

The Fertile City

Raising Food Awareness Through Architecture



Jino Fattah

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Drought vs Flood



Illinois, VS



Nepal, India

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19 miljoen hectare regenwoud wordt jaarlijks verloren aan landbouwgrond



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Healthy diets from sustainable food systems

The Lancet

Food systems have the potential to nurture human health and support environmental sustainability; however, they are currently threatening both. Providing a growing global population with healthy diets from sustainable food systems is an immediate challenge. Although global food production of calories has kept pace with population growth, more than 820 million people have insufficient food and many more consume low-quality diets that cause micronutrient deficiencies and contribute to a substantial rise in the incidence of diet-related obesity and diet-related non-communicable diseases, including coronary heart disease, stroke, and diabetes. Unhealthy diets pose a greater risk to morbidity and mortality than does unsafe sex, and alcohol, drug, and tobacco use combined. Because much of the world's population is inadequately nourished and many environmental systems and processes are pushed beyond safe boundaries by food production, a global transformation of the food system is urgently needed.

A radical change in human diet and a global transformation of the food system is urgently needed to prevent permanent damage to the environment.

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Dutch Housing Graduation Studio's assignment

How do we want to live in the city of the future and what kind of buildings do we need to allow for that?

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More and more people will live in cities in the near future to live close to their work, university or because of all the facilities in cities.

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In 2050

- It is expected that the world population will grow to 10 billion people by 2050 (now 7,6 billion).
- In Europe it is estimated that 80% of the population will live in cities by that time.

source: (Food and Agriculture Organization of the UN, 2017).

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73% of deforestation can be attributed to agriculture

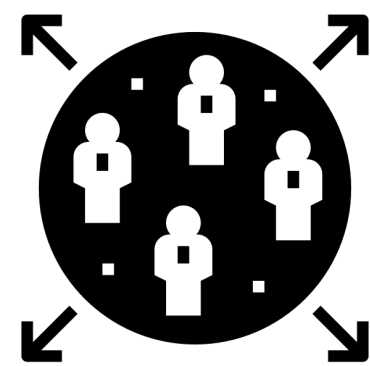


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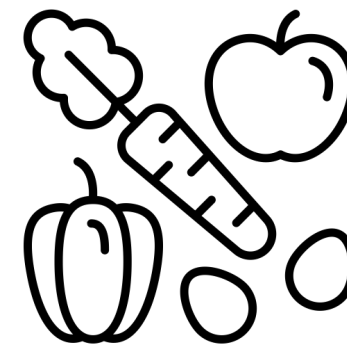
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In 2050 (Food and Agriculture Organization of the UN, 2017)

- To feed the expected 10 billion of world population, 70% more food need to be produced.



Population growth



More food



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In 2050 (Food and Agriculture Organization of the UN, 2017)

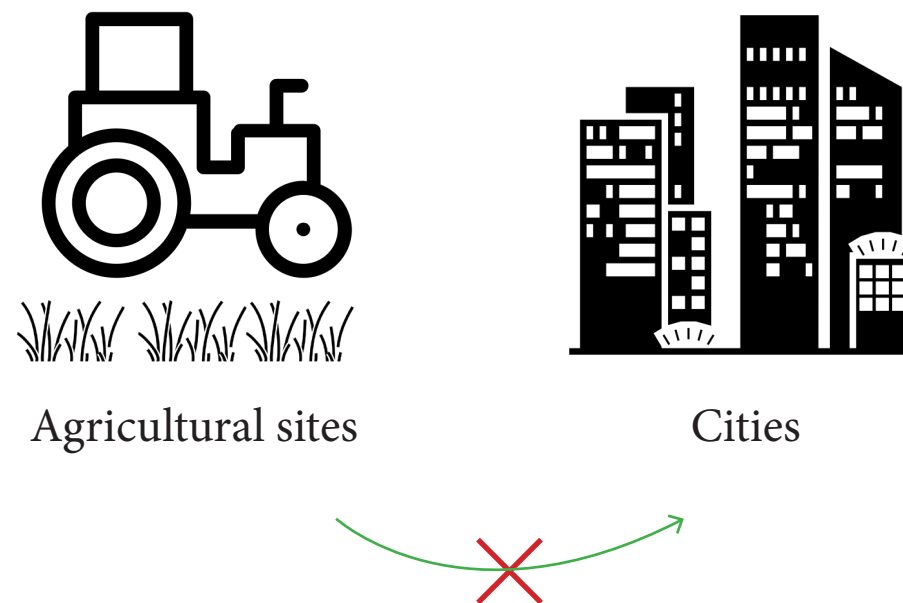
- This is a very difficult to achieve because most available farmland is already being farmed and in ways that decrease its productivity and lead to soil erosion and water wasting.



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- As cities became distance independent, it was no longer necessary to produce food in the close environments.
- Agricultural sites moved outside the city and over time it became possible to even import food from any place in the world



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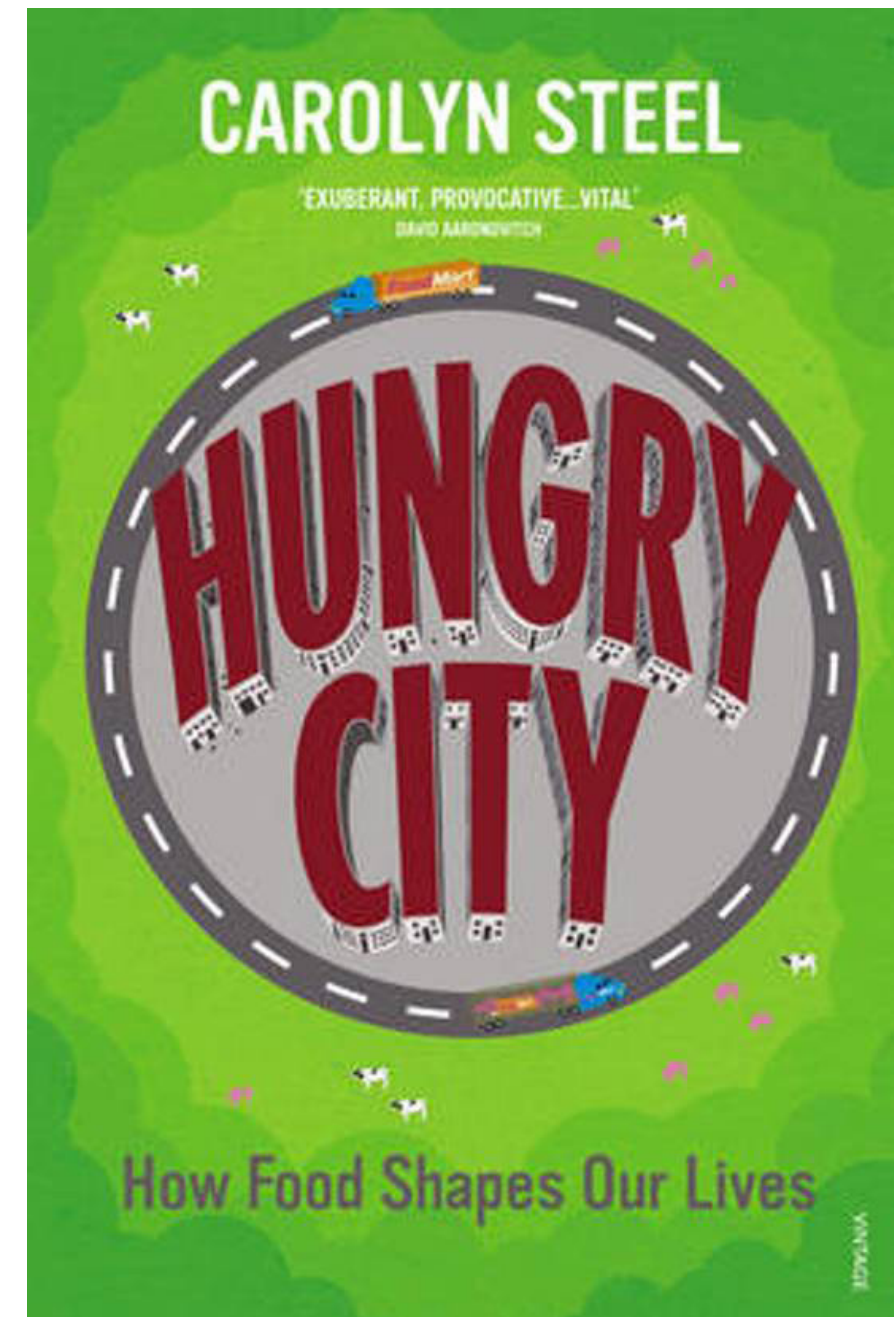
Raising Food Awareness Through Architecture

- Today food is developed in a mass globalized system which separated food production from its consumers and therefore the relationship between people and their food is being lost.

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Raising Food Awareness Through Architecture

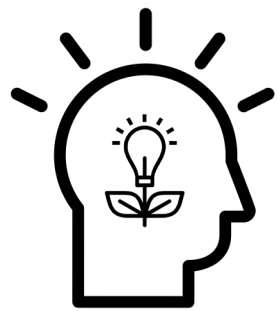
- 80 % of global trade in food now is controlled by just five multinational corporations which give them the power to completely control the food system.



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Project aims

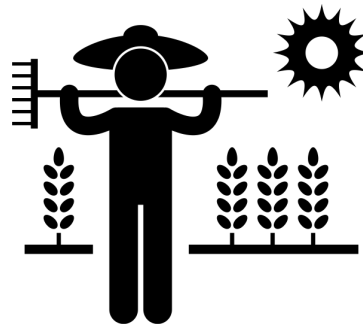
Reconciling Cities, Peoples and Food



Food awareness



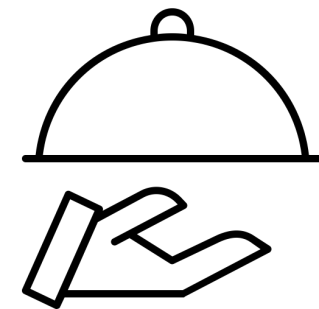
Food based education



Consumers = co-producers



Local food

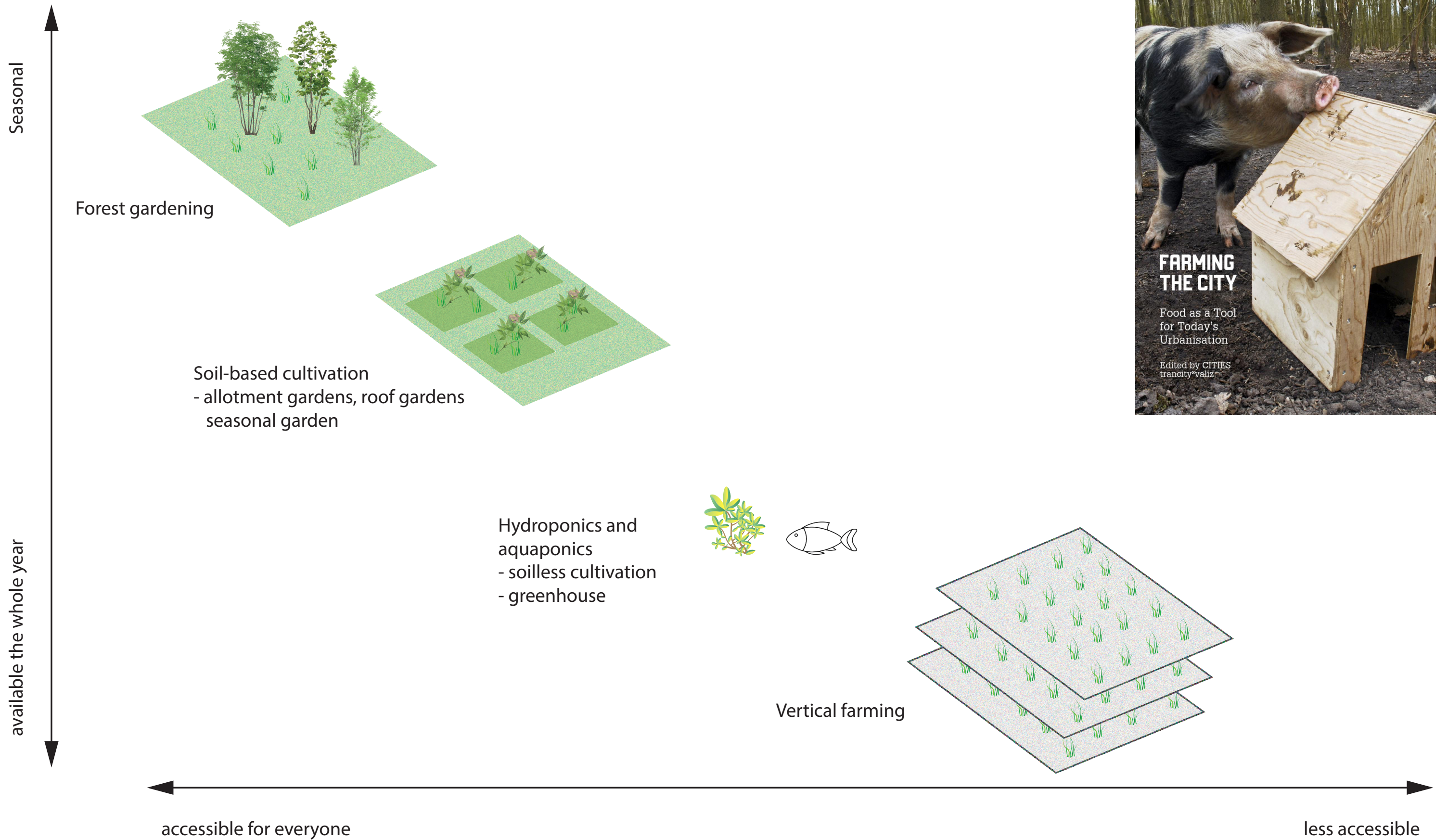


Value food

How can the architecture of a residential building create an active way for people to get involved in the food system again?

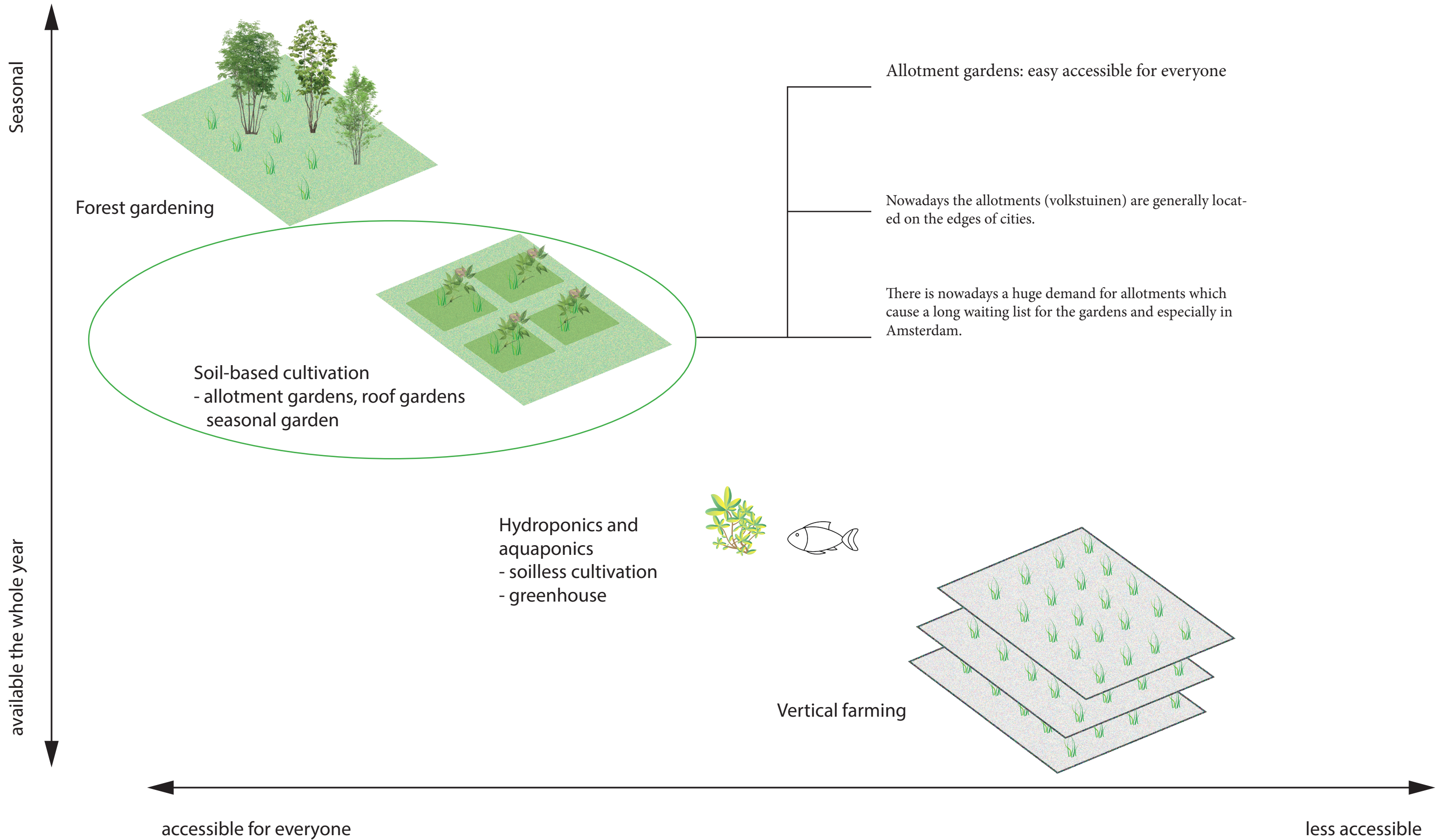
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Types of urban agriculture



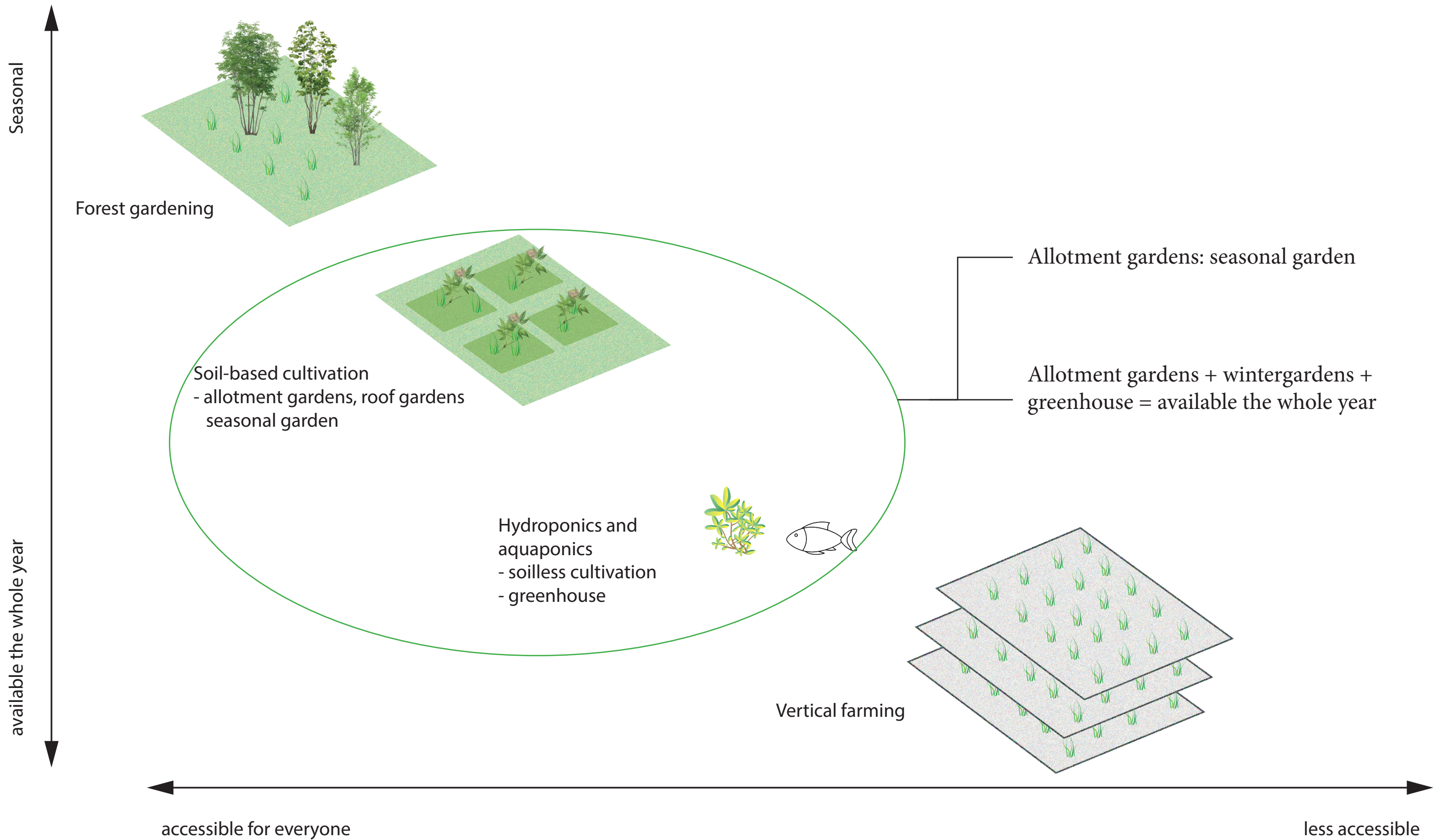
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Types of urban agriculture



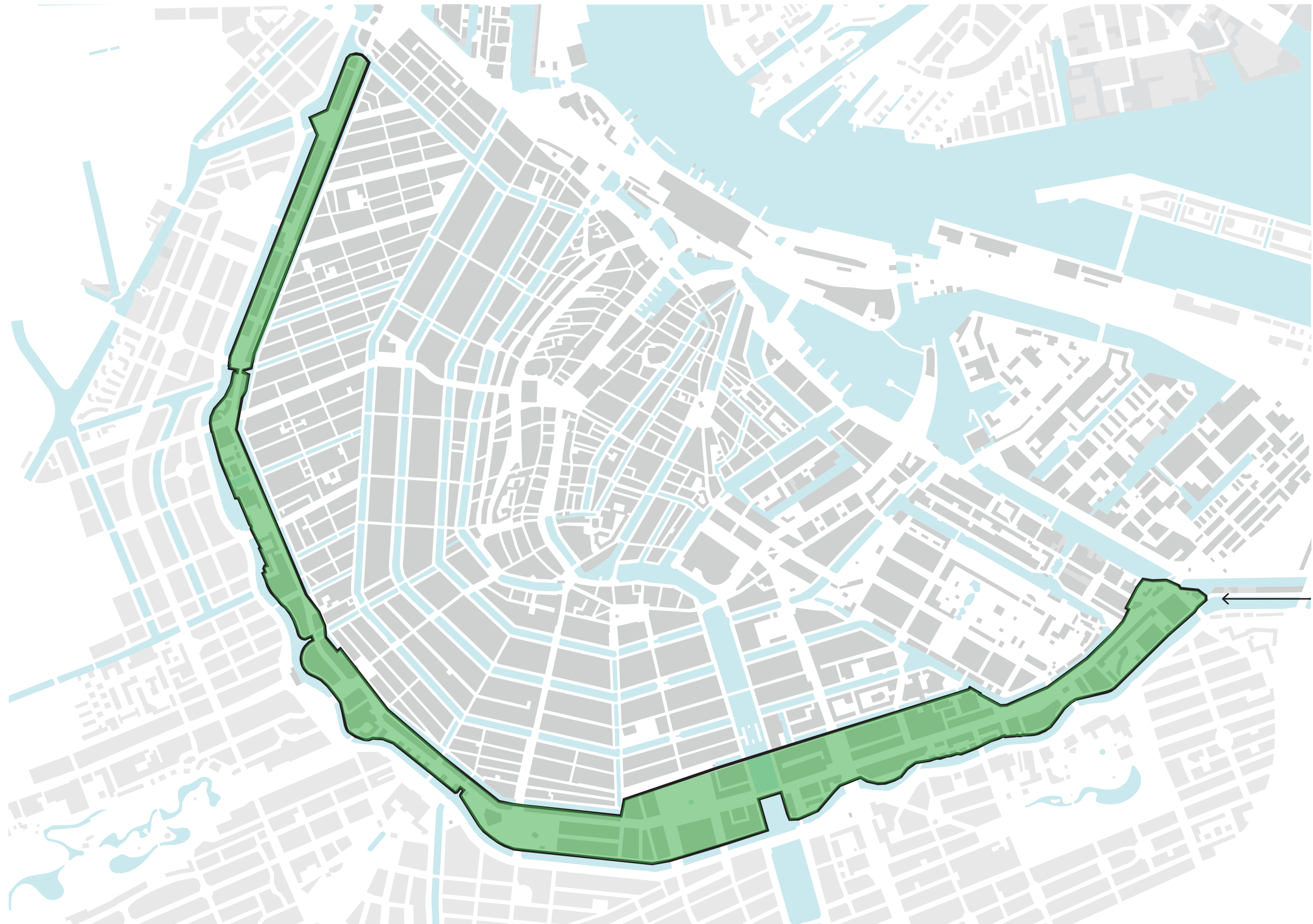
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Types of urban agriculture



