

THE LIVING CITY

Migration of the Garden City Movement



Complex Projects P5 - final

09/14/2021

Hannah J. Baghuis

Introduction

Project research

Design Brief

Concept

Implementation

Development

Conclusion

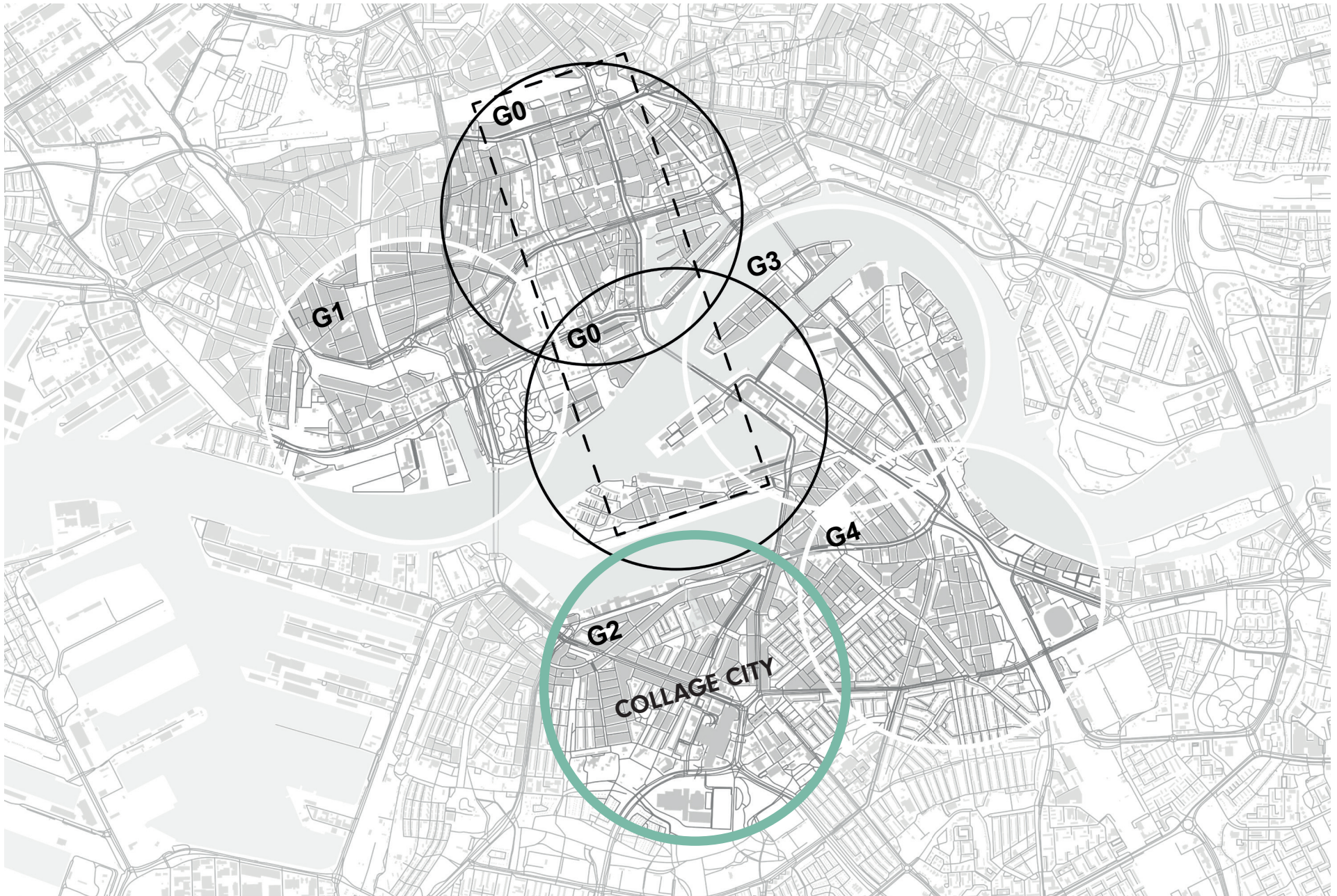
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Introduction

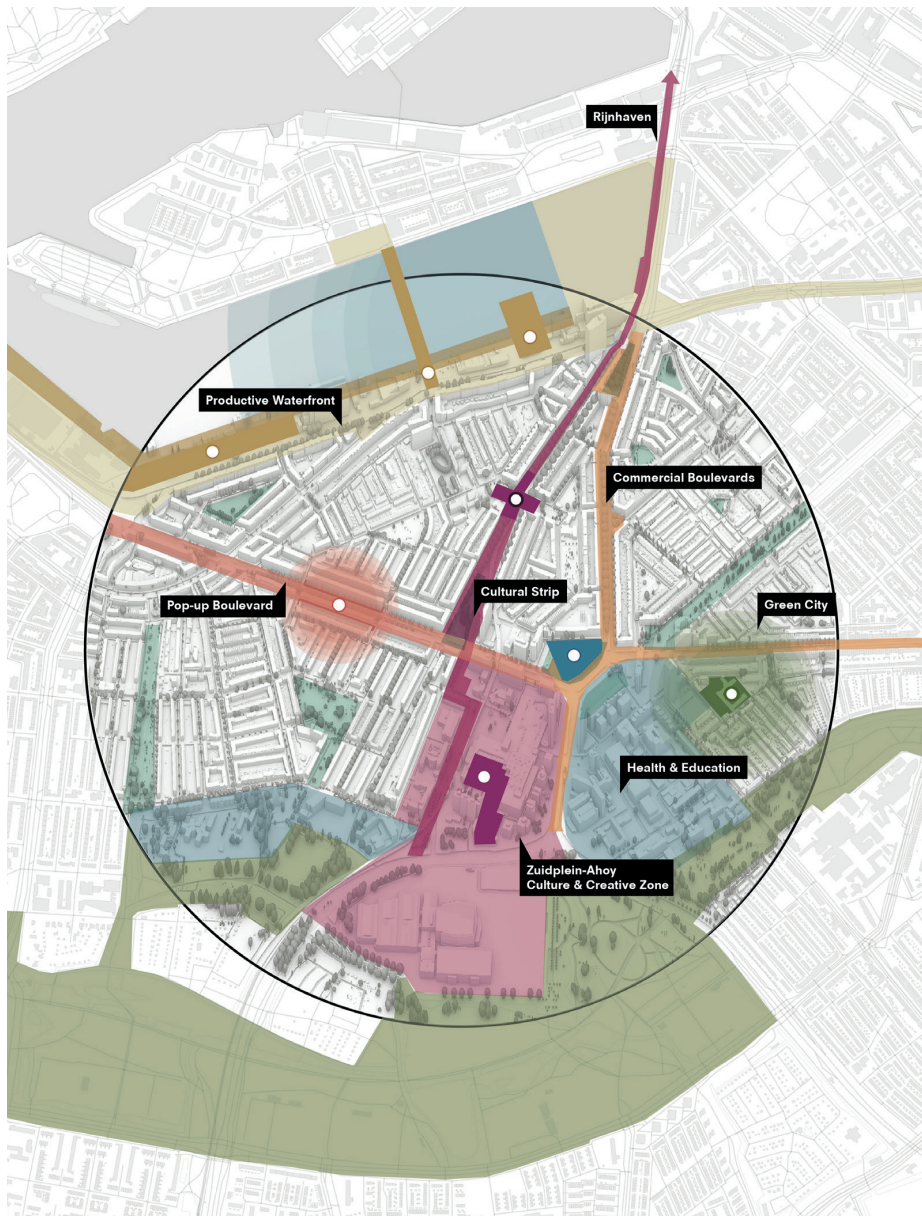
Studio project location



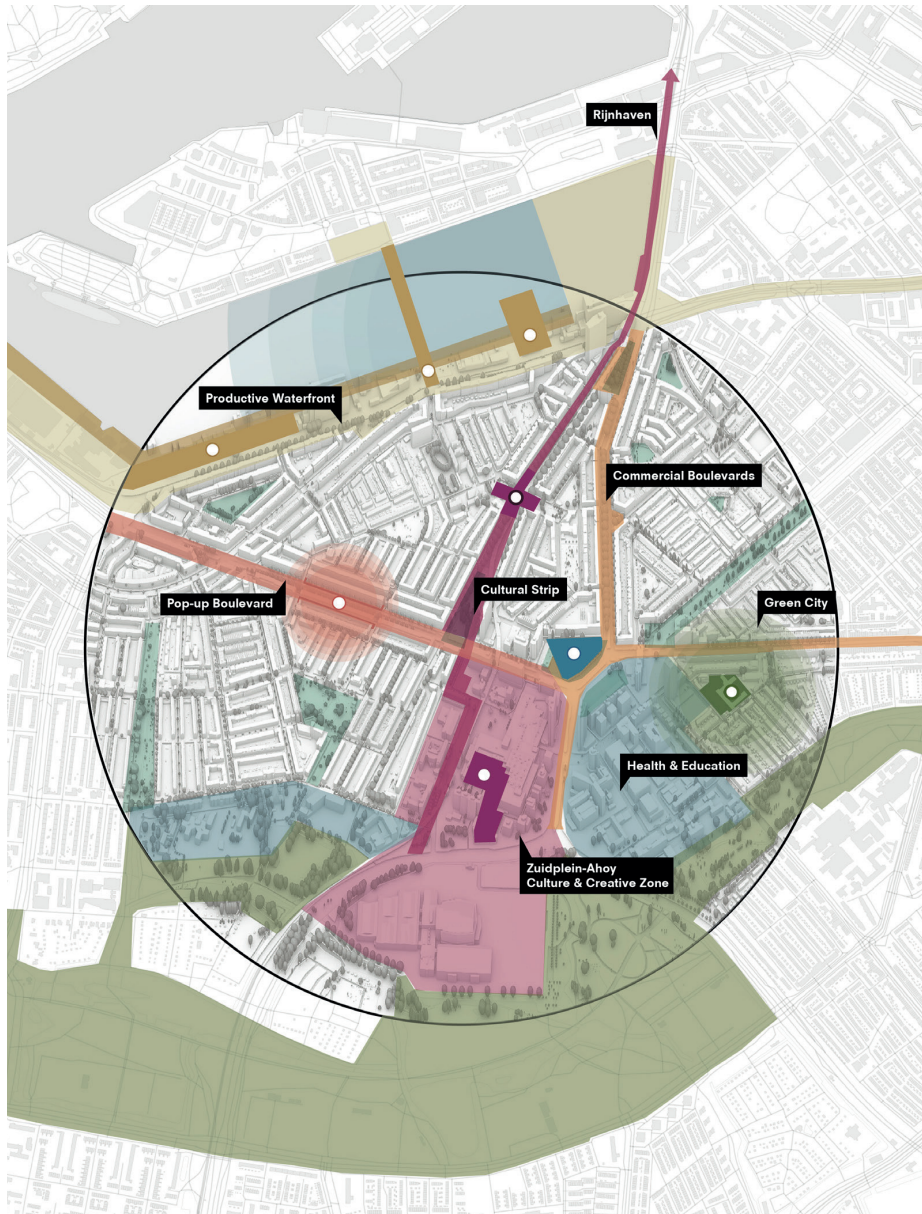
Studio project location - all studio groups



Collage City - group vision



Studio theme - "migration"



Individual projects of Collage City

Productive Waterfront

Activating Maashaven waterfront area through productive infrastructures and the expansion of public walking space and dike park.



Logistics Infrastructure



Iconic Bridge



Myco-remediation



Metro Station & Community Space



Creative Industry Hub

Cultural Strip

Stimulating cultural activities, both indoor and outdoor, while connecting Rotterdam Ahoy to Rotterdam Noord through a cultural strip.

Climate-Proof Community

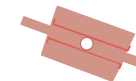
Bottom-up, collective climate change mitigation encouraged through local community efforts and infrastructure.



Centre for Social Climate Change Adaptation

Pop-up Boulevard

Integrating temporary social programmes within vacant buildings along a new car-free boulevard.



Temporary Exhibitions and Social Activation

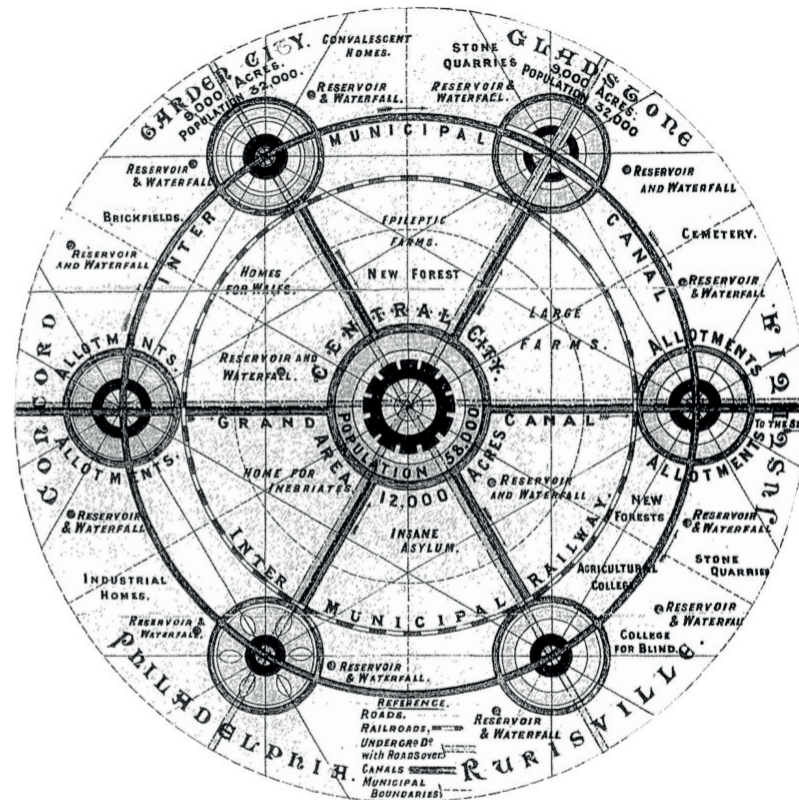
Green City

Urban and social experiments with a renovation task, activated through public urban green spaces and farming.



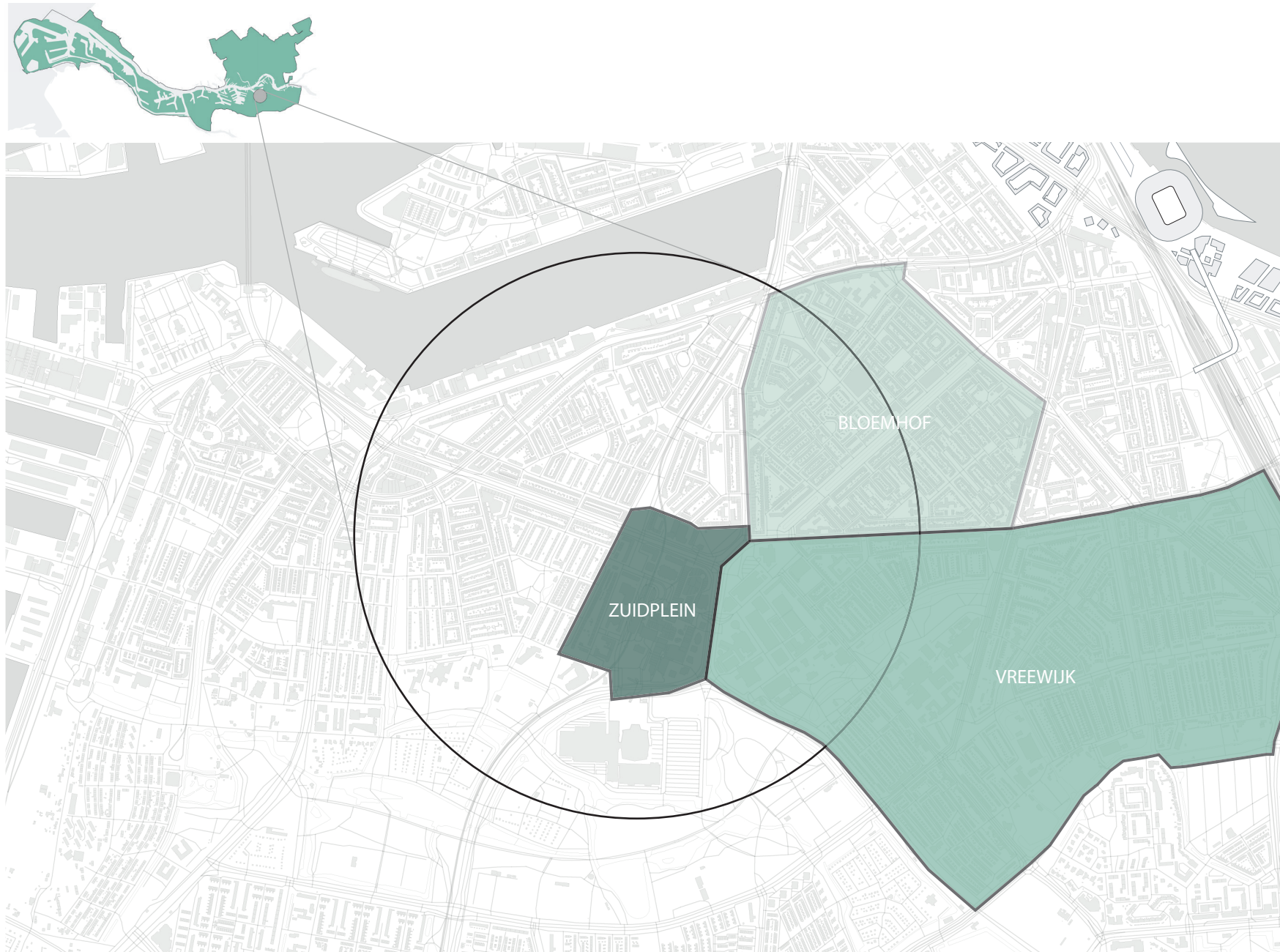
Urban Green Playground

Project topic



Migration of the Garden City

Project location

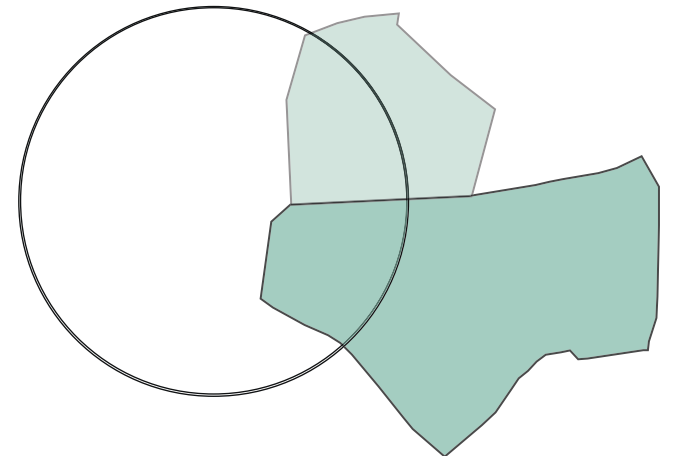


Introduction

Project topic



Garden Suburbs

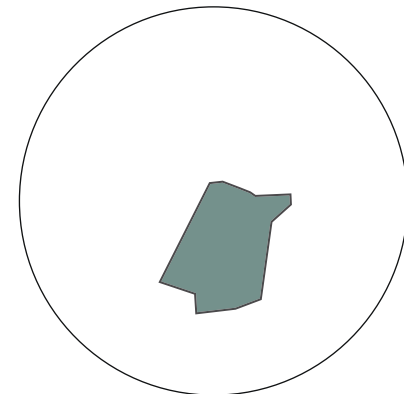


Introduction

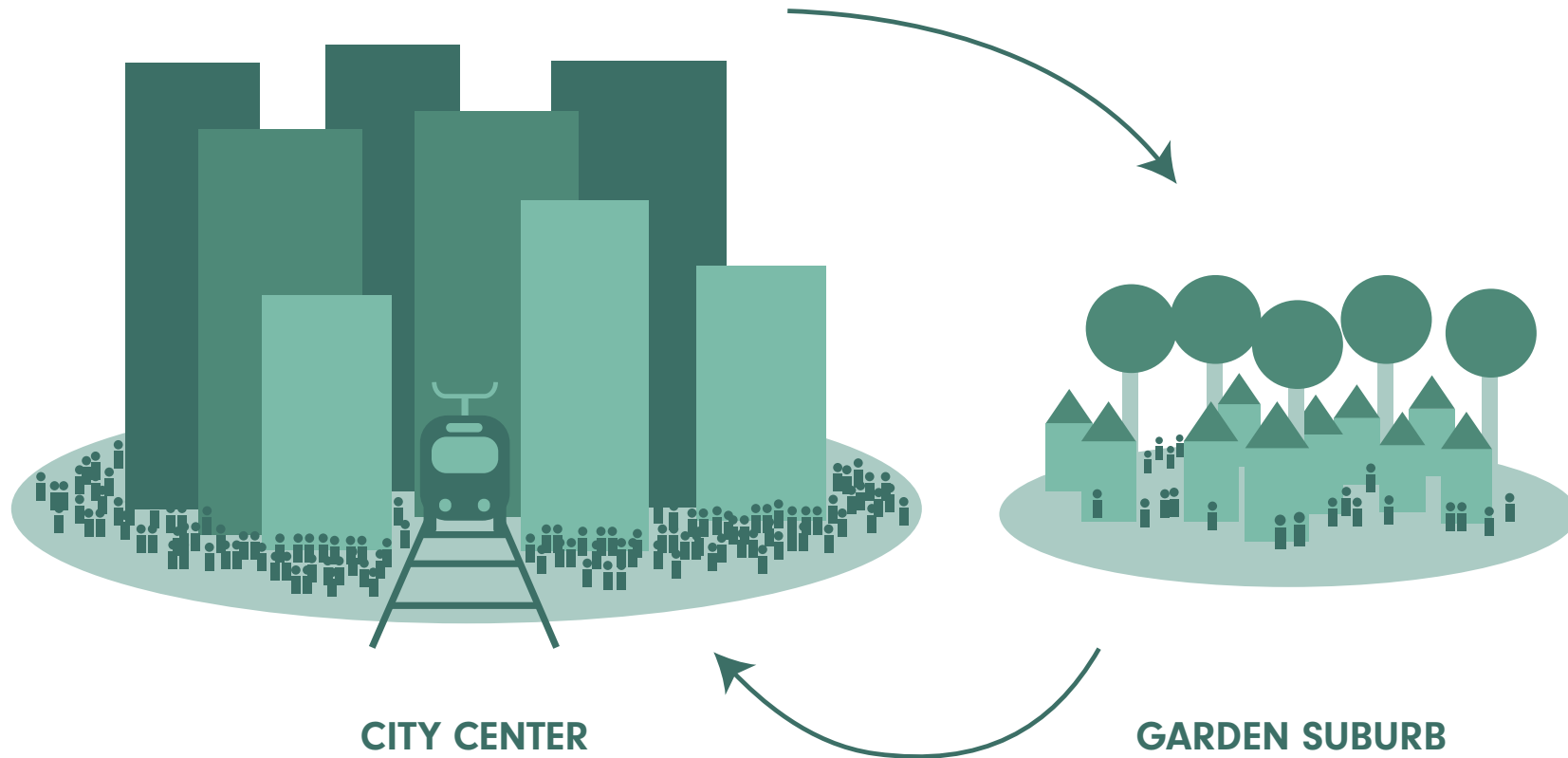
Project topic



Future high-rise district



Project topic potential



Introduction

Design theme



THE FUTURE IS ALGAE

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Project research

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Concept

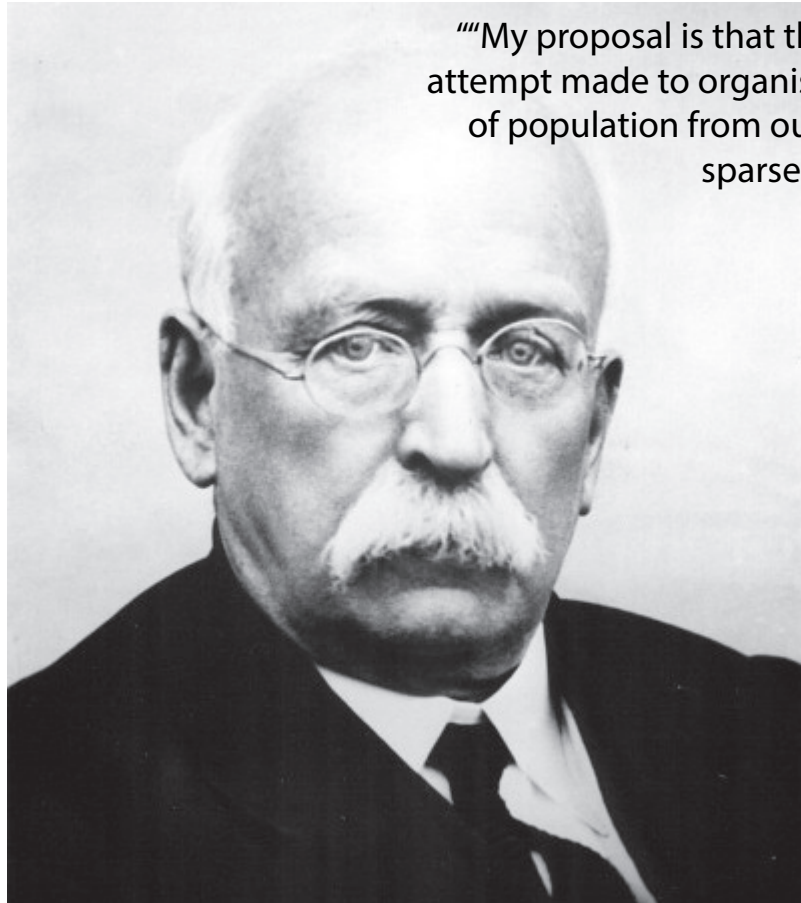
Implementation

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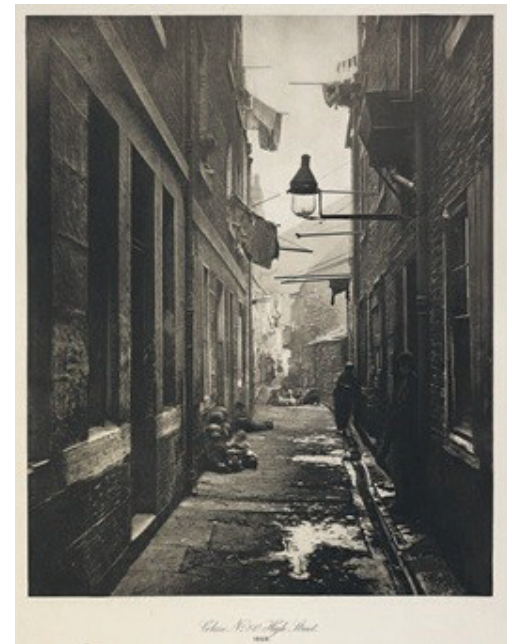
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Studio topic - migration of the Garden City



“My proposal is that there should be an earnest attempt made to organise a migratory movement of population from our overcrowded centres to sparsely-settled rural districts...”

Ebenezer Howard (1902)



London 1850

Project research

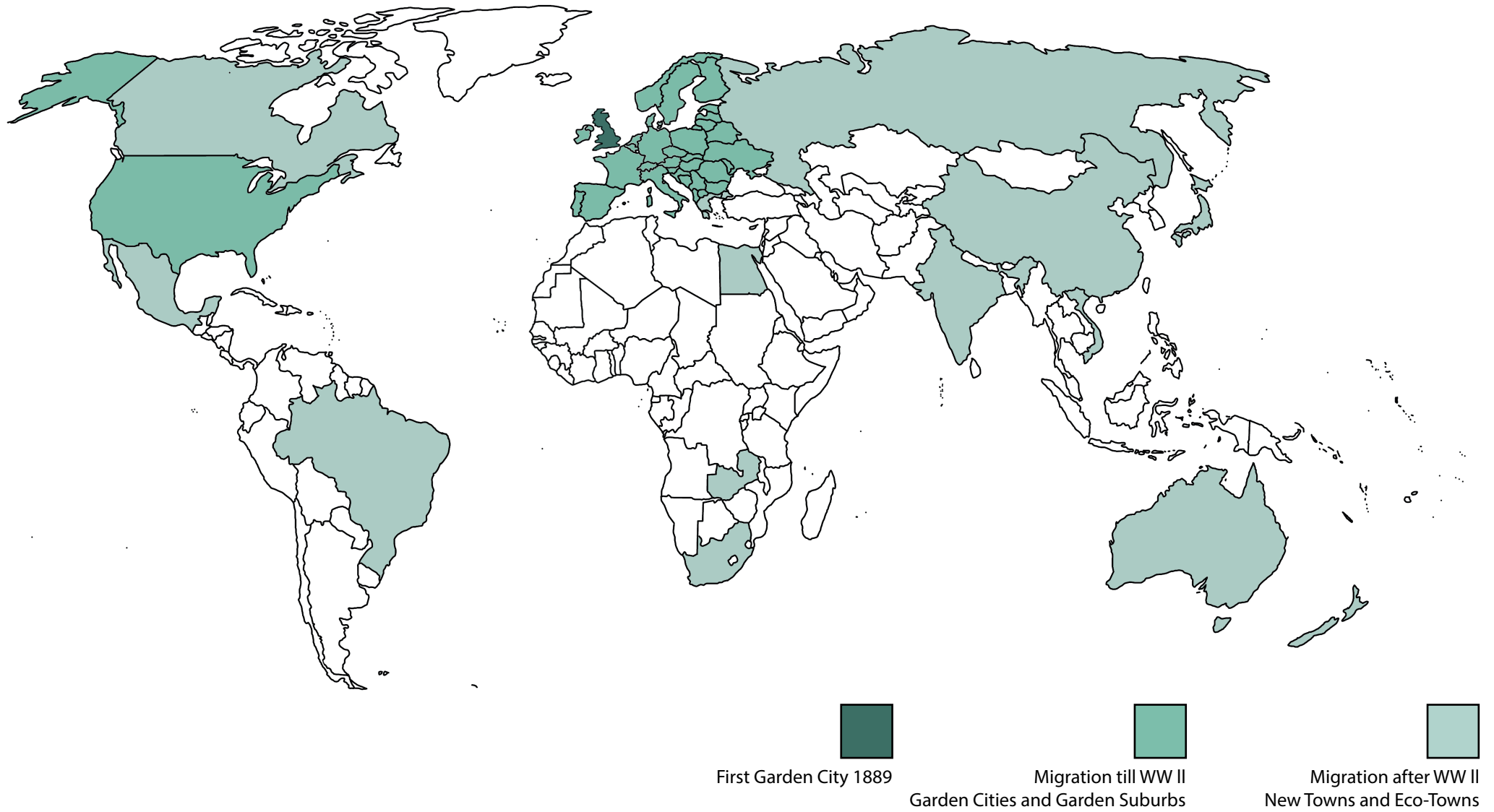
Studio topic - migration of the Garden City



The first Garden City Letchworth

Green - Social - Low density

Studio topic - migration of the Garden City



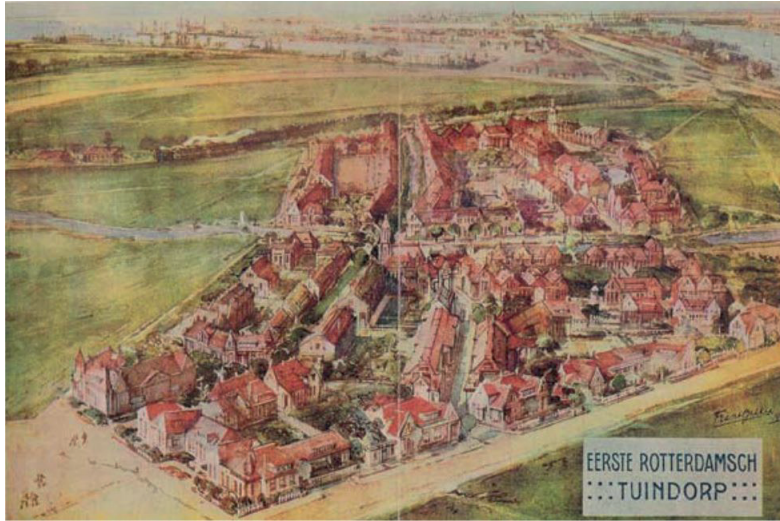
Studio topic - migration of the Garden City



Studio topic - migration of the Garden City



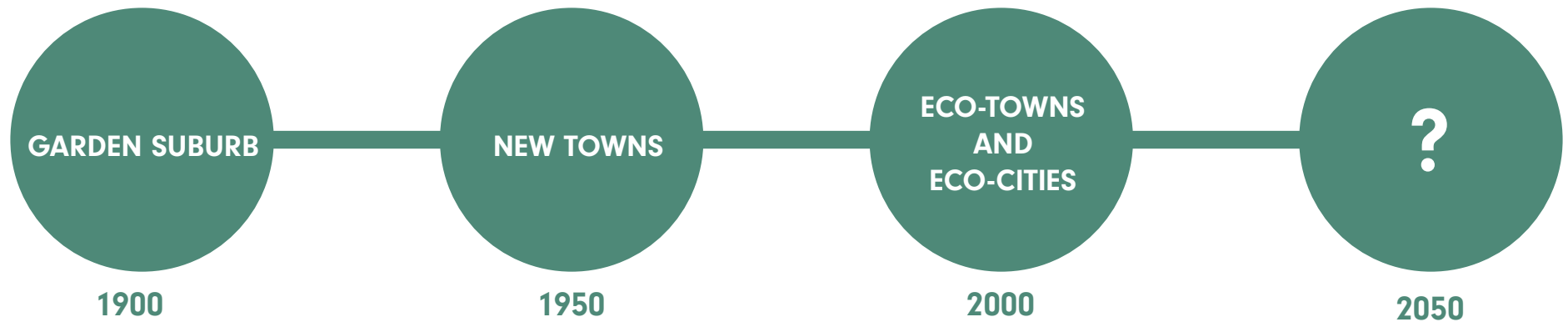
Studio topic - migration of the Garden City



Garden suburb Vreewijk



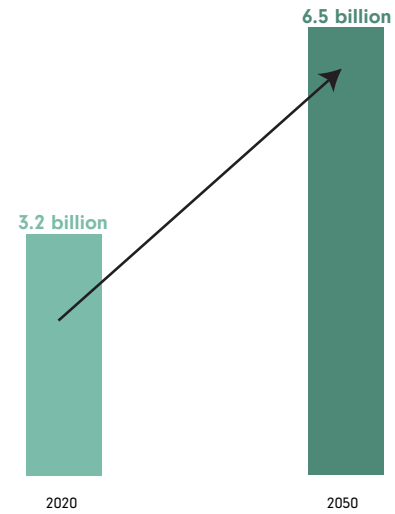
WHAT IS NEXT?



Problem statement; global scale



ISOLATED GARDEN SUBURBS

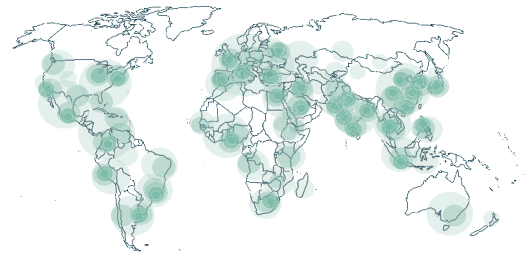


URBAN POPULATION GROWTH



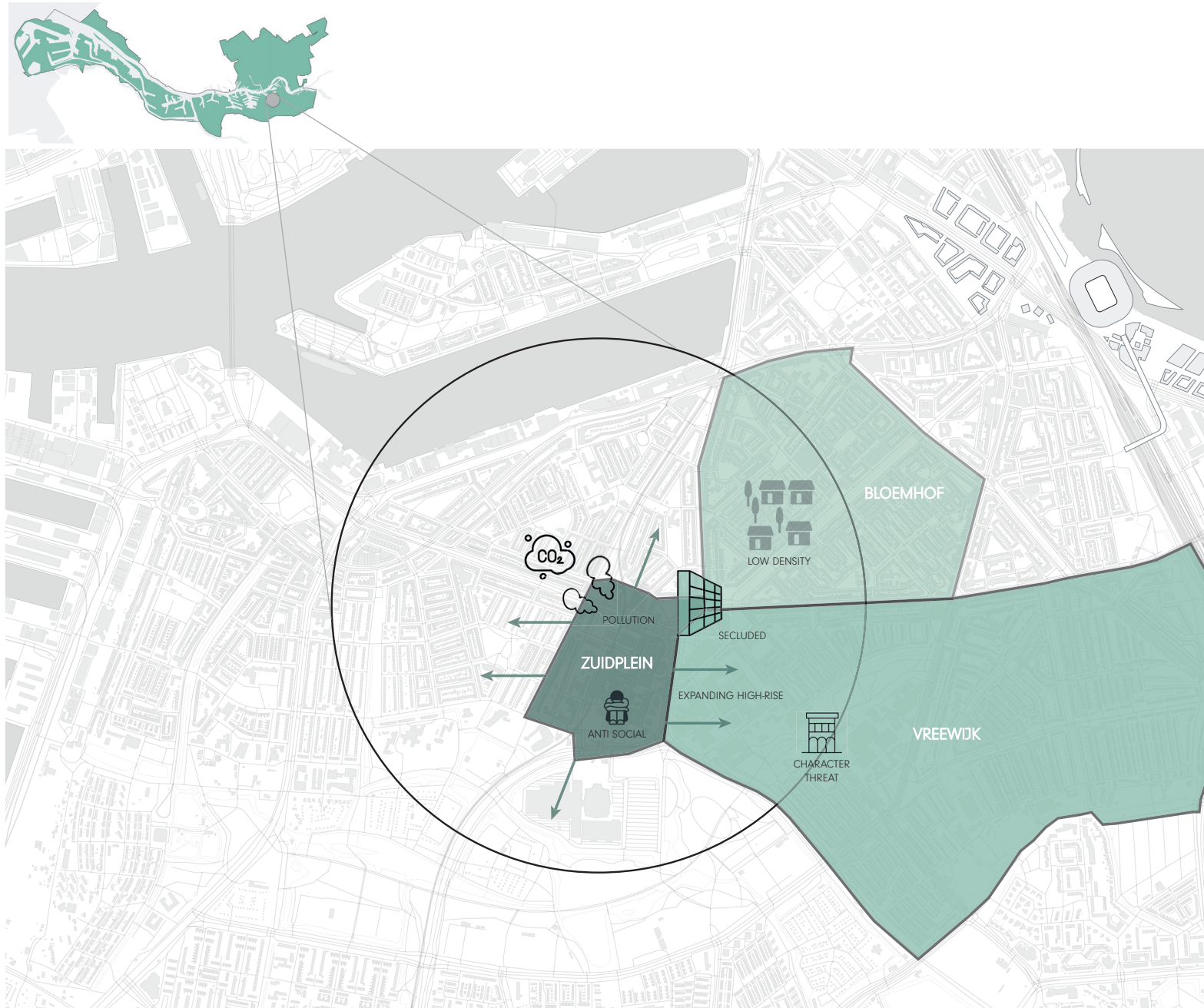
ANTI SOCIAL CITY

Cities produce more than 70% of the world's GDP and greenhouse gas emissions.

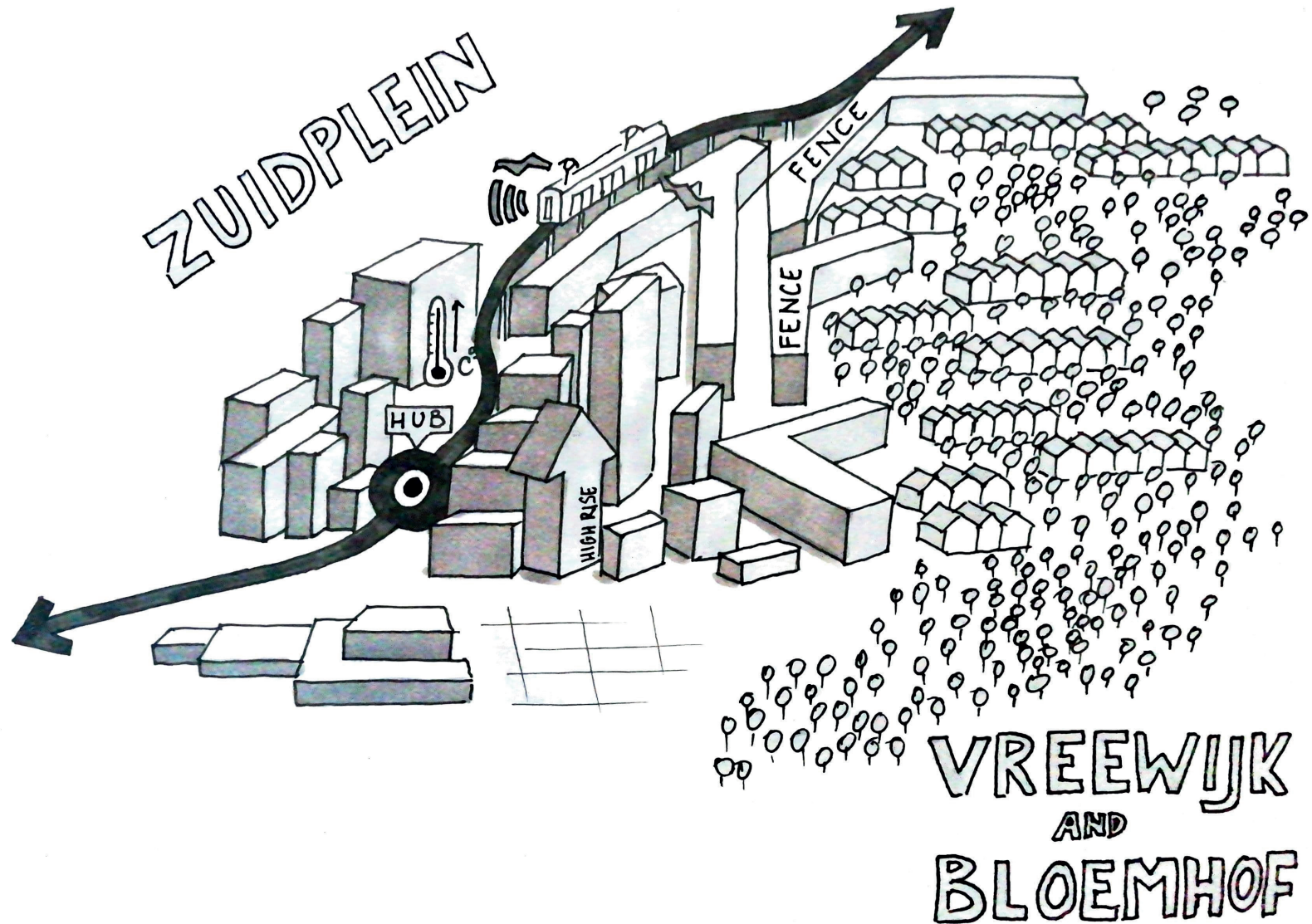


POLLUTION OF THE CITY

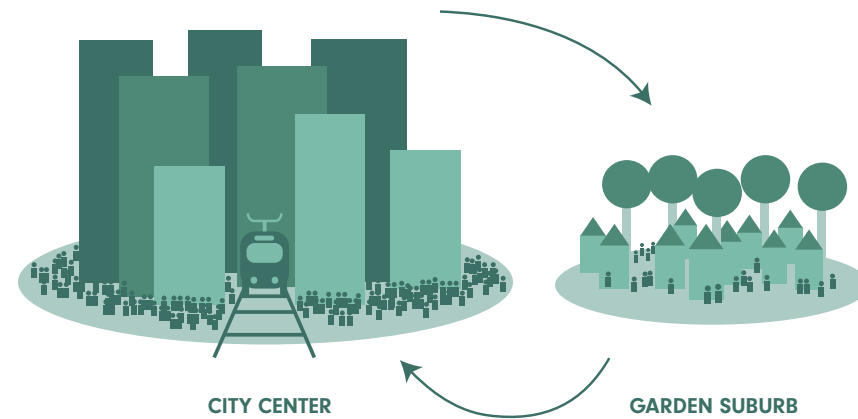
Problem statement; site scale



Problem statement; site scale



Research question



*How can the urban model
of the Southern Garden Suburbs of Rotterdam
be transformed in order
to adapt and contribute
to the expanding high rise city center?*

