

EXPLORAY

Experiencing circular architecture

In a community lab

Else Dekker | P5 | 12.07.2019

Architectural Engineering | Amstel III

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The background is a soft-focus photograph of a park. In the foreground, there are several thin, light-colored tree trunks. Behind them, a path or road curves through a dense area of trees with green and yellow foliage. The overall tone is warm and natural.

INTRODUCTION

EXPERIENCING CIRCULAR ARCHITECTURE

What is circular
architecture?

How does one experience
architecture

Upcycle Amstel

- + Transformation of Amstel III in a circular way
- + Research what circular economy consists off
- + What can it provide to the building sector
- + Reuse materials released by the area
- + Engage community to circular economy in order to help

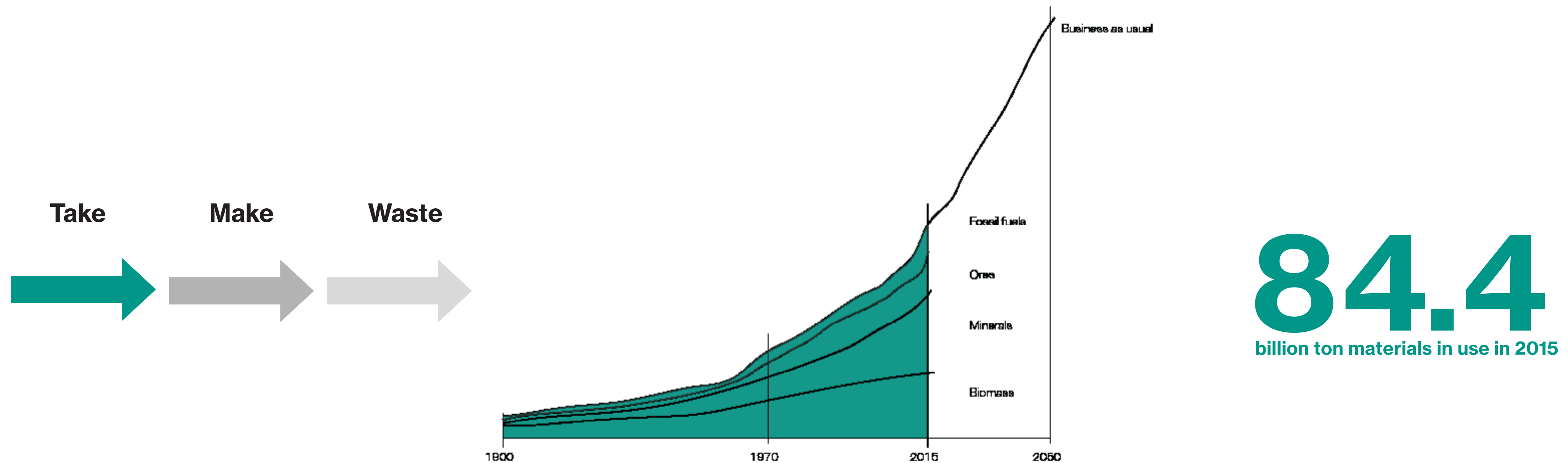


Problem statement

Current model

Material consumption | World wide

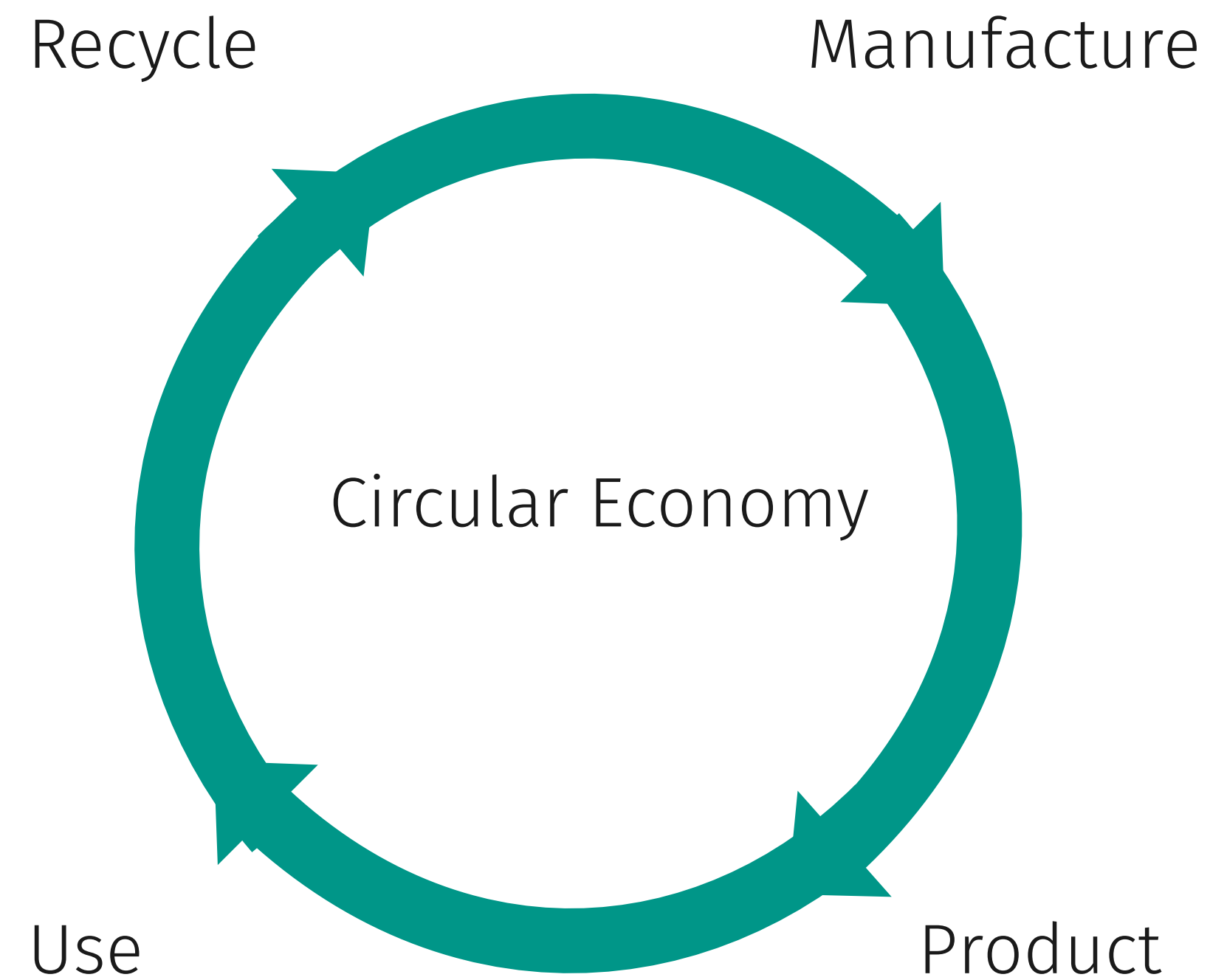
Materials in use by building sector



84.4 billion materials used globally in 2015. Today 67% of global greenhouse gas emission are related to material management

Problem statement

Need for new economic model



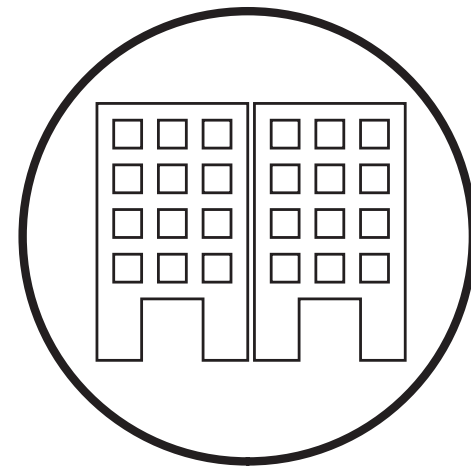
Context | Amsterdam



Amstel III



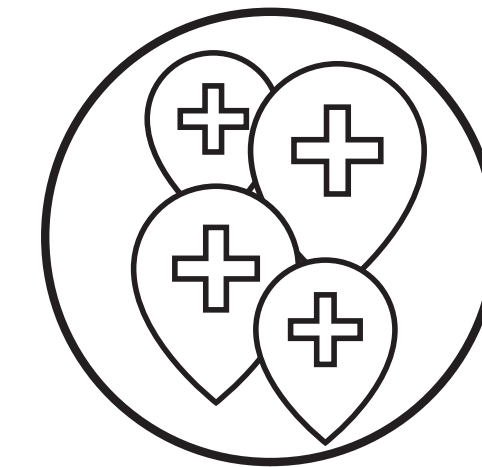
Problem statement Amstel III



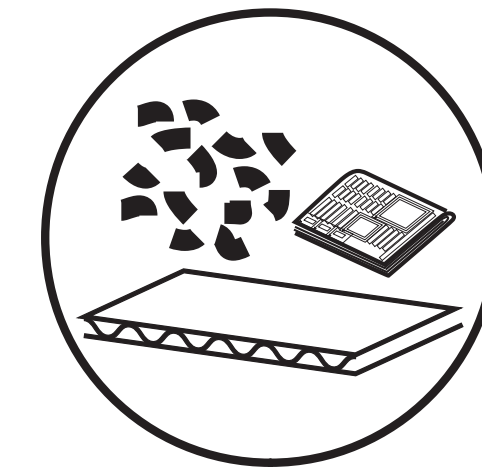
only offices



desire for mixed
urban city



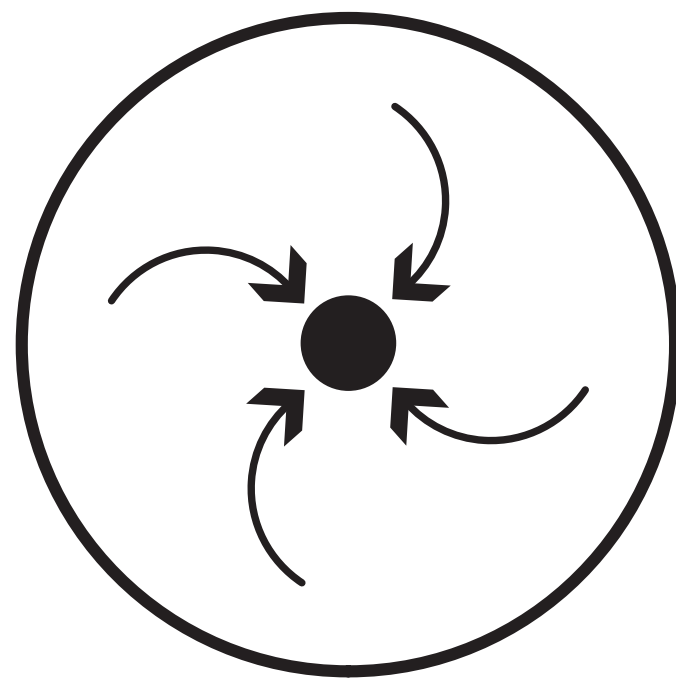
No cultural functions



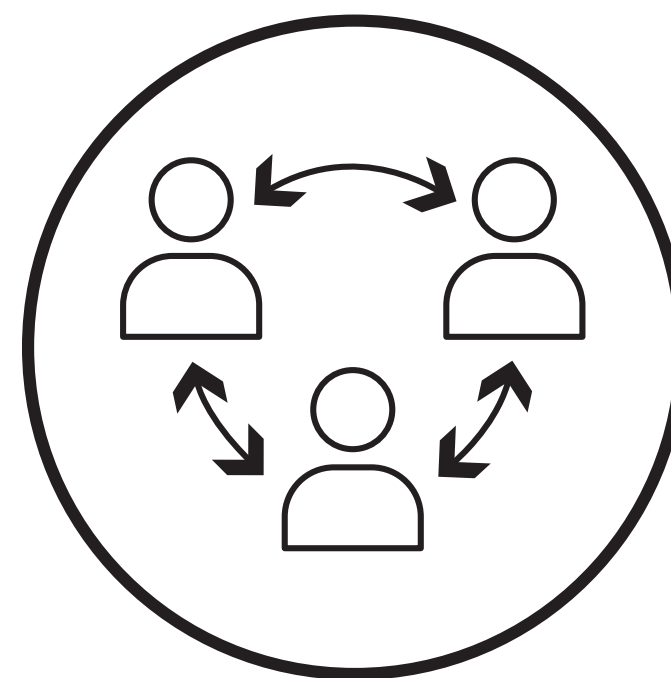
great amount of
materials available

Goals of the municipality

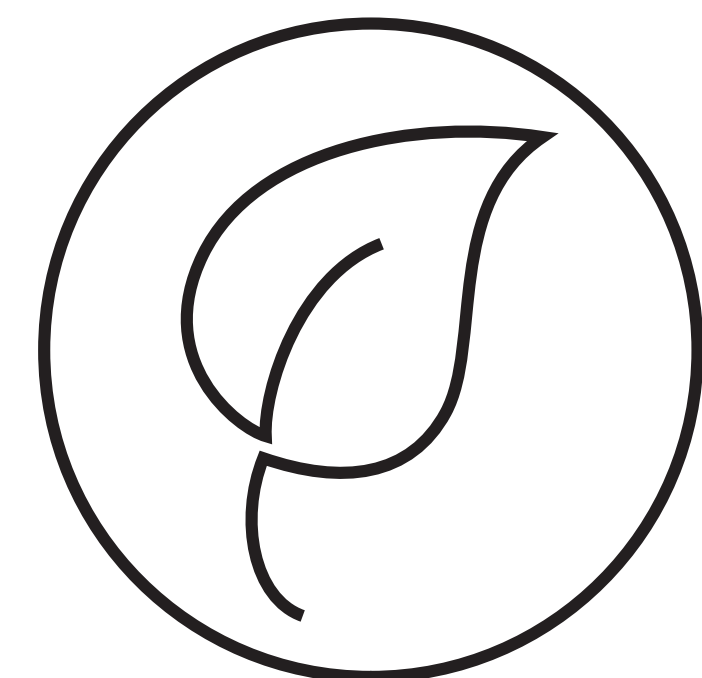
Inviting area



Connecting neighbors



Healthy environment

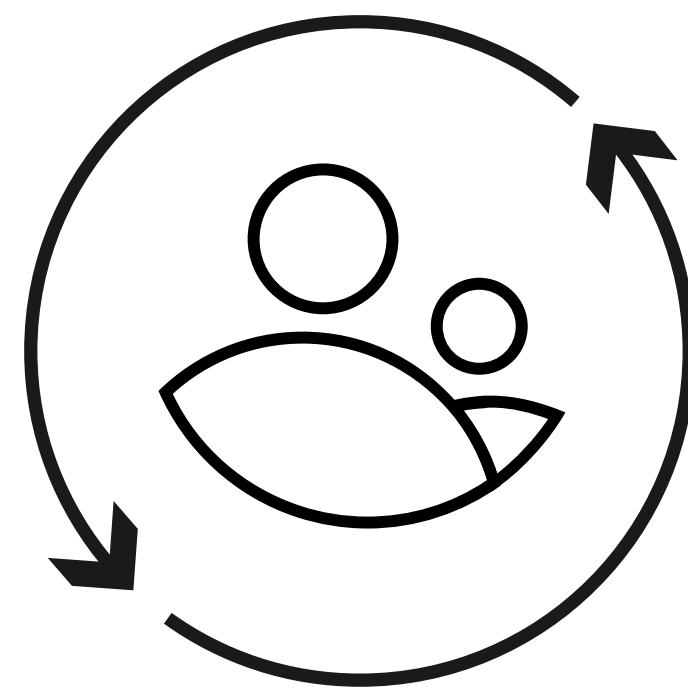


Opportunities - Amstel III

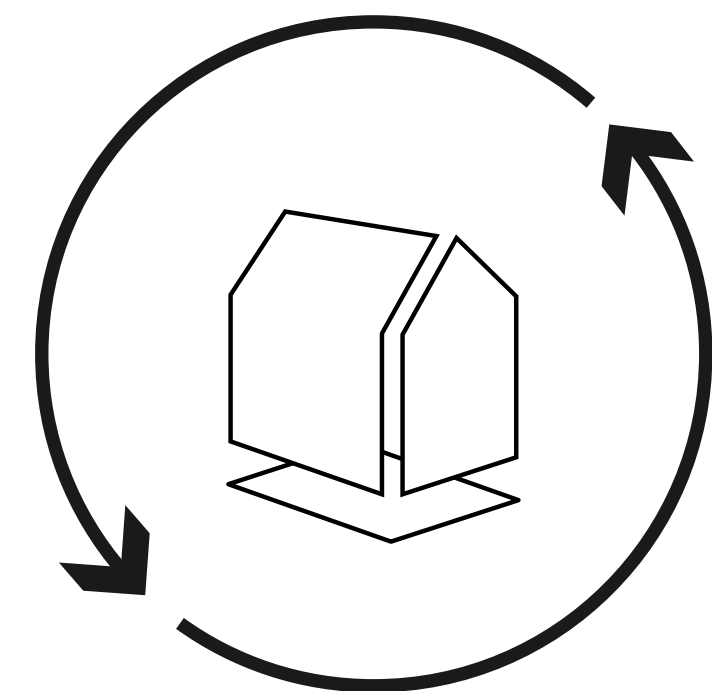
Creating Identity
- gathering together



Social Circularity
- work together



Circular building
- build with the existing





RESEARCH

Objective

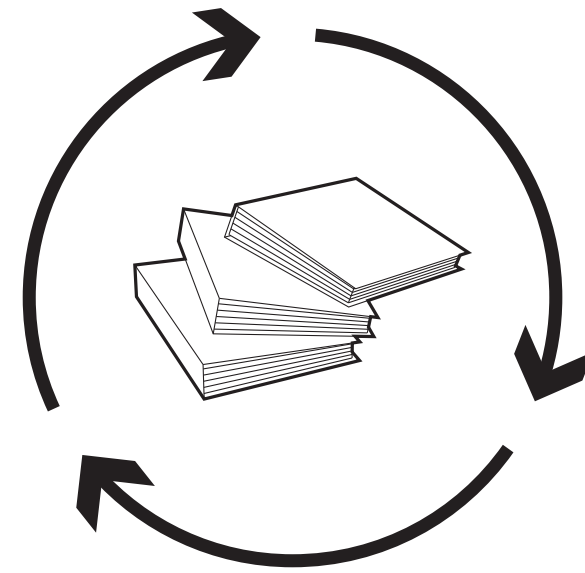
Engage the community of Amstel III to circular economy through providing a low key public learning environment where the reuse of reclaimed materials from the Amstel area provide a circular experience throughout a community lab.

Key principles of Circular Economy

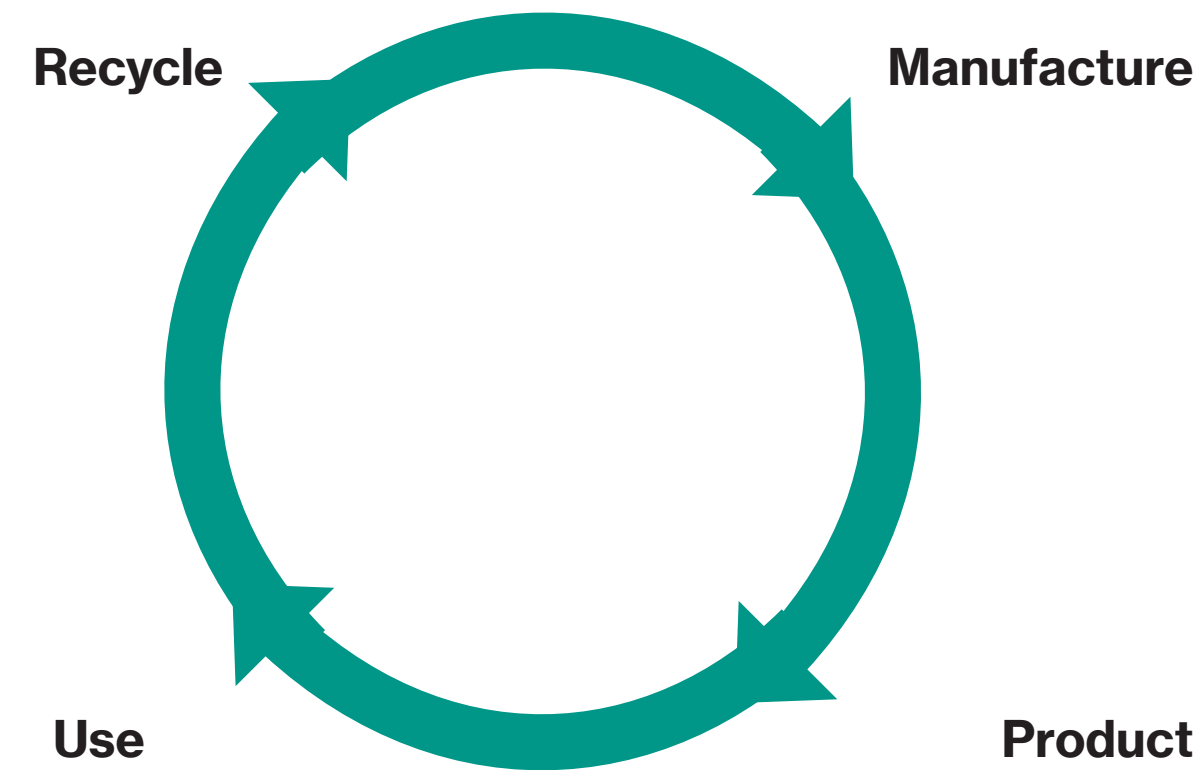
Design out
waste



Keep materials
circulating



Regenerate
natural systems

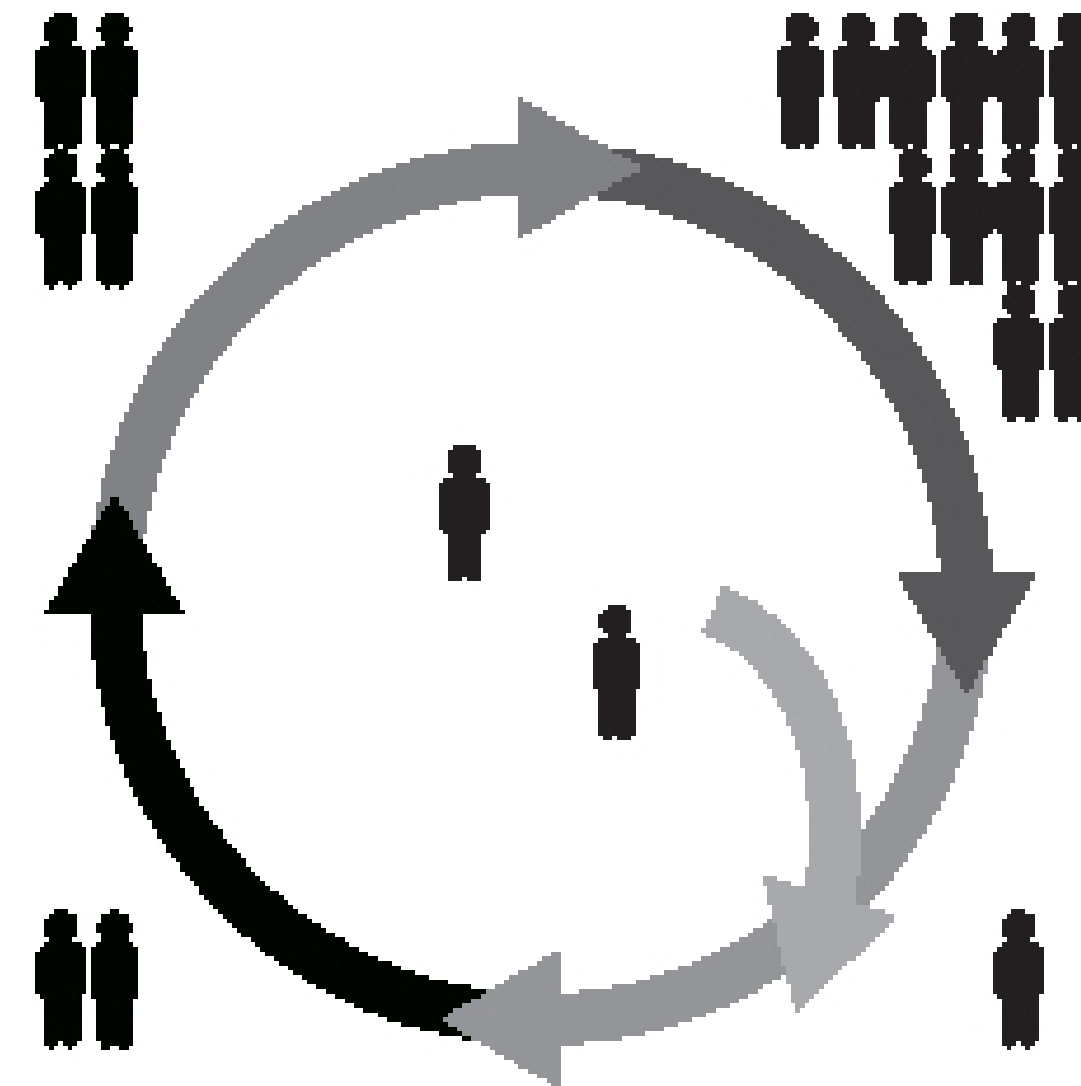


What's needed



1. Preserving materials

Upcycling Amstel III materials
Harvest materials in Amstel
Meaning of materials; experience



2. Community engagement

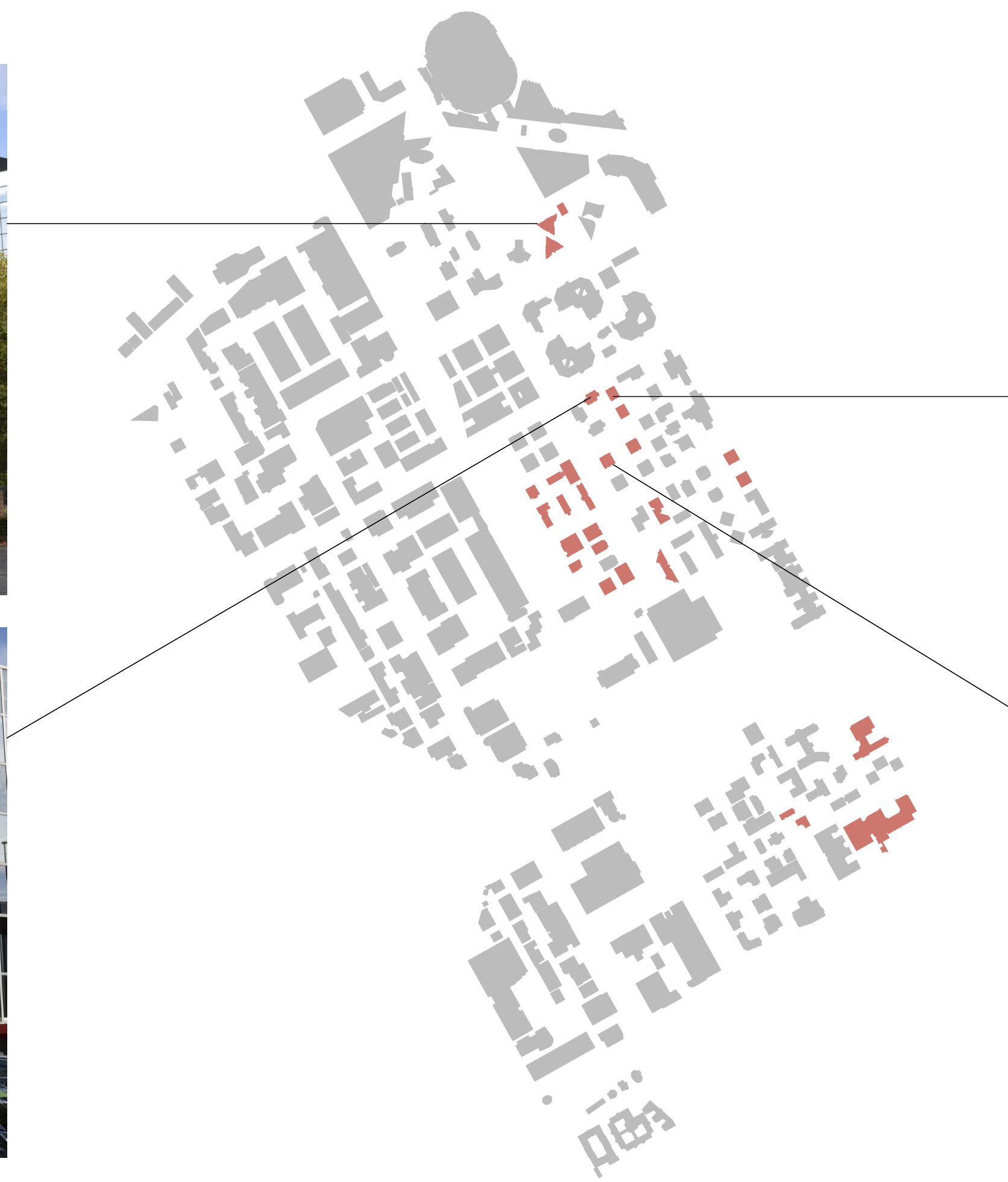
Let people feel connected to the building
- Emotional connection is needed to engage people to a building¹
Material gives a building its personality
- Exploring the meaning of materials
Material experience needed for engagement;

