SYMBIOSIS UNEARTHED

regeneratively transforming postwar flats into healthy urban communities

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Architectural Engineering studio

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Delegate: Susanne Pietsch

POSTWAR HOUSING STOCK

Demolition of portiekflats in Dordrecht

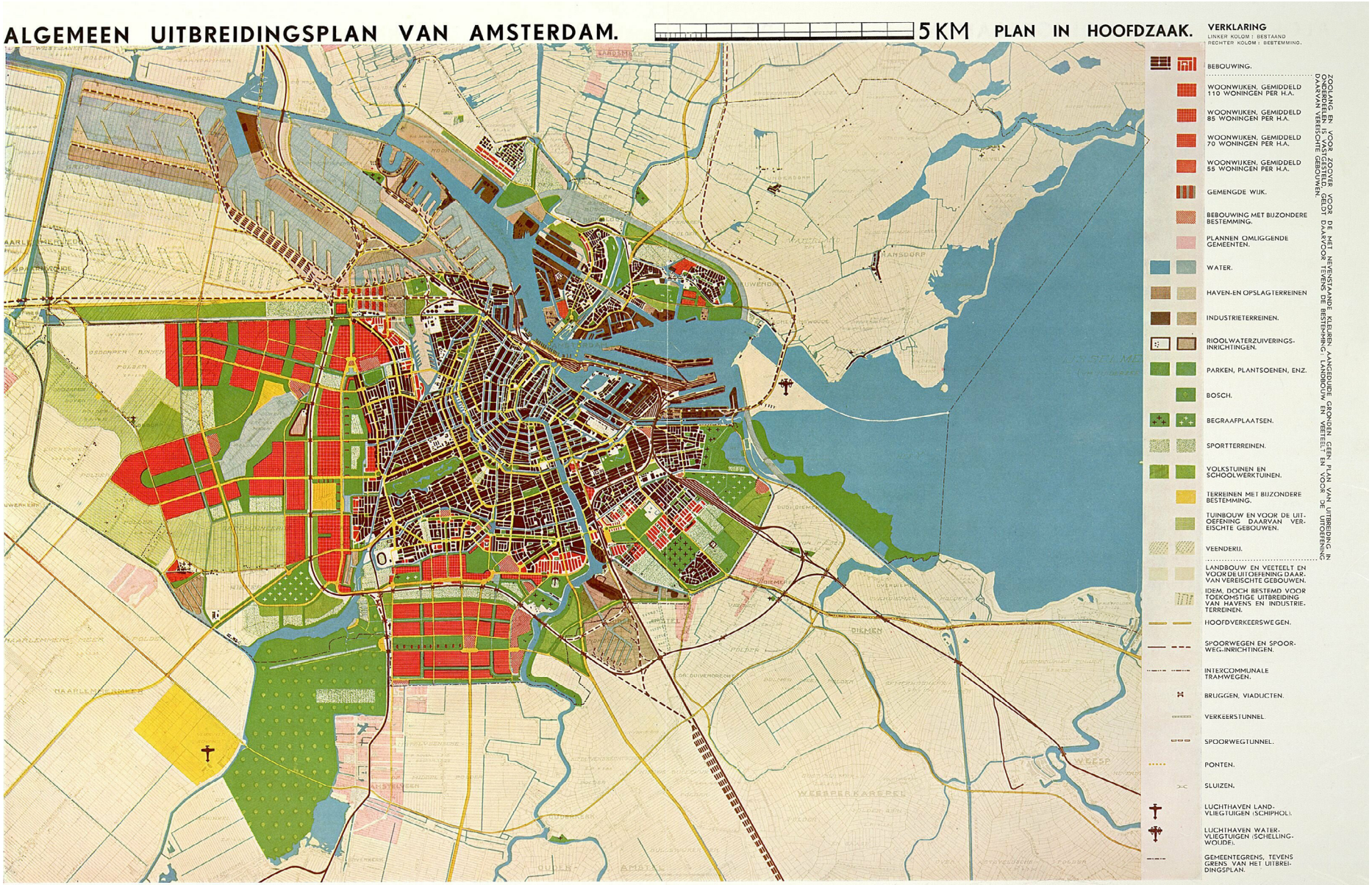
Gejuich Om Sloop Portiekflats. October 26, 2018. Dordtcentraal. https://dordtcentraal.nl/actueel/video-gejuich-om-sloop-portiekflats/.

HOUSING DEMAND

Housing demonstration 2021

Het Woonprotest Gaat Door! n.d. WBVG. https://www.wbvg.nl/het-woonprotest-gaat-door/.

AUP AMSTERDAM



introduction

Van Eesteren. *Algemeen Uitbreidingsplan van Amsterdam*. 1934. Gemeente Amsterdam Stadsarchief. https://archief.amsterdam/beeldbank/detail/e62d2005-d01a-b141-04c0-b7b55f4b98fb?mode=gallery&switch=1.

POSTWAR HOUSING

Housing shortage after WWII

Standardised building systems with prefab elements

Fast assembly on site

NTR. "Woningnood - andere tijden." Andere Tijden, n.d. https://anderetijden.nl/aflevering/204/Woningnood.
12.1 Baksteen Montage Bouw. 1969.
Verhulst, Lily. "Bouwsystemen." www.groosman.com, April 13, 2020. https://www.groosman.com/bouwsystemen/.

POSTWAR HOUSING

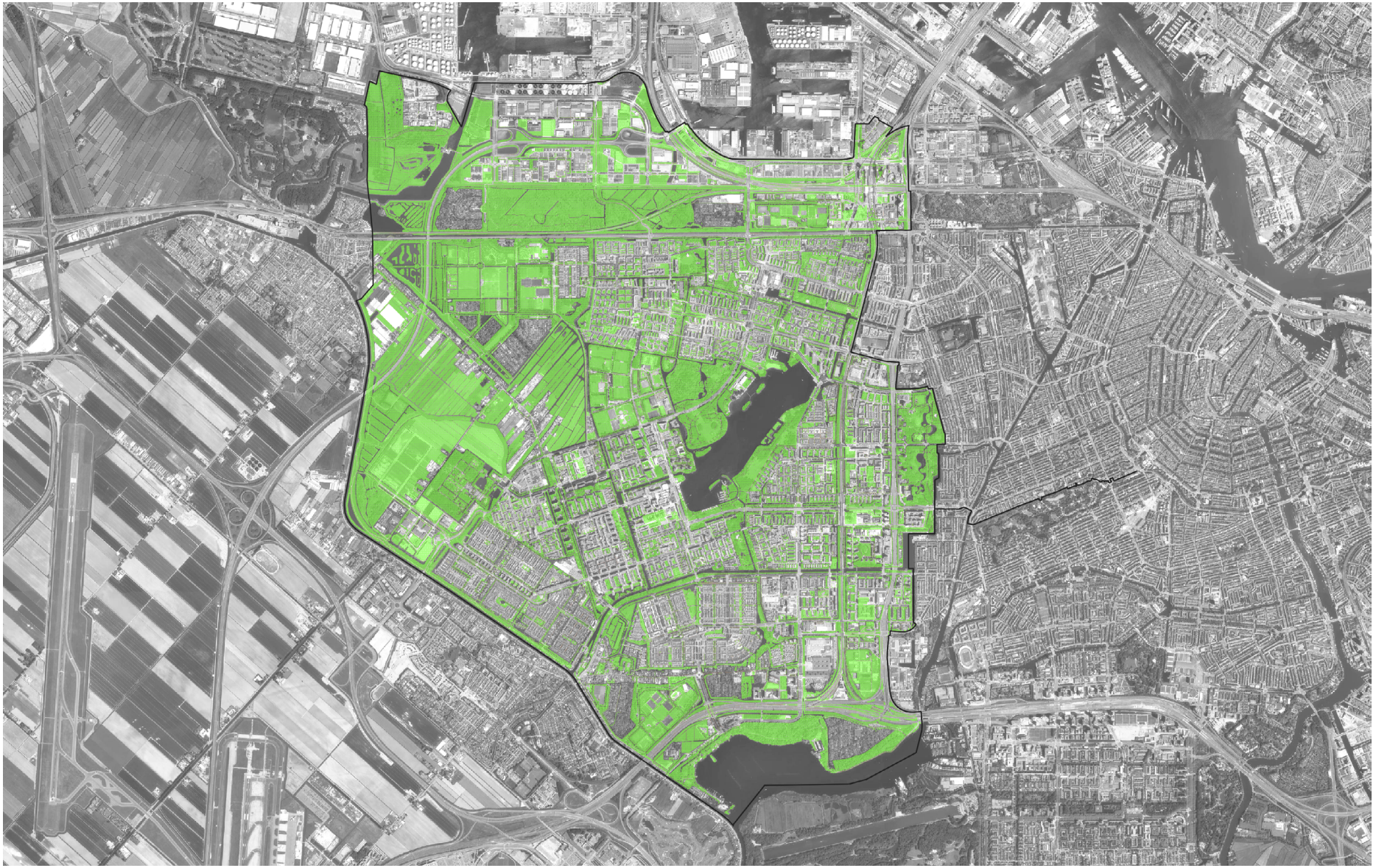
Clear urban grid

Repetitive 'stempels'

Open building blocks

Luchtfoto van Geuzenveld in Noordoostelijke Richting; 1968. n.d. Photograph. Van Eesteren Museum. Van Eesteren Museum. https://vaneesterenmuseum.nl/nl/de-tuinsteden/geuzenveld/.
Naoorlogse Bomenwijk in Delft Met Laagbouw Portiekwoningen, Sociale En Middeldure Huurwoningen Wordt Geherstructureerd. April 18, 2018. Flying Holland. https://www.flyingholland.nl/-/portfolio/beeldbank/-/medias/a44d4521-889b-44ef-b3bc-6a8fe1ded5ef-naoorlogse-bomenwijk-in-delft-met-laagbouw-portiekwoningen-so.
Alberts, Martin. Braak En Bosch 13 t/m 24 (v.l.n.r.) Met Woningcomplex. August 8, 2003. Gemeente Amsterdam Stadsarchief. https://archief.amsterdam/beeldbank/detail/2446e063-6e5c-d931-3944-67736d337ce3/media/7443a51f-7a19-3ebb-13ca-3d63c0ab191c?mode=detail&view=horizontal&q=osdorper%20ban&rows=1&page=26.

GREEN IN WESTELIJKE TUINSTEDEN AMSTERDAM



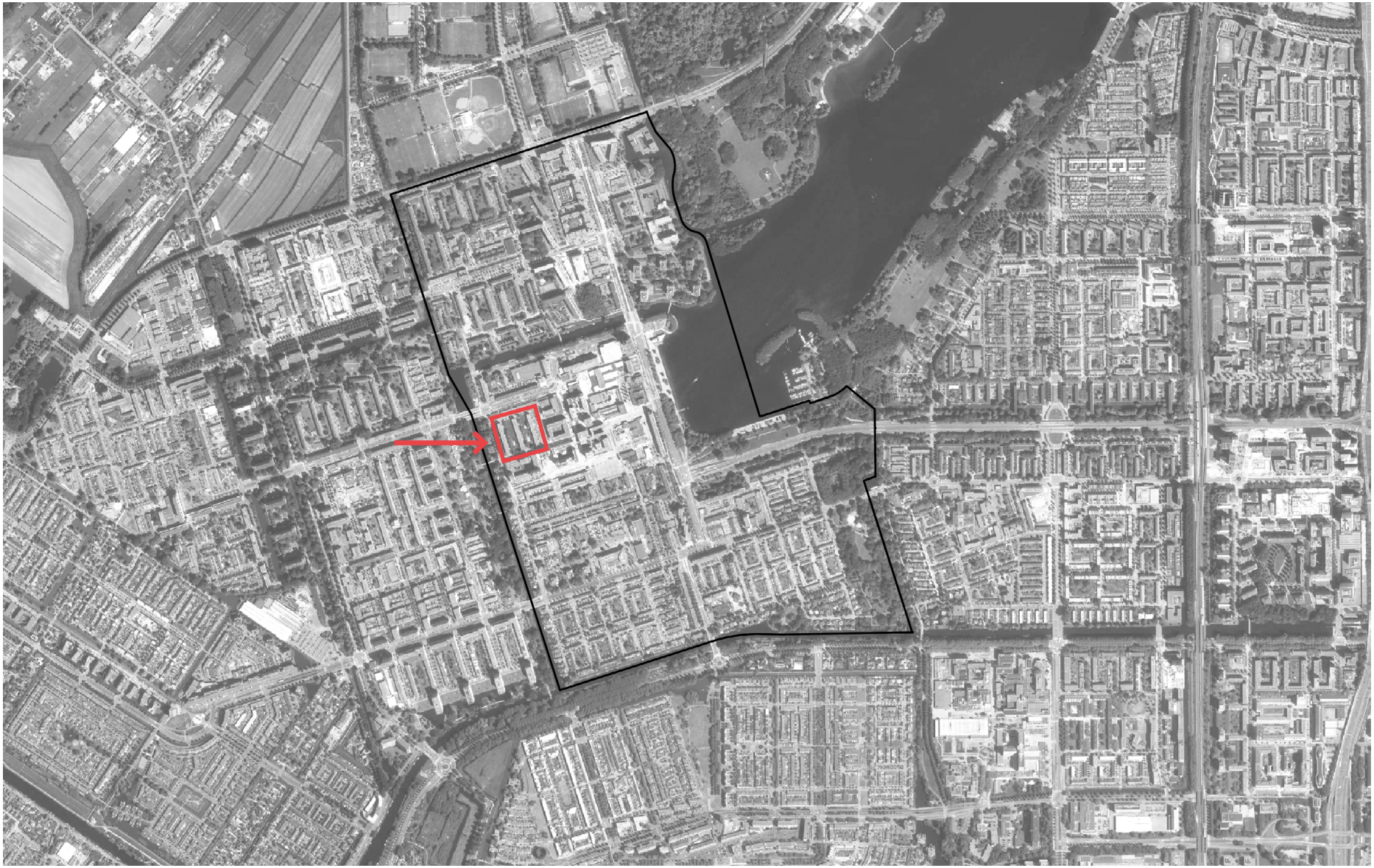
1 : 50.000

OSDORP-OOST

BIJLAGE VAN HET BOUWKUNDIG WEEKBLAD ARCHITECTURA VAN 23 MAART 1935, No. 12.

project site

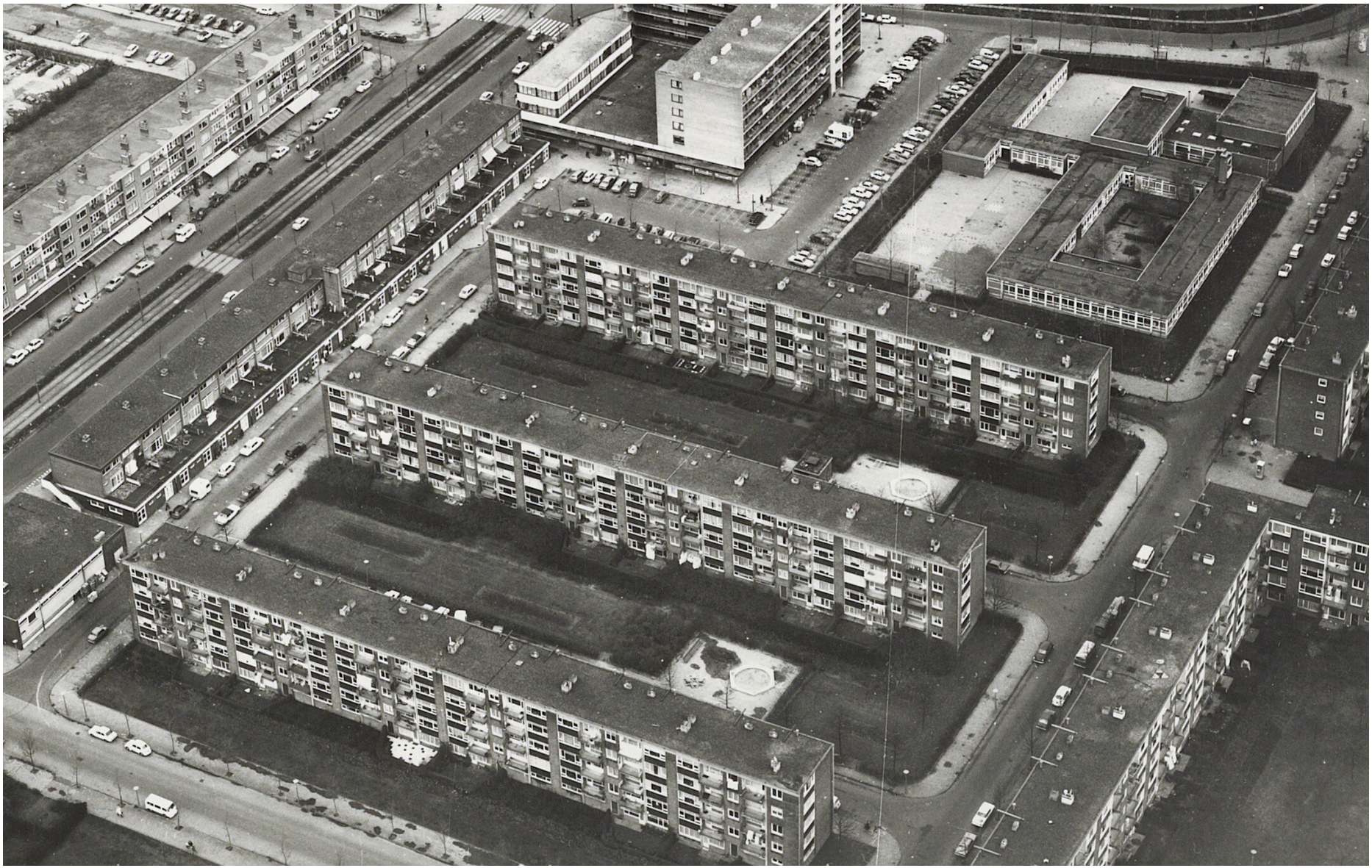
OSDORP-OOST



project site

1 : 15.000

PORTIEKFLATS



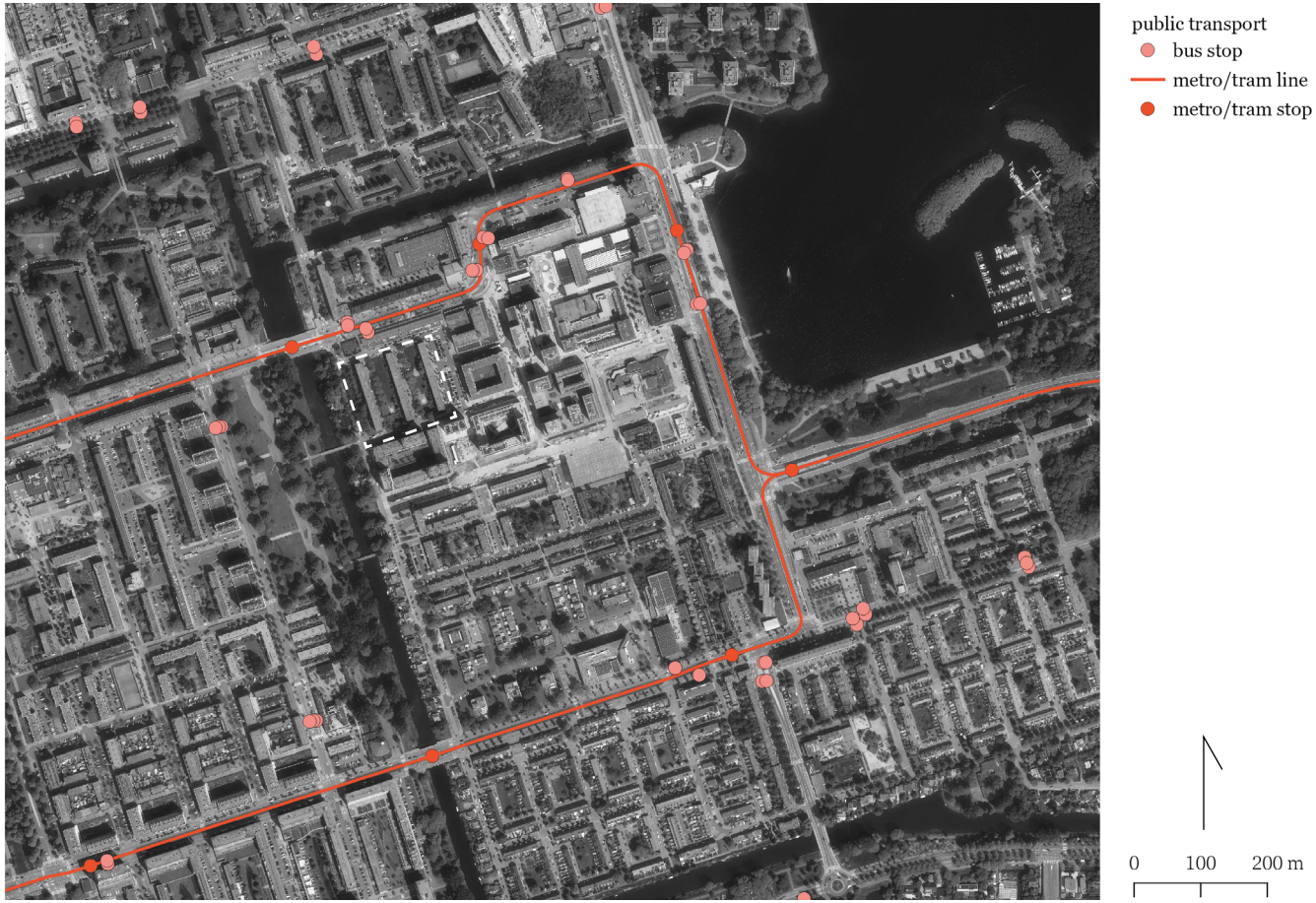
project site

Van Suchtelen van de Haarestraat 98-144. Architect: H. van Vreeswijk. Bouwjaar 1960, photograph (Amsterdam), Gemeente Amsterdam, accessed January 17, 2024, https://archief.amsterdam/beeldbank/detail/fe20426b-d061-1d17-e6e7-aea042a52775/media/6160b097-544e-ec04-6b10-71f4d6fcb623?mode=detail&view=horizontal&q=Van%20Suchtelen%20van%20de%20Haarestraat&rows=1&page=3.

FUNCTIONS IN AREA

project site

PUBLIC TRANSPORT



project site

CHARACTERISTICS

Van Suchtelen van de Haarestraat & Martini van Geffenstraat, Osdorp-Oost, Amsterdam

project site

BMB

Baksteen Montage Bouw

prefabrication

project site

transport

construction

project site

12.1 Baksteen Montage Bouw. 1969.

PROBLEMS

Long building, silent and empty street

Prominent parking

Non-optimal use of green space

project site

A SYMBIOTIC, HEALTHY, INCLUSIVE, REGENERATIVE ECOSYSTEM

A SYMBIOTIC, HEALTHY, INCLUSIVE, REGENERATIVE ECOSYSTEM

OIKOS

>regenerative forest

>healthy environment for all living beings

>safe and inclusive architecture for every body

>interaction and connection with the land

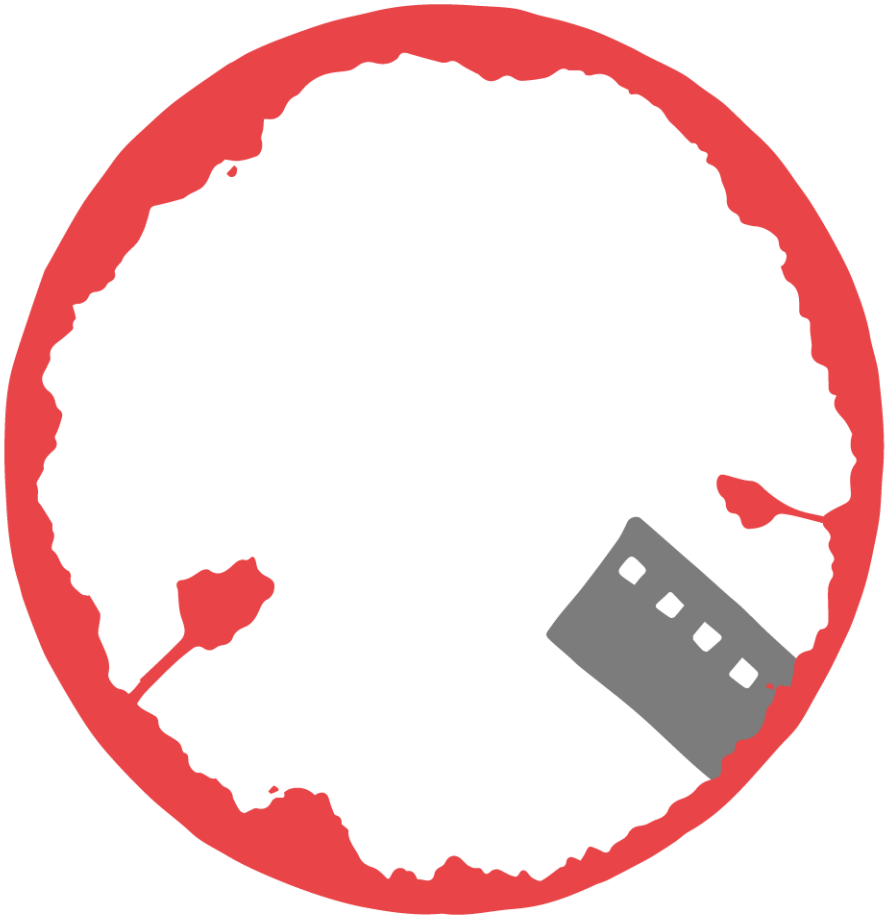
>active community

MATERIAL

>keep and reuse as much as possible

>regeneratively using local, biobased building materials

REGENERATIVE FOREST IN POSTWAR NEIGHBOURHOOD



REGENERATIVE FOREST IN POSTWAR NEIGHBOURHOOD

REGENERATIVE FOREST IN POSTWAR NEIGHBOURHOOD

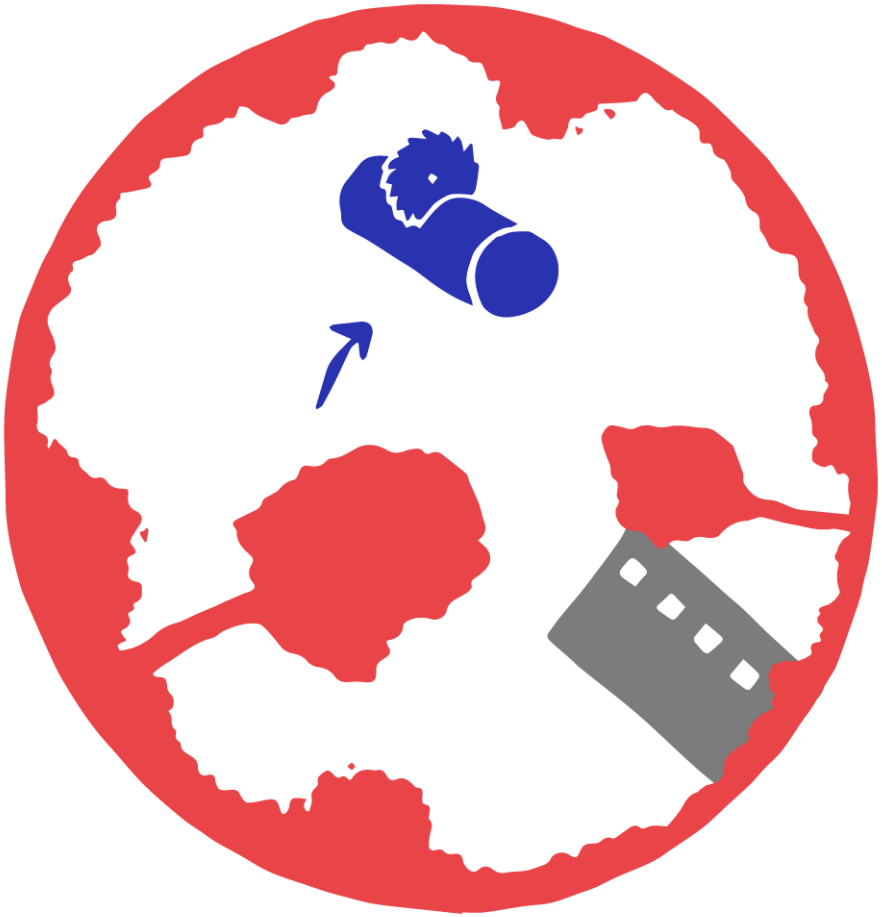
OSDORP-OOST

design approach

REGENERATIVE FOREST IN OSDORP-OOST

design approach

LOCAL WOOD SYSTEM



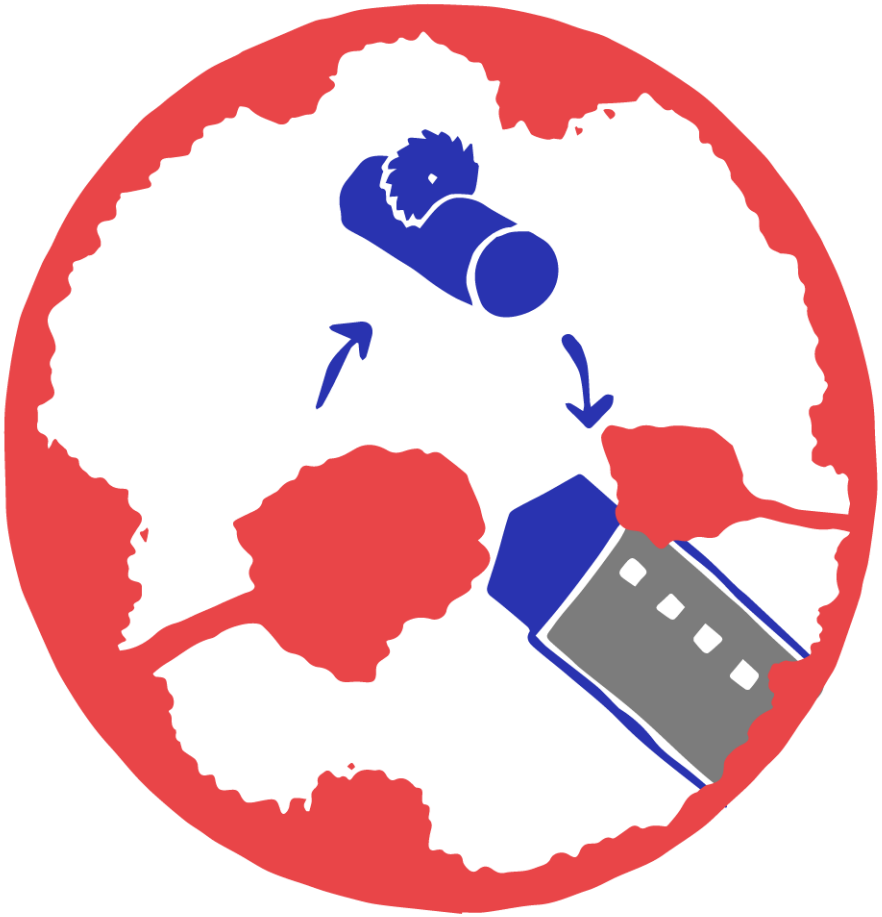
LOCAL WOOD SYSTEM

Building application	**Suitable tree species**
Window frame	Douglas fir, Oak, Ash, Spruce, Honeylocust, Larch, Pine, Black locust, Chataignier
Exterior door	Douglas, Oak, Spruce, Elm, Larch, Pine, Black locust, Chataignier
Façade cladding	Douglas fir, Oak, Spruce, Larch, Pine, Black locust, Chataignier
Roof cladding	Birch, Black locust, Oak, Larch, Chataignier
Structure	Douglas, Oak, Alder, Ash, Spruce, Larch, Pine, Poplar, Black locust, Chataignier, Common walnut, Silver fir
Insulation	Any rest wood

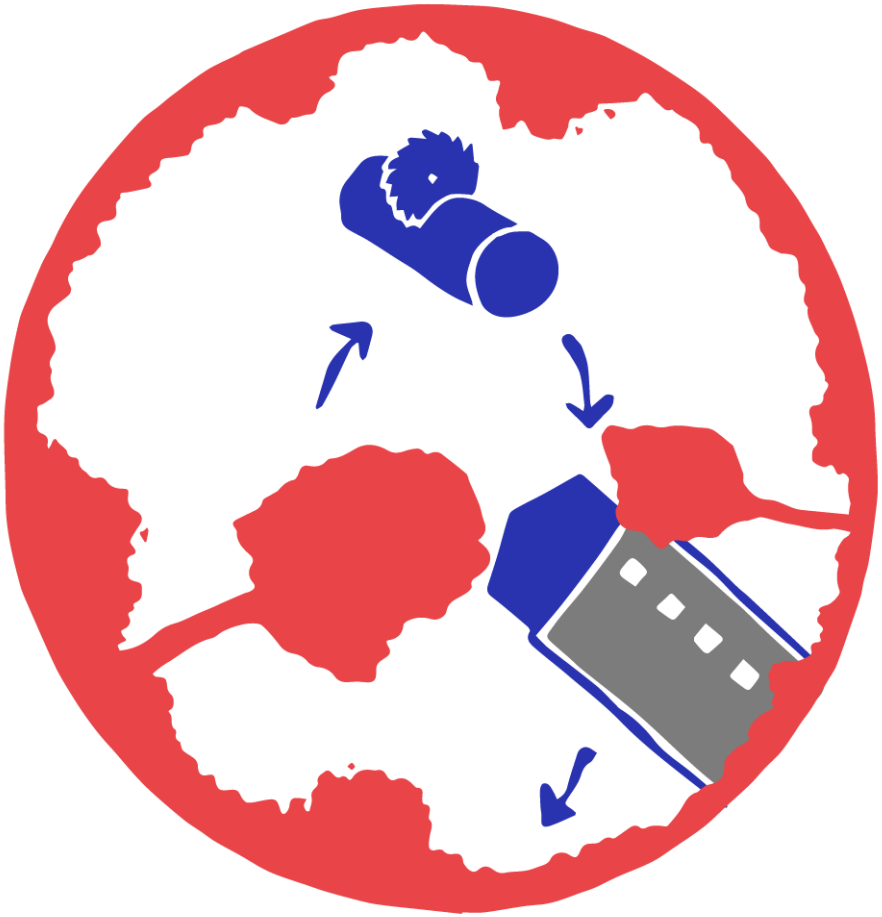
Stadshout Amsterdam

Logo Stadshout. n.d. Stadshout. https://stadshout.nu/.

