Networks of Care

A spatial exploration of informal care and community

P5 Presentation

Emmy Vermeulen – 4881869

23.06.2025

AR3AD110 Dwelling Graduation Studio: Designing for Care in an Inclusive Environment (2024/25 Q1)



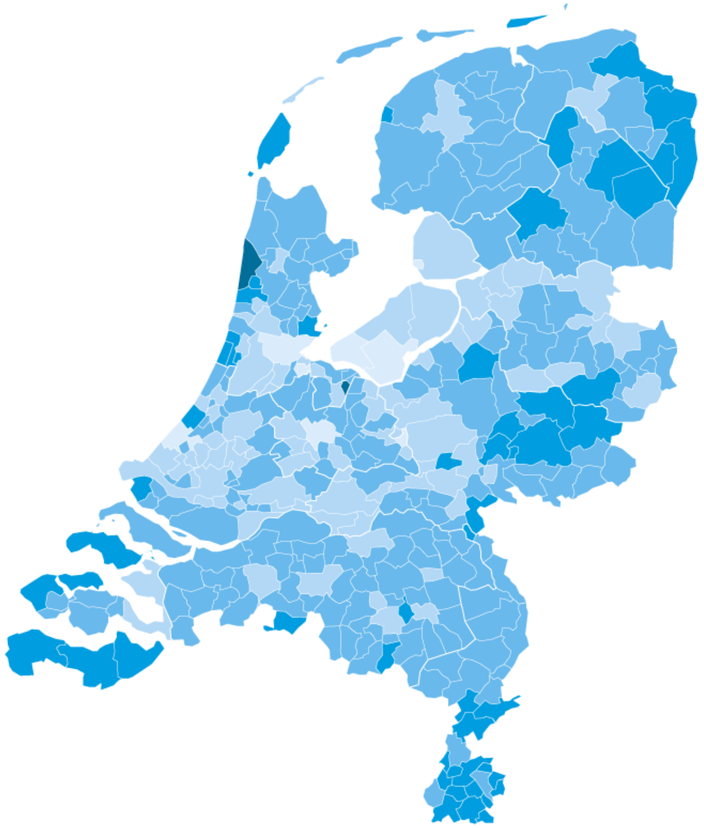

Steden schuilen niet wanneer het regent

If the city itself cannot take shelter, who does it shelter?

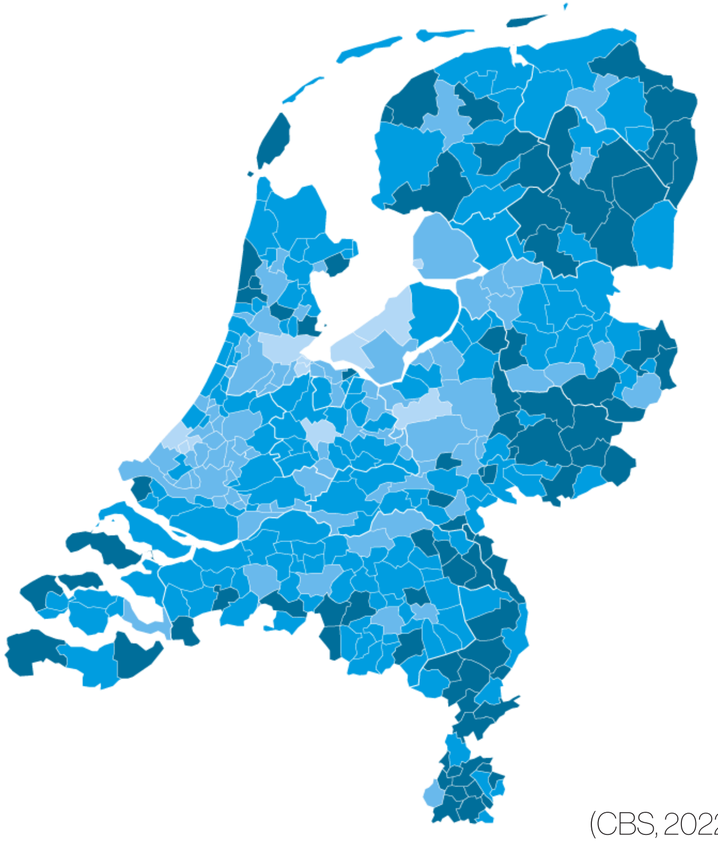
Shouldn’t the city offer some form of protection, a space for support, rest, and care?

Problem

2021



2035



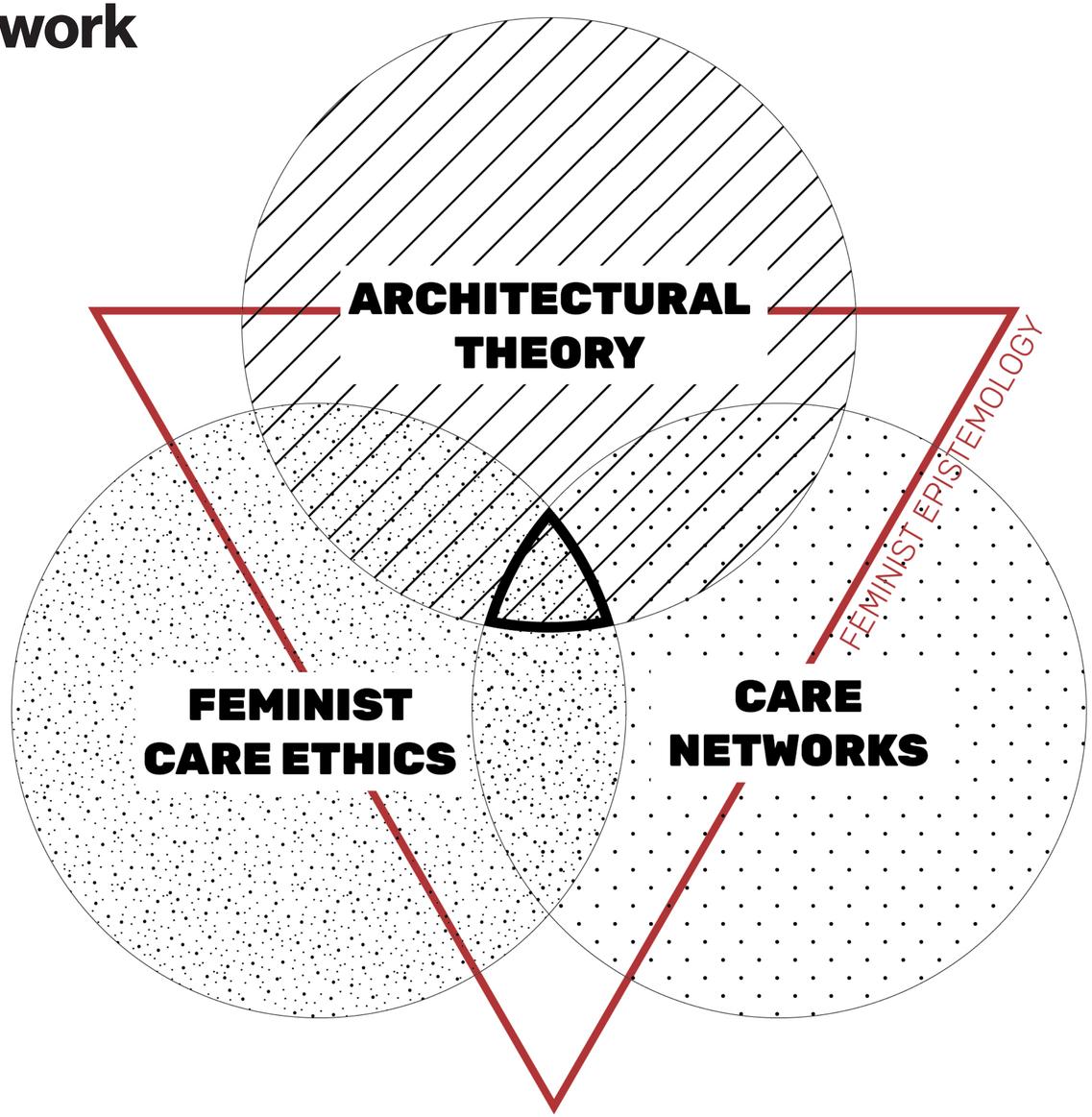
(CBS, 2022)

In 2035, more than 24 percent of the population of the Netherlands will be 65 years or older

Modern societies are facing a **growing crisis** in providing adequate **care**. There is an increasing pressure on both **formal healthcare systems** and **informal care networks.**

(Verbeek-Oudijk, 2019)

Theoretical framework



Research Questions

1. How can spatial mapping of existing **care networks** reveal **the strengths** and **weaknesses** of **care nodes** within urban neighbourhoods?

2. What role do **architectural characteristics** play in shaping **care nodes** in urban neighbourhoods?

Case Study

Tarwewijk, Rotterdam South



Google Earth, 2023

Case Study

Tarwewijk, Rotterdam south











Methods & Results

Methods & Results

Three parts

1. Mapping Quantitative	**2. Street interviews** Quantitative + Qualitative	**3. Care Node visits** Quantitative + Qualitative
• Exploring the neighbourhood using Google Maps to identify potential care spaces, such as schools, community centres, and religious places. • Exploratory	Asking three guiding questions to collect situated knowledge: • Where do you feel at home? • Where do you meet others in the neighbourhood? • When and where was the last time you helped some one?	Observations at three care nodes (Creative, Food, Religious) to understand how care takes place and to build trust with local community members.

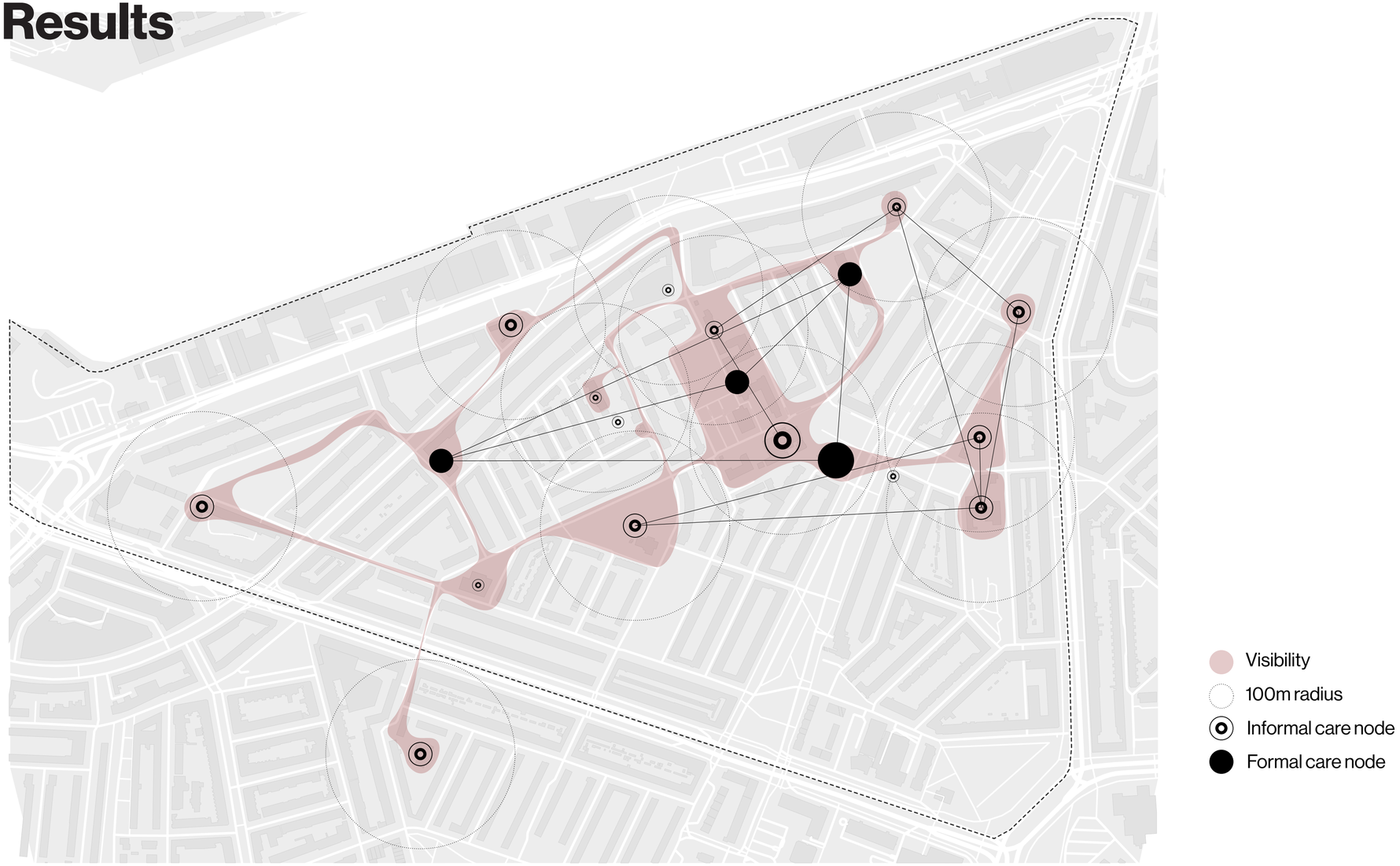
Methods & Results

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Methods & Results

Part 1 - Mapping



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Methods & Results

Part 2 - Street interviews

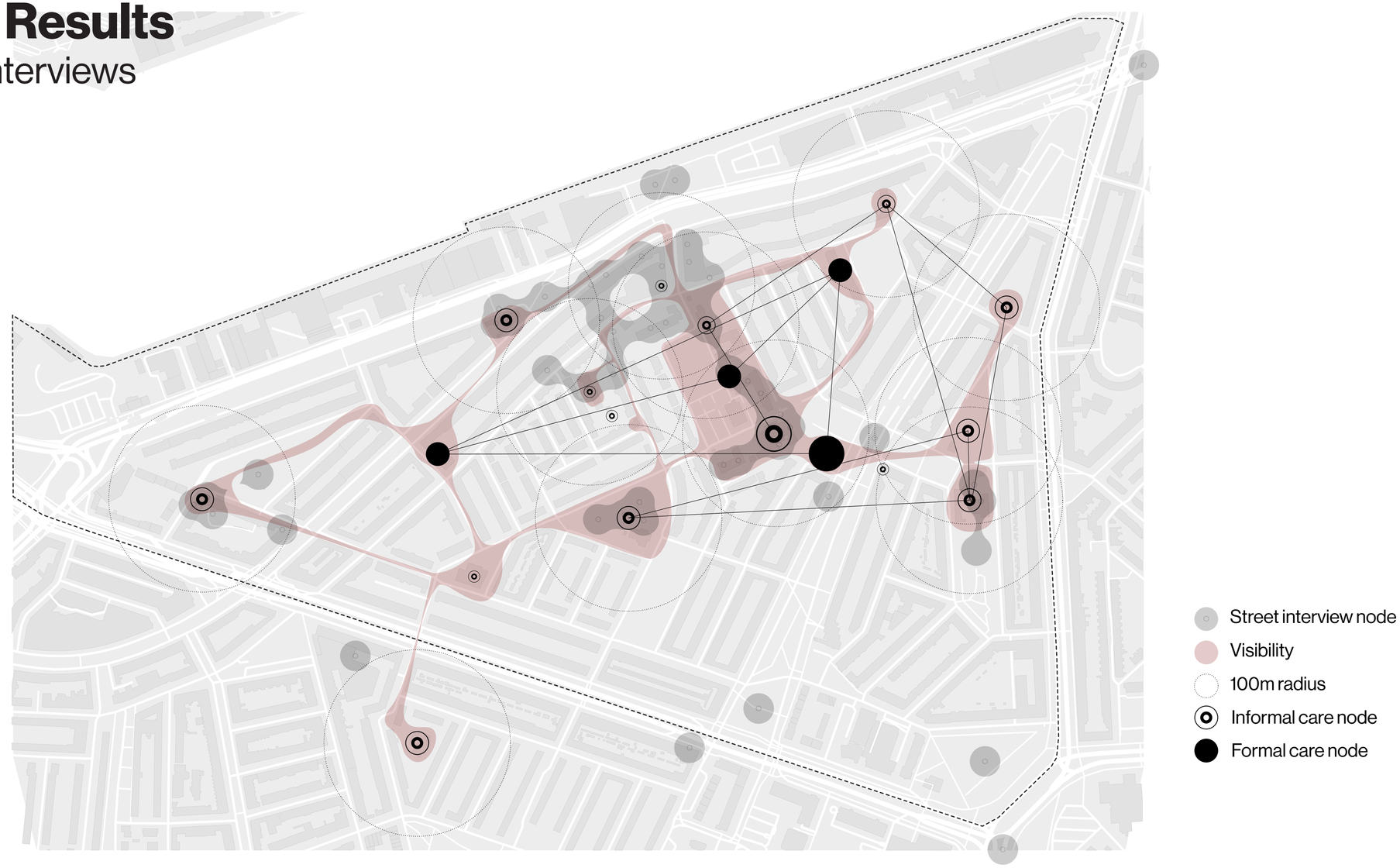
Three guiding questions:

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Methods & Results

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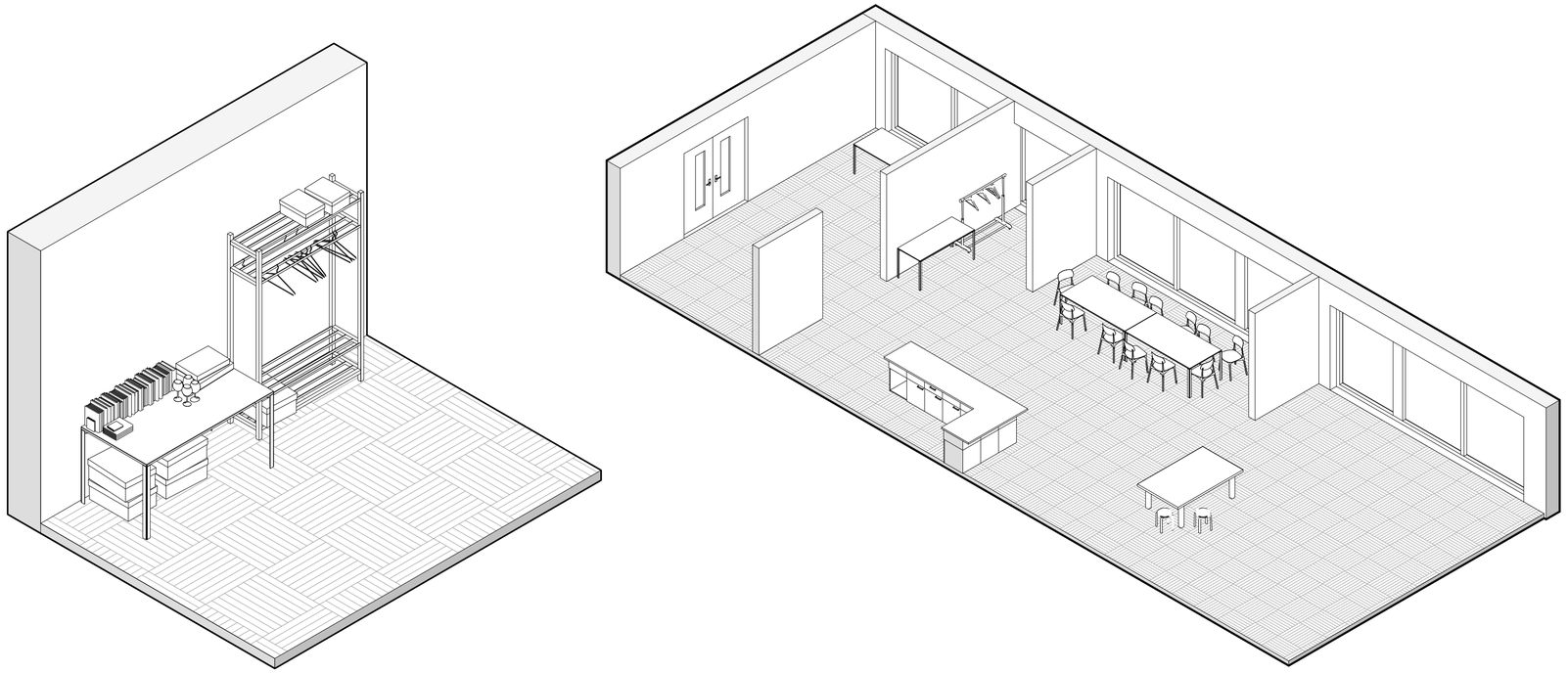


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Methods & Results

Part 3 - Care Node visits

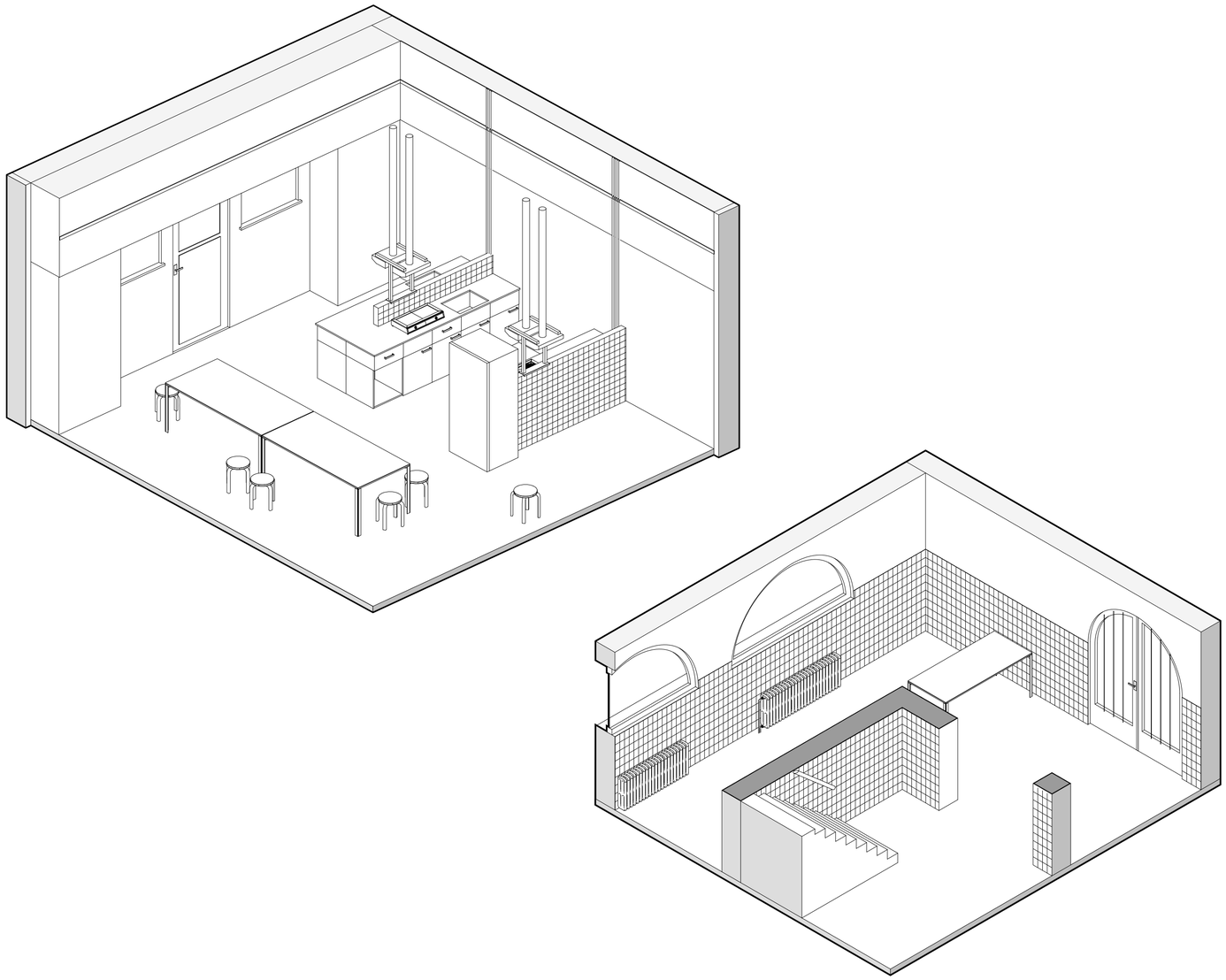
Creative Care Node



Methods & Results

Part 3 - Care Node visits

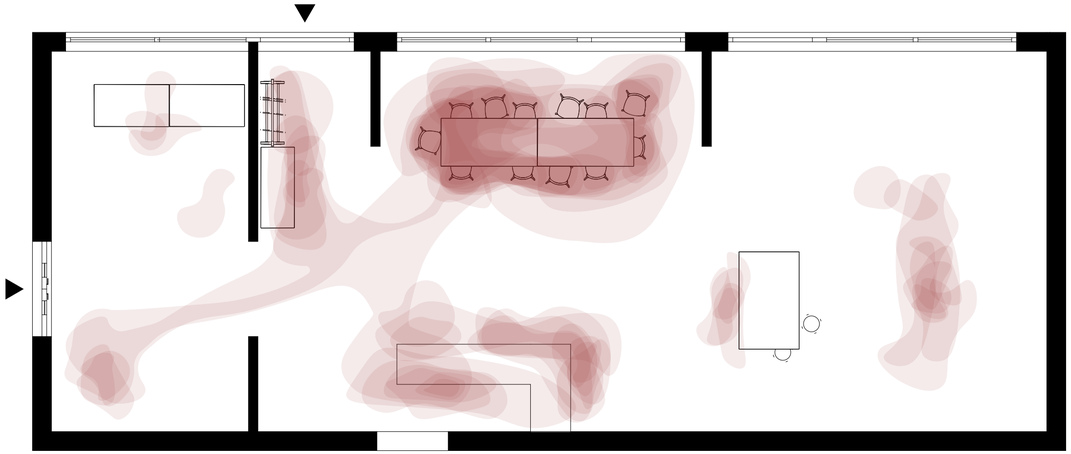
Food Care Node

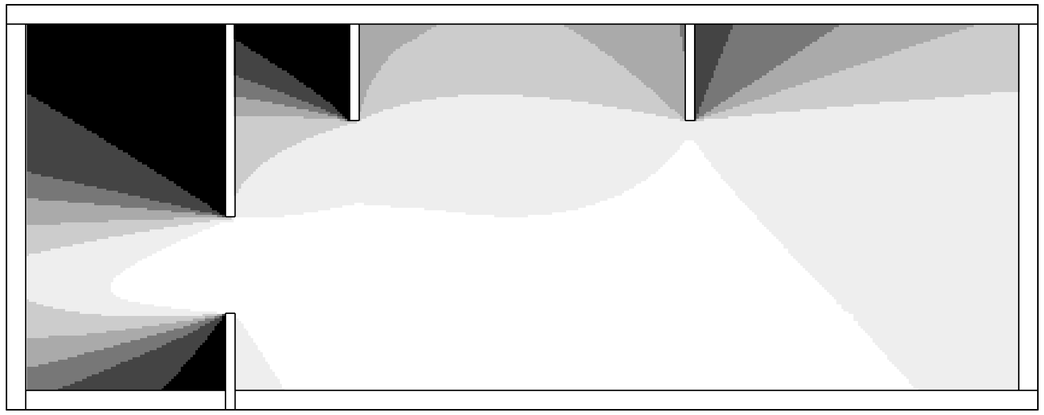


Methods & Results

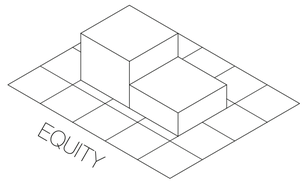
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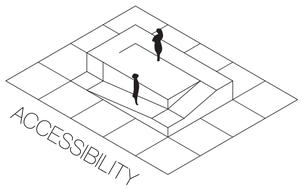
Creative Care Node

