

# STARTERS IN THE CITY:

A LIVELY AND VIBRANT  
LIVE-WORK ENVIRONMENT IN  
THE FUTURE METROPOLITAN  
AREA OF ROTTERDAM.

GRADUATION PRESENTATION  
TIJMEN LOURENS DIJK

28 JANUARY 2021

IR. T.W. KUPERS  
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TU DELFT | FACULTY OF ARCHITECTURE  
ARCHITECTURE AND DWELLING

DUTCH HOUSING  
GRADUATION STUDIO  
JANUARY 2021



# INTRODUCTION

## Woningtekort blijft nog tot zeker 2030 groot probleem

De woningnood waar we momenteel in Nederland mee te kampen hebben blijft nog zeker tien jaar duren. In 2030 zijn er nog steeds 200.000 woningen te weinig. Met name in de Randstad blijft de situatie nijpend. Dat blijkt uit onderzoek van [ABF Research](#) in opdracht van het ministerie van Binnenlandse Zaken.

Stefan ten Teije 14-06-19, 10:35 Laatste update: 14-06-19, 10:35

ED Abonneren

### Woningnood in Rotterdam verergert: explosieve stijging urgentieverklaringen

Het aantal urgentieverklaringen, dat voorrang geeft op een sociale huurwoning, is de laatste jaren in Rotterdam explosief gestegen. Zo wordt het voor doorsnee woningzoekenden alleen maar moeilijker een geschikt huisje te vinden.

Antti Liukku 03-04-19, 10:41

### 'Te weinig bouwplannen om woningtekort terug te dringen'

Om de doelen uit de Nationale Woonagenda te halen, moet het aantal geplande woningen worden verdubbeld. Dat blijkt uit onderzoek van het Economisch Instituut voor de Bouw.

Kasper van Laarhoven 13 mei 2019  
Leestijd 1 minuut

Trouw

### Kamer wil nu daden tegen groeiend woningtekort



Woningnood

an bouwplaats in Utrecht. Beeld ANP

er worden te weinig huizen gebouwd en huren stijgen. In de Tweede Kamer groeit het ongeduld.

Economie

## Woningtekort in 2030 nog steeds groot: 157.000 huizen te weinig

29 april 2019 08:54  
Aangepast: 29 april 2019 09:18

Mijn nieuws

## Het woningtekort loopt nog veel verder op

**ijfers bouw** De recente stikstofcrisis zal nog jaren voelbaar zijn in de bouw. De gewenste bouw van 75.000 woningen per jaar blijft uit.

Egbert Kalse 22 januari 2020 Leestijd 2 minuten



Komende tien jaar 845.000 nieuwe woningen nodig om tekort weg te werken

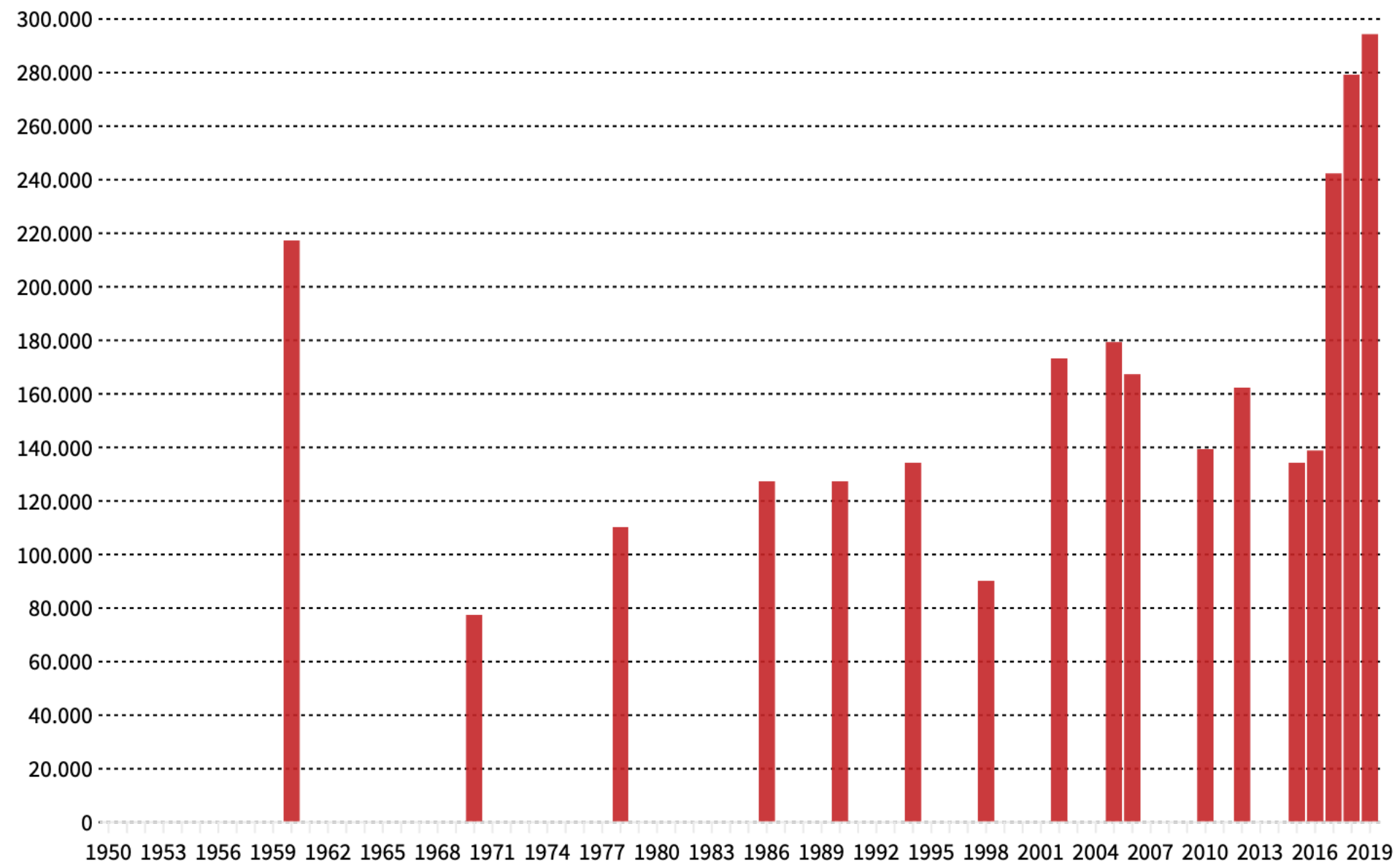
16 juni 2020 05:03  
Laatste update: 11 minuten geleden

472 WhatsApp Facebook Twitter LinkedIn Email

Tussen 2020 en 2030 moeten er in totaal 845.000 woningen worden gebouwd om aan de groeiende vraag te voldoen. Dat schrijft minister Kajsa Ollongren van Binnenlandse Zaken maandag in de [Staat van de Woningmarkt 2020](#).



# HOUSING SHORTAGE

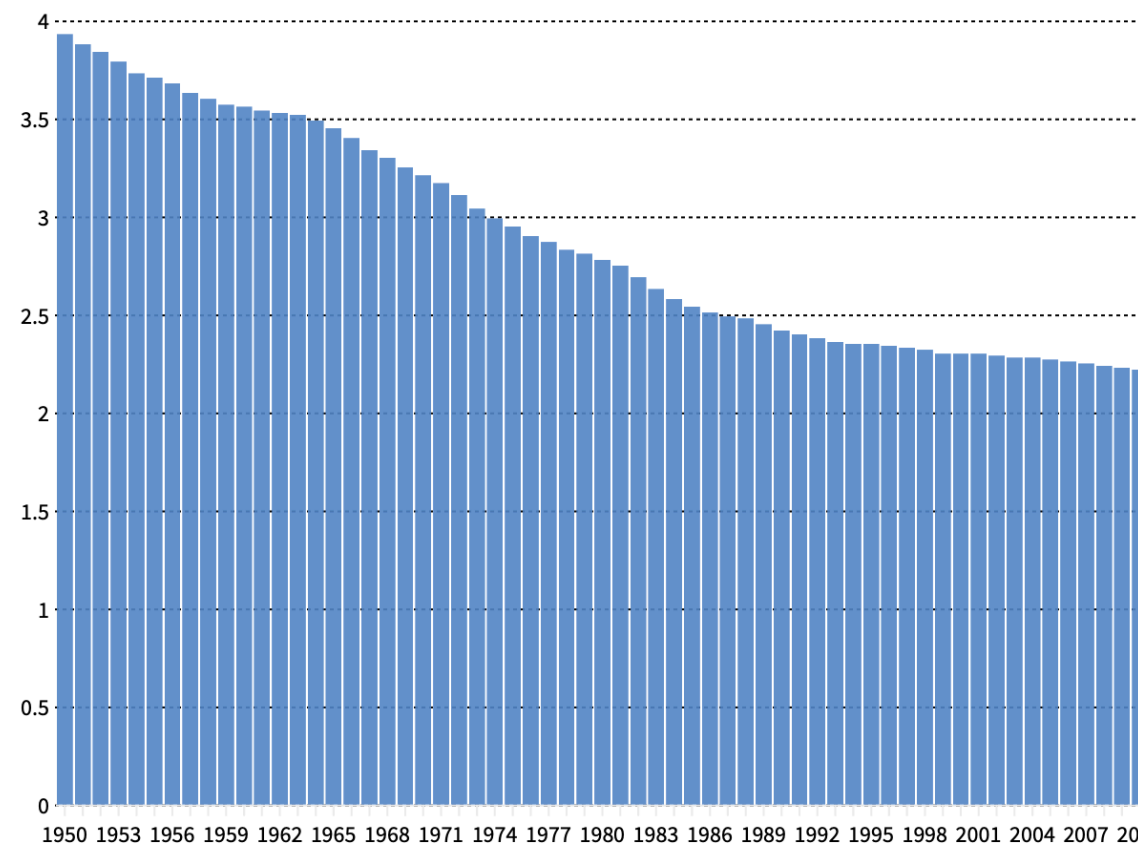


Bron: Staat van de woningmarkt, ABF Primos



# POPULATION

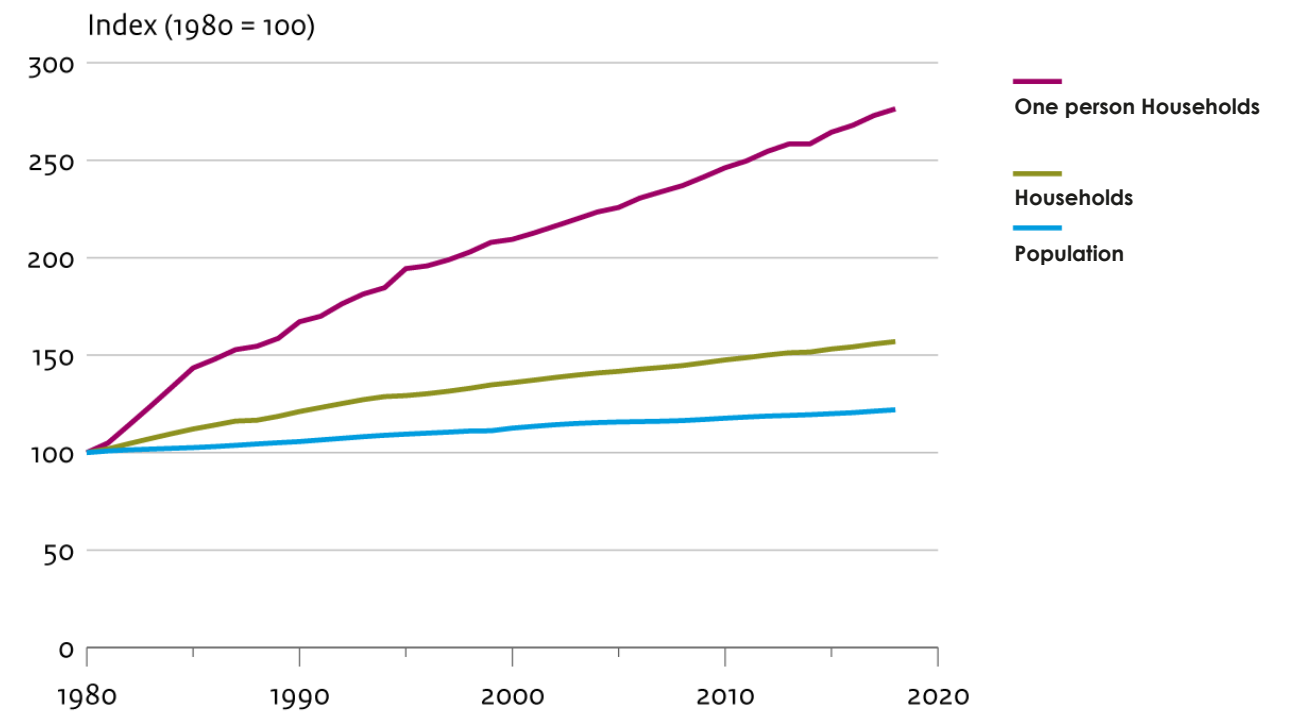
### Average Household Size 1950 - 2019



Bron: CBS

### Population 1980 - 2020

### Bevolkingsomvang en aantal huishoudens



Bron: CBS



# 1M HOMES

## DELFT INTEGRAAL

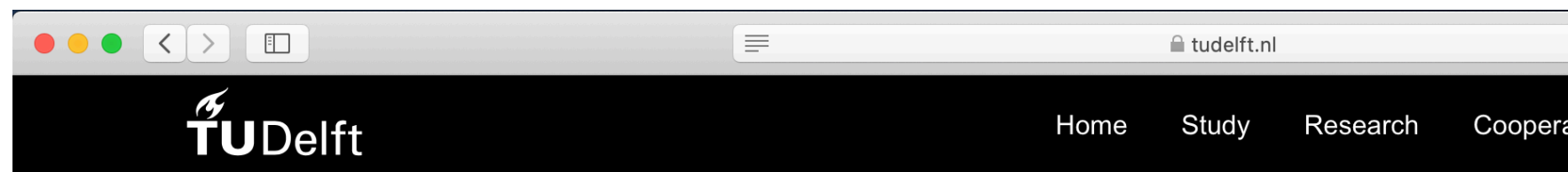
How to build a million new homes

Last spring, Minister of Foreign Affairs Kajsa Ollongren suggested that the Netherlands will need a million new homes by 2030. That sounds like a lot, but it isn't really. The important question is: what types of homes? We mustn't repeat the mistake of building endless series of exactly the same homes, says Prof. Dick van Gameren, Professor of Dwelling at TU Delft.

Dick van Gameren has just returned from India, where he leads a housing design studio for students of KRVIA, an architecture degree programme at the University of Mumbai. The Architecture department of the Faculty of Architecture and the Built Environment has formed a partnership with this school and Van Gameren will be visiting there shortly with a group of TU Delft students.

'The problems in the Netherlands are nothing compared with the challenges in India,' he says. 'Millions live in so-called informal settlements, which are in fact slums. Some people have to make do with only 1 to 1.5 square metres of living space per person, conditions which haven't existed here for 150 years. These were the living conditions of workers in Victorian London and nineteenth-century Amsterdam.'

On the one hand, these conditions make Mumbai's current building challenge completely different to that of the Netherlands, but there are also similarities, caused by the global trend of migration to



Architecture and the Built Environment > Research > Research at BK Bouwkunde > 1M Homes

Research at BK Bouwkunde

Architecture

Architectural Engineering +  
Technology

## 1M Homes

### Creating 1 million homes

**The 1M Homes Initiative is an interdisciplinary platform of research Environment that aims to promote the development of knowledge towards an inclusive, affordable, climate friendly and healthy living environment.**

There is an urgent need for affordable housing solutions in the Netherlands before 2030. However, the focus should not only be on producing new dwellings, but rather on creating homes and neighbourhoods that meet the needs of the future population. In urban regions, housing production lags behind and real estate prices are growing, resulting in a shortage of affordable homes, especially for starters. Moreover, changes in the housing provision have led to a lack of affordable homes in non-urban regions as well.

In response to these challenges, the 1M Homes Initiative brings together experts from various fields to ensure a coherent vision across scales and disciplines. Social, economic, geographical, technological and environmental aspects are equally important. Through living labs we conduct live scale projects and experiments in cooperation between researchers, educators, the public sector, housing associations and society.

#### Latest articles





# PROBLEM

Reportage

## 30 jaar, fulltimebaan, maar nog altijd de badkamer delen

**Woningtekort** De huren zijn te hoog, de koophuizen te duur. En dus moeten stedelijke twintigers en dertigers met een fulltimebaan hospiteren voor een kamer. Best gezellig, maar soms voelt het alsof het leven stilstaat.

Romy van der Poel | 27 april 2020 | Leestijd 5 minuten



### Langer bij ouders of op kamers

Door het woningtekort betrekken bijvoorbeeld twintigers en dertigers later dan gewenst een zelfstandige woning en blijven ze langer bij ouders of op kamers wonen.

Het woningtekort gaat omhoog doordat de bevolking harder groeit dan verwacht en het aantal bouwvergunningen afgelopen jaar is teruggelopen door de stikstofproblematiek.

Source: CBS

**Tekort aan woningen in de regio wordt alleen maar groter: jongeren de dupe**

Ondanks de ambitieuze [bouwplannen](#) voor de regio Rijnmond, dreigt het woningtekort de komende jaren alleen maar groter te worden. Komend jaar zal er in de regio een tekort van bijna 18.000 woningen zijn. In 2025 zijn dat er naar verwachting 21.100, zo blijkt uit nieuw onderzoek van Capital Value en ABF Research. Vooral jongeren zijn de dupe.

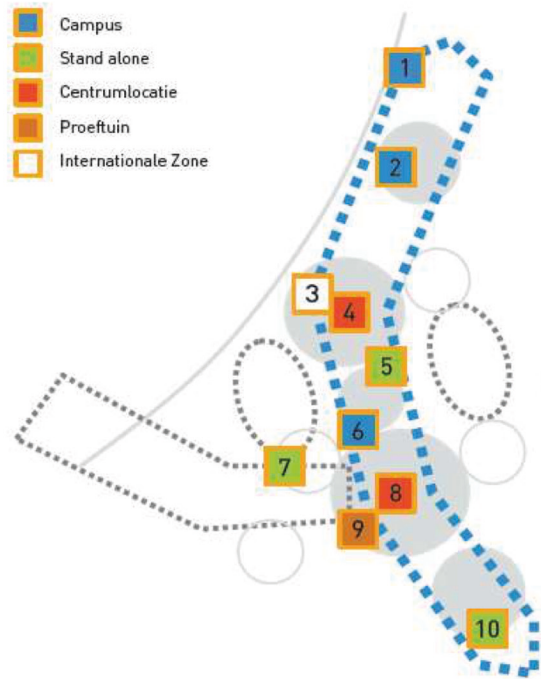
### Aandacht voor specifieke groepen (starters, middeninkomens) en kwetsbare doelgroepen

Voor starters en middeninkomens is het lastig om in de huidige woningmarkt een passende woning te vinden. Zij moeten vaak genoegen nemen met de beschikbare voorraad. Verder is het aandeel van starters op de koopmarkt gedaald van 48% in 2013 naar 32% in 2019. Op lange termijn zijn daarom meer koop- en huurwoningen nodig voor deze groep. Zo hebben corporaties en gemeenten onlangs laten weten 80.000 nieuwe woningen te gaan bouwen met behulp van de regeling vermindering verhuurdersheffing. Naast de starters en middeninkomens lopen kwetsbare groepen tegen soortgelijke problemen aan. Als oplossing gaat 50 miljoen euro extra naar de opvang van dak- en thuislozen en zijn partijen actief bezig met het faciliteren van nieuwe flexwoningen. In het jaar 2019 ging het om een aantal van 3.664.

Source: Rijksoverheid

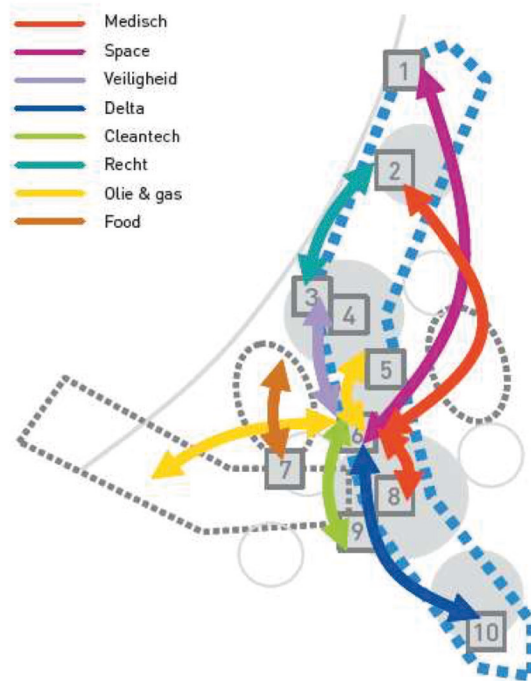


Parels op de kennis-as



- |                       |                              |
|-----------------------|------------------------------|
| 1 ESA Estec           | 6 TIC Delft                  |
| 2 Bio Sciencepark     | 7 Unilever Lab               |
| 3 Internationale Zone | 8 Rotterdam Central District |
| 4 Den Haag Centrum    | 9 Stadshavens/CTD            |
| 5 Shell Lab Rijswijk  | 10 Waterbouwers              |

Schakels op de kennis-as



- |                       |                              |
|-----------------------|------------------------------|
| 1 ESA Estec           | 6 TIC Delft                  |
| 2 Bio Sciencepark     | 7 Unilever Lab               |
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| 5 Shell Lab Rijswijk  | 10 Waterbouwers              |





# ZUIDVLEUGEL REGION



Just graduated starters want to live here



230.000 homes before 2030



Keep the 'young potentials' in the city after graduation







# RESEARCH:

How to create a building block that perfectly meets the requirements and wishes of the young graduated starter?

# STARTERS

## KNOWLEDGE WORKERS

YOUNG SINGLES



YOUNG COUPLES



YOUNG EXPATS

- **JUST GRADUATED**

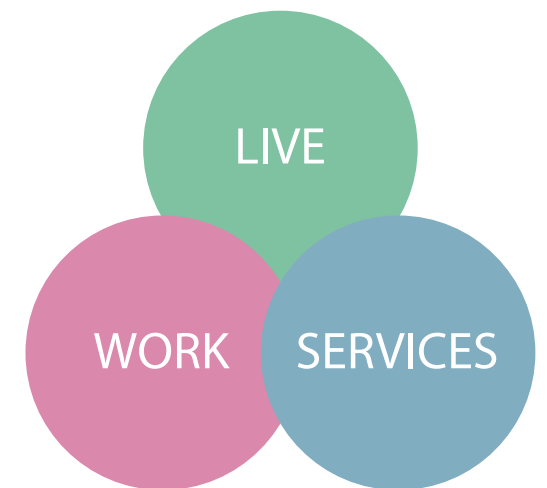
- **HIGH EDUCATED**

- **UNCERTAIN JOB**

- INCOME TOO HIGH FOR SOCIAL RENT

- INCOME TOO LOW FOR THE FREE MARKET

- NEED TO LIVE IN THE CITY FOR WORK AND NETWORK





# PREFERENCES



## SINGLES (23-28)

- Rent
- Uncertain Future
- Location is the most important
- Around City Center
- Studio/Apartment
- 1/2 Rooms
- 40-70 m<sup>2</sup>
- ± €700,- Incl.