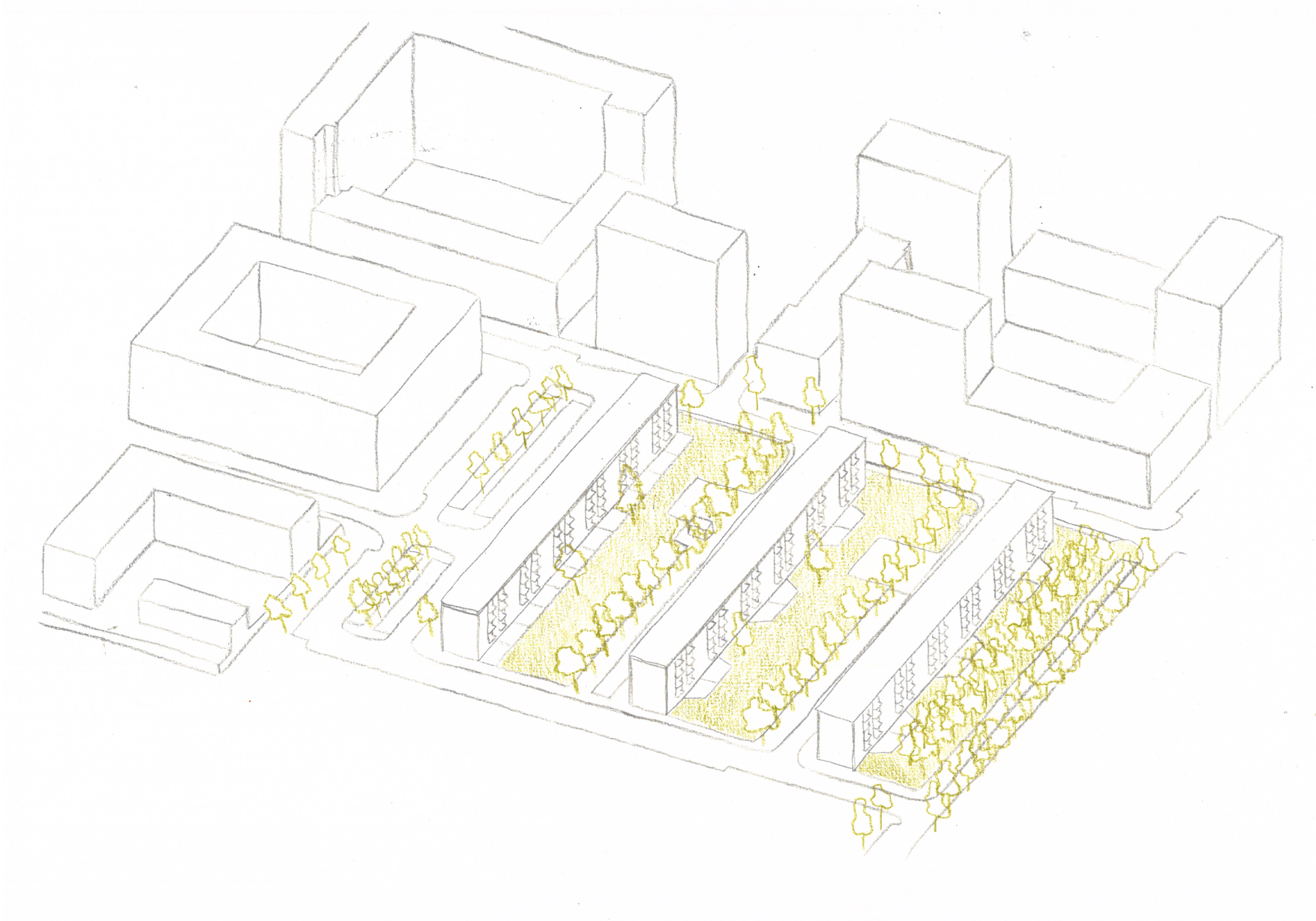
LOCAL, BIOBASED MATERIALS FOR FLAT RENOVATION



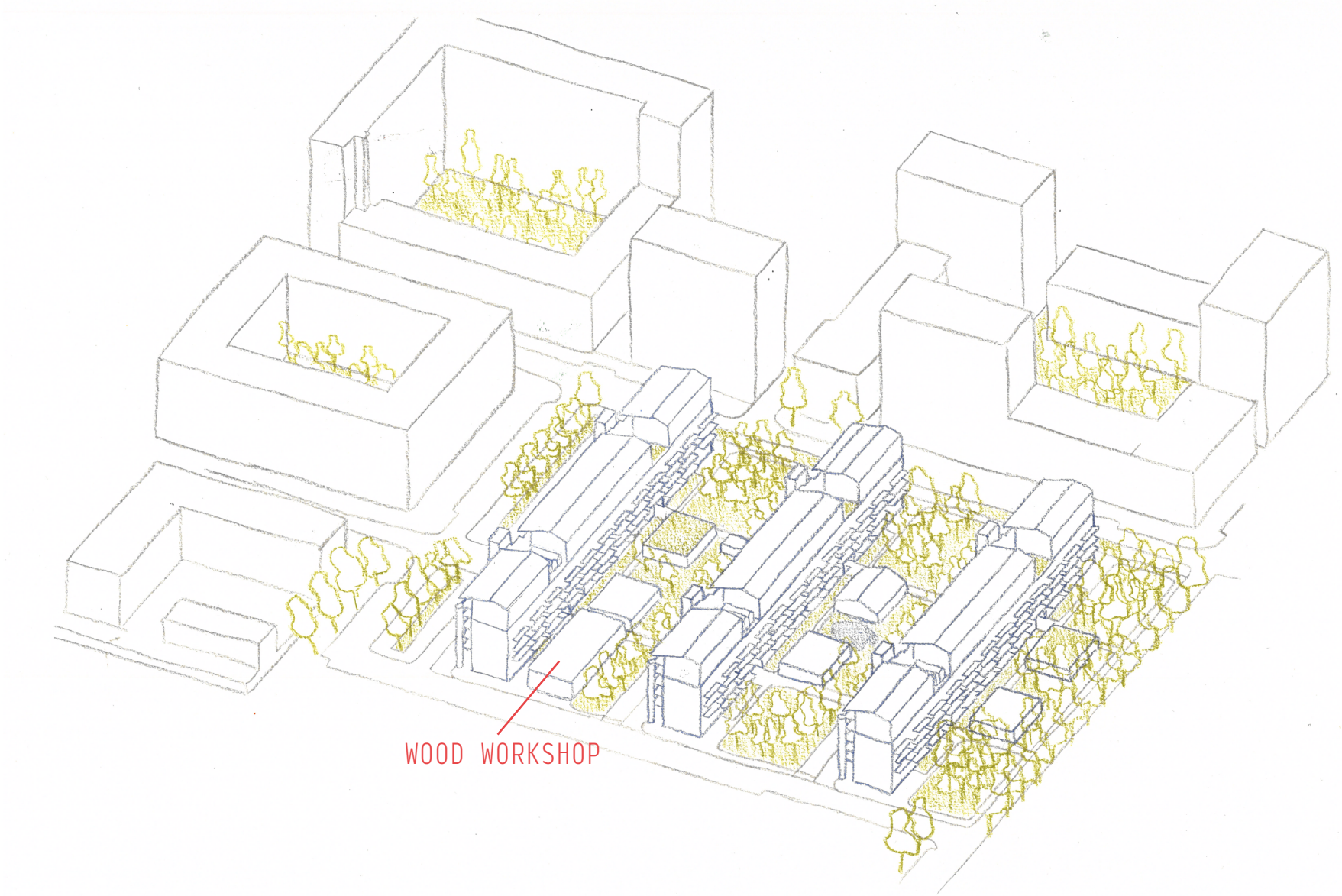
A SYMBIOTIC, HEALTHY, INCLUSIVE, REGENERATIVE ECOSYSTEM



EXISTING PROJECT SITE



PROJECT SITE PROPOSAL



PROJECT STEPS

S.1 PLANTING REGENERATIVE FOREST

S.2 BUILDING WOOD WORKSHOP

S.3 REMOVING EXISTING PARTS

S.4 RENOVATING FLATS

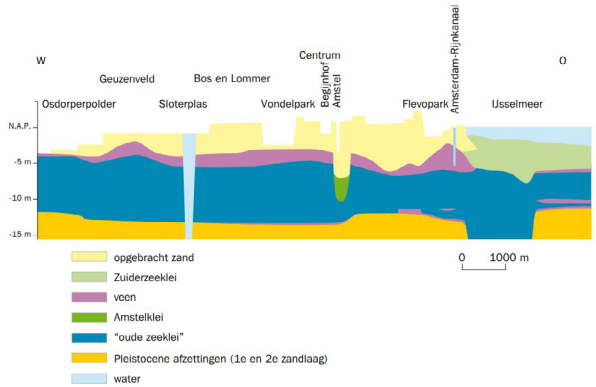
S.5 MAINTAINING BUILDINGS

OSDORP-OOST

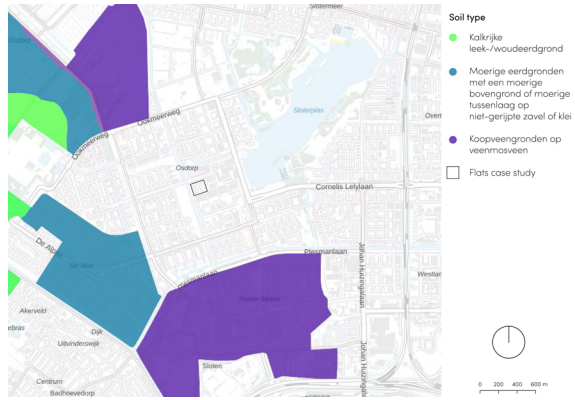
80 ha

regenerative forest

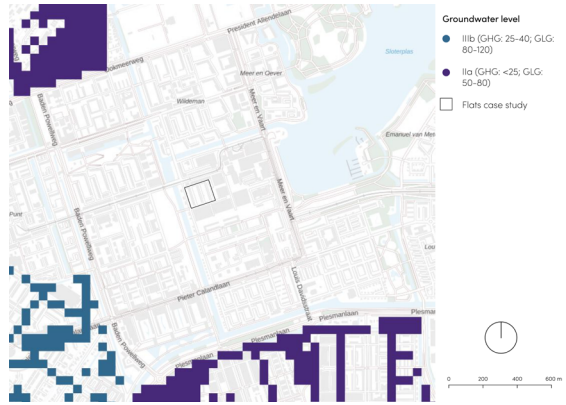
SOIL TYPE



Soil type layers Amsterdam



Soil type around project site



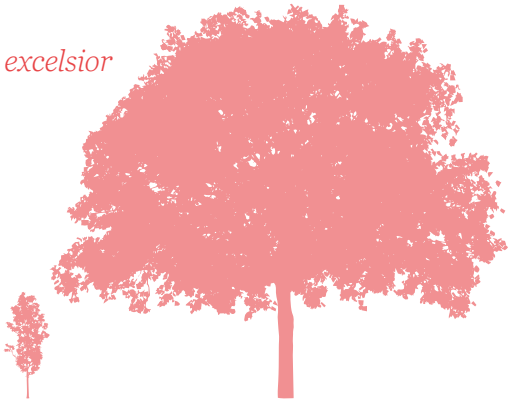
Groundwater level around project site

regenerative forest

TREE TYPES

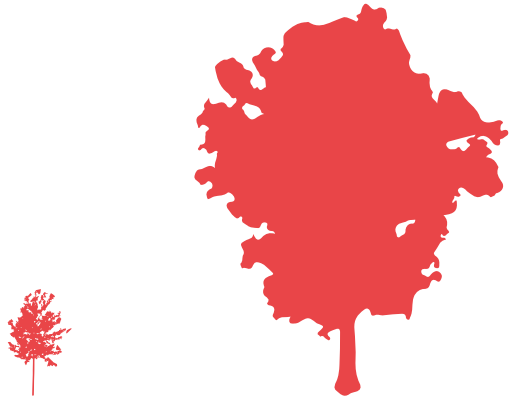
Black Alder
Alnus glutinosa

Ash
Fraxinus excelsior



Pedunculate Oak
Quercus robur

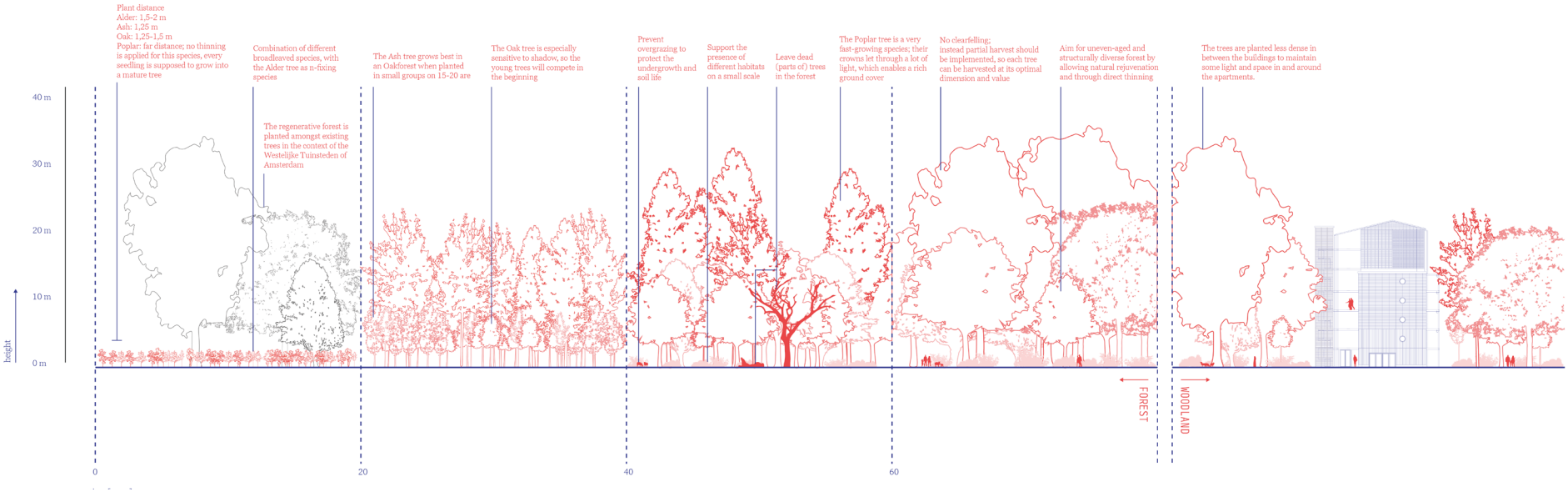
Poplar
Populus



MANAGEMENT

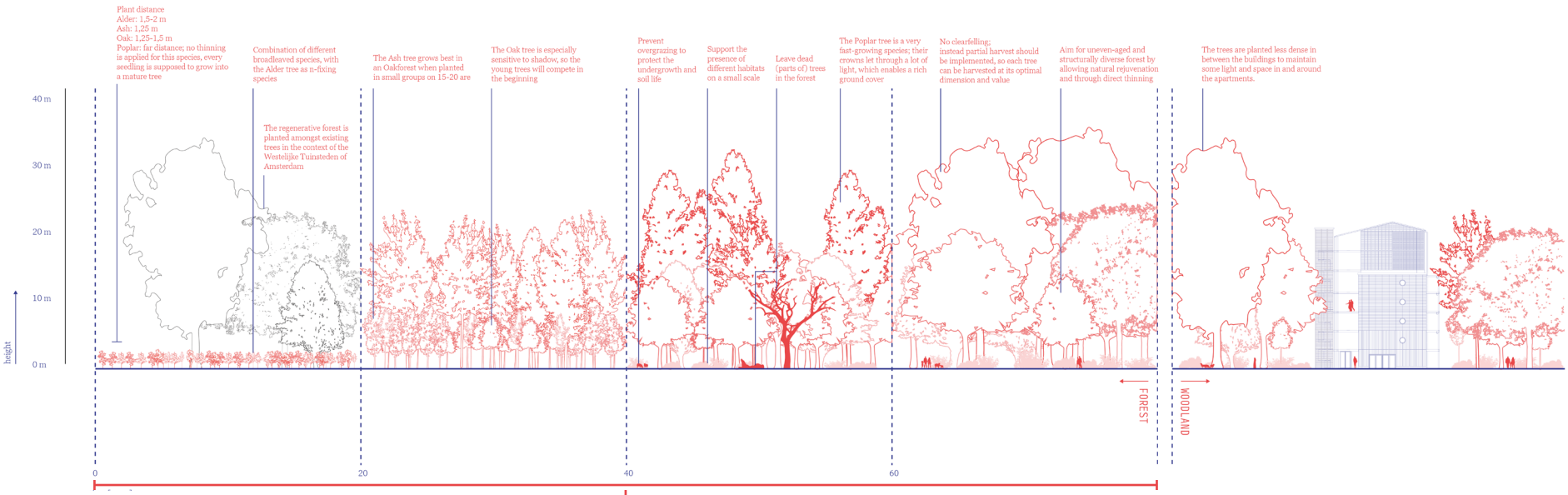
regenerative forest

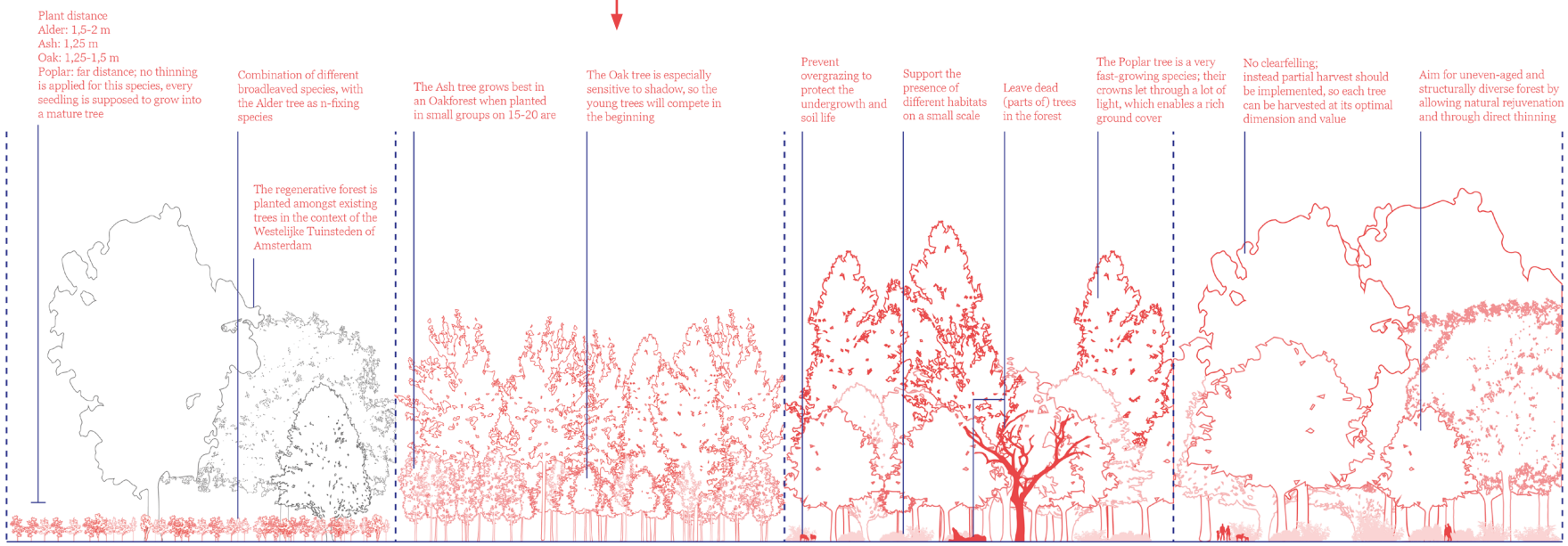
FOREST SECTION



MANAGEMENT

Closer-To-Nature Forest Management & Continuous Cover Forest Management





regenerative forest

MANAGEMENT

Closer-To-Nature Forest Management & Continuous Cover Forest Management

grazing sheep in the city of Rotterdam

Rijnmond, "Schapen Nemen Rotterdam-West Over", *Rijnmond*, 20 December 2021, https://www.rijnmond.nl/nieuws/102893/schapen-nemen-rotterdam-west-over.

ECOSYSTEM ORGANISMS

Soil organic matter

Trees

Birds

Sheep

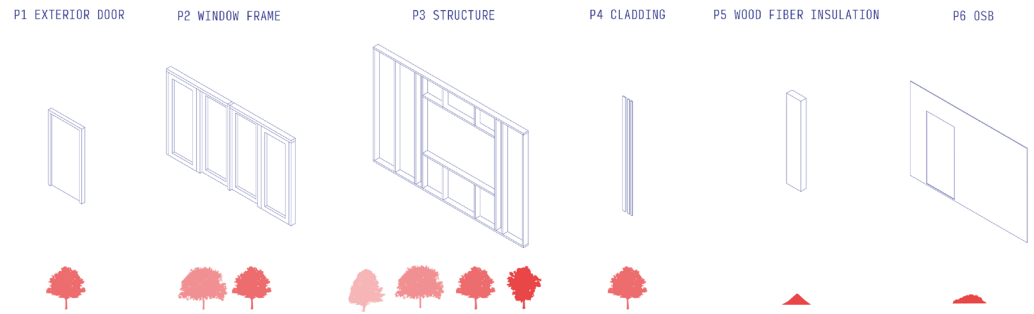
Shrub species

Undergrowth

WOOD FROM THE FOREST

TREE TYPES	COMPOSITION	POSSIBLE HARVEST*
Black Alder - *Alnus Glutinosa*	10%	0,6 m^3/ha/year
Ash - *Fraxinus excelsior*	5%	0,3 m^3/ha/year
Pedunculate Oak - *Quercus robur*	65%	3,5 m^3/ha/year
Poplar - *Populus*	20%	2 m^3/ha/year
		total = 6,4 m^3/ha/year

BUILDING PARTS & SUITABLE MATERIALS



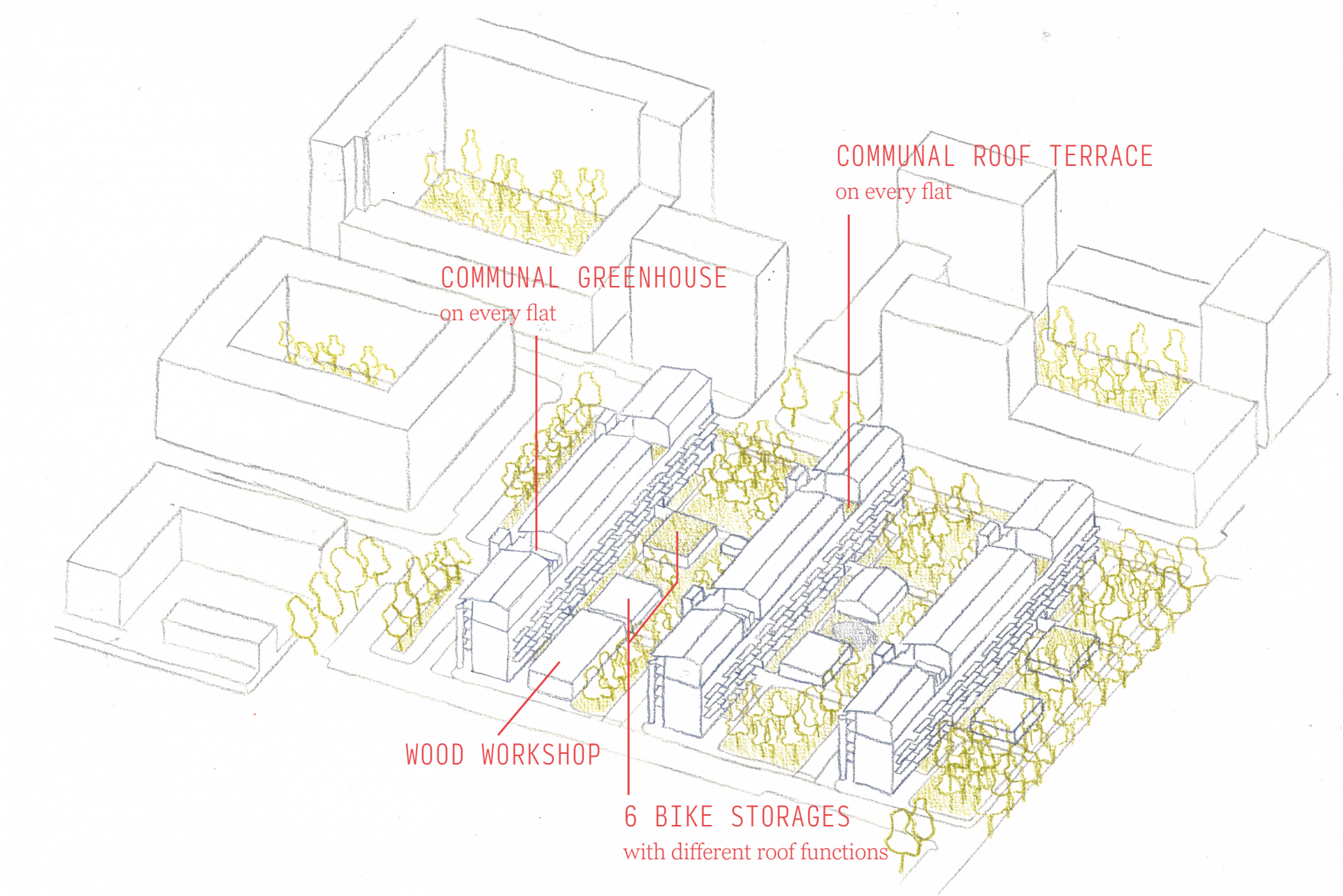
RESIDUAL PRODUCTS OF WOOD PROCESSING

wood chips

wood fibers

*Approximately 50% of the harvested trunk can be used for qualitative beams and boards, the rest of the wood can be used for small interiors products for example, or it can be processed into chips or fibers. After the trees have reached the desired diameter, the wood can be sustainably harvested for building parts like beams or frames. The quantities of possible harvest are based on a maximum harvest of 80% of the increment every year.
**Native species in the Netherlands

