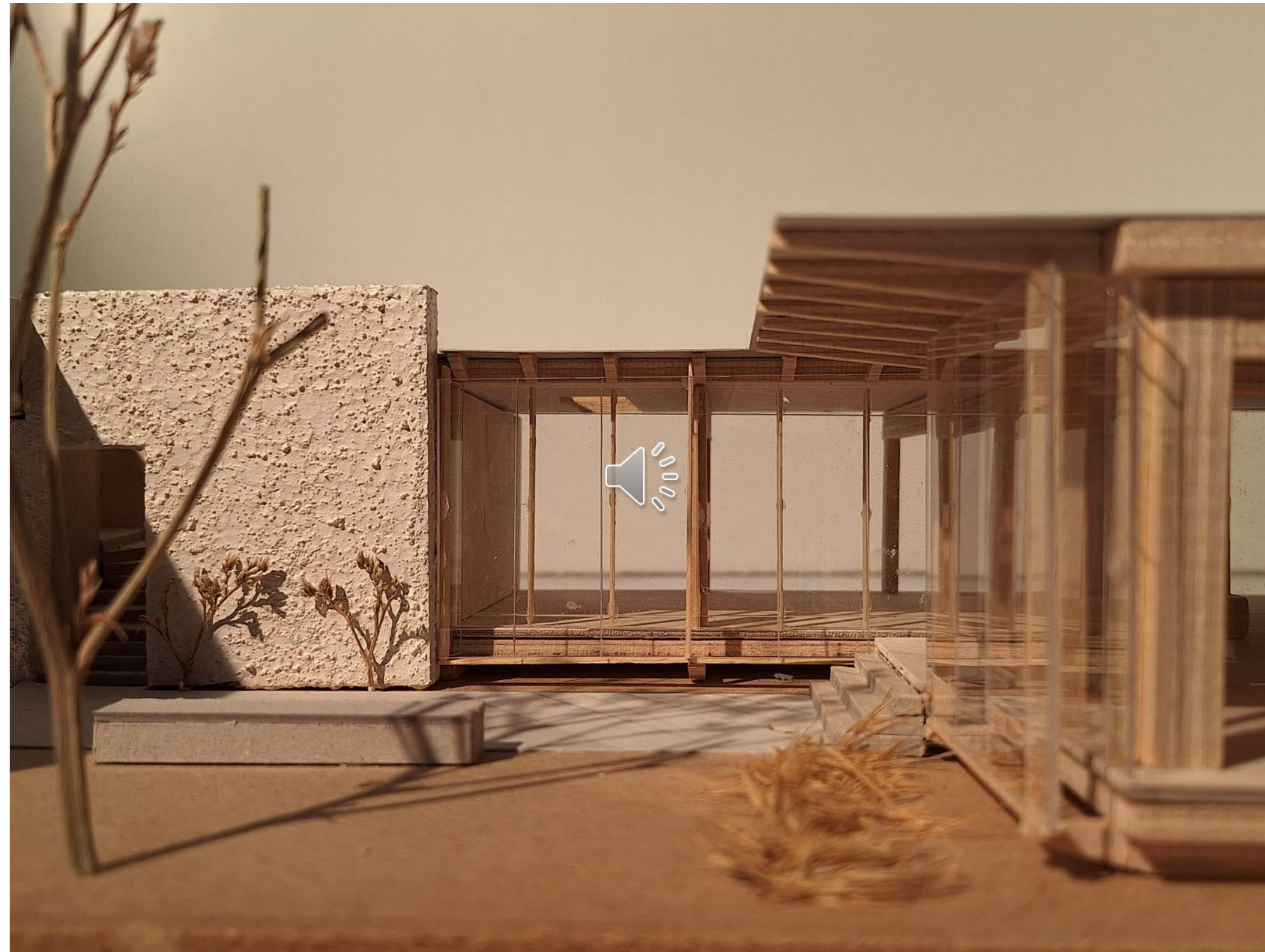


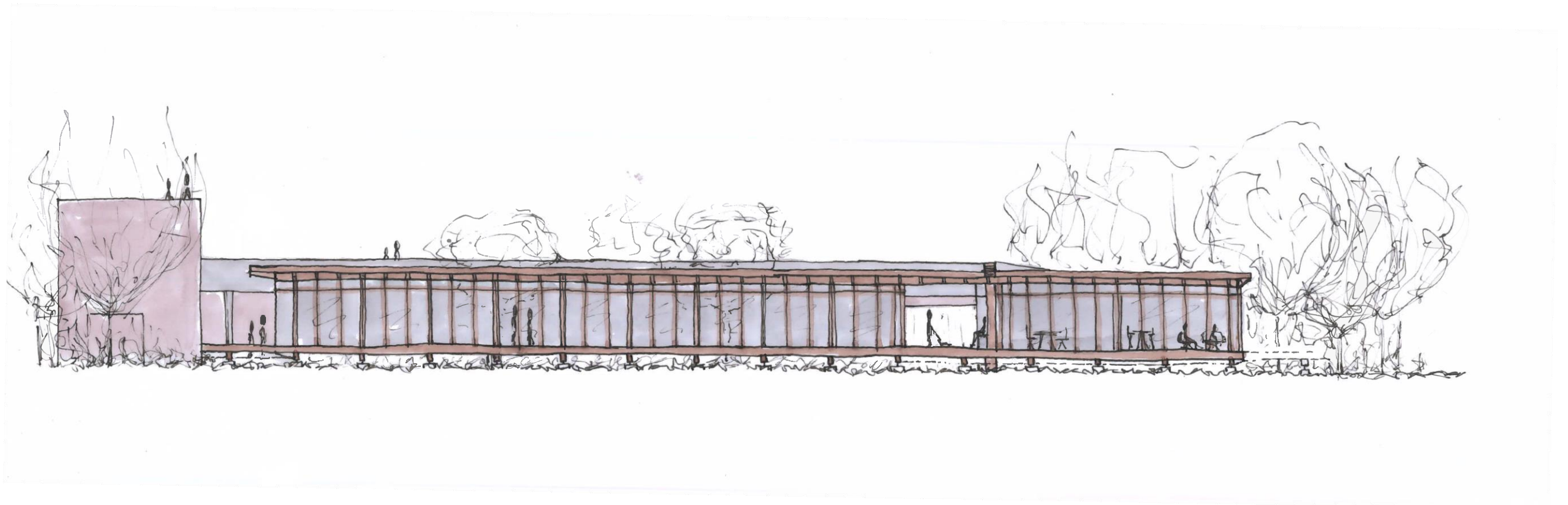
## P5 presentation | The sound of the Friche



Elbrich van Stralen

Architecture Graduation Studio Urban Architecture 'Last Green in Town' 2023/2024  
Tutors: Sam Stalker, Eireen Schreurs & Anet Meijer

## P5 presentation | The sound of the Friche



Elbrich van Stralen

Architecture Graduation Studio Urban Architecture 'Last Green in Town' 2023/2024  
Tutors: Sam Stalker, Eireen Schreurs & Anet Meijer

Close your eyes for a moment



*'Sound is the crossing between people and their environment' - Van Lengen*

*'Sound is the crossing between people and their environment' - Van Lengen*

*Sound connects people & environment; the human and non-human; the object, subject & place*

*'Sound is the crossing between people and their environment' - Van Lengen*

*Sound connects people & environment; the human and non-human; the object, subject & place*

*But often forgotten...*

Sound in the urban environment





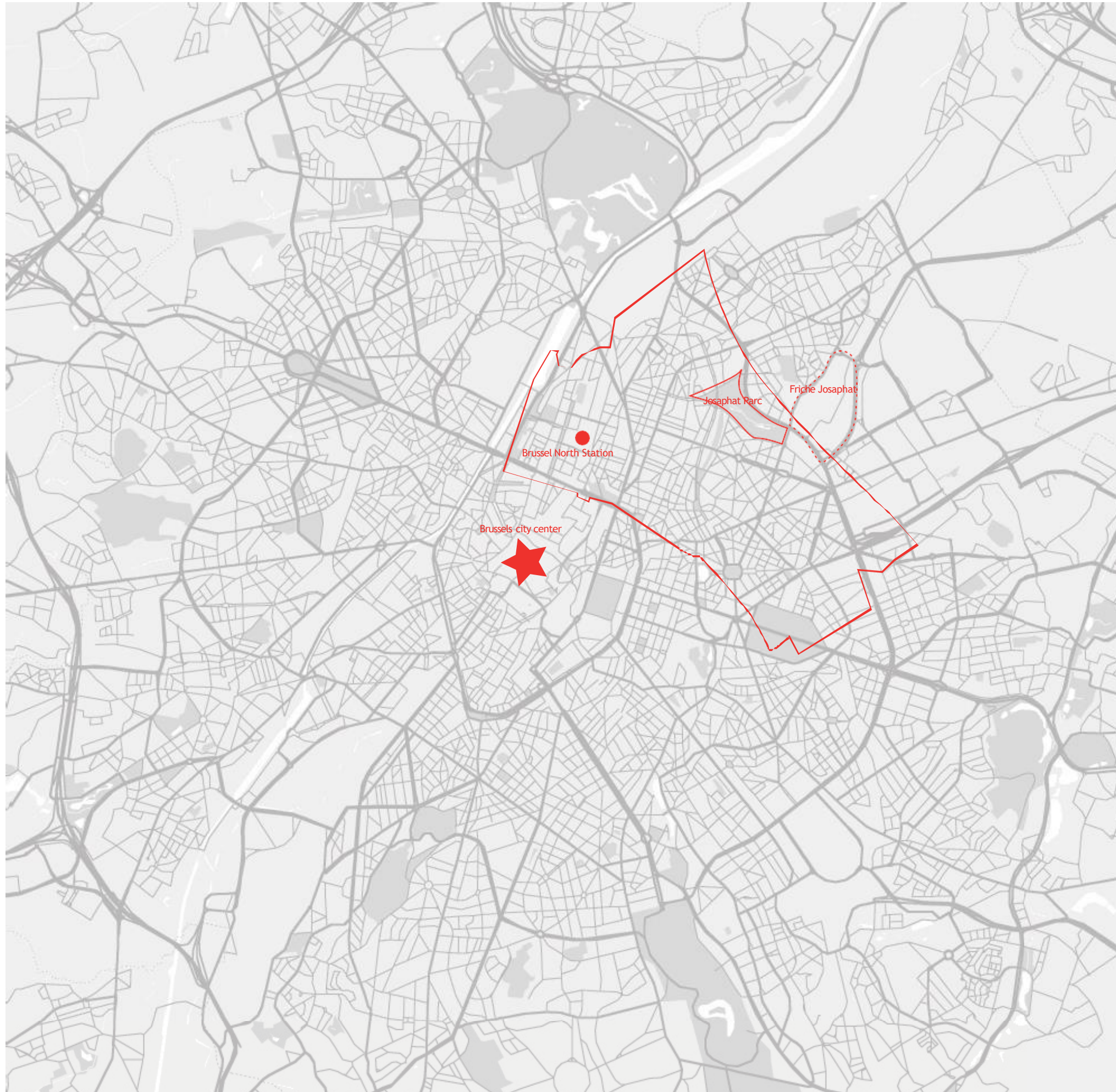
**Friche Josaphat - Brussels**

**Friche Josaphat - Brussels I Context**

**Introduction** | Friche Josaphat as a green spot in the urban environment

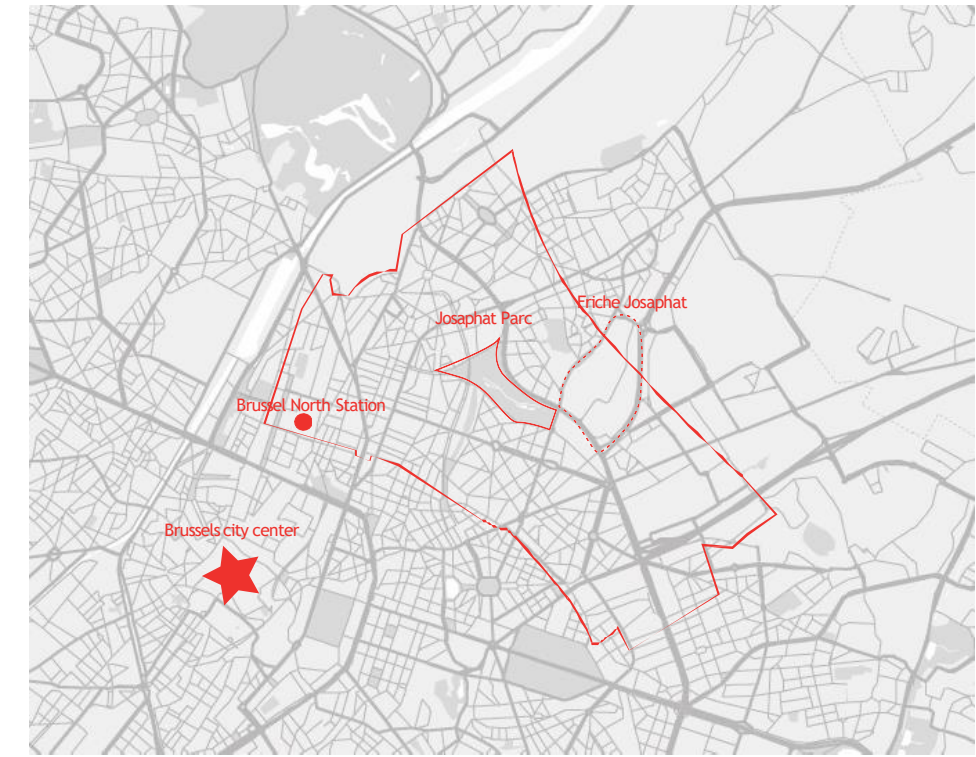
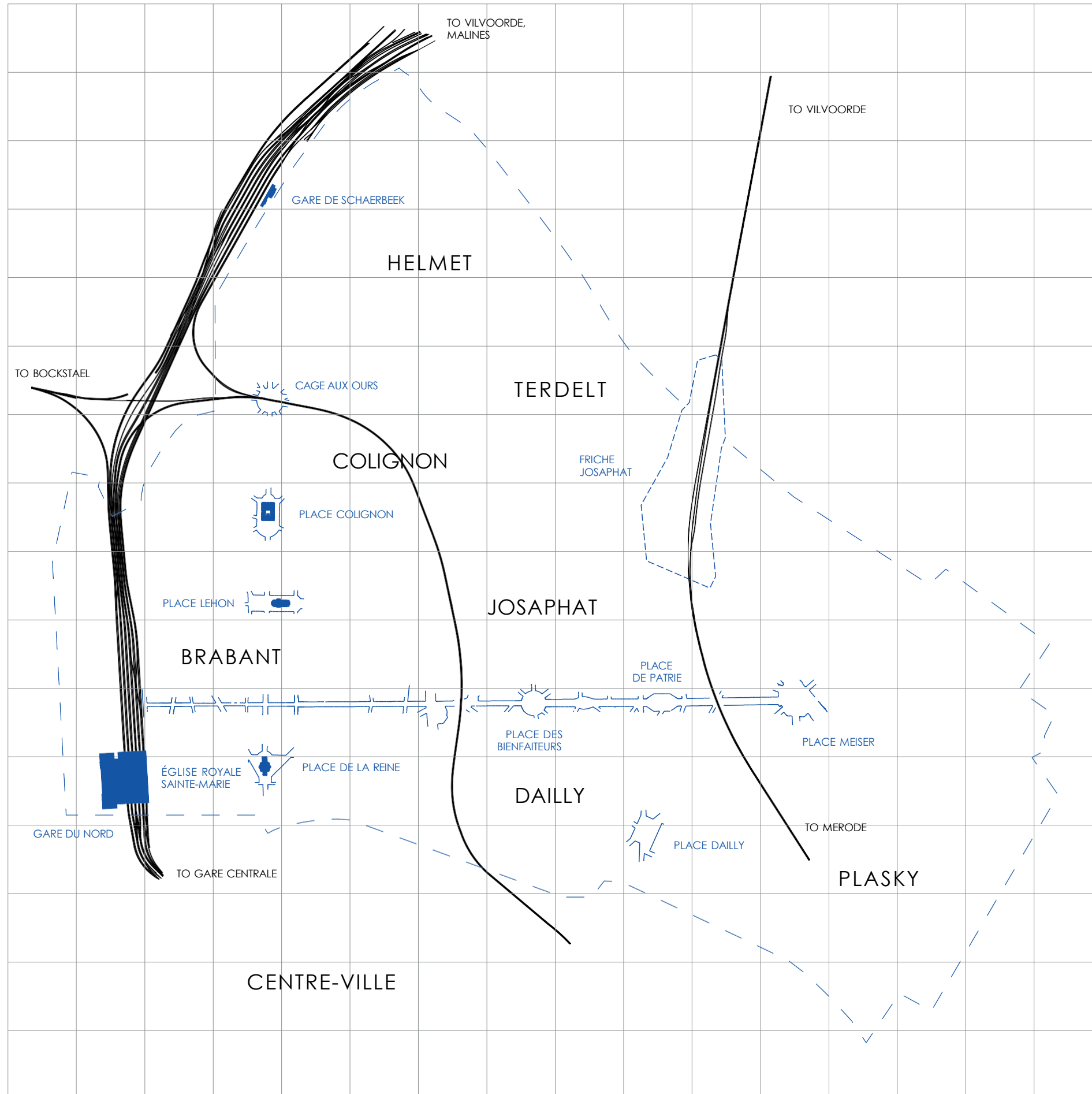






**Friche Josaphat - Brussels |** Schaerbeek research

# Introduction | Rue Rogier







# Introduction | Collecting observations Rue Rogier







Introduction | Schaarbeek model



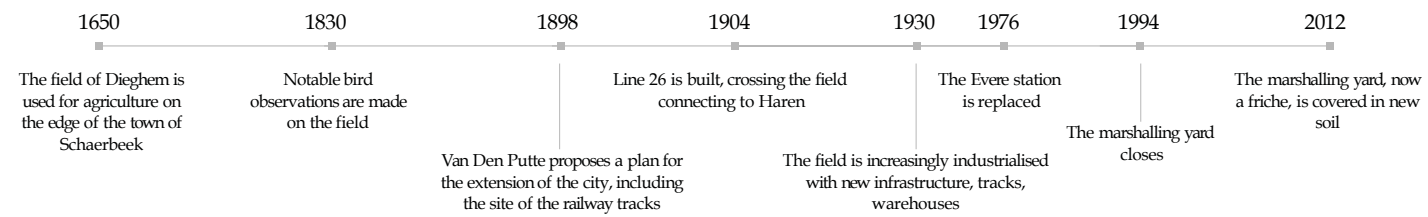
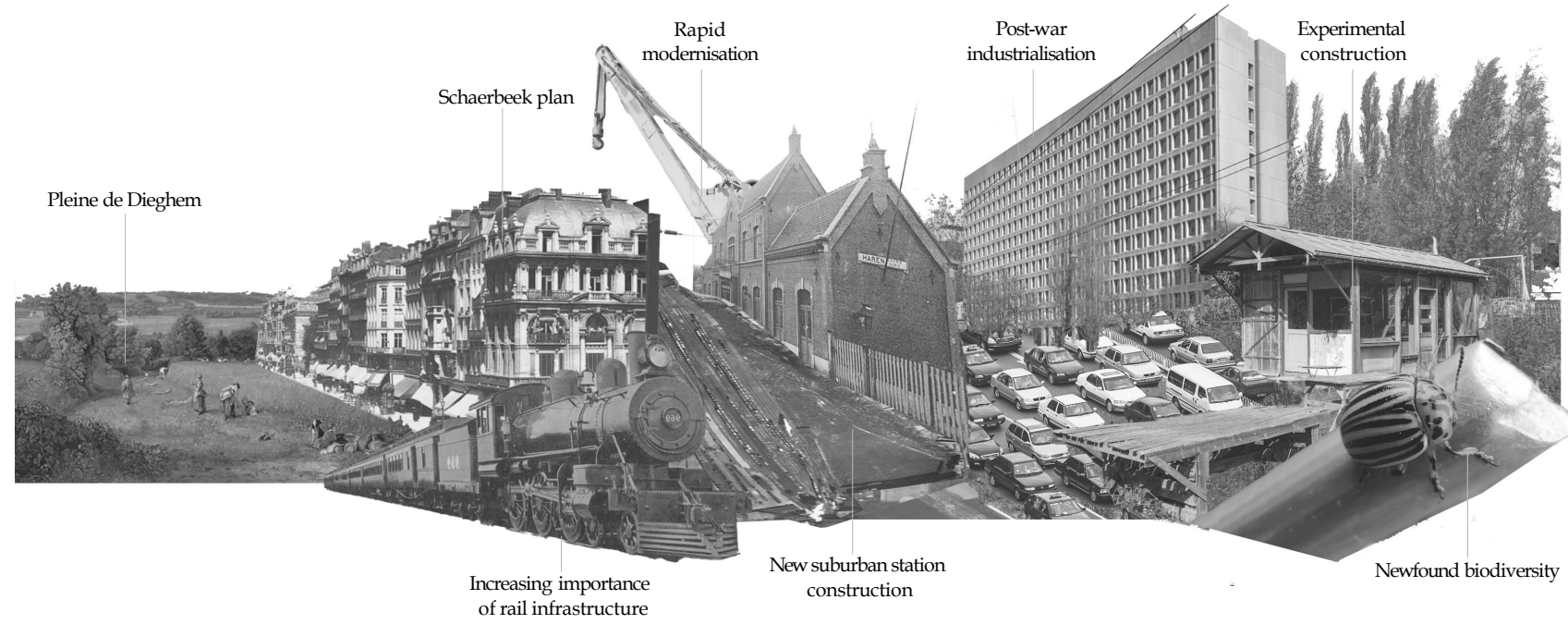


**Friche Josaphat I Site**



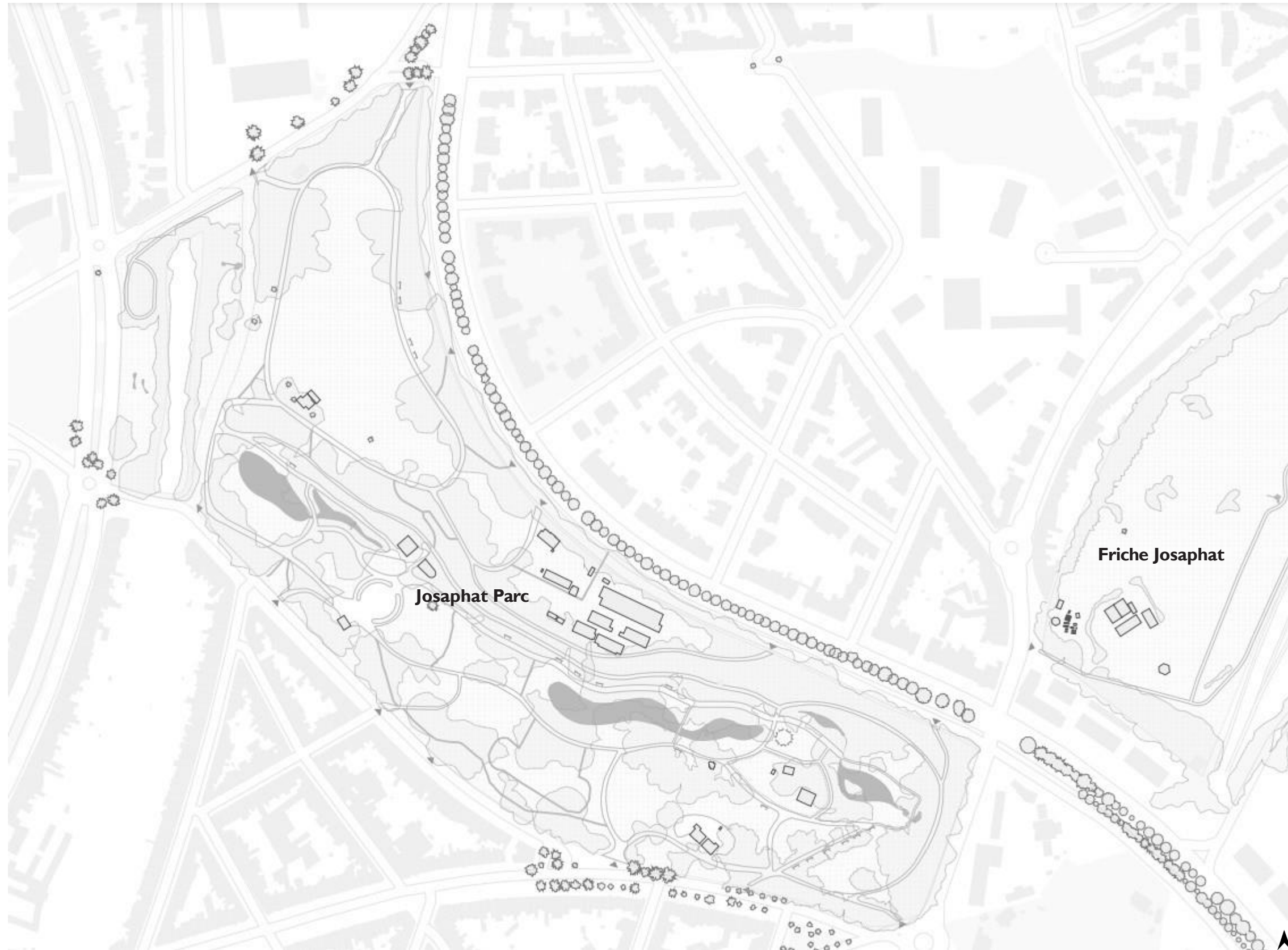


A timeline and collage of the history of the Friche Josaphat





**Introduction** | Function compared to Josaphat park



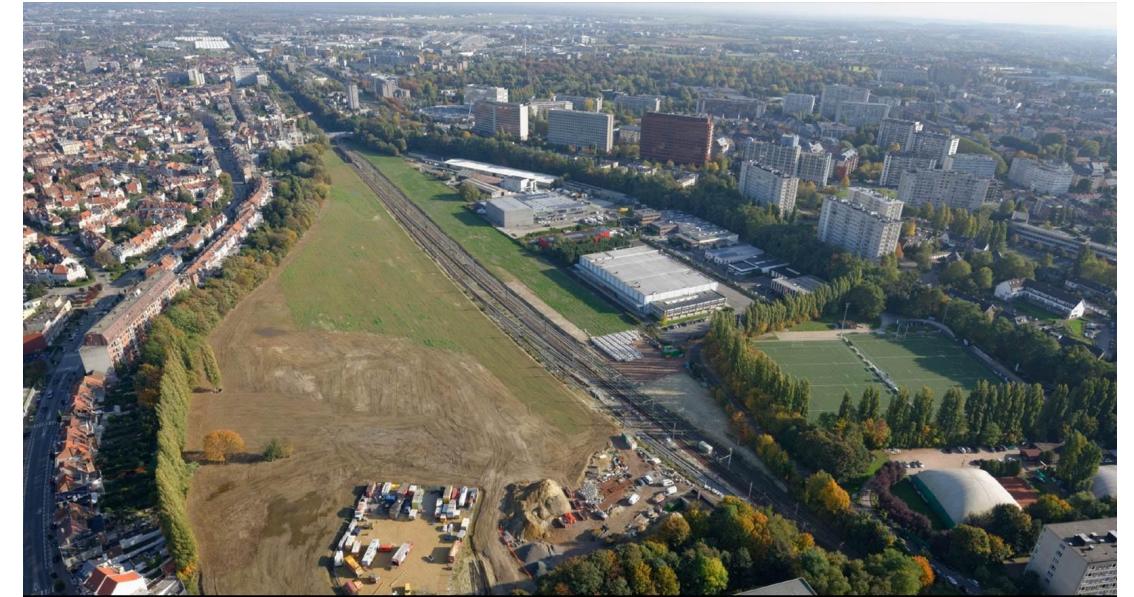
## Introduction | The Friche as a void

‘it is a place that is **often hidden from view**, using the physical walls that surround the site to exist outside of capitalist space, **occupied by nature automatically, free from human intervention**’

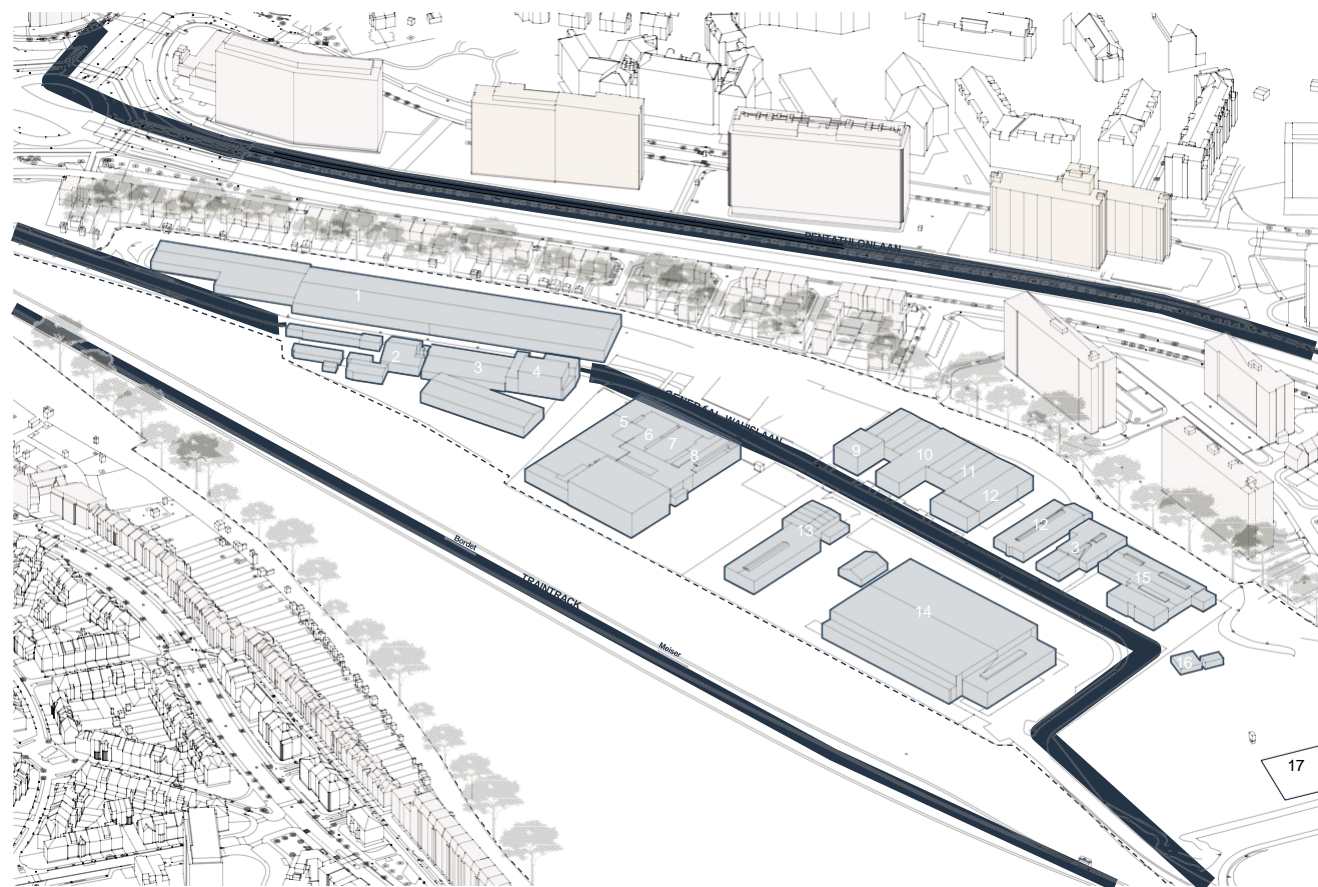
‘it becomes a space with the representation of the ‘other’ or the ‘rejected’, **free from social expectations**’



**Friche Josaphat I** What is there?



en-rich area. This research focusses mainly vironment.



LEGEND:

- Industry within area
- Industry outside area
- Residential



- 1 Baustoff + metal**  
distribution building materials  
<https://www.baustoff-metall.be/>
- 2 Rova**  
repair shop  
<https://www.rovasprl.be/>
- 3 Delivco**  
distribution wine  
<https://www.bigbagdelivery.com/>
- 4 Bfc rental**  
Camera rental  
<https://www.bfcrental.com/>
- 5 Eyclite**  
video production service  
<https://www.eye-lite.com/>  
<https://www.eventlounge.be/>
- 6 Keygripsystems**  
Audio rental  
<https://www.kgs.be/>

- 7 Bulterys**  
generator rental  
<https://www.bulterys.be/contact-bulterys-mobile-power-stations/>
- 8 Eventlounge**  
Event location  
<https://www.eventlounge.be/>
- 9 Javry coffee**  
coffee supplier  
<https://javry.com/>
- 10 Skeeled**  
softwarecompany  
<https://www.skeeled.com/>
- 11 Tsf.be**  
camerashop  
<https://tsf-belgique.be/>
- 12. Bpost**  
postcompany  
<https://www.bpost.be/en>

- 13 Balcaen**  
construction company  
<https://balcaen.net/contact/>
- 14 EMD music**  
distribution musical instruments  
<https://www.emdmusic.com/>
- 15 Kcp**  
mediacompany  
<https://www.kcp.be/>
- 16 Kituro**  
rugby sports club  
<https://www.kituro.be/>
- 17 Wahis**  
tennis sports club  
<http://www.tcsetwahis.be/>

# Introduction | Trains









# Natuur voor alle Brusselaars

Greenpeace Belgium  
5 januari 2023 • 3 min read



De natuur is de beste buffer tegen de klimaatcrisis die we hebben, maar toch blijft ze slinken. In Brussel verdween 14% van de groene ruimte tussen 2003 en 2016. Die trend zet zich zorgeloos verder, met vele geplande nieuwbouwprojecten waar waardevolle natuur voor moet wijken. Daarom steunt Greenpeace Brusselaars die werken aan een leefbaar Brussel en eisen we dat het gewest zich beter inzet voor de bescherming van groene ruimten.

## Toekomst oogt onzeker voor 'laatste wildernis van Brussel'

Met de *friche Josaphat* dreigt een cruciale schakel in het ecosysteem van de hoofdstad te verdwijnen. 11.000 mensen ondertekenden een petitie tegen plannen van de Brusselse regering om er een nieuwe wijk te bouwen.

Jef Poppelmonde  
Woensdag 16 december 2020 om 3:25 uur



## 'Brussels Paradox': A wealthy region with an 'acute' housing crisis

Tuesday, 6 February 2024  
By Ciara Carolan



Aerial view of Brussels. Credit: Belga / Laurie Dieffembacq

A report from the Organisation for Economic Co-operation and Development (OECD) warns that the Brussels-Capital Region is suffering an "acute housing crisis" which unevenly affects the population.



© perspective.brussels | De Josaphatsite in Schaerbeek/EVERE. De nieuwbouw komt in de zone met 'hoogste biologische kwaliteit,' zeggen actiegroepen.

## 'Vertrokken voor juridische guerrillastrijd': actiegroepen tegen beslissing Josaphat-site

SVG © BRUZZ 06/04/2023

Delen:

'We zijn vertrokken voor een juridische guerrillastrijd,' zegt Pierre Ryckmans van Sauvons la friche Josaphat, als reactie op de toekenning van het bouwproject aan Axa-Eiffage op het voormalig spoorterrein in Schaerbeek.

## Burgers dagen ministers voor de rechter om bouwstop in natuurgebieden af te dwingen

Emmanuel Vanbrussel 05/02/2024 Updated: 05/02/2024 16:18u

Delen:

Het burgercollectief We Are Nature.Brussels lanceert vandaag een procedure bij de rechtbank van eerste aanleg die gericht is tegen het Brussels Gewest. De initiatiefnemers hopen via de rechtbank een Brussels bouwmoratorium in tientallen natuurlijke gebieden in de stad te bekomen. Er zijn duizend mede-ondertekenaars, maar de initiatiefnemers hopen dat "een veelvoud" aan klimaatbewuste burgers zich nog aansluit.

Lees ook: [We Are Nature.Brussels: 'Brussel volbouwen lost de woningnood niet op'](#)



## Axa-Eiffage mag 509 woningen bouwen op Josaphat-site

RV, SVG 06/04/2023 Updated: 06/04/2023 16:30u

Delen:

Het consortium Axa-Eiffage heeft het contract binnengehaald voor de eerste fase van de ontwikkeling van de Josaphat-site. Dat is bekendgemaakt door de Maatschappij voor Stedelijke Inrichting (MSI). Er zullen 509 woningen worden gebouwd. "We willen snel beginnen bouwen," zegt Patrick Verougstraete (Eiffage).



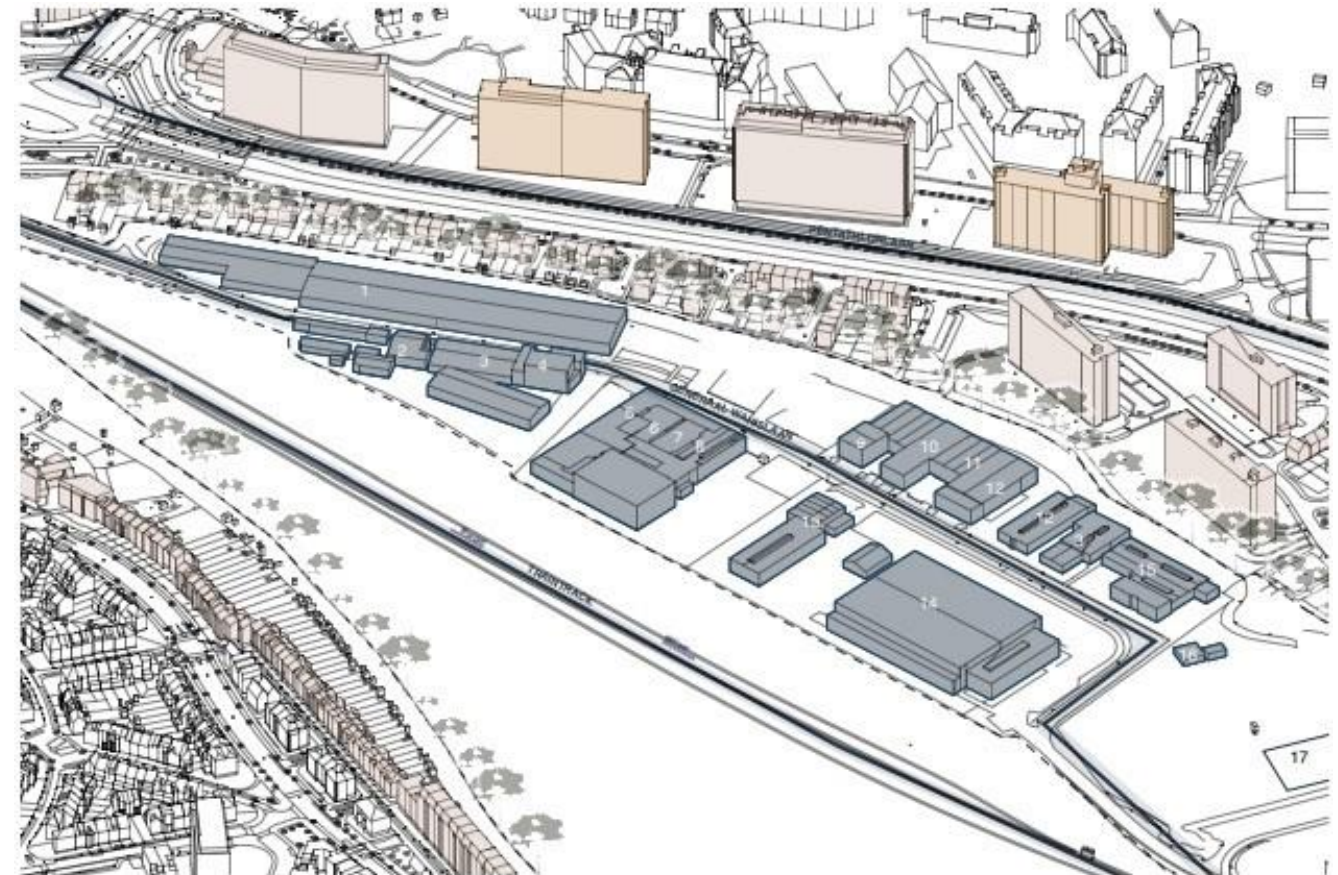




**"We have been here for a long time, we don't want to leave."**



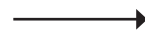
**"It is impossible for us to find another space in the city like this, so close to the city centre."**



**Analysis by listening to sounds**



## And translating this sounds into music



**Zone 1**  
Walking on the Friche  
Erich von Stroheim

The image shows a musical score for the piece "Walking on the Friche" by Erich von Stroheim. The score is written for a string quartet, with parts for Violin I, Violin II, Viola, and Cello/Double Bass. The score includes various musical notations such as notes, rests, and dynamic markings. The title "Zone 1" is prominently displayed at the top, along with the subtitle "Walking on the Friche" and the composer's name "Erich von Stroheim". The score is organized into measures and includes performance instructions like "Increasing rate of city sounds" and "Decreasing rate of city sounds".

What is the sound of the Friche?





# Research & design P2 | Analysis of west side of the Friche

## Chirping of birds // Melody

Musical notation for 'Chirping of birds // Melody'. The score is in G-flat major (one flat) and 4/4 time. It features a melody line with four distinct bird sounds labeled Bird 1 (high pitch), Bird 2, Bird 3, and Bird 4. Chords Bb, Bb#5, Bb6, and Bb7 are indicated above the staff. The piece starts with a piano (*p*) dynamic.

## City sound // Harmony

Musical notation for 'City sound // Harmony'. The score is in G-flat major and 4/4 time. It features a harmonic line with notes representing city sounds. Annotations include 'Drones of cars', 'Striking traffic --> suspense', and 'Still city noise in the background'. The piece starts with a piano (*p*) dynamic.

## Footsteps // Tempo

Musical notation for 'Footsteps // Tempo'. The score is in G-flat major and 4/4 time. It features a tempo marking of  $\text{♩} = 70$ . The melody is described as 'Walking, playing birdsounds'. The piece starts with a piano (*pp*) dynamic and is annotated with 'Footsteps fading in'.

## Train // Harmony

Musical notation for 'Train // Harmony'. The score is in G-flat major and 4/4 time. It features a harmonic line with notes representing train sounds. Annotations include 'Train coming...' and 'ff Overwhelming train noise >'. The piece starts with a piano (*p*) dynamic.

## Flowing water // Industry

Musical notation for 'Flowing water // Industry'. The score is in G-flat major and 4/4 time. It features a melody line with two distinct flows of water. Annotations include 'Water flowing, play moving', 'Another flow (different pitch)', and 'City noise blends in'. The piece starts with a piano (*p*) dynamic.



### Zone 1

Walking on the Friche Elbrich van Stralen

**Intro**  
♩ = 70

Walking, playing bird sounds

*pp* Footsteps fading in

5

81 City noise in the background

**Birds**

*p* Bird 1 (high pitch) Bird 2 Bird 3 Bird 4

Drone of cars Striking traffic Striking traffic

Still city noise in the background --> suspense

5

8 Ebmaj7 Bb45 Ebmaj7/Bb Bb7

*mp* Bird 5 Bird 2 Bird 2 Bird 4

Striking traffic Striking traffic

Increasing role of city sounds --> suspense

9

Fm7 Bb45

Train coming... *ff* Overwelming train noise >

**2 Pond**

11 Ebmaj7 Abmaj7

*p* Water flowing, play moving Another flow (different pitch)

City noise blends in

13 Gbmaj7 Fmaj7

Another flow again

15 Ebmaj7 Abmaj7

Energy, play moving

17 Dbmaj7 C6 8<sup>7</sup> B6 Bb6 8

Water drips, sparkling open sound Another drip

Transition back to nature, water fading away

**Birds**

20 Bb8 Bb45 Bb6 Bb7

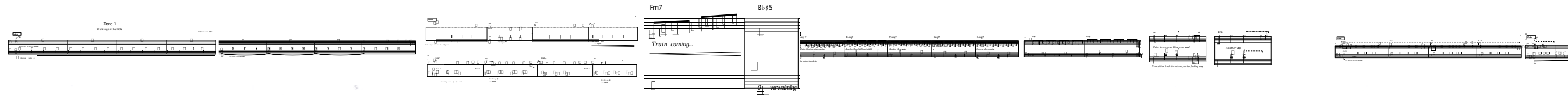
Bird 1

Footsteps

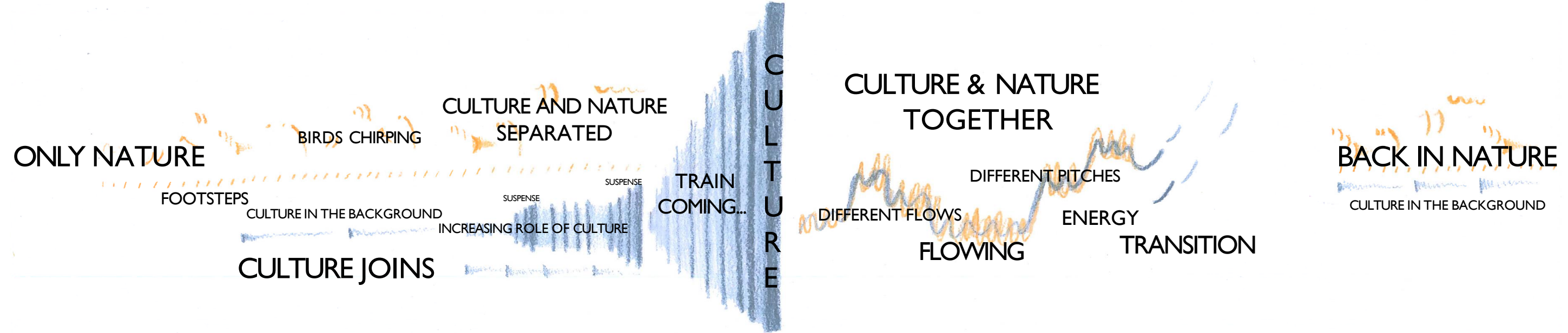
81 City noise in the background



Research & design P2 | Looking for options to use this music

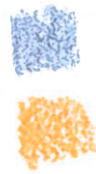
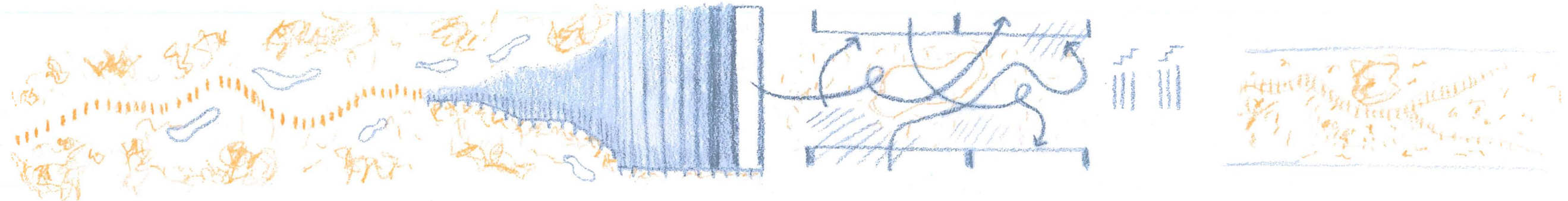


GRAPHIC



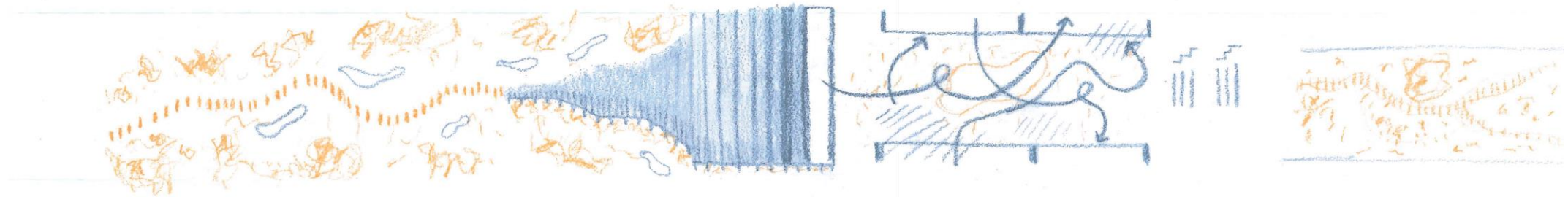
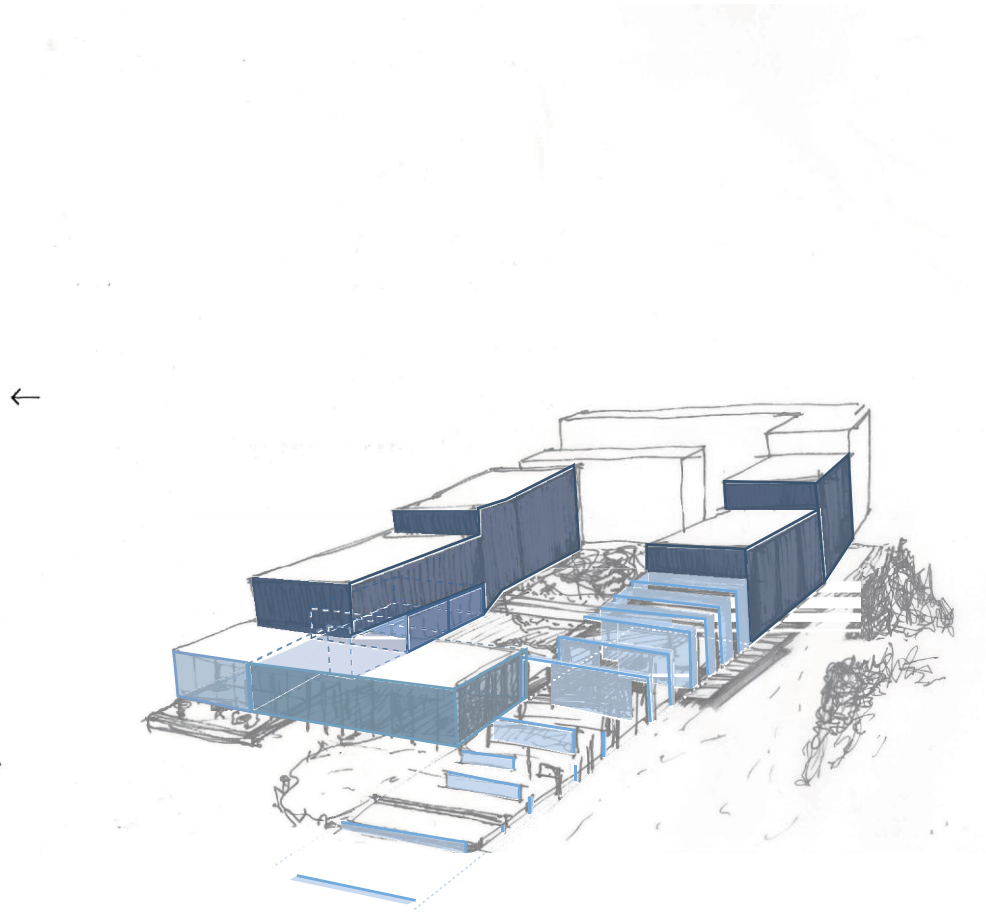
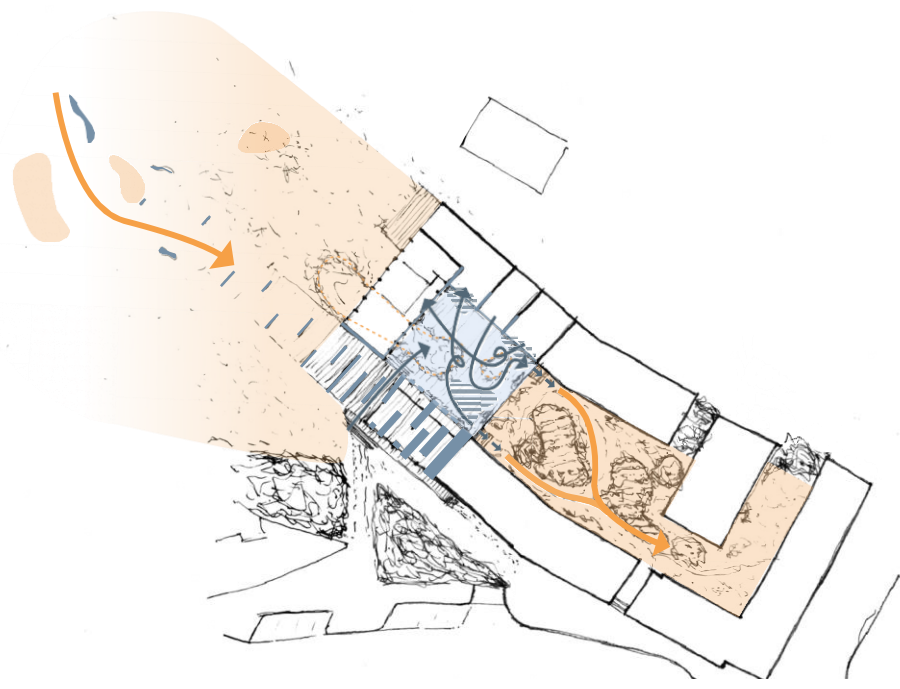
SPATIAL

A SEQUENCE OF SPACES



**CULTURE** - THE IDEAS, CUSTOMS, AND SOCIAL BEHAVIOUR OF A PARTICULAR PEOPLE OR SOCIETY

**NATURE** - THE PHENOMENA OF THE PHYSICAL WORLD COLLECTIVELY, INCLUDING PLANTS, ANIMALS, THE LANDSCAPE, AND OTHER FEATURES AND PRODUCTS OF THE EARTH, AS OPPOSED TO HUMANS OR HUMAN CREATIONS





### West side of the Friche

1. **Different layers of sound**, sounds of nature & culture, human & non-human
2. Being a void in the centre of Brussels and having a high biodiversity, **the Friche is a special place**, which also manifests itself in sounds that can be found at the Friche

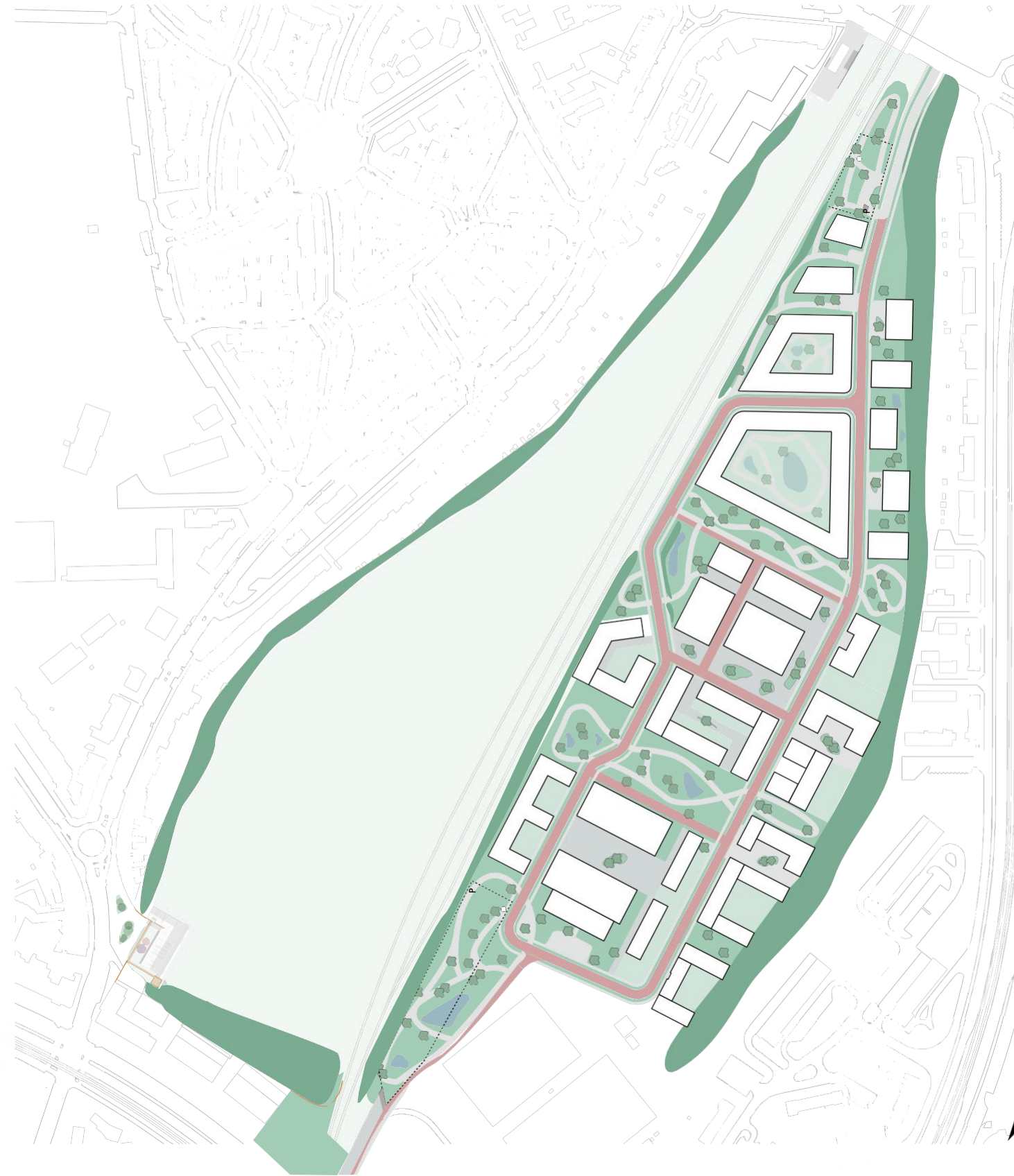


**CULTURE** - THE IDEAS, CUSTOMS, AND SOCIAL BEHAVIOUR OF A PARTICULAR PEOPLE OR SOCIETY



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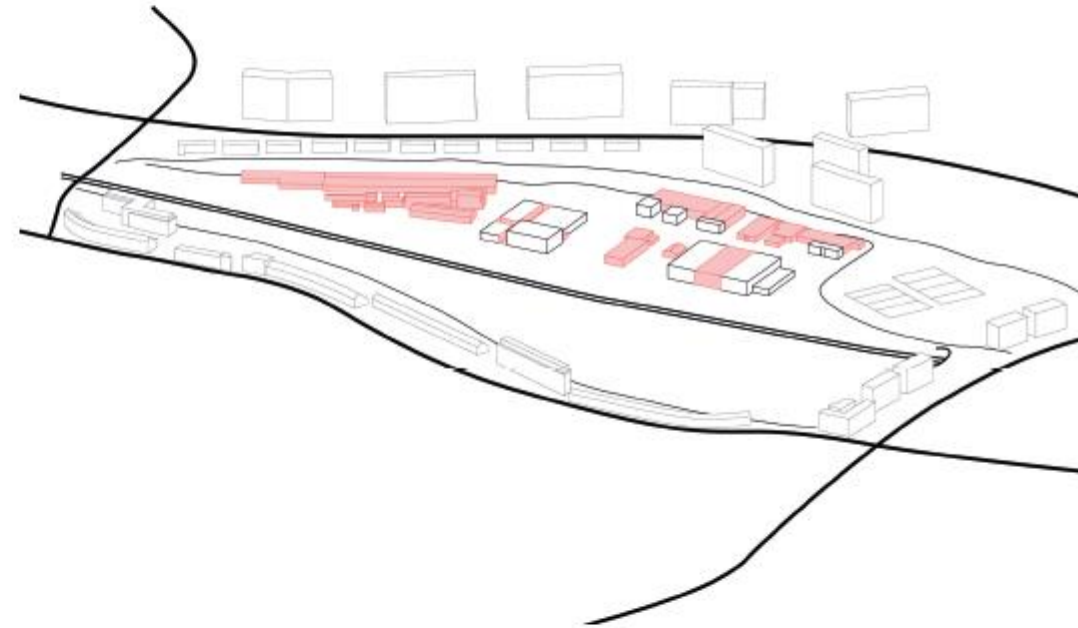
**Masterplan**





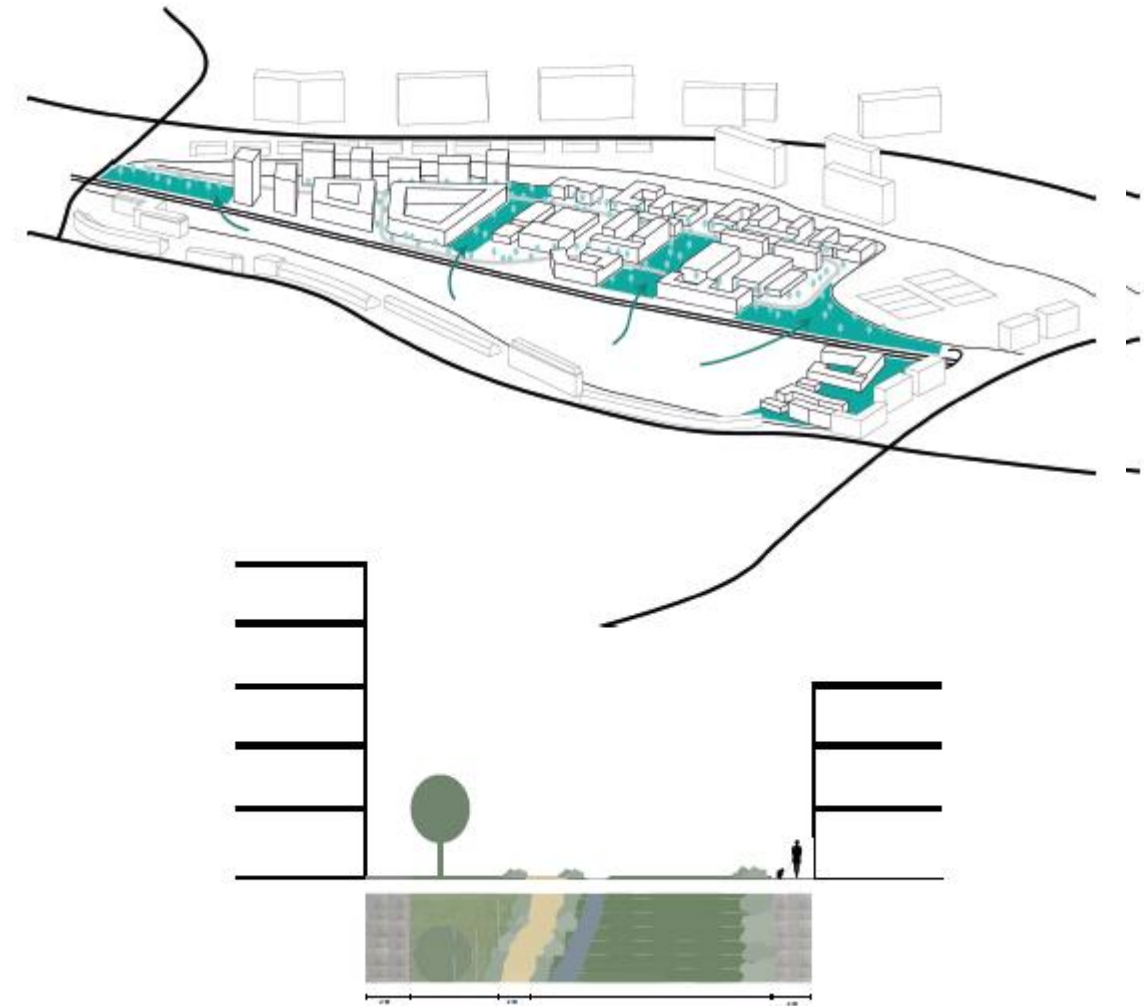


Re-use old industry structures and part of the road structure  
and keep opportunities for industry





Creating a bufferzone between biodiverse nature and new neighbourhood  
& connecting the green



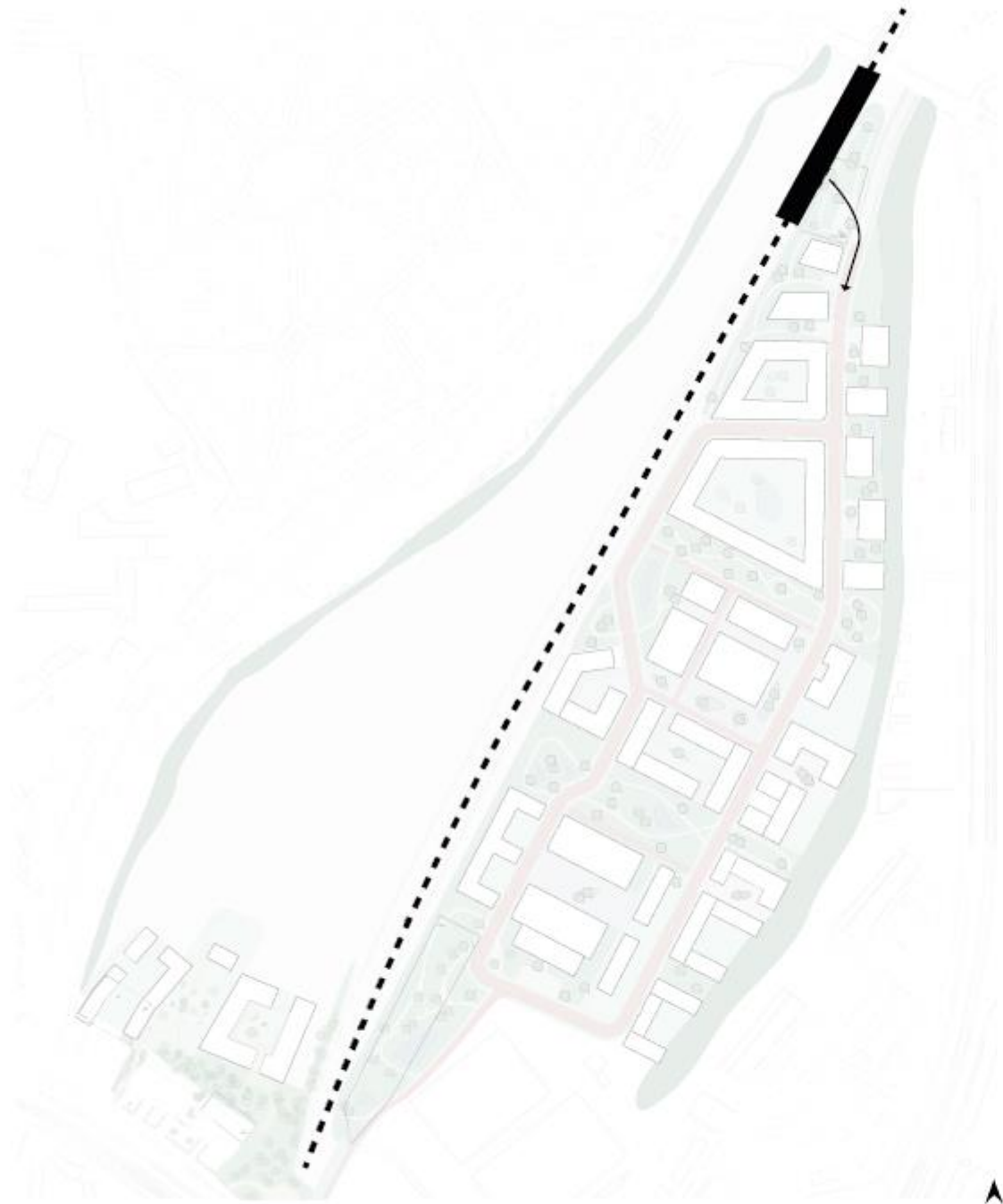




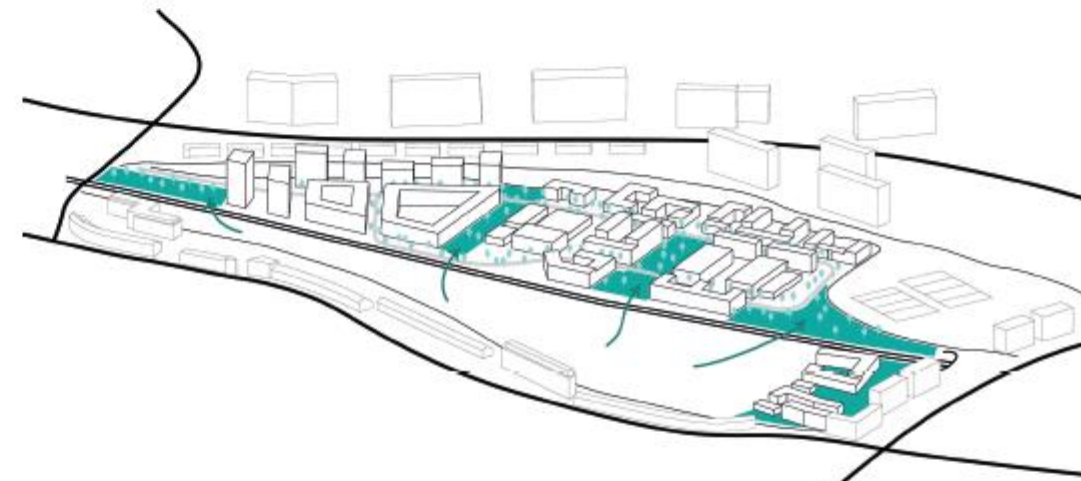
Zones of functions

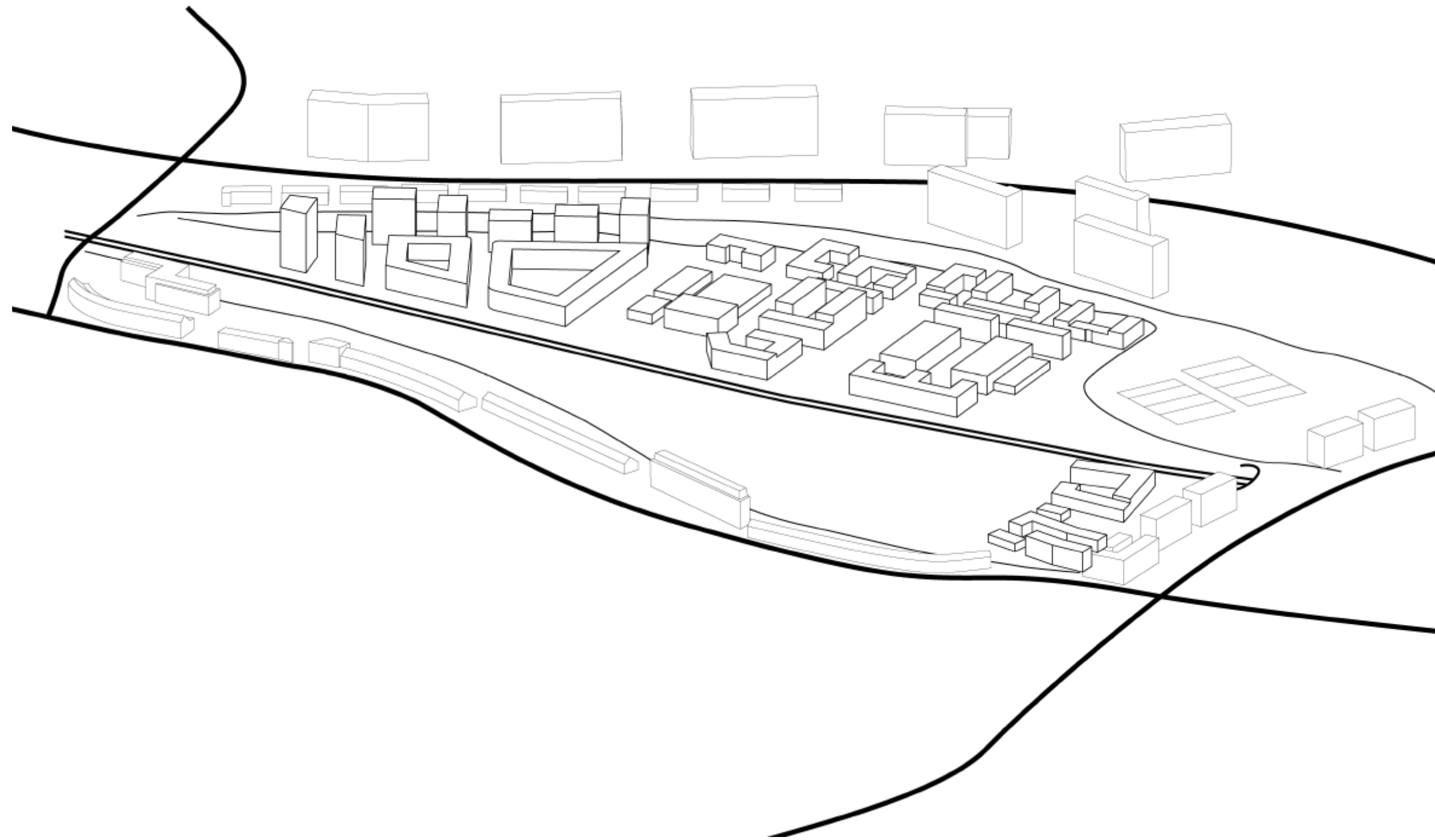


- Offices
- (Handcraft) industry
- Shops
- Schools
- Culture



Make use of the existing traintrack to connect the new neighbourhood to the rest of the city





**How can the sound of the Friche be implemented in a project there?**

# de luwteplek

een ruimtelijk onderzoek naar  
stilte, rust en verstilling in de stad

Geert Peymen en Pleuntje Jellema



*A place where people find silence and peace in a city*

# de luwteplek

een ruimtelijk onderzoek naar  
stilte, rust en verstillling in de stad

Geert Peymen en Pleuntje Jellema



*A place where people find silence and peace in a city*

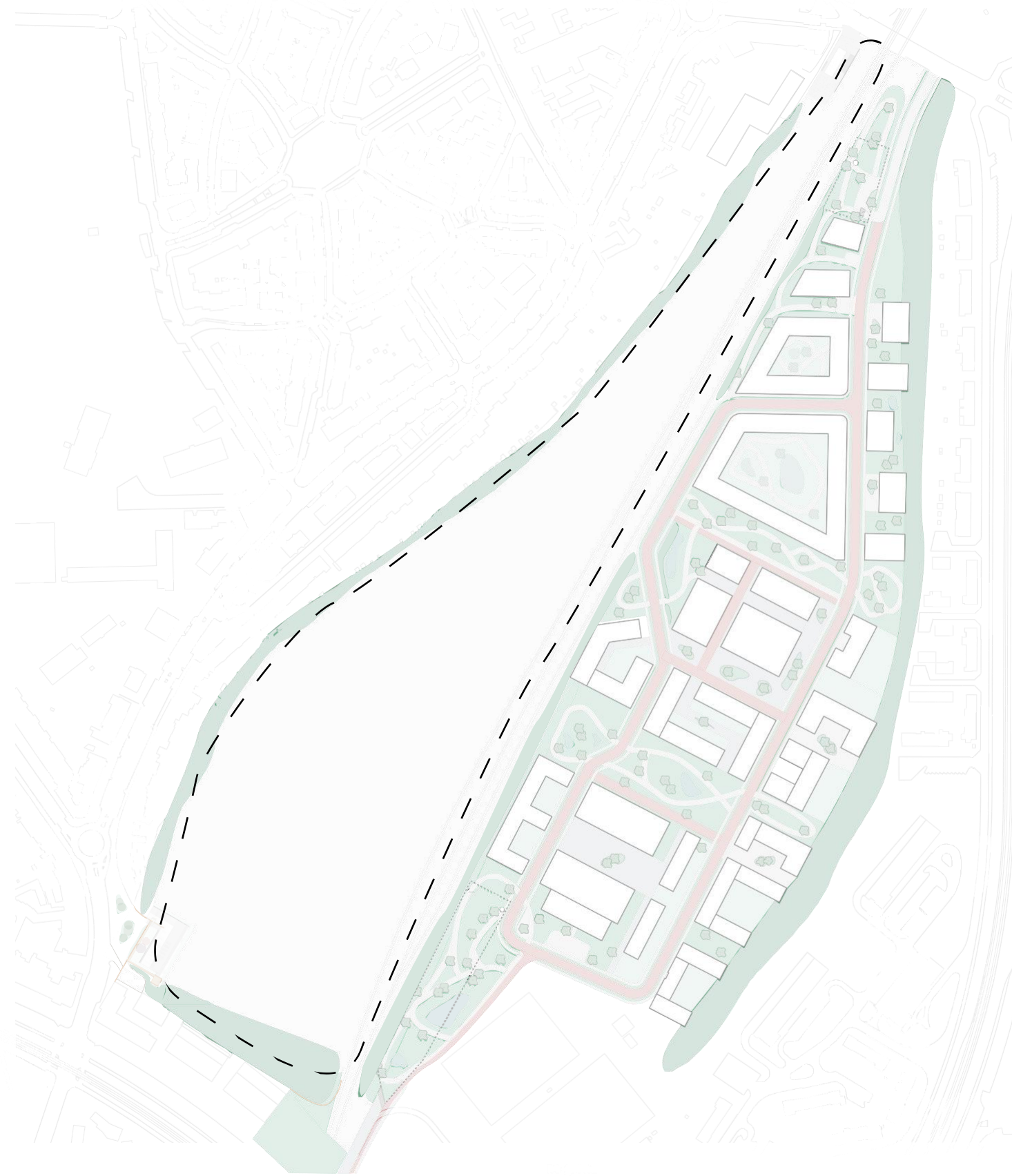
*A place where people really connect with the environment around them*

# de luwteplek

een ruimtelijk onderzoek naar  
stilte, rust en verstillling in de stad

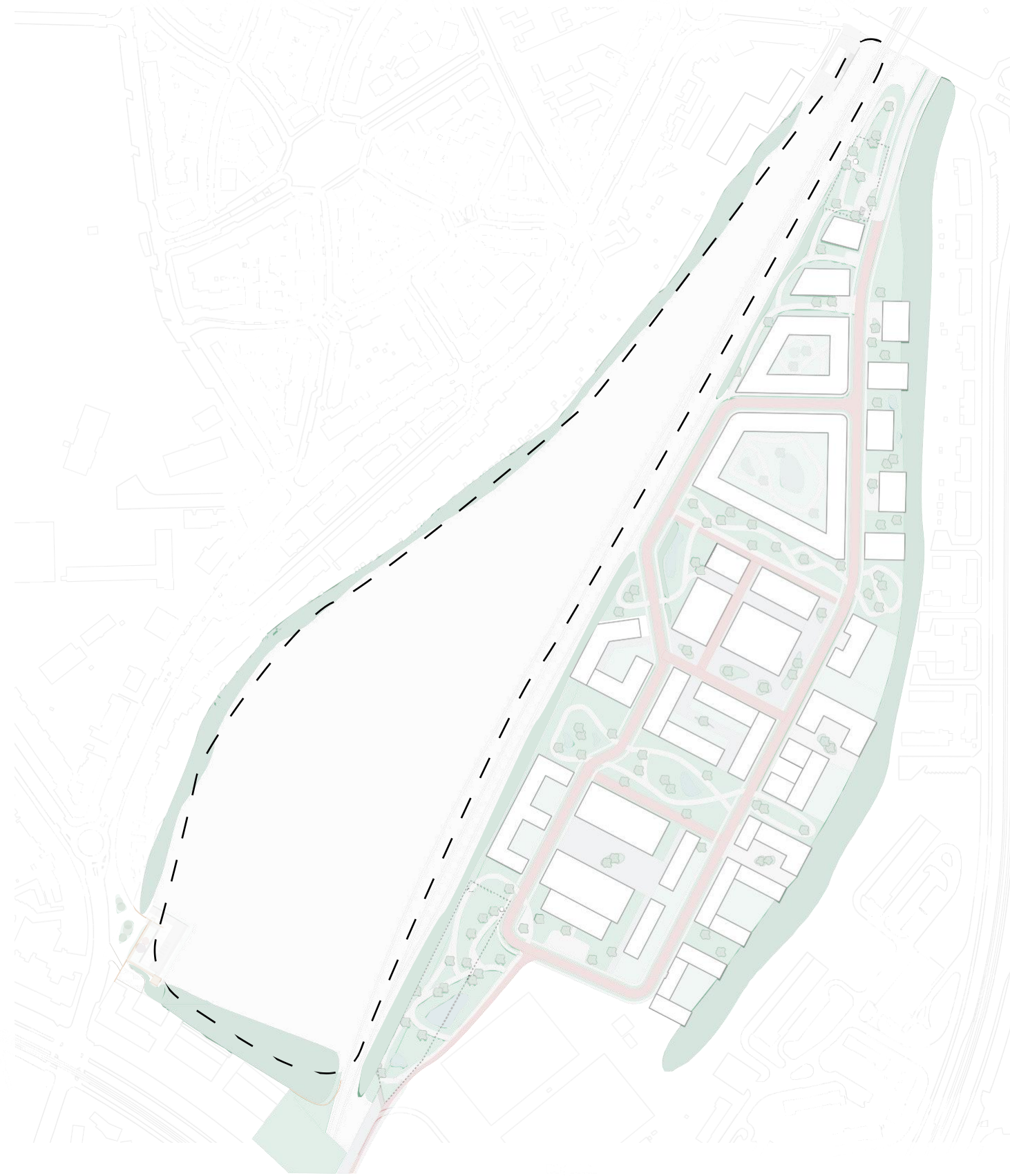
Geert Peymen en Pleuntje Jellema







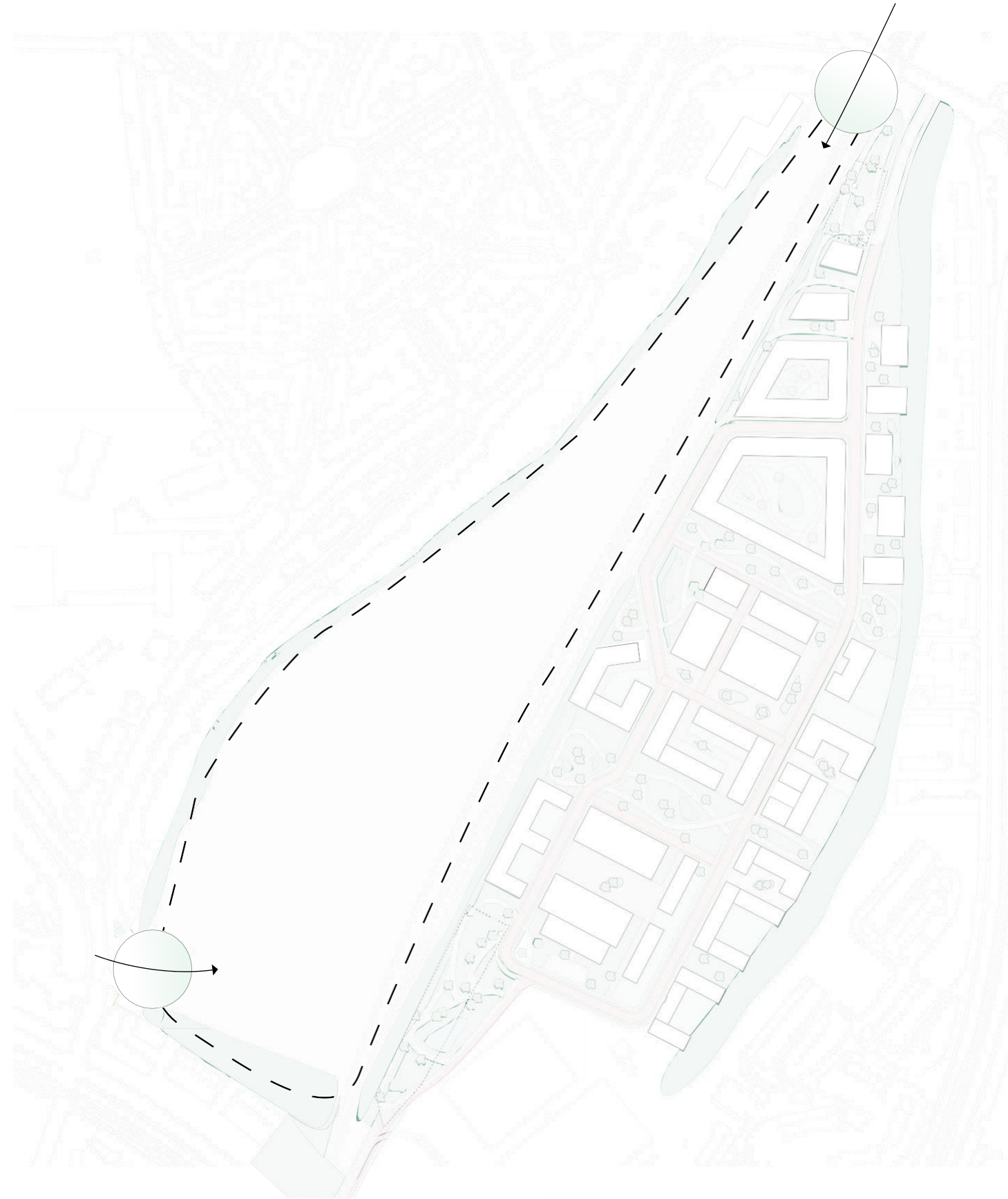
**Masterplan I** Giving the void a clear function

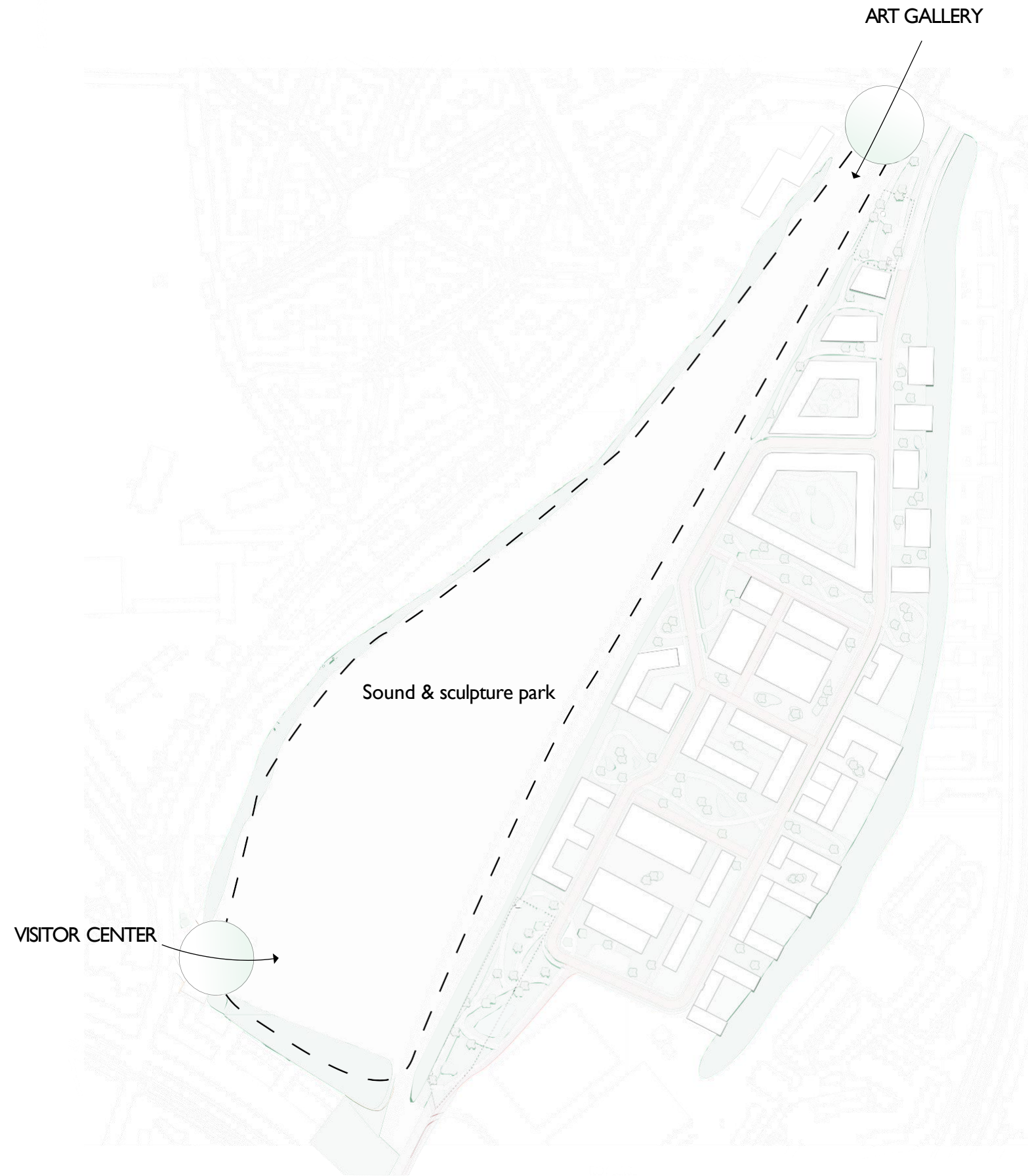


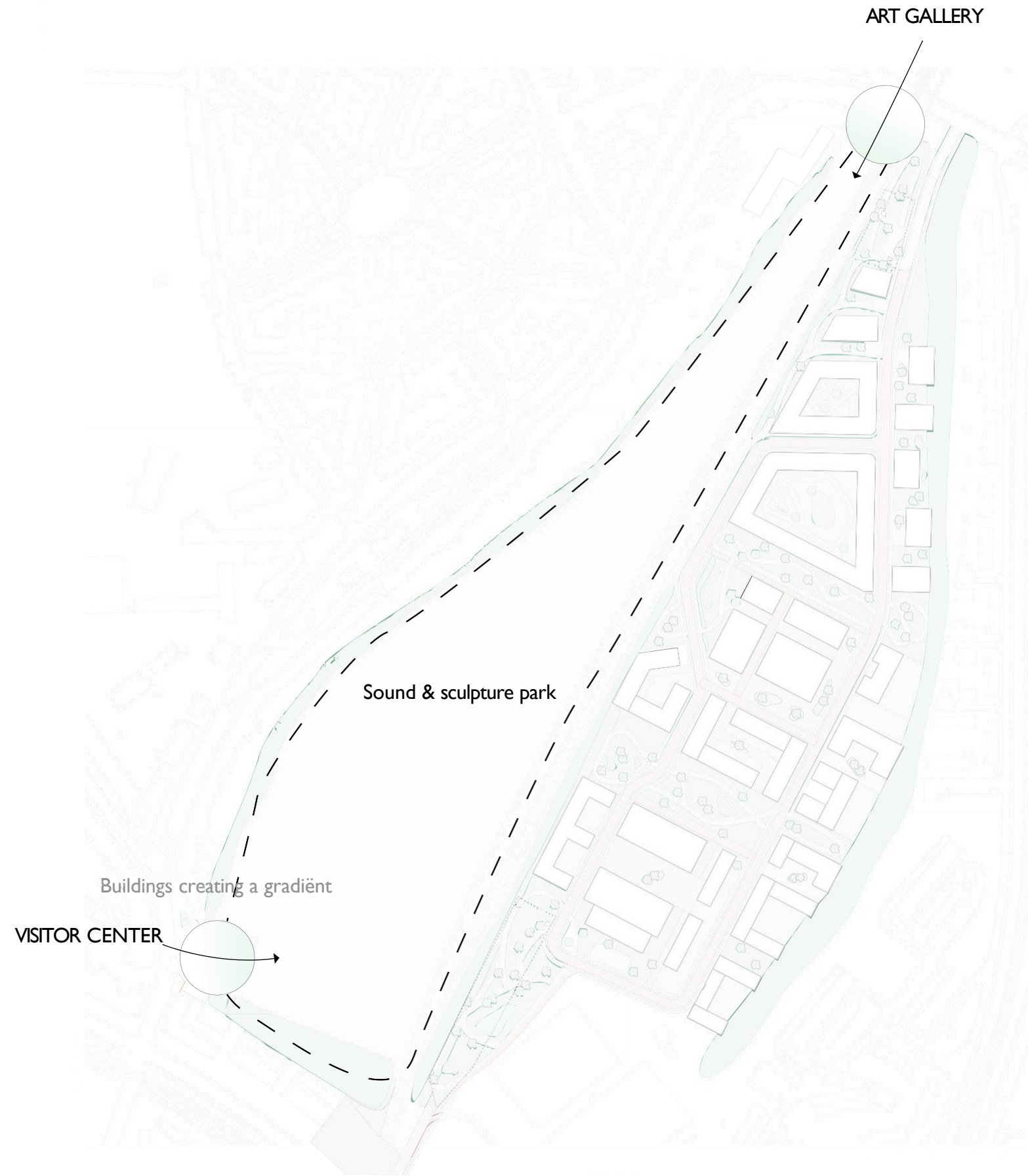
**Masterplan | Make it accessible for people from the neighbourhood**



**Masterplan** | Keeping an eye on entrances with 2 entrance buildings







*A sonic experience, a place  
to feel connected to the  
world around us*

*Where sounds will be  
emphasized in the visible  
(art) and invisible*



Masterplan I Physical barrier to enter another world

SOUNDBART GARDEN | 1:1000



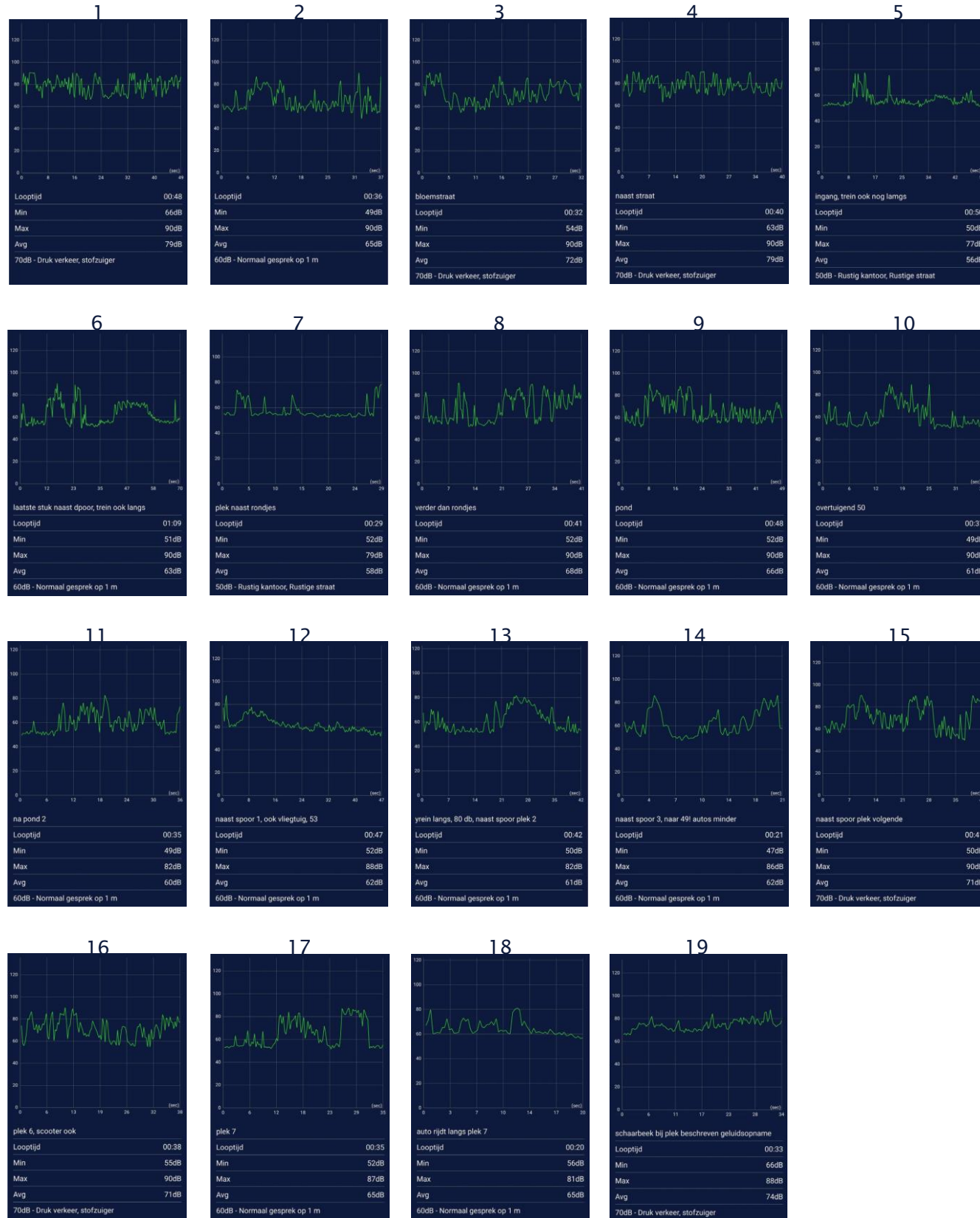


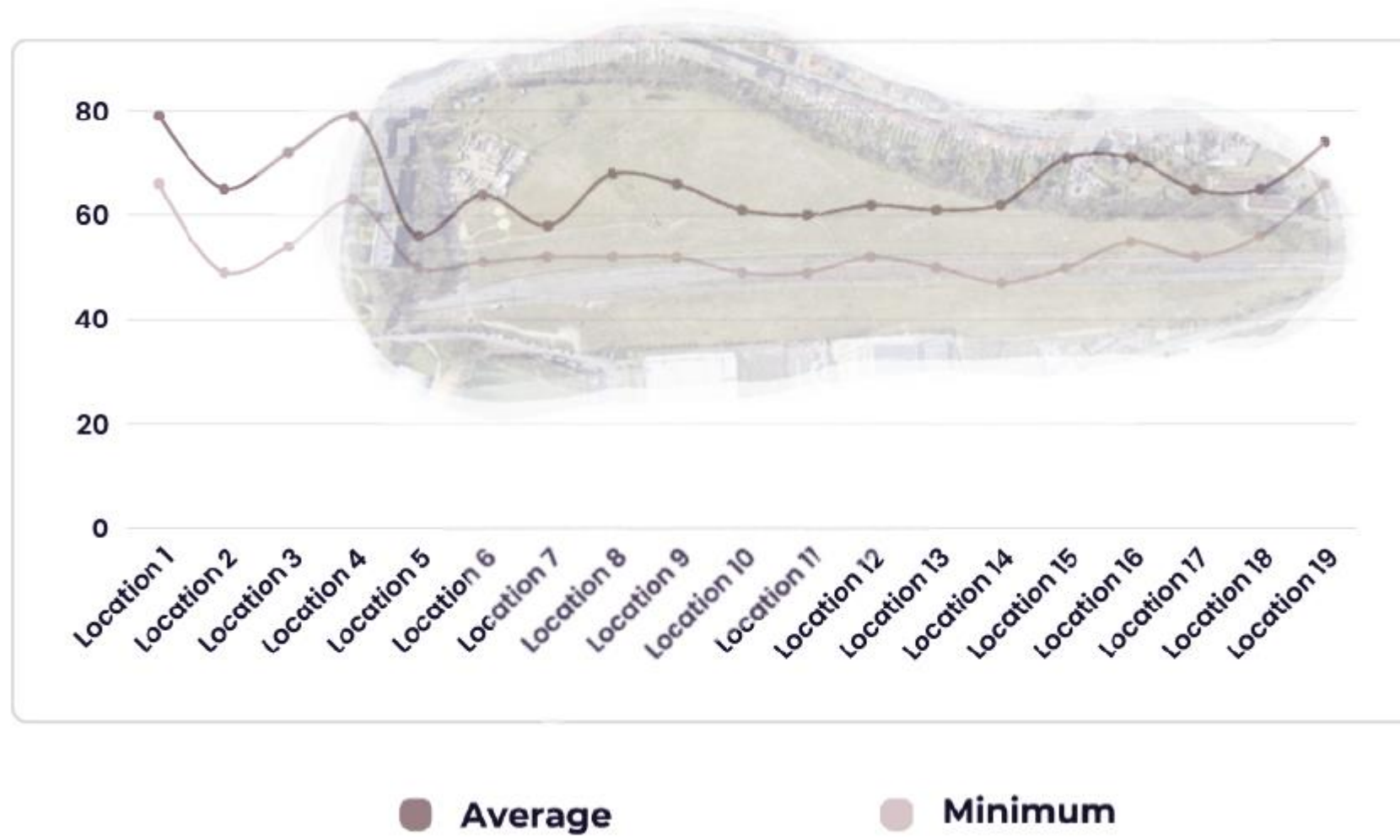
**Research**



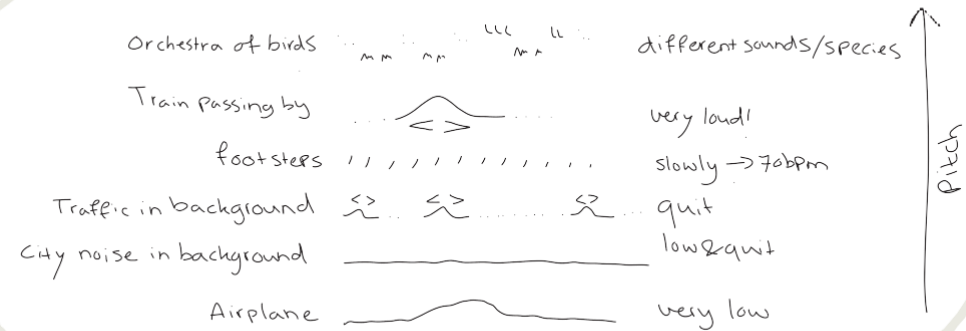


RESULTS OF DECIBEL MEASUREMENTS





### Layers of sounds

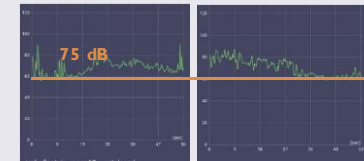


### Airplanes crossing

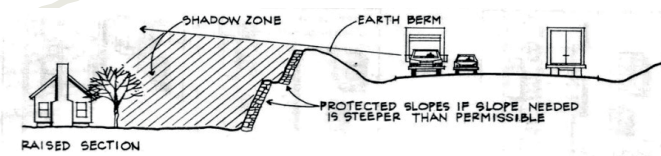
Flightpaths Brussels



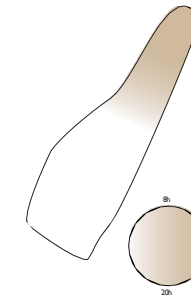
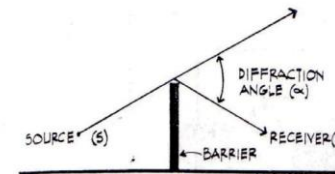
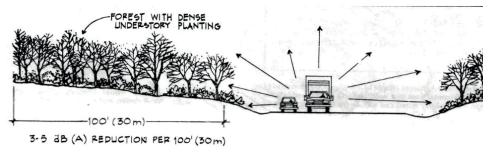
Measurements on site



### Acoustic concepts



Compression/resonance



### Trains coming along

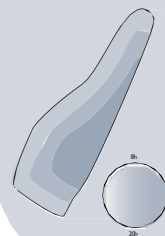
Passenger train



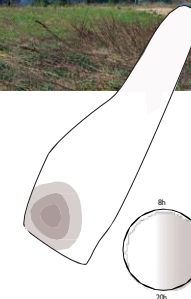
Freight train



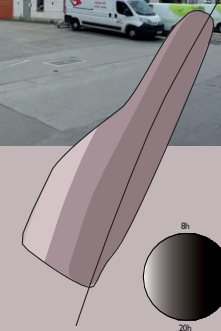
### Traffic & City



### Circus



### Industry



# BIRDS

## Chiffchaff



**Habitat:** Dense undergrowth and low trees, breeds on or near the ground in forests, urban areas, and semi-open landscapes with trees and bushes.  
**Breeding:** Dense vegetation or near the ground.  
**Diet:** Insects, larvae, and berries, foraging restlessly.  
**Migration:** From August to October to winter in Spain, Portugal, or North Africa, returning between April and May.

**Habitat:** Forested areas with old deciduous trees, nesting in tree hollows. In urban and village settings, prefers nest boxes, parks, and gardens, and winters in reed beds.  
**Breeding:** From late March to July, nest in tree hollows or nest boxes  
**Diet:** Insects, their larvae, spiders, and other invertebrates. In winter, consumes seeds (birch, larch, hornbeam, Spanish oak), peanuts. Found in reeds during winter to search for insects in the stems. Often forages high in trees, on thin branches and twigs.  
**Migration:** Resident year-round, with more activity between mid-September and mid-November (winter residents).

## Blue tit



## Blackcap



**Breeding:** In low dense shrubbery from mid-April to late June  
**Habitat:** In forests and semi-open landscapes with rich undergrowth, especially favoring brambles. Also found in parks and gardens. Prefers older trees and shrubs in natural forest settings. Often heard singing in spring but not easily seen. Flies infrequently, mainly vocalizes.  
**Diet:** Insects during breeding and berries and fruits throughout the rest of the year.  
**Migration:** Mid-August to mid-October to South England or the western Mediterranean, returning early to the Netherlands, even in March.

**Breeding:** From April to July, in tree hollows, walls, or dense climbing plants, with a messy construction of grasses and leaves  
**Habitat:** Not found in treeless areas. Prefers mature forests, gardens, and parks, especially where bushes and herbs are abundant.  
**Diet:** Insects, spiders, berries, and seeds  
**Migration:** Spain and Portugal from August to November, or stay in the Belgium. Lasts until late April, mostly at night.

## Robin



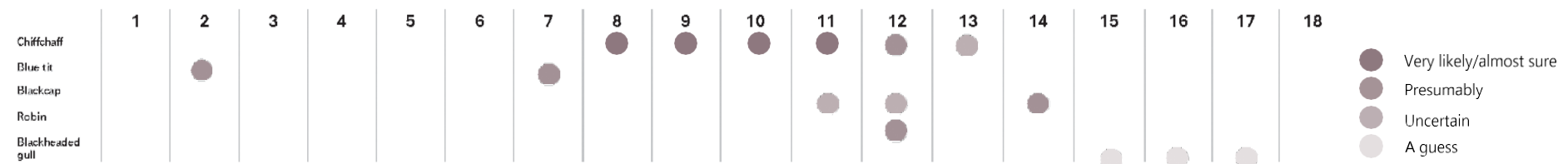
## Black-headed gull



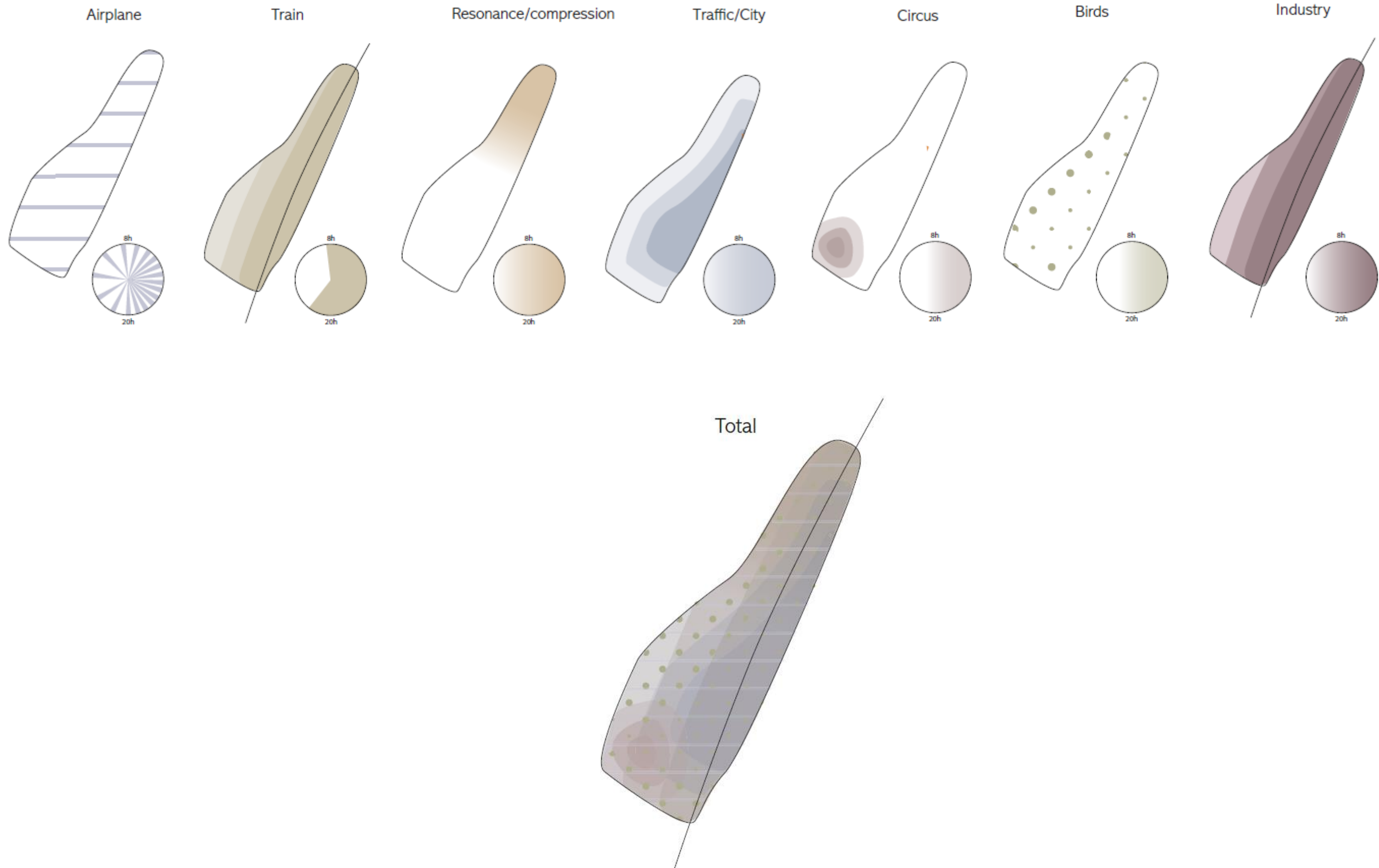
**Habitat:** Inland near freshwater and also in coastal areas. Forages in diverse landscapes, especially water-rich grasslands, and tidal flats. Found widely outside breeding season, including in farmland and urban areas.  
**Diet:** Insects, fish, and scavenged scraps. Known to steal food from other birds and probe mudflats for invertebrates.  
**Migration:** Southward, or stay, spans from February to April, crossing land and sea day and night.



## Analysis birds



Research | Schematic overview sounds



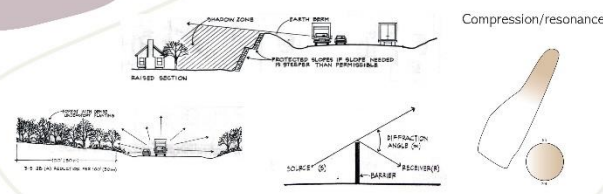


# SONIC PLAN OF THE FRICHE

## Sound in the urban environment

Sound is the crossing between people and their environment - 'van Lengen'  
 Sound connects people & environment; the human and non-human; the object, subject & place

## Acoustic concepts



## Industry



## Analysis of decibels



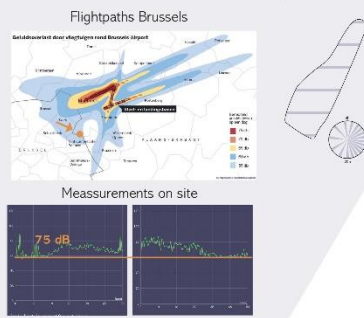
## Traffic & City



## Trains coming along



## Airplanes crossing



## Circus



## BIRDS

### Chiffchaff



**Habitat:** Classic undergrowth and low trees, mostly on or near the ground in forests, urban areas, and semi-wooded areas with trees and bushes.  
**Breeding:** Classic vegetation or near the ground.  
**Diet:** Insects, snails, and berries, foraging restlessly.  
**Migration:** From August to October to winter in Spain, Portugal, or North Africa, returning between April and May.

### Blue tit



**Habitat:** Forested areas with old deciduous trees, nesting in tree hollows. In urban and village settings, prefers near boxes, parks, and gardens, and winters in roost boxes.  
**Breeding:** From late March to July, nest in tree hollows or roost boxes.  
**Diet:** Insects, fruit in late spring and other invertebrates. In winter, consumes seeds (such as larch, hawthorn, hazelnut oak), acorns. Found in roosts during winter to search for insects in the stems. Often forages high in trees, on tree branches and logs.  
**Migration:** Resident year-round, with more activity between mid-September and mid-November (winter residents).

### Blackcap



**Breeding:** In low dense shrubbery from mid-April to late June.  
**Habitat:** In forests and semi-wooded landscapes with rich undergrowth, especially involving brambles. Also found in parks and gardens. Prefers dense trees and shrubs in natural forest settings. Often heard singing in spring but not easily seen. Flies frequently, mainly vocalises.  
**Diet:** Insects during breeding and berries and nuts throughout the rest of the year.  
**Migration:** Mid-August to mid-October to South England or the western Mediterranean, returning early to the Netherlands, even in March.

### Robin

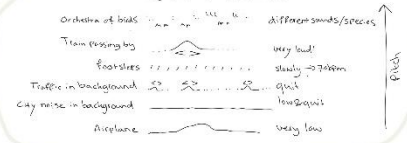


**Breeding:** From April to July, in tree hollows, walls, or dense climbing plants, with a messy construction of grass and leaves.  
**Habitat:** Not found in treeless areas. Prefers mature forests, gardens, and parks, especially where bushes and berries are abundant.  
**Diet:** Insects, worms, berries, and seeds.  
**Migration:** Spain and Portugal from August to November; or stay in the Belgium. Lasts until late April, mostly at night.

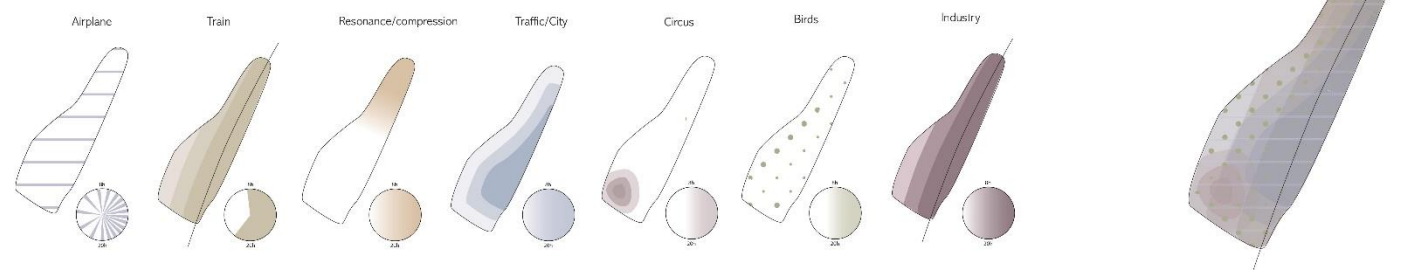
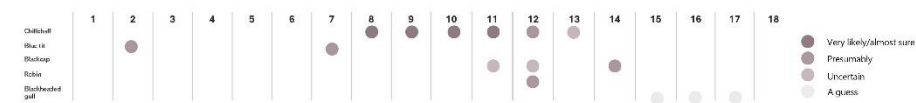


**Habitat:** Breed near freshwater and also in coastal areas. Forages in diverse landscapes, especially water-rich grasslands, and tidal flats. Found widely outside breeding seasons, including in farmland and urban areas.  
**Diet:** Insects, fish, and scavenged scraps. Known to scold food from other birds and probe mudflats for invertebrates.  
**Migration:** Southward, or stay, starts from February to April, crossing land and sea day and night.

## Layers of sounds

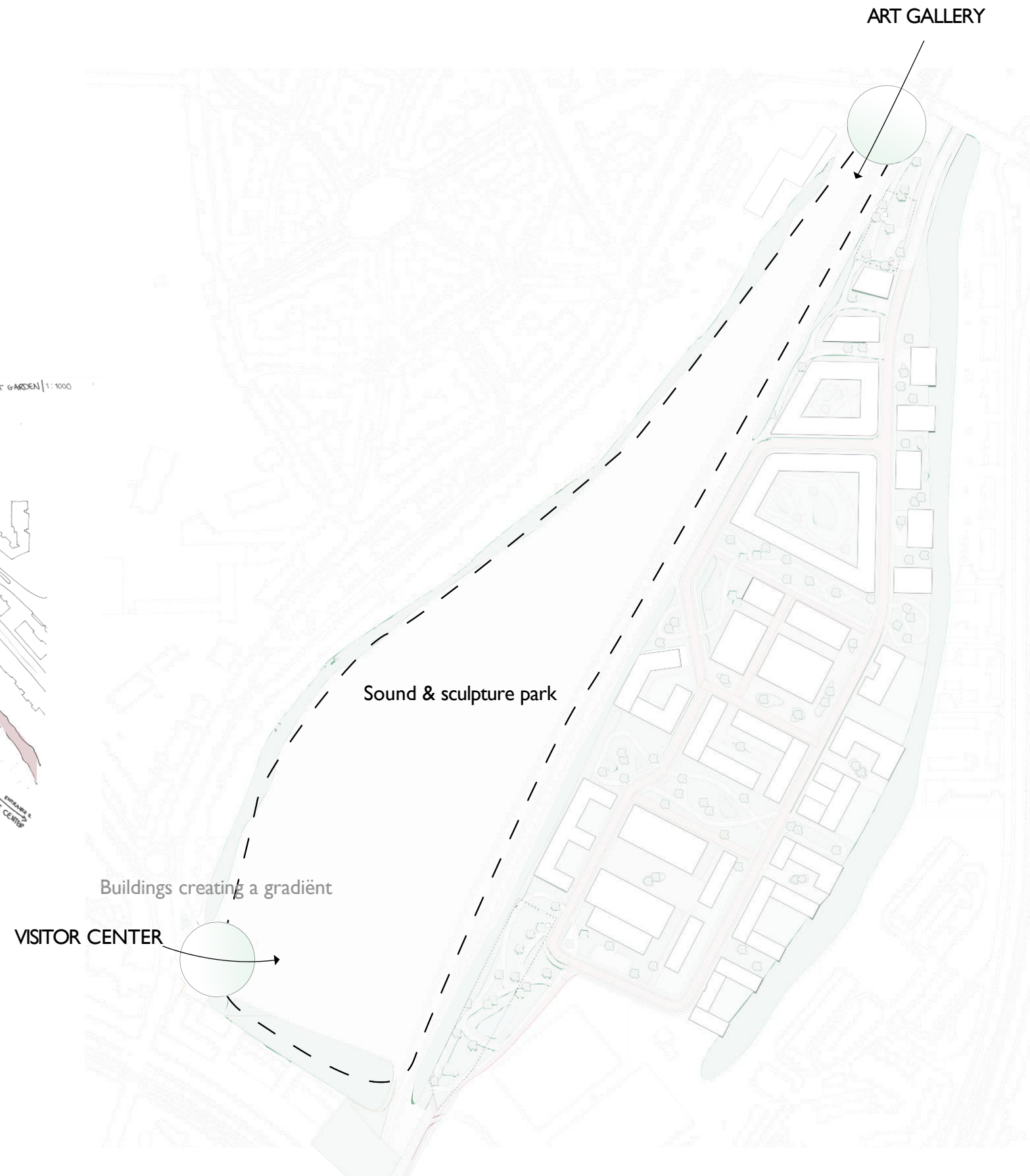


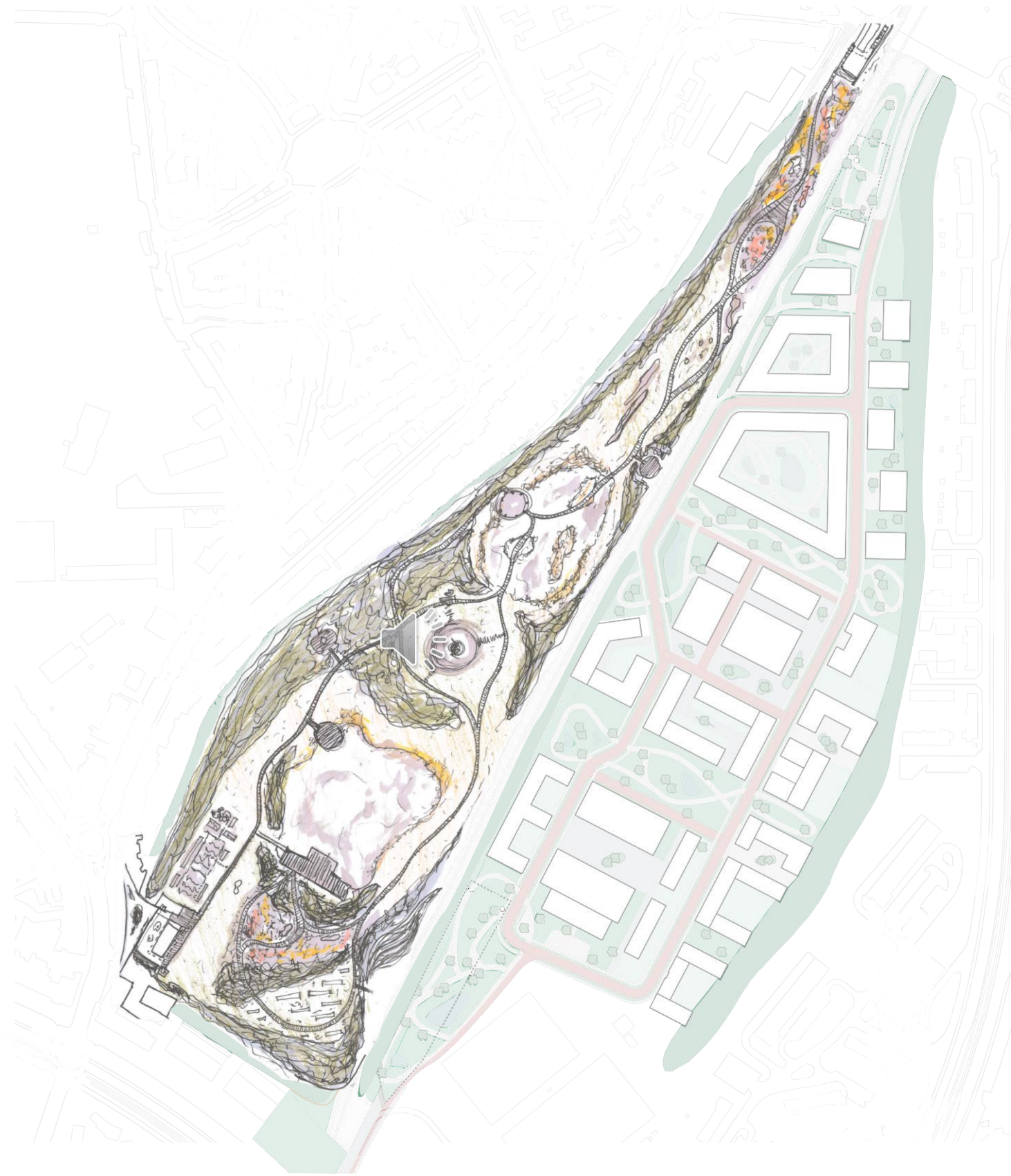
## Analysis birds



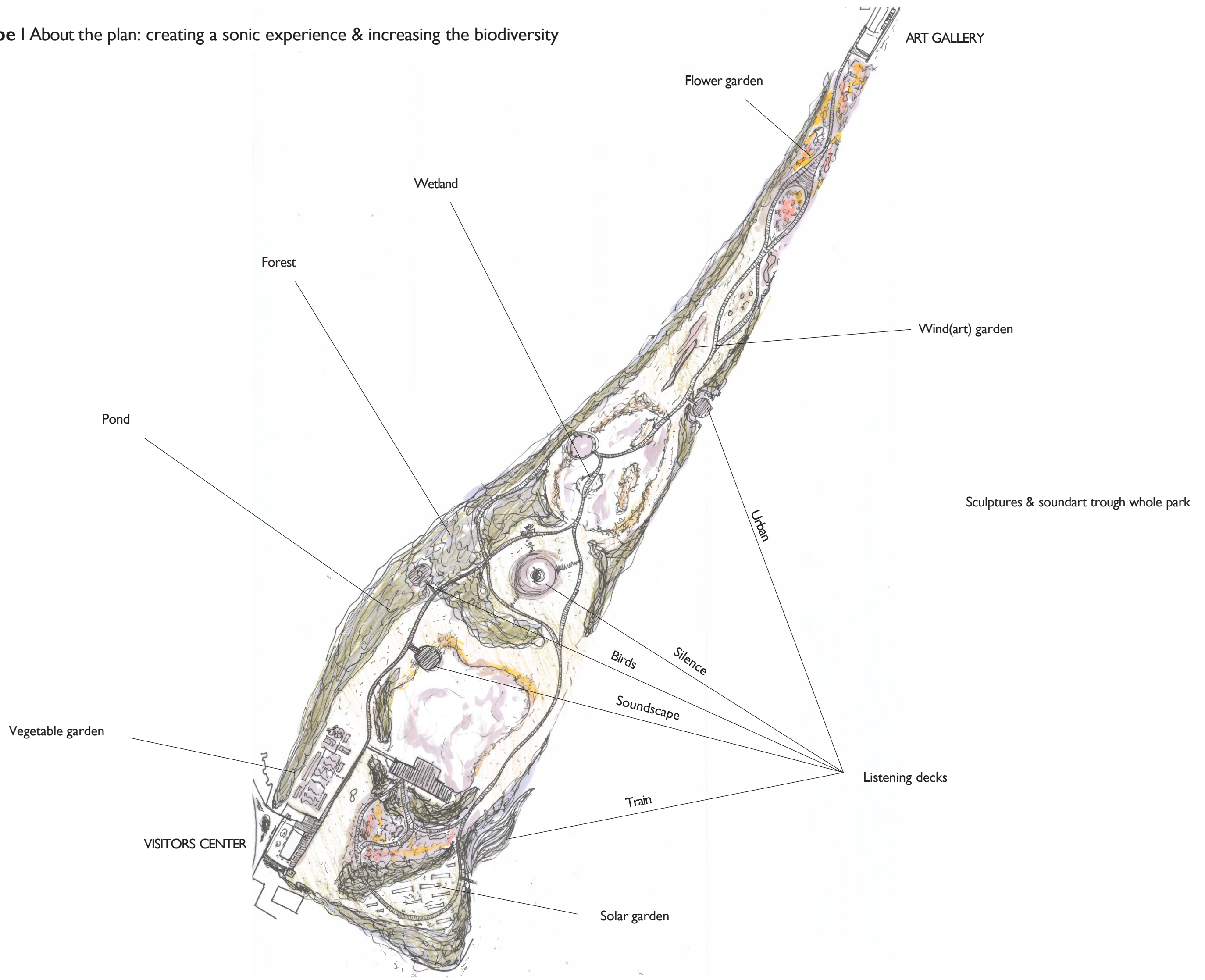
**Landscape**

# Landscape I Design task





**Landscape I** About the plan: creating a sonic experience & increasing the biodiversity



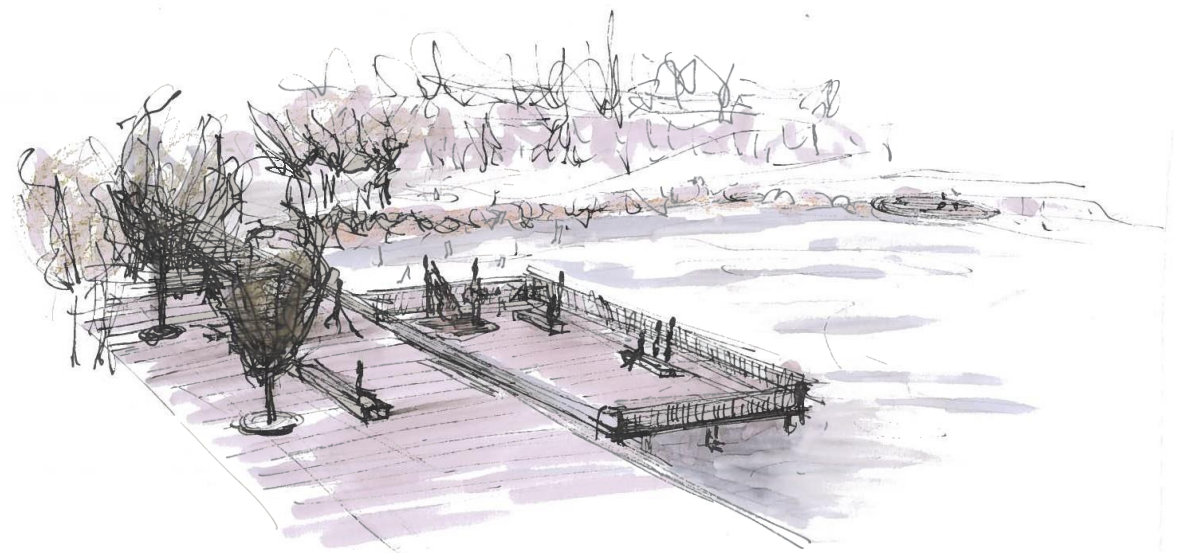
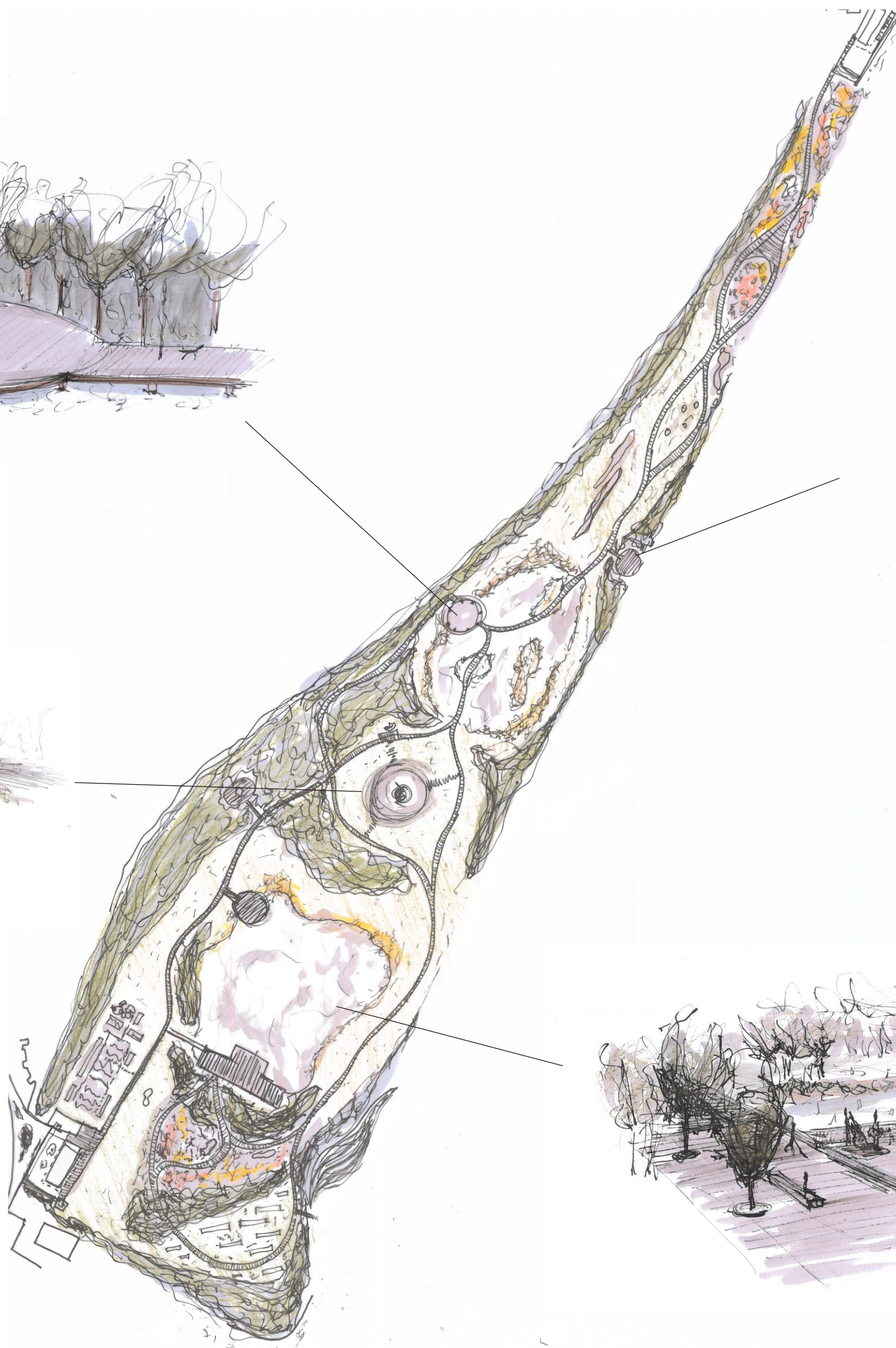
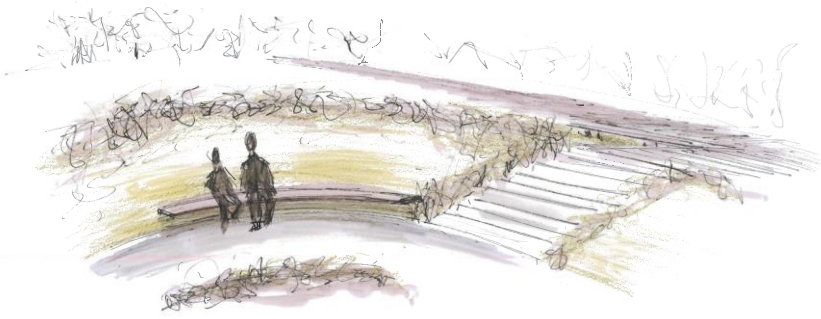
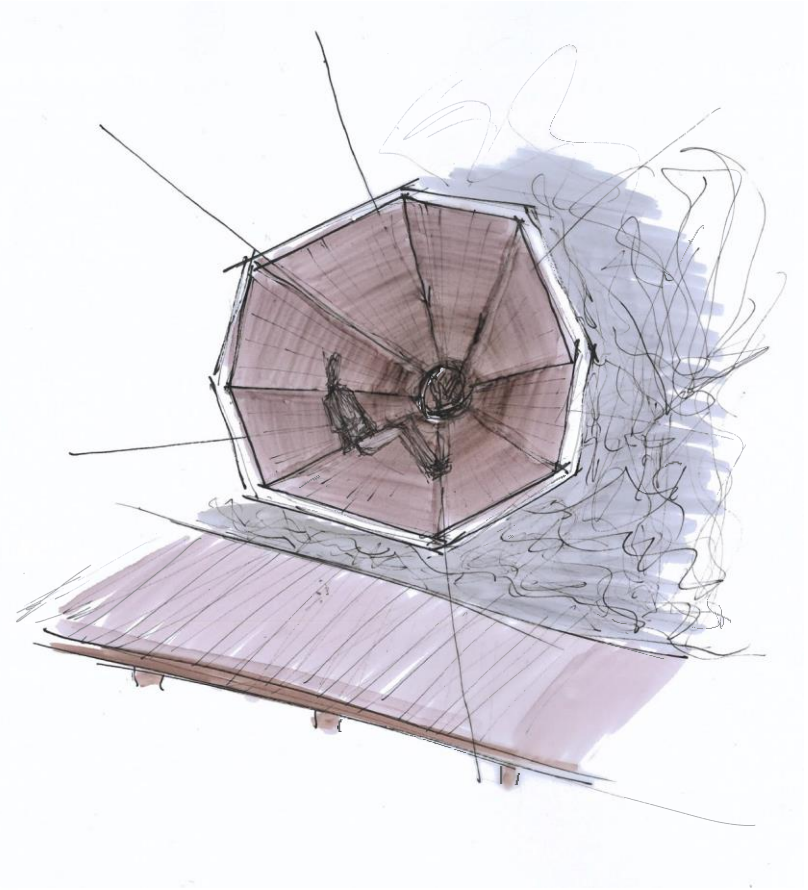
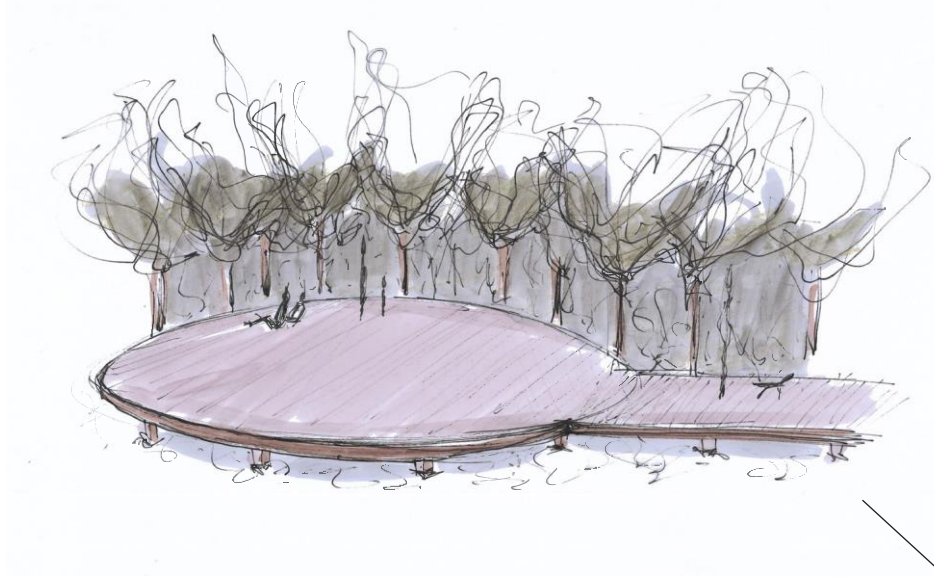
**Landscape** | Soundart & sculptures that visualise sounds and help to emphasize the awareness of sounds



# Landscape | Sounds at the park



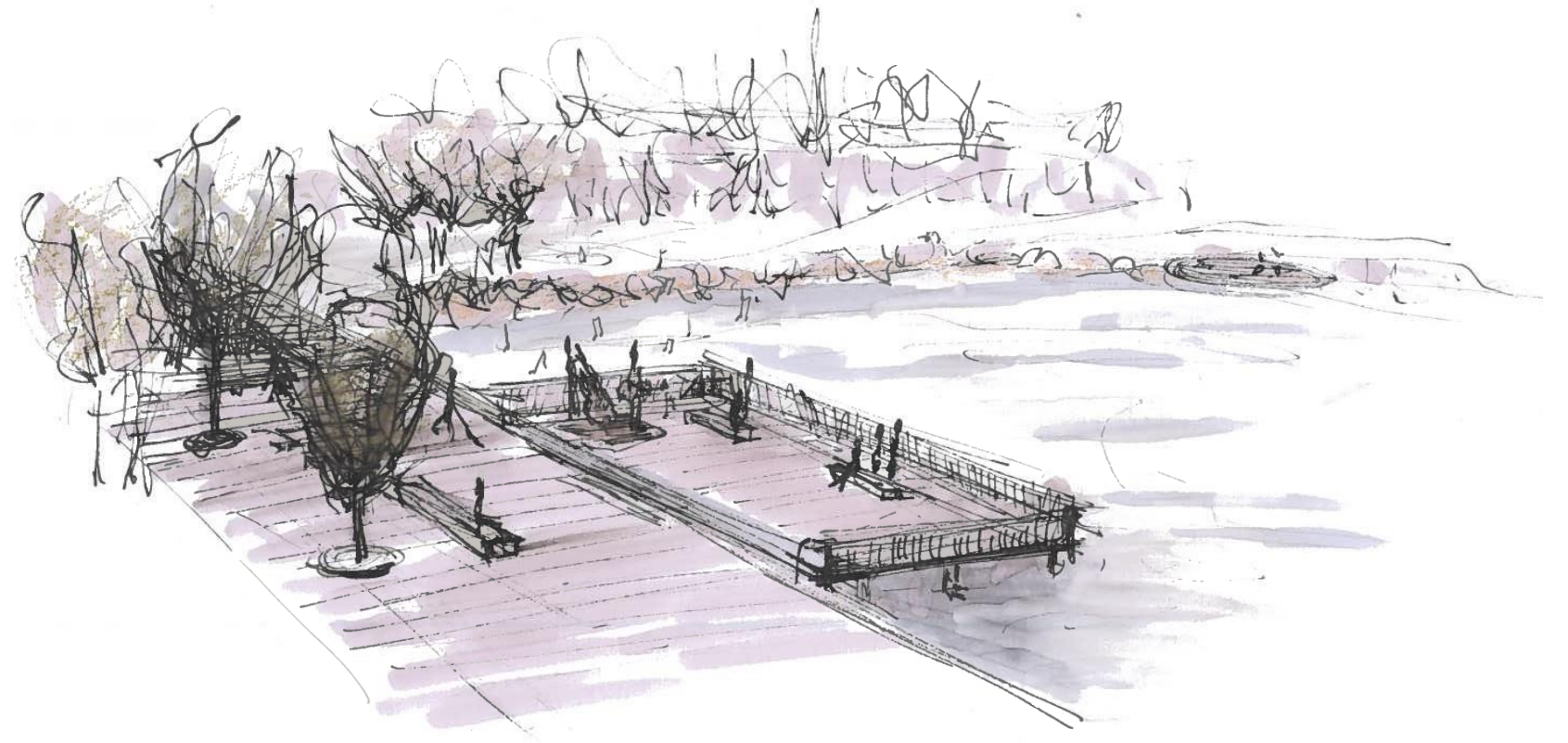
Landscape | Zooming in: moments







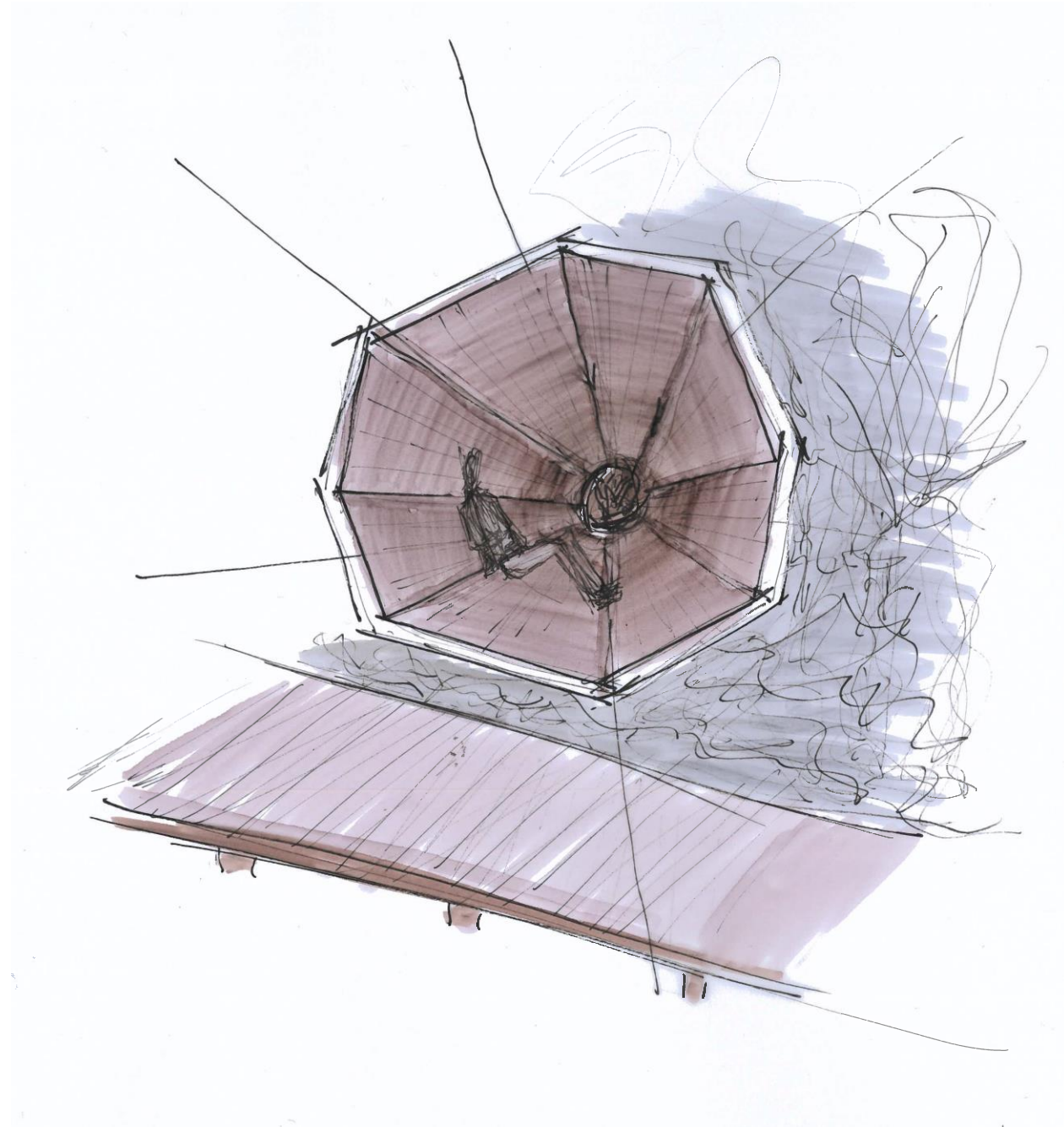
Free zone



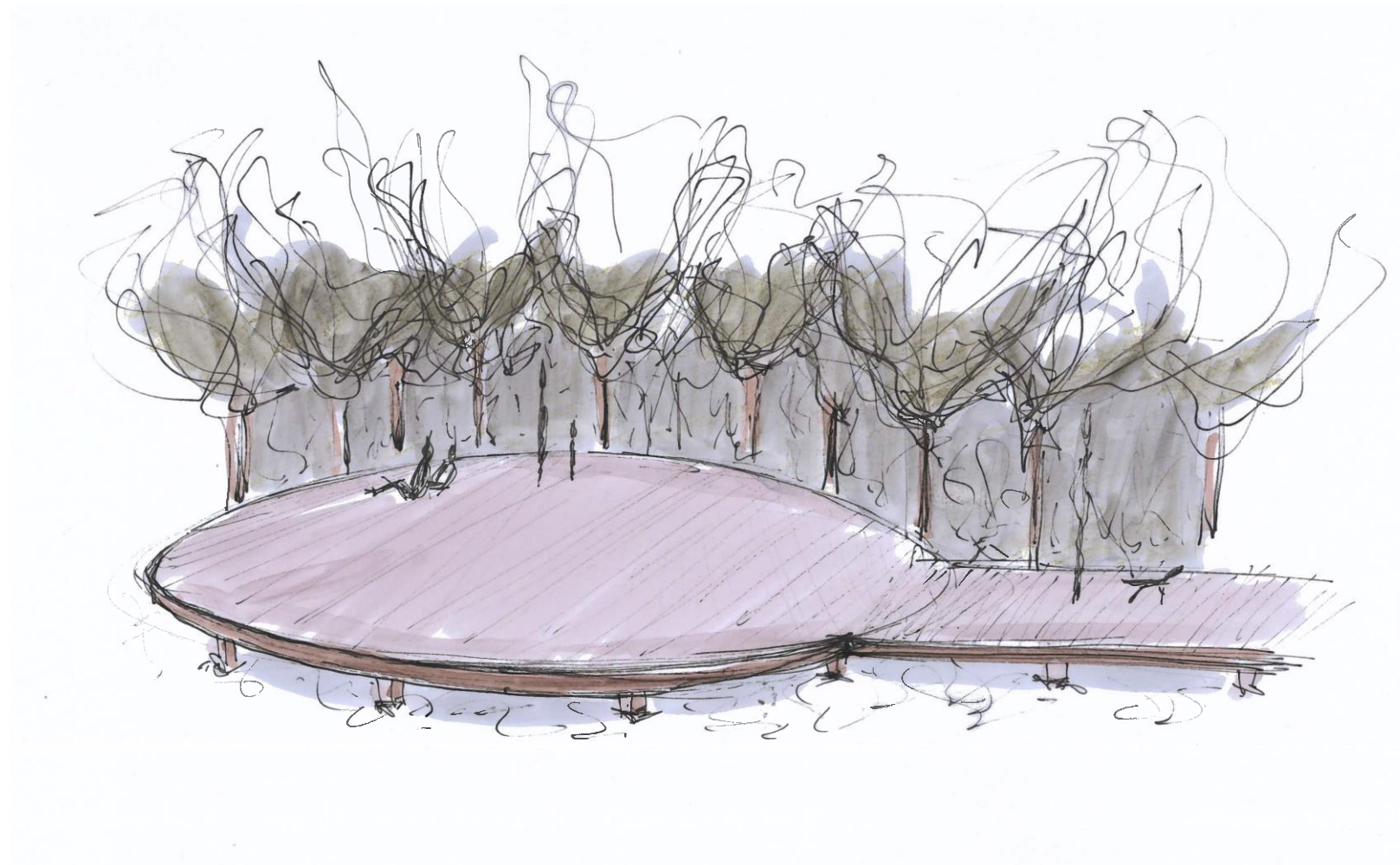
Quite place



Amplifying sounds



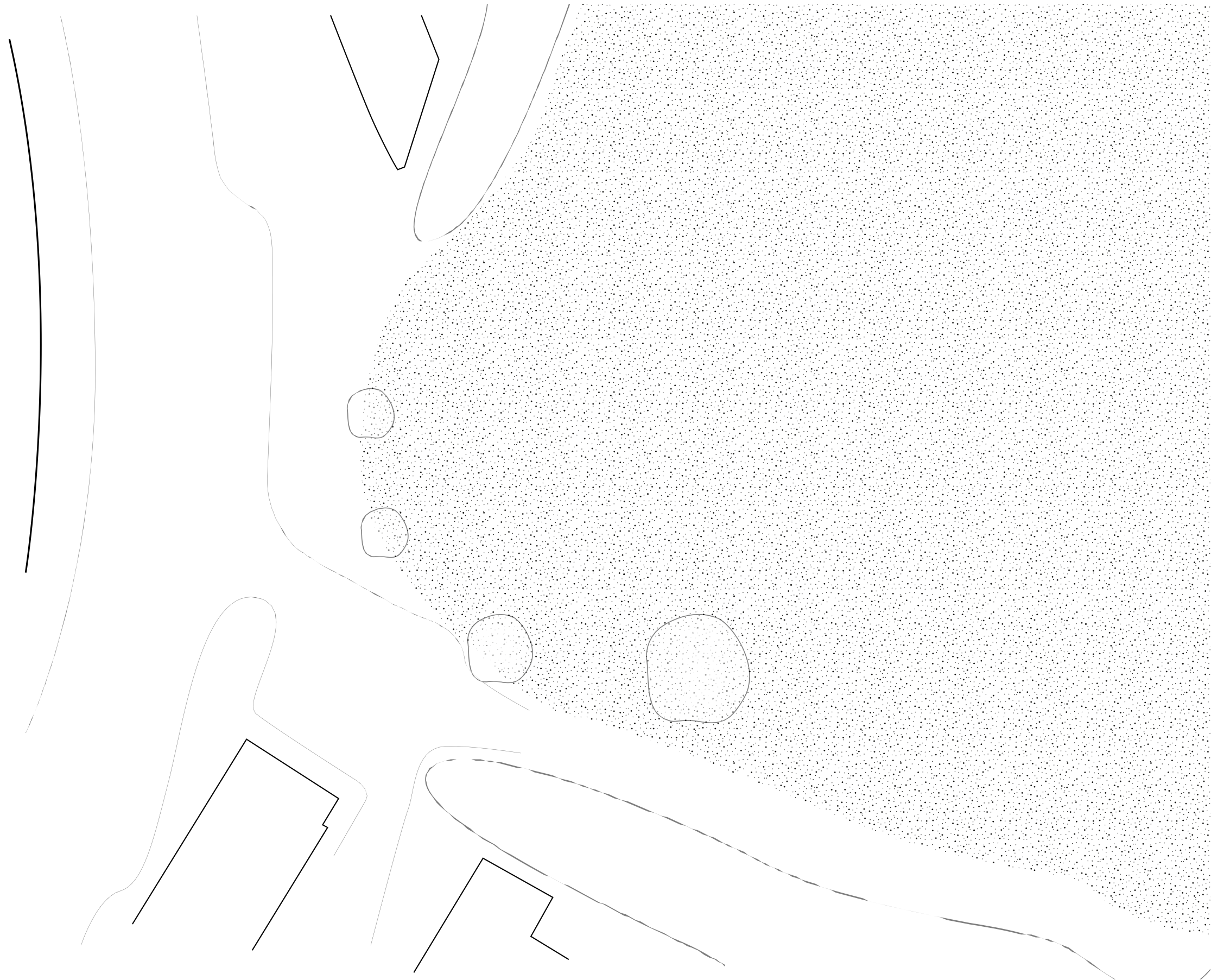
Listening decks



**Architecture**

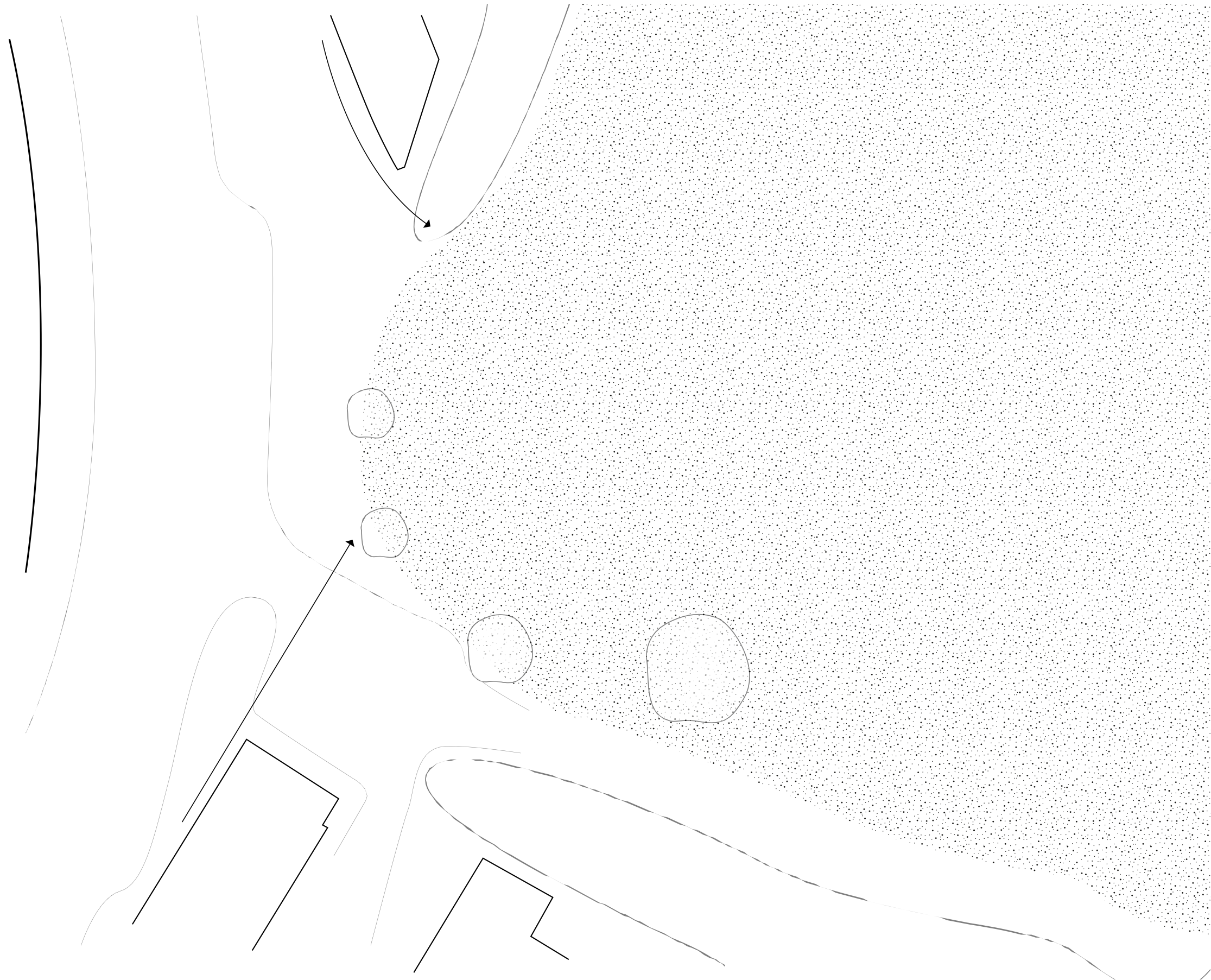








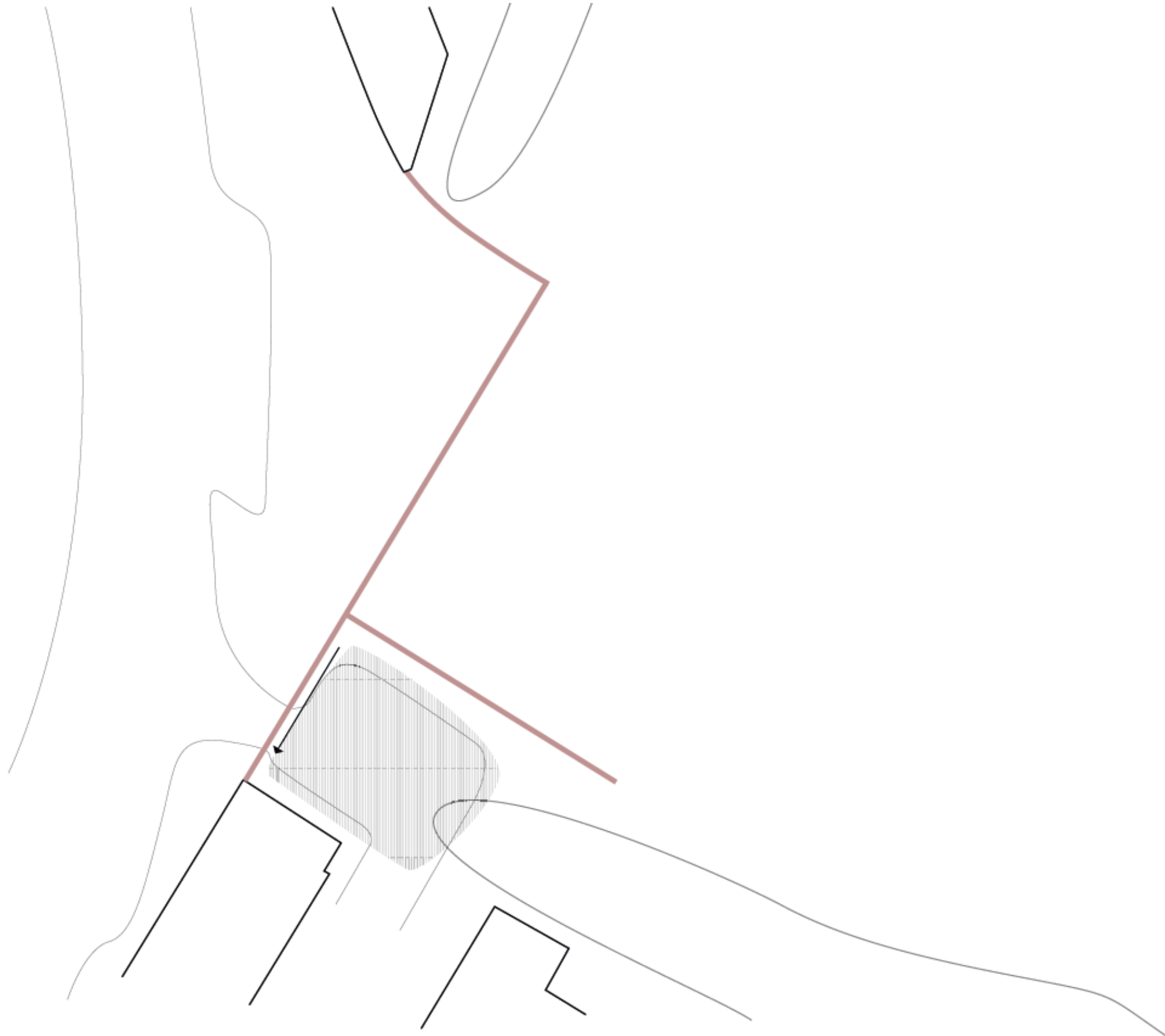
Architecture I Following lines of existing urban morphology



**Architecture I** Designing an acoustic barrier that also emphasizes entering a hidden world



**Architecture I** Extending the wall to create a private parkingspace & prevent this (& Friche) from unwanted visitors







Architecture I Goal: design a (acoustic) gradient from urban to the park



**Architecture I** Which is oriented on the Friche



Architecture I Creating volumes based on optimal windowpositions





Architecture I Result, creation of in-between zone





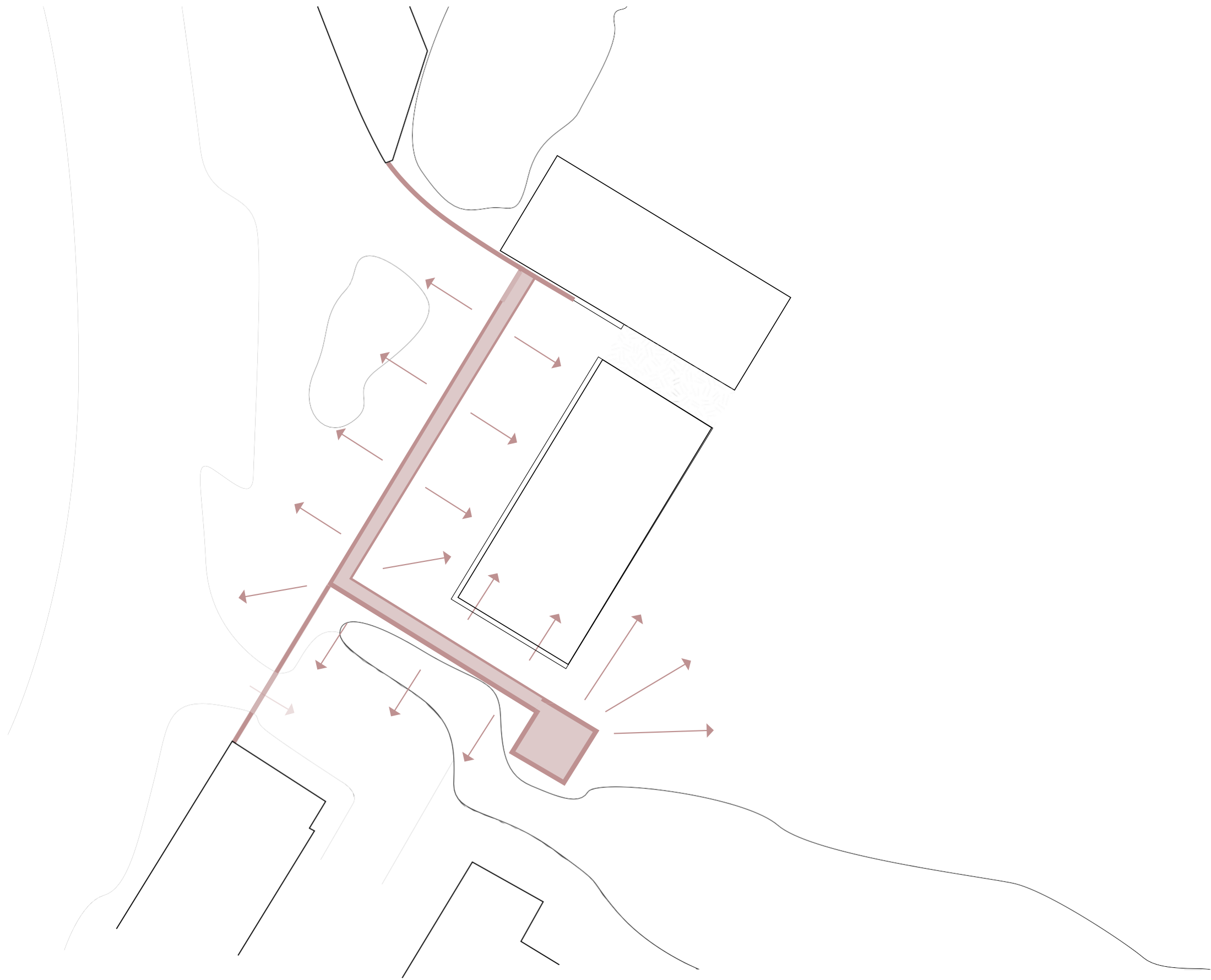
Architecture I A tresholdzone from the urban to the park



Architecture I Adding an extra acoustic barrier: second skin



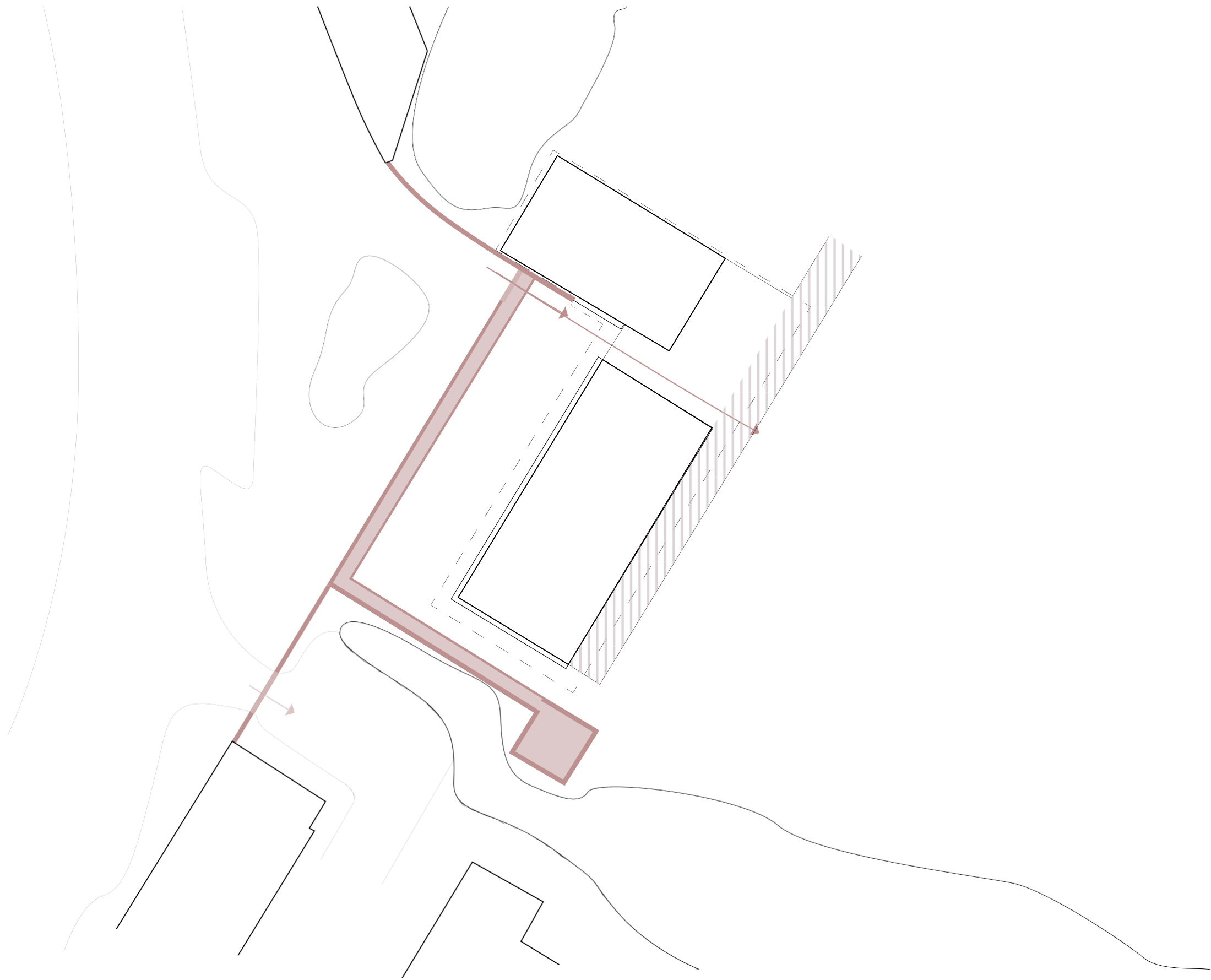
**Architecture I** Strenthening the concept of the wall by making it accessible and adding a tower



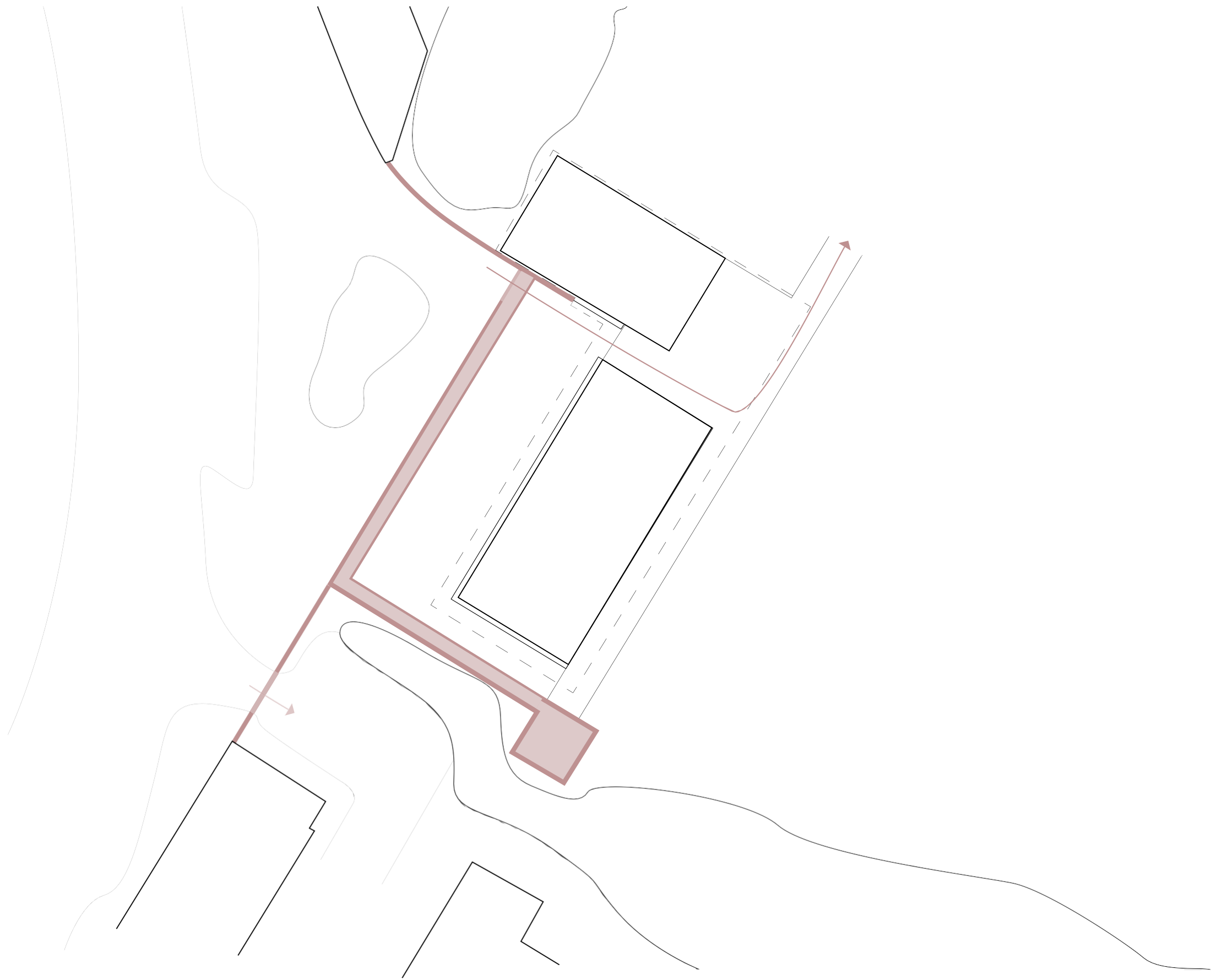
Architecture I Change volumes to create better sightlines



Architecture I Adding the last part of gradient: a roofed walkway



**Architecture I** Result: an acoustic and physical gradient from urban to park







Architecture I Two sides of building



URBAN

LANDSCAPE



Architecture I Connection to surroundings



Architecture I Access routes



Architecture I Entrance route

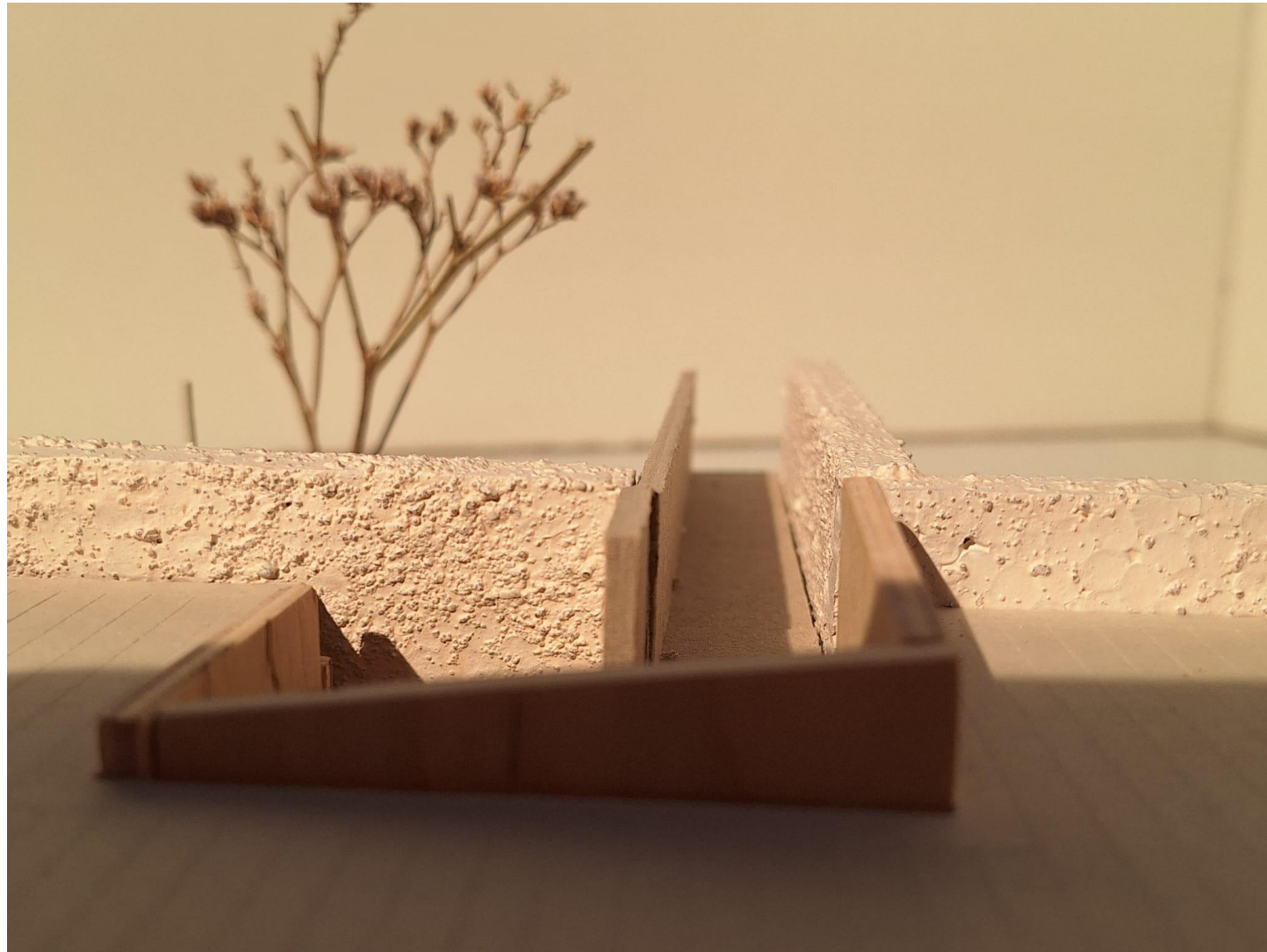




Architecture I Wall & tower route



Architecture I Wall & tower route





Architecture I Connection to walkway

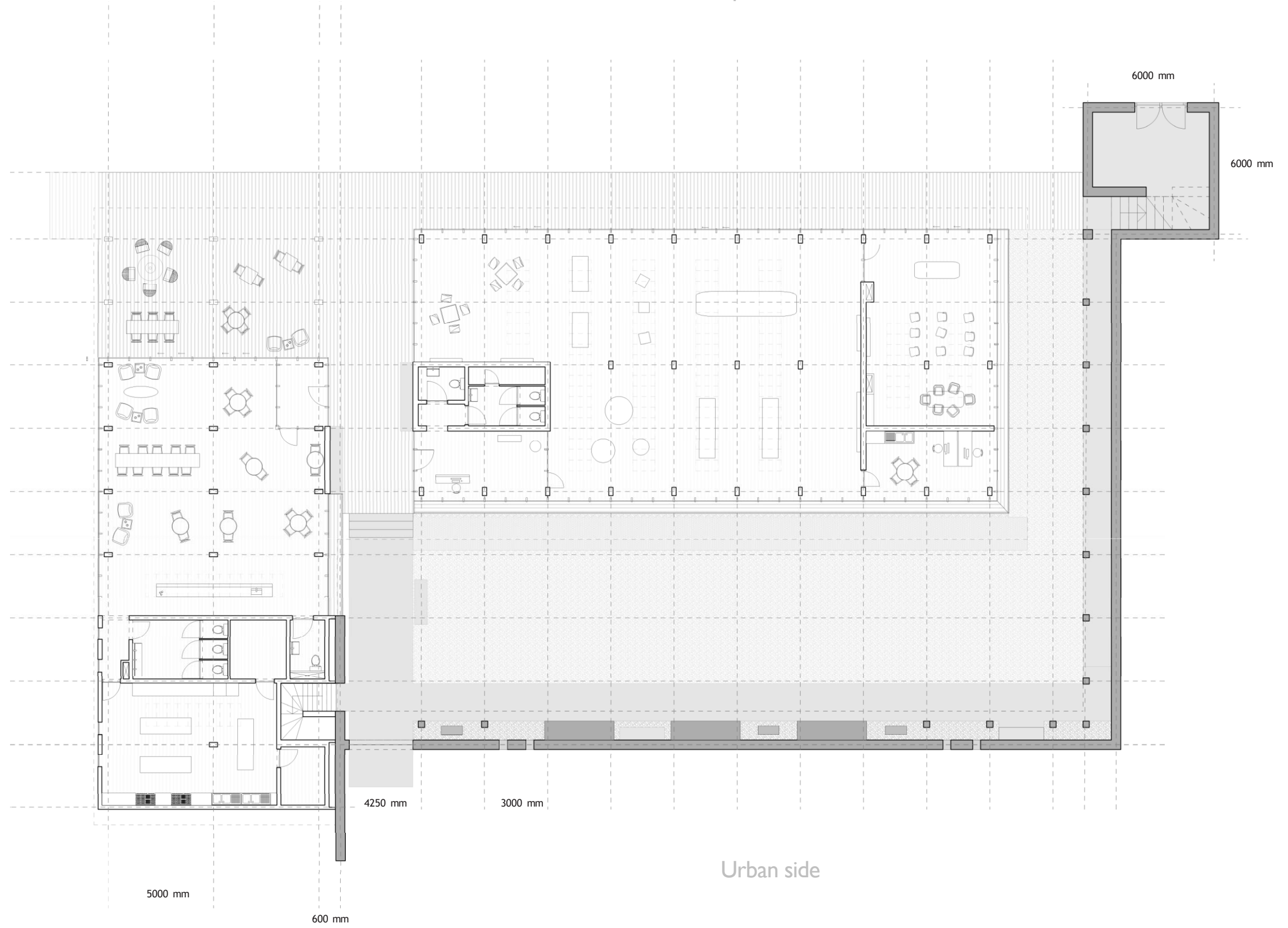


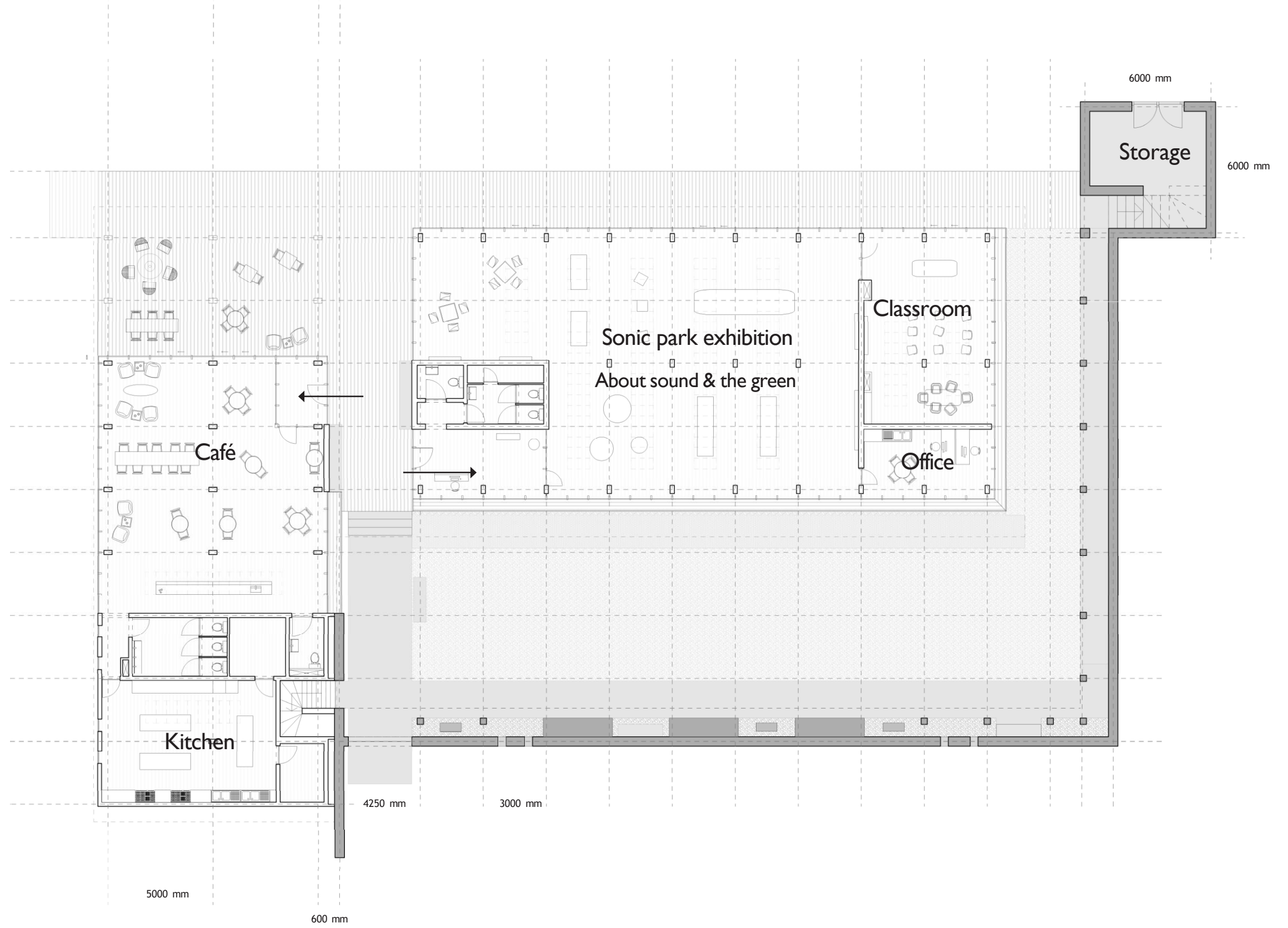




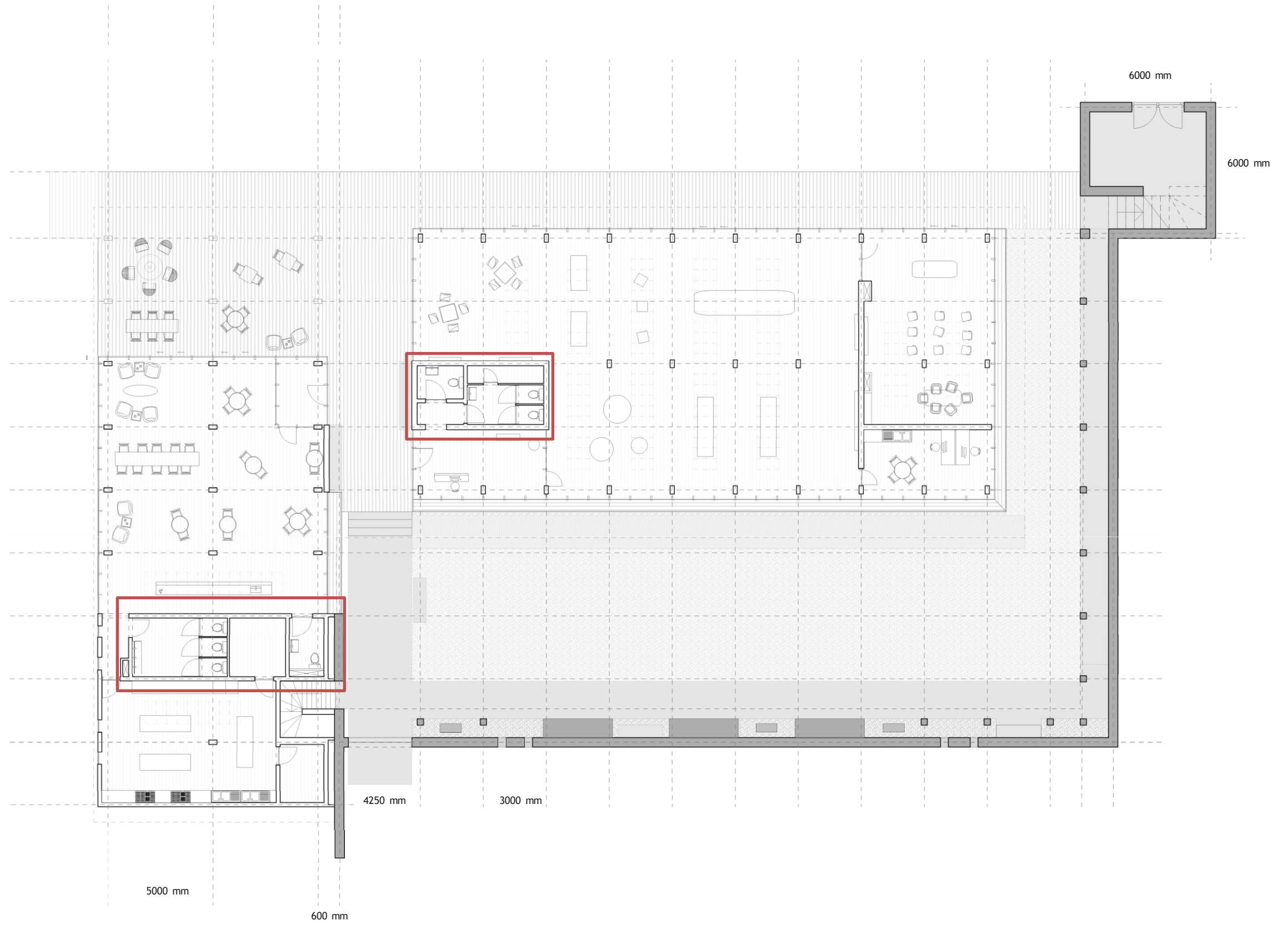


Landscape side

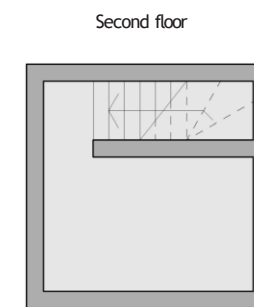
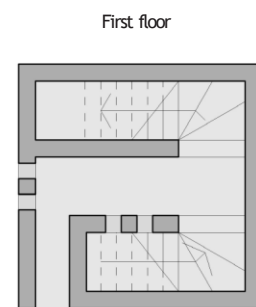
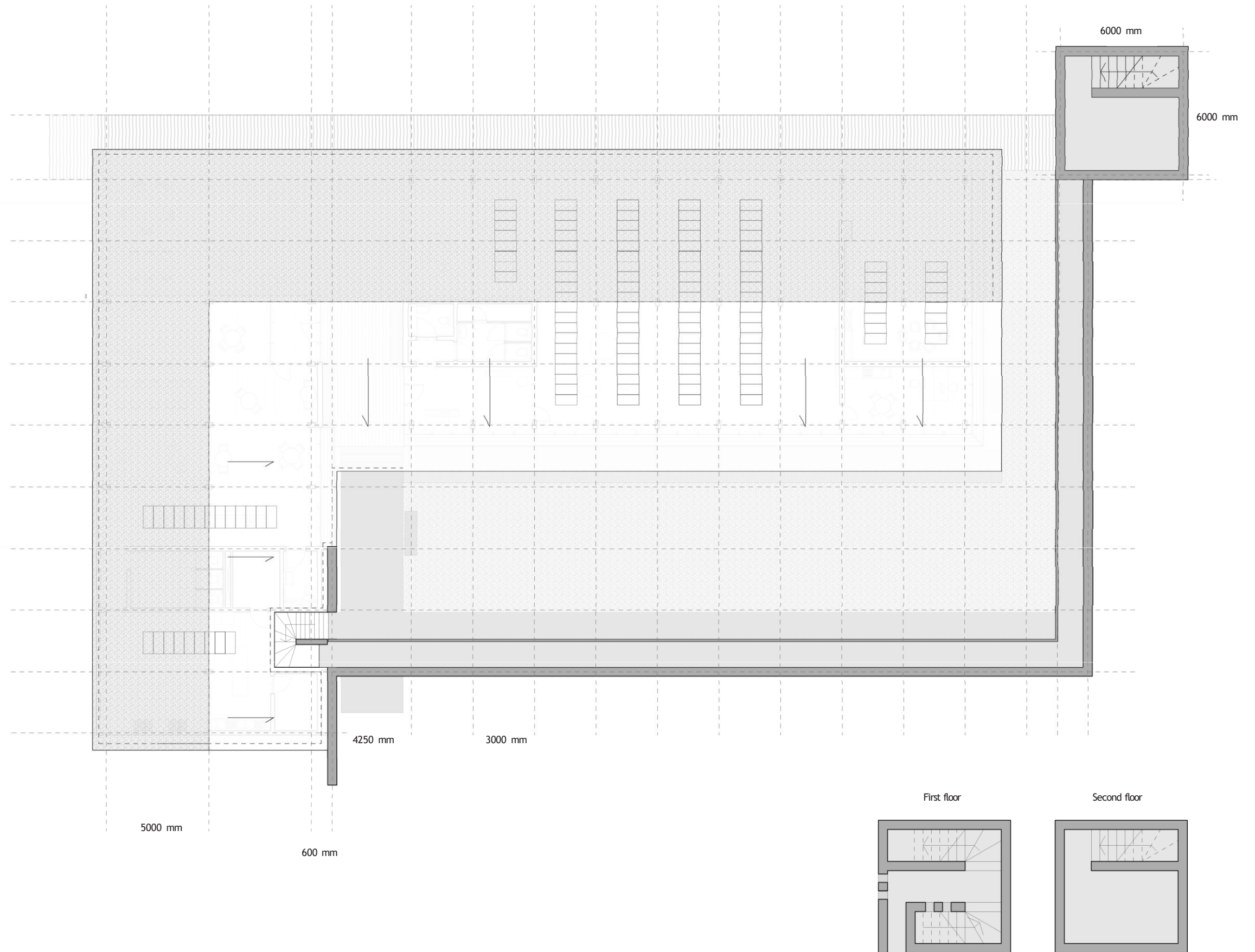




Architecture | Plan groundfloor

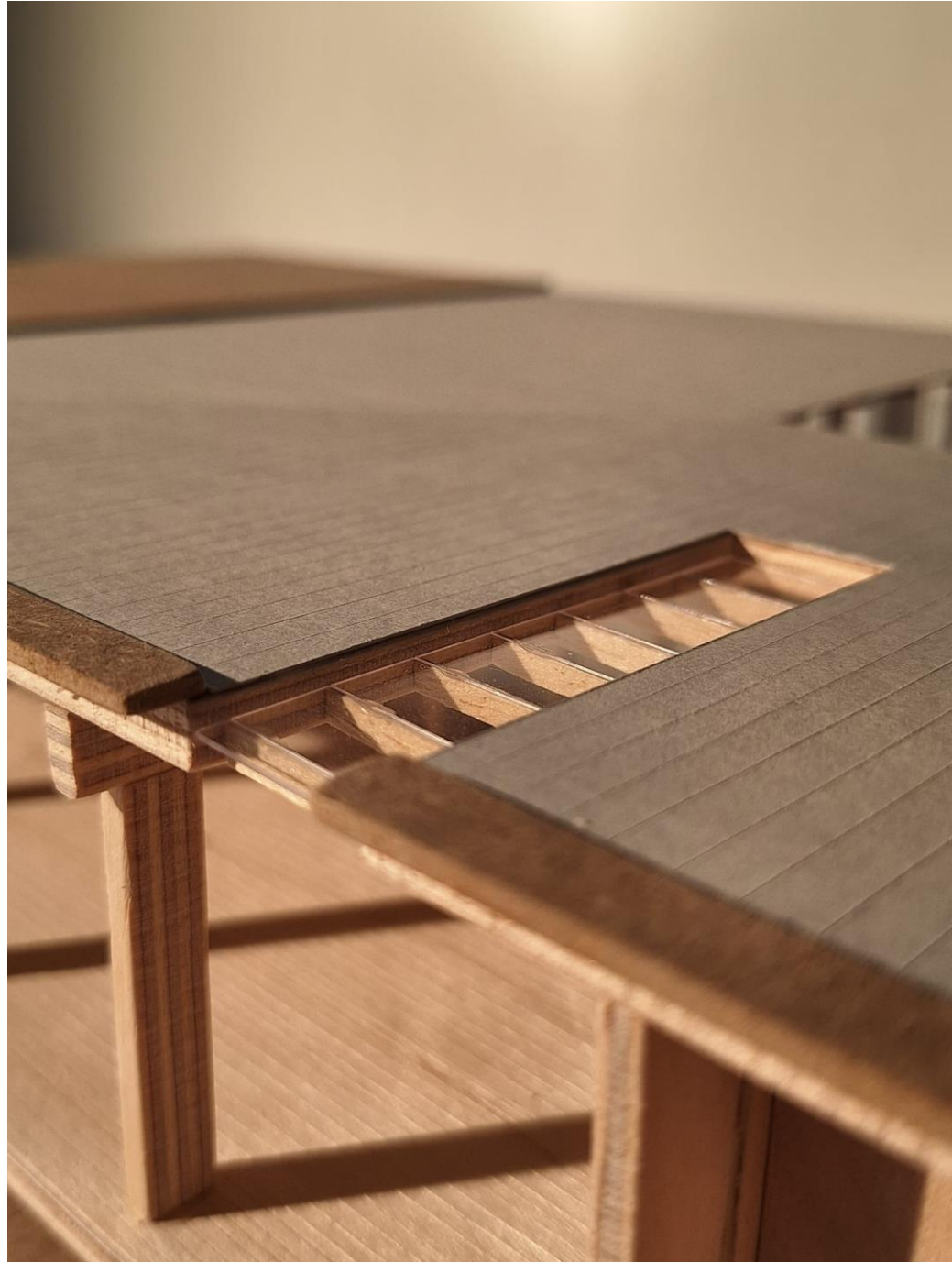


Architecture I Plan roof skylight emphasizing the connection between courtyard & landscape

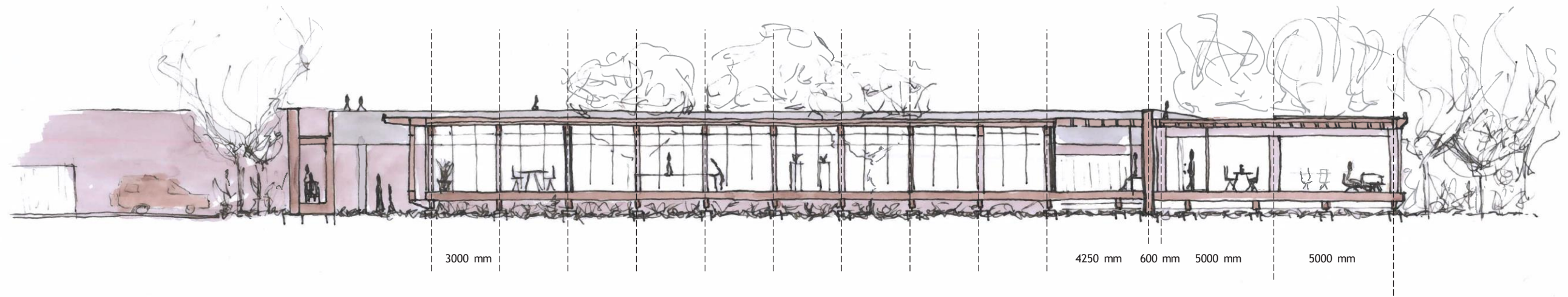
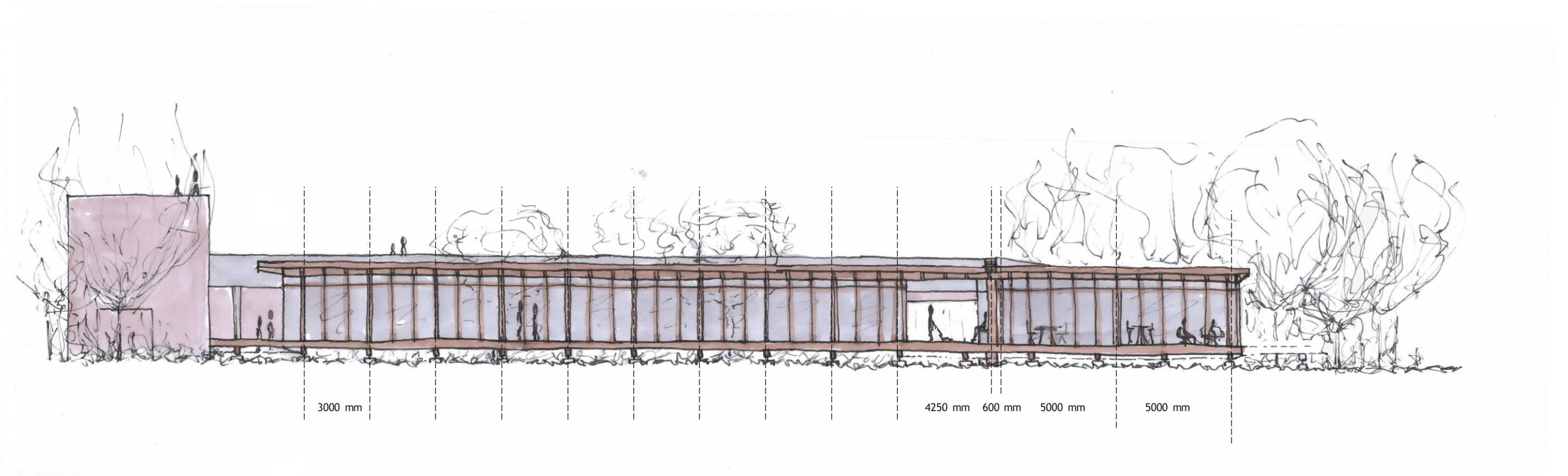




**Architecture I** Plan roof skylight emphasizing the connection between courtyard & landscape



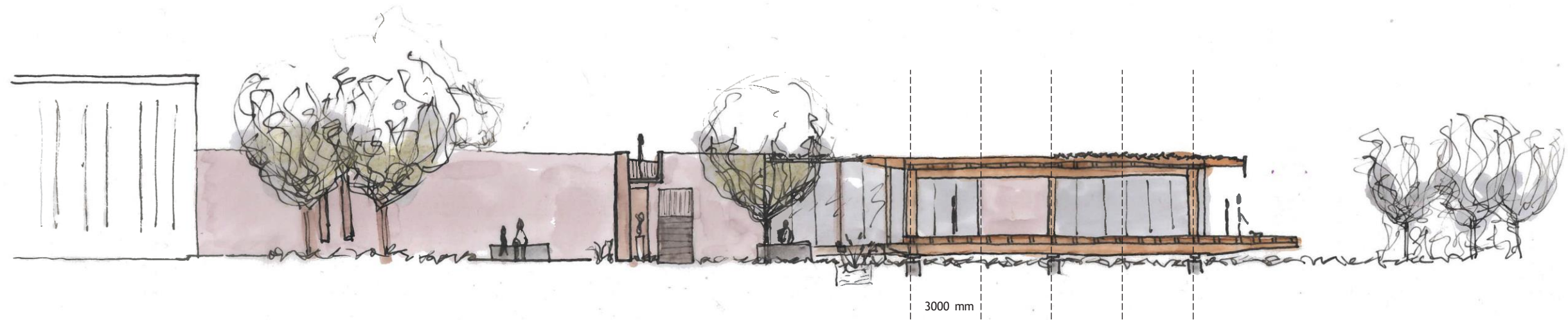
Architecture | Facade & section



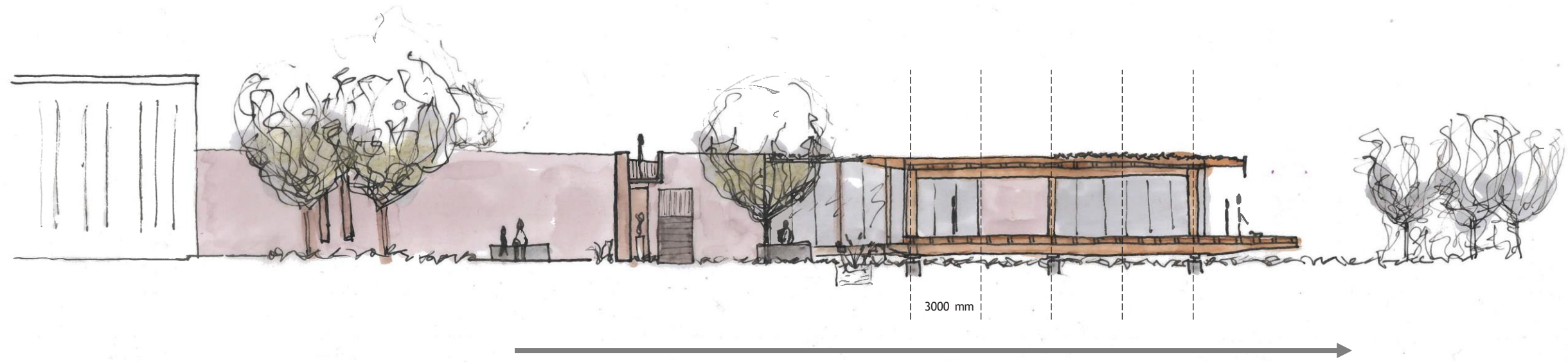
Urban plan I Section buiding Urban – Nature (transition)



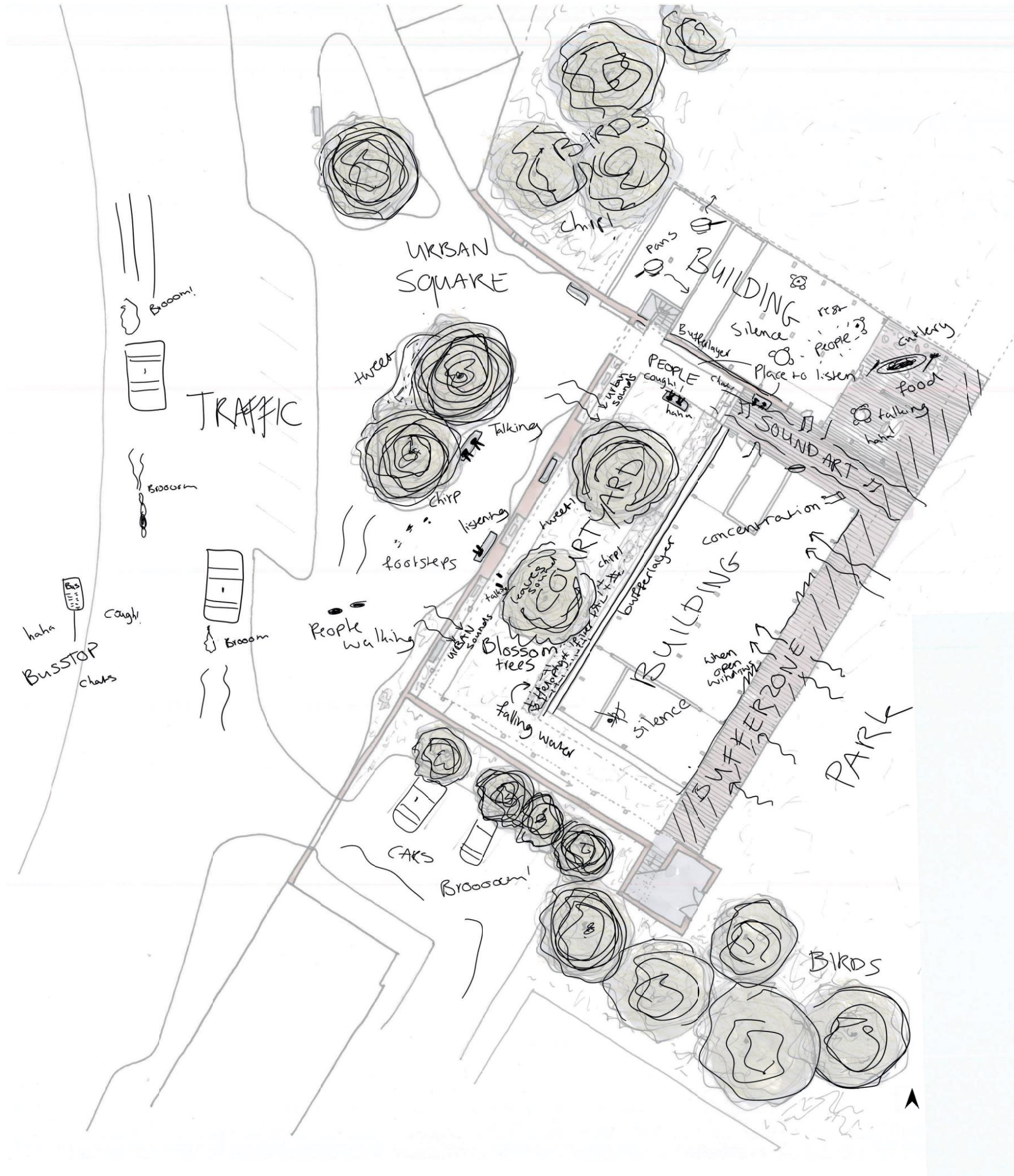
Architecture | Section urban – landscape (balustrade on wall)



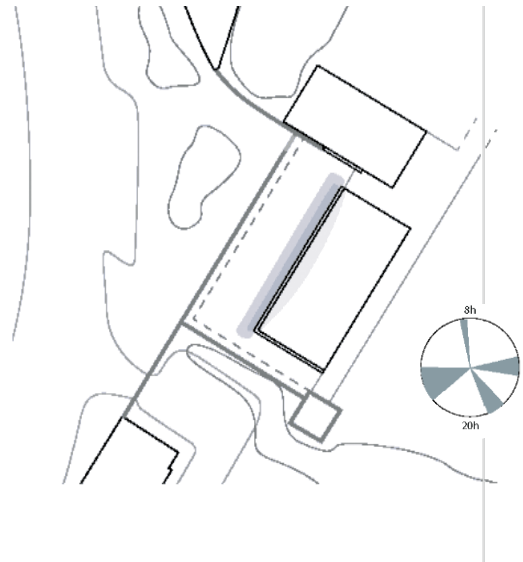
**Sounds in the building**



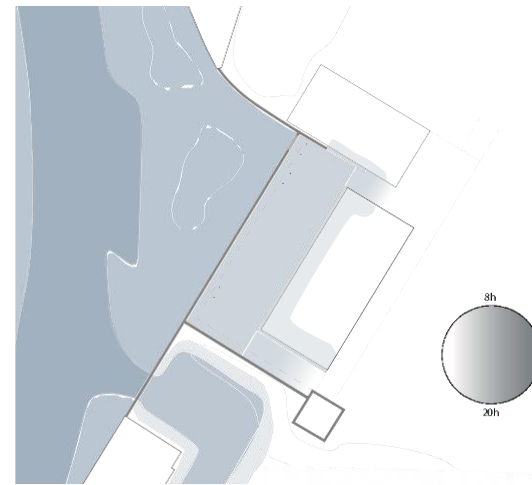
Architecture | Inventarisation of sounds in the building



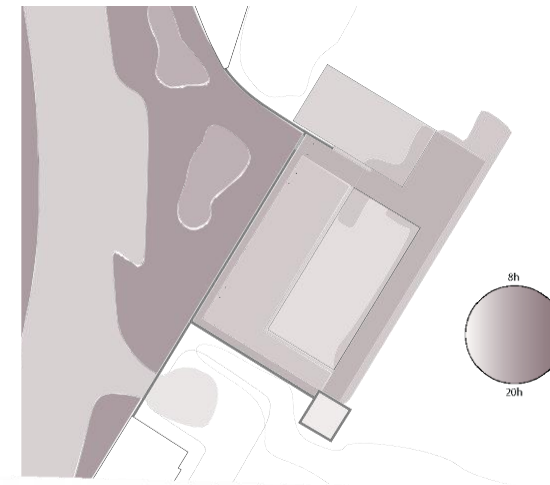
Rain from roof



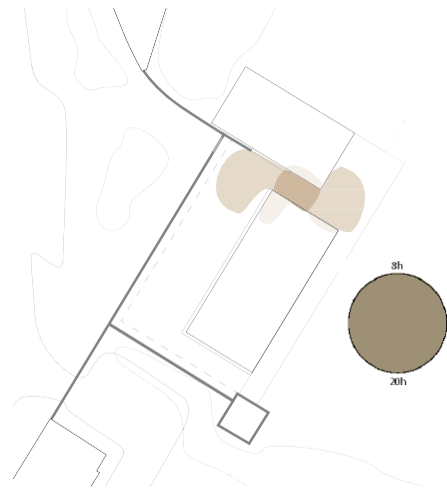
Traffic



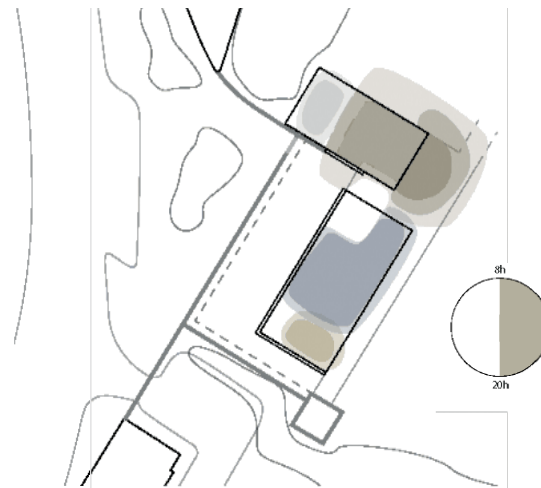
Life



Soundart



Use



Green

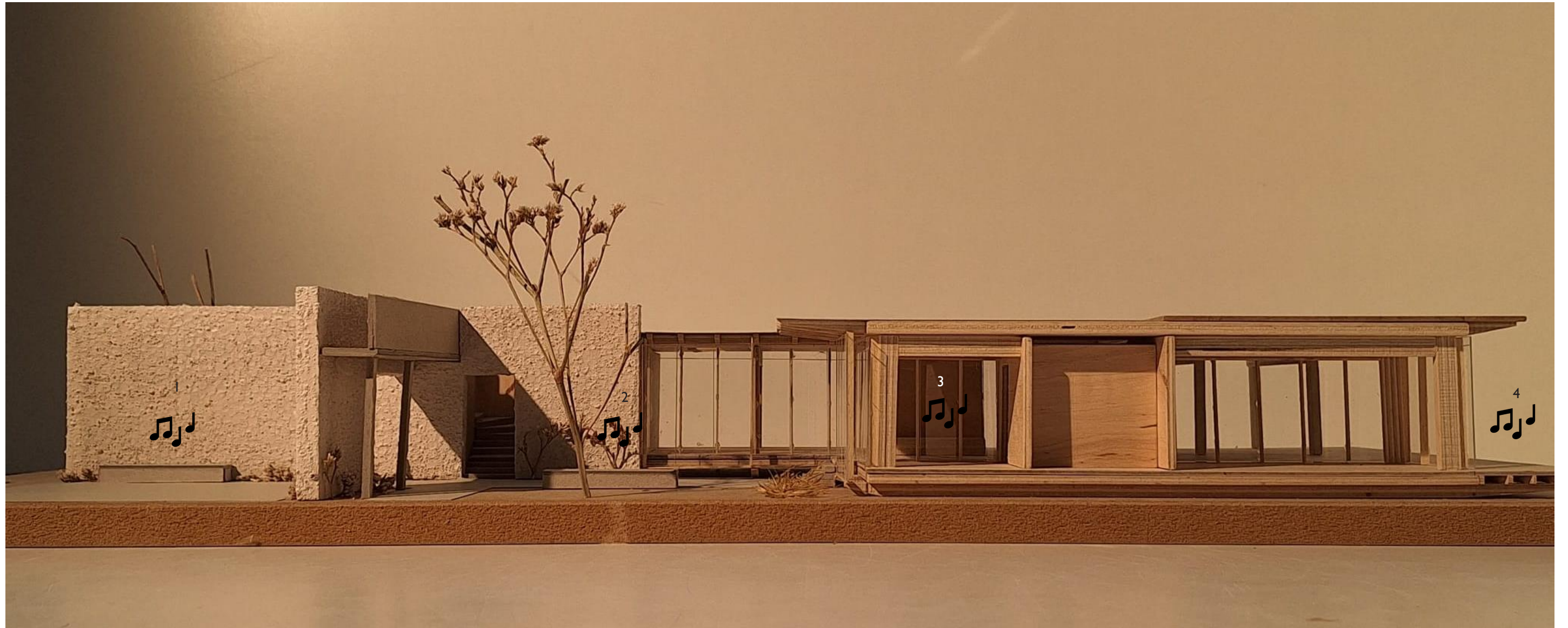






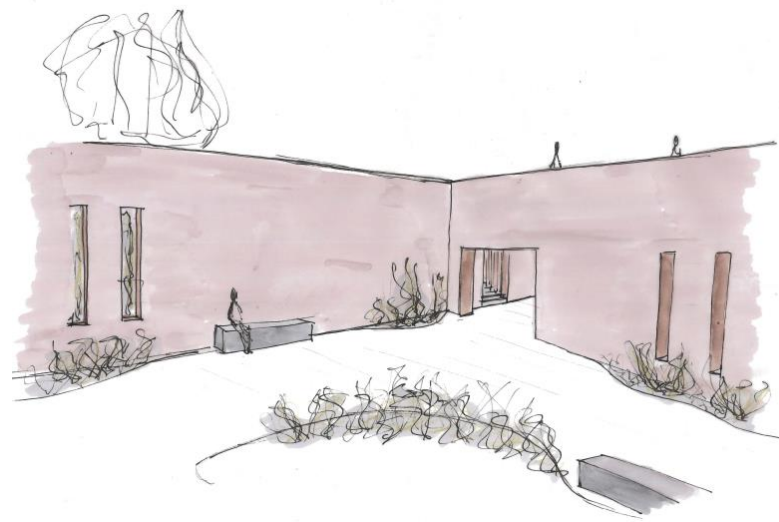
**Architecture** | For each moment I wrote music to emphasize the sounds you can hear





**Different moments, combined with music**

Architecture | I. Urban square





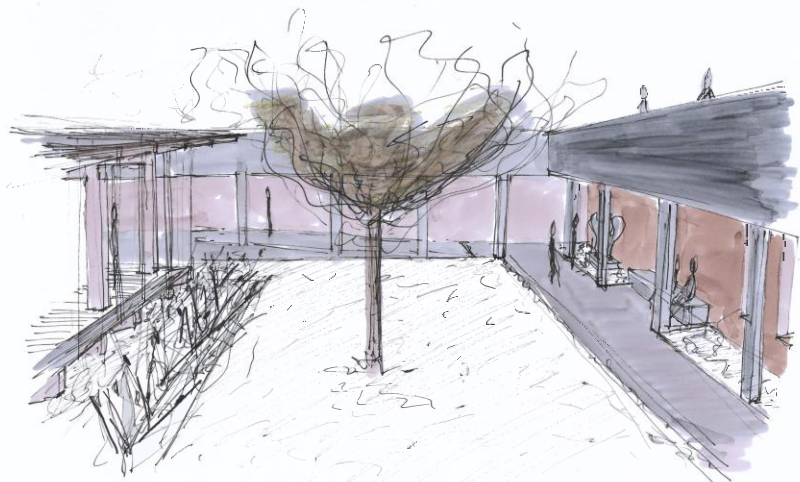
1

2

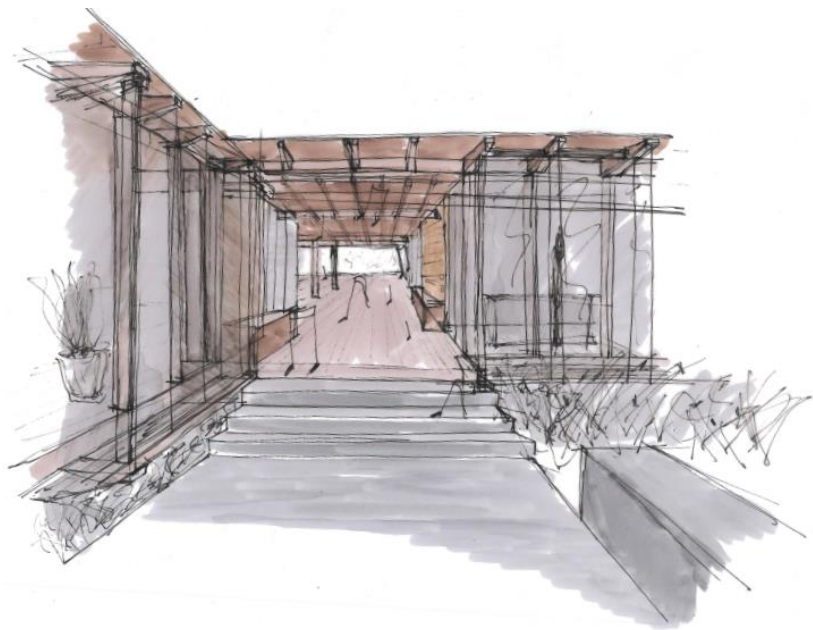
3

4

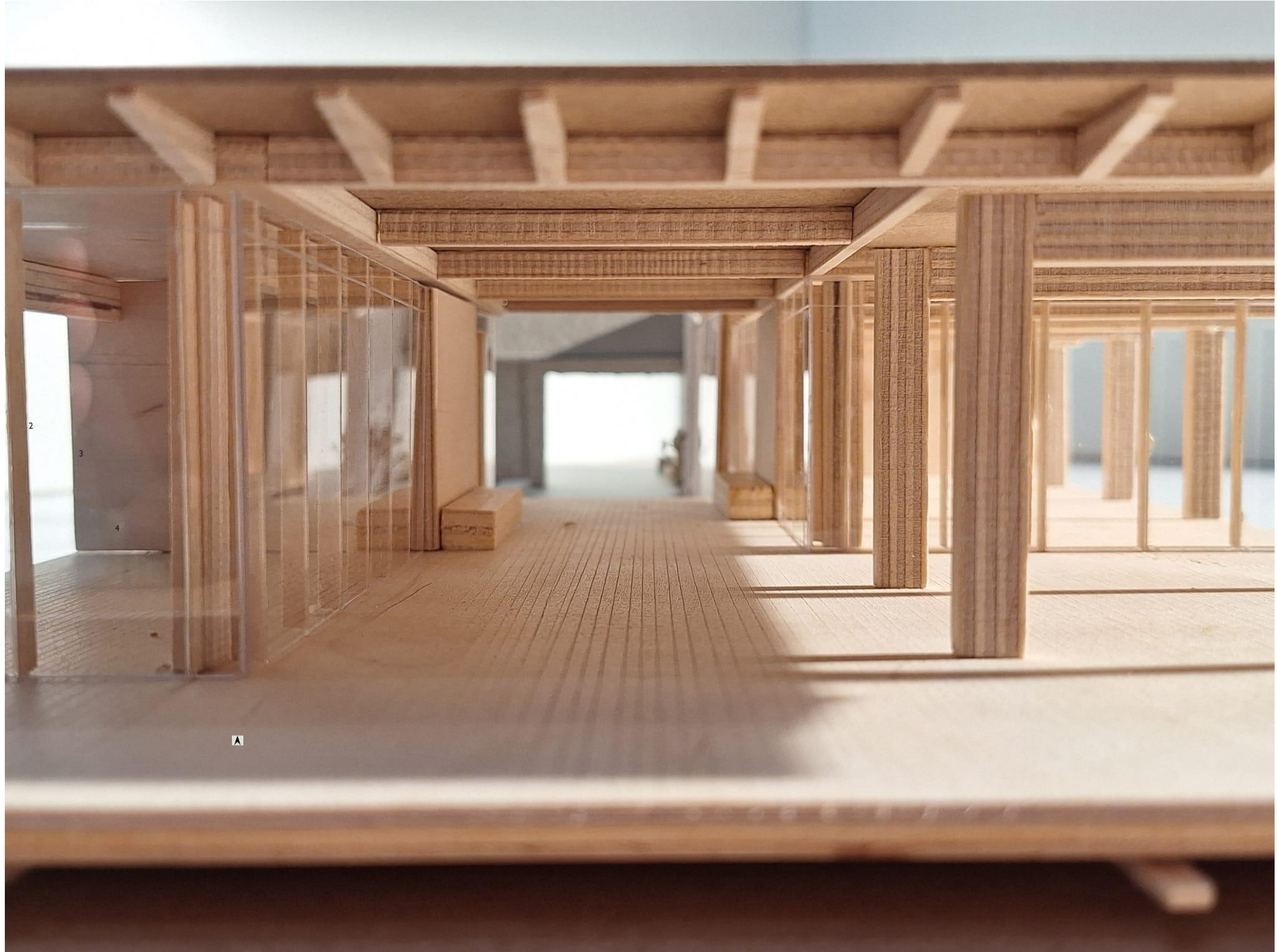
# Architecture | 2. Courtyard



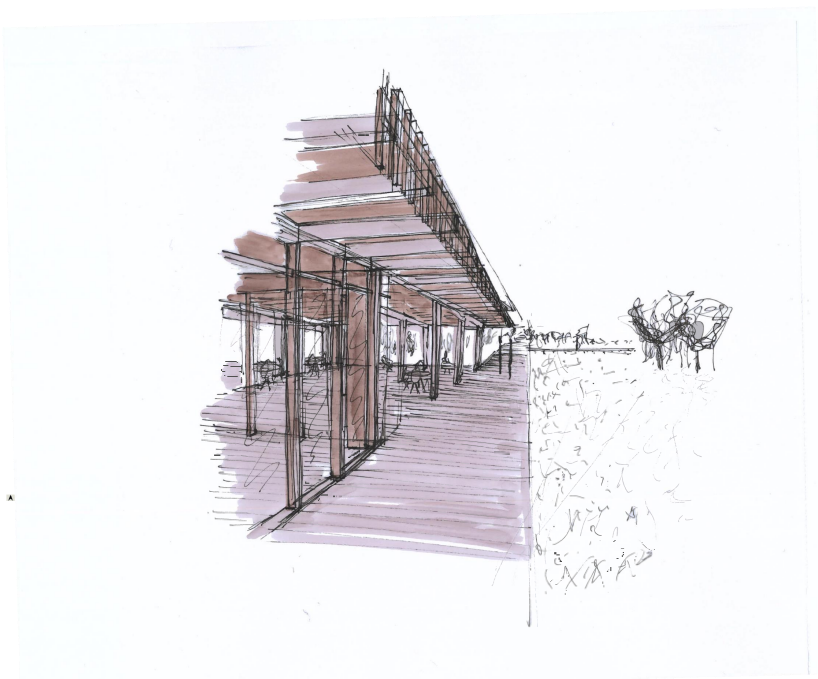
Architecture | 3. Treshold zone



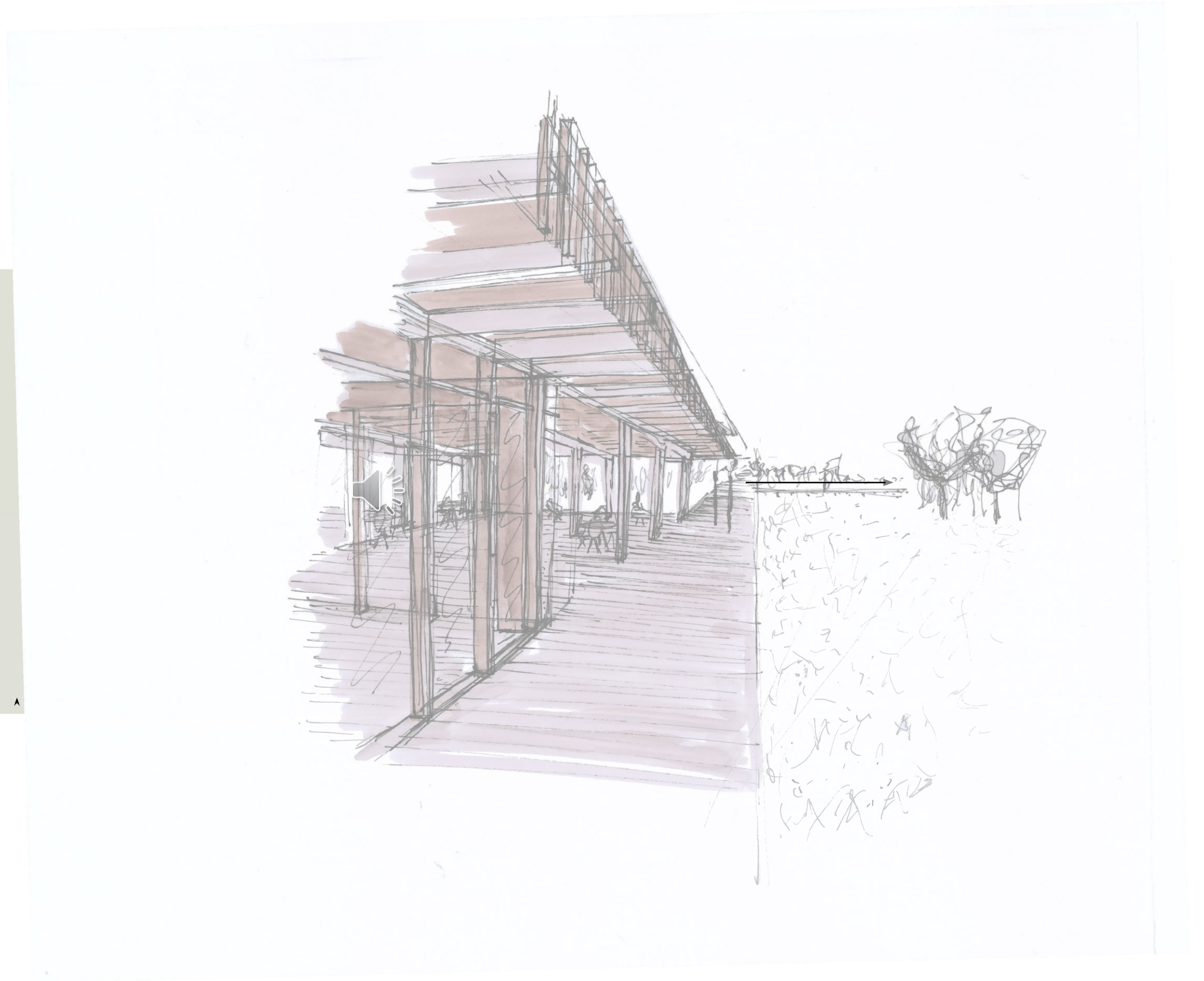




Architecture | 4. Roofed walkway



Architecture | 5. At the park



**Technical building design**

Technical building design | Relation to ecological aspects, gradient also visible



No heat/cold storage underground to reduce impact on the ground

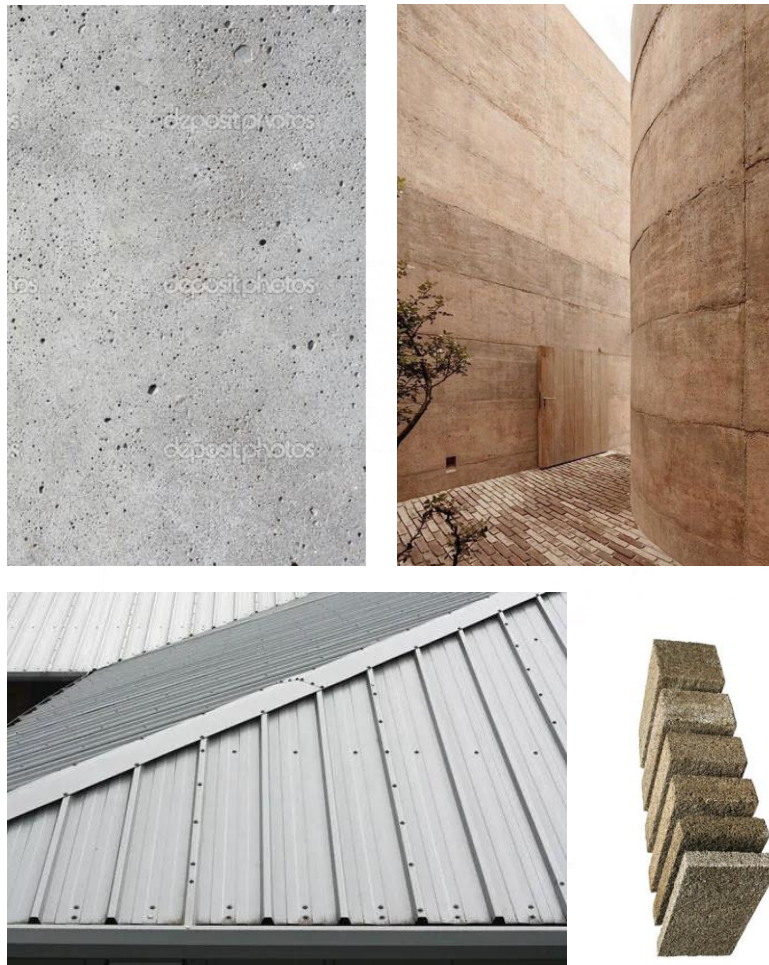
Helophyte filter

Raised floor, to have less impact on the nature

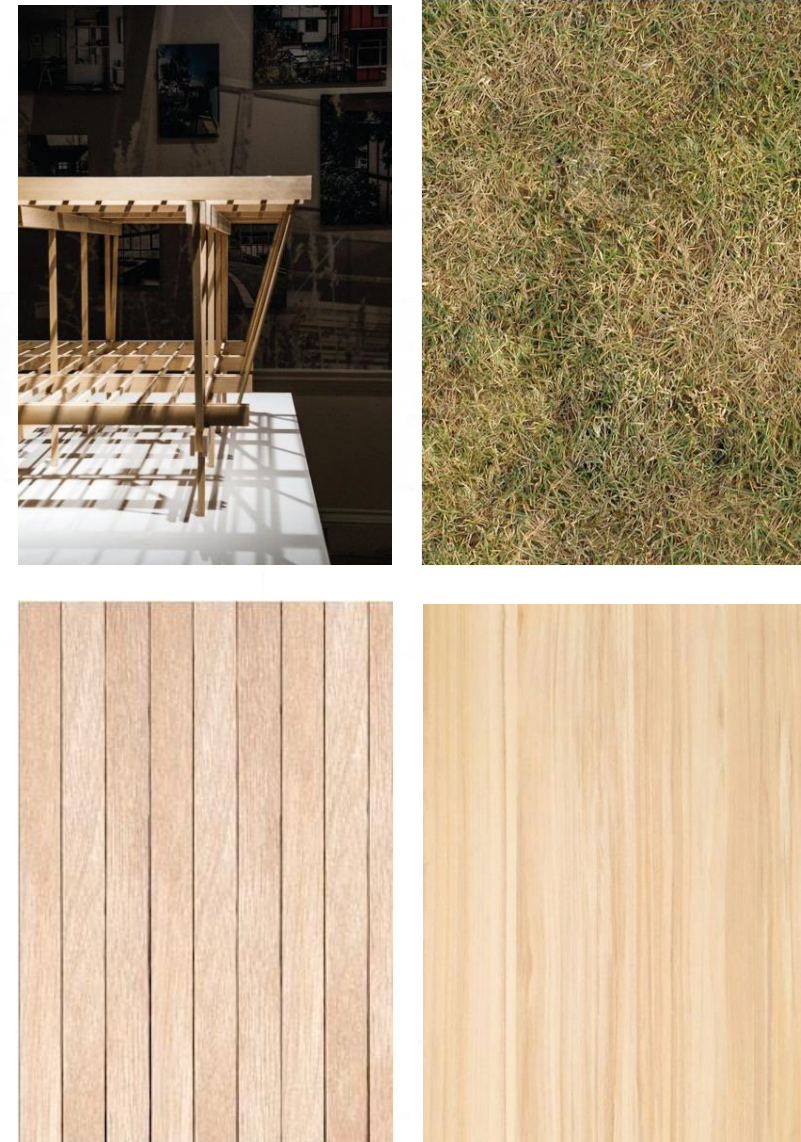
Keeping green and emphasizing biodiversity

Technical building design | Materialisation: gradient of materiality

Urban side



Landscape side



Concrete for walkaway on wall

Sink for roof: suitable for reuse

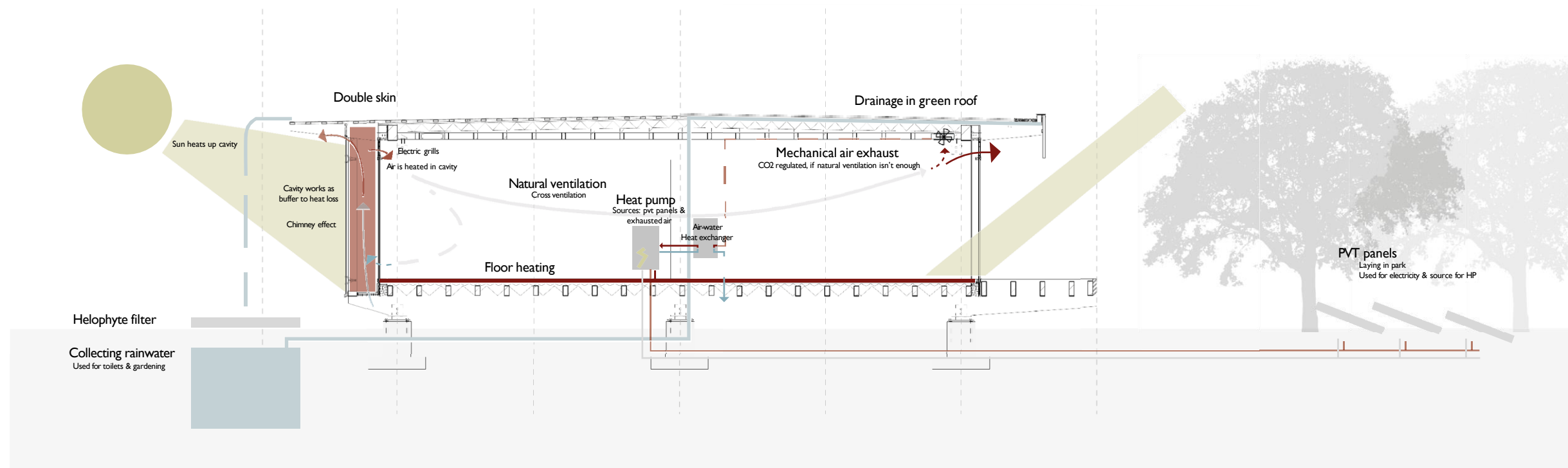
Green roof towards nature

Use of biobased insulation: hemp

Rammed earth, natural product

Use of renewable material: wood

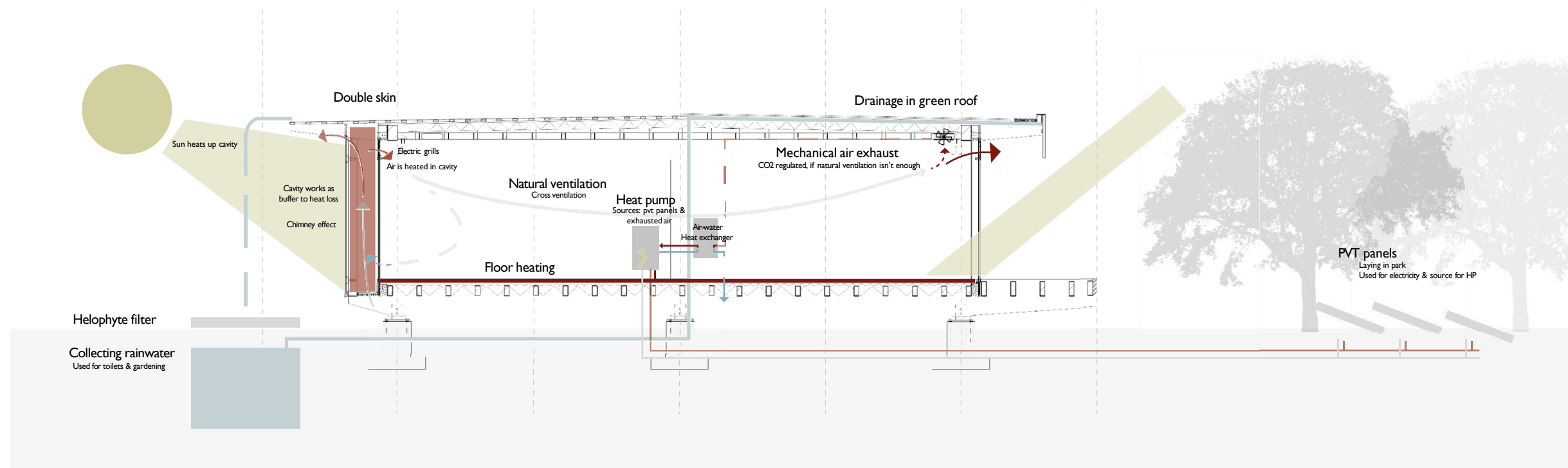
Winter situation



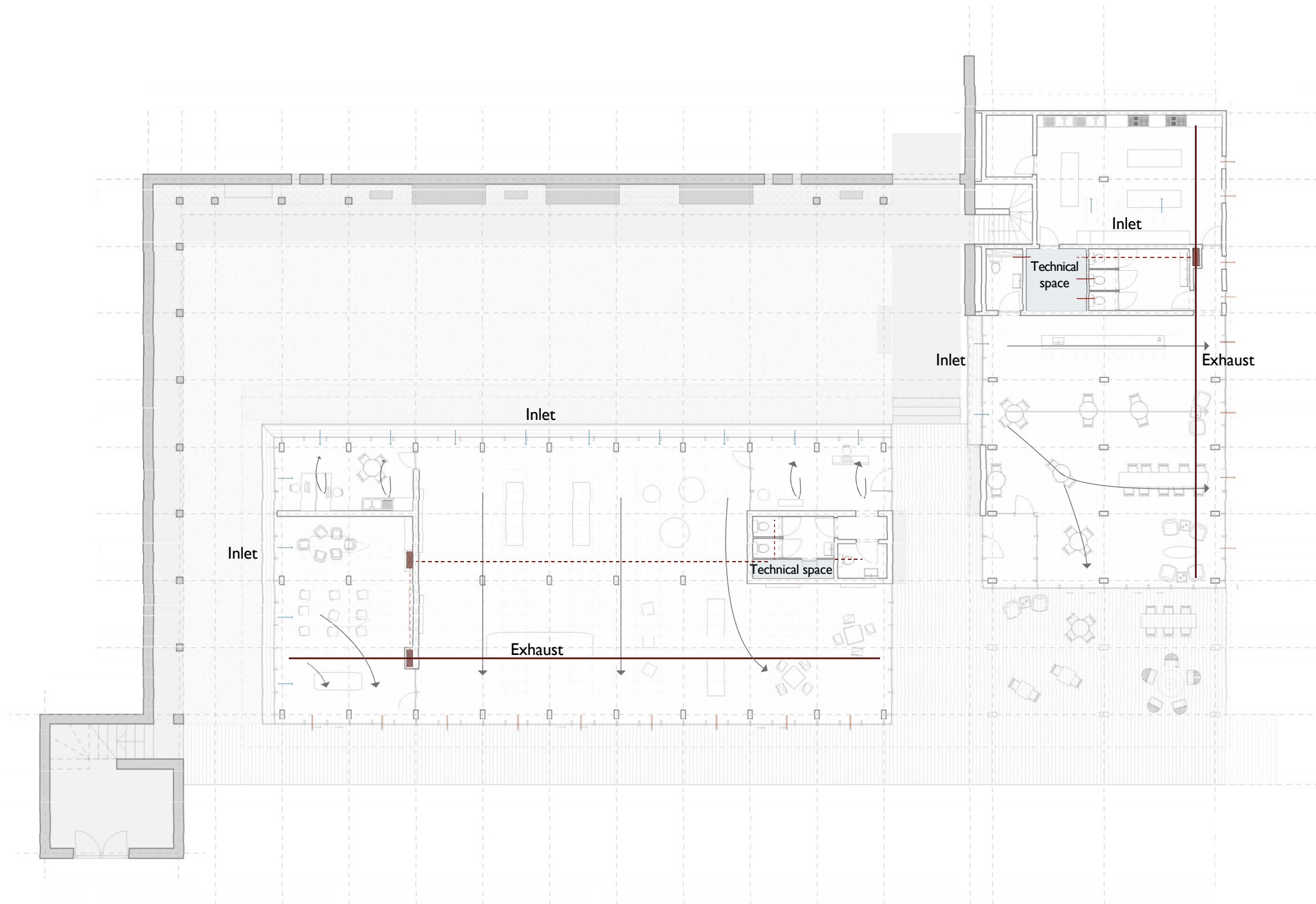




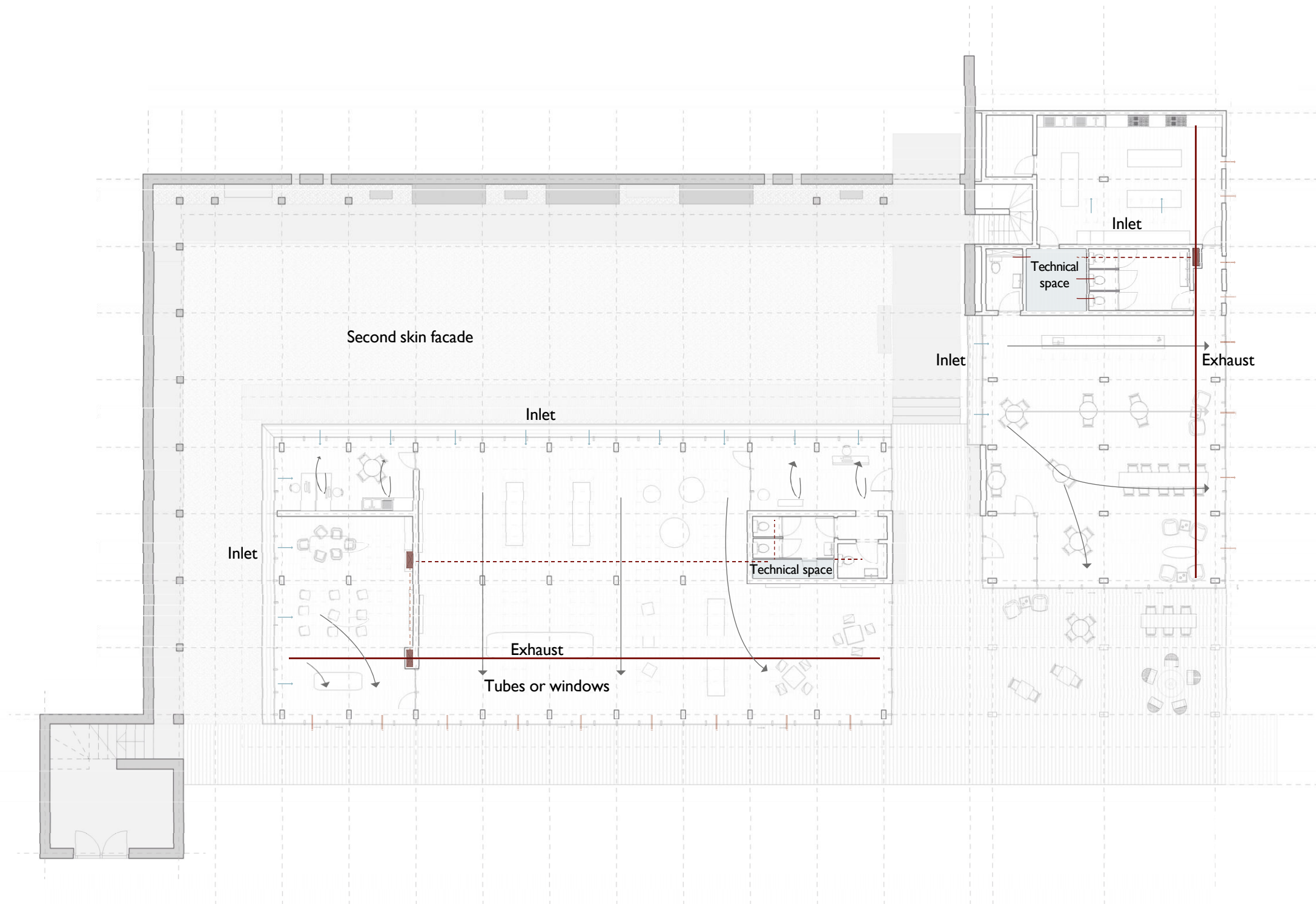
Winter situation



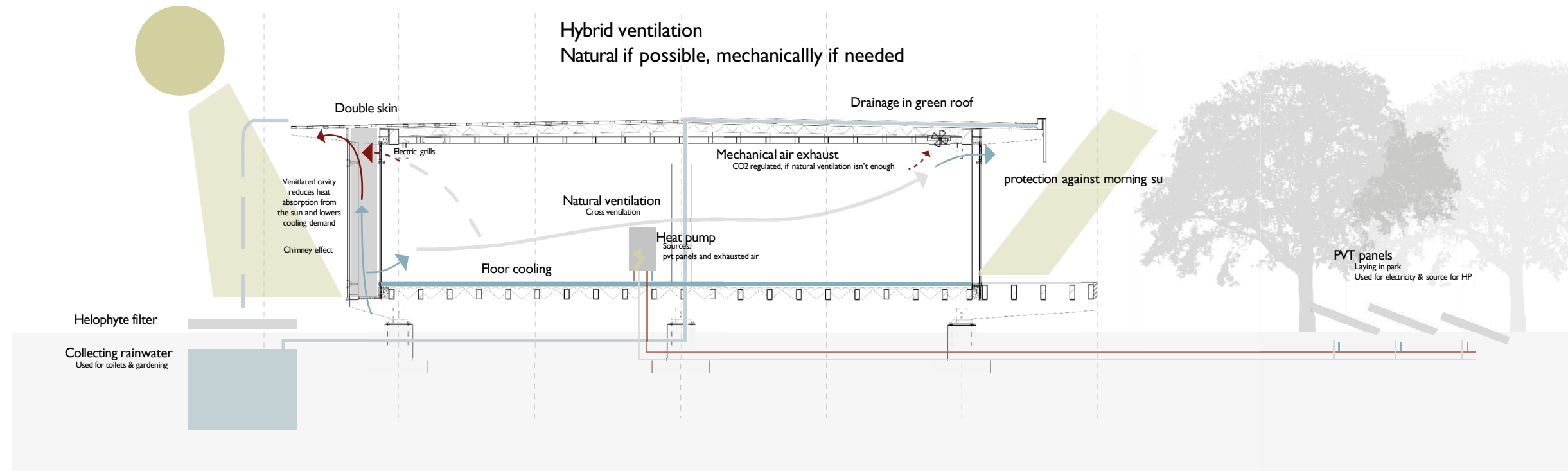
# Technical building design I Ventilation diagram, working of ventilationsystem

