Konrad Schlüter

RUINS AND REGENERATION

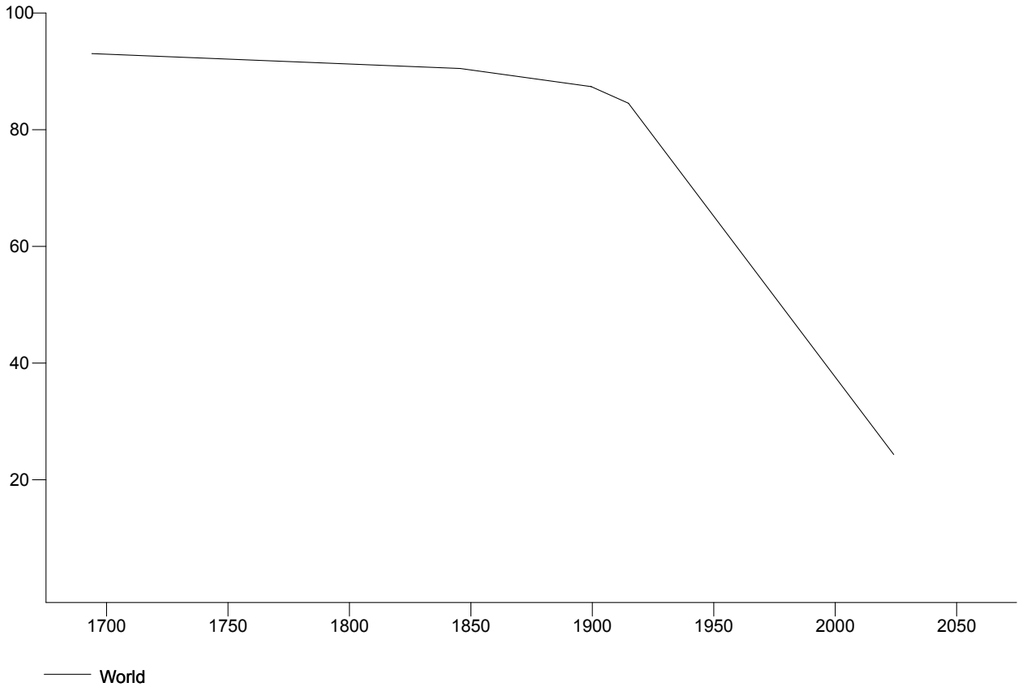
Konrad Schlüter



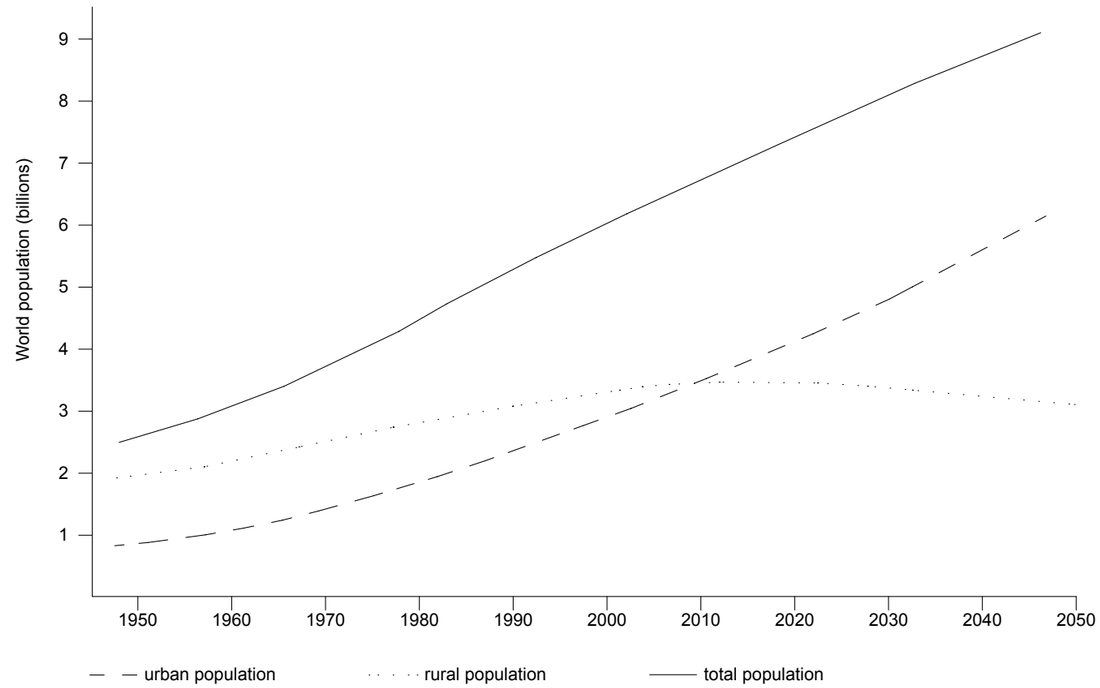
Bridge made from rubber trees, by Khasi and Jainta, Magahlaya in the north of India

Problem statement: Global issue - Loss of global species abundance

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Global main species abundance

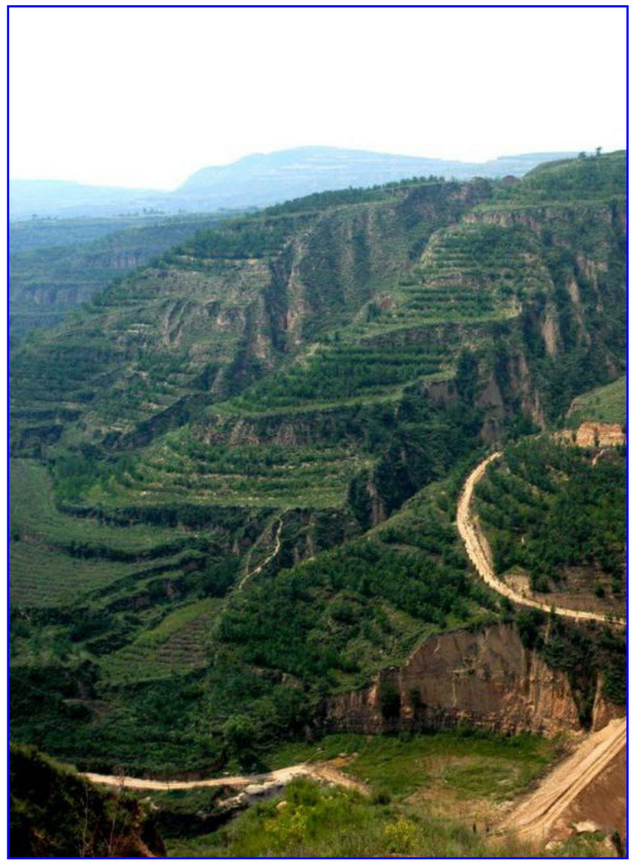


The growth of human population taking place in cities

Source: Stiphout van, Maike. First Guide To Nature Inclusive Design. Amsterdam: nextcity.nl, 2019. p.20, p.18.

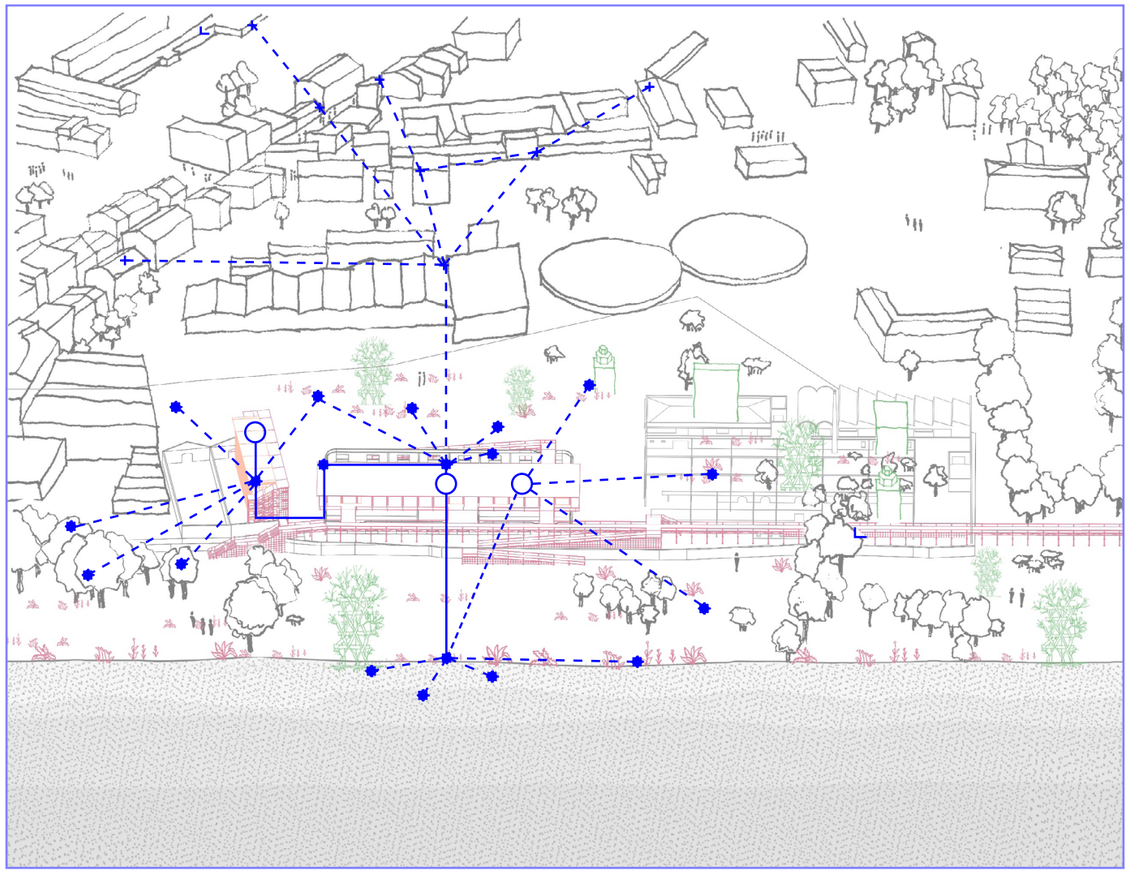
Defining Regenerative Design:



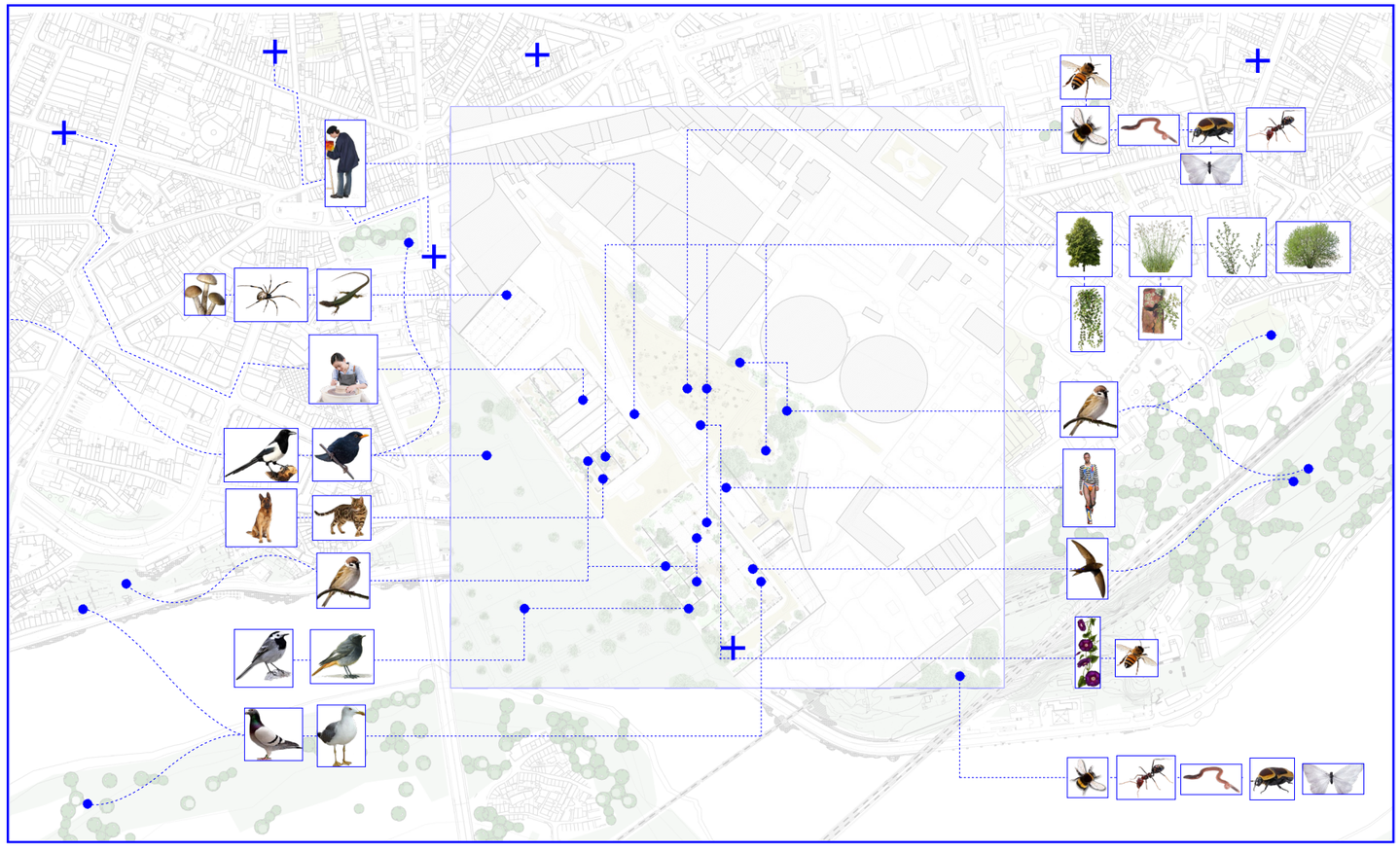


Regeneration of the “Loess Plateau” in the north of China

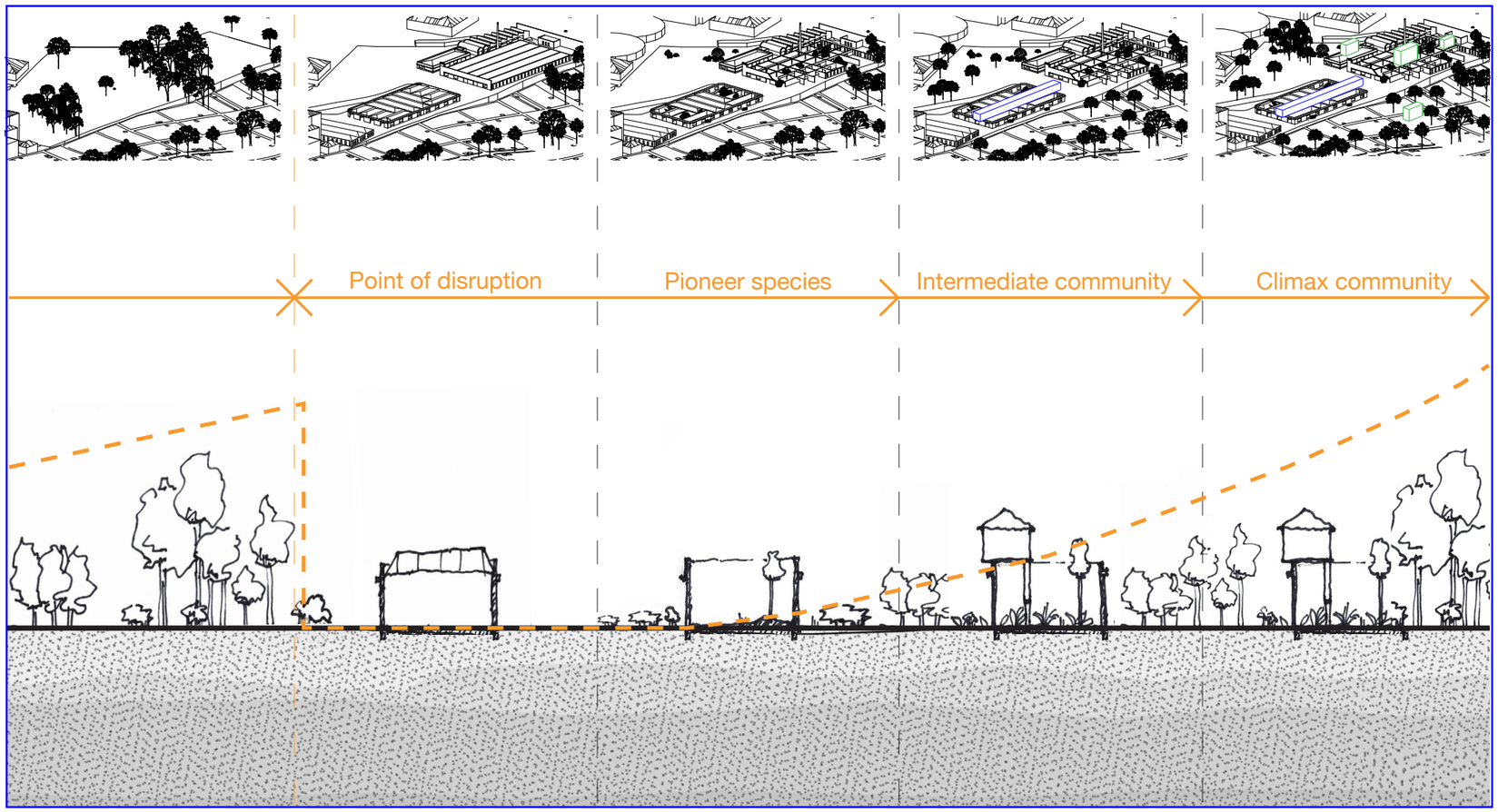
1. The Idea of Role



2. The Idea of Place



3. The Idea of Time



Cohabitation

4. Building upon Potentials



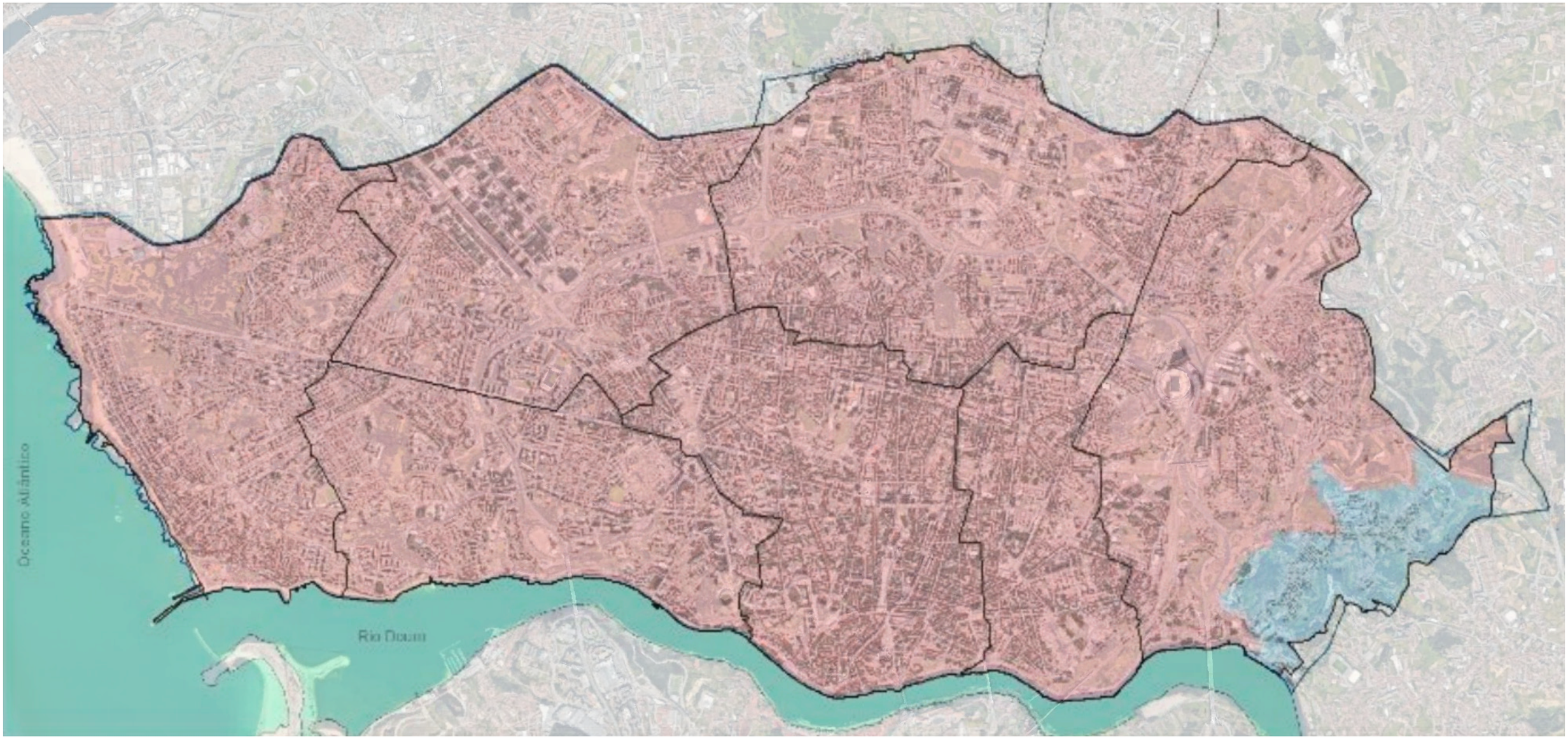
Case Study: Porto, Portugal

Case Study: Porto

Konrad Schlüter







Extreme temperatures

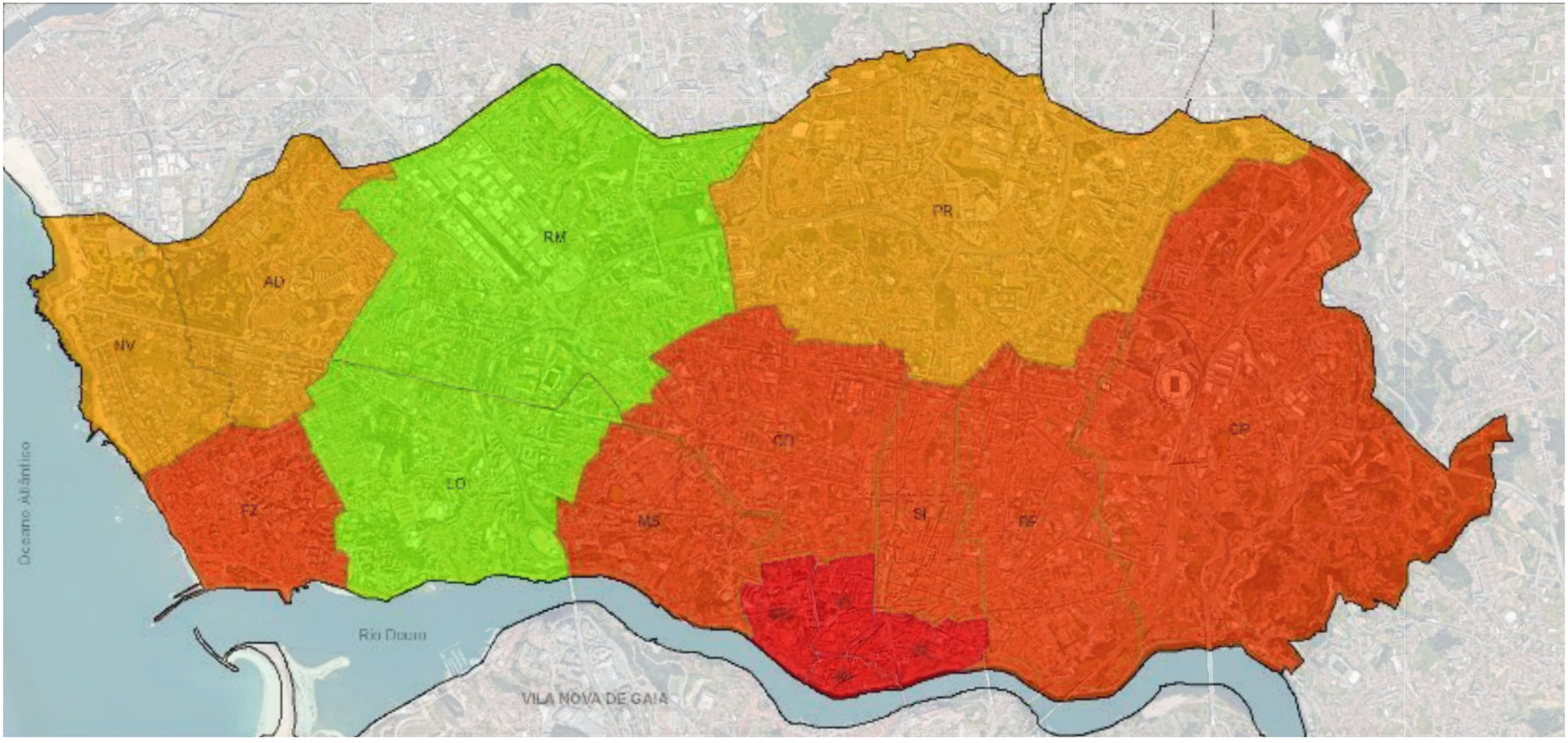
Local Issue: Areas of extreme heat in summer, Source: Esteves, 2010; Grupo Clima e Ambiente Urbano, CEGOT, 2017.



Probability of decrease in air quality

- Low
- Medium
- High

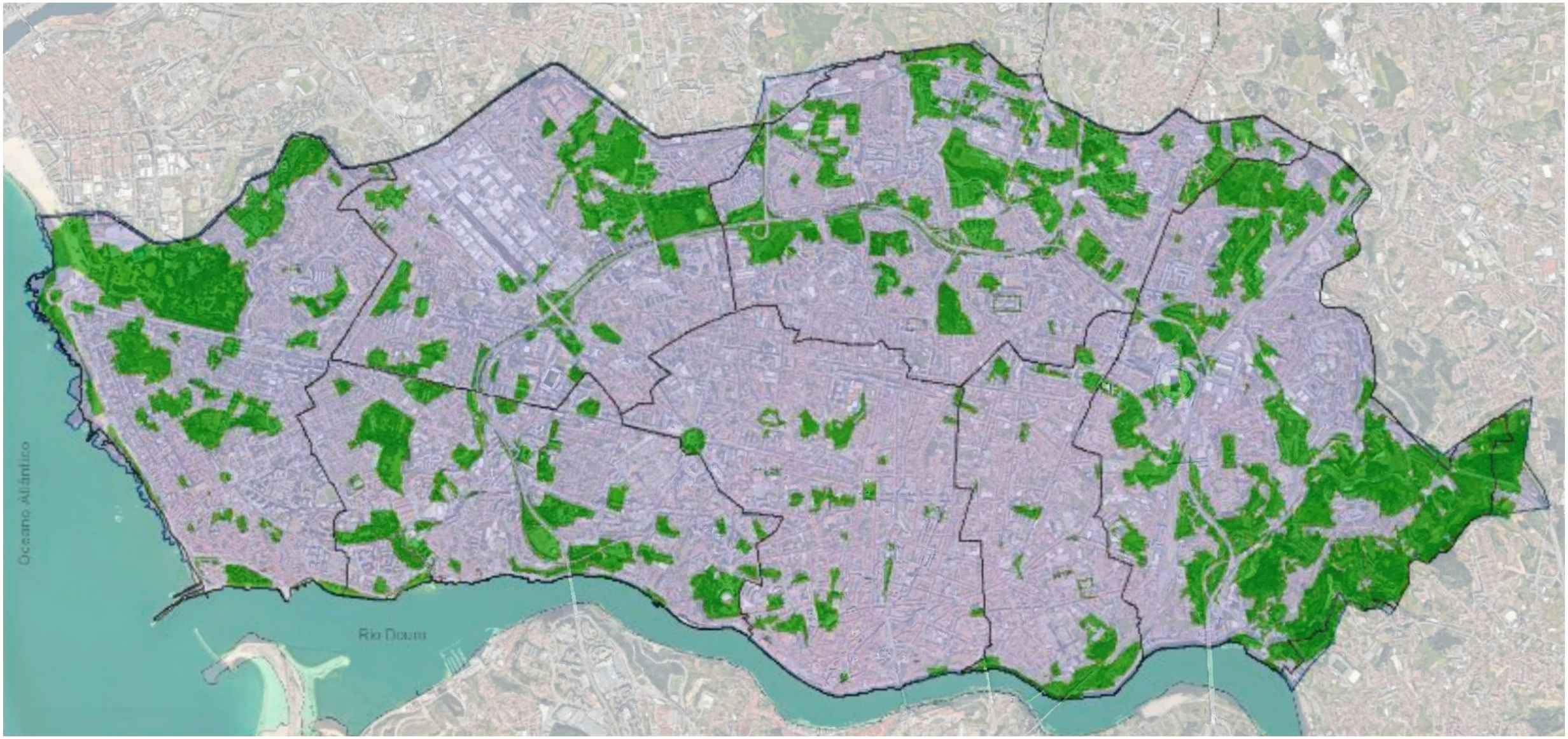
Local Issue: Air quality, Source: CMP 2016; Grupo Clima e Ambiente Urbano, CEGOT, 2017.



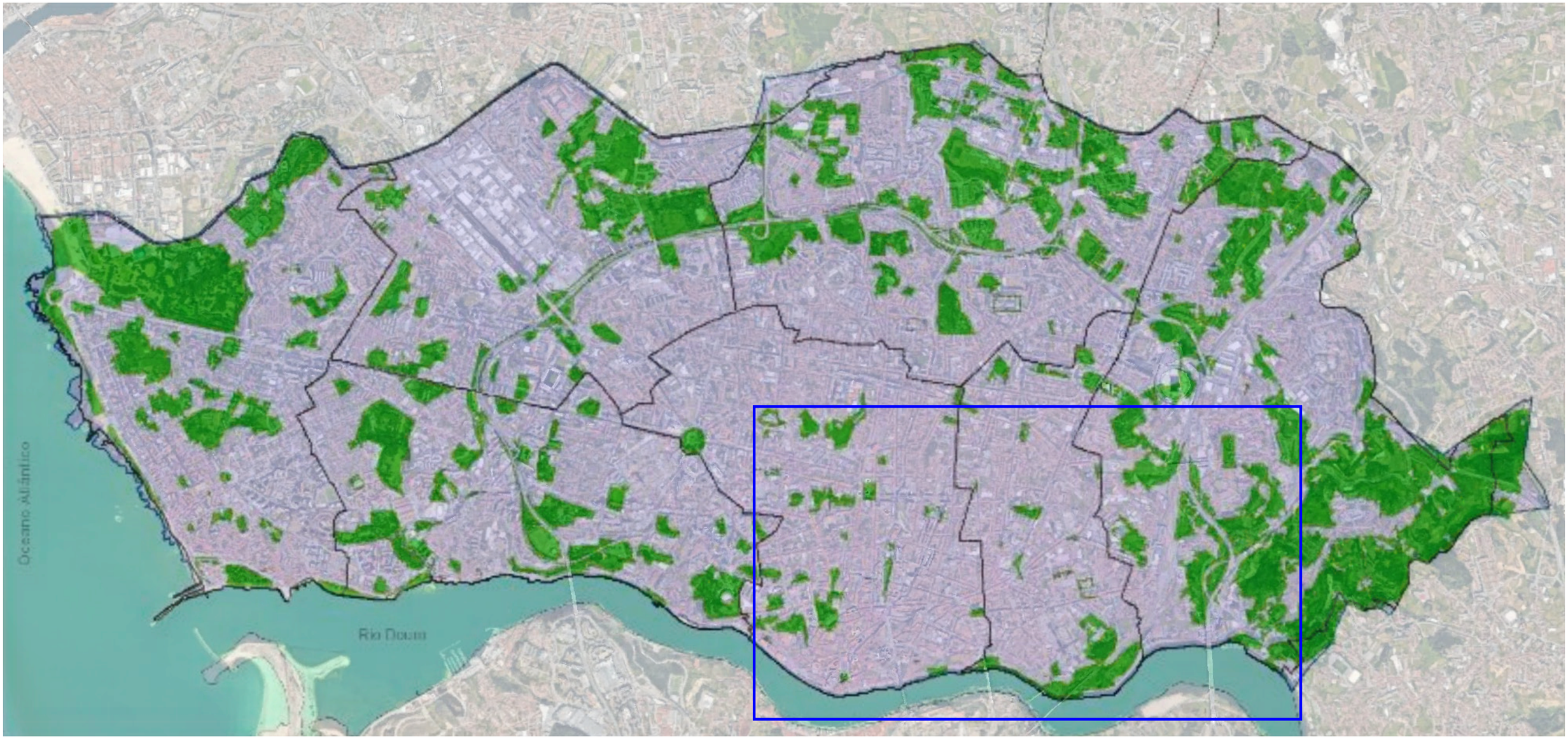
Variation in population between 2001-2011 (%)

-35.1 - -25.0 -24.9 - -10.0 -9.9 - 0.0 0.

Local Issue: Change in the population inbetween 2001-2011



Local Issue: Sealed surface, Source: CMP 2016; Grupo Clima e Ambiente Urbano, CEGOT, 2017.



Green spaces
Sealed surface

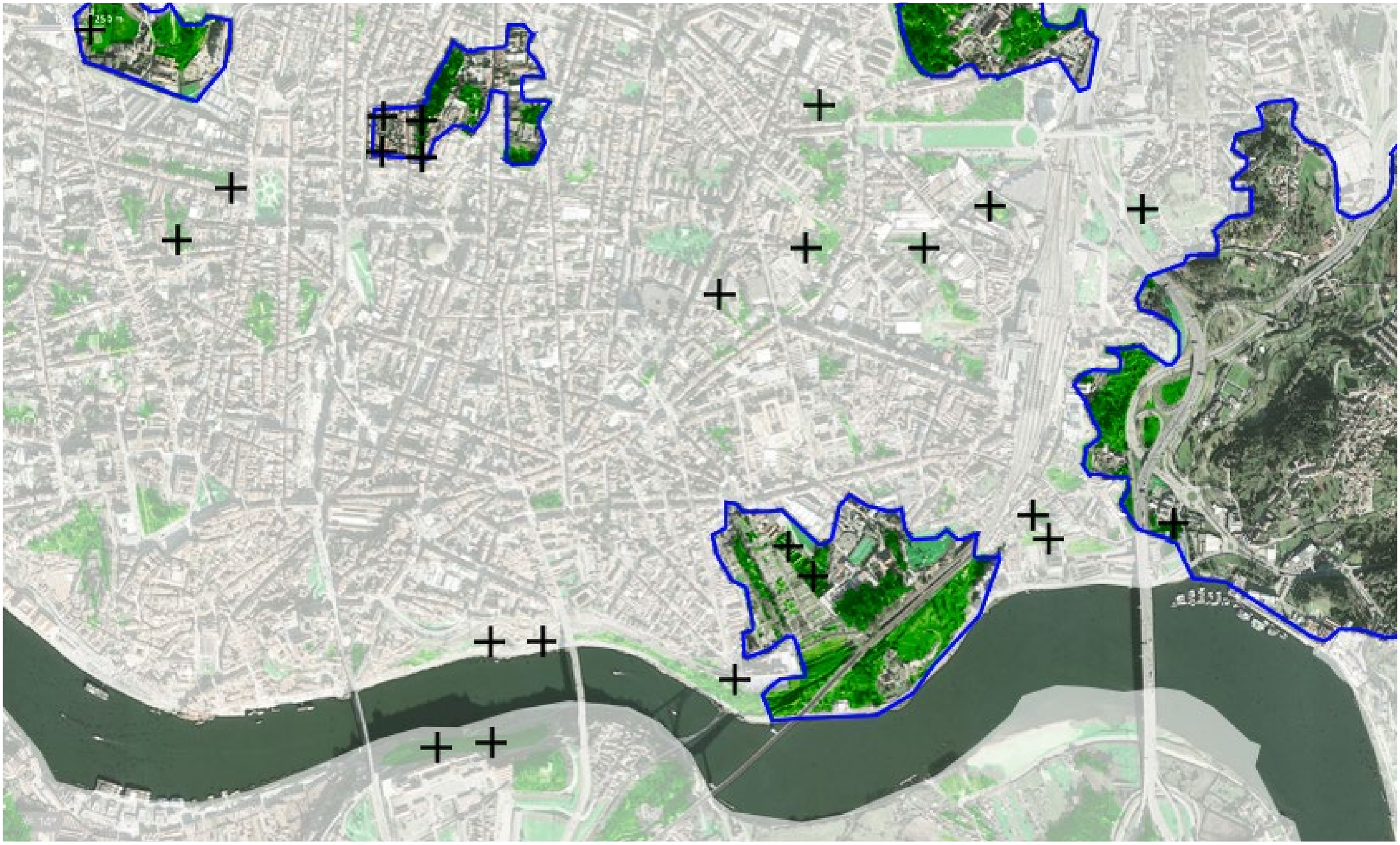
Local Issue: Sealed surface, Source: CMP 2016; Grupo Clima e Ambiente Urbano, CEGOT, 2017.



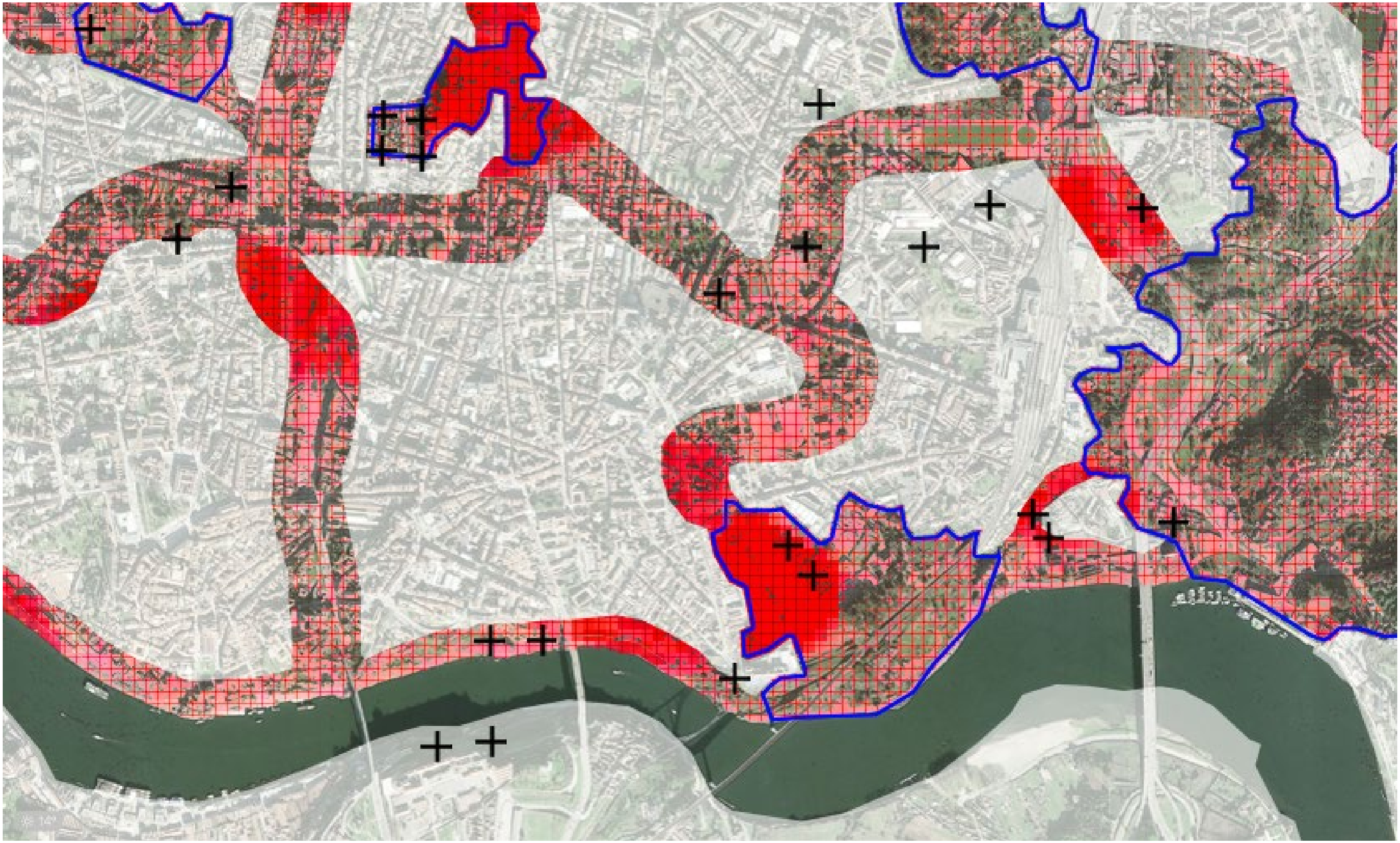





FORD







Local Issue: Soil Pollution, Source: CMP 2016; Grupo Clima e Ambiente Urbano, CEGOT, 2017.


FORD



Concurso de Conceção para o Quarteirão da Oficina do Ferro

Oficina do Ferro Block Conception Contest

Lançamento do concurso a 13 de Julho
Enquadrado no Archi Summit

Contest launch on July 13th
Framed at the Archi Summit

CONCURSO DE ARQUITECTURA
EM PARCERIA COM A OASRN
ARCHITECTURE CONTEST
IN PARTNERSHIP WITH OASRN

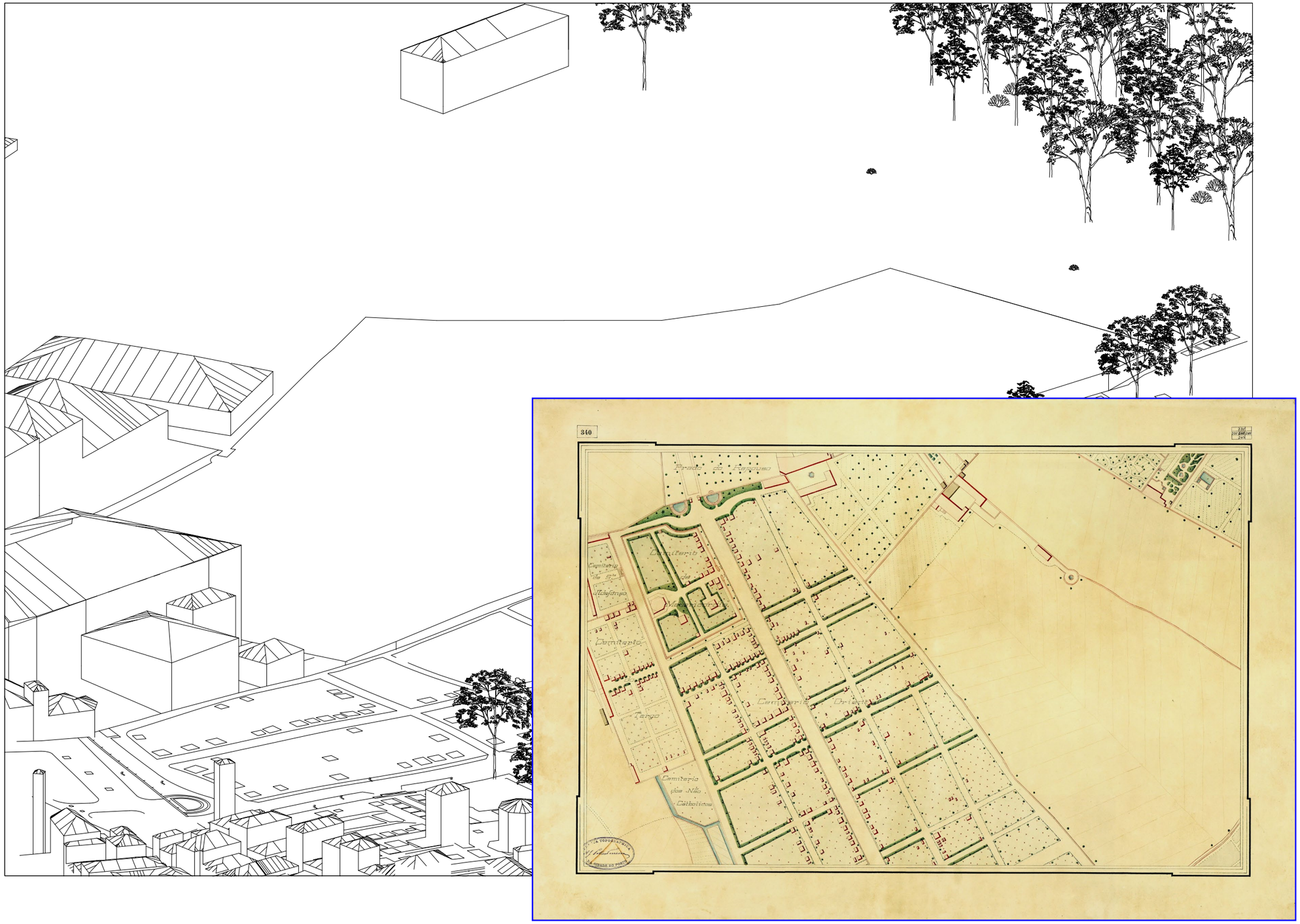
52.000 M²
HEROÍSMO, PORTO
52.000 M²
HEROÍSMO, PORTO

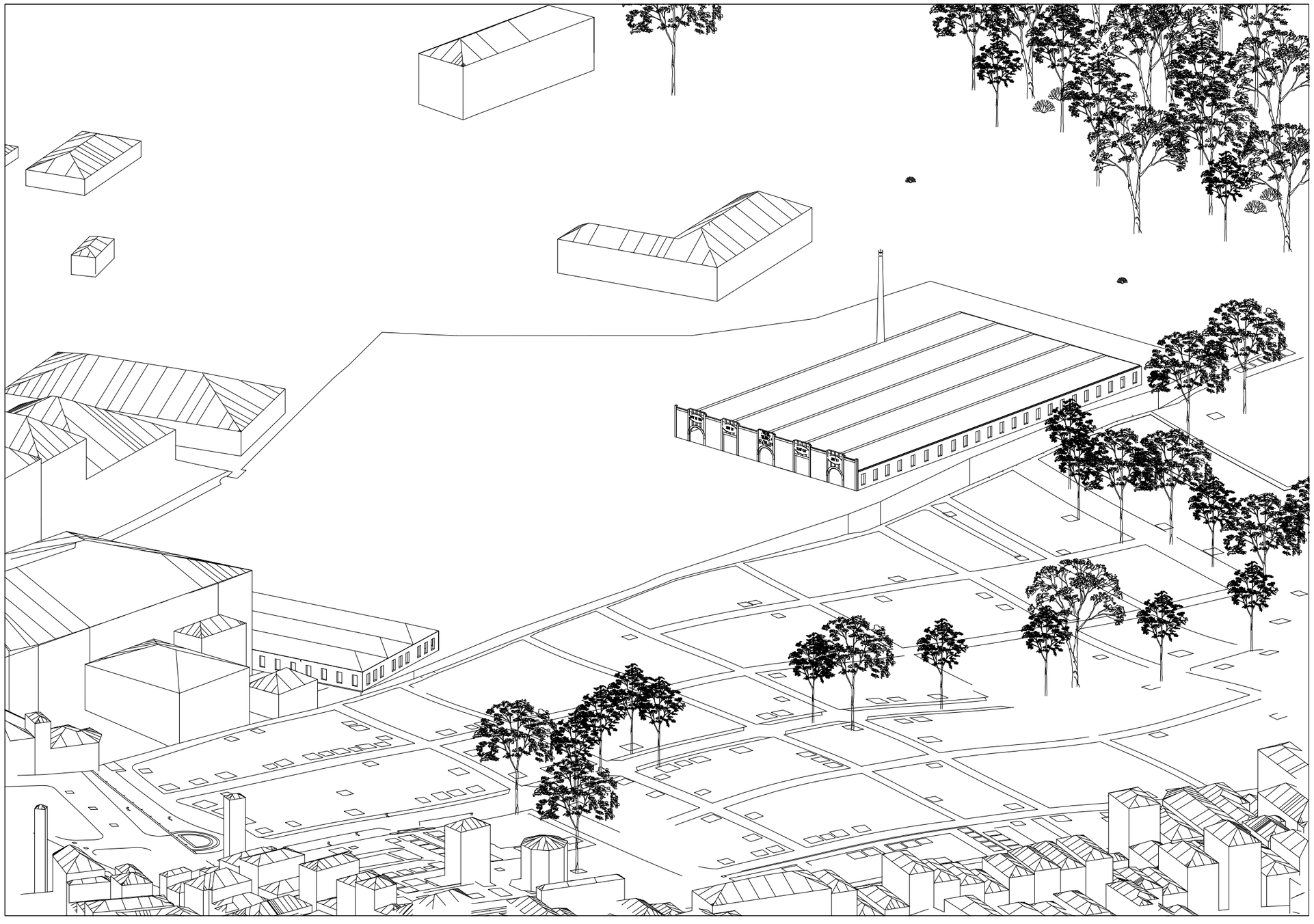


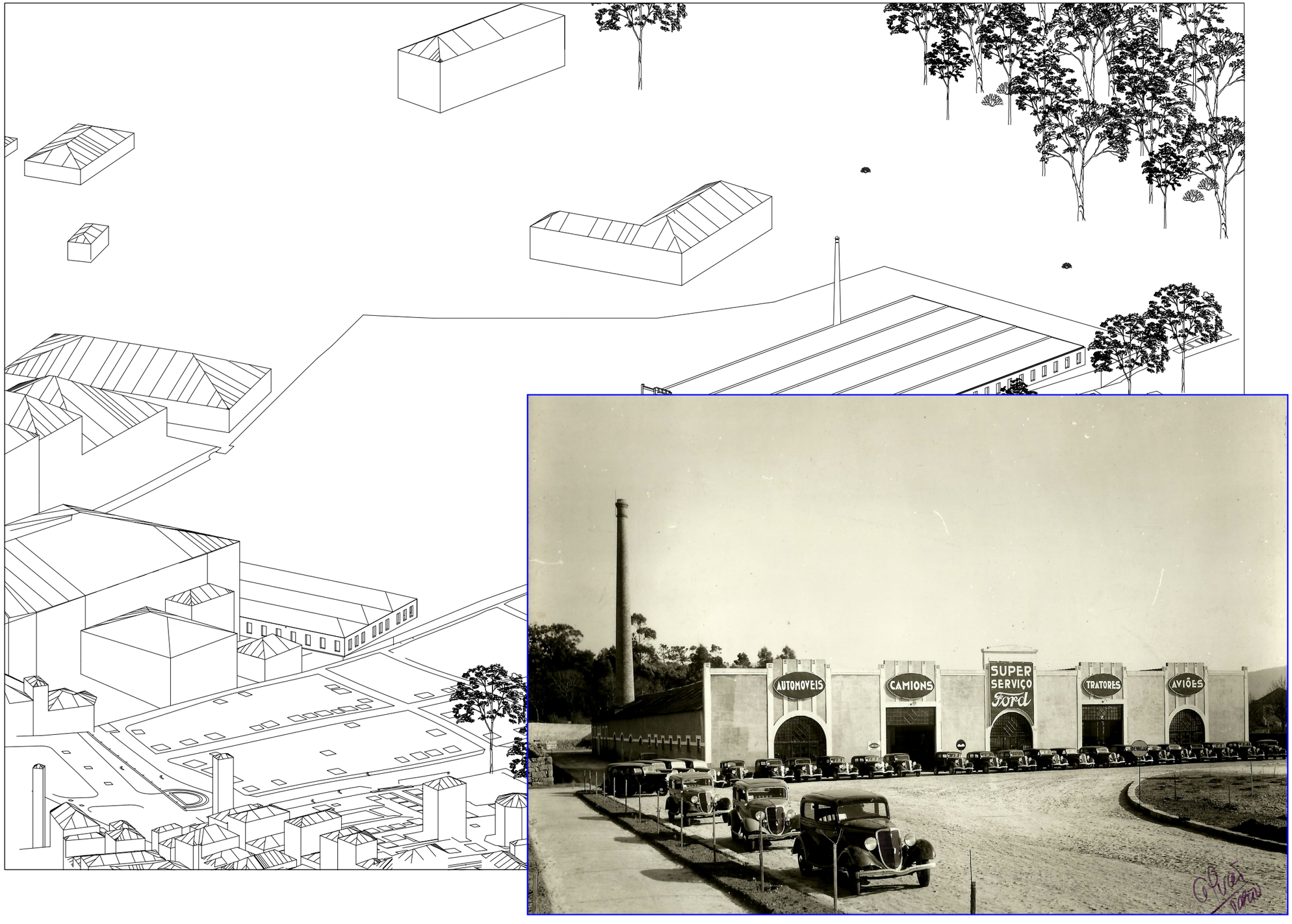

NOEDA
Mauser
Teatro De Ferro
Parque das Águas
Mota-Engil
Infraspeak
Oficina do Ferro

