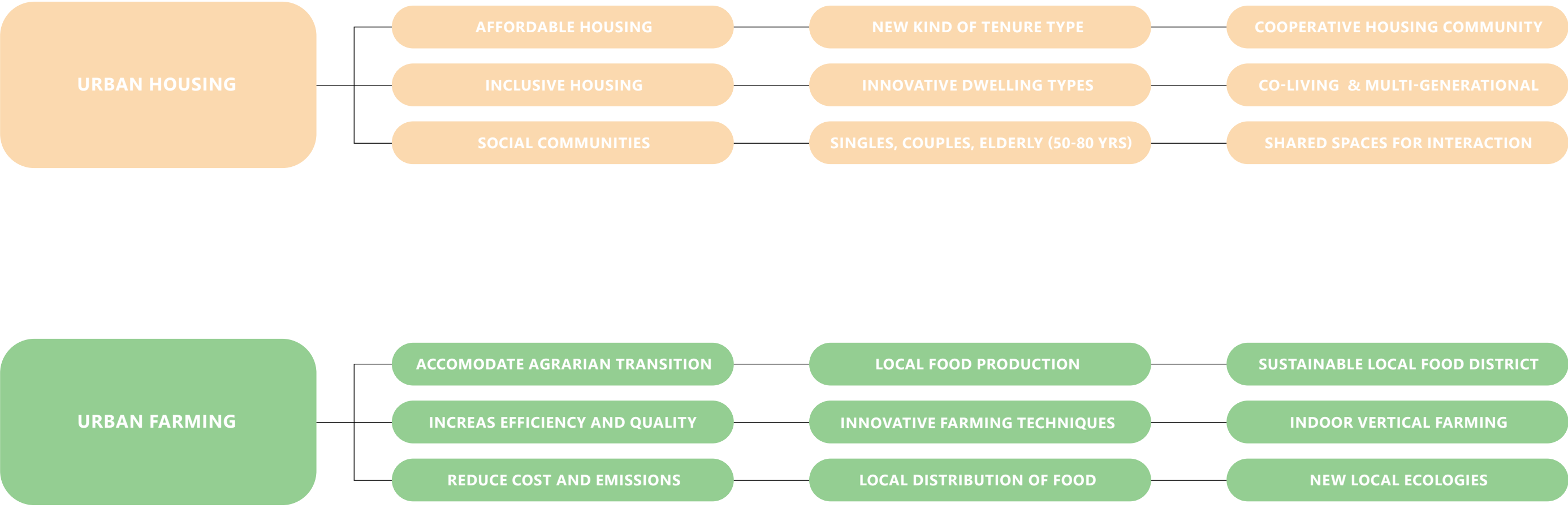
Type of Urbanity. Existing buildings can be transformed into mixed-use housing estates, and can become icons for the larger area.