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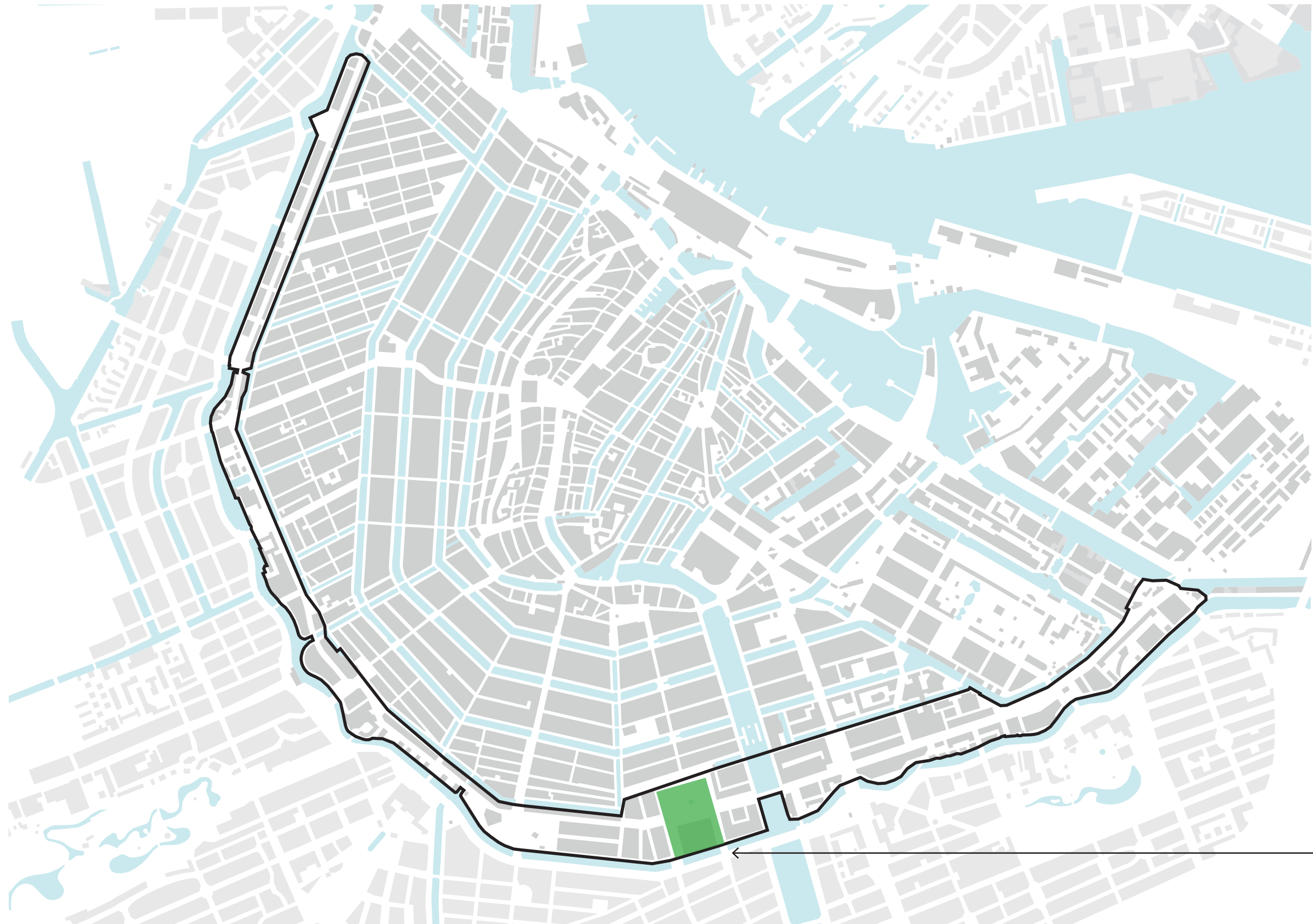
Project location



← The Belt:
formerly held the
fortification works
that run around
the inner city.

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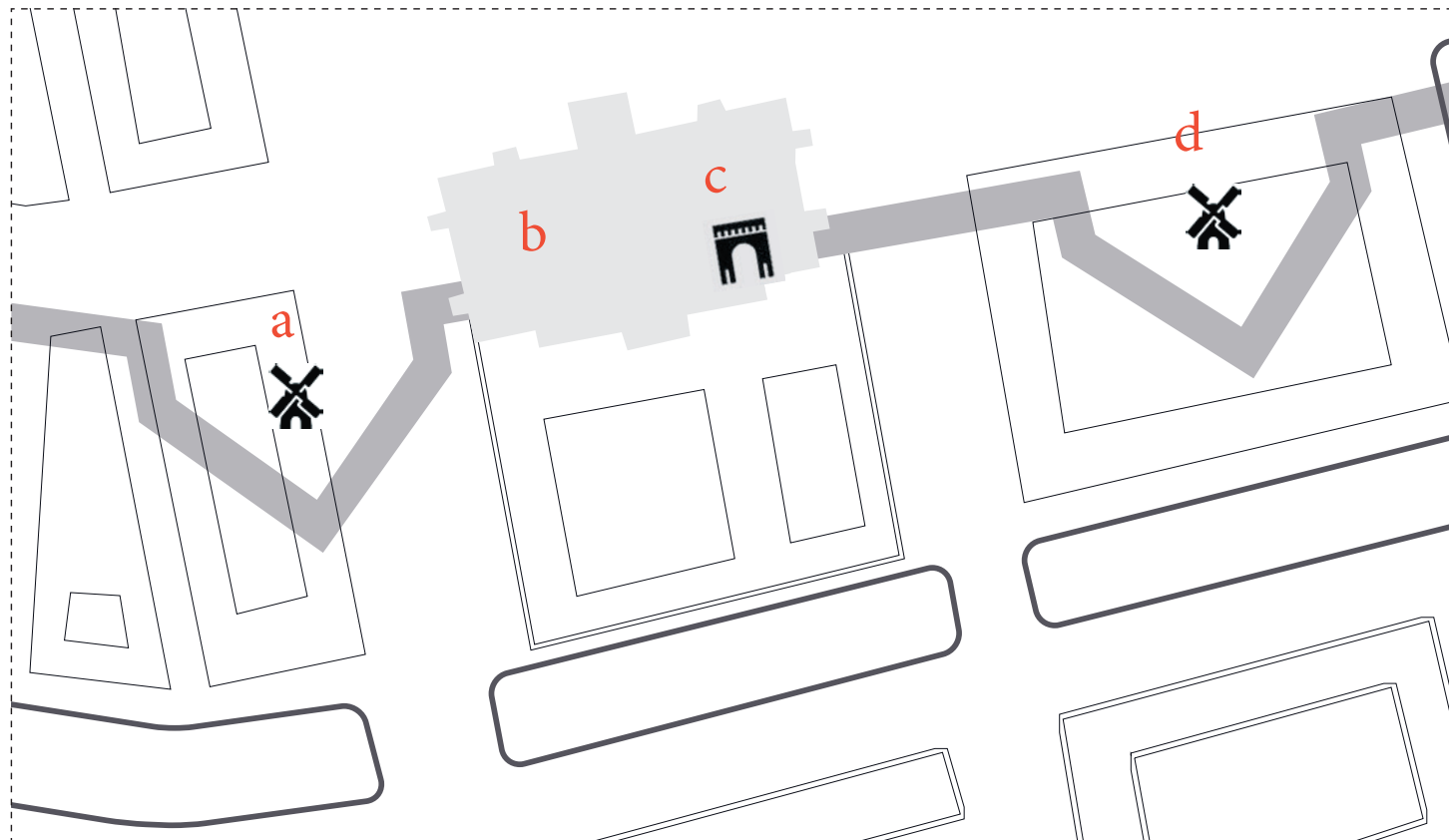
Project location



Frederiksplein
Amsterdam

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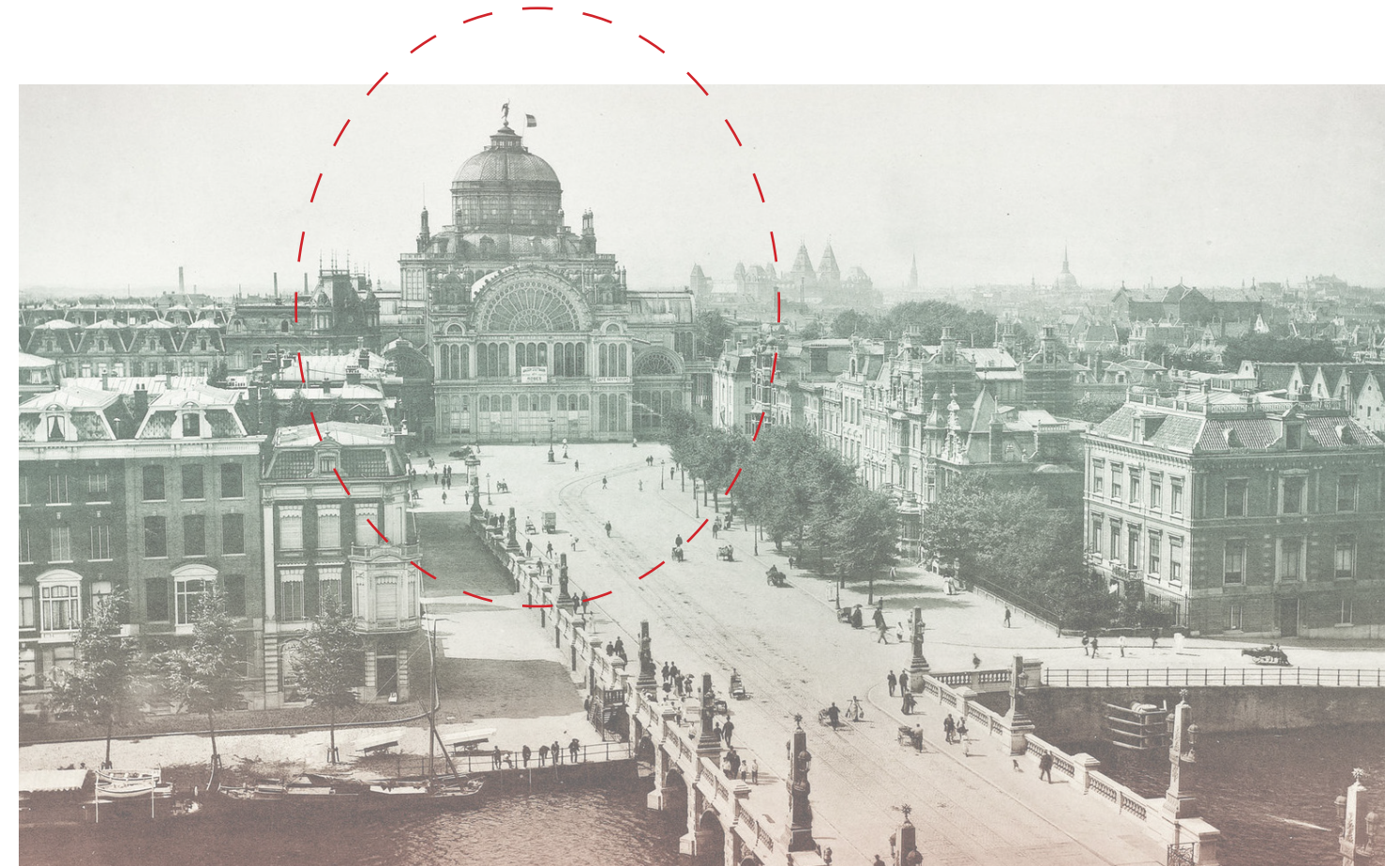
History



100m 200m

History: what was there?

- a. Bastion Ouderkerk, Molen de Haan
- b. Paleis voor Volksvlijt 1864-1929
- c. Utrechtse Poort, City Gate
- d. Bastion Westerblokhuis, Molen de Groen

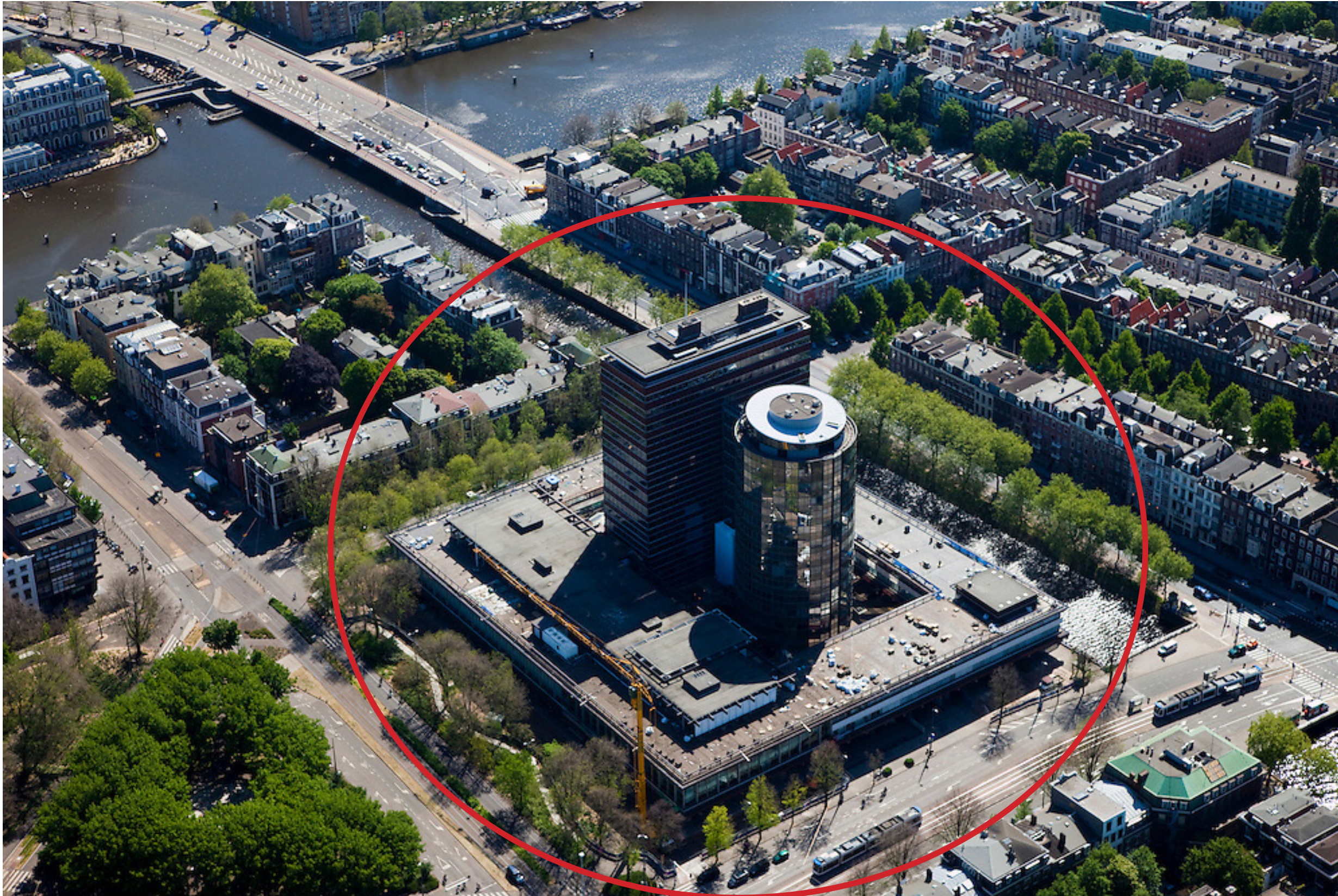


Paleis voor Volksvlijt

Built in:	1864
Burned down in:	1929
Function:	exhibition hall, later entertainment and shopping-arcade

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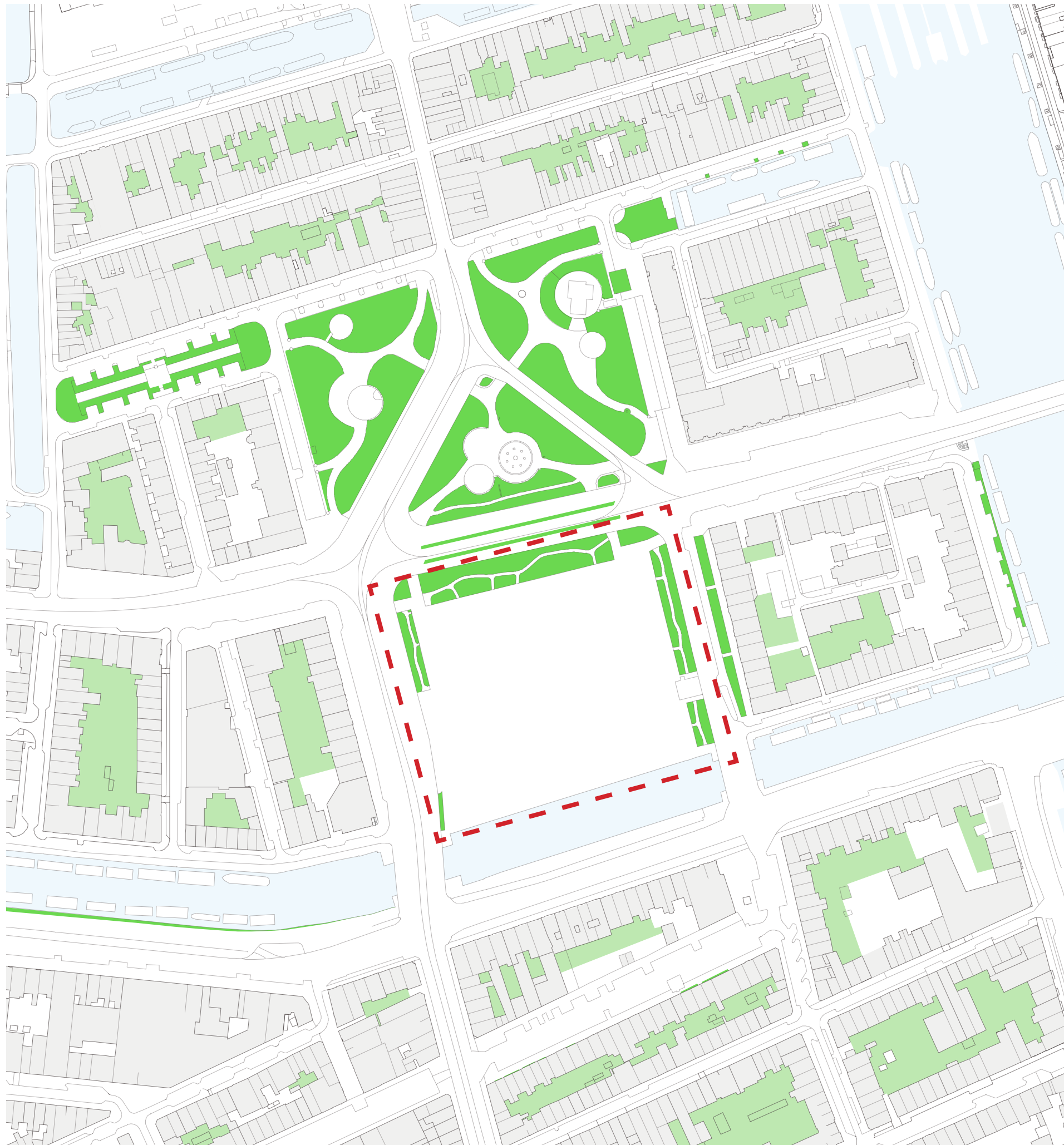
What is there now



De Nederlandsche Bank: the bank safe will move to the Zuidas

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The plot



- Public
- Collective/ private

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Green character



- Horse chestnut
- Acacia
- Hornbeam
- Hawthorn
- Cherry
- Birch
- Oak
- Plane tree
- Ash tree
- Lime tree
- Maple
- Elm
- Alder
- Other species

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Block typologies

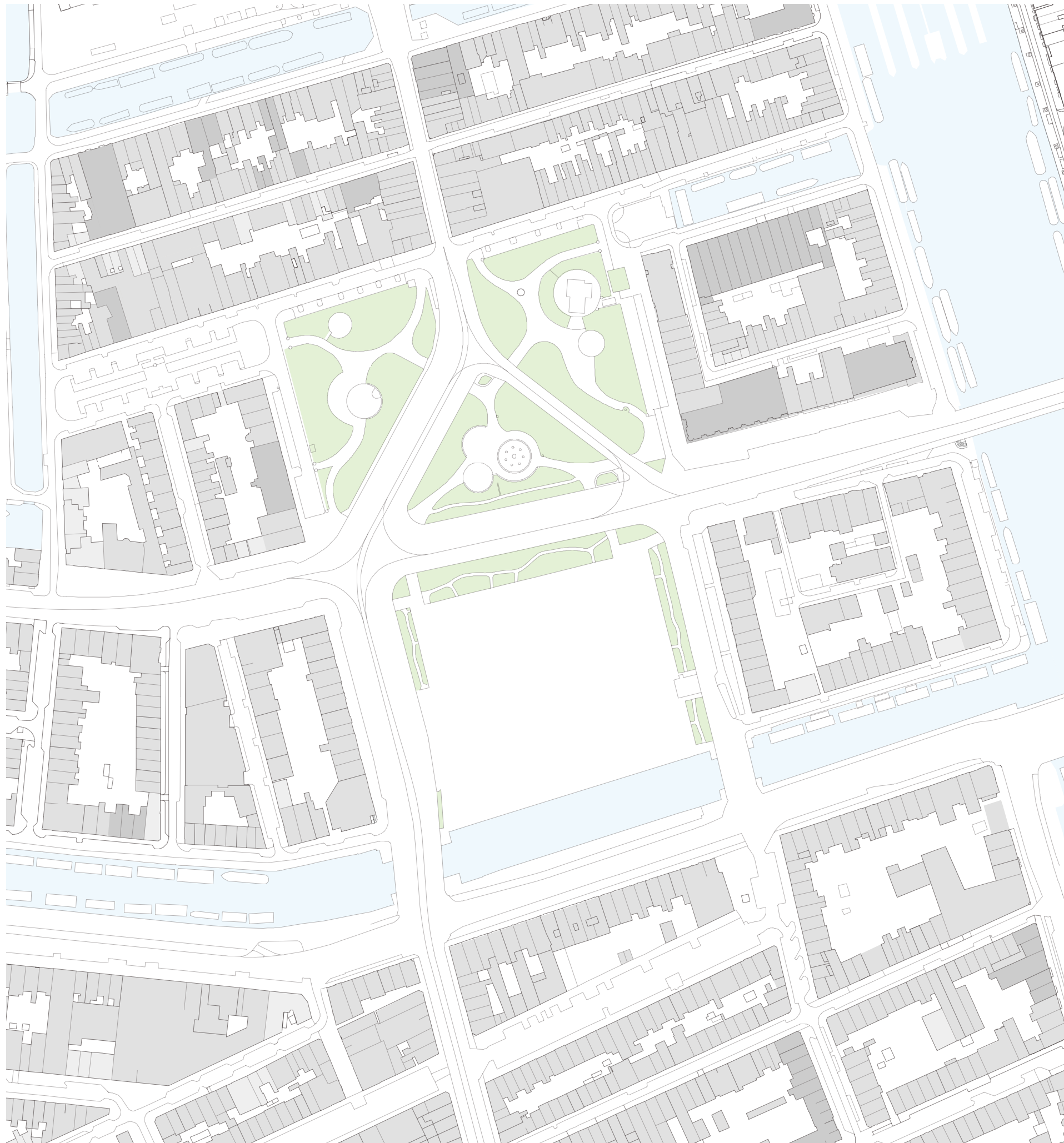


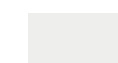


 Courtyard typology

Half open courtyard typology

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Building highs



-  < 12 m (< 4 layers)
-  12 - 15 m (4-5 layers)
-  15 - 21 m (5-7 layers)