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Design brief

City ambition; concept



**REFORM THE URBAN TYPOLOGY
USING GARDEN CITY PRINCIPLES**

Design brief

City ambition; concept

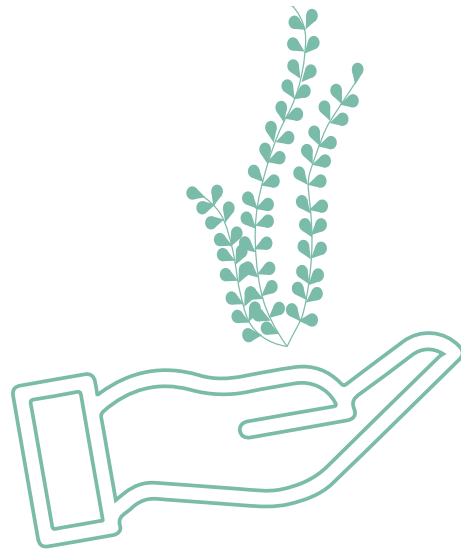


ALGAE

EXPANDING THE GARDEN CITY GREENERY

Design brief

Design theme



ALGAE

THE LIVING CITY

...ARE **20x**
MORE PRODUCTIVE
THAN TREES

...CONTAIN **150x**
MORE ENERGY
THAN BEEF

...PRODUCE **70%**
OF WORLD'S
TOTAL O₂

...NEED **5x**
LESS WATER THAN
CONVENTIONAL PLANTS



CONVENTIONAL GREEN

THE GARDEN CITY

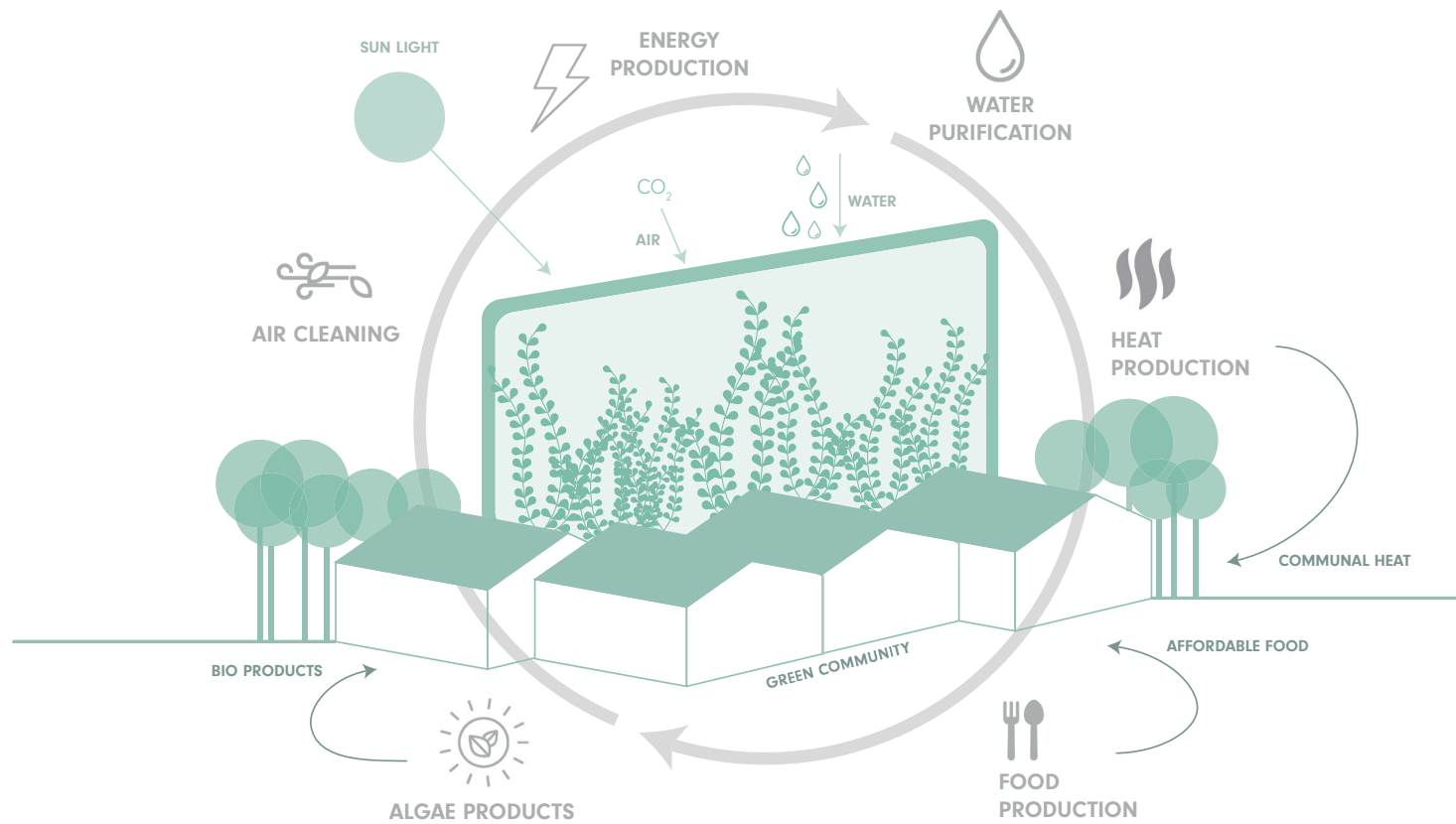
Design brief

Design theme



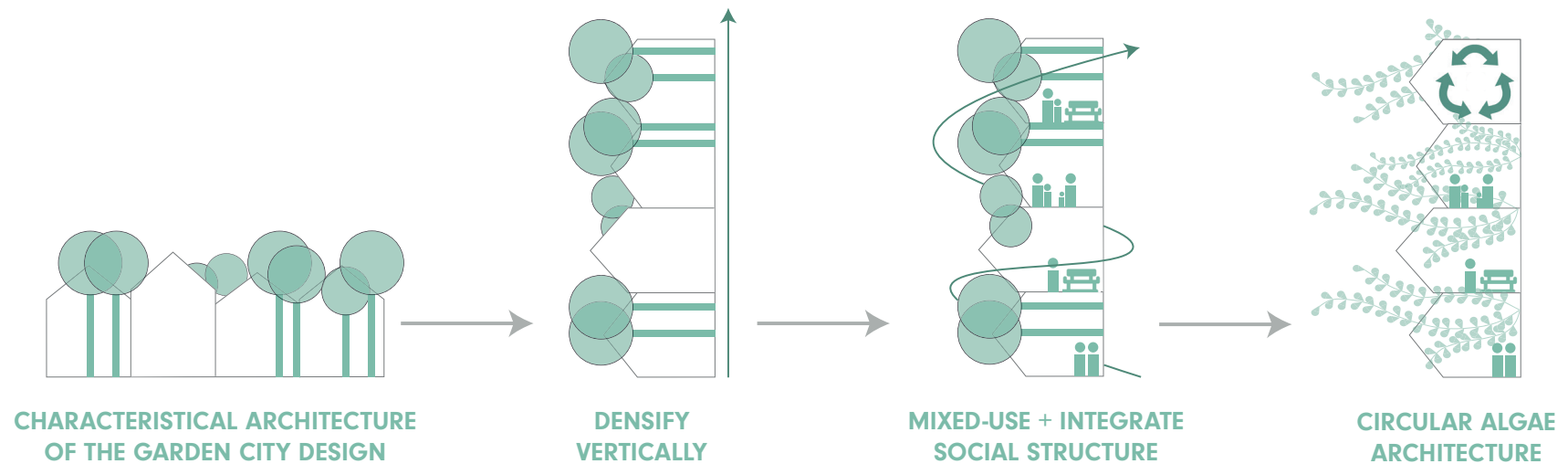
THE FUTURE IS ALGAE

Circular algae architecture



ALGAE-ARCHITECTURE POTENTIAL

Typology ambition



EVOLVEMENT OF THE LIVING CITY TYPOLOGY

Urban ambitions; city scale



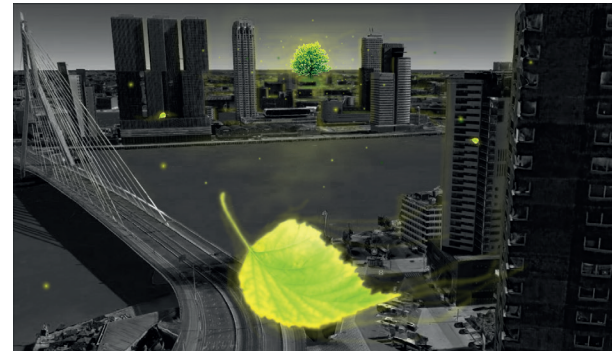
CELEBRATE THE GARDEN CITY ARCHITECTURE



CREATE MIXED-USE DENSIFICATION

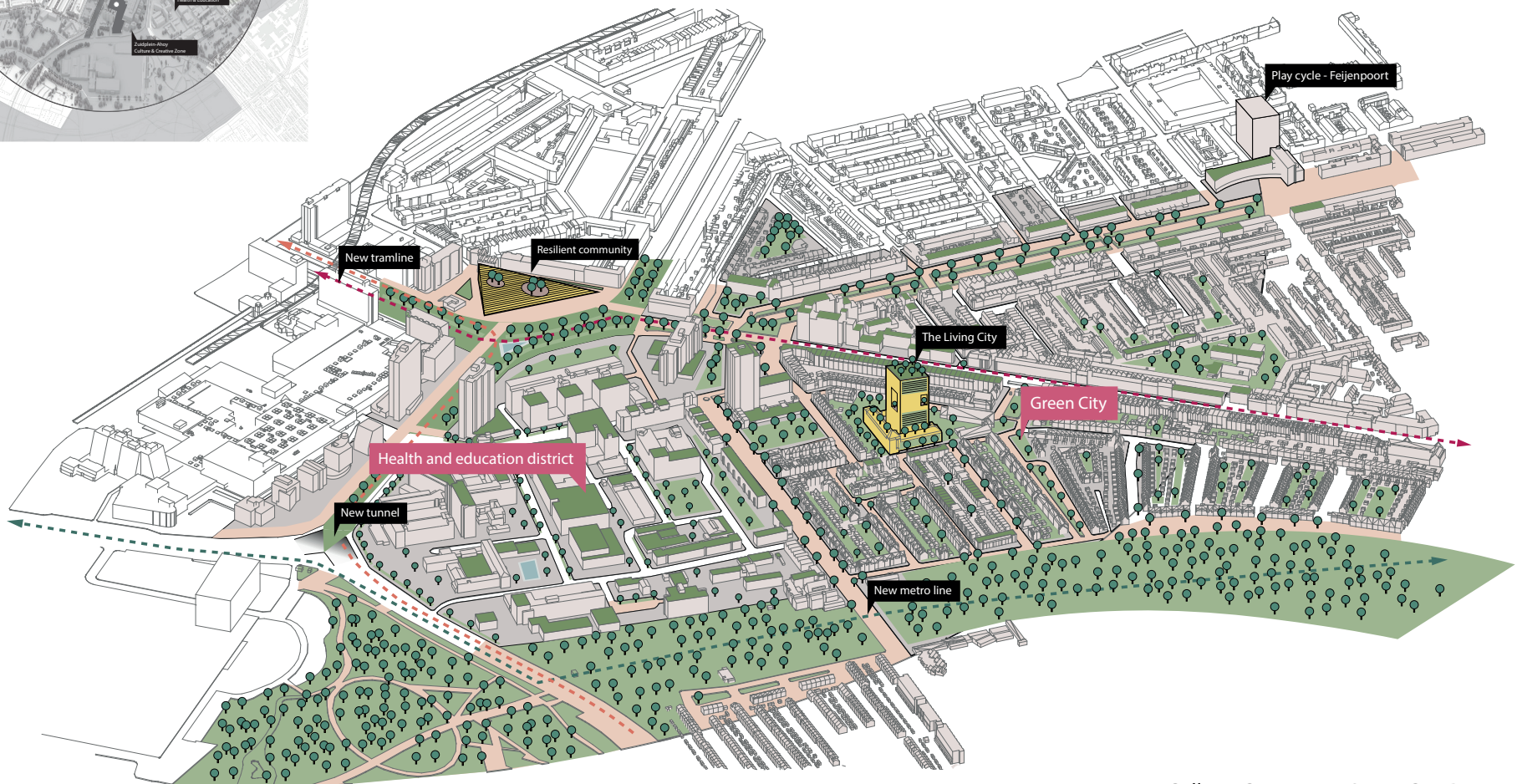
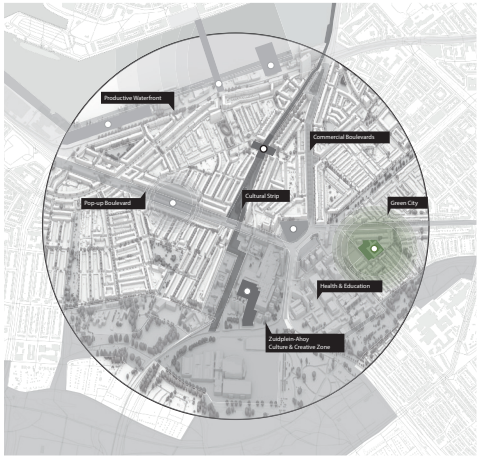


ESTABLISH SOCIAL INCLUSIVITY



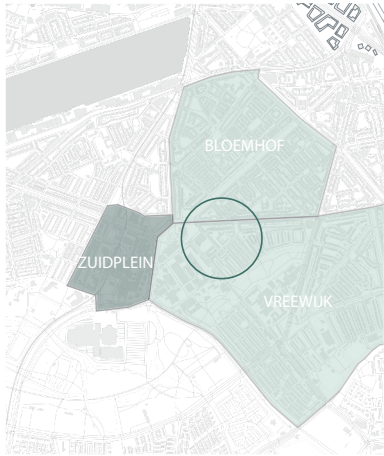
REALIZE INNOVATIVE ALGAE ARCHITECTURE

Green City district as catalyst

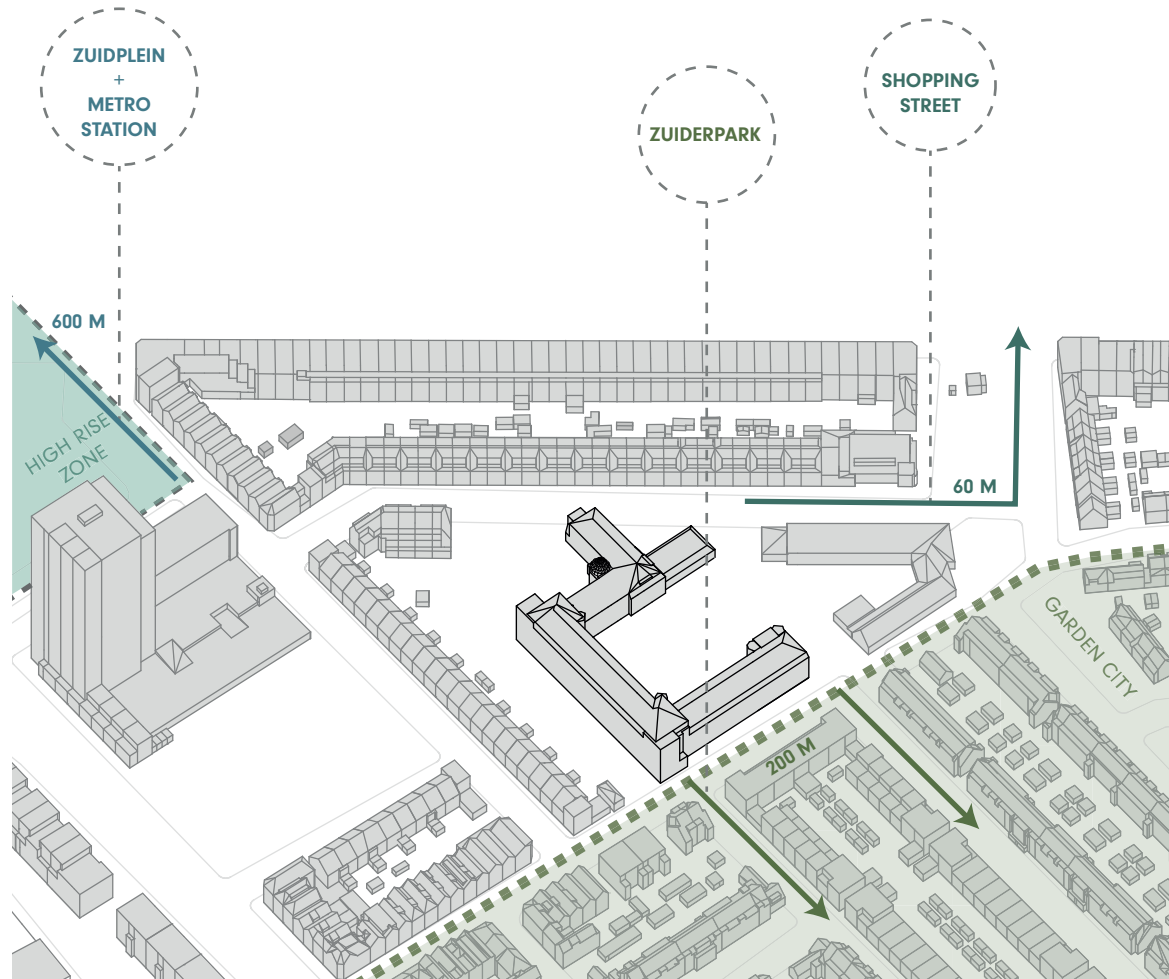
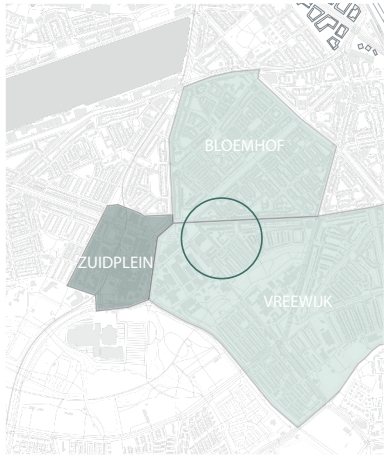


Collage City vision; Green City District

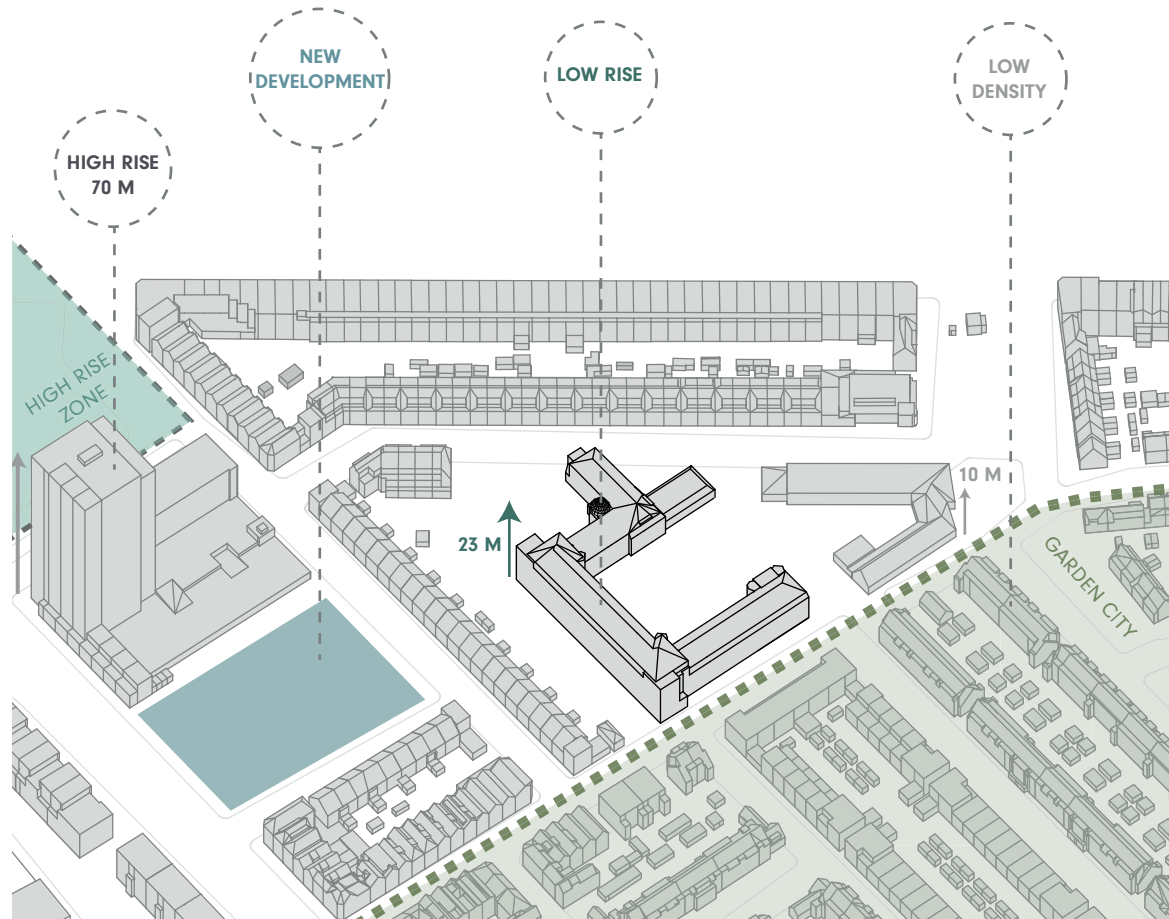
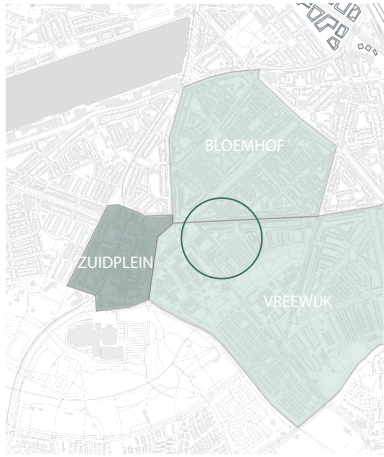
Project location; borders



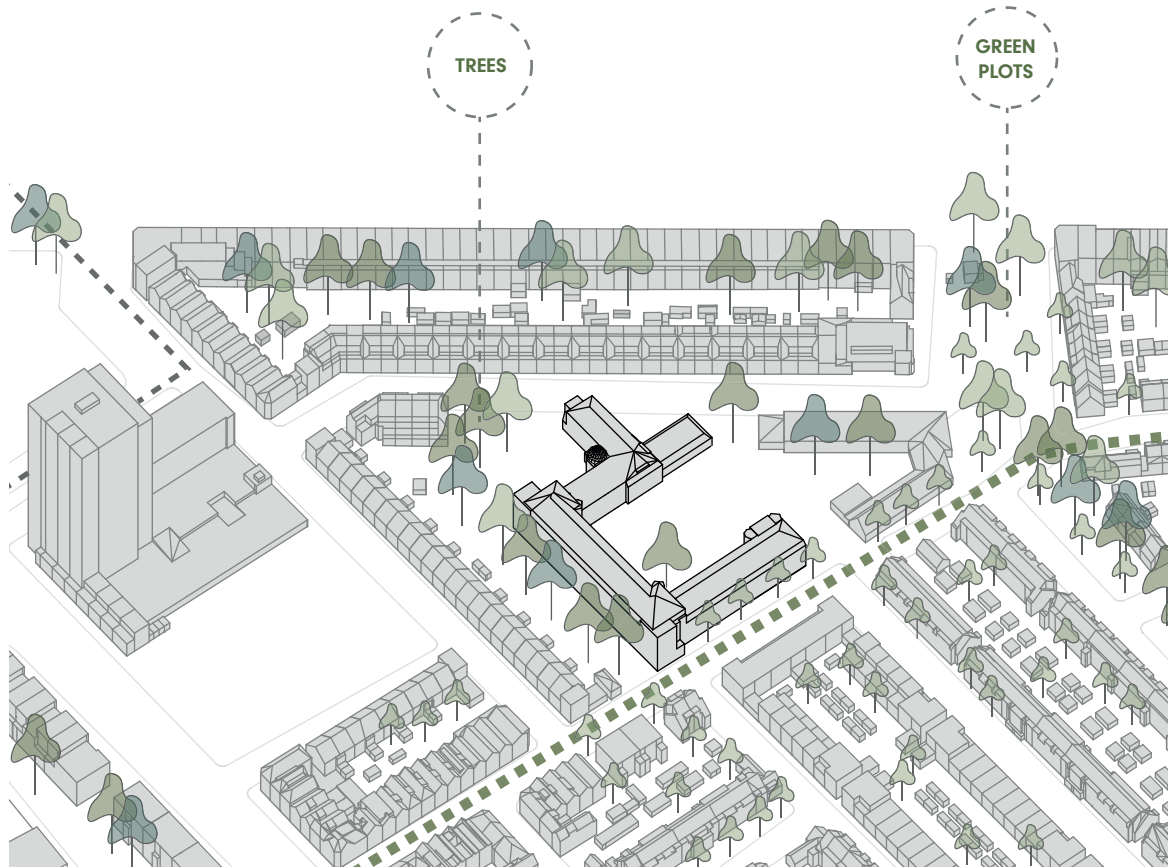
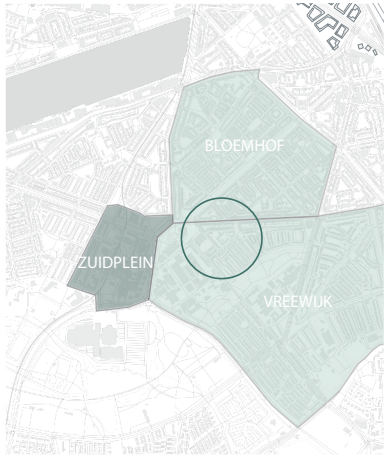
Project location; directions



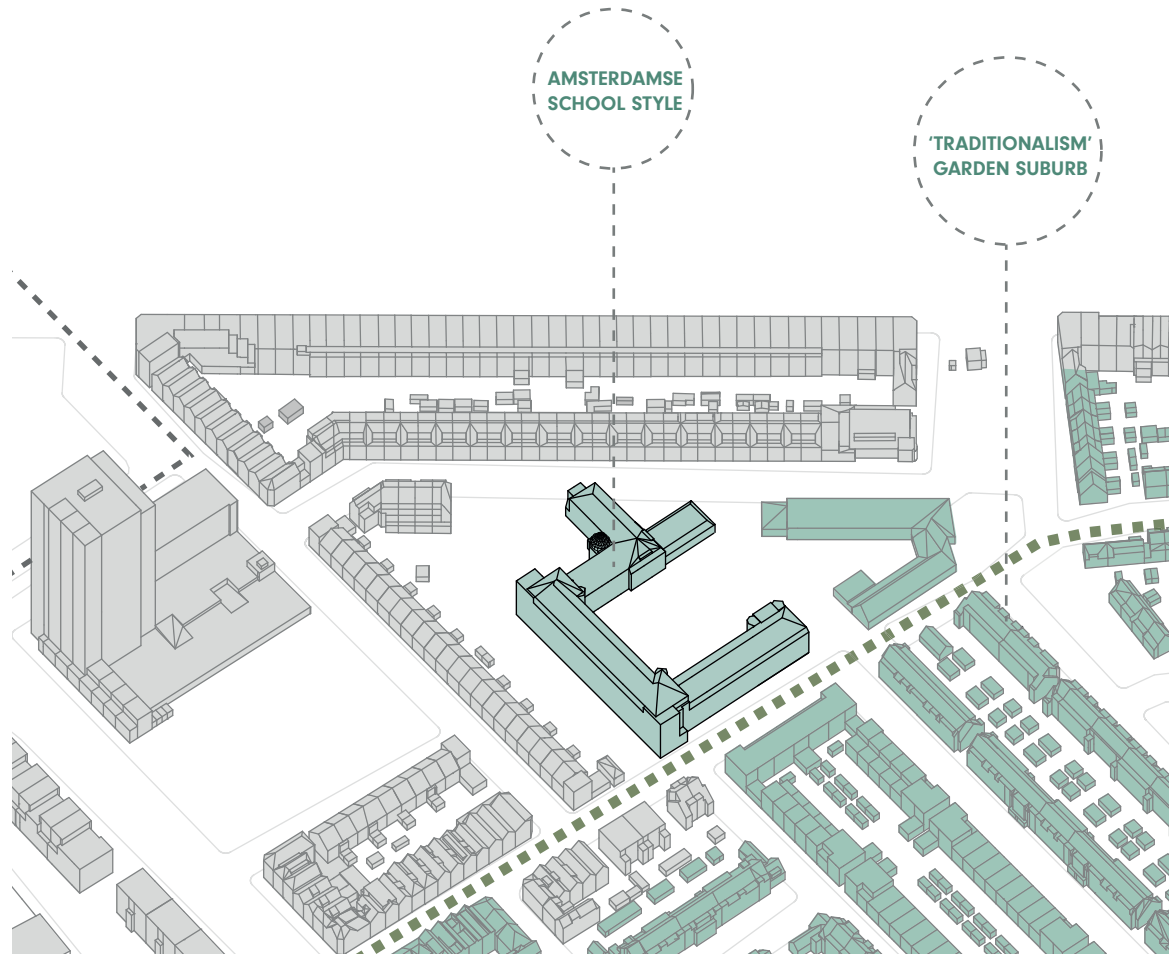
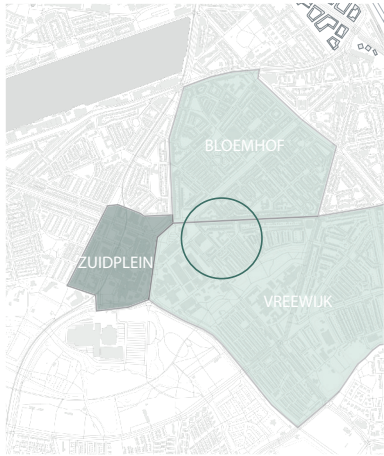
Project location; density



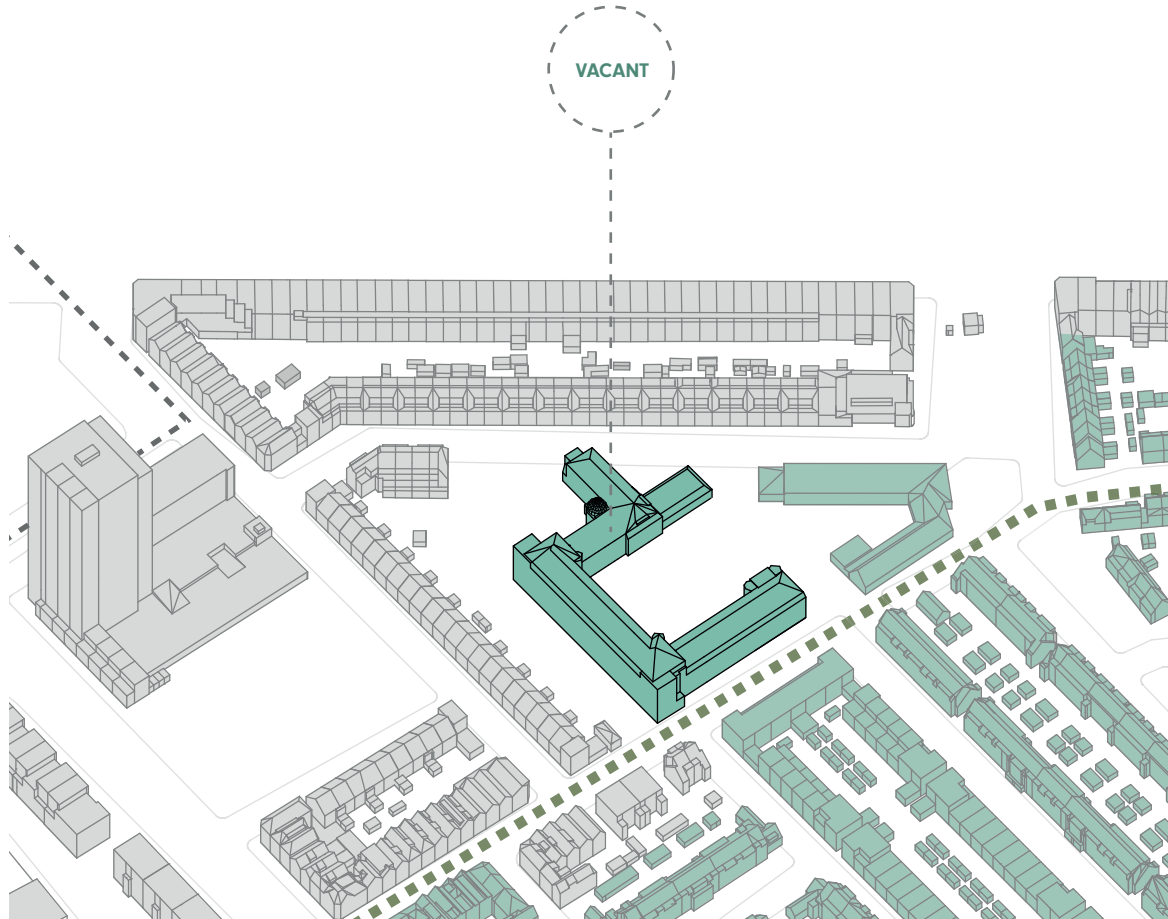
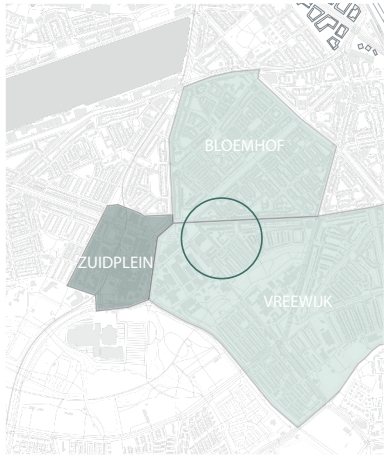
Project location; greenery



Project location; Garden Suburb architecture



Project location; vacancy



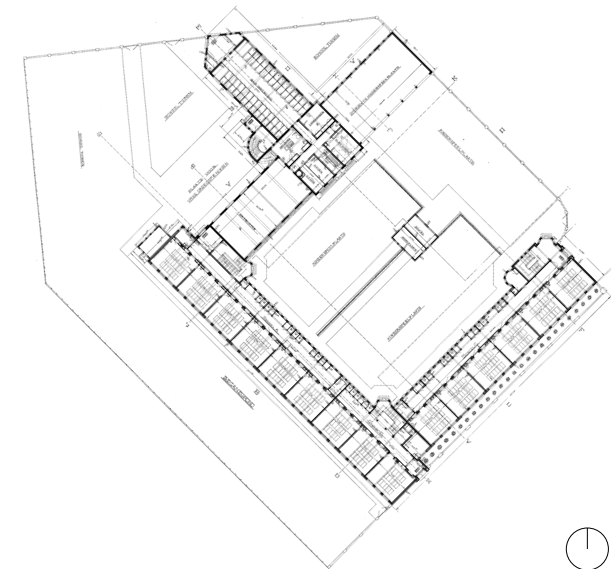
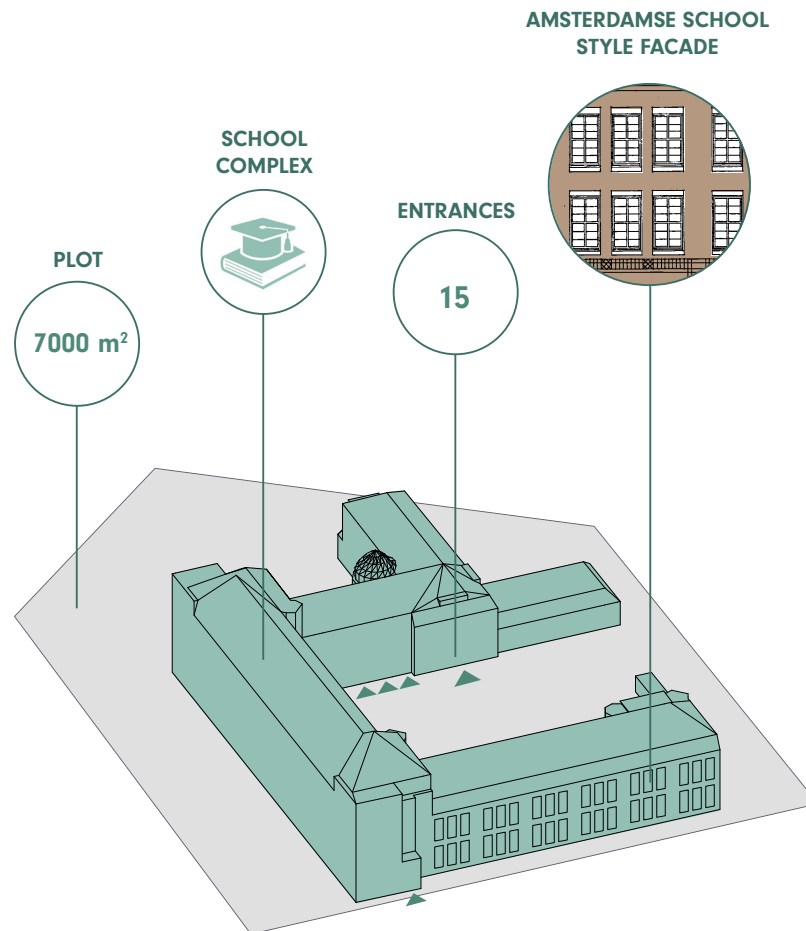
Vacant school complex from 1923

ADRESS: PLOEGSTRAAT 26/28, VORKSTRAAT 1/3/5, SIKKELSTRAAT 35

DATE: 1923

ARCHITECT: AD VAN DER STEUR

STATUS: VACANT SINCE 2016



Vacant school complex from 1923; characteristics



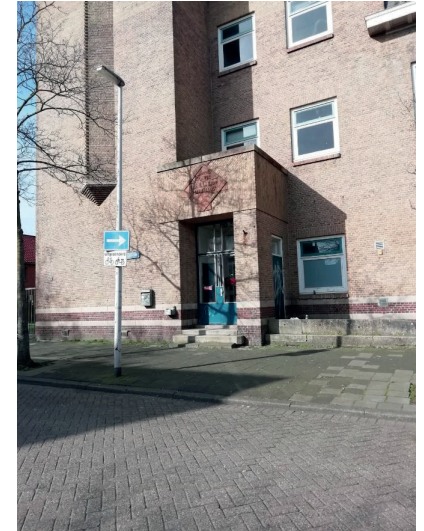
DECORATED WITH TURRETS



STEEP ROOFS AND DOMINANT
FACADE GRID

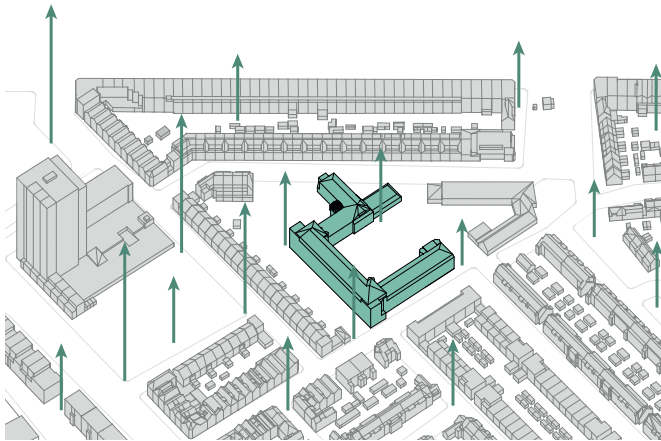


PLASTICITY OF THE FACADE
MADE WITH BRICK

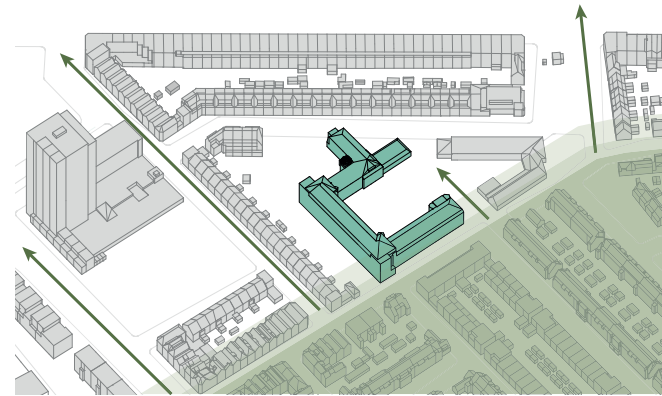


DECORATIVE ELEMENTS FROM
NATURAL STONE

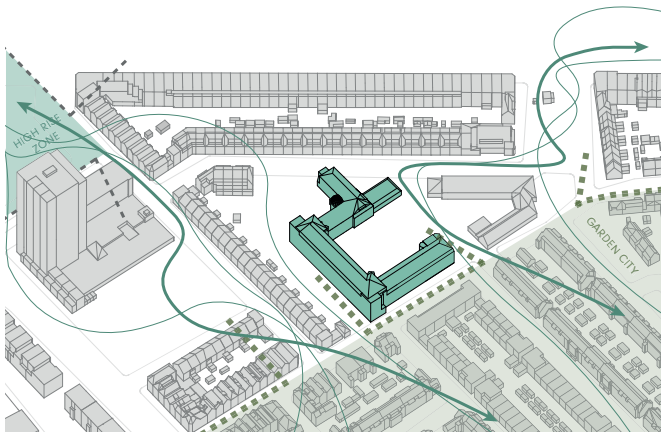
Site ambitions



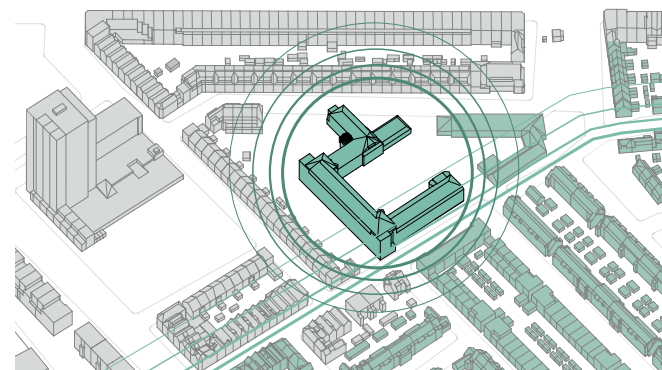
ADDRESS VACANCY AND DENSIFY



EXPAND GREEN NETWORK



BREAK BORDERS AND CREATE FLOW



CELEBRATE HISTORICAL GARDEN CITY ARCHITECTURE



Program ambitions



MIXED
FUNCTIONS



DENSIFY WITH
HOUSING



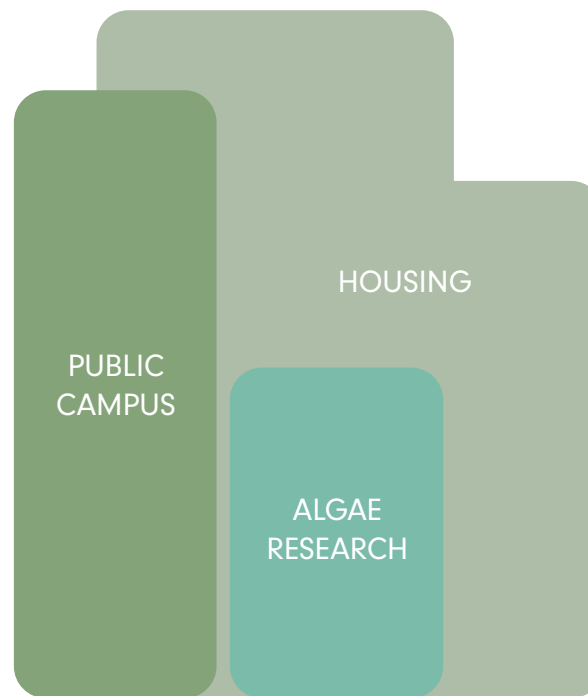
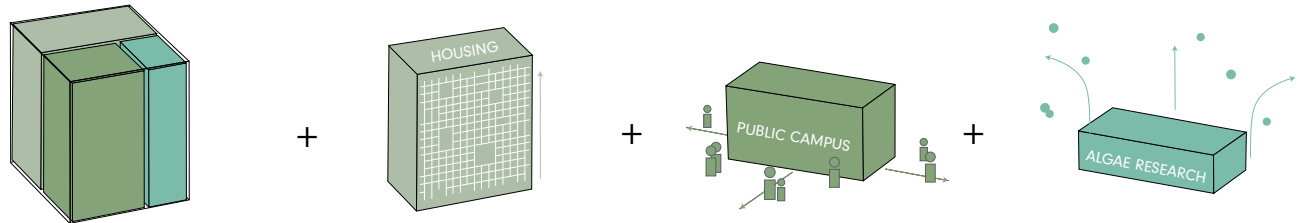
PUBLIC AND
COMMUNAL SPACE



EXPLORE
ALGAE ARCHITECTURE

Design brief

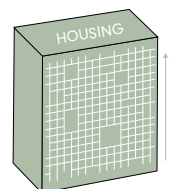
Program statement



Program; housing ambition

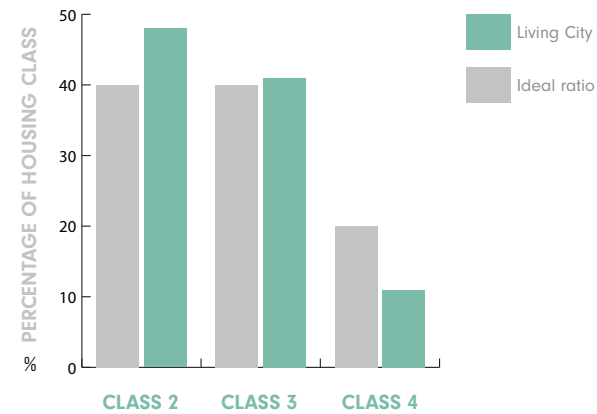
CLASS	CLASS 1	CLASS 2	CLASS 3	CLASS 4	CLASS 5	CLASS 6	CLASS 7
Sector	Social housing	Social housing	Social housing	Medium rent	Medium rent	High rent	Private rental
Price range	< €592,55	€592,55 – €635,05	€710,68	€872 – €1.300	€872 – €971	€972 – €1.300	> €1.300
Income per year	< €22.000	€22.000 – €30.150	< €36.165	€36.166 – €44.360	€44.360 – €54.248	€54.248 – €72.330	> €72.330

CREATE A FLOW IN THE HOUSING MARKET

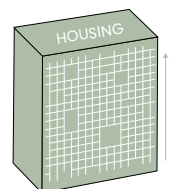


Program; housing ambition

CLASS 2	CLASS 3	CLASS 4
Social housing	Social housing	Medium rent
€592,55 – €635,05	€635,06 – €710,68	€710,68 – €872
€22.000 – €30.150	< €36.165	€36.166 – €44.360



CLASS DIVISION ACCORDING TO THE IDEAL RATIO

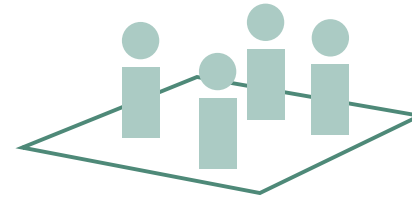


Program; greenery ambition



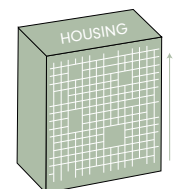
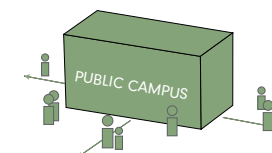
GARDEN CITY DESIGN

DENSIFICATION

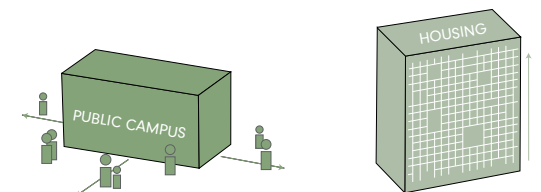
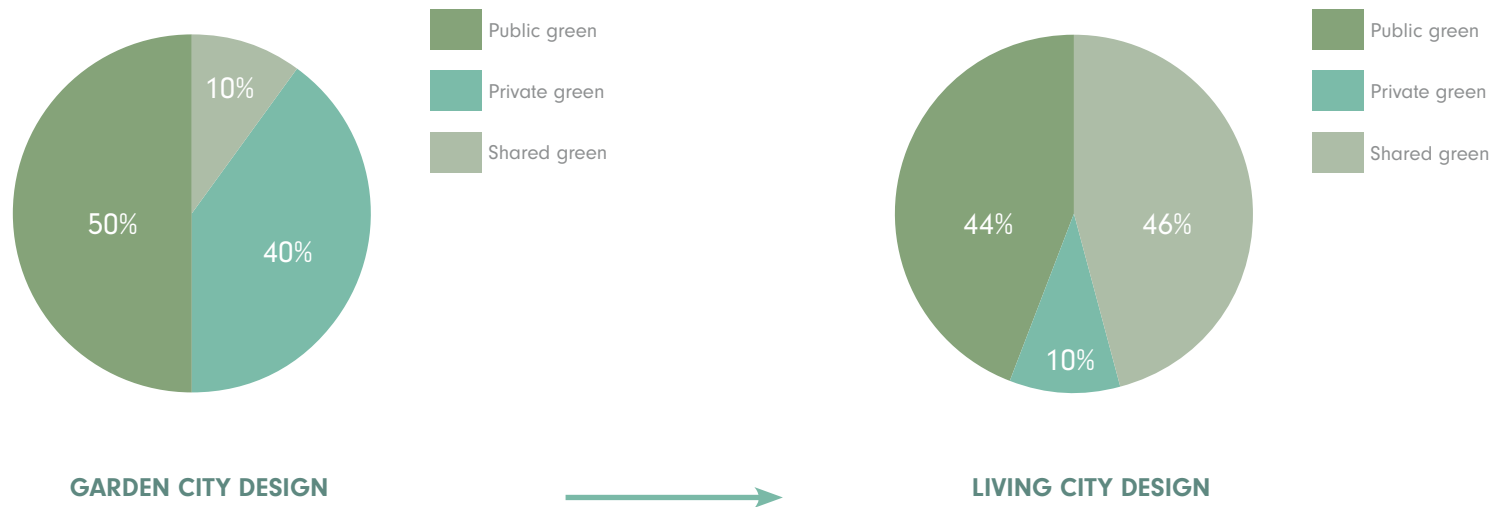