DESIGN BRIEF

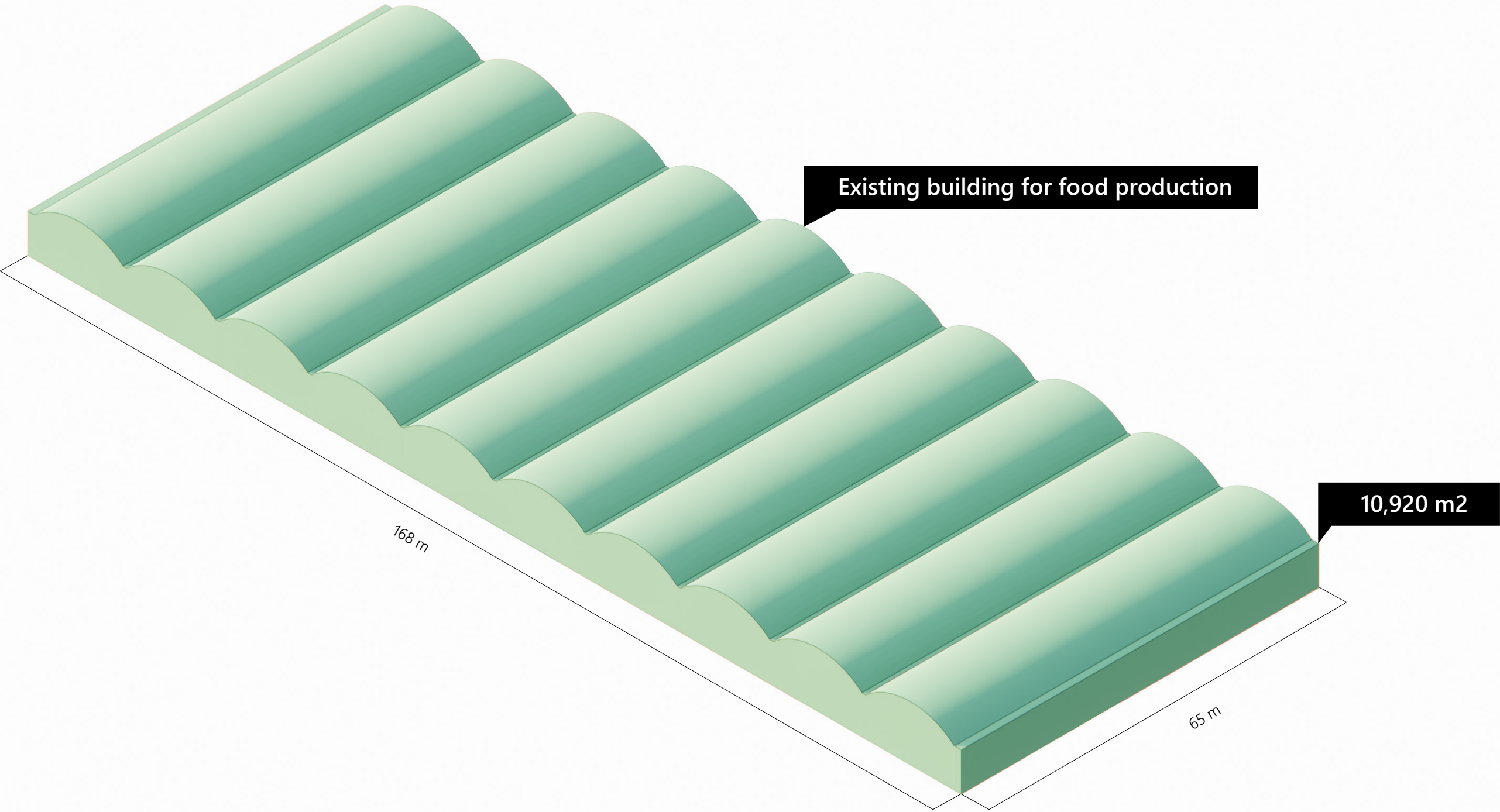
AMBITIONS

PROJECT PRINCIPLES

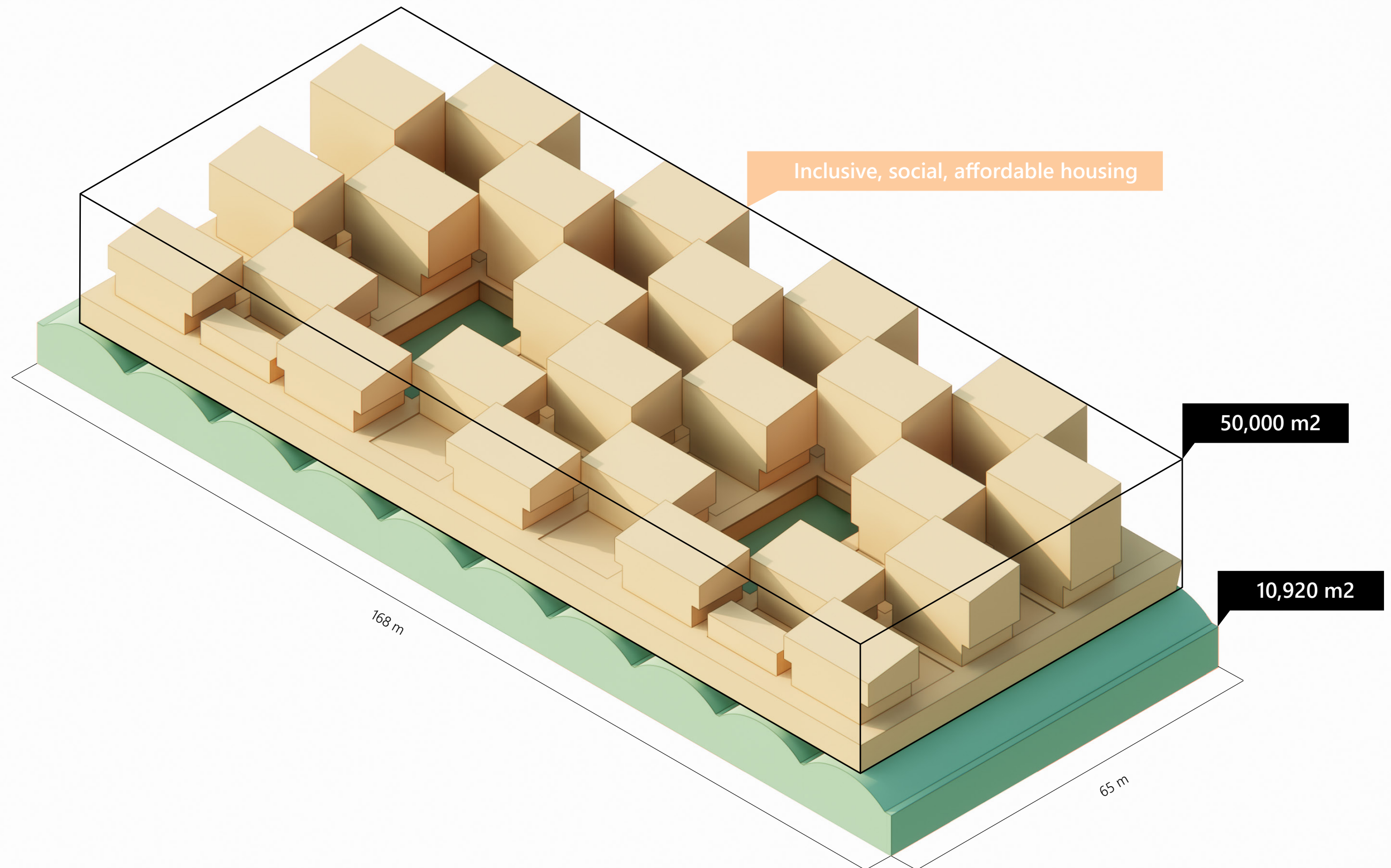
SPATIAL STRATEGIES



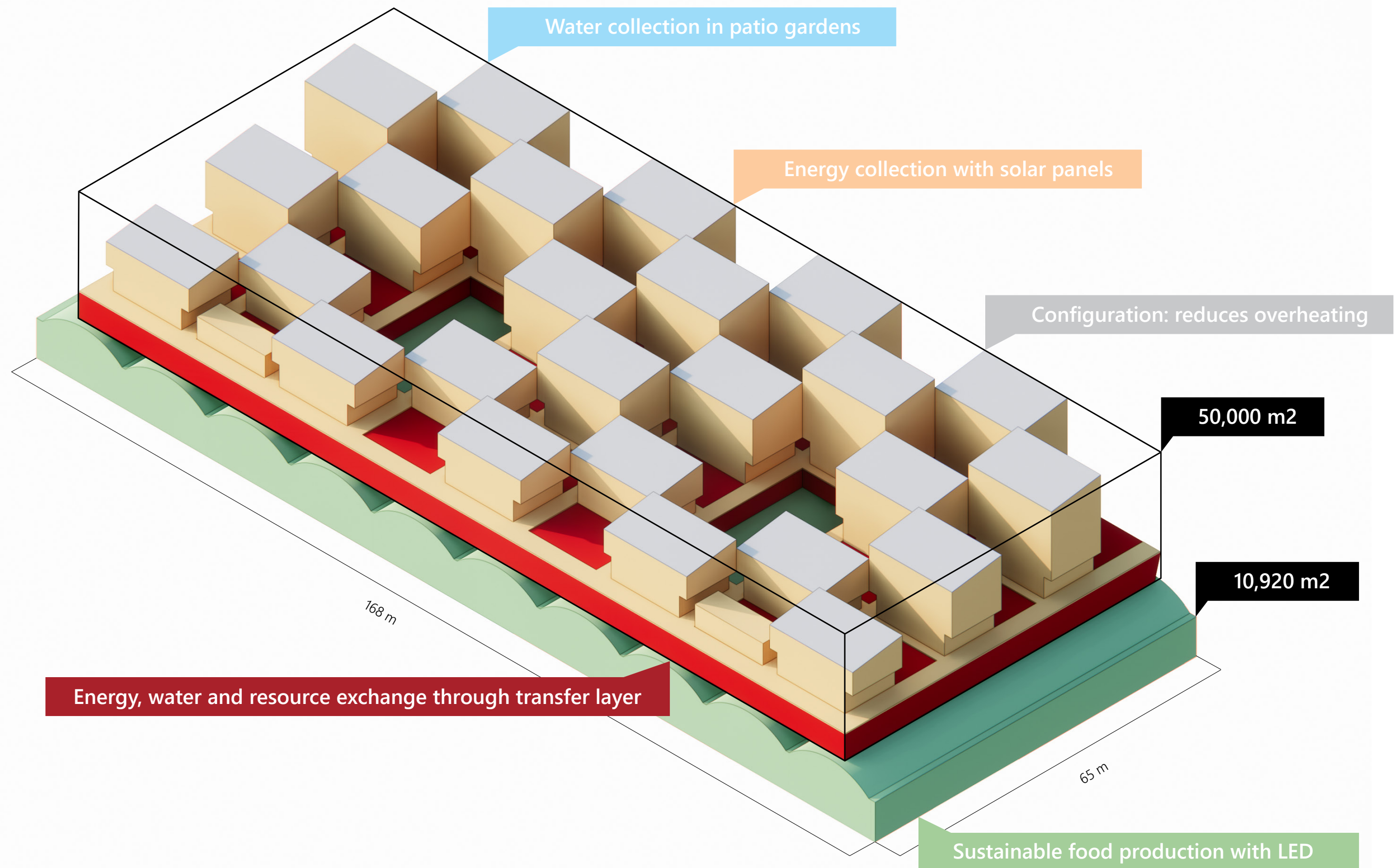
CONCEPT - REUSE EXISTING



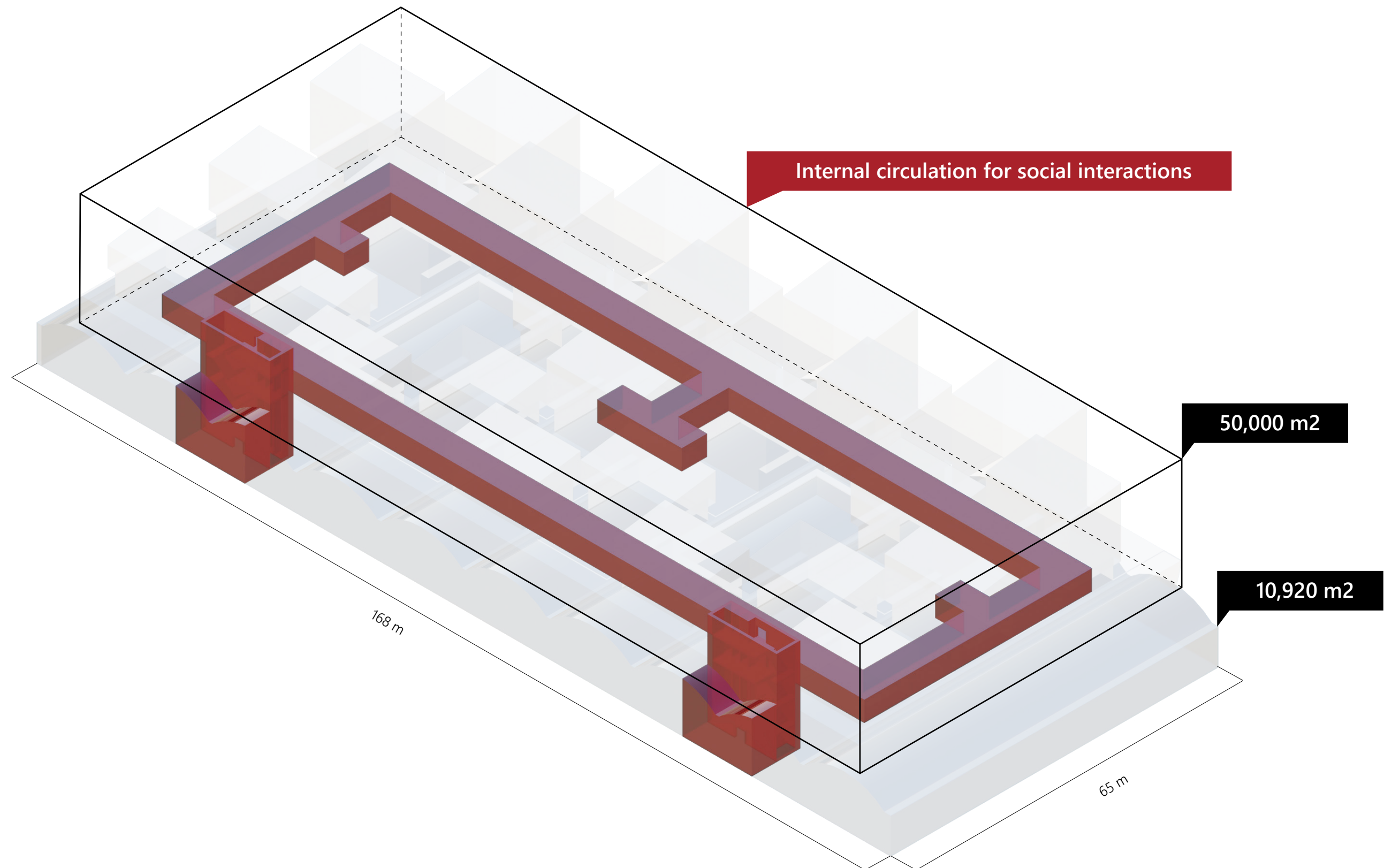
CONCEPT - NEW HOUSING



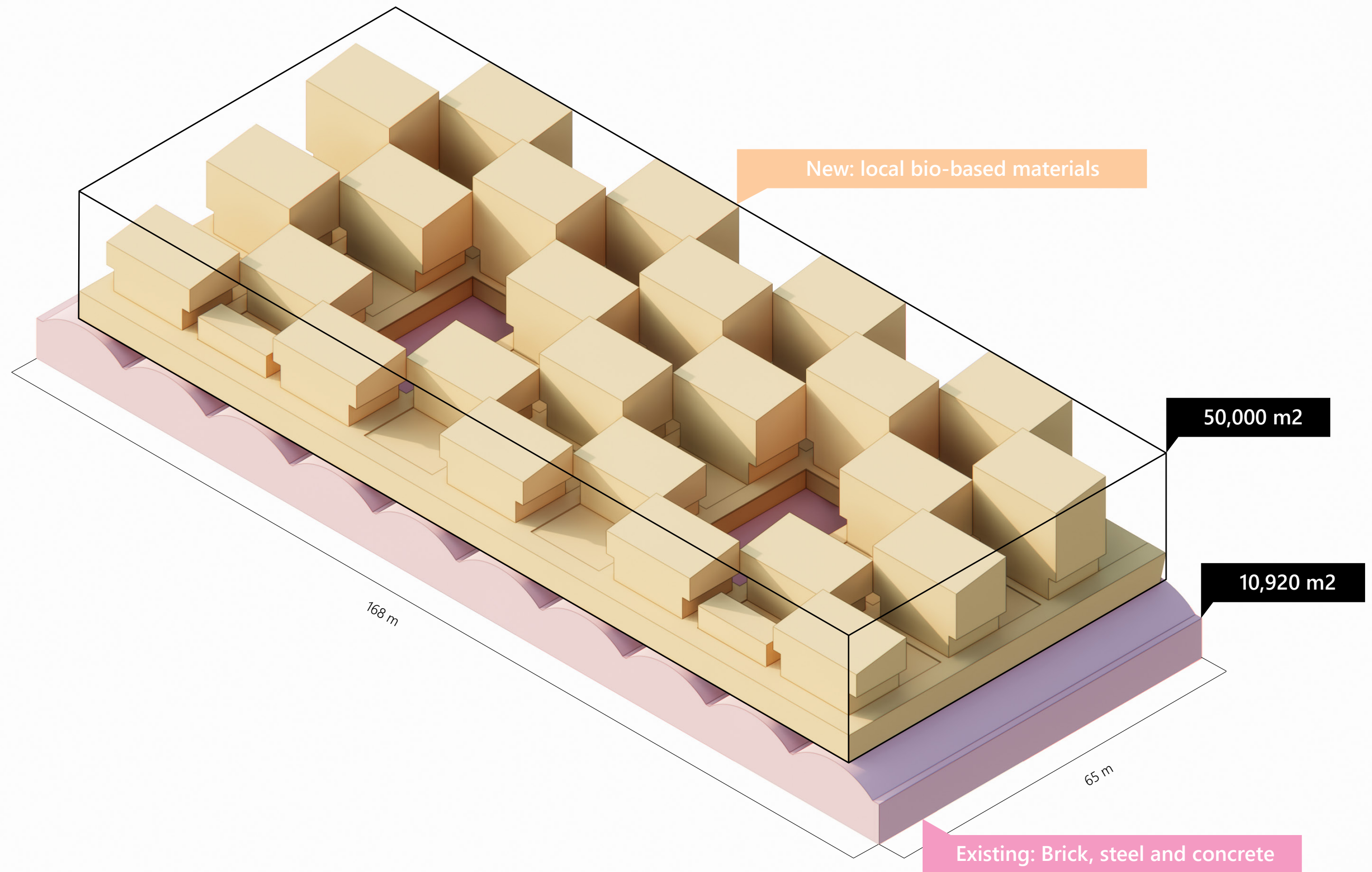
CONCEPT - CLIMATE



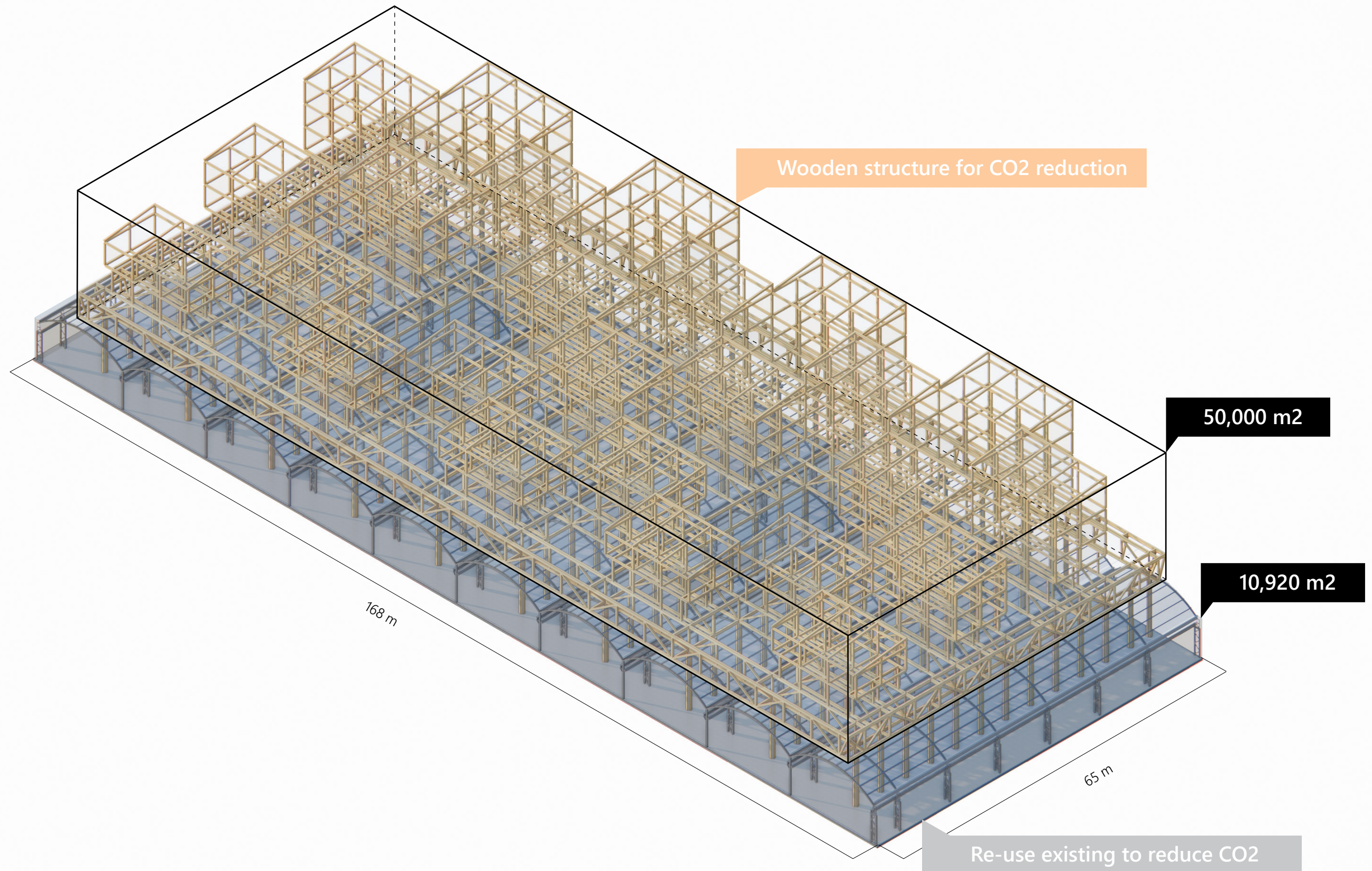
CONCEPT - CIRCULATION

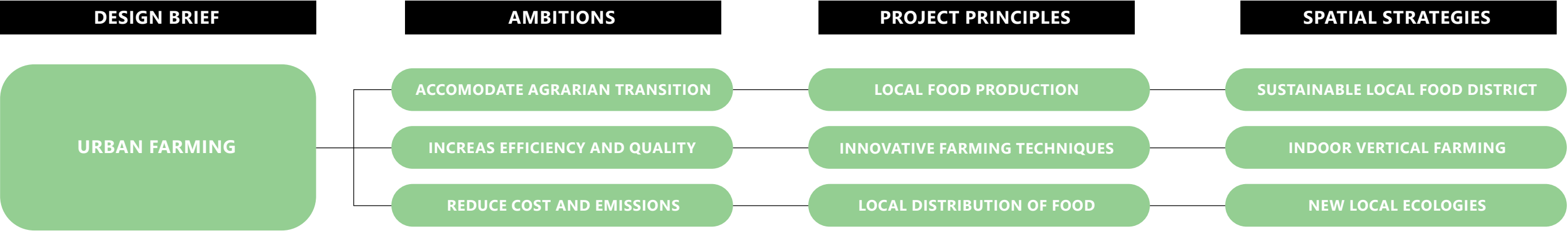


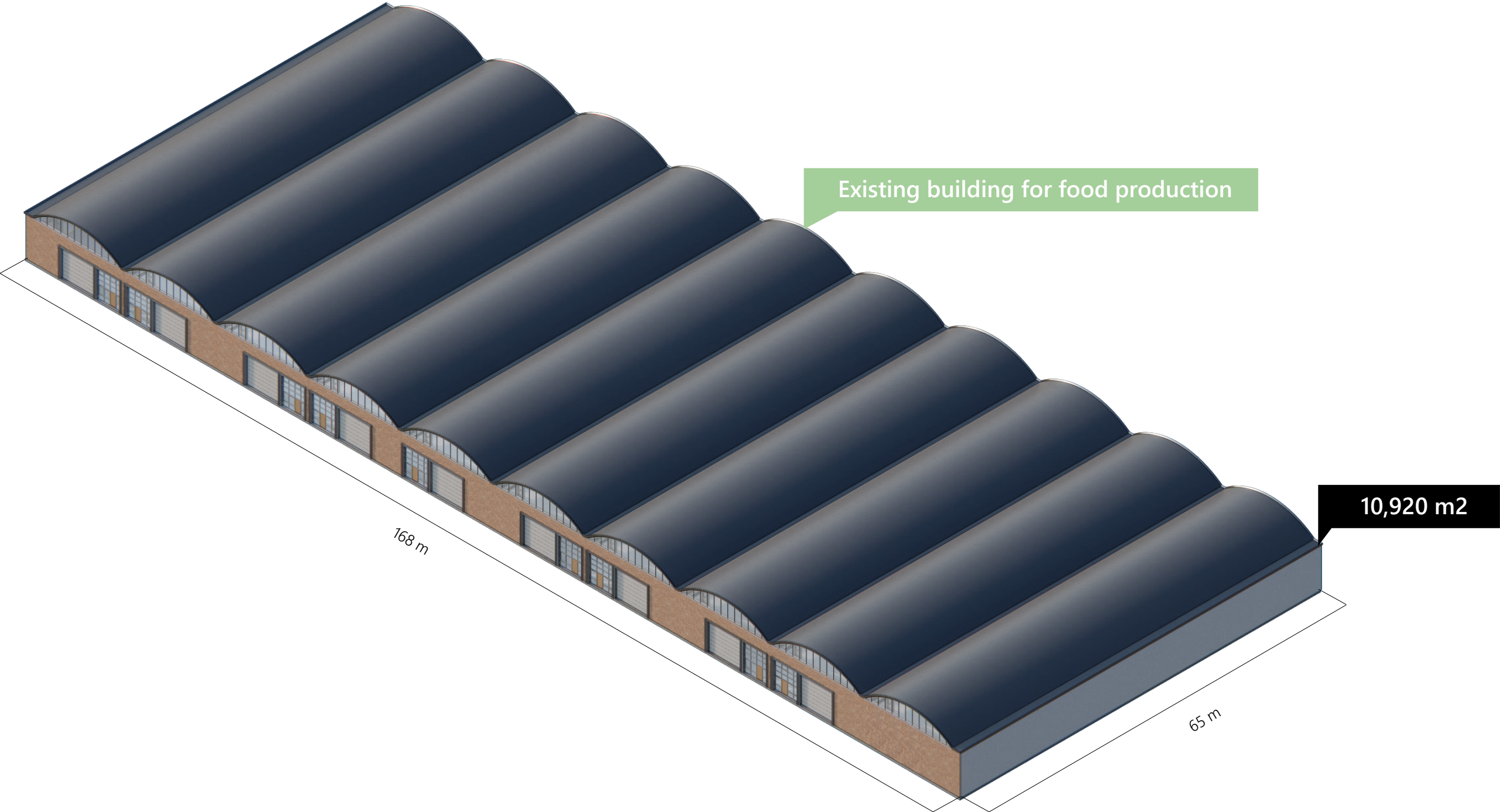
CONCEPT - MATERIALS



CONCEPT - STRUCTURE





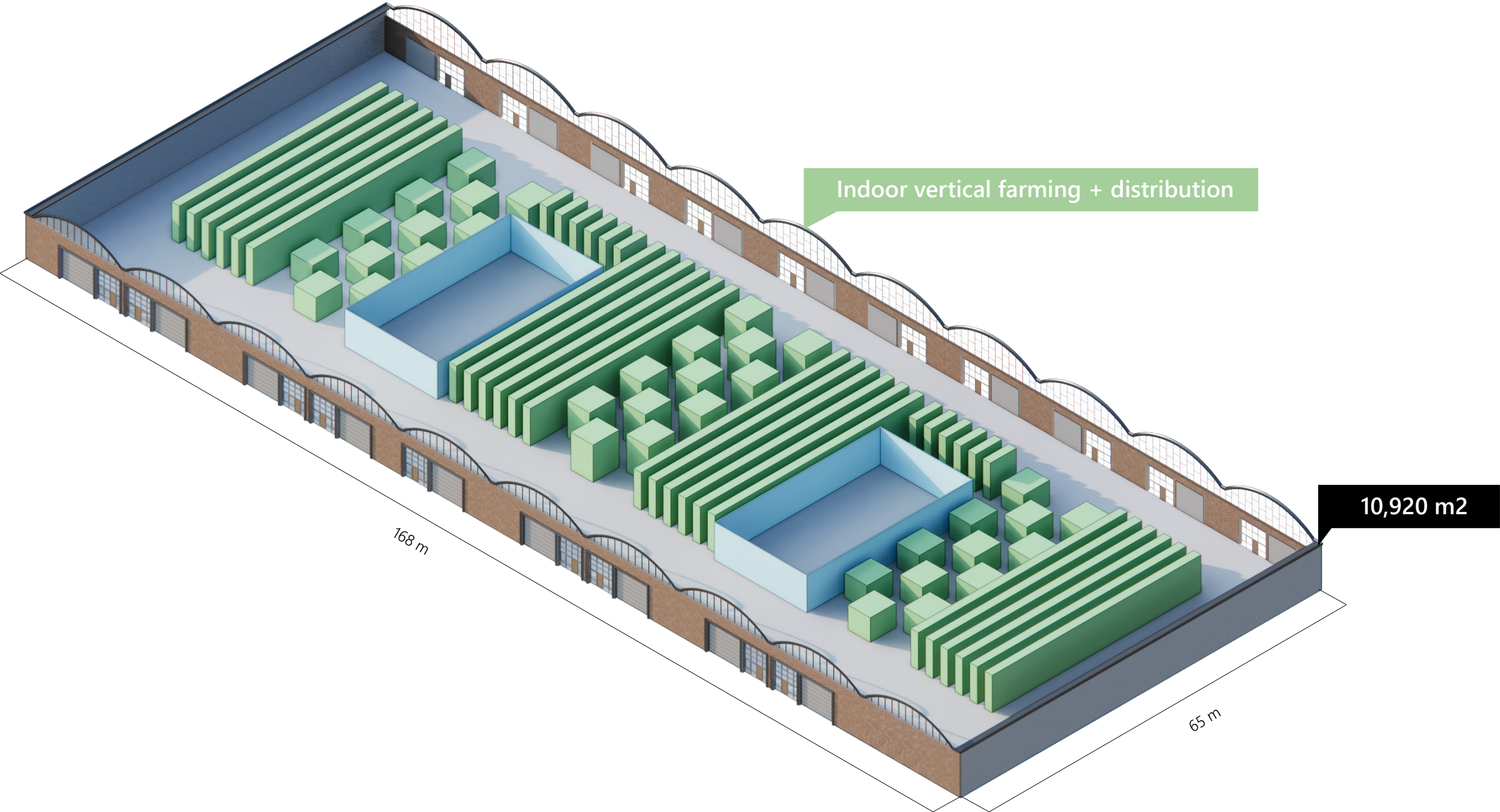


FOOD PRODUCTION HALL

SPATIAL STRATEGIES

SUSTAINABLE LOCAL FOOD DISTRICT

INDOOR VERTICAL FARMING



FOOD PRODUCTION HALL

SPATIAL STRATEGIES

SUSTAINABLE LOCAL FOOD DISTRICT

INDOOR VERTICAL FARMING

NEW LOCAL ECOLOGIES

Bike parking and storage spaces

Internal logistic corridor

A combination of beneficial functions

Atriums: indoor terrace & food market

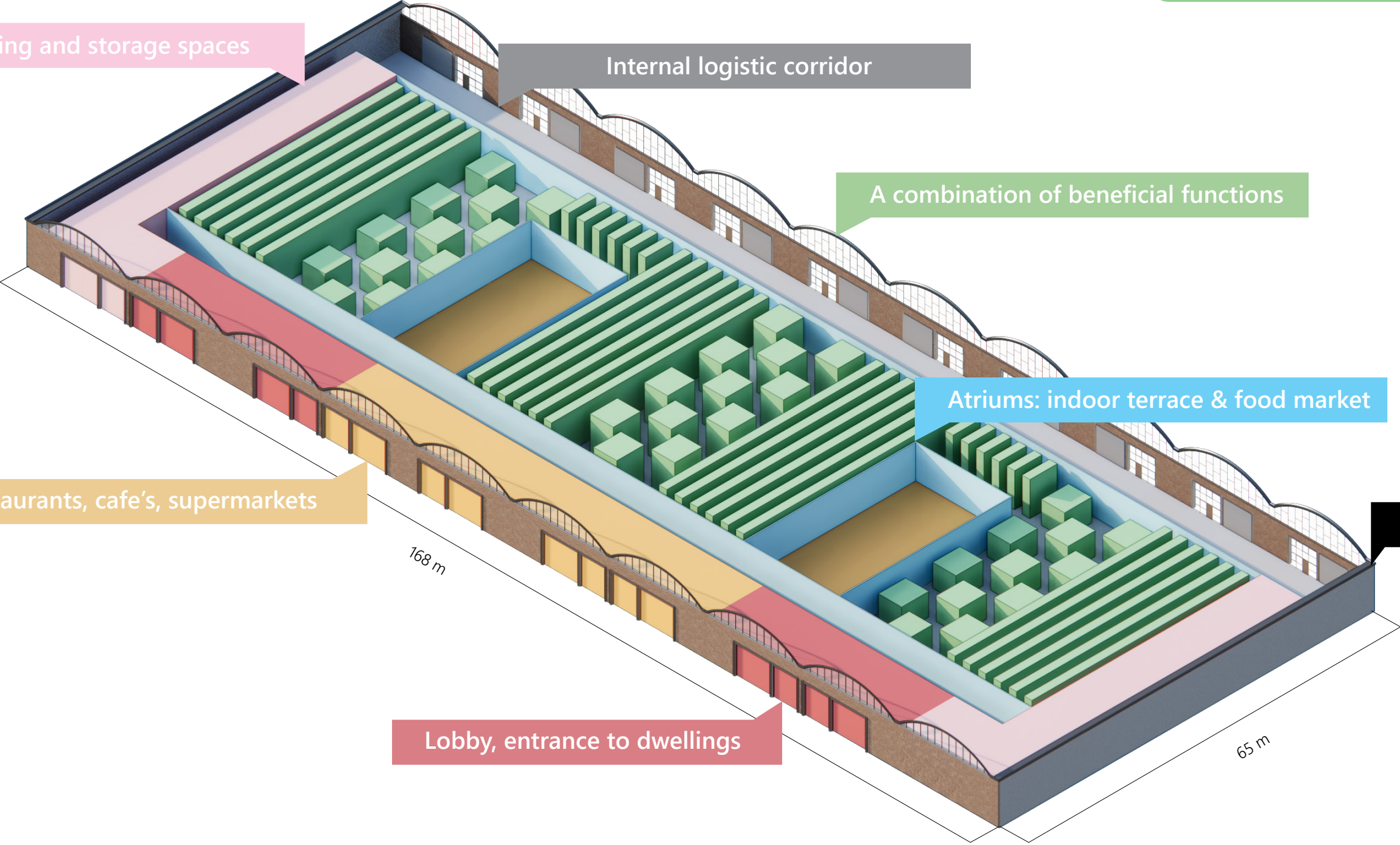
Restaurants, cafe's, supermarkets

Lobby, entrance to dwellings

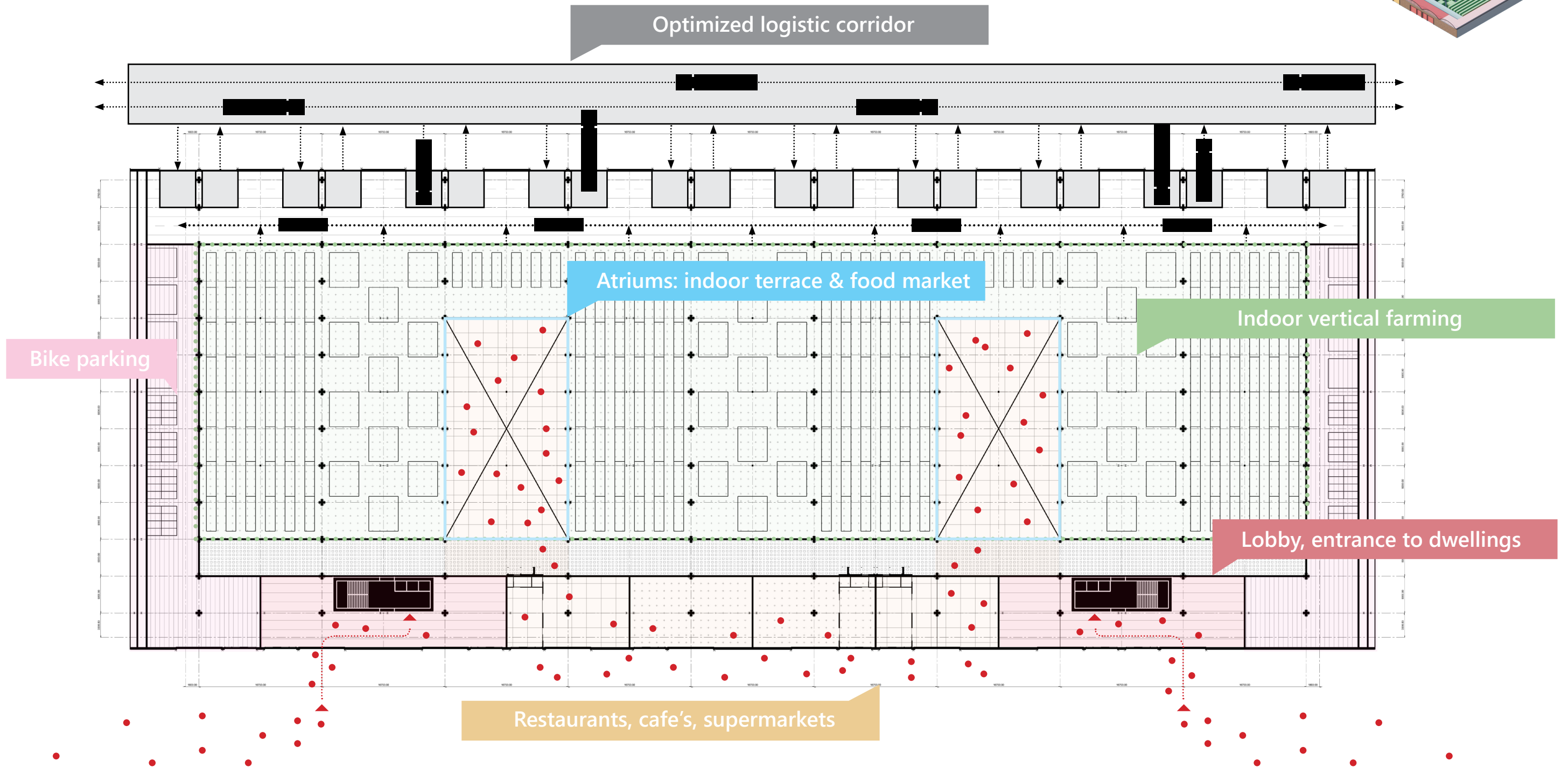
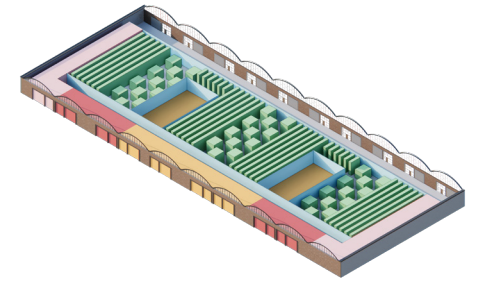
10,920 m²

168 m

65 m



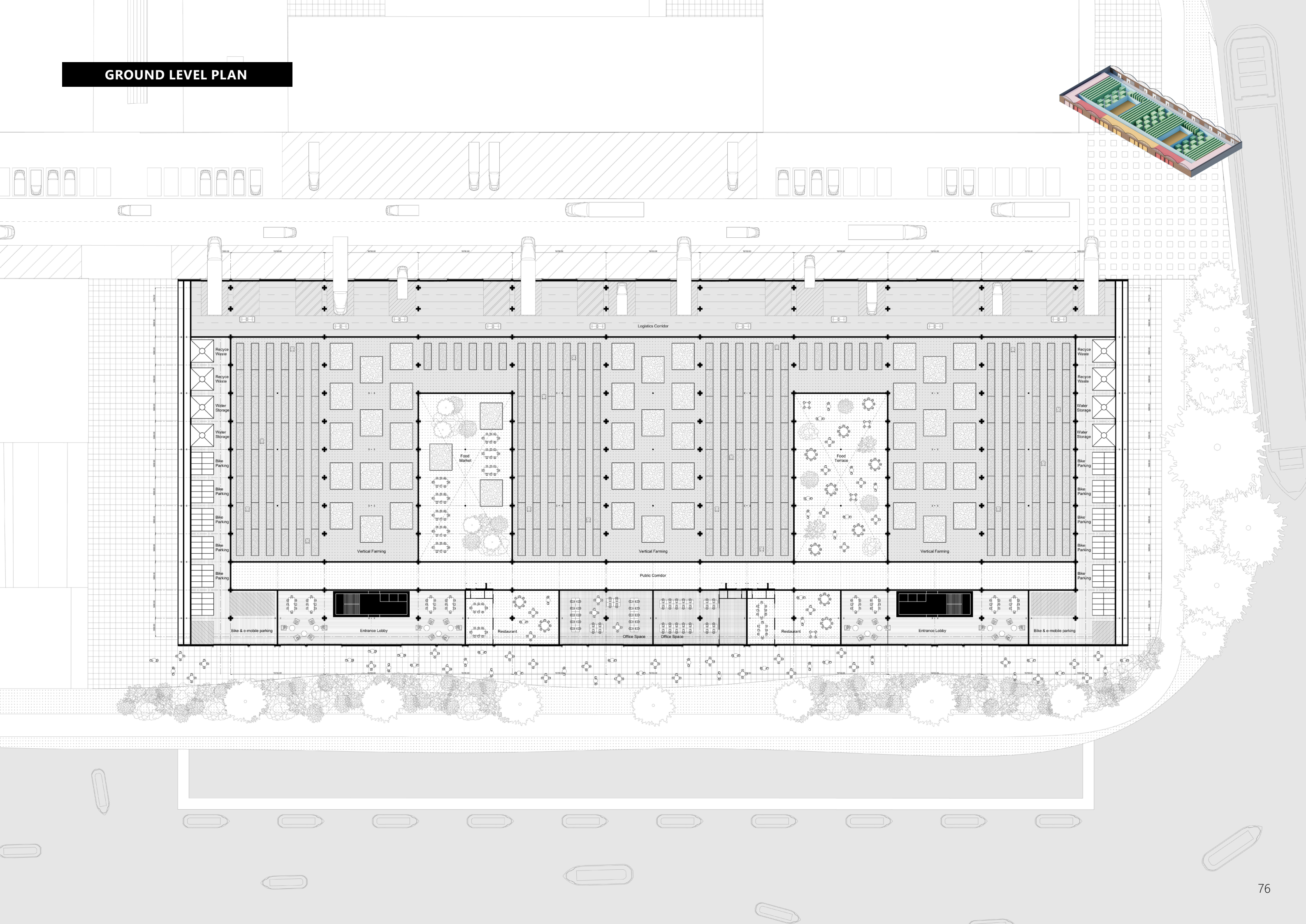
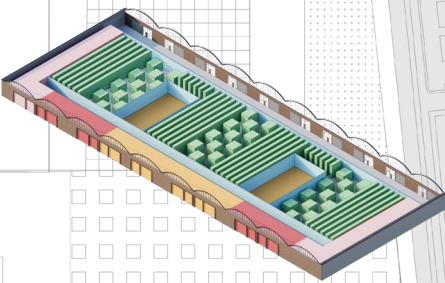
FOOD PRODUCTION PLAN



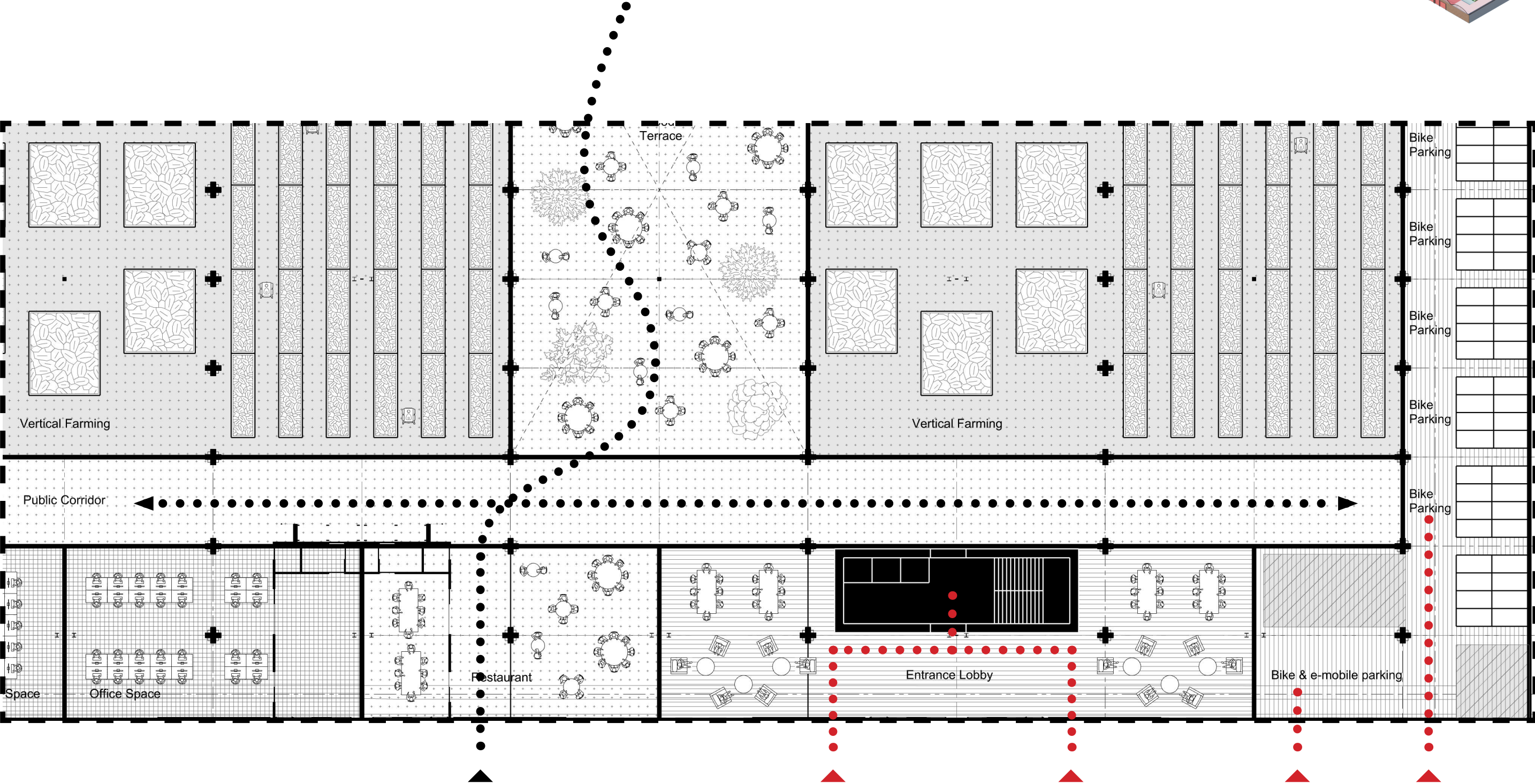
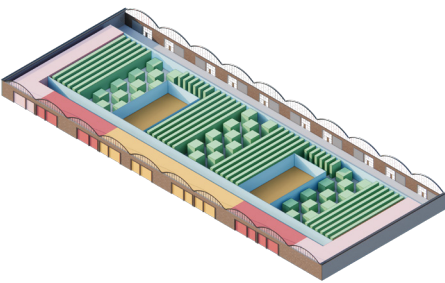
GROUND LEVEL PLAN



GROUND LEVEL PLAN



GROUND LEVEL PLAN



PUBLIC SPACE & ENTRANCE



Urban Thresholds. Re-development allows for an upgrade of the existing public space, and can be re-defined by transformations.

ENTRANCE & LOBBY



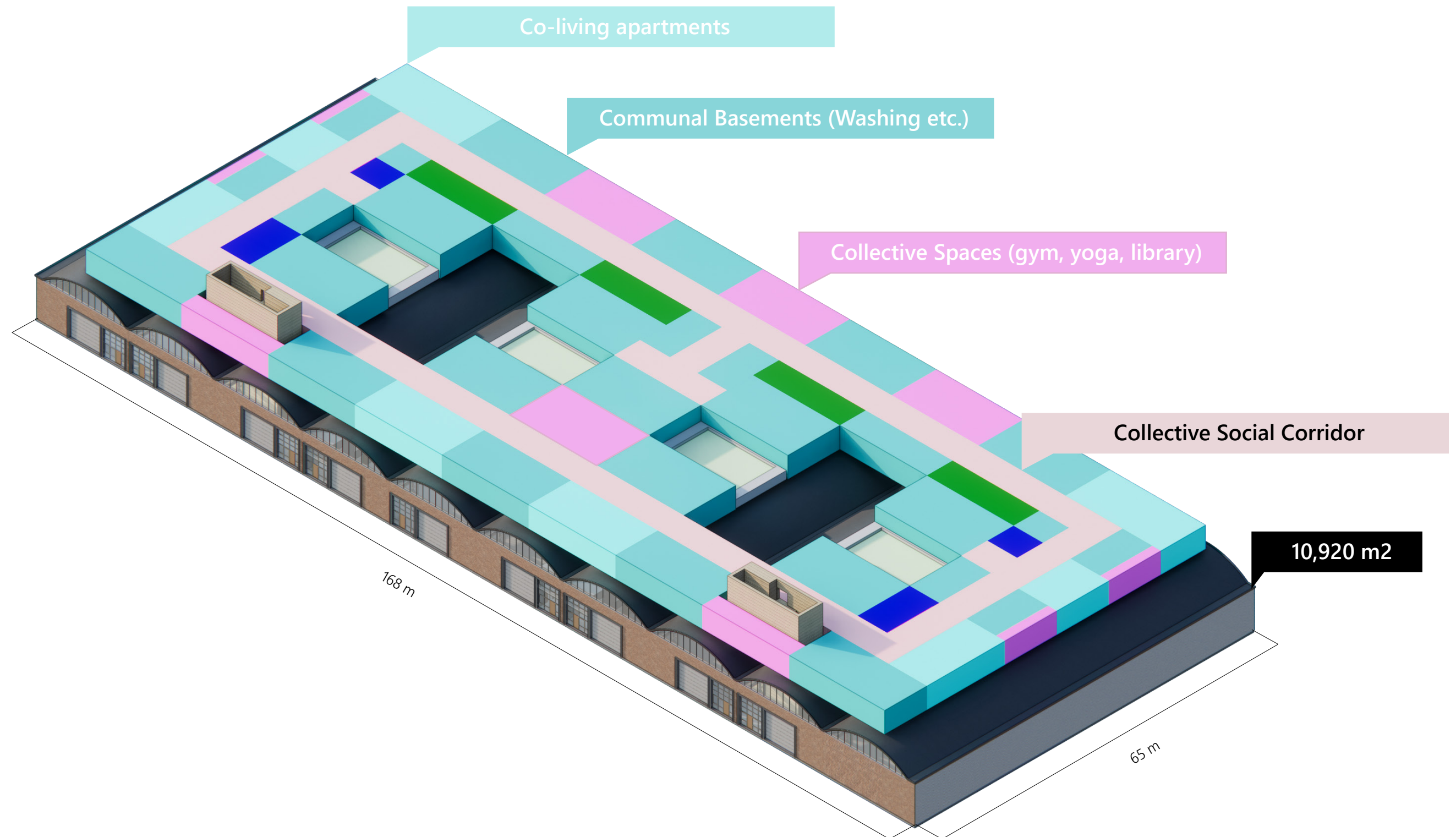
Urban Thresholds. The large monumental doors provide an entrance for pedestrians and bikes, the core connects to the dwellings.

TERRACE & FOOD PRODUCTION

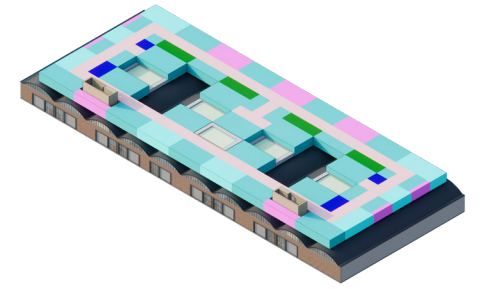


Urban Thresholds. Public space finds its way into the building, in the form of a foodmarket and a large terrace to eat locally produced food.

INBETWEEN LEVEL



INBETWEEN LEVEL PLAN



Collective Social Corridor

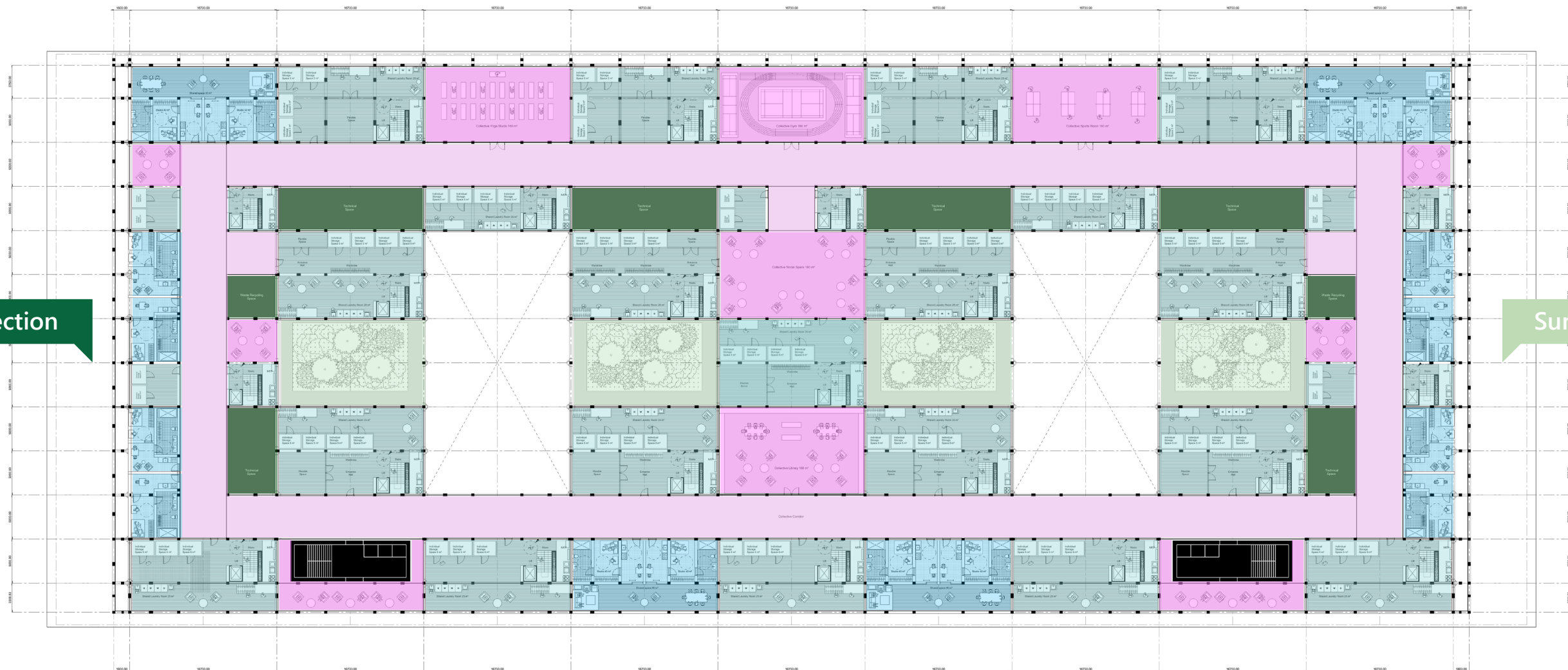
Collective Spaces (gym, yoga, library)

Waste collection

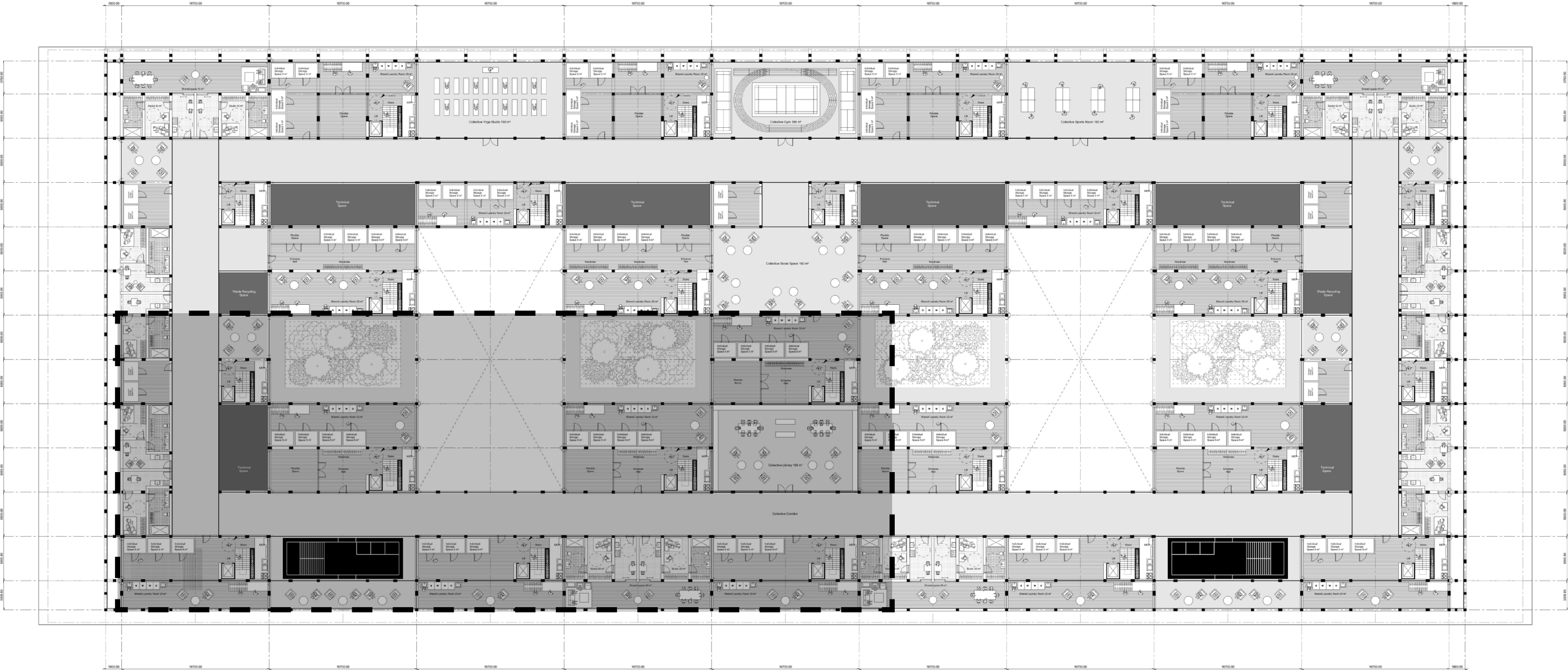
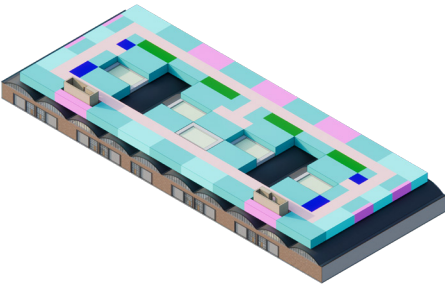
Sunken Gardens

Communal Basements (Washing etc.)

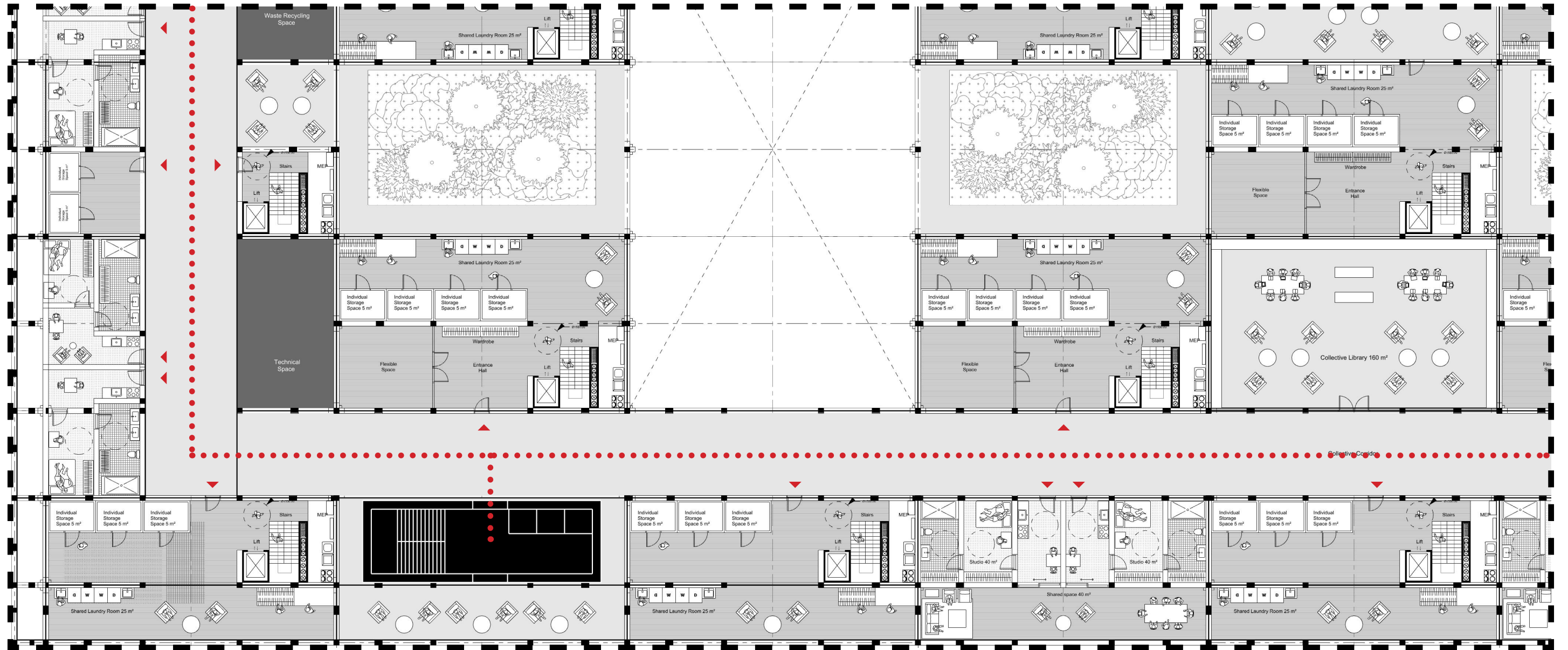
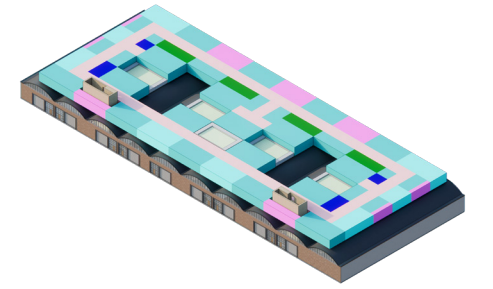
Co-living apartments



