

Grochowska Row Revival

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Jan Zawadzki



Poland



Warsaw



Grochów



[\(https://earth.google.com/\)](https://earth.google.com/)



https://fotopolska.eu/80386,str.html?map_z=17&l=2284128-foto

~1920s

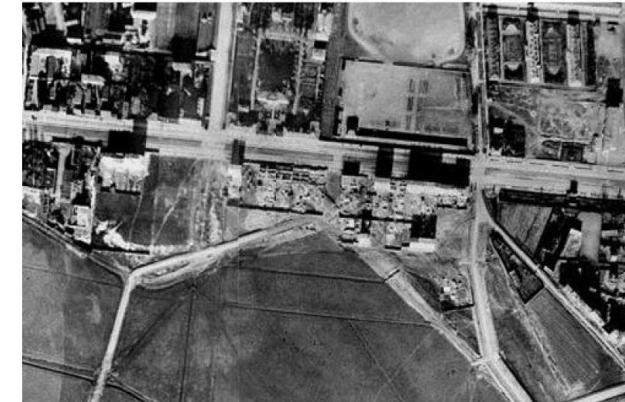
Grochów district being Warsaw's "far-west", swamps, fields, wooden huts.



https://fotopolska.eu/408985,obiekt.html?map_z=17&l=1371179-foto

~1930s

Growing industrial hub, rail, various factories defining the landscape.



<https://mapa.um.warszawa.pl/>

1935

First non-timber mass housing constructed for incoming workers, Grochowska street becomes hard surface.



<https://fotopolska.eu/1836879.foto.html>

Rapid Growth

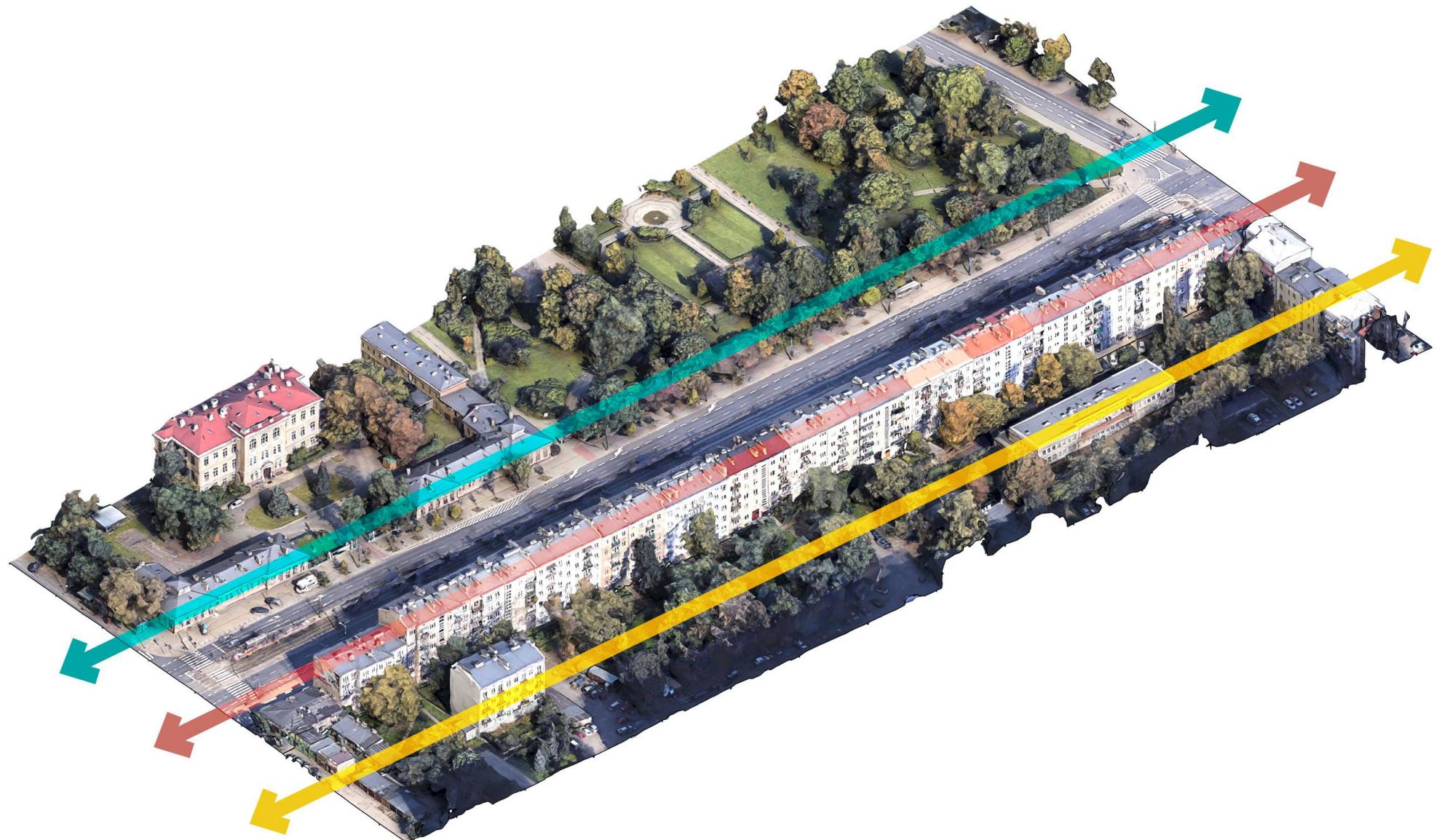
Grochów experiences rapid growth during the inter-war period, with factories and new housing directly neighbouring fields and slums.

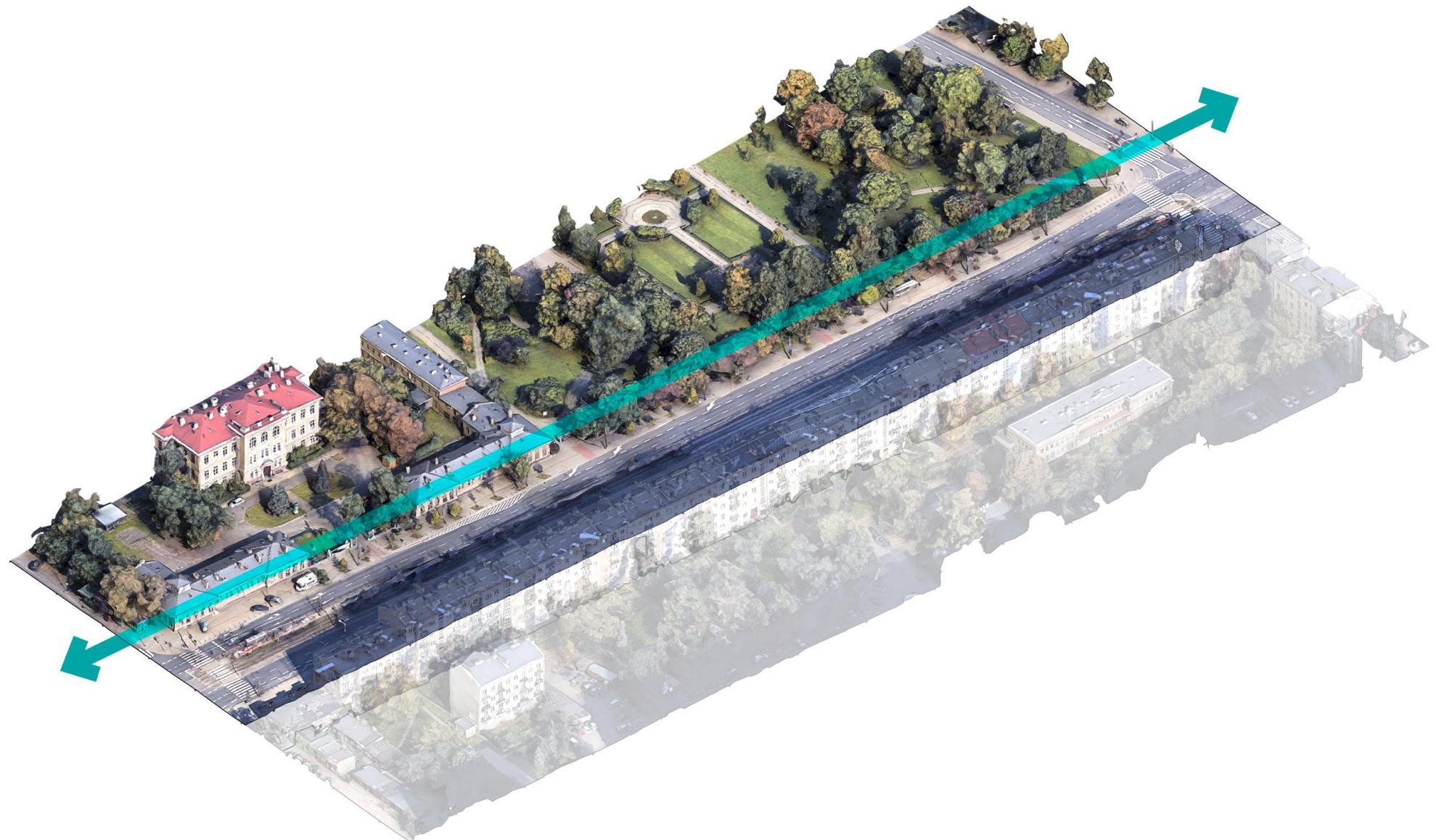


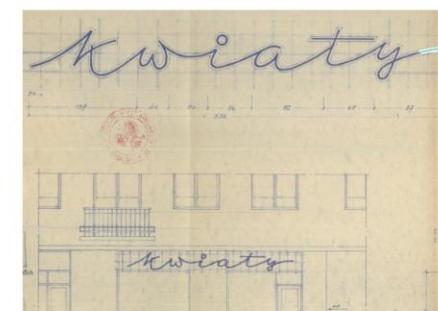
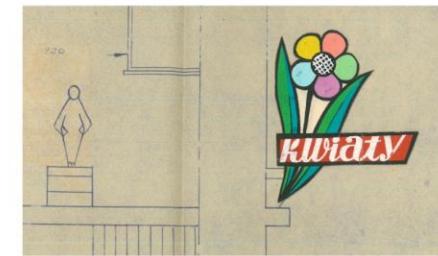
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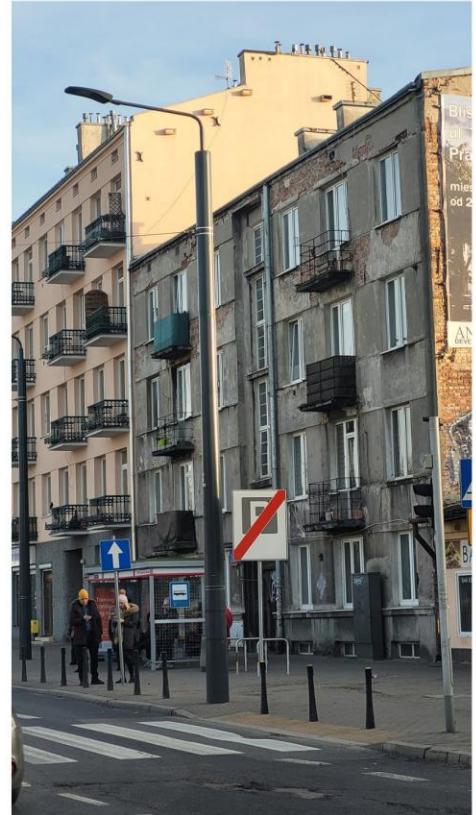
Mass Housing

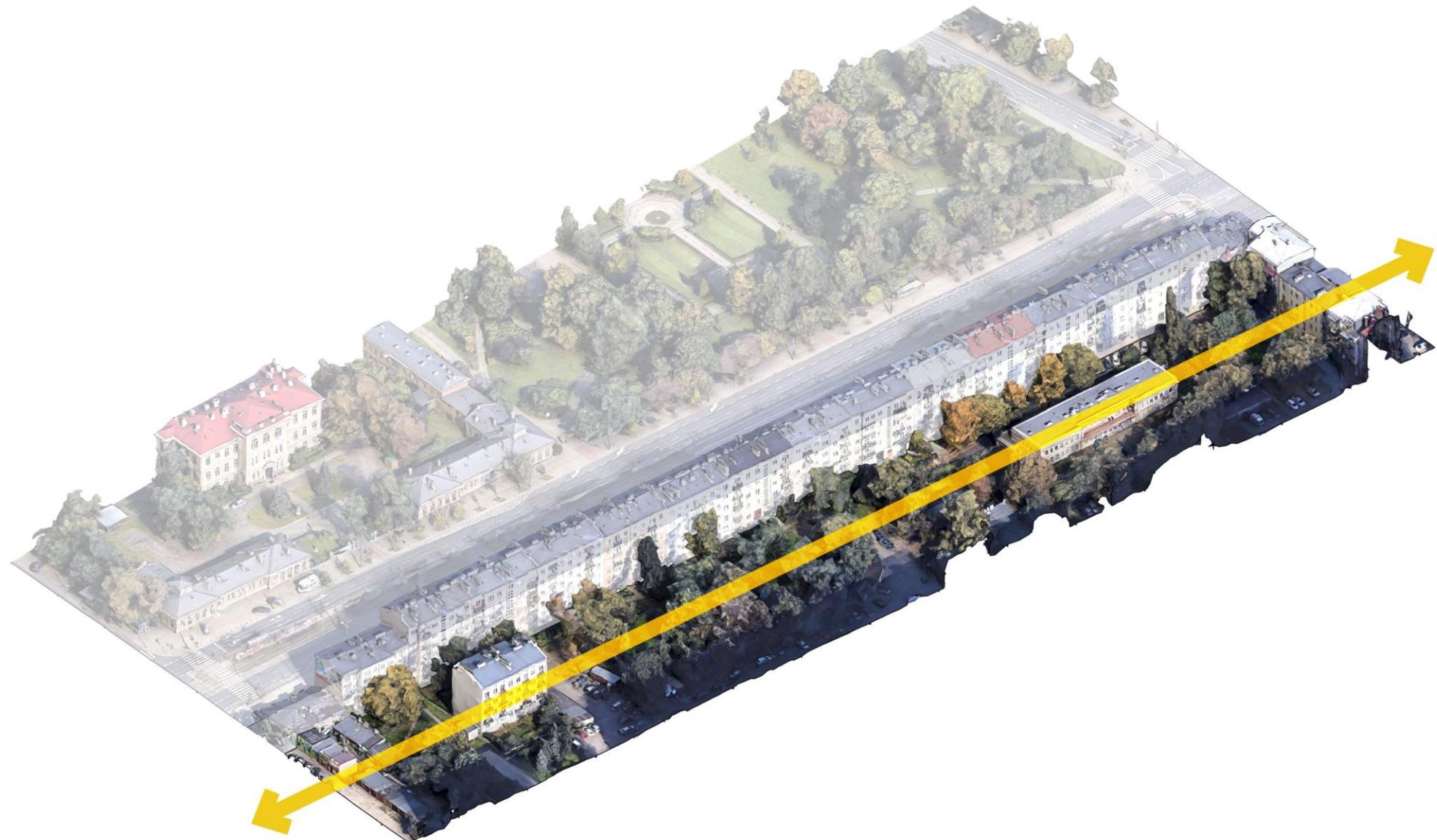
Mass housing built just before the war to provide for workers needs, with sewage and running water. Erected in batches, probably by the same teams.















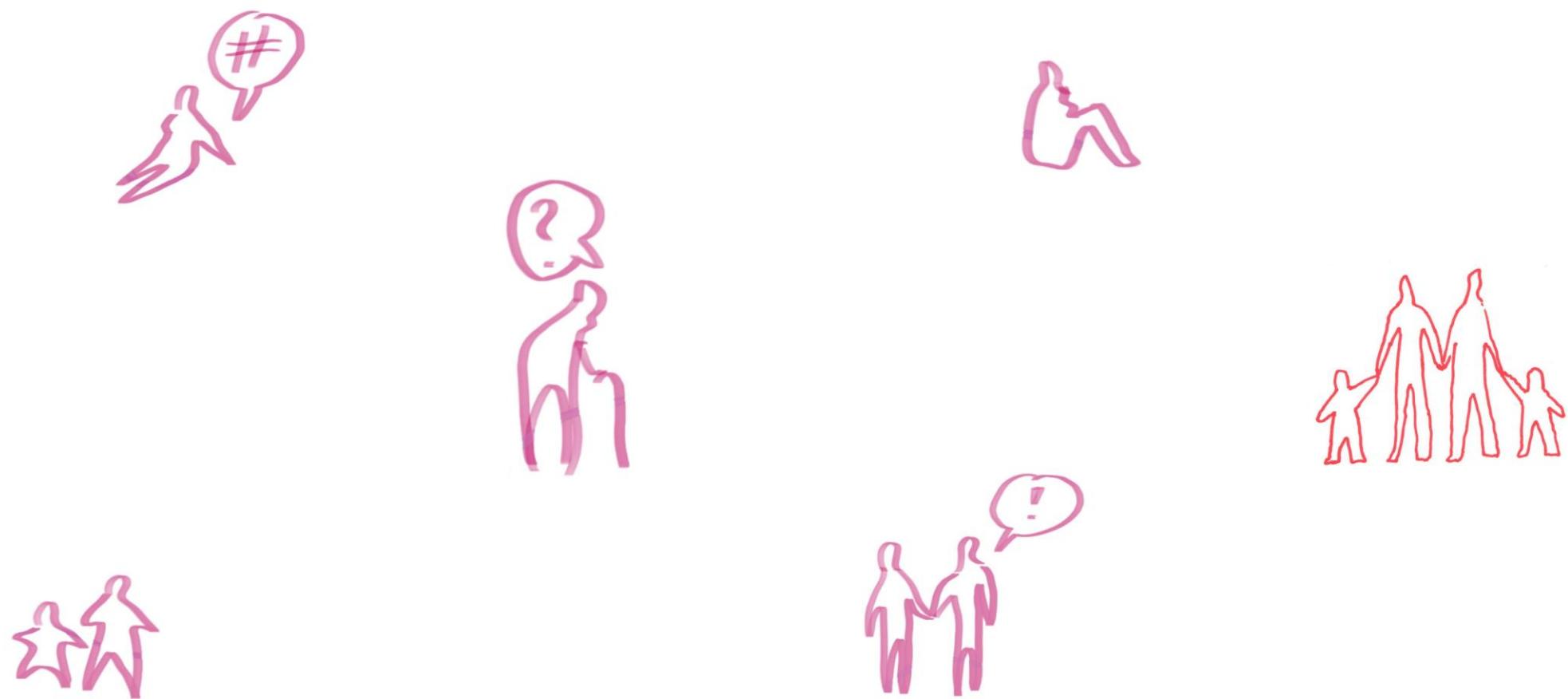
Elderly

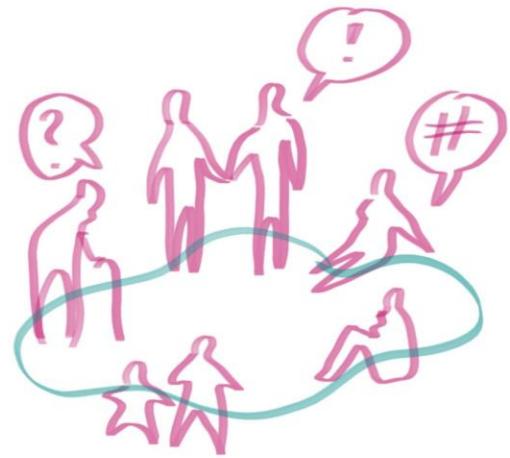


Elderly

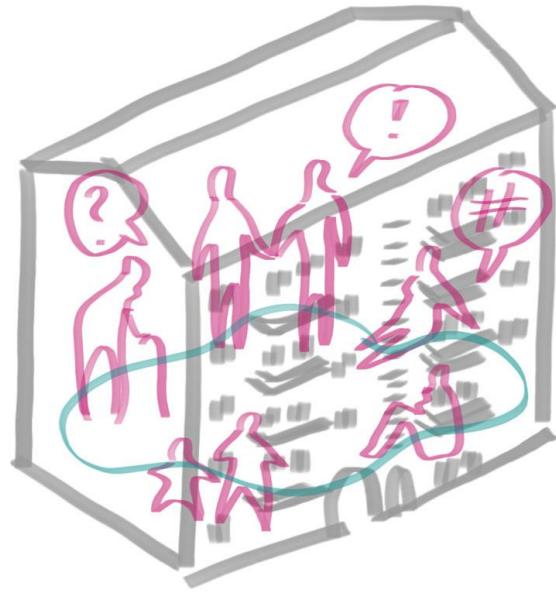


Local Family

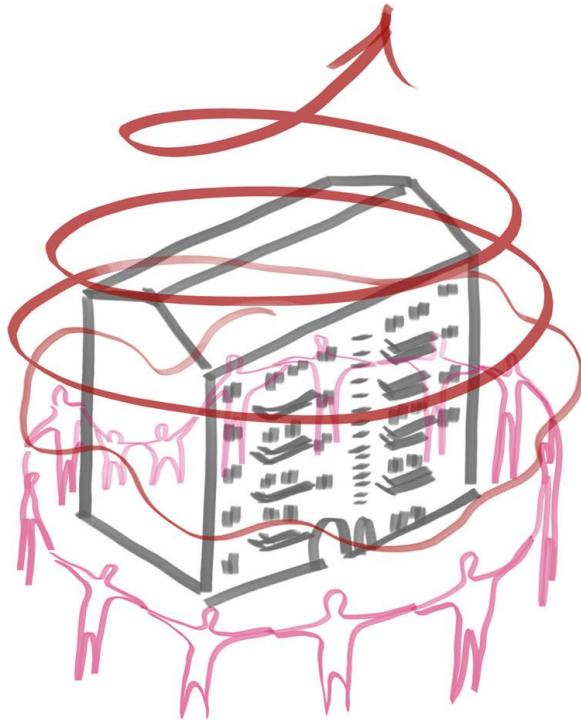




Lively Symbiosis

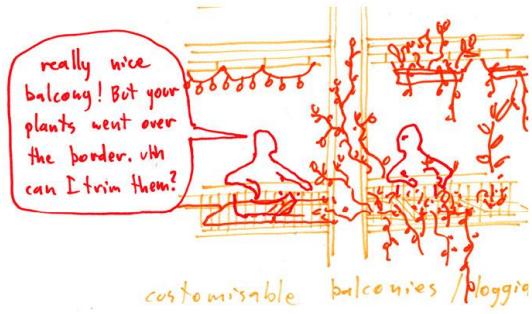
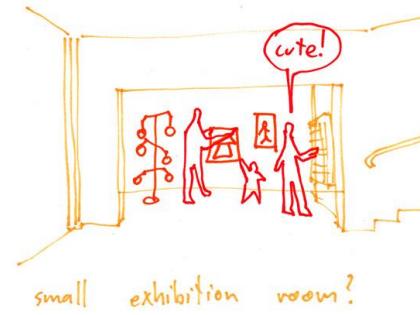
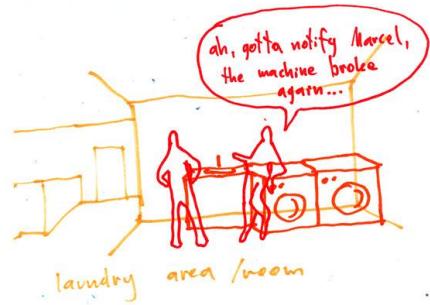


Lively Symbiosis



Building (self)Healing

Buildings can “heal themselves” if the community action is strong among residents. How can I facilitate that more with the design?



Can design build community?





Google.pl



Google.pl



Google.pl



Google.pl



Murator.pl

Deterioration

Many buildings did not see treatment since construction, bare brick faces the exterior.

Chaotic Progress

Potential for systematic action is overlooked, leading to chaos and deepened inequalities.

User Exclusion

In the process, the needs of users, the most vulnerable, are often forgotten.

Conservative Practice

Rarely a circular approach is even taken into account in Polish practice.



Visible Similarity

Though not modular, such as post-war “big-plate” mass housing, those buildings share key similarities within typology.

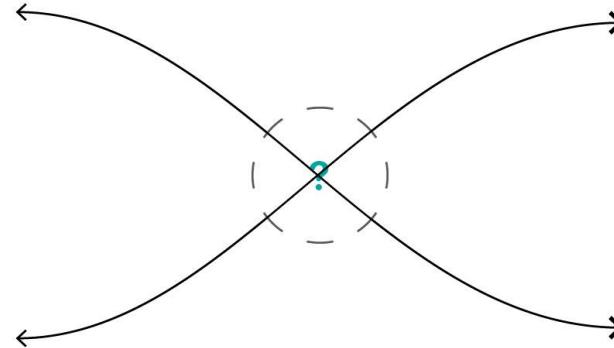


<http://ukosne.um.warszawa.pl/>

Is there more?



Original averaged Grochowska typology



*Comparison to Grochowska typology via
DINOv2 foundation model*

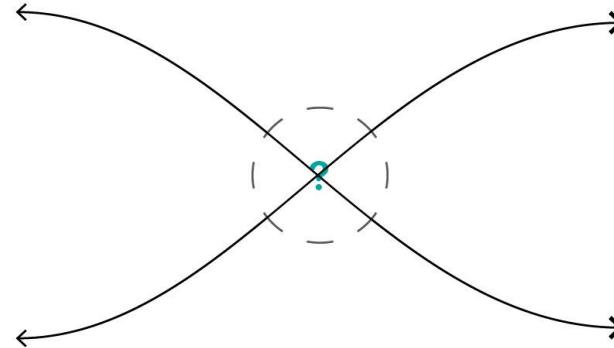


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*Checking ismilarity with 3200 buildings from
Warsaw. Pre-filtered with geospatial data.*



Original averaged Grochowska typology



*Comparison to Grochowska typology via
DINOv2 foundation model*



<http://ukosne.um.warszawa.pl/>

*Checking ismilarity with 3200 buildings from
Warsaw. Pre-filtered with geospatial data.*

Building Rank: 0, ID: 103502



~450

Buildings closely matching Grochowska typology

~120

Buildings of exact typological match

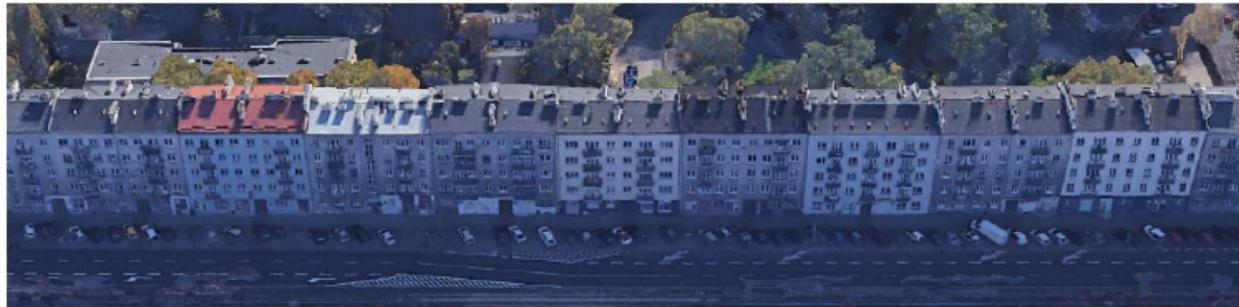
*sorting
ranking
empirical analysis*







Mokotów



Grochowska



Sosnowiec



Gdańsk



Pruszków



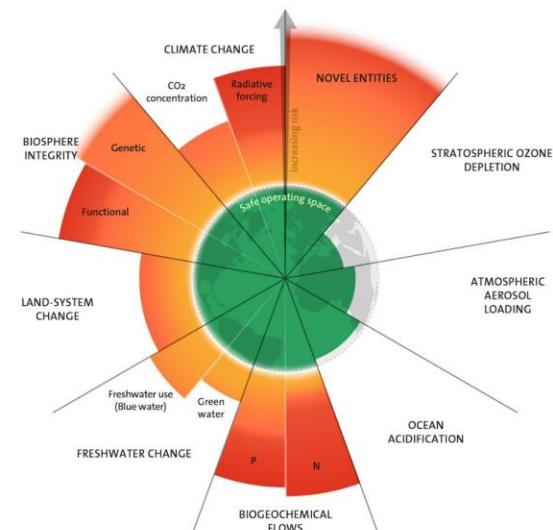
A System! to enable scalable impact

Similar topologies common in other parts of Warsaw and other cities in Poland. There is a potential for considerable, scaled improvement by designing a “system” for refurbishment that could be easily applied to other buildings from this same typology.

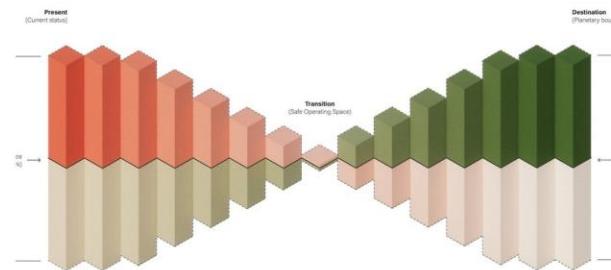








stockholmresilience.org



reductionroadmap.dk



dezeen.com

Call for drastic measures

IPCC, EU, WEF, and many other institutions leave no doubt that a paradigm shift is needed to break from the marasmus of climate inaction.

No carbon budget left

Reduction Roadmap, among many, shows that we simply do not have almost any carbon budget left for construction, to stay safe.

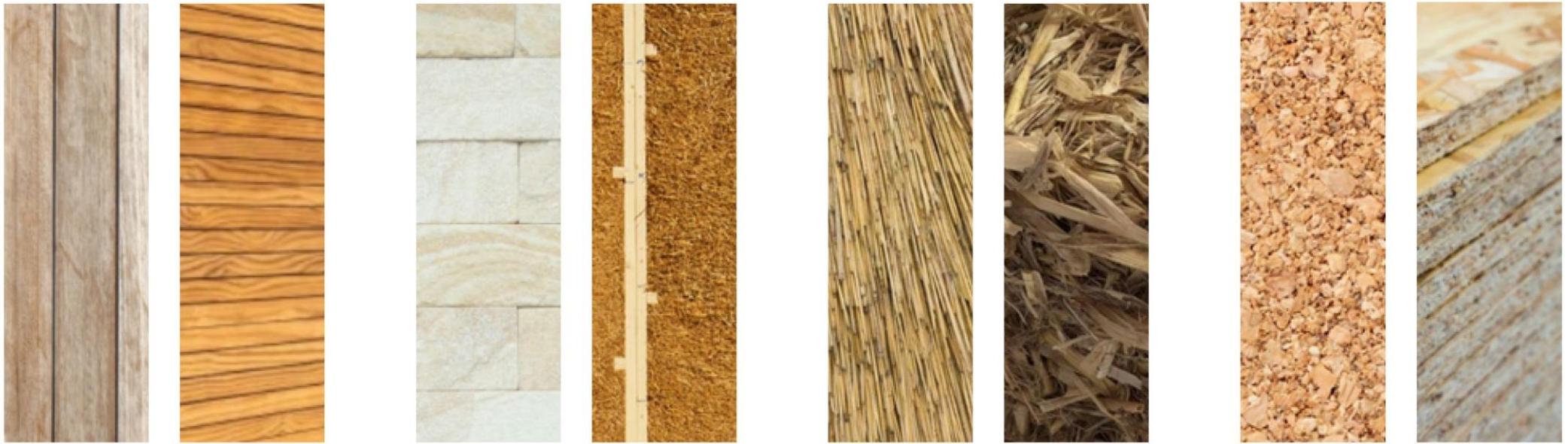
Stop building!

We need to reduce emissions by 96%, as estimated by Reduction Roadmap. So we either stop building, or do so completely differently.



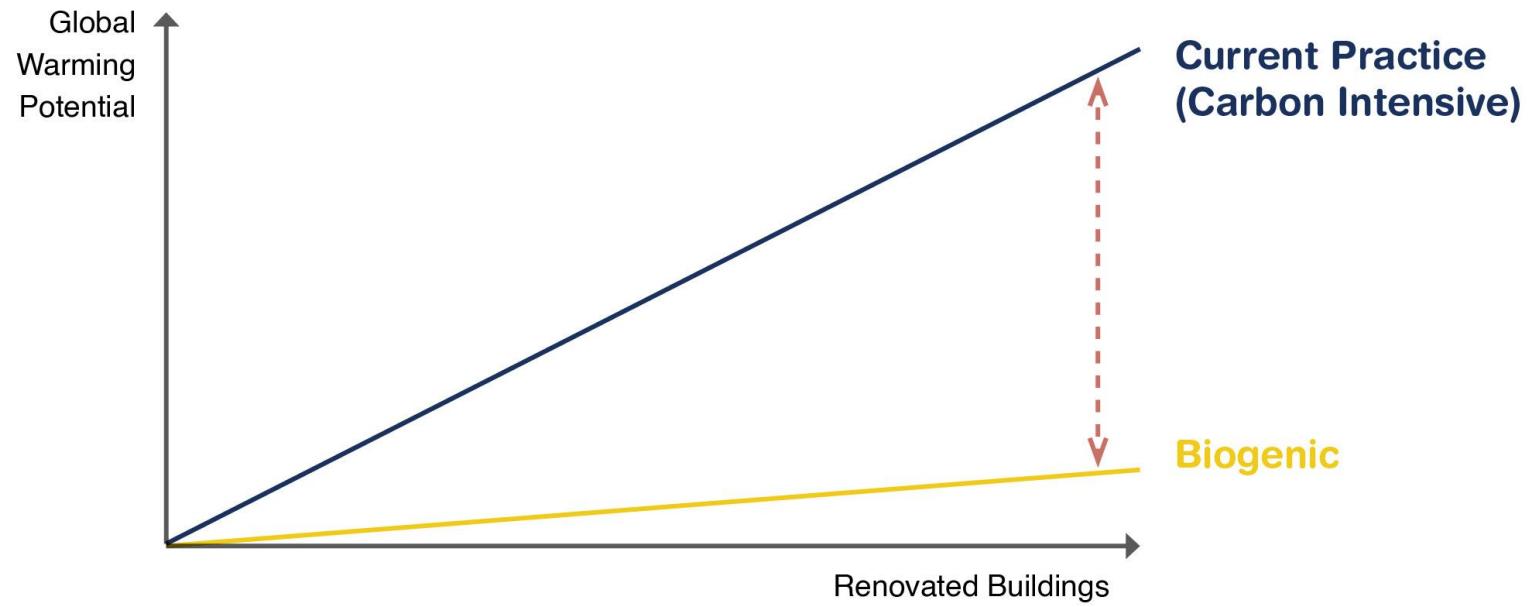
Make use of what's out there first

Better materials or techniques will not save us if we continue building at this rate anyway, but we cannot stop building fully. We must cleverly reuse and upgrade what is available.



Let's maximise bio-based material use

Biogenic materials are renewable, biodegradable, can store carbon, are proven to be safe by millennia of architecture practice, and we can do even better now, rediscovering them.



Scale makes a difference



Regulations + Habits



Limited Availability



Lack of Knowledge

Helping myself and contributing to others

How to integrate bio-based solutions in masonry building retrofitting, considering both technical requirements and user preferences?

What are the technical requirements while futureproofing masonry buildings?

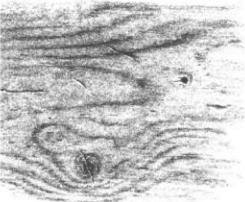
What are the user needs and priorities in transition towards biobased futureproofing?

How biogenic materials fit into these predefined metrics?

How can an accessible knowledge base of biobased refurbishment strategies help advance their adoption rate?

How to do it right?

BIO-BASED MATERIAL CATALOGUE



Jan Zawadzki | Delft | 2025



Grass Fibre | Gramitherm

Main Material	Grass Fibre
Main Purpose	Insulation
Short Description	Soft and flexible grass fibre insulation boards
GWP A1-3 [kg CO ₂ eq/m ³]	-50.1
Standard Thickness [mm]	100
Density [kg/m ³]	40
Thermal Conductivity [W/mK]	0.04
Primary Energy A1-3 [MJ/m ³]	1298
Fire Resistance Class	E
Organic Content [%]	92
Compostable	No

Insulation 2



Softwood Cladding | Latvia Timber

Main Material	Wood
Main Purpose	Finishing
Short Description	Plained softwood products for finishing elements eg. cladding
GWP A1-3 [kg CO ₂ eq/m ³]	-647
Standard Thickness [mm]	20
Density [kg/m ³]	438.95
Thermal Conductivity [W/mK]	not listed
Primary Energy A1-3 [MJ/m ³]	17500
Fire Resistance Class	not listed
Organic Content [%]	100
Compostable	Yes

Finishing 19



OSB Ecoboard | Sonae Arauco

Main Material	Wood
Main Purpose	Structure
Short Description	Oriented Strand Boards
GWP A1-3 [kg CO ₂ eq/m ³]	-658
Standard Thickness [mm]	20
Density [kg/m ³]	600
Thermal Conductivity [W/mK]	0.13
Primary Energy A1-3 [MJ/m ³]	30530
Fire Resistance Class	D
Organic Content [%]	95
Compostable	No

Structure 26

The Catalogue

Of Bio-Based materials suitable for masonry housing refurbishment.

