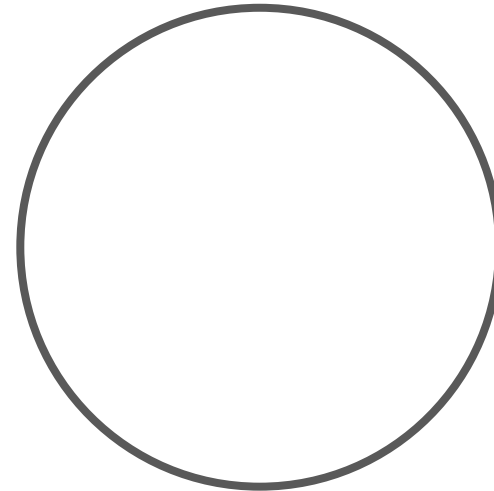
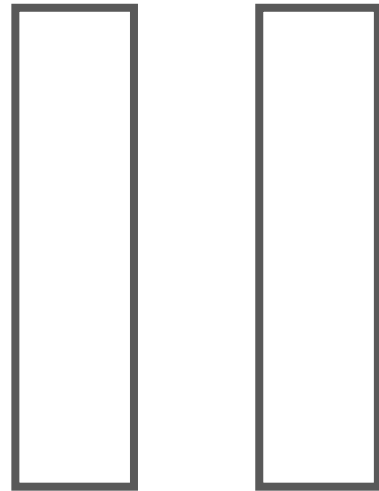
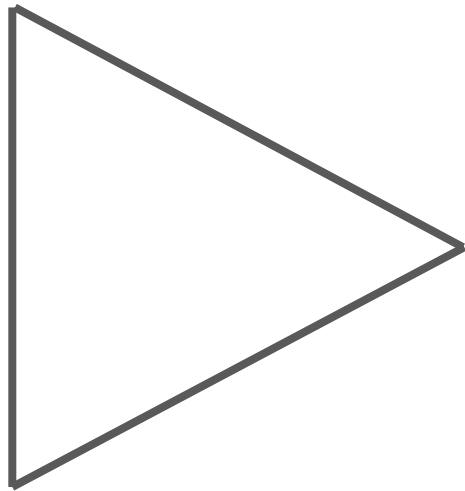


# TRANSIT VILLAGE

**Creating Space for Transition**



**Arnhem.**



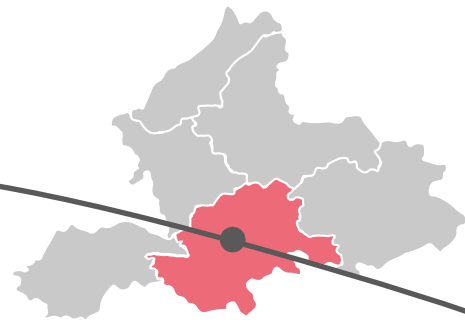
**Planning area.**

**“Rail Junction East Arnhem”**





**One million  
homes shortage.**



**Region Arnhem-  
Nijmegen.**



**Planning area = development location.**







**Arnhem  
City center.**

**Blank space.**

**Rail Junction East Arnhem**

**5 min walk.**



**How do you build  
a neighborhood  
from scratch?**



**How do you build  
a neighborhood  
from scratch?**

**Variety of people and lifestyles.**



**Lifestyles change over time.**

**How do you build  
a neighborhood  
from scratch?**



# Traditional Building Techniques.



**Glued.**



**Welded.**



**Cast.**



# Traditional Building Techniques.



Hard to reuse materials.



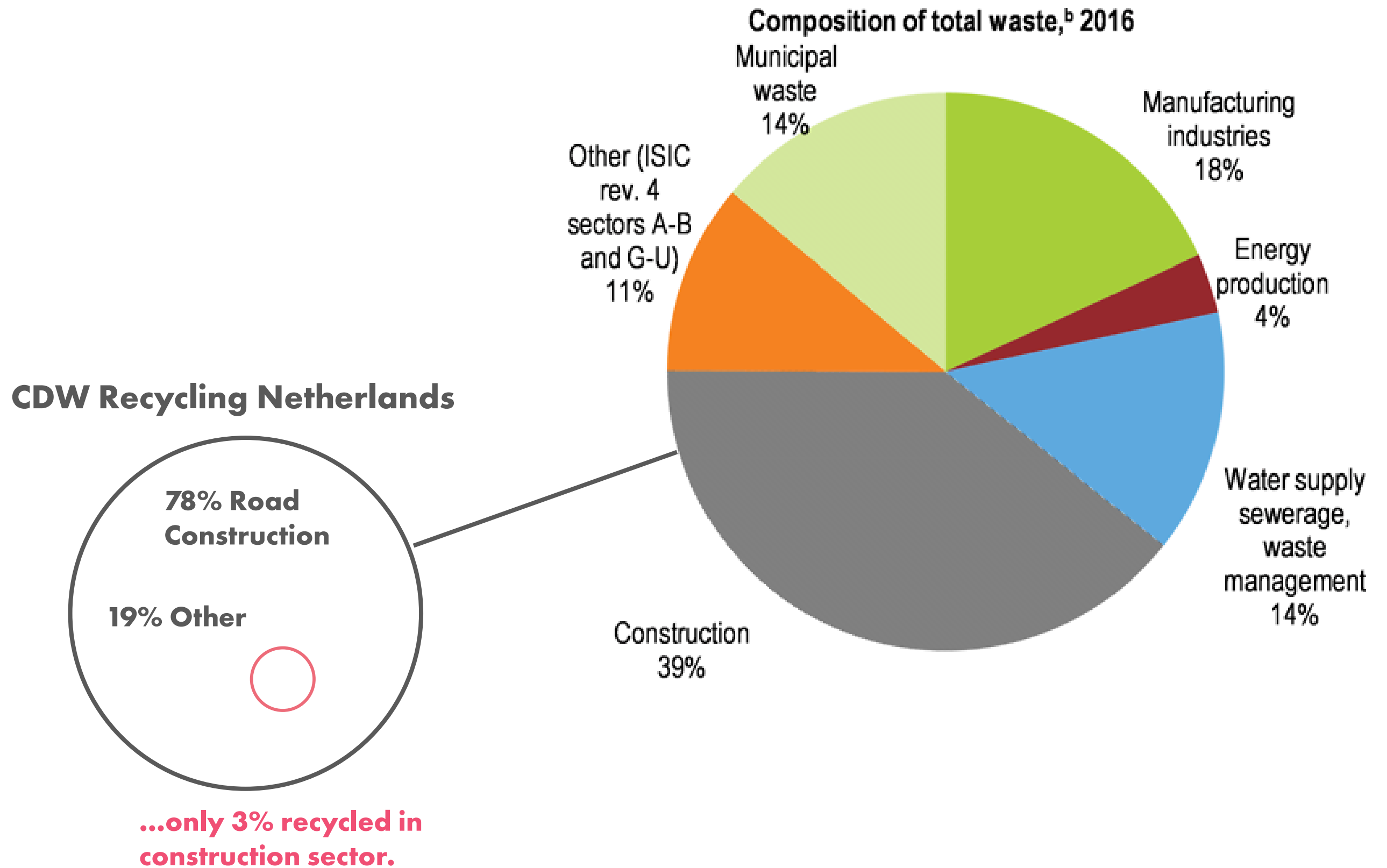
Hard to adjust apartments + buildings.



**Construction and Demolition Waste!**

# Problem statement.

## Construction and Demolition Waste!





# **Problem statement.**

**Construction and Demolition Waste!**

**Construction of 1M homes**

**=**

**Severe Construction +  
Demolition Waste problem!**

# Problem statement.

Construction and Demolition Waste!

Construction of 1M homes

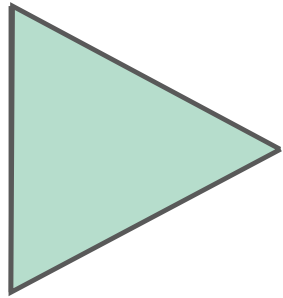
**Circular!**

Demolition Waste problem!

**How can I build  
Transit Village in a  
circular way?**

# Circularity

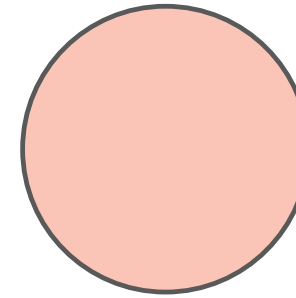
In Transit Village.



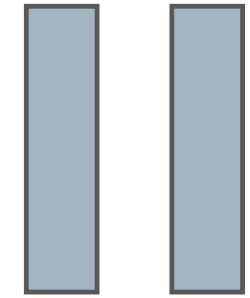
**Materials.**



**Remountability.**



**Happy City.**

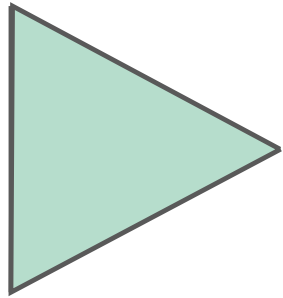


**Process.**



# Circularity

Reasoning.



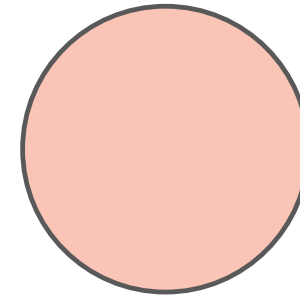
## Materials.

Take better  
choices.

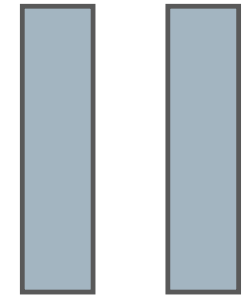
Some materials  
become waste per  
definition.



## Remountability.



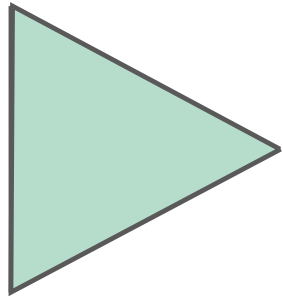
## Happy City.



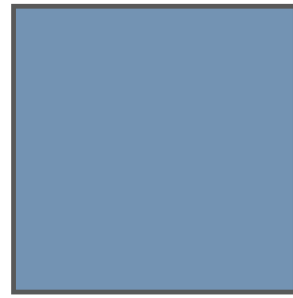
## Process.

# Circularity

Reasoning.

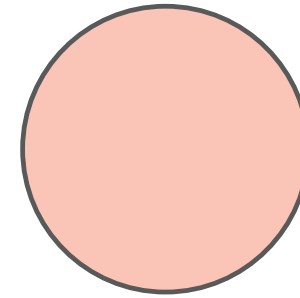


**Materials.**

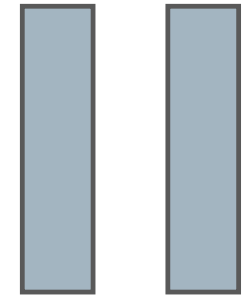


**Remountability.**

Design remountable.



**Happy City.**

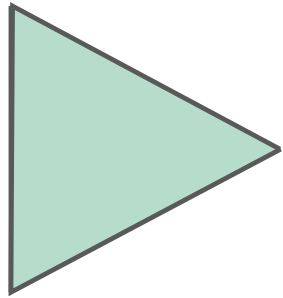


**Process.**

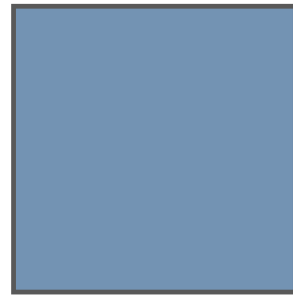
**Traditional building  
techniques imply  
demolition.**

# Circularity

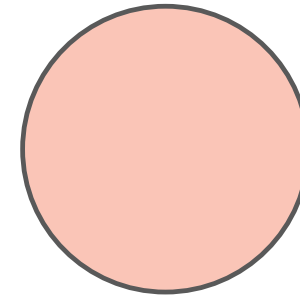
Reasoning.



**Materials.**

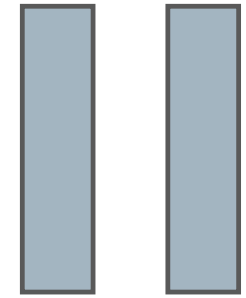


**Remountability.**



**Happy City.**

Create architecture  
that is loved.

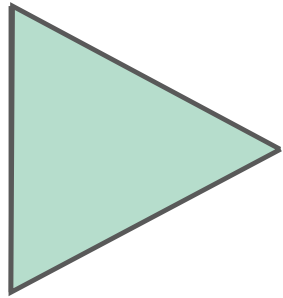


**Process.**

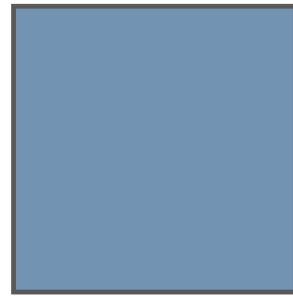
**Something that is  
loved, lasts longer.**

# Circularity

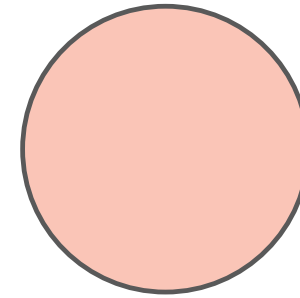
Reasoning.



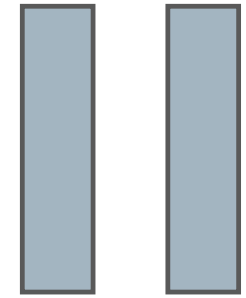
**Materials.**



**Remountability.**



**Happy City.**



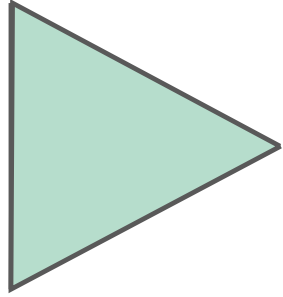
**Process.**

Create financial  
incentives for  
circular design.

**Circular design is  
not compensated  
enough.**



# Circularity Strategies.



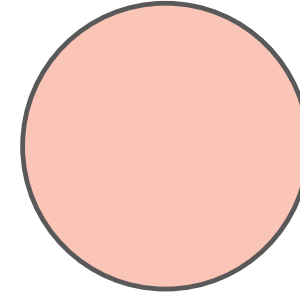
**Materials.**

**Local resources.**

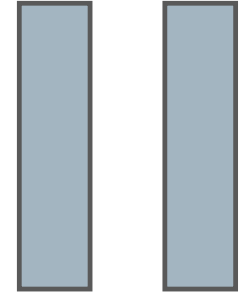
**Reclaimed.  
or  
Biobased.**



**Remountability.**

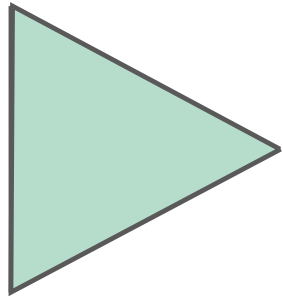


**Happy City.**



**Process.**

# Circularity Strategies.



**Materials.**

**Local sources.**

**Reclaimed.  
or  
Biobased.**

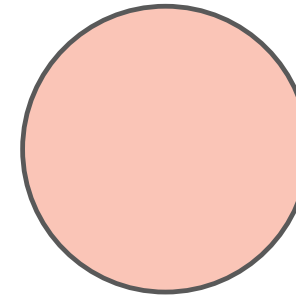


**Remountability.**

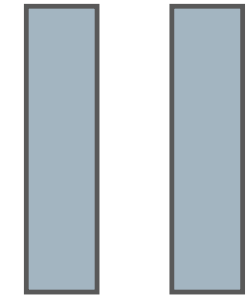
**Prefabricated.**

**Modular.**

**Shearing layers.**



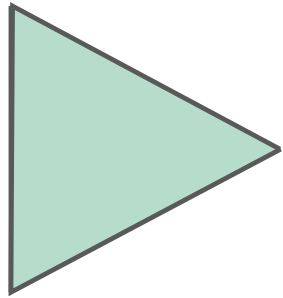
**Happy City.**



**Process.**

# Circularity

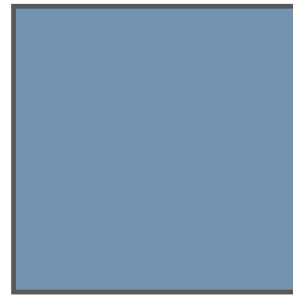
## Strategies.



**Materials.**

Local sources.

Reclaimed.  
or  
Biobased.

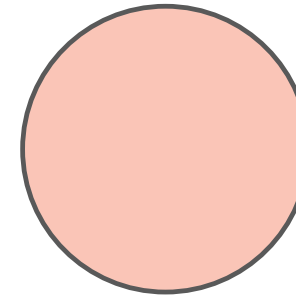


**Remountability.**

Prefabricated.

Modular.

Shearing layers.

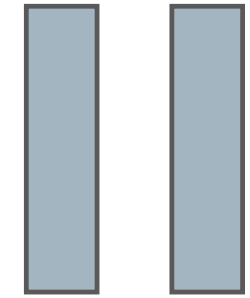


**Happy City.**

Interaction.

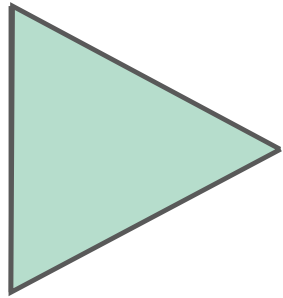
Walkable.

Nature inclusive.



**Process.**

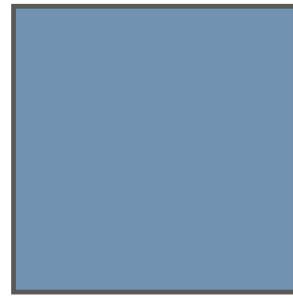
# Circularity Strategies.



## Materials.

Local sources.

Reclaimed.  
or  
Biobased.

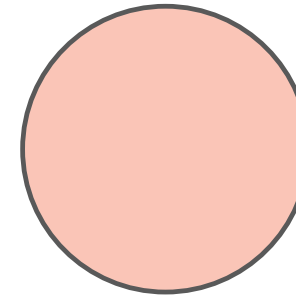


## Remountability.

Prefabricated.

Modular.

Shearing layers.

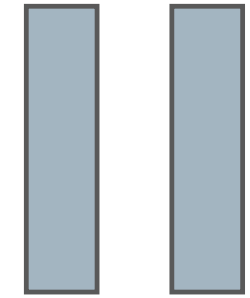


## Happy City.

Interaction.

Walkable.

Nature inclusive.



## Process.

Maintenance  
contracts.

Material  
management.



# Content.

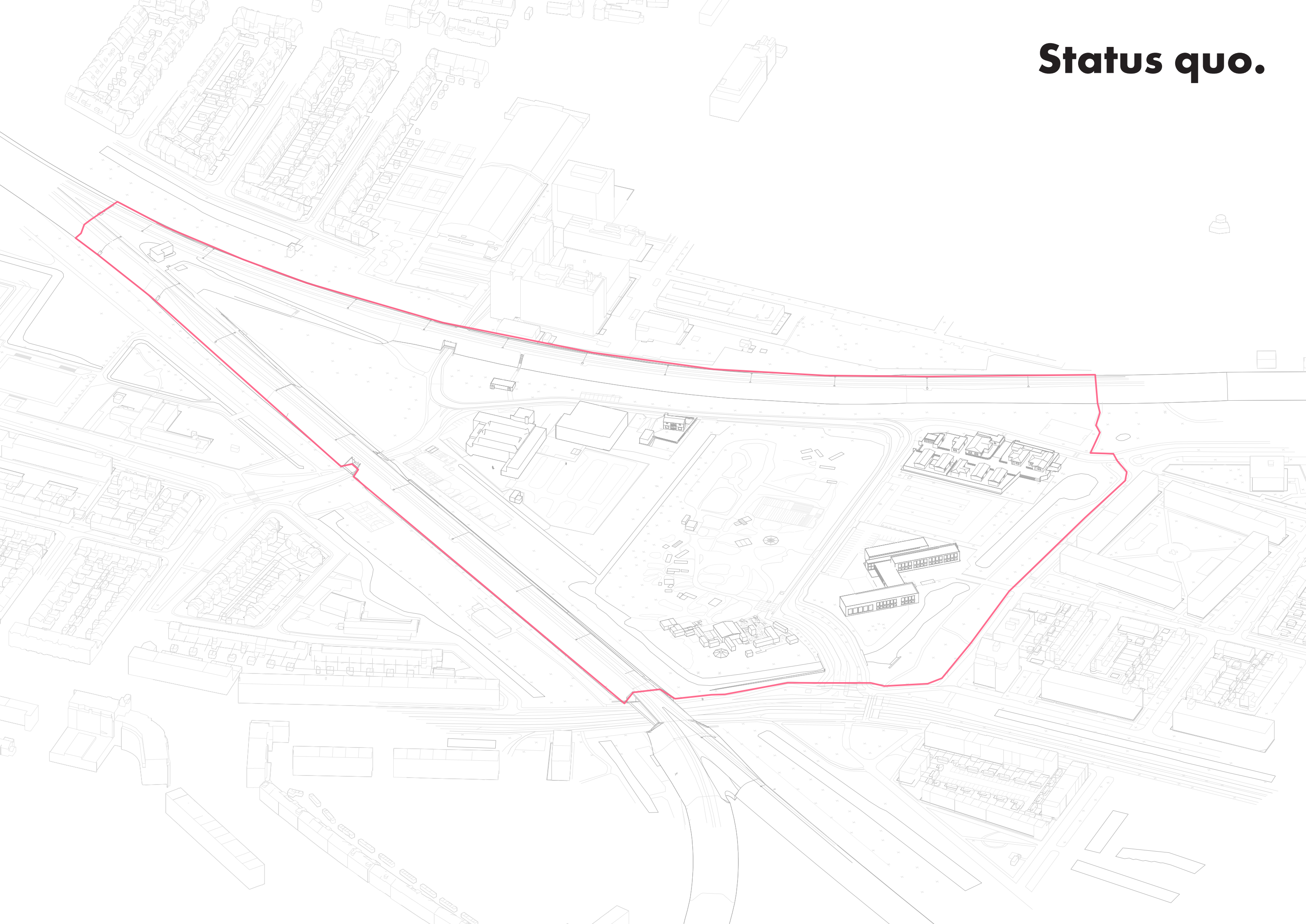
Introduction.

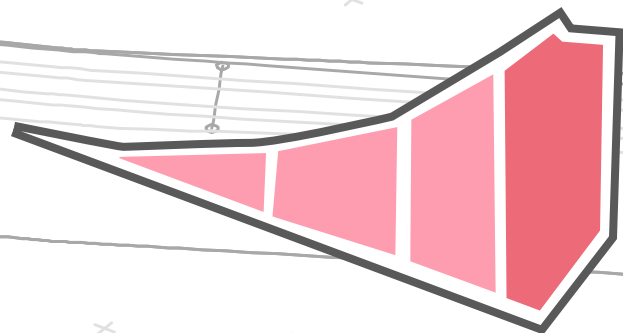
Problem Statement.

Objective.

Site.

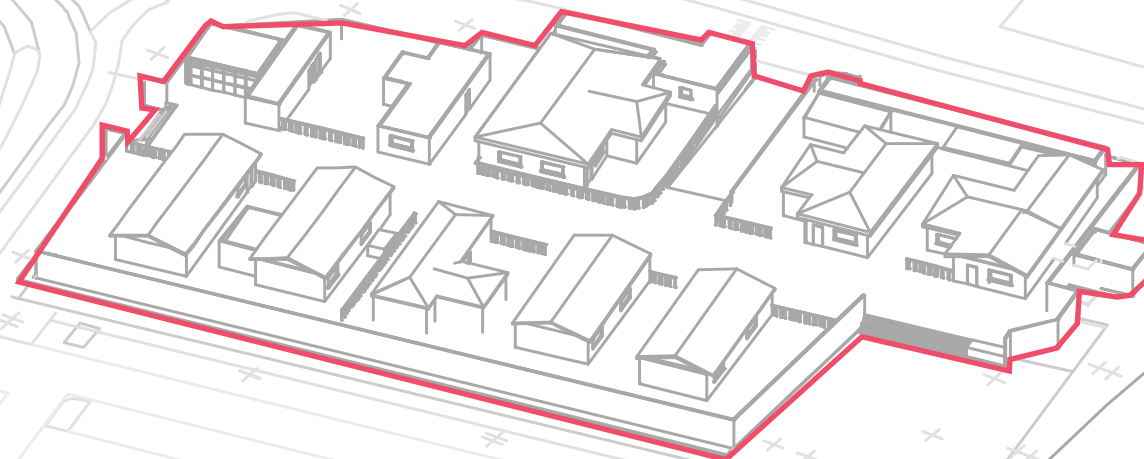
**Status quo.**





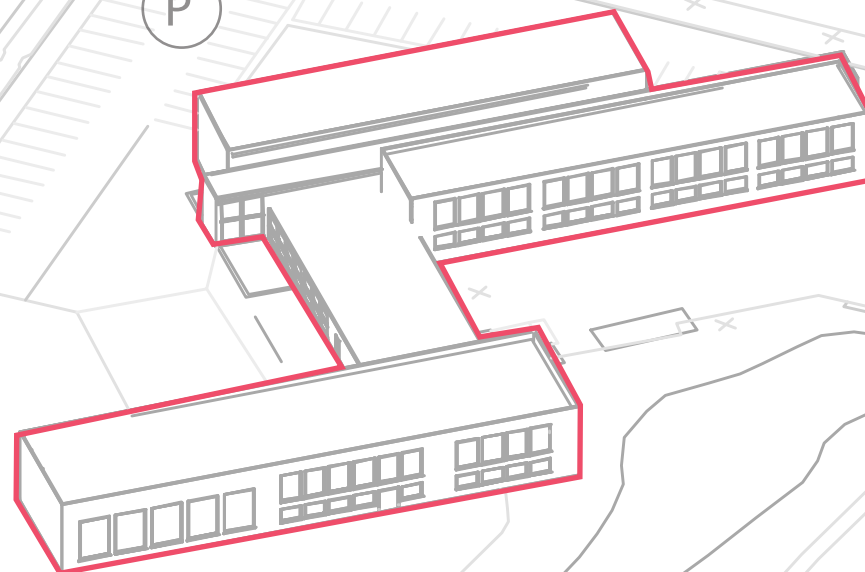
**Status quo.**  
Existing functions.

**Mobile homes.**



P

P



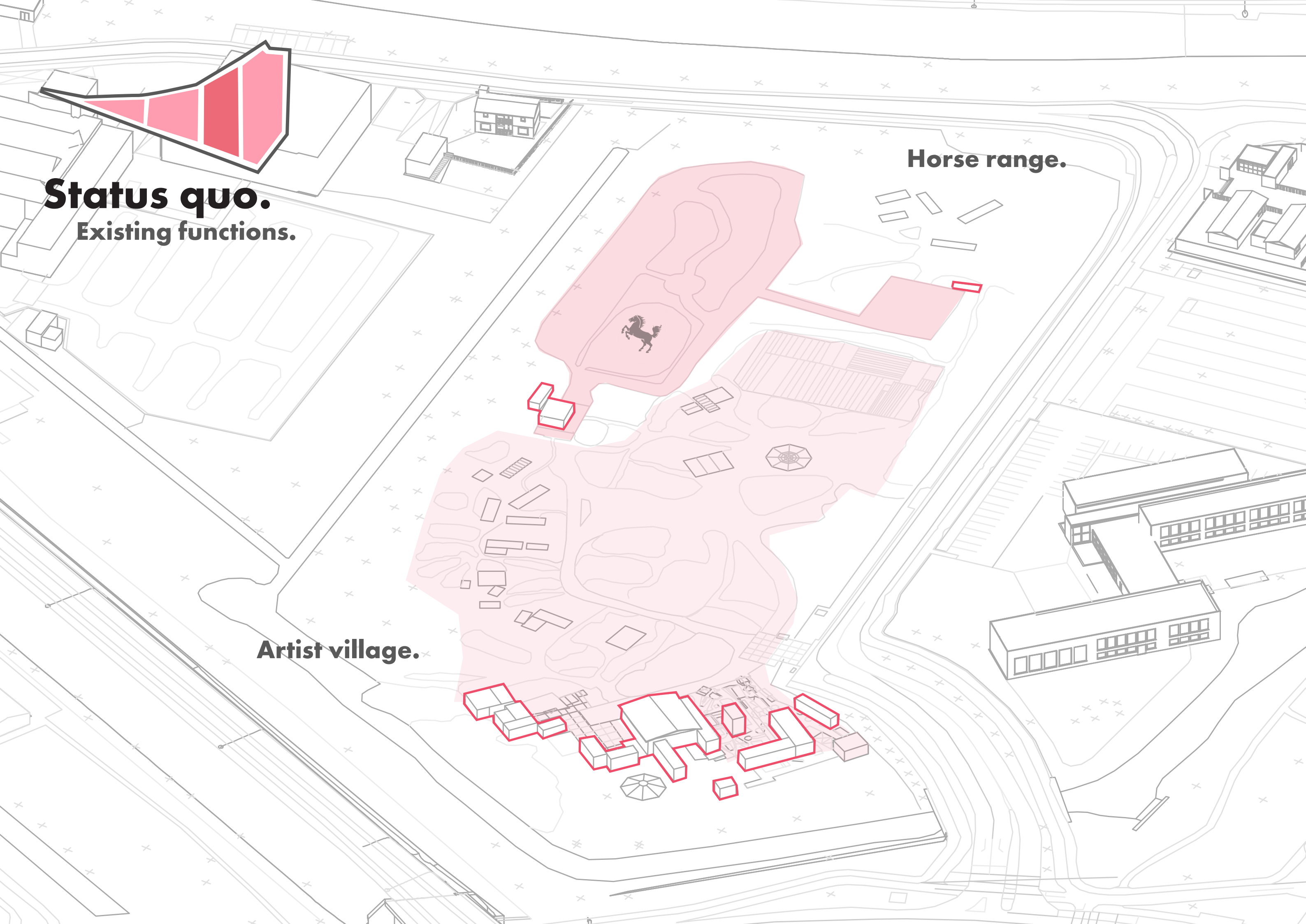
**Mosque.**

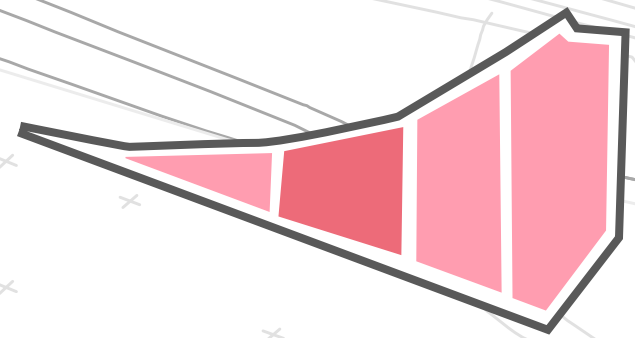


**Status quo.**  
Existing functions.

**Horse range.**

**Artist village.**

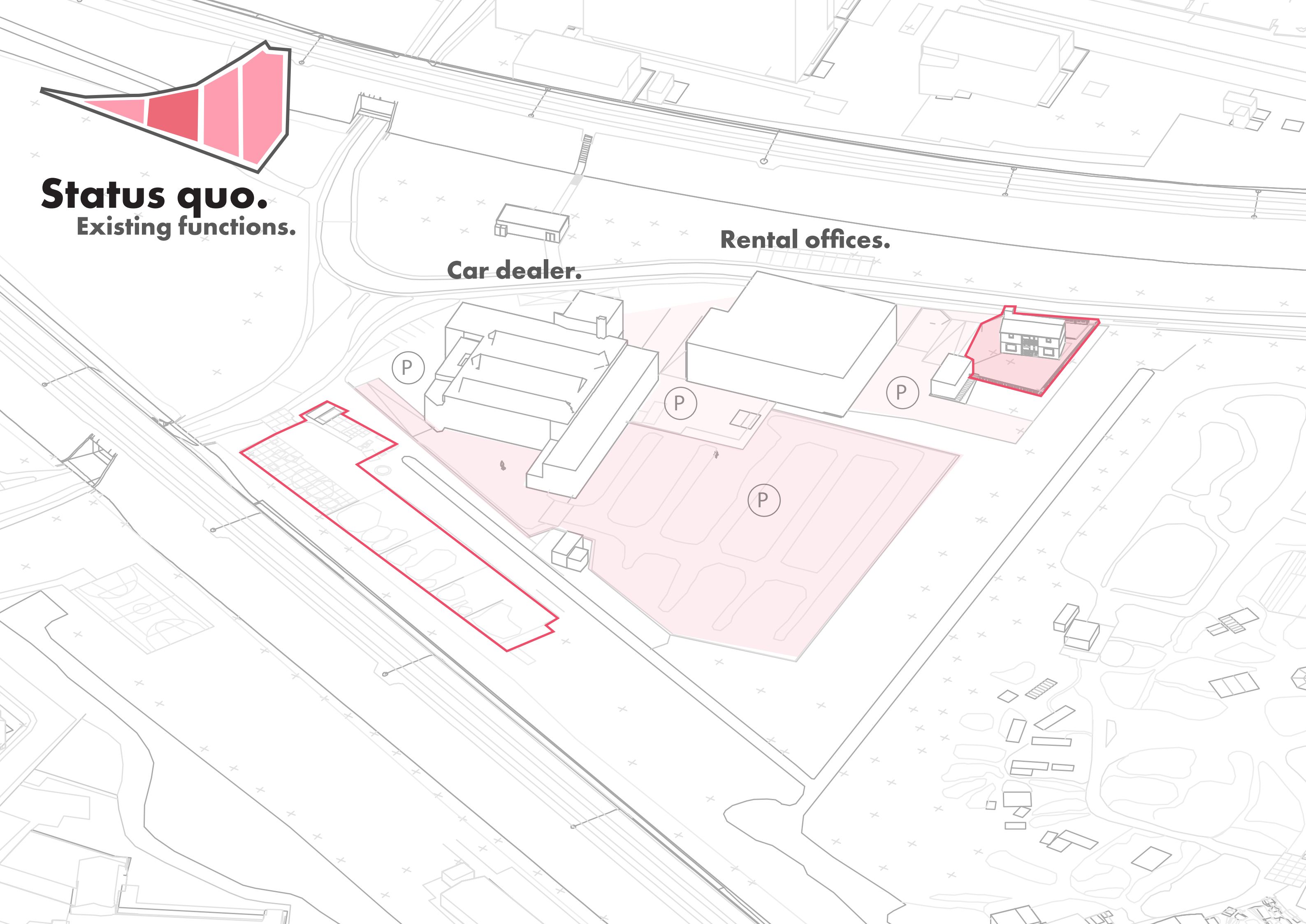




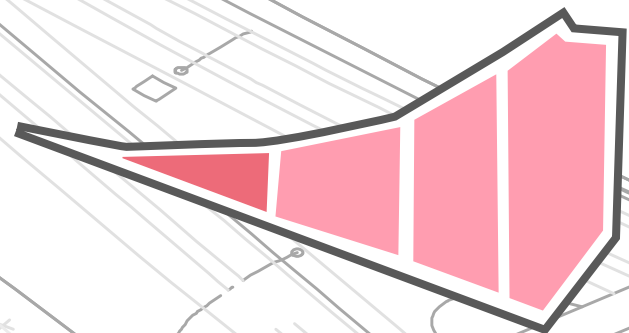
**Status quo.**  
Existing functions.

**Car dealer.**

**Rental offices.**

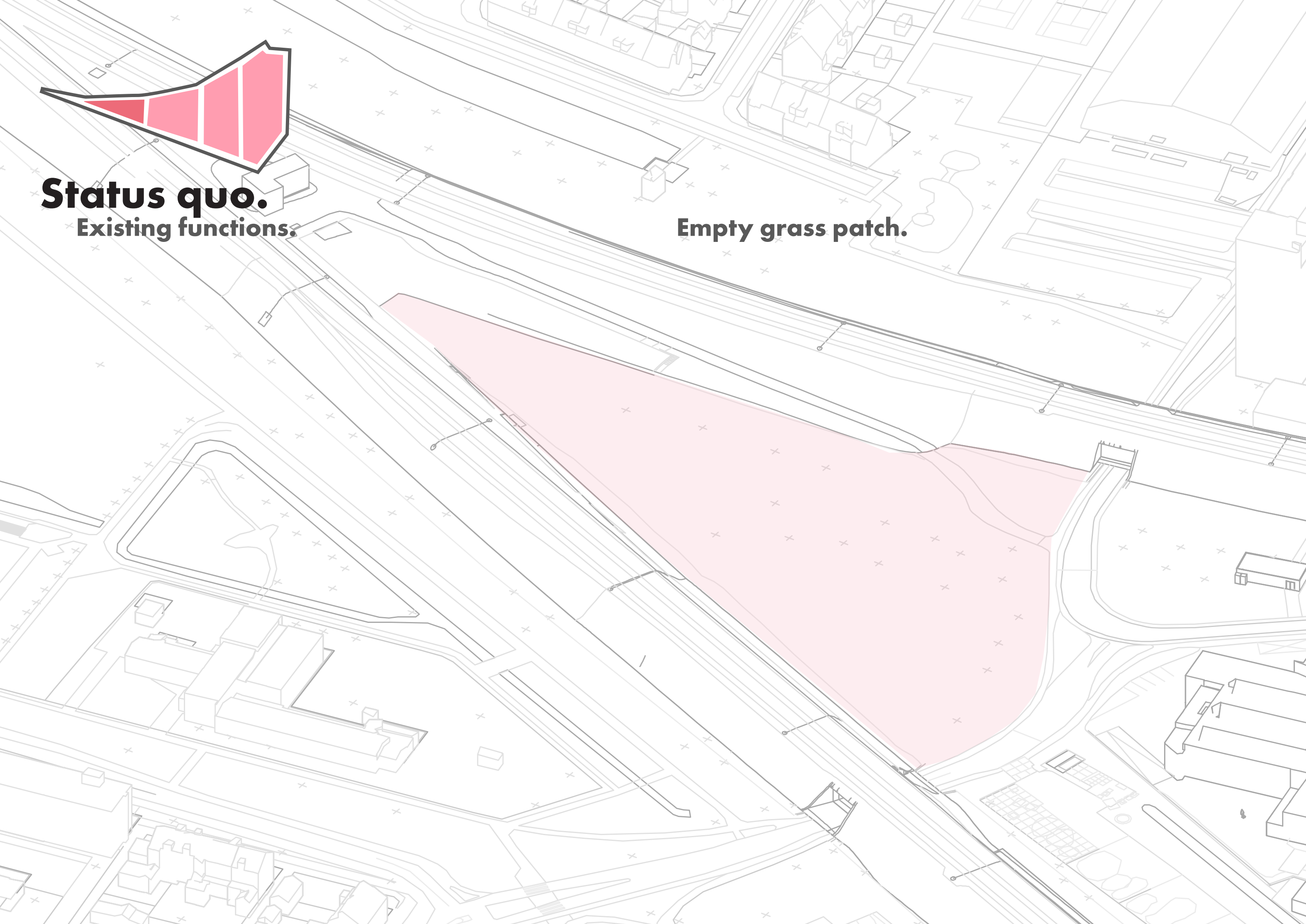






**Status quo.**  
Existing functions.

**Empty grass patch.**





**Train noise.**

**Confined by  
train tracks.**

Utrecht  
Amsterdam



**Noise.**



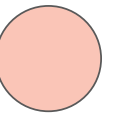
Zwolle  
Groningen

Duisburg  
Düsseldorf



**Connectivity.**  
On site.

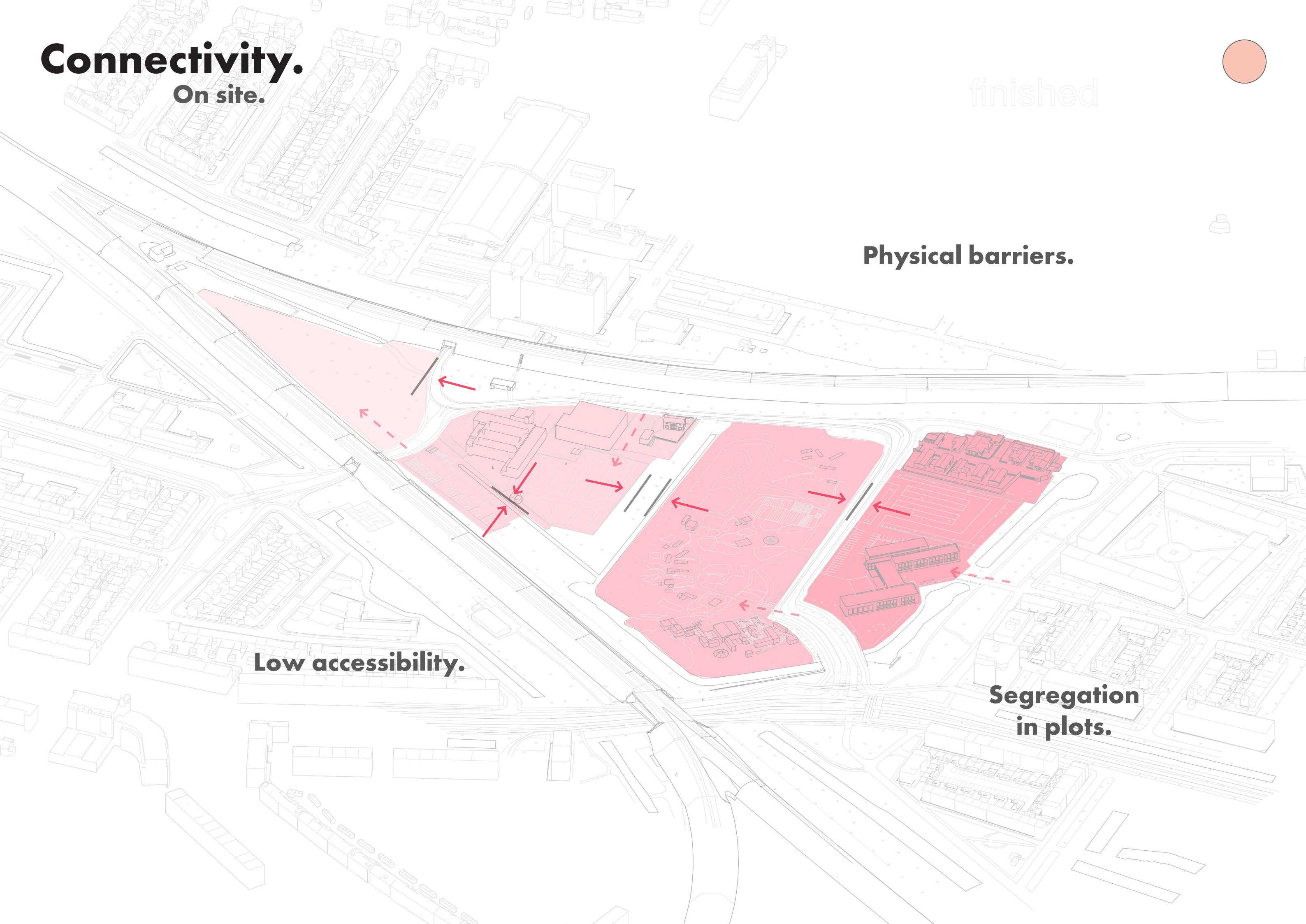
finished



**Physical barriers.**

**Low accessibility.**

**Segregation  
in plots.**





**Connectivity.**  
To surrounding areas.



**City Center  
Arnhem**



**Eastern  
Residential  
Districts**

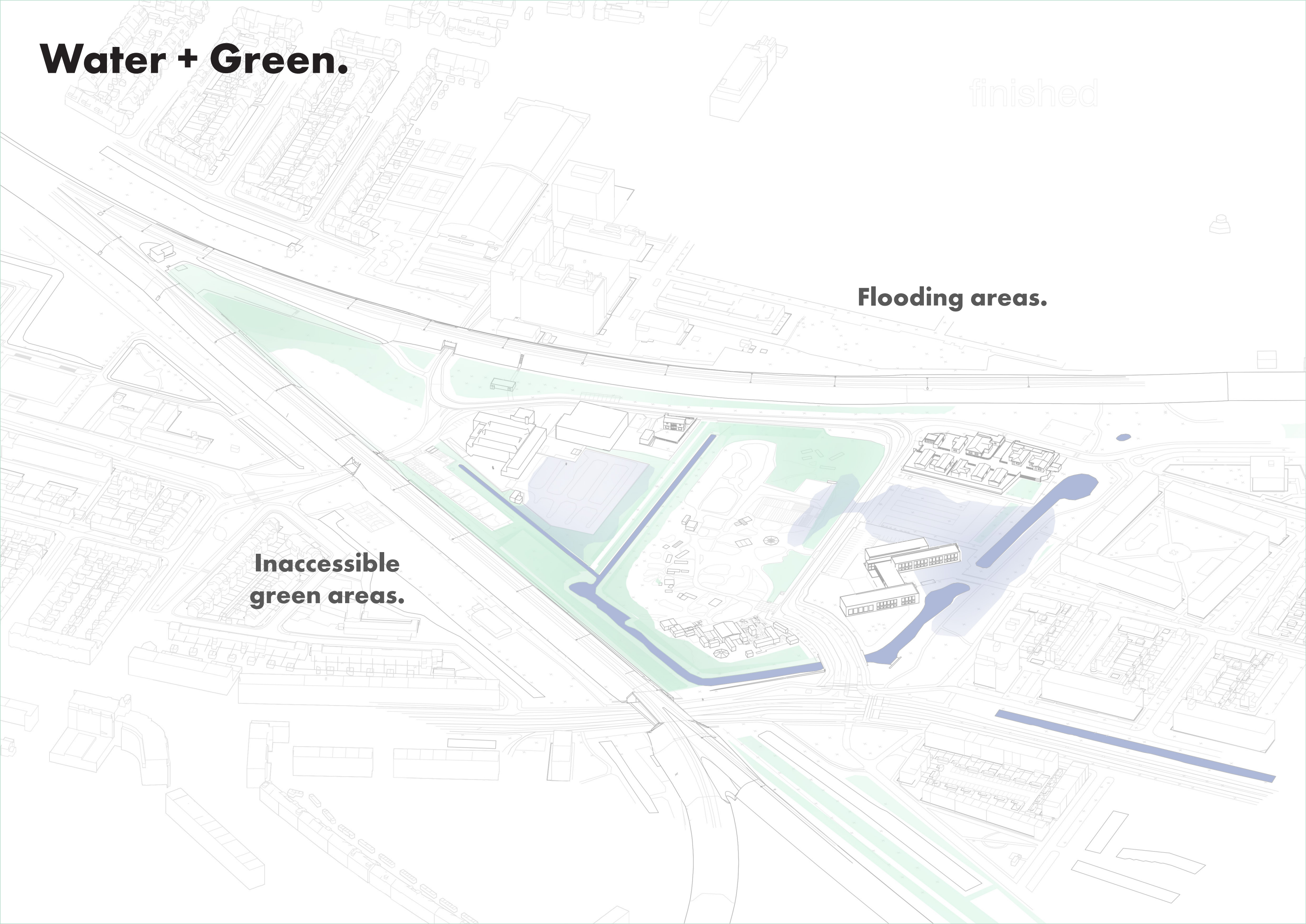


**Water + Green.**

finished

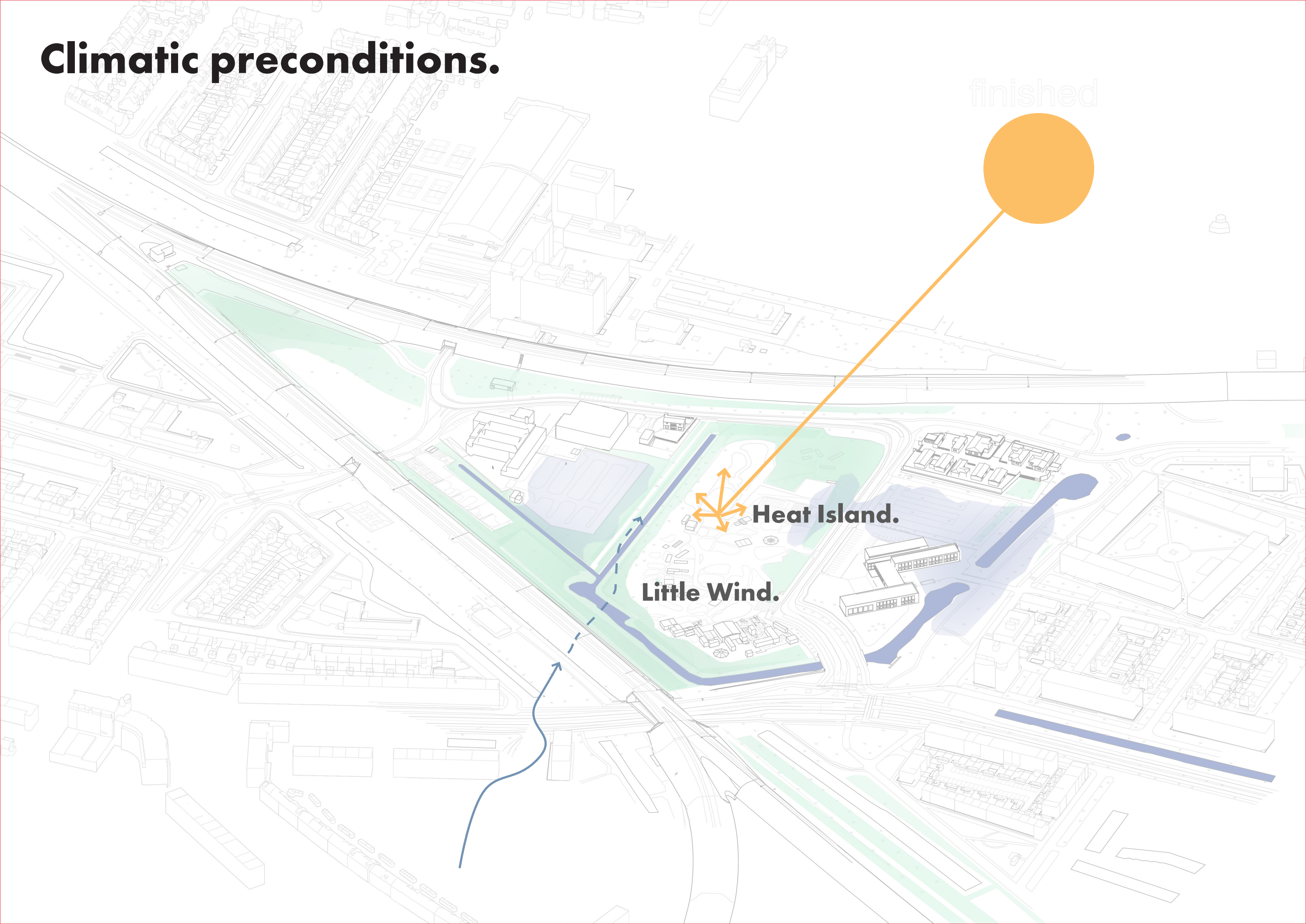
**Flooding areas.**

**Inaccessible  
green areas.**





# Climatic preconditions.





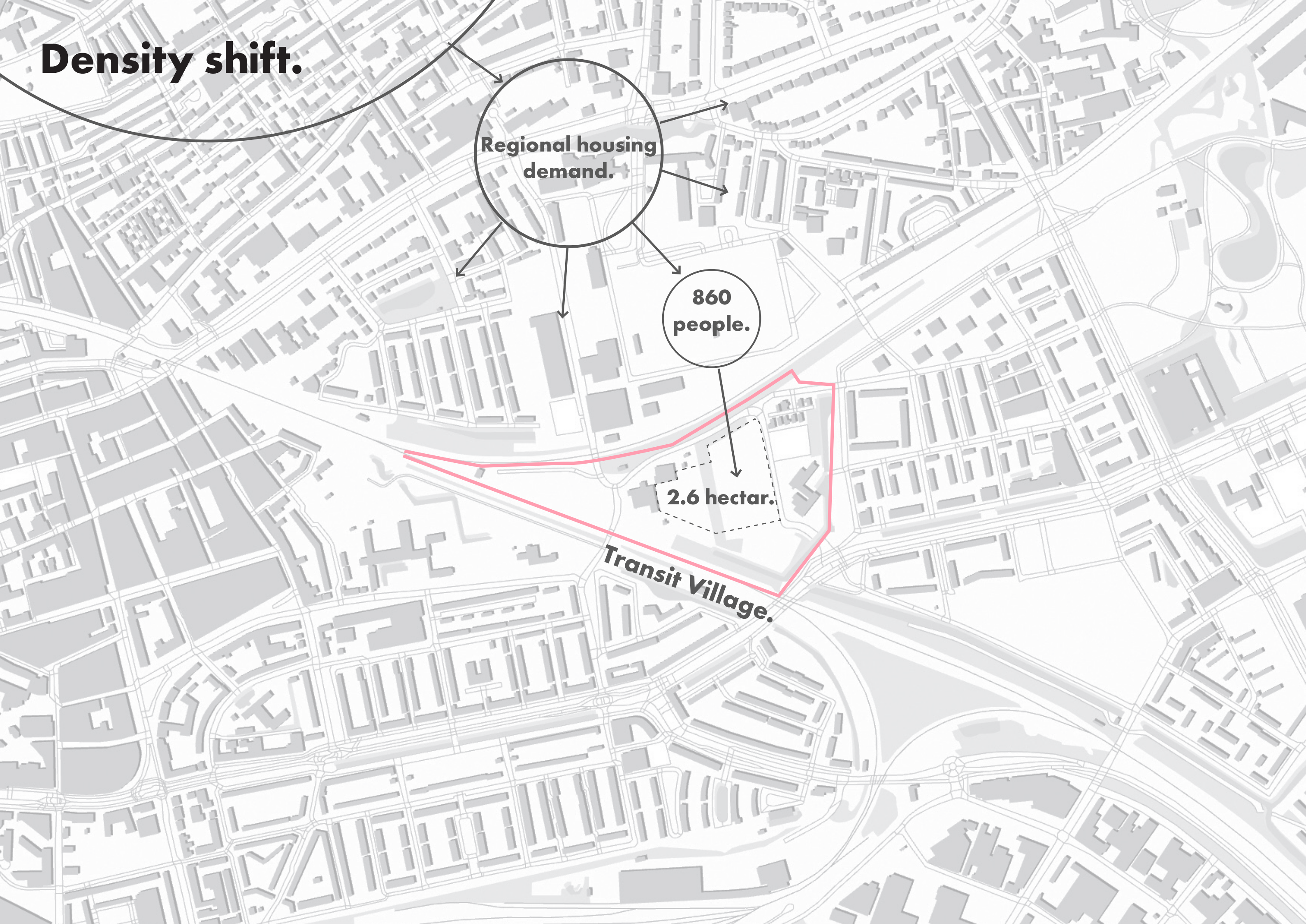
**Density shift.**

**Regional housing  
demand.**

**860  
people.**

**2.6 hectar.**

**Transit Village.**





# Density shift.

Low density  
~10 U/ha.