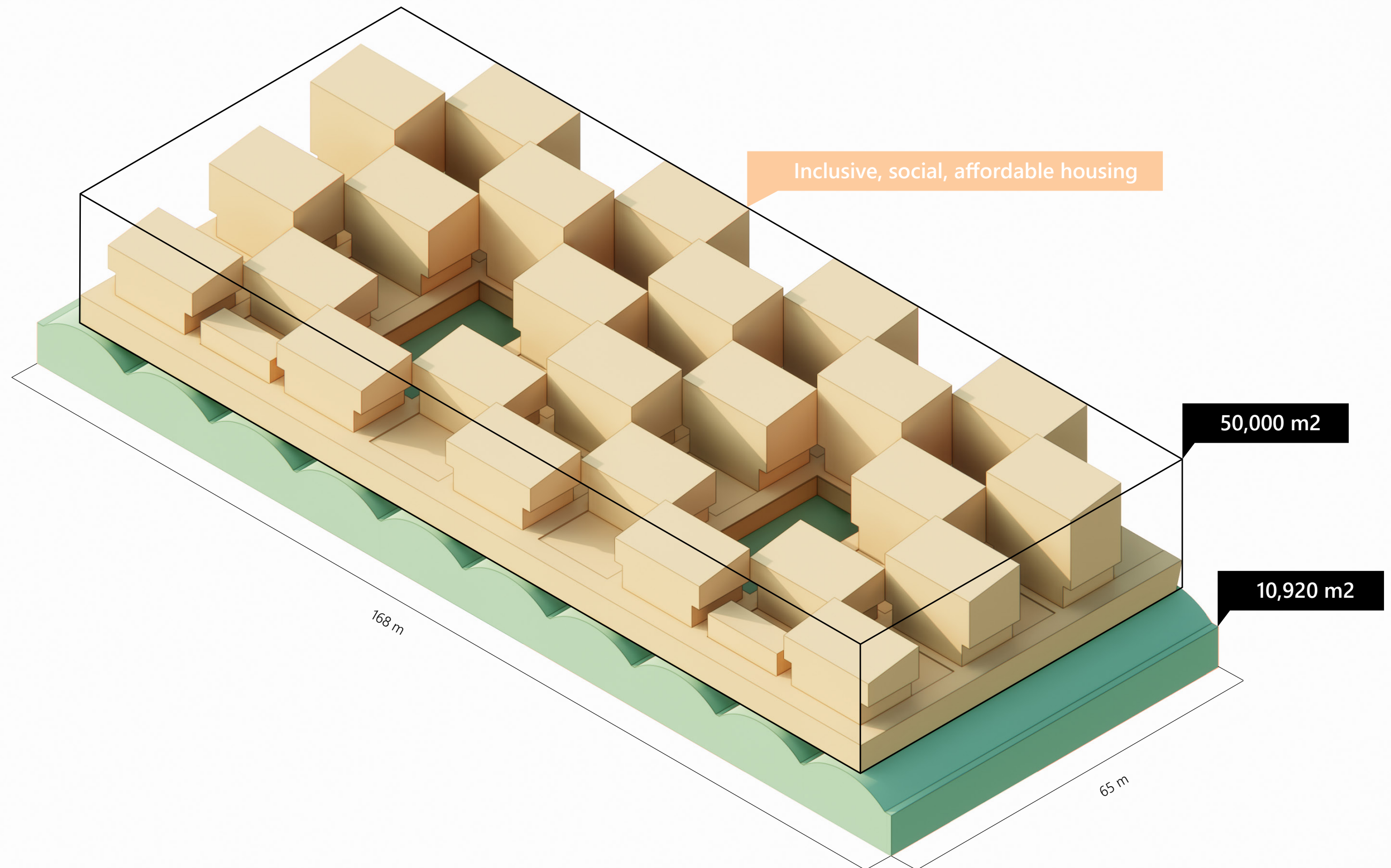
INBETWEEN LEVEL PLAN



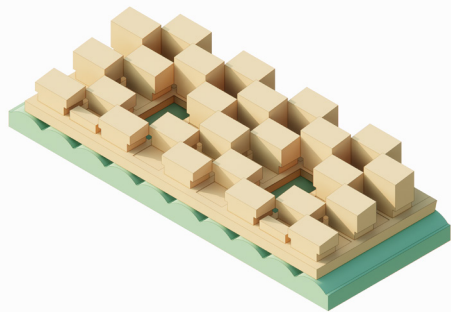
INBETWEEN LEVEL PLAN



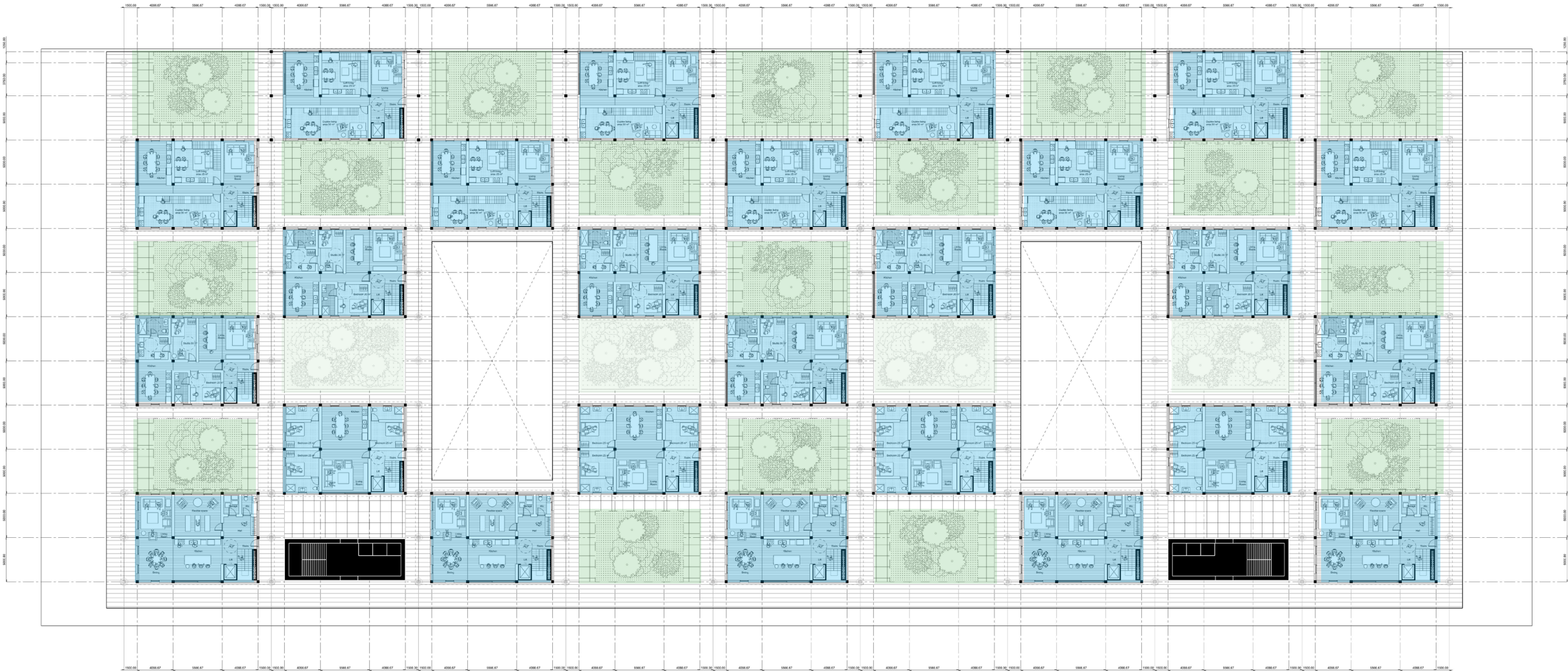
DWELLING LEVEL



DWELLING LEVEL PLAN

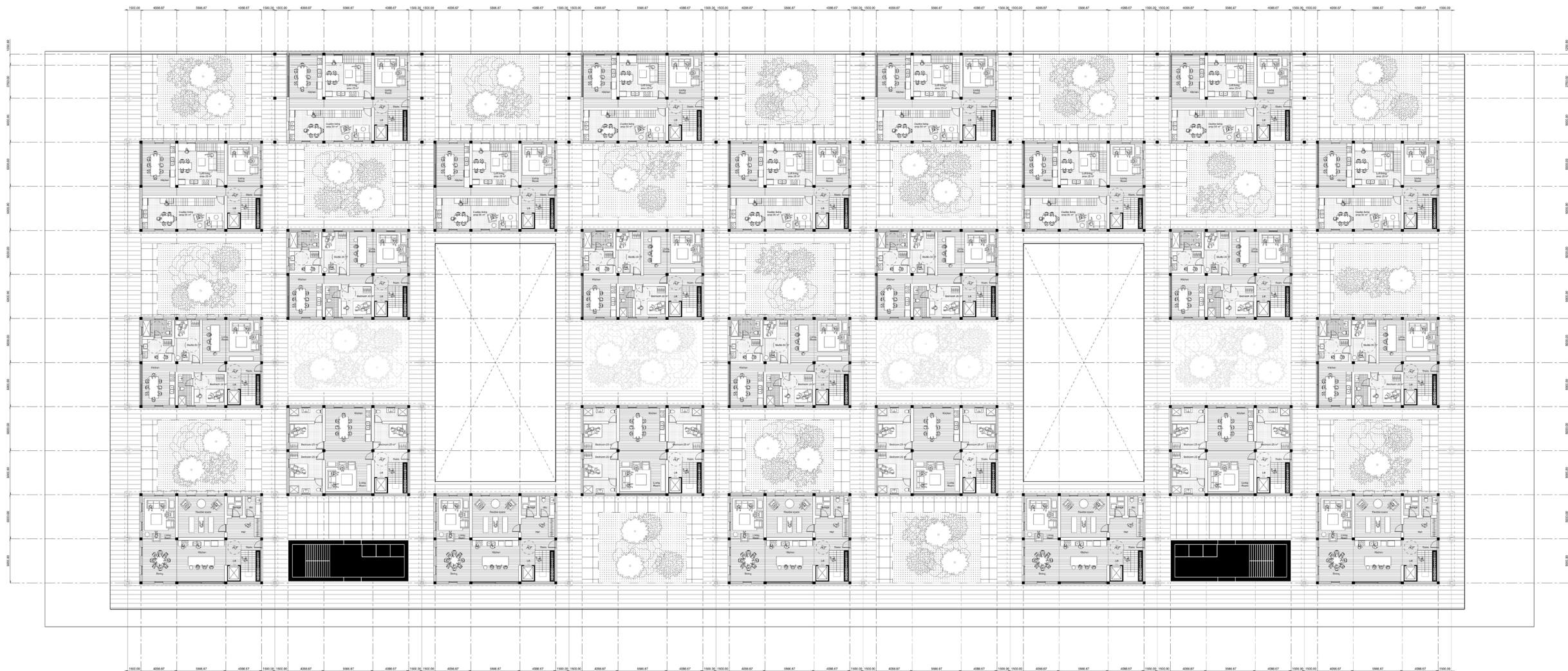
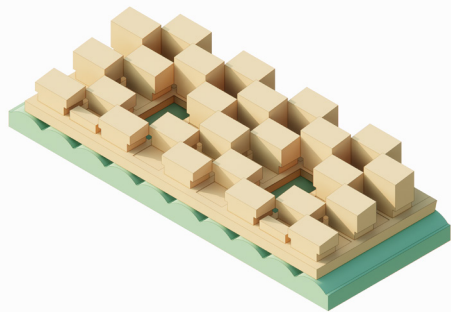


Communal Gardens

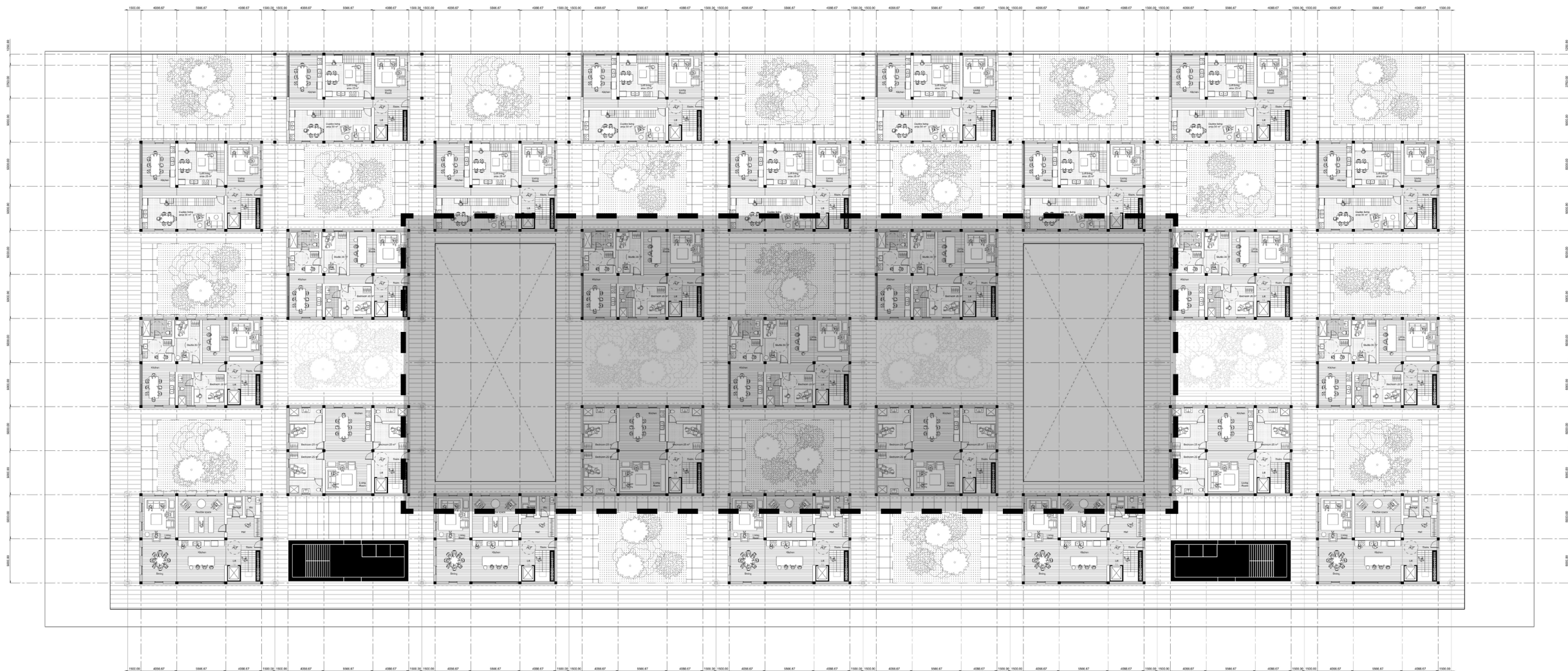
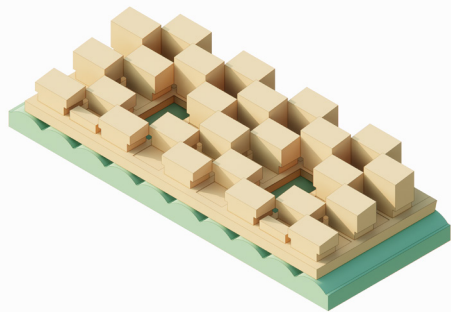


Co-living Clusters

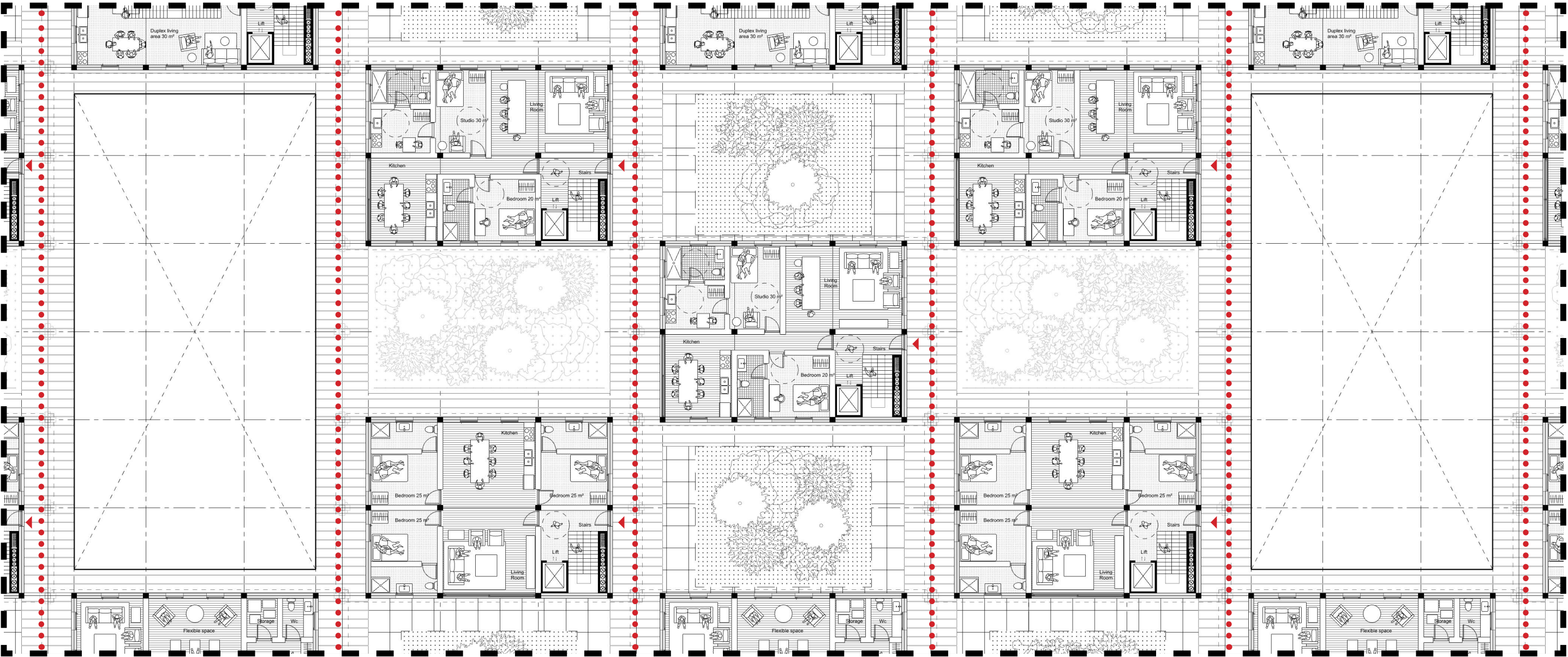
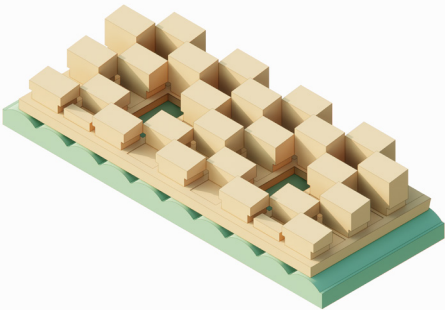
DWELLING LEVEL PLAN



DWELLING LEVEL PLAN



DWELLING LEVEL PLAN

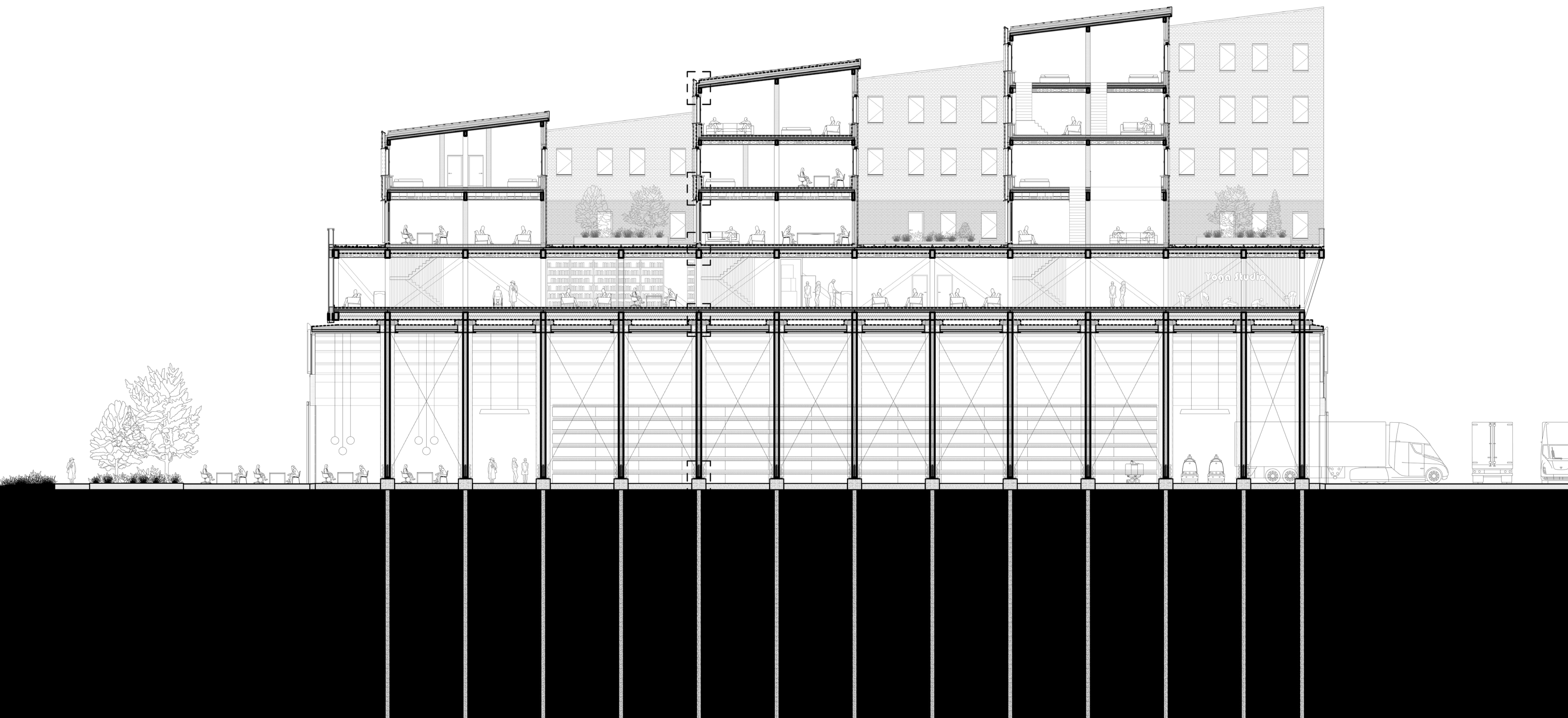
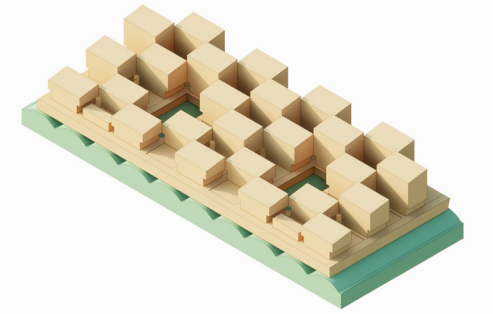


COLLECTIVE GARDENS



Collective Gardens. The 'deck' of the building is a second ground level, where various living clusters have access to green courtyards.

BUILDING CROSS SECTION



BUILDING CROSS SECTION

GROUND FLOOR

GREEN LUSH BOULEVARD

PUBLIC SPACE / CAFES

VERTICAL FARMING

PROCESSING / LOGISTICS

IN BETWEEN LEVEL

SHARED BASEMENTS

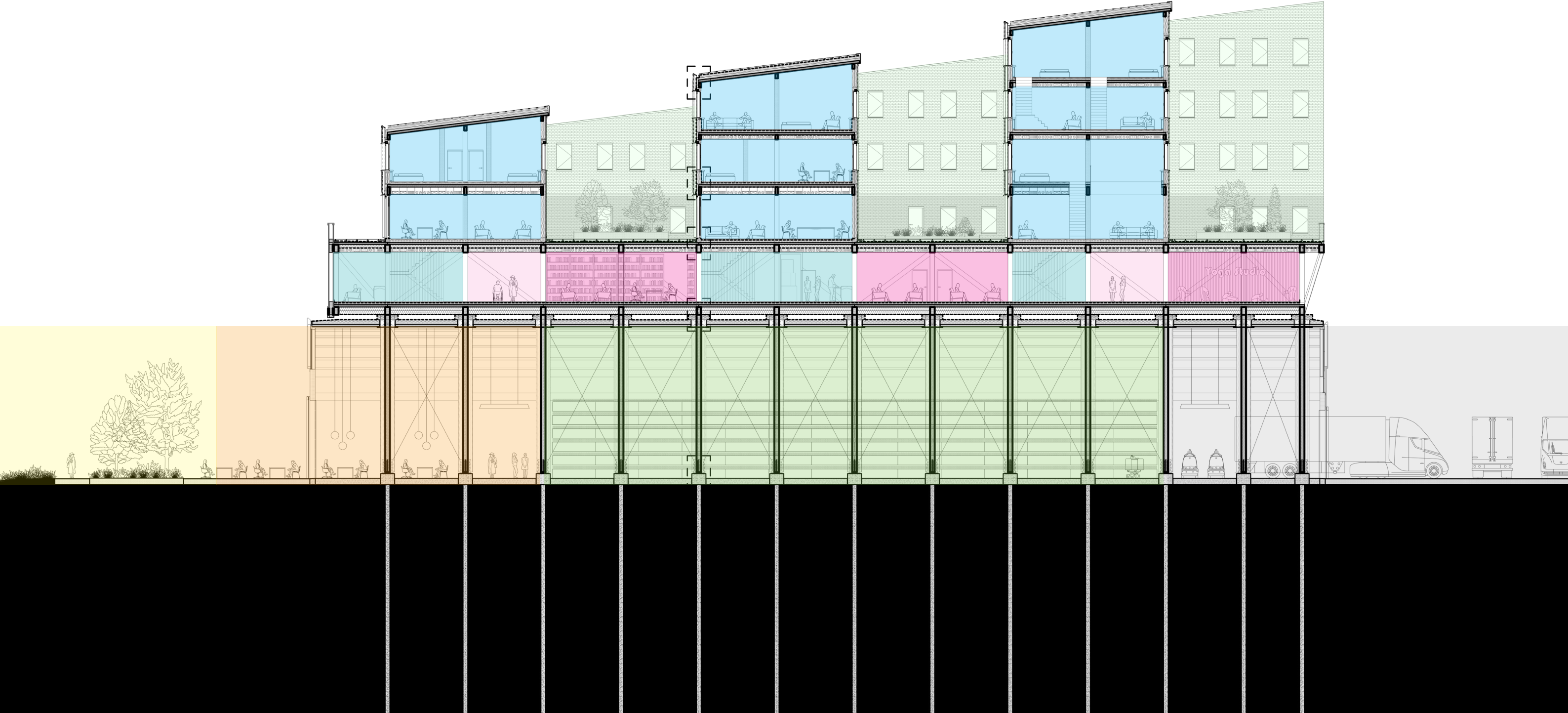
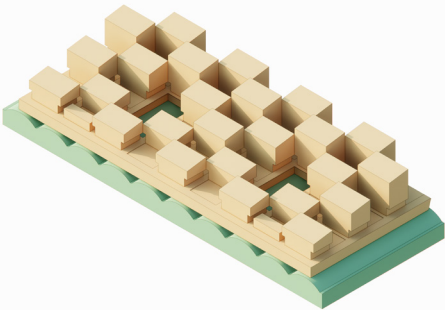
SOCIAL HALLWAY

COLLECTIVE SPACES

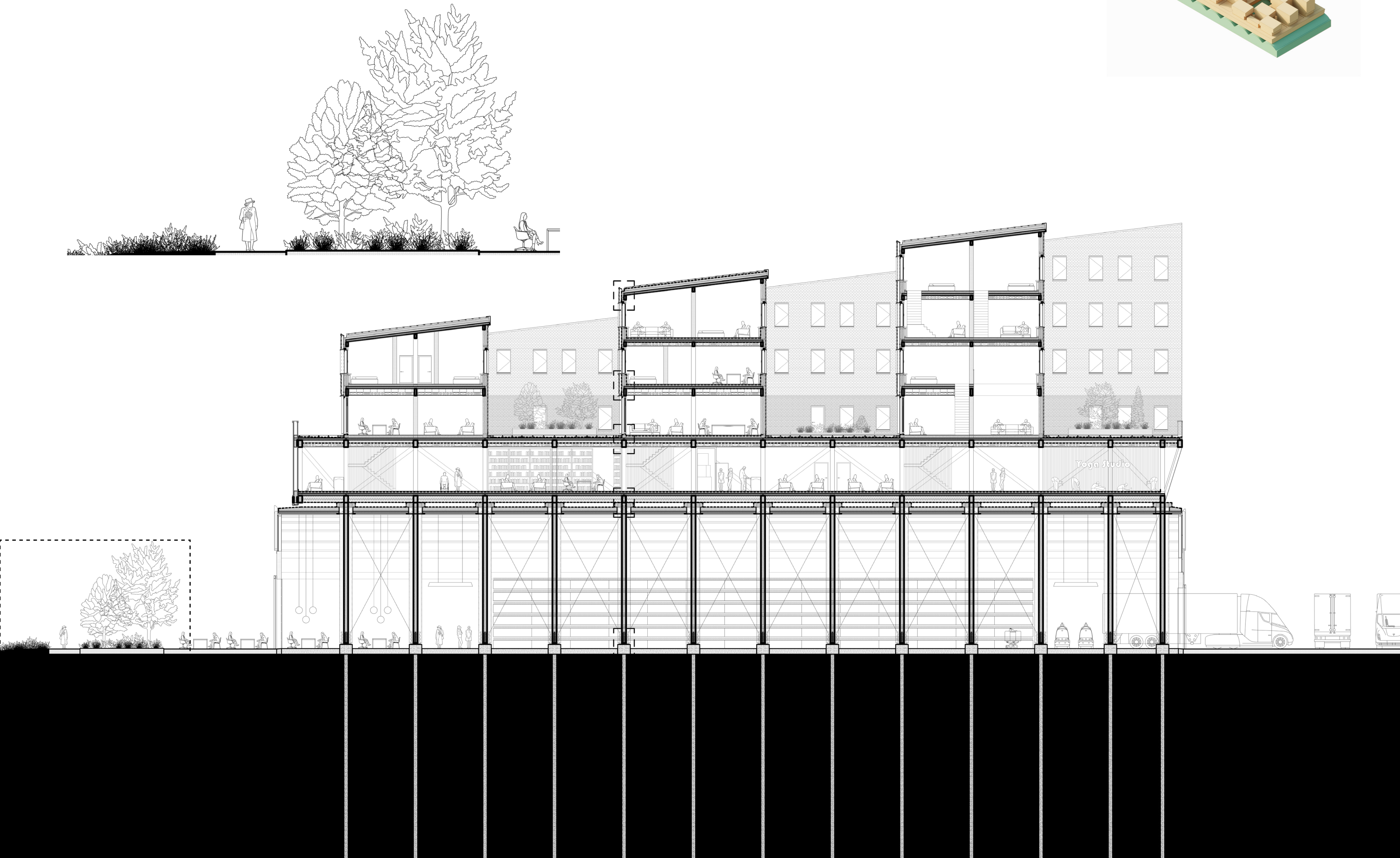
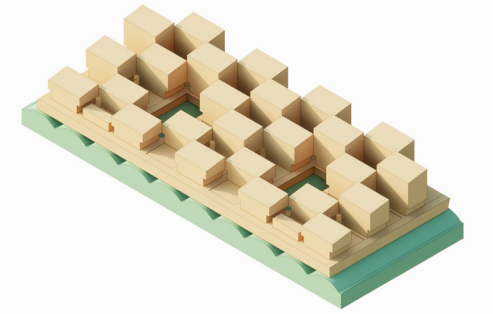
DWELLINGS

COLLECTIVE GARDENS

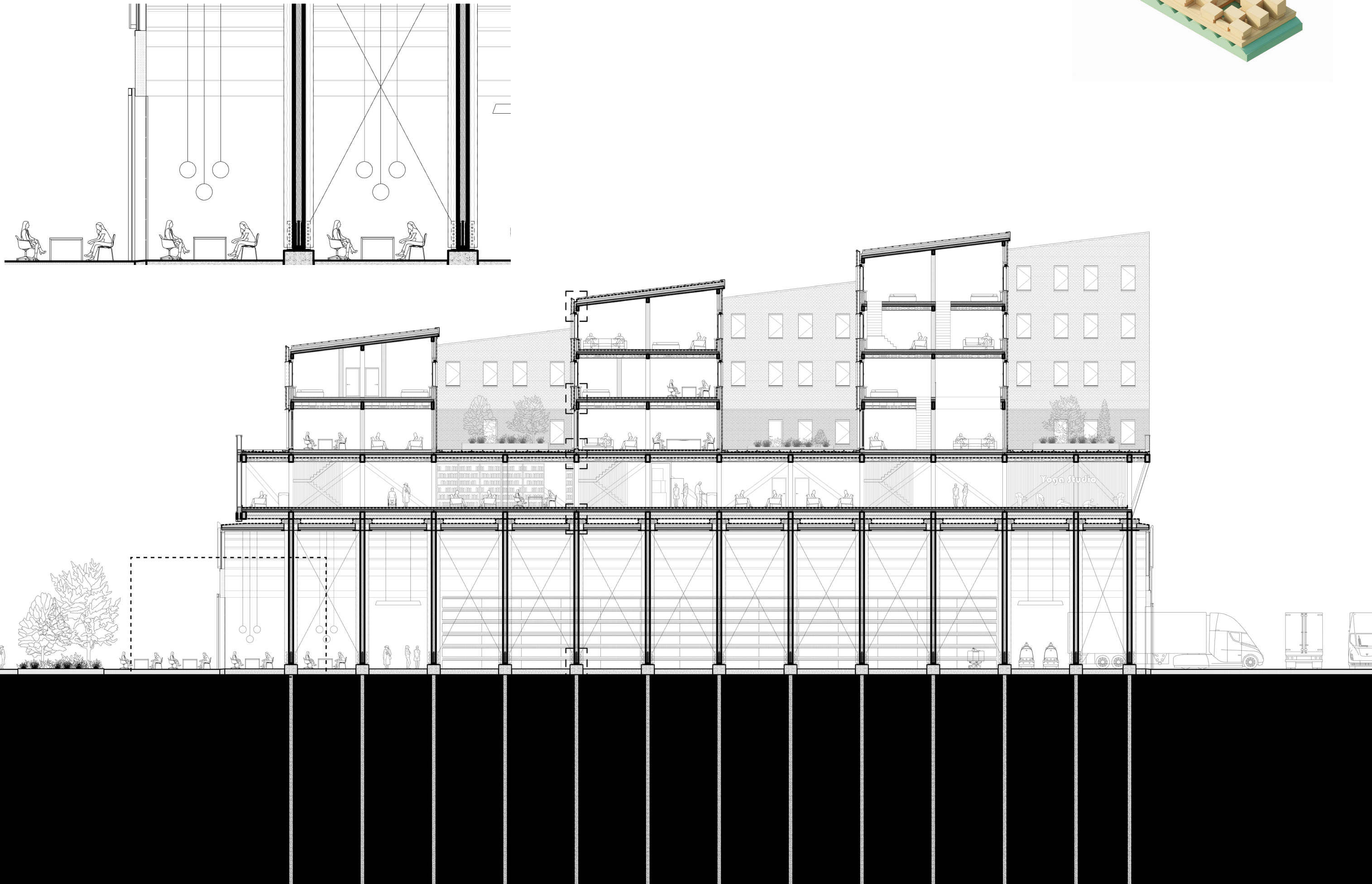
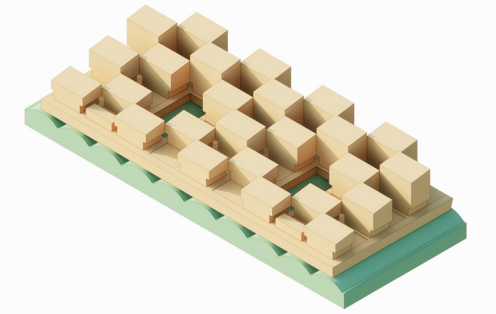
LIVING CLUSTERS



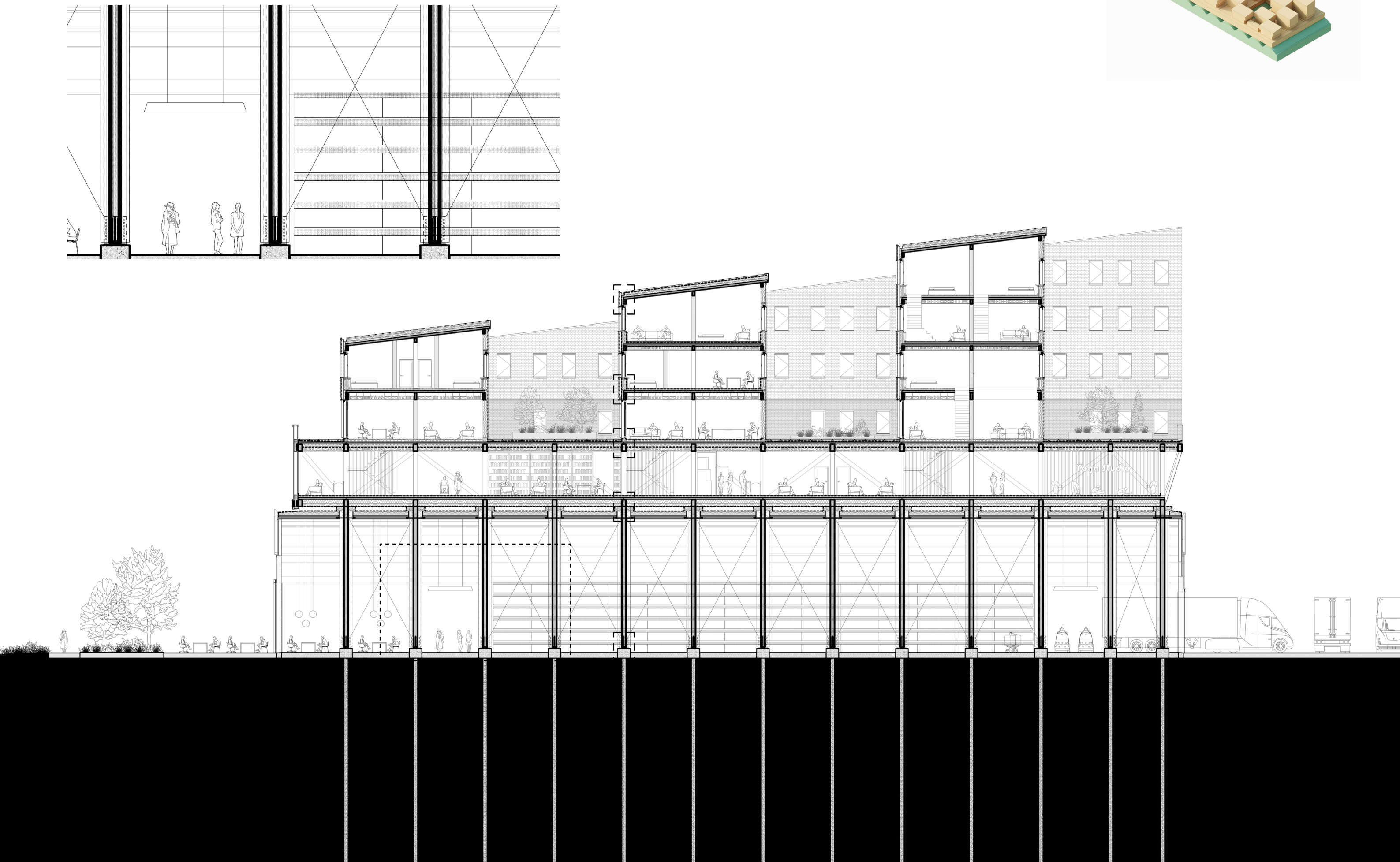
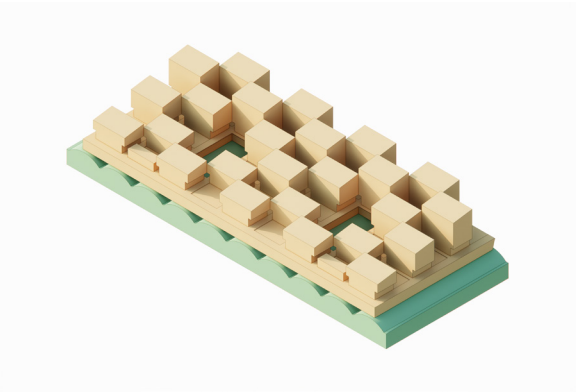
BUILDING CROSS SECTION