Creating experience vocabulary
Engagement of people with design

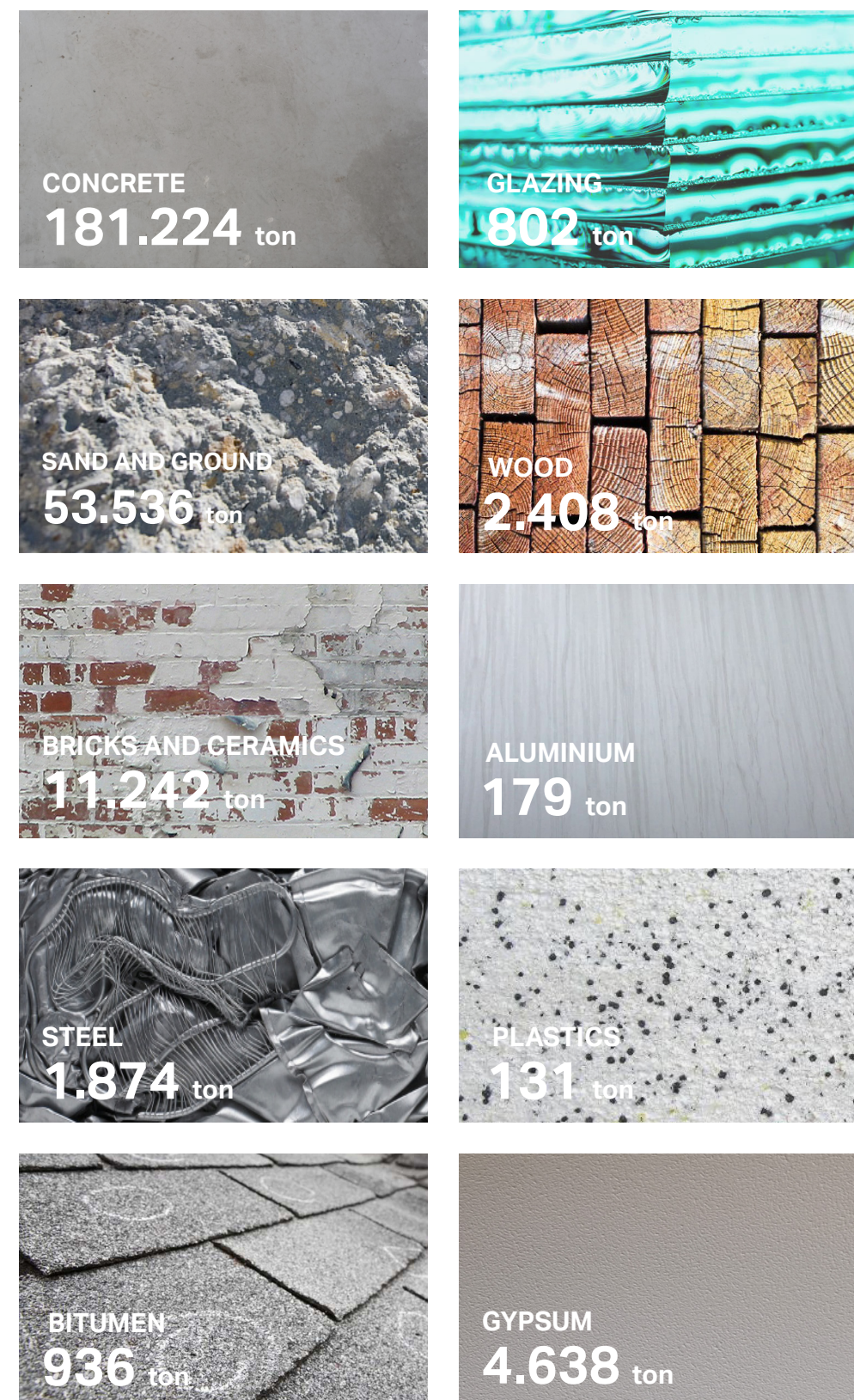
Demolishing map



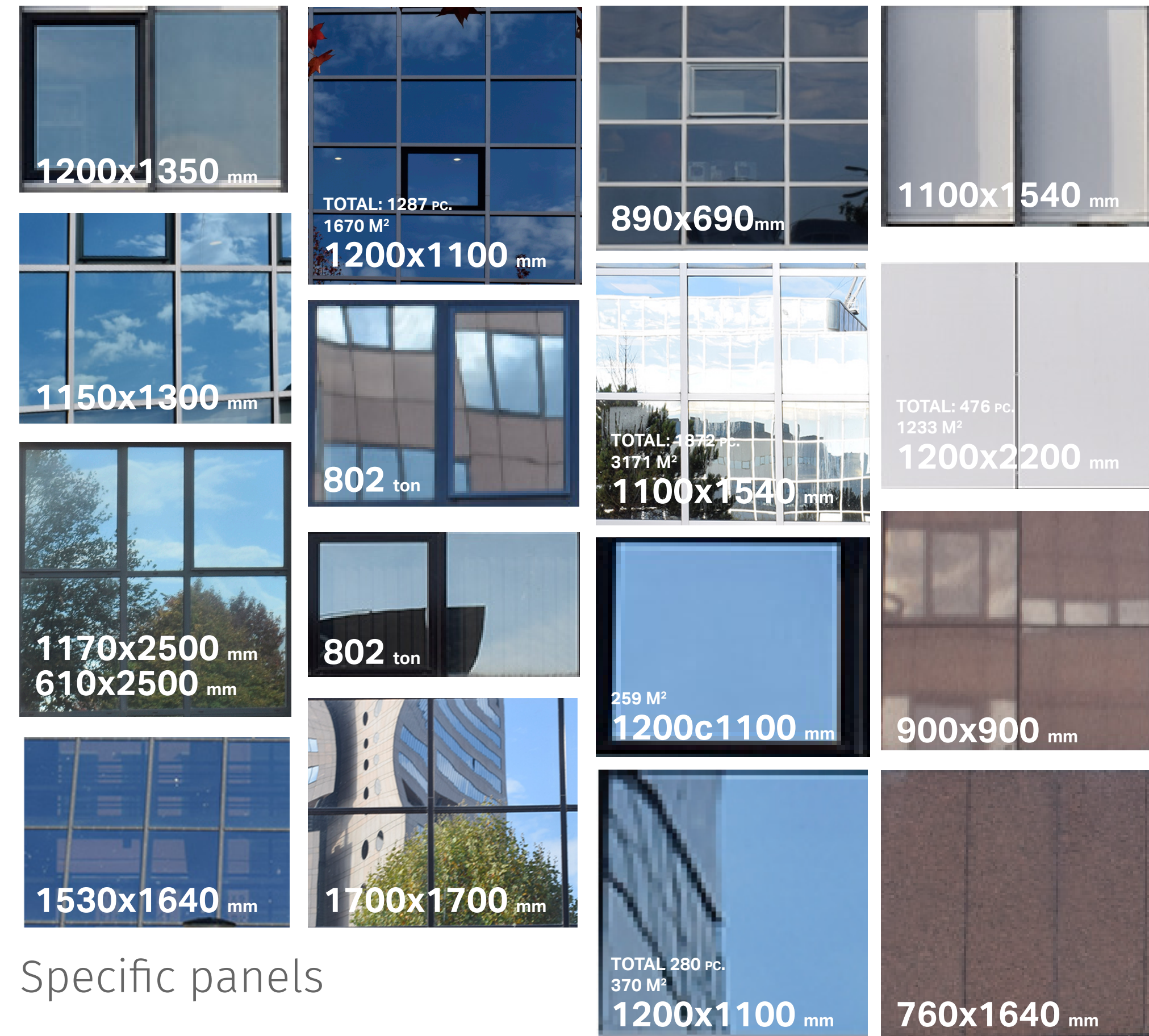
Buildings



Inventorize materials



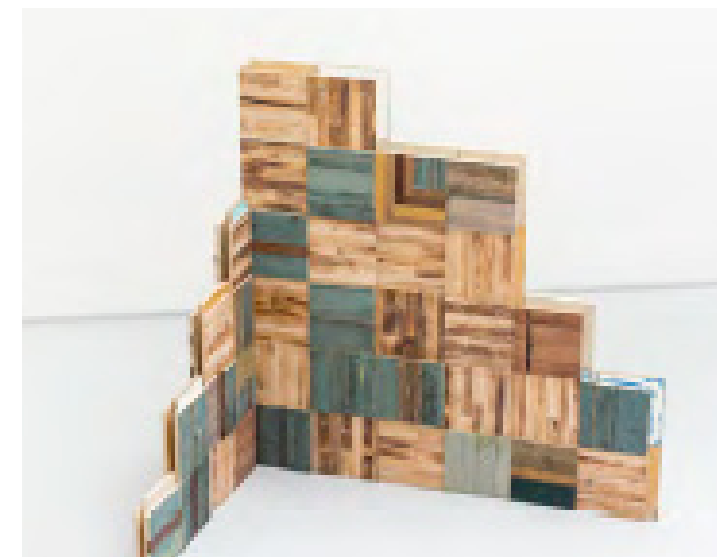
Generic amounts in area¹



Specific panels

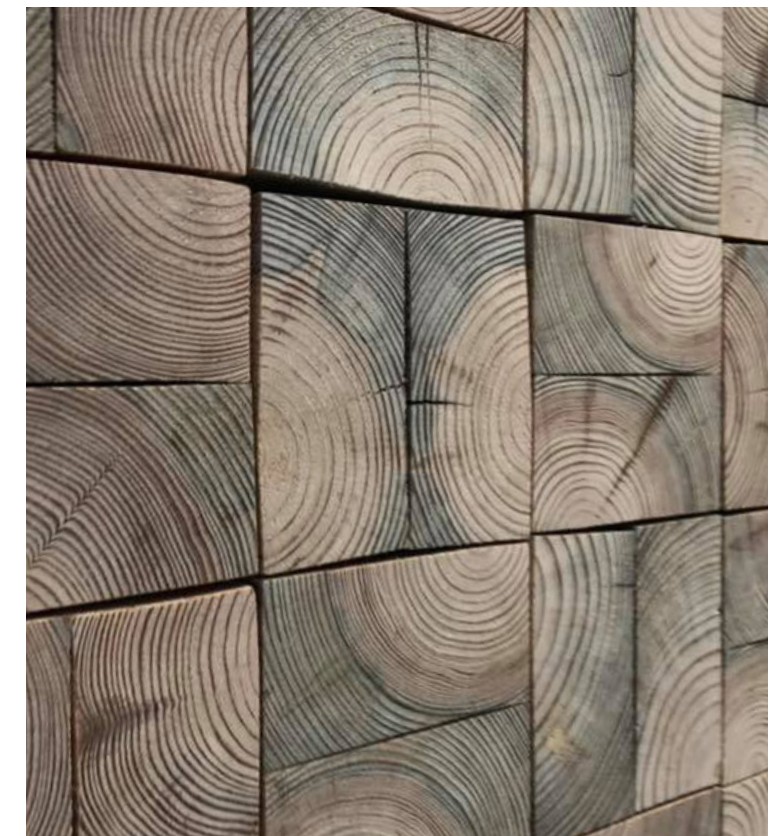
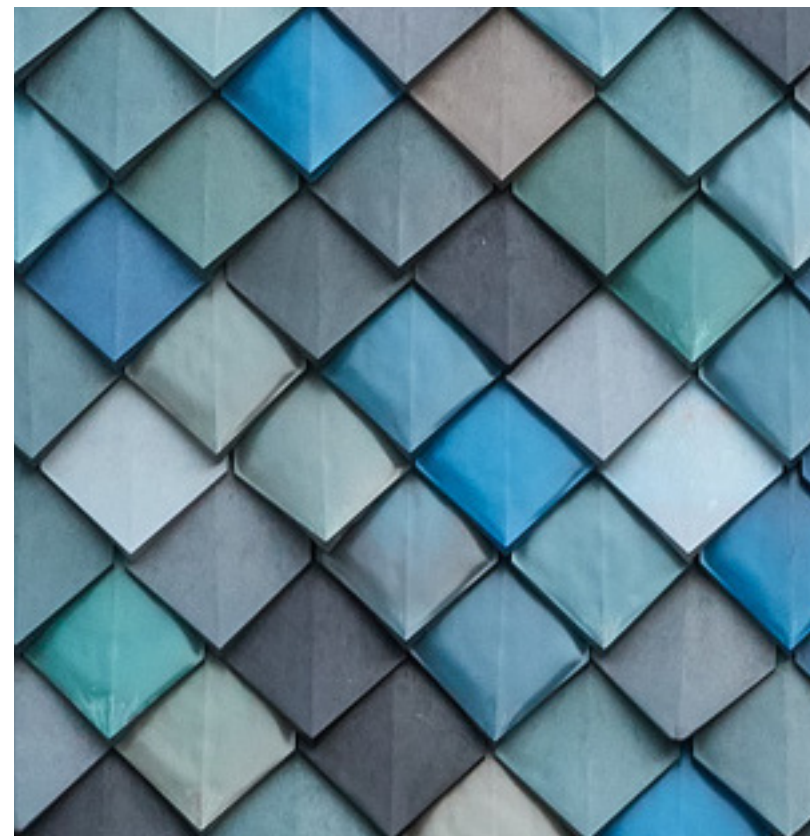
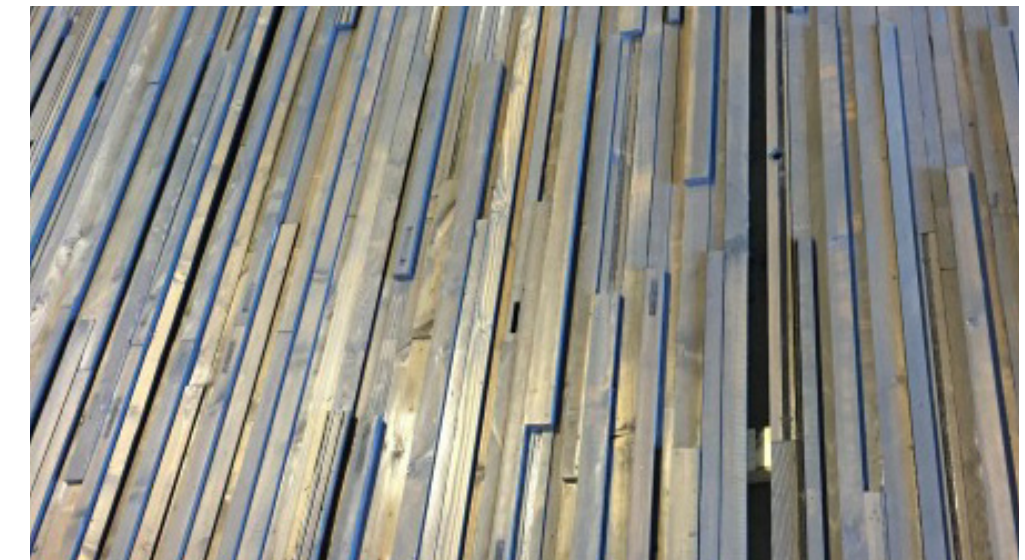
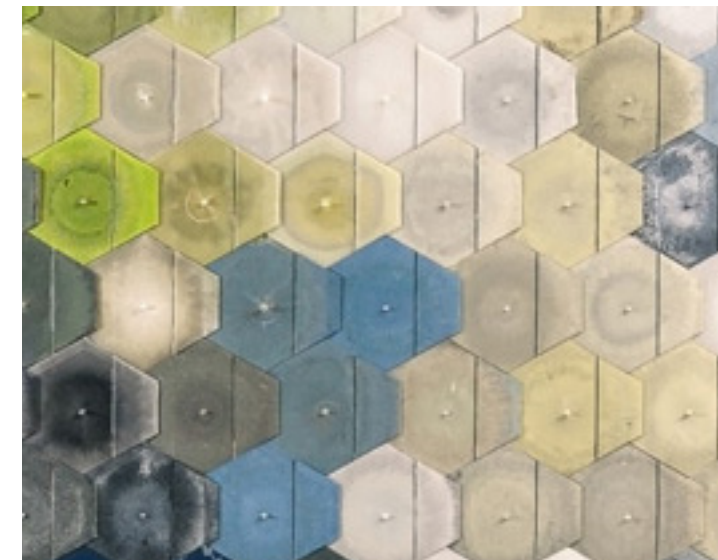
Reuse Possibilities

look differently at materials



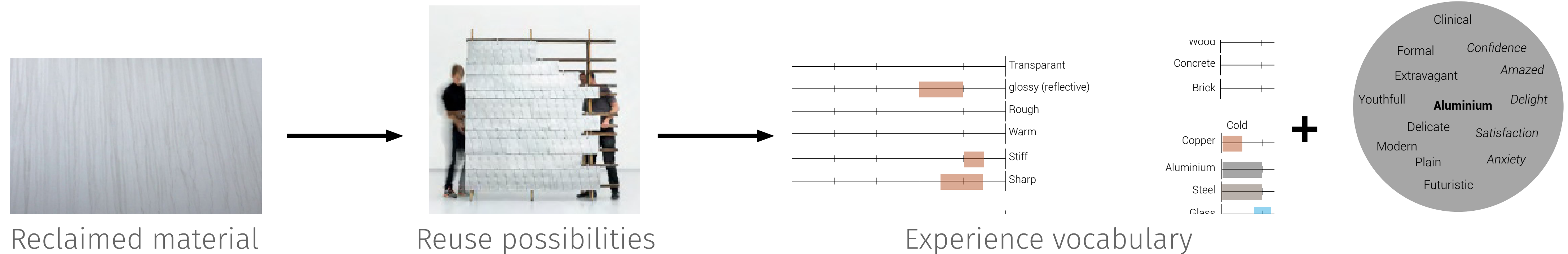
Reuse Possibilities

apply materials differently



Material Experiences

Creating a Tool



Design Tool to
apply material experience

Material Experiences

Experience vocabulary

Sensorial

Touch	Smooth Rough Soft Hard Light Heavy Cold Warm Flexible Stiff Weak Strong Ductile Tough Non elastic Elastic
Sight	Non-Transparent Transparent Translucent Optically clear Matte Glossy Non-Reflective Reflective Smooth Textured
Hearing	Muffled Sharp Dull Resonant Low Pitched High Pitched
Smell/Taste	Bitter Sweet

Interpretive

Aggressive	Passive
Cheap	Expensive
Classic	Trendy
Clinical	Friendly
Clever	Silly
Common	Exclusive
Decorated	Plain
Delicate	Rugged
Disposable	Lasting
Dull	Sexy
Elegant	Clumsy
Extravagant	Restrained
Feminine	Masculine
Formal	Informal
Hand made	Mass Produces
Honest	Deceptive
Humorous	Serious
Irritating	Loveable
Mature	Youthful
Modern	Traditional
Nostalgic	Futuristic

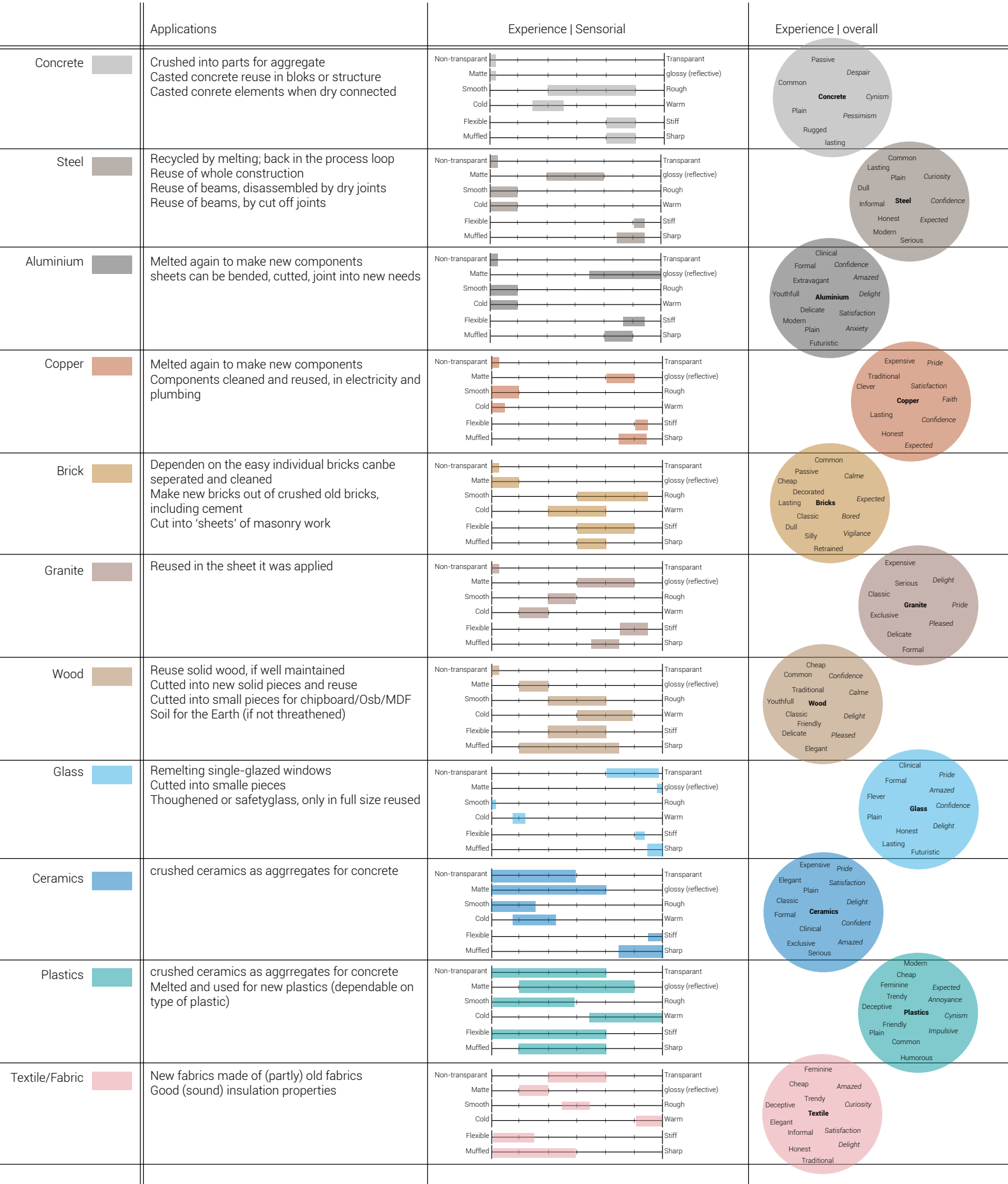
Affective

Amazed	Calm
Surprised	Expected
Bored	Joy/Exited
Disappointed	Pleased
Disgust	Like/Admiration
Hate	Love
Annoyance	Satisfaction
Fear	Faith
Vigilance	Impulsive
Pensiveness	Confidence
Optimism	Disapproval
Hope	Unbelief
Anxiety	Outrage
Despair	Pride
Awe	Aggressive
Cynicism	Curiosity
Delight	Pessimism

Design Tool

+ Choosing material based on experiences

+ Reusability Options

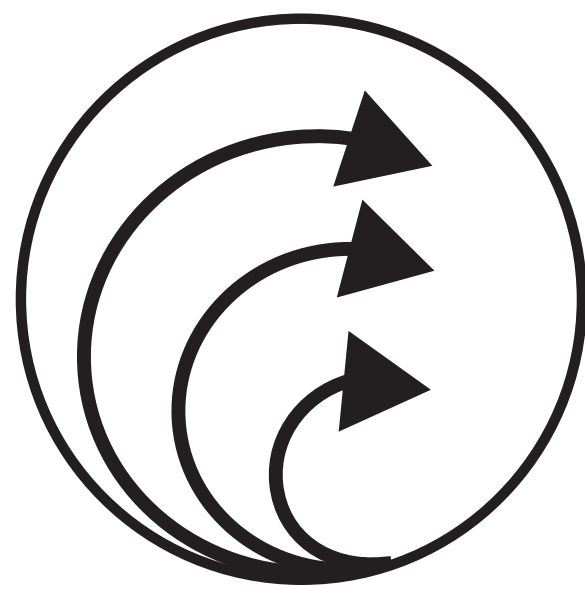


Design Tool

	Applications	Experience Sensorial	Experience overall
Concrete	Crushed into parts for aggregate Casted concrete reuse in bloks or structure Casted concrete elements when dry connected	<div><div>Non-transparent</div><div>Matte</div><div>Smooth</div><div>Cold</div><div>Flexible</div><div>Muffled</div><div>Transparent</div><div>glossy (reflective)</div><div>Rough</div><div>Warm</div><div>Stiff</div><div>Sharp</div></div>	<div><div>Passive</div><div>Despair</div><div>Common</div><div>Cynism</div><div>Concrete</div><div>Plain</div><div>Pessimism</div><div>Rugged</div><div>lasting</div></div>
Steel	Recycled by melting; back in the process loop Reuse of whole construction Reuse of beams, disassembled by dry joints Reuse of beams, by cut off joints	<div><div>Non-transparent</div><div>Matte</div><div>Smooth</div><div>Cold</div><div>Flexible</div><div>Muffled</div><div>Transparent</div><div>glossy (reflective)</div><div>Rough</div><div>Warm</div><div>Stiff</div><div>Sharp</div></div>	<div><div>Common</div><div>Lasting</div><div>Plain</div><div>Curiosity</div><div>Dull</div><div>Informal</div><div>Steel</div><div>Confidence</div><div>Honest</div><div>Expected</div><div>Modern</div><div>Serious</div></div>
Aluminium	Melted again to make new components sheets can be bended, cutted, joint into new needs	<div><div>Non-transparent</div><div>Matte</div><div>Smooth</div><div>Cold</div><div>Flexible</div><div>Muffled</div><div>Transparent</div><div>glossy (reflective)</div><div>Rough</div><div>Warm</div><div>Stiff</div><div>Sharp</div></div>	<div><div>Clinical</div><div>Formal</div><div>Confidence</div><div>Extravagant</div><div>Amazed</div><div>Youthfull</div><div>Aluminium</div><div>Delight</div><div>Delicate</div><div>Satisfaction</div><div>Modern</div><div>Plain</div><div>Anxiety</div><div>Futuristic</div></div>
Copper	Melted again to make new components Components cleaned and reused, in electricity and plumbing	<div><div>Non-transparent</div><div>Matte</div><div>Smooth</div><div>Cold</div><div>Flexible</div><div>Muffled</div><div>Transparent</div><div>glossy (reflective)</div><div>Rough</div><div>Warm</div><div>Stiff</div><div>Sharp</div></div>	<div><div>Expensive</div><div>Pride</div><div>Traditional</div><div>Satisfaction</div><div>Clever</div><div>Copper</div><div>Faith</div><div>Lasting</div><div>Confidence</div><div>Honest</div><div>Expected</div></div>
Brick	Dependen on the easy individual bricks canbe seperated and cleaned Make new bricks out of crushed old bricks, including cement Cut into 'sheets' of masonry work	<div><div>Non-transparent</div><div>Matte</div><div>Smooth</div><div>Cold</div><div>Flexible</div><div>Muffled</div><div>Transparent</div><div>glossy (reflective)</div><div>Rough</div><div>Warm</div><div>Stiff</div><div>Sharp</div></div>	<div><div>Common</div><div>Passive</div><div>Calme</div><div>Cheap</div><div>Decorated</div><div>Expected</div><div>Lasting</div><div>Bricks</div><div>Bored</div><div>Classic</div><div>Dull</div><div>Silly</div><div>Vigilance</div><div>Retrained</div></div>
Grante	Reused in the sheet it was applied	<div><div>Non-transparent</div><div>Matte</div><div>Smooth</div><div>Cold</div><div>Flexible</div><div>Muffled</div><div>Transparent</div><div>glossy (reflective)</div><div>Rough</div><div>Warm</div><div>Stiff</div><div>Sharp</div></div>	<div><div>Expensive</div><div>Delight</div></div>