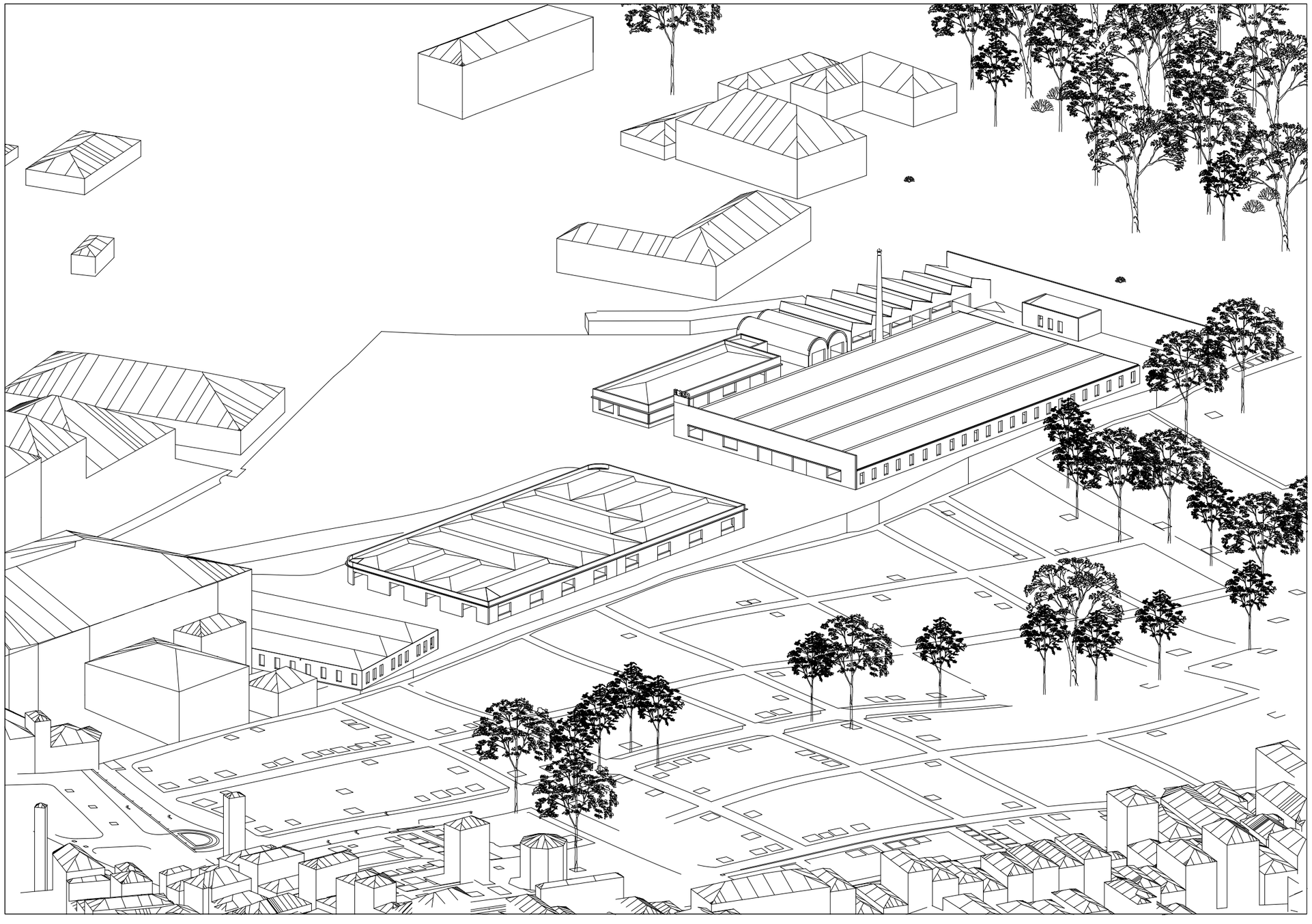
Site Analysis

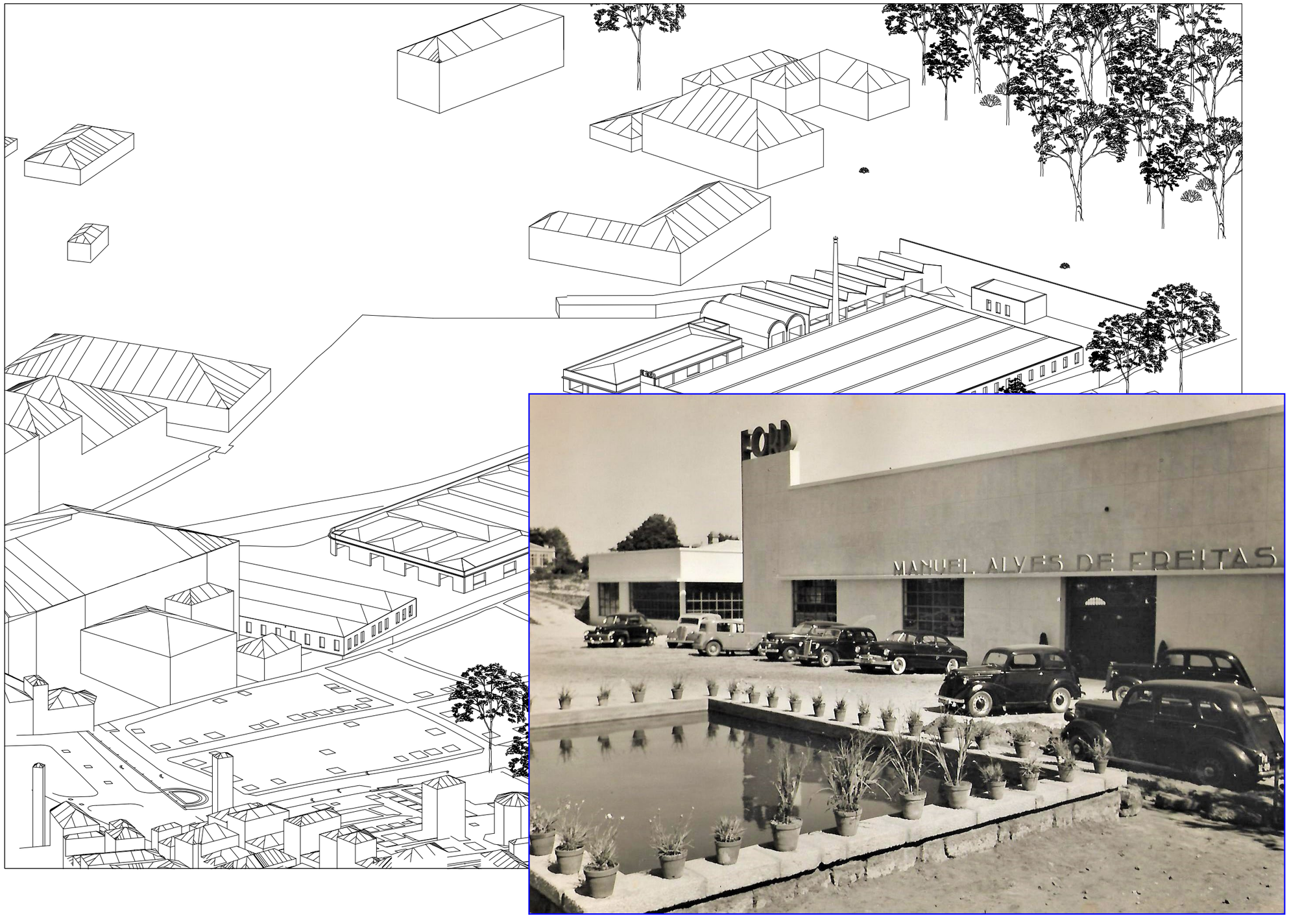


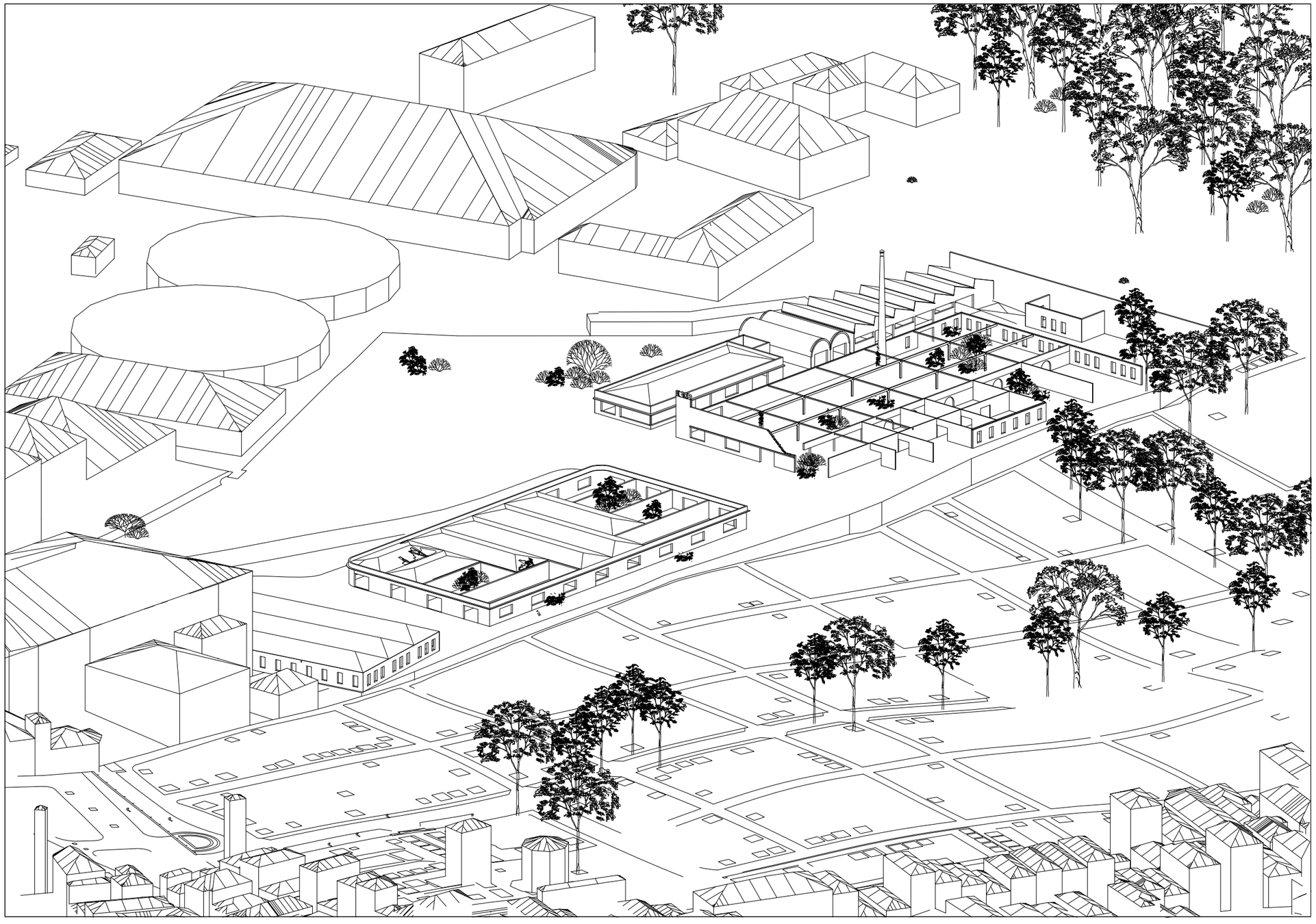

340
Praça de Ramos
Cemiterio
Cemiterio
Cemiterio



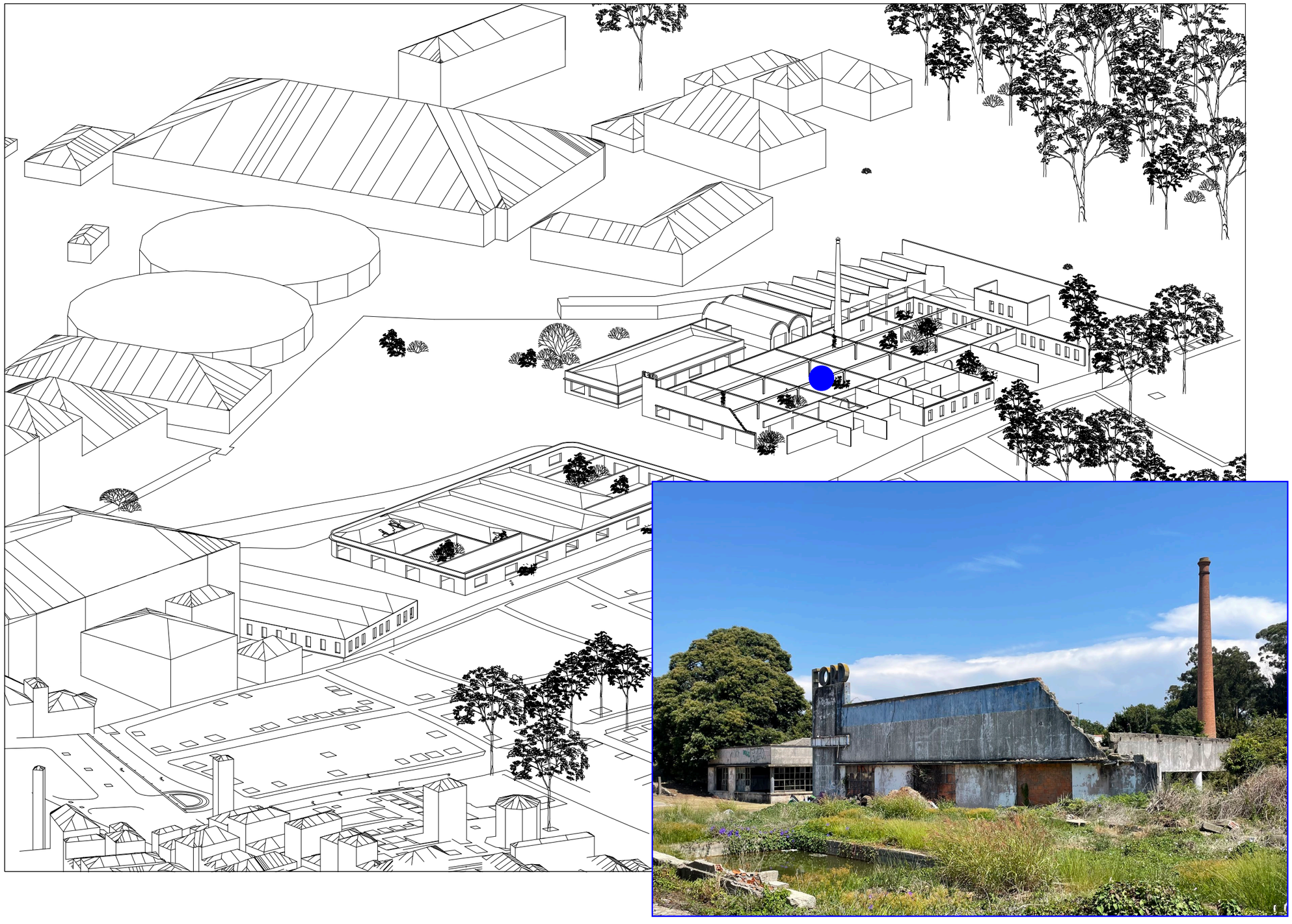

AUTOMOVEIS
CAMIONS
SUPER SERVIÇO Ford
TRATORES
AVIÕES




FORD
MANUEL ALVES DE FREITAS

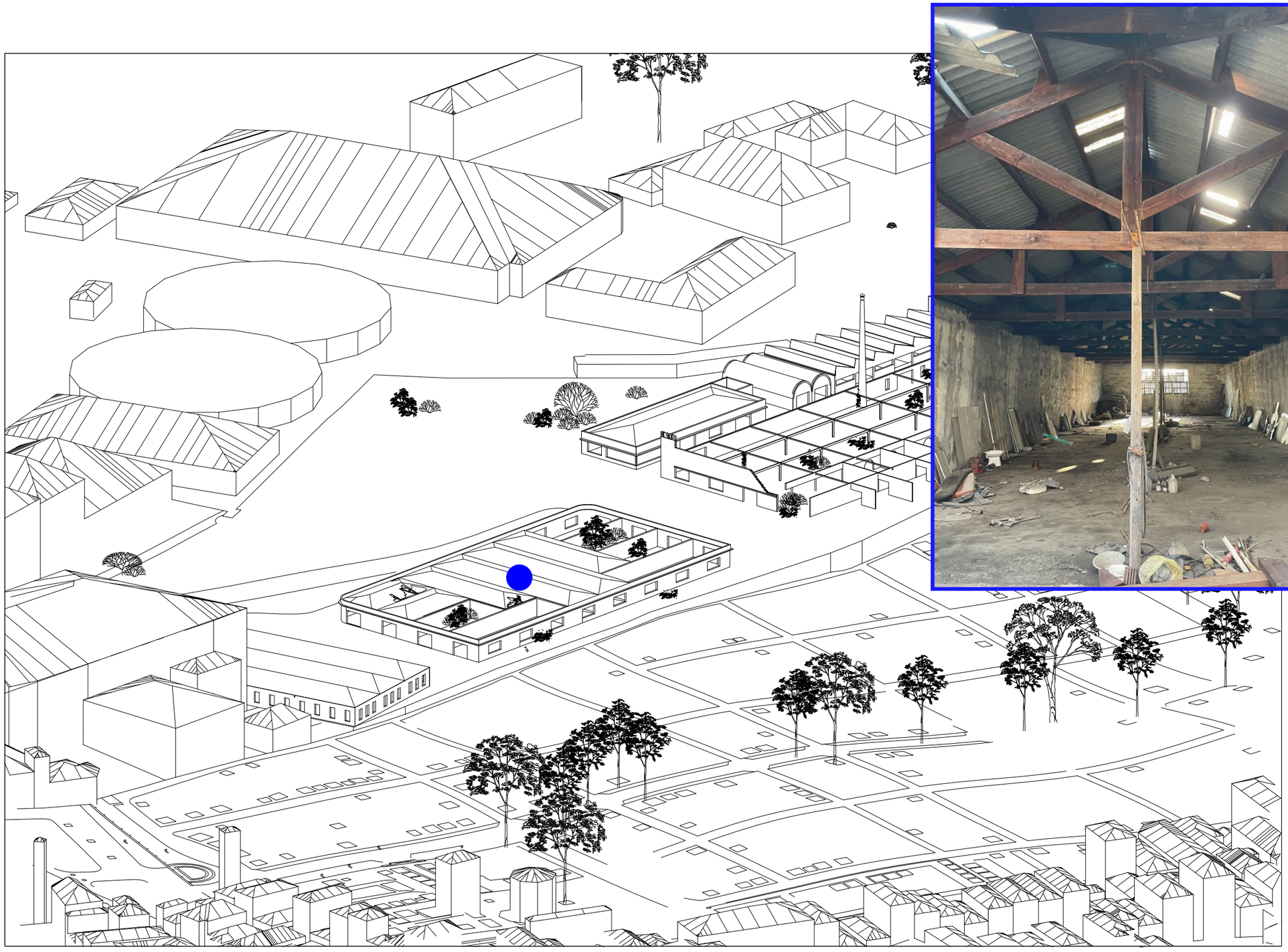


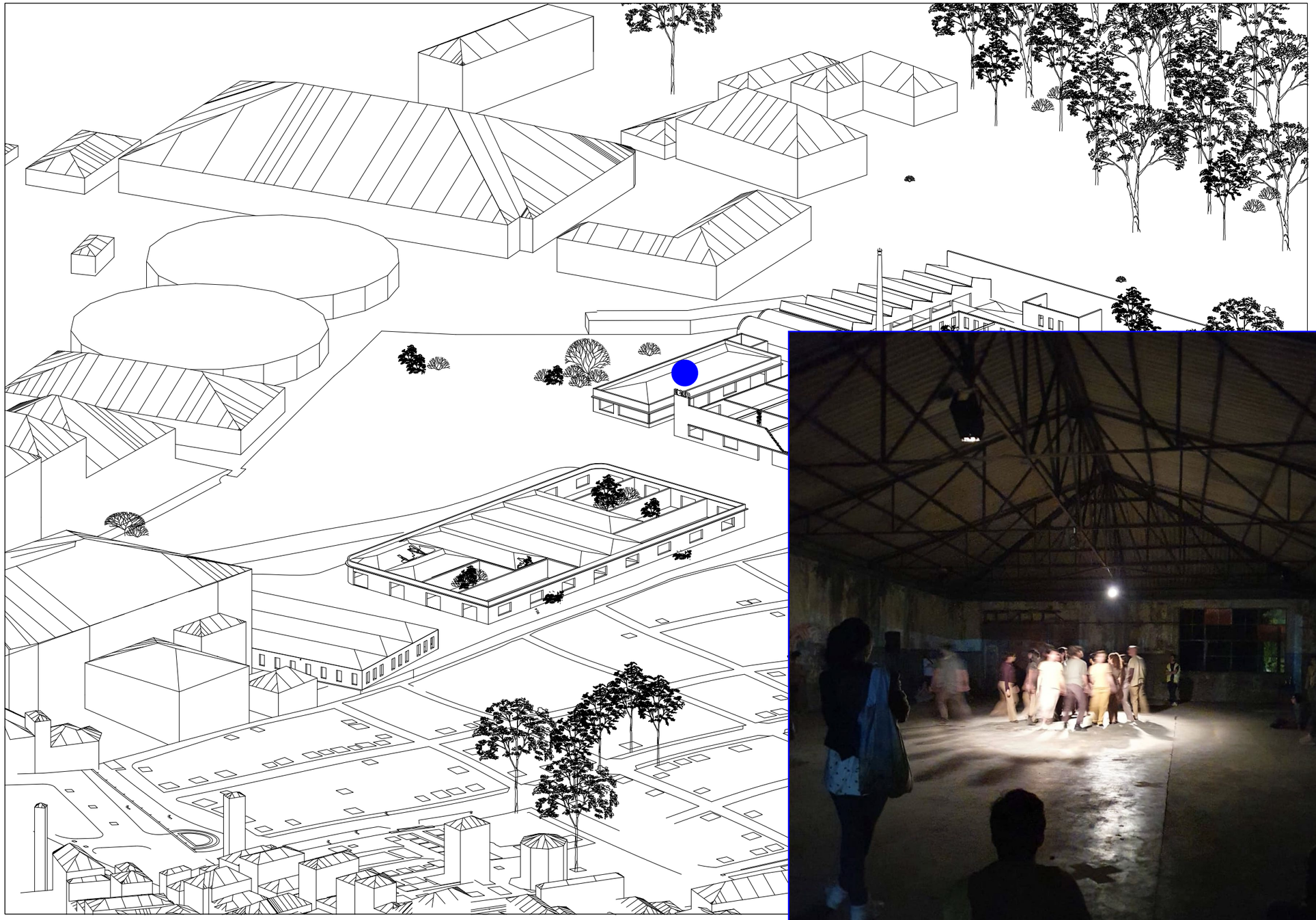
















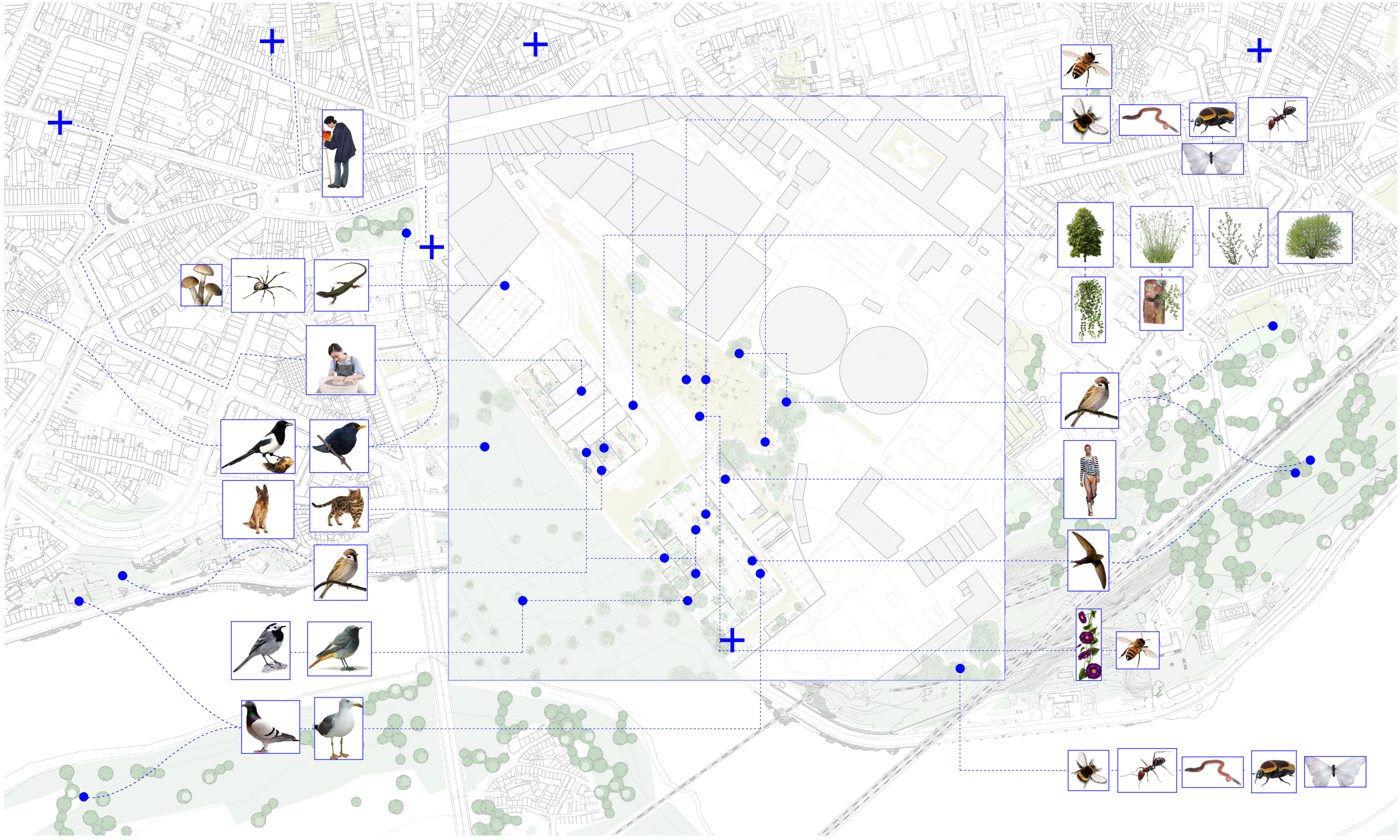


Cohabitation

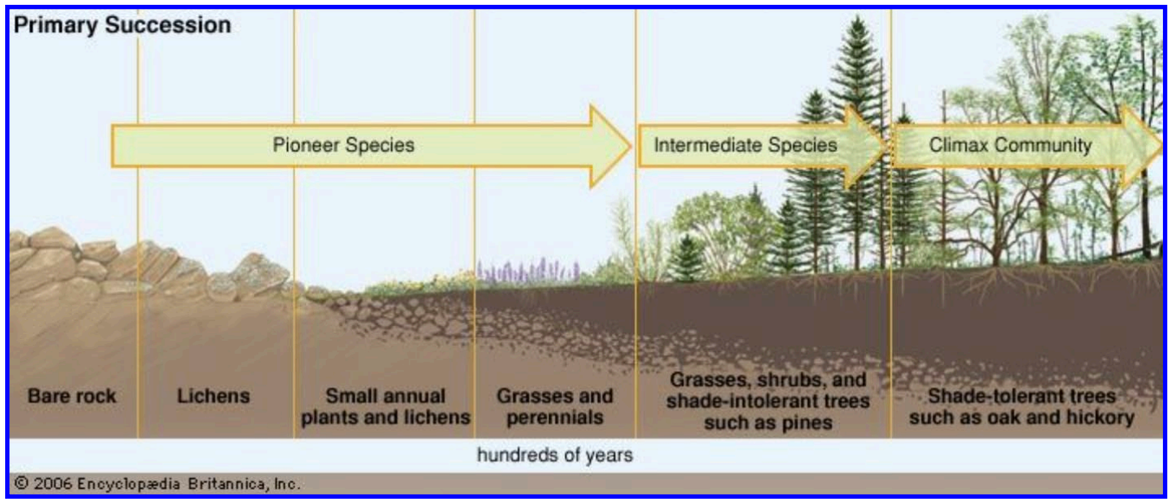


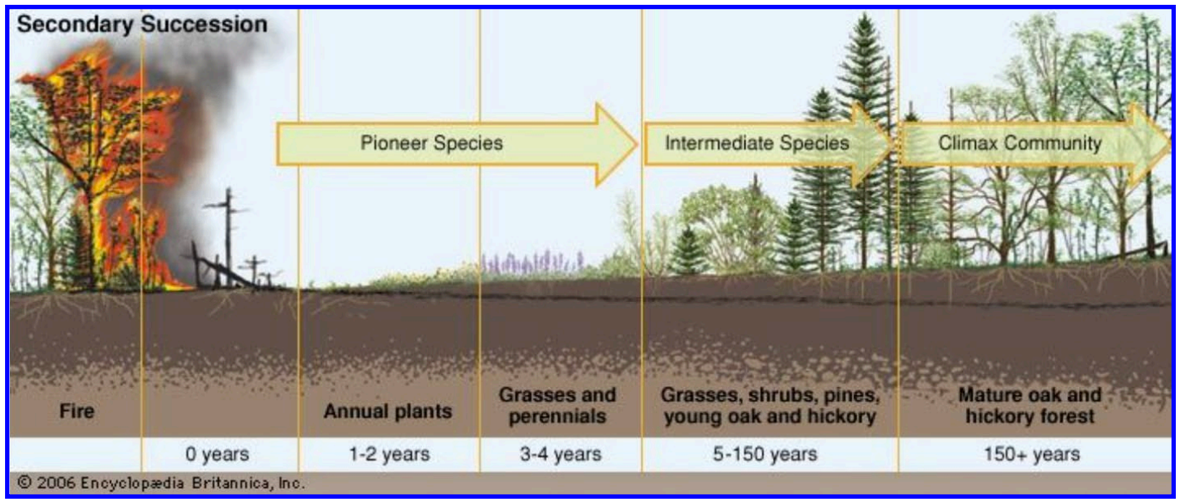
● Actors + Organisations

Cohabitation



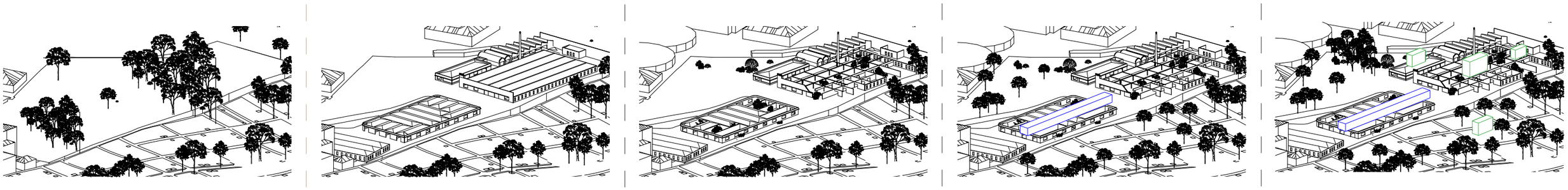
● Actors + Organisations





Concept of Ecological Sucession, source: https://www.britannica.com/science/ecological-succession

Cohabitation

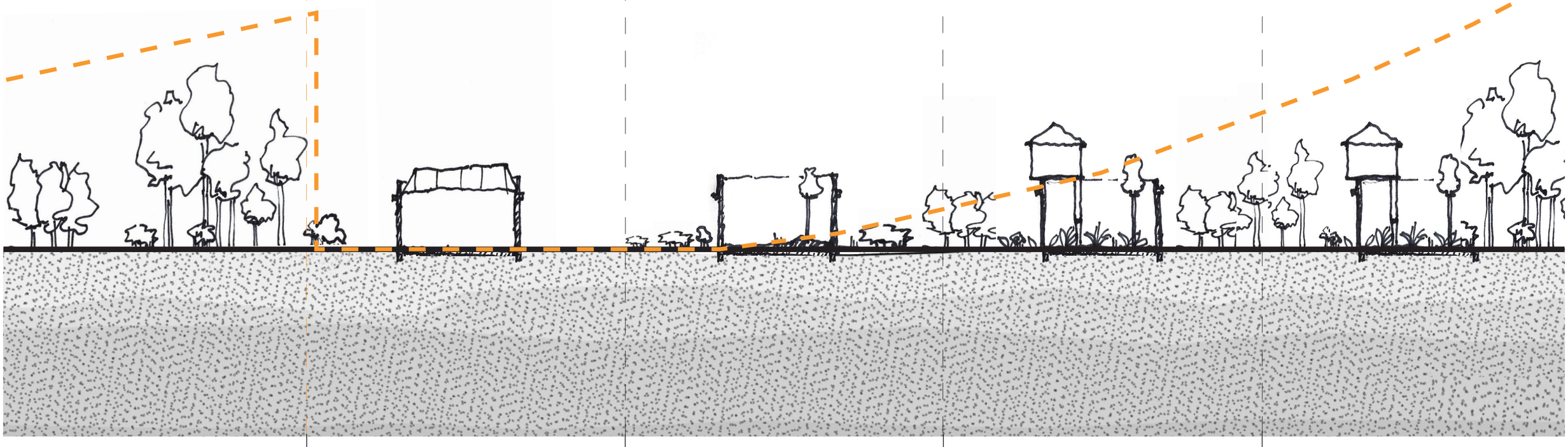


Point of disruption

Pioneer species

Intermediate community

Climax community



Forest

1934 Ford Production

1960 “Abandonment”

2023 Regeneration

2035+ Urban Forest

Cohabitation

Intervention

Intervention Goals



Site model 1:1000

Intervention Goals

1. Accessibility



Site model 1:1000

Intervention Goals

1. Accessibility

2. Regeneration



Site model 1:1000

Intervention Goals

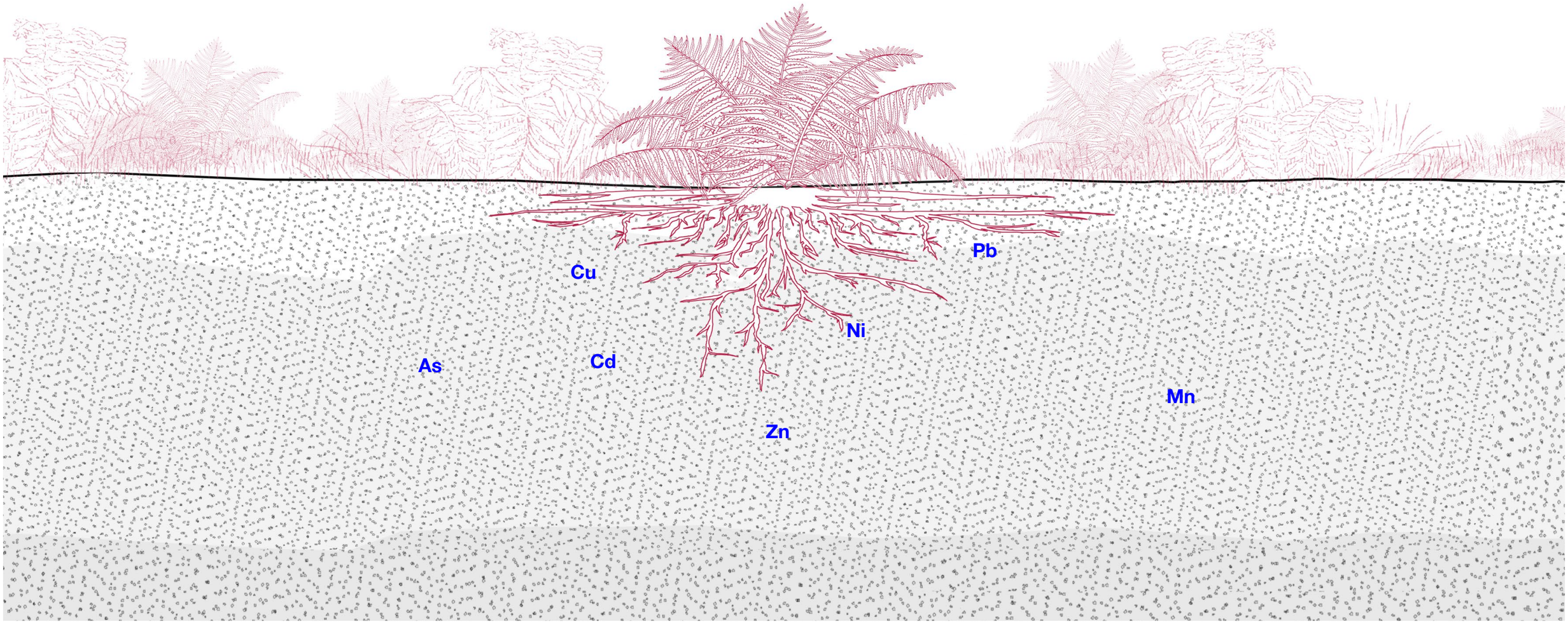
1. Accessibility

2. Regeneration

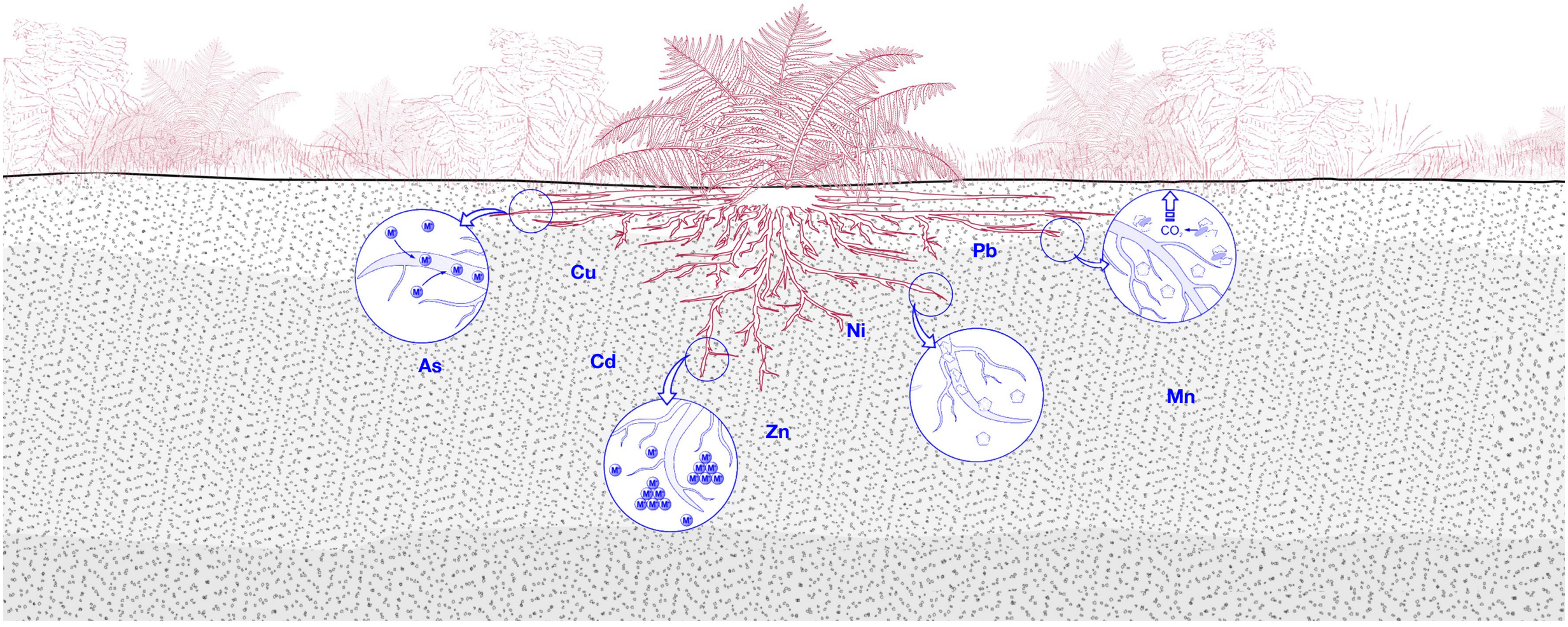
3. Catalysation of an Urban Forest



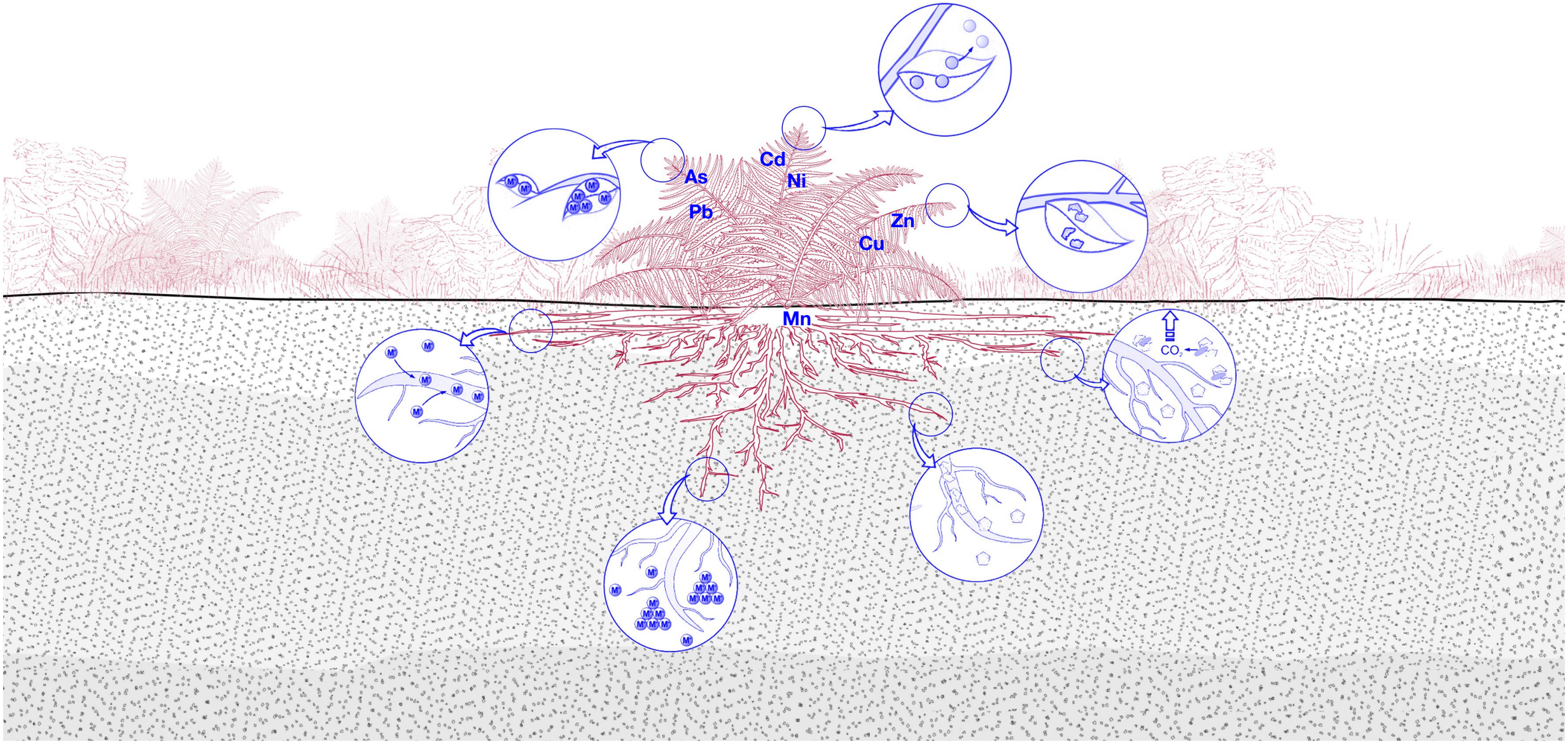
Site model 1:1000



Phytoextraction: Uptake of Heavy Metals by Phytoextraction

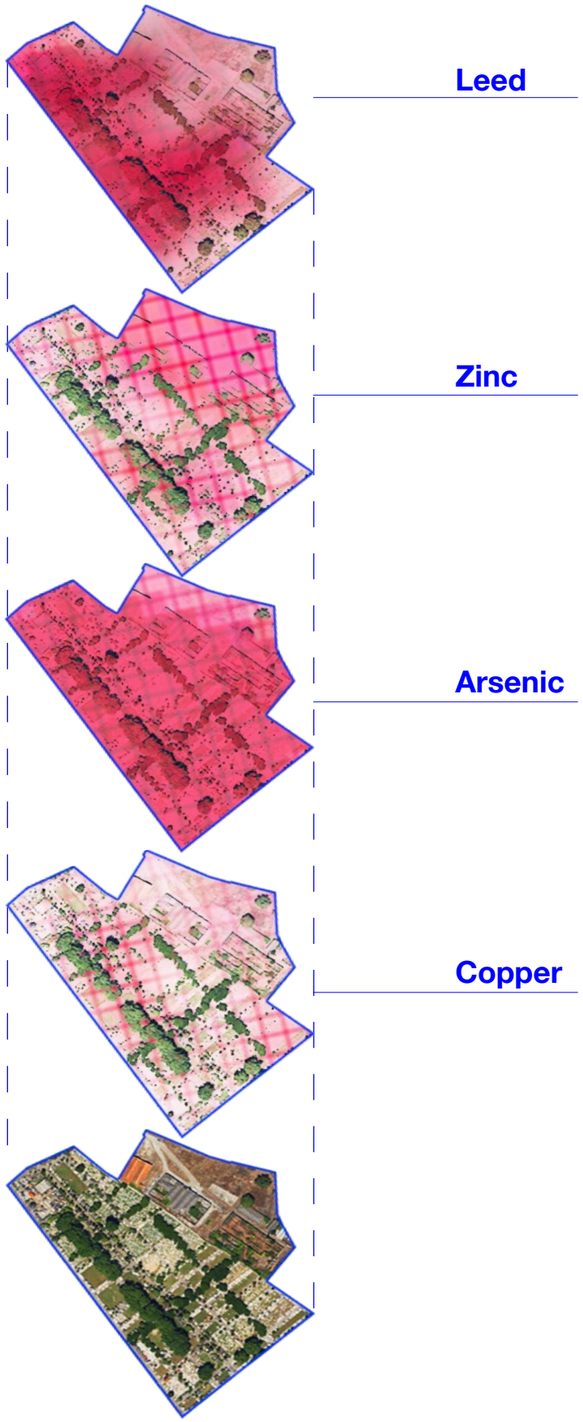


Phytoextraction: Uptake of Heavy Metals by Phytoextraction

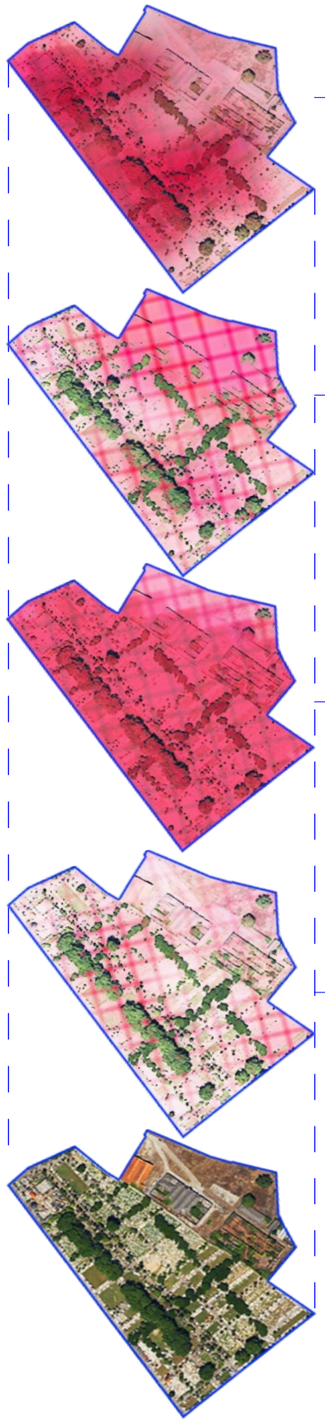


Phytoextraction Phytostabilisation Phytodegradation Phytostimulation

Phytoextraction: Uptake of Heavy Metals by Phytoextraction

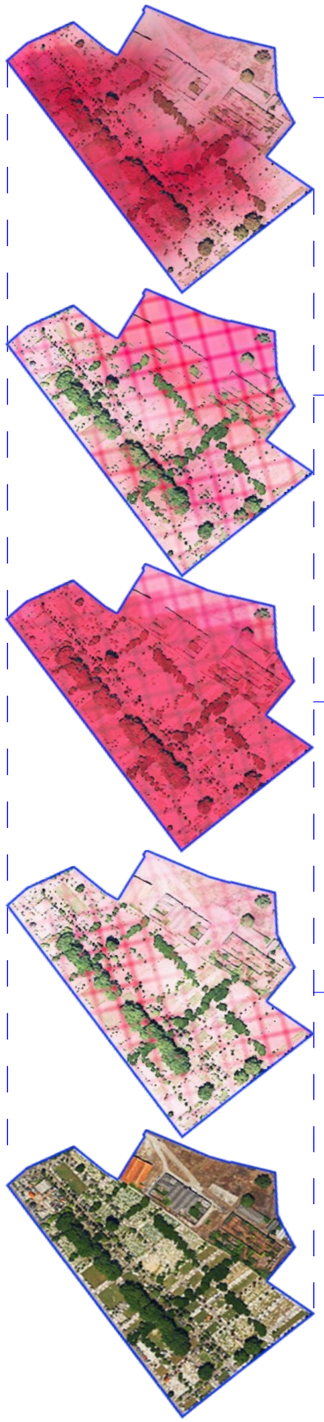


Local Issue: Soil Pollution, Source: CMP 2016; Grupo Clima e Ambiente Urbano, CEGOT, 2017.