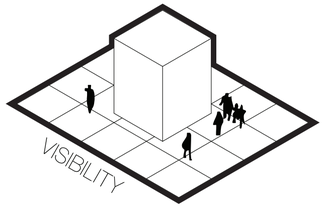


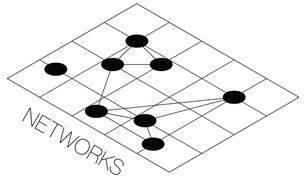


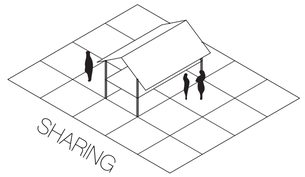
Conclusions
Design Guidelines



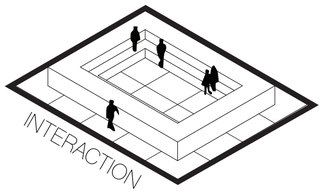


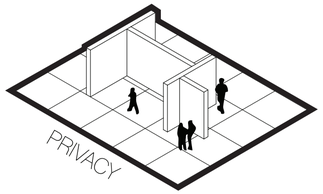


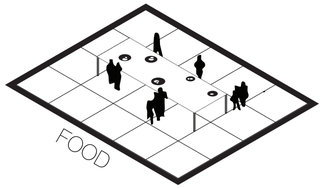


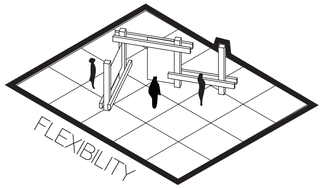




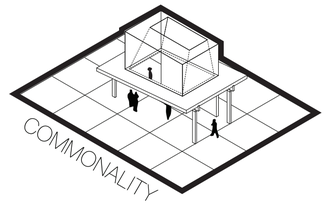












Program

Program

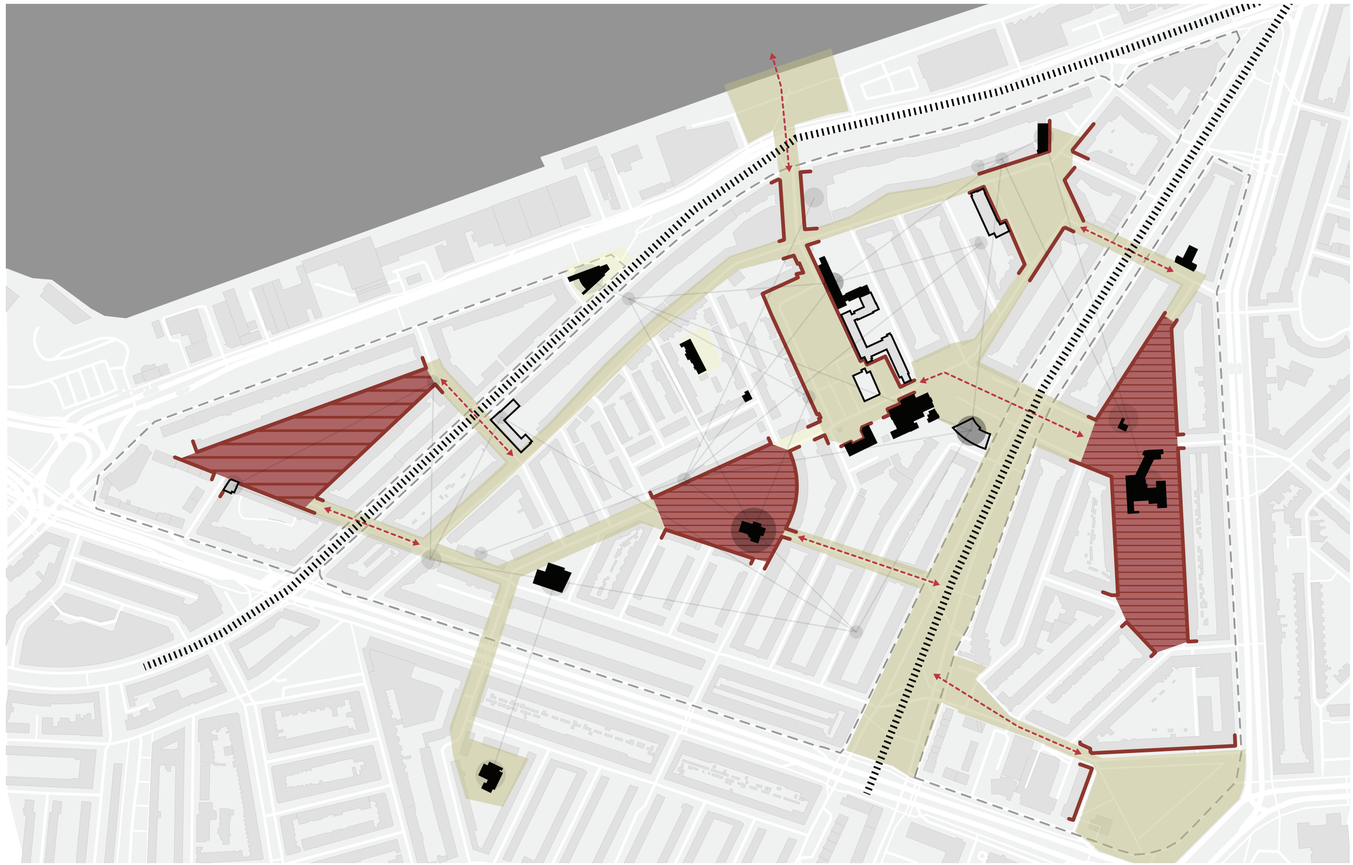
- Public Square
- Multifunctional Centre with a Communal Kitchen
- Inclusive Dwellings