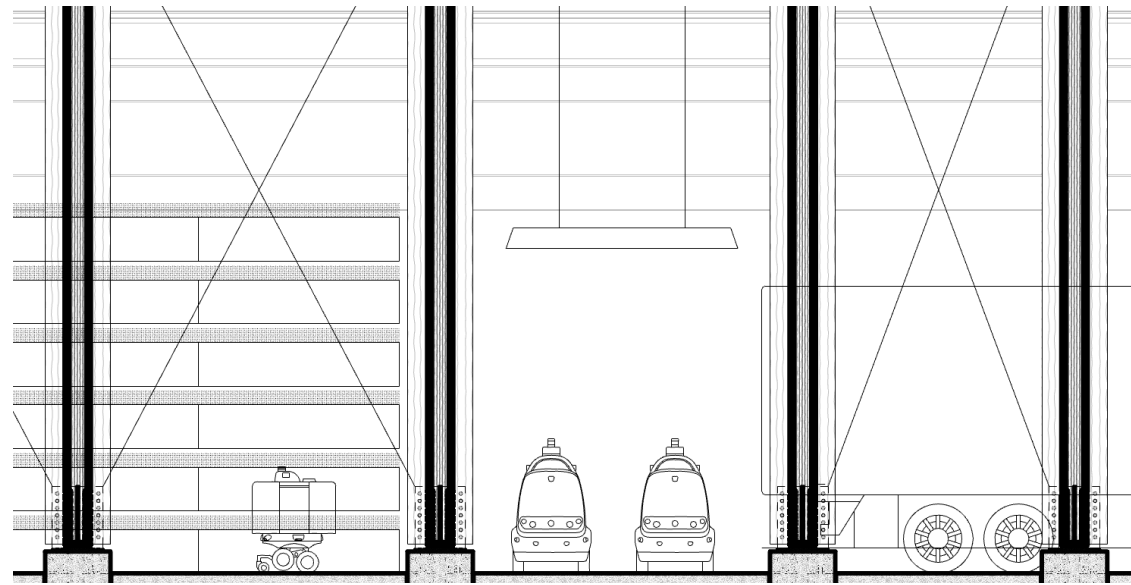
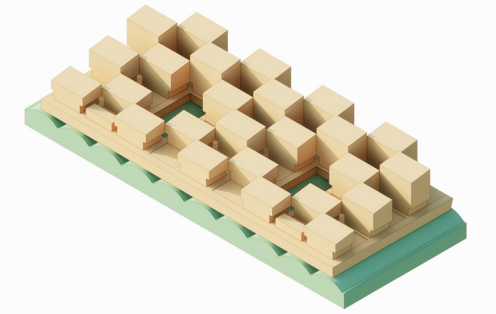
BUILDING CROSS SECTION



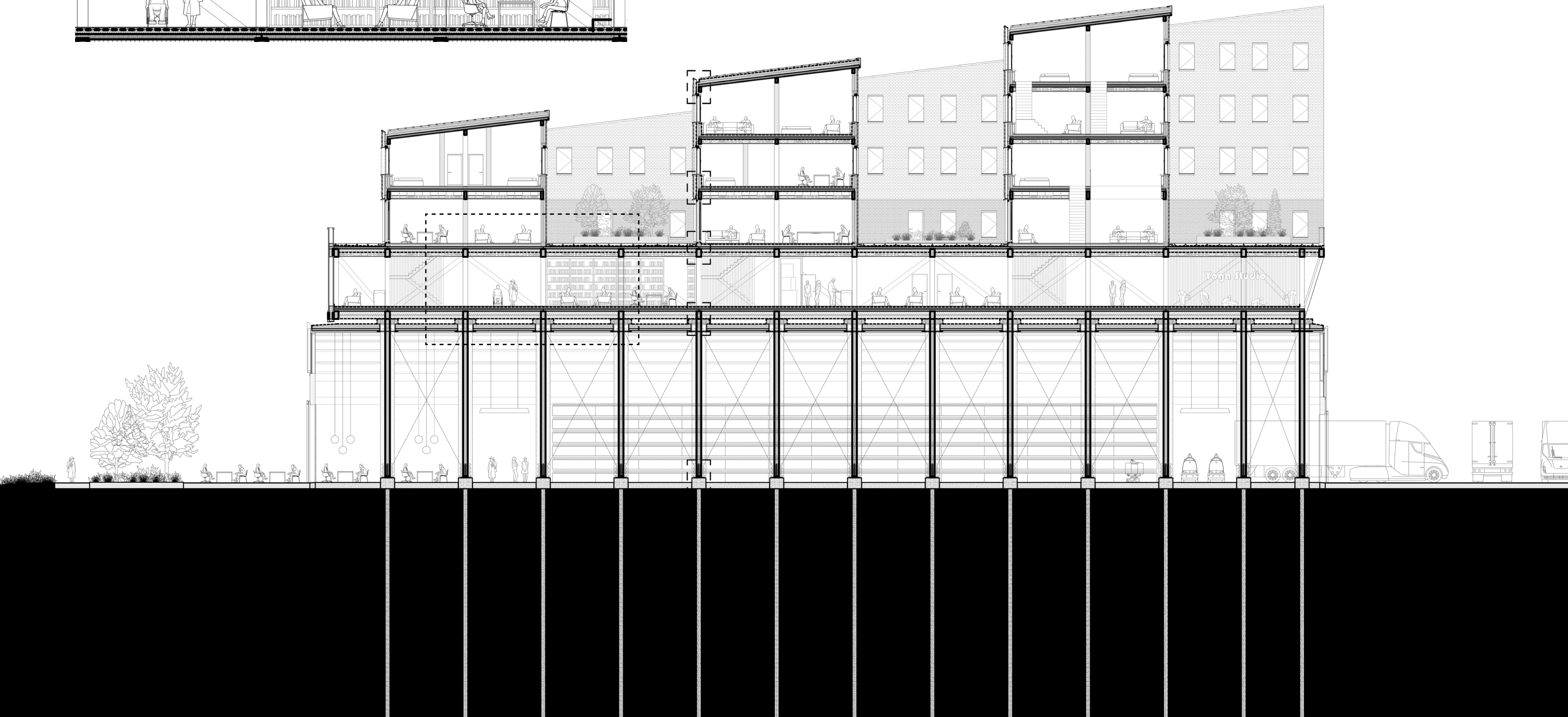
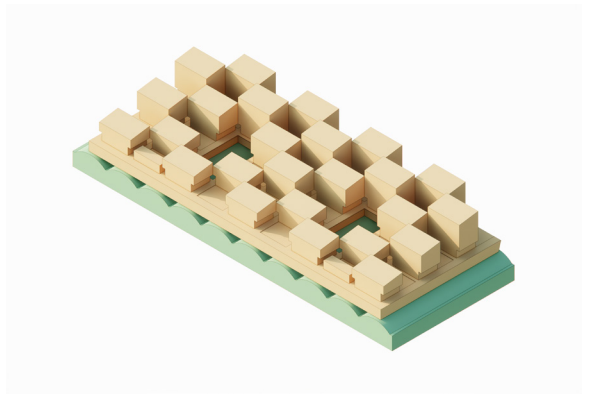
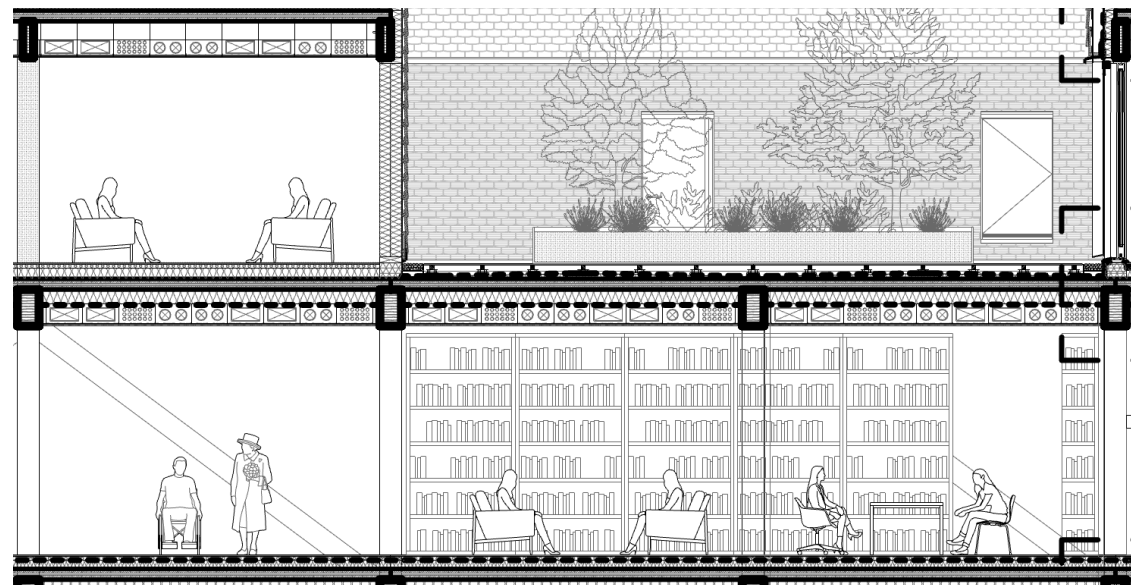
BUILDING CROSS SECTION



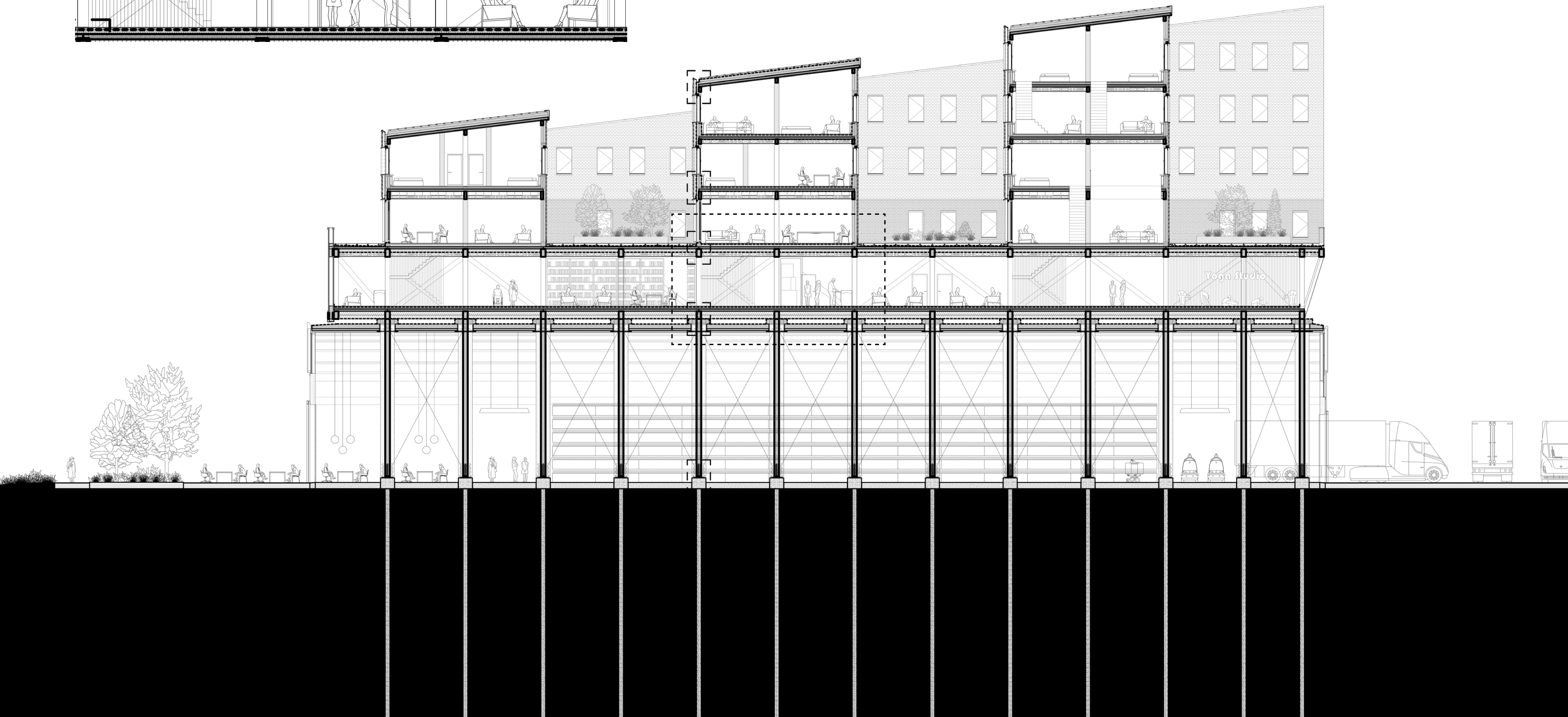
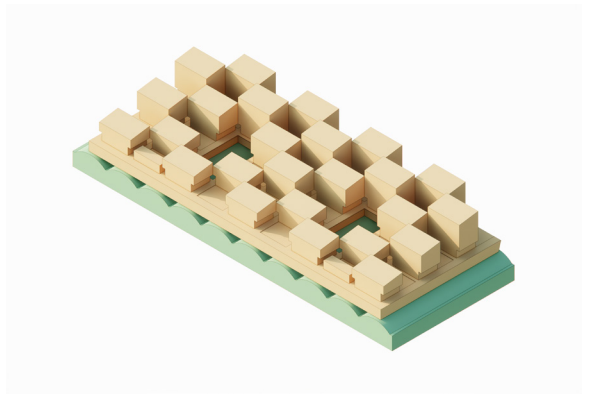
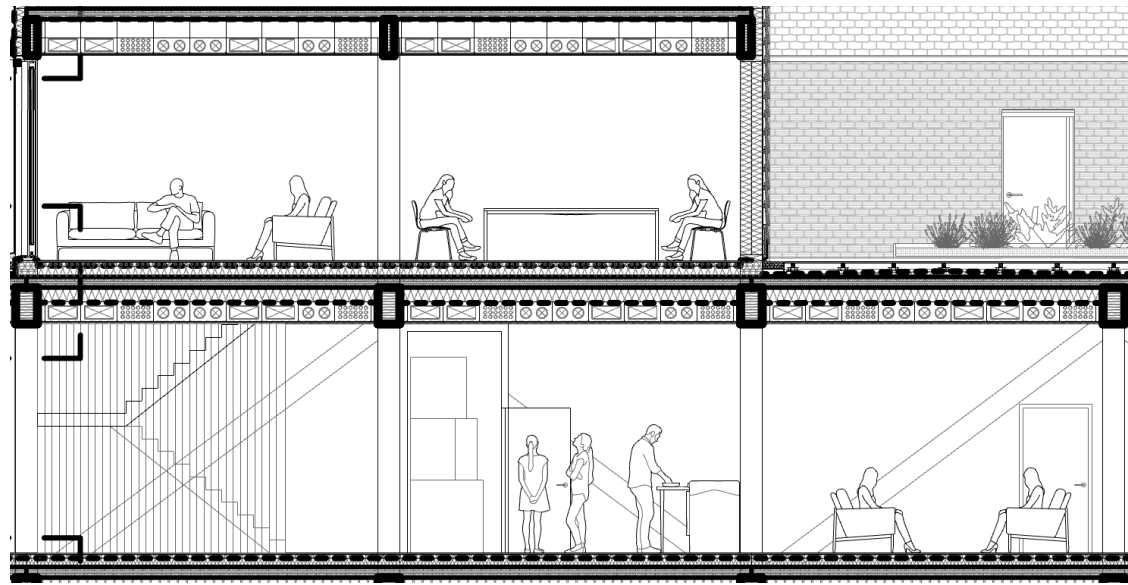
BUILDING CROSS SECTION



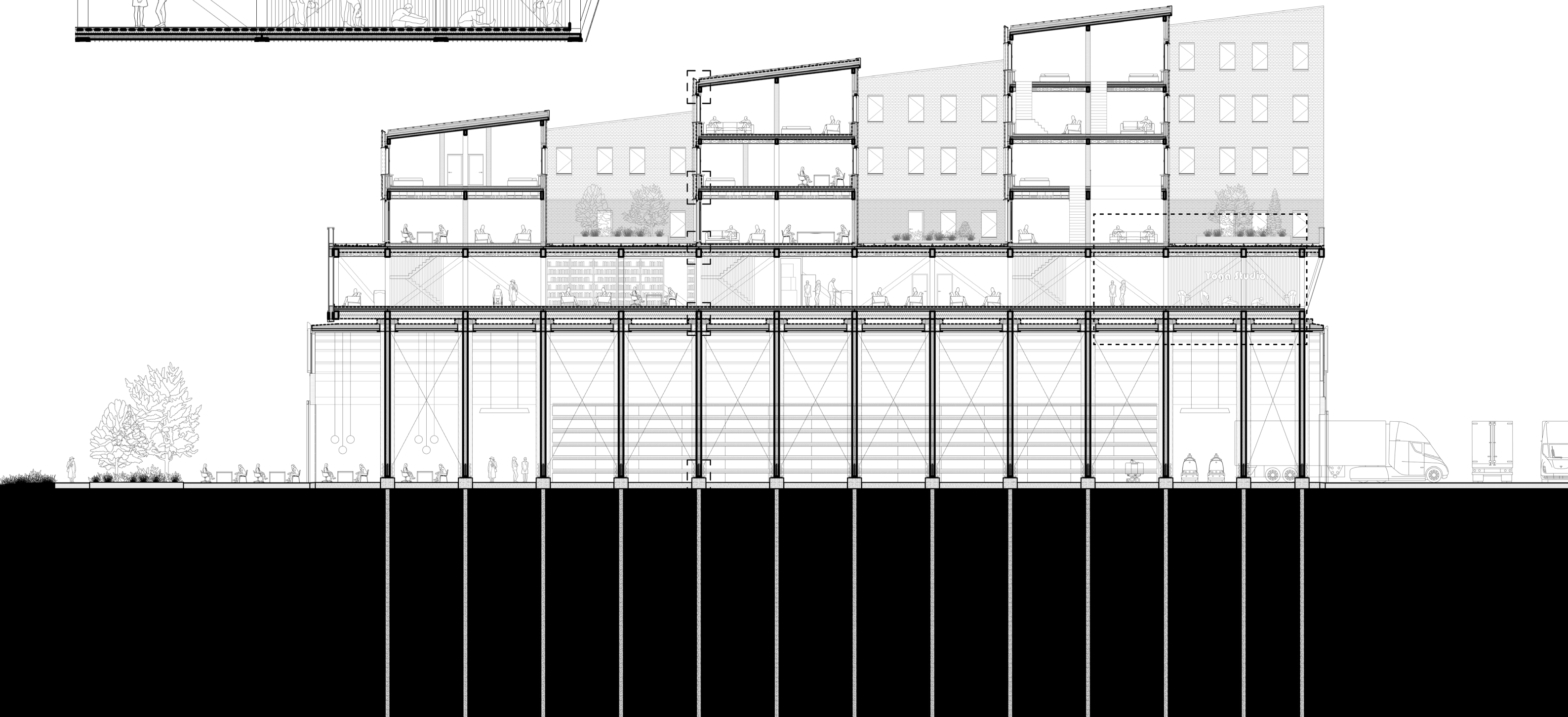
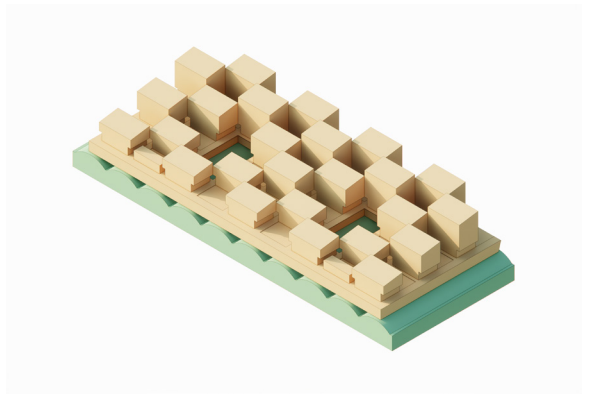
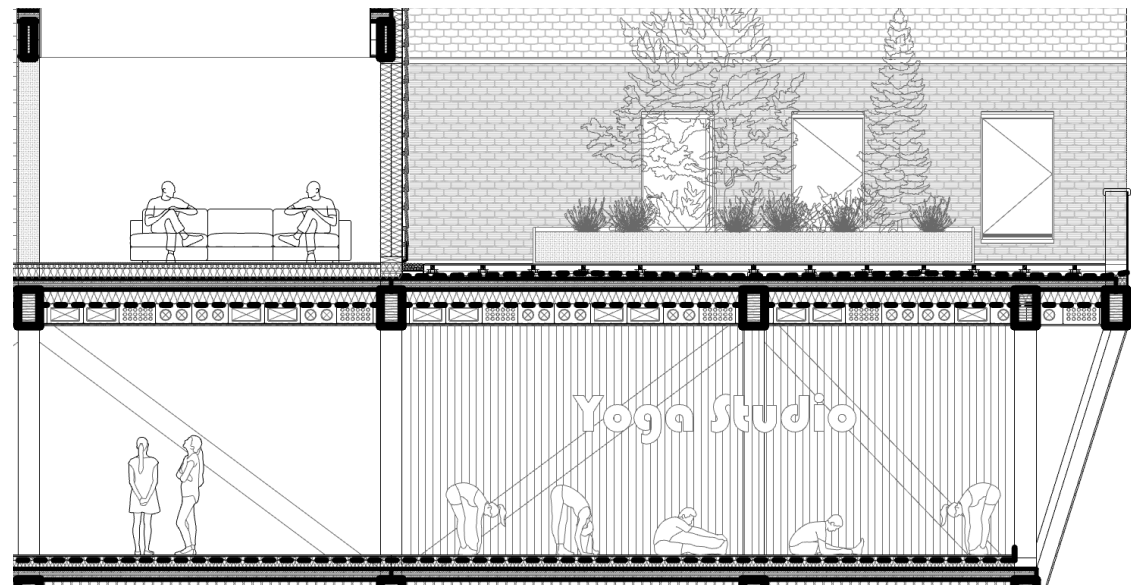
BUILDING CROSS SECTION



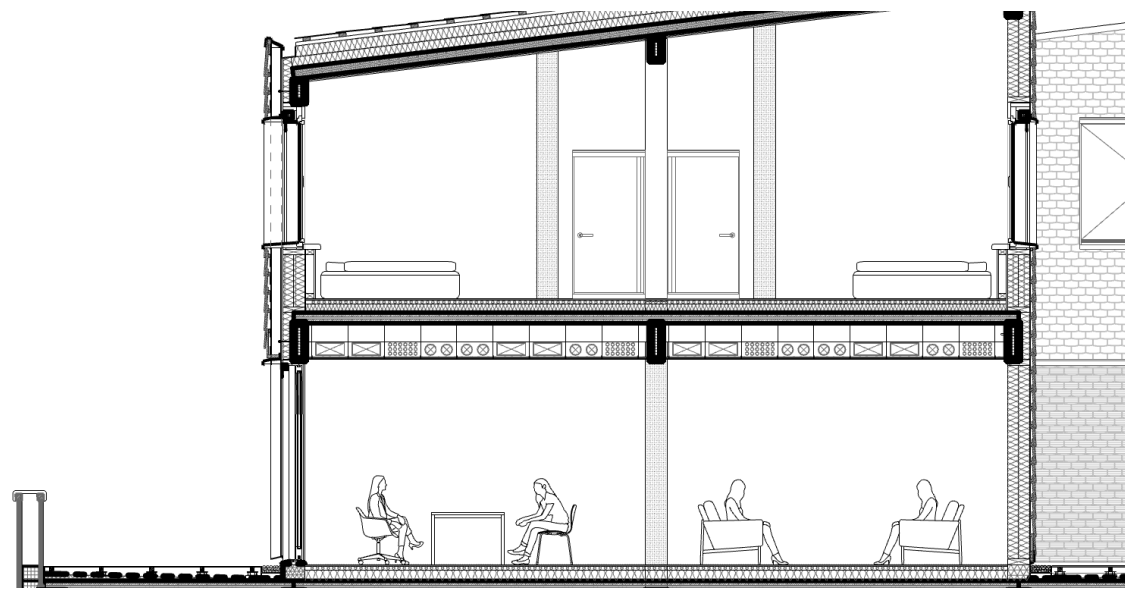
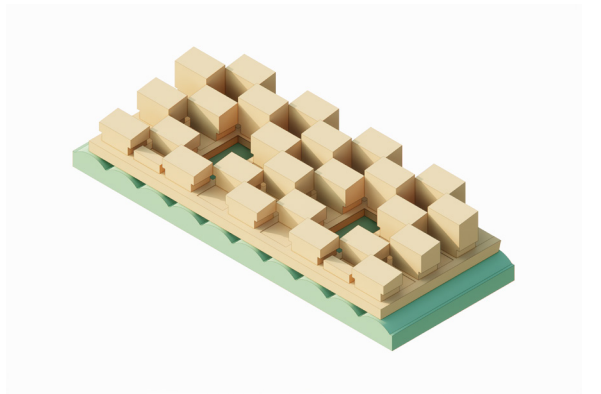
BUILDING CROSS SECTION



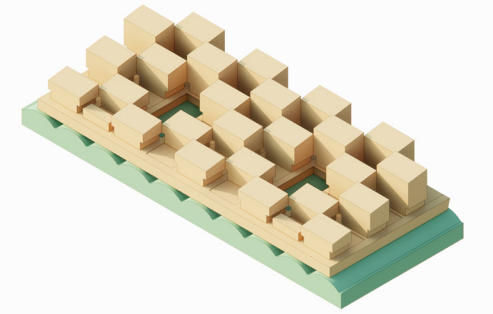
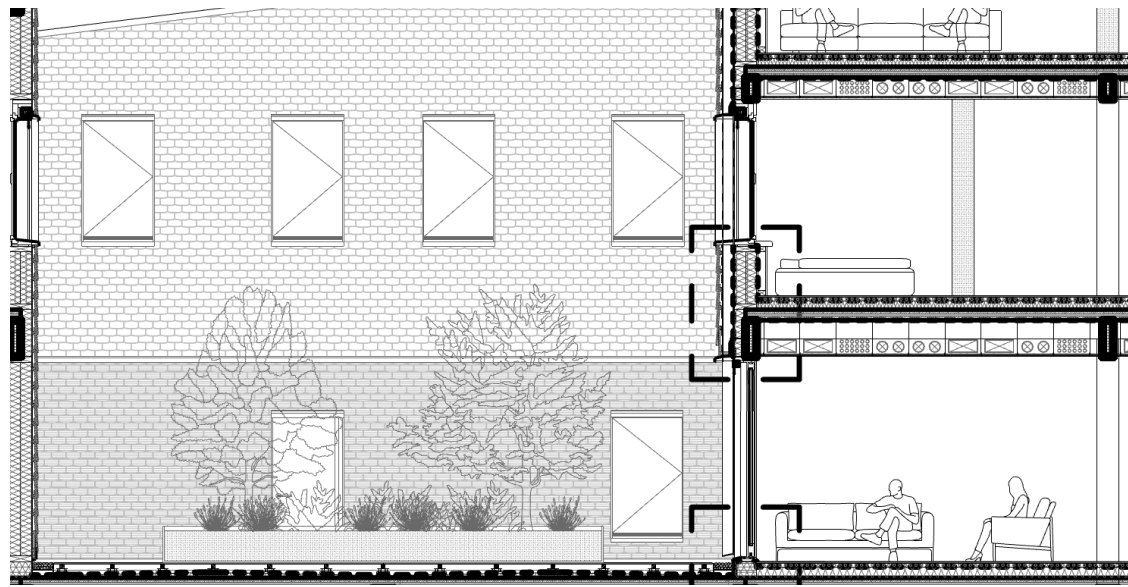
BUILDING CROSS SECTION



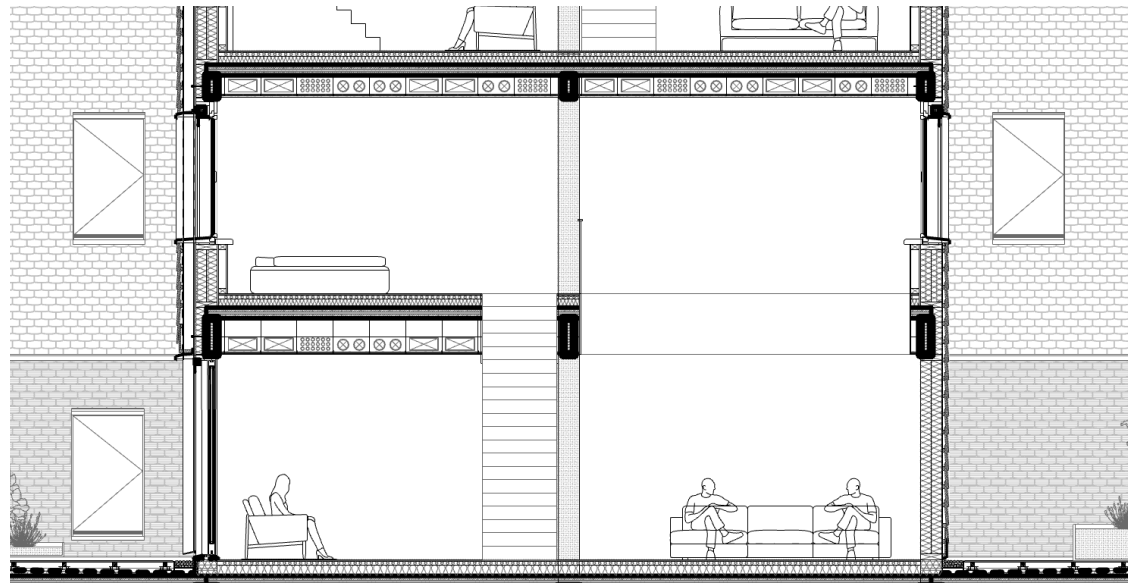
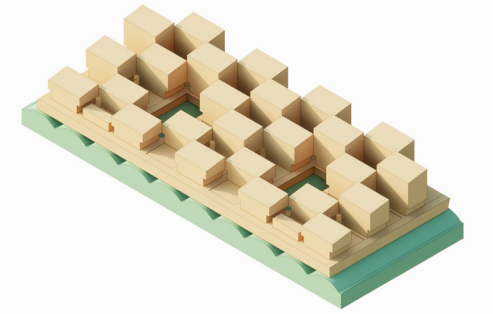
BUILDING CROSS SECTION



BUILDING CROSS SECTION



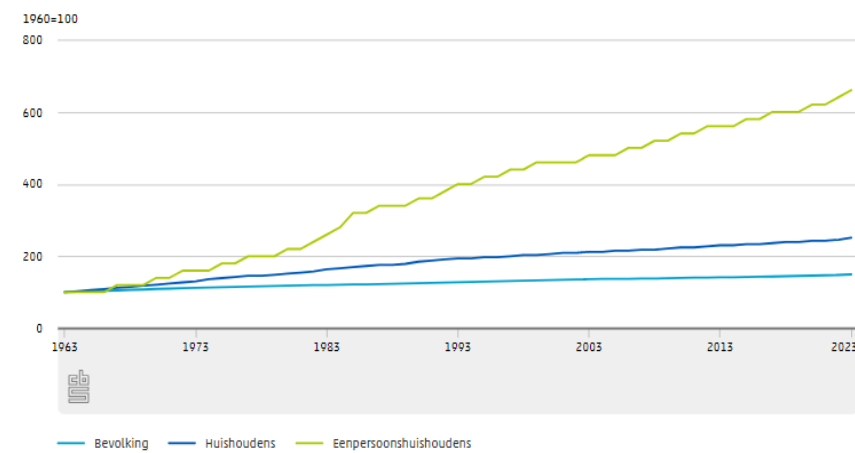
BUILDING CROSS SECTION



05 - THE DWELLINGS

RESEARCH DATA

Groei bevolking en huishoudens



Demographic composition

Population structure by age, the Netherlands (2023)

Total: 17 811 000 residents

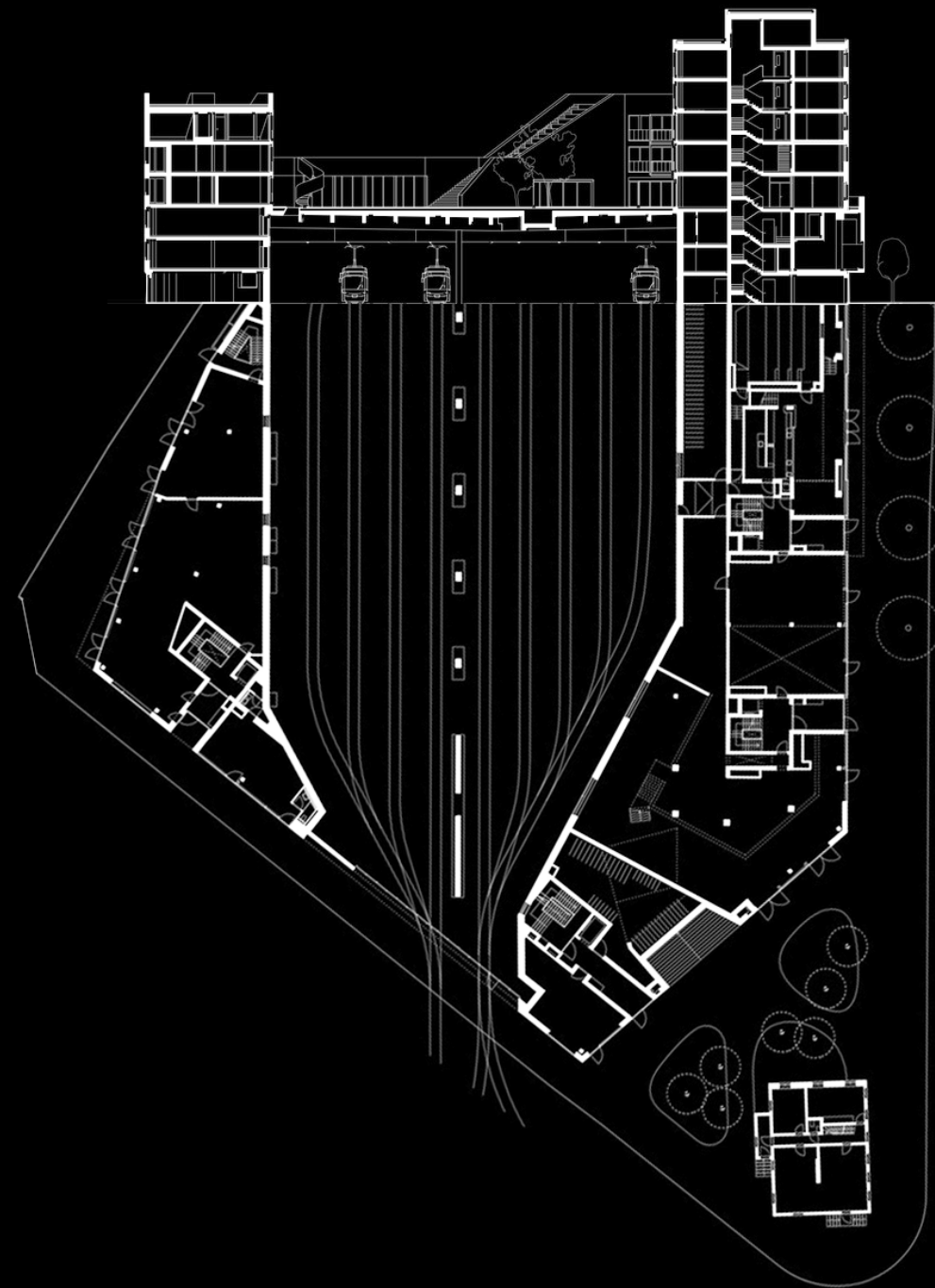


Households in relation to the housing supply, the Netherlands (2020 - 2021).