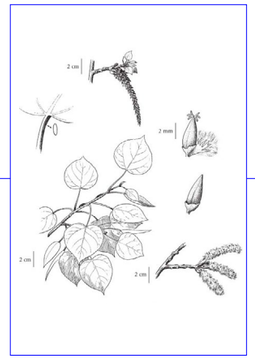


Schwermetall	Toxische Konzentration (µg/g Trockenmasse)	Konzentration in Hyperakkumulatoren (µg/g Trockenmasse)	Rekordpflanzen
Arsen (As)	<2-80	>1000	*Pteris vittata*
Blei (Pb)	0,6-28	>1000	*Noccaea rotondifolia*
Kadmium (Cd)	6-10	>100	*Arabidopsis halleri*
Kupfer (Cu)	20-30	>300	*Aeolanthus biformifolius*
Mangan (Mn)	200-3500	>10000	*Virotia neurophylla*
Nickel (Ni)	10-50	>1000	*Berkheya coddi*
Zink (Zn)	100-300	>3000	*Noccaea caerulescens*

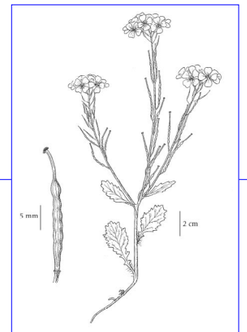
Local Issue: Soil Pollution, Source: CMP 2016; Grupo Clima e Ambiente Urbano, CEGOT, 2017.



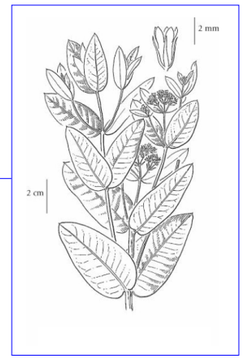
Lead



Populus tremuloides / Poplar

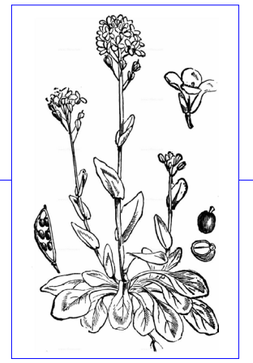


Brassica juncea / brown mustard

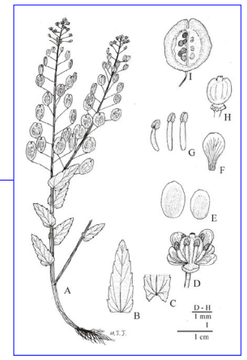


Apocynum cannabinum / hemp dogbane

Zinc

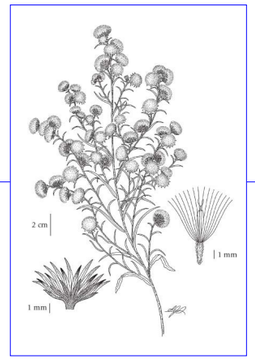


Noccaea caerulescens / Penny-cress

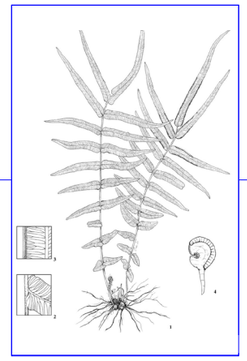


Thalaspi arvense / Field penny-ycress

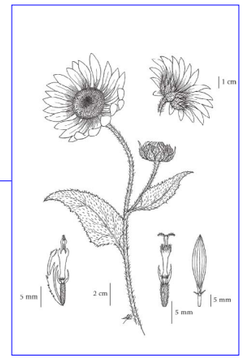
Arsenic



Mimosa pudica / Mimosa

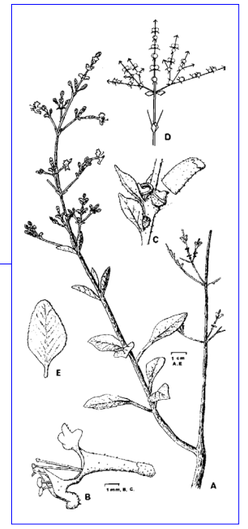


Pteris Vittata / Chinese brake



Helianthus annus / Common Sunflower

Copper

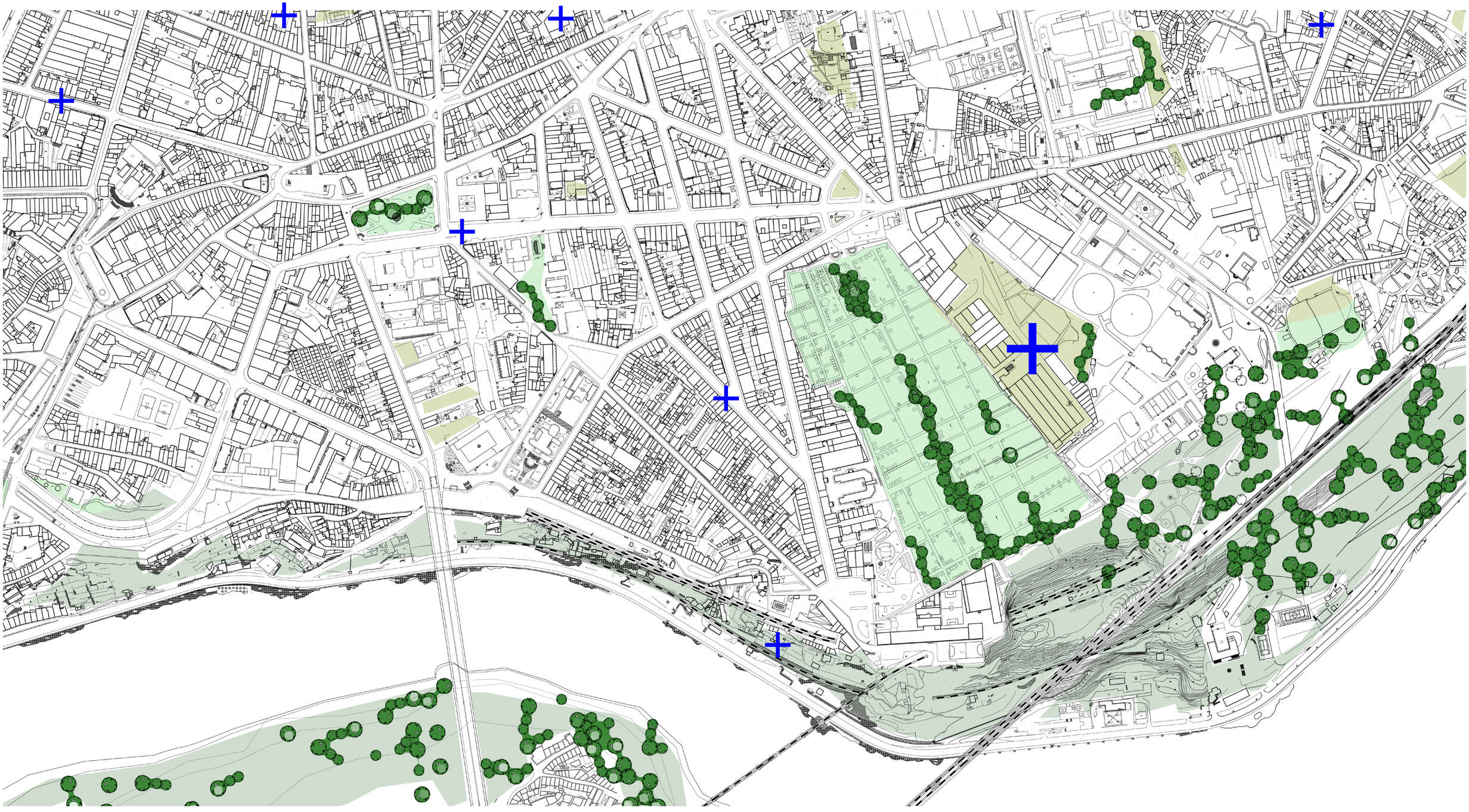


Aeollanthus biformifolius / Rocksage

Local Issue: Soil Pollution, Source: CMP 2016; Grupo Clima e Ambiente Urbano, CEGOT, 2017.

Case study: Palacio Ford

Konrad Schlüter



Case study: Palacio Ford

Konrad Schlüter





Organisation: Local network, Casa Musas

Case study: Palacio Ford

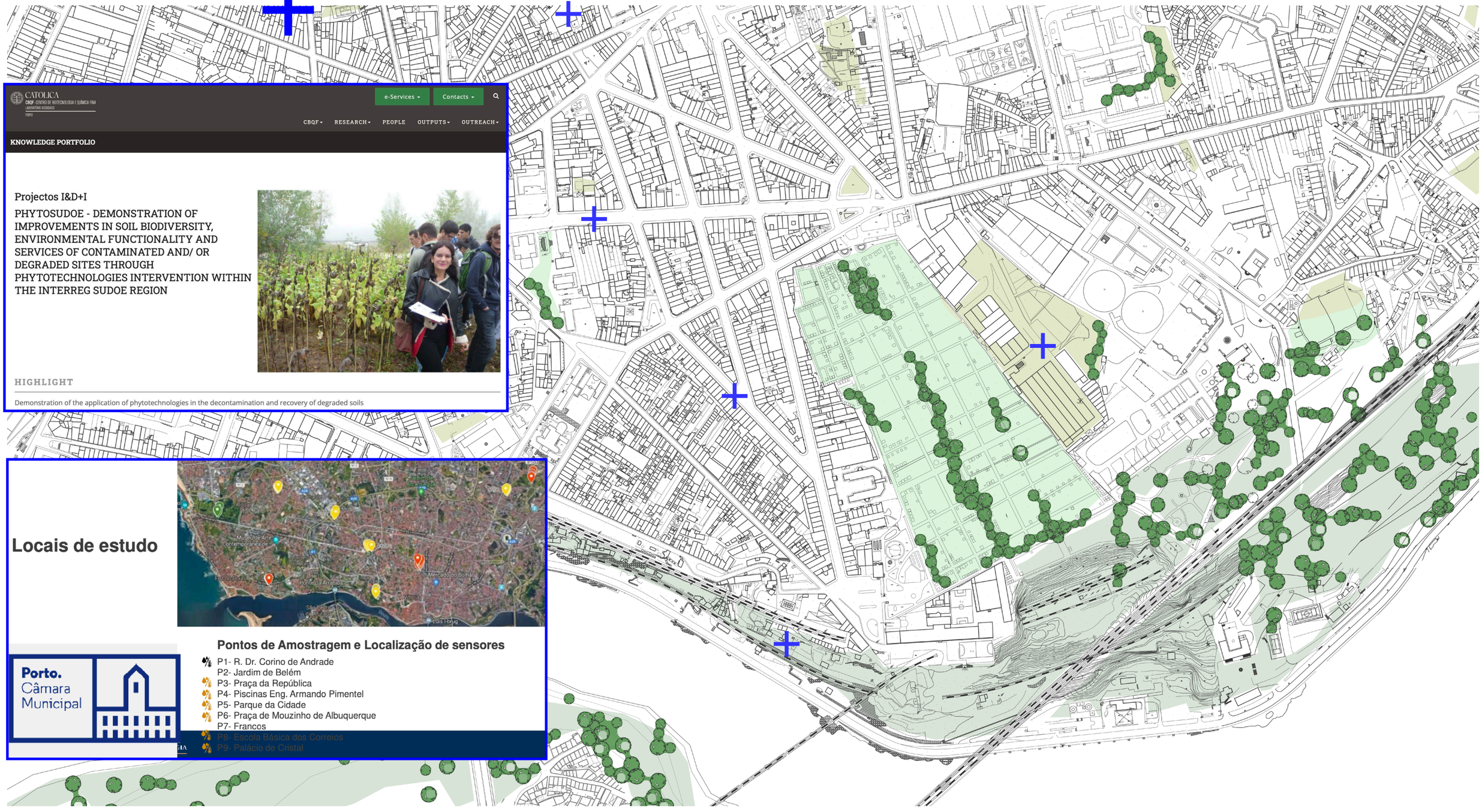
Konrad Schlüter



Organisation: Local network, As Hortas

Case study: Palacio Ford

Konrad Schlüter



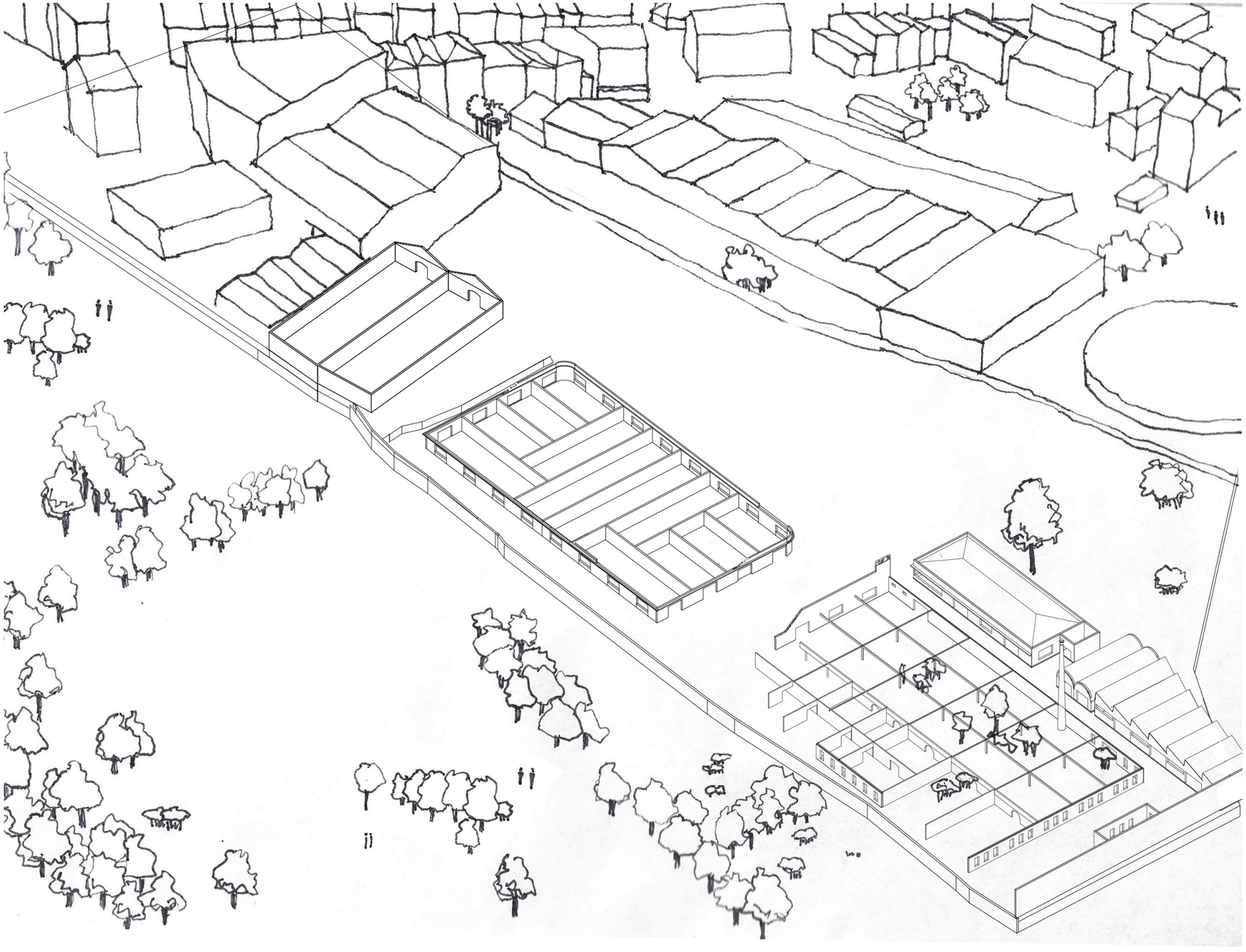
Organisation: Local network, Universidade Catholica do Porto

Intervention strategy

1.Infrastructure

-Access

-Water distribution
and collection



Axonometry of Pergola

1.Infrastructure

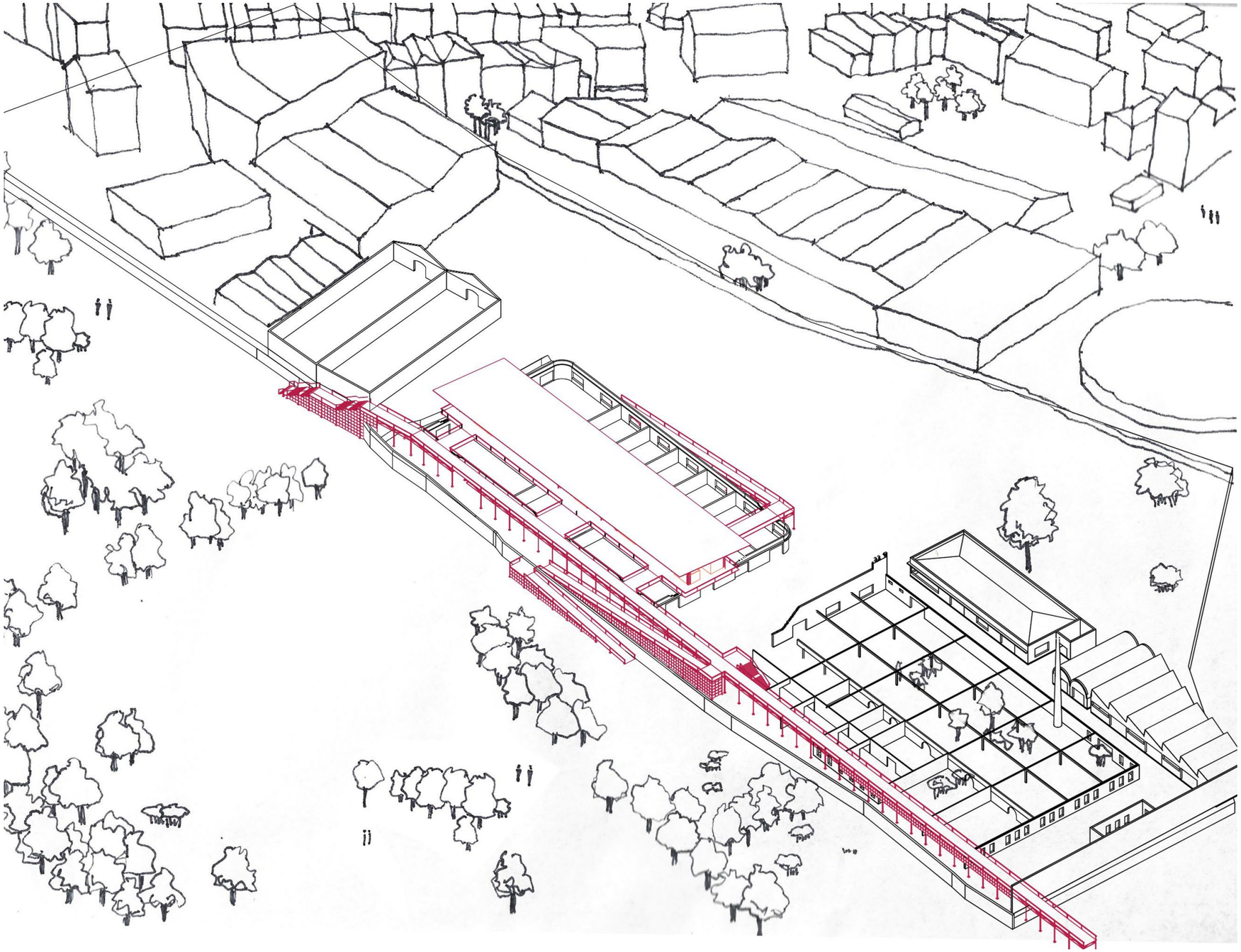
-Access

-Water distribution
and collection

2.Community building

-Water storage
and purification

-Spaces for agriculture



Axonometry of Pergola

1.Infrastructure

-Access

-Water distribution
and collection

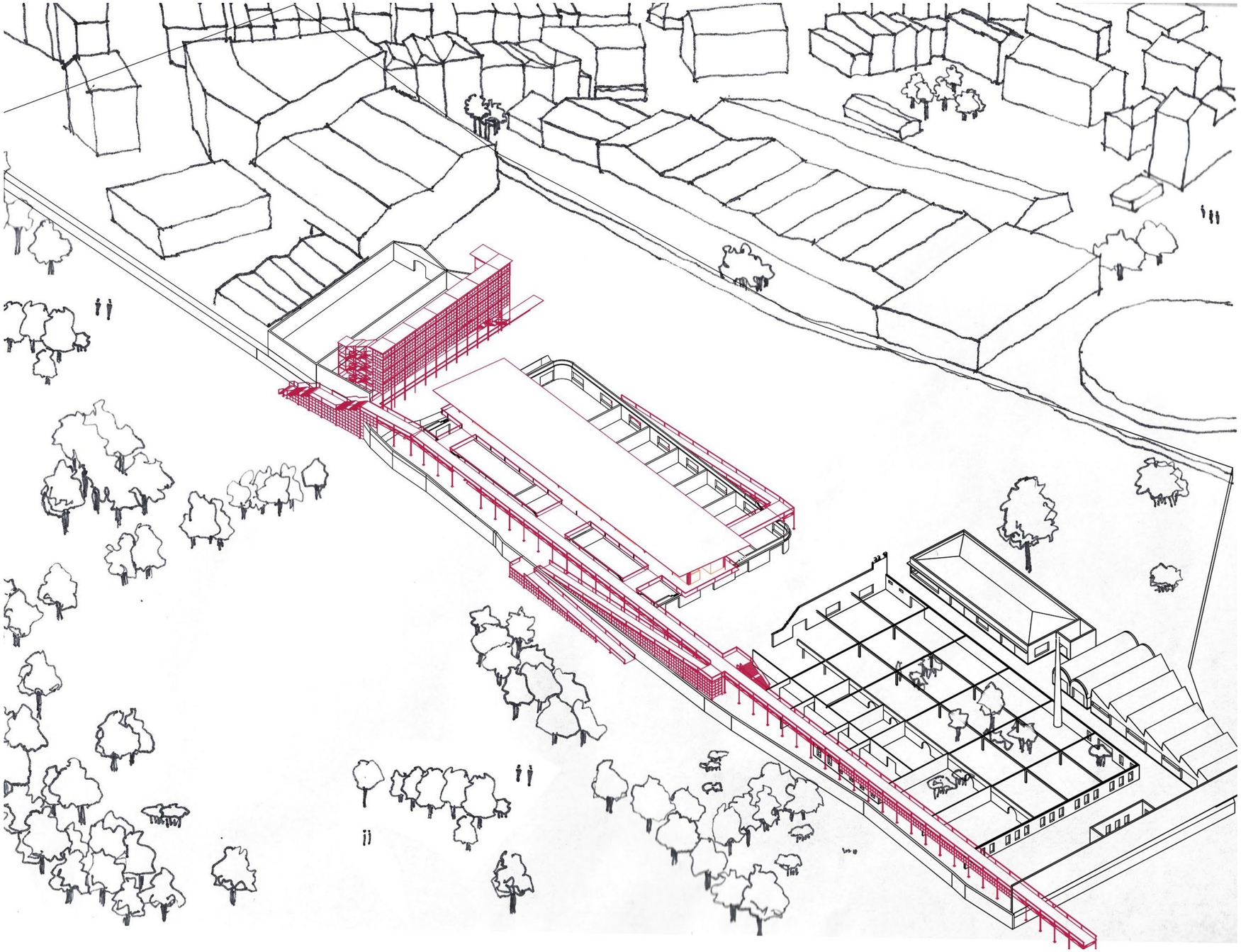
2.Community building

-Water storage
and purification

-Spaces for agriculture

3.Habitation

-Cohabitation for humans
and non-humans



Axonometry of Pergola

1.Infrastructure

-Access

-Water distribution
and collection

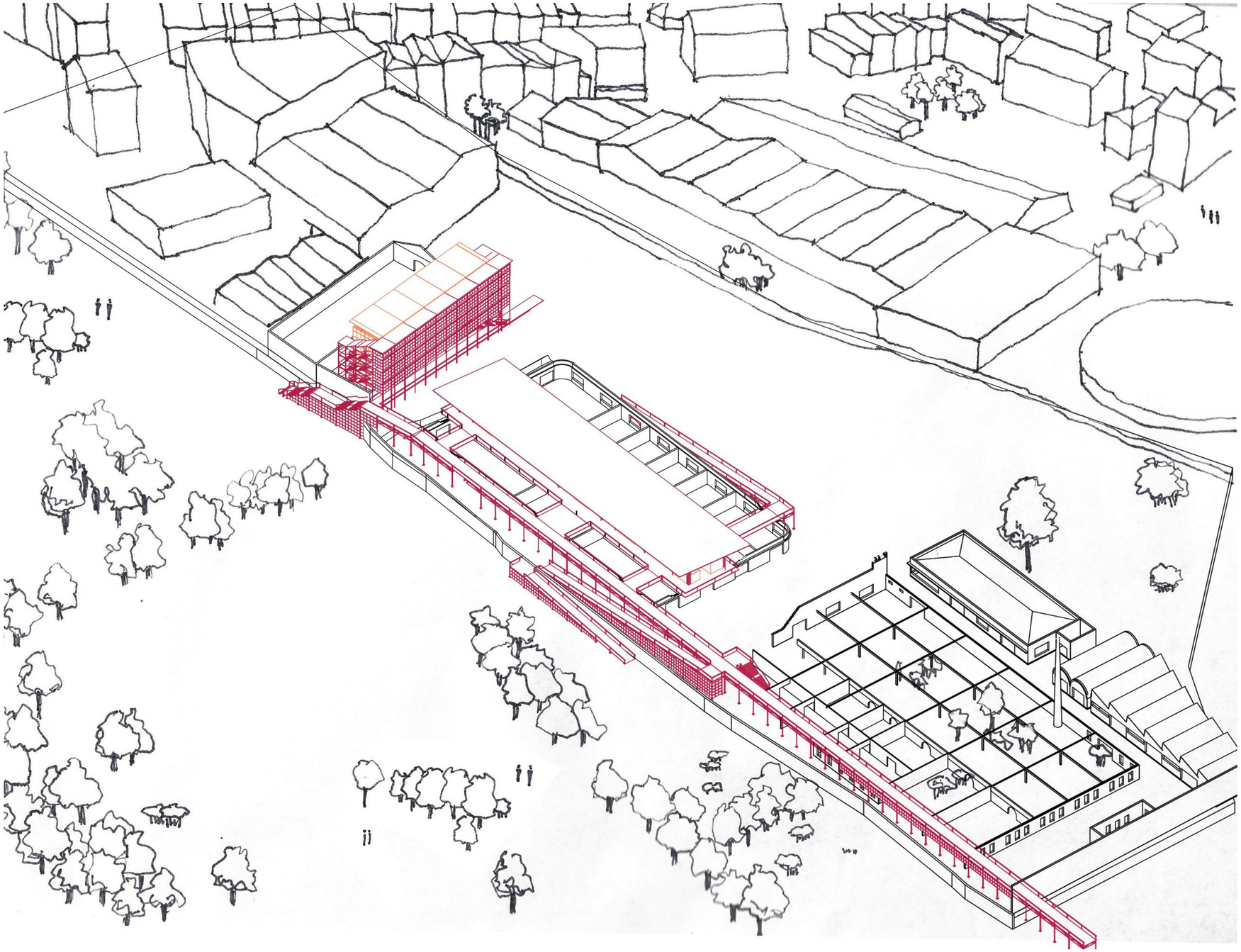
2.Community building

-Water storage
and purification

-Spaces for agriculture

3.Habitation

-Cohabitation for humans
and non-humans



Axonometry of Pergola

1.Infrastructure

-Access

-Water distribution
and collection

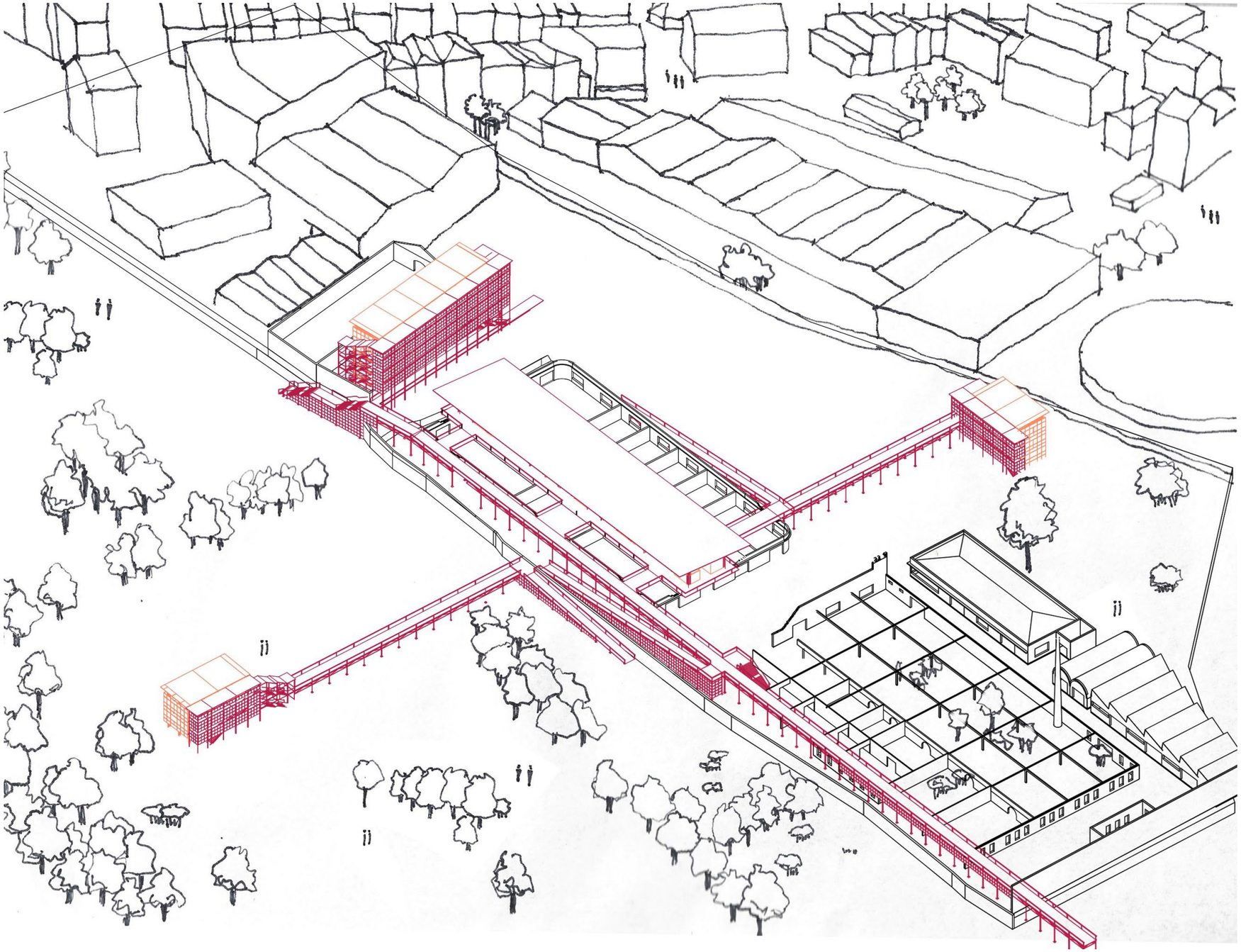
2.Community building

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Axonometry of Pergola

1.Infrastructure

-Access

-Water distribution
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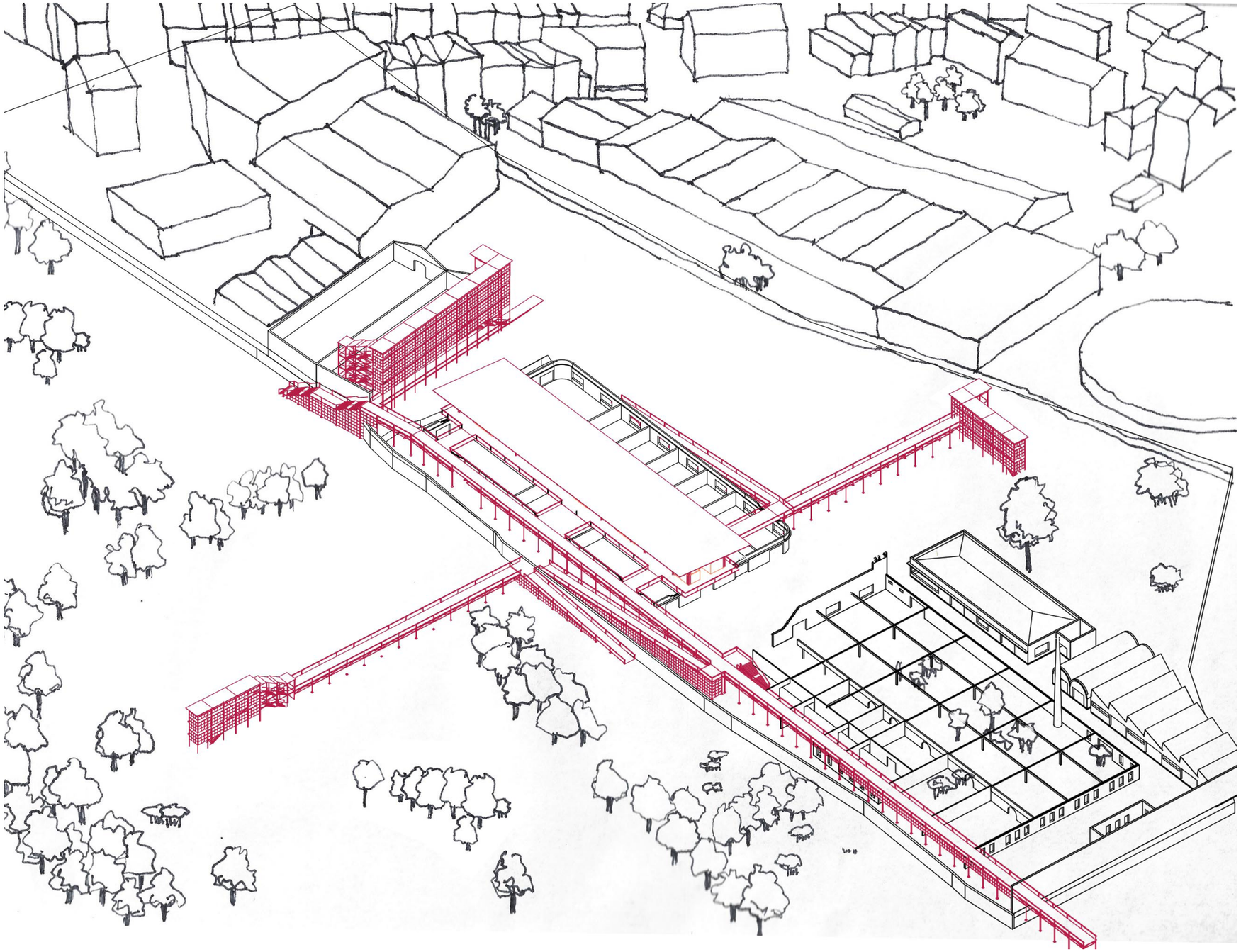
2.Community building

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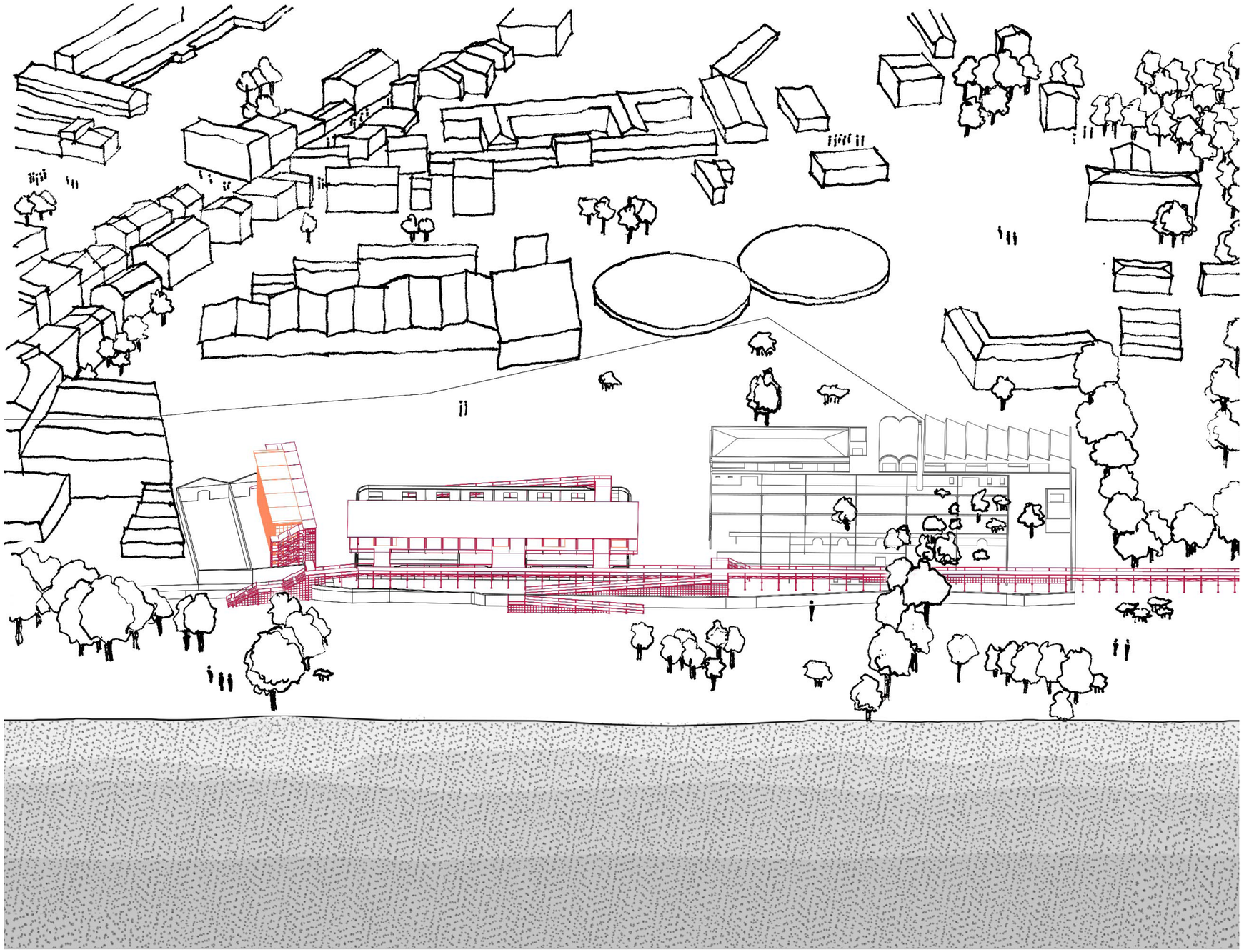
-Spaces for agriculture