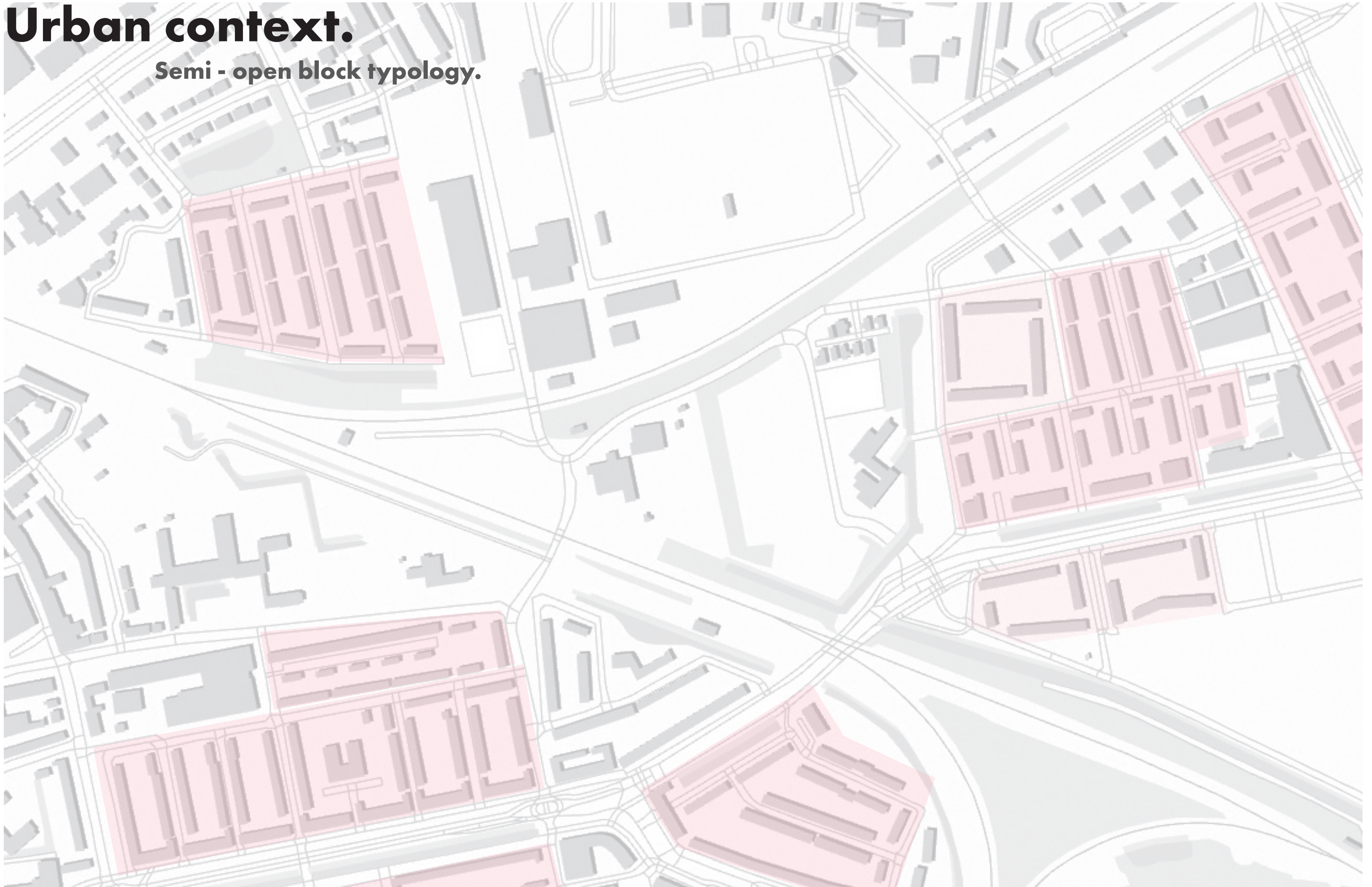
High density  
~150 U/ha.

2.6 hectar.



# Urban context.

Semi - open block typology.





# Semi-open block.



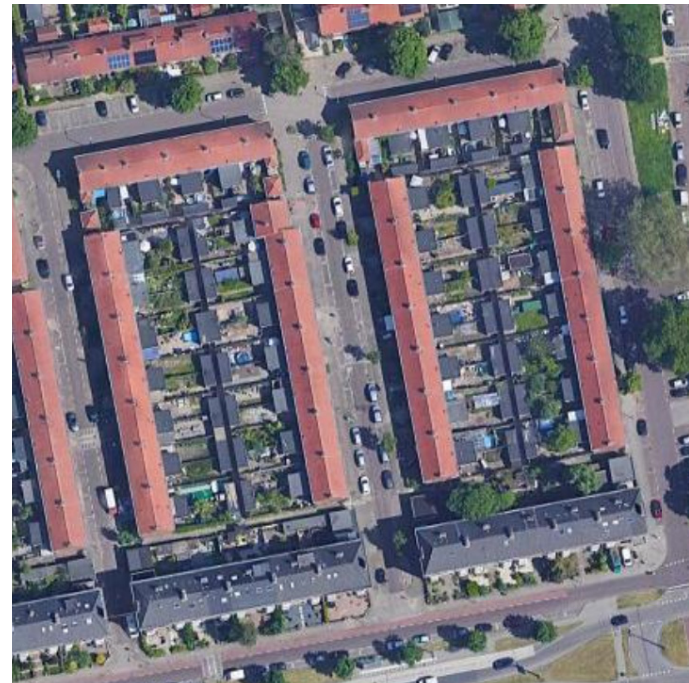
**ca. 1930-1970.**



**Brandgang.**



**Private gardens.**





# Semi-open block.

Type of movement.



**Restructuring the site.**

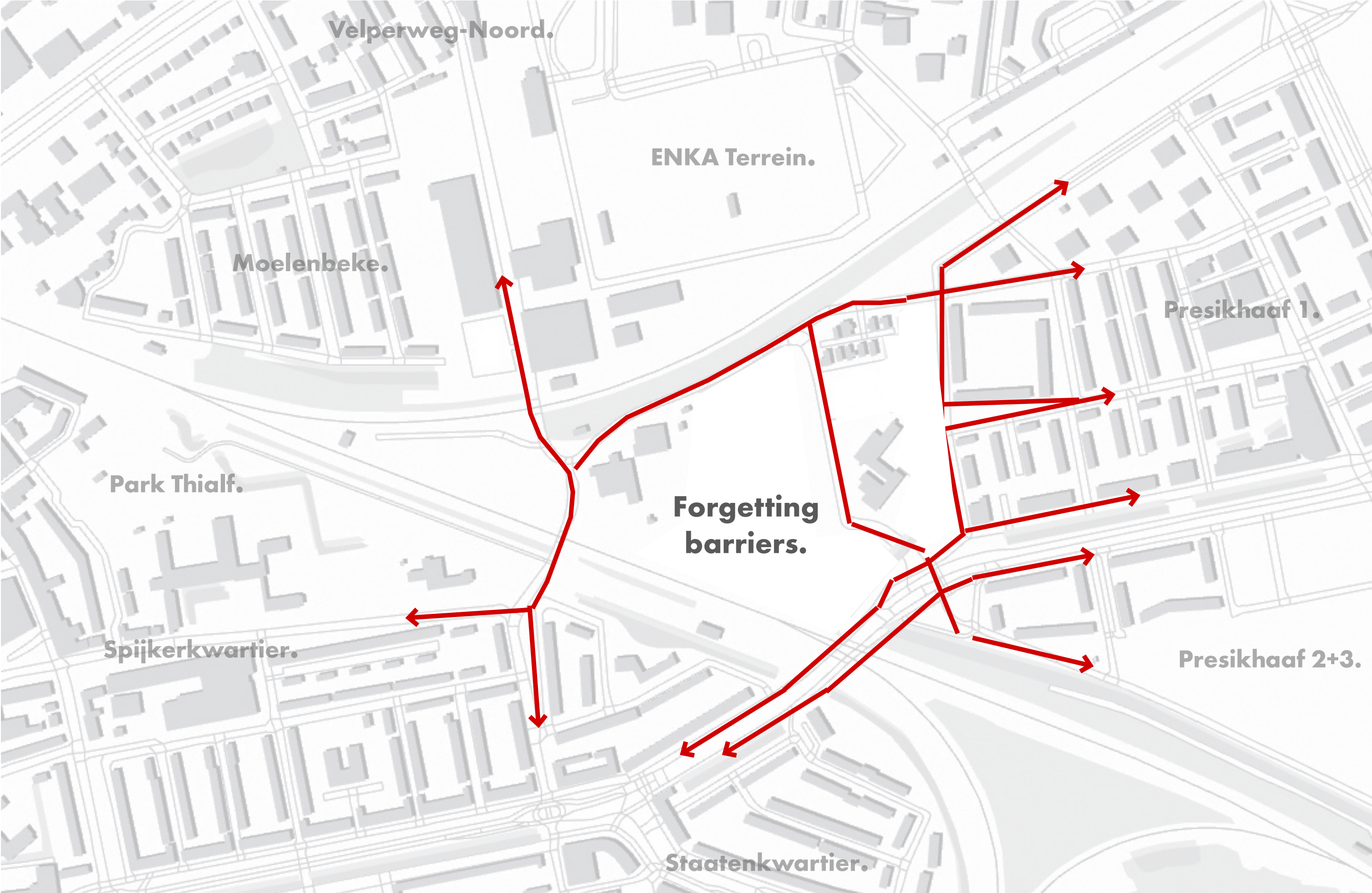


# New main axes

Presikhaaf Station.

Park Sonsbeek.

Park Presikhaaf.



Park Thialf.

Forgetting  
barriers.

Presikhaaf 1.

Presikhaaf 2+3.

Spijkerkwartier.

Statenkwartier.

Het Broek.

City Center.

Rijn-IJssel Delta.

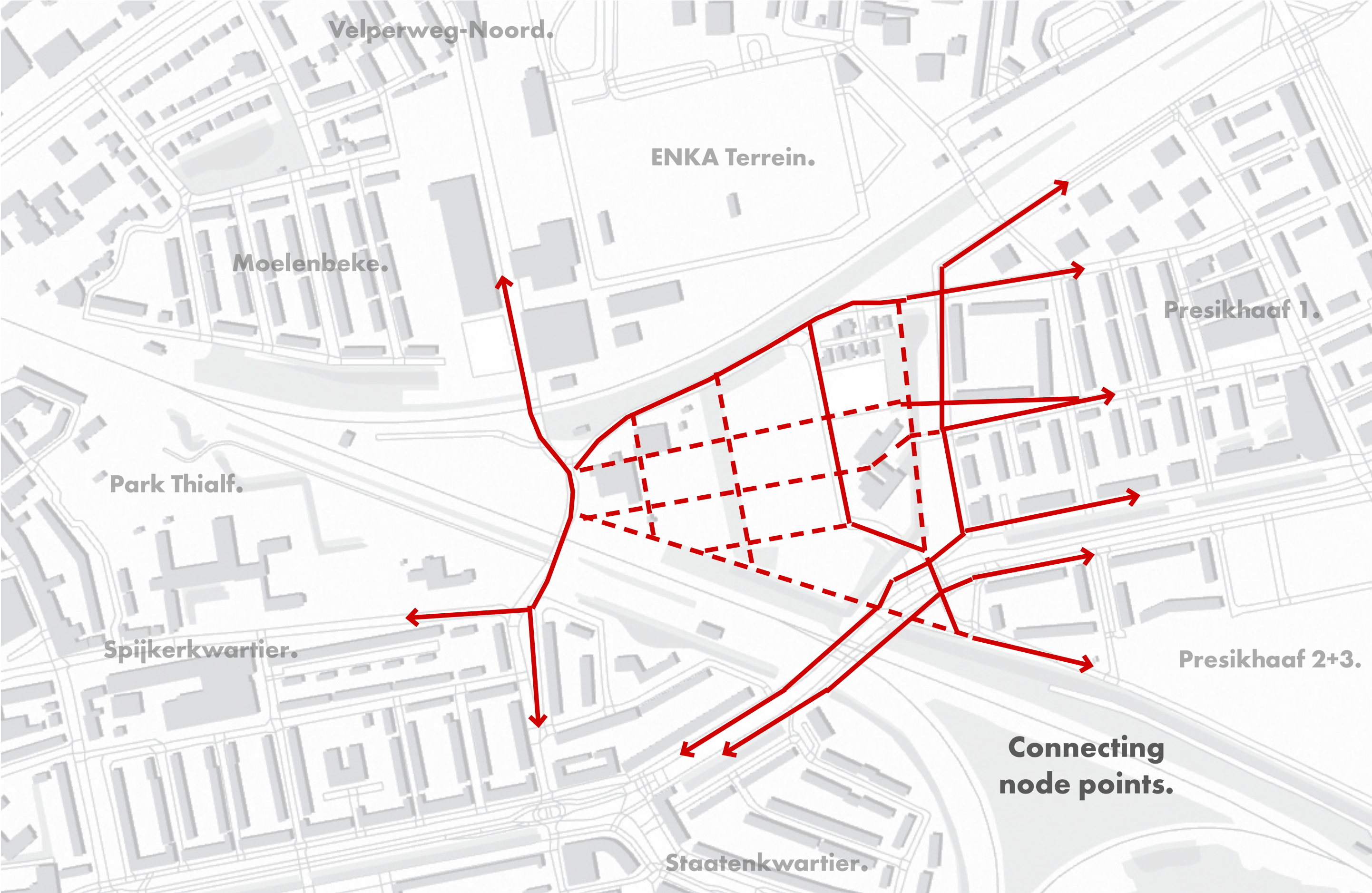


# New main axes.

Presikhaaf Station.

Park Sonsbeek.

Park Presikhaaf.



Park Thialf.

Presikhaaf 1.

Presikhaaf 2+3.

Connecting  
node points.

Statenkwartier.

Het Broek.

City Center.

Rijn-IJssel Delta.

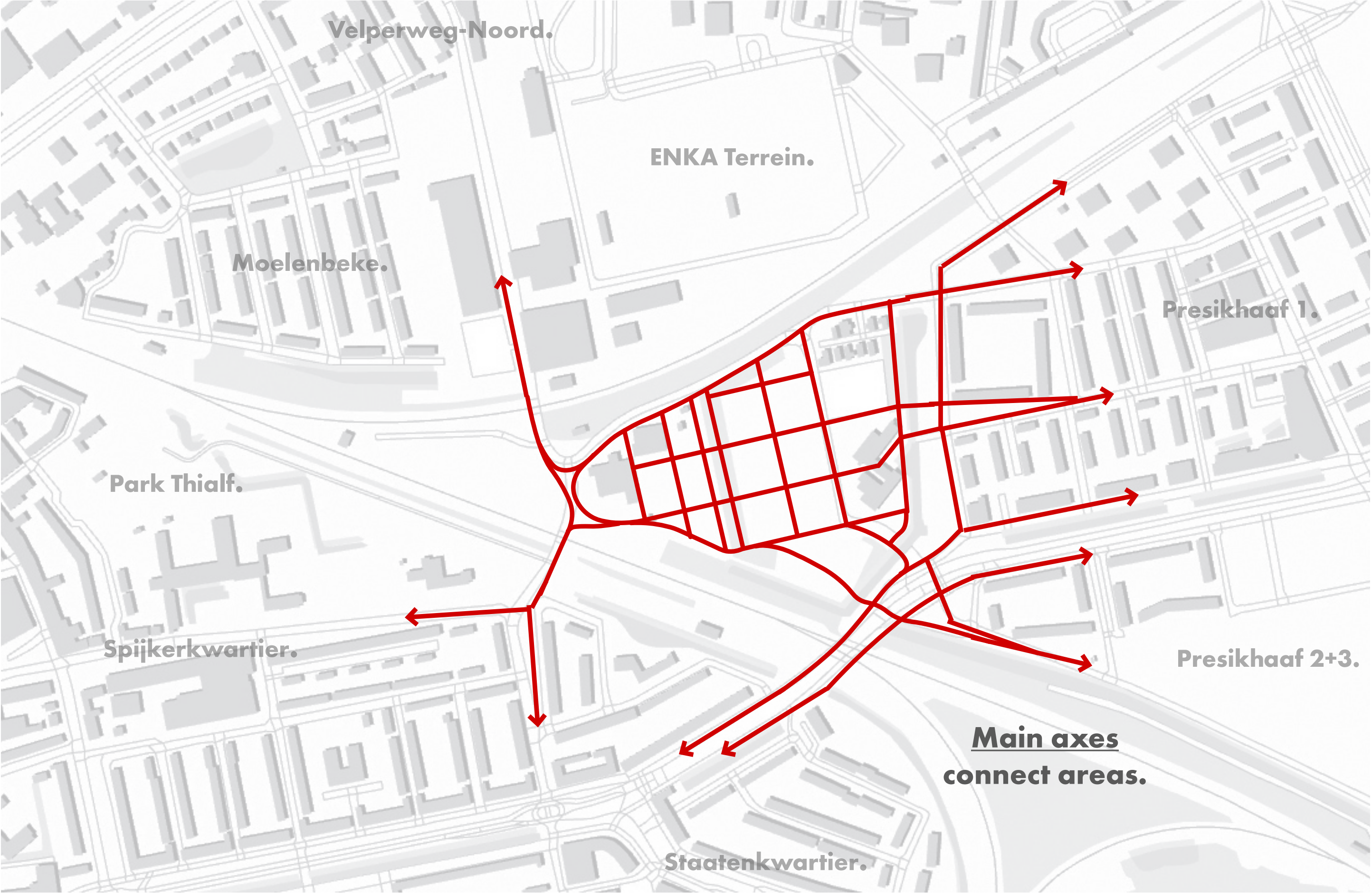


# New main axes.

Presikhaaf Station.

Park Sonsbeek.

Park Presikhaaf.



Rijn-IJssel Delta.

City Center.

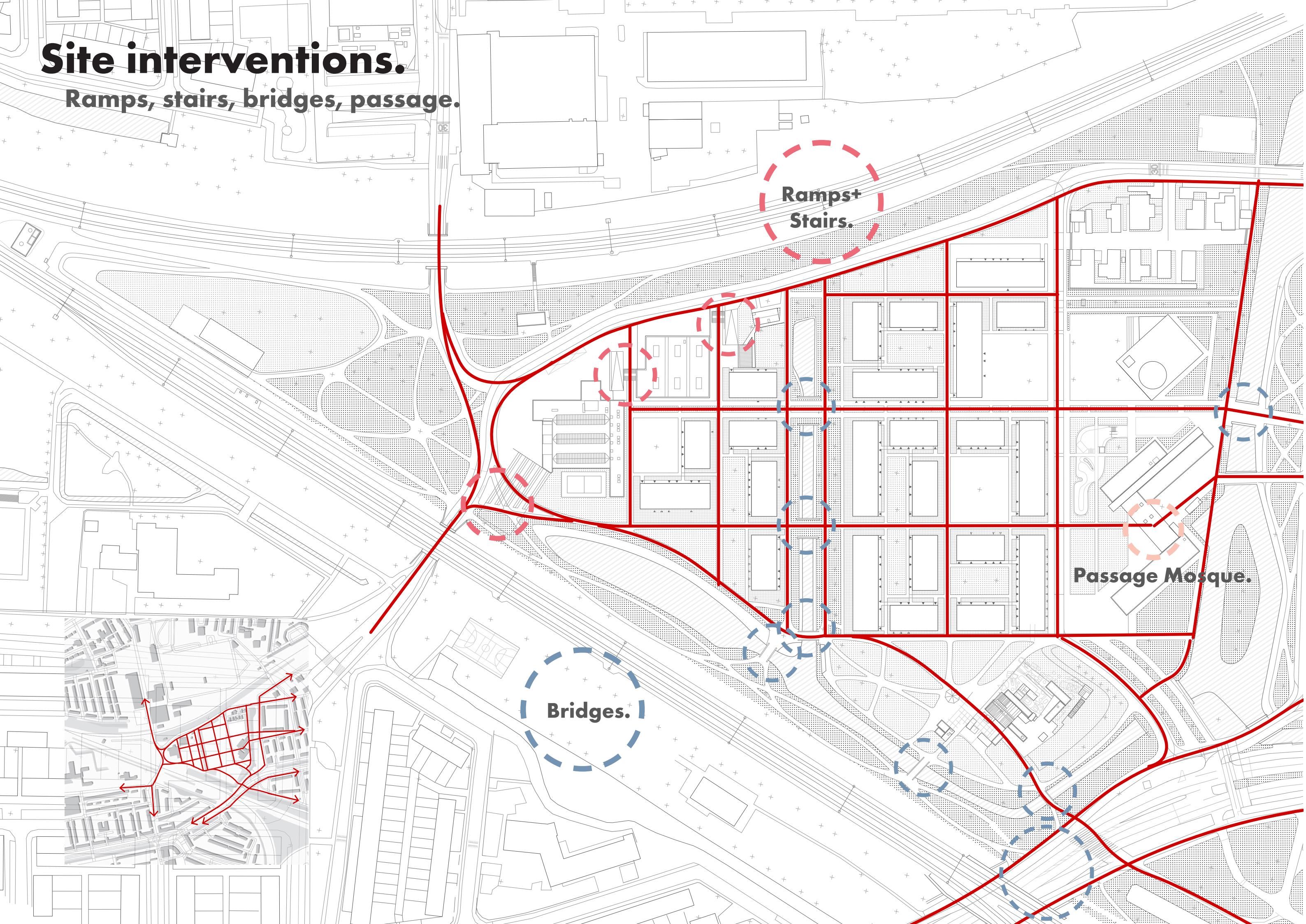
Het Broek.

**Main axes  
connect areas.**



# Site interventions.

Ramps, stairs, bridges, passage.





# Flooding prevention.



**City Beach as  
retainment pond.**

**Relieving canal  
system.**



**Skate bowl as  
overflow pond.**

**Flooding area.**



# Train noise strategy.

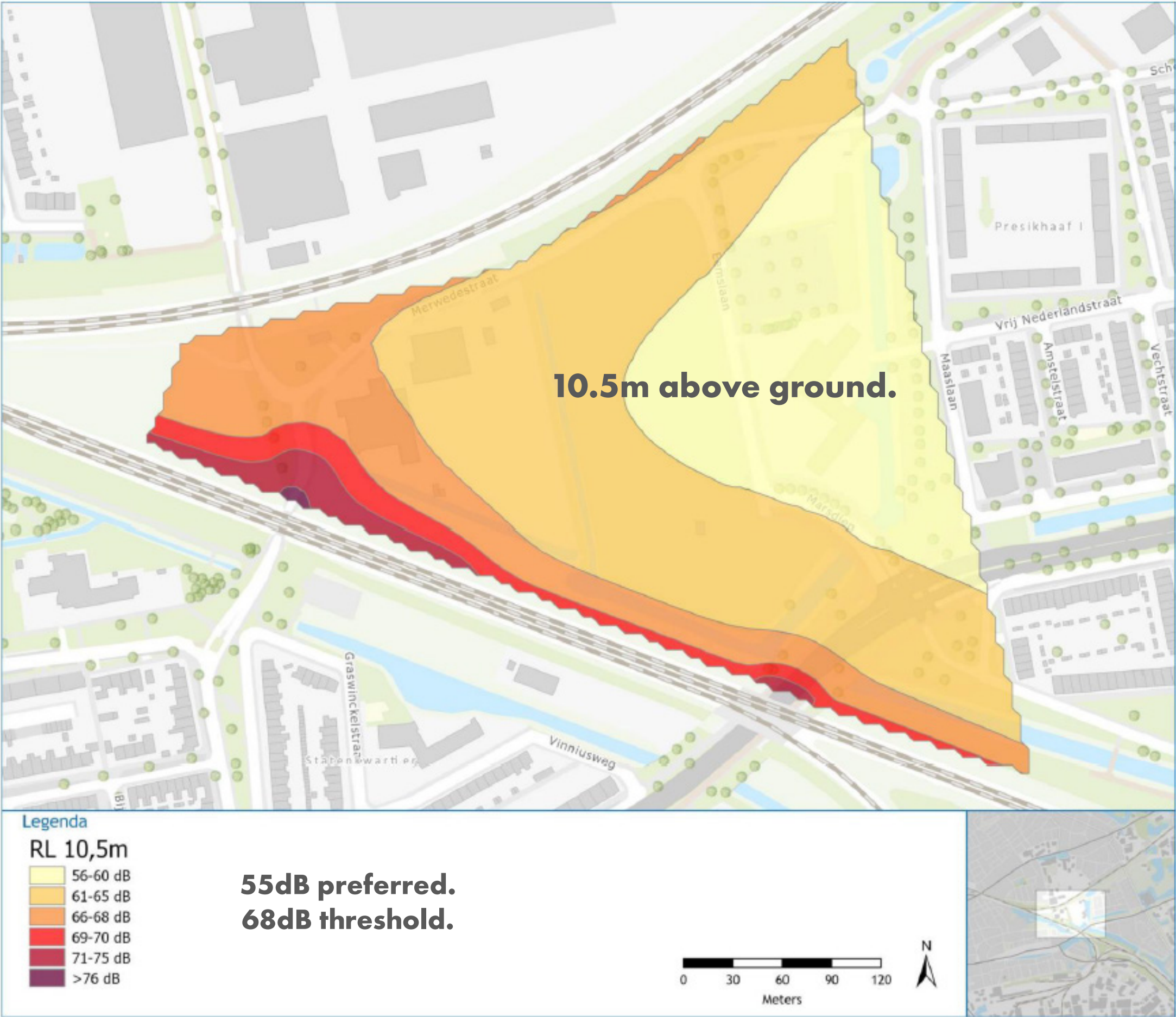
Noise increases with height.





# Train noise strategy.

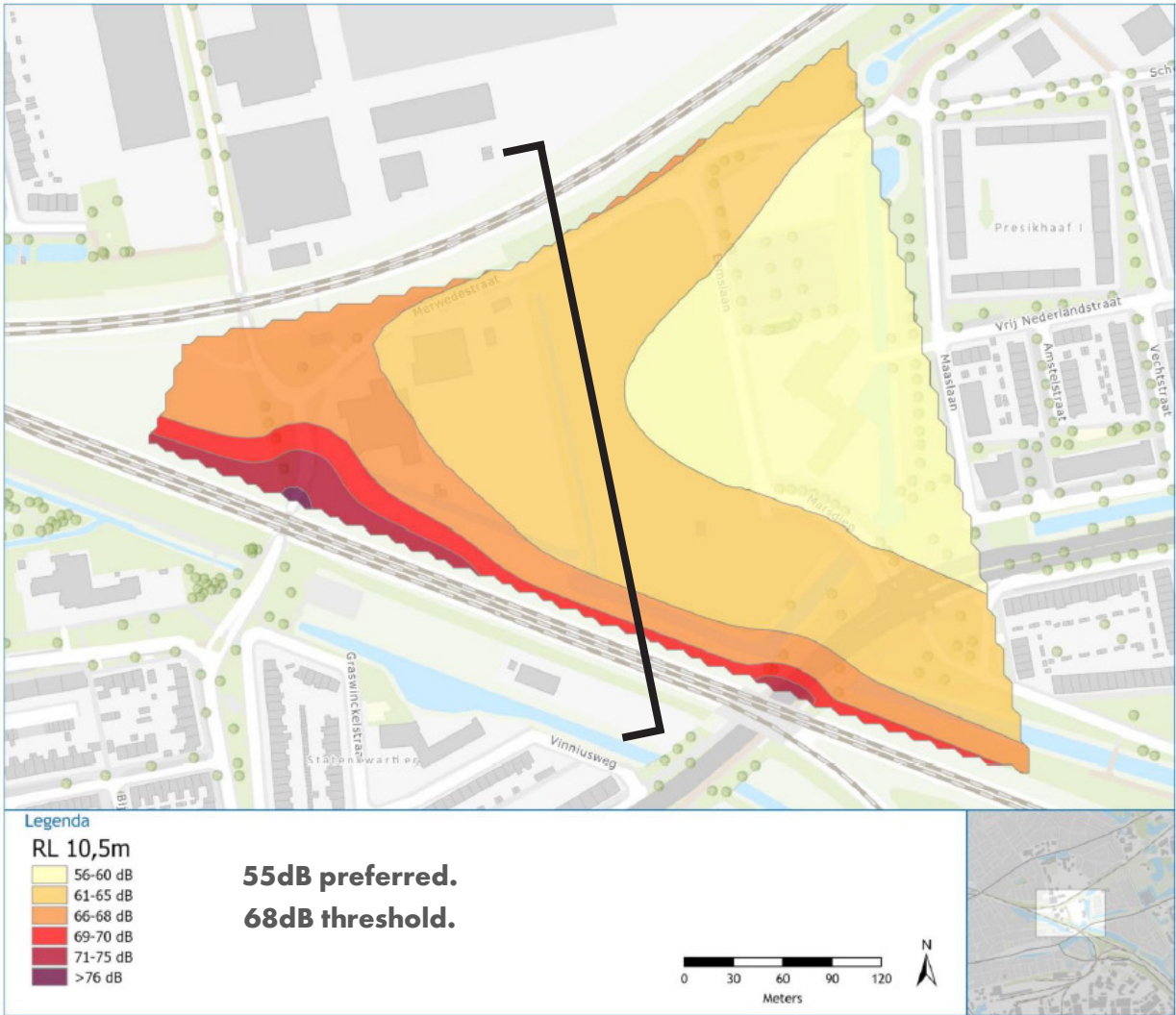
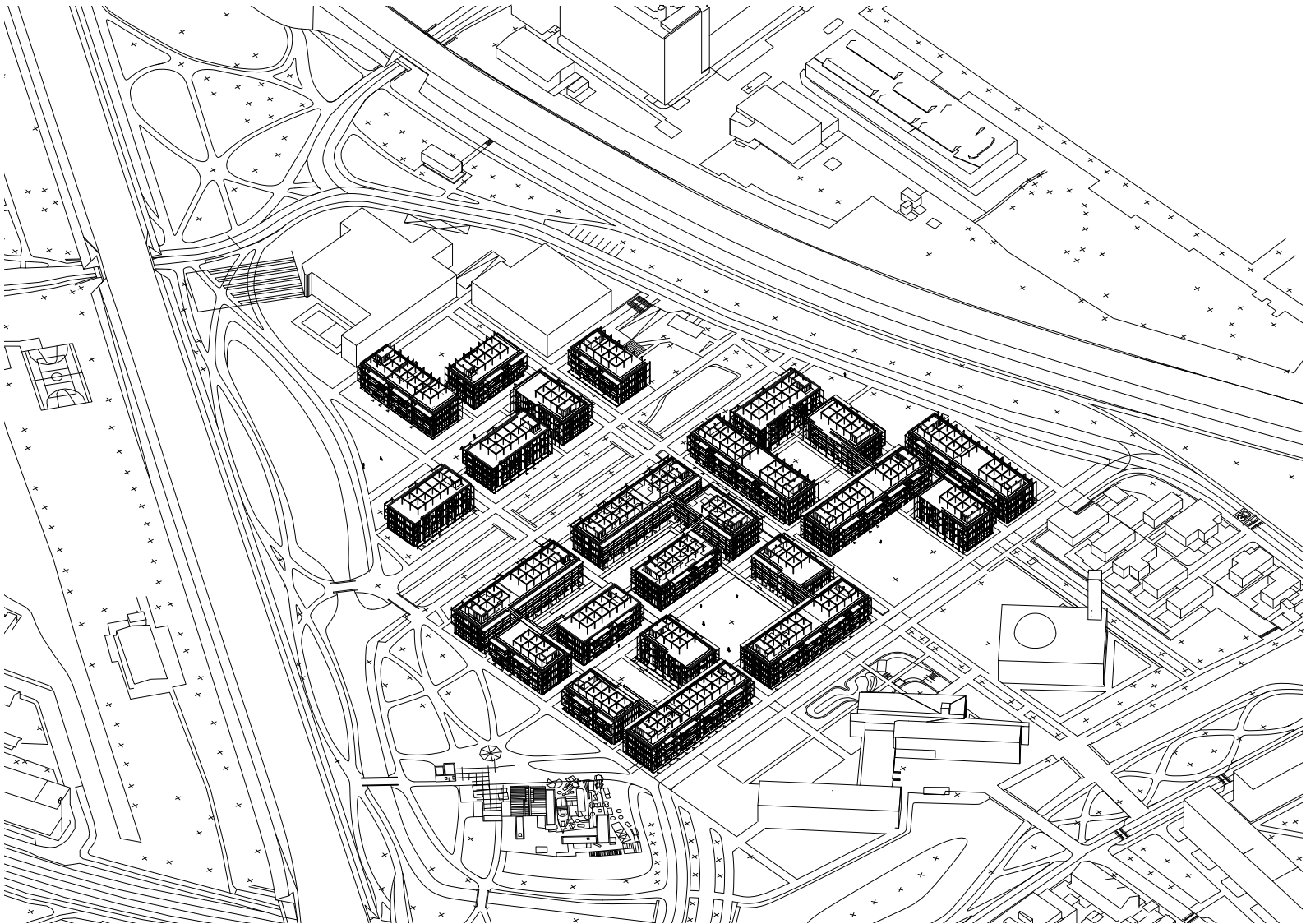
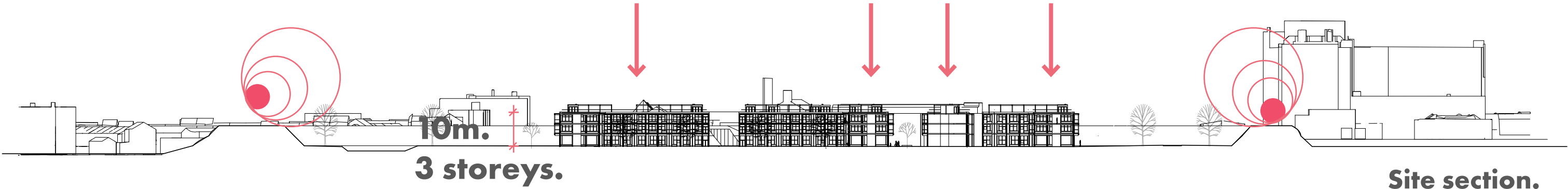
Noise increases with height.





# Transit Village.

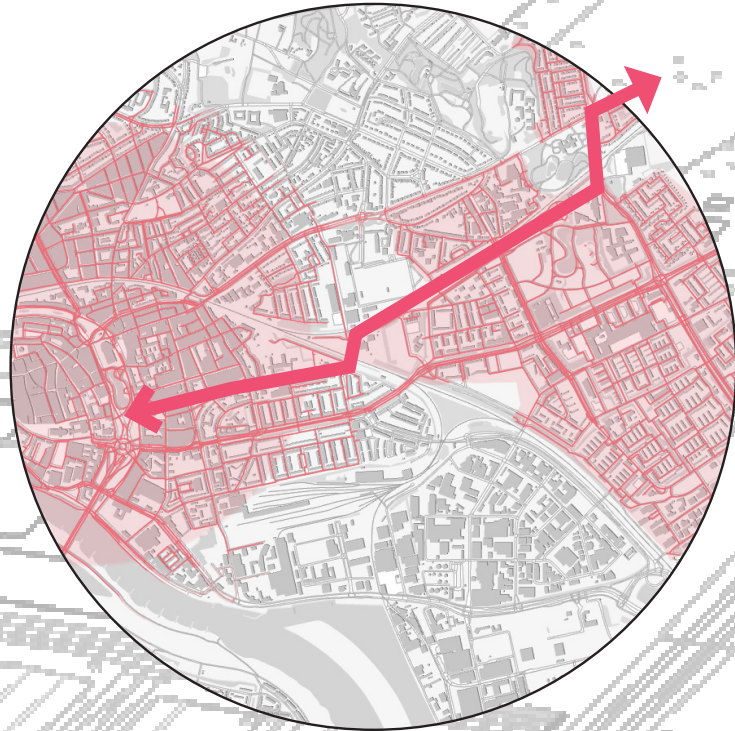
Low-rise approach.





# Bicycle Highway.

Connecting Arnhem-East to  
the city center.



**Before.**



**After.**

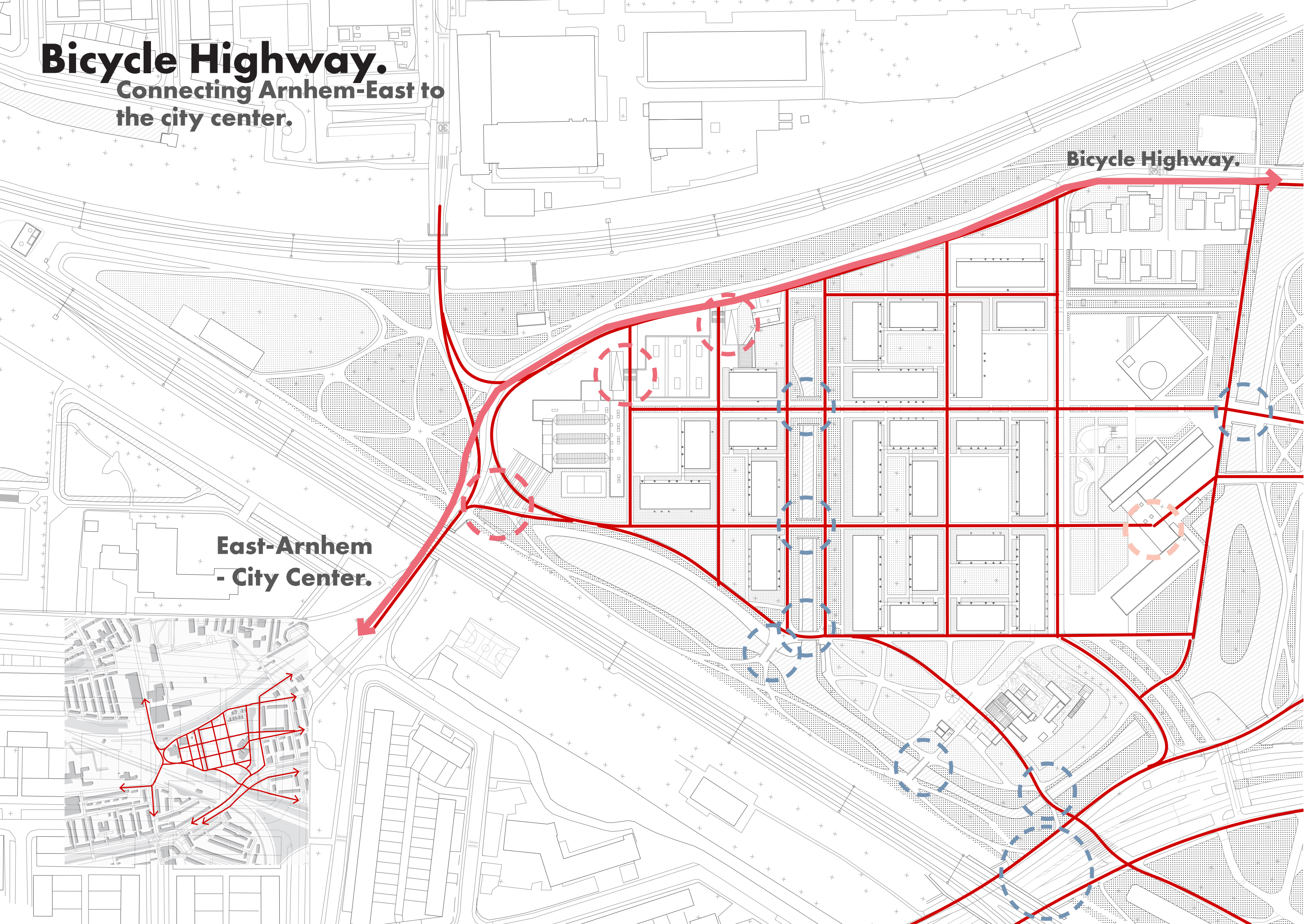
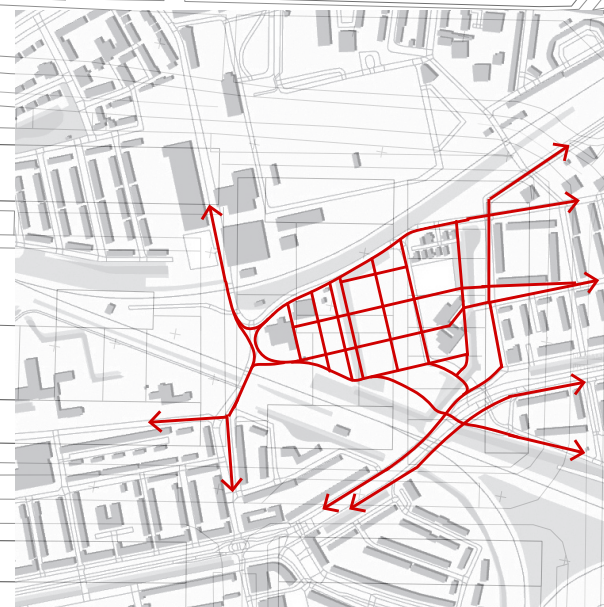


# Bicycle Highway.

Connecting Arnhem-East to  
the city center.

Bicycle Highway.

East-Arnhem  
- City Center.