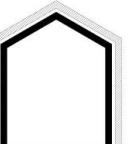
Strategies for masonry building retrofitting



Jan Zawadzki | TU Delft Architecture

Walls and Windows

Exterior Insulation



laws dictate regarding facade preservation and styling, and other situational factors such as property boundaries and aesthetic regulations. Early consultation with local authorities or heritage expert may be necessary to ensure compliance.

Exterior insulation can be applied in various ways:

1. Insulation boards with external protection. Boards are applied directly to the main wall using adhesives and bolts, followed by a layer of plaster or other protective coating. This approach is cost-effective and straightforward, suitable for a wide range of building types.
2. Substructure with ventilated insulation. A supporting framework is installed, allowing soft or rigid insulation boards to be placed between the structural elements. This assembly is then covered.

The feasibility of this approach depends on how much thickness can be added to the facade, what local

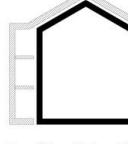
Top-Up



If site specific regulations and structural integrity of exterior walls and floors allow, another fully usable floor can be added on top with brand new walls and roof. This would be similar to adding, as replacing, the roof, with significant upgrades, the new usable space can be bigger and even more comfortable. That would allow for more revenue for the association. This should be combined with overall refurbishment of the building, preferably adding external insulation or a second facade. Similarly, as with a new roof, everything can be done with lightweight bio-based construction, like wood from a tree structure combined with renewable insulation. As with any building work, quality should be of highest priority, with special care put into water and moisture control, especially where brickwork meets with new construction.

6 15

Second Façade



unheated buffer spaces protecting the wall, or in the new facade layer, making the new loggias unheated (or heated) interior spaces. These can be closed completely, allowing for balconies and terraces to form a kind of winter garden. This approach not only adds more usable space, but also allows for significant personalization on a larger scale, moving beyond the current trends of small cluttered balconies. Along personalization, additional features could be installed, like adjustable shading elements that could provide more sun during winters, or more shade during summers. The new facade also offers an opportunity to integrate modern building services like ventilation systems or heat pumps, avoiding any prolonged interior works and enhancing overall building performance.

If conditions like local laws, daylight, and space availability allow, adding a second facade to the existing wall is an interesting option that gives new possibilities. It is a form of external insulation, but with extra steps.

In this case, the existing wall does not need to be changed much or at all, except for some basic repairs like removing old plaster or repainting. The new facade can be added at a distance while the insulation can be placed either on the outside of the original wall, making the loggias or terraces exterior

8

In terms of materials, the new facade can be made entirely out of structural wood ele-

and The Guidebook

Of Refurbishment strategies for inter-war masonry residential housing.



Strengthening the Community
Extending Available Space
Giving a Sense of Agency and Belonging
Improving Comfort and Health
Maximising Circularity



Strengthening the **Community Extending Available Space**

Giving a Sense of **Agency and Belonging**
Improving **Comfort and Health**
Maximising **Circularity**



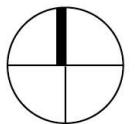
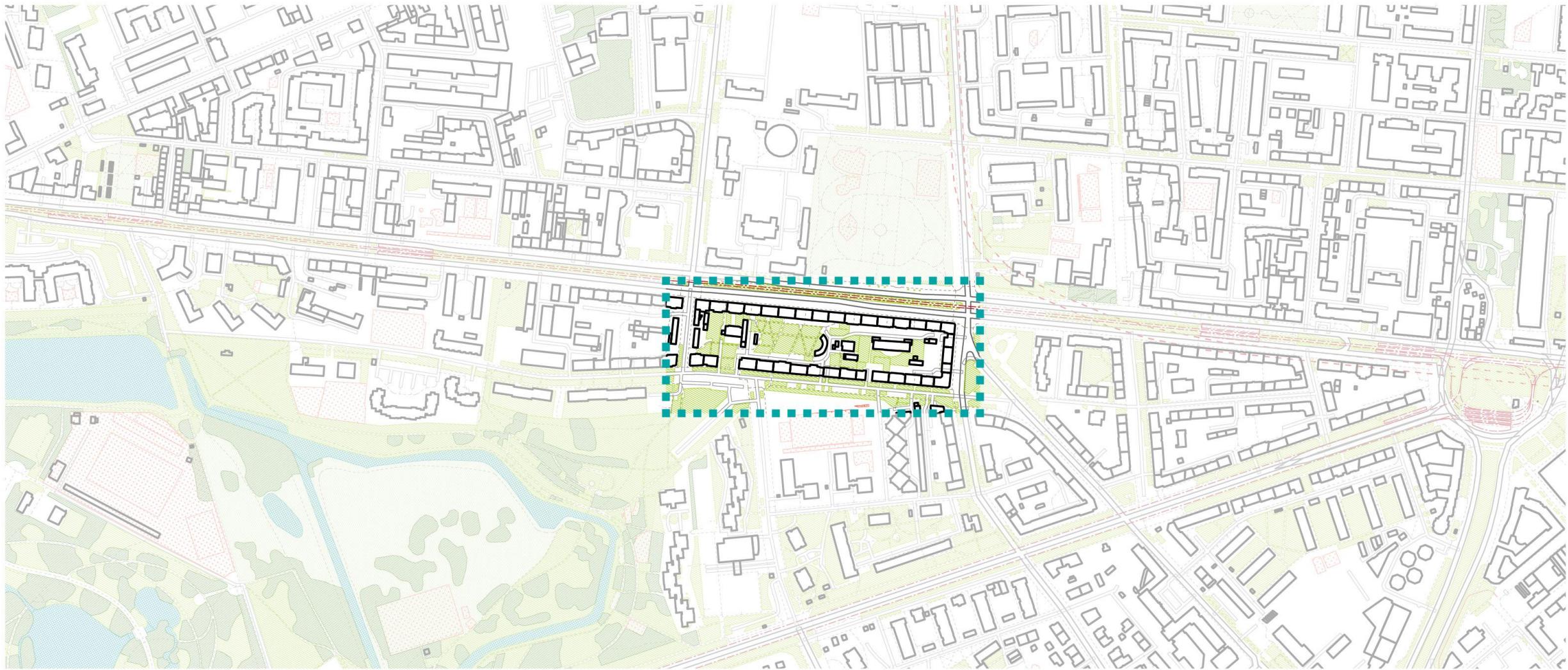
Strengthening the Community
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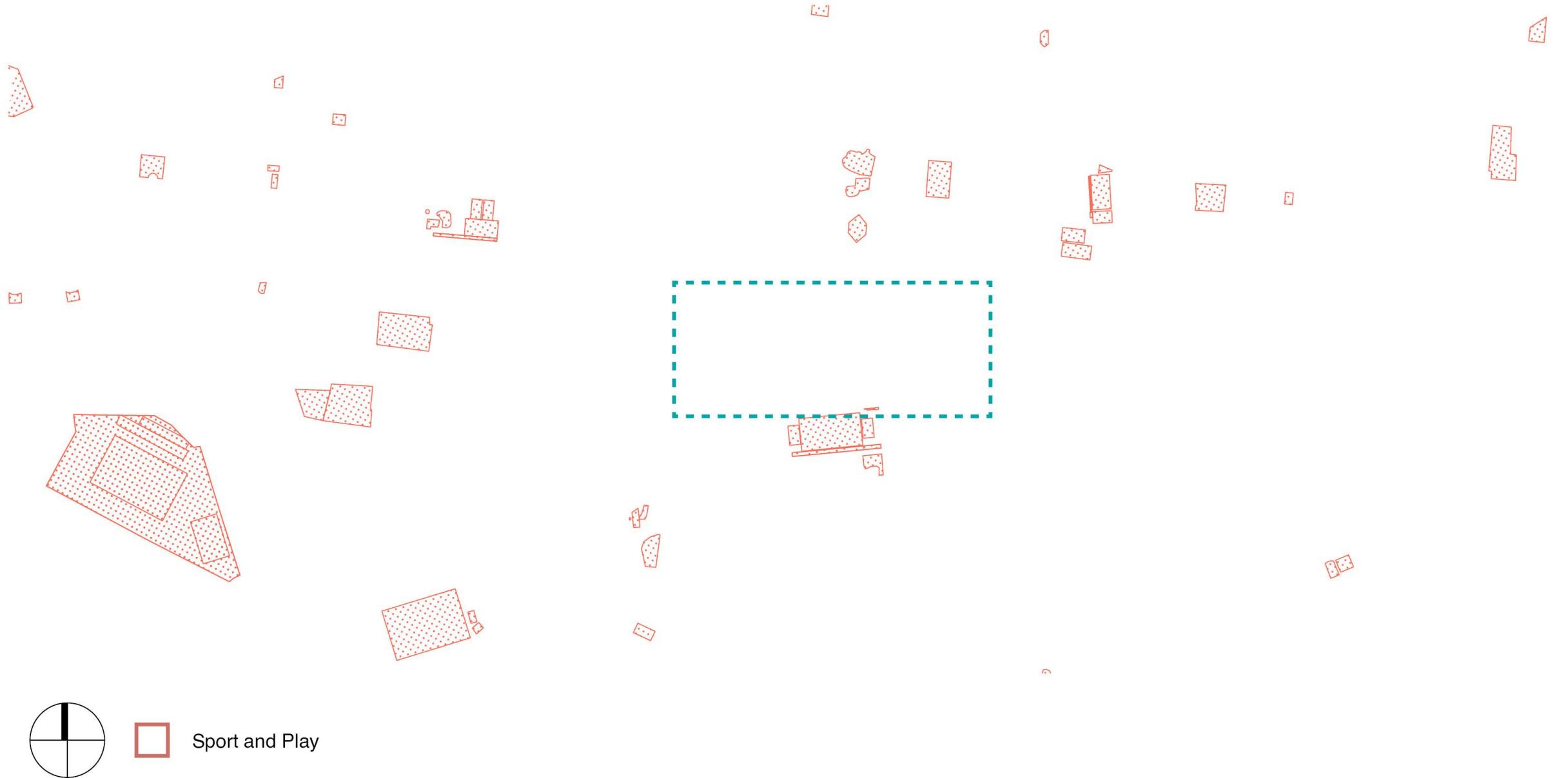


Strengthening the Community
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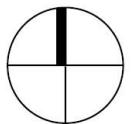


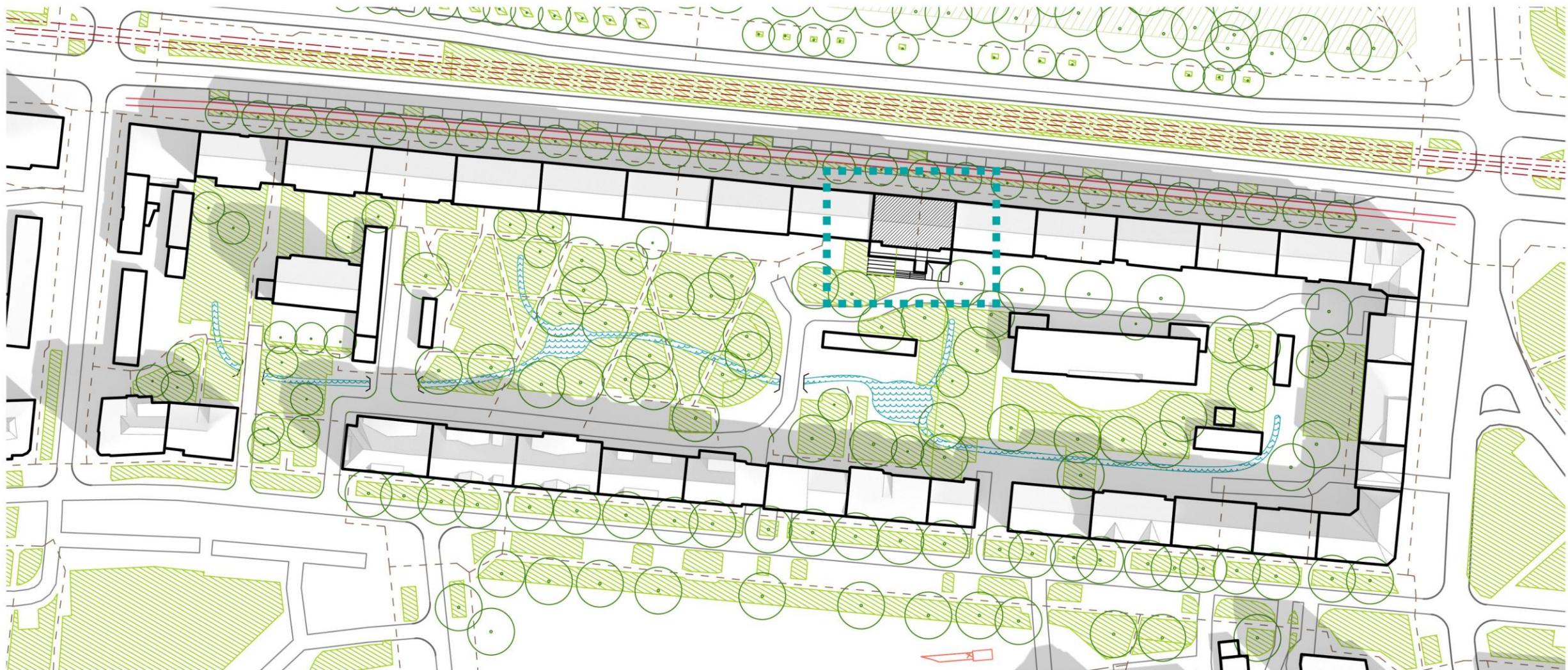
■ Buildings



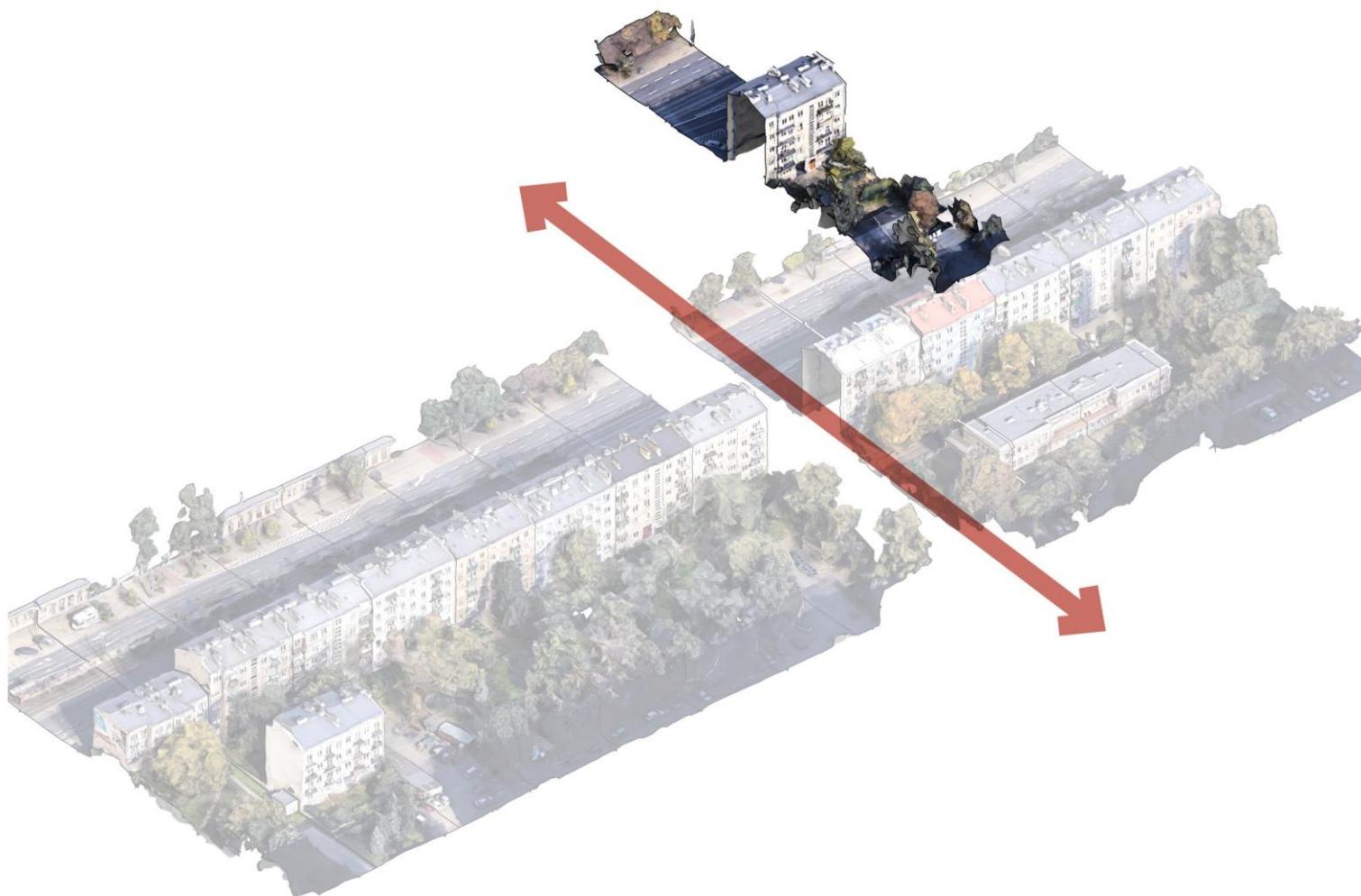


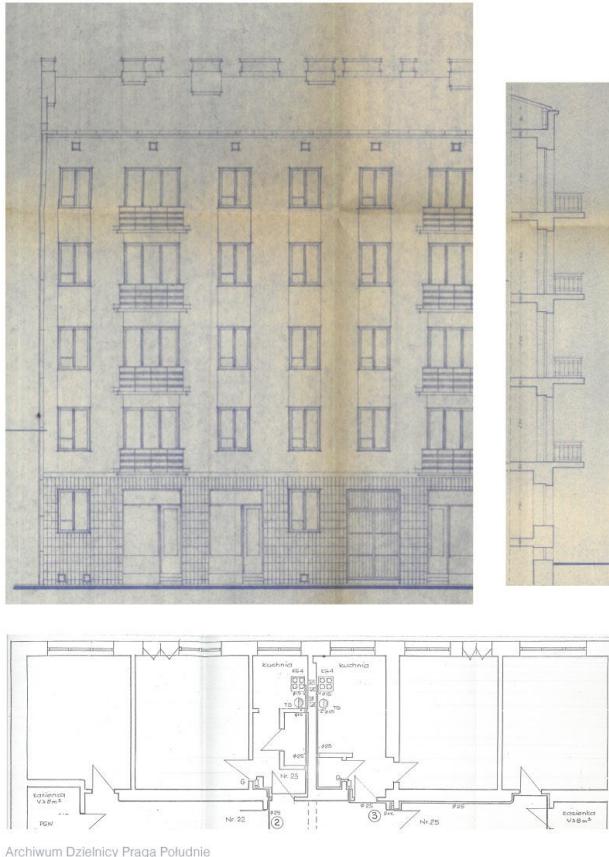
□ Greenery and Leisure



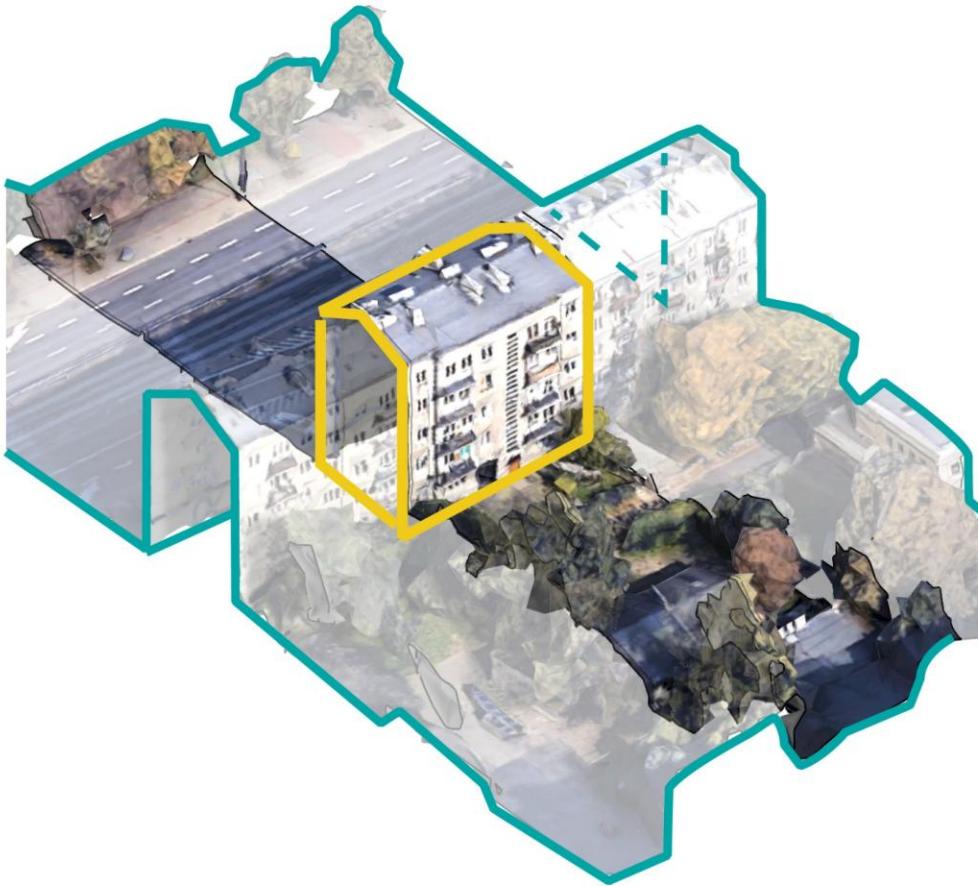


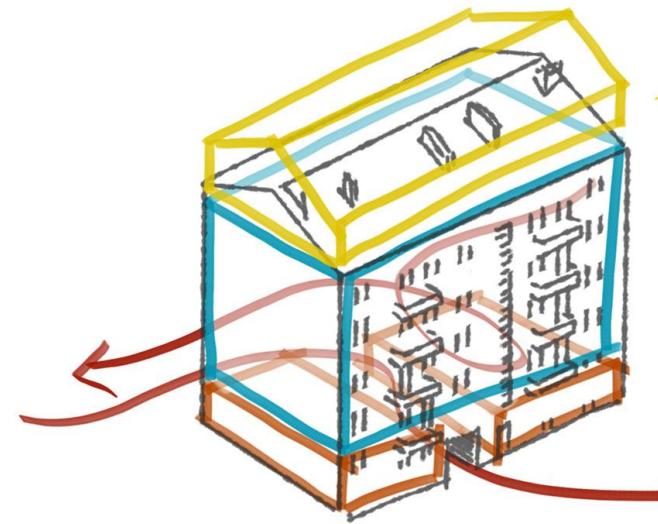
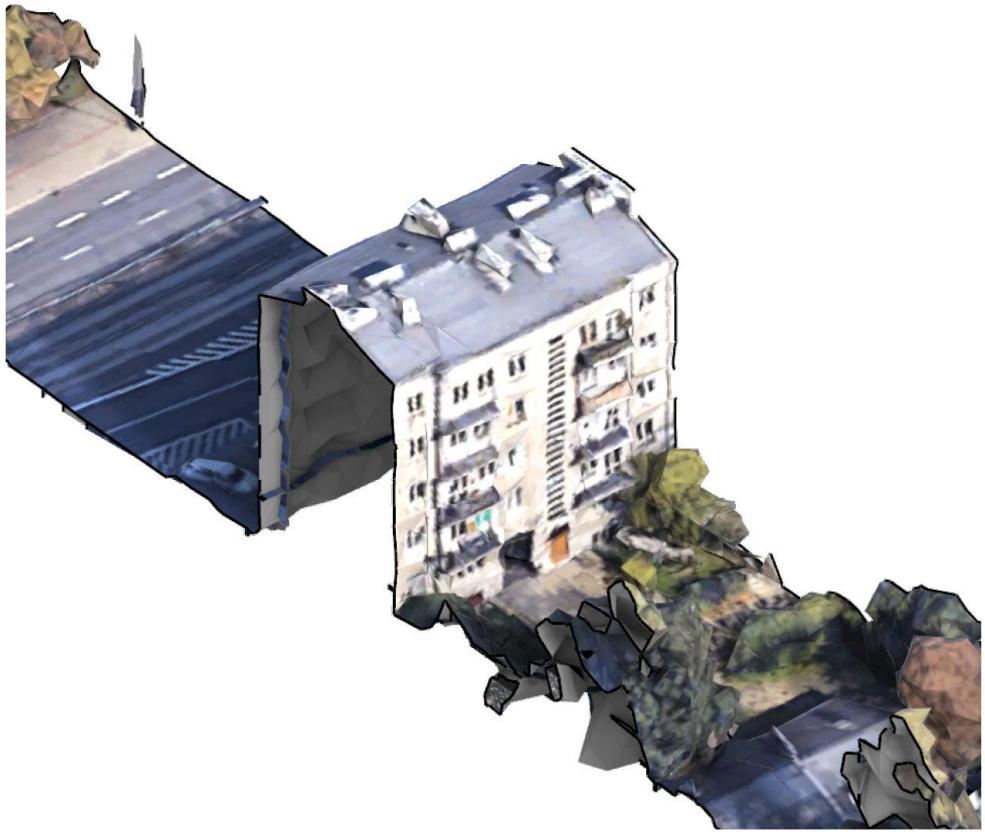


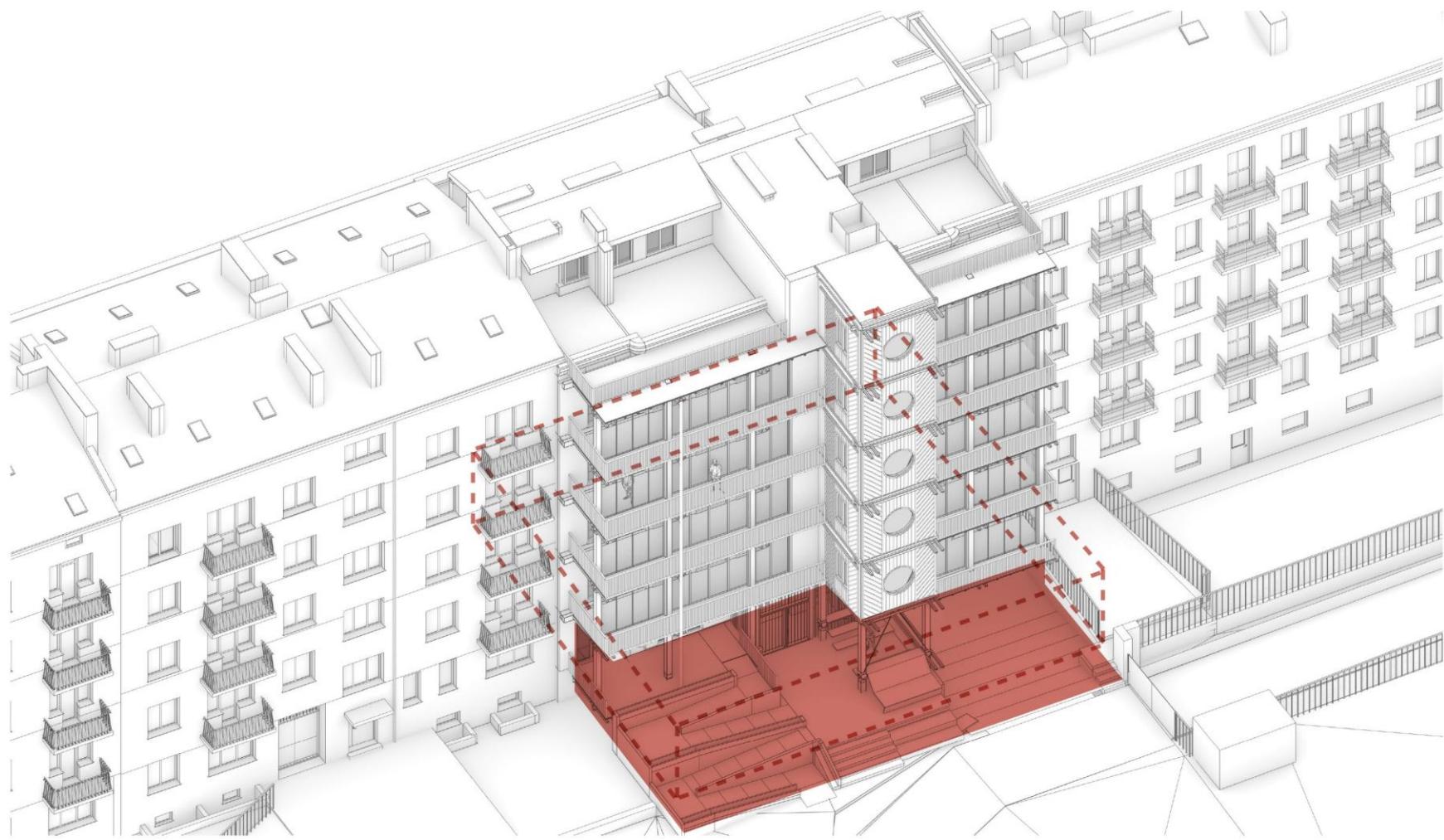


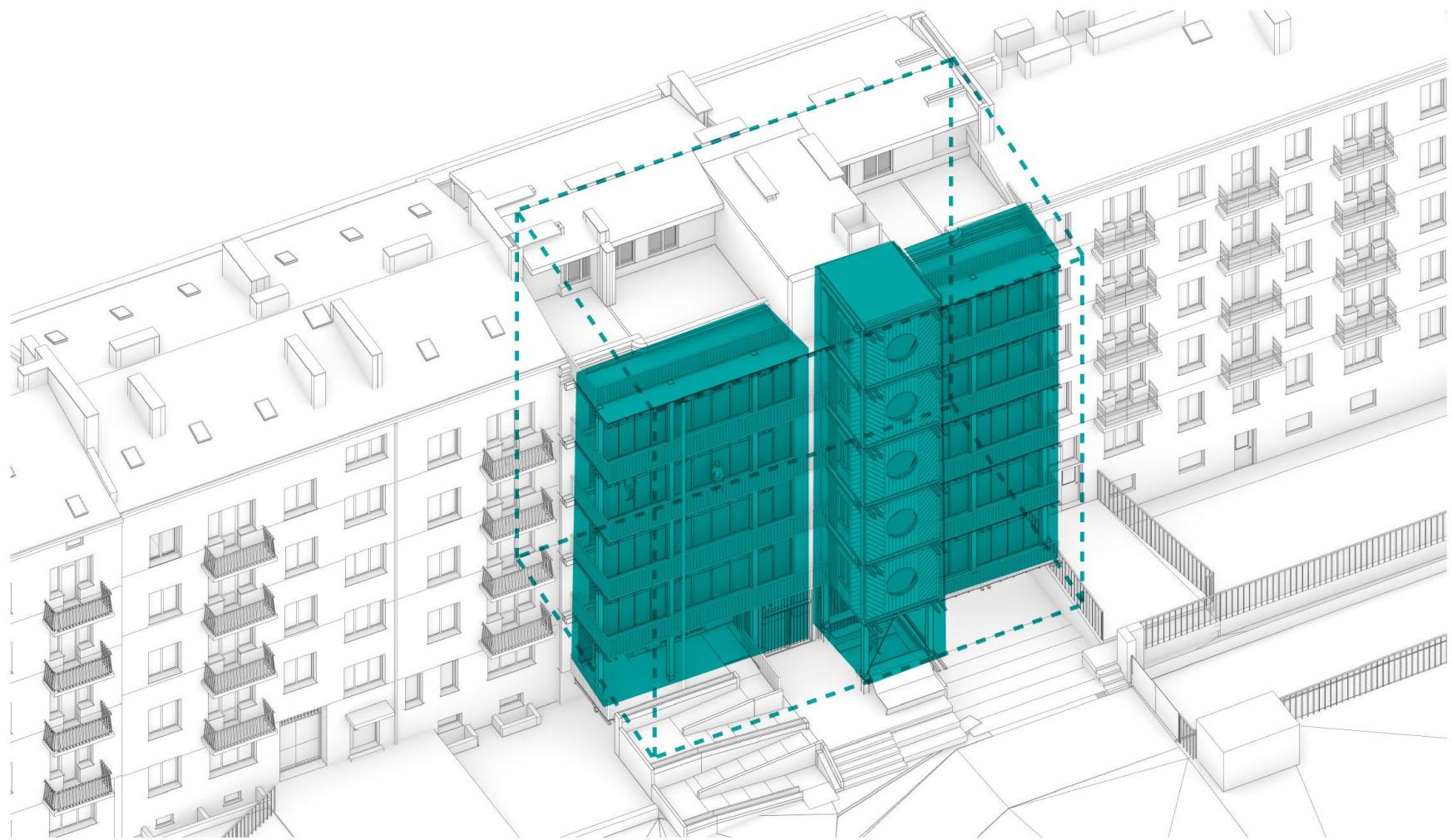


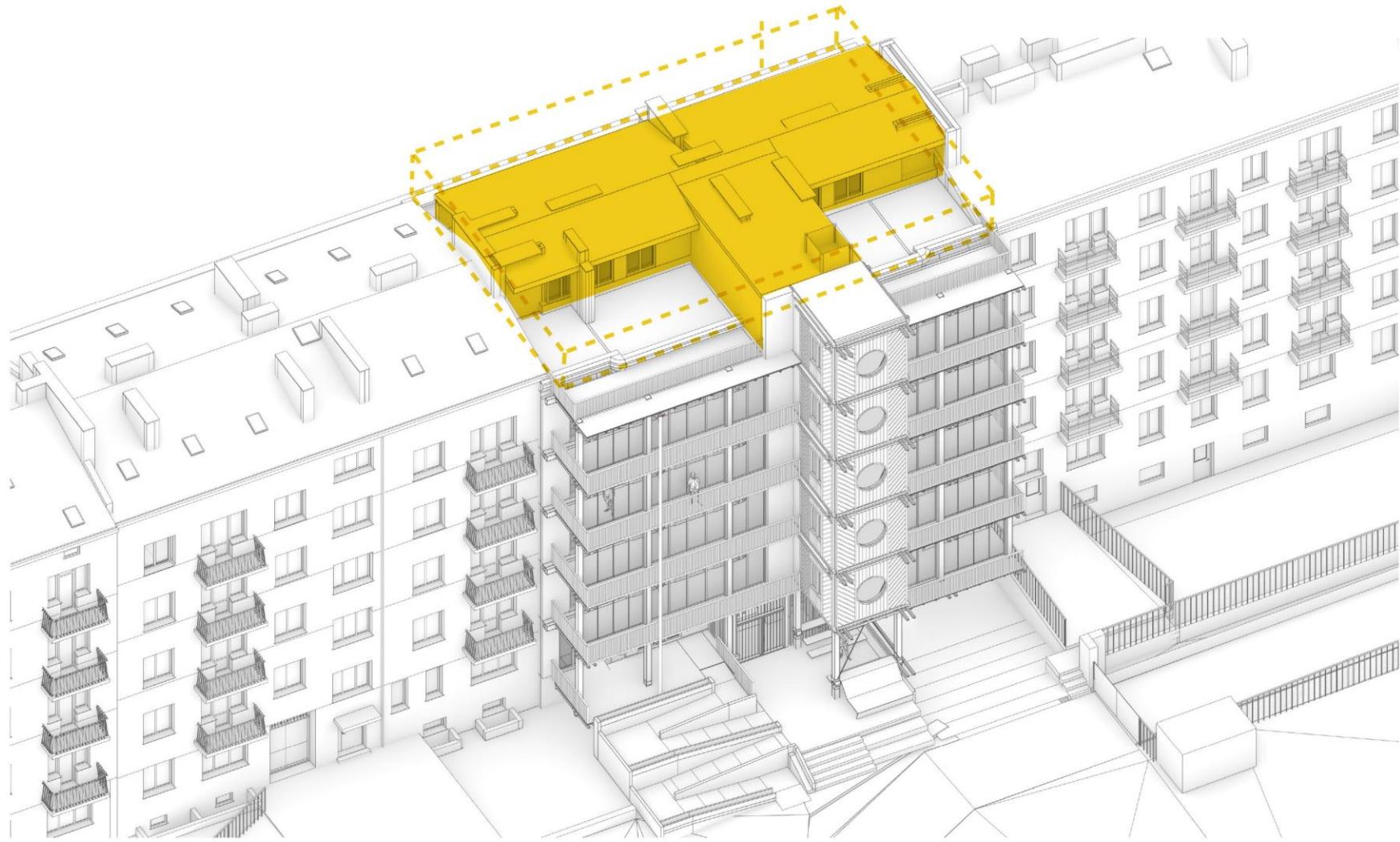
- 730mm mass brick structural walls
- 300mm Klein brick floors
- storage basements
- shops and amenities on the groundfloors
- 5 above ground floors
- originally 2 apartments / floor, now ~4 apartments / floor
- wooden ventilated roof
- small staircase without an elevator
- ground floor gate passage leading to the courtyard and entrance