PUBLIC SPACE & FUNCTIONS



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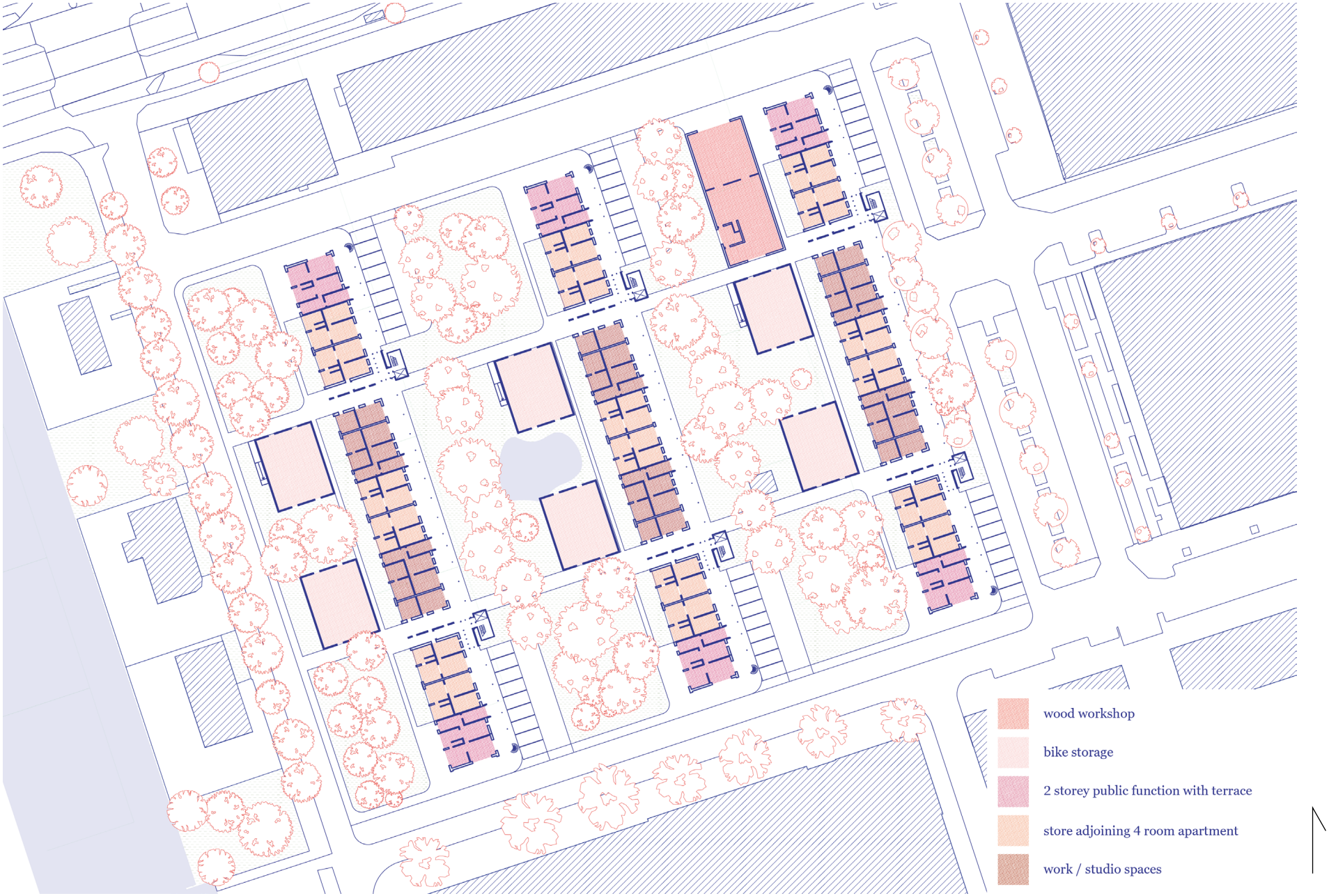
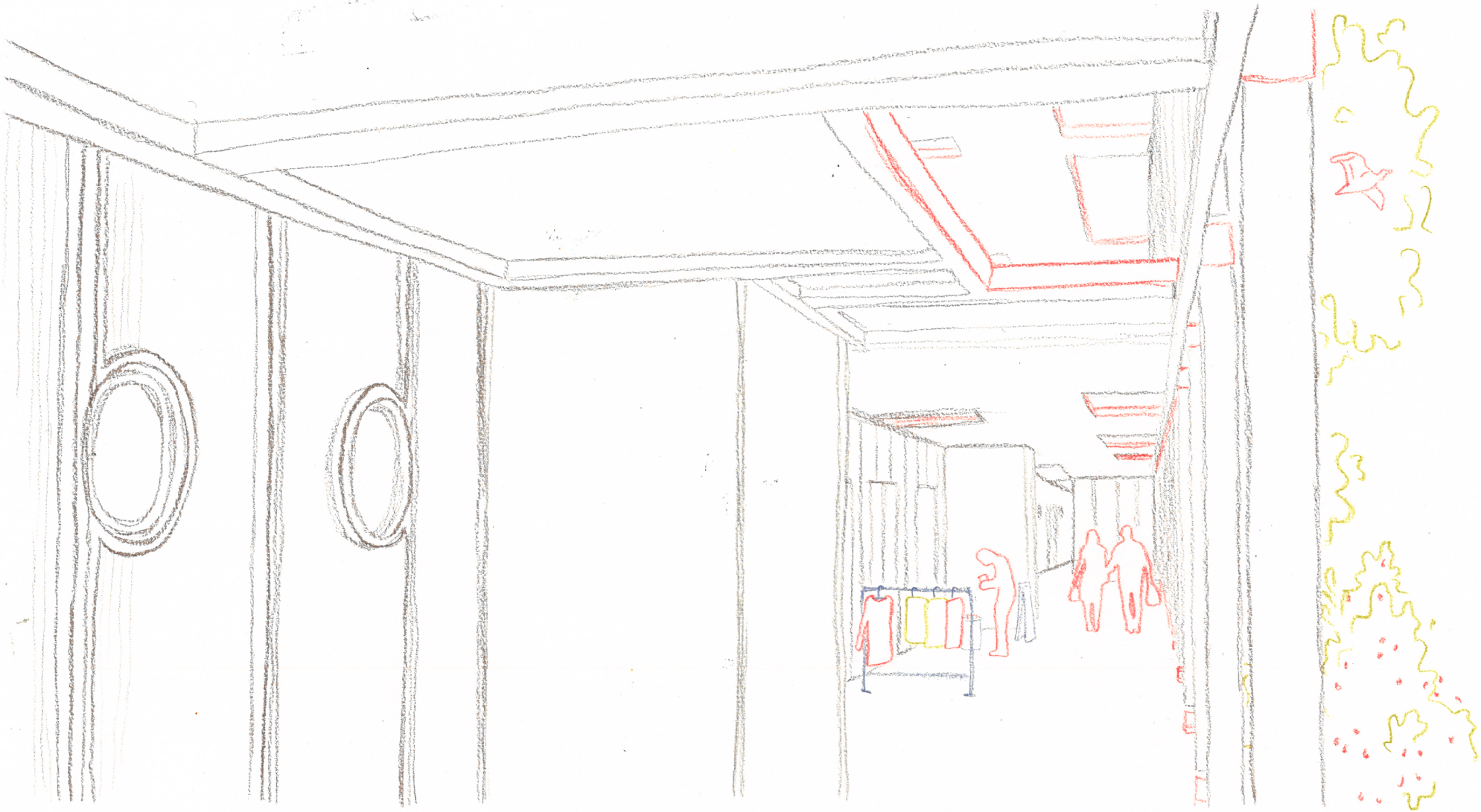


design

floor plan - 1 : 500

PUBLIC SPACE & FUNCTIONS



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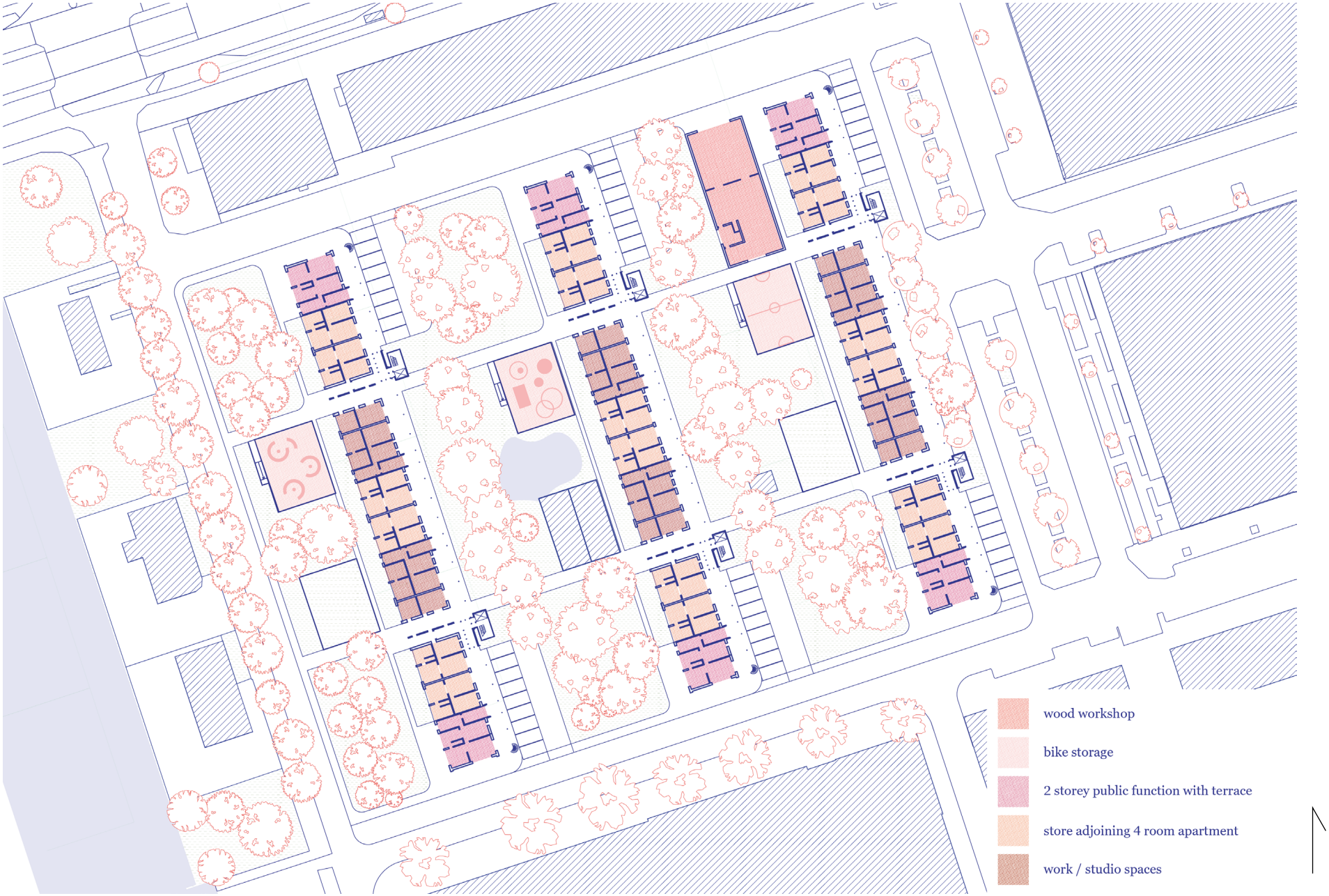
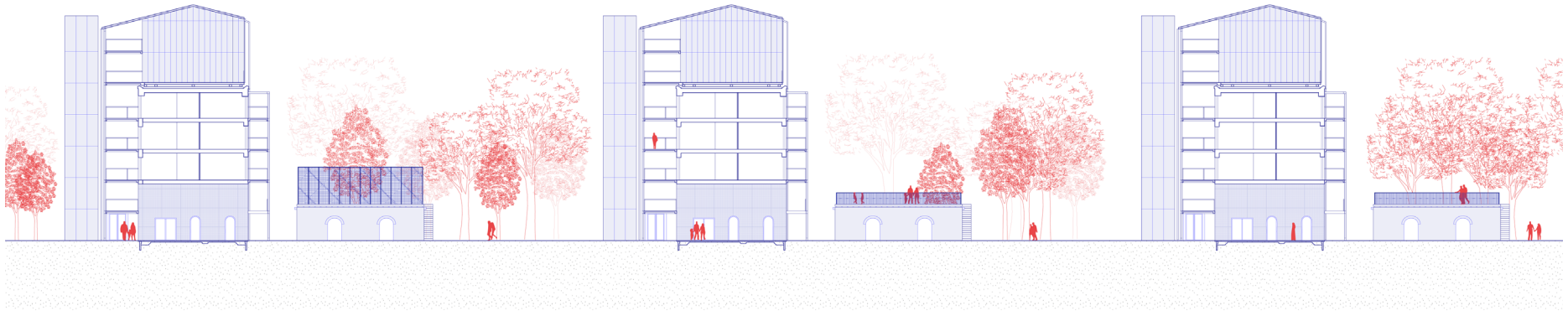
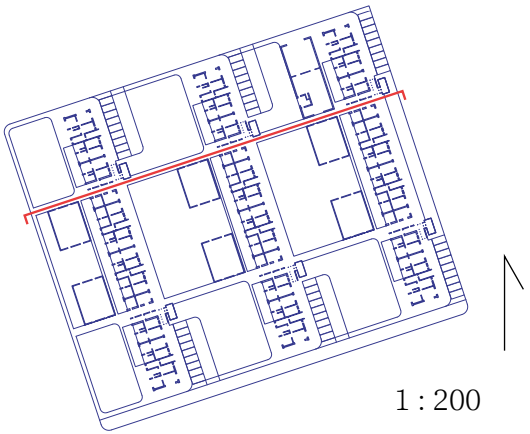


design

floor plan - 1 : 500

PUBLIC SPACE & FUNCTIONS

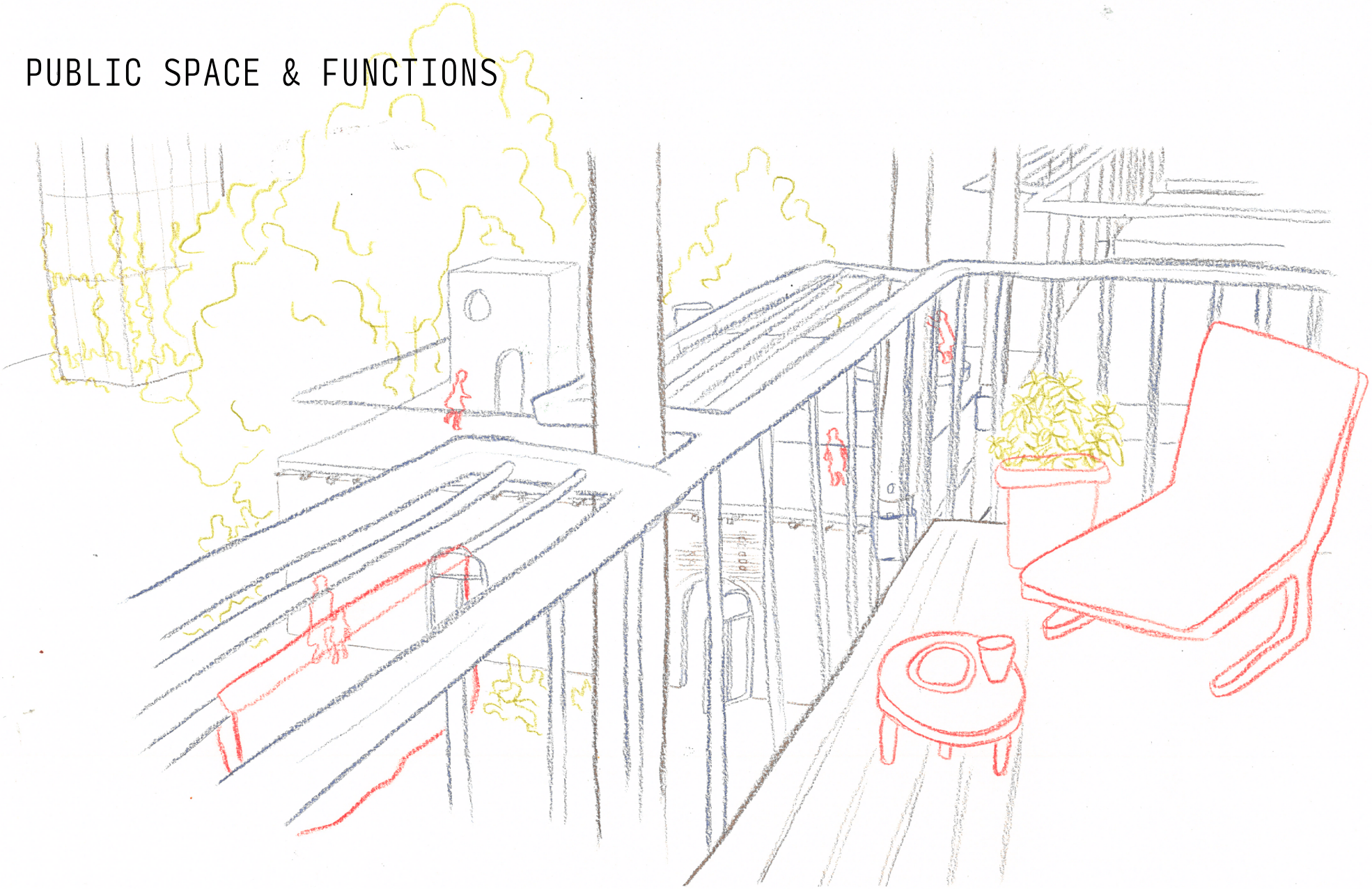




design

1 : 200

PUBLIC SPACE & FUNCTIONS



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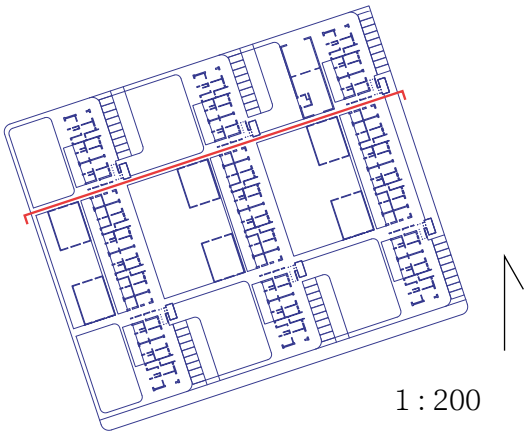

design

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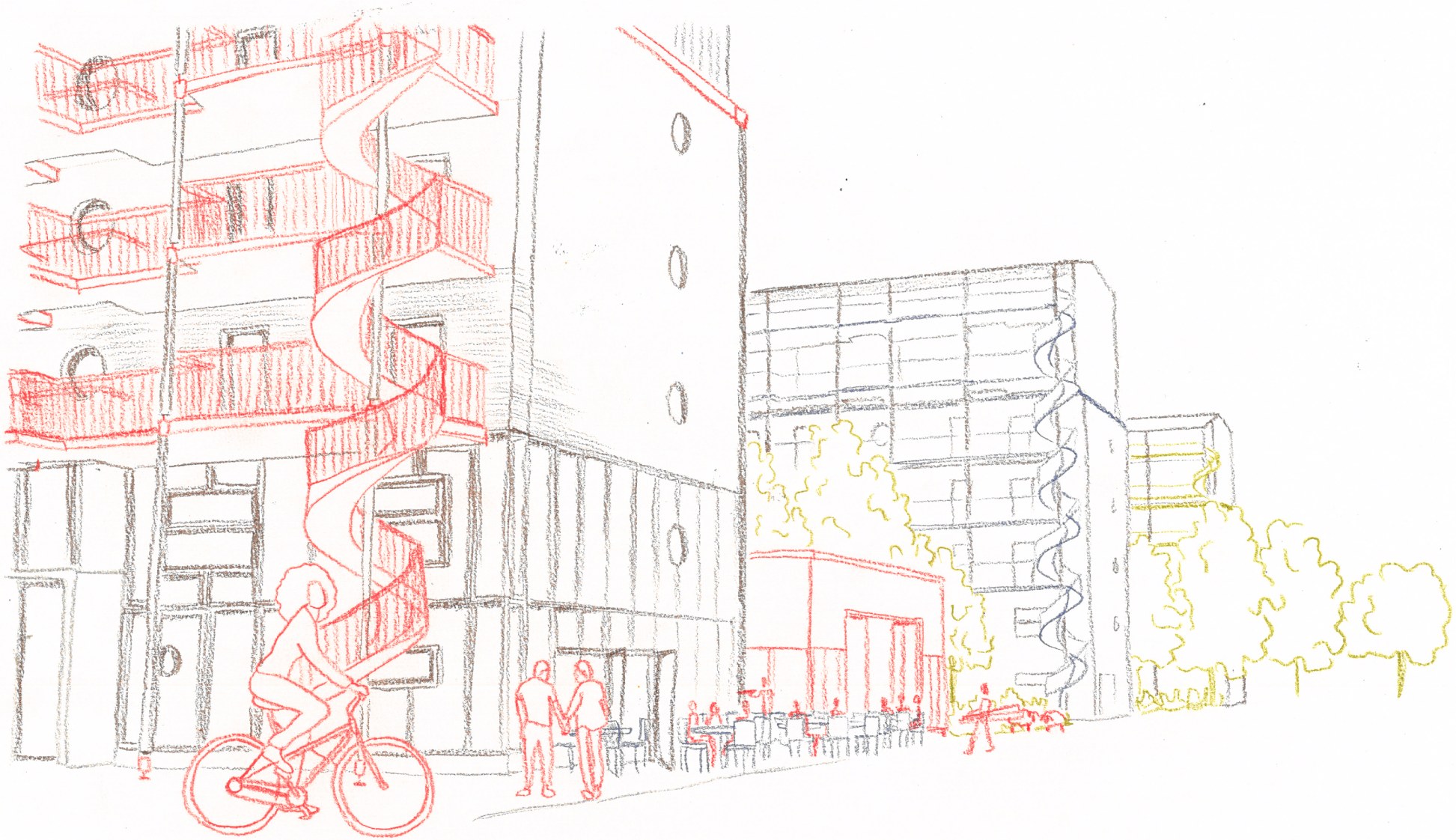

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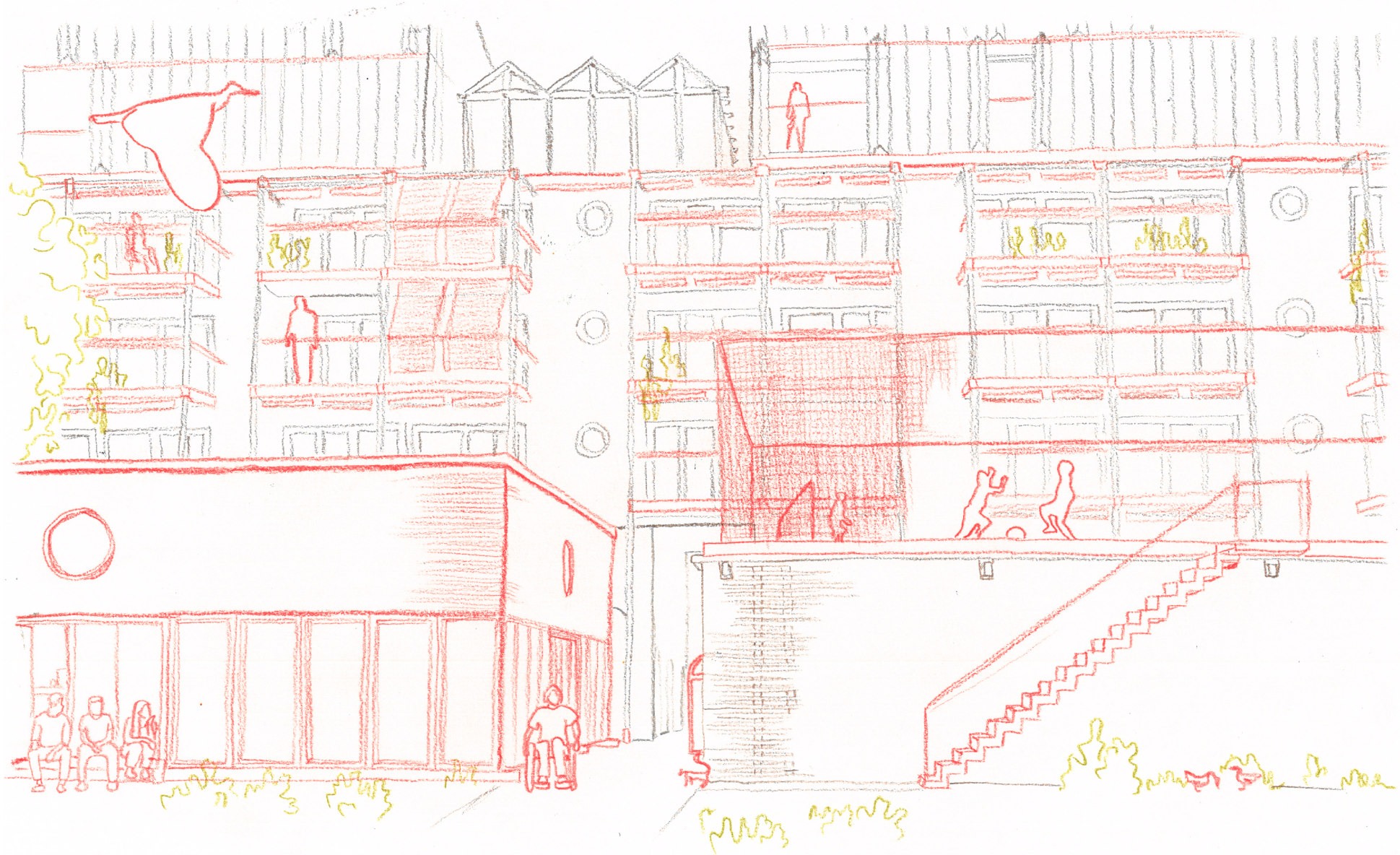
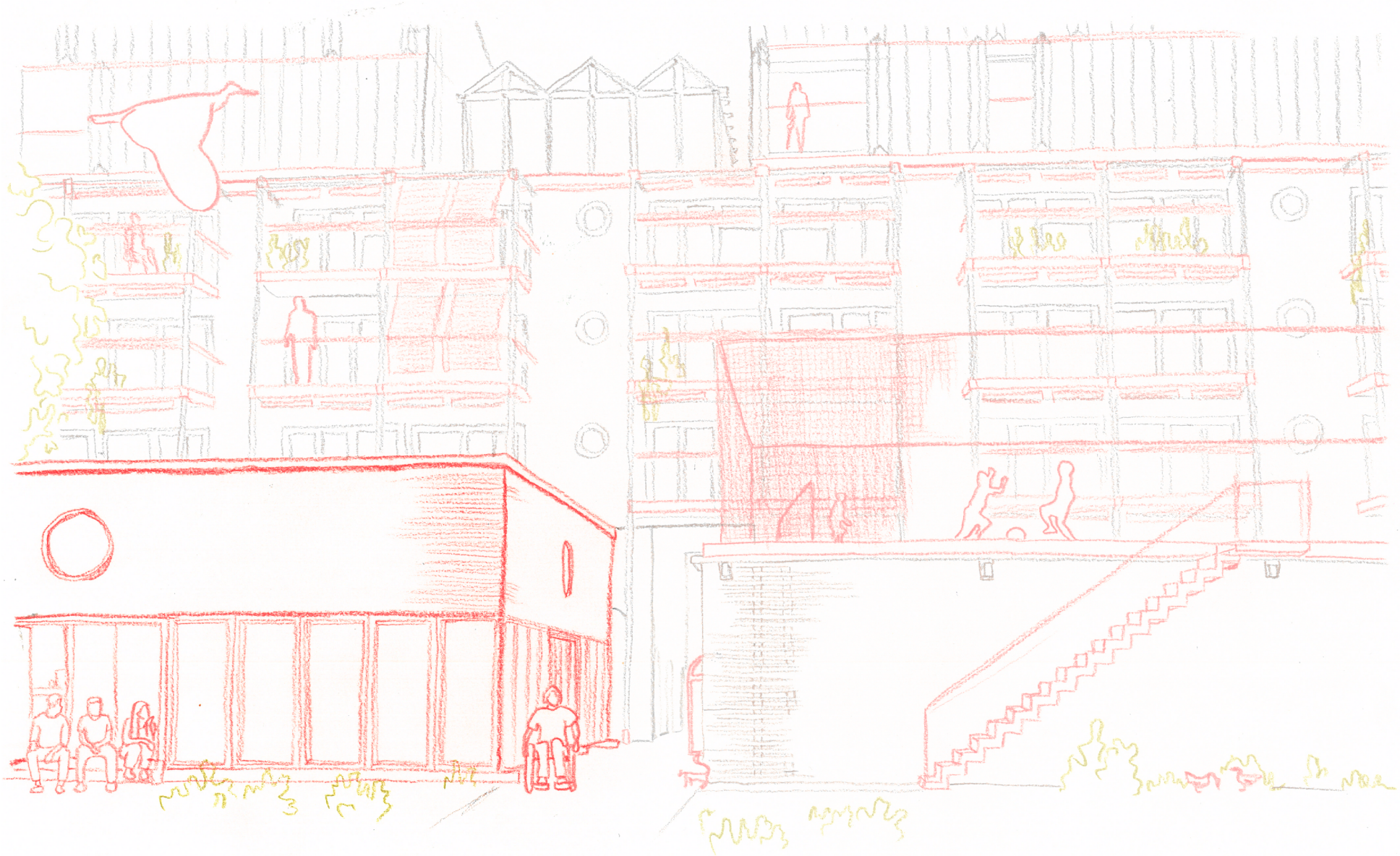


WOOD WORKSHOP



STEPS OF WOOD PROCESSING

1 TREE GROWTH

2 HARVEST

3 SAWING

4 DRYING

5 WOODWORK

6 STORAGE

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1 TREE GROWTH

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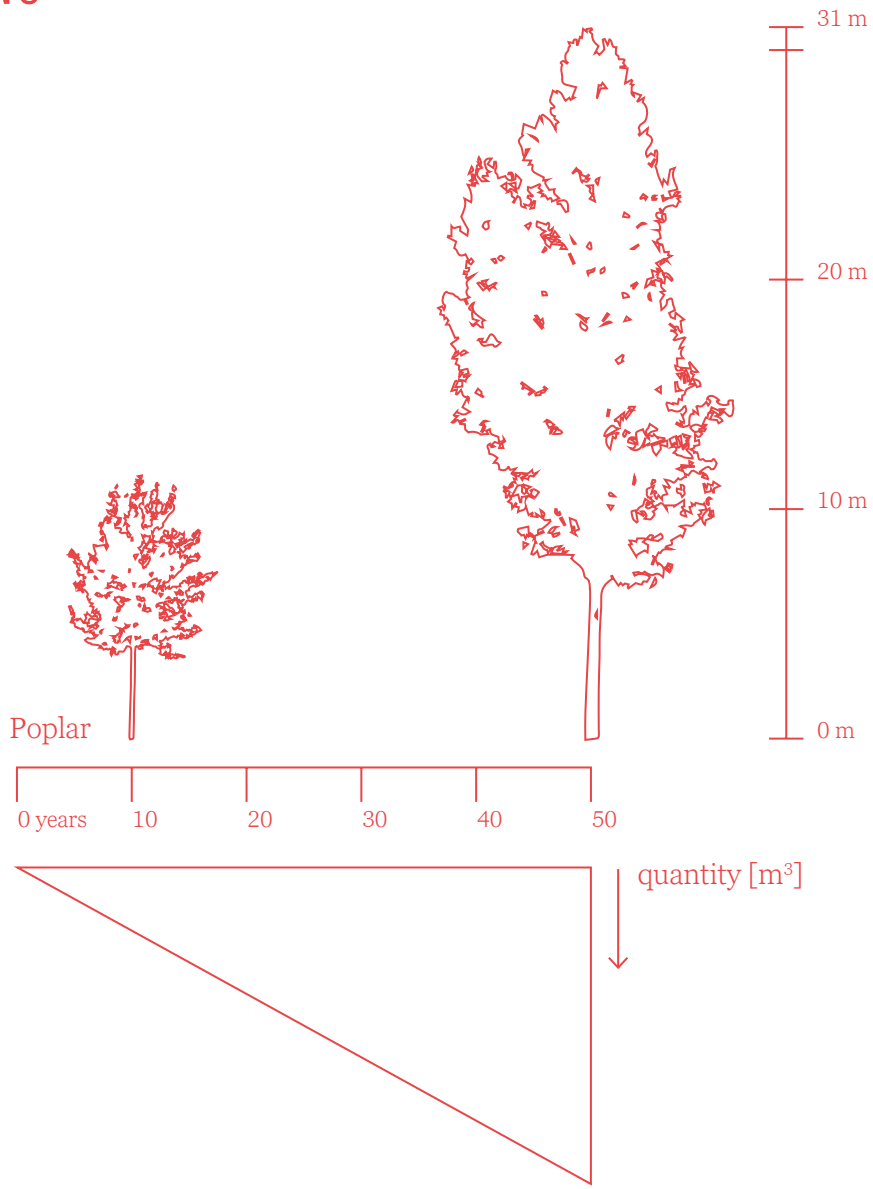

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5 WOODWORK

6 STORAGE

HM130MAX Portable Band Sawmill, n.d., Nukor, n.d., https://www.nukor.co.za/product/hm130_portable_sawmill/.