**Green Belt.**

**Horse  
Range.**

**Horse Trail.**

**City Park.**

**Transit Trail.**

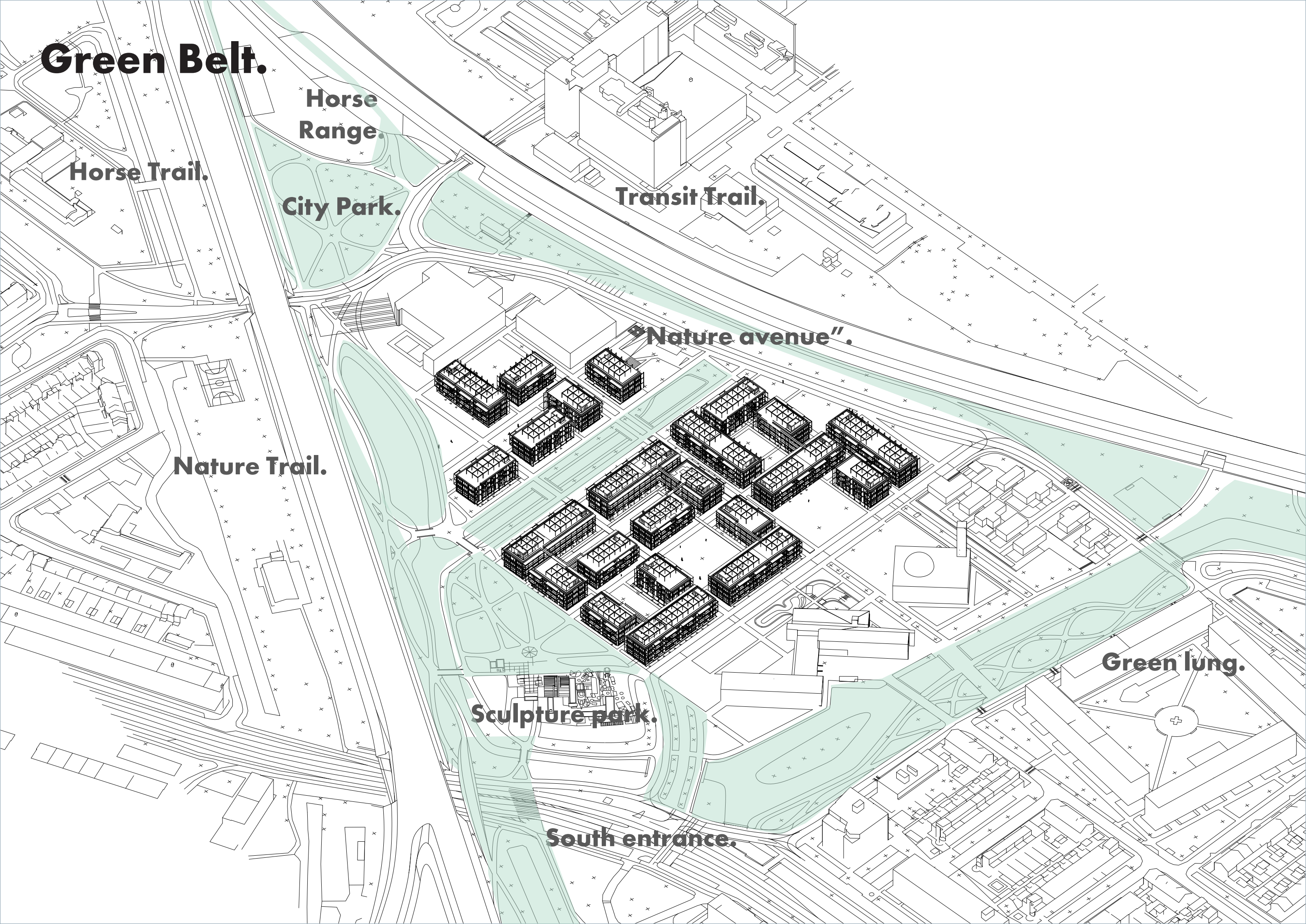
**“Nature avenue”.**

**Nature Trail.**

**Sculpture park.**

**South entrance.**

**Green lung.**





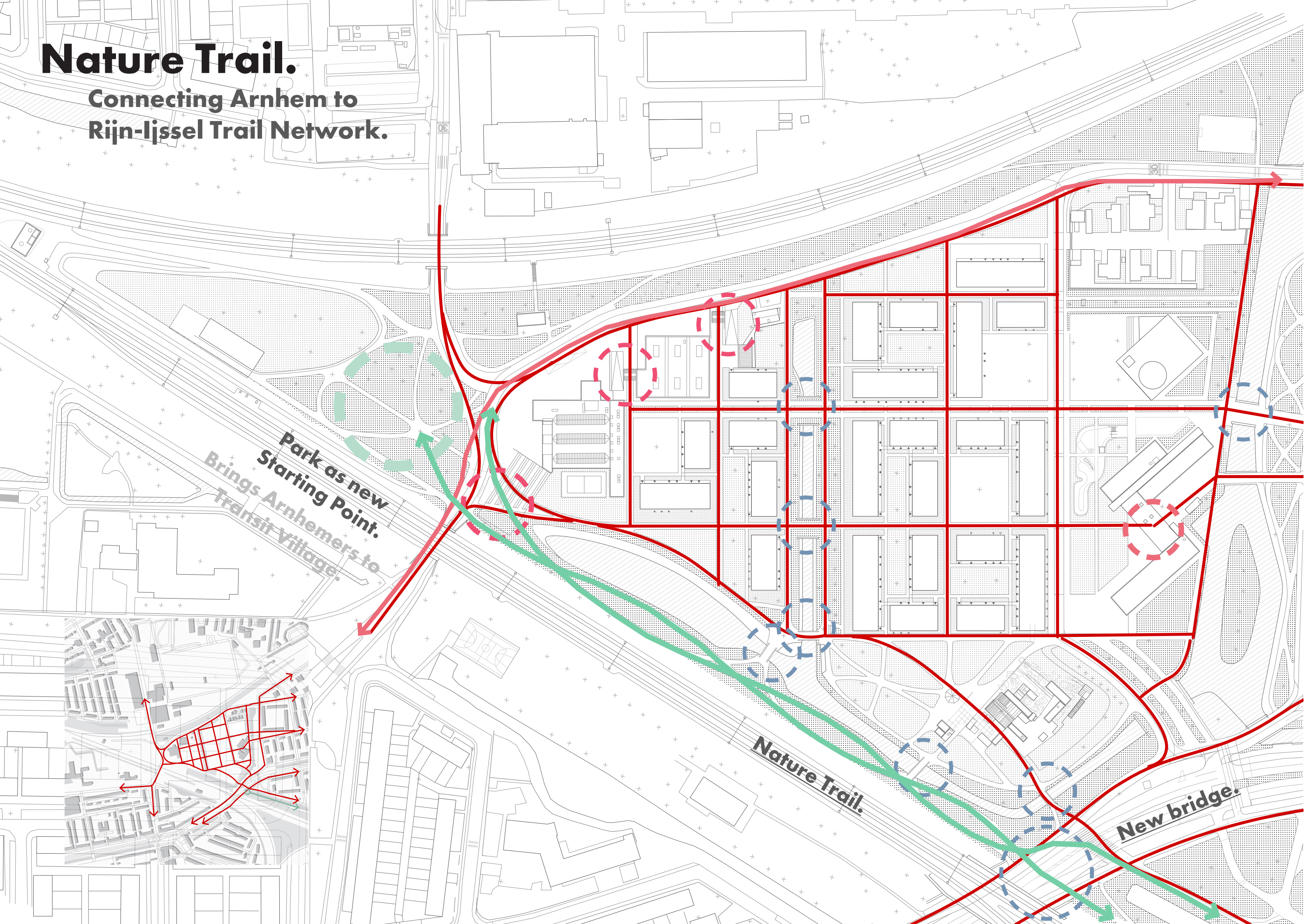
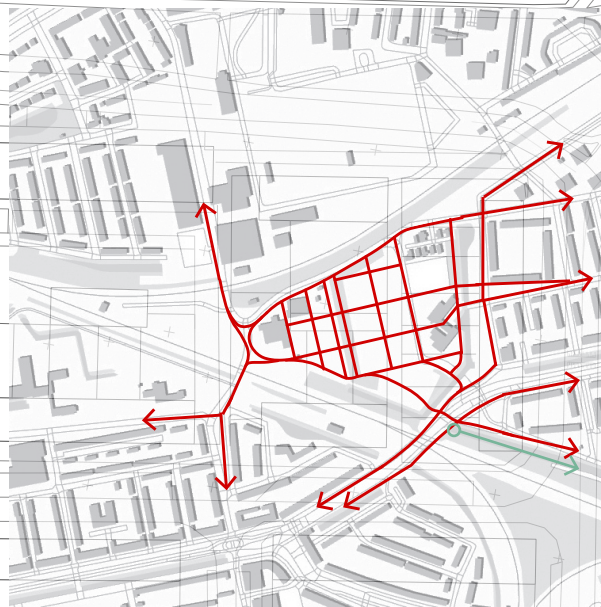
# Nature Trail.

Connecting Arnhem to  
Rijn-IJssel Trail Network.

Park as new  
Starting Point.  
Brings Arnhemers to  
Transit Village.

Nature Trail.

New bridge.





# Nature Trail.

Connecting Arnhem to  
Rijn-IJssel Trail Network.

Rijn-IJssel  
Trail Network.

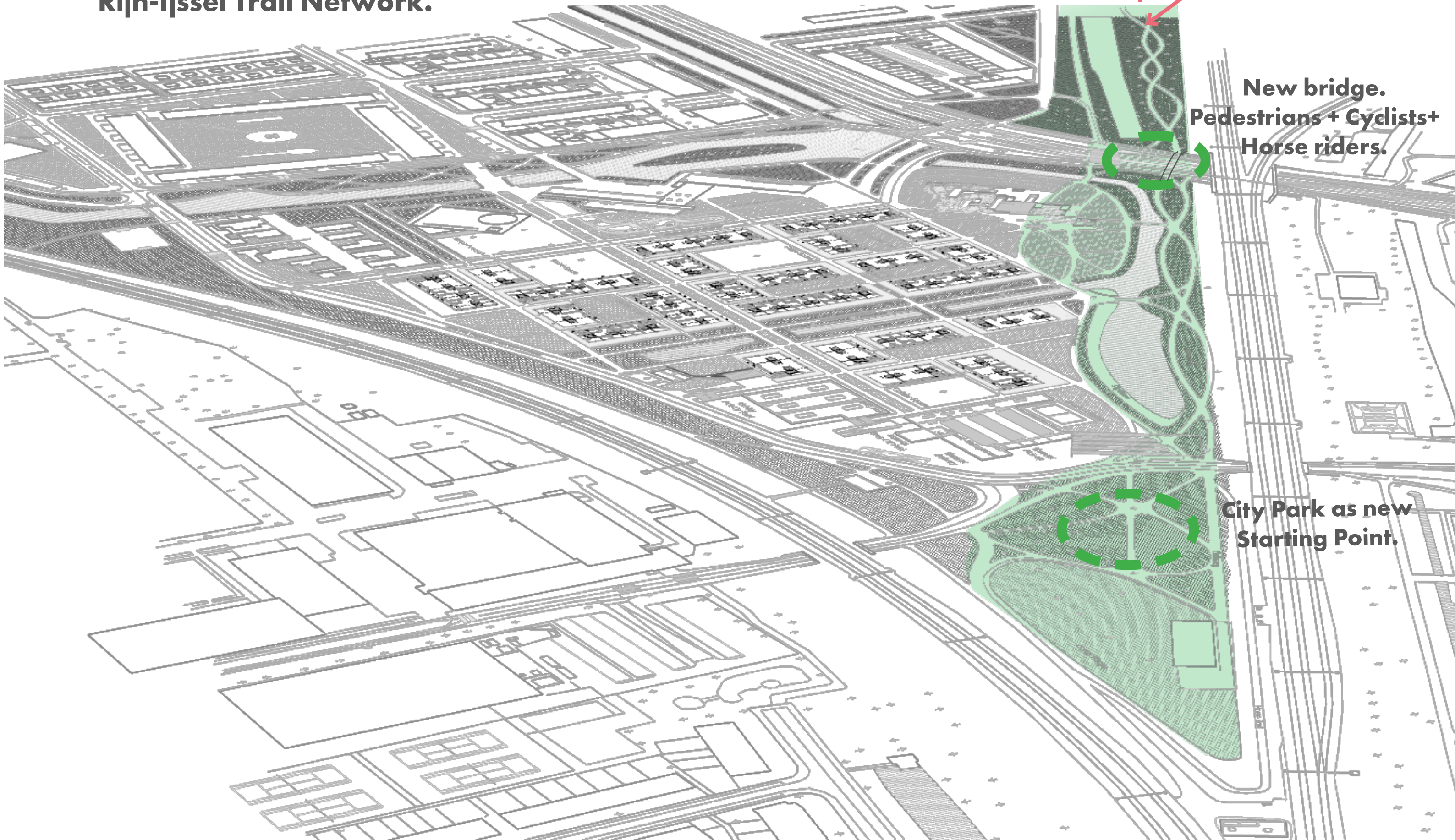
Starting point currently  
south-east of the site.





# Nature Trail.

Connecting Arnhem to  
Rijn-IJssel Trail Network.



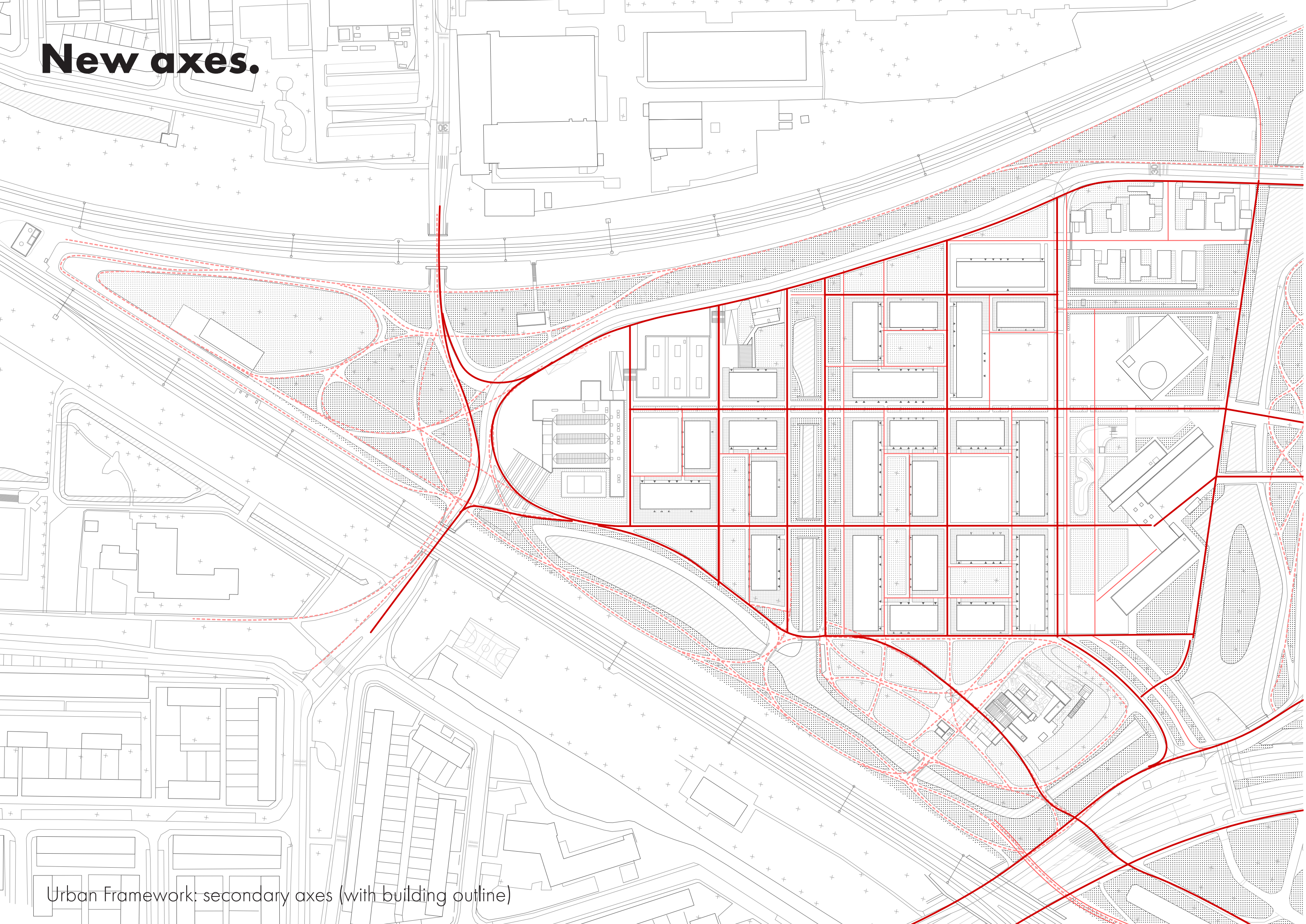
Former  
starting point.

New bridge.  
Pedestrians + Cyclists +  
Horse riders.

City Park as new  
Starting Point.



**New axes.**



Urban Framework: secondary axes (with building outline)



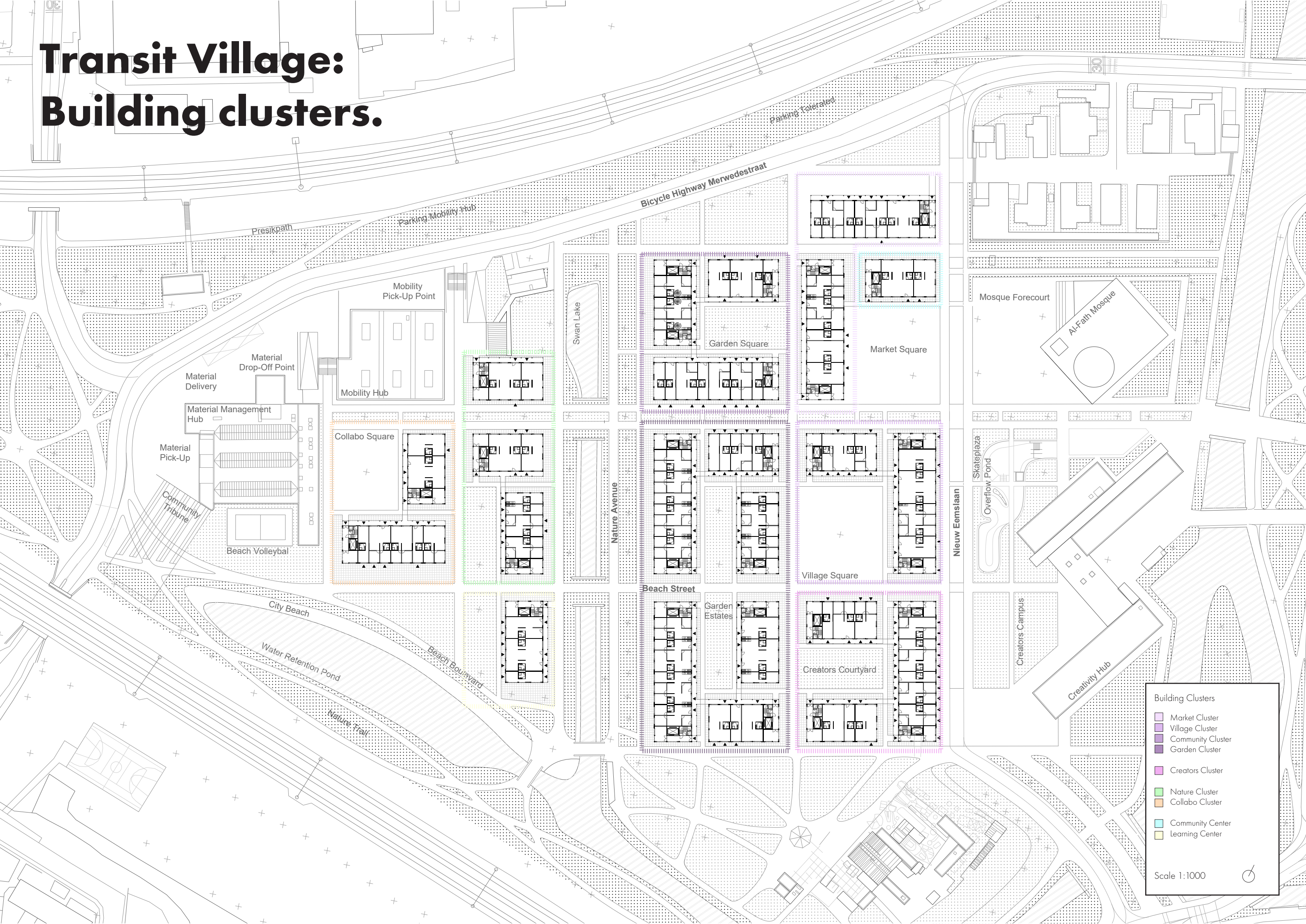
**No cars needed daily =  
Less residents own cars=  
providing rental car mobility  
for elderly, weekend trips, etc.**

**Mobility Hub**

Urban Framework: secondary axes (with building outline)



# Transit Village: Building clusters.





# Collabo Cluster.

Community workshop.



Upcycle store.





**Homes for  
Creative Industry  
workers**

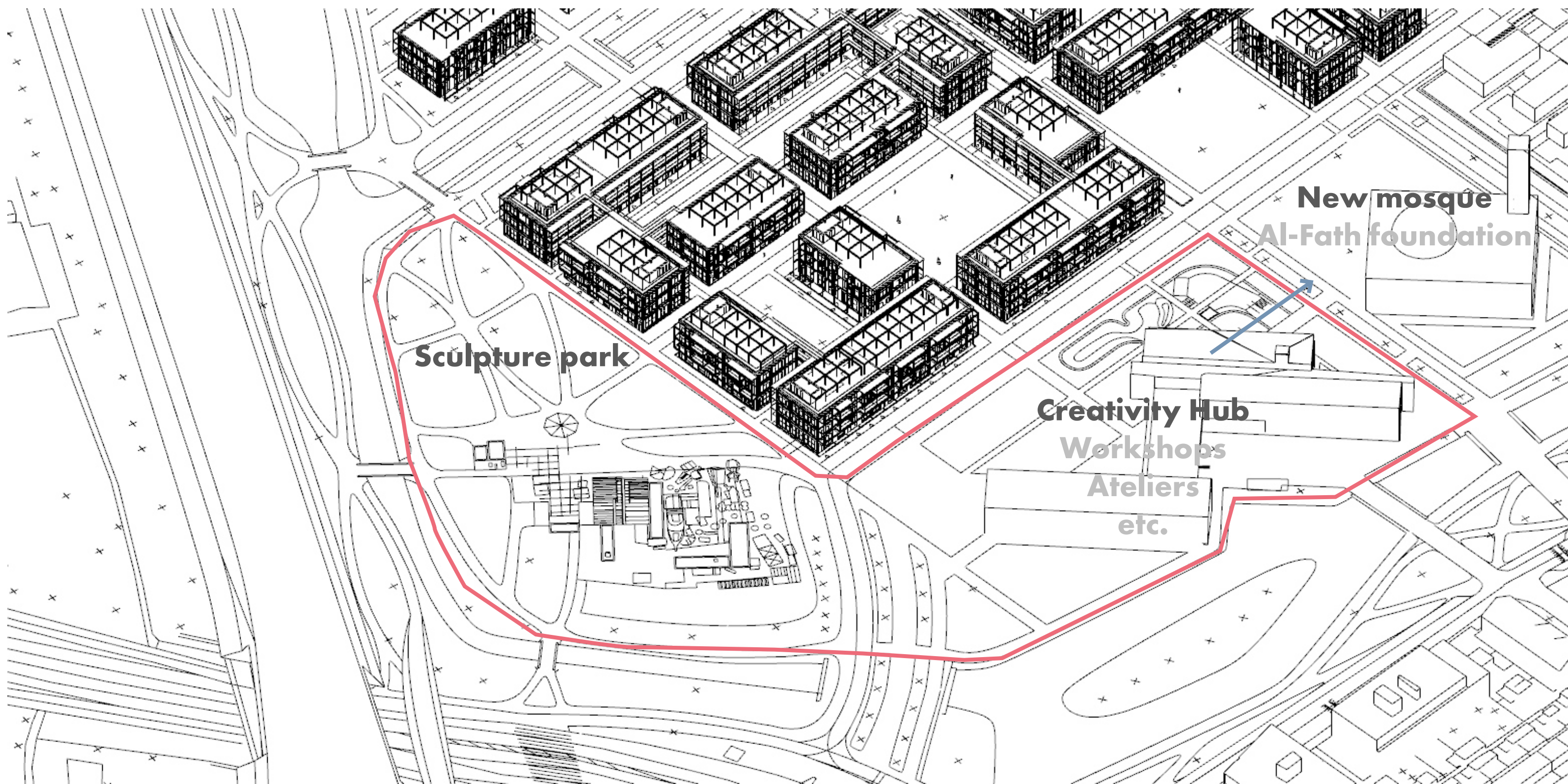


**Creators Cluster.**

**Rental offices for  
Creators + Start-ups.**







**Sculpture park**


**Creativity Hub**  
Workshops  
Ateliers  
etc.

**New mosque**  
Al-Fath foundation





**Weekly  
farmers market**

  
Perspective

**Market Cluster.**





**Bicycle axis.**

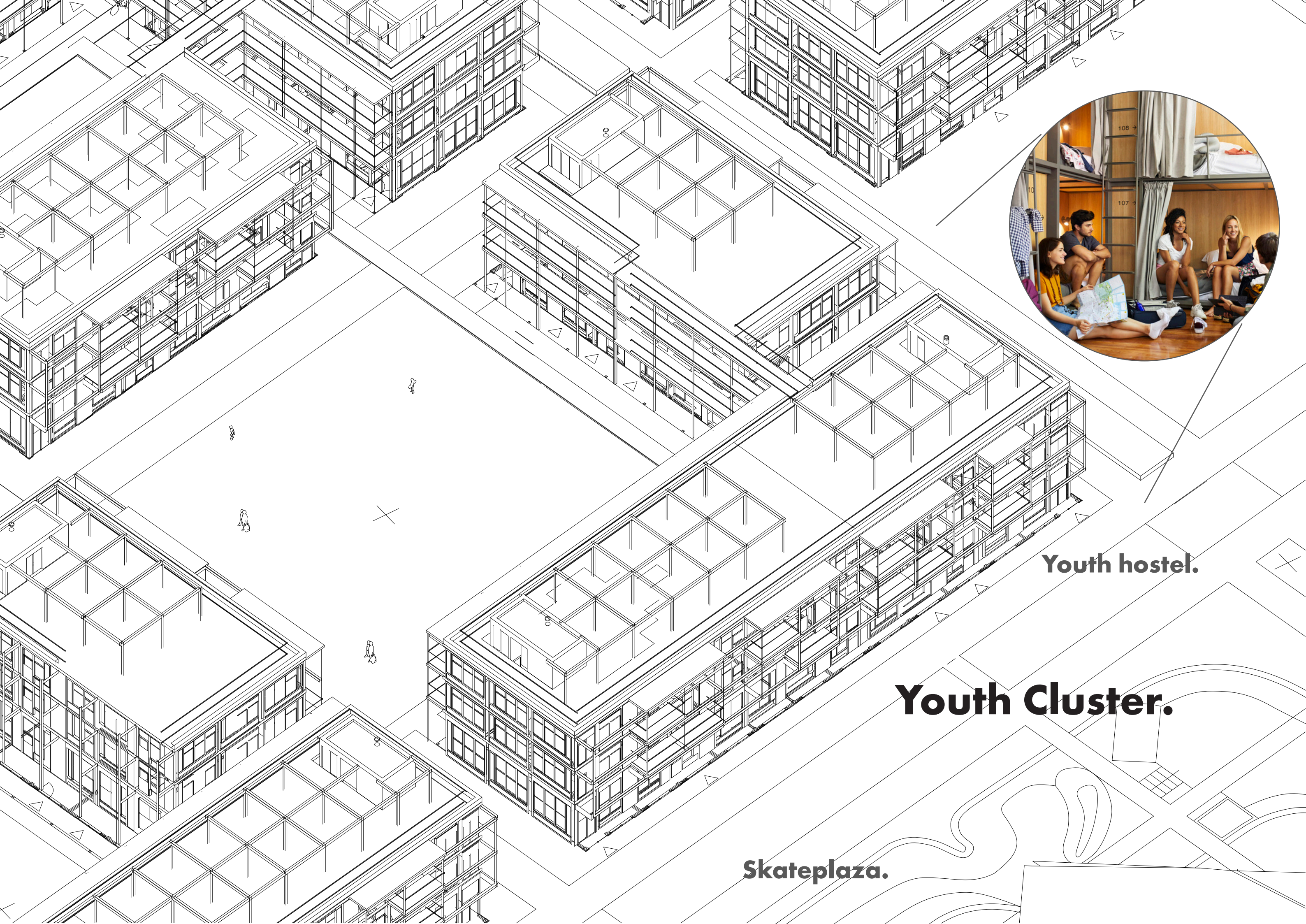
**High  
Street.**

**Bar. Cafe.  
Bakery.**

**Farmers  
Market.**

**Market Square.**





**Youth hostel.**

**Youth Cluster.**

**Skateplaza.**



# Garden Cluster.

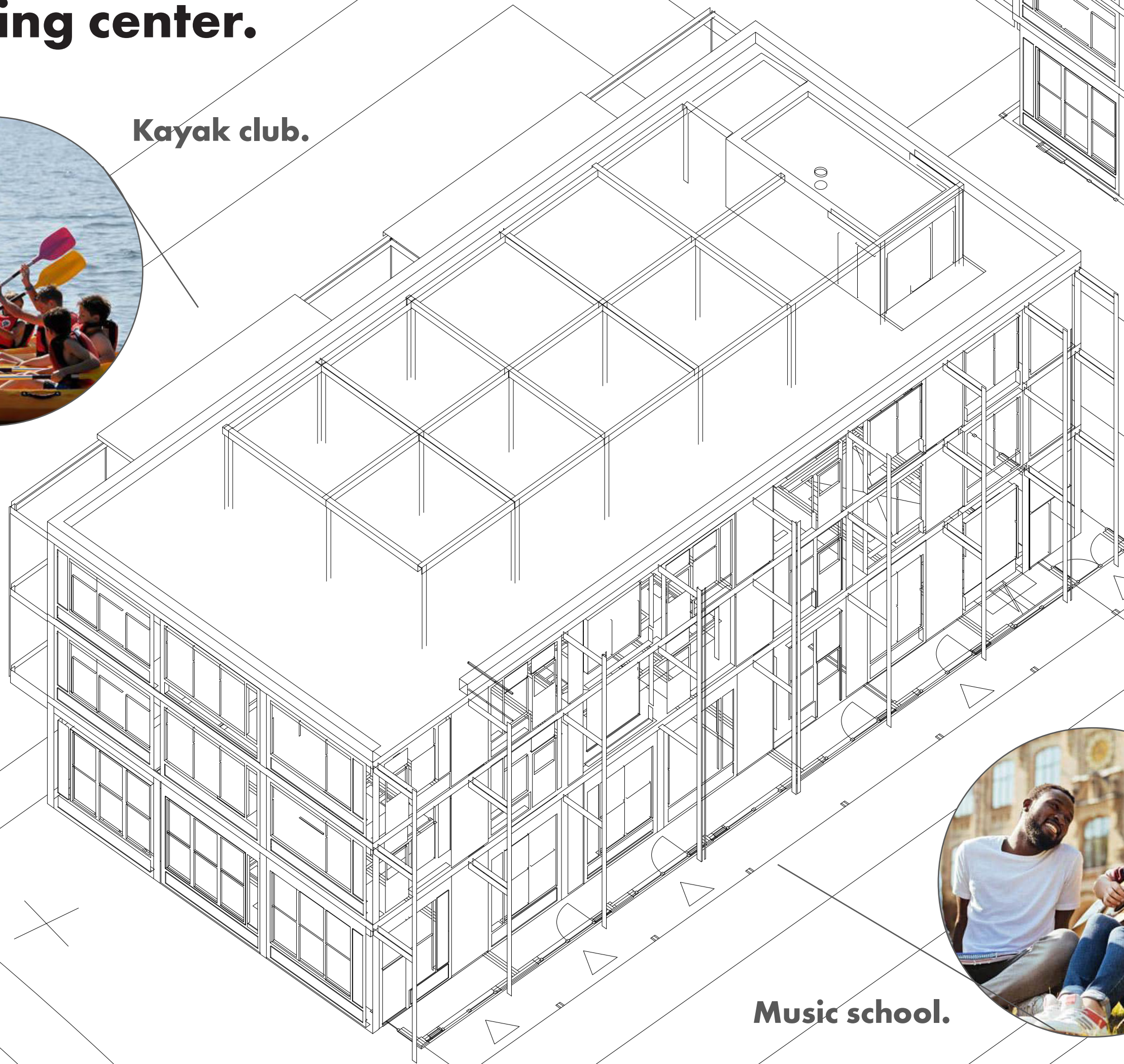


**Community  
garden.**



# Learning center.

Kayak club.



Music school.





**Nature avenue cluster.**



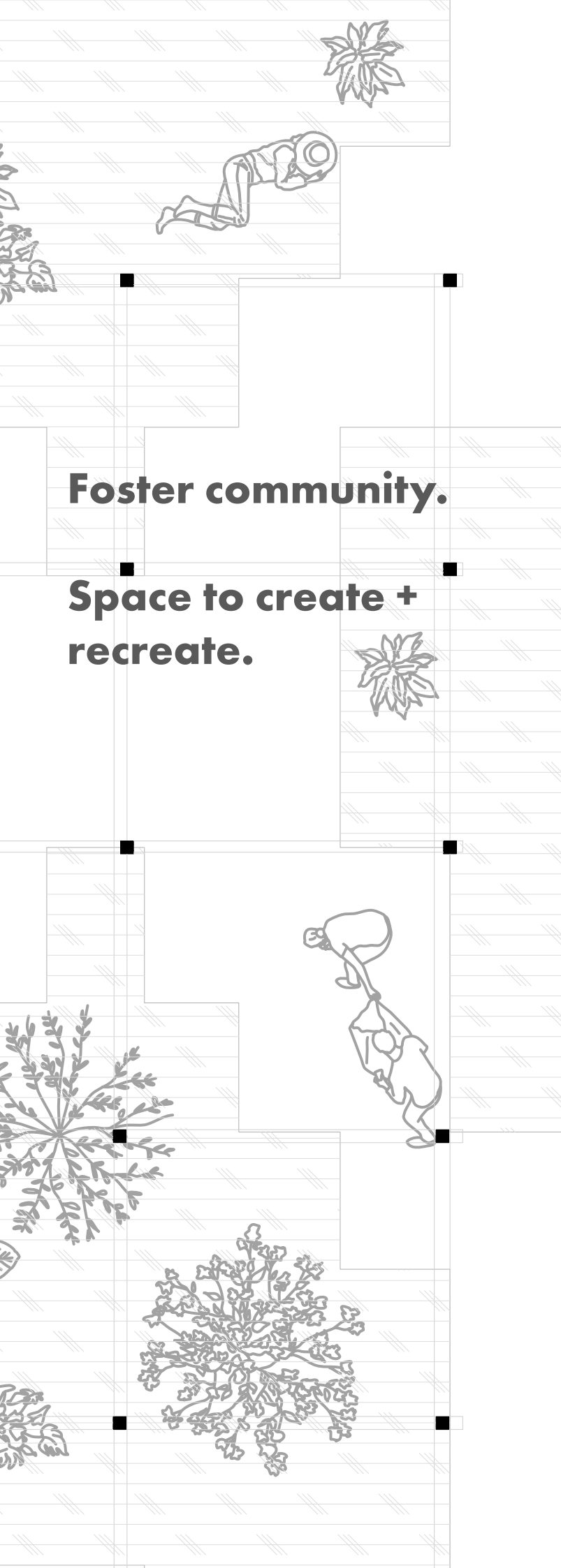


**Artist cluster.**

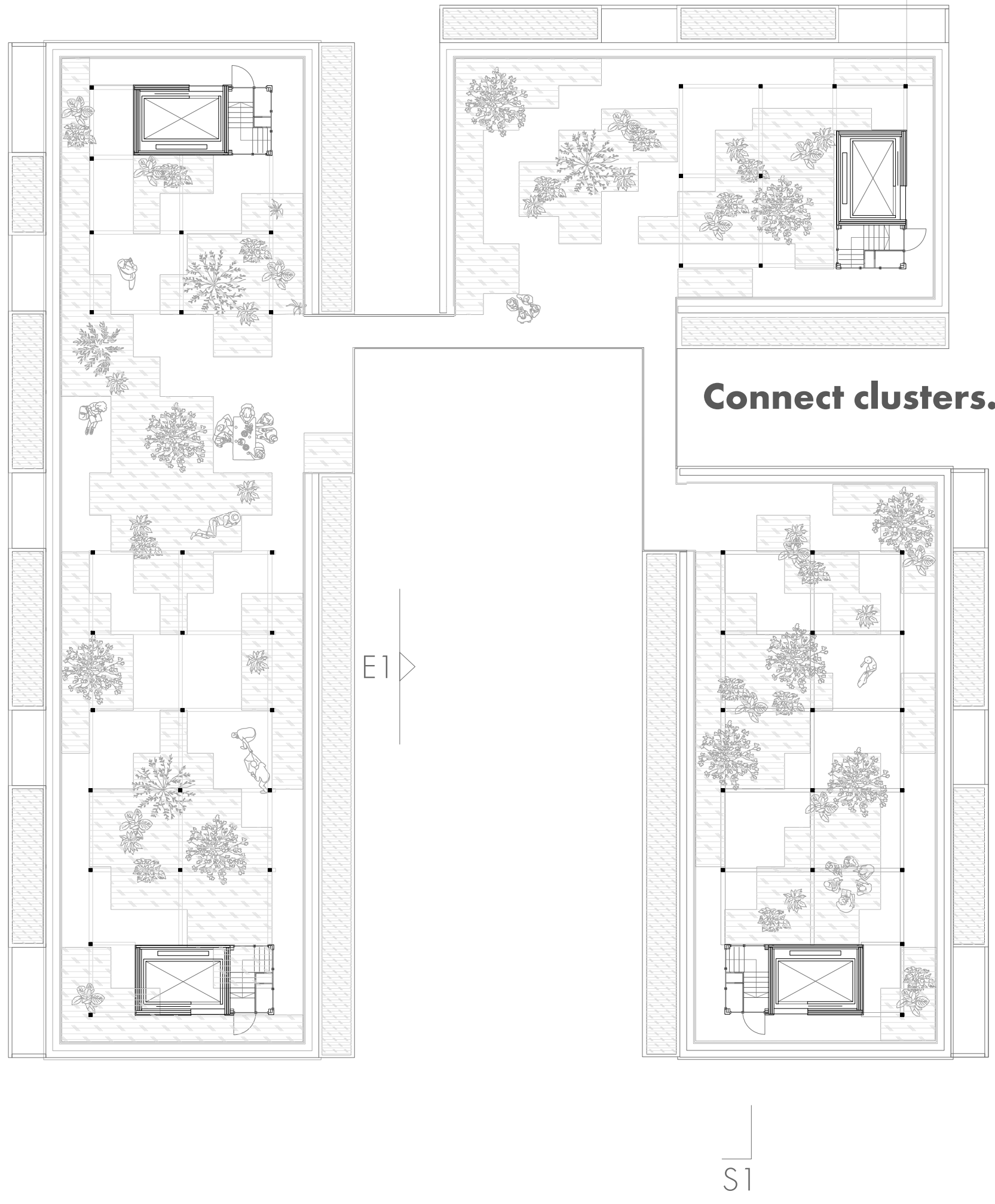


**Sculpture park.**





# Roof terraces.



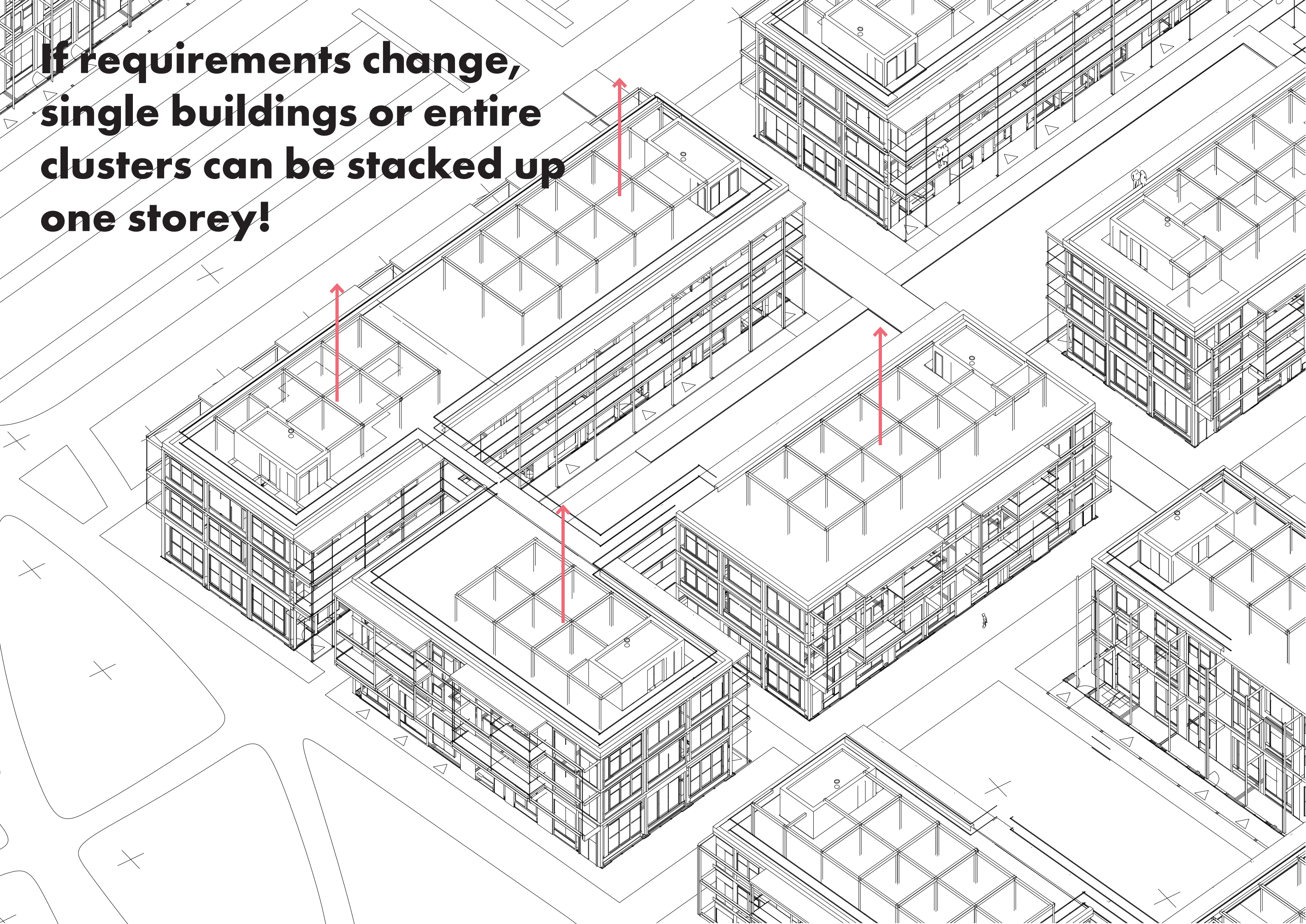




**House community space.**

**Roof terrace.**





**If requirements change,  
single buildings or entire  
clusters can be stacked up  
one storey!**





**If requirements change,  
single buildings or entire  
clusters can be stacked up  
one storey!**

**Also: Flexibility for residents to adjust their  
apartments.**



# Flexibility for residents to adjust their apartments.



**Dealing with...  
disassembly of components,  
material reclaiming, etc.**

## **Material Management Hub**

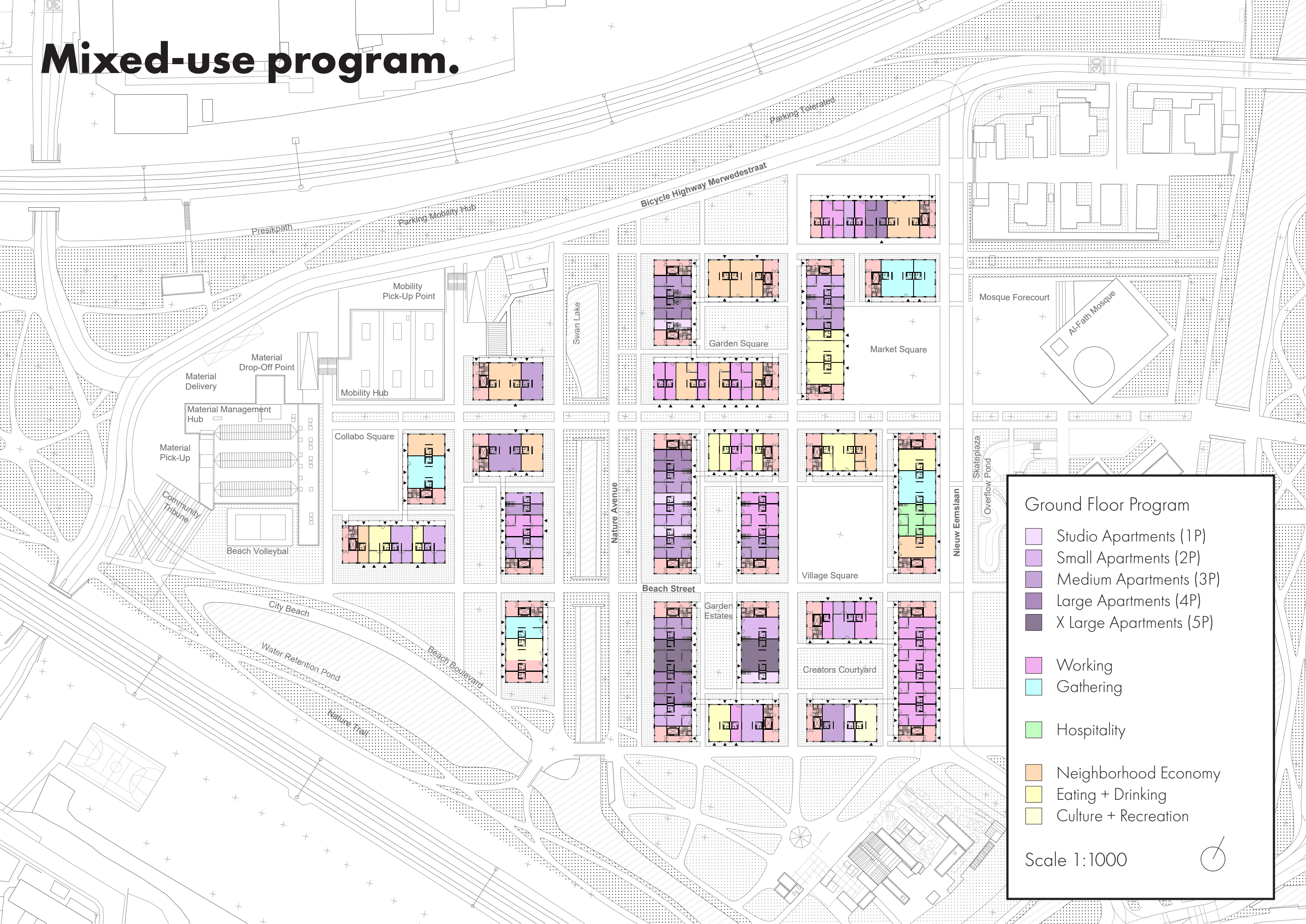
**Intact components stored flat packed for 1 year. After: Disassembly and selling.**

**Material Management Hub also reclaims materials from building sites in the area.**

**Use of material residual value! = financial incentive**

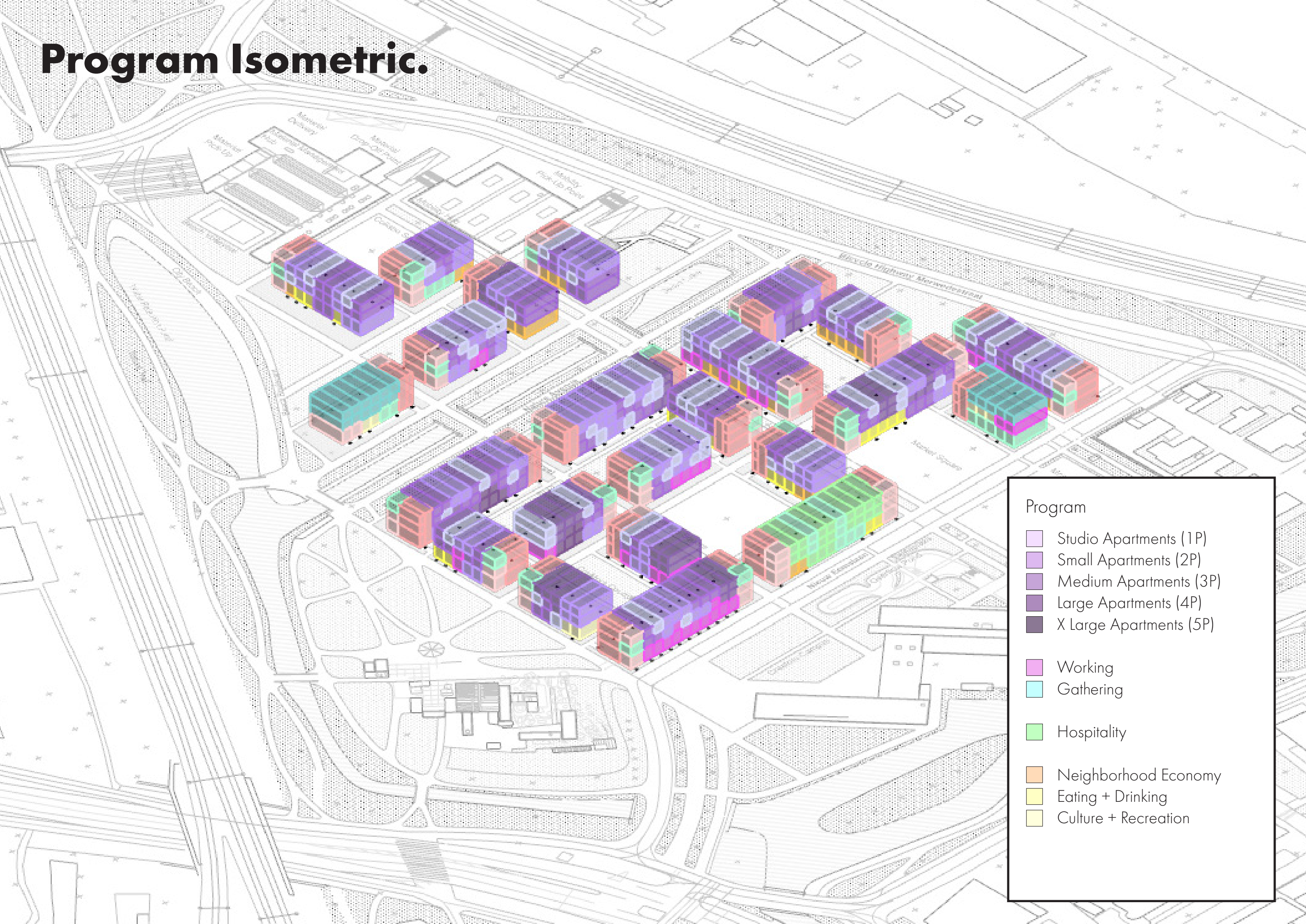


# Mixed-use program.





# Program Isometric.



## Program

- Studio Apartments (1P)
- Small Apartments (2P)
- Medium Apartments (3P)
- Large Apartments (4P)
- X Large Apartments (5P)
- Working
- Gathering
- Hospitality
- Neighborhood Economy
- Eating + Drinking
- Culture + Recreation



**Village cluster.**  
Further examination.

**How can we make it possible for users to flexibly adjust their apartments?**

Program

- Studio Apartments (1P)
- Small Apartments (2P)
- Medium Apartments (3P)
- Large Apartments (4P)
- X Large Apartments (5P)
- Working
- Gathering
- Hospitality
- Neighborhood Economy
- Eating + Drinking
- Culture + Recreation



# Village Cluster.



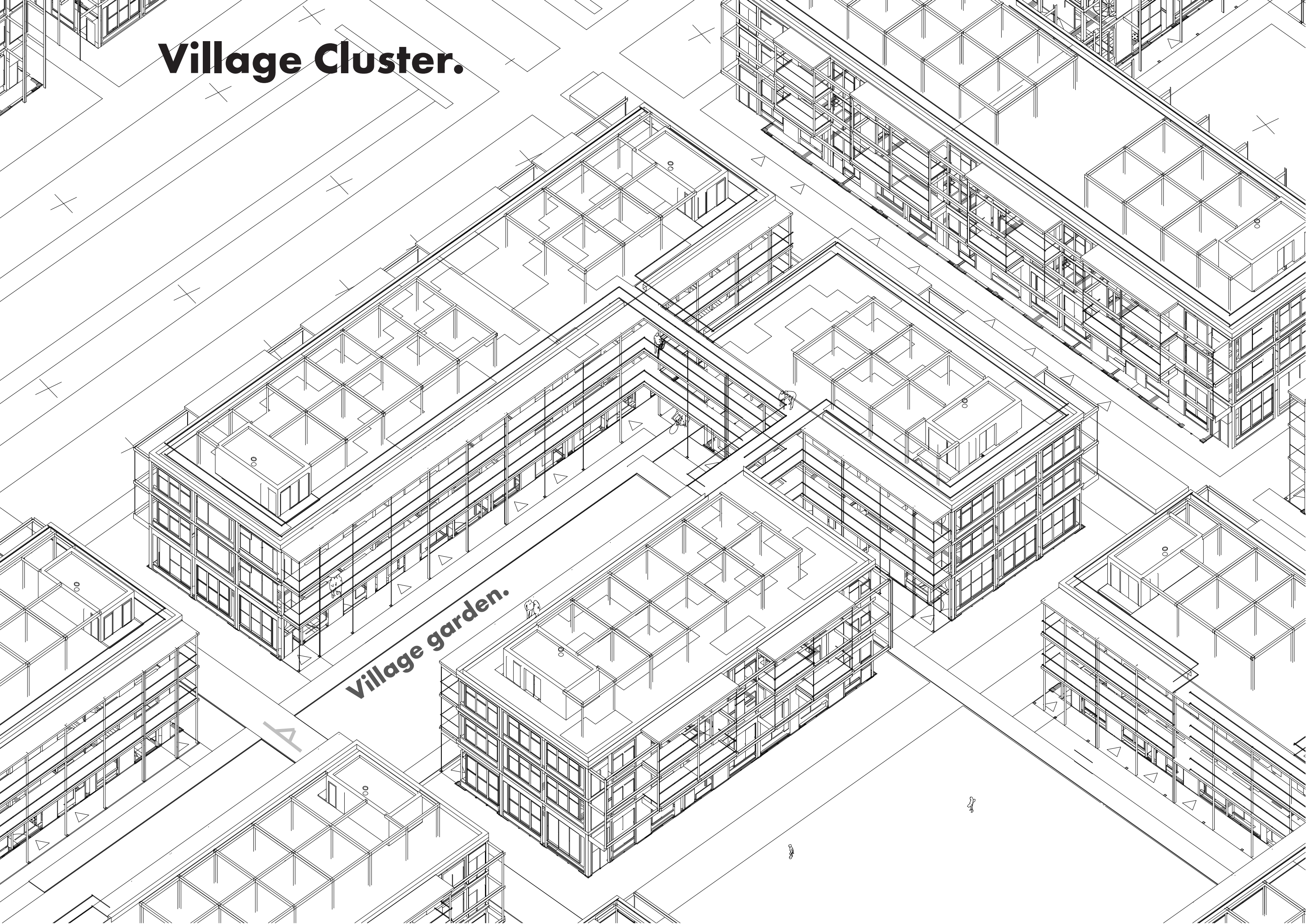
**Flea markets.  
Community events.**

**VILLAGE SQUARE.**



# Village Cluster.

Village garden.