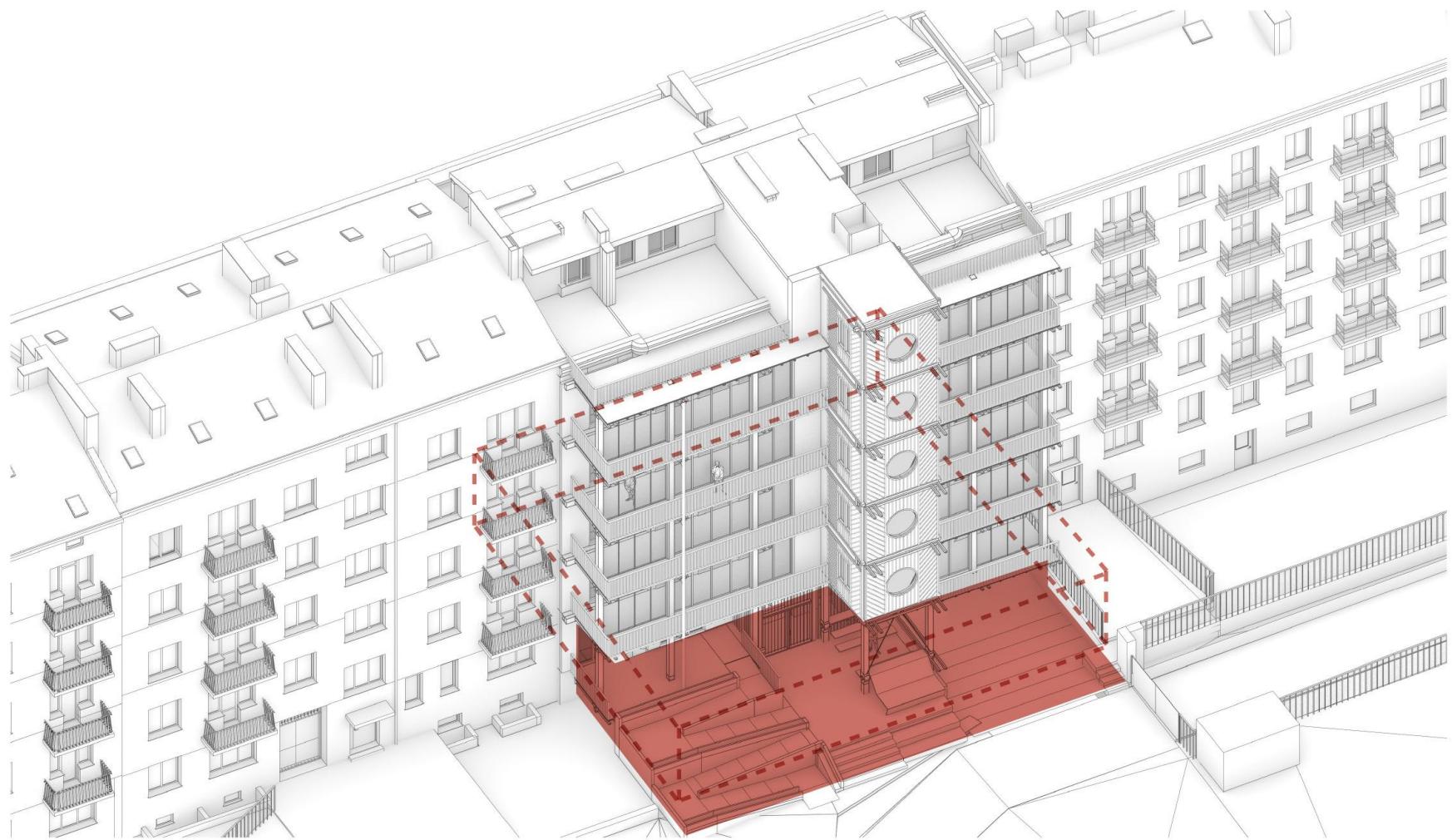




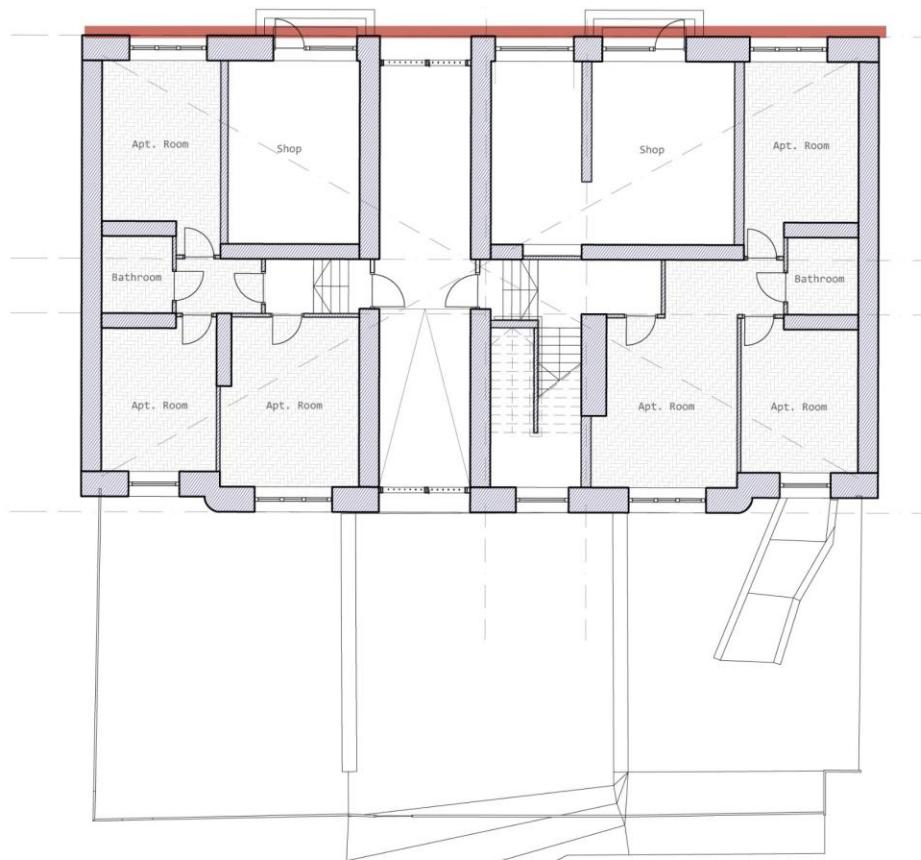








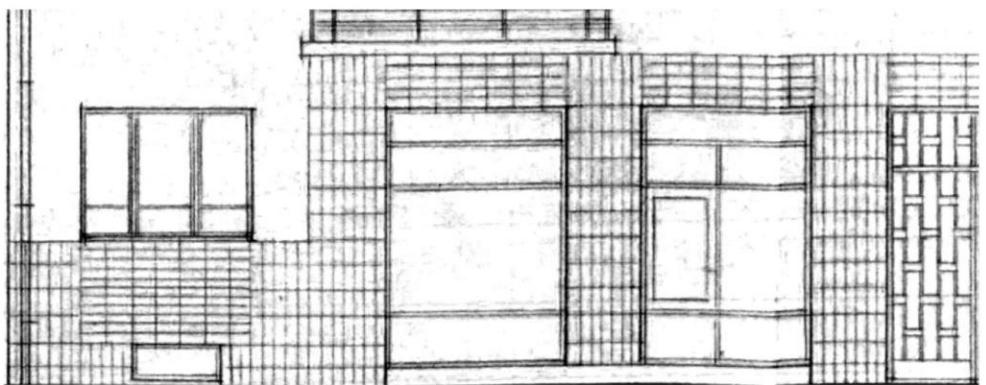
Grochowska Street

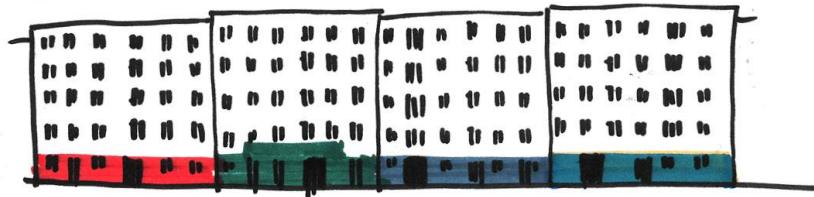
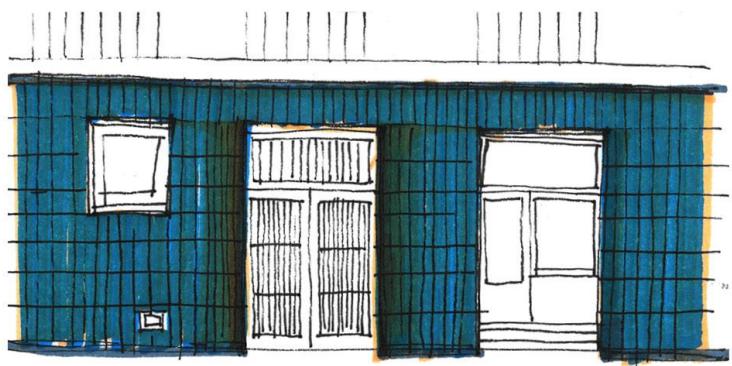


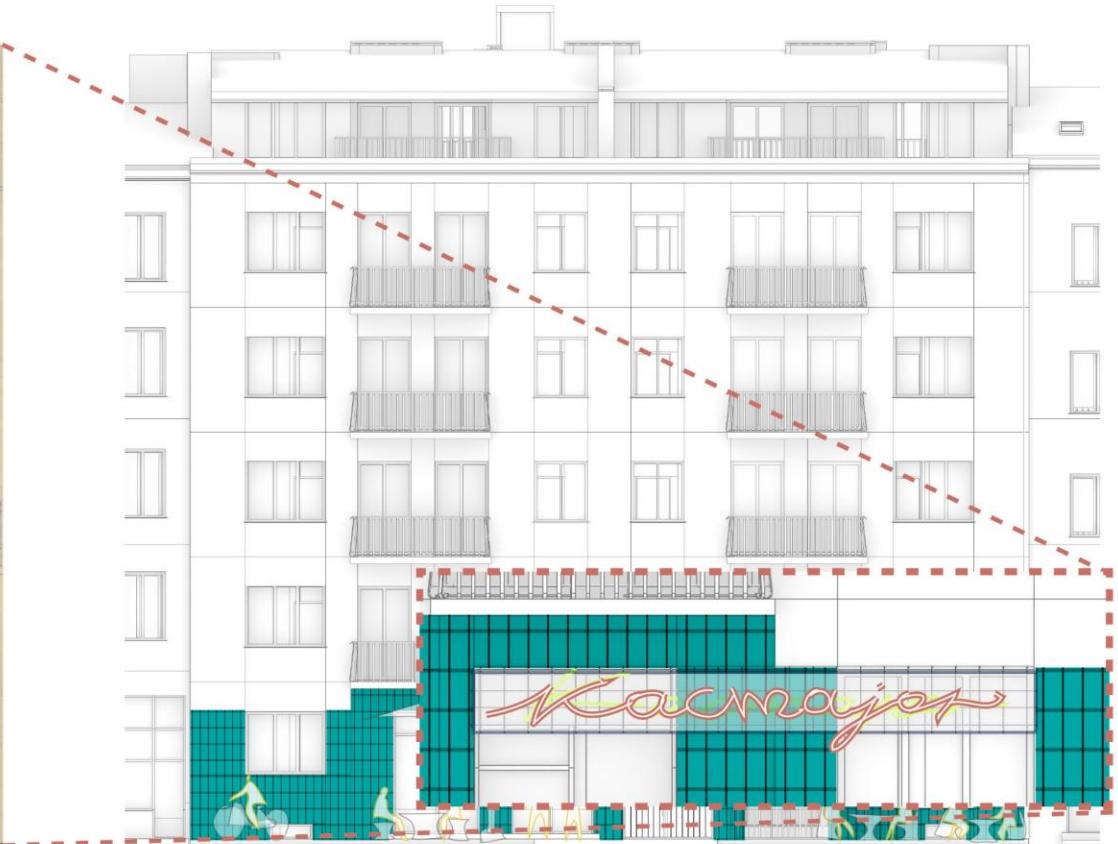
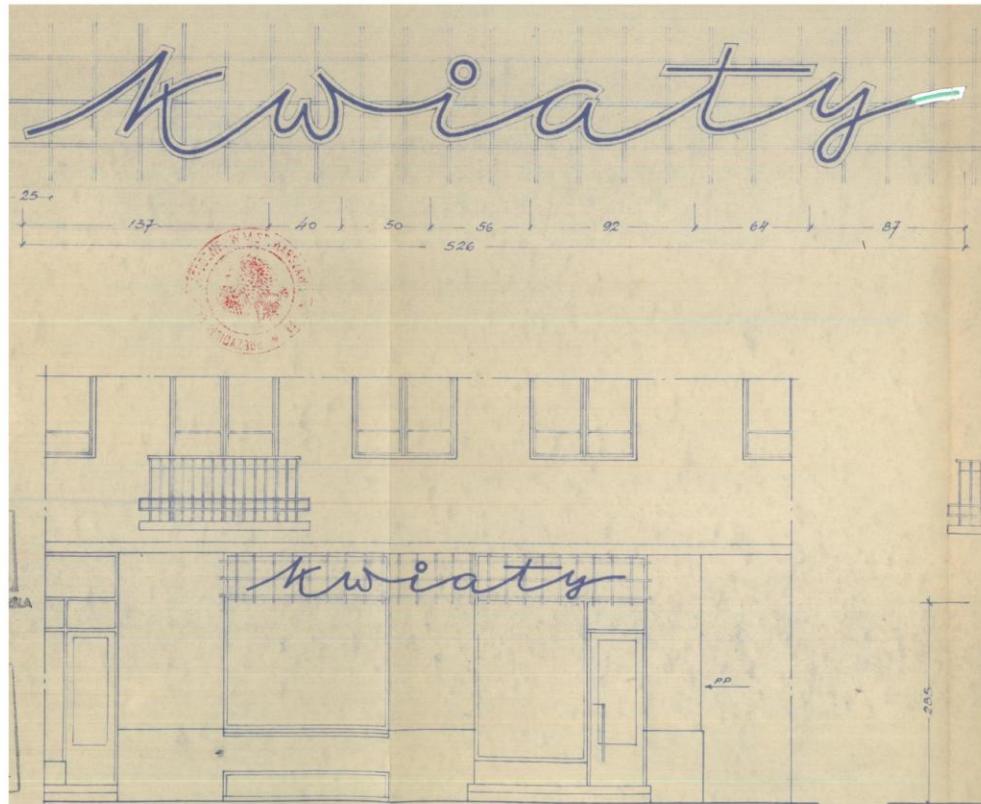
Courtyard

Grochowska Street



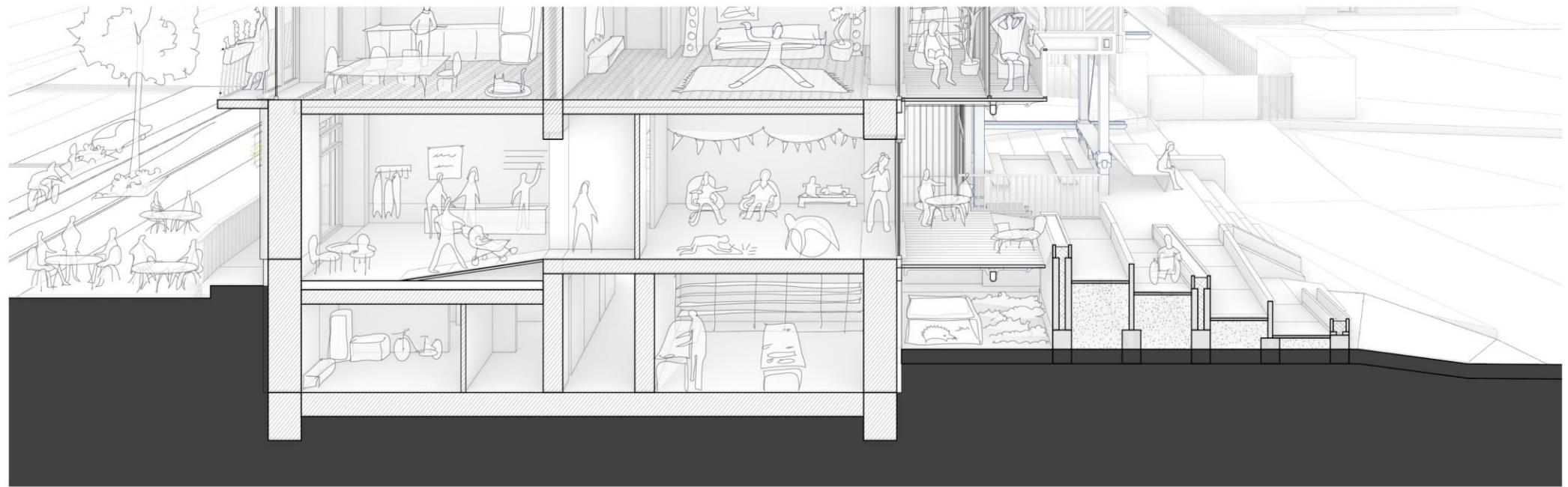




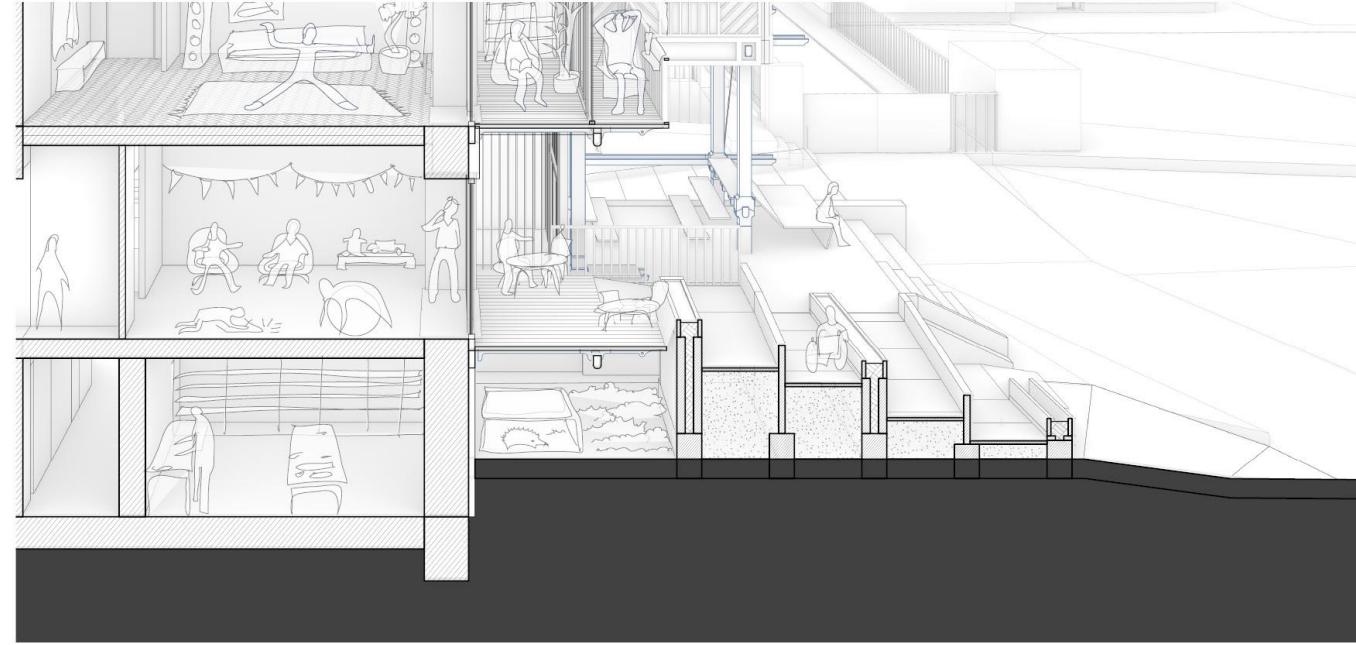
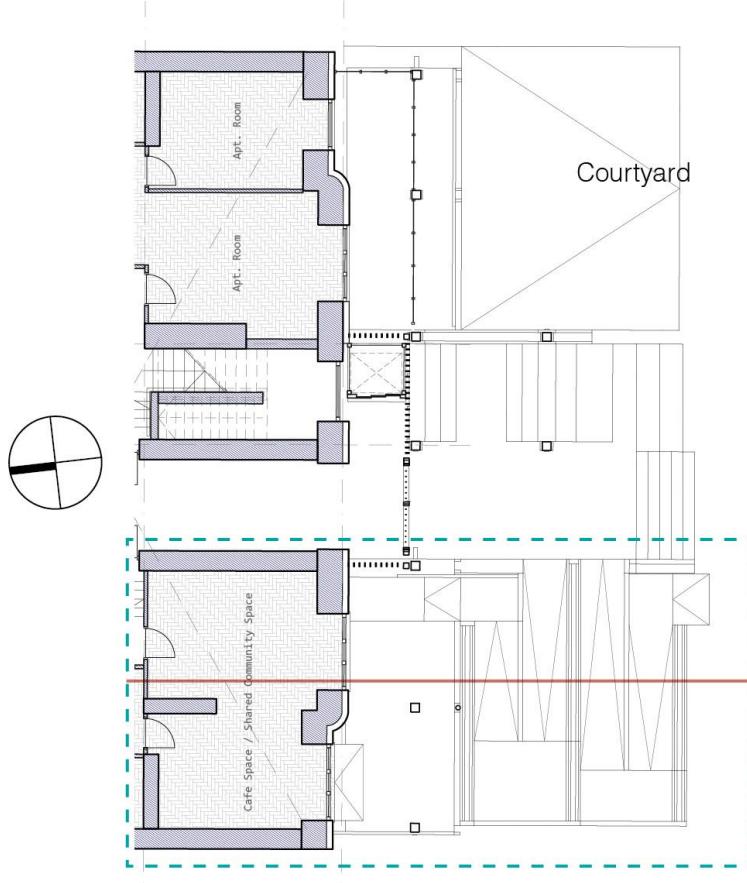


Vibrant past

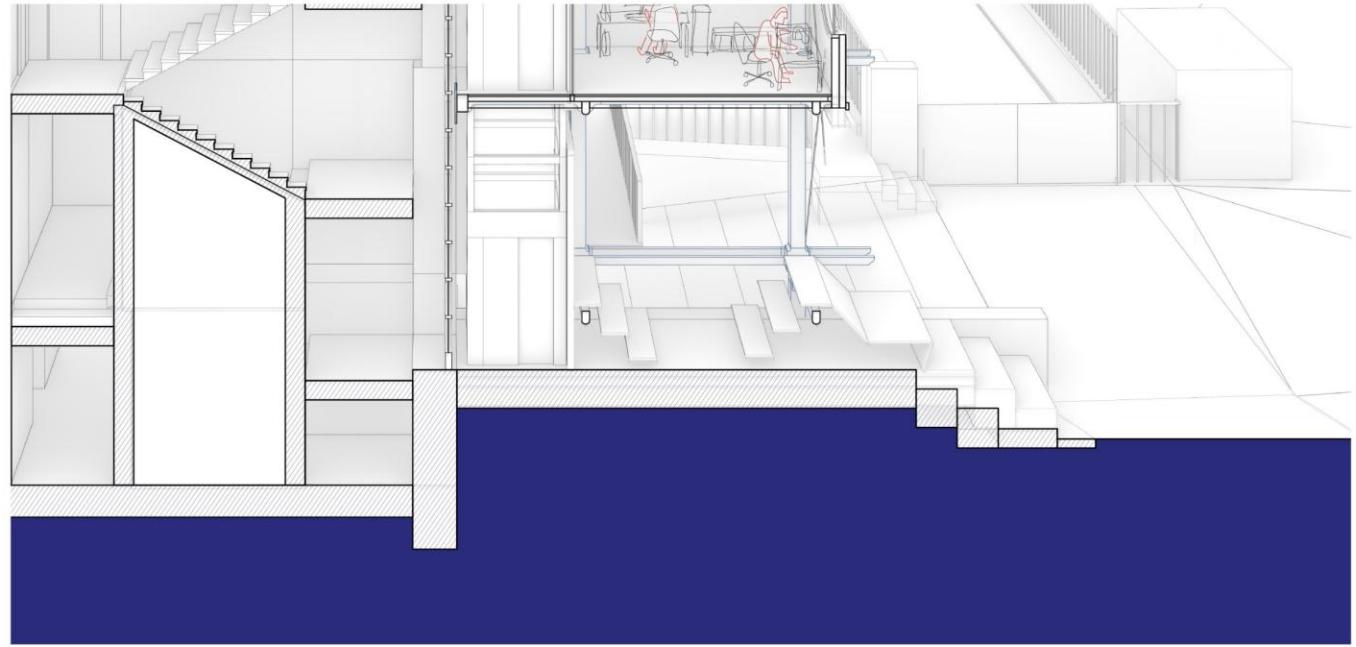
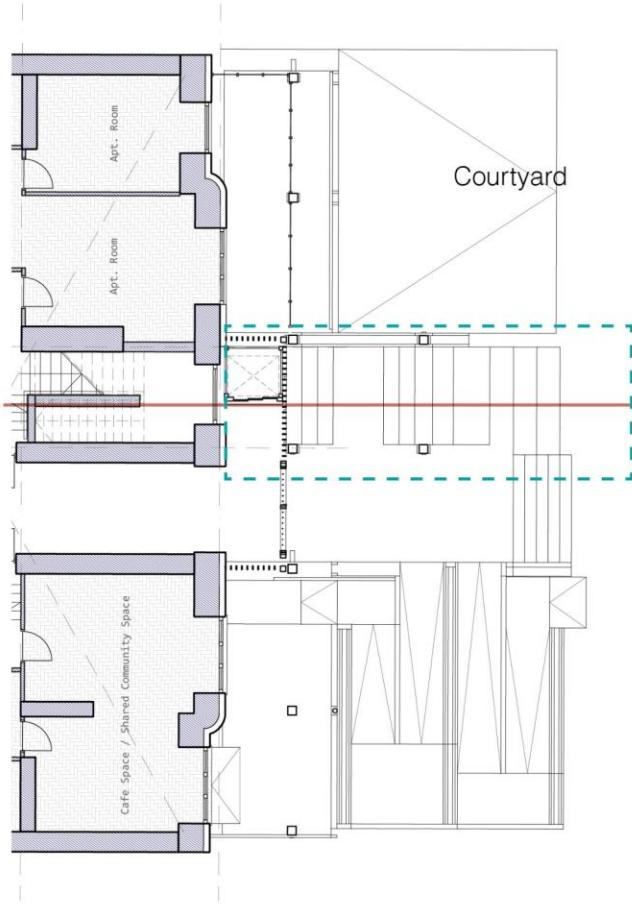




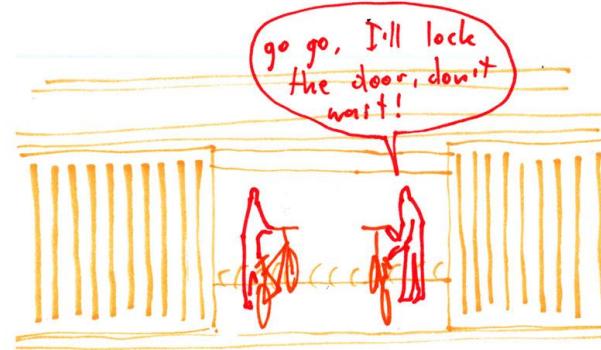
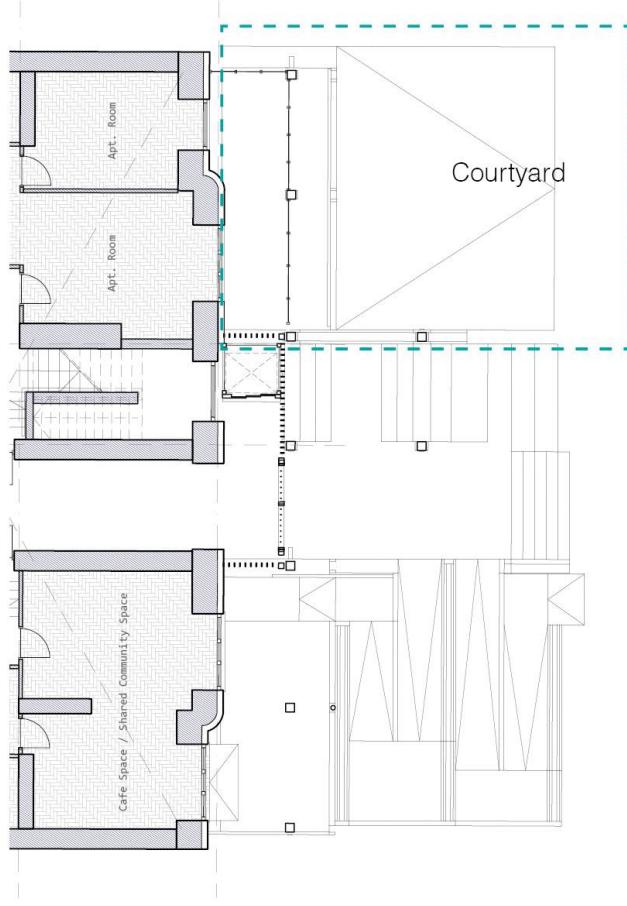
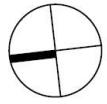
Life on the ground floor



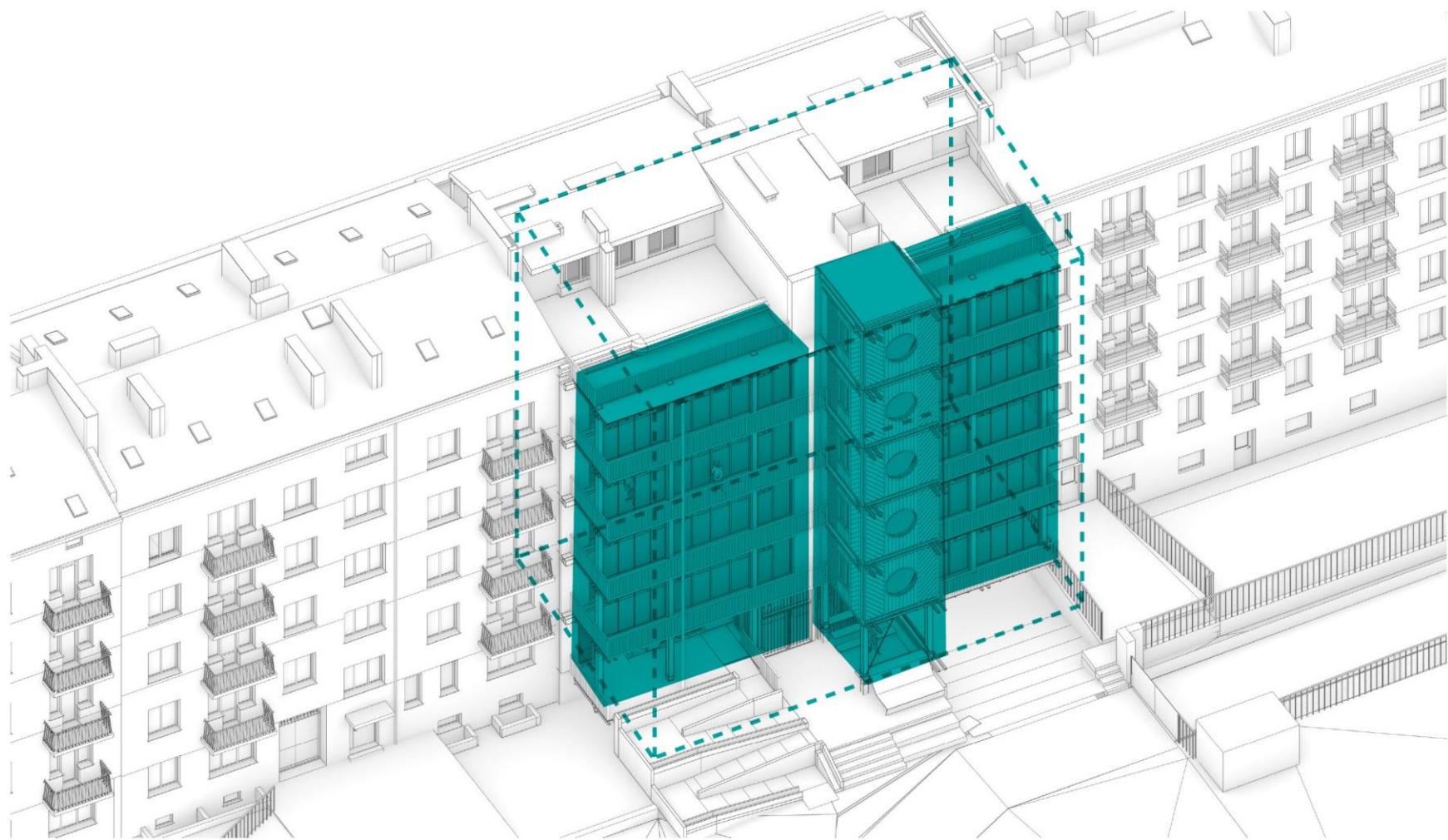
Community space for everybody

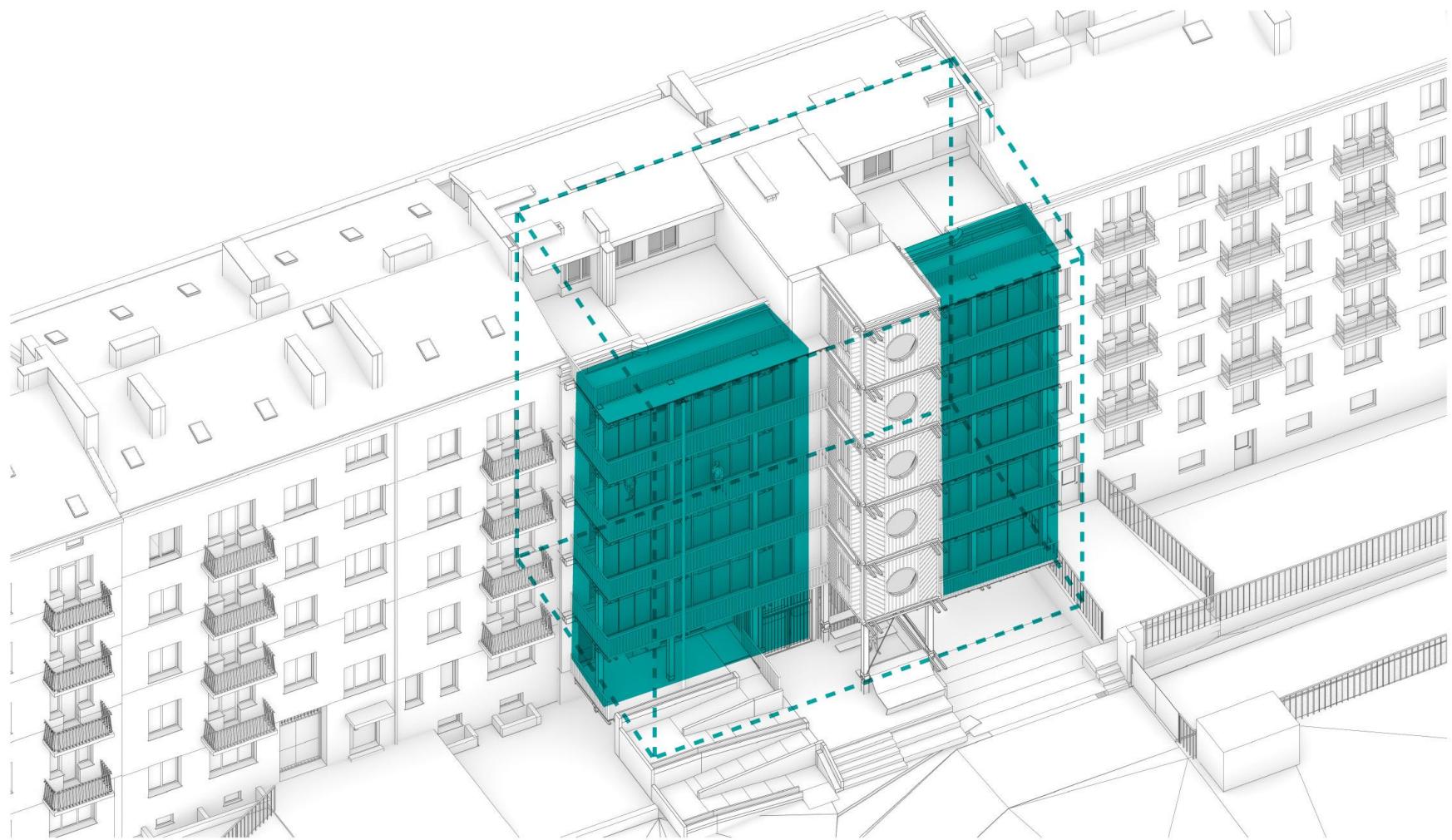


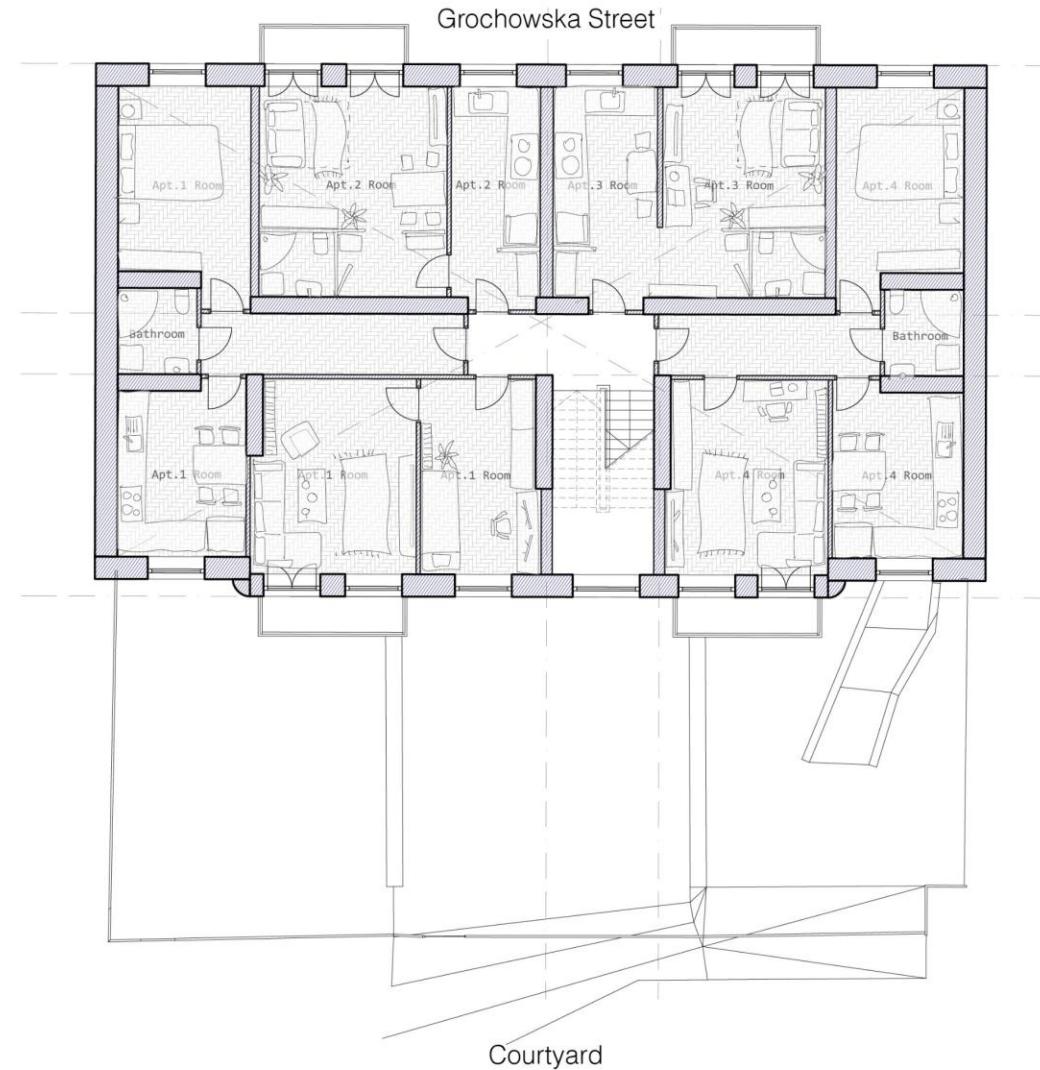
Waiting for a friend *Or policing the courtyard*