STEPS OF WOOD PROCESSING

1 TREE GROWTH

2 HARVEST

3 SAWING

4 DRYING

5 WOODWORK

6 STORAGE

Our Process « City Bench, n.d., n.d., https://i.pinimg.com/originals/51/c3/07/51c307a47a32805019e77a0992d026f0.jpg.

STEPS OF WOOD PROCESSING

1 TREE GROWTH

2 HARVEST

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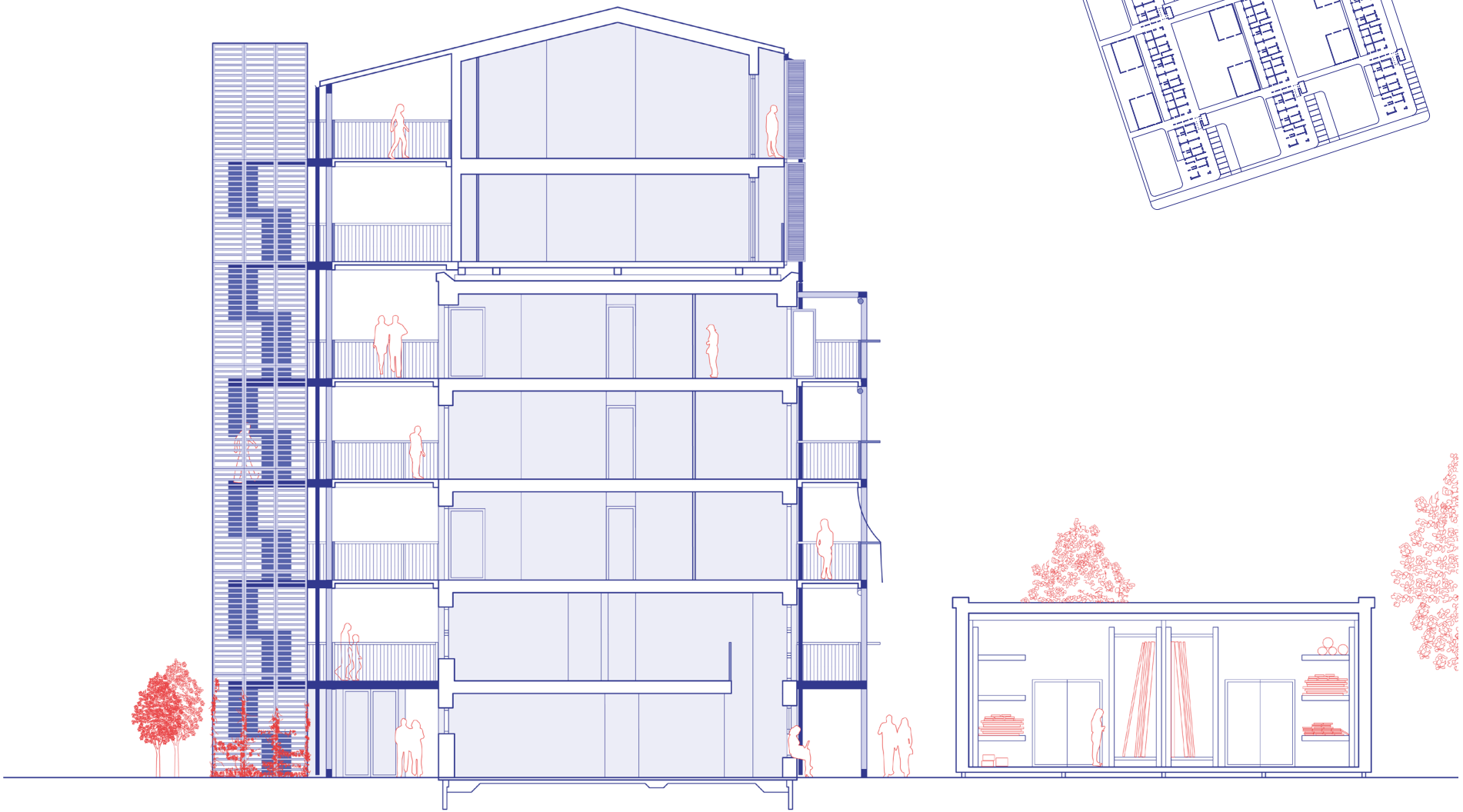
6 STORAGE