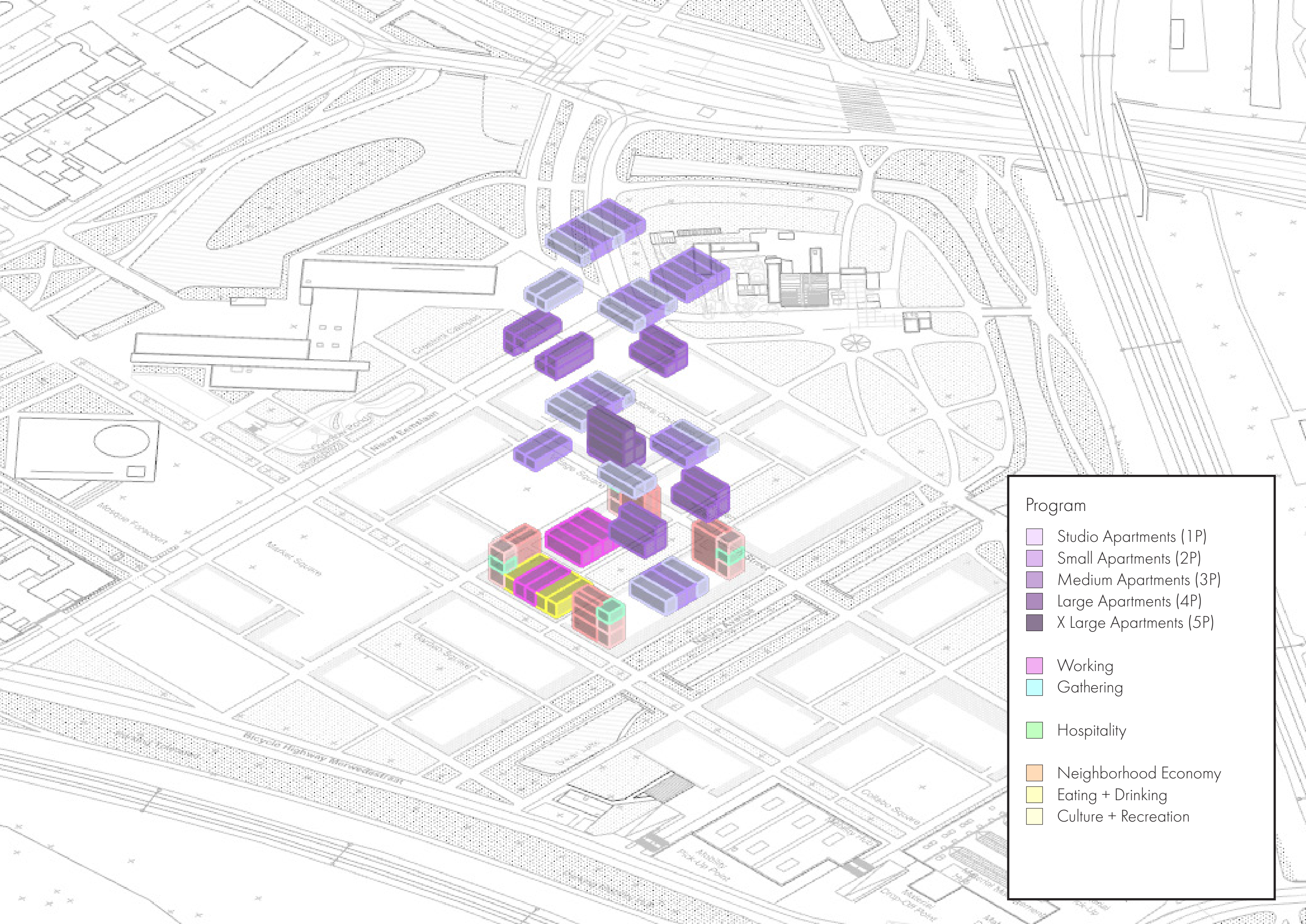






**Village garden.**

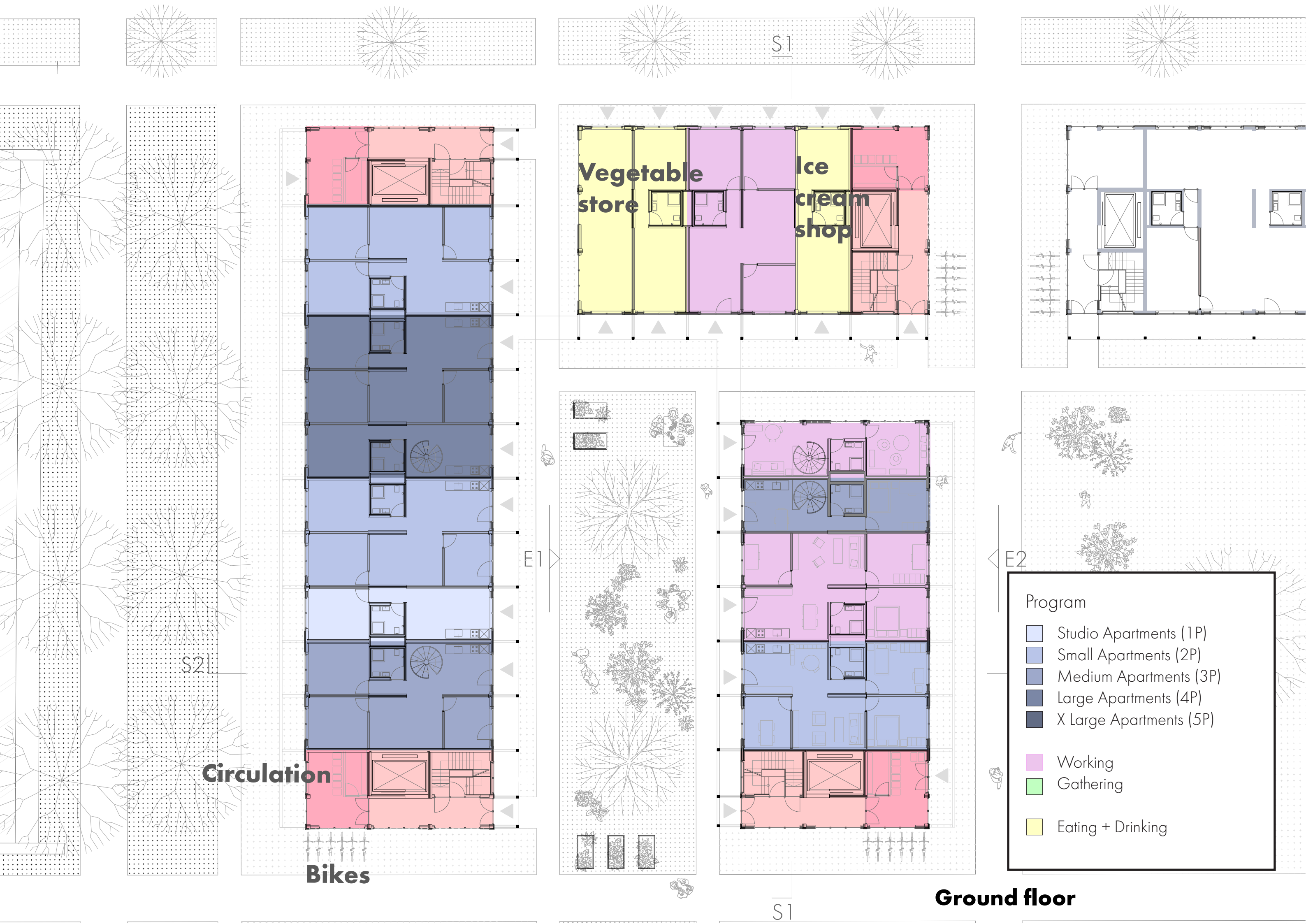




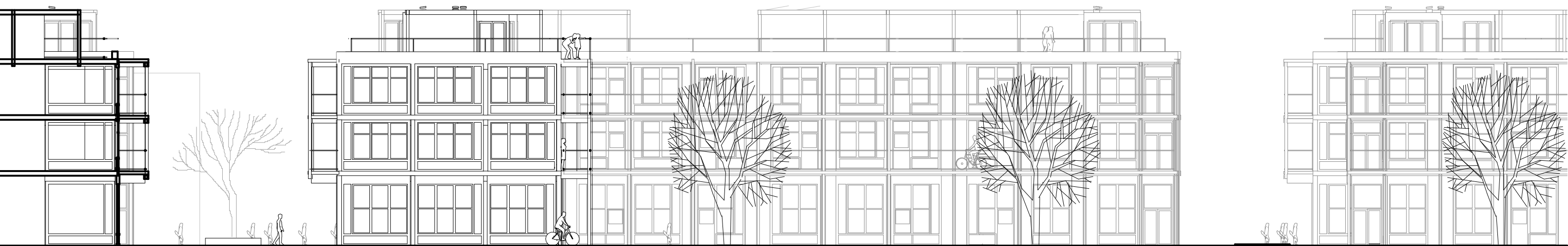
Program

- Studio Apartments (1P)
- Small Apartments (2P)
- Medium Apartments (3P)
- Large Apartments (4P)
- X Large Apartments (5P)
- Working
- Gathering
- Hospitality
- Neighborhood Economy
- Eating + Drinking
- Culture + Recreation



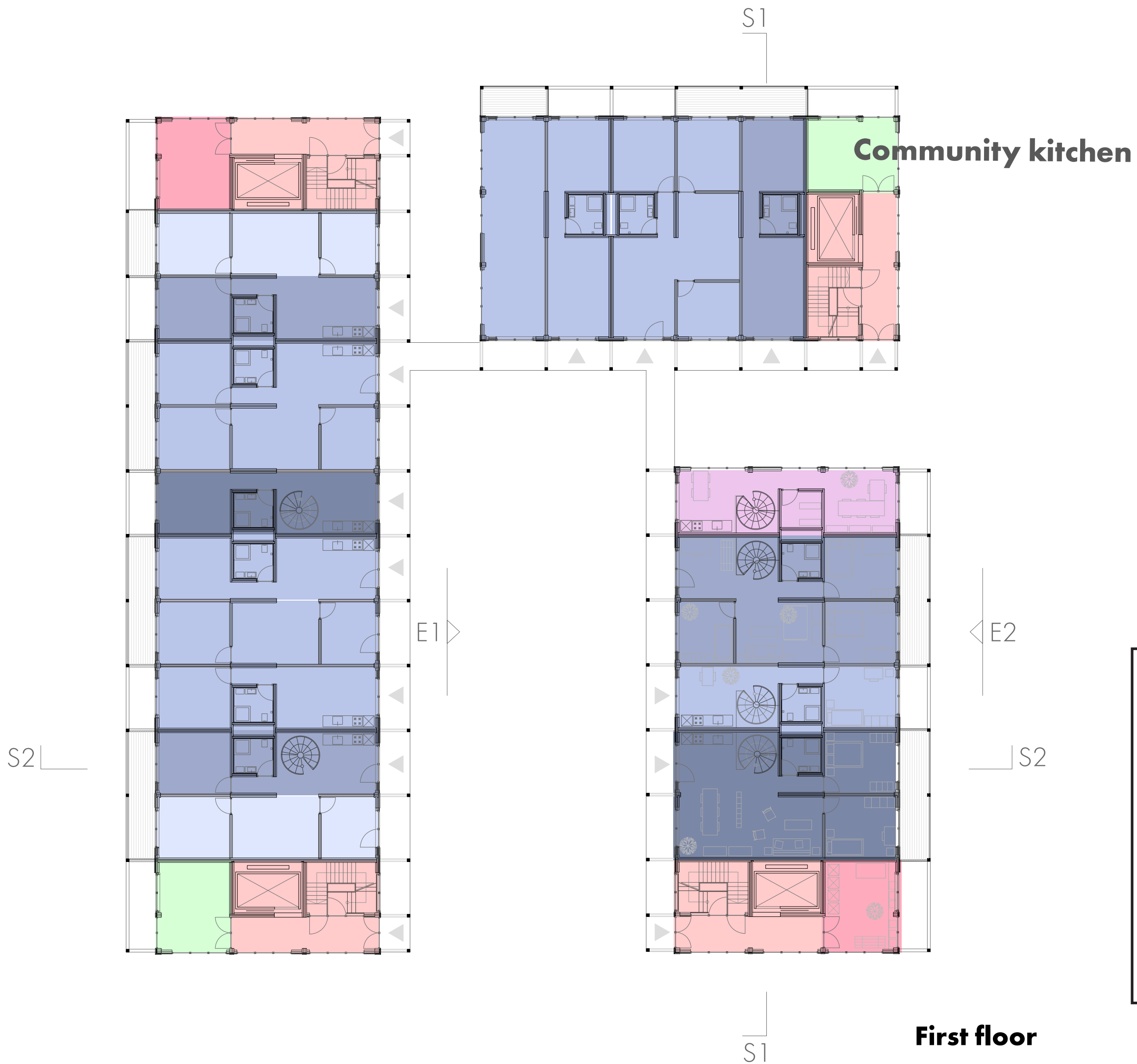






**Elevation E1**

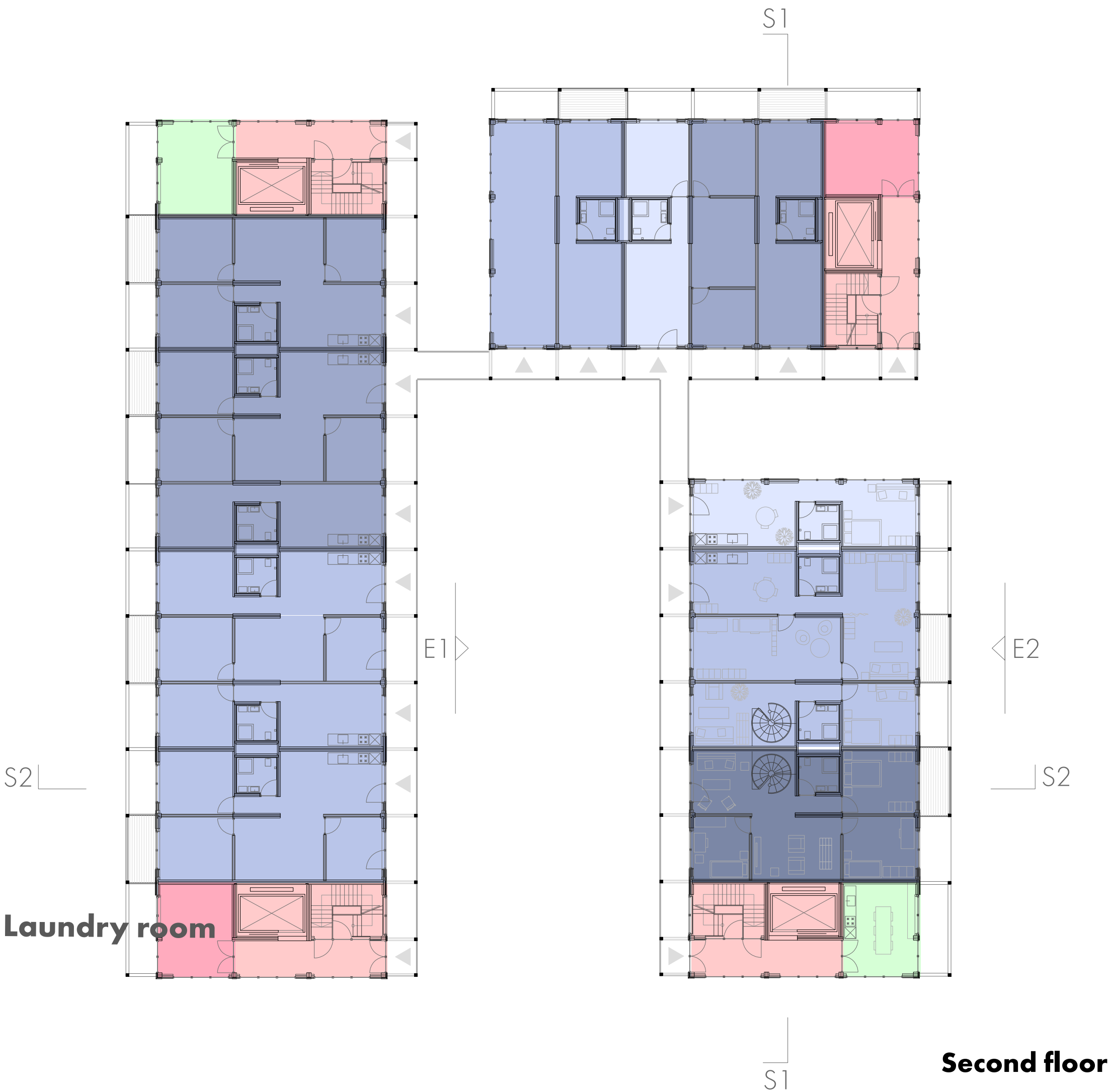




Program

- Studio Apartments (1P)
- Small Apartments (2P)
- Medium Apartments (3P)
- Large Apartments (4P)
- X Large Apartments (5P)
- Working
- Gathering
- Eating + Drinking





**Second floor**

Program

- Studio Apartments (1P)
- Small Apartments (2P)
- Medium Apartments (3P)
- Large Apartments (4P)
- X Large Apartments (5P)
- Working
- Gathering
- Eating + Drinking





**Balconies**

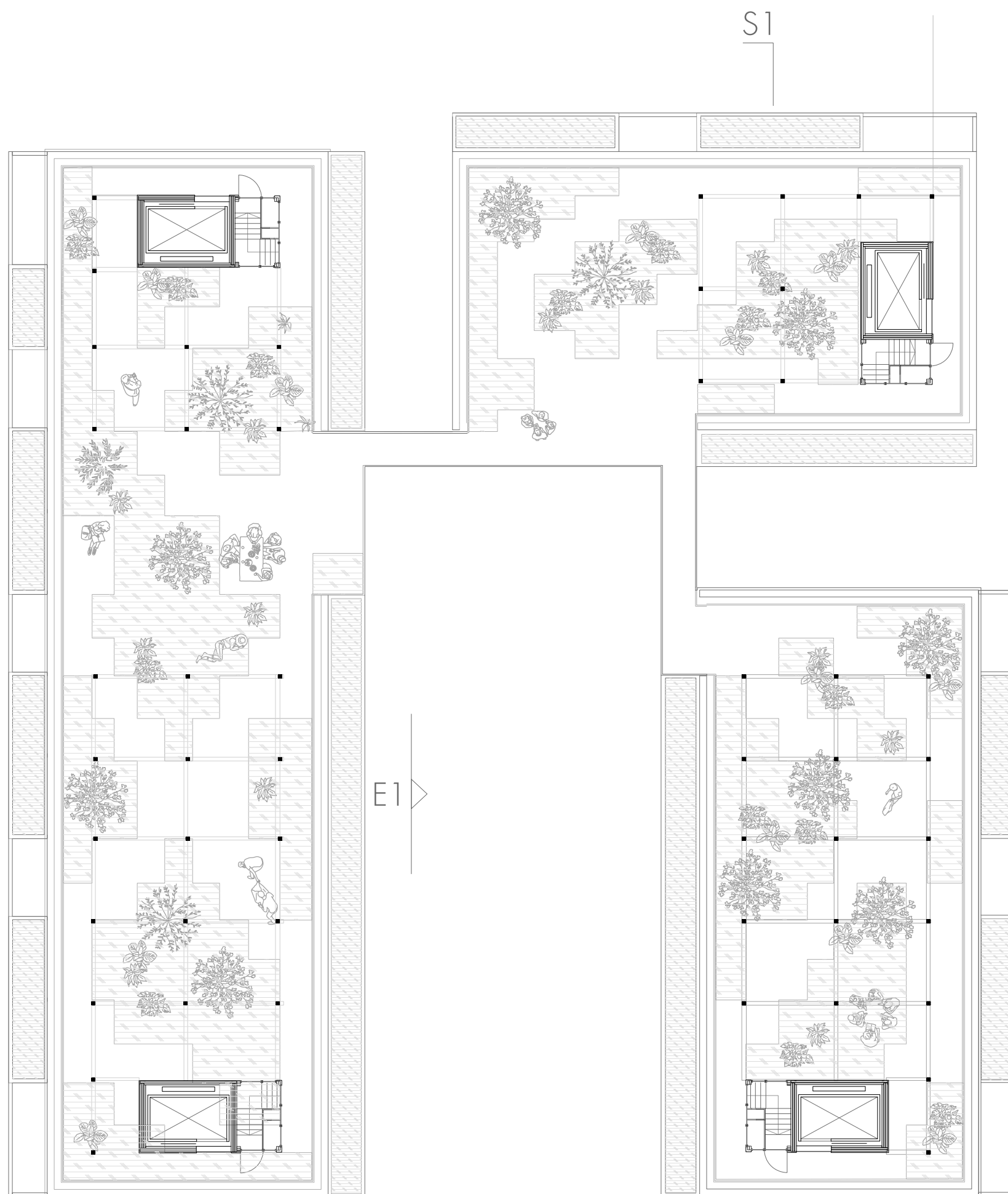
**Arcade**

**High street**

**Nature avenue**

**Elevation E2**





S1

S2

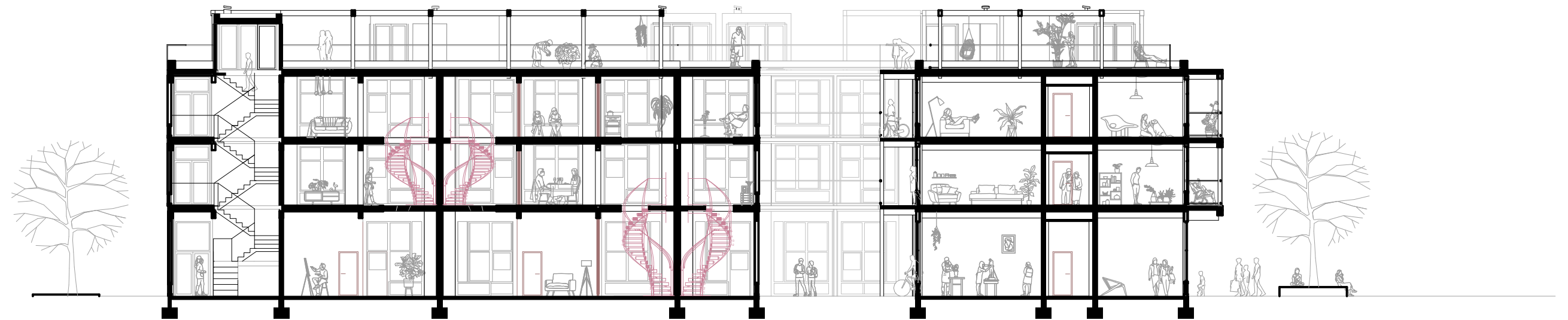
E1

E2

S2

S1





**Interior stairs  
= Duplex**



**Roof garden**

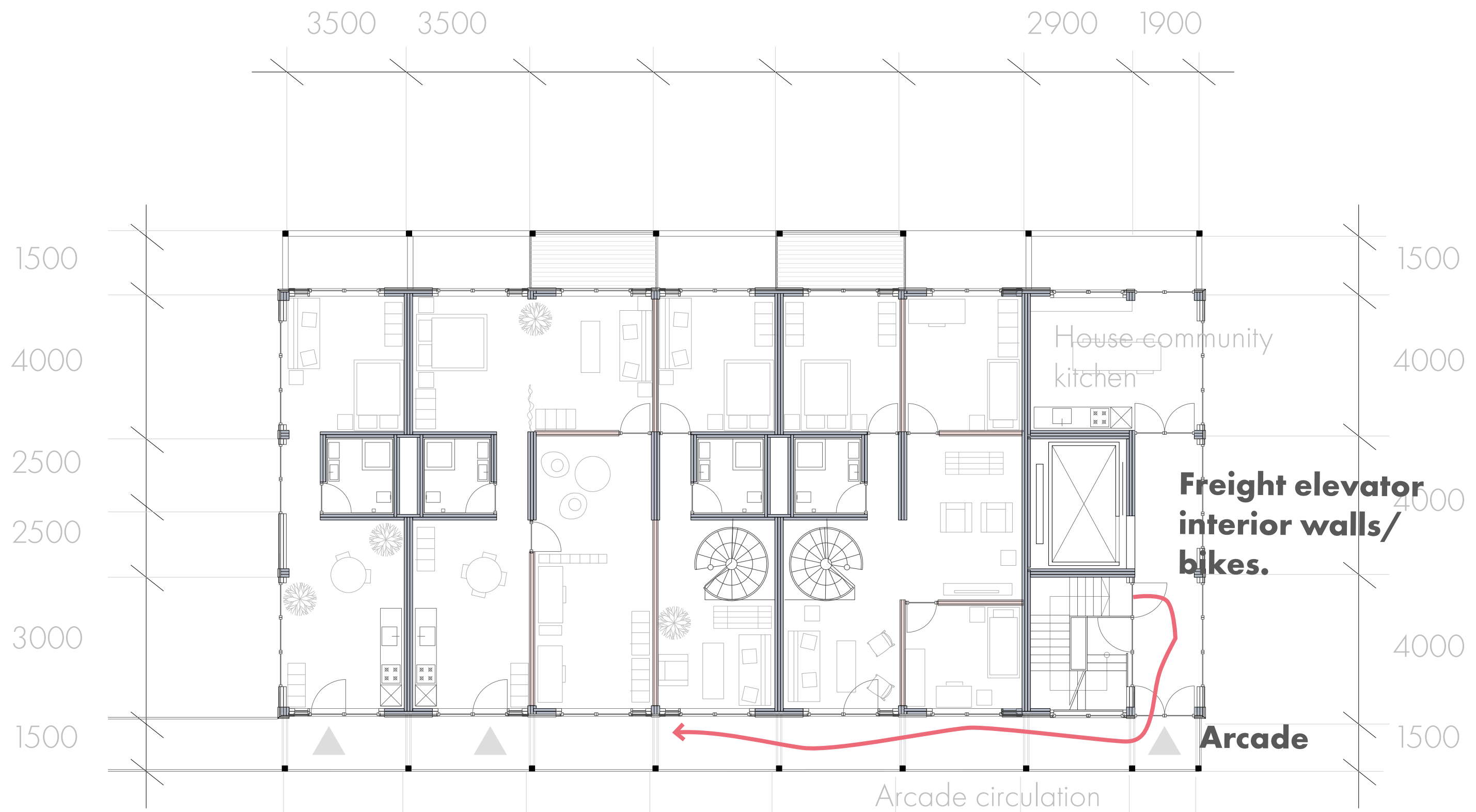


**Village garden**

**Village square**

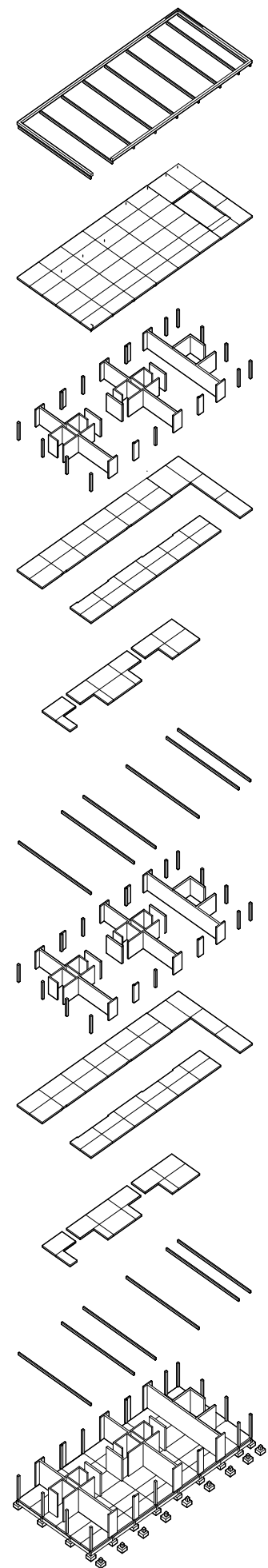
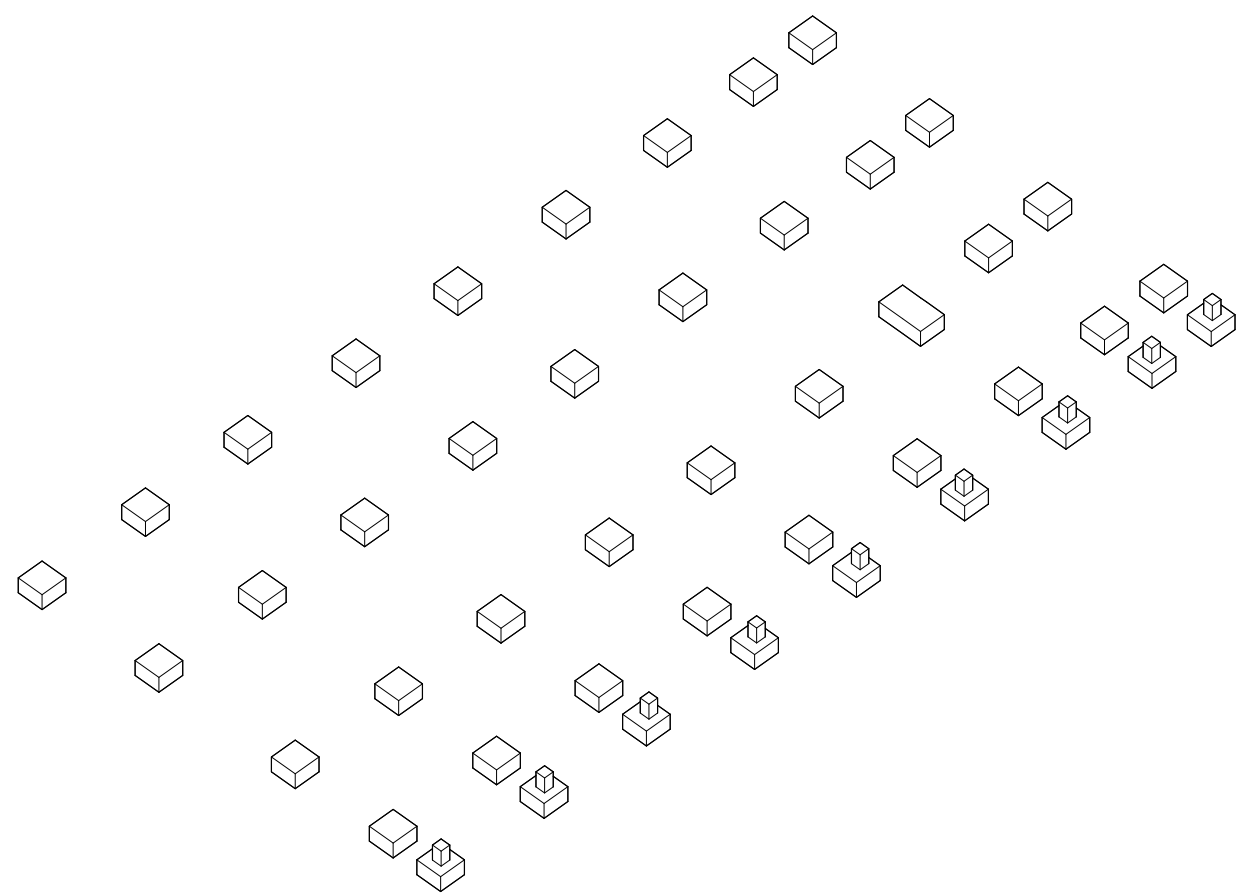
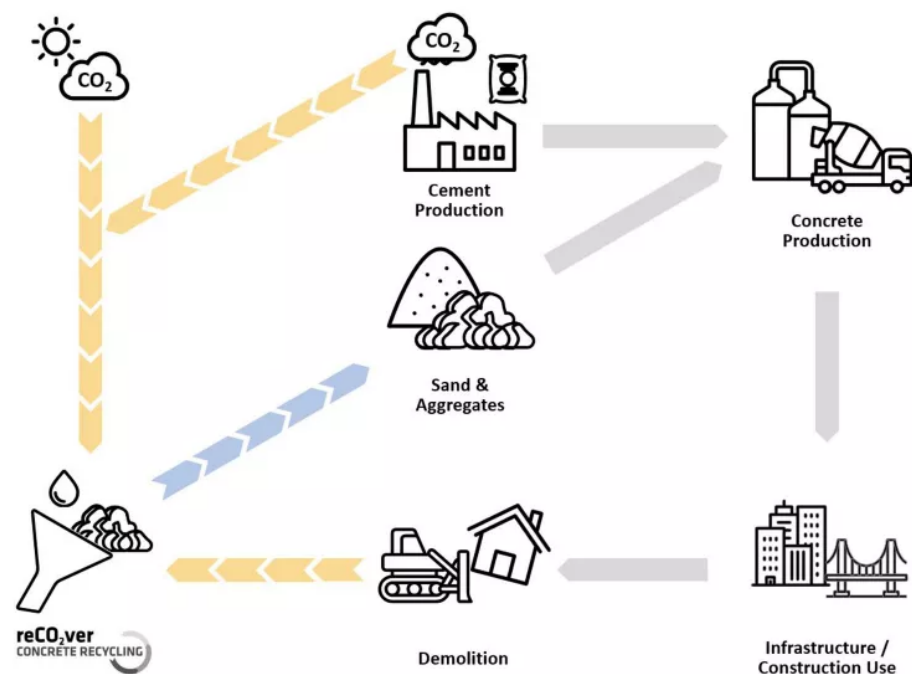
**Section S2**







# Build-up sequence.

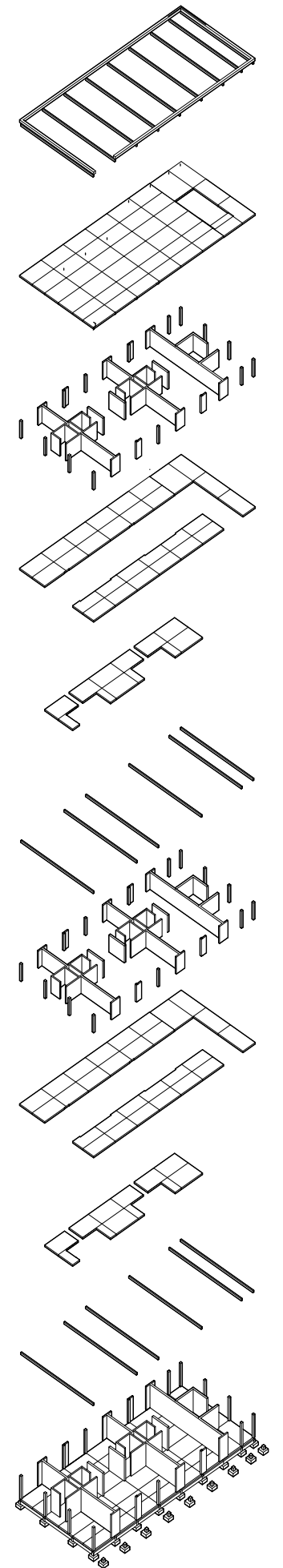
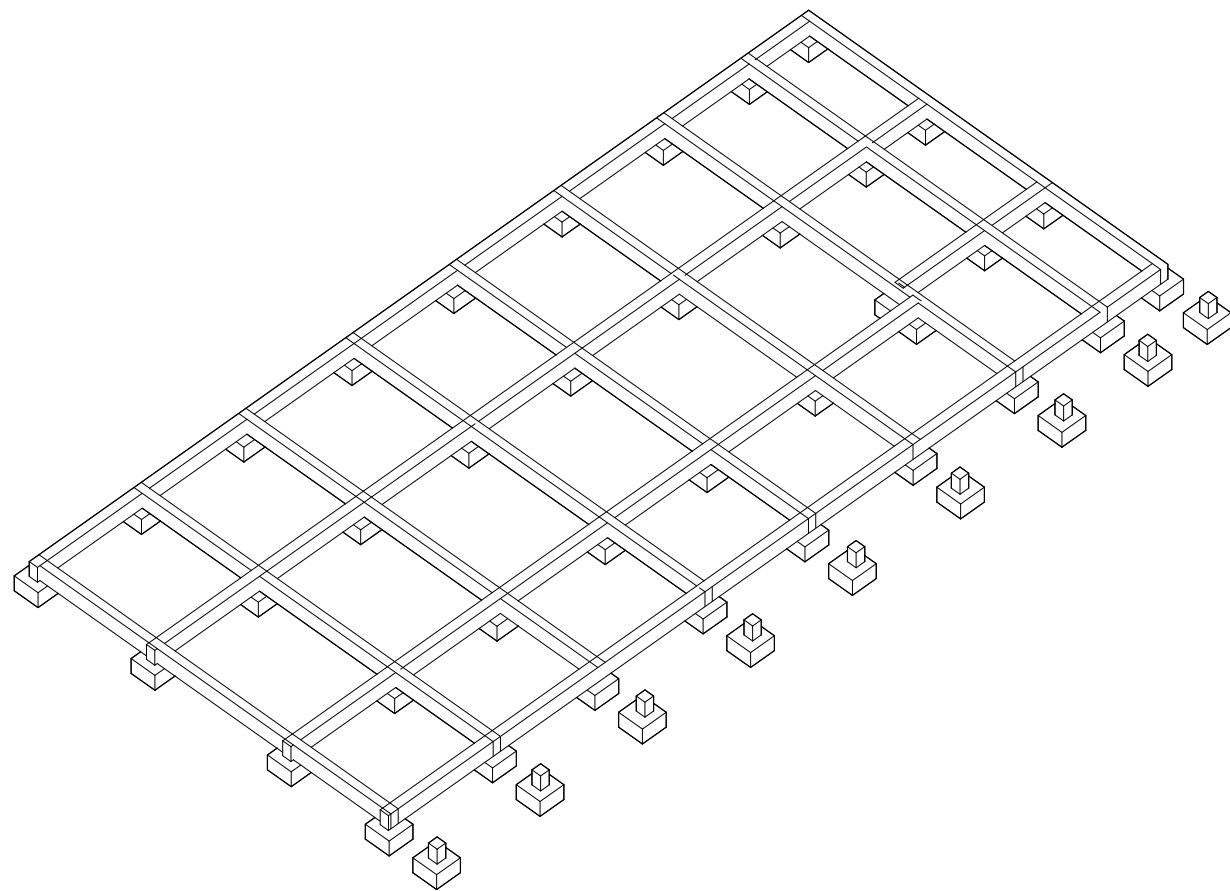


Modular pad + beam foundation. Reco2ver concrete.



# Build-up sequence.

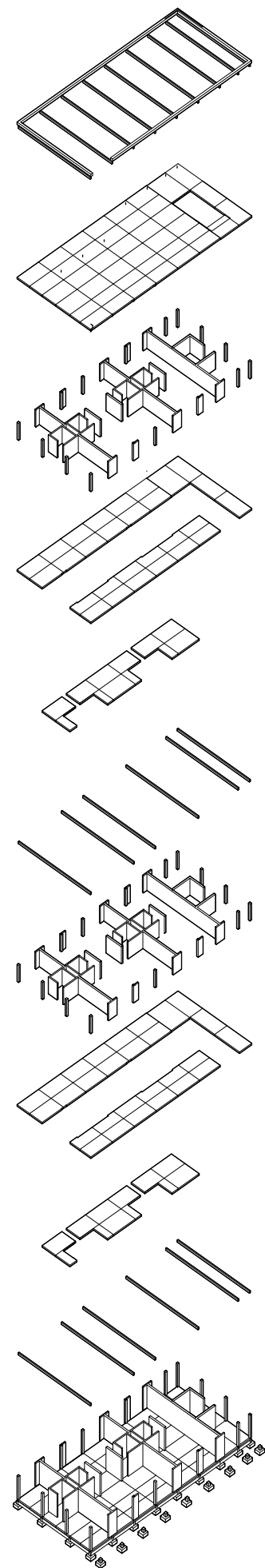
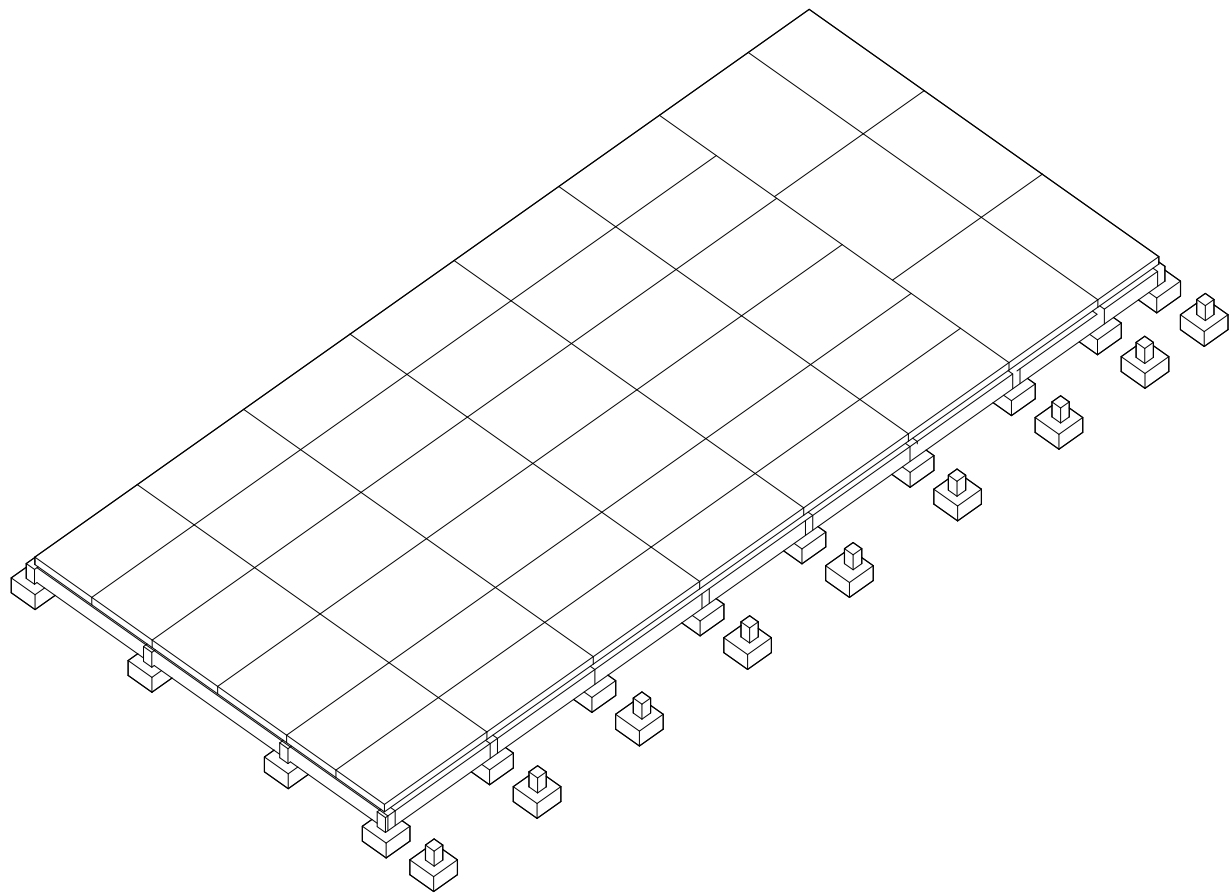
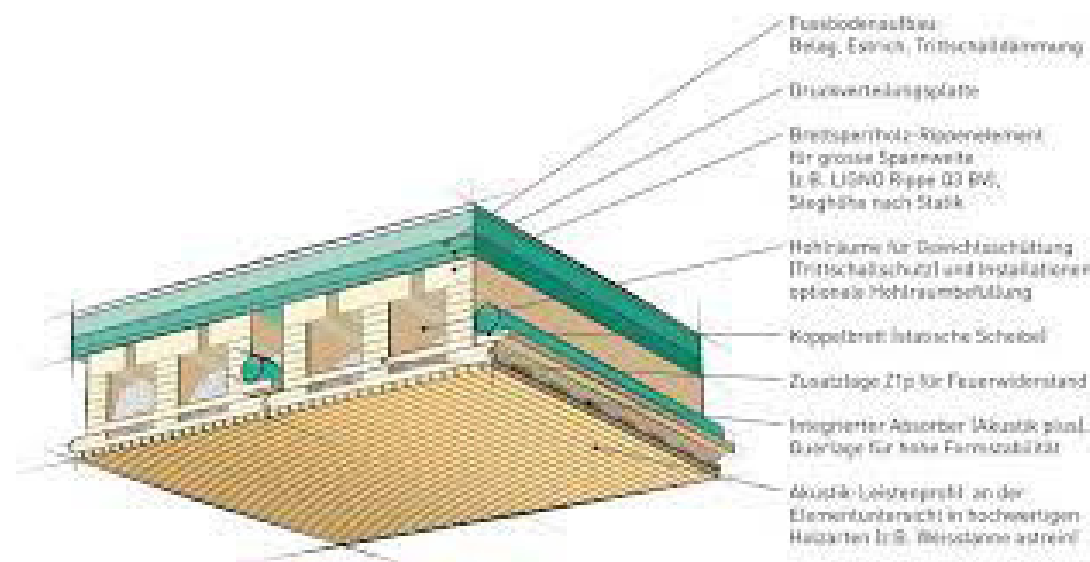
Reversible!