Design

Care Network

Public Square as largest scale care node



Design Site



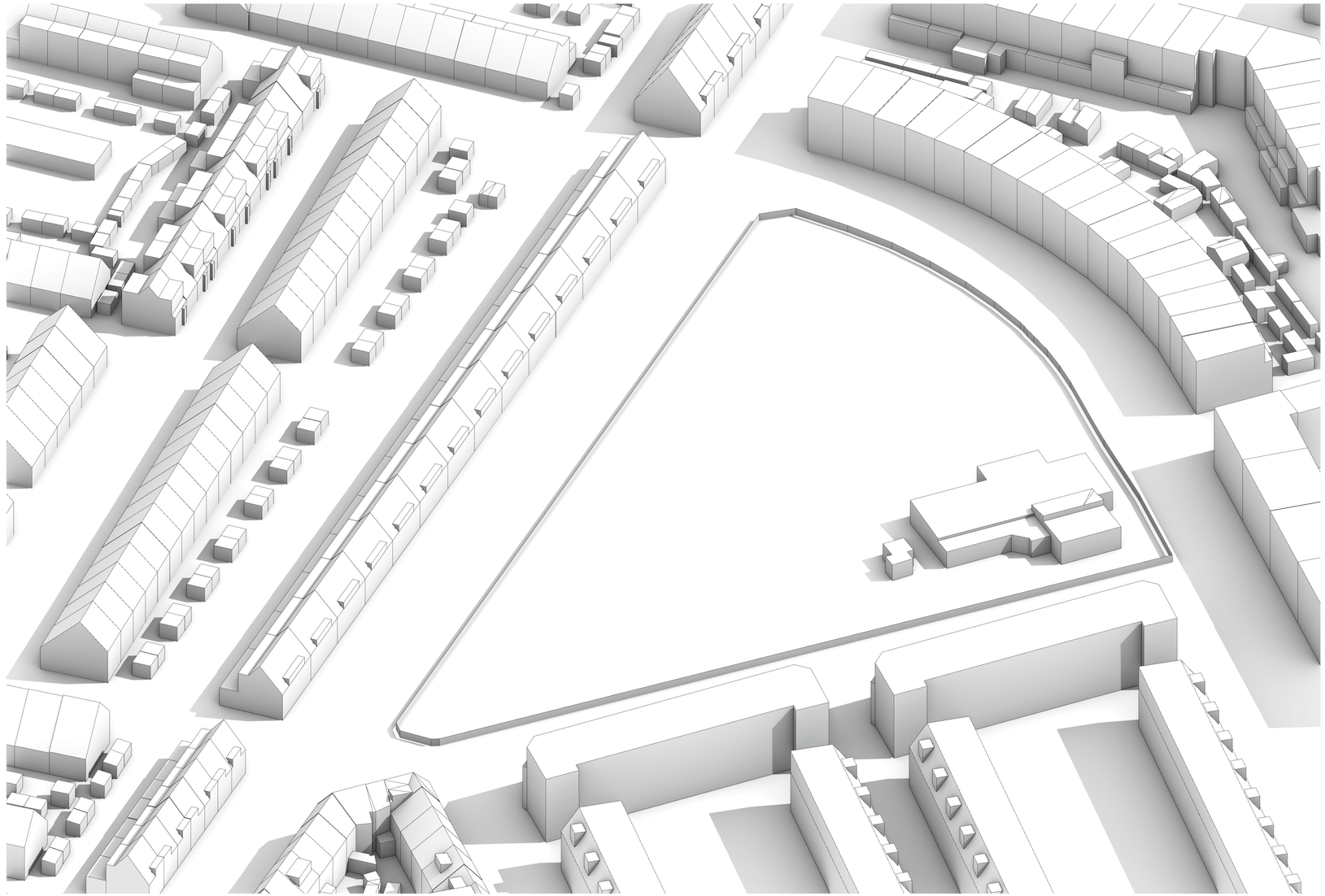
Google Earth, 2023

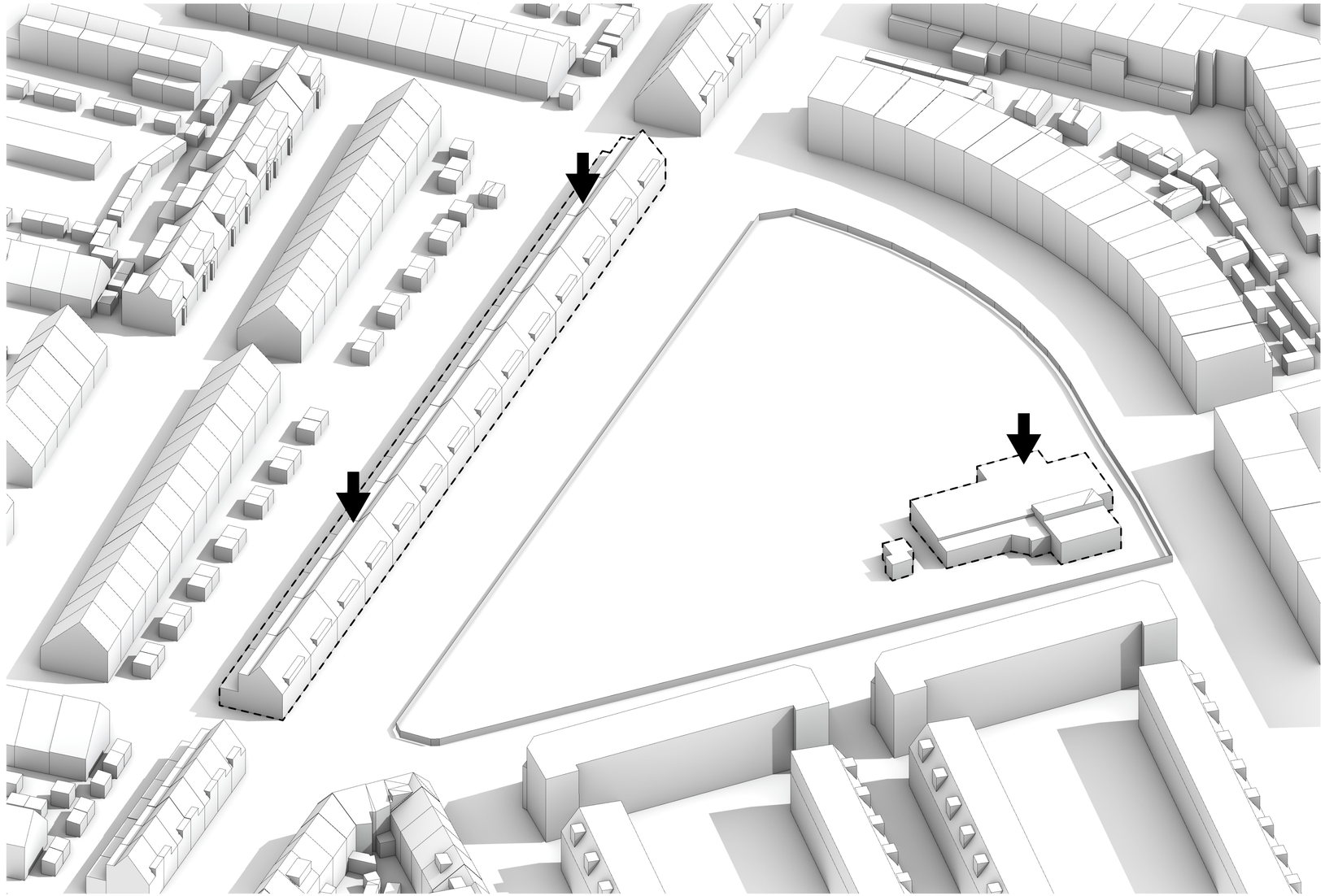
Design Site

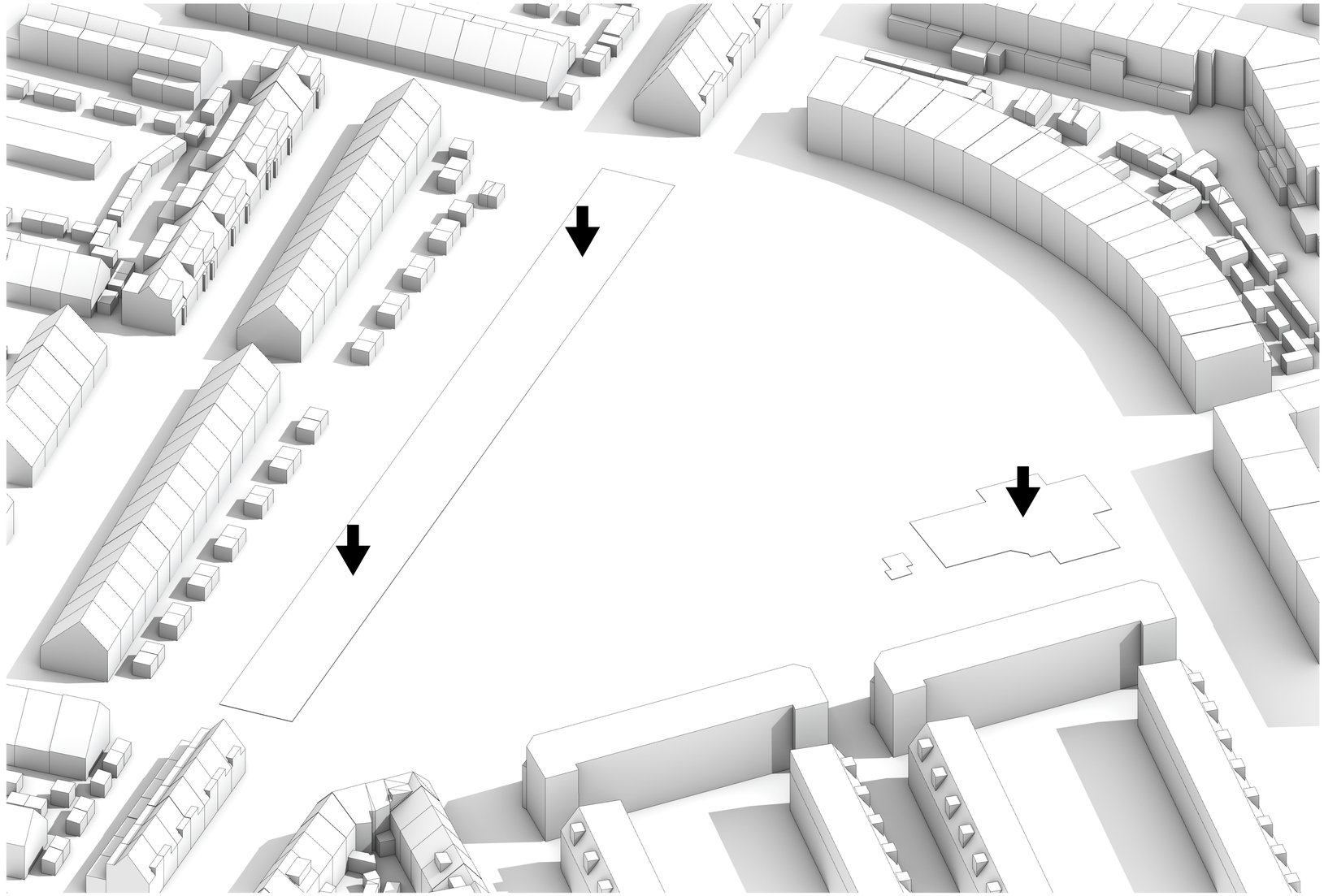
Current situation

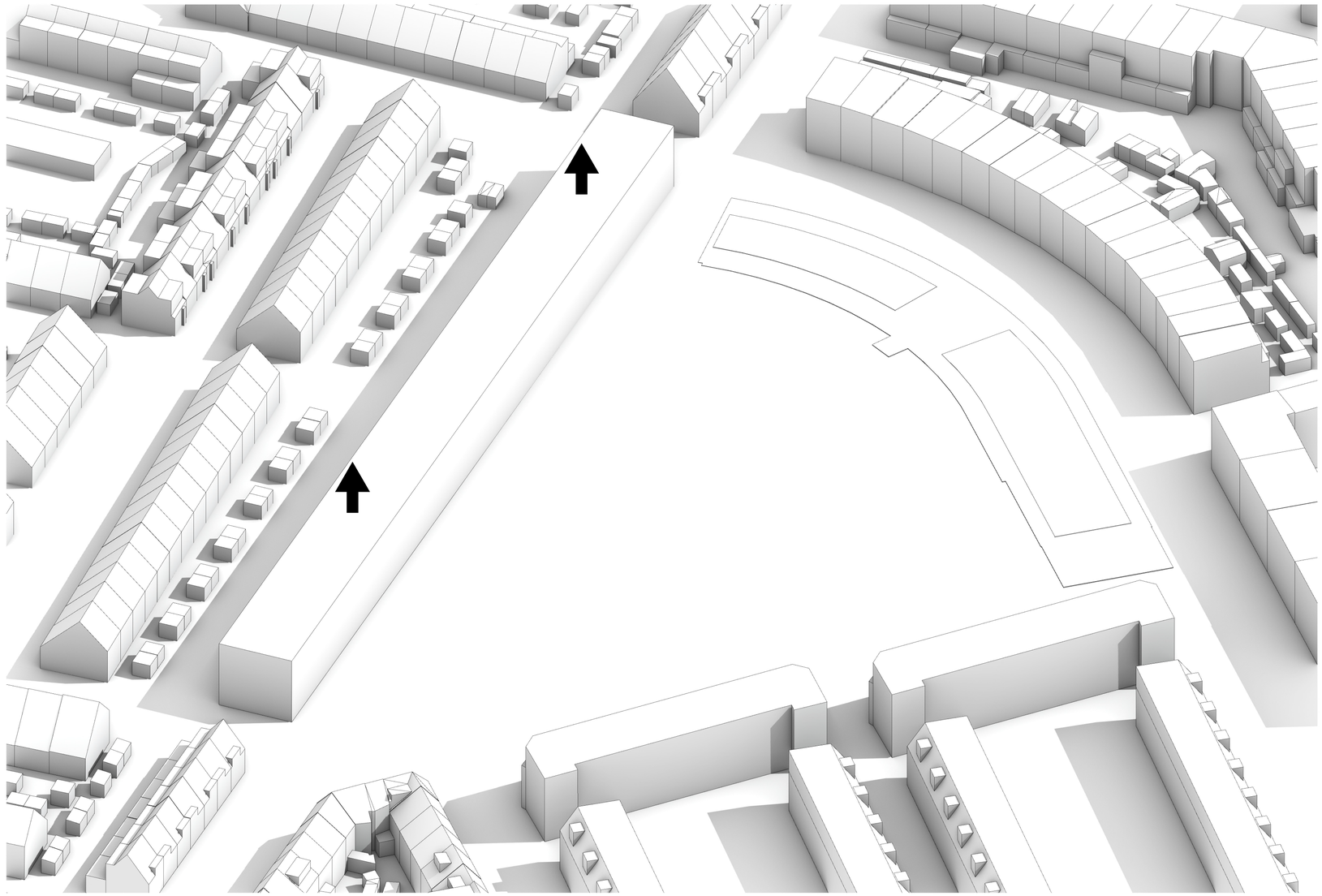


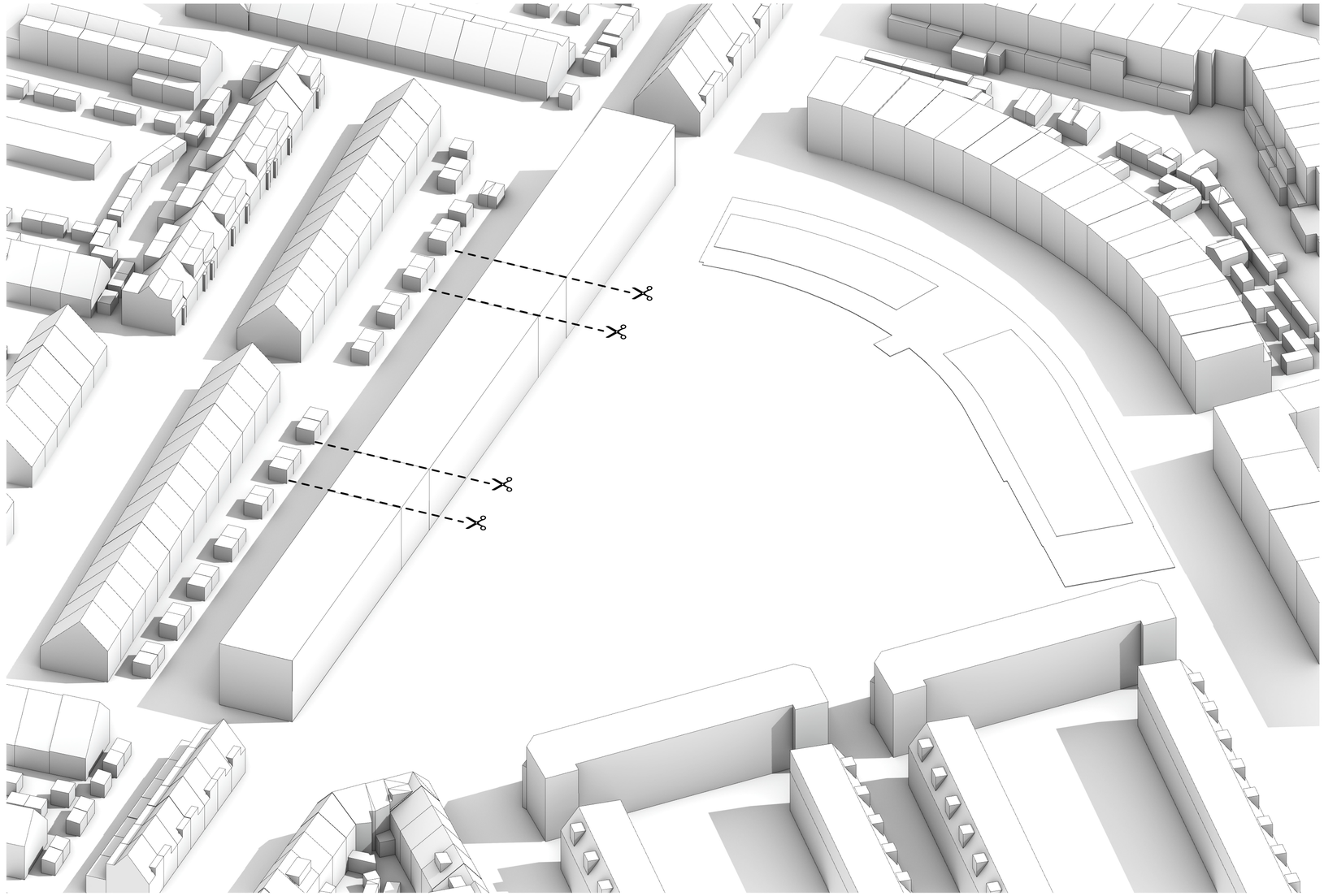
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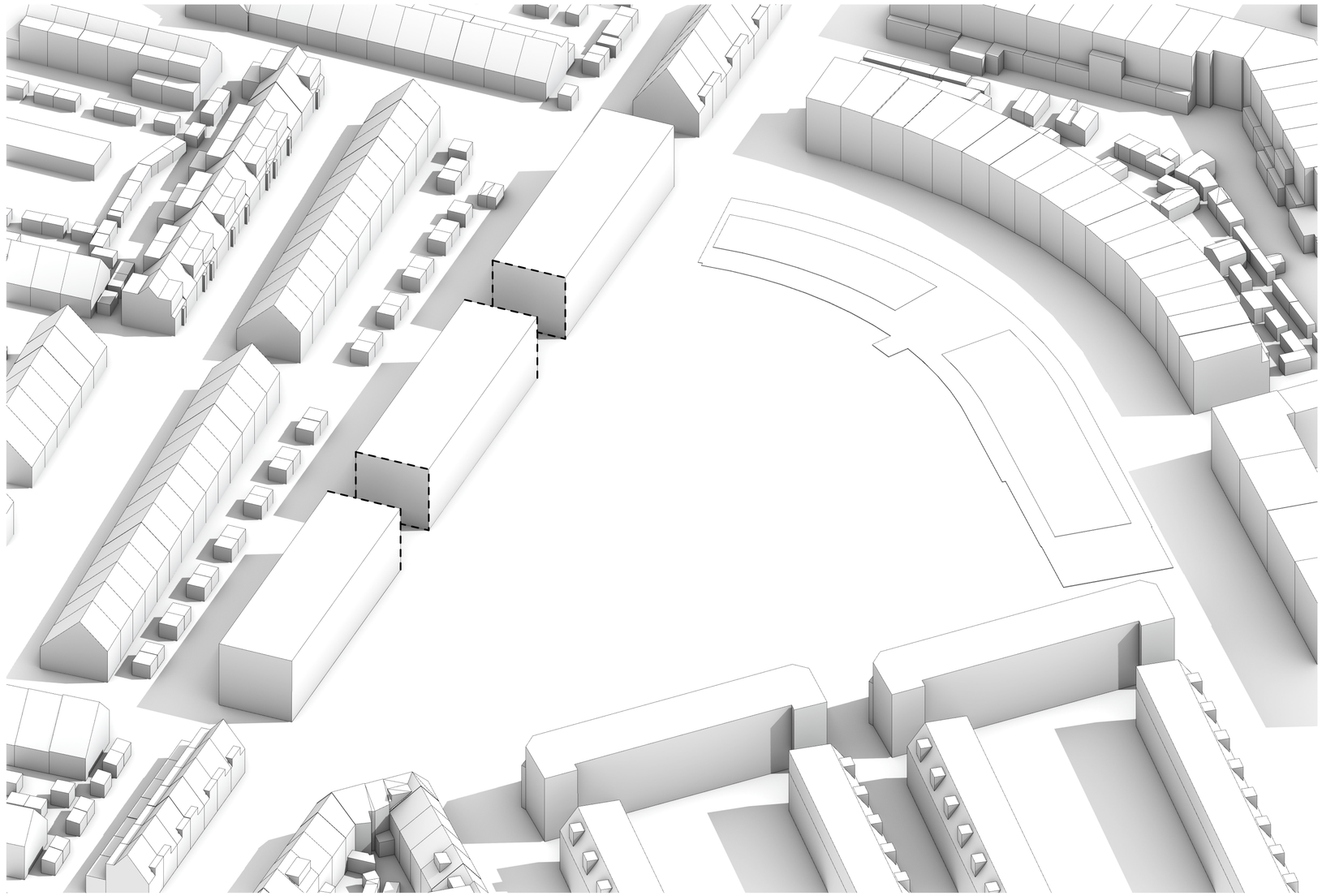