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Building highs



De Nederlandsche Bank

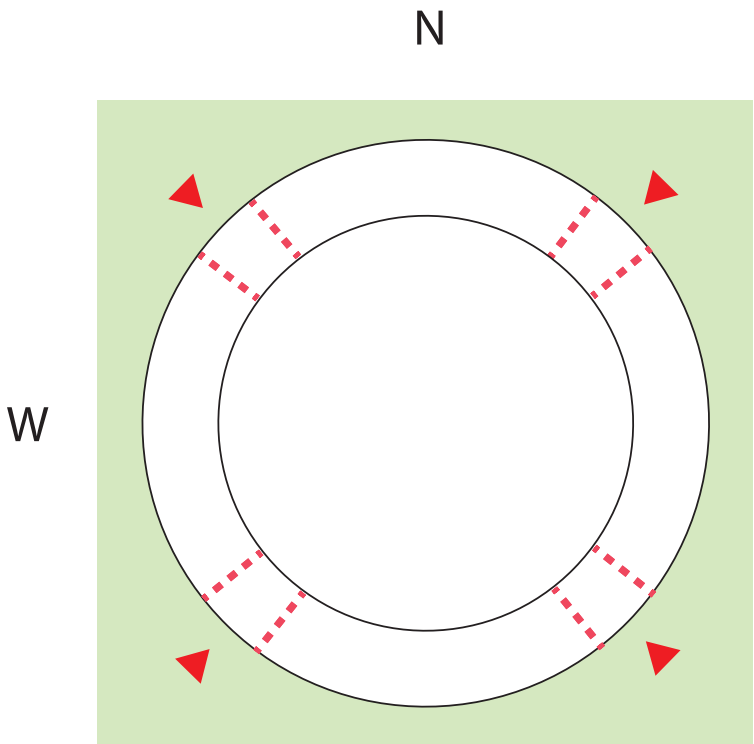
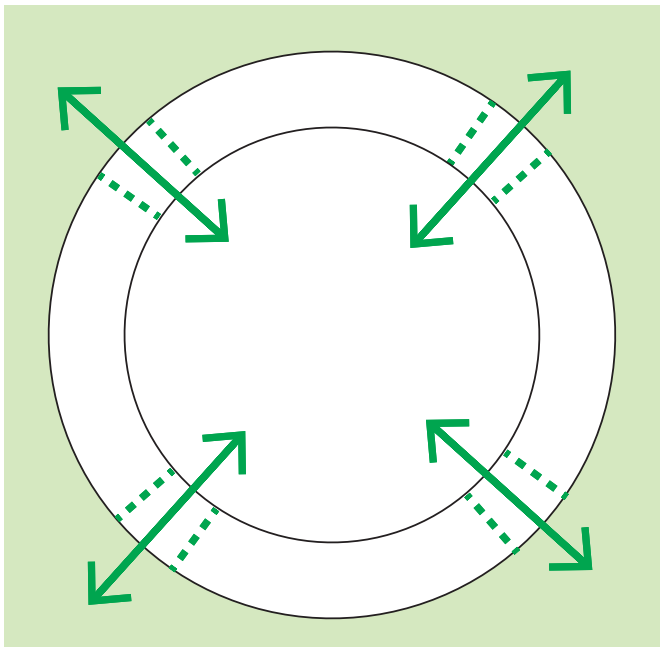
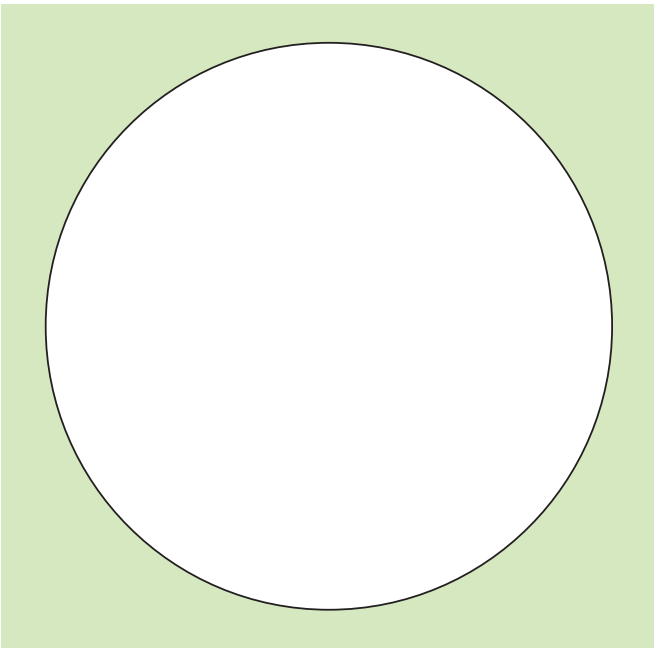
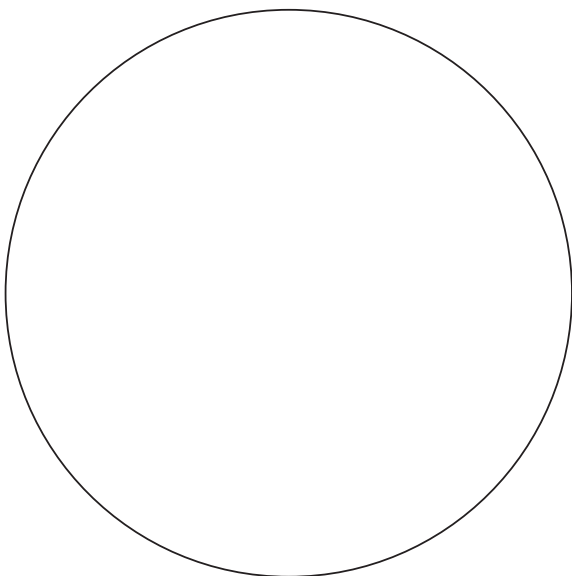
Office 66 meter high

14 layers 56 meter high

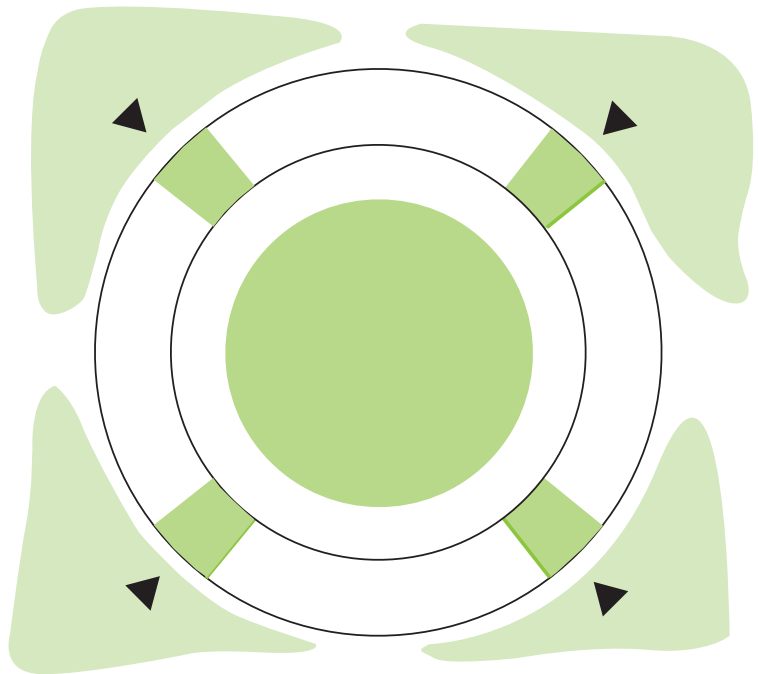
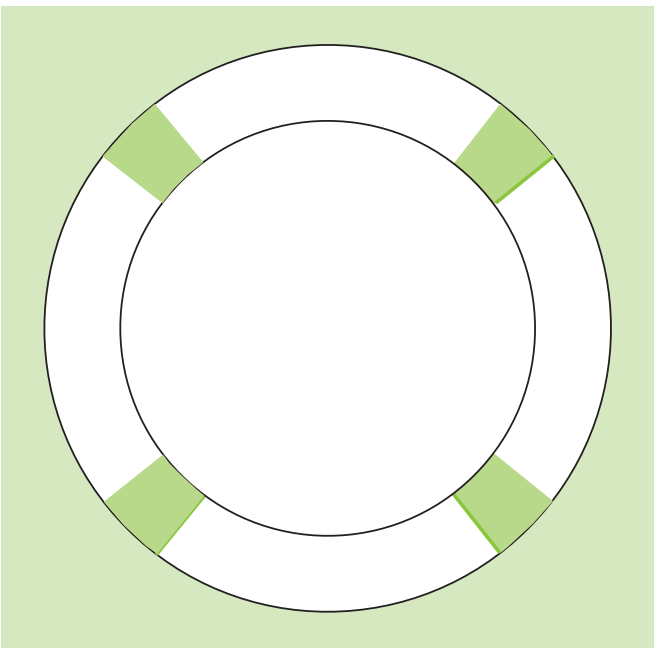
4 layers 21 meter high
100 x 150 meter

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Design concept

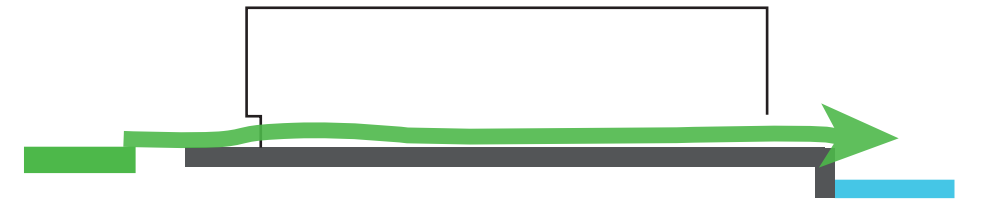


O



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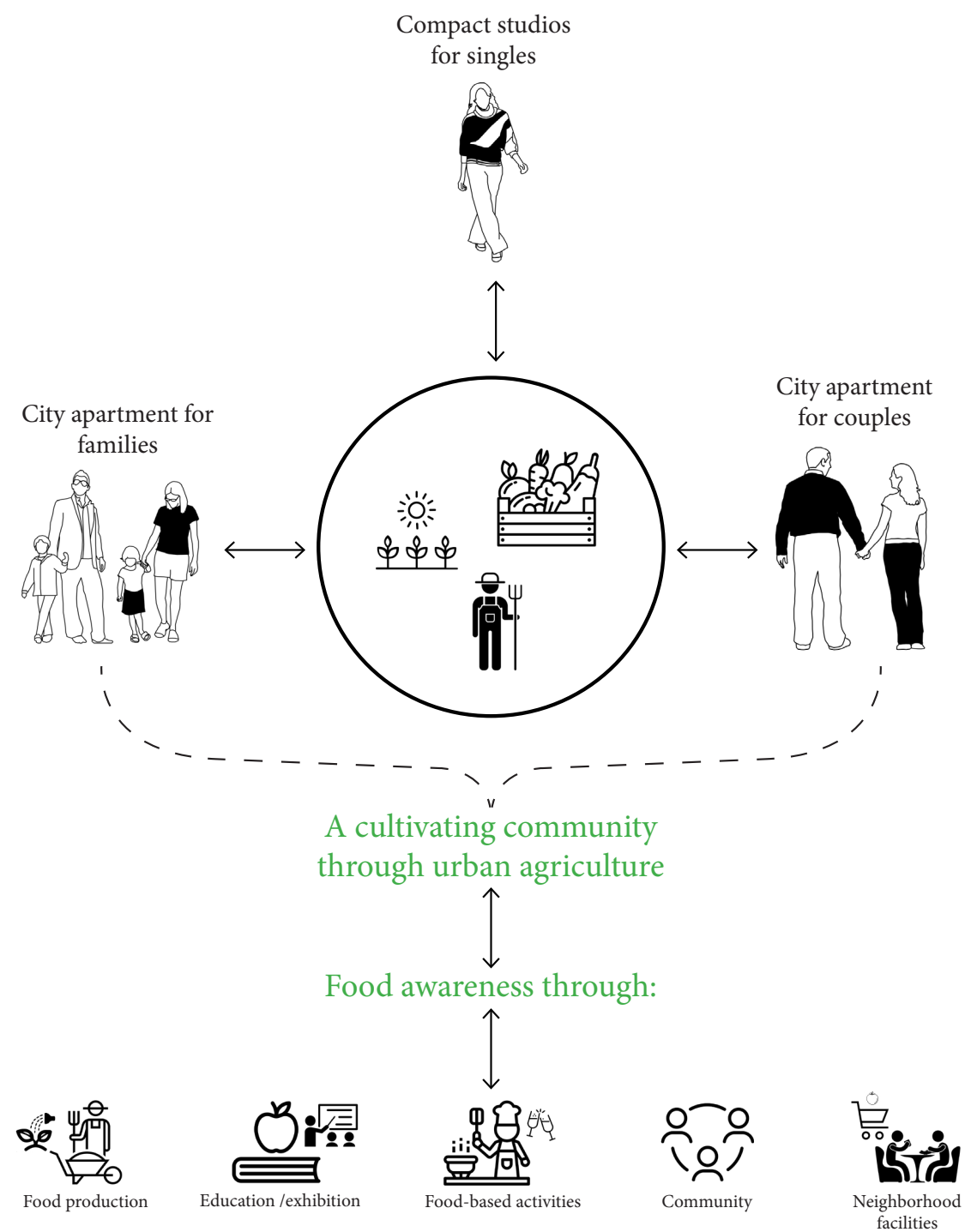
Design concept



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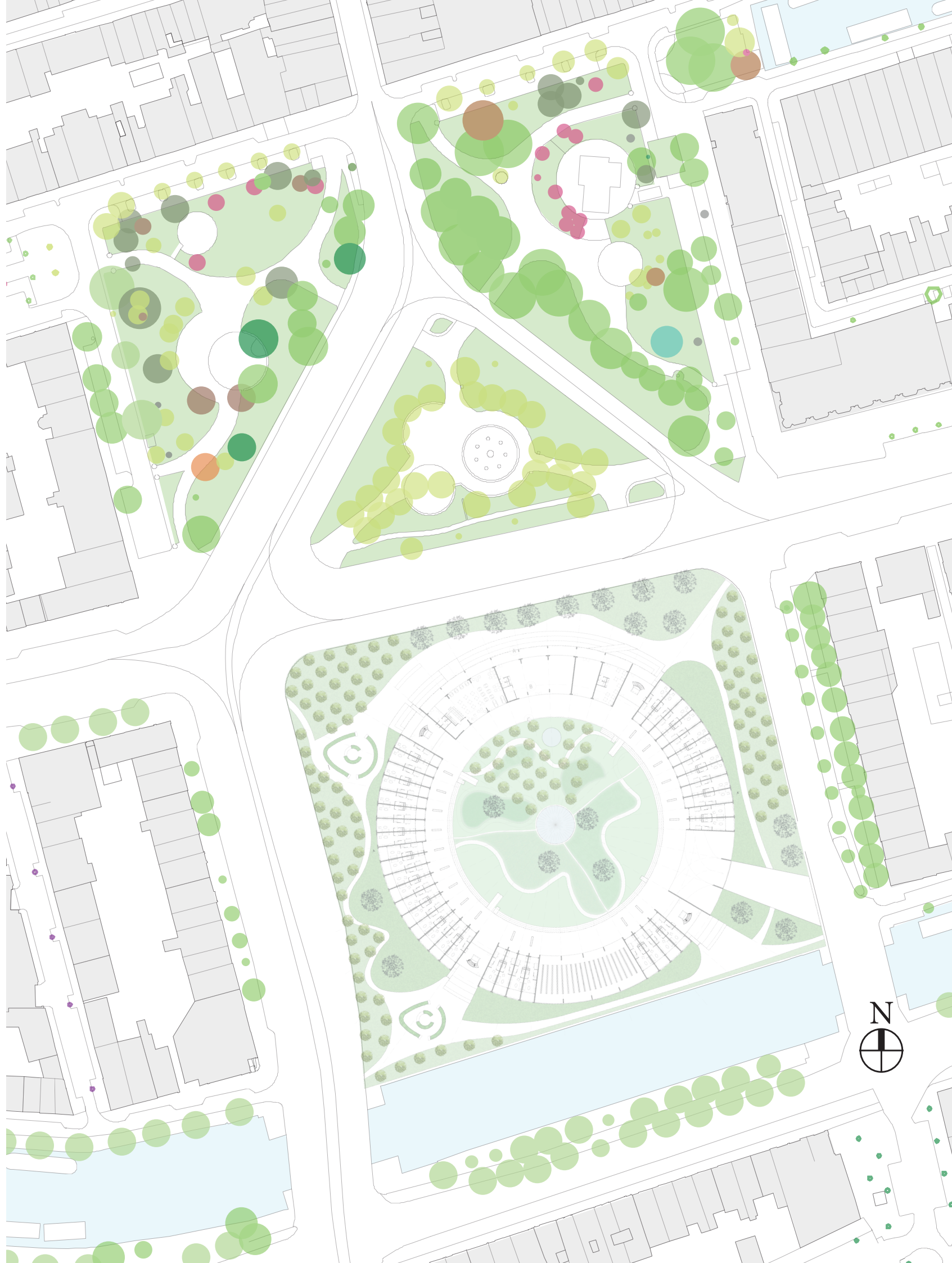
Target groups

A residential building for everyone who wants to get involved in the food production through an active way.



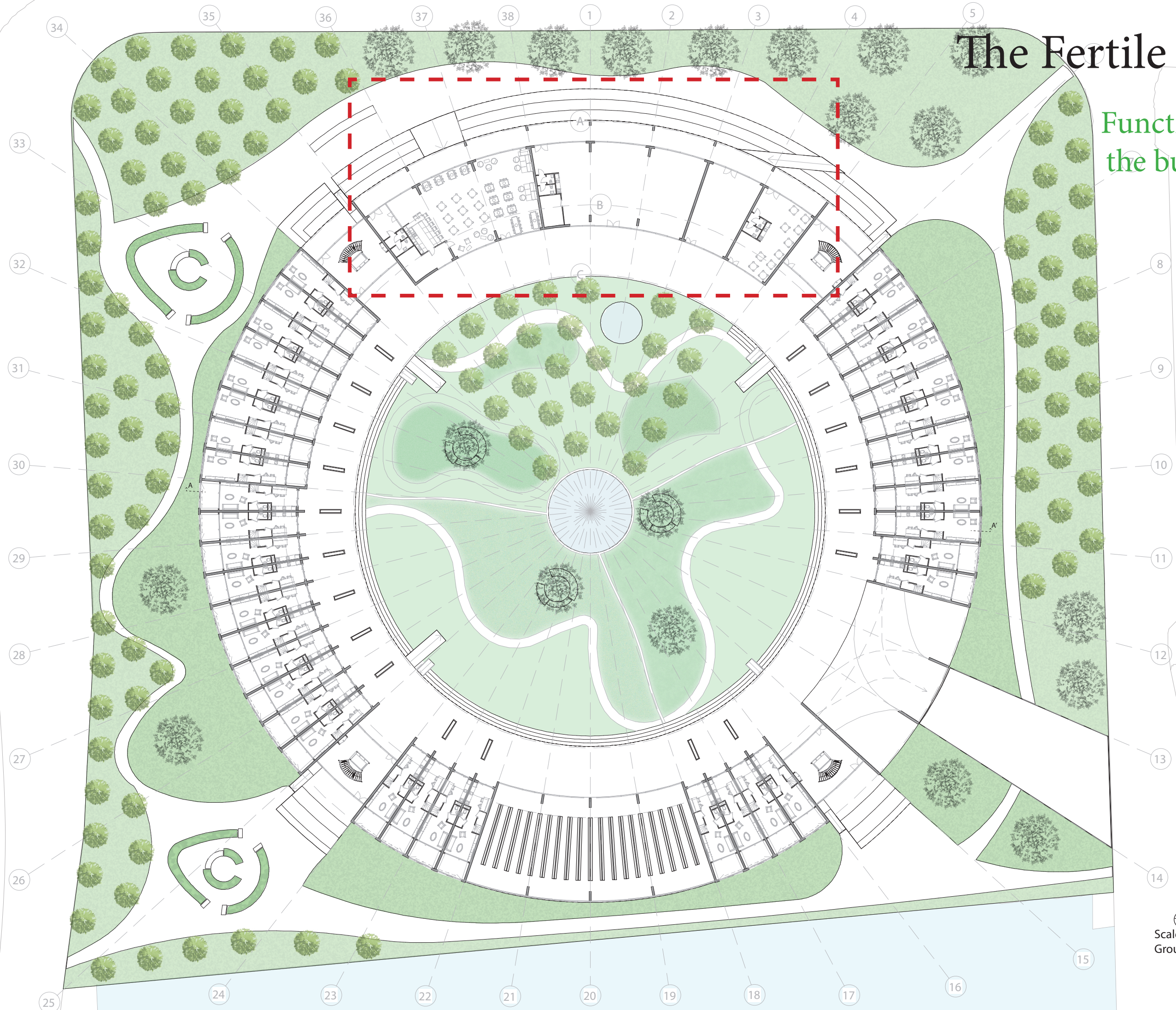
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Urban plan