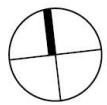


Bicycles safely stored









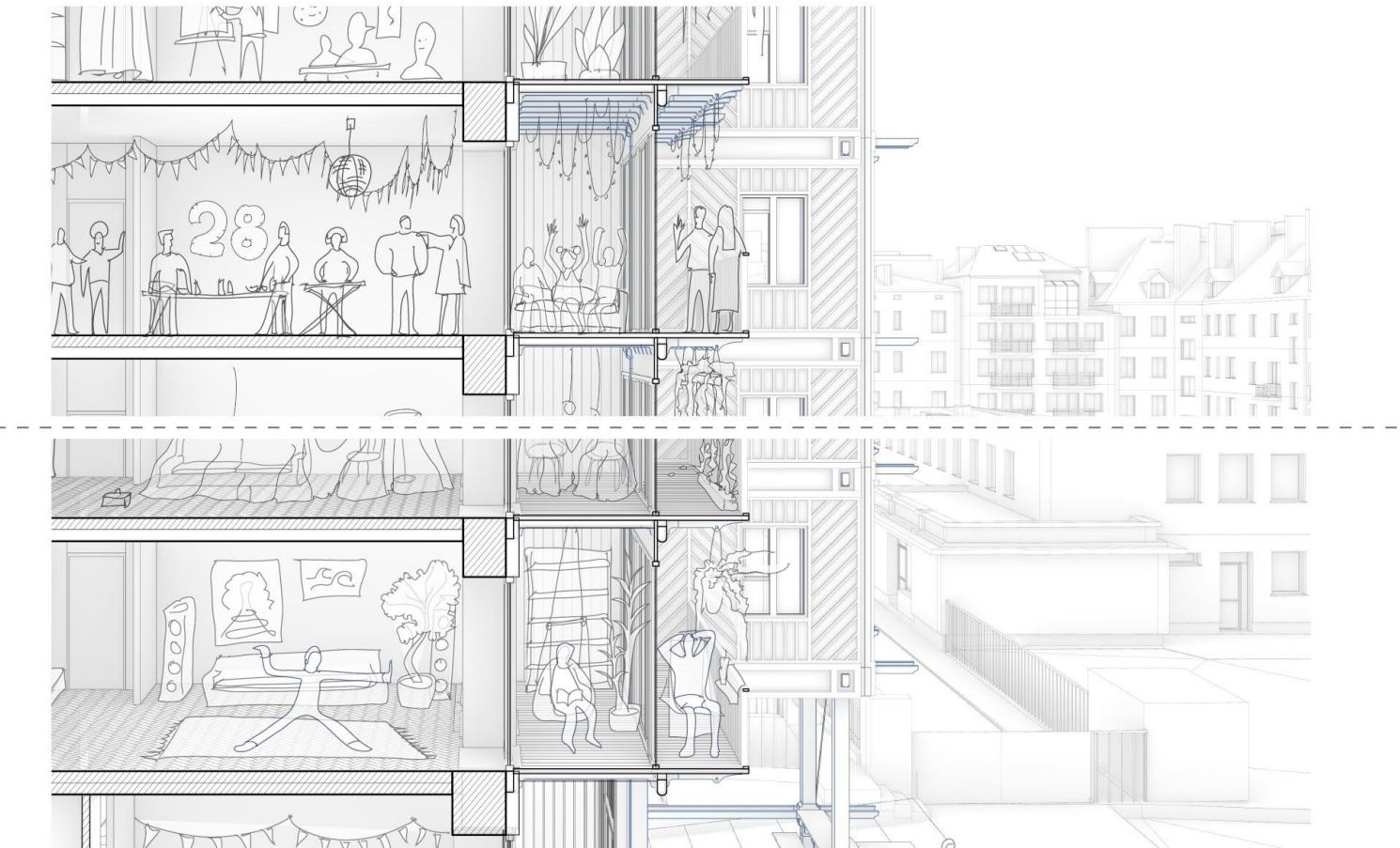
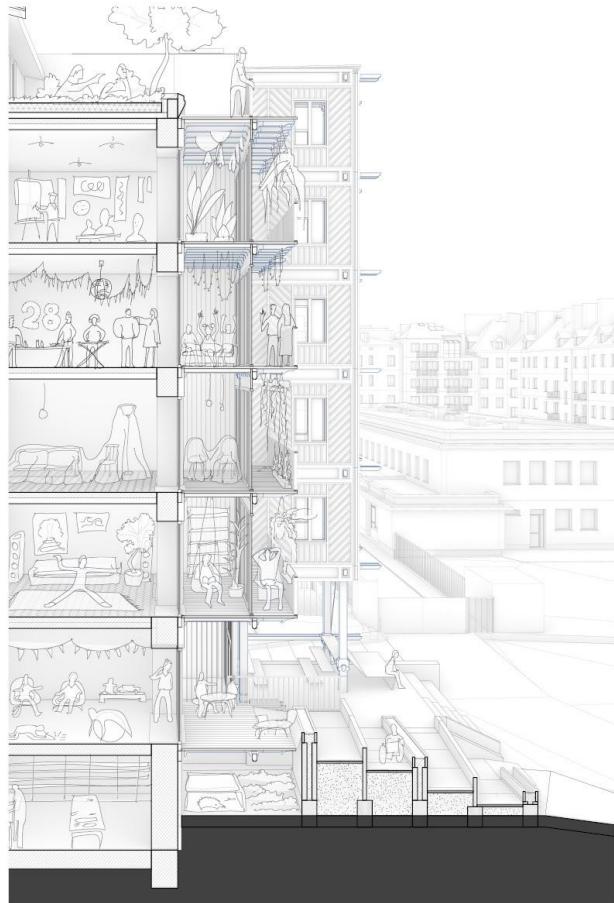






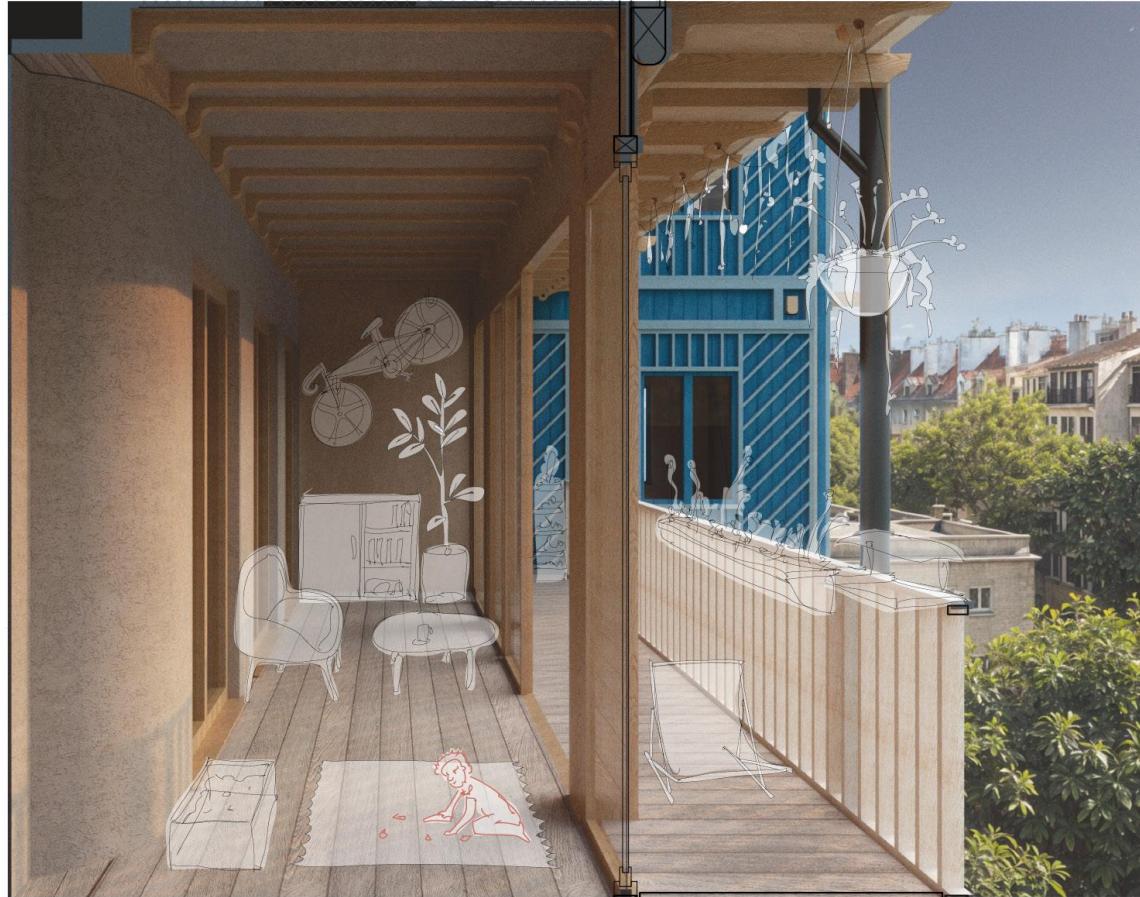






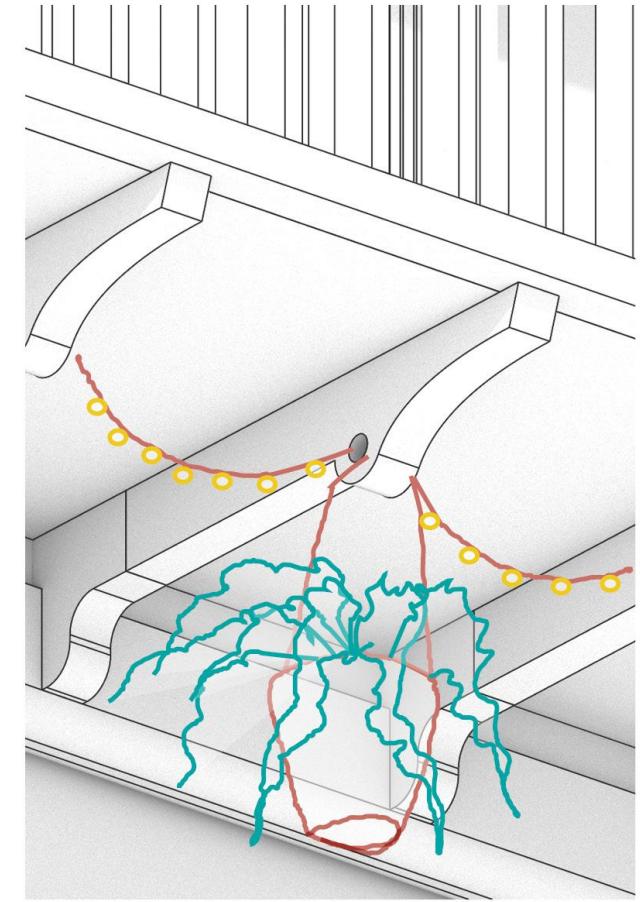
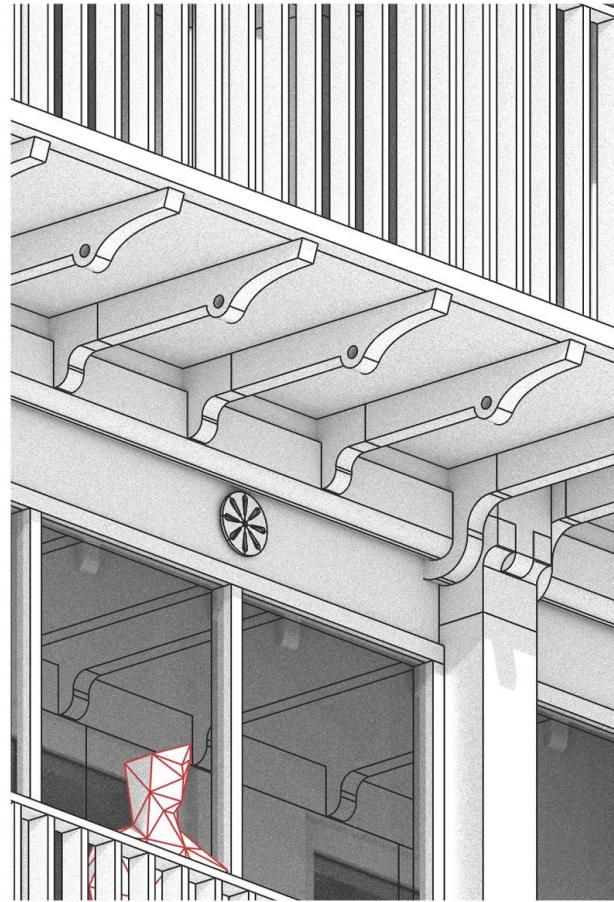
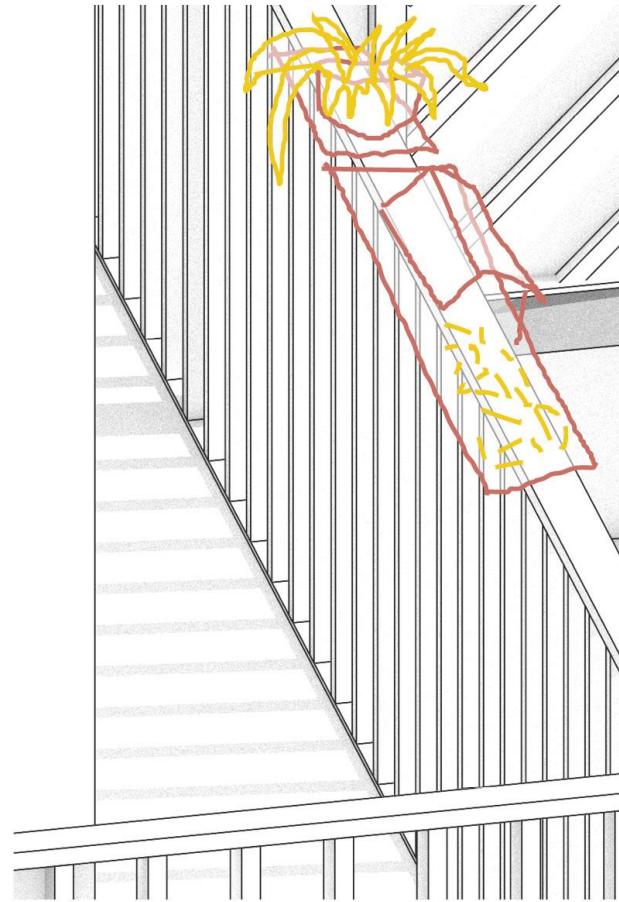
New possibilities



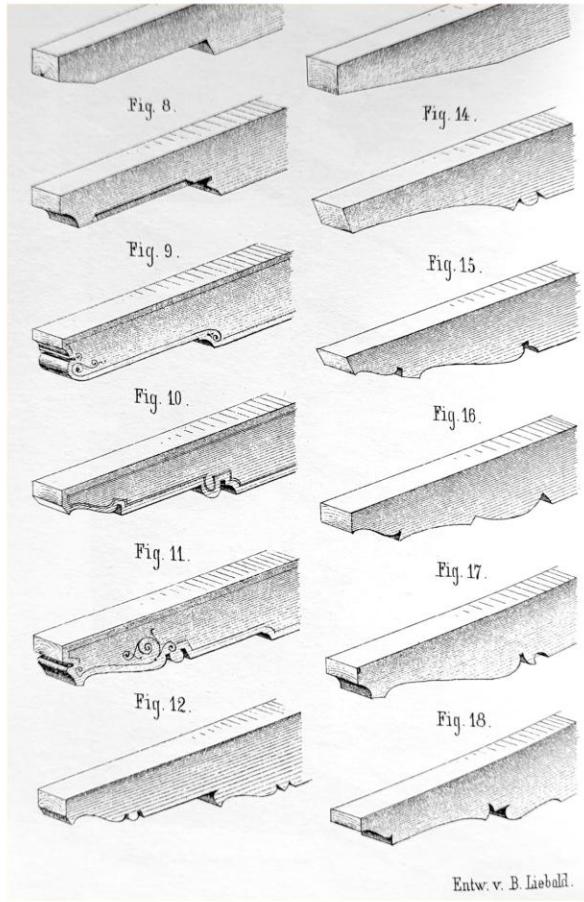
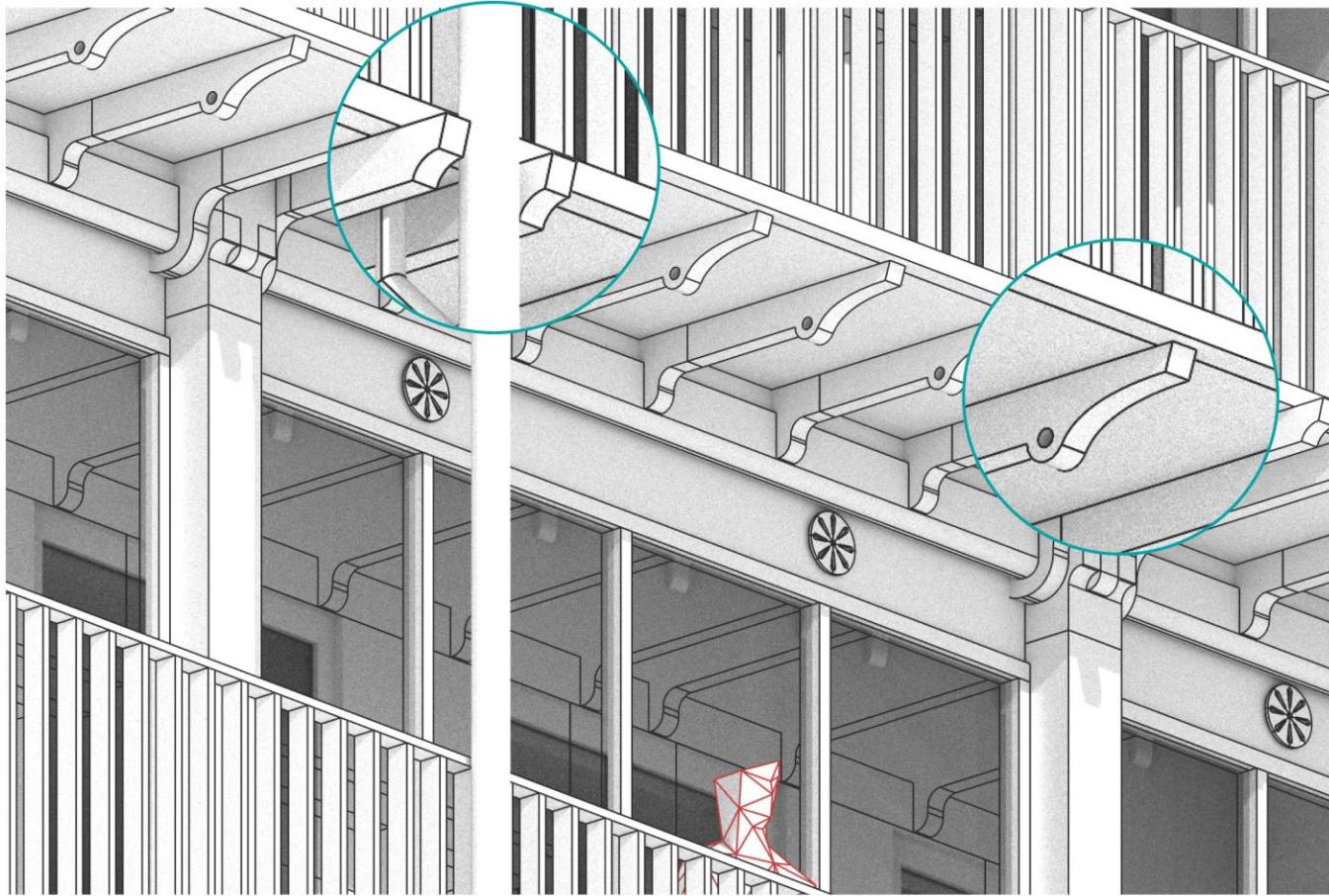


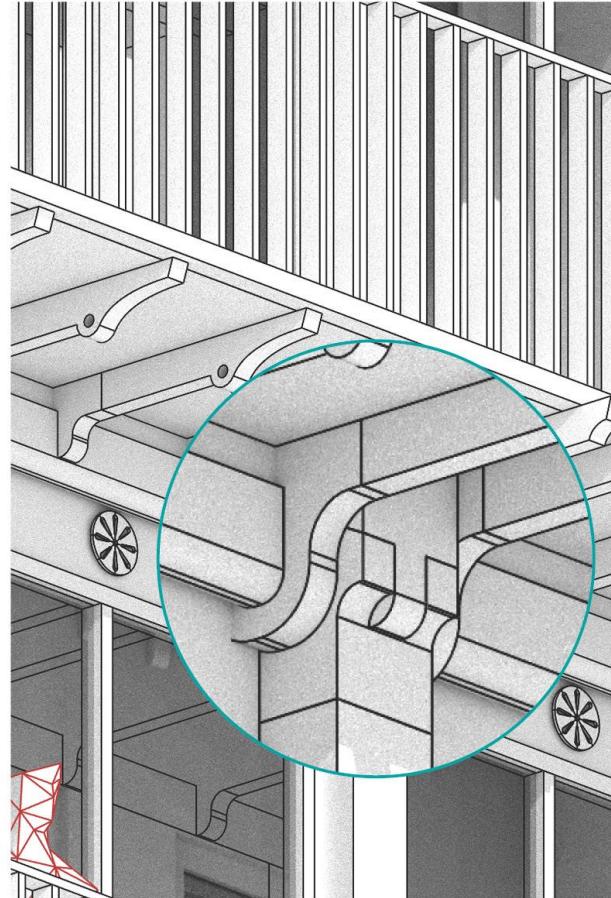


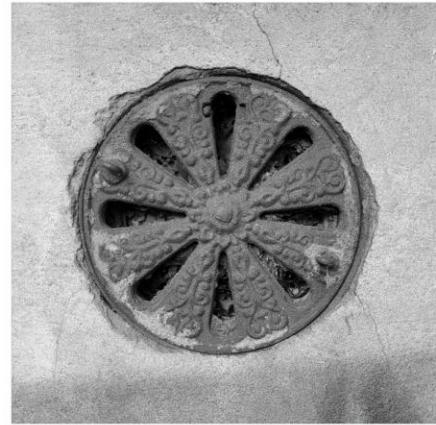
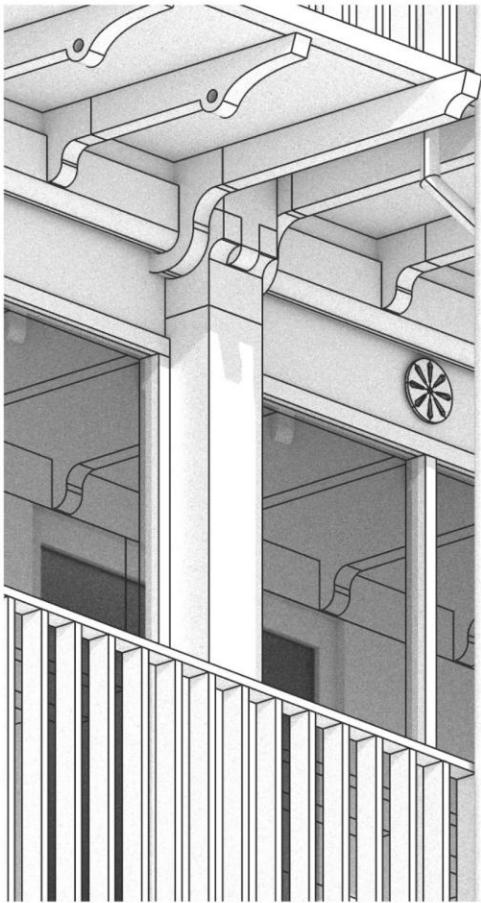
Make it your own!