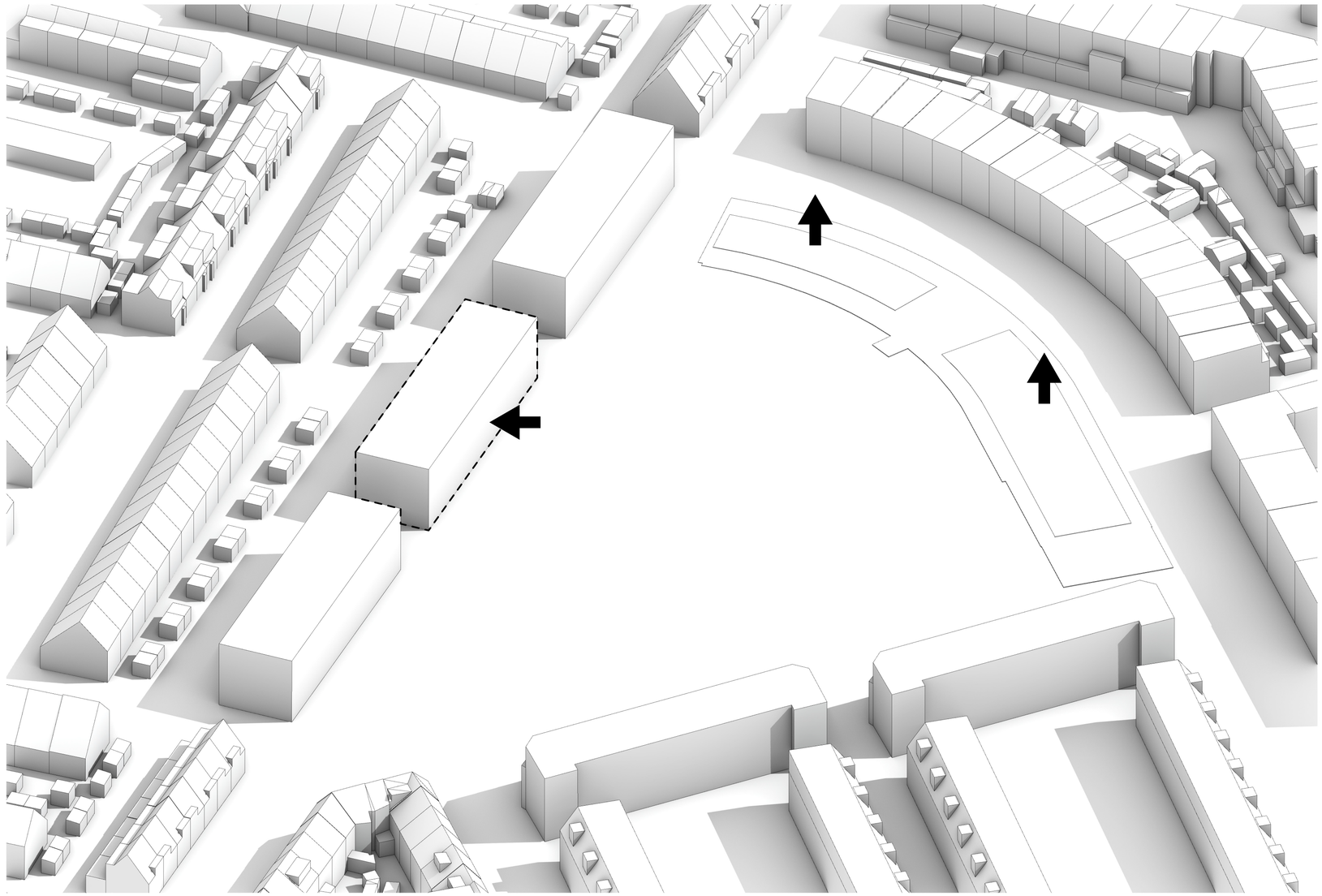


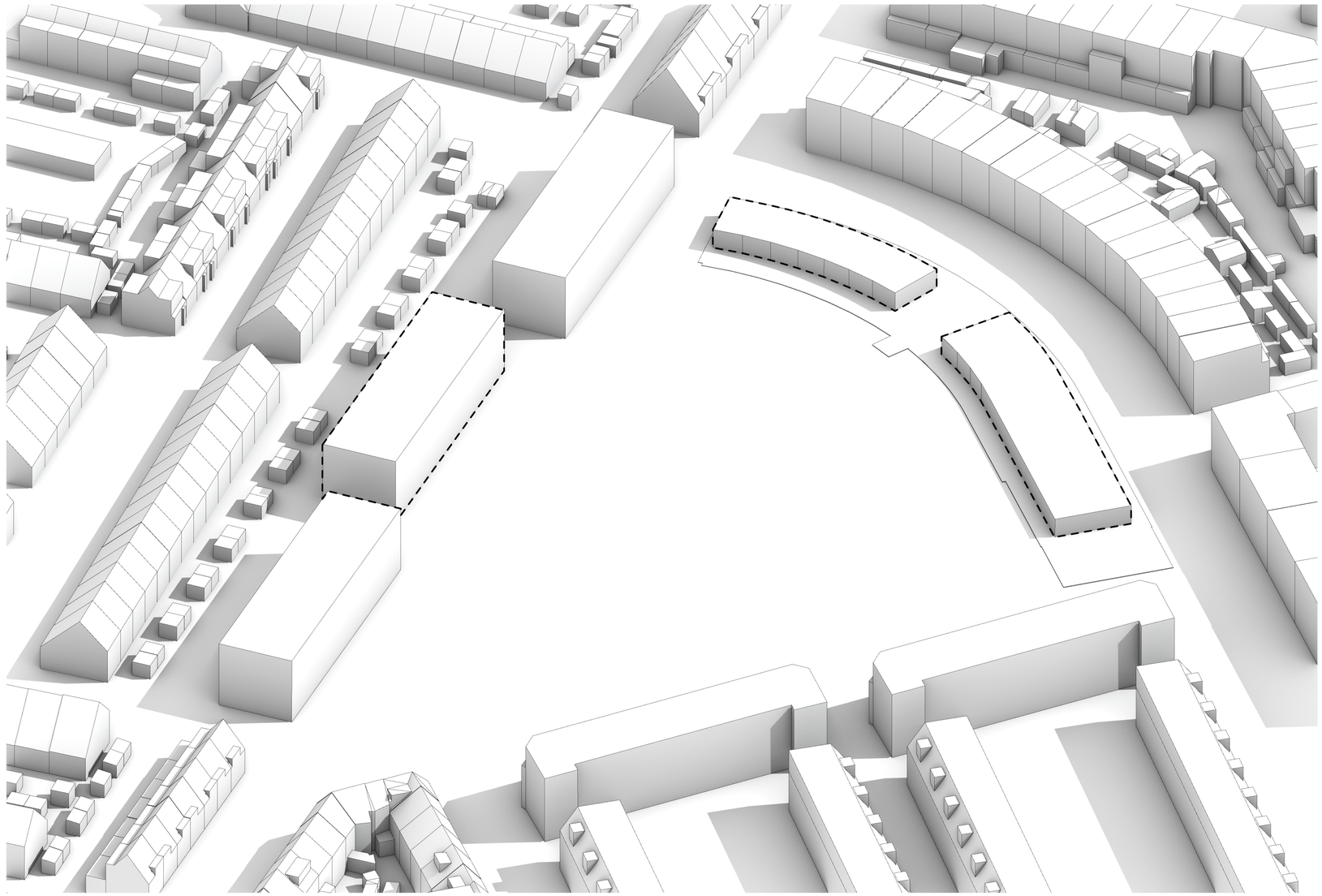


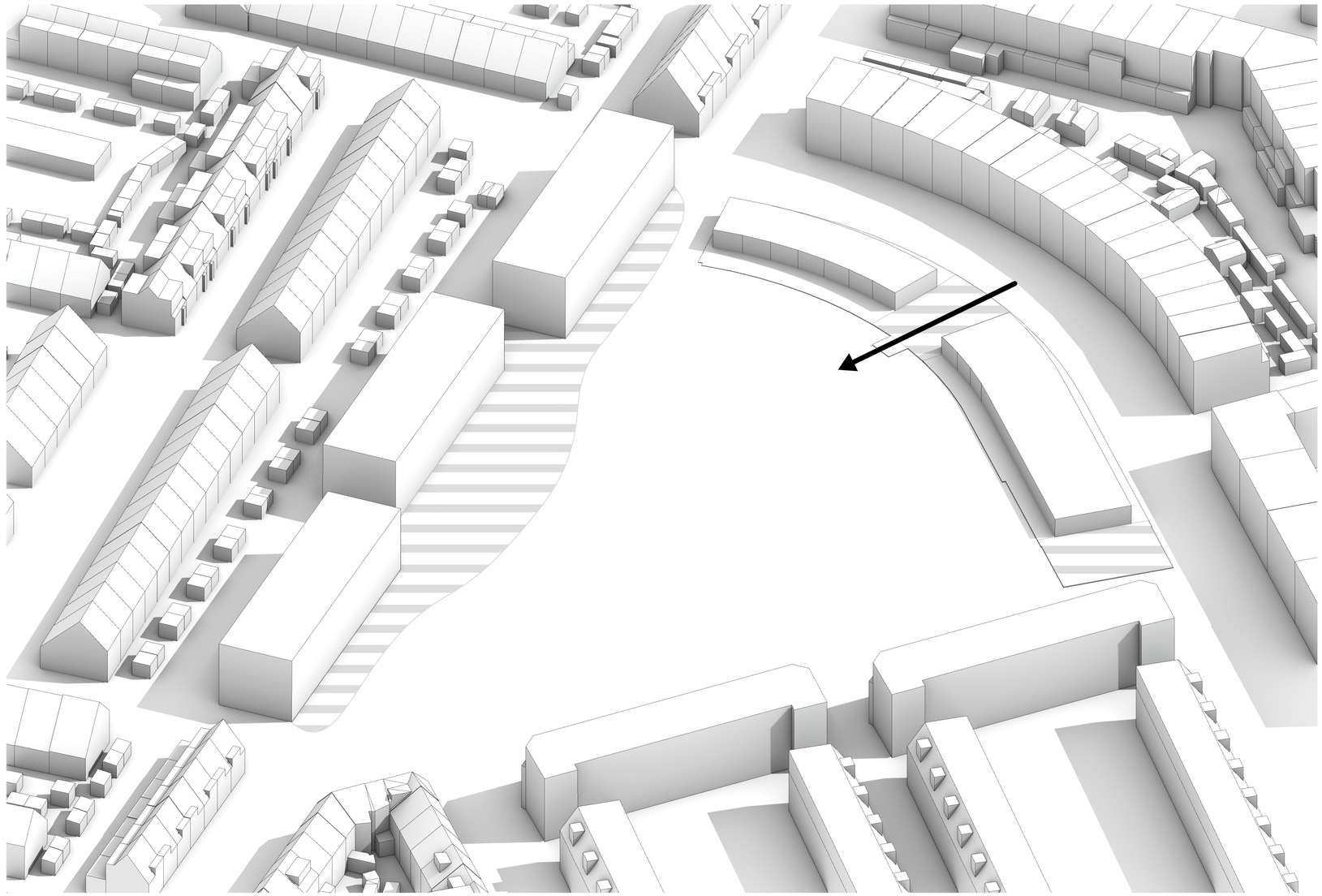


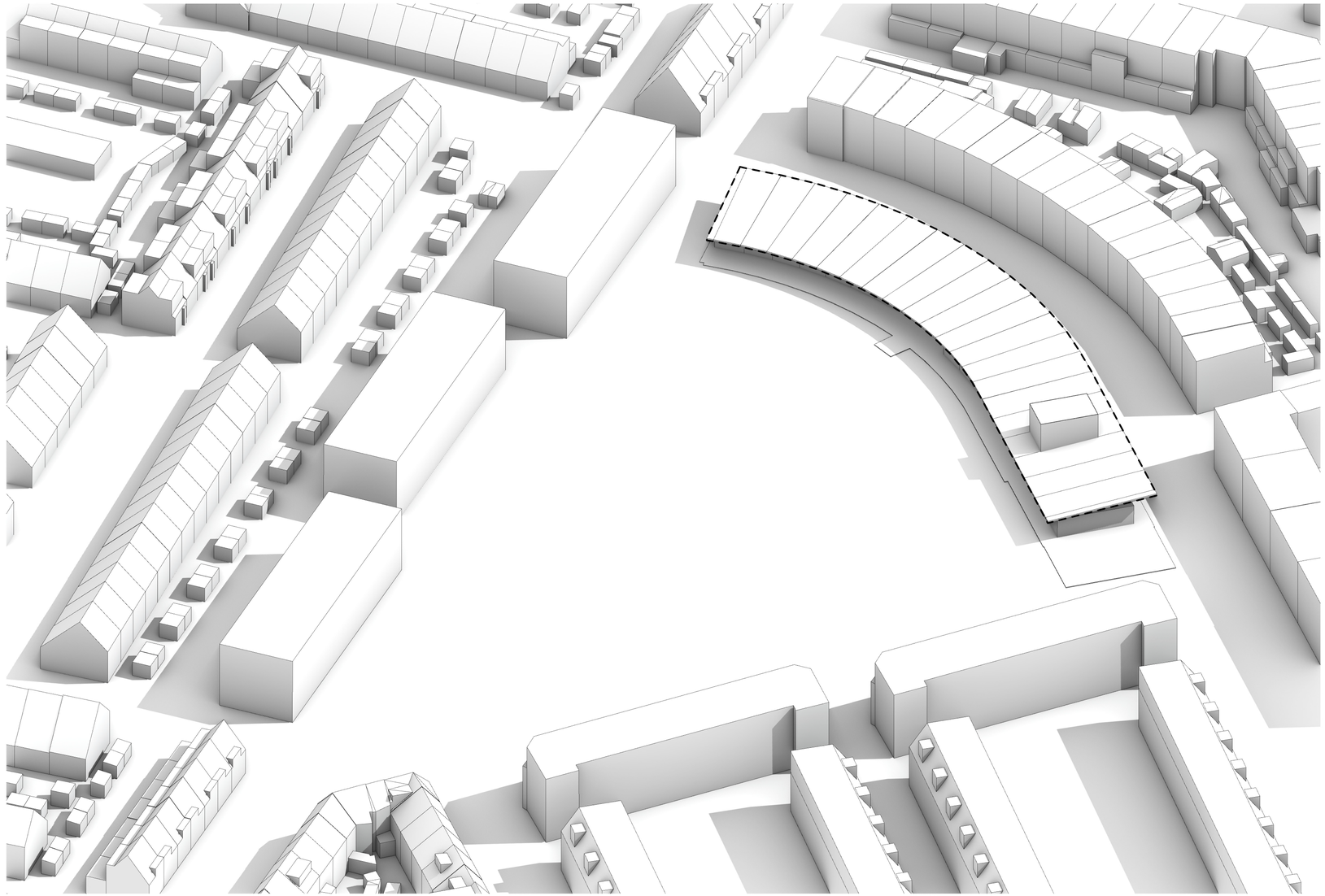


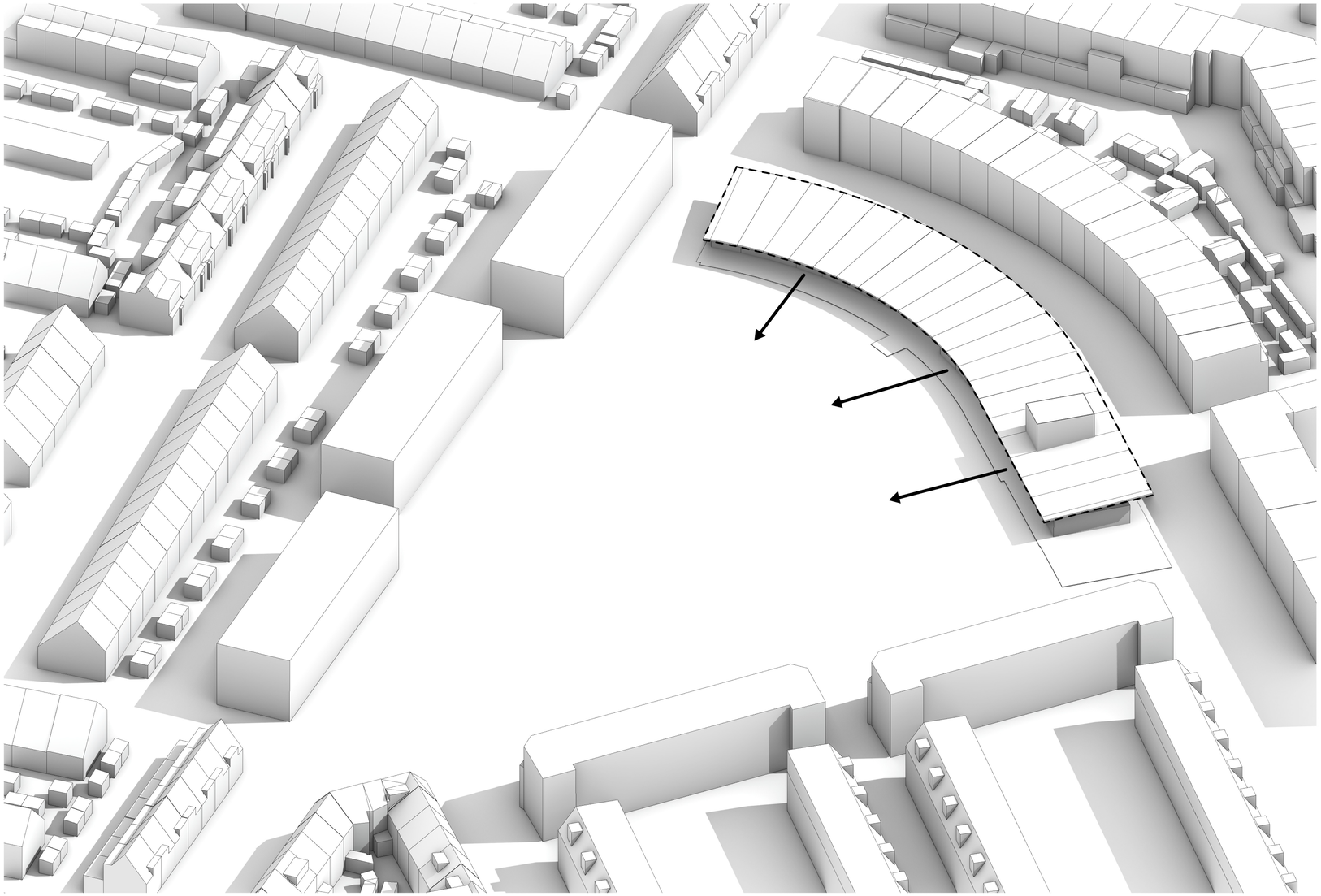




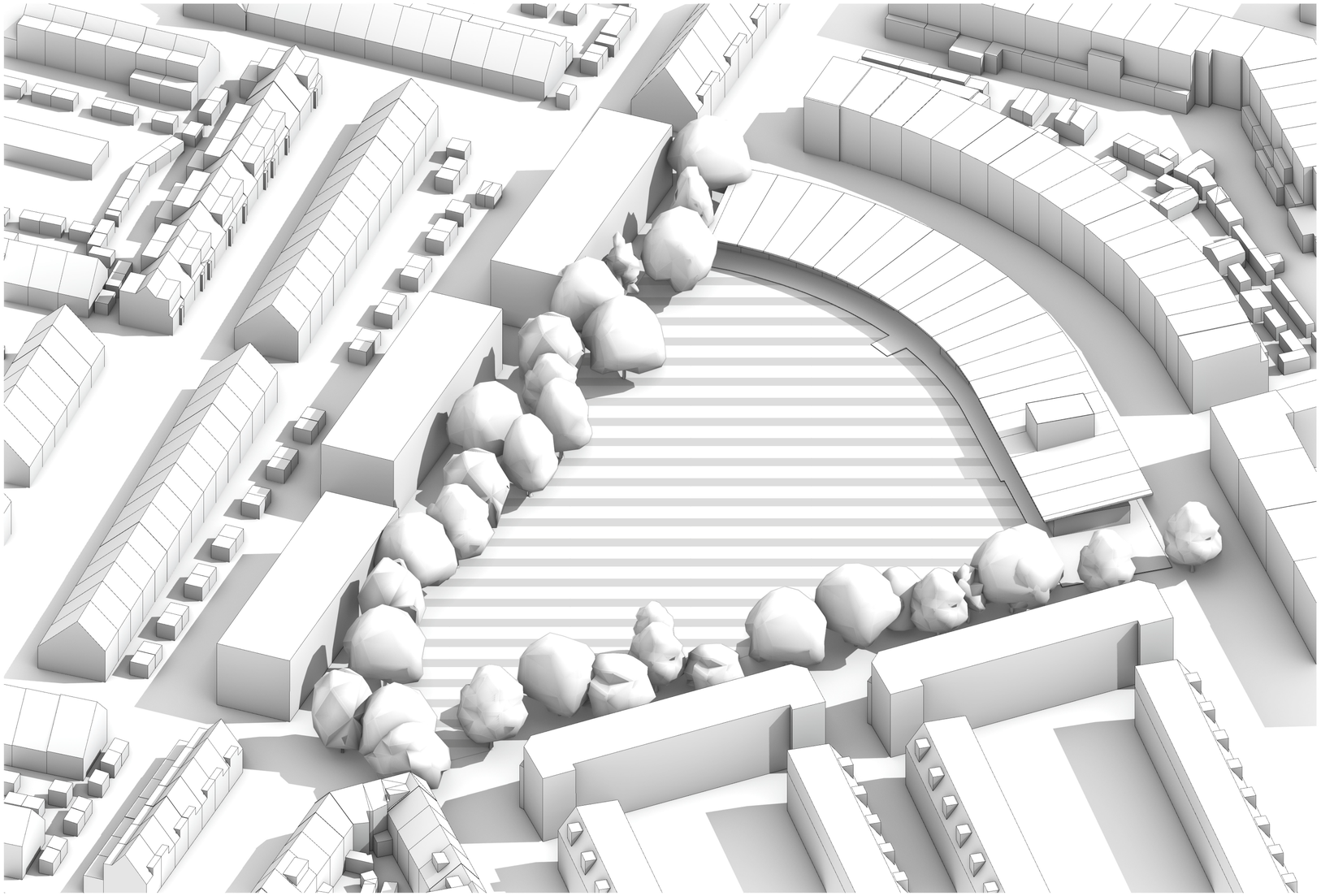






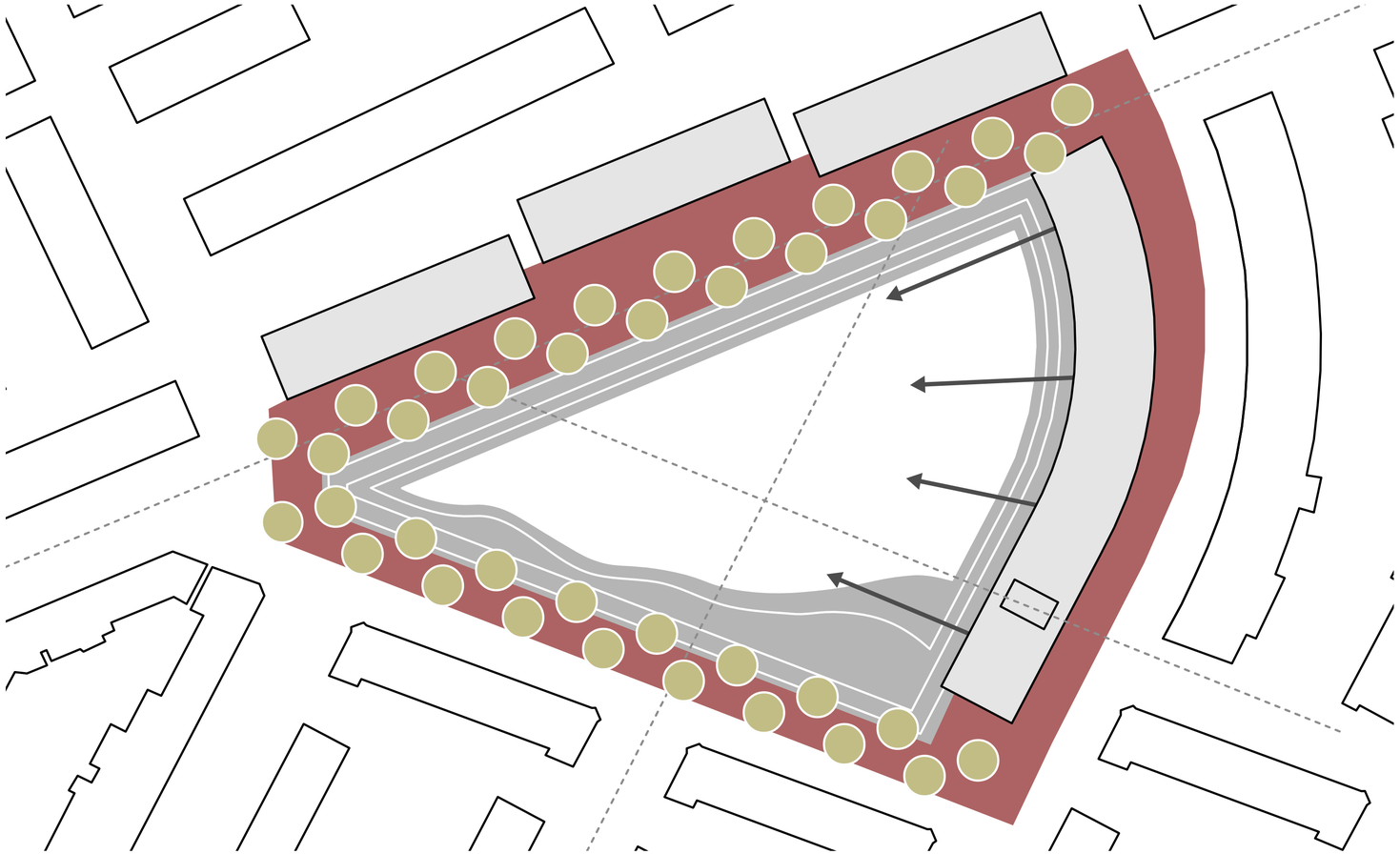






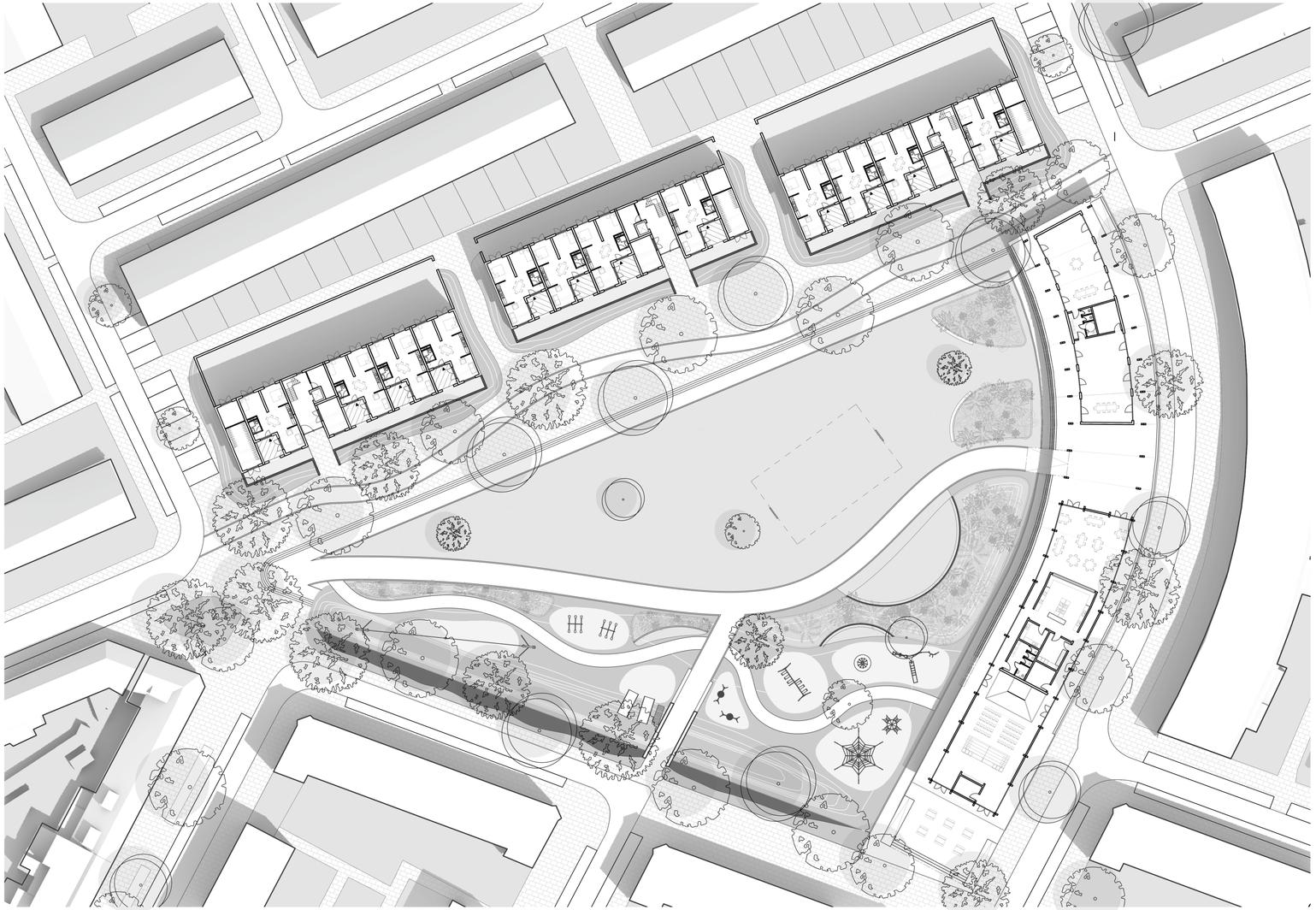
Design Site

Principle



Masterplan

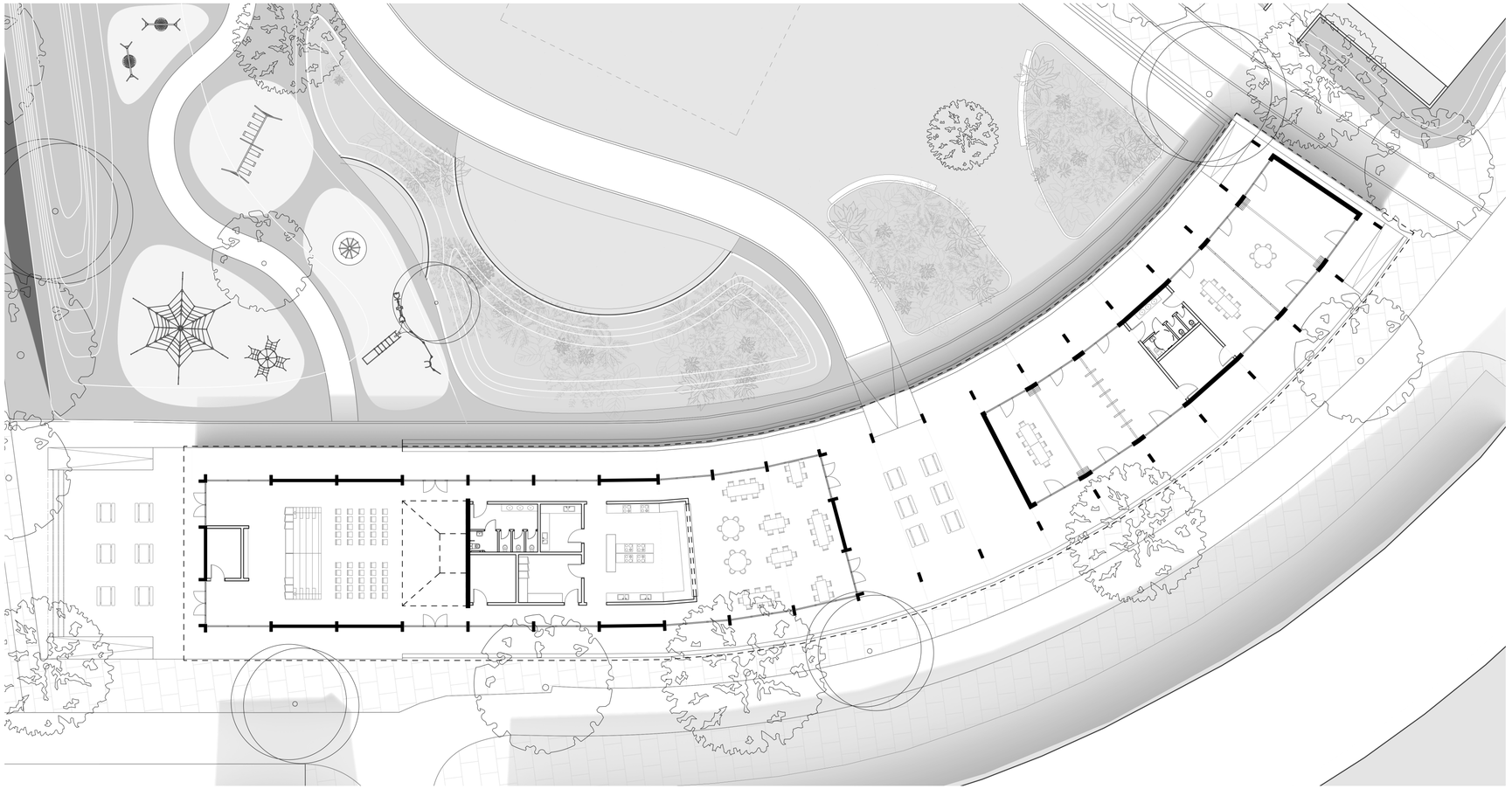
1:500



Design:
Community Kitchen

Situation

Community Kitchen 1:200





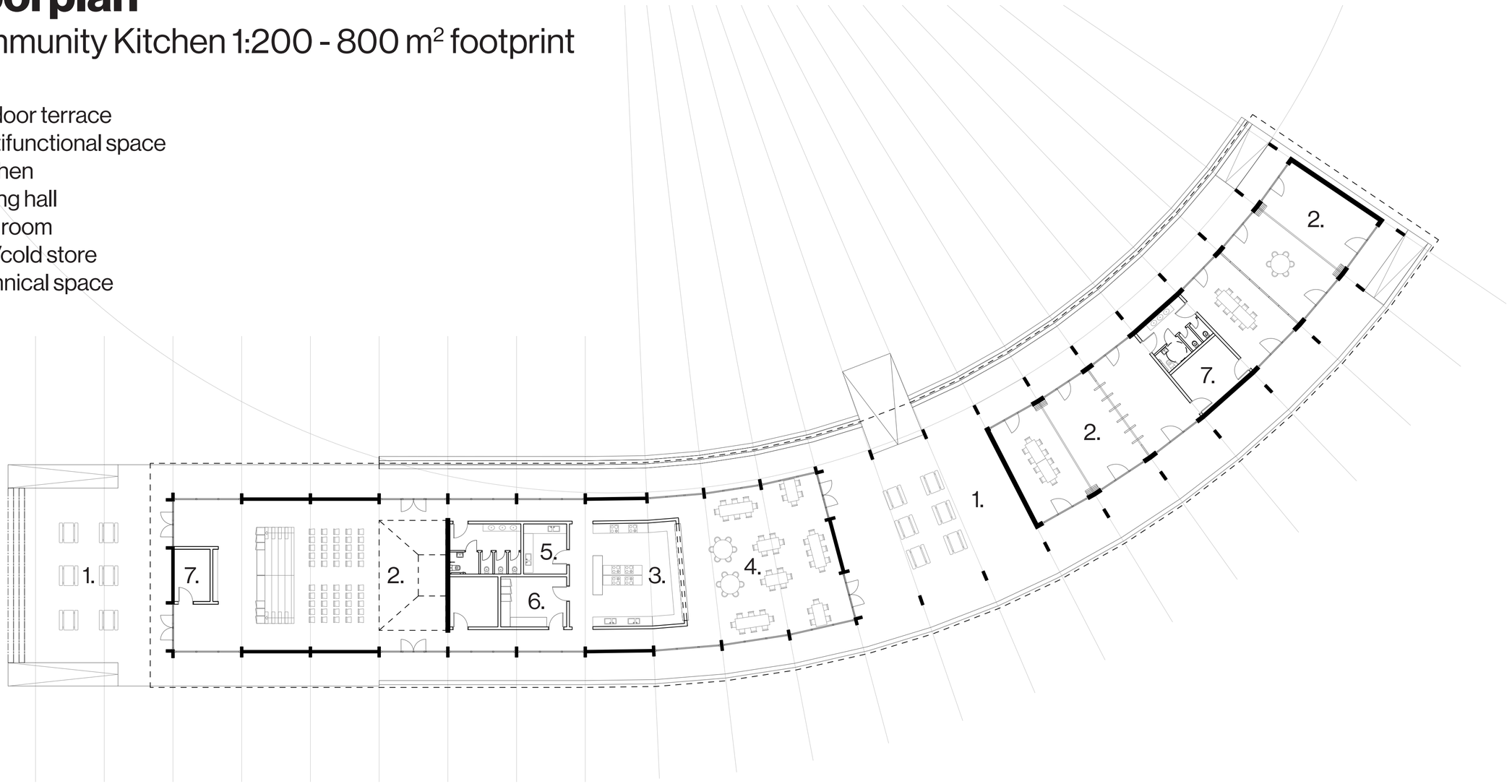




Floorplan

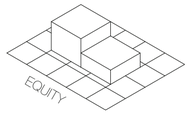
Community Kitchen 1:200 - 800 m² footprint

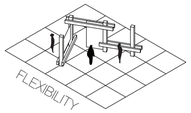
1. Outdoor terrace
2. Multifunctional space
3. Kitchen
4. Dining hall
5. Wet room
6. Dry/cold store
7. Technical space