Modular pad + beam foundation. **Reco2ver concrete.**



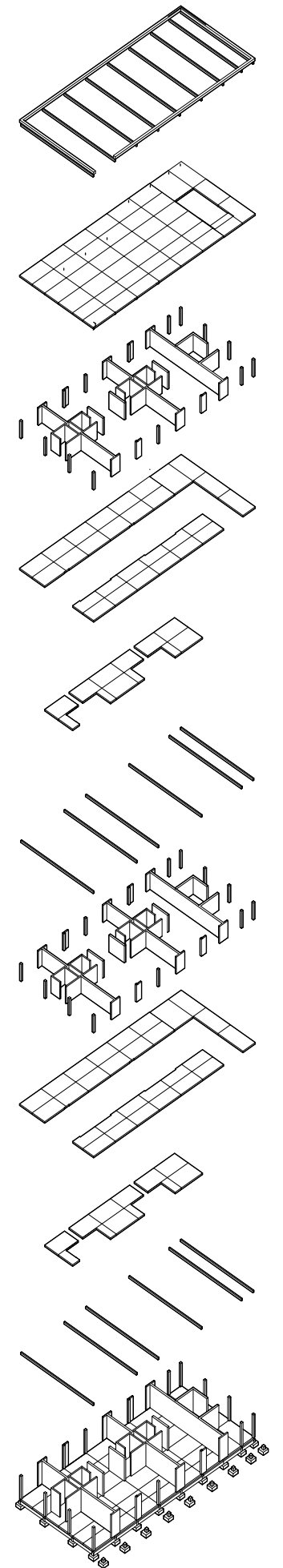
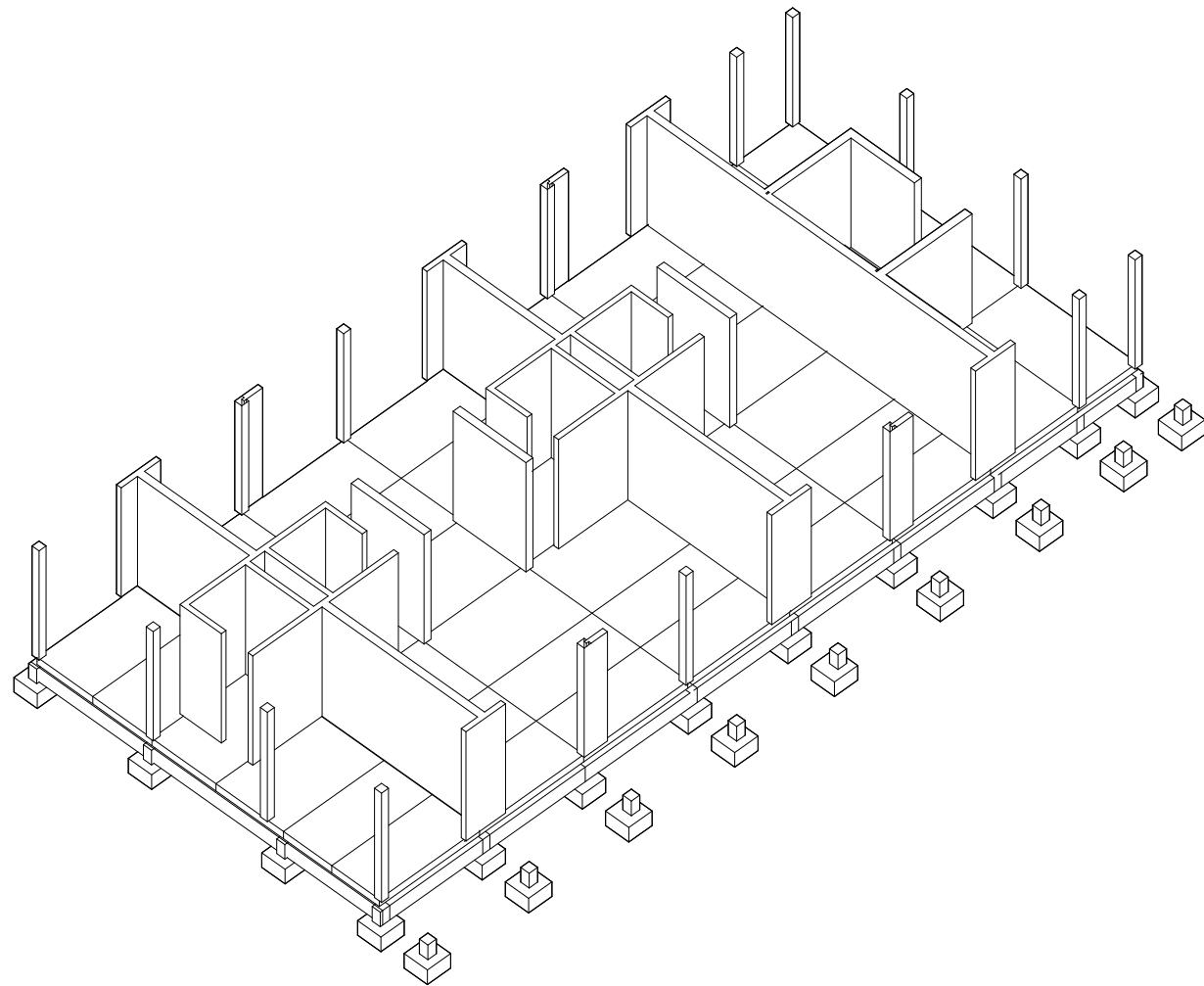
# Build-up sequence.



Modular timber system floor. Lignotrend “Rippe”. Local Veluwe-larch.



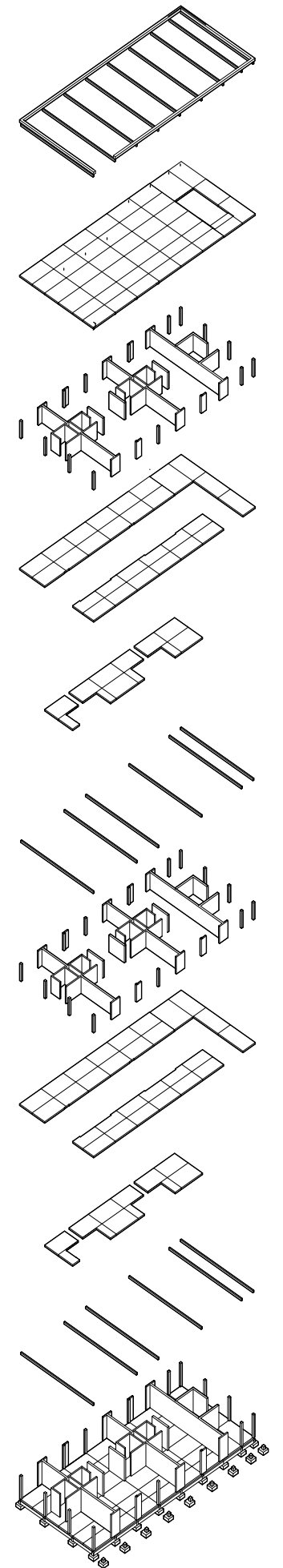
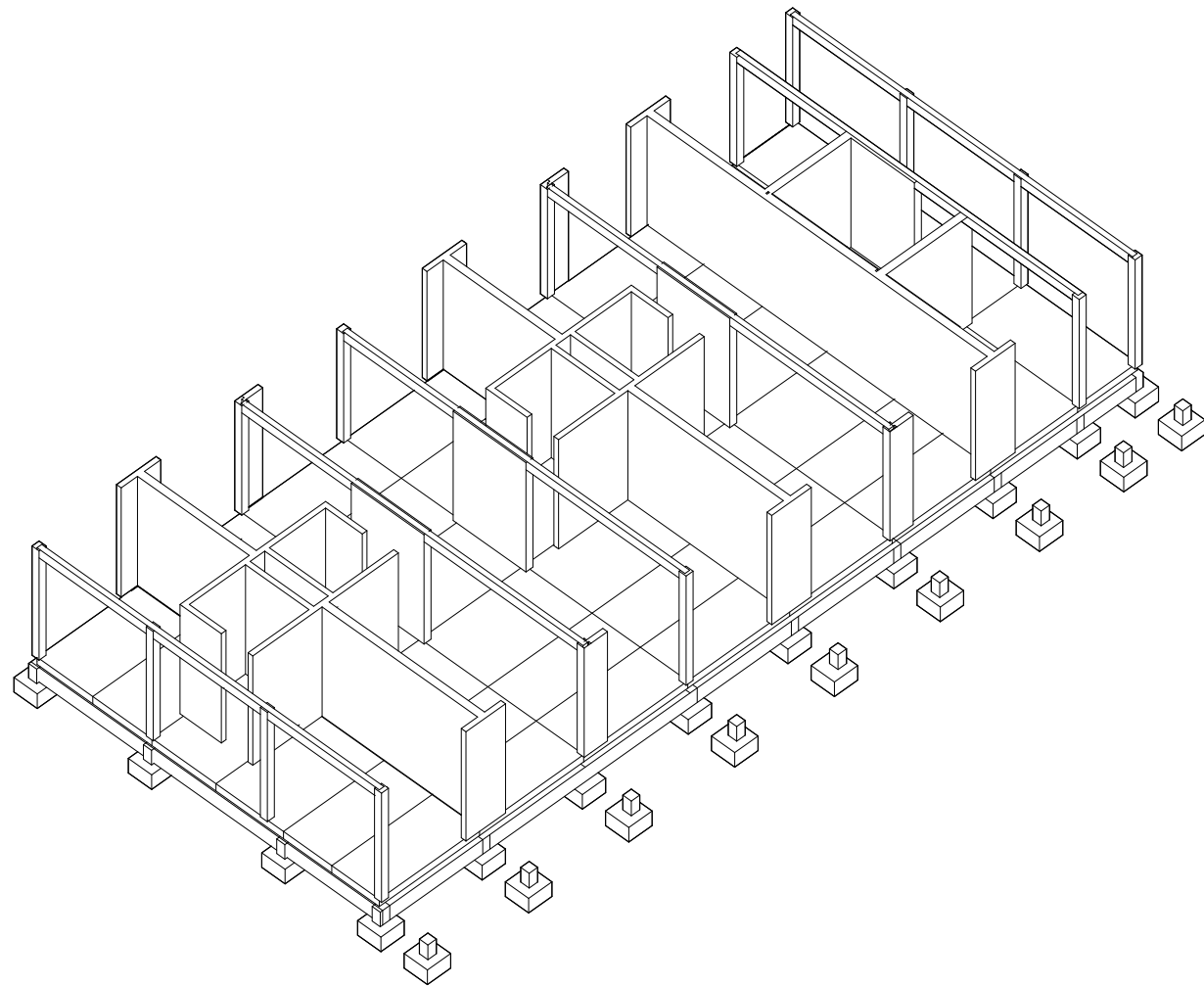
# Build-up sequence.



**Prefabricated Wet-cell modules + Post/ Shear wall elements.**  
**Local Veluwe-larch.**



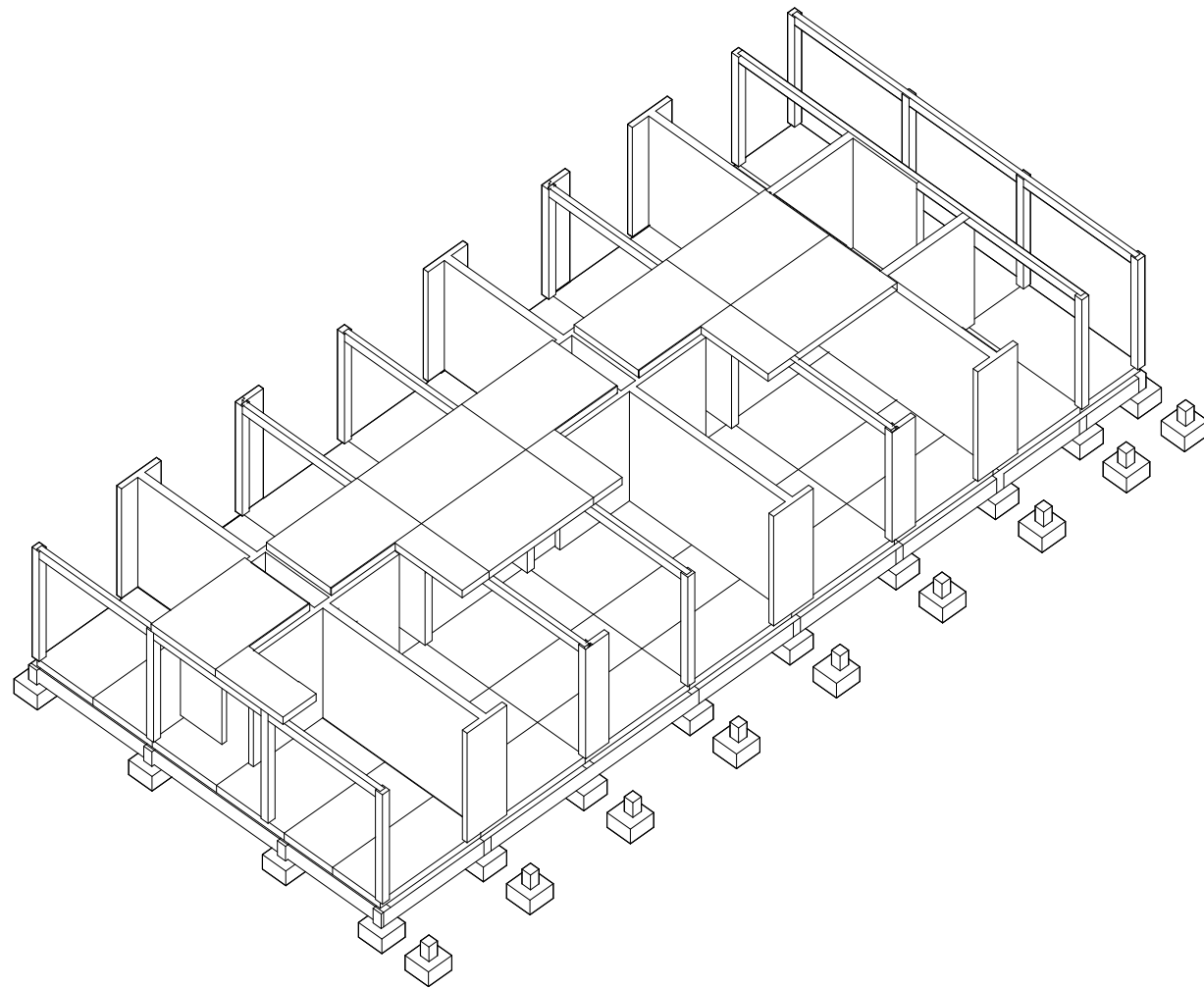
# Build-up sequence.



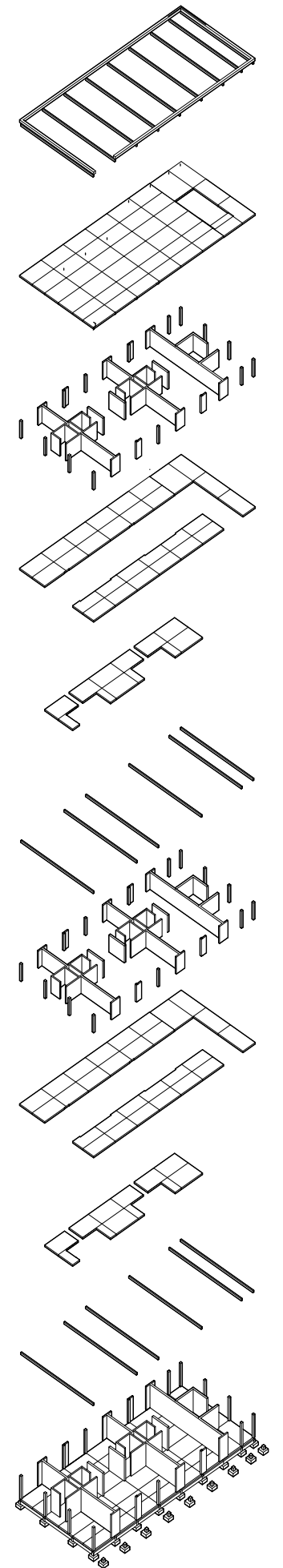
Glulam beam elements. Local Veluwe-larch.



## Build-up sequence.

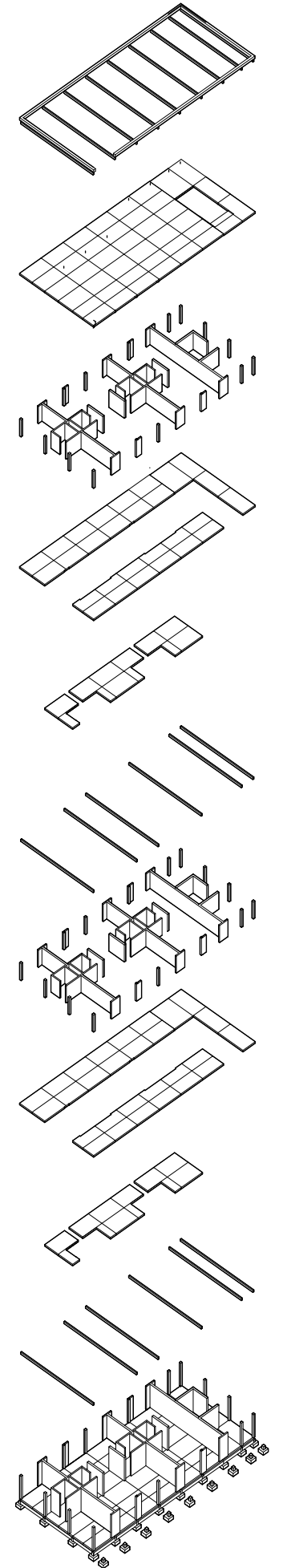
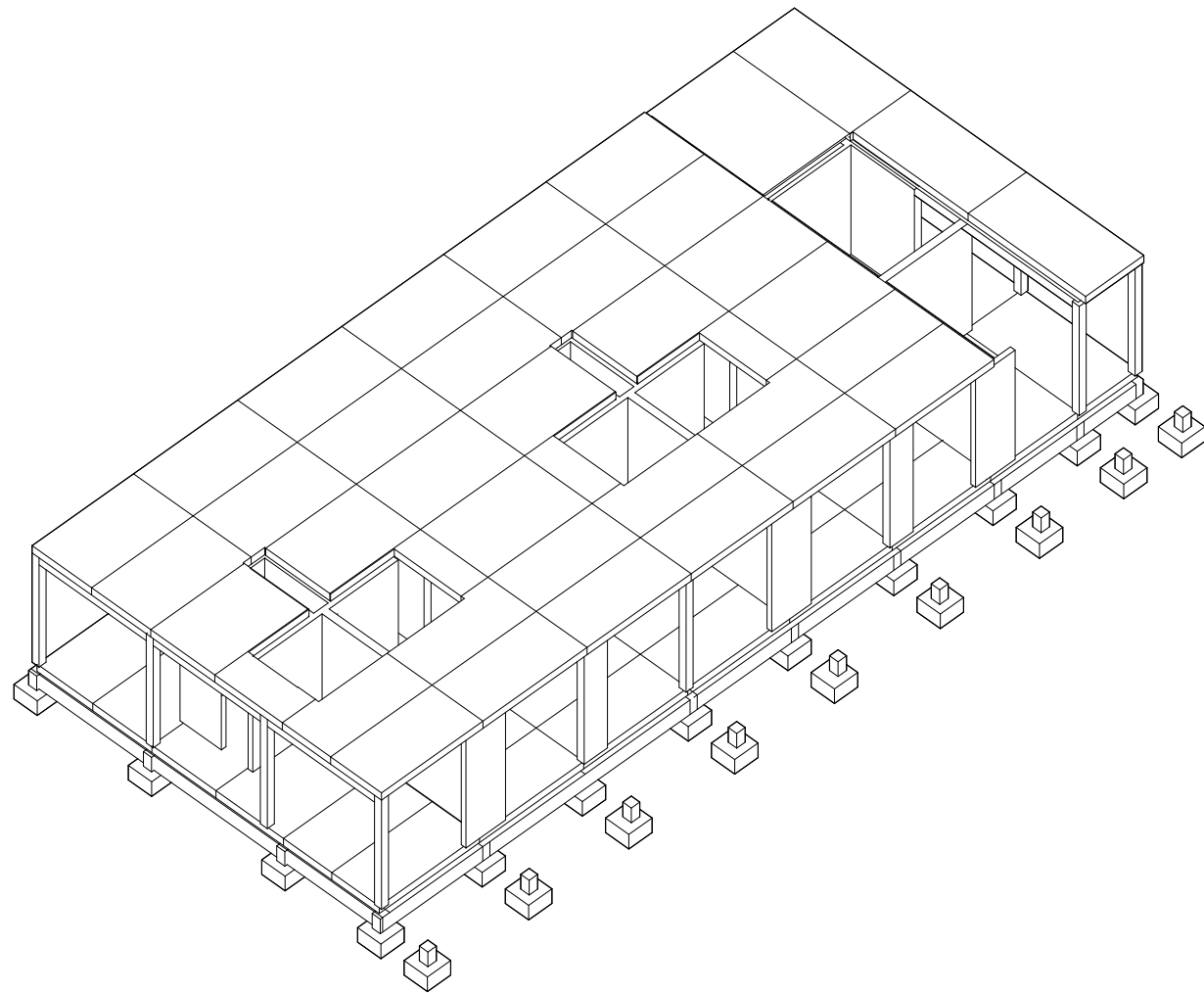


## Stiffening CLT slab elements. Local Veluwe-larch.





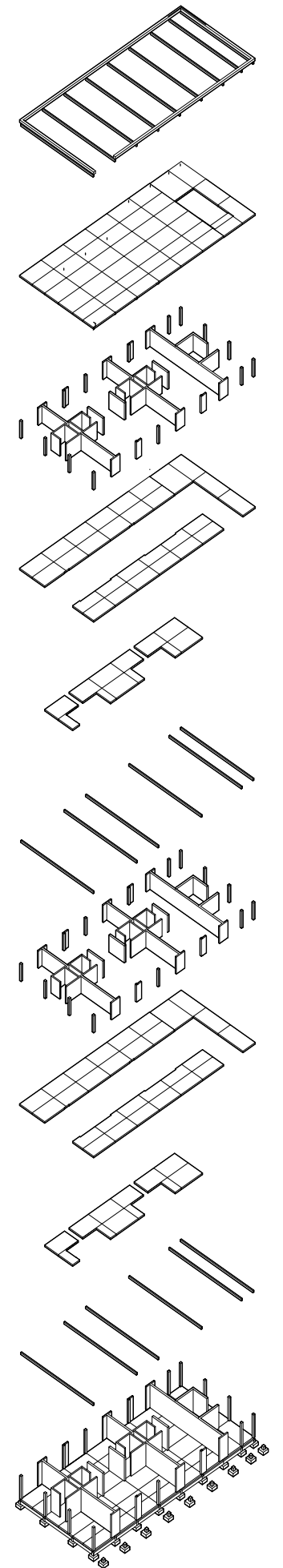
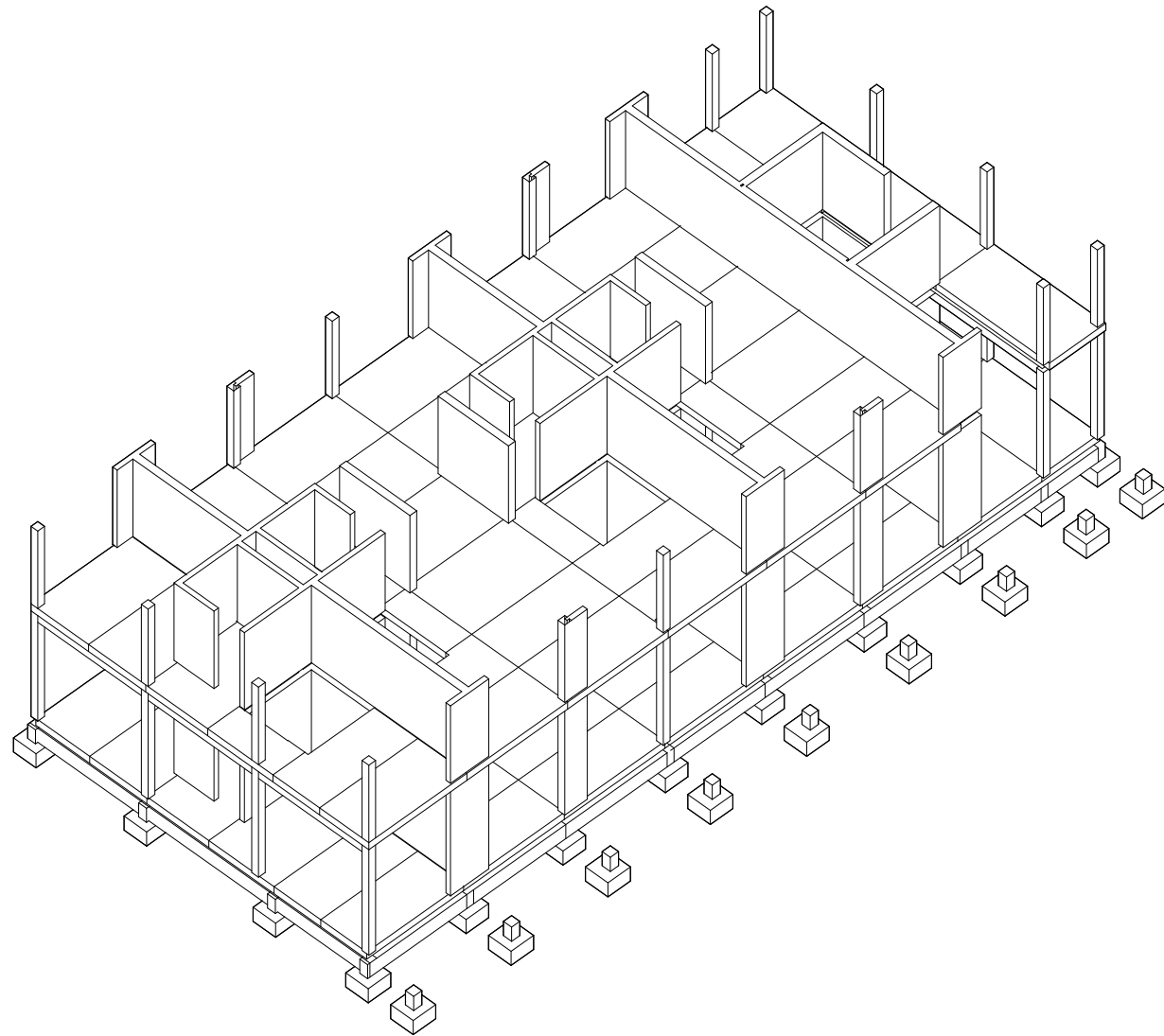
# Build-up sequence.



**Modular timber system floor. Lignotrend “Rippe”. Local Veluwe-larch.**



# Build-up sequence.



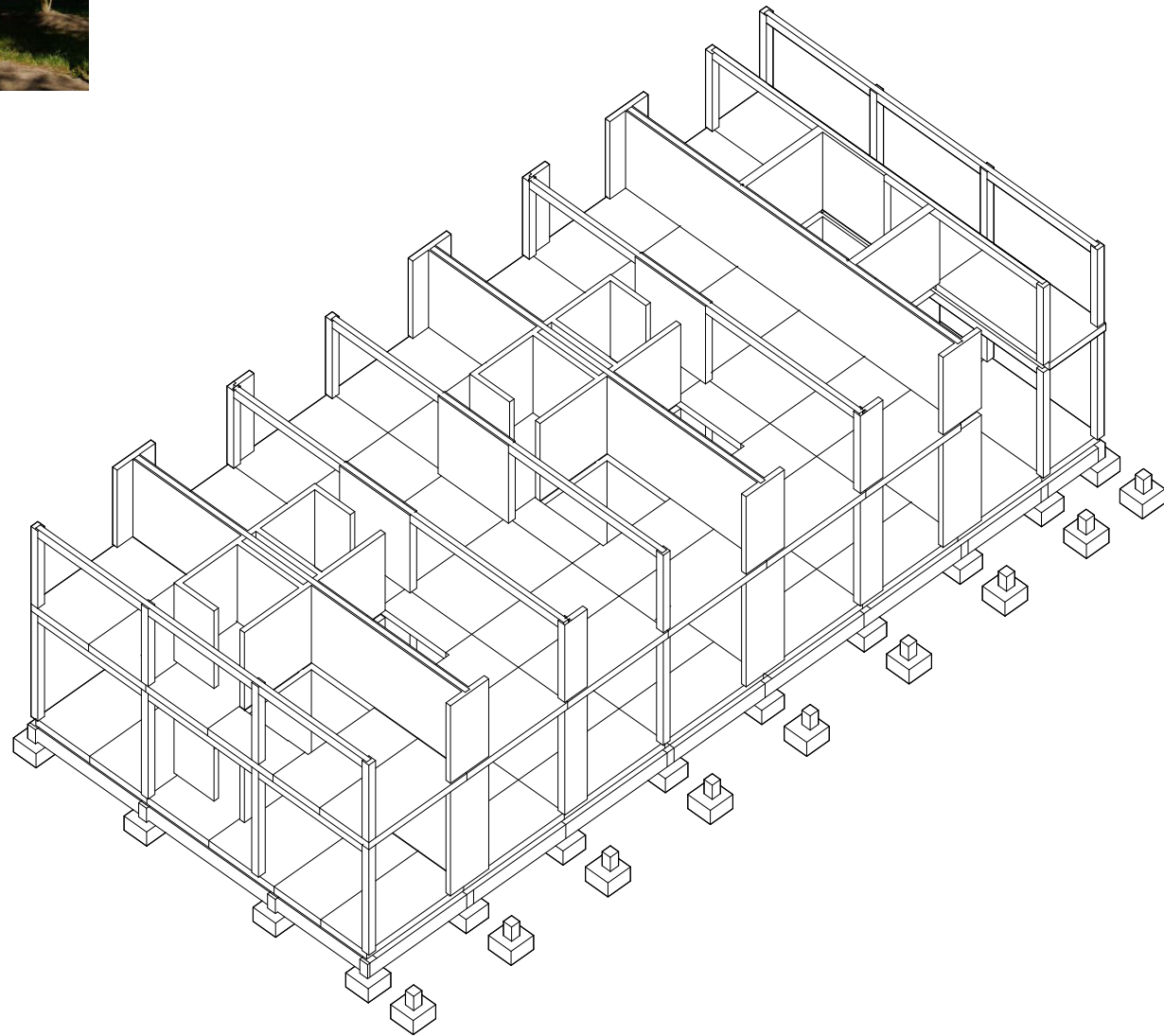
**Prefabricated Wet-cell modules + Post/ Shear wall elements.**  
**Local Veluwe-larch.**



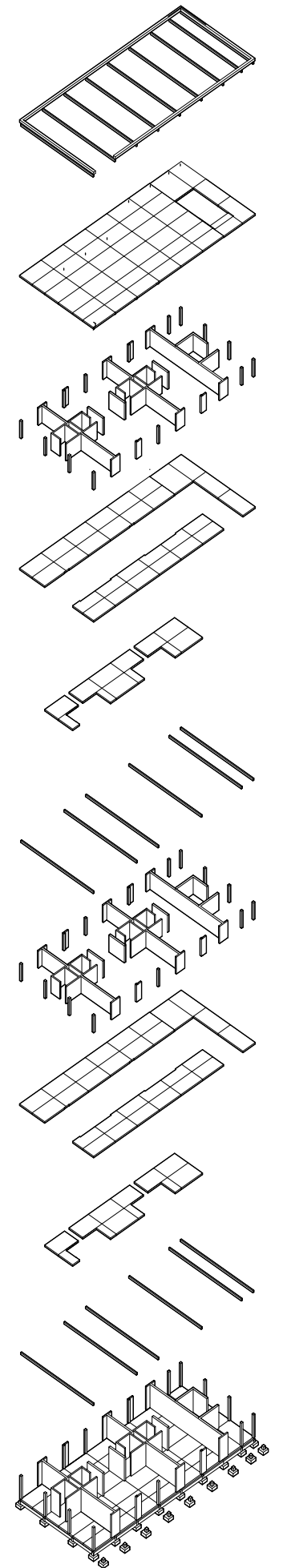
# Build-up sequence.



**Local!**

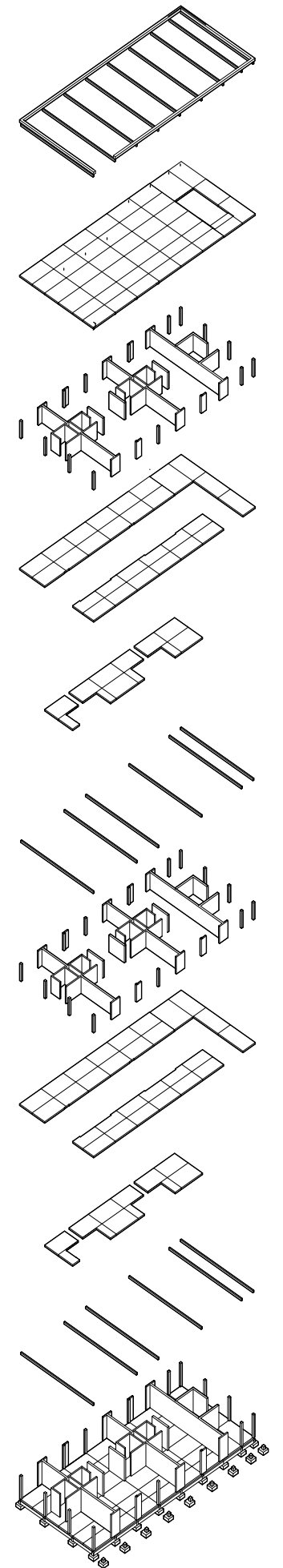
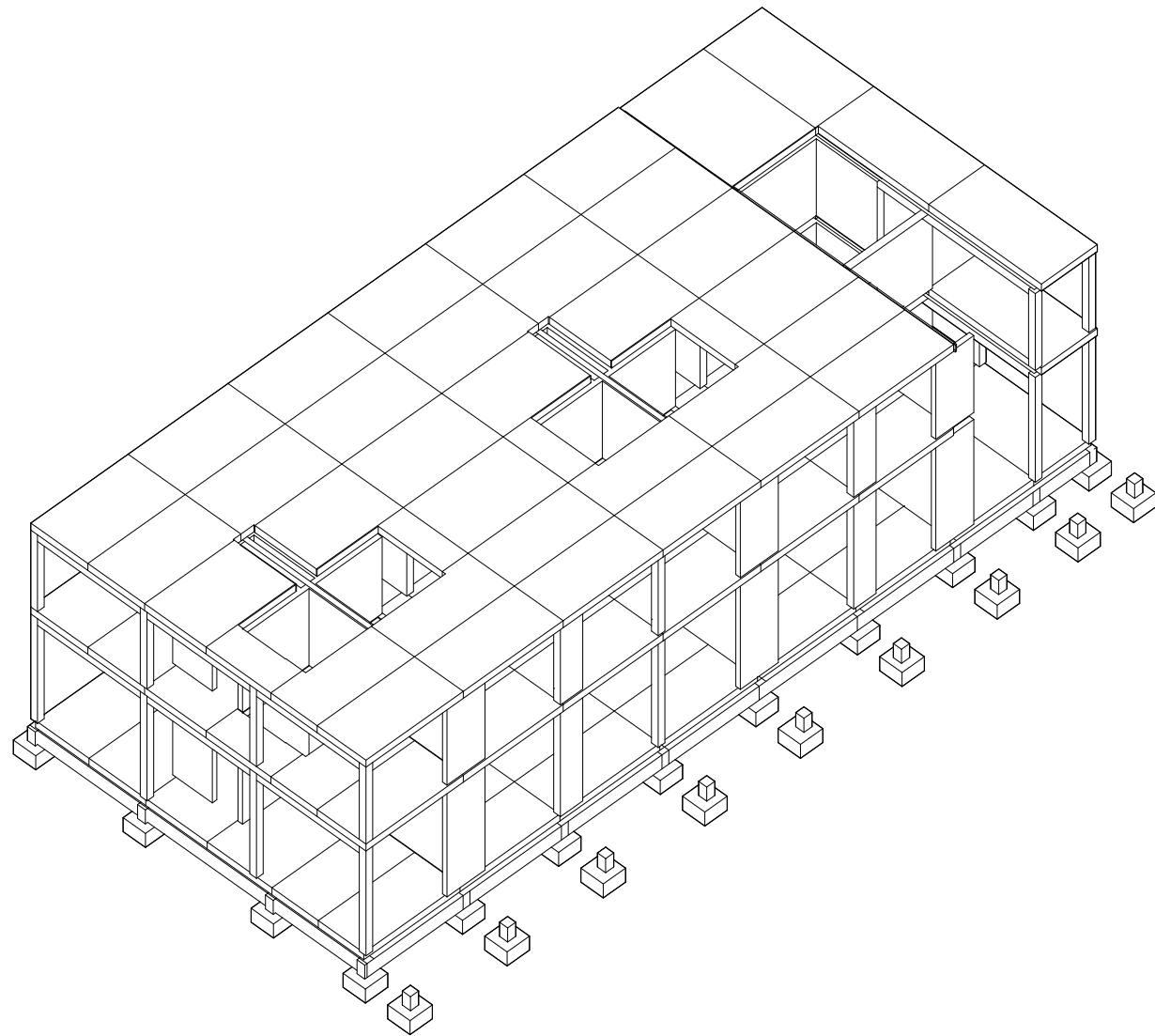


Glulam beam elements. Local Veluwe-larch.





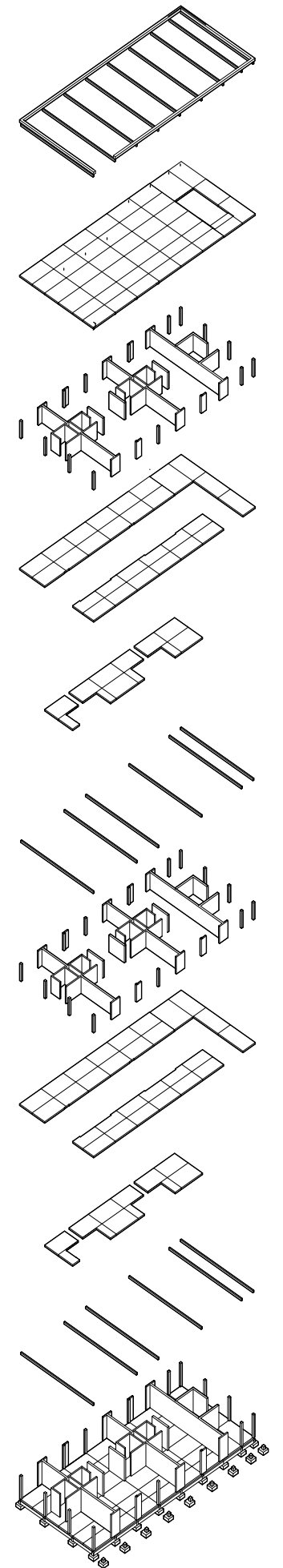
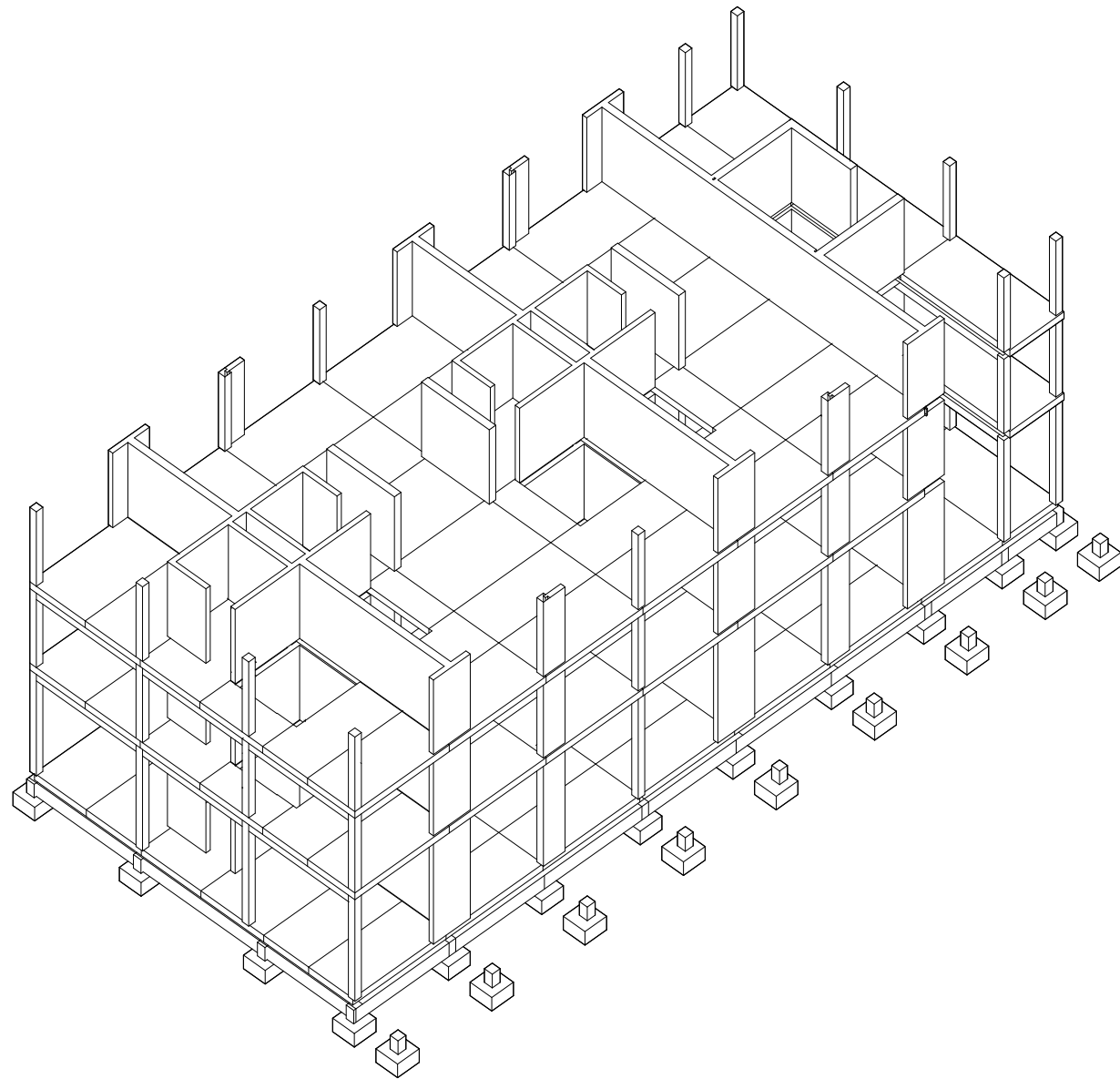
## Build-up sequence.



**Modular timber system floor. Lignotrend "Rippe". Local Veluwe-larch.**



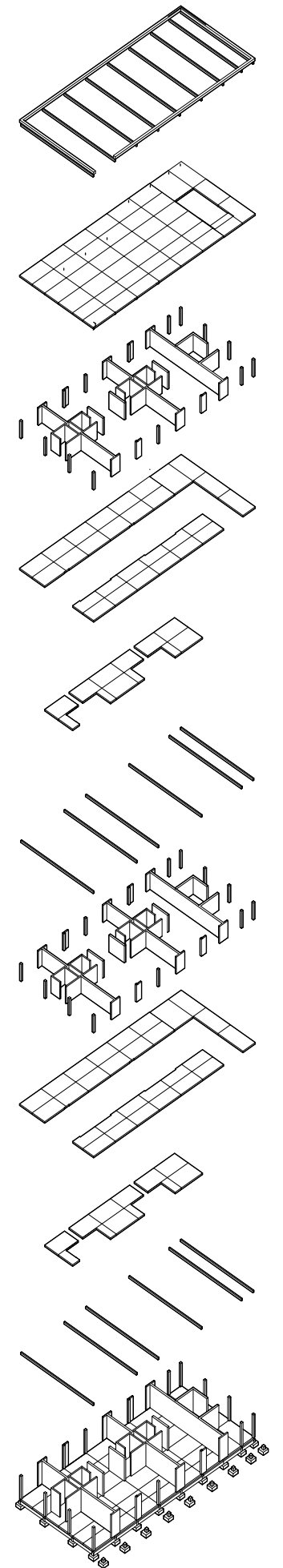
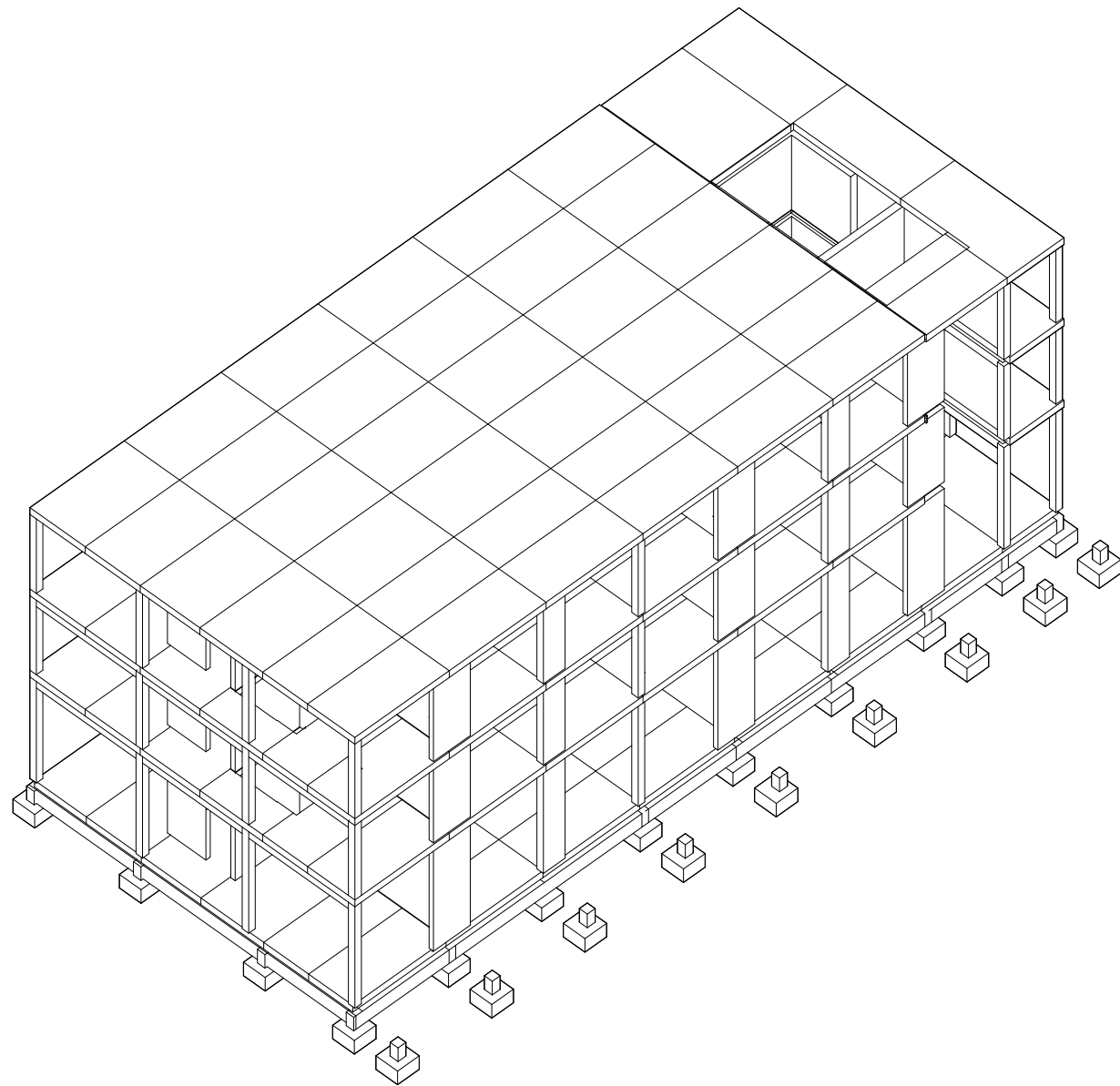
# Build-up sequence.