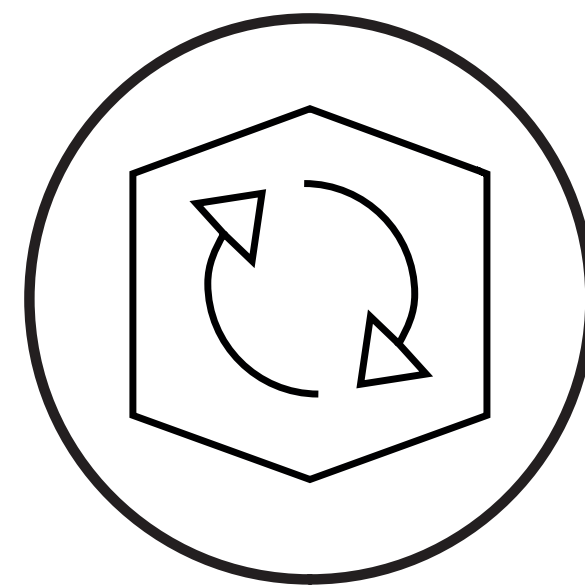
Conclusions research

Research will inform design by its usable materials
New way of designing



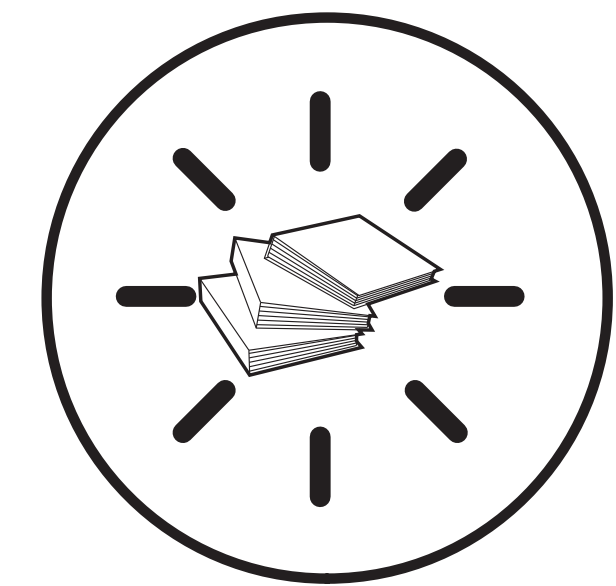
Apply Circular Economy

- + Preserve materials coming free
- + Indicating amount of materials
- + Which materials to harvest
- + Most available materials



Reuse reclaimed materials

- + Simplify the process to reuse materials
- + How to apply reclaimed materials



Material Experience

- + Defining experiences
- + Design tool:
- + Connect experiences to materials

The background is a soft-focus photograph of a park. In the foreground, there are several thin, light-colored tree trunks. Behind them, a path or road is visible, and further back, there are more trees with green and yellow foliage. The overall tone is warm and natural.

LOCATION

Location - Amsterdam | NL



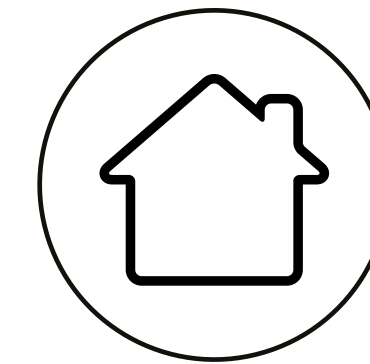
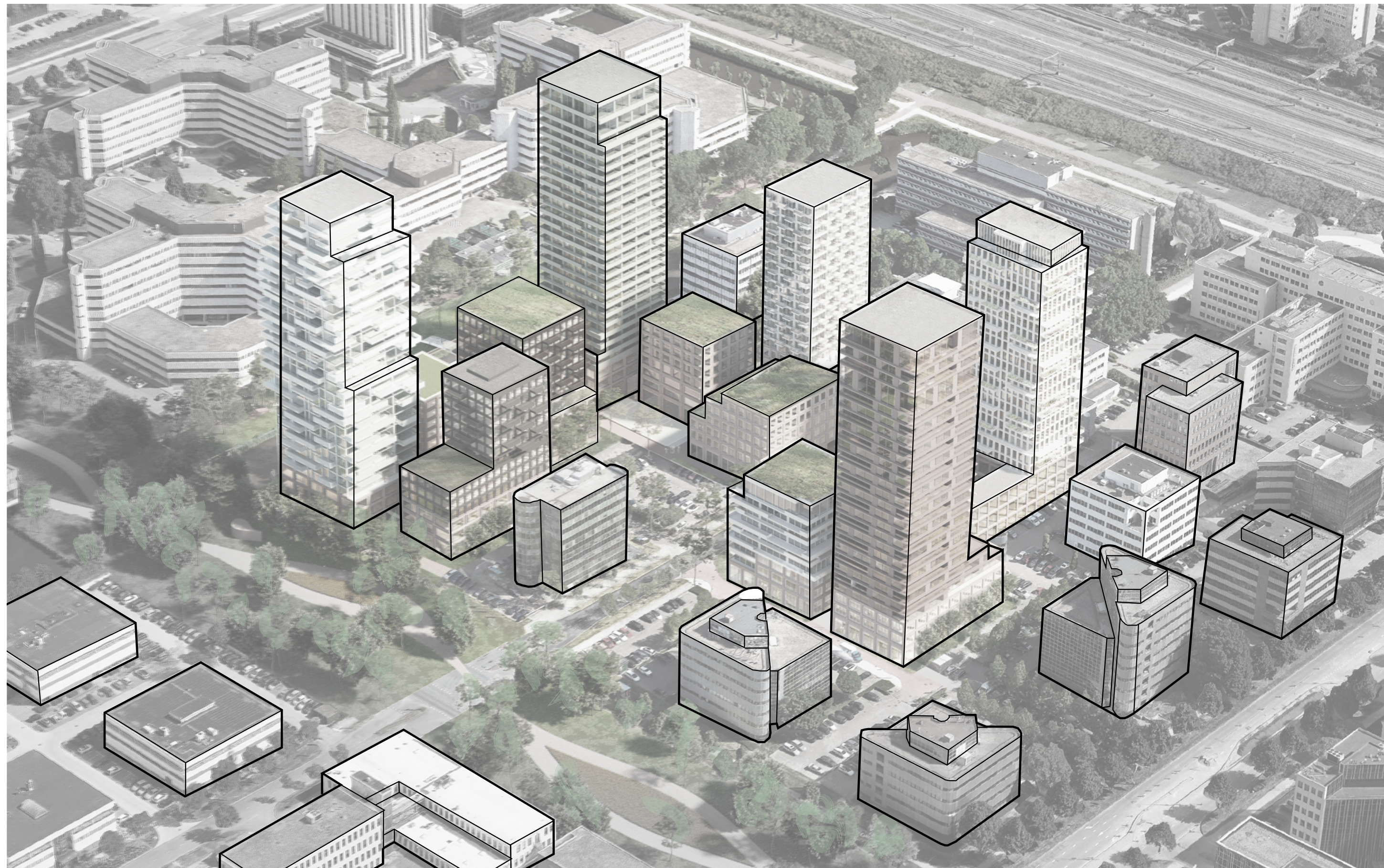
Location - Amstel III