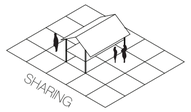


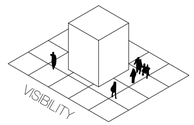
Floorplan

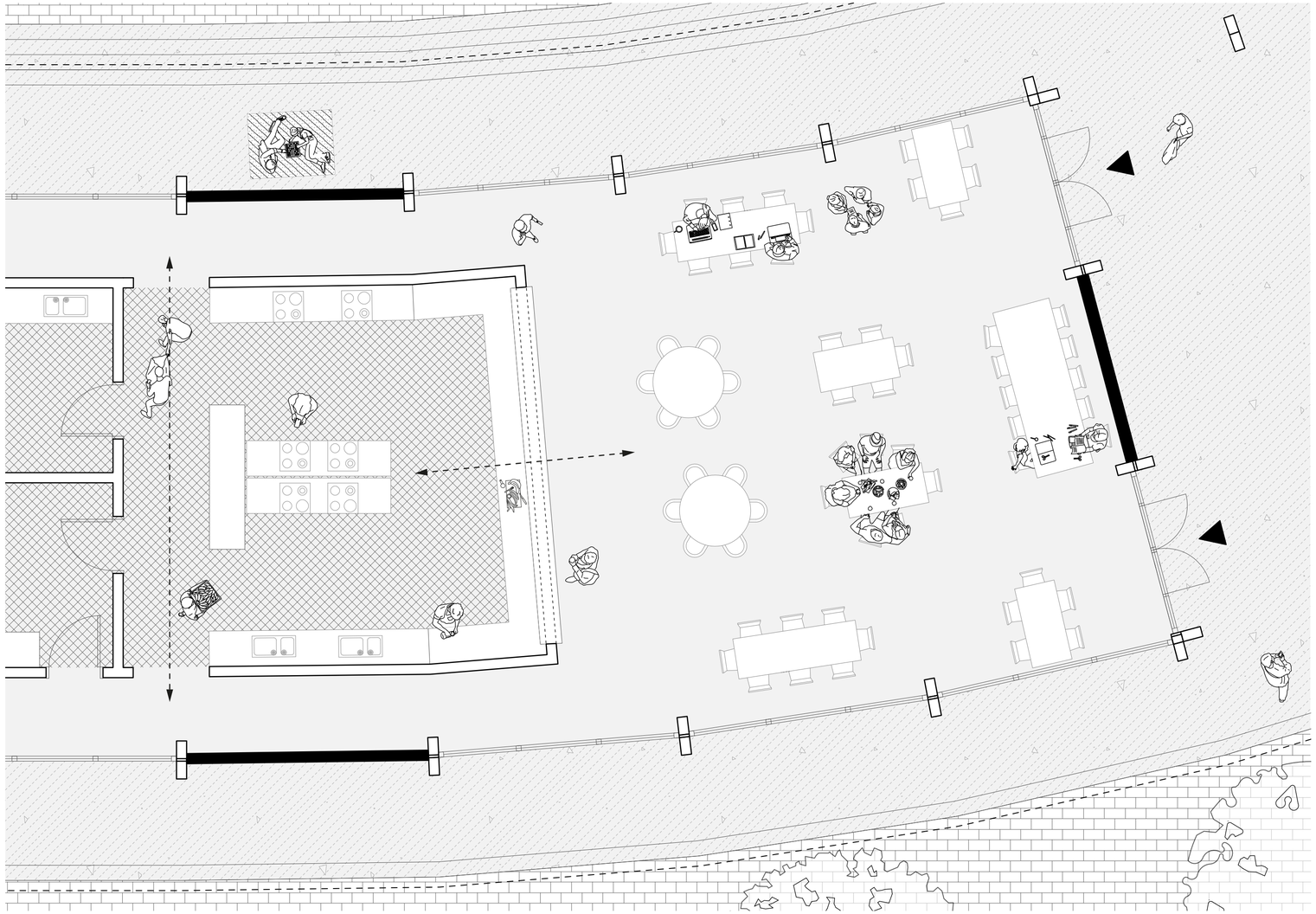
Shared kitchen 1:50







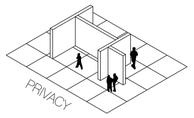


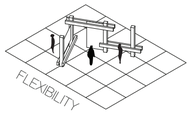


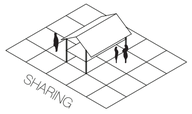


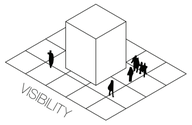
Floorplan

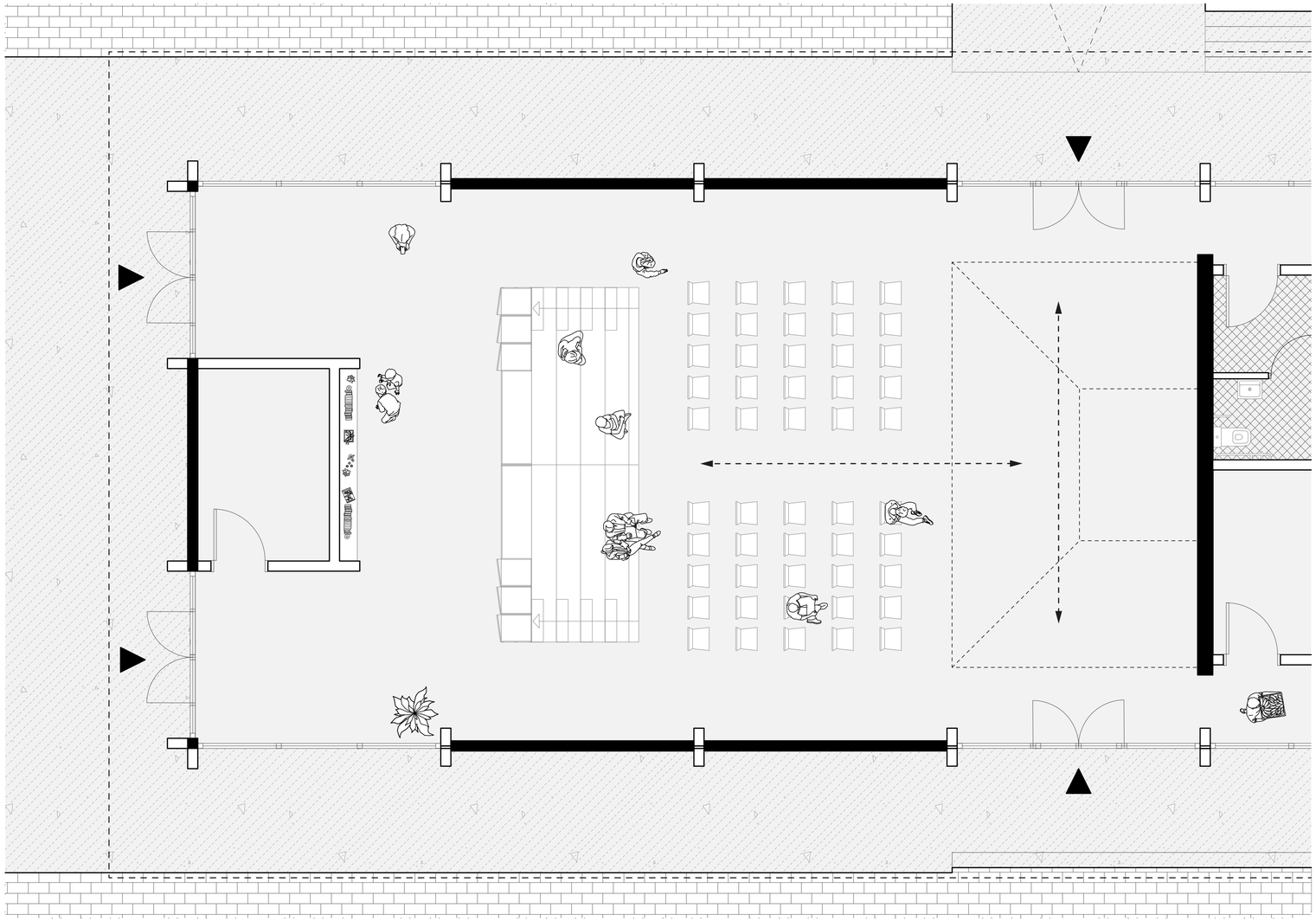
Multifunctional space 1:50







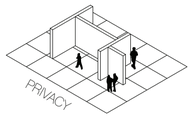


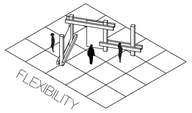


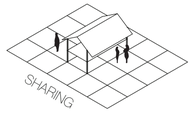


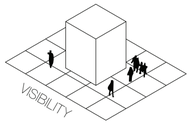
Floorplan

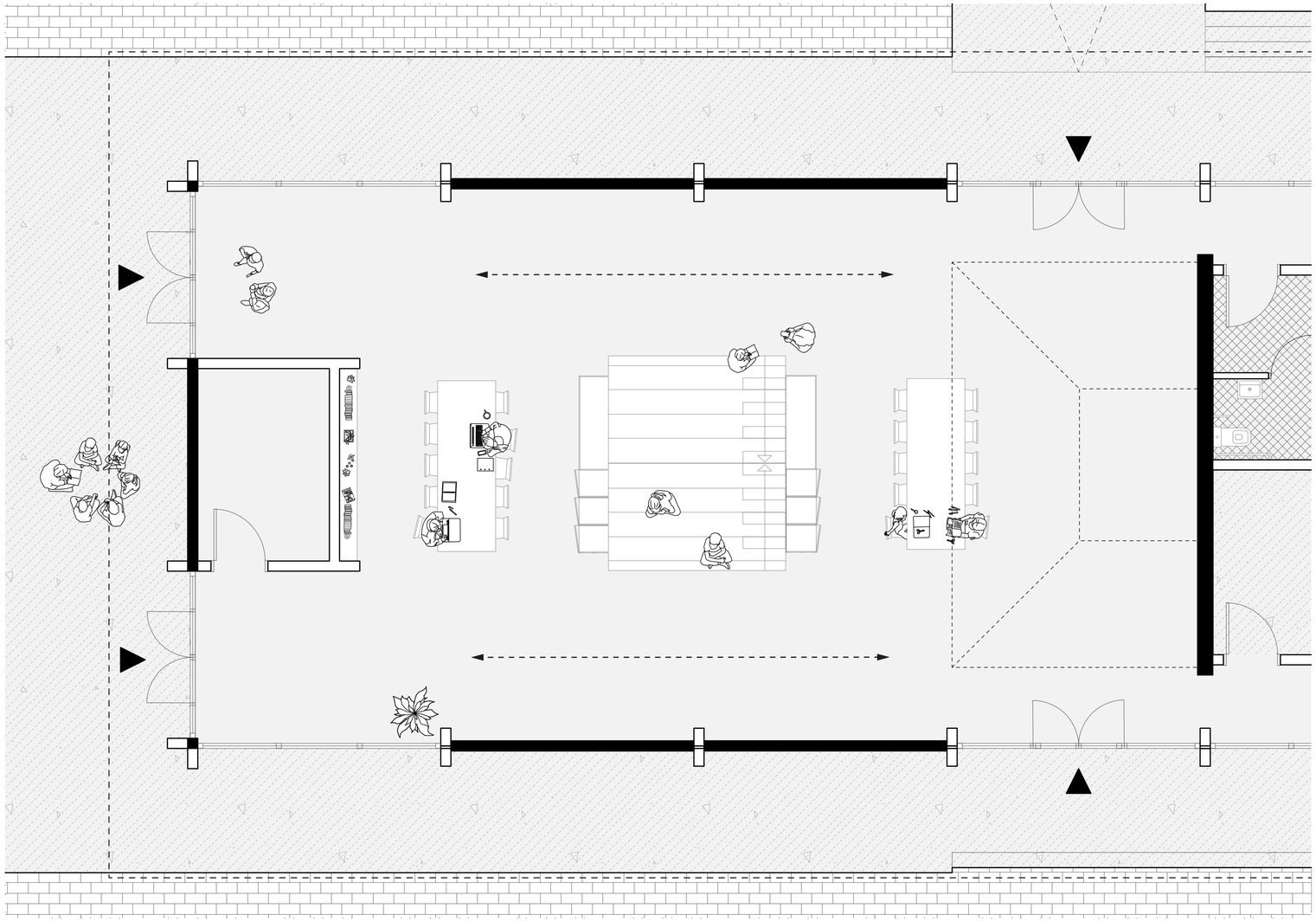
Multifunctional space 1:50







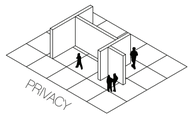


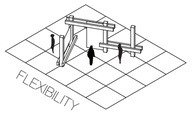


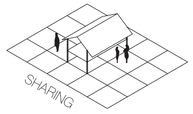


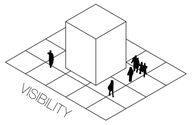
Floorplan

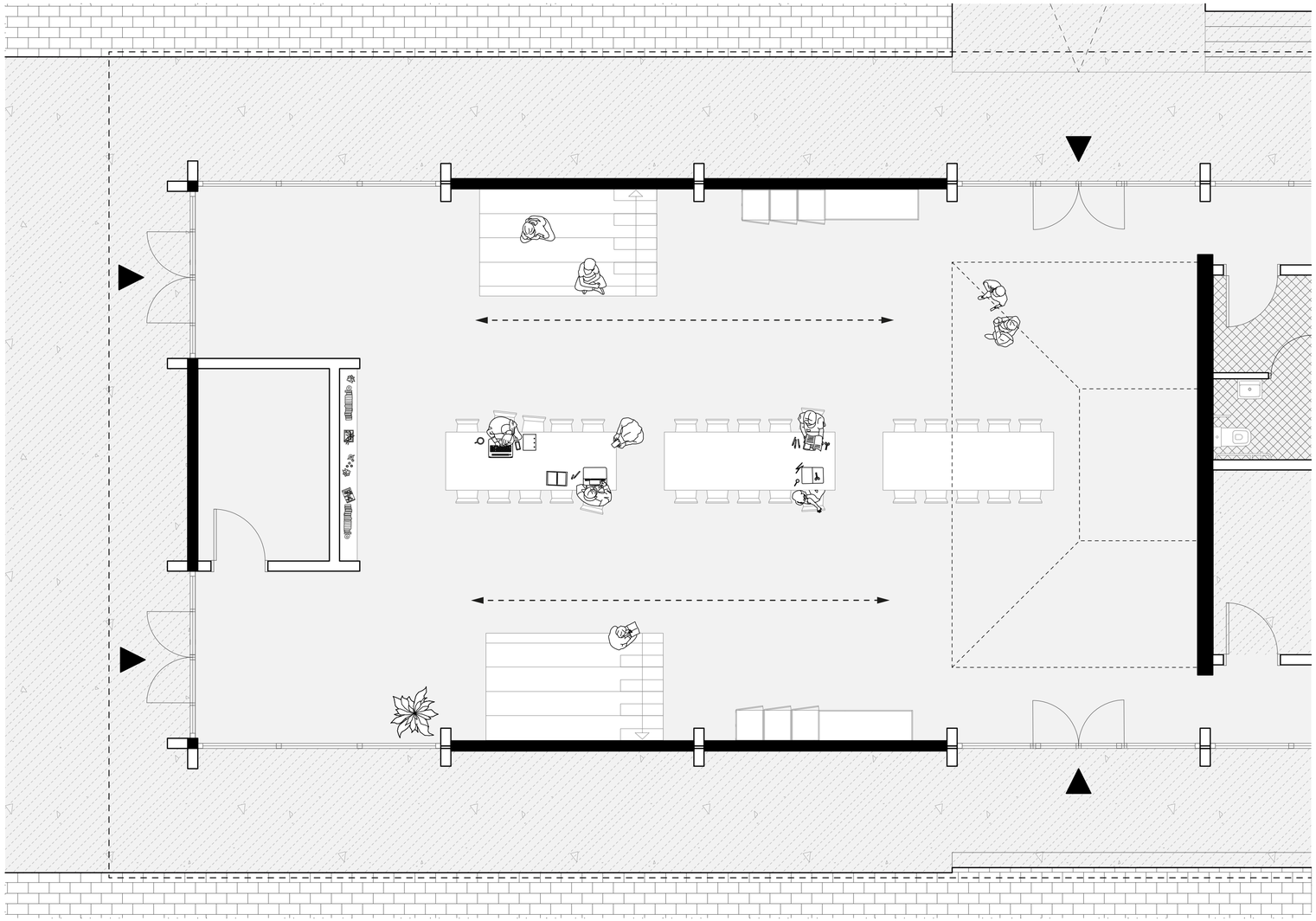
Multifunctional space 1:50







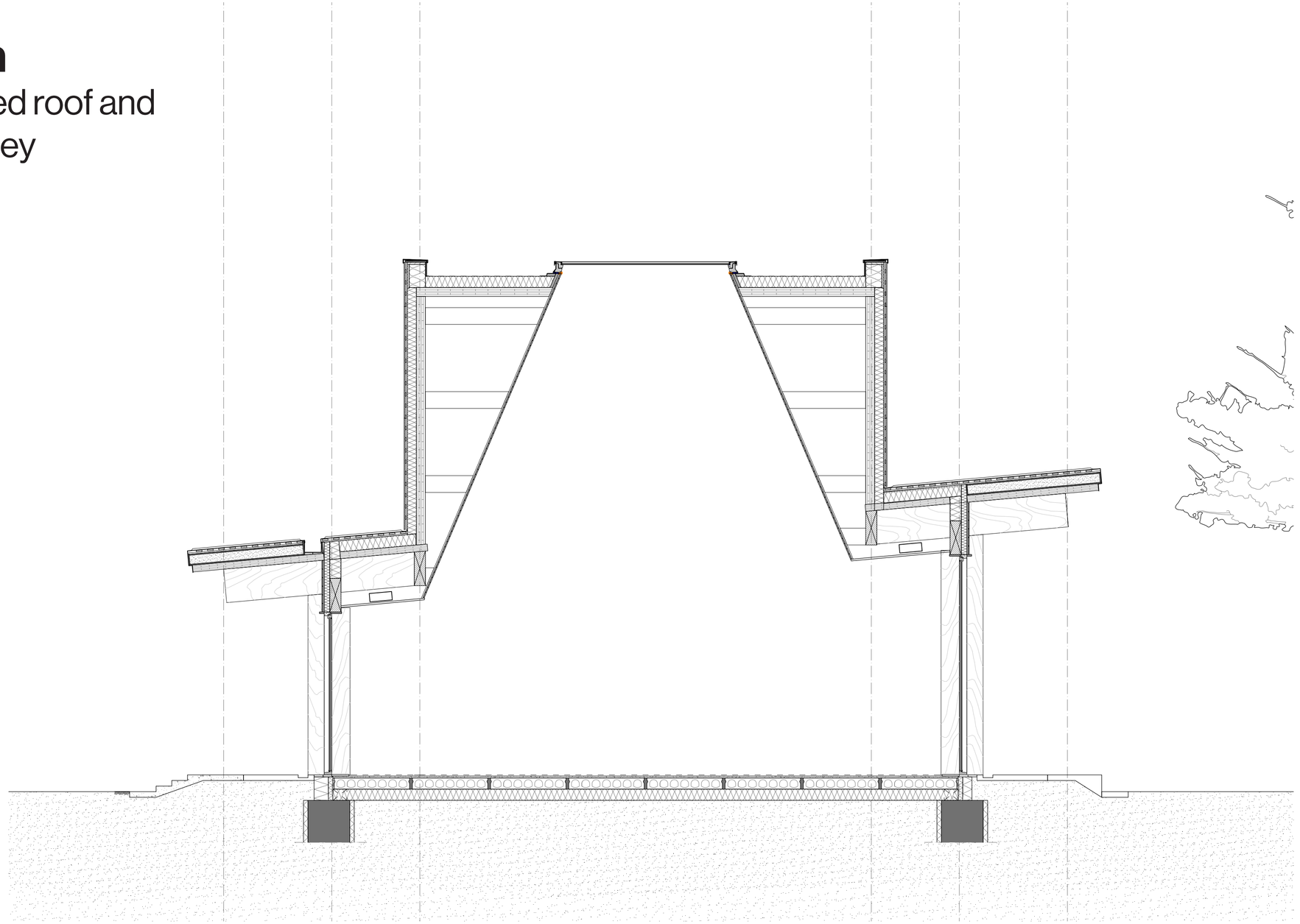






Section

1:50 - sloped roof and light chimney



Perspective

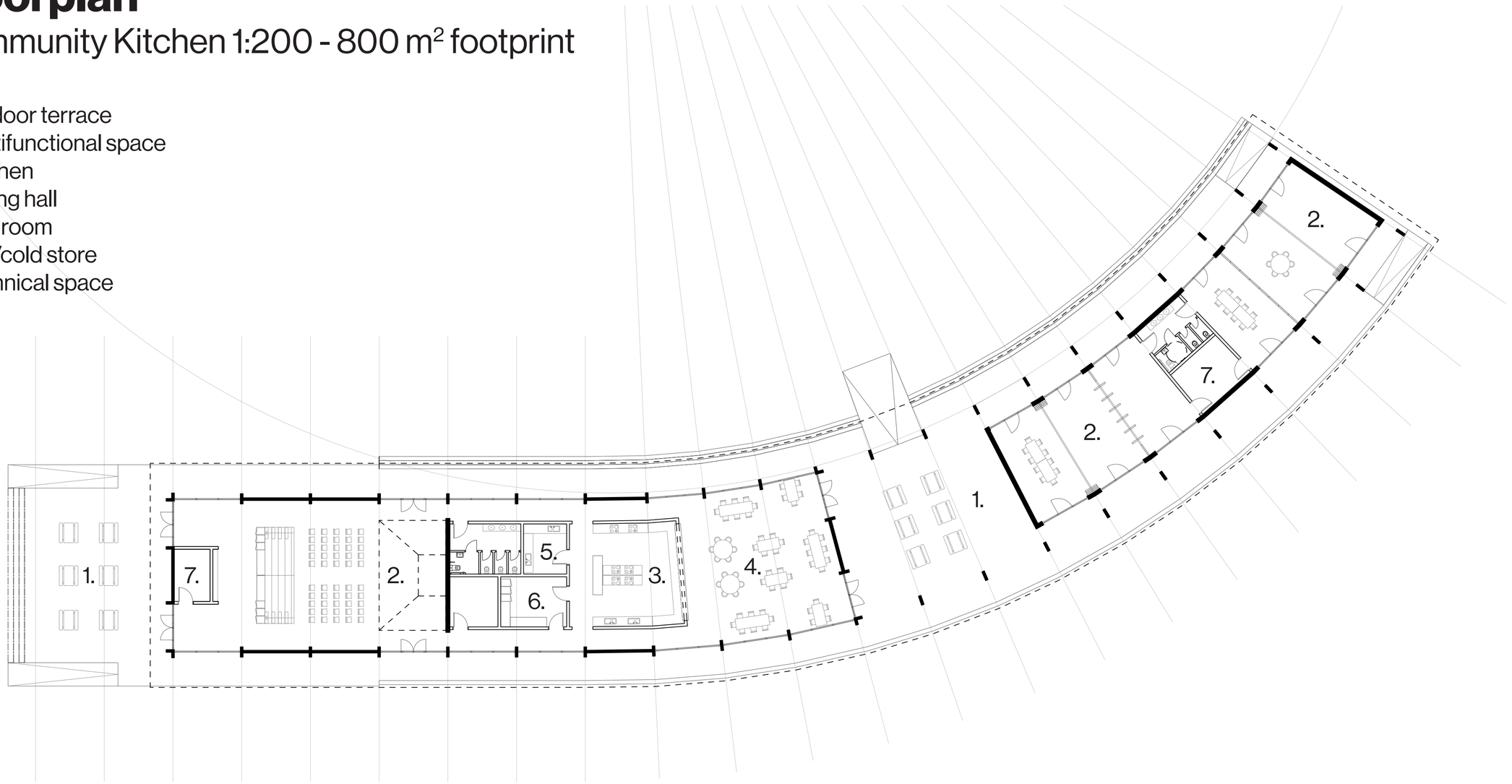
Light chimney, similar to a traditional chimney, marks the symbolic central point in the buildinig. A new focal point of the multifunctional space / building.



Floorplan

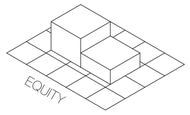
Community Kitchen 1:200 - 800 m² footprint

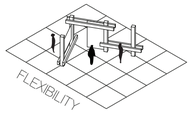
1. Outdoor terrace
2. Multifunctional space
3. Kitchen
4. Dining hall
5. Wet room
6. Dry/cold store
7. Technical space