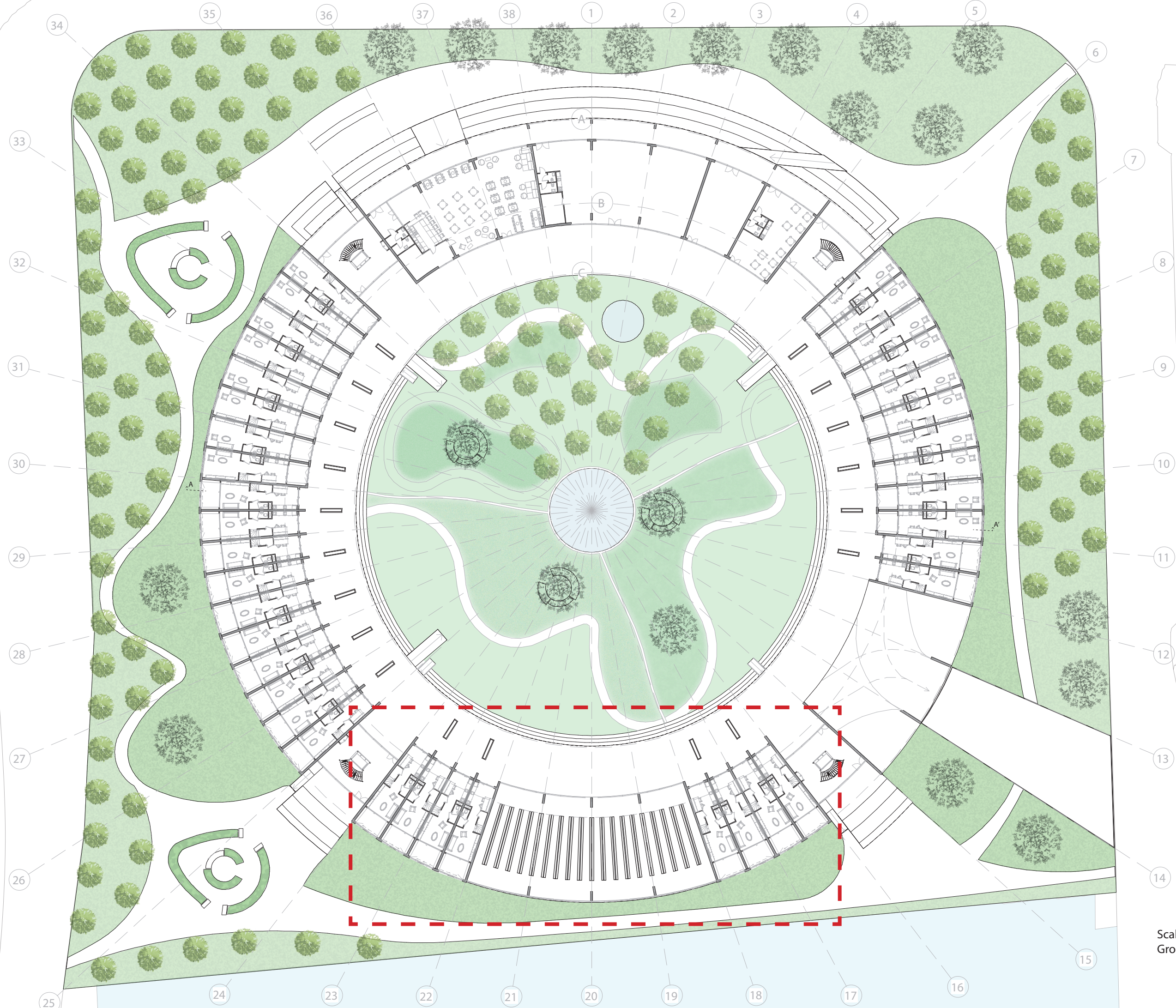


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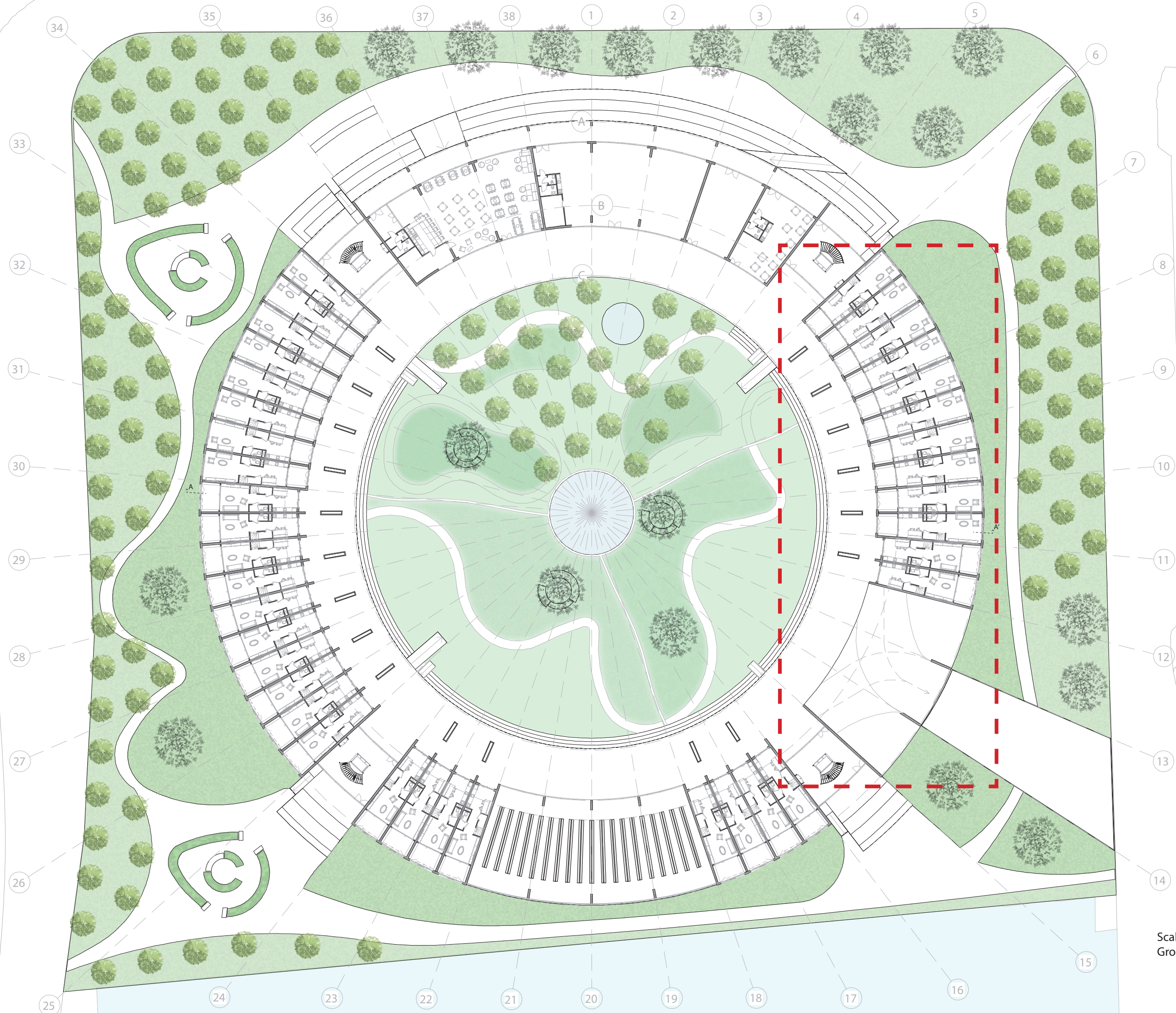
Functions of the building



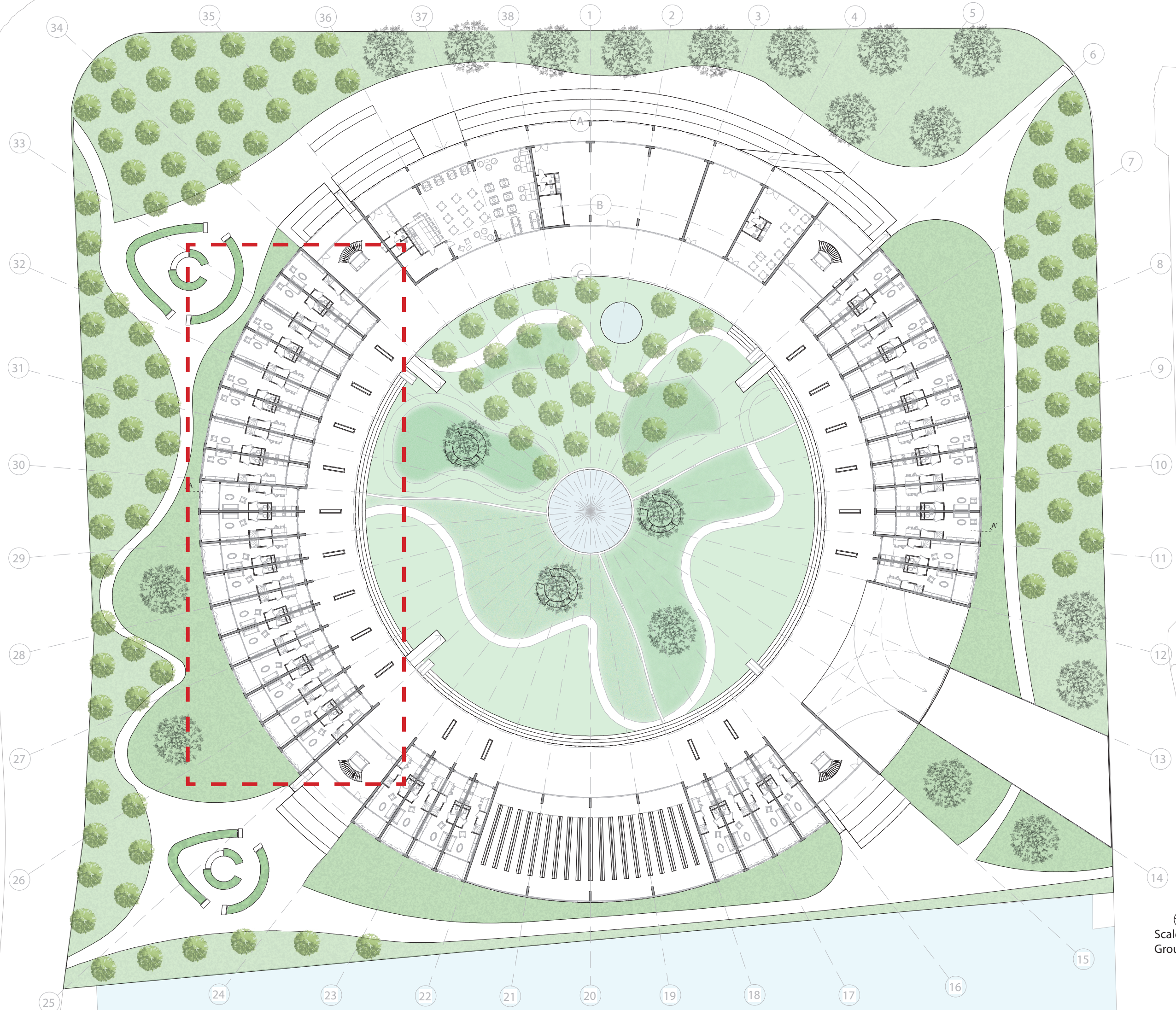
N
Scale 1:500
Ground Floor



N
Scale 1:500
Ground Floor



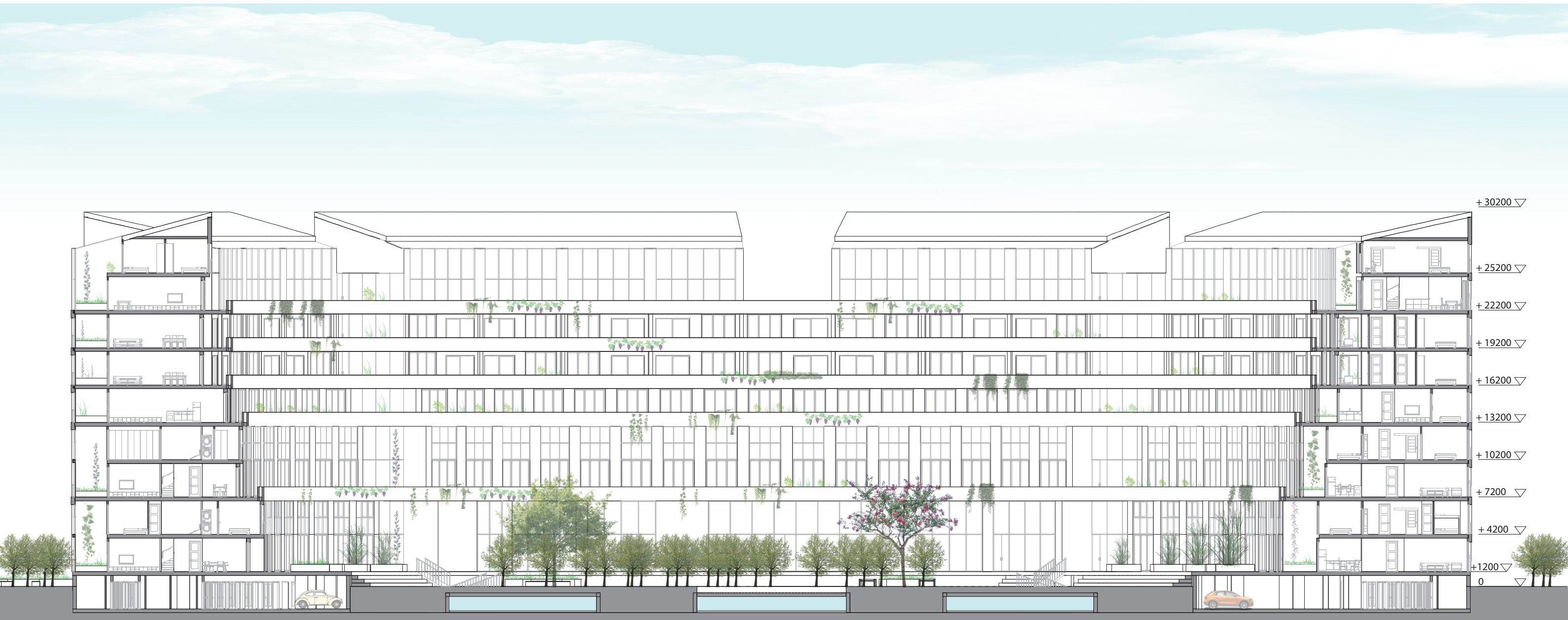
N
Scale 1:500
Ground Floor



N
Scale 1:500
Ground Floor

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Building set-up: section A-A' 1:300



Section 1:300

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Building set-up: section A-A' 1:300



Section 1:300

The Fertile City

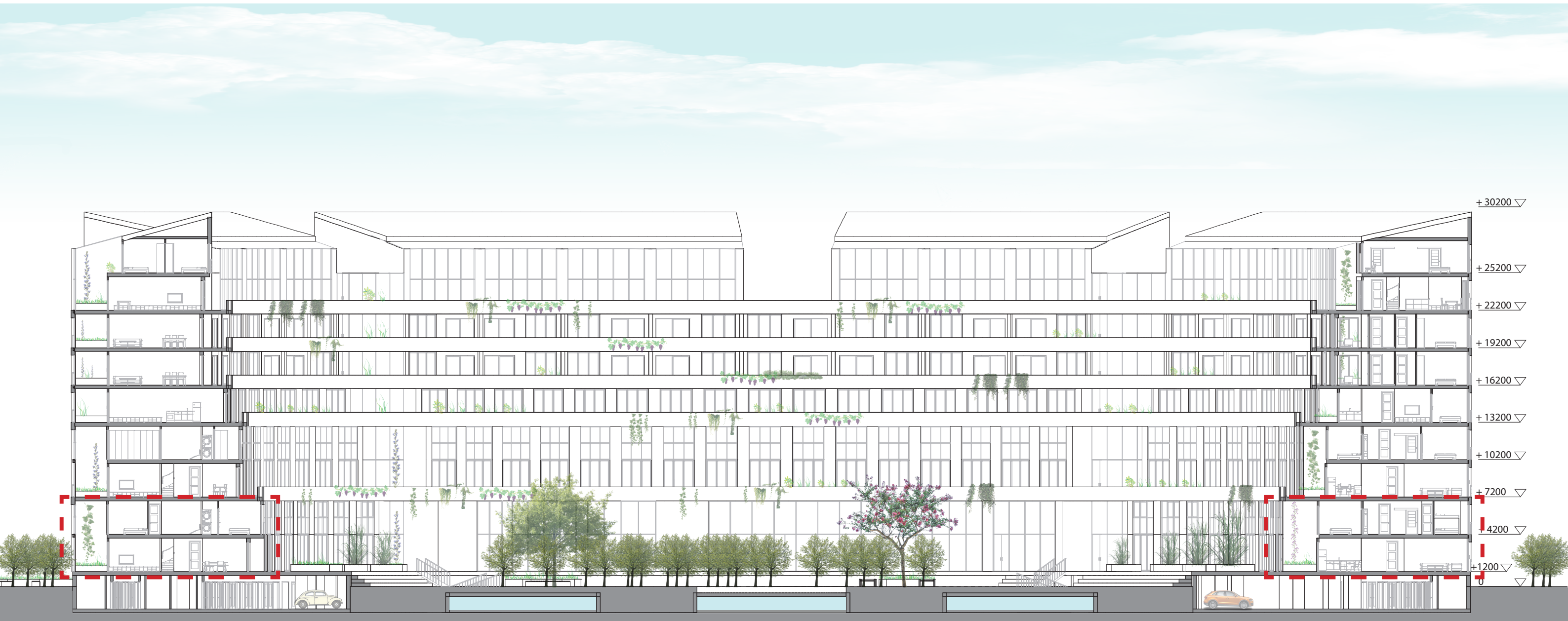
Building set-up: section A-A' 1:300



Section 1:300

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Building set-up: section A-A' 1:300