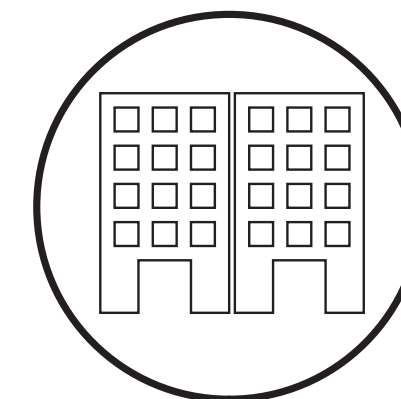
Project location



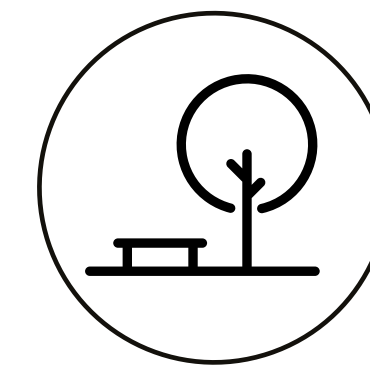
Location analysis



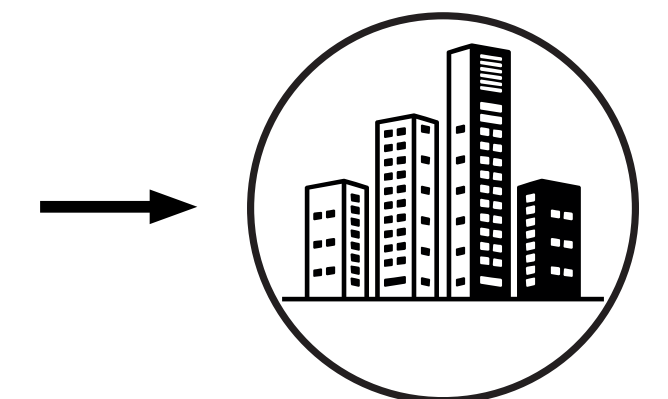
Housing
• + 15000



Offices
• keep current amount m2



public space
• healthy environment



Mixed urban
city district



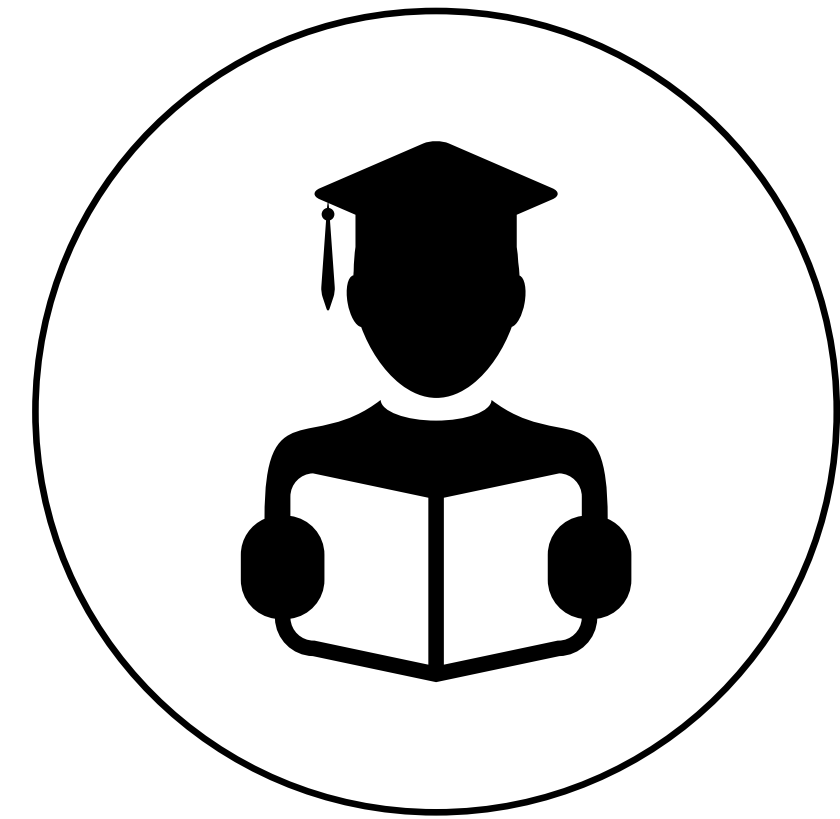
Population



Young professionals

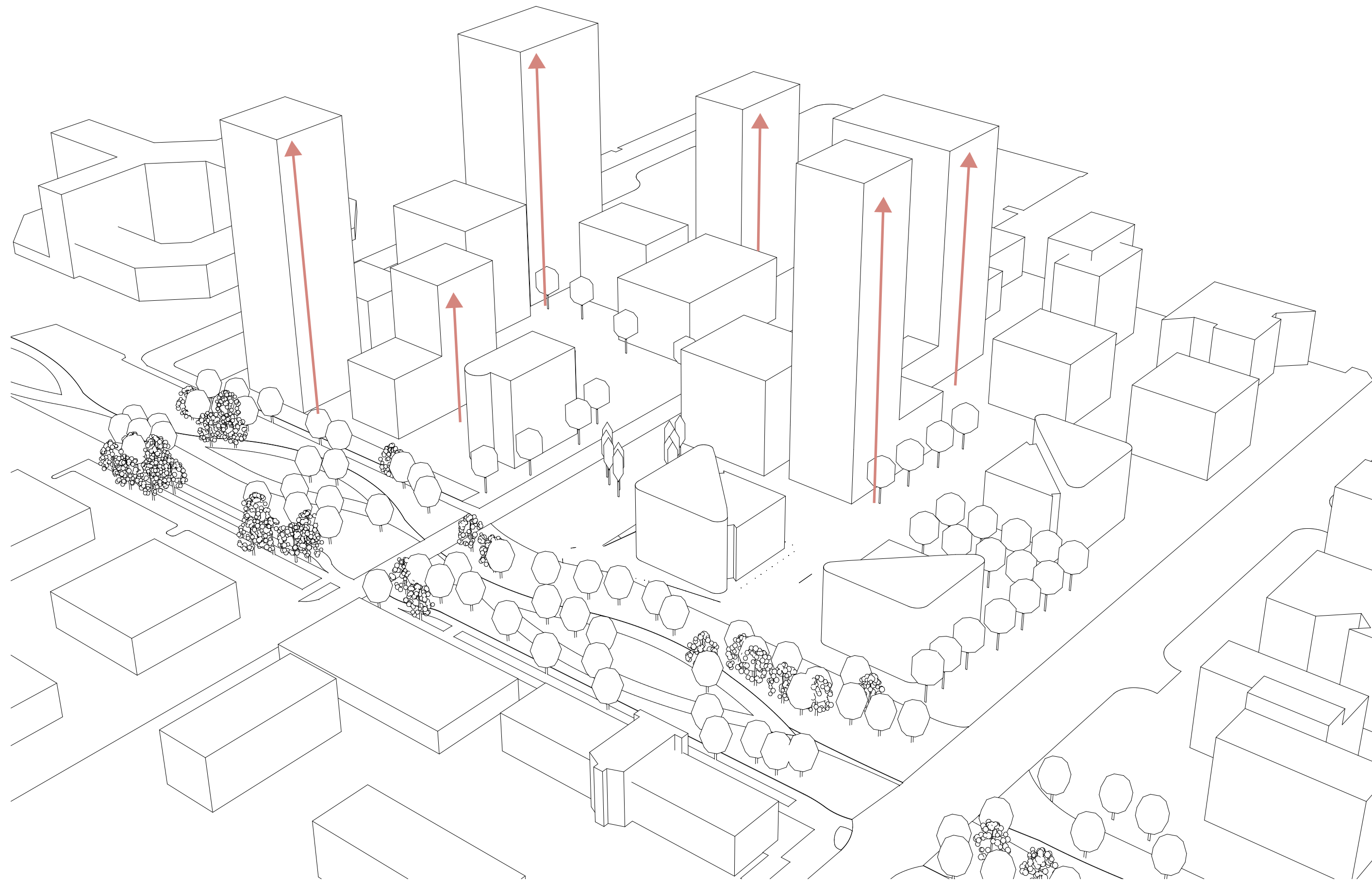


Seniors

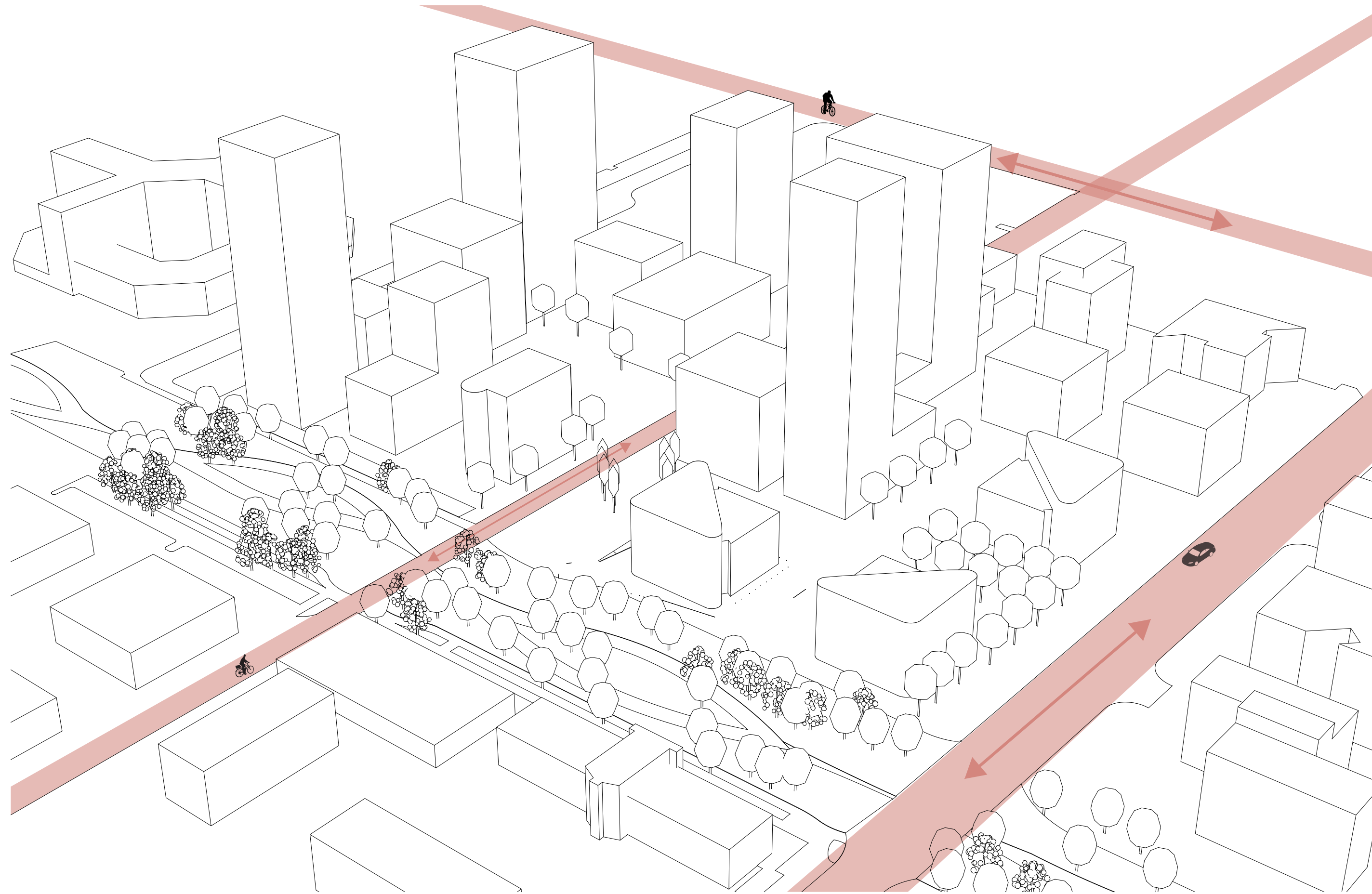


Students

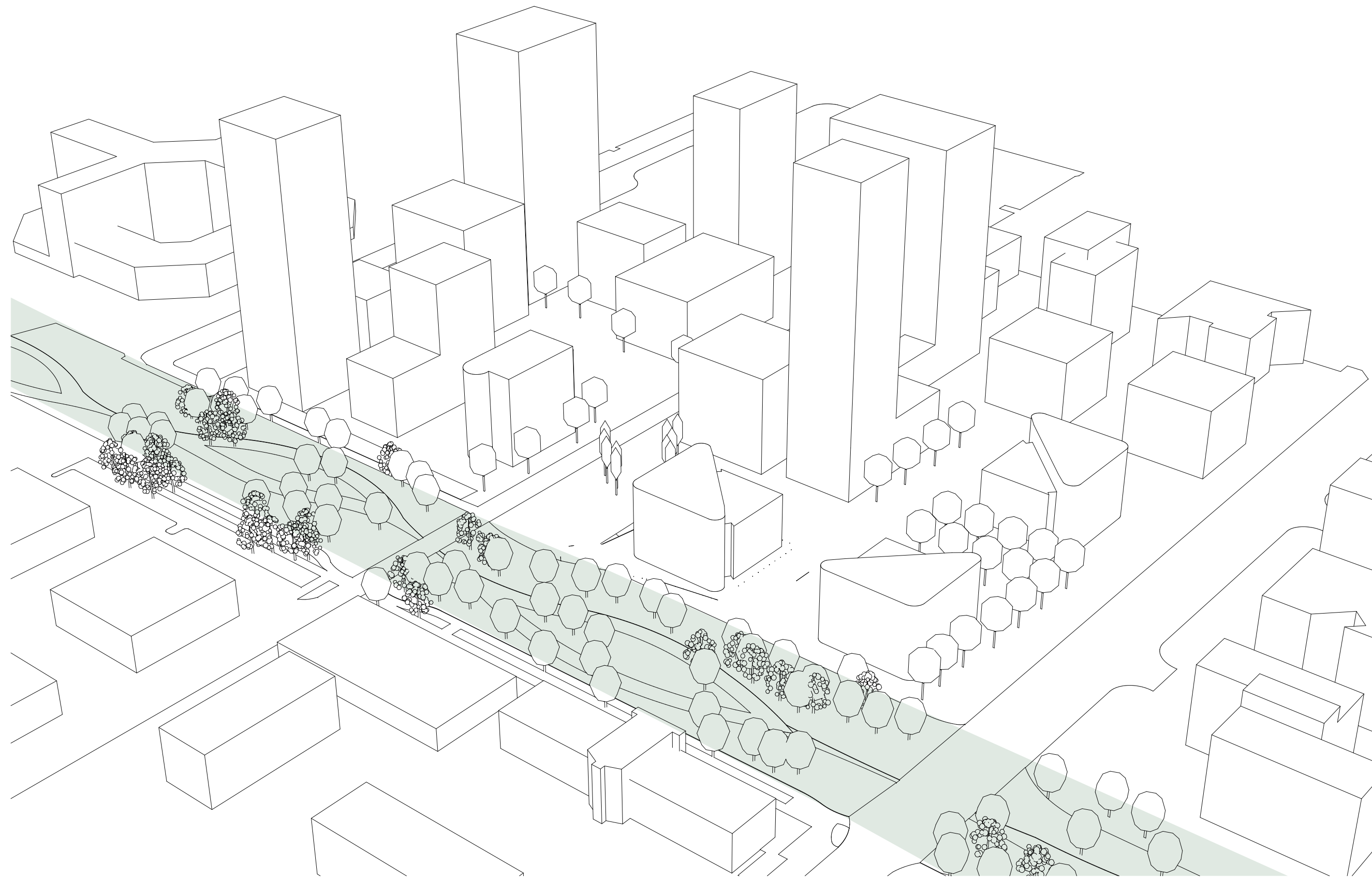
Amstel III | Density



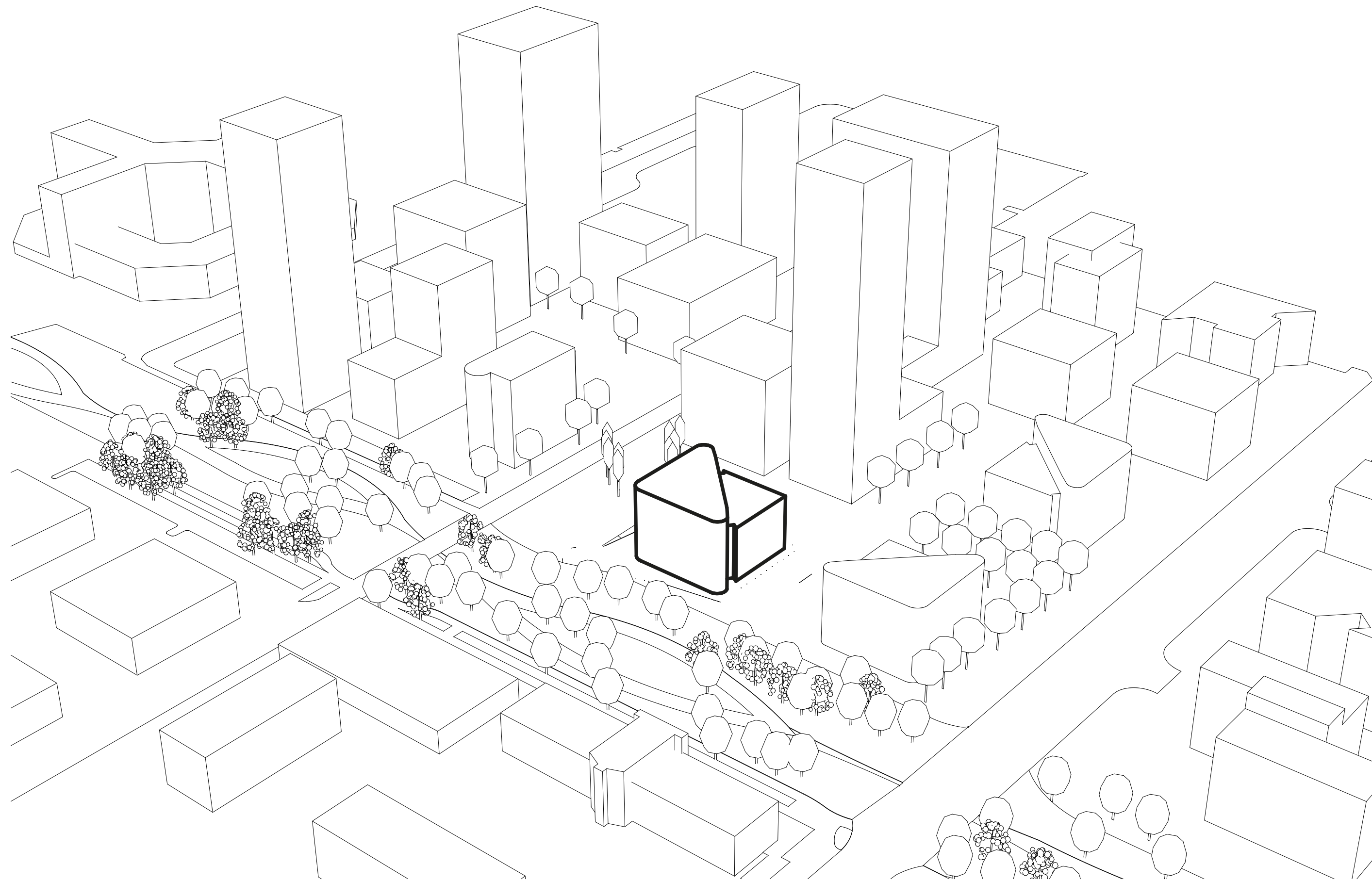
Amstel III | traffic



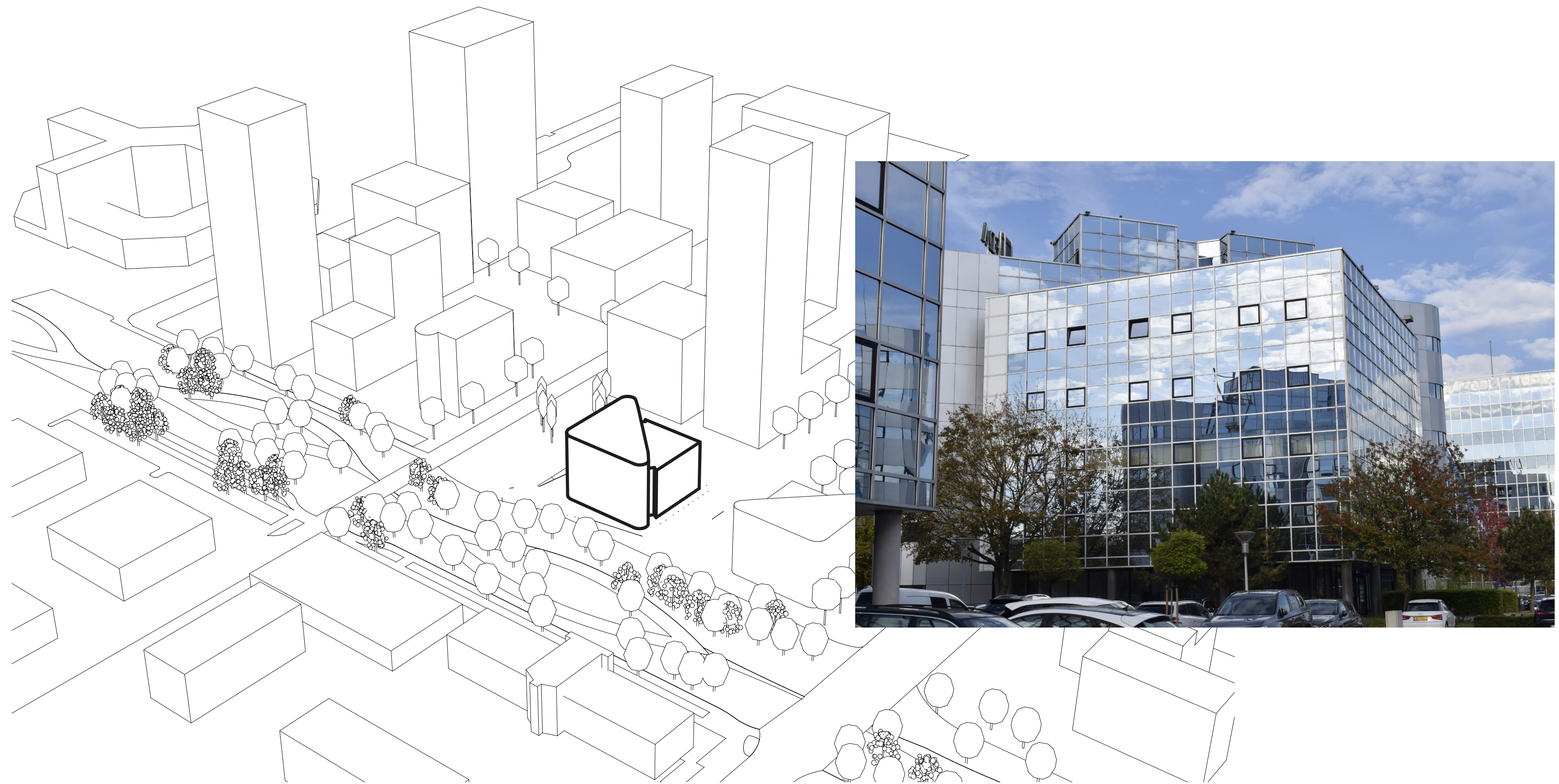
Amstel III | public space



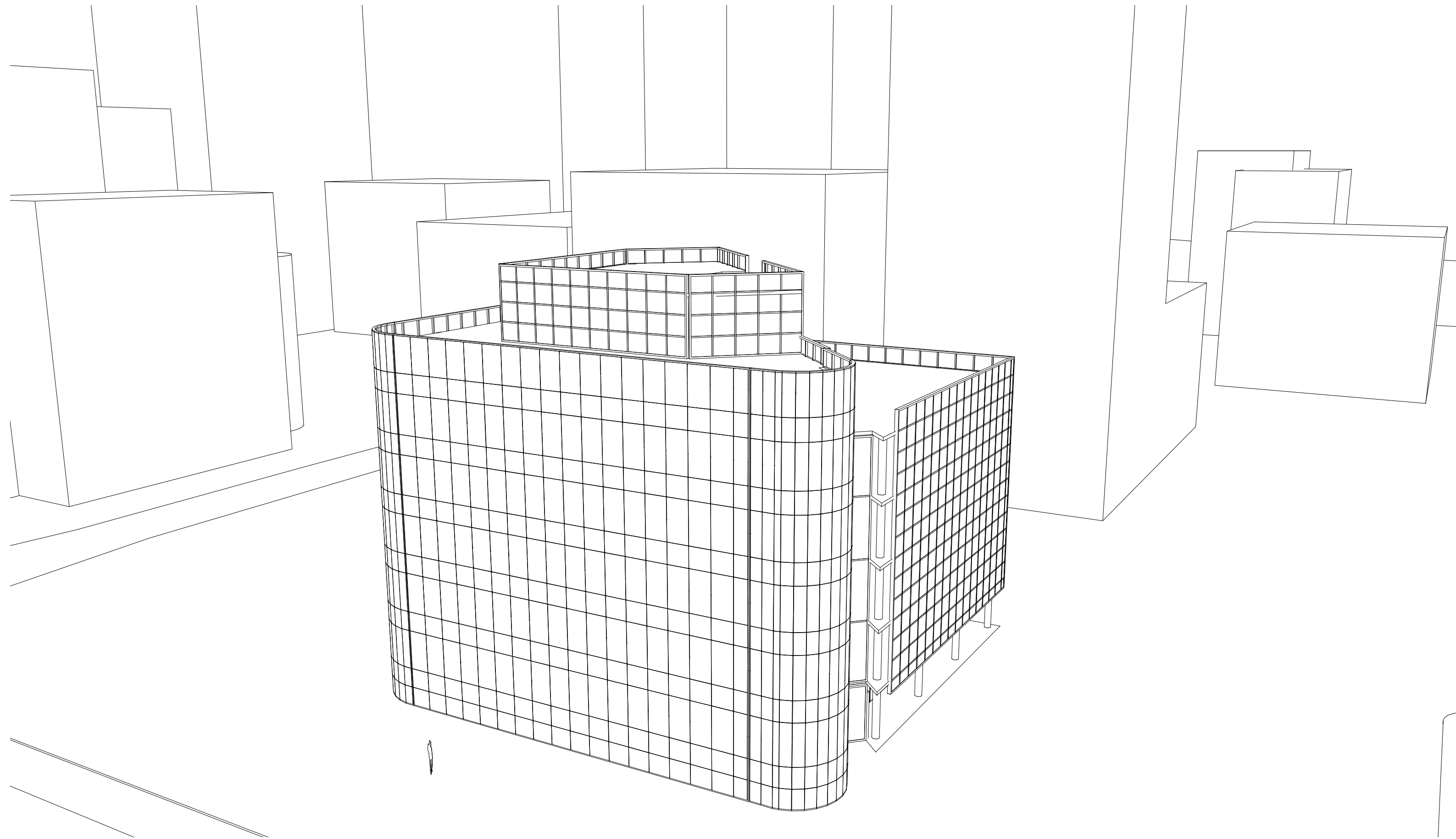
Amstel III | location



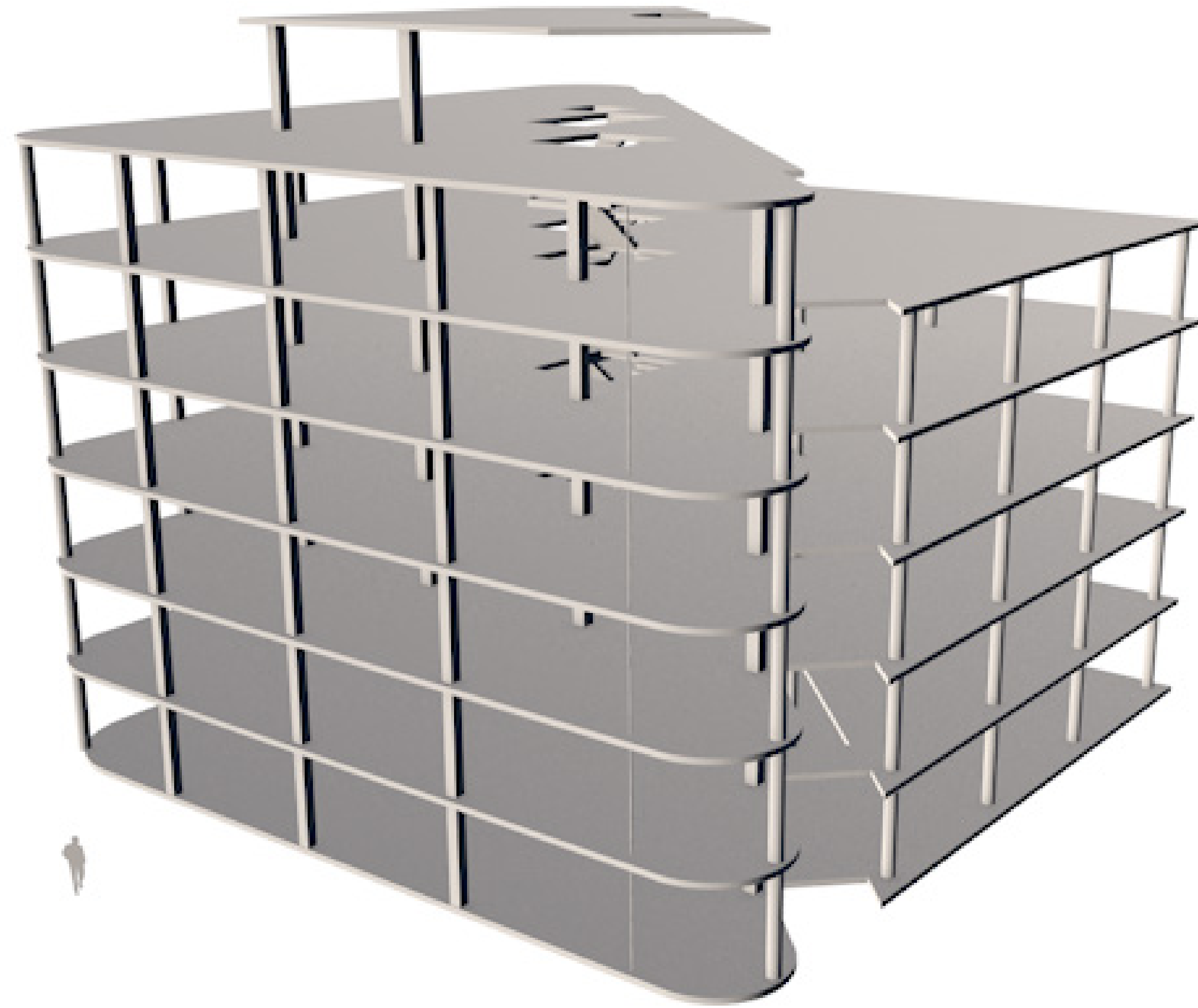
Amstel III | location



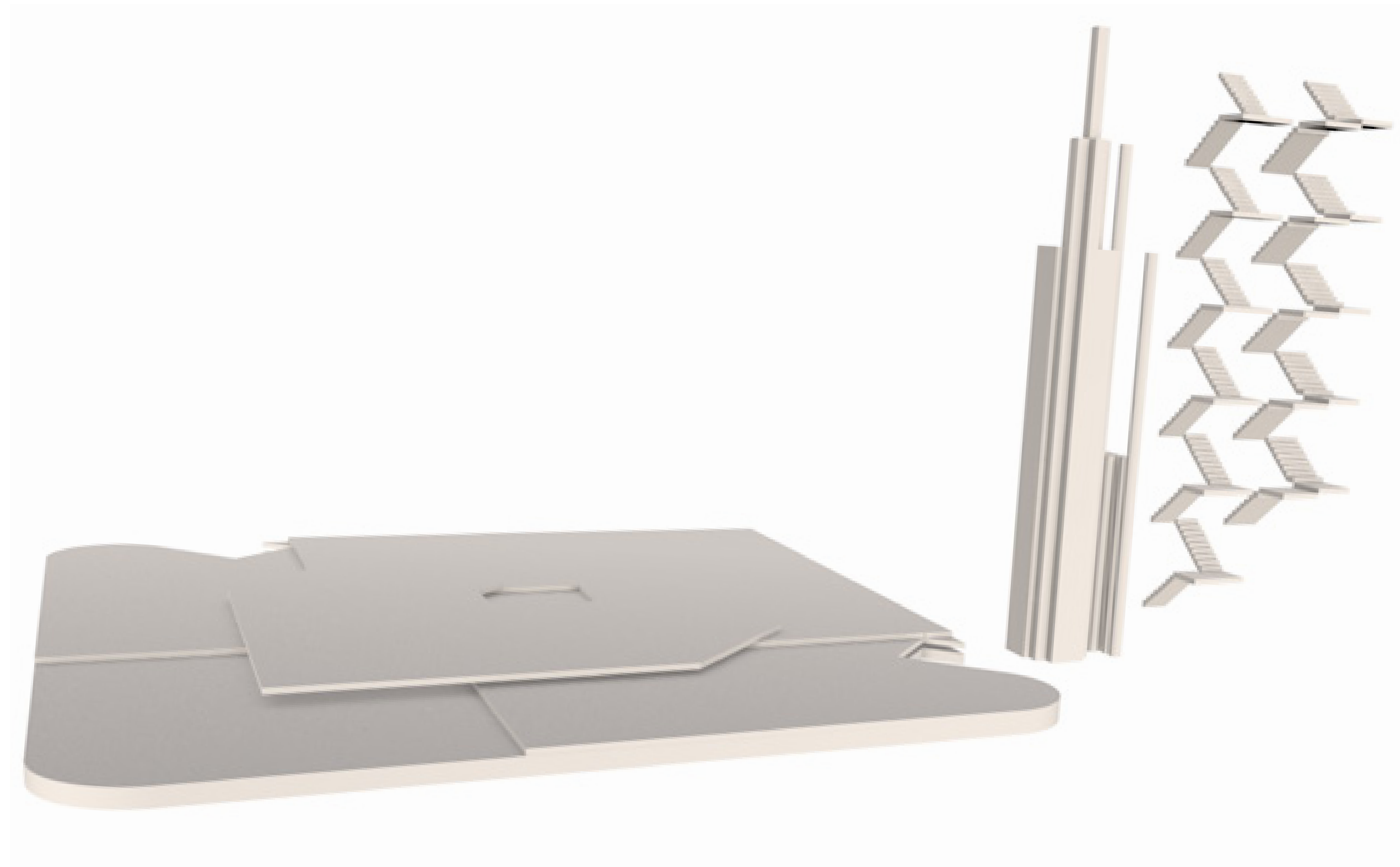
Hogehilweg 4



Invetorize | structure



Invetorize | structure



Recommendations

Community building to create identity in area

- + gather people together

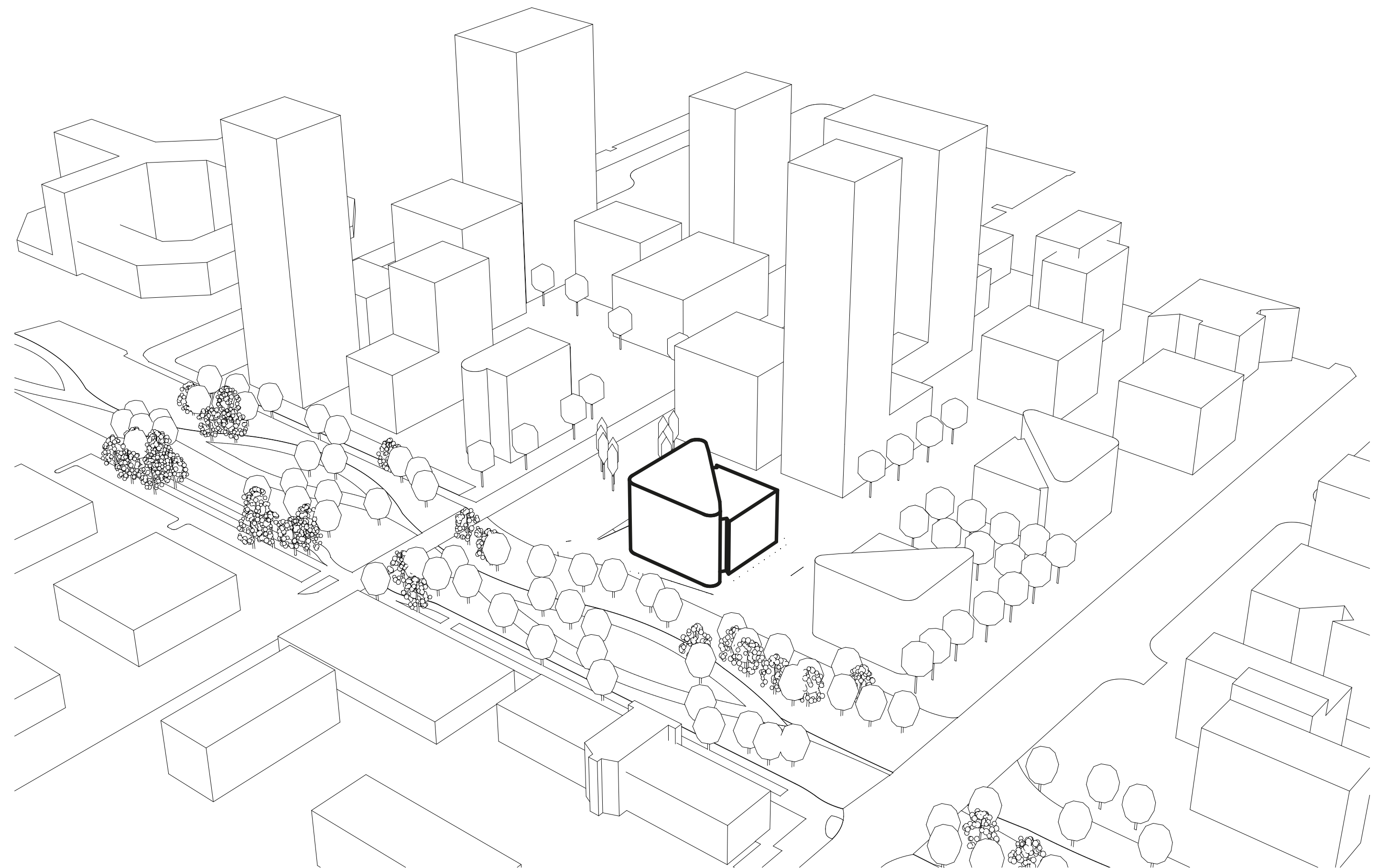
Building will be circular

- + experience and learn about circular architecture,

Multi functional building for social circularity

- + working together

- + add cultural functions to the area





Design

Concept of building

Cultural community lab

Learning about CE

Experience the building

Reuse all materials which
possible

Design principles

Reuse all materials which
possible

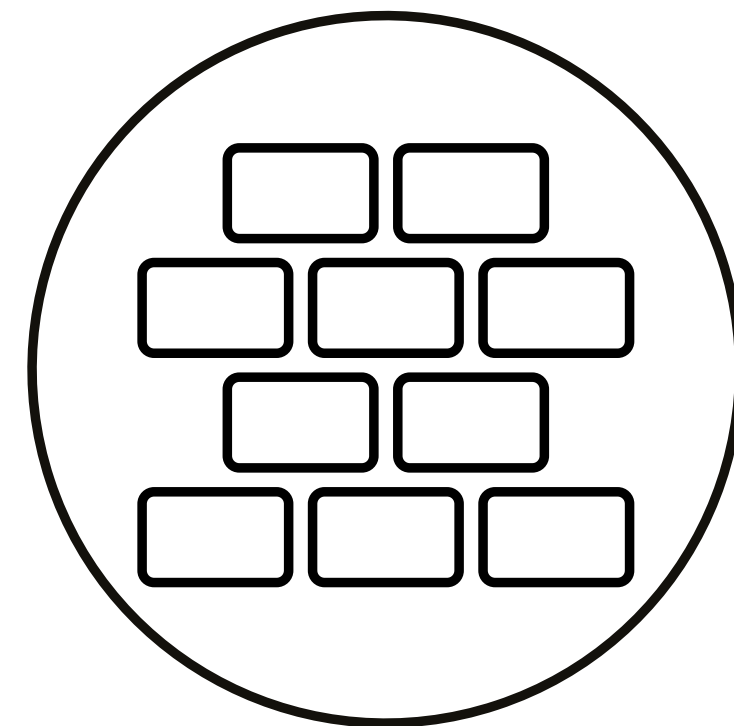
Reuse existing building
its own materials