## YOUNG COUPLES (28-35)

- Rent/Buy
- Ensured Job
- Location is still important
- Size of the house is important
- Around City Center
- Apartment
- 2/3 Rooms
- 80-100 m<sup>2</sup>
- > €1000,- Excl.



## EXPATS (25-30)

- Rent
- 'Short Stay'
- Location is the most important
- Preference for Furnished Room
- Studio/Apartment
- 1/2 Rooms
- Price is less important



## LIVE

- Living urban environment with various types of building and population
- Green Neighbourhood
- Studio / Small Apartment
- The city as an extension of the house
- Small private outdoor space



## WORK

- Large international offices
- Technical startups
- University Campus



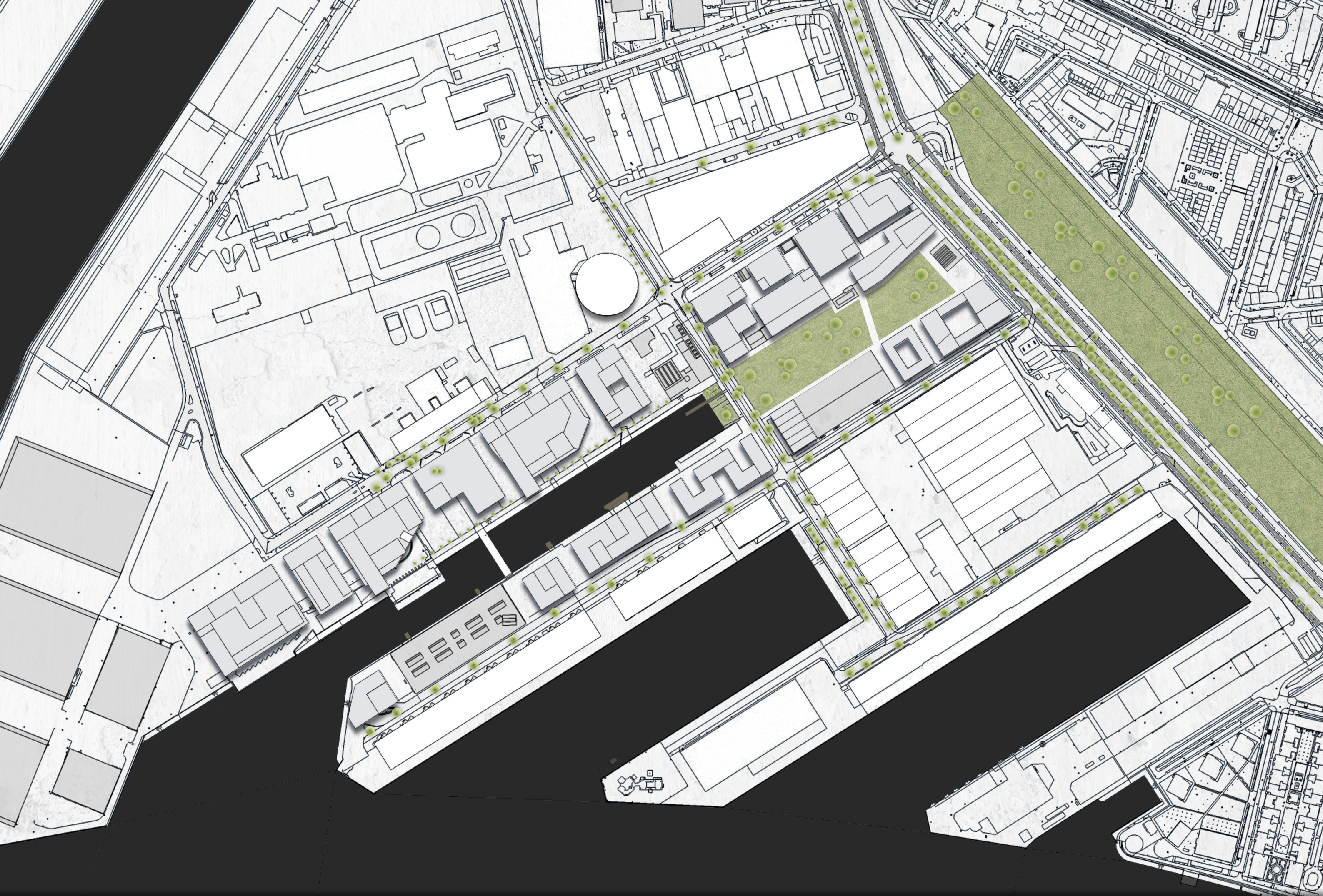
## SERVICES

- Shared Facilities
- Urban Facilities on walking/biking distance
- Good Connection to Public Transport
- Close to the city center
- 'Urban Living Rooms' Like a coffeebar

# COLLECTIVITY











Keileweg

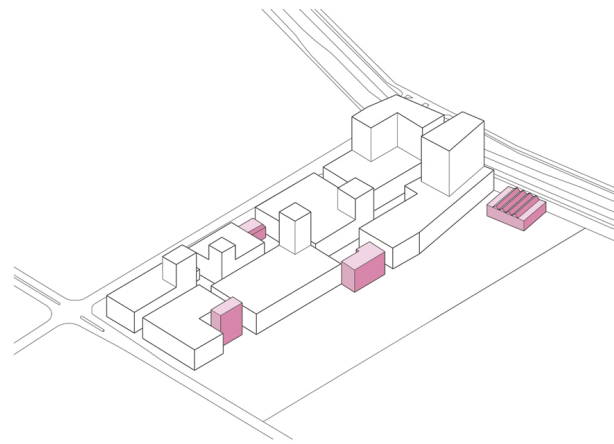
Benjamin Franklinstraat

Vlietavenstraat

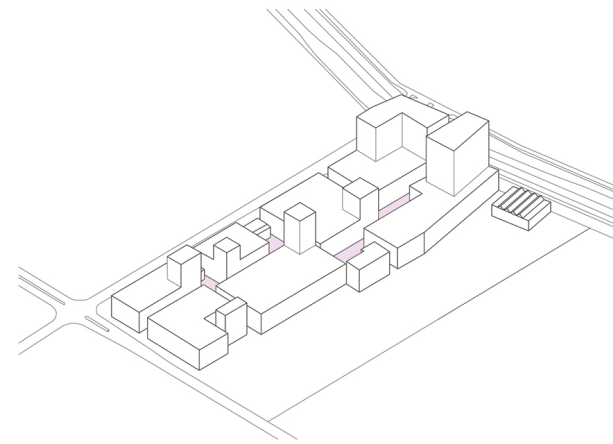
Keilestraat



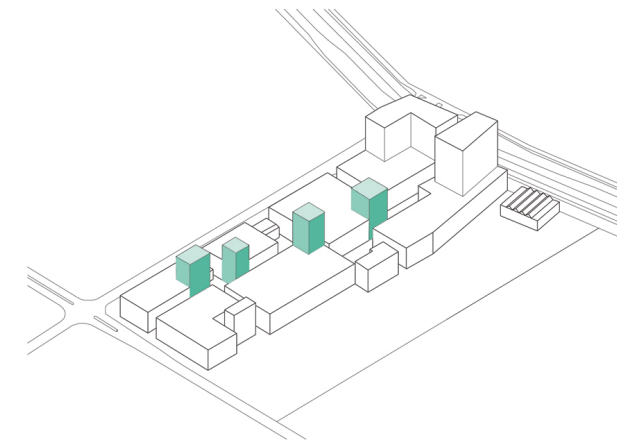
# URBAN PLAN



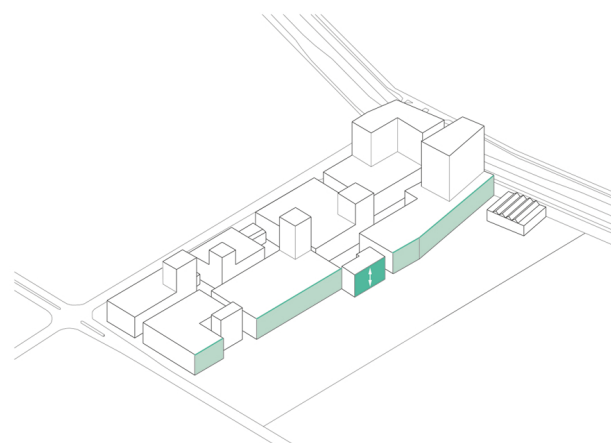
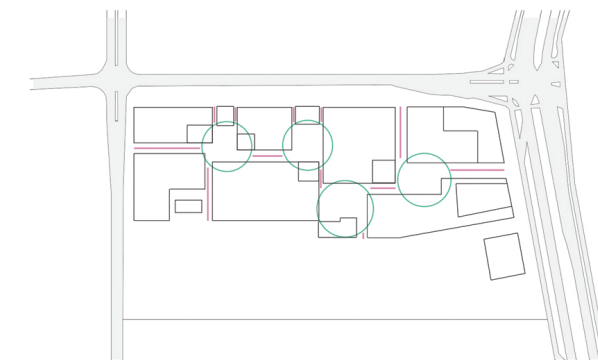
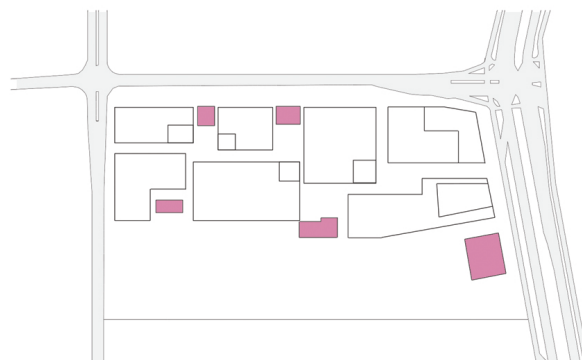
Keep the old characteristic buildings  
And form the new buildings around them.



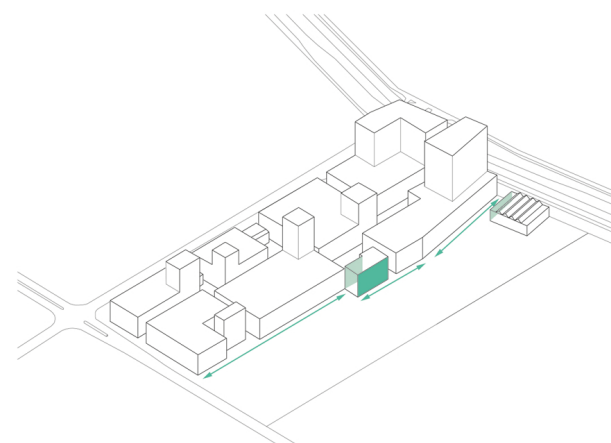
Create small squares inside the block  
to keep the cozyness of the current  
area alive



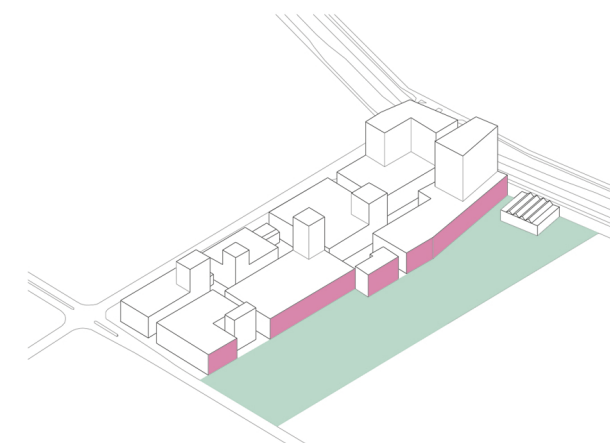
Create landmarks  
at the end of every street



The building height at the park side  
is based on the height of the soundport  
building

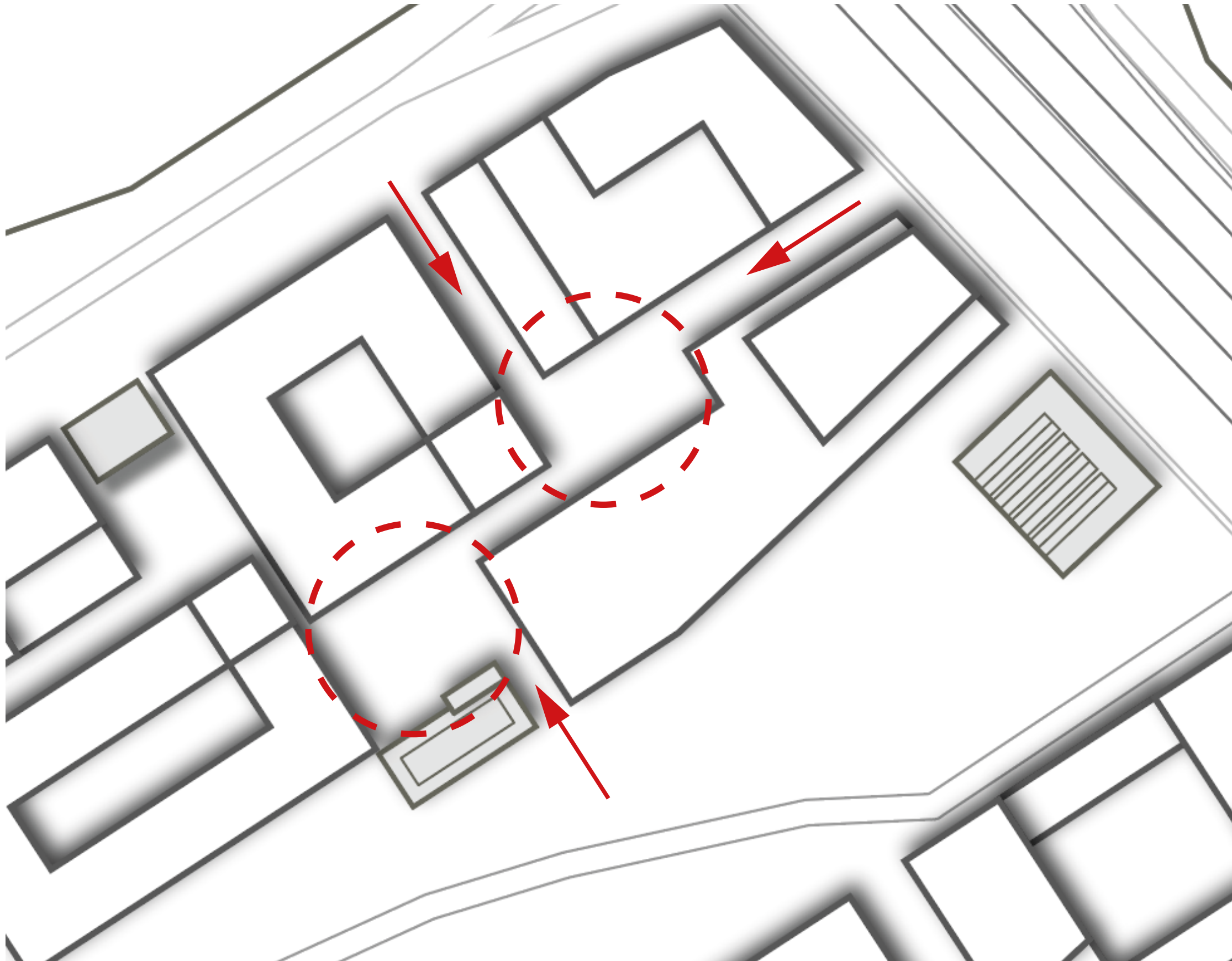


The building line at the park side  
is based on the kept buildings



The facades at the park side  
are all the same height and orientated to  
the park (South-East)

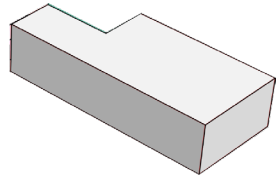
# SQUARES



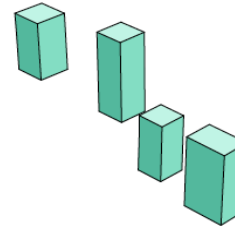


# URBAN BLOCK

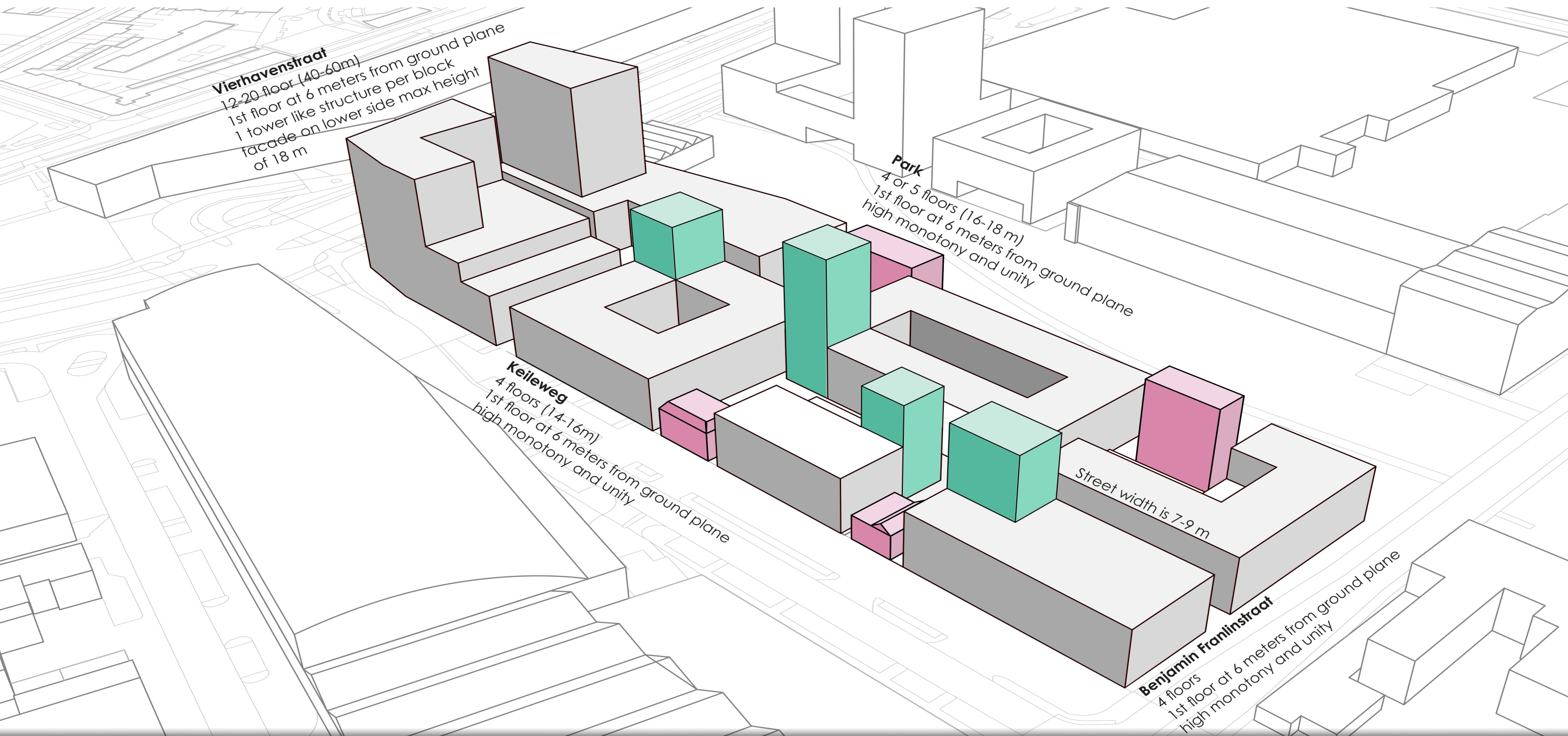
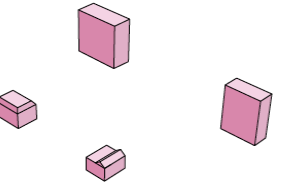
**Building blocks**  
 Plint height 6 meter  
 4 Layers on top  
 Monotony and Unity



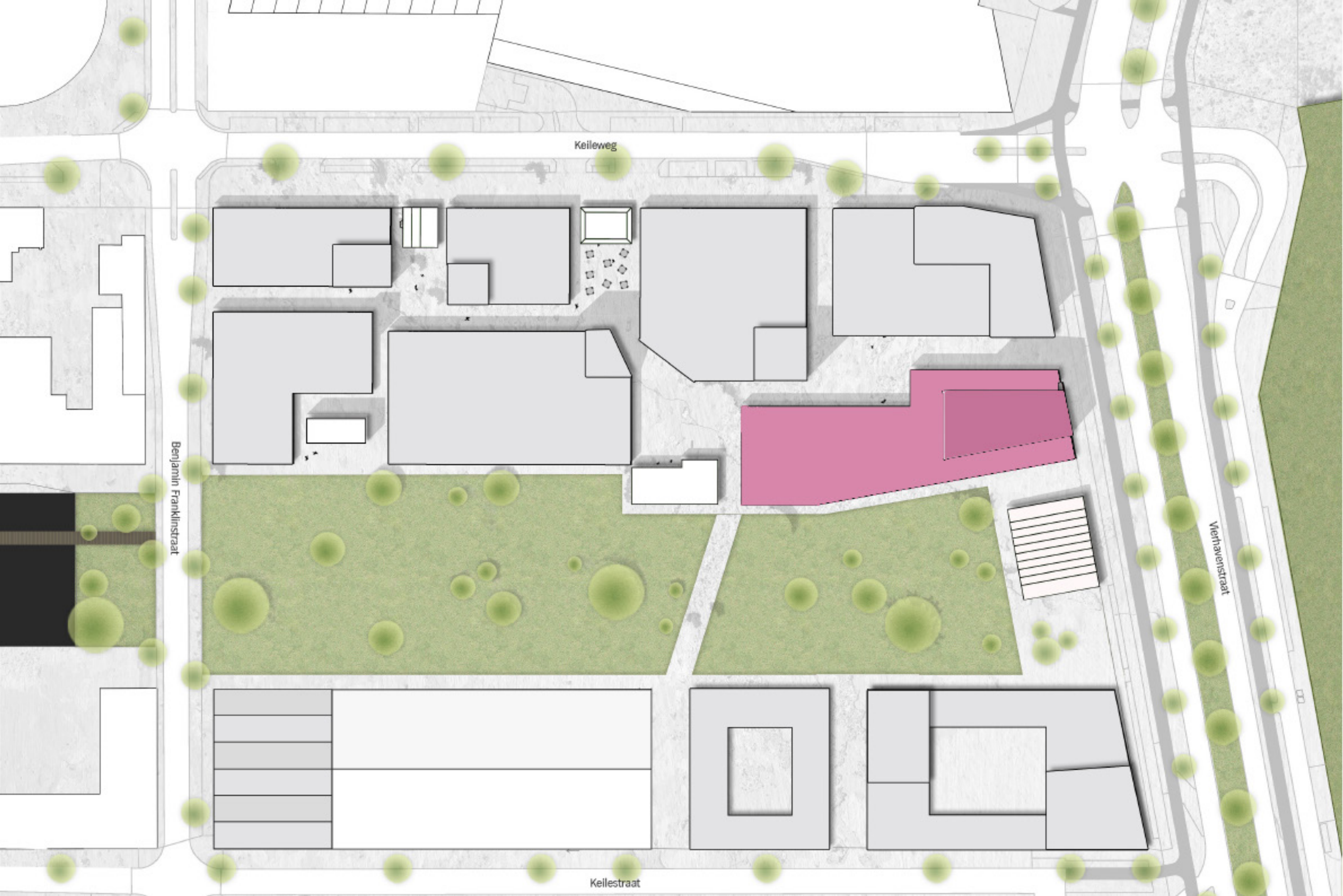
**The Towers**  
 8-12 Floors High  
 Need to be visible from the ground floor of the Ferrodome