Section 1:300

The Fertile City

Building set-up: section A-A' 1:300



Section 1:300

The Fertile City

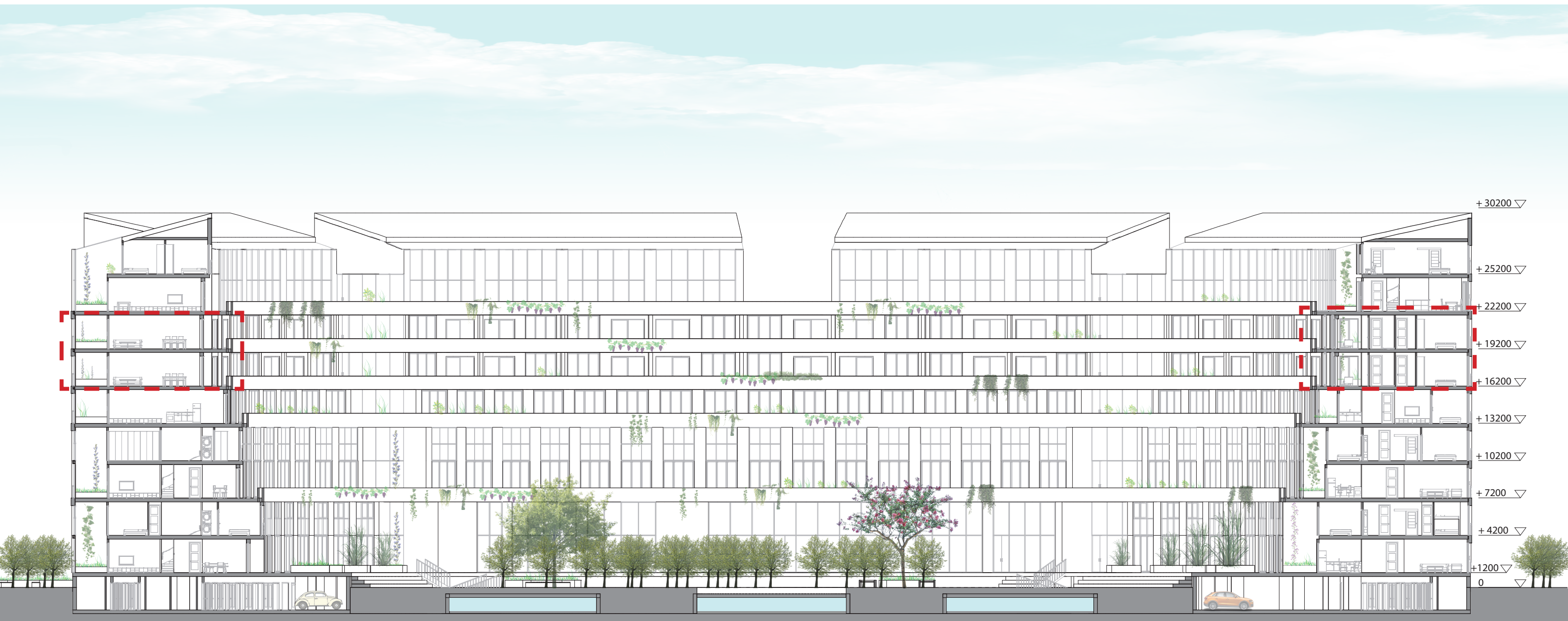
Building set-up: section A-A' 1:300



Section 1:300

The Fertile City

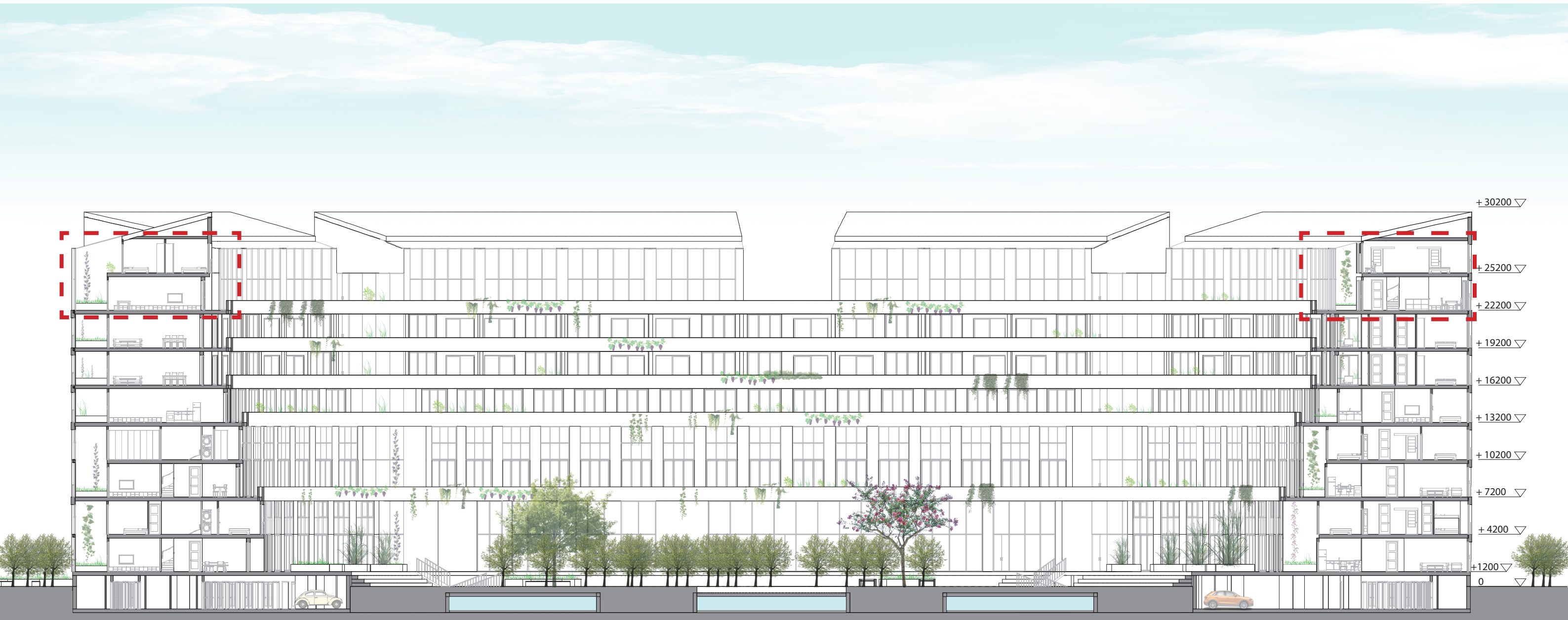
Building set-up: section A-A' 1:300



Section 1:300

The Fertile City

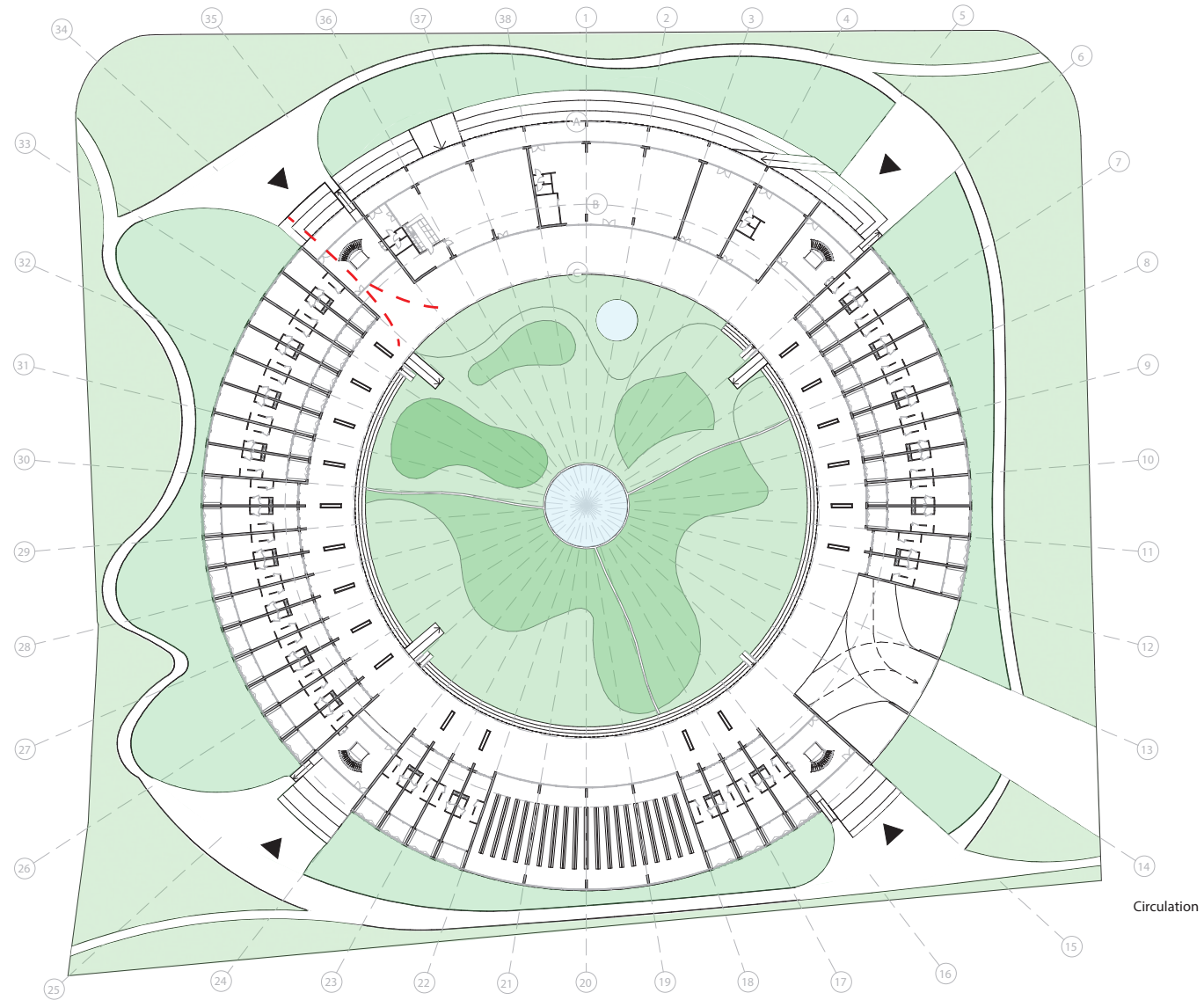
Building set-up: section A-A' 1:300



Section 1:300

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Circulation



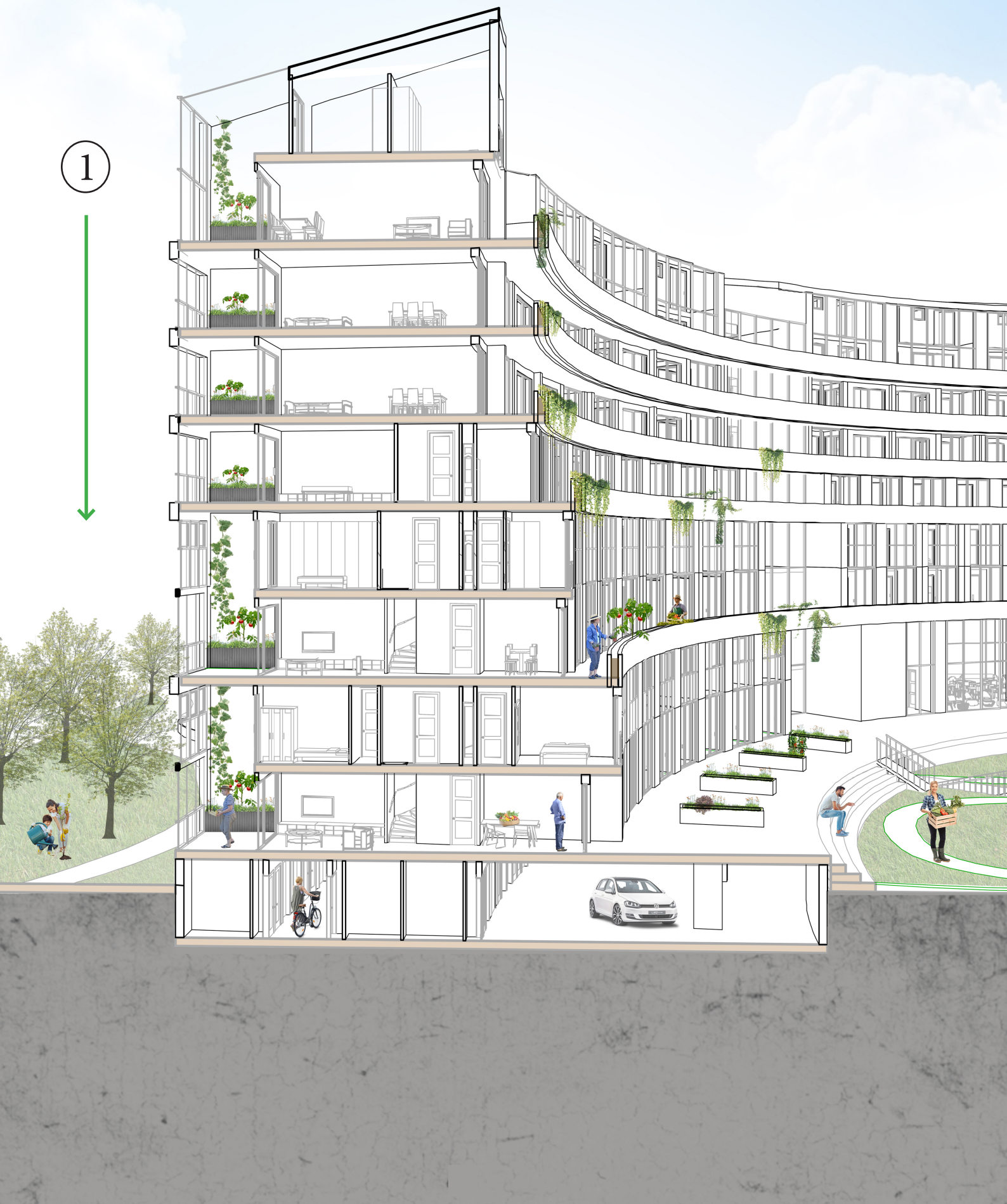
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Different types of green



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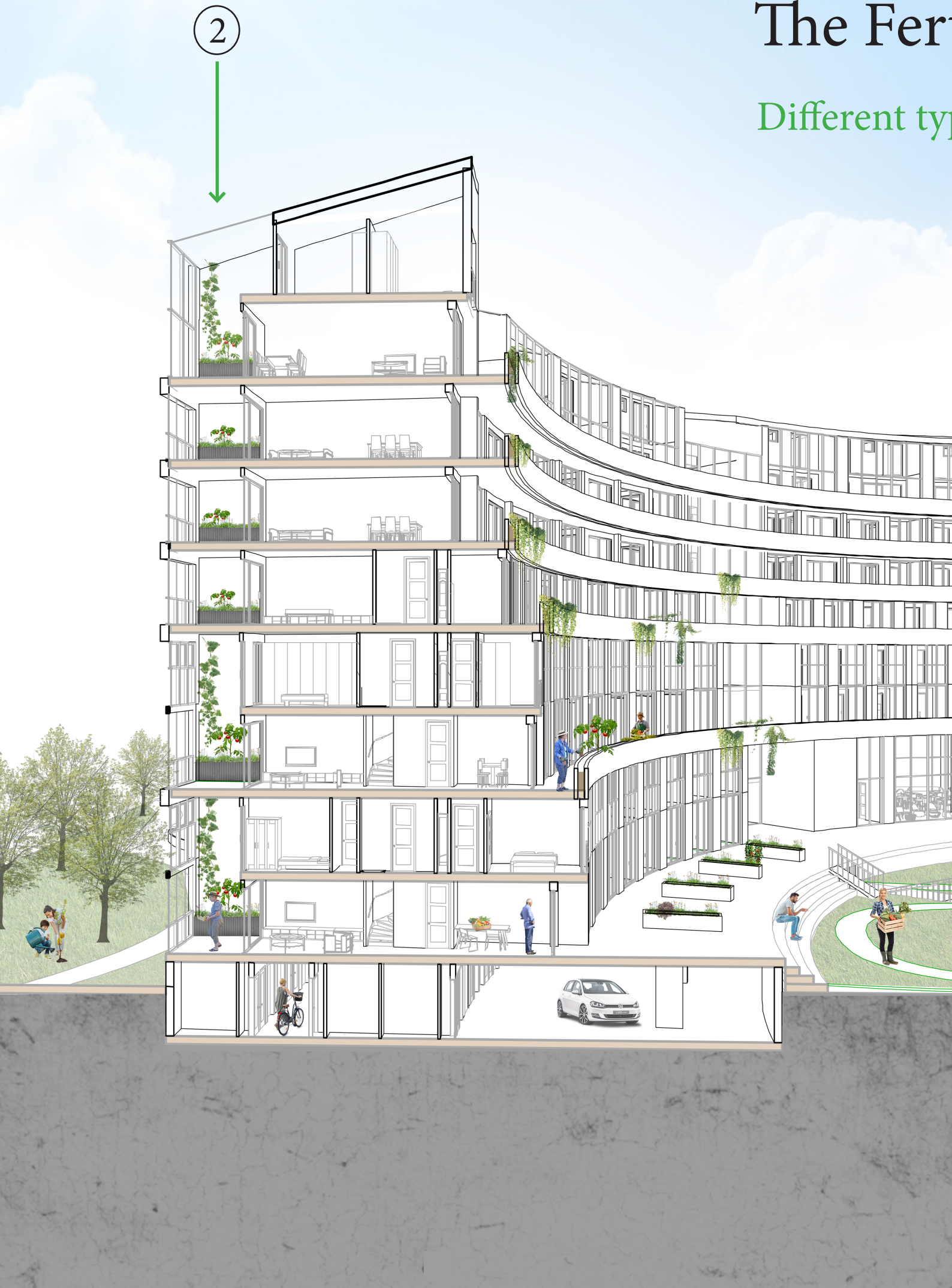
Different types of green



1. Edible garden around the building

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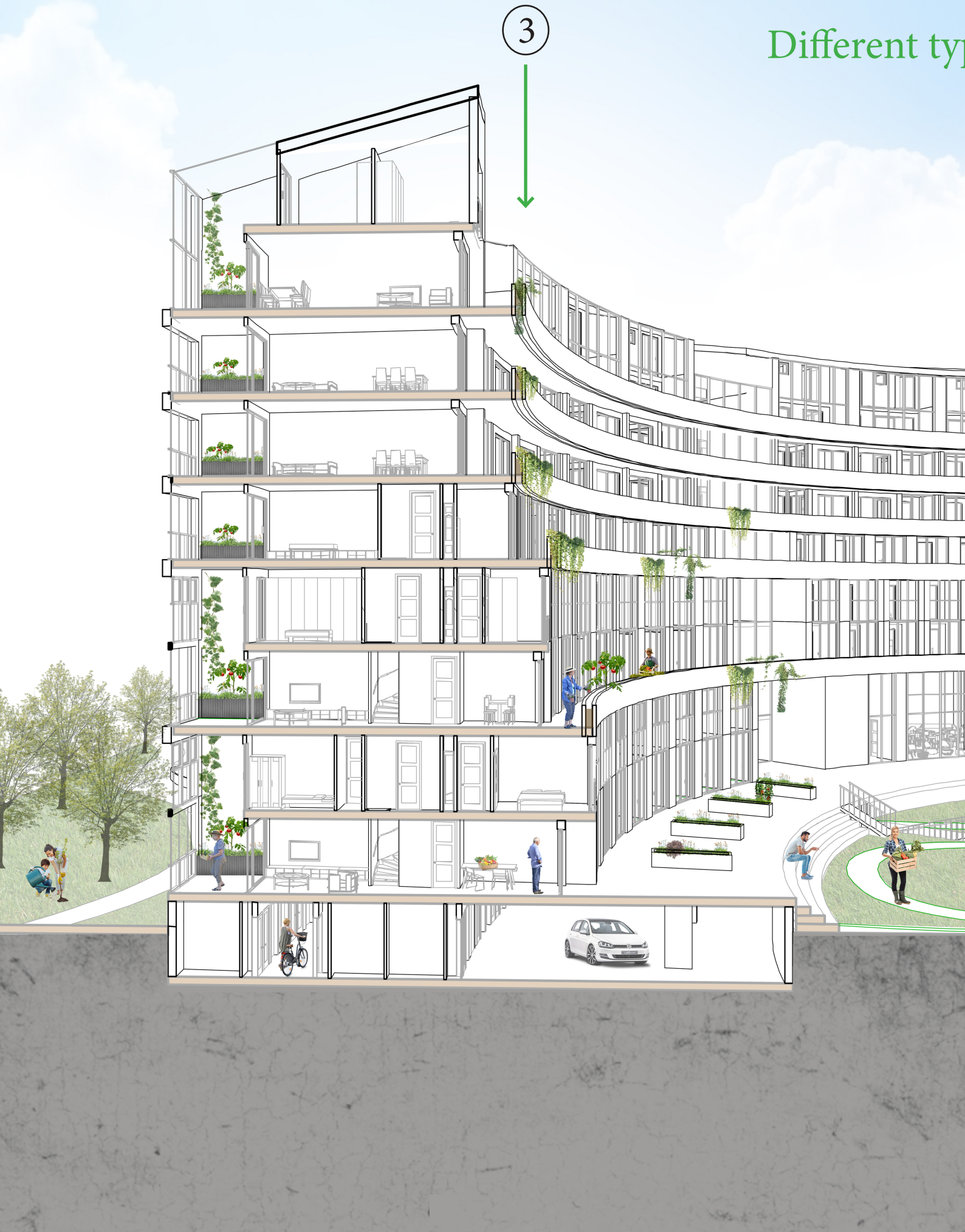
Different types of green



2. Each dwelling has its own wintergarden

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Different types of green



3. Balustrades as vegetable gardens

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4

Different types of green



4. Planters as vegetable gardens

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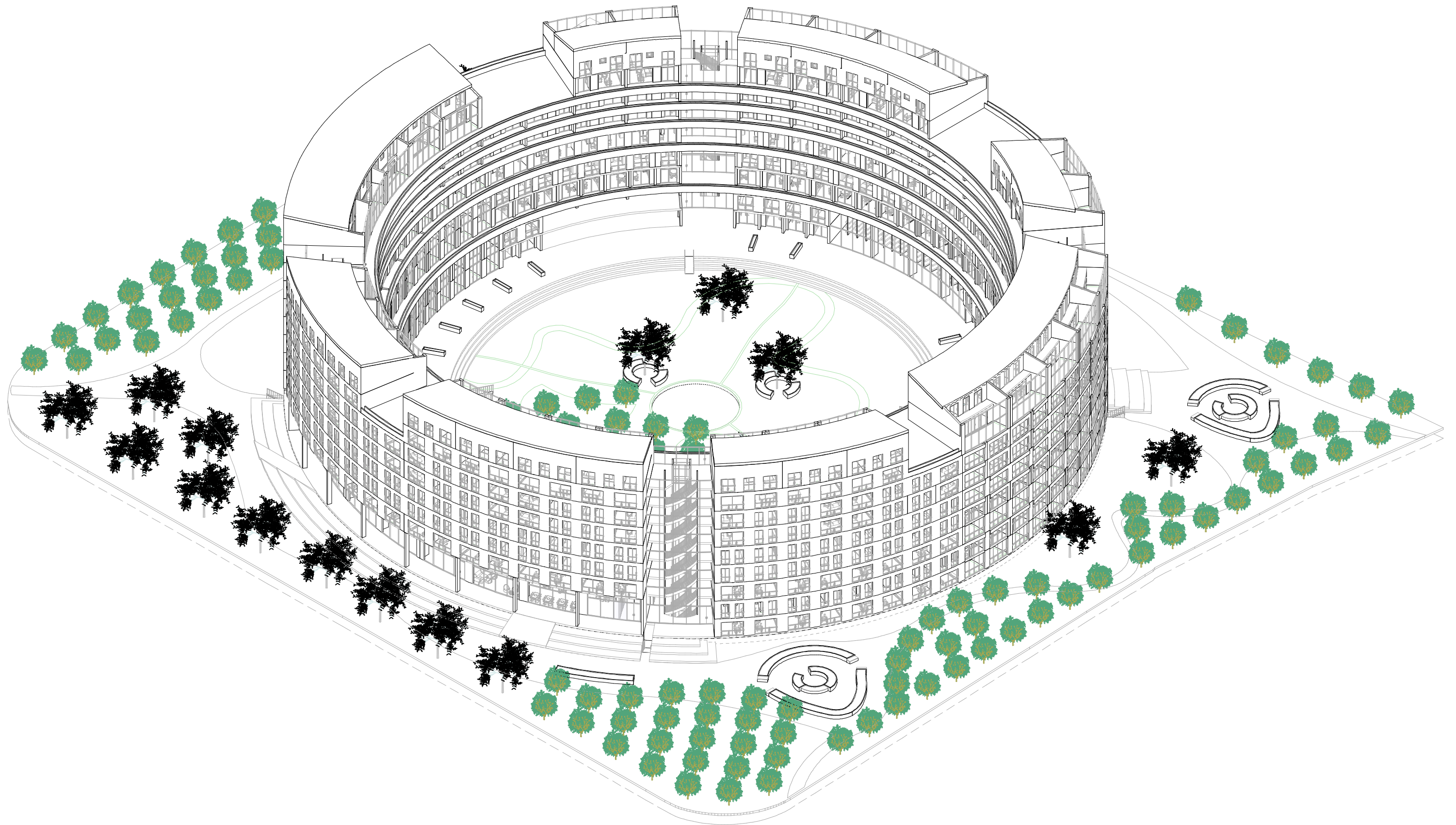
Different types of green



5. Inner garden

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Different types of green



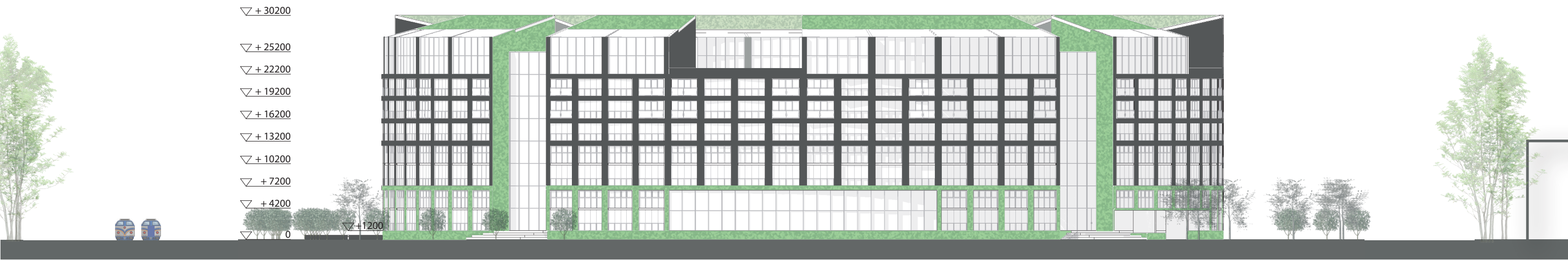
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The facades: North facade (city&park) 1:500



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The facades: South facade (Singelgracht) 1:500



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The facades: east facade 1:500



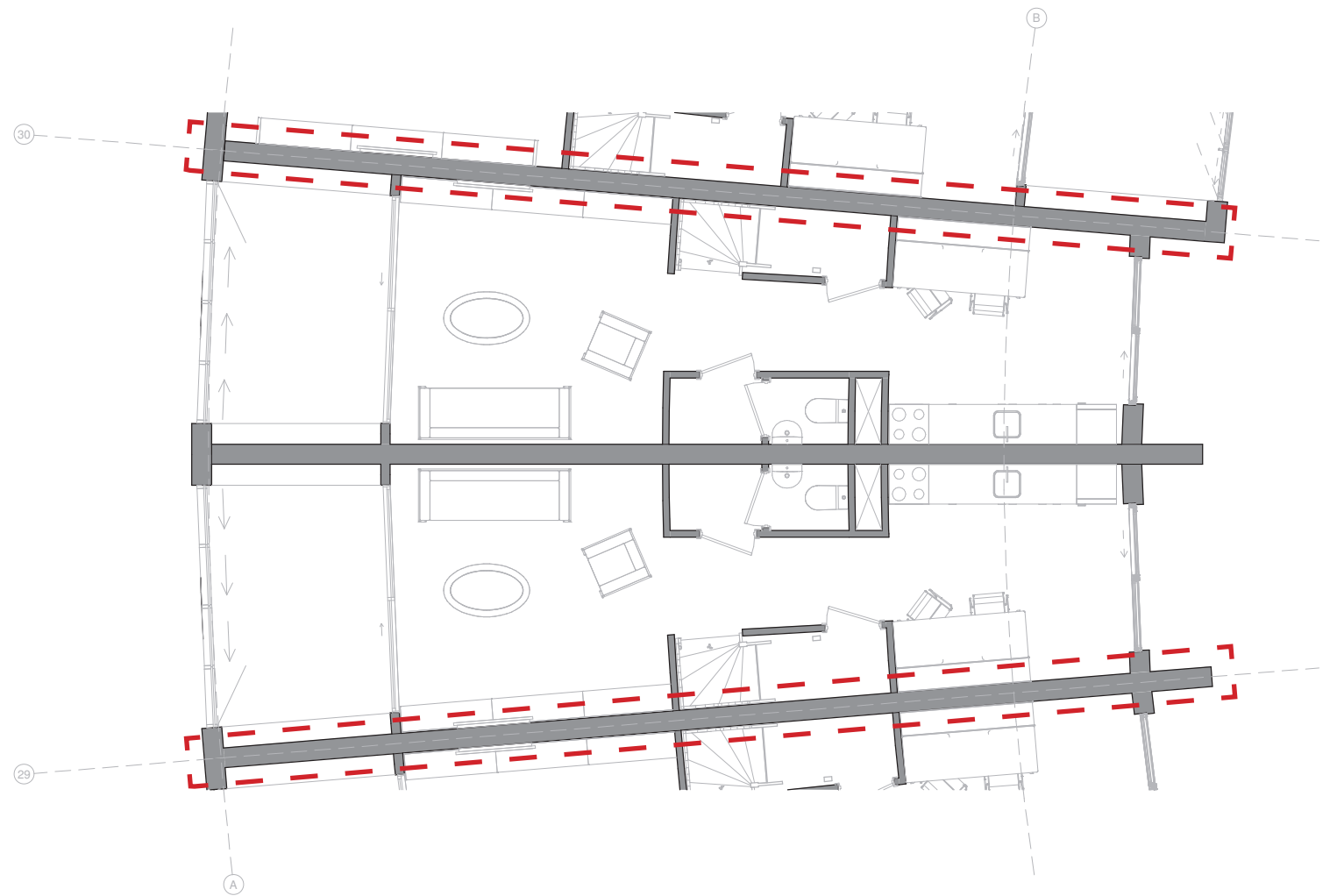
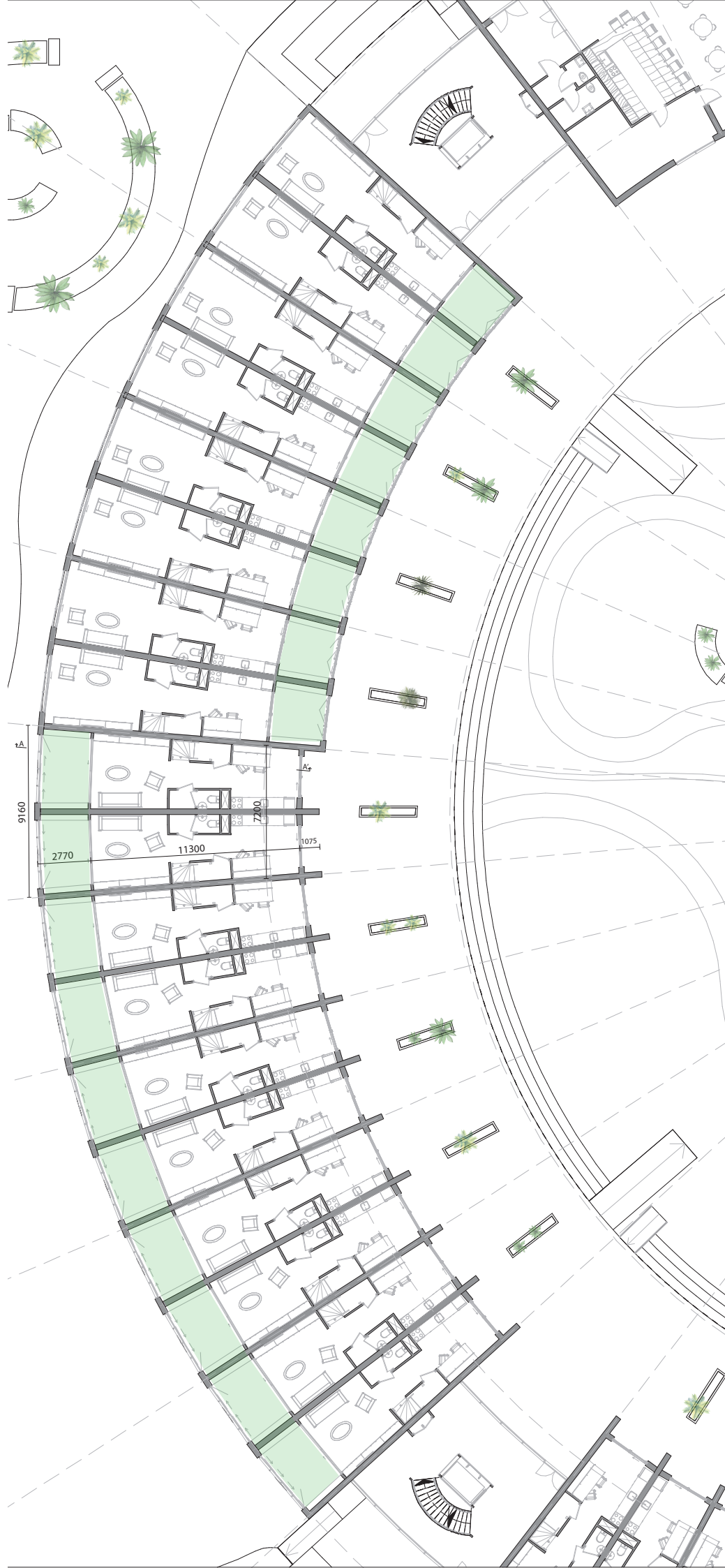
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The facades: west facade 1:500