*“How to realize affordable housing types
without losing essential qualities?”*

KALKBREITE

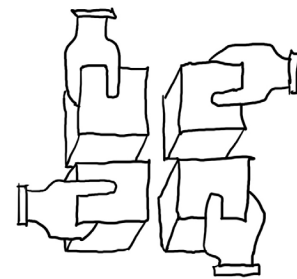


CASE STUDY

MEHR ALS WOHNEN

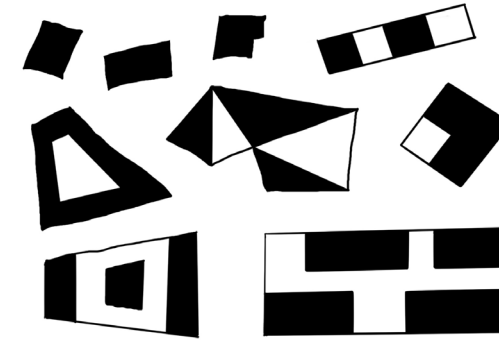


CASE STUDY

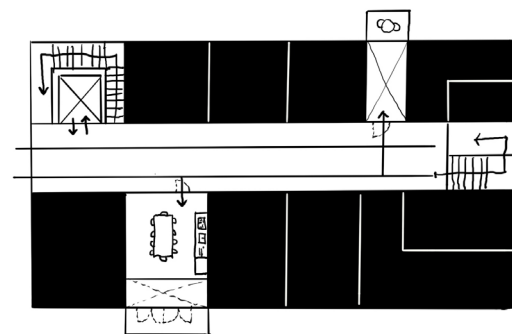


- GOVERNMENTAL AND MUNICIPAL SUPPORT
- CLEAR AMBITIONS
- PARTICIPATION
- TENDER OR COMPETITION prerequisites
- PLANNING EXPERTS

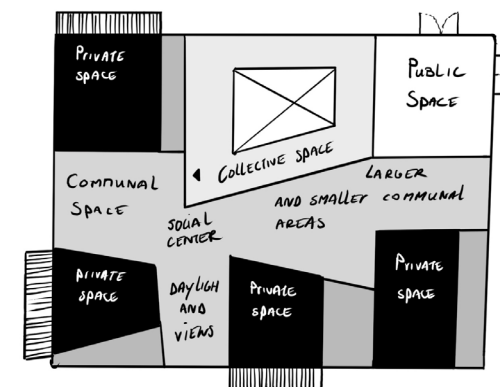
Non-speculative developing with local support and participation



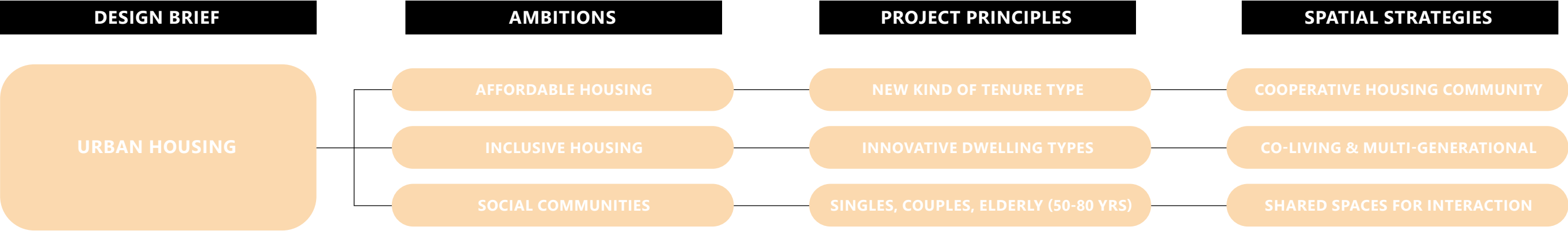
A large diversity of clusters allows for inclusion and circulation of households



Co-living clusters and collective spaces are connected by a central corridor

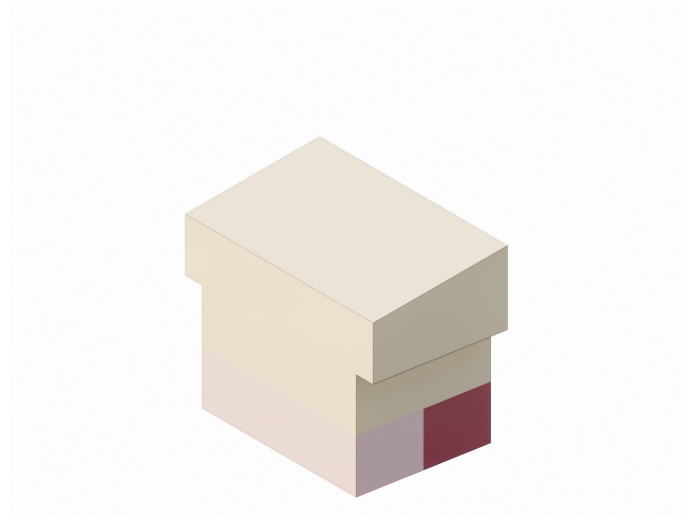


A gradient of spaces provide essential living qualities for affordable prices



TYPE A: SPLIT LEVEL

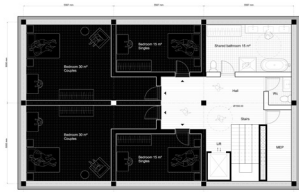
STARTERS: SINGLES-COUPLES



PRIVATE SPACE
COLLECTIVE SPACE
SHARED BASEMENT

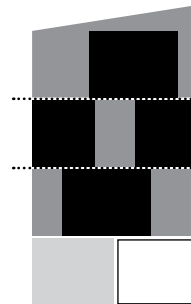
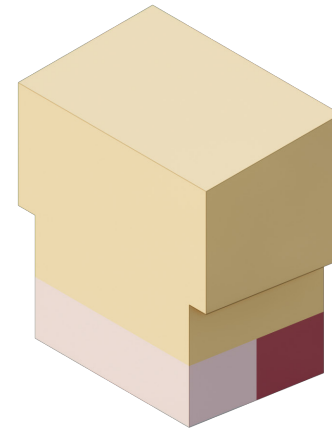


ROOMS: 30 M2
ROOMS: 15 M2
HALLWAY



TYPE B: SPLIT FLOOR

SINGLES-ELDERLY (50+)



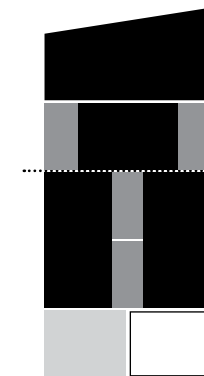
STUDIOS: 30 M2
ROOMS: 20 M2
ROOMS: 10 M2



TYPE C & D: LOFTS & DUPLEX

MULTI-GENERATIONAL

DIVORCED FAMILIES

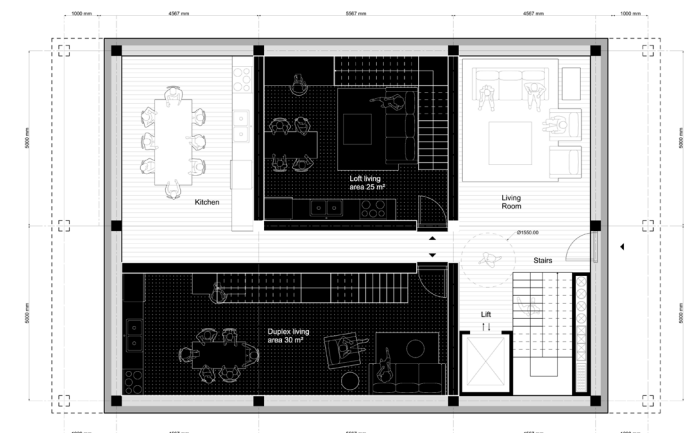
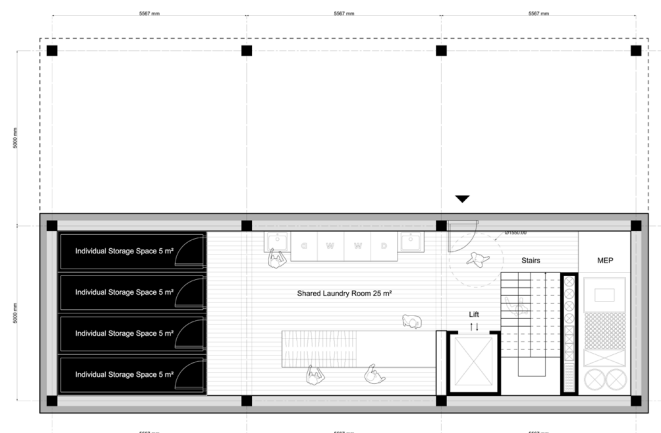
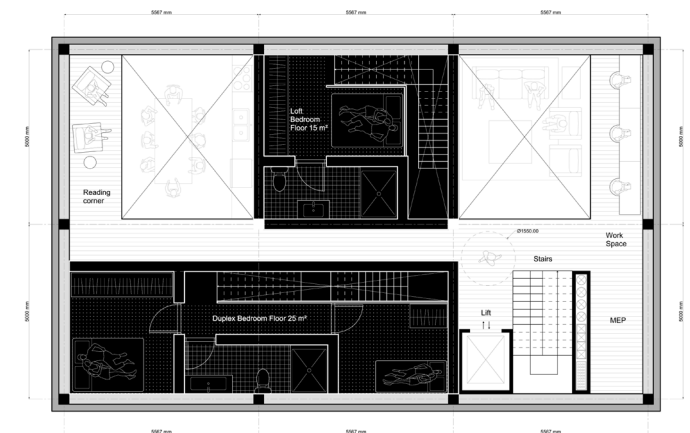
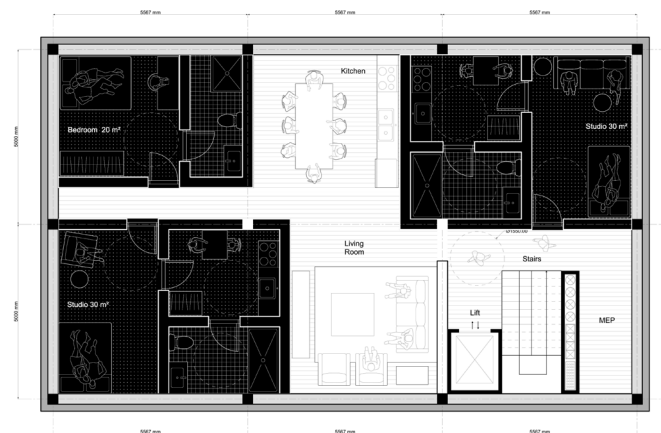
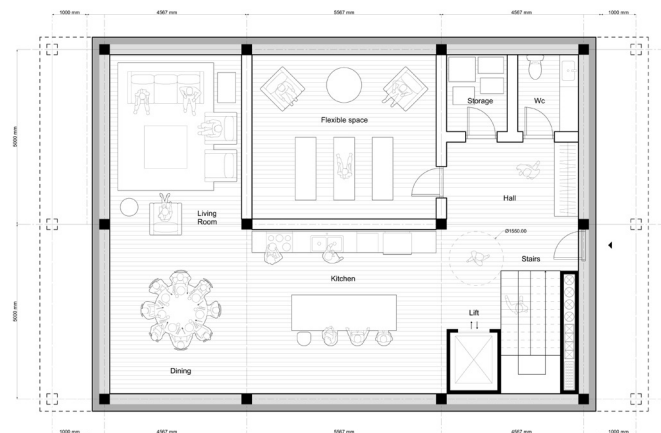
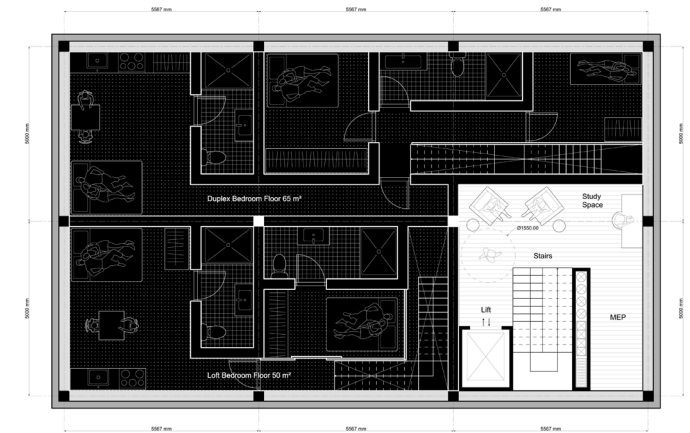
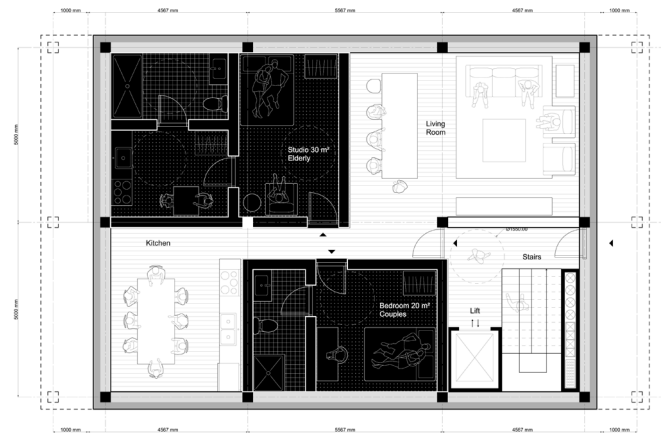
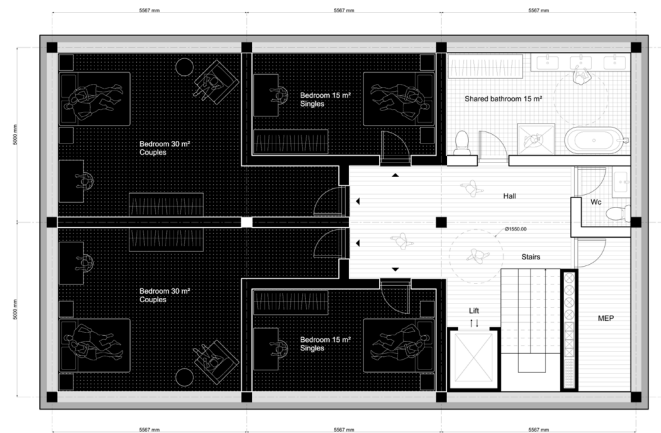


DUPLEX: 150 M2
LOFTS: 50 M2 & 100M2



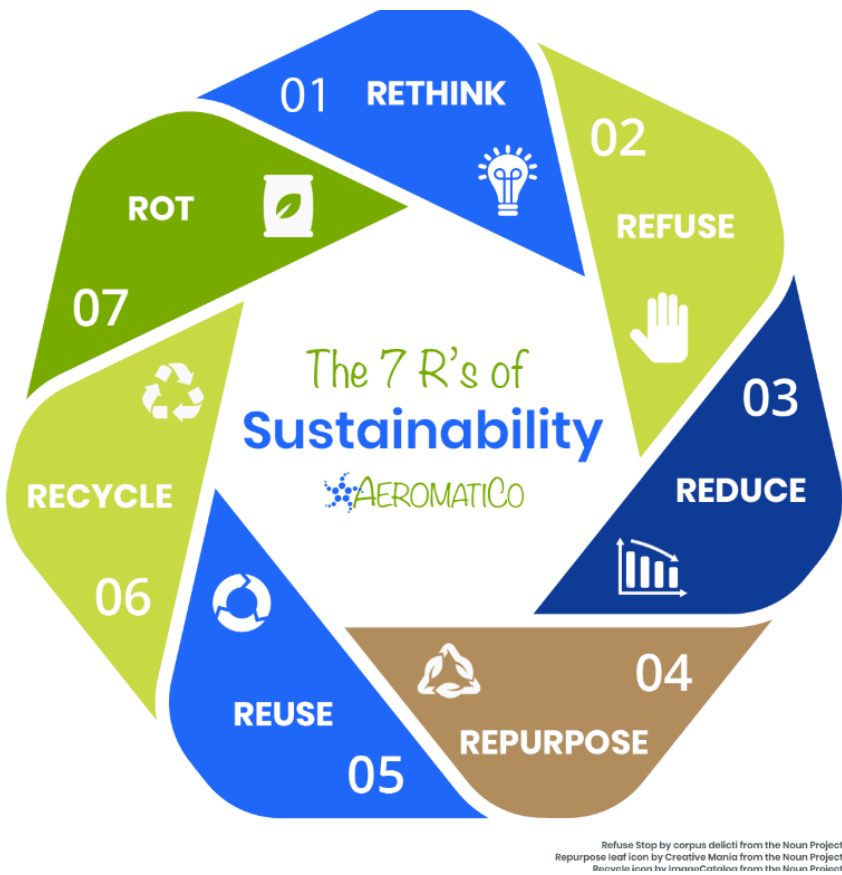
DWELLING FLOORPLANS

CO-LIVING PRINCIPLES



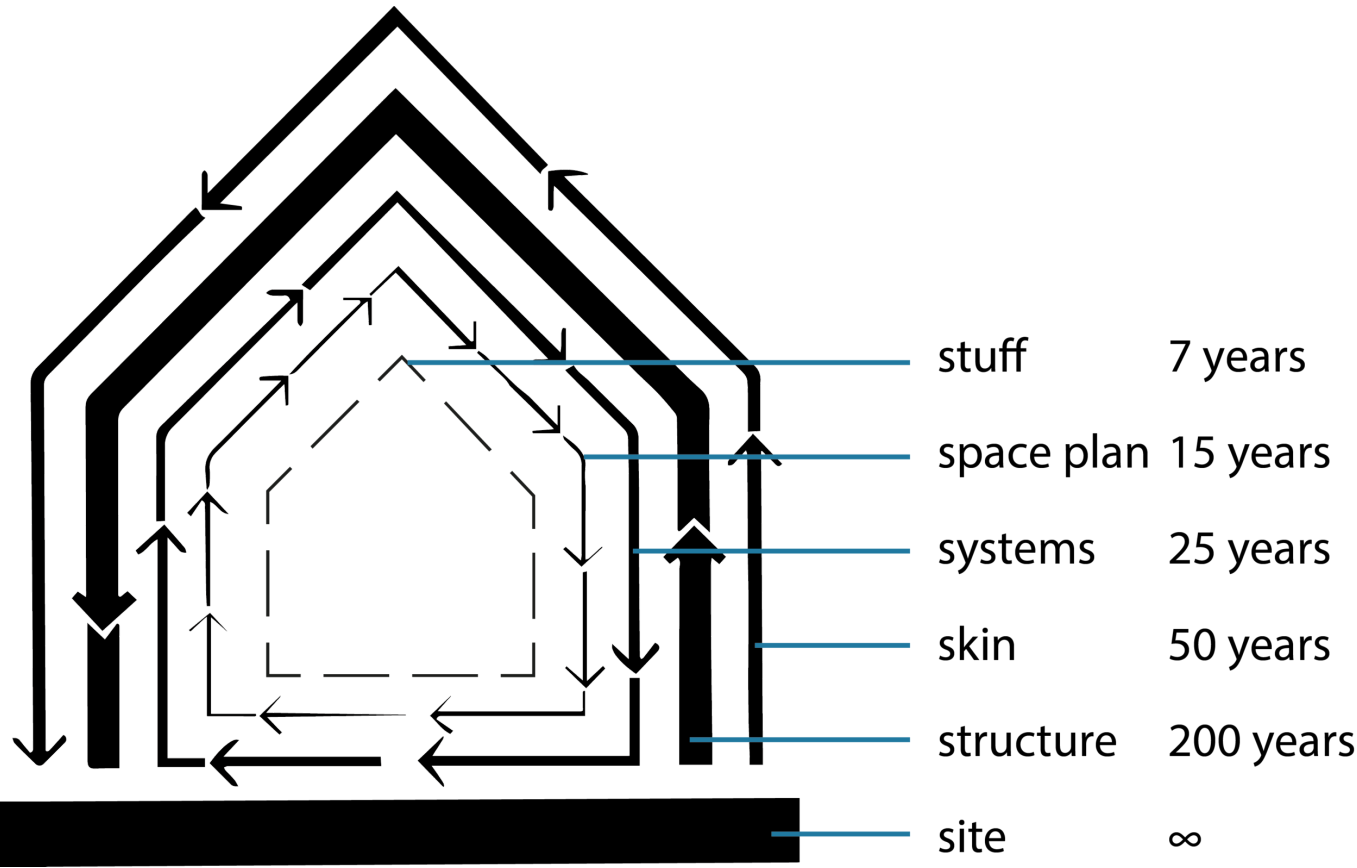
05 - BUILDING TECHNOLOGY

STRATEGIES



SUSTAINABILITY

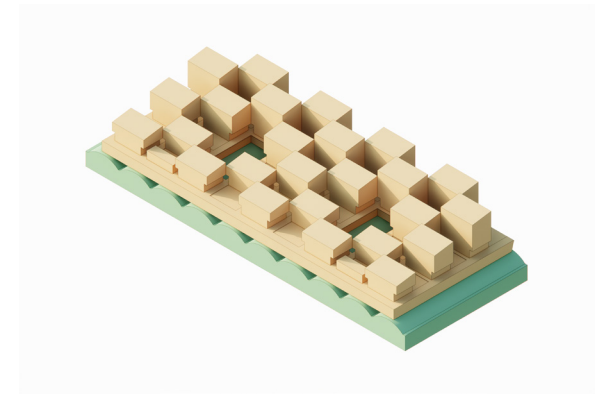
- 1. RETHINK: URBAN PLANNING
- 2. REFUSE: TO USE POLLUTING MATERIALS
- 3. REDUCE: CO2 EMISSIONS
- 4. REPURPOSE: EXISTING BUILDINGS
- 5. REUSE: EXISTING MATERIALS
- 6. RECYCLE: RESOURCES
- 7. ROT: RESIDUAL FLOWS



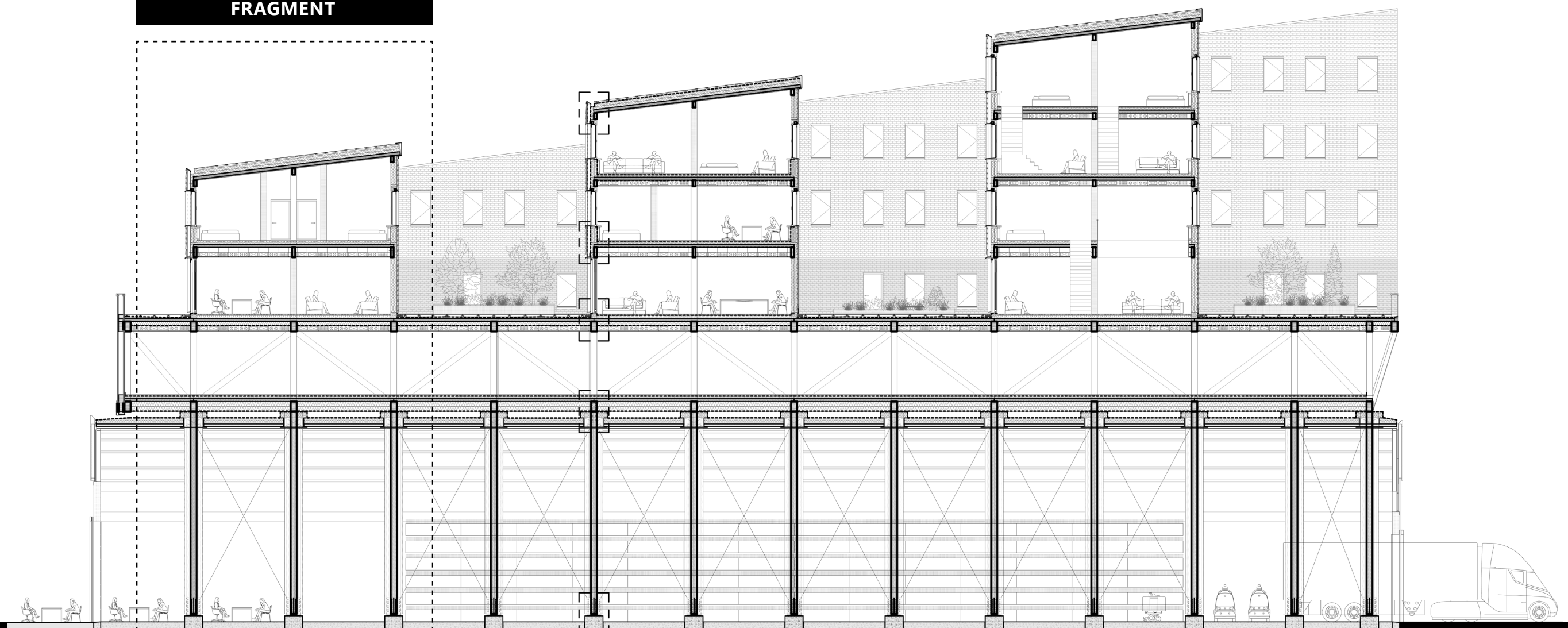
CIRCULARITY

- 1. SITE: BUILD ON EXISTING URBAN SITE
- 2. STRUCTURE: SEALING FOR DURABILITY
- 3. SKIN: DEMOUNTABLE SHINGLES
- 4. SYSTEMS: EFFICIENT & UPGRADABLE
- 5. SPACE PLAN: FLEXIBLE STRUCTUE
- 6. STUFF: SHARED SPACE & OBJECTS
- 7. * MAXIMUM DEMOUNTABILITY

BUILDING CROSS SECTION



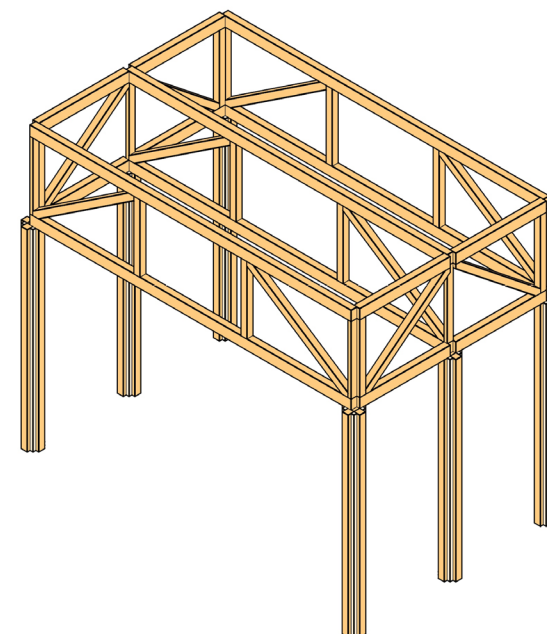
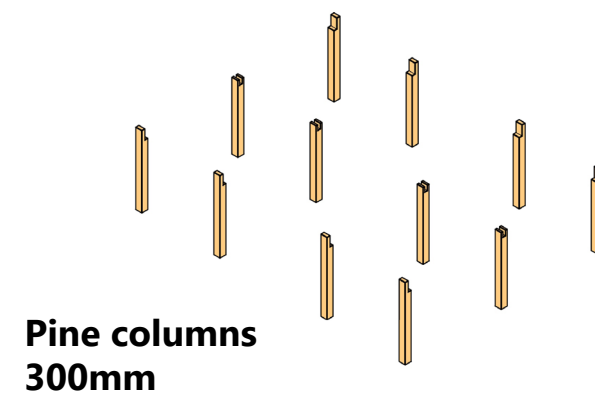
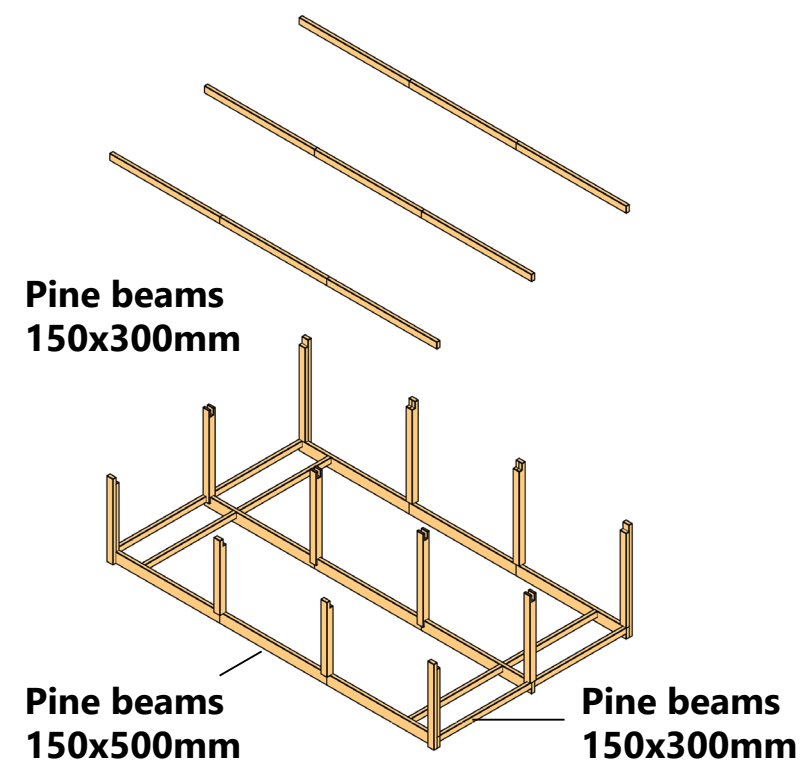
FRAGMENT



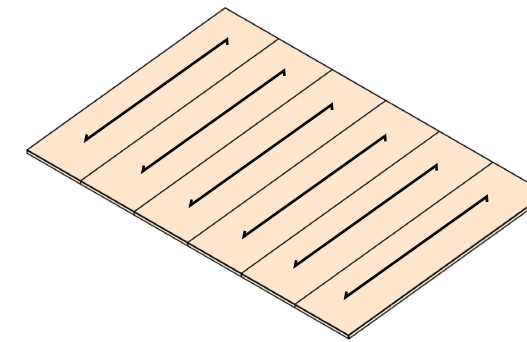
STRUCTURE & FLOORS

BIO-BASED LOCAL MATERIALS

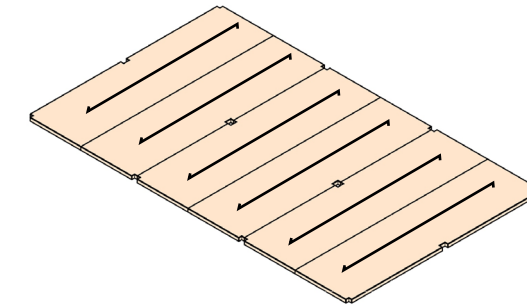
DEMOUNTABILITY OF KNOTS



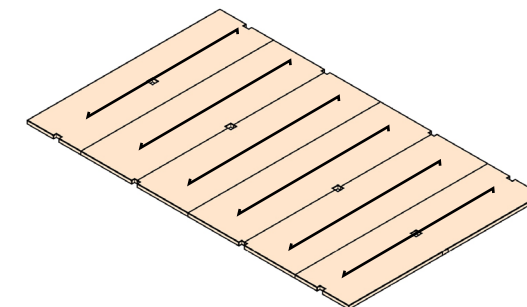
Glulam Lattice Girder Horizontal Beam - 500x300mm
Glulam Lattice Girder Vertical and Diagonal - 300x300mm
Glulam Columns - 900x900mm