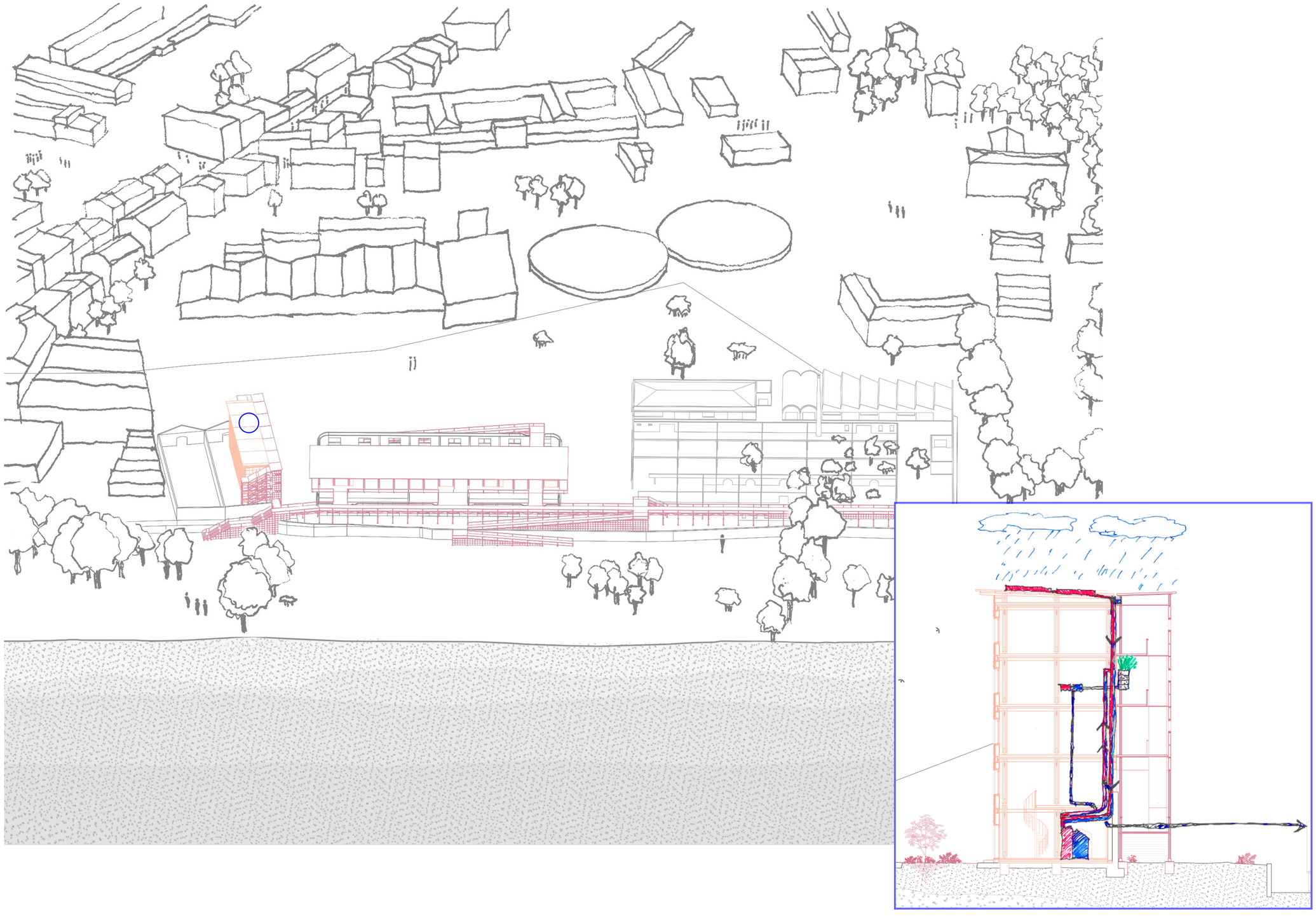
3.Habitation

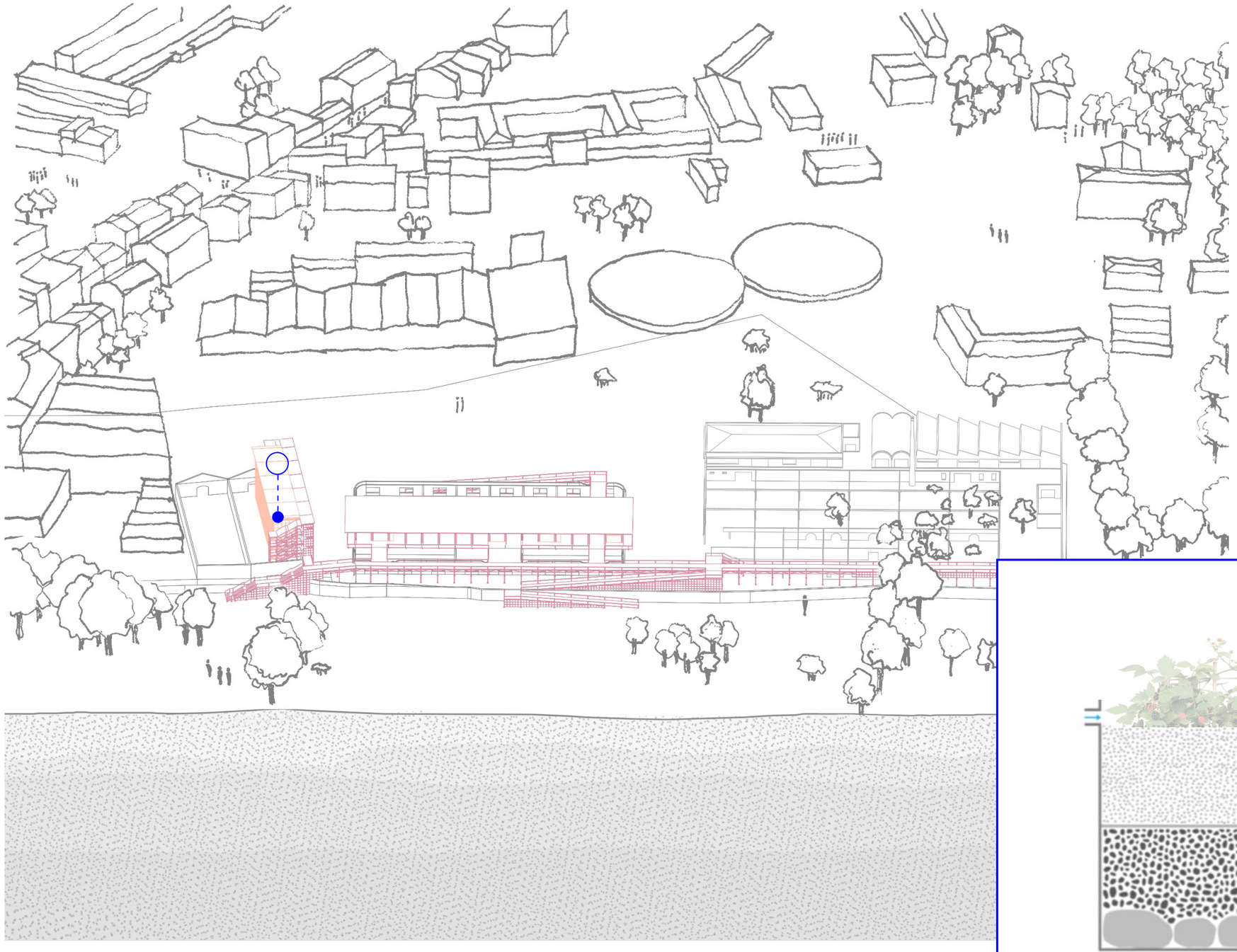
-Cohabitation for humans
and non-humans

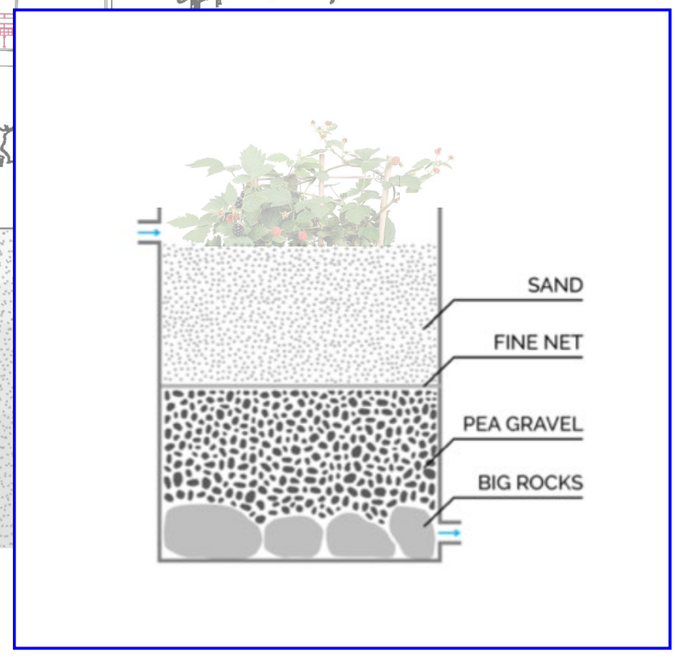


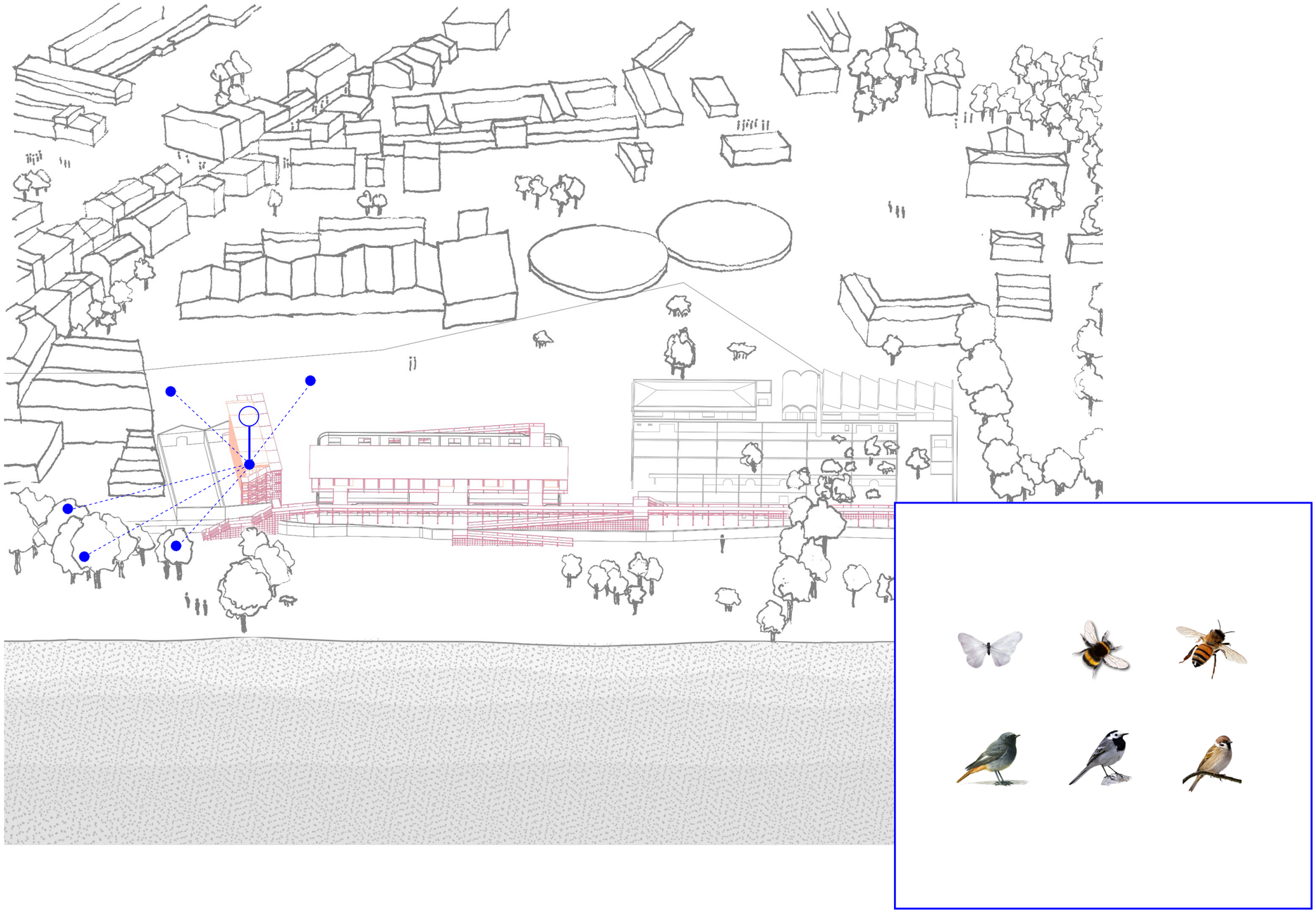
Axonometry of Pergola

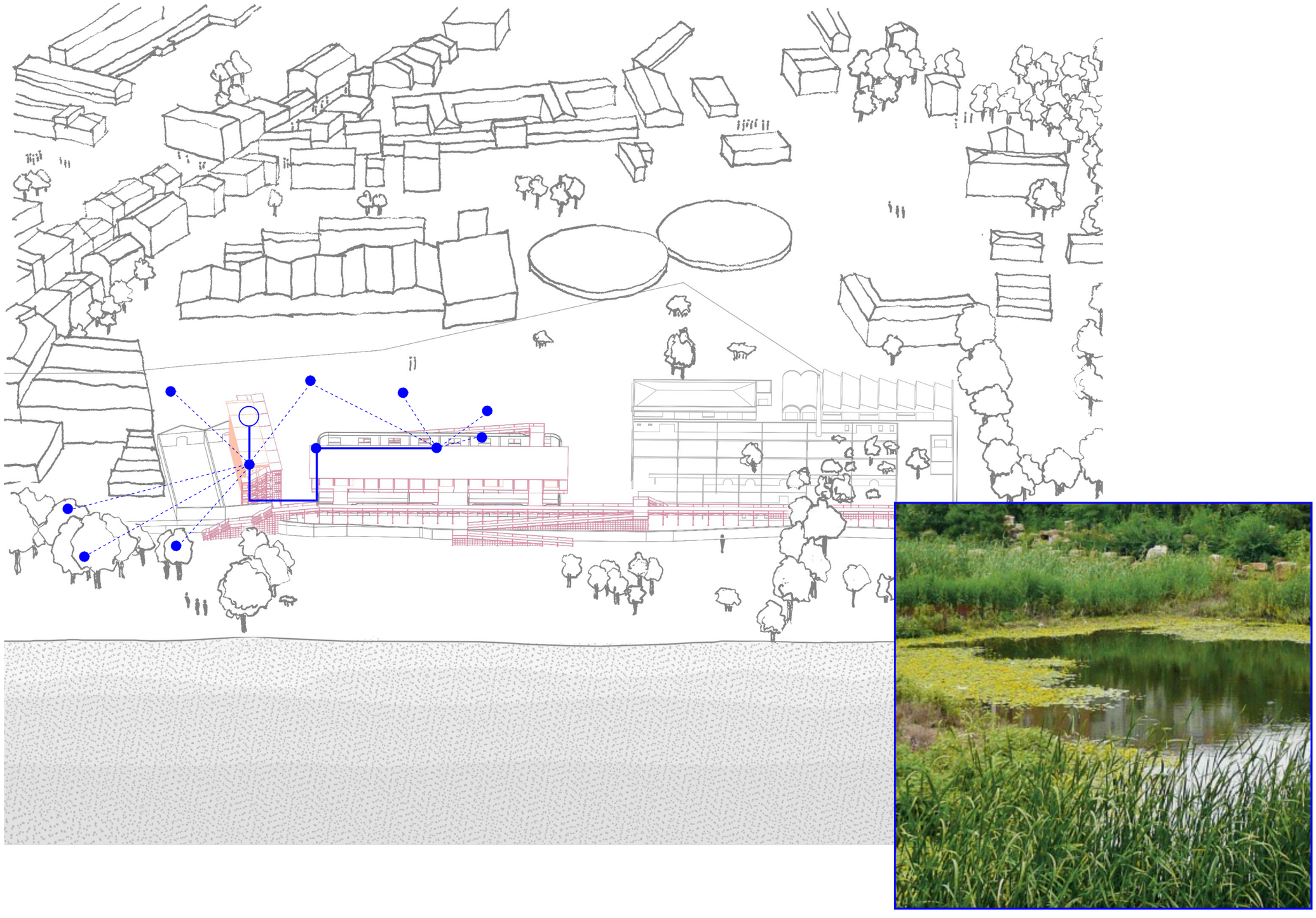


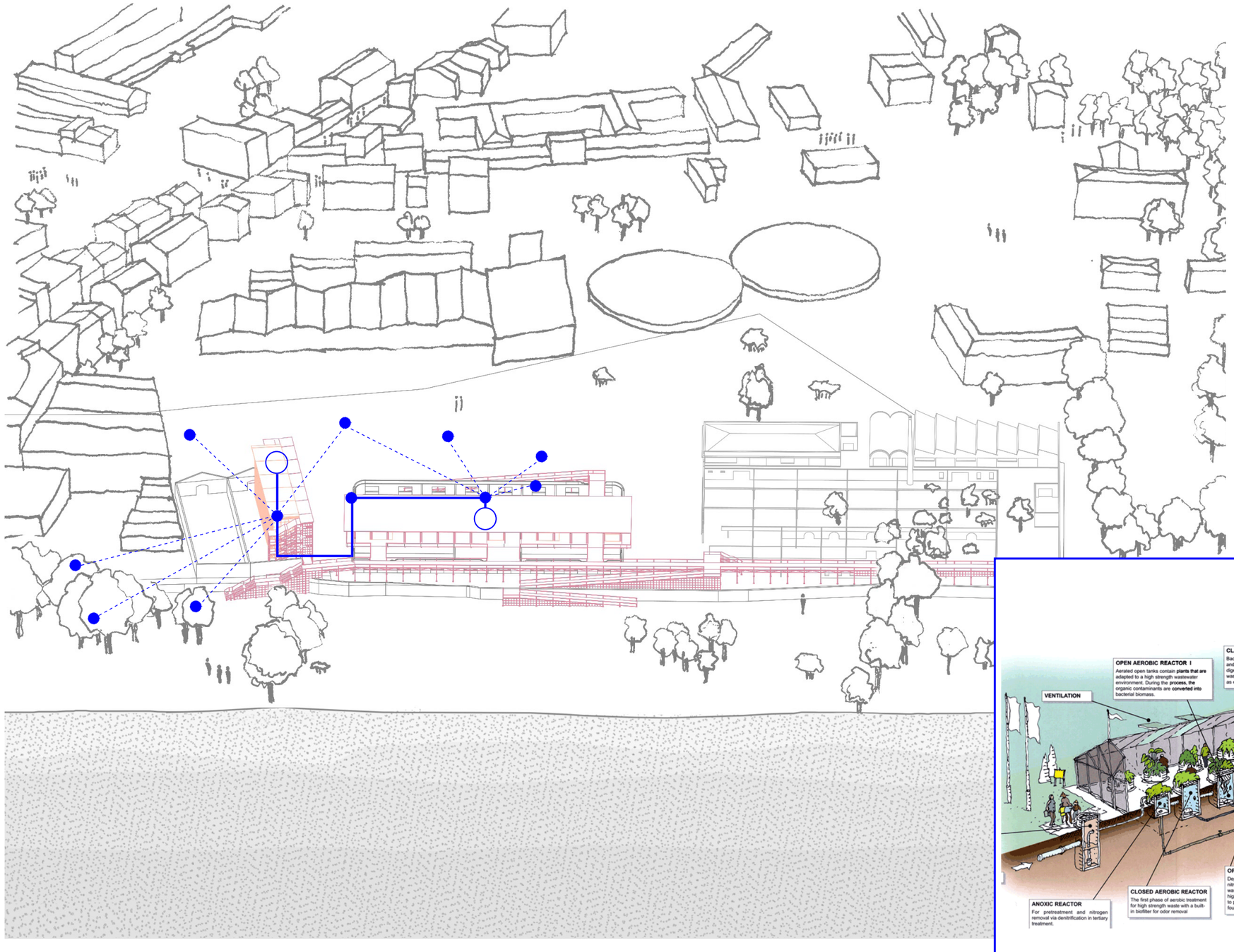


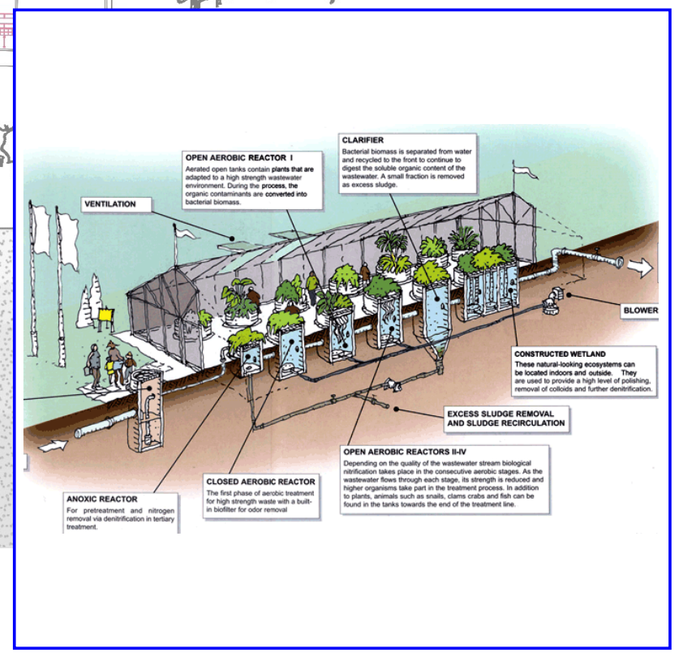


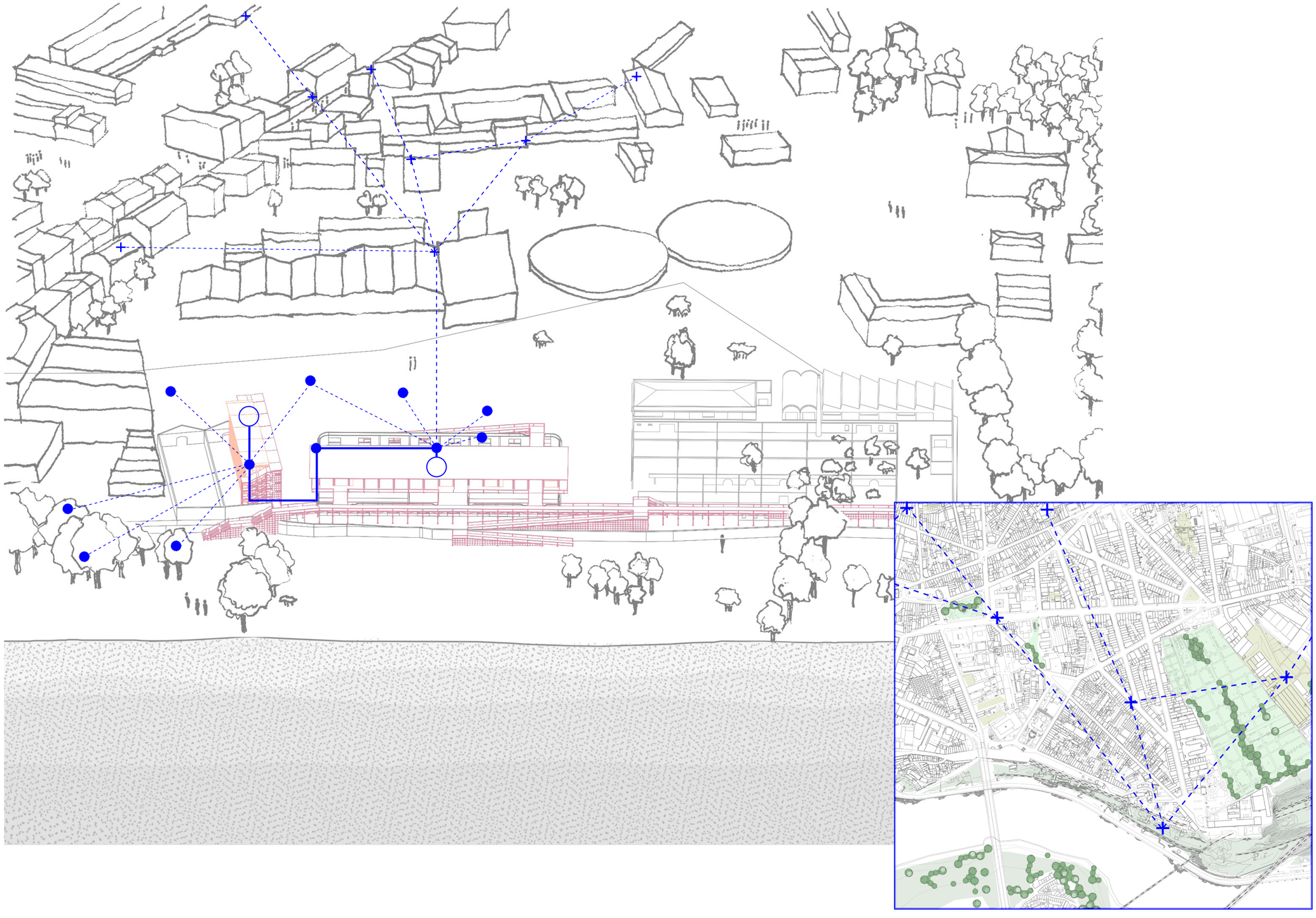

SAND
FINE NET
PEA GRAVEL
BIG ROCKS

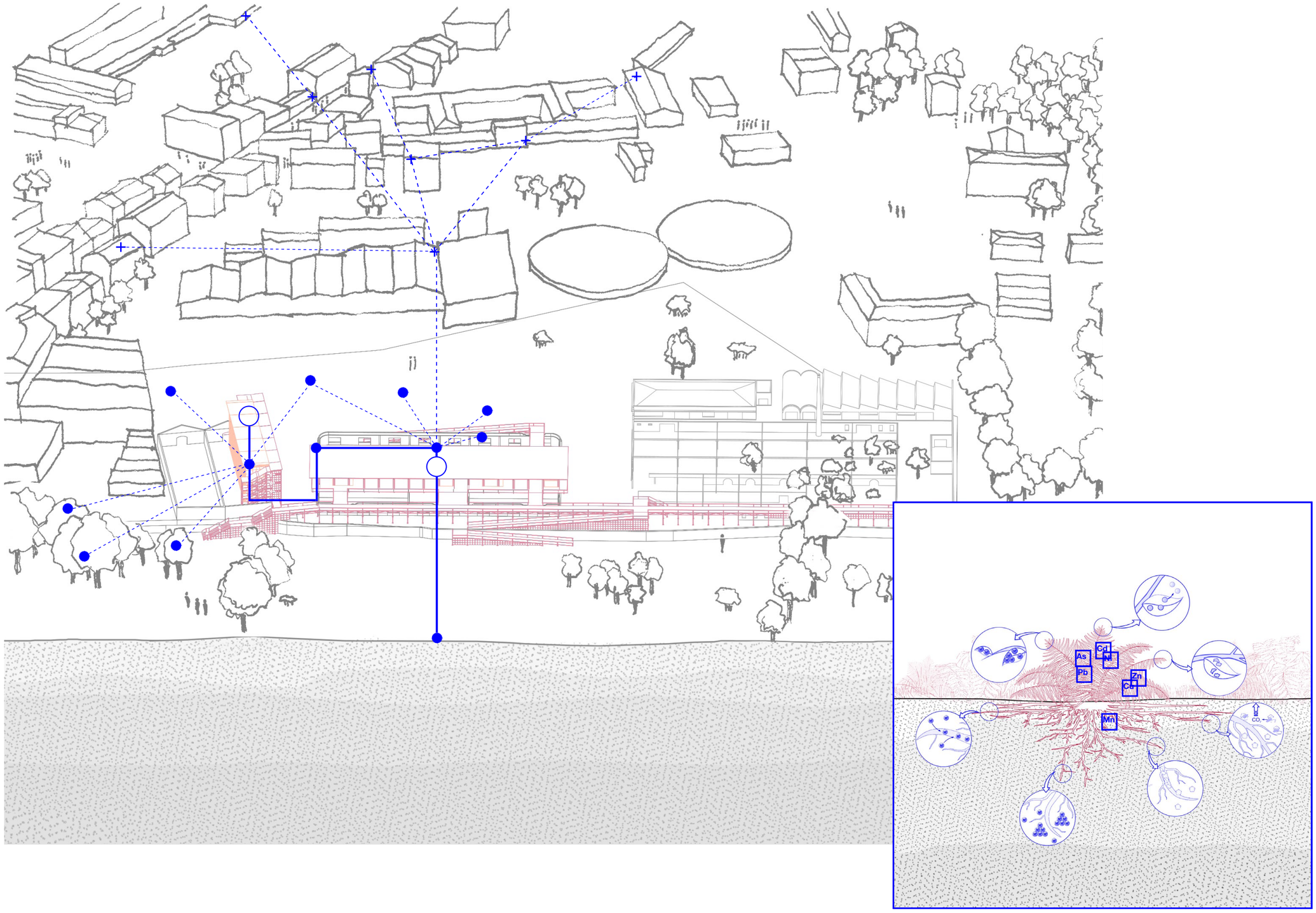


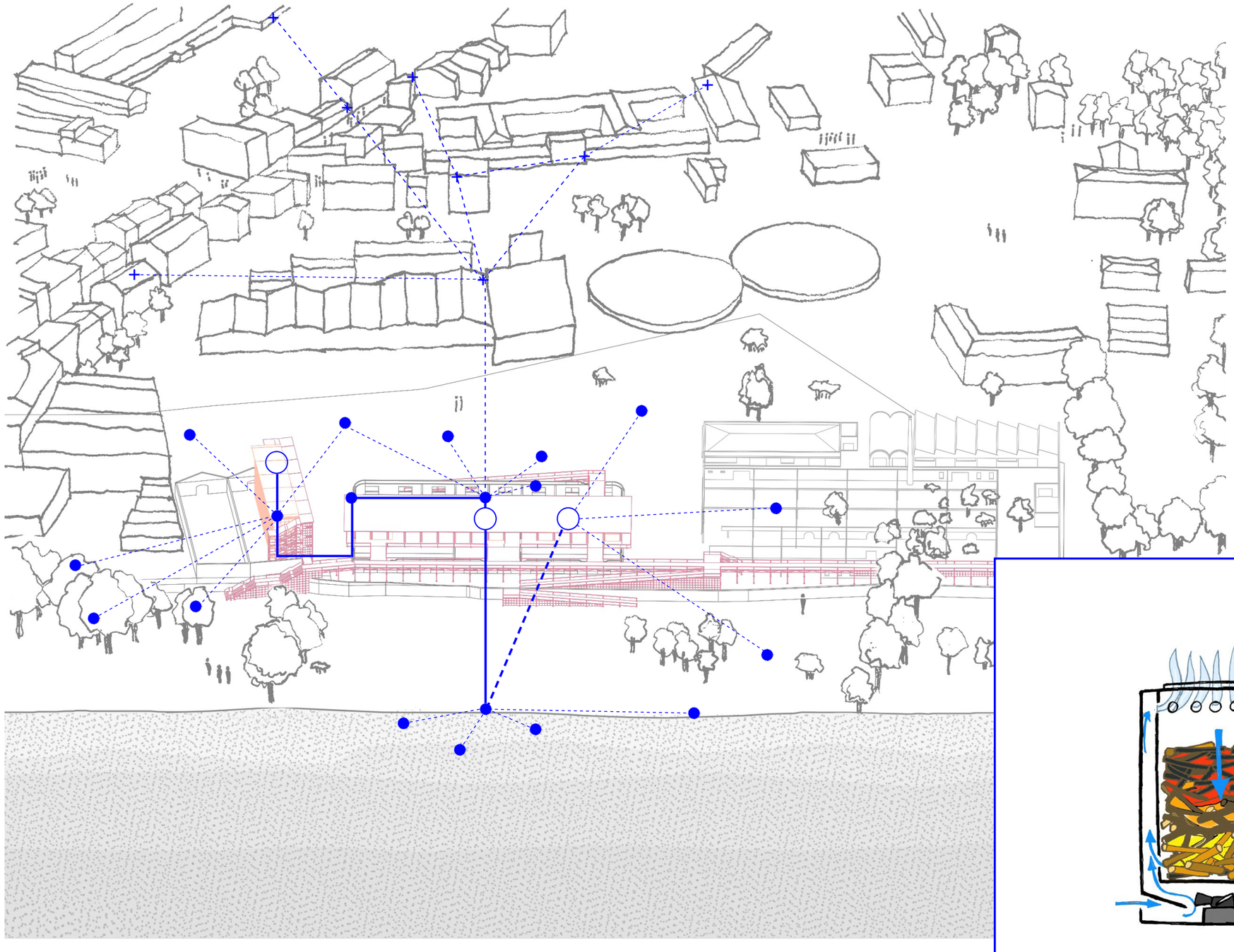


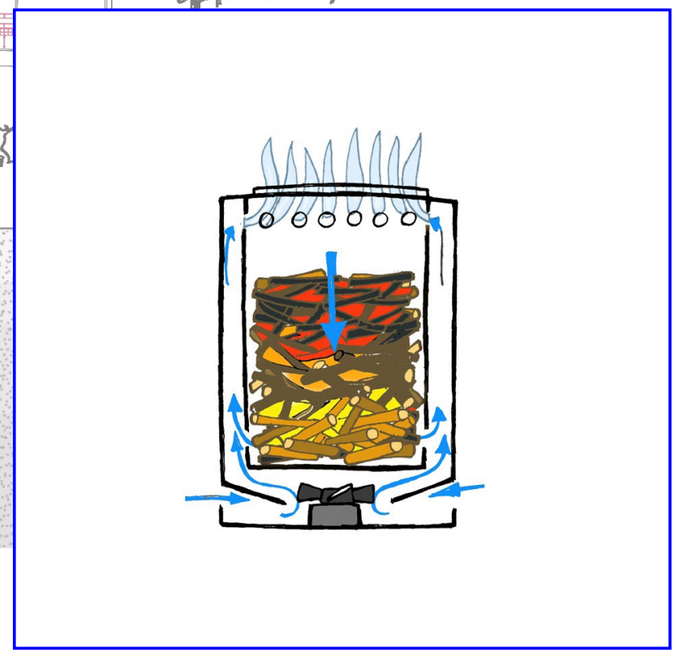


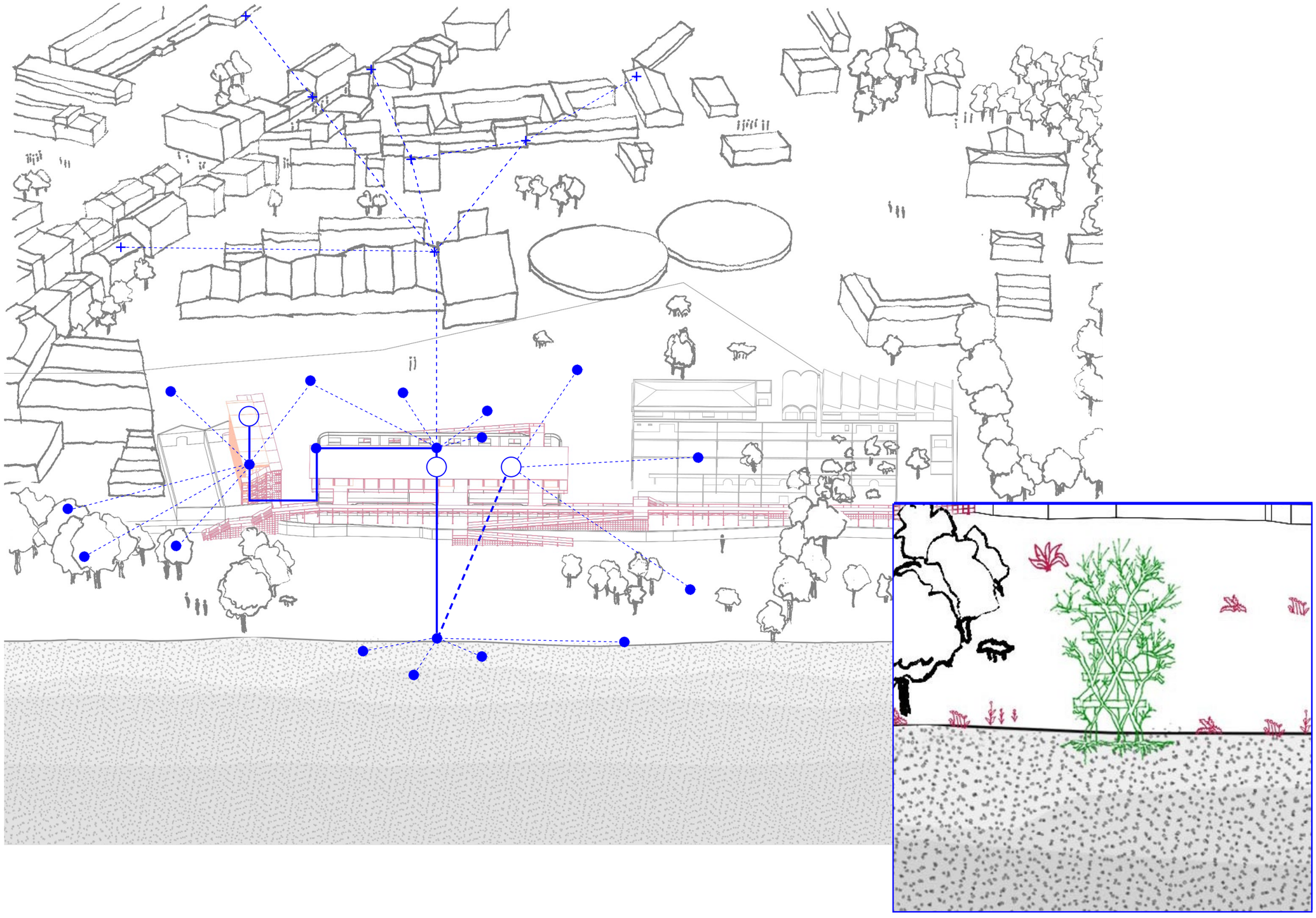

OPEN AEROBIC REACTOR I
Aerated open tanks contain plants that are adapted to a high strength wastewater environment. During the process, the organic contaminants are converted into bacterial biomass.
CLARIFIER
Bacterial biomass is separated from water and recycled to the front to continue to digest the soluble organic content of the wastewater. A small fraction is removed as excess sludge.
VENTILATION
BLOWER
CONSTRUCTED WETLAND
These natural-looking ecosystems can be located indoors and outside. They are used to provide a high level of polishing, removal of colloids and further denitrification.
EXCESS SLUDGE REMOVAL AND SLUDGE RECIRCULATION
OPEN AEROBIC REACTORS II-IV
Depending on the quality of the wastewater stream biological nitrification takes place in the consecutive aerobic stages. As the wastewater flows through each stage, its strength is reduced and higher organisms take part in the treatment process. In addition to plants, animals such as snails, clams crabs and fish can be found in the tanks towards the end of the treatment line.
CLOSED AEROBIC REACTOR
The first phase of aerobic treatment for high strength waste with a built-in biofilter for odor removal
ANOXIC REACTOR
For pretreatment and nitrogen removal via denitrification in tertiary treatment.

