

KAIZEN TOWER

IMPROVING THROUGH CHANGE

ADAPTABLE, SOCIAL & GREEN

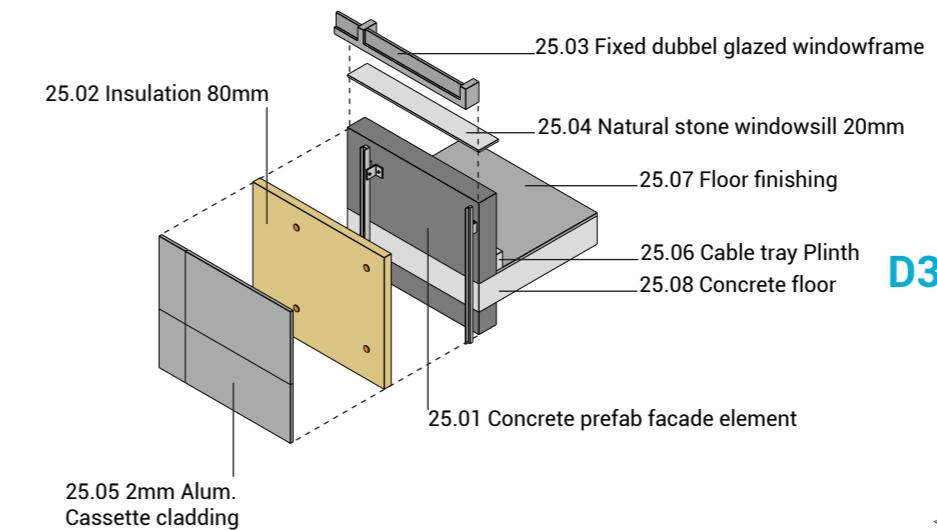
NOW
OFFICE

FUTURE
MIX- USE RESIDENTIAL

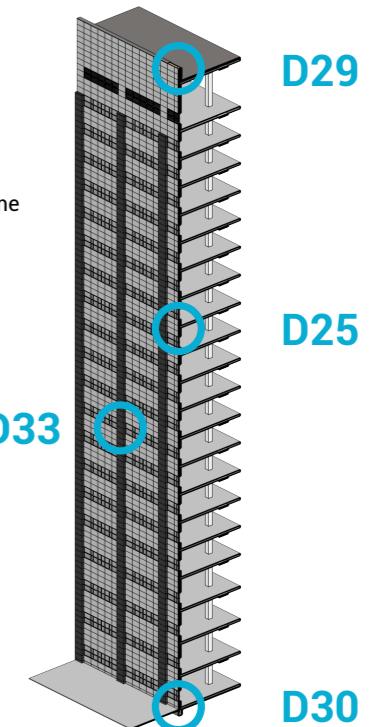


ADAPTABILITY DEMOUNTABILITY

In existing office building connections
High rise



D25



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RESEARCH

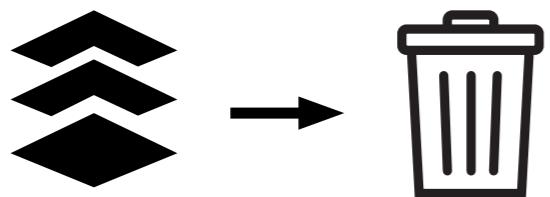
Demountability
Definitions

DESIGN

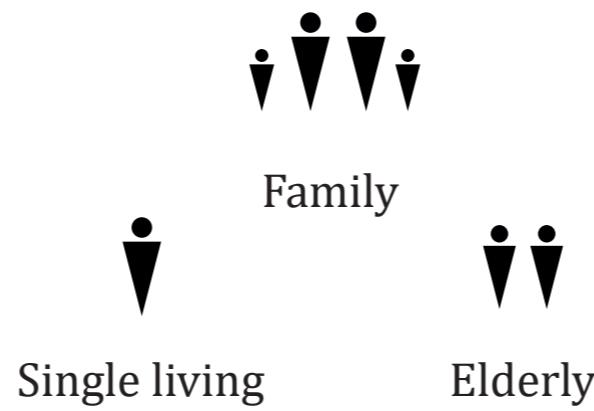
Structure
Facade
Detailing & Climate
Social integration

INTRODUCTION

WHY ADAPTABILITY? PROBLEM STATEMENT



Singular use of building materials



Changing life style demands

Between 2020-2030 845.000
Dwellings are needed

BY 2035

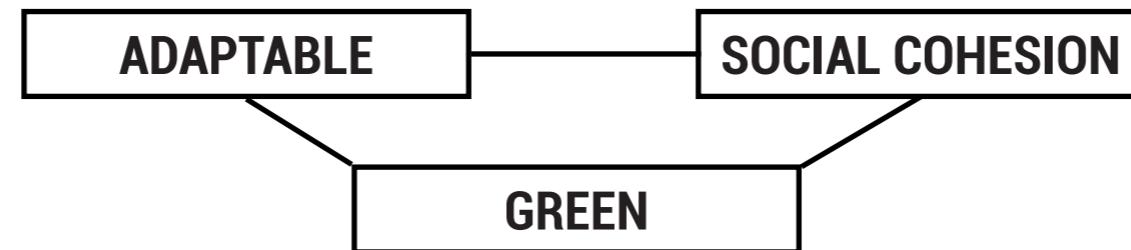


18.8M Residents in
the Netherlands

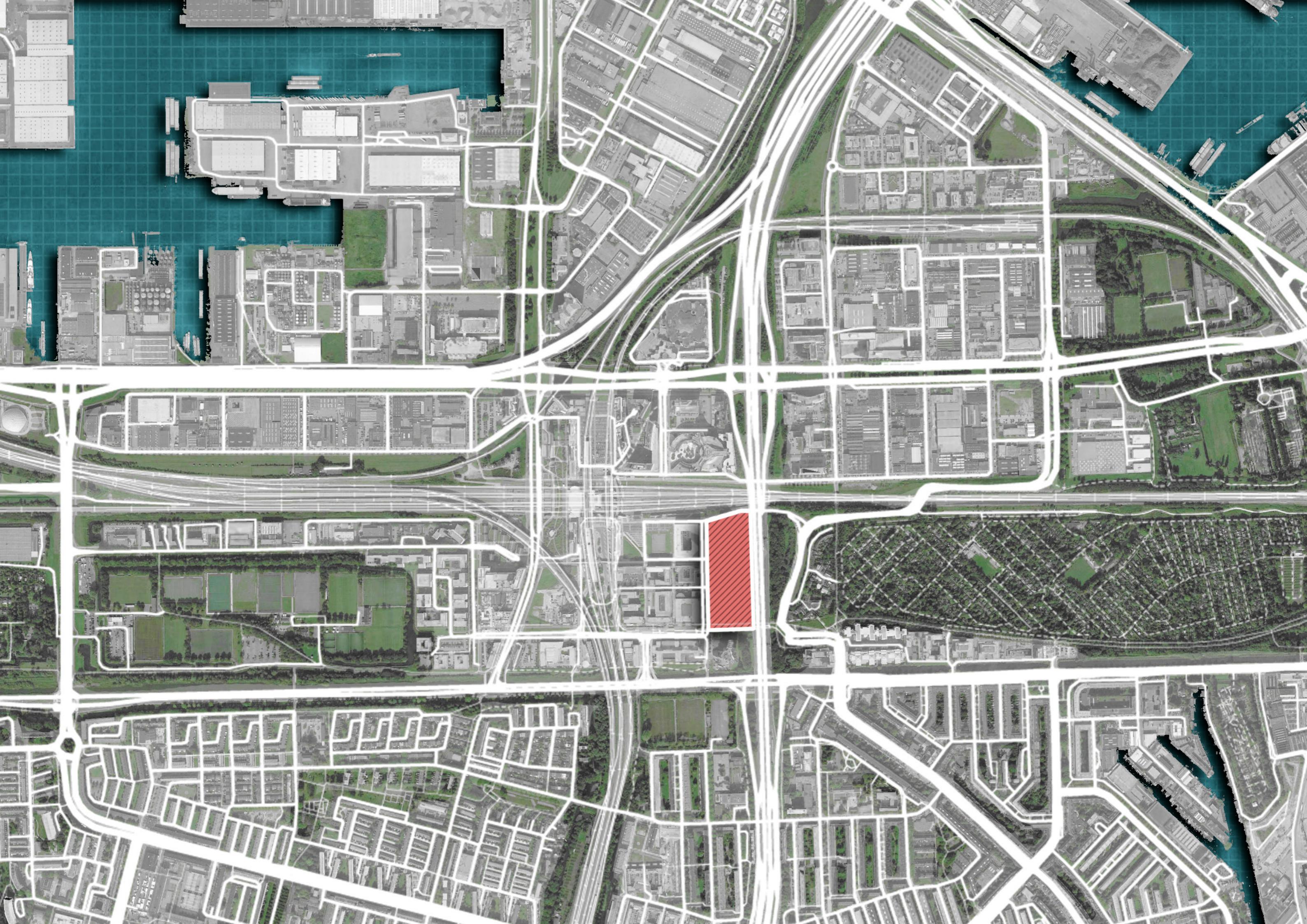
VISION

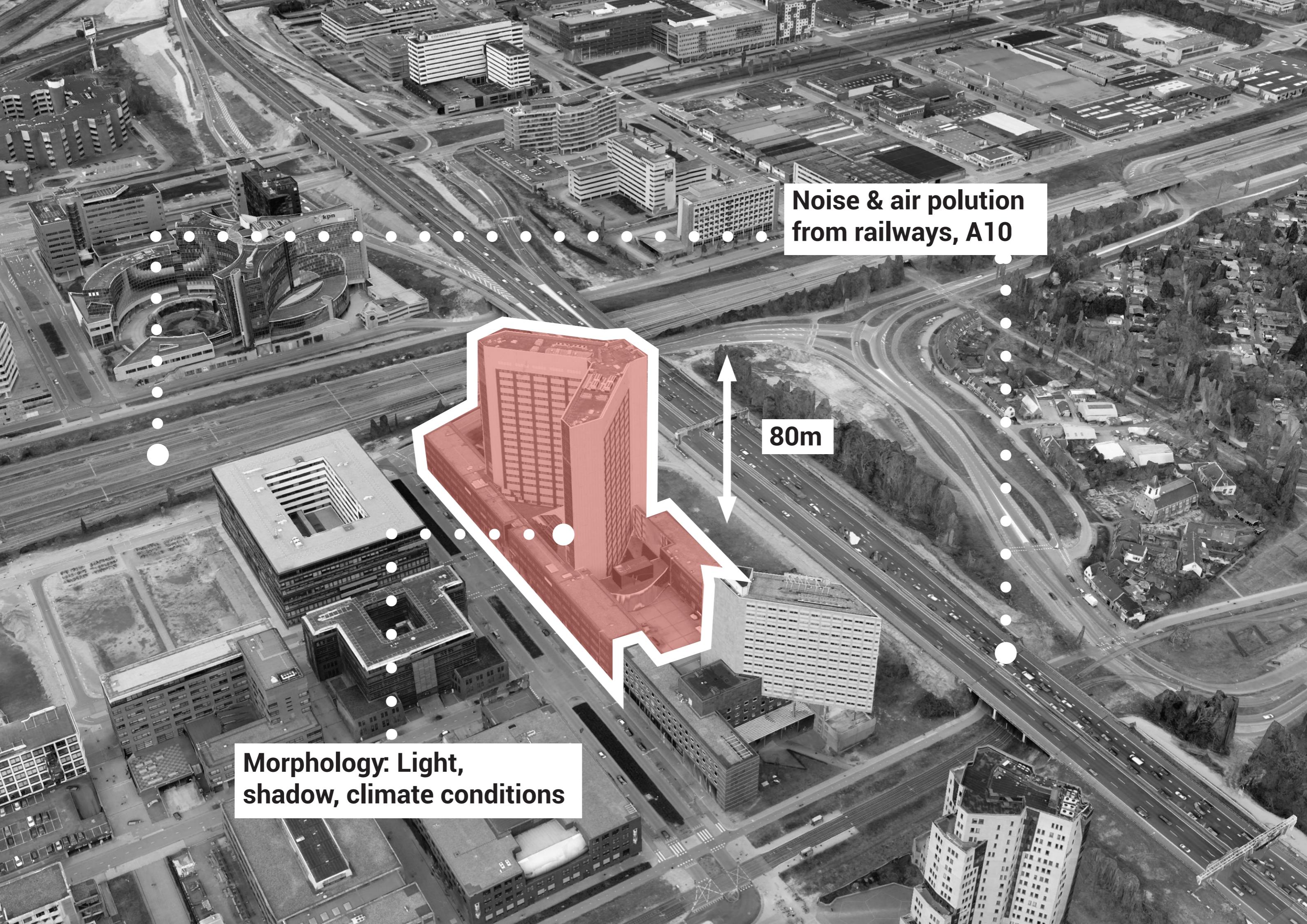
DESIGN FOR CHANGE

VERTICAL VILLAGE



What building structure (structuur) enables this concept?

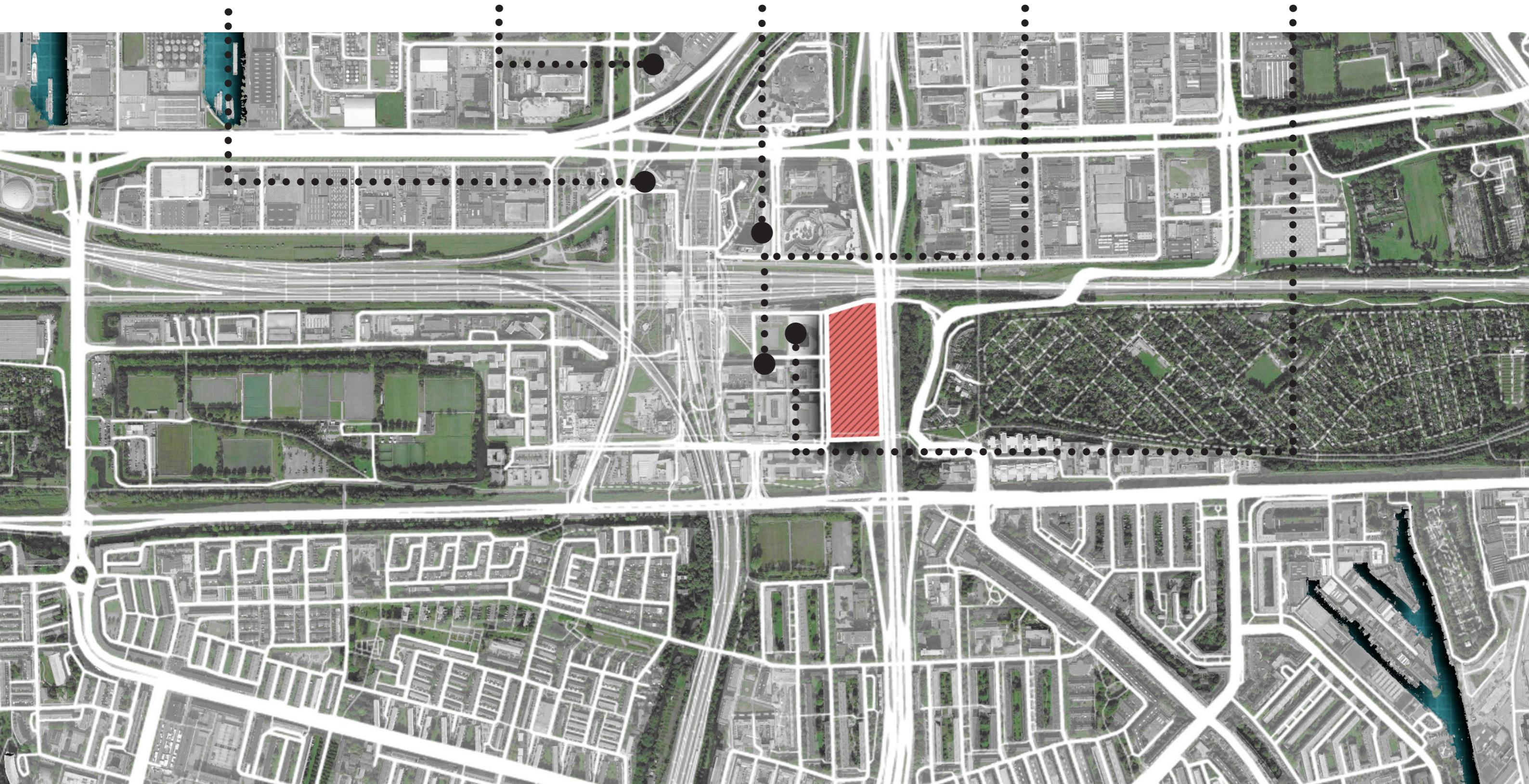


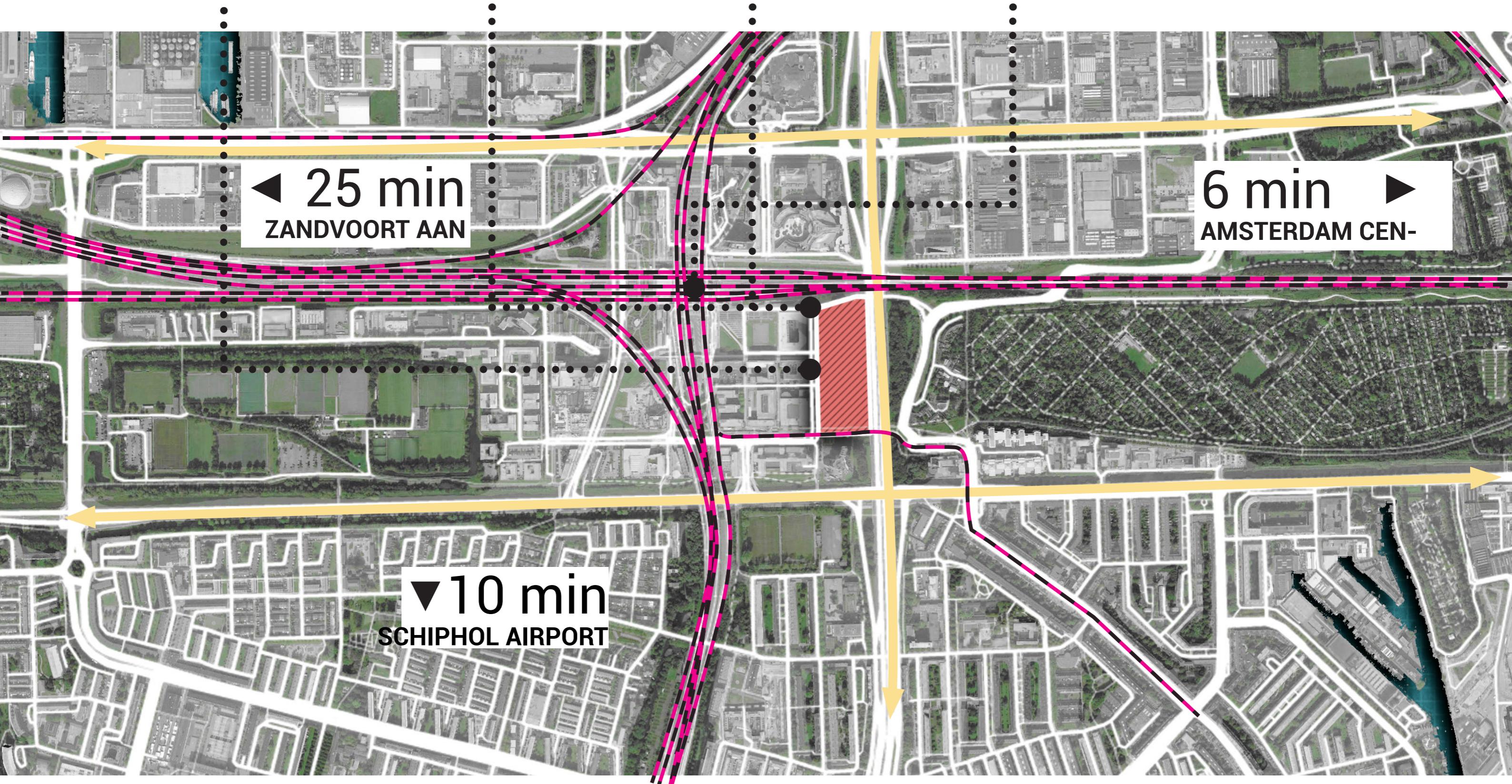


Noise & air pollution
from railways, A10

80m

Morphology: Light,
shadow, climate conditions





VISION

MUNICIPALITY



Static & Monofunctional office area

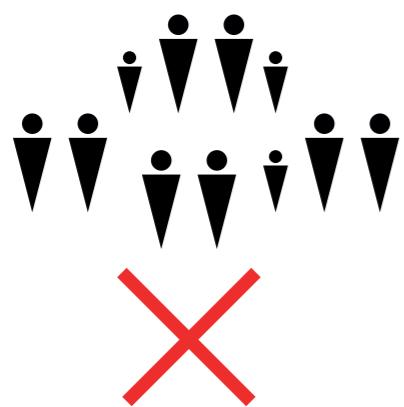


Mix use residential & work environment

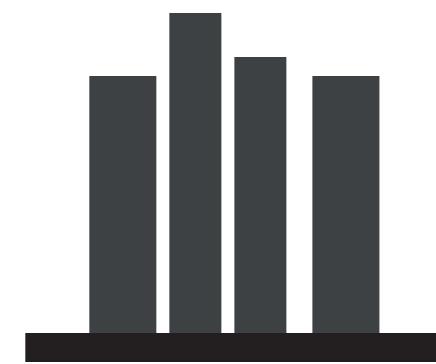


CONTEXT

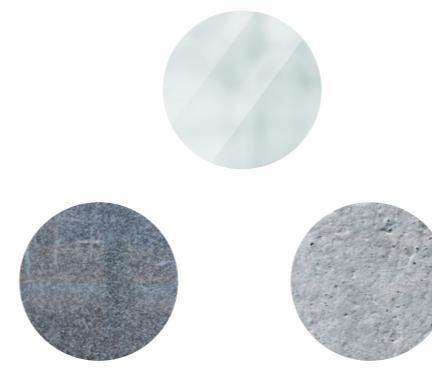
PROBLEMS



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 Schimidt III, 2016)

THEMATIC

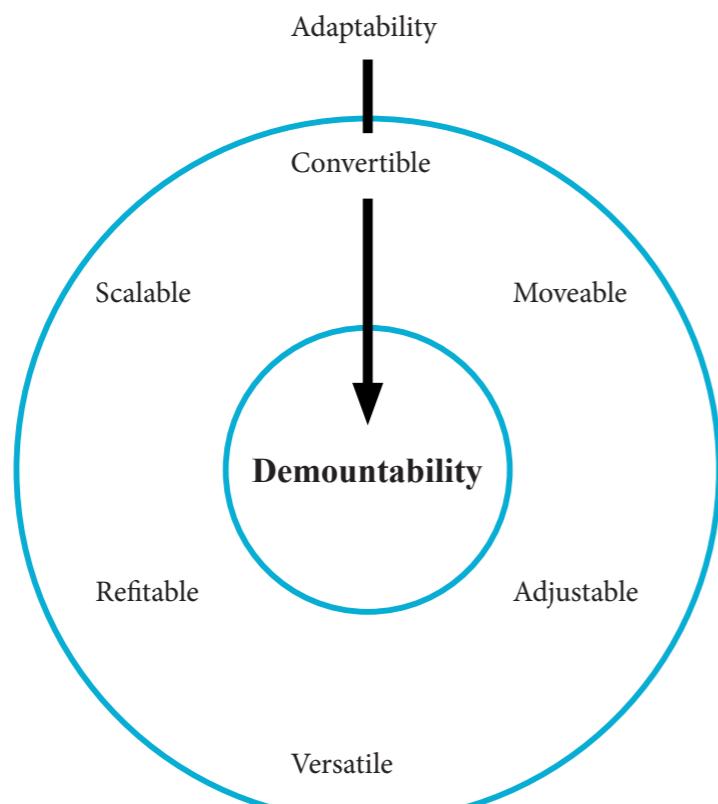
RESEARCH QUESTION

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

<i>Lev- el</i>	<i>Source</i>	<i>Adopted Definition</i>	<i>Example Descrip- tion</i>
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