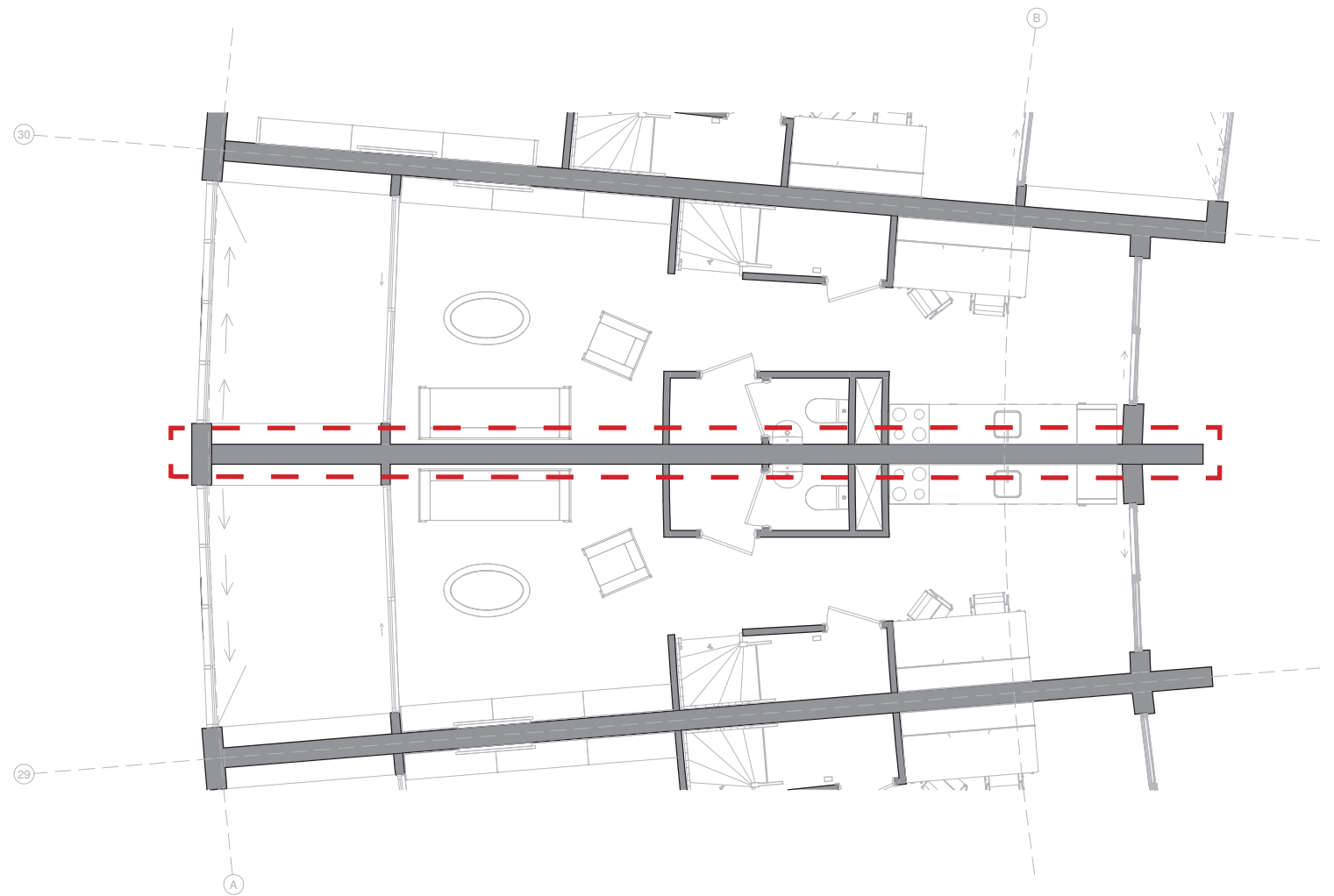
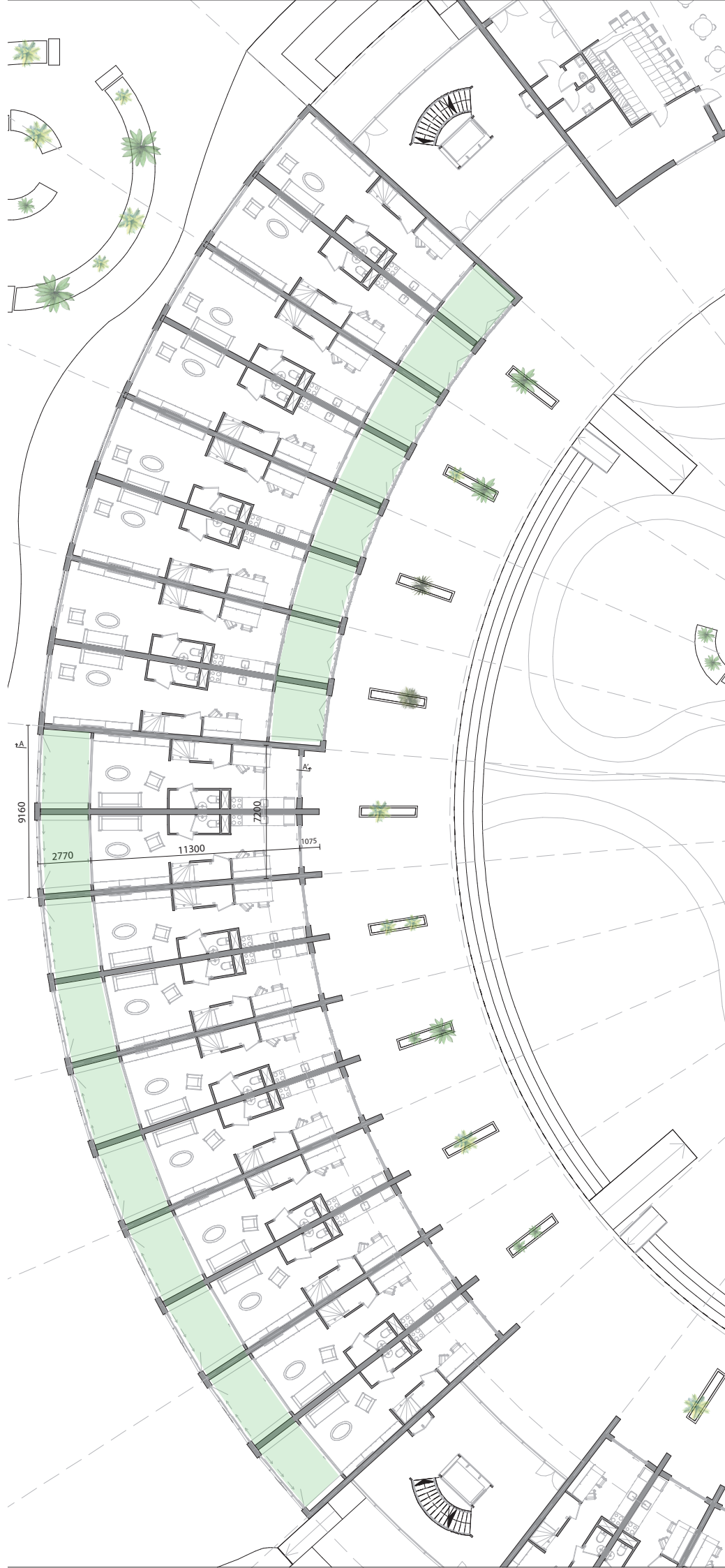
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Floor plan
Ground floor 1:100



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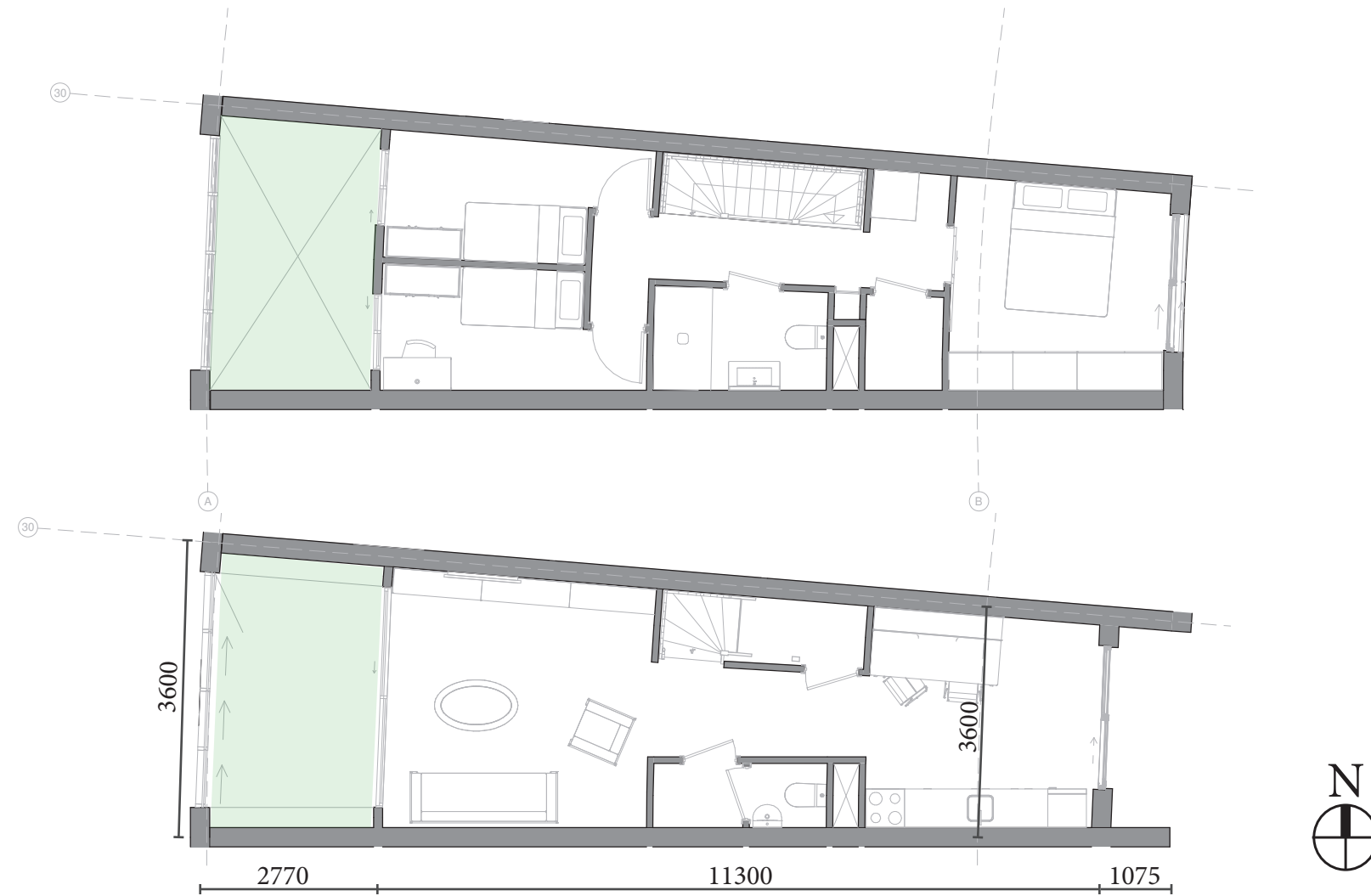
Floor plan
Ground floor 1:100



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Floorplan: Ground & First floor

Maisonnette 85 m²

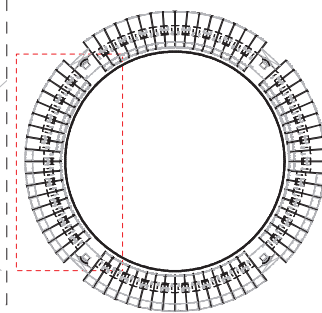
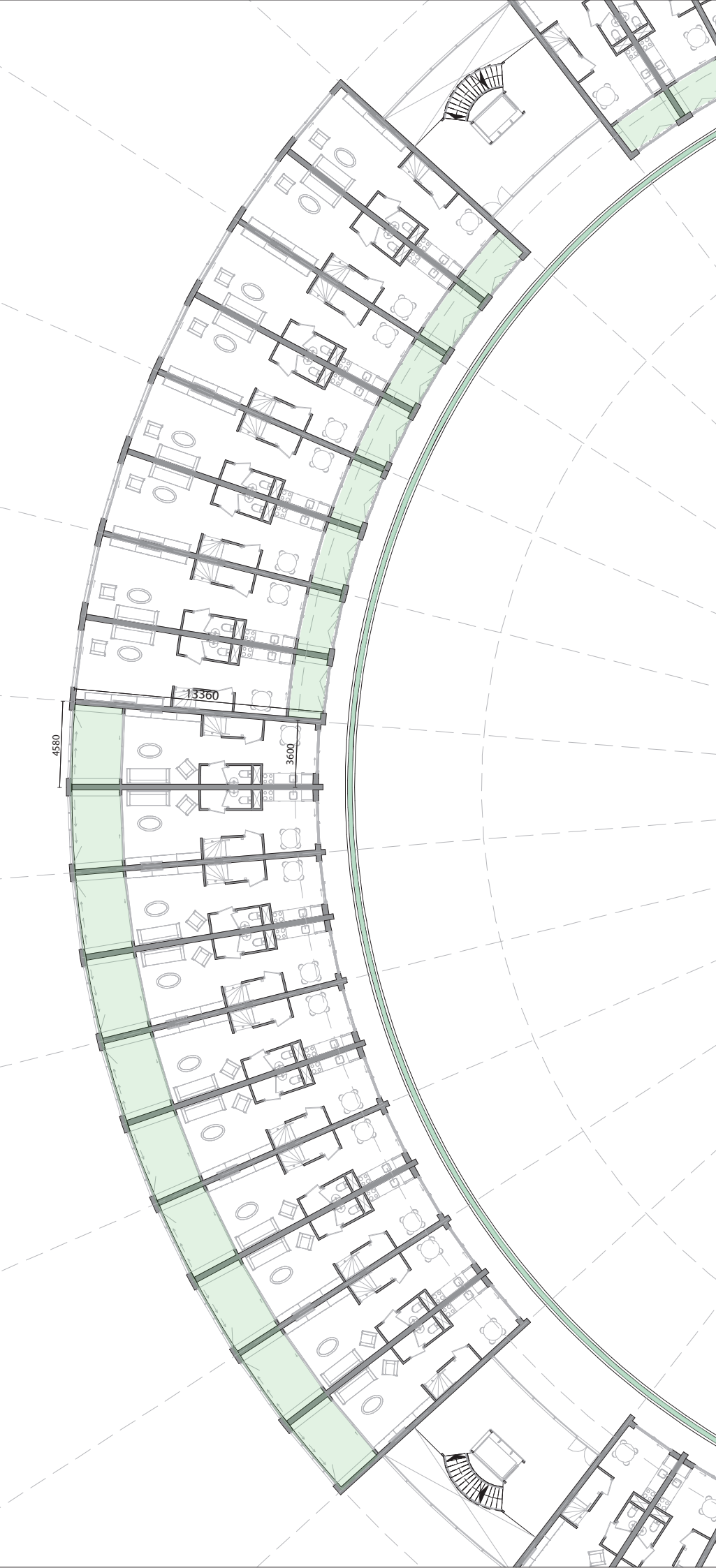






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Floor plan: Second & third floor
Maisonnette 77 m²



N
Scale 1:200
Second Floor
Maisonnette

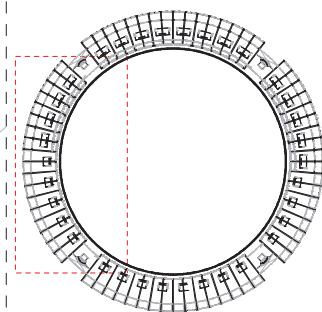
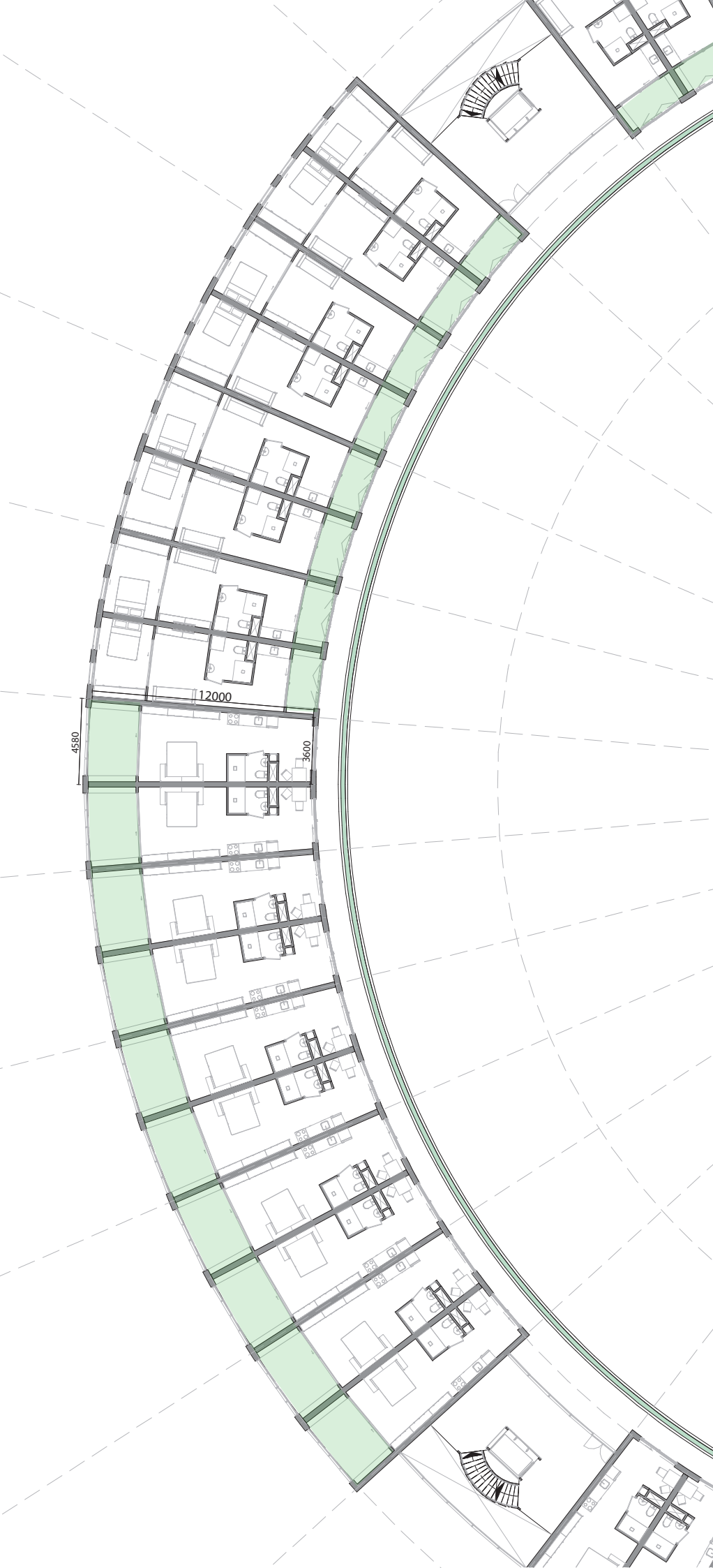




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Floor plan: Fourth floor

Studio 34 m² & 39 m²

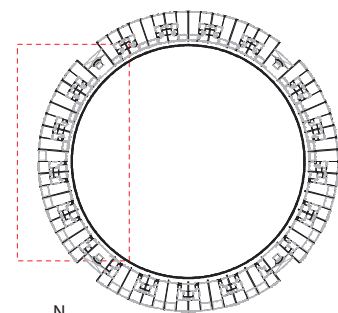
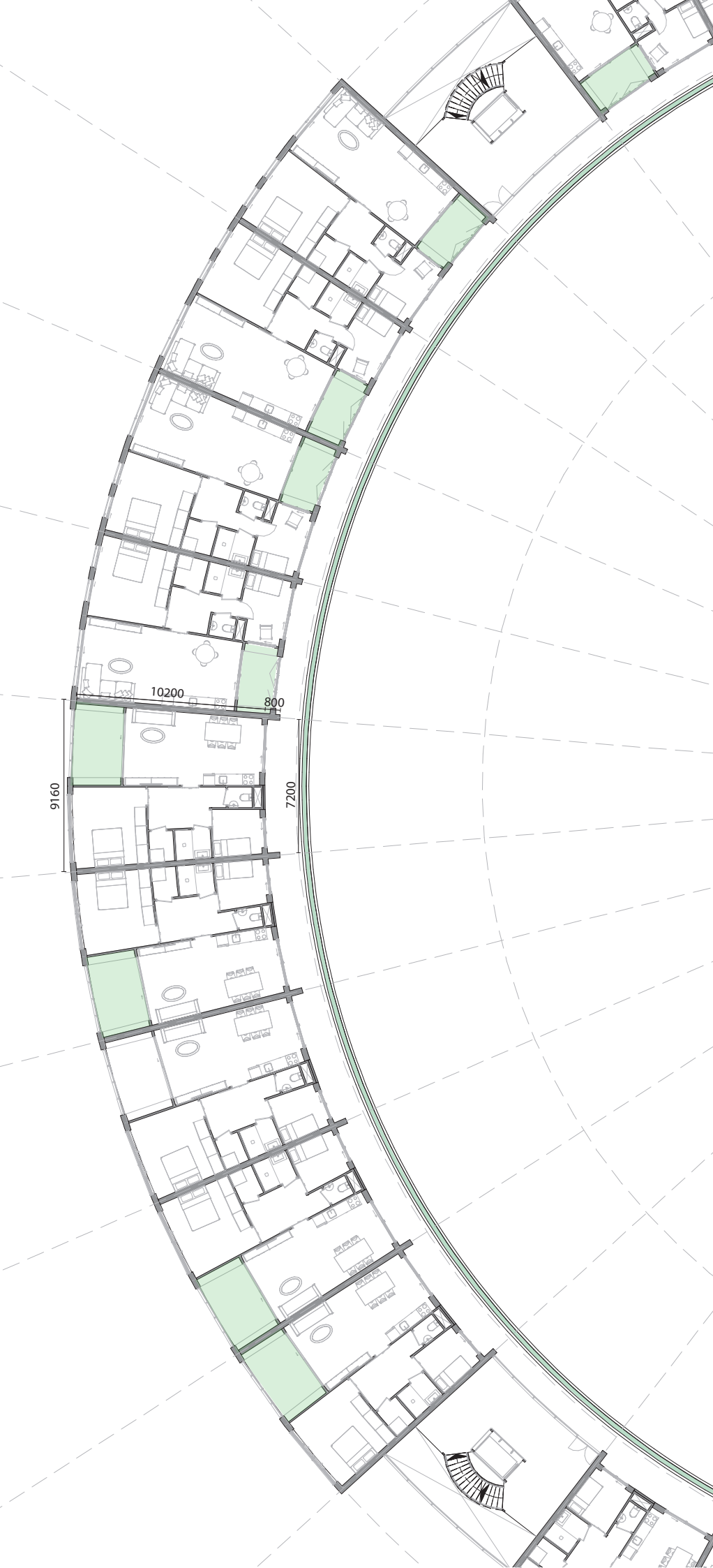