LIVING CITY DESIGN

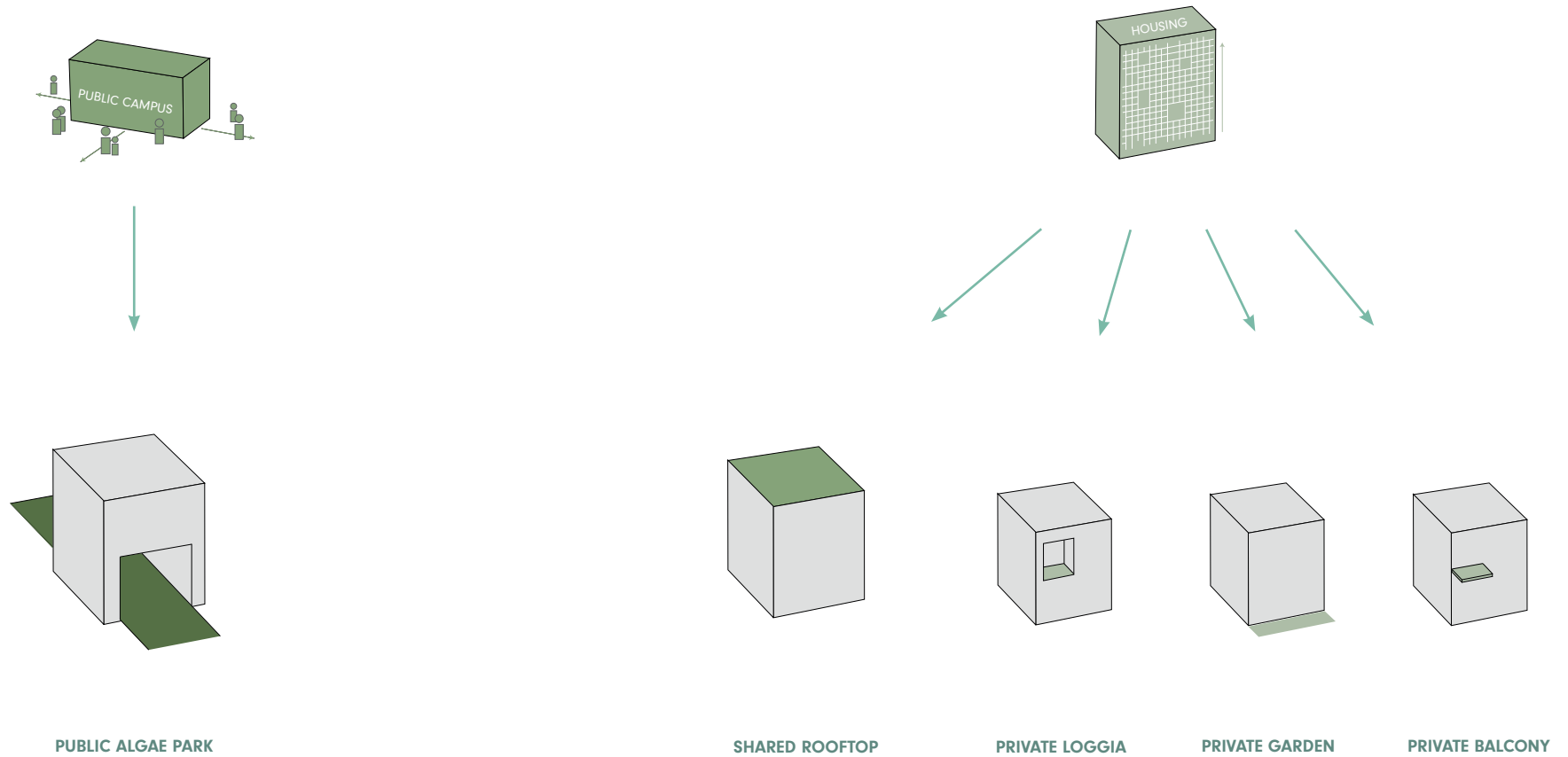
MORE SHARED
LESS PRIVATE



Program; greenery ambition



Program; greenery typology

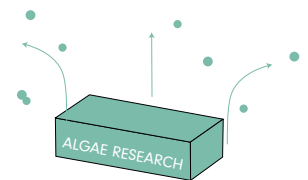


Design brief

Program; algae-architecture ambition

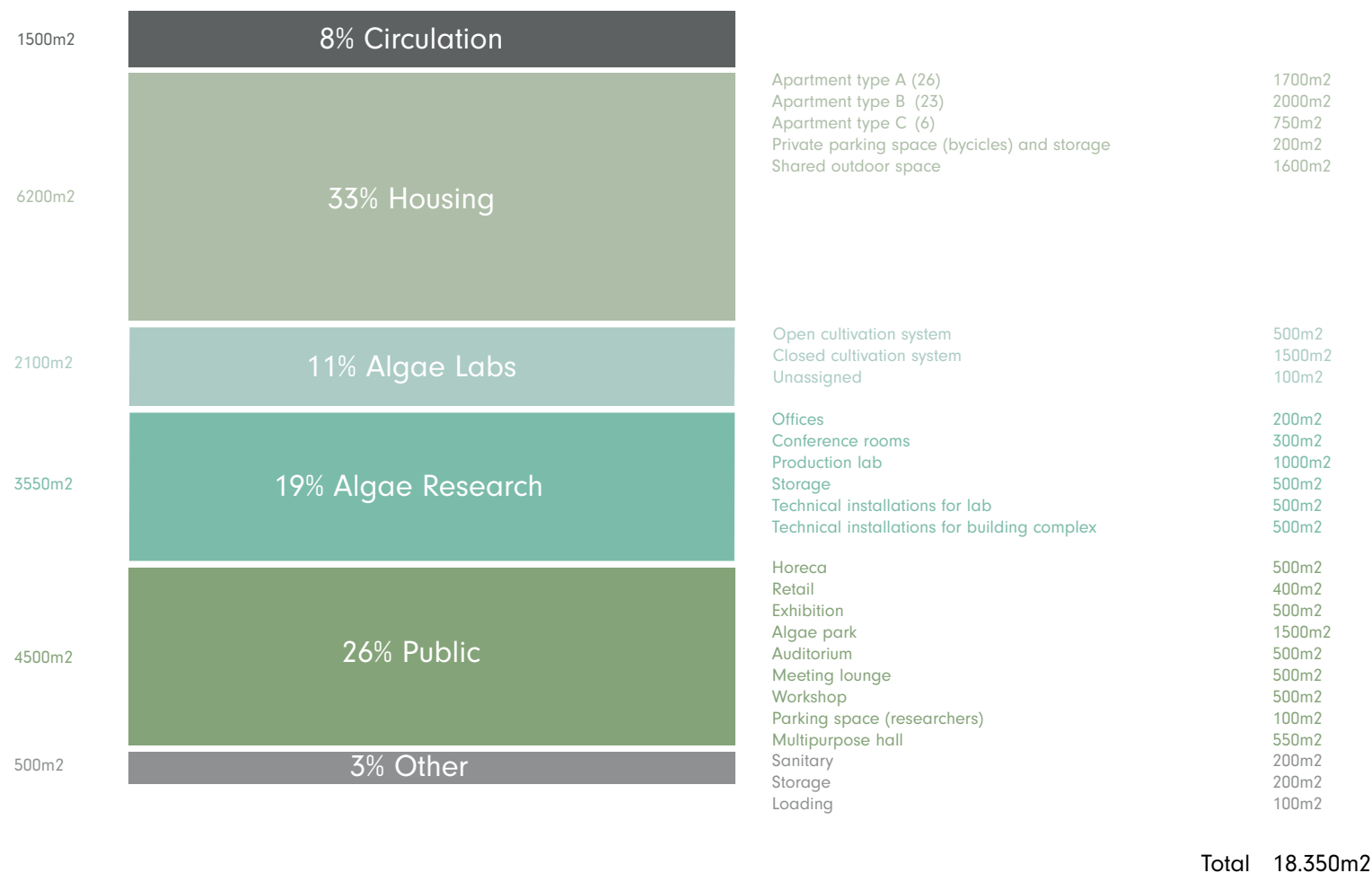


EXPLORE THE POTENTIAL OF ALGAE-ARCHITECTURE
AND PRODUCE ALGAE INNOVATIONS



Design brief

Program bar



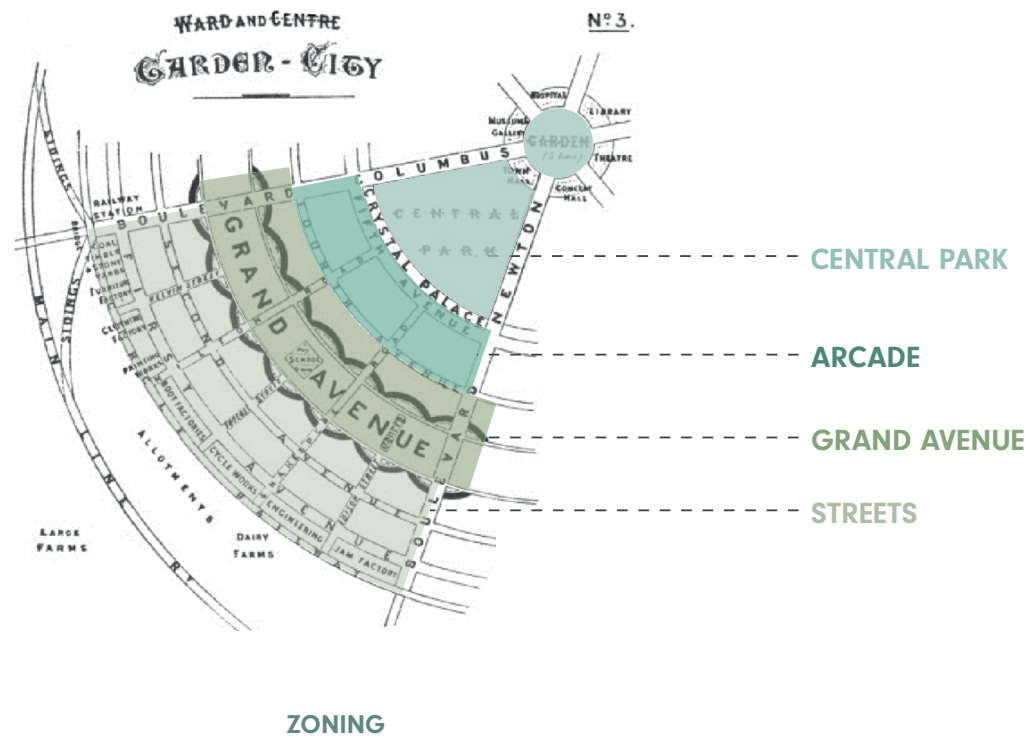
Design brief

Program; relation ambitions

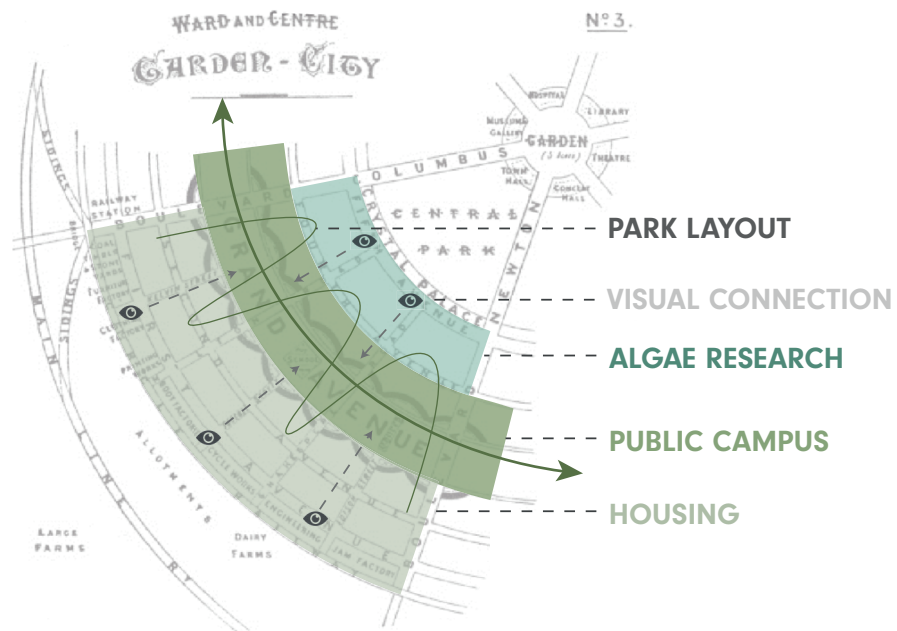


GARDEN CITY DESIGN

Program; relation ambitions

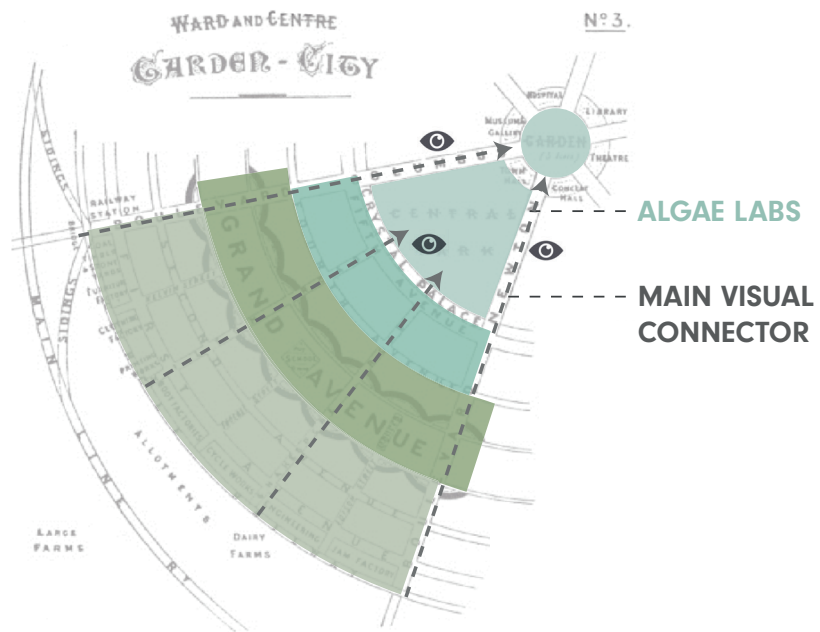


Program; relation ambitions



PUBLIC CAMPUS PARK LAYOUT

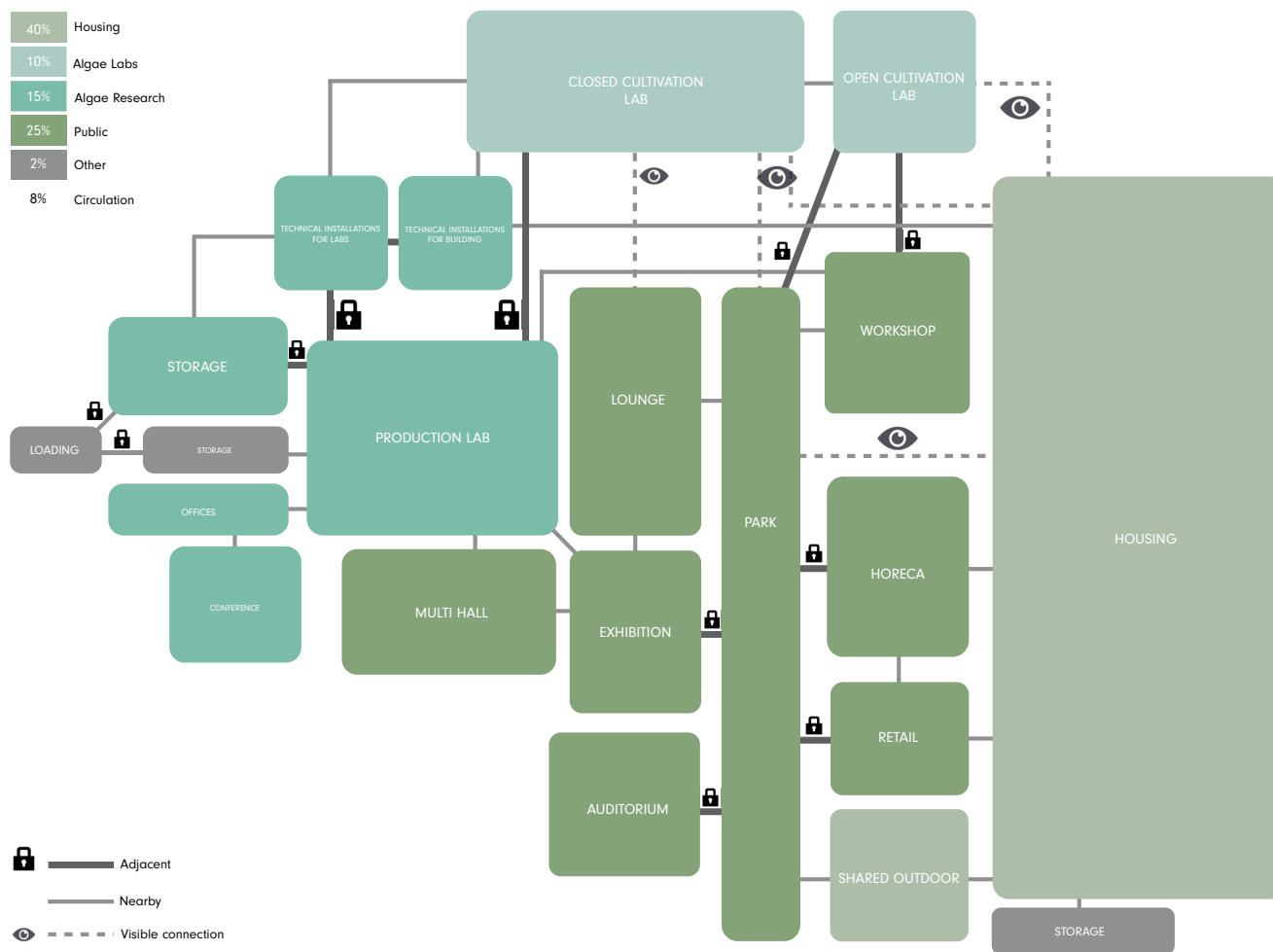
Program; relation ambitions



ALGAE LABS AS VISUAL CONNECTOR

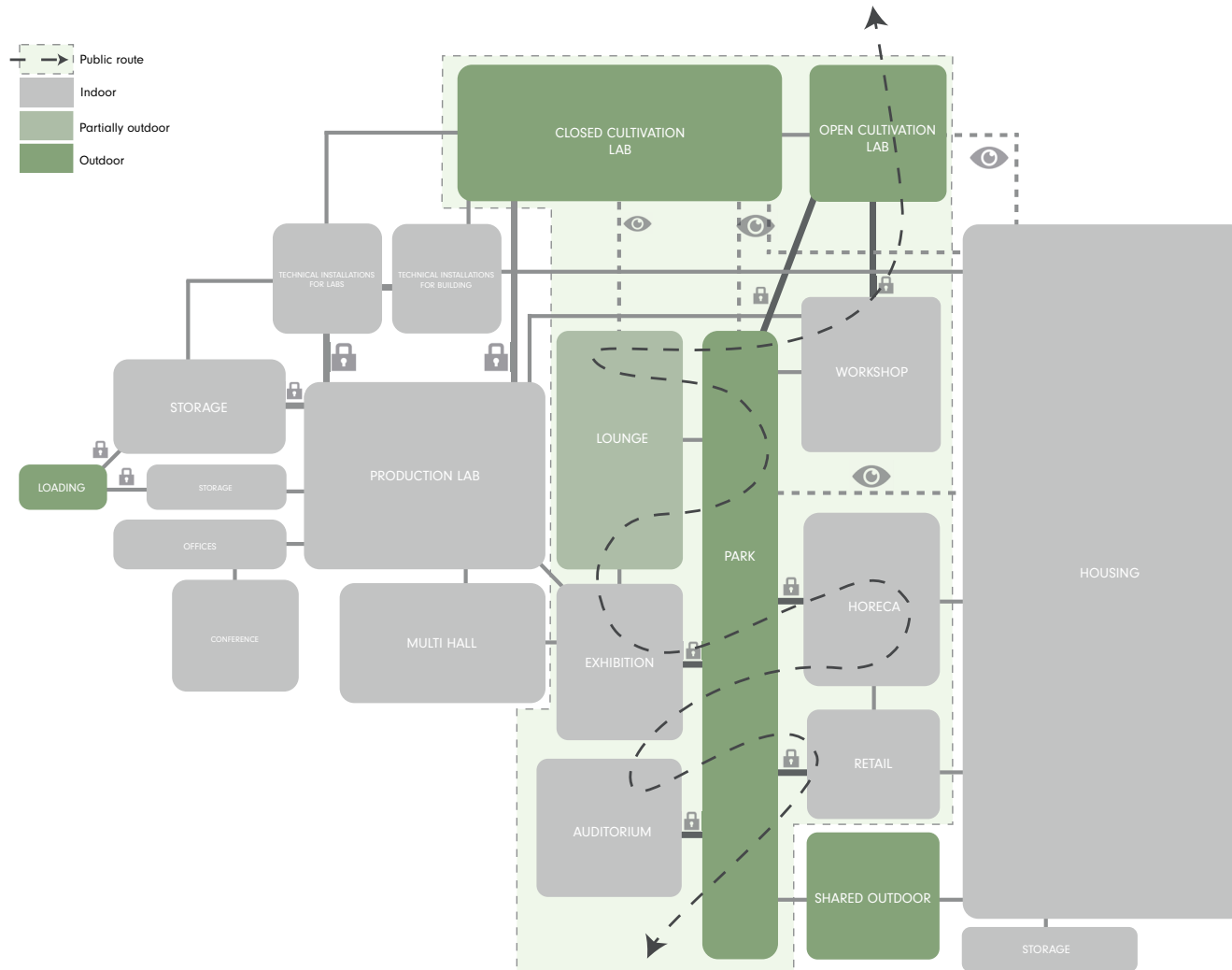
Design brief

Program relations



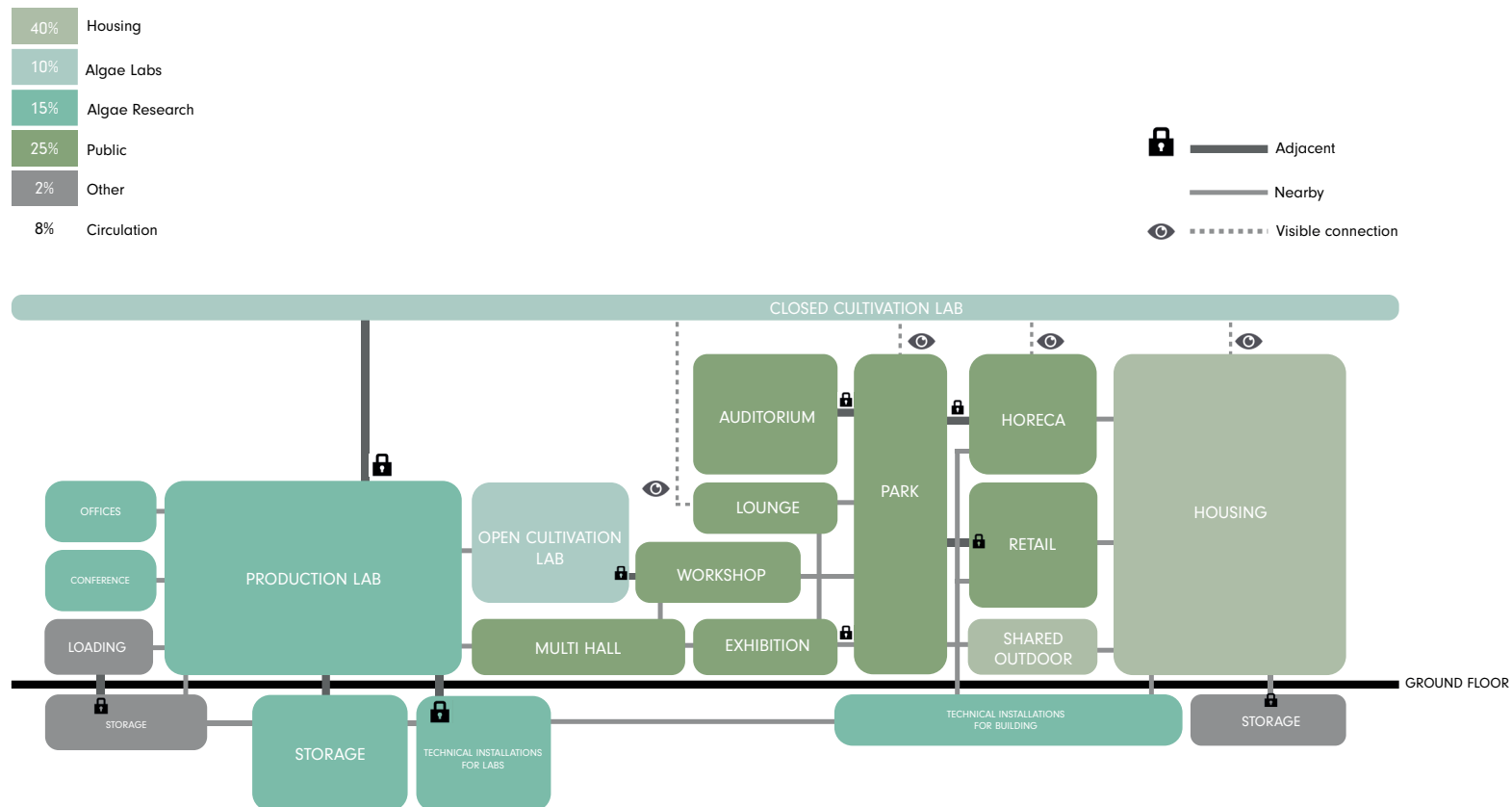
Design brief

Program relations; public route



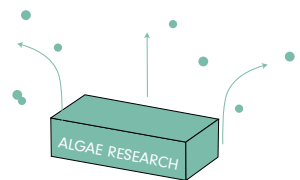
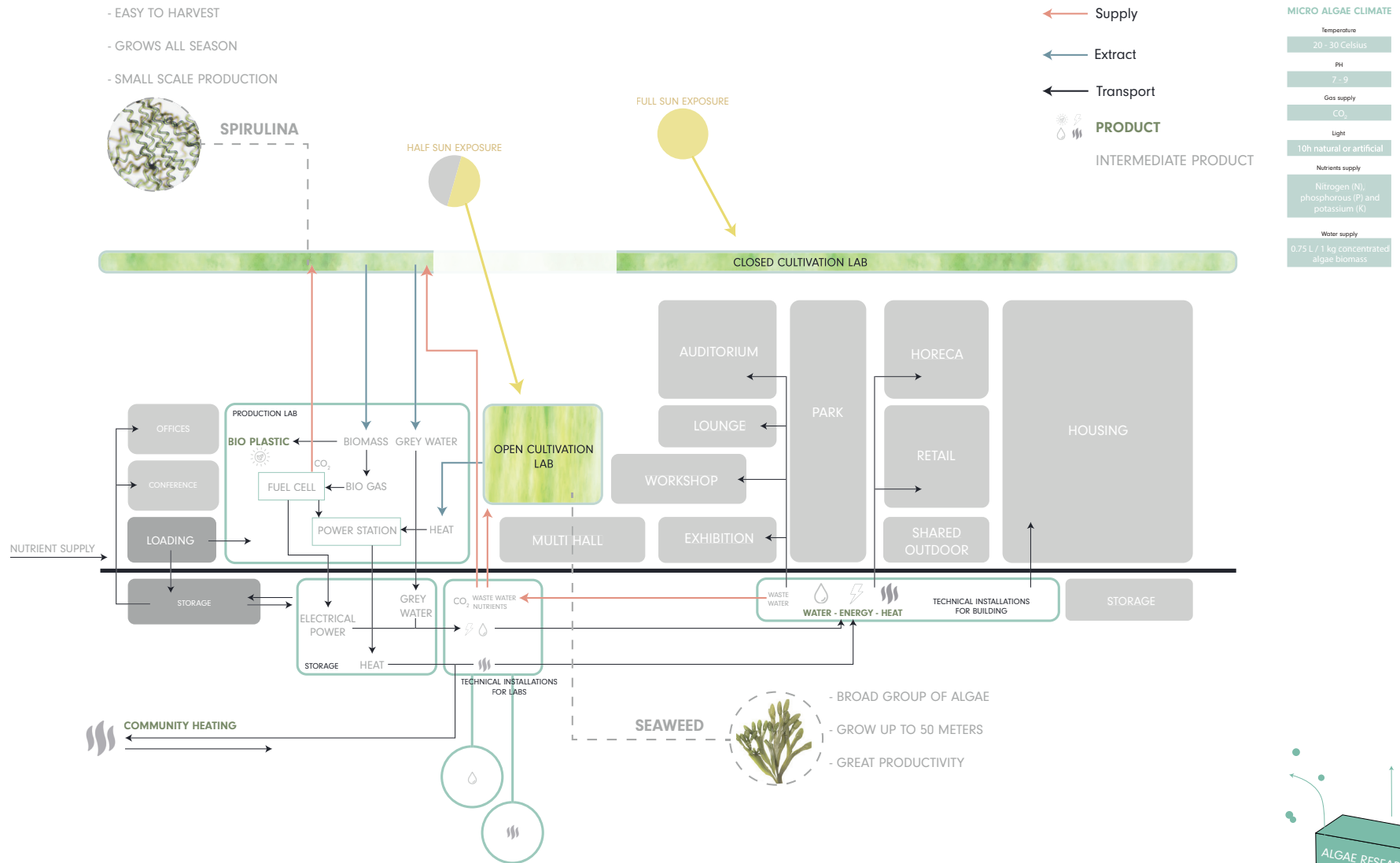
Design brief

Program relations; section



Design brief

Technical algae system



Design ambition

The Living City is an algae-architecture experiment that combines an algae research institute with a public algae park running through and social housing in one complex.



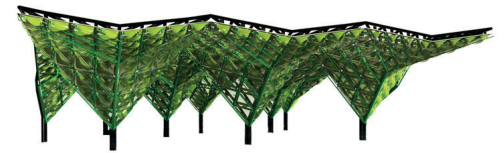
CITY TYPOLOGY



COMMUNITY FEELING



CURIOSITY

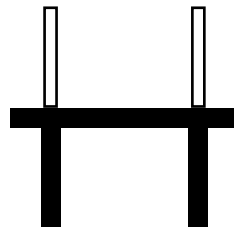


EXTREME ALGAE ARCHITECTURE

Construction ambitions



USE THE GRID OF THE EXISTING



HEAVY VERSUS LIGHT



SEPARATE ALGAE-ROOF STRUCTURE

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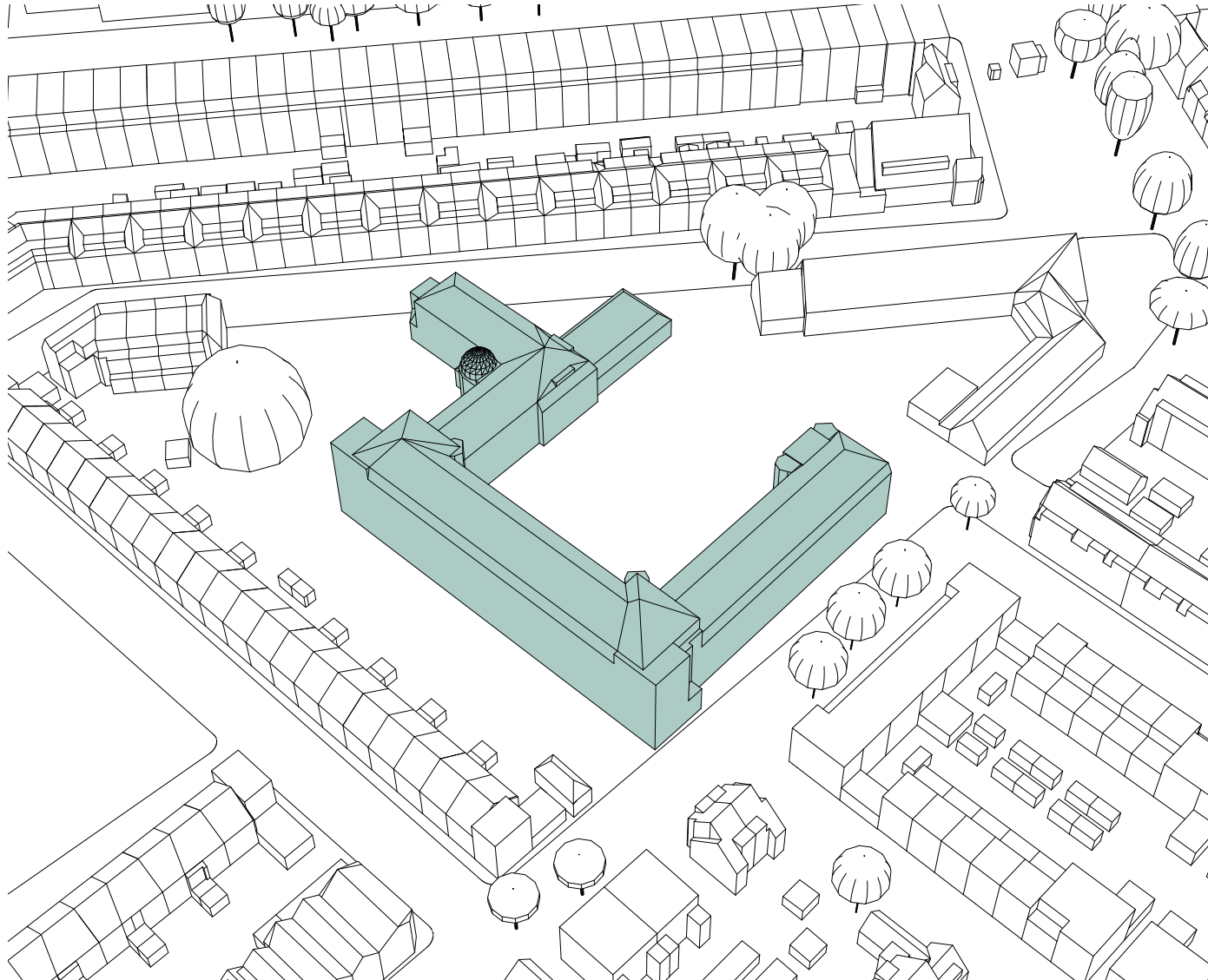
Concept

The existing building



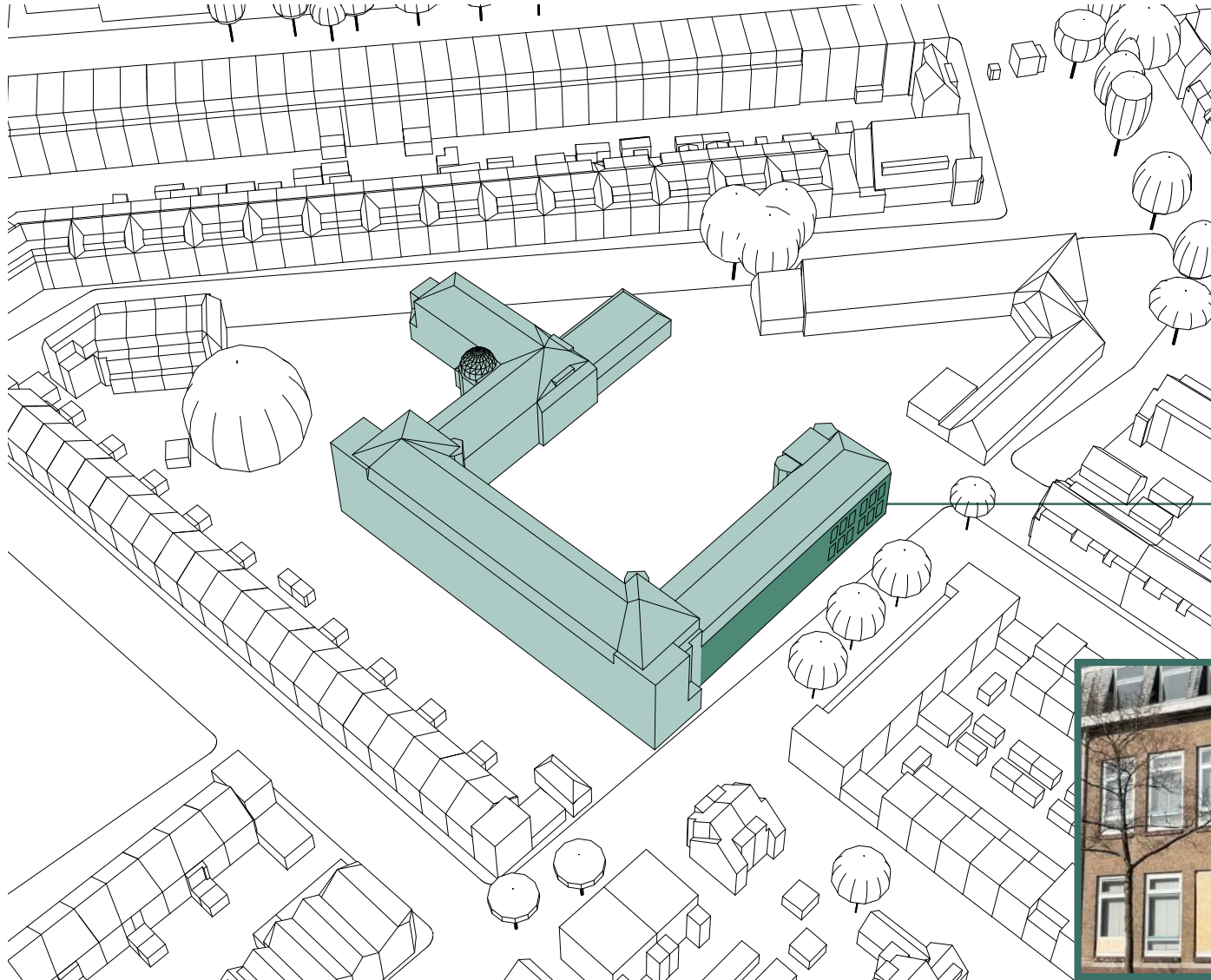
Concept

The existing building

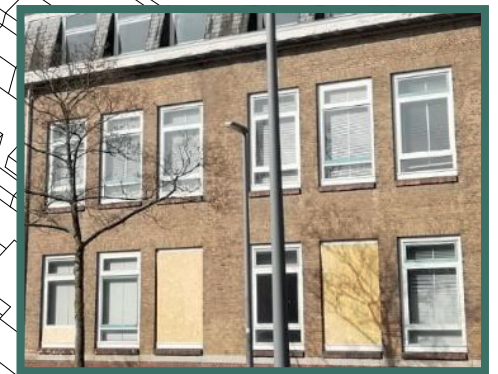


Concept

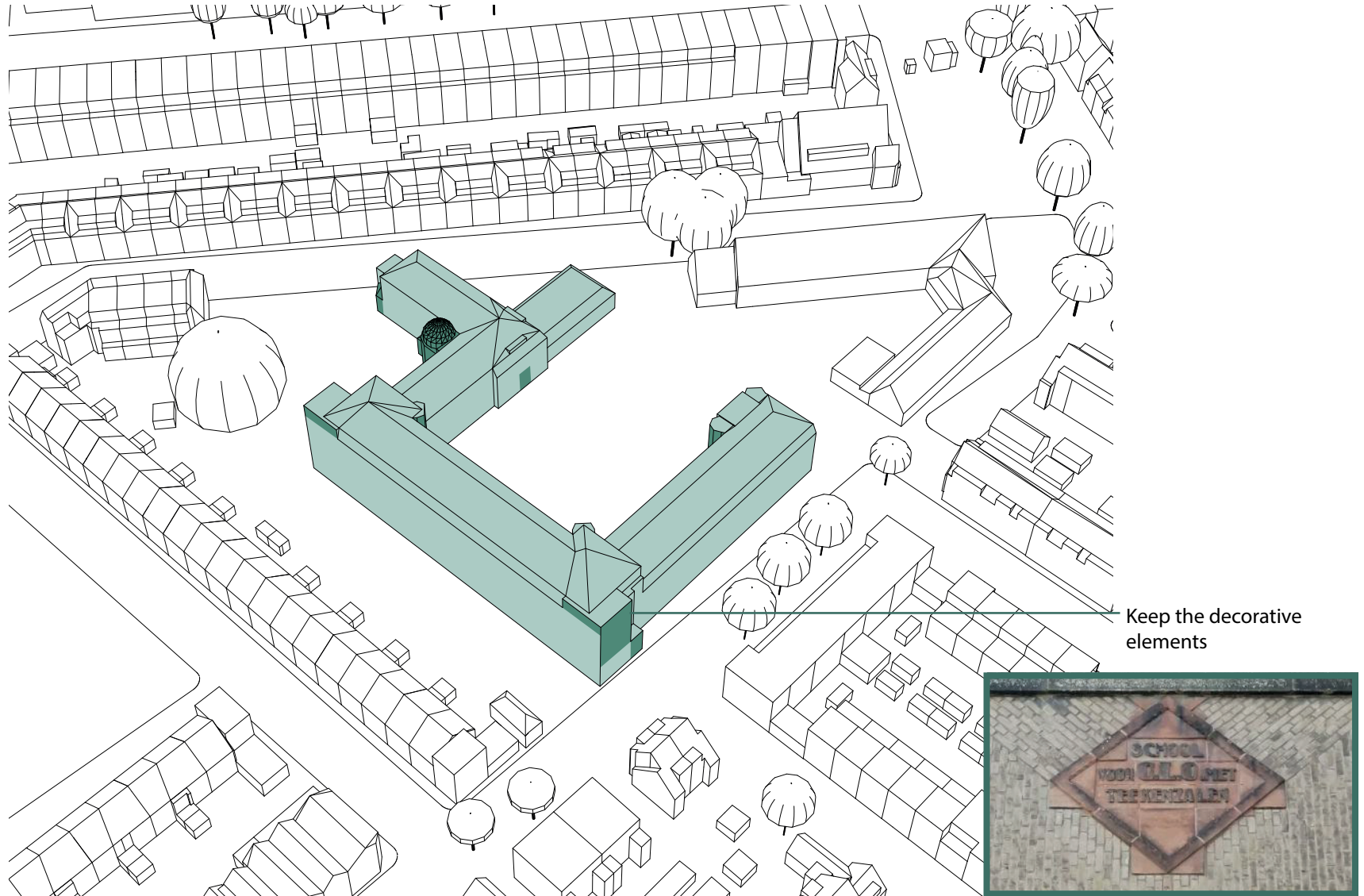
The existing building - qualities



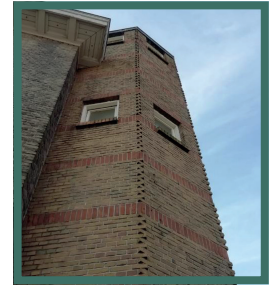
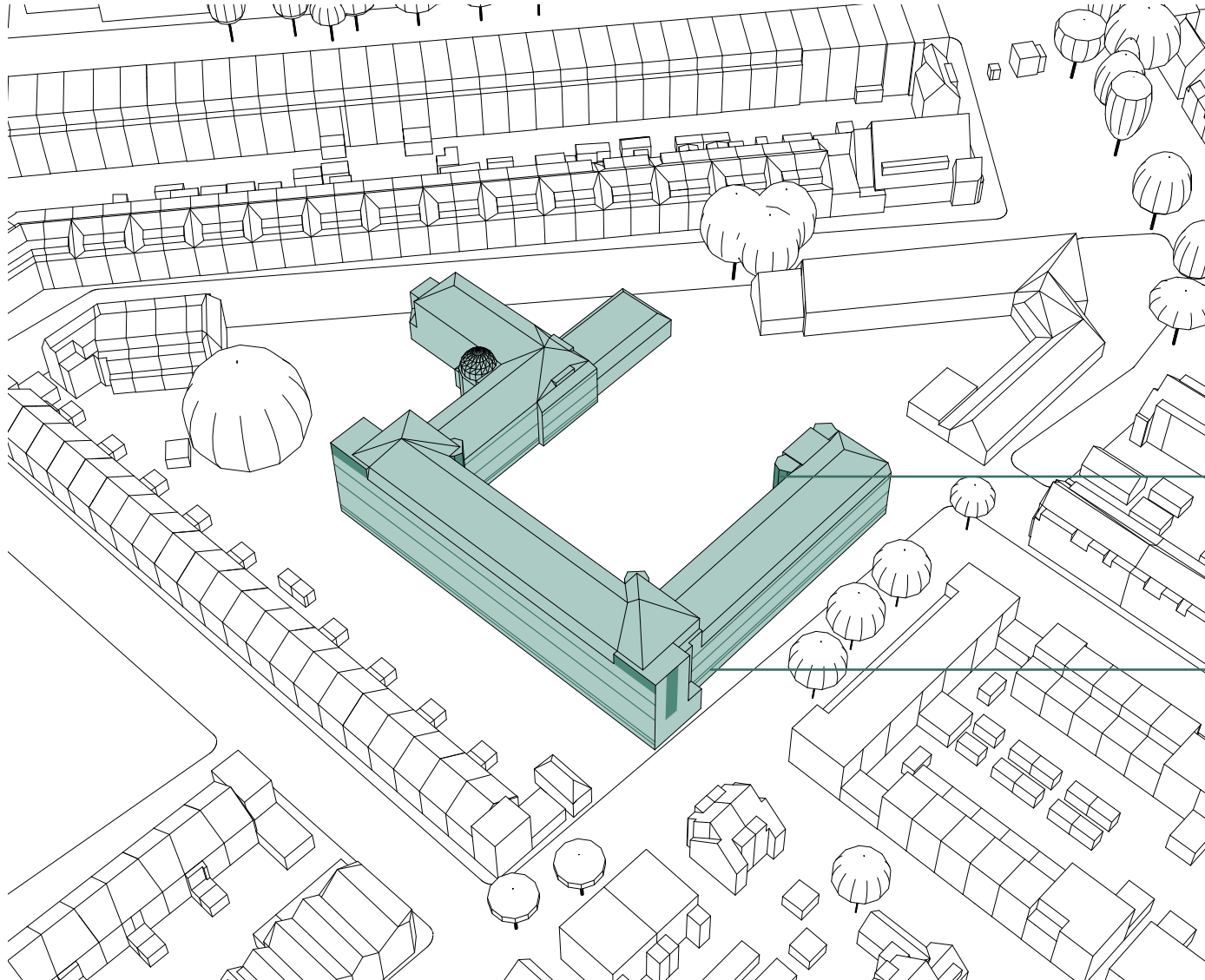
Use the grid of the facade