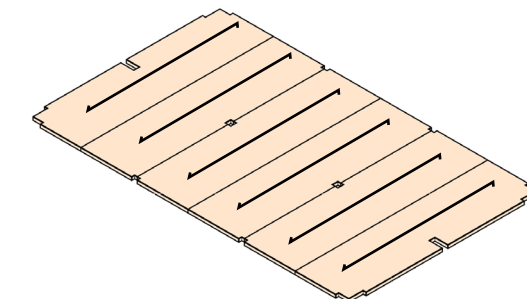
CLT 150mm - 5 layers



CLT 150mm - 5 layers



CLT 150mm - 5 layers

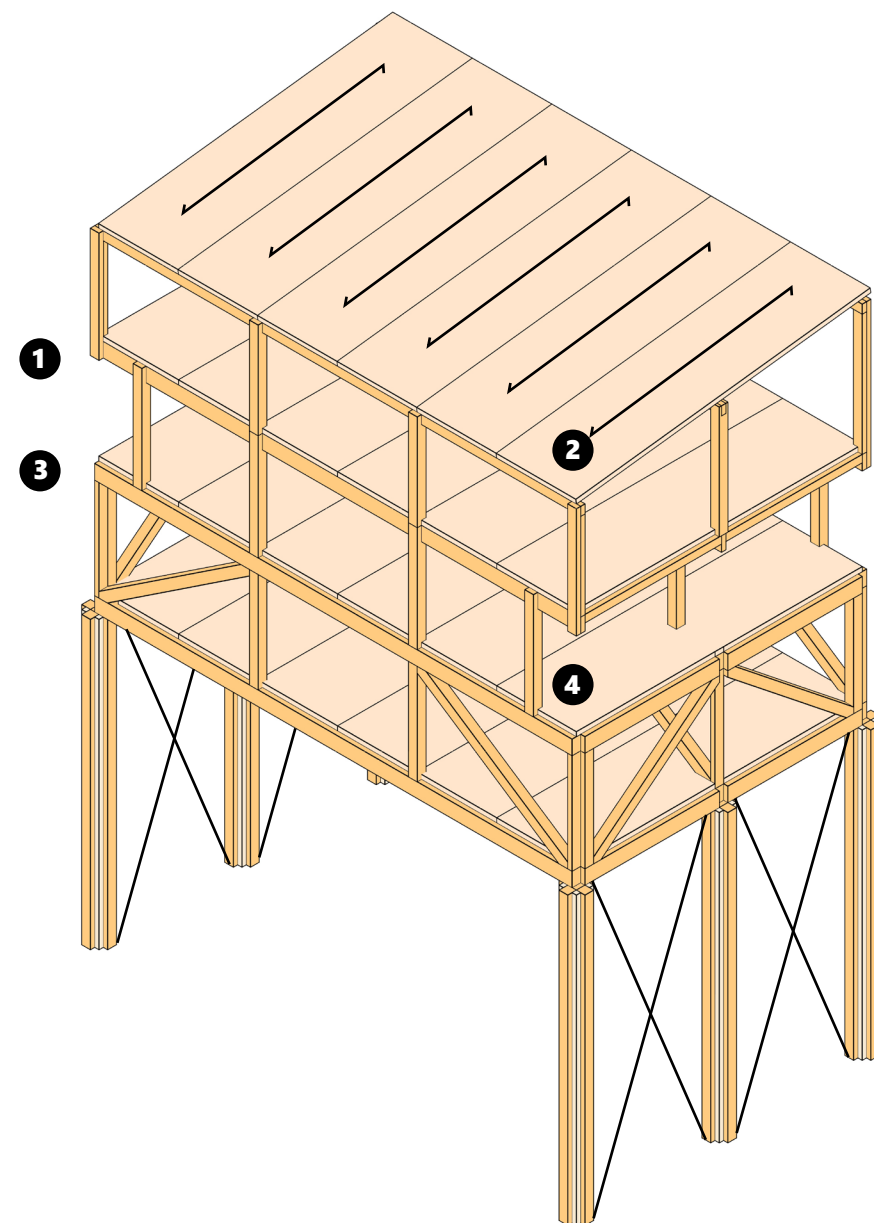


CLT 150mm - 5 layers

STRUCTURE & CONNECTIONS

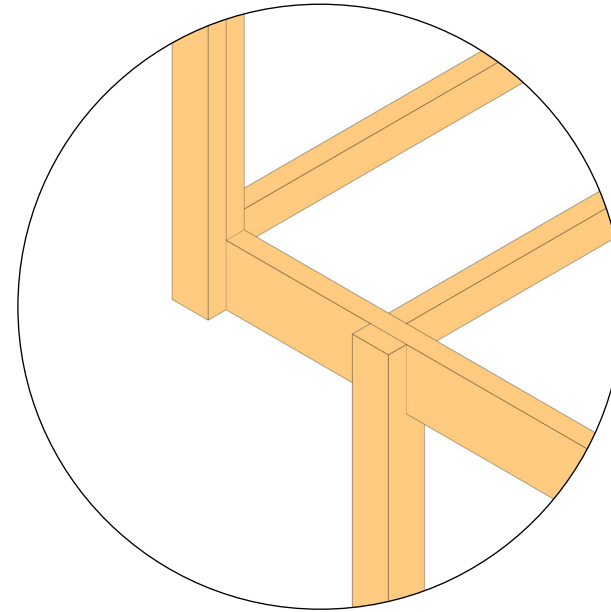
BIO-BASED LOCAL MATERIALS

DEMOUNTABILITY OF KNOTS

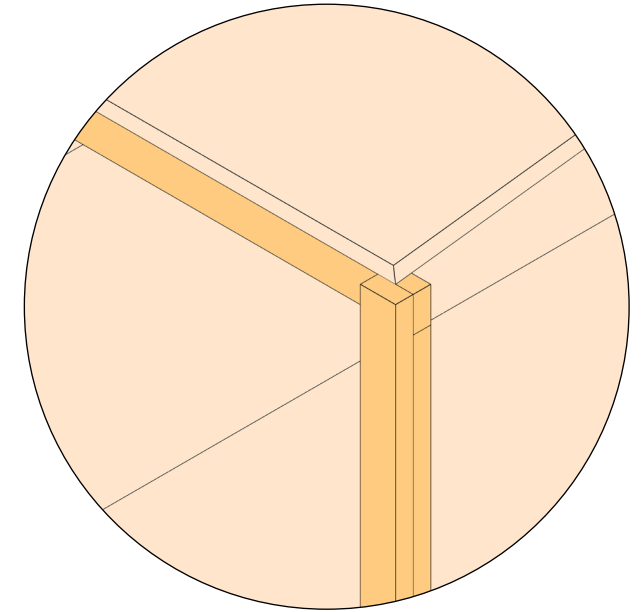


Diagonals for structural stiffness

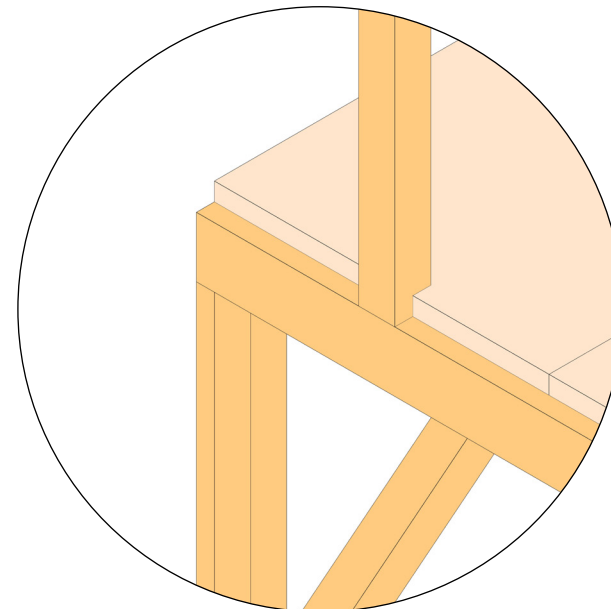
1 Imposition of the beams



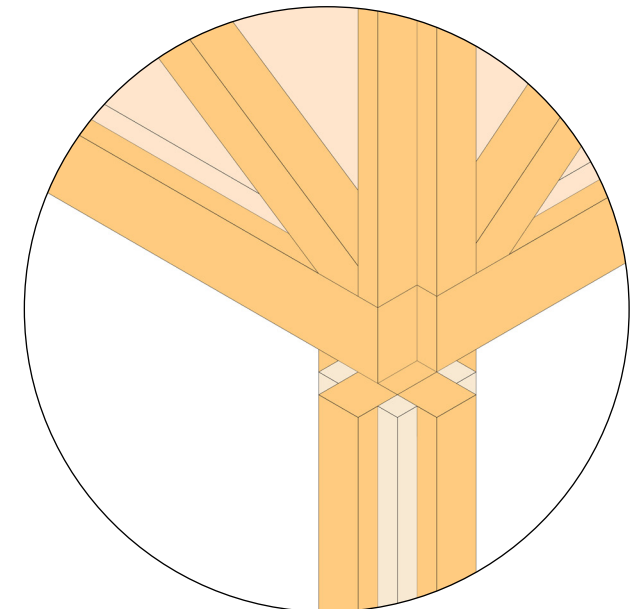
2 Imposition of the CLT panels



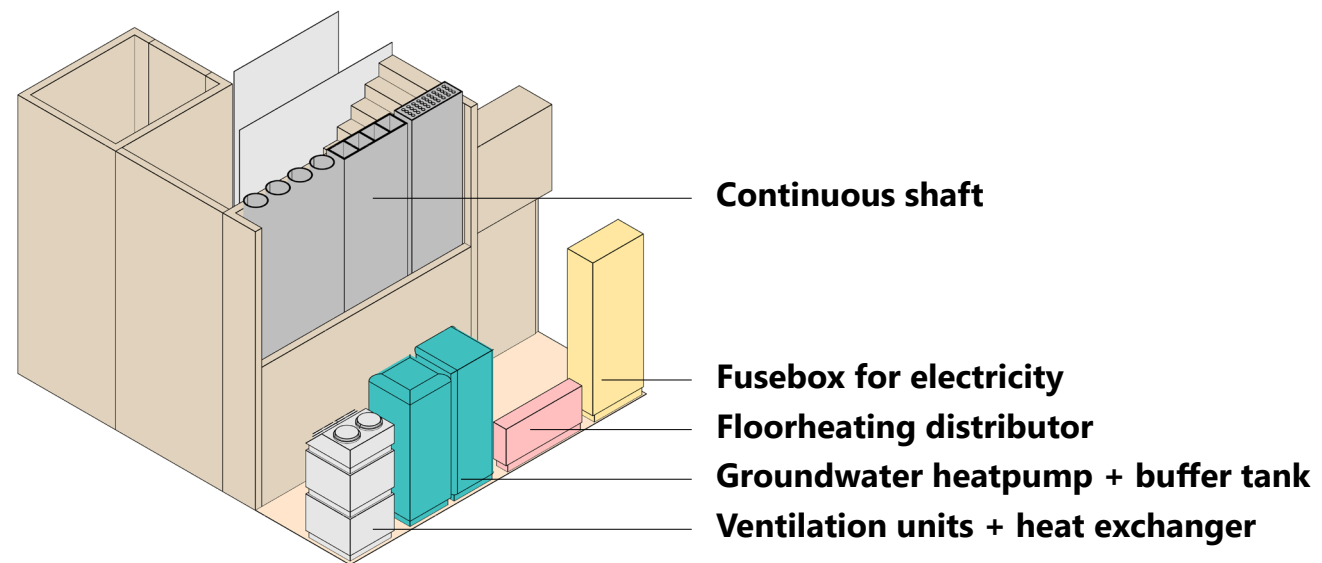
3 Lattice girder-column connection



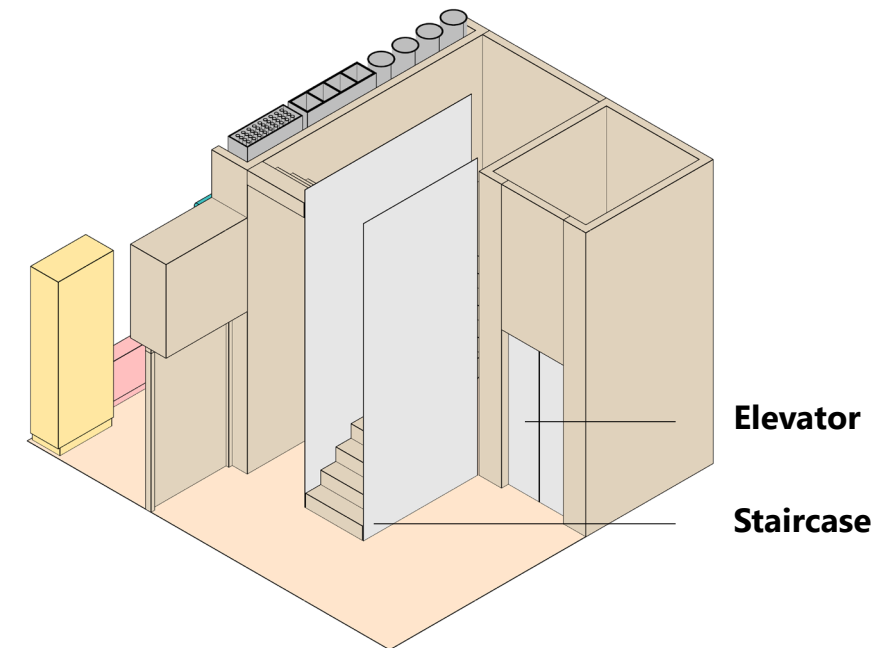
4 Column-lattice girder connection



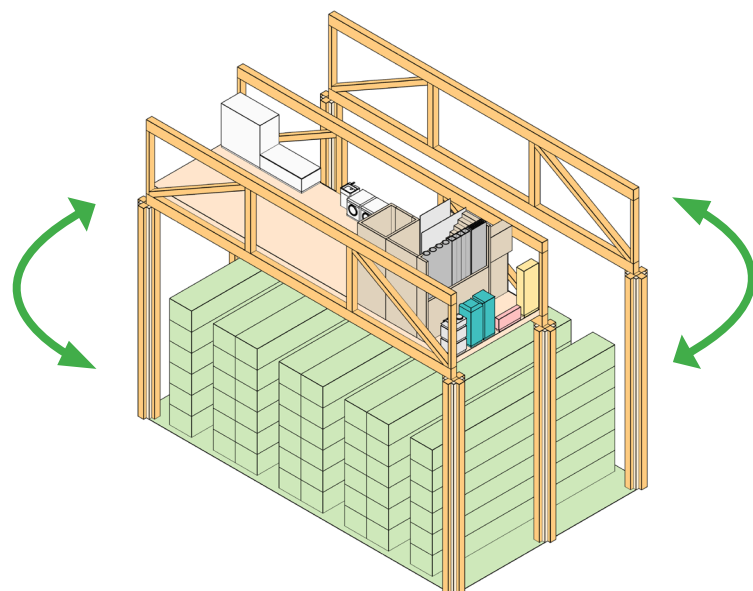
1 Dedicated space for installation technique



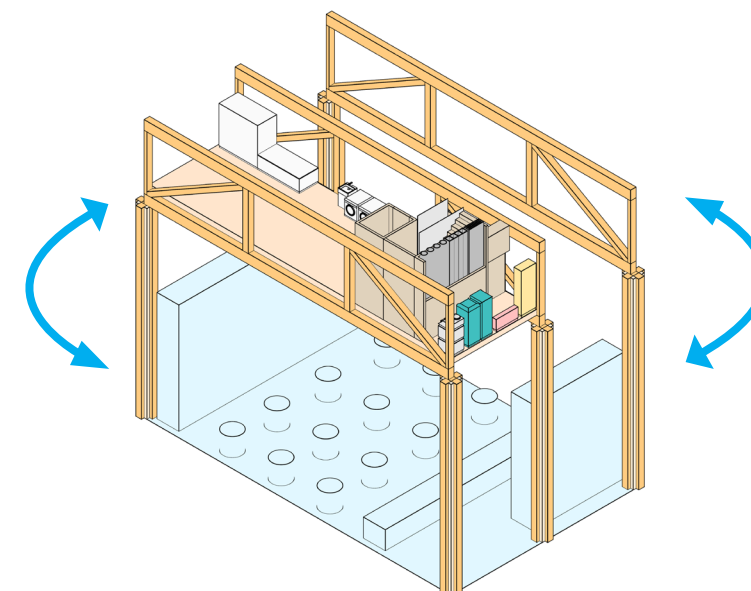
2 Continuous core for optimal accessibility



3 Exchange of water/energy (vertical farming)



4 Exchange of water/energy (shops/restaurants)



CLIMATE DIAGRAMS

Rain water flow
from pitched roof
drained via rainpipe
in the facade

Water collected
in courtyards
re-used for farm
and dwellings

Rain water
re-used as
grey water
to flush toilets

Residue energy
from vertical farms
can feed dwellings

Passive cooling by
cavity in facade

Sustainable
Active systems
in the basement
+ vertical shaft

Energy from solar panels,
water heatpump,
residual heat
the grid

Floor heating/cooling
Type D ventilation

Floor heating/cooling
Type D ventilation

Residual
heat

Residue energy
from restaurants
can feed dwellings

WO

KO

Floor heating/cooling
Type D ventilation

FACADE DIAGRAM

FACADE CONCEPT

Integrated
solar panels

Big windows

Wooden shingles

Facade setback
for air inlet

Wooden deck
on terrace
holders

Spacers create air cavity
under solar panels
for passive cooling

Hidden rain gutter
and hidden pipes

Vertical spacers
create vertical
air cavity behind
facade skin

Facade with cavity for
passive cooling

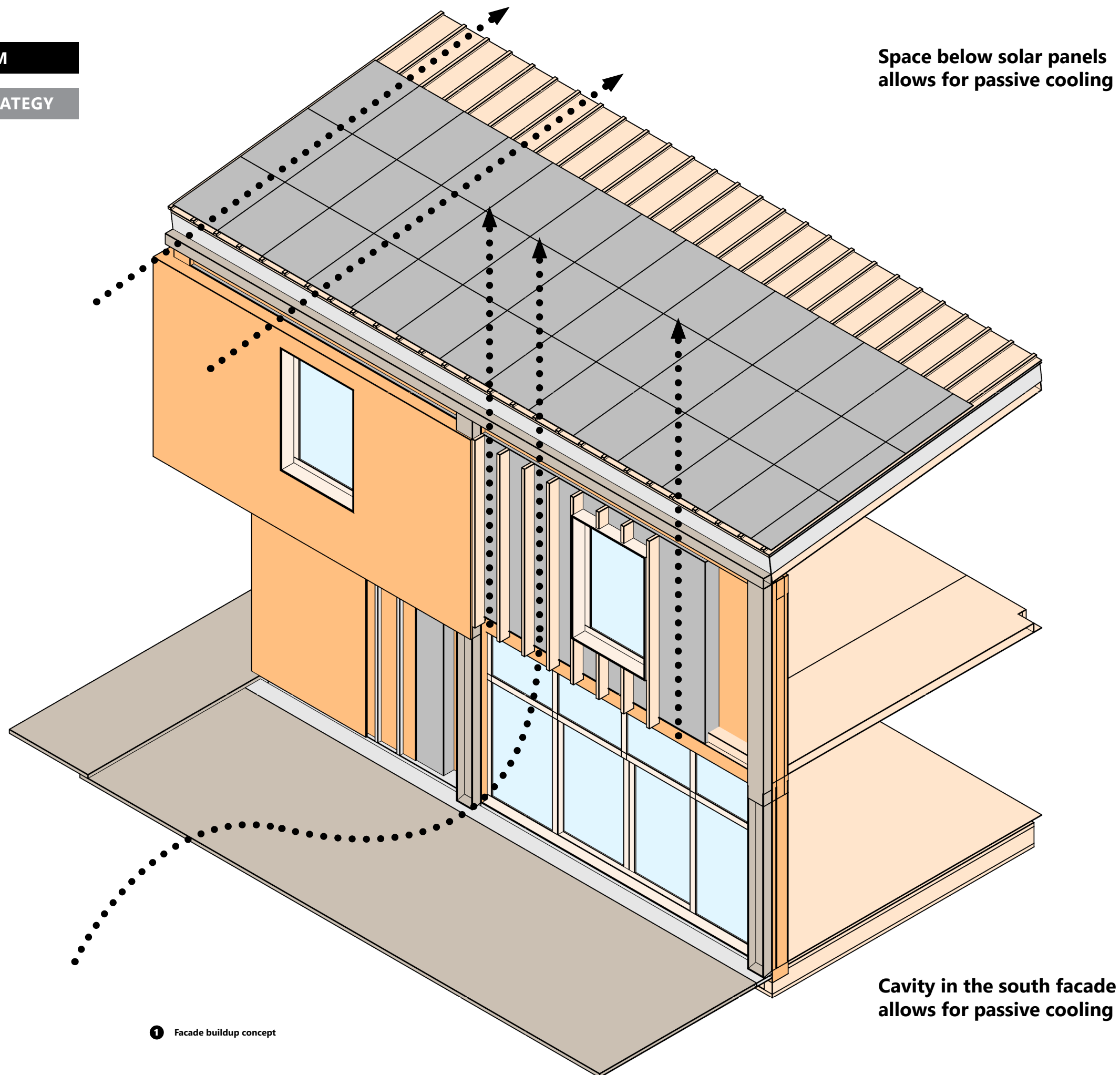
Exposed rainpipes
to show water

Big sliding doors
towards the courtyard

1 Facade buildup concept

FACADE DIAGRAM

PASSIVE COOLING STRATEGY



FACADE DIAGRAM

RESOURCE STRATEGY

Energy from solar panels on the roof

Rainwater collection

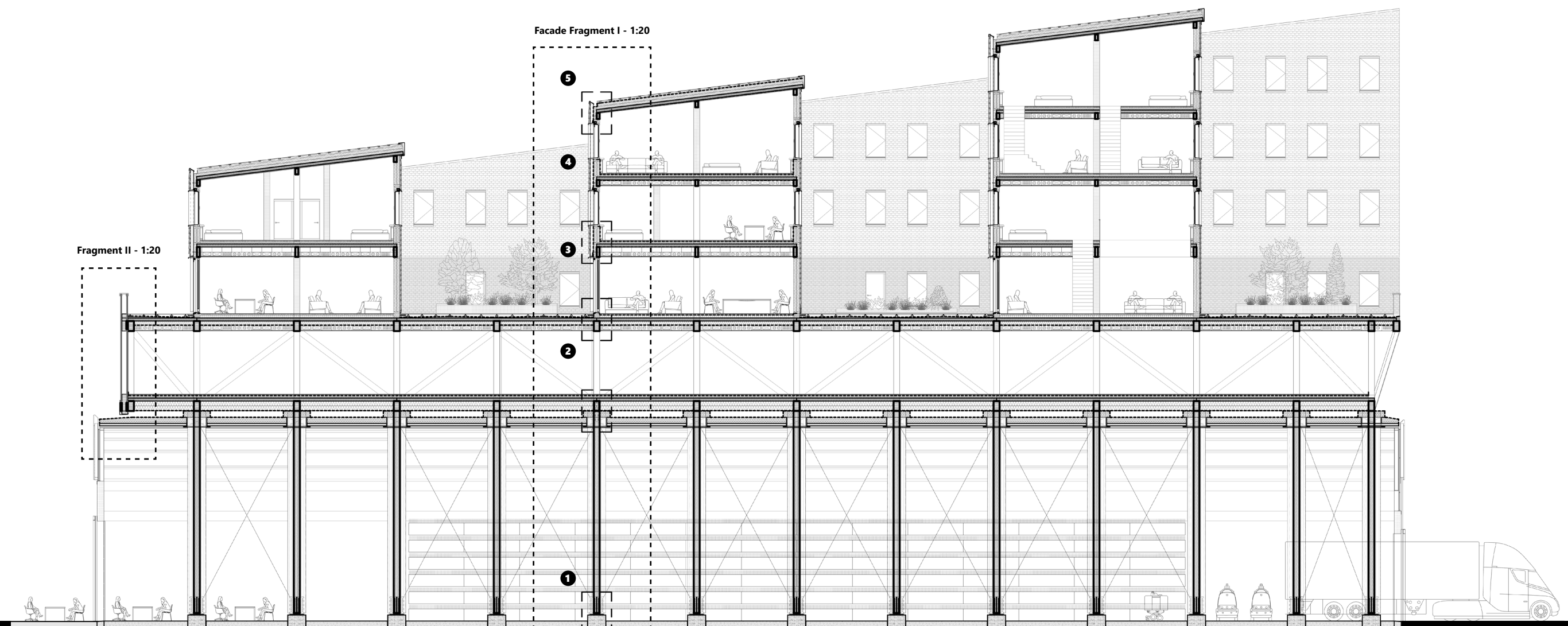
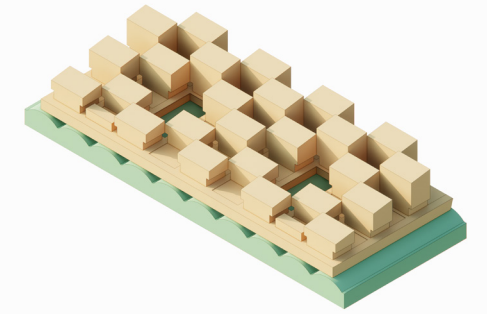
**Hidden
rain pipe**