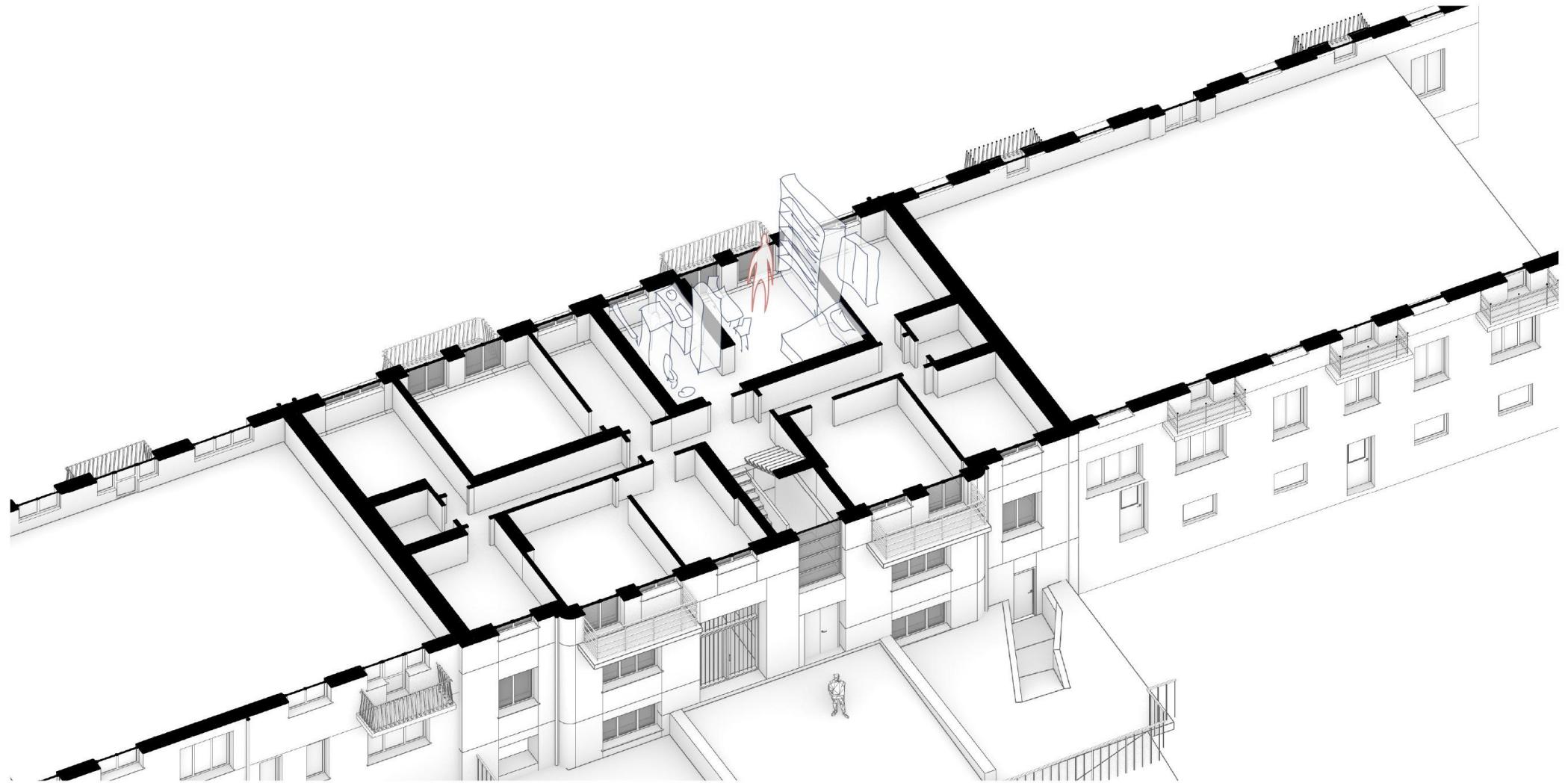


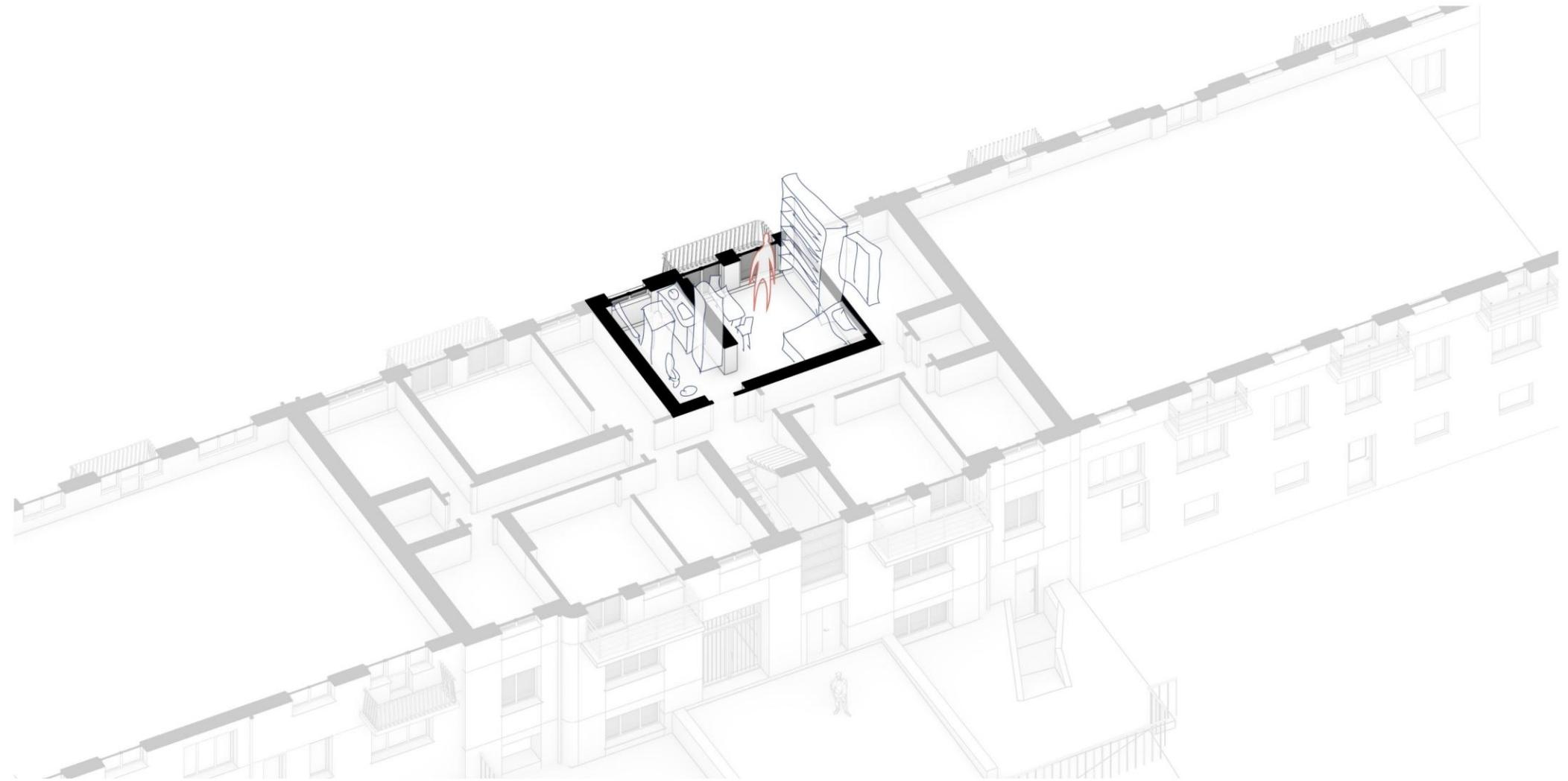
New affordances

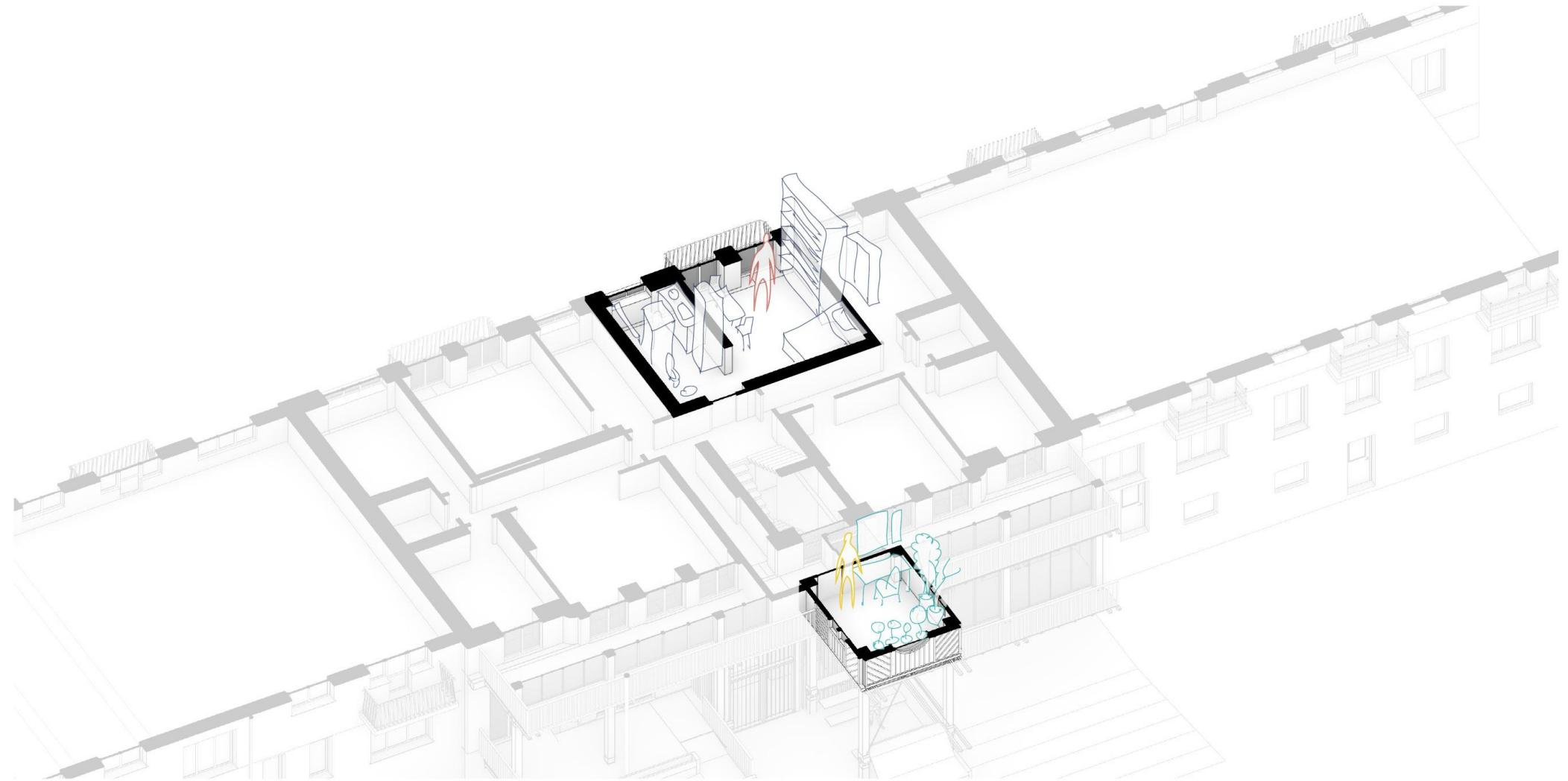


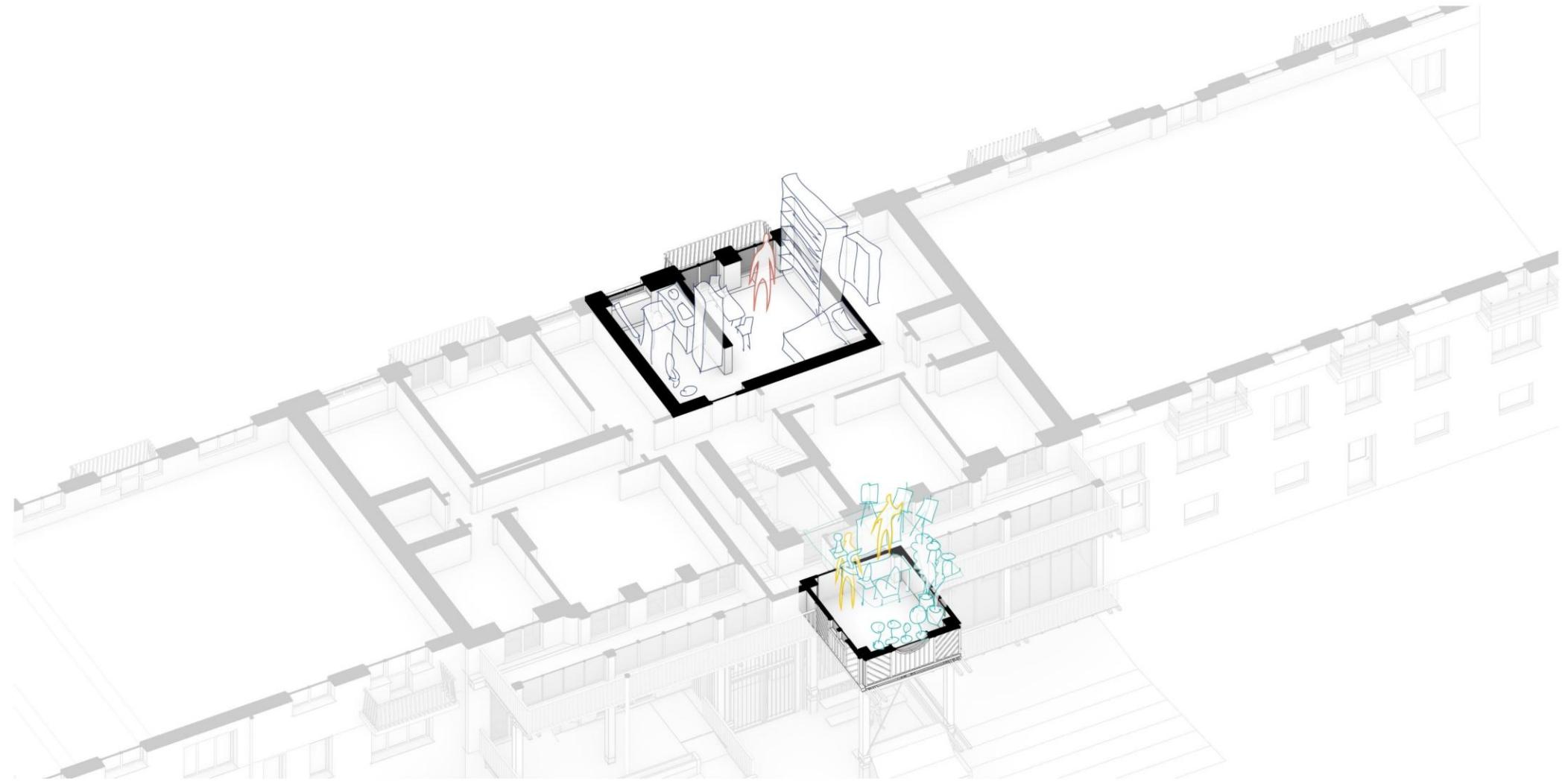


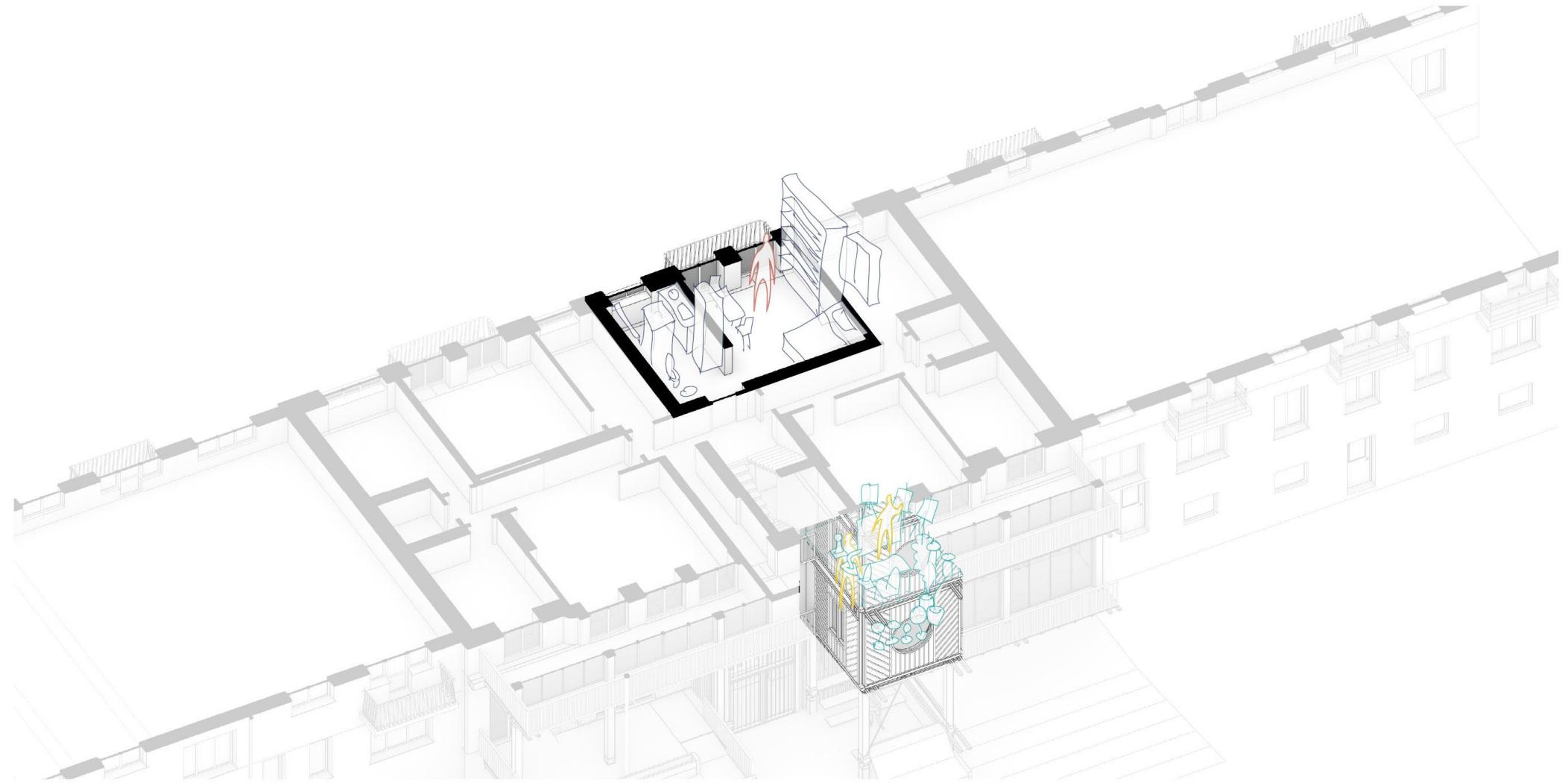


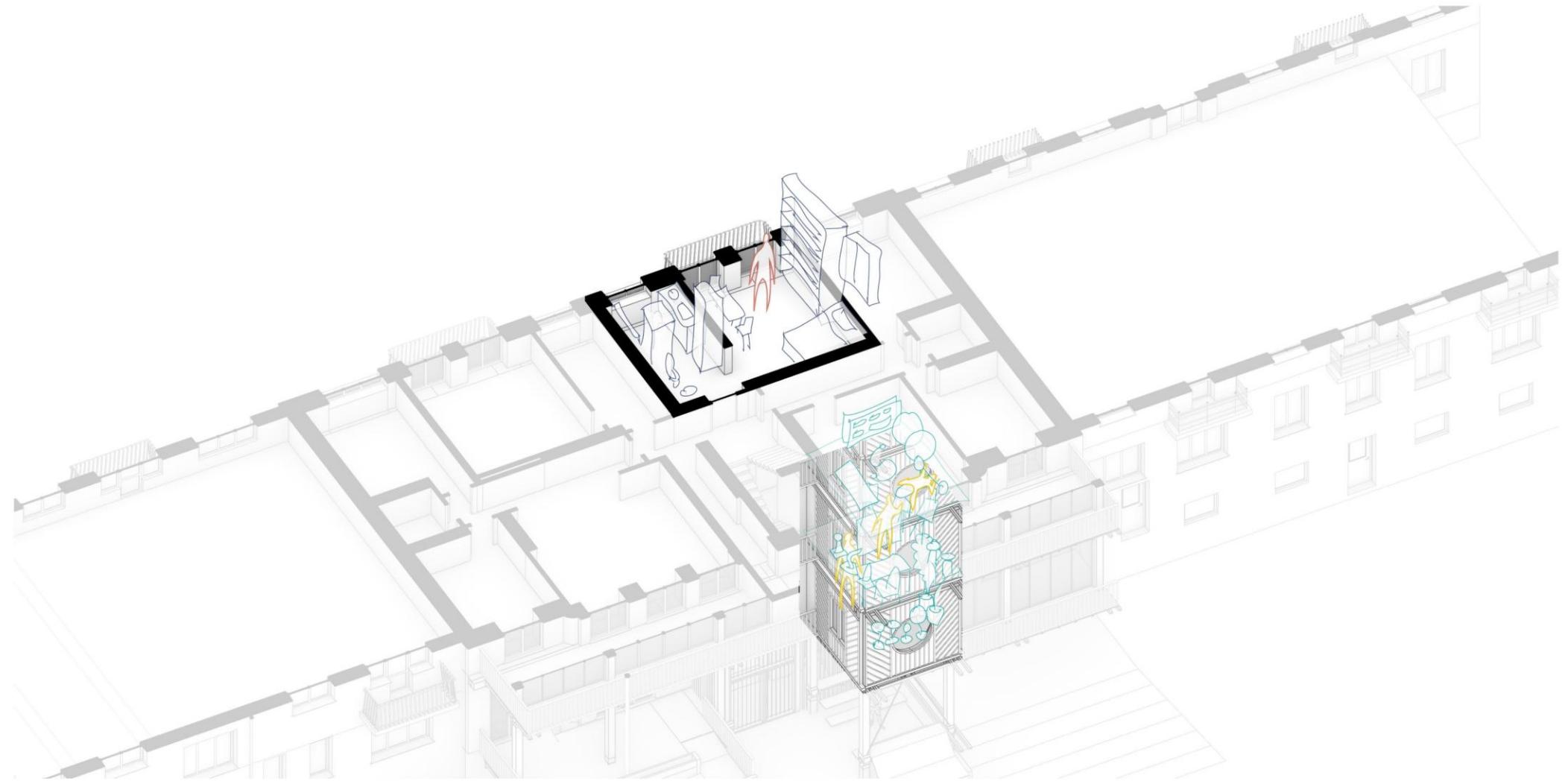








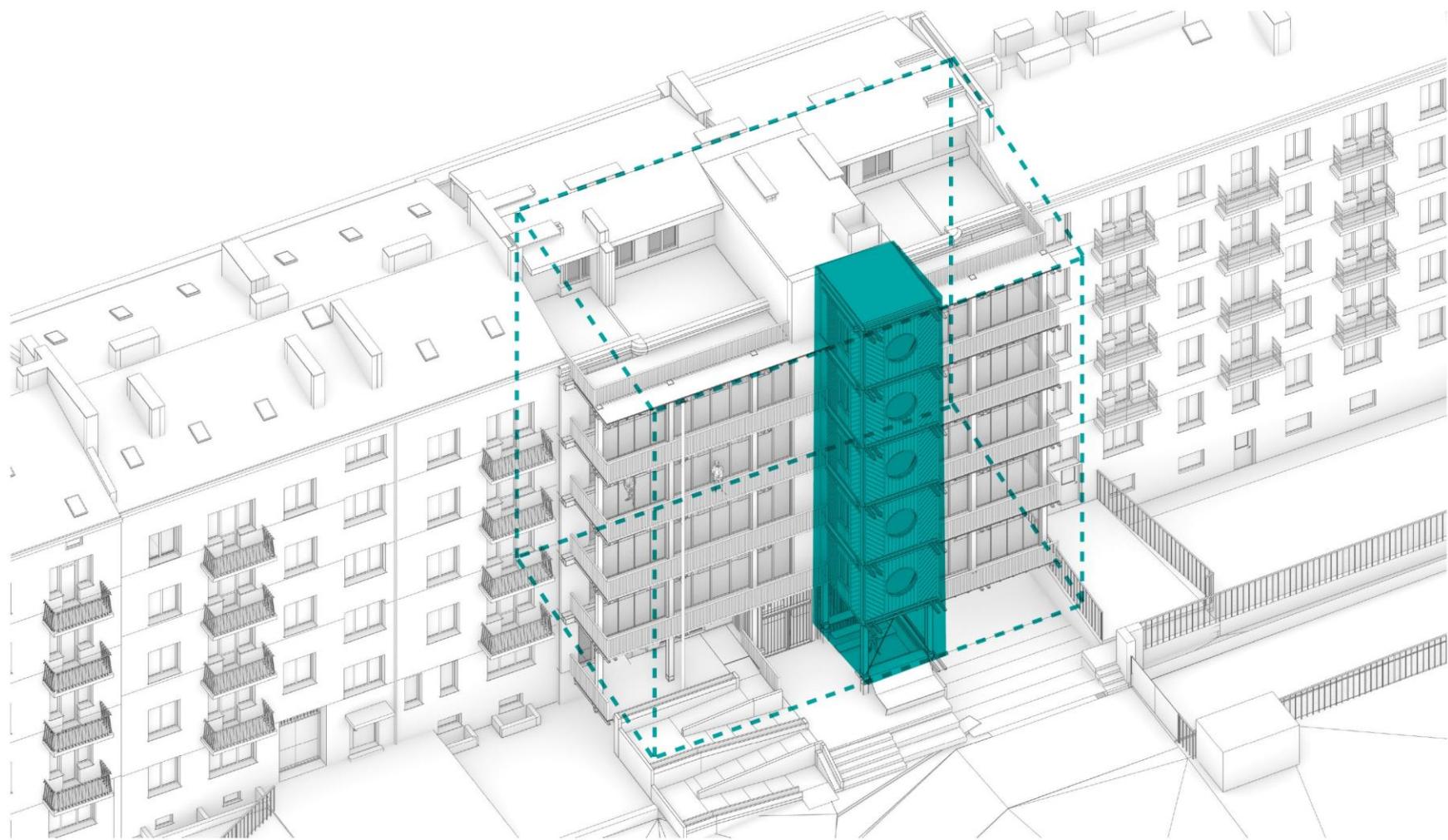


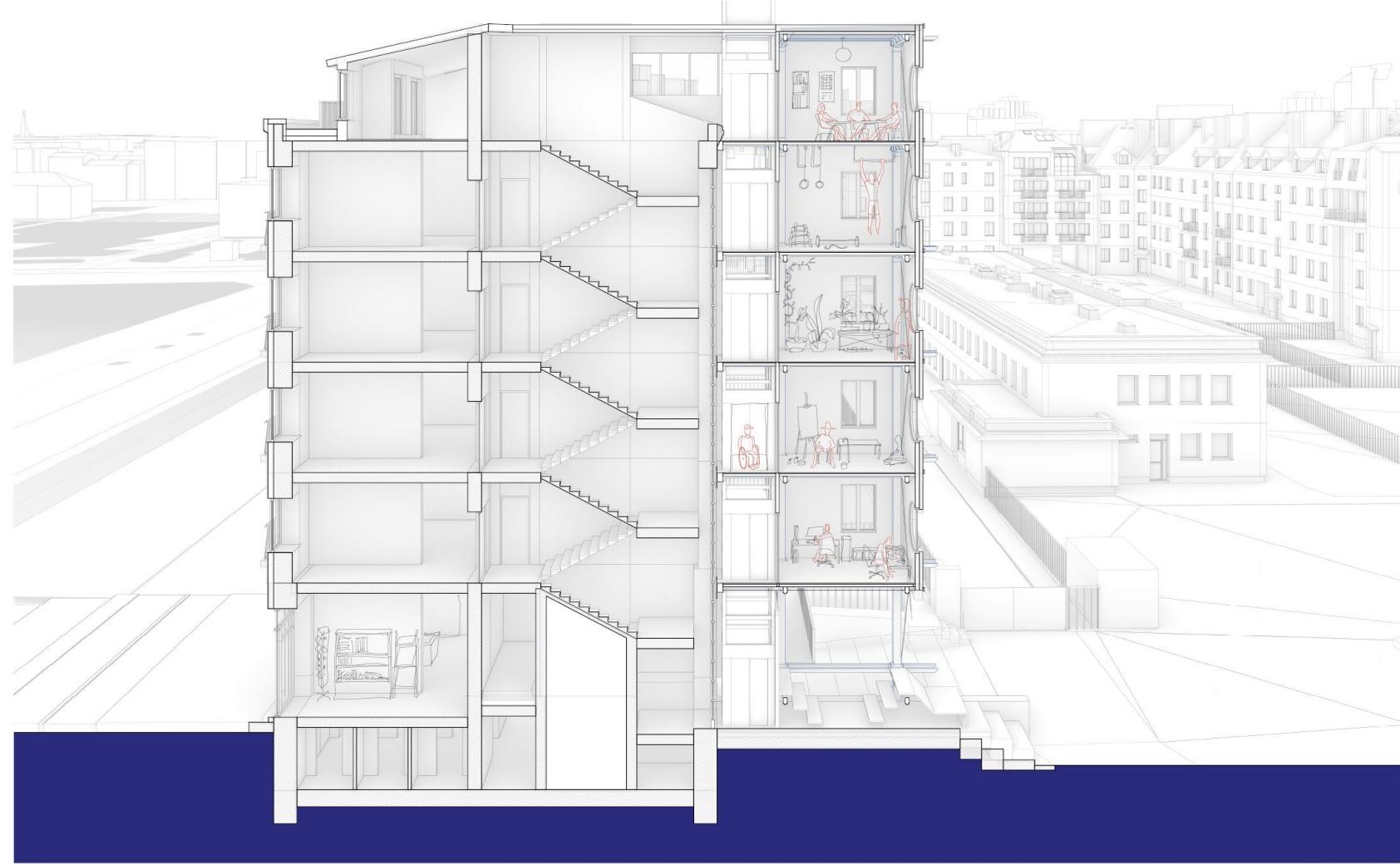


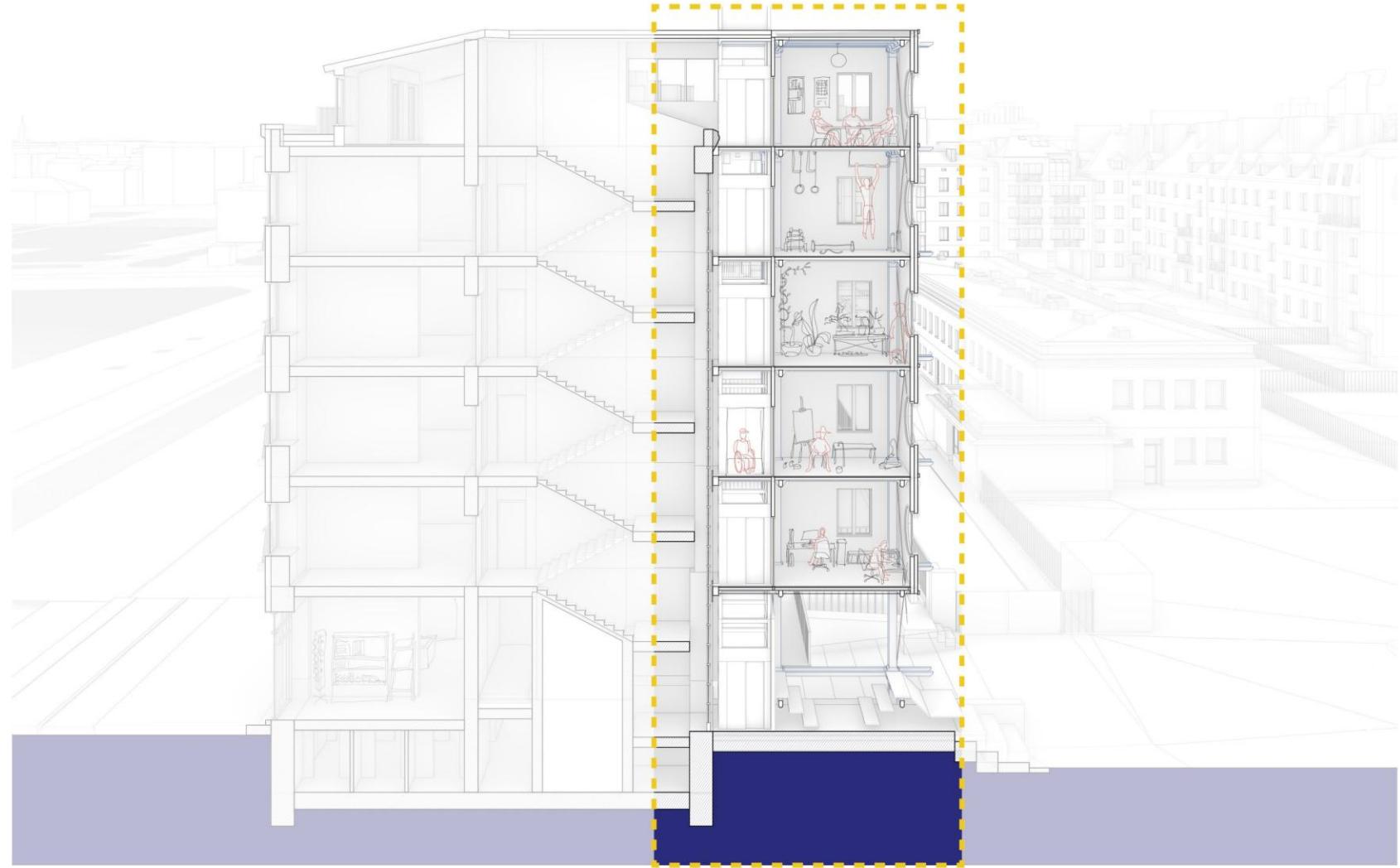


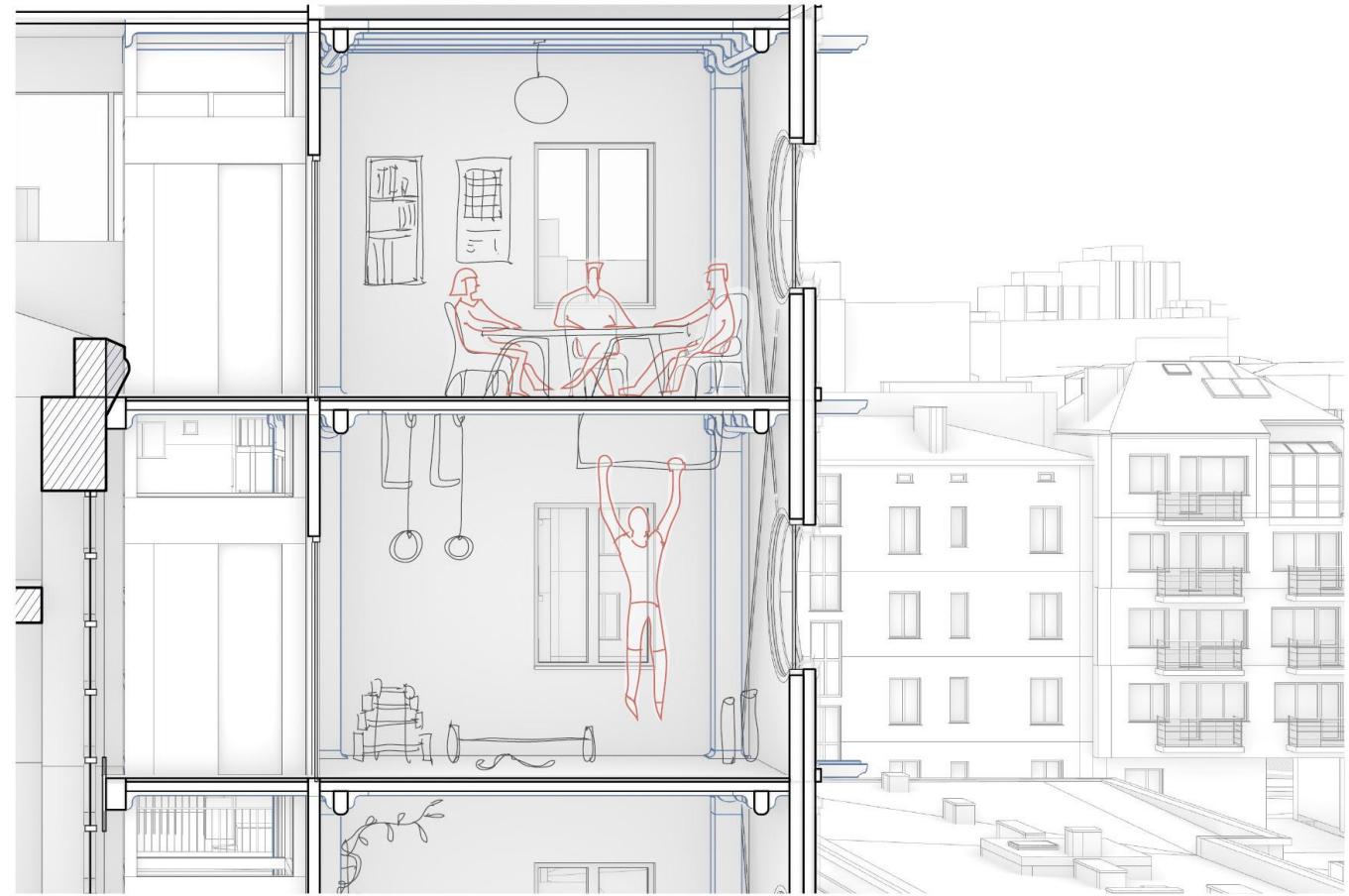
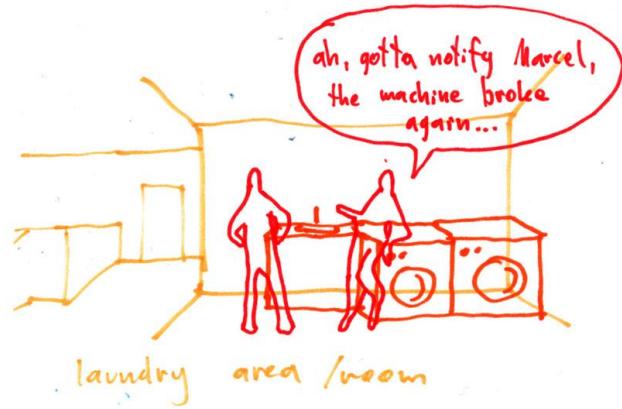


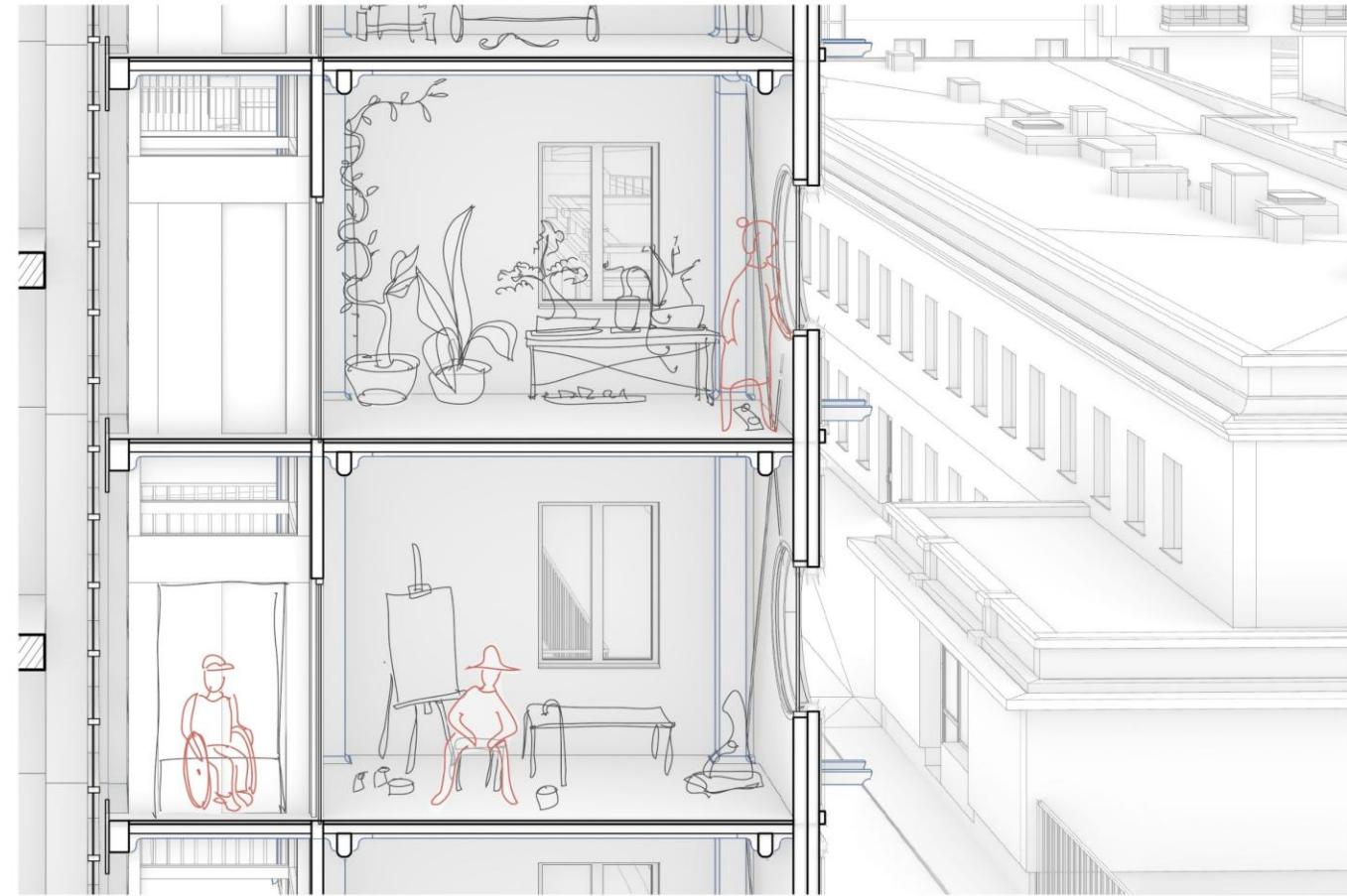


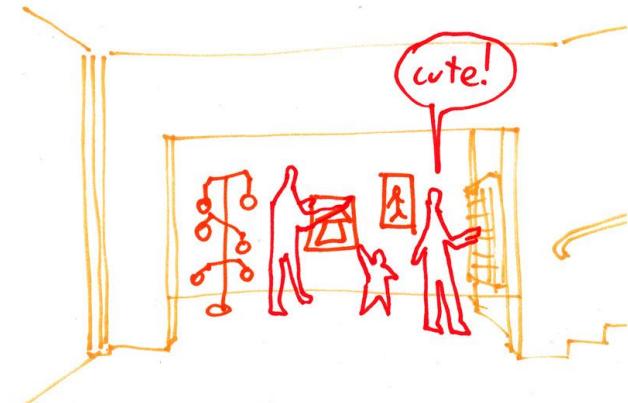




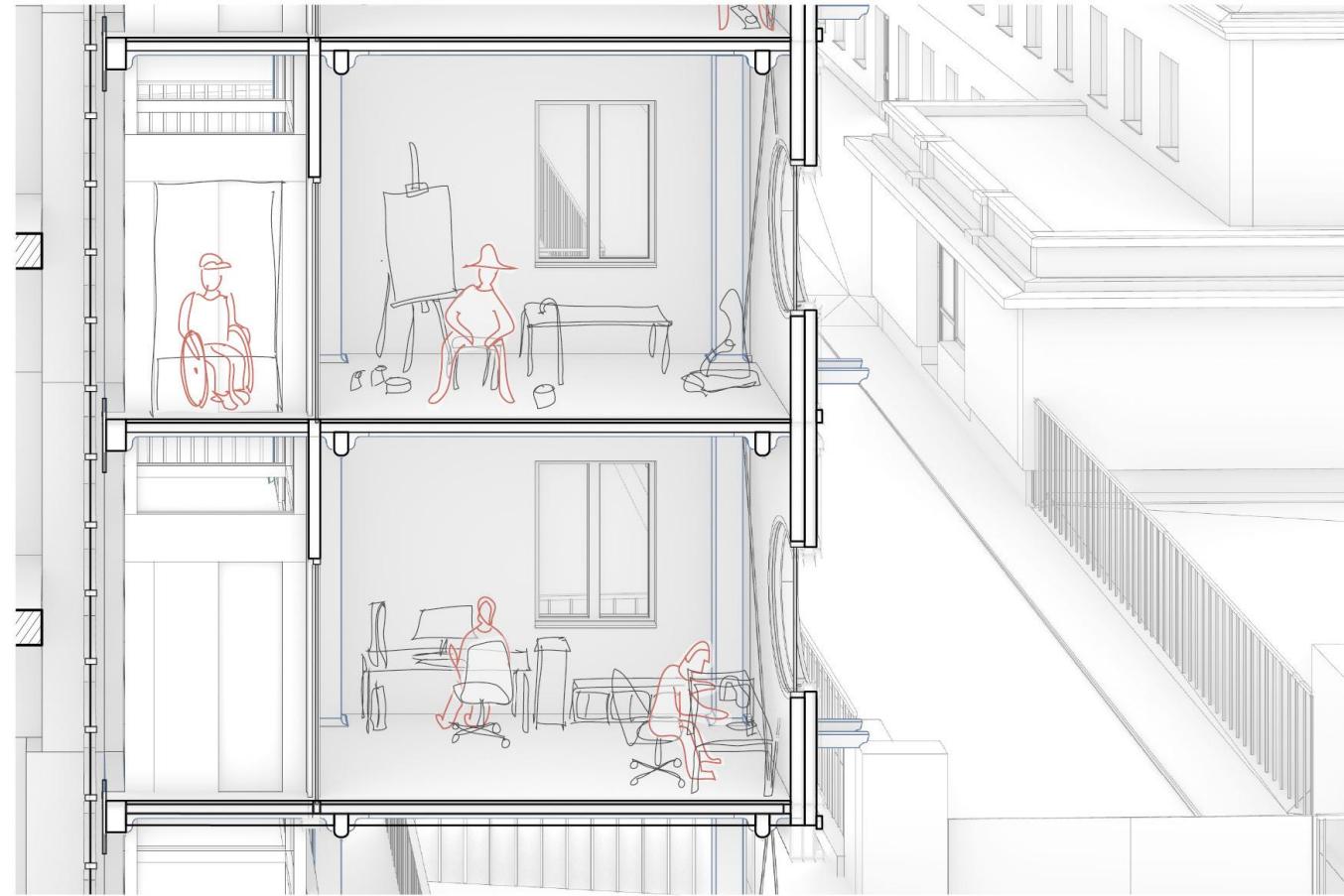


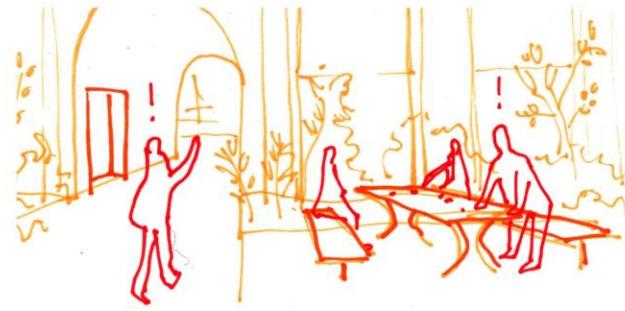




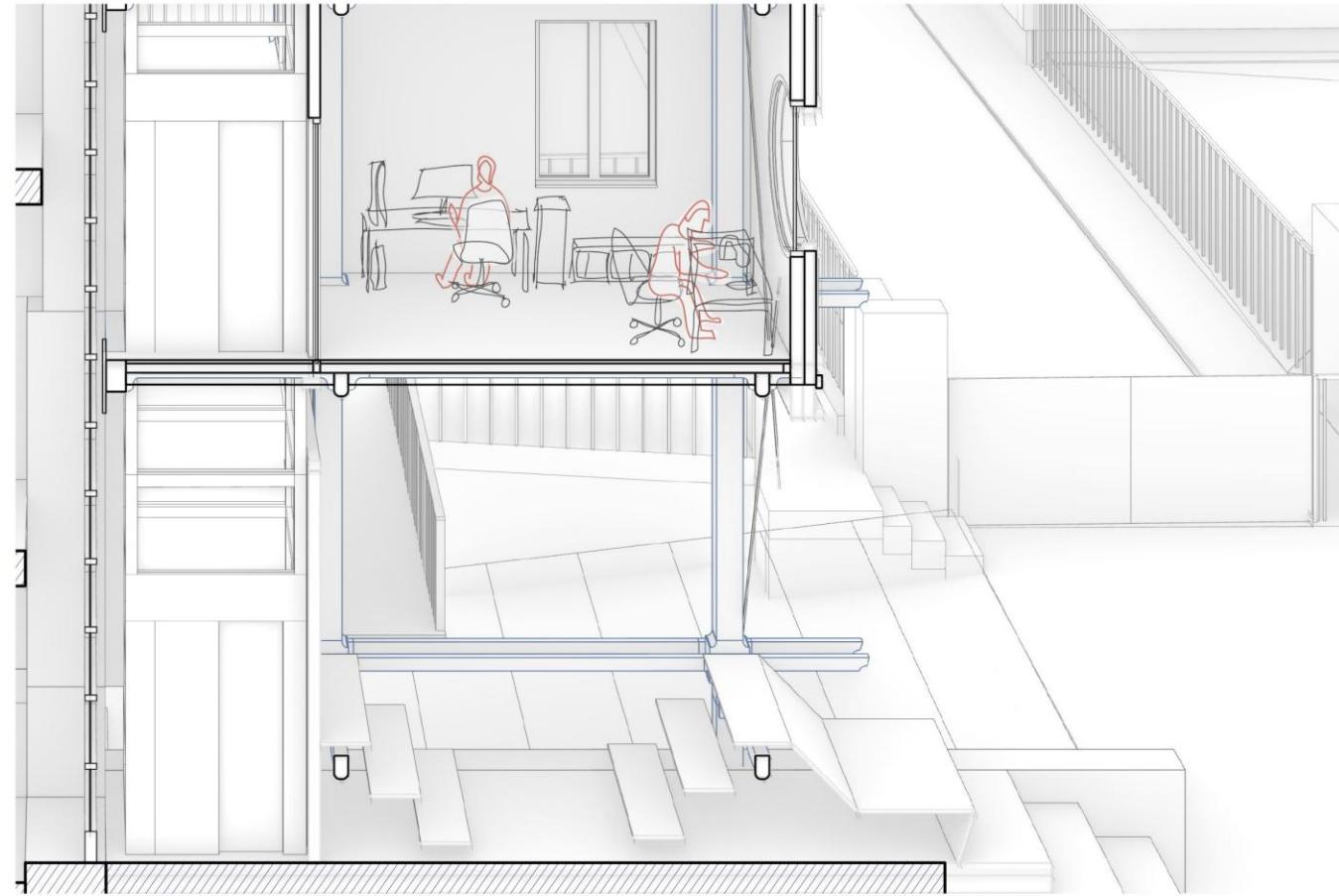


small exhibition room?