The existing building - qualities

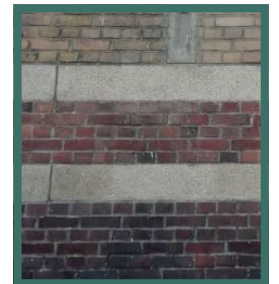


The existing building - qualities



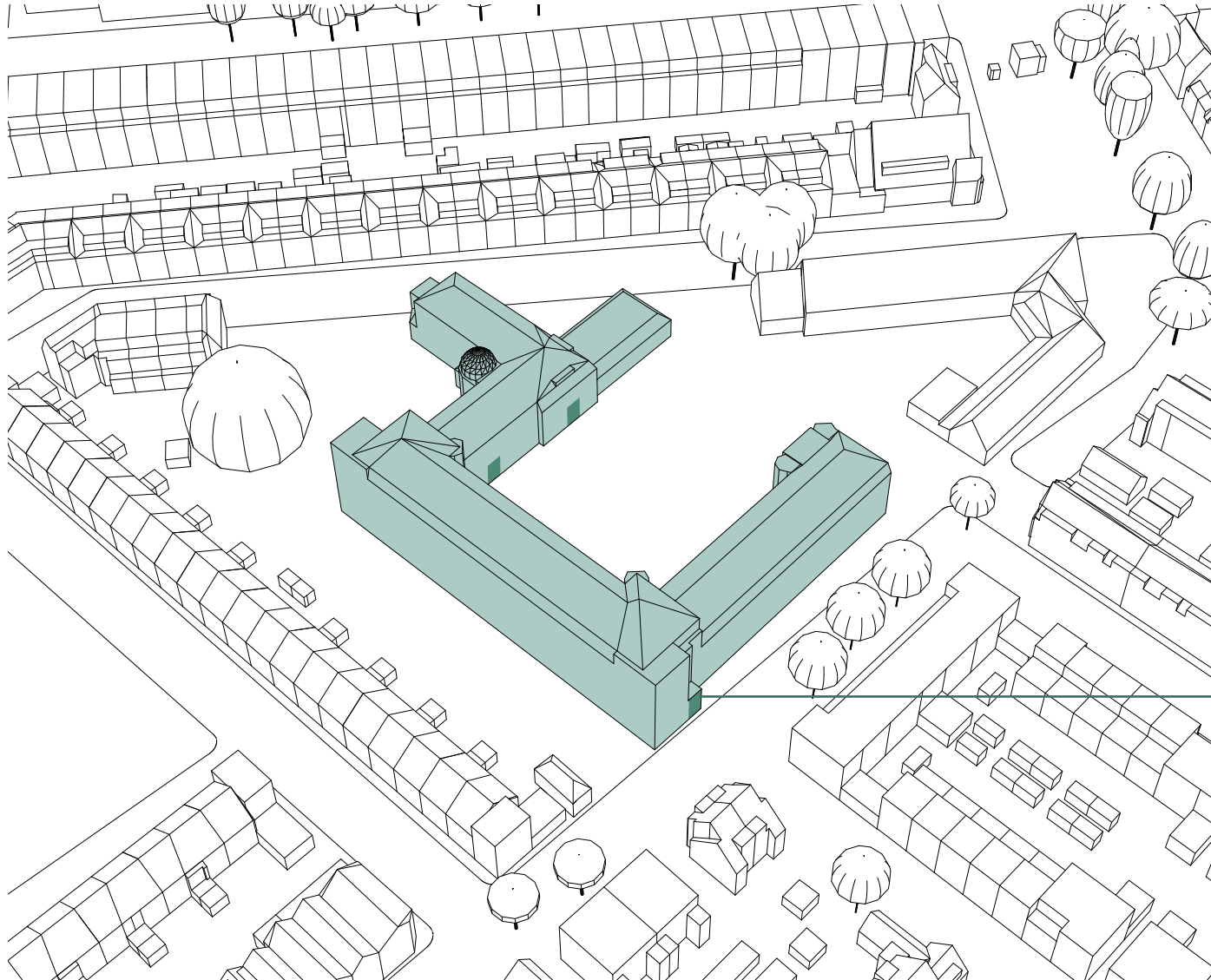
Value the plasticity of
brick facade

Maintain the horizontal
lines of brick facade



Concept

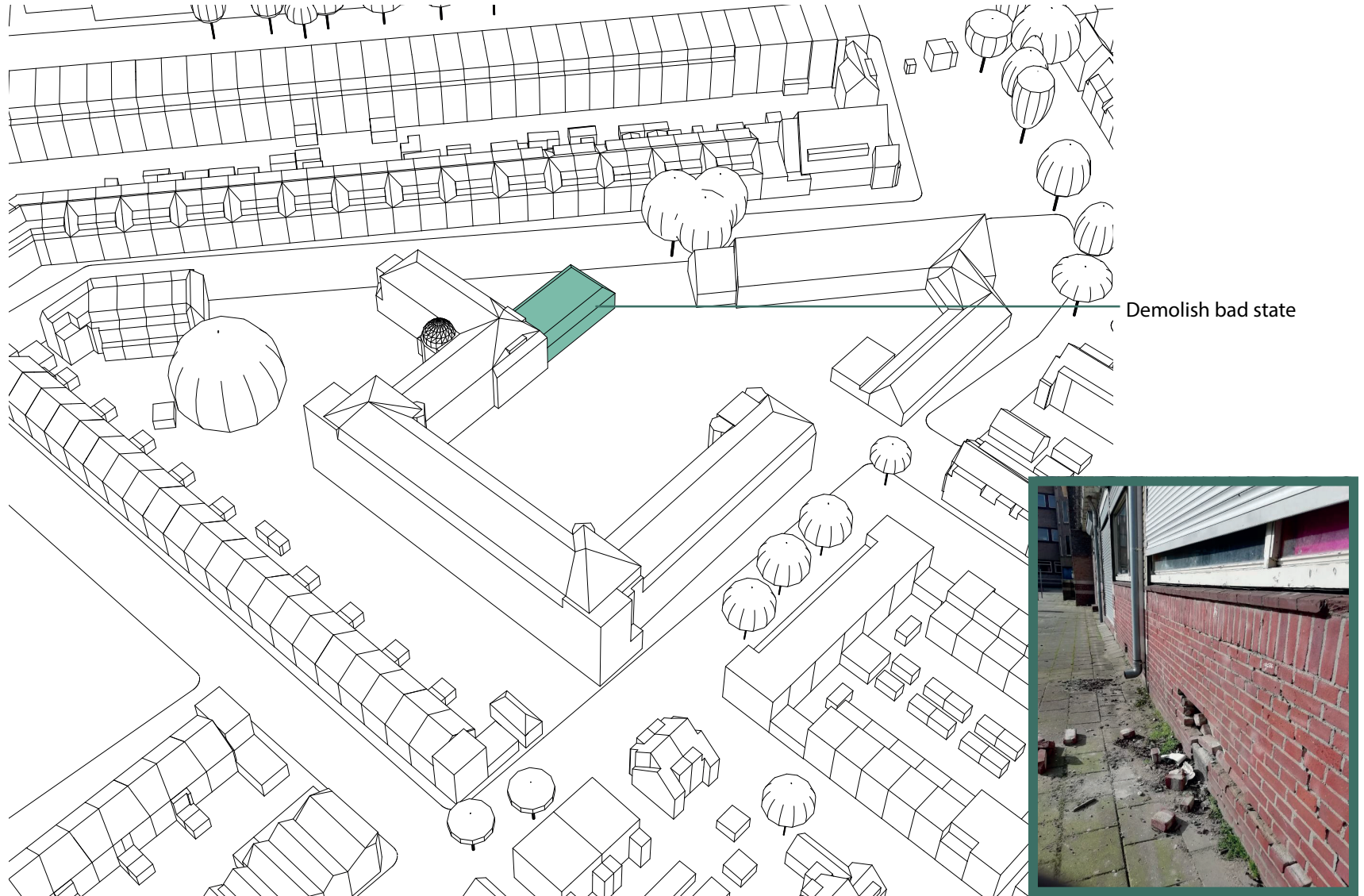
The existing building - qualities



Use the entrances

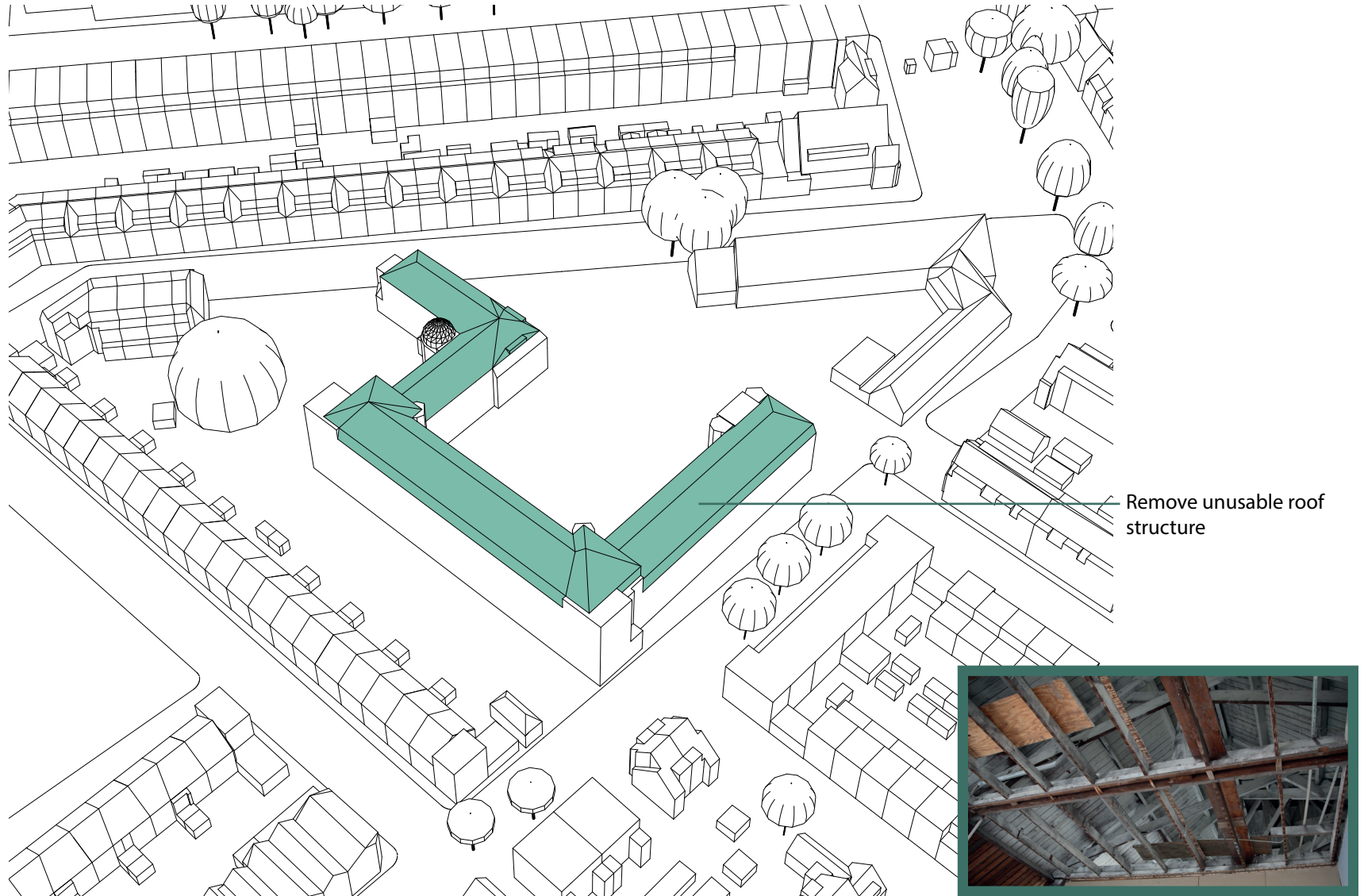
Concept

The existing building



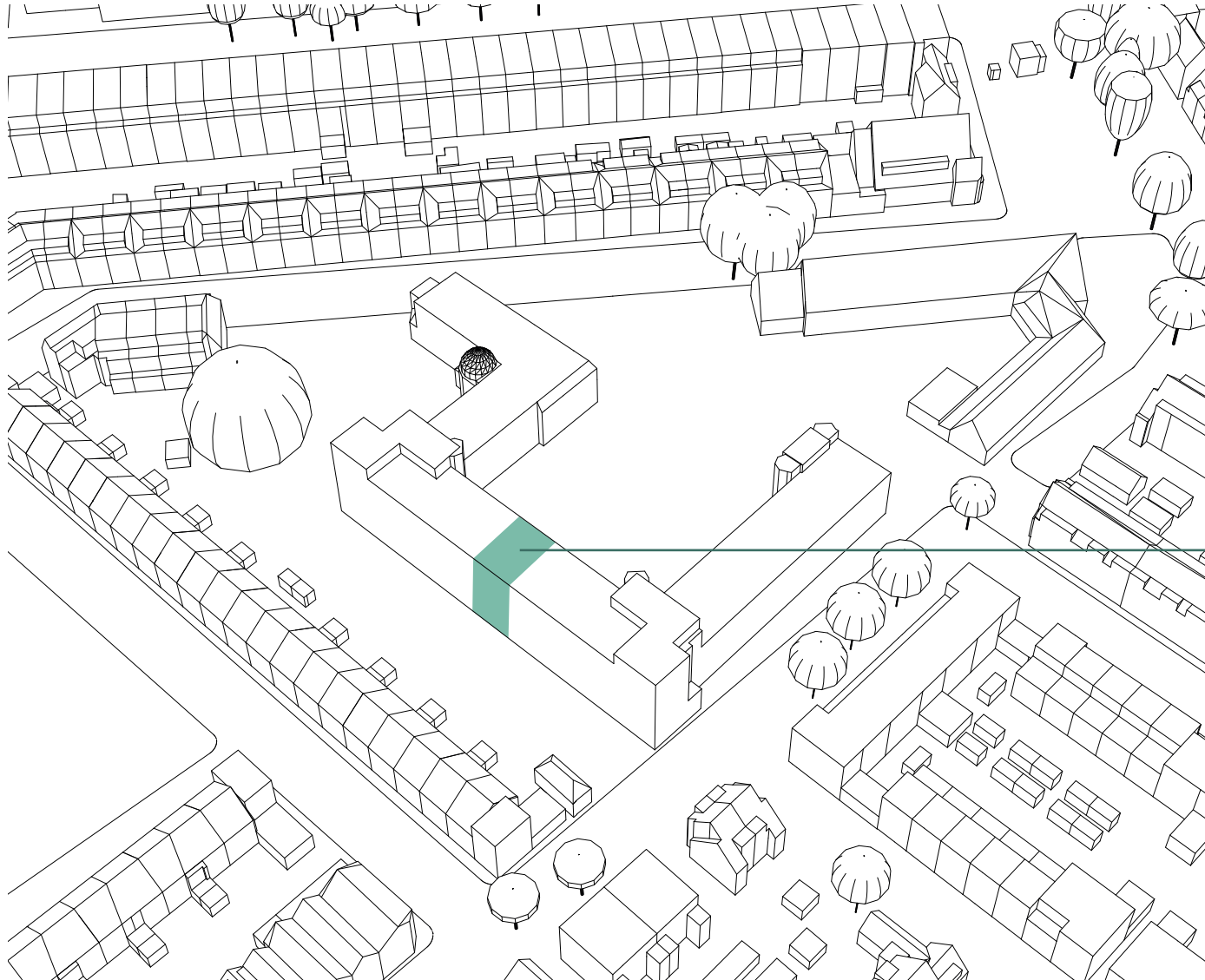
Concept

The existing building



Concept

The existing building

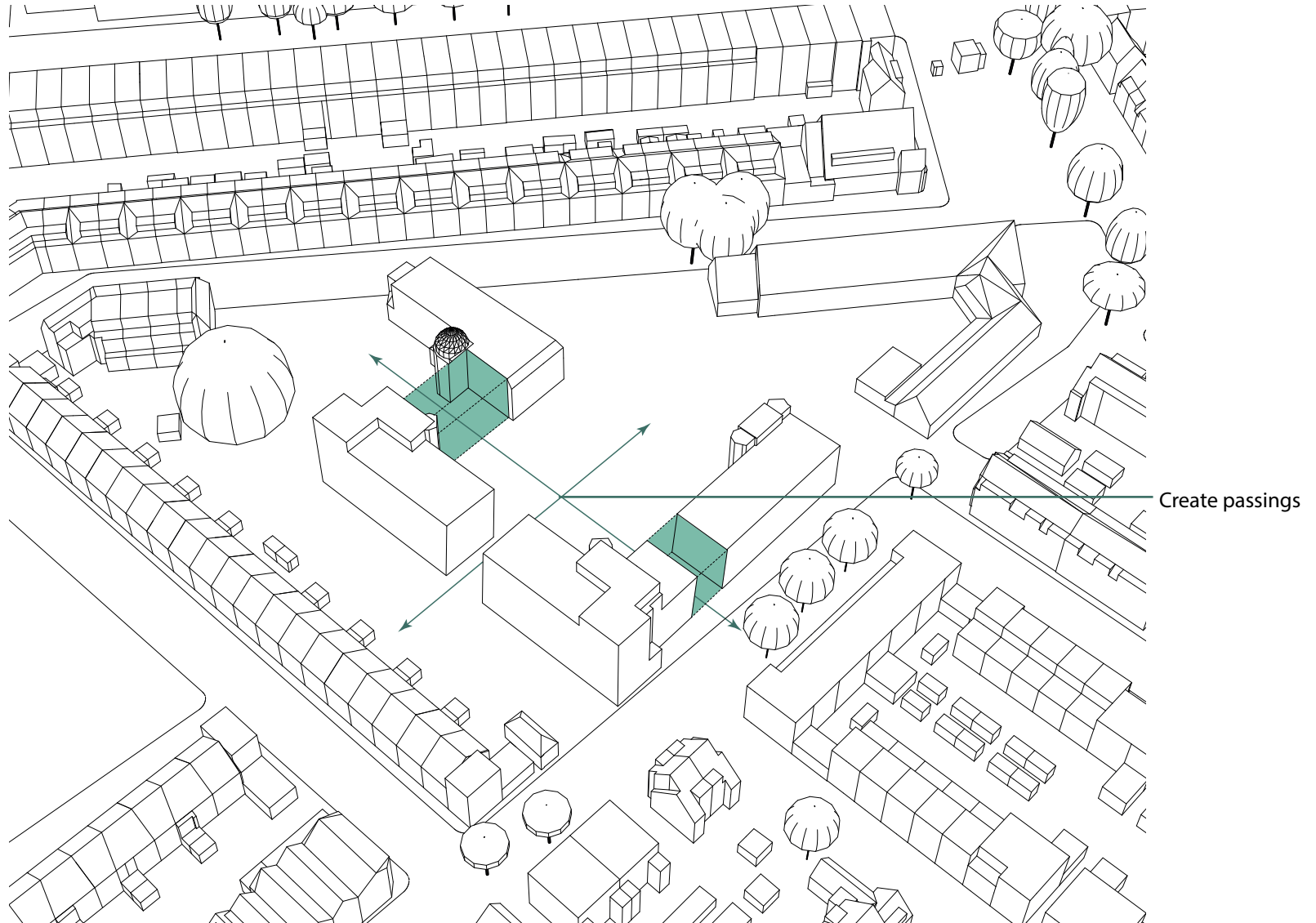


Demolish unoriginal part
from 1962



Concept

City typology ambition



Concept

City typology ambition

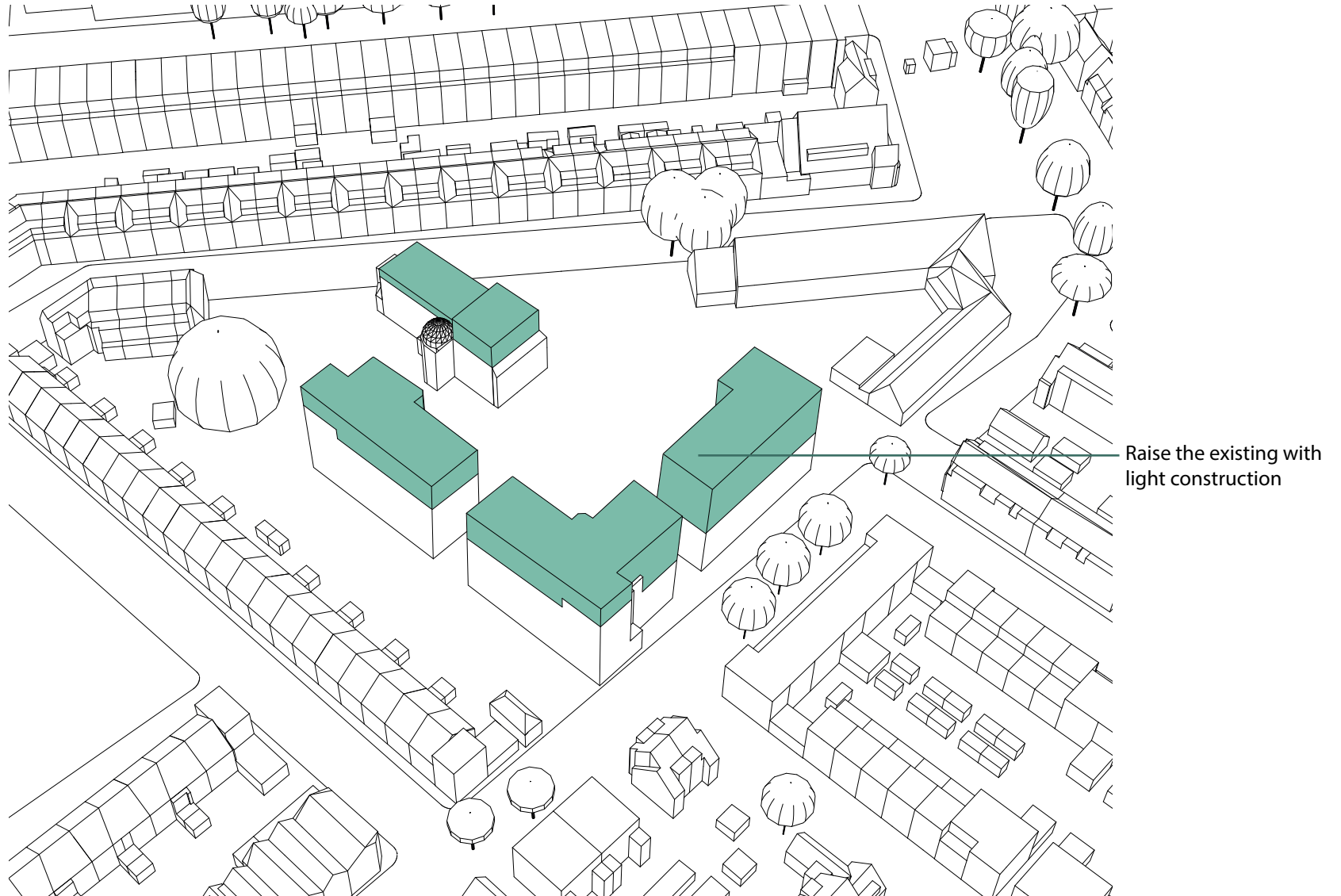


Maintain the courtyard



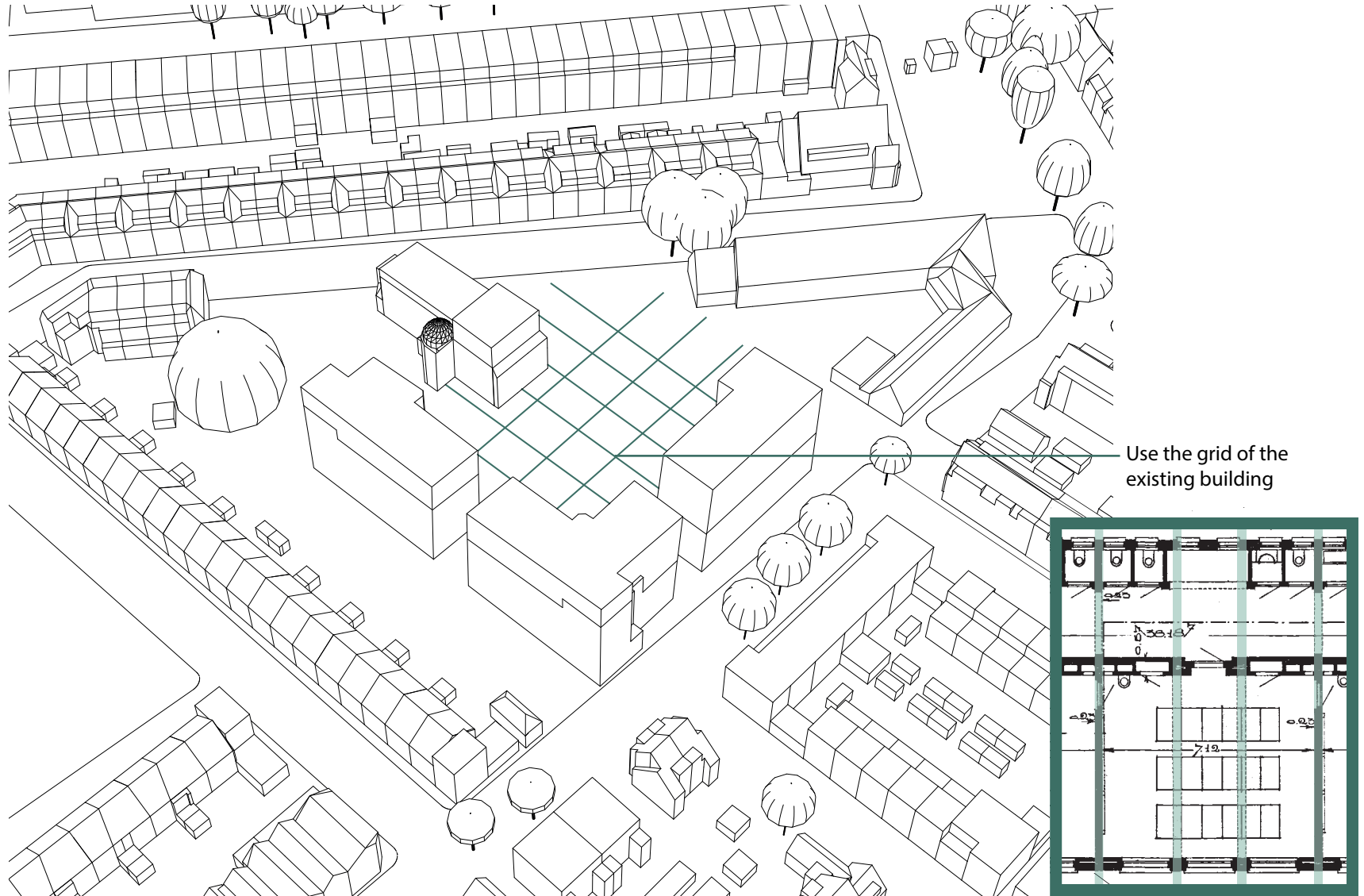
Concept

Additional volume



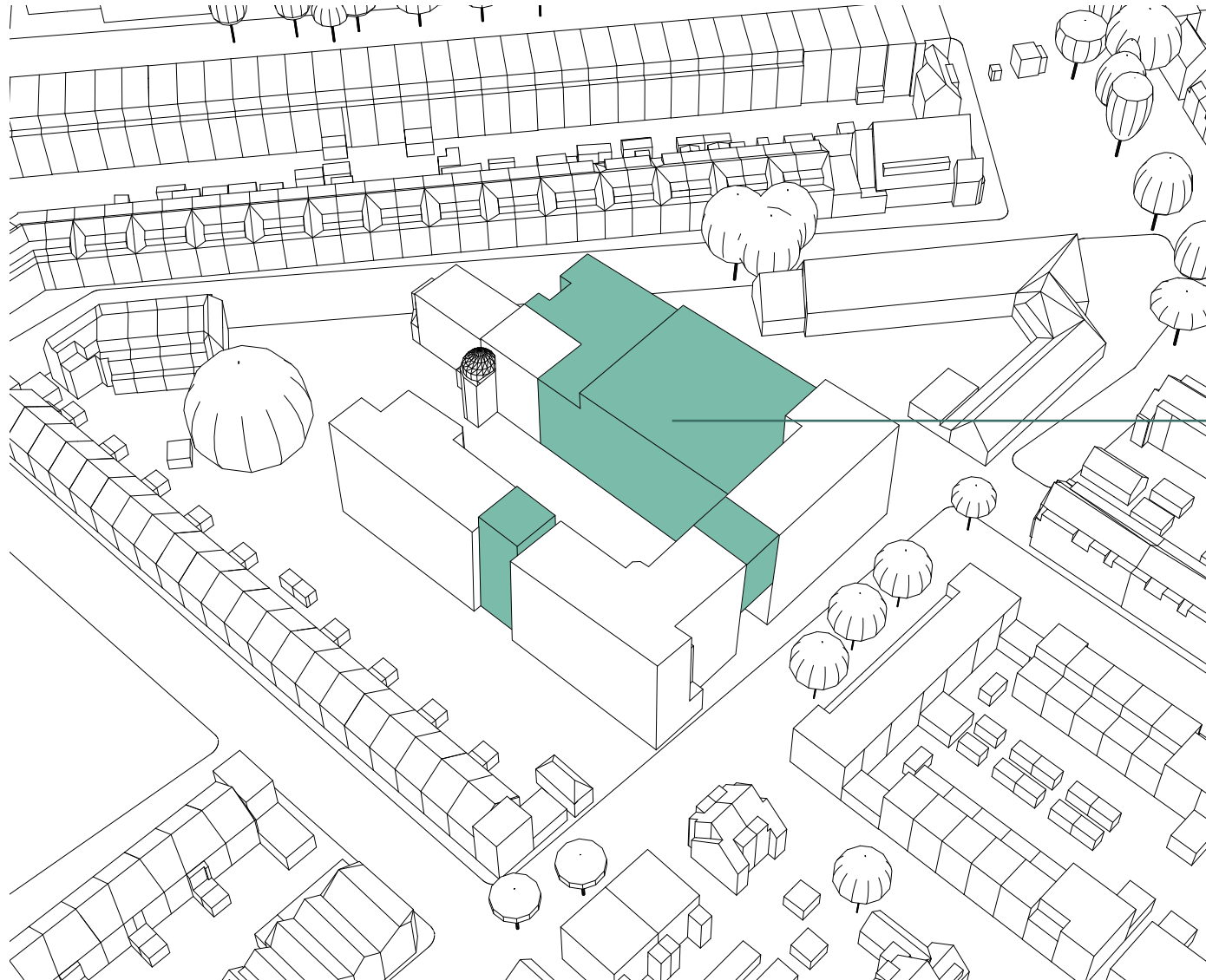
Concept

Additional volume



Concept

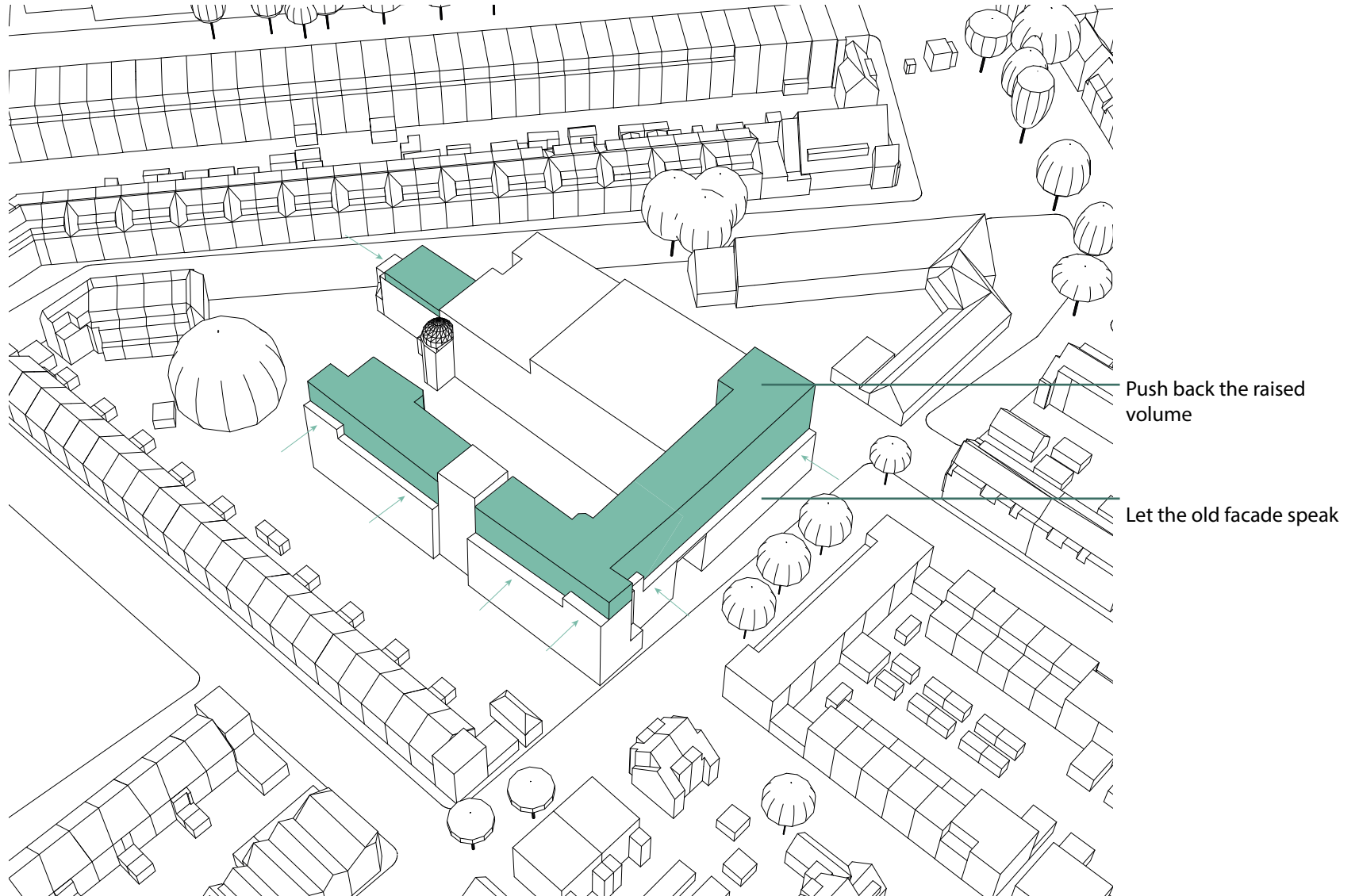
Additional volume



Add volume and enclose the courtyard

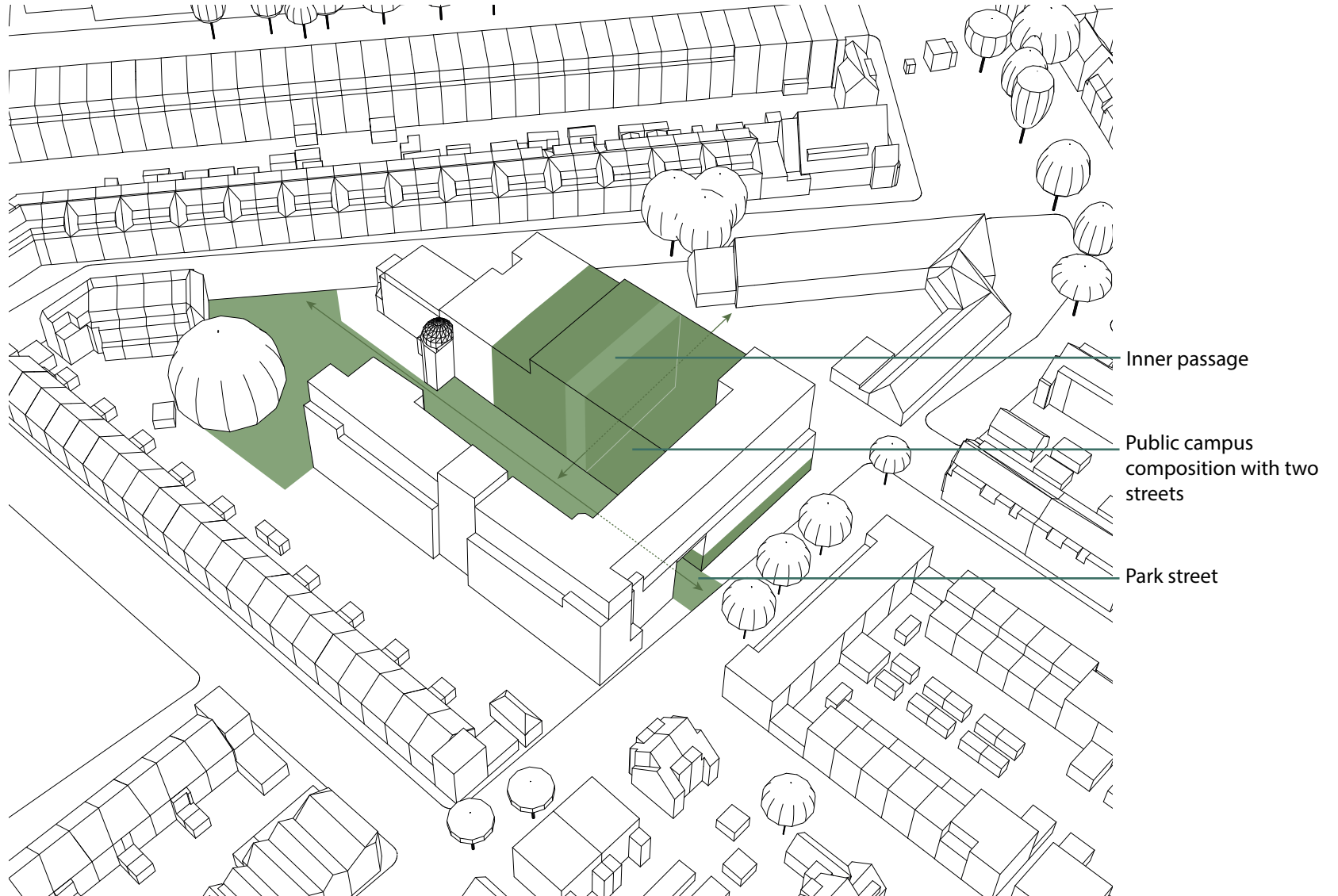
Concept

Additional volume



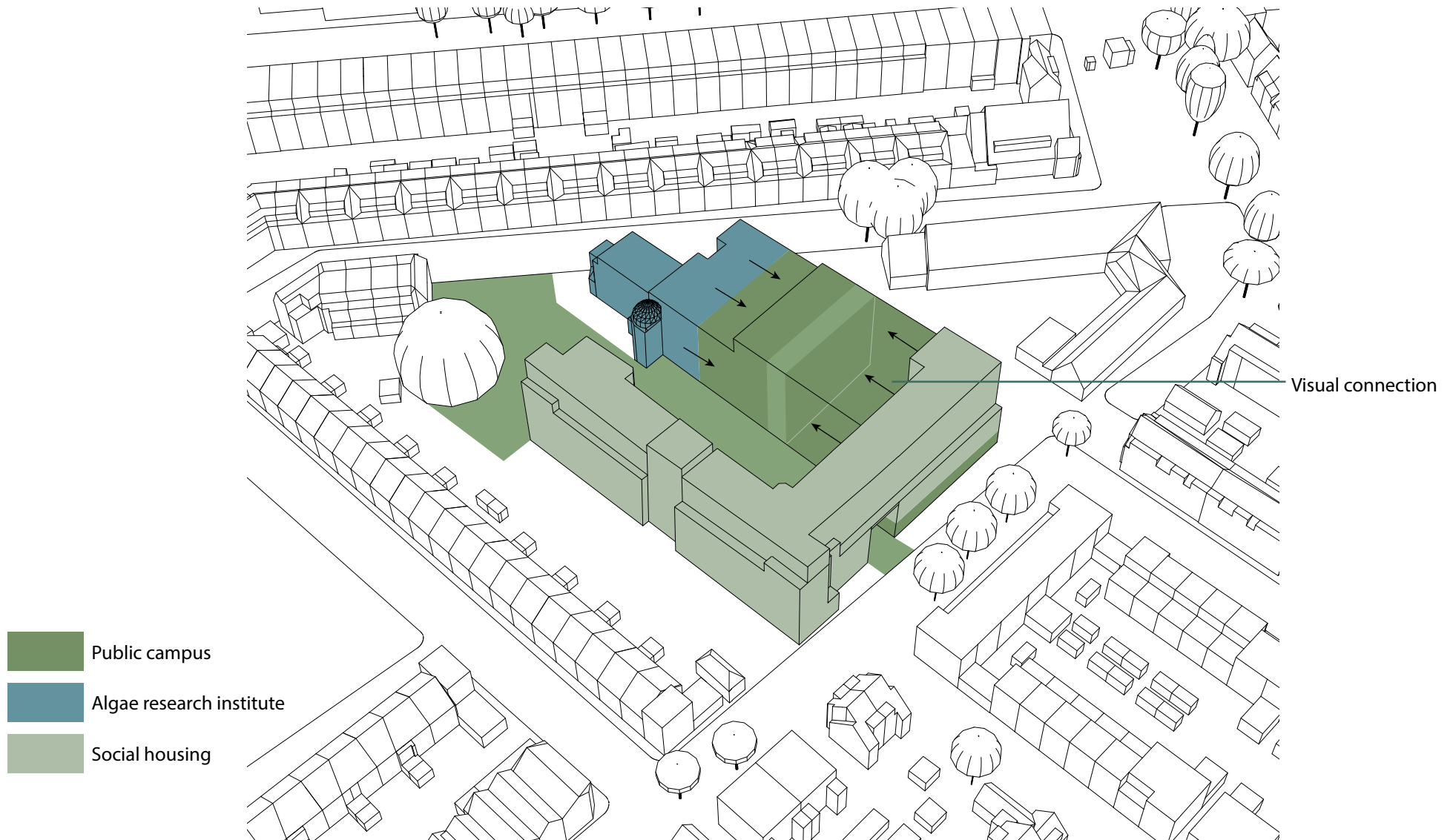
Concept

Program composition; public campus



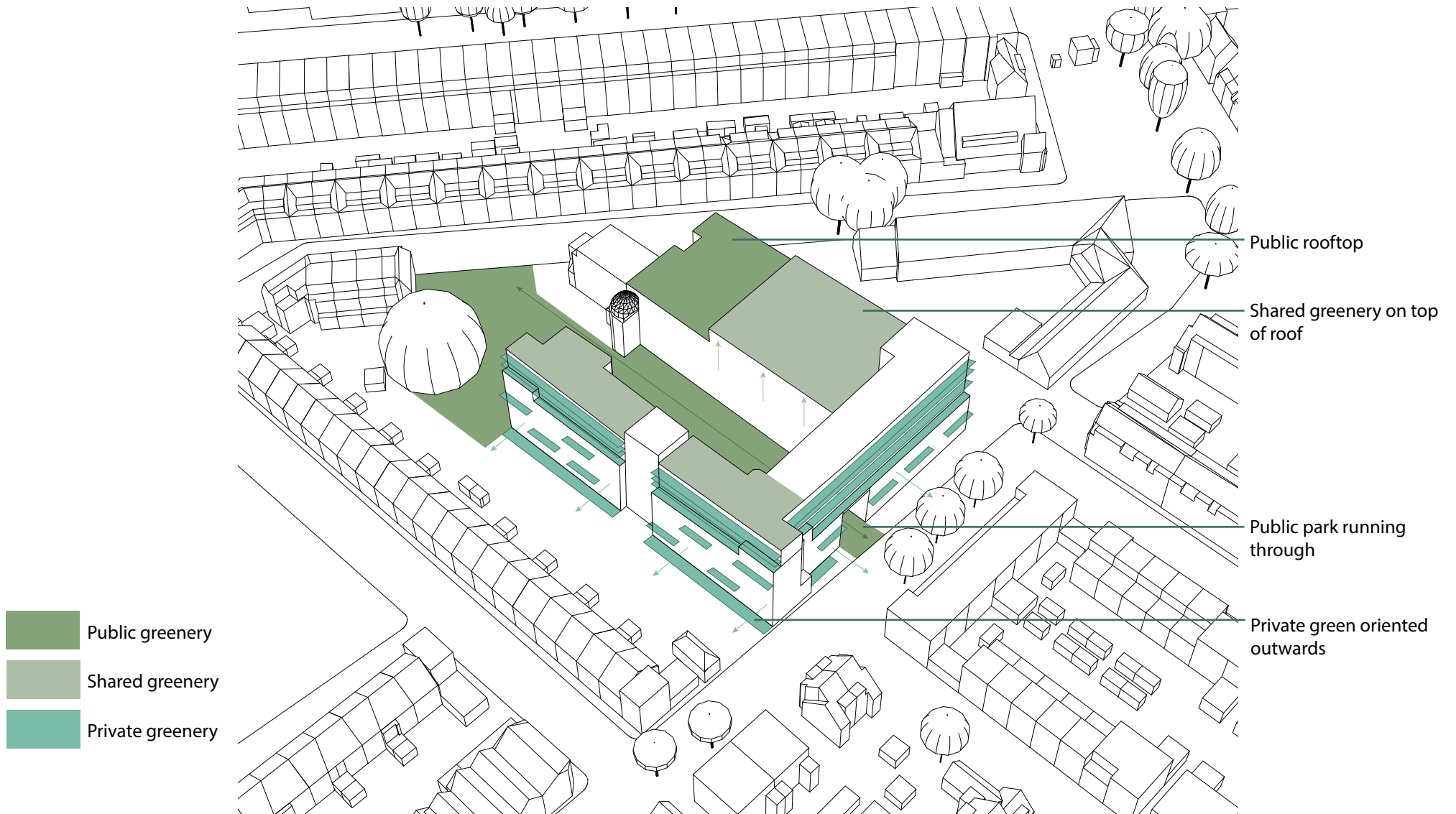
Concept

Program composition; zoning plan



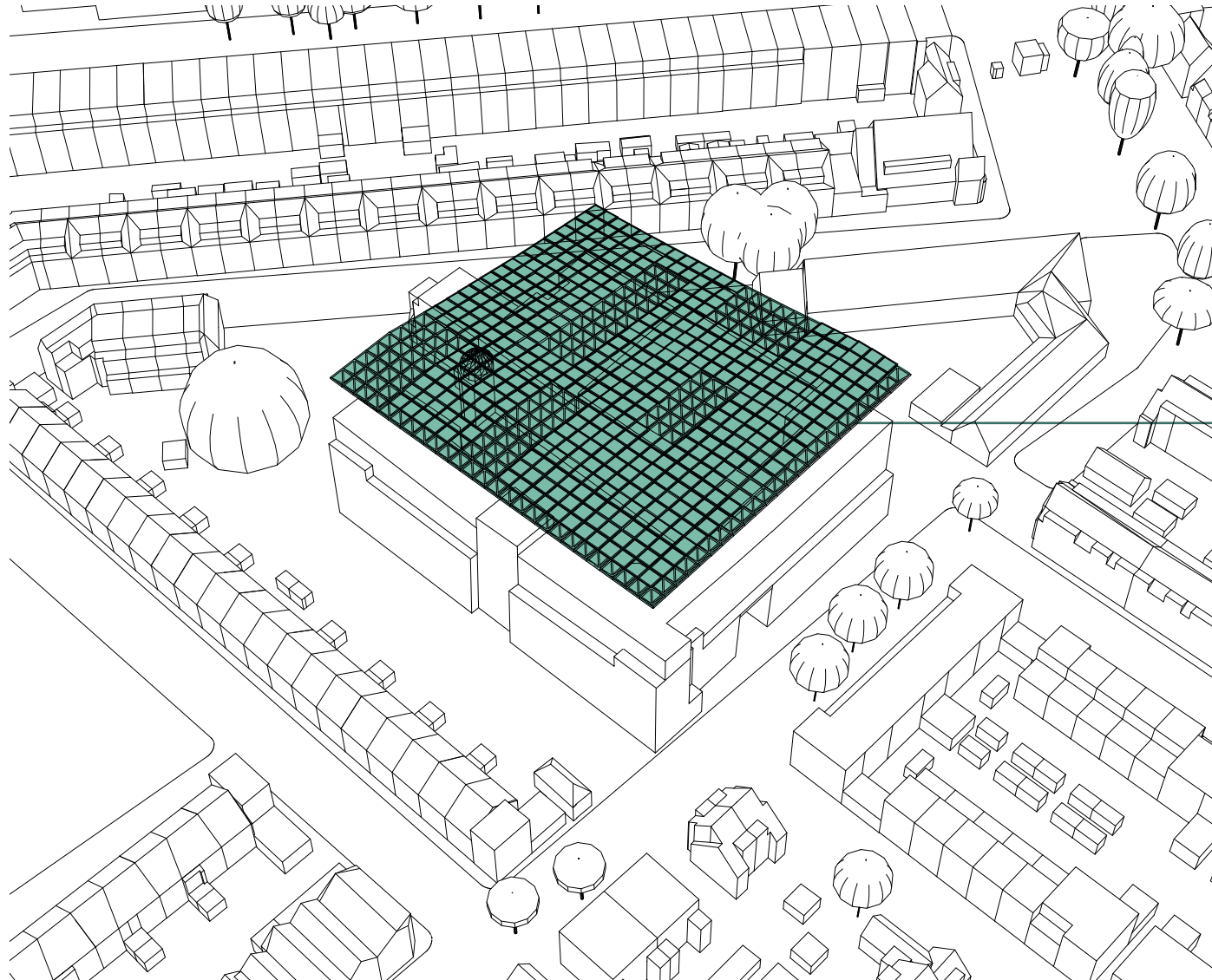
Concept

Greenery composition; public - shared - private



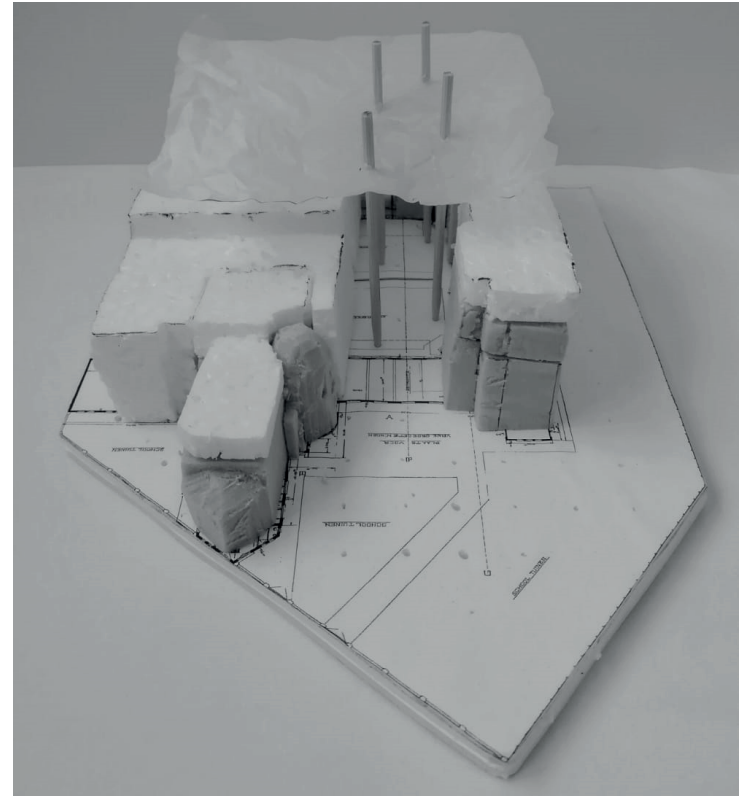
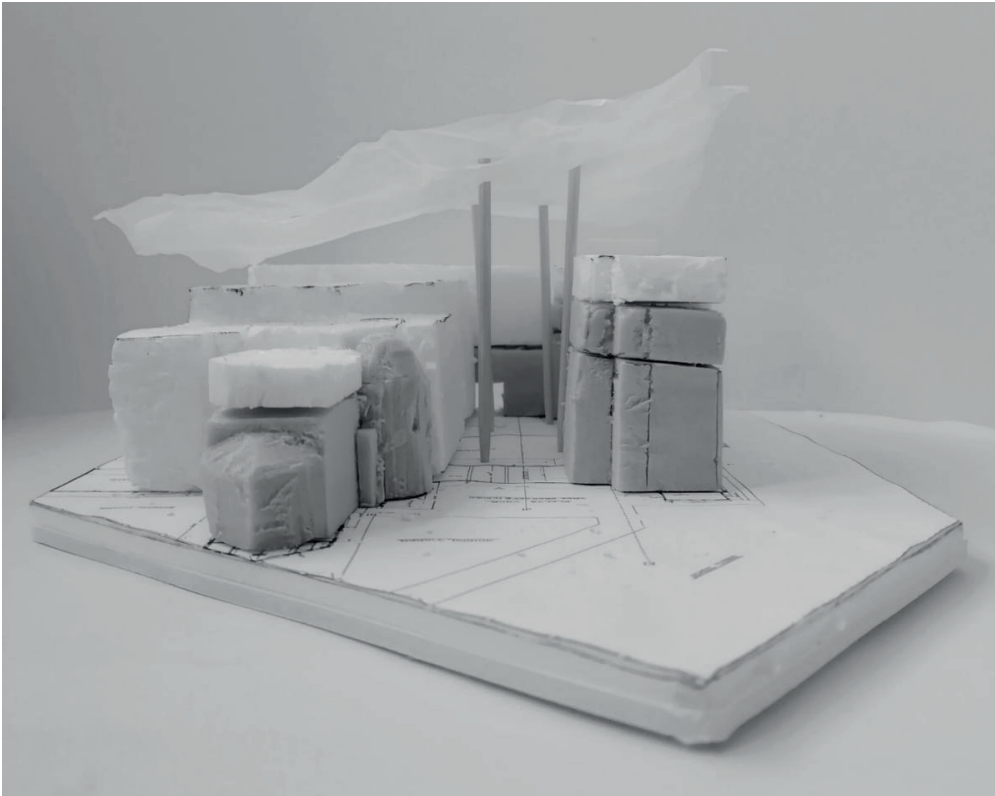
Concept

Algae - canopy structure



Place big algae - canopy structure on top

Concept
Concept model

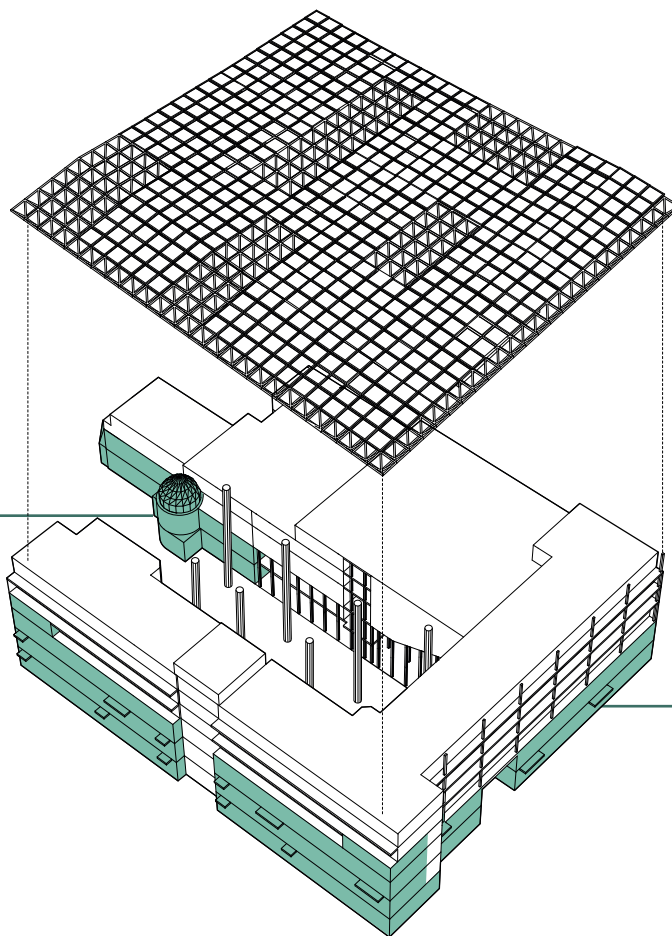


Concept

Typolgy concept



Bring out the existing architecture

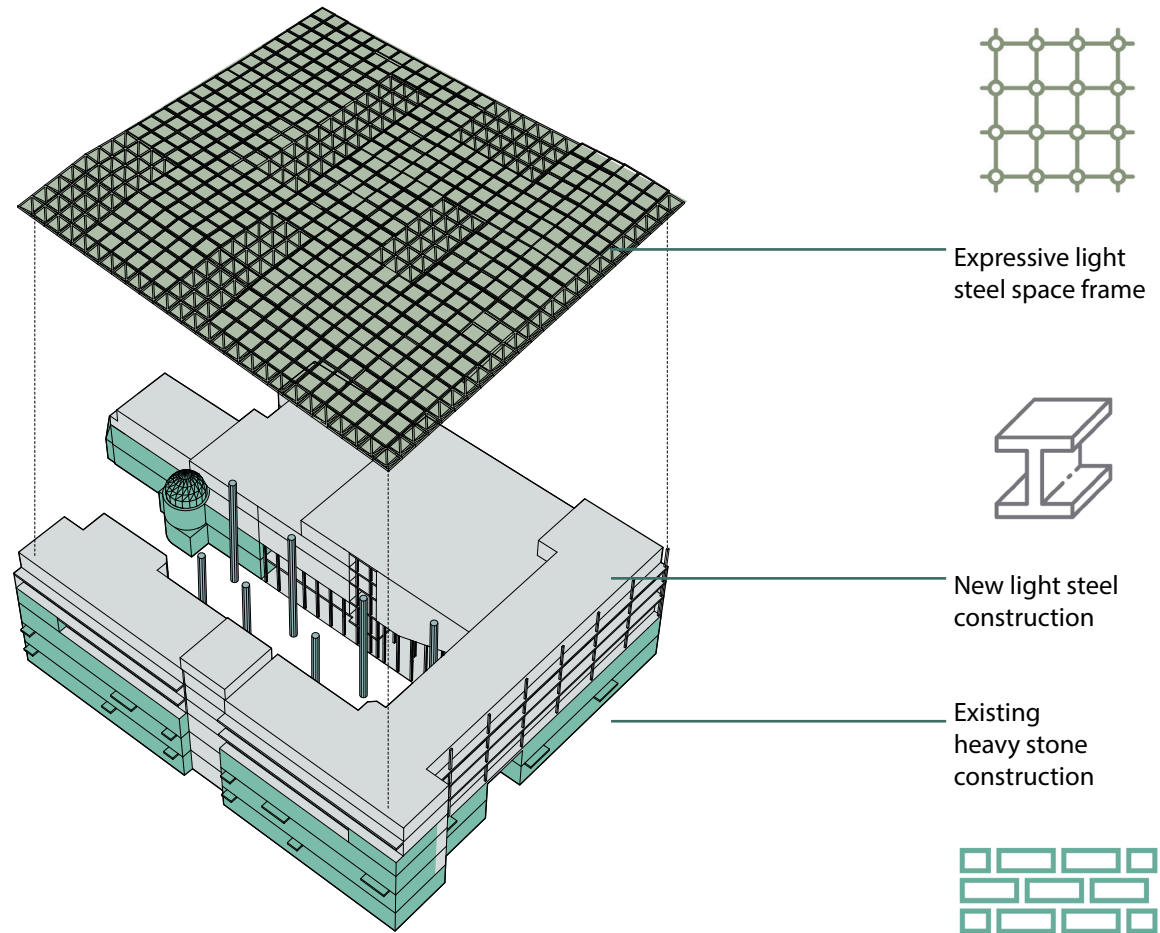


Change classrooms into apartments

OLD BUILDING PARTS
THE AMSTERDAMSE SCHOOL STYLE

Concept

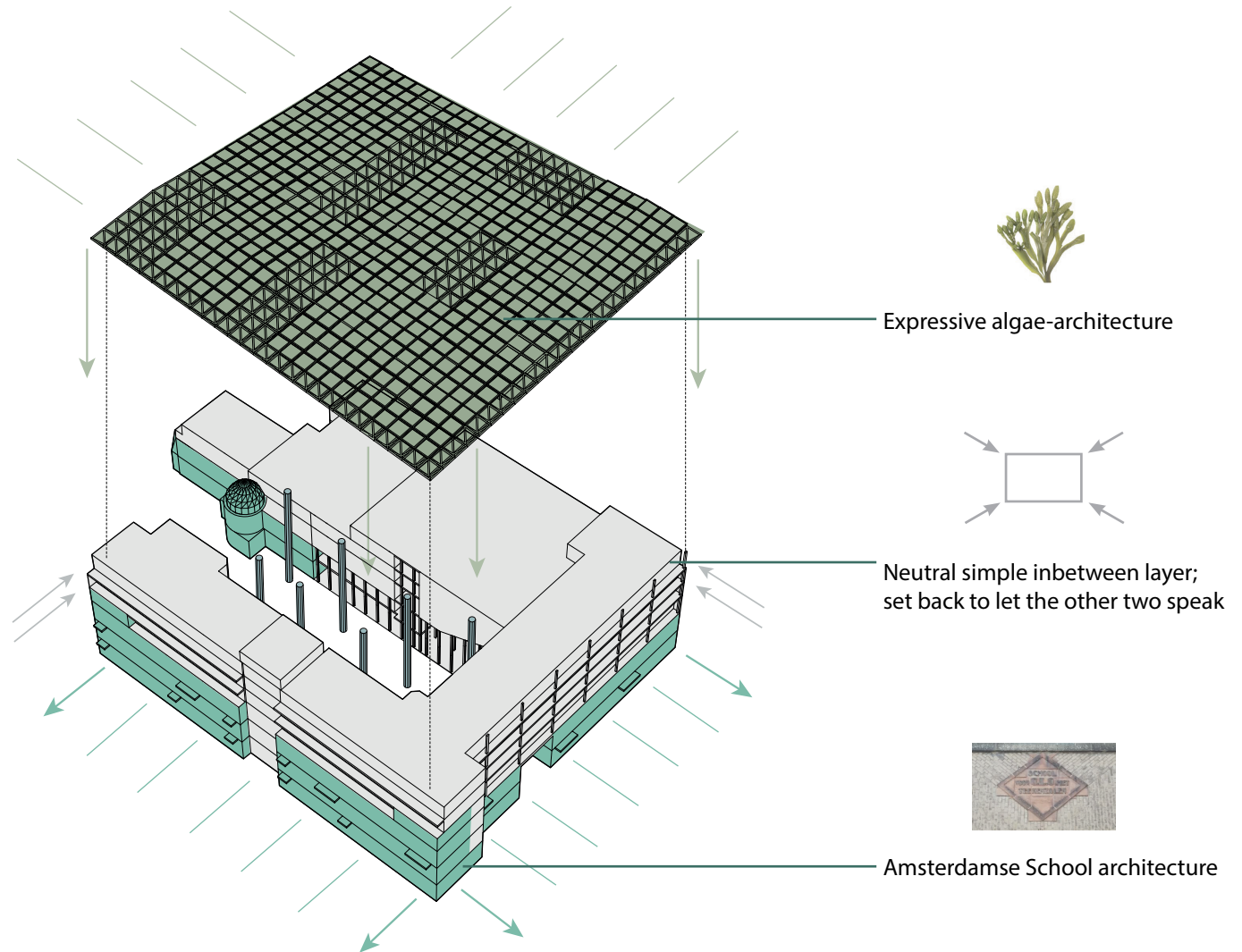
Structure concept



THREE MAIN CONTRASTING ELEMENTS OF THE CONSTRUCTION

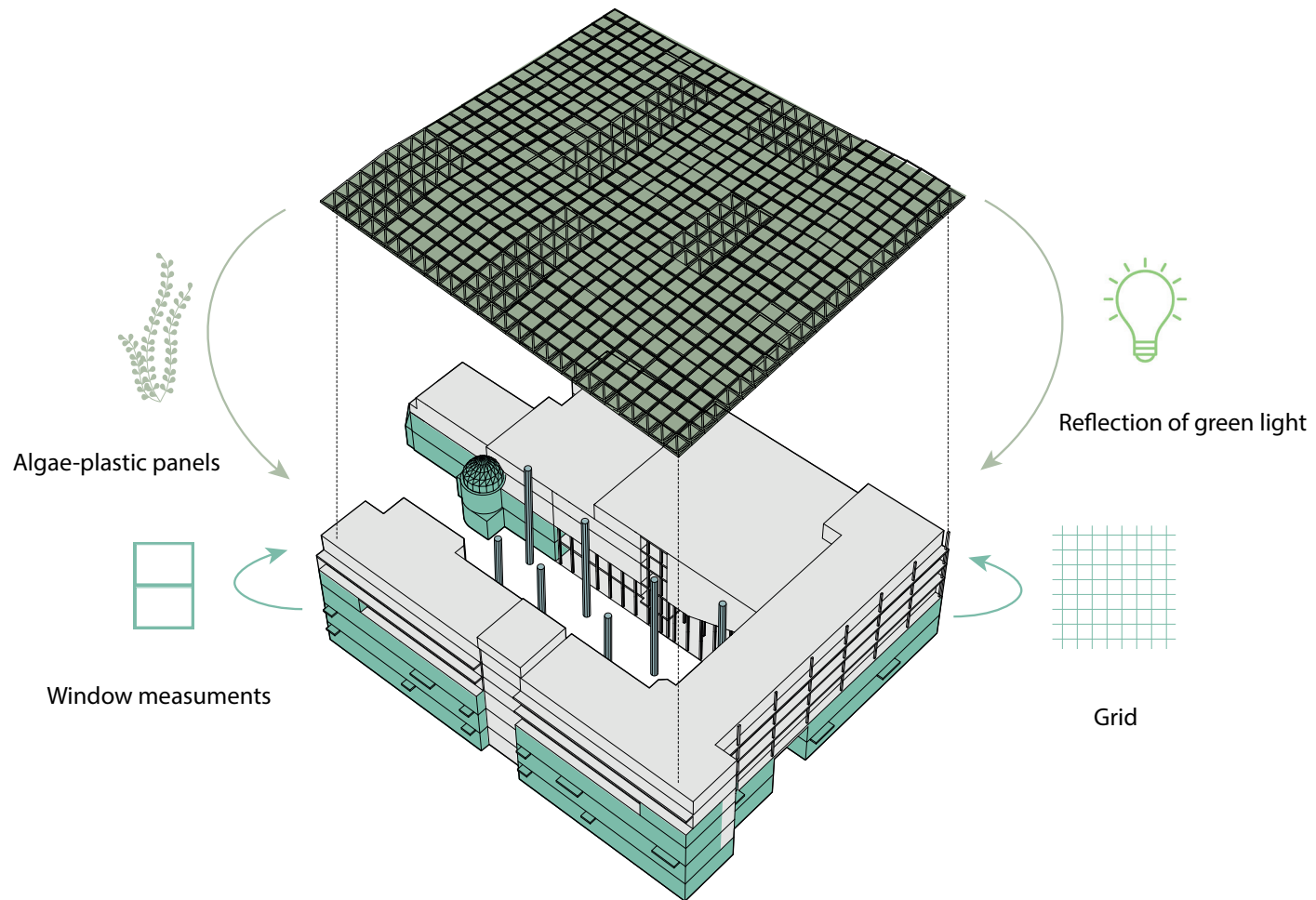
Concept

Facade concept



THREE MAIN FACADES

Concept
Facade concept

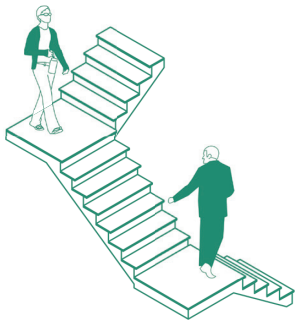


ELEMENTS TAKEN FROM THE OLD AND THE ROOF

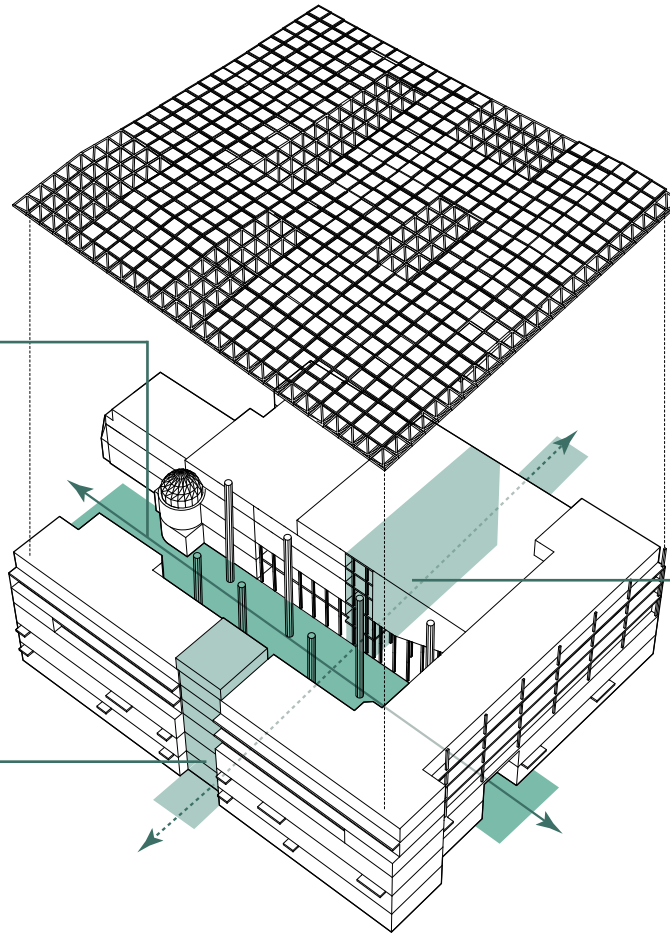
Concept
Typolgy concept



Public park street



Communal staircase

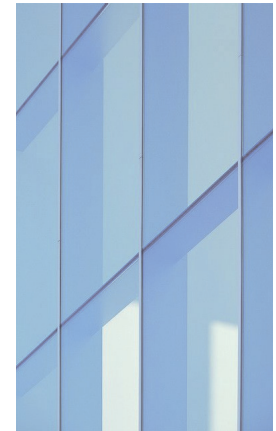
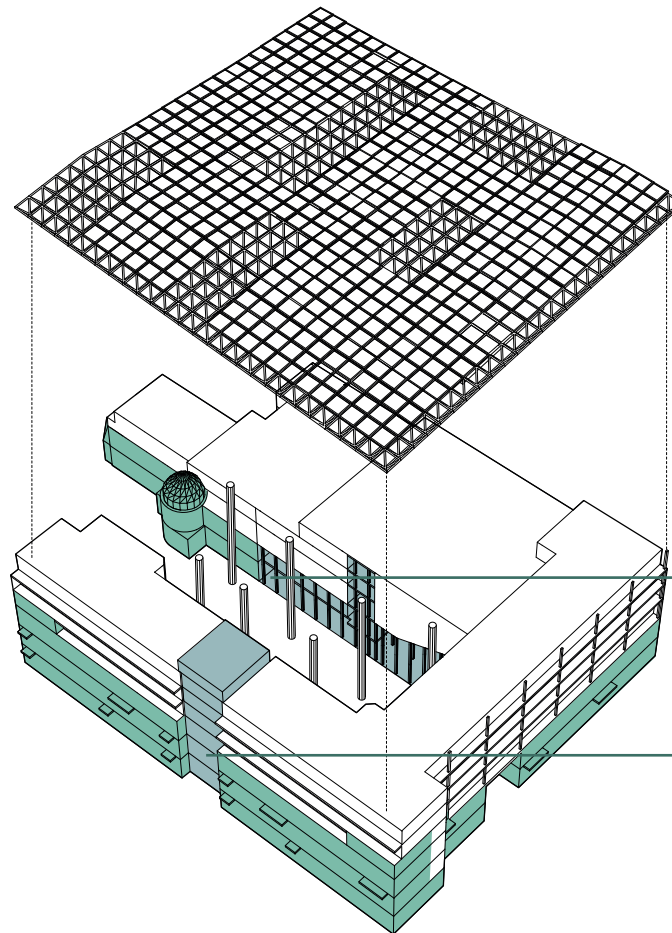


Public foyer

TWO PERPENDICULAR PASSAGES

Concept

Facade concept



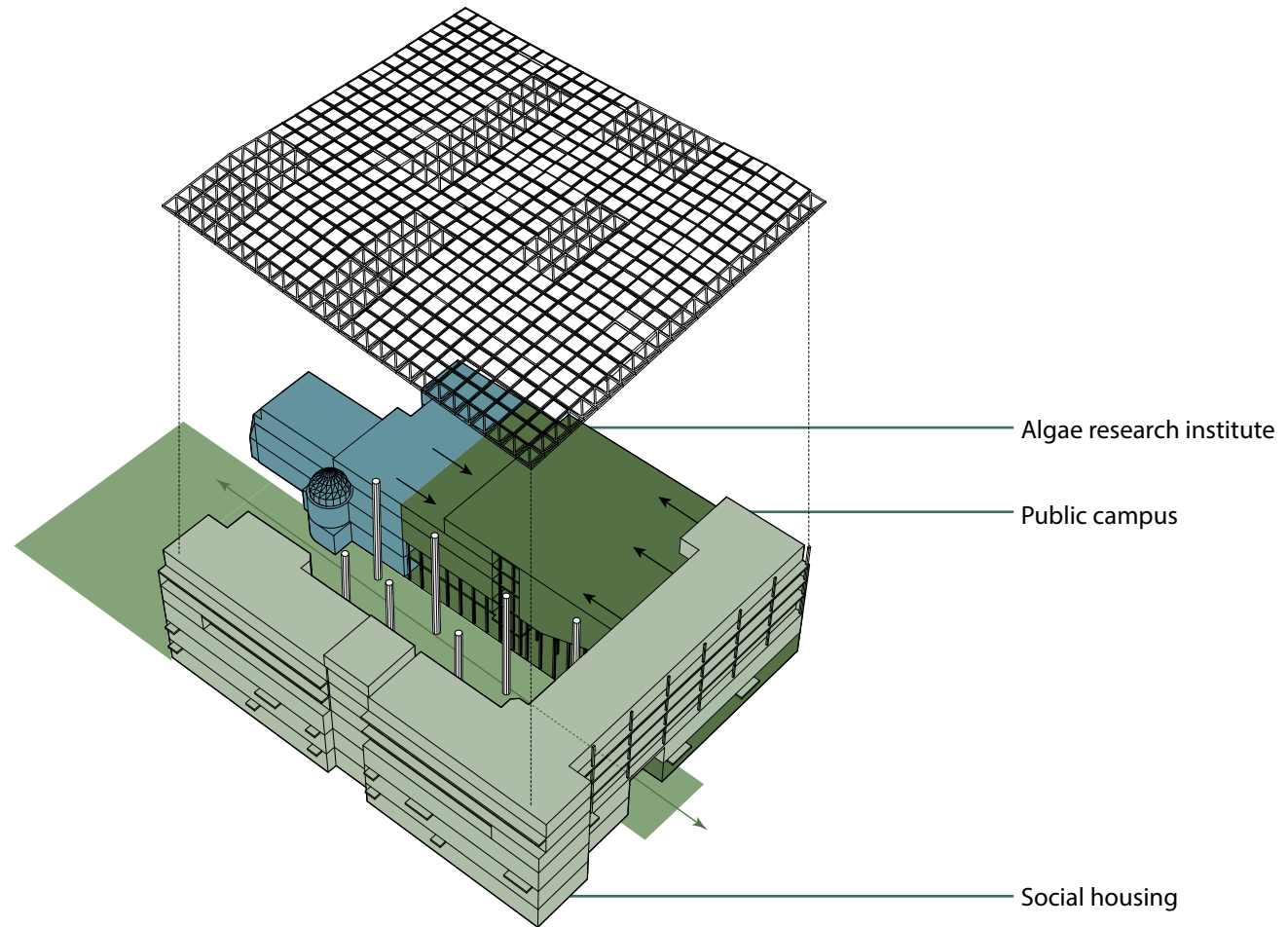
Glass facade where new touches old

Additional circulation areas with glass facade

EMPHASIZE CONTRAST WHERE OLD AND NEW TOUCH

Concept

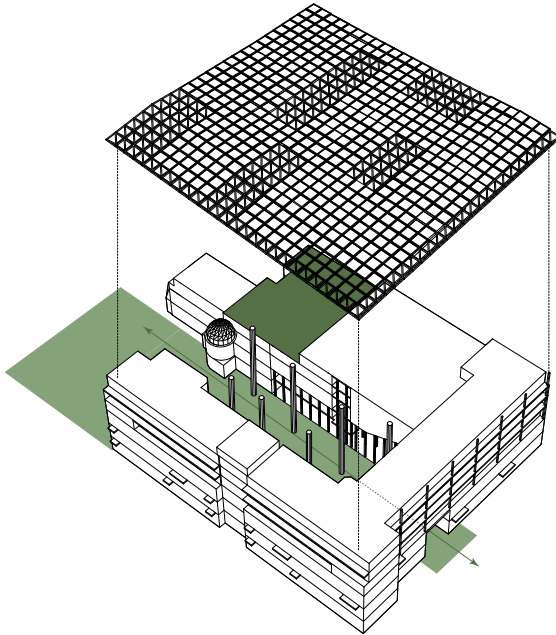
Zoning concept



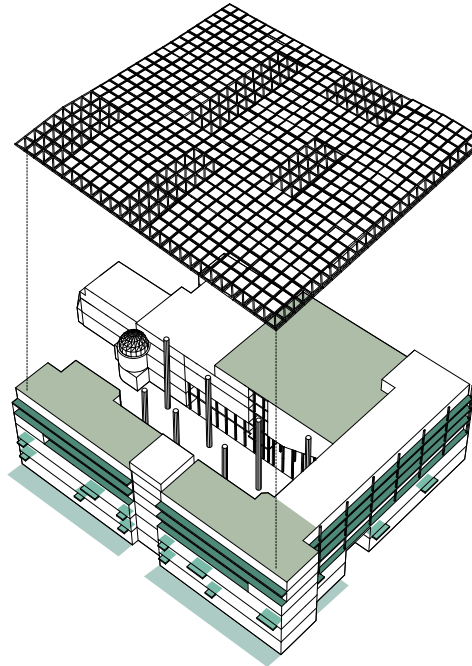
**PUBLIC CAMPUS AS VISUAL AND PHYSICAL
CONNECTOR BETWEEN THE ZONES**

Concept

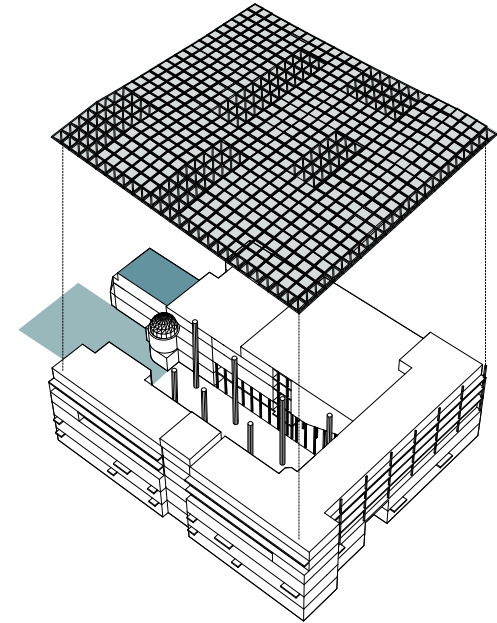
Greenery concept



PUBLIC CAMPUS - GREENERY



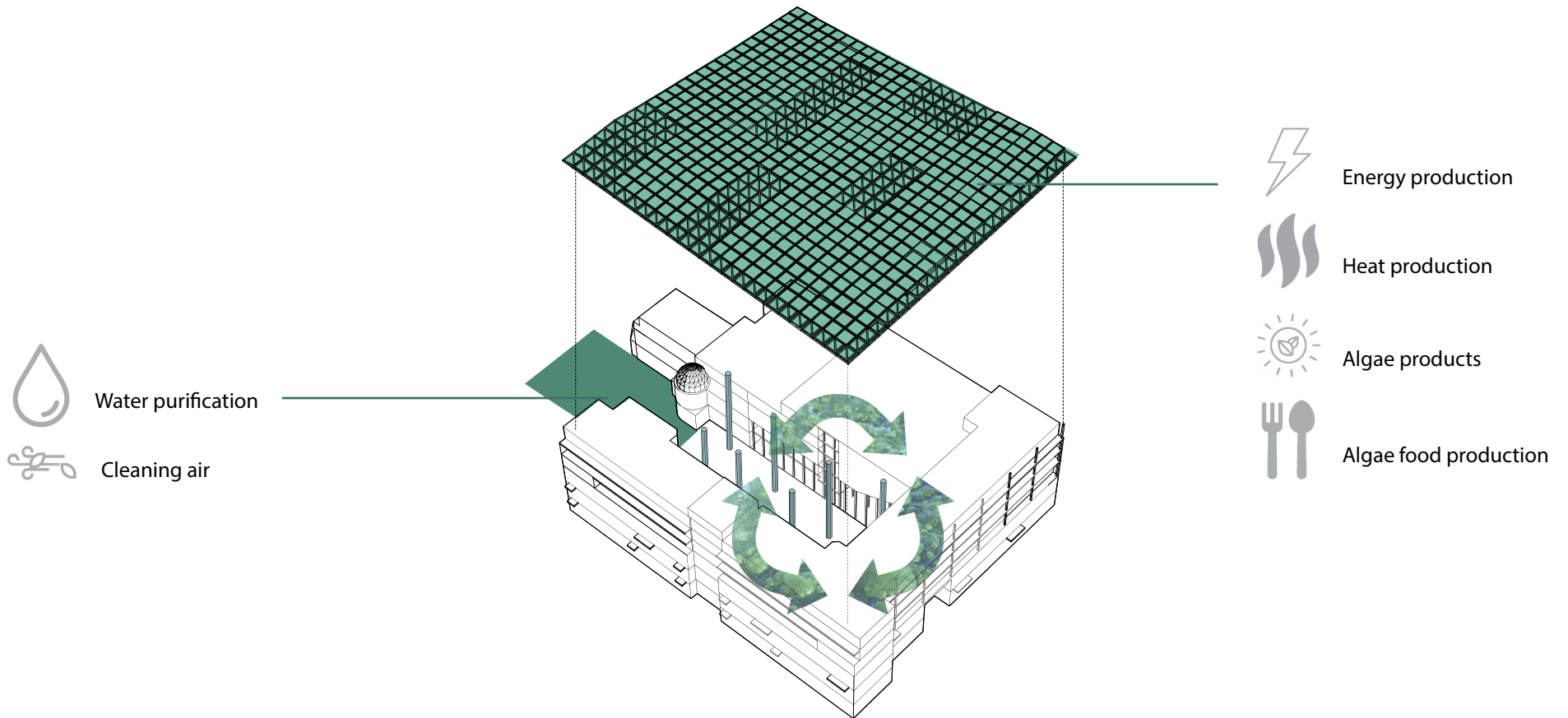
SOCIAL HOUSING - GREENERY



RESEARCH INSTITUTE - GREENERY

Concept

Climate concept



ALGAE ROOF AND OPEN ALGAE LABORATORY

Introduction

Project research

Design Brief

Concept

Implementation

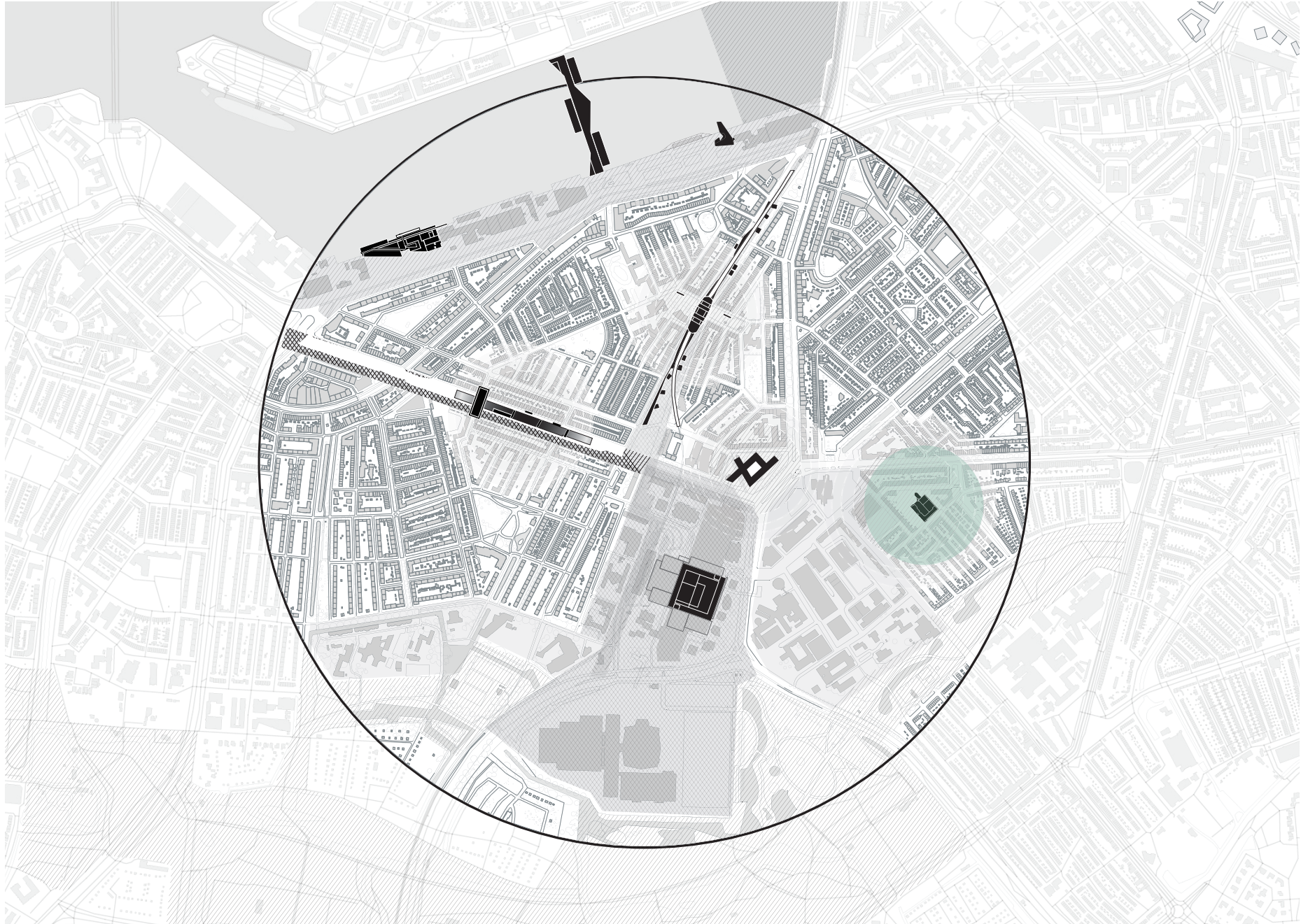
Development

Conclusion

INDEX

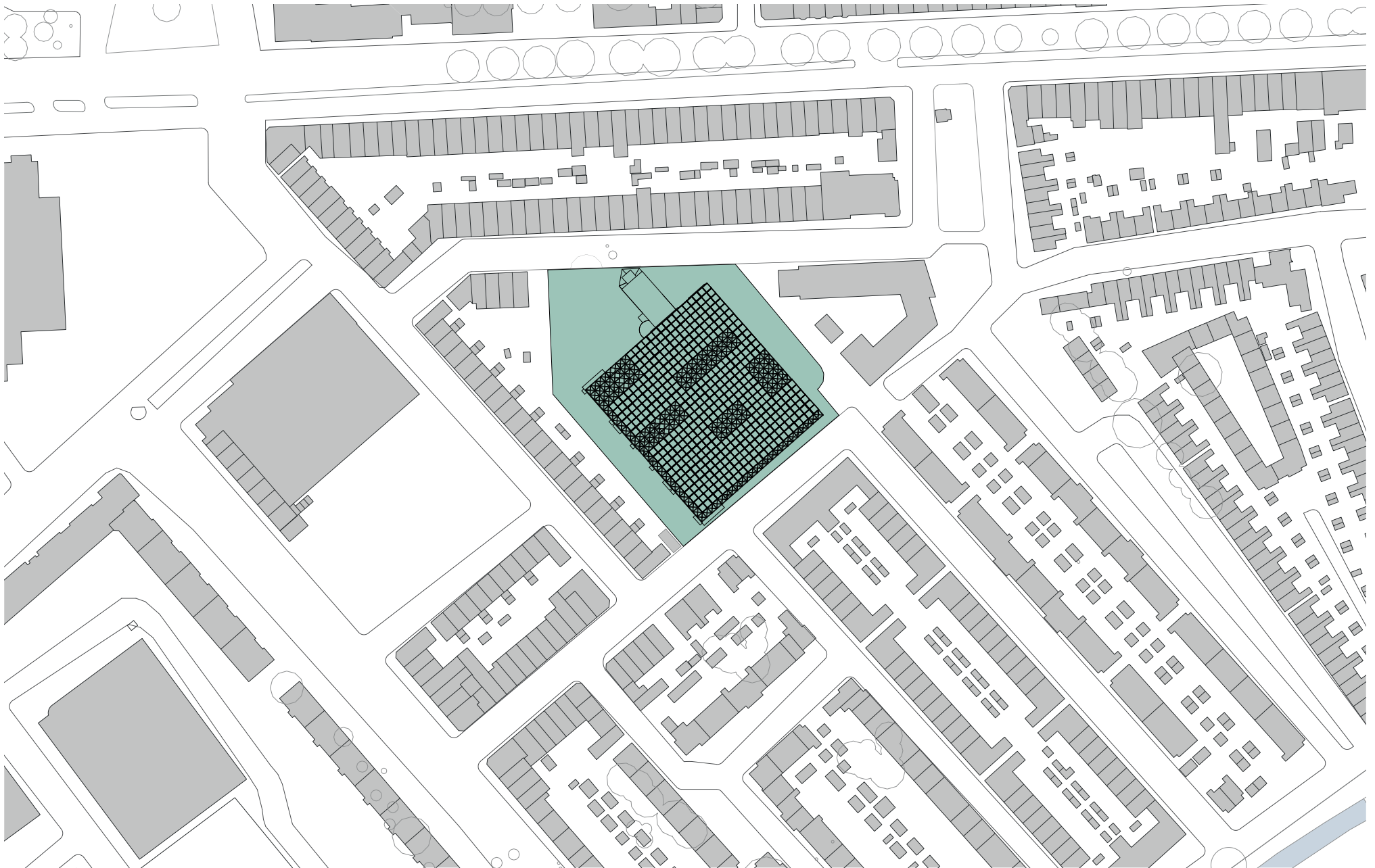
Implementation

The Collage City

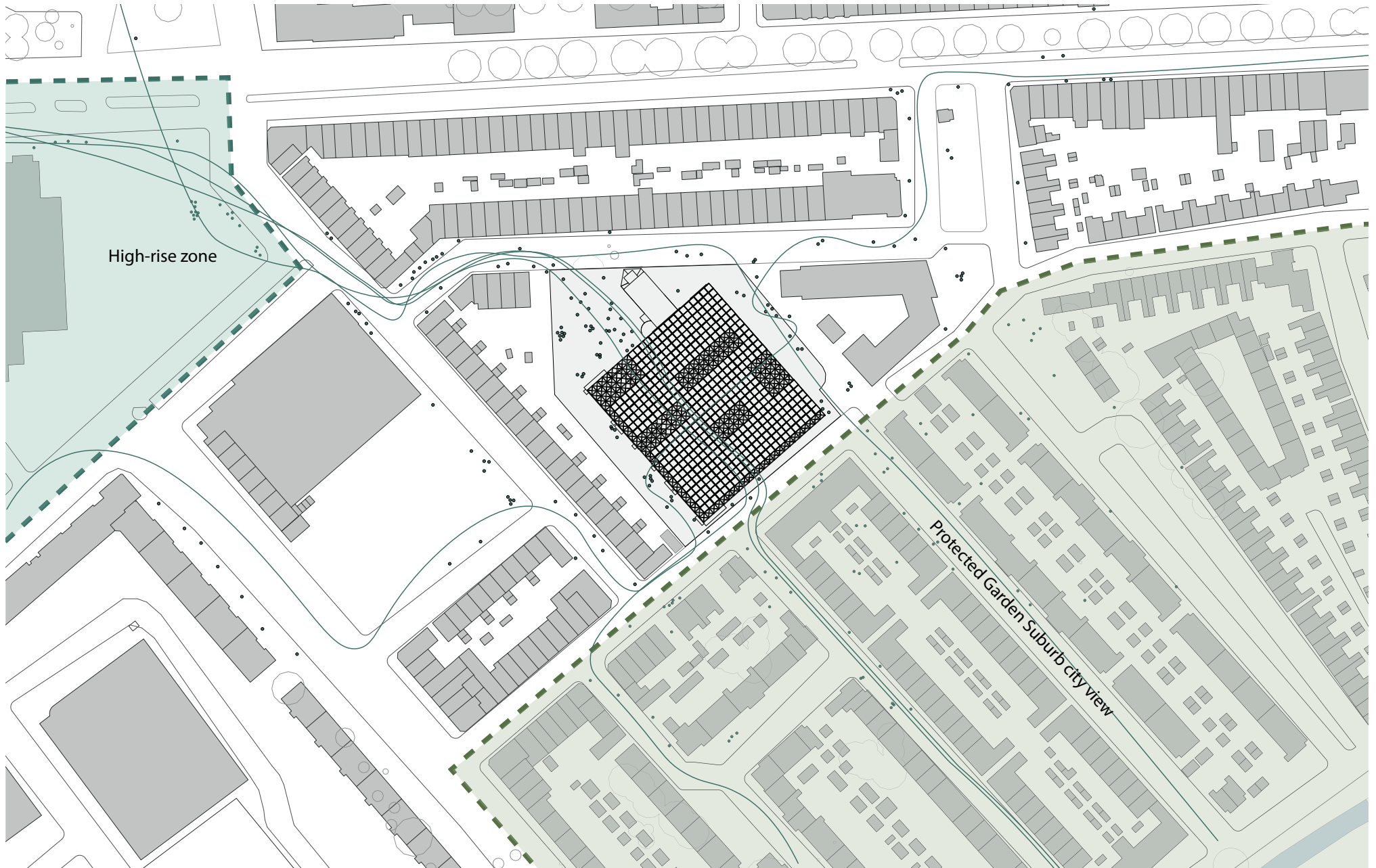


Implementation

Site plan drawing

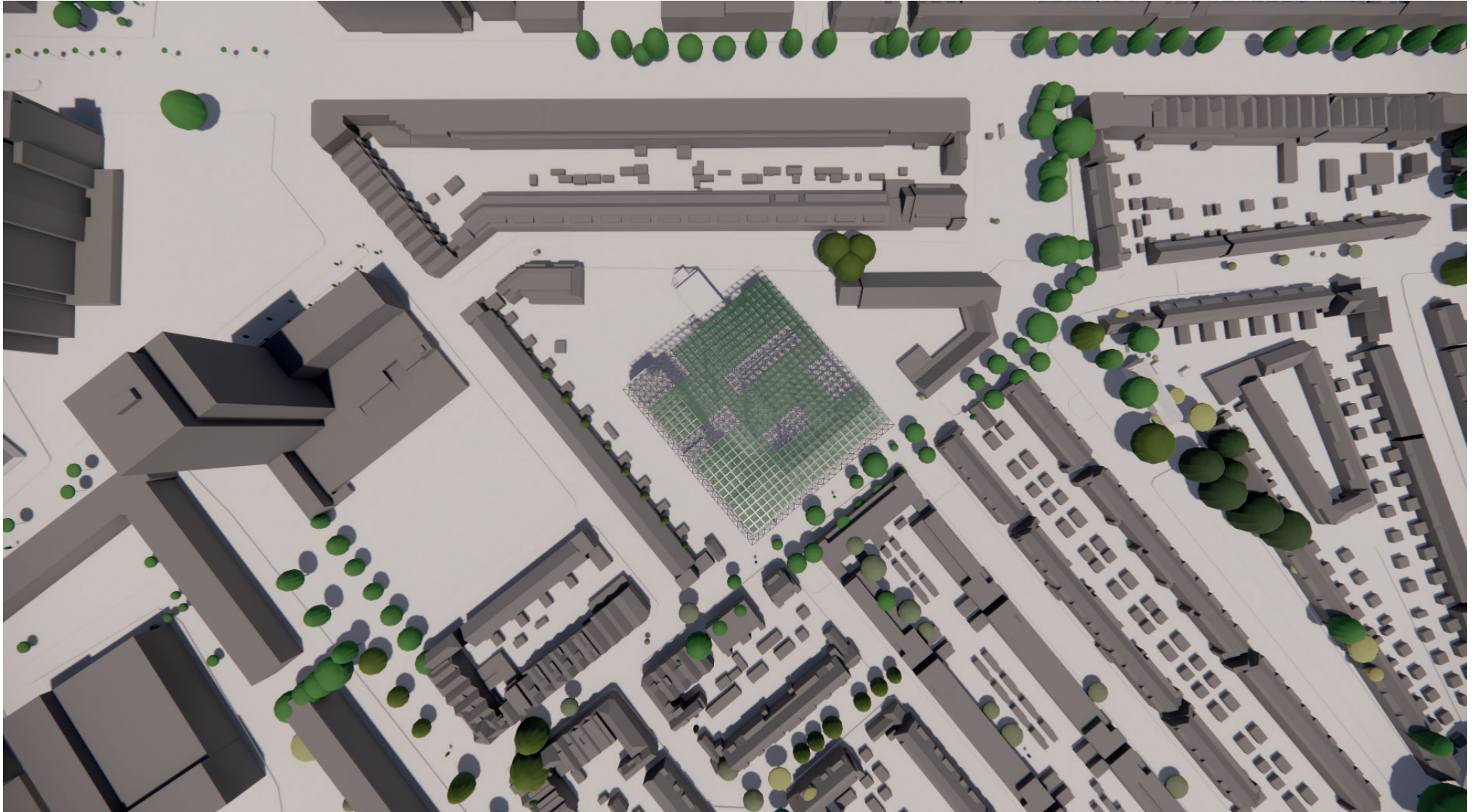


Urban borders and connections



Implementation

Top view - greenery



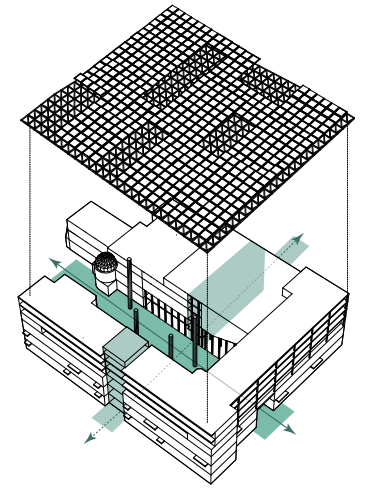
Implementation

Urban implementation



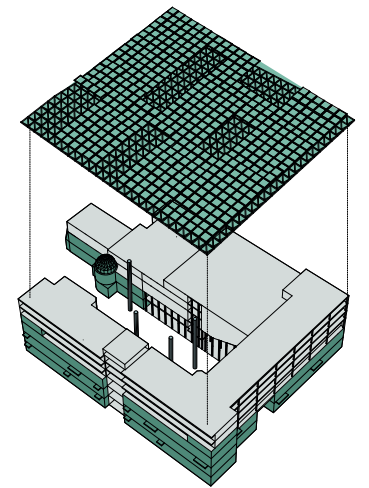
Implementation

Two streets



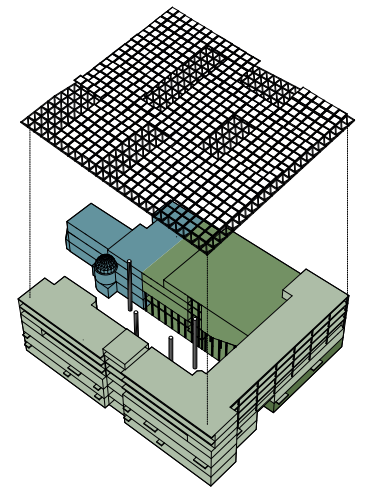
Implementation

Old and new



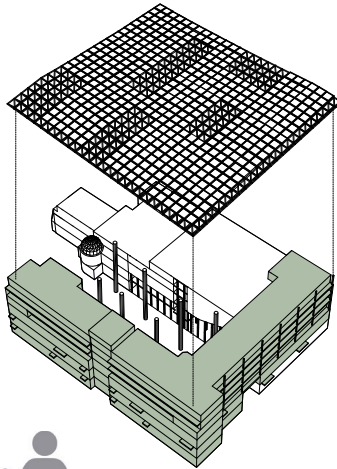
Implementation

Three zones

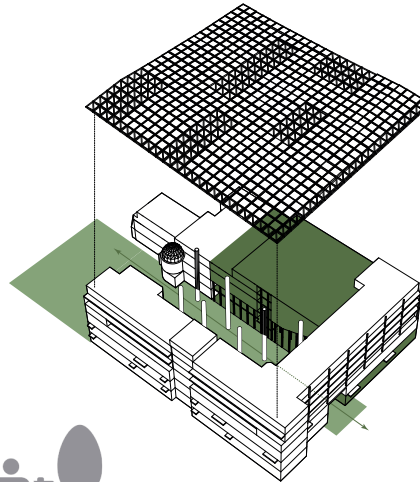


Implementation

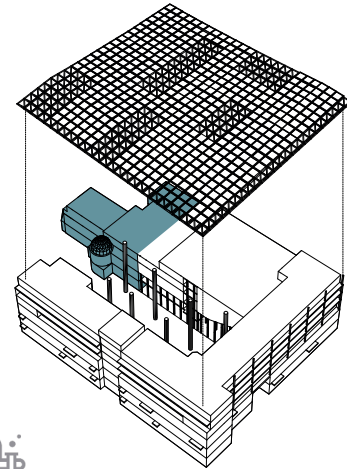
3 users



Residents



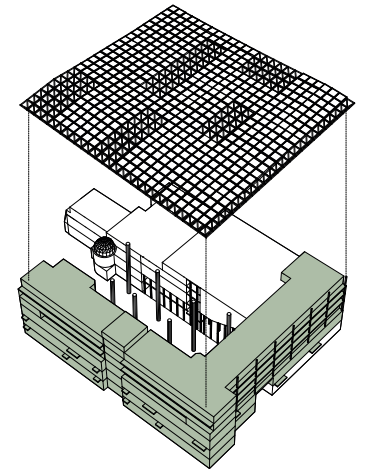
Regional and local visitors



Researchers and employees

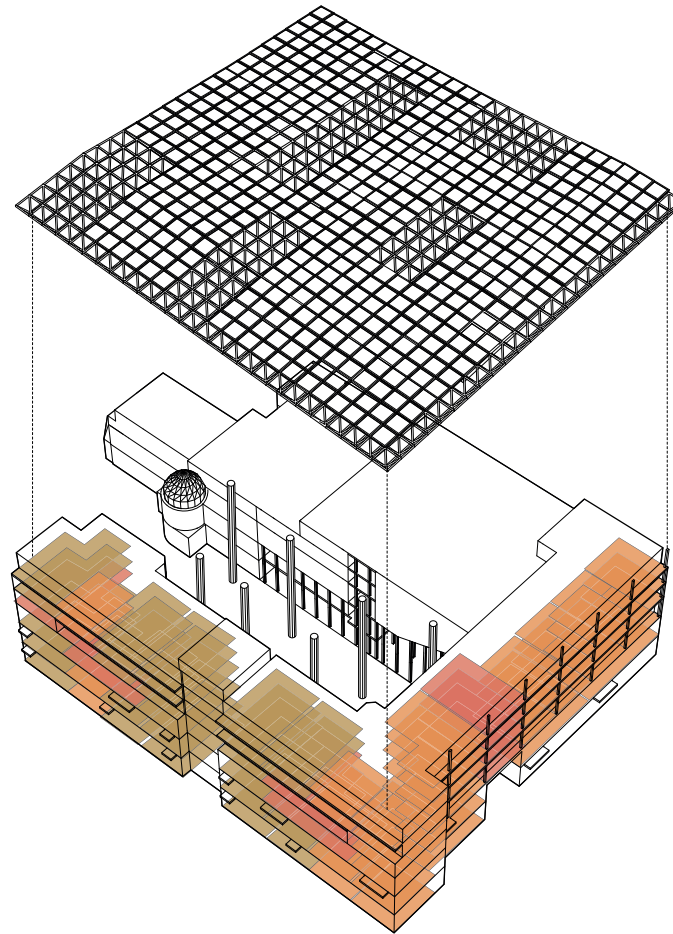
Implementation

Housing



Implementation

Housing profiles



Total of 55 housing units

Implementation

Housing profiles - type 1

Type 1

CLASS 2 - SOCIAL HOUSING

55 - 70 m² 2 - 4 €592,55 - €635,05

Square meters

Rooms

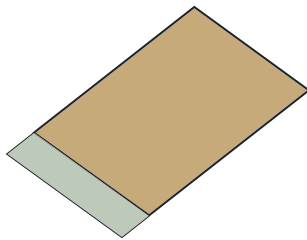
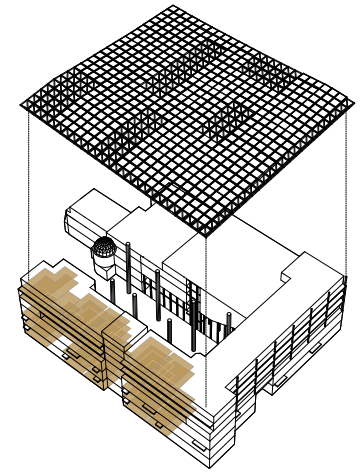
Price

10 - 20% of
total m²

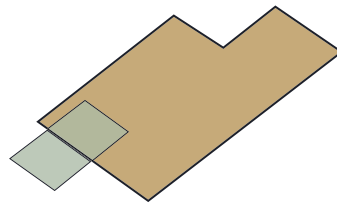
2,5 m²

Private outdoor

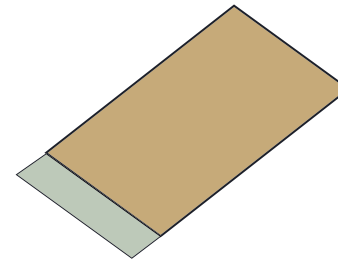
Storage



Type 1A - Balcony over full length



Type 1B - Loggia and balcony

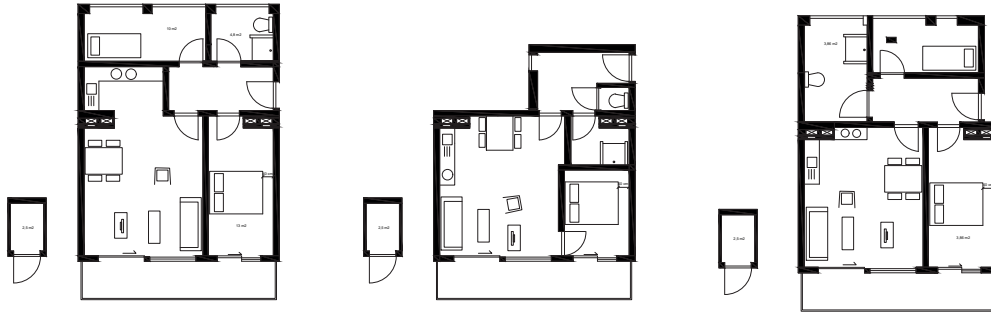


Type 1C - Garden

Implementation

Housing profiles - type 1

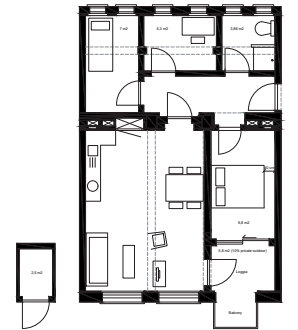
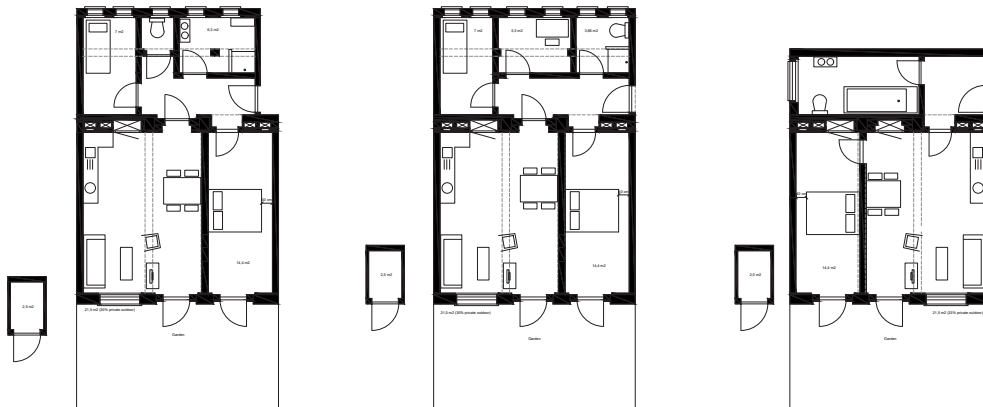
Type 1A



Type 1B



Type 1C



Implementation

Housing profiles - type 2

Type 2

CLASS 3 - SOCIAL HOUSING

85 - 90 m² 4 €635,05 - €710,68

Square meters

Rooms

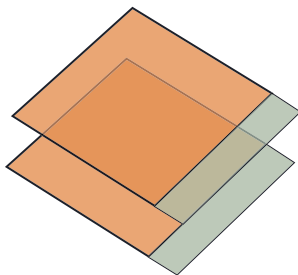
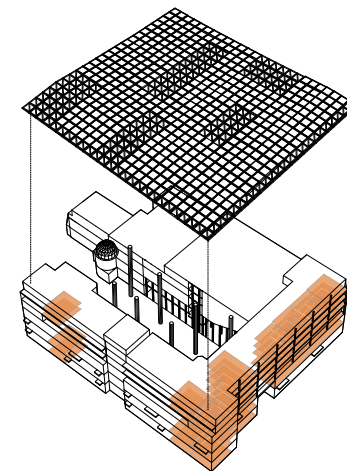
Price

10 - 20% of
total m²

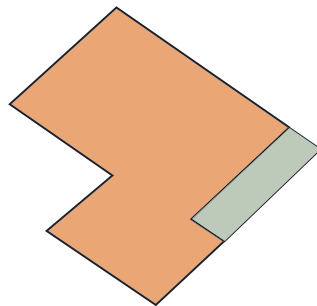
2,5 m²

Private outdoor

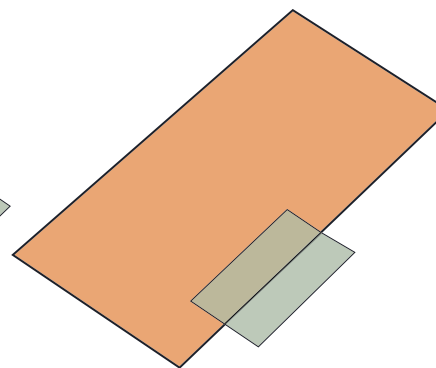
Storage



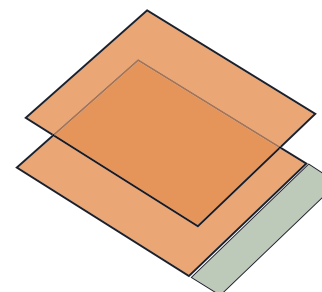
Type 2A - two storey; balcony over full length



Type 2B - balcony



Type 2C - Loggia and balcony



Type 2D - Garden

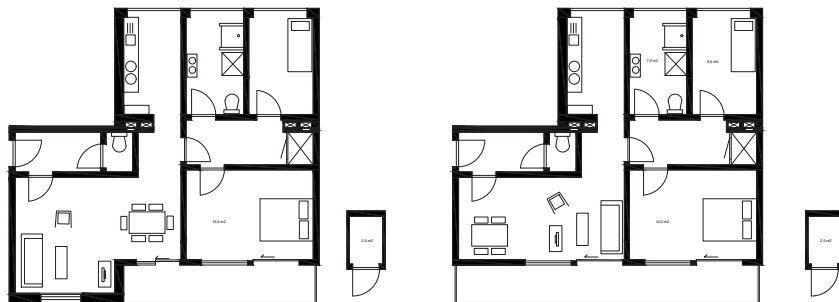
Implementation

Housing profiles - type 2

Type 2A



Type 2B



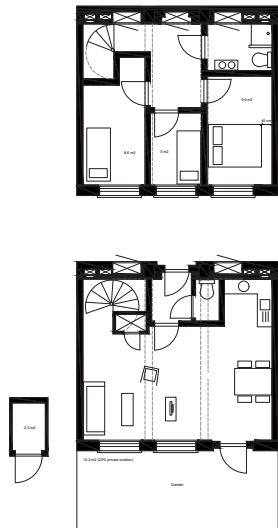
Implementation

Housing profiles - type 2

Type 2C



Type 2D



Implementation

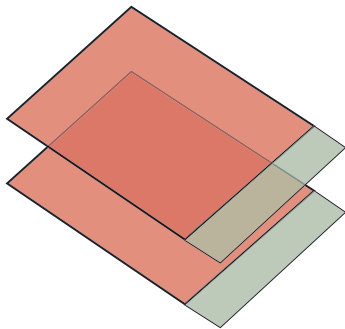
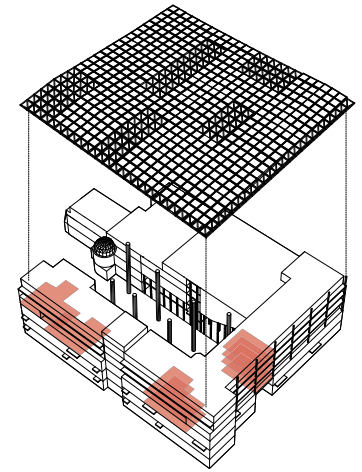
Housing profiles - type 3

Type 3

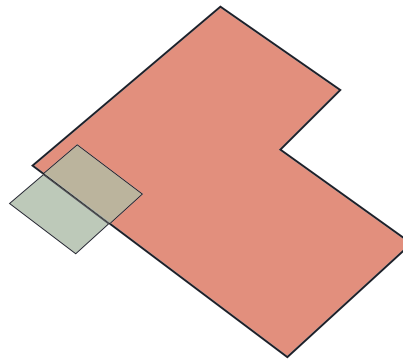
CLASS 4 - MEDIUM RENT

100 - 130 m ²	4 - 5	€710,69 - €872
Square meters	Rooms	Price

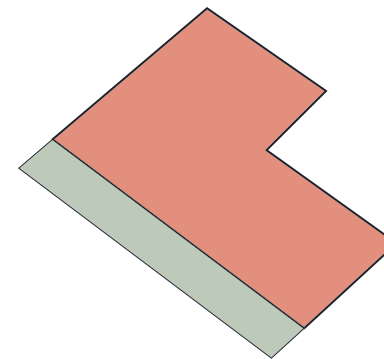
10 - 20% of total m ²	2,5 m ²
Private outdoor	Storage



Type 1A - two storey; balcony over full length



Type 1B - Loggia and balcony



Type 1C - Balcony over full length

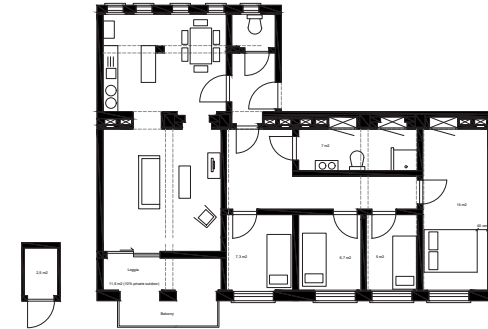
Implementation

Housing profiles - type 3

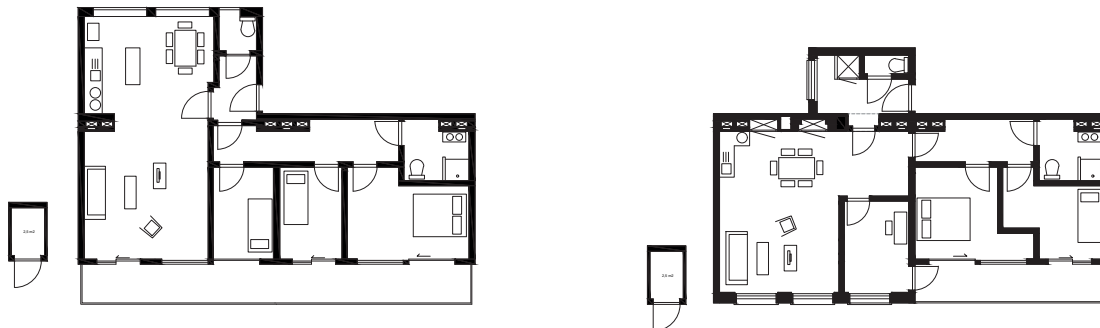
Type 3A



Type 3B

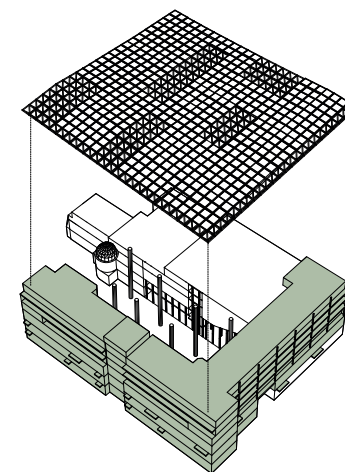
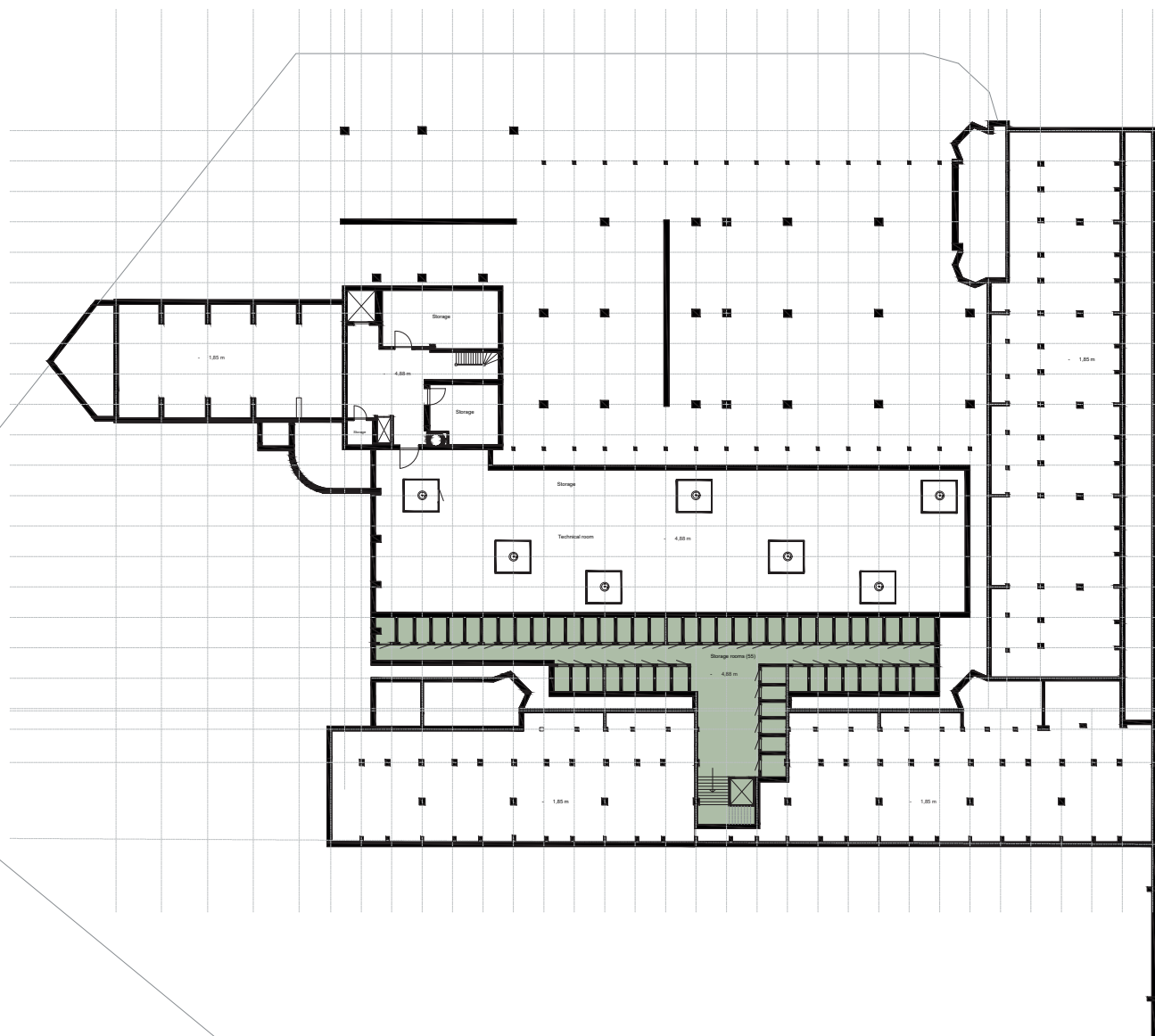


Type 3C



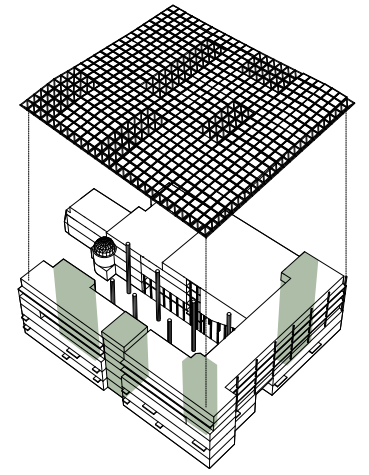
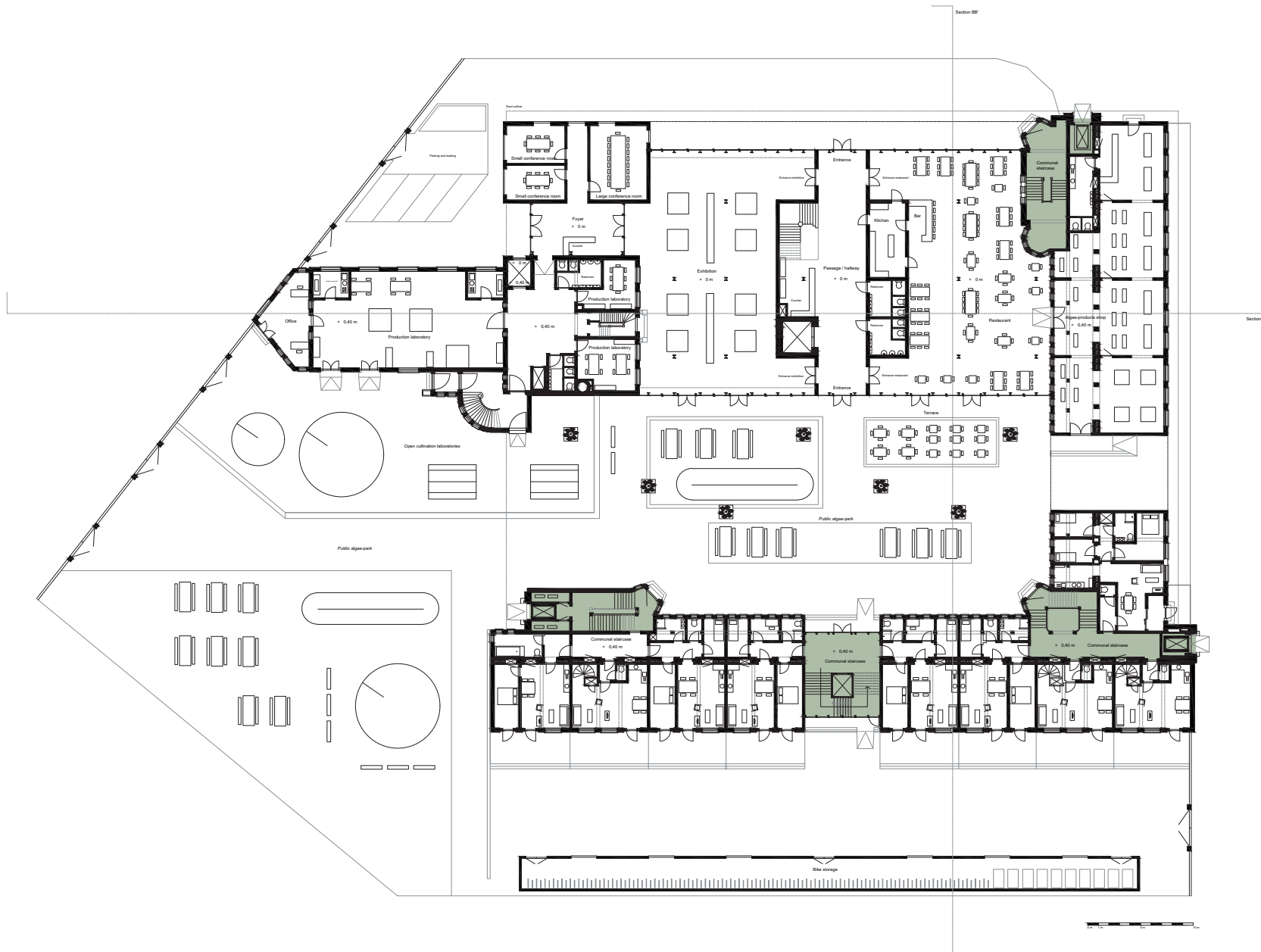
Implementation

Housing - storage



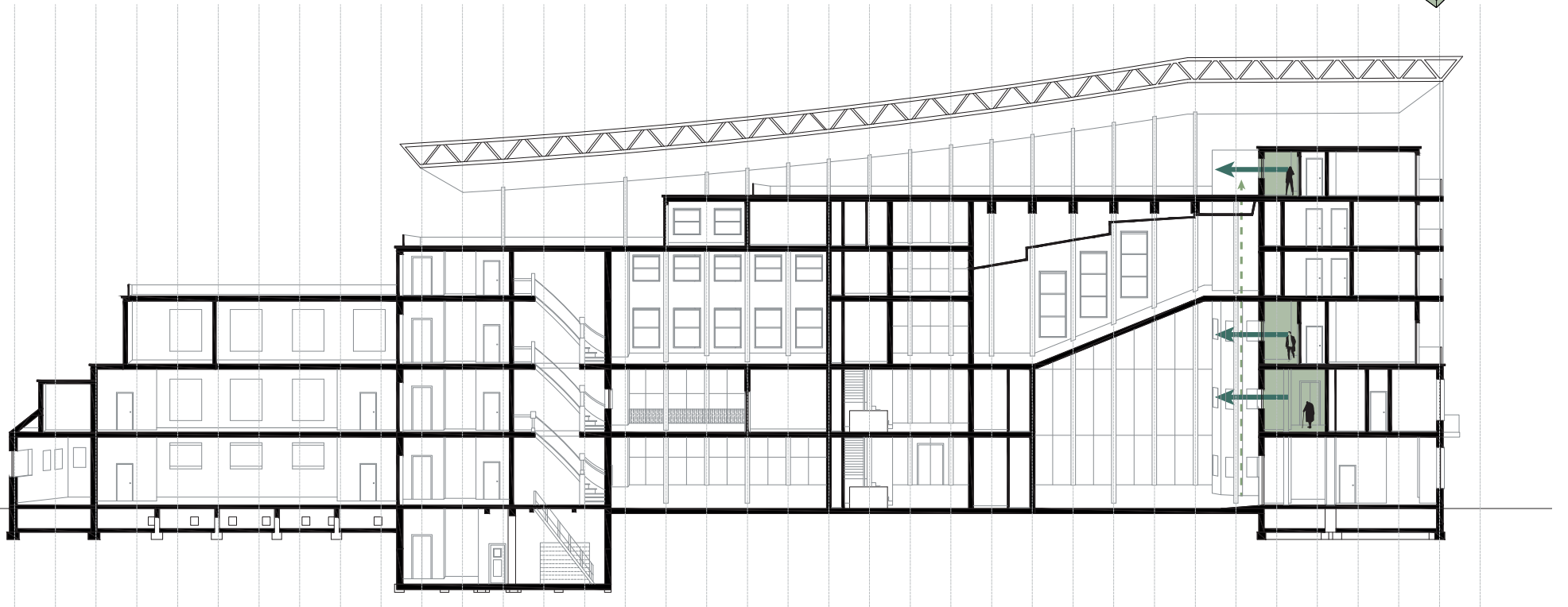
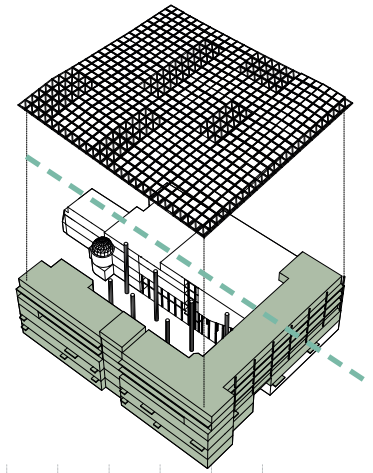
Implementation

Housing - vertical circulation

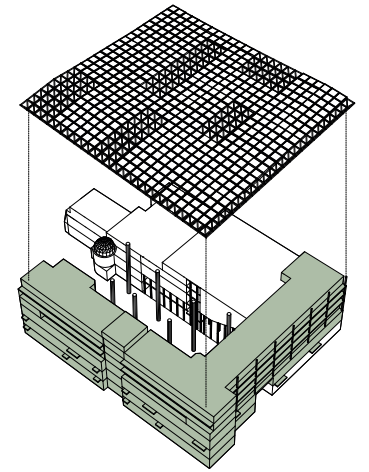


Implementation

Housing - corridors; section AA'



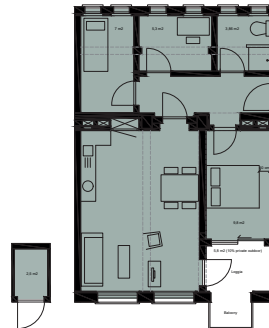
Housing - 2nd floor; old vs new housing; type 1



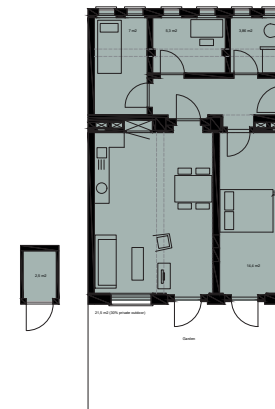
Type 1A - New (balcony)



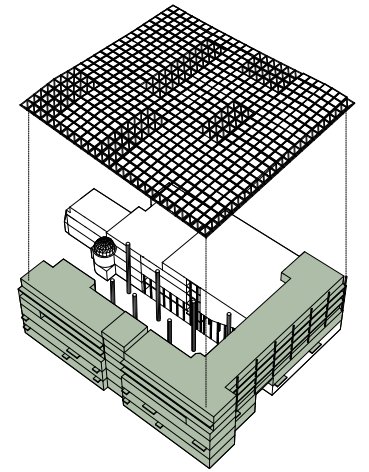
Type 1B - Old (loggia and balcony)



Type 1C - Old (garden)

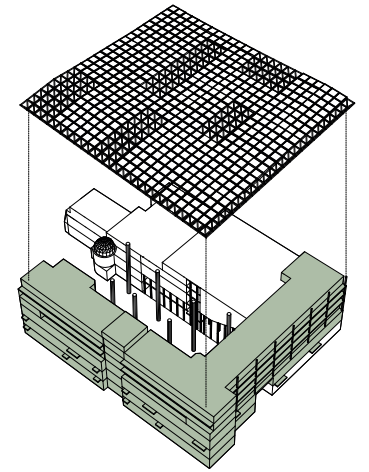


Housing - Facade SE; old vs new housing



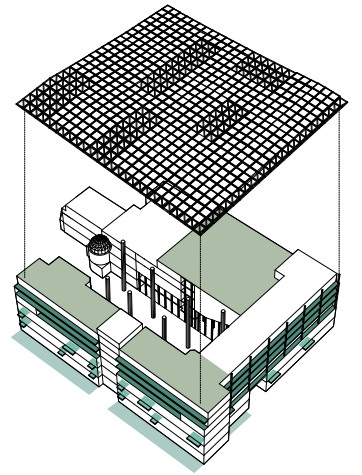
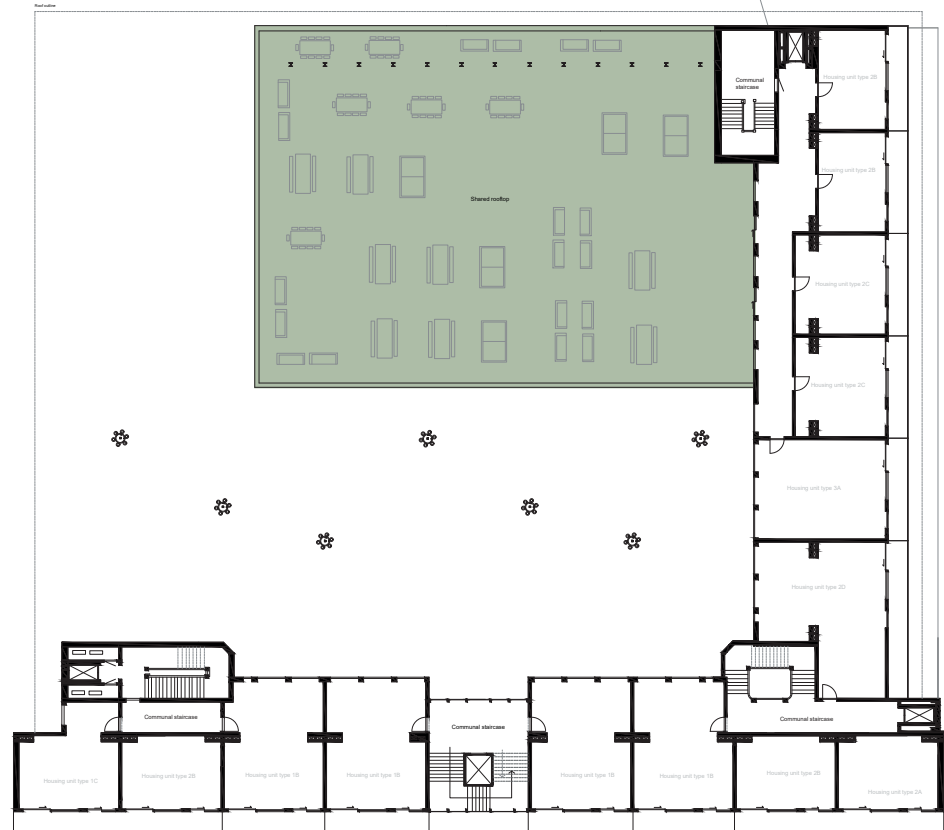
Implementation

Housing - Facade SW; old vs new housing

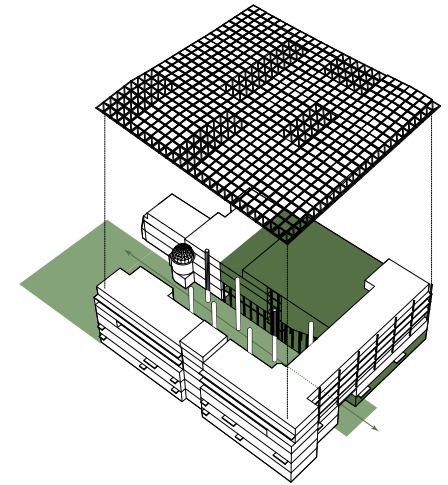


Implementation

Housing - 5th floor; shared rooftop



Implementation
Public campus



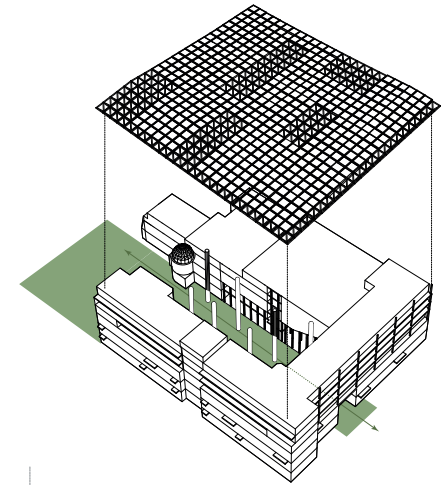
Implementation

Routing - visitor public park



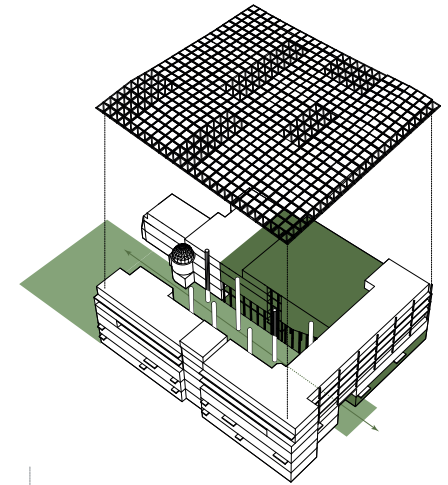
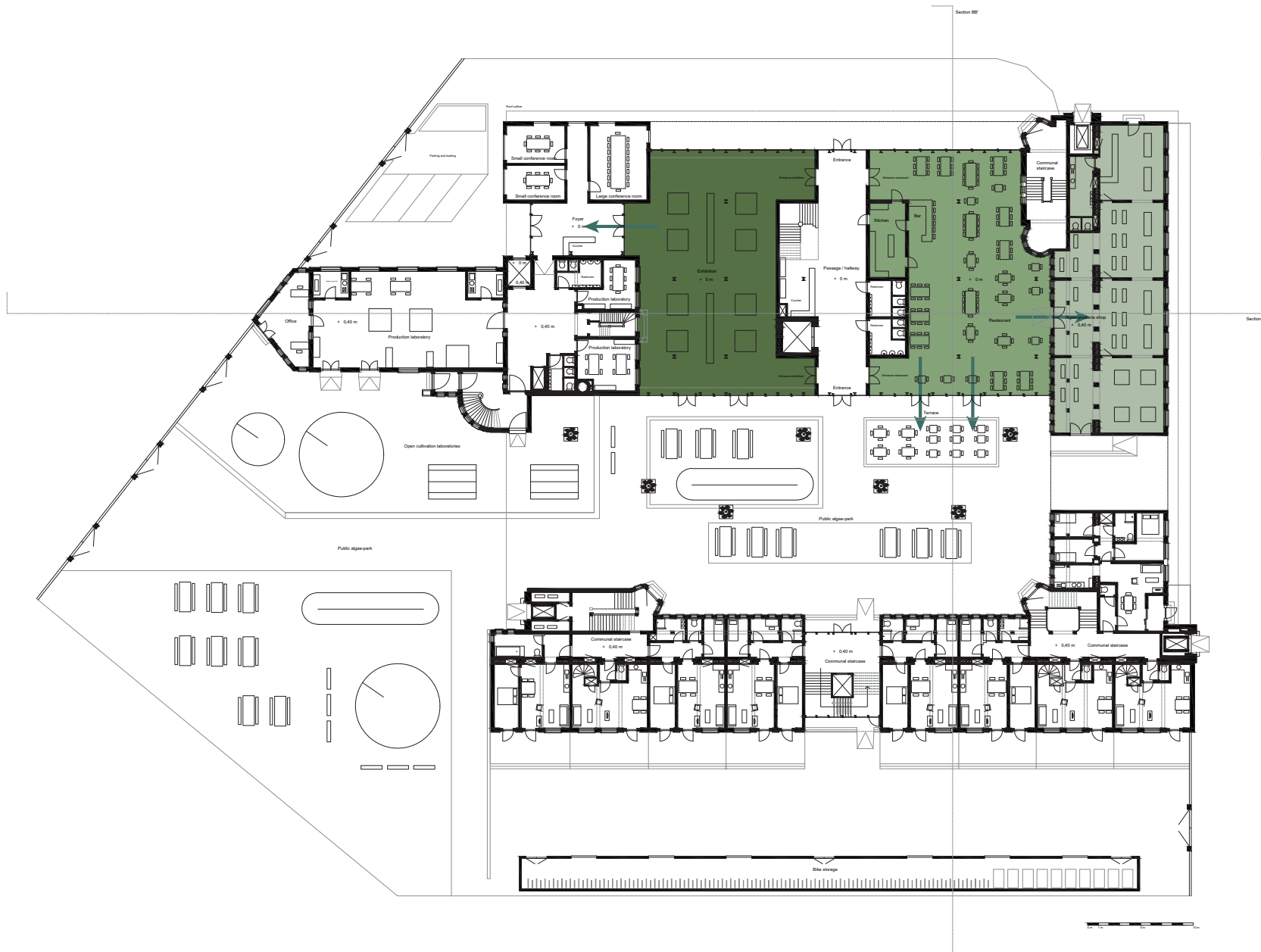
Implementation

Public park



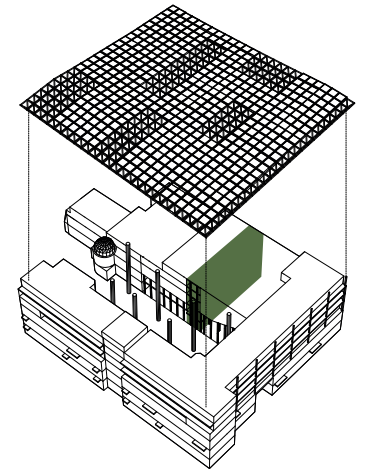
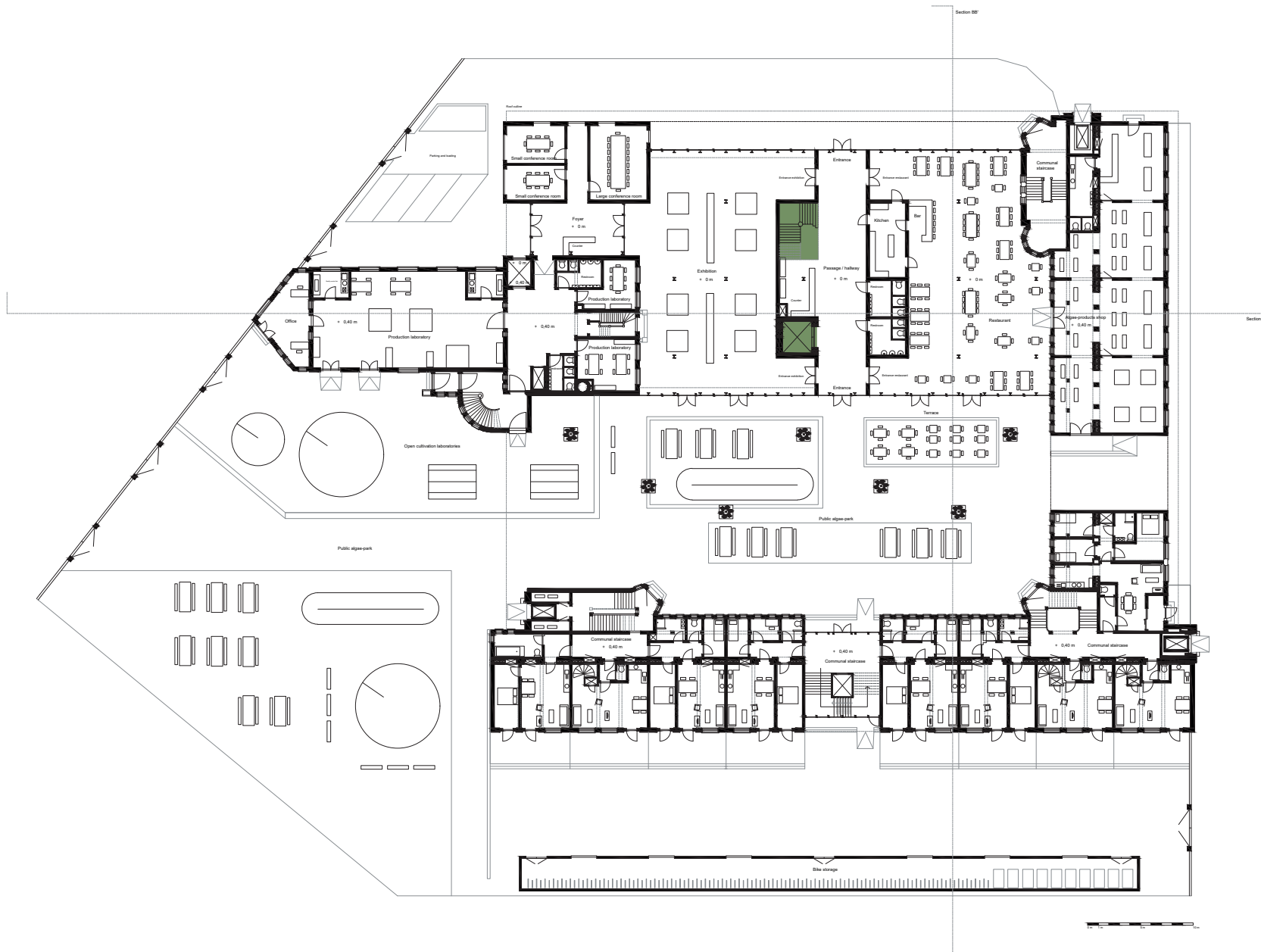
Implementation

Public campus - exhibition, restaurant and shop



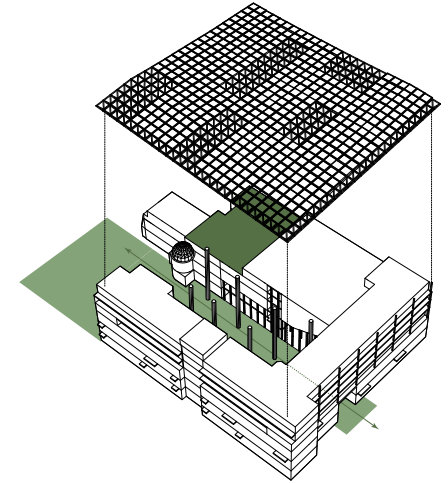
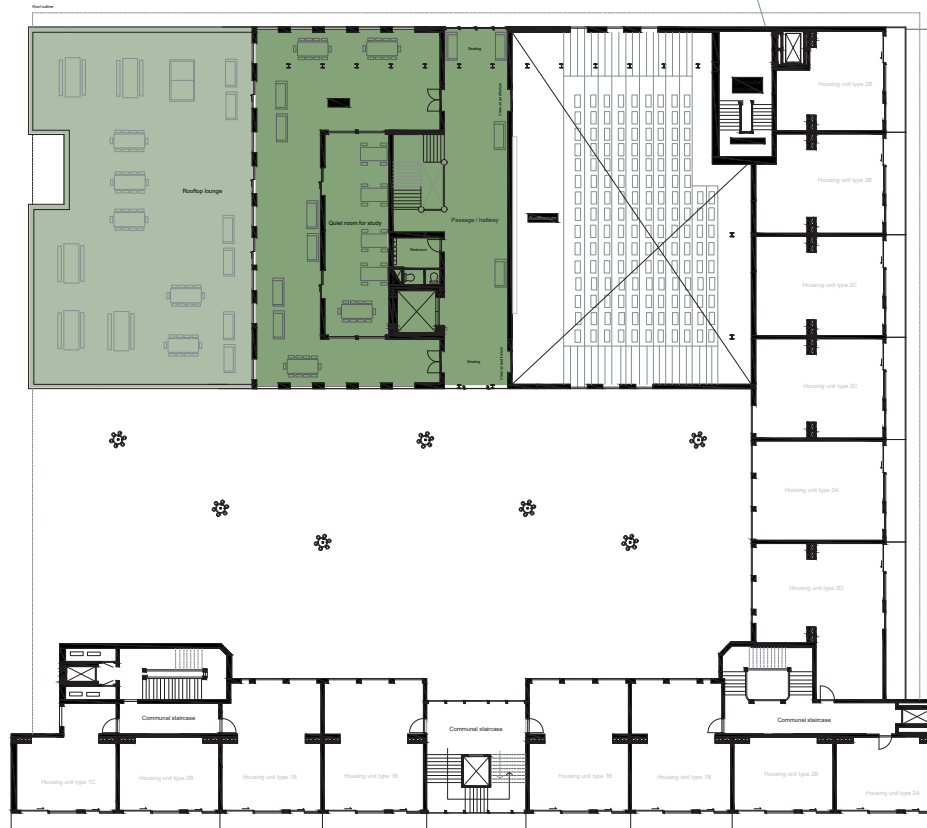
Implementation

Public campus - vertical circulation



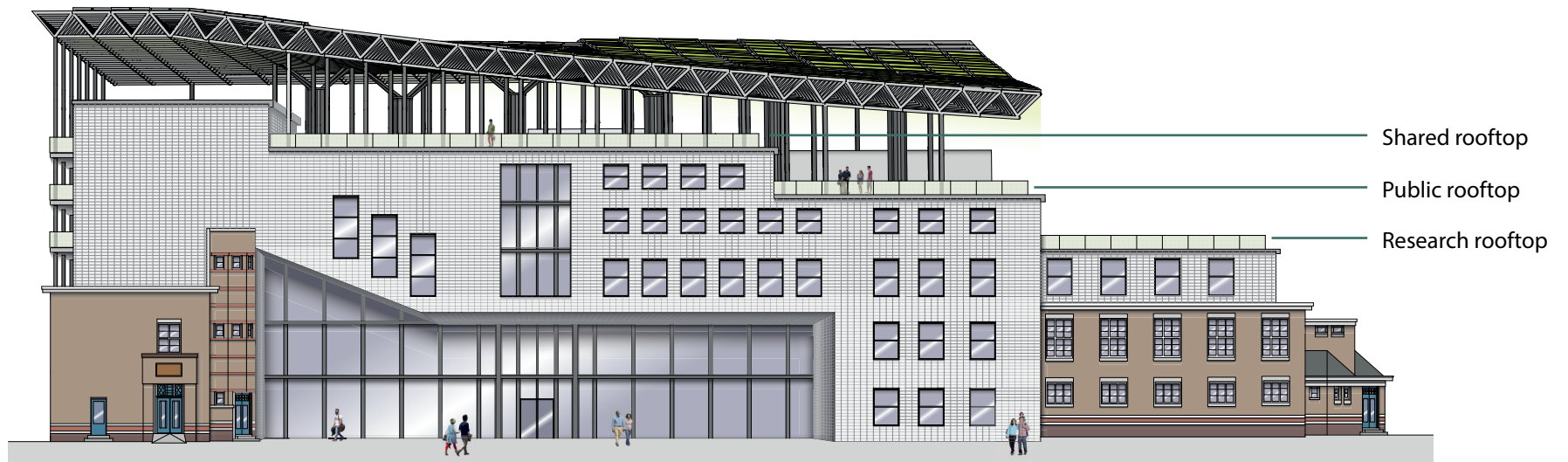
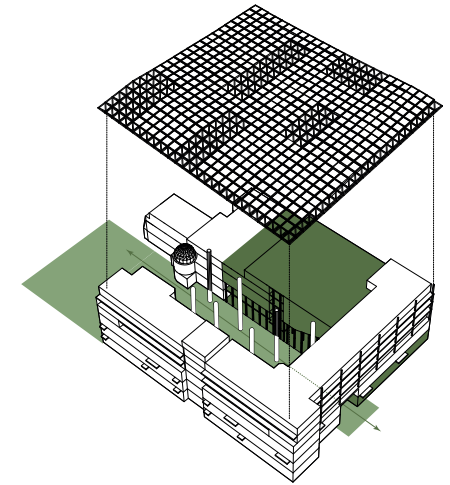
Implementation

Public campus - 4th floor; lounge and rooftop

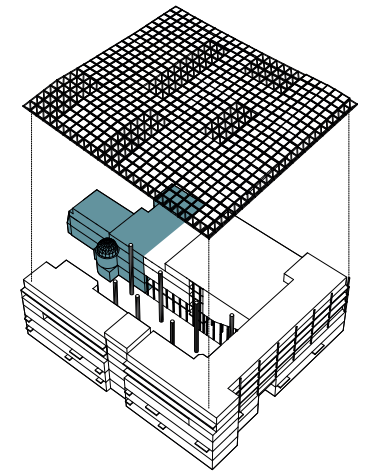
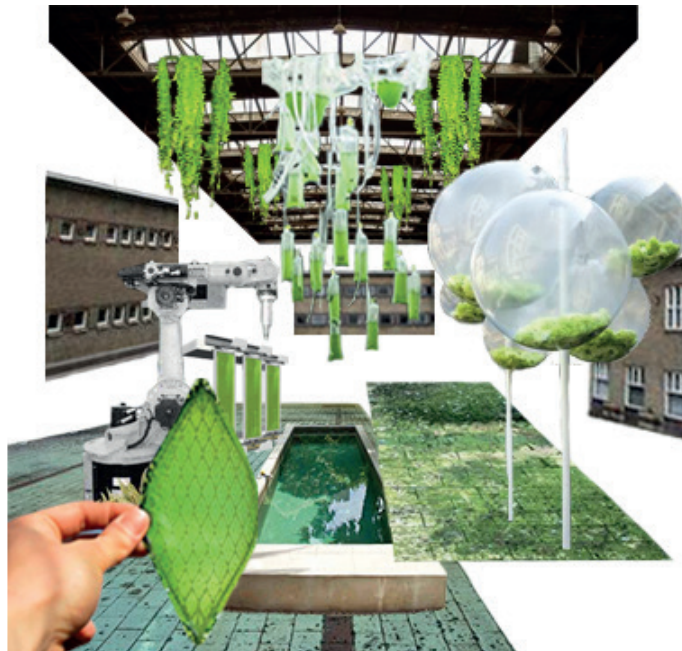