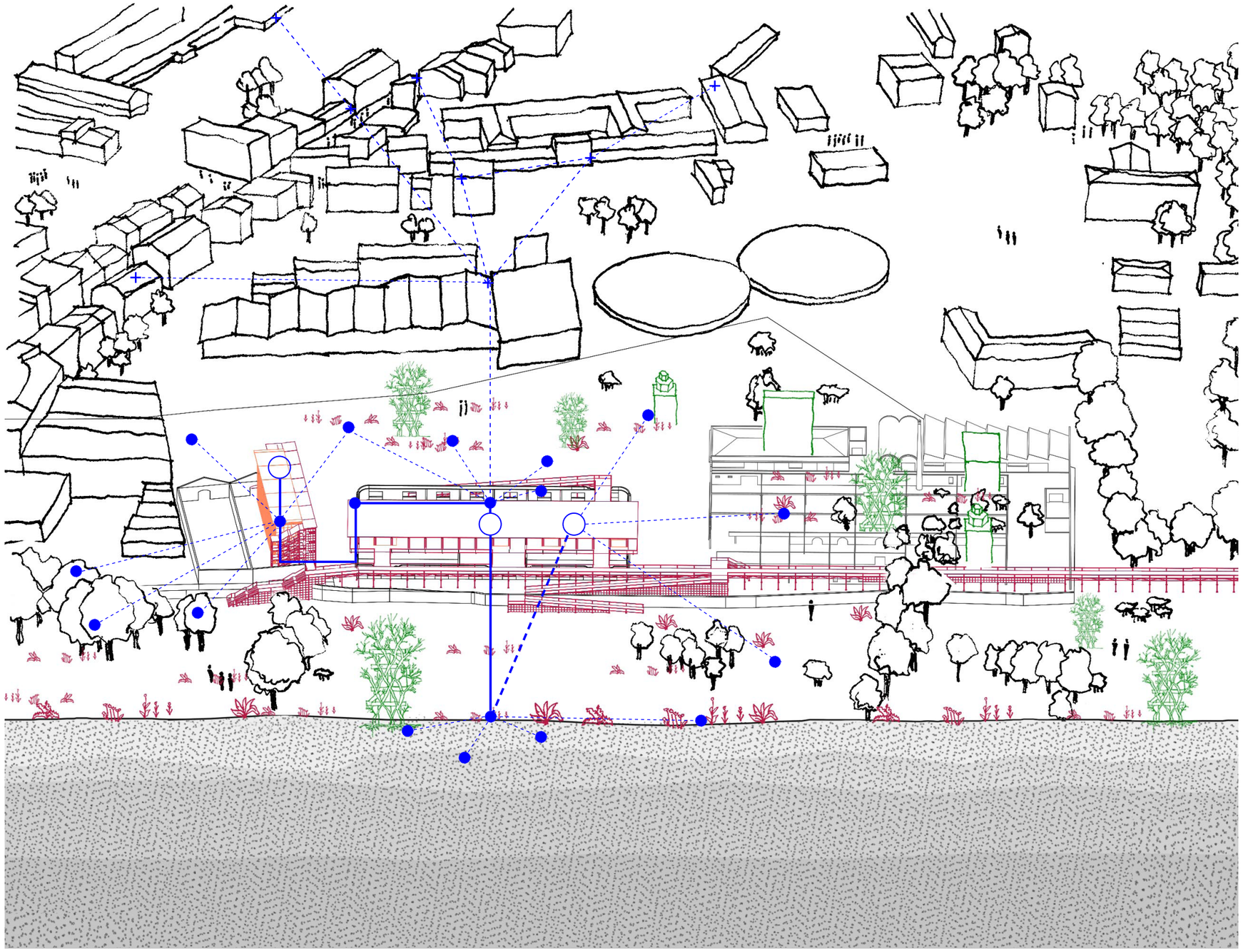



Cd
Ni
As
Pb
Zn
Cu
Mn
Co

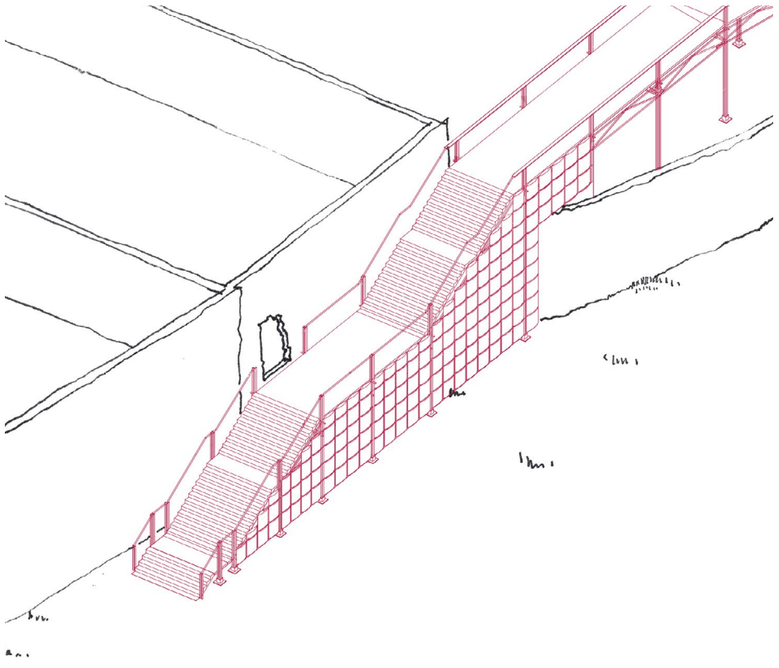


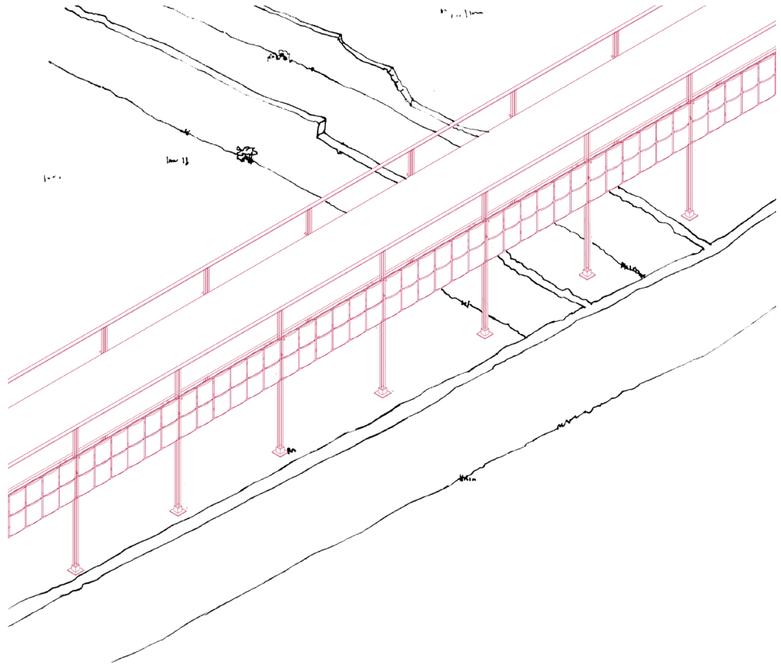


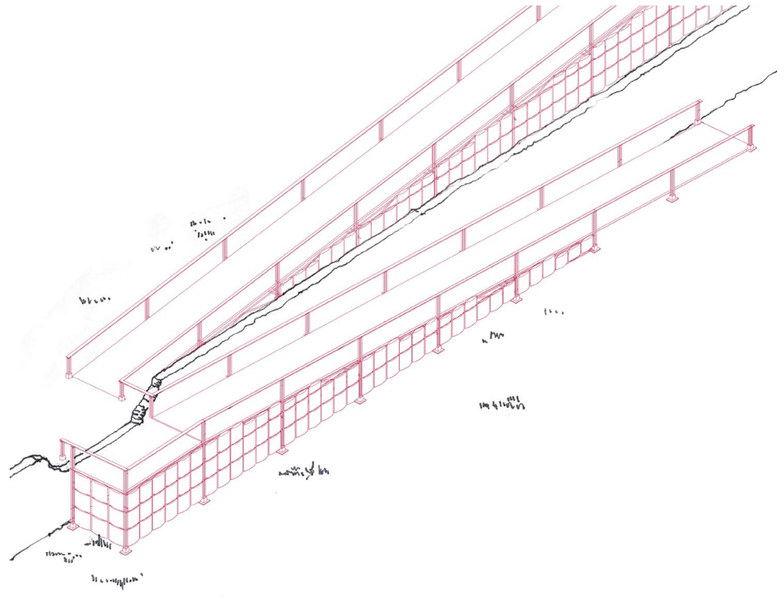




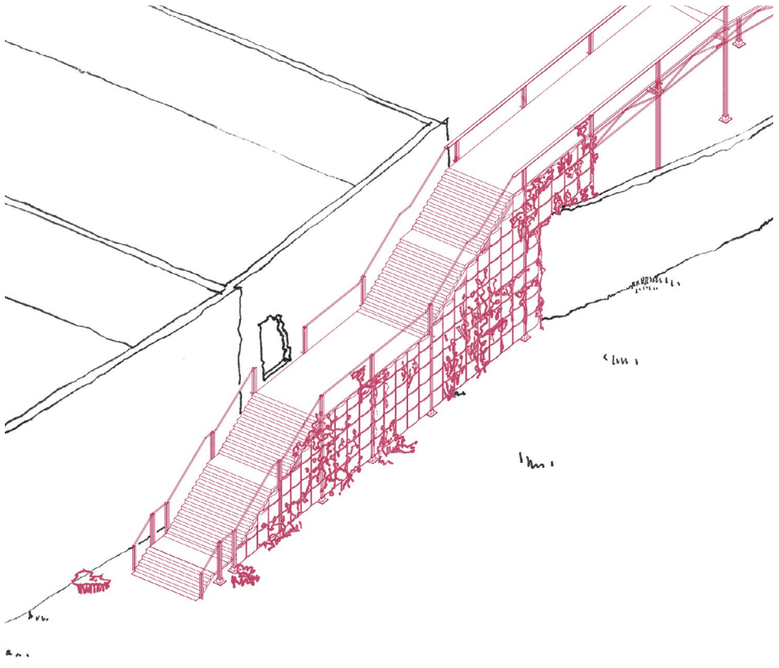
1. Pergola

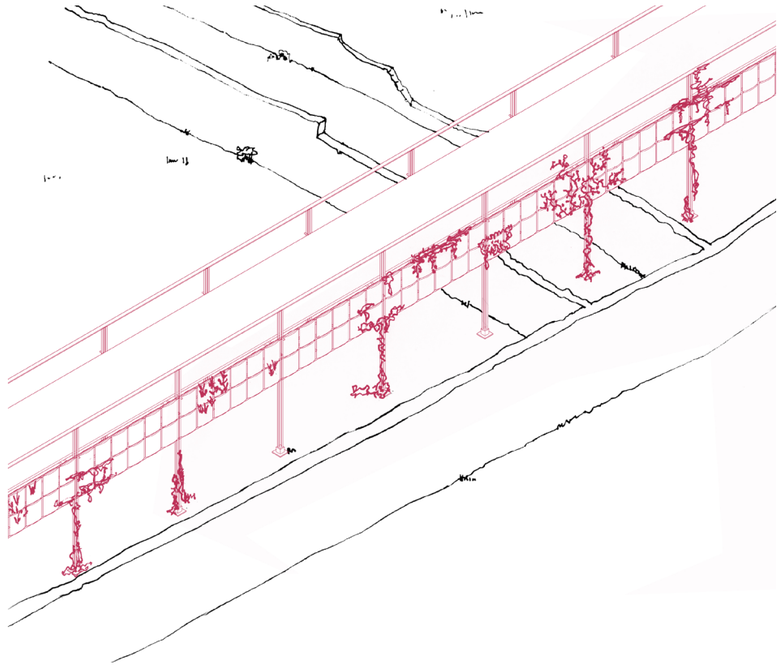


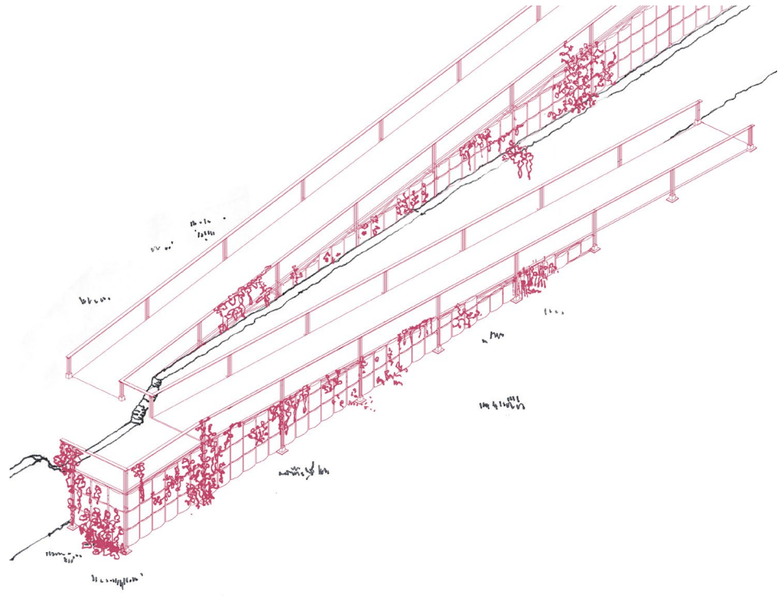




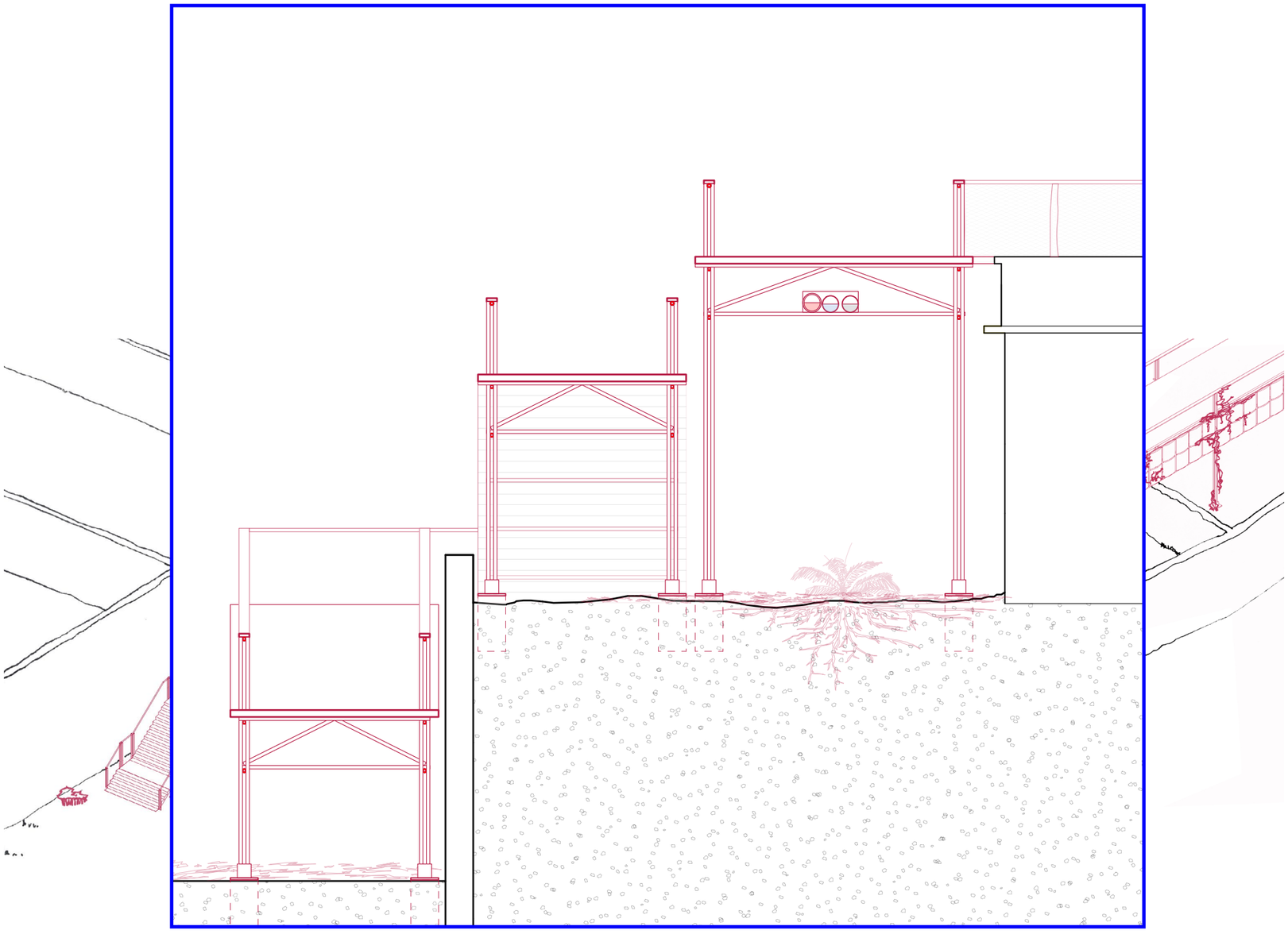
Axonometry of Pergola

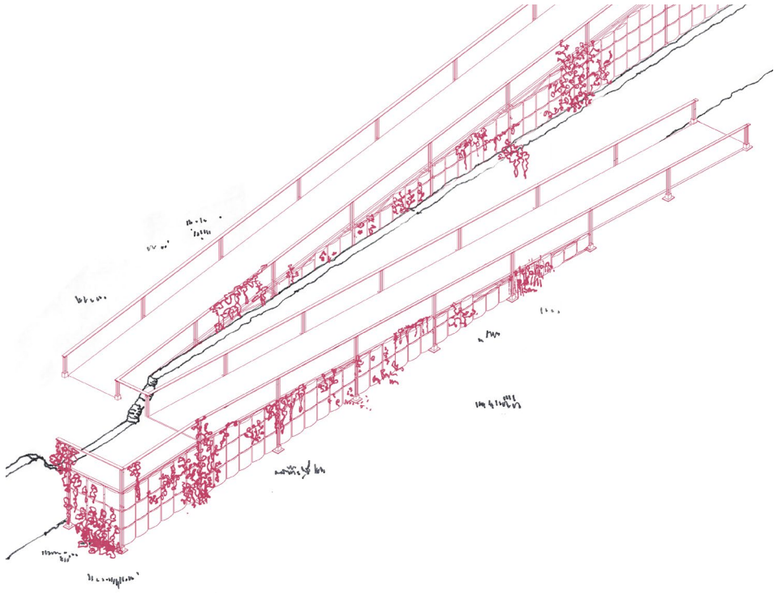


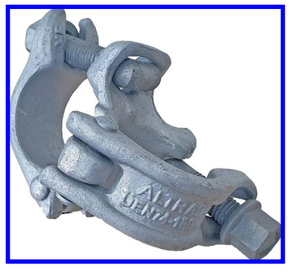




Axonometry of Pergola



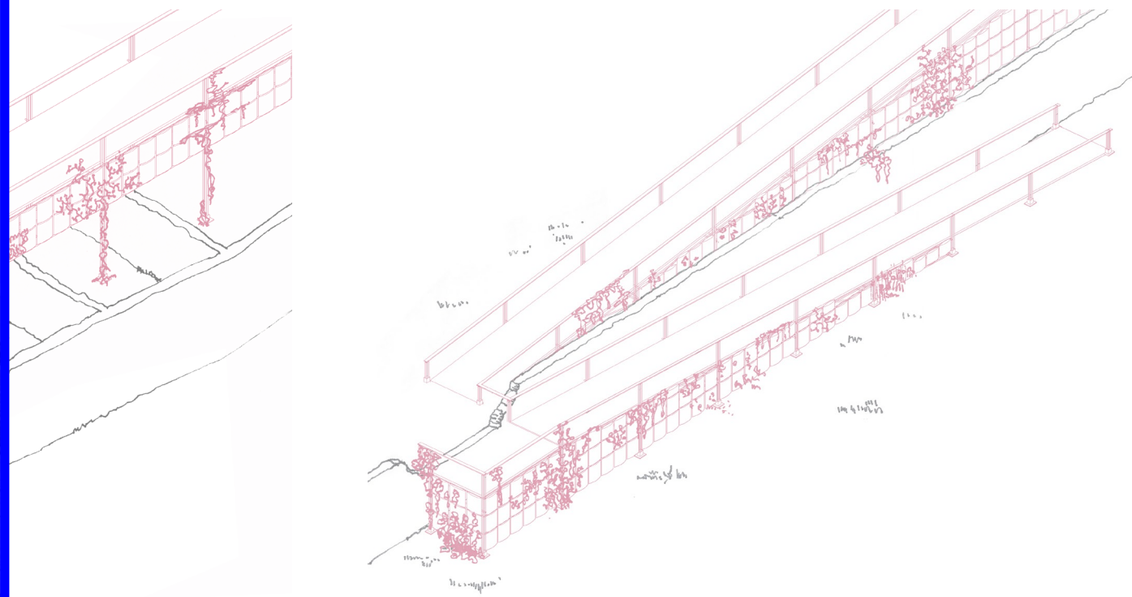




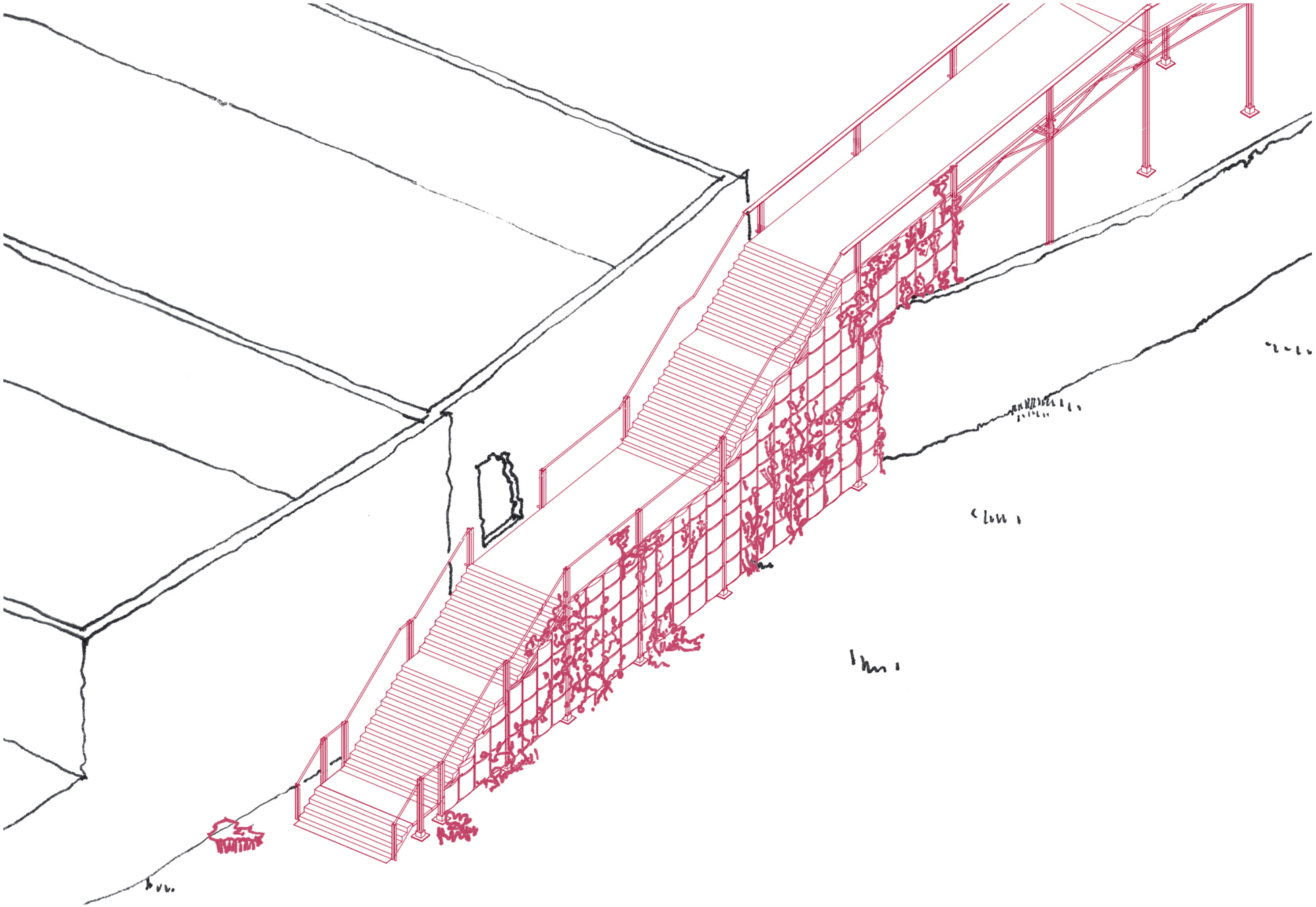




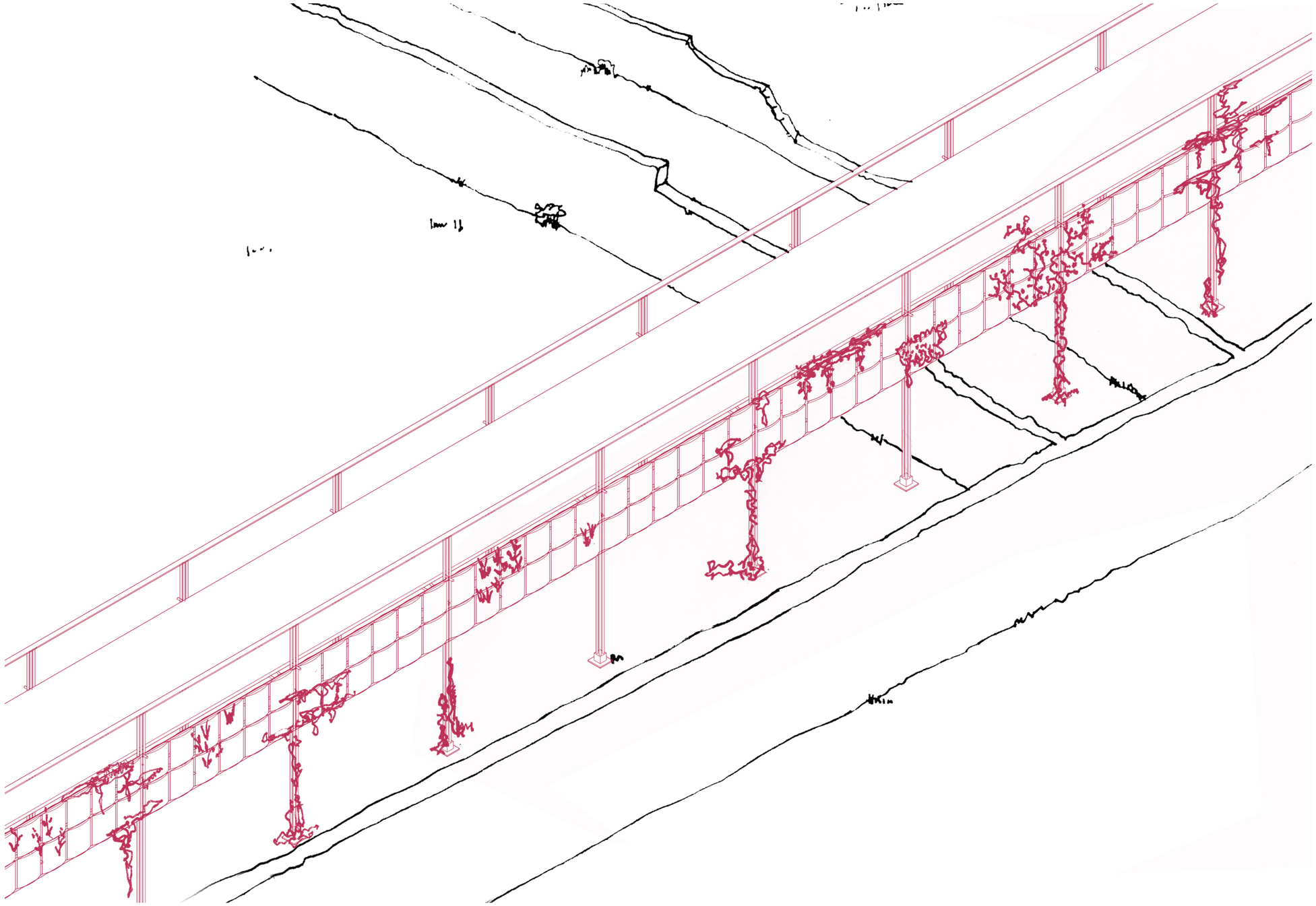




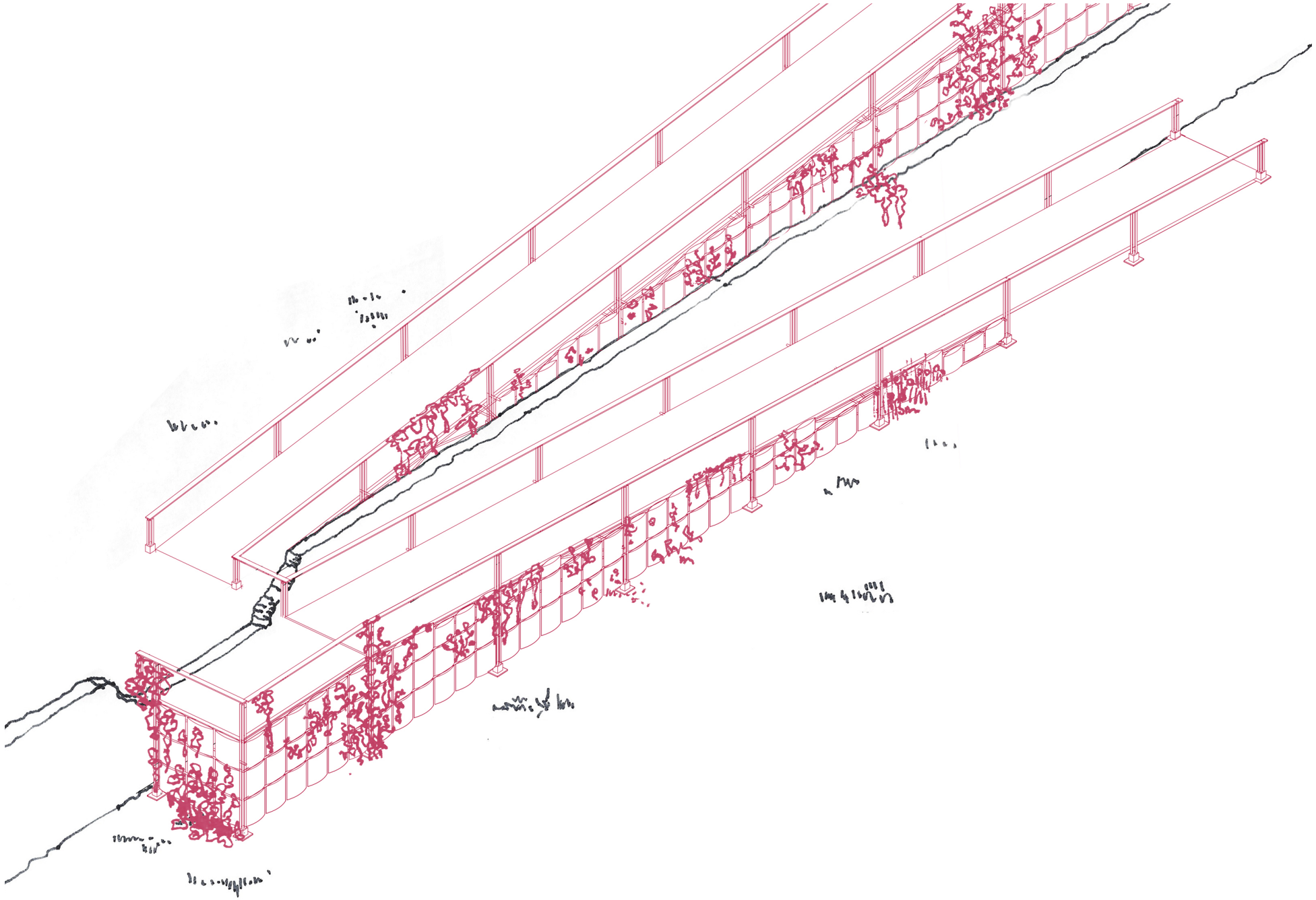
Construction of Pergola



Axonometry of Pergola

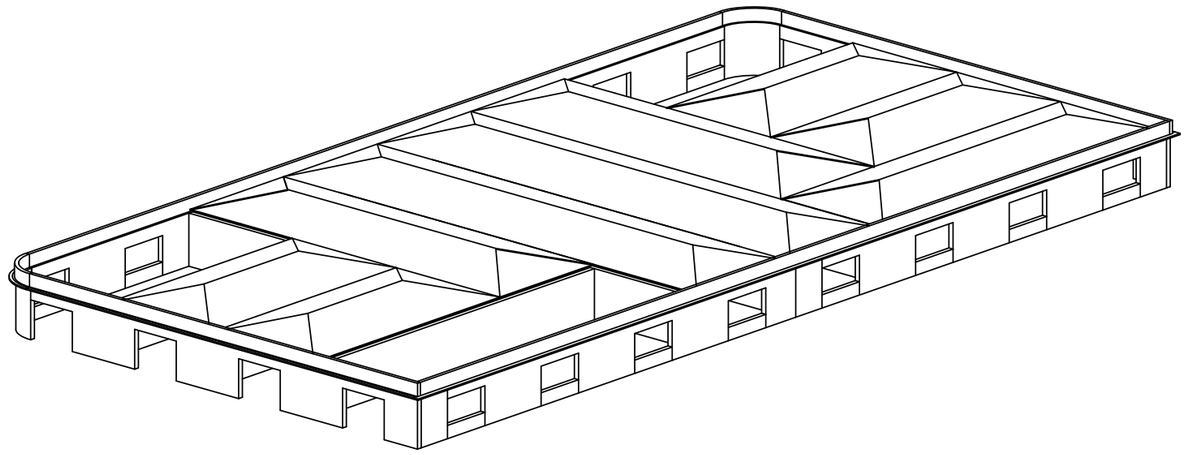


Axonometry of Pergola

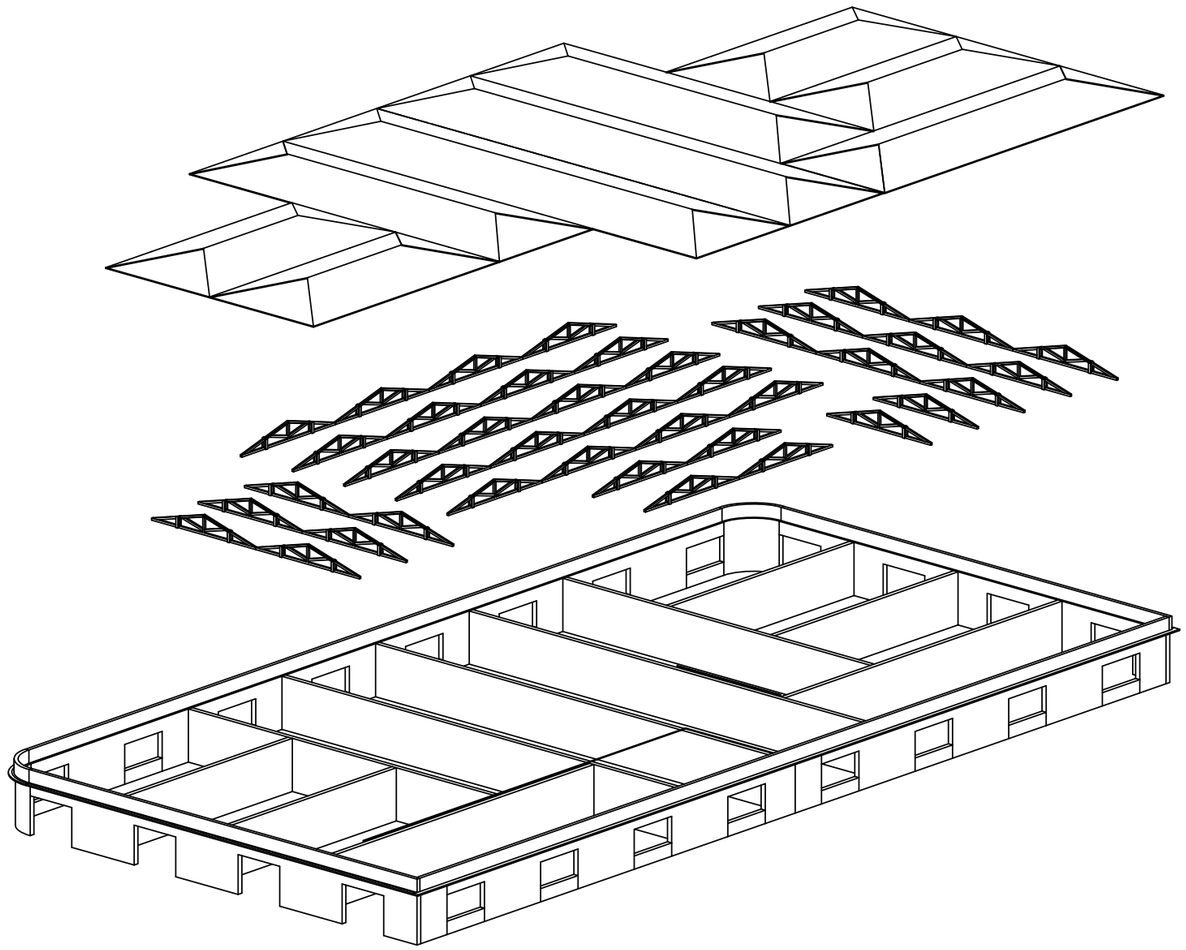


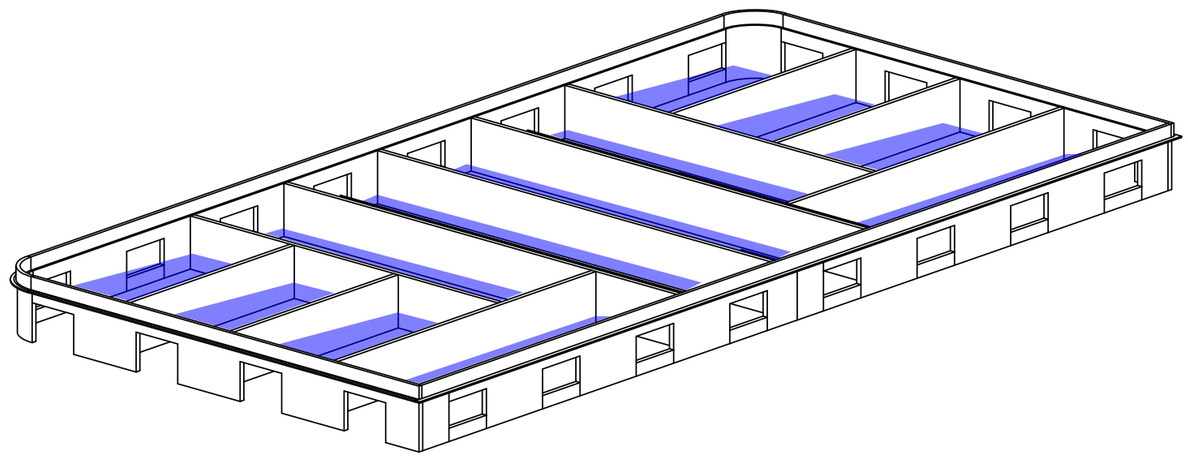
Axonometry of Pergola

2. Comunity building

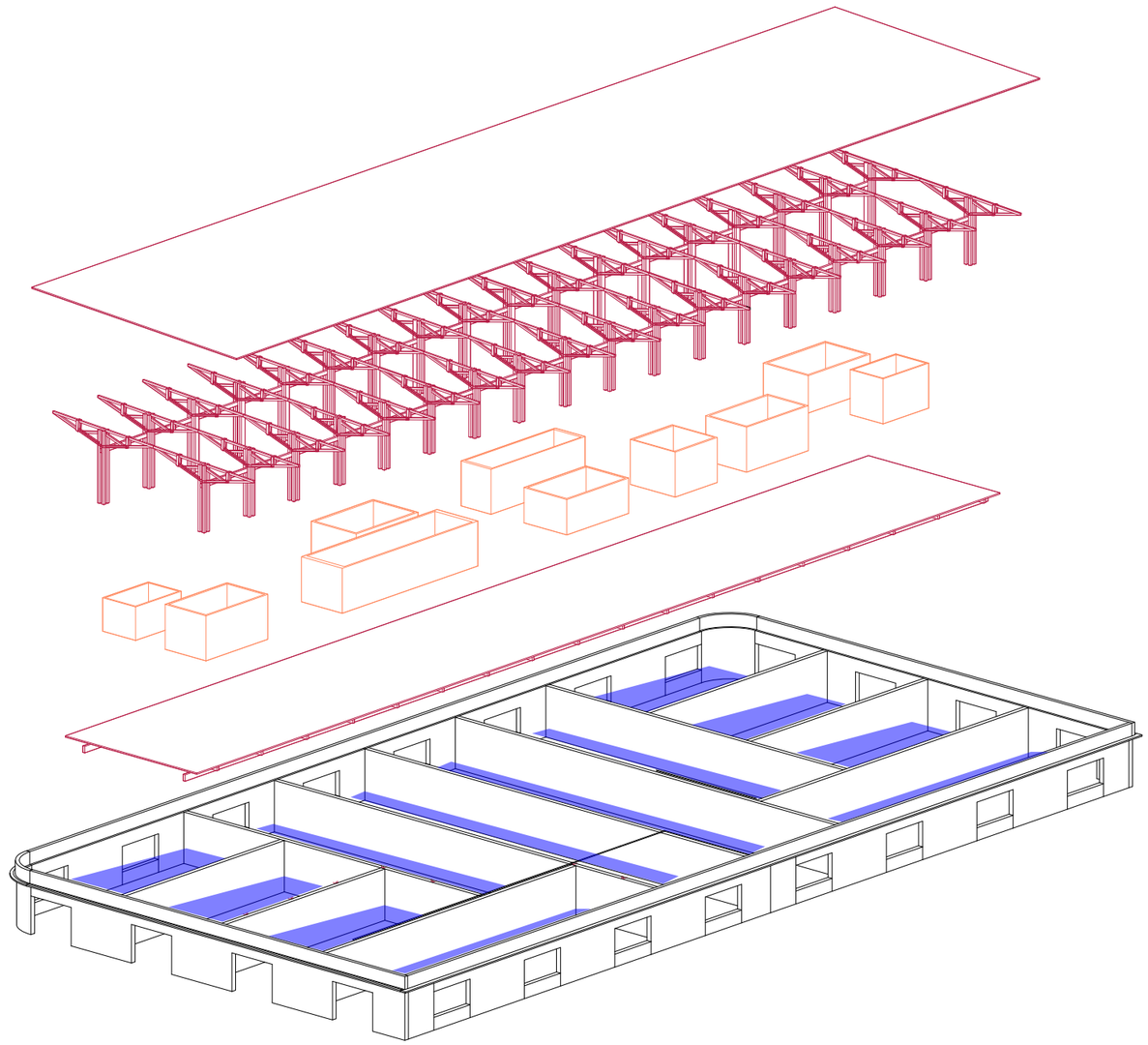


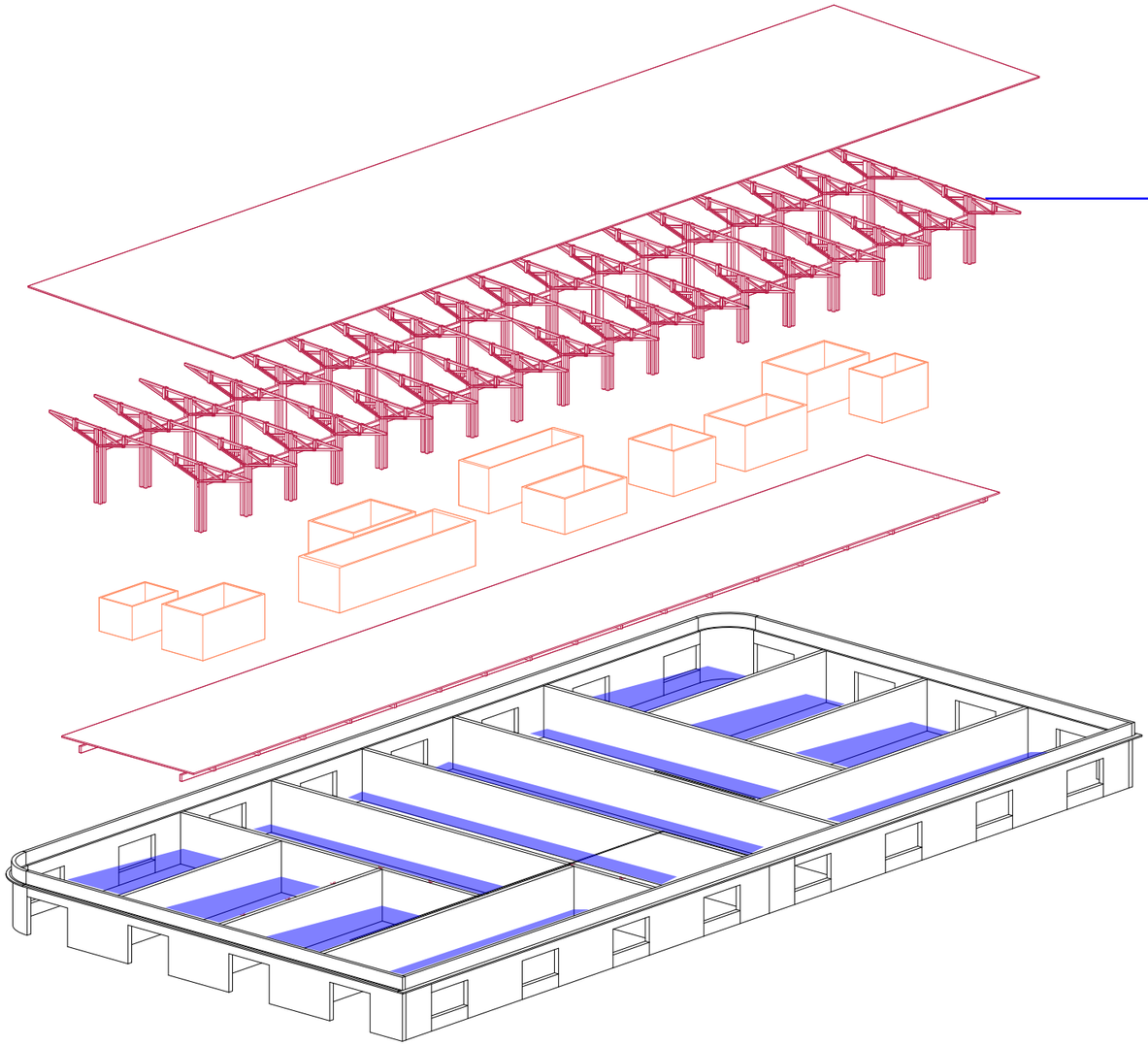
Existing structure





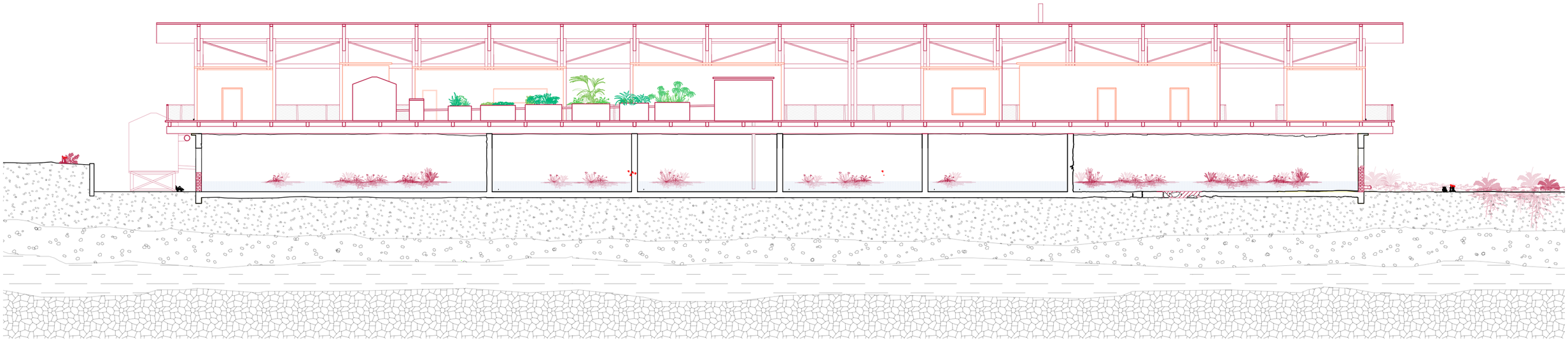
Creating wetland



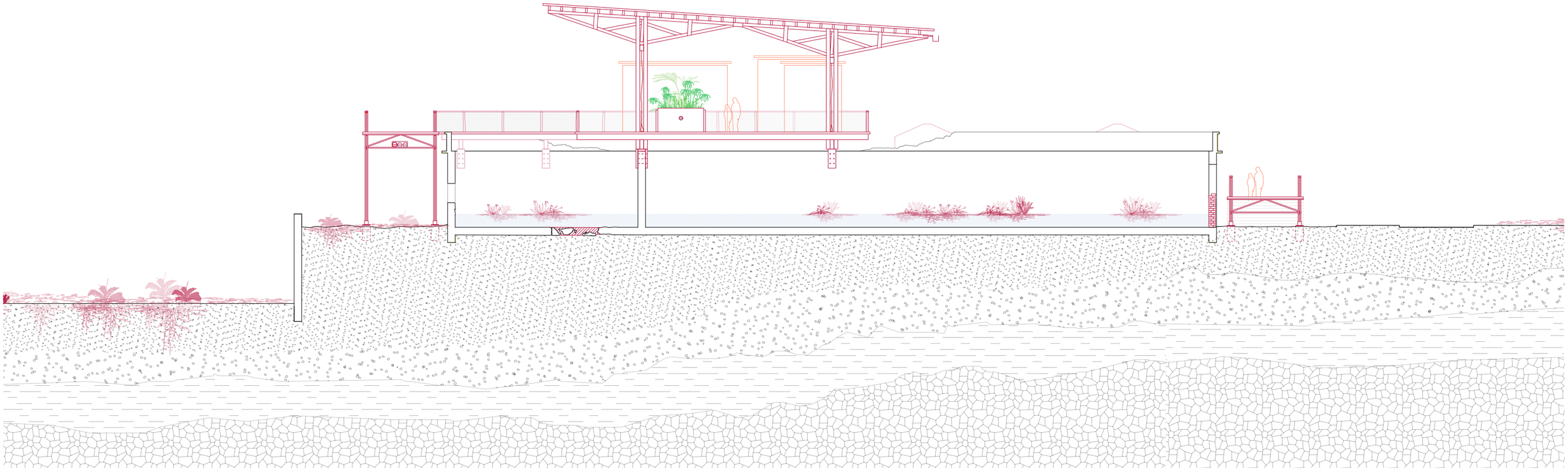




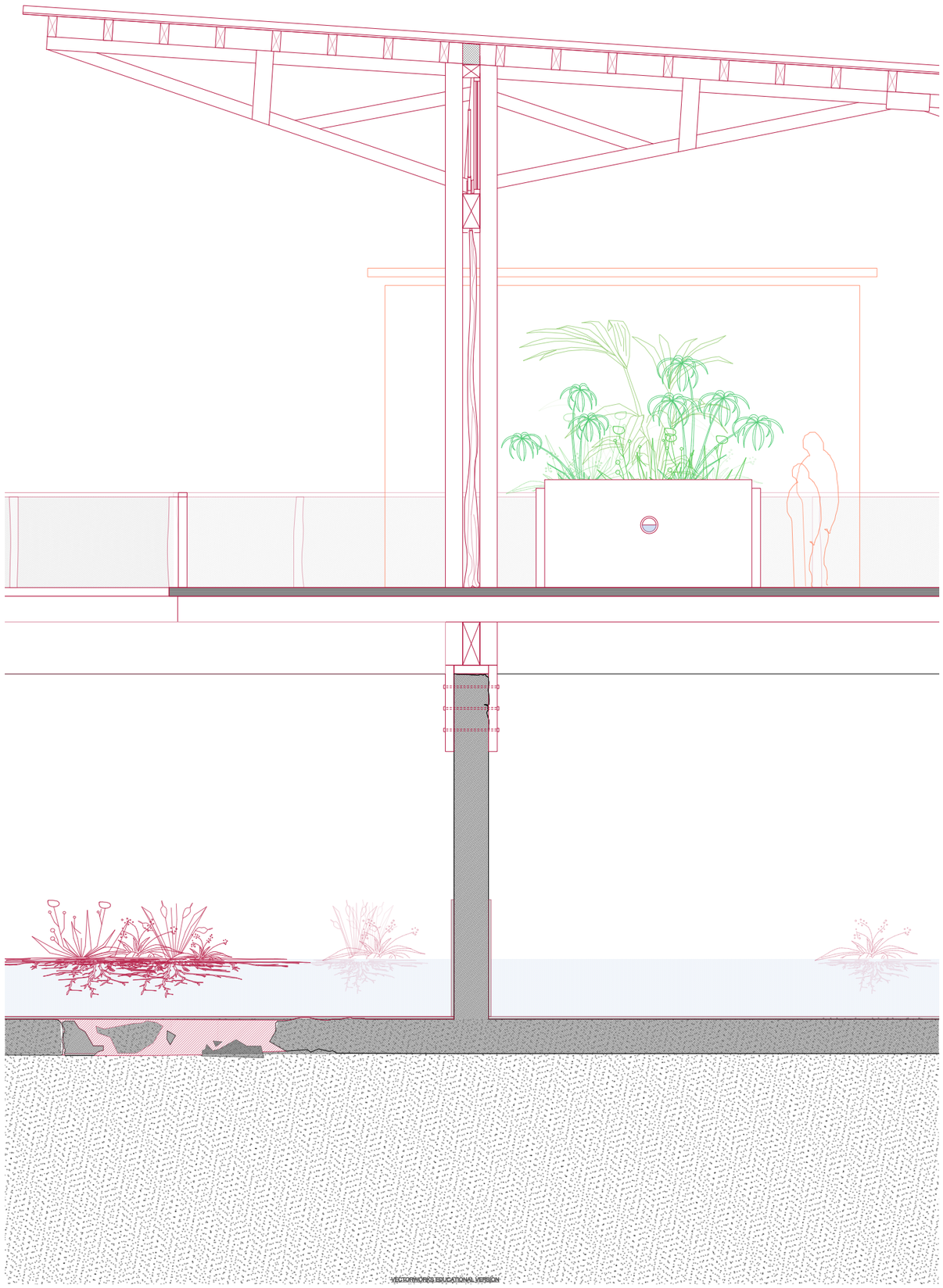
Re-using wooden trusses of existing structure



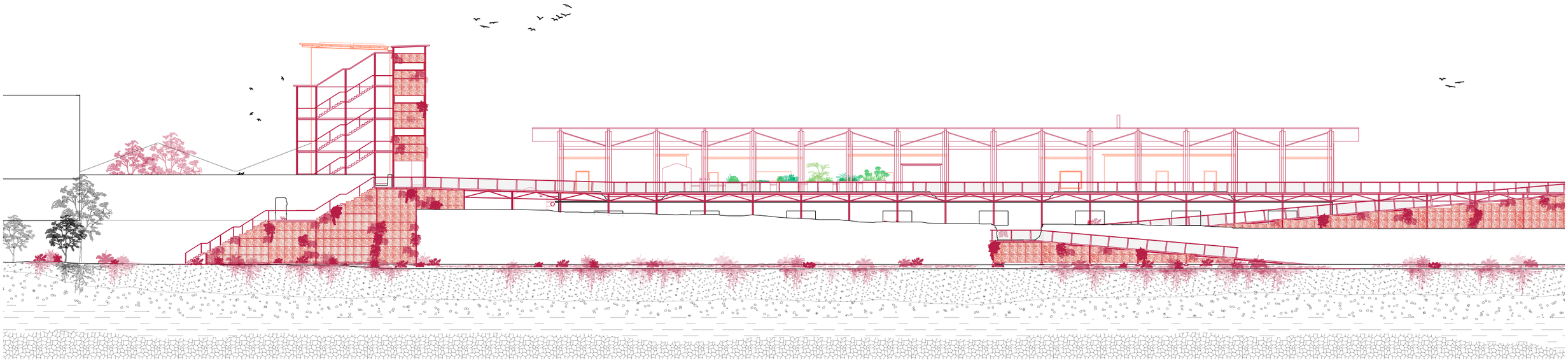
Section north-south 1:100



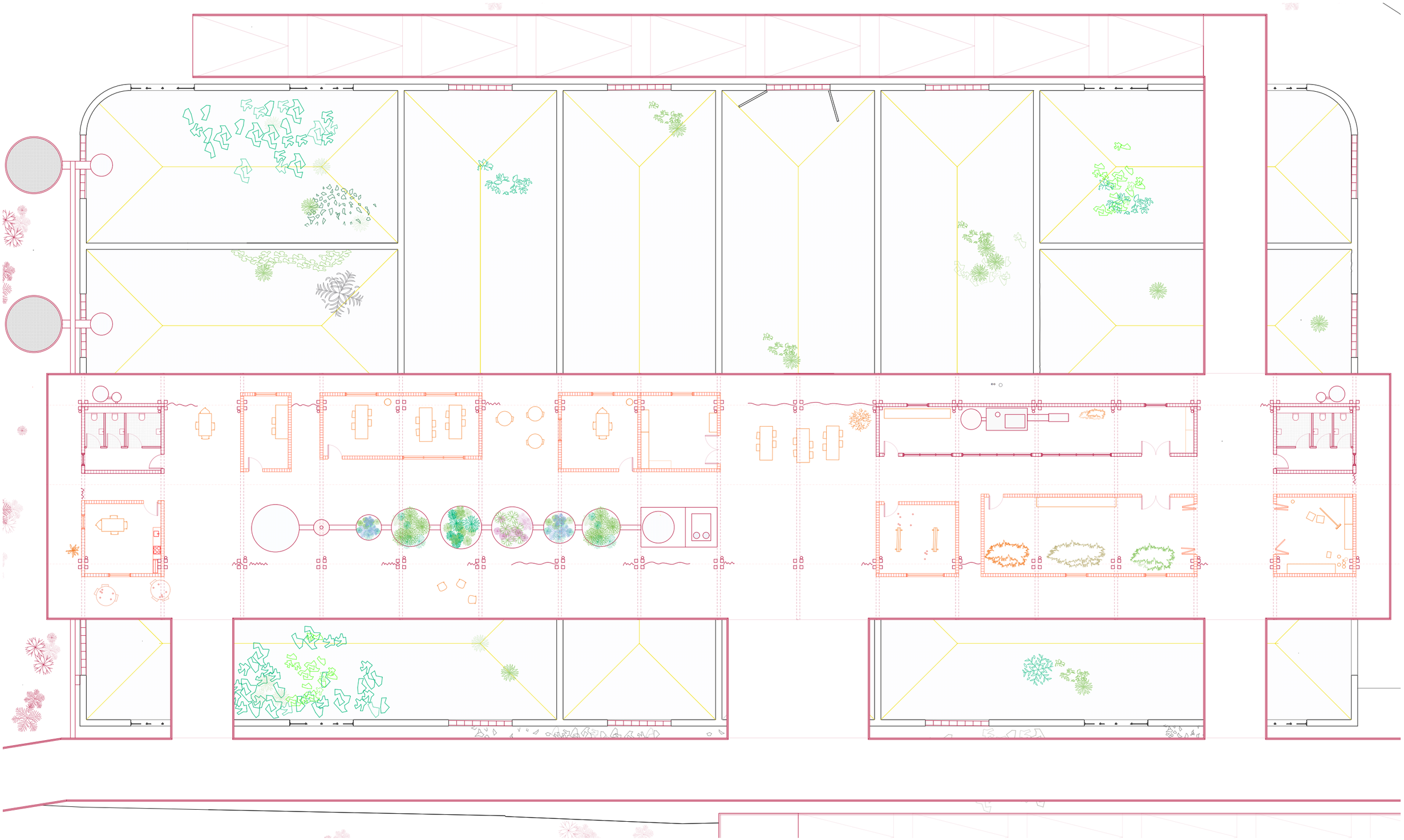
Section East-West 1:100



Section 1:20



Elevation west 1:100



1. Lab for monitoring 2. Tools for agriculture 3. Drying biomass 4. Biomass oven 5. Living Machine 6. Lab for LM 7. Meeting room 8. Kitchen 9. Workshop 10. Storage 11. Bathrooms

Living Machine

Cohabitation

1st Basin:



Typha latifolia / broadleaf cattail



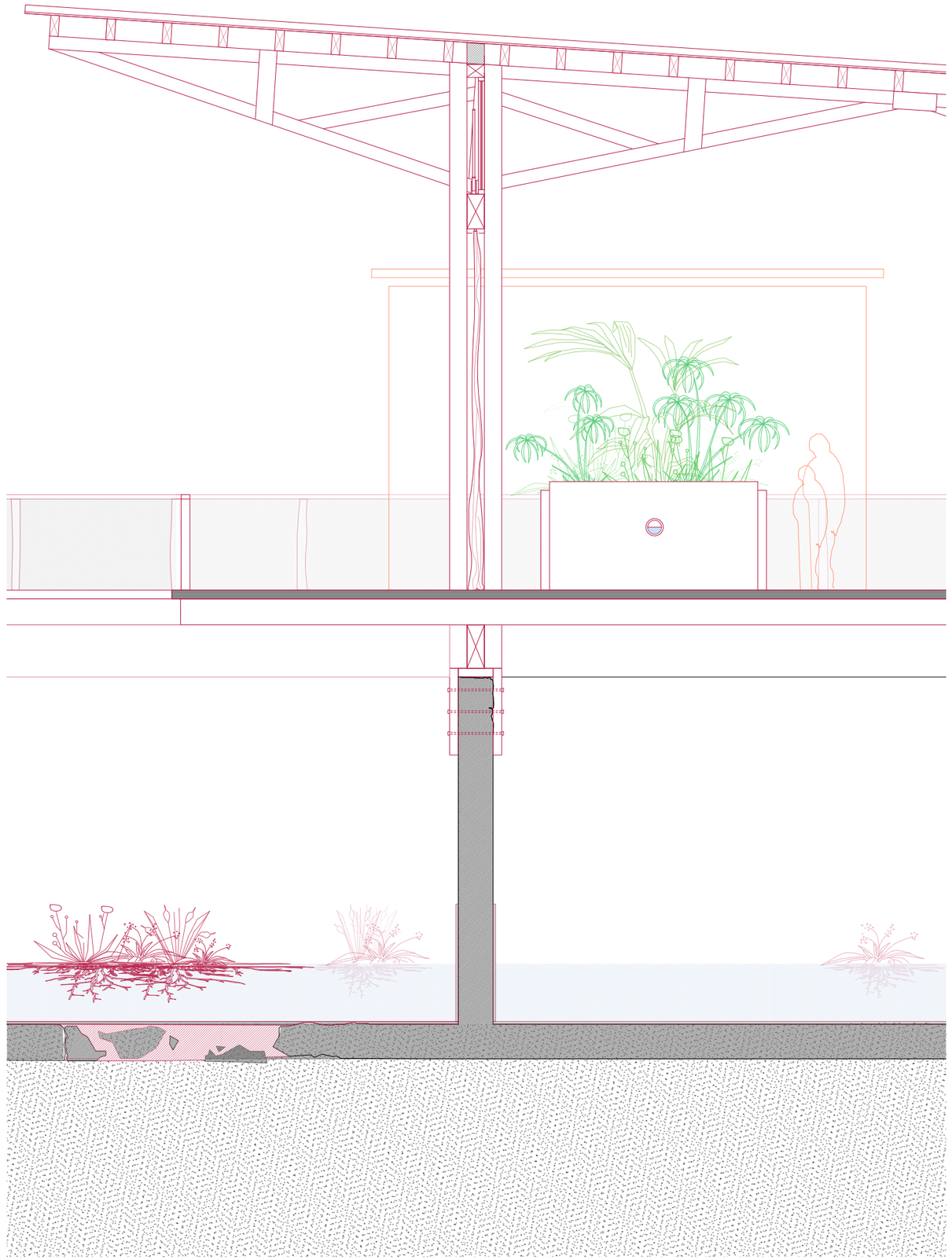
Phragmites communis / common reed



Caltha palustris / marsh-marigold



Veronica beccabunga /European speedwell



2nd Basin:



Sparganium erectum / simplestem bur-reed



Baldellia ranunculoides / lesser water-plantain



Iris pseudacorus / water flag

Plants for Phytodepuration:

Phragmites communis, Caltha palustris, Veronica beccabunga and Typha latifolia,transporting oxygen through their roots

Bacteria:

Filtering the wastewater and depuration liberates nutrients for plants



Juncaceae /
Rush



Eichhornia crassipes /
Water hyacinth



Centella asiatica /
Pennywort



Canna indica /
Canna Lily



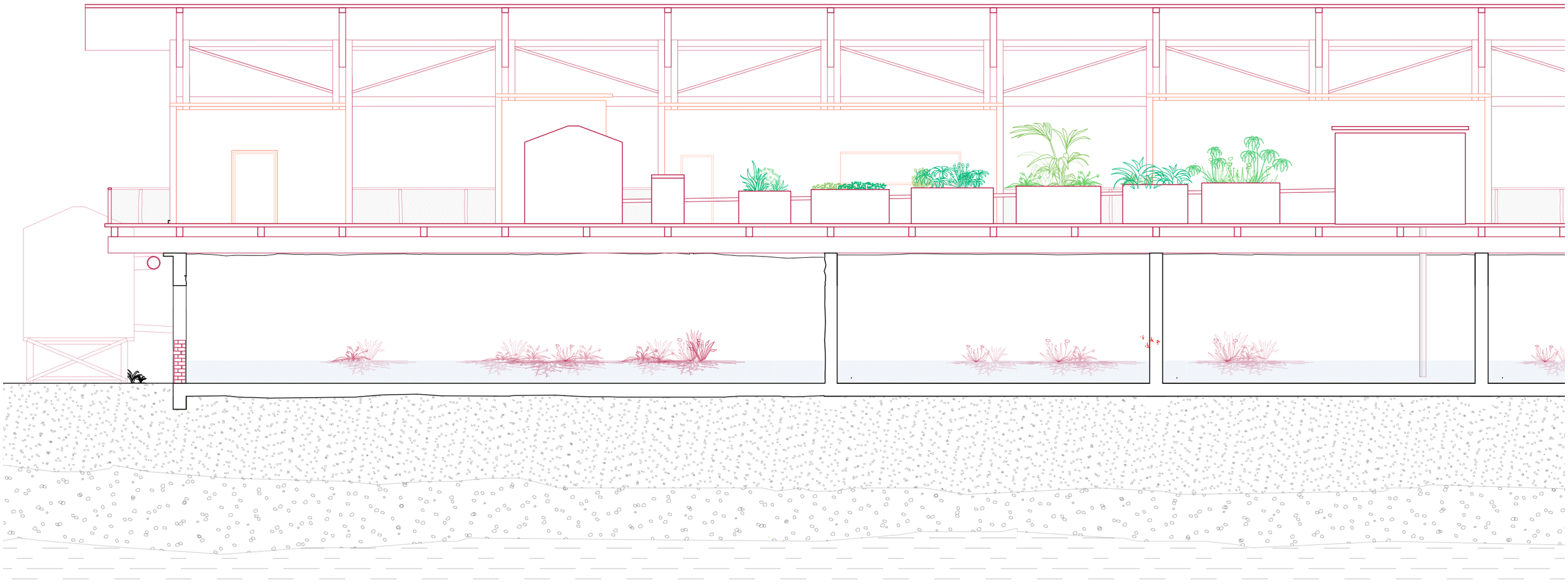
Nymphaea /
Water Lily



Costus scaber /
Spiral Ginger



Mentha aquatica /
Water mint



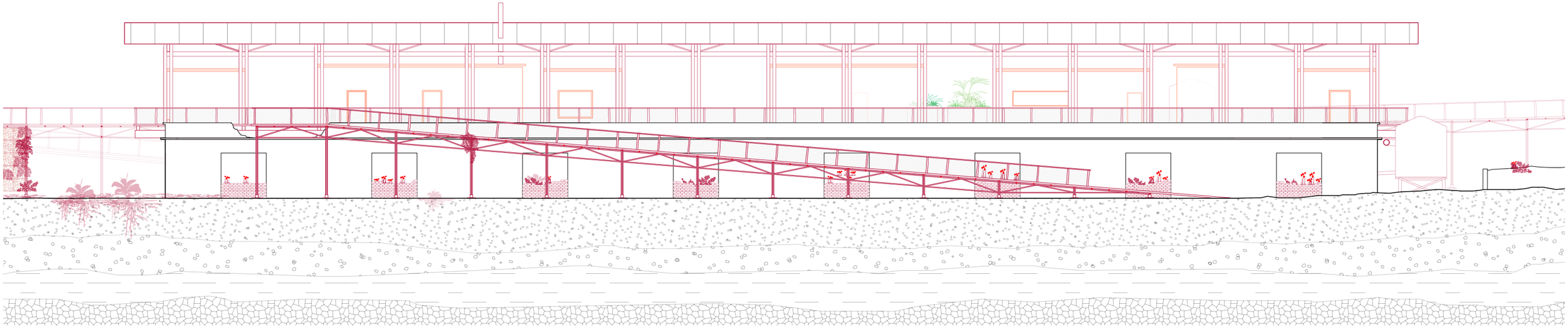
1. Solar septic tank
2. Constructed Wetland
3. Closed Aerobic Reactor
4. I - IV Open Aerobic Reactor
5. Polishing
6. Optional Recirculation
7. Water tank

Cohabitation



View by arrival

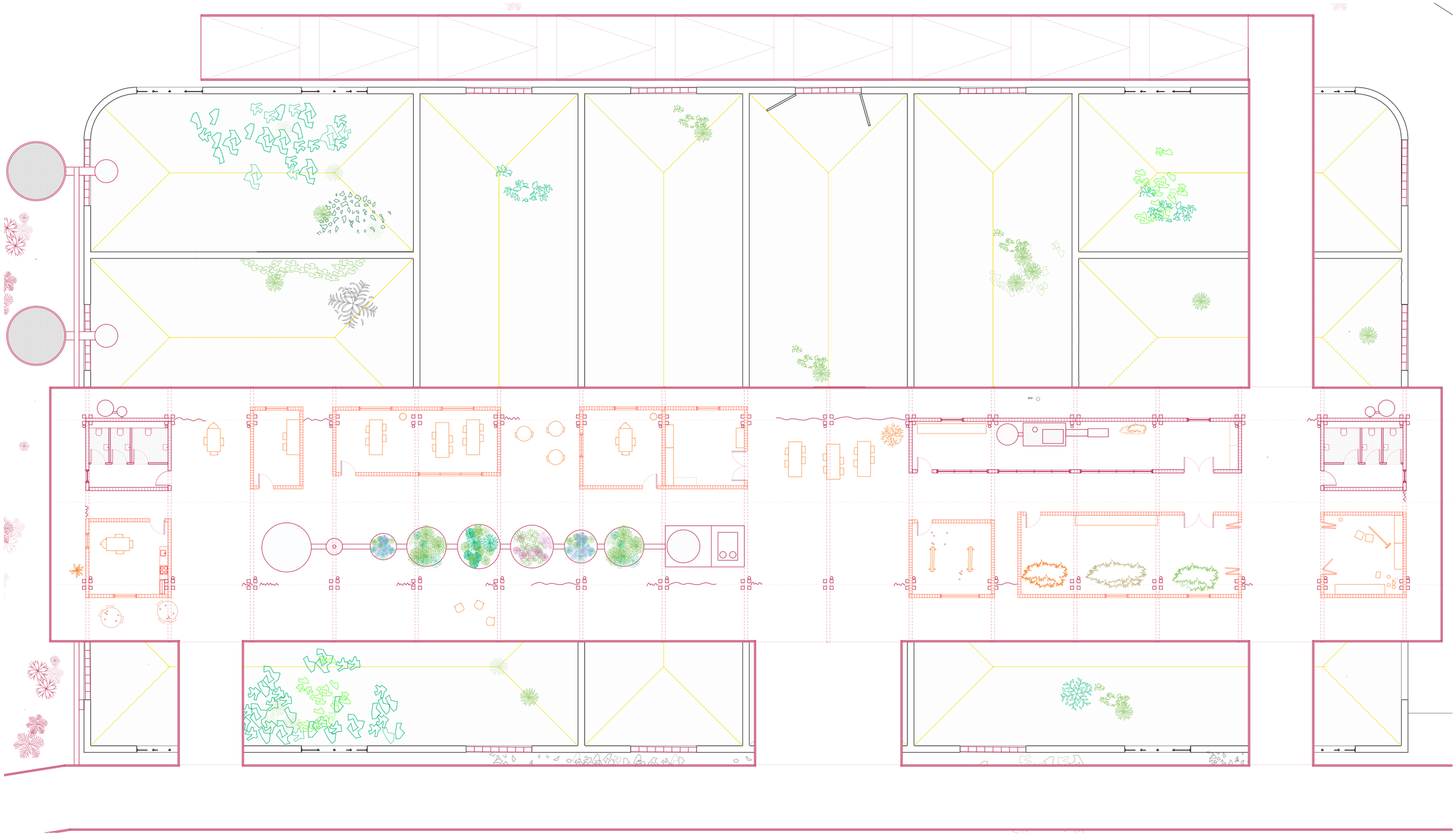




Elevation East

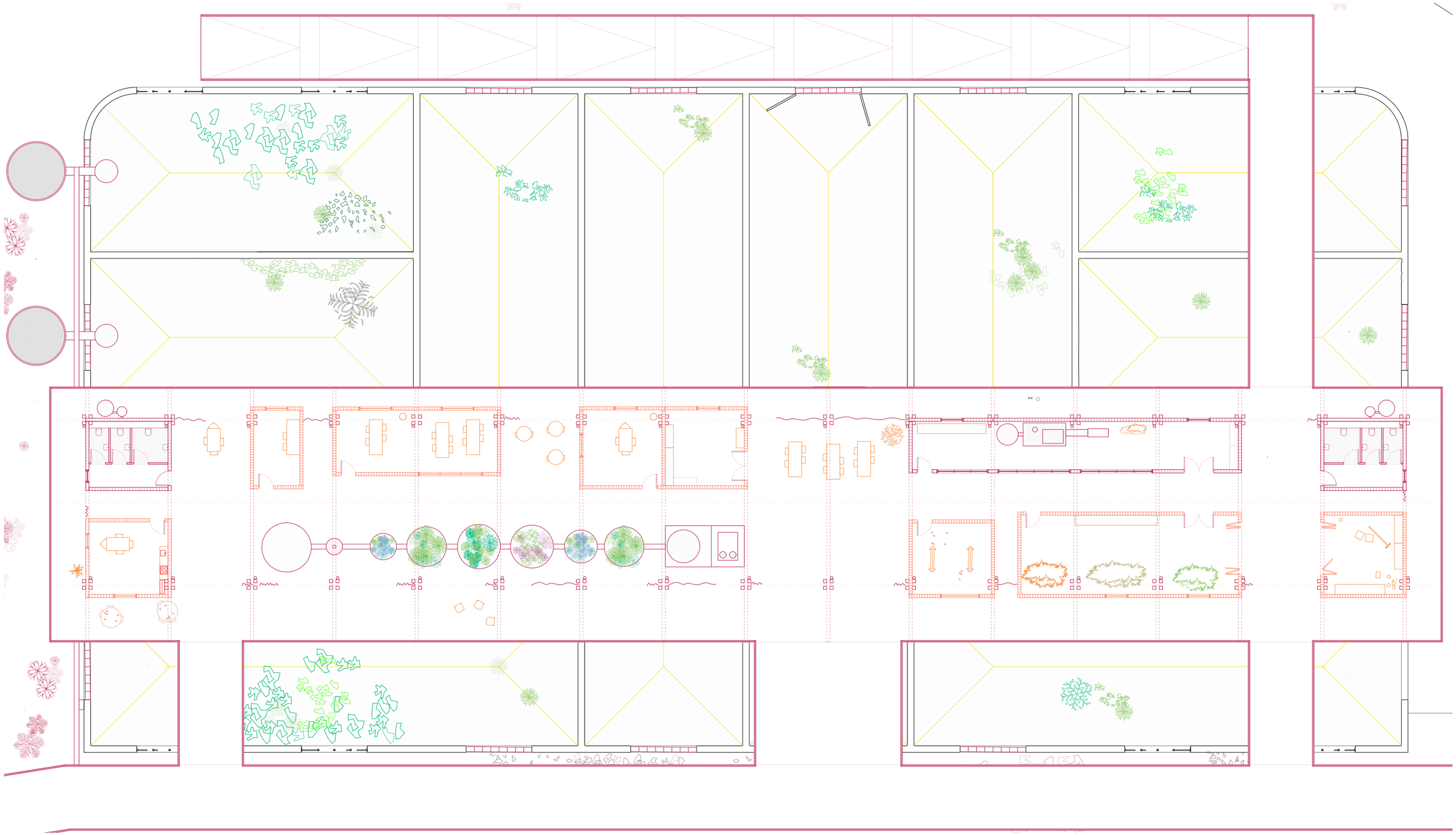


Perspective on Wetland



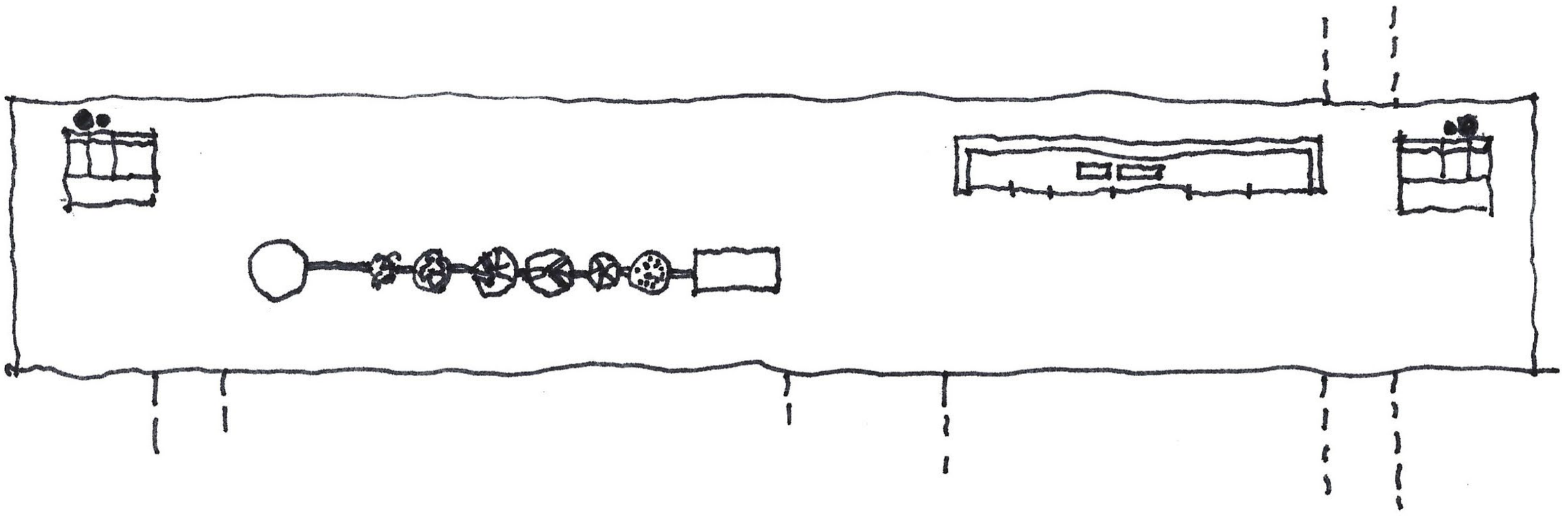
1. Lab for monitoring 2. Tools for agriculture 3. Drying biomass 4. Biomass oven 5. Living Machine 6. Lab for LM 7. Meeting room 8. Kitchen 9. Workshop 10. Storage 11. Bathrooms

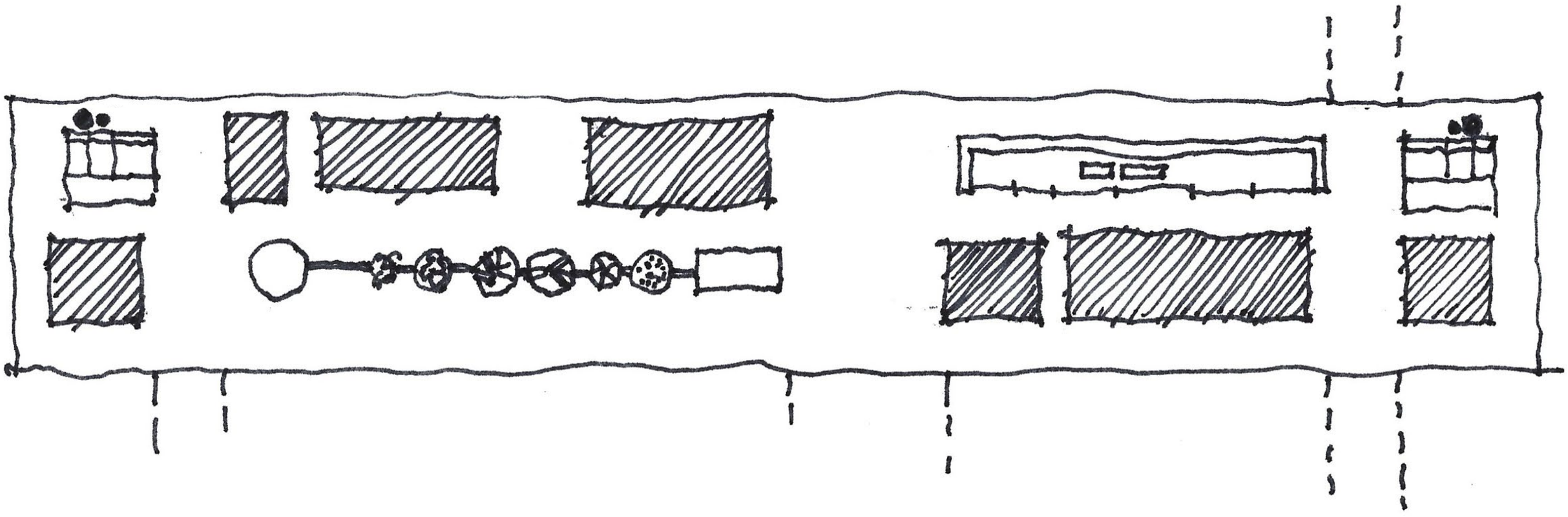




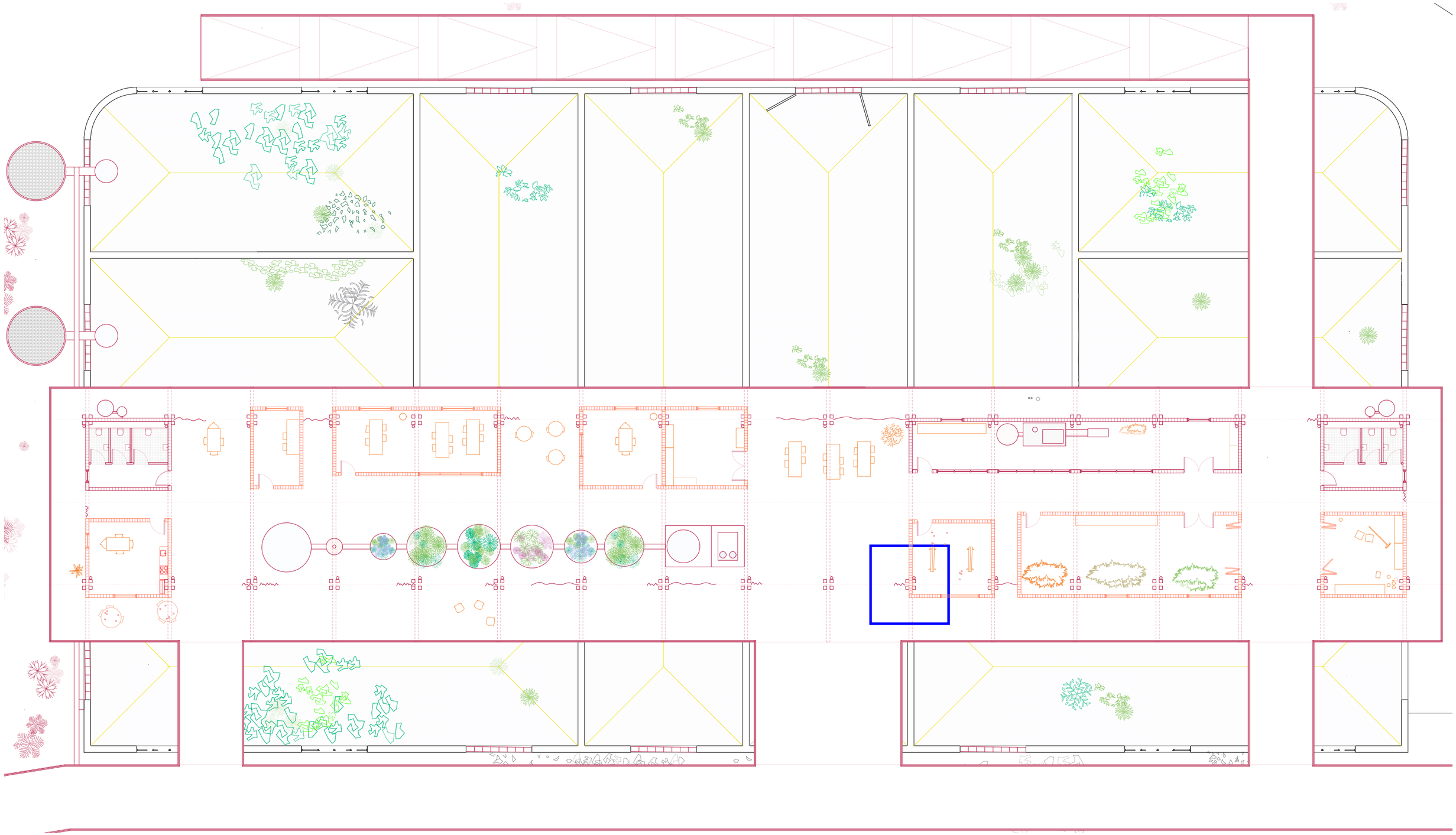
1. Lab for monitoring 2. Tools for agriculture 3. Drying biomass 4. Biomass oven 5. Living Machine 6. Lab for LM 7. Meeting room 8. Kitchen 9. Workshop 10. Storage 11. Bathrooms

Floorplan 1:100





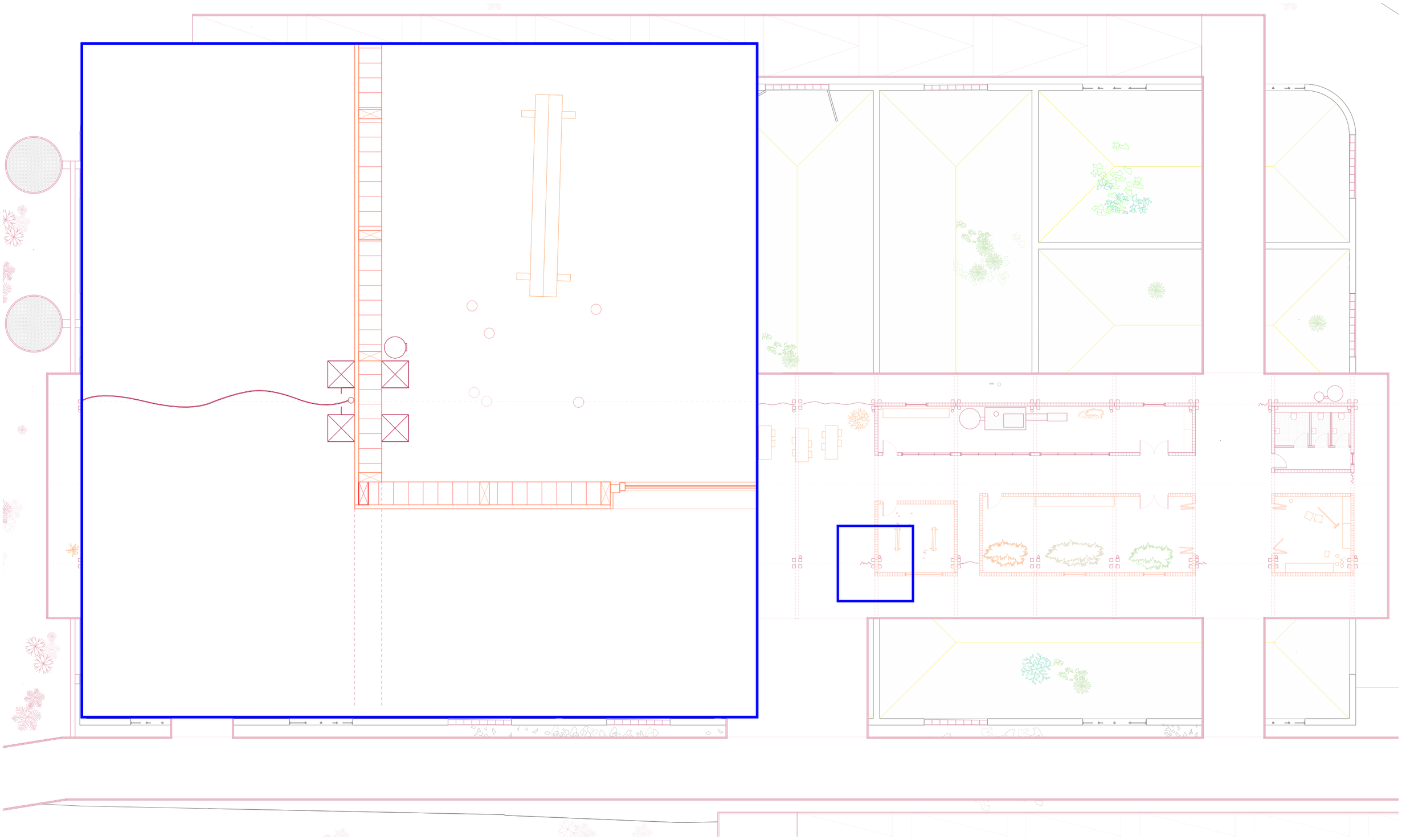
Cohabitation



1. Lab for monitoring 2. Tools for agriculture 3. Drying biomass 4. Biomass oven 5. Living Machine 6. Lab for LM 7. Meeting room 8. Kitchen 9. Workshop 10. Storage 11. Bathrooms

Concept Floorplan

Cohabitation



Floorplan Coworking 1:100

Plan 1:20, Walls from rammed earth



Floorplan Coworking 1:100

Ramming earth





Ramming earth



Ramming earth

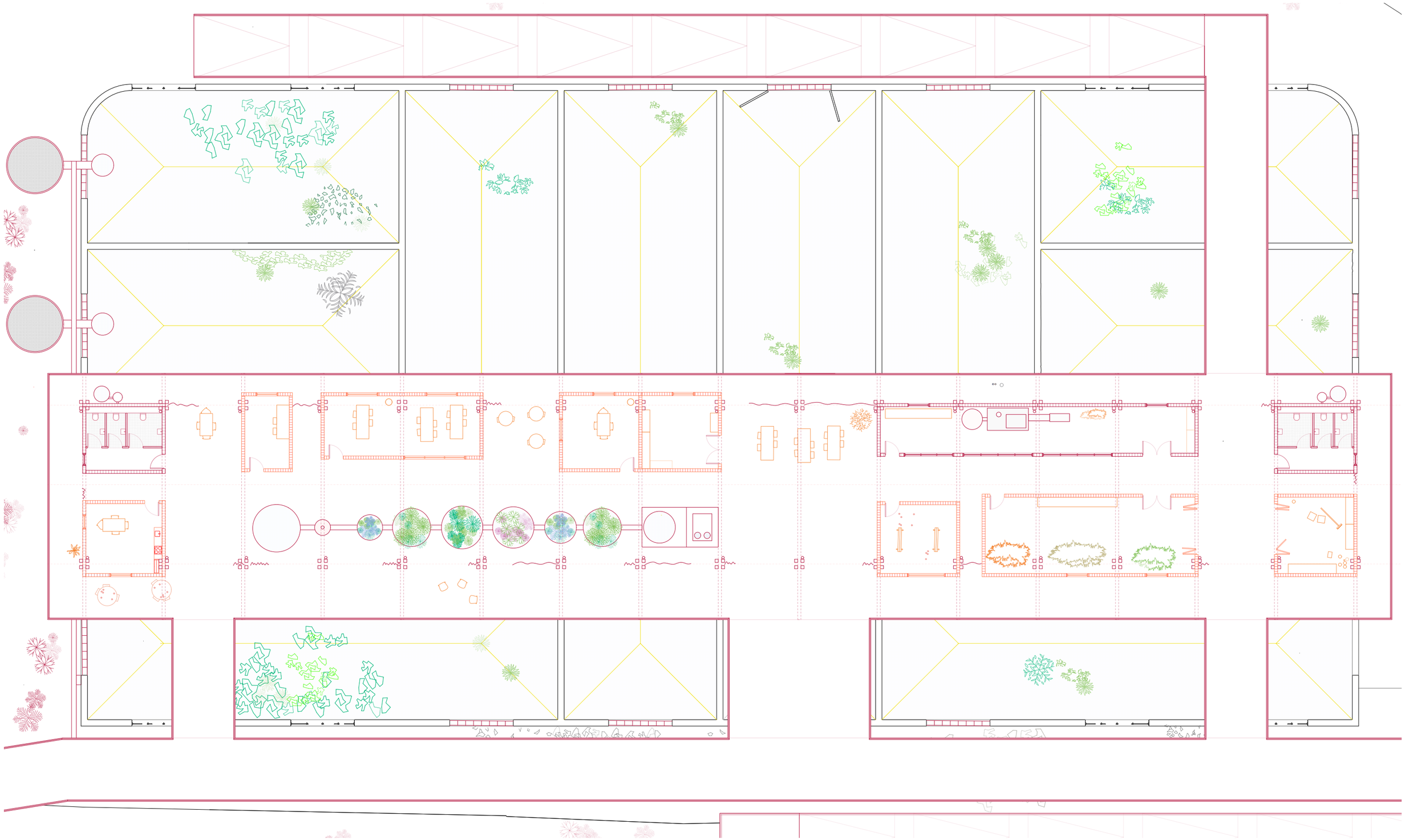


Ramming earth



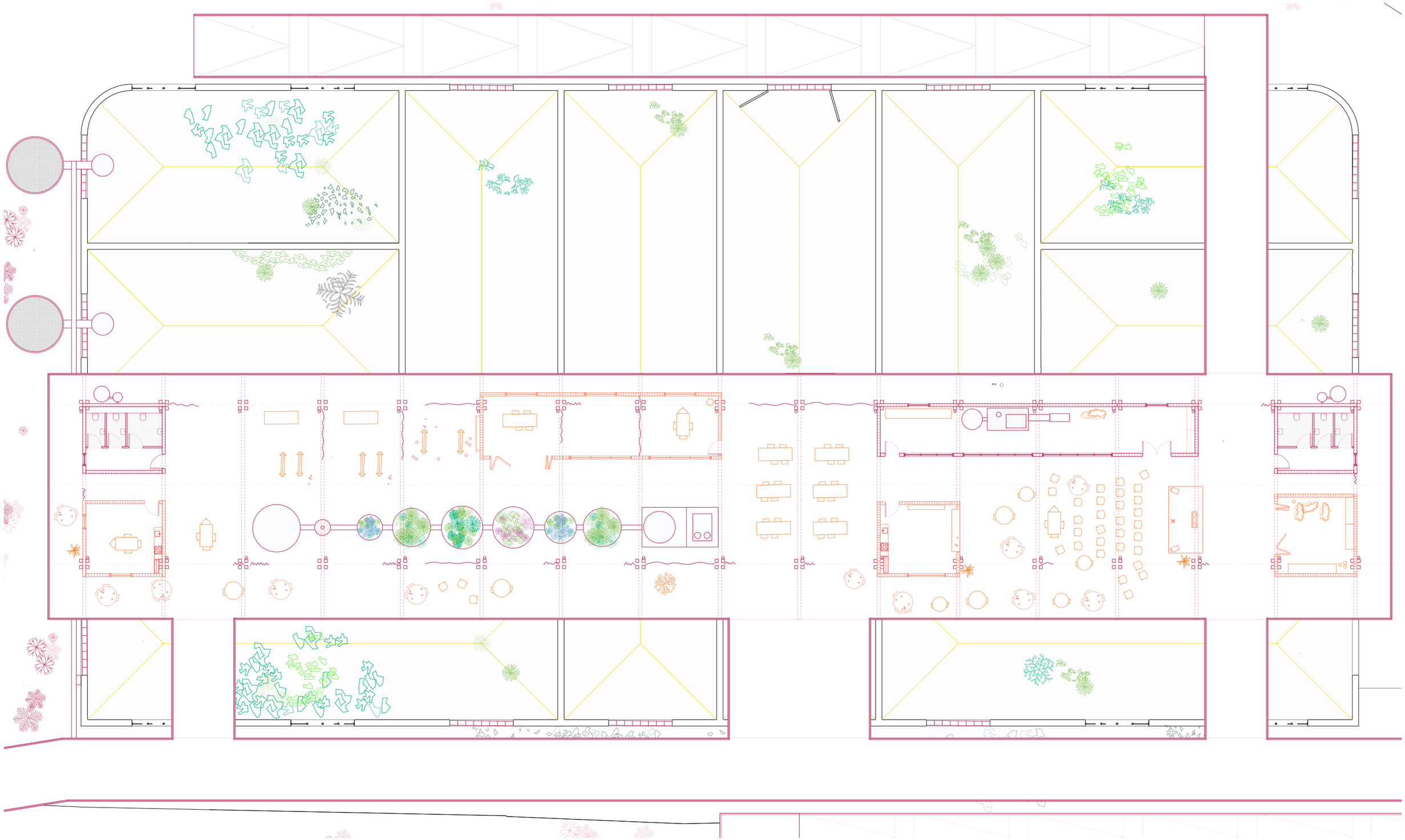
Ramming earth





1. Lab for monitoring 2. Tools for agriculture 3. Drying biomass 4. Biomass oven 5. Living Machine 6. Lab for LM 7. Meeting room 8. Kitchen 9. Workshop 10. Storage 11. Bathrooms

Floorplan 1:100



1. Lab for monitoring 2. Tools for agriculture 3. Ateliers 4. Stage 5. Living Machine 6. Lab for LM 7. Meeting room 8. Kitchen 9. Workshop 10. Storage 11. Bathrooms