**Prefabricated Wet-cell modules + Post/ Shear wall elements.**  
**Local Veluwe-larch.**



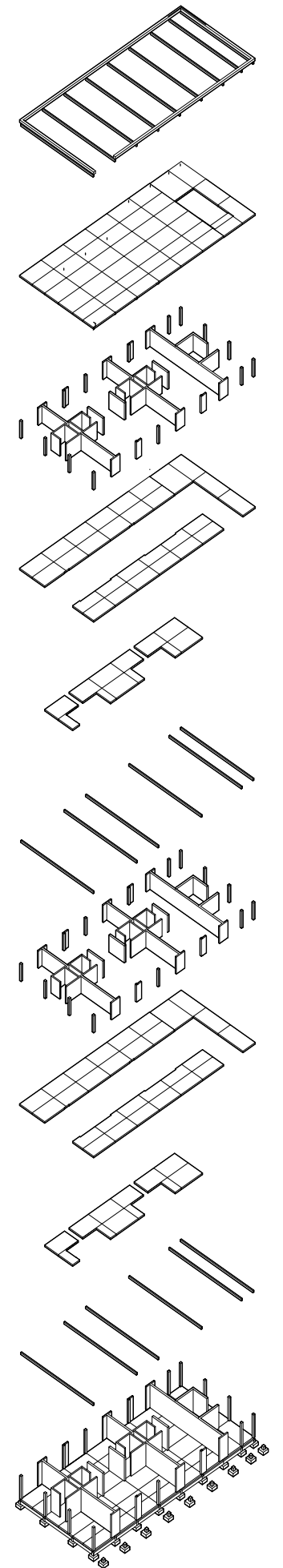
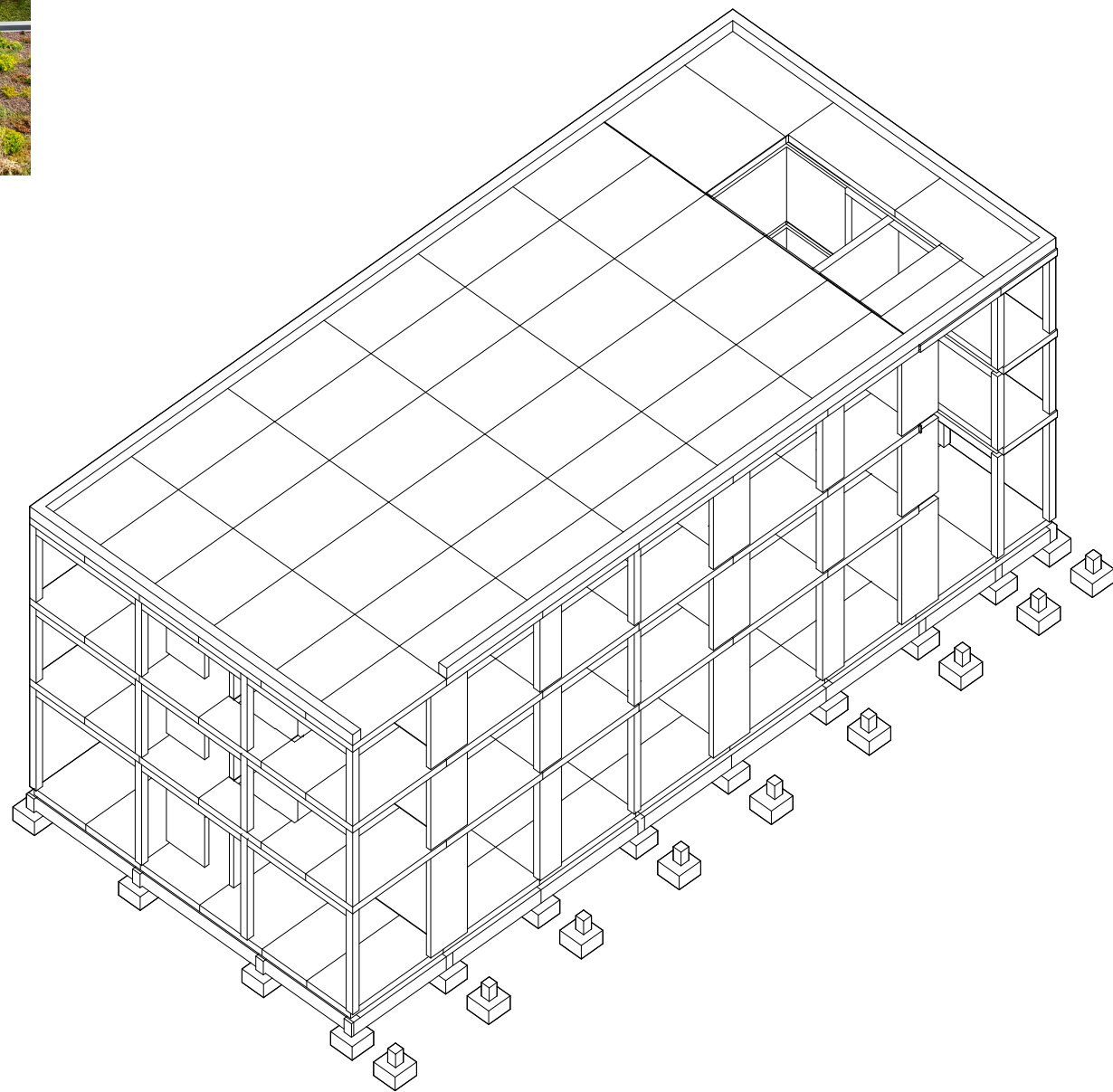
# Build-up sequence.



Modular timber roof slabs. Lignotrend "Rippe". Local Veluwe-larch.



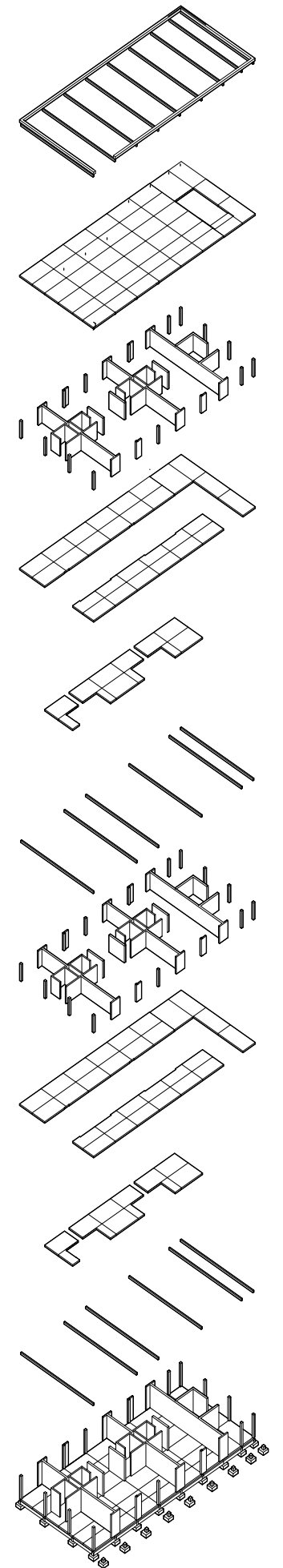
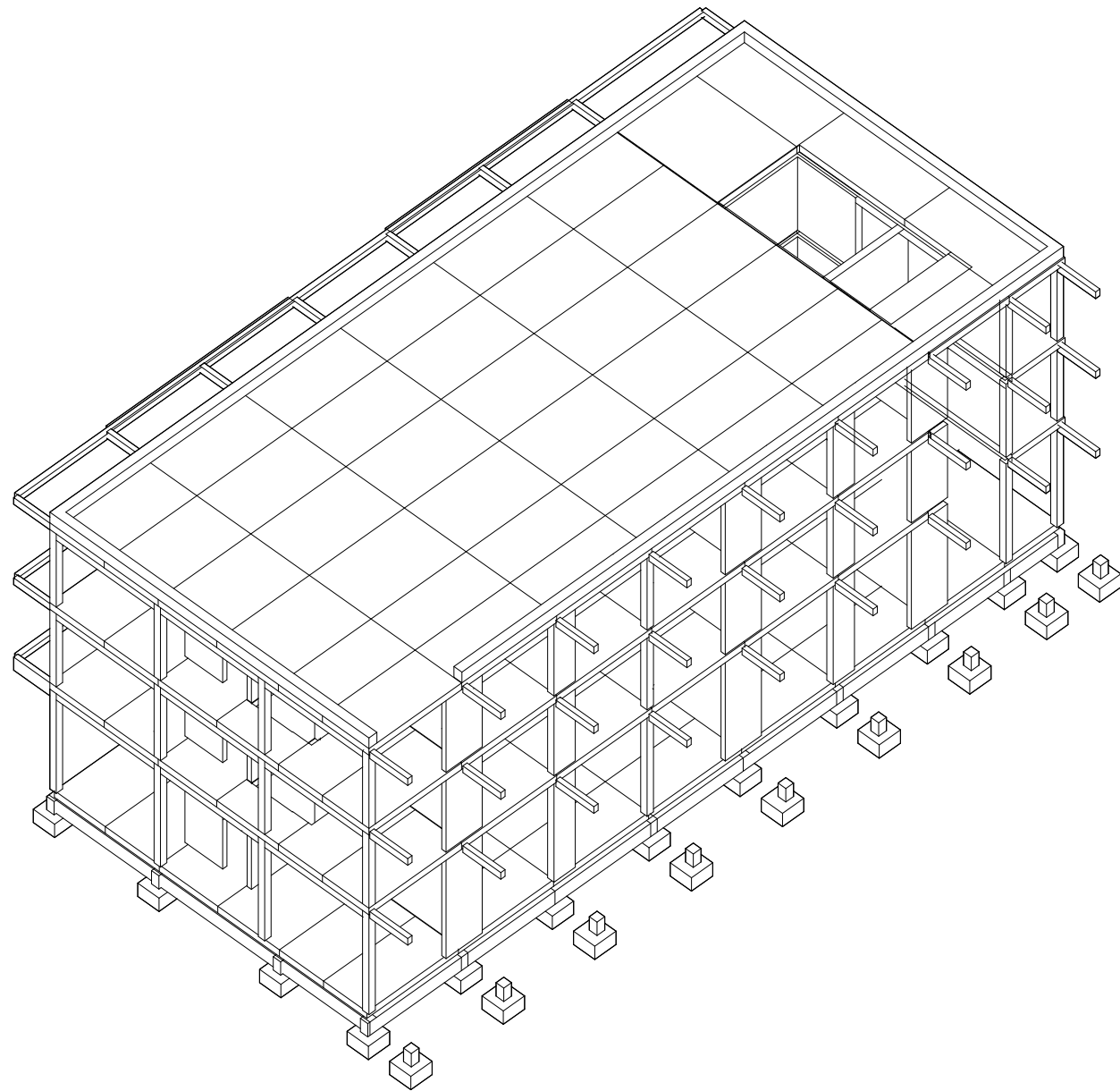
# Build-up sequence.



Green roof on circular bitumen sheeting (Citumen). Soil from site, Citumen.



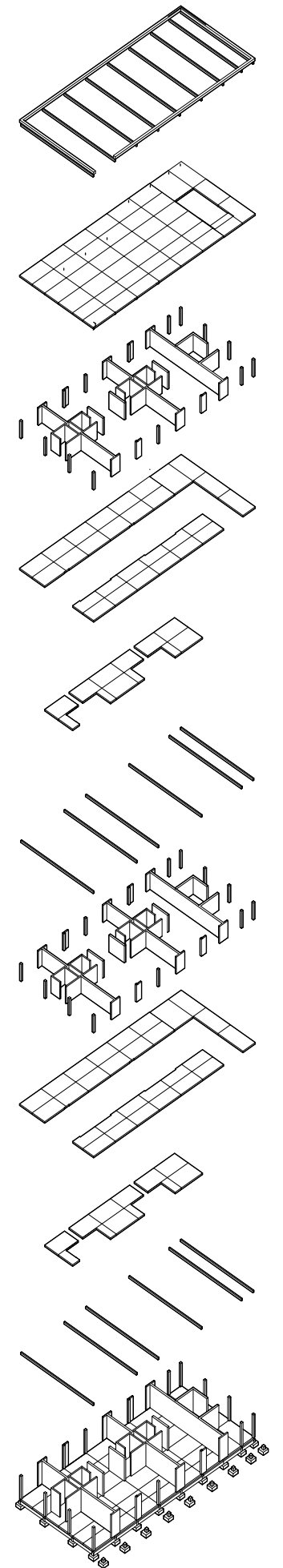
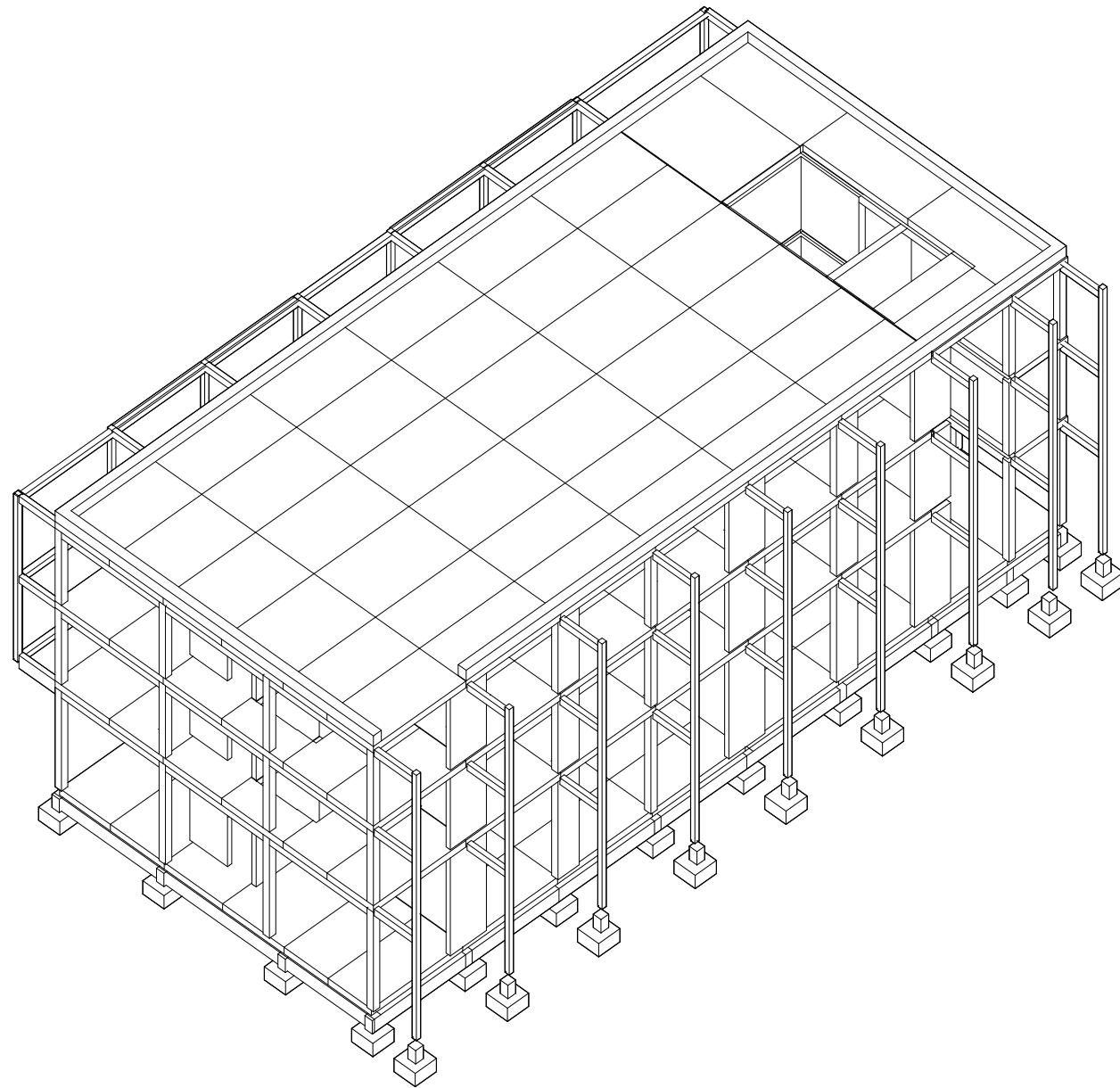
# Build-up sequence.



Glulam beams/ cantilevers. Local Veluwe larch.



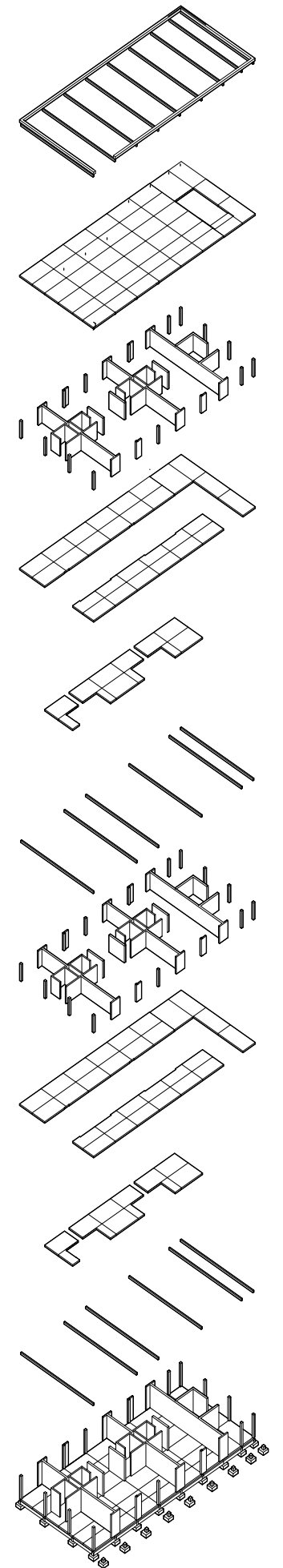
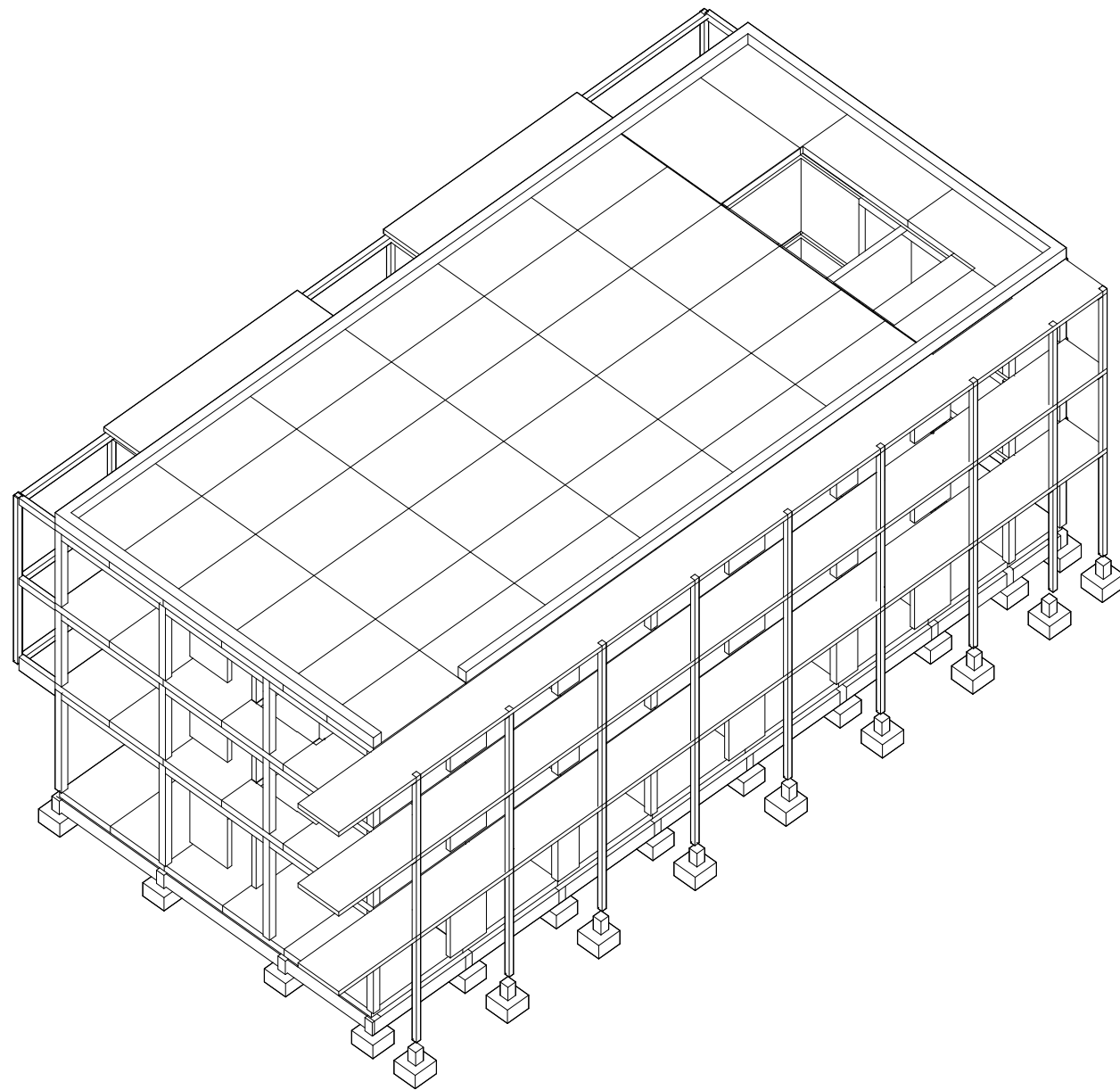
# Build-up sequence.



Glulam beams. Local Veluwe larch.



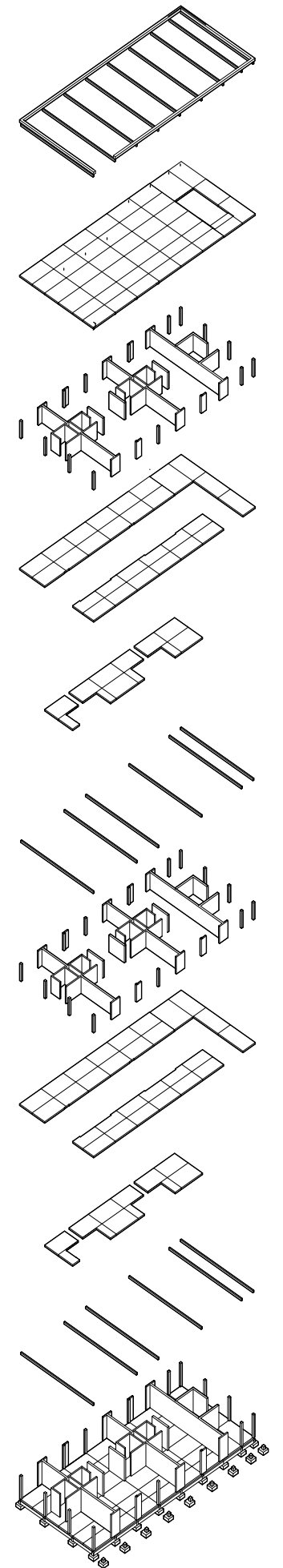
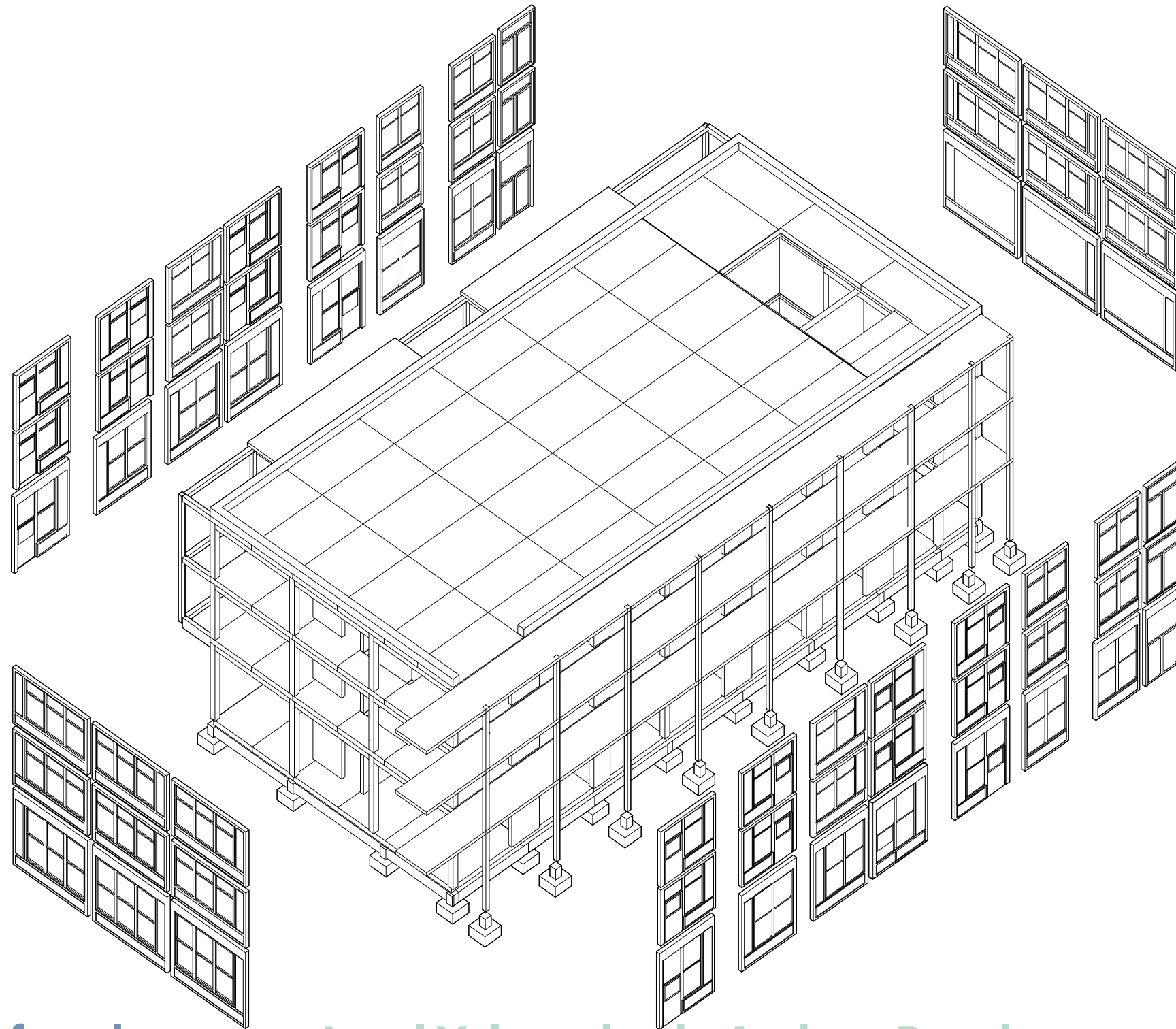
# Build-up sequence.



CLT balcony slabs, terrace board decking. Local Veluwe larch.



# Build-up sequence.



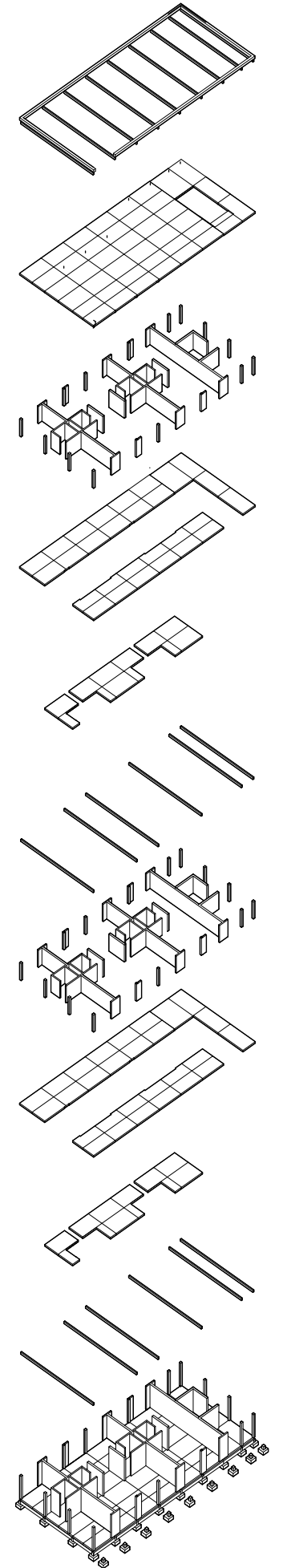
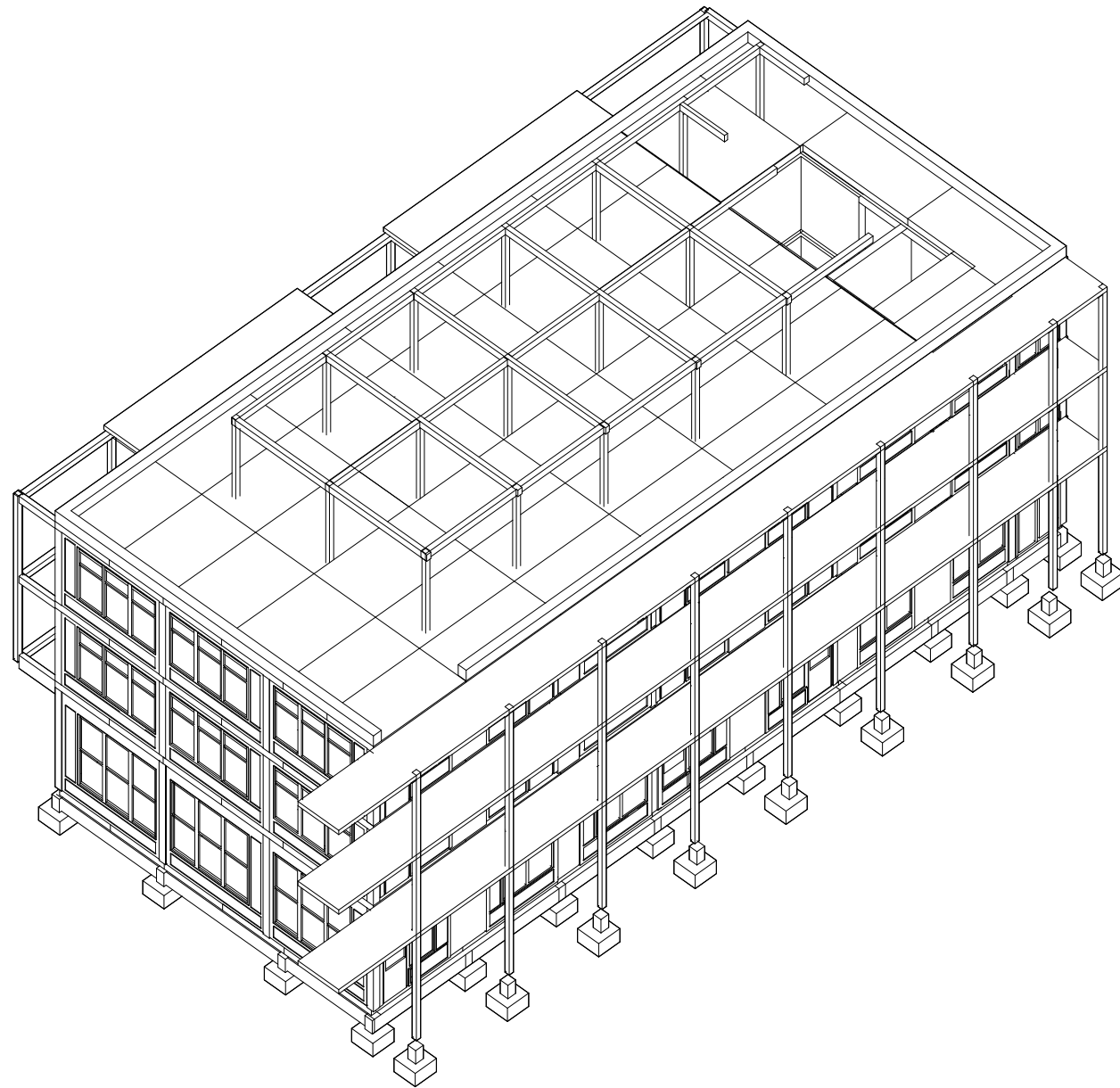
**Modular facade system.** Local Veluwe larch, Arnhem Populus.  
(Robotically) recovered window glass.



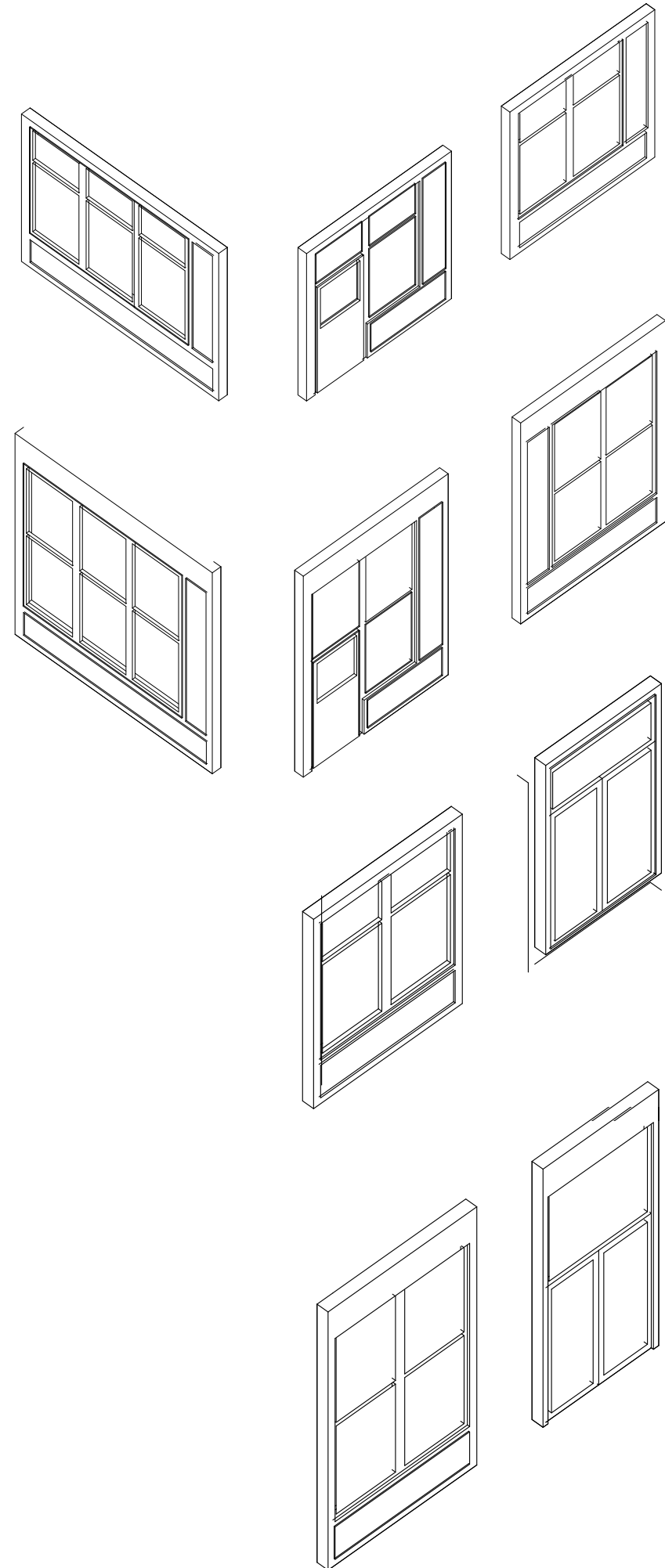
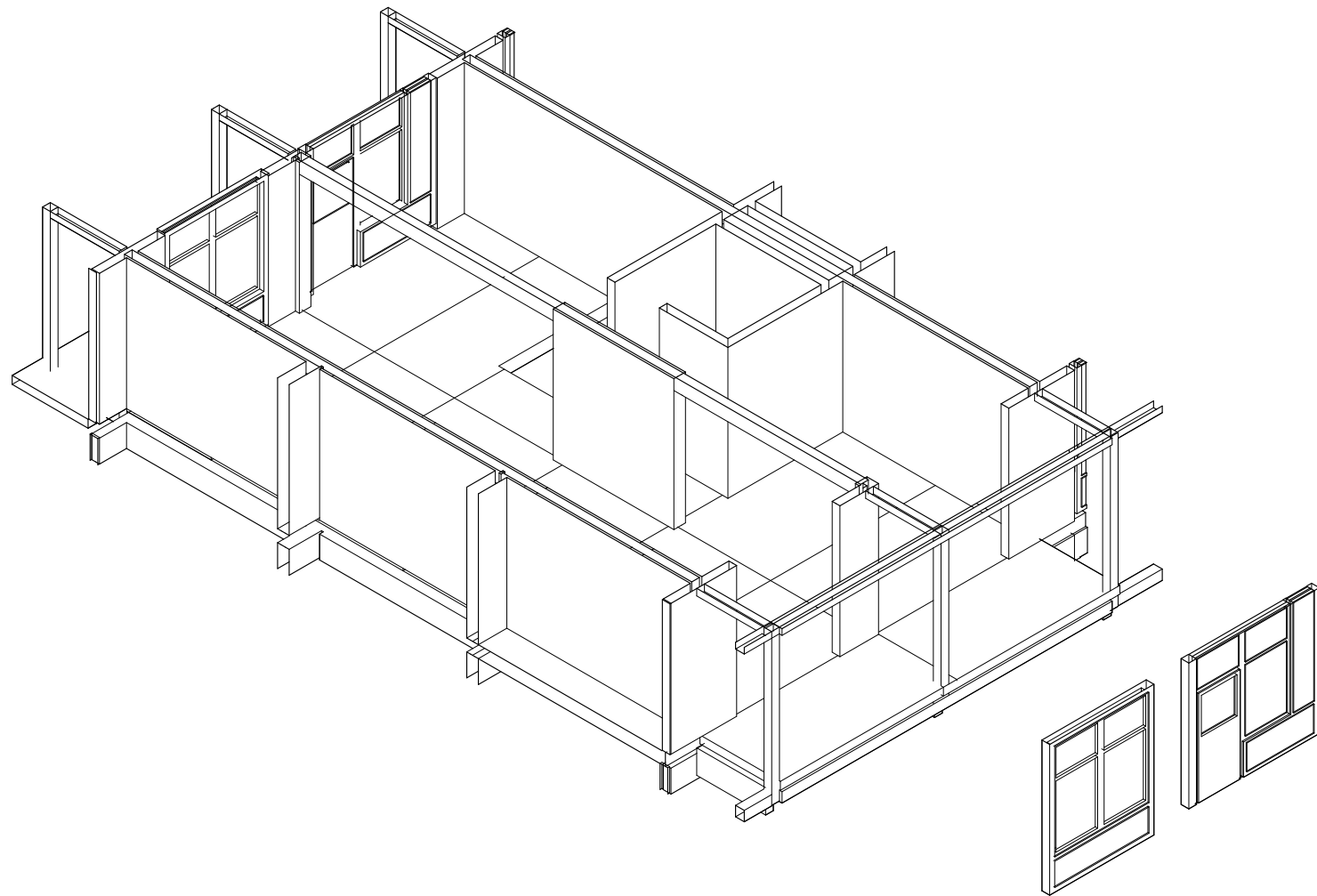


# Base building.

Achieve "Climate-tightness"

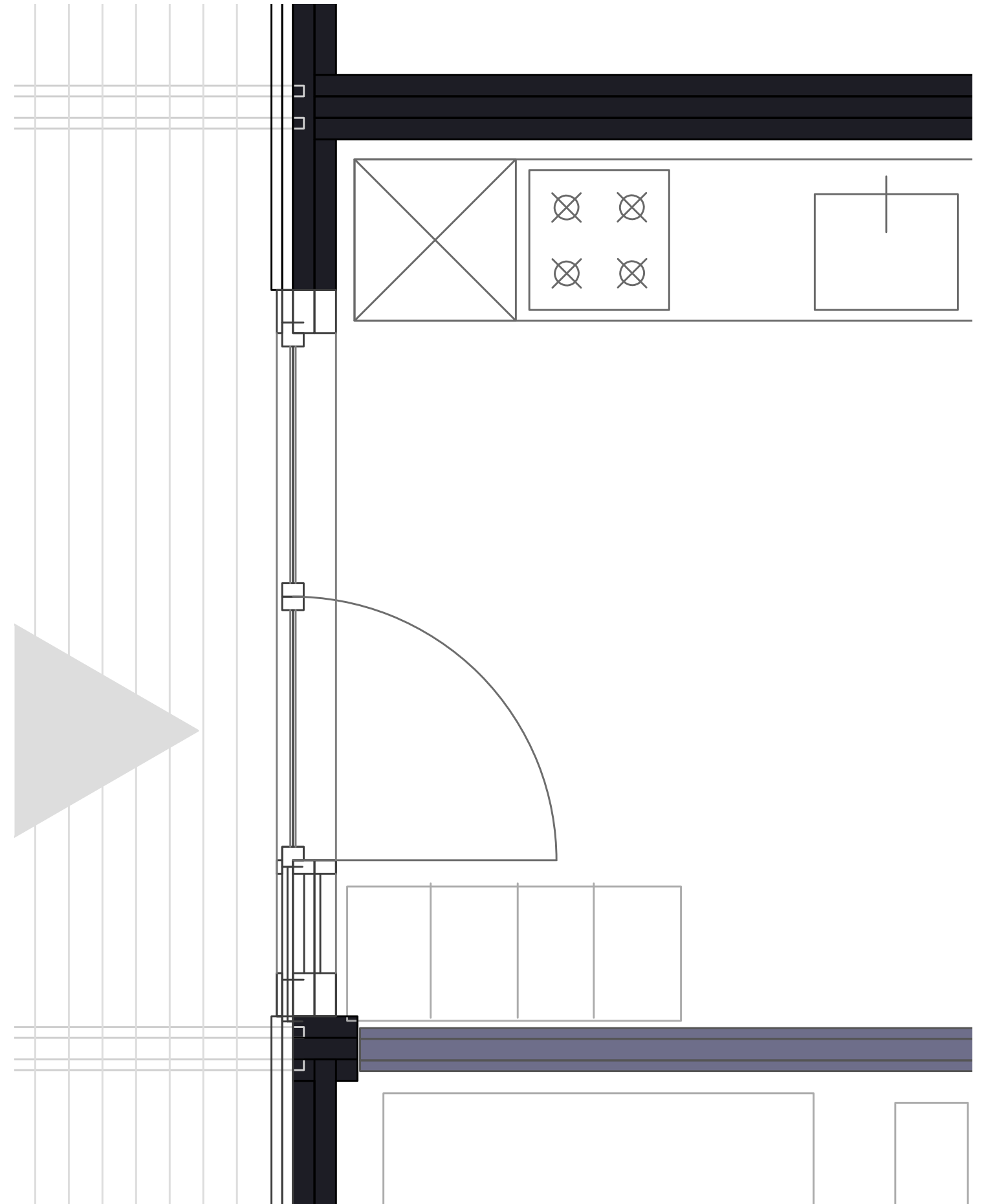
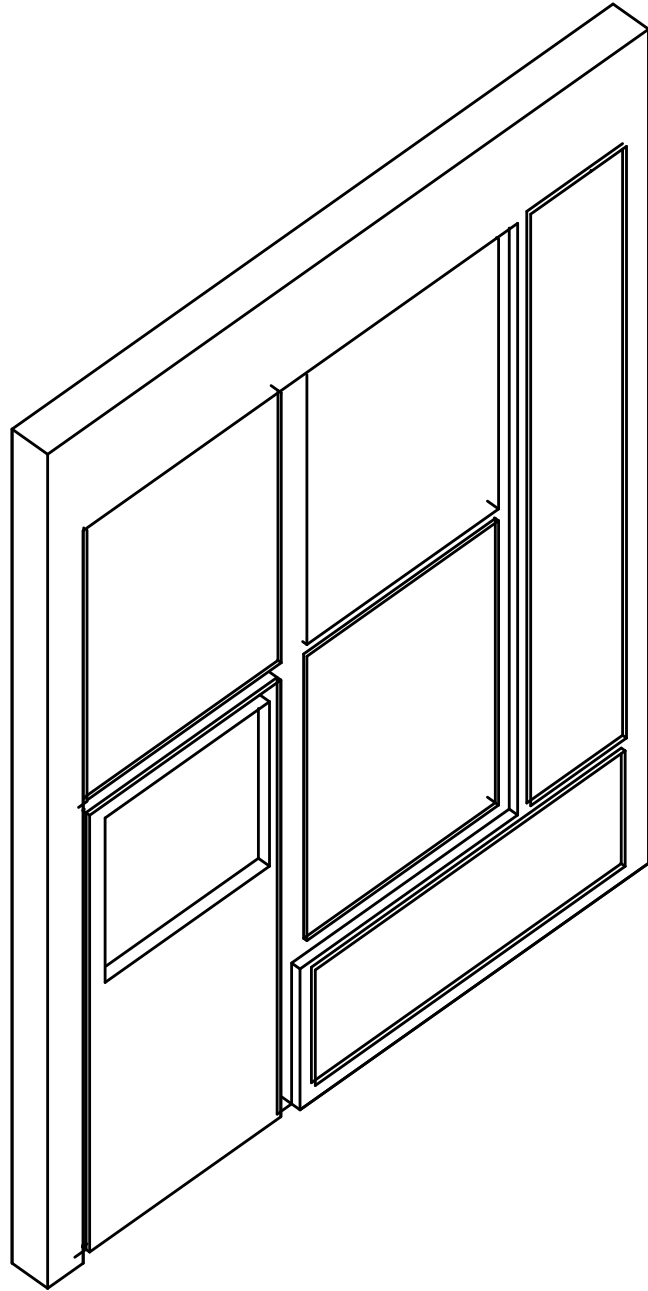