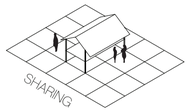


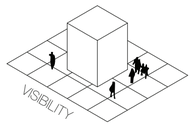
Floorplan

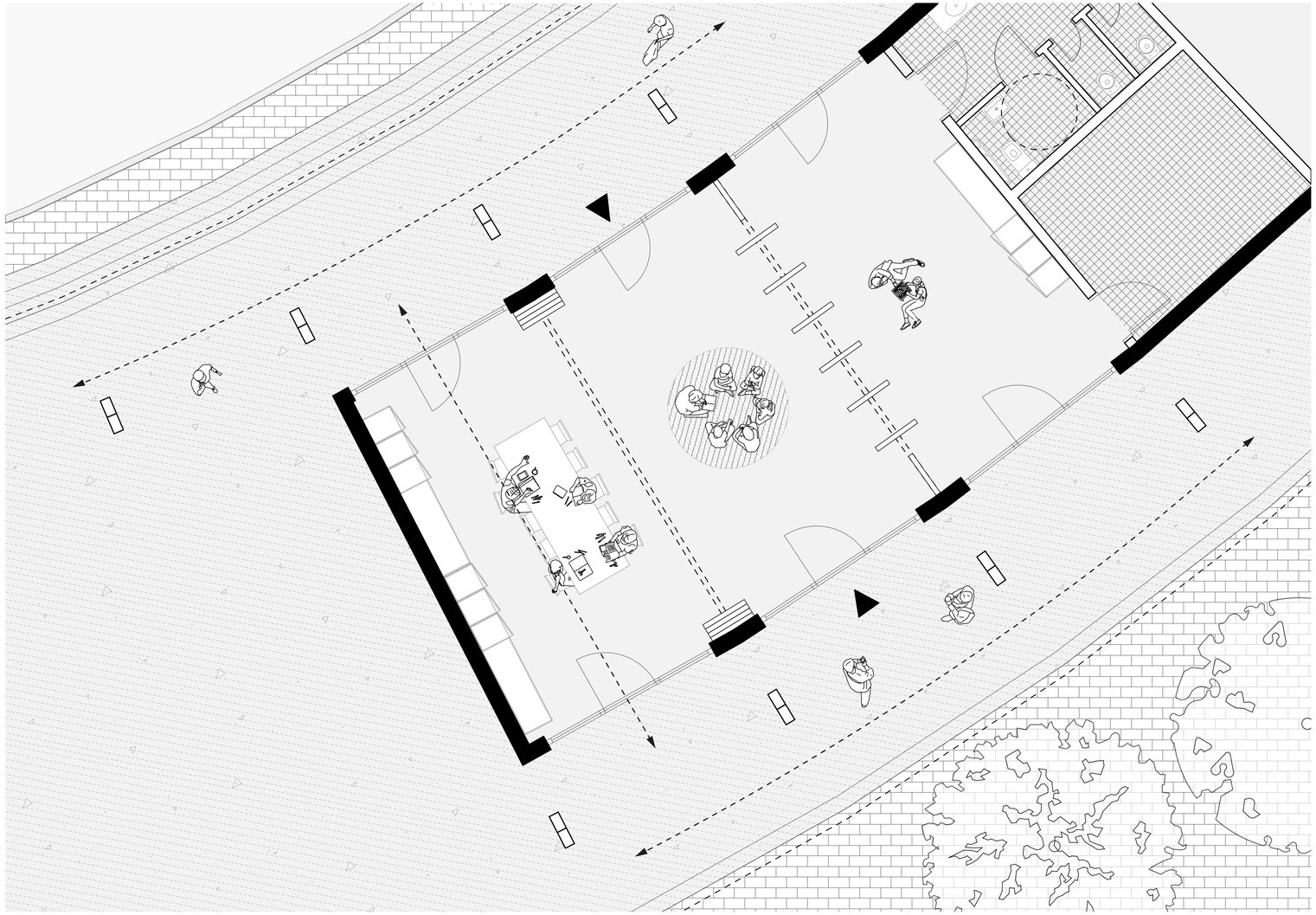
Multifunctional modules 1:50





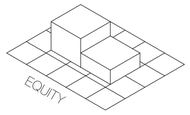


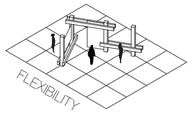


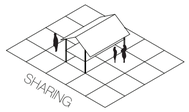


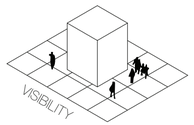
Floorplan

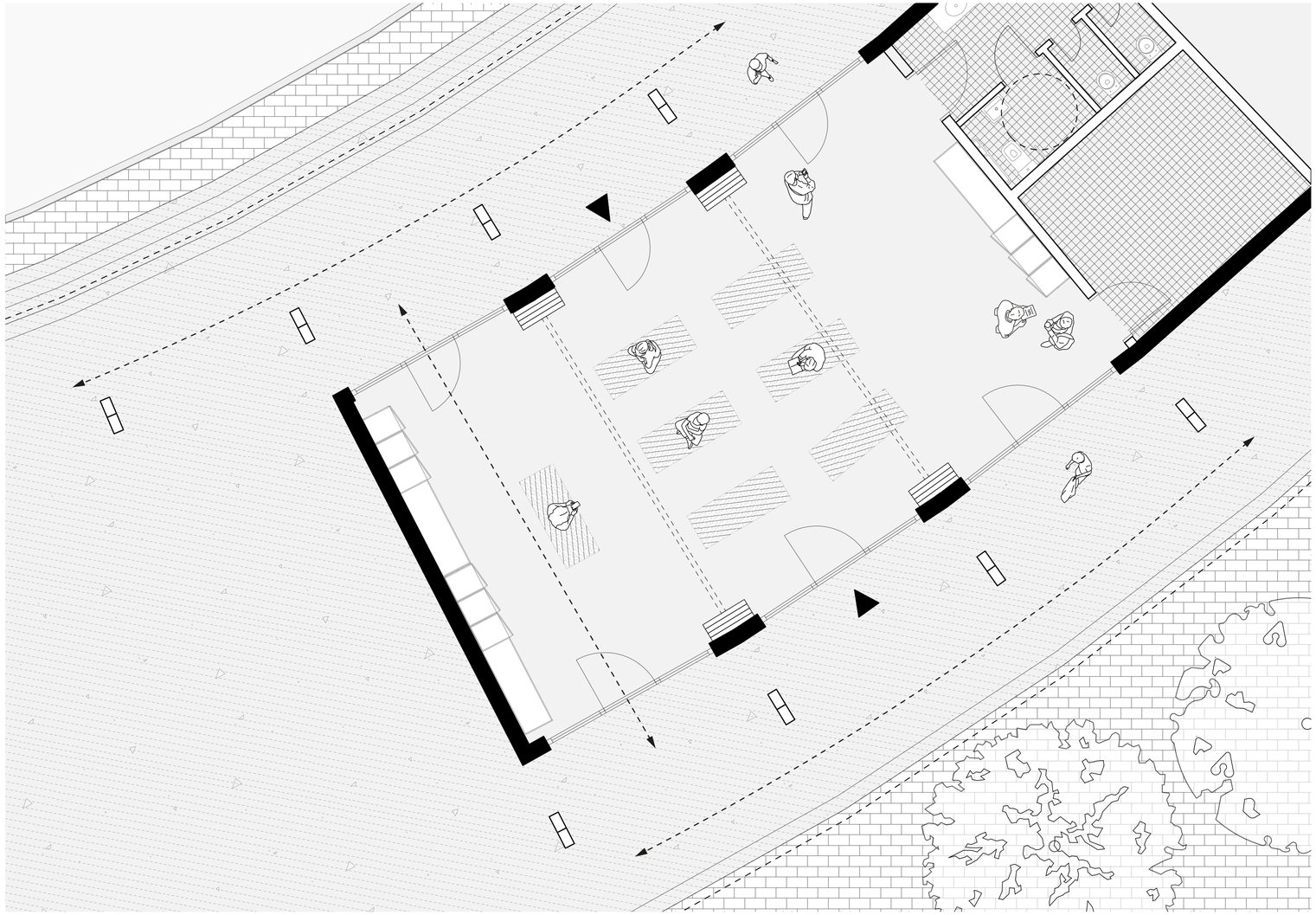
Multifunctional modules 1:50











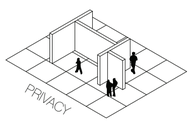


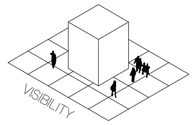




Visibility analysis

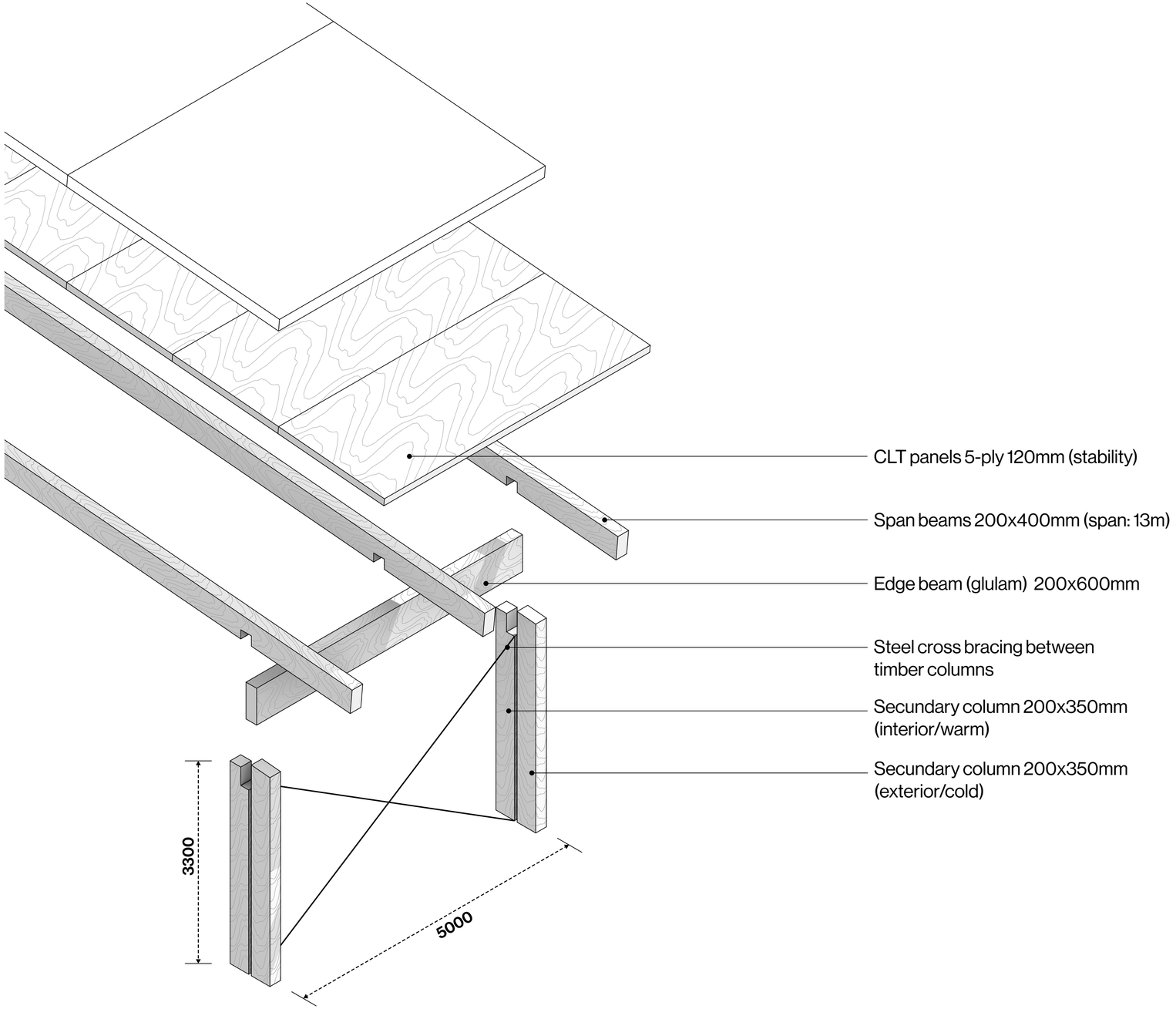
Community kitchen





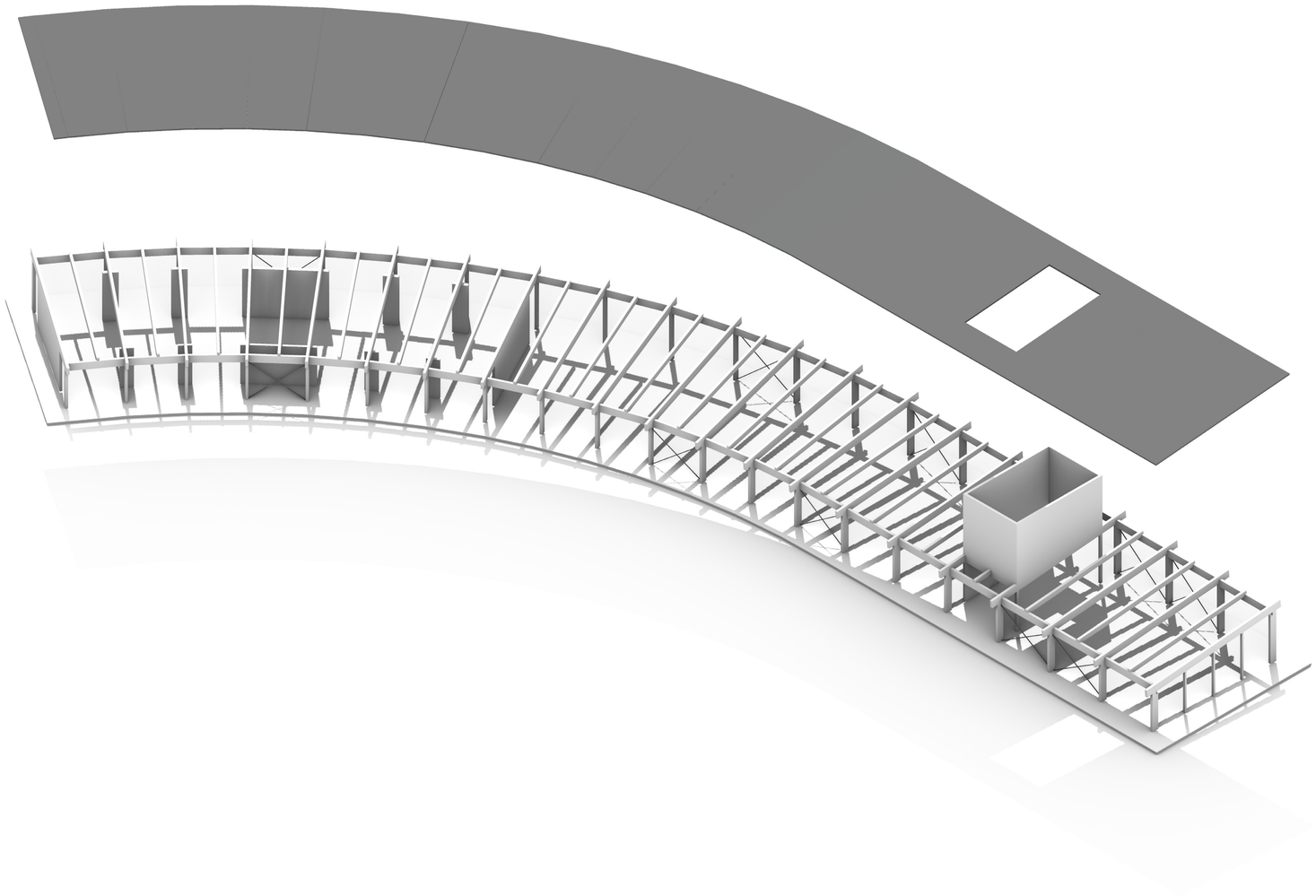
Load bearing structure

Timber - Principle



Load bearing structure

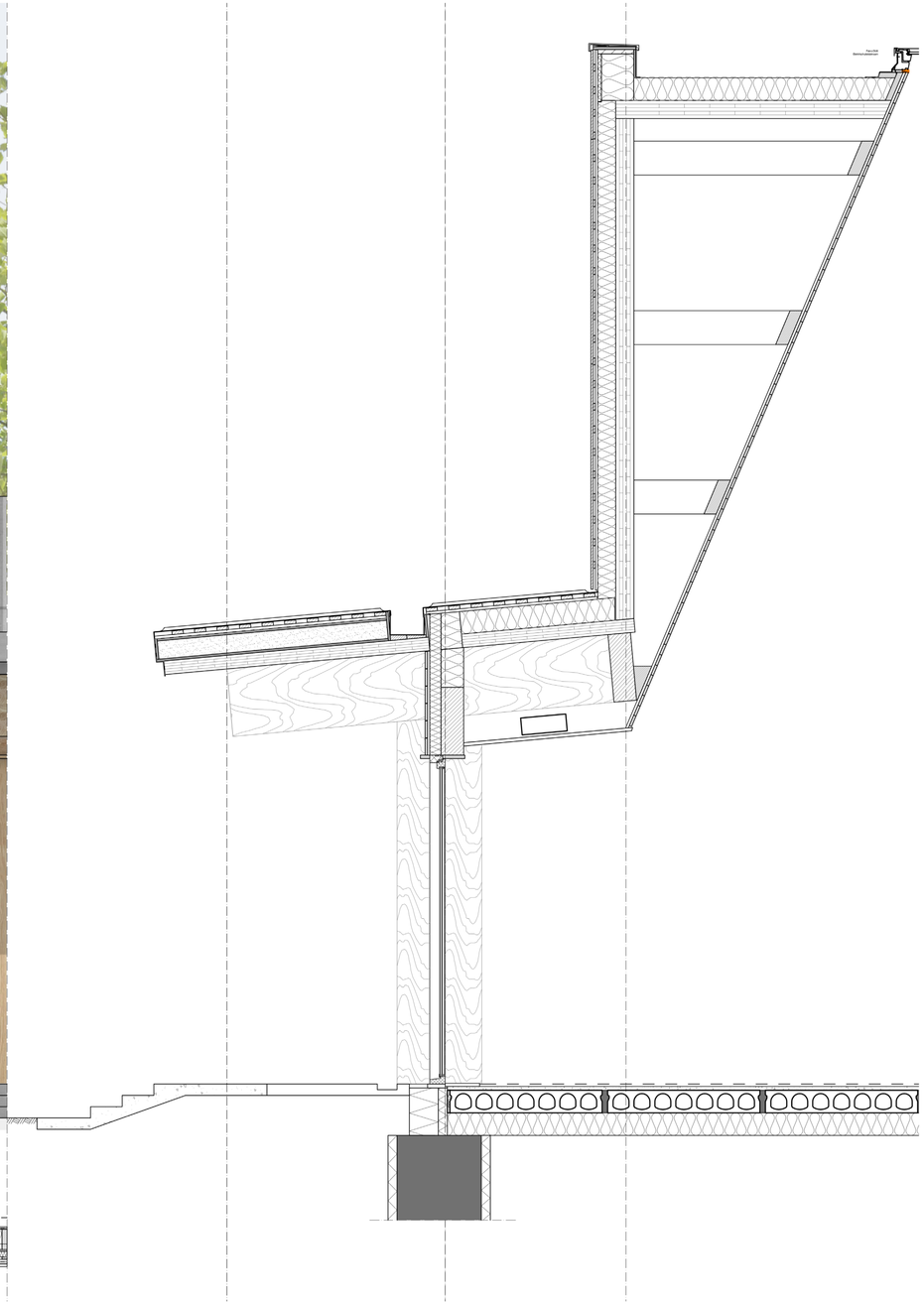
Timber - Total view



Facade

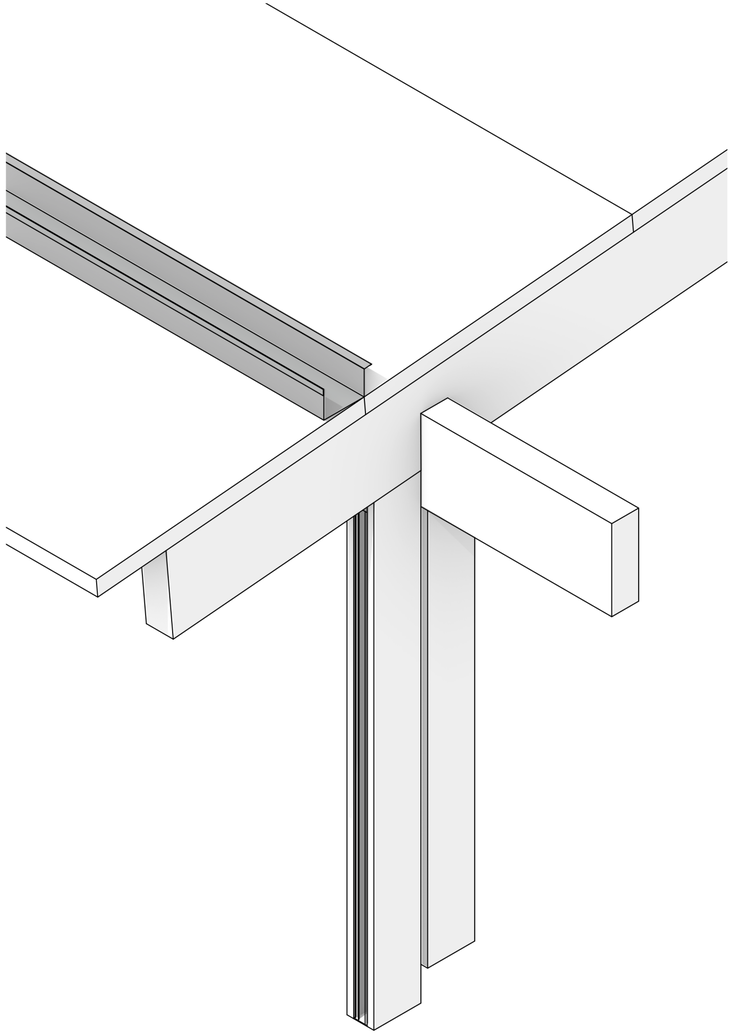
1:20 fragment



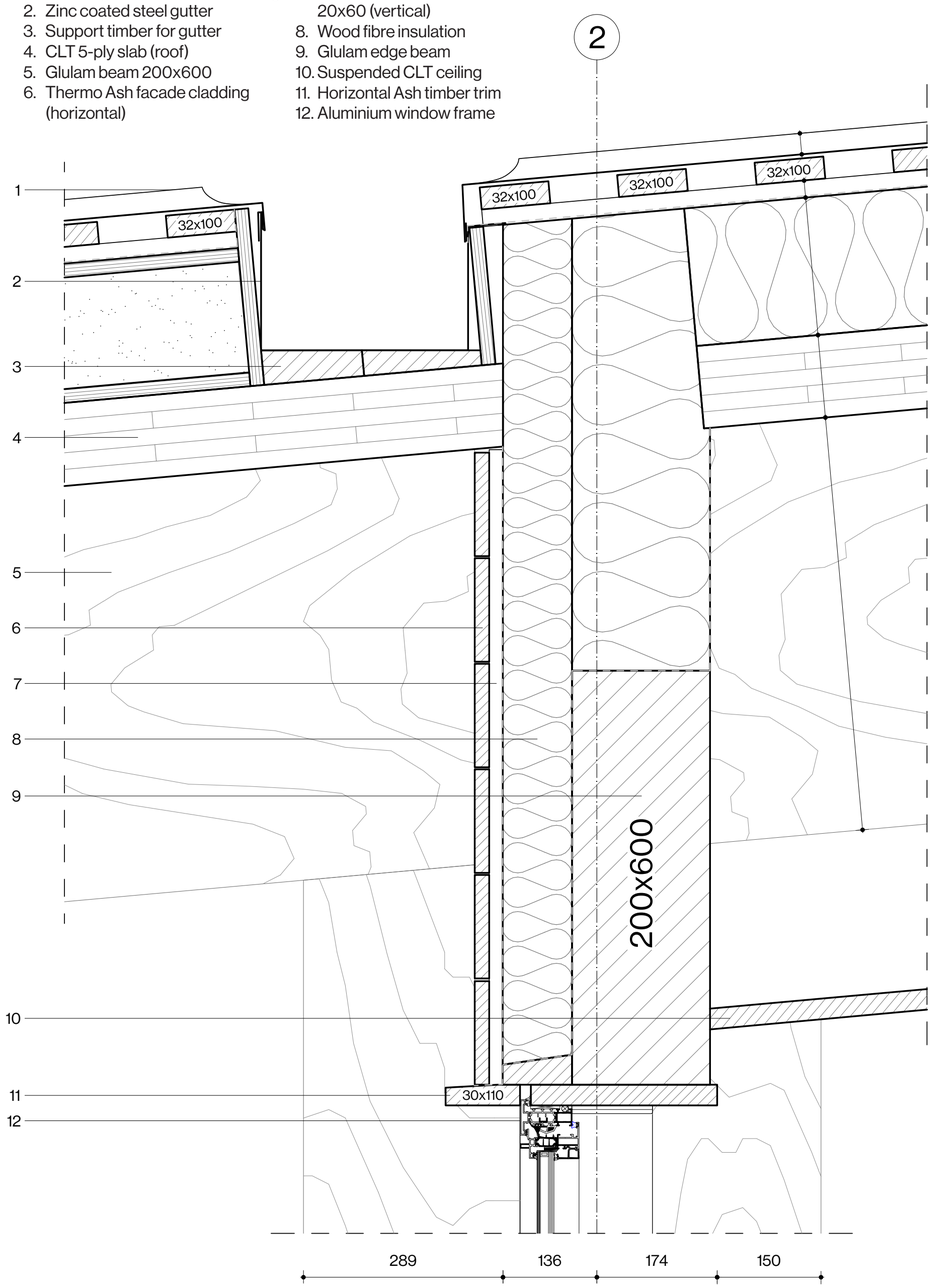


Detail V4 1:5

Rain water collection



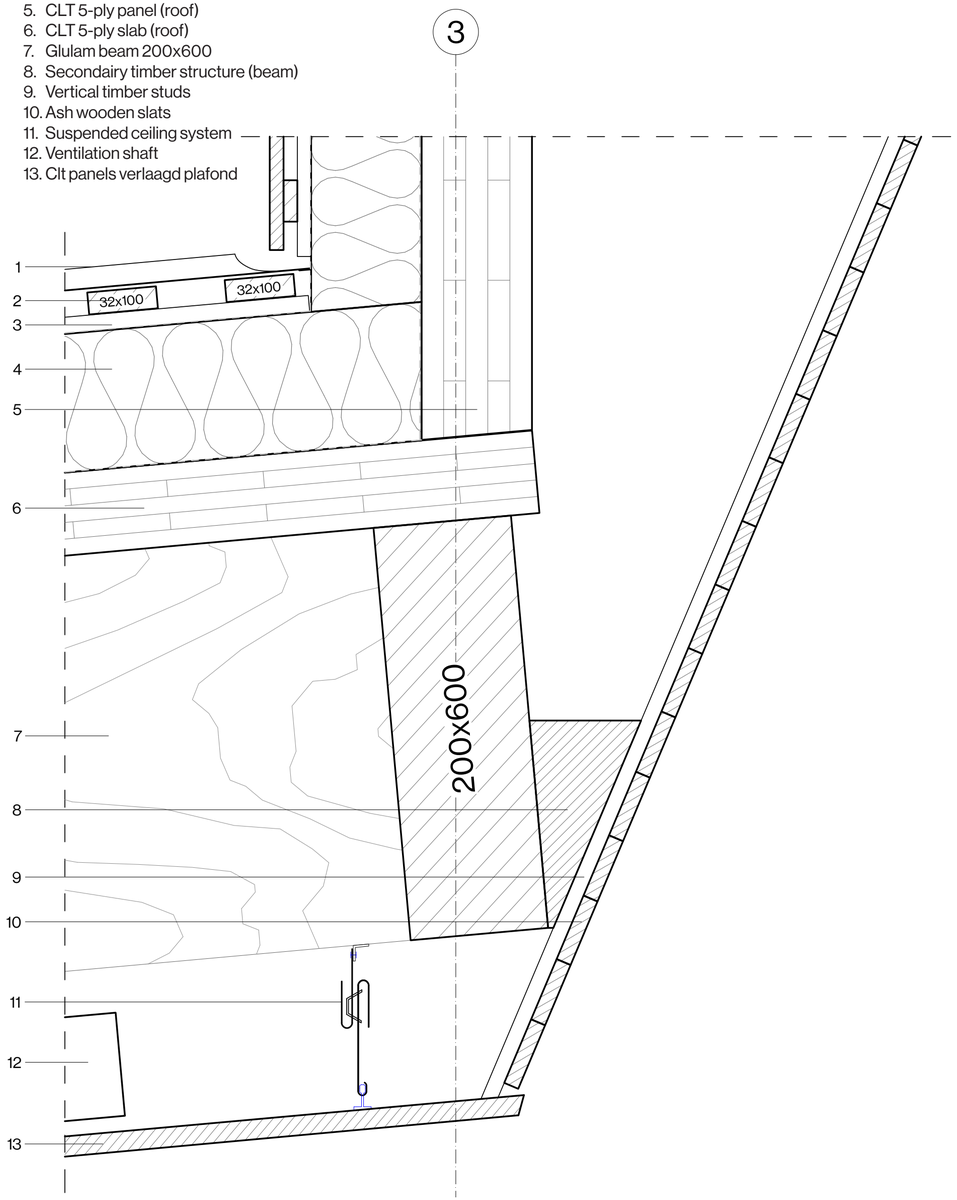
1. Standing seam aluminium roofing
2. Zinc coated steel gutter
3. Support timber for gutter
4. CLT 5-ply slab (roof)
5. Glulam beam 200x600
6. Thermo Ash facade cladding (horizontal)
7. Wooden ventilation battens 20x60 (vertical)
8. Wood fibre insulation
9. Glulam edge beam
10. Suspended CLT ceiling
11. Horizontal Ash timber trim
12. Aluminium window frame



Detail V3 1:5

Ash wooden interior cladding

1. Standing seam aluminium roofing
2. Wooden ventilation battens 20x60 (horizontal)
3. Wooden ventilation battens 20x60 (vertical)
4. Insulation (mineral wool)
5. CLT 5-ply panel (roof)
6. CLT 5-ply slab (roof)
7. Glulam beam 200x600
8. Secondairy timber structure (beam)
9. Vertical timber studs
10. Ash wooden slats
11. Suspended ceiling system
12. Ventilation shaft
13. Clt panels verlaagd plafond



Facade

Elevations 1:200





Climate scheme

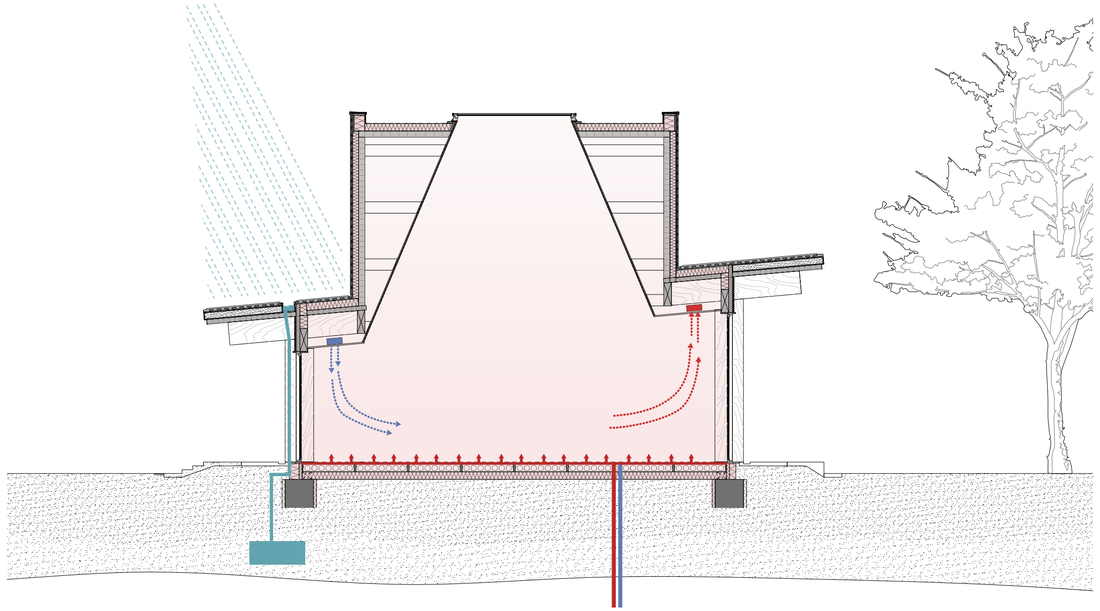
Winter and summer situation

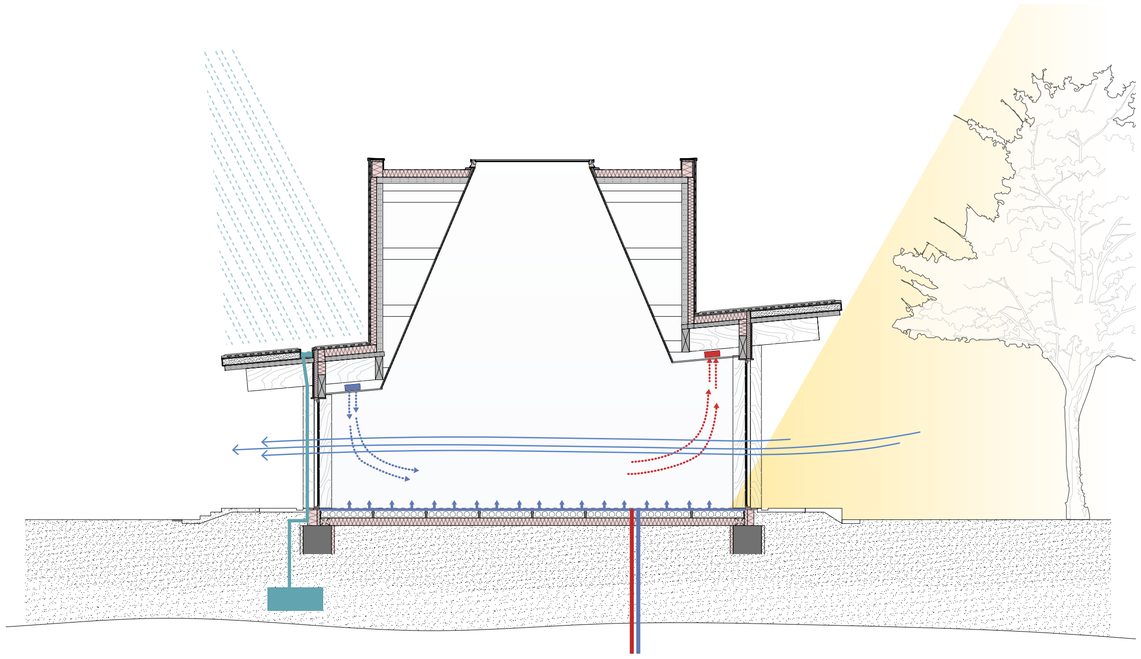
Winter:

1. Ground Source Heat Pump (GSHP) in combination with floor heating provides efficient, low-temperature heating.
2. Mechanical Supply & Exhaust. Ensures a healthy indoor climate with controlled airflow. Reduces dependence on natural ventilation in colder months.
3. Insulation & Airtightness. High-performance building envelope minimizes heat loss.
4. Rainwater harvesting. Collect runoff for non-potable uses.

Summer:

1. 2.4m overhang facade, reduces direct solar heat gain.
2. Natural cross ventilation. Opposite operable windows enable airflow.
3. Mechanical Exhaust: ventilation demand: ±7 l/s per person. Approx. 60 dining guests + multifunctional room. Total demand: ±1100 l/s (≈3960 m^3/h). And separate exhaust system for kitchen area (same for the winter situation).
4. Rainwater harvesting. Collect runoff for non-potable uses.