**Kept Structures**  
 Original character and structure are kept. Only minor refurbishments and interventions









DESIGN:



# STARTING POINT



## SINGLES (23-28)

- Rent
- Uncertain Future
- Location is the most important
- Around City Center
- Studio/Apartment
- 1/2 Rooms
- 40-70 m<sup>2</sup>
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AFFORDABLE

COLLECTIVITY

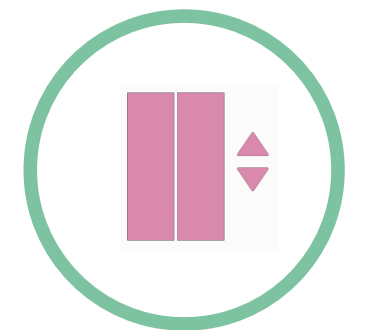
SUSTAINABILITY

LIVE-WORK ENVIRONMENT



## LIVE

Living urban environment with various types of building and population  
Green Neighbourhood  
Studio / Small Apartment  
The city as an extension of the house  
Small private outdoor space



## WORK

Large international offices  
Technical startups  
University Campus



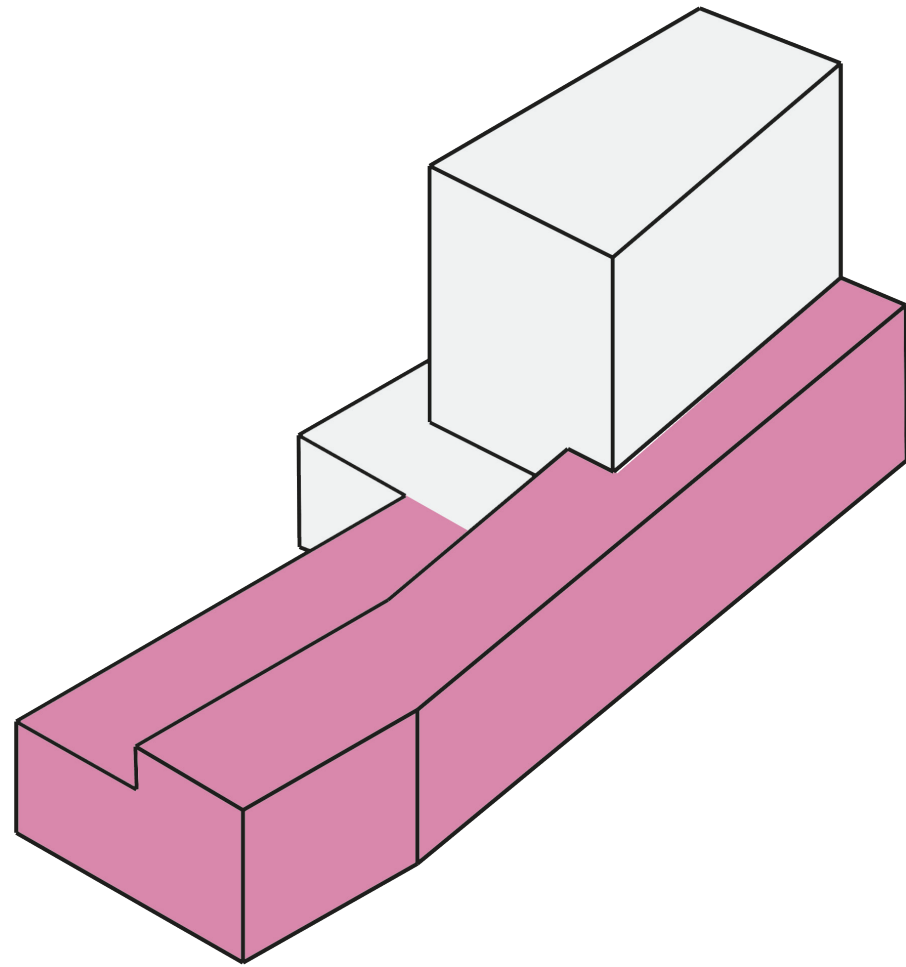
## SERVICES

Shared Facilities  
Urban Facilities on walking/biking distance  
Good Connection to Public Transport  
Close to the city center  
'Urban Living Rooms' Like a coffeebar



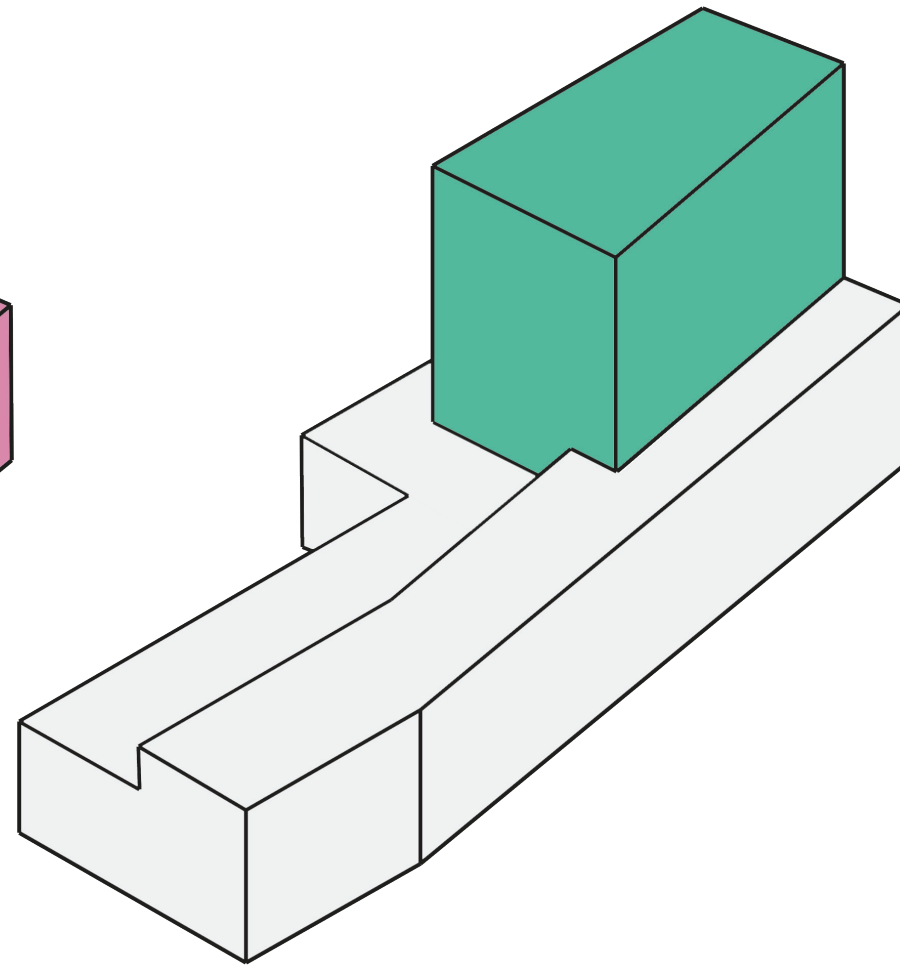


# CONCEPT



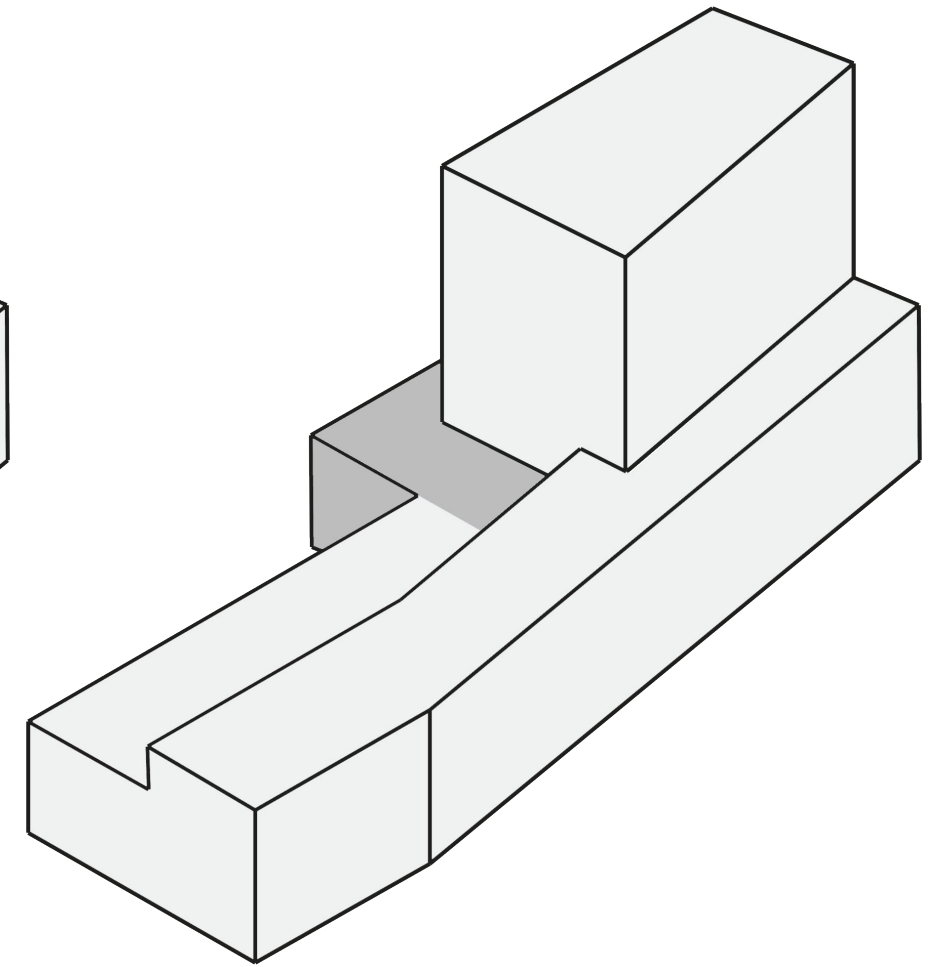
## Low Rise

4-6 Floors  
Studios  
Apartments  
Corridor Acces  
Elevator and Stairs



## High Rise

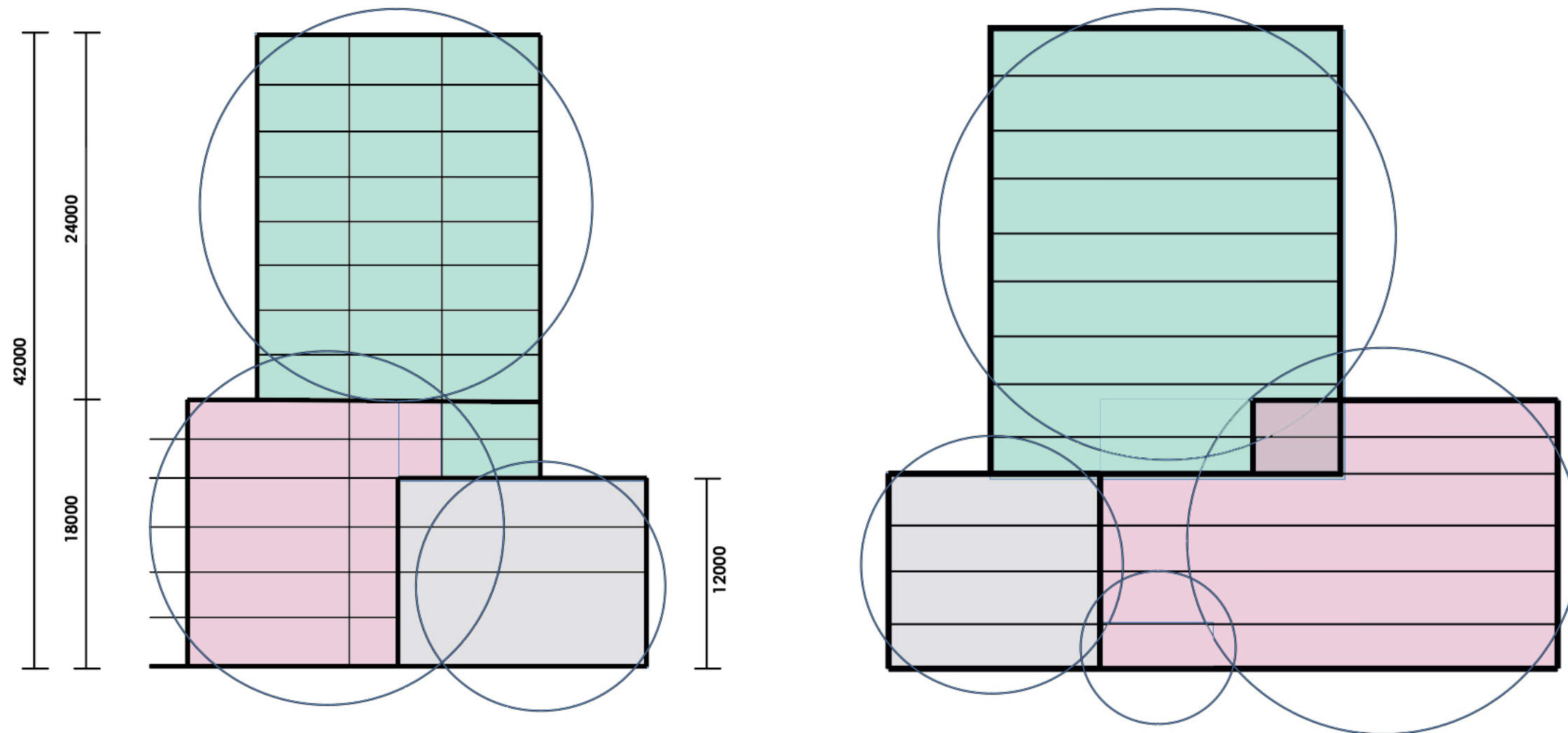
13 Floors  
Apartments  
Core Acces  
Elevator and Stairs



## Makers

6 Meter plint height  
2 Floors above  
Workshop and offices  
Glass Facade

# CONCEPT





# SUSTAINABILITY

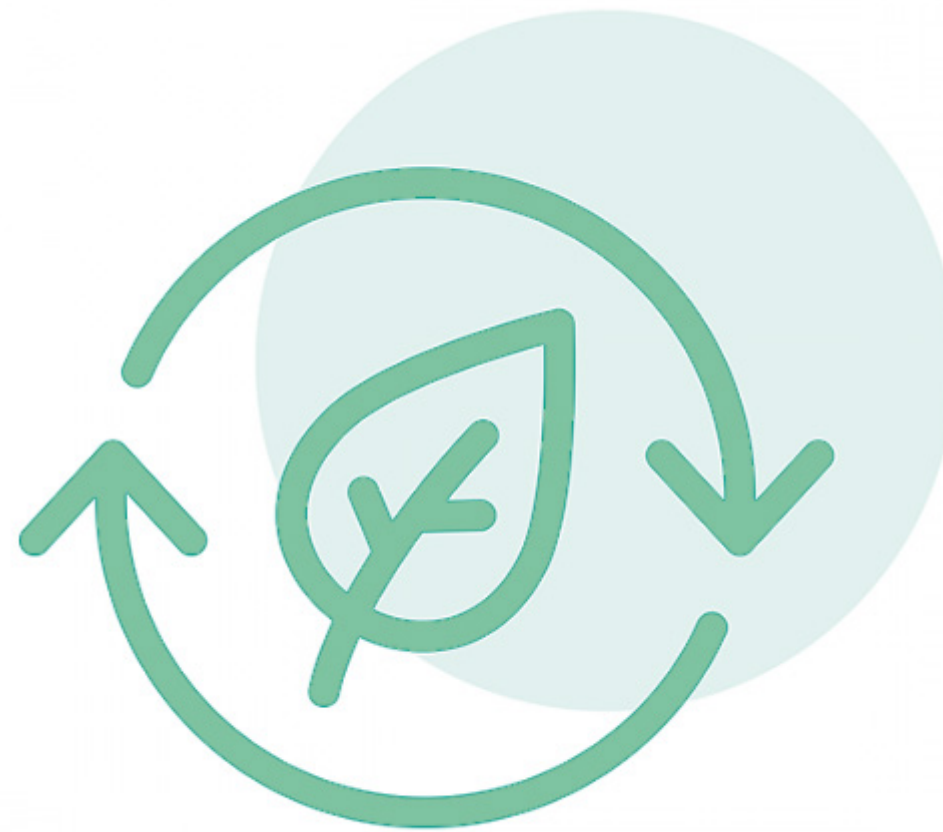
BENG

'Bijne Energie Neutraal Gebouw'