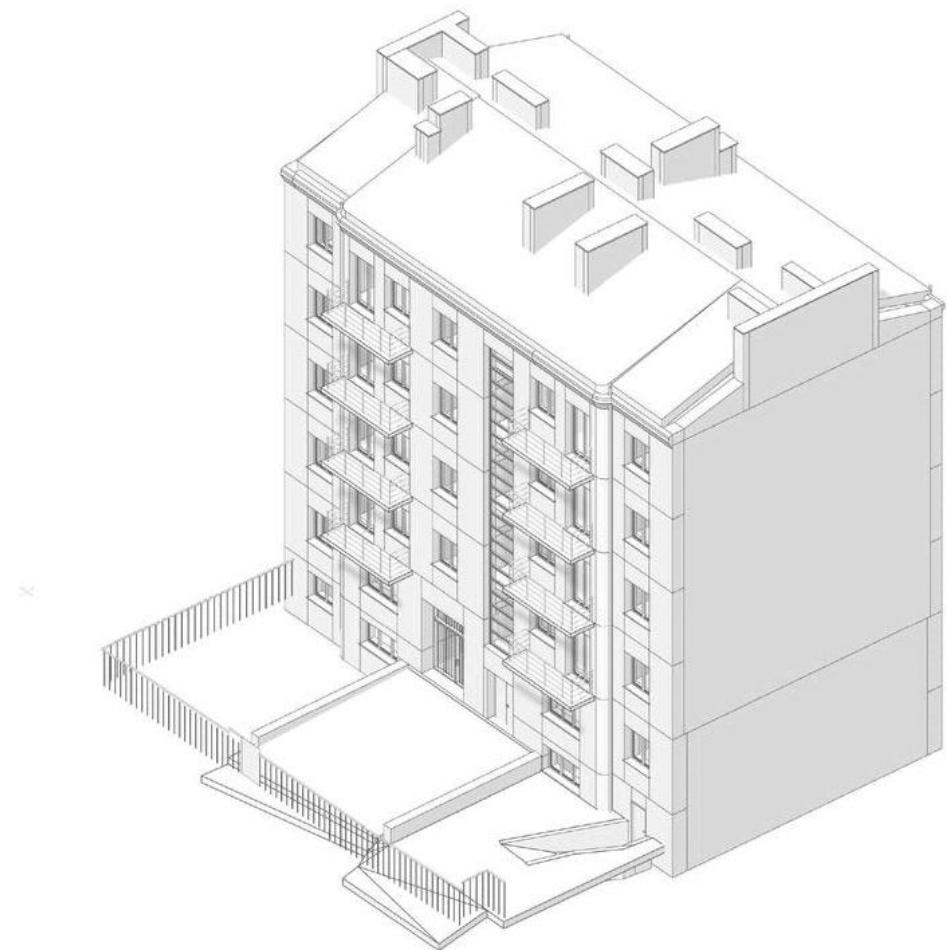


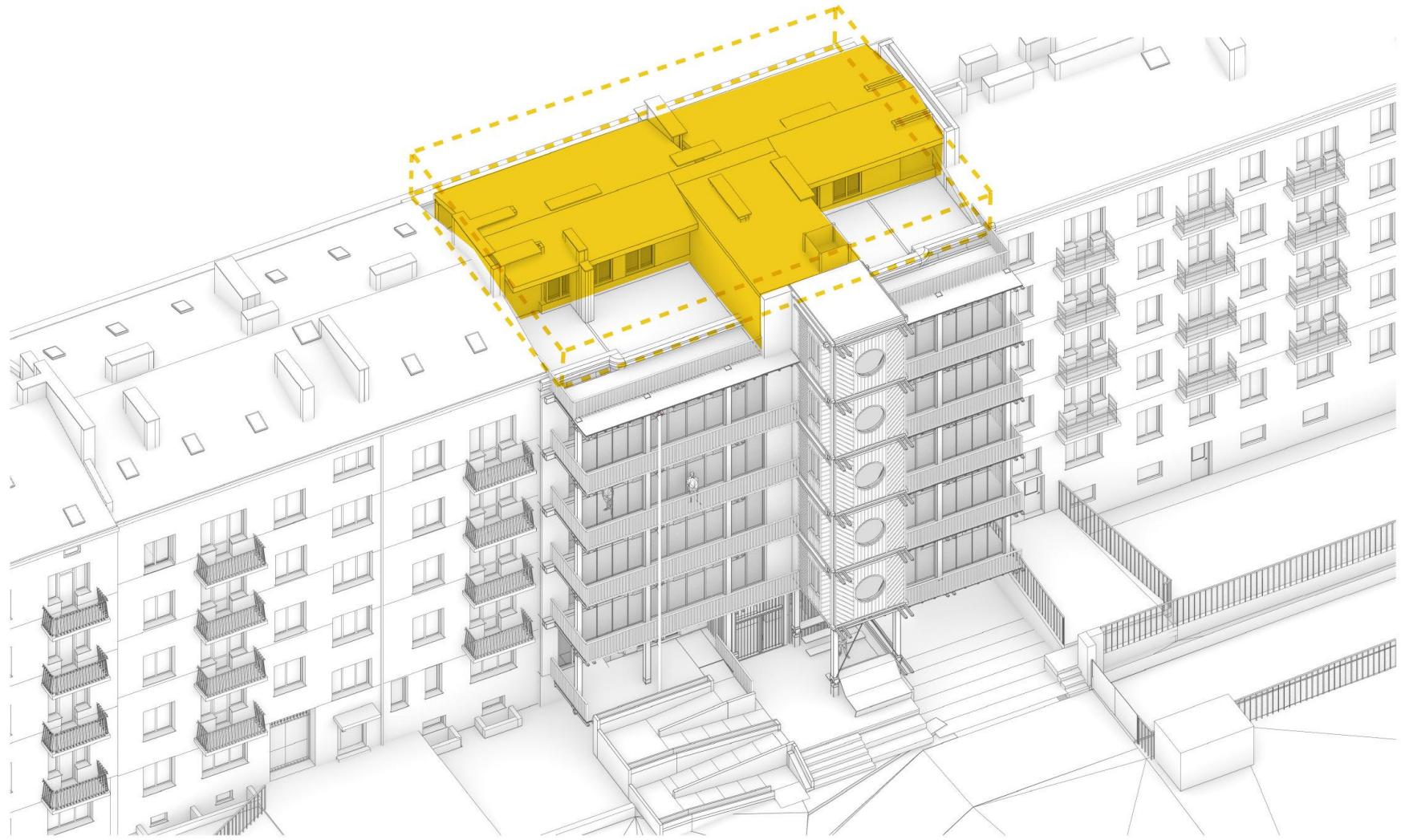


picnic area near the entrance

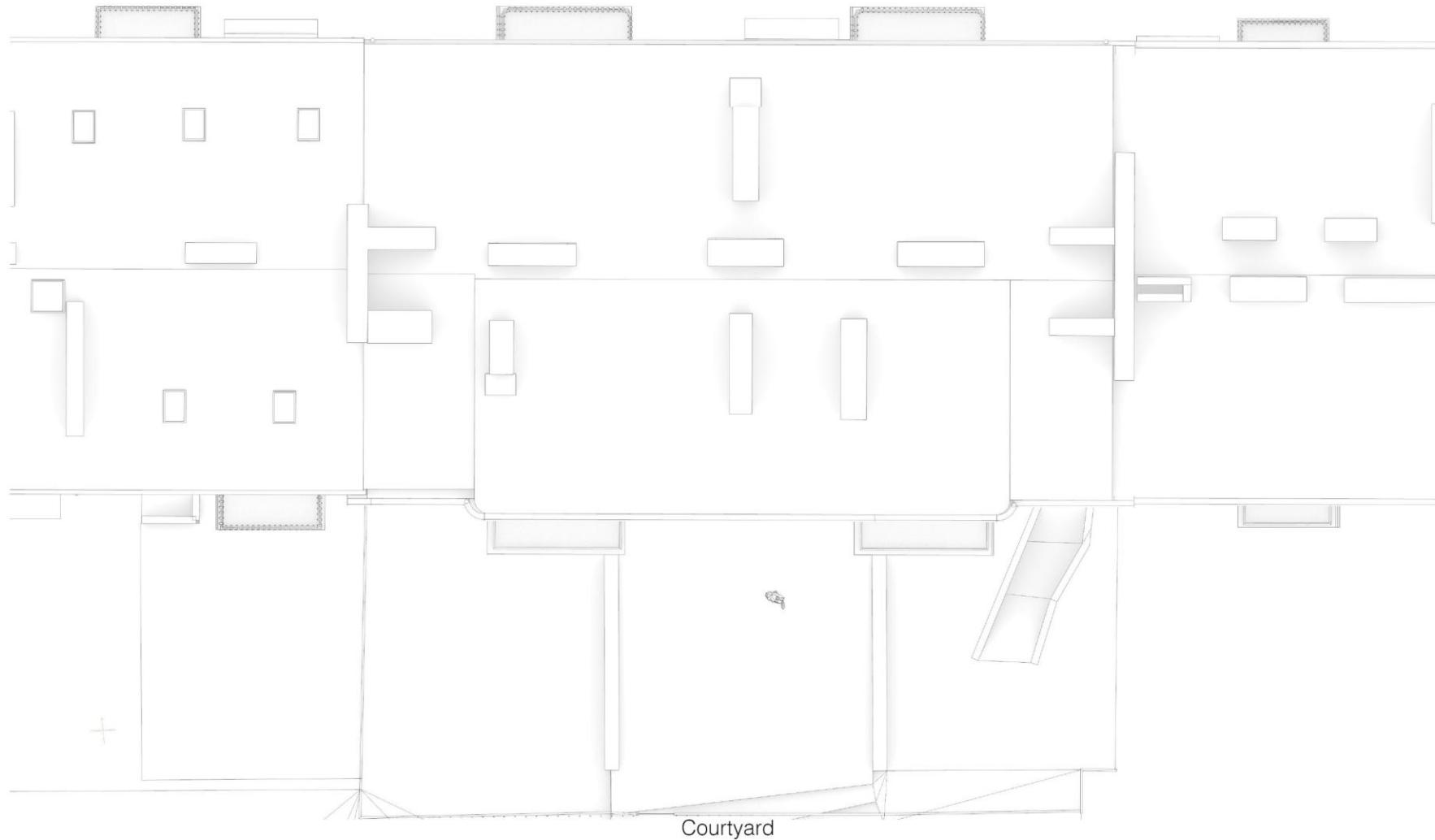


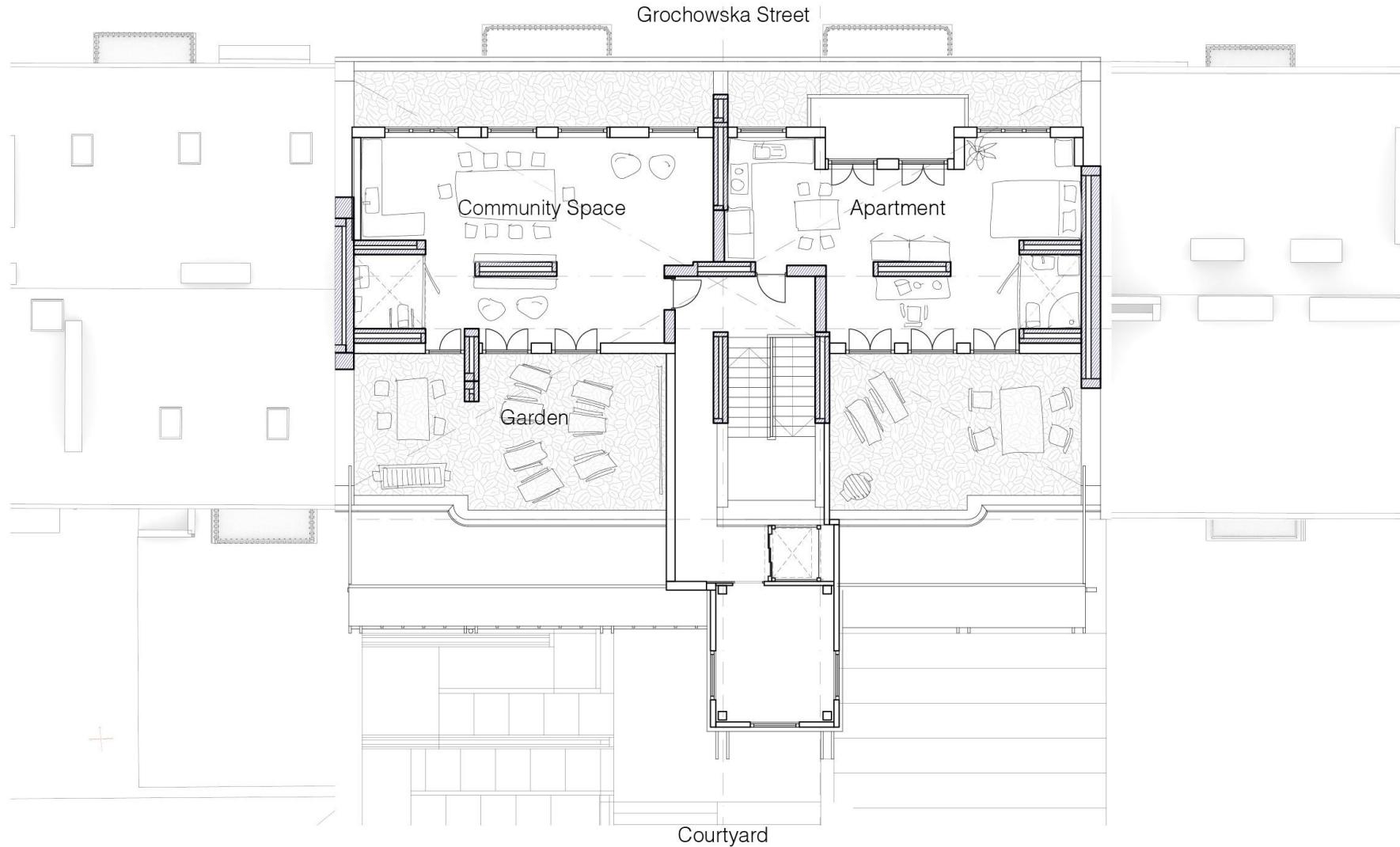


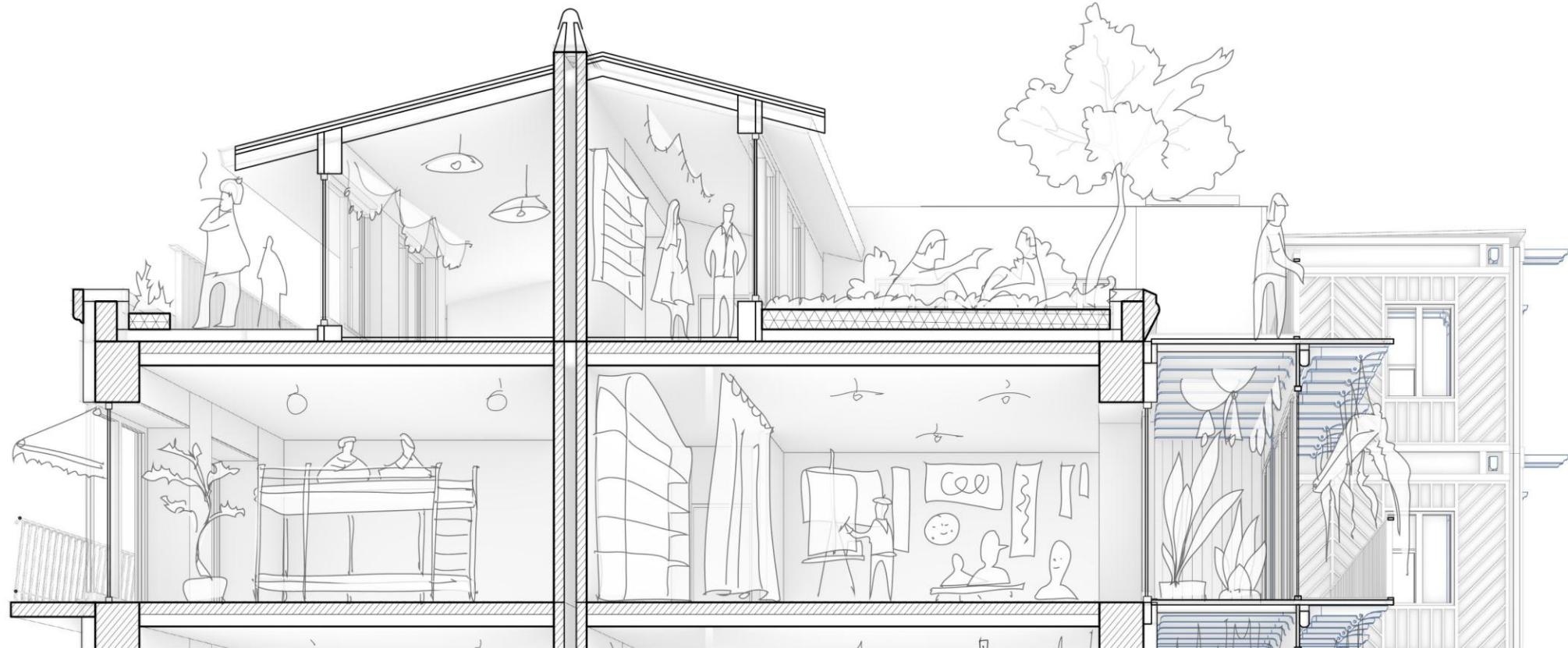




Grochowska Street



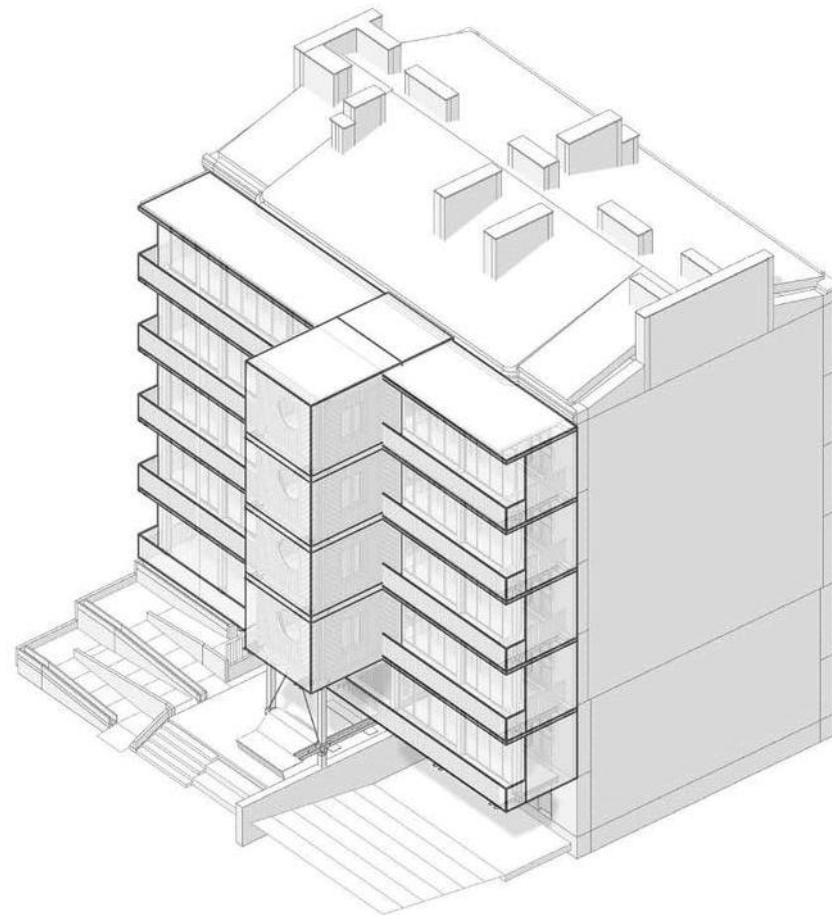




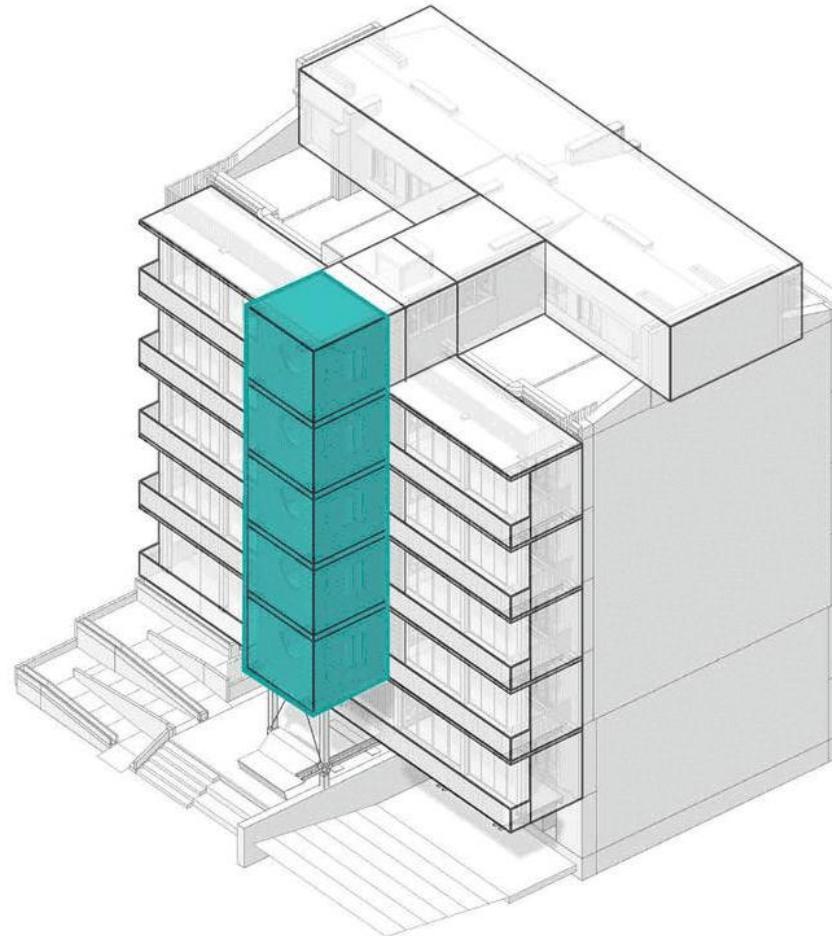
Roof-Top Hang-Outs

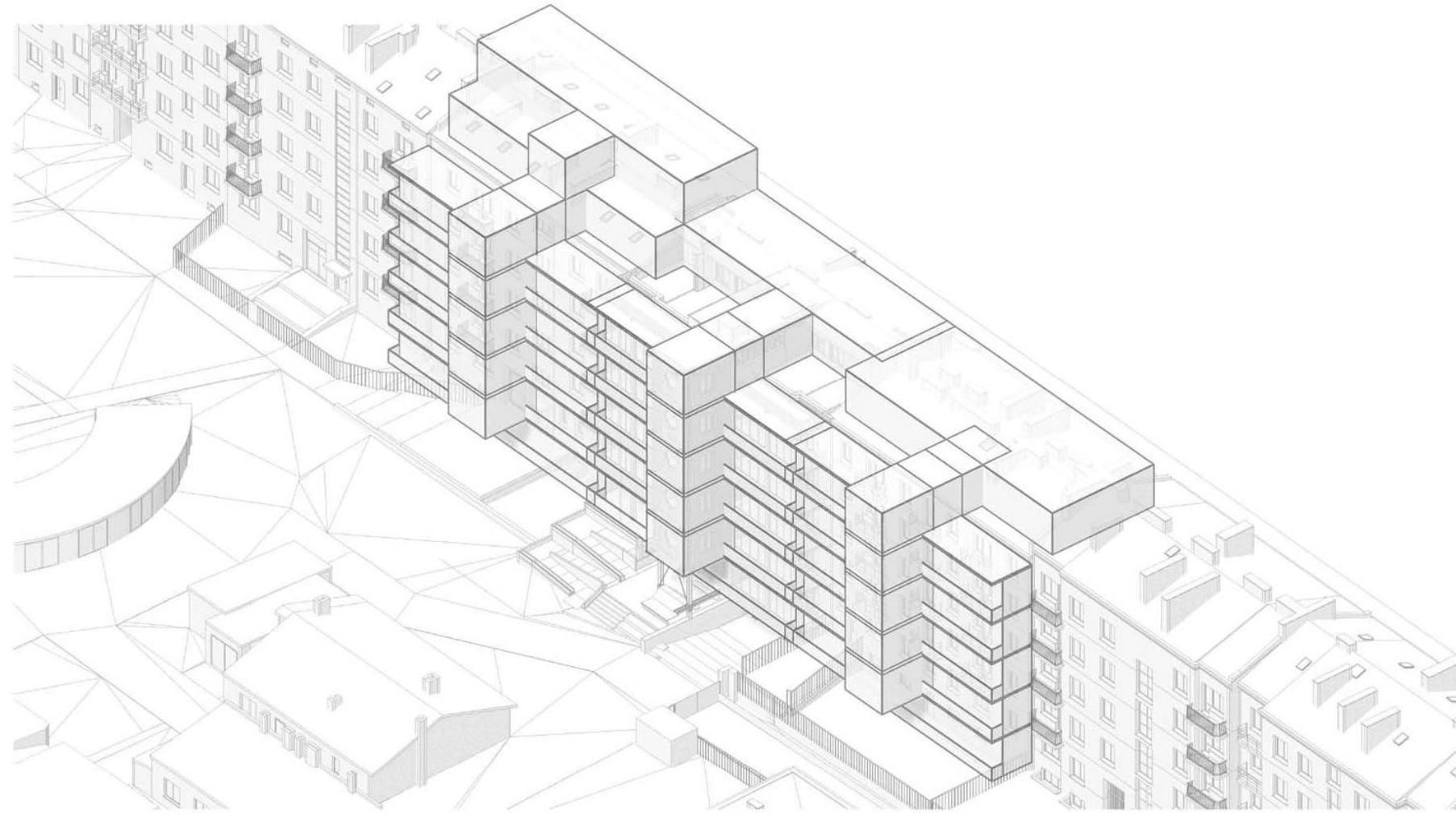


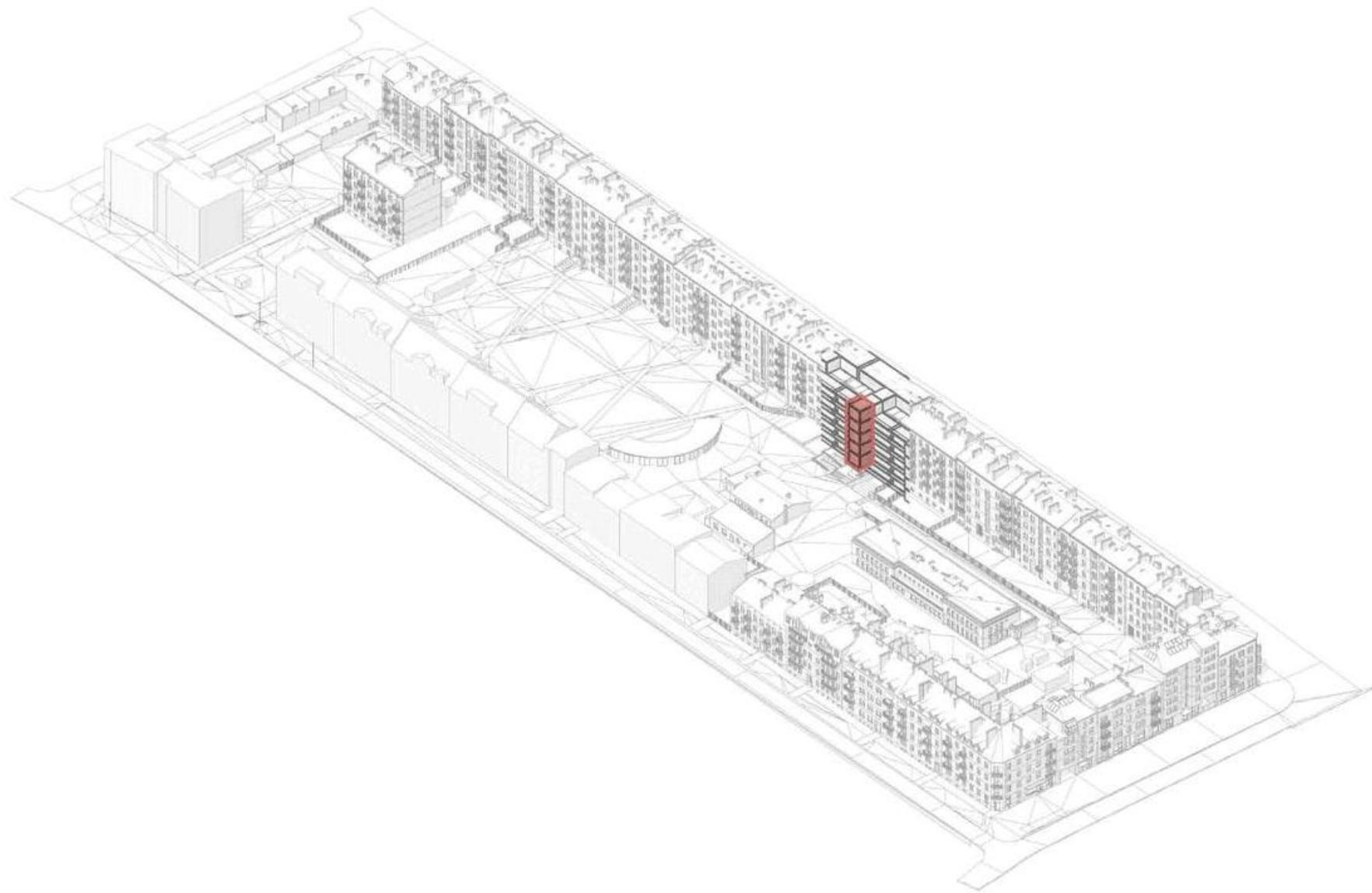


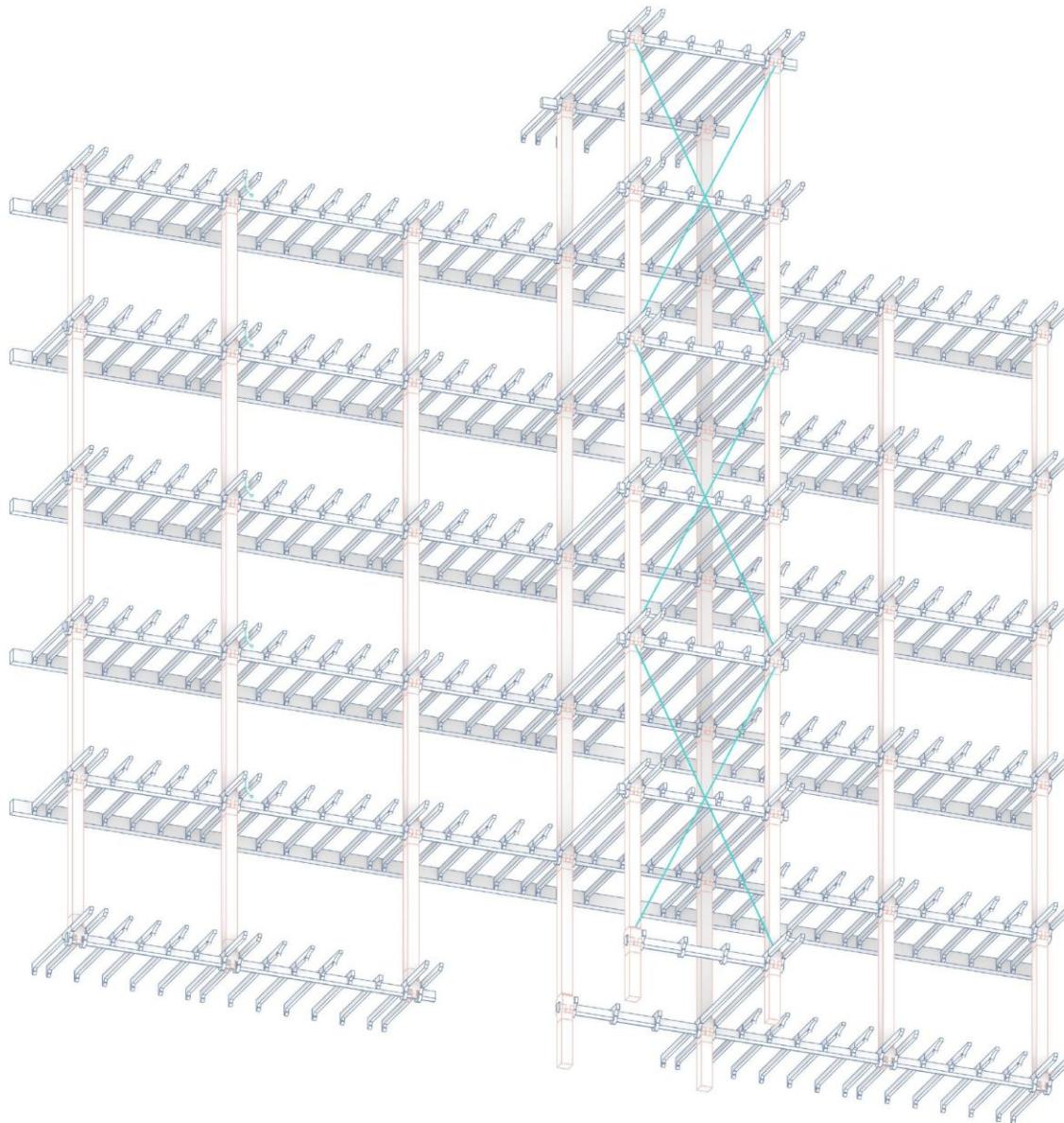


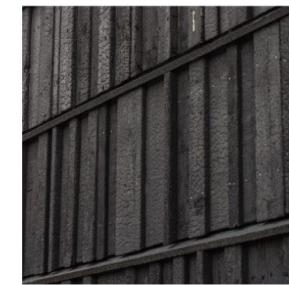
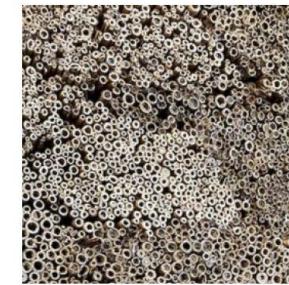