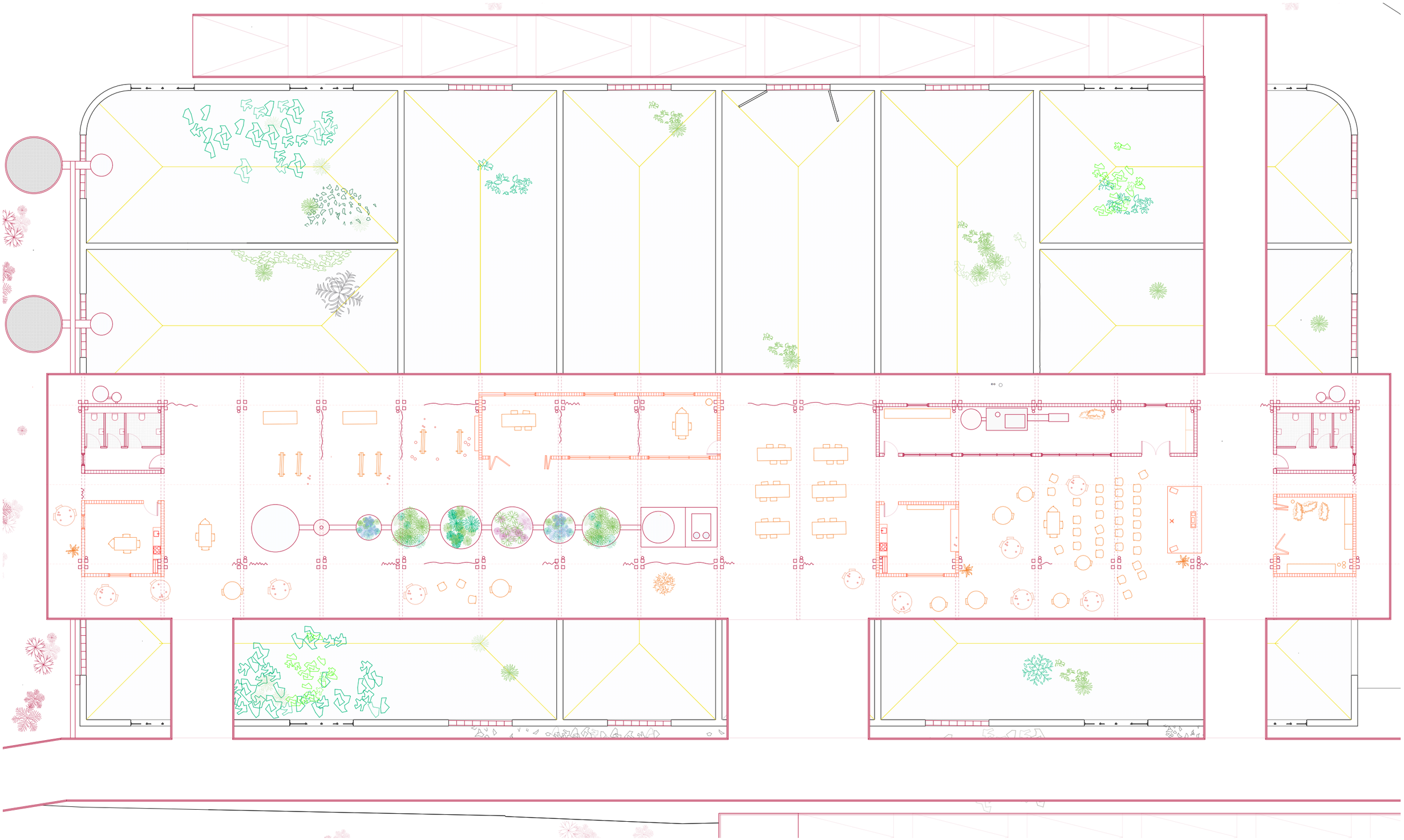
Floorplan 1:100



Interior of community building

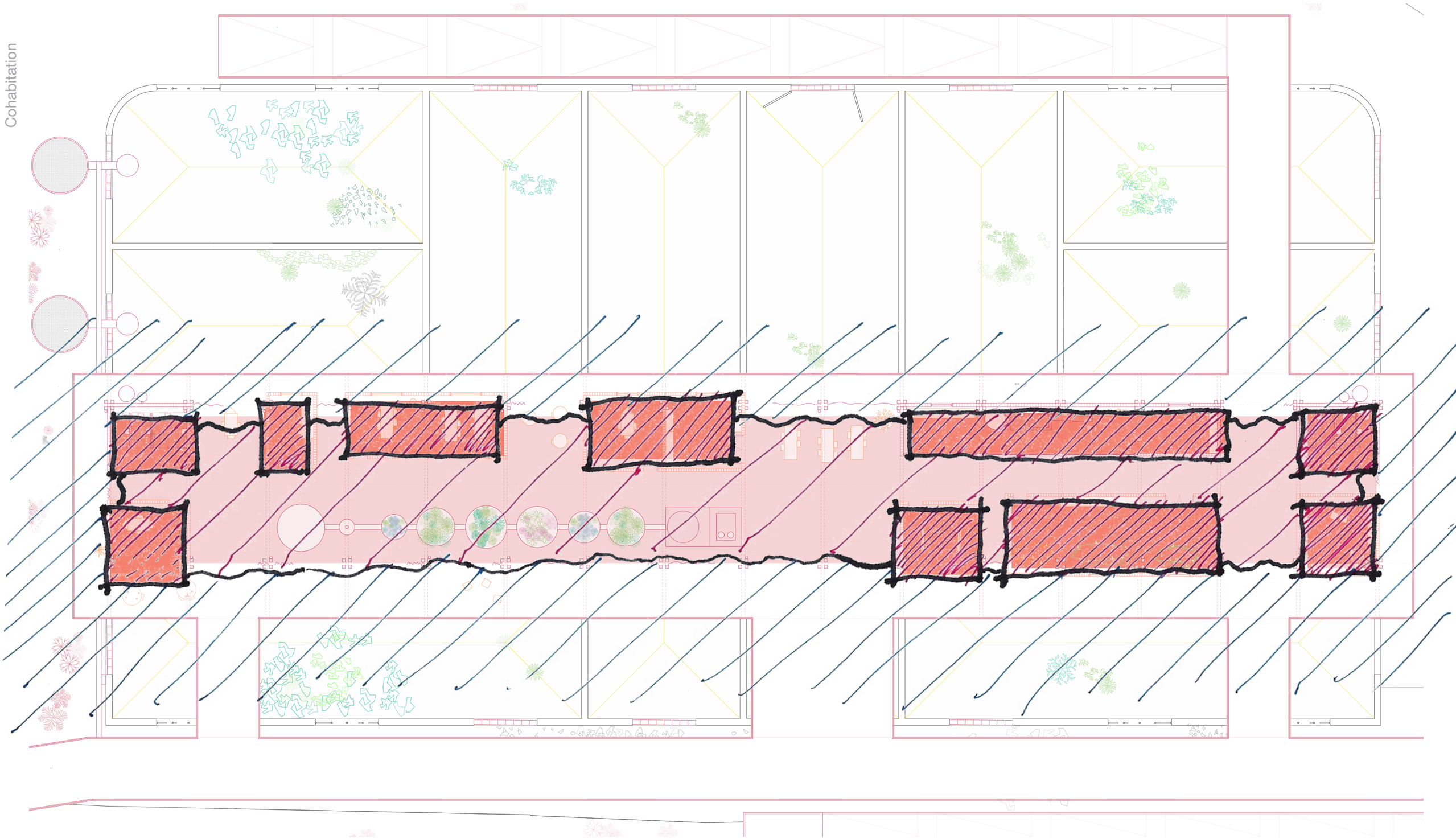


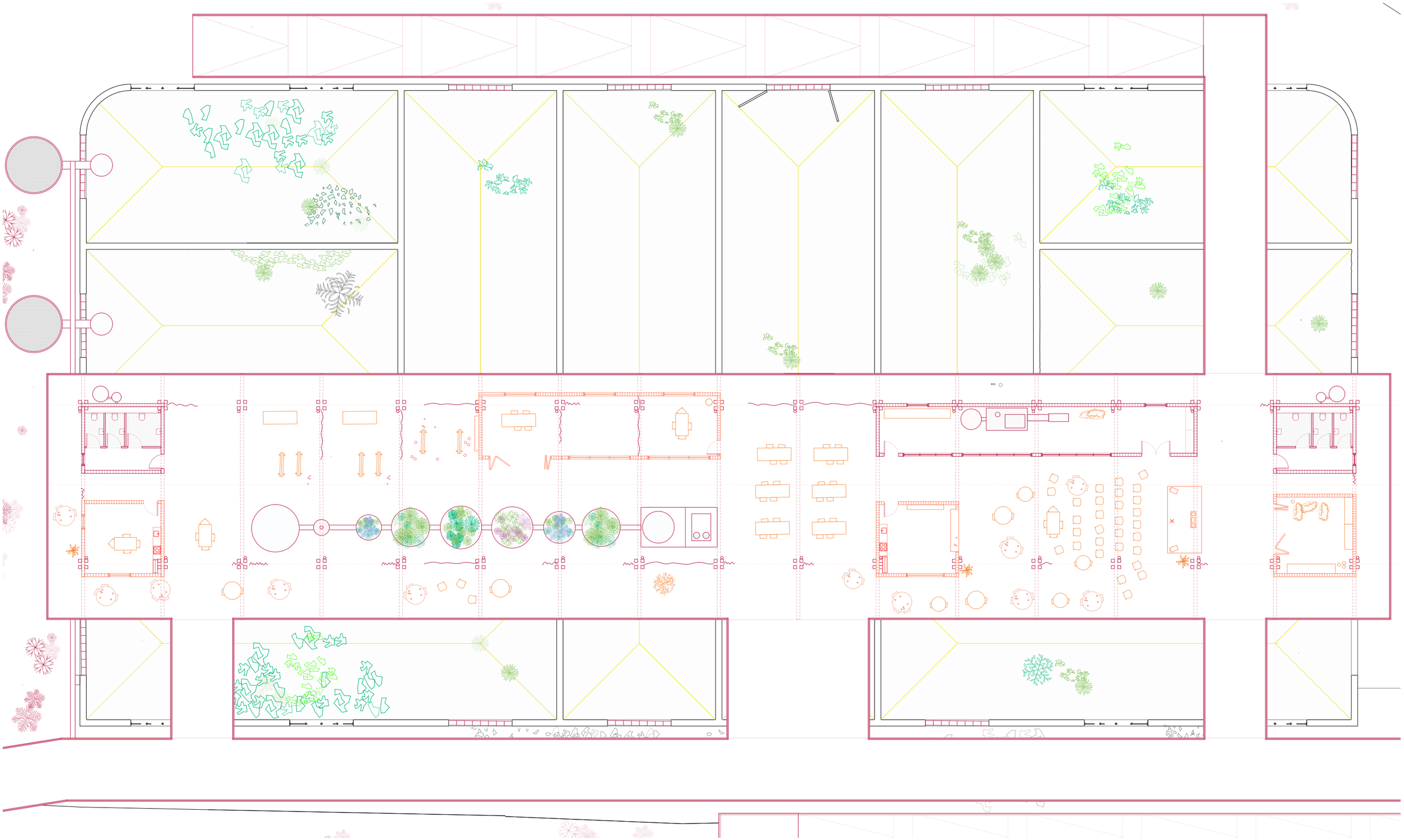
Interior of community building



Floorplan 1:100

Cohabitation



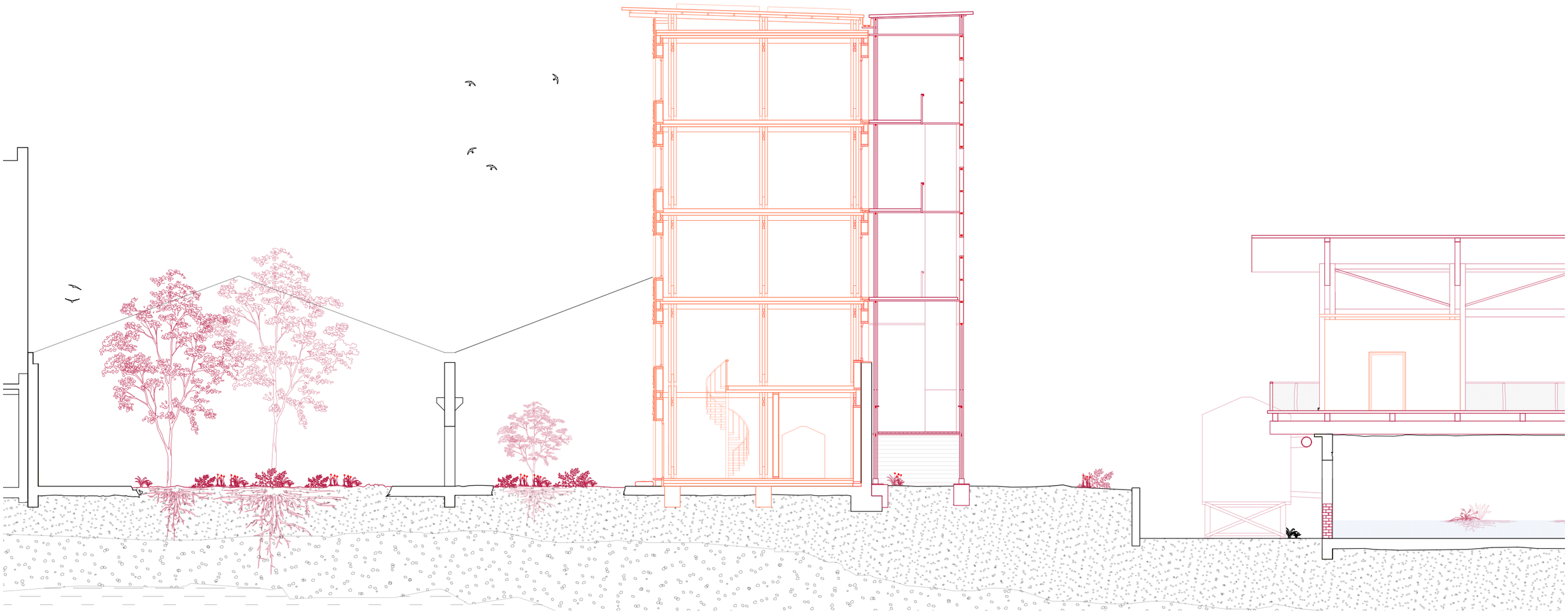


Floorplan 1:100

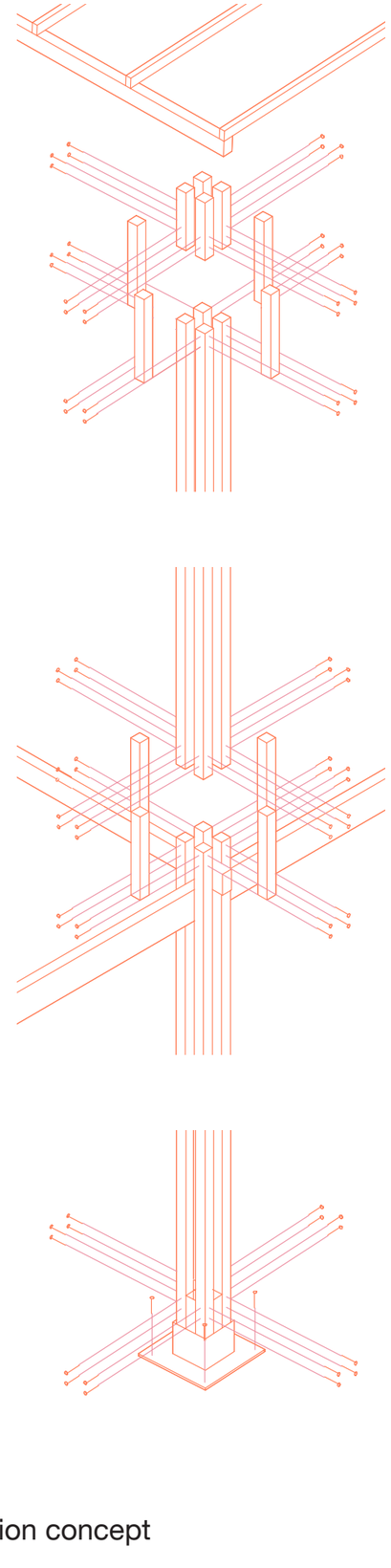
Cohabitation

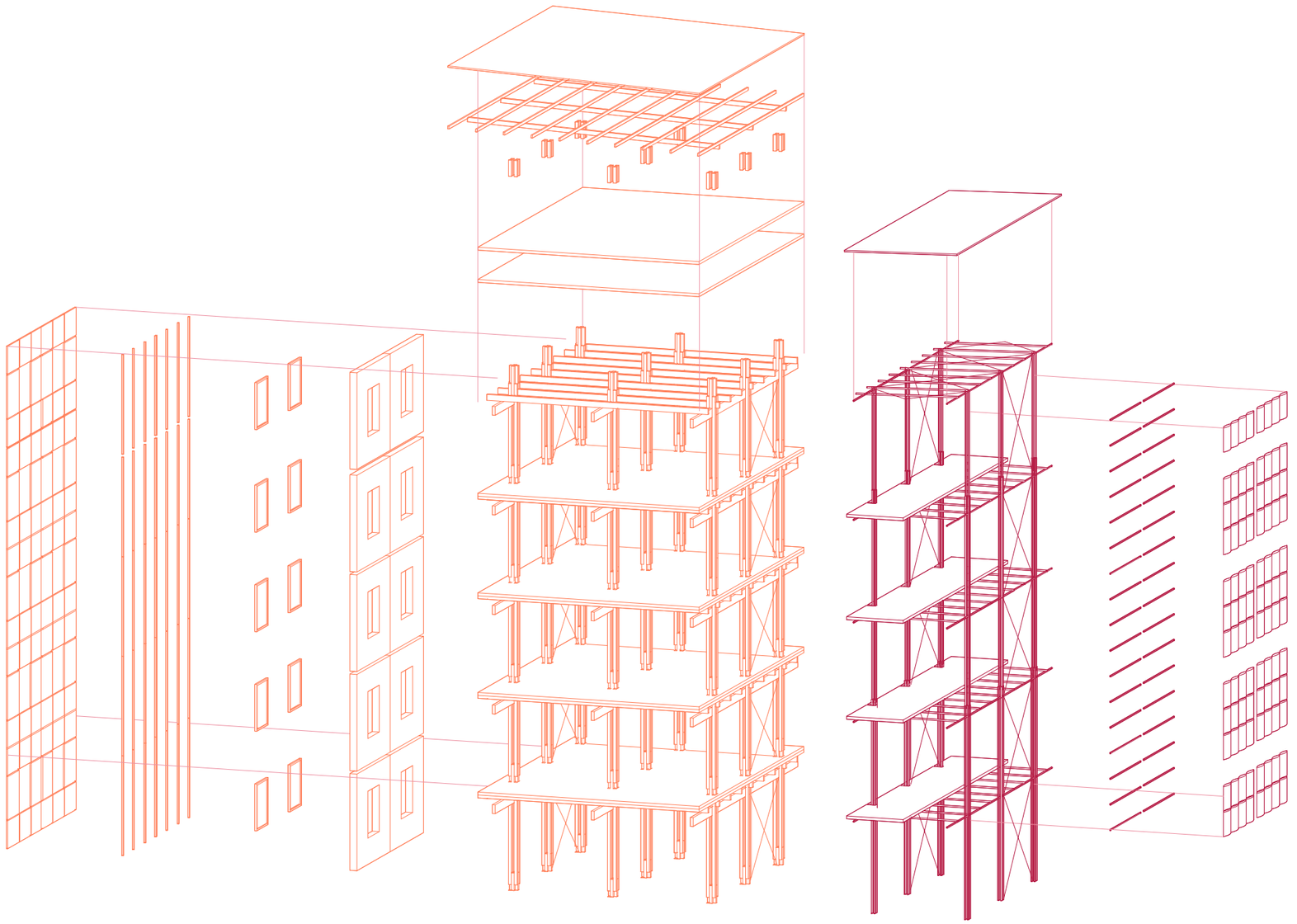


3. Cohabitation

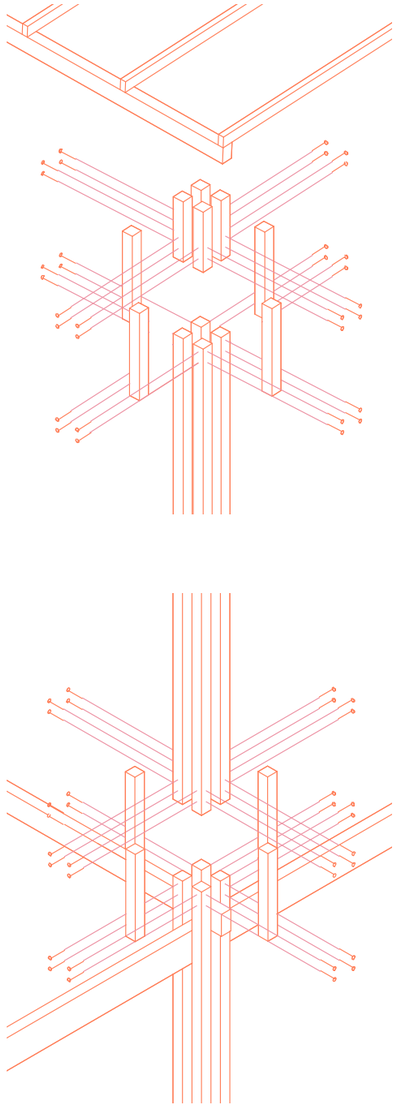


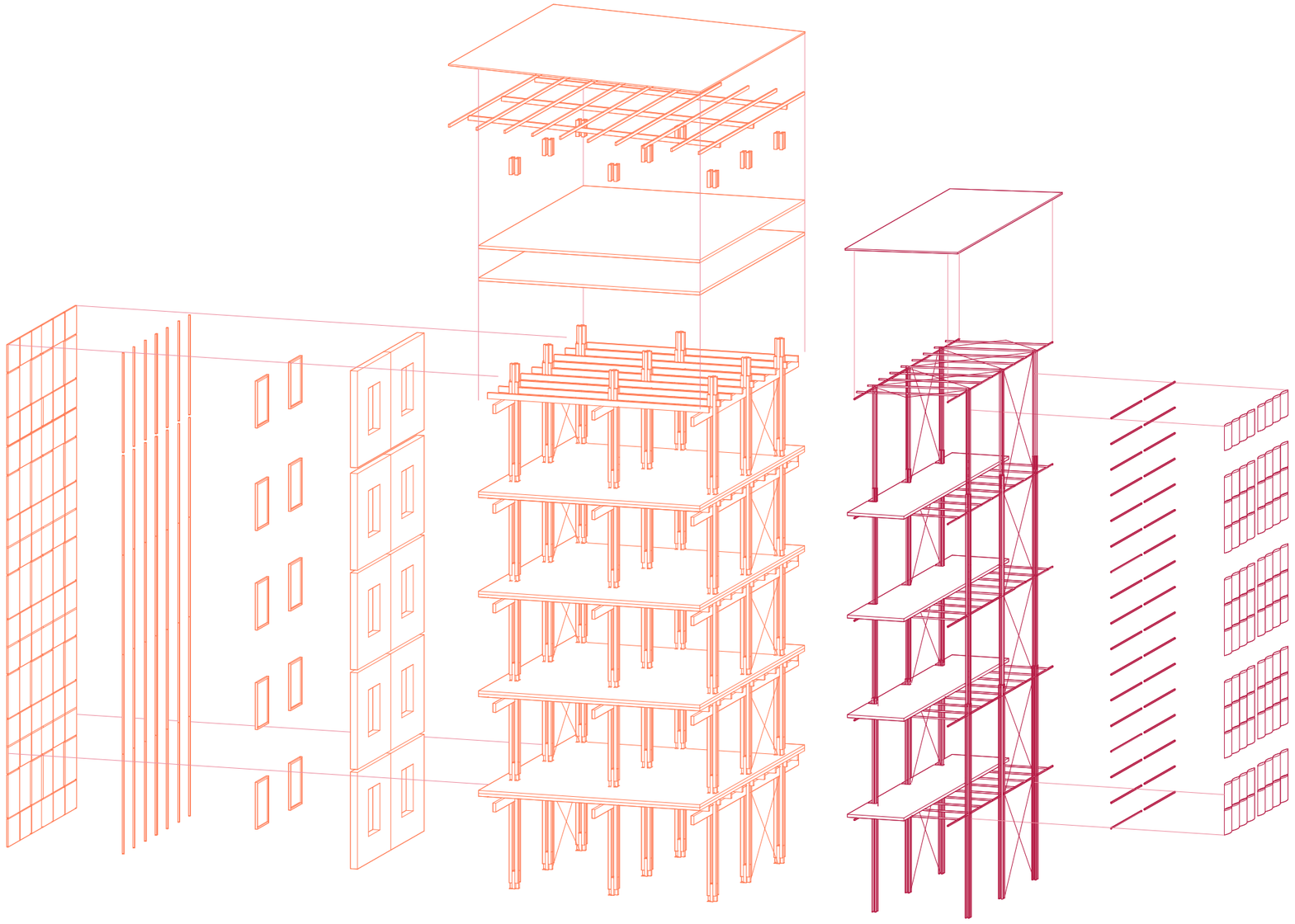
Section Cohabitation 1:100

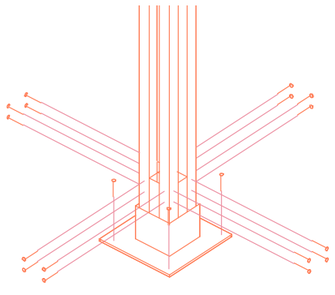




Cohabitation









Reused Wood Facade



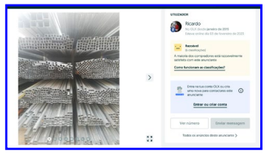
Hay Insulation



Wooden Structure



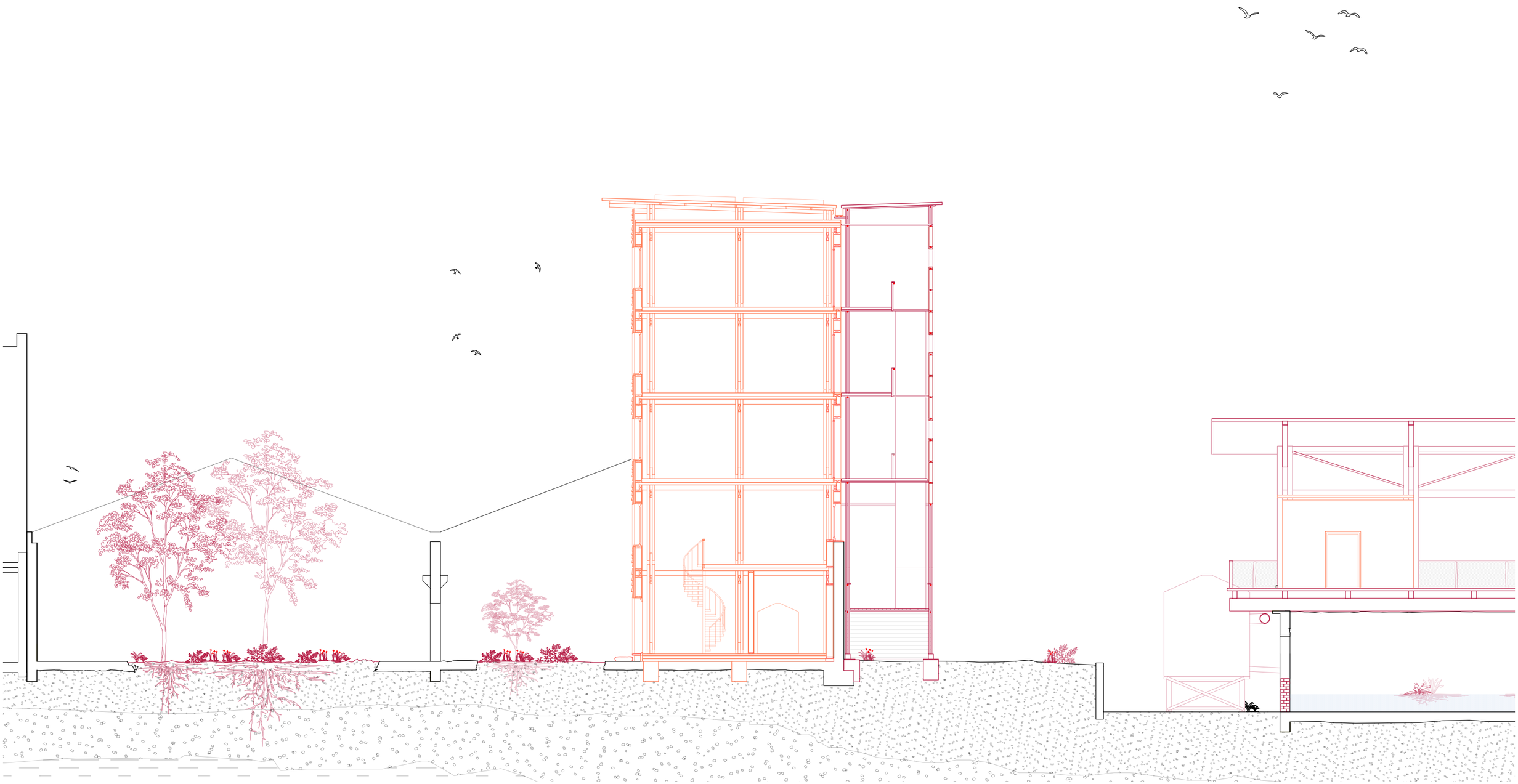
Earth block Partition walls



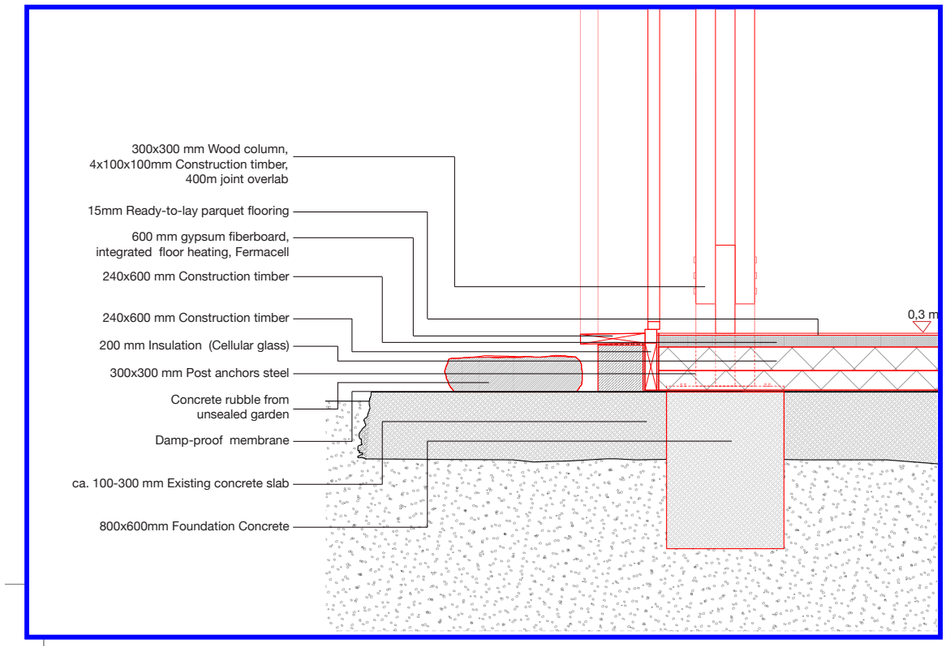
Reused Scaffold

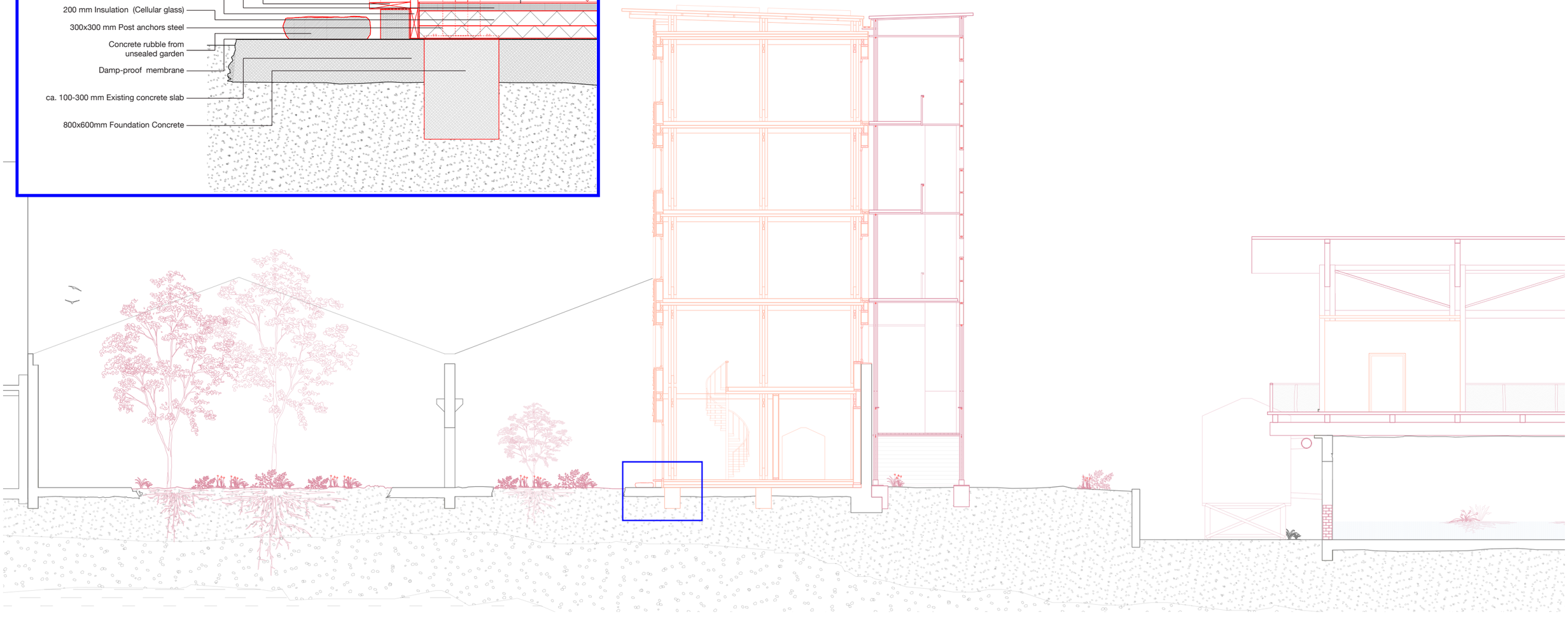


Reused Roof tiles

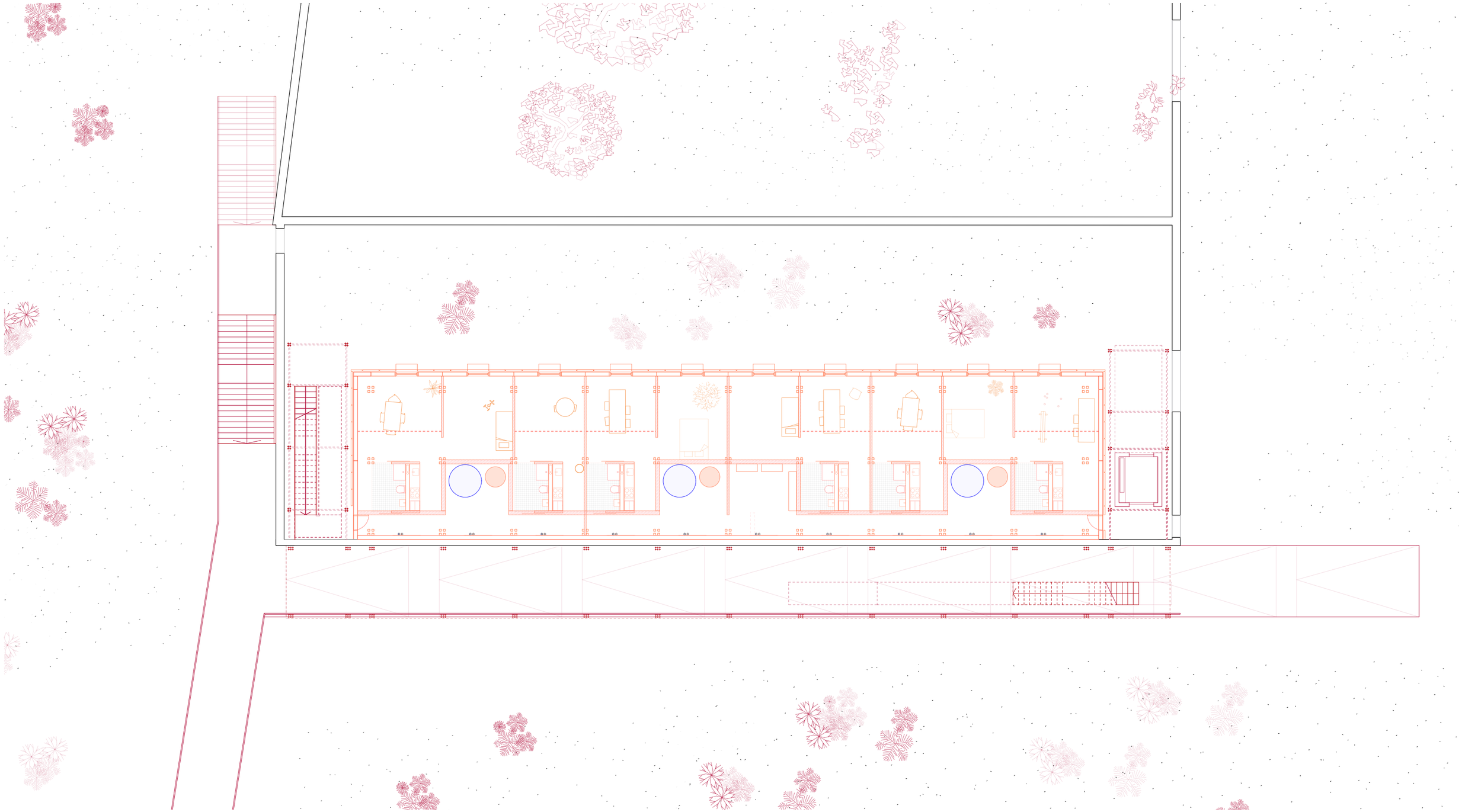


Section Cohabitation 1:100

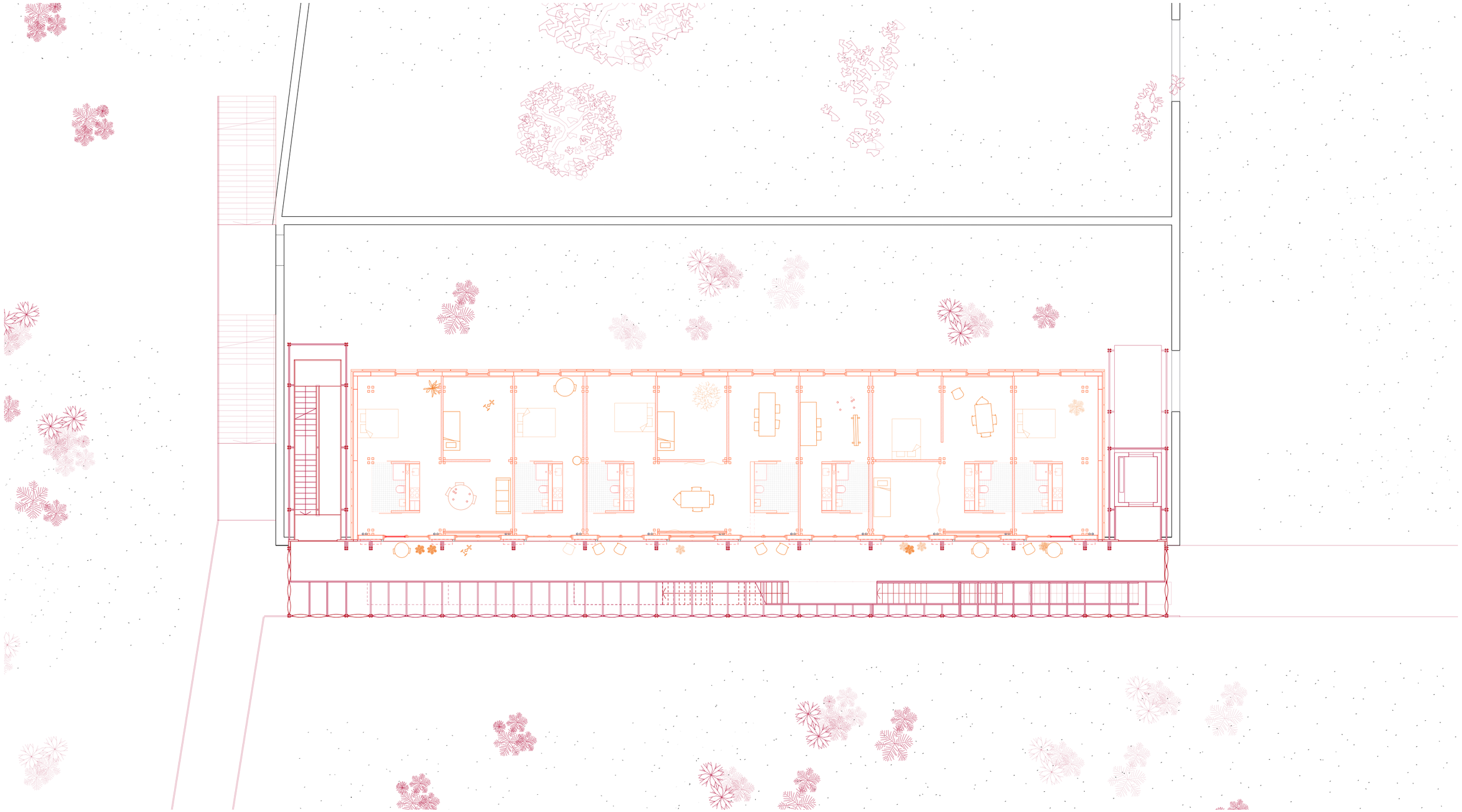




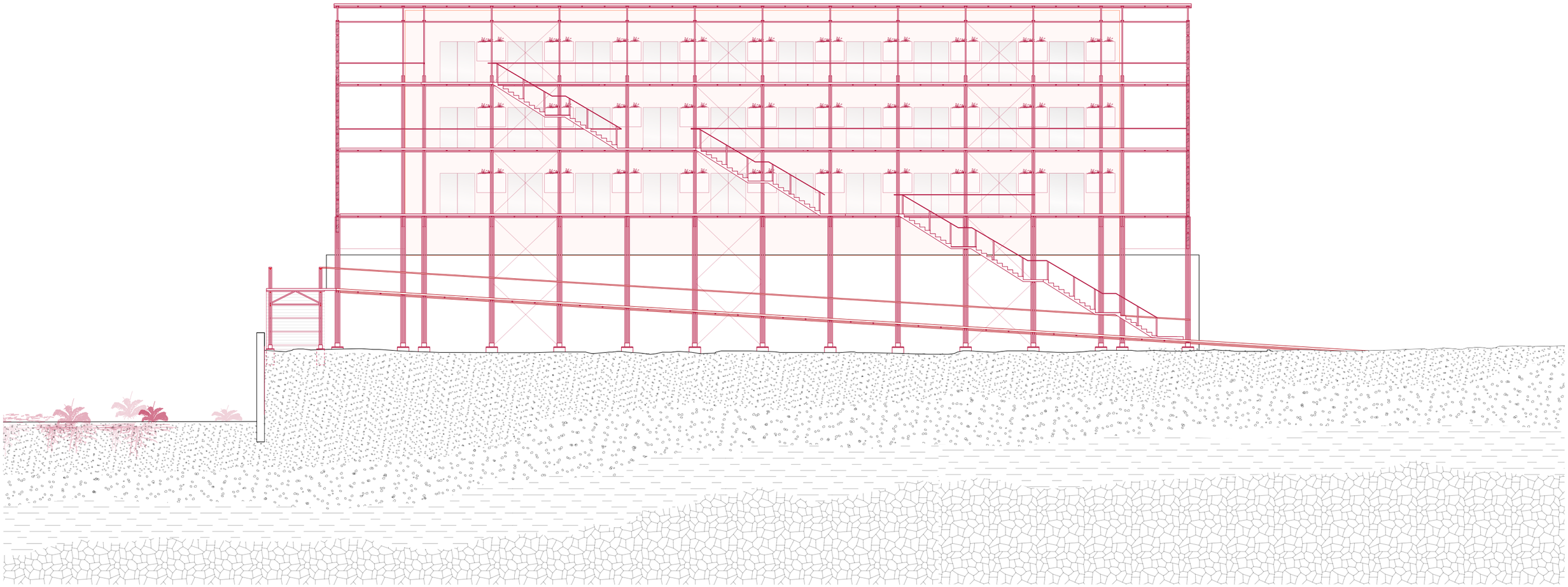
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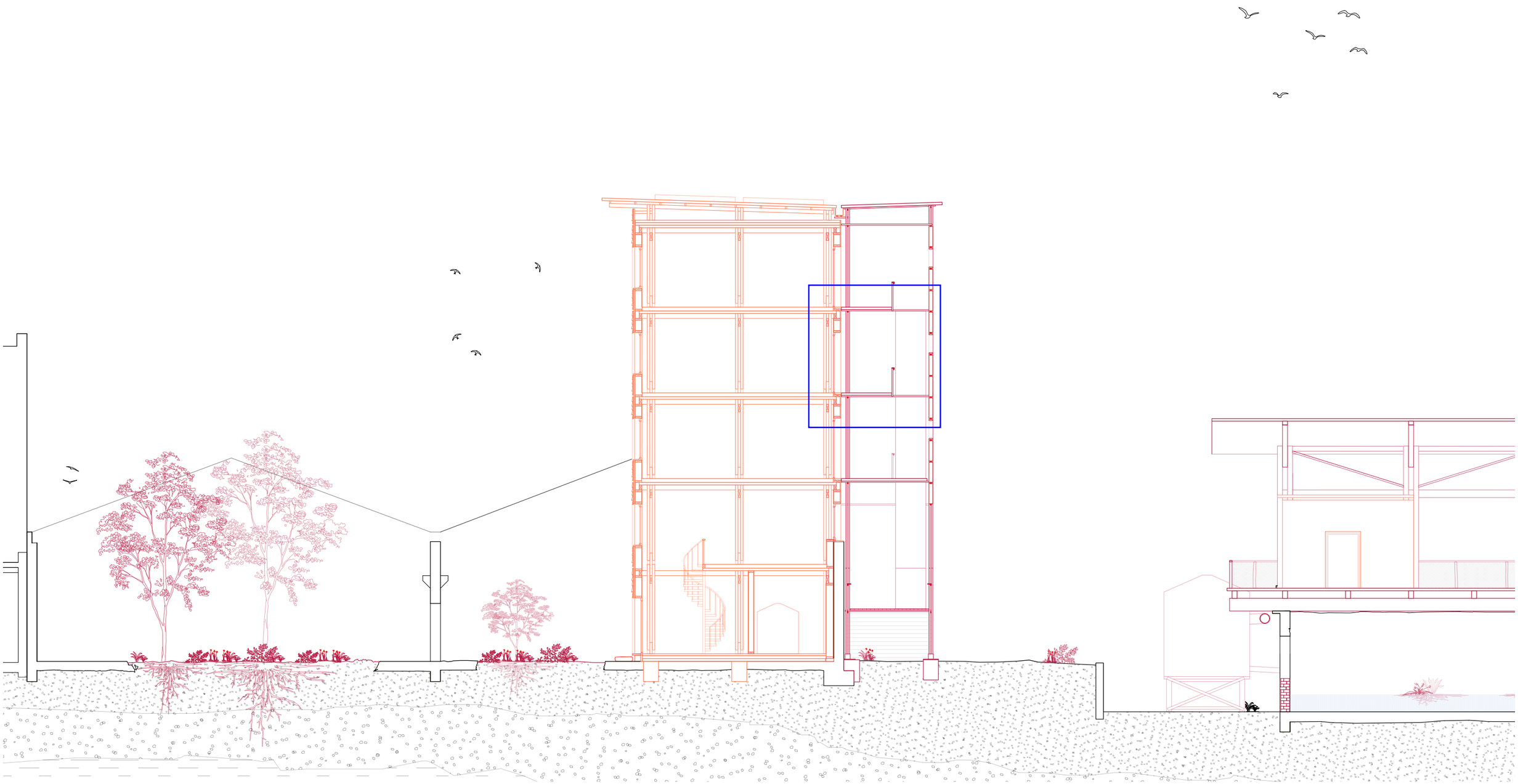
Floorplan Groundfloor, 1:100



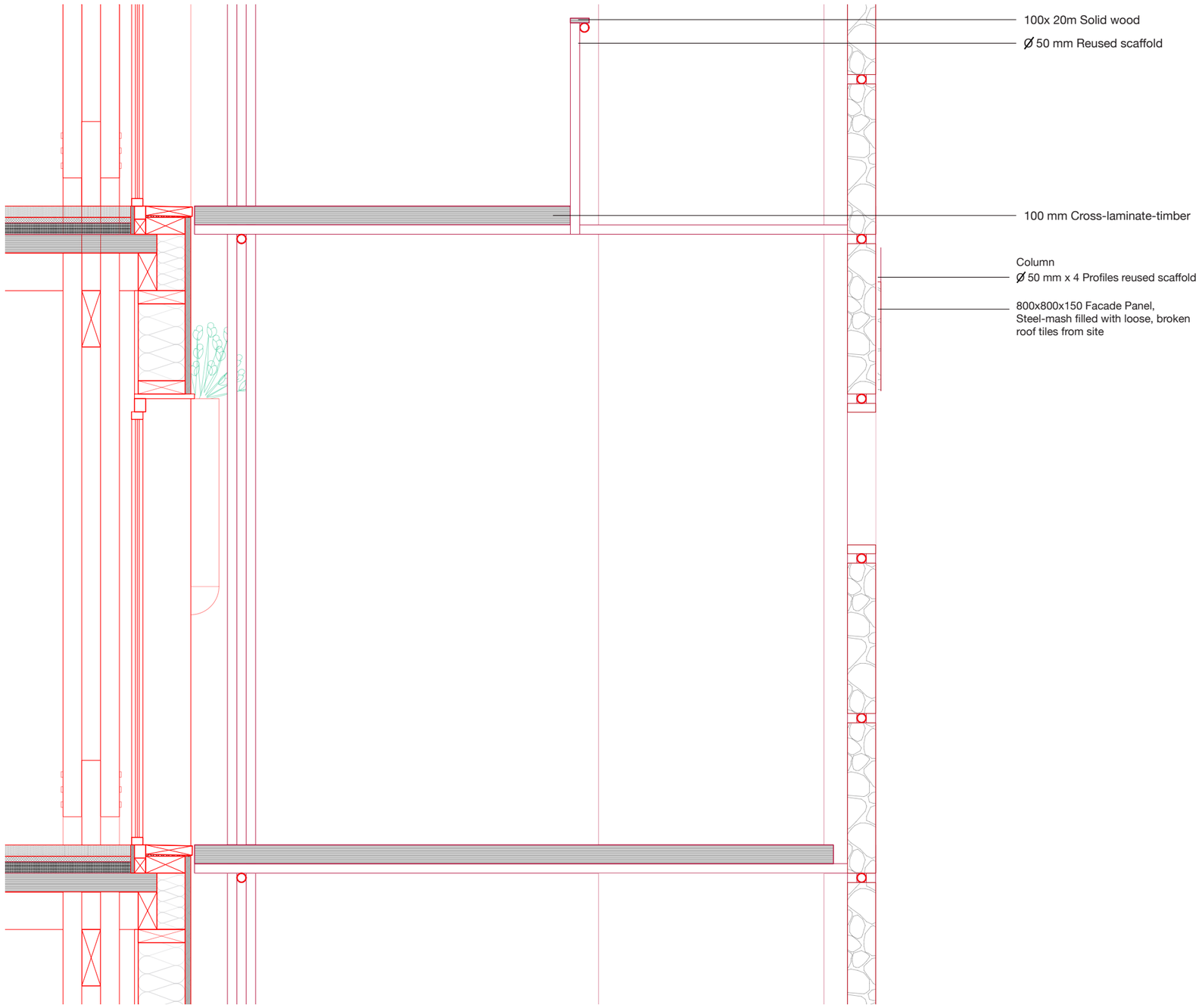
Floorplan +3, 1:100



Section Cohabitation 1:100



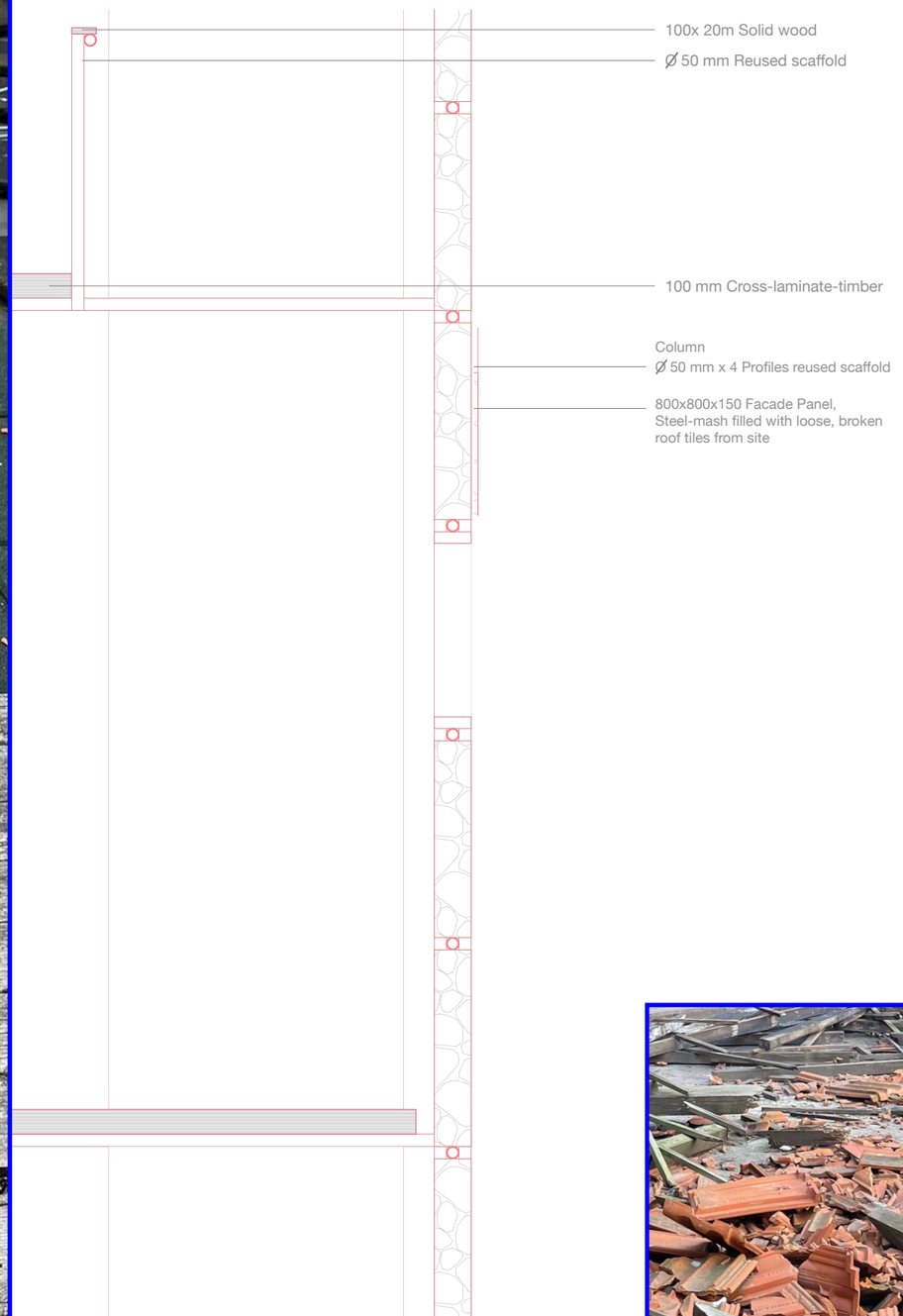
Section Cohabitation 1:100



Section Cohabitation 1:20

Cohabitation

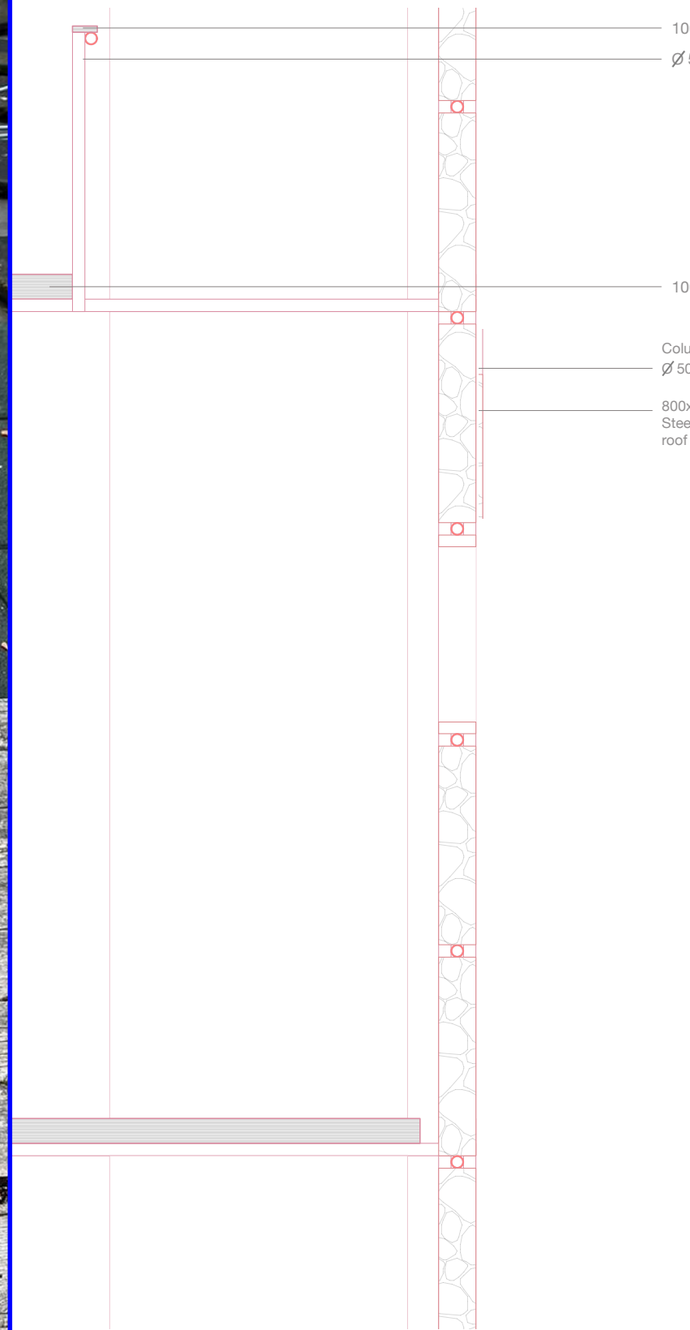


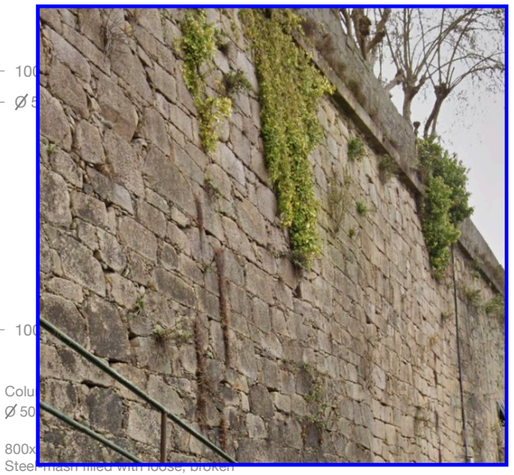




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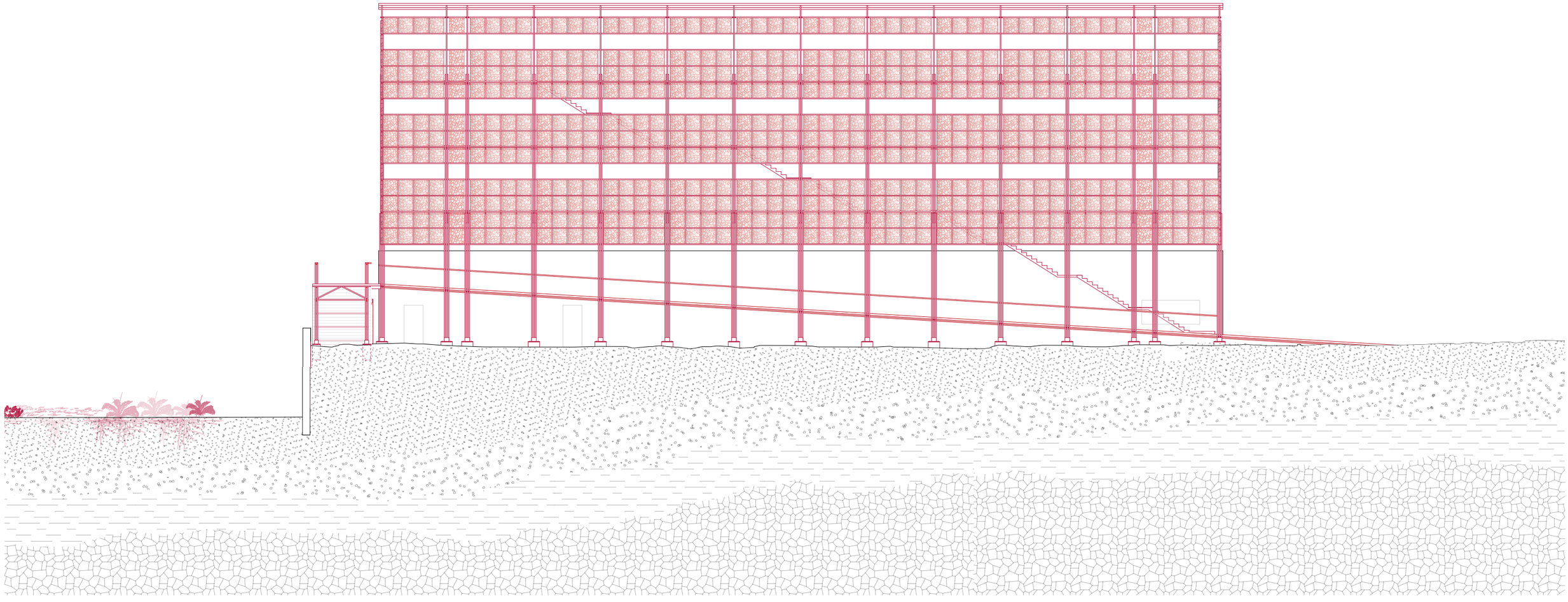