LOW IN ENERGY

SELF-SUFFICIENT

RENEWABLE  
MATERIALS



SMALL DWELLINGS

GREEN ROOF

SOLAR PANELS

HEATING PUMP

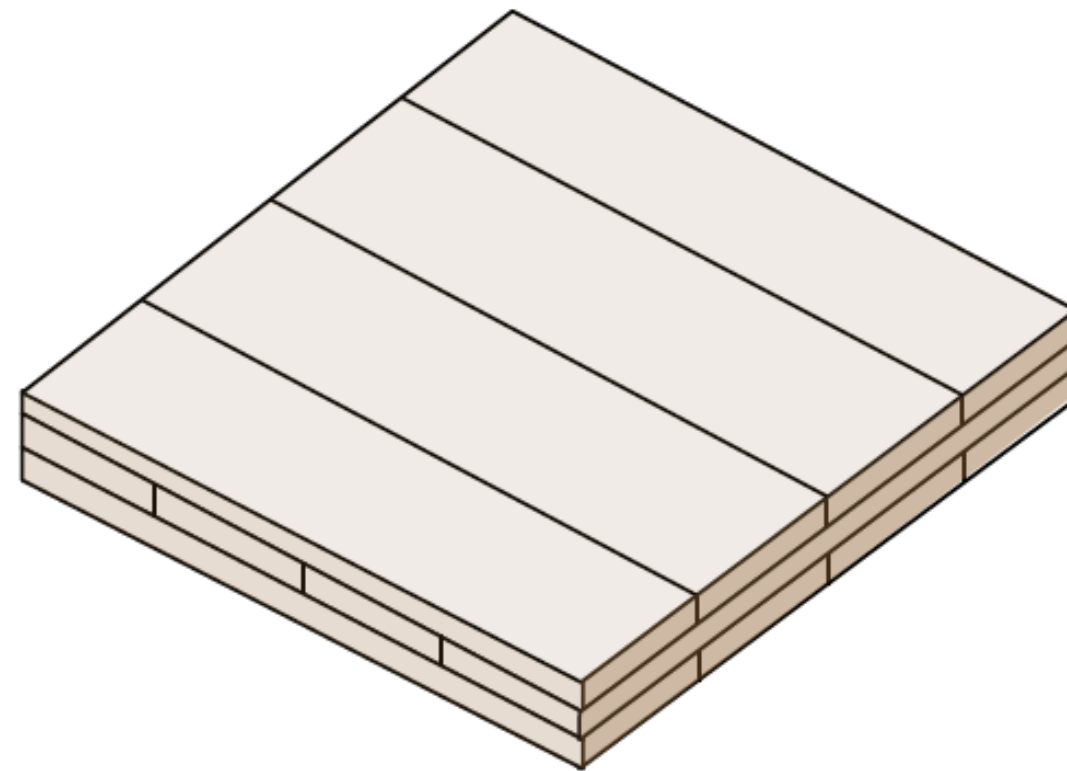
# CLT

PREFABRICATION

LESS CO<sub>2</sub>

FIRE RESISTANT

RENEWABLE  
MATERIAL



GOOD INSULATION

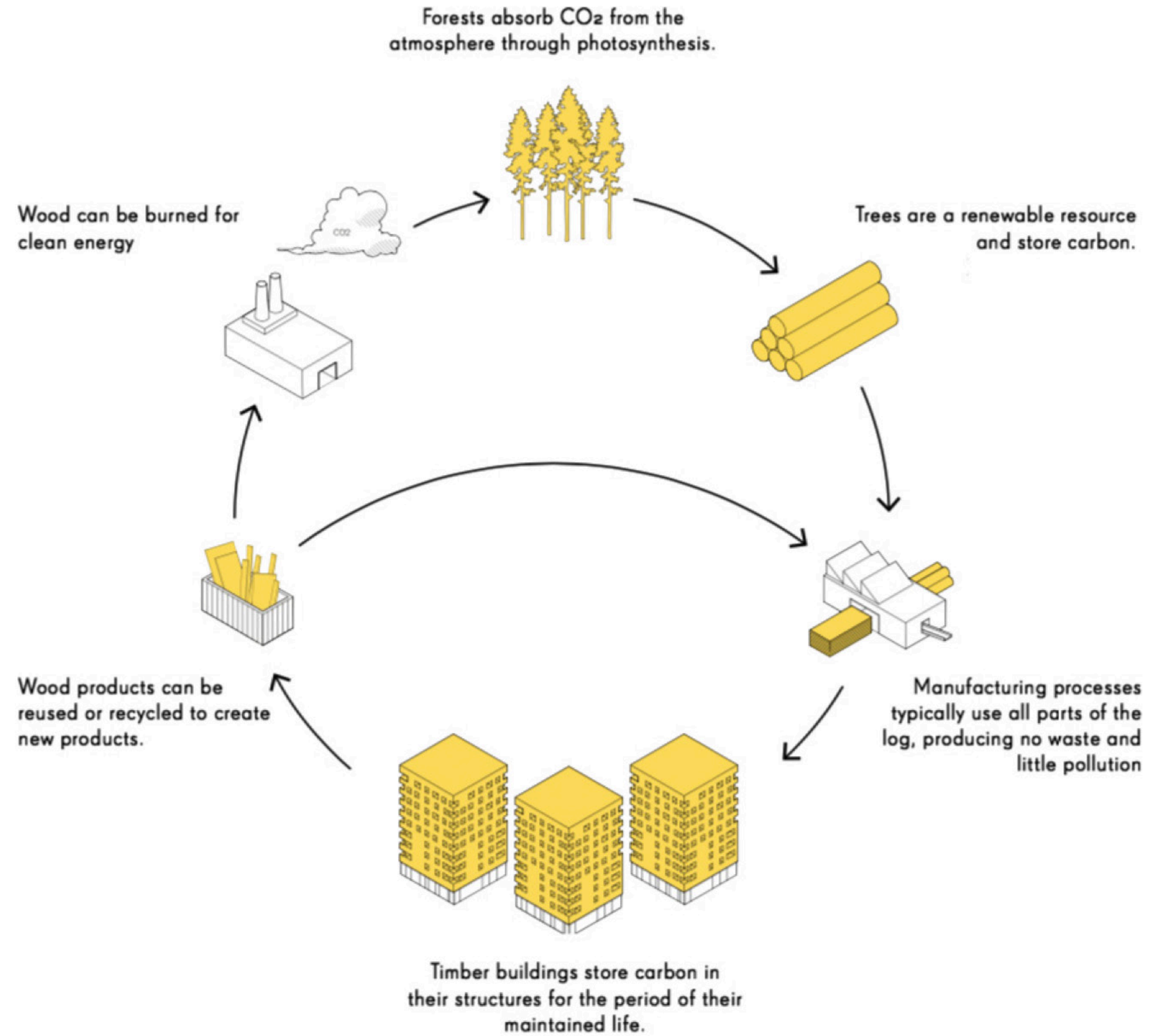
LIGHT WEIGHT

LESS WASTE

FASTER  
CONSTRUCTION

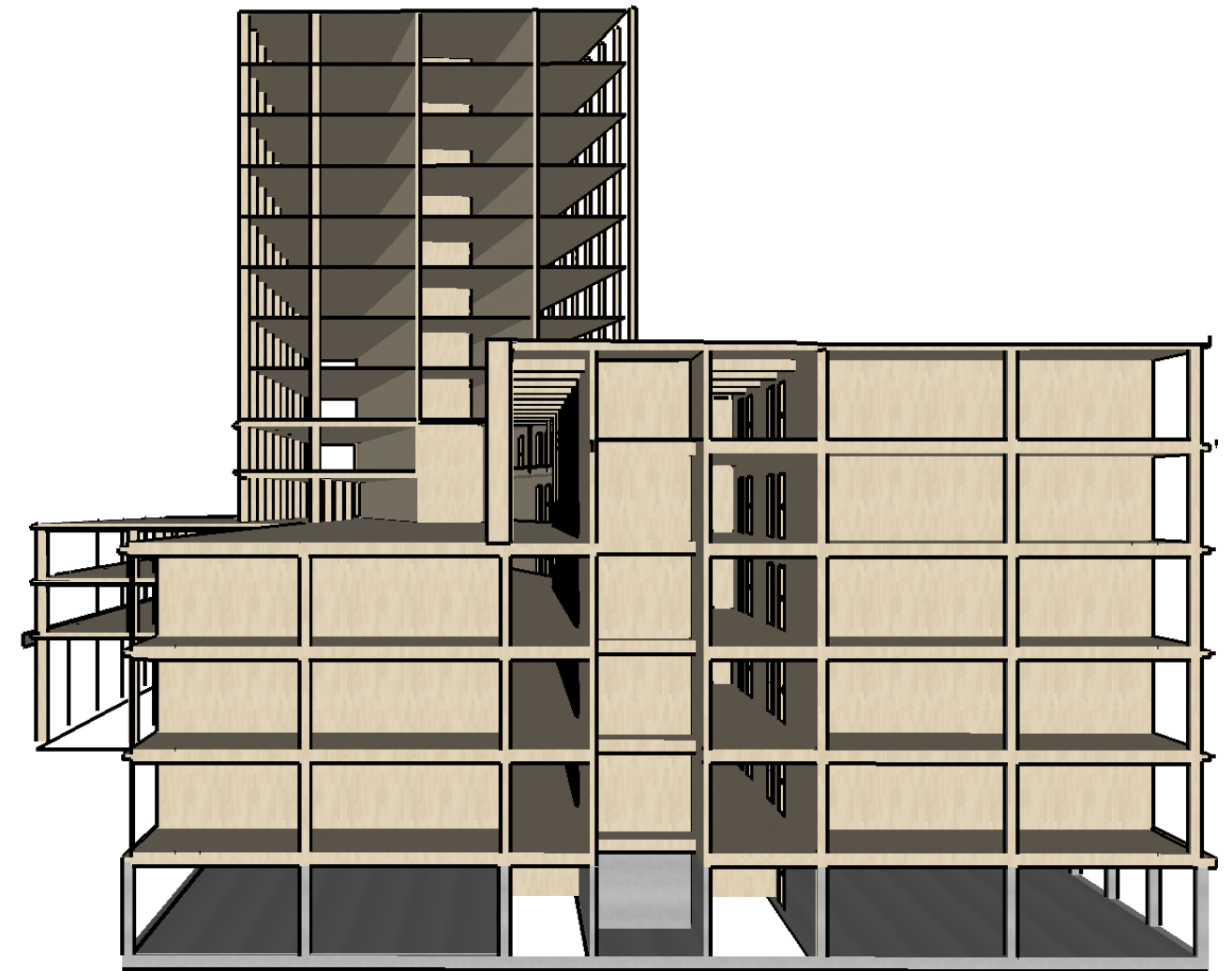
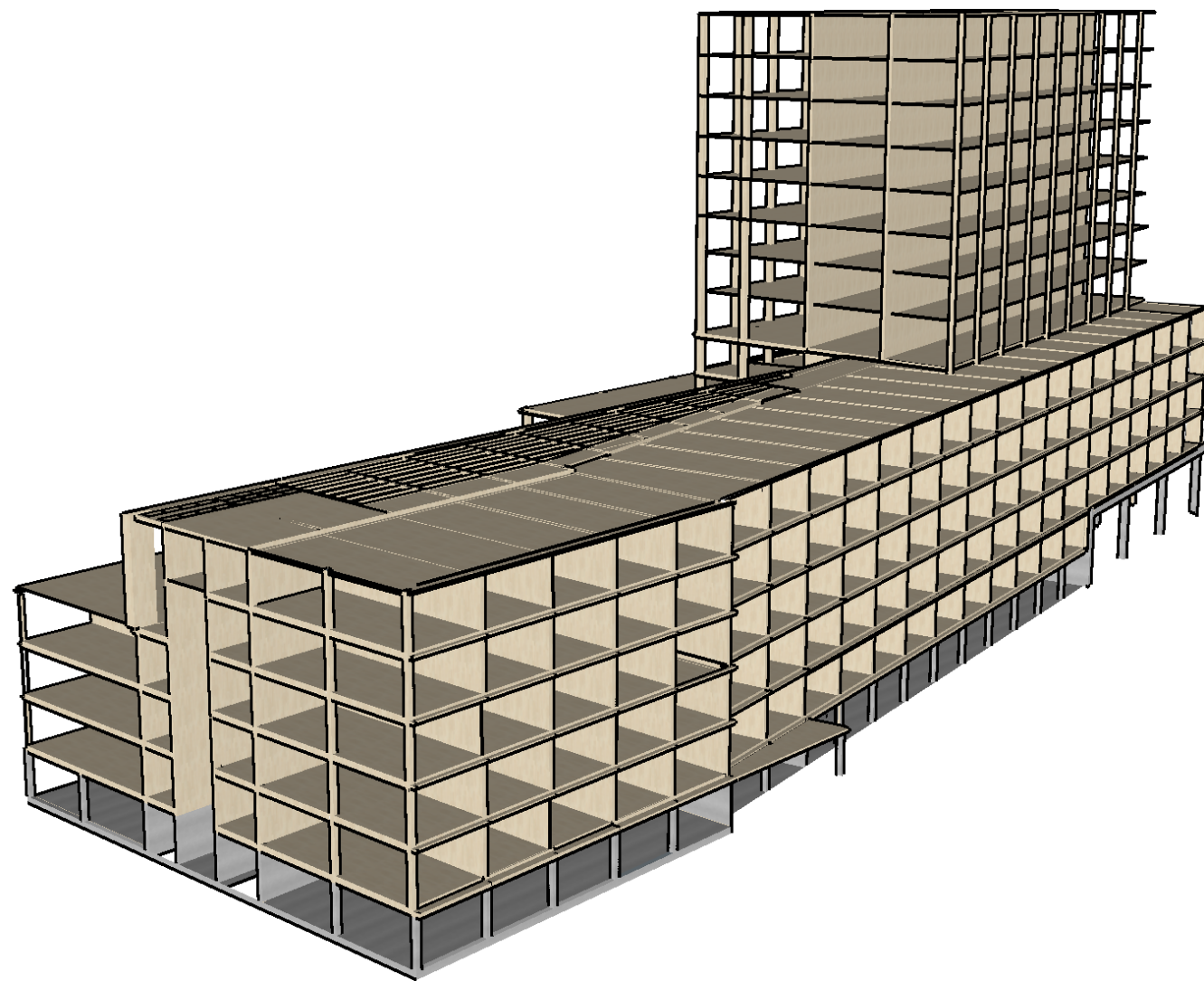


# CLT



Bouwen in CLT: duurzaam en circulair - © Waugh Thistleton Architects

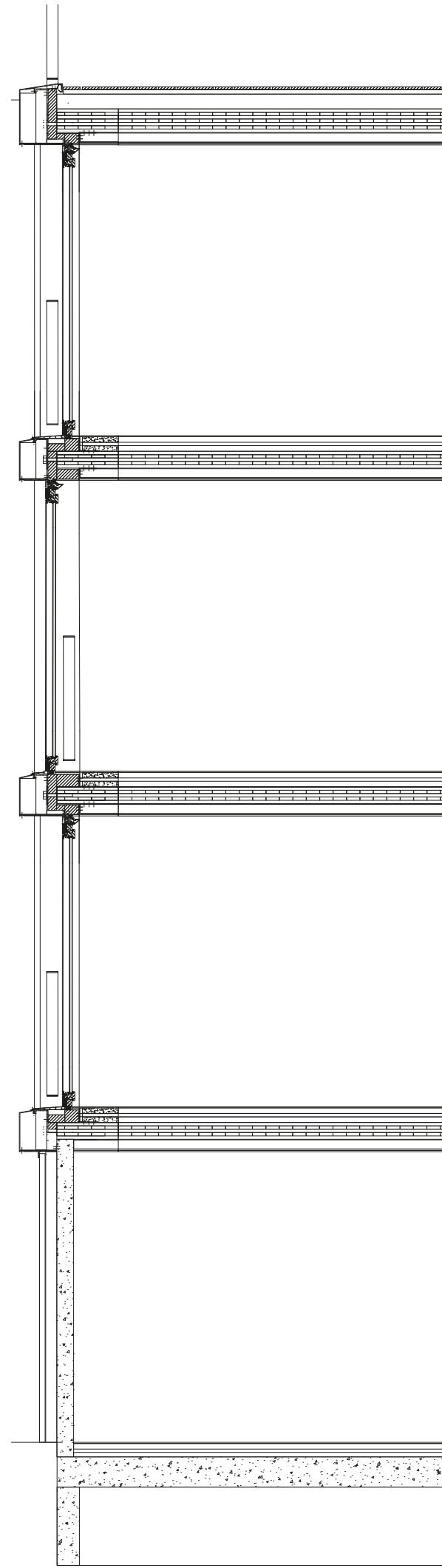
# CONSTRUCTION



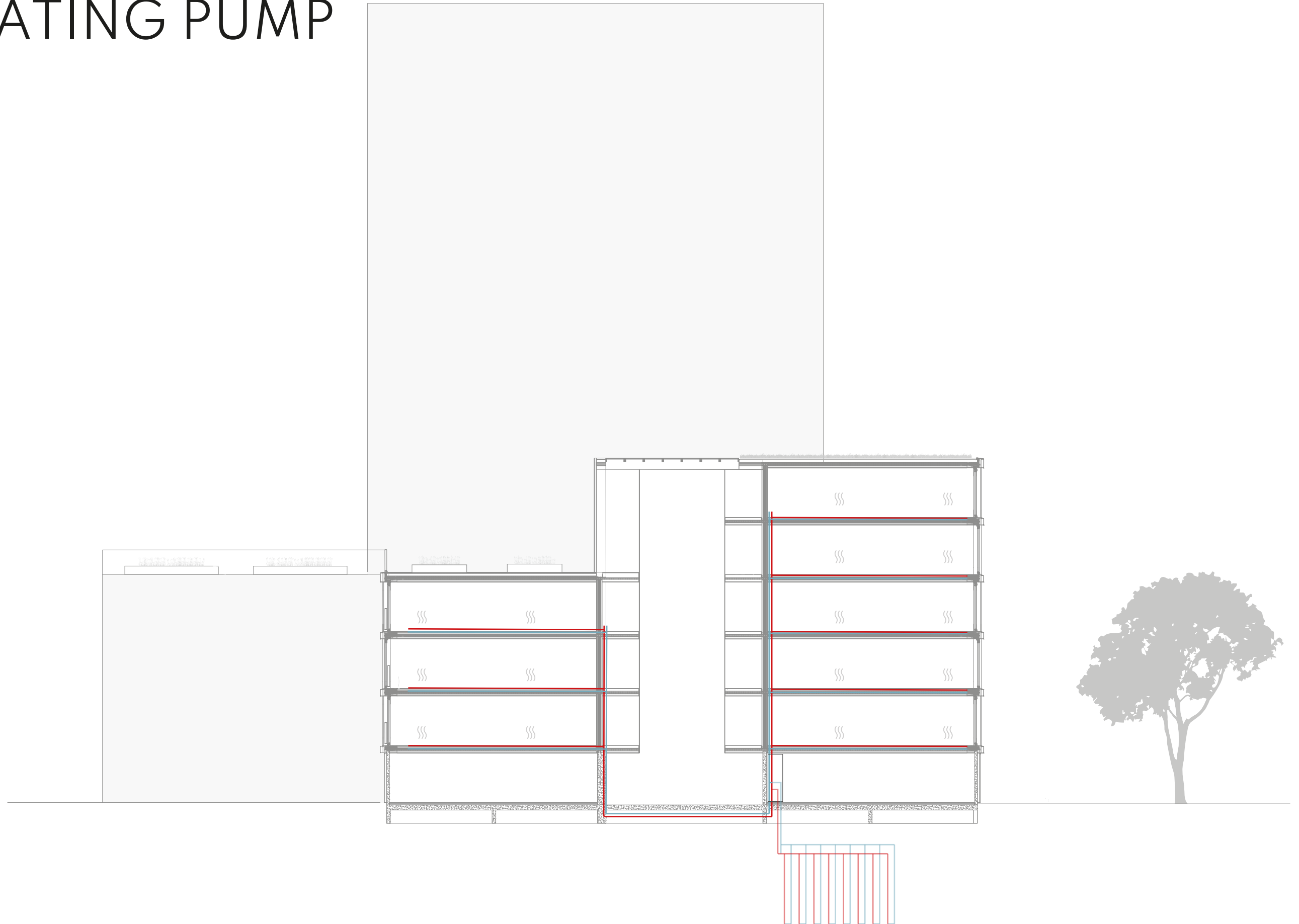


CROSS LAMINATED TIMBER

CONCRETE

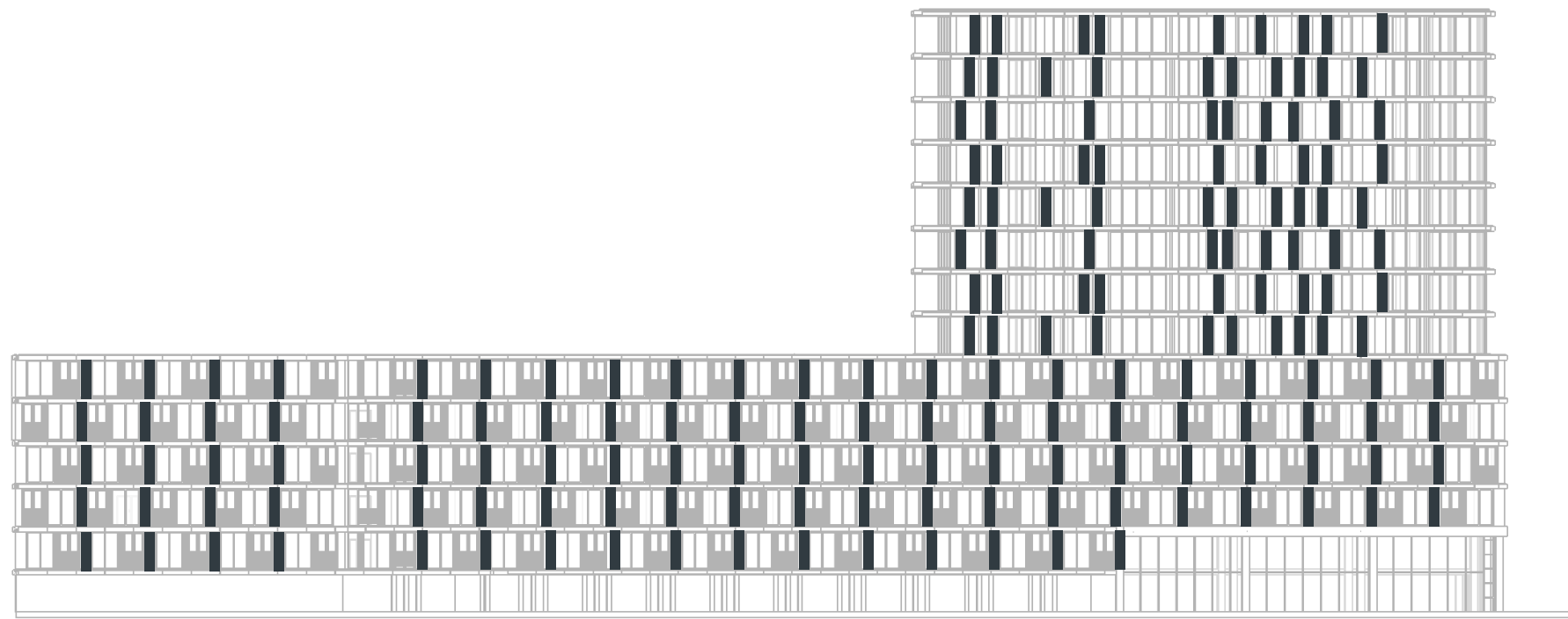


# HEATING PUMP





# SOLAR PANELS



## ENERGY BY SOLAR PANELS

- Southwest Facade
- Southeast Facade

By using solar panels most of the needed energy for the building is produced on a natural way. The panels are integrated in the facade, which gives the facade a modern appearance.

