

KAIZEN TOWER

IMPROVING THROUGH CHANGE

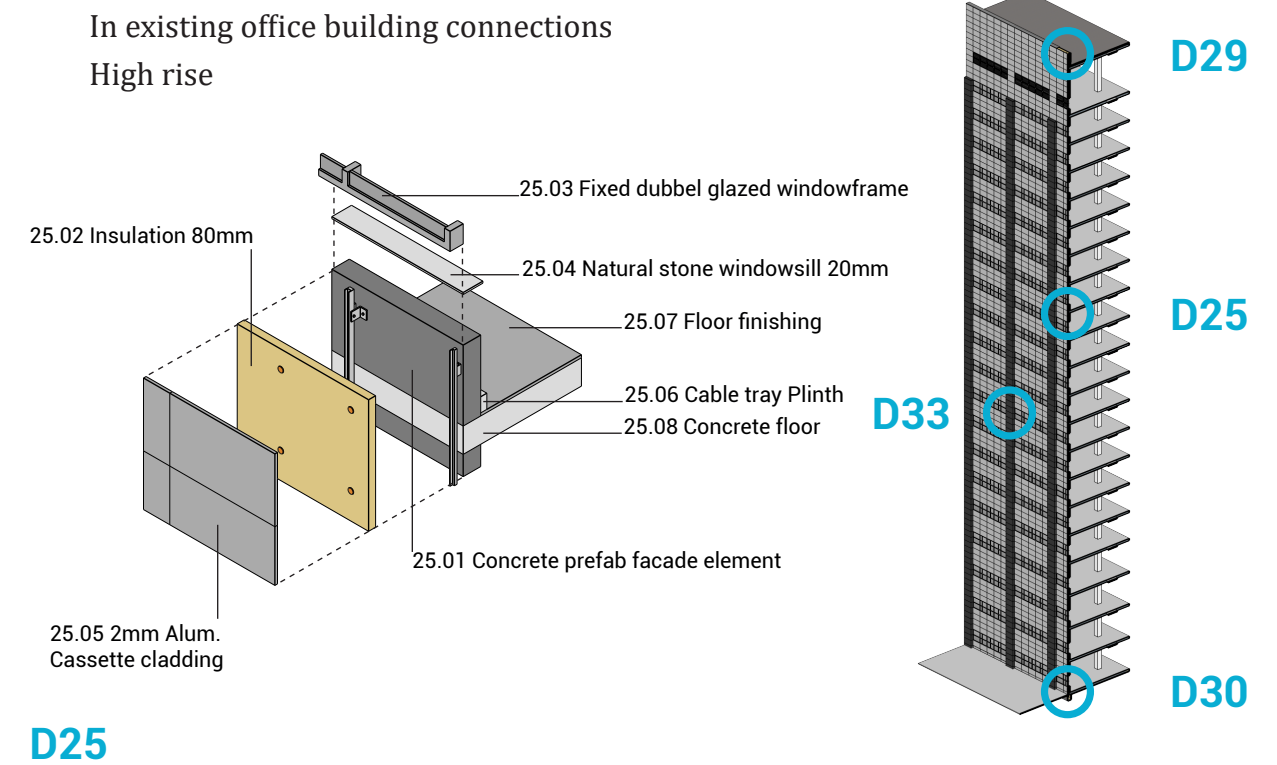
ADAPTABLE, SOCIAL & GREEN

NOW
OFFICE

FUTURE
MIX- USE RESIDENTIAL



ADAPTABILITY DEMOUNTABILITY



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Problem statement
Context

RESEARCH

Demountability
Definitions

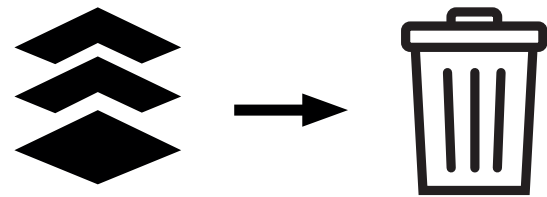
DESIGN

Structure
Facade
Detailing & Climate
Social integration

INTRODUCTION

WHY ADAPTABILITY?

PROBLEM STATEMENT



Singular use of building materials



Family



Single living



Elderly

Changing life style demands

Between 2020-2030 845.000 Dwellings are needed

BY **2035**



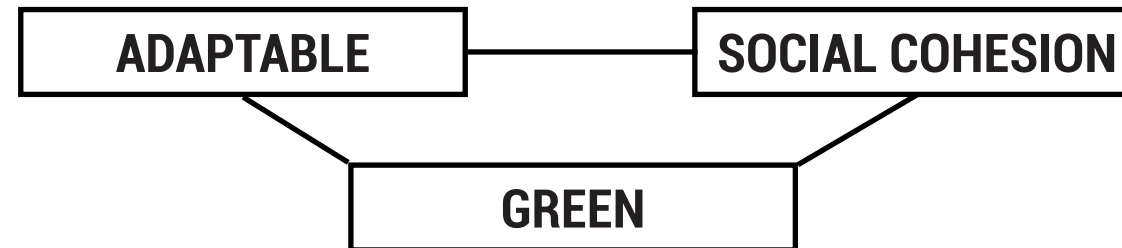
18.8M Residents in the Netherlands

Housing shortage

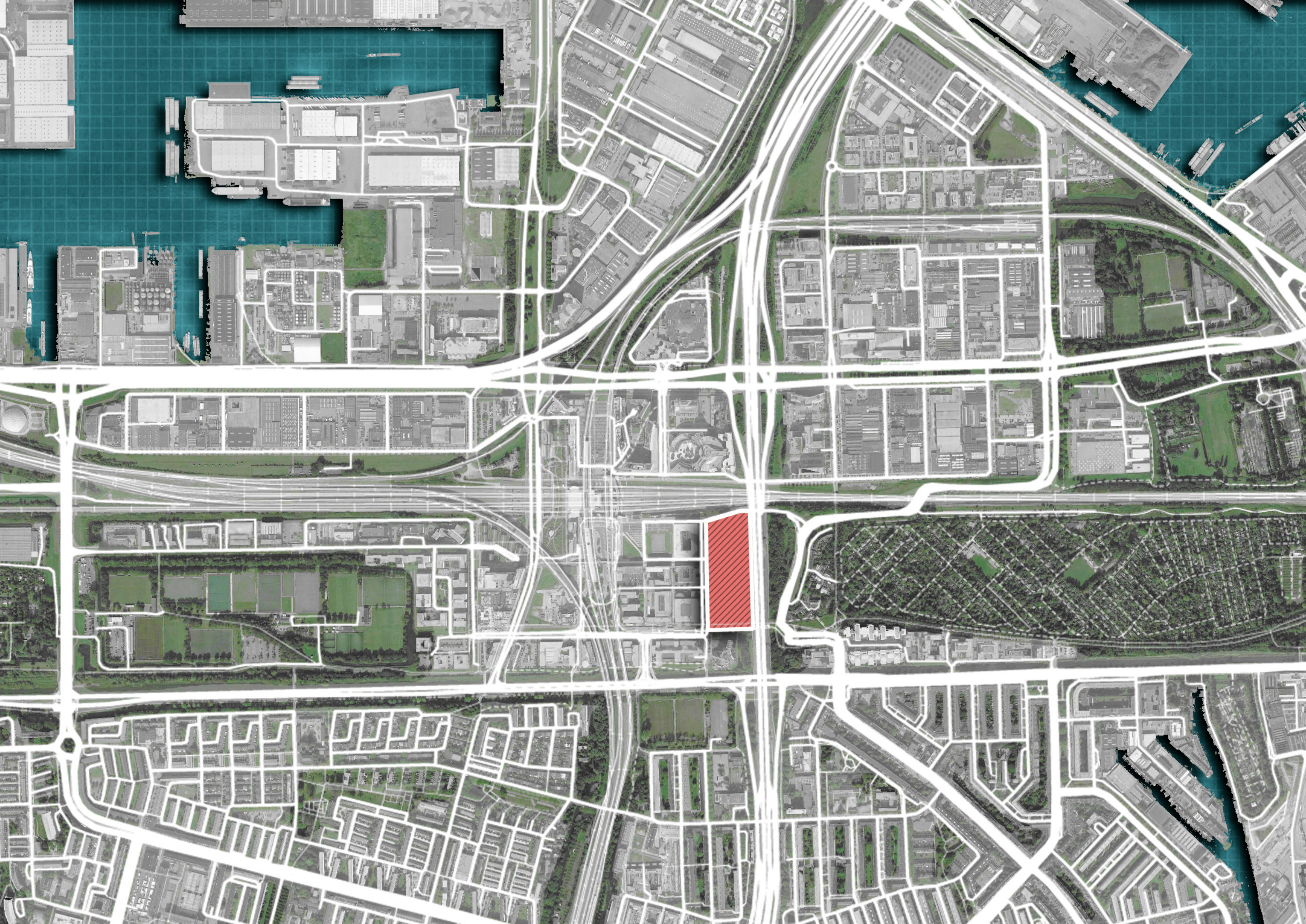
VISION

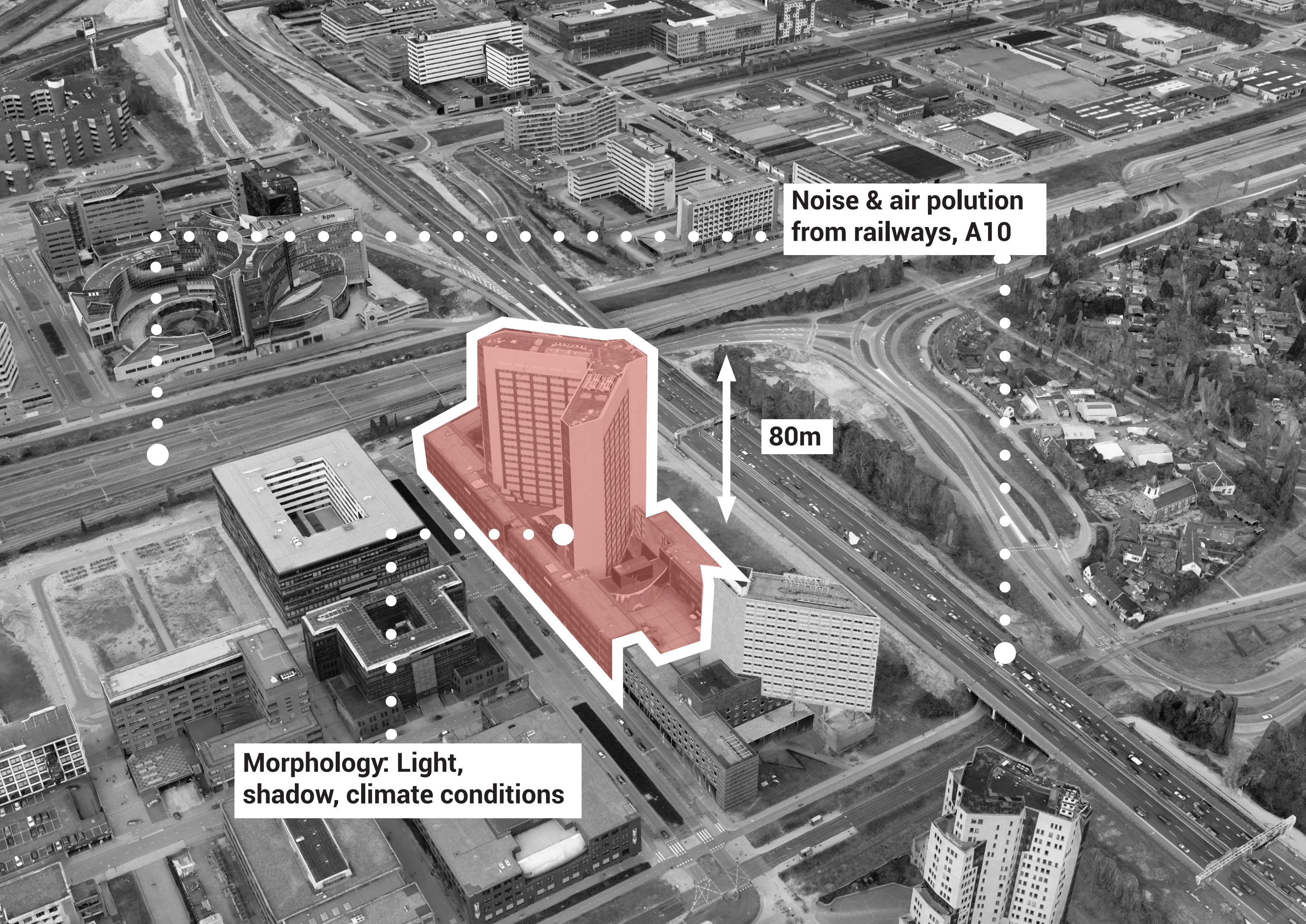
DESIGN FOR CHANGE

VERTICAL VILLAGE



What building structure (structuur) enables this concept?

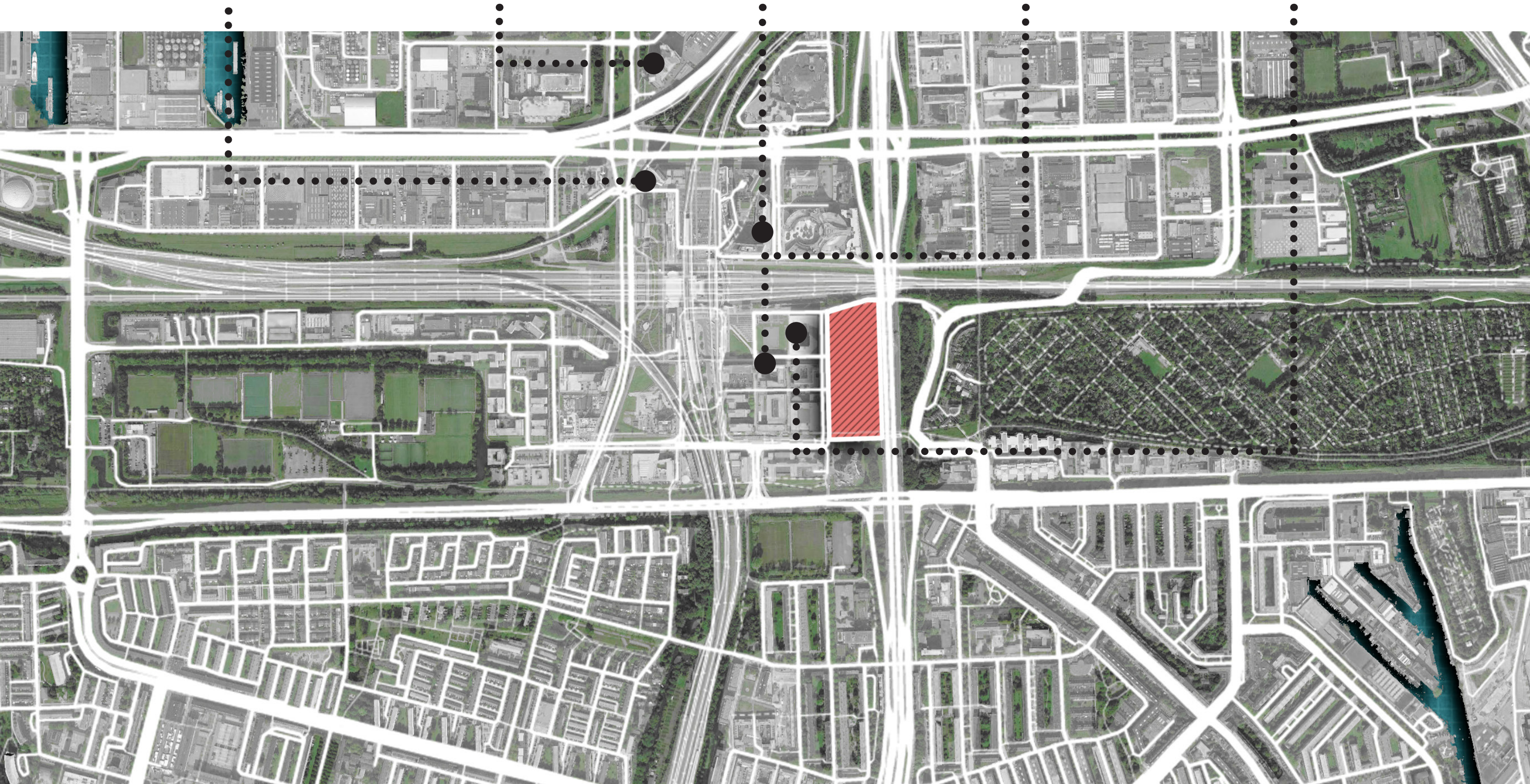


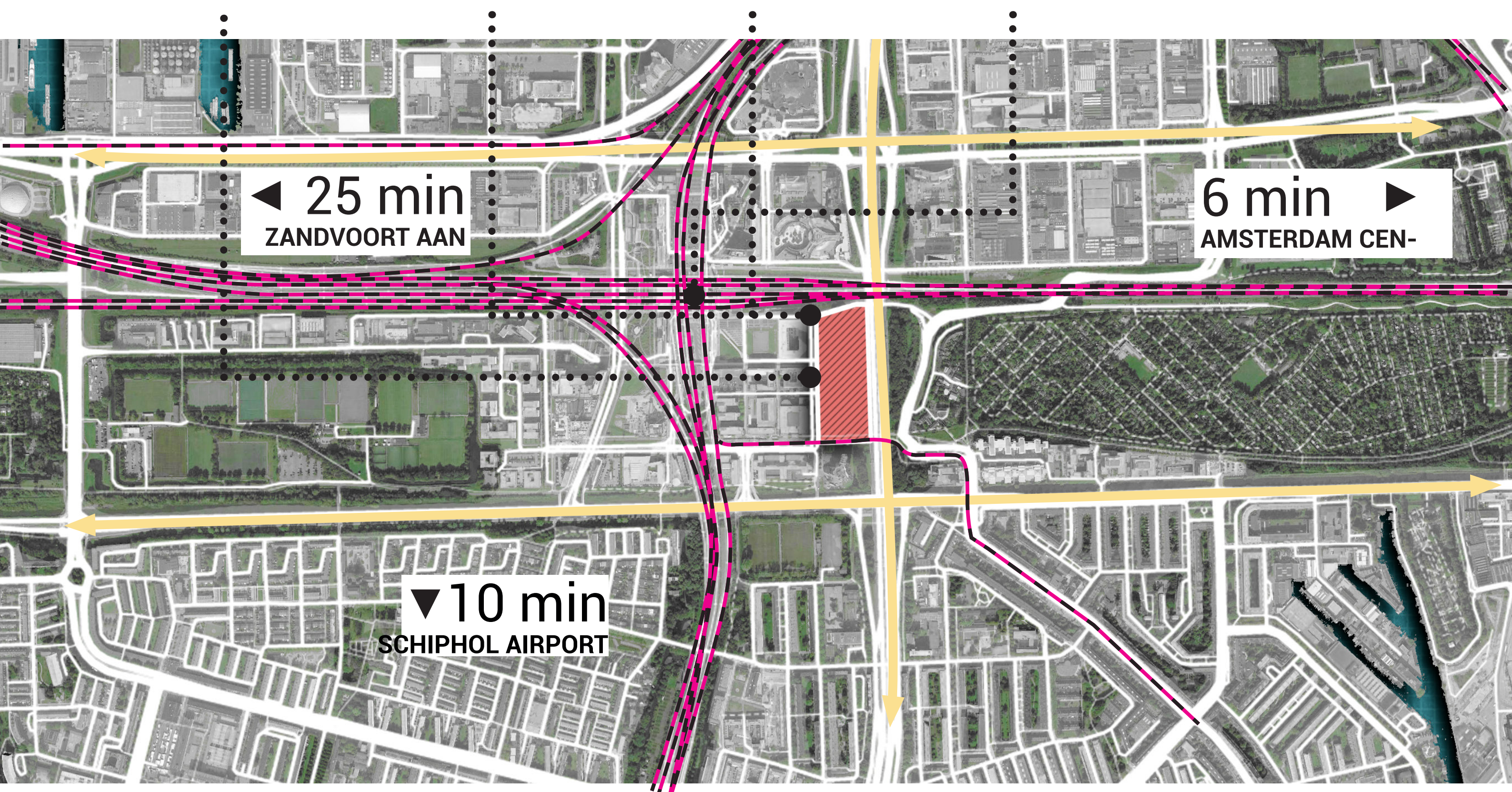


Noise & air polution
from railways, A10

80m

Morphology: Light,
shadow, climate conditions





VISION MUNICIPALITY



Static & Monofunctional office area



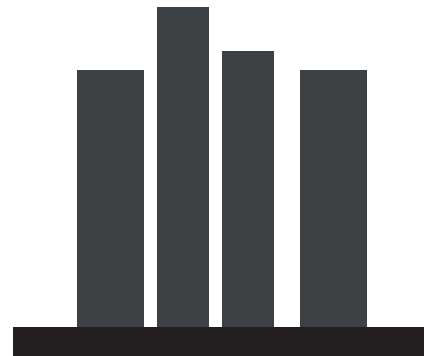
Mix use residential & work environment



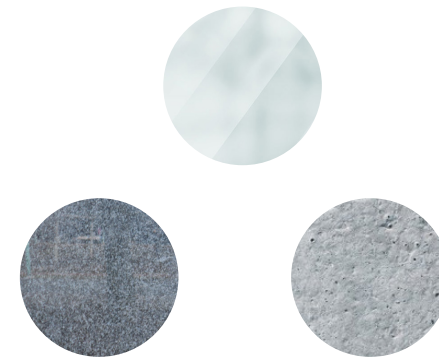
CONTEXT PROBLEMS



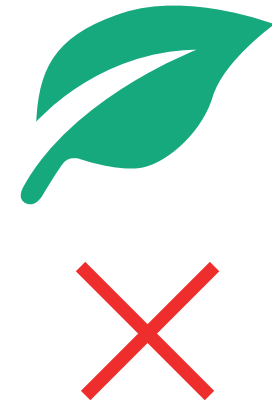
No place for social
interaction



Monofunctional office area



No connection to the context
Hard materials
All stone and glass façades +
Asphalt and concrete



No/Very little nature
inclusiveness -> no
biodiversity

RESEARCH

ADAPTABILITY

DEFINITION

“The capacity of a building to accommodate effectively the evolving (spatial) demands of its context, thus maximising its value through life.” (Robert Schmidt III, 2016)

THEMATIC

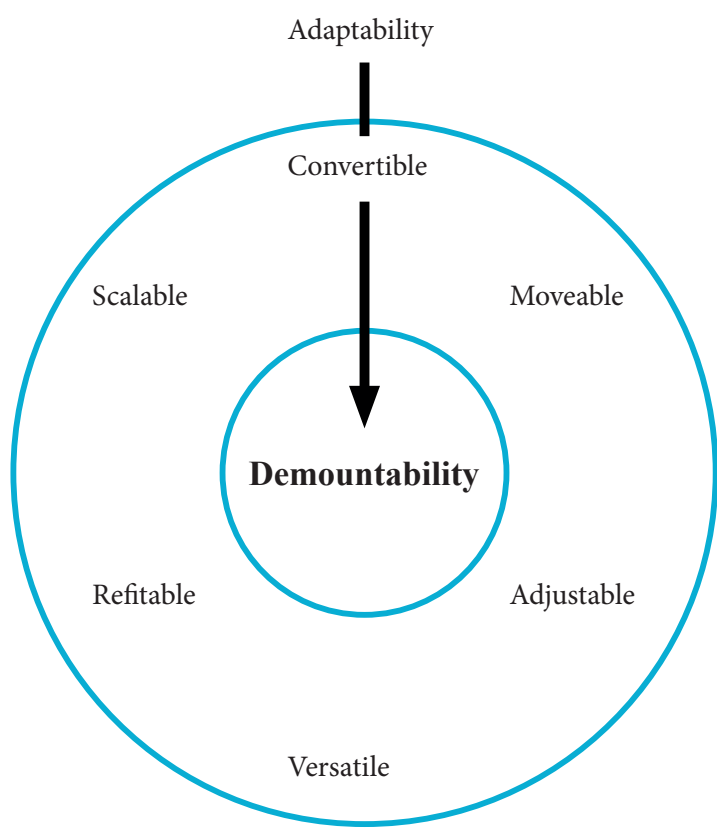
RESEARCH QUESTION

How to improve the demountability of existing office buildings by using designed for disassembly components?

THEMATIC

RESEARCH QUESTION

How to improve the demountability of existing office buildings by using designed for disassembly components?



Adaptability through Demountability

Lev-el	Source	Adopted Definition	Example Descrip-tion
0.	Layers of Brand	Building layers	Space plan
1.	NL/SfB (2 digit cod-ing)	System level	Interior wall
2.	NL/SfB (3 digit cod-ing)	Element group level	Non-structural
3.	NL/SfB (4 digit cod-ing)	Element level	Fixed partition wall
4.	NL/SfB (6 digit cod-ing)	Product level	Metal stud wall, plasterboard
5.	STABU2 (specifica-tion group)	Component level	Plasterboard
6.	STABU2 (specifica-tion group)	Material level	Plasterboard
7.		Raw material	Gypsum

Building levels - measure 'depth'

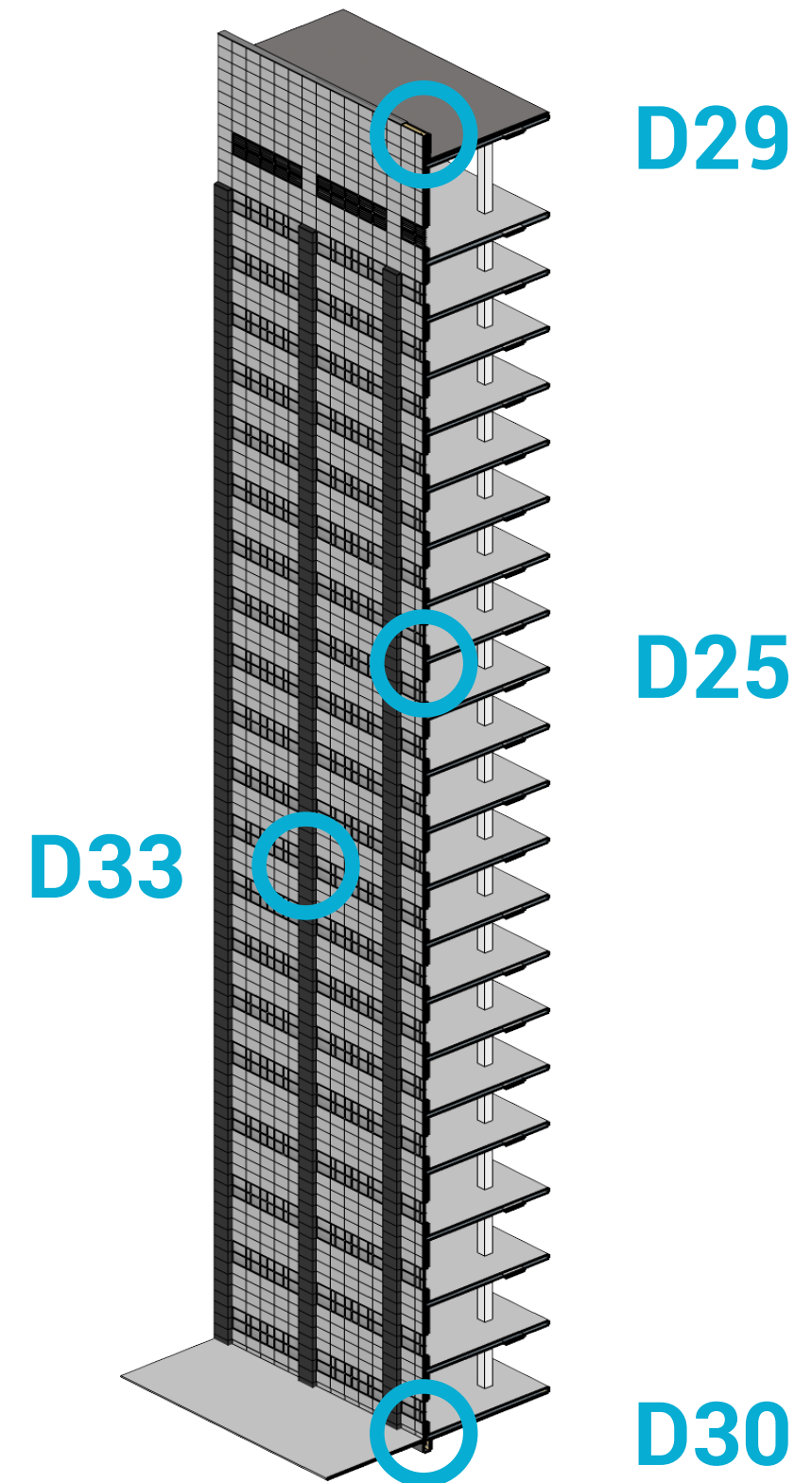
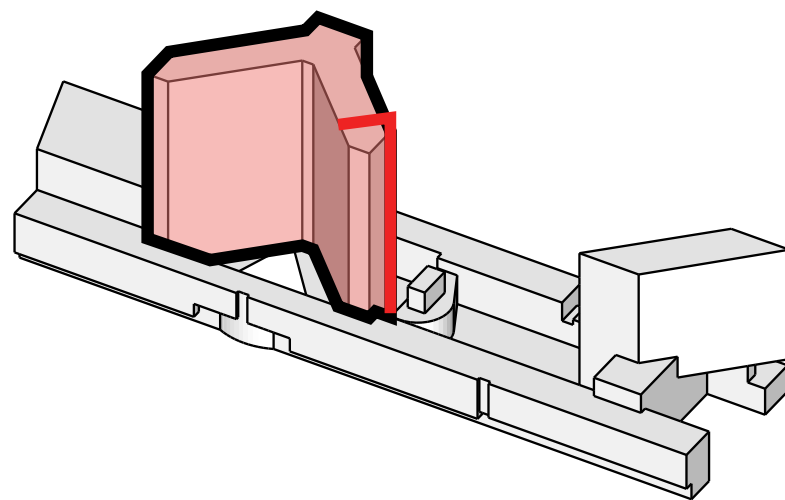
Different Building levels. (Vliet,2018) Adapted by Alba Concepts.

ADAPTABILITY

DEMOUNTABILITY

In existing office building connections

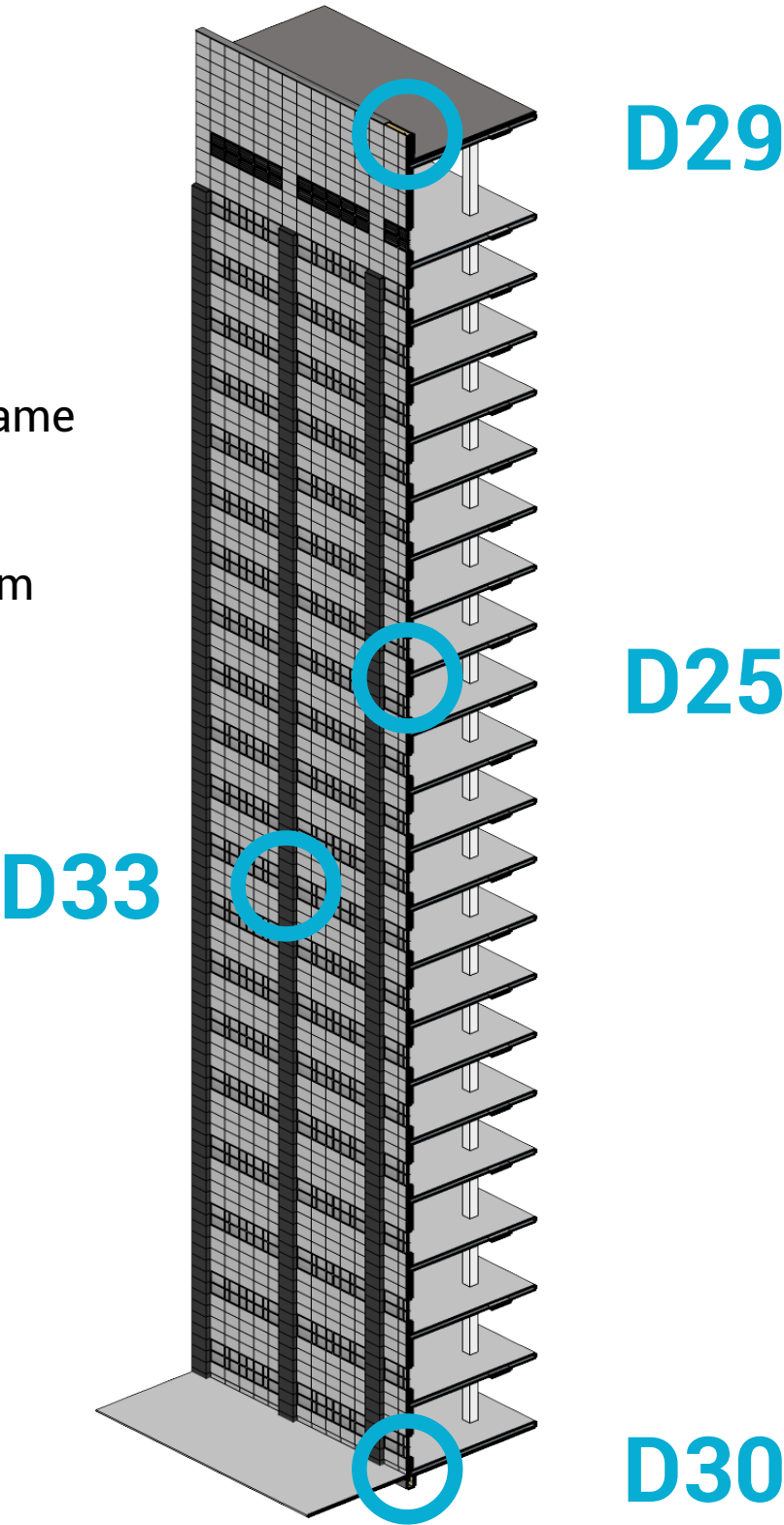
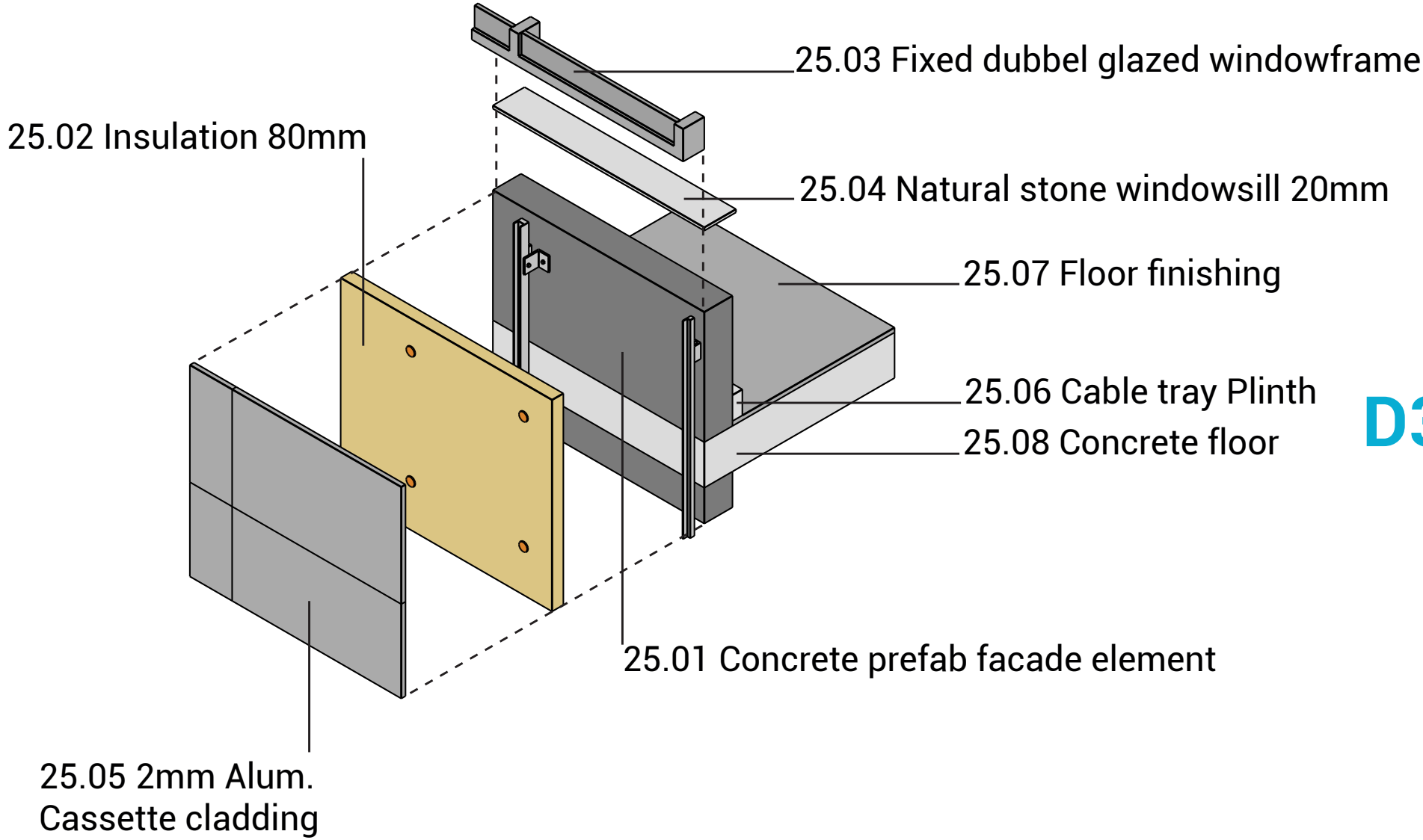
High rise



ADAPTABILITY

DEMOUNTABILITY

In existing office building connections
High rise

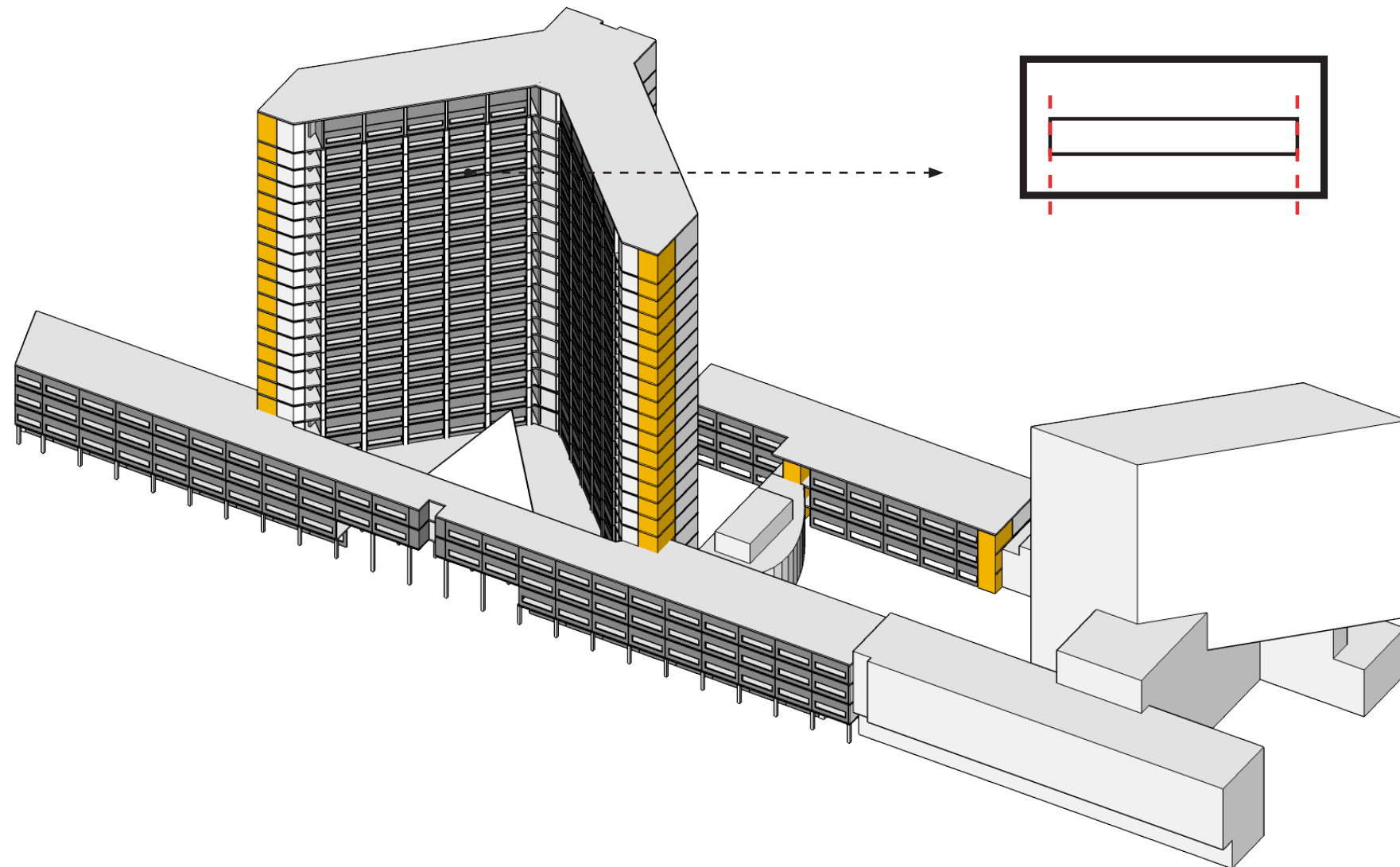


D25

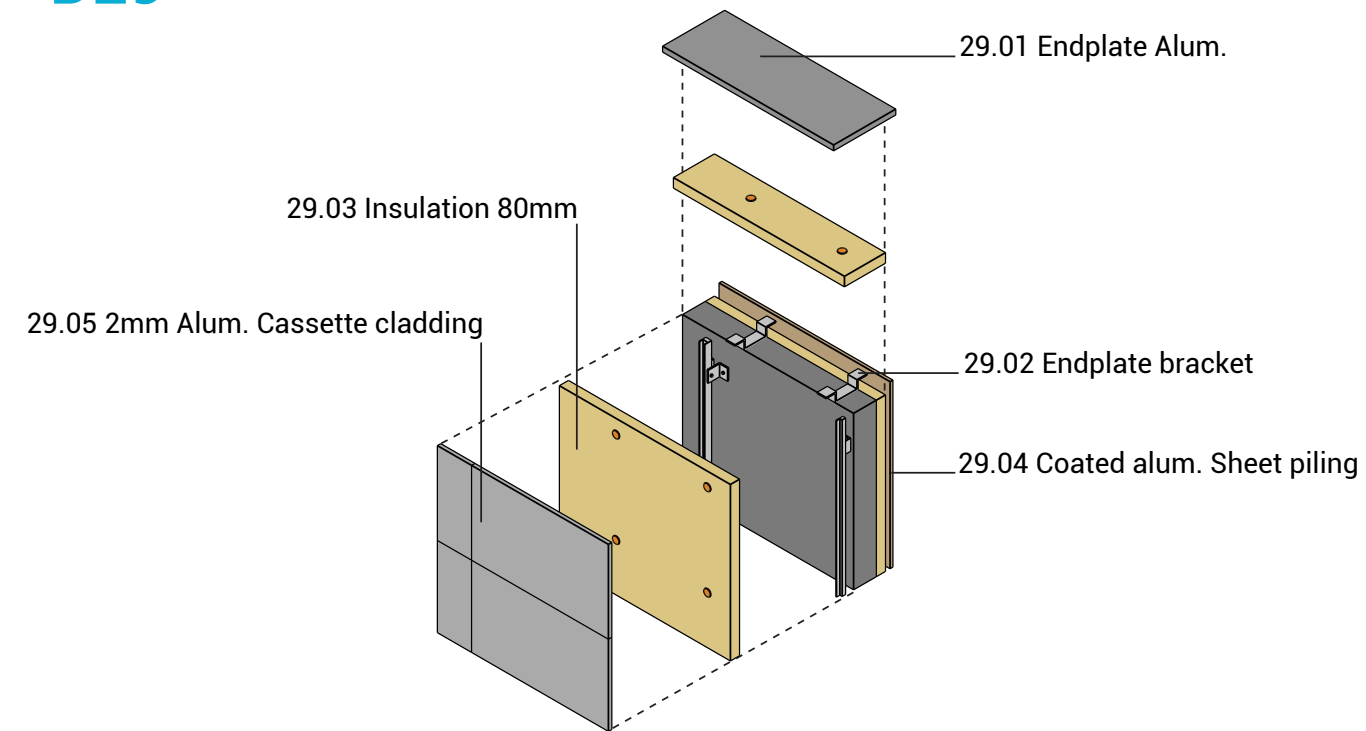
ADAPTABILITY

DEMOUNTABILITY

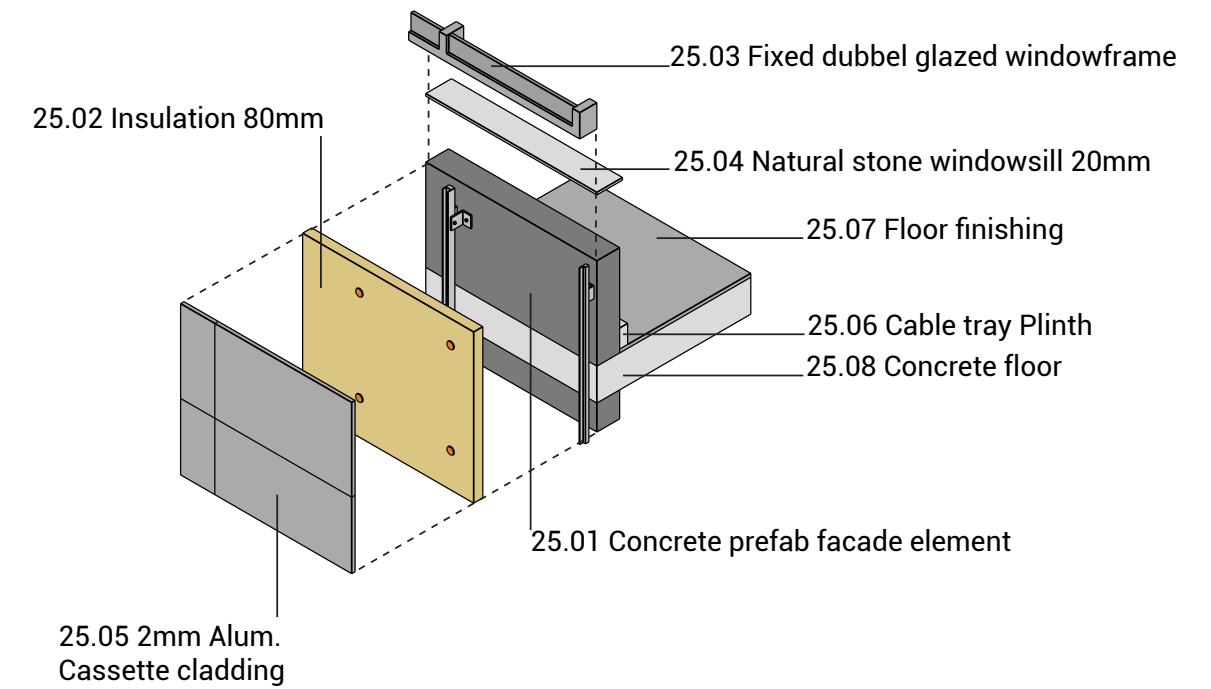
Current structure



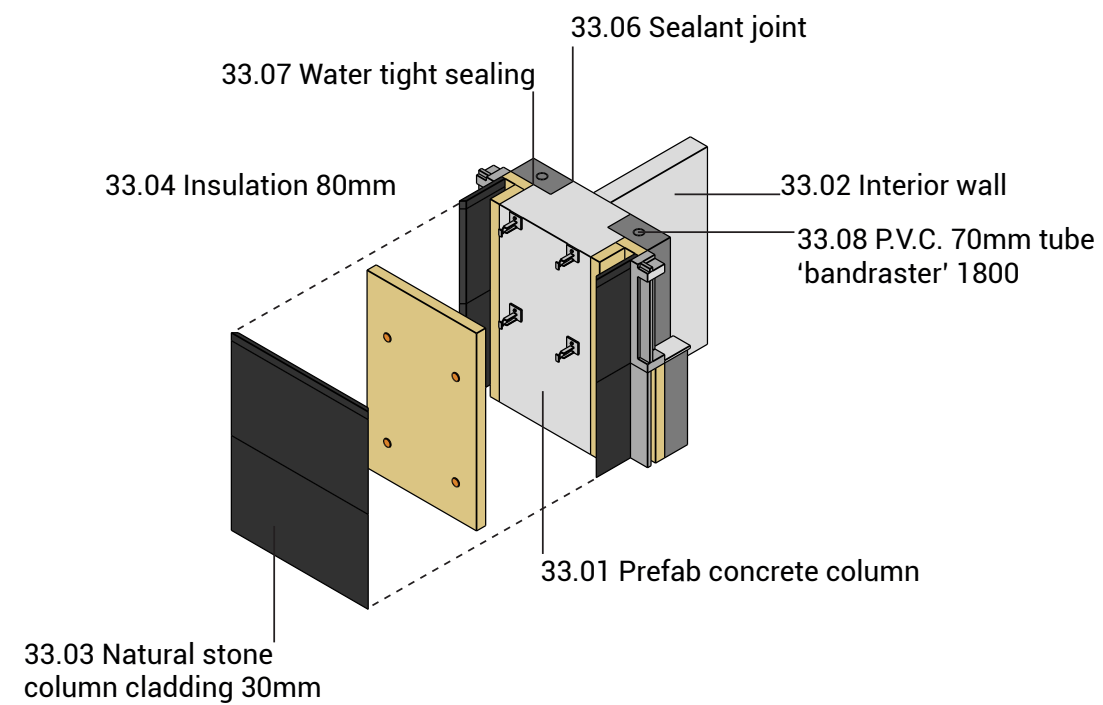
D29



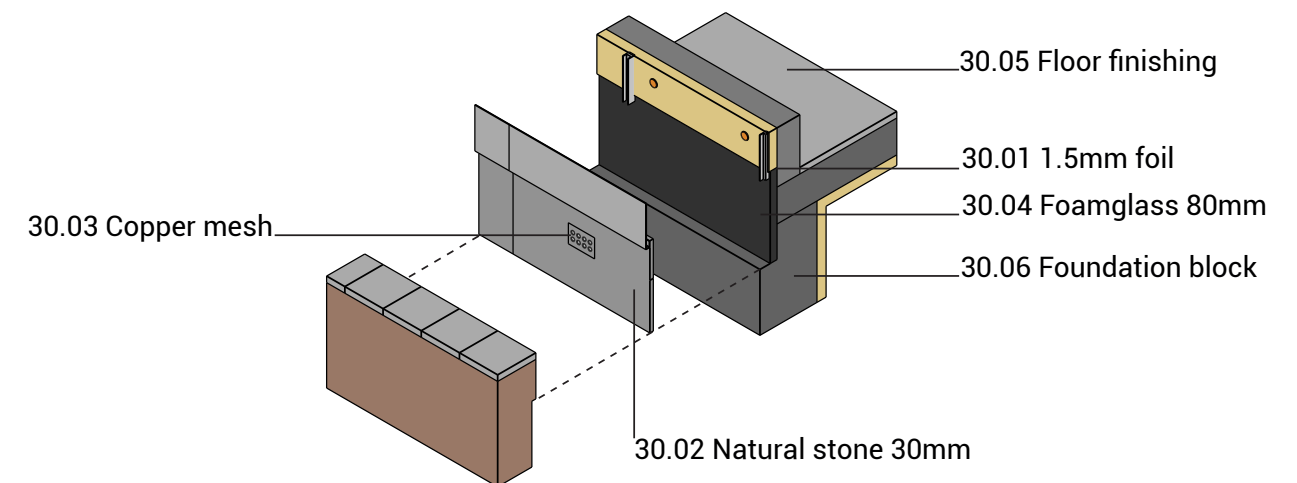
D25



D33



D30

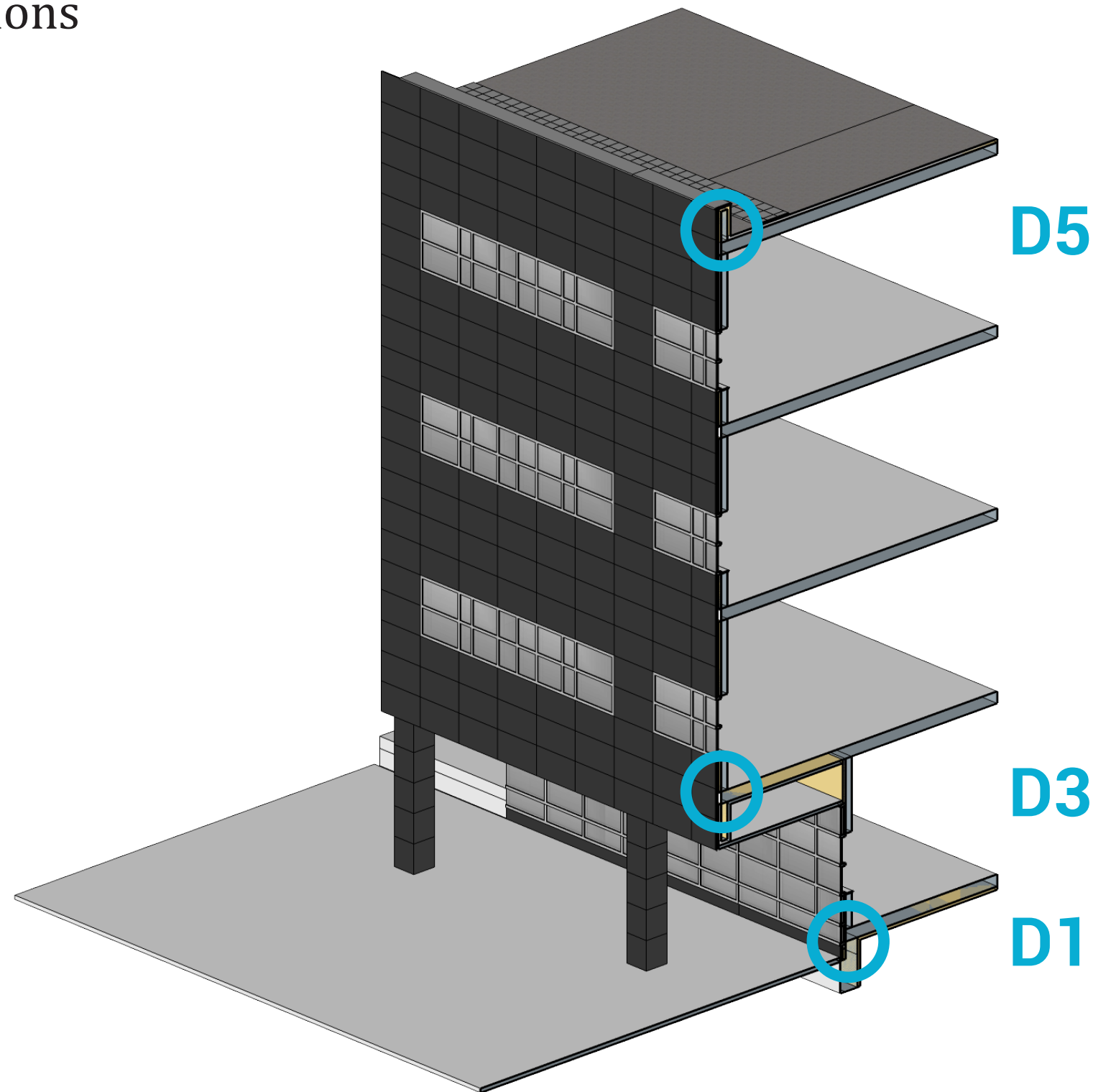
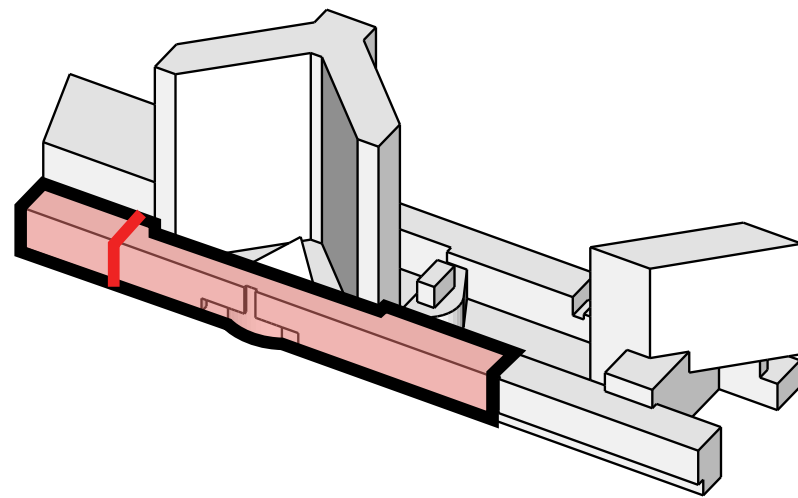


ADAPTABILITY

DEMOUNTABILITY

In existing office building connections

Low rise

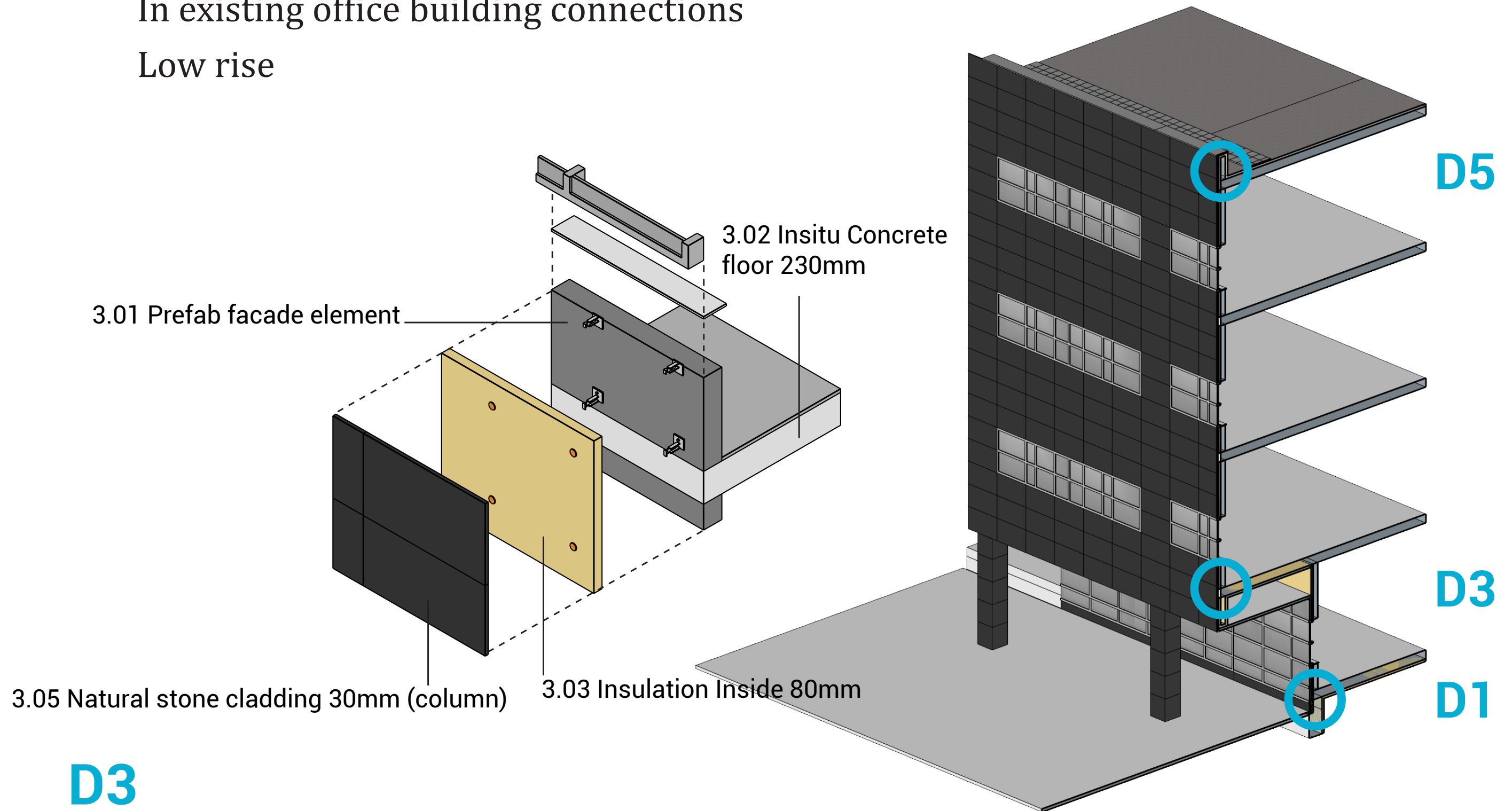


ADAPTABILITY

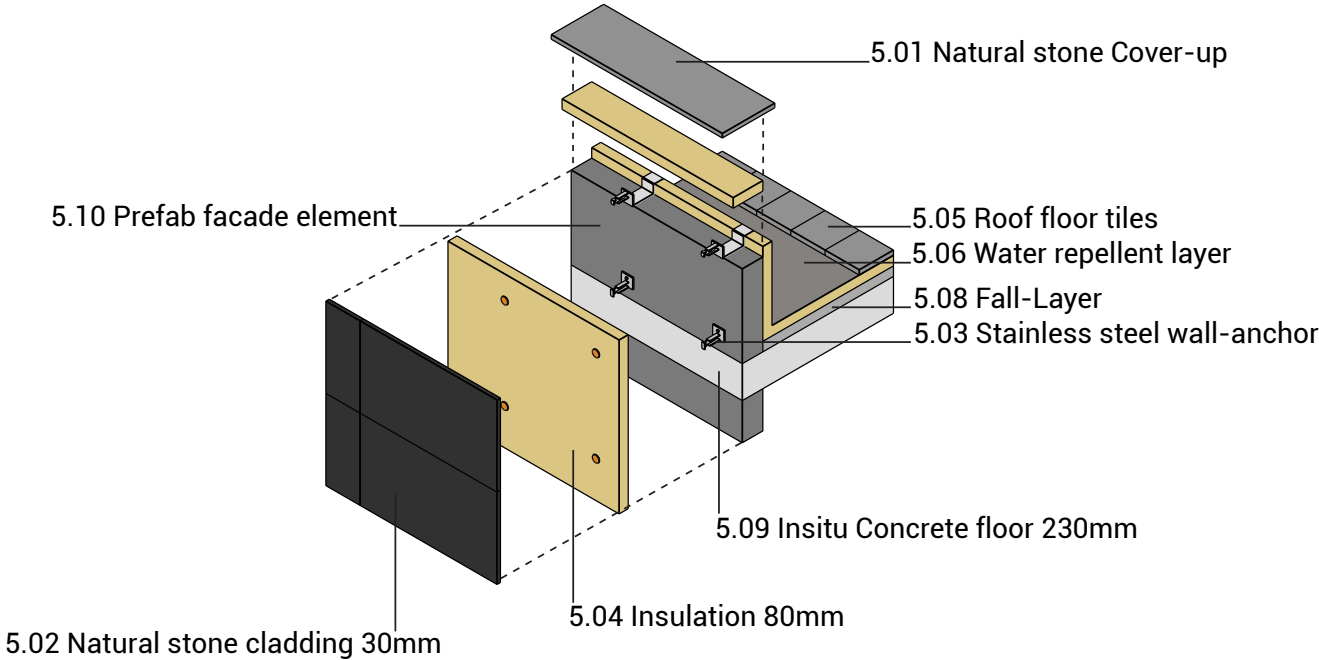
DEMOUNTABILITY

In existing office building connections

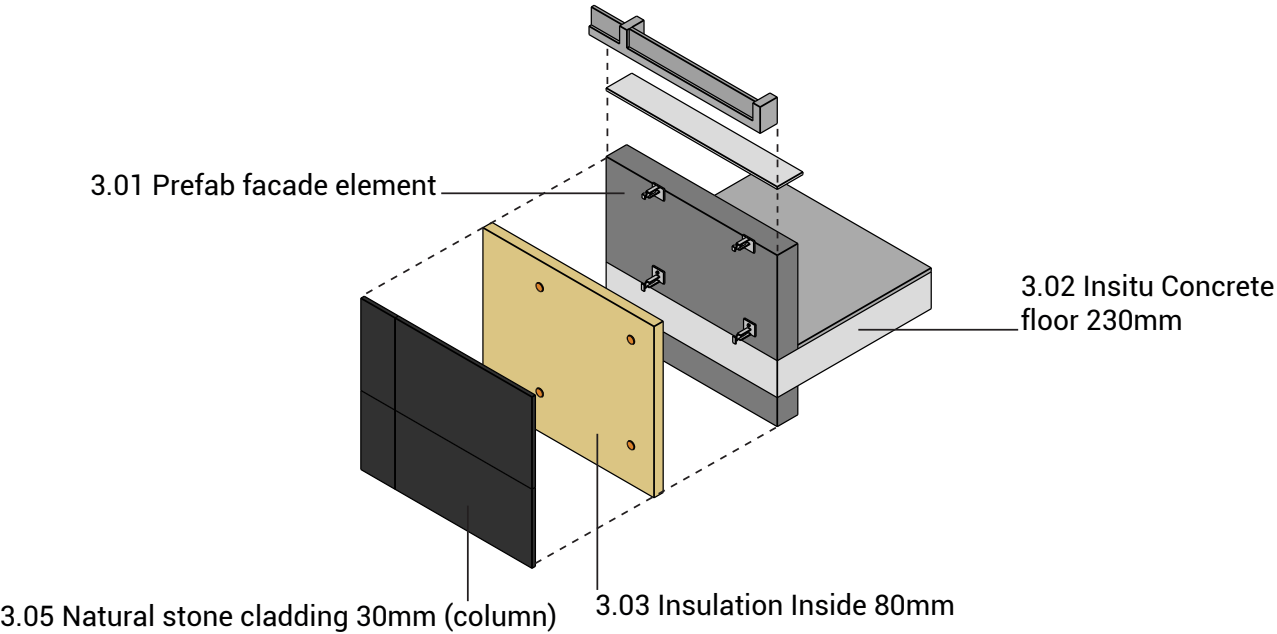
Low rise



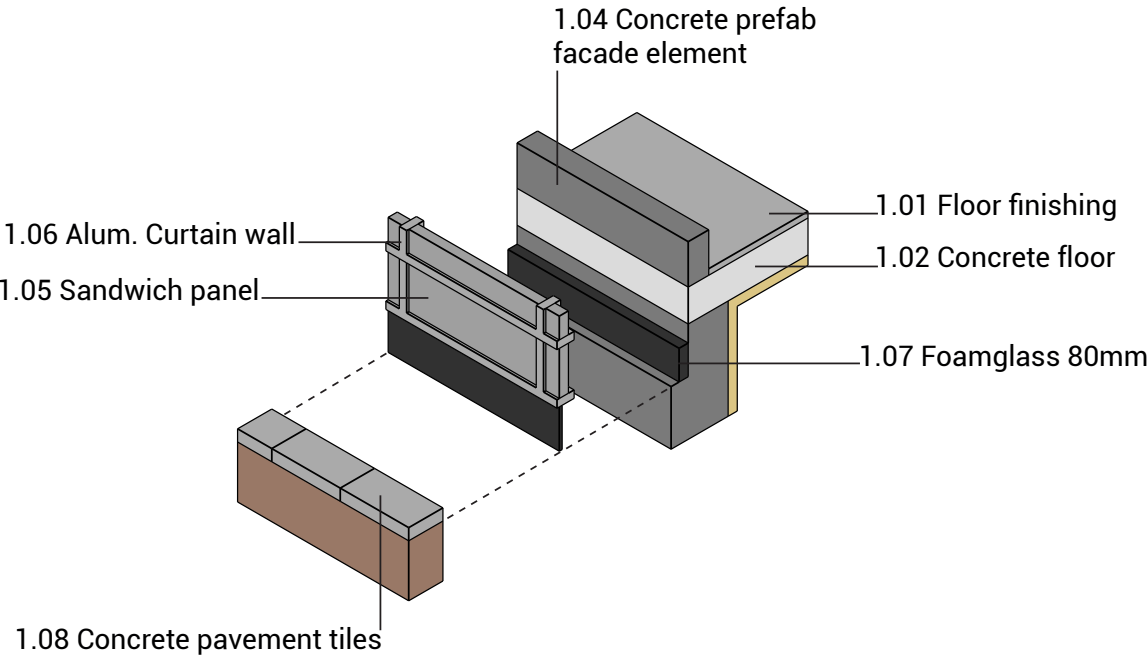
D5



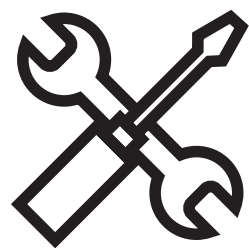
D3



D1



DEMOUNTABILITY
PARAMETERS



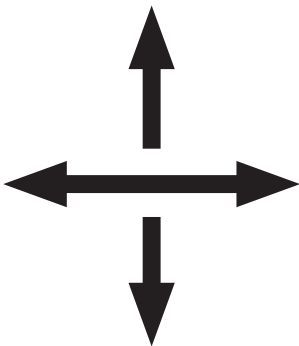
Connection type

- Dry connection
- Additional elments
- Interal connection
- Soft chemical connection
- Hard chemical



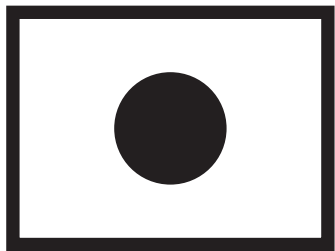
Connection Access

- Free access
- Additional action but no damage
- Additional action small damage
- Soft chemical connection
- No access irreversible damage



Intersection

- Modular zoning of object
- Elements crossing one ore more
- Full integration of objects



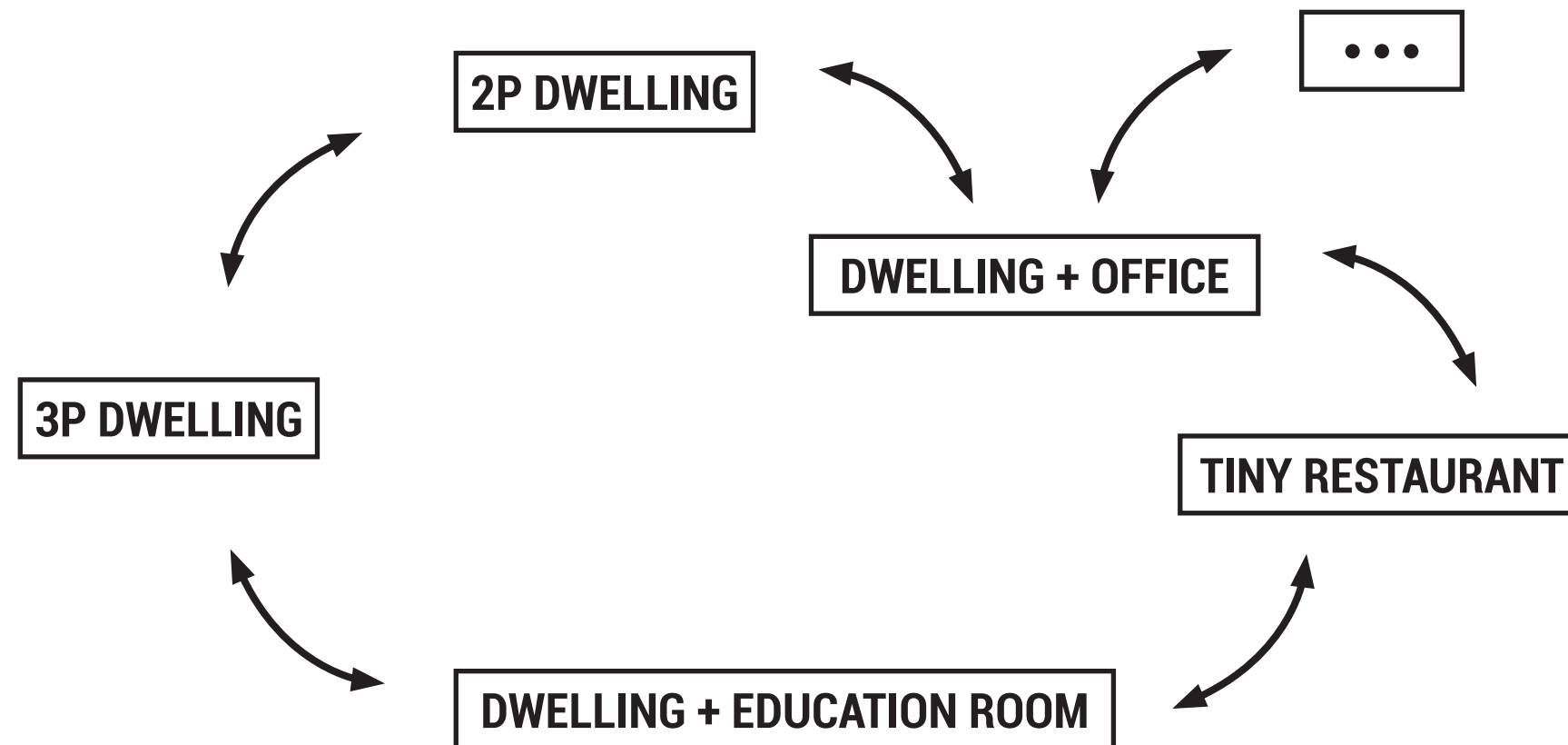
Enclosure

- Open
- Overlap one side
- Closed on side
- Closed multiple sides

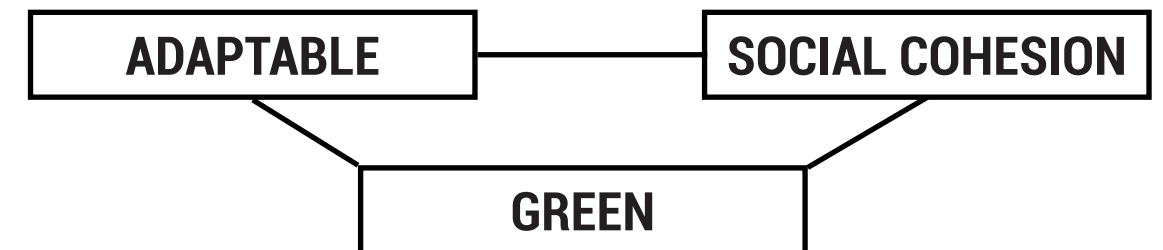
Design input

DESIGN

STRUCTURE (STRUCTUUR) ADAPTABLE






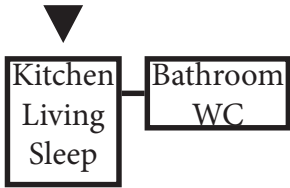
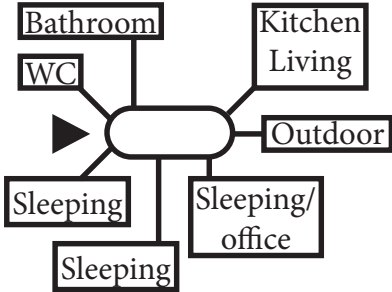
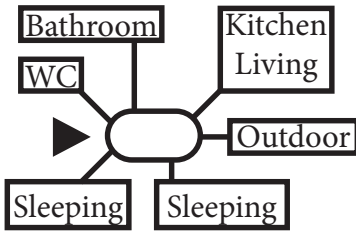
VERTICAL VILLAGE

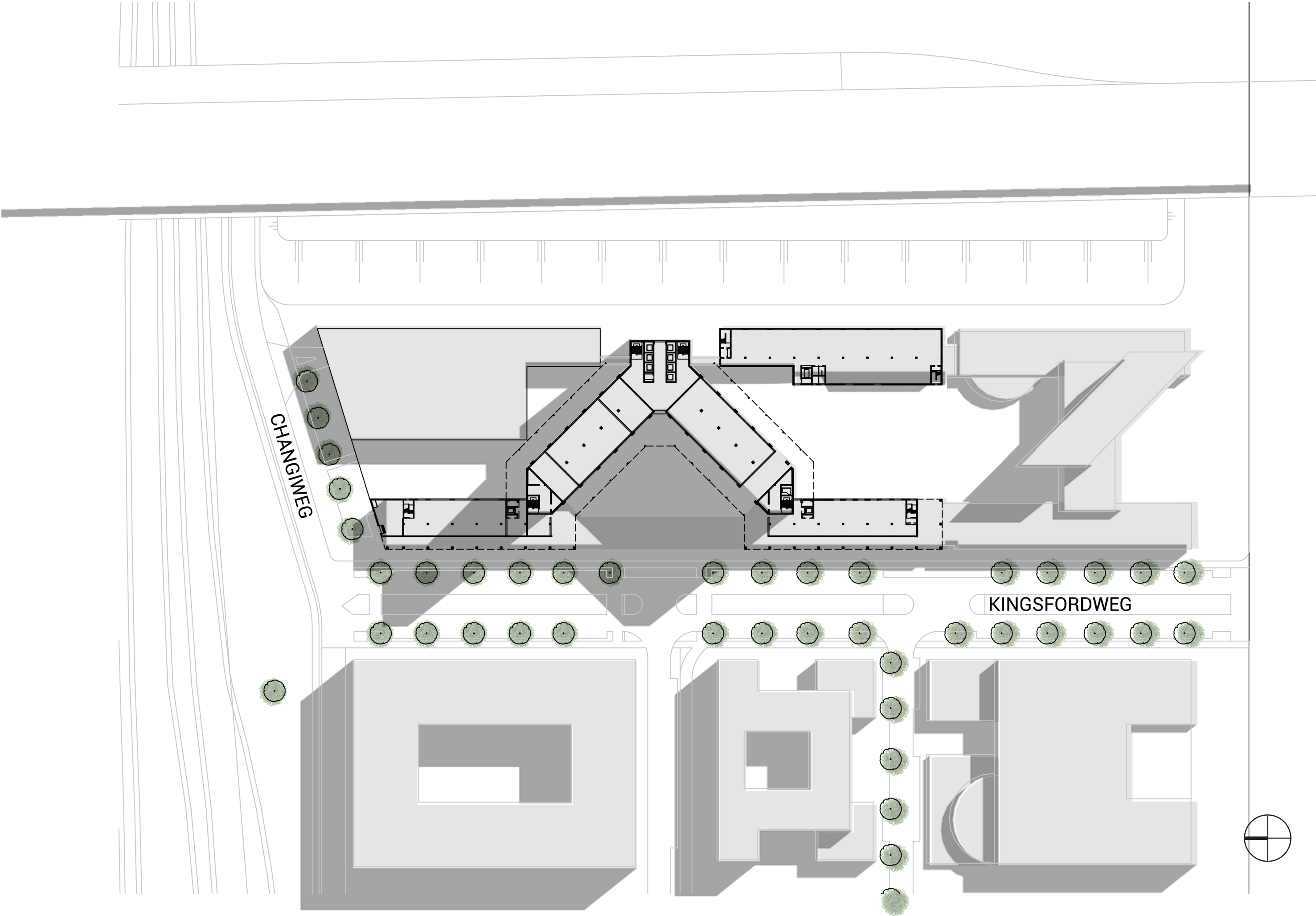


What building structure (structuur) enables this concept?

ADAPTABLE DWELLINGS

3 USER PROFILES

<div>Piet</div> <div></div>	<div>Ellen, Fred, Senna en Eddie</div> <div></div>	<div>Mo & Fien</div> <div></div>
<div>DAILY LIFE</div> <div>Away from home allot. Only needs the basic requirements in a home.</div> <div>HOBBIES</div> <div>Active in sports. Likes to be able to live in a green but urban environment.</div> <div>FAVOURITE WEEKEND</div> <div>Likes to be social with neighbors and friends.</div> <div>FAVOURITE SUNDAY MORNING</div> <div>Always wakes up early and enjoys a coffee in the morning sun.</div> <div></div>	<div>DAILY LIFE</div> <div>Ellen and Fred both work partime jobs, Senna and Eddy go to kindergarten.</div> <div>HOBBIES</div> <div>Going to the park with the kids, preferably close by.</div> <div>FAVOURITE WEEKEND</div> <div>Spending time with the kids, or going to restaurants. Having friends come over.</div> <div>FAVOURITE SUNDAY MORNING</div> <div>Eating breakfast together and having a relaxed afternoon.</div> <div></div>	<div>DAILY LIFE</div> <div>Active elderly couple who enjoy being outside and work in the garden.</div> <div>HOBBIES</div> <div>Gardening, reading, going for walks, community activities.</div> <div>FAVOURITE WEEKEND</div> <div>Going away on trips throughout the country.</div> <div>FAVOURITE SUNDAY MORNING</div> <div>Reading outside or work in the garden.</div> <div></div>



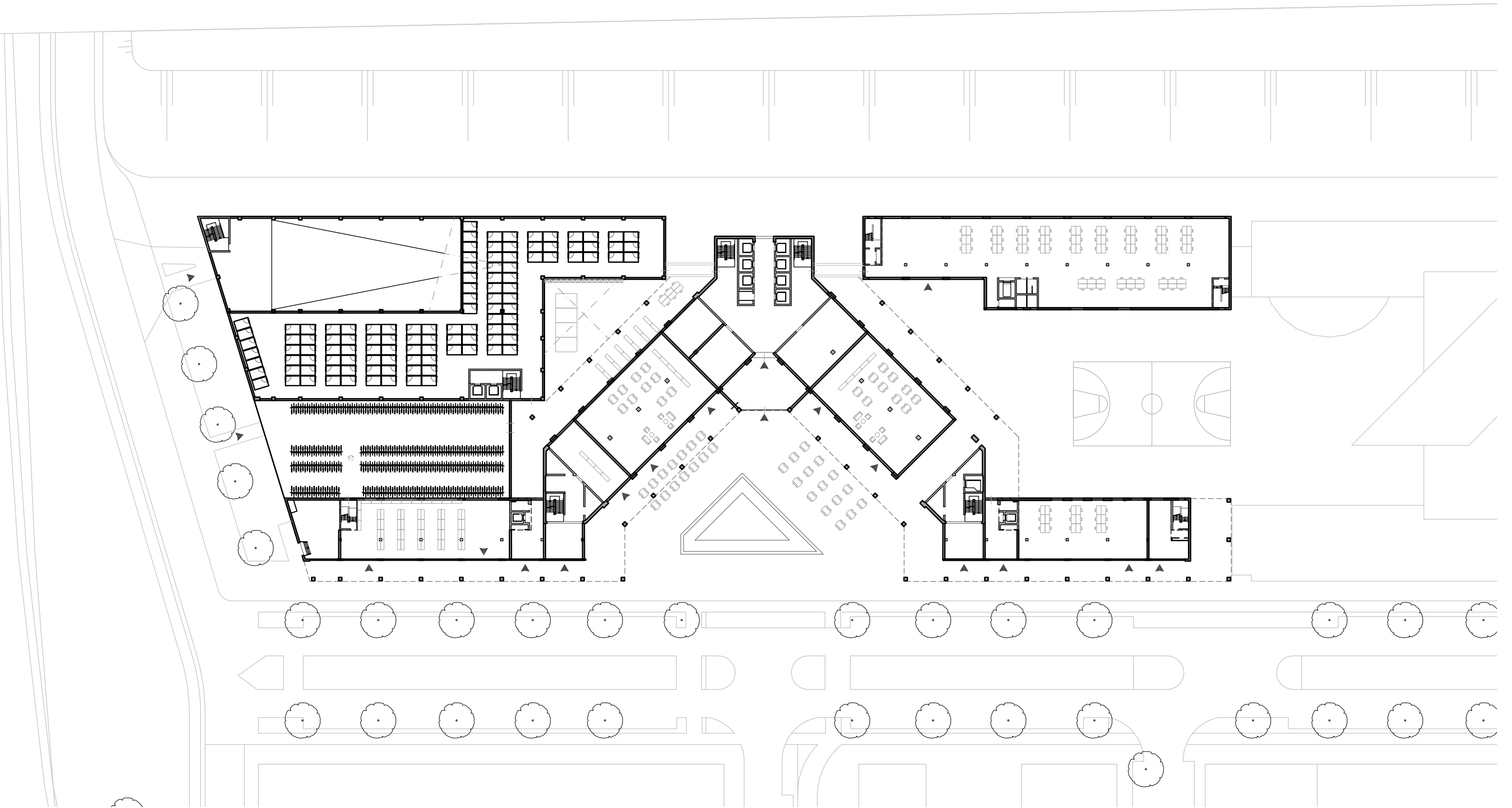
CHANGI WEG

KINGSFORD WEG



FLOORPLAN

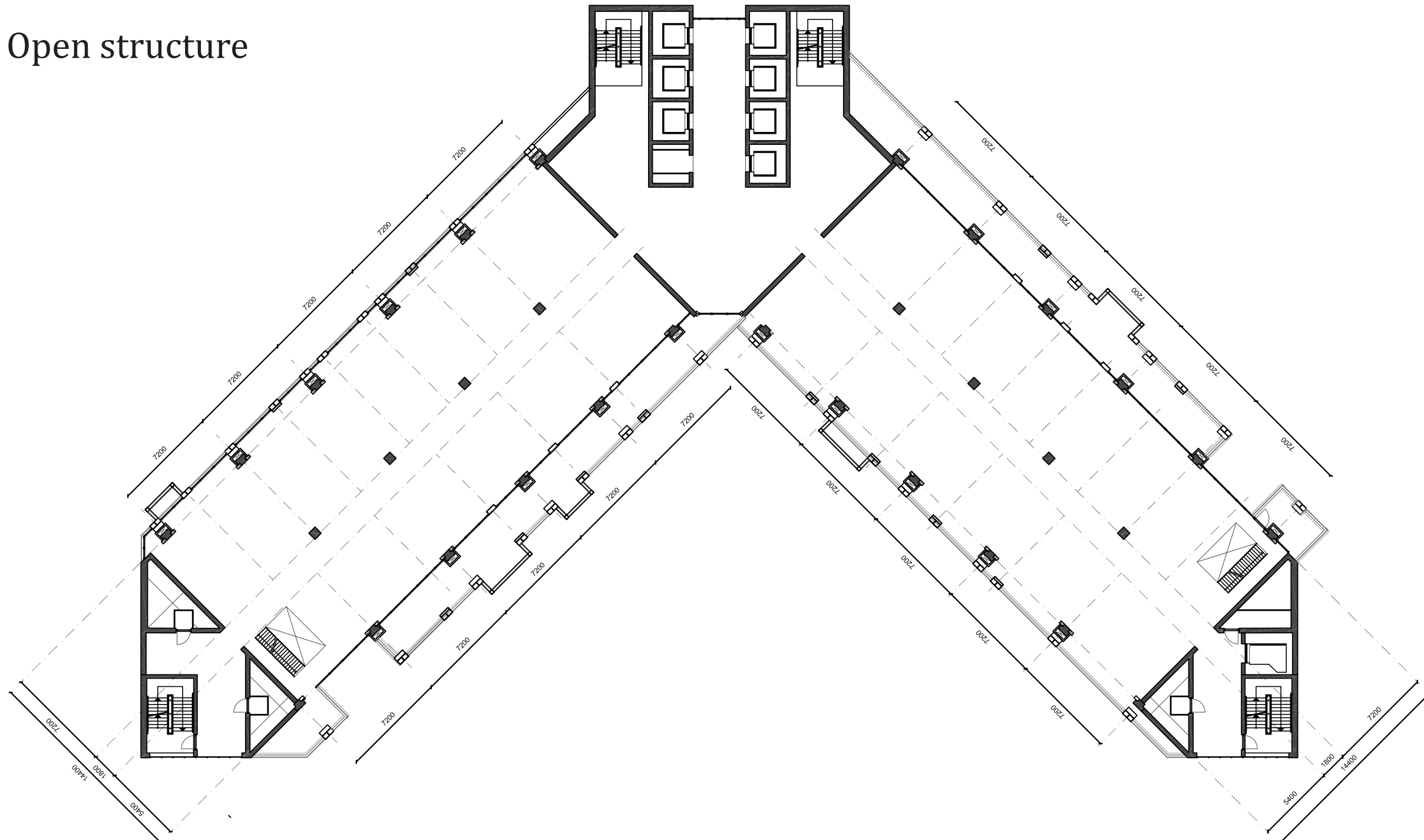
GROUND FLOOR



STRUCTURE (STRUCTUUR)

FLEXIBLE BUILDING STRUCTURE

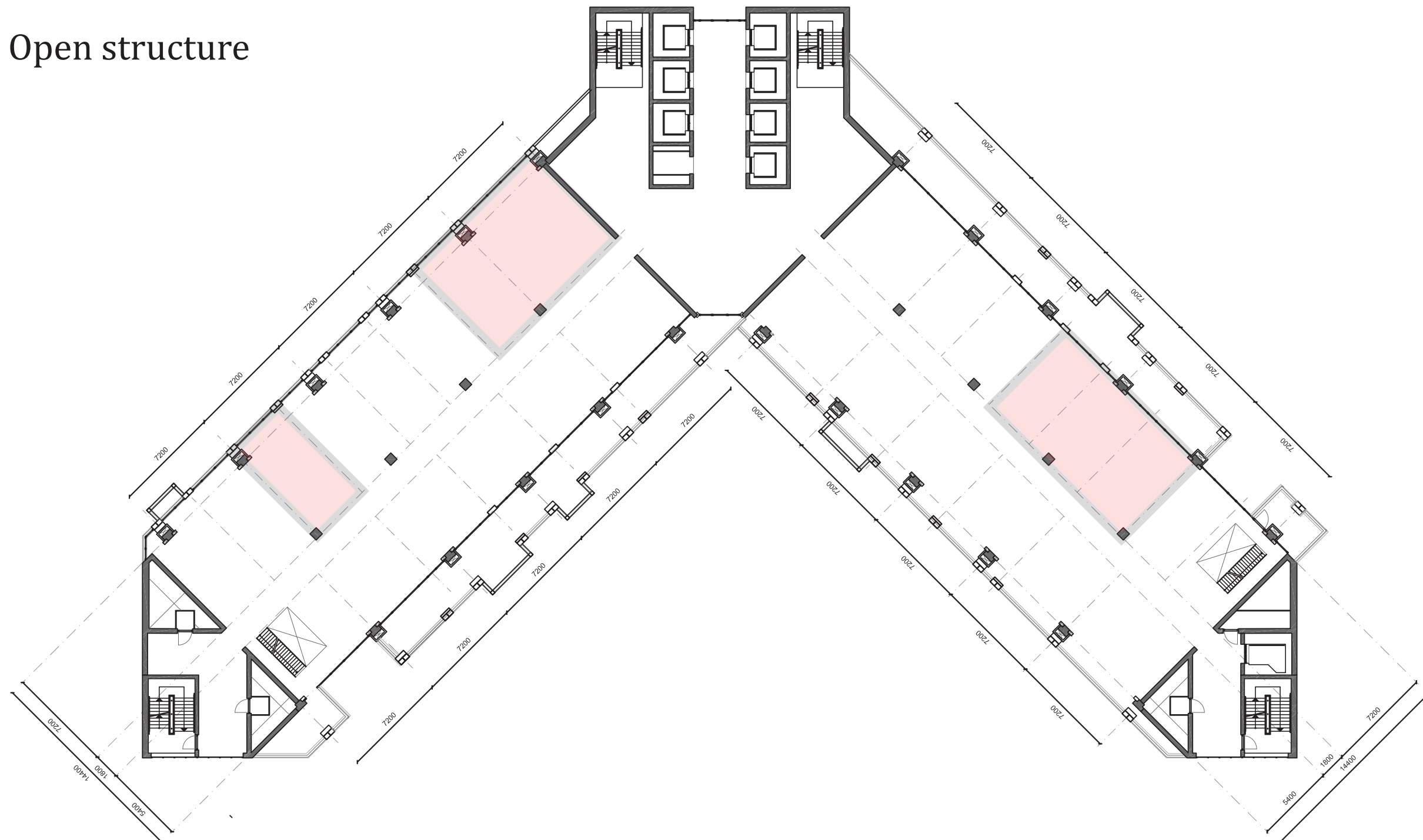
Open structure



STRUCTURE (STRUCTUUR)

FLEXIBLE BUILDING STRUCTURE

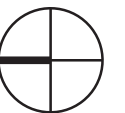
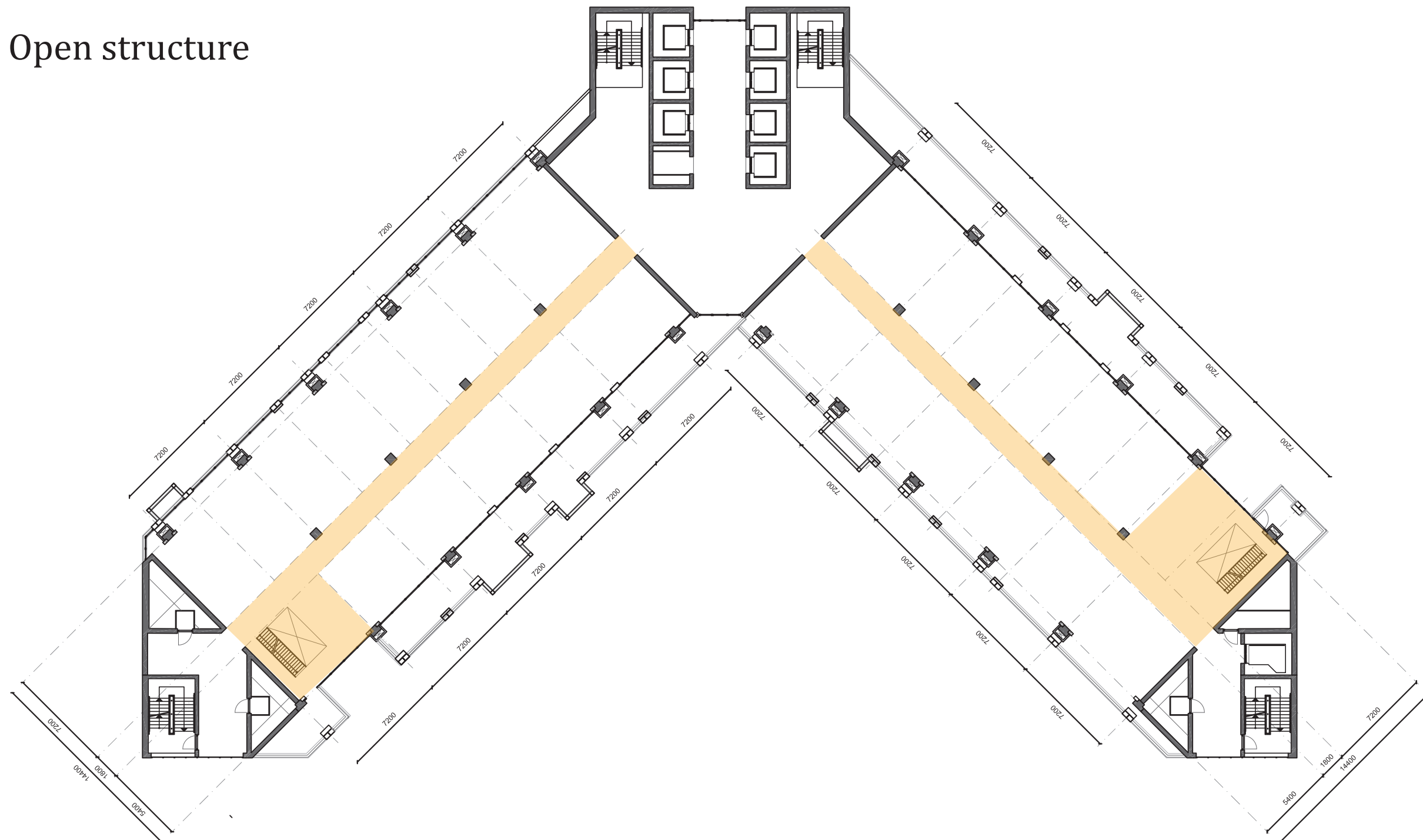
Open structure



STRUCTURE (STRUCTUUR)

FLEXIBLE BUILDING STRUCTURE

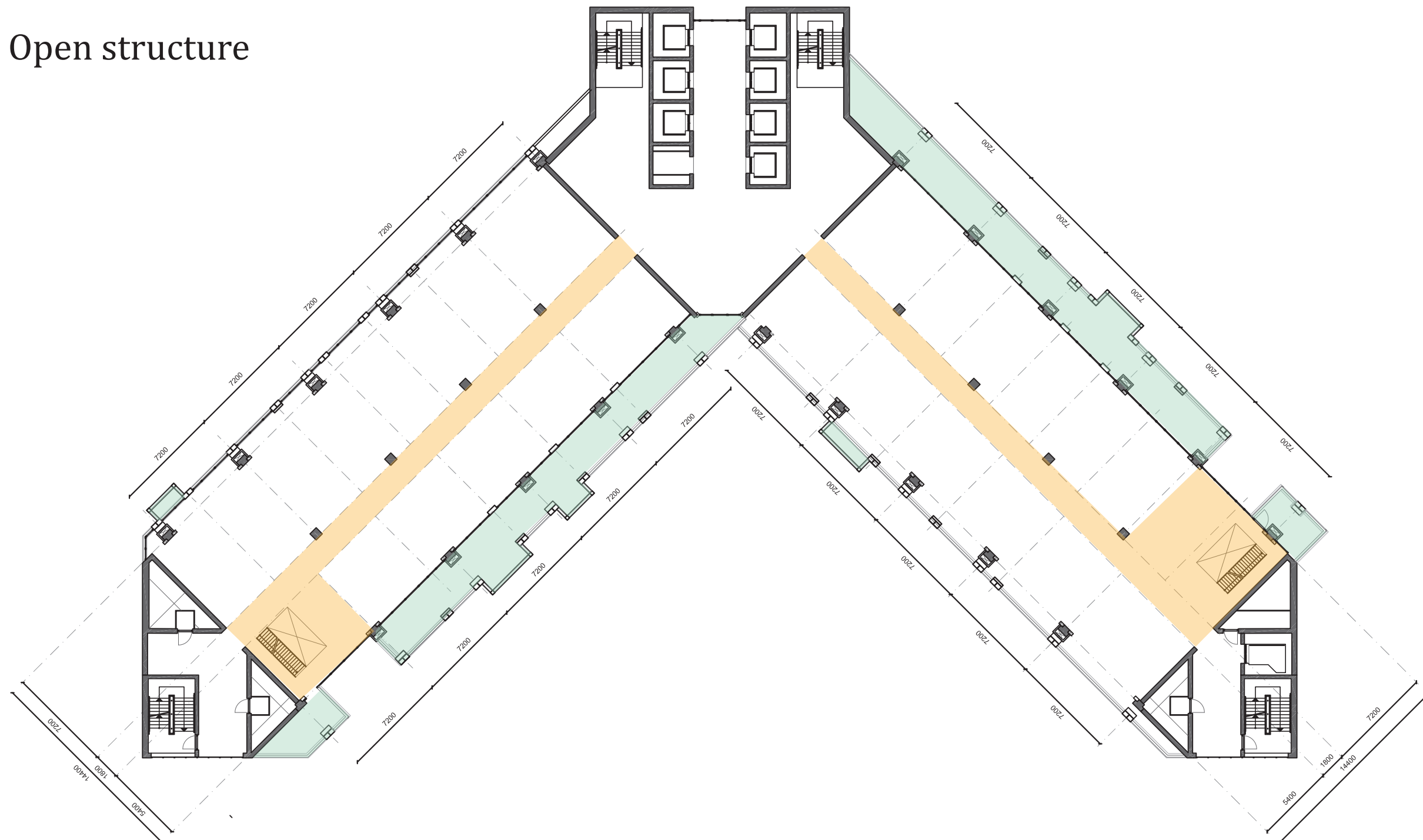
Open structure



STRUCTURE (STRUCTUUR)

FLEXIBLE BUILDING STRUCTURE

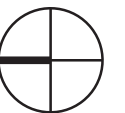
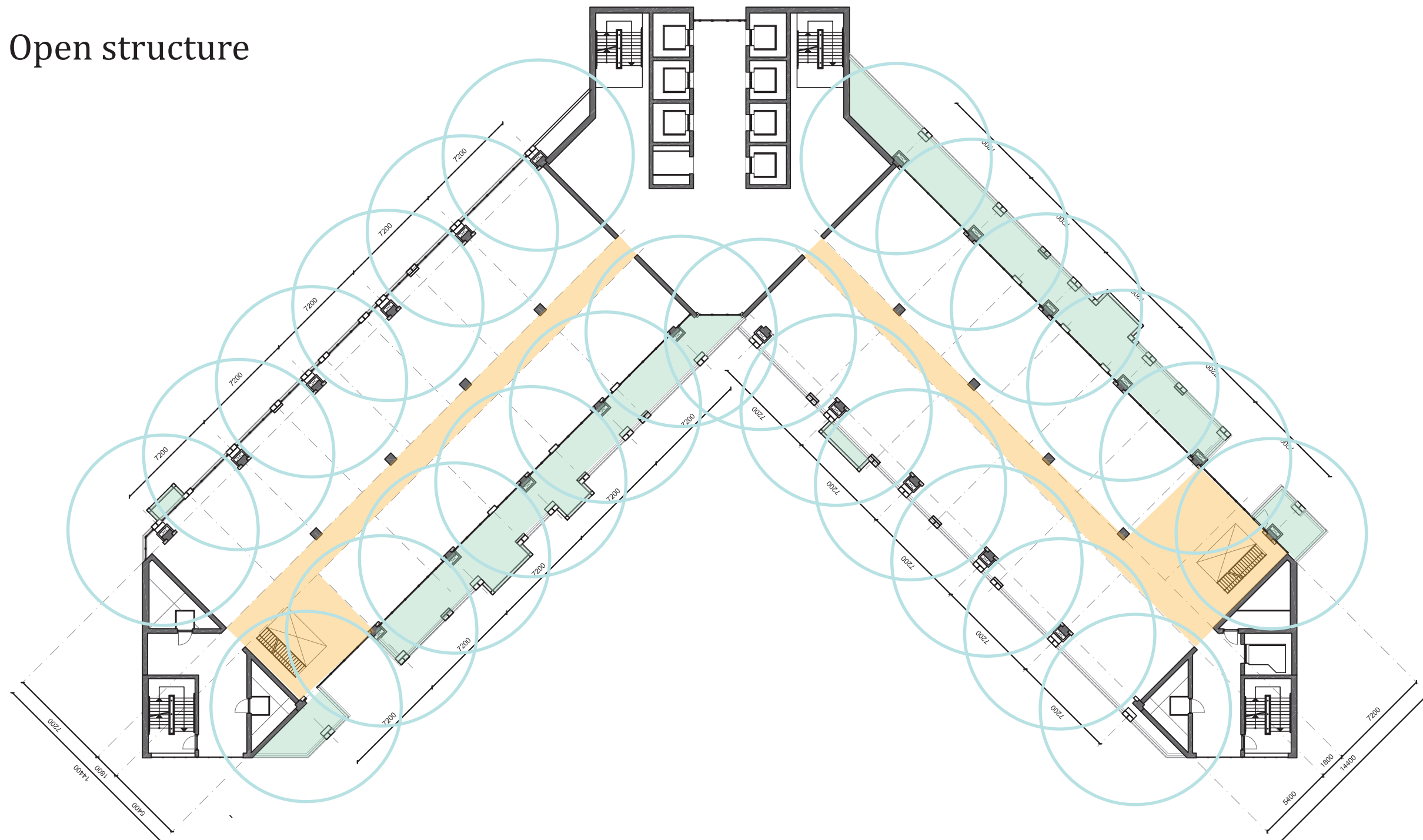
Open structure



STRUCTURE (STRUCTUUR)

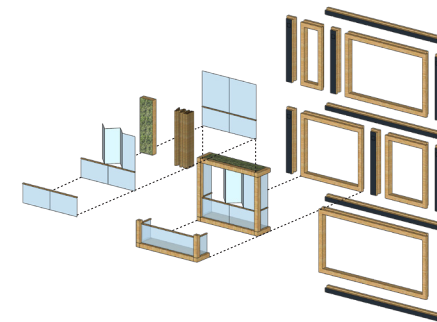
FLEXIBLE BUILDING STRUCTURE

Open structure

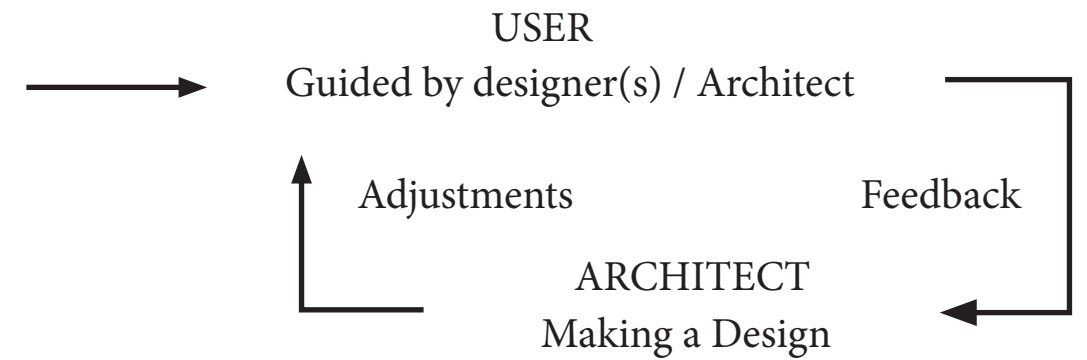


STRUCTURE (STRUCTUUR) FOUNDATION KAIZEN

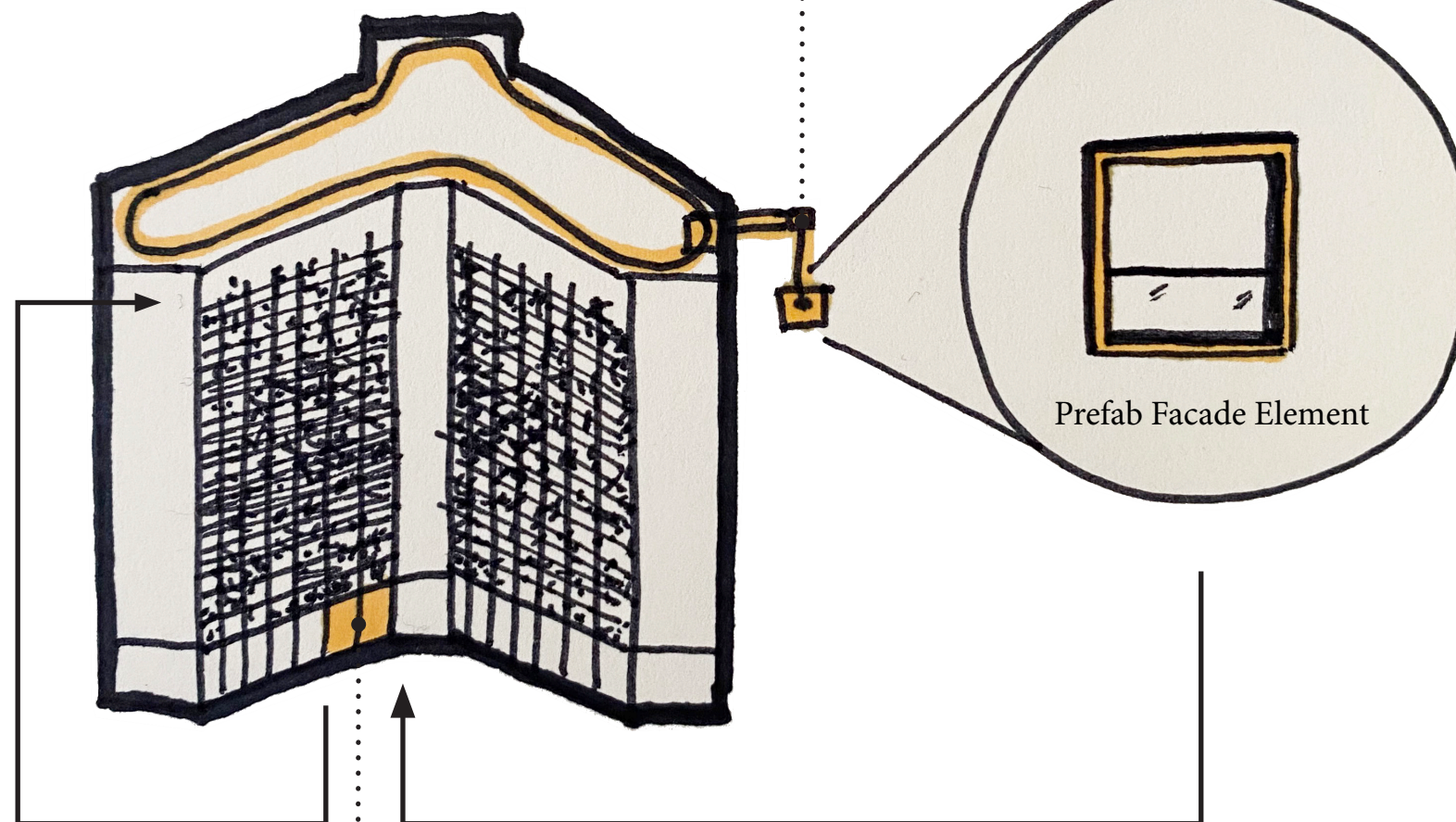
Facade



TOOLBOX



Demountable & Remountable facade elements from crane (strengthened window cleaning installation)



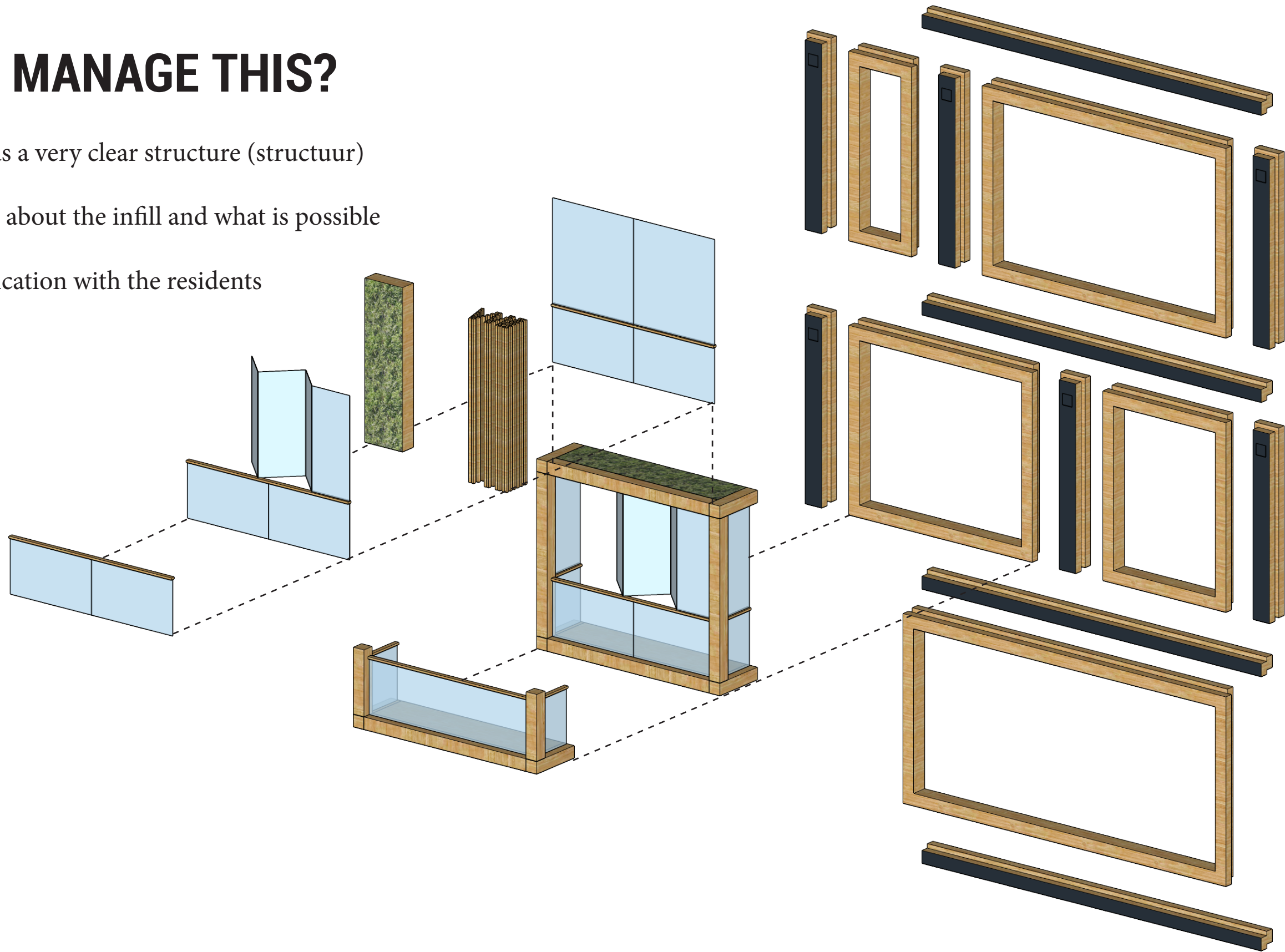
Facade Leasing -> Custom design from toolbox

Facade Elements Repair/Maintenance by the Kaizen Foundation, in the building itself (local)

COHERENCE

HOW TO MANAGE THIS?

- The building has a very clear structure (structuur)
- Very clear rules about the infill and what is possible
- Clear communication with the residents



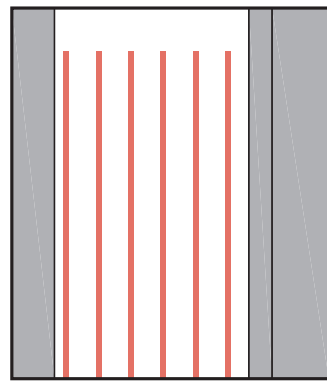
FACADE

FOUNDATION KAIZEN

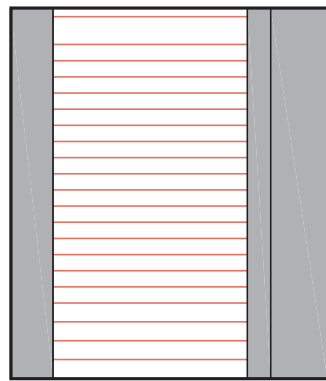


FACADE

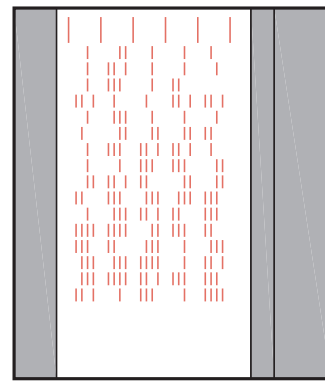
FOUNDATION KAIZEN



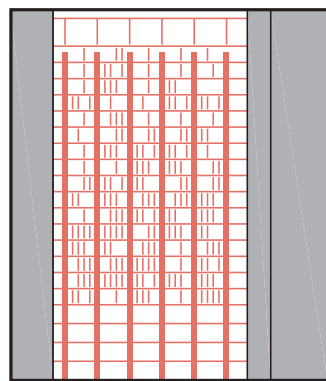
Verticale elementen



Horizontale elementen (vloeren)



Uitzonderdingen



Ritme en diversiteit

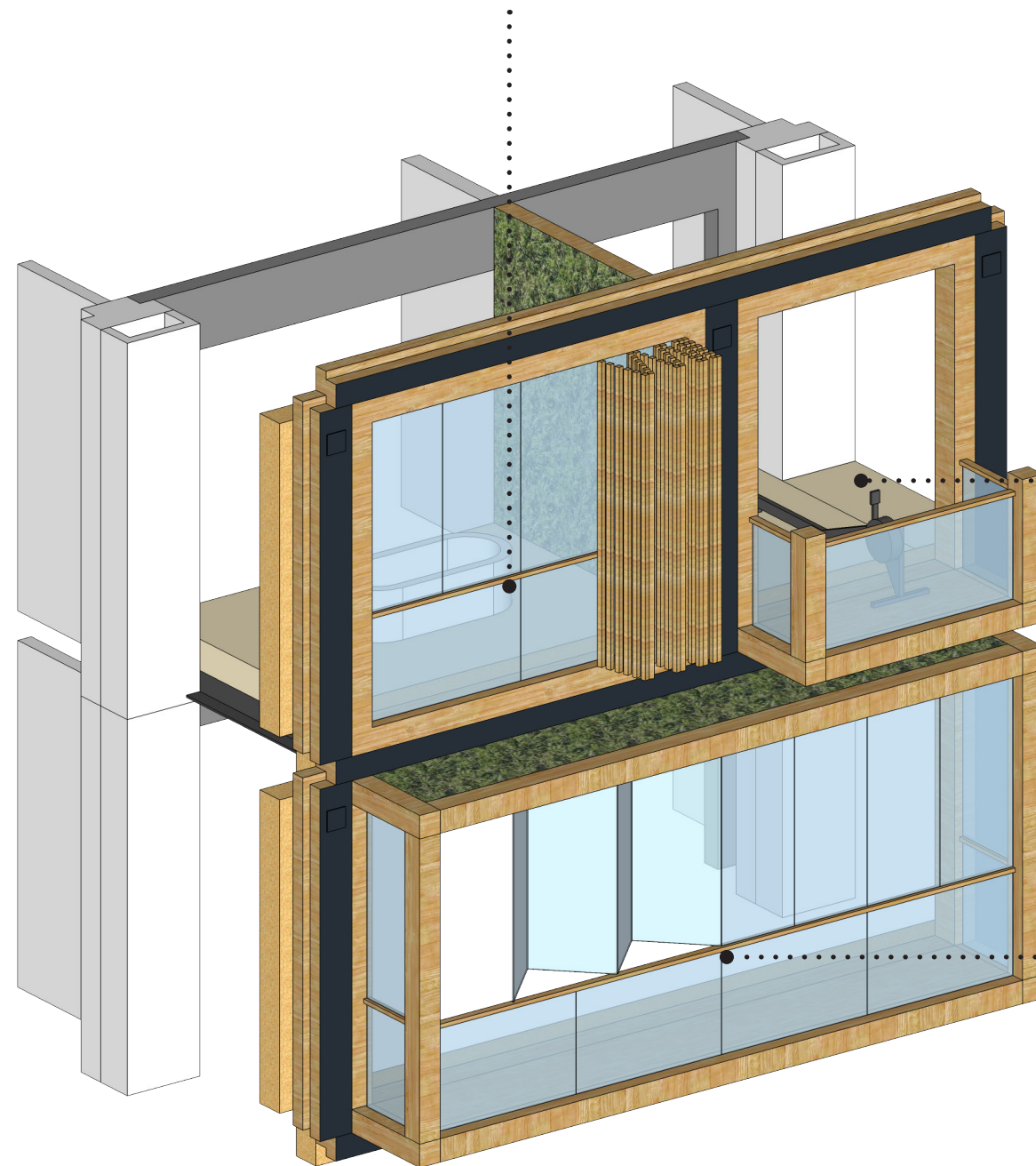


ADAPTABLE FACADE

SCENARIO 1

ELDERLY 2P

Outdoor bathing + enclosure



STUDIO

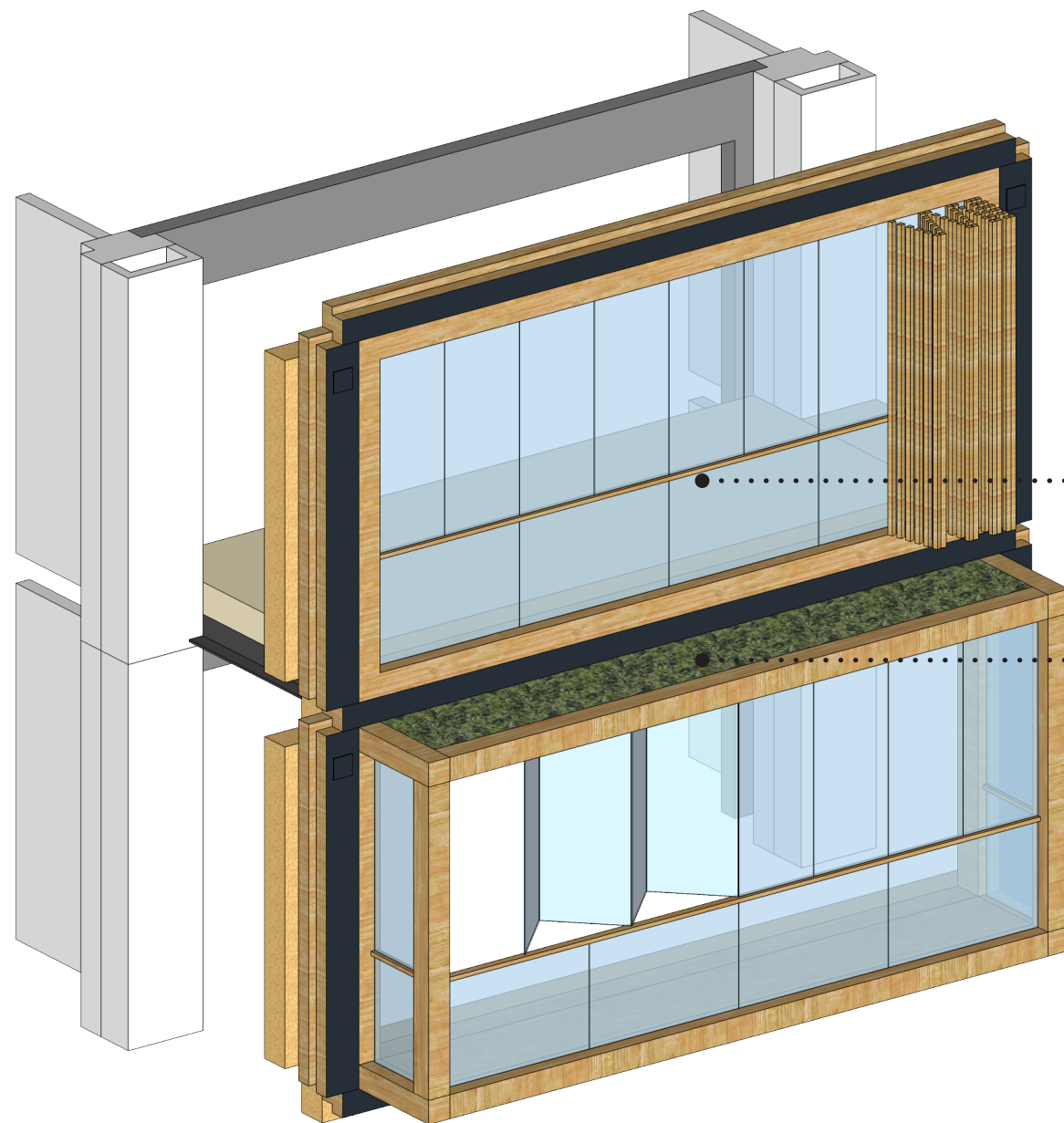
Outdoor sports

FAMILY

Large outdoor space



ADAPTABLE FACADE SCENARIO 2



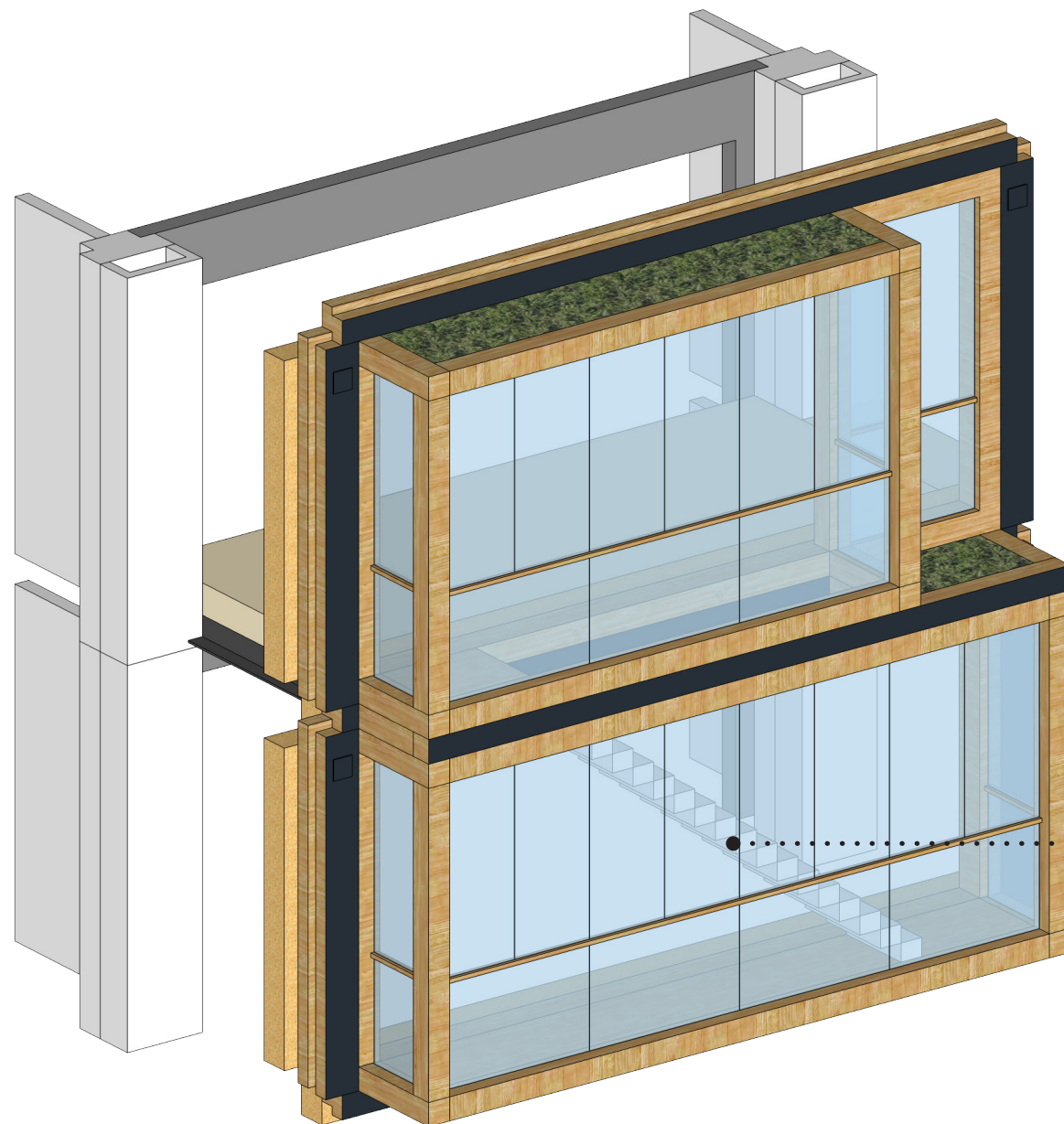
Combining Apartments



Bay window -> low-maintenance sedum roof covering



ADAPTABLE FACADE SCENARIO 3



Slender steel stairs



ADAPTABLE

RIGHT NOW

A house that fits the residents right now, it will make them happy, they are attached to it and to their surroundings

ADAPTABLE **RIGHT NOW**

A house that fits the residents right now, it will make them happy, they are attached to it and to their surroundings



ADAPTABLE **NEAR FUTURE**

Easily adapted to the near future. (flexible building)

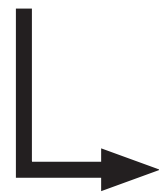
ADAPTABLE **RIGHT NOW**

A house that fits the residents right now, it will make them happy, they are attached to it and to their surroundings



ADAPTABLE **NEAR FUTURE**

Easily adapted to the near future. (flexible building)

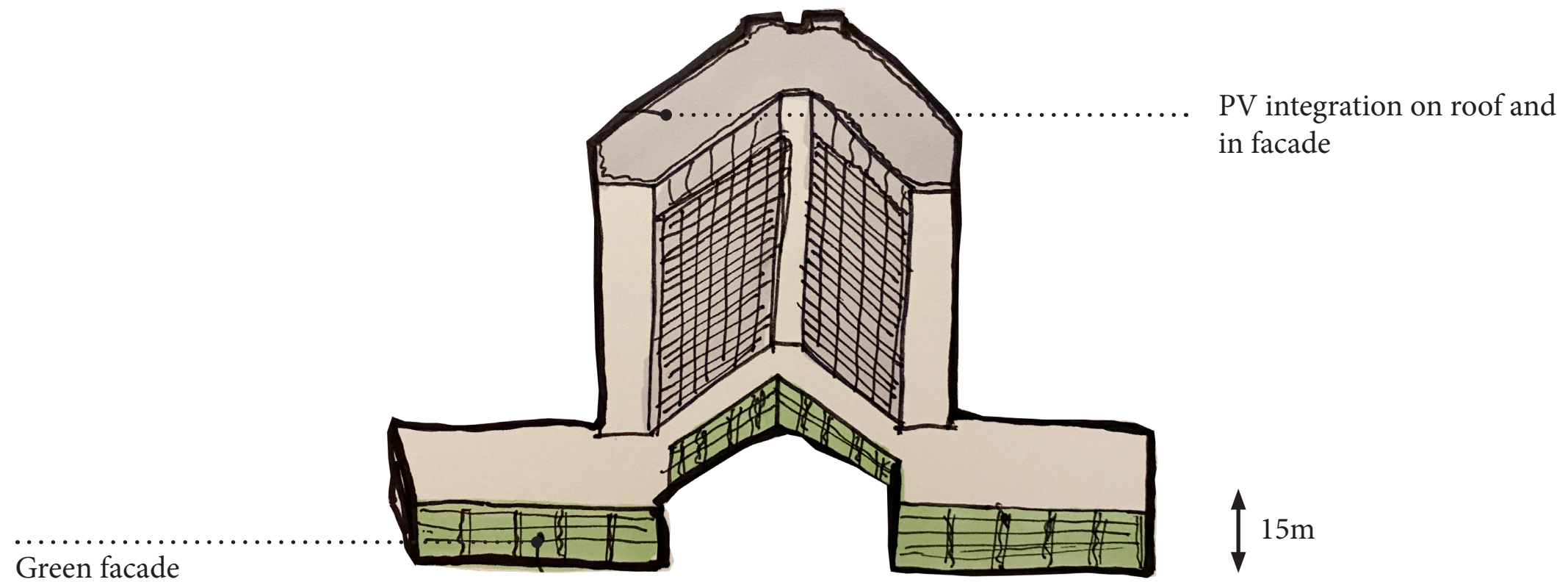


ADAPTABLE **UNKNOWN FUTURE**

Important. We just don't know how people will live in the future.
(future proof)

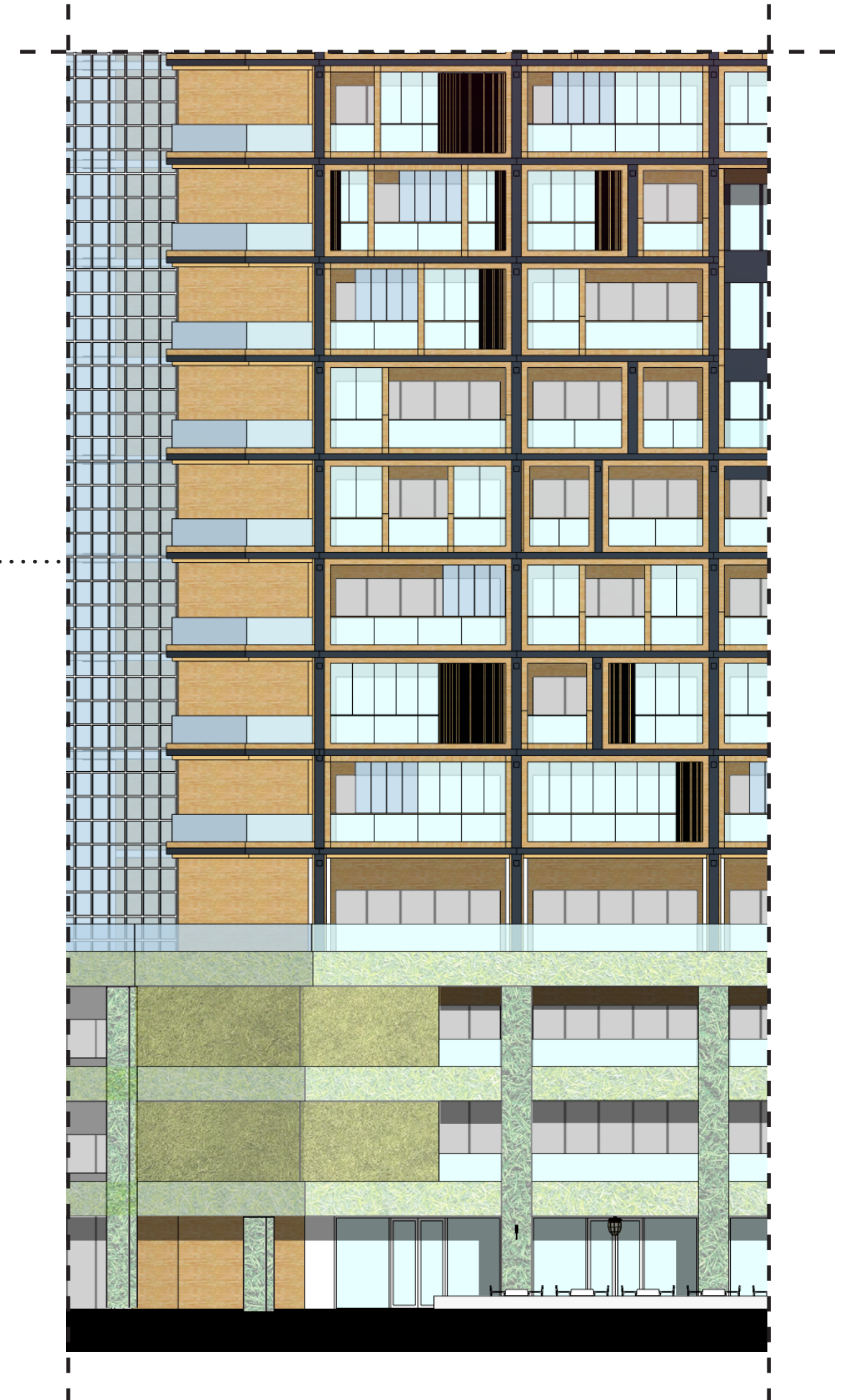
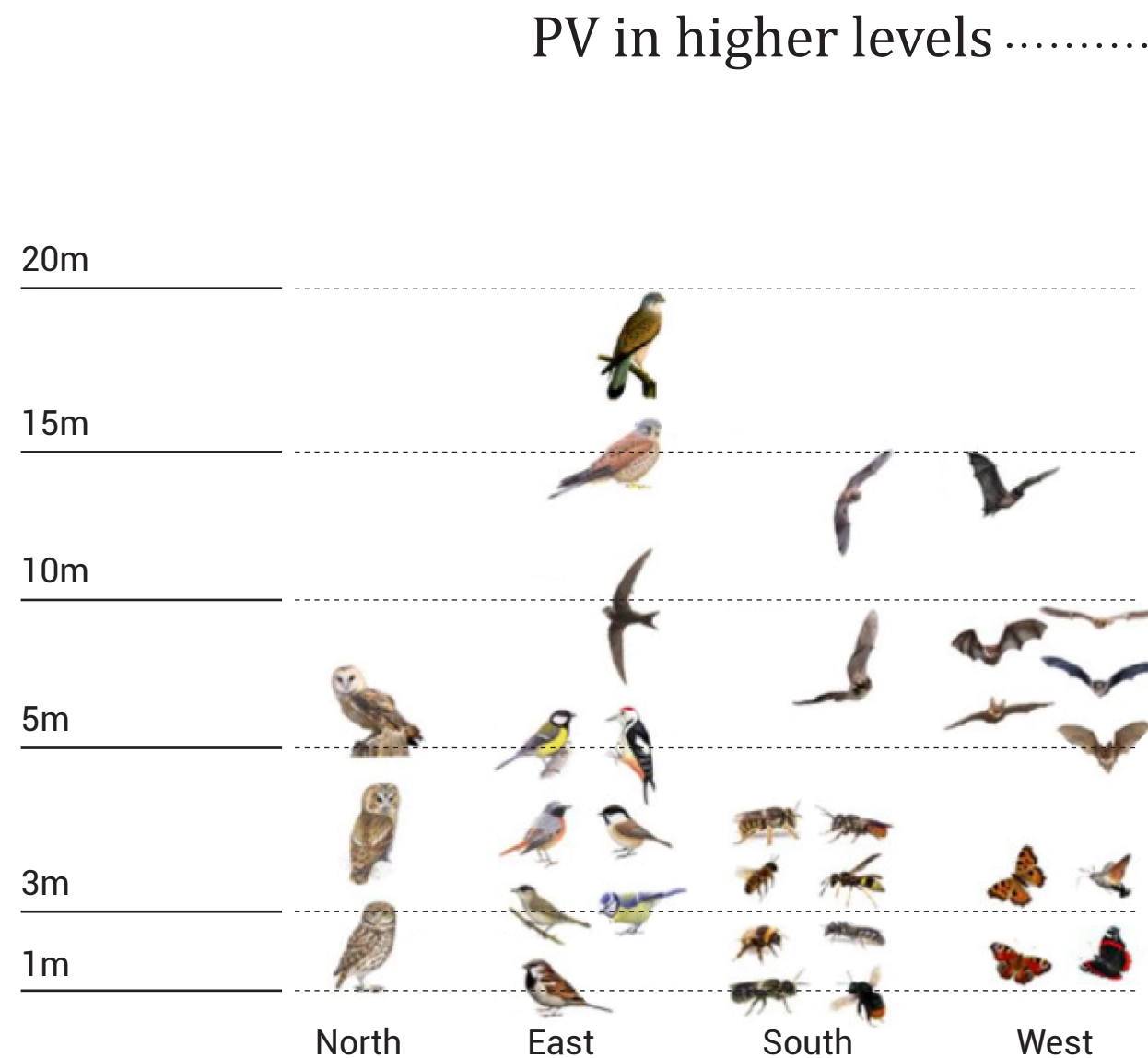
STRUCTUUR

FIXED || ADAPTABLE



LOWER LEVELS

INCREASE BIO DIVERSITY



IDENTITY

INDIVIDUAL

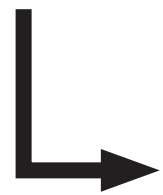
Shape the interior and personal facade within boundries



IDENTITY

INDIVIDUAL

Shape the interior and personal facade within boundries



IDENTITY

COLLECTIVE

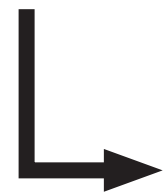
Shape the building



IDENTITY

INDIVIDUAL

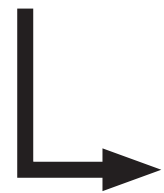
Shape the interior and personal facade within boundries



IDENTITY

COLLECTIVE

Shape the building



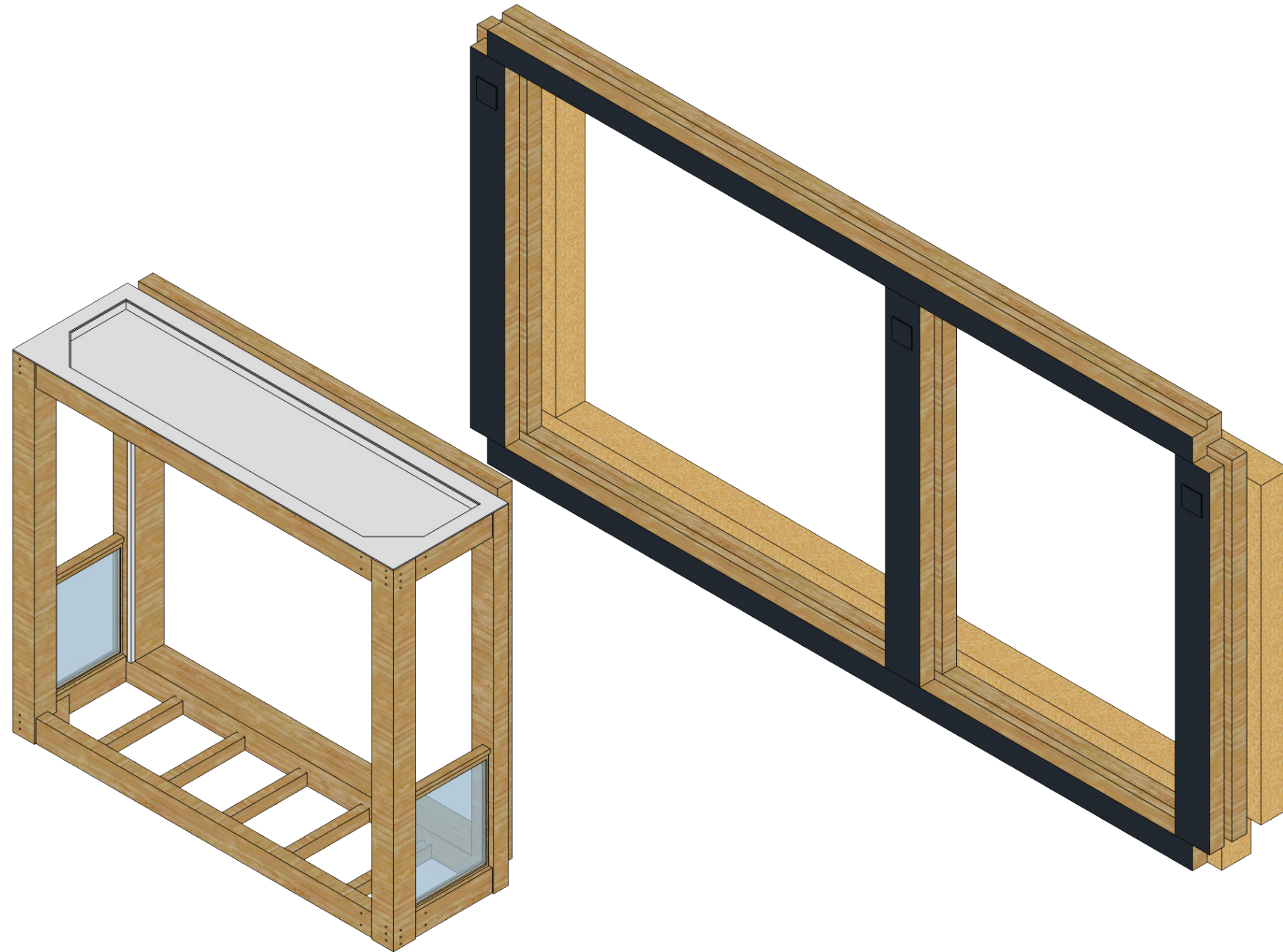
IDENTITY

BUILDINGS

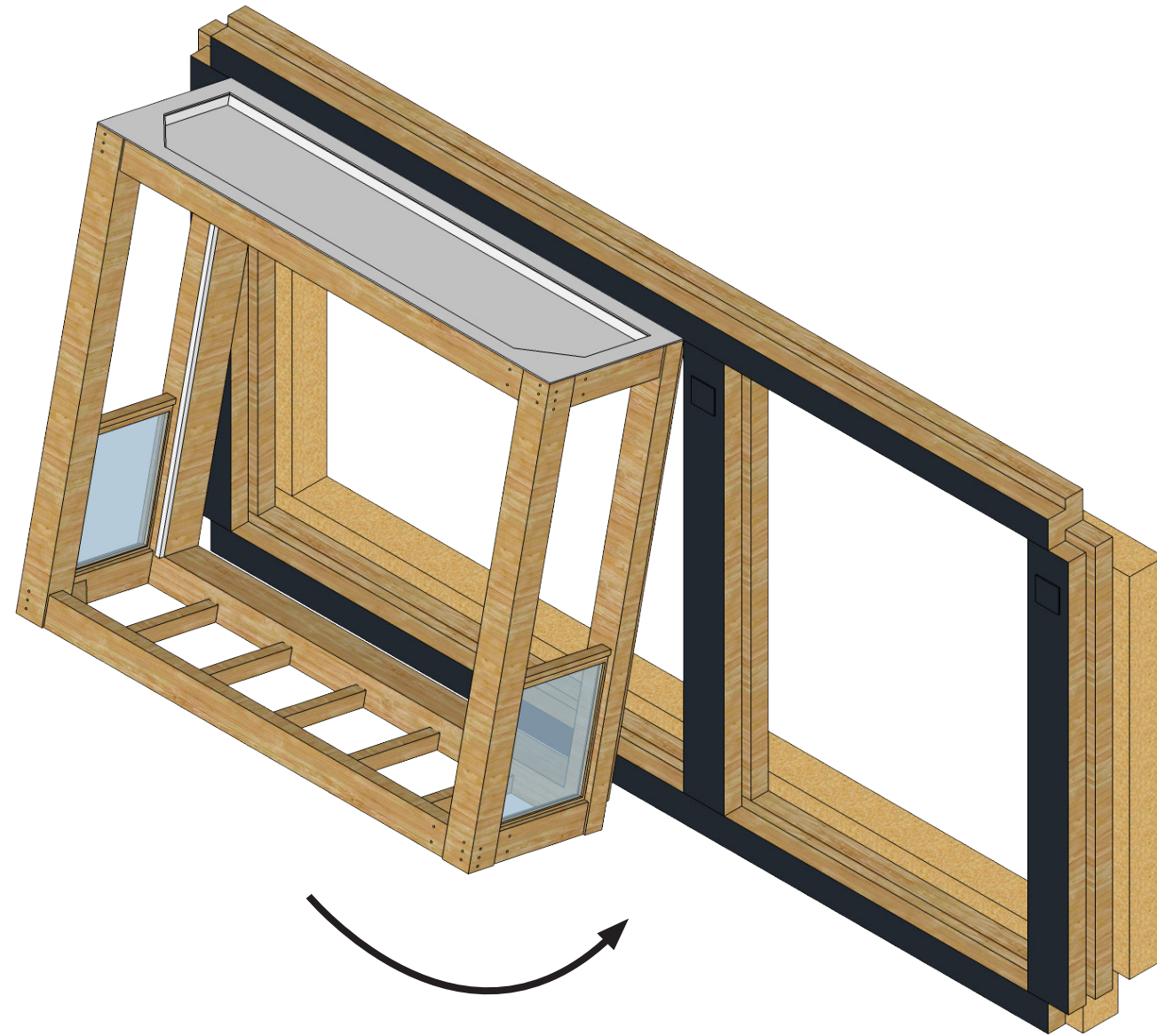
Shape the urban identity.



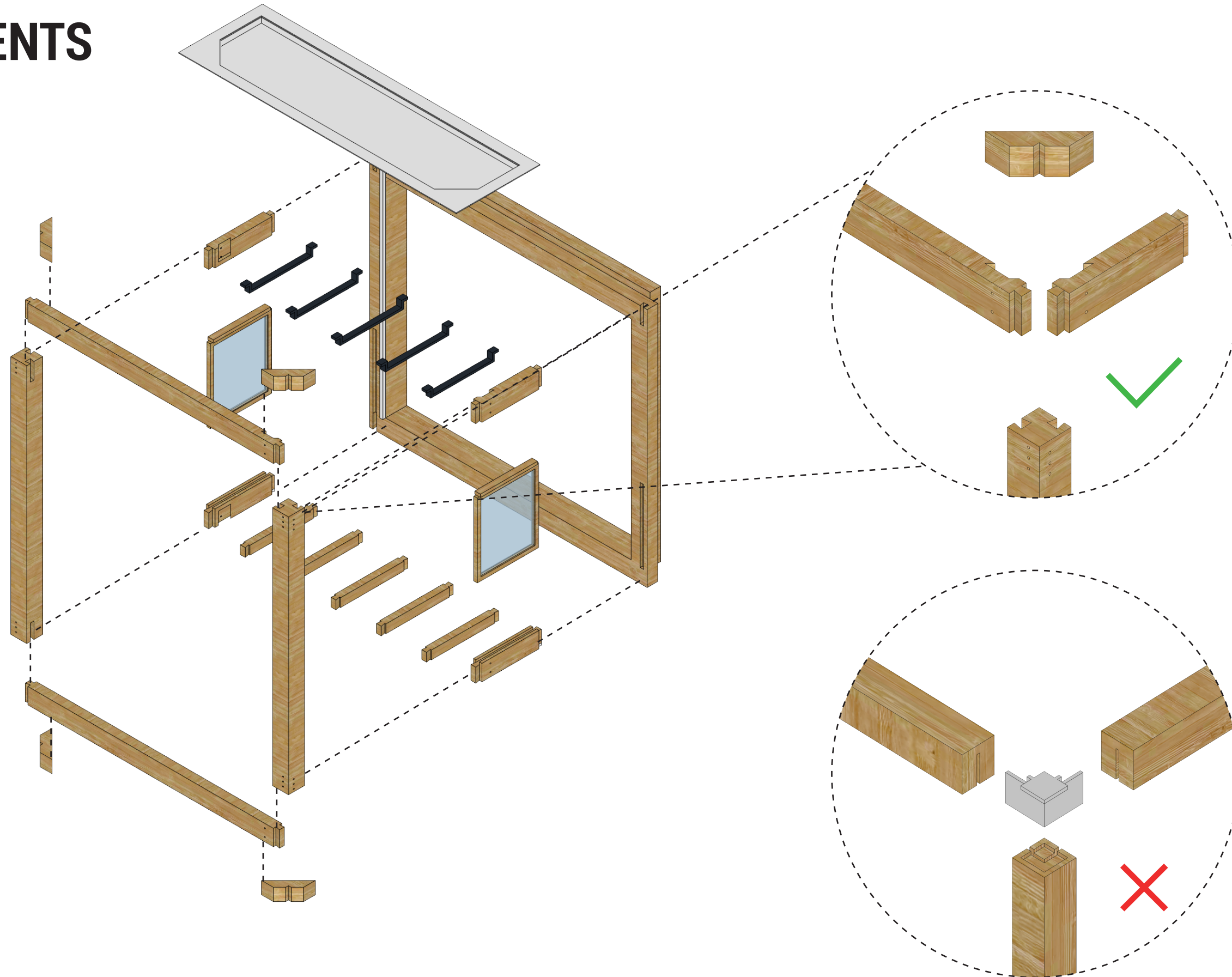
FACADE ELEMENTS



FACADE ELEMENTS



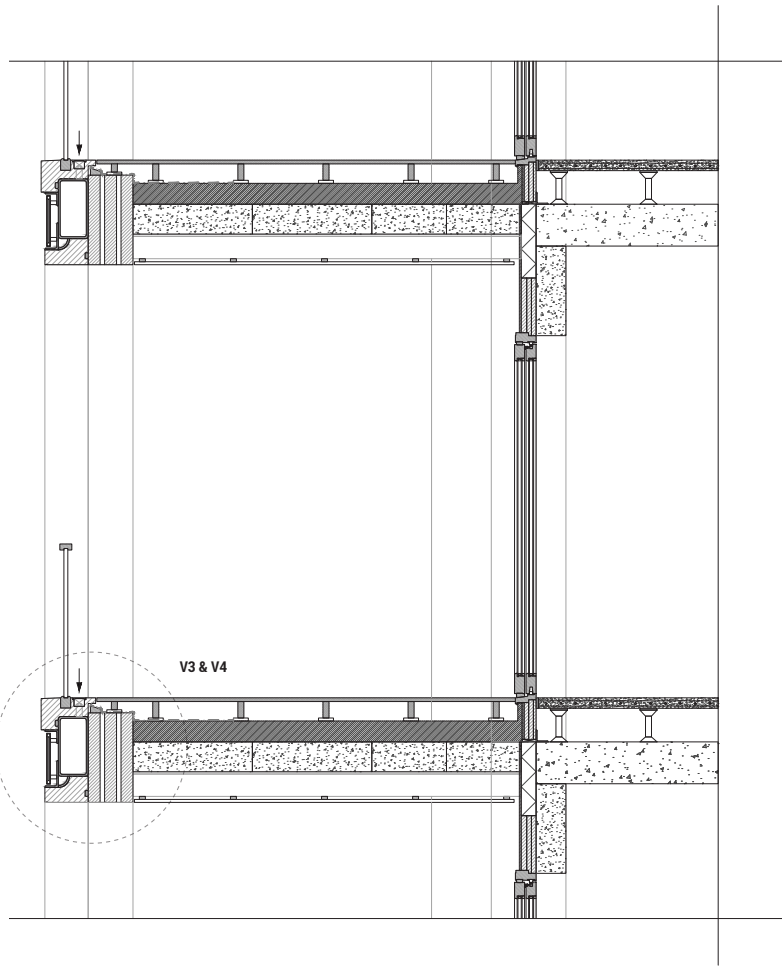
FACADE ELEMENTS



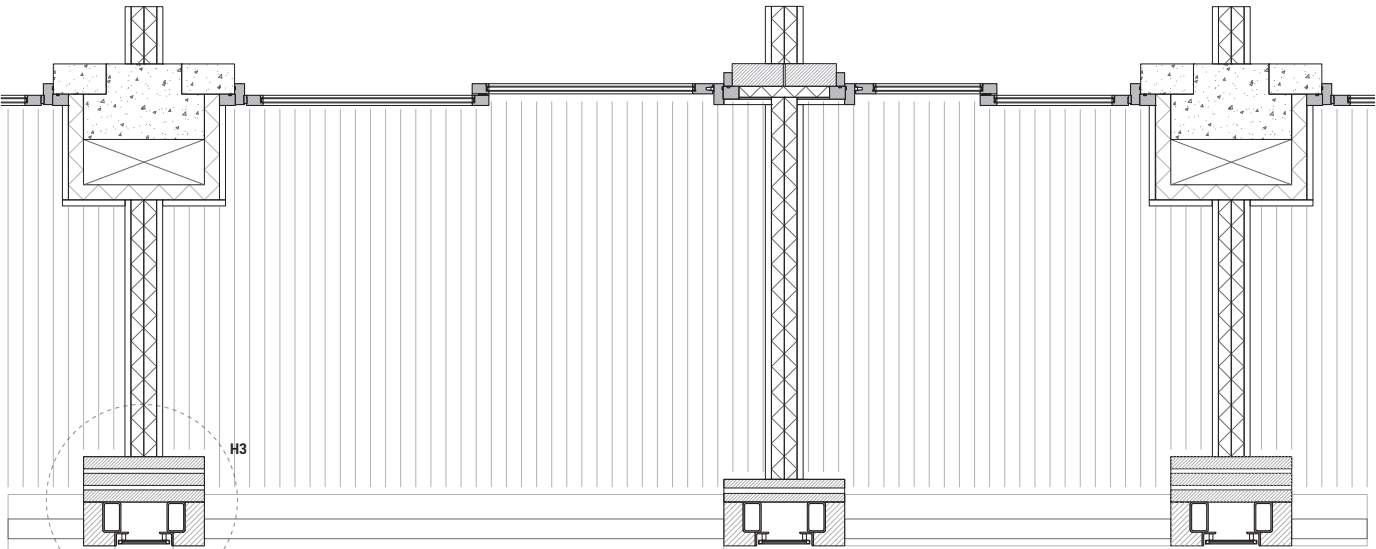
FACADE
DETAILING



FRAGMENT ELEVATION 1:20

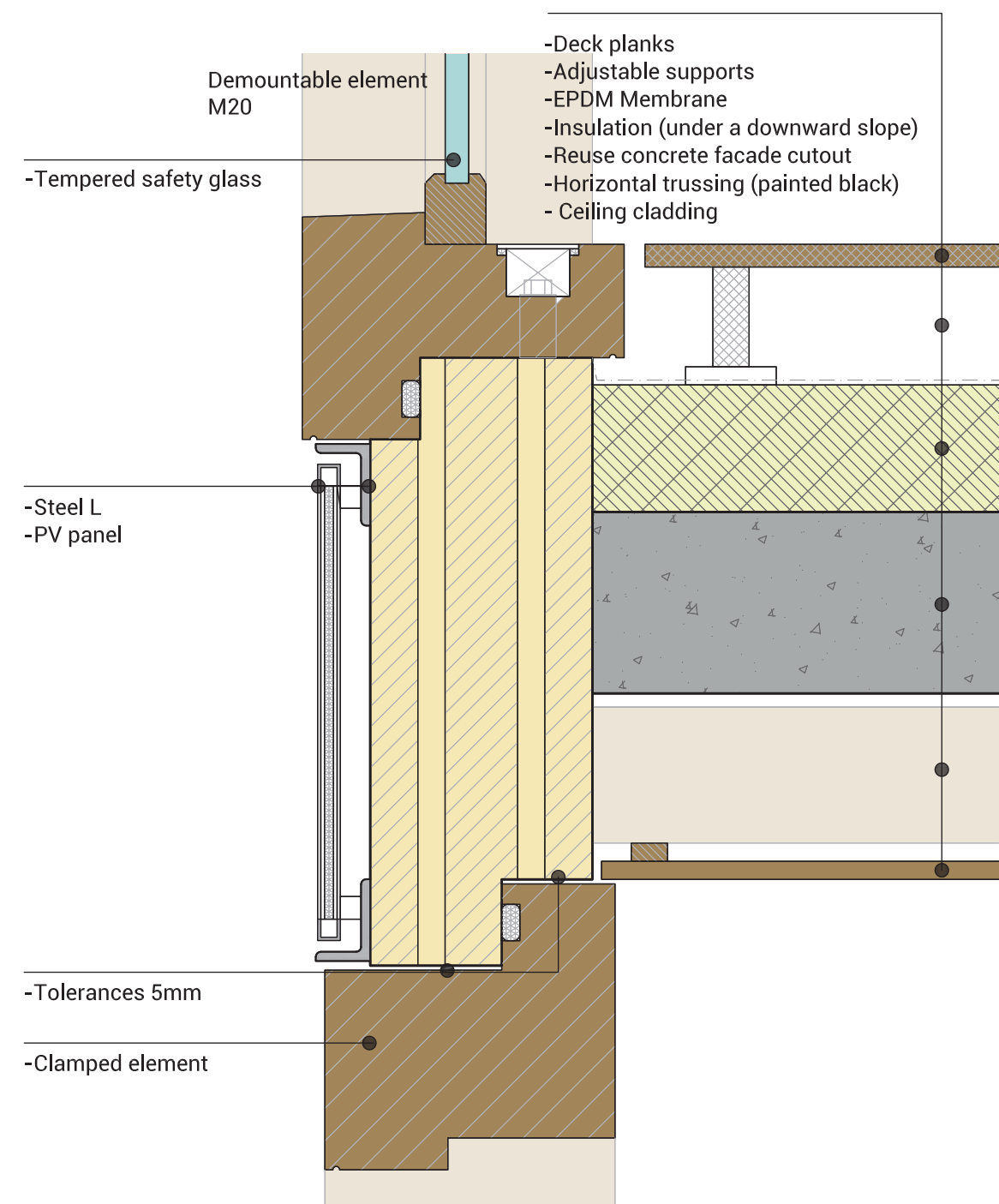


FRAGMENT VERTICAL SECTION 1:20

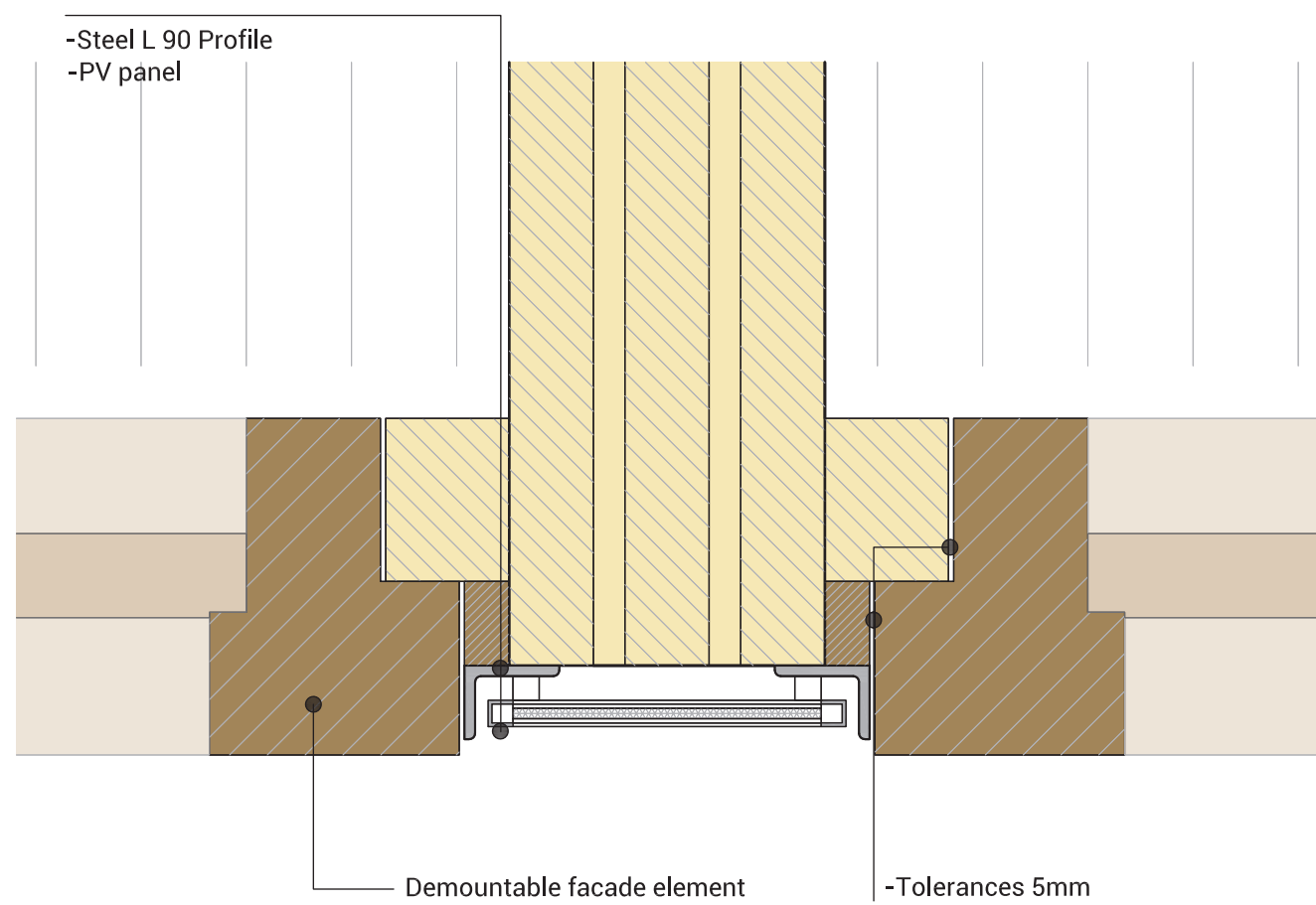


FRAGMENT HORIZONTAL 1:20

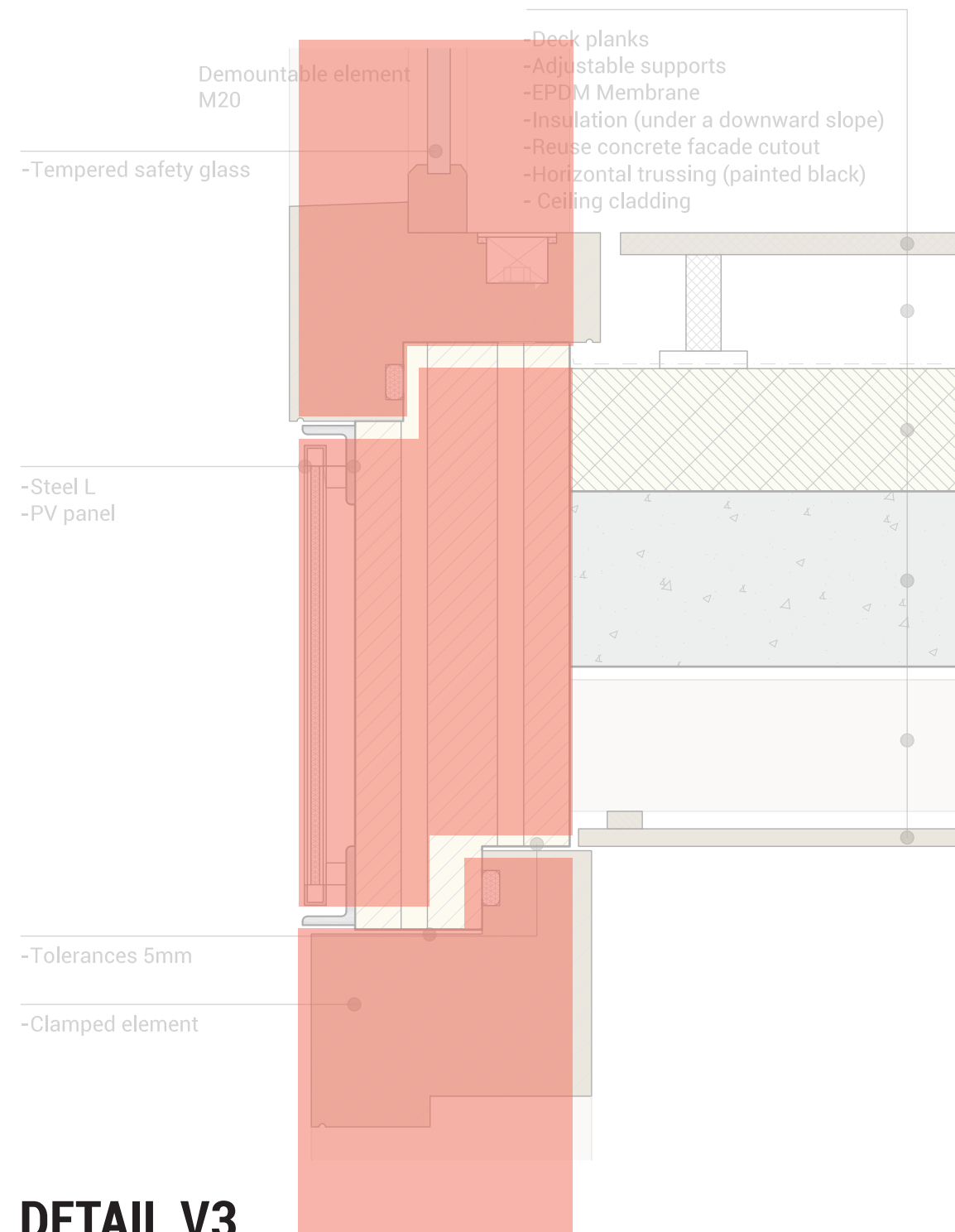
FACADE
DETAILING



DETAIL V3 & V4 1:20

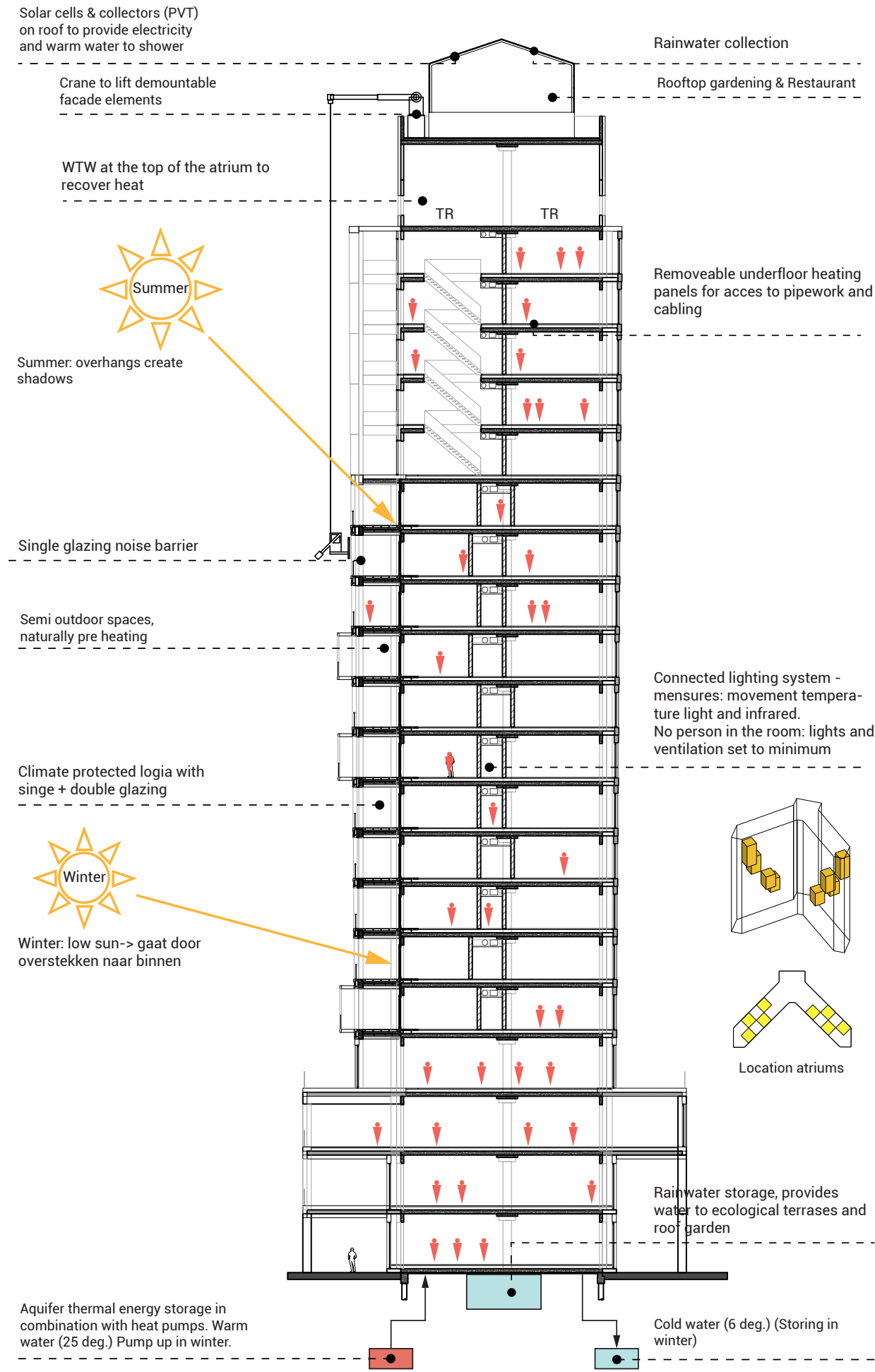


FACADE DETAILING



Like rooftiles

BUILDING
CLIMATE



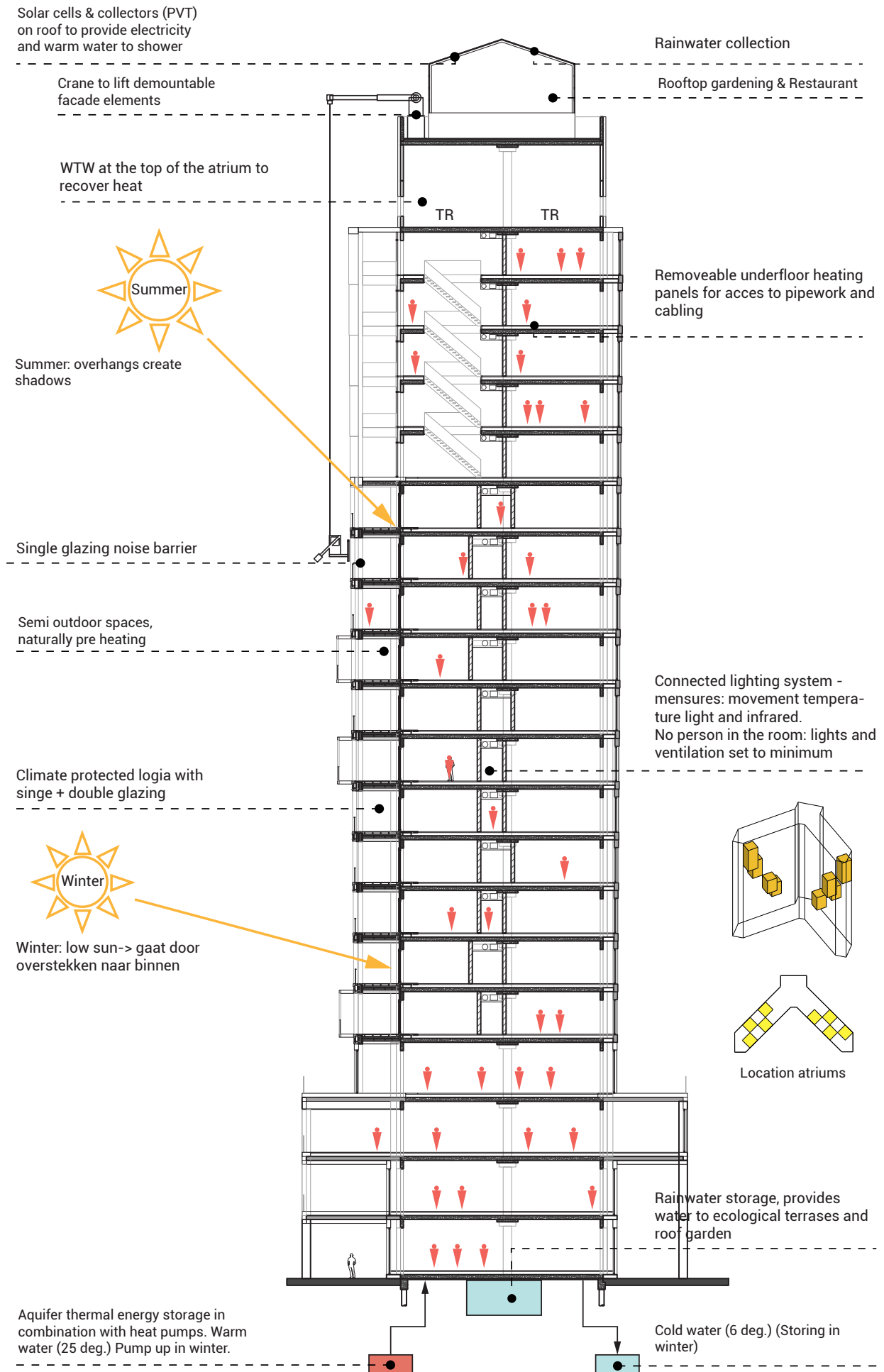
BUILDING CLIMATE



‘Op Vlucht’

- Showing details better
- Easier to lift elements to position
- Better drainage

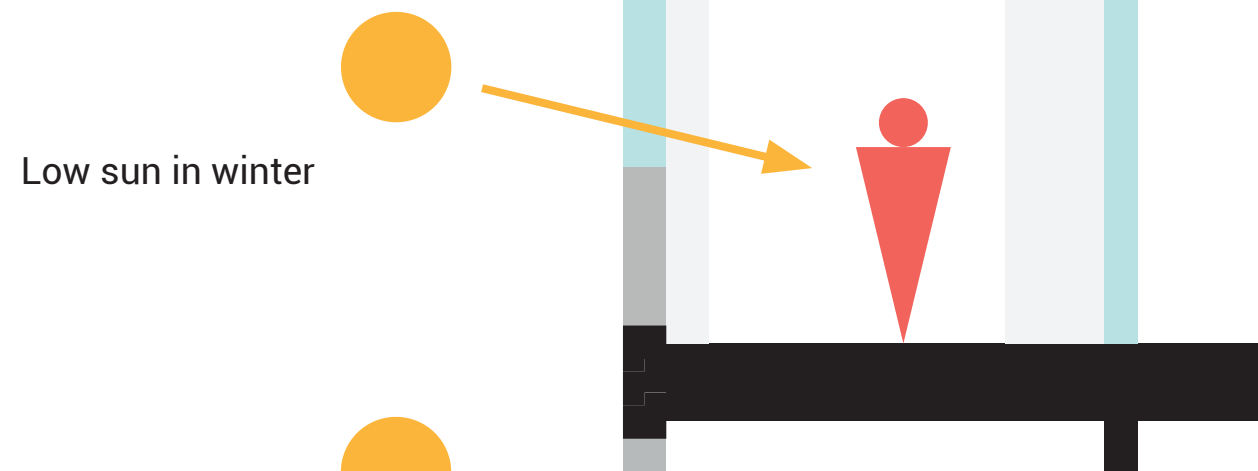
<https://www.dreamstime.com/stock-illustration-city-view-amsterdam-canal-bridge-color-hand-drawing-typical-houses-bridge-holland-netherlands-picture-made-liner-image76792169>



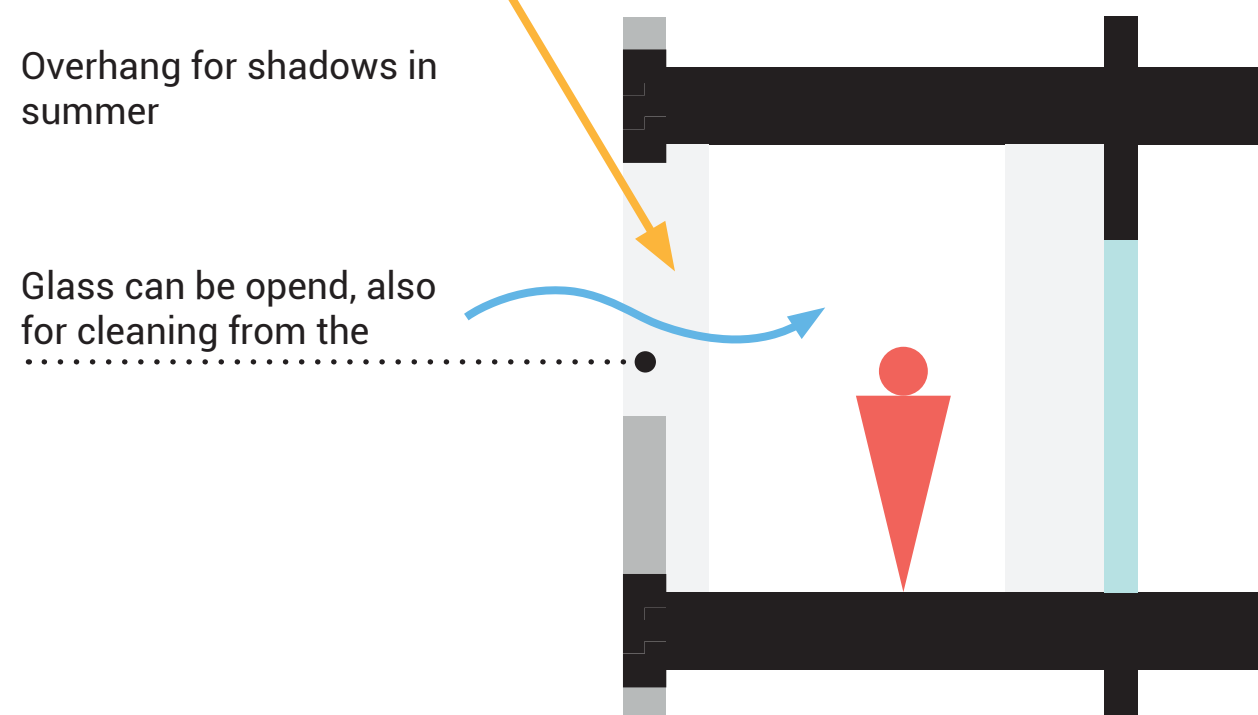
SECTION 1:200

BUILDING CLIMATE

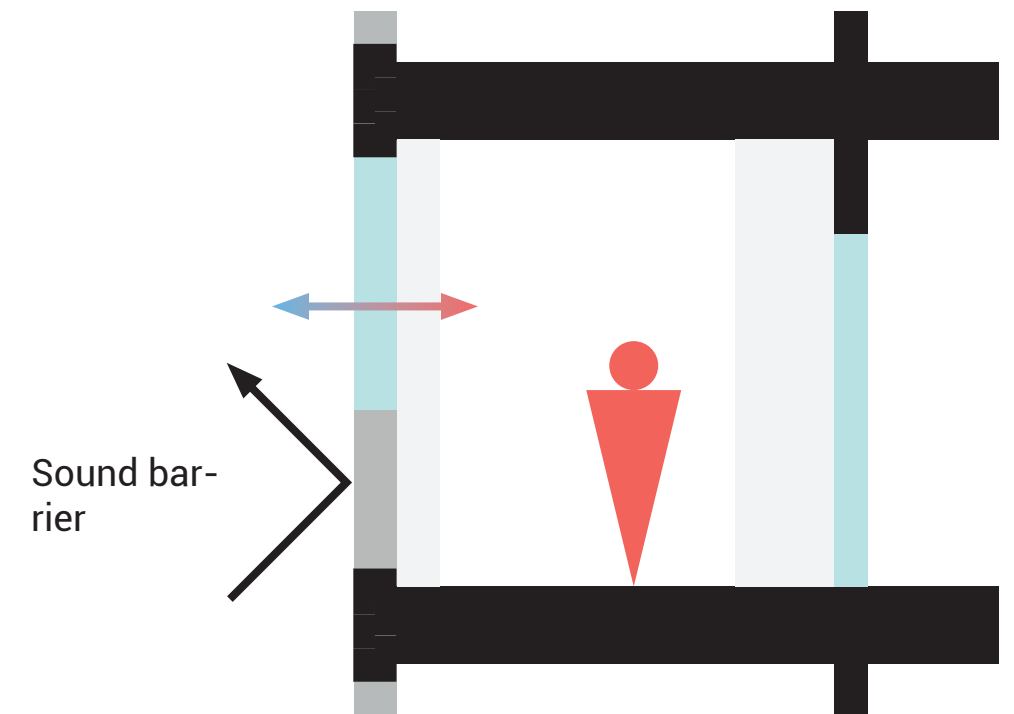
WINTER



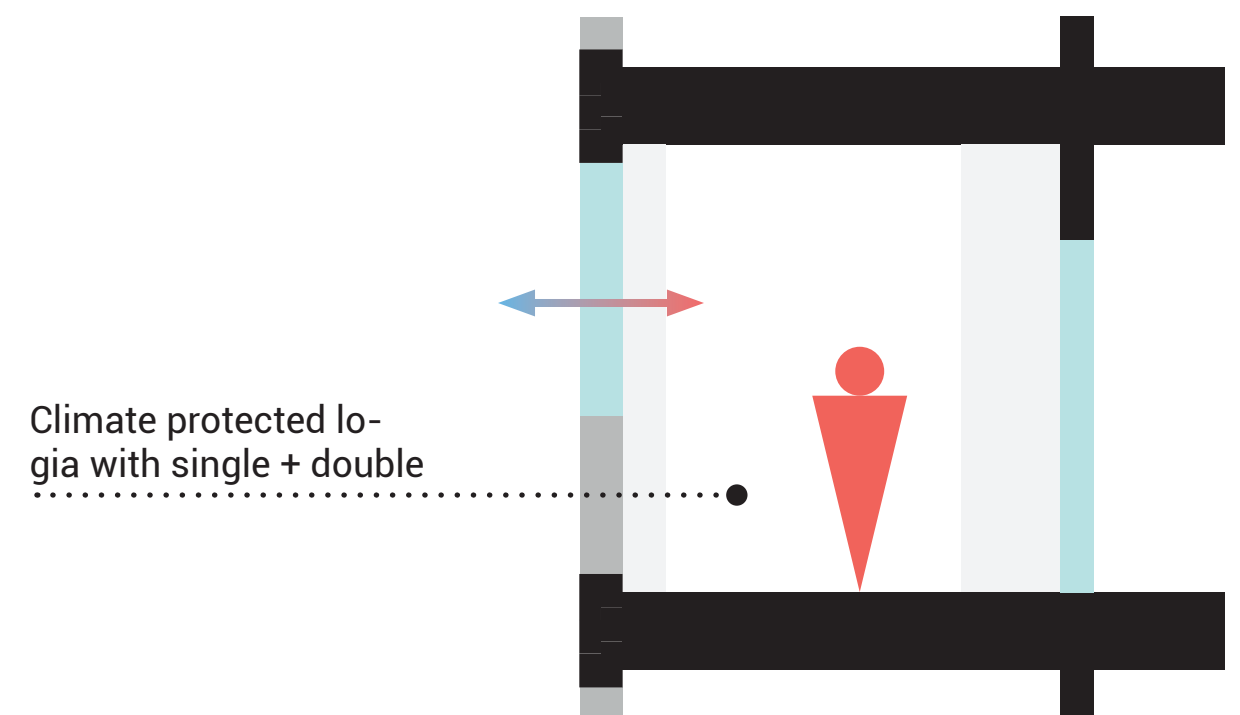
SUMMER



SPRING

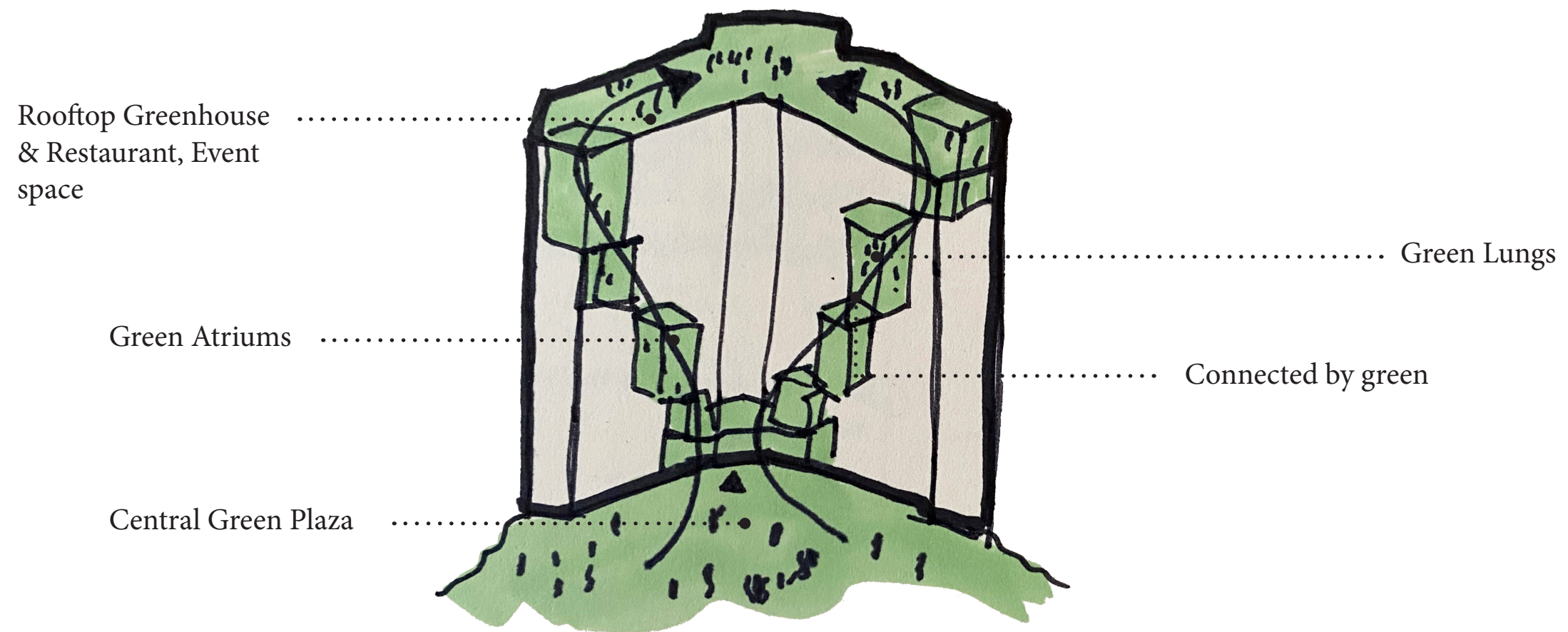


AUTUMN



STRUCTURE (STRUCTUUR)

SOCIAL & GREEN INTEGRATION



Fully covered access to All facilities
in plinth from the main entrance

RESTAURANT WITH TERRACE

Upper street for Transporting
Facade elements

- Fountain to prevent algae growth



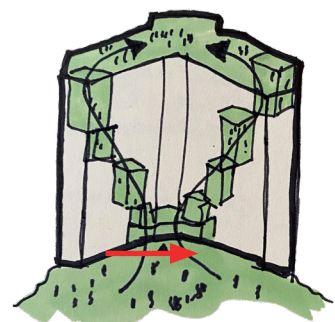
LUNCH ROOM WITH TERRACE

- & Bakery in plinth
- Also in plinth building: Grocery store & Daycare

Green columns & Borstwering to
increase biodiversity. Max. 15m

Water

- Fountain to prevent algae growth

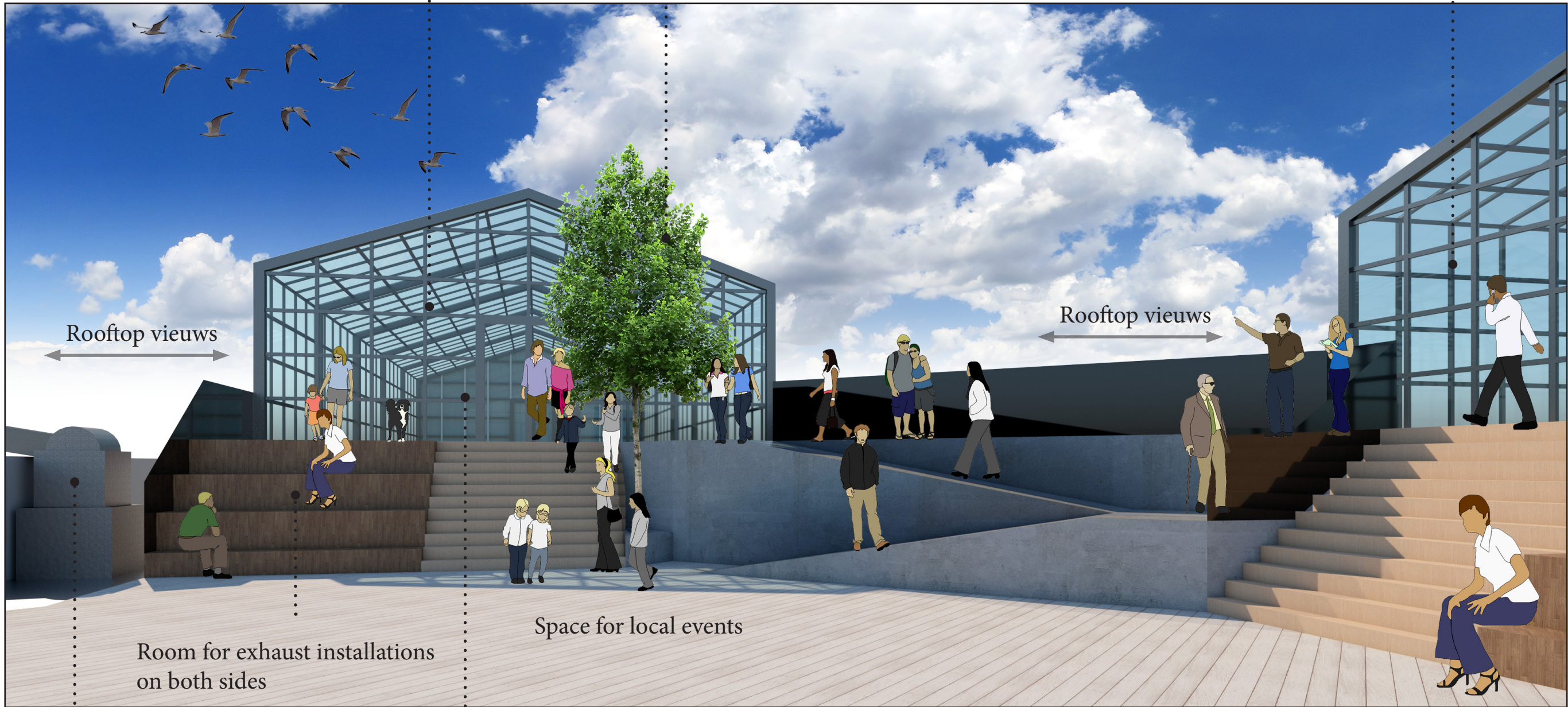


LOCAL FOOD PRODUCTION

- Contribute to local economy
- Learning about food production
- Reuse of CO2 from the building

PV For solar energy production

Lightweight stainless steel construction



Rooftop views

Rooftop views

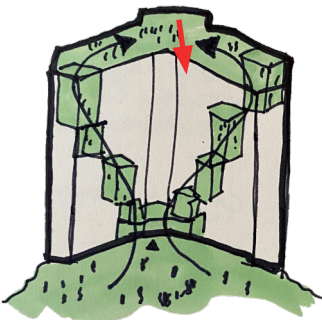
Room for exhaust installations on both sides

Space for local events

Crane for facade elements

- Strengthening existing window cleaning system

ROOFTOP RESTAURANT



CHALLENGES & CONCLUSIONS

Connections that are demountable & at the same time allow for many user options

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Demountability does not says everything

CHALLENGES & CONCLUSIONS

Connections that are demountable & at the same time allow for many user options

Demountability does not says everything

Demountability adds a lot more complexity

ACKNOWLEDGMENT



THANK YOU

THEMATIC

DESIGN QUESTION

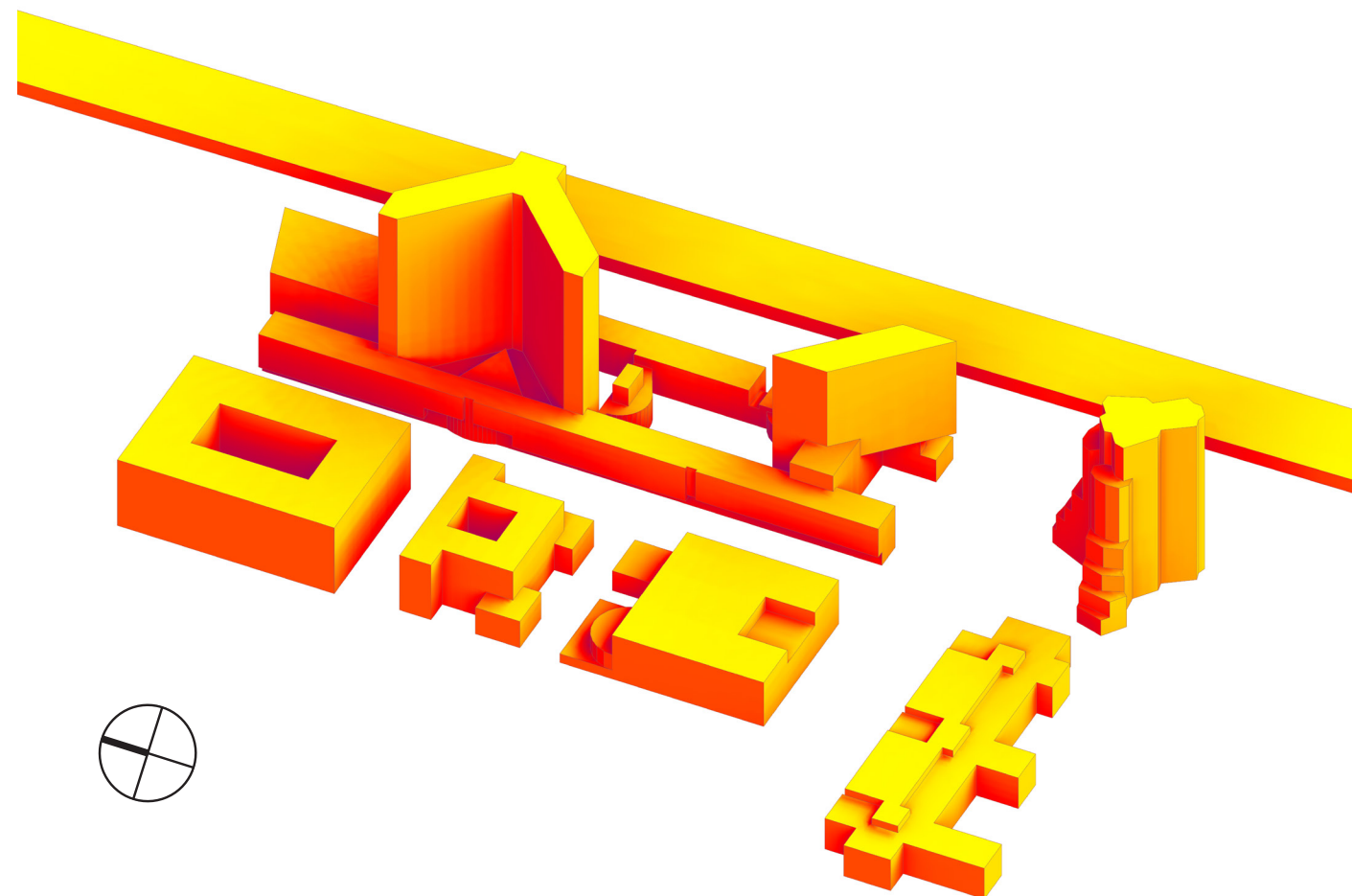
How to transform the building De Knip in Amsterdam Sloterdijk in a residential, adaptable live environment?

SOLAR ANALYSIS

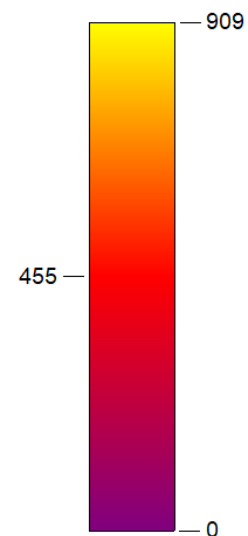
Average daylight exposure to sunlight per facade:

NO	ZO	ZW	NW
2.5h	7h	2.5h	5.3h

- The upper left diagonal of the North West facade has better texposure t o sunlight than the lower right part.
- The Roof of the main building is fully exposed to sunlight.
- The lowrise parts of the building vary.
- The courtyards around the main building get almost zero sunlight exposure
- South East and Norht West facade get the most sunlight exposure, 7 and 5.3 hours repectively.

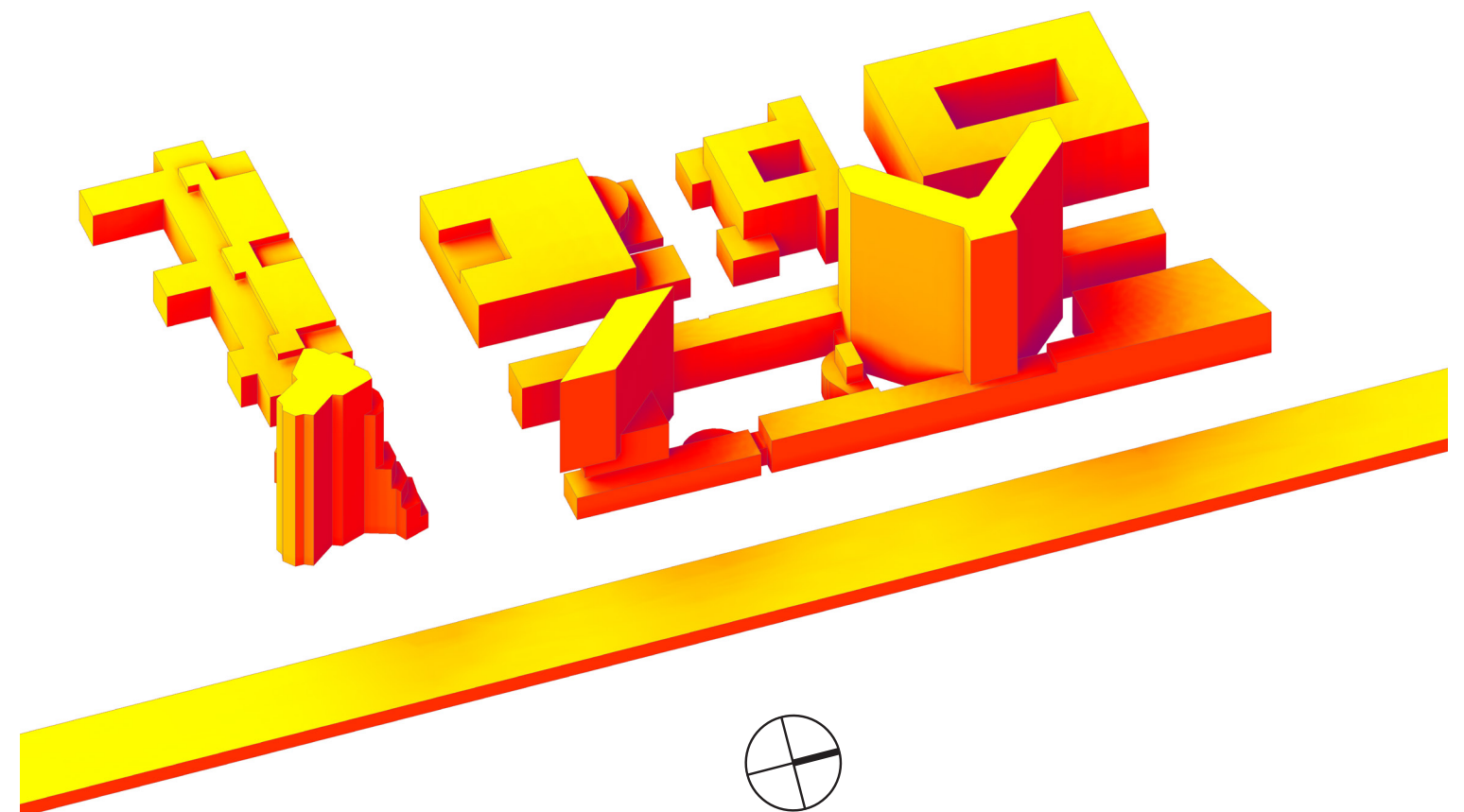


Custom Solar (kWh/m²)



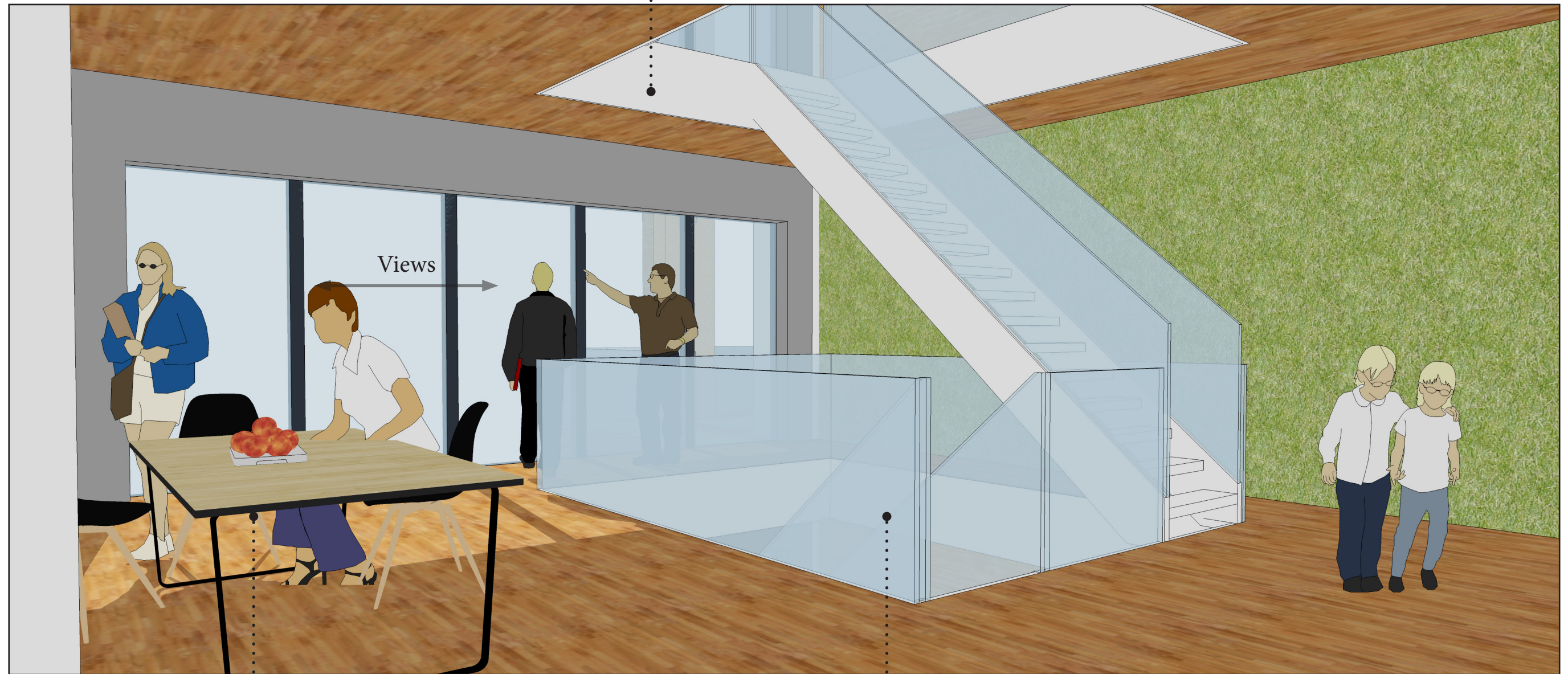
Project location: 52.3870239257813,4.84368276596069
 Sun study start date time: 1-1-2010 00:00:00
 Sun study end date time: 31-12-2010 23:59:00

Cumulative Insolation



Atrium

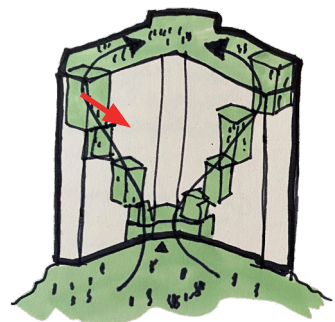
- Vertically connection dwellings
- Spatially high quality space
- The green plants serve a cleaning and moisturizing purpose as well as reducing the CO2 concentration of the incoming air in the building

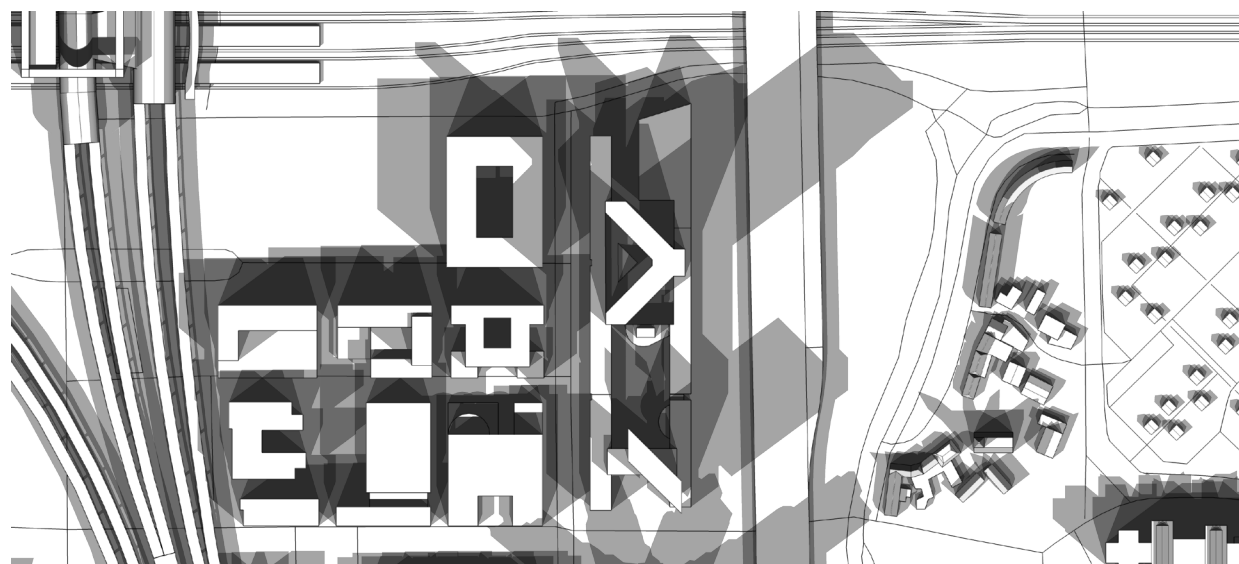


Atrium

- Space for socializing & social coherence between residents

- Glass for maximum openness off the space





21 MARCH

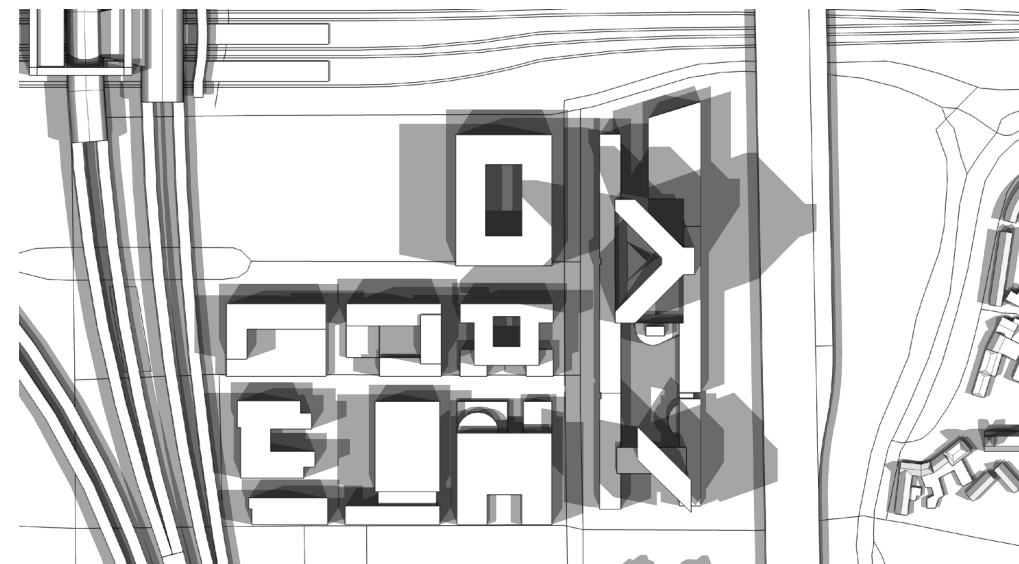
NO	ZO	ZW	NW
3h	8h	3h	5h



Most of the day the Kingsfordweg is covered in shadow. The inner courtyards are half exposed to sunlight during the midday. Especially the west and north facade are covered in shadow.

Day Length: 12:15 Hrs

Rise/Set: 06:40/18:55



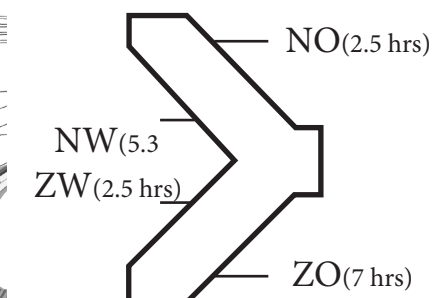
21 JUNE

NO	ZO	ZW	NW
5h	7h	5h	8h

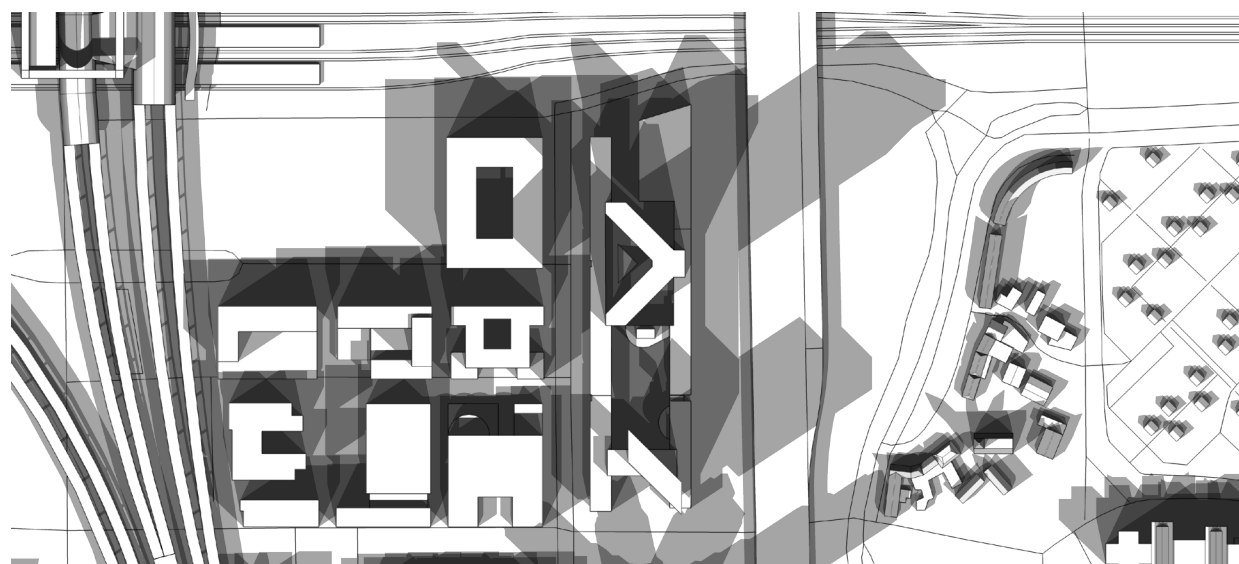
Most exposed façades to sunlight radiation are: the north facade. The Kingsfordweg and inner courtyards are free of shadow during the midday.

Day Length: 16:01 Hrs

Rise/Set: 05:45/21:46



Facades of the main building. (NO = North east, etc.) The exposure to direct sunlight (hrs.) is indicated in the tables for each season.



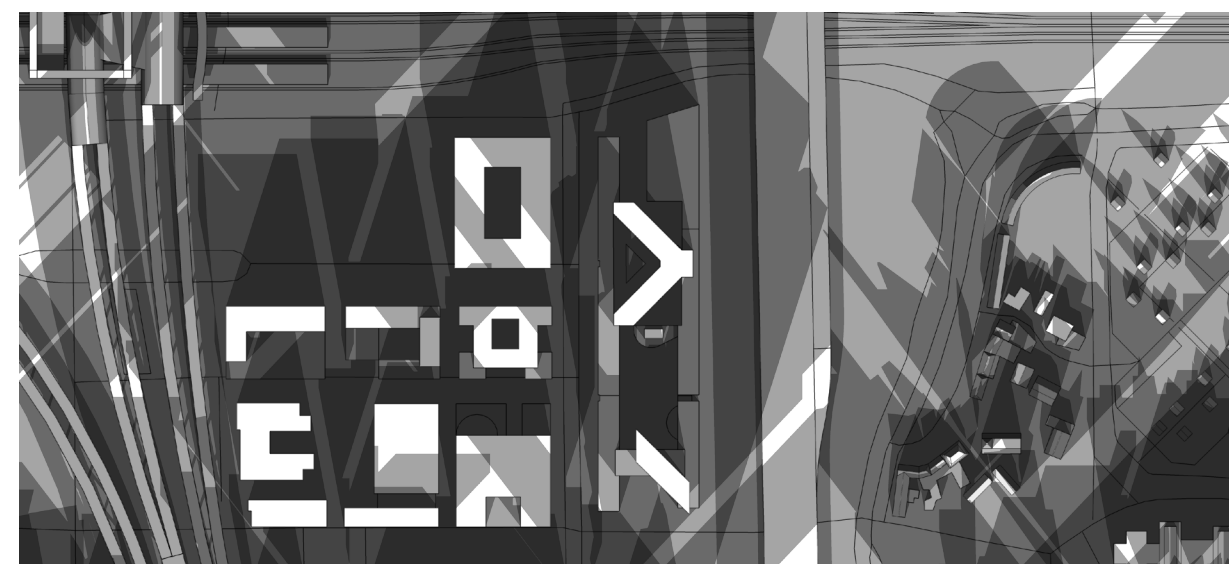
21 SEPTEMBER

NO	ZO	ZW	NW
2h	7h	2h	5h

Most exposed façades to sunlight radiation are: West and North.

Day Length: 12:16 Hrs

Rise/Set: 07:24/19:40



21 DECEMBER

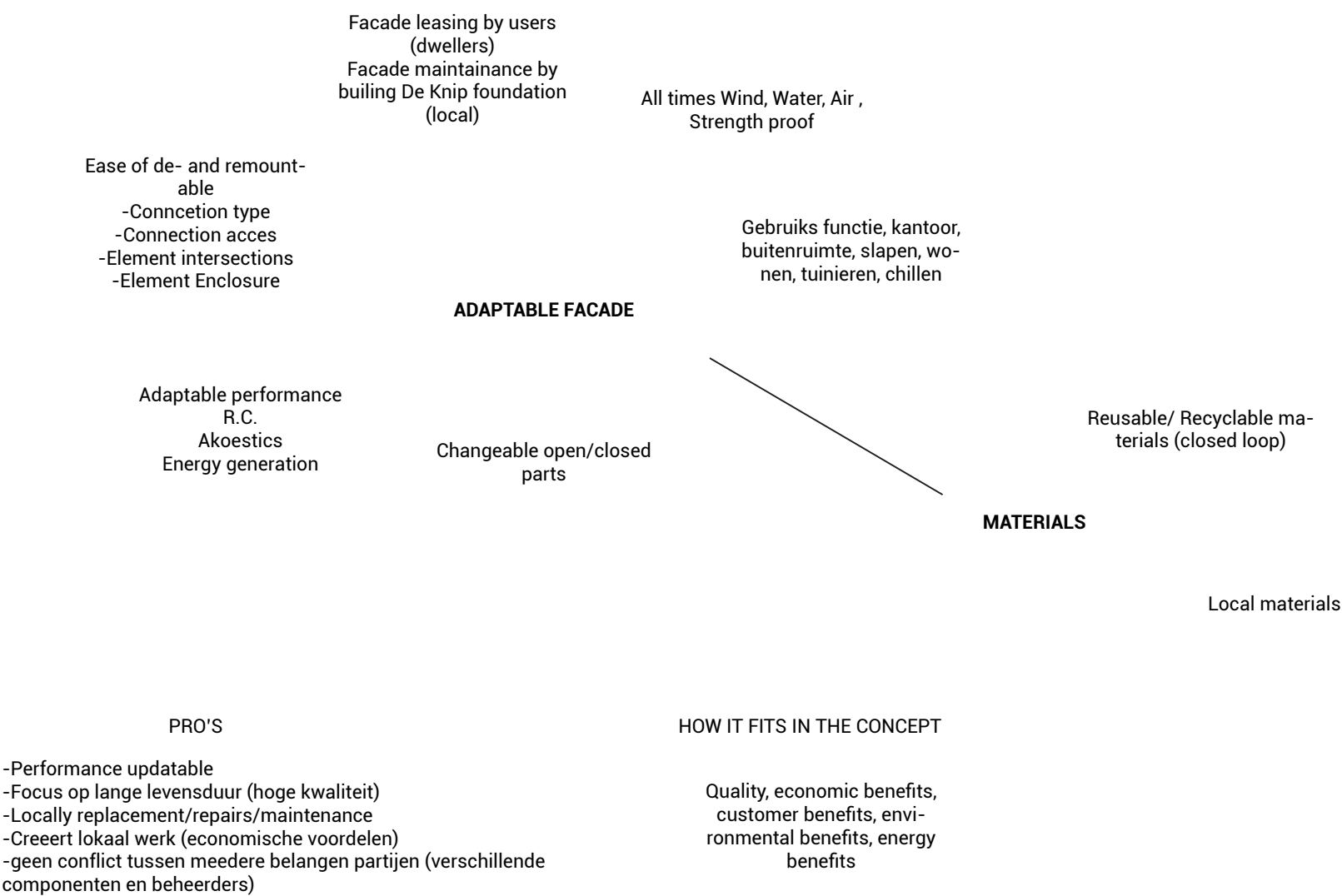
NO	ZO	ZW	NW
0h	6h	0h	3h

Lots of shadow during the day on all facades and inner courtyards.

Day Length: 07:43 Hrs

Rise/Set: 08:46/16:29

ADAPTABLE FACADE



BONUS SLIDES

HARVEST COMPONENTS

Natural stone column cladding

- Main material: Nero Impala Granite Polished
- Weight of element:

D3.05 Natural stone cladding 30mm

- Main material: Nero Impala Granite Polished
- Weight of element:

Fixed dubbel glazed window-

- Main material:
- Weight of element:

Low rise & High rise

Natural stone column cladding 30mm

- Main material: Nero Impala Granite Polished
- Weight of element:

2mm Alum. Cassette cladding

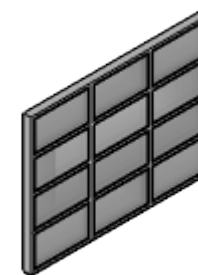
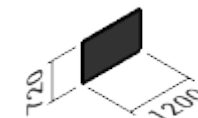
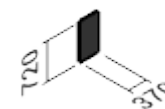
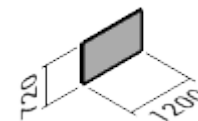
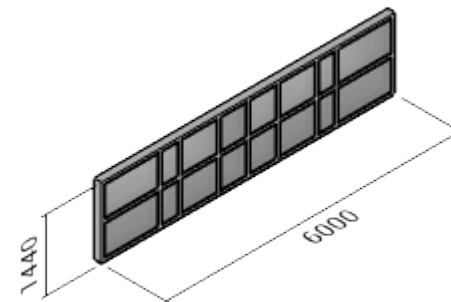
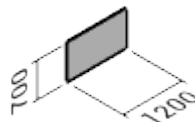
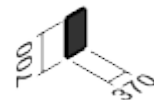
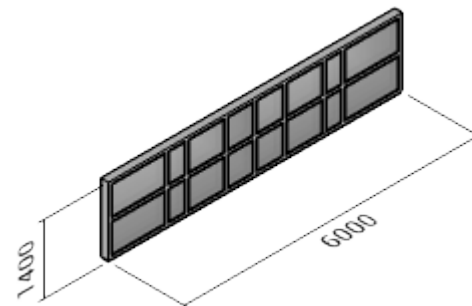
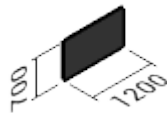
- Main material:
- Weight of element:

High rise

Insulation 80mm

- Main material:
- Weight of element:

Low rise & High rise



D25.03 Fixed dubbel glazed window-

- Main material:
- Weight of element:

High rise

D25.05 2mm Alum. Cassette cladding

- Main material:
- Weight of element:

High rise

Natural stone column cladding 30mm

- Main material: Nero Impala Granite Polished
- Weight of element:

D33.03 Natural stone column cladding

- Main material: Nero Impala Granite Polished
- Weight of element:

Additional Dubbel glazed windowframe

- Main material:
- Weight of element:

Low rise & High rise

2441m2 Glass

BONUS SLIDES

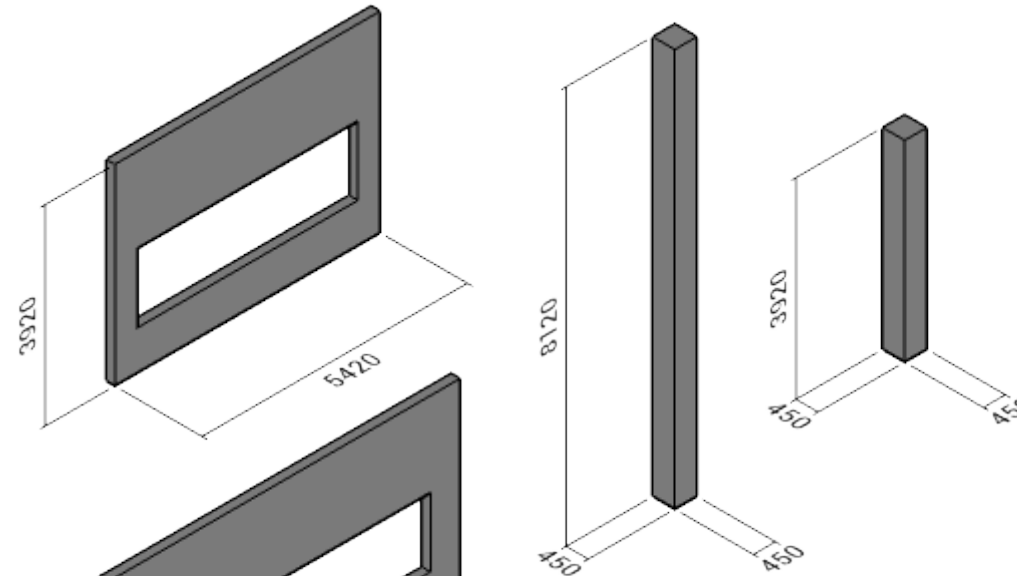
HARVEST COMPONENTS

D3.01b Prefab facade element

- Main material: Concrete
- Weight of element: 6700kg

Low rise

17pts.

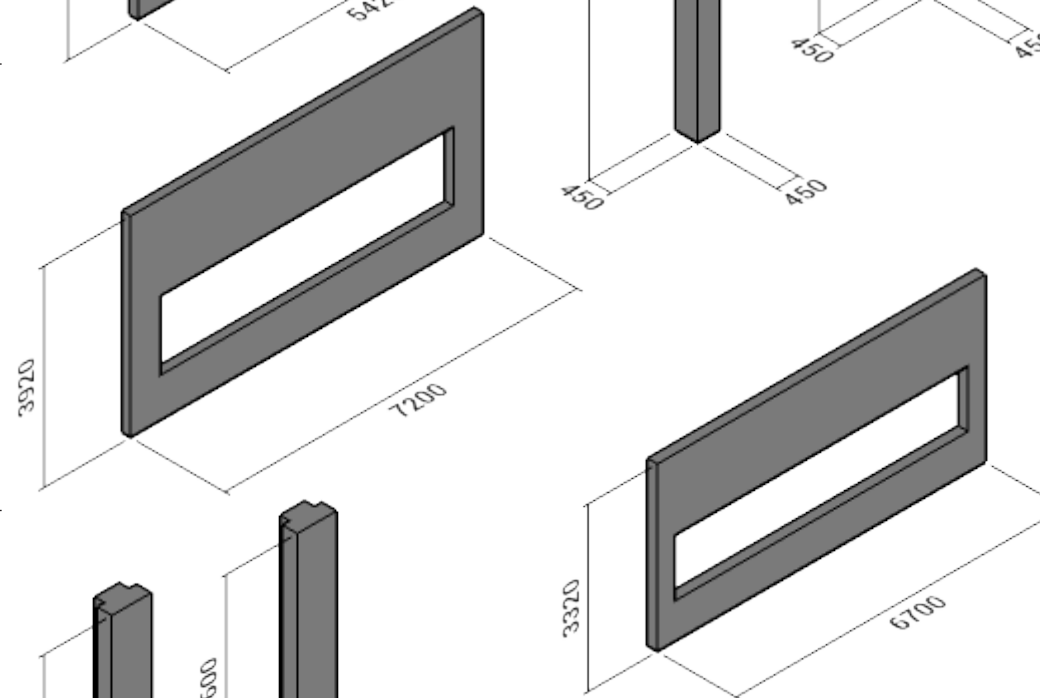


D3.01 Prefab facade element

- Main material: Concrete
- Weight of element: 8920kg

Low rise

149pts.



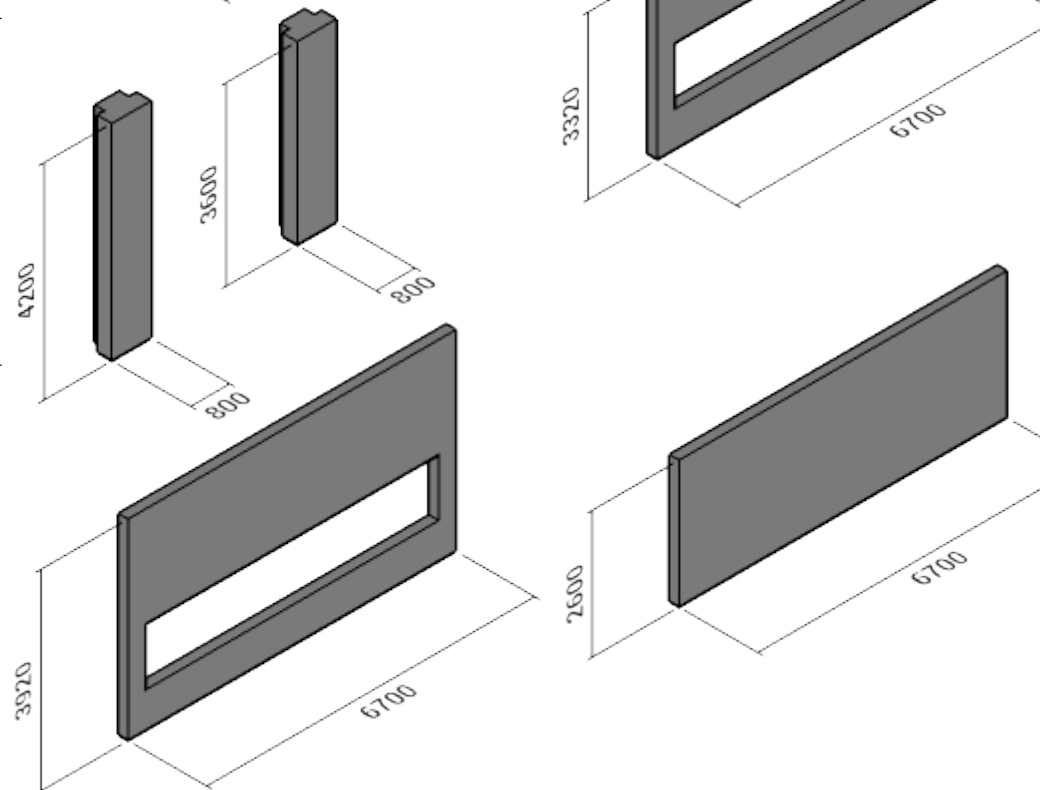
D33.01 & Prefab concrete column

- Main material: Concrete
- Weight of element: (l) 3570kg (r) 3060kg

High rise

96pts.

364pts.

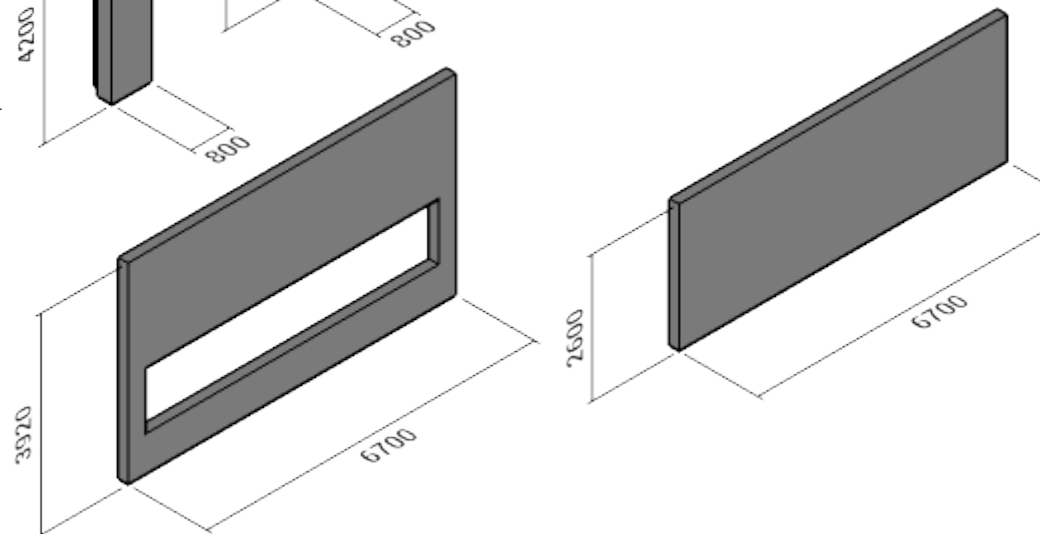


Prefab facade element

- Main material: Concrete
- Weight of element: 9650kg

High rise

60pts.



Prefab concrete column

- Main material: Concrete
- Weight of element: (l) 4110kg (r) 1985kg

Low rise

10pts.

8pts.

D25.01 Prefab facade element

- Main material: Concrete
- Weight of element: 7640kg

High rise

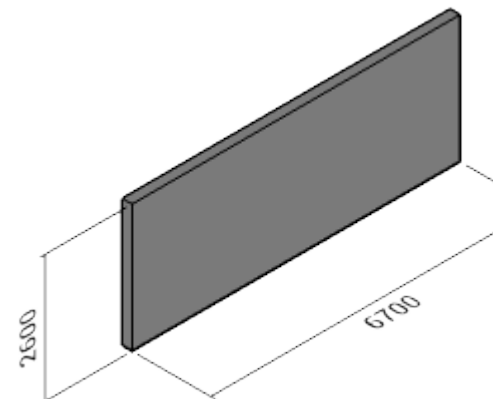
317pts.

Prefab facade element

- Main material: Concrete
- Weight of element: 8710kg

High rise

20pts.



requirements for animals