N
Scale 1:200
Fourth Floor
Studio

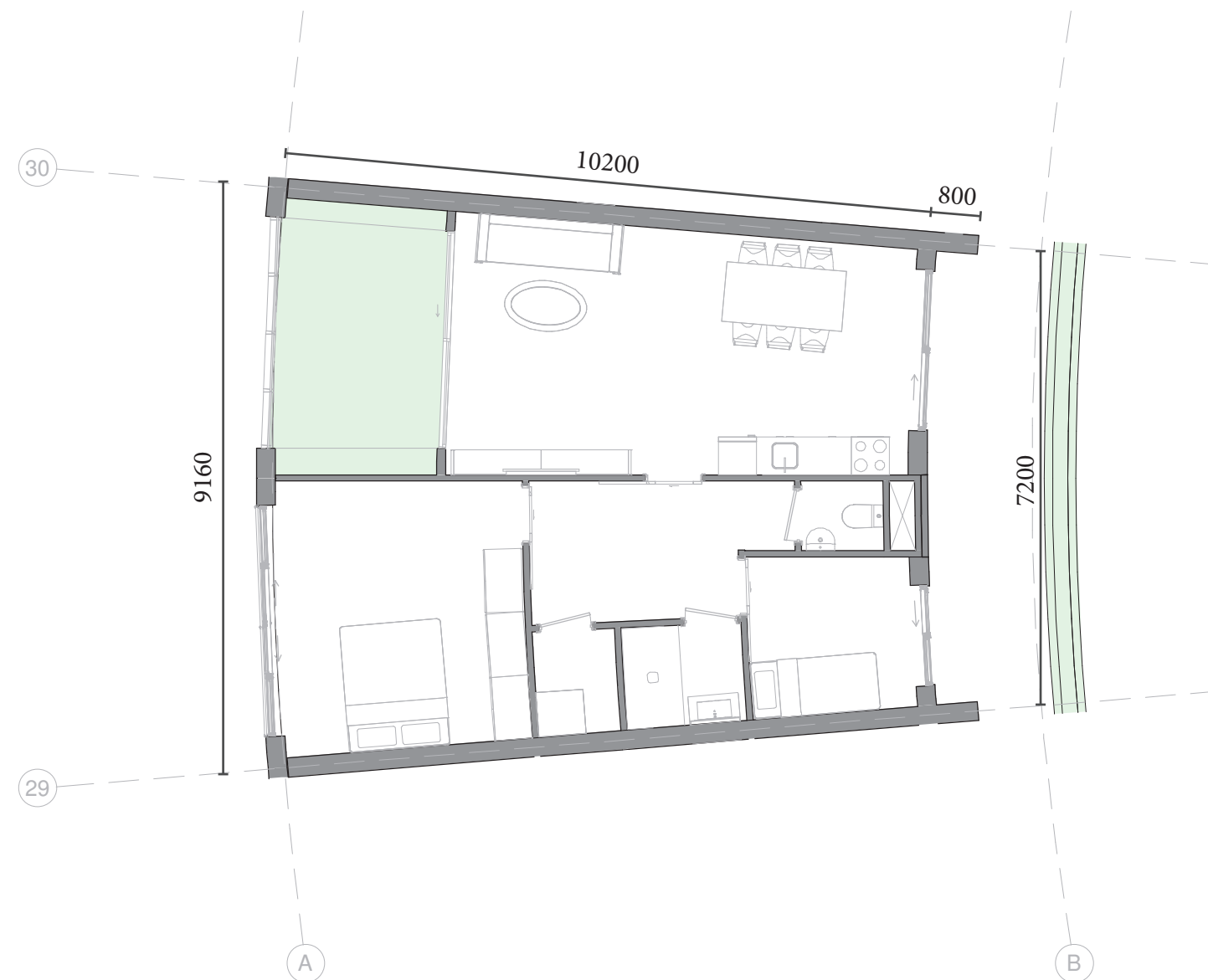


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Floor plan: Fifth & Sixth floor
Apartment 75 m²

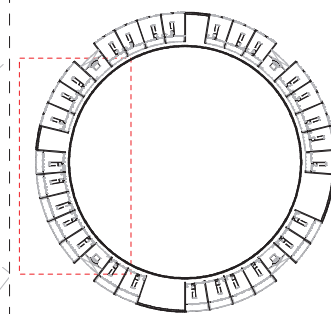
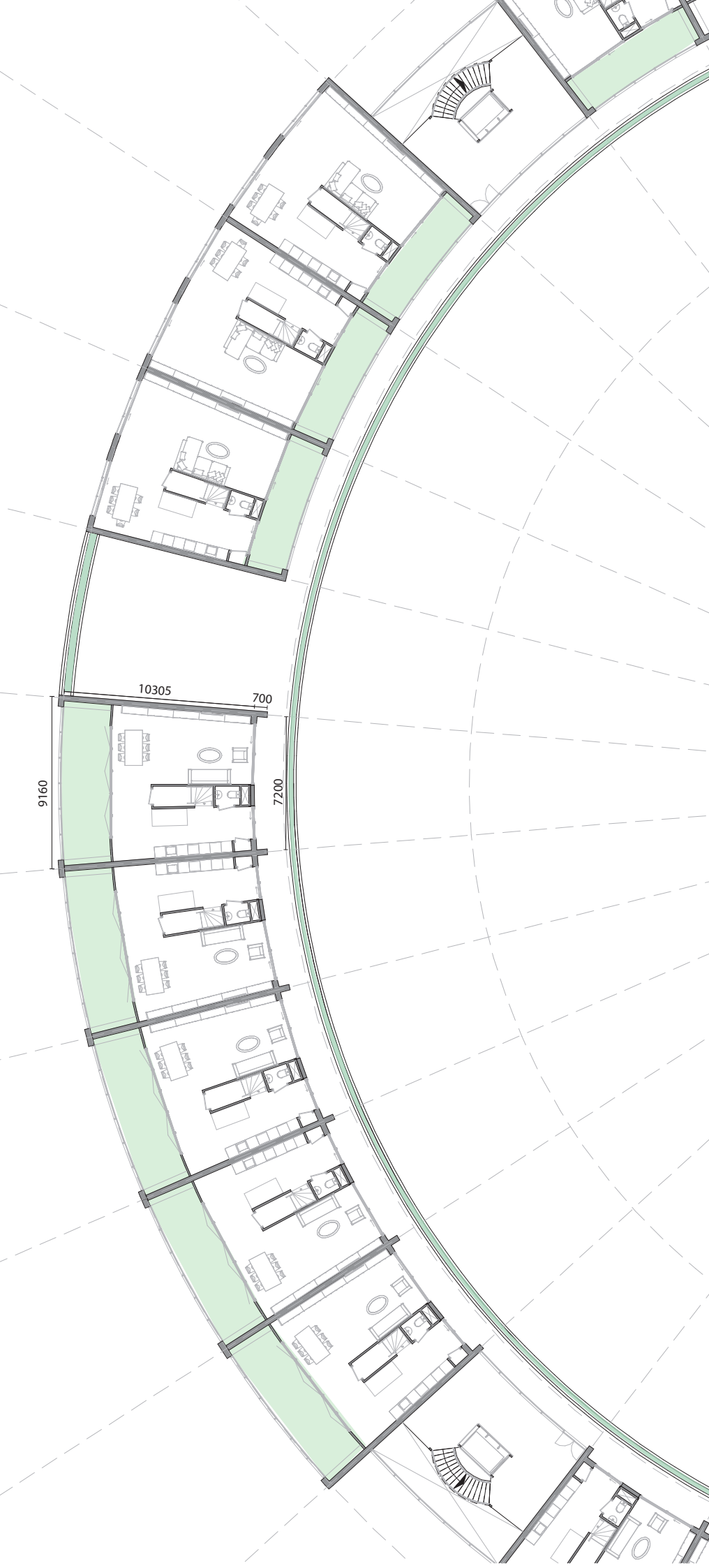


N
Scale 1:200
Fifth & Sixth Floor
one layer apartment

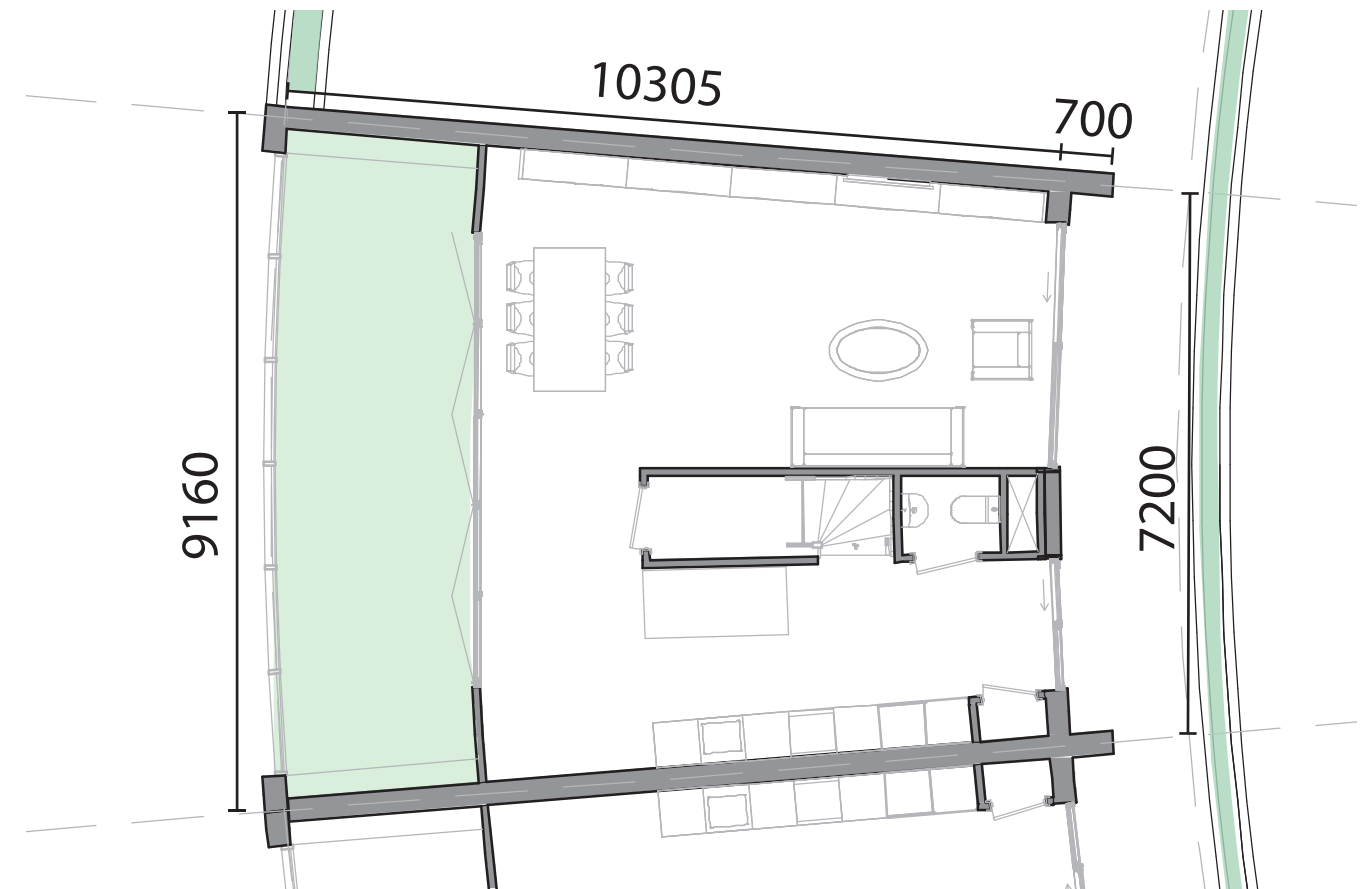


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Floor plan: Seventh & Eighth floor
Penthouse 117 m²

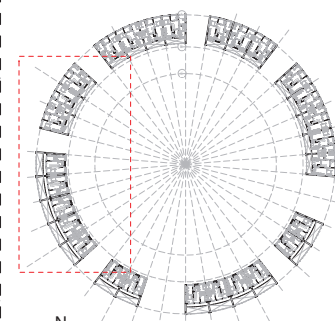
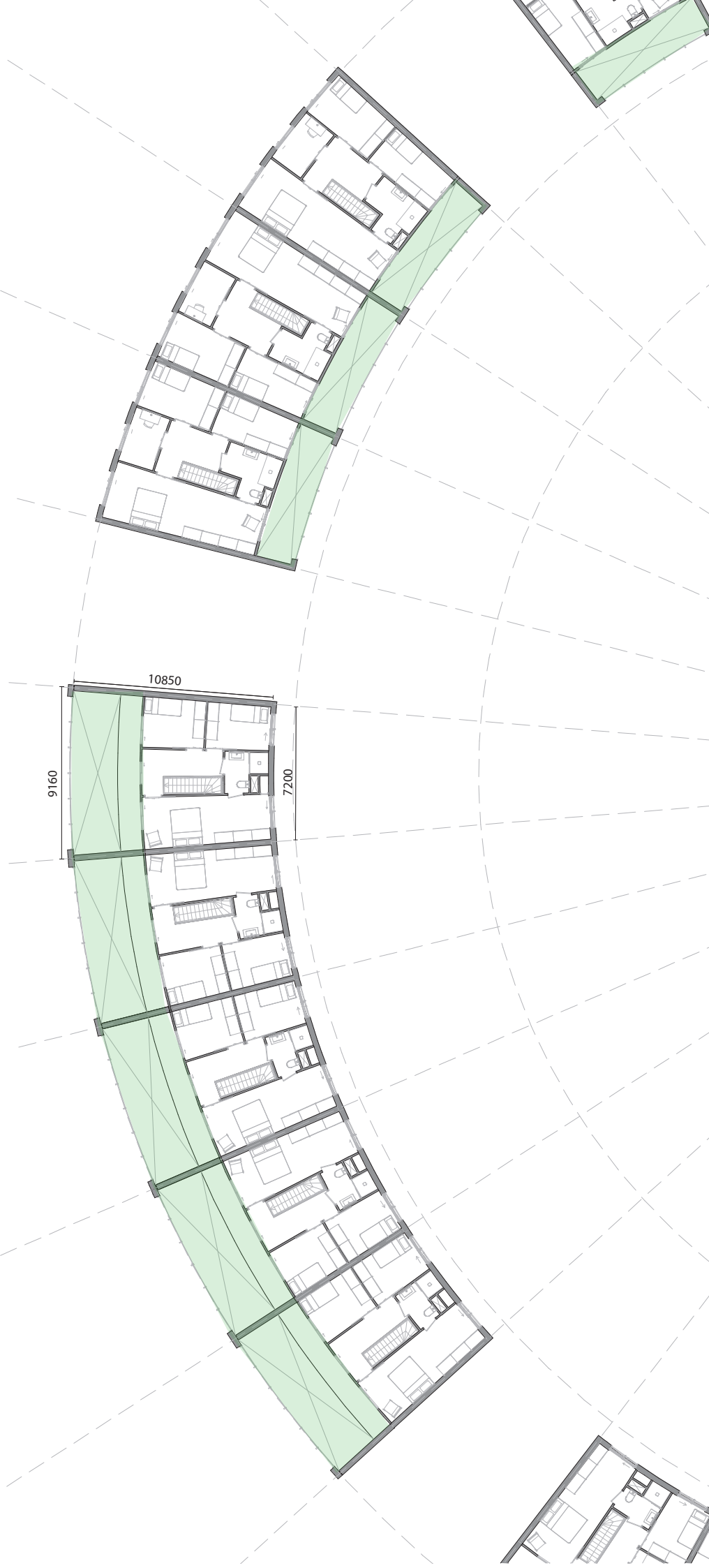


N
Scale 1:200
Seventh Floor
Penthouse

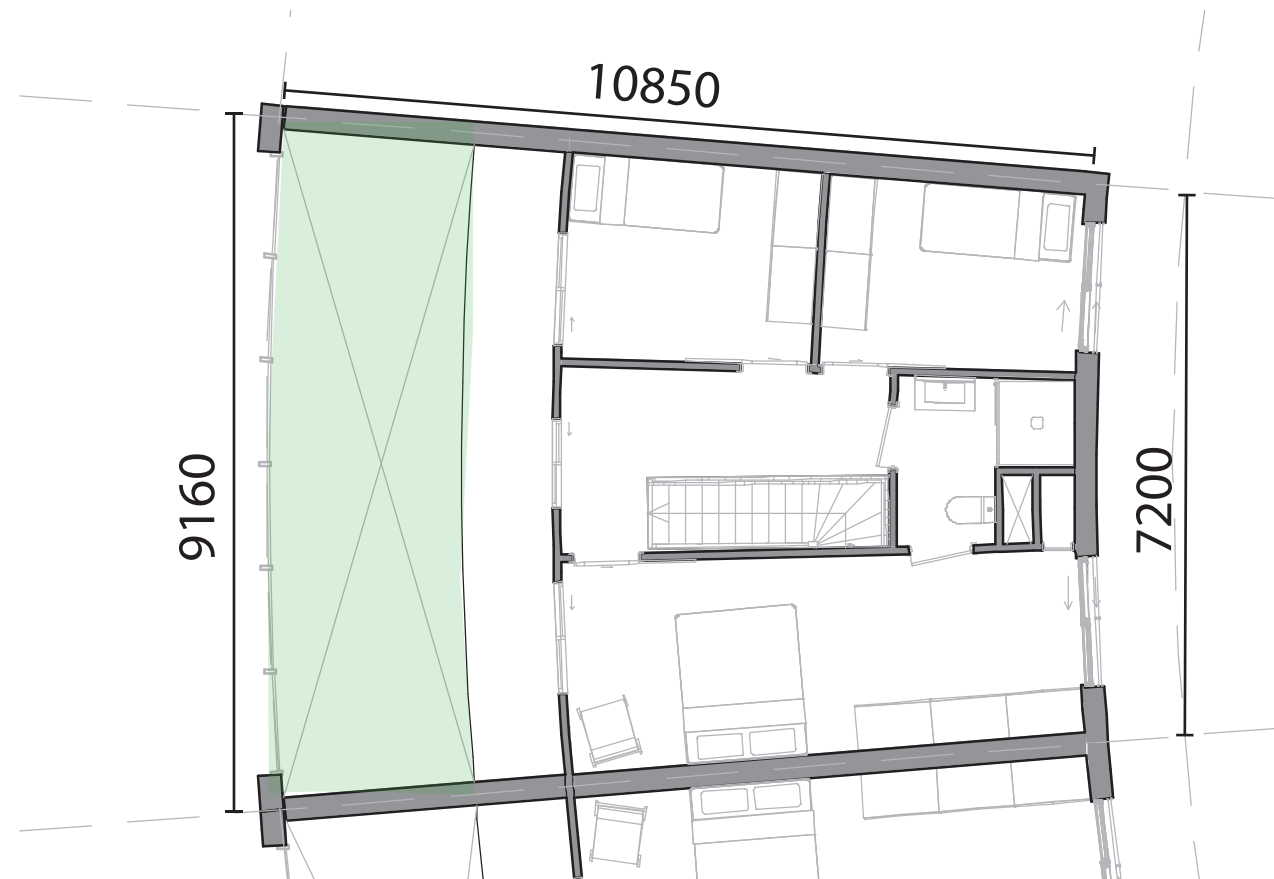


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Floor plan: Seventh & Eighth floor
Penthouse 117 m²