## TOWER LOWRISE

880x2600  
216 x 2.288

116 x  
100 x

2.288 m<sup>2</sup>  
494 m<sup>2</sup>

## ROOF

1100 m<sup>2</sup>

## TOTAL

**1594 m<sup>2</sup>**

OUTPUT/M<sup>2</sup>

150 kWh

**TOTAL OUTPUT**

**239,100 kWh/J**



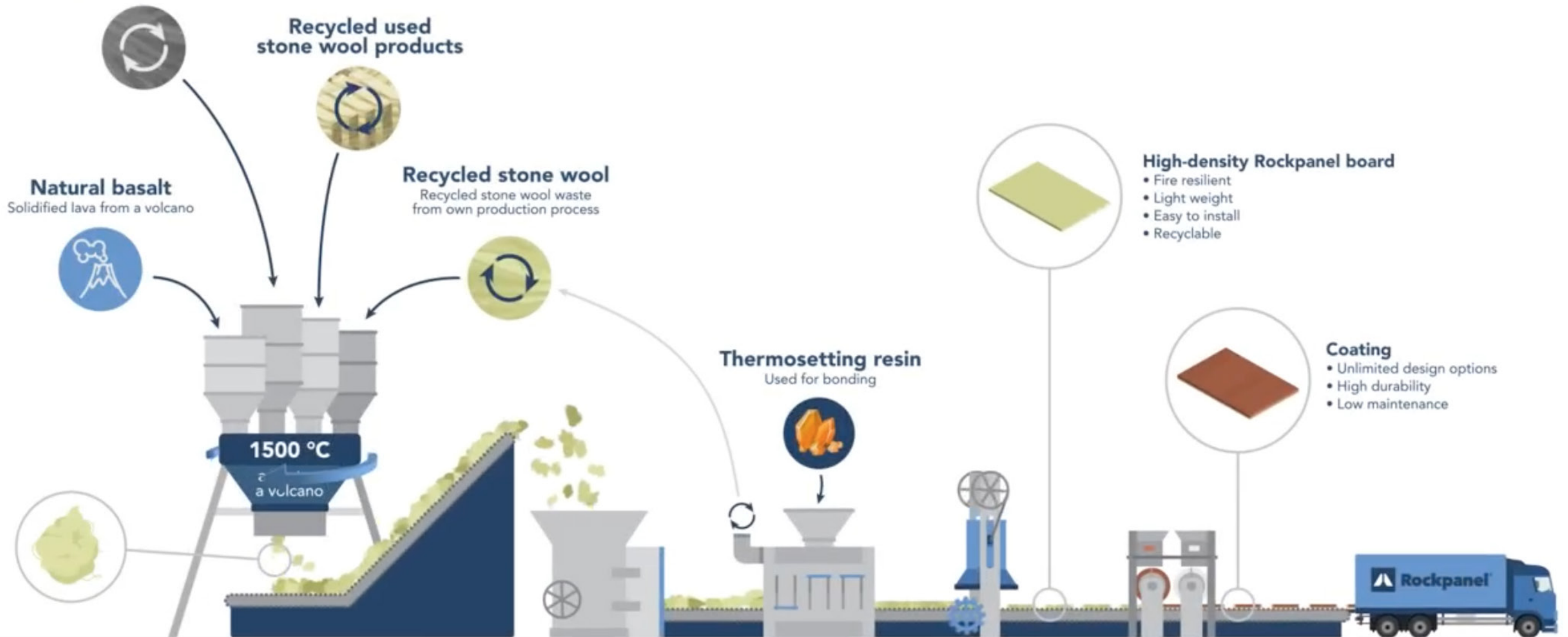




# FAÇADE MATERIAL

## Rockpanel

**Secondary raw materials**  
Recycled content from other industries



STEP 1  
**Producing stone wool fibres**

STEP 2  
**Pressing the boards**

STEP 3  
**Coating the boards**

# FAÇADE MATERIAL

Rockpanel



FIRE RESISTANT MATERIAL



NATURAL MATERIAL



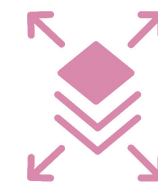
ENVIRONMENTAL FRIENDLY



DURABLE MATERIAL



ENDLESS COLOUR  
POSSIBILITIES



FLEXIBLE MATERIAL



HIGH SELF-CLEANING  
ABILITY



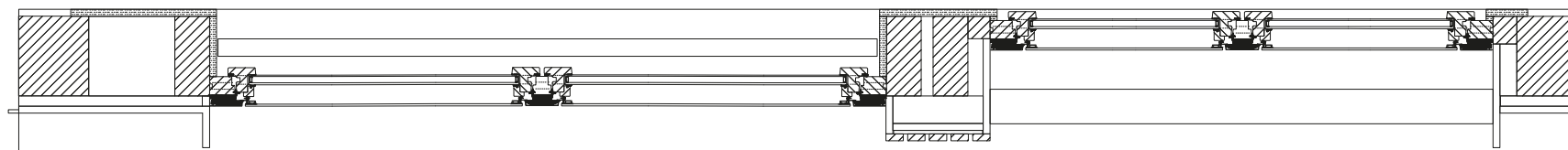
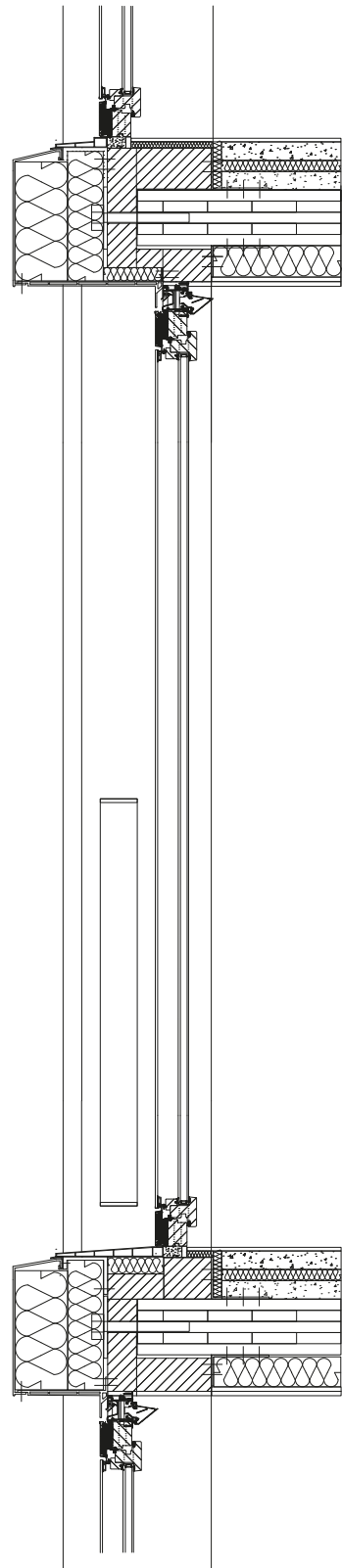
100% RECYCABLE



HEATED ON 1500 C





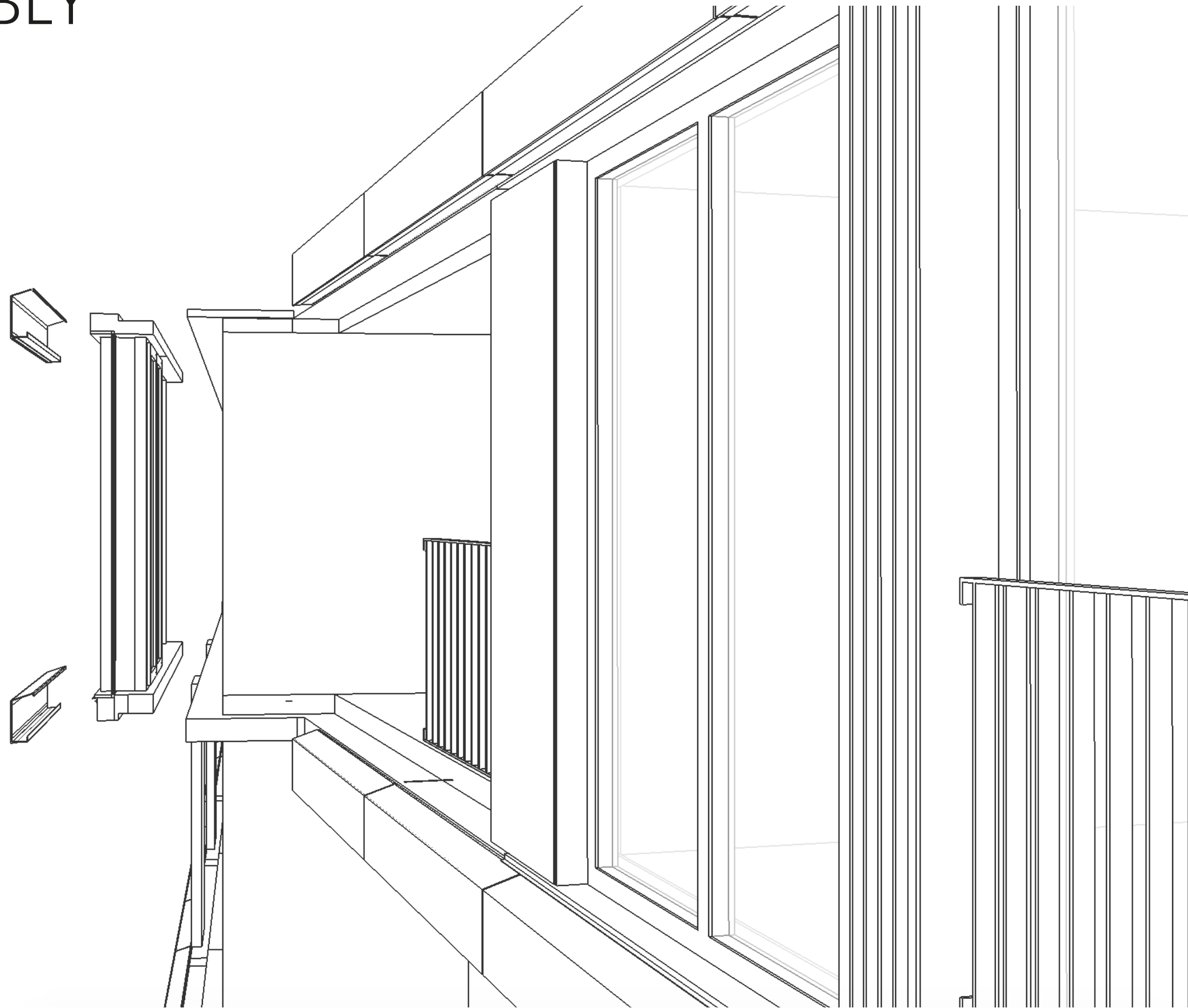




# FAÇADE ELEMENTS

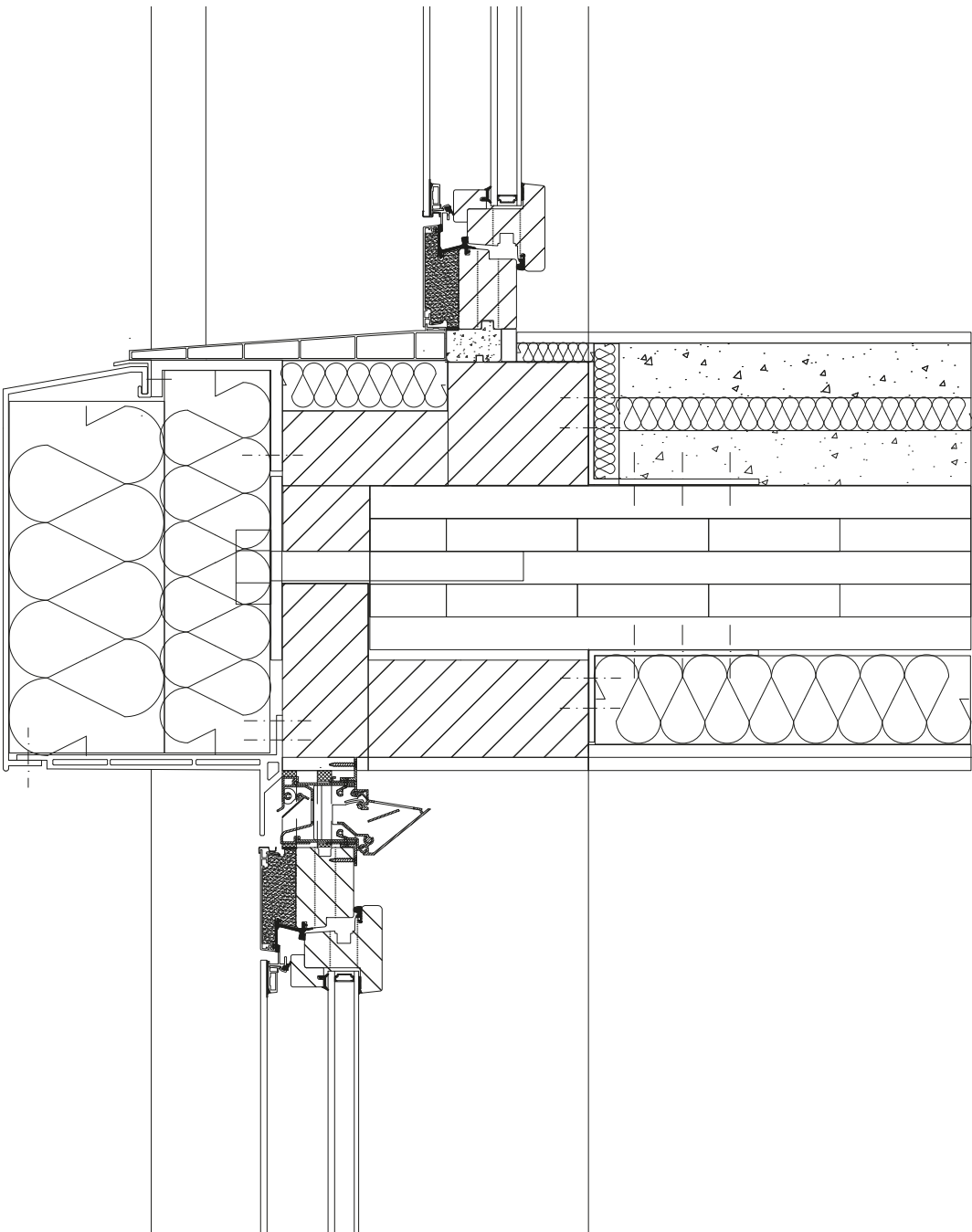
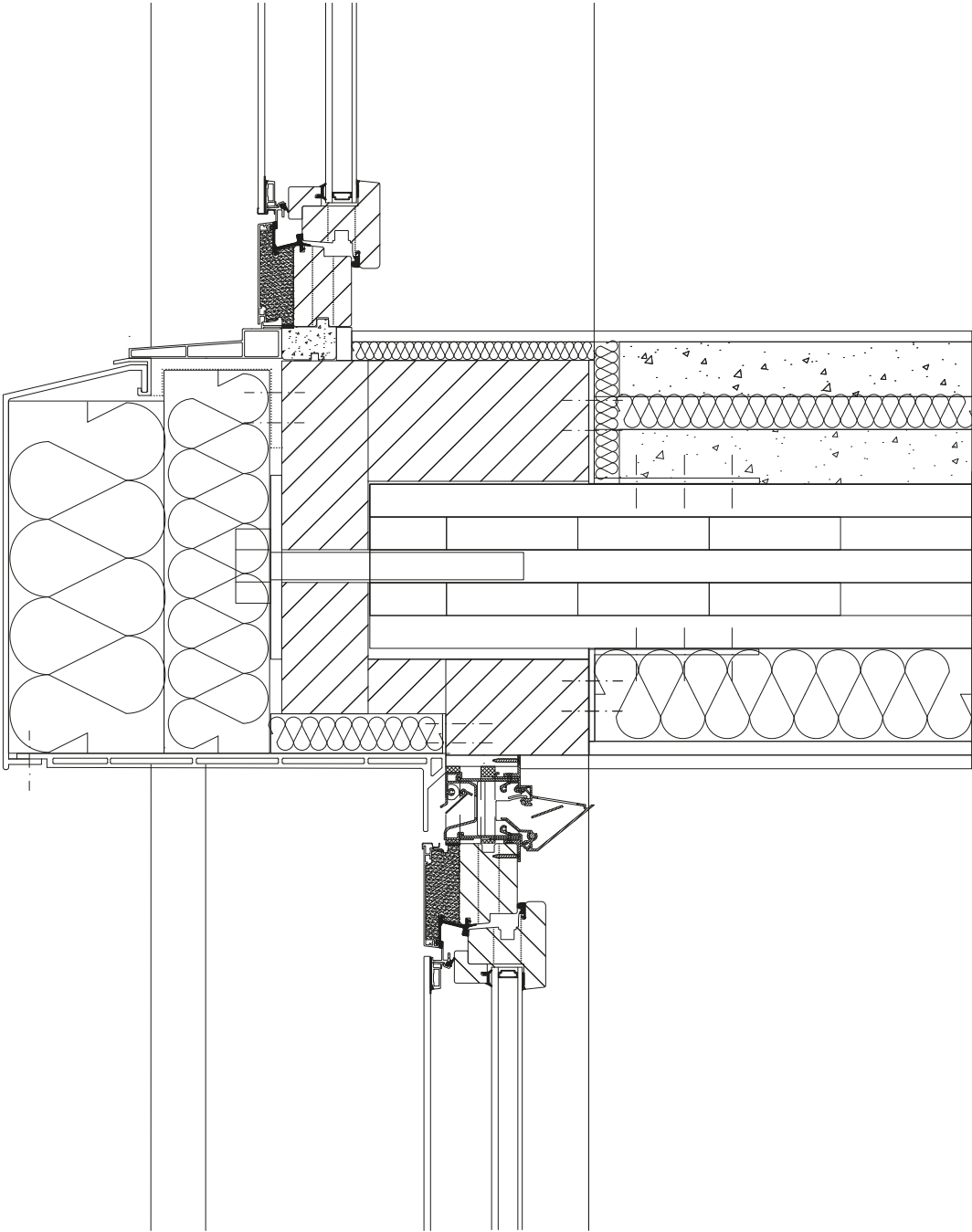


# ASSEMBLY

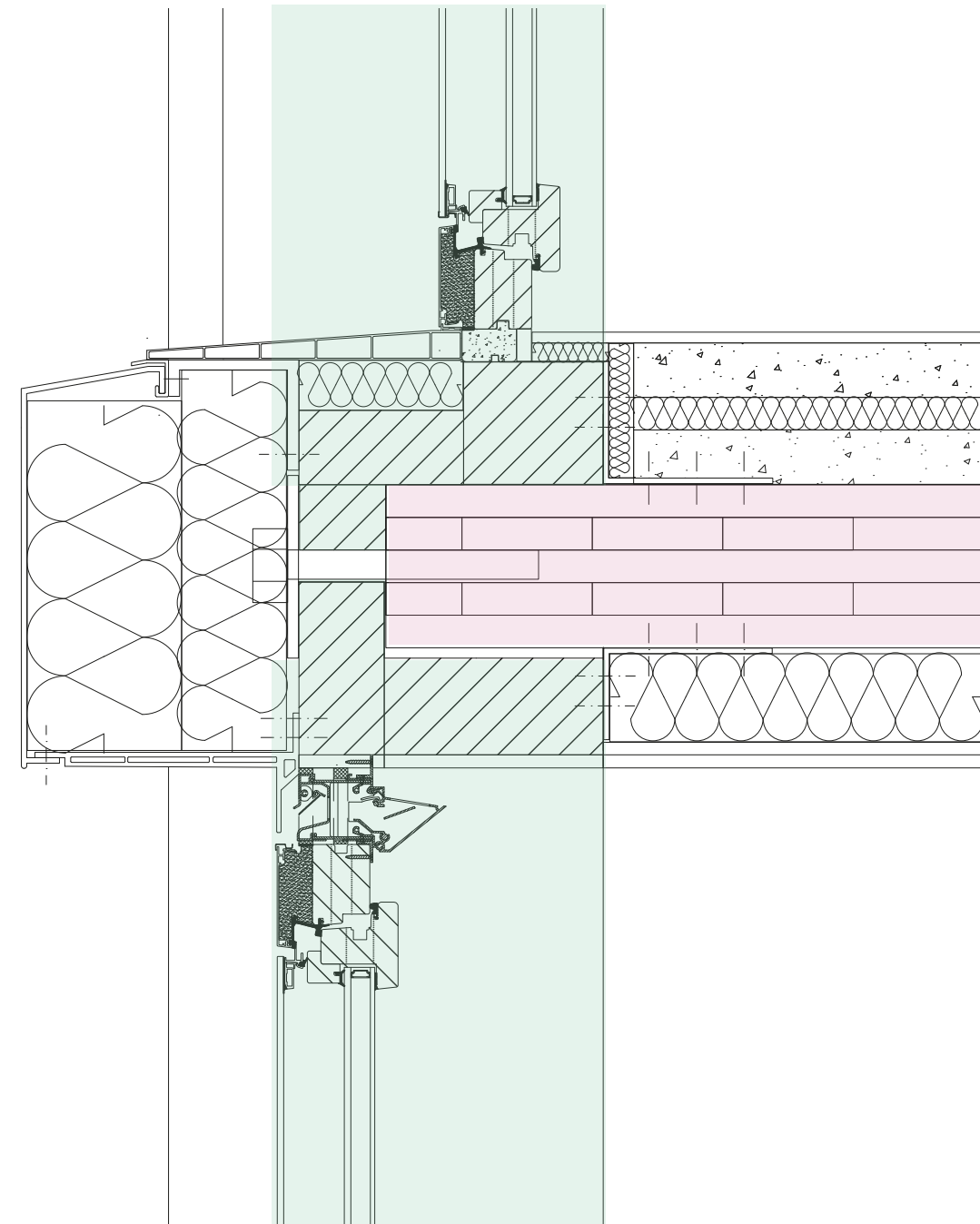
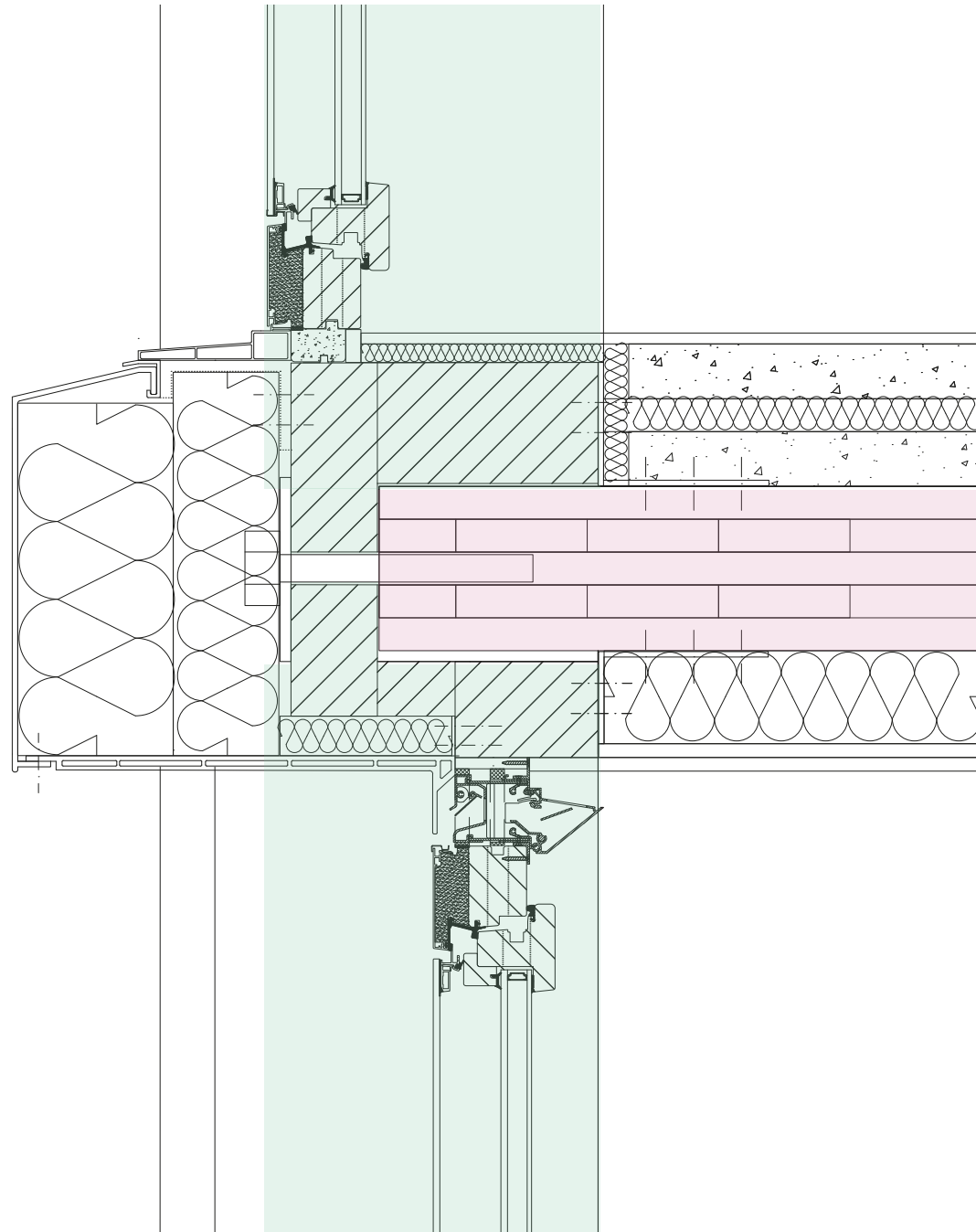