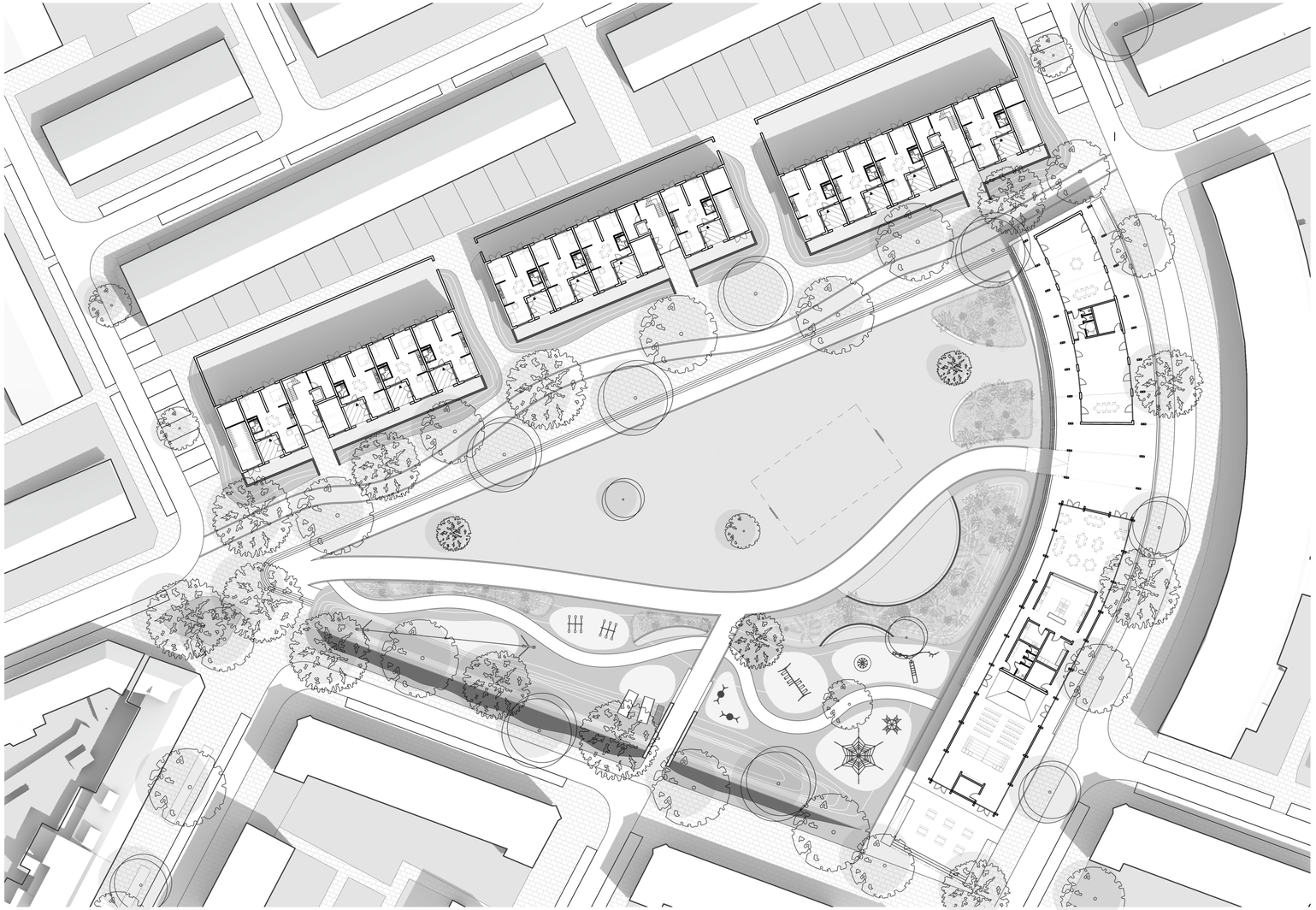




Design:
Apartment Buildings

Site

1:500



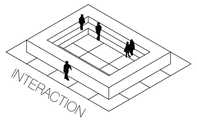
Floorplan

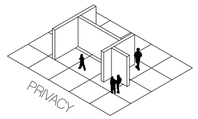
Ground floor with context 1:200

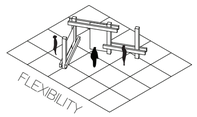


Floorplan

360x360 grid



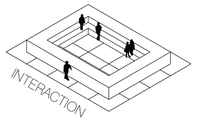


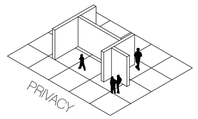


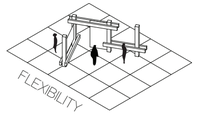


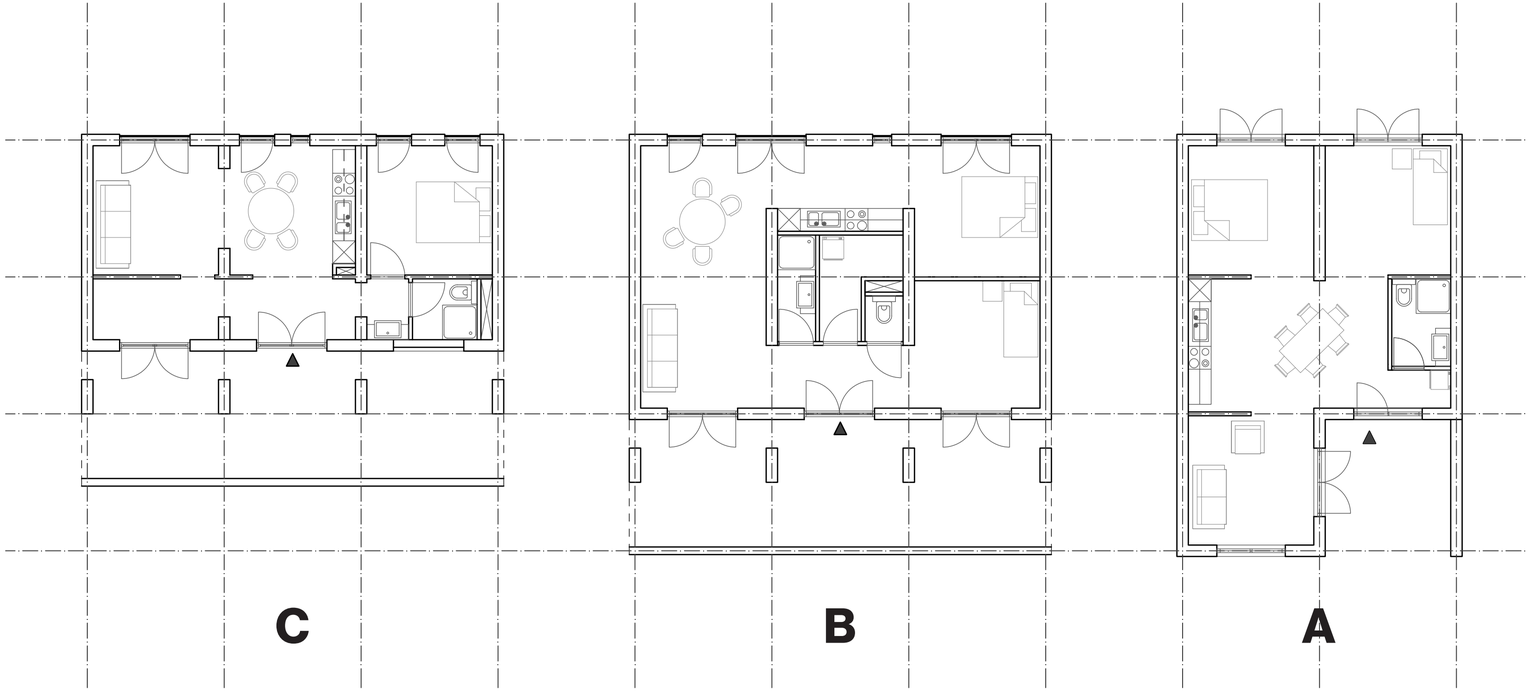
Floorplan

Three types A, B, C





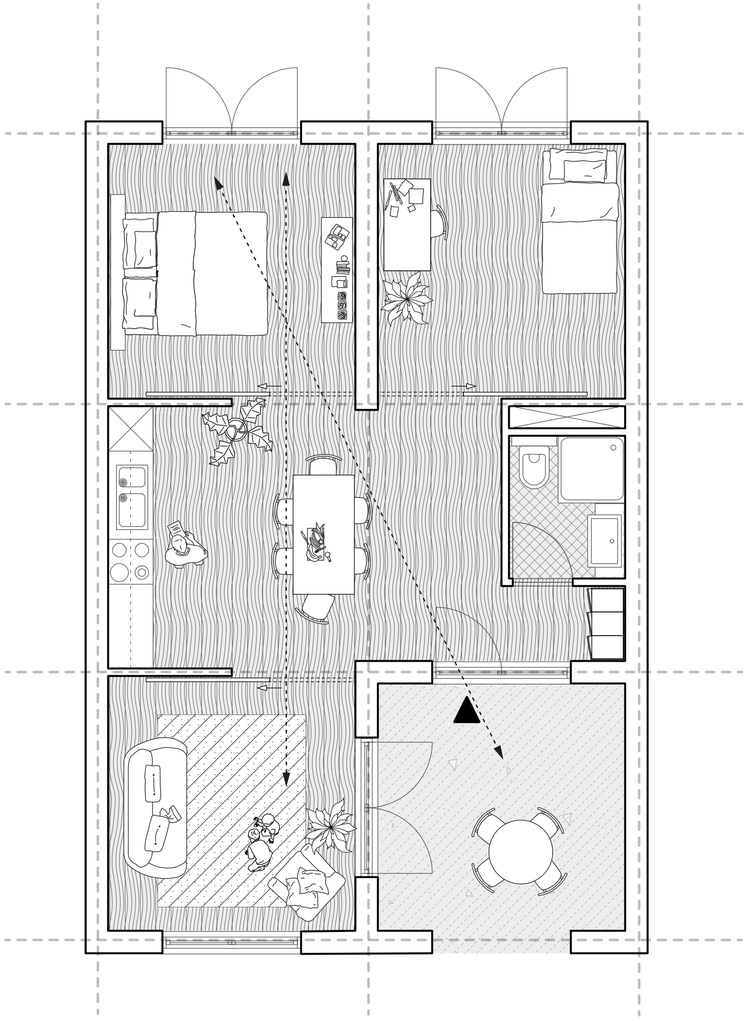




Floorplan 1:50

Unit A - 60 m^2

Ground floor

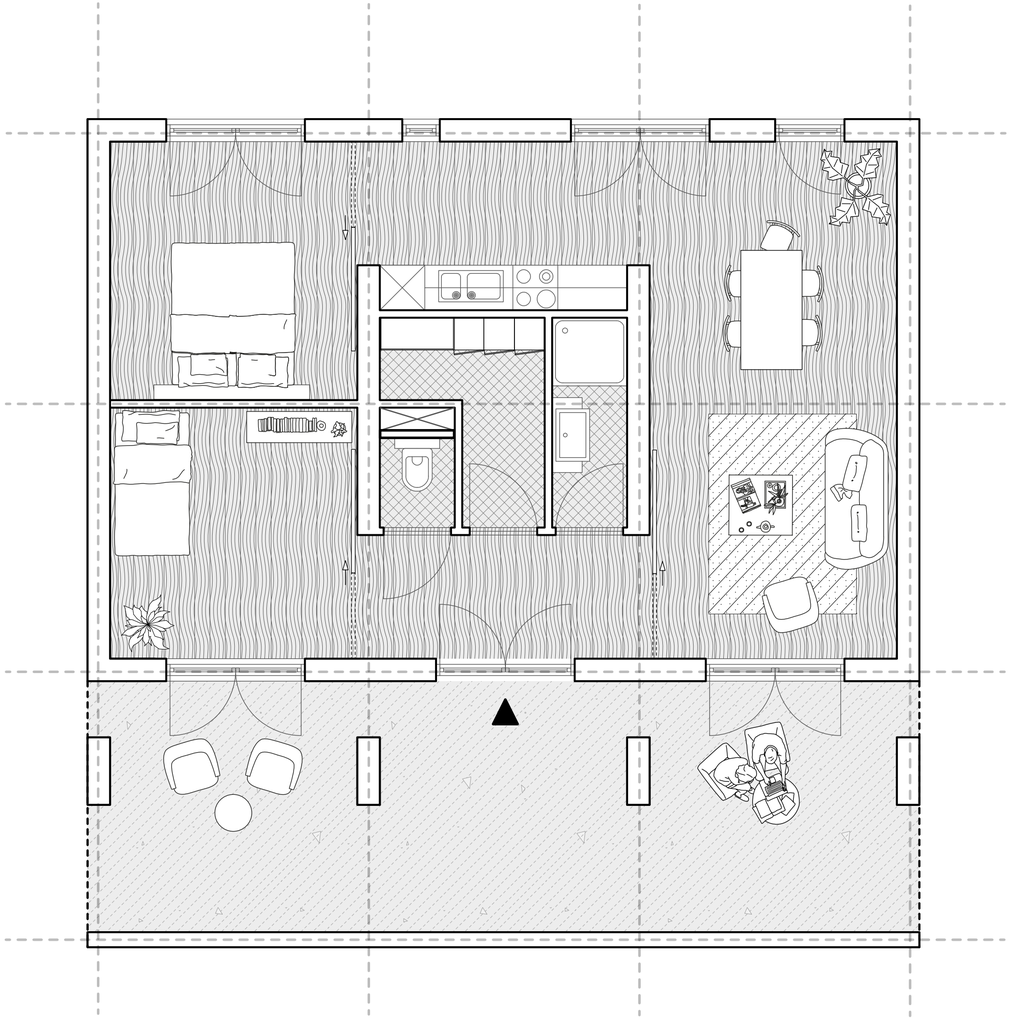




Floorplan 1:50

Unit B - 72 m²

First floor

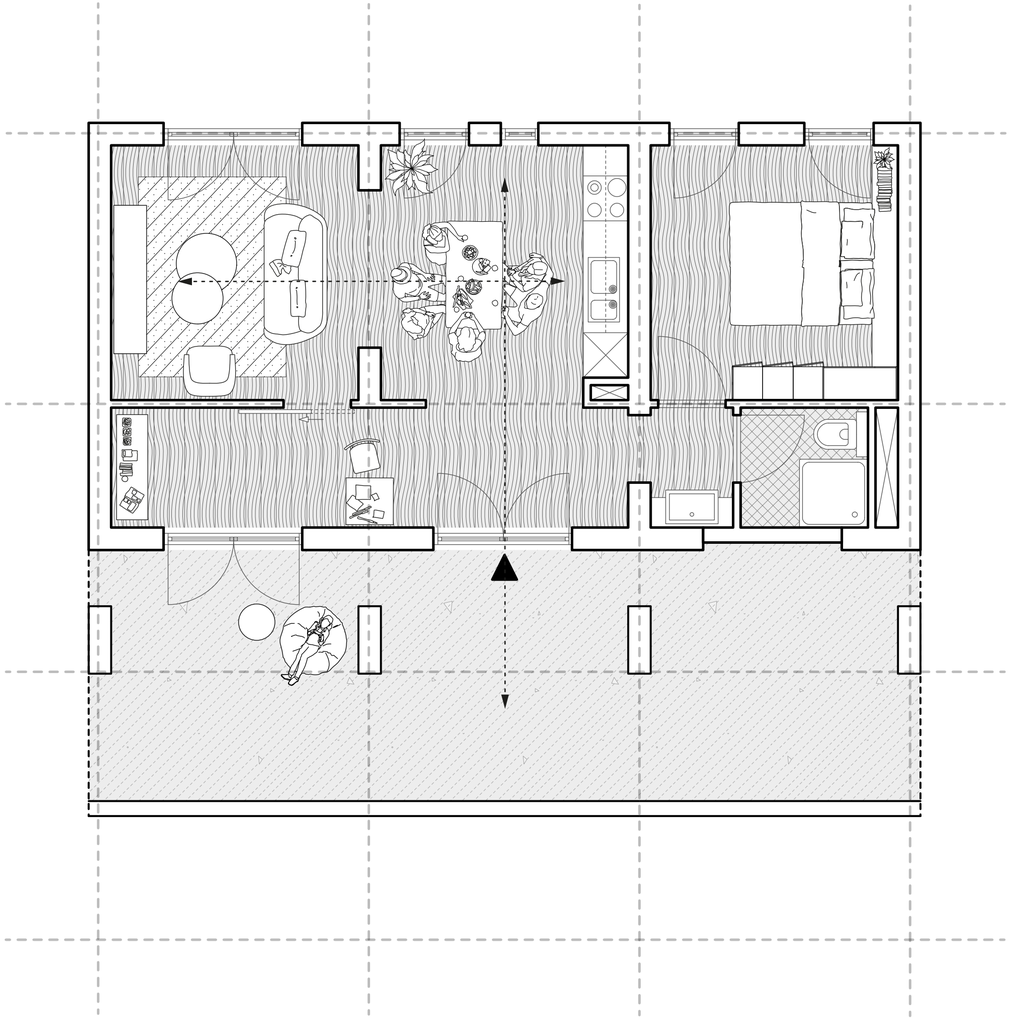




Floorplan 1:50

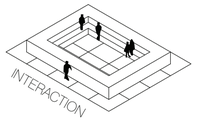
Unit C - 53 m^2

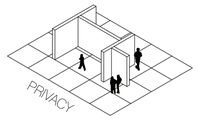
Second floor

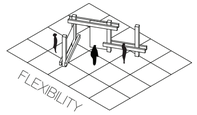


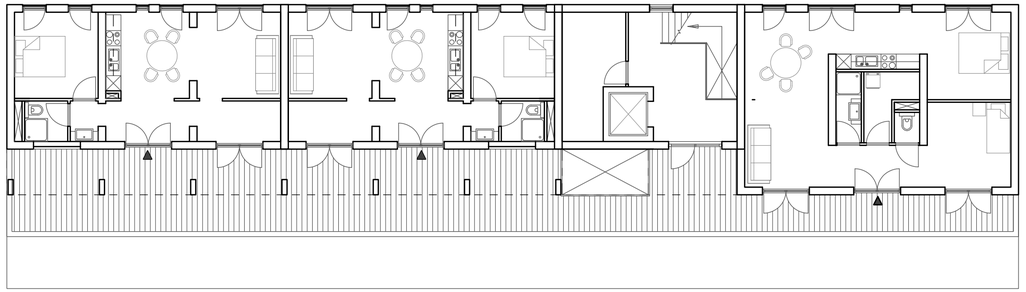


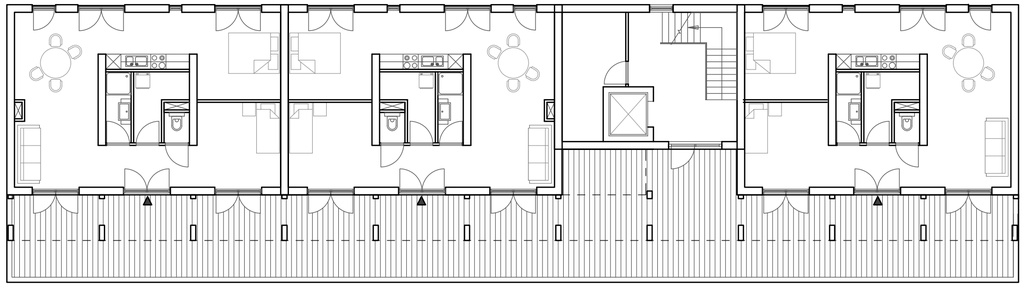
Floorplan 1:100

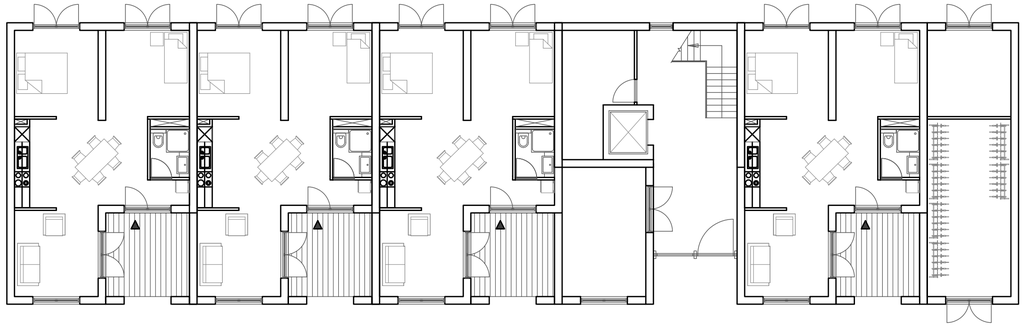








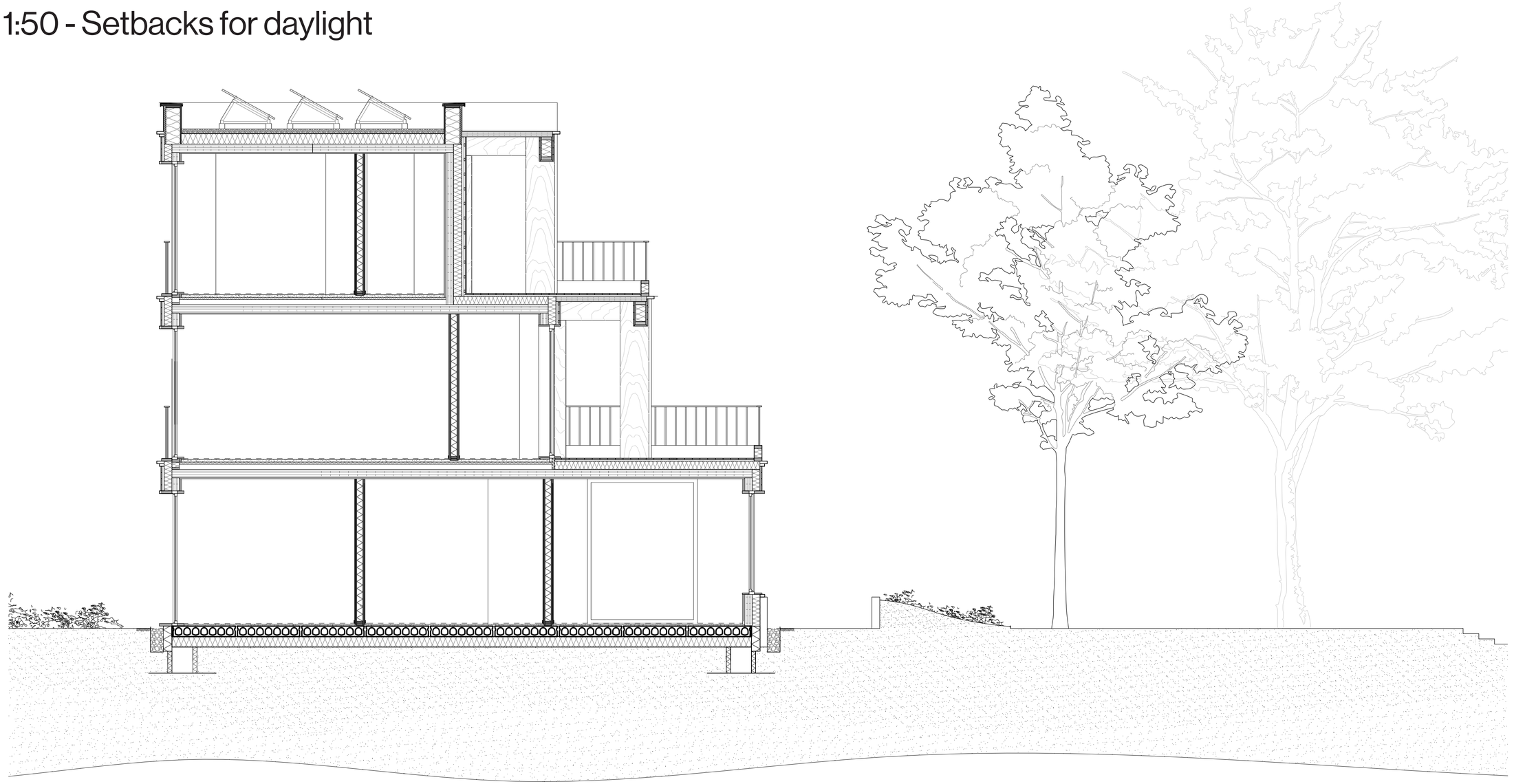






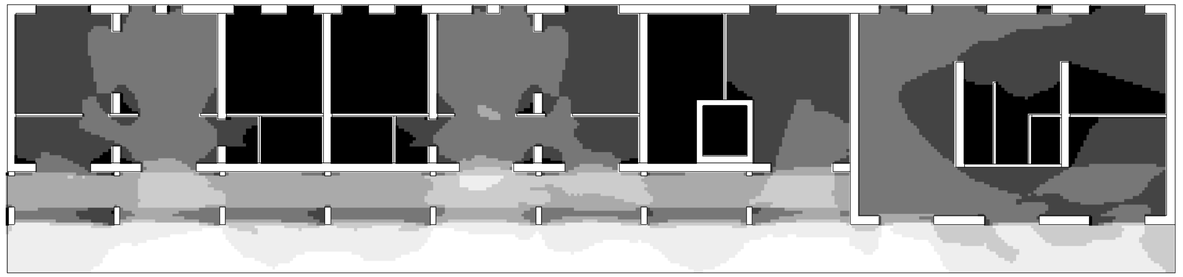
Section

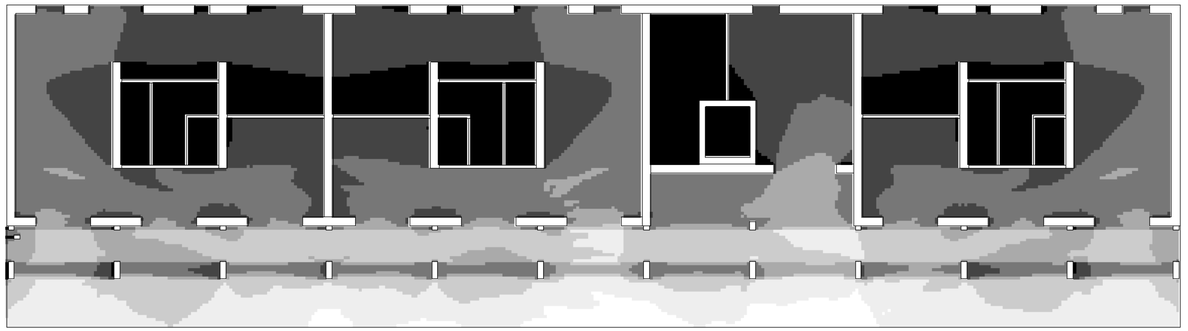
1:50 - Setbacks for daylight

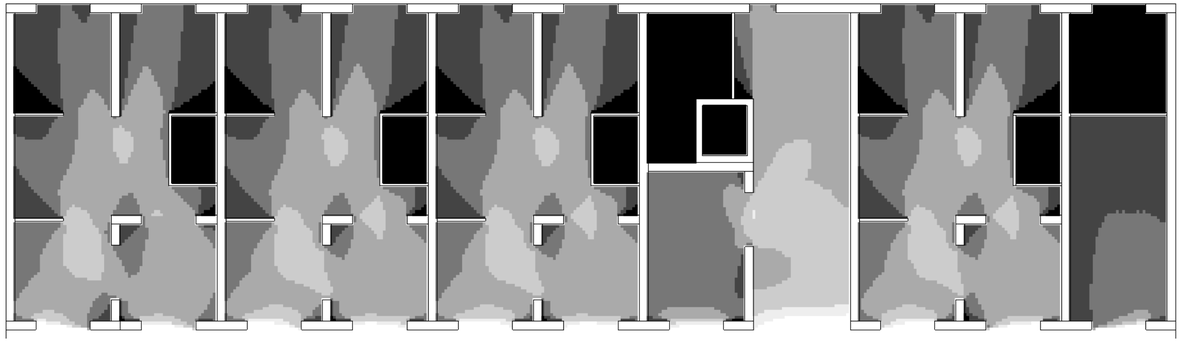


Visibility analysis

Apartment Building

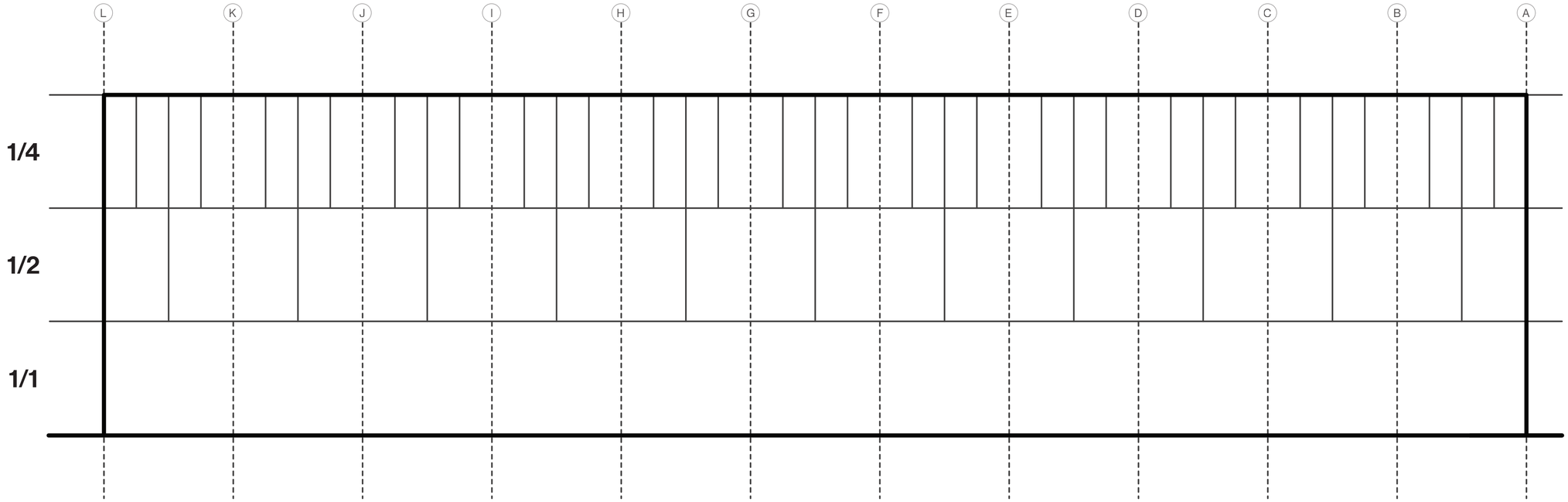






Facade

Elevations 1:100



Facade

Northwest elevation 1:100



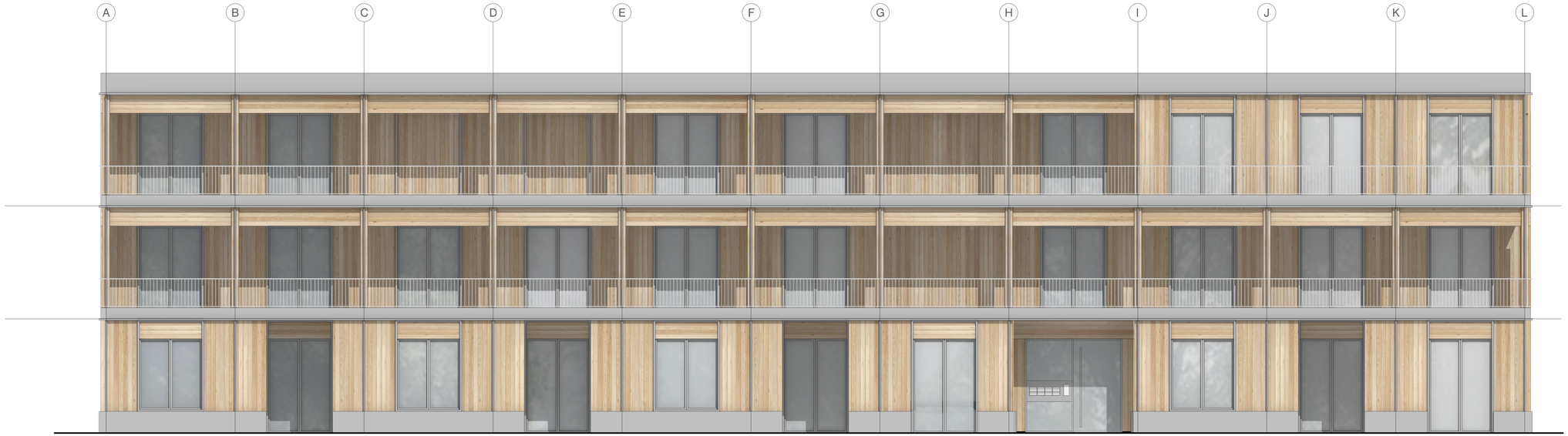
Facade

Northwest elevation (back) 1:100



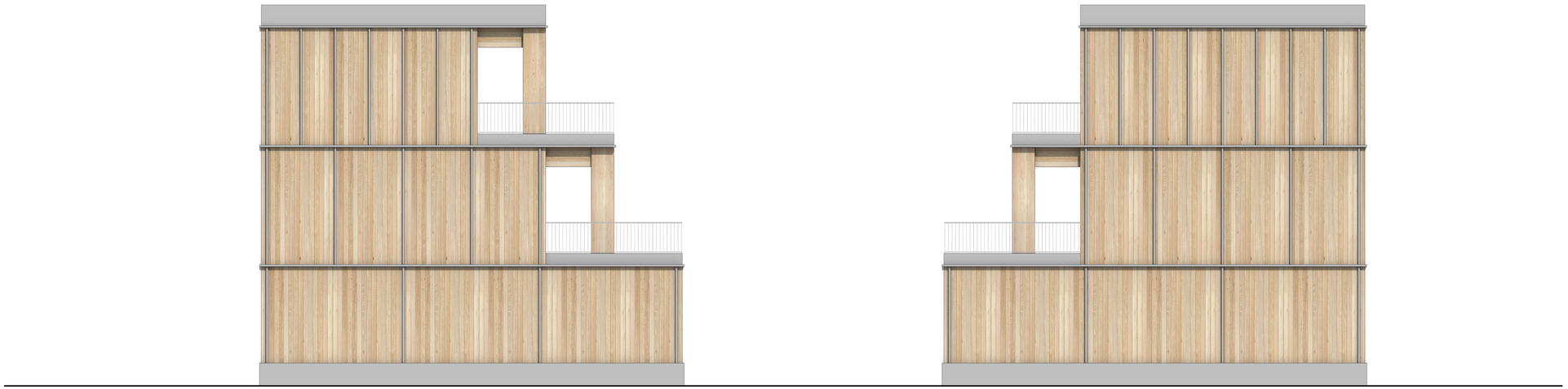
Facade

Southeast elevation (front) 1:100



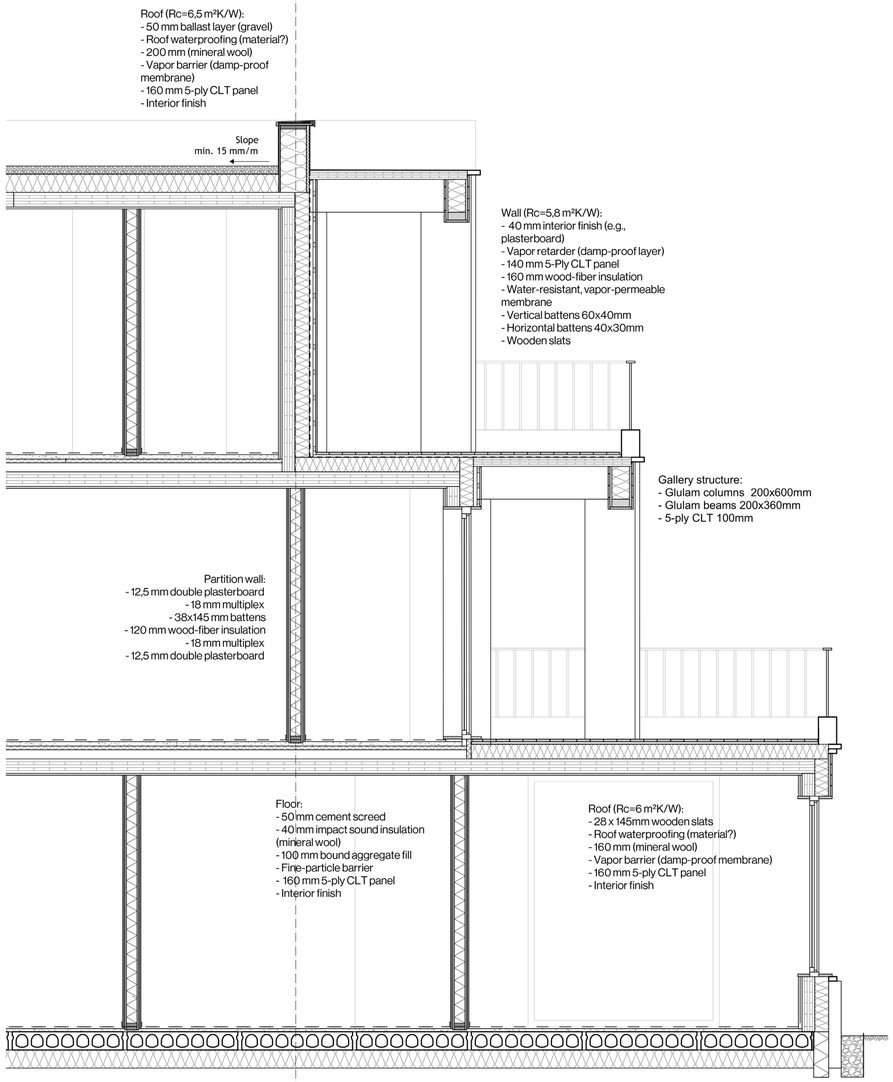
Facade

Southwest & Northeast elevations (sides) 1:100



Facade

1:20 fragment

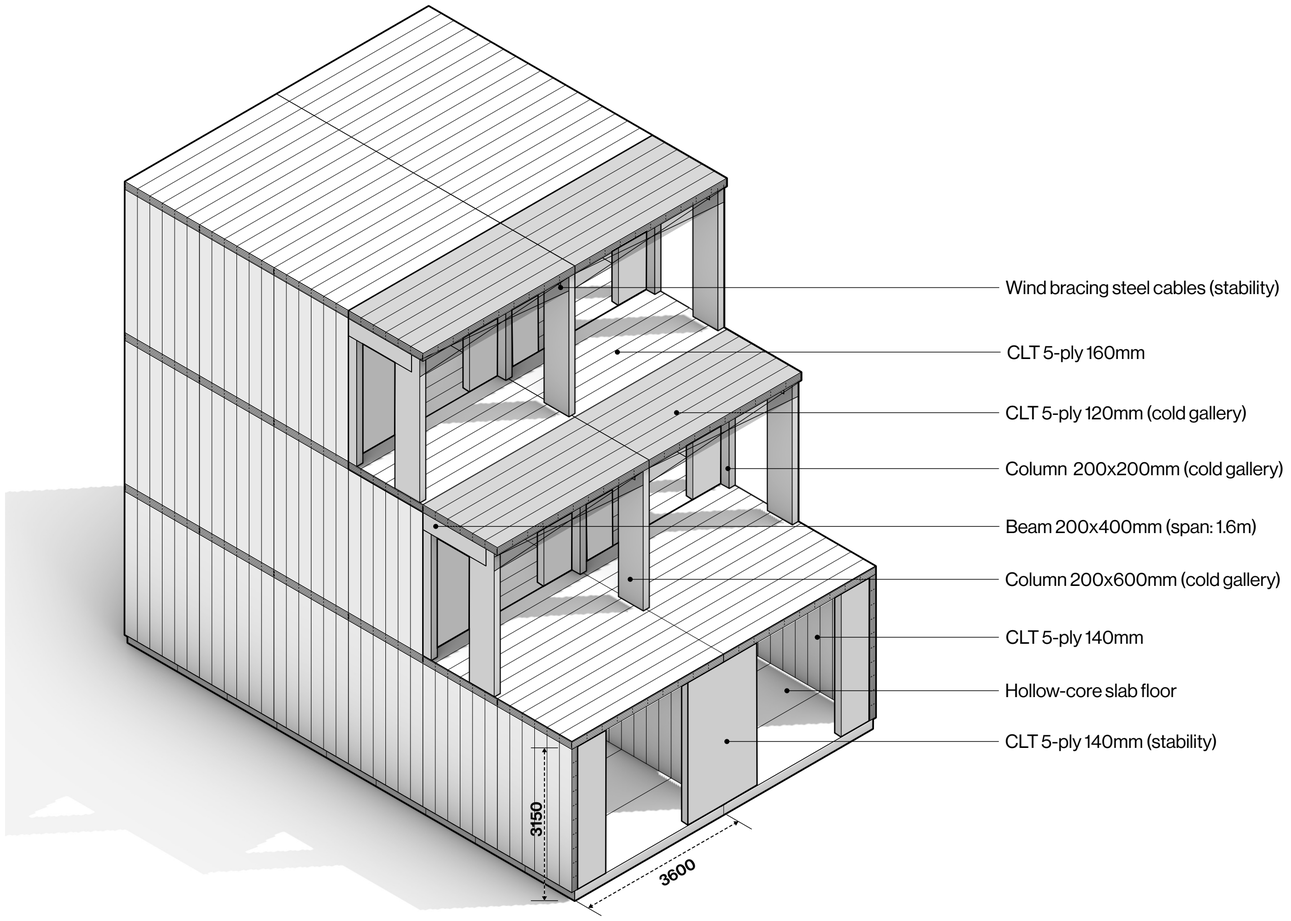






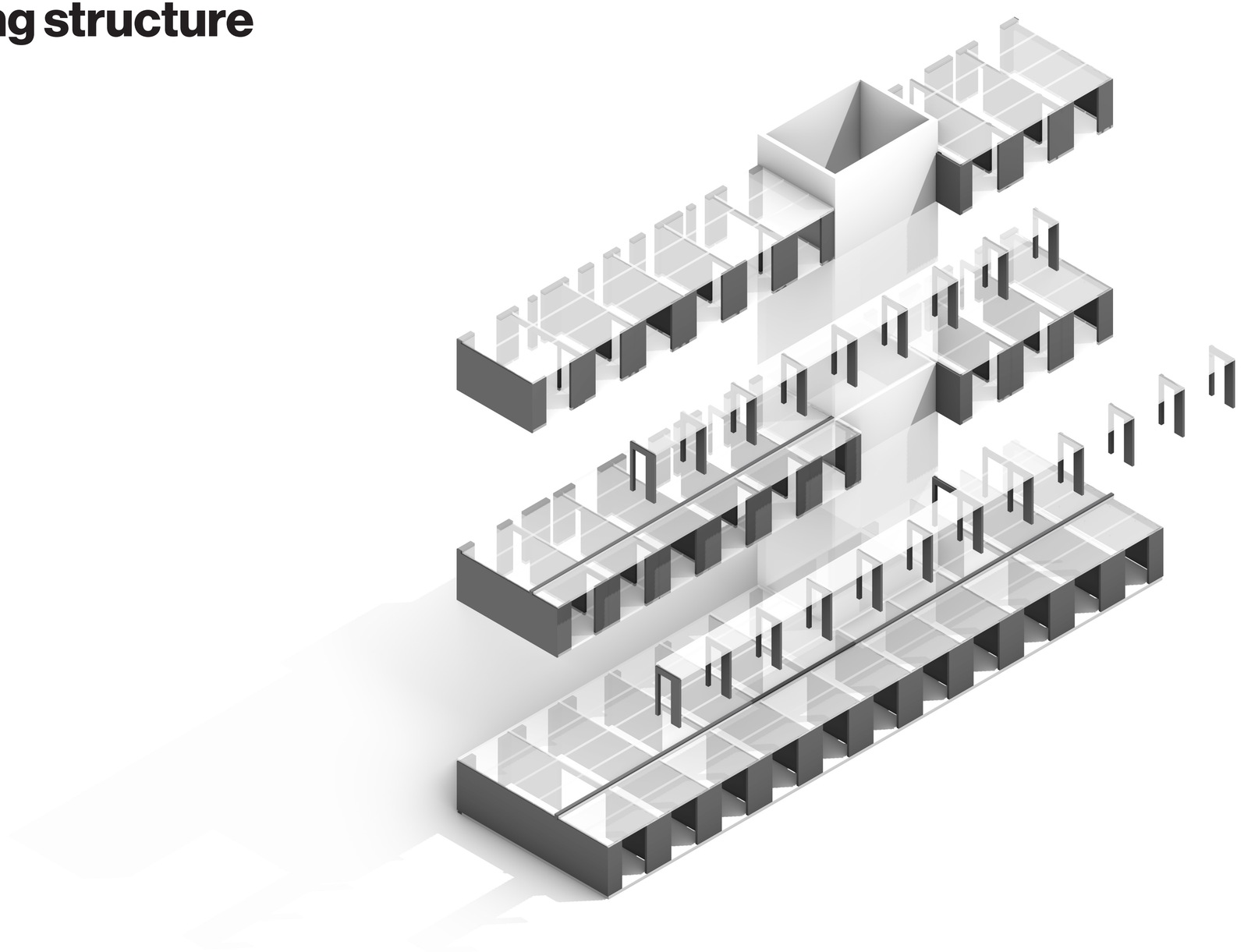
Load bearing structure

CLT - Principle



Load bearing structure

CLT - Total view



Climate scheme

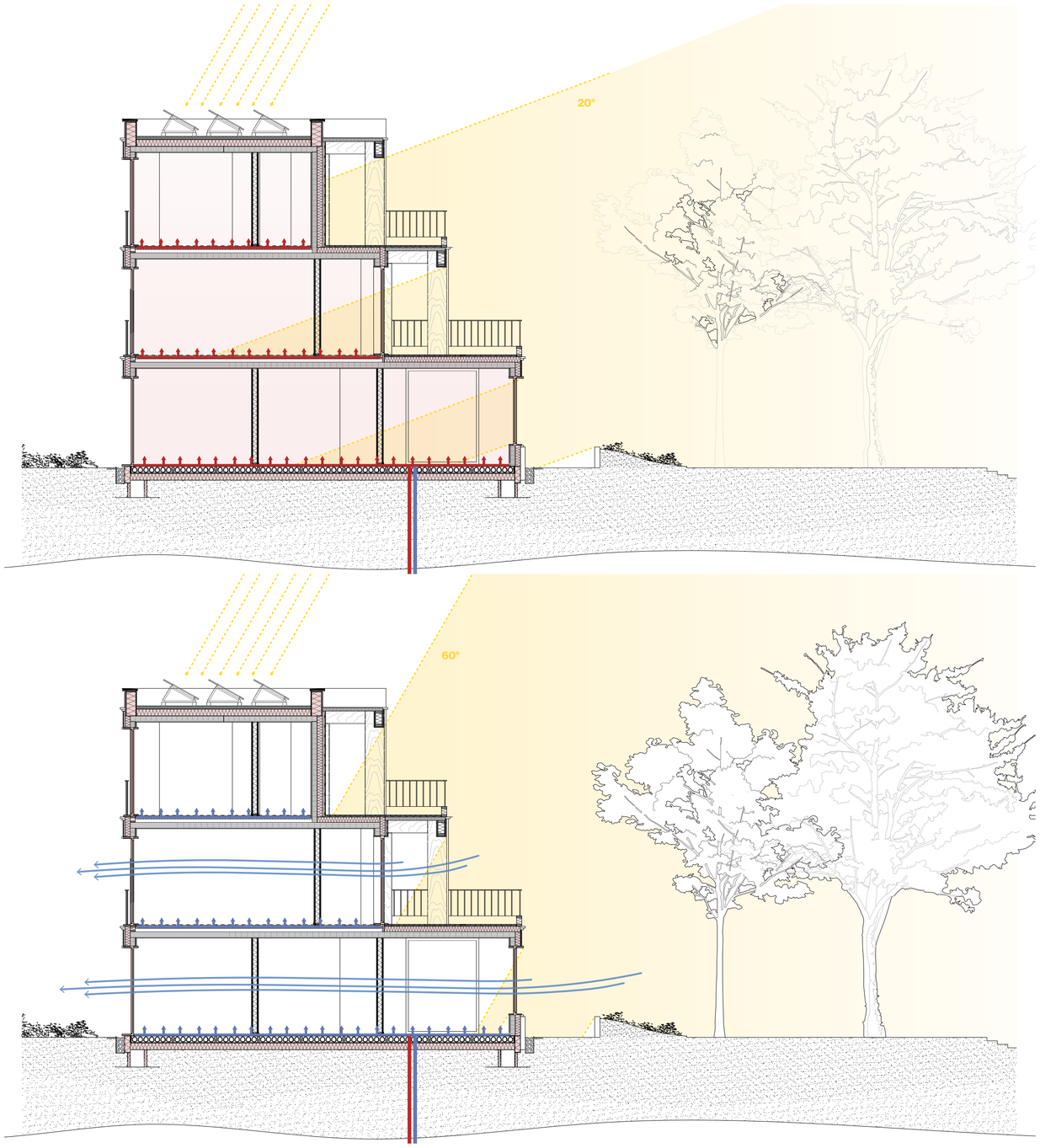
Winter and summer situation

Winter:

1. Ground Source Heat Pump (GSHP) in combination with floor heating provides efficient, low-temperature heating.
2. Mechanical Supply & Exhaust. Ensures a healthy indoor climate with controlled airflow. Reduces dependence on natural ventilation in colder months.
3. Insulation & Airtightness. High-performance building envelope minimizes heat loss.
4. PV panels. Approx. 185m2 on the roof for on-site power generation (11x 25.00 kW/h per year). Battery storage stores excess solar energy for use during peak demand or at night.

Summer:

1. 1.8m overhang on south(west) facade, Reduces direct solar heat gain.