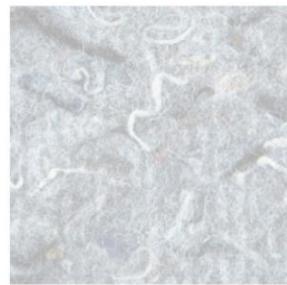
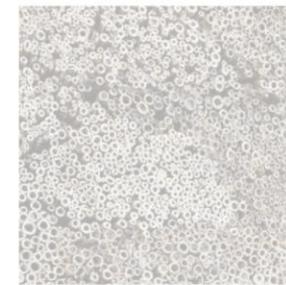




Structure

Insulation

Finishings



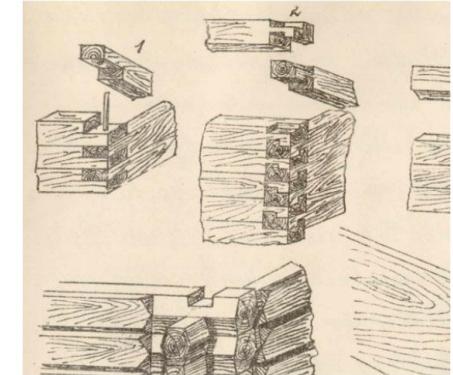
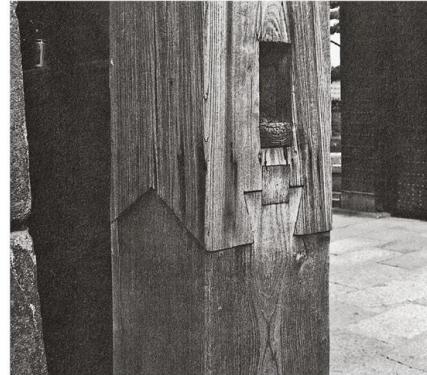
Structure

Insulation

Finishings

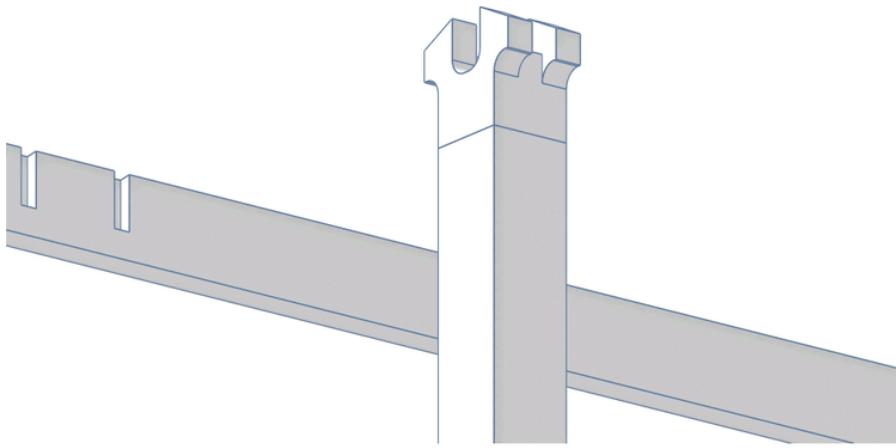
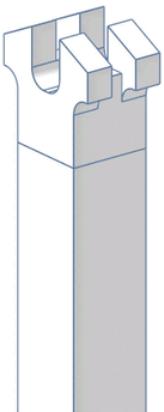
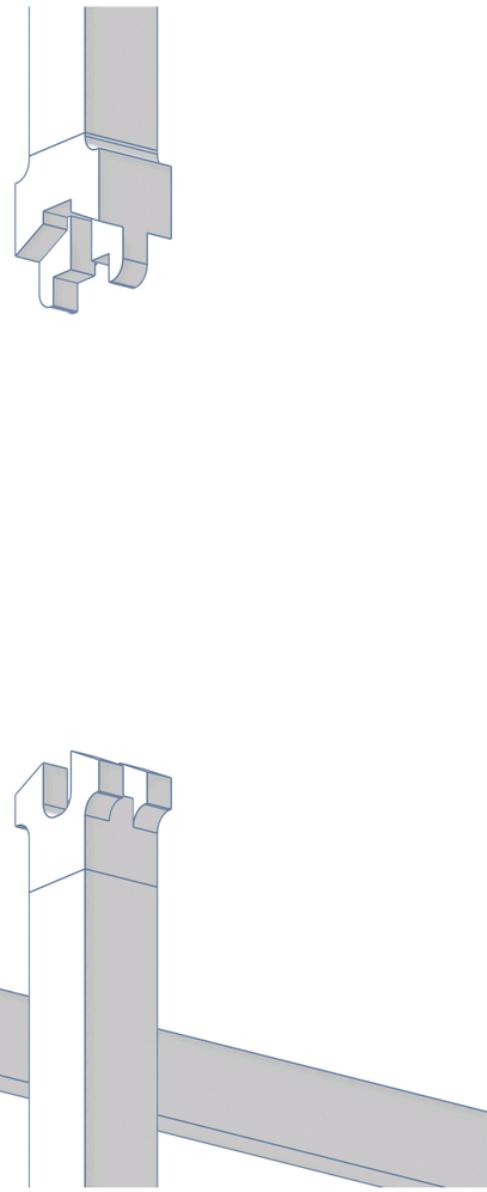
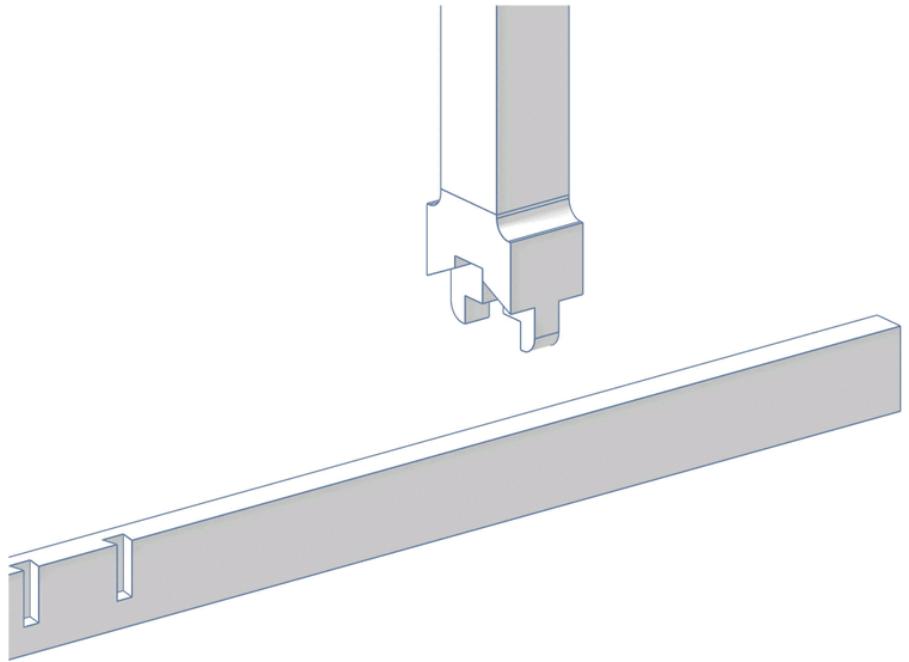


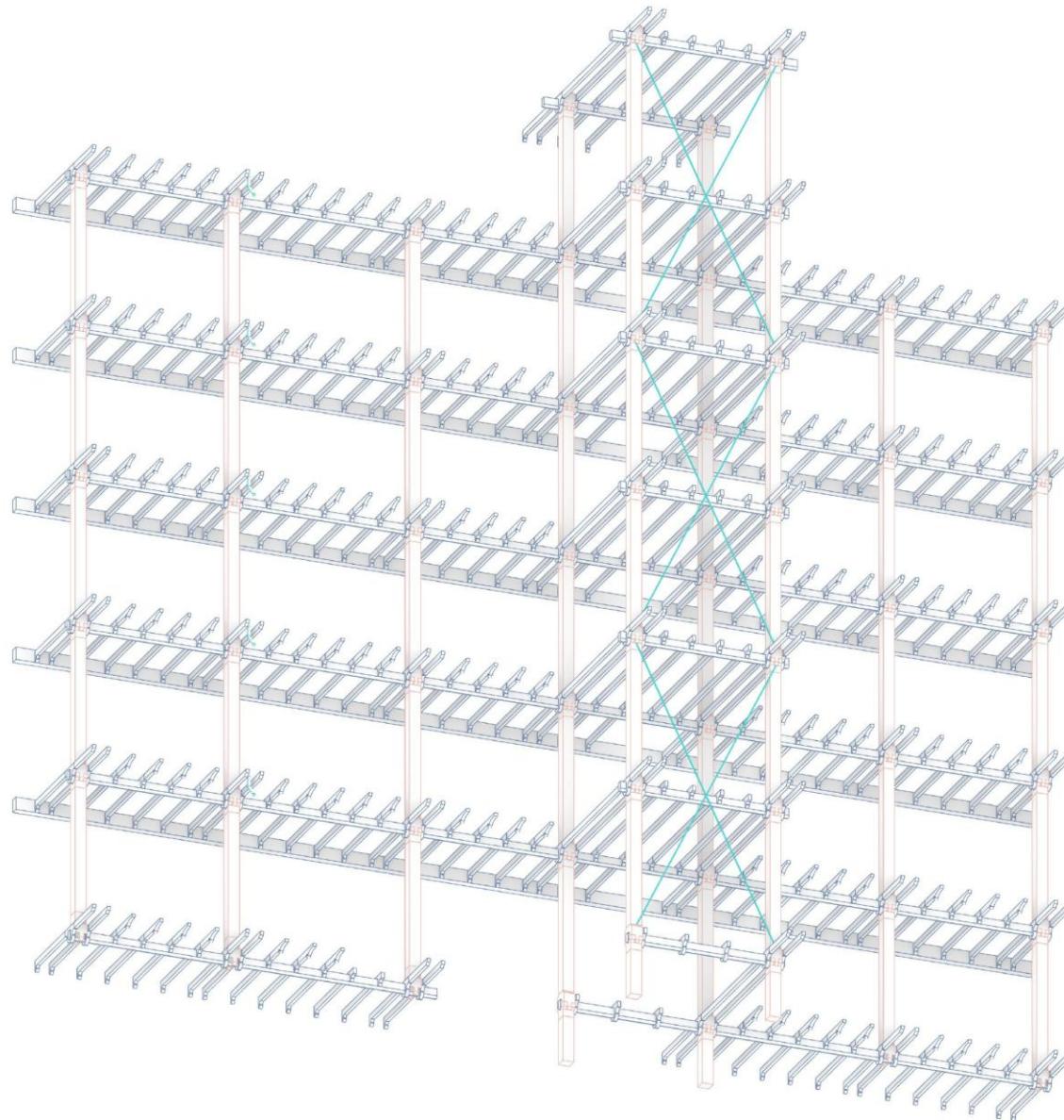


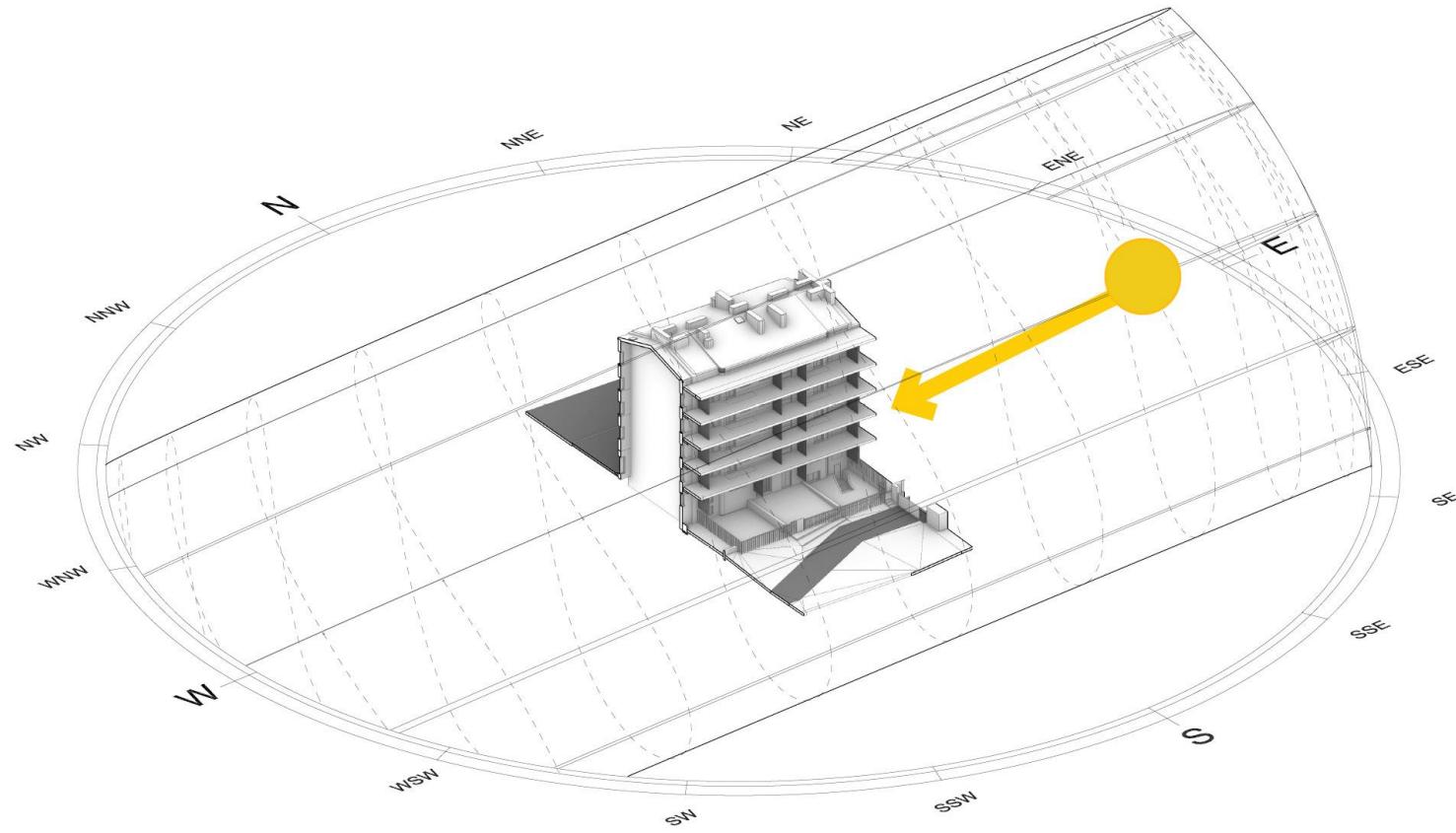


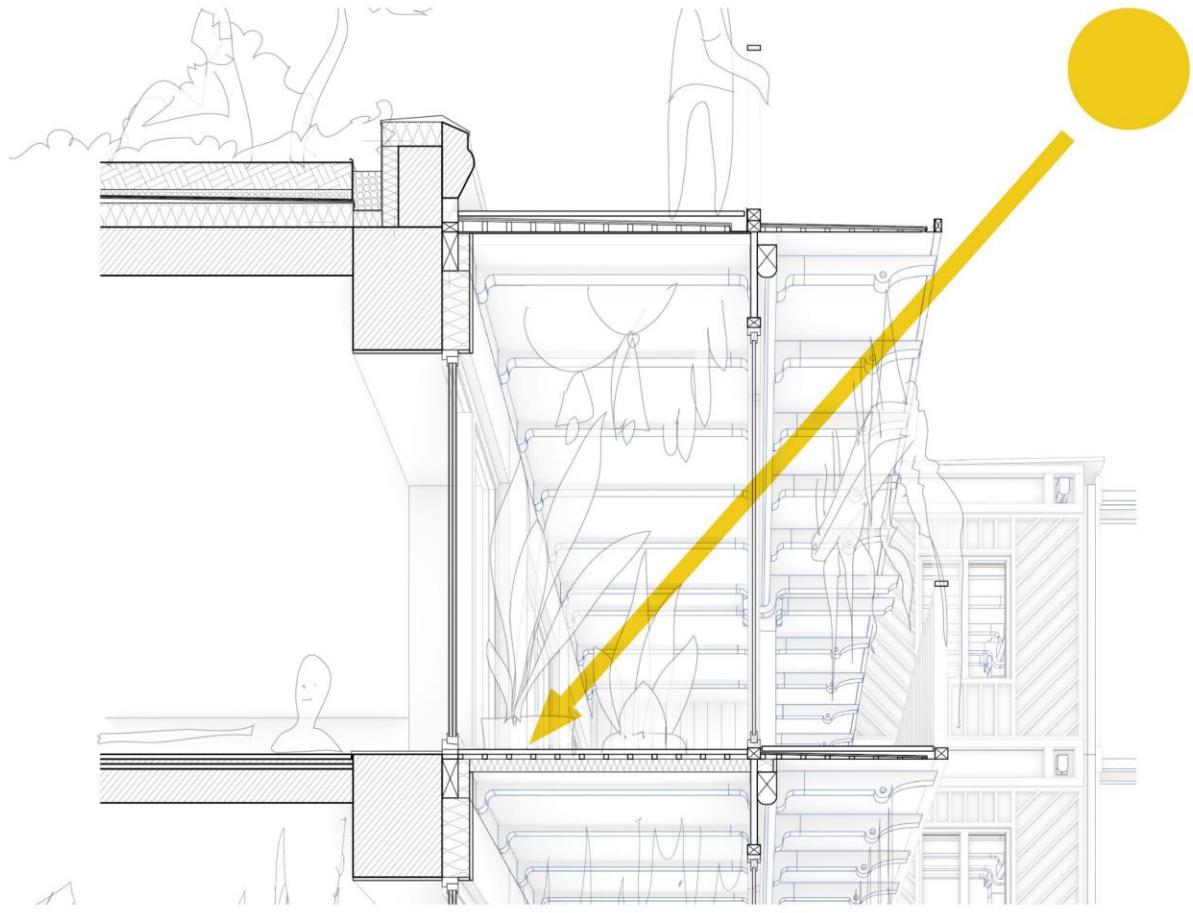
Timber Joinery

Drawing inspiration from Japanese, Polish, and modern international approaches to timber joint design.

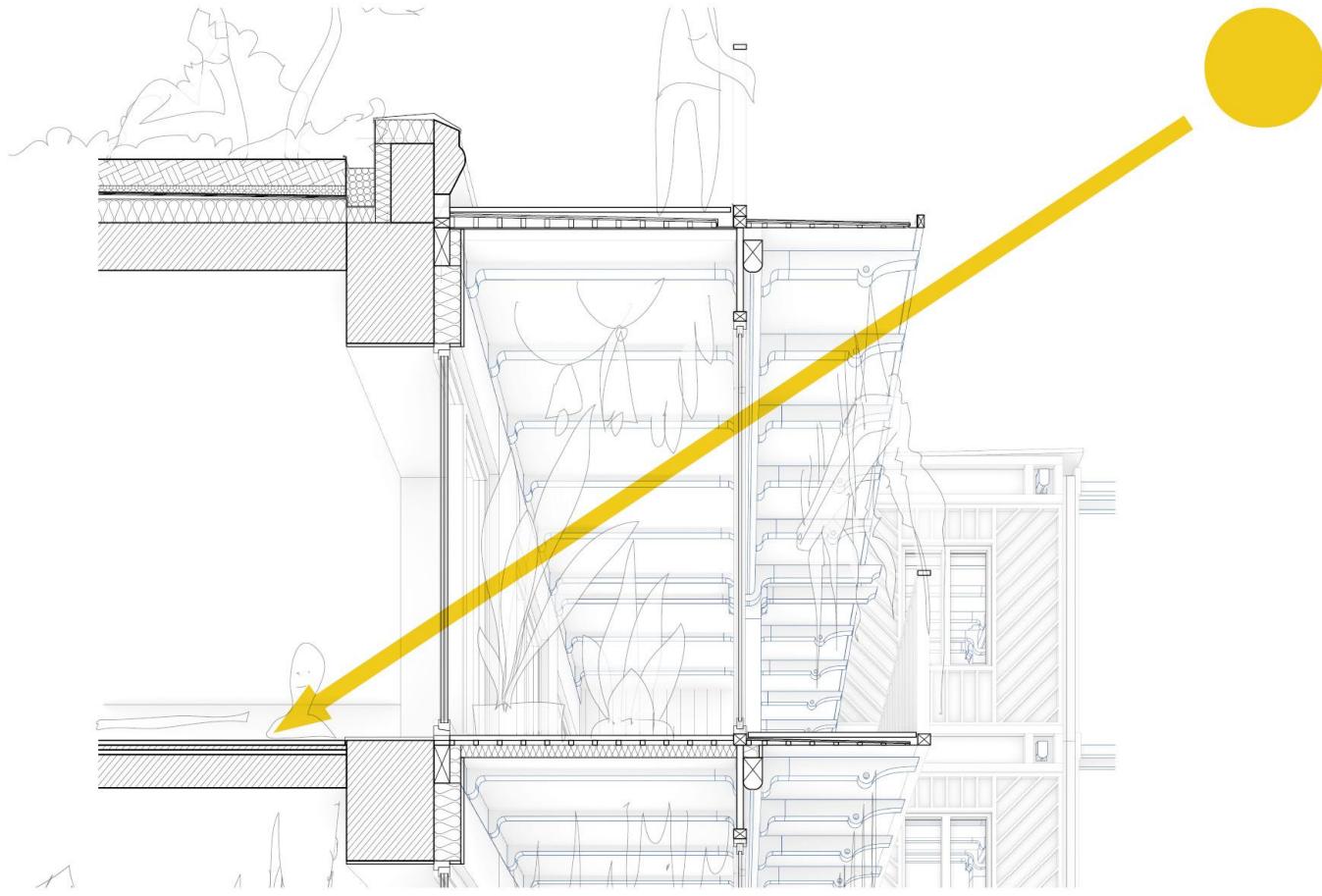




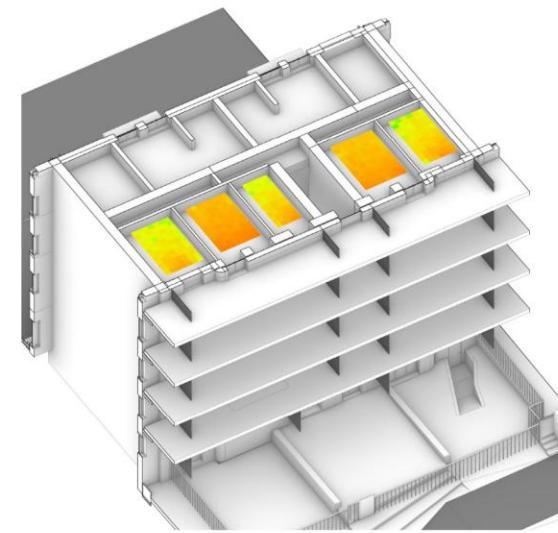
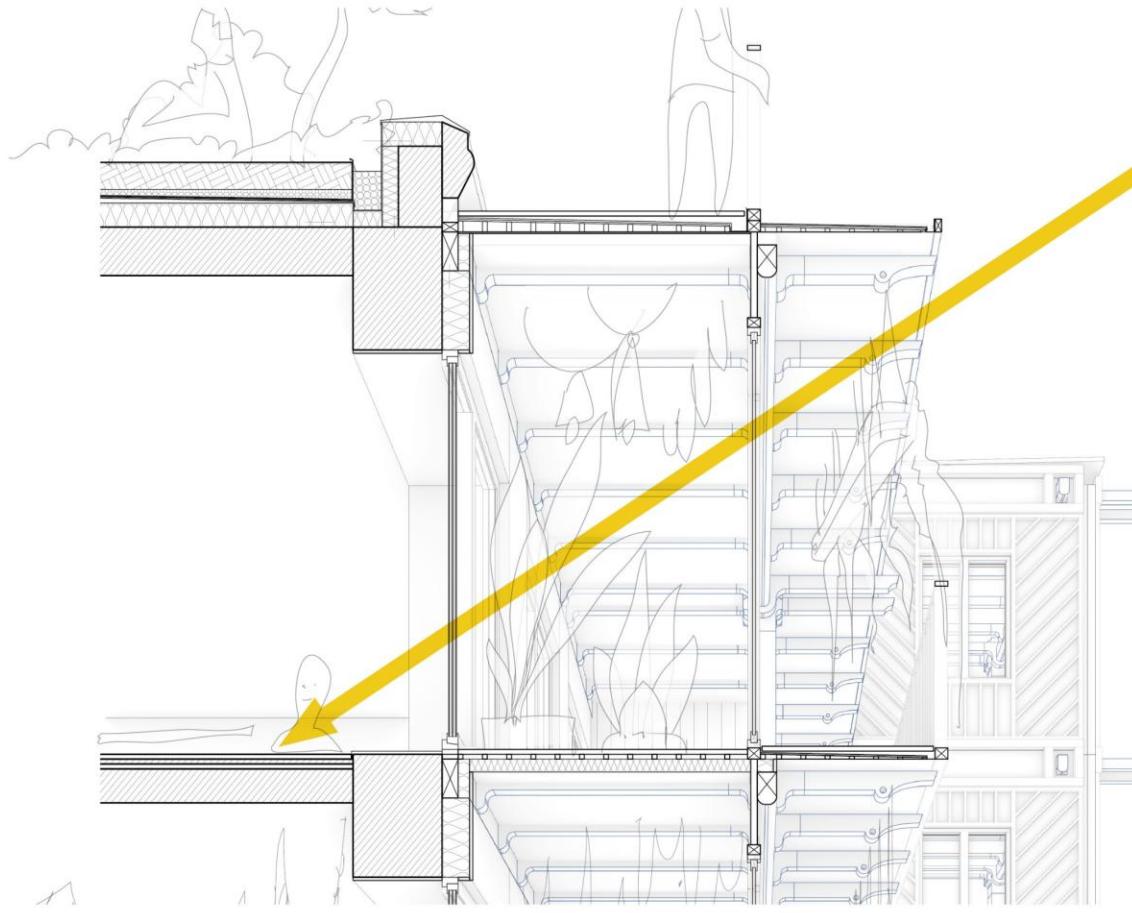




Summer



Winter



sDA %



Option 1. Simulation: Spatial Daylight Autonomy (2-3 points, 1-2 points: Healthcare)

Demonstrate through annual computer simulations that spatial daylight autonomy (sDA) of at least 55%, 75%, or 90% is achieved. Use regularly occupied floor area. Healthcare projects should use the perimeter area determined under EQ Credit Quality Views. Points are awarded according to Table 1.

Table 1. Points for daylight floor area: Spatial daylight autonomy

New Construction, Core and Shell, Schools, Retail, Data Centers, Warehouses & Distribution Centers, CI, Hospitality

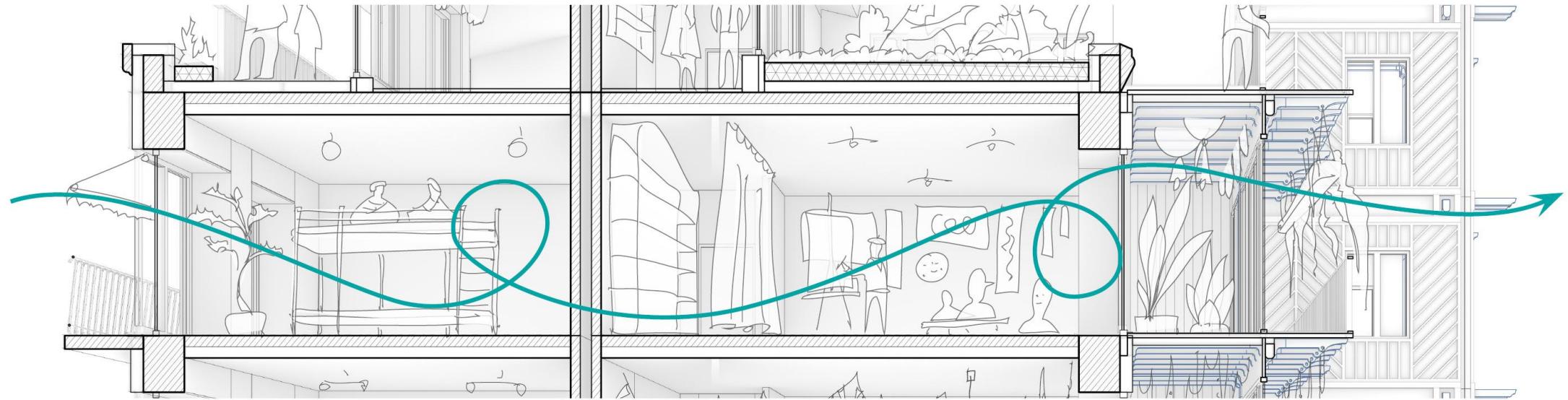
Points sDA (for regularly occupied floor area)

55% - 2

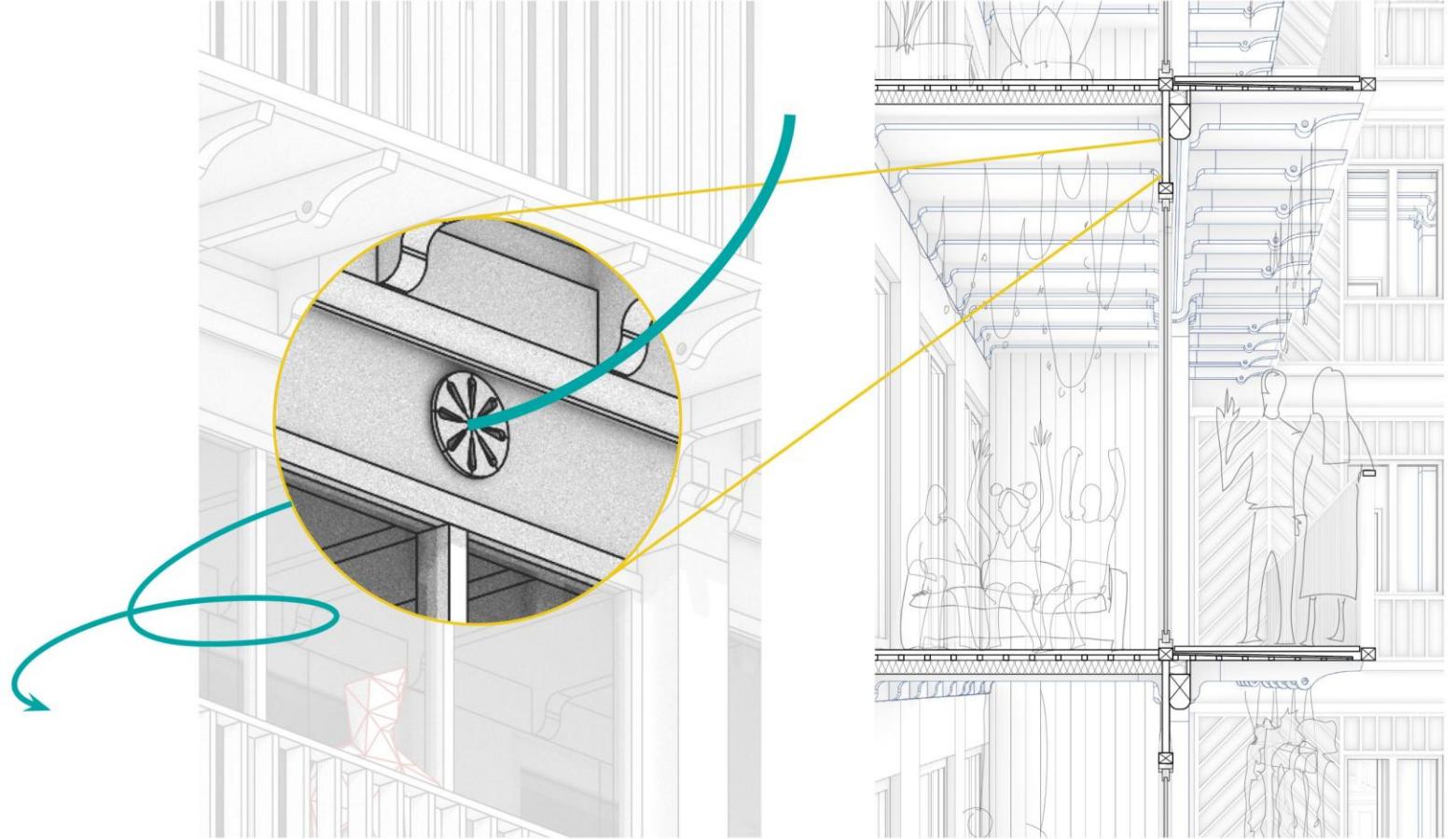
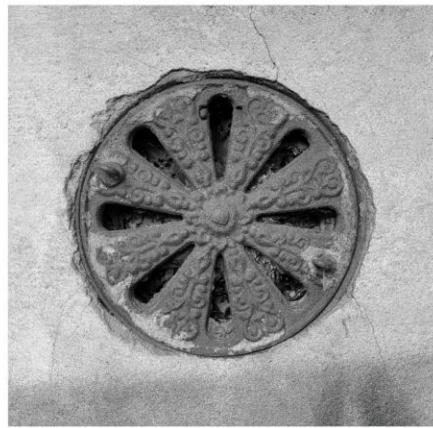
75% - 3

90% Demonstrate through annual computer simulations that annual sunlight exposure (ASE) (000-250) of no more than 10% is achieved. Use the regularly occupied floor area that is daylit per the sDA 50/50% simulations. The sDA and ASE calculation grids should be no more than 2 feet (600 millimeters) square and laid out across the regularly occupied area at a work plane height of 30 inches (760 millimeters) above finished floor (unless otherwise defined). Use an hourly time-step analysis based on typical meteorological year data, or an equivalent, for the nearest available weather station. Include any permanent interior obstructions. Movable furniture and partitions may be excluded.