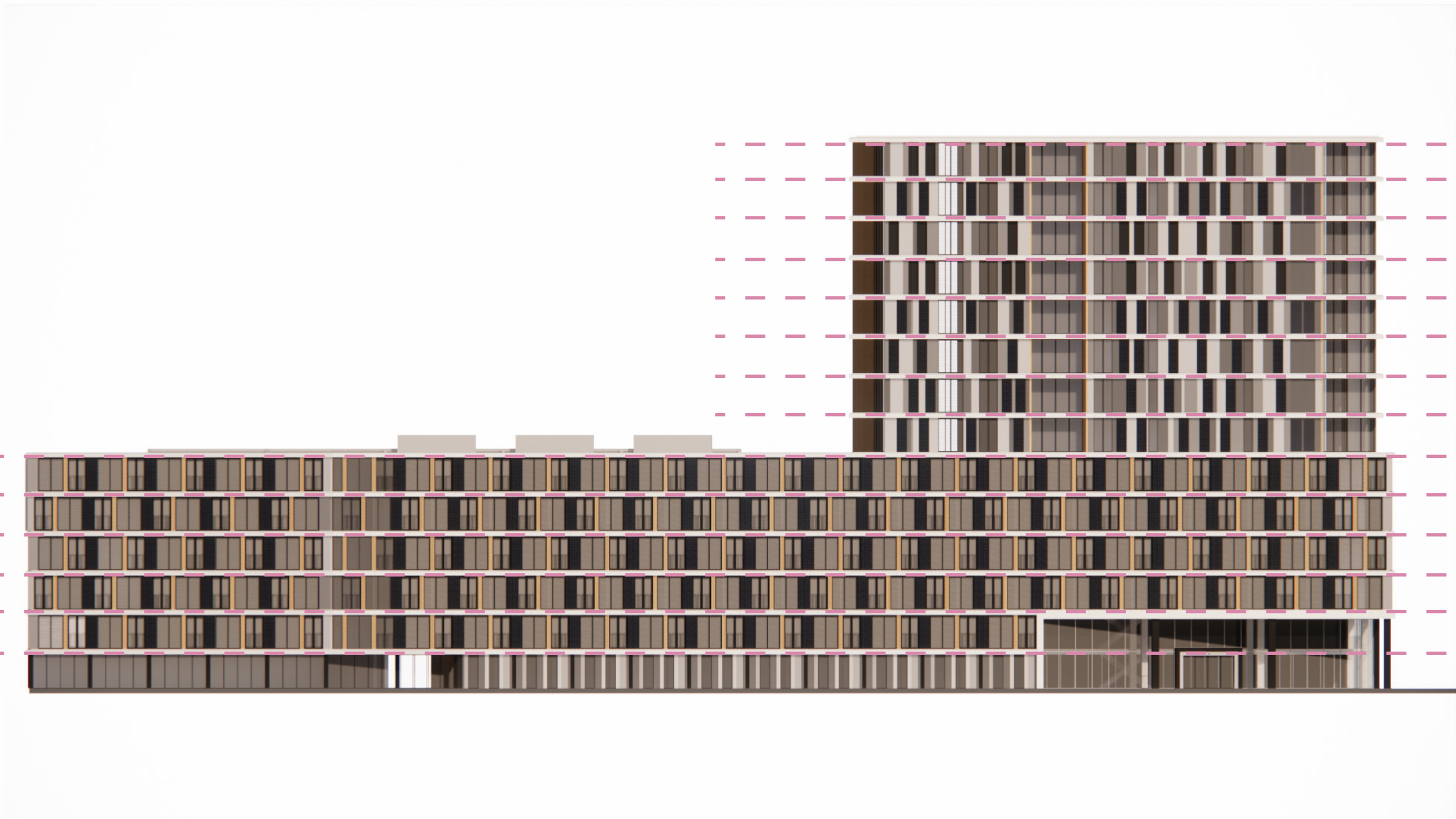
# DETAIL



# DETAIL

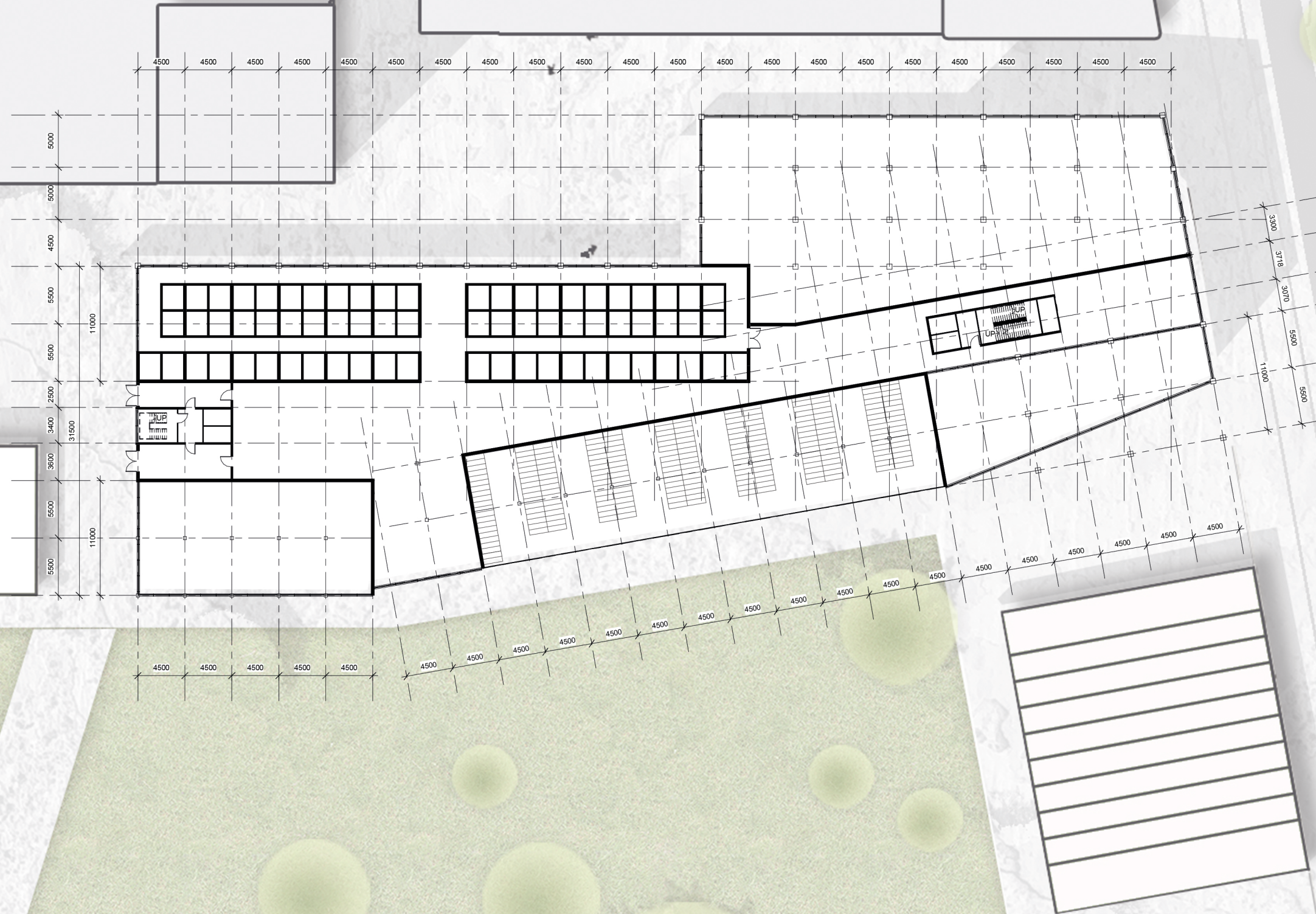






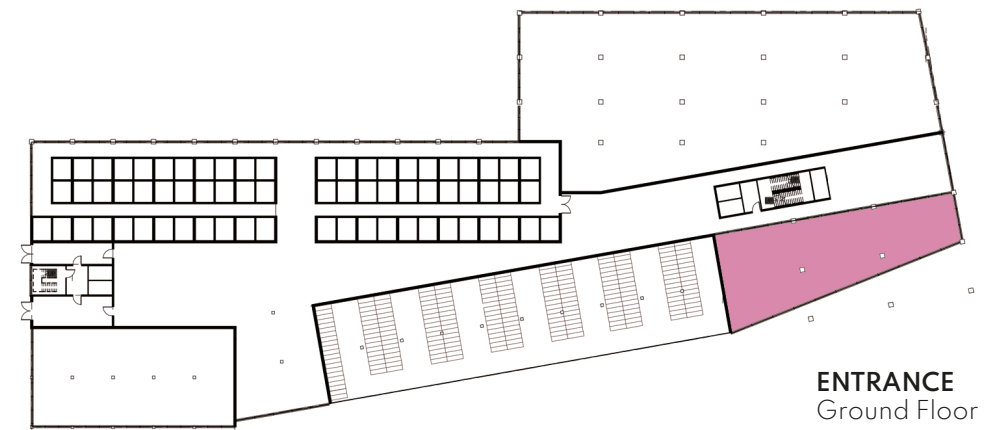
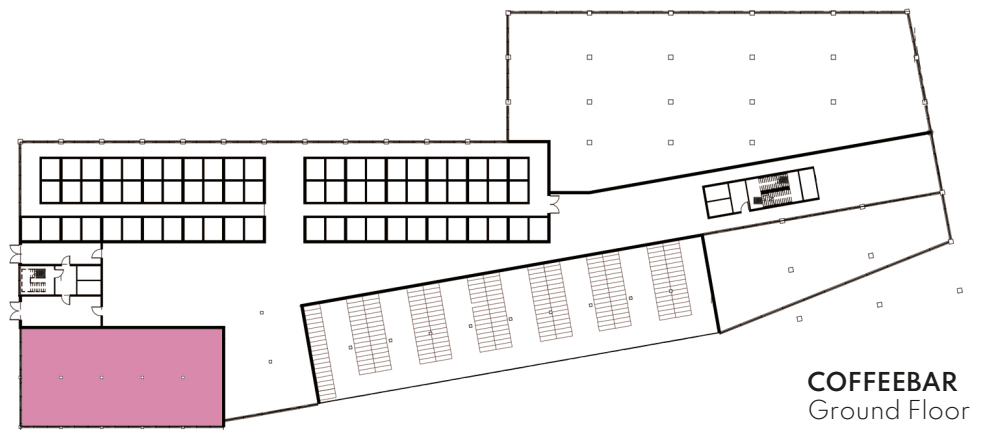
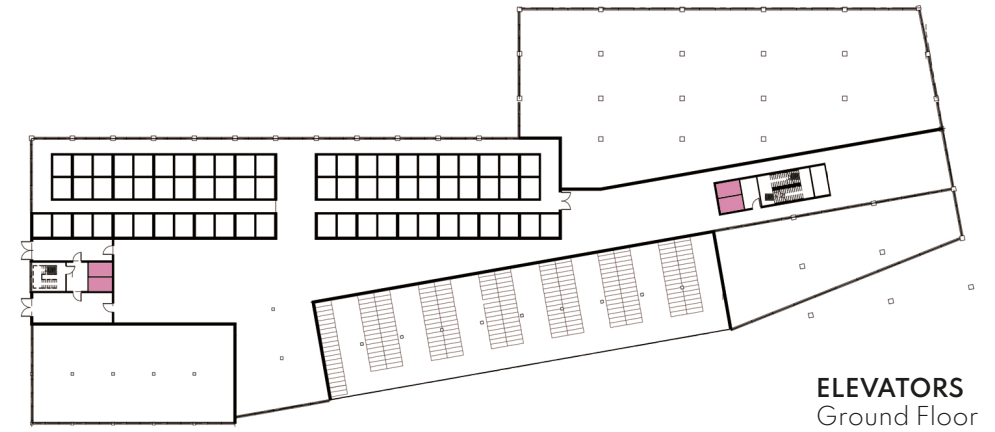
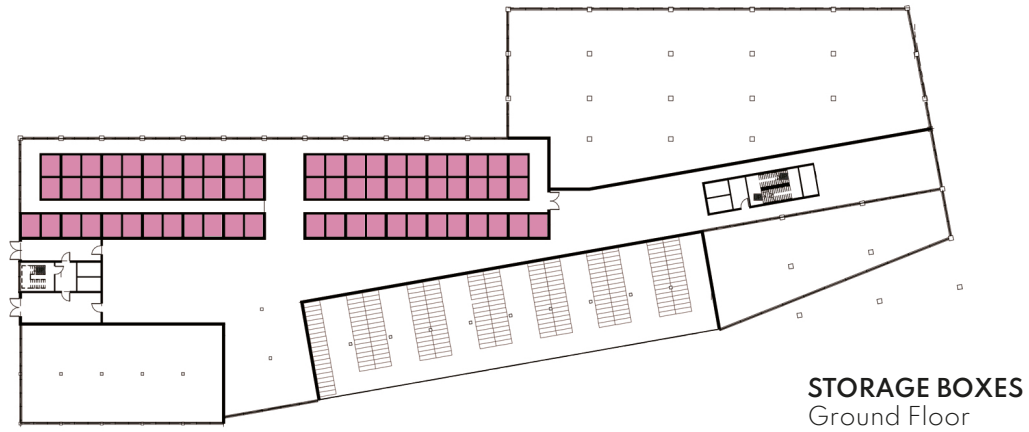
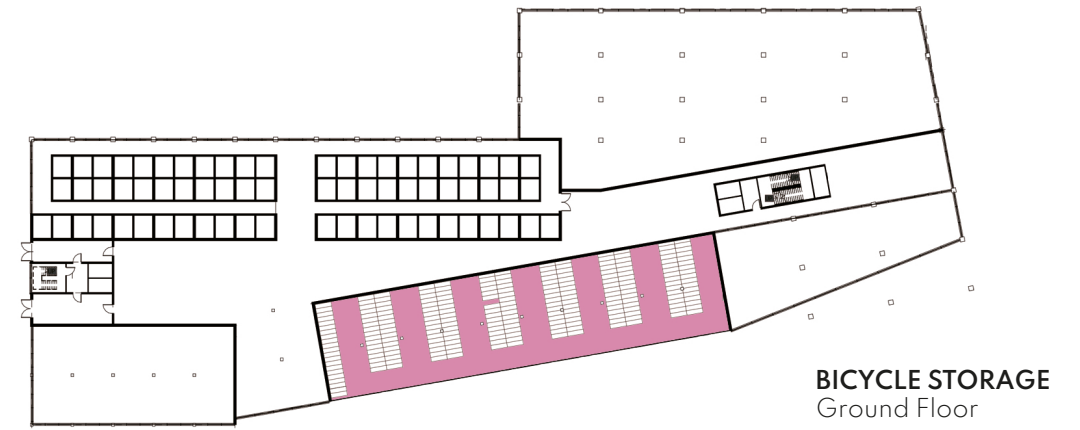
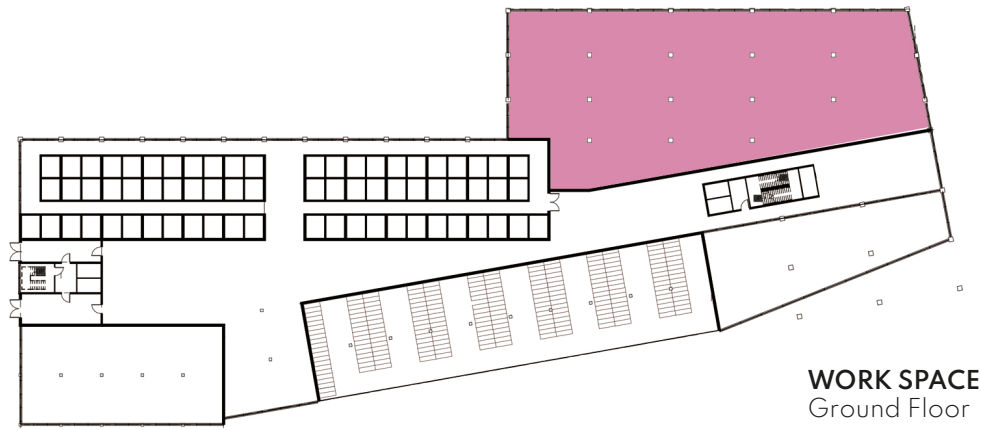