Harvest locally

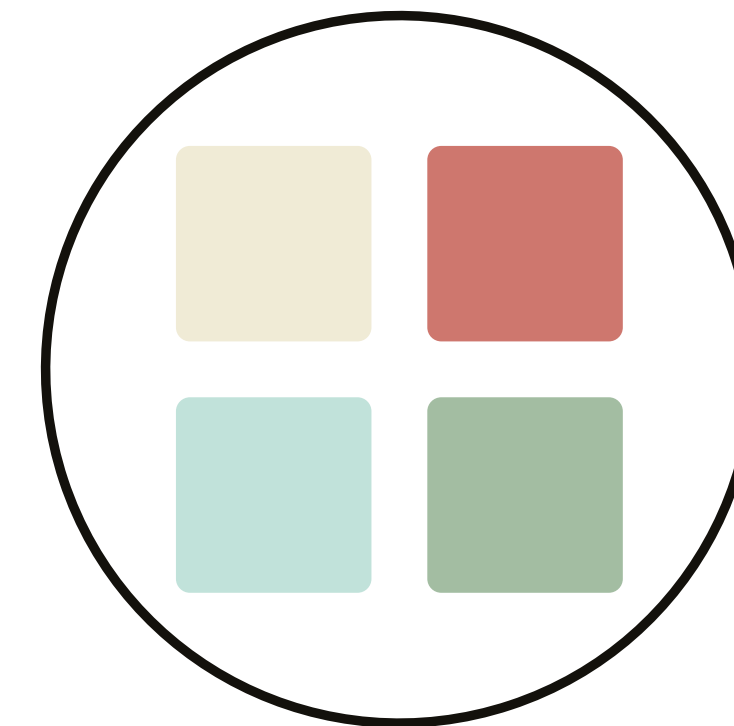
apply harvested
materials visually

Learning about CE

Through materials



Through functions
and activities



Experience CE

Reuse everything if possible

Materials with a history

+ reclaimed materials applied

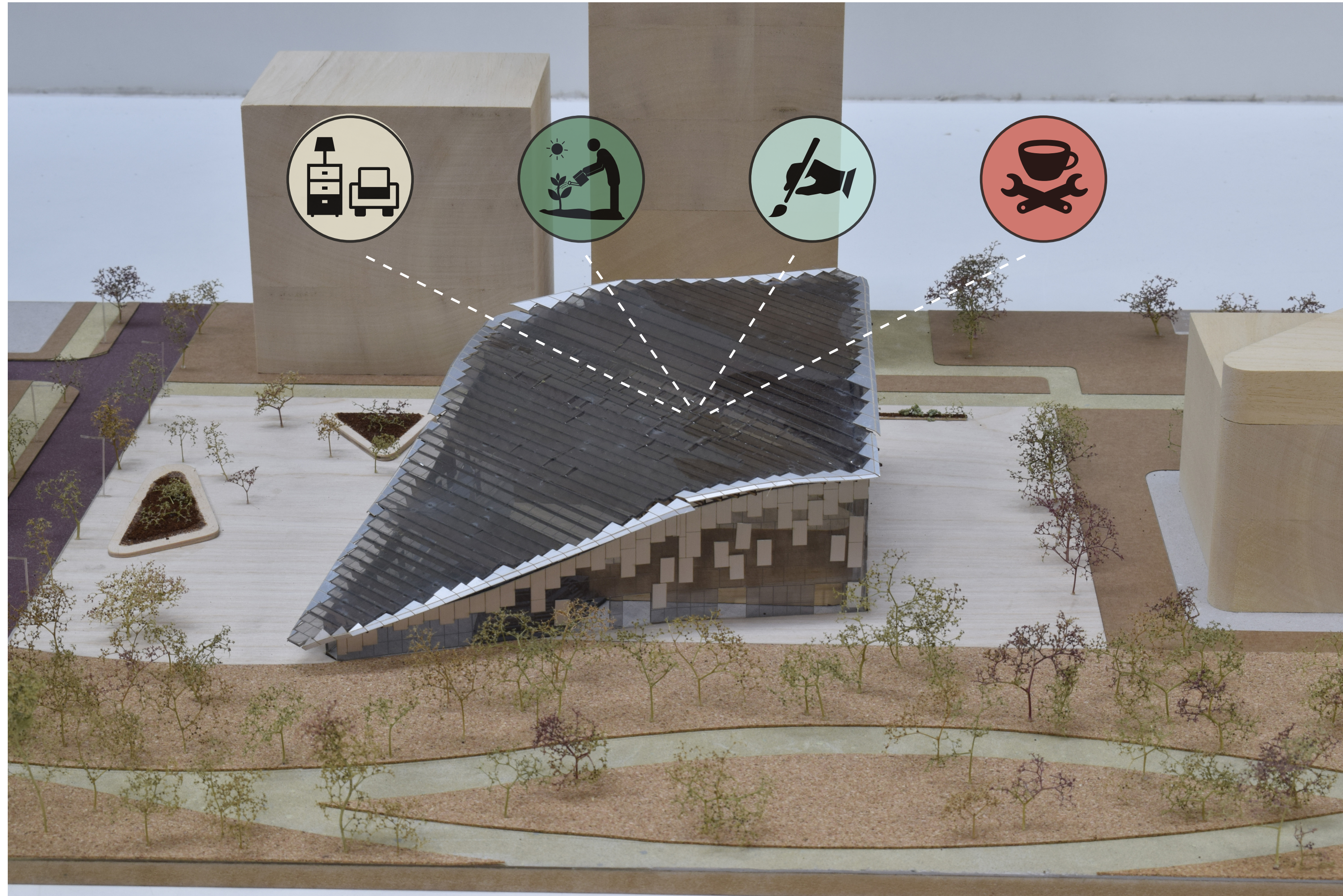
Experience interaction
between old-new

+ visible in preserving the old

Need for a system to reapply all the reclaimed materials

A cluster of functions

in a community lab



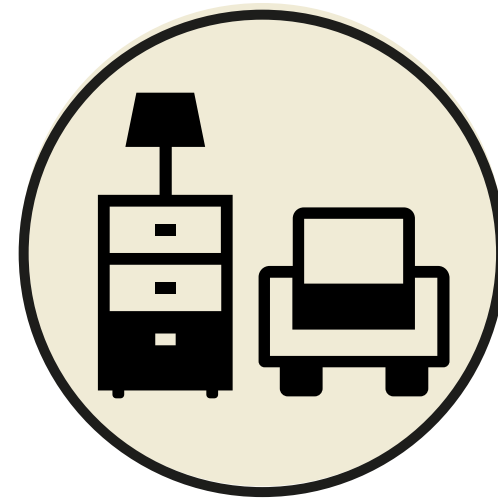
Functions in building

Cultural community lab for the people

MEET



Café



Urban living
room

SHARE

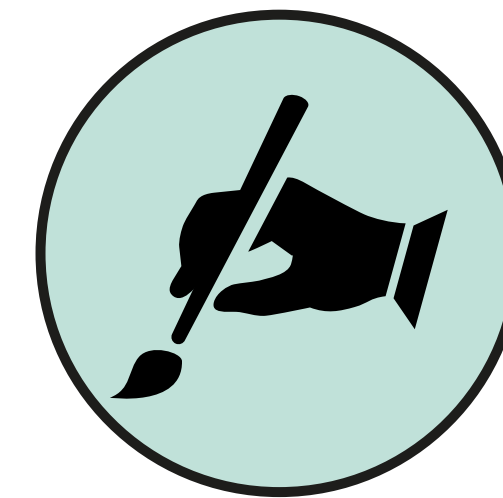


Workshop
- repair cafe

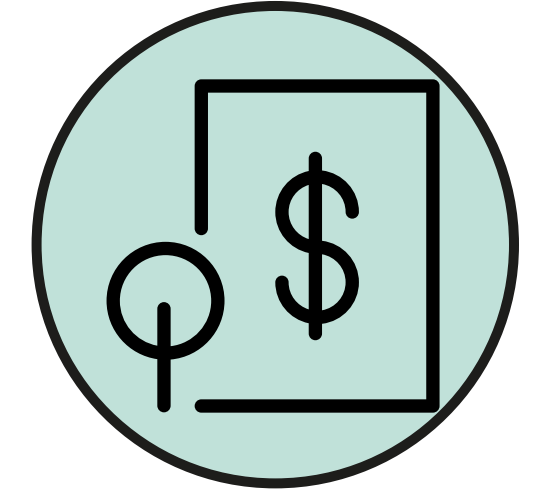


Gardening/
green/market

CREATE



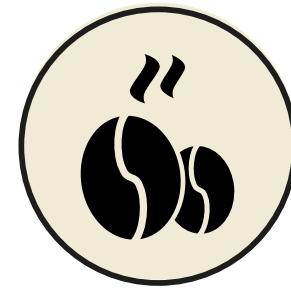
Atelier
- hobbies



rentable rooms

Elaboration of Functions

Meeting



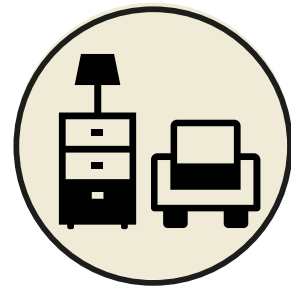
Cafe

- gathering
- meet

Urban living room

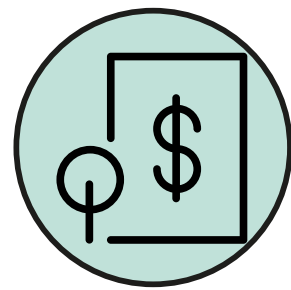
- dining
- reading
- cooking

Creating



Atelier

- painting
- pottery
- computer/it
- instruments/band
- hairdresser
- jewelry
- small business developments/selling own stuff

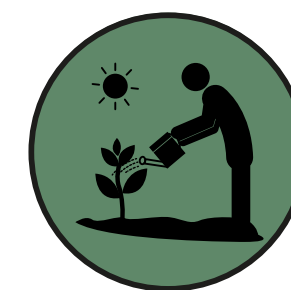


Sharing



Workshop

- woodwork
- bike repair
- repair café
- exchange tools

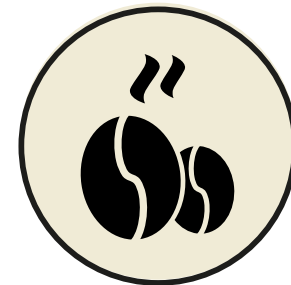


Green/outside

- city gardening
- playground
- picnic
- performance/speakers

Program

Meeting

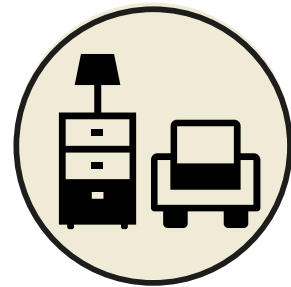


Cafe

- gathering
- meet

Urban living room

- dining
- reading
- cooking

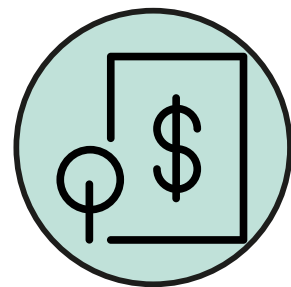


Creating



Atelier

- painting
- pottery
- computer/it
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- jewelry
- small business developments/selling own stuff



Sharing



Workshop

- woodwork
- bike repair
- repair cafe
- exchange tools



Green/outside

- city gardening
- playground
- picnic
- performance/speakers

Meet

400 m²

Cafe	200 m²
Urban living room	75 m²
Dining	100 m²
Bar	40 m²
Kitchen	50 m²
Toilets	

Create

700 m²

Workshop working space (big /dirty materials)	200 m²
Atelier/working space (dry/clean materials)	200 m²
Atelier/working space rentable space	250 m²
Rehearsal/Performance	150 m²

Sharing

600 m²

Repair space/café	100 m²
Gardening play area	300 m²
Outside space Terrace Playground	

Who are the users?



Sophie



HANS



Kristel

Who are the users?



Sophie

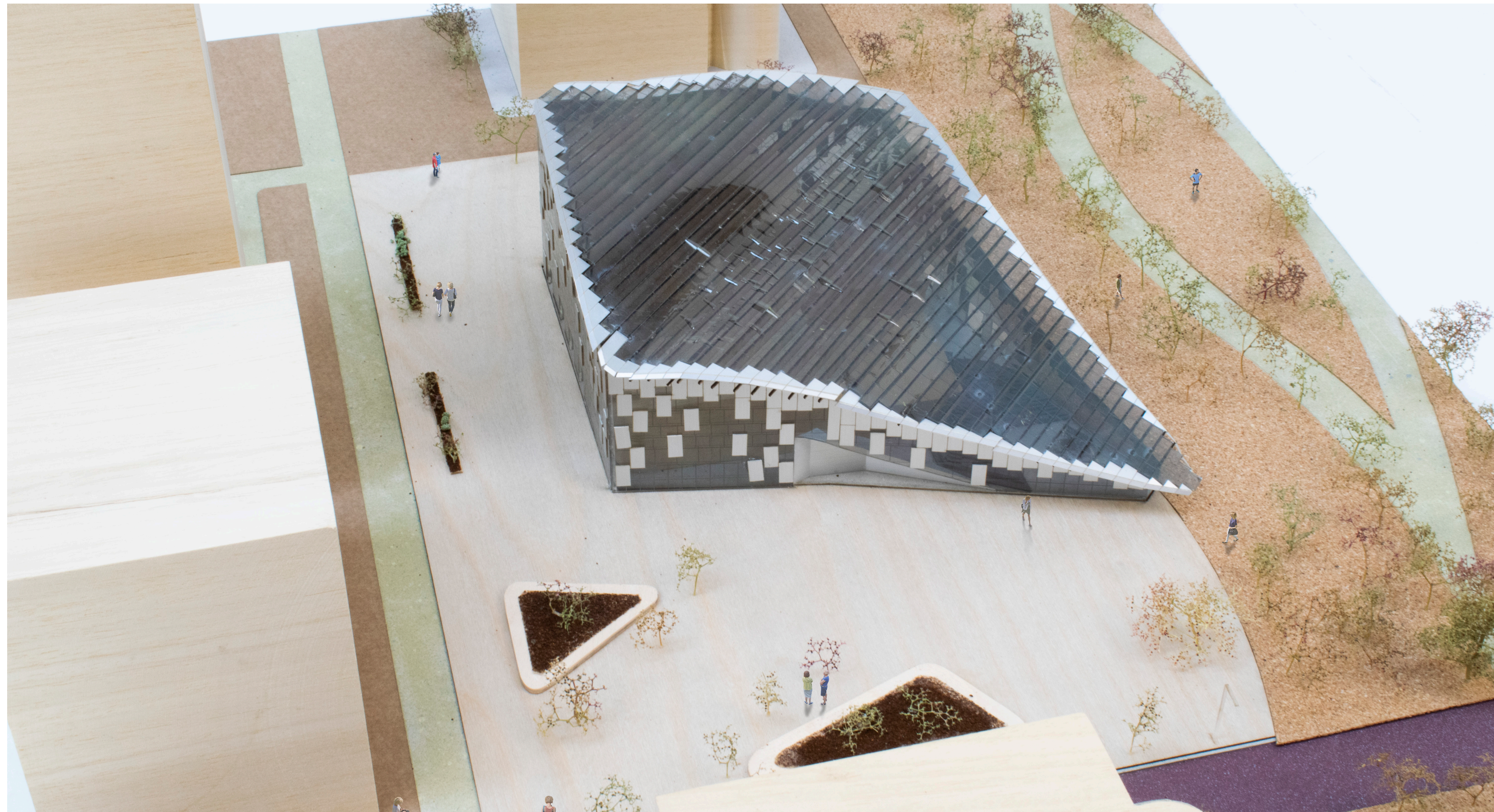


HANS



Kristel

Hans reading the newspaper







Who are the users?



Sophie



HANS



Kristel

Sophie the freelancer







Who are the users?



Sophie



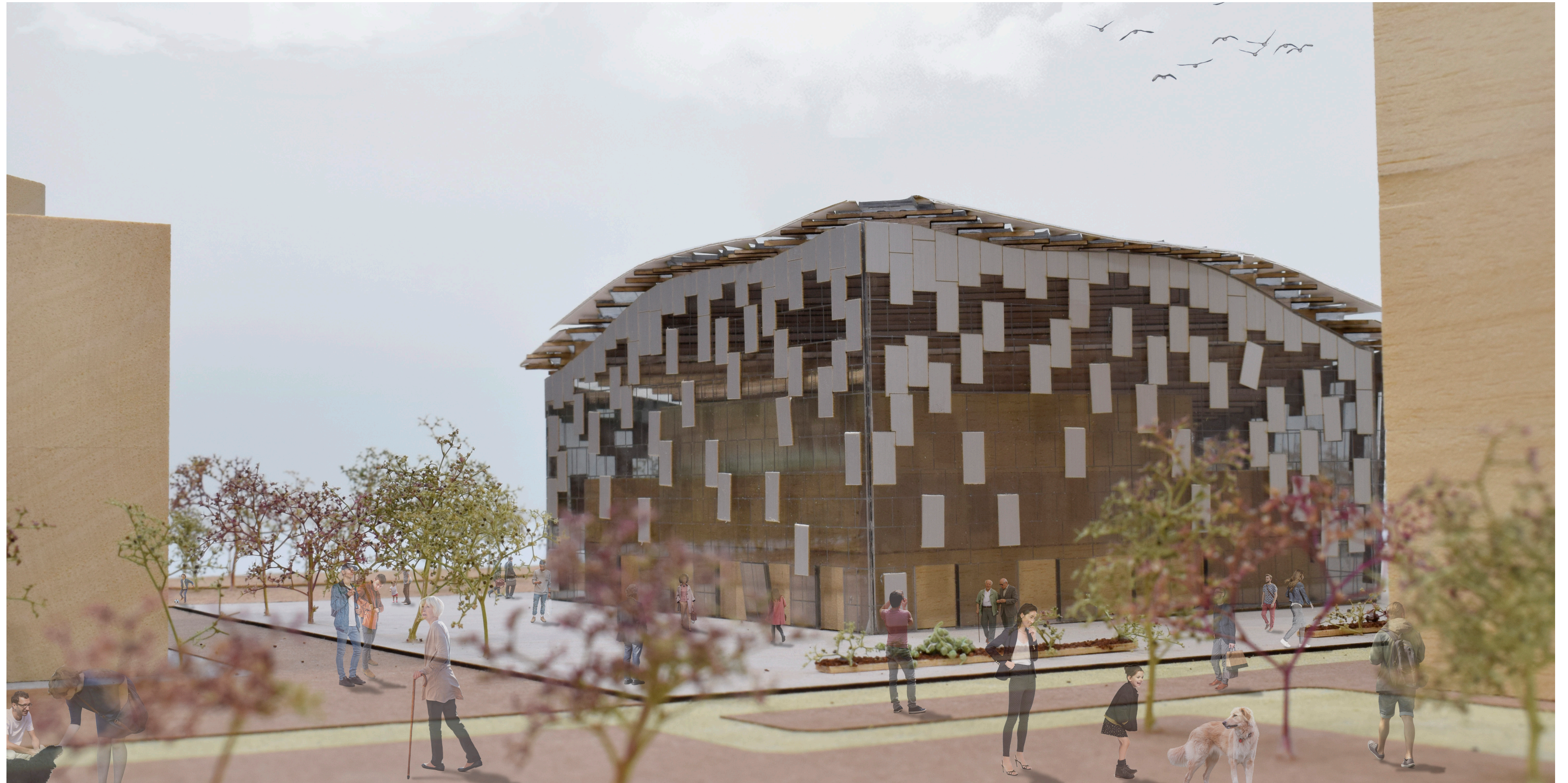
HANS



Kristel

Kristel the gardener





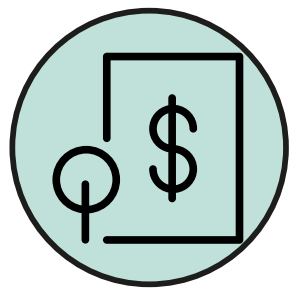
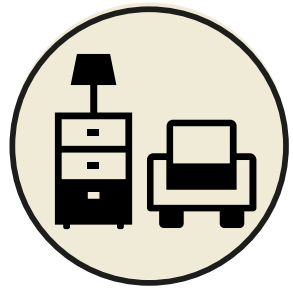


Program

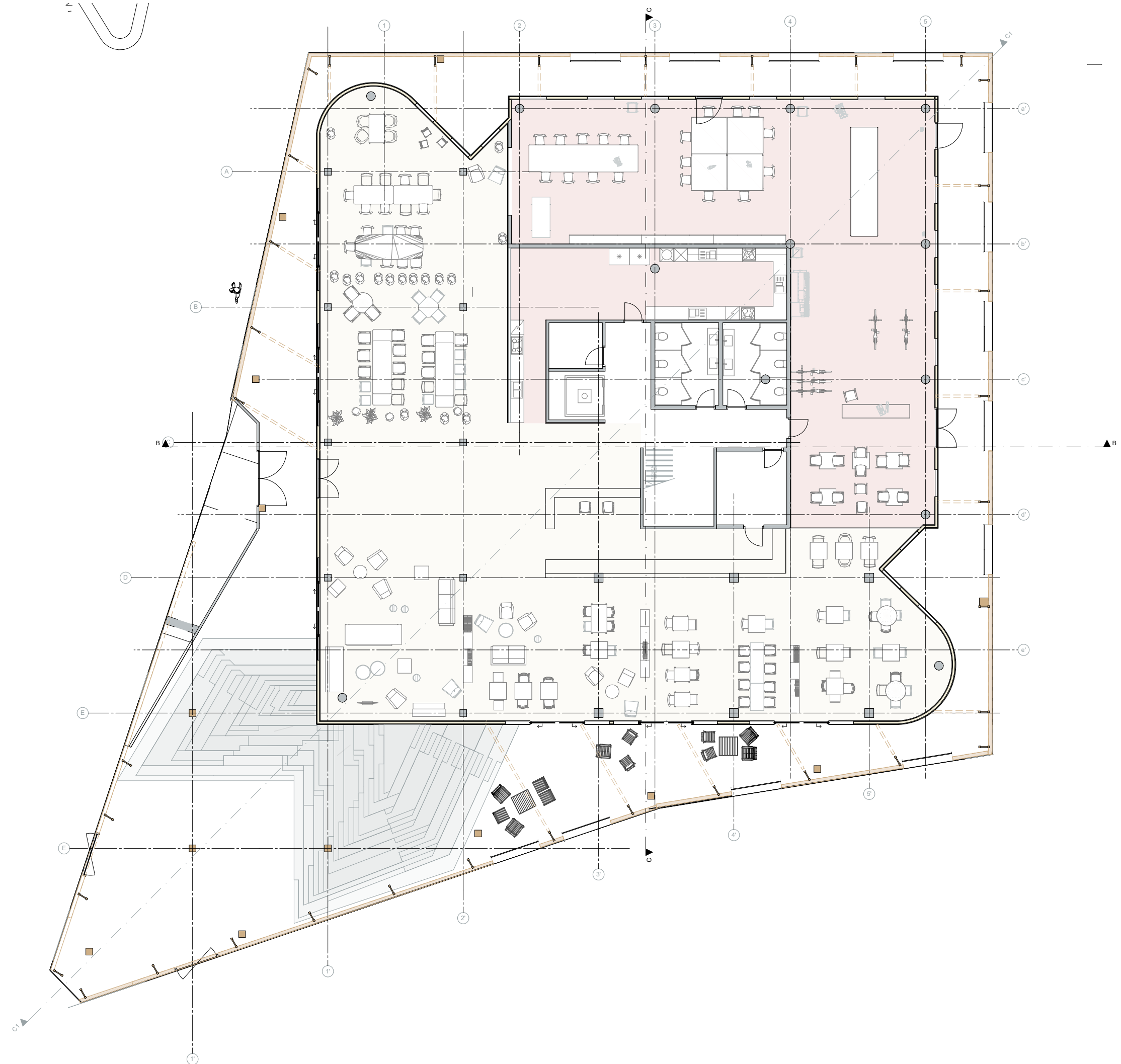
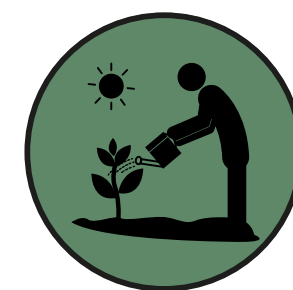
Meeting



Creating



Sharing

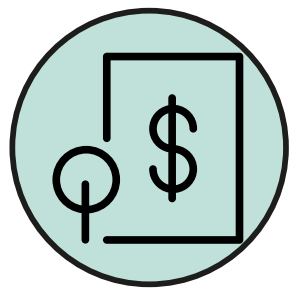
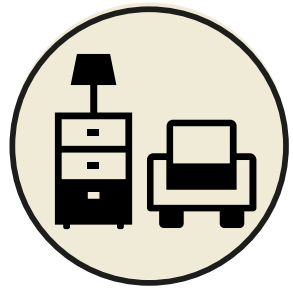


Program

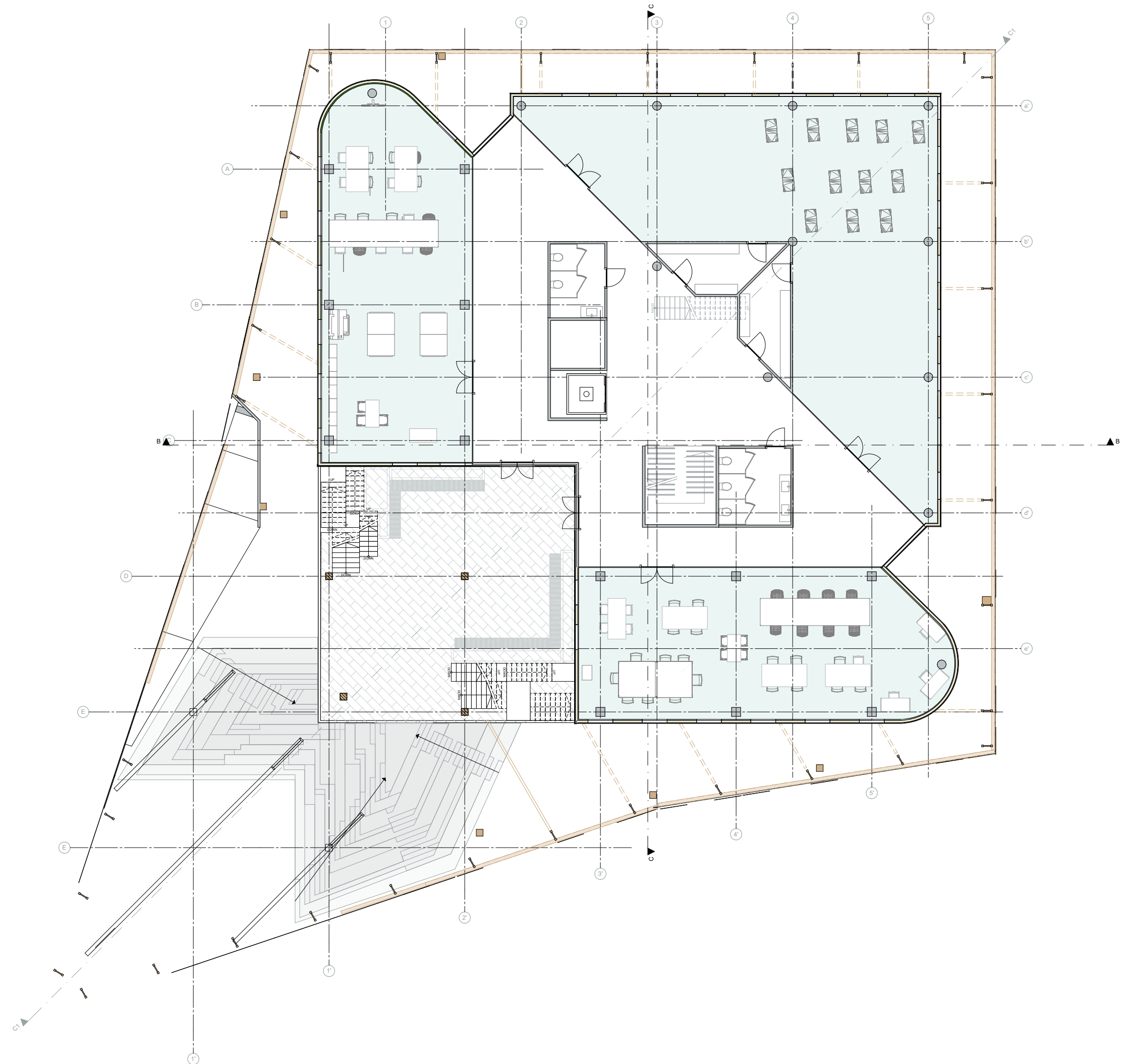
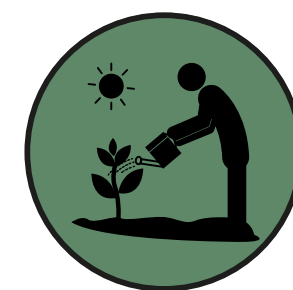
Meeting



Creating



Sharing

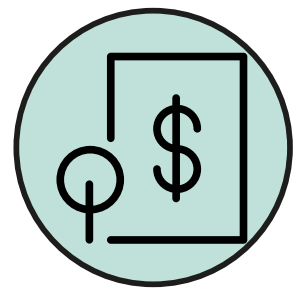


Program

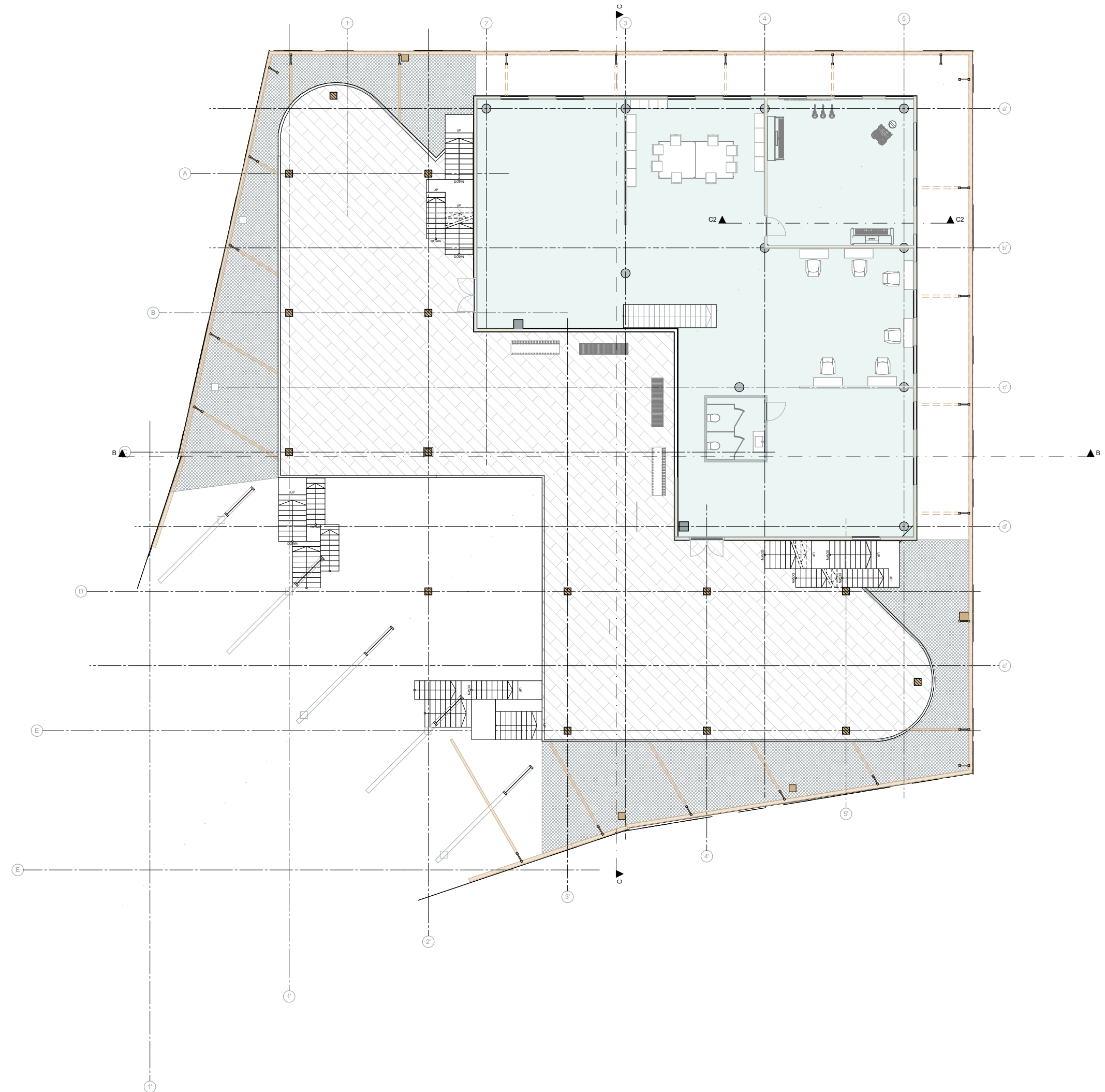
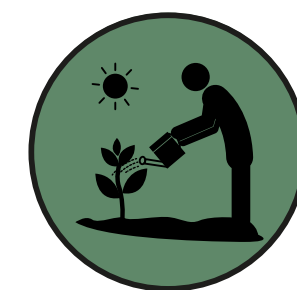
Meeting