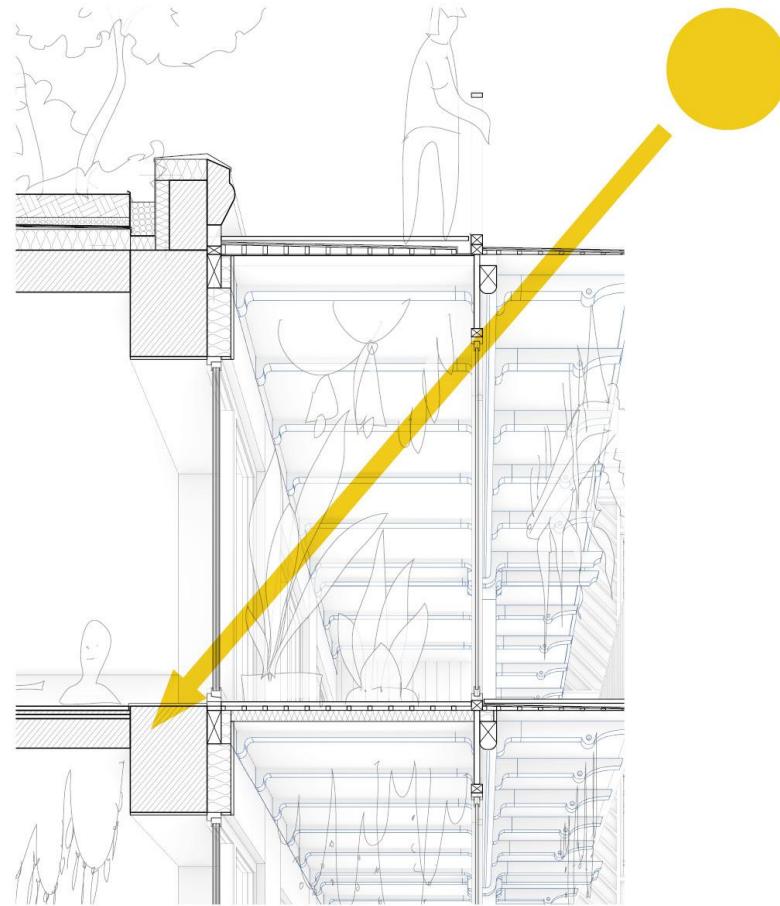
Ensuring Enough Daylight



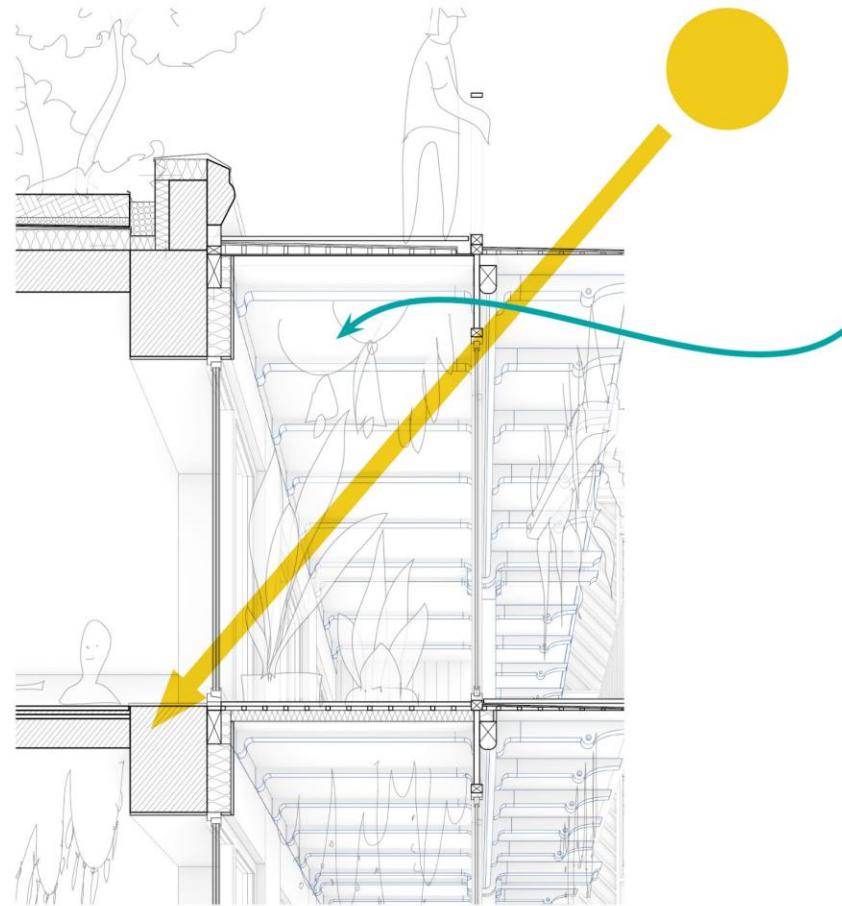
Summer Cross Ventilation



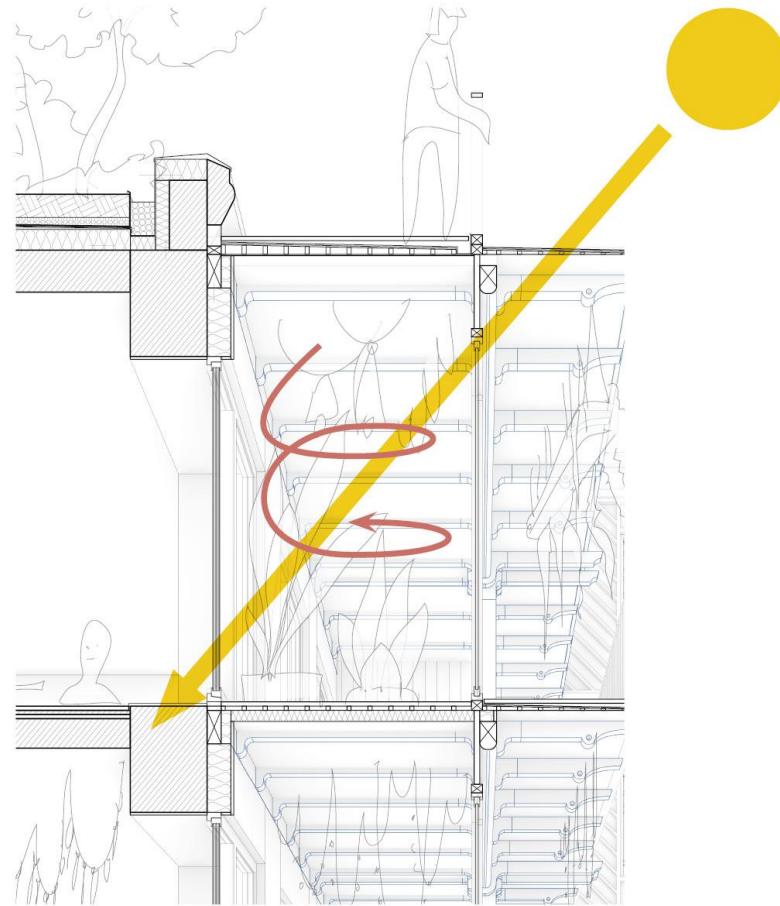
Adjustable Vents



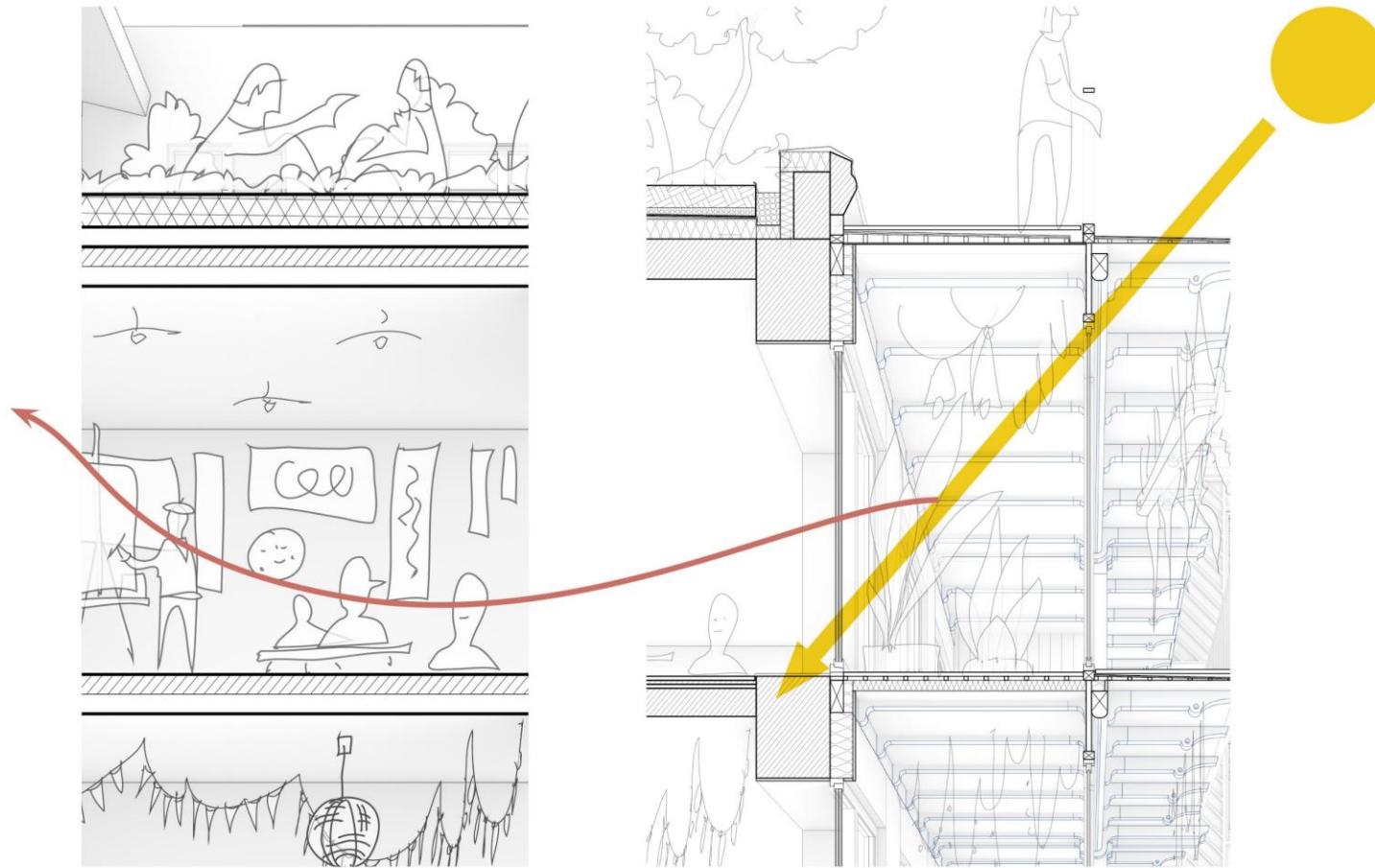
Winter Buffer



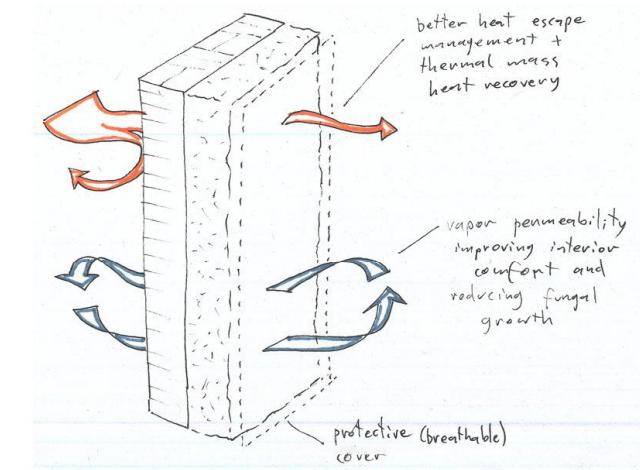
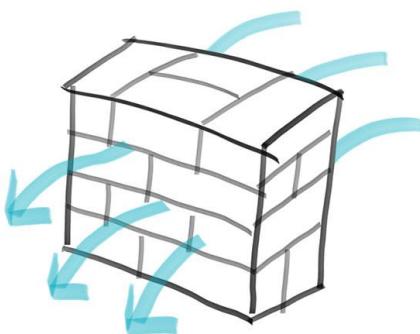
Pre-heating air



Pre-heating air



Pre-heating air

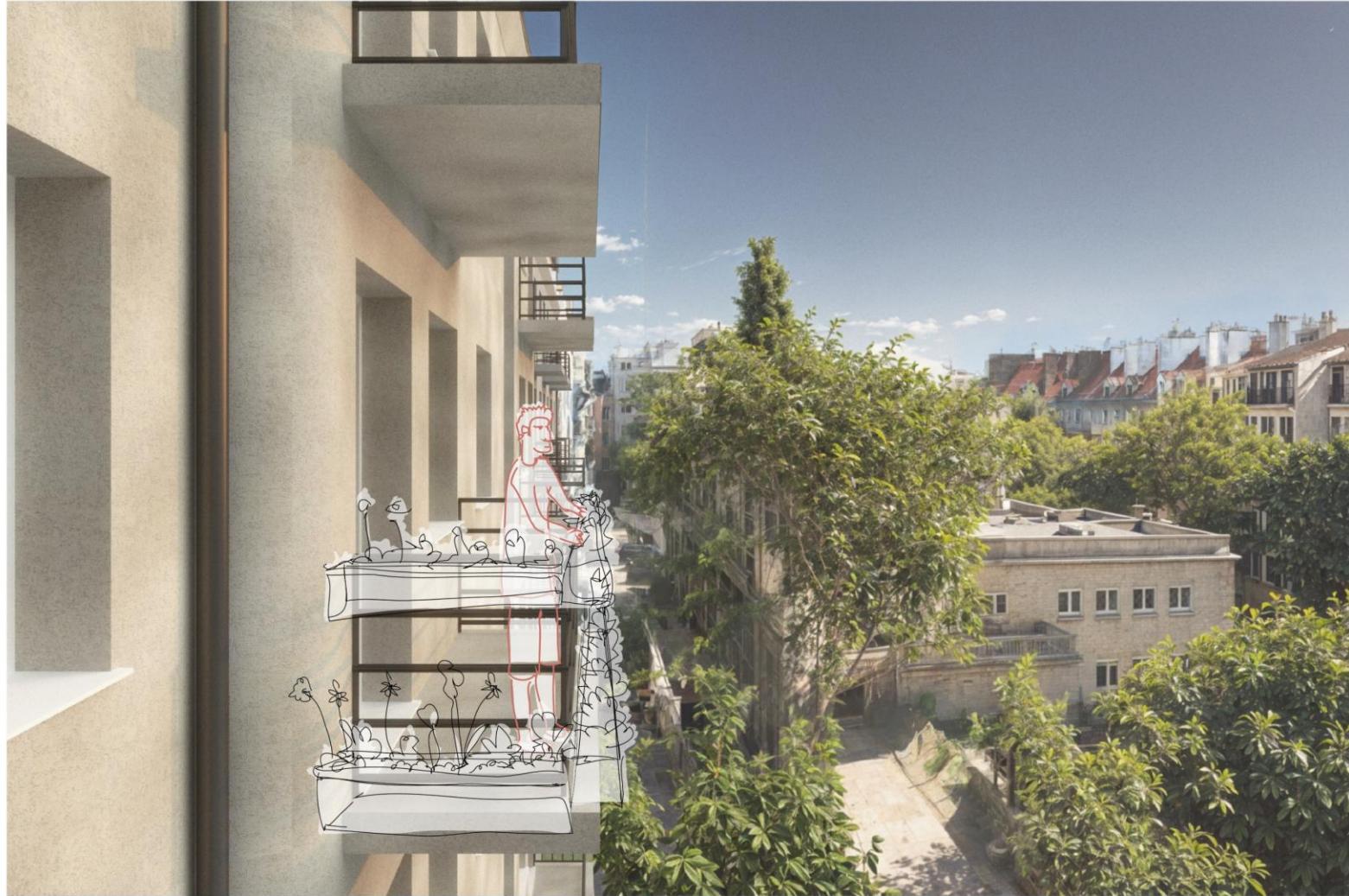


Natural Humidity Management

Bio-Based insulation materials can be bonded with masonry to form a continuous, humidity permeable barrier. That improves indoor comfort and reduces mold issues.







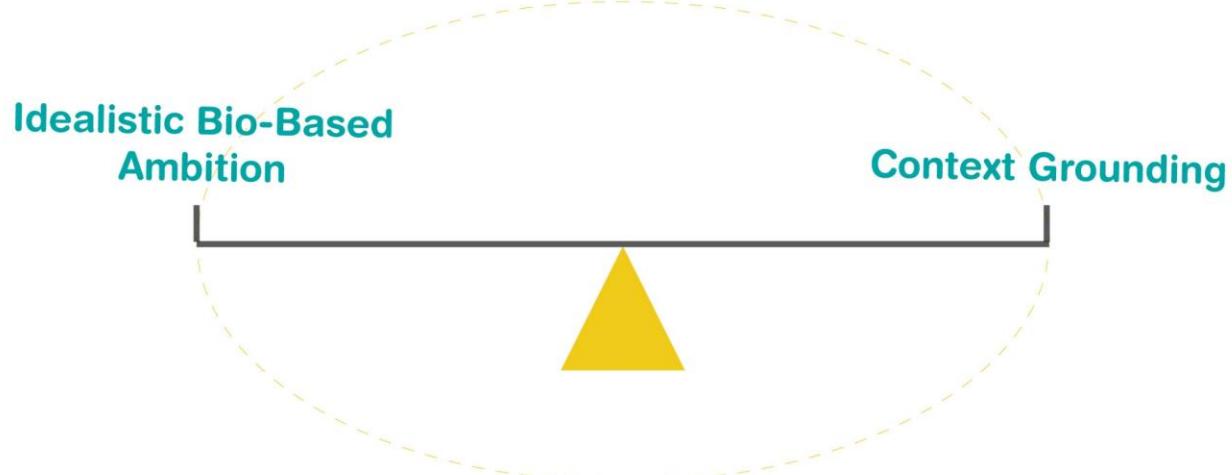


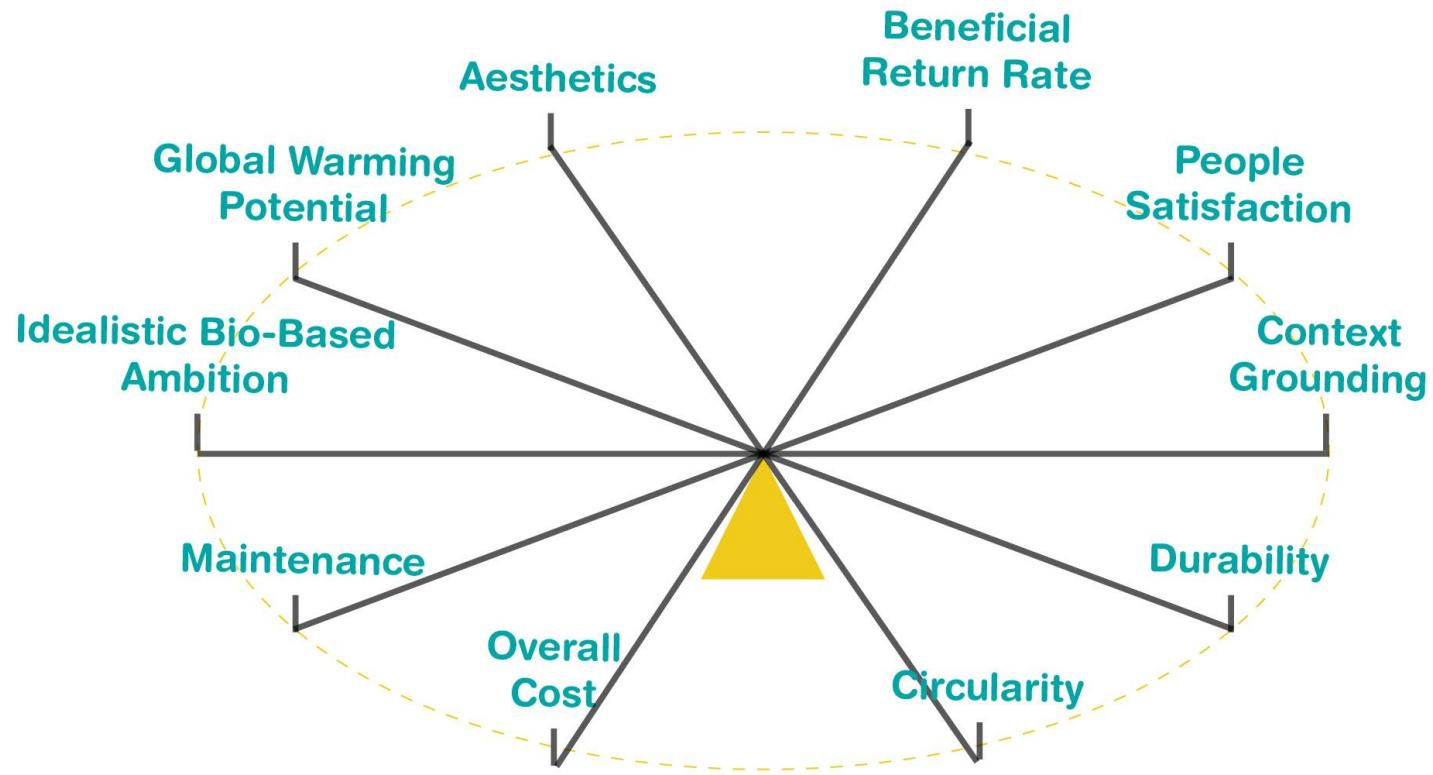


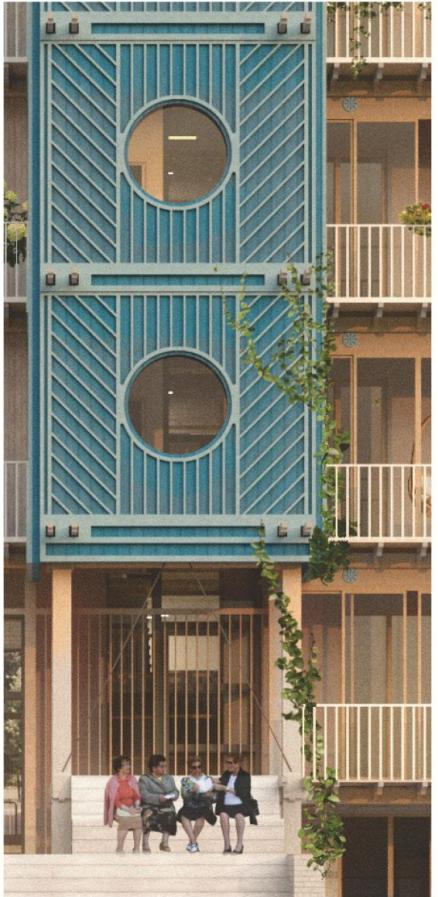




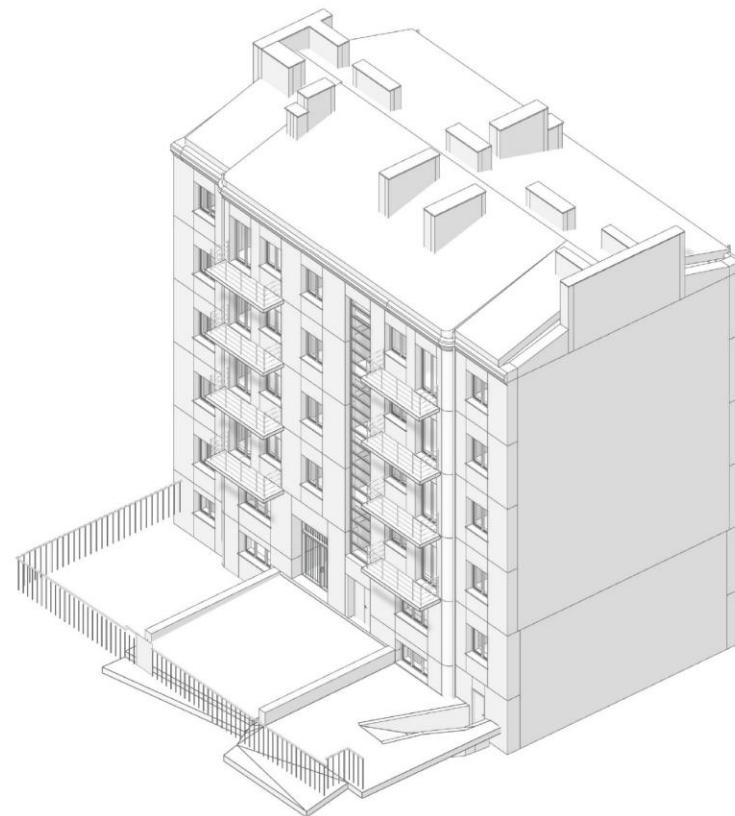


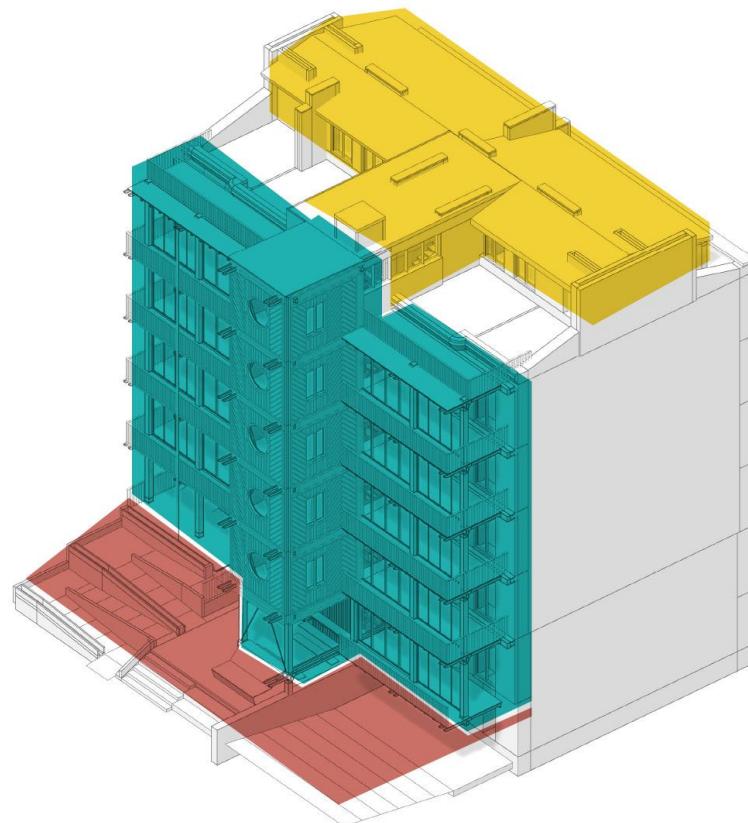


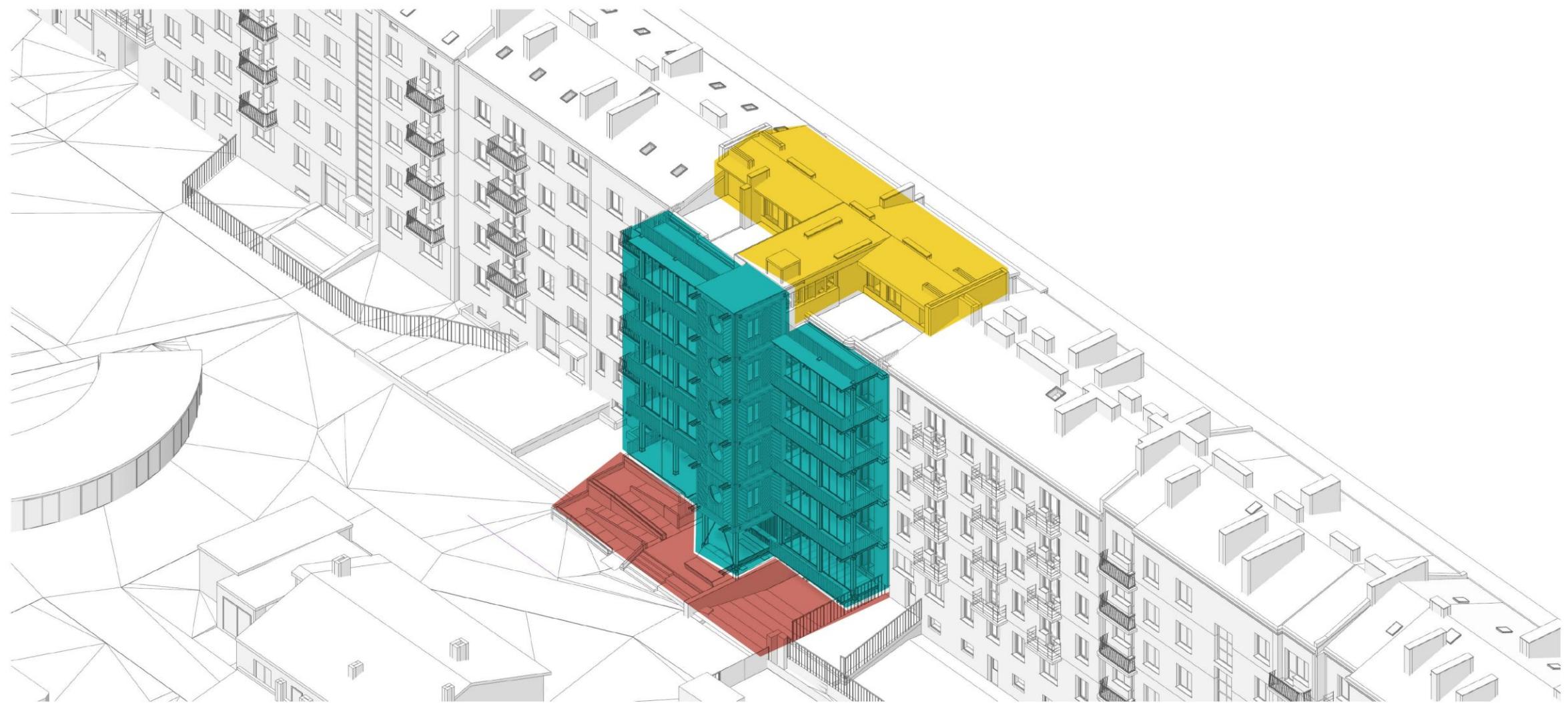




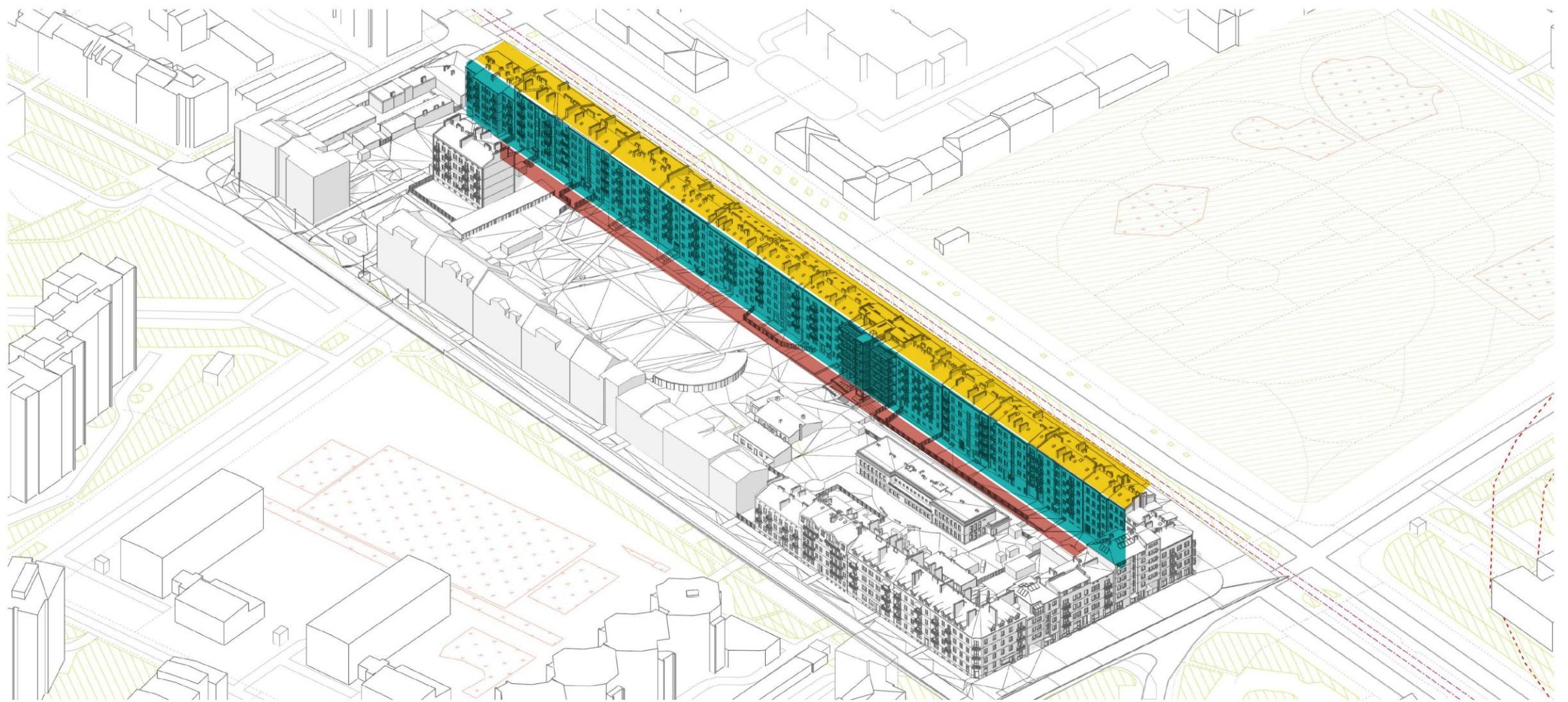
Material Decisions





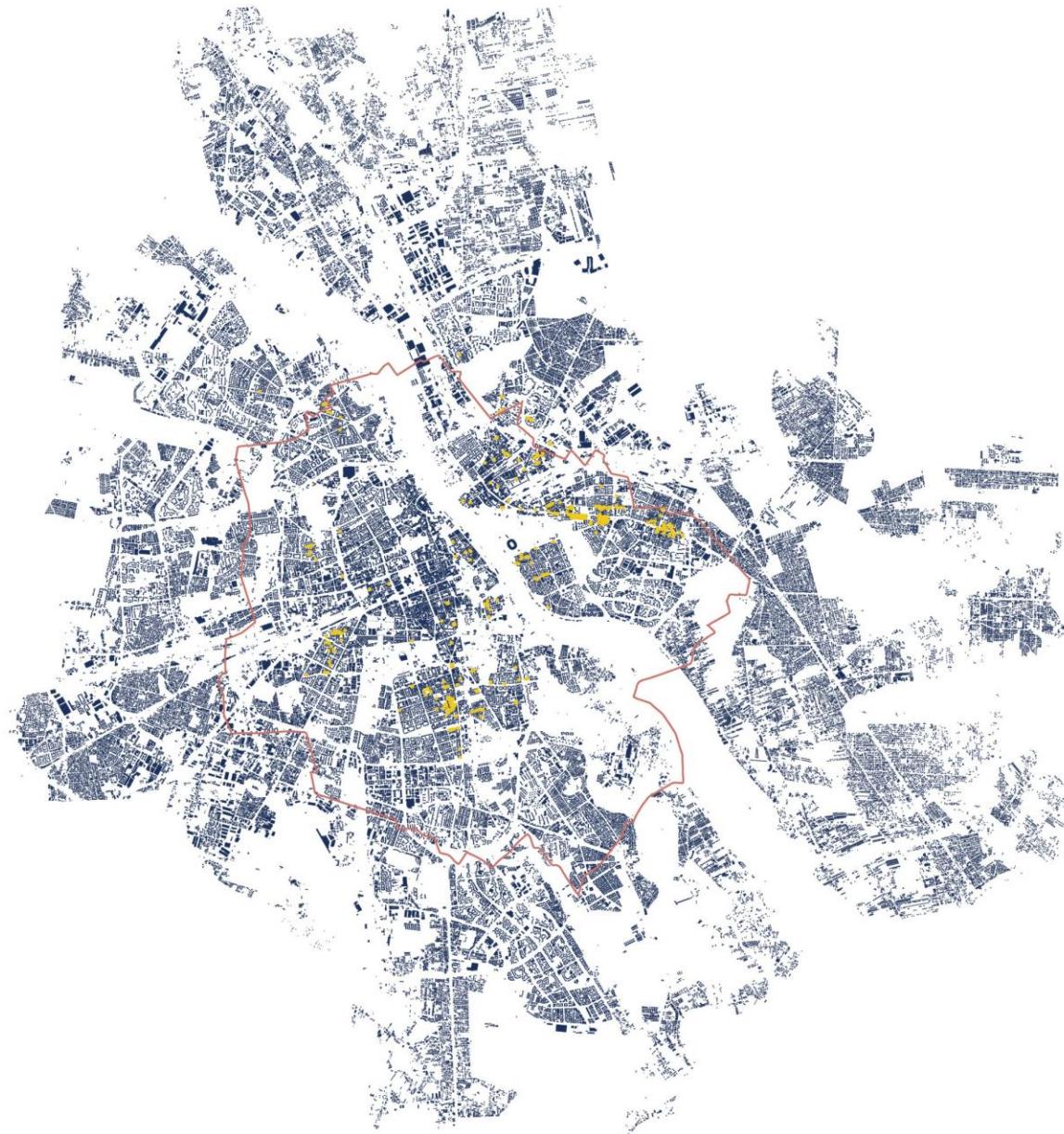


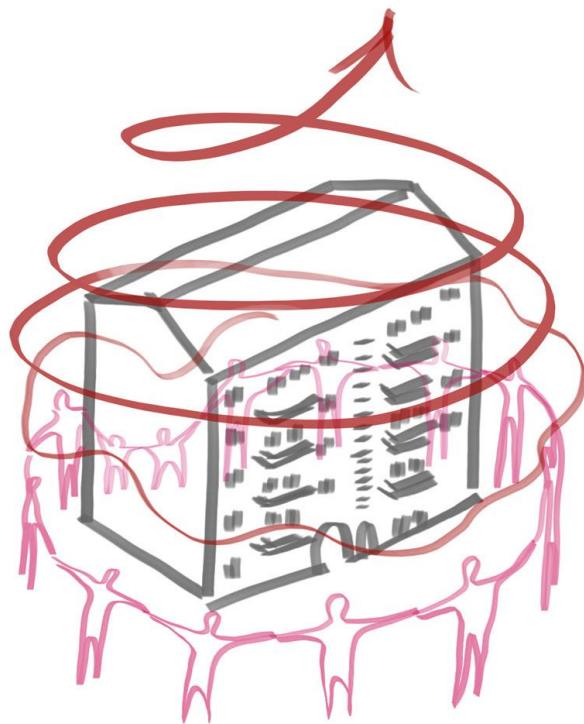






Hundreds of buildings to benefit





We can start with just one

Thank You!

Reflection



Jan Zawadzki