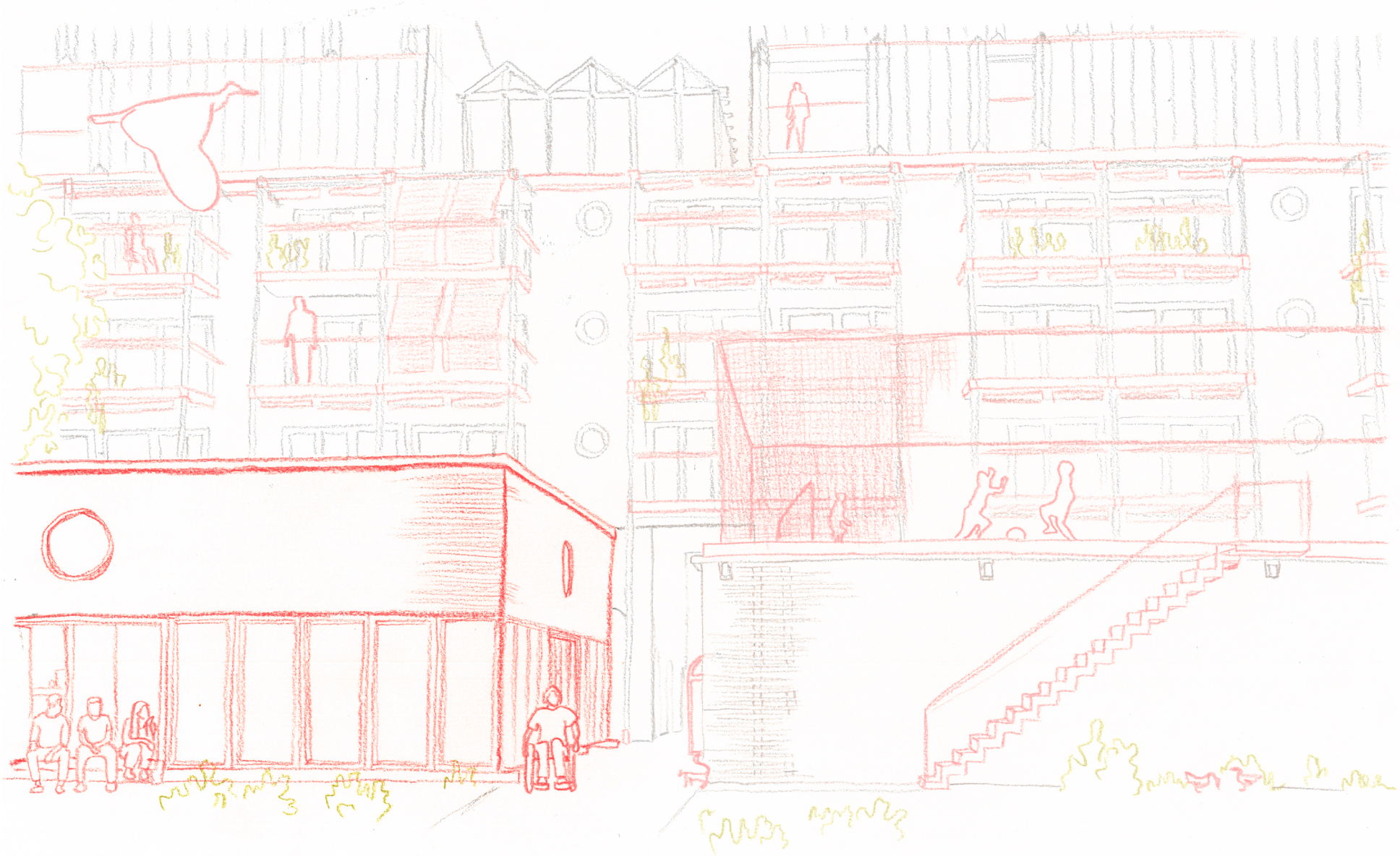
WOOD WORKSHOP DESIGN

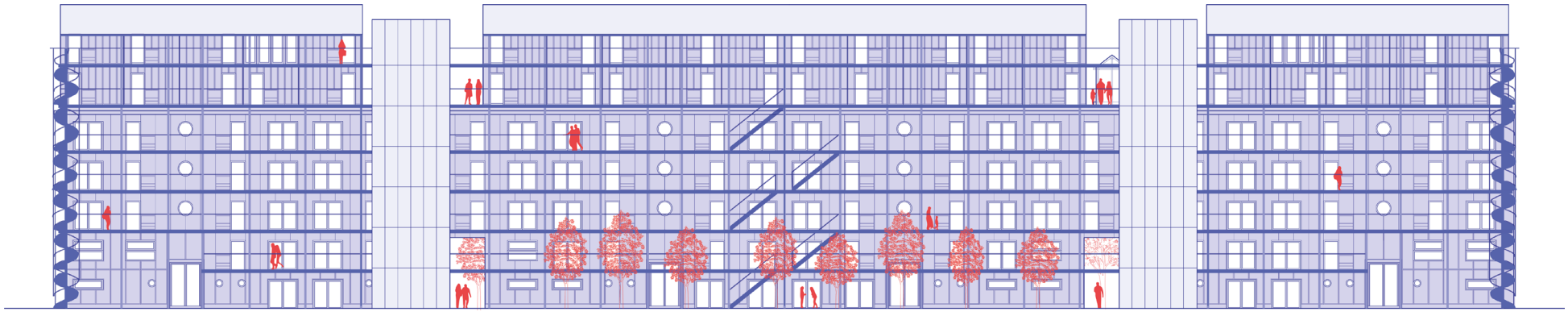


wood workshop

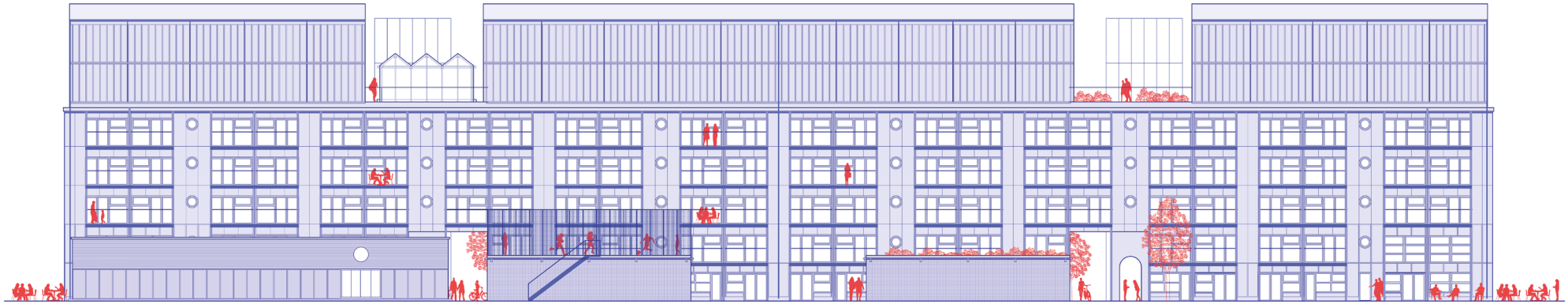
1 : 100

WOOD WORKSHOP





east elevation

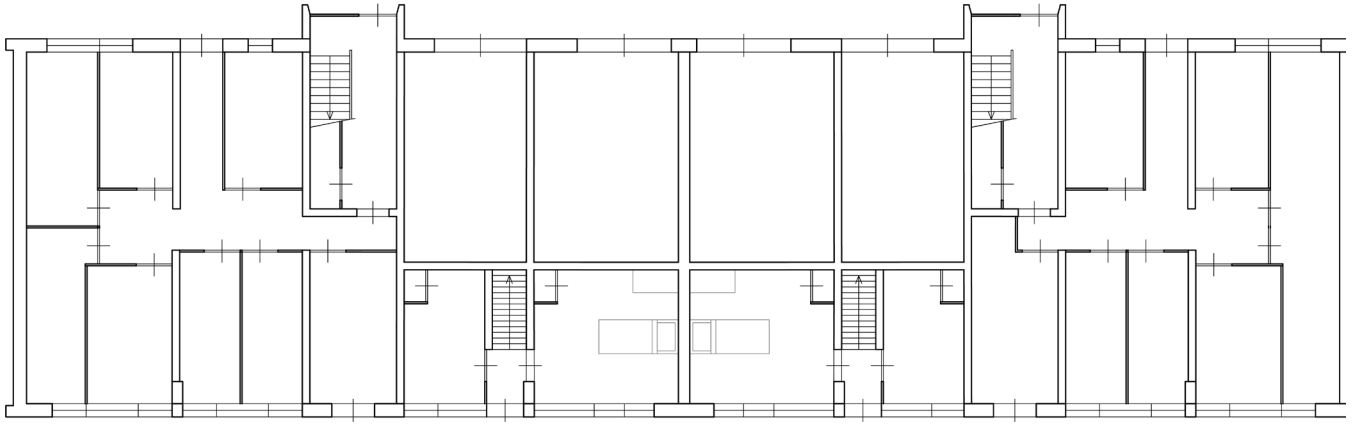


west elevation

design

1 : 200

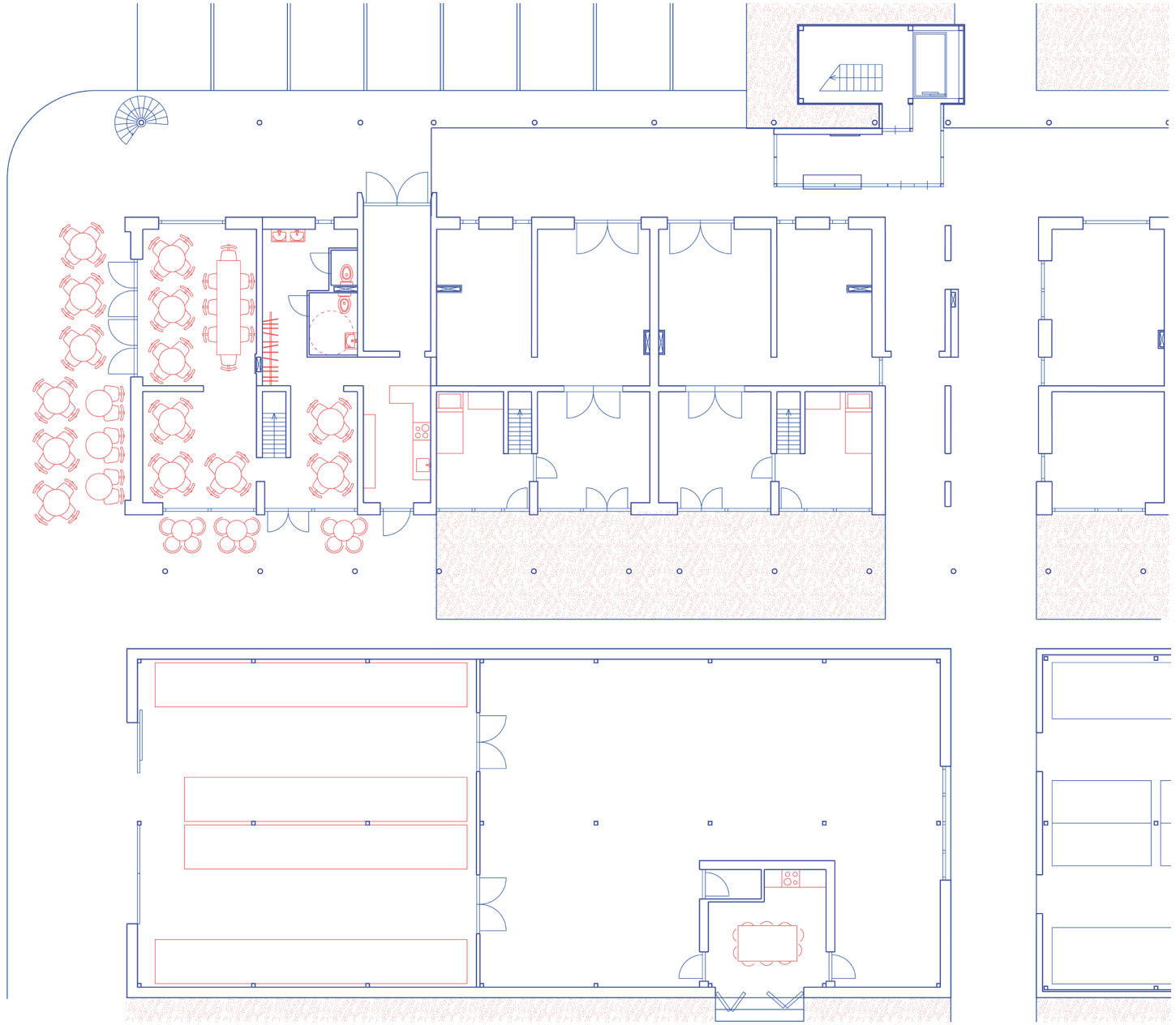
EXISTING GROUND FLOOR



design

1 : 100

NEW GROUND FLOOR



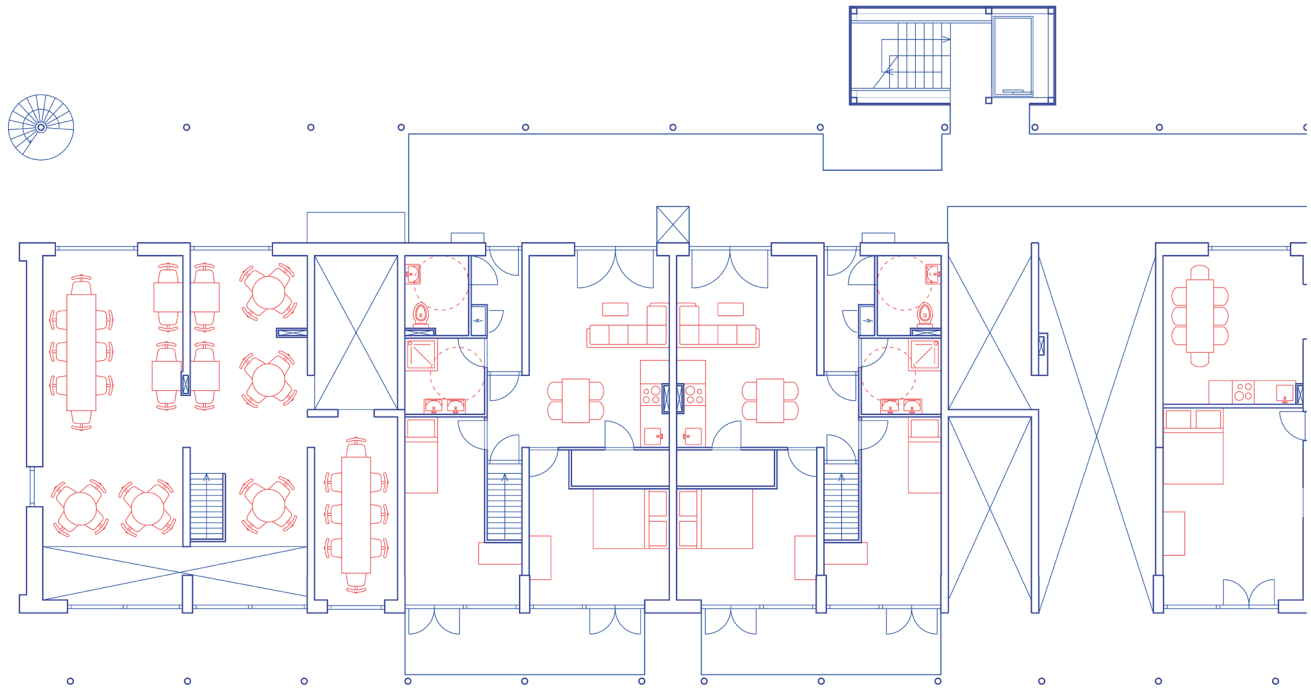
design

1 : 100

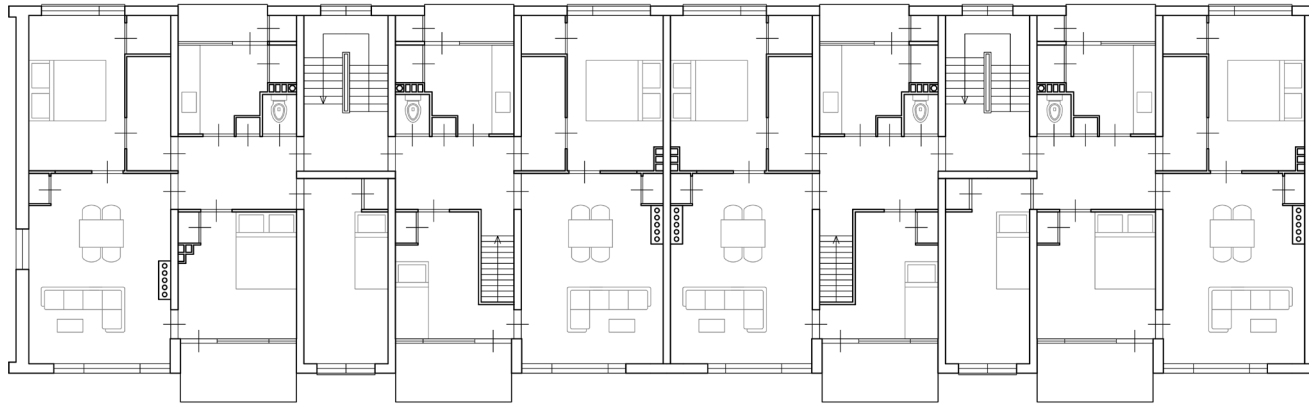
design

1 : 50 model

FIRST FLOOR



new

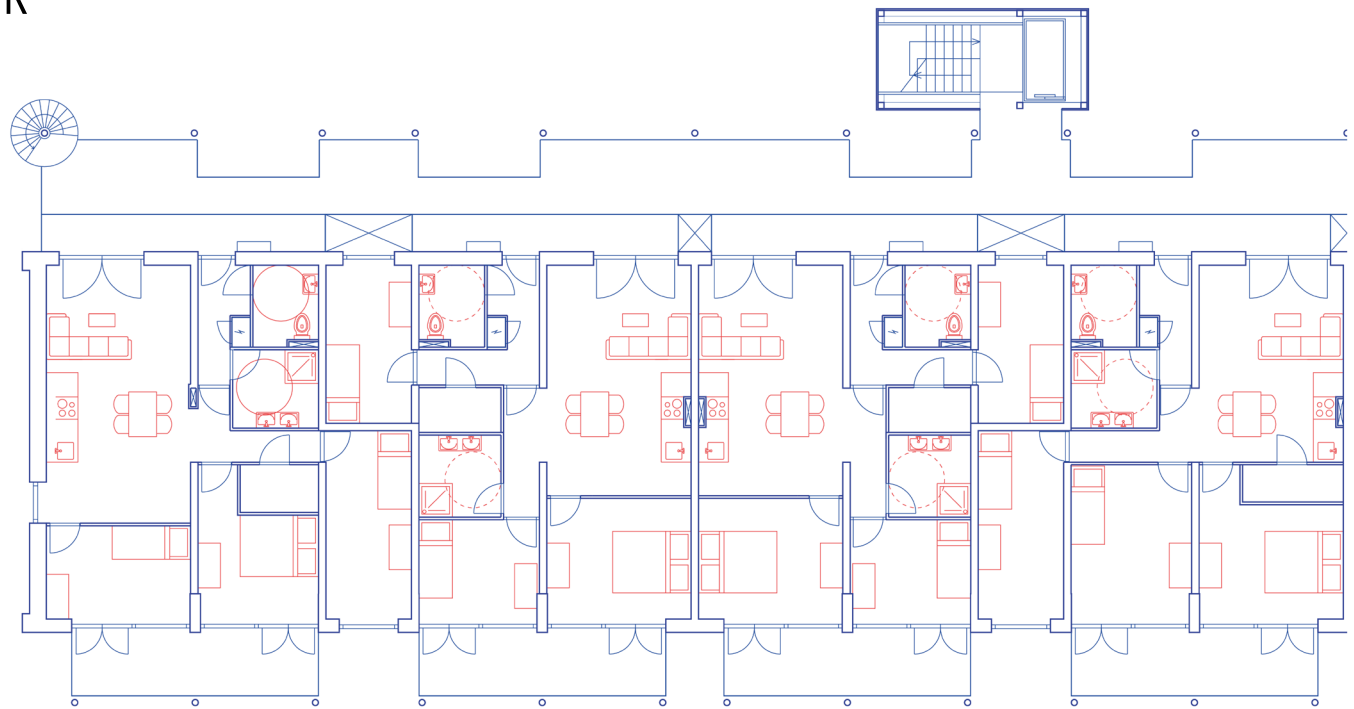


existing

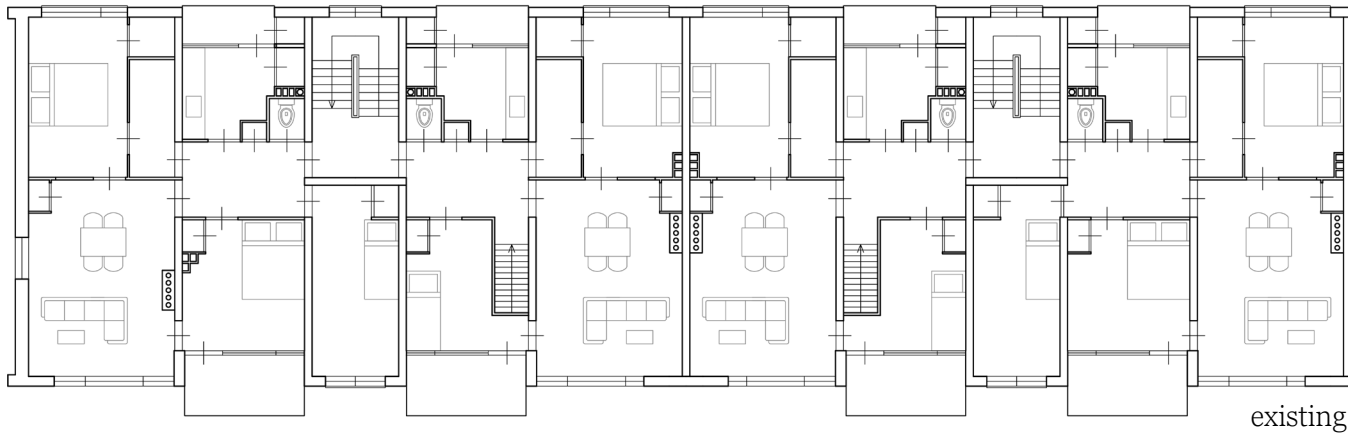
design

1 : 100

SECOND-FOURTH FLOOR



new

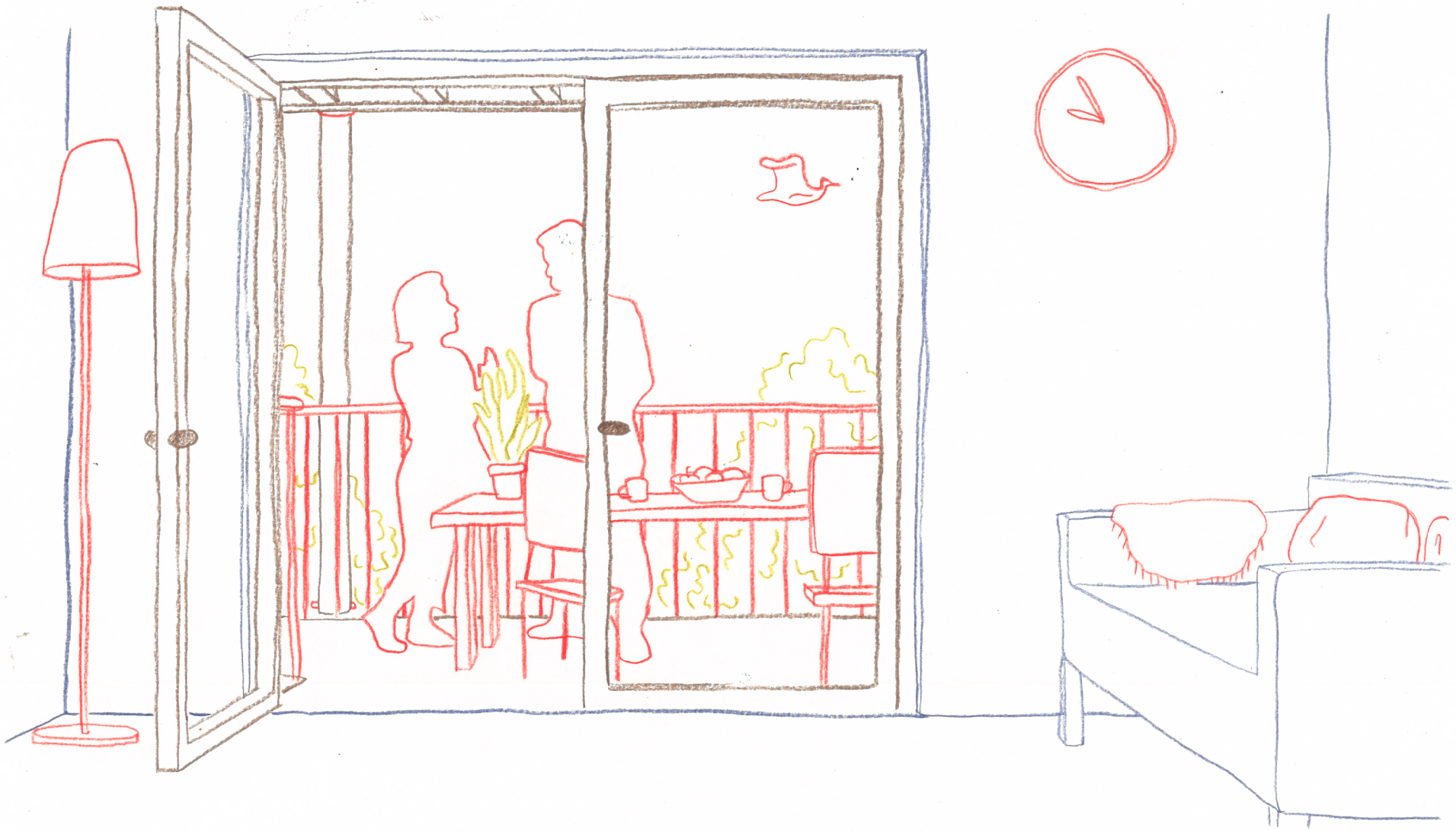


existing

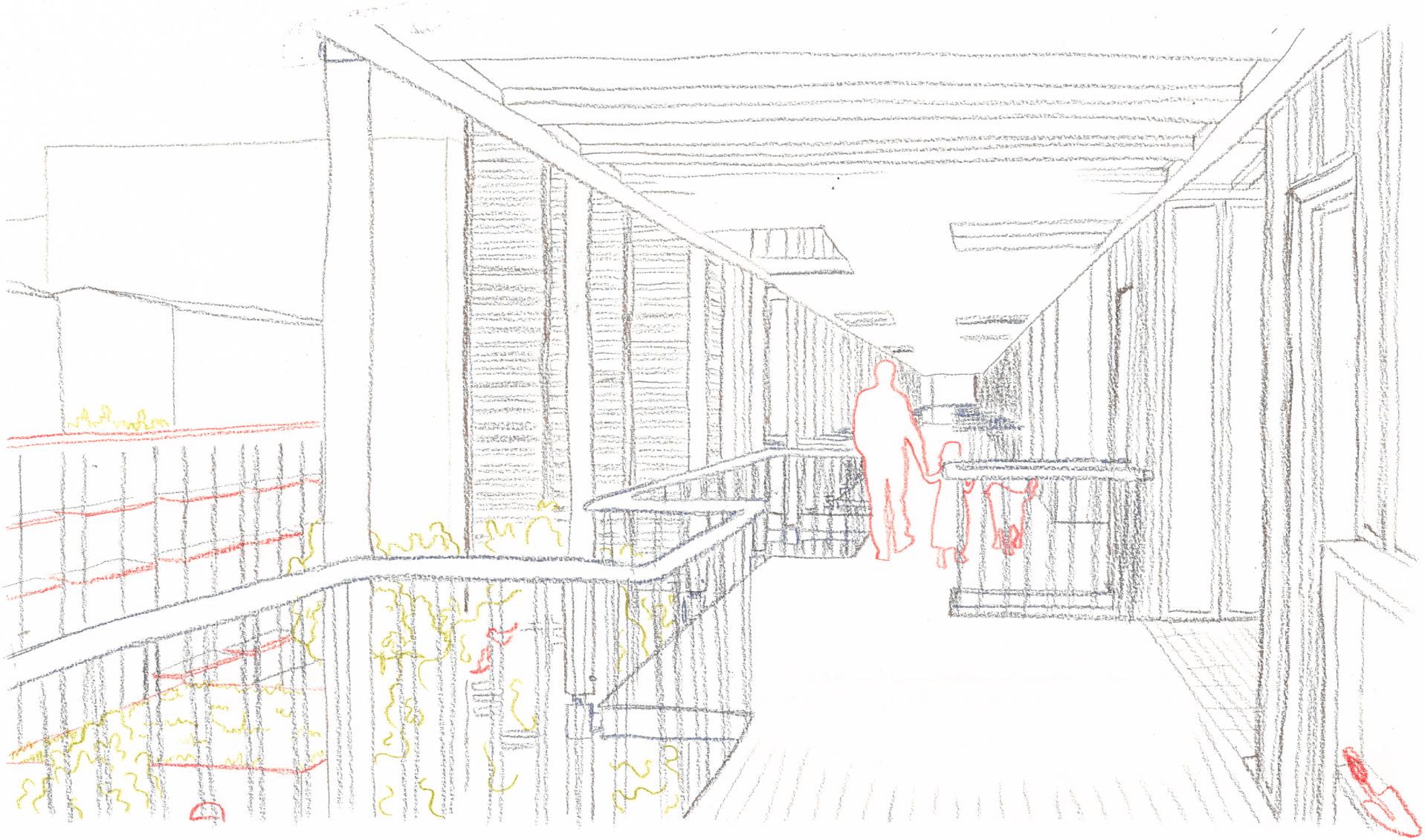
design

1 : 100

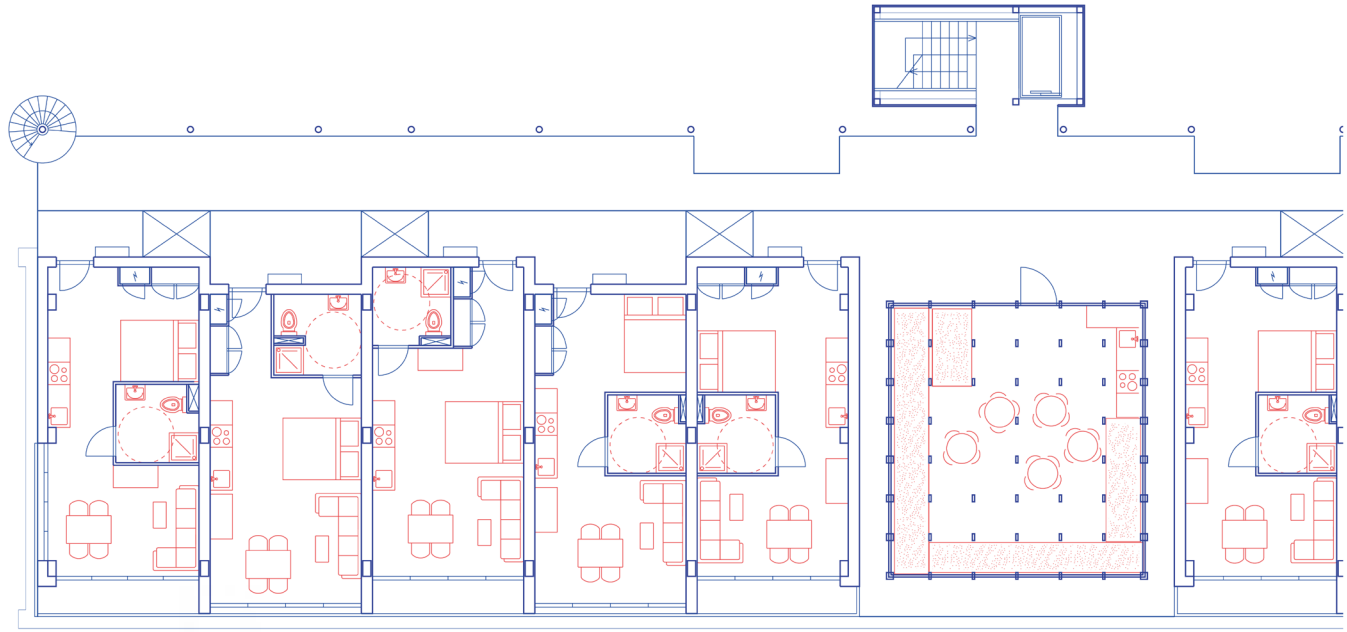
INTERIOR



GALERY



FIFTH FLOOR



design

1 : 100

SIXTH FLOOR

design

1 : 100

FAÇADE DESIGN

design

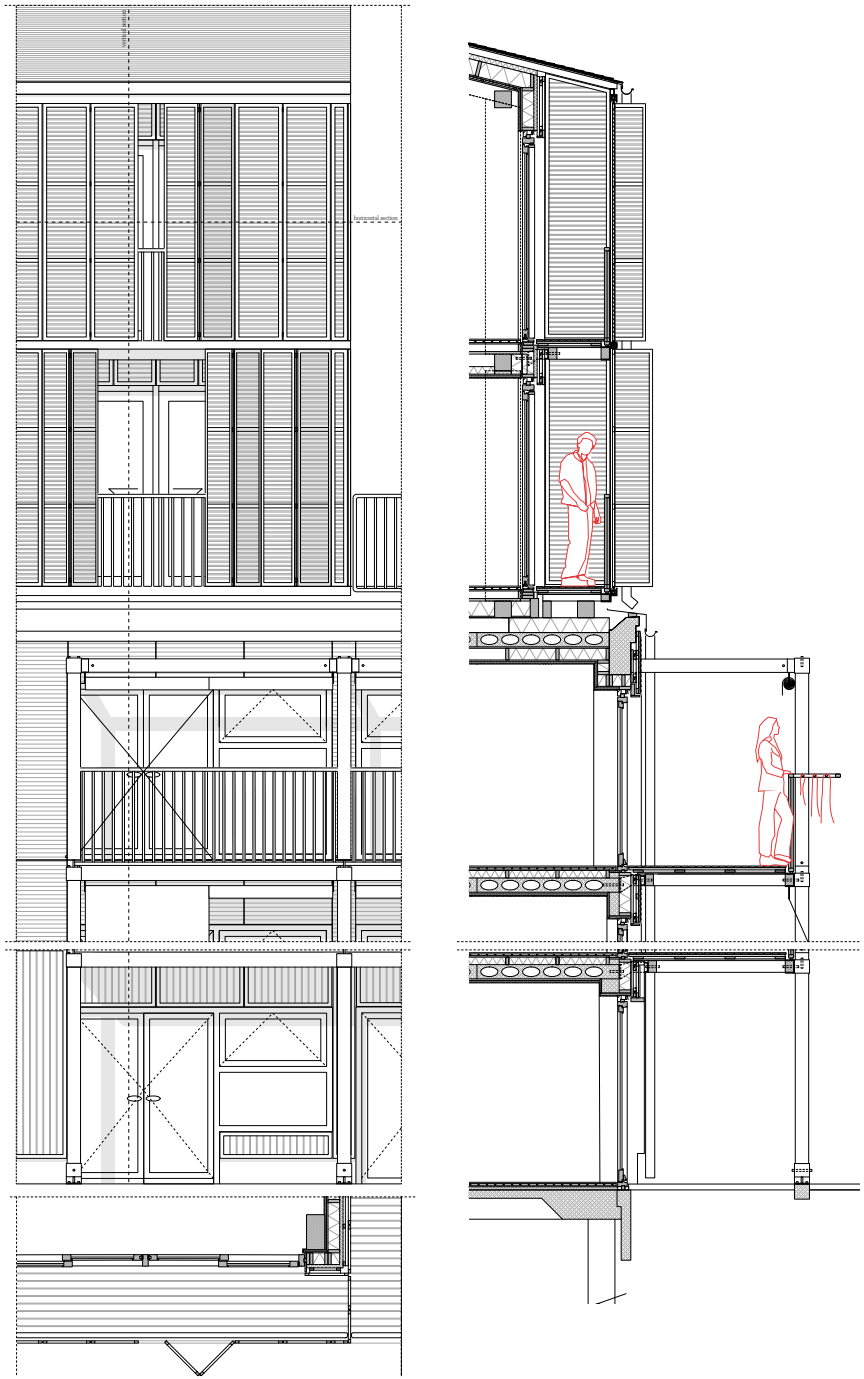
1 : 20 fragment east elevation

FAÇADE DESIGN

design

1 : 50 model

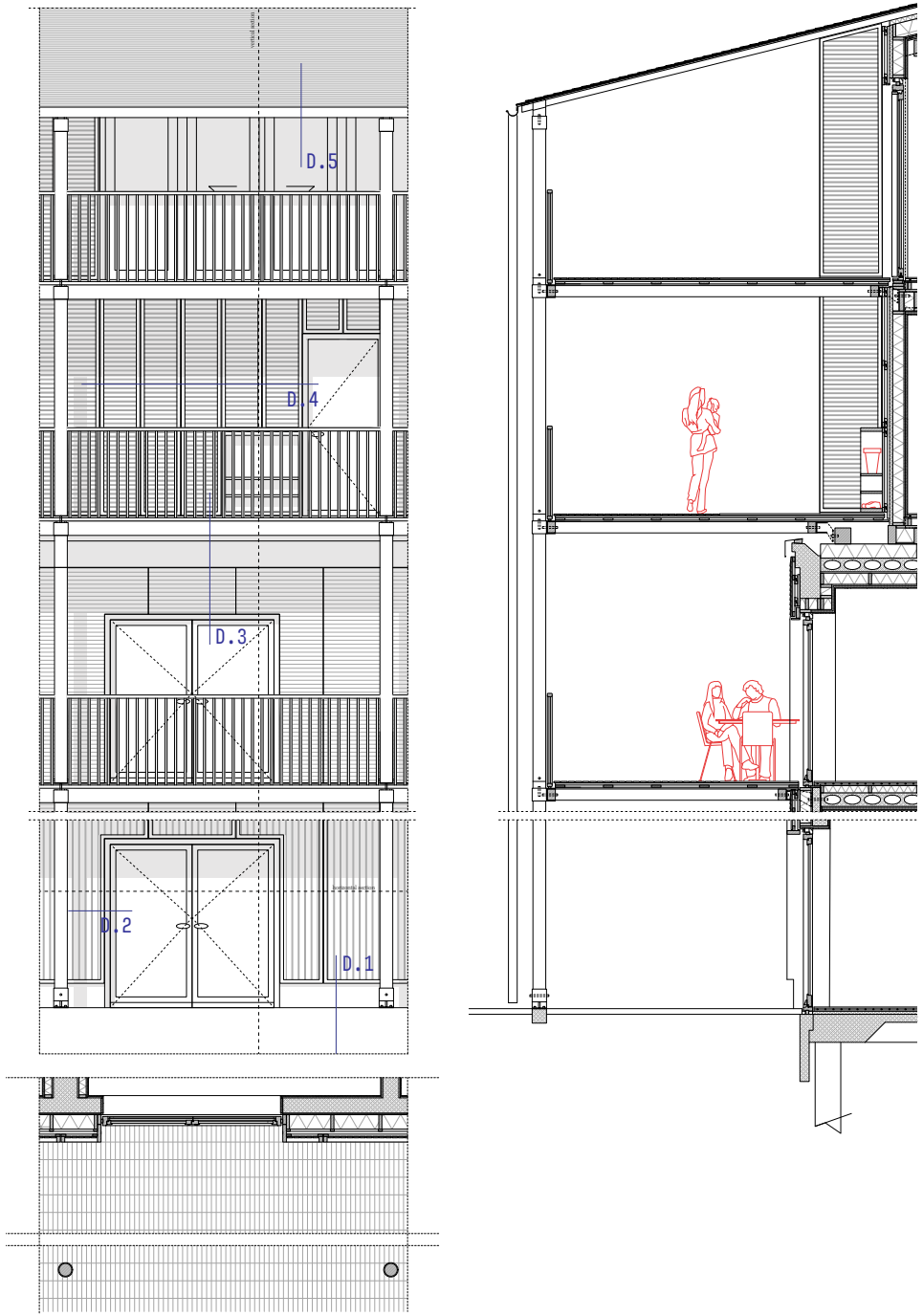
TECHNICAL DESIGN



building technology

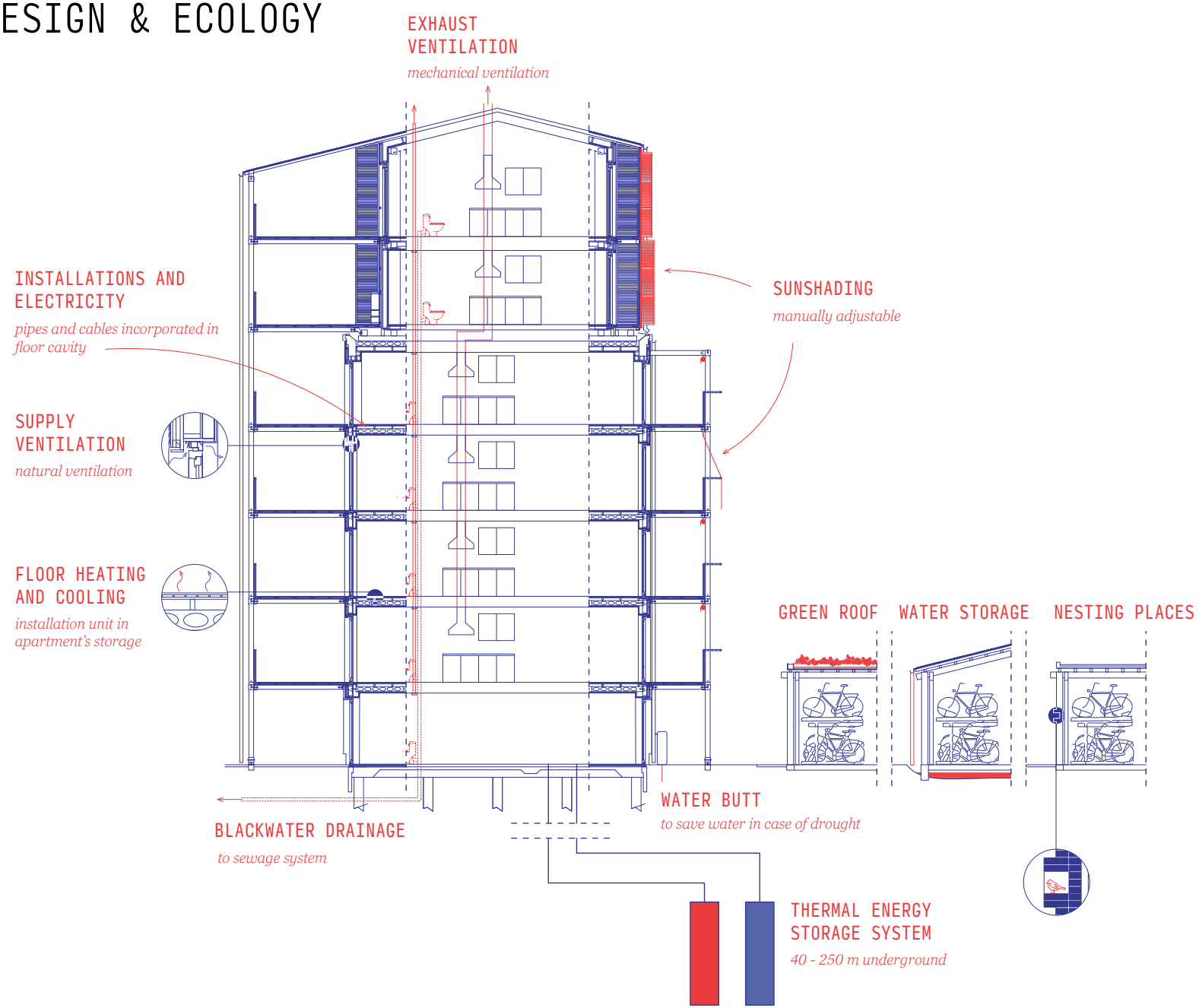
1 : 20 fragment west elevation

TECHNICAL DESIGN



1 : 20 fragment east elevation

CLIMATE DESIGN & ECOLOGY

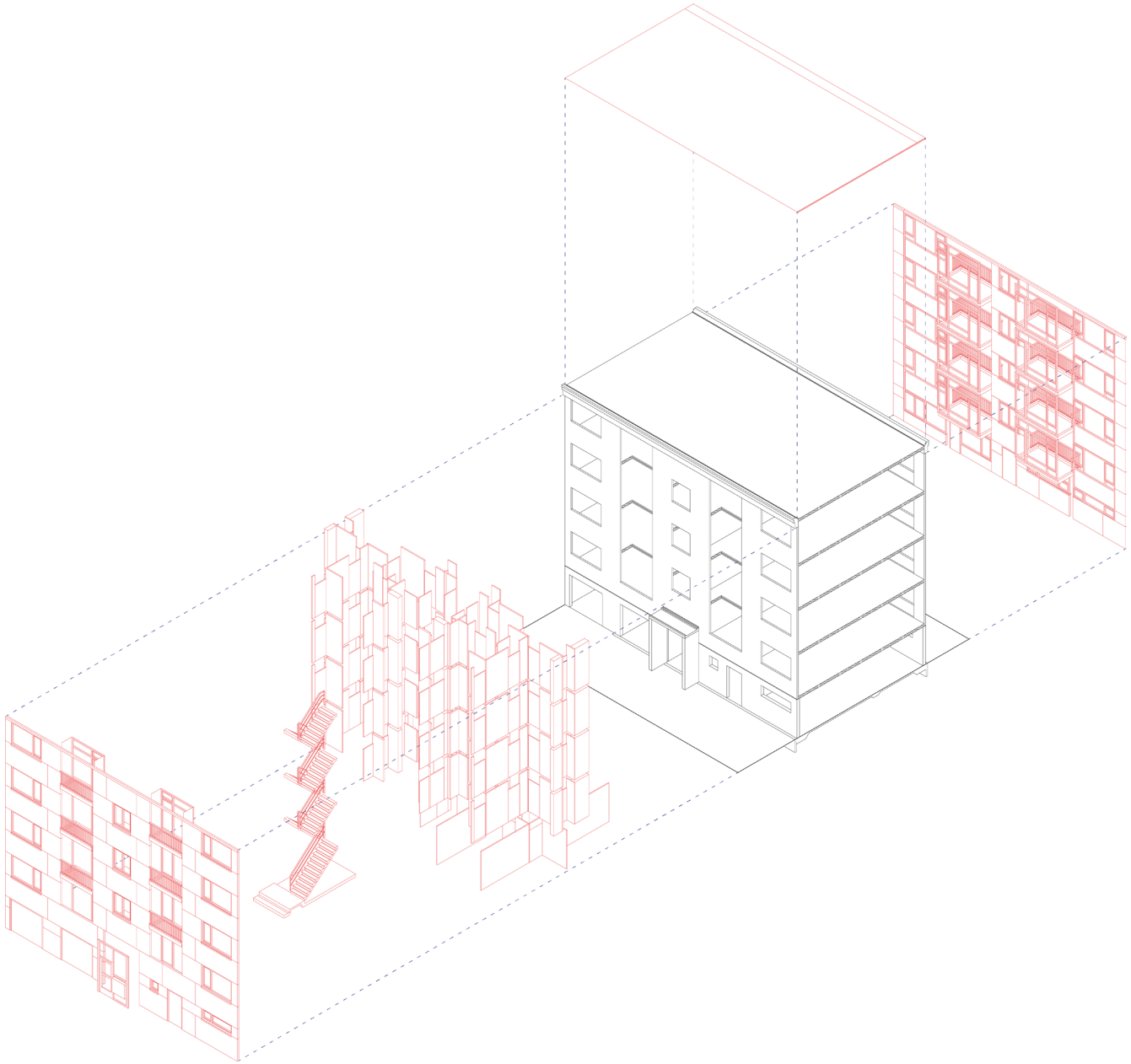


EXISTING

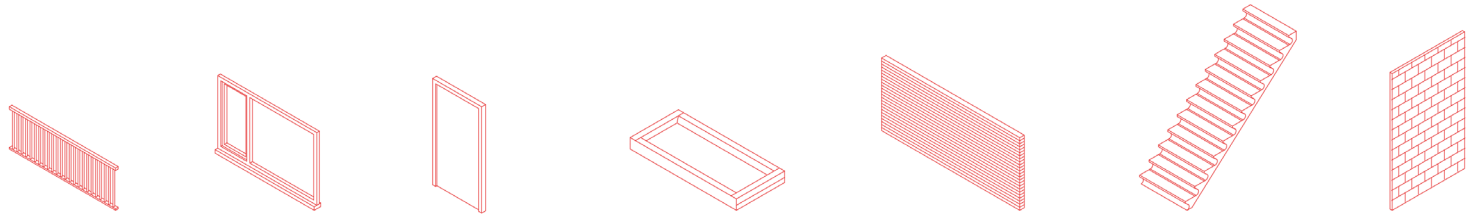
building technology

isometric of building segment

REMOVAL MATERIALS



REMOVAL MATERIALS

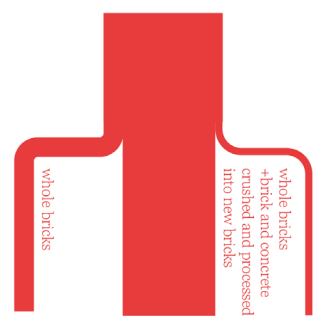


	BALUSTRADE metal	WINDOW FRAME plastic	EXTERIOR DOOR wood	BALCONY concrete	BRICK FAÇADE ELEMENTS / WALL	STAIRS concrete	INTERIOR WALL honed masonry
QUANTITIES							
per segment/portiek	21 pieces	49 pieces	1 piece	7,2 m³	28 m³	3,7 m³	20,6 m³
per flat	126 pieces	303 pieces	12 pieces	43,2 m³	192 m³	22,2 m³	123,6 m³
in total	378 pieces	909 pieces	36 pieces +12 garage doors	129,6 m³	576 m³	66,6 m³	370,8 m³
				total: 772,2 m³			
POTENTIAL REPURPOSING	100% reuse	repurpose outside of project	100% reuse/repurpose		100% reuse/repurpose		100% reuse/repurpose

- 126 balustrade pieces can all be reused in the 6 new staircases of the project (only 6 new balustrade pieces would need to be produced)
- The removed balustrade pieces from the balconies make up a length of 935 meters in total. If these are reused for the new project, galery and balcony balustrades for almost 4 segments/portie-ken would be provided.

According to a technical analysis of the existing buildings, the window frames are mainly outdated. Hopefully these frames could be reused with a different purpose, inside for example.

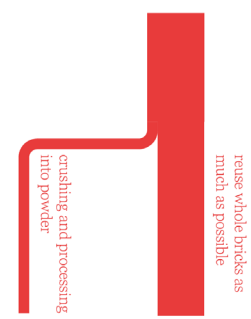
The exterior doors are made from wood. The single doors can be reused as apartment front doors. The garage doors do not fit in the new design in their current state, but after reprocessing the material could made into new doors.



brick walls
bike storages
127,2 m³

stone paving project
site park
± 600 m³

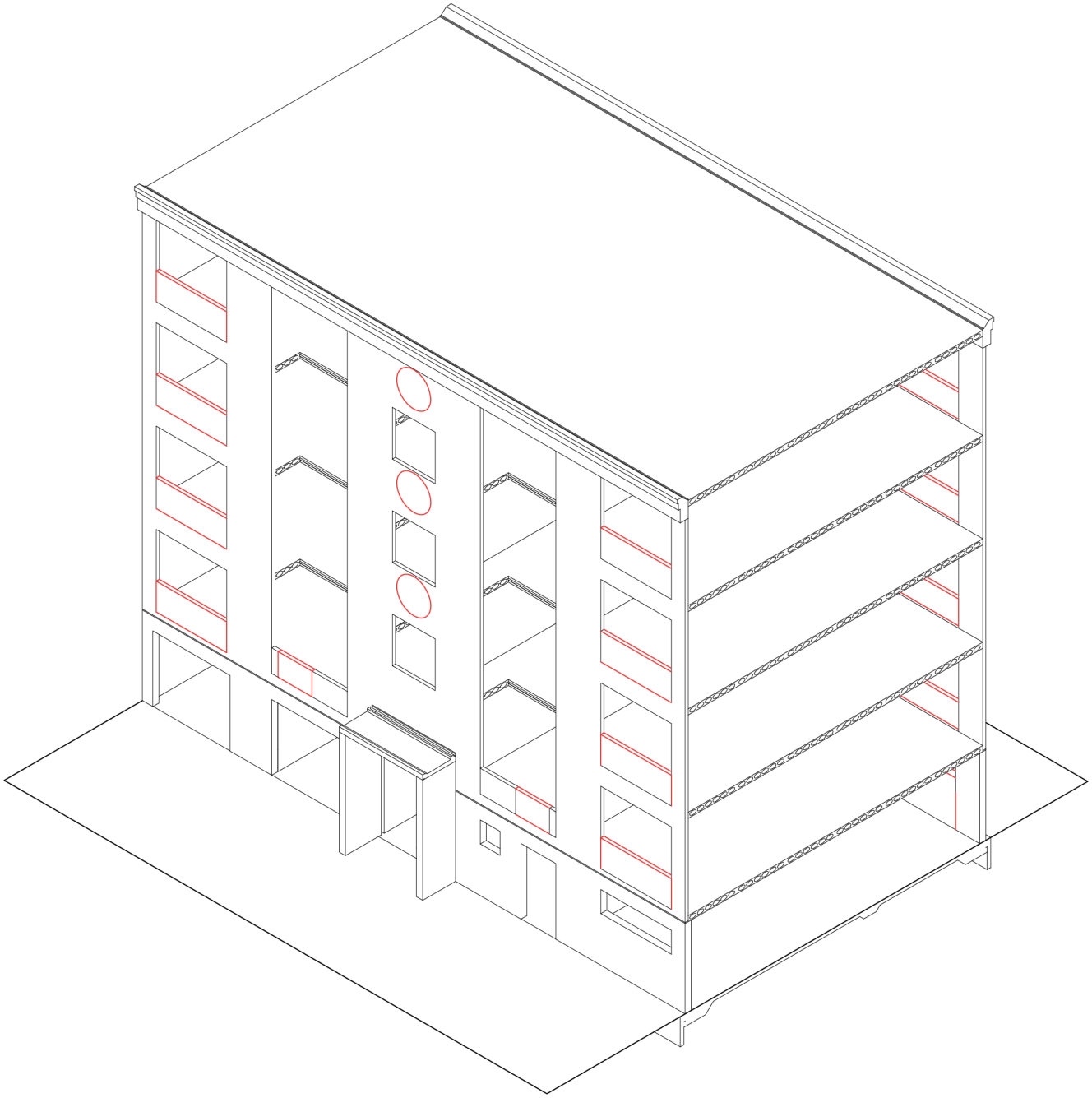
galery tiles
45,9 m³
see detail .3



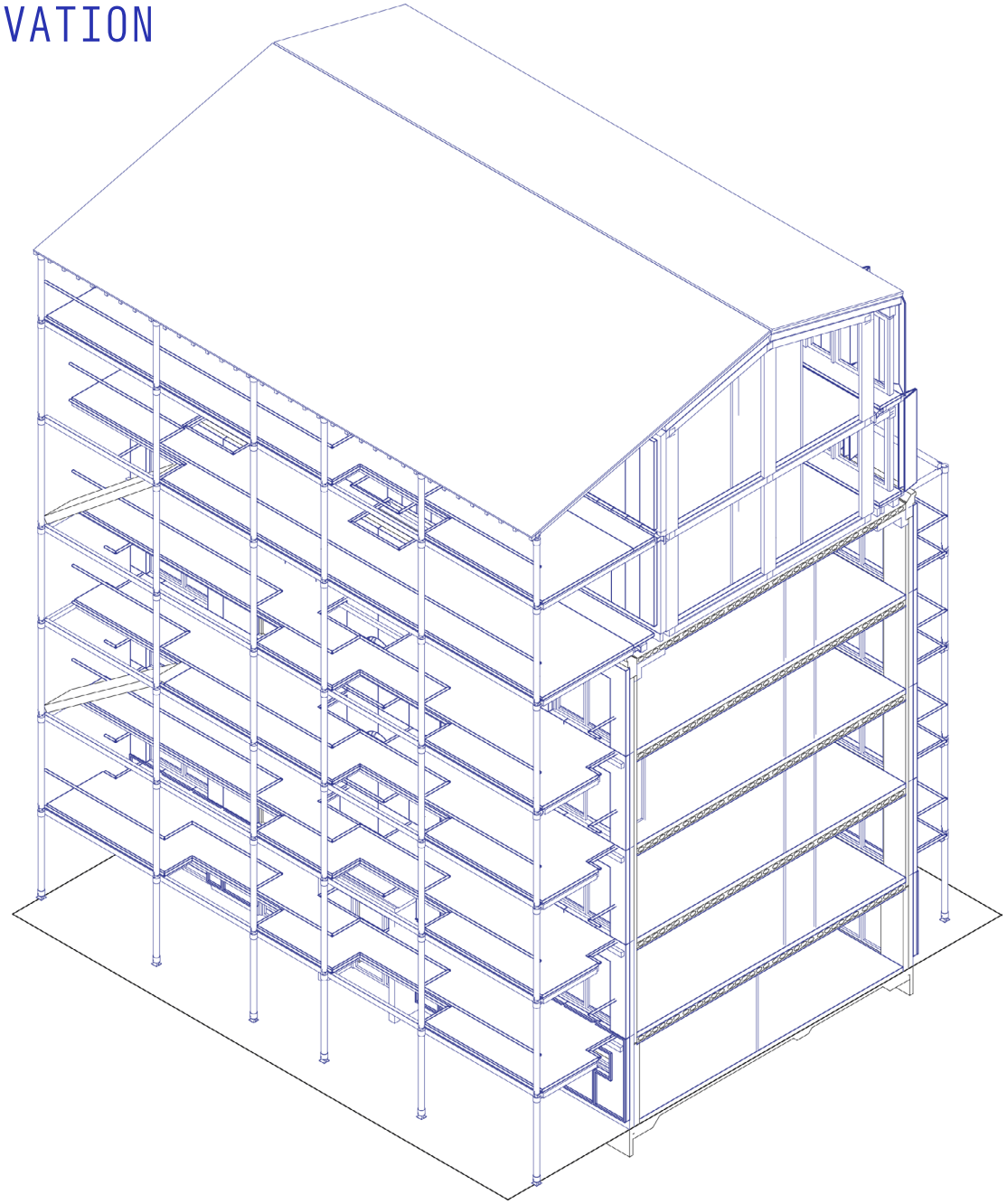
sideboard stucco
ground floor
69 m³
see detail .1

interior walls
27,56 m³ per segment/portiek
301,8 m³ (11 segments)
This was not implemented in the design.