Implementation

Public campus - facade NW; relation old and new

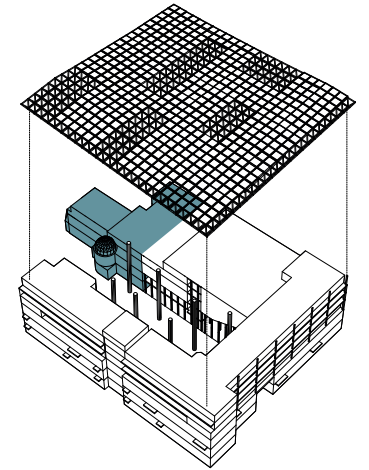


Implementation
Research institute

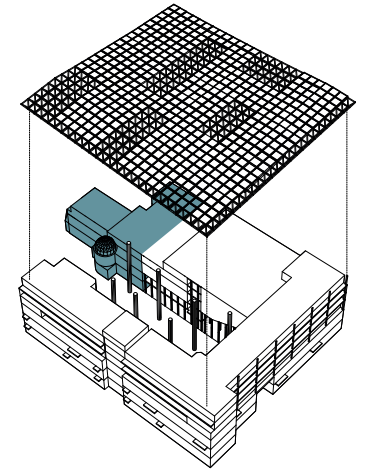
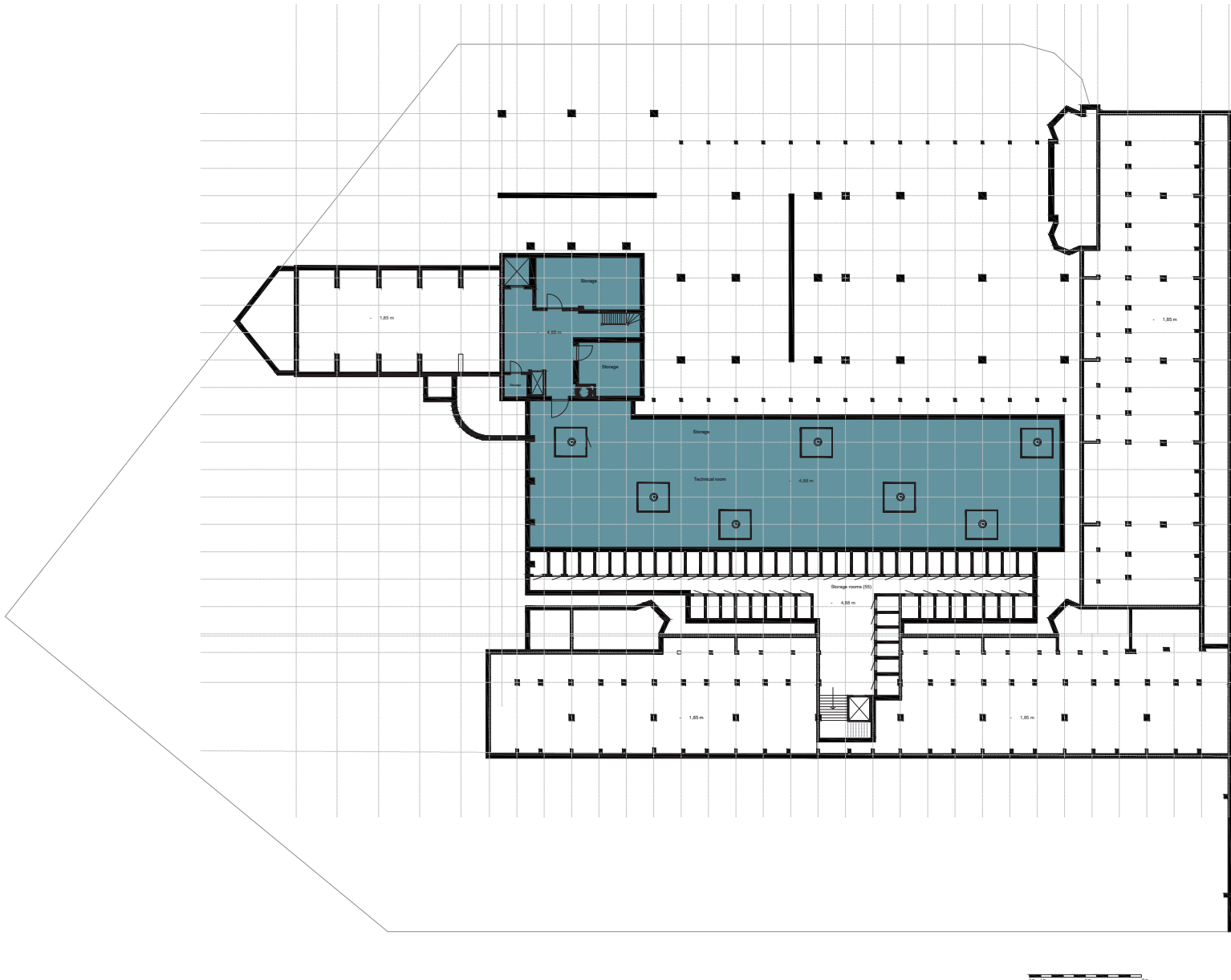


Implementation

Research institute - outdoor laboratory

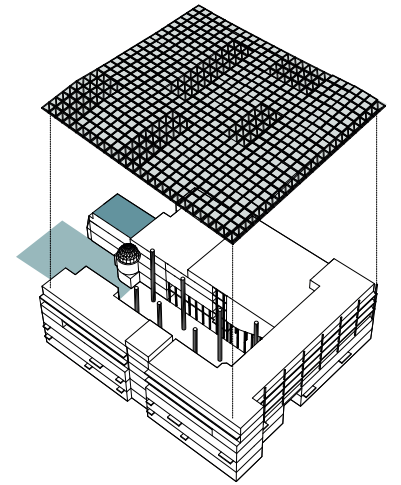
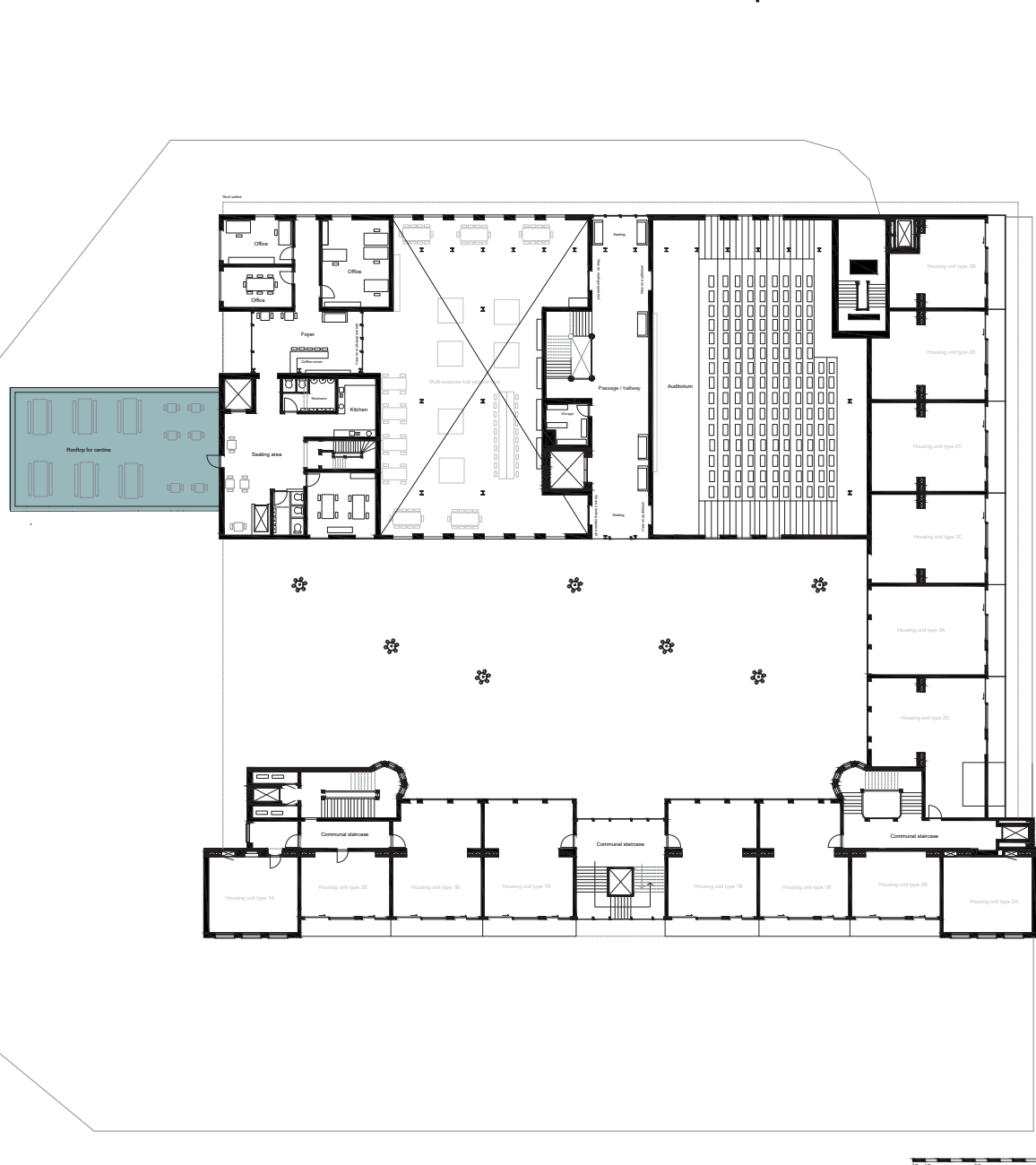


Research institute - technical space and storage



Implementation

Research institute - 3rd floor; rooftop cantine



Implementation

Public park atmospheric view



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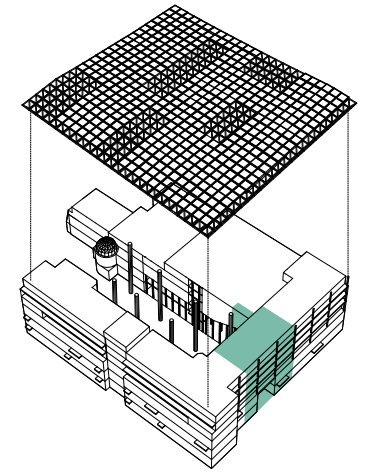
Conclusion

INDEX

Connection between old and new - fragment

Algae panel roof

Glass facade



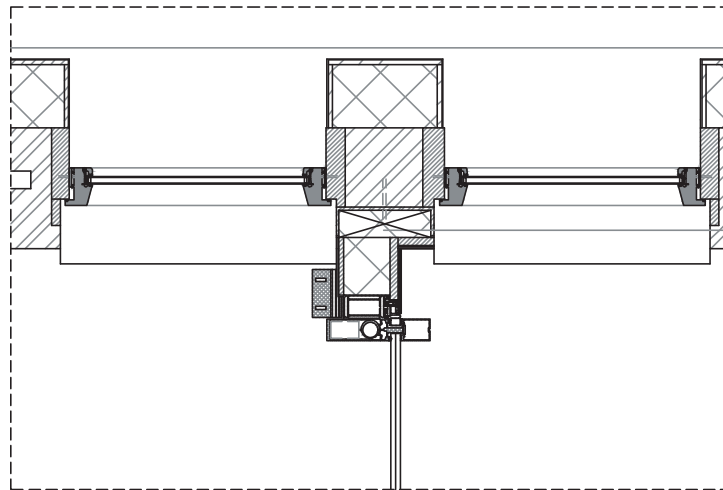
White reflective
ceramic tile
40,8 x 20 cm

Light brown
masonry



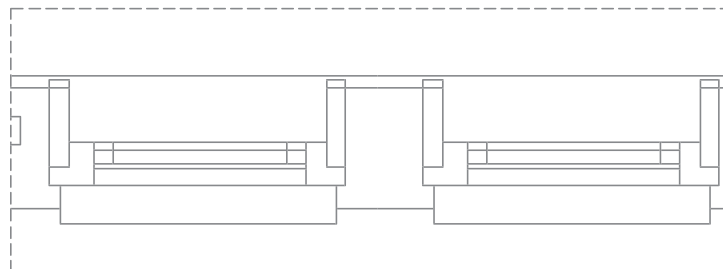
Connection between old and new - detail

New horizontal detail



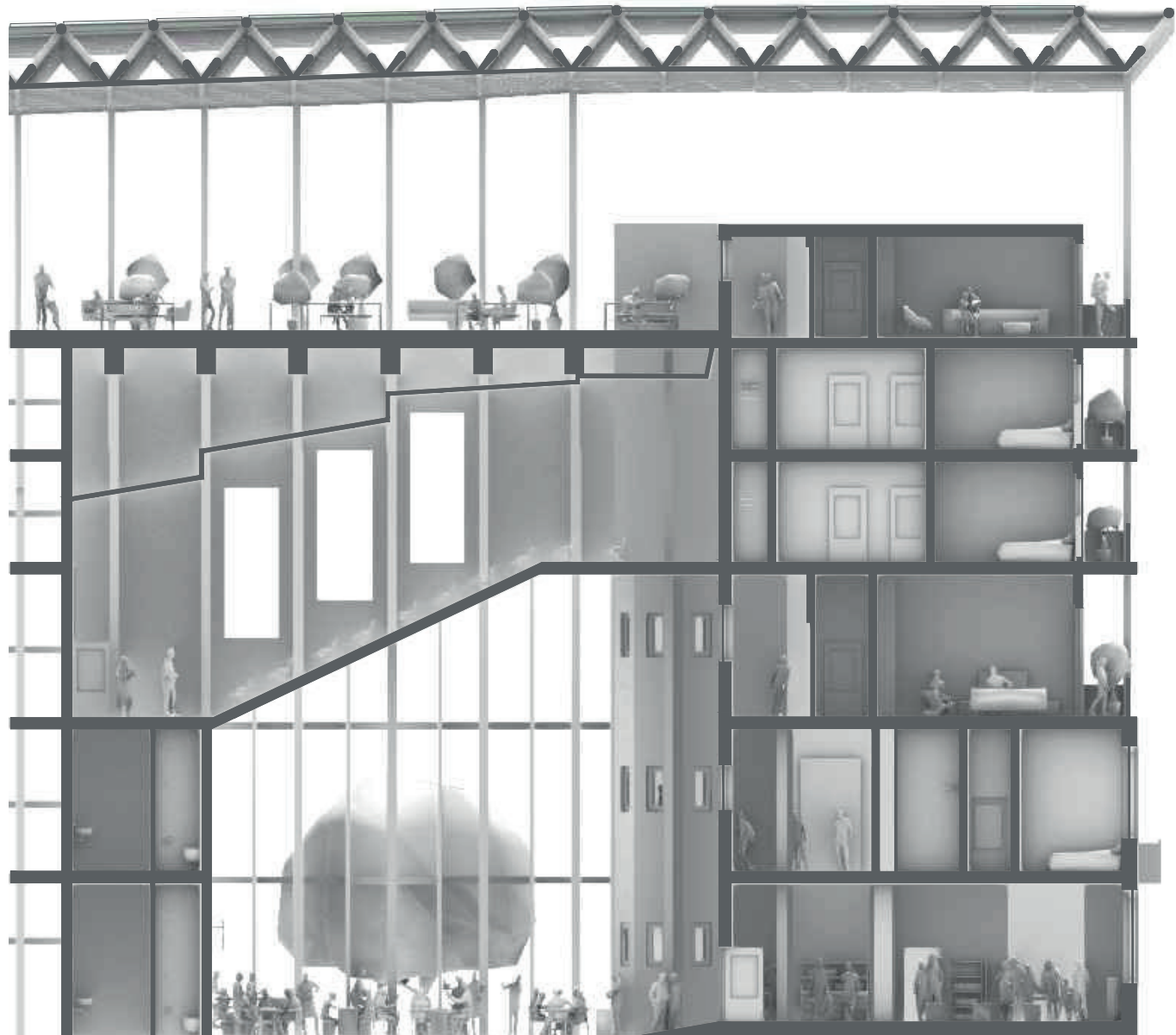
Load bearing masonry replaced by steel frame with insulation
Strengthen if necessary

Old horizontal detail



Development

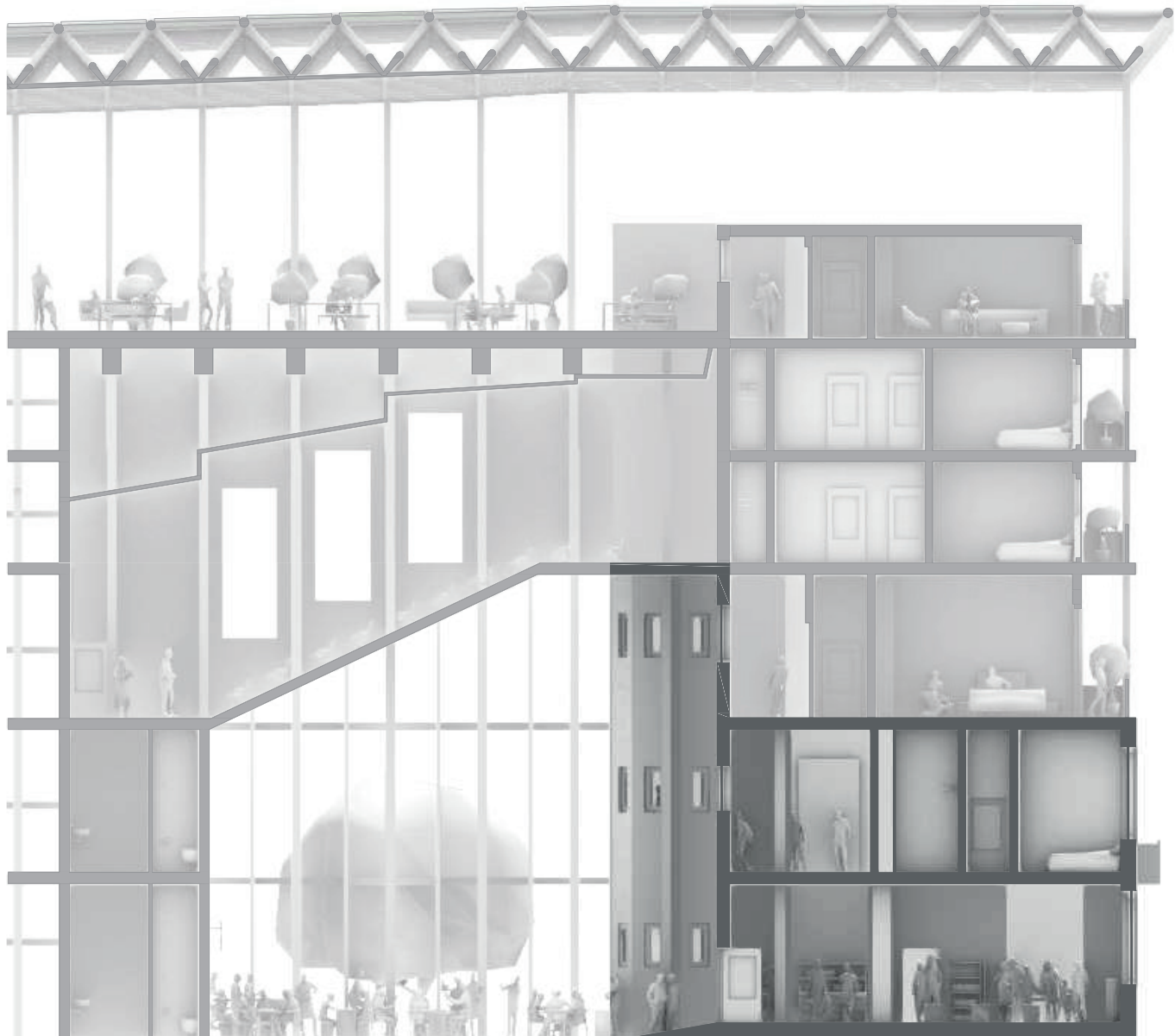
Connection between old and new - interior



0 m 1 m 5 m 10 m

Development

Connection between old and new - interior



0 m 1 m 5 m 10 m

Development

Connection between old and new - interior view



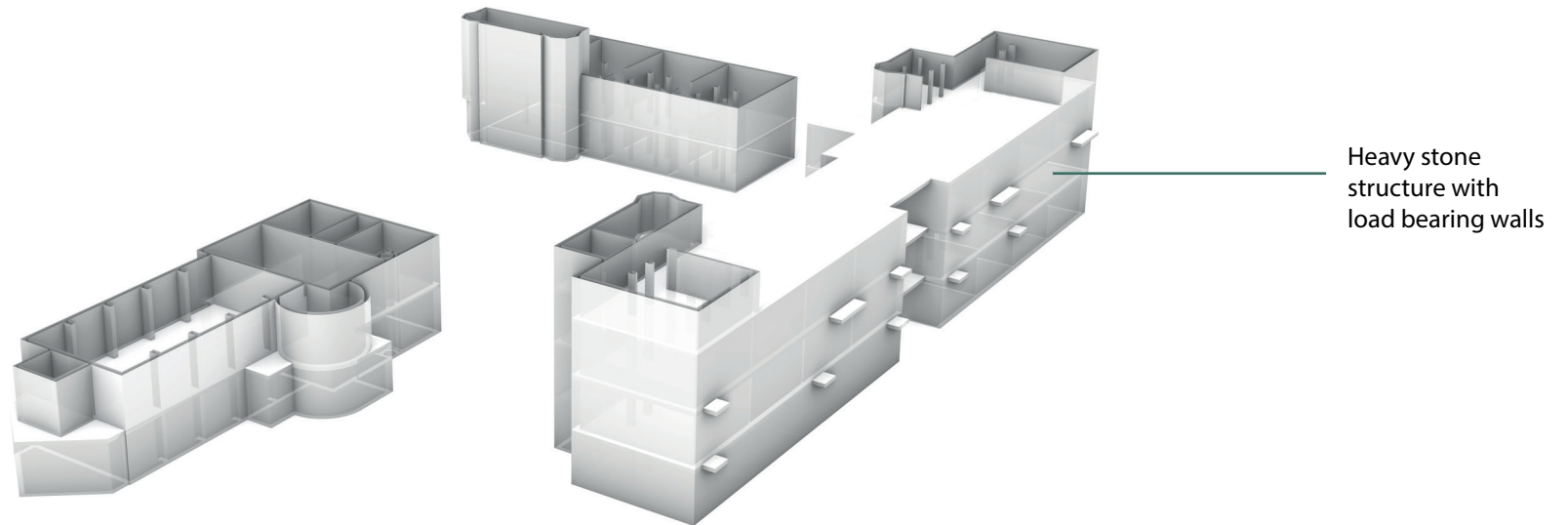
Development

Connection between old and new - interior view



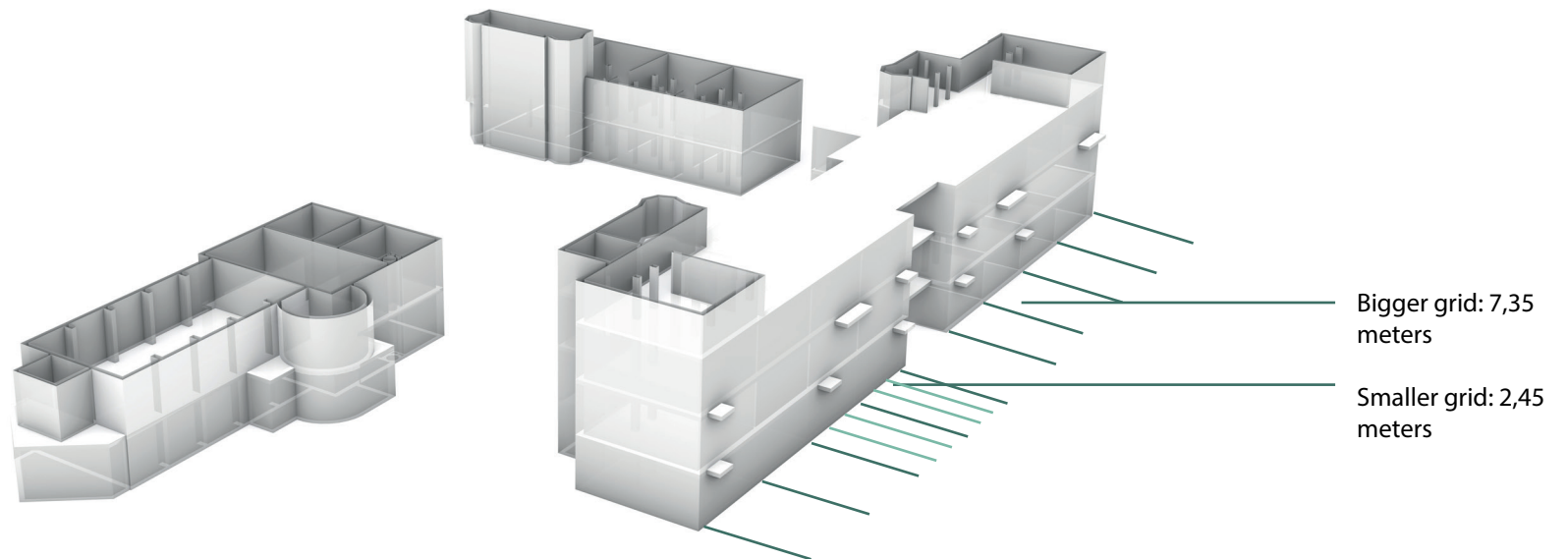
Development

Existing structure



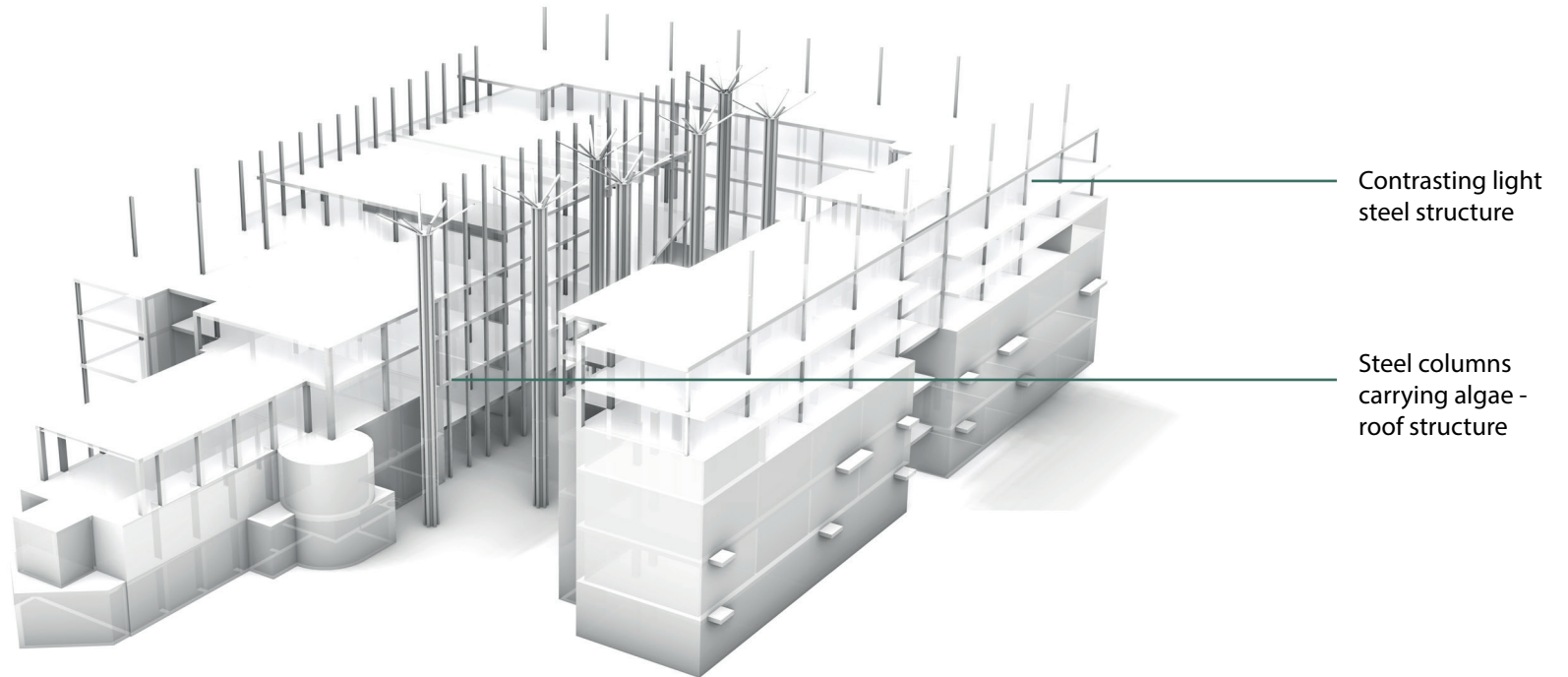
Development

Existing structure grid



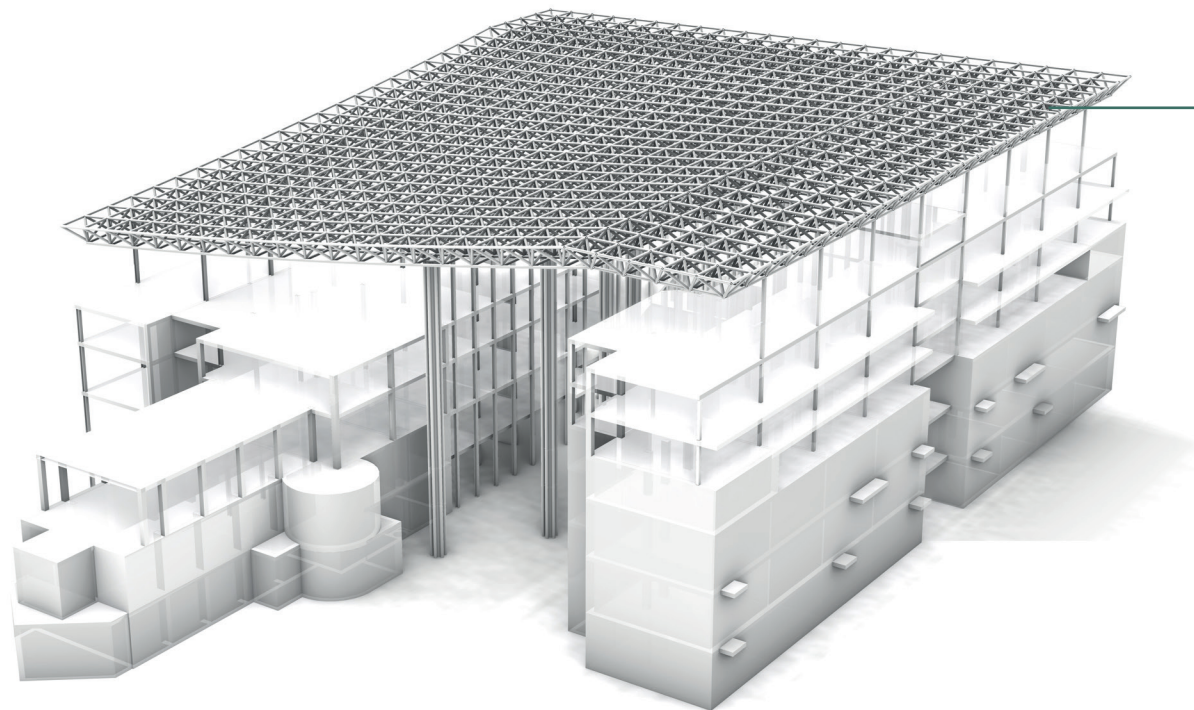
Development

Additional structure



Development

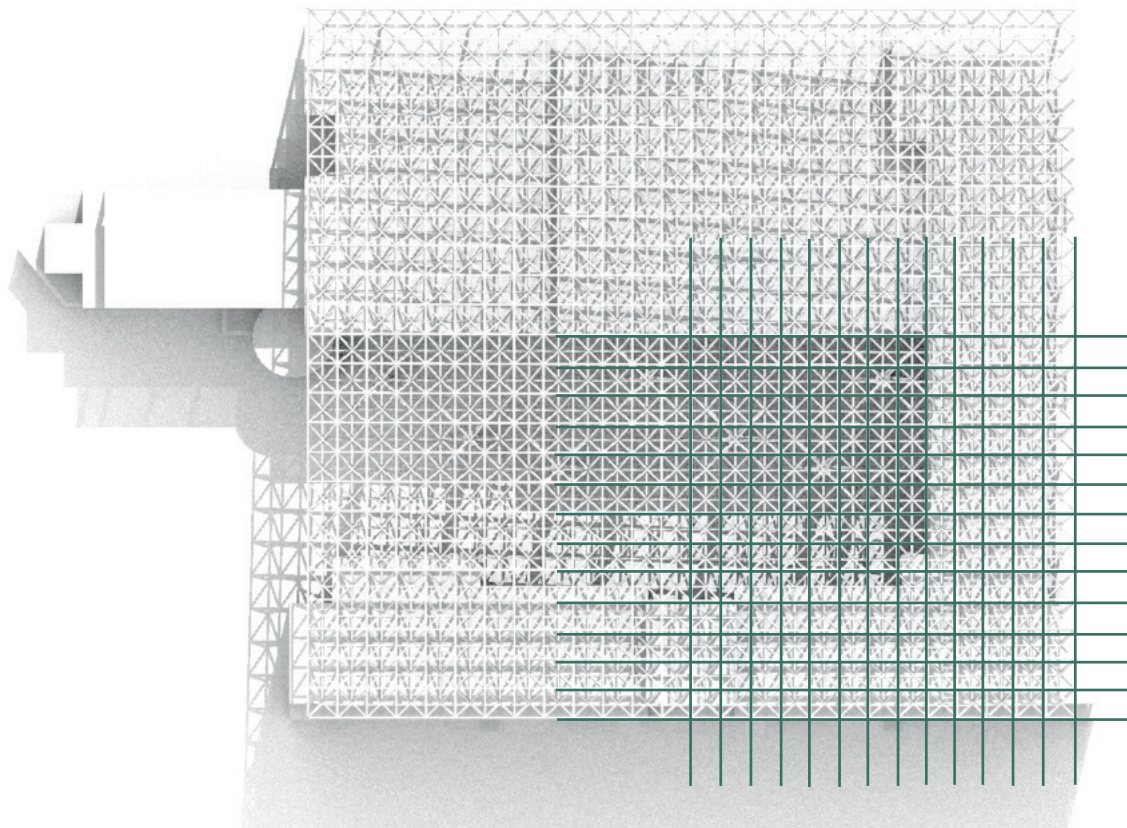
Algae - roof structure



Algae - roof
structure
Steel space frame

Development

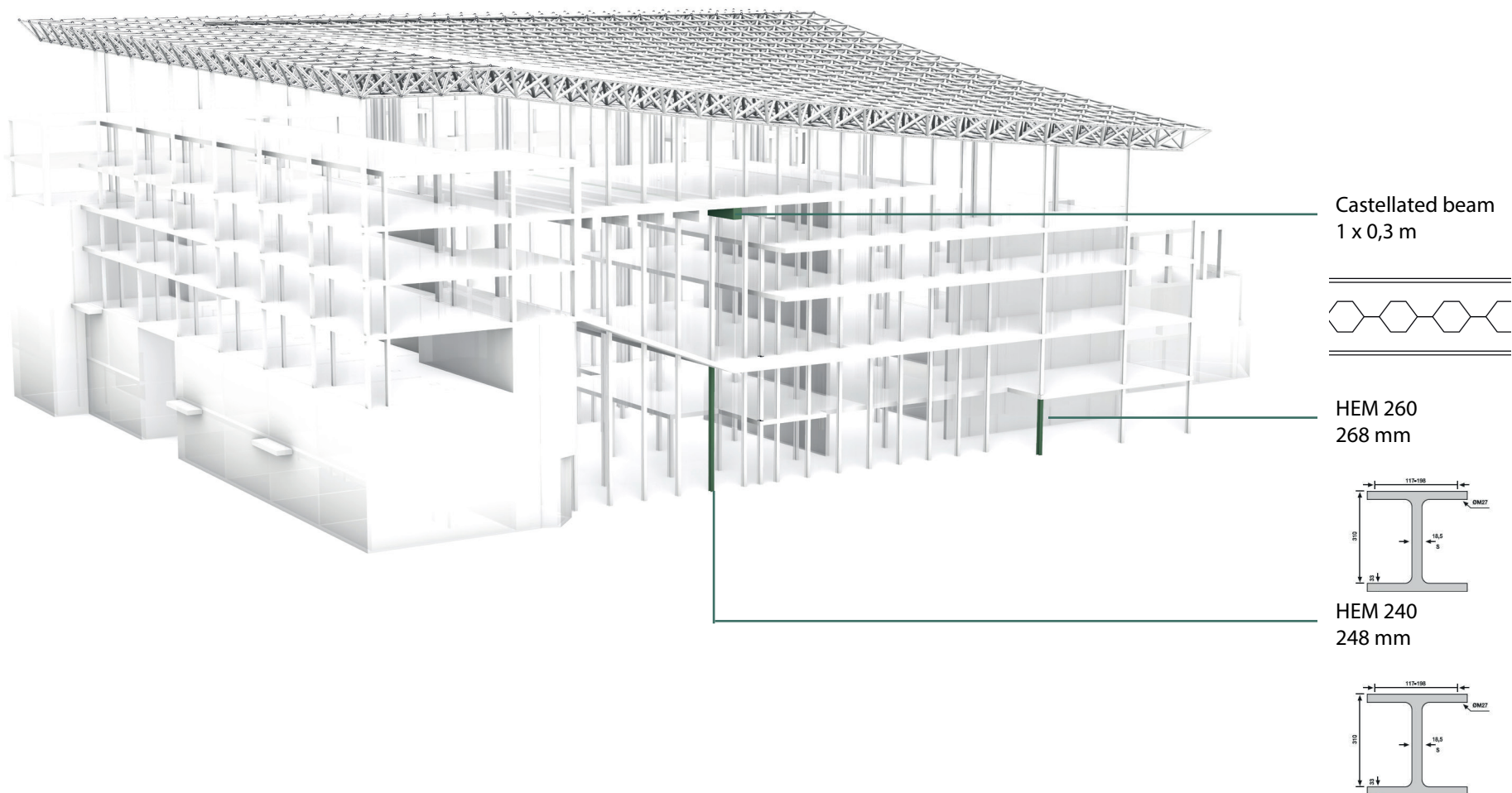
Top view - grid construction



Grid taken from
existing structure
2,45 x 2,45 m

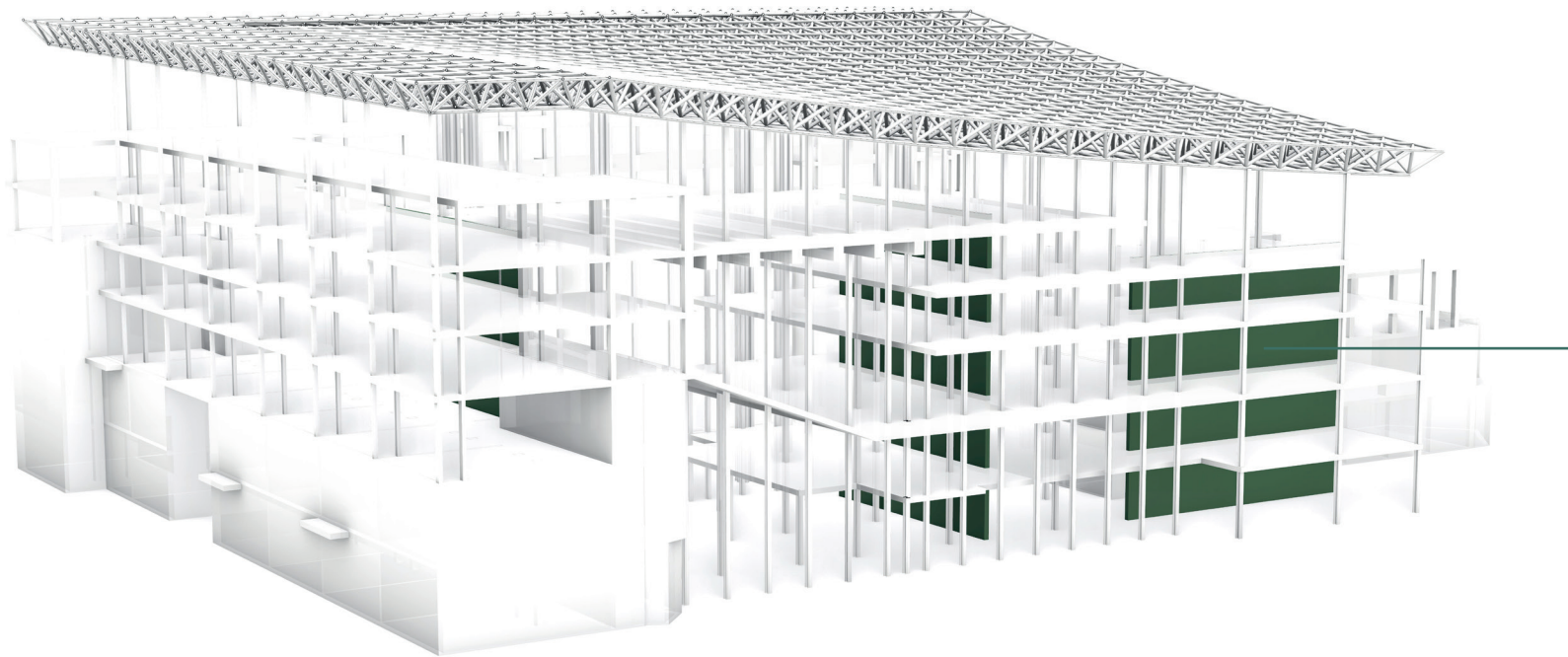
Development

Steel profiles



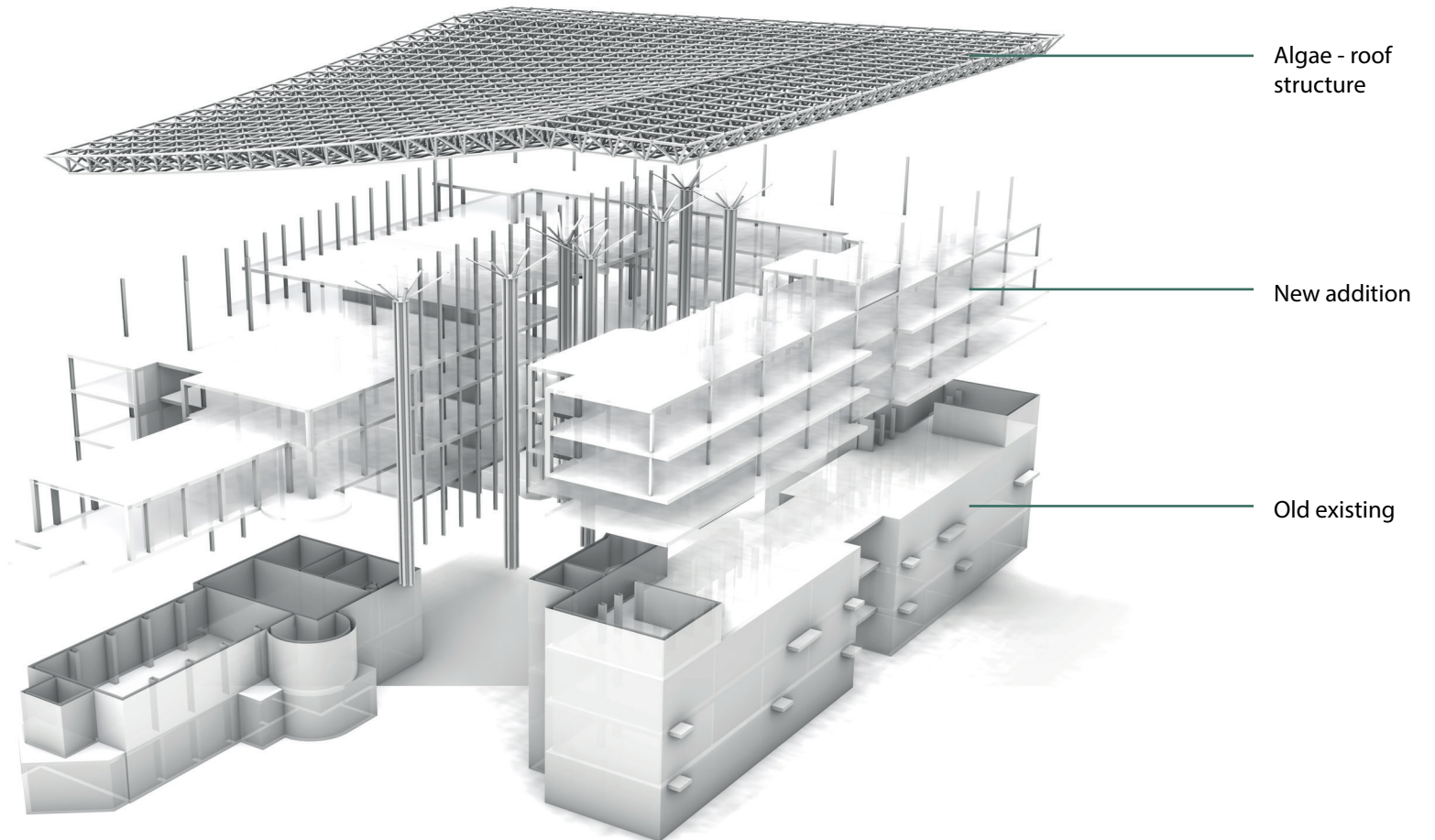
Development

Stability



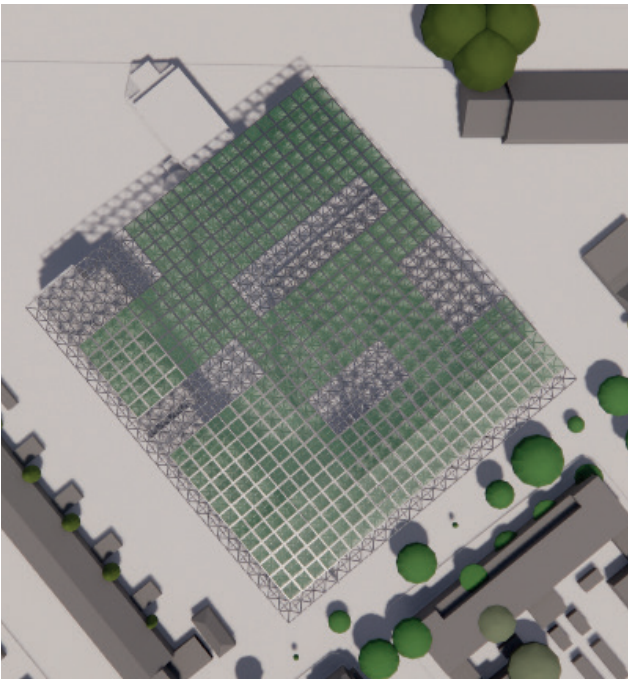
3 concrete wall-
elements for
stability

Development
Structure axo



Development

Steel frame structure with panels



448 panels (72% of roof structure covered)