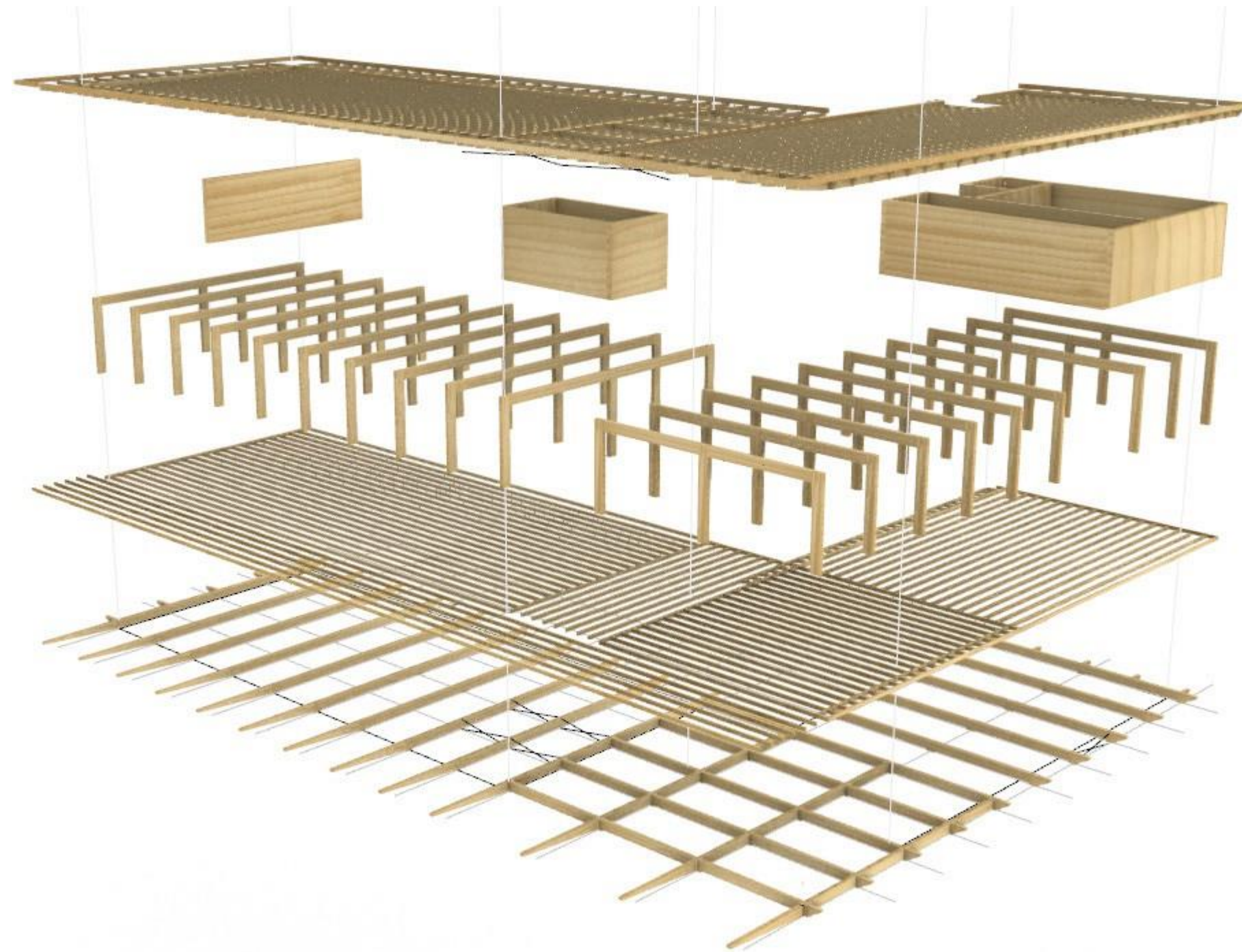


# Technical building design I Ventilation diagram, working of ventilationsystem

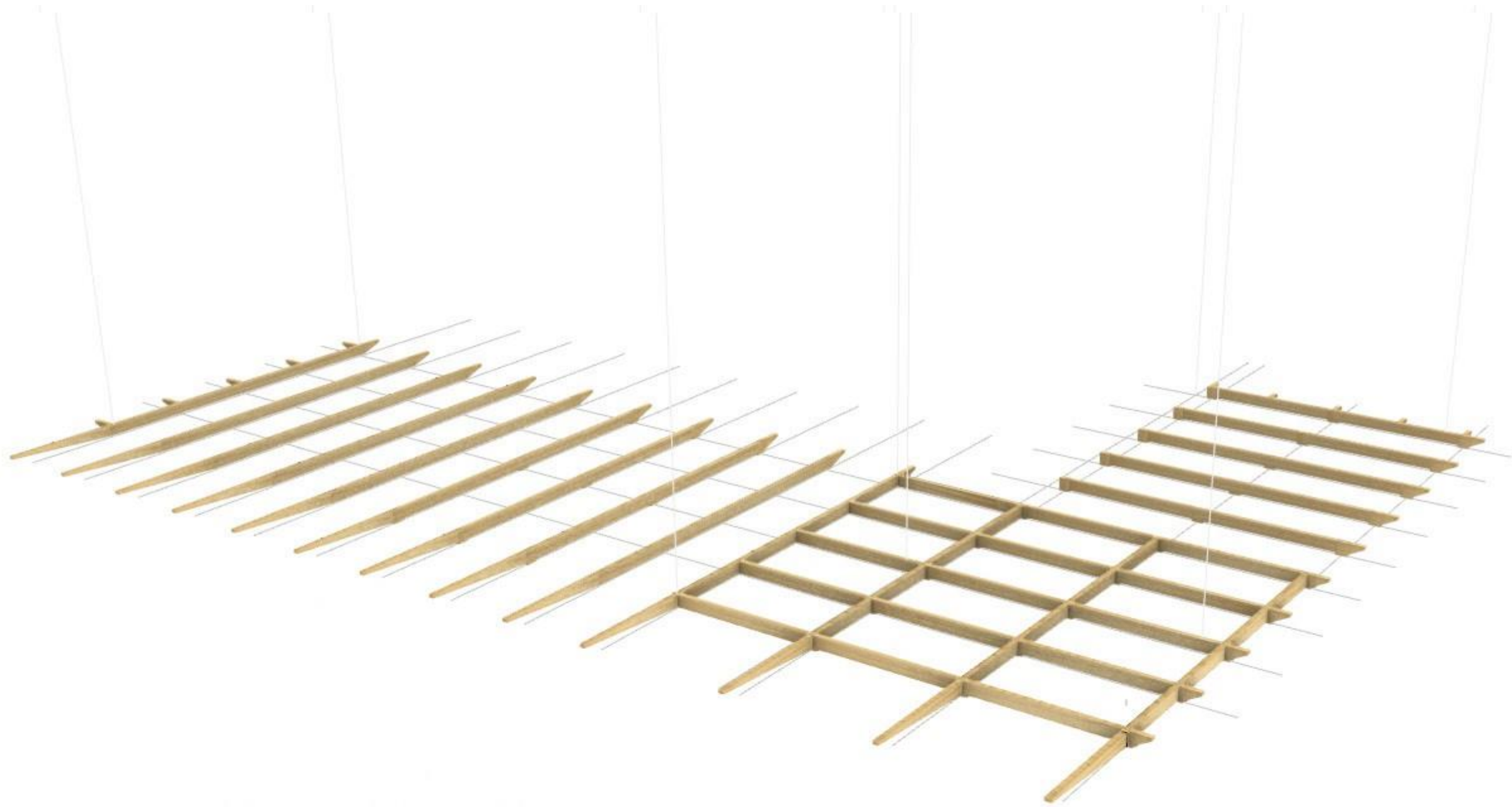


Summer situation

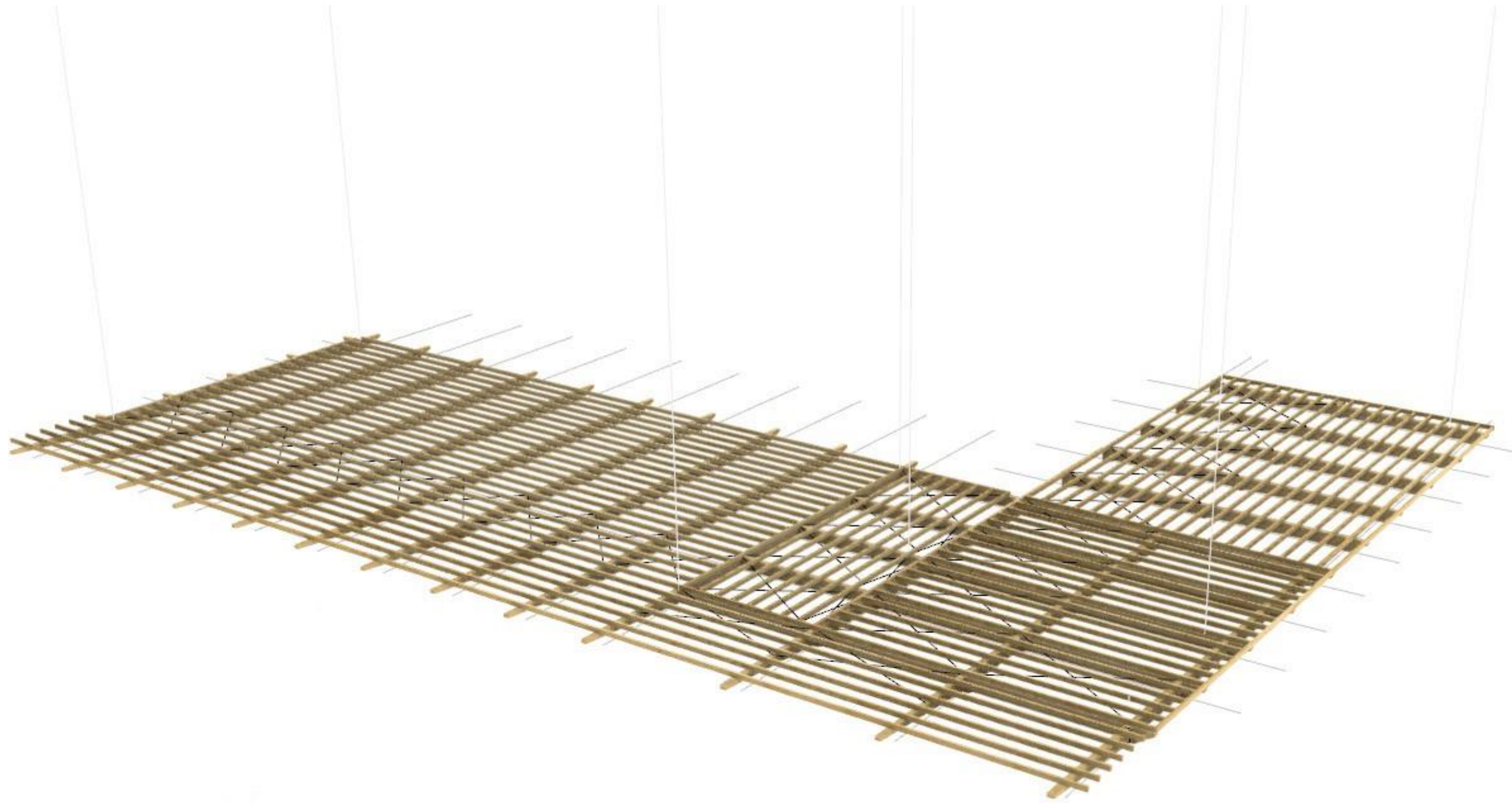




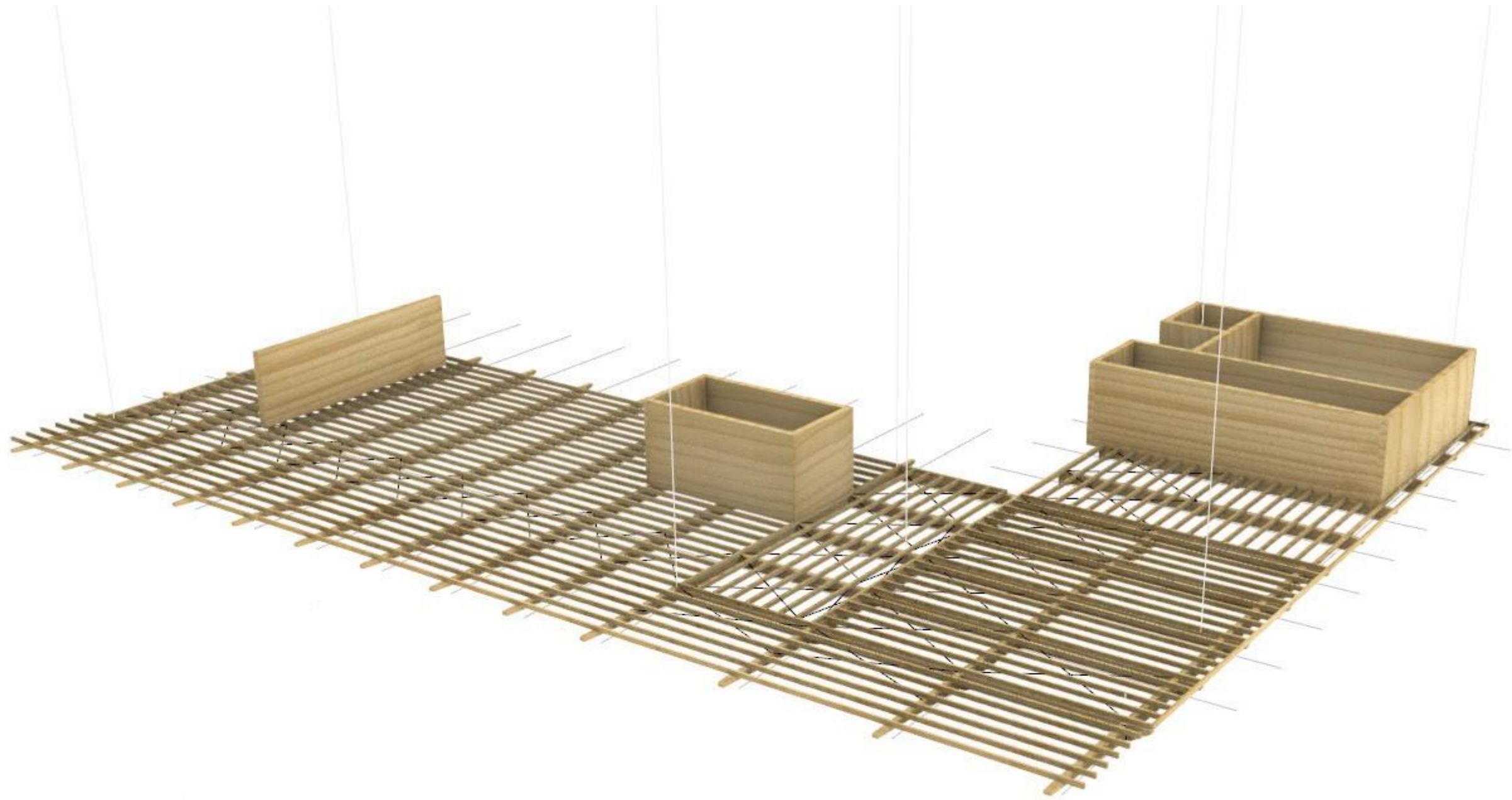
## Construction I Beams for raised floor



# Construction I Floor

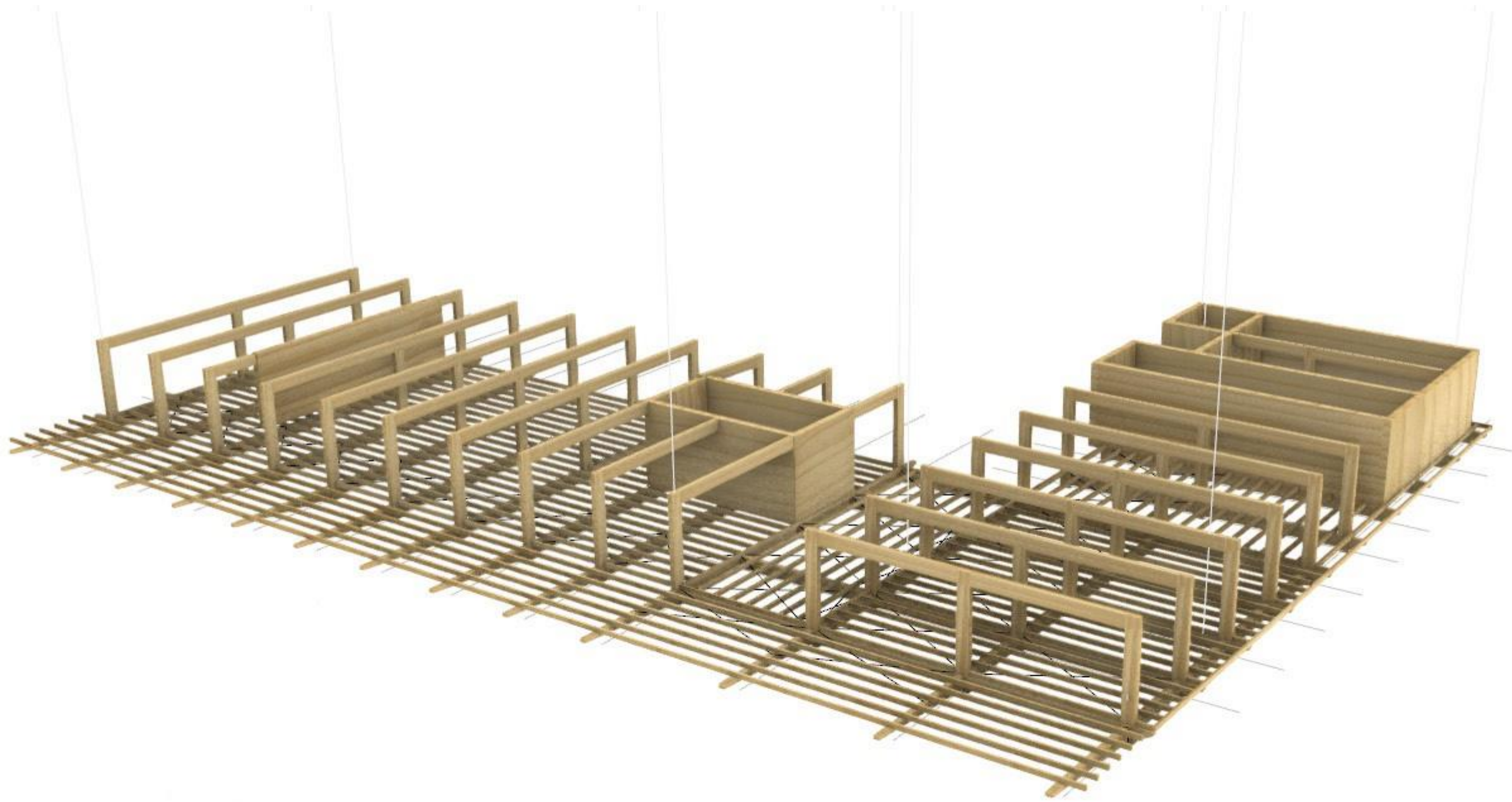


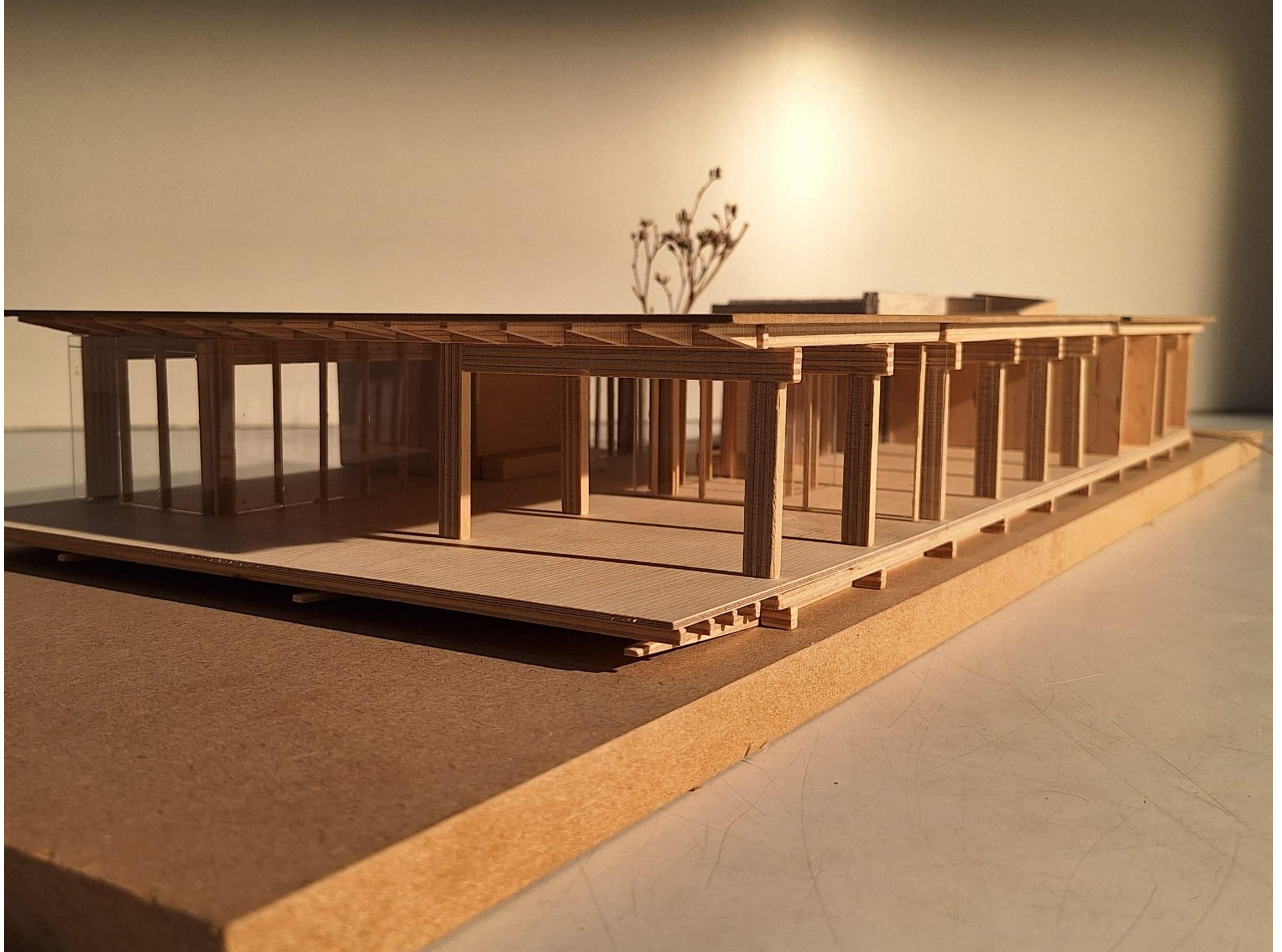
## Construction I Stability walls



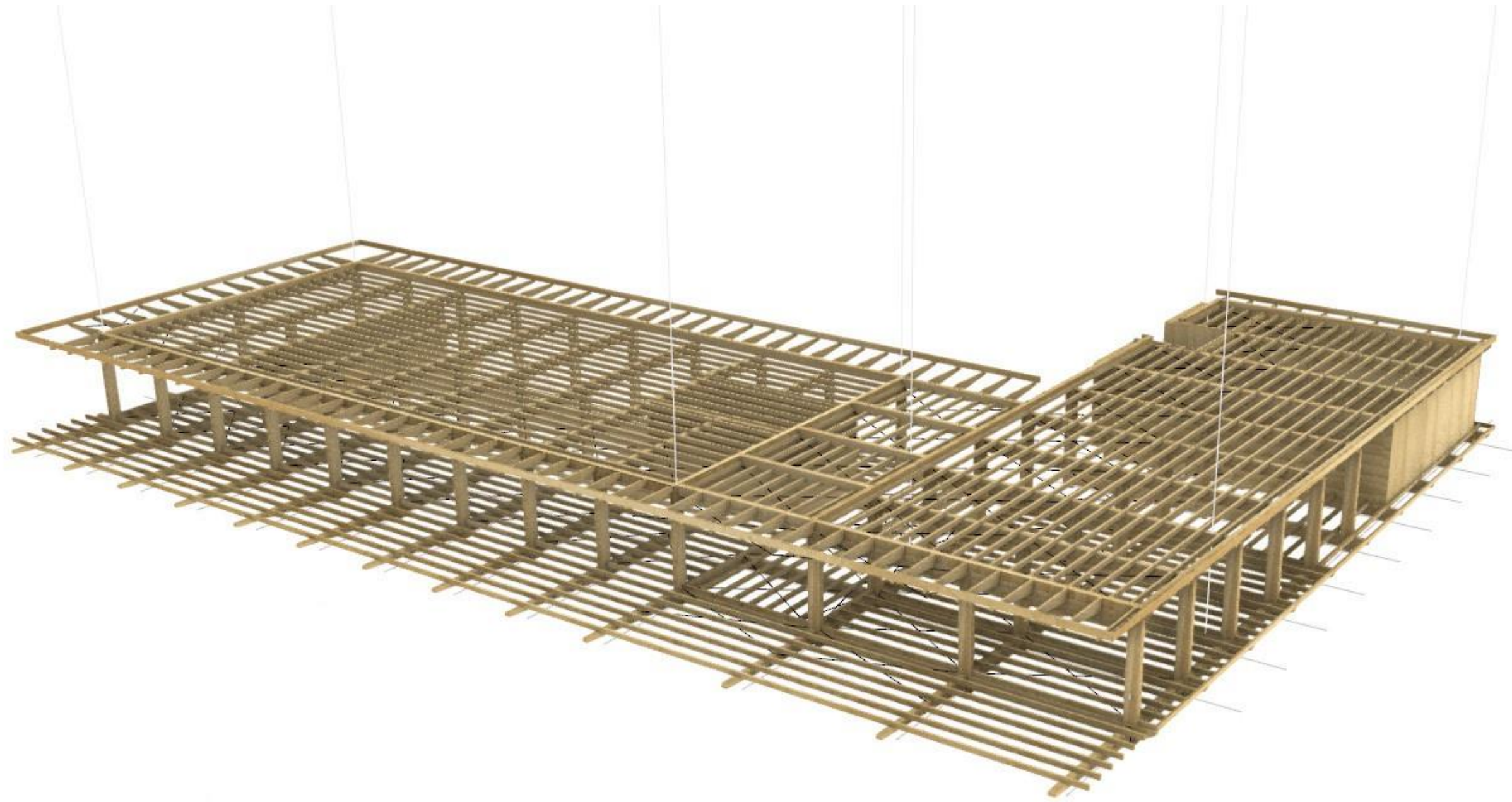


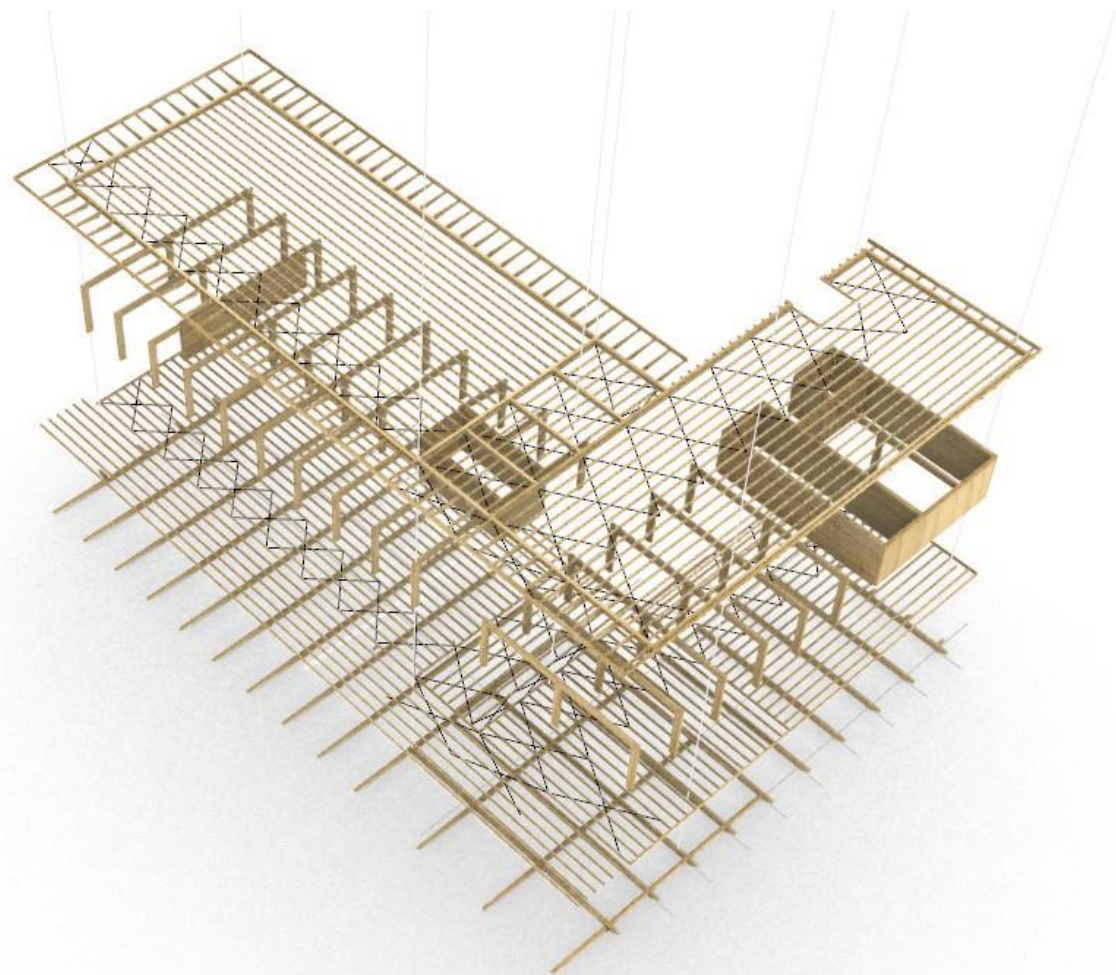
**Construction I** Portals connecting courtyard & landscape





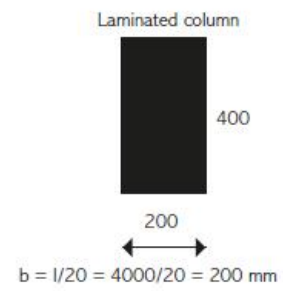
## Construction I Roofconstruction with cantilever





# Construction I Justification of global dimensioning main elements

Aantal verdiepingen	Kolom afmeting* [mm]
1	L / 20



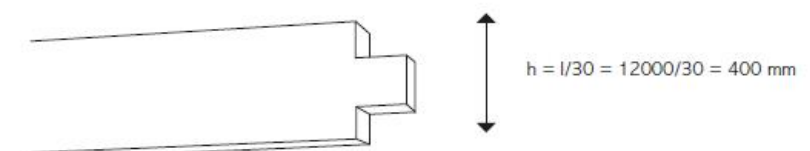
DAKCONSTRUCTIES		$l = 5$		$10$		$15$	
planken en triplexplaten		$\frac{1}{30} - \frac{1}{35}$	$l$	platte daken		$< - 1,0 \text{ m}$	
		$\frac{1}{40} - \frac{1}{50}$	$l$	hellende daken		$< - 1,5 \text{ m}$	
balken, gezaagd		$\frac{1}{20} - \frac{1}{30}$	$l$				



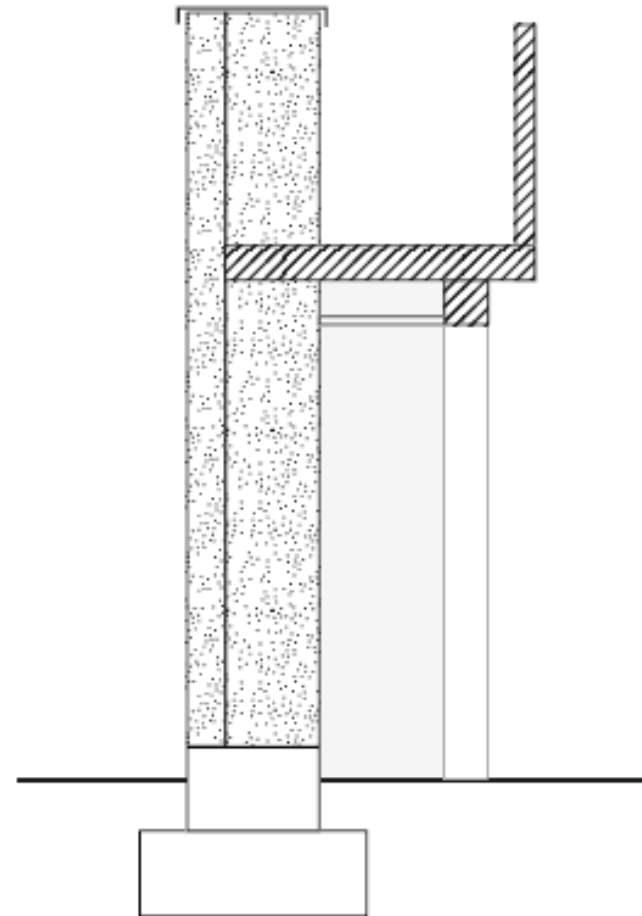
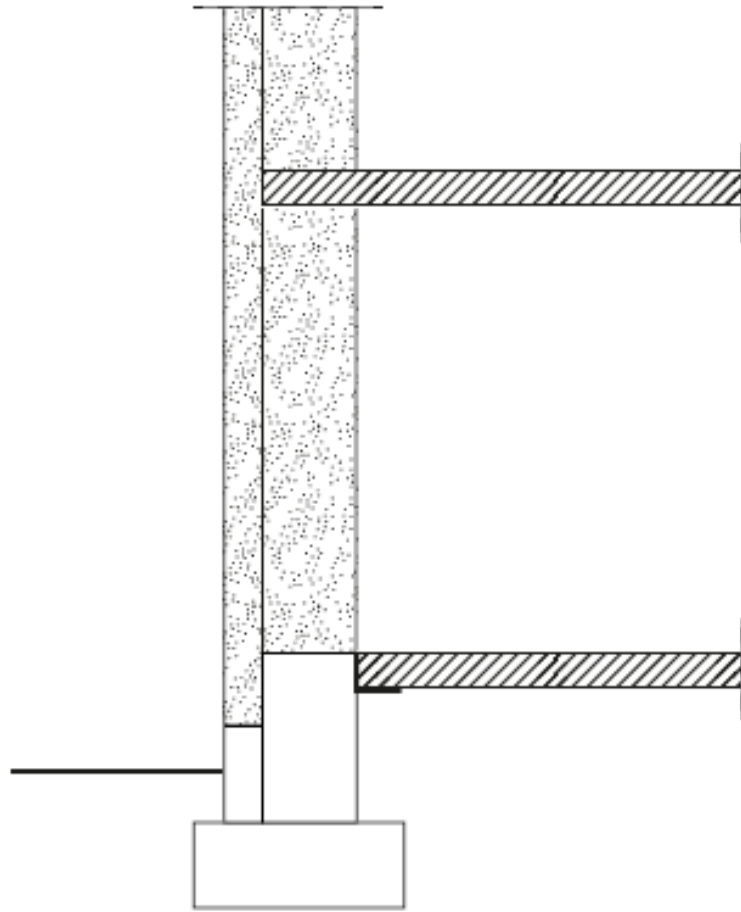
Spruce wood beam



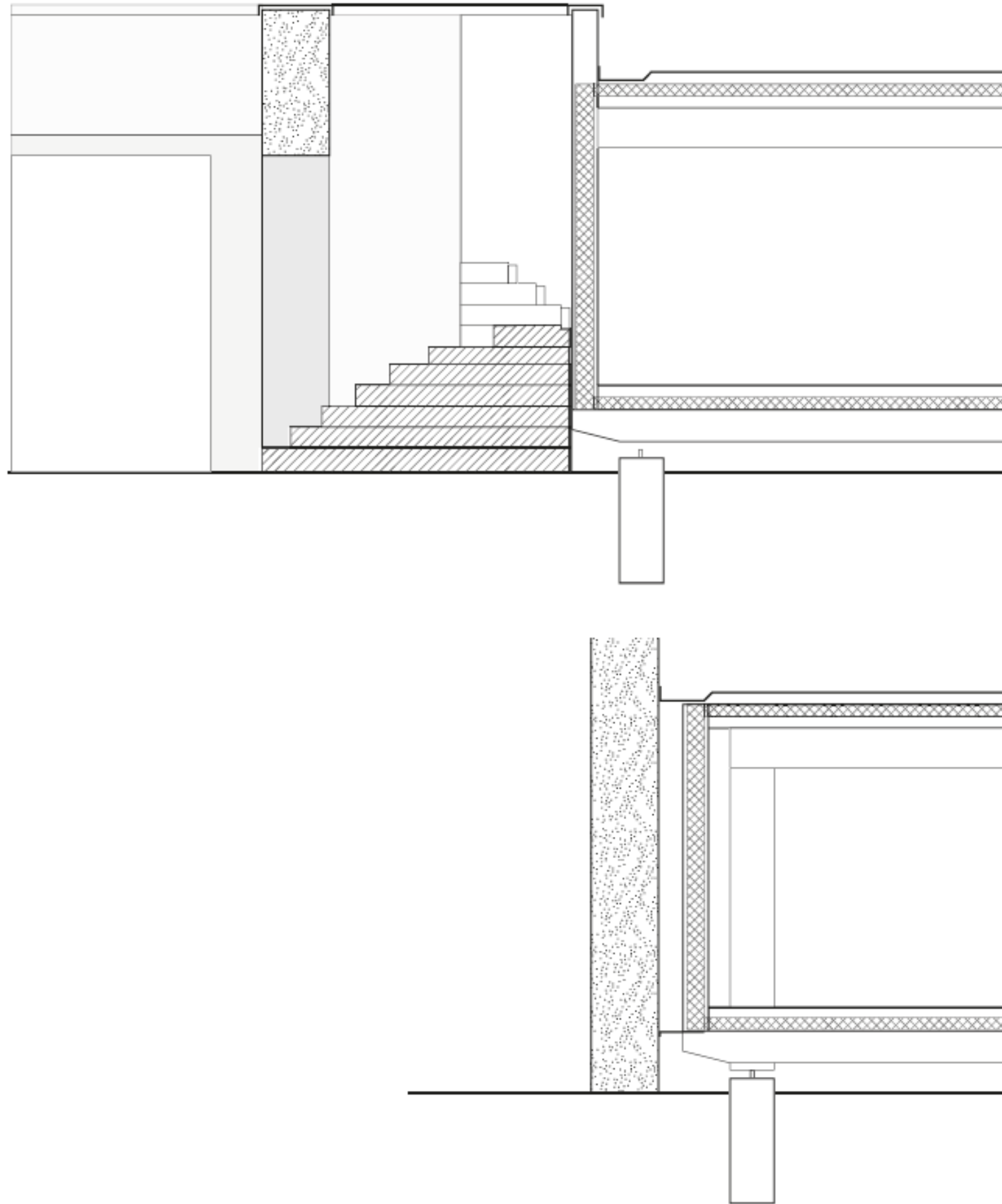
Laminated beam



Construction I Principles urban side

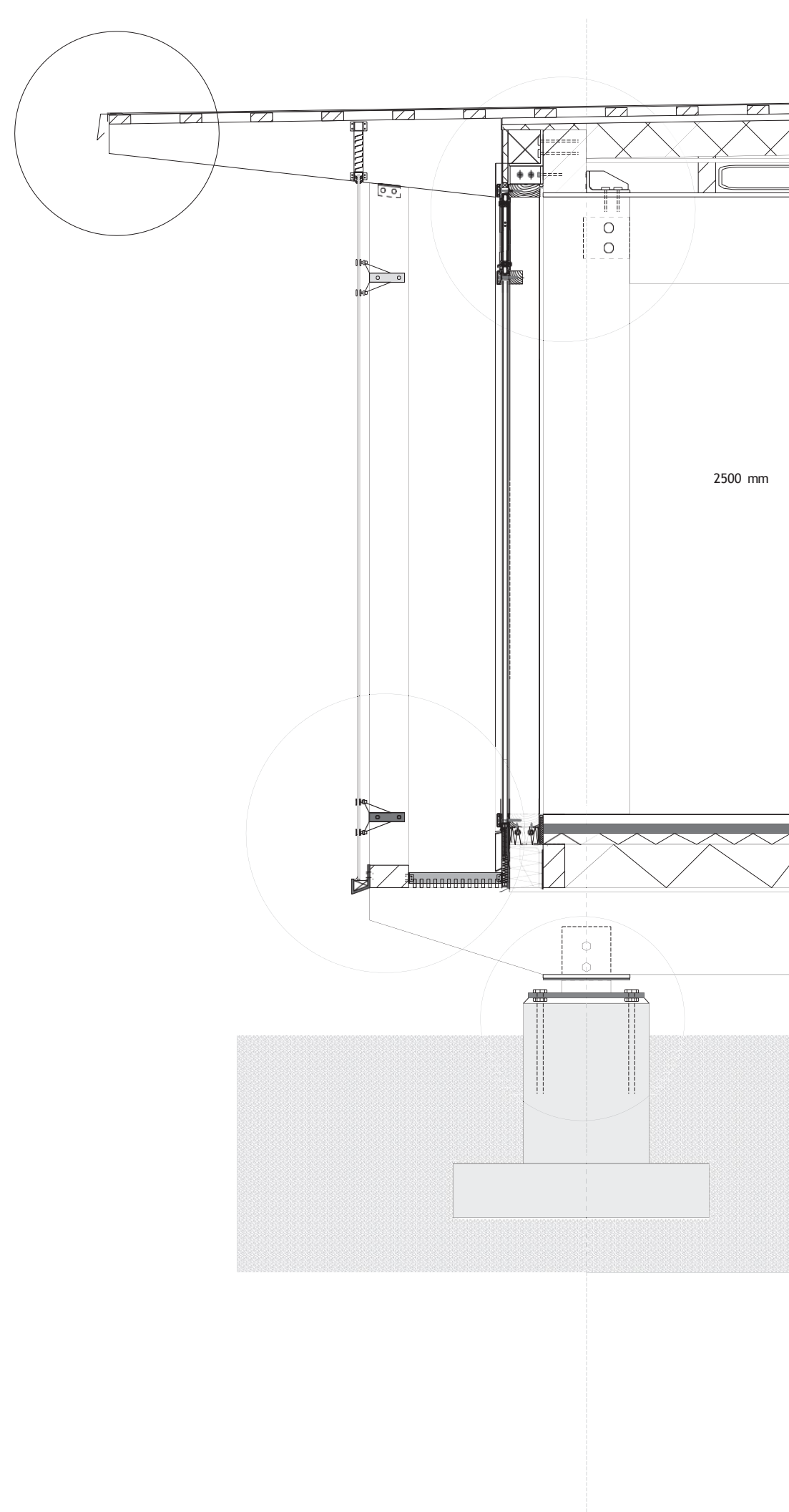
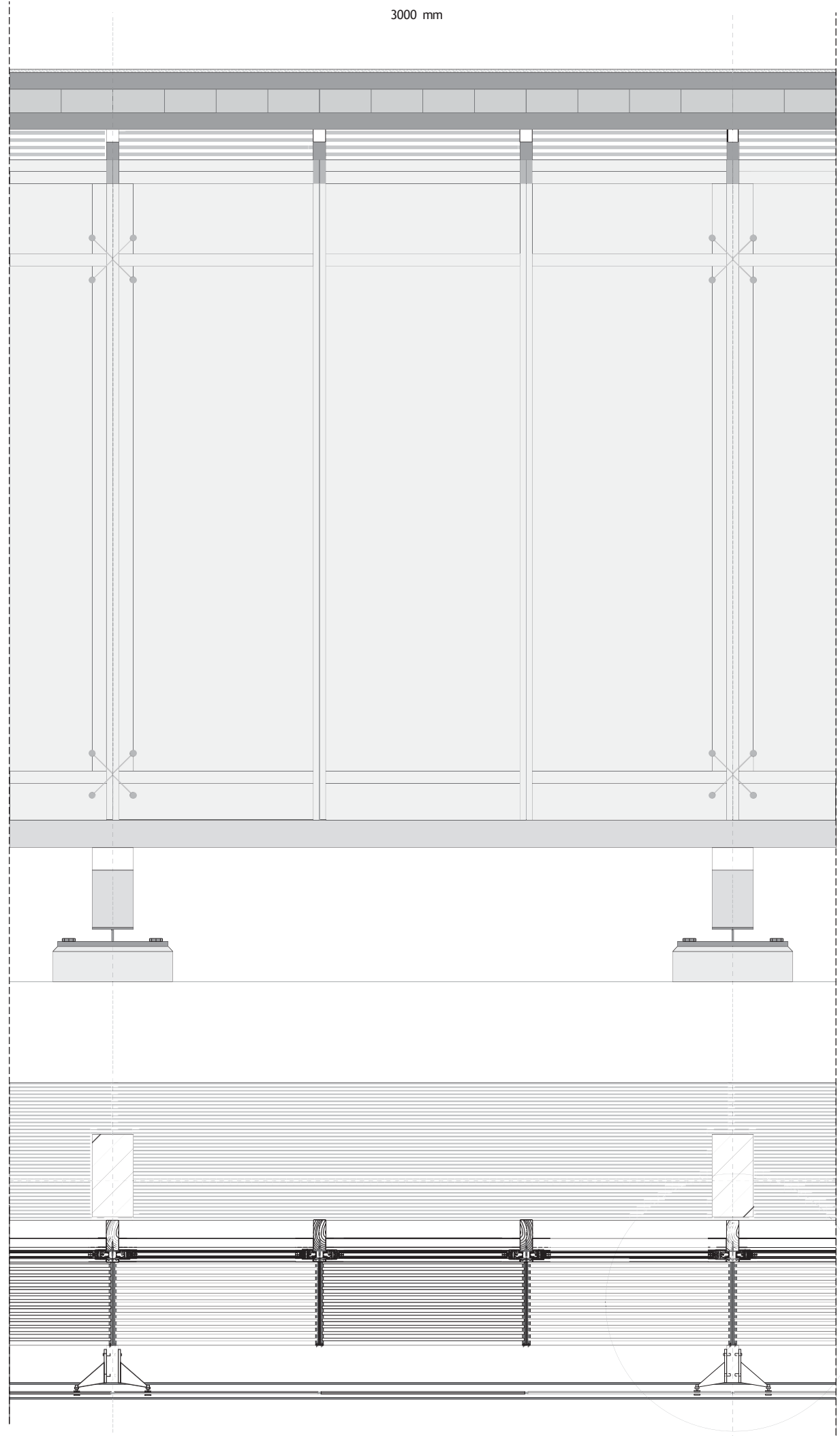


**Construction I** Connection rammed earth wall to building



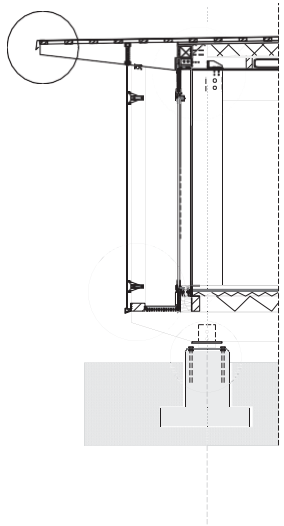
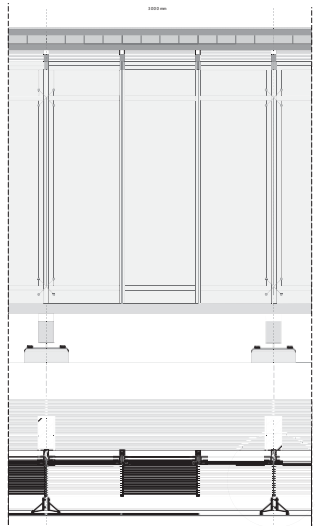
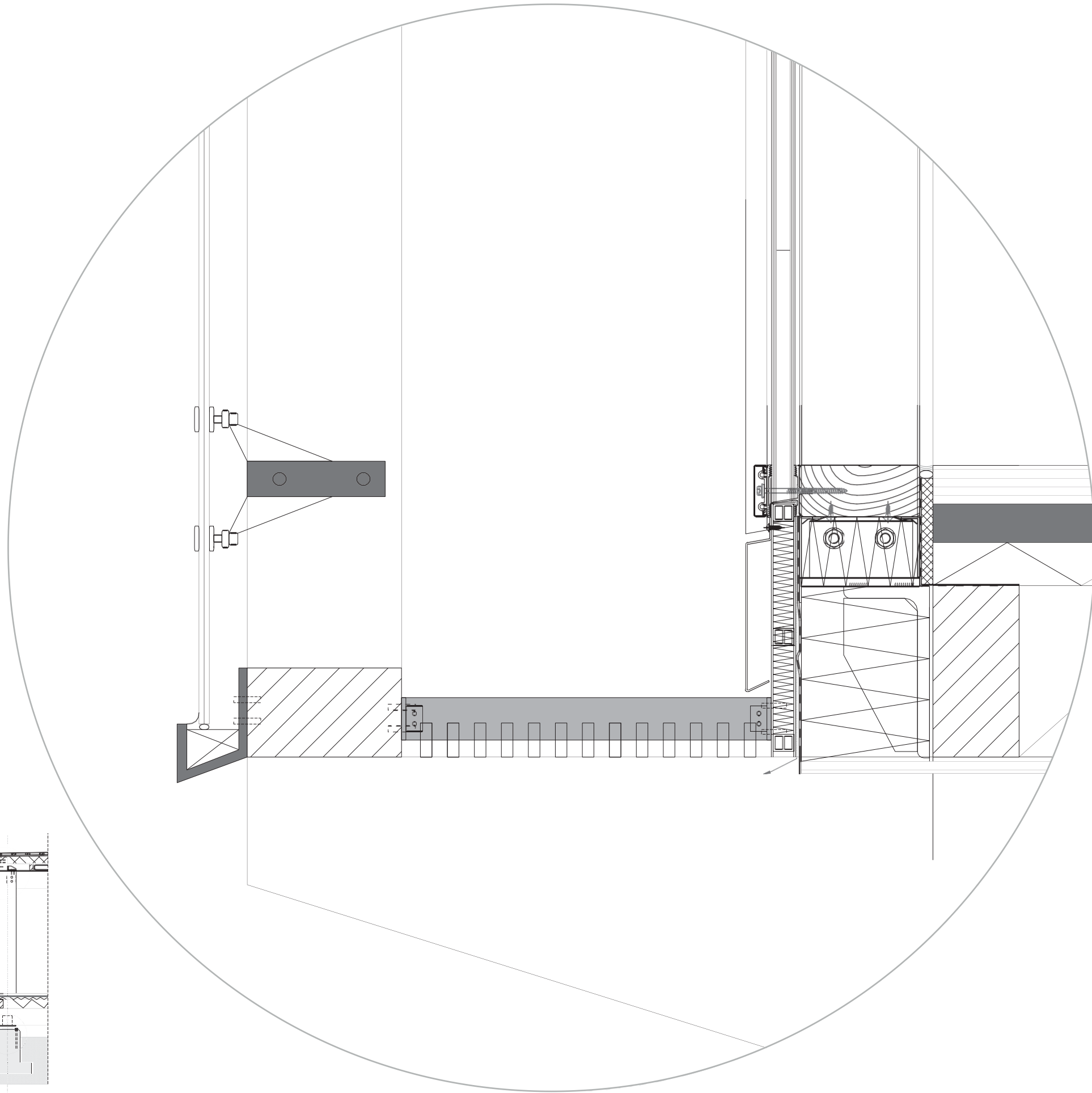
Building technology | 1:20 fragment double skin facade

3000 mm

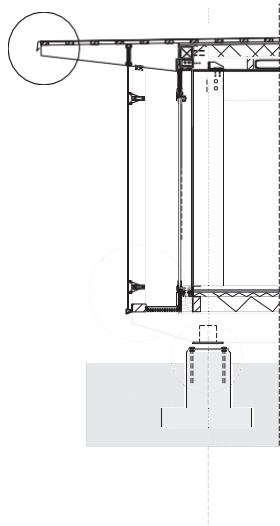
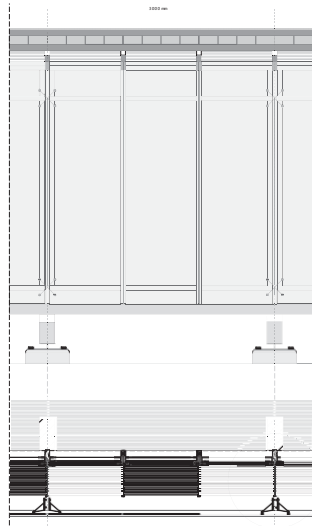
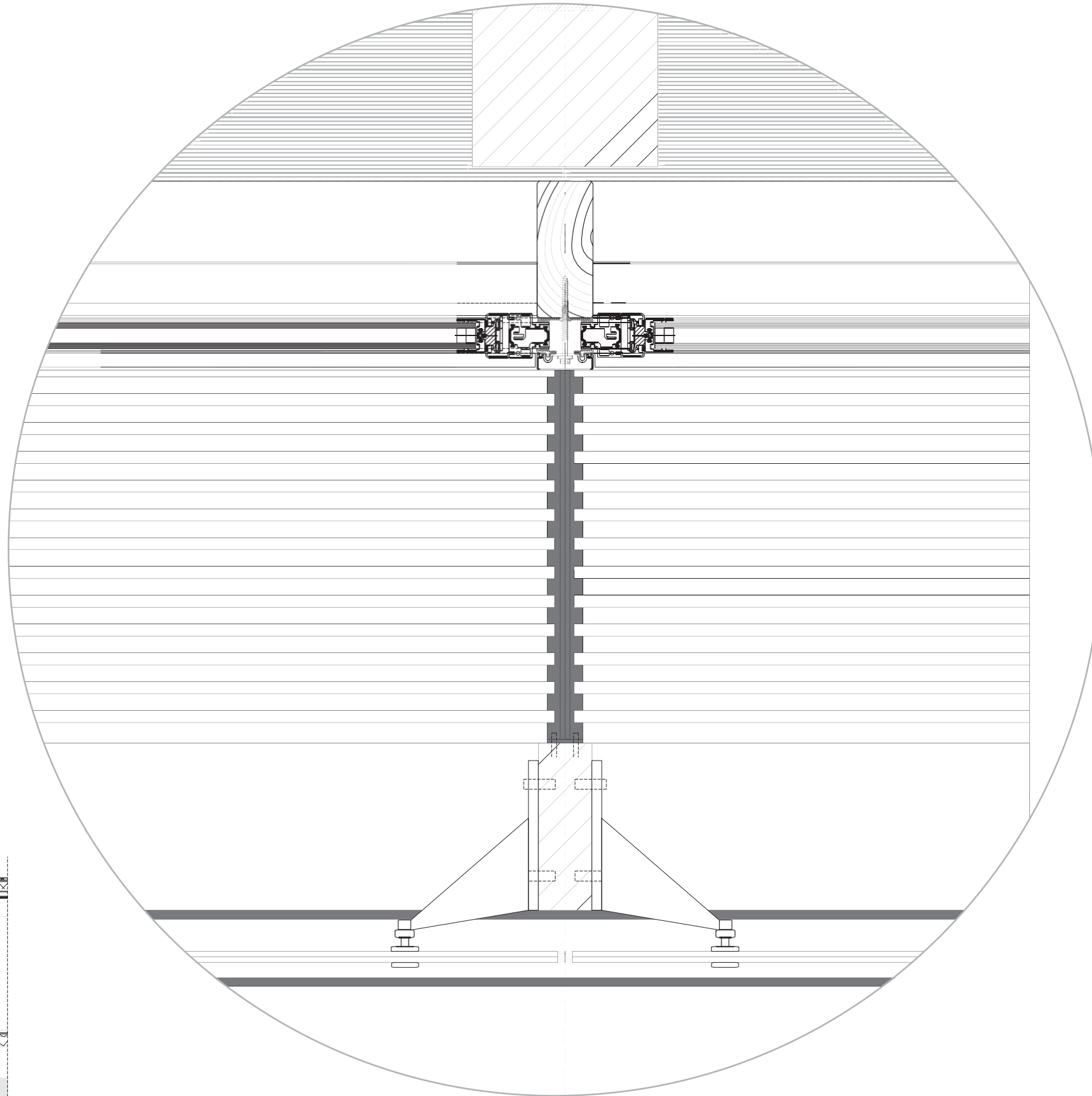




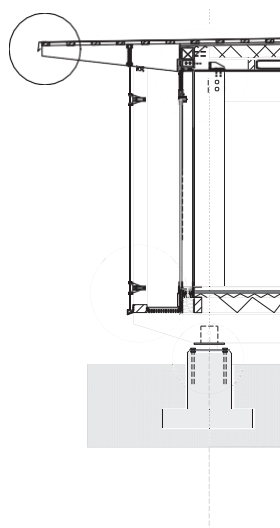
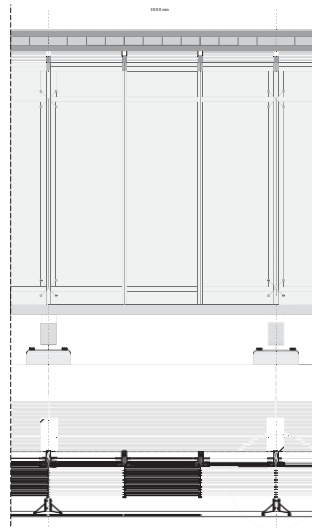
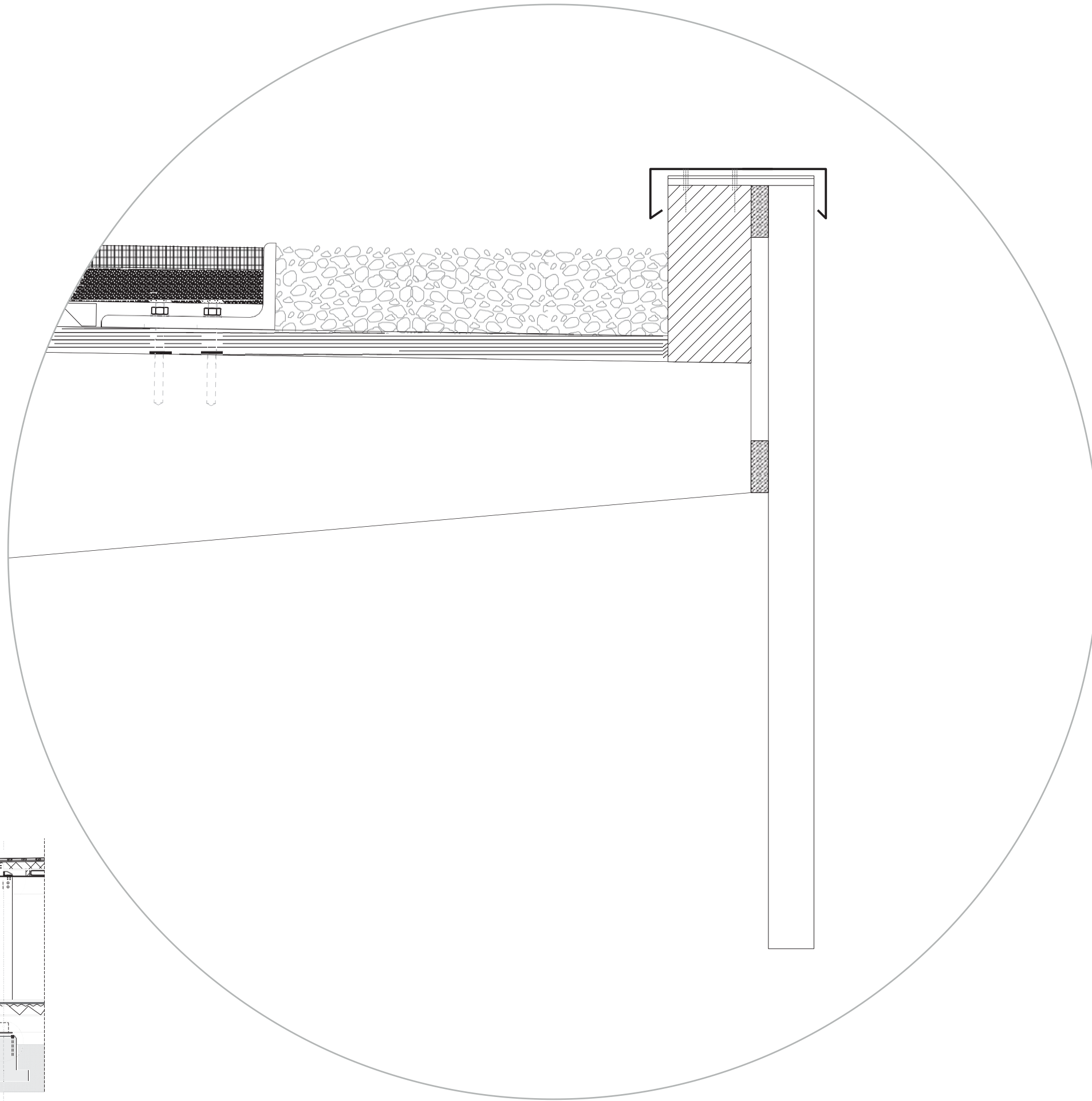
Building technology I Detail second skin bottom, ventilation grill



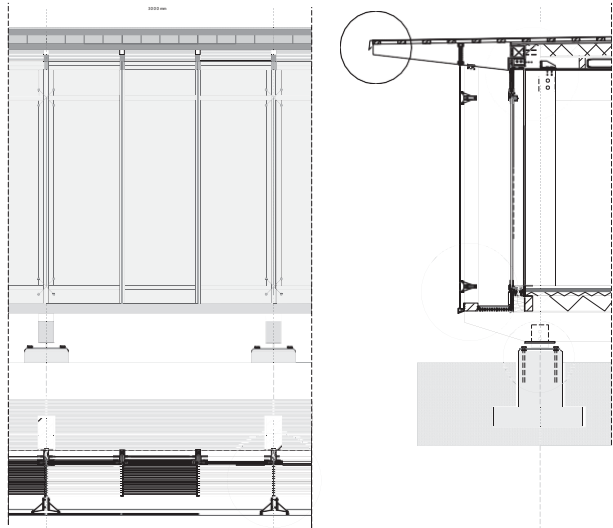
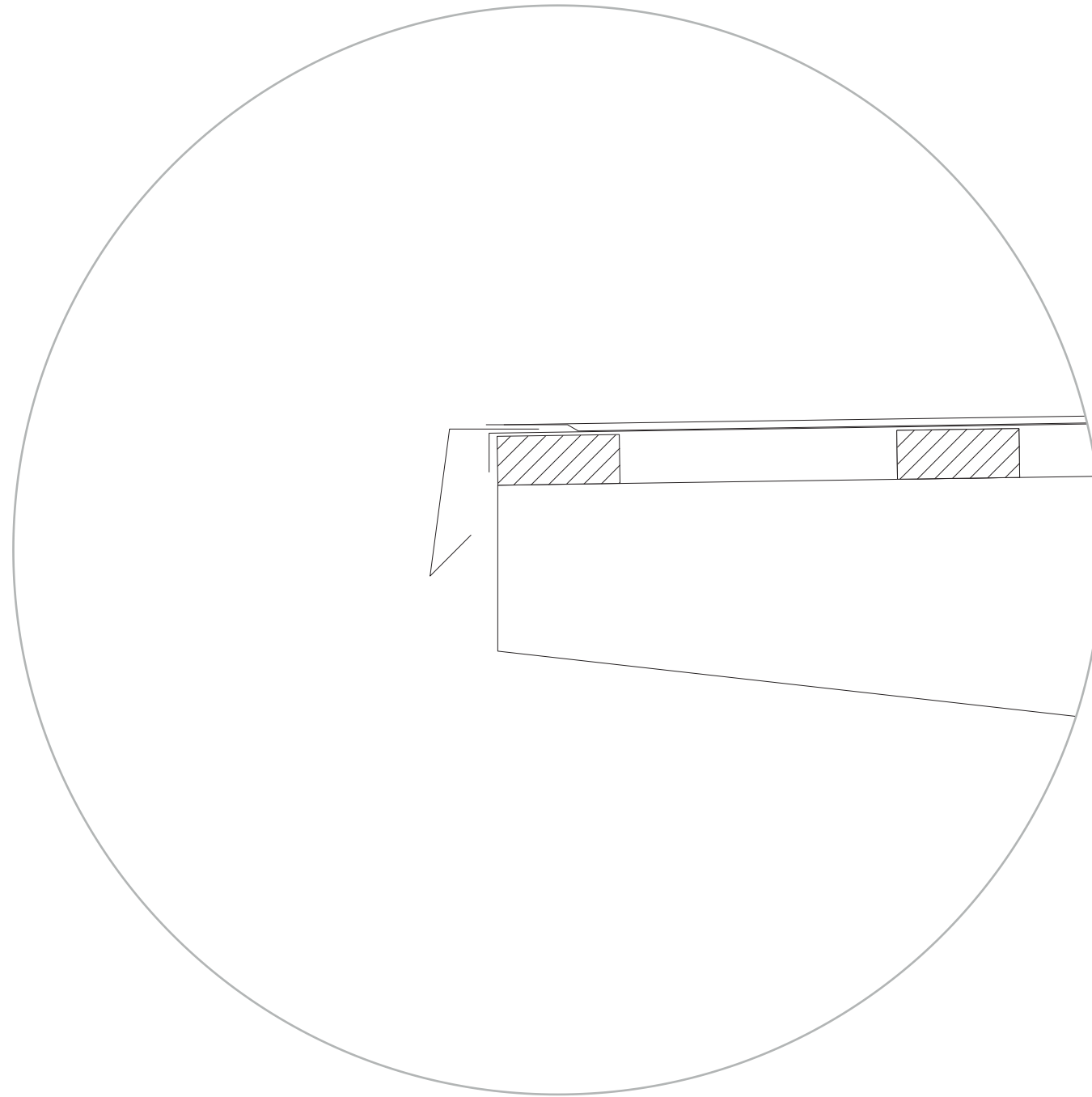
Building technology I Horizontal detail second skin

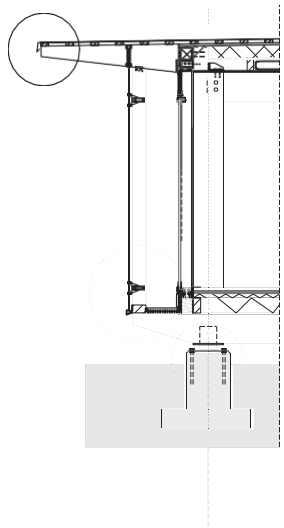
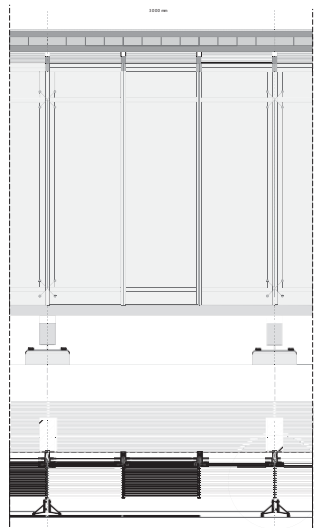
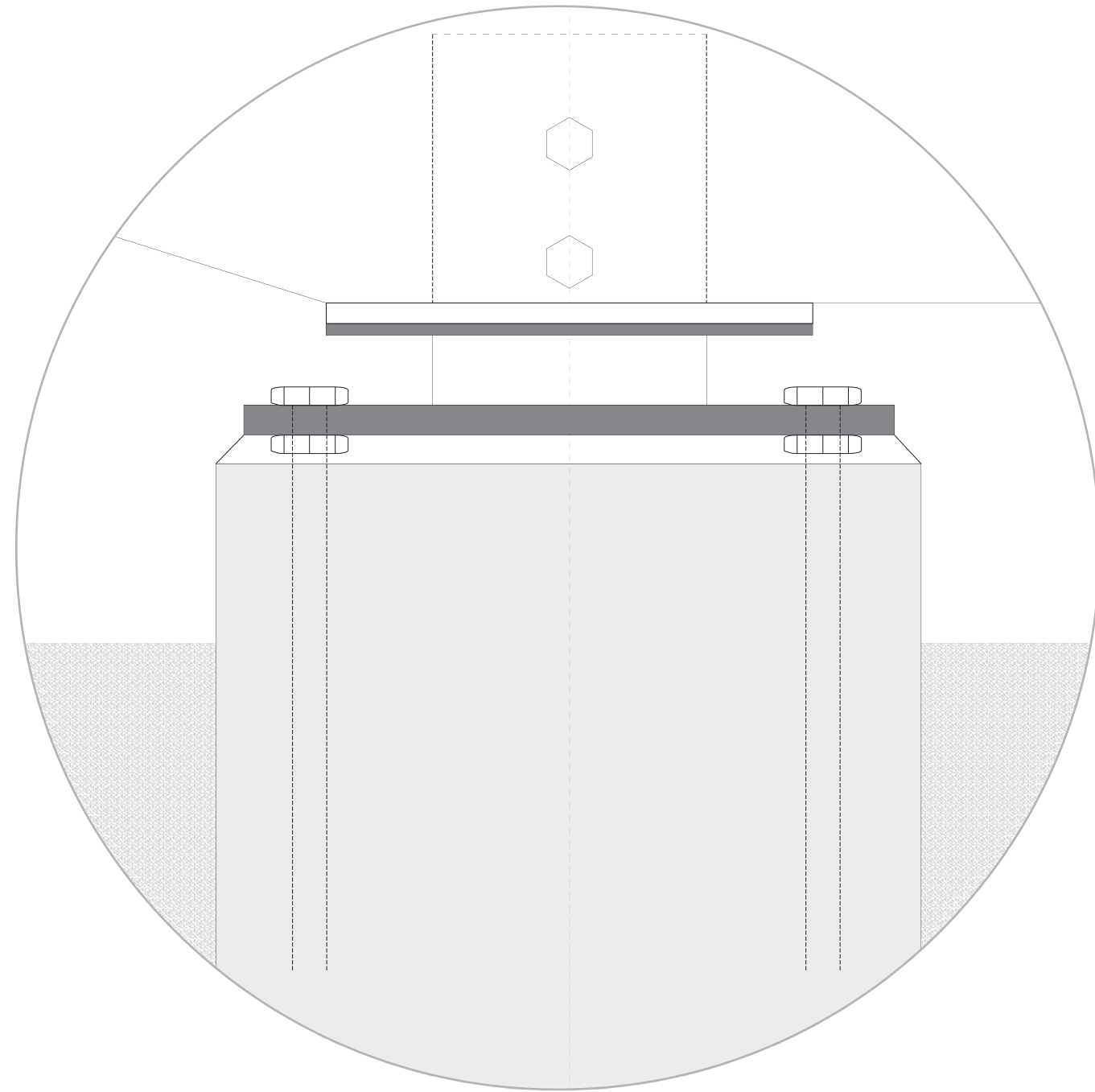


Building technology I Detail roof landscape side



Building technology I Detail roof urban side



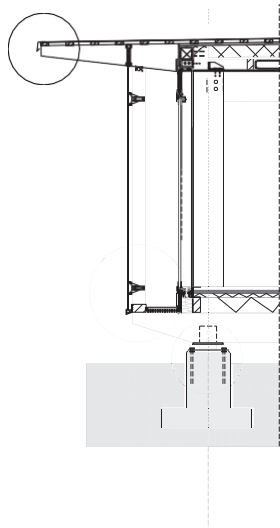
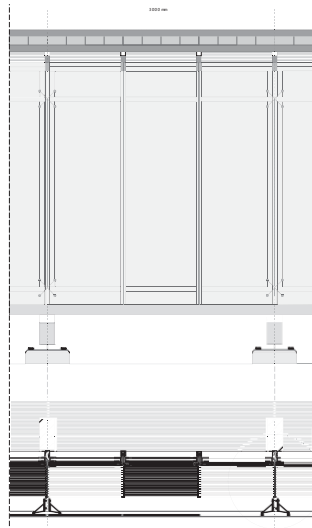
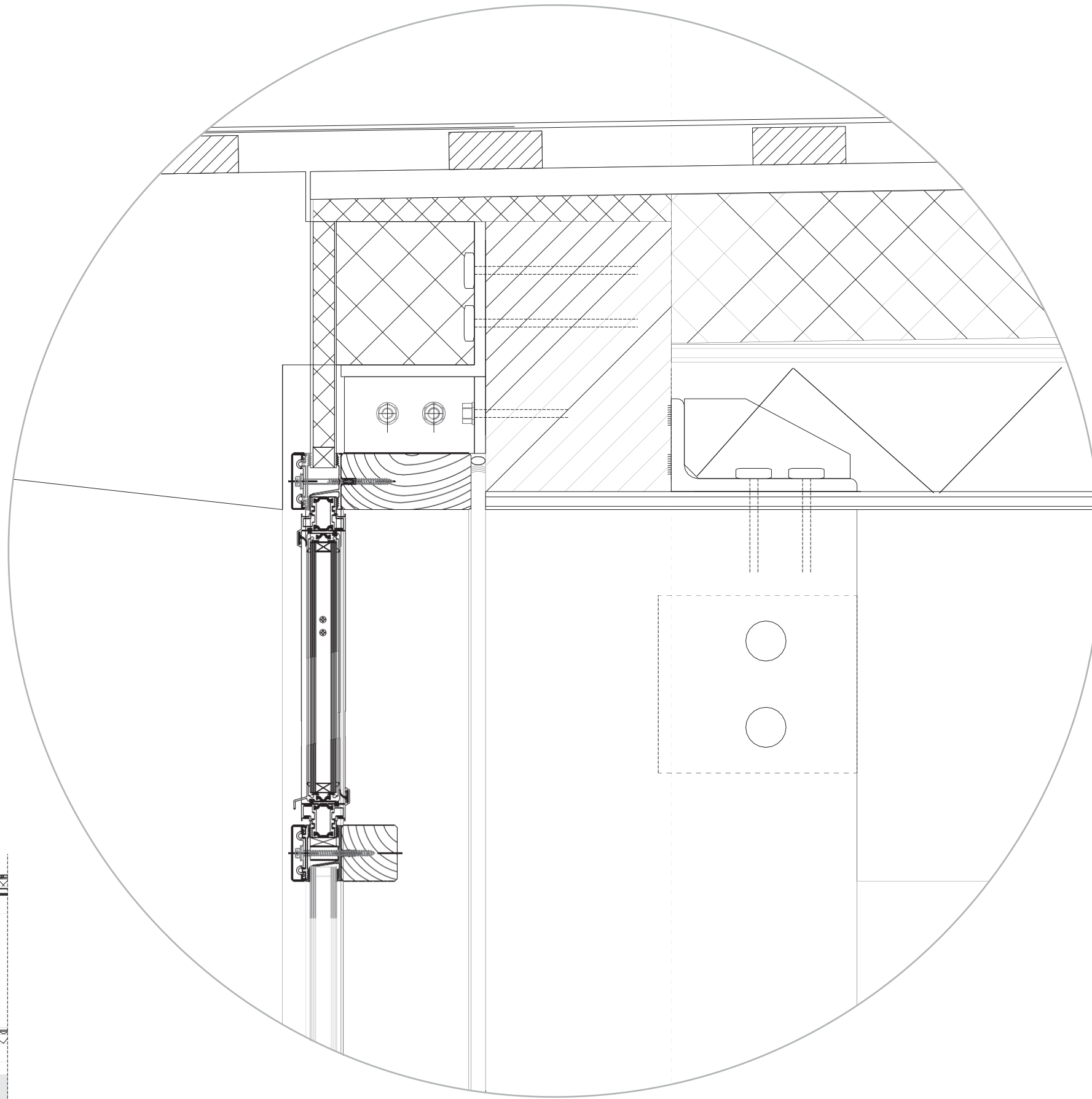


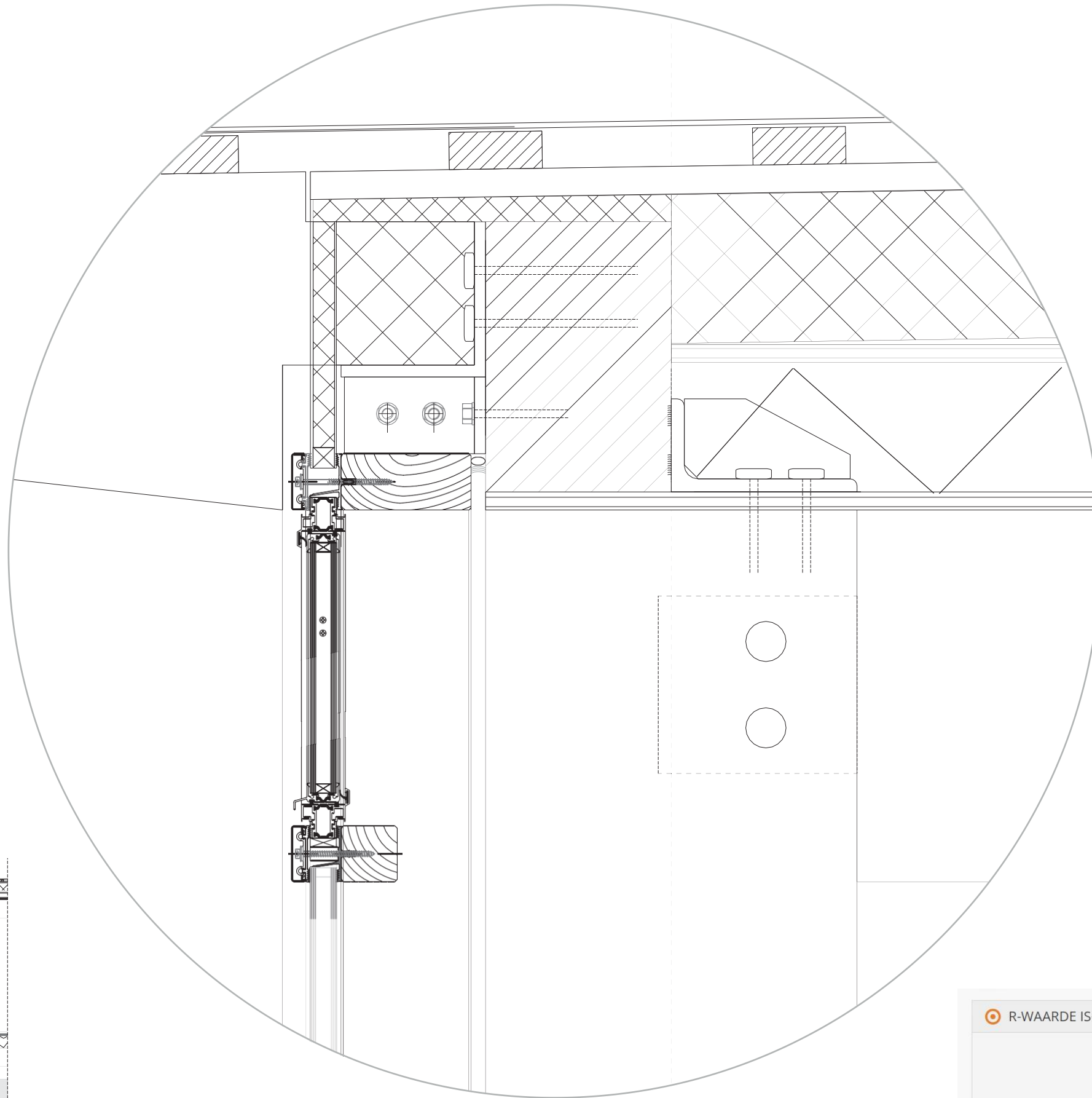
Thank you!



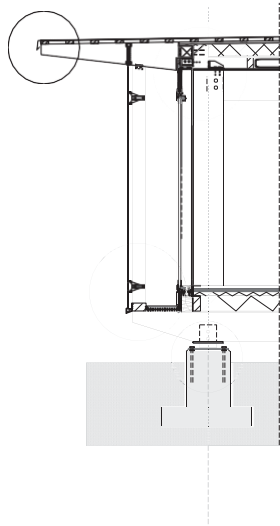
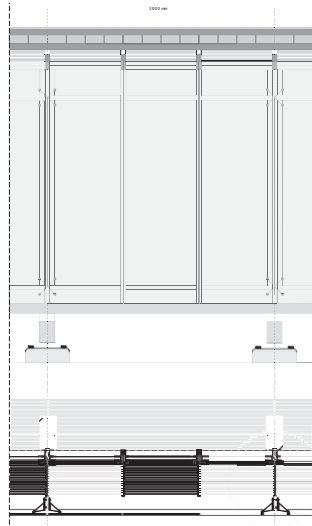
**Special thanks to:**  
Sam Stalker  
Eireen Schreurs  
Anét Meijer

Building technology I Detail window-ceiling





320 mm

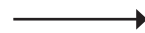


**R-WAARDE ISOLATIE**

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$\lambda$ -waarde isolatie	<input type="text" value="0,38"/>	W/mK
R-waarde isolatie	<input type="text" value="6.05"/>	m <sup>2</sup> K/W



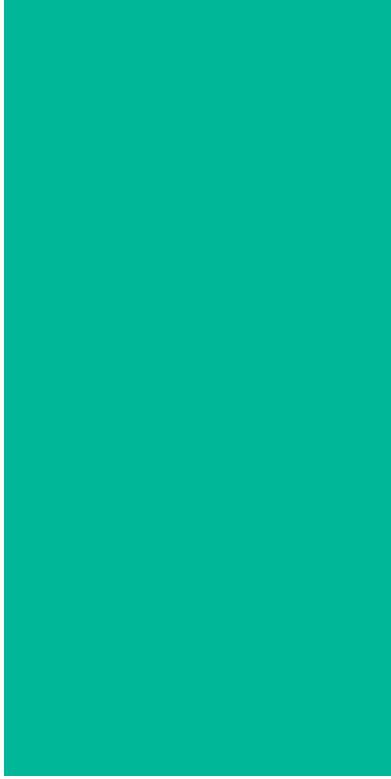
## Analysing sounds by use of music



**Zone 1**  
Walking on the Friche  
Eberich van Steen

The image shows a musical score for the piece "Walking on the Friche" by Eberich van Steen. The score is written on a grand staff with two staves per system. It includes various musical notations such as notes, rests, and dynamic markings. The score is divided into sections labeled "Entrée", "Marche", and "Fin". There are also some performance instructions in French, such as "Marche sur le rythme de la marche" and "Marche sur le rythme de la marche". The score is presented in a clean, professional layout with a white background and black ink.

**Research & design P2**



**Analysis by music**