STRIPPED



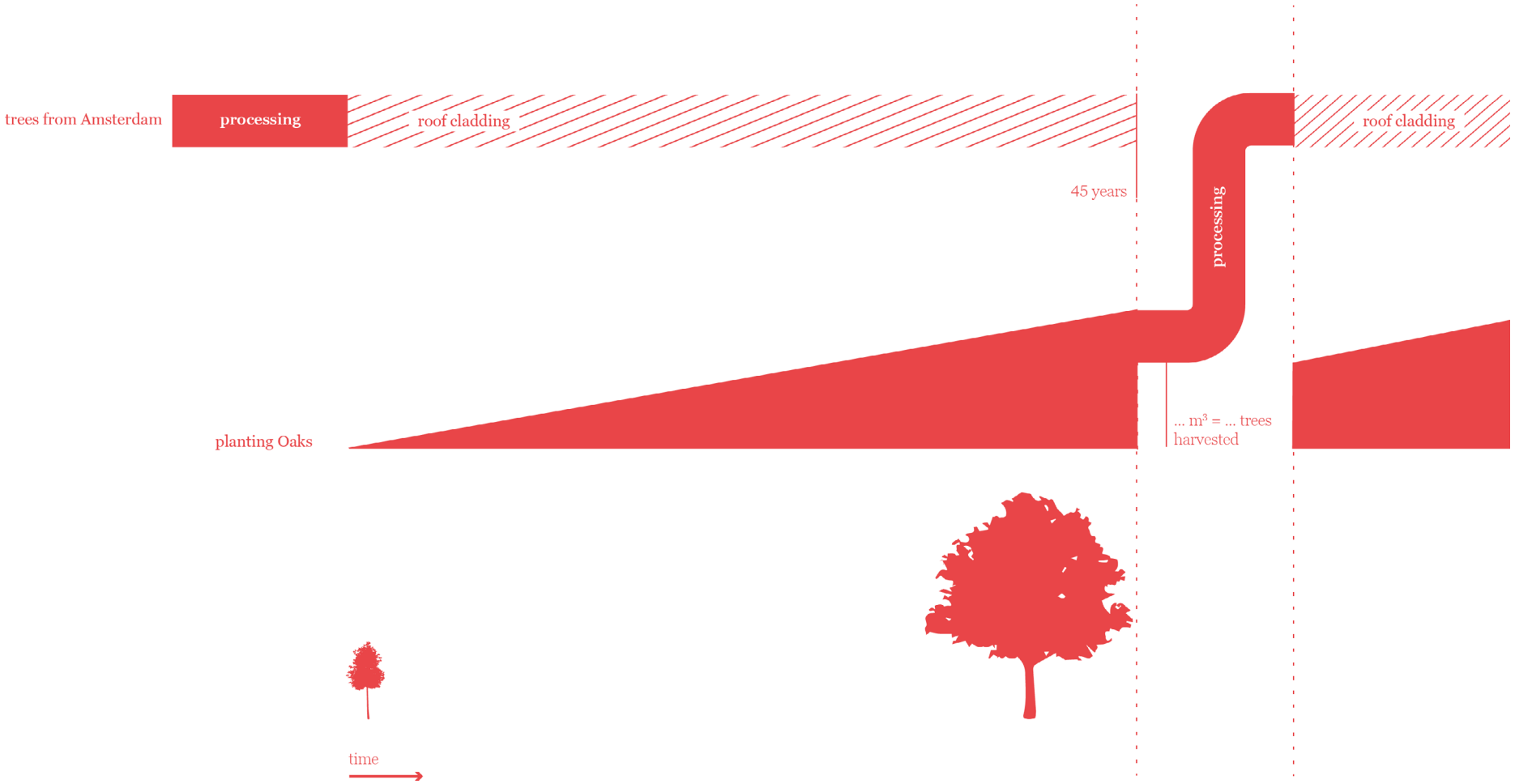
FINISHED RENOVATION



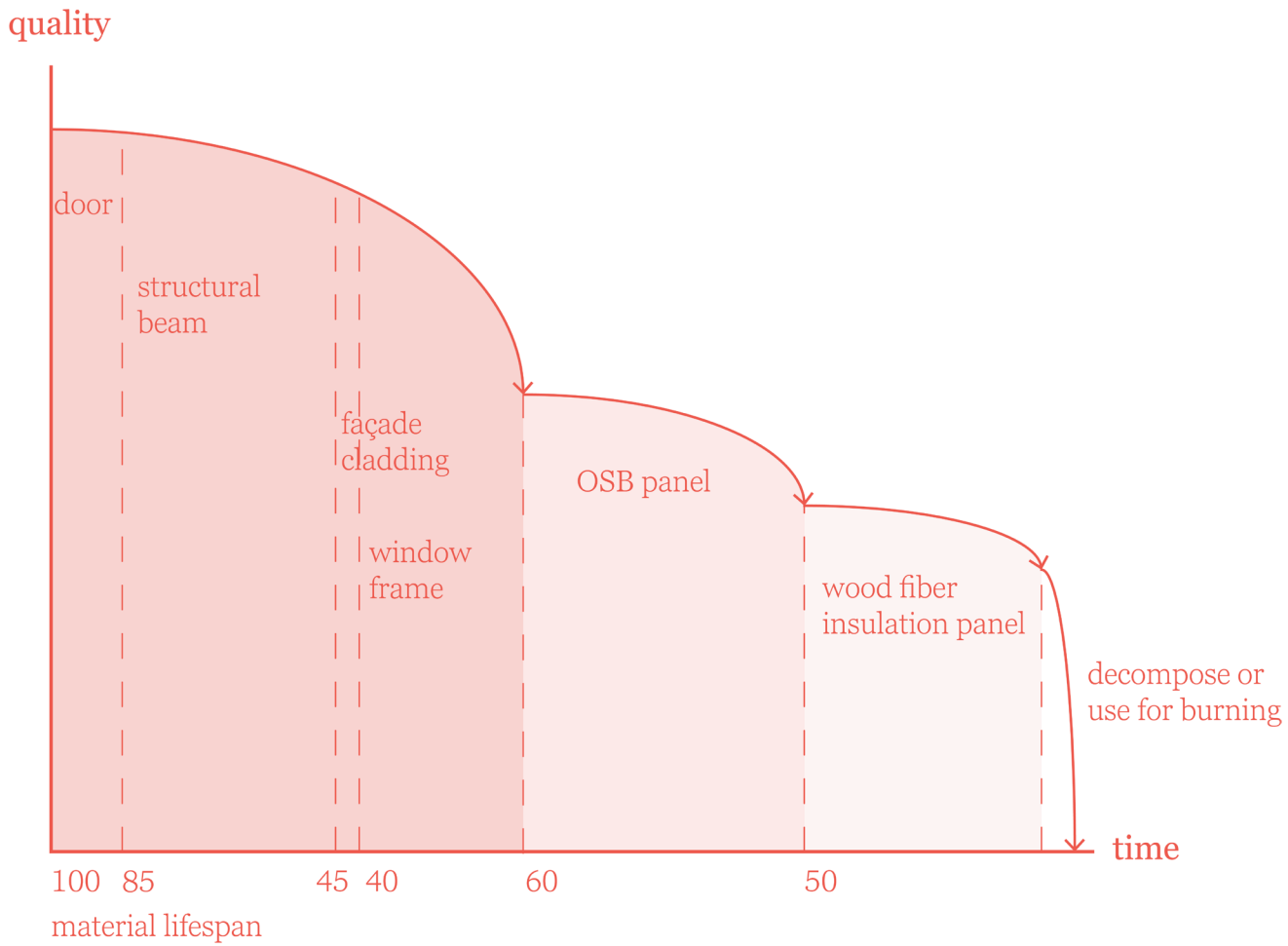
building technology

isometric of building segment

MAINTENANCE

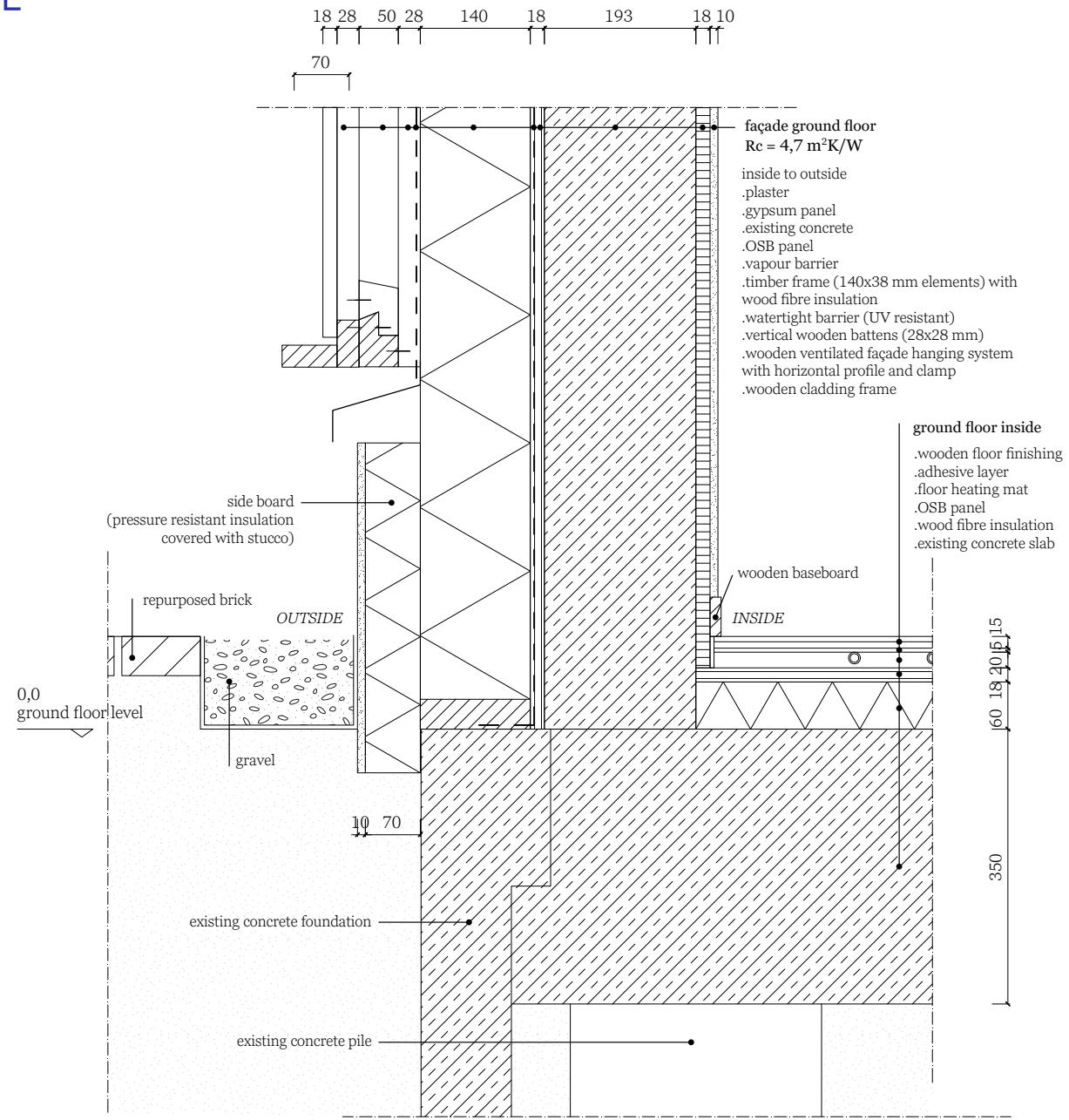


MAINTENANCE



cascading

MAINTENANCE

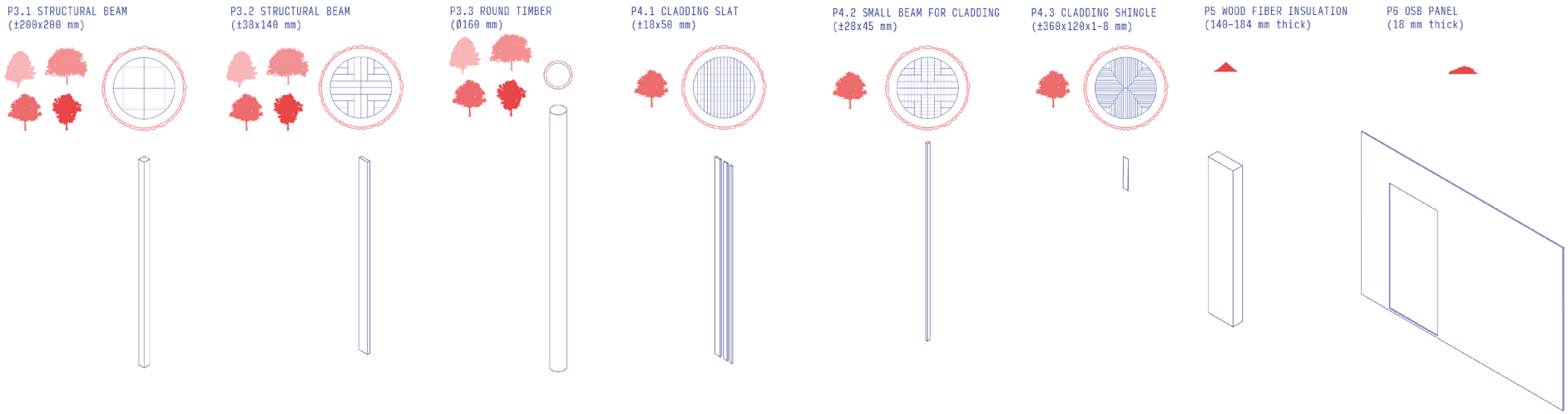


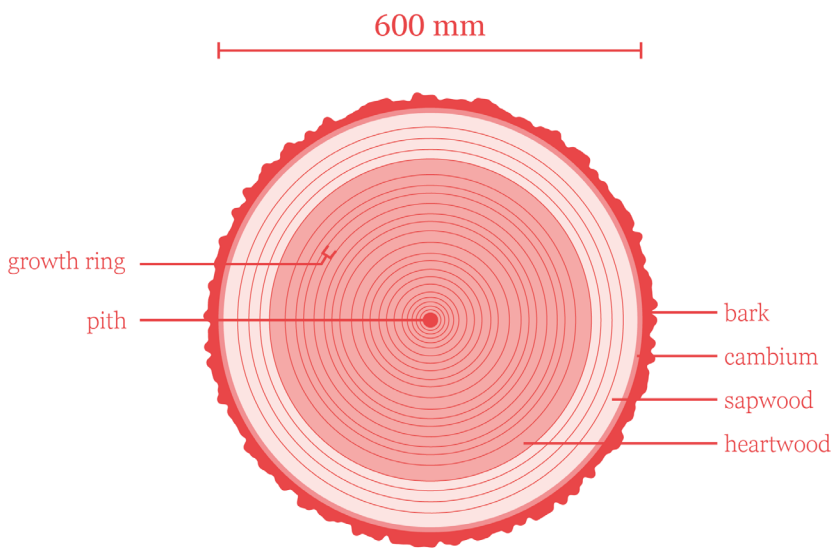
building technology

1 : 5 detail

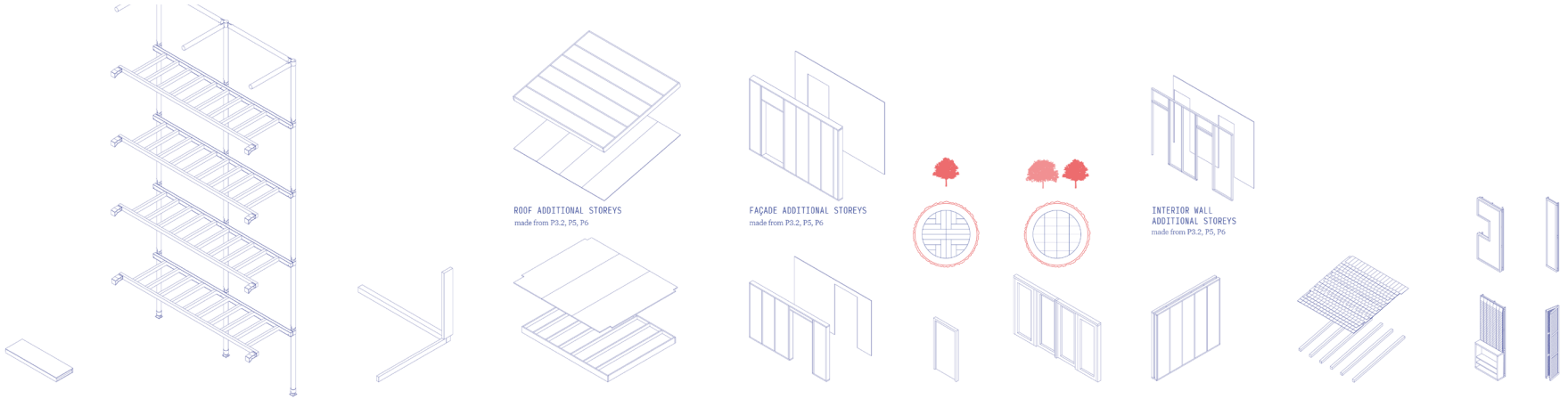
ground floor façade - *vertical*

BUILDING PARTS





BUILDING ELEMENTS



BUILDING ELEMENTS

WOOD QUANTITY [m³]

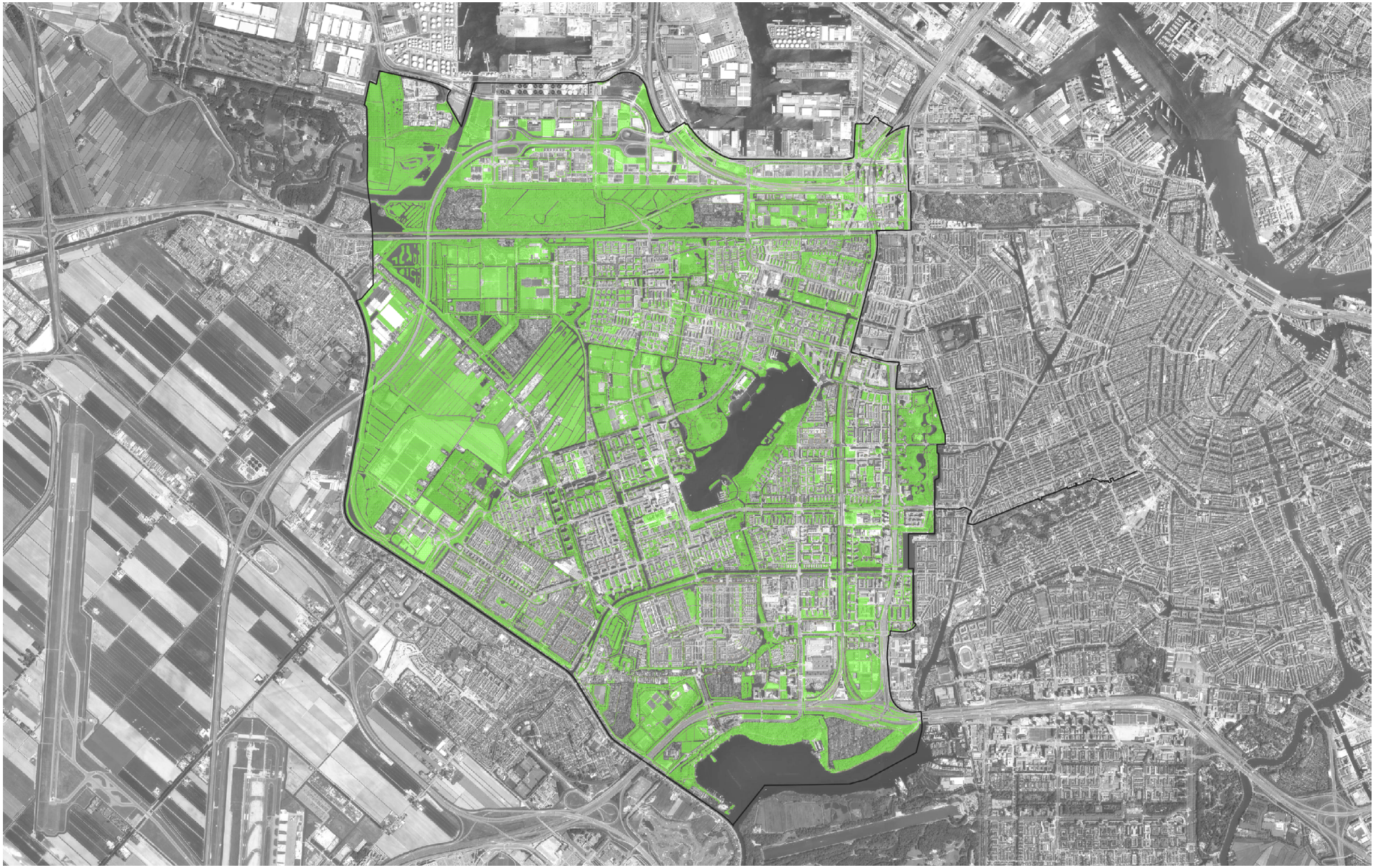
	FLOOR FILL made from P3.2, P5, P6	GALERY & BALCONY STRUCTURE made from P3.1, P3.3 & steel joint elements	STRUCTURE ADDITIONAL STOREYS made from P3.1	FLOOR ADDITIONAL STOREYS made from P3.2, P5, P6	INSULATION EXISTING FAÇADE made from P3.2, P5, P6	P1 EXTERIOR DOOR	P2 WINDOW FRAME	DIVISION WALL ADDITIONAL STOREYS made from P3.2, P5, P6	ROOF CLADDING made from P4.2, P4.3	FAÇADE CLADDING made from P4.1, P4.2, P4.3	all building parts
per segment	4,7	21,8	18,3	89	82,1	1,9	7,3	83,2	15,3	57,7	381,3
per flat	28,2	130,8	109,8	534	492,6	11,4	43,8	499,2	91,8	346,2	2287,8
total (3 flats)	84,6	392,4	329,4	1602	1477,8	34,2	131,4	1497,6	275,4	1038,6	6863,4

OSDORP-OOST

80 ha

regenerative forest

WESTELIJKE TUINSTEDEN AMSTERDAM?



2 WOOD GROWTH

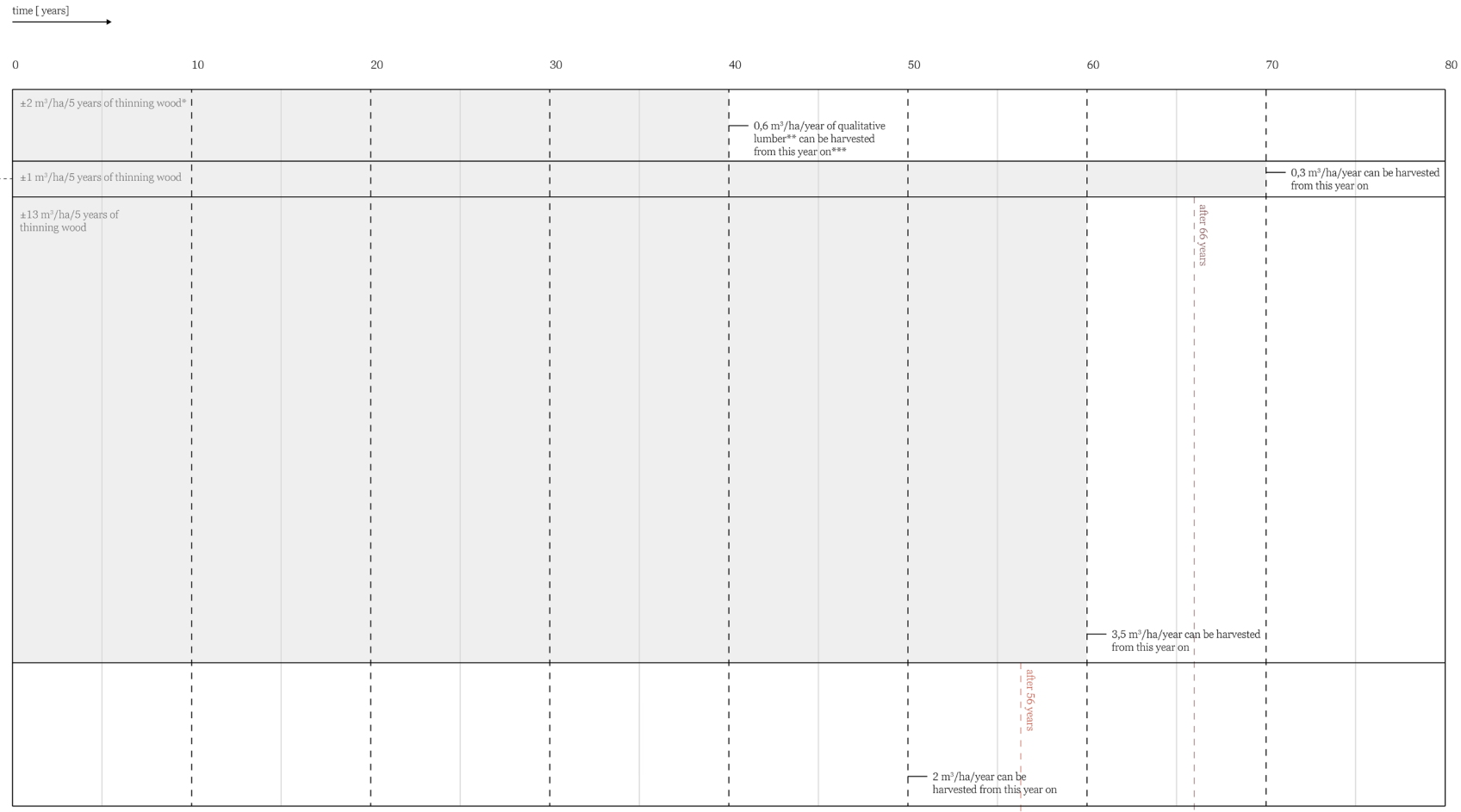
10 ha forest

ALDER
average growth
0,7 m³/ha/year
10%

ASH
average growth
0.4 m³/ha/year
5%

OAK
average growth
4,1 m³/ha/year
65%

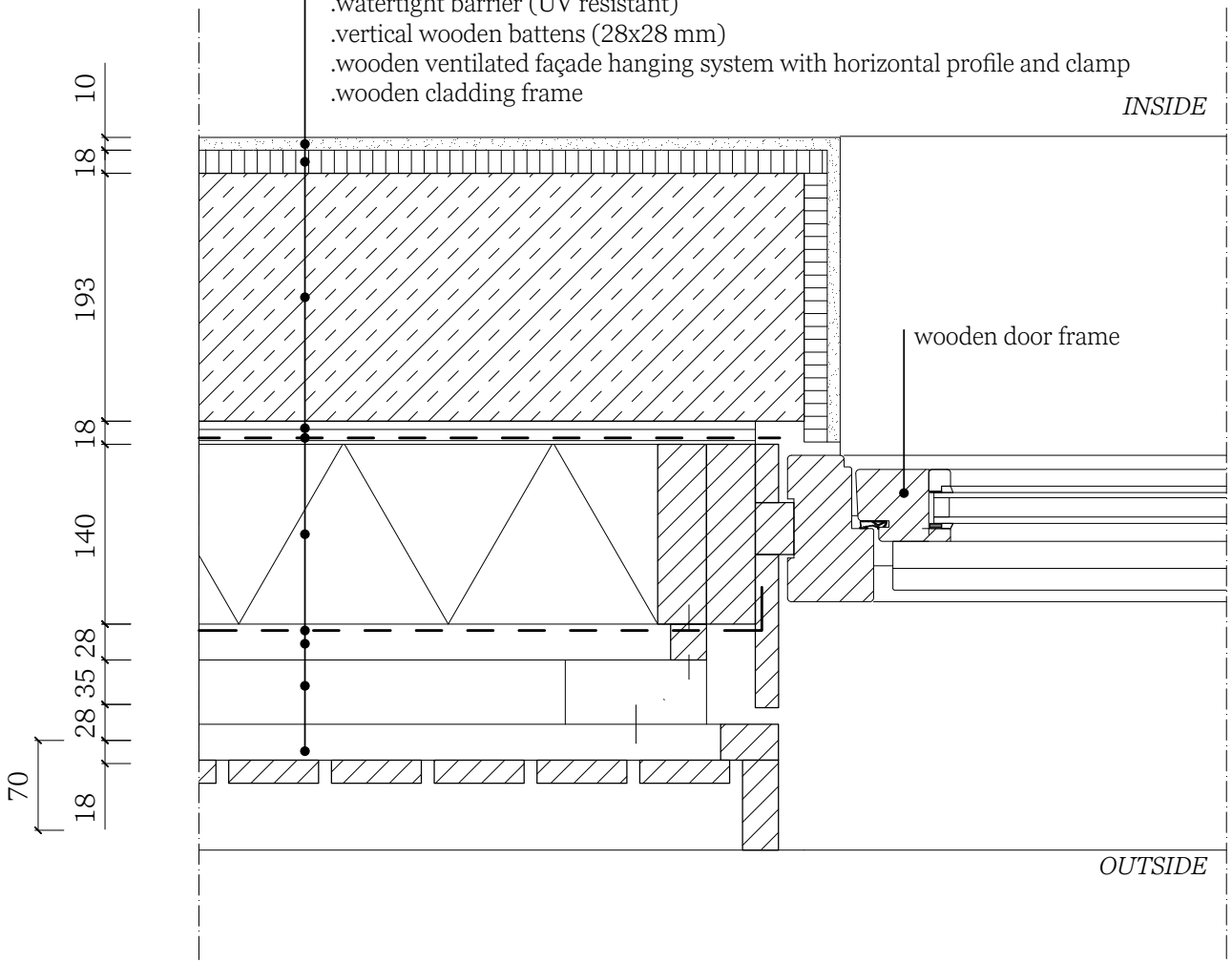
POPLAR
average growth
2,46 m³/ha/year
20%