Exposed rain pipe

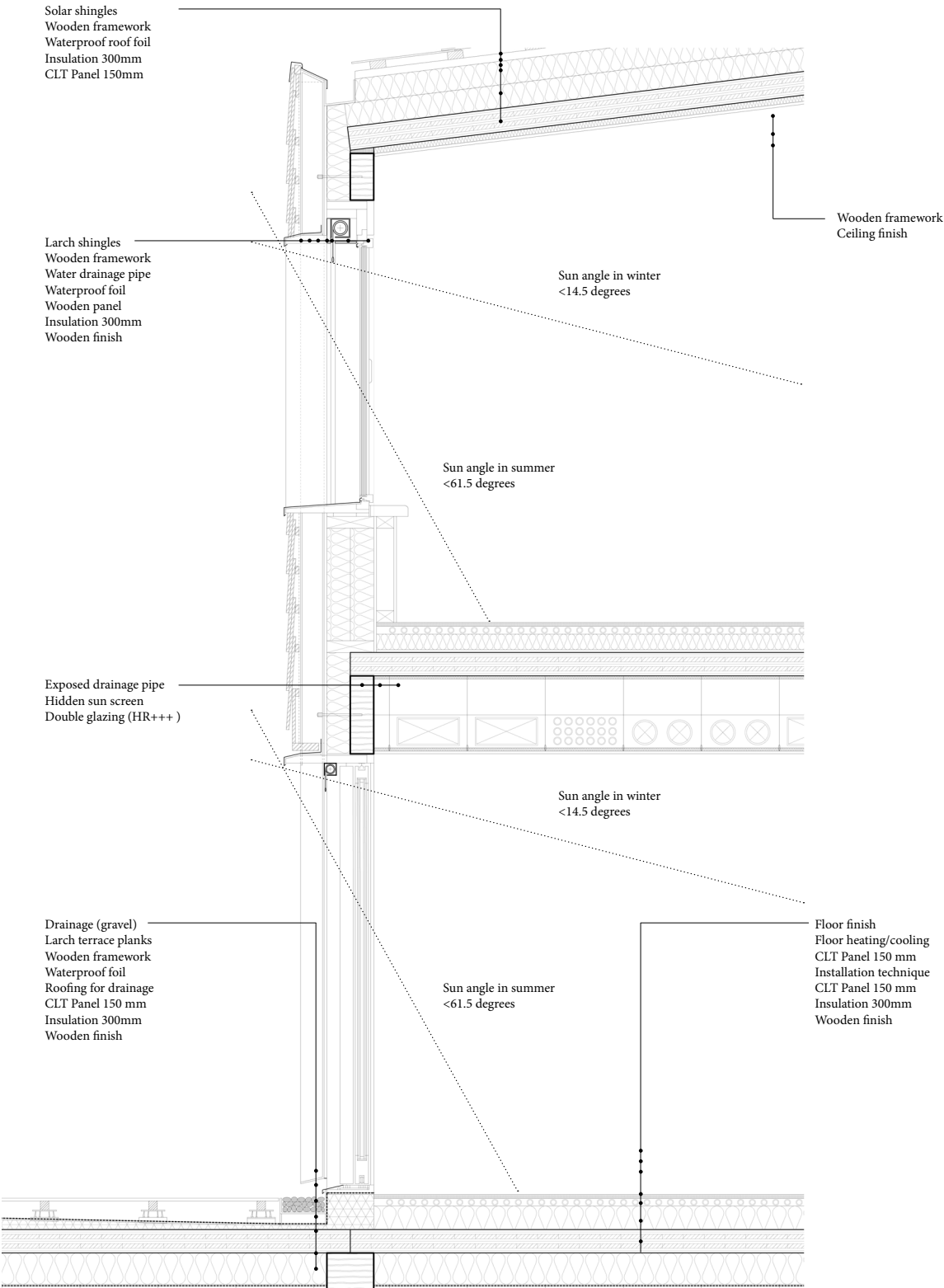
Rainwater Re-use

1 Facade buildup concept

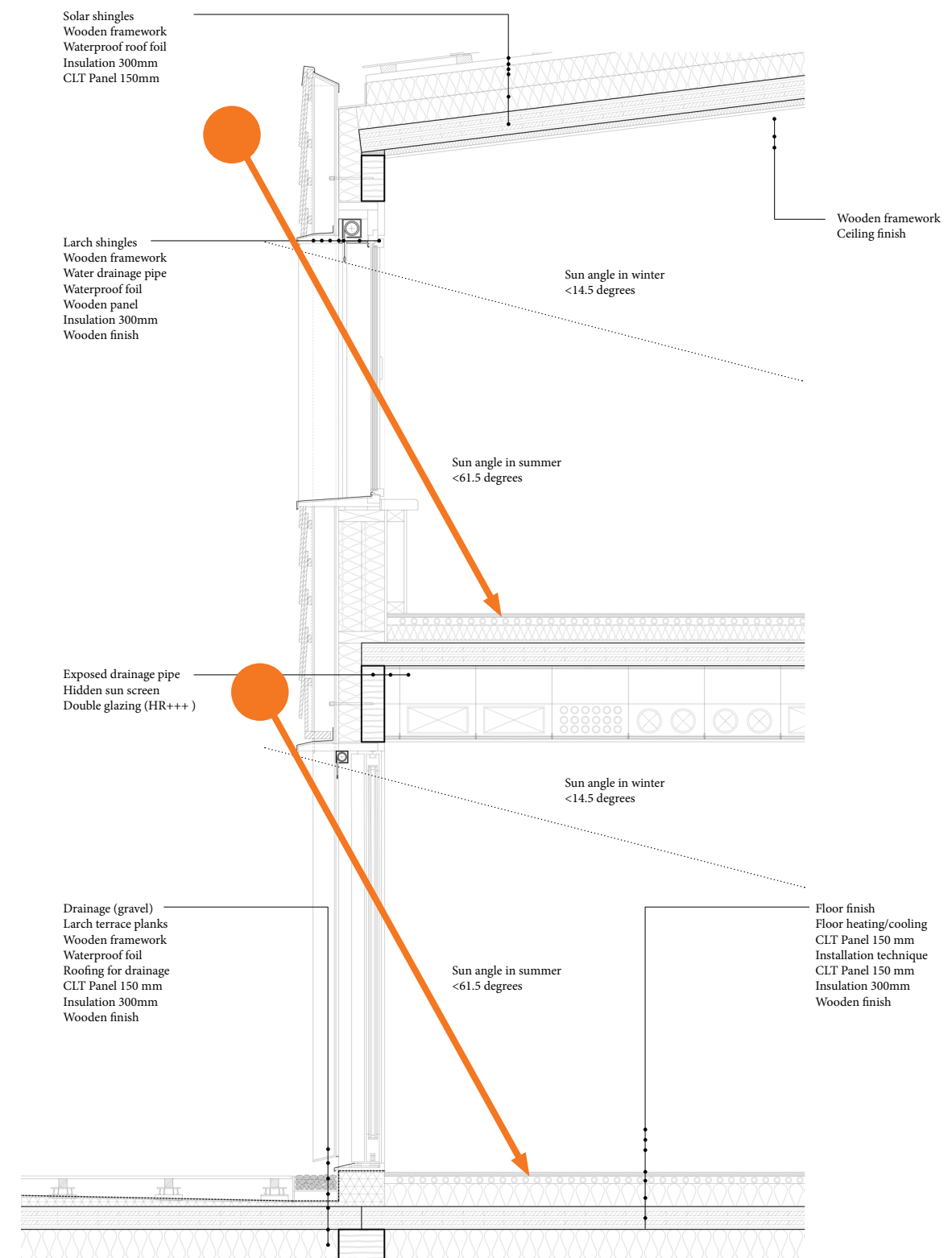
TECHNICAL SECTION



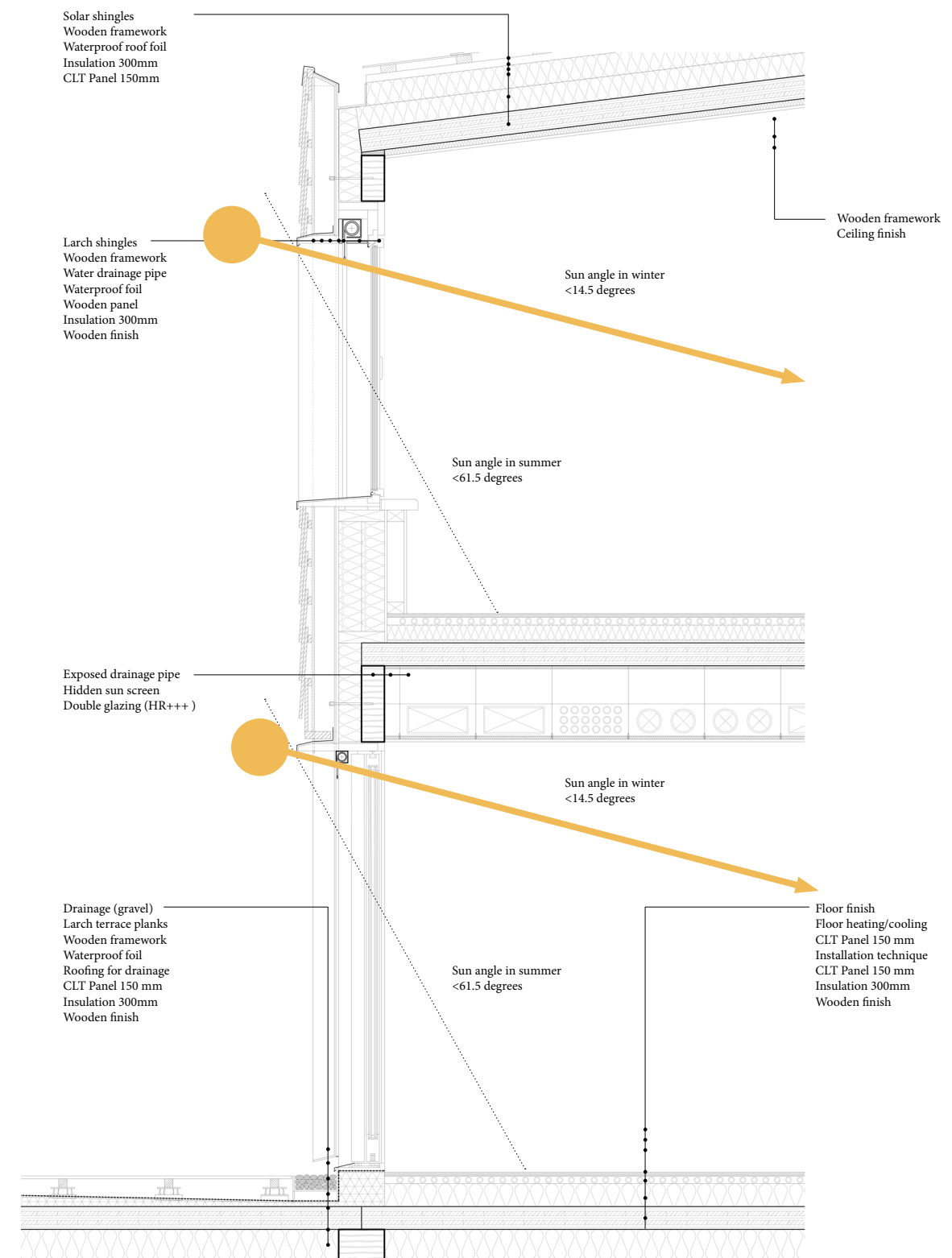
FACADE FRAGMENT



FACADE FRAGMENT

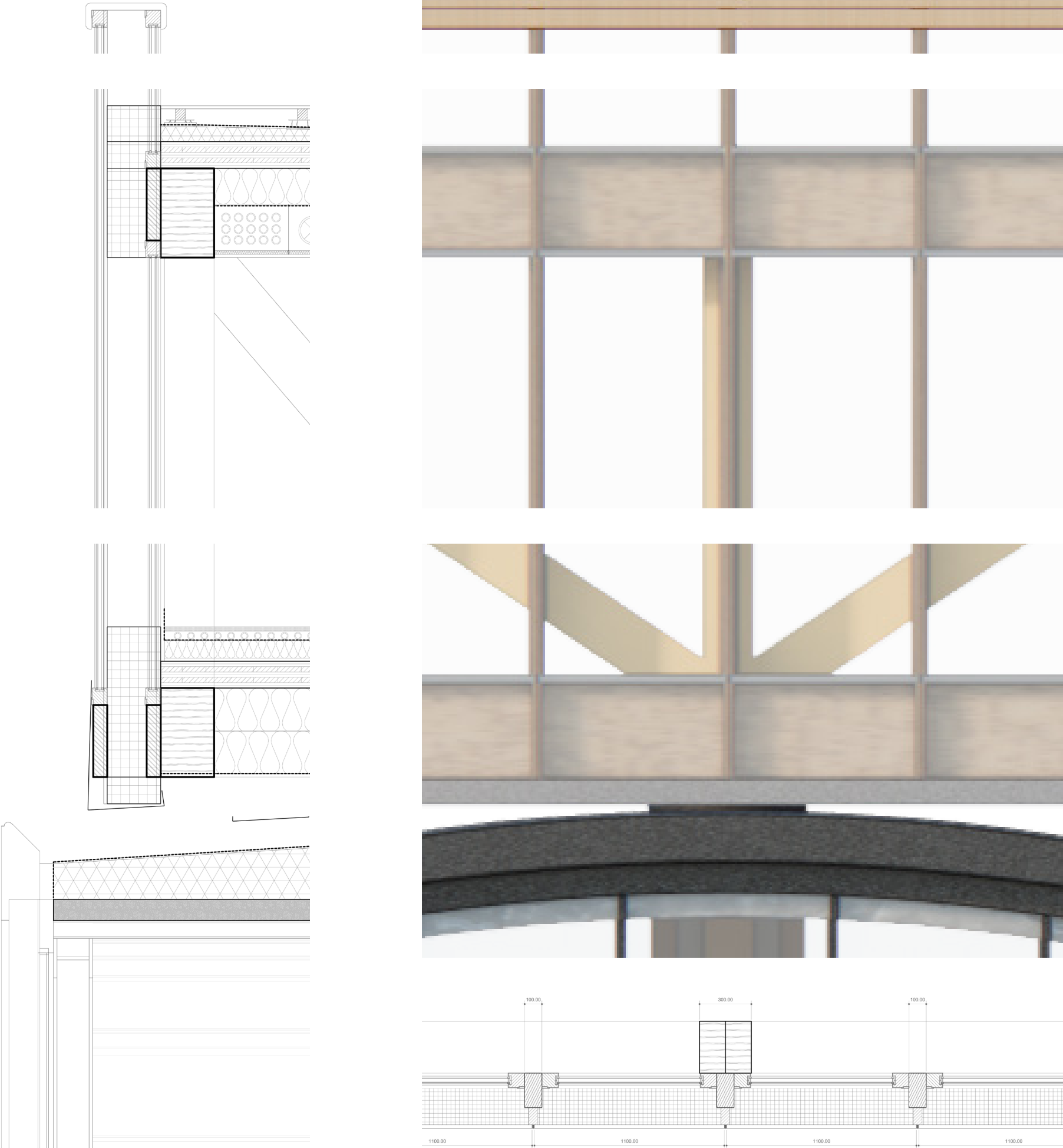


FACADE FRAGMENT



FACADE FRAGMENT

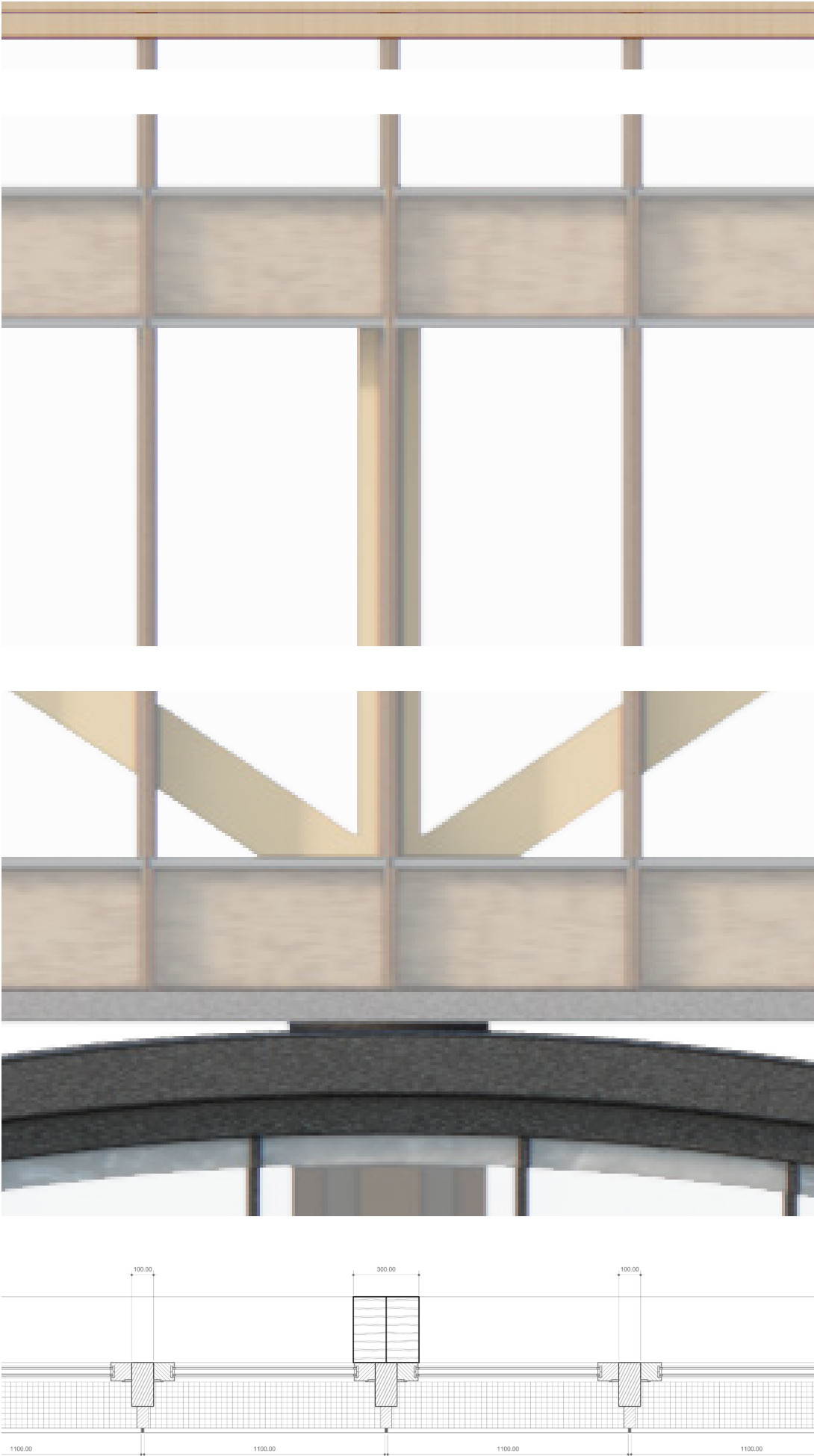
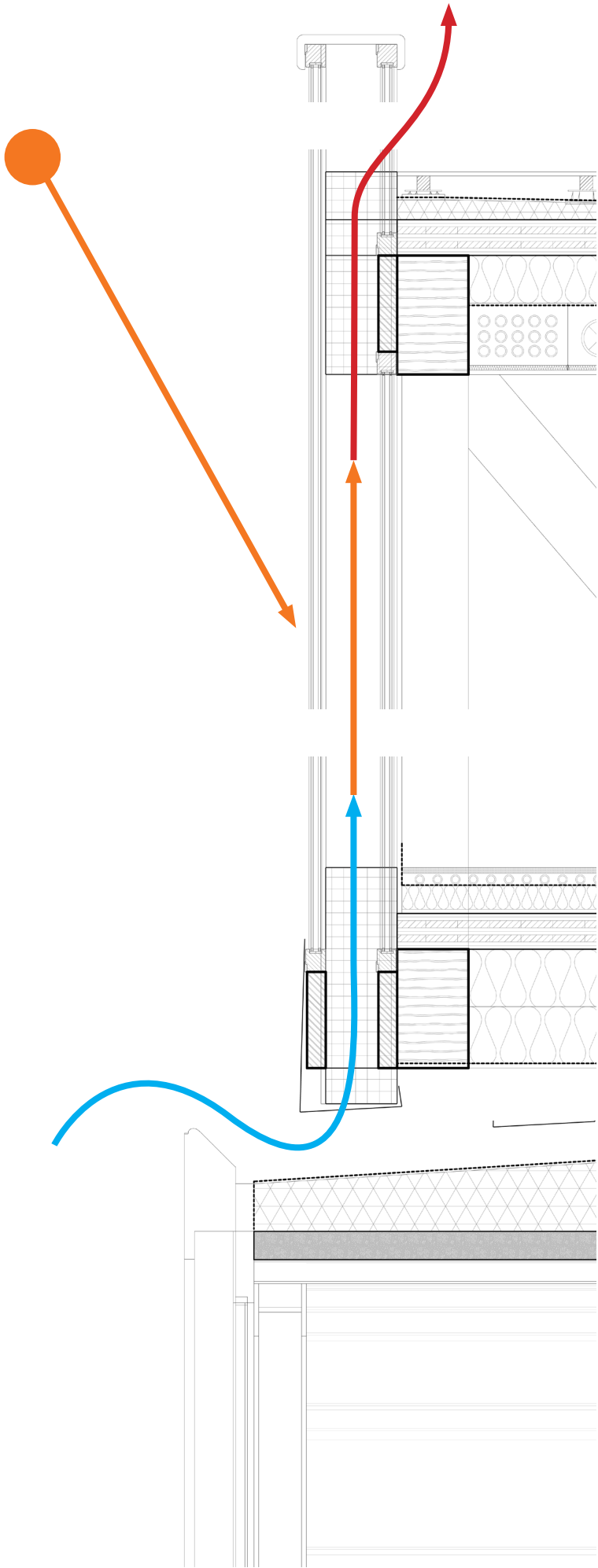
Souple Skin facade
on the south



FACADE FRAGMENT

Souple Skin facade
on the south

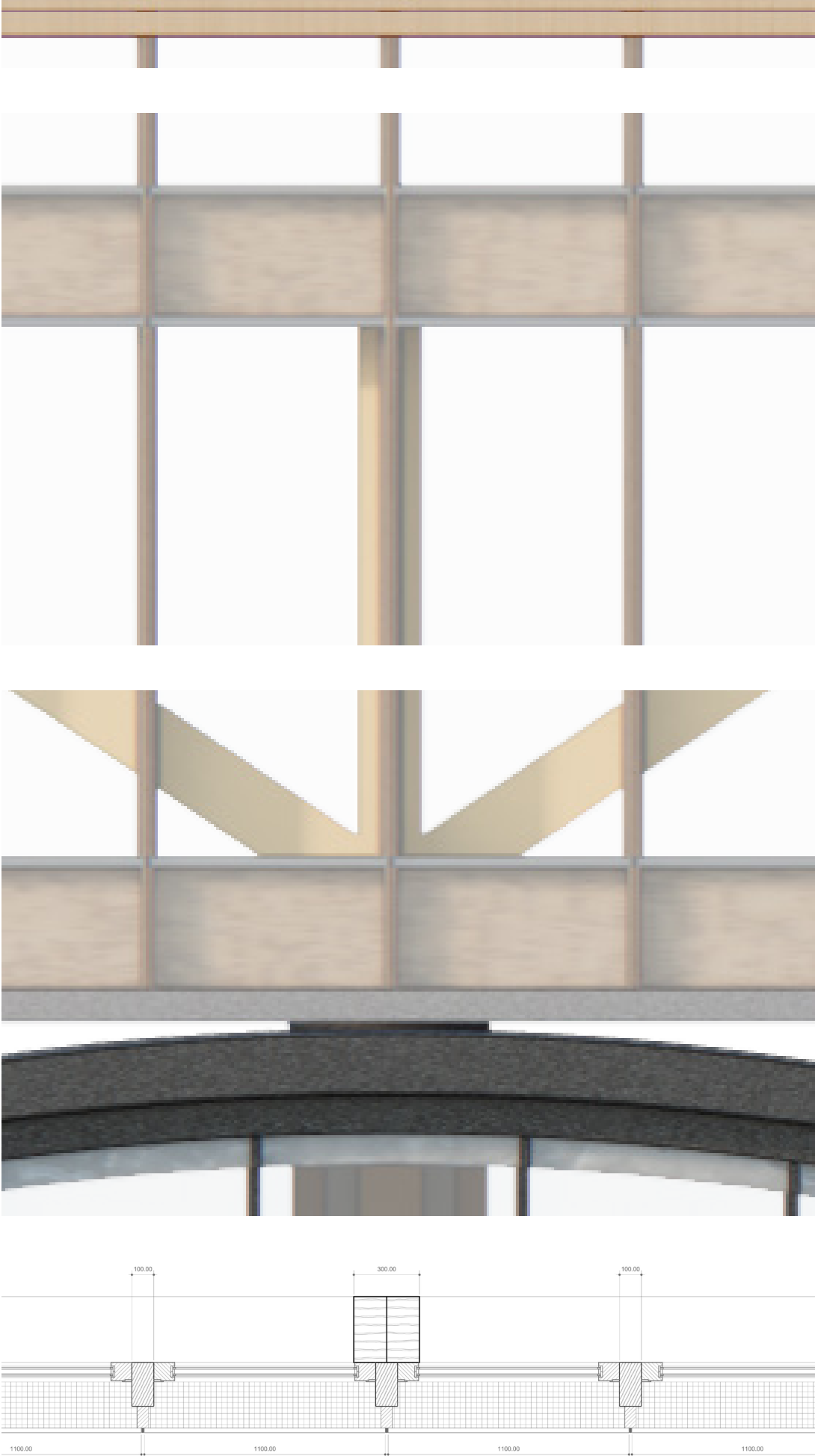
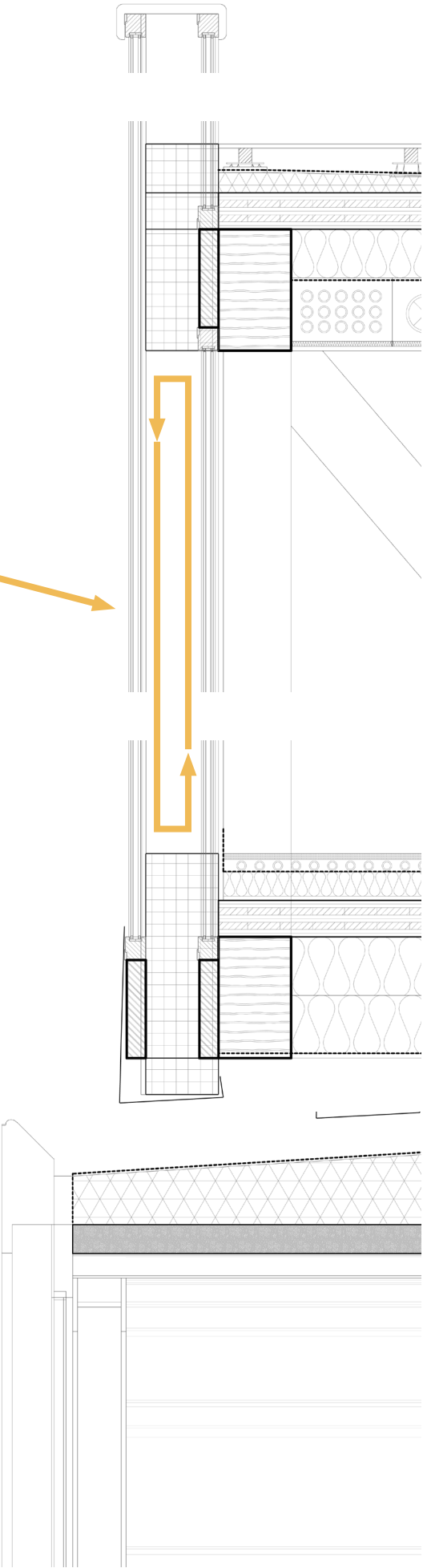
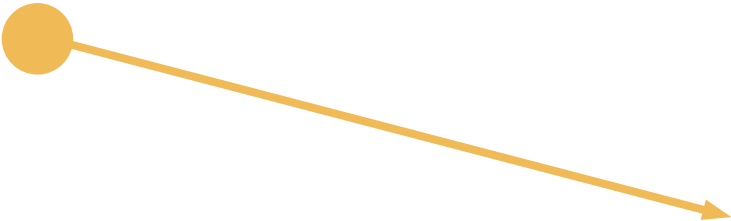
Climate scheme 1: Summer sun



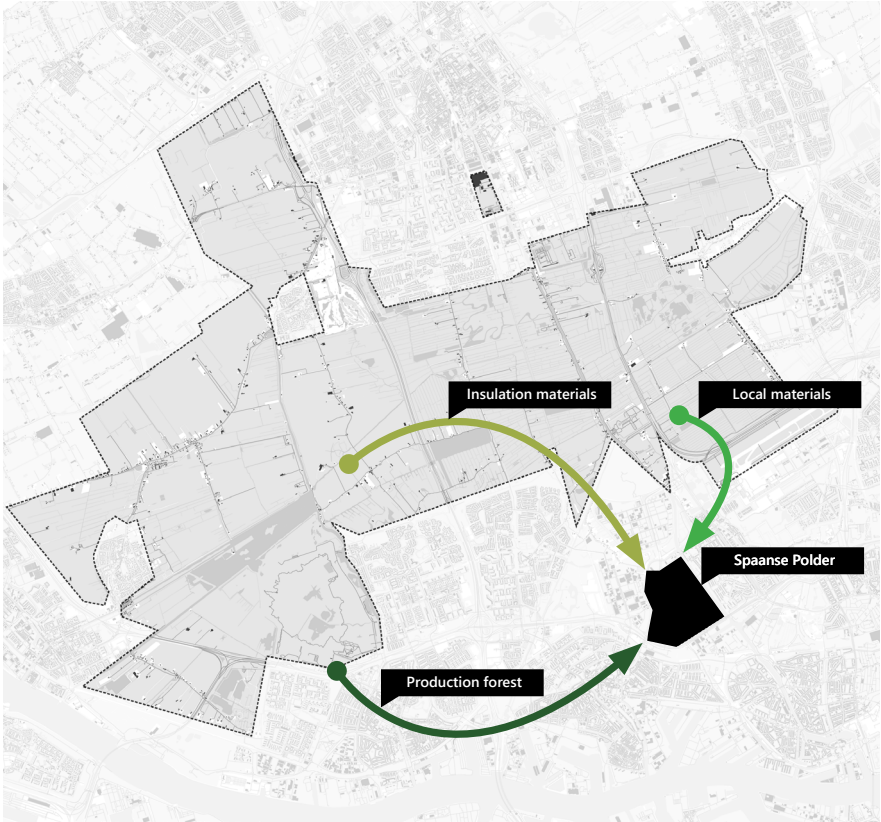
FACADE FRAGMENT

Souple Skin facade
on the south

Climate scheme 2: Winter sun



LOCAL MATERIALS



Light structural beams/columns	<div> <div>1. </div> <div>2. </div> <div>3. </div> </div>	<div> 1. Spruce or poplar wooden beams (Gadero) 2. Galvanized steel connection points/insert leafs (when needed) 3. Wooden connections with minal use and visibility of steel </div>
Heavy beams & floorsystems	<div> <div>1. </div> <div>2. </div> <div>3. </div> </div>	<div> 1. Glue Laminated beams (Stora Enso - various sizes) 2. Cross Laminated timber (Stora Enso - 150mm 5 layers) 3. Galvanized steel connection points/insert leafs </div>
Facade exterior materials	<div> <div>1. </div> <div>2. </div> <div>3. </div> </div>	<div> 1. Larch wood for exterior use: Spacers, windowframes, plating 2. Larch shingles with cavity behind it for passive cooling 3. Glavanized metal (exposed) rainpipe, zinc windowsill </div>
Insulation material products	<div> <div>1. </div> <div>2. </div> <div>3. </div> </div>	<div> 1. Woodfibre insulation boards (Pavatherm - pressure resistant) 2. Flax insulation material in the walls (Isovlas) 3. Hemp insulation material (Isohemp) - optional </div>
Interior finises products	<div> <div>1. </div> <div>2. </div> </div>	<div> 1. Multiplex materials as a wall finish or 2. Pine wood for wall/floor/ceiling finish </div>

Material ambitions: Re-use existing (building) & use local bio-based resources *

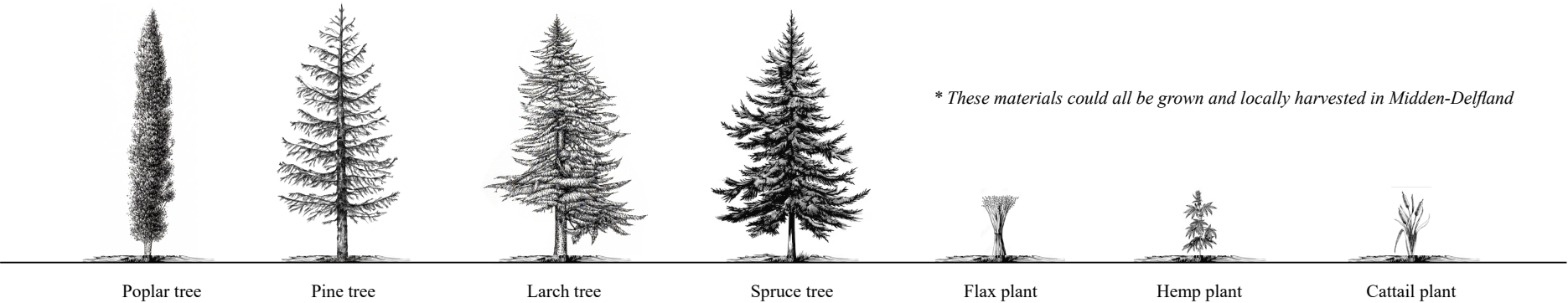
Light structural beams/columns: Pine or poplar trees that can grow locally.

Heavy beams & floors: CLT & Glulam from locally sourced pine/spruce trees.

Facade: Durable larch spacers, frames and shingles, locally grown/sourced.

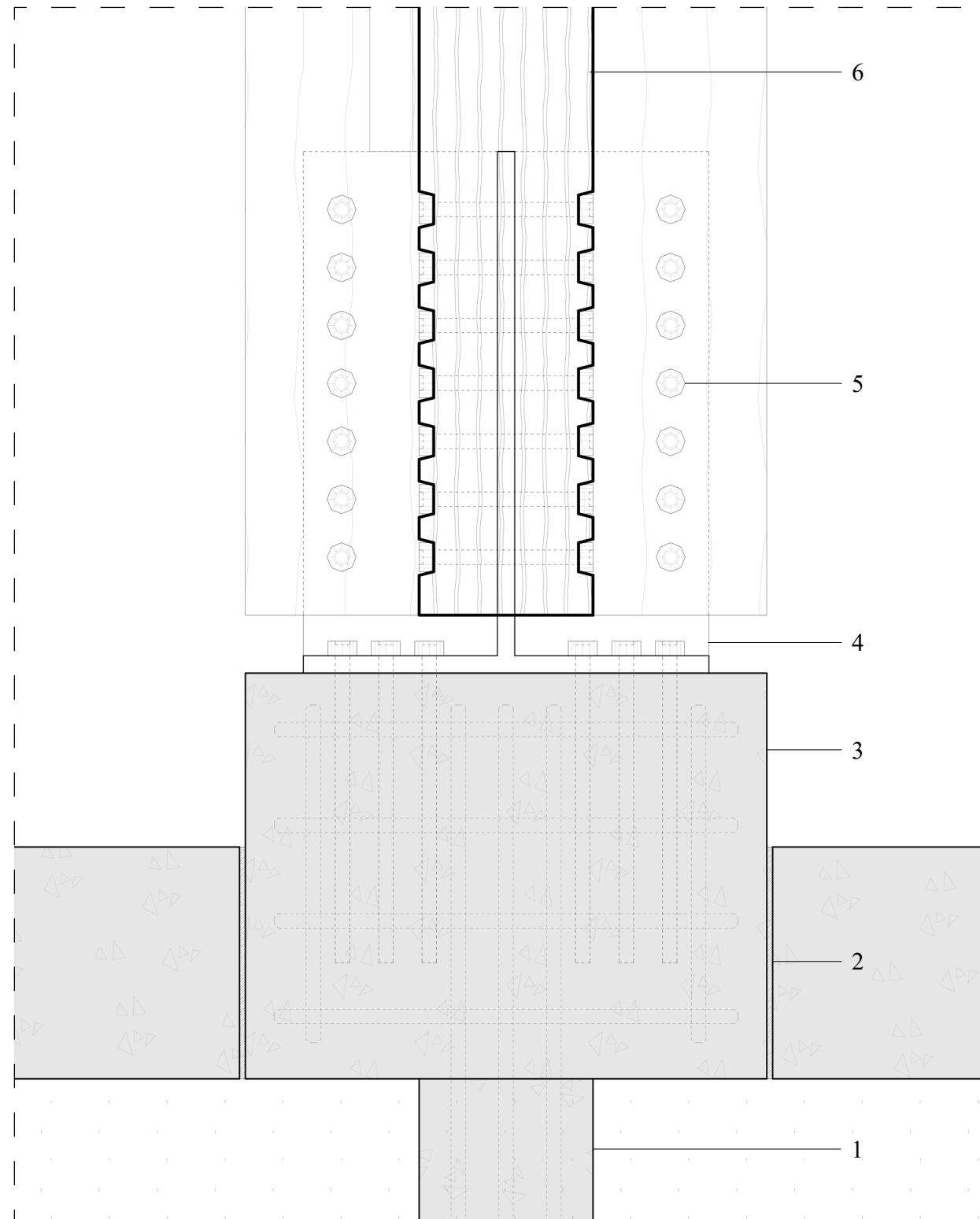
Insulation: Flax insulation , woodfibre insulation, hemp & cattail (optional).

Interior: Multiplex (made from pine/spruce/fir) or pine wood finishes.



* These materials could all be grown and locally harvested in Midden-Delfland

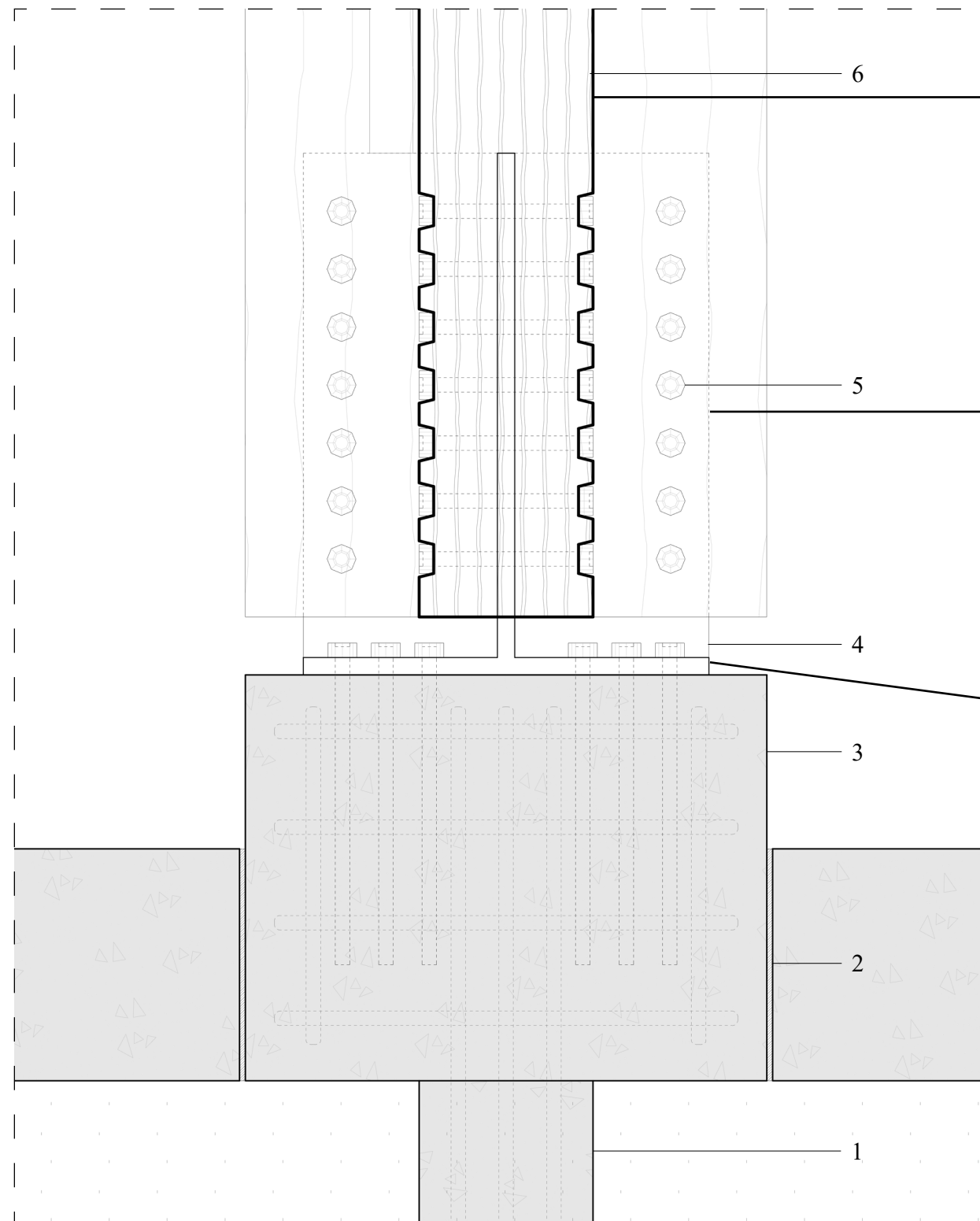
DETAIL FOUNDATION



Detail Foundation - Scale 1:10

1. Vroom prefab reinforced concrete foundation 26 meters, 290x290mm, C55 XC2.
2. Existing concrete floors 400mm, Peridam Tempex incision separation strip 5mm.
3. In situ concrete connection with foundation head, interwoven reinforced steel connection.
4. Adjustable galvanized stainless steel column base with insert leaf 700x900mm.
5. Galvanized steel class 4.8 Bolts 300mm, same bolts at the concrete base 500mm.
6. Glue laminated timber column, 900x900mm, 300mm in width, 10 meters in height.

DETAIL FOUNDATION

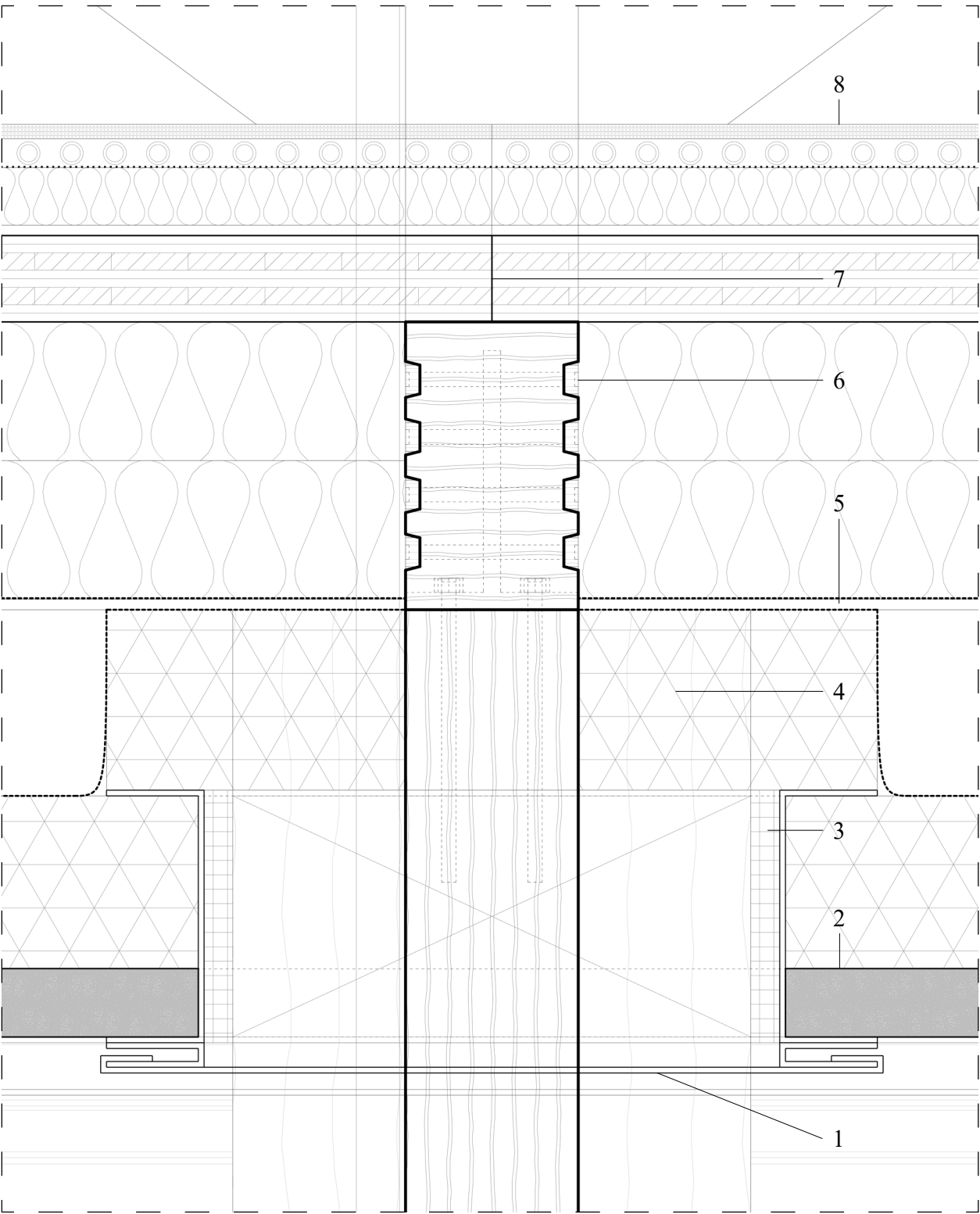


- Wooden Glulam column
- Separated from concrete base
- with galvanized steel insert leaf
- De-mountability with bolting

Detail Foundation - Scale 1:10

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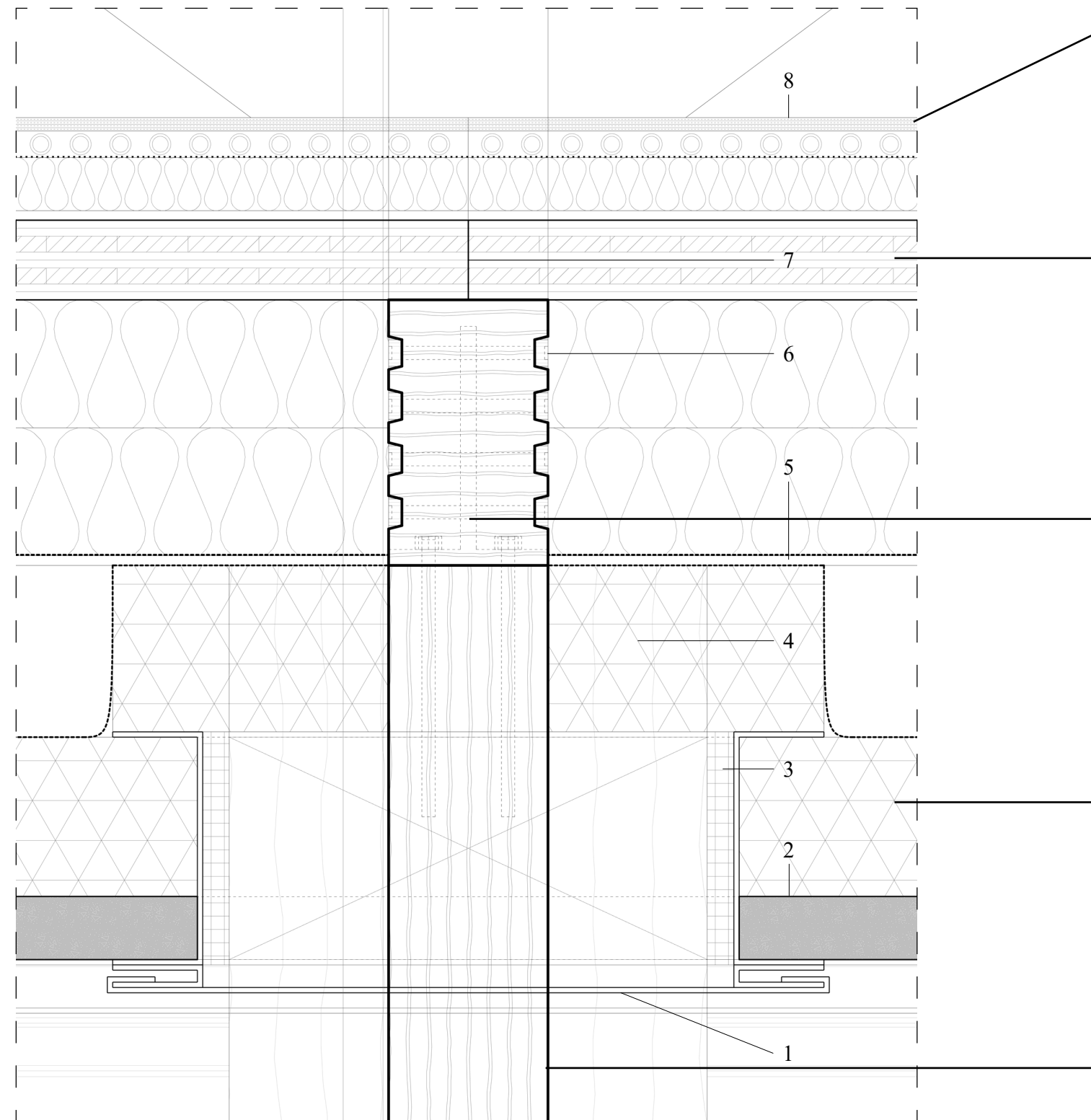
DETAIL COLUMN