# LAYOUT

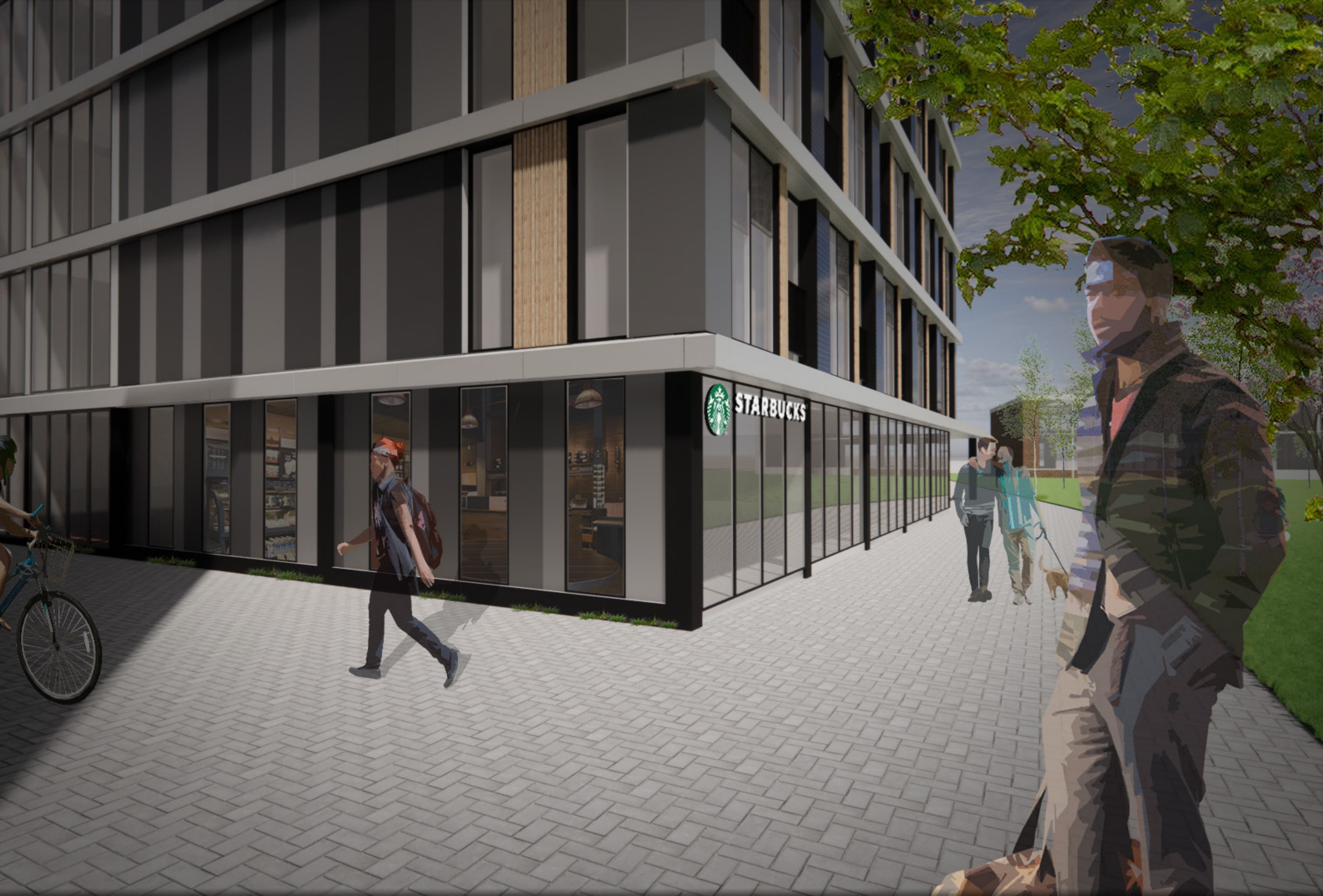




# LAYOUT





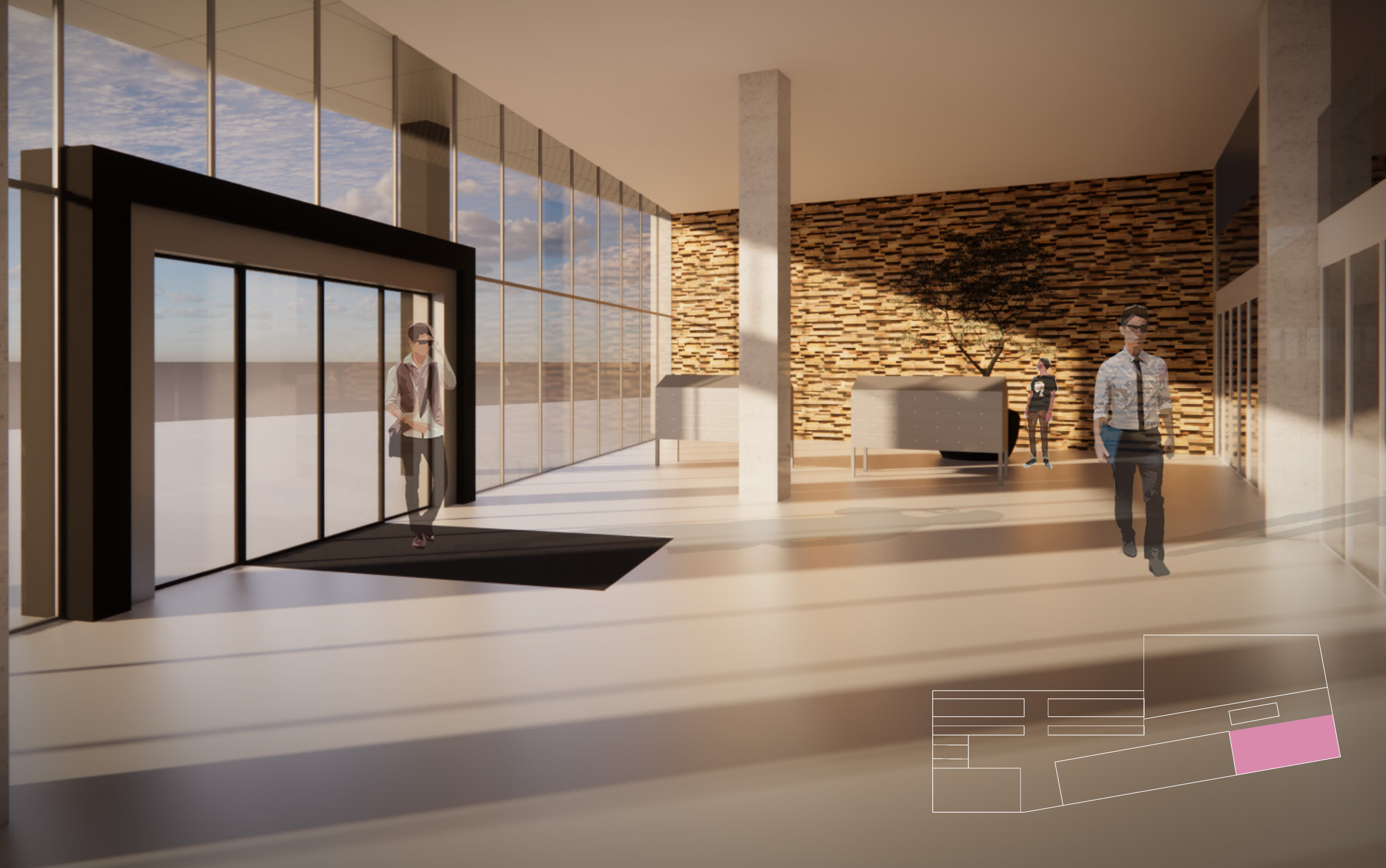








# ENTRANCE









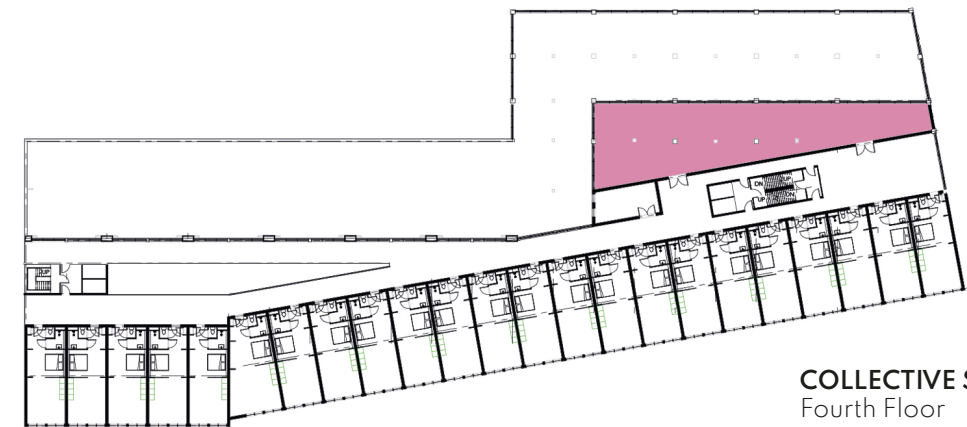




# COLLECTIVE SPACES



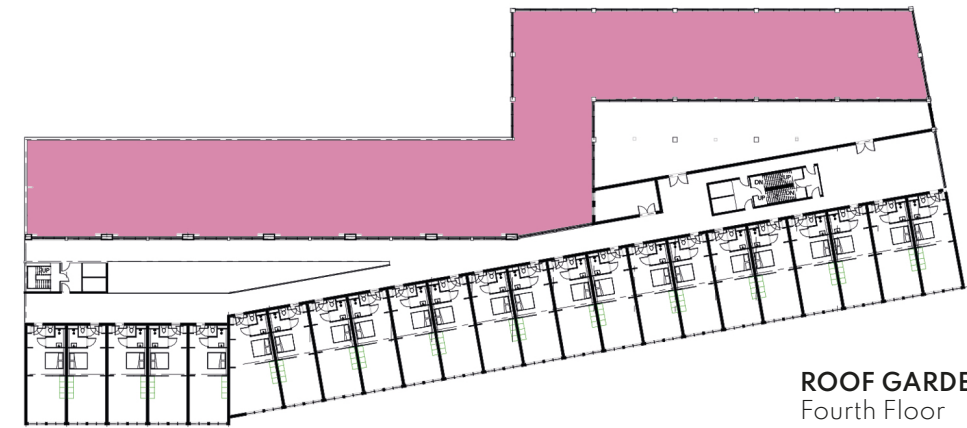
**WORK SPACE**  
Third Floor



**COLLECTIVE SPACE**  
Fourth Floor



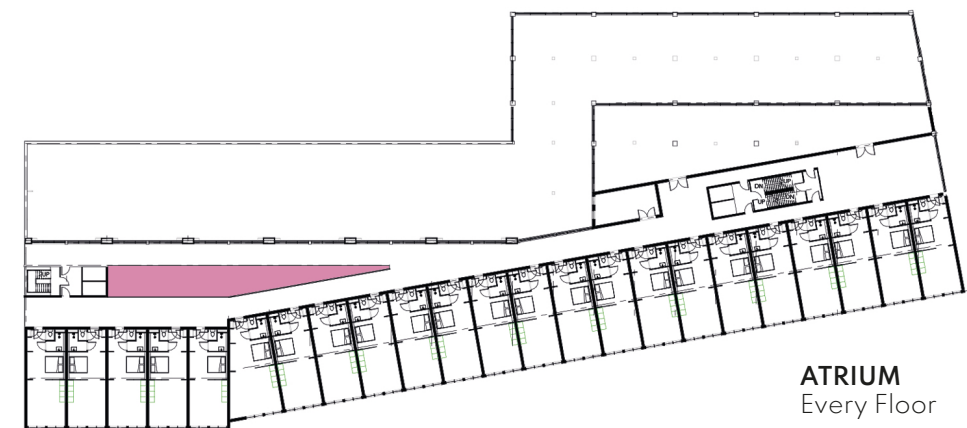
**CORRIDOR**  
Every Floor



**ROOF GARDEN**  
Fourth Floor



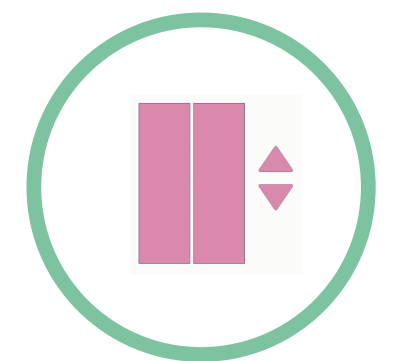
**WASHING ROOM**  
Every Floor



**ATRIUM**  
Every Floor

# LAUNDRY ROOM

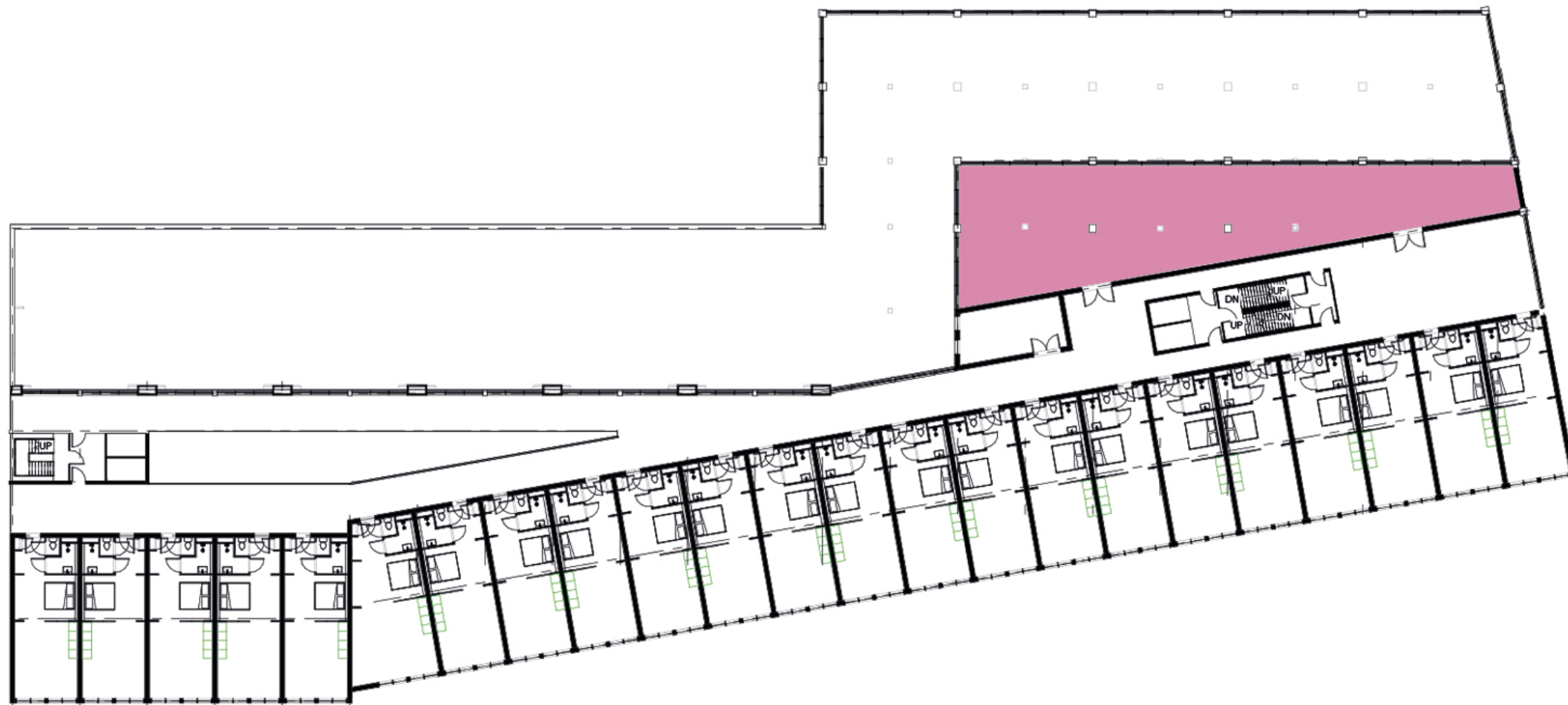
Every Lower Floor



SHARED FACILITIES



# COLLECTIVE 'LIVING ROOM'



SHARED LIVING ELEMENTS

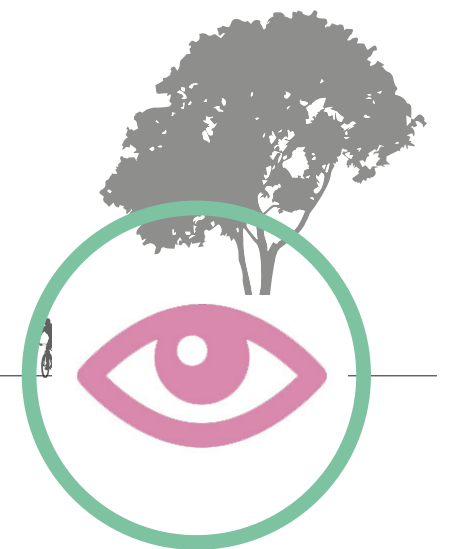
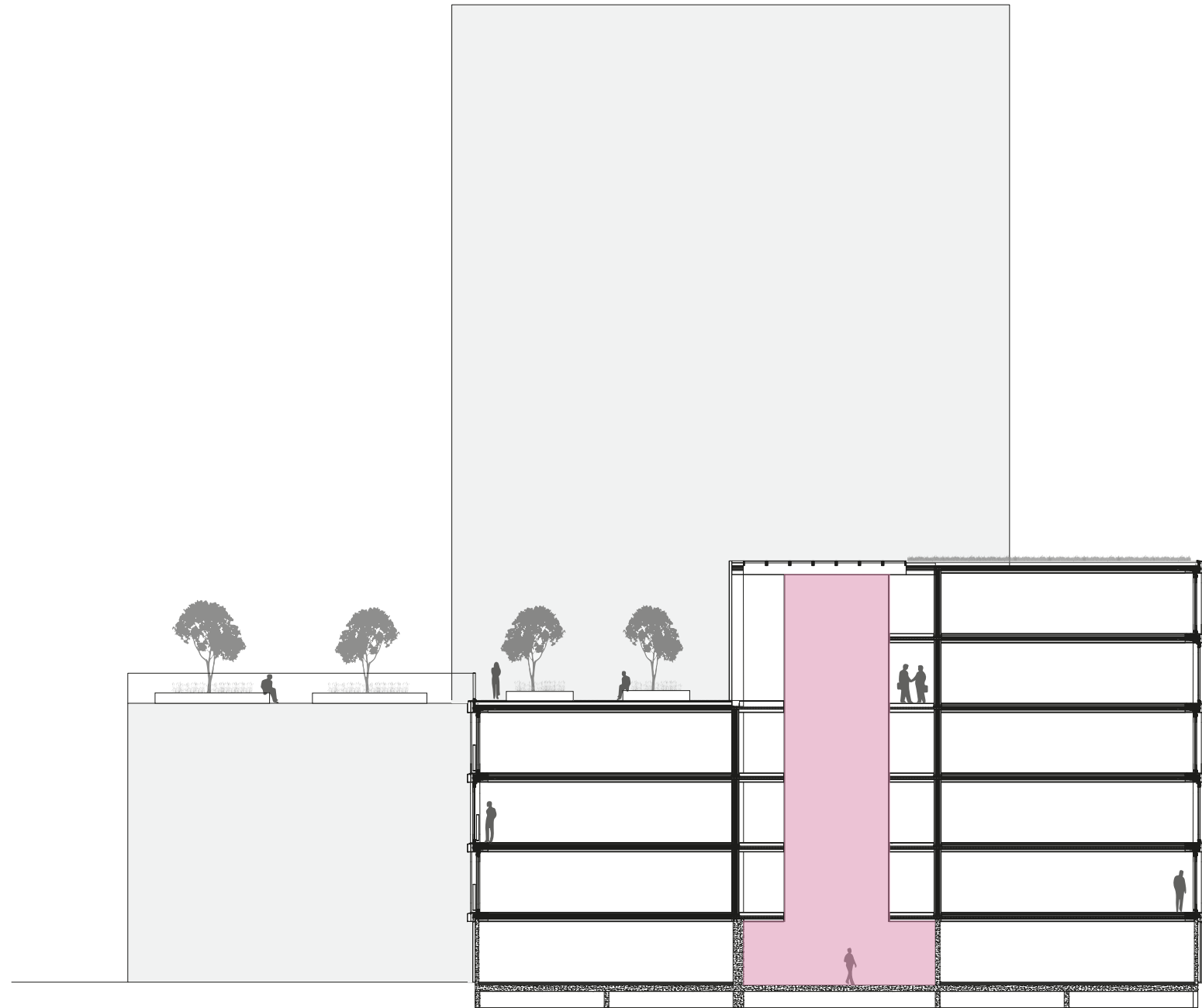
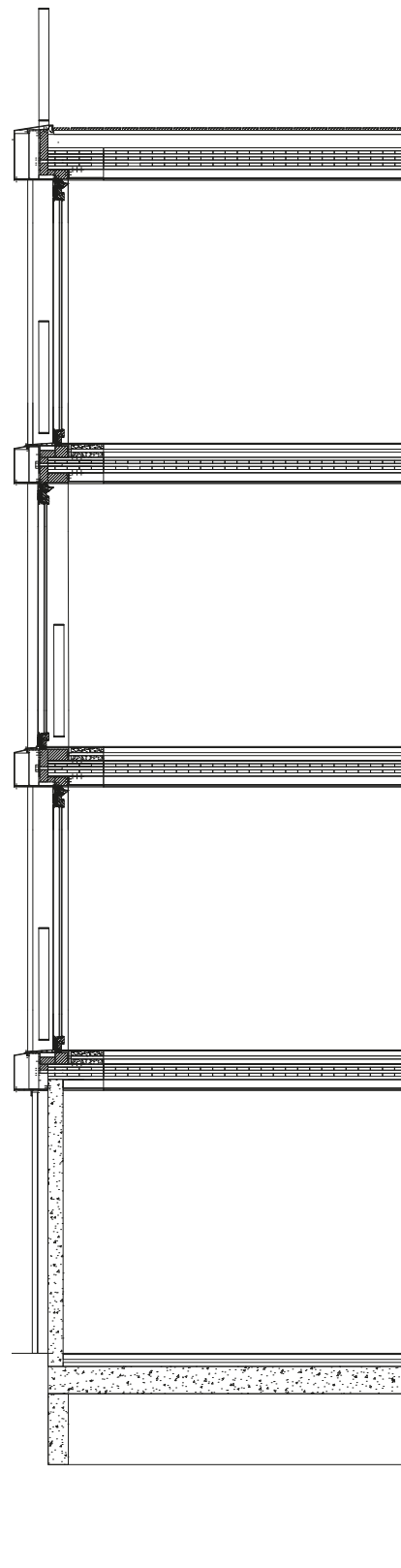
# COLLECTIVE ROOF TERRACE