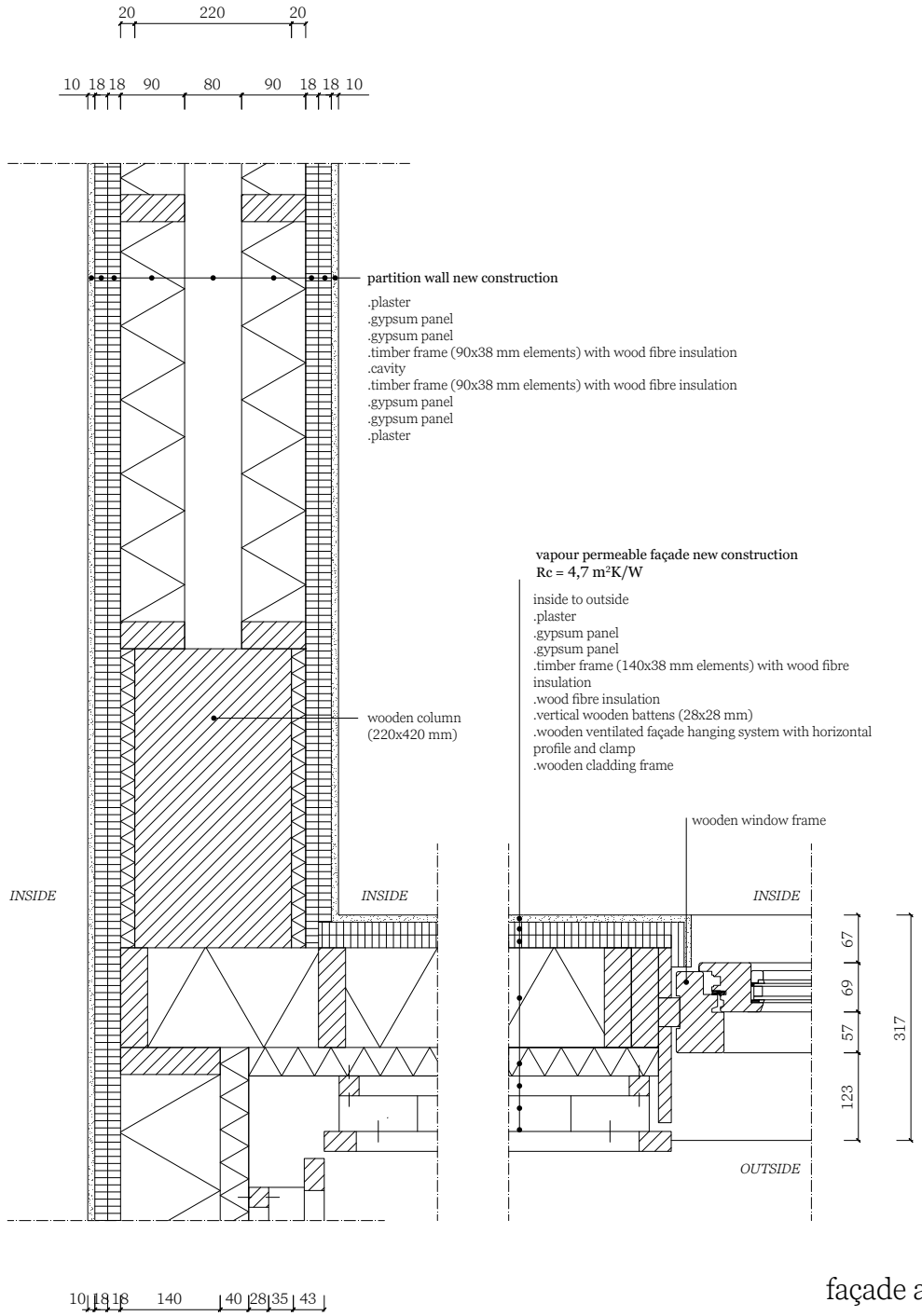
*Thinning is needed to advantage specific trees over others and to create forest variation. As the trees are still young in this phase, the wood can only be used for fibers.
**Approximately 50% of the harvested trunk can be used for qualitative beams and boards, the rest of the wood can be used for small interiors products for example, or it can be processed into chips or fibers.
***After the trees have reached the desired diameter, the wood can be sustainably harvested for building parts like beams or frames. 80% of the increment is harvested at most every year.

façade ground floor
Rc = 4,7 m^2K/W

inside to outside
.plaster
.gypsum panel
.existing concrete
.OSB panel
.vapour barrier
.timber frame (140x38 mm elements) with wood fibre insulation
.watertight barrier (UV resistant)
.vertical wooden battens (28x28 mm)
.wooden ventilated façade hanging system with horizontal profile and clamp
.wooden cladding frame

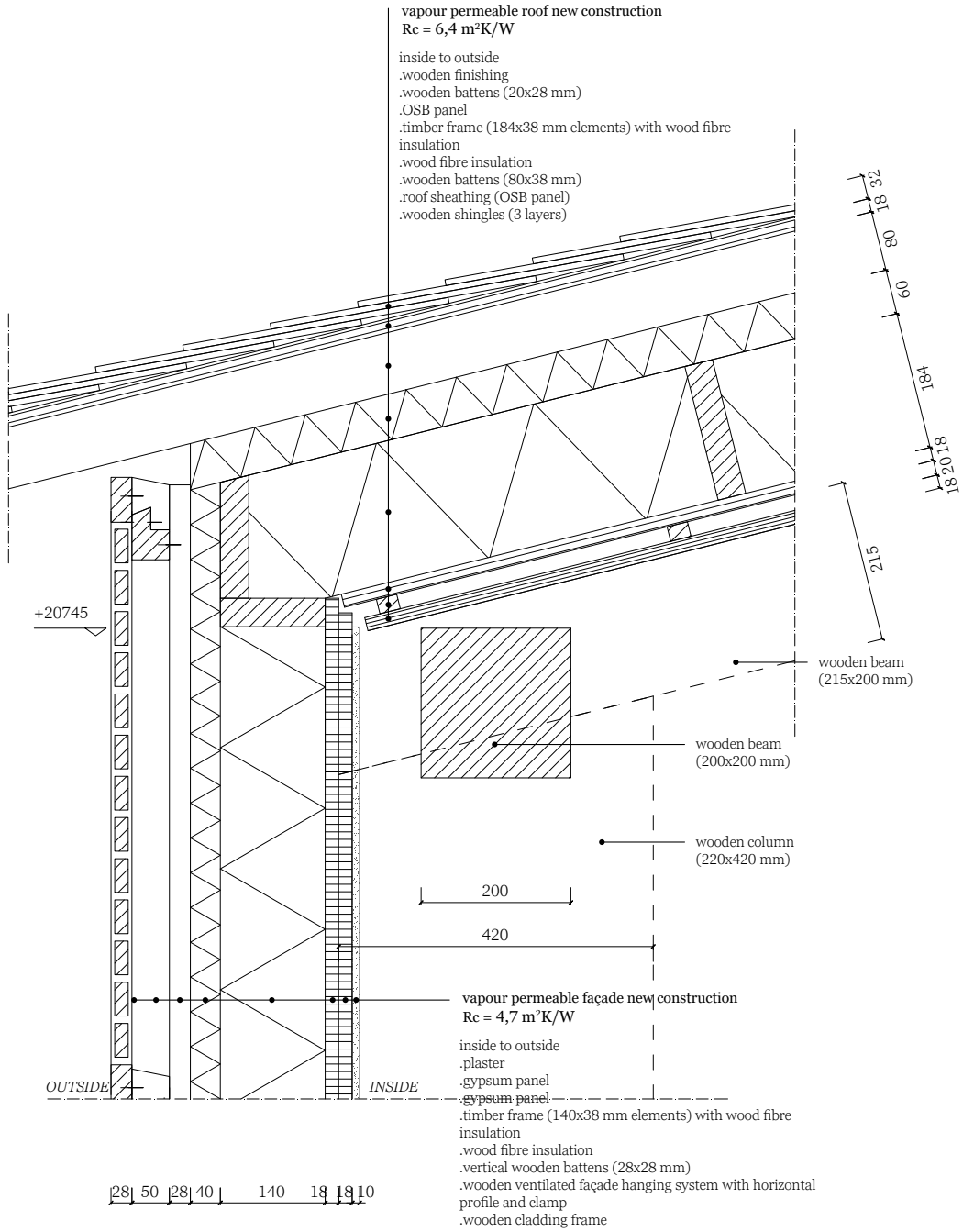


façade ground floor - *horizontal*
1 : 5



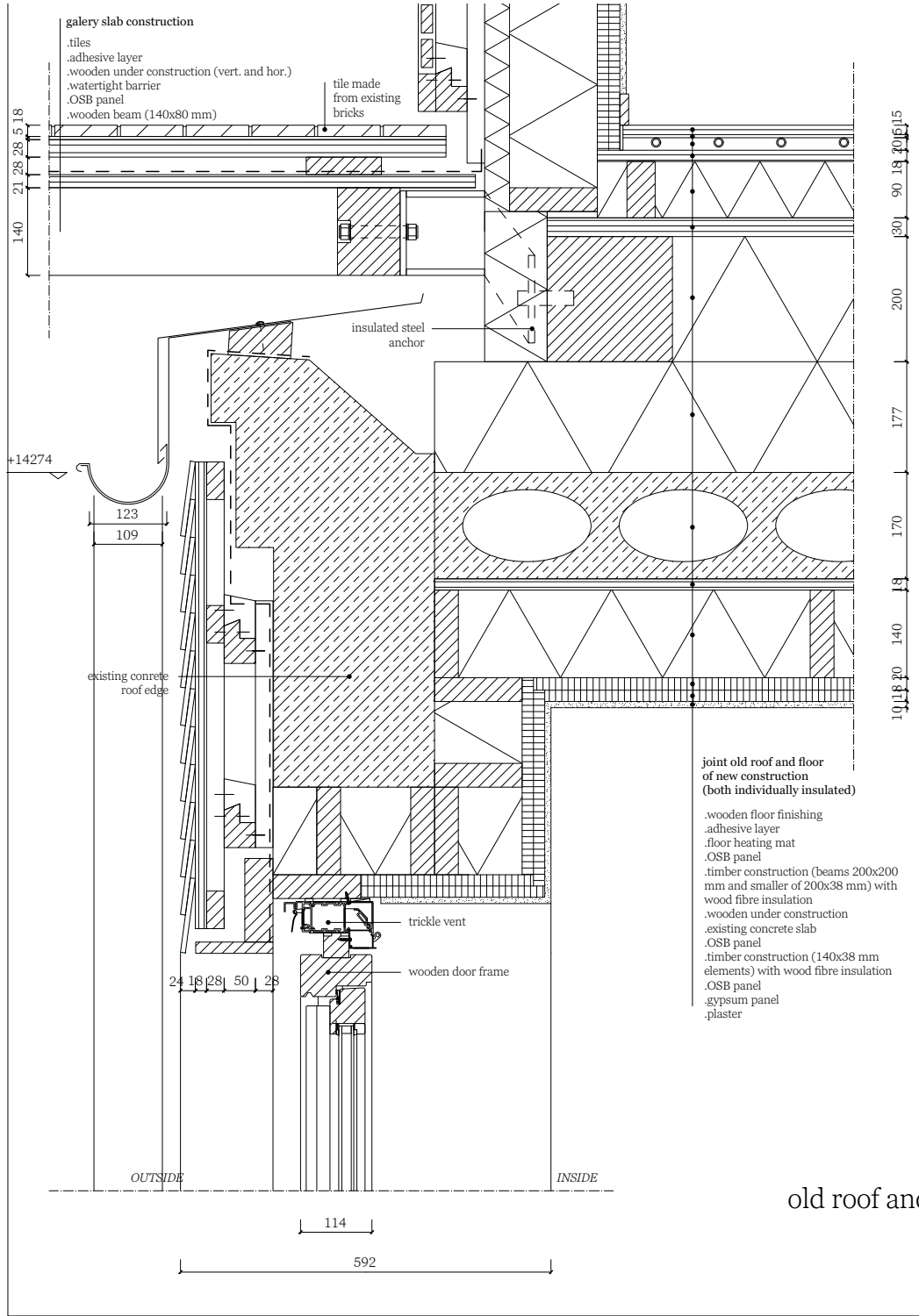
façade additional storeys - *horizontal*

1 : 5



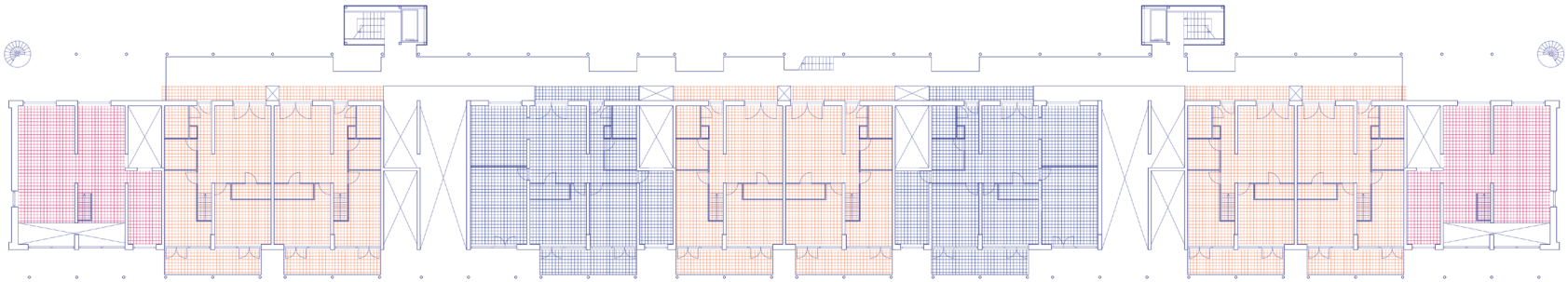
roof additional storeys - *vertical*

1 : 5

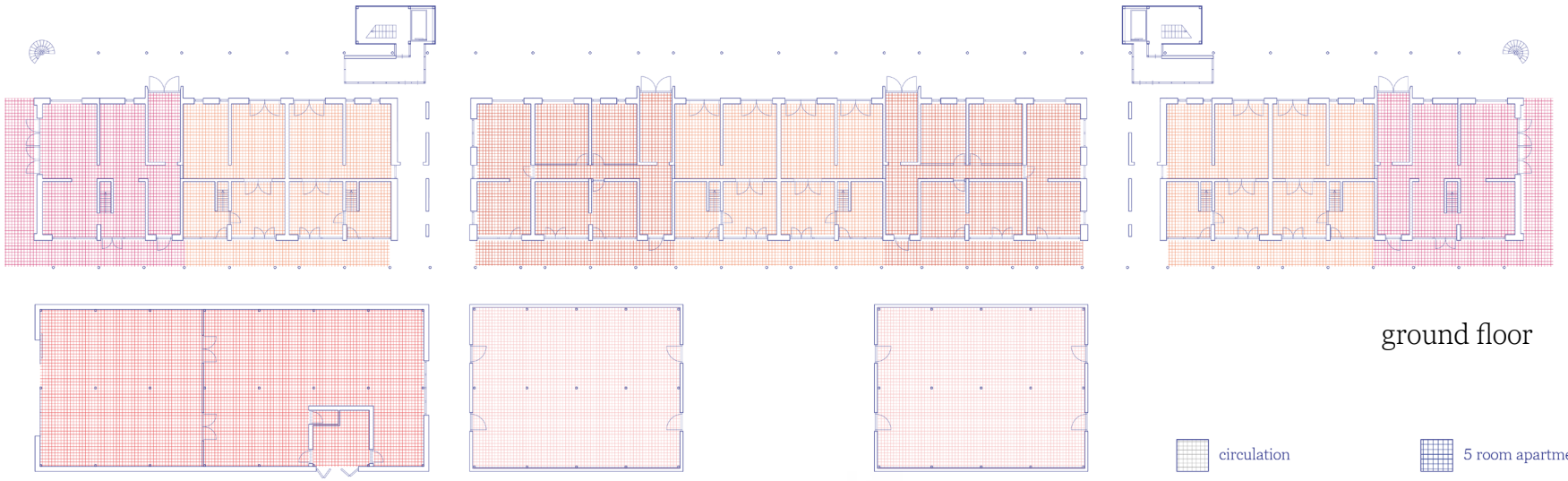


old roof and additional storeys - *vertical*

1 : 5

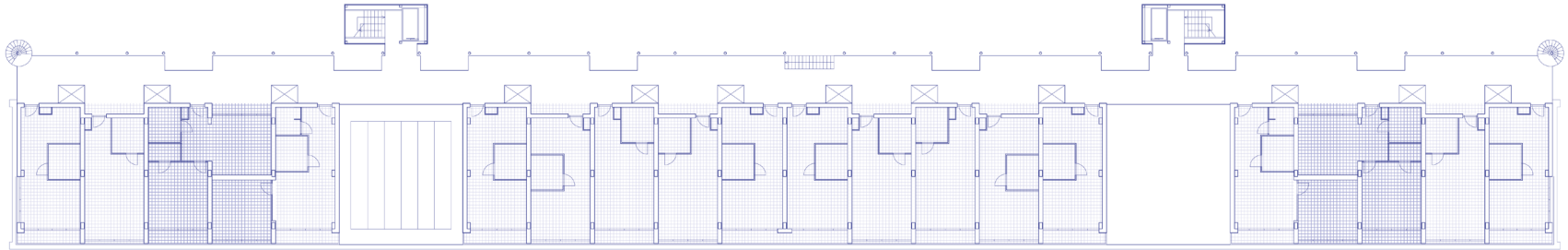


first floor

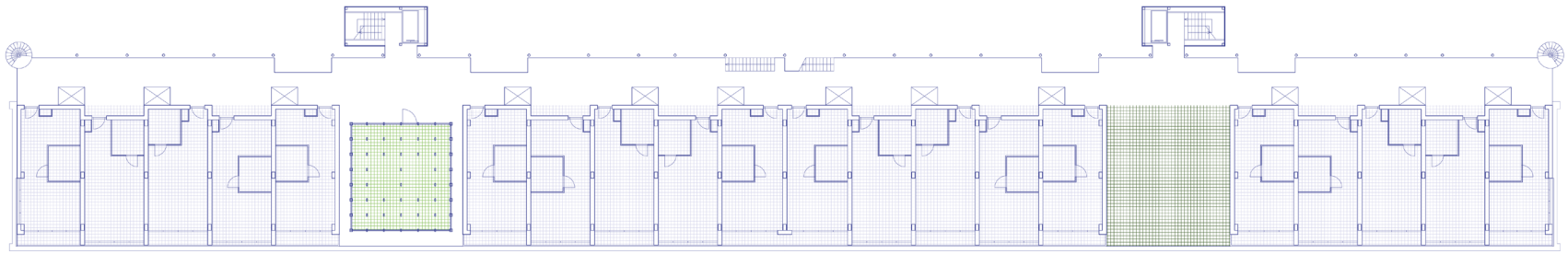


ground floor

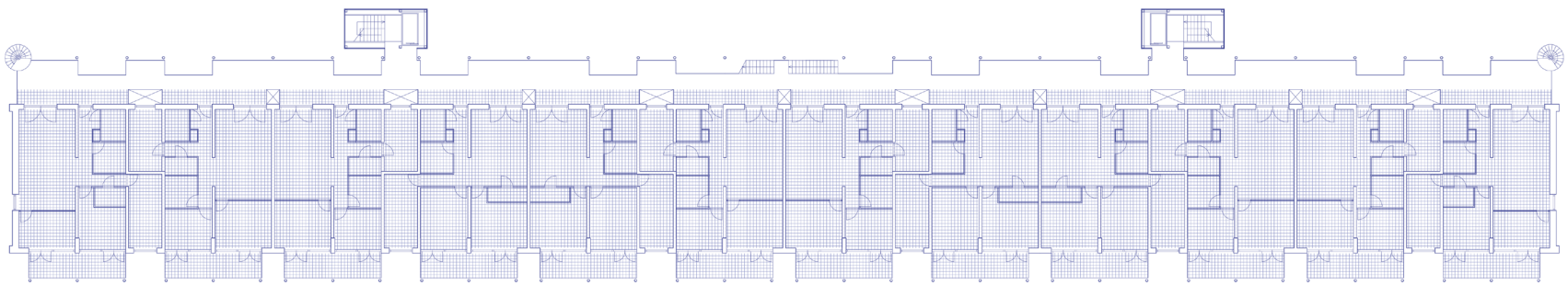
circulation
bike storage
wood workshop
2-storey public function with terrace
work / studio spaces
store adjoining 4 room apartment
5 room apartment
4 room apartment
2 room apartment
studio apartment
greenhouse
shared roof terrace



sixth floor

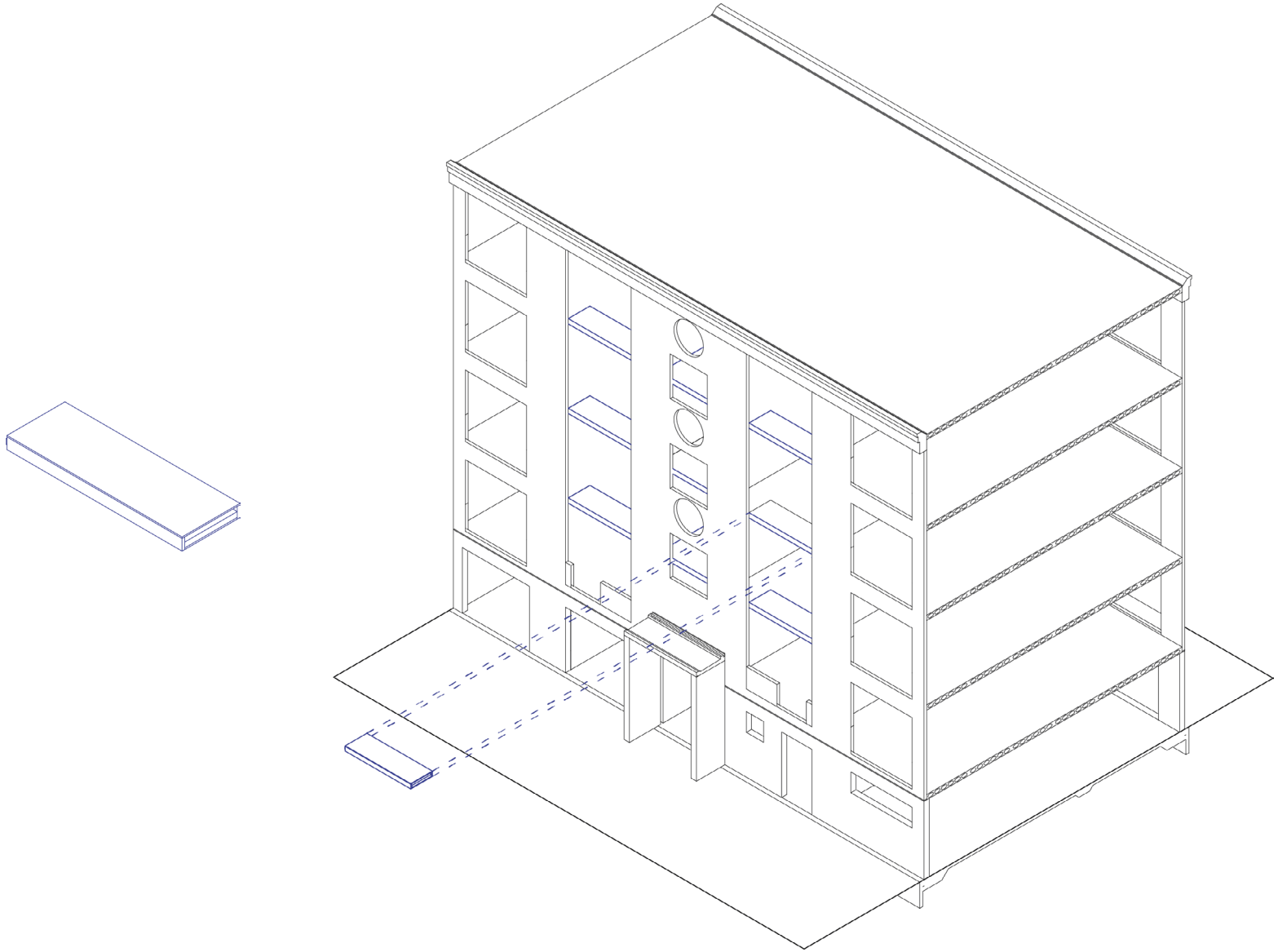


fifth floor

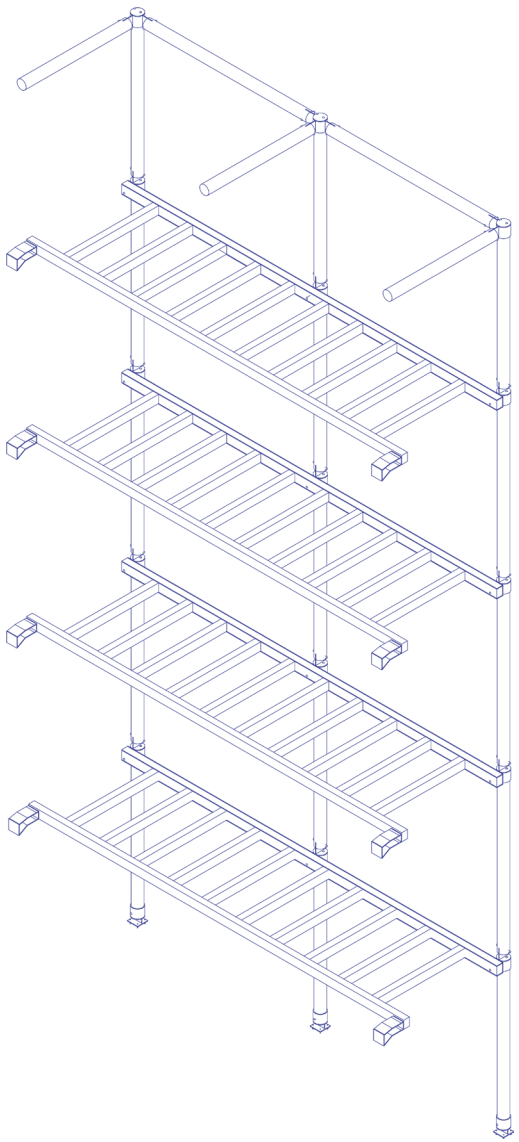


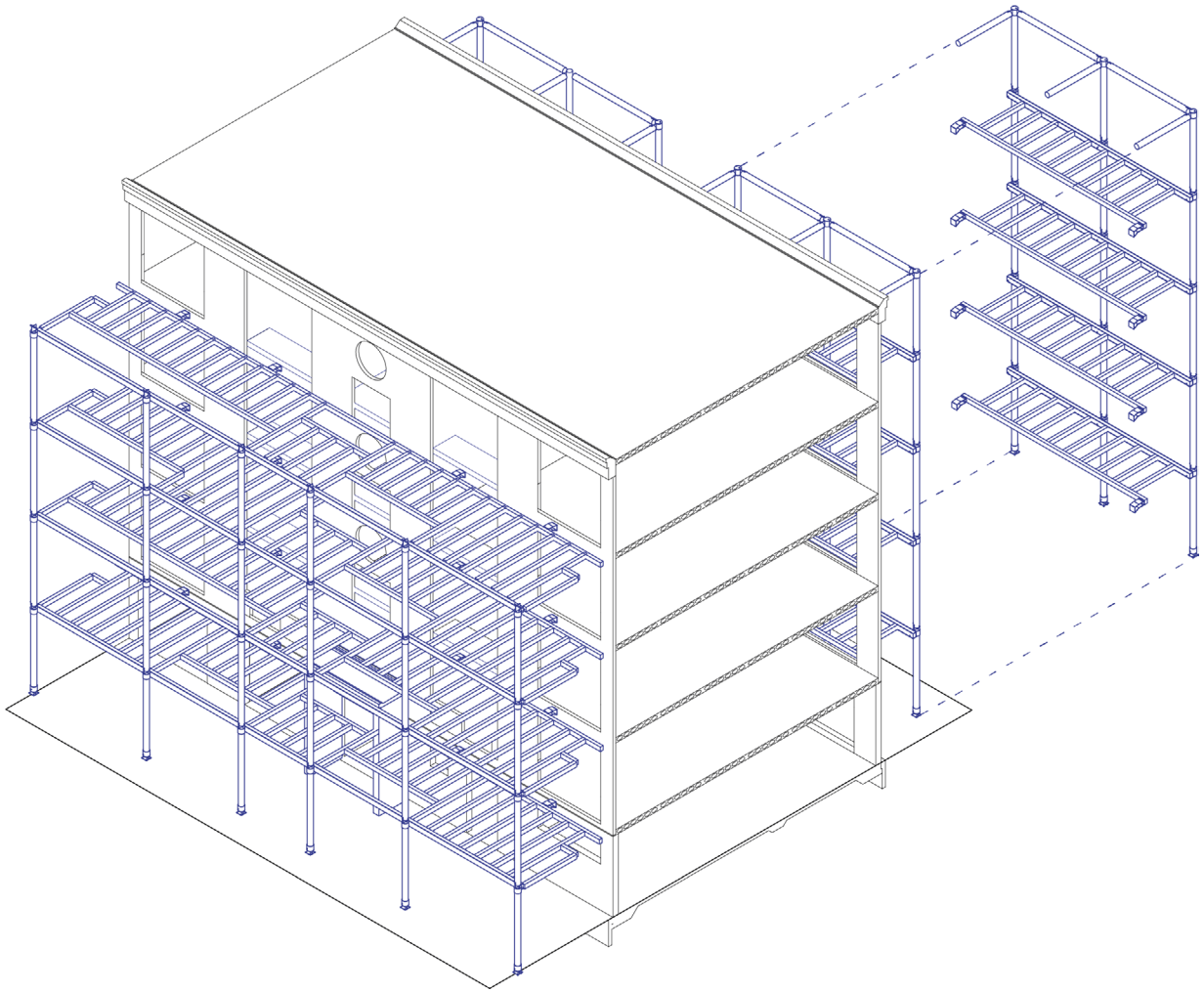
second-fourth floor

- circulation
- bike storage
- wood workshop
- 2-storey public function with terrace
- work / studio spaces
- store adjoining 4 room apartment
- 5 room apartment
- 4 room apartment
- 2 room apartment
- studio apartment
- greenhouse
- shared roof terrace