Detail Column - Scale 1:10

1. Folded steel 2mm, attached to perforated concrete roof, central cut out for column intersection.
2. Existing concrete roof, waffle panels 150mm, situated on existing galvanized steel beams IPE 180.
3. Tempex EPS incision separation strip 50mm, for column positioning and concealment of the side cavities.
4. Pavatherm pressure-resistant insulation 300mm ($R_d = 7,86 \text{ m}^2\text{K/W}$), water resistant foil, bitumen roof covering
5. WBP wooden plate 18mm, Isovlax, water resistant foil, flax insulation 500mm ($R_d = 13,12 \text{ m}^2\text{K/W}$).
6. Adjustable galvanized stainless steel column base with insert leaf 300x450mm. galvanized steel class 4.8 Bolts 300mm.
7. Stora Enso CLT flooring system (5 layers) 150mm, width 2,75m and length 10m, non-visual quality (NVI), fire protection board 18mm
8. Flooring finish, floor heating in 100mm concrete screed, PE damp proof membrane, Thermoflex wood fiber insulation 100mm

DETAIL COLUMN

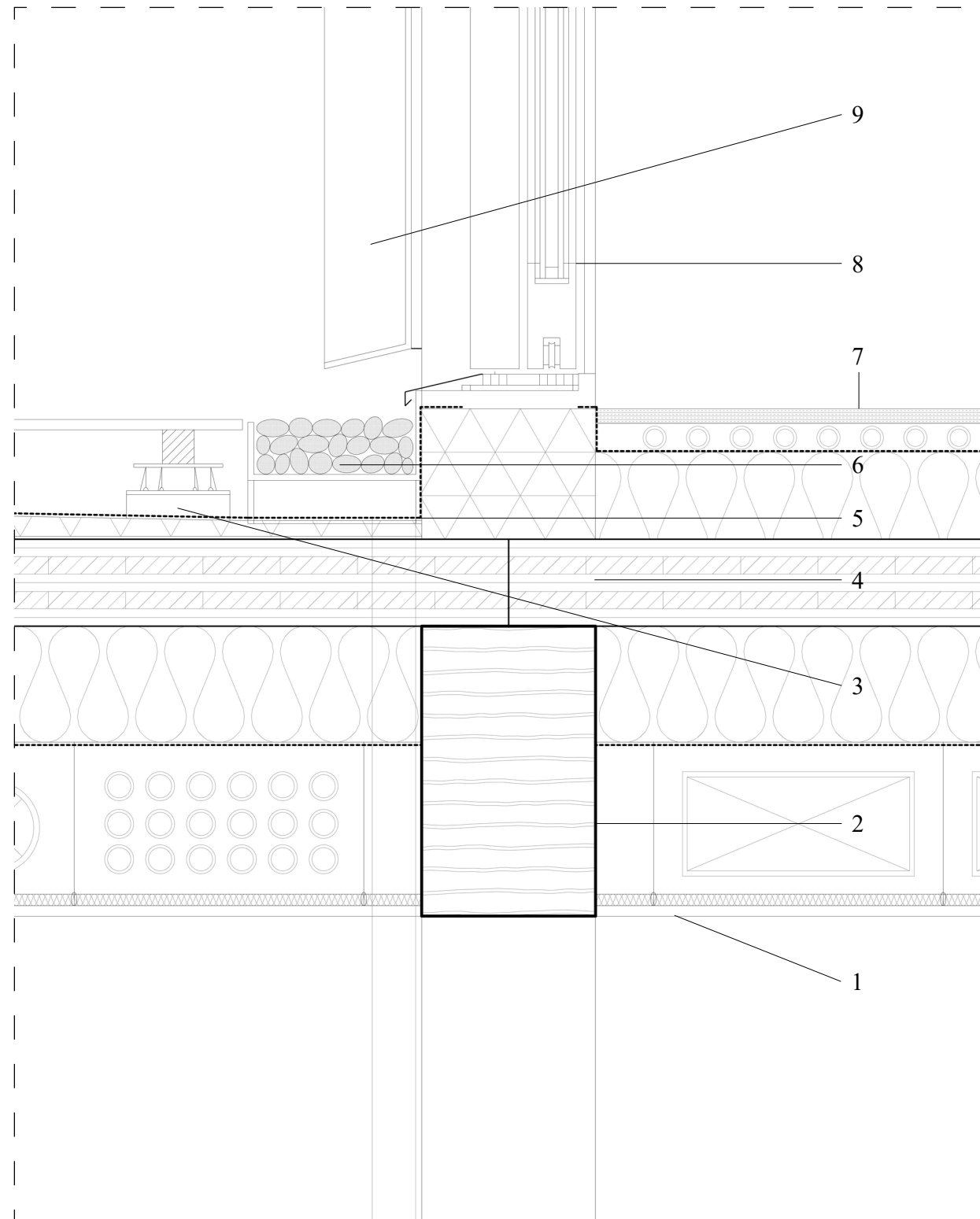


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- **Wooden flooring (with heating)**
- **CLT flooring system (150mm)**
- **Galvanized steel insert leaf**
- **de-mountability with bolting**
- **Woodfibre insulation**
- **Glulam structure**

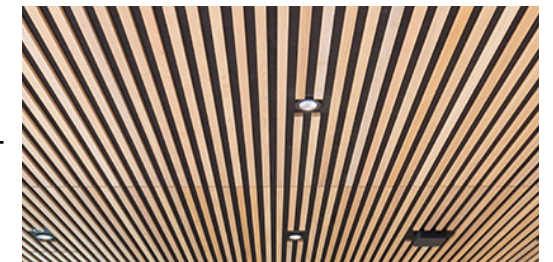
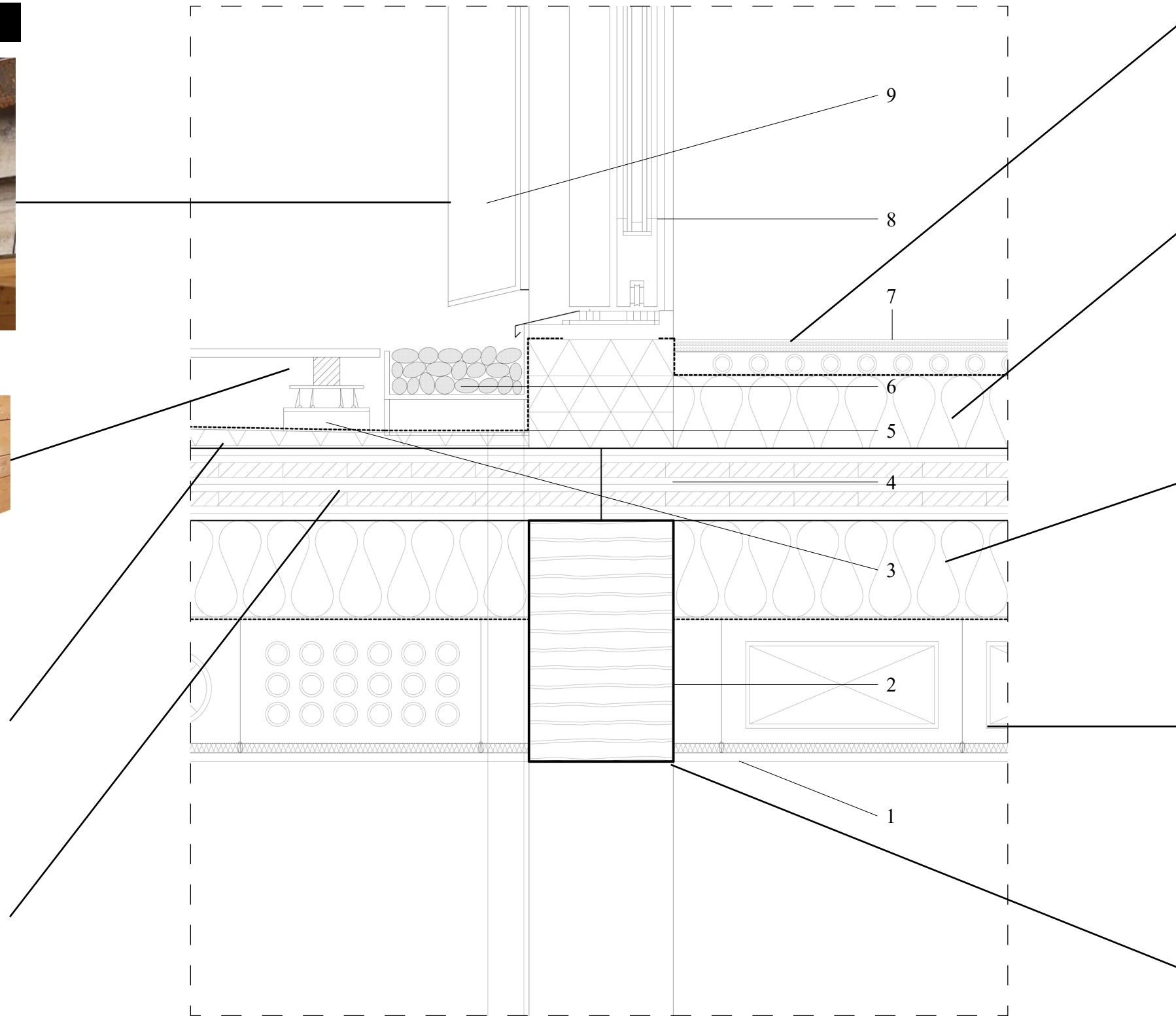
DETAIL FLOOR



Detail Floor - Scale 1:10

1. Climate ceiling 300mm, perforated fir 18mm, 50mm felt acoustic layer
2. Glue laminated beam 500mm, width 300mm
3. Dural patio support system, larch beam 50mm, larch terrace planks 18mm
4. Stora Enso CLT flooring system (5 layers) 150mm, width 2,75m and length 10m, non-visual quality (NVI)
5. Pavatherm pressure-resistant insulation 300mm (Rd - 7,86 m2K/W), water resistant foil, bitumen roof covering
6. Drain stone lineair element for gravel finishing; stainless steel drainage system with pebbles for water filtration
7. Flooring finish, floor heating in 100mm concrete screed, PE damp proof membrane, Thermoflex wood fiber insulation 100mm
8. Sliding door: insulation glazing in larch frame: 2x 4 mm lam. safety glass + 16 mm cavity + 2x 4 mm lam. safety glass, Ug = 1.0 W/m2K
9. Exposed galvanized steel rain pipe, depth 150mm and width 300mm, attached to structural column

DETAIL FLOOR



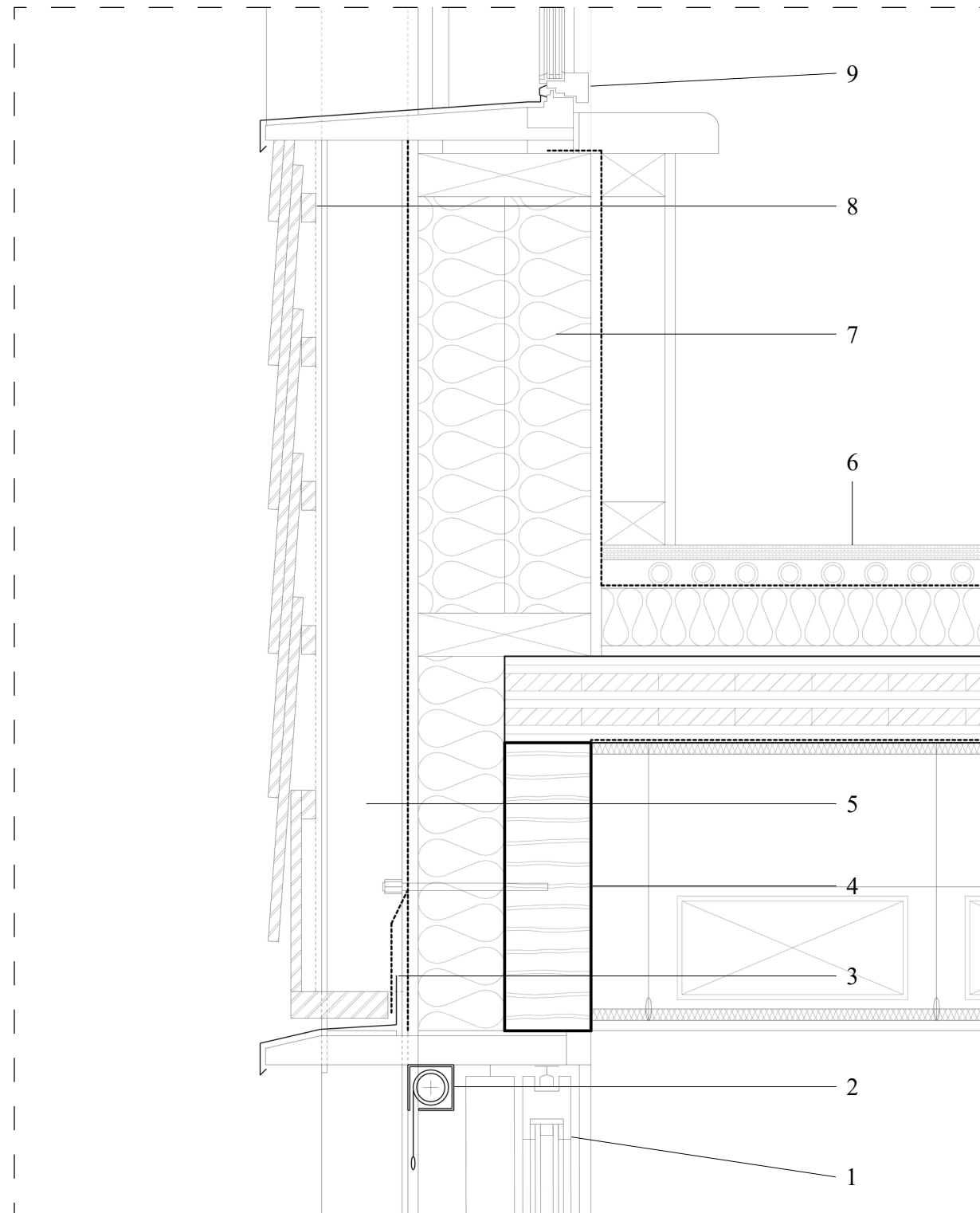
- Exposed galvanized rainpipe
- Larch wood for outside deck
- Woodfire insulation for roof
- CLT flooring system (150mm)

Detail Floor - Scale 1:10

1. Climate ceiling 300mm, perforated fir 18mm, 50mm felt acoustic layer
2. Glue laminated beam 500mm, width 300mm
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9. Exposed galvanized steel rain pipe, depth 150mm and width 300mm, attached to structural column

- Wooden flooring (with heating)
- Woodfibre insulation
- Flax insulation material
- Climate ceiling (acoustic)
- Glulam structure

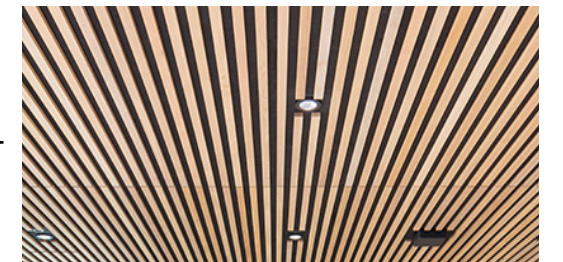
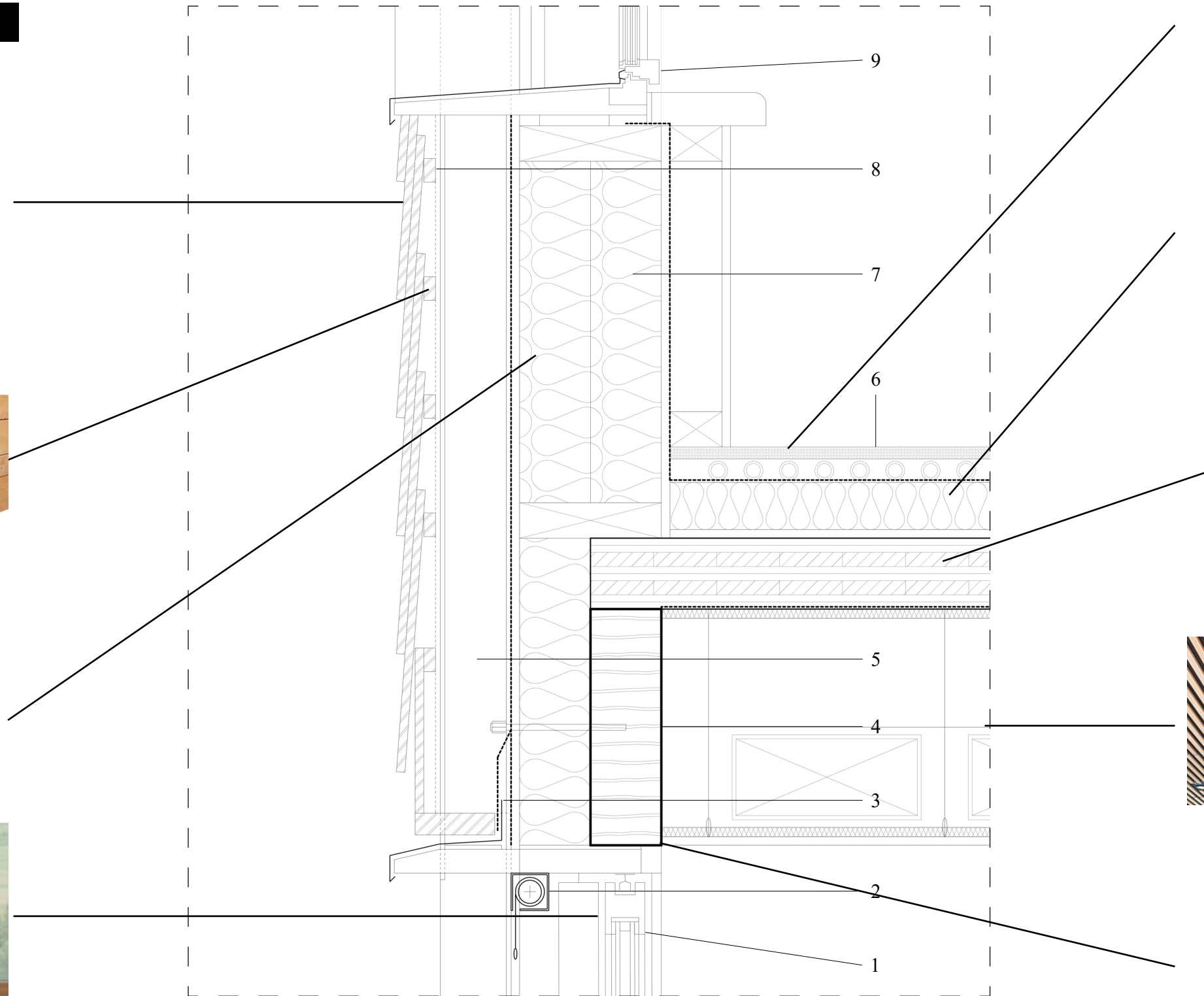
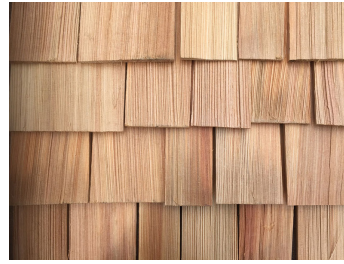
DETAIL WINDOWS



Detail Windows - Scale 1:10

1. Sliding door: insulation glazing in larch frame: 2×4 mm lam. safety glass + 16 mm cavity + 2×4 mm lam. safety glass, $U_g = 1.0$ W/m²K
2. Ritscreen, electric retractable exterior window screening to mitigate solar gain in summer
3. Sheet zinc cornice, pre-weathered for water drainage, water resistant PE membrane covering
4. Glue laminated beam, height 500mm and width 150mm, rainpipe locally bolted to structure
5. Facade cavity for passive airflow and cooling, hidden galvanized steel rain pipe, depth 150mm and width 300mm, attached to structural beam
6. Flooring finish, floor heating in 100mm concrete screed, PE damp proof membrane, Thermoflex wood fiber insulation 100mm
7. Water resistant PE membrane, WBP wooden plate 18mm, Isovlas natural biobased flax insulation 300mm ($R_d = 7,86$ m²K/W), multiplex 18mm
8. Larch shingles split 2-layer length 600 mm, Support battens 25 mm, vertical spacer battens 160 mm, PE membrane, WBP wooden plate 18mm
9. Insulation glazing in larch frame: 2×4 mm laminated safety glass + 16 mm cavity + 2×4 mm laminated safety glass, $U_g = 1.0$ W/m²K

DETAIL WINDOWS



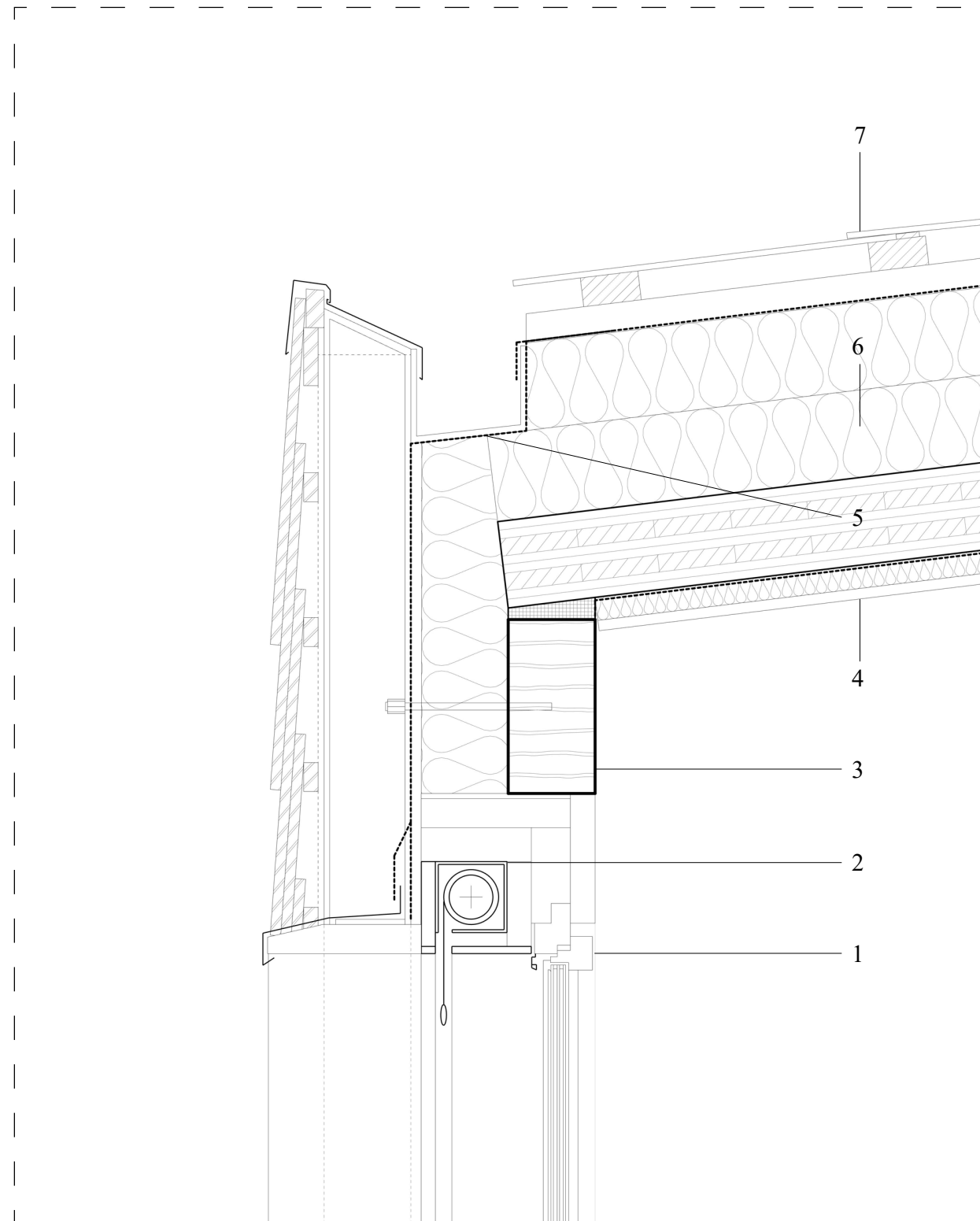
Detail Windows - Scale 1:10

- Larch wood shingles skin
- Larch wood facade spacers
- Flax facade insulation
- Larch wood window frames

1. Sliding door:insulation glazing in larch frame: 2× 4 mm lam. safety glass + 16 mm cavity + 2× 4 mm lam. safety glass, $U_g = 1.0 \text{ W/m}^2\text{K}$
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- Wooden flooring (with heating)
- Woodfibre insulation
- CLT flooring system (150mm)
- Climate ceiling (acoustic)
- Spruce structure

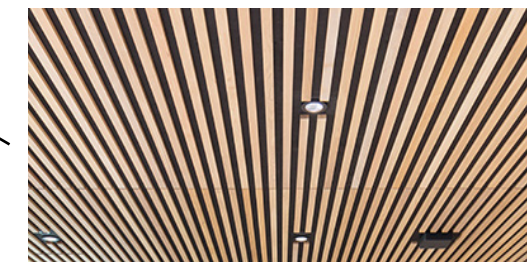
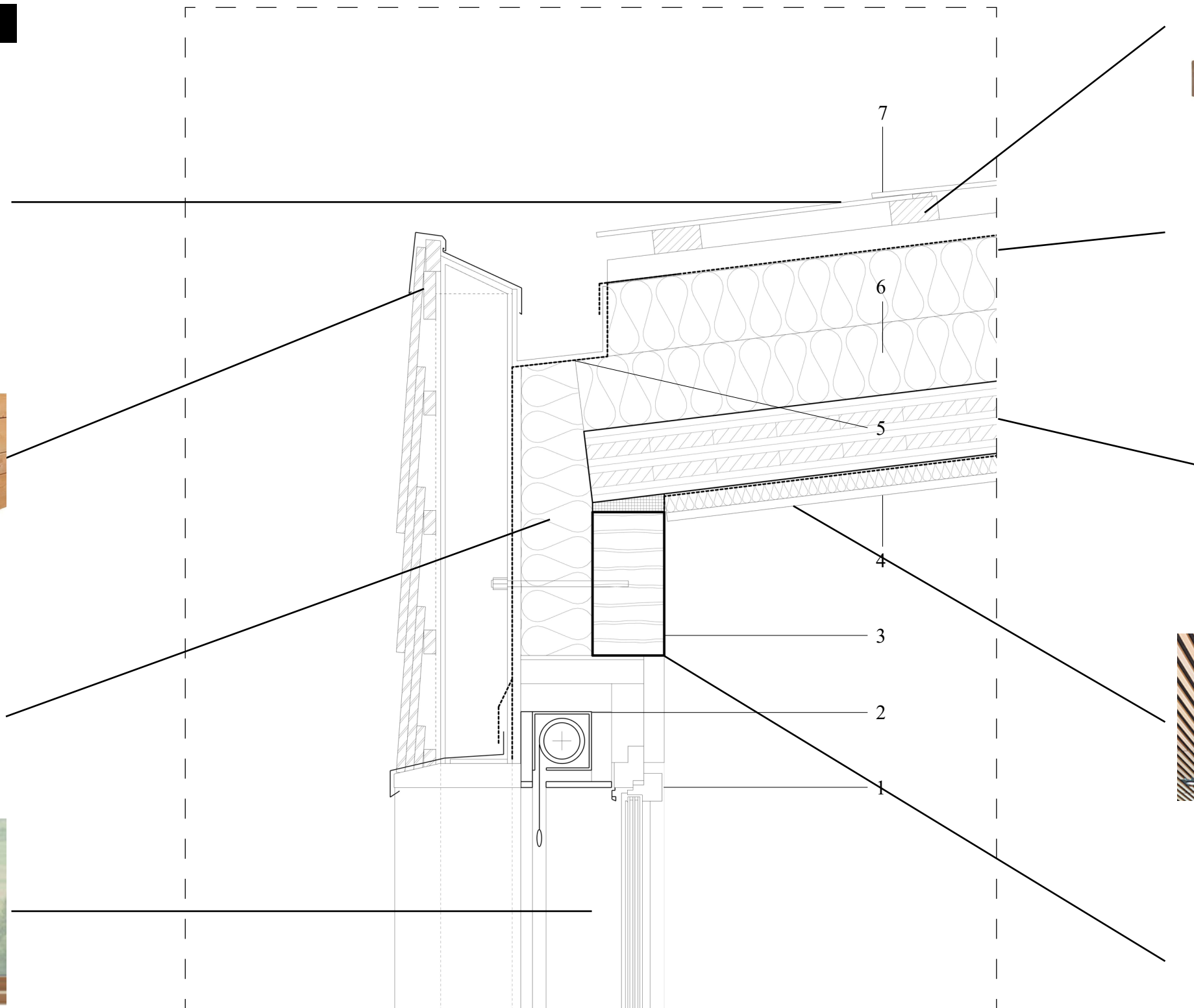
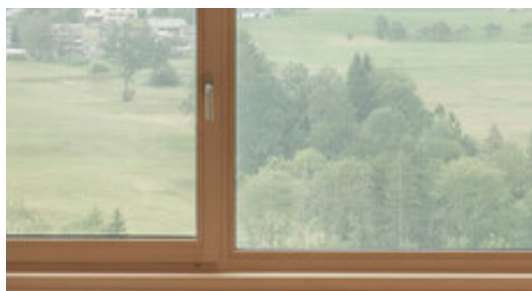
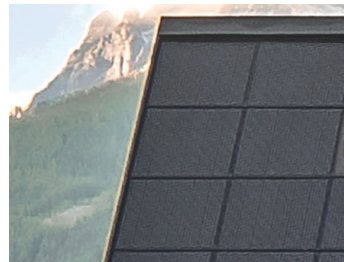
DETAIL ROOF



Detail Roof - Scale 1:10

1. Insulation glazing in larch frame: 2× 4 mm laminated safety glass + 16 mm cavity + 2× 4 mm laminated safety glass, $U_g = 1.0 \text{ W/m}^2\text{K}$
2. Ritscreen, electric retractable exterior window screening to mitigate solar gain in summer
3. Glue laminated beam, height 500mm and width 150mm, rainpipe locally bolted to structure, CLT roof panel bolted to beam
4. Ceiling panels perforated fir 18mm, 50mm felt acoustic layer, PE damp proof membrane.
5. Water resistant PE membrane, galvanized steel, hidden gutter 300mm connected to vertical rainpipe
6. Stora Enso CLT 150mm, Pavatherm pressure-resistant insulation 300mm ($R_d = 7,86 \text{ m}^2\text{K/W}$)
7. Glass monocrystalline 7.5 mm, battens 50 mm, counter battens 50 mm, bitumen roof finish, water resistant PE membrane

DETAIL ROOF



- Monocrystalline solar panels
- Larch wood facade spacers
- Flax facade insulation
- Larch wood window frames

Detail Roof - Scale 1:10

1. Insulation glazing in larch frame: 2× 4 mm laminated safety glass + 16 mm cavity + 2× 4 mm laminated safety glass, $U_g = 1.0 \text{ W/m}^2\text{K}$
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- Larch wood roofing spacers
- Woodfibre roofing insulation
- CLT flooring system (150mm)
- Ceiling (acoustic)
- Spruce structure

06 - PHYSICAL MODEL







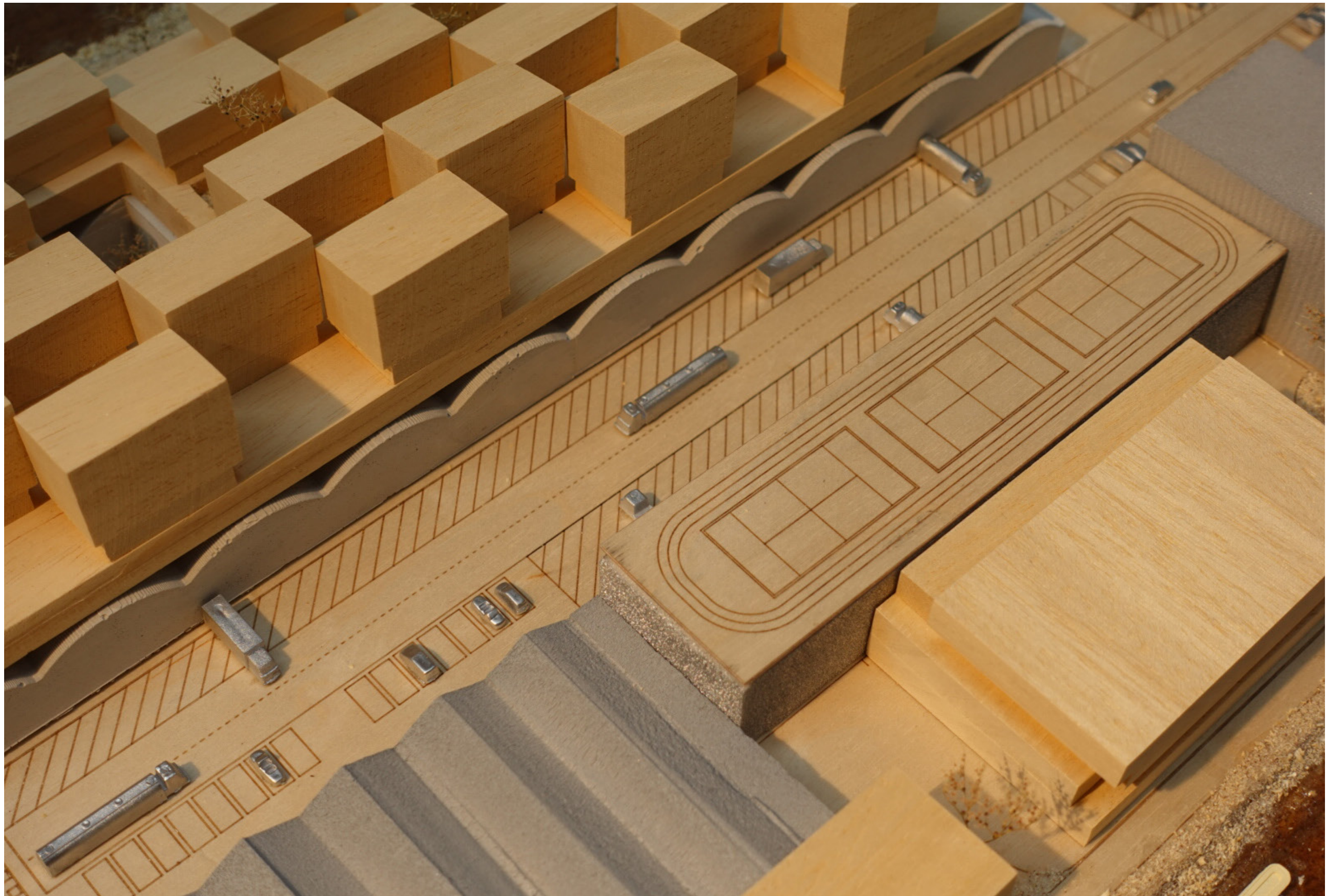












QUESTIONS AND FEEDBACK