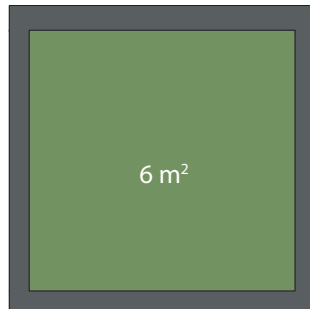
Steel frame structure with panels



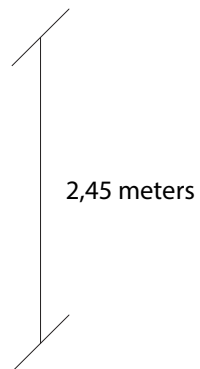
Energy production



Heat production

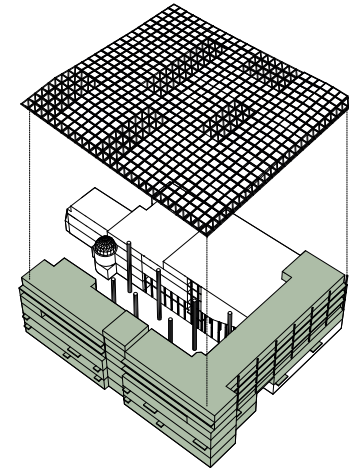


1000 kWh/year per panel



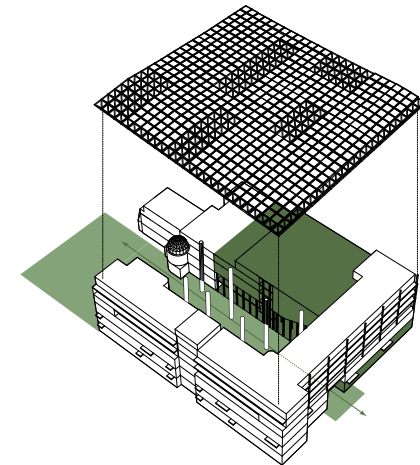
900 m² panels

Total of 134095,5 kWh/year



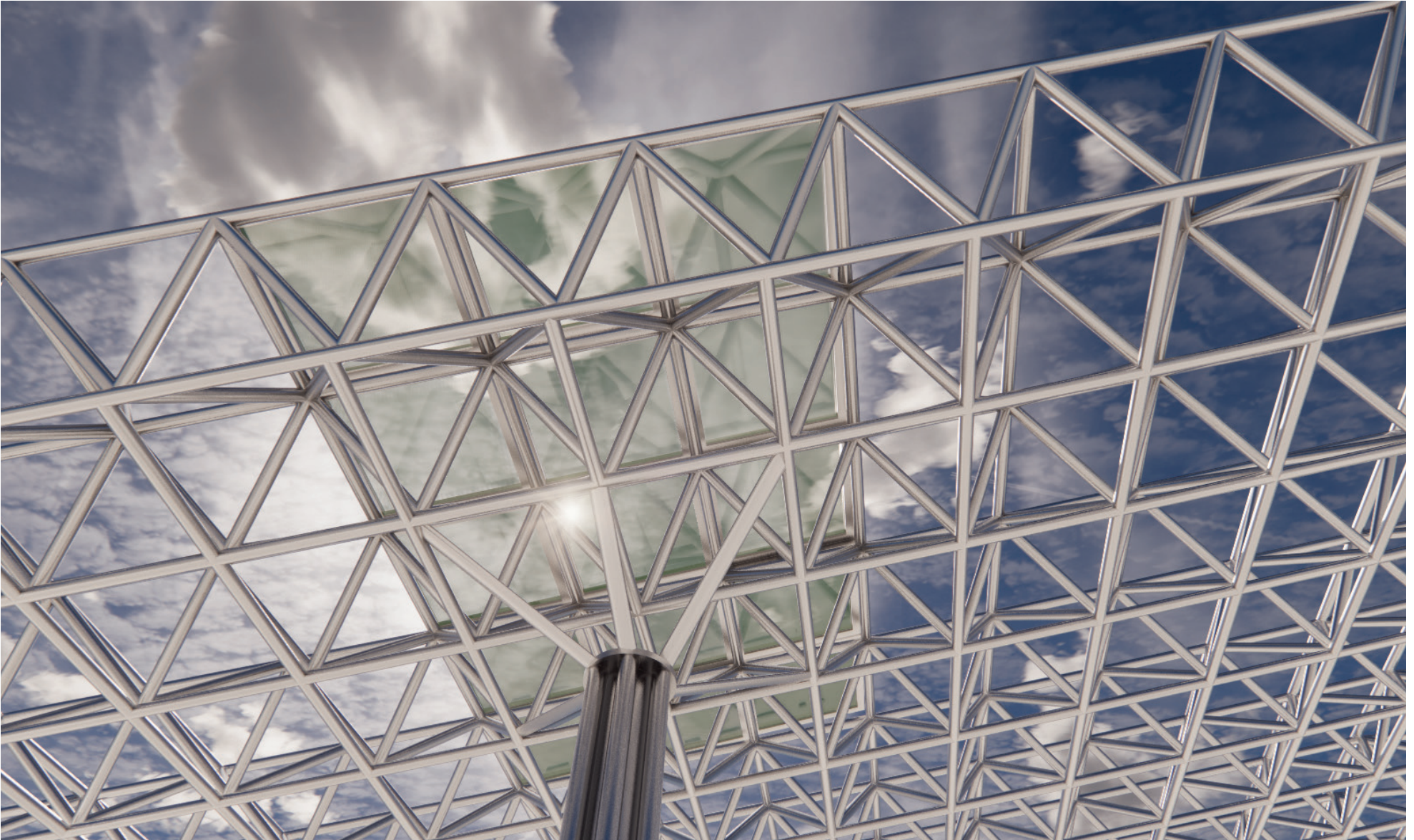
1800 m² panels

Total of 268191 kWh/year



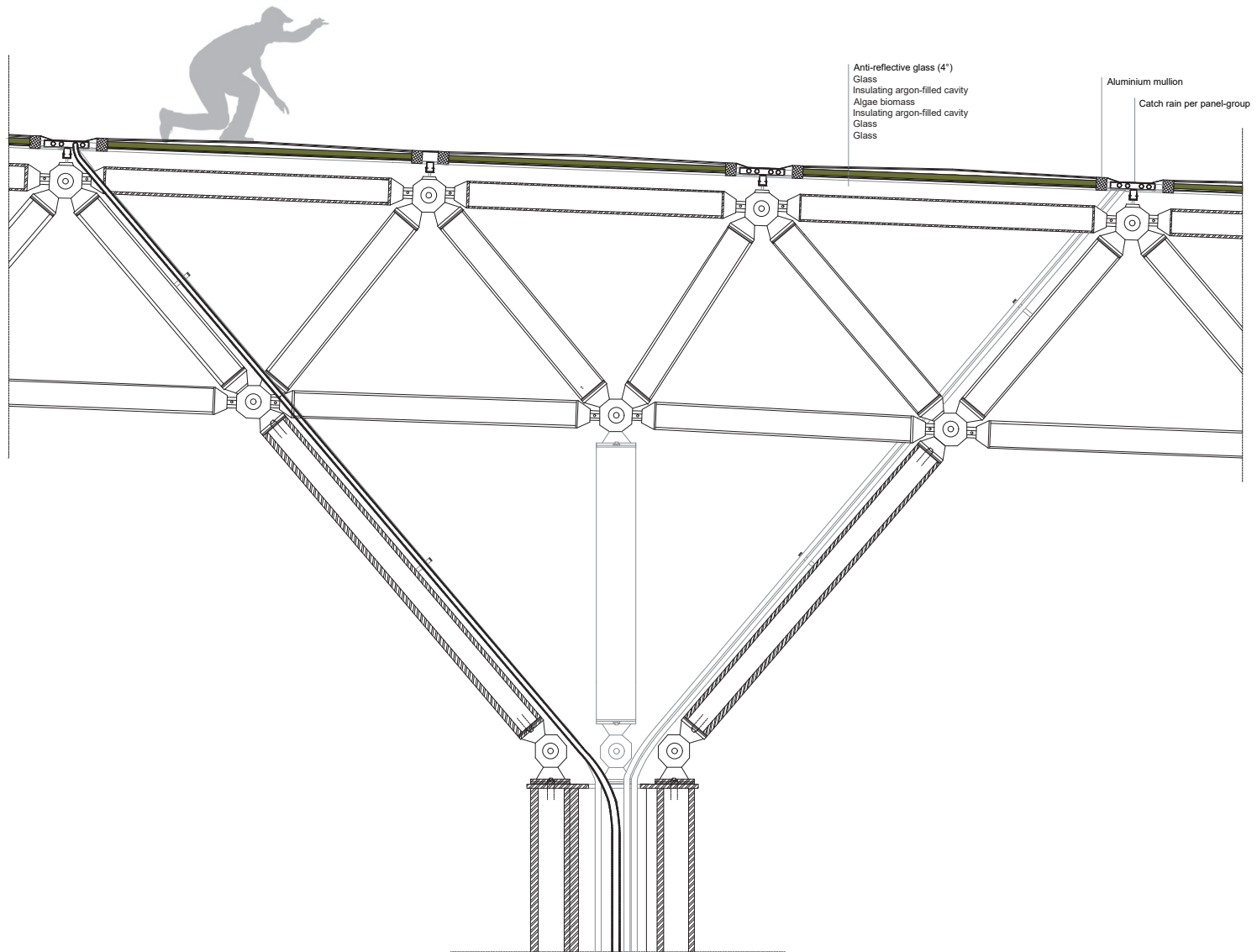
Development

Steel frame structure with panels



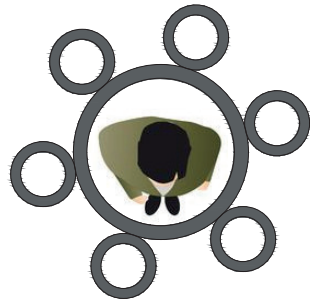
Development

Steel frame structure with panels - detail

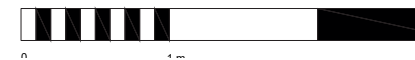
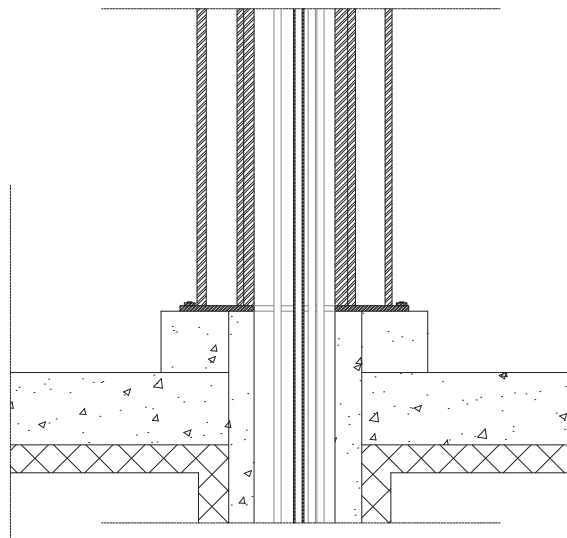
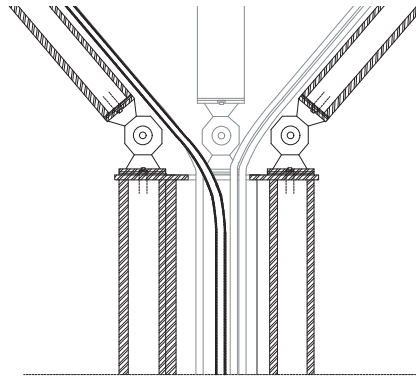


Development

Steel column - detail

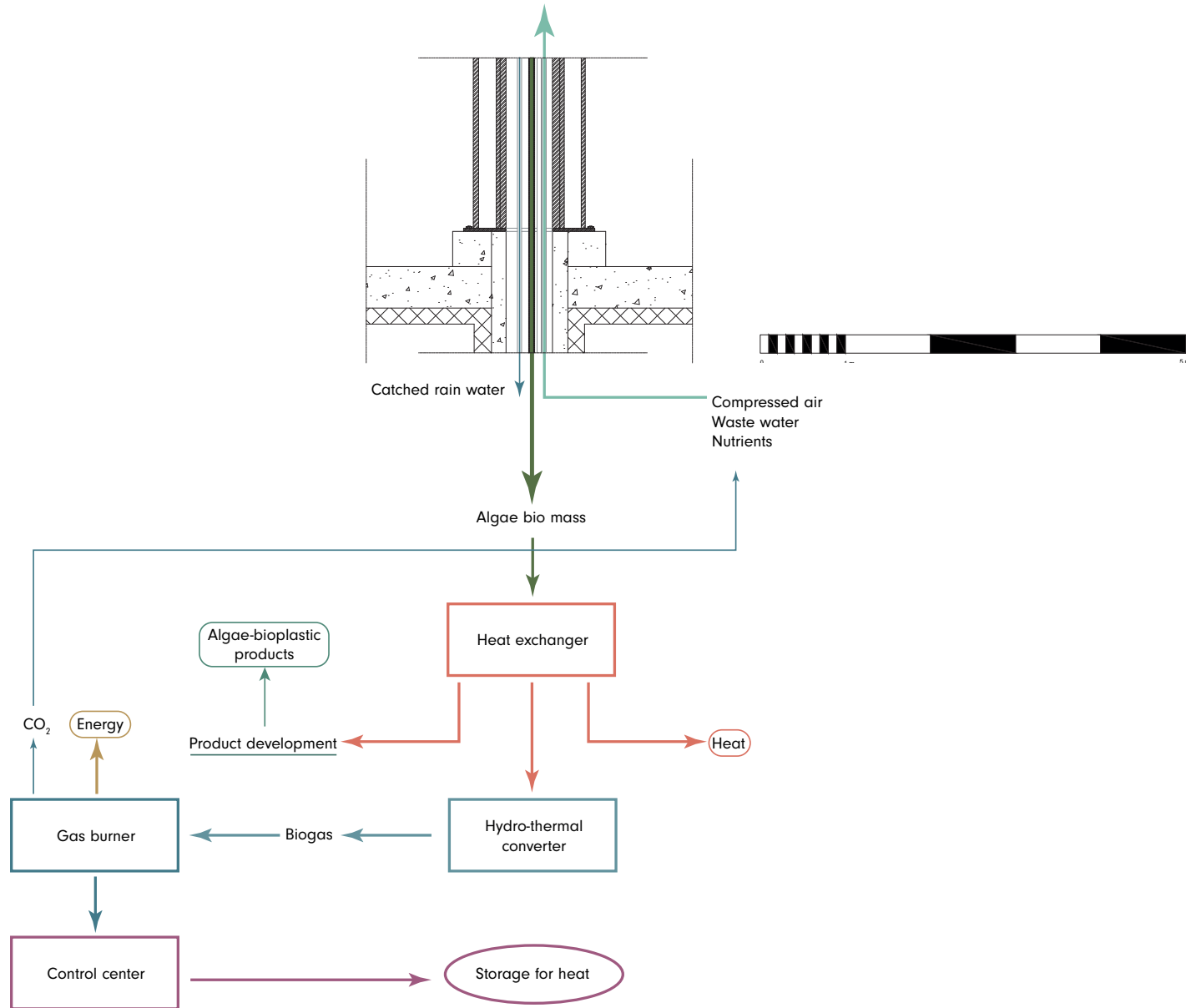


0,70 meters



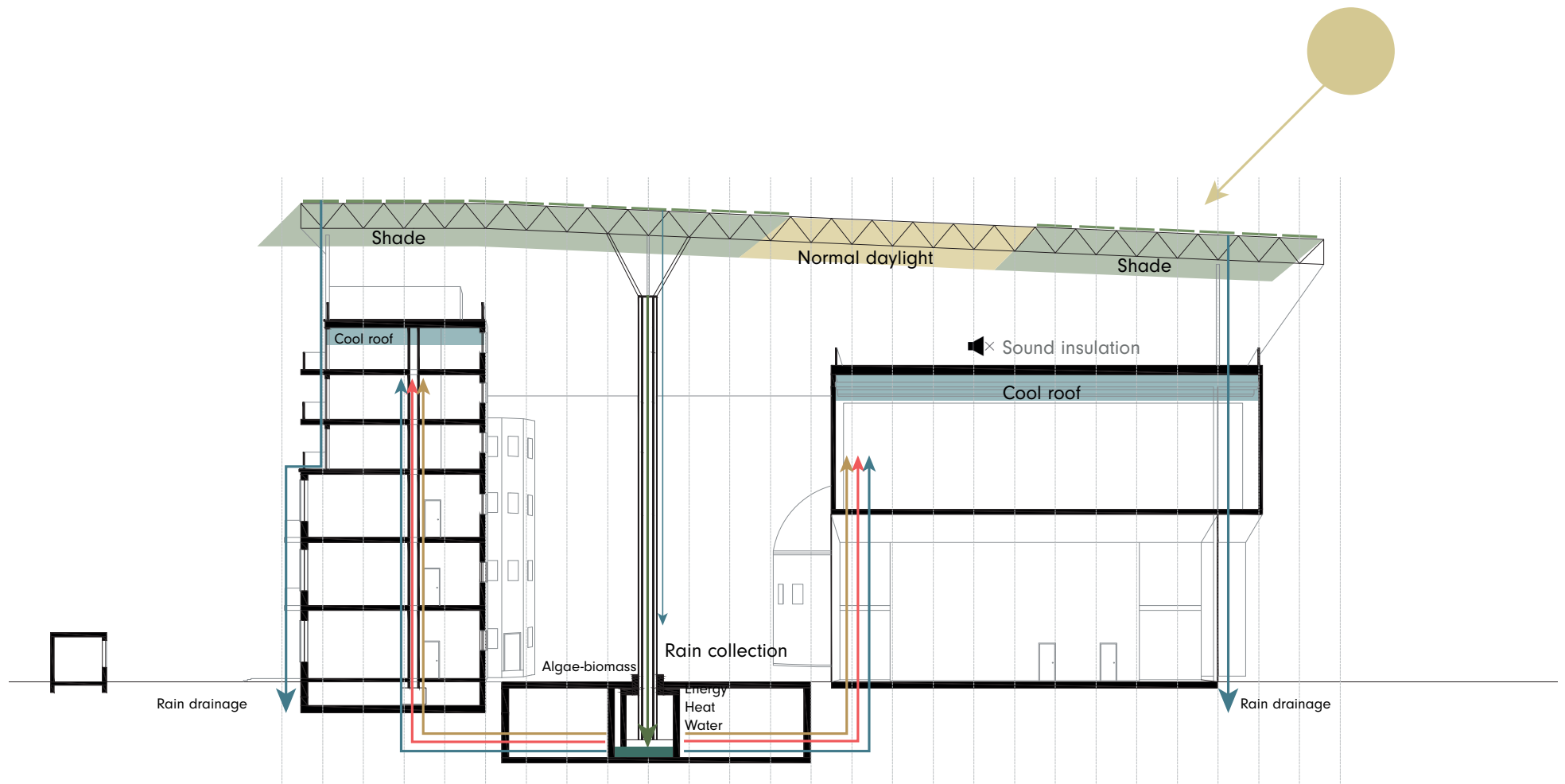
Development

Steel column - system

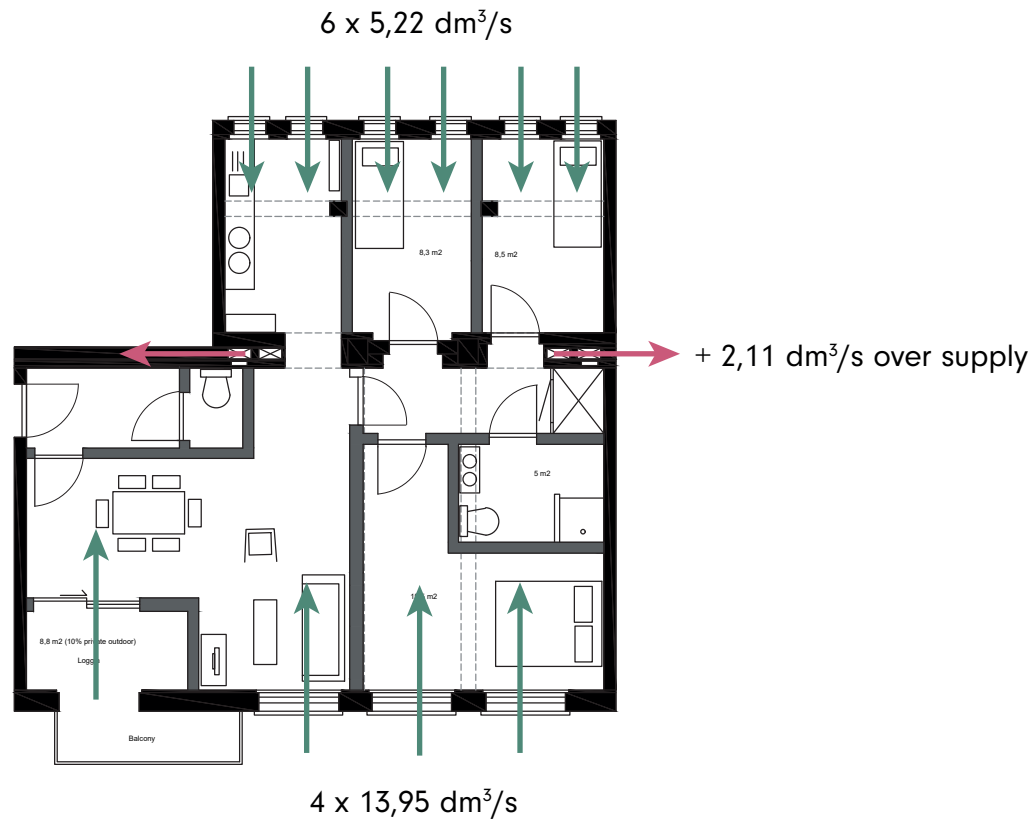


Development

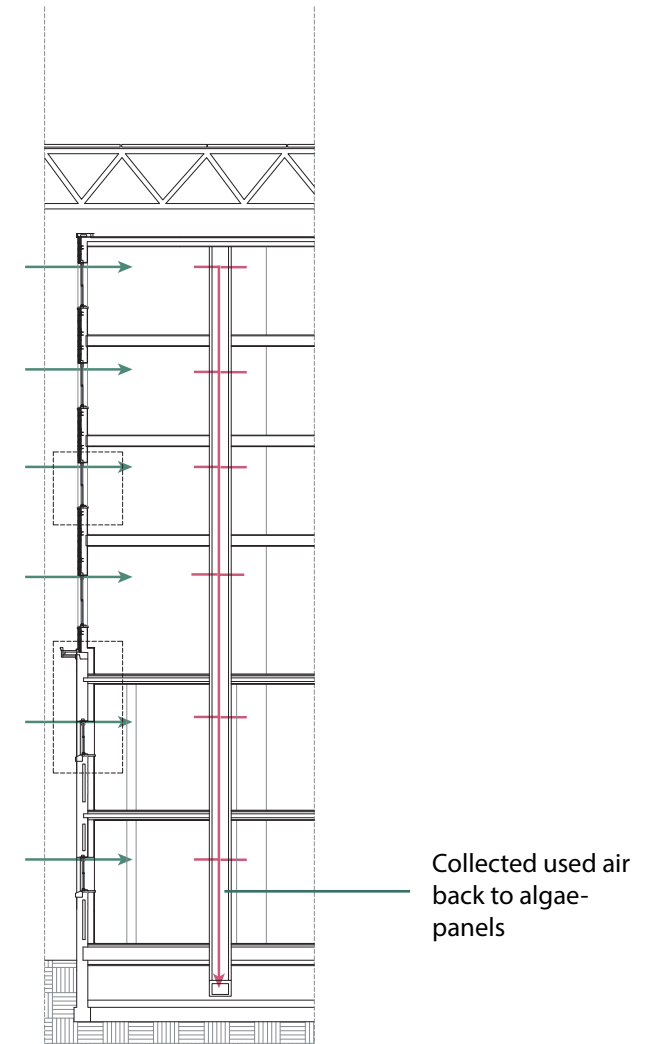
Climate scheme - section



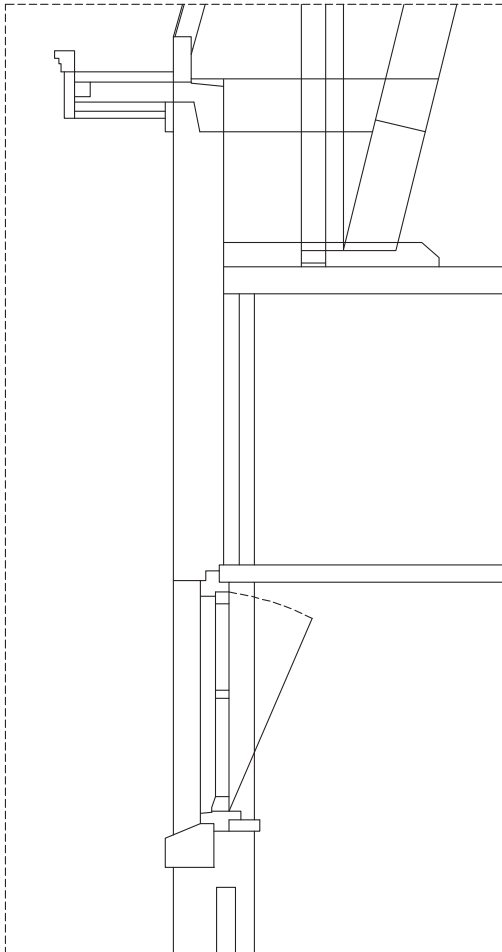
Renovation classrooms - housing ventilation



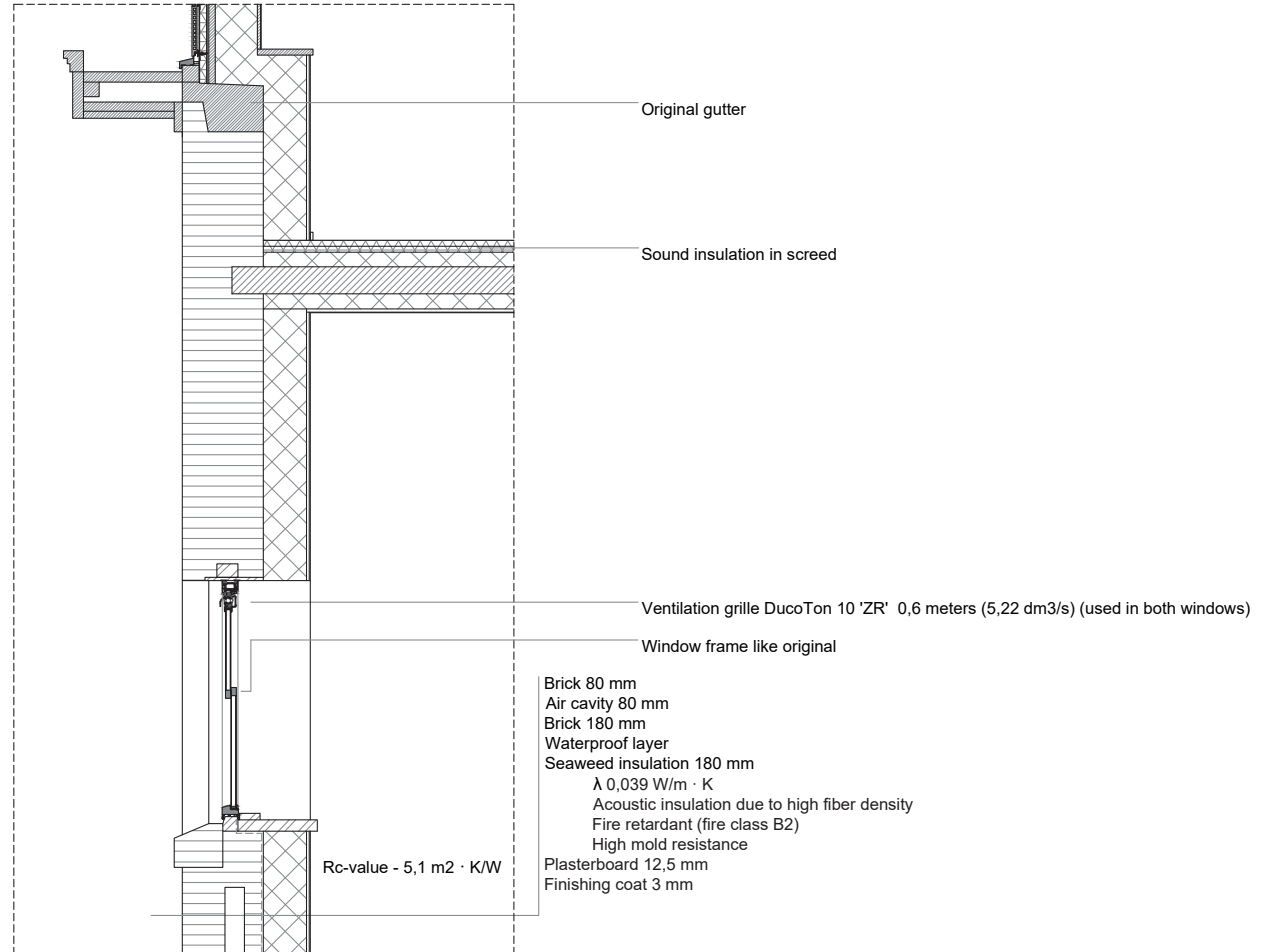
Ventilation type C: natural supply - mechanical drain



Detail housing renovation part



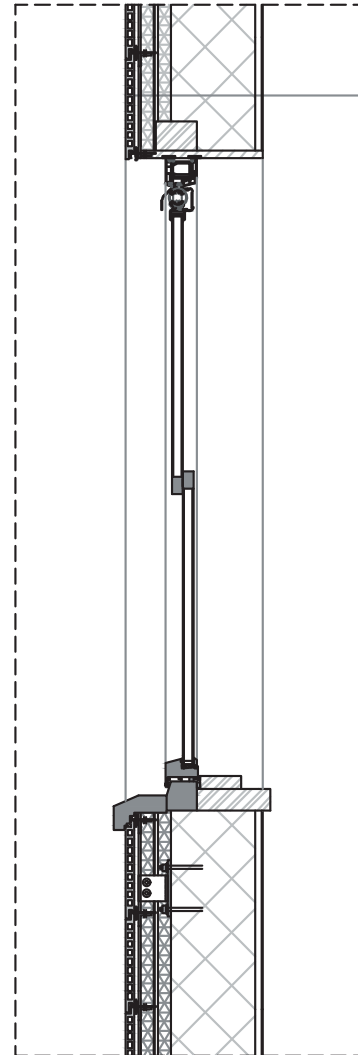
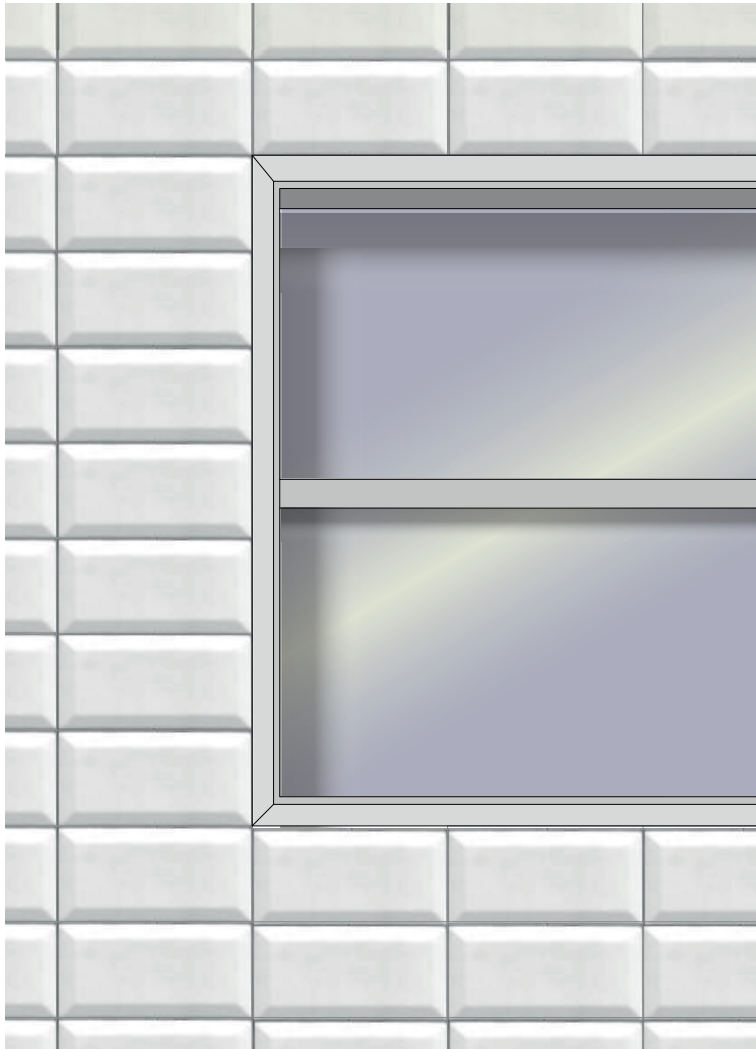
Old vertical detail



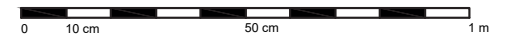
New vertical detail

Development

Detail ceramic tile facade



White reflective ceramic tile
408 mm x 200 mm



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MOVIE

THANK YOU.



APPENDIX



Appendix

Public park view



Appendix

Park from elevator entrance



Appendix

Park from inner square



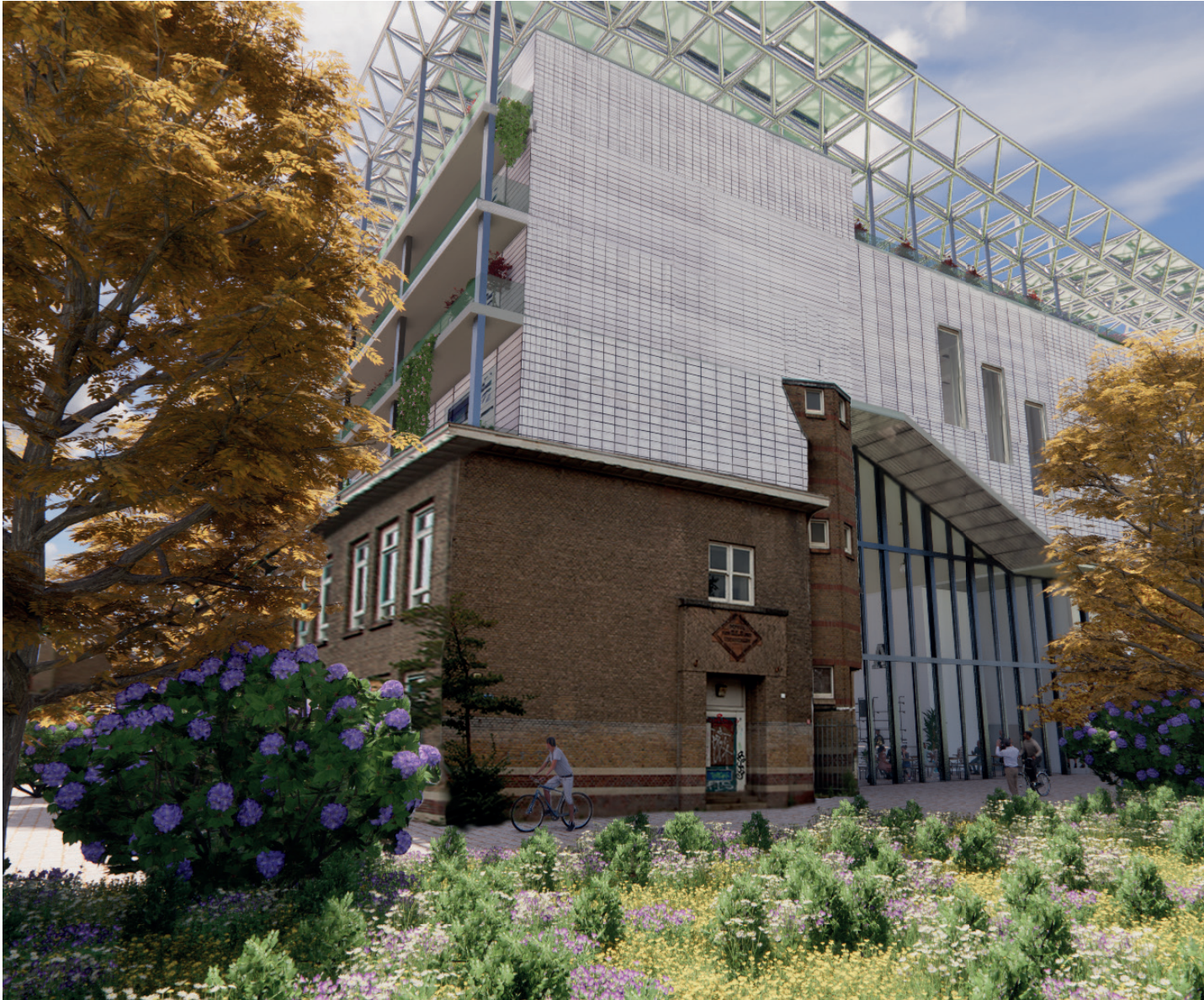
Appendix

South-West facade



Appendix

East corner



Appendix

Shared rooftop afternoon



Shared rooftop morning



Appendix

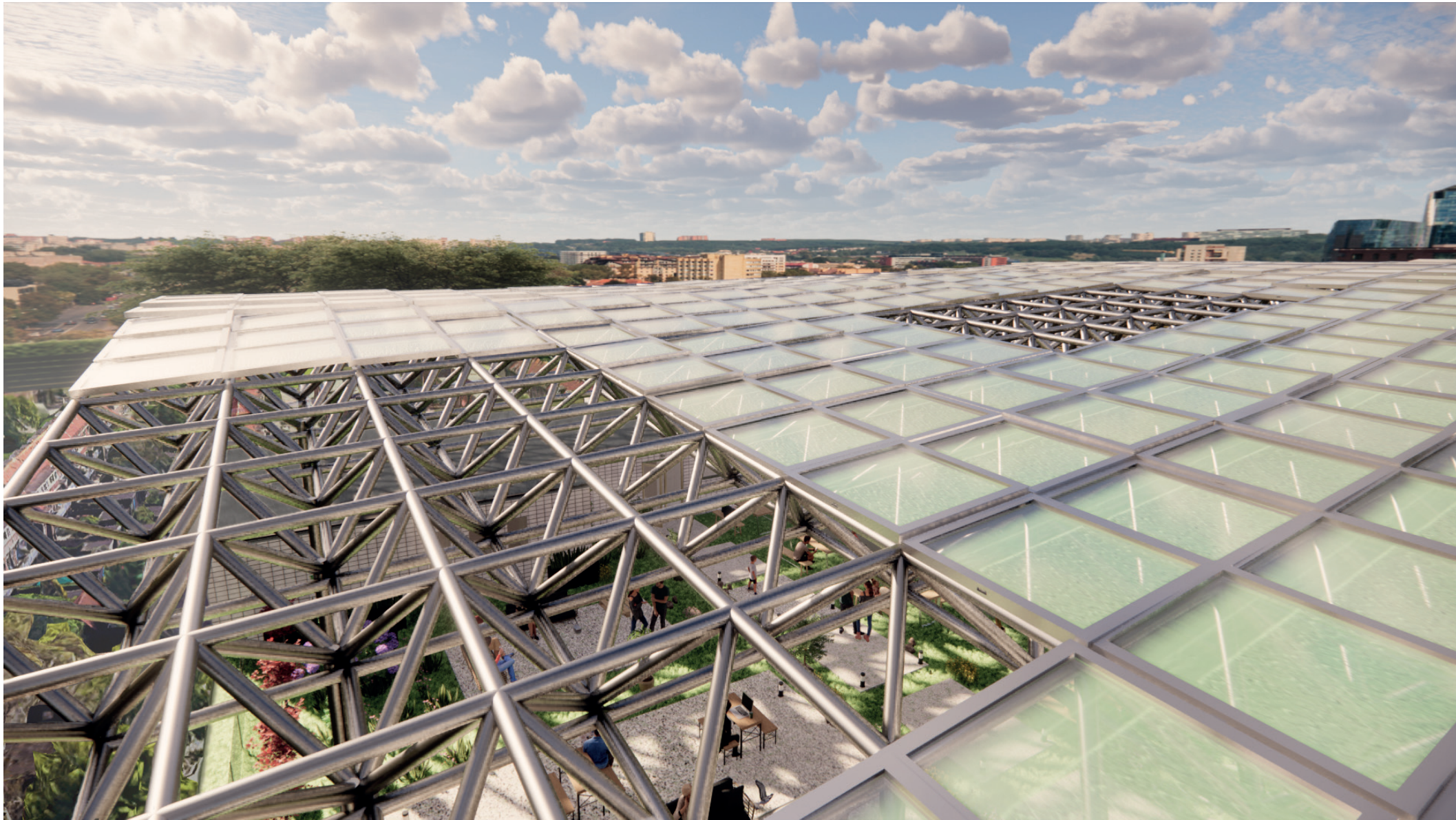
Shared rooftop evening



Shared rooftop night



Algae panel construction from above



Appendix

Classroom transformed to apartment



Appendix

Research park outdoor view from staircase



Appendix

Research laboratory



Appendix

Restaurant interior view



Appendix

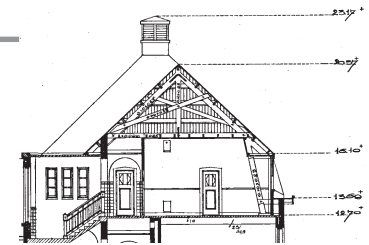
View from staircase into restaurant



Appendix

Value assessment

	AGE value	HISTORICAL value	INTENTIAL COMMEMORATIVE value	NON INTENDED COMMEMORATIVE value	USE value	NEW-NESS value	(relative) ART value	RARITY value	OTHER relevant values
SURROUNDINGS/ SETTINGS	100 year old houses The park	The Garden Suburb			Close to commercial center Zuidplein and large park.			Preserved Garden Suburb became isolated island in the city.	Large park nearby.
SITE	Trees on site	Monumental status.	COURTYARD	Architectural image for Garden Suburb.	No height difference. Big plot.		Empty garden.		
SKIN (exterior)	BAD STATE OF INDOOR PLAY AREA.	The Amsterdamse School style. The round tower and dome; staircase	Stately and exclusive Horizontal window grid. Detailed facade	Iron fences.	LOTS OF ENTRANCES (15).	ORIGINAL PARTS OF FACADE DEMOLISHED.	Characteristic architecture: style of the Garden Suburbs.	Closed off from the outside.	
STRUCTURE			Clear grid of columns and beams.	Adjustable to new functions.	Repetitional construction. SLOPED UNUSED ROOF.		Made from traditional materials.	Original structure still there.	
SPACE PLAN		The old classrooms and the bathhouse with gyms.	Division into several separate units. Big open spaces.	Narrow hallways.	Courtyard. Classrooms can be easily turned into housing; big spaces for labs.		UNIQUE UNITS. Big open spaces.	Separate units.	Many entrances; units can be closed off.
SURFACES (interior)					Minimal walls.				
SERVICES			Aged heating and ventilation system. Bad insulation.	No elevator.	The old stairs probably do not meet the current demands.				Currently empty.
STUFF		Historical details above entrances on the facade.	Large water network and connections.						
SPIRIT OF PLACE		The migration of the Garden Suburb from England.	Former school.		Vacant and ready for a new use.		THE AMSTERDAMSE SCHOOL STYLE.	Well preserved dome.	

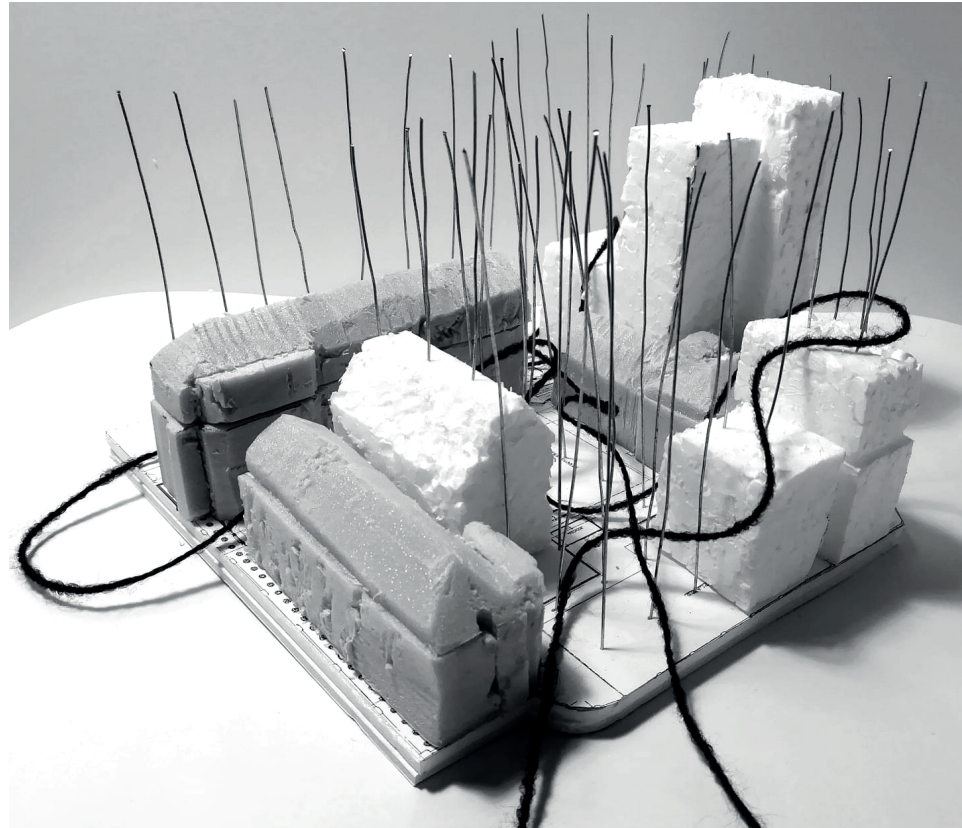


HIGH VALUE
 MEDIUM VALUE
 LOW VALUE



Appendix

Physical model; routing



Original drawings

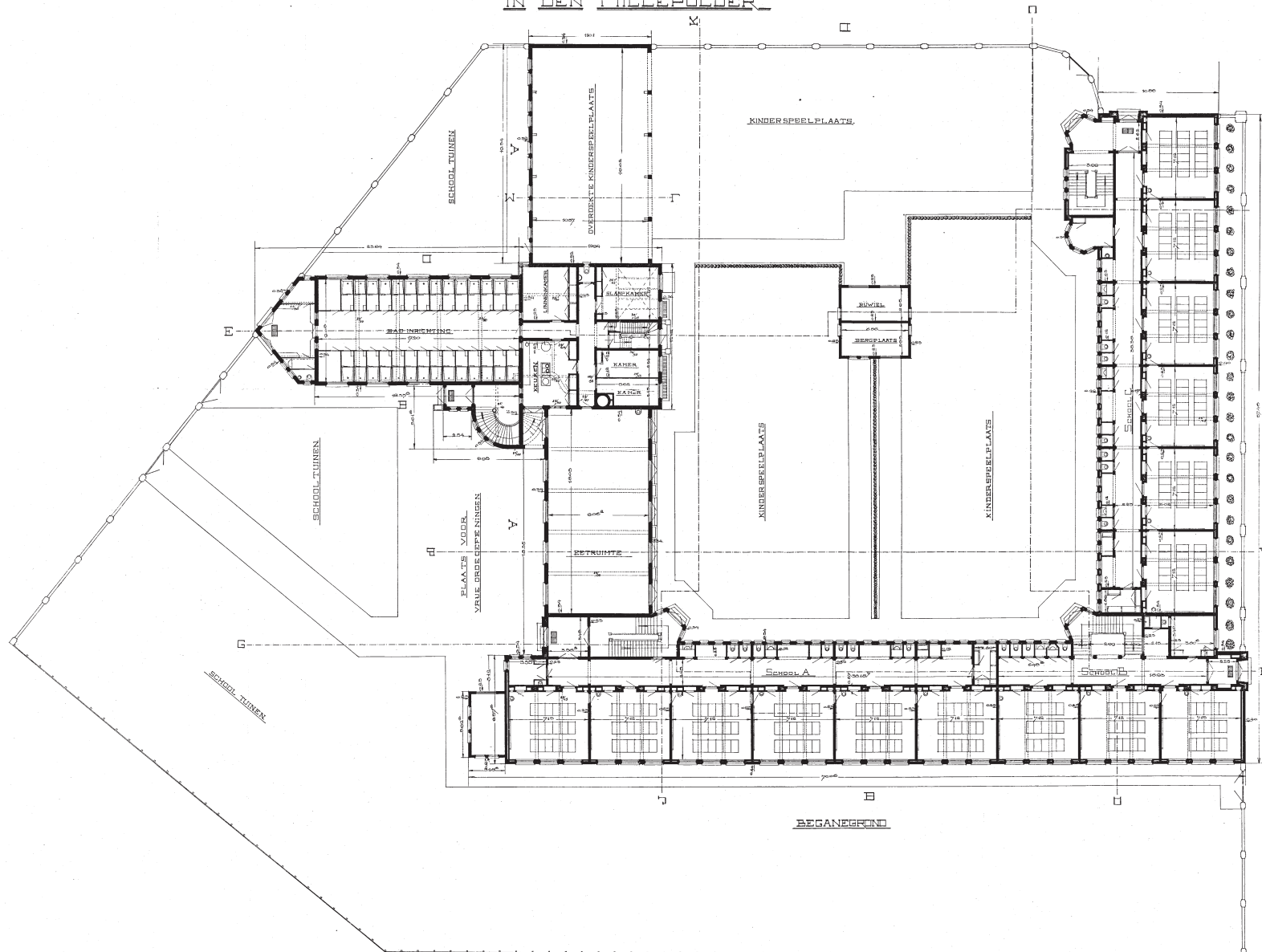
GEMEENTE ROTTERDAM
1923

DRIE SCHOLEN, WAARVAN TWEE VOOR G.L.O. EN ÉÉN VOOR U.L.O.

TEKENING IN 11 BLADEN
BLAD N^o 3

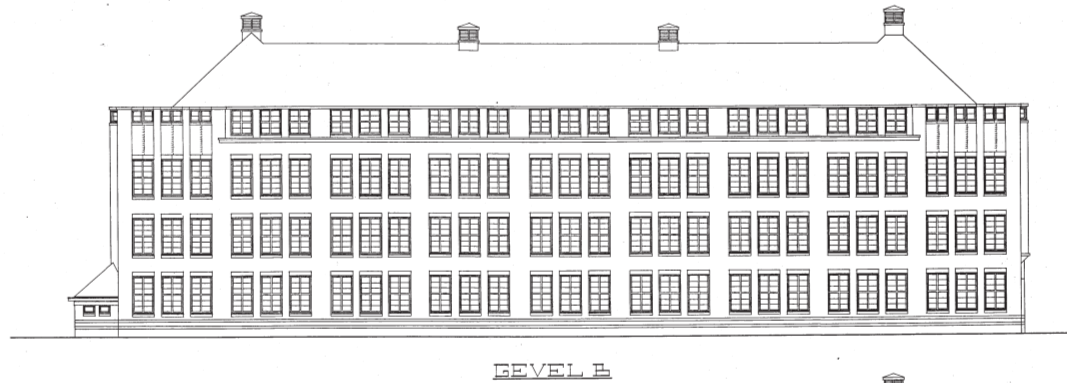
BEHOORT BIJ BESTEK N^o 573 MET GYMNASIEK-EN TEEKENZALEN, ESTRUIMTE, BADHUIS, CONCIERGEWONING, OVERDEKTE KINDERSPEELPLAATS, RIJWELBERGPLAATSEN EN TUINMUREN

IN DEN HILLEPOLDER



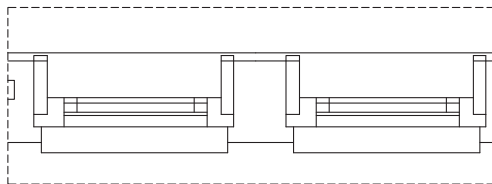
Appendix

Original drawings

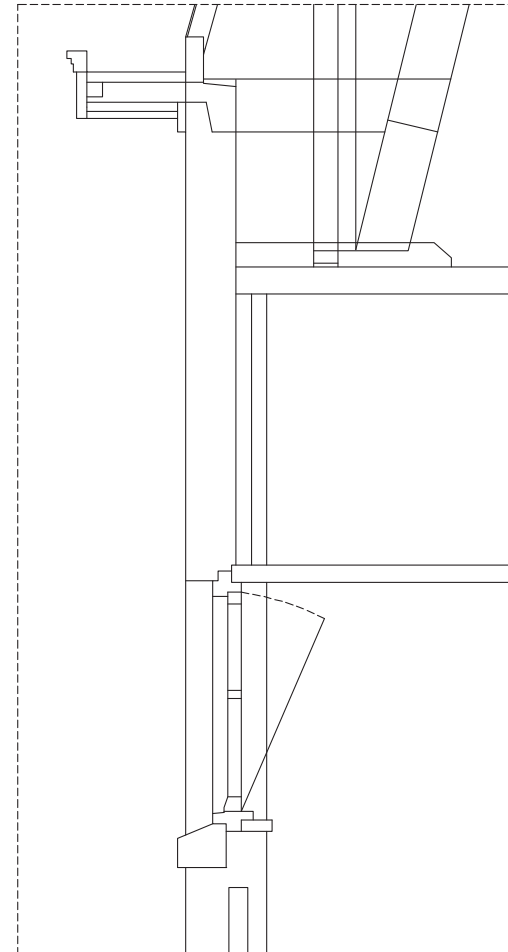


Appendix

Original drawings



Horizontal window frame



Vertical window frame