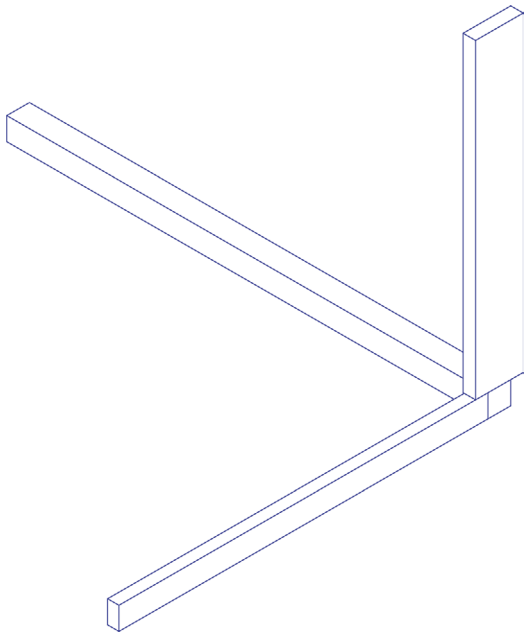


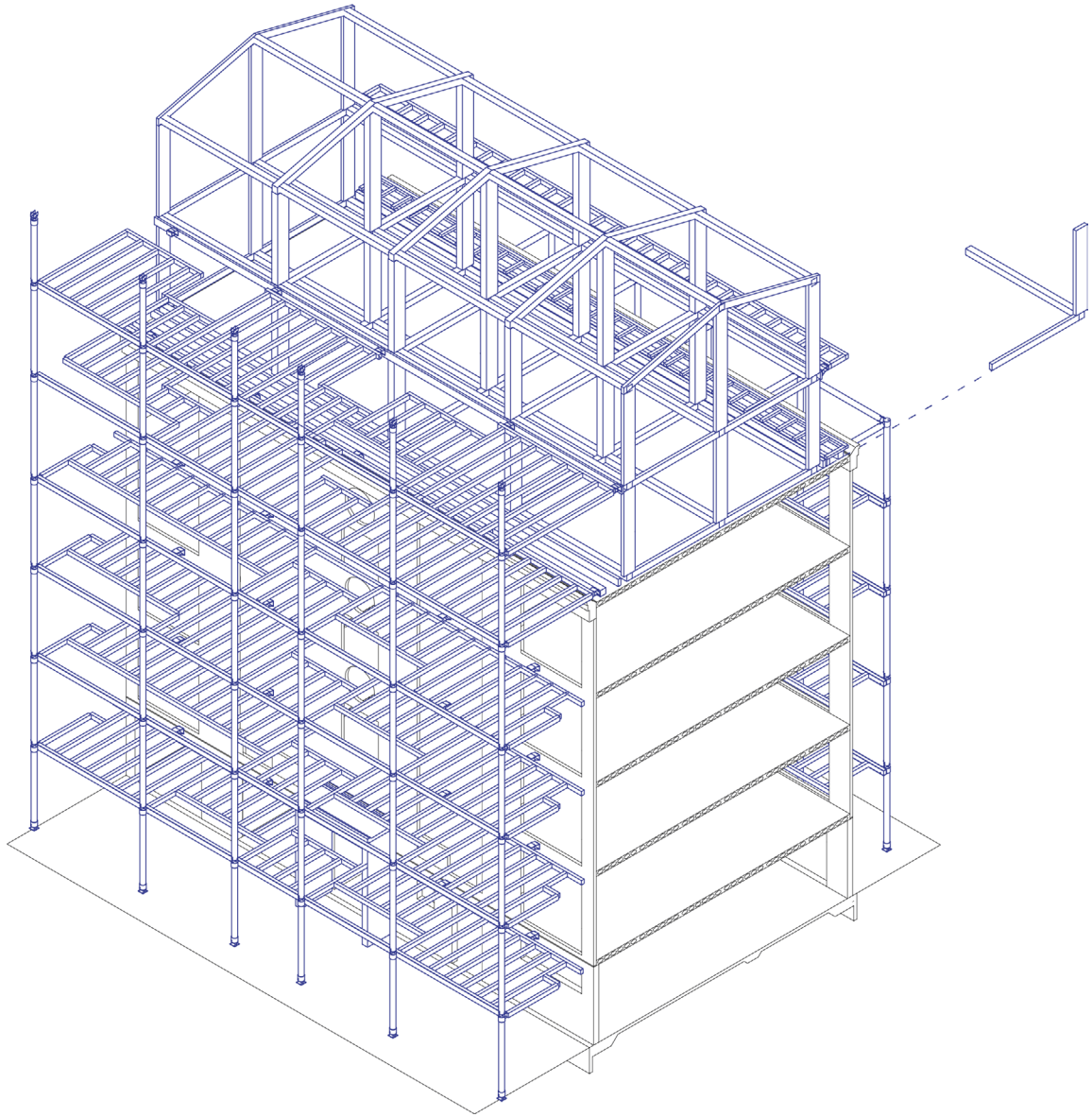
filling openings in existing floors



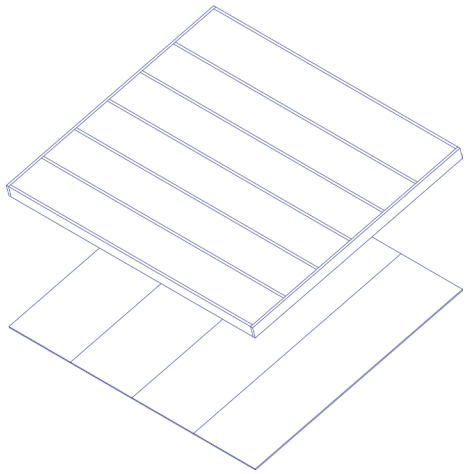


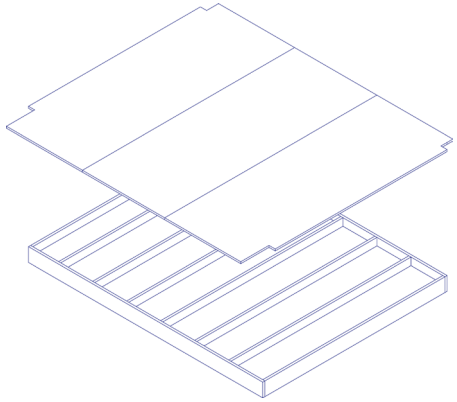
galery & balcony structure

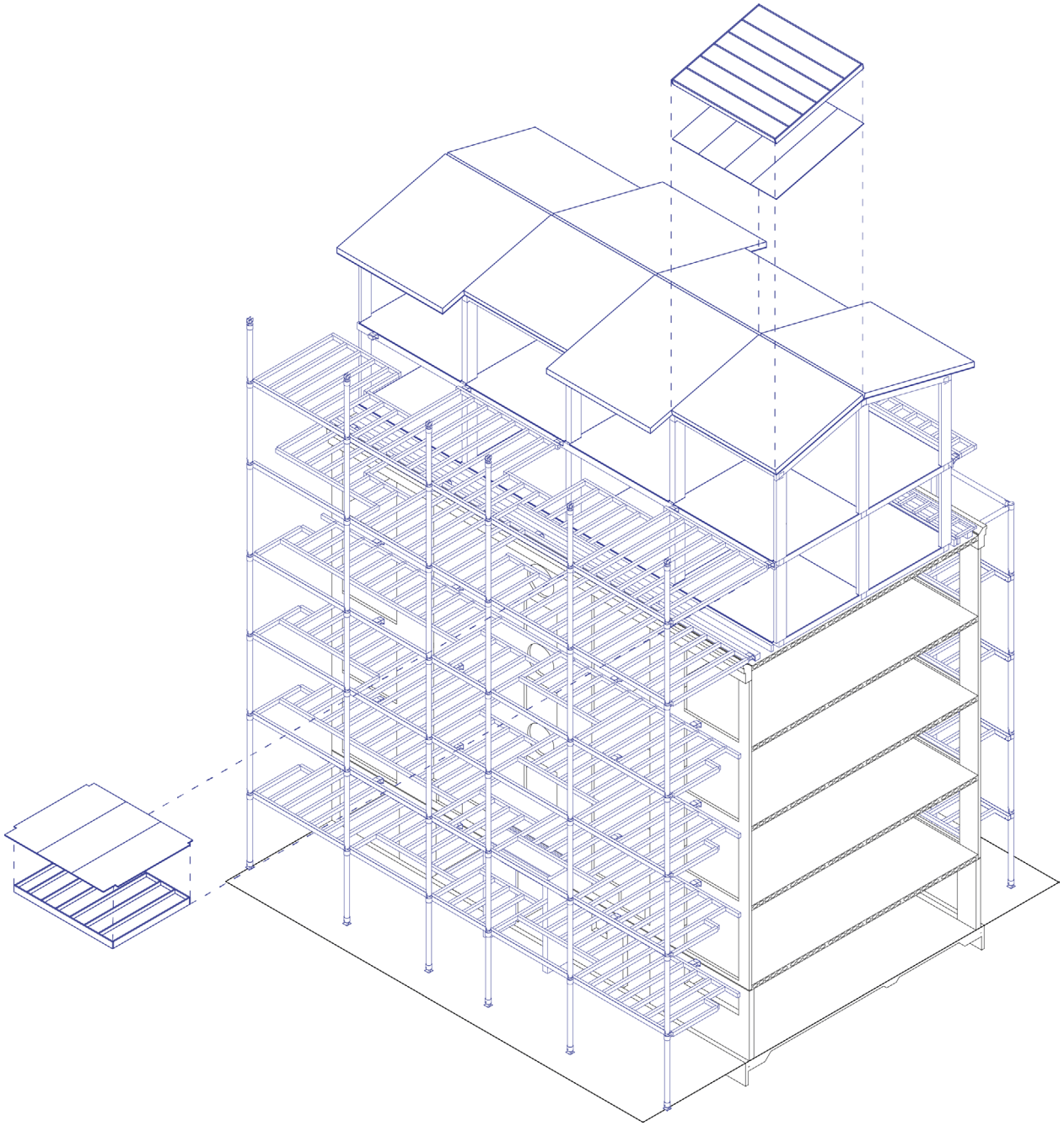




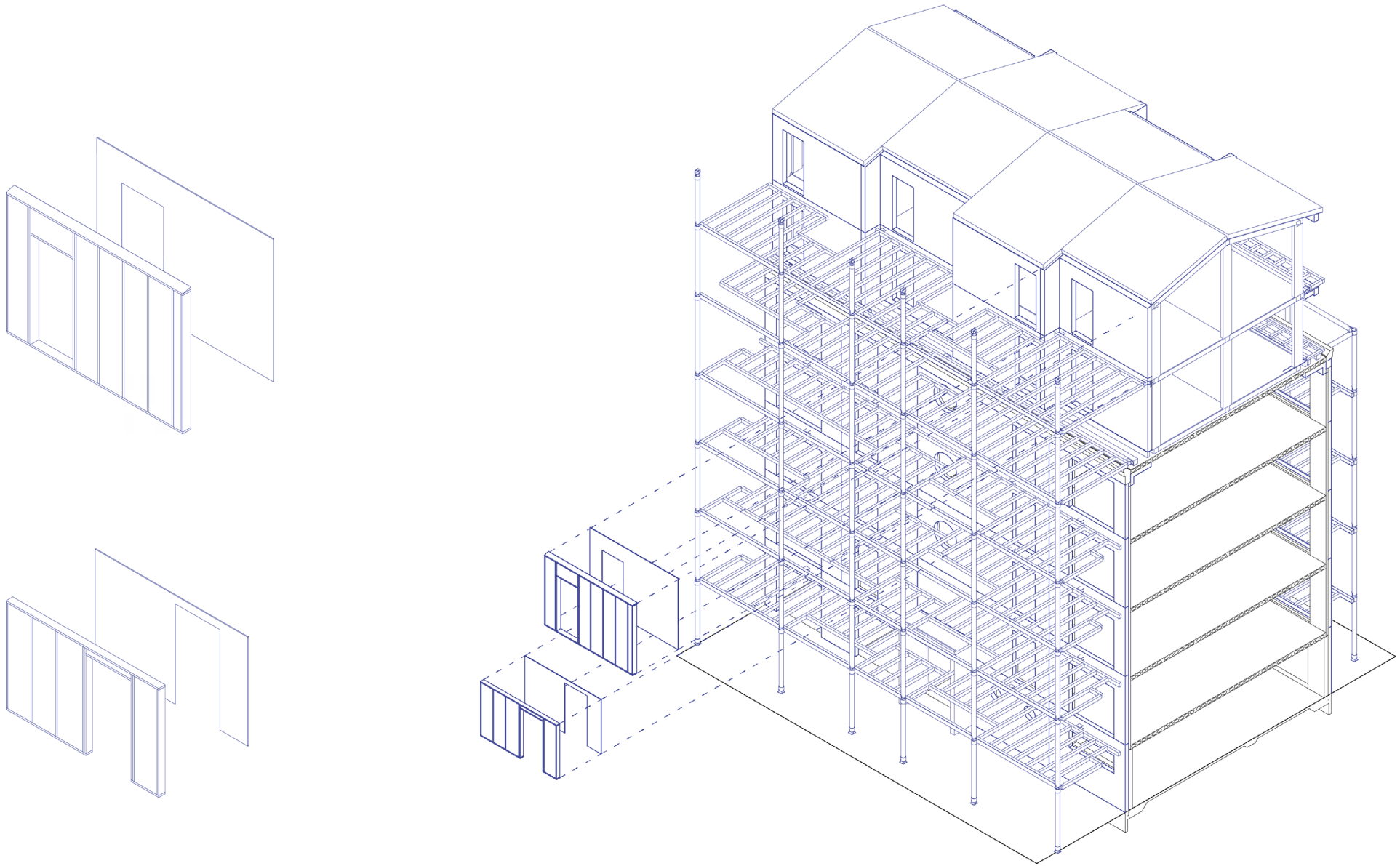
galery & balcony structure, structure additional storeys



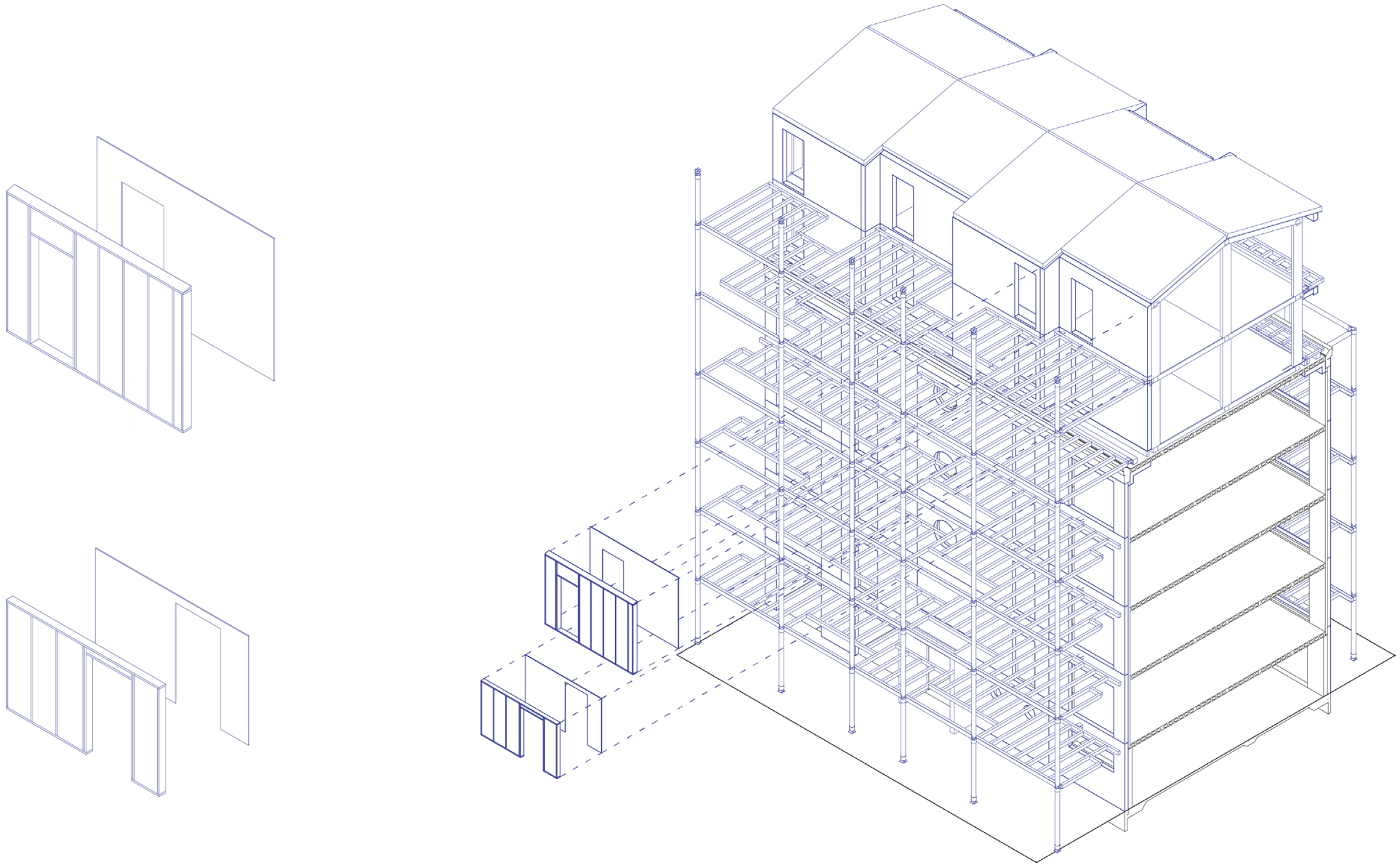




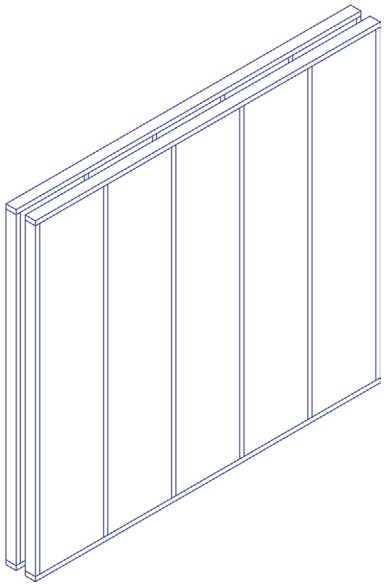
floor and roof additional storeys

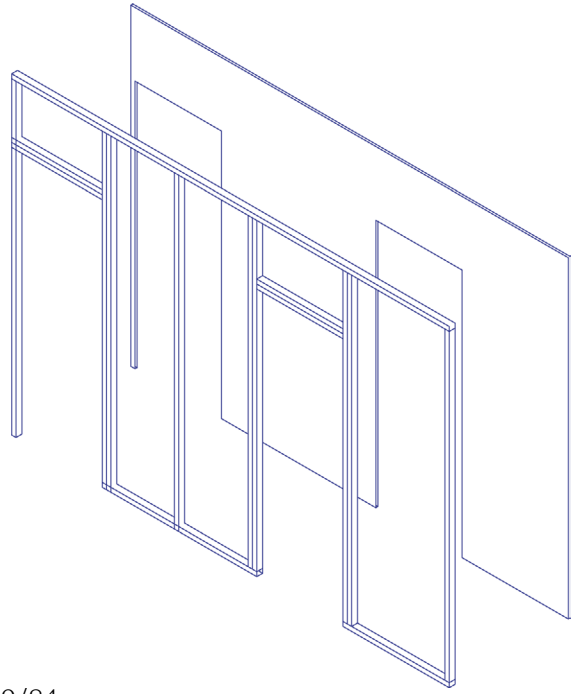


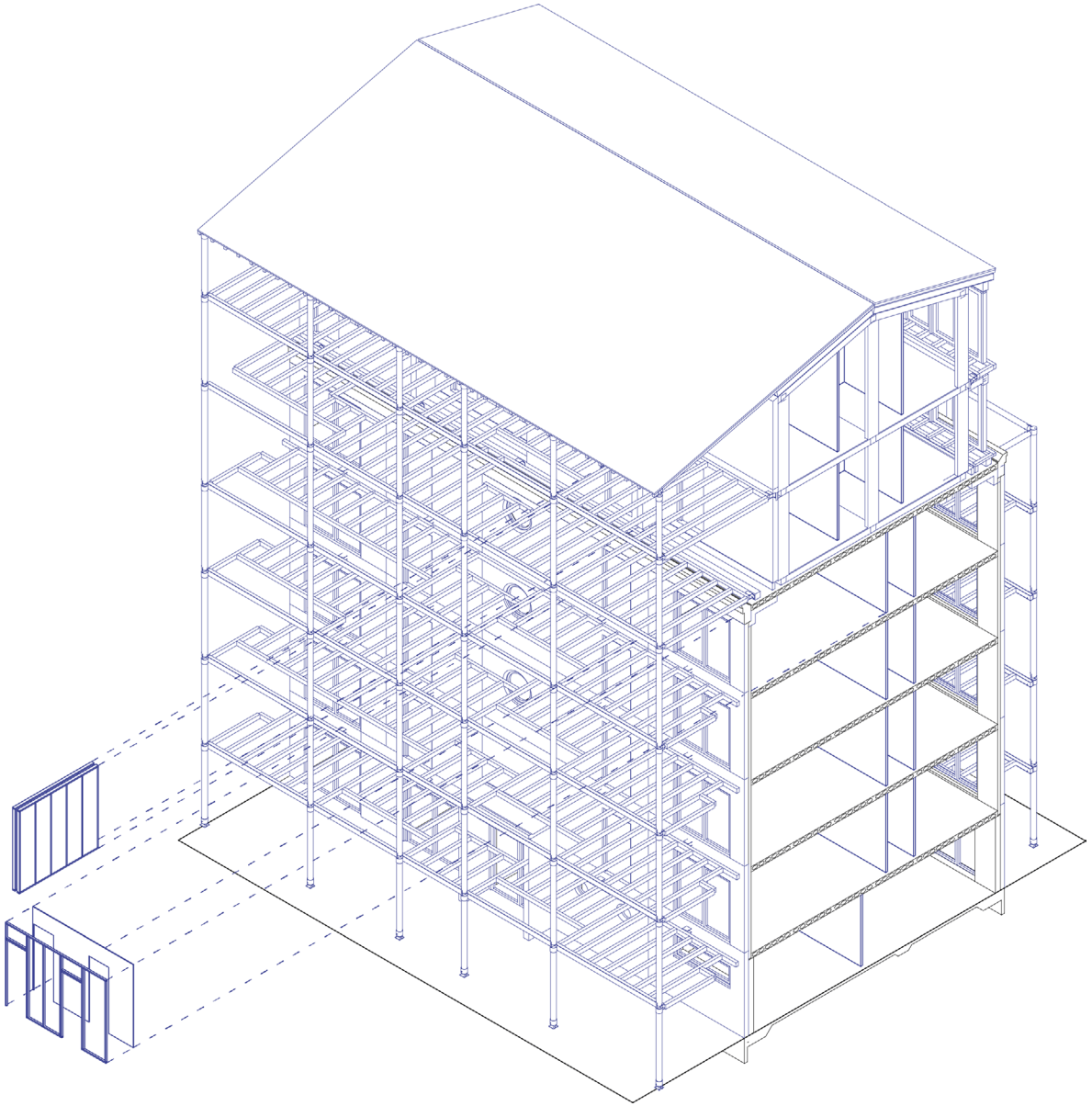
insulation of existing, façade additional storeys



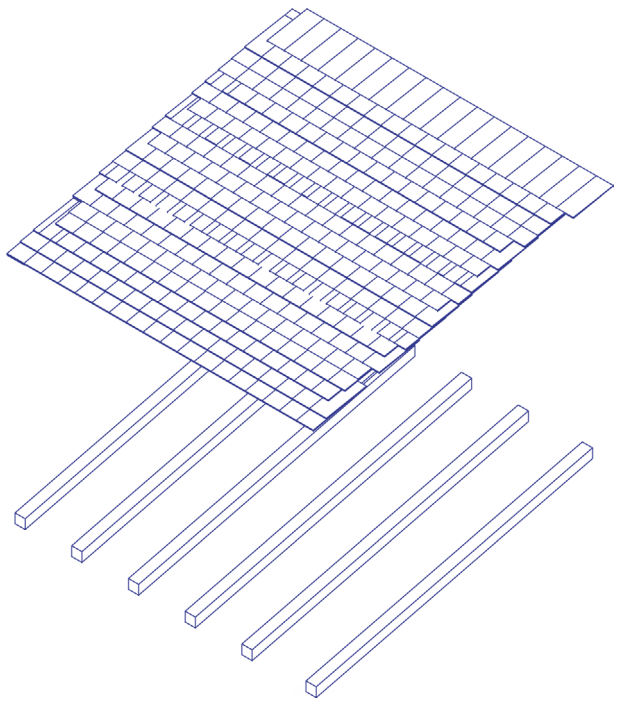
exterior doors & window frames

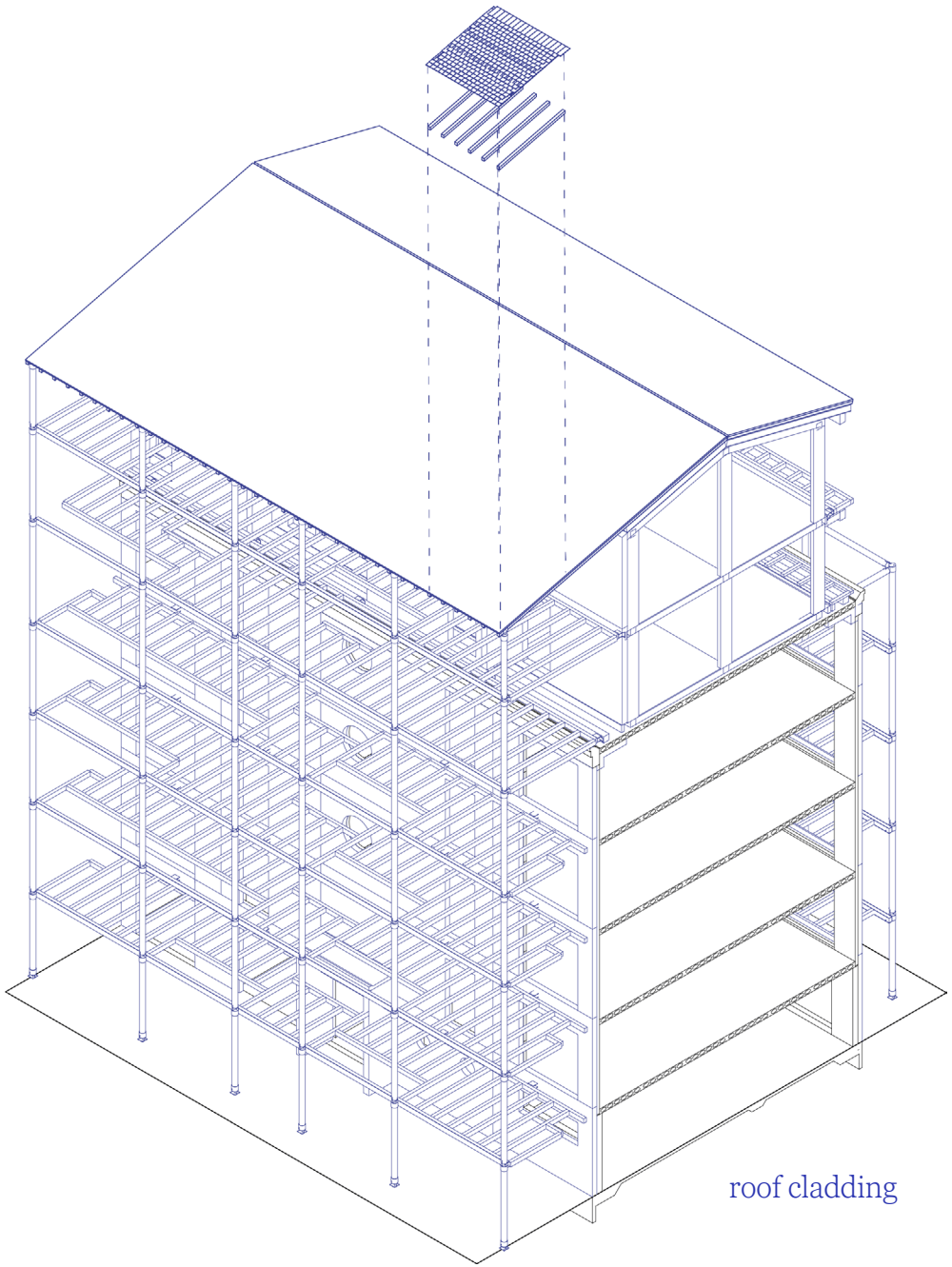






interior walls additional storeys




roof cladding