2. Cross ventilation. Opposite windows enable airflow from south (overpressure) to north (underpressure). The prevailing southwesterly wind in the Netherlands supports this natural airflow.
3. PV panels. Approx. 185m2 on the roof for on-site power generation (11x 25.000 kW/h per year). Battery storage stores excess solar energy for use during peak demand or at night.







Care & Sustainability

Care & Sustainability	**Refuse** Design phase	**Rethink** Design phase	**Reduce** Design phase	**Reuse** Consumption phase
Care moves beyond interpersonal relationships to include a **responsibility toward the environment** itself. By integrating social and environmental concerns, the project aims to provide inclusive and lasting solutions that benefit both current and future users, and the planet they inhabit.	• Only buildings of **low quality** are demolished. E.g. the small workers houses with foundational issues. Limitations: *Total refusal of new construction is not feasible here, because new dwellings and community functions are necessary to meet current programme requirements.*	• A 3.60×3.60m **grid** is used to provide **flexible dwelling configurations**. • The community kitchen functions as **a free-span roof structure**, reducing the need for enclosed, single-purpose buildings.	• **Lightweight timber** construction helps **decrease material consumption** and lowers the project's embodied carbon Limitations: *Certain load-bearing elements still demand more resource-intensive materials (e.g., concrete for foundations), making it impossible to reduce all structural components to timber alone.*	

Repair Consumption phase	**Refurbish** Consumption phase	**Repurpose** Consumption phase	**Recyle** End-of-life phase	**Recover** End-of-life phase
	• Prefabricated timber modules can be remanufactured or modified if the building programme needs to adapt over time.	• The neighbourhood kitchen roof and other structural elements can serve **new functions** (e.g., market space, workspace, restaurant) as community needs change.	• Timber elements no longer fit for direct reuse can be recycled into new wood-based products (e.g., particleboard). Limitations: *High-quality recycling sometimes depends on local recycling facilities and market demand for secondary materials, which can limit outcomes if infrastructure is lacking.*	• Components unsuitable for reuse or recycling can be used for energy recovery through incineration with heat capture. Limitations: *This is considered a last-resort strategy; reliance on incineration still produces emissions and should be minimized.*



A city that offers a form of protection, a space for support, rest, and care.


Thank you for listening.