SHARED LIVING ELEMENTS



# ATRIUM



VISUAL CONNECTIONS



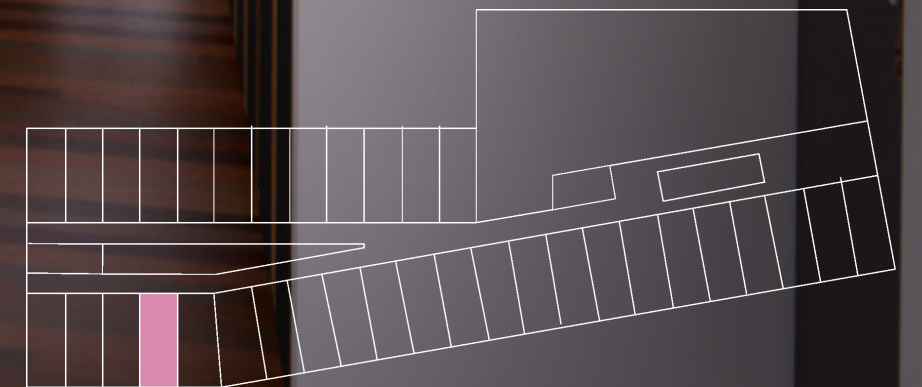
# ROOF GARDEN







# STUDIO





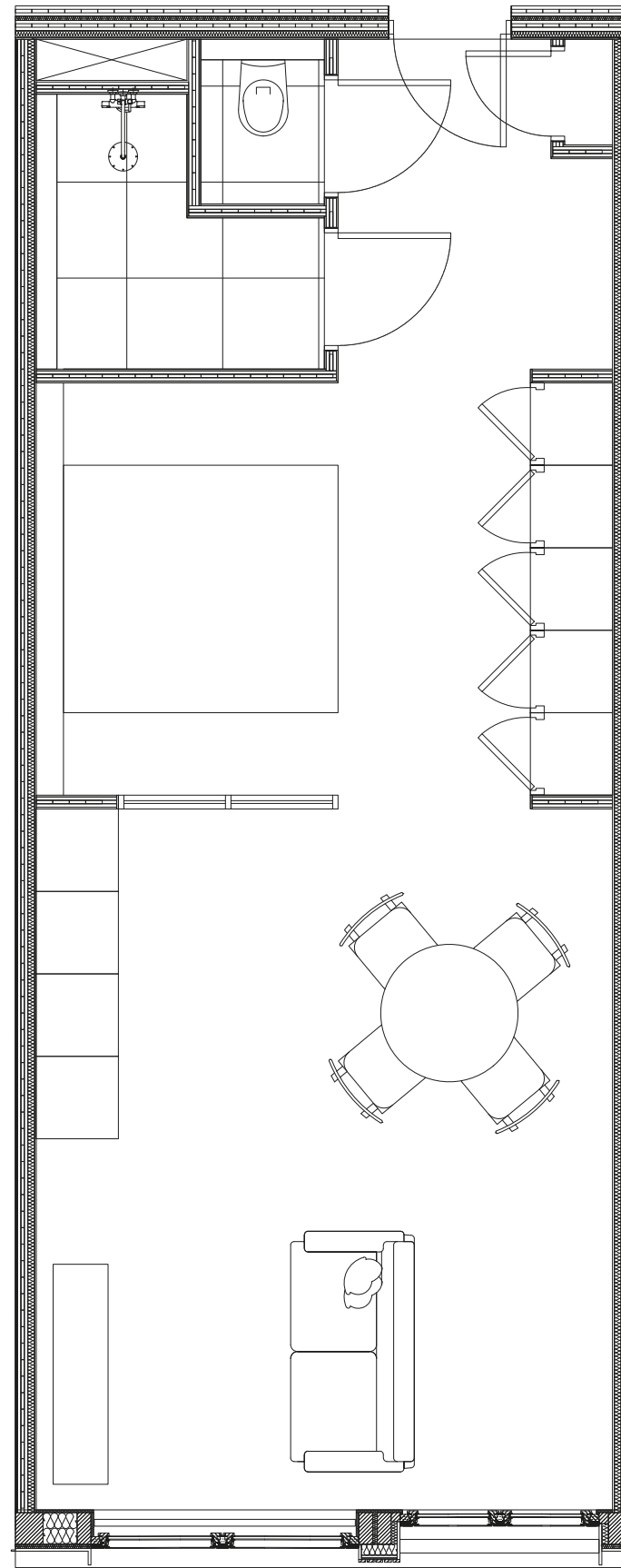




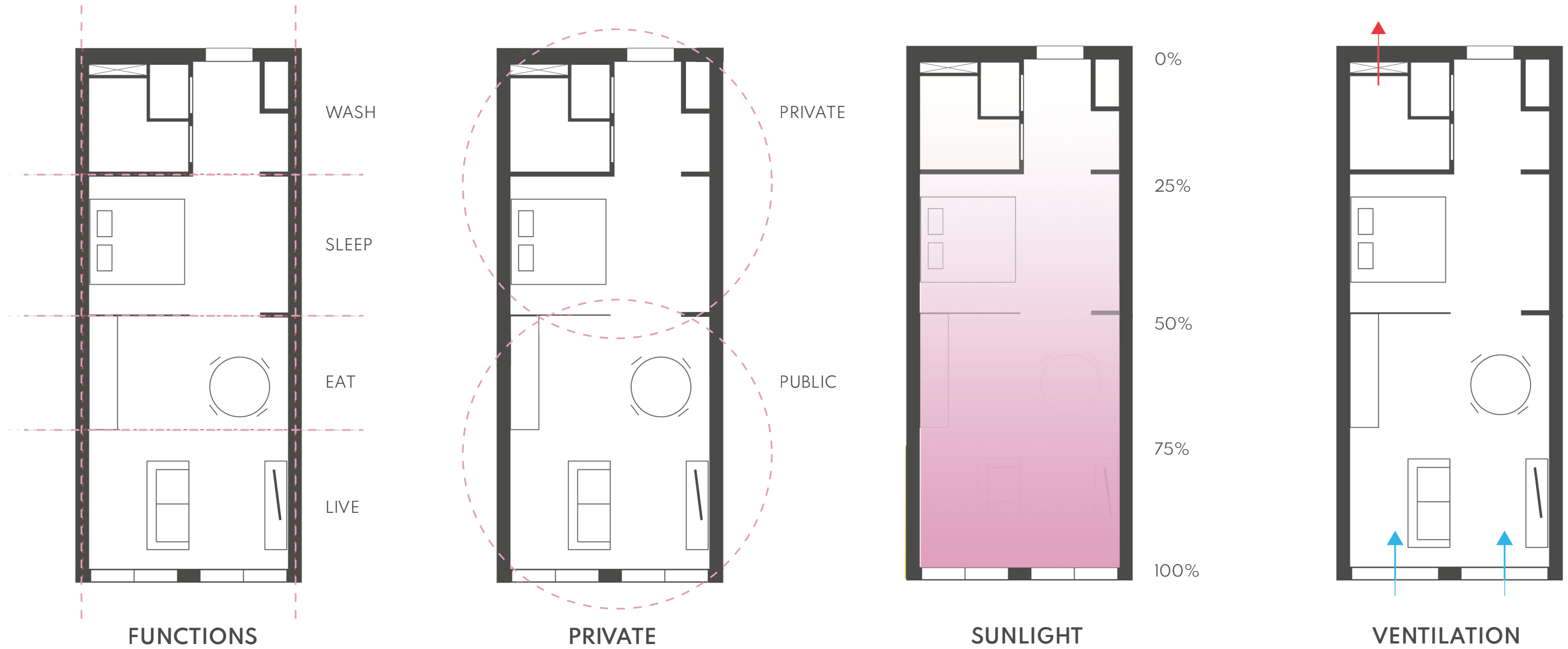




# FLOORPLAN

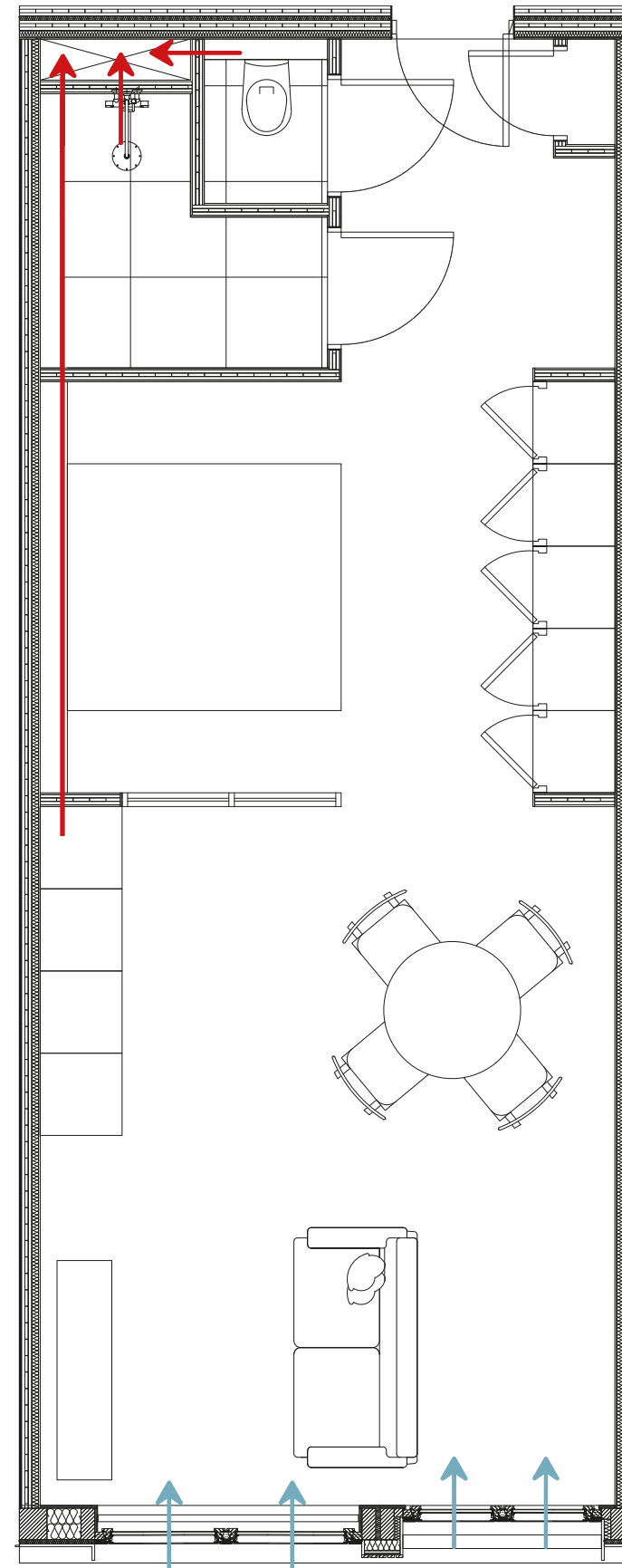
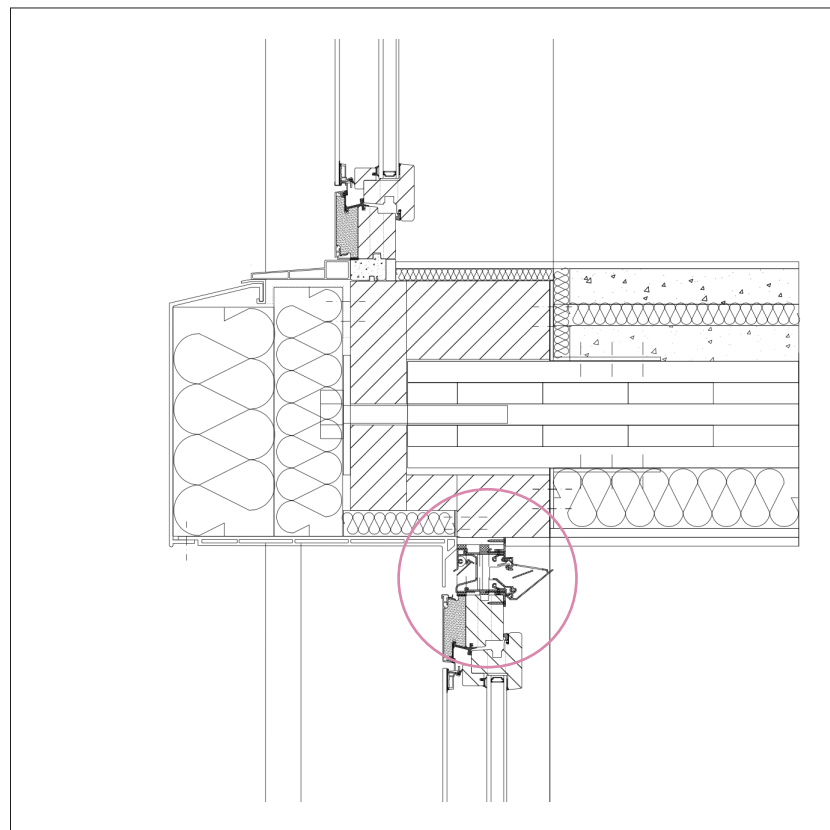
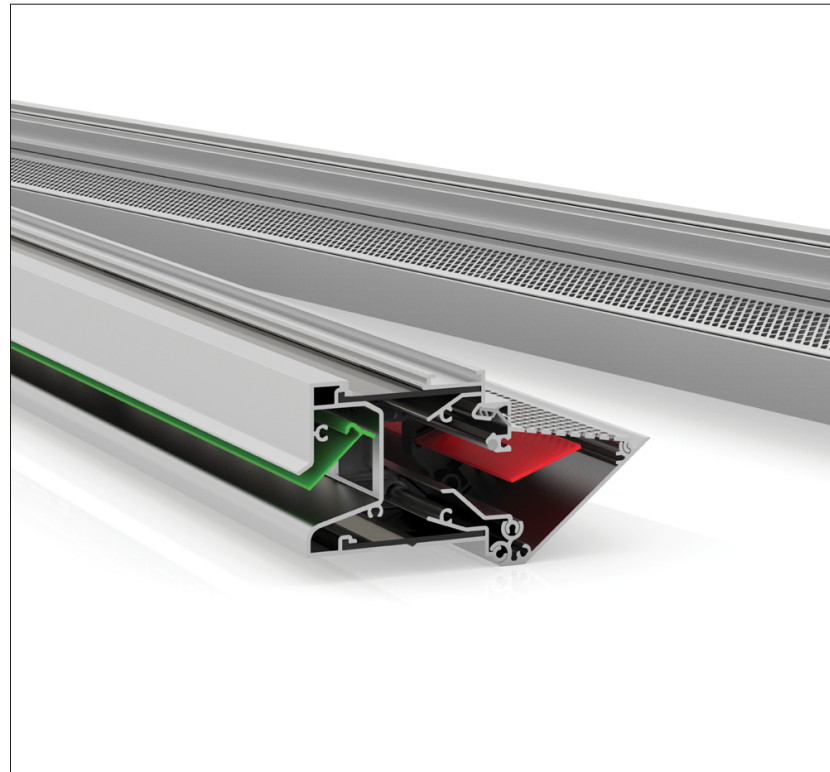


# LAYOUT





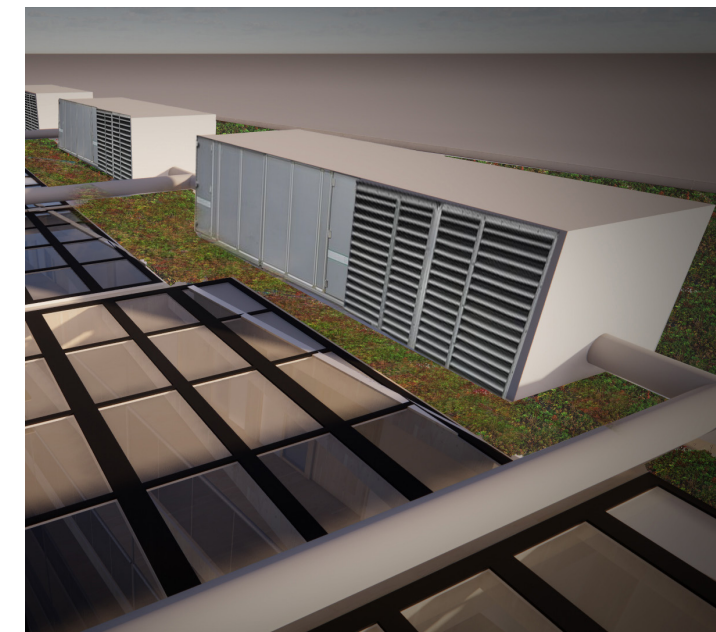
# VENTILATION



TOILET 7dm<sup>3</sup>/s  
 BATHROOM 14 dm<sup>3</sup>/s  
 KITCHEN 21 dm<sup>3</sup>/s

42 dm<sup>3</sup>/s

MINIMUM  
 46m<sup>2</sup> x 0,9 = 41,58 dm<sup>3</sup>/s



PREHEATED AIR

CLIMATOP 60 12dm<sup>3</sup>/s / m  
 DOORWIDTH 3,5 meter

3,5 x 12 = 42 dm<sup>3</sup>/s

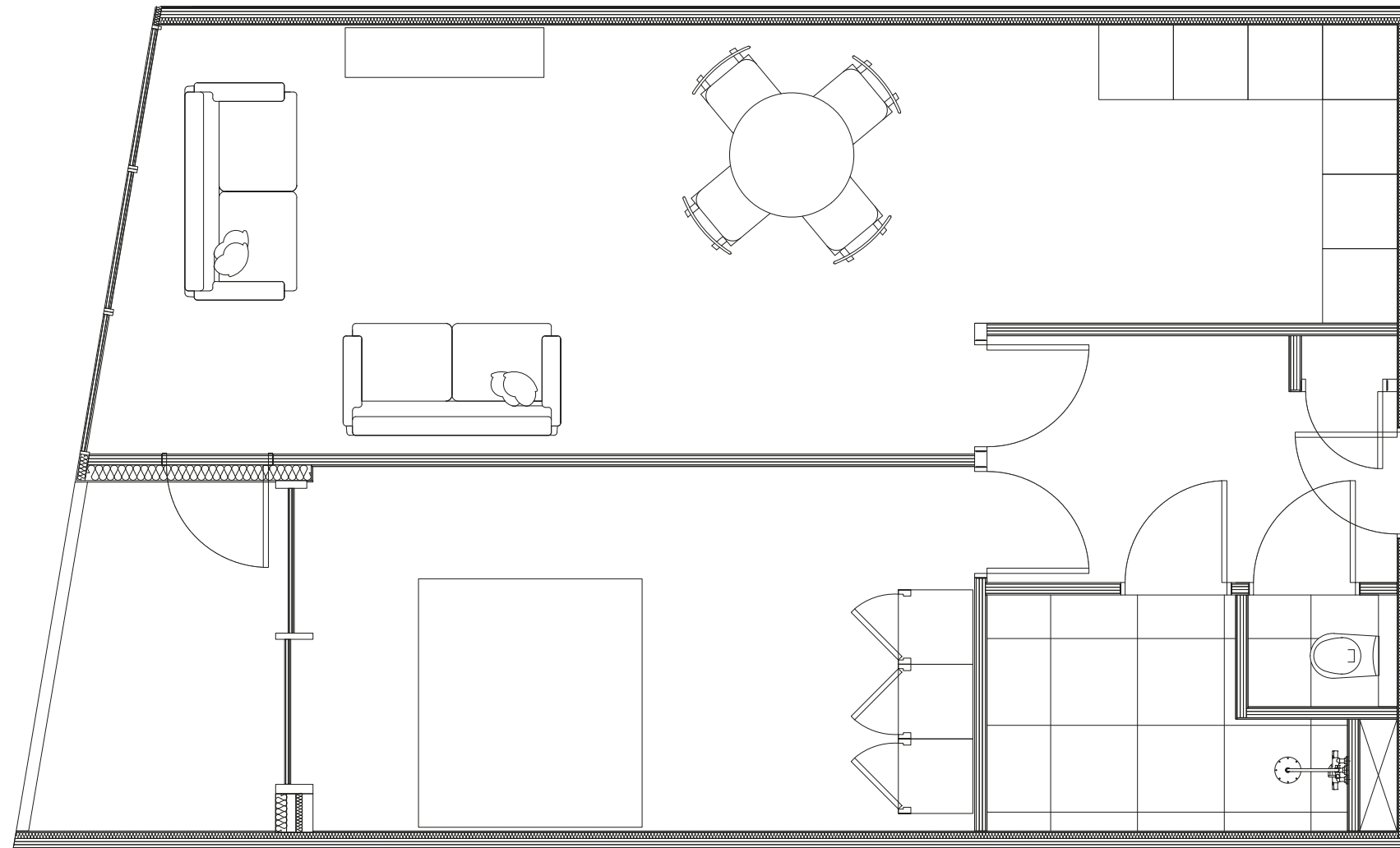




# TOWER

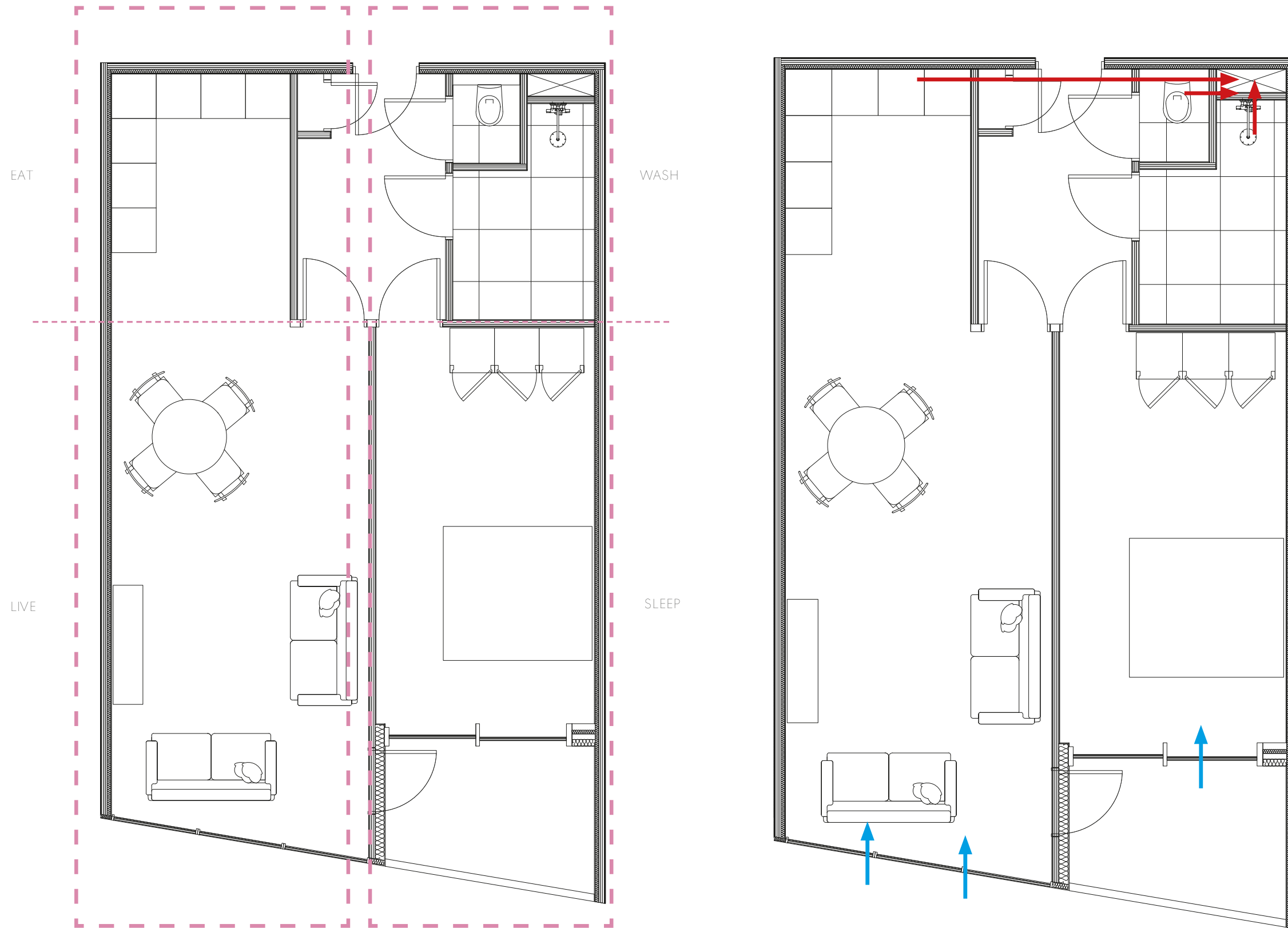


# APARTMENT





# APARTMENT

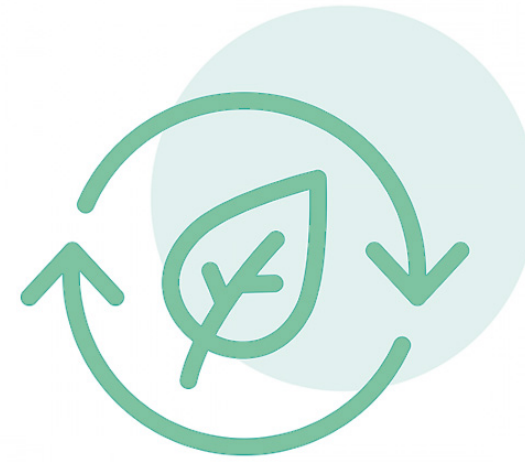


## DWELLINGS:

67 STUDIOS

147 APARTMENTS

## COLLECTIVE FACILITIES



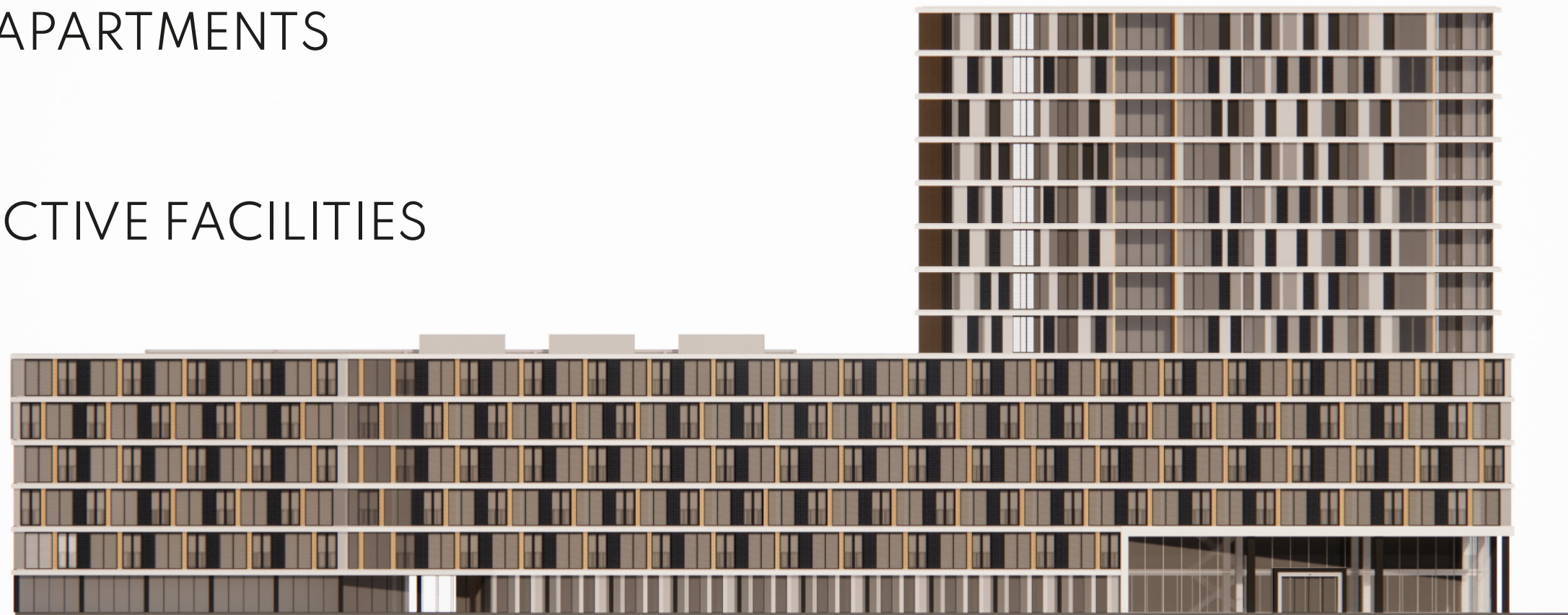
WOODEN CONSTRUCTION

GOOD INSULATED

HEATING PUMP

SOLAR PANELS

RECYCLEBLE FAÇADE



1000m<sup>2</sup> WORKSHOP SPACE

1594m<sup>2</sup> SOLAR PANELS

COFFEE BAR

1500m<sup>2</sup> OFFICES

800m<sup>2</sup> GREEN ROOF

BICYCLE STORAGE



# REFLECTION:





'A dense residential building, which meets the requirements of the graduated starter, and facilitates a Lively and vibrant live-work environment'