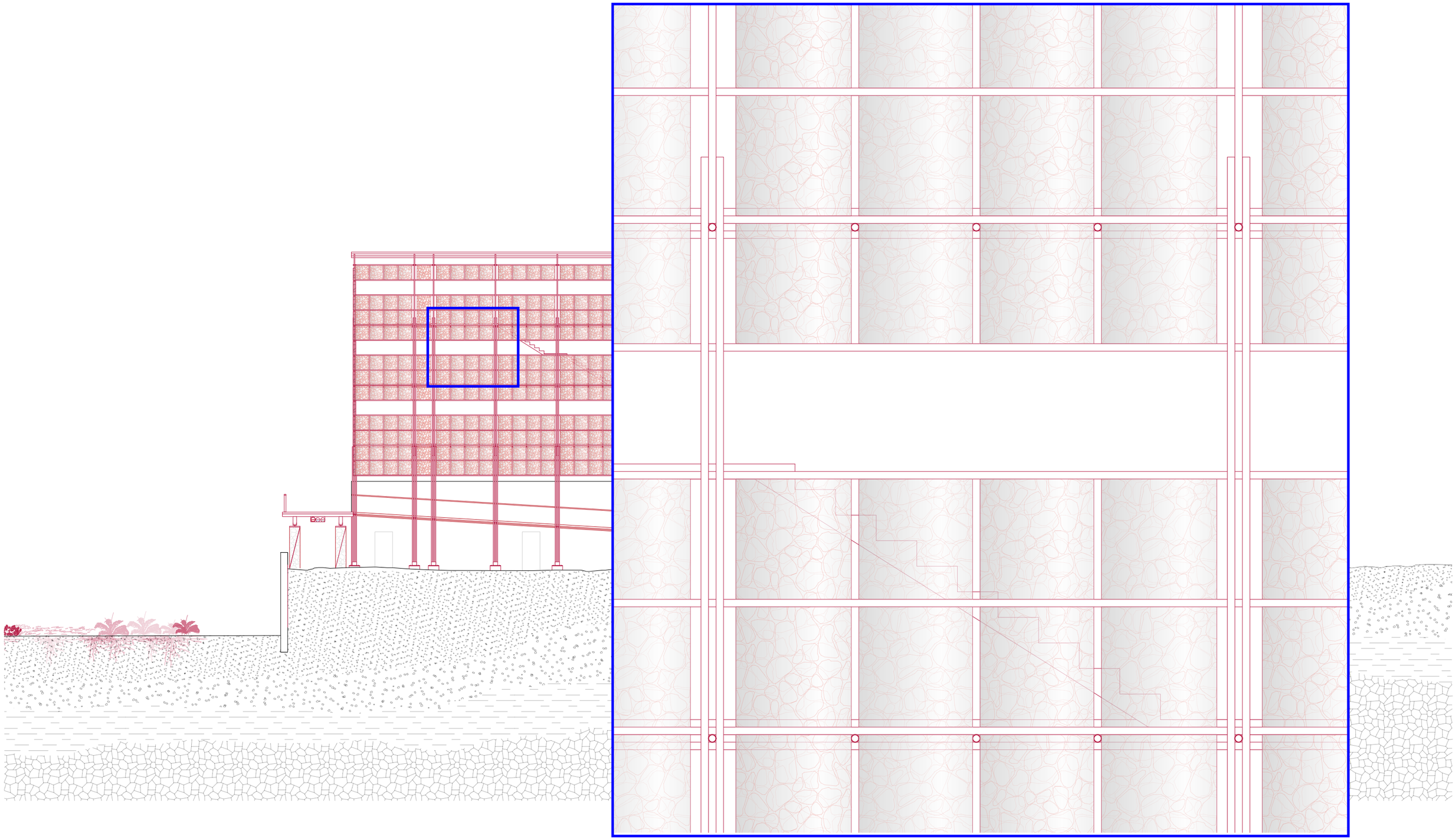




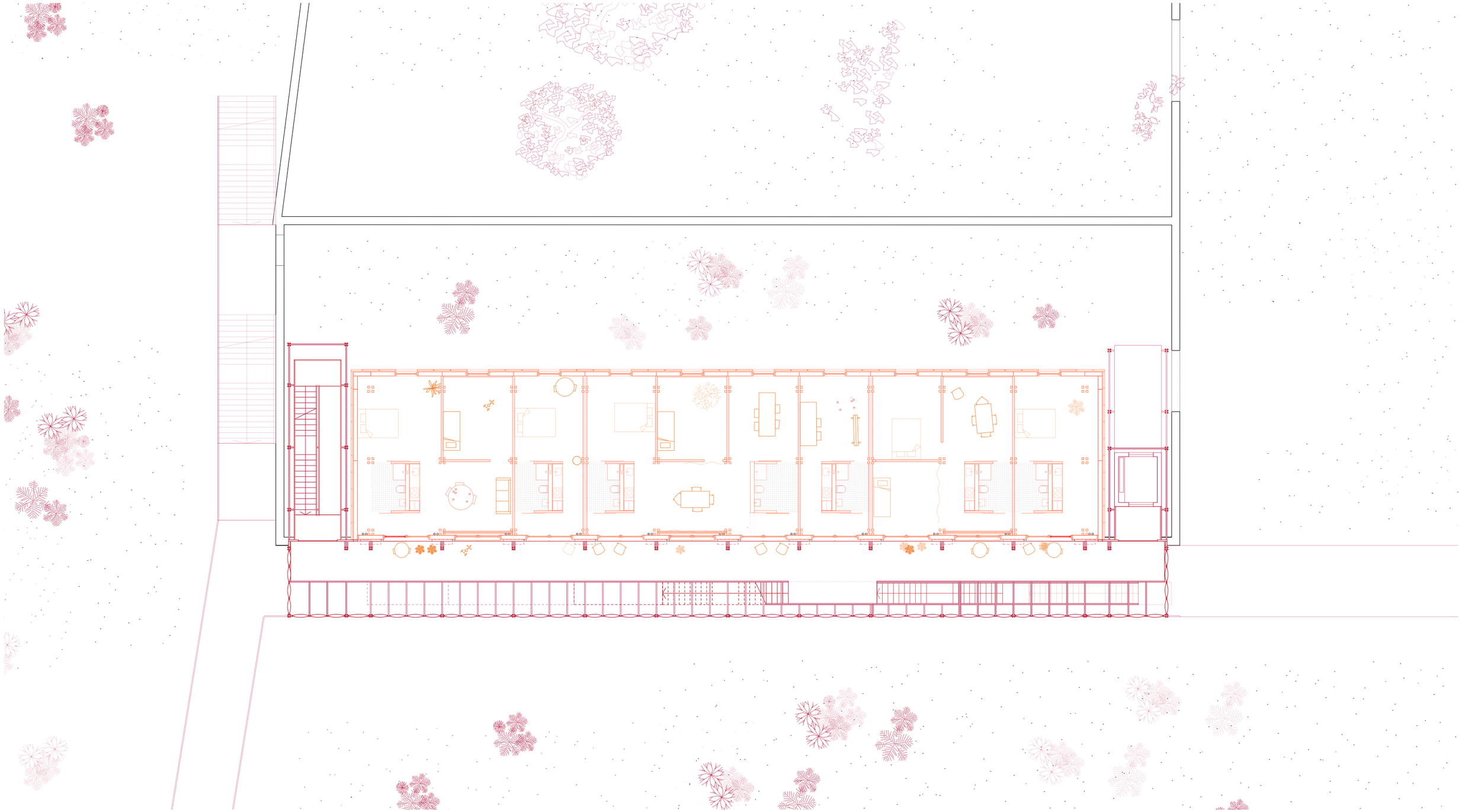
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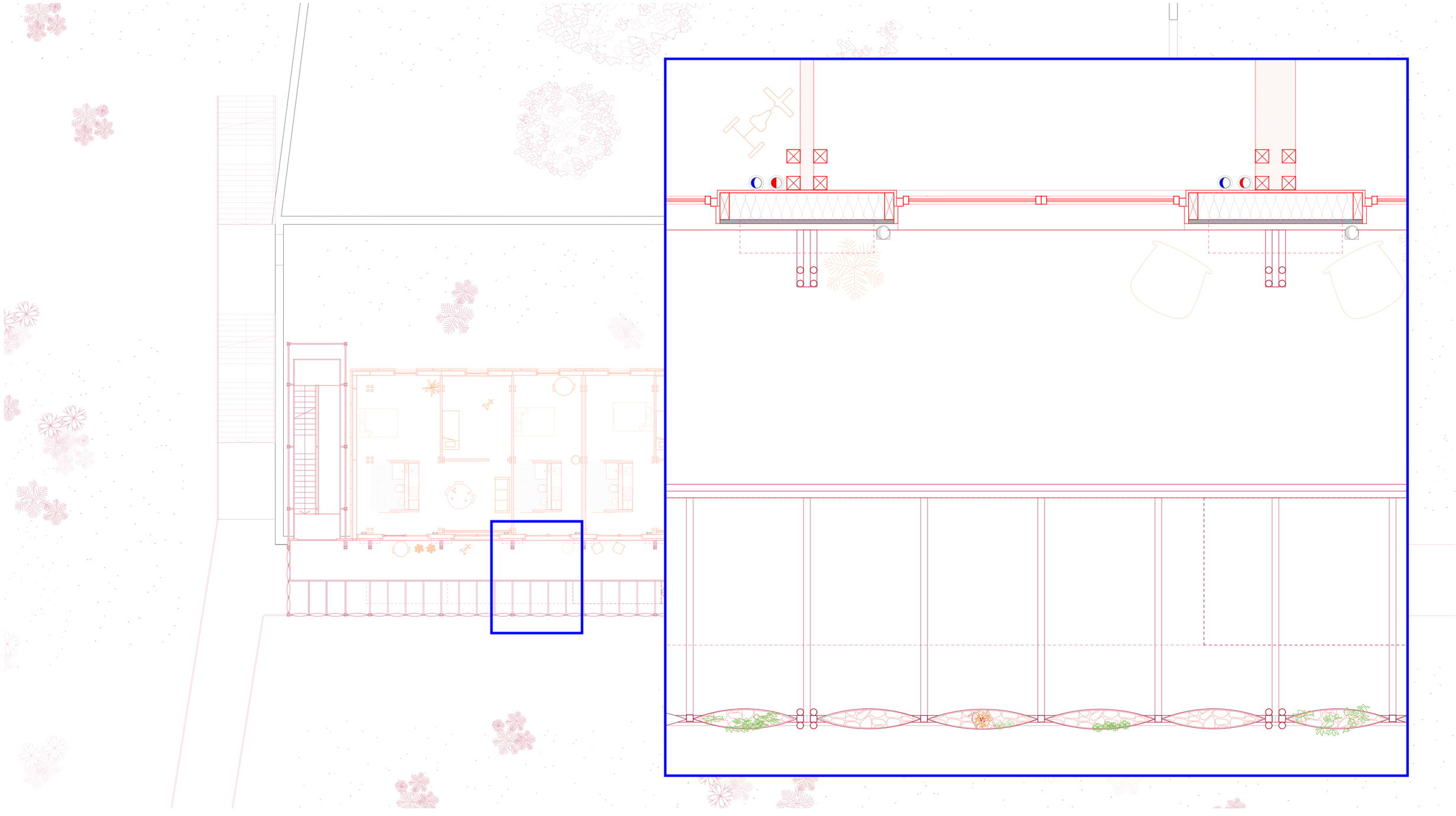
Elevation South East 1:100



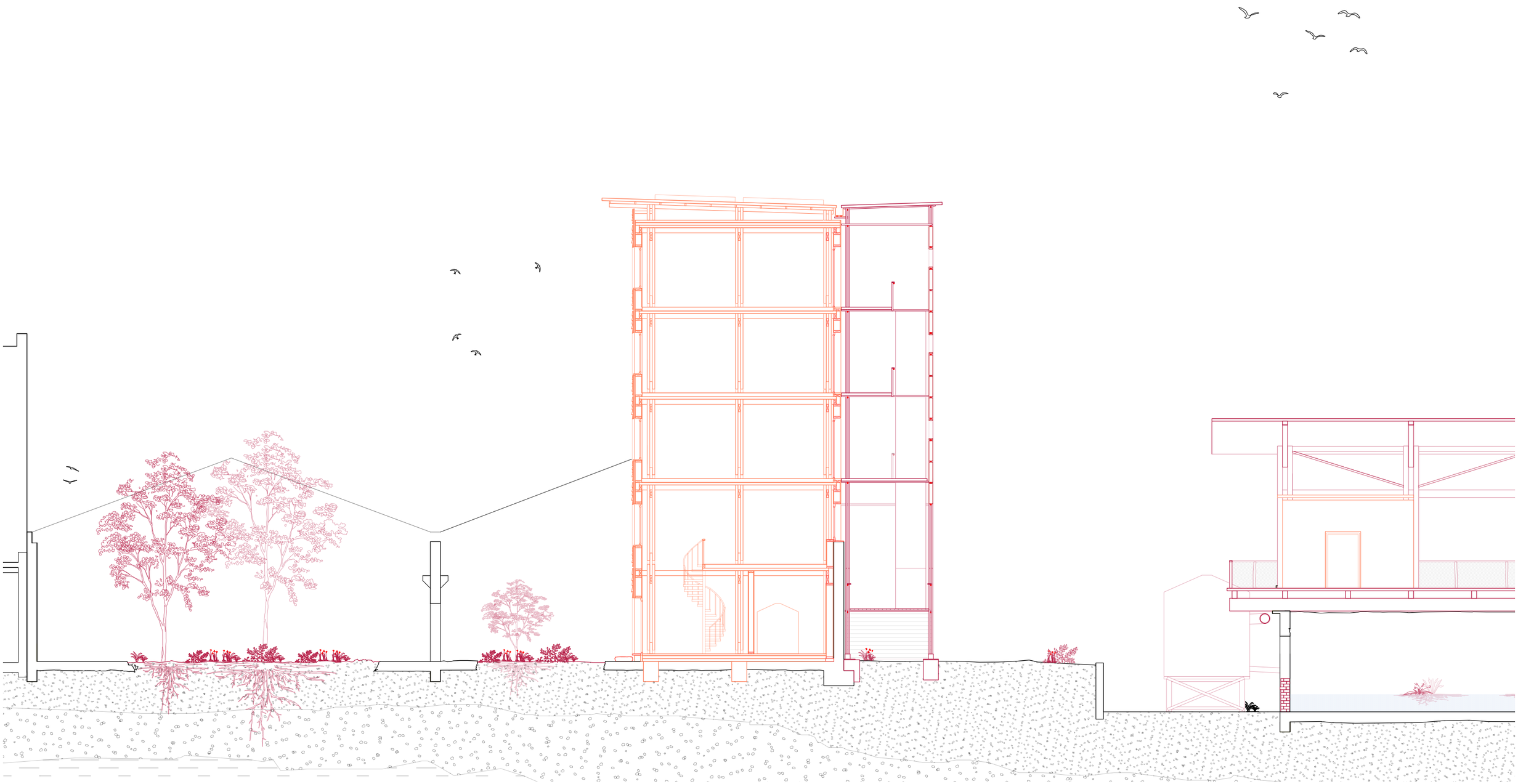
Elevation South East 1:20

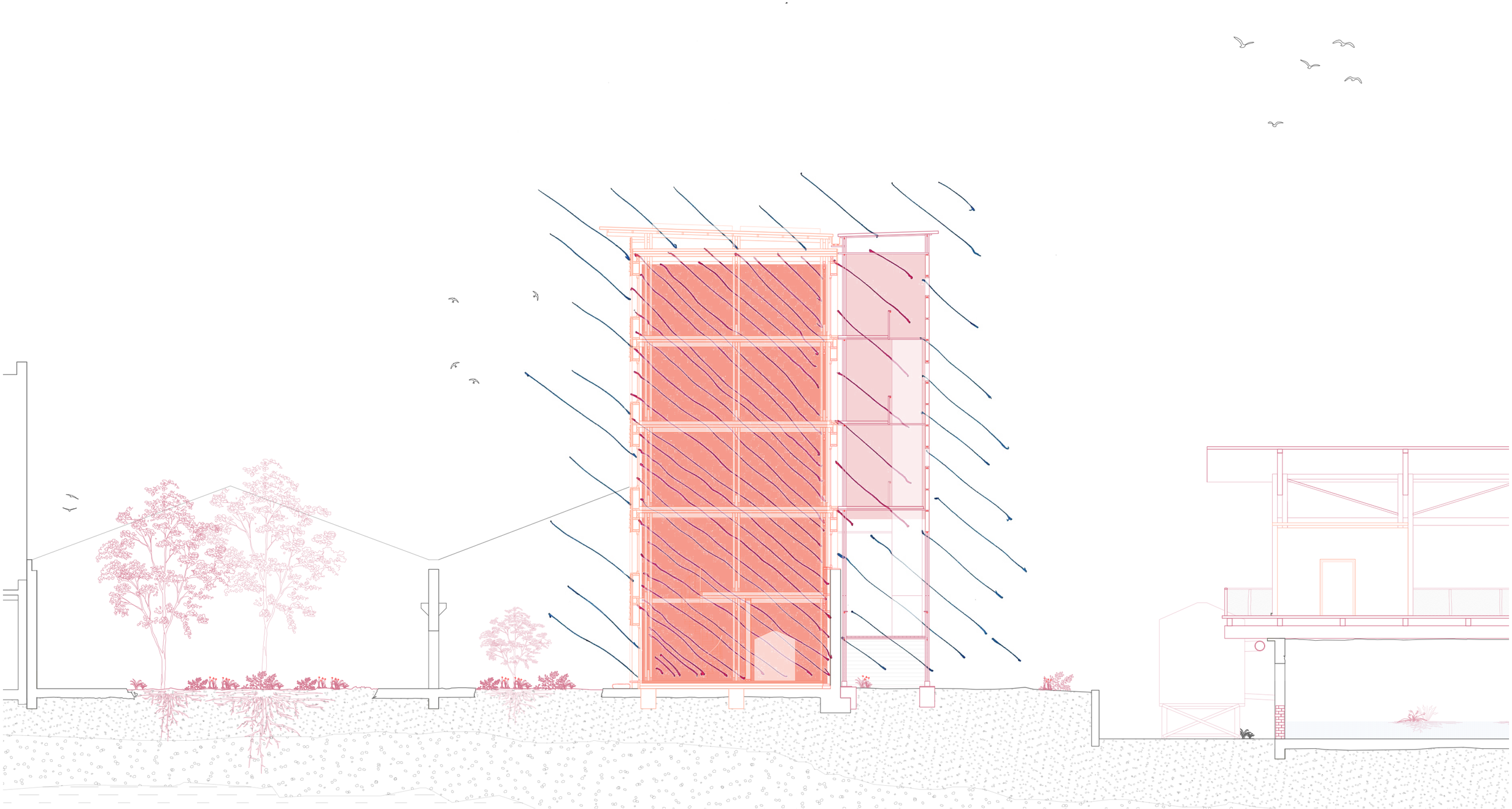


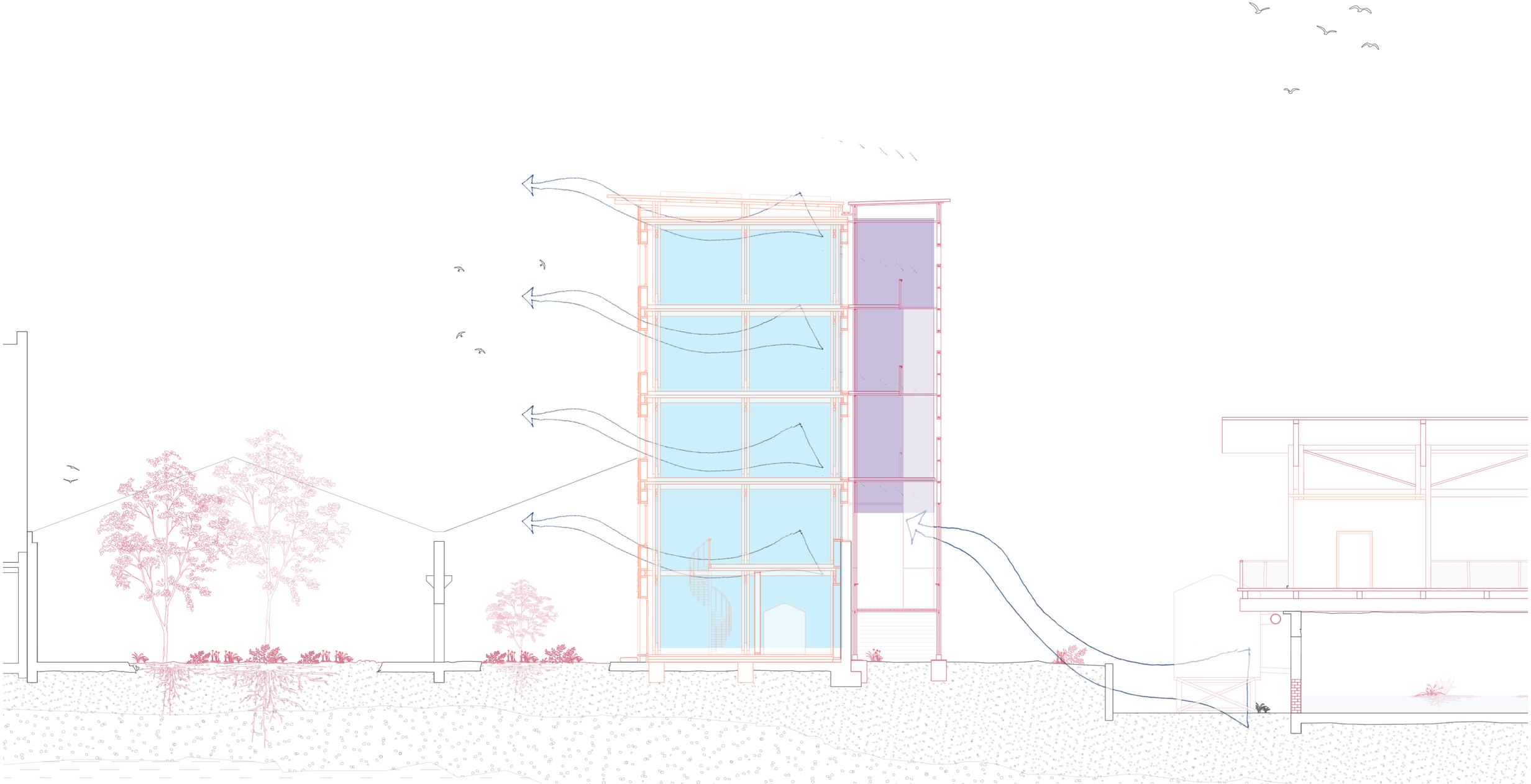
Floorplan +3, 1:100



Floorplan +3, 1:100

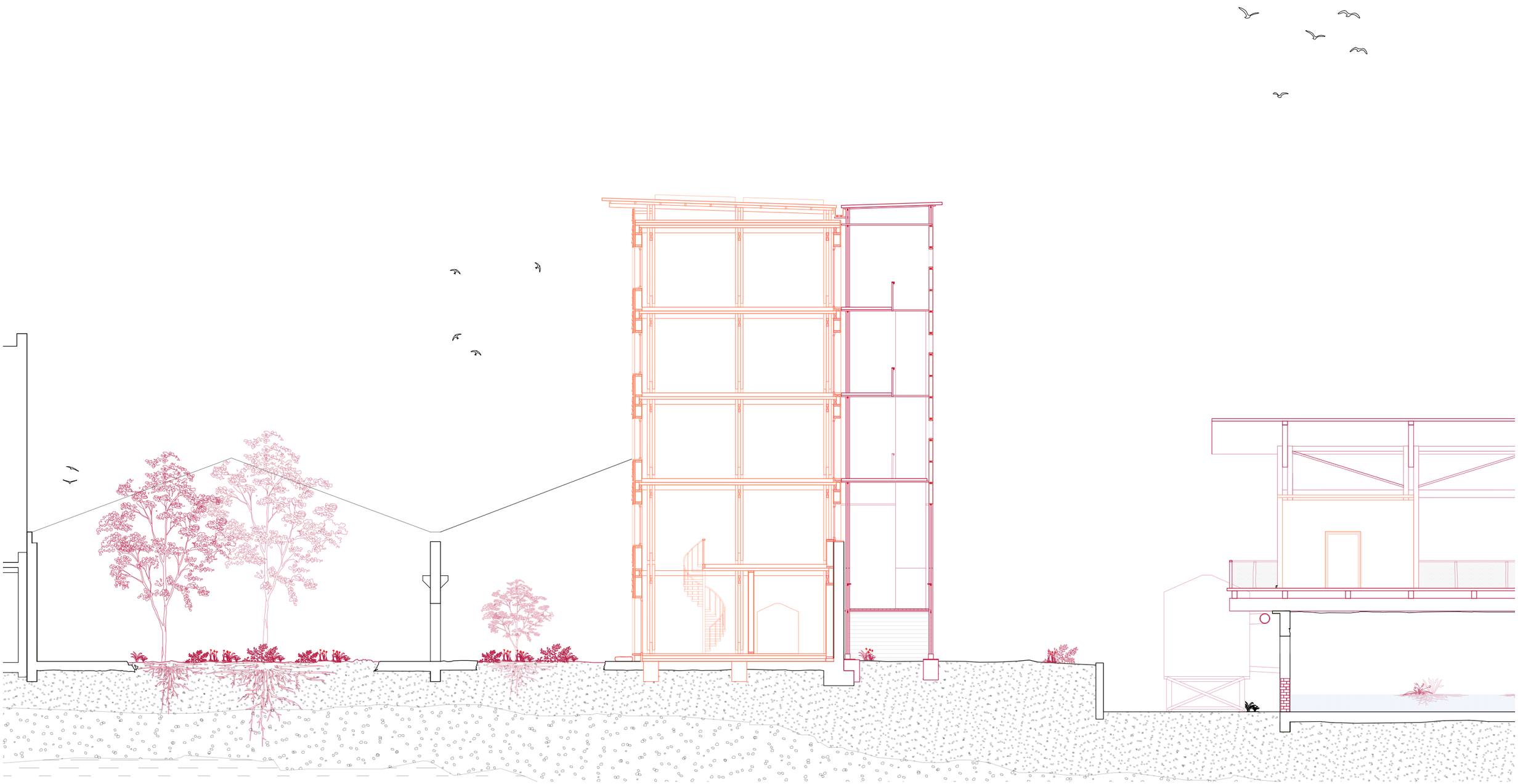




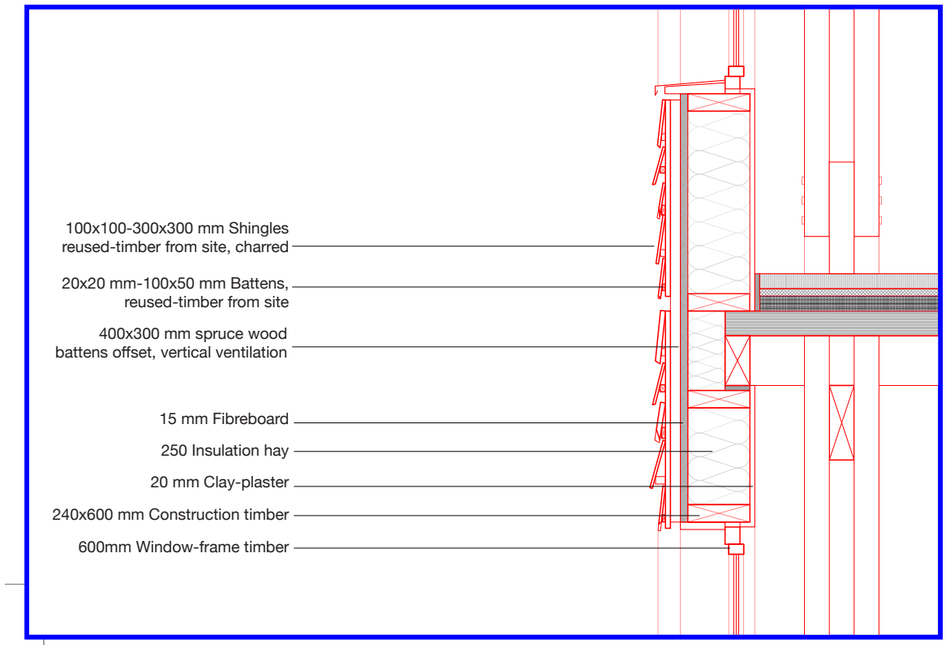


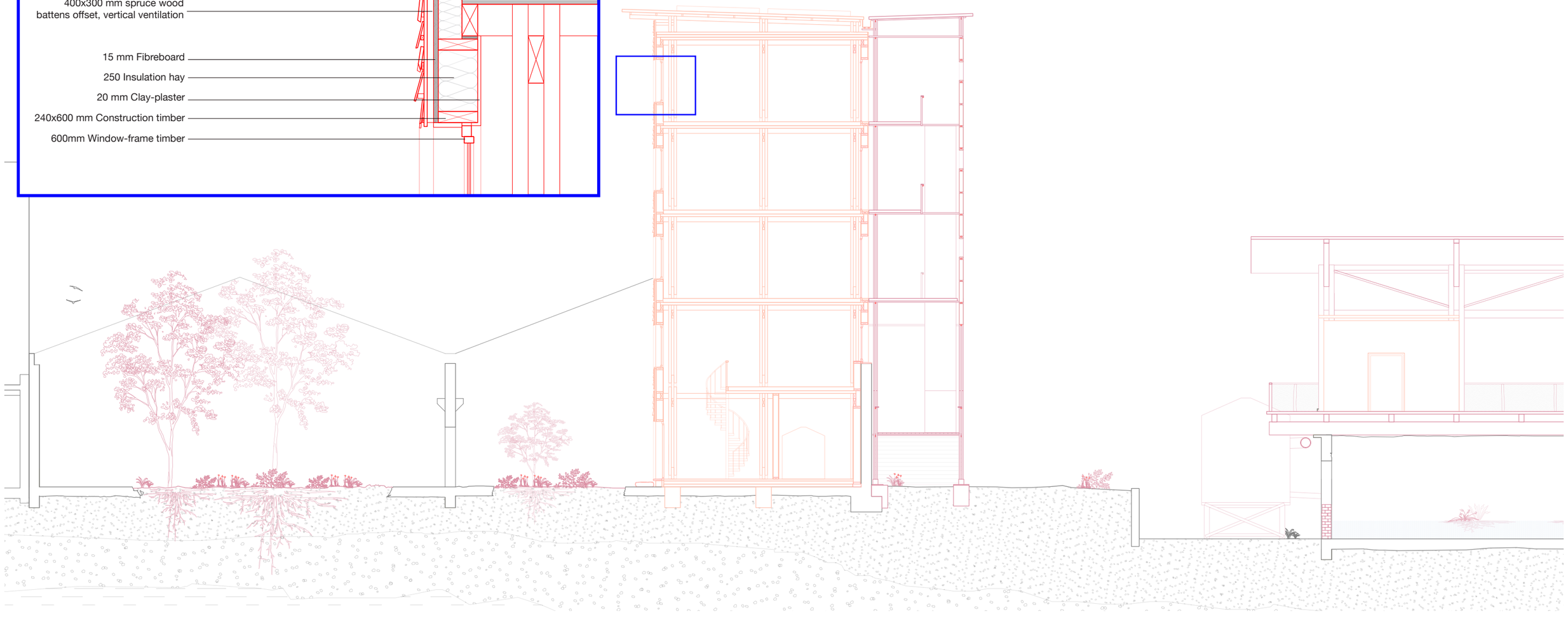
Climate concept



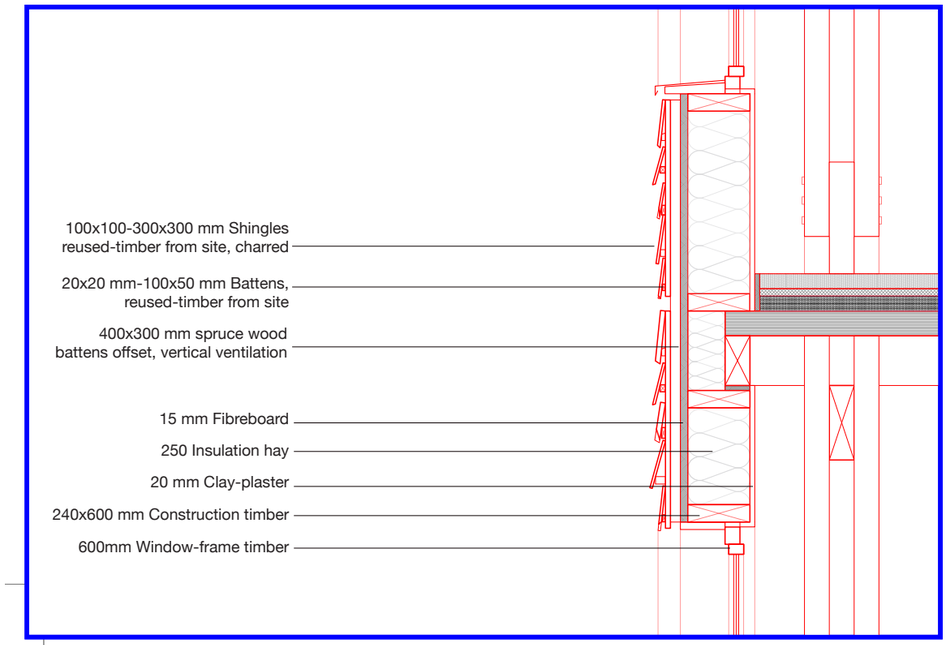


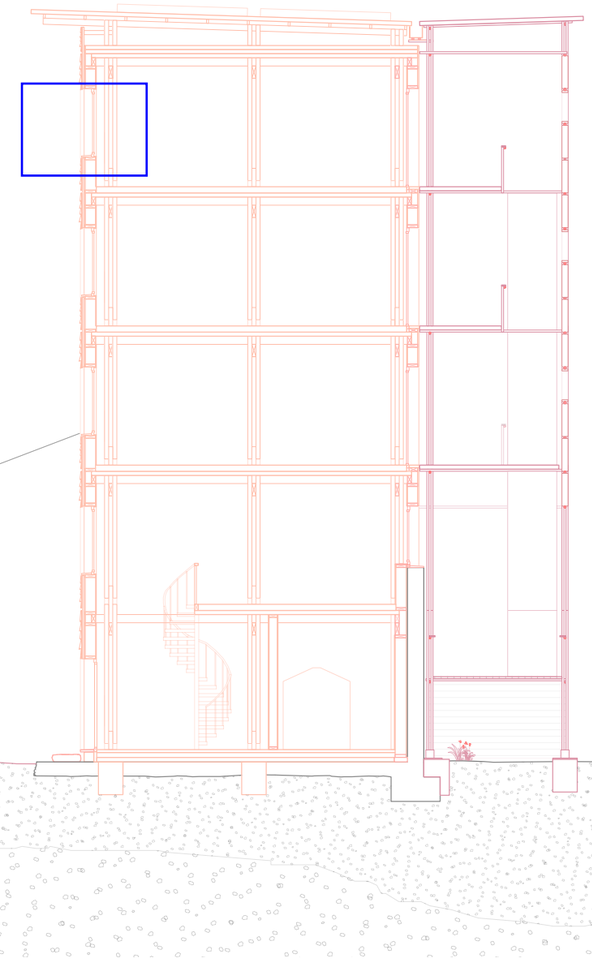
Section Cohabitation 1:100





Section Cohabitation 1:100







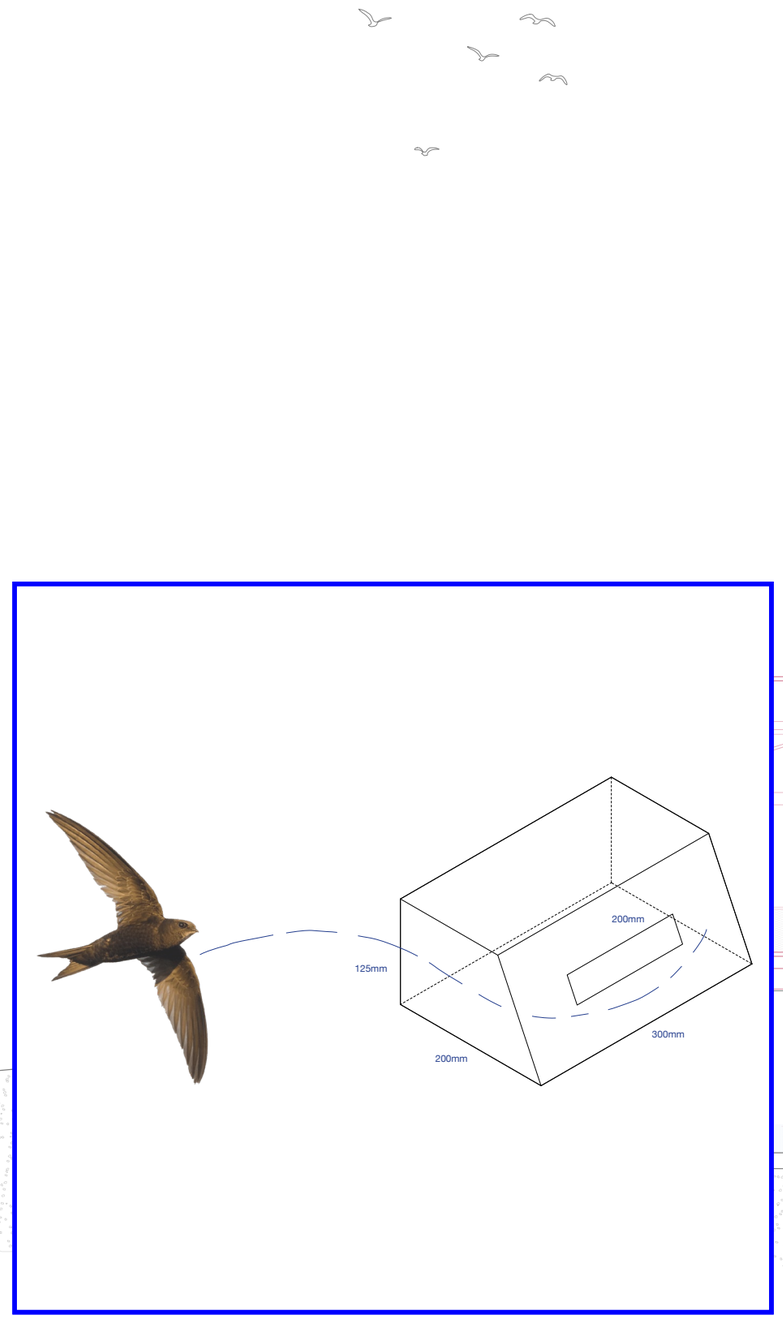




Section Cohabitation 1:100

Cohabitation





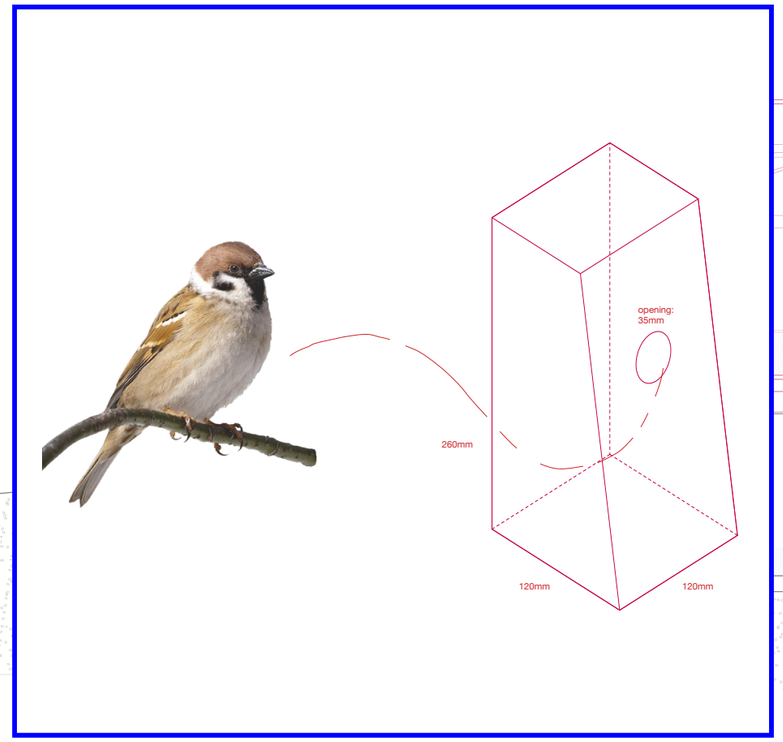
Swift / Gierzwaluw: 3-20m; North, East, West

Section Cohabitation 1:100

Cohabitation





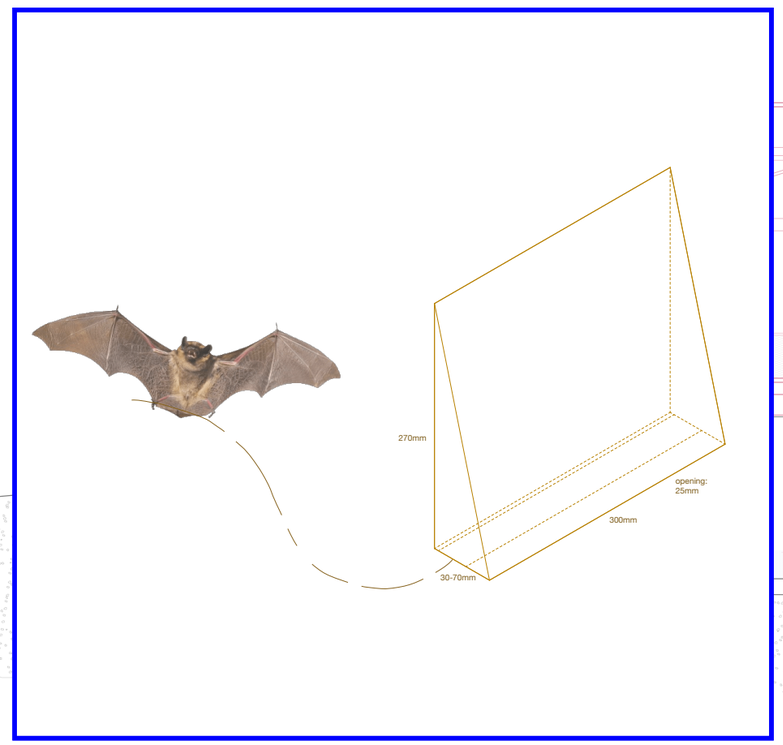


House Sparrow / Huismus: 1-10m; North, East

Section Cohabitation 1:100

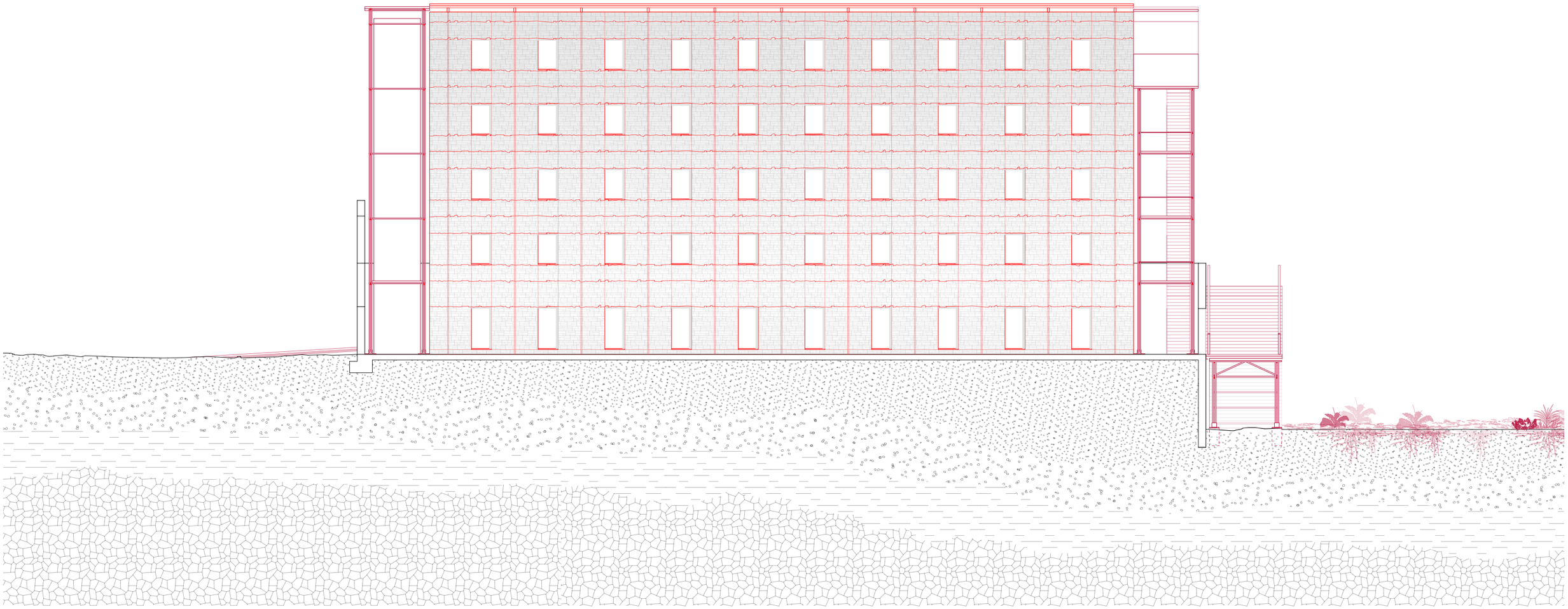
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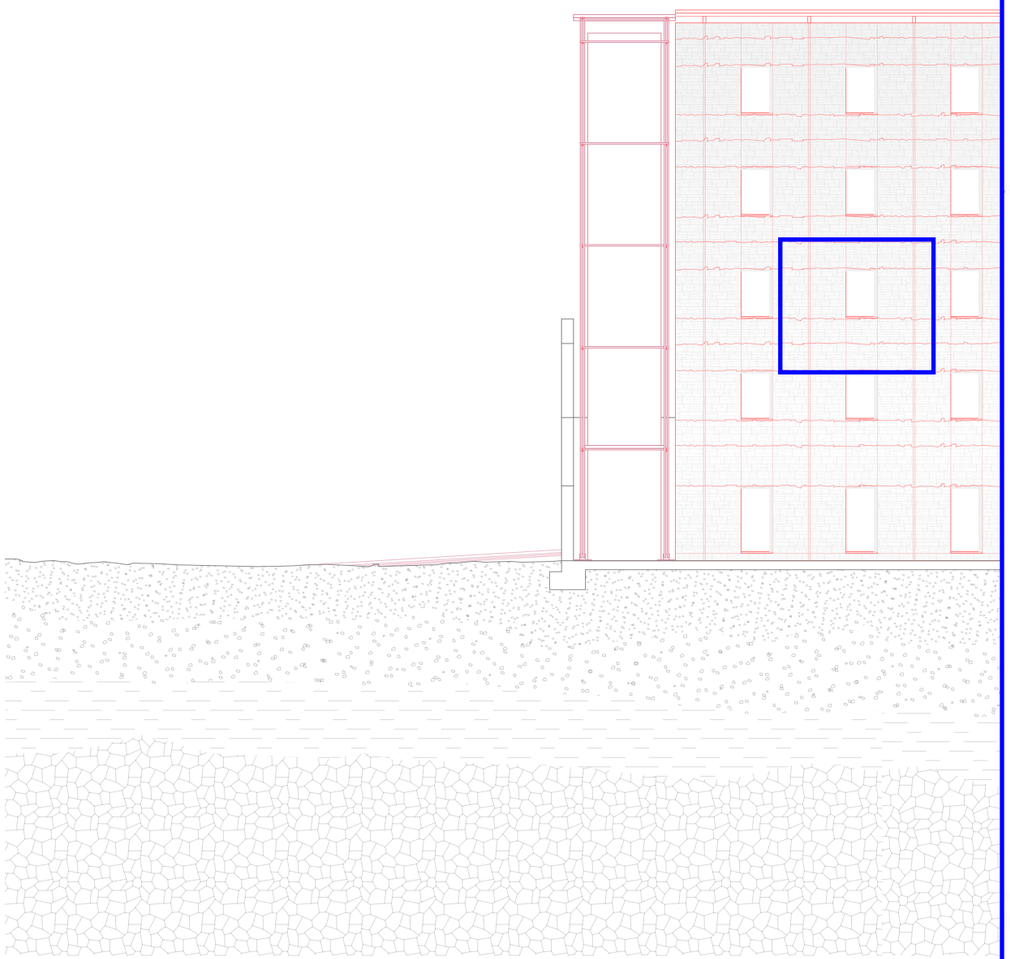


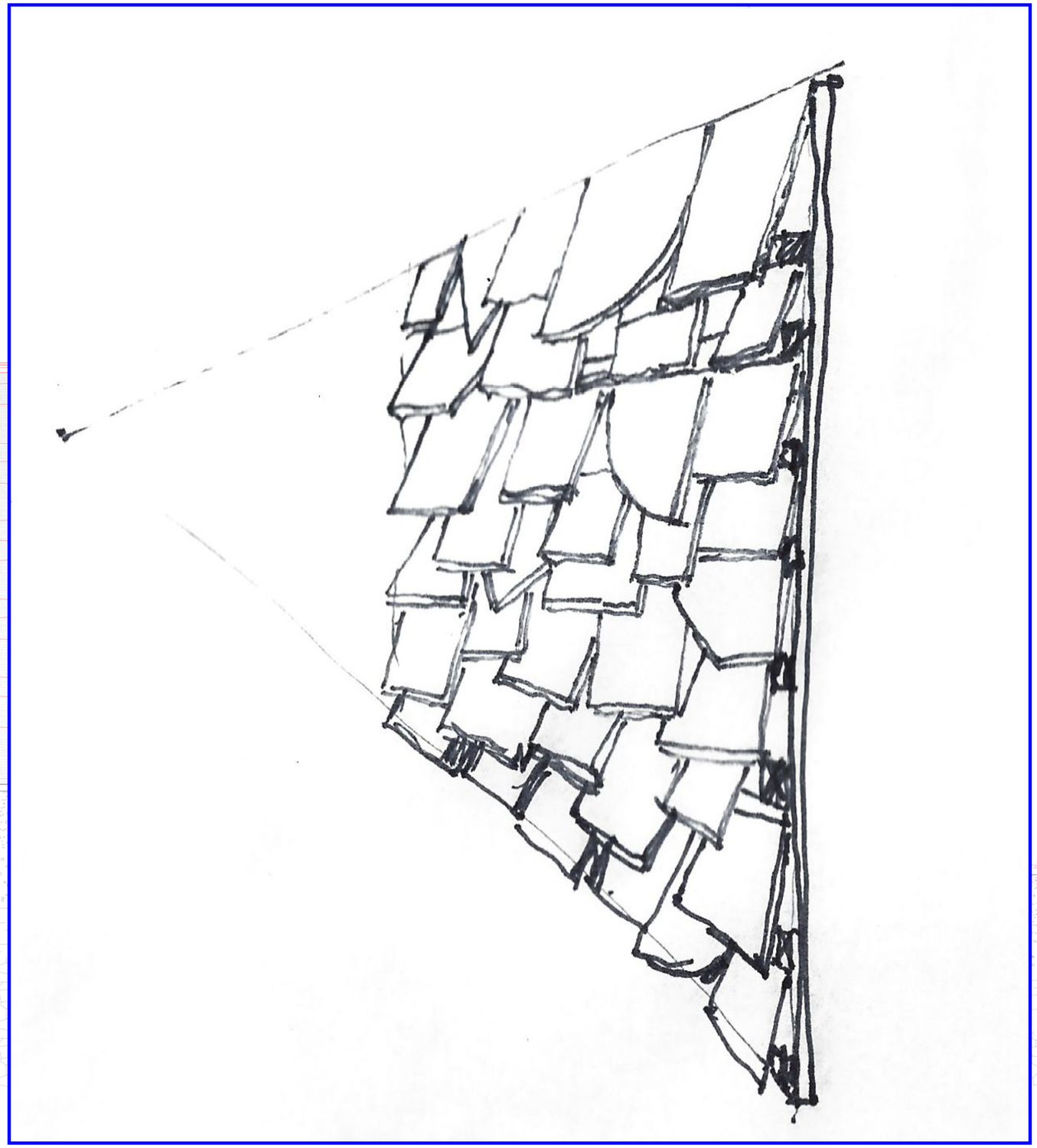
Bat / Vleermuis: 5-10m; South, West

Section Cohabitation 1:100



Elevation North-West 1:100





Elevation North-West 1:20