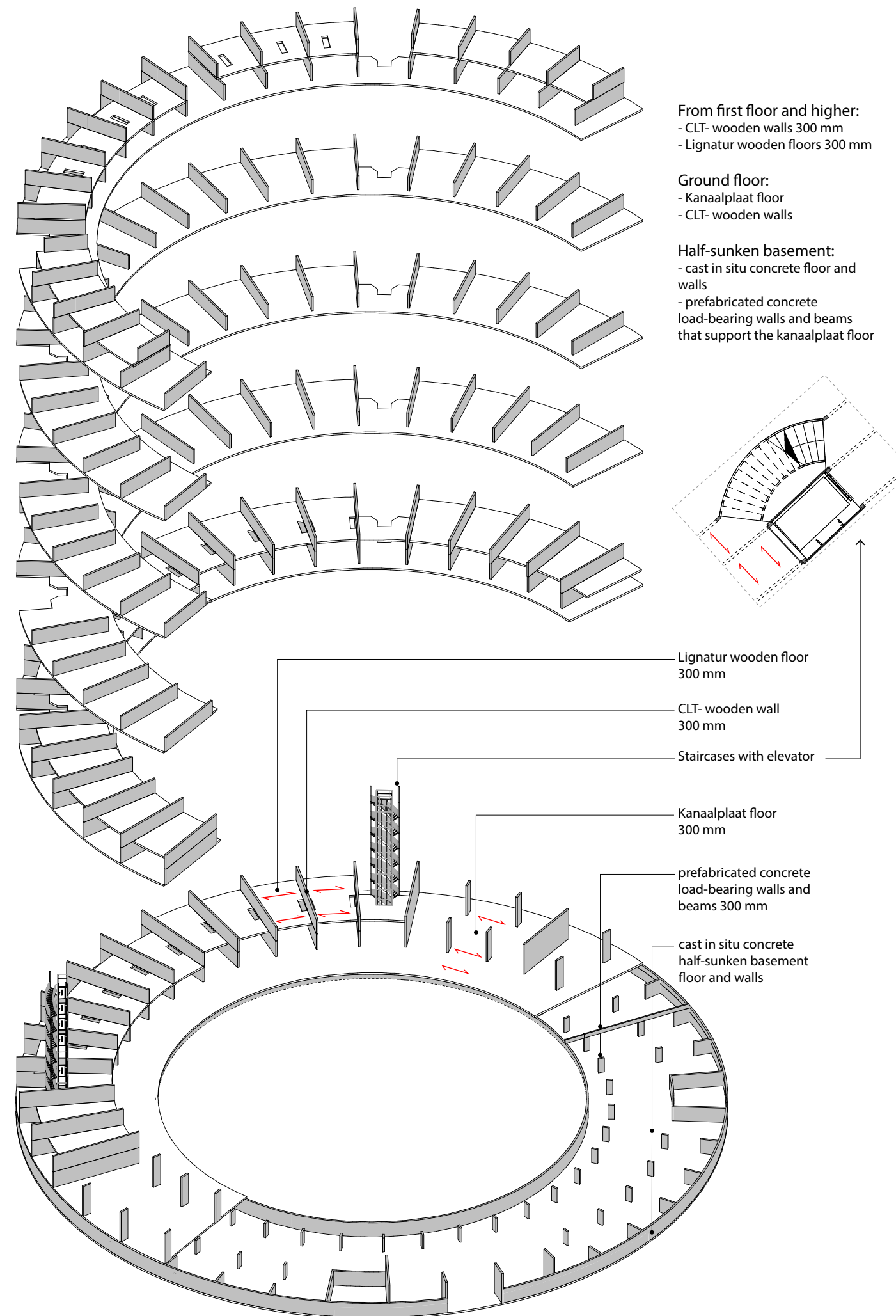


N
Scale 1:200
Eighth Floor
Penthouse

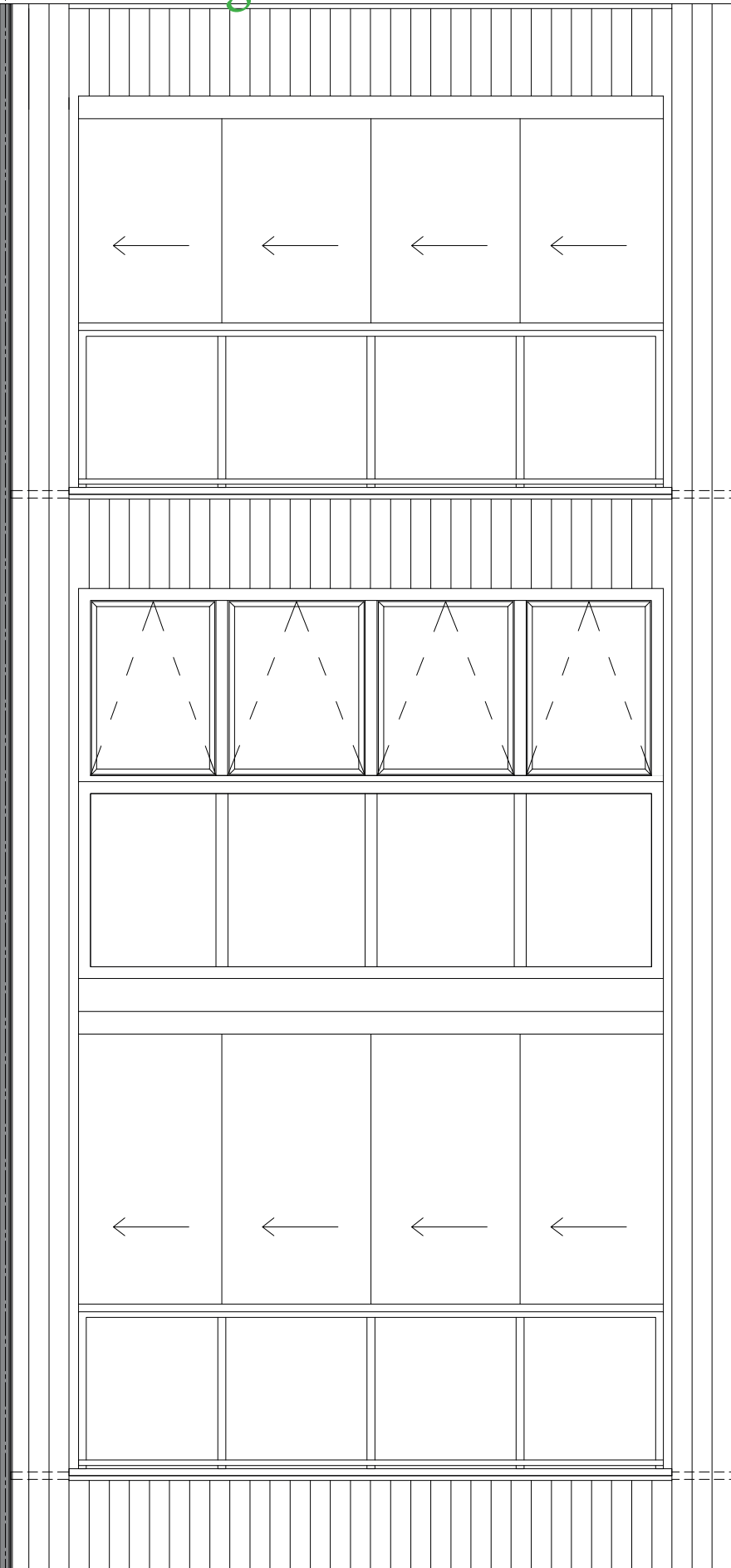


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Building structure



Structure 1:20
Fragment section & Facade



b.k. vloer
+16825

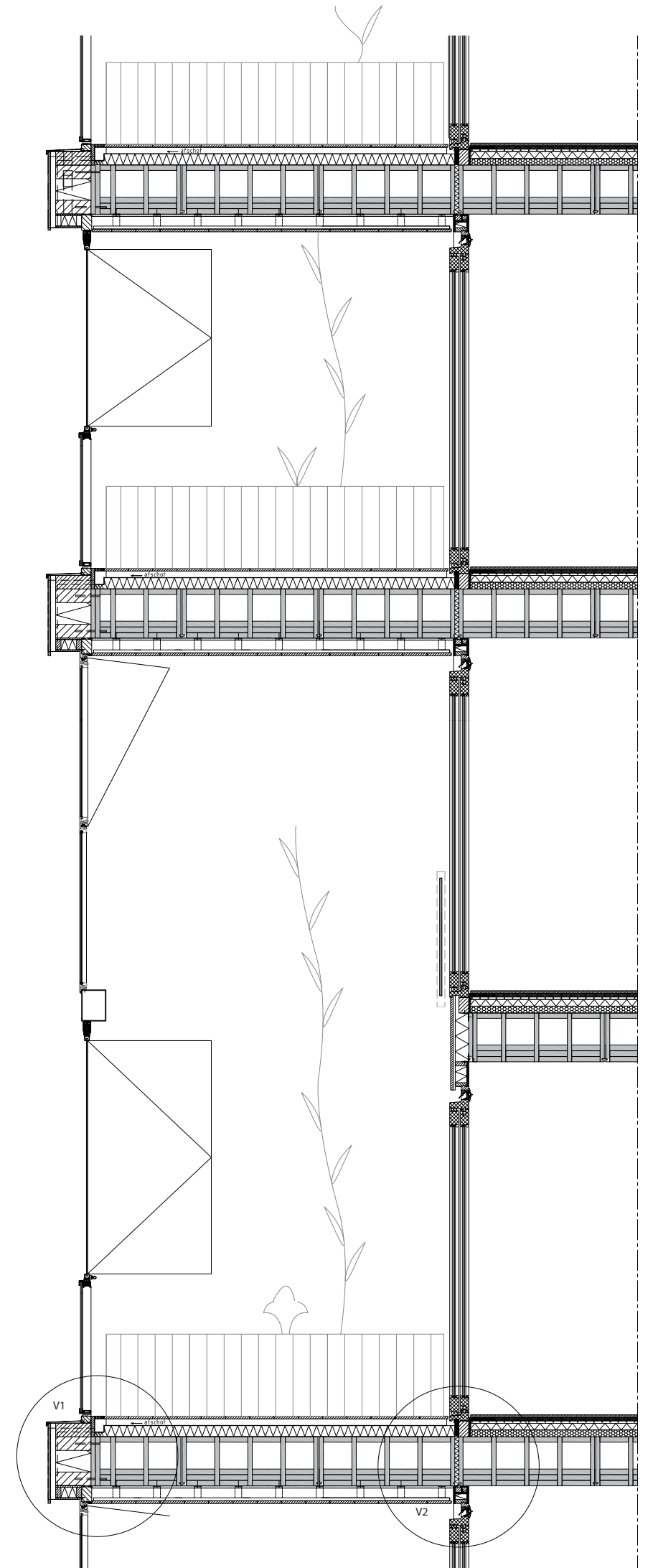
+14700

b.k. vloer
+13700

b.k. vloer
+10575

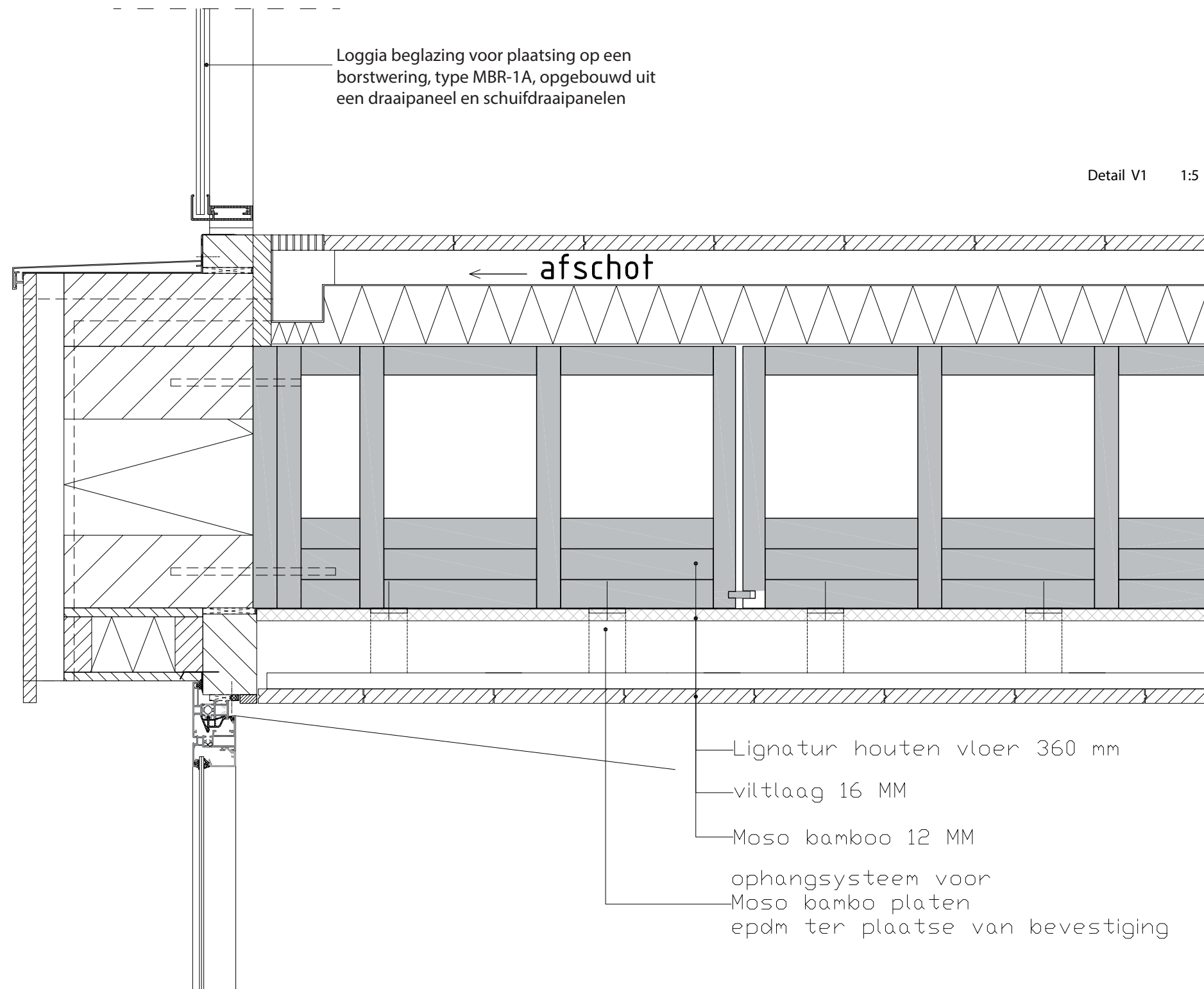
+8450

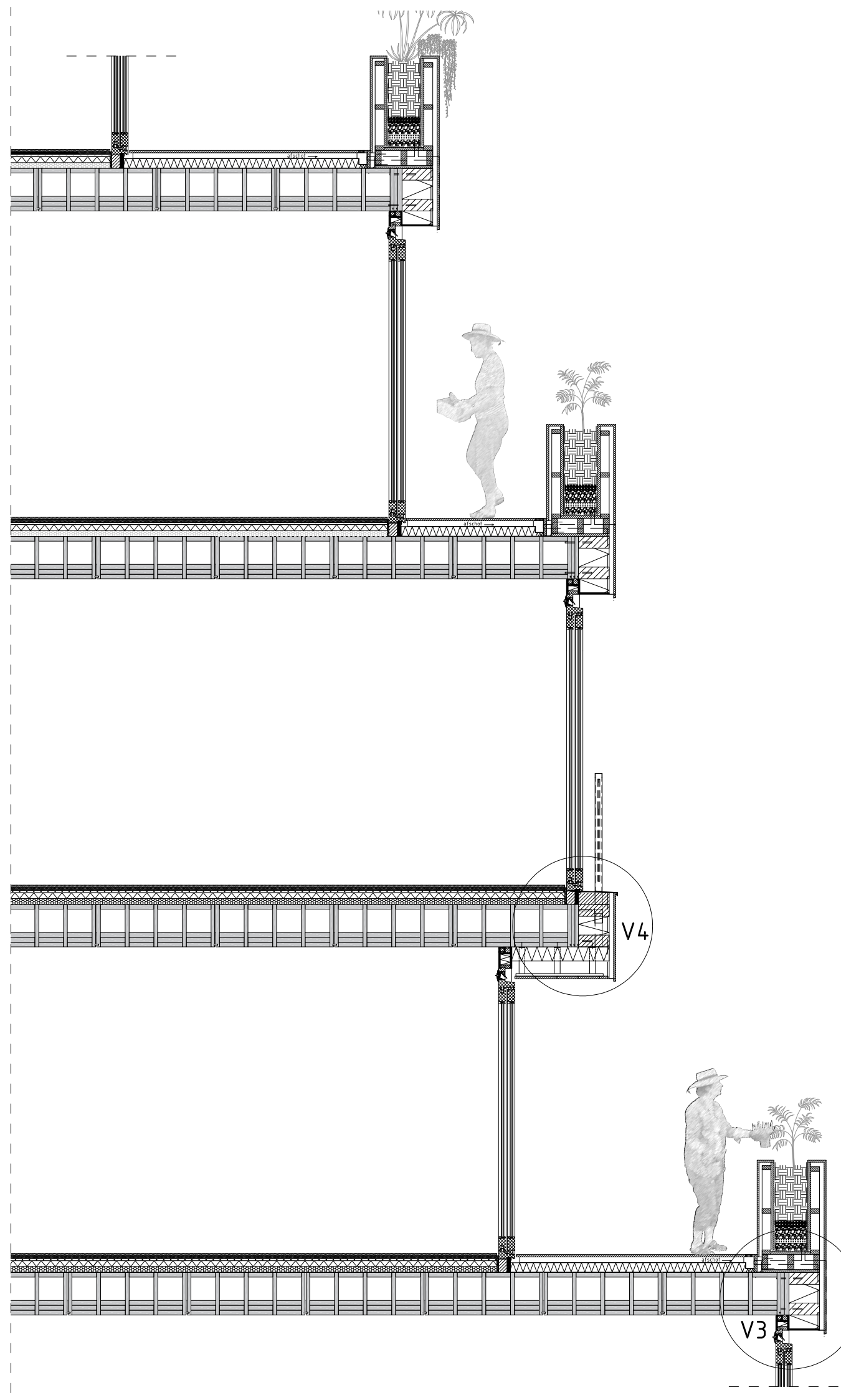
b.k. vloer
+7450



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Structure 1:5 detail





b.k. vloer
+17615

b.k. vloer
+16825

b.k. vloer
+14490

b.k. vloer
+13700

b.k. vloer
+10575

+8240

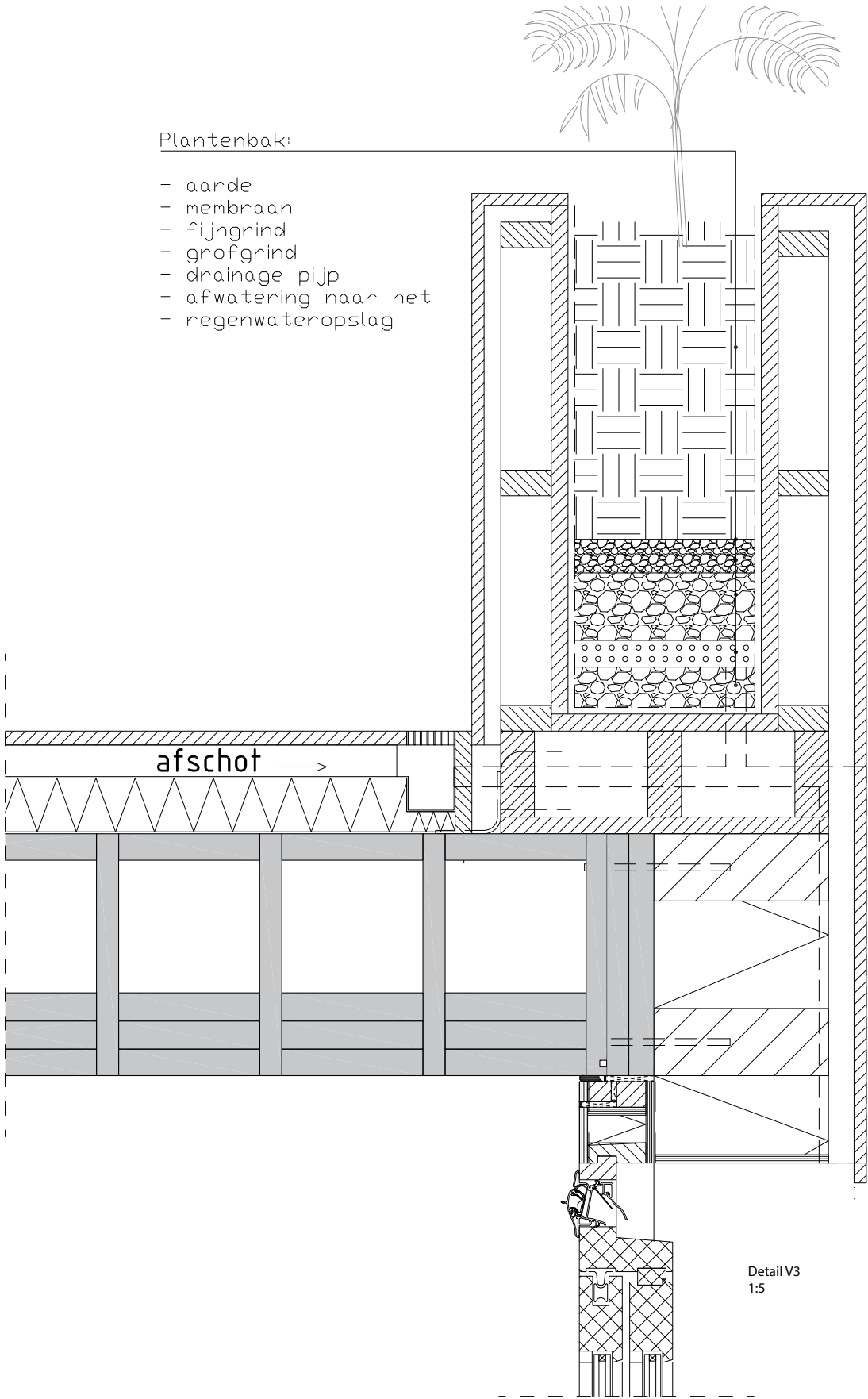
b.k. vloer
+7450

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Structure 1:20
section fragment

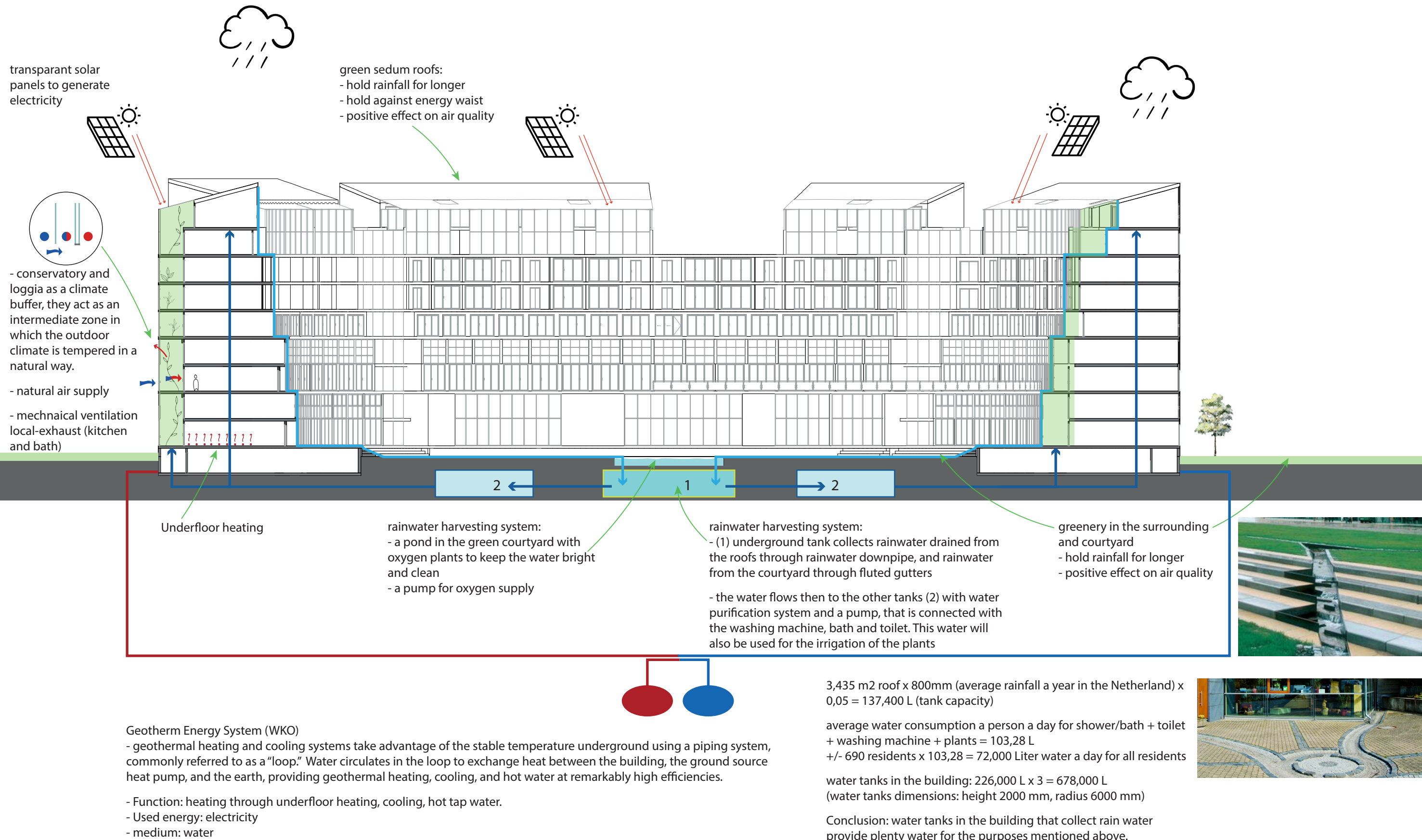
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Structure 1:5 detail



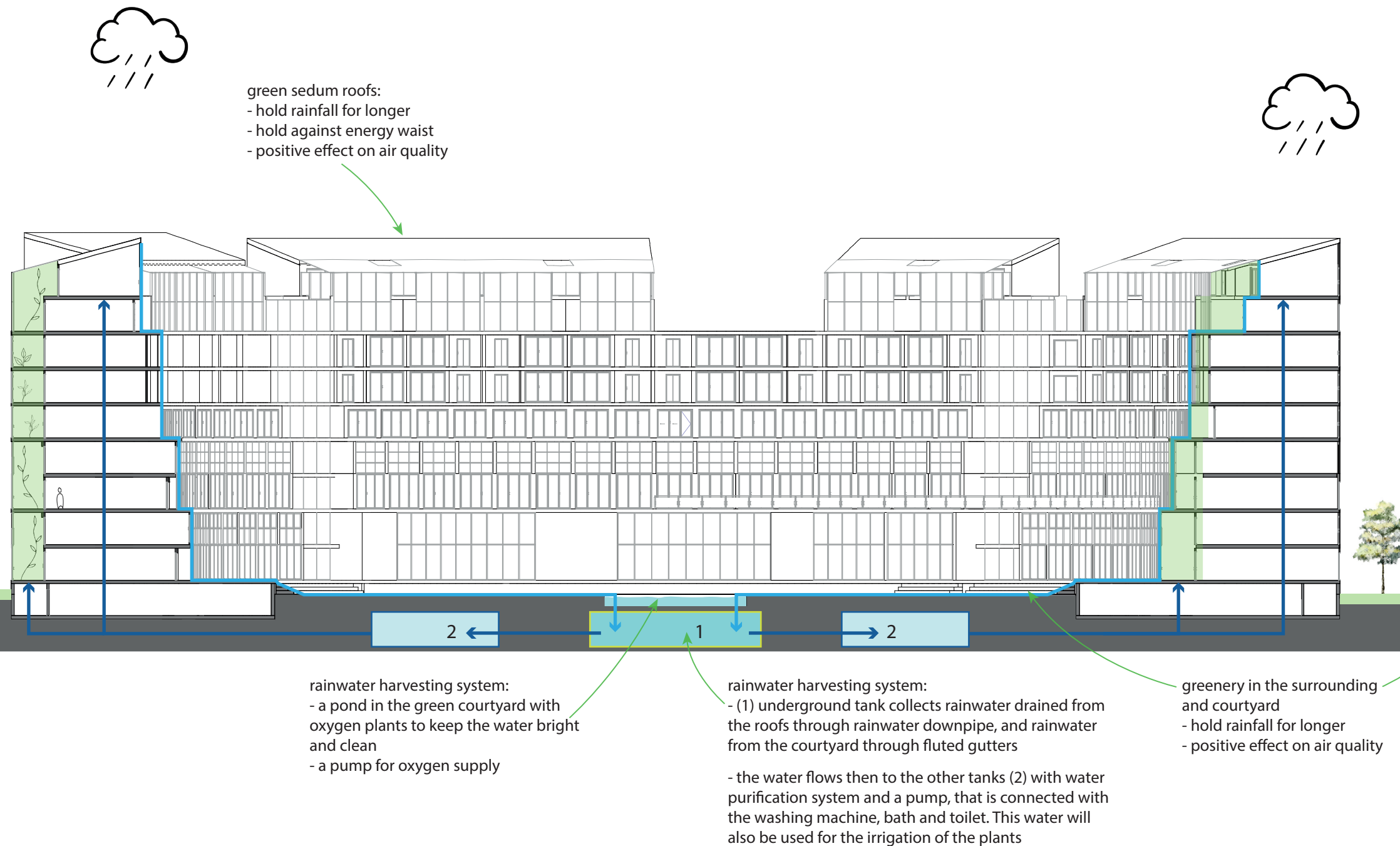
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Climate: overview



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Climate: water & green



$3,435 \text{ m}^2 \text{ roof} \times 800\text{mm (average rainfall a year in the Netherlands)} \times 0,05 = 137,400 \text{ L (tank capacity)}$

average water consumption a person a day for shower/bath + toilet + washing machine + plants = 103,28 L
 $\pm 690 \text{ residents} \times 103,28 = 72,000 \text{ Liter water a day for all residents}$

water tanks in the building: $226,000 \text{ L} \times 3 = 678,000 \text{ L}$
(water tanks dimensions: height 2000 mm, radius 6000 mm)

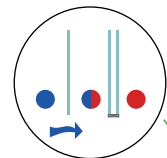
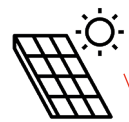
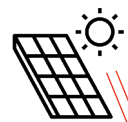
Conclusion: water tanks in the building that collect rain water provide plenty water for the purposes mentioned above.



The Fertile City

Climate: energy, heating & ventilation

transparent solar panels to generate electricity



- conservatory and loggia as a climate buffer, they act as an intermediate zone in which the outdoor climate is tempered in a natural way.

- natural air supply
- mechanical ventilation local-exhaust (kitchen and bath)

Underfloor heating

Geotherm Energy System (WKO)

- geothermal heating and cooling systems take advantage of the stable temperature underground using a piping system, commonly referred to as a "loop." Water circulates in the loop to exchange heat between the building, the ground source heat pump, and the earth, providing geothermal heating, cooling, and hot water at remarkably high efficiencies.

- Function: heating through underfloor heating, cooling, hot tap water.
- Used energy: electricity
- medium: water











Thank you!
Questions?