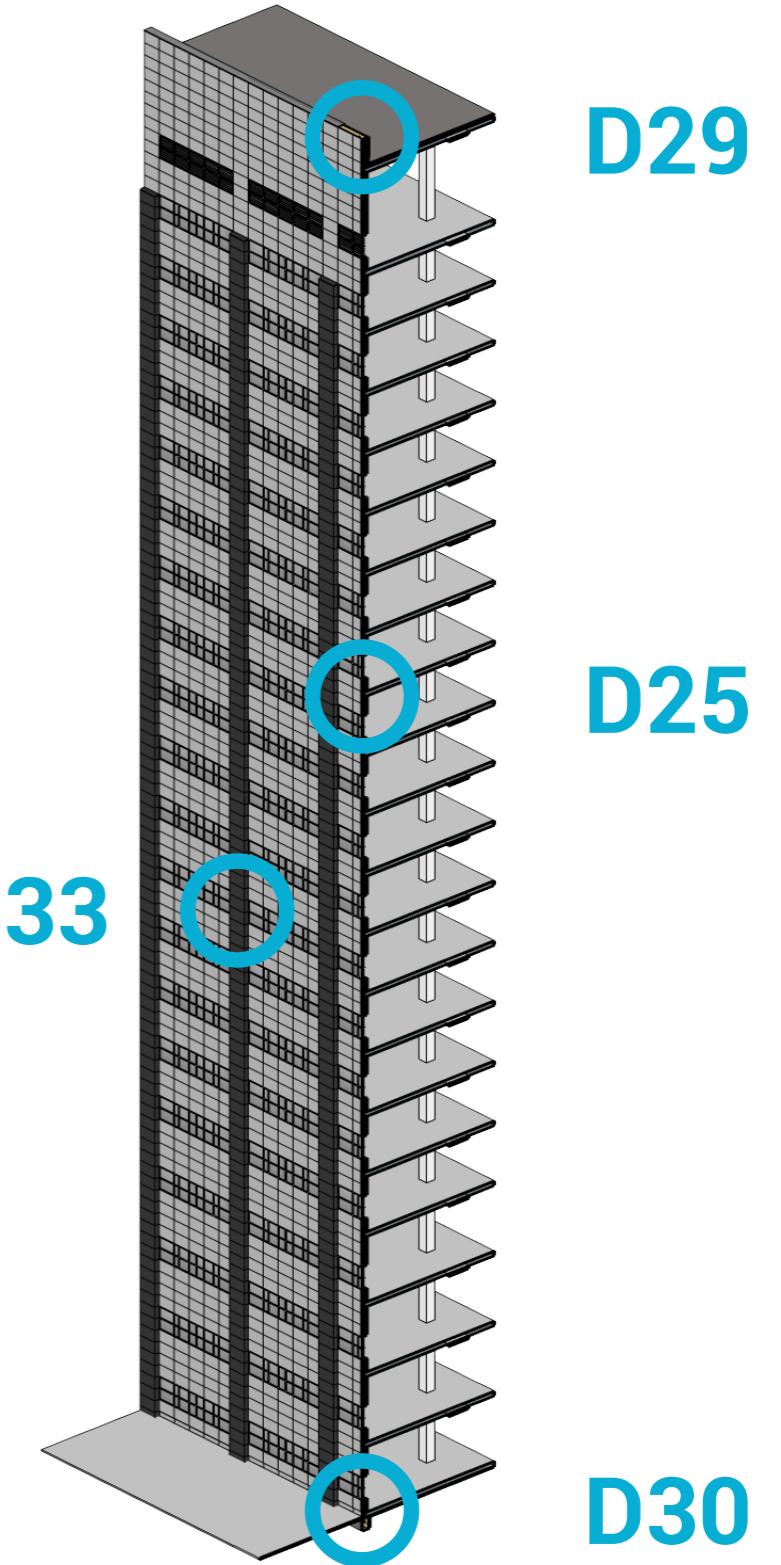
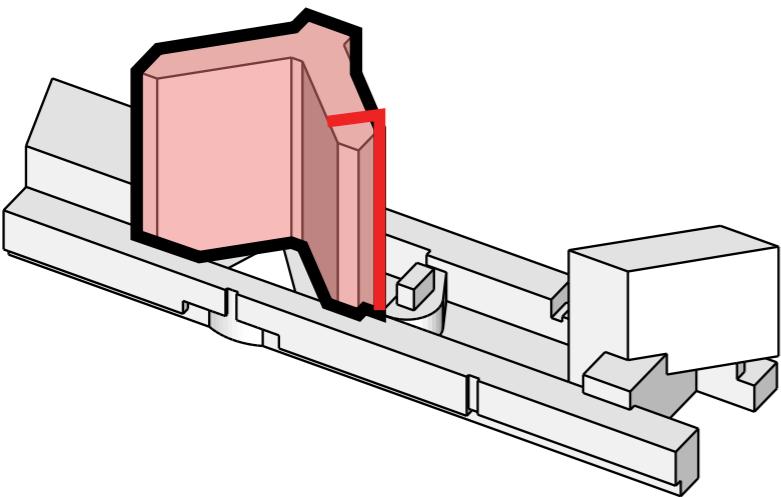
Building levels - measure 'depth'

ADAPTABILITY

DEMOUNTABILITY

In existing office building connections

High rise

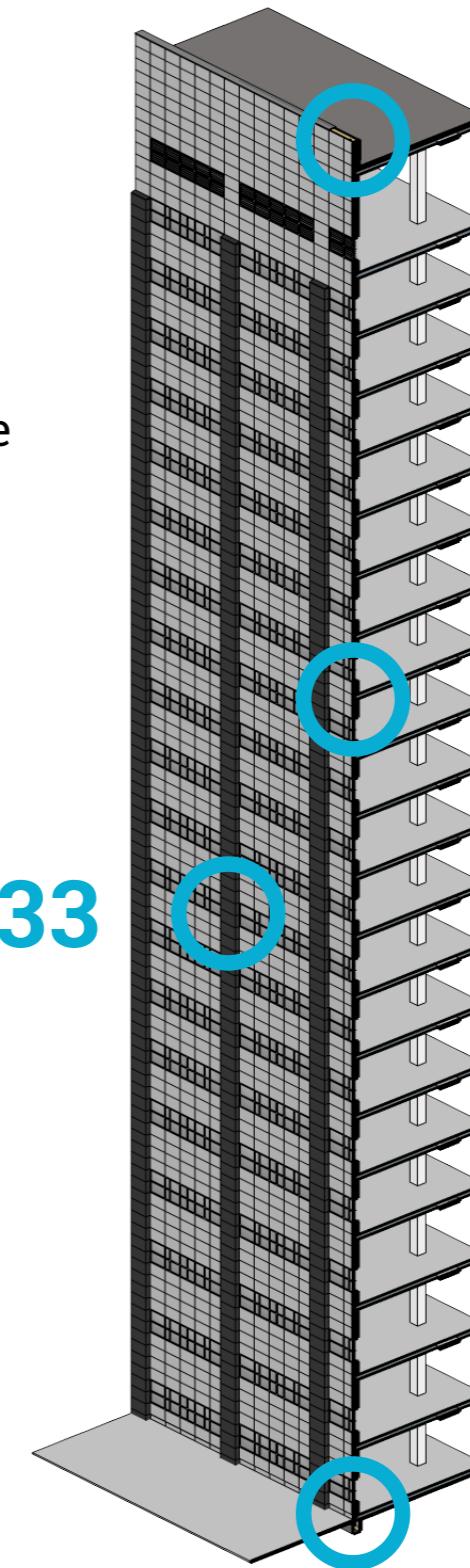
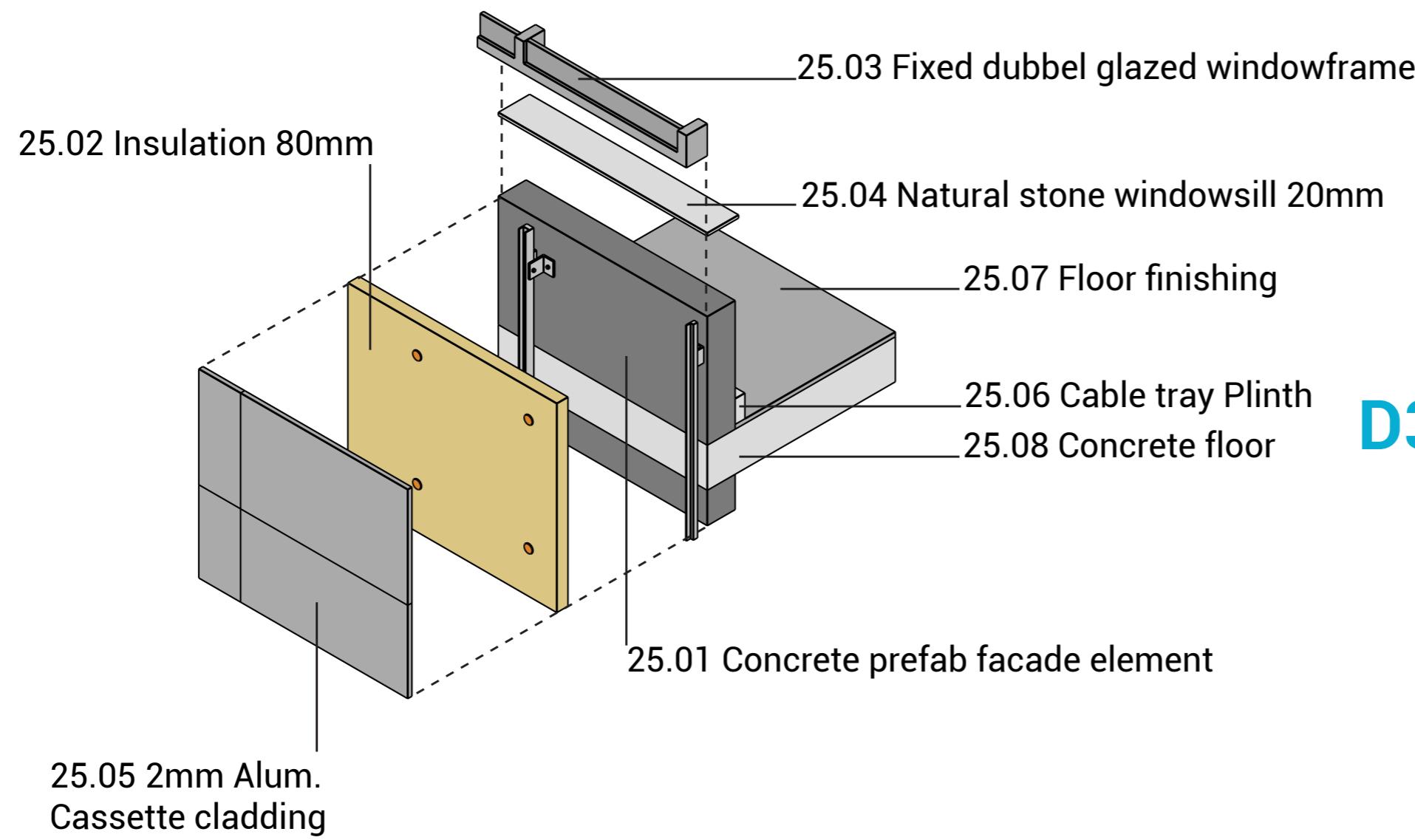


ADAPTABILITY

DEMOUNTABILITY

In existing office building connections

High rise



D25

D29

D25

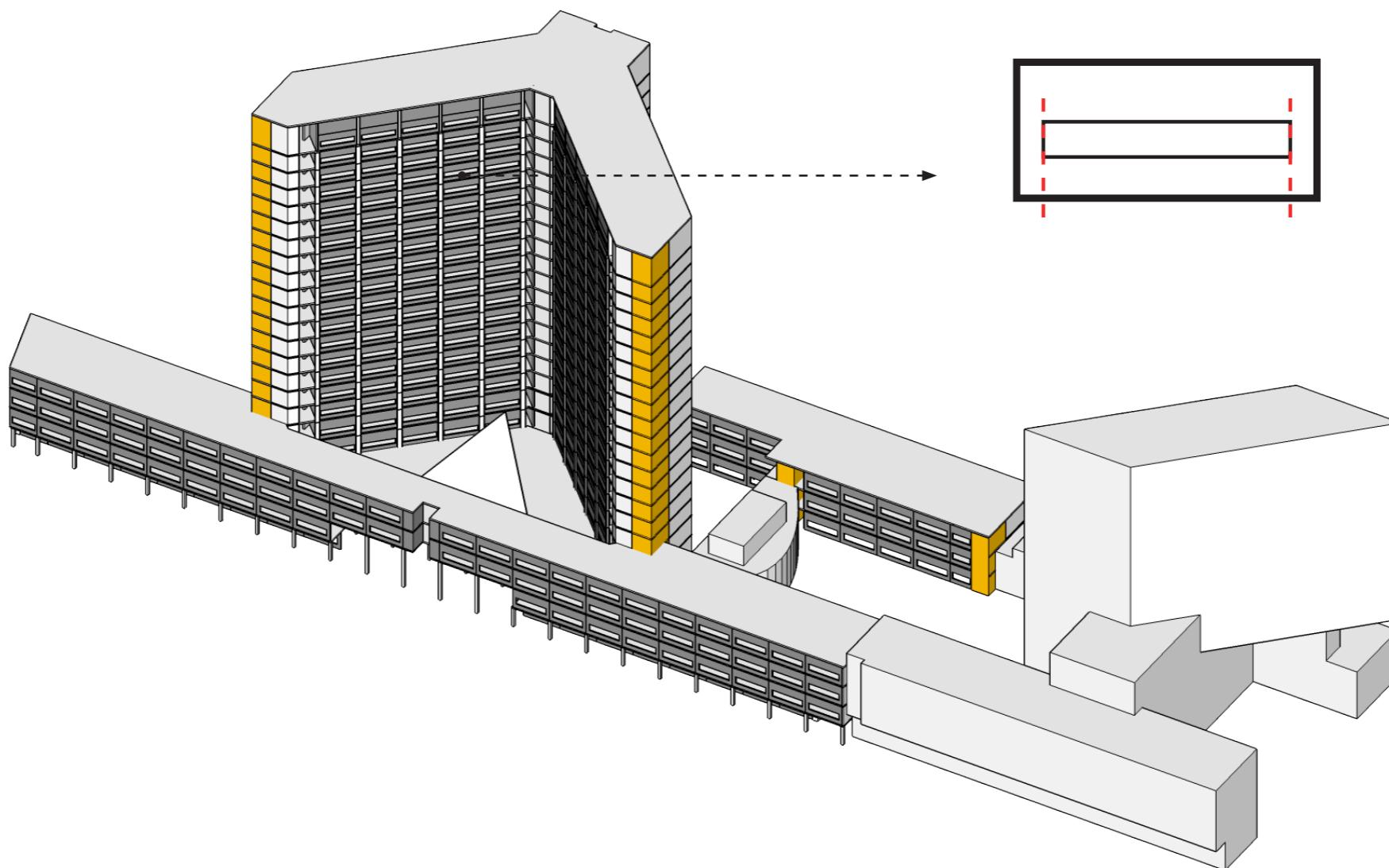
D33

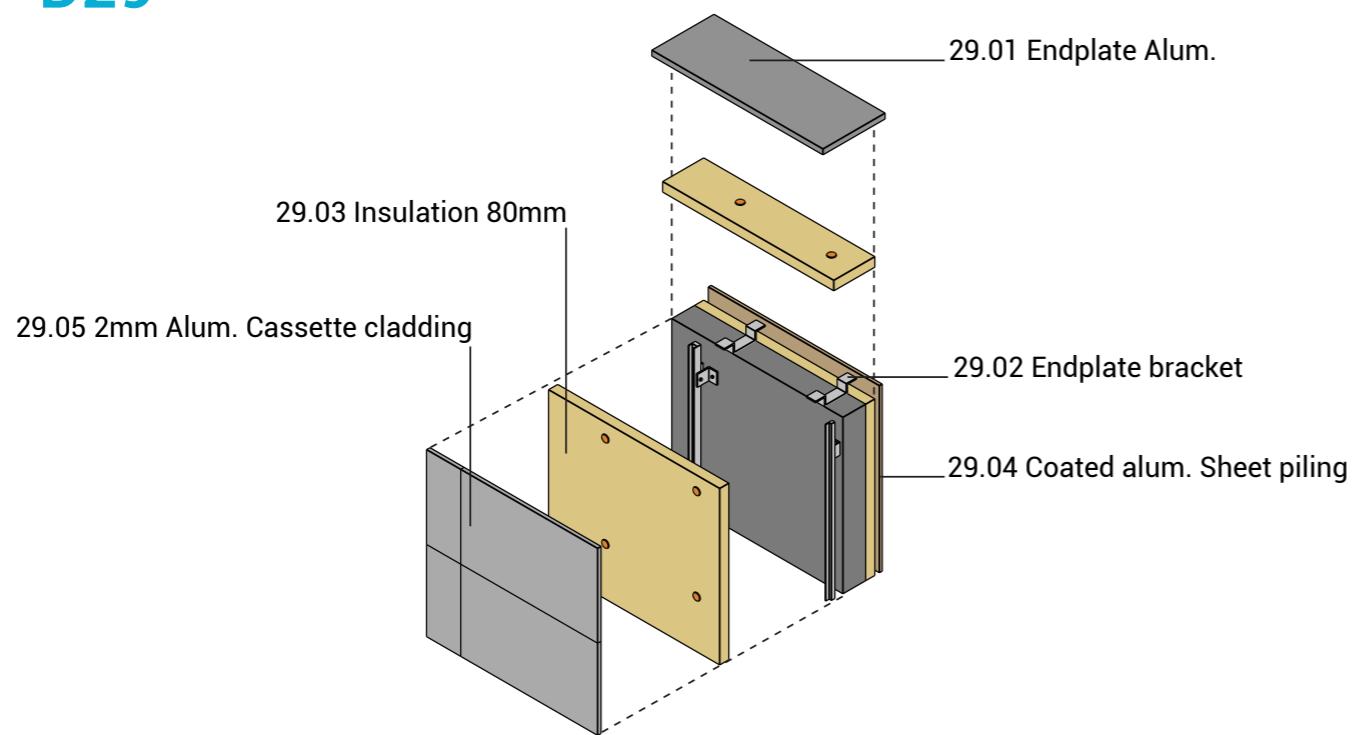
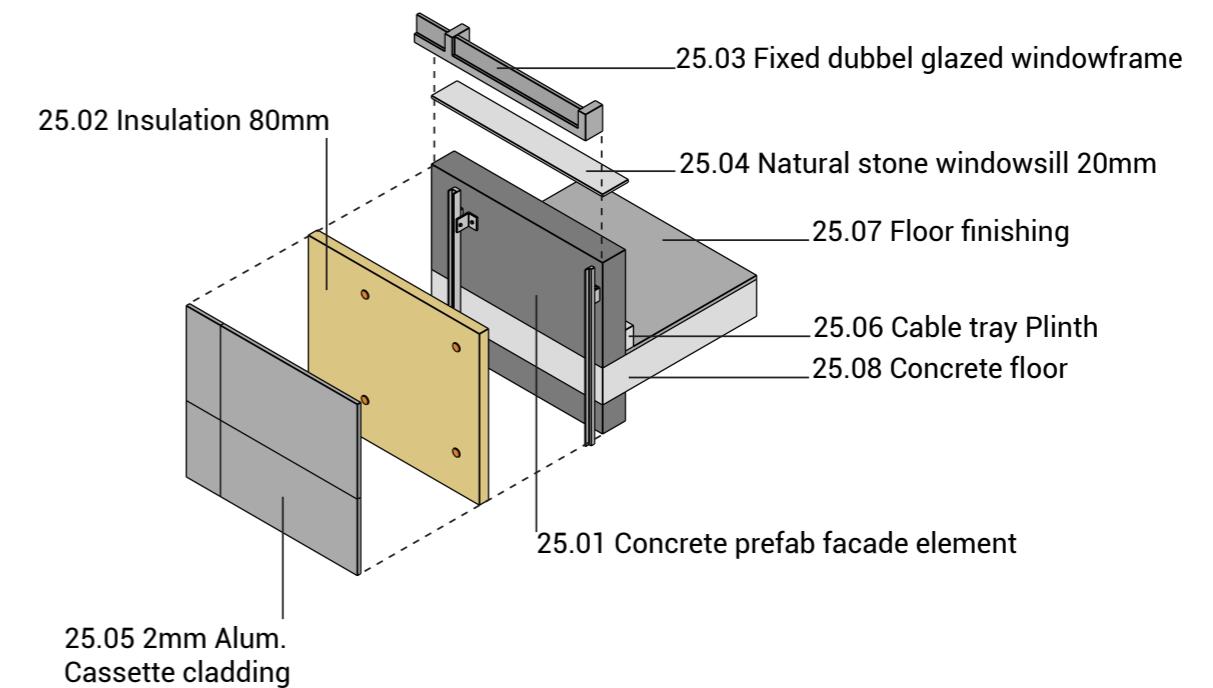
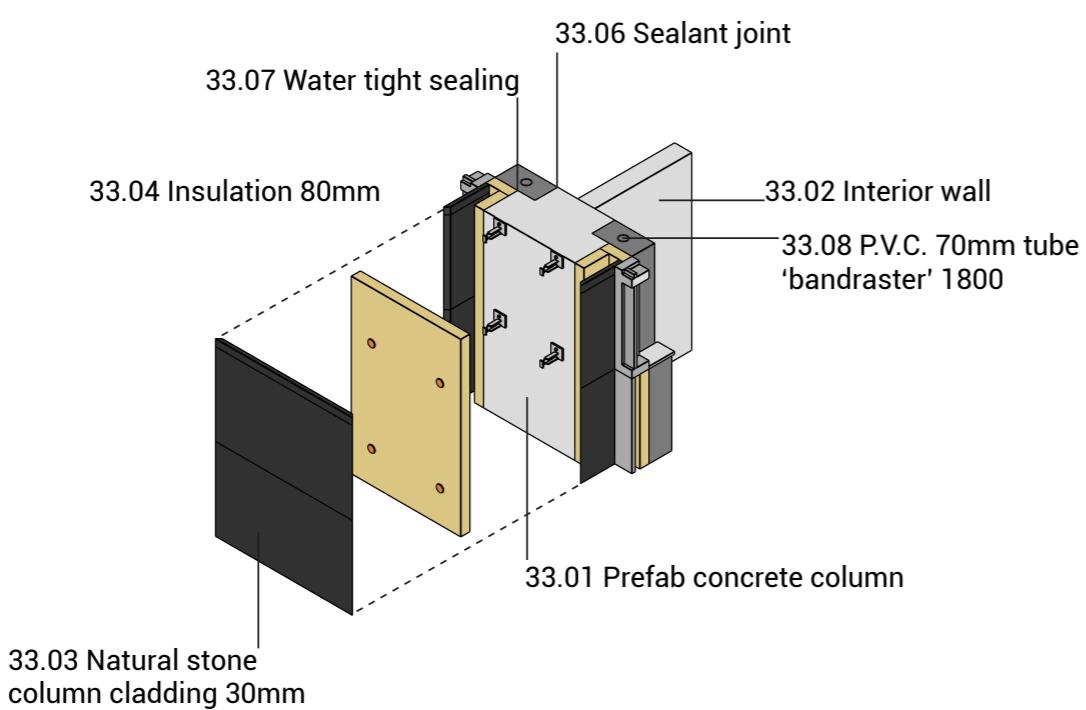
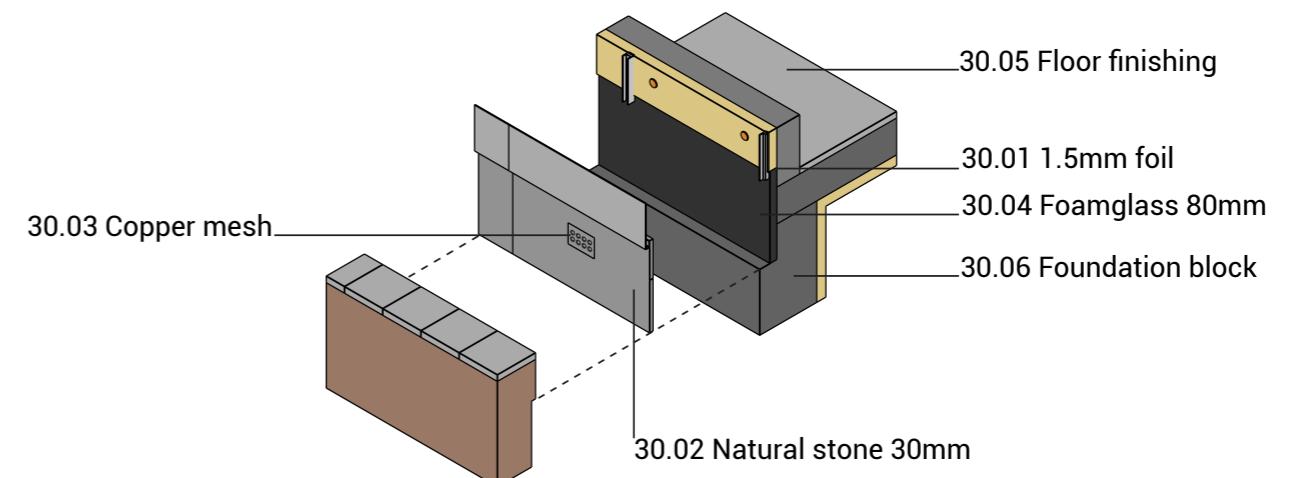
D30

ADAPTABILITY

DEMOUNTABILITY

Current structure

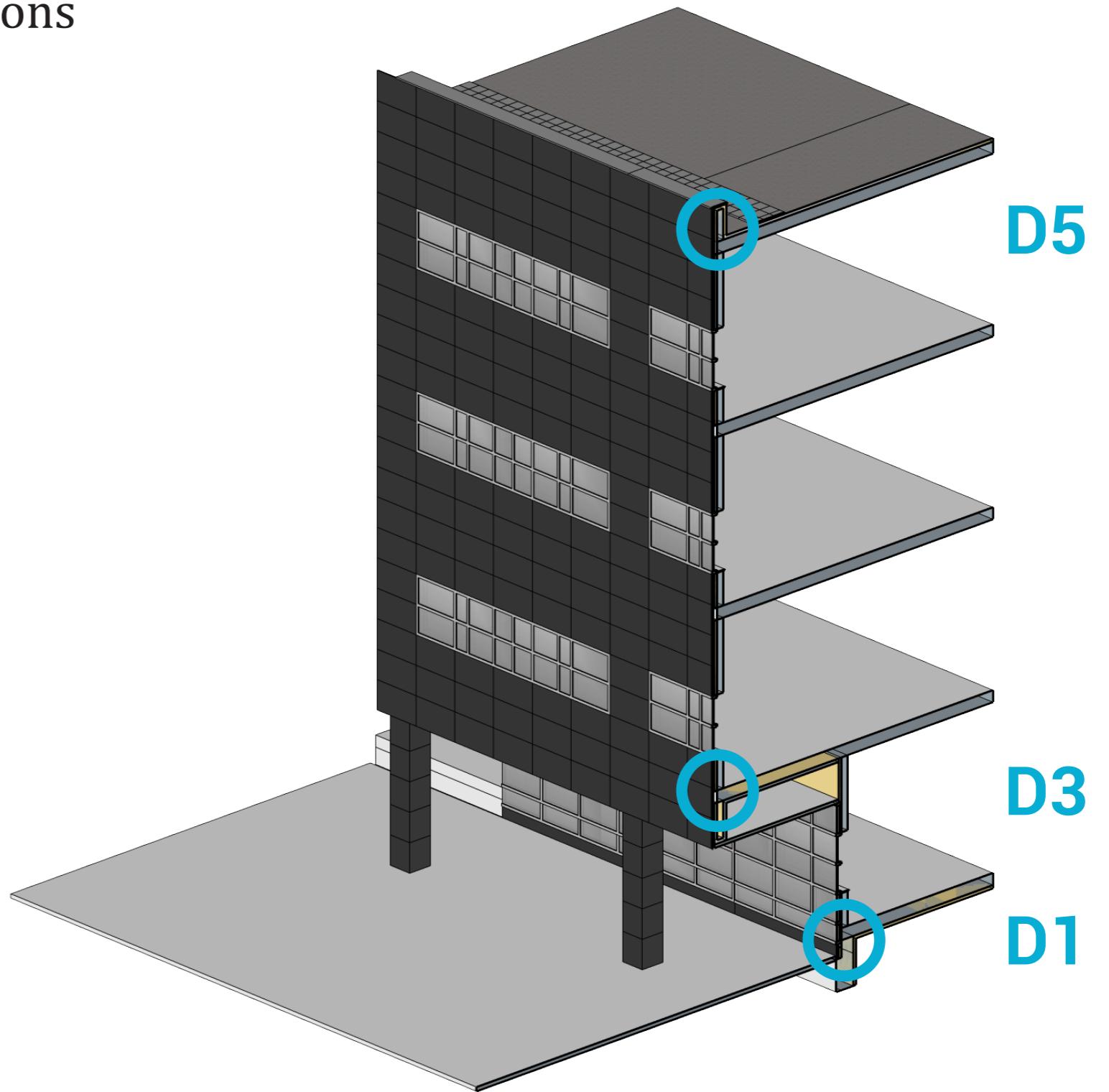
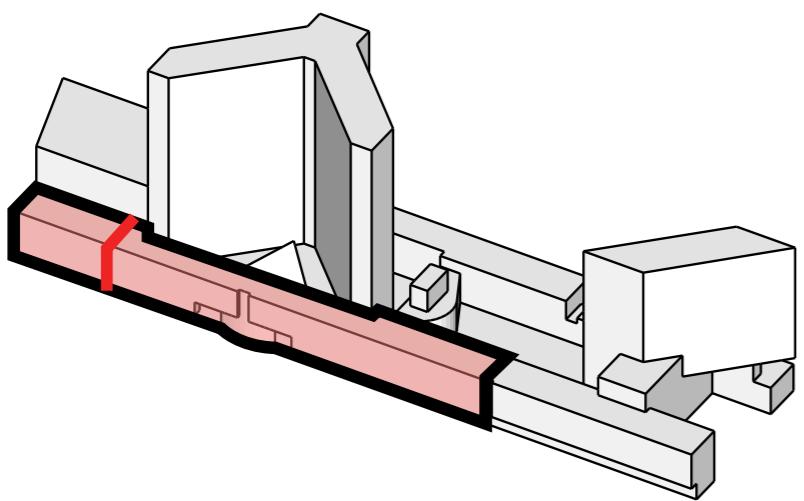


D29**D25****D33****D30**

ADAPTABILITY DEMOUNTABILITY

In existing office building connections

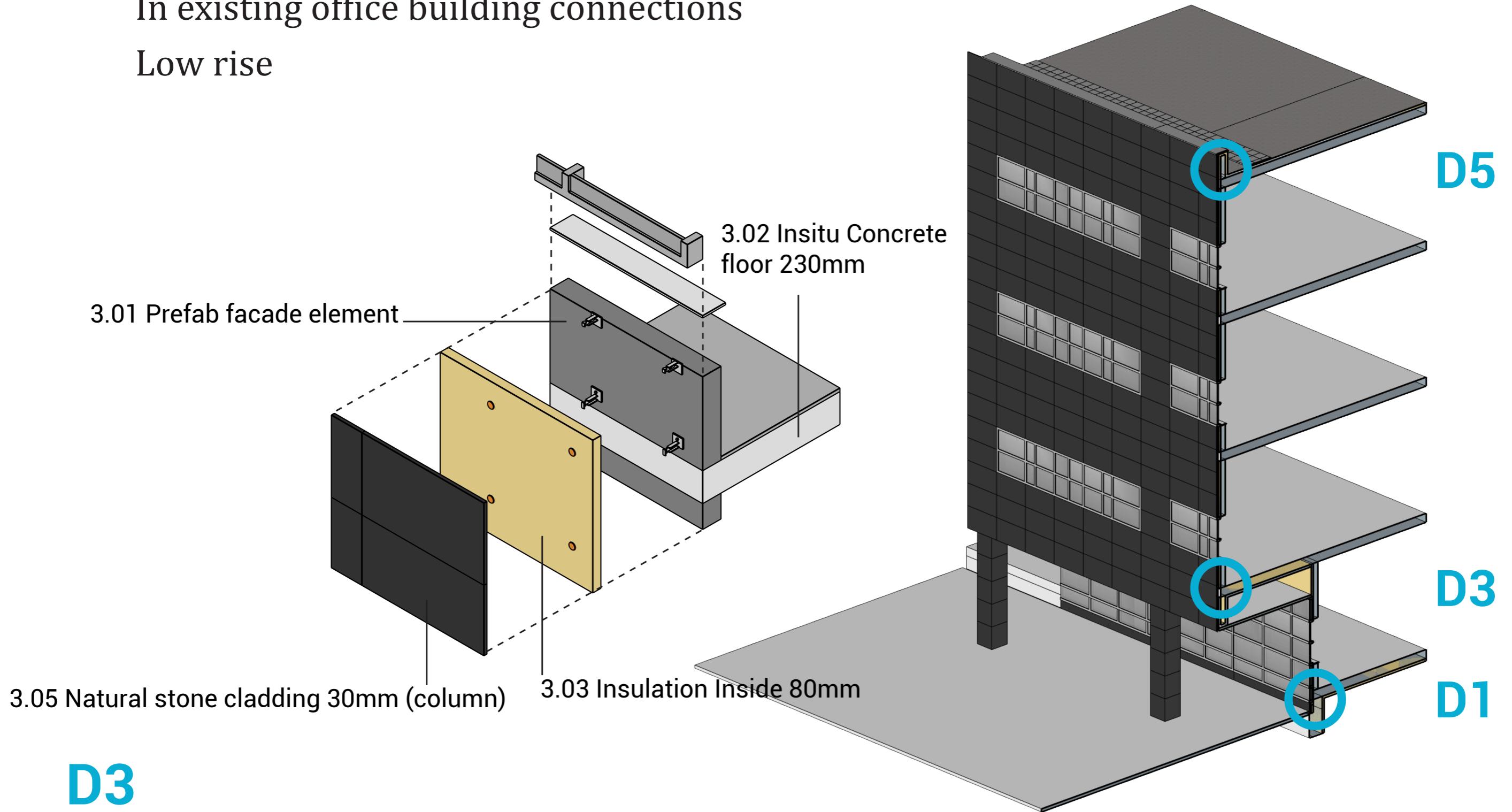
Low rise



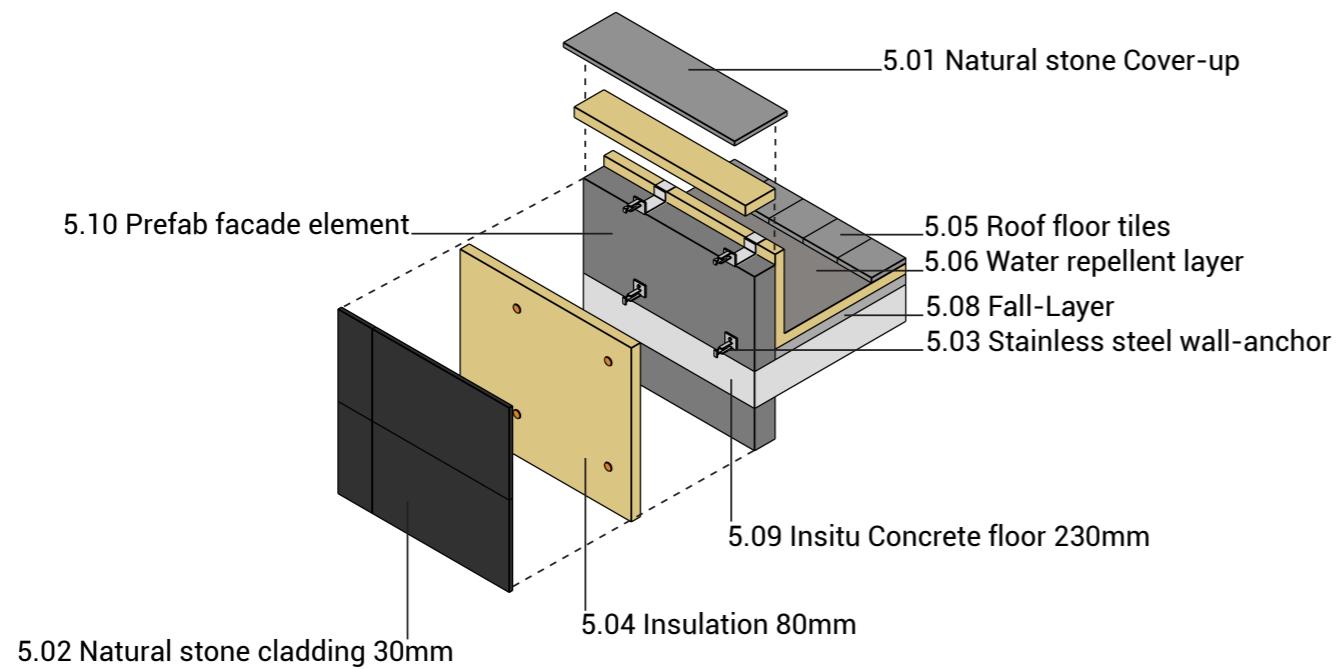
ADAPTABILITY DEMOUNTABILITY

In existing office building connections

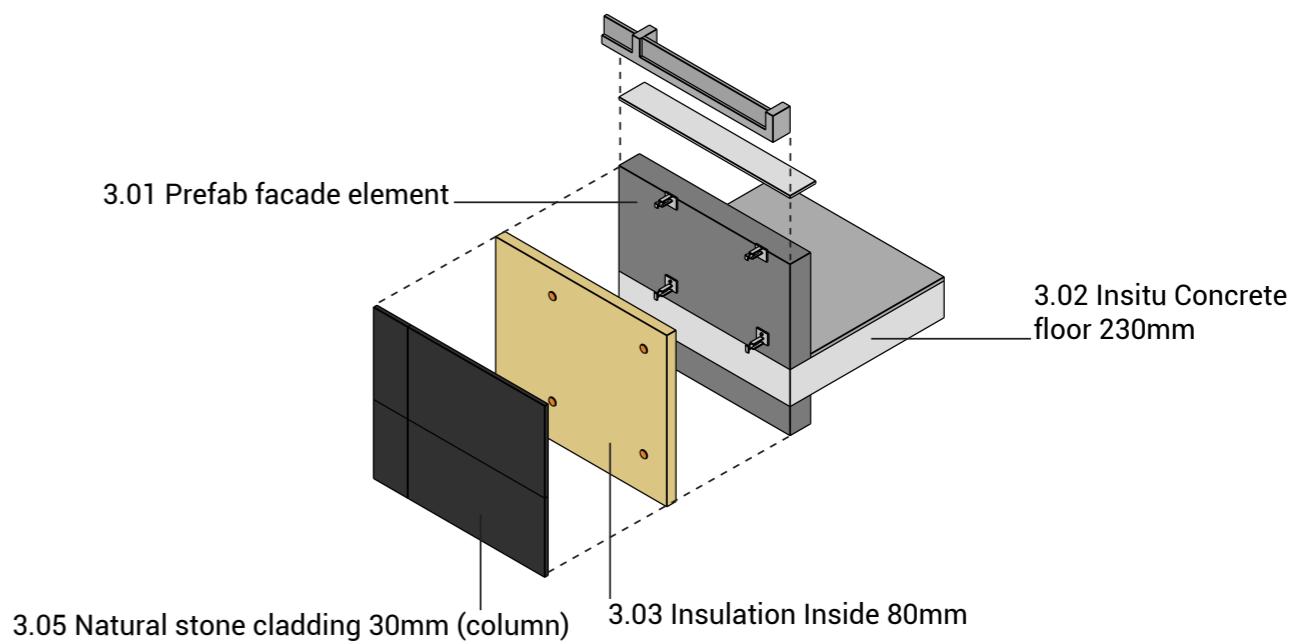
Low rise



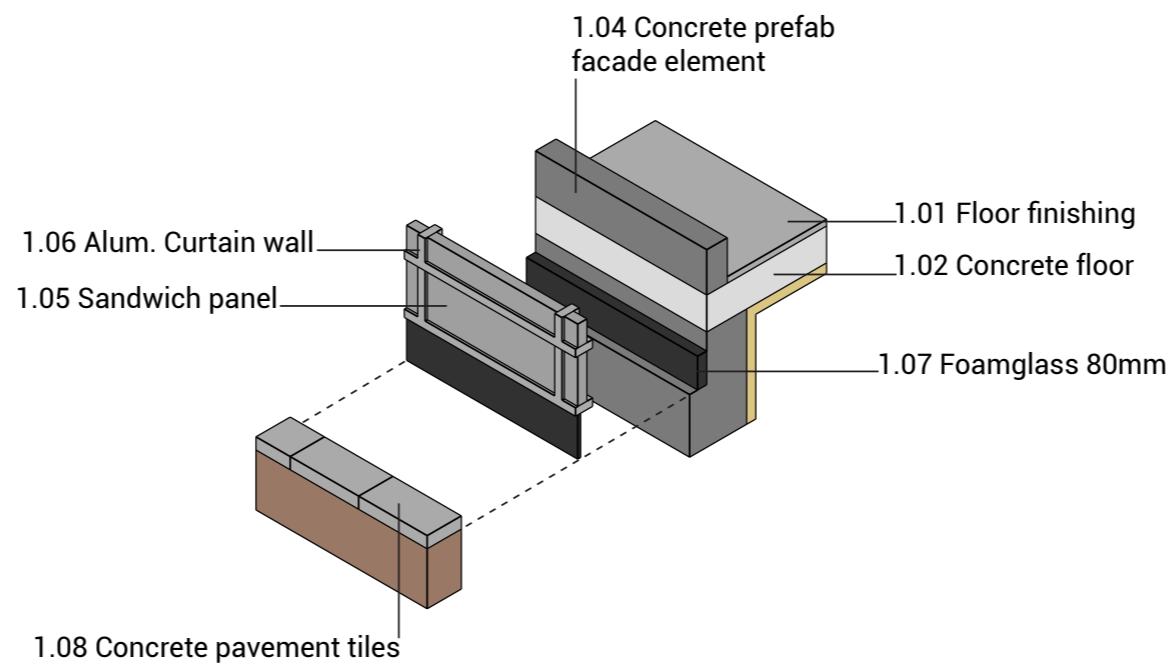
D5



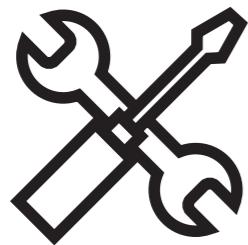
D3



D1



DEMOUNTABILITY PARAMETERS



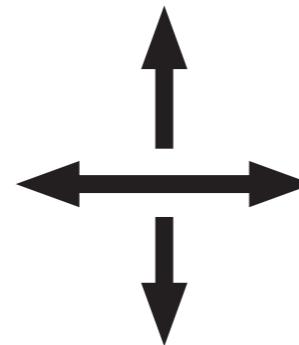
Connection type

- Dry connection
- Additional elements
- Internal connection
- Soft chemical connection
- Hard chemical



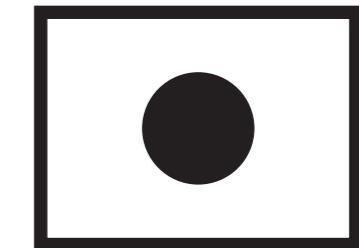
Connection Access

- 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 or more
- Full integration of objects



Enclosure

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

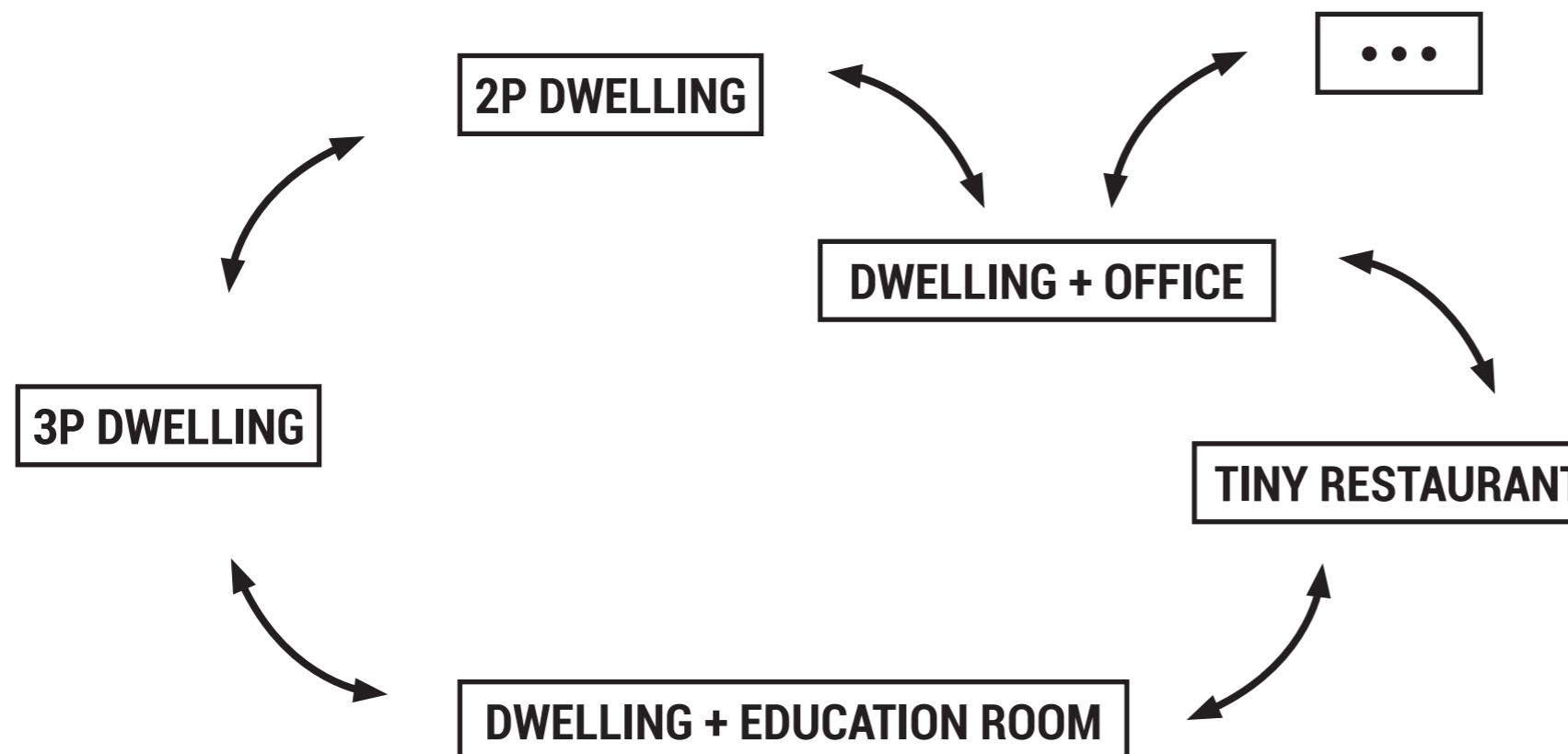


Design input

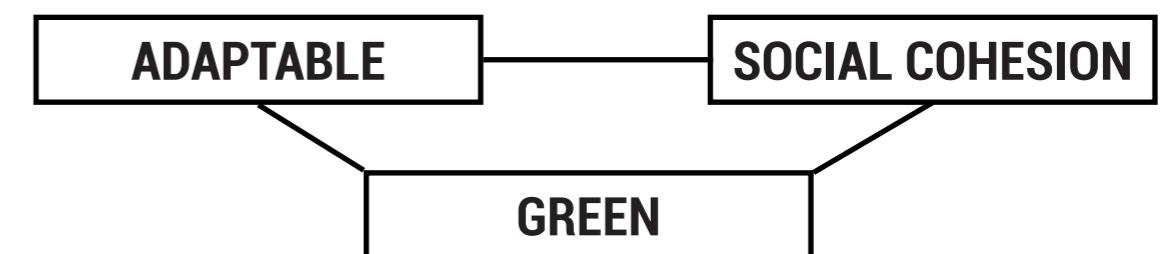
DESIGN

STRUCTURE (STRUCTUUR)

ADAPTABLE



VERTICAL VILLAGE



What building structure (structuur) enables this concept?

ADAPTABLE DWELLINGS

3 USER PROFILES

Piet



Ellen, Fred, Senna en Eddie



Mo & Fien



DAILY LIFE

Away from home allot. Only needs the basic requirements in a home.

HOBBIES

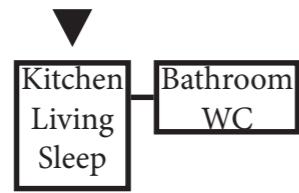
Active in sports. Likes to be able to live in a green but urban environment.

FAVOURITE WEEKEND

Likes to be social with neighbors and friends.

FAVOURITE SUNDAY MORNING

Always wakes up early and enjoys a coffee in the morning sun.



DAILY LIFE

Ellen and Fred both work partime jobs, Senna and Eddy go to kindergarten.

HOBBIES

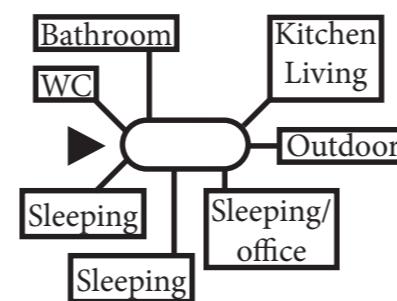
Going to the park with the kids, preferably close by.

FAVOURITE WEEKEND

Spending time with the kids, or going to restaurants. Having friends come over.

FAVOURITE SUNDAY MORNING

Eating breakfast together and having a relaxed afternoon.



DAILY LIFE

Active elderly couple who enjoy being outside and work in the garden.

HOBBIES

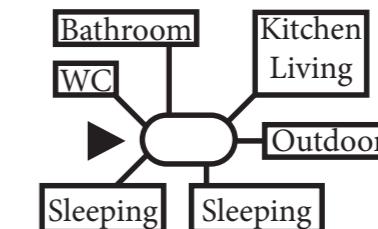
Gardening, reading, going for walks, community activities.

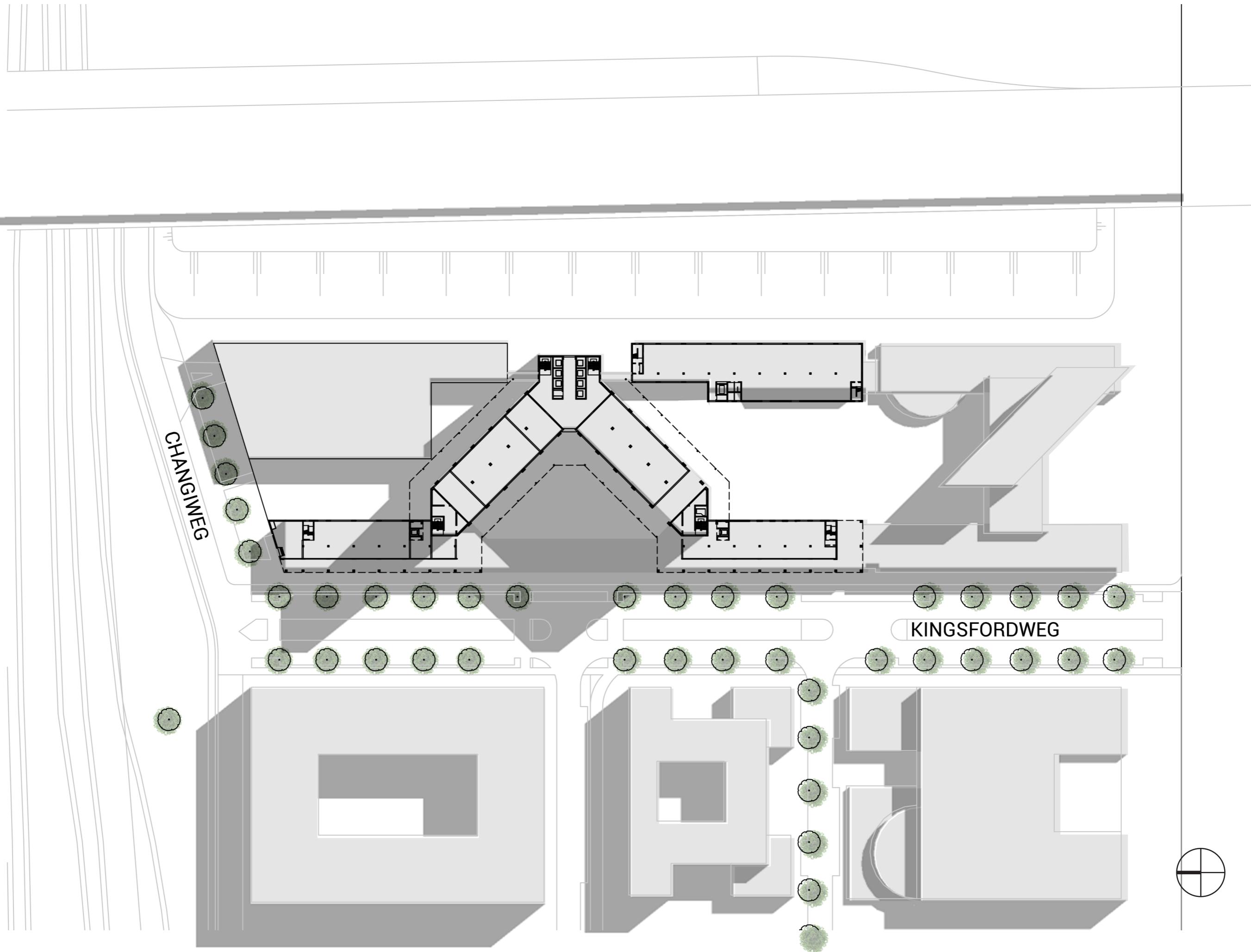
FAVOURITE WEEKEND

Going away on trips throughout the country.

FAVOURITE SUNDAY MORNING

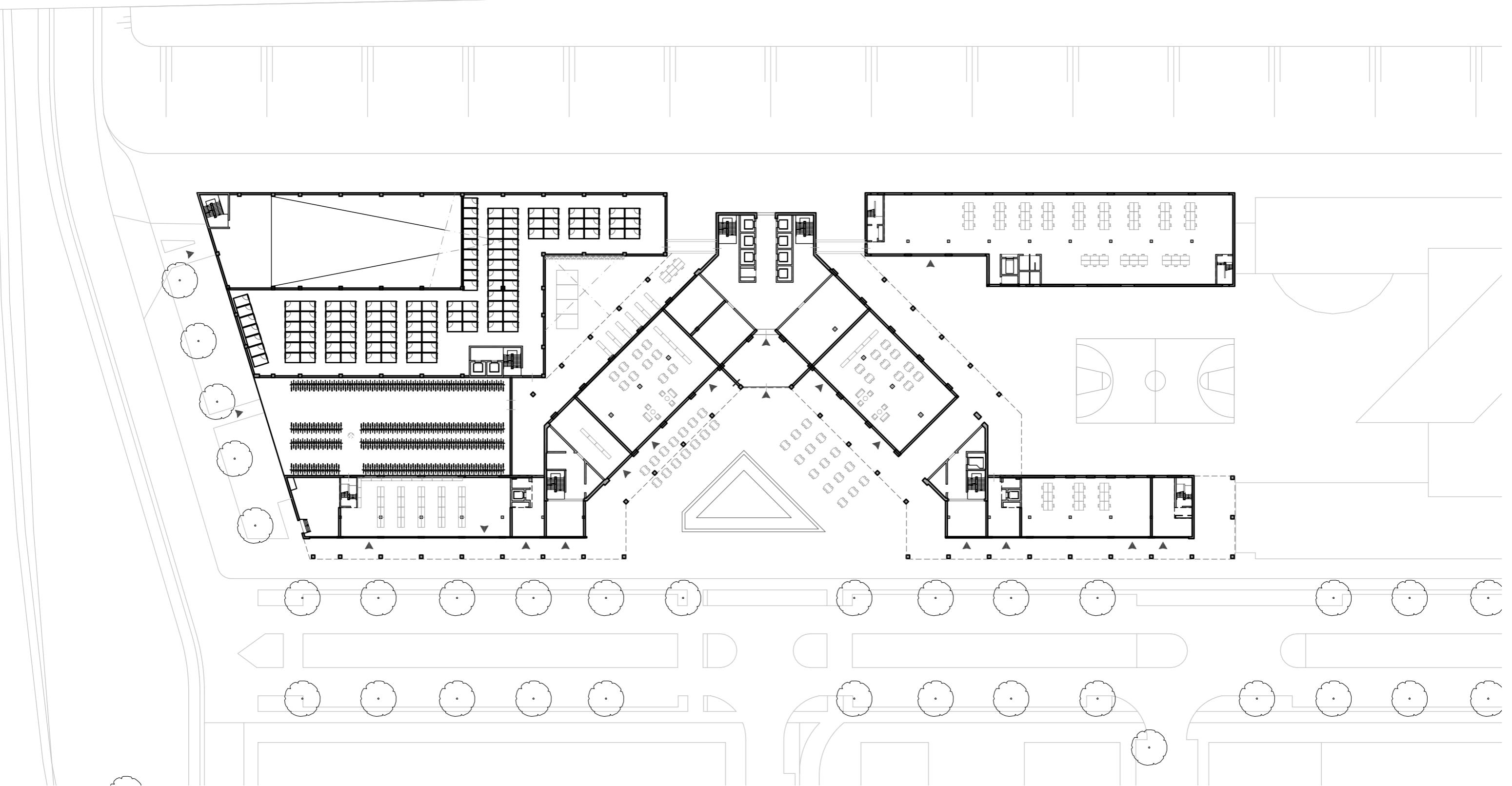
Reading outside or work in the garden.





FLOORPLAN

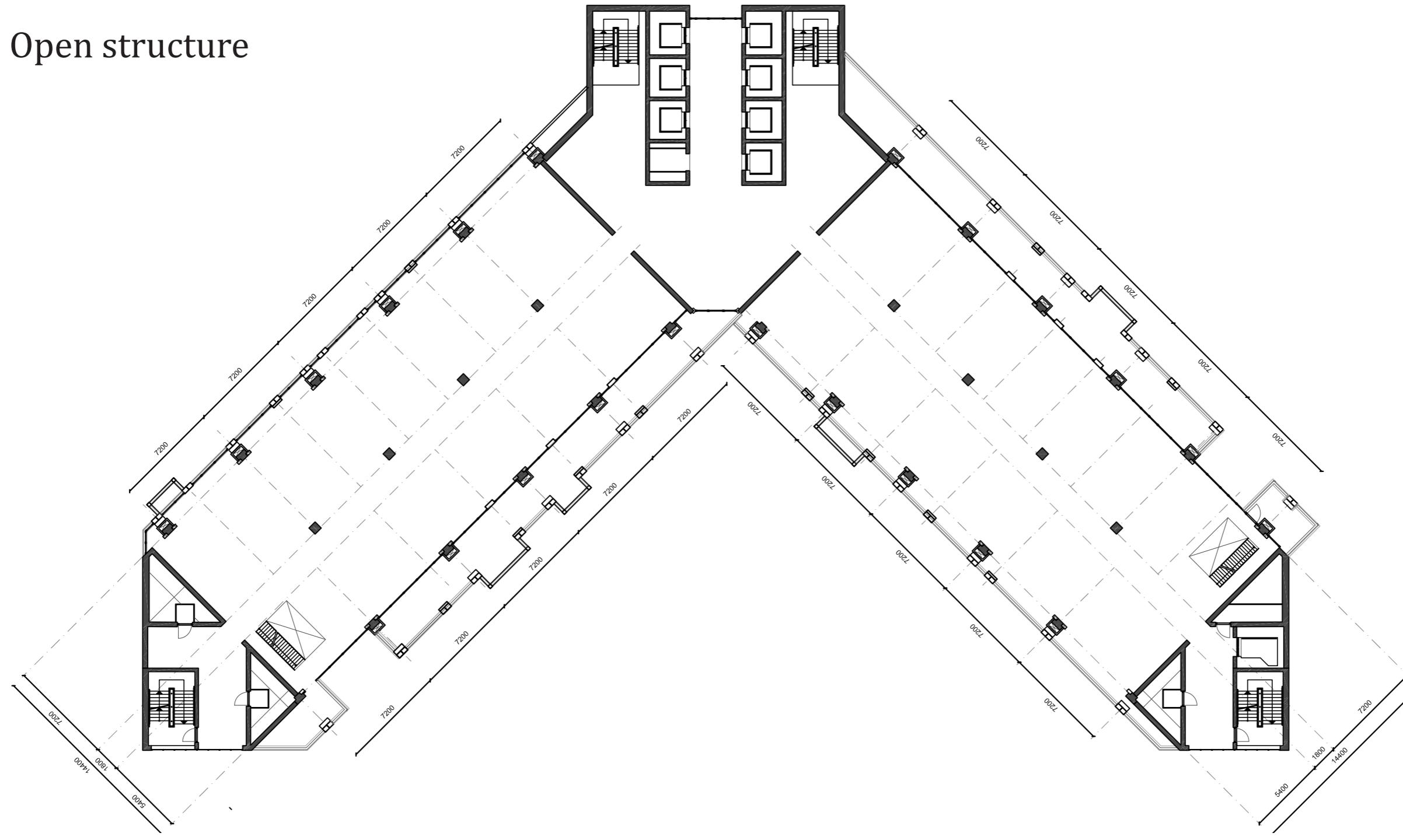
GROUND FLOOR



STRUCTURE (STRUCTUUR)

FLEXIBLE BUILDING STRUCTURE

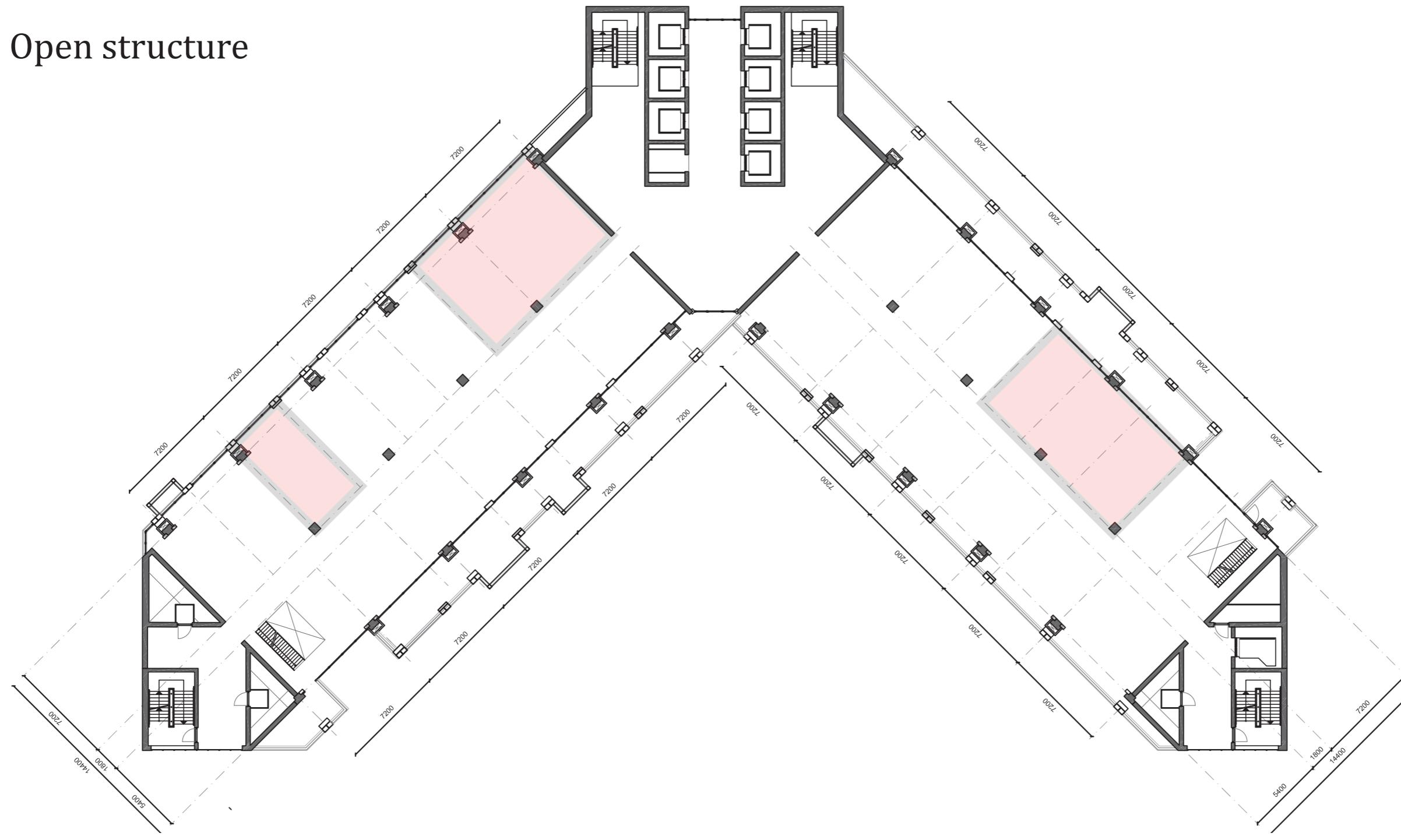
Open structure



STRUCTURE (STRUCTUUR)

FLEXIBLE BUILDING STRUCTURE

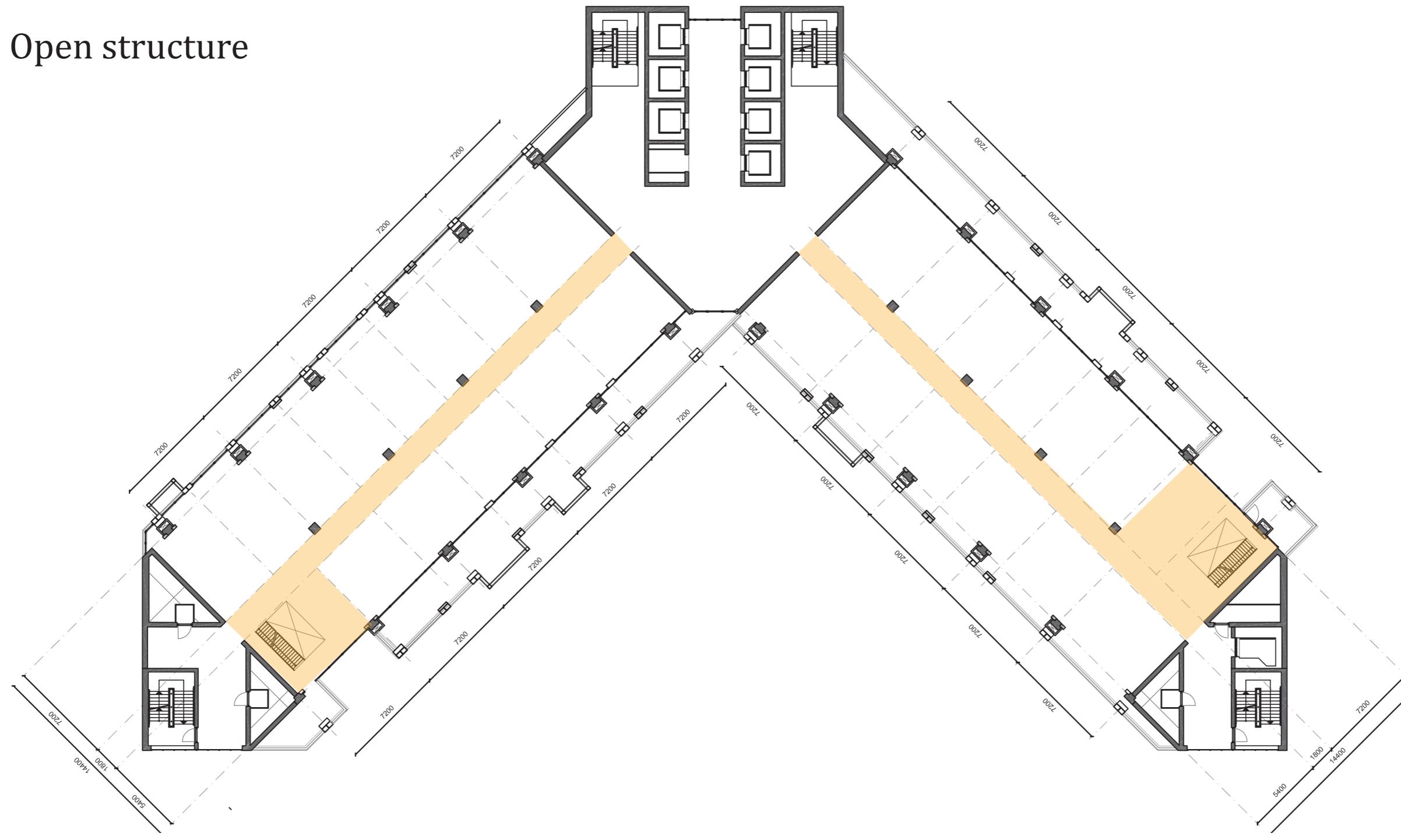
Open structure



STRUCTURE (STRUCTUUR)

FLEXIBLE BUILDING STRUCTURE

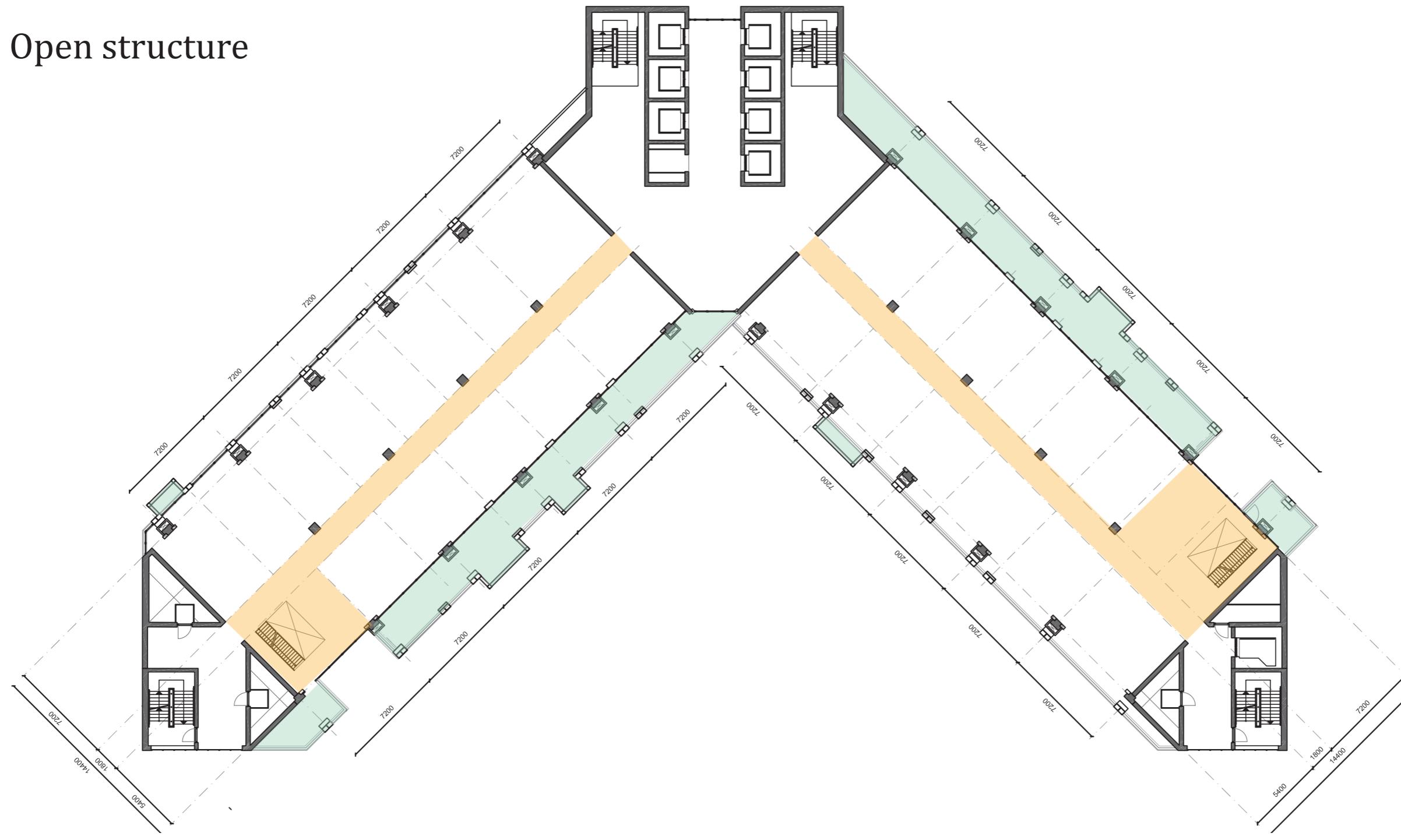
Open structure



STRUCTURE (STRUCTUUR)

FLEXIBLE BUILDING STRUCTURE

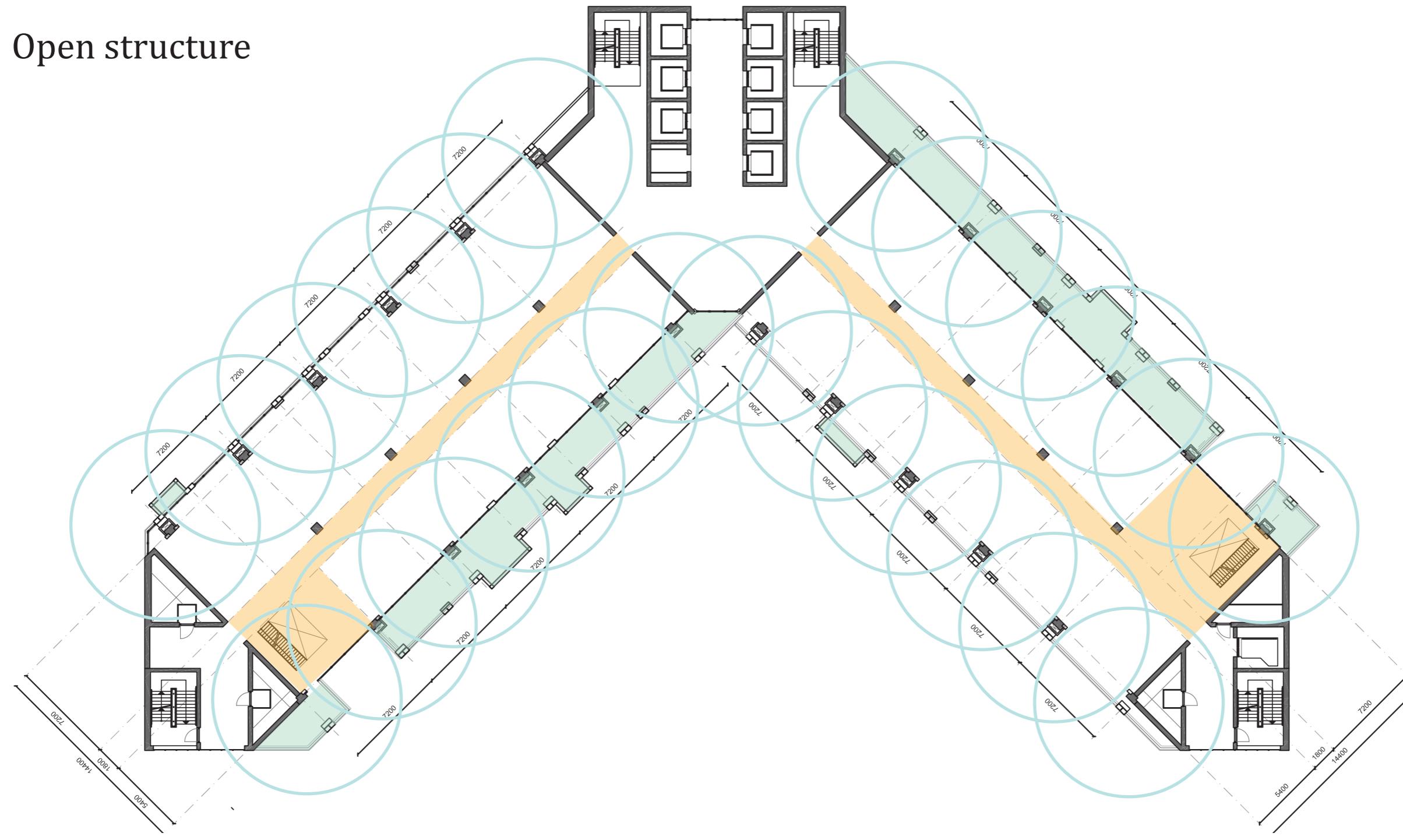
Open structure



STRUCTURE (STRUCTUUR)

FLEXIBLE BUILDING STRUCTURE

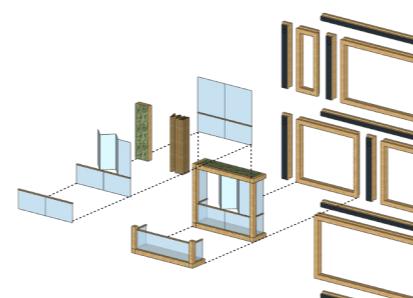
Open structure



STRUCTURE (STRUCTUUR)

FOUNDATION KAIZEN

Facade



TOOLBOX

USER

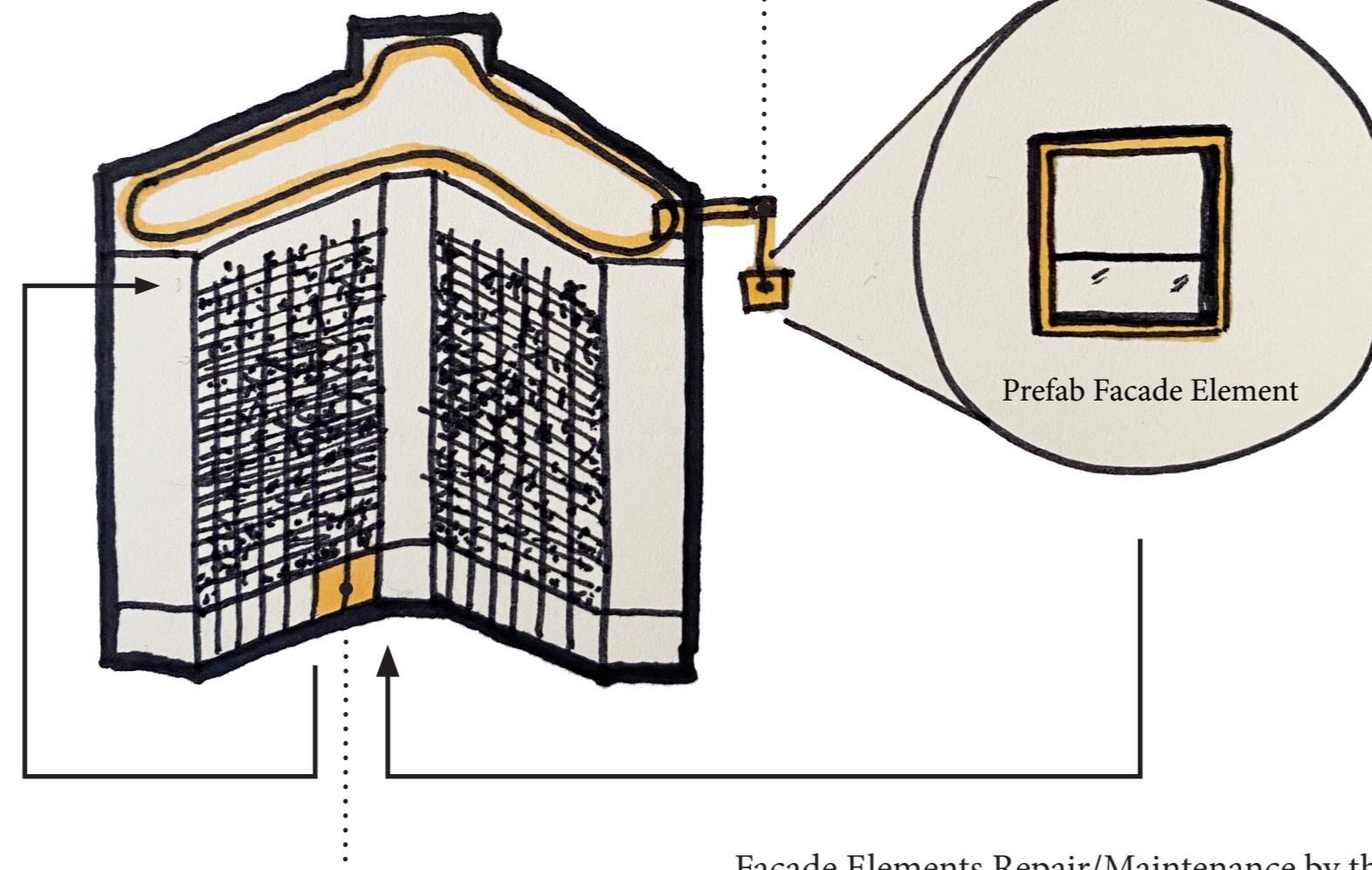
Guided by designer(s) / Architect

Adjustments

Feedback

ARCHITECT
Making a Design

Demountable & Remountable facade elements
from crane (strengthened window cleaning in-
stallation)



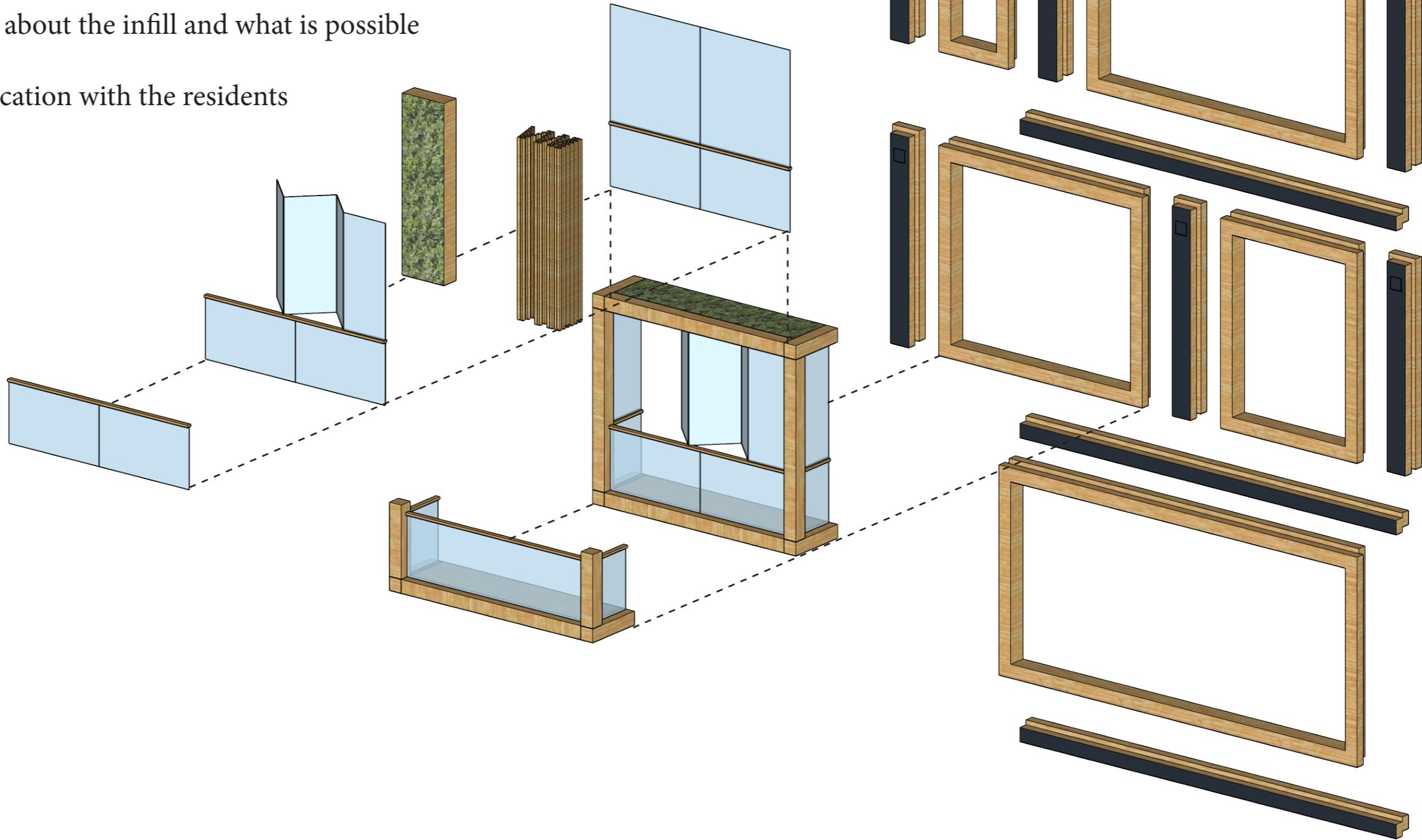
Facade Leasing -> Custom
design from toolbox

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



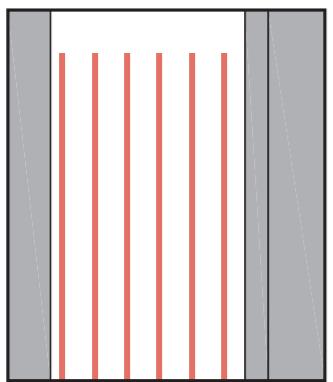
FACADE

FOUNDATION KAIZEN

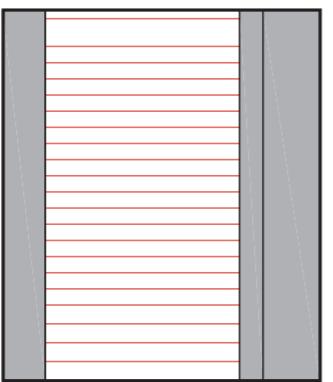


FACADE

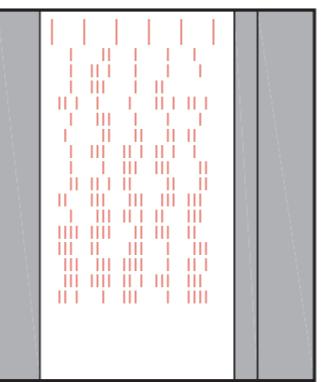
FOUNDATION KAIZEN



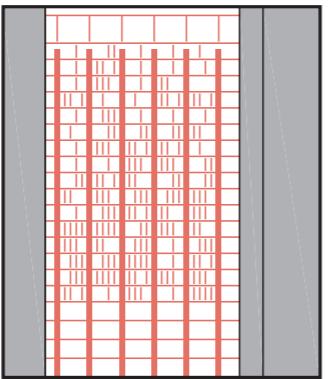
Verticale elementen



Horizontale elementen (vloeren)



Uitzonerdingen



Ritme en diversiteit

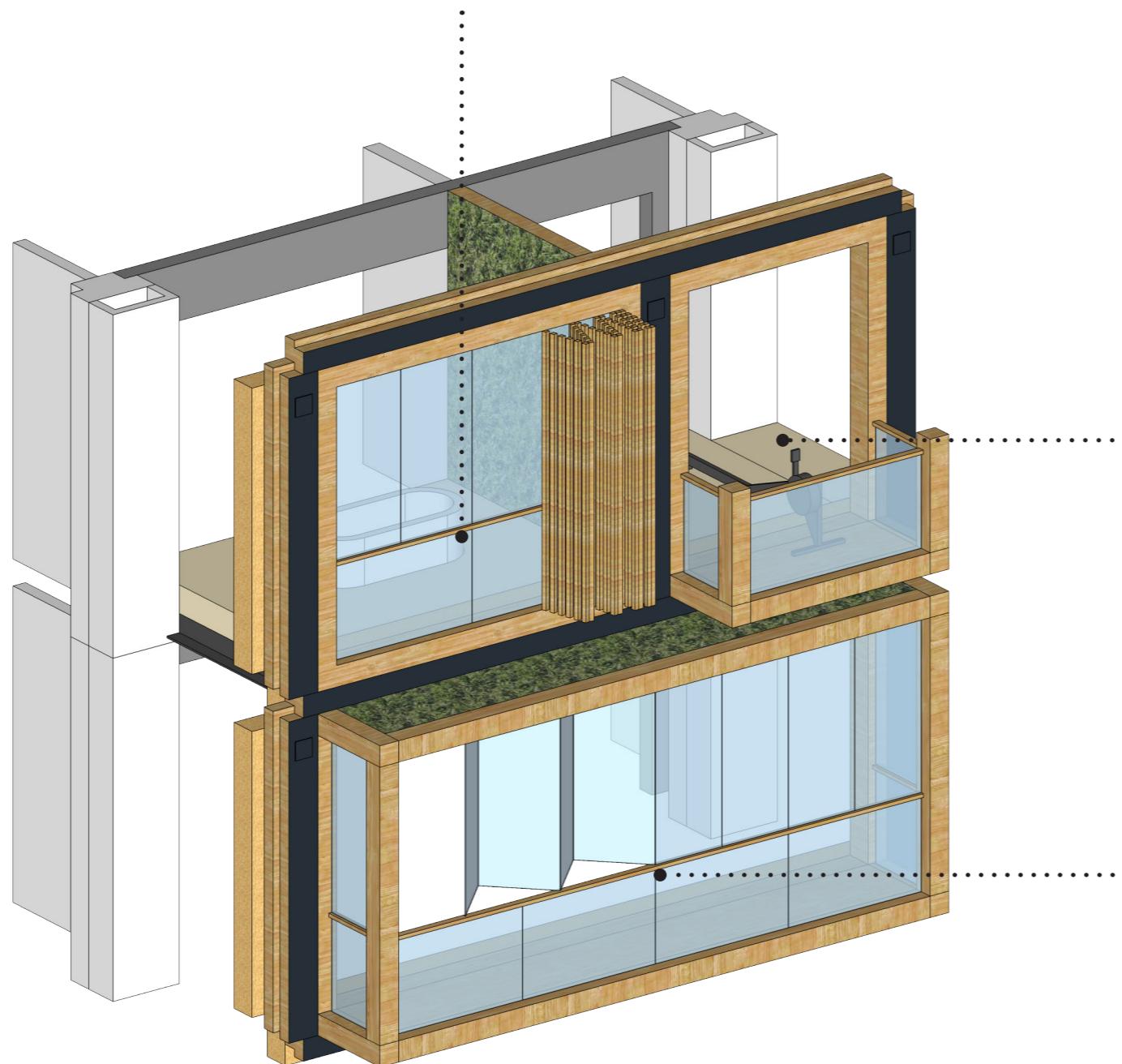


ADAPTABLE FACADE

SCENARIO 1

ELDERLY 2P

Outdoor bathing +
enclosure



STUDIO

Outdoor sports

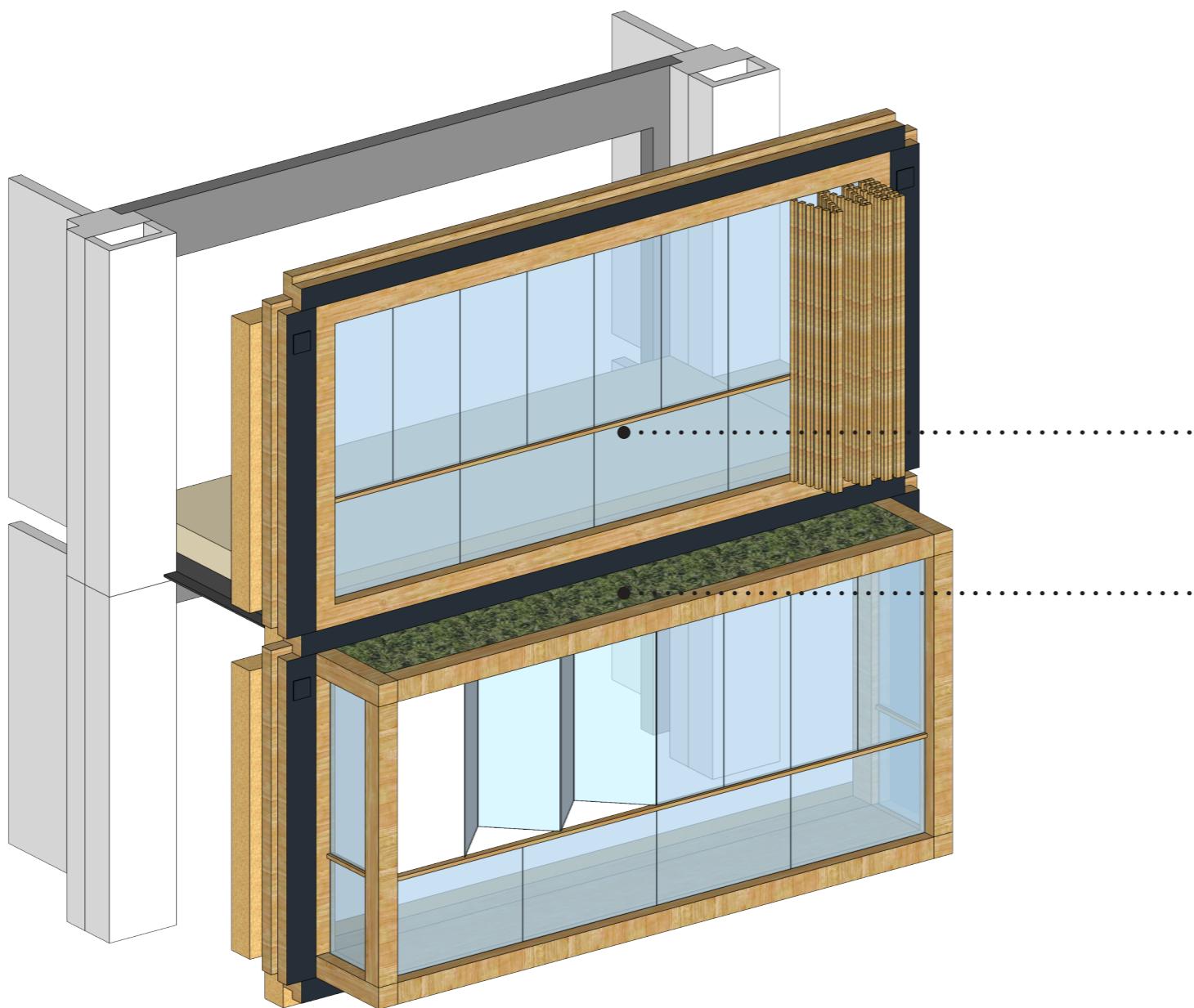
FAMILY

Large outdoor space



ADAPTABLE FAÇADE

SCENARIO 2



Combining Apartments

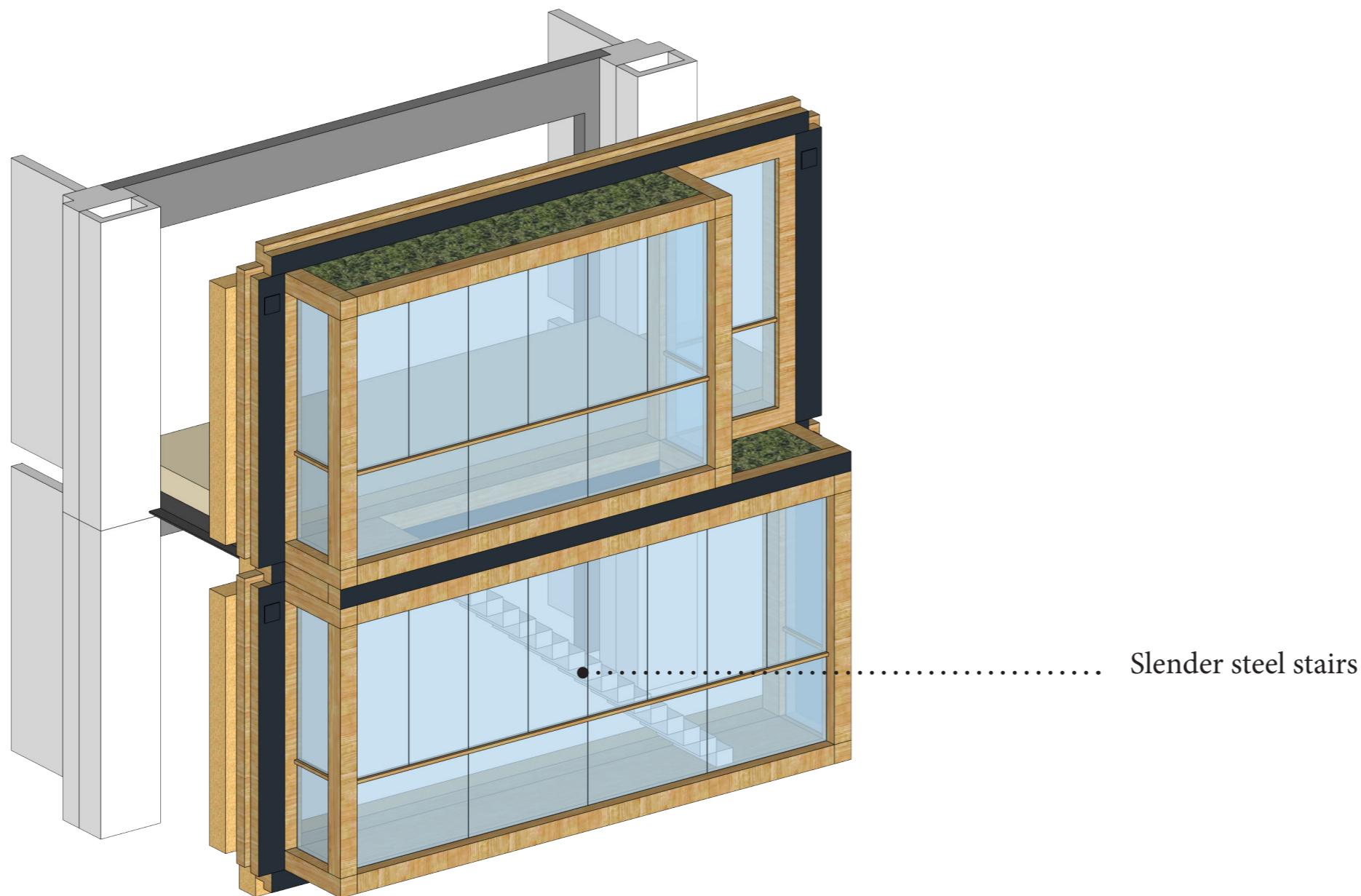


Bay window -> low-maintenance sedum roof covering



ADAPTABLE FACADE

SCENARIO 3

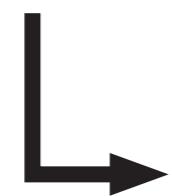


ADAPTABLE **RIGHT NOW**

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



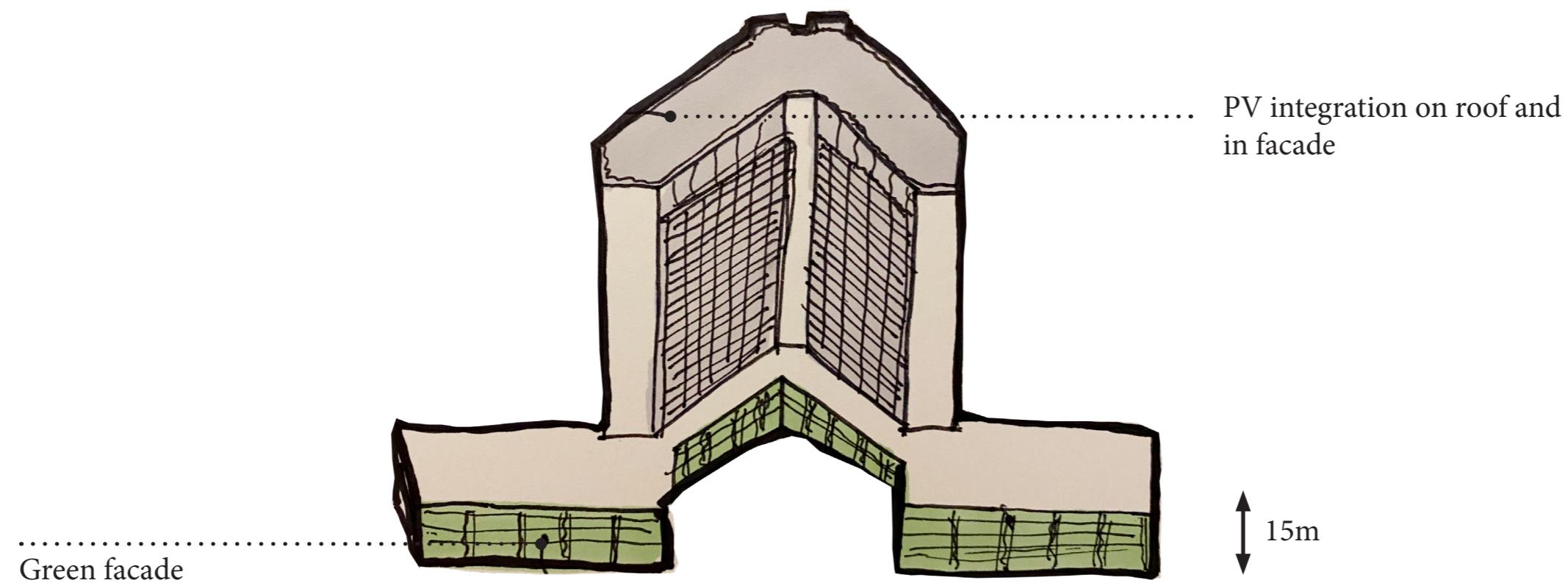
Easily adapted to the near future. (flexible building)



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

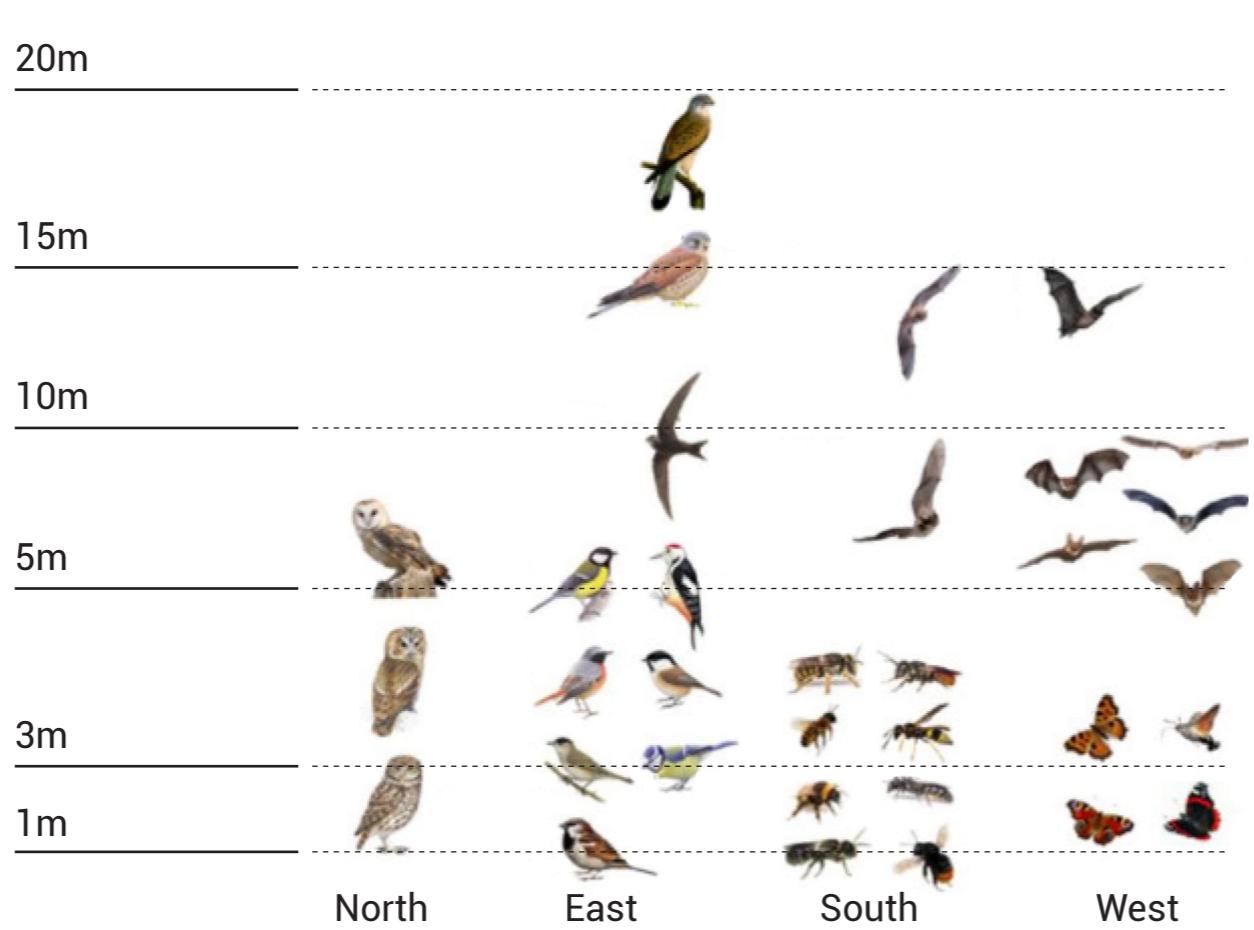
STRUCTUUR

FIXED || ADAPTABLE

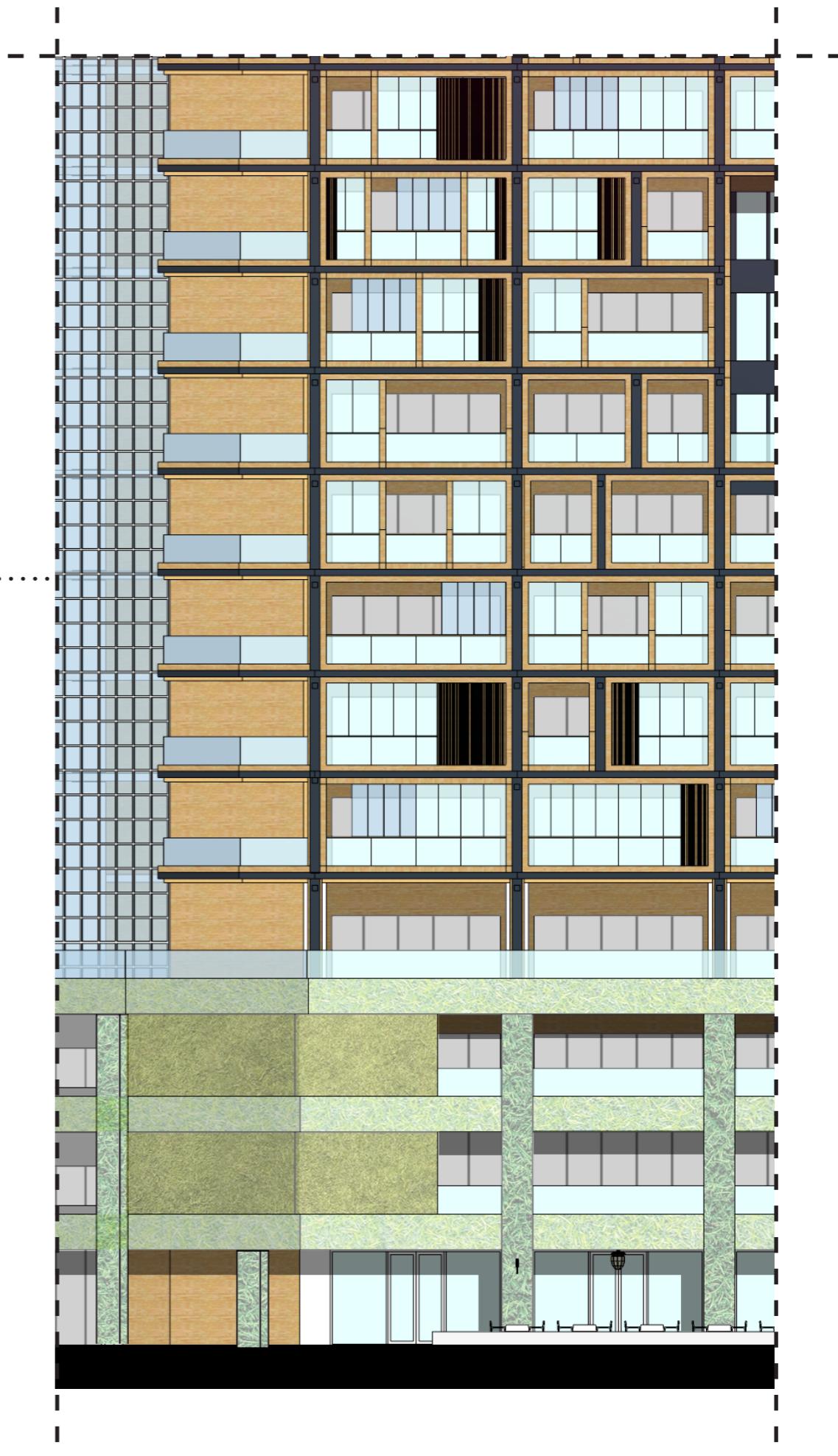


LOWER LEVELS

INCREASE BIO DIVERSITY



PV in higher levels



IDENTITY INDIVIDUAL

Shape the interior and personal facade within boundaries



IDENTITY **INDIVIDUAL**

Shape the interior and personal facade within boundaries

IDENTITY **COLLECTIVE**

Shape the building



IDENTITY **INDIVIDUAL**

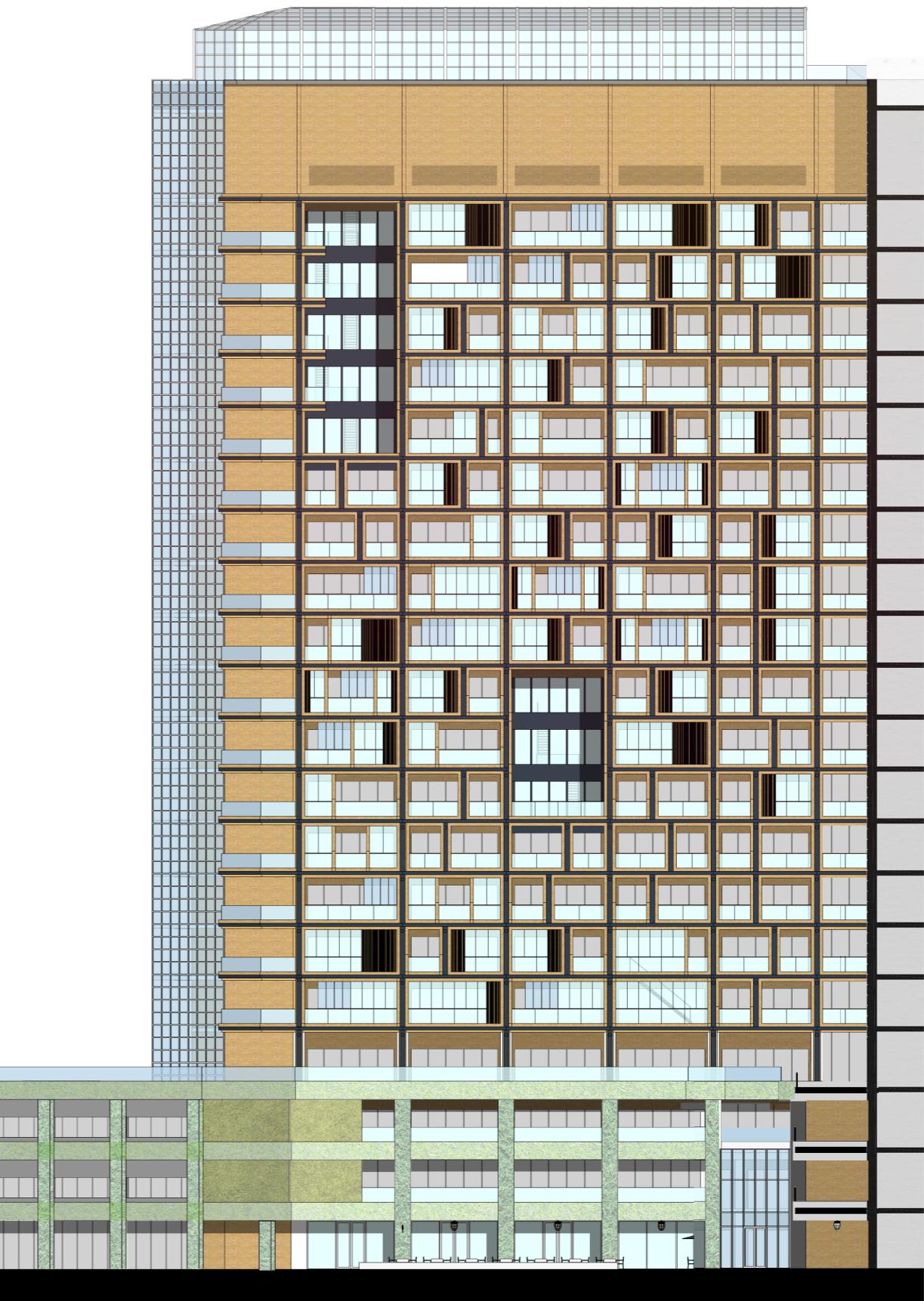
Shape the interior and personal facade within boundaries

→ **IDENTITY**
COLLECTIVE

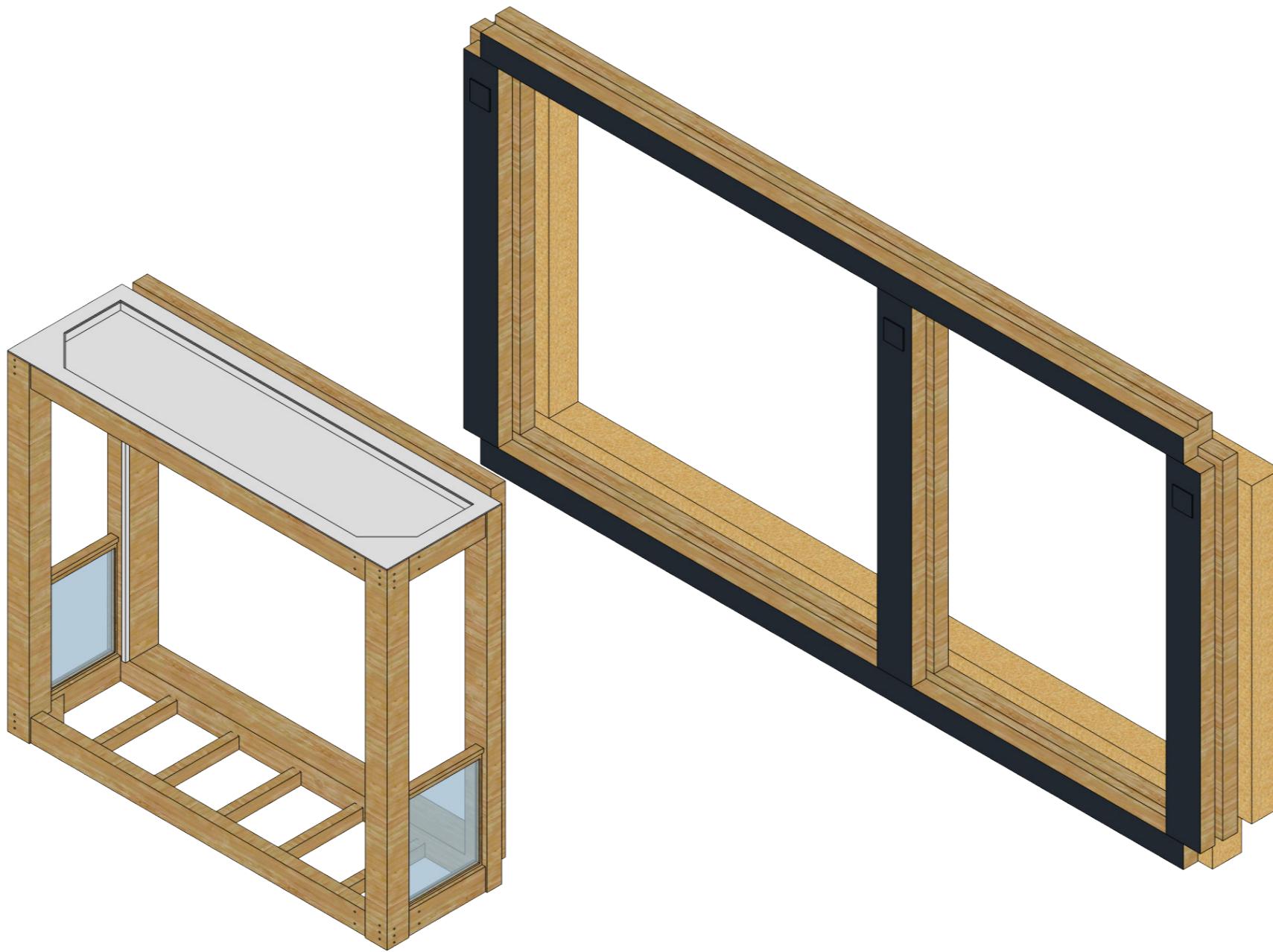
Shape the building

→ **IDENTITY**
BUILDINGS

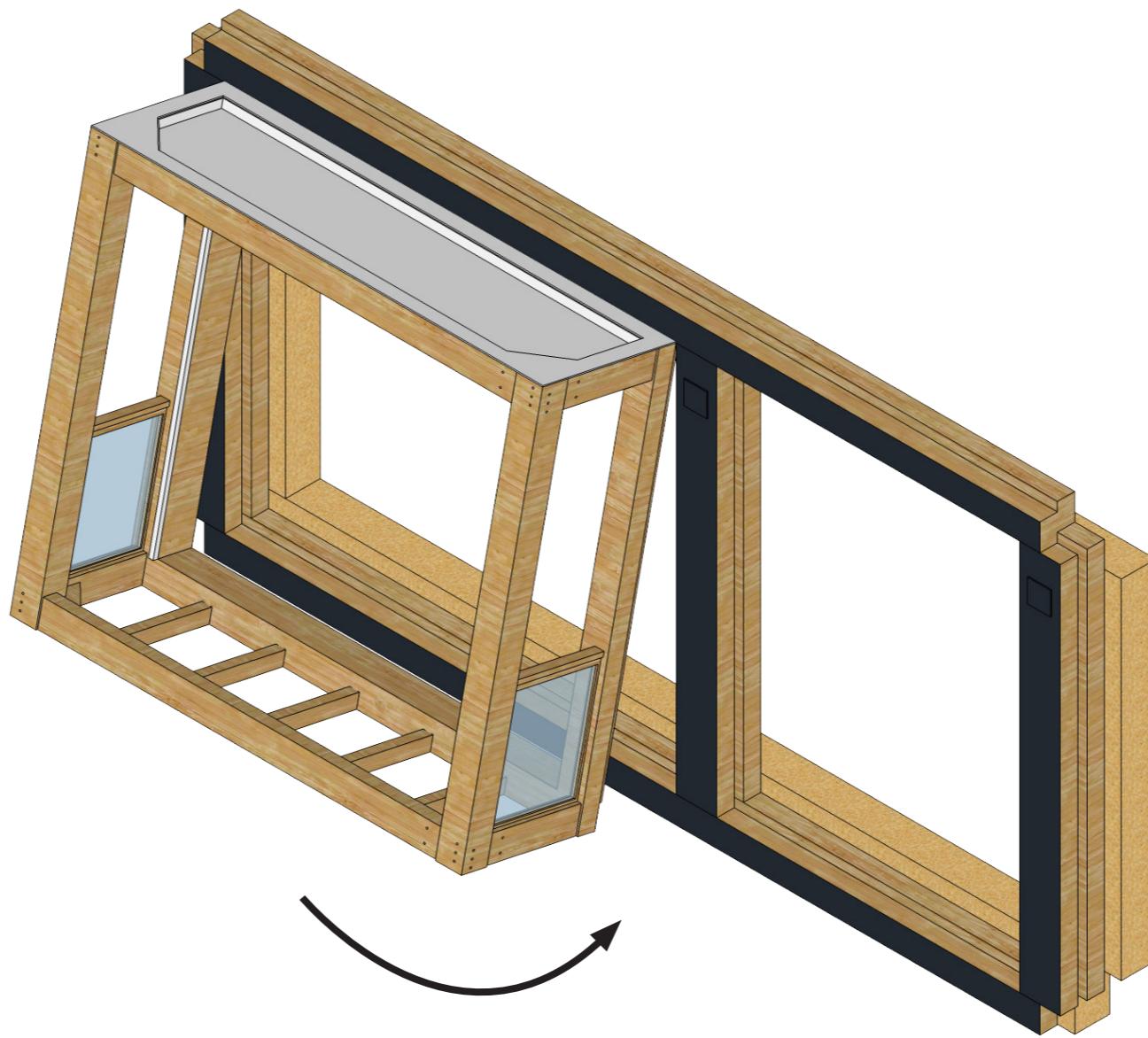
Shape the urban identity.



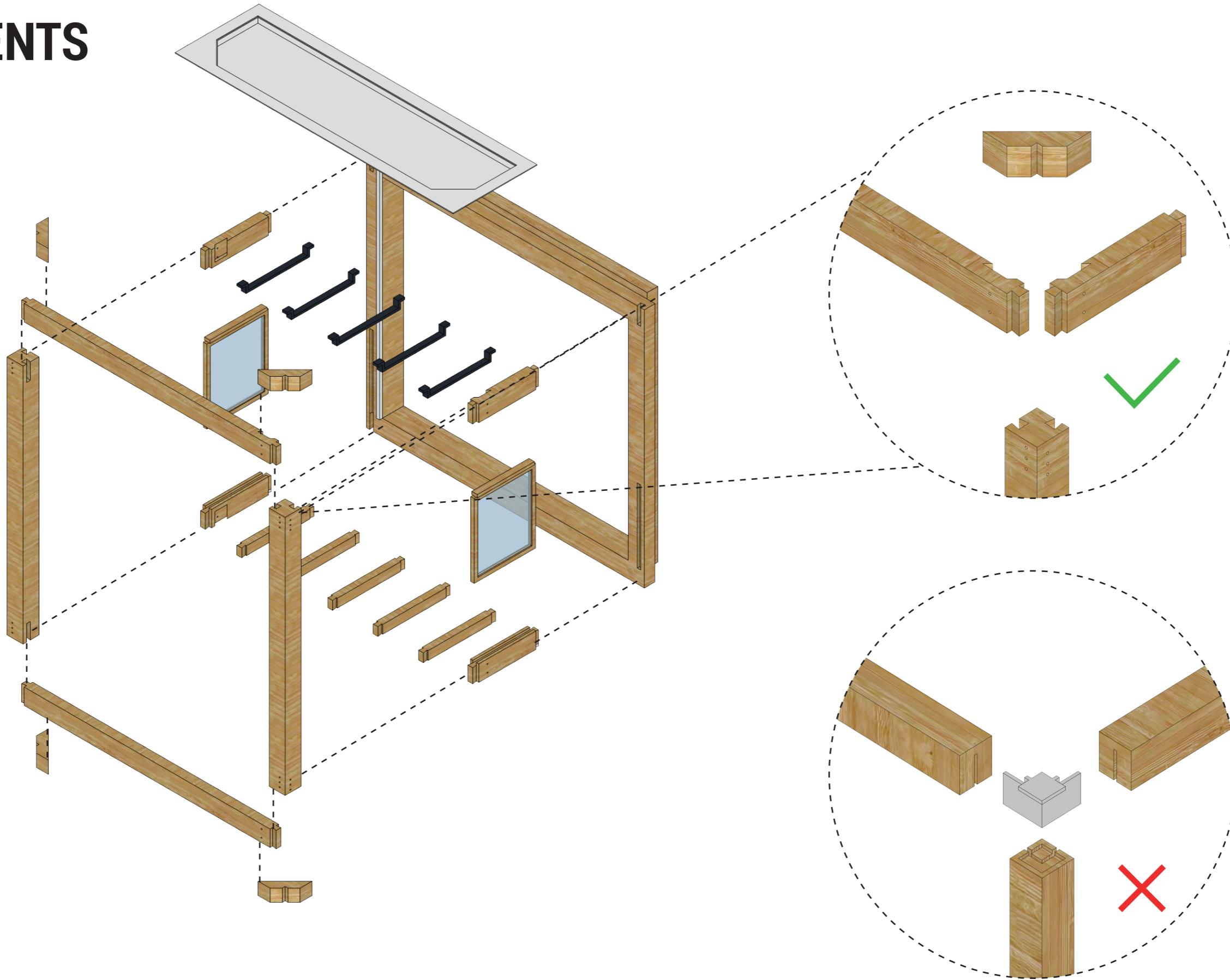
FACADE ELEMENTS



FACADE ELEMENTS

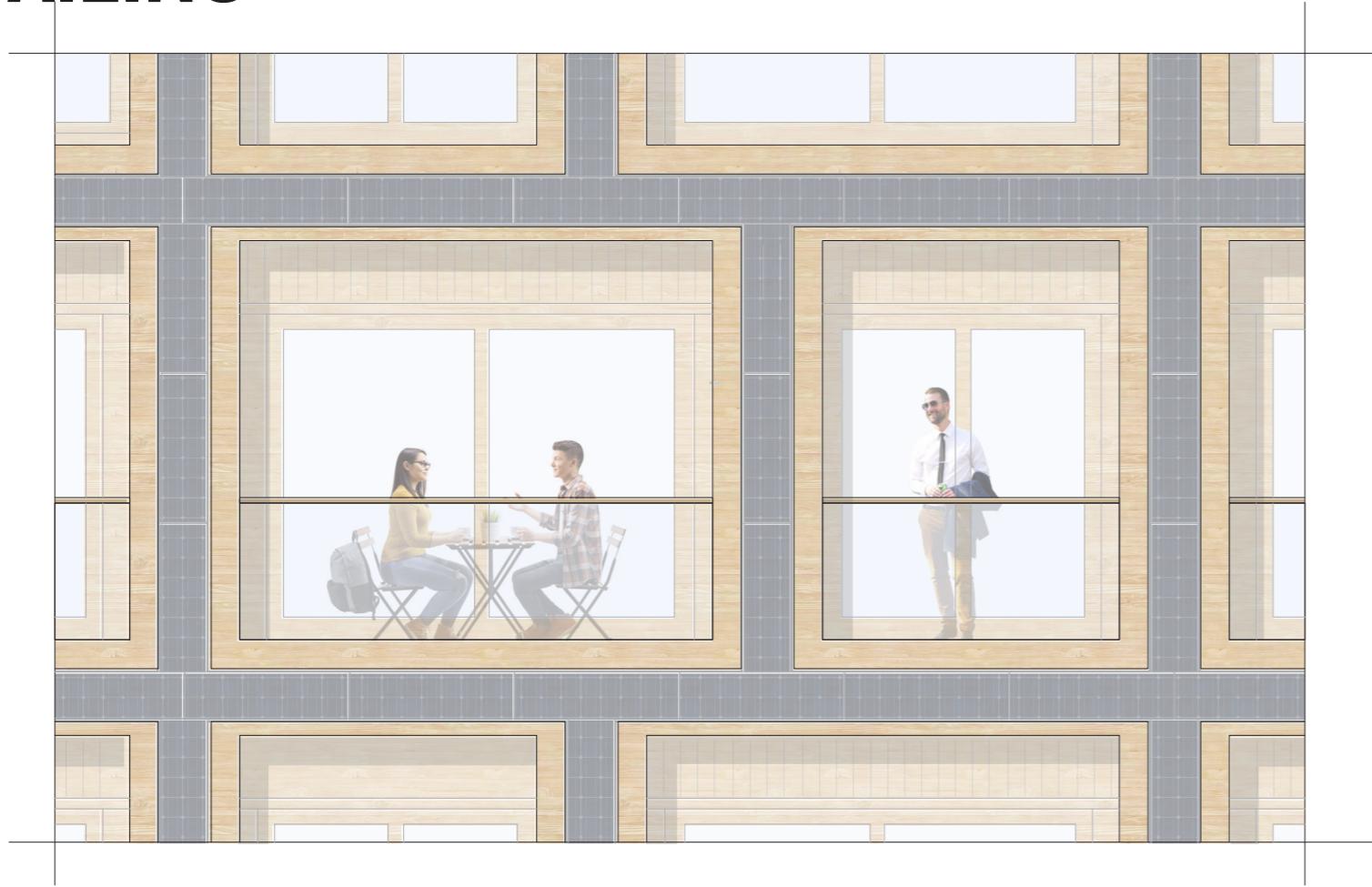


FACADE ELEMENTS

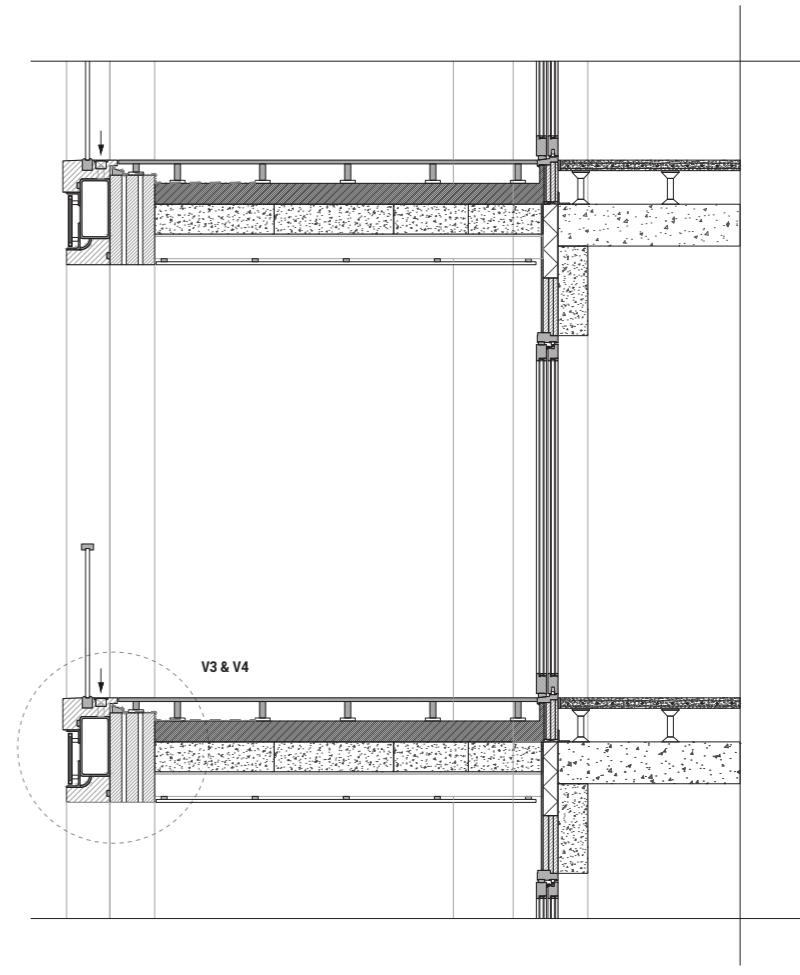


FACADE

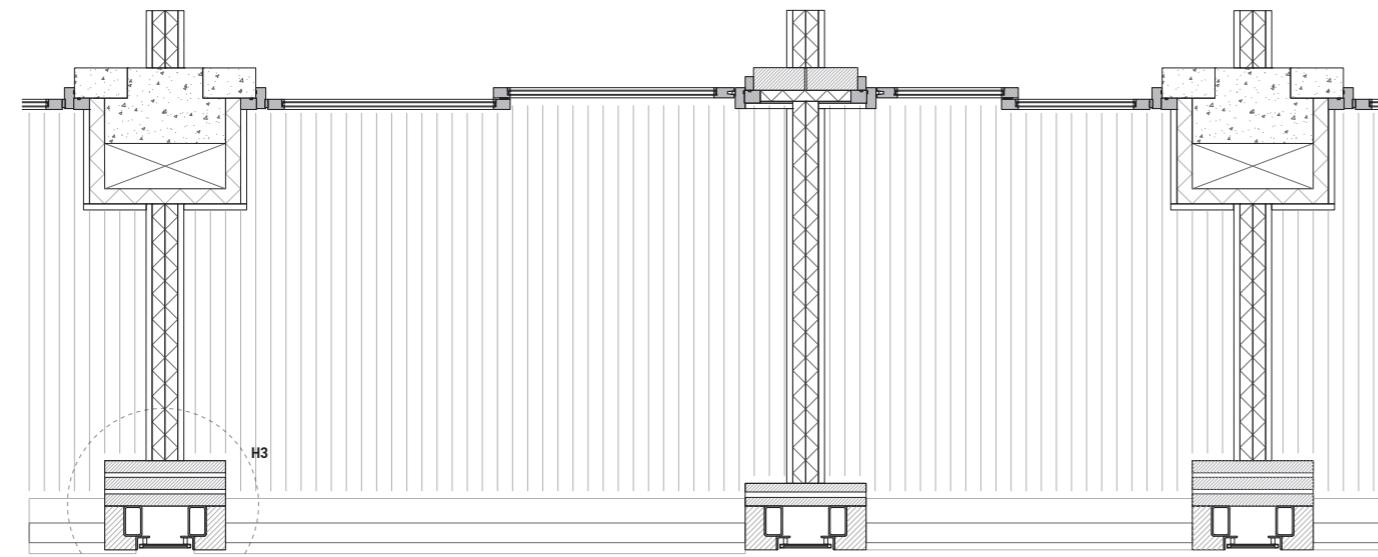
DETAILING



FRAGMENT ELEVATION 1:20

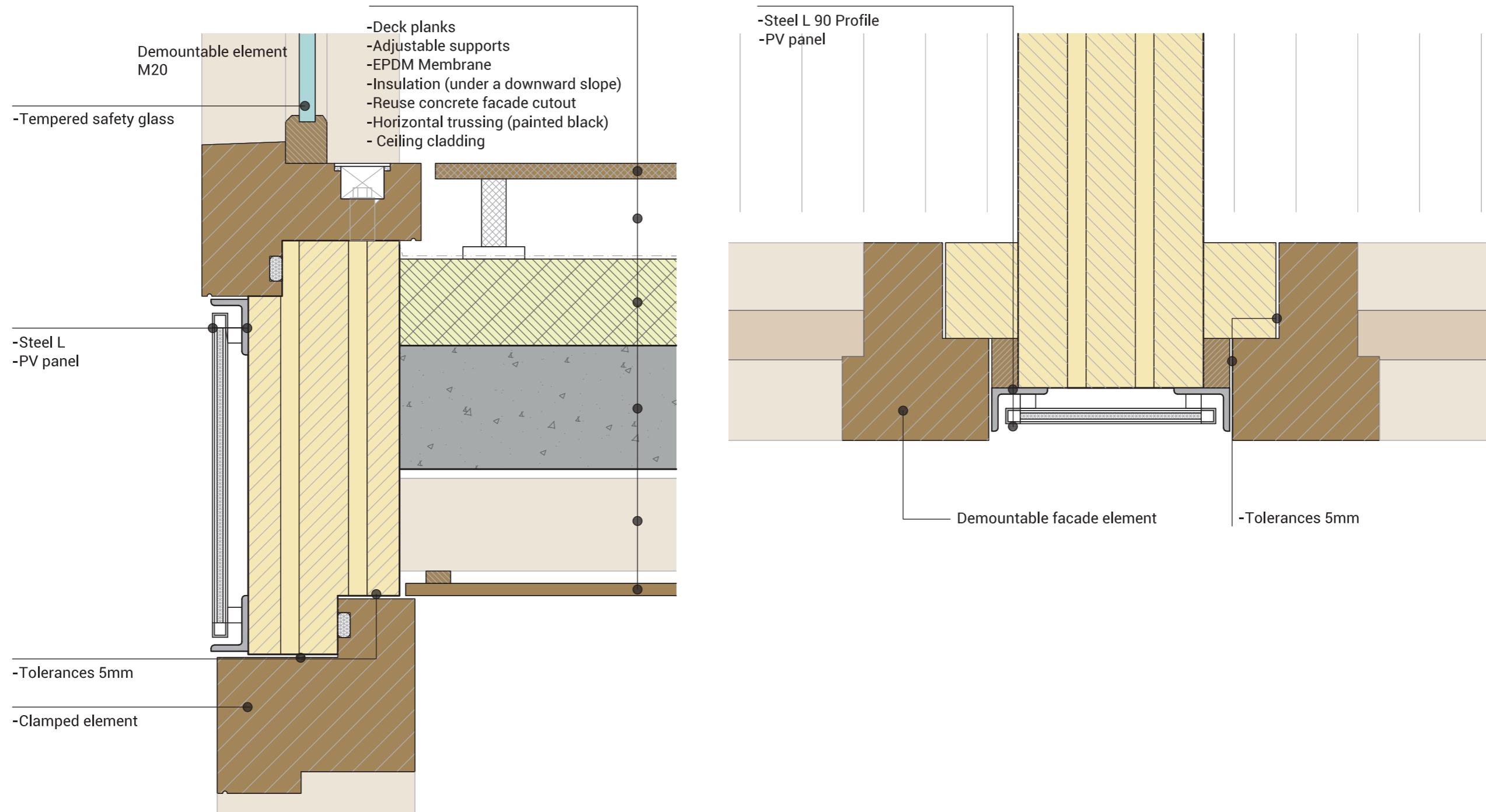


FRAGMENT VERTICAL SECTION 1:20



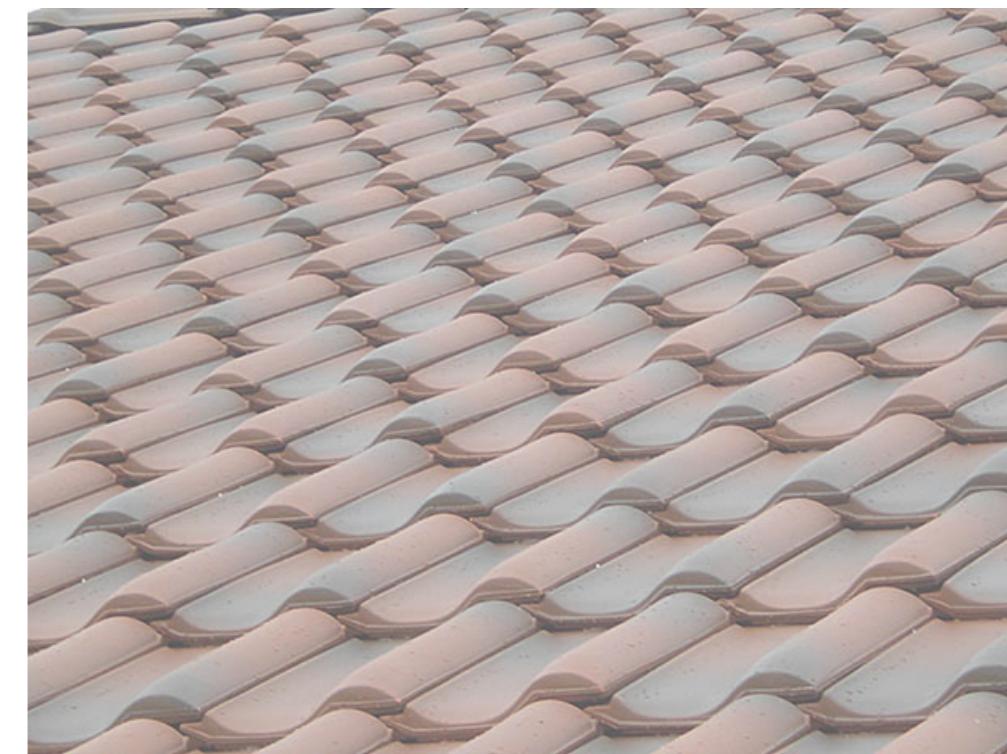
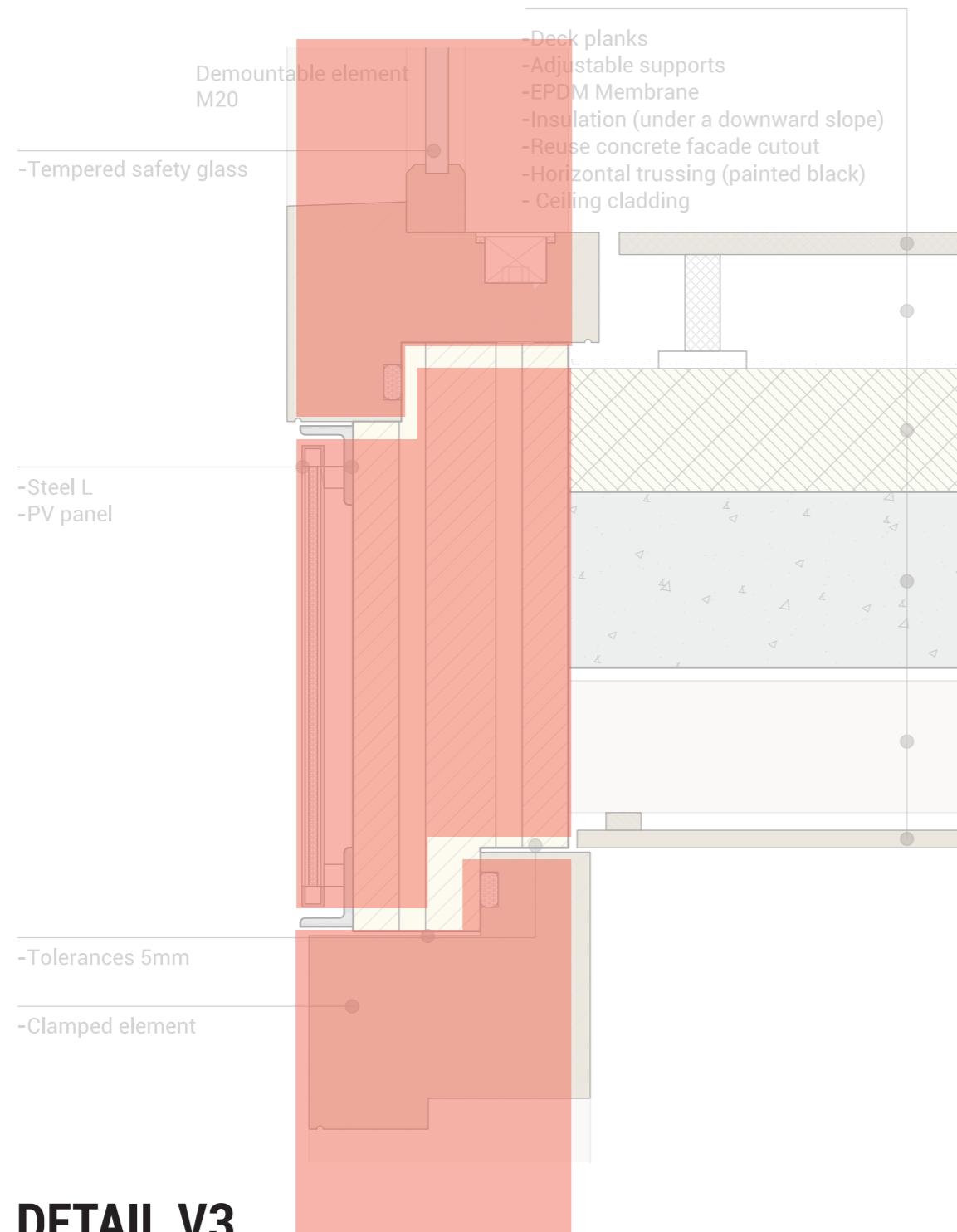
FRAGMENT HORIZONTAL 1:20

FACADE DETAILING



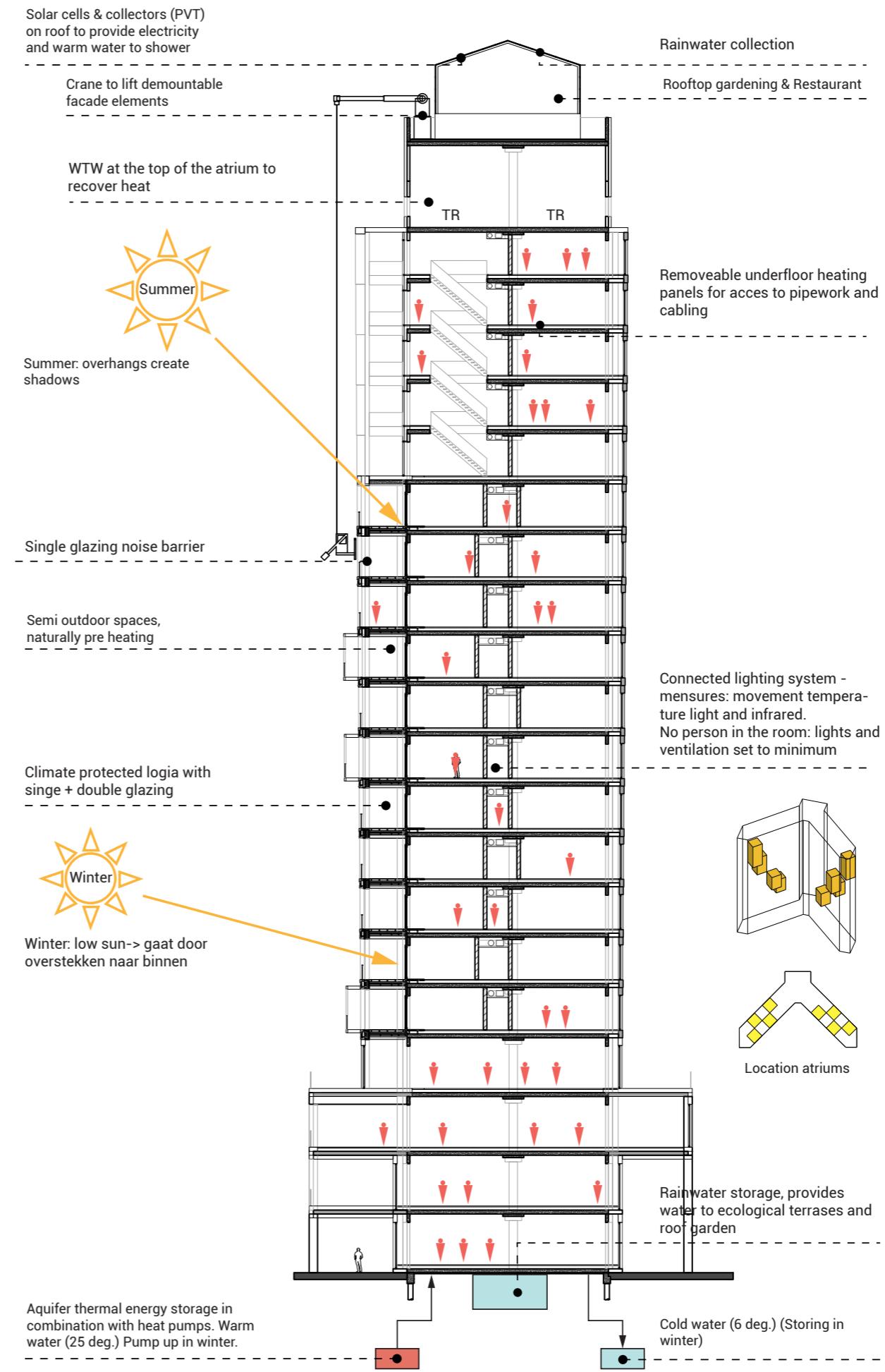
DETAIL V3 & V4 1:20

FACADE DETAILING



Like rooftiles

BUILDING CLIMATE



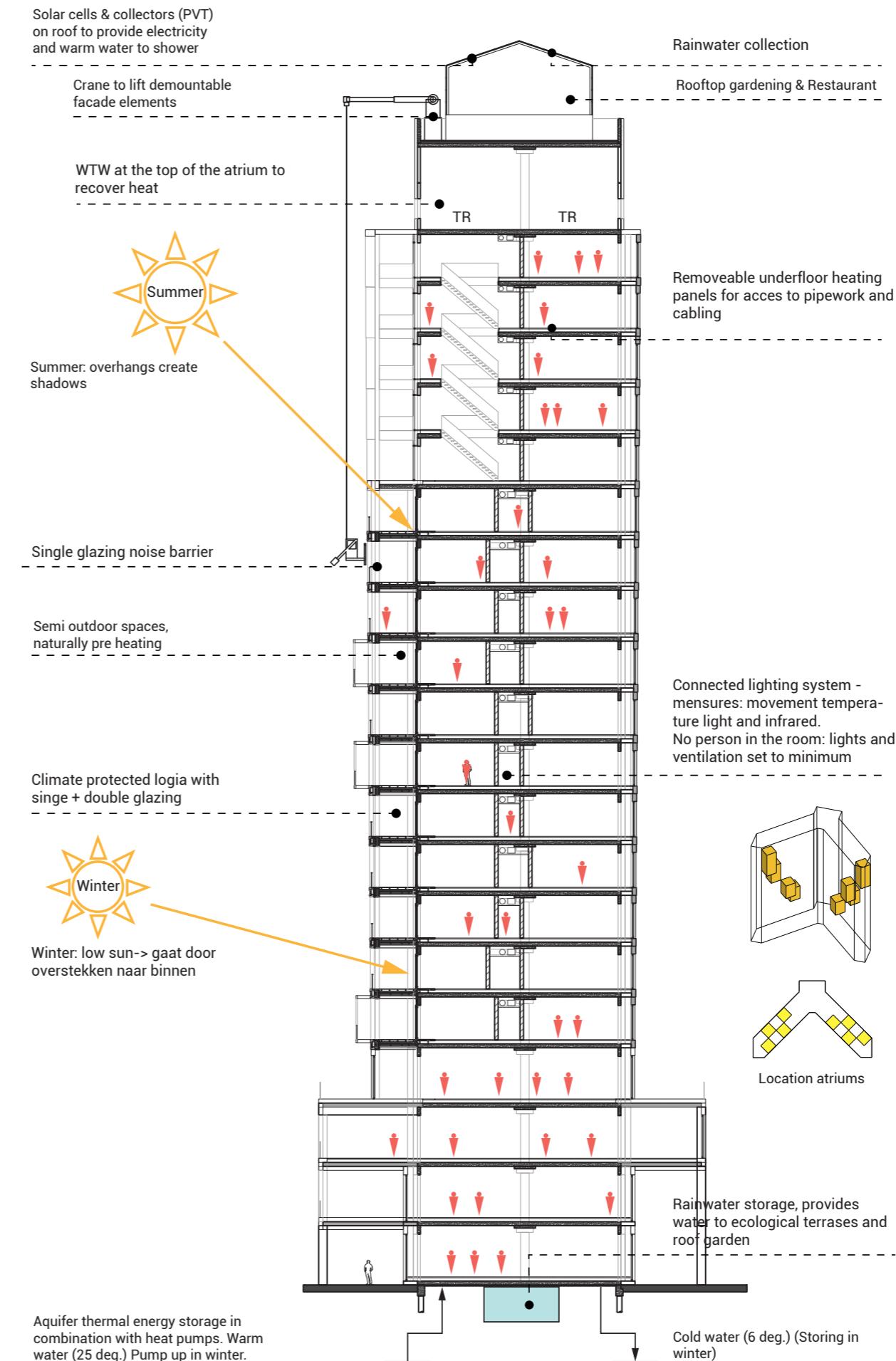
SECTION 1:200

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-brifge-color-hand-drawing-typical-houses-bridge-holland-netherlands-picture-made-liner-image76792169>

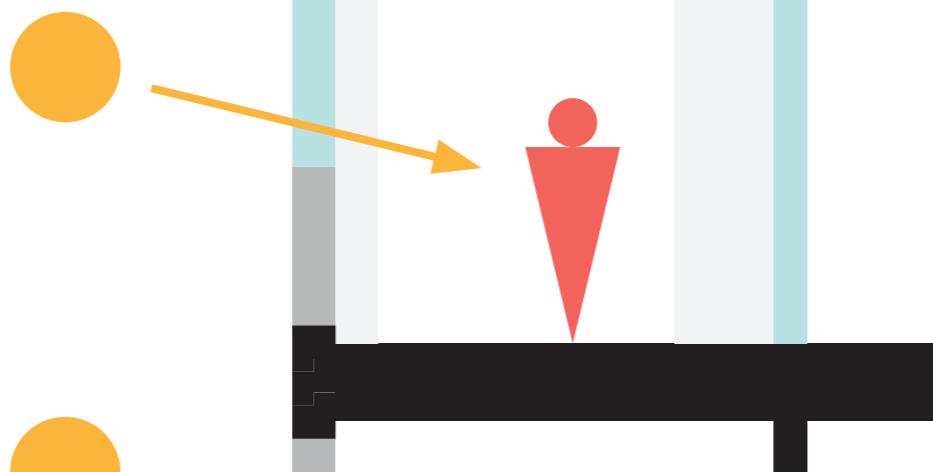


SECTION 1:200

BUILDING CLIMATE

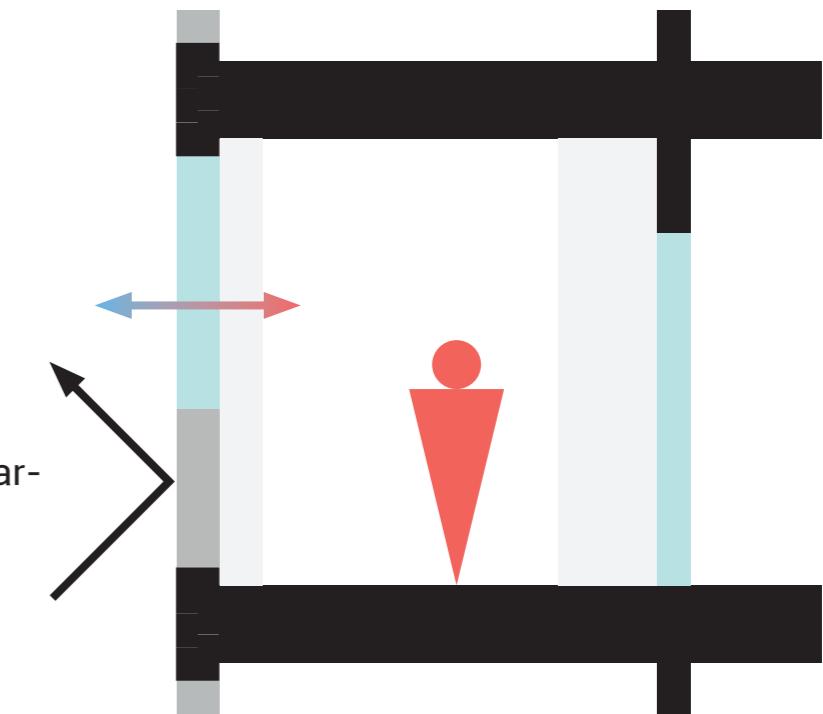
WINTER

Low sun in winter



SPRING

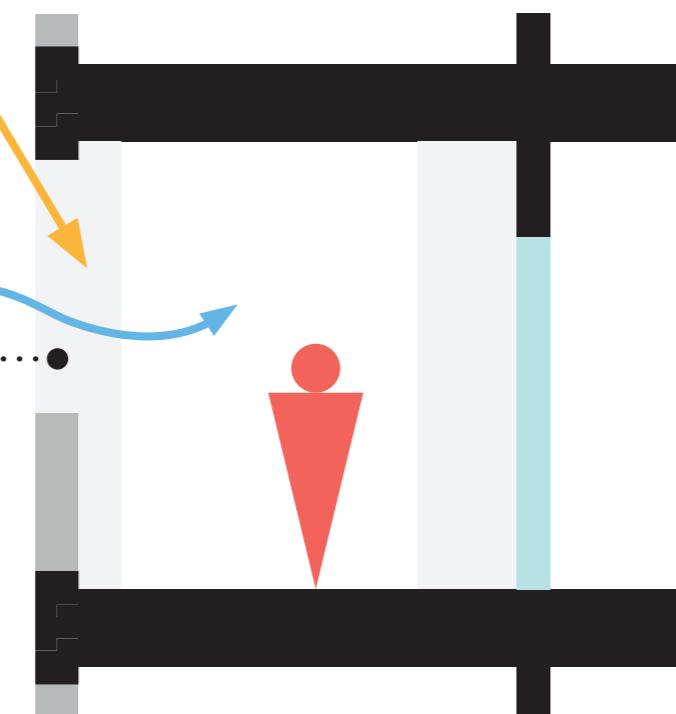
Sound bar-
rier



SUMMER

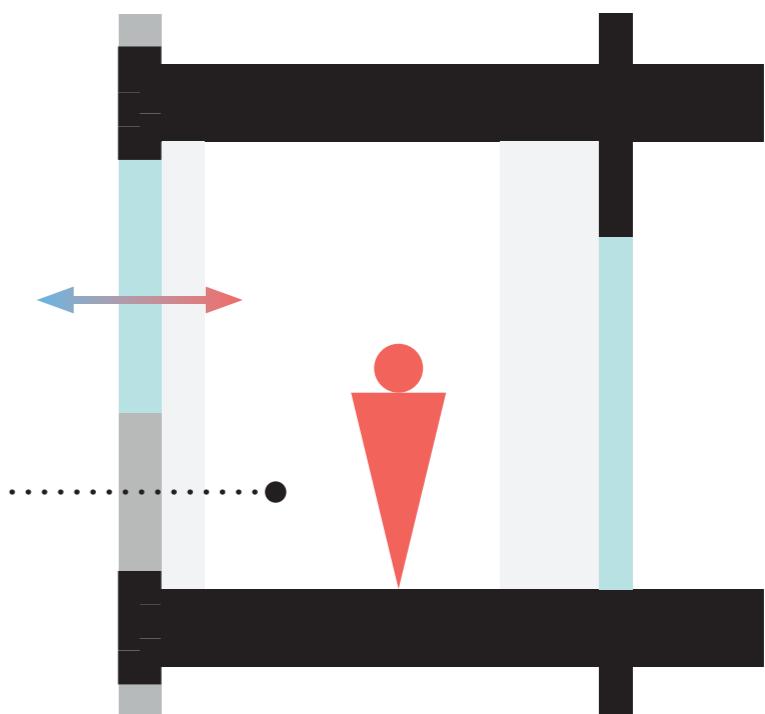
Overhang for shadows in
summer

Glass can be open, also
for cleaning from the



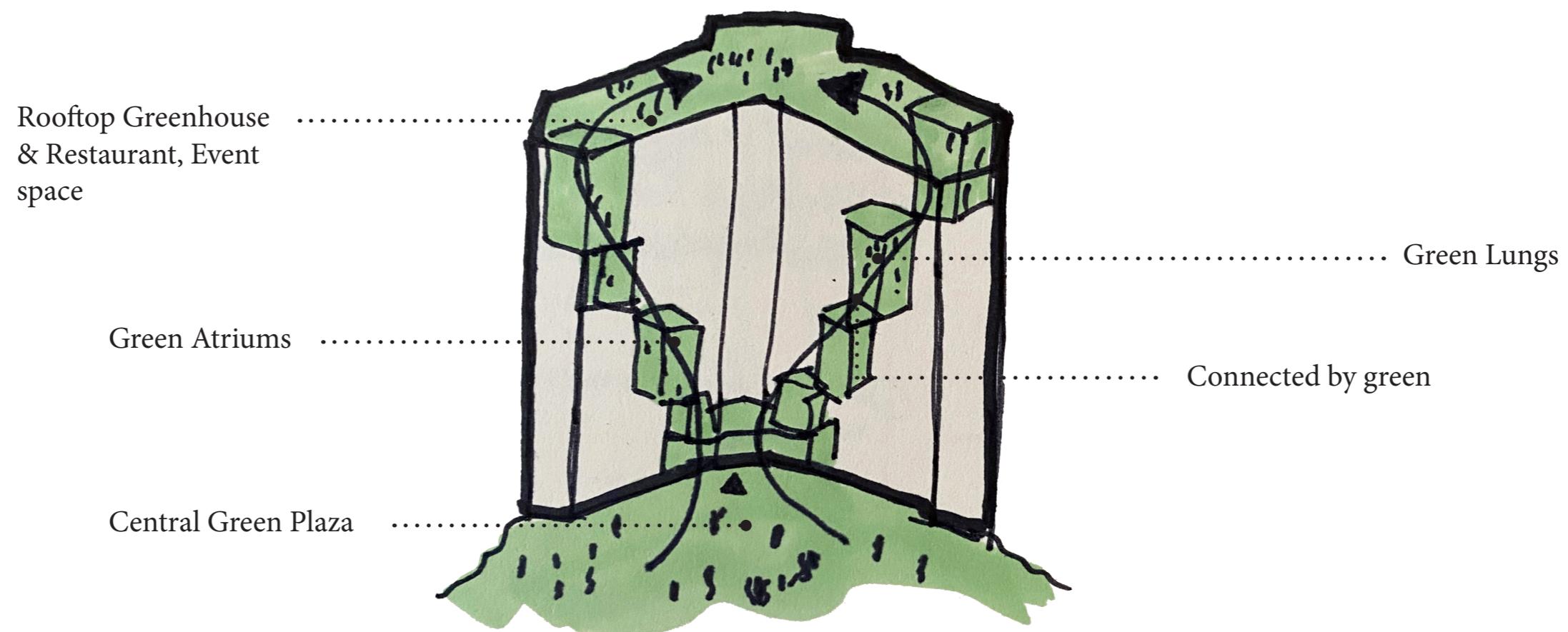
AUTUMN

Climate protected lo-
gia with single + double



STRUCTURE (STRUCTUUR)

SOCIAL & GREEN INTEGRATION

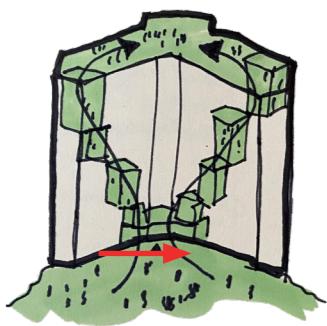


Fully covered access to All facilities in plinth from the main entrance

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

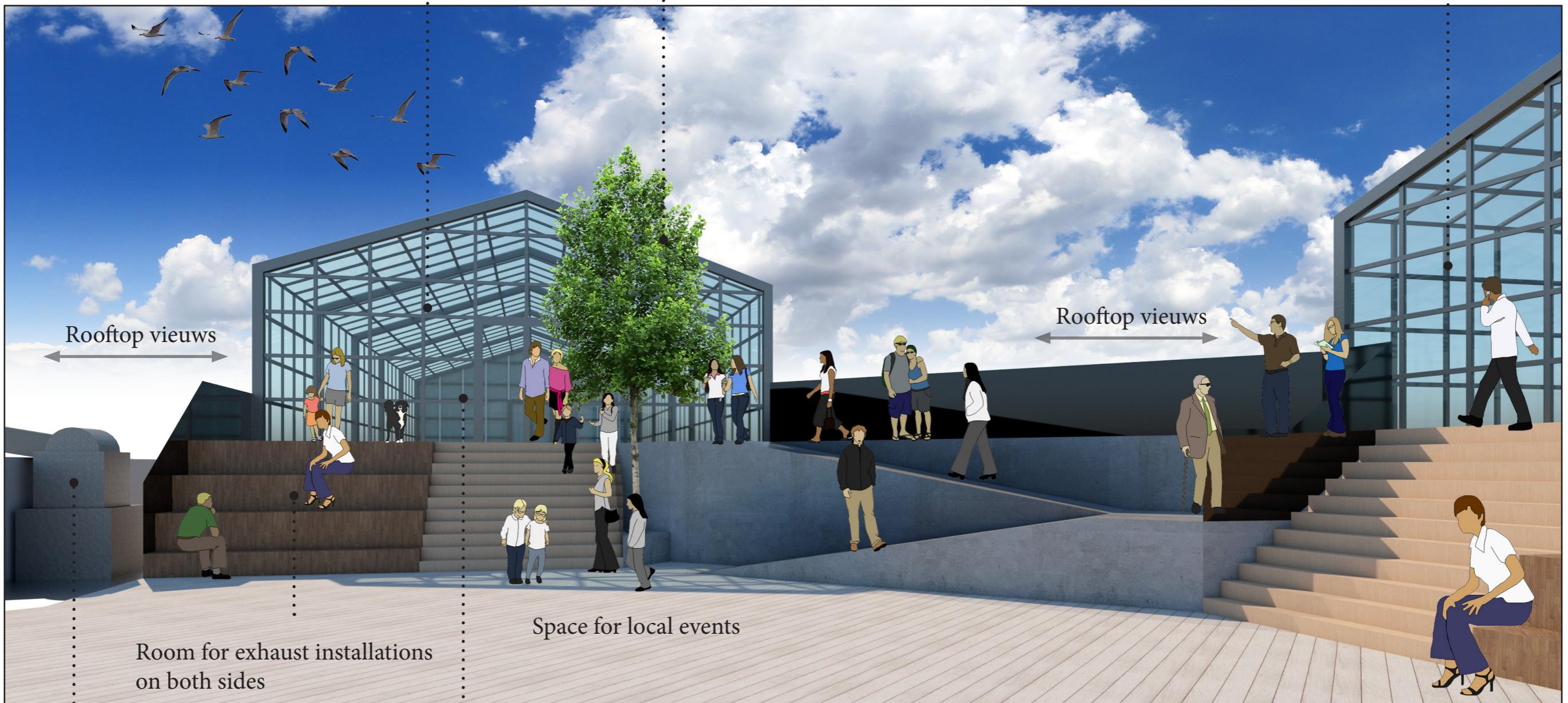
- Fountain to prevent algae growth

Lightweight stainless steel construction

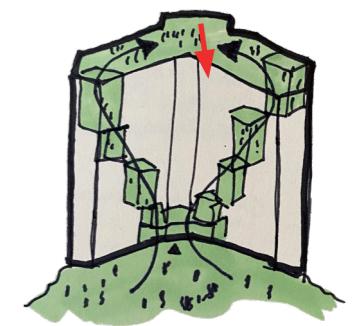
PV For solar energy production

LOCAL FOOD PRODUCTION

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



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



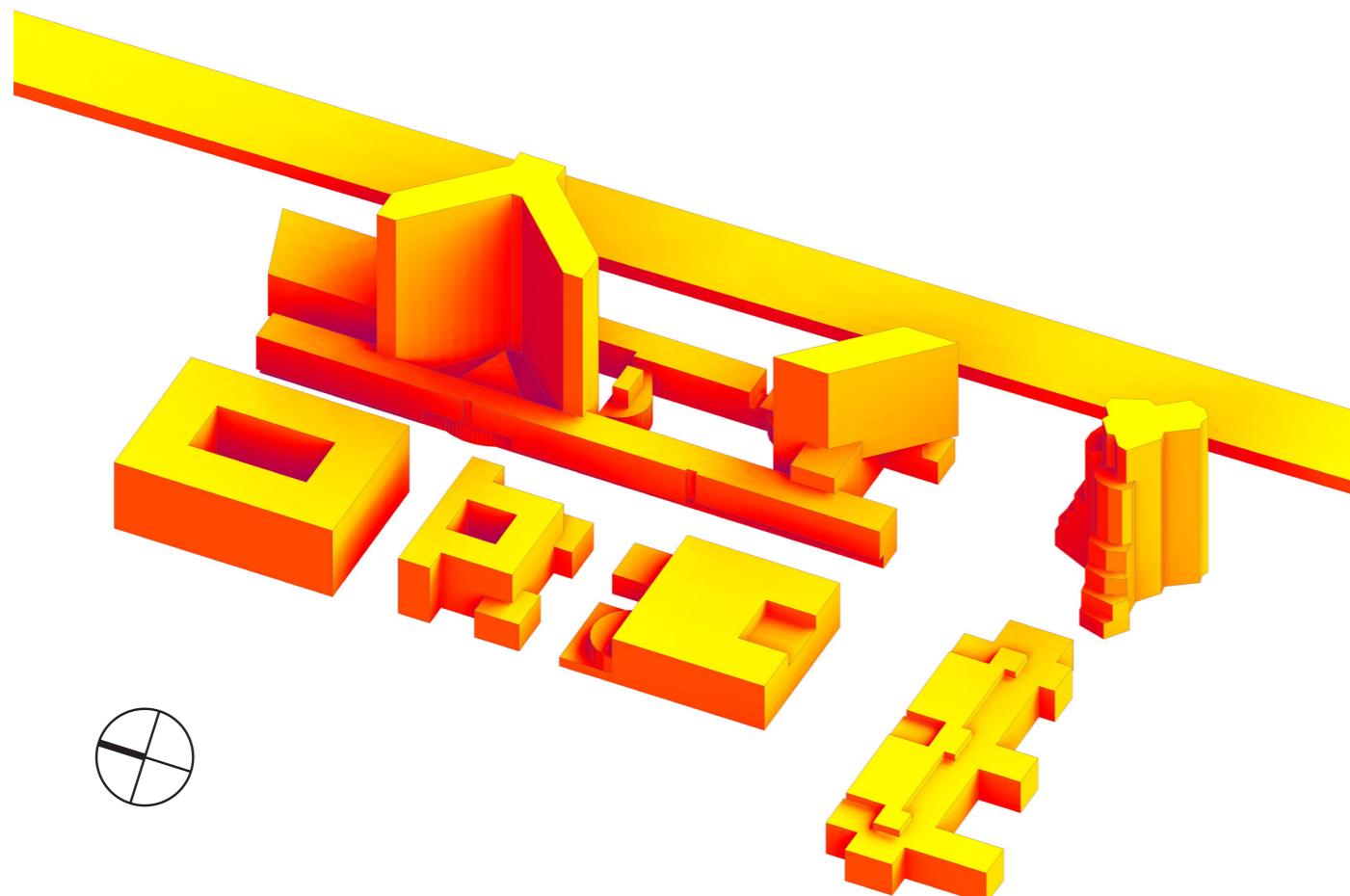
THANK YOU

THEMATIC

DESIGN QUESTION

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

SOLAR ANALYSIS



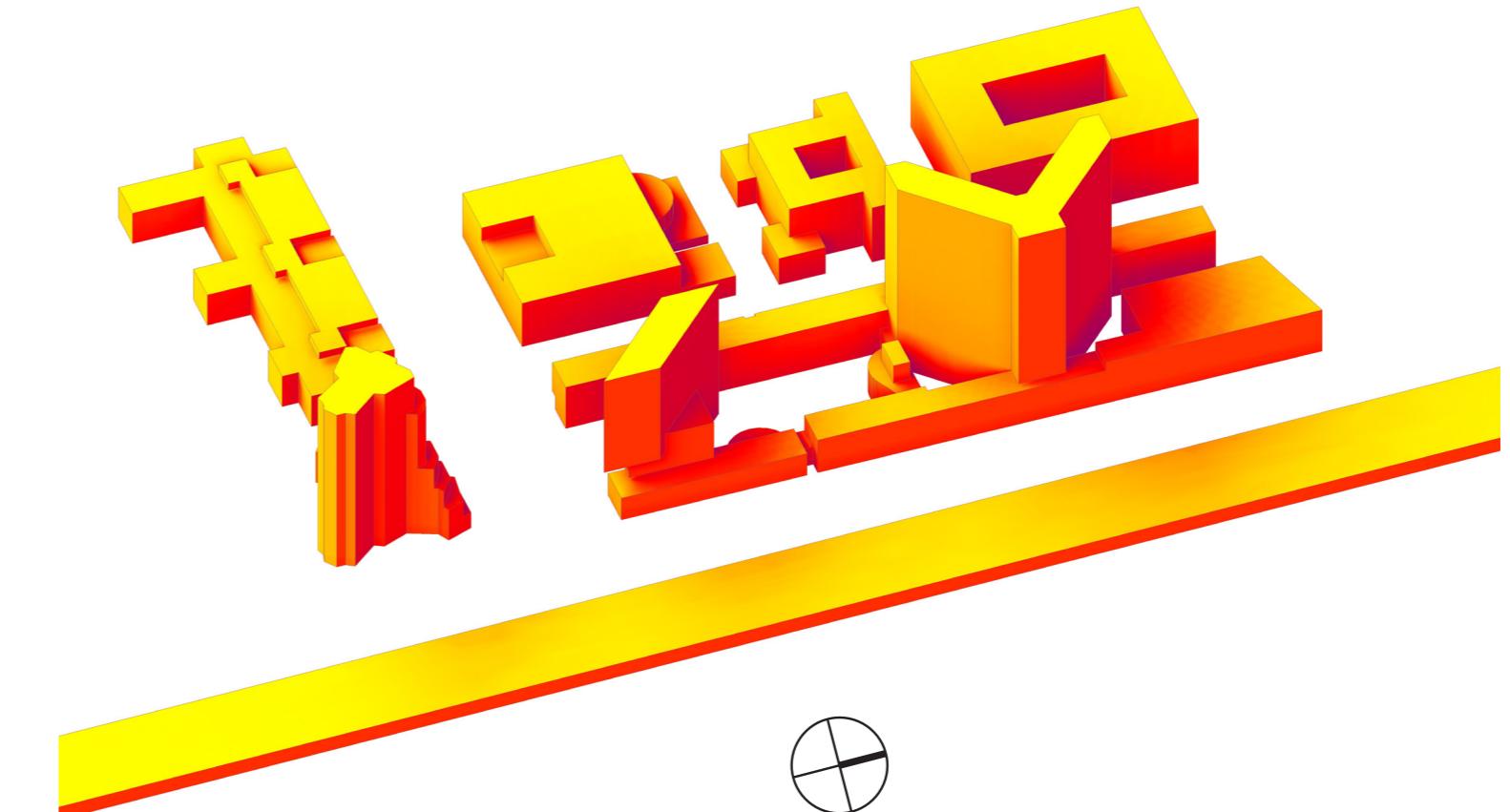
Project location: 52.3870239257813,4.84368276596069
Sun study start date time: 1-1-2010 00:00:00
Sun study end date time: 31-12-2010 23:59:00

Cumulative Insolation

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 exposure to 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 North West facade get the most sunlight exposure, 7 and 5.3 hours respectively.



Atrium

- Vertically connection dwellings
- Spatially high quality space

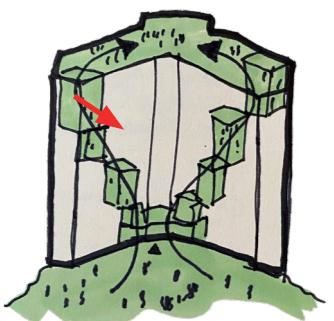
- The green plants serve a cleaning and moisturizing purpose as well as reducing the CO2 concentration of the incoming air in the building