Creating



Sharing

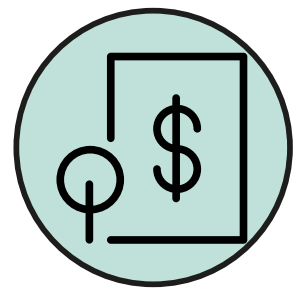


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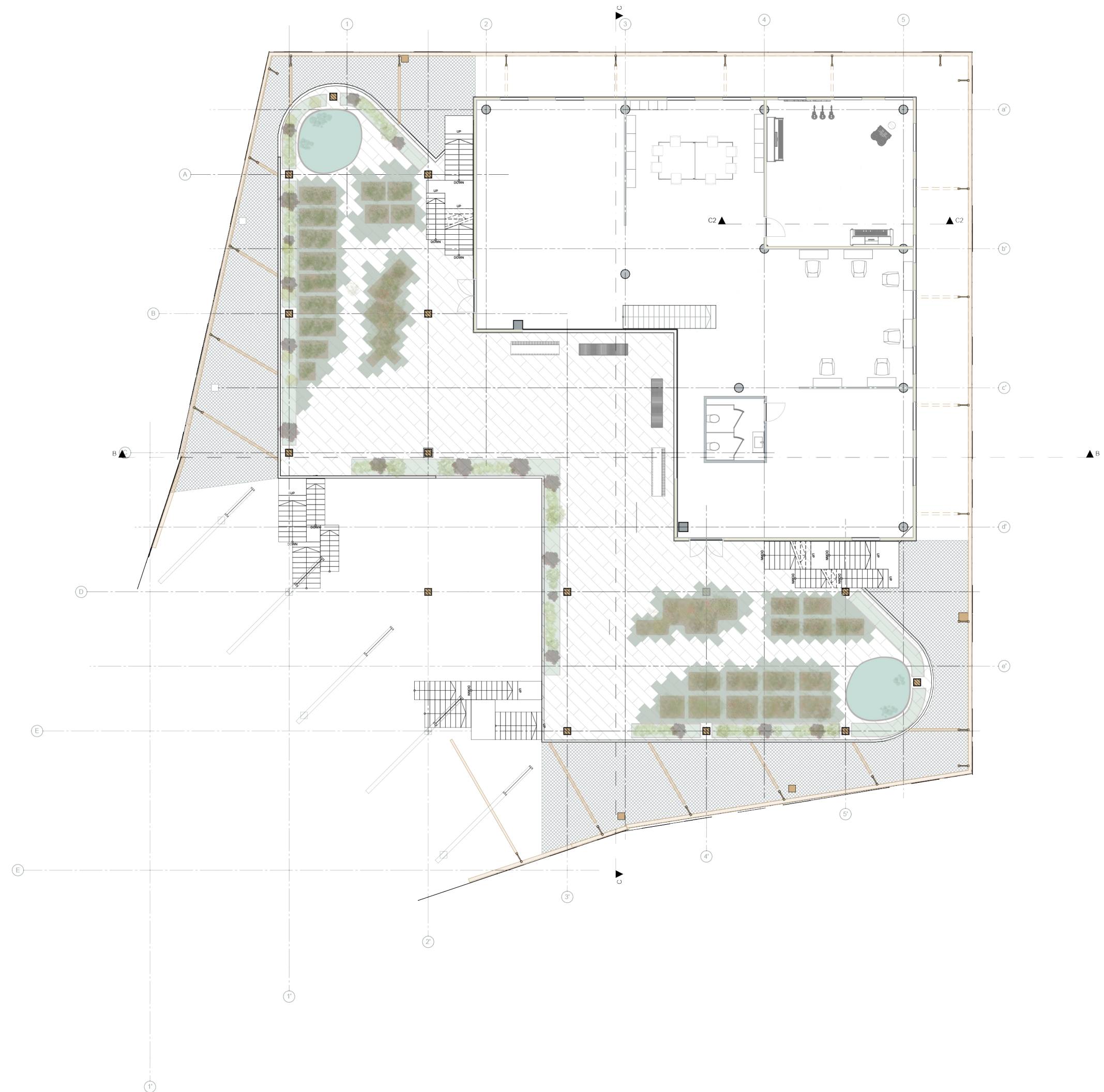
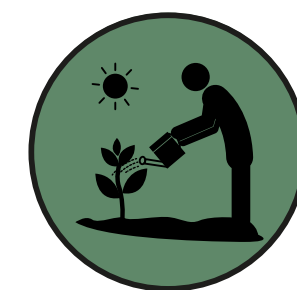
Meeting