# Modular facade.

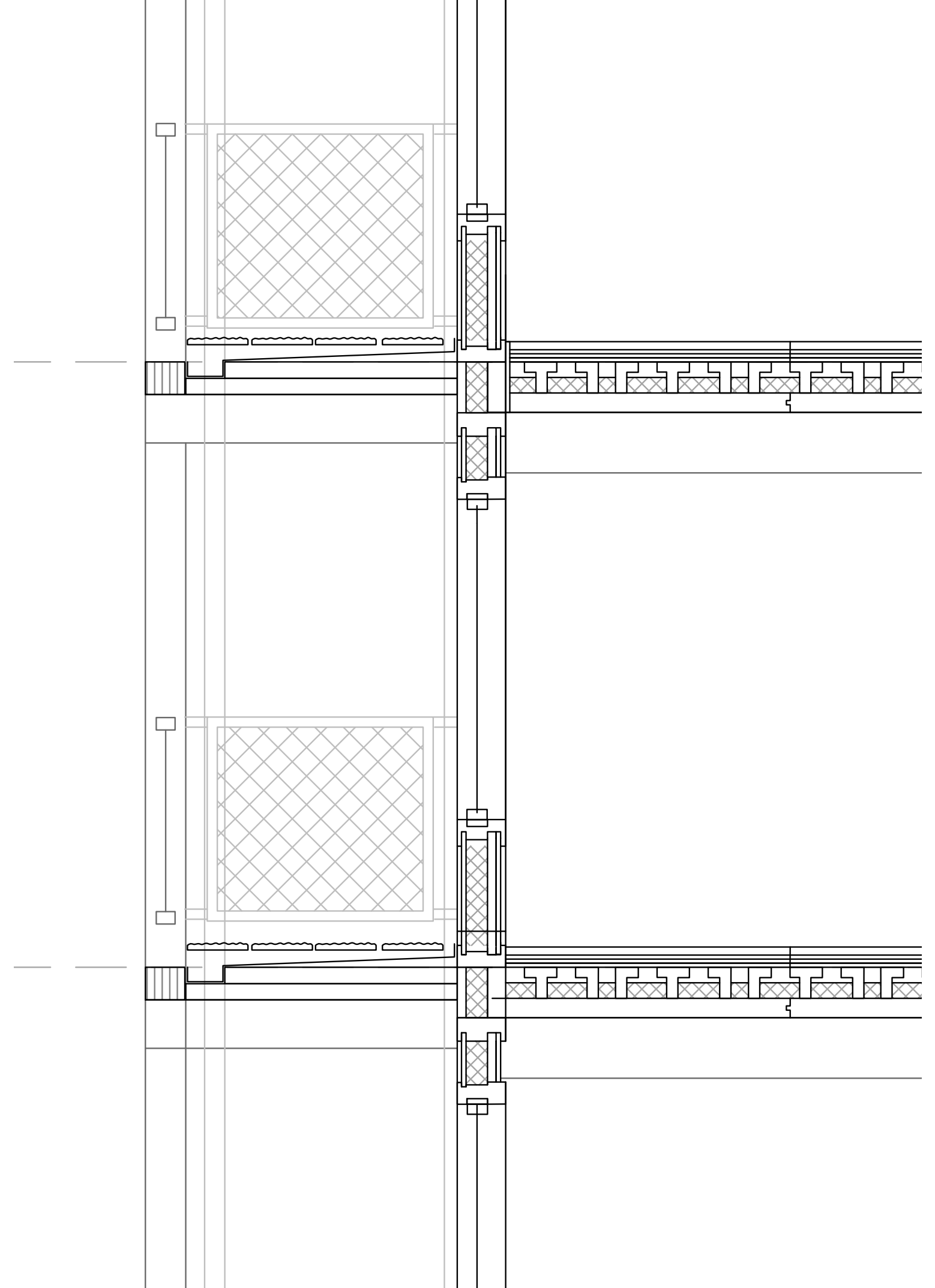
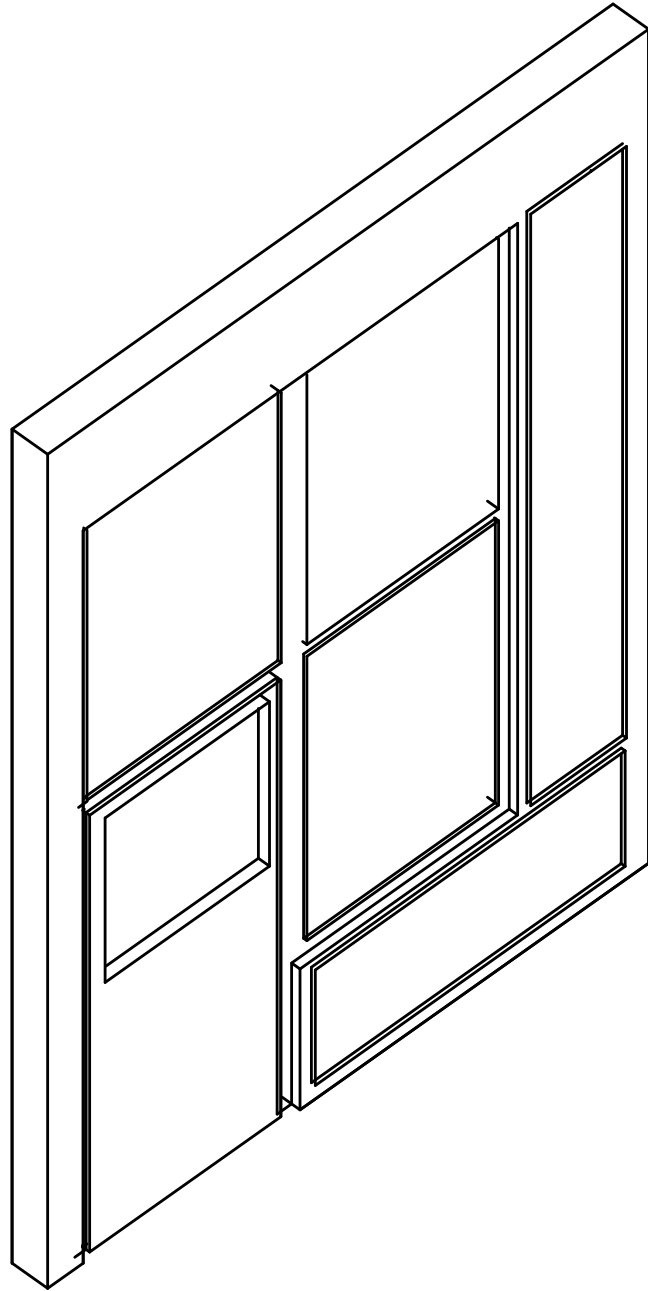




# Modular facade.

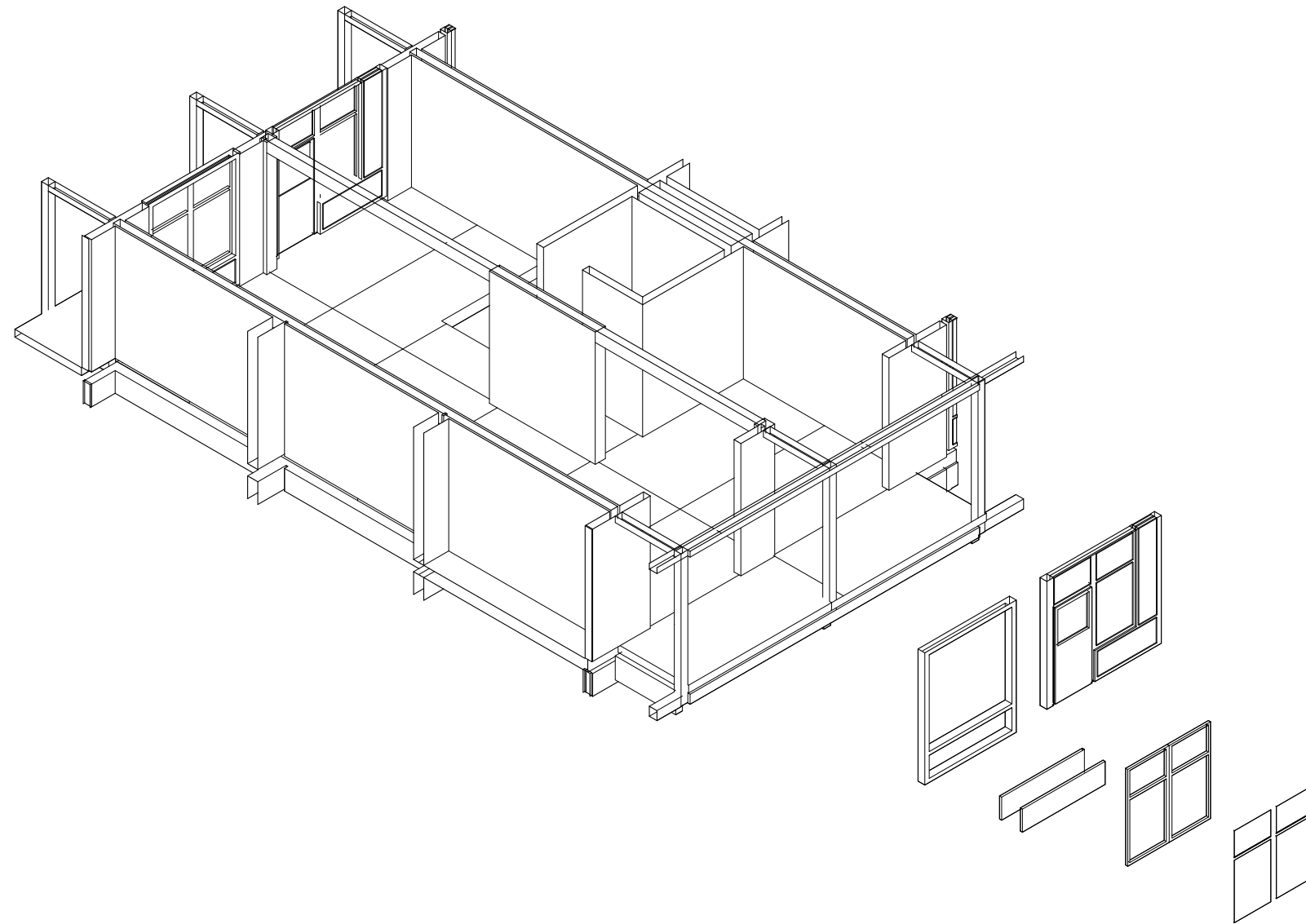


# Modular facade.

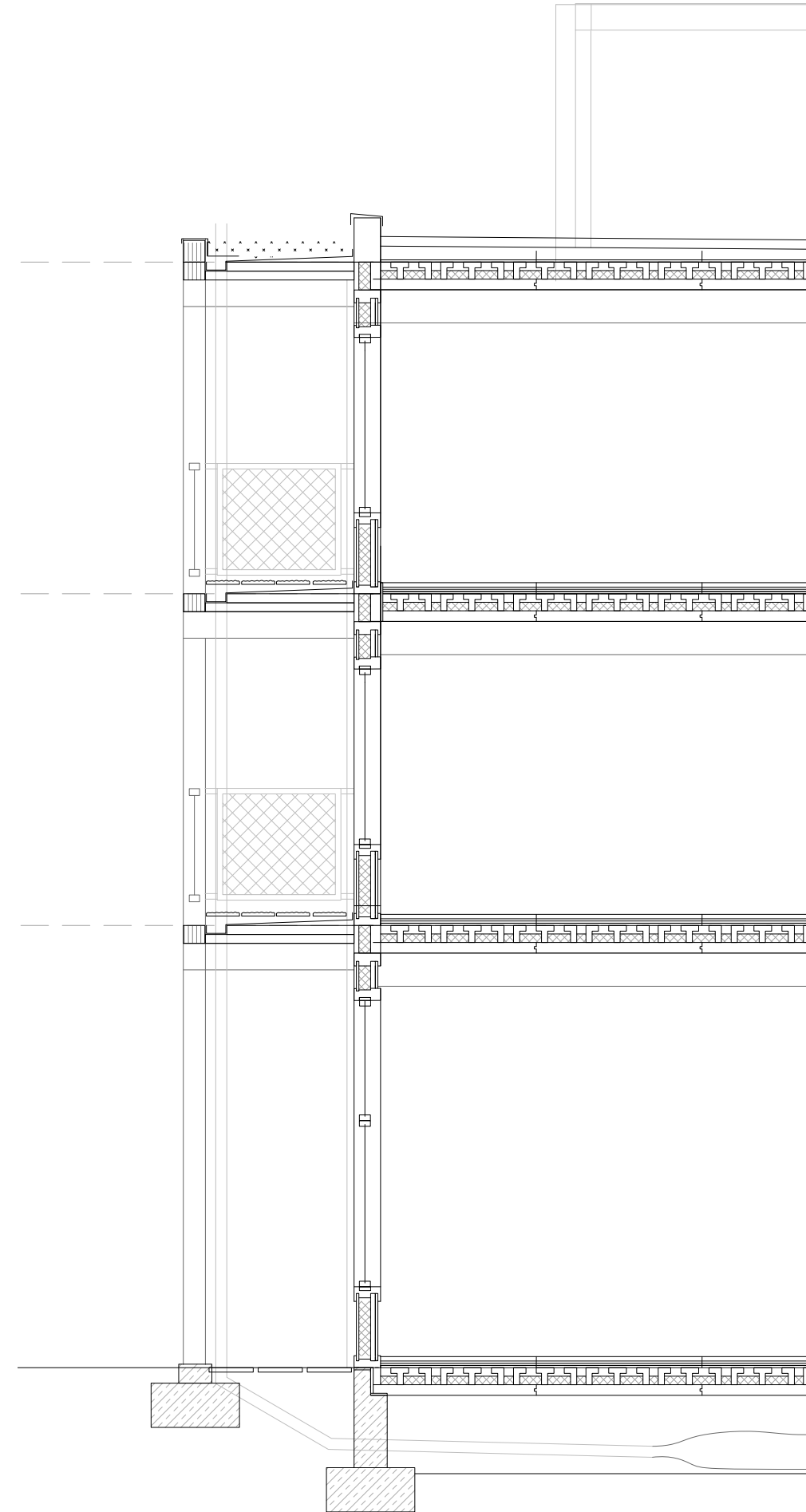
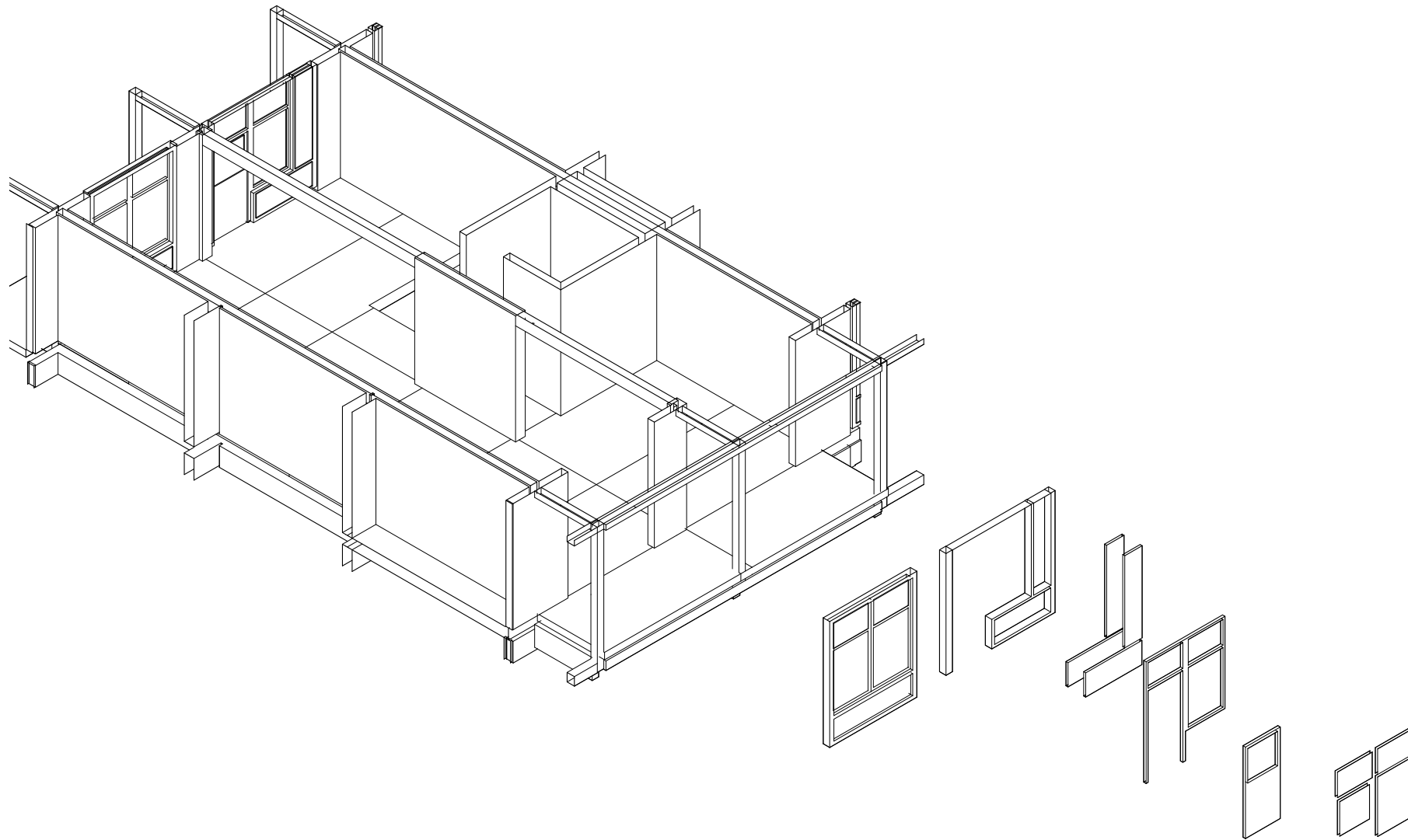




# Modular facade.

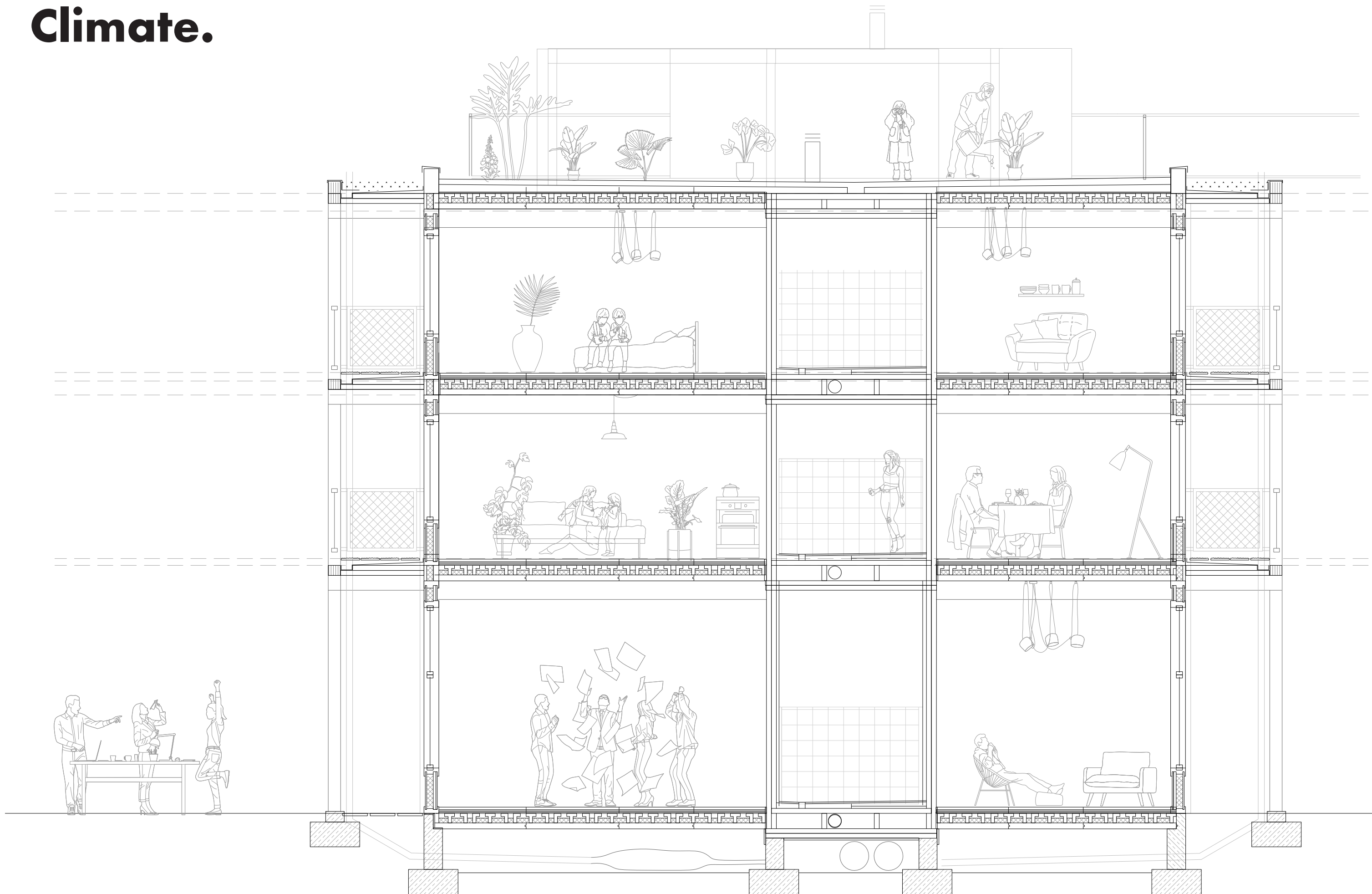


# Modular facade.





# Climate.



# Climate.

Summer.

PV panels on pergolas

Green roof prevents heat island effect

Arcades and balconies provide natural shading.

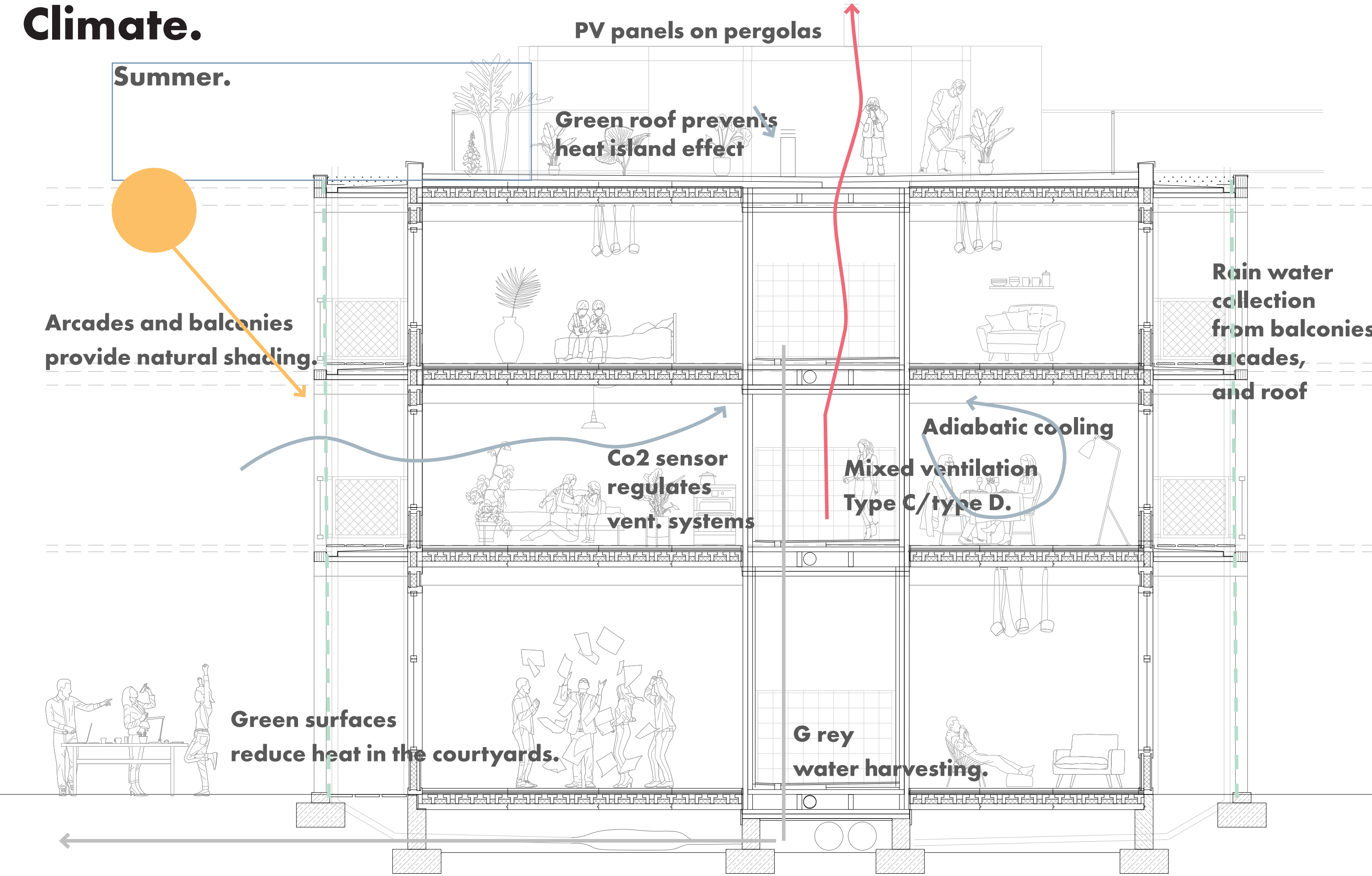
Rain water collection from balconies, arcades, and roof

Co2 sensor regulates vent. systems

Adiabatic cooling  
Mixed ventilation Type C/type D.

Green surfaces reduce heat in the courtyards.

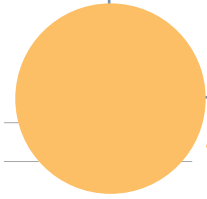
Grey water harvesting.





# Climate.

Winter.



Sun enters deeper into rooms.

PV panels on pergolas

Green roof lowers heat loss.

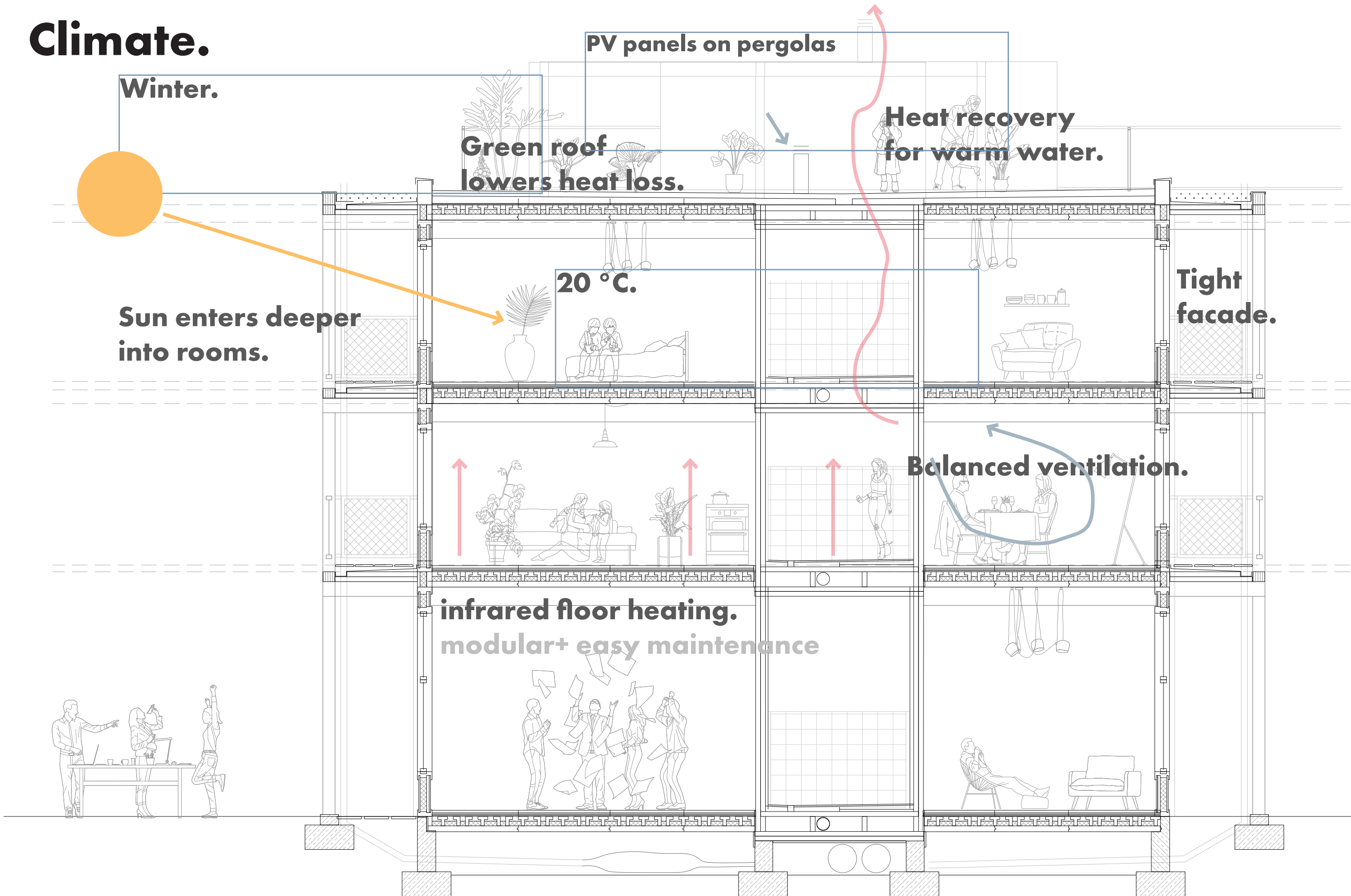
Heat recovery for warm water.

20 °C.

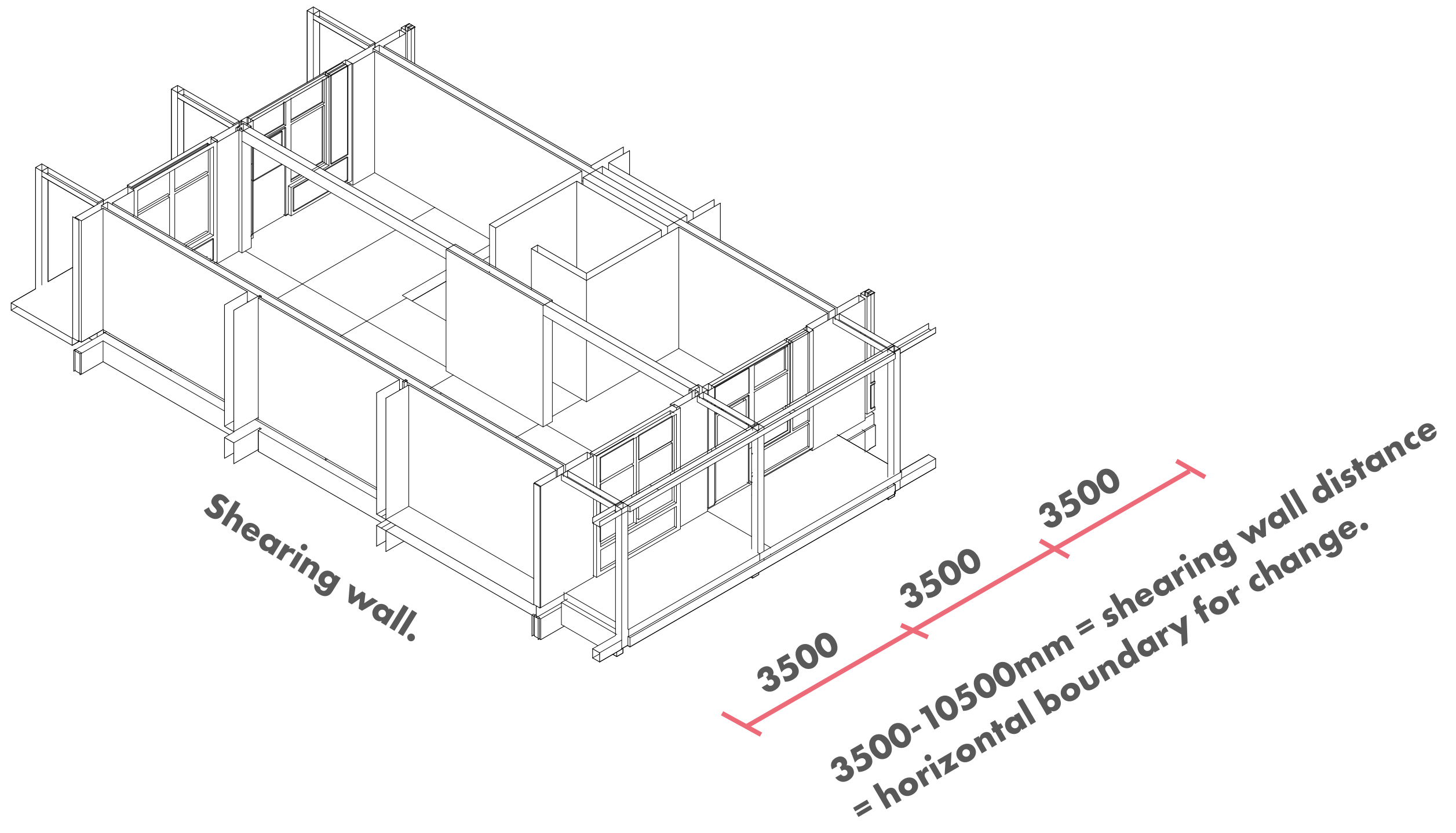
Tight facade.

Balanced ventilation.

infrared floor heating.  
modular+ easy maintenance

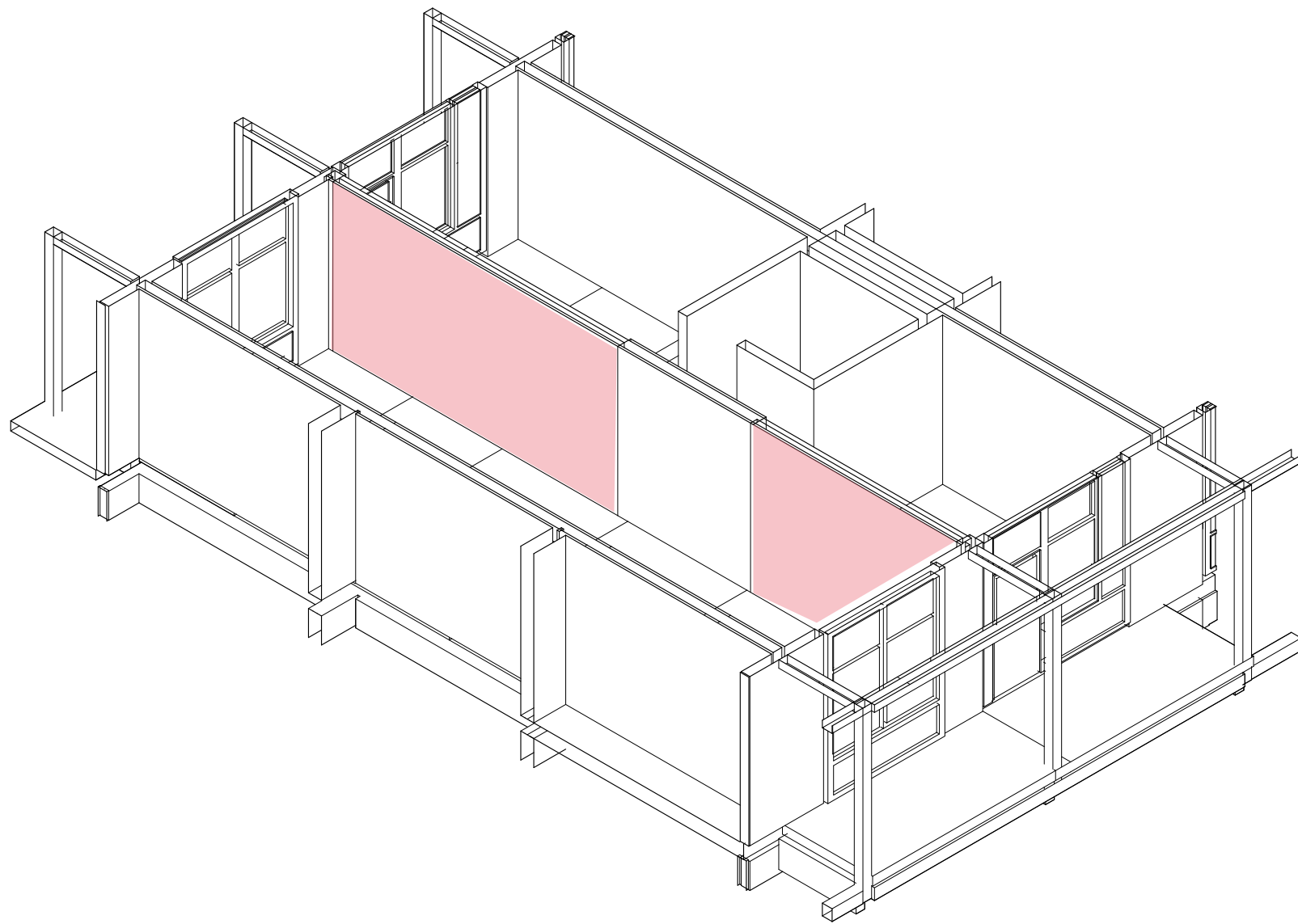


# Flexible apartments.

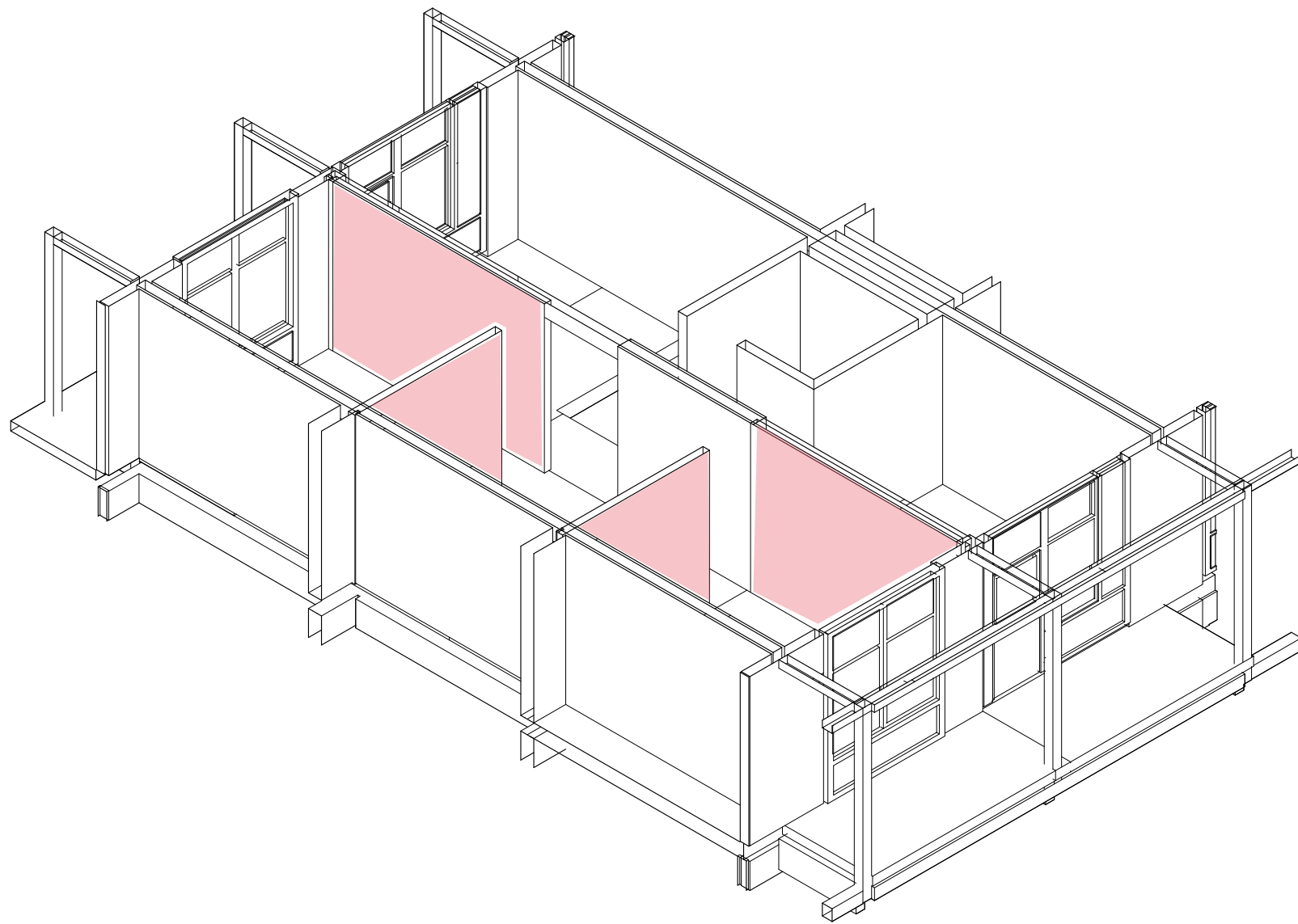




# Flexible apartments.

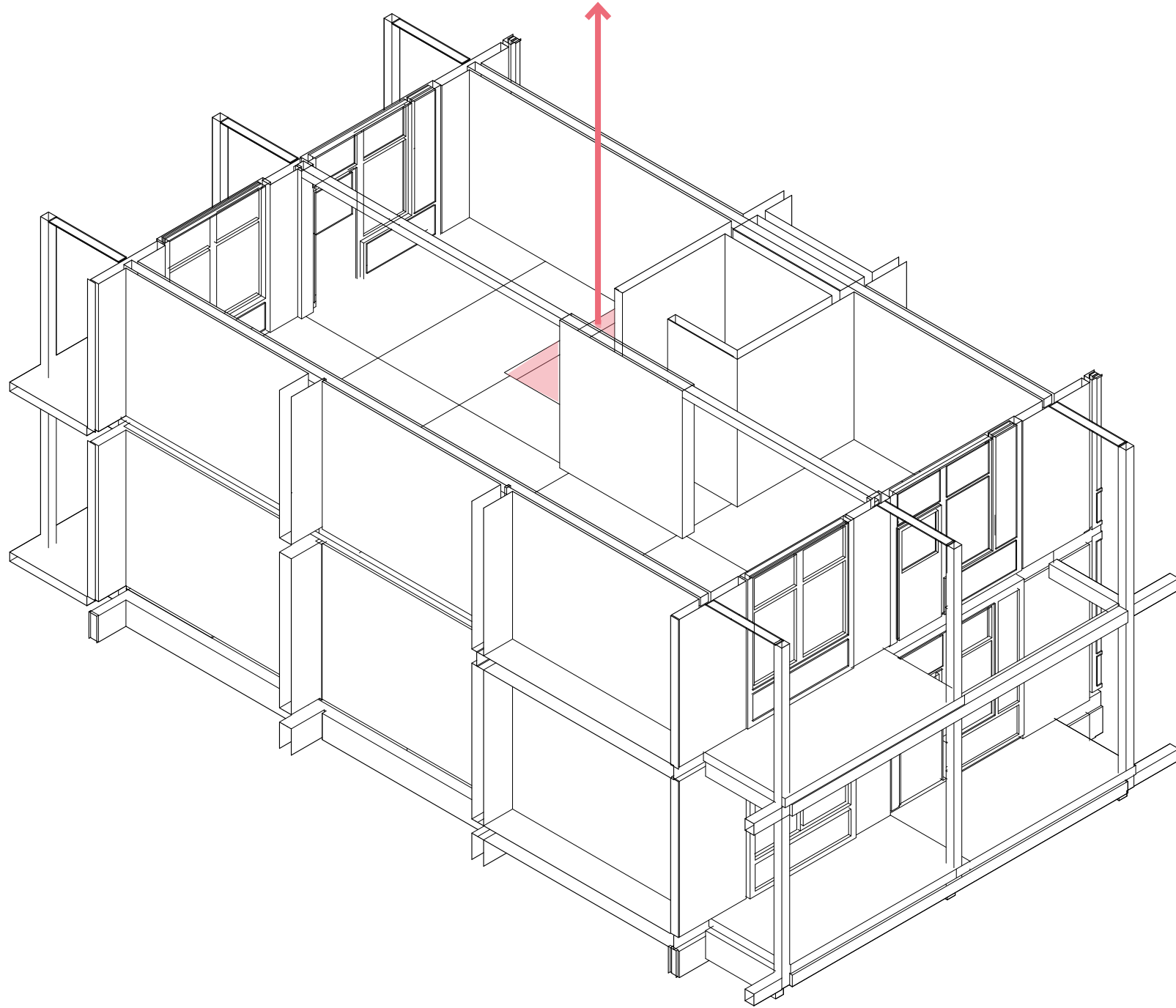


# Flexible interior walls.





# Flexible interior walls.





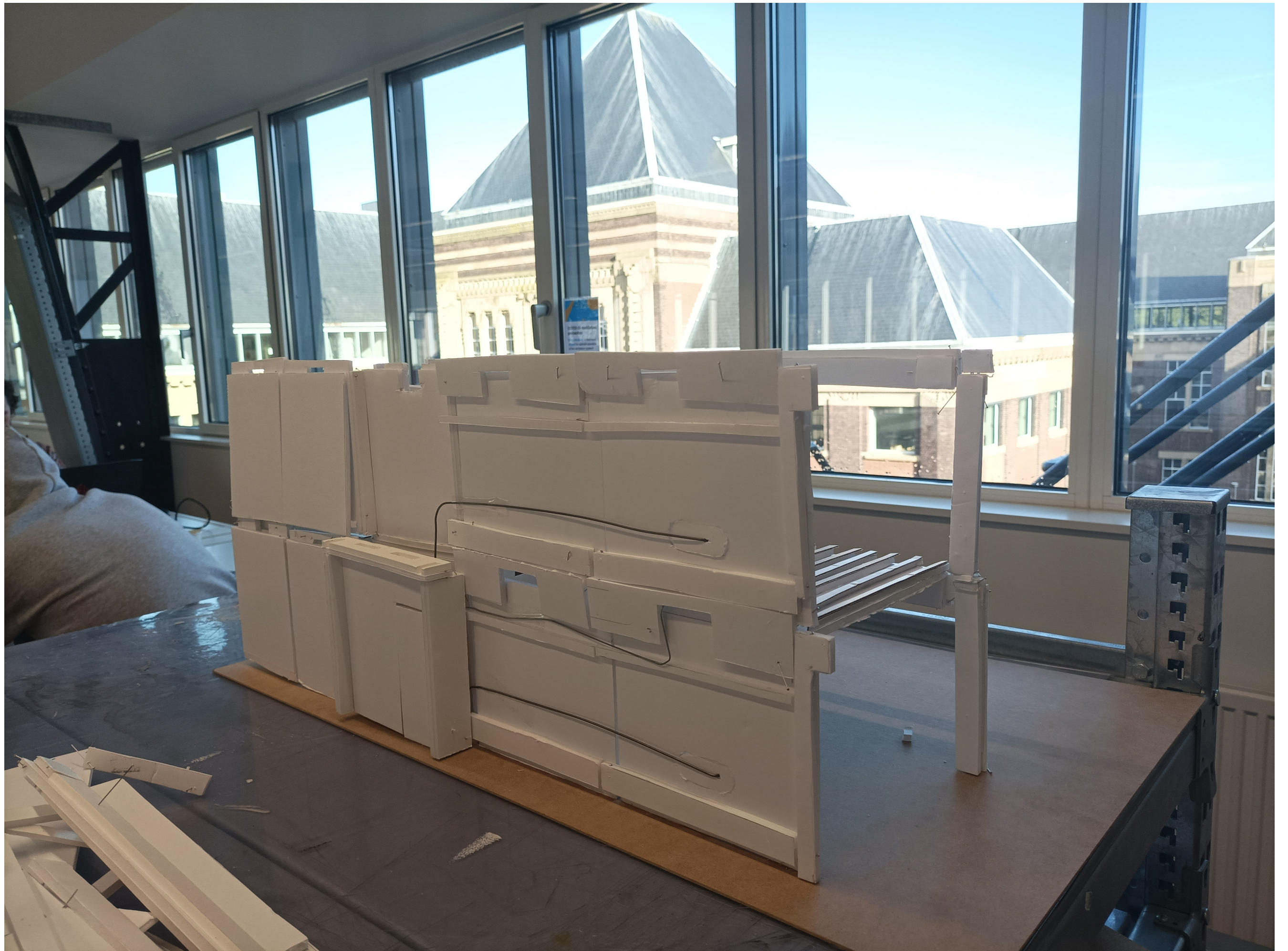




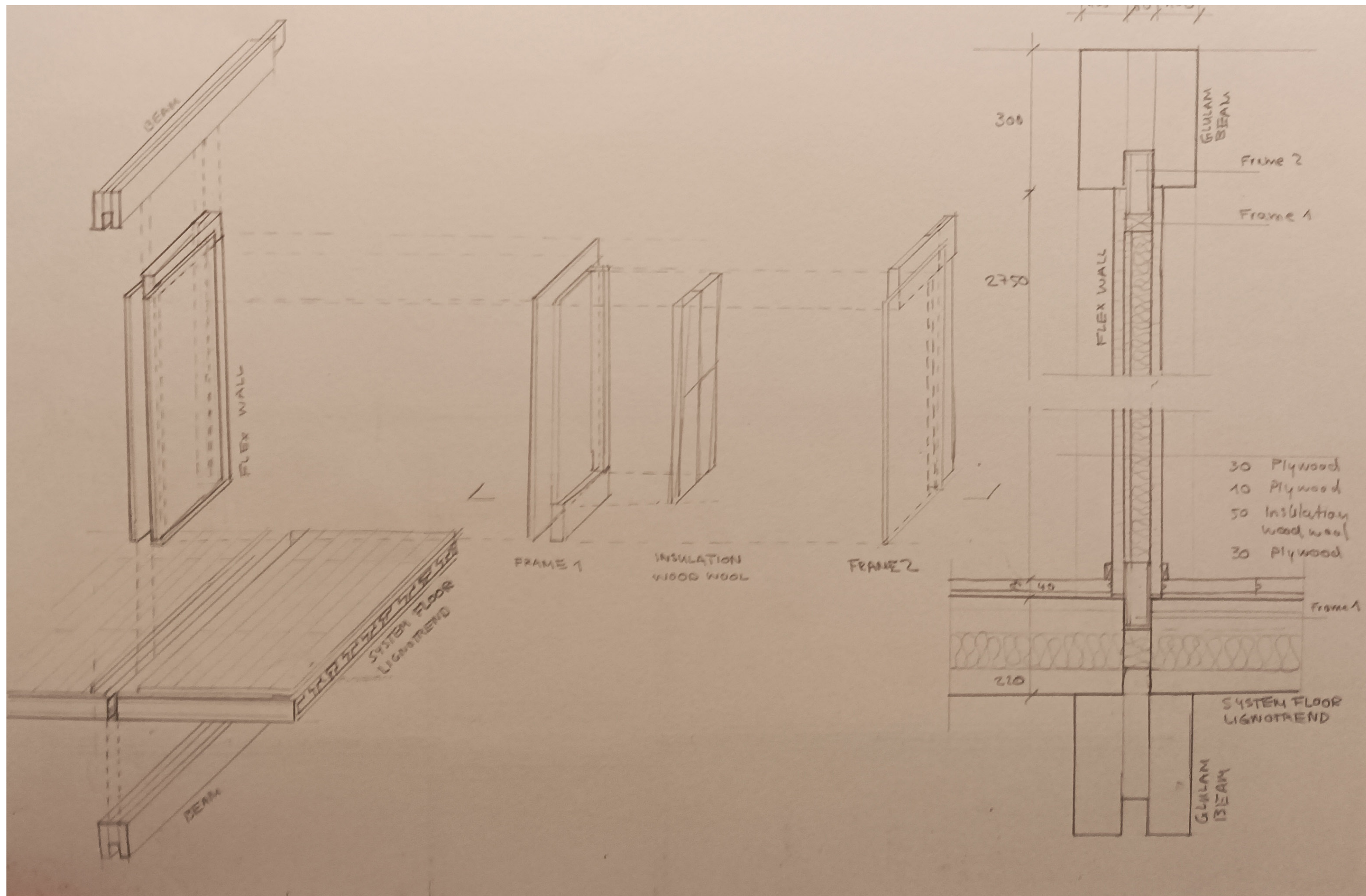






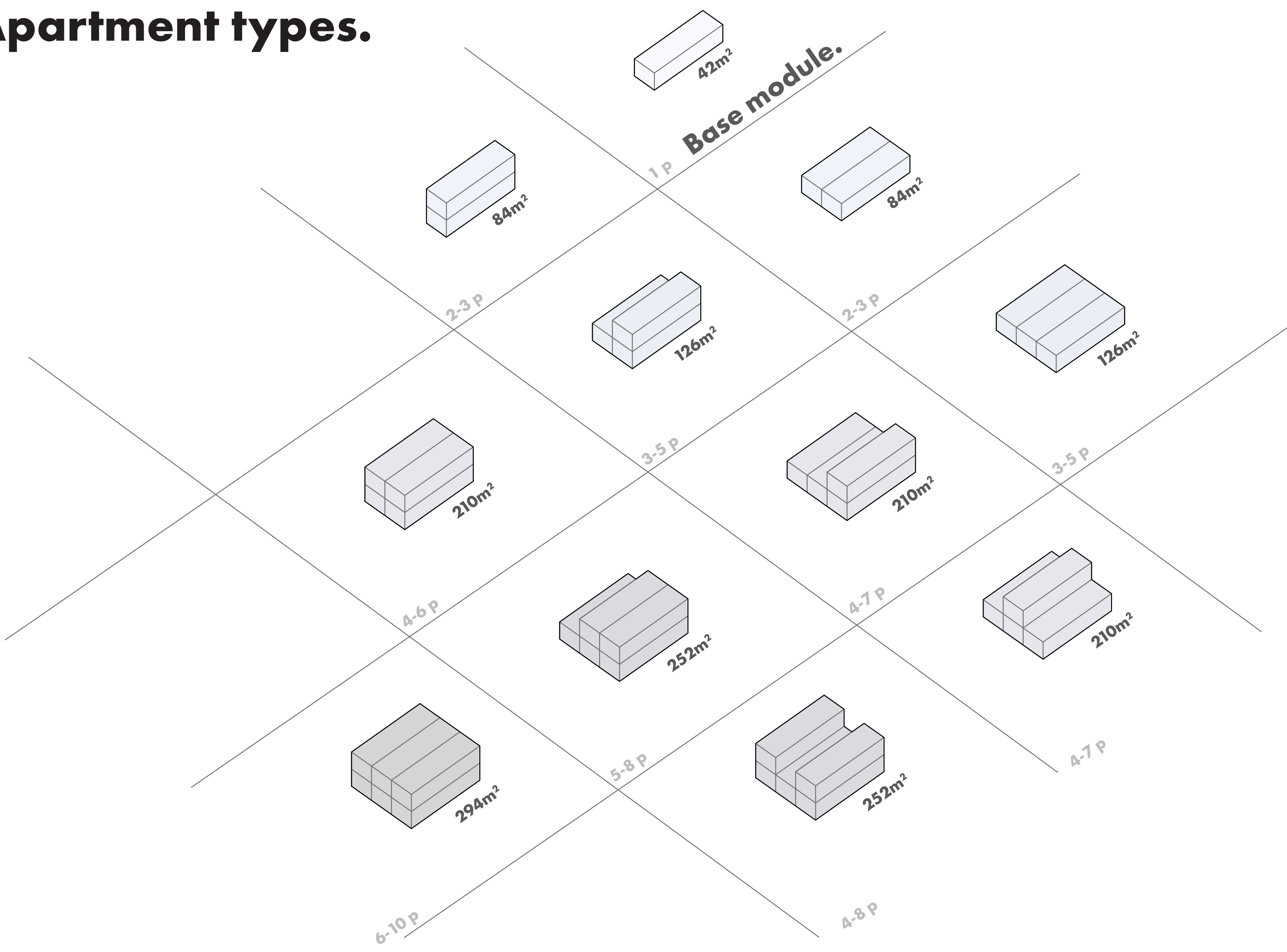






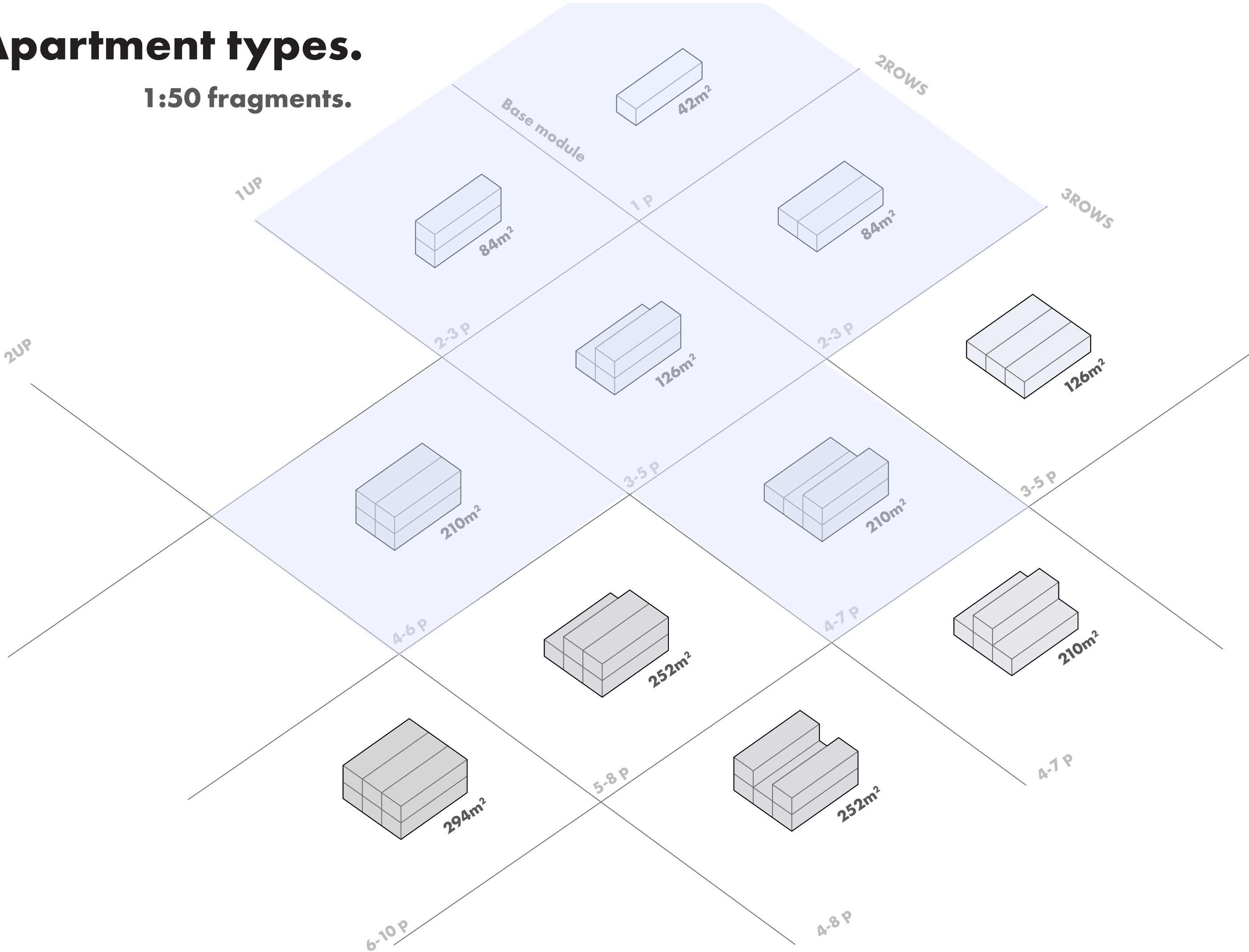


# Apartment types.

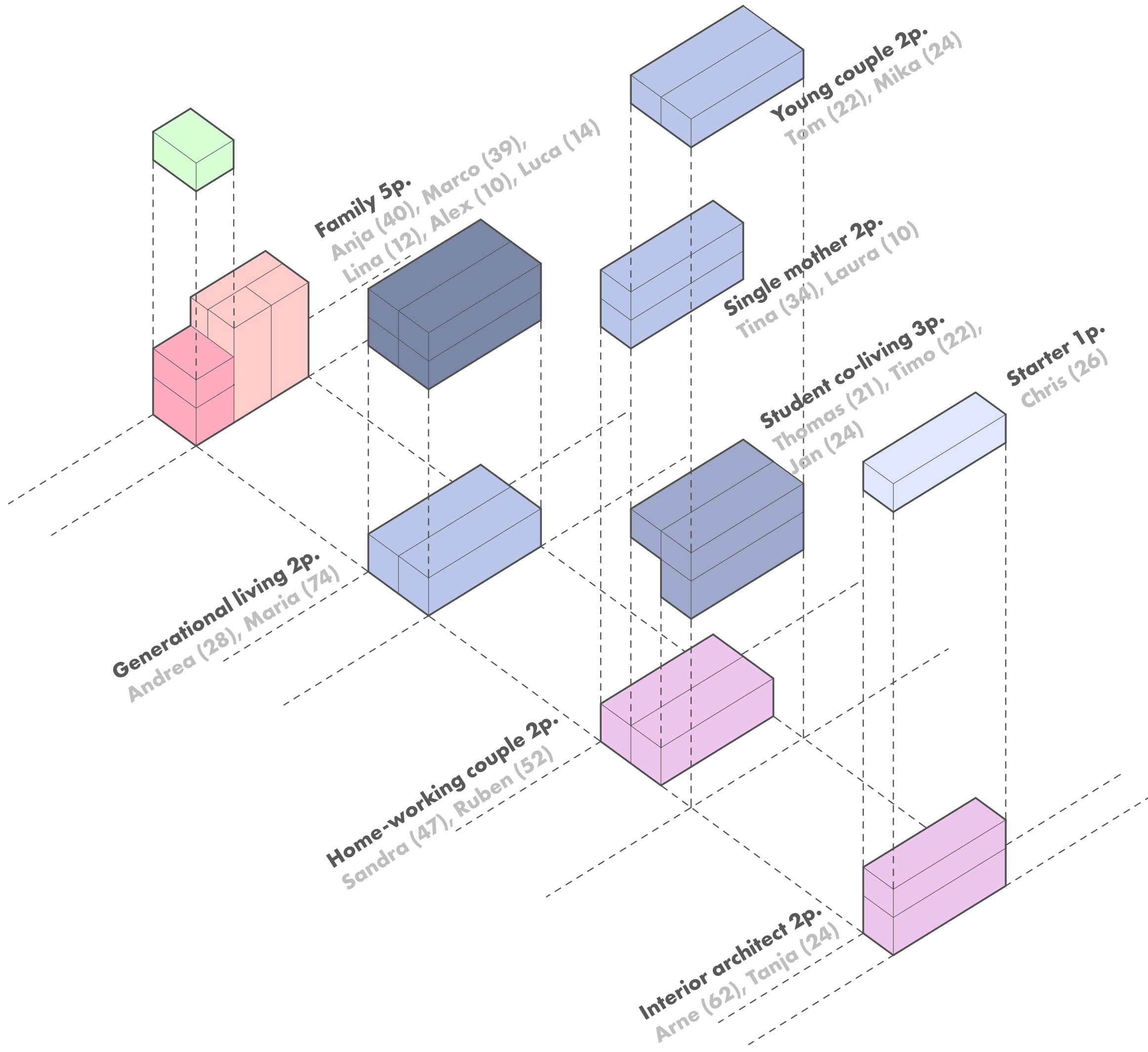


# Apartment types.

1:50 fragments.

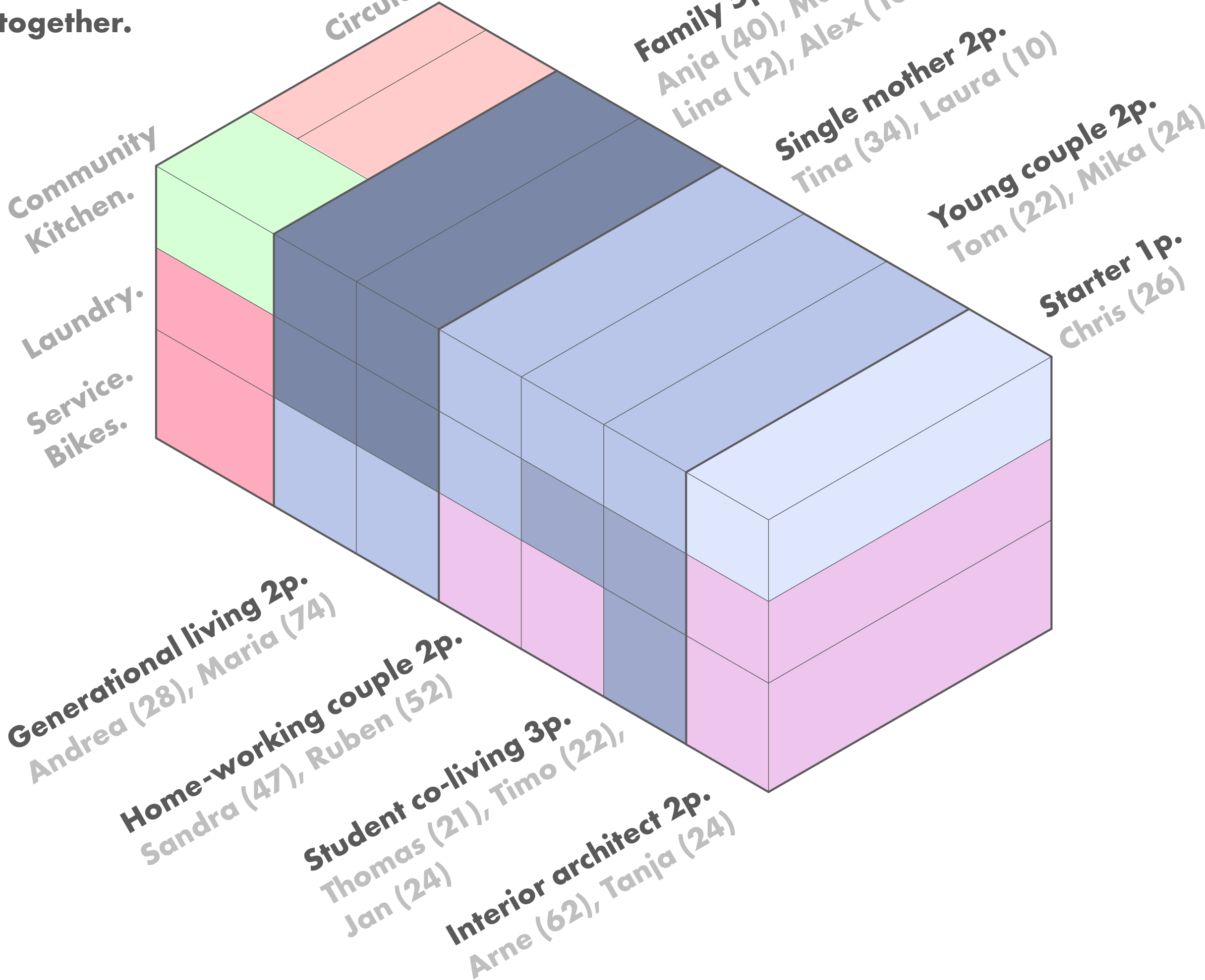






# Apartment types.

Joined together.

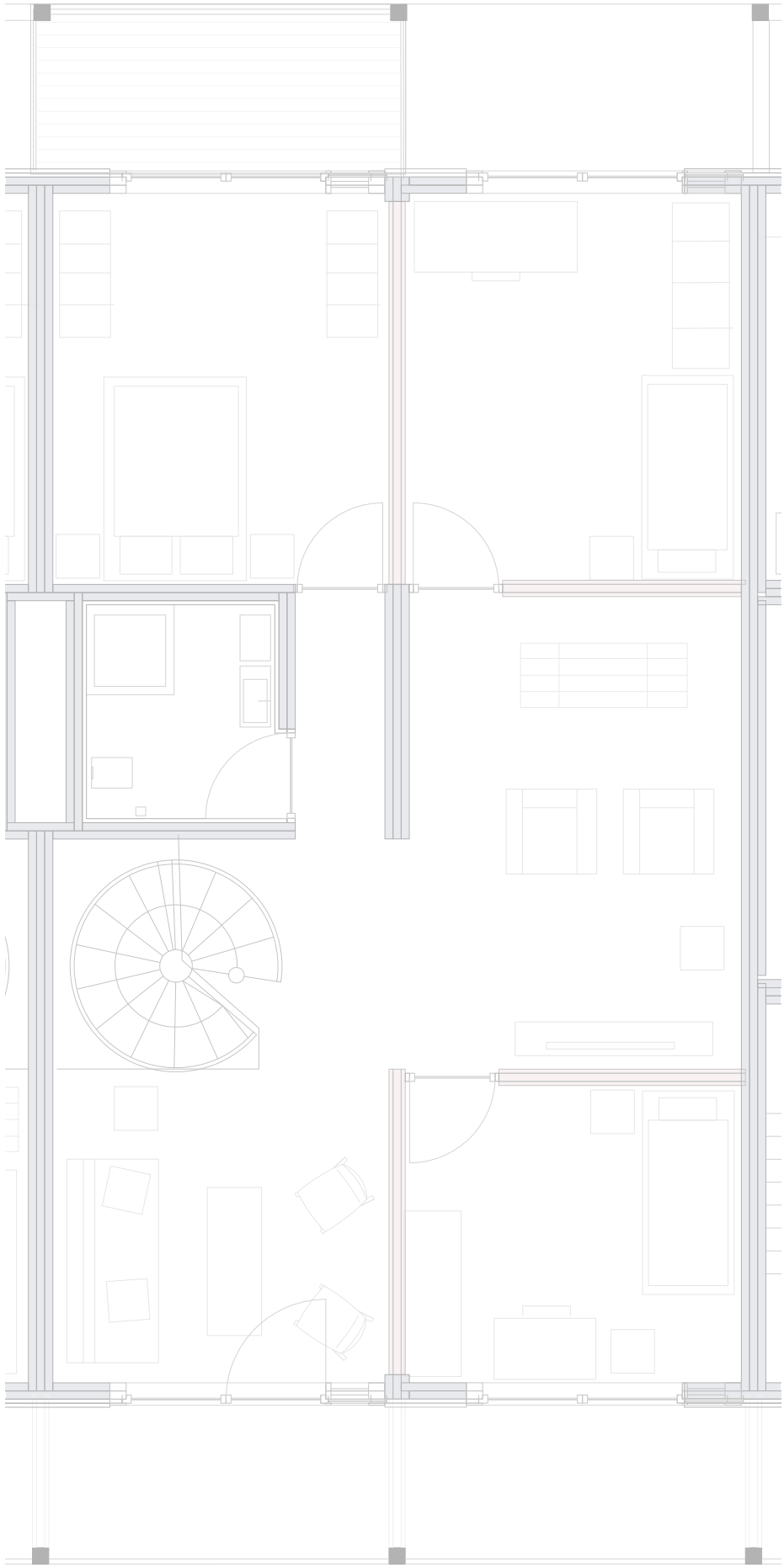
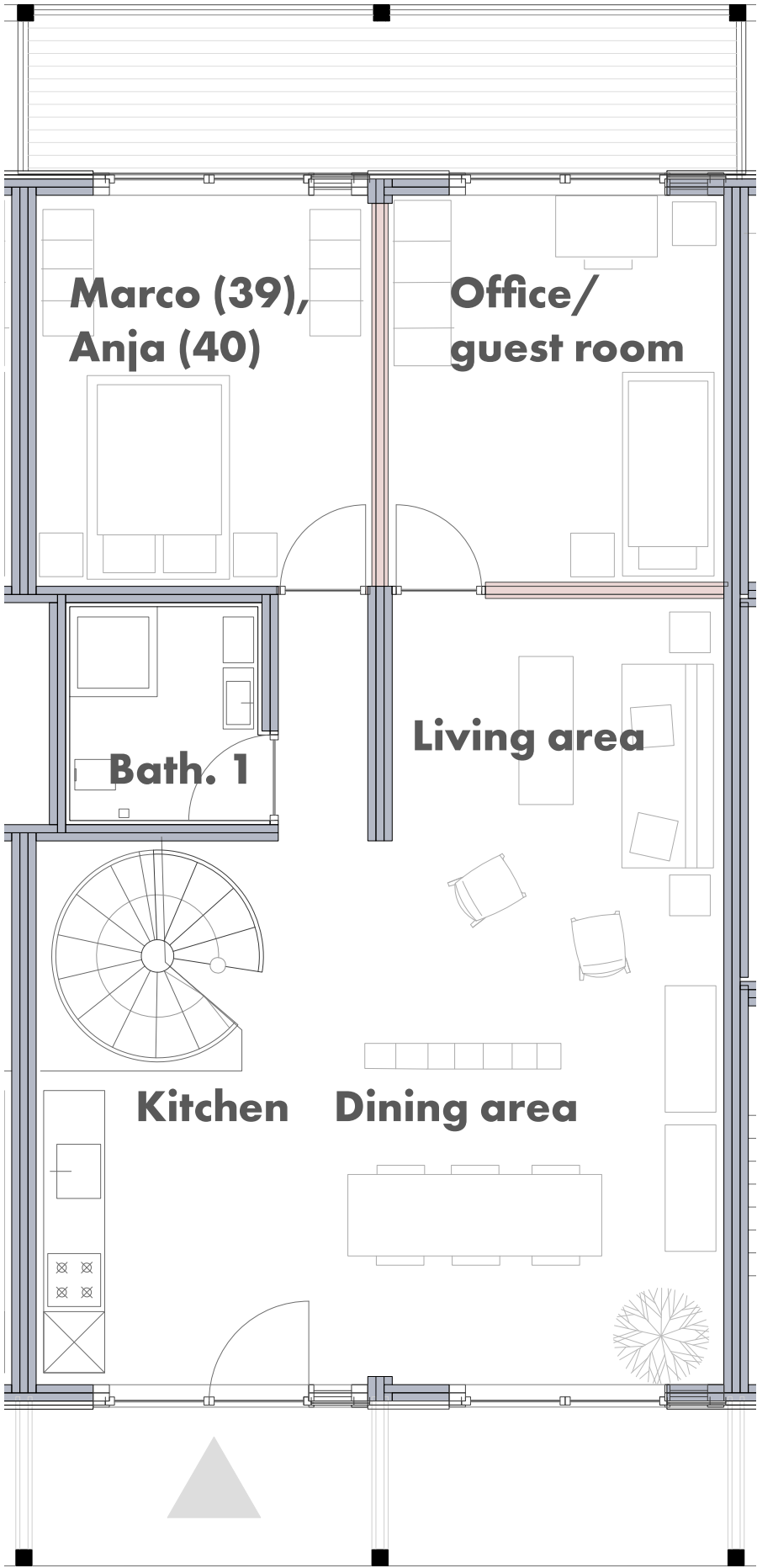




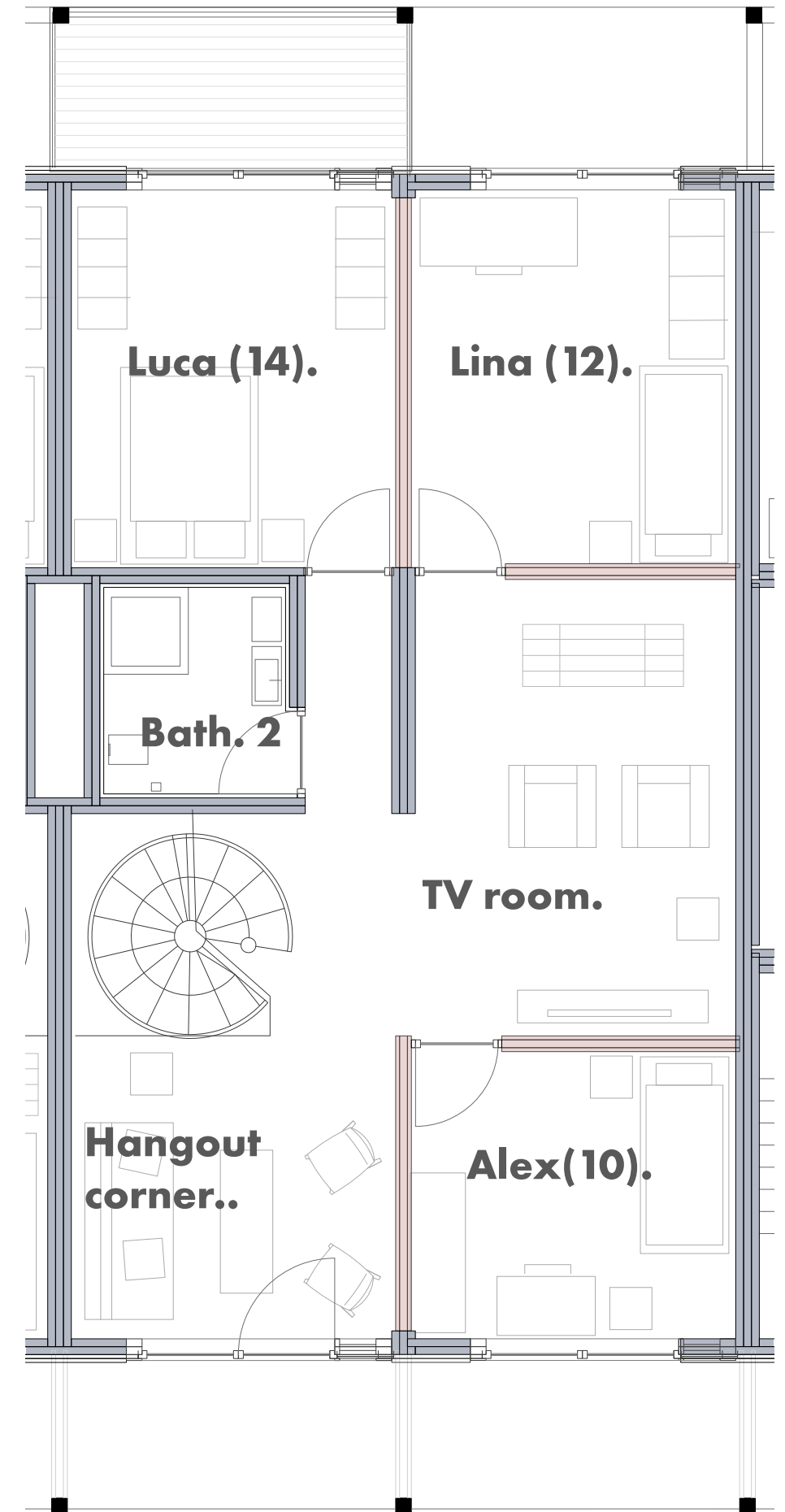
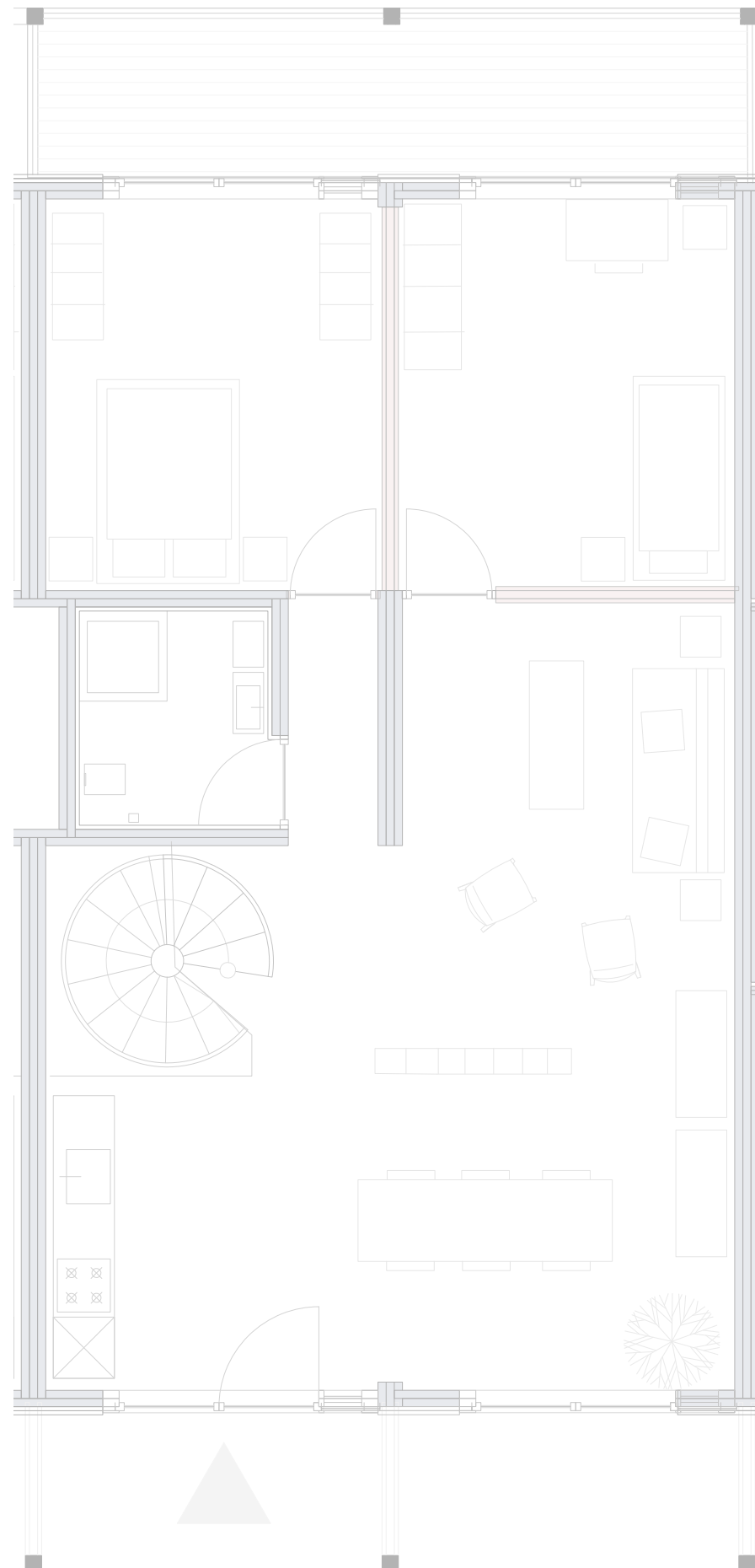
# Family 5p.

Anja (40)  
Marco (39)

Lina (12)  
Luca (14)  
Alex (10)

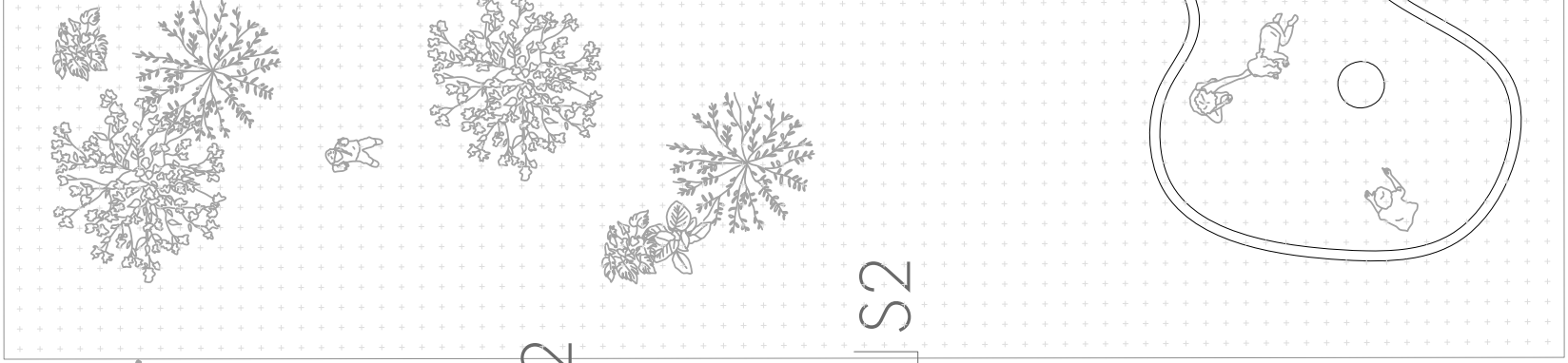
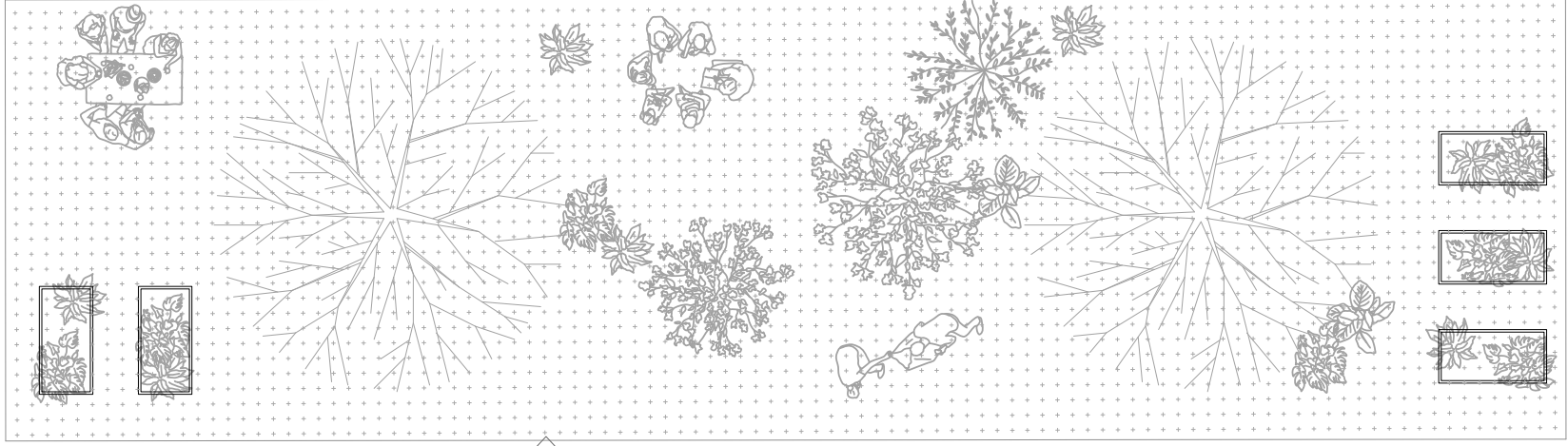
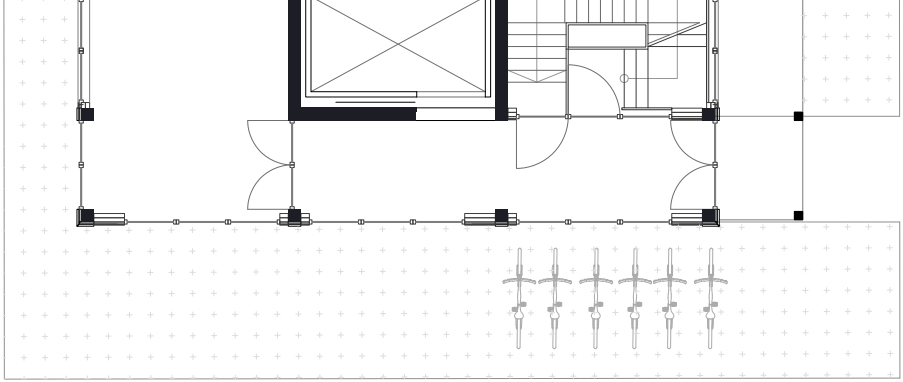
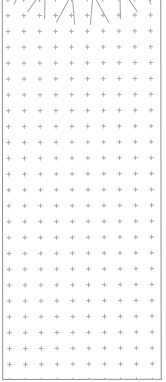
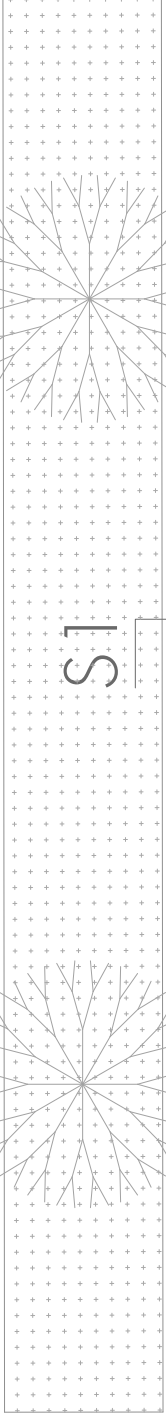
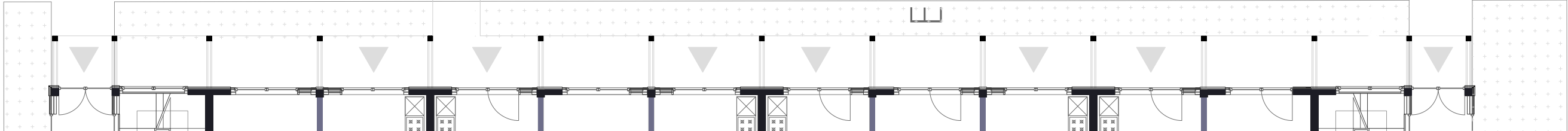
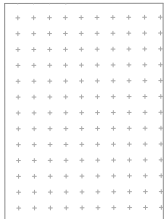


Entrance first floor.



**Second floor.**





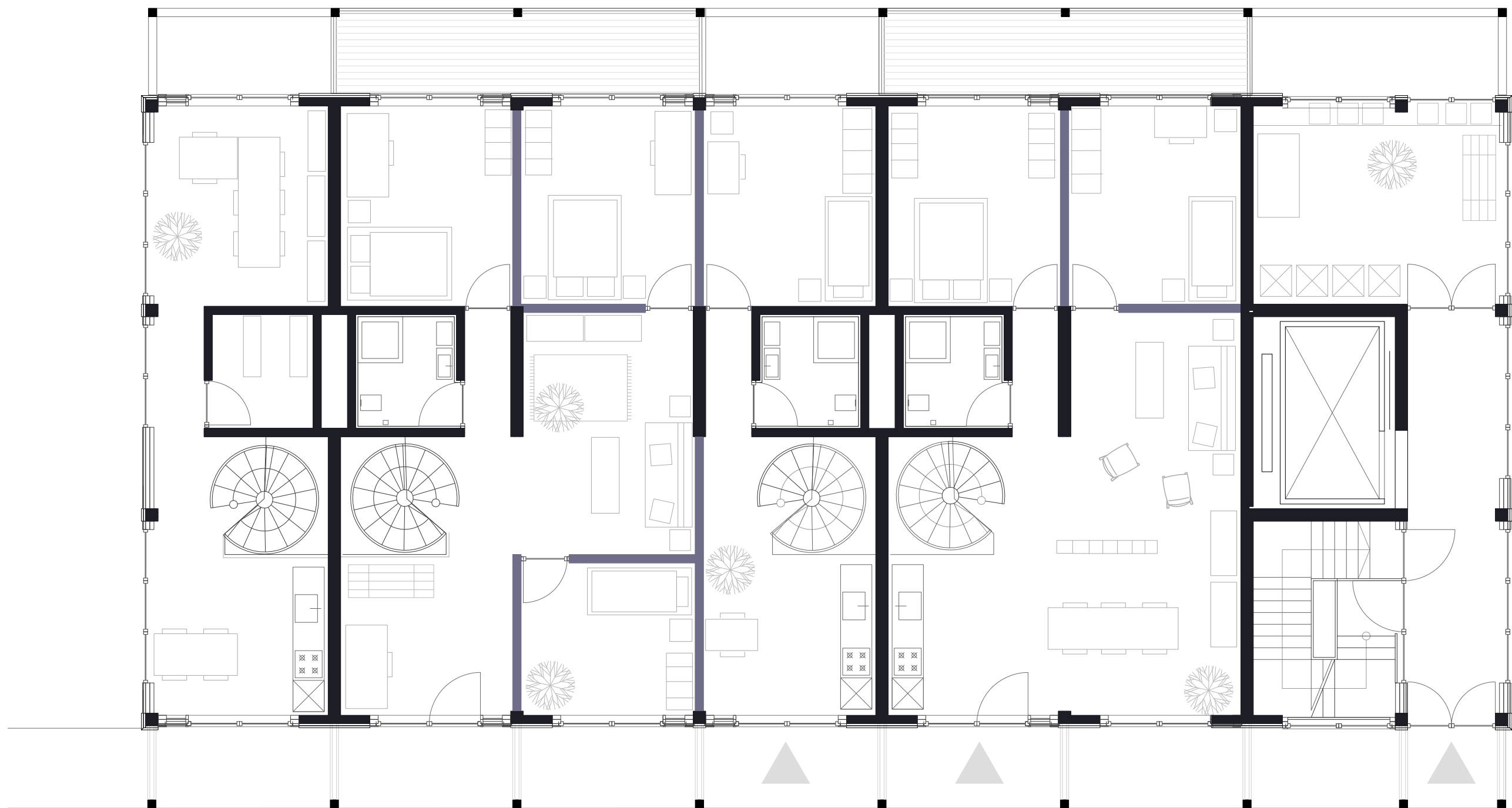
S1

E1

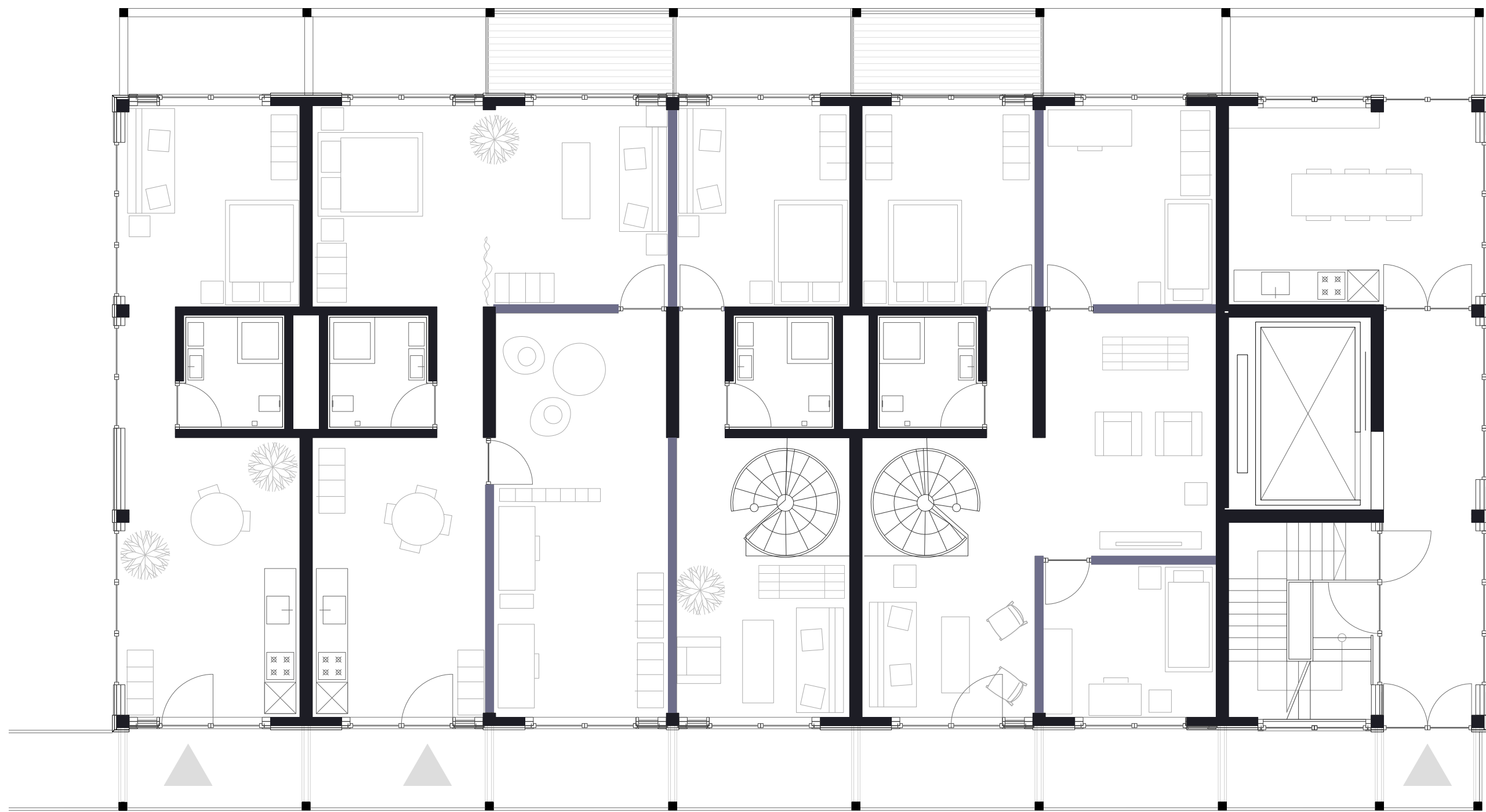
E2

S2

S1











**Thank you!**