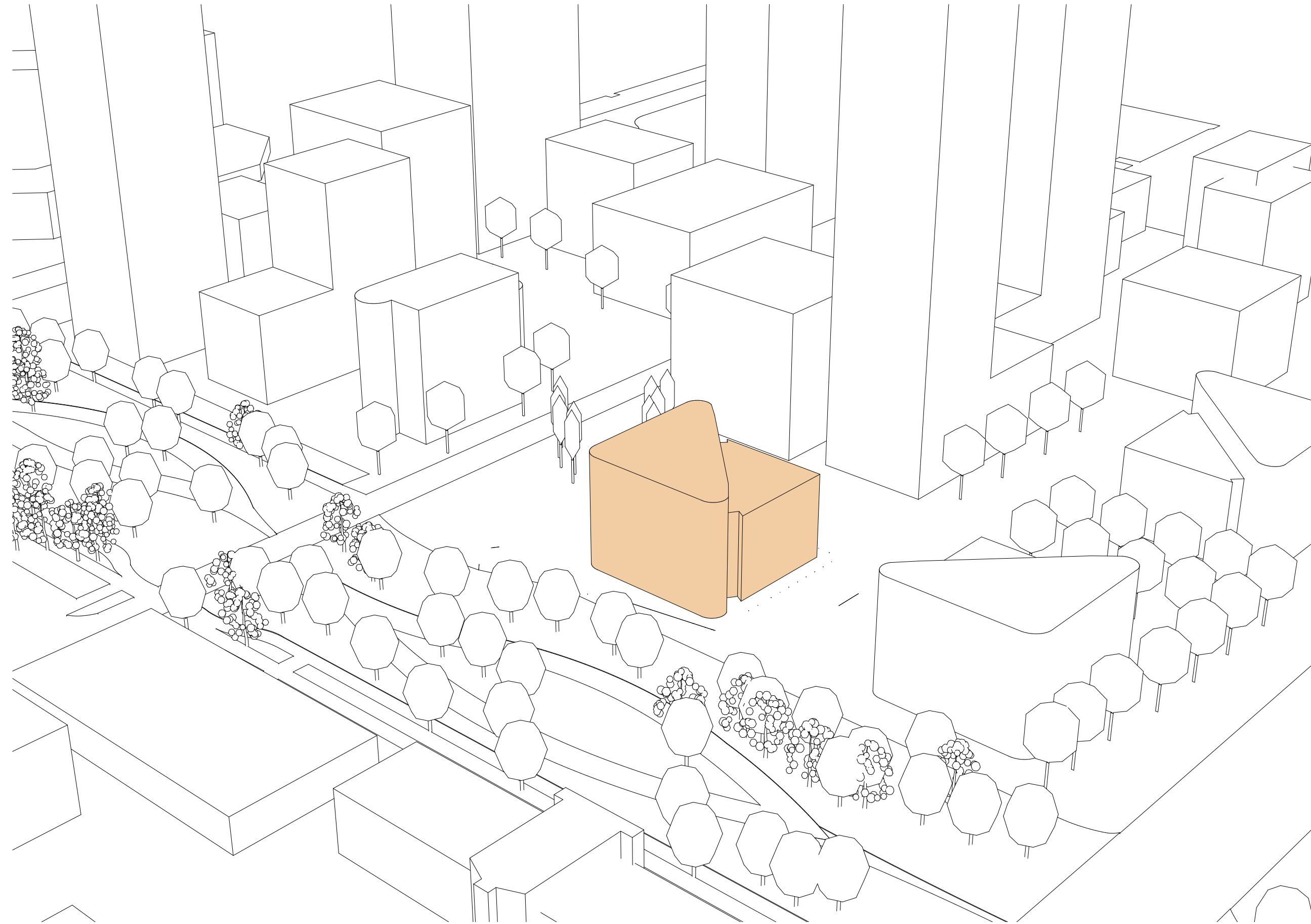
Creating



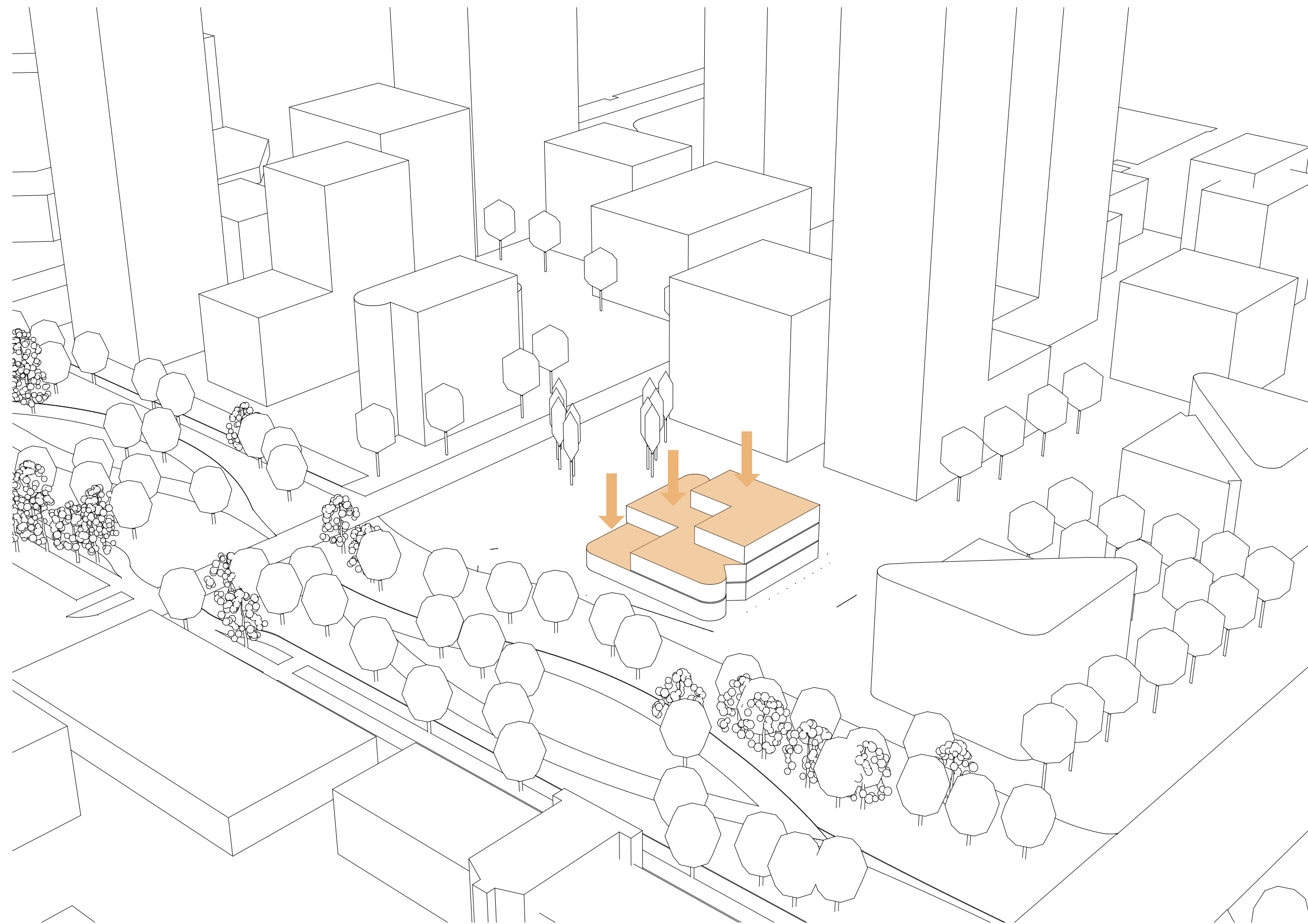
Sharing



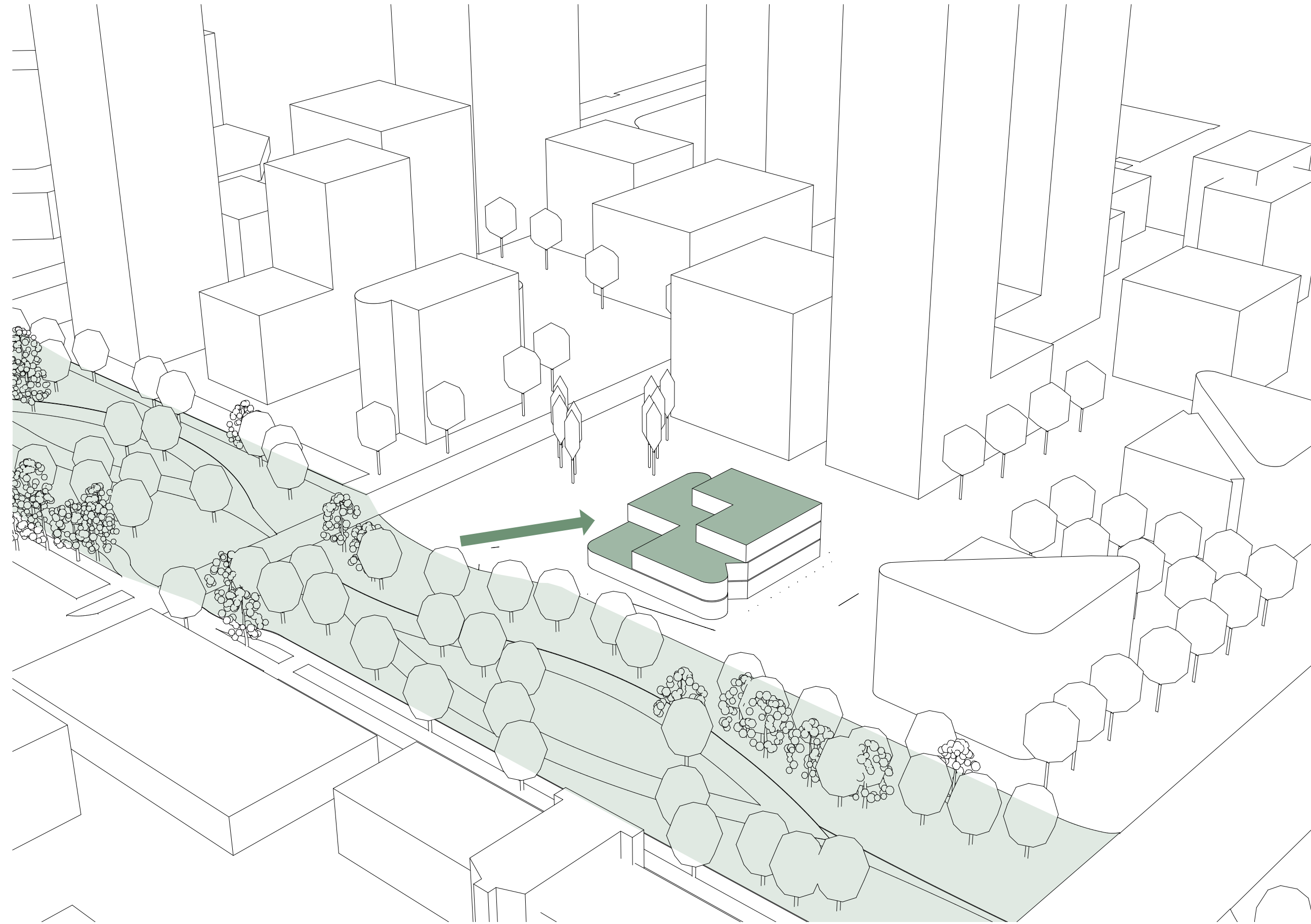
Reuse existing building



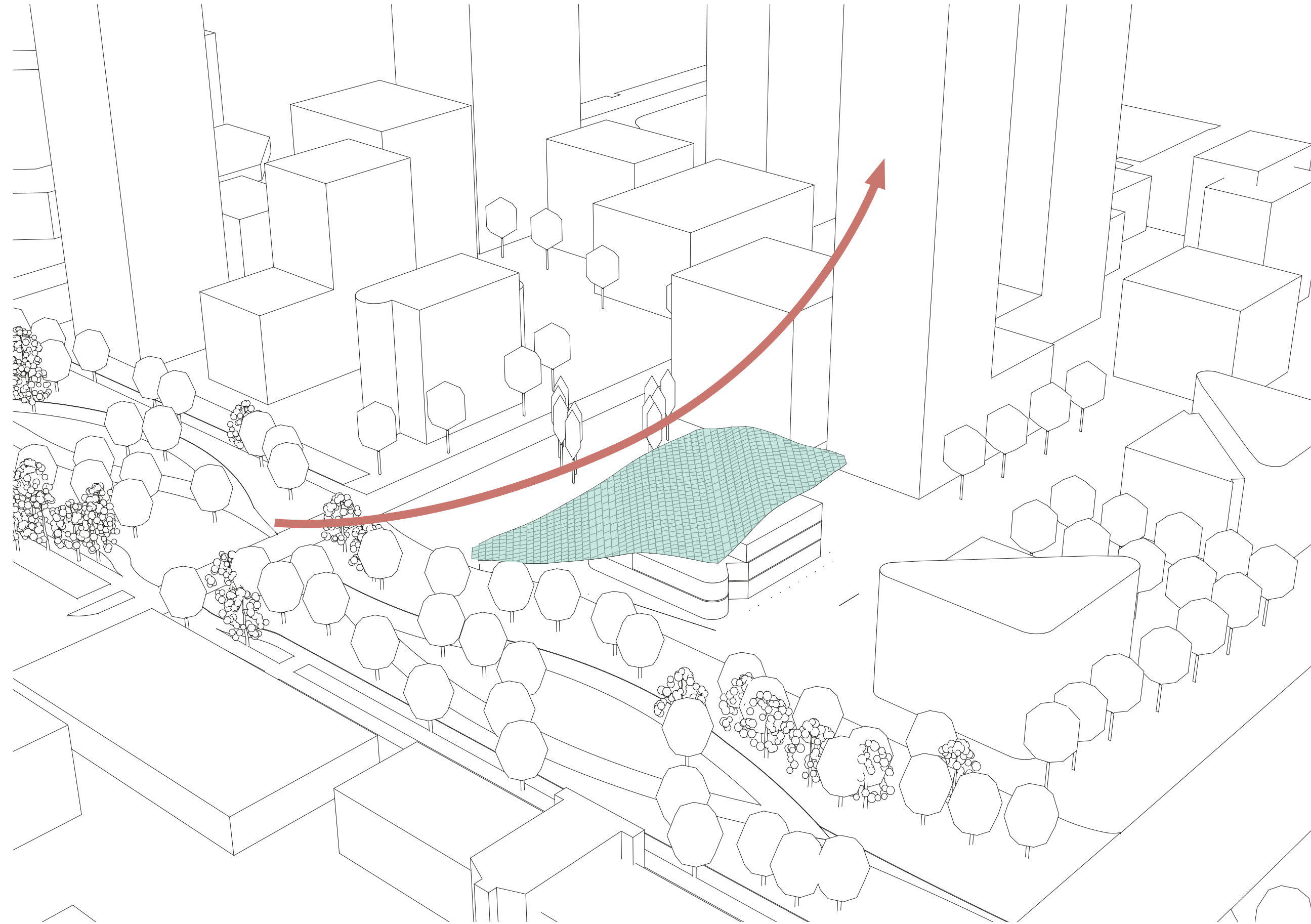
Friendly



Engage green



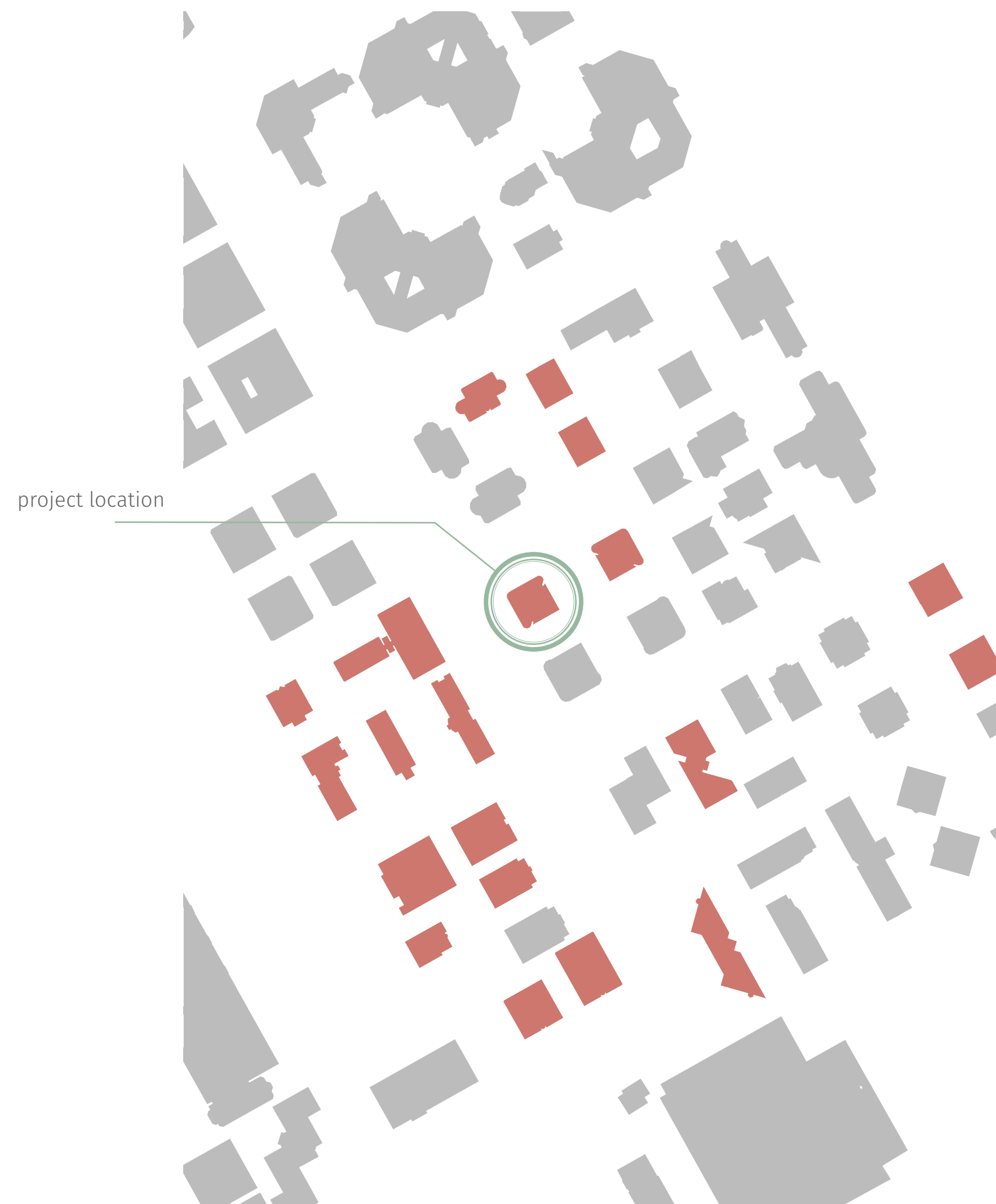
Roof



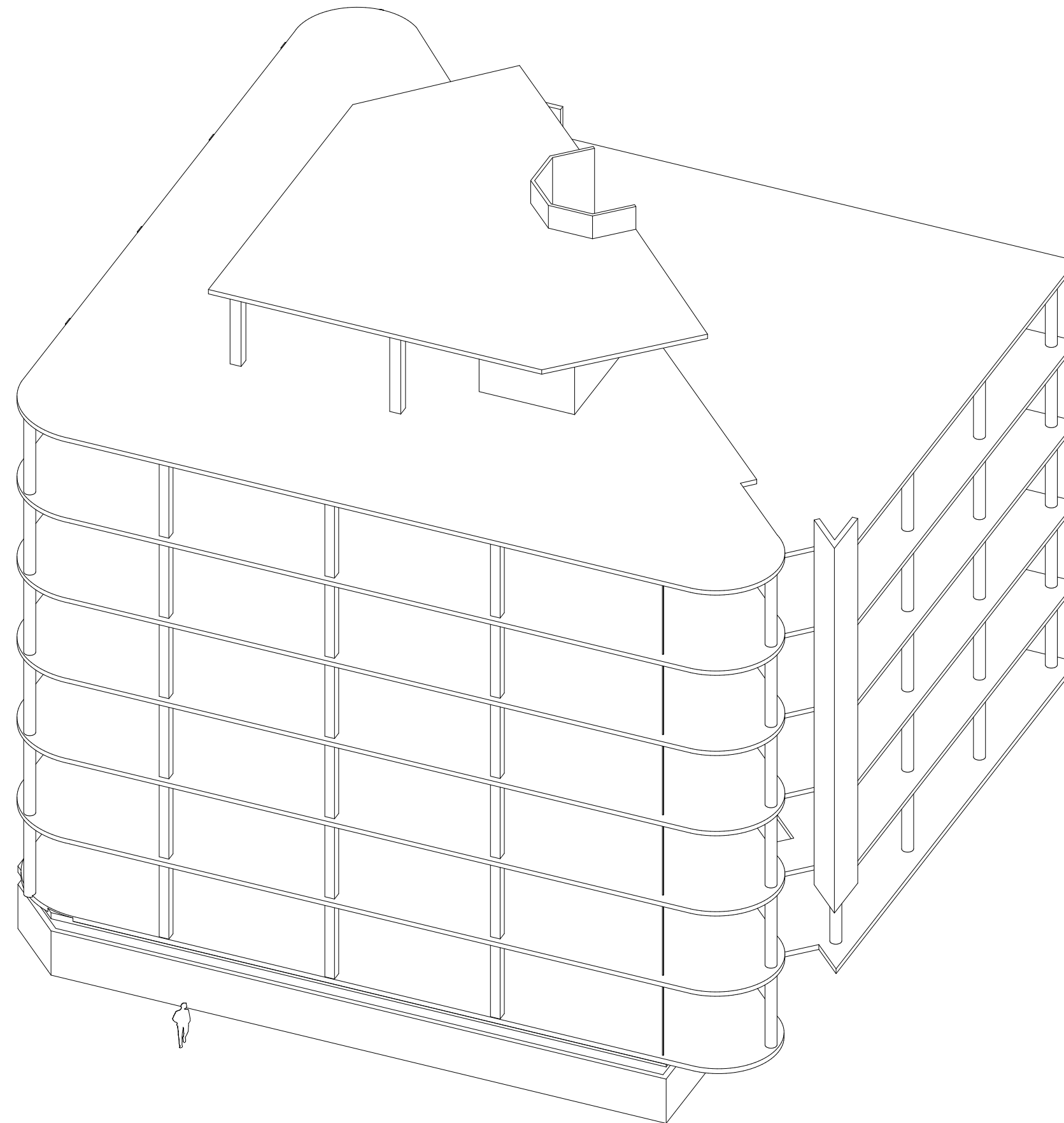
Inclusive design



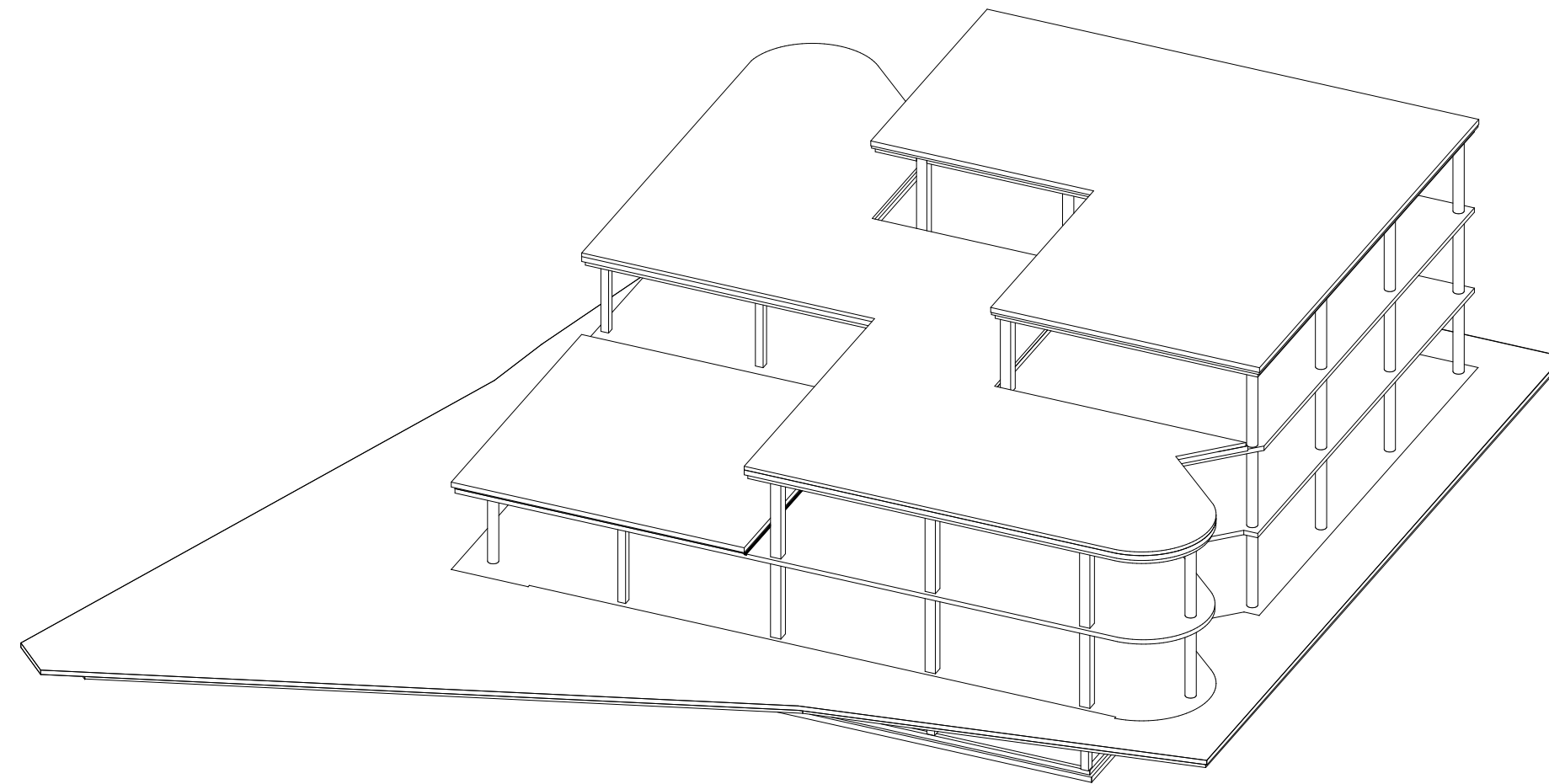
Reclaim materials



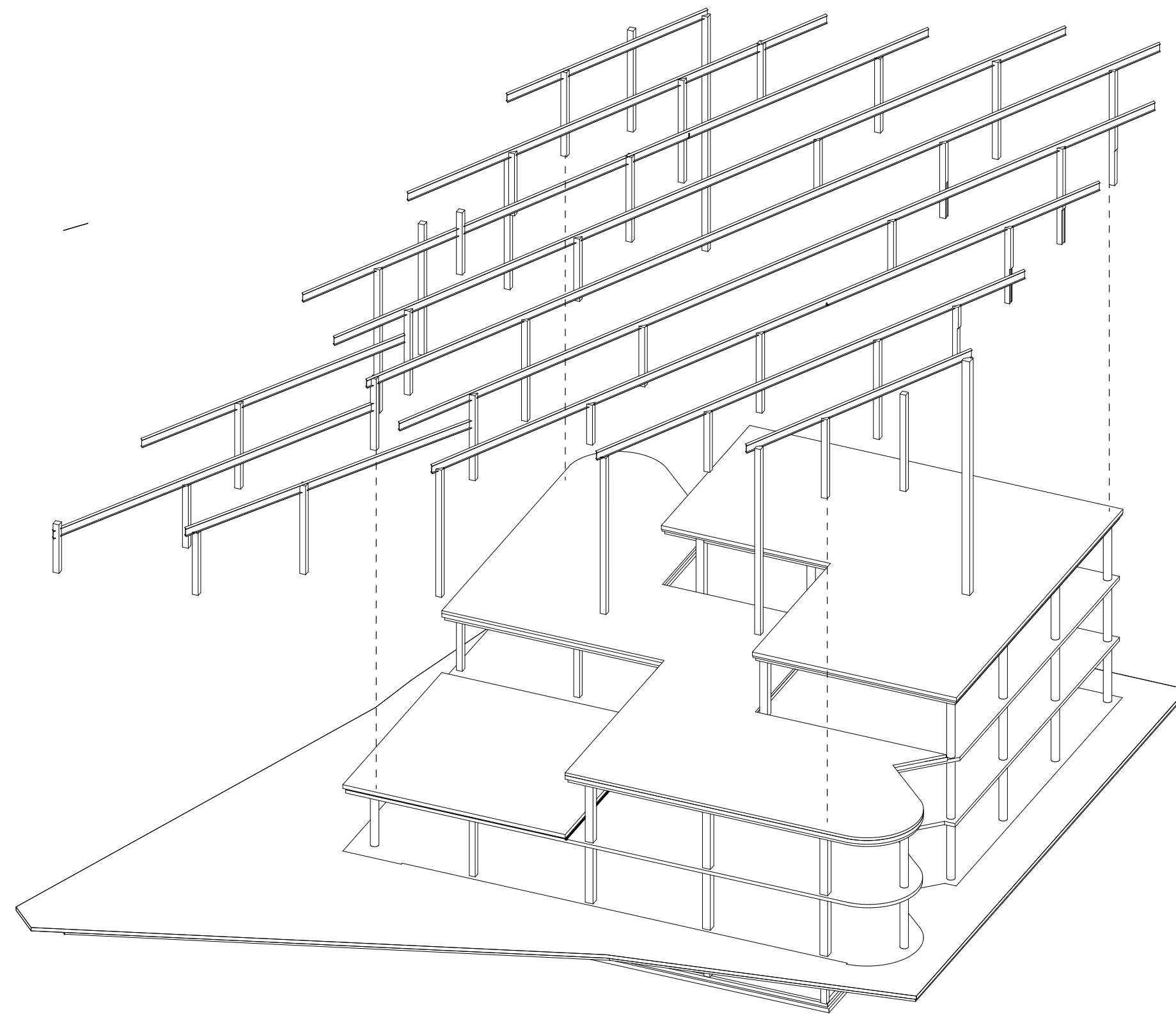
Reuse existing construction



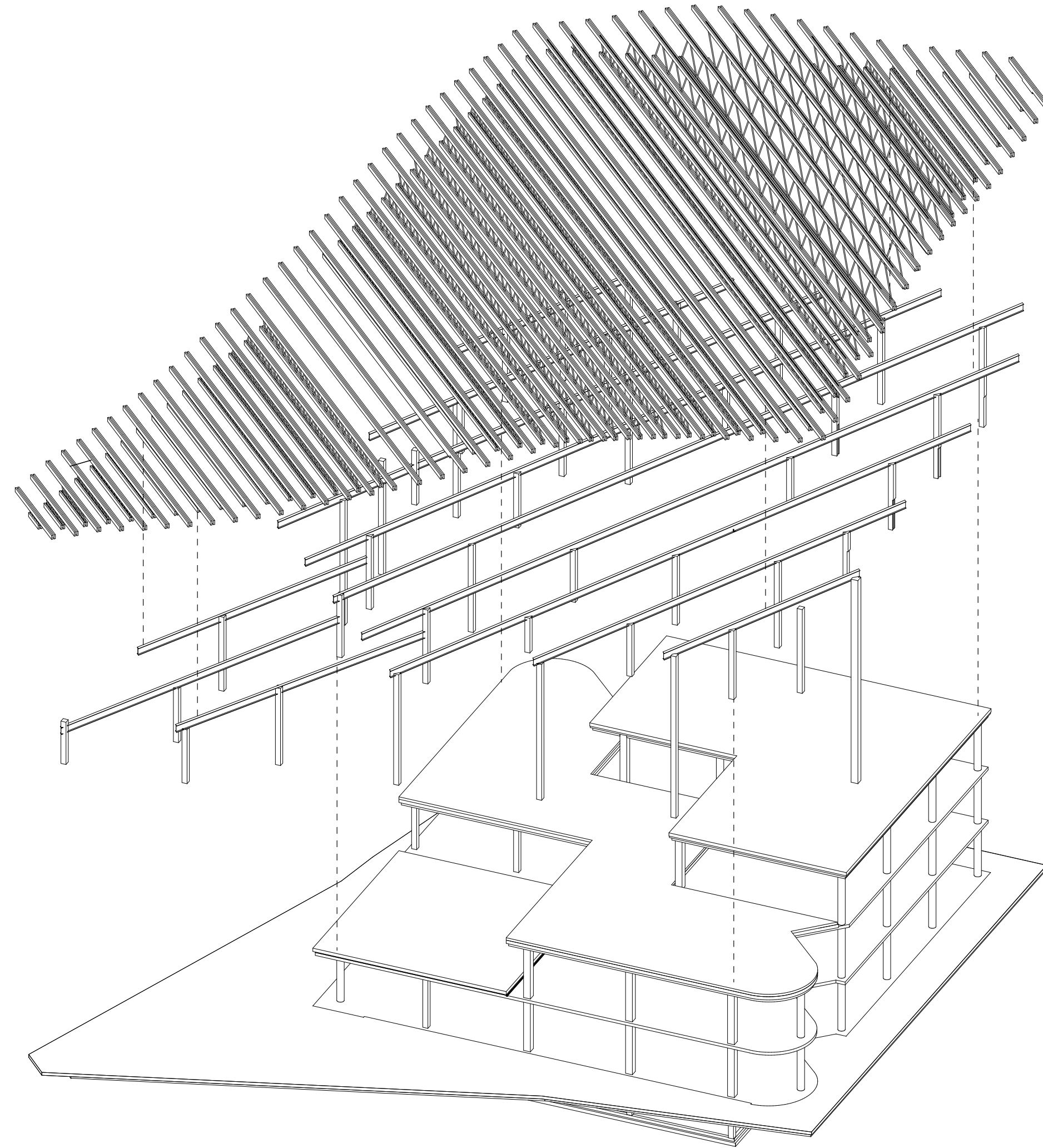
Adapt to needs of building



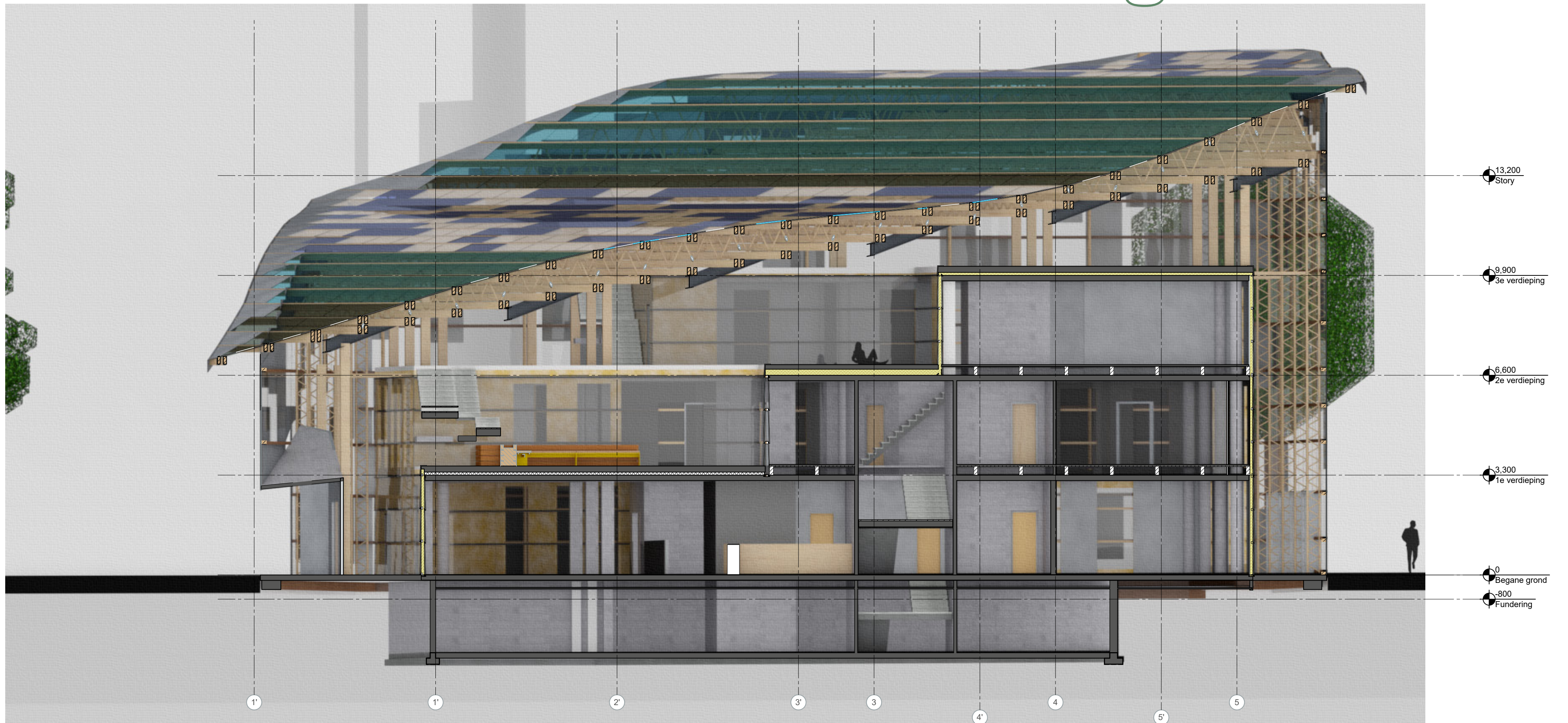
Adding structure



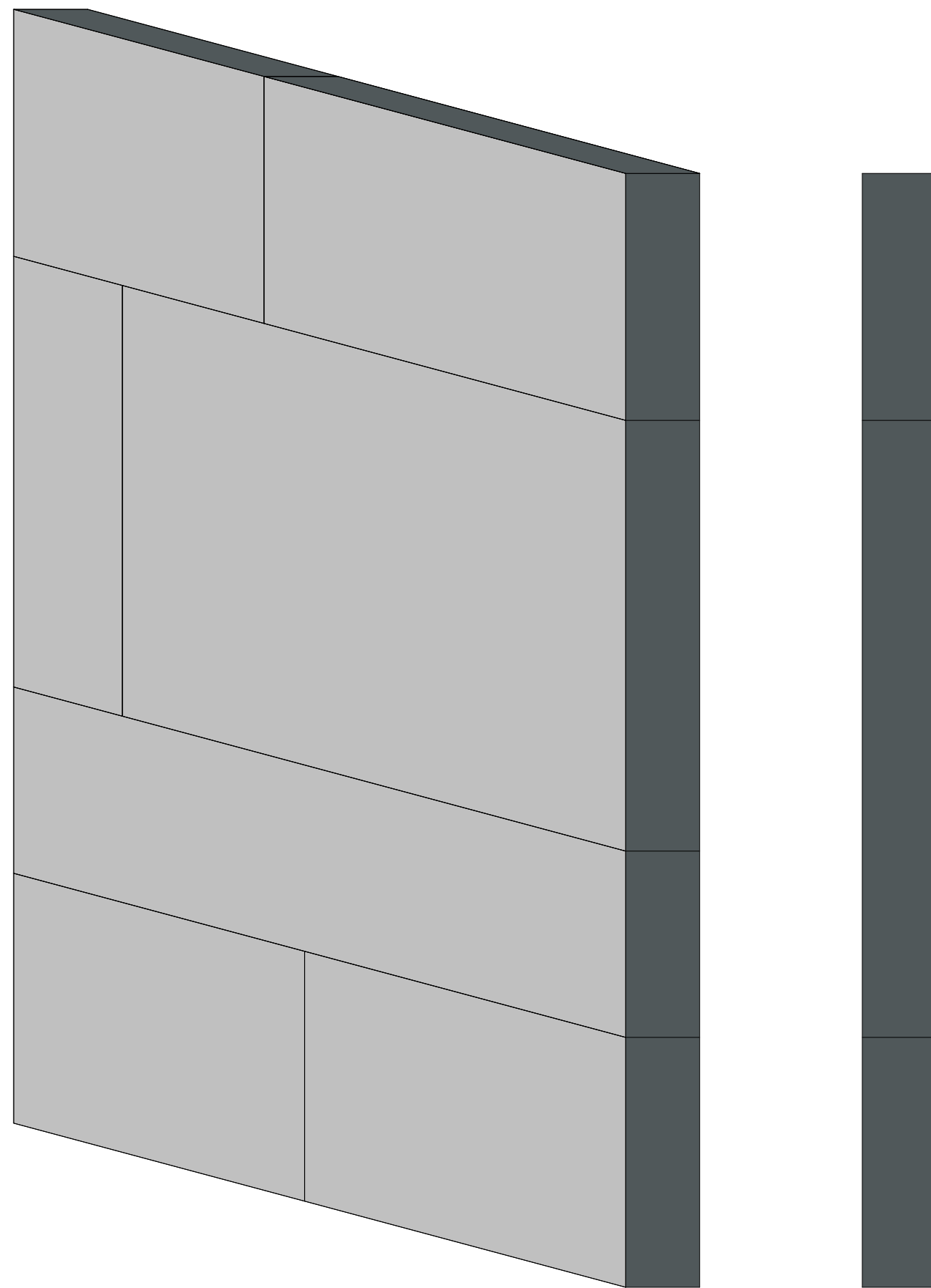
Adding structure



Preserve the existing



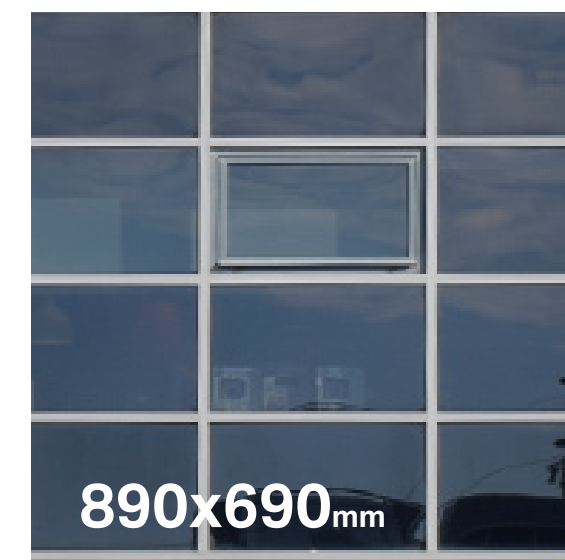
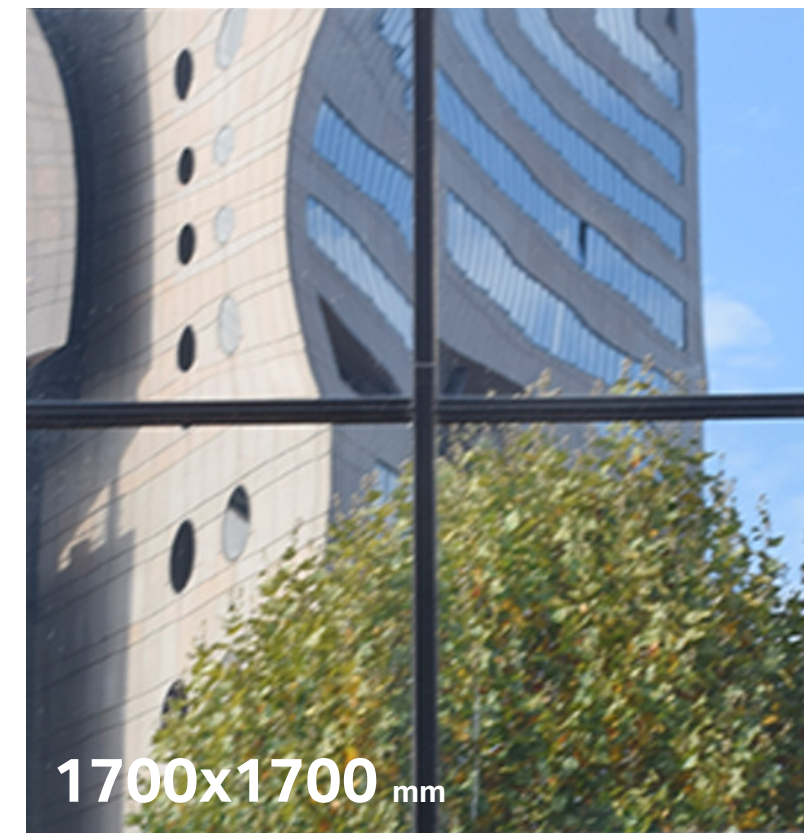
Reuse concrete



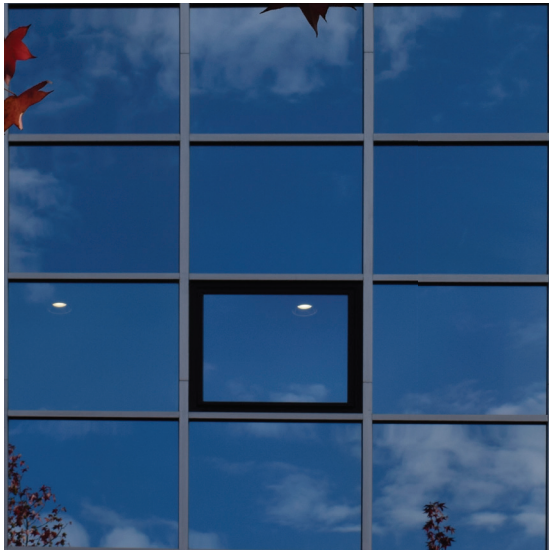




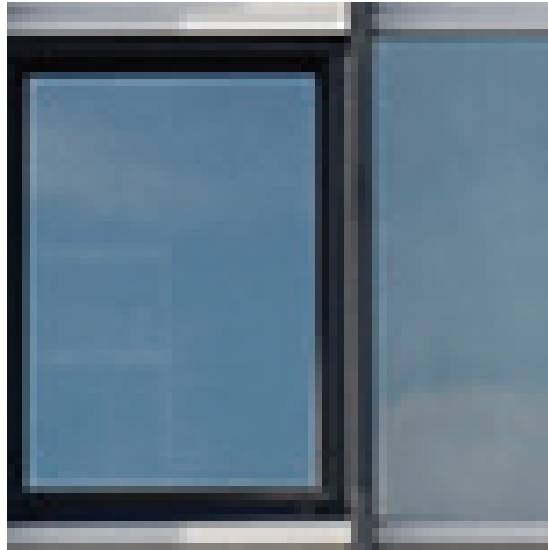
Additional resources



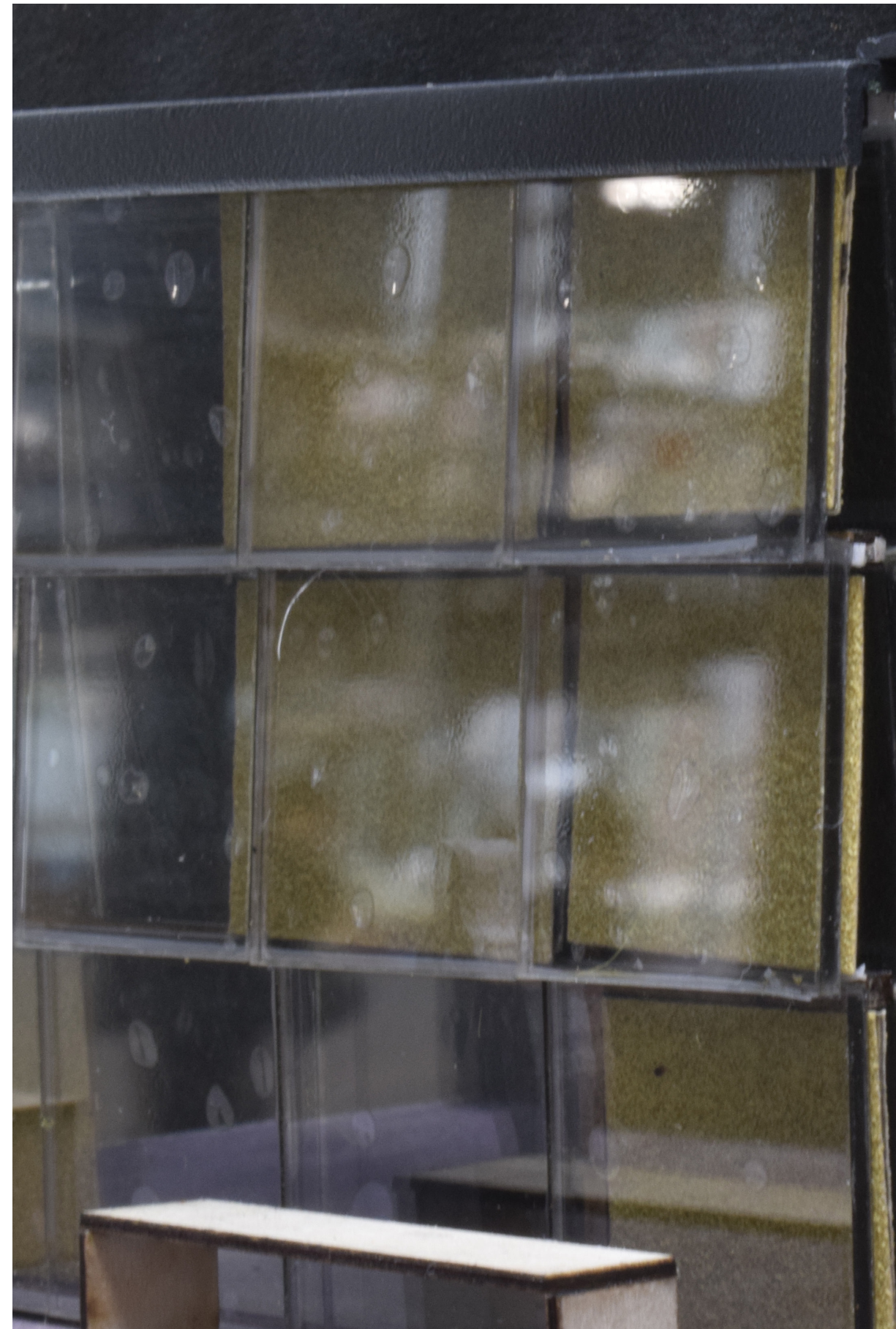
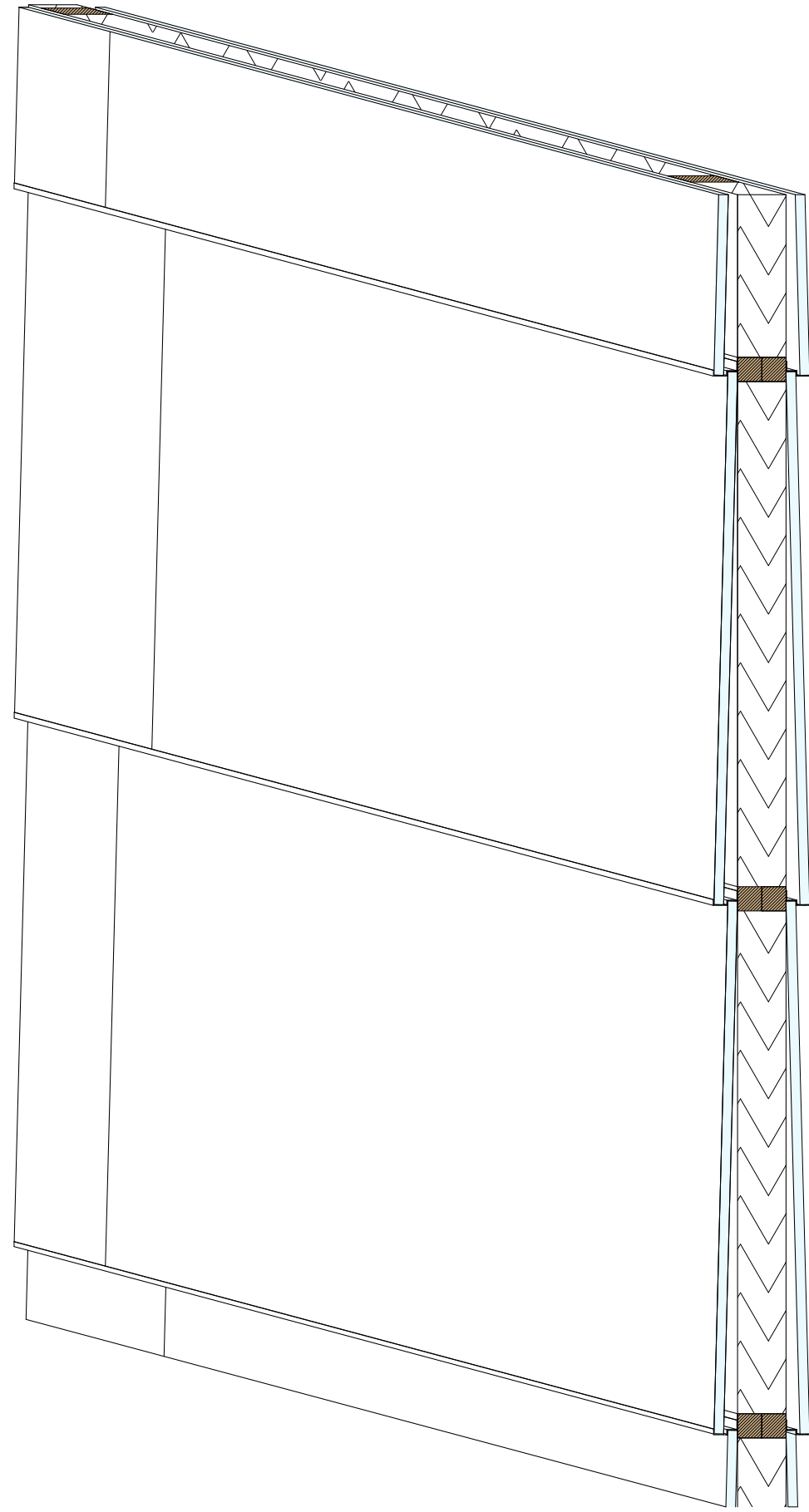
Lots of panels available



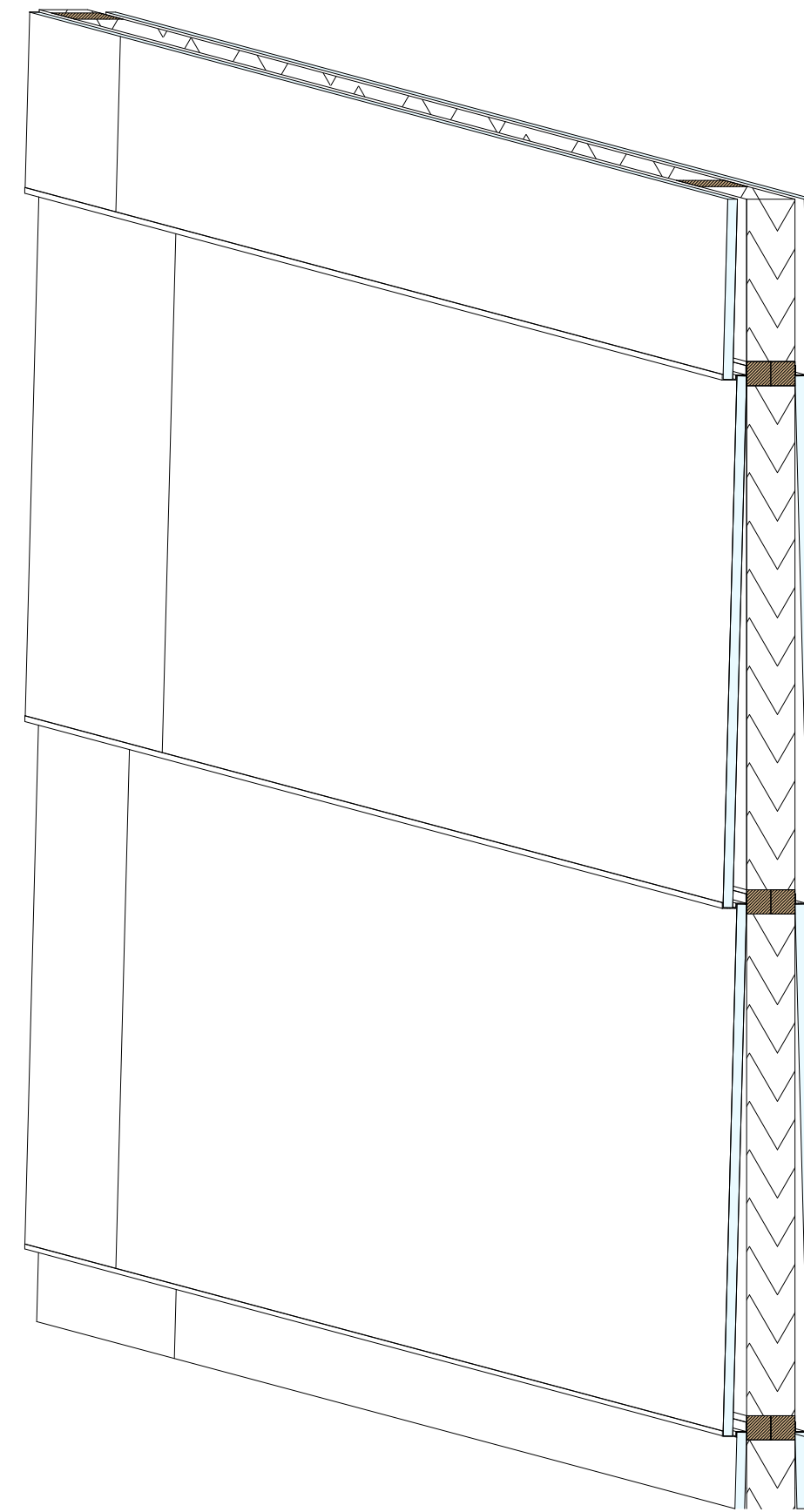
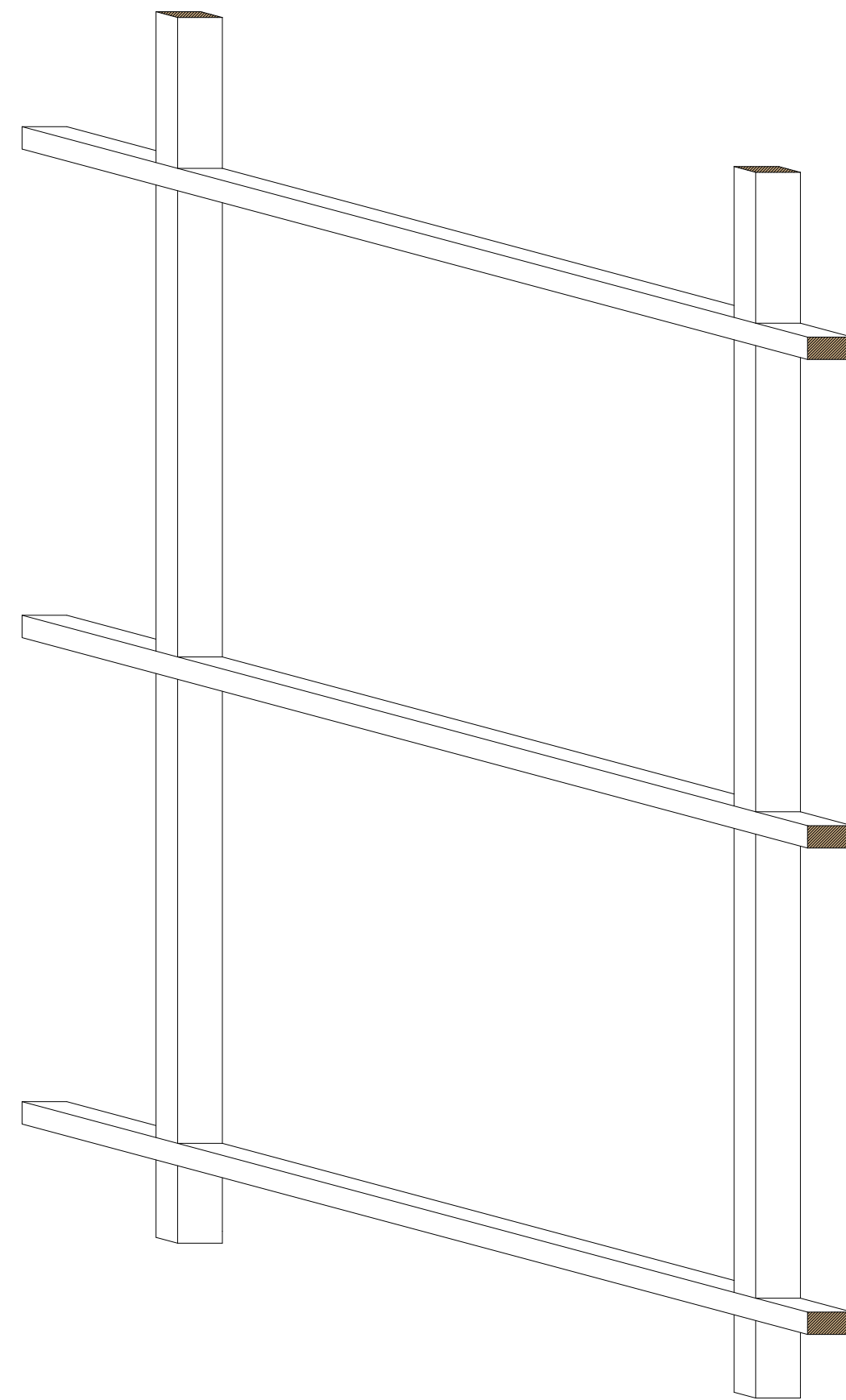
Usage of glass panels

Needed		Available		Needed		Available	
	1100x1200 Total: 567 pc.	Each building: 576 pc. 2 buildings available			1170x2500 Roof: 54 pc.	192 pc.	
	1540x1100 Total: 452 pc.				1700x1700 Facades: 136 pc.		
	1150x1300 Total: 315 pc.				1200x1350 Roof: 110 pc.		
						great amount	
						120 pc.	

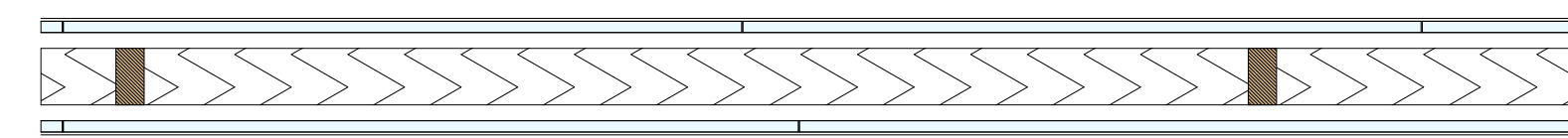
Reuse Panels



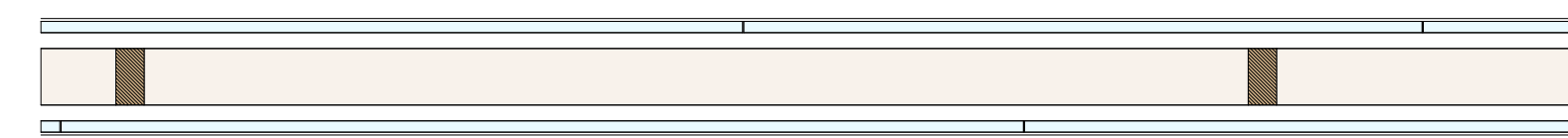
Paneling options



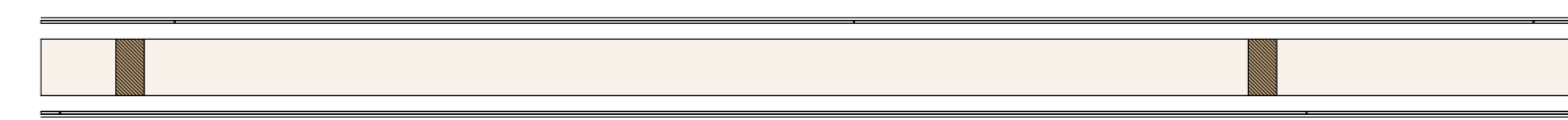
Stacking panels in one direction



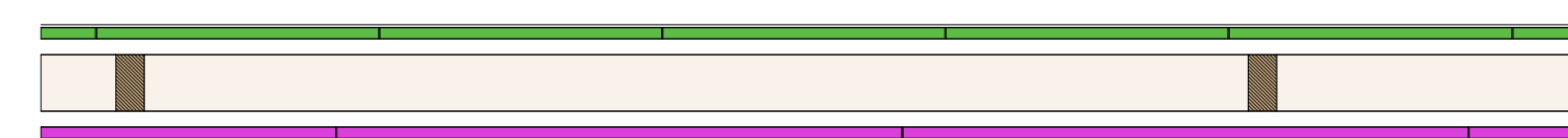
- insulation
- wooden construction
- glass



- wooden construction
- glass panels



- wooden construction
- aluminum panels



- wooden construction
- ceiling panels
- plastics

Materials



Acoustic ceiling panels

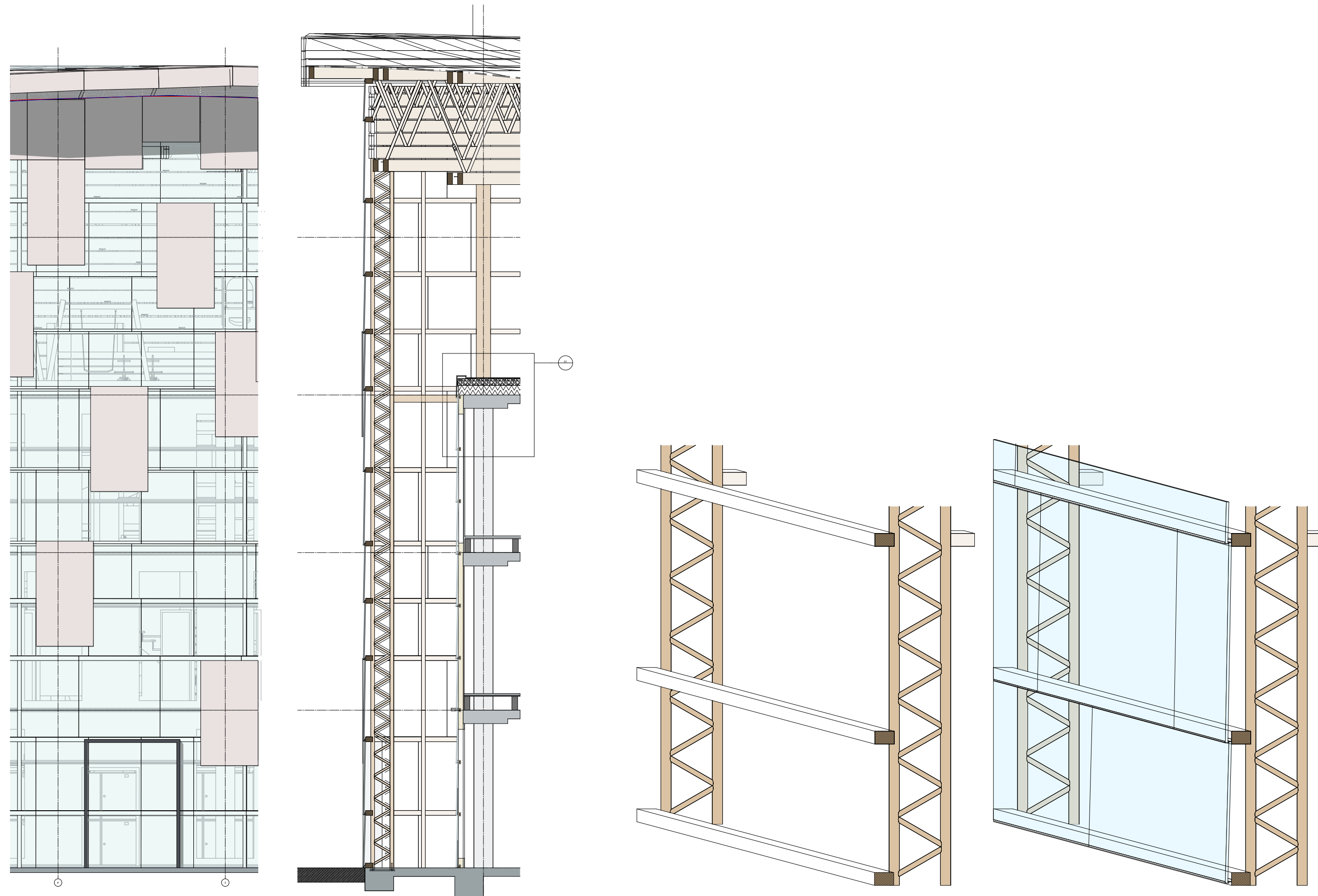


Woven vinyl



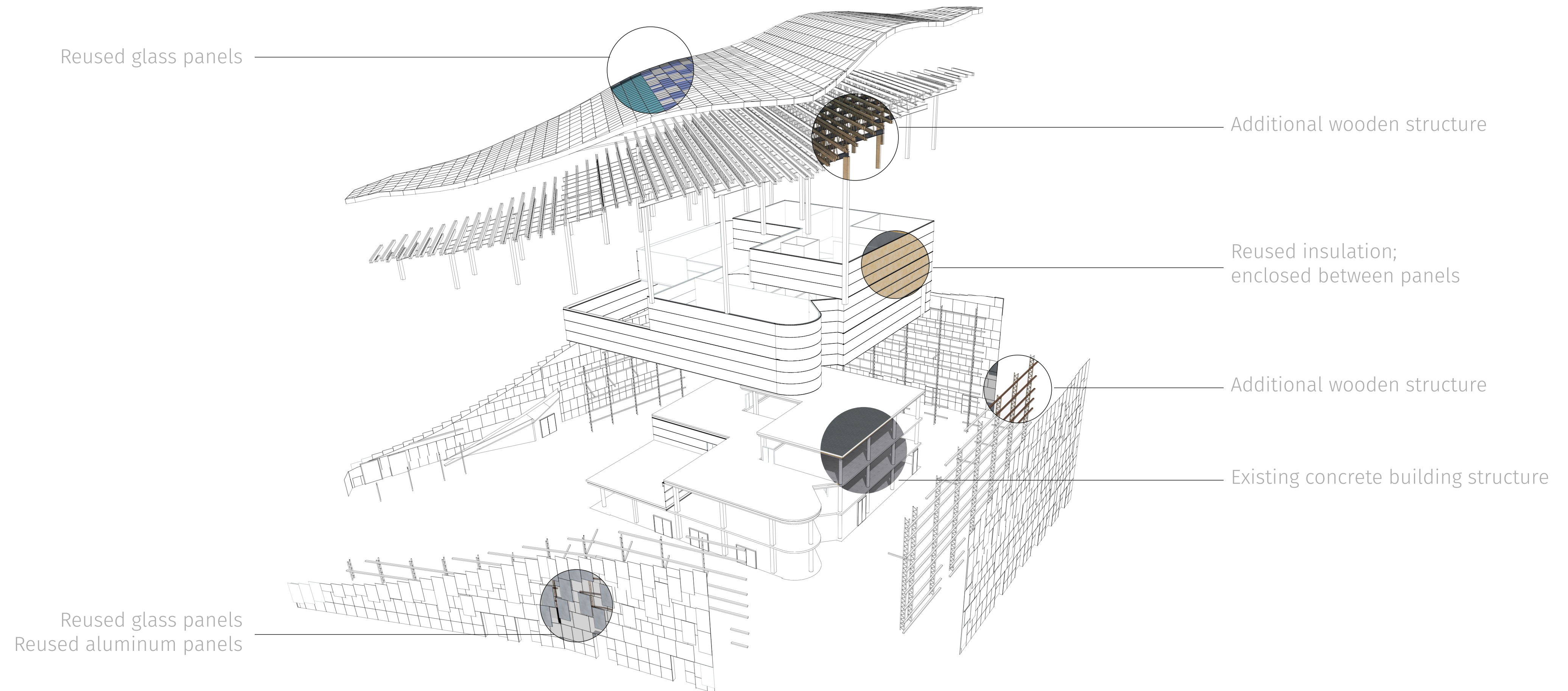
Aluminum panels

Facade glass panels





Application of materials



Experience old - 'new'

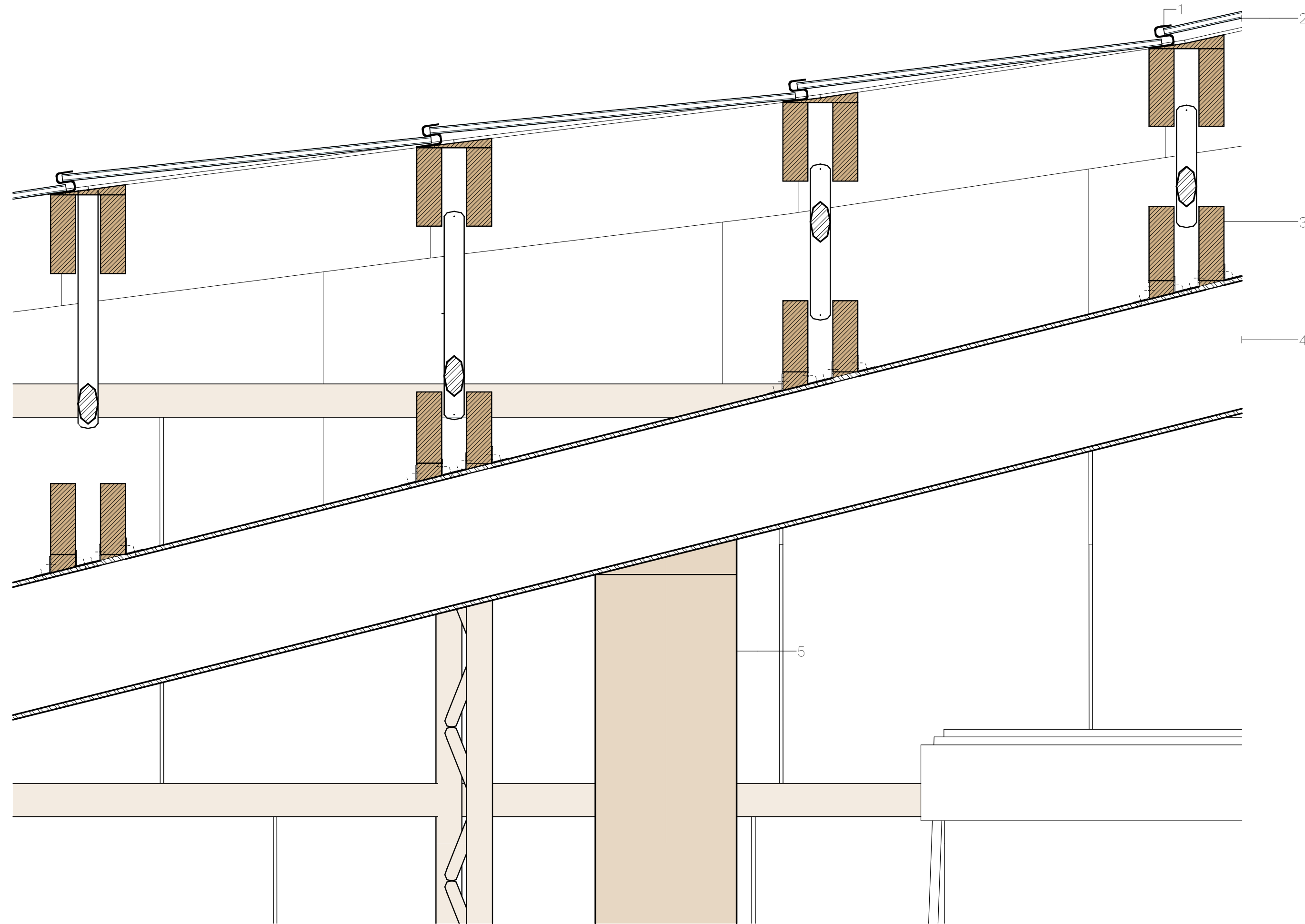


Covering the roof

‘Greenhouse’ effect with glass roof



Roof





Experiences













An architectural rendering of a modern building with a textured, metallic facade. The building has a curved roofline and large windows. In the foreground, a paved courtyard with a purple-painted path is populated with several people: two men riding bicycles, a man walking, a person sitting on a low wall, and another person sitting on the ground. The scene is set against a backdrop of trees and a sky with birds flying. A white horizontal line is positioned above the text.

Exposing a new language of architectural materials



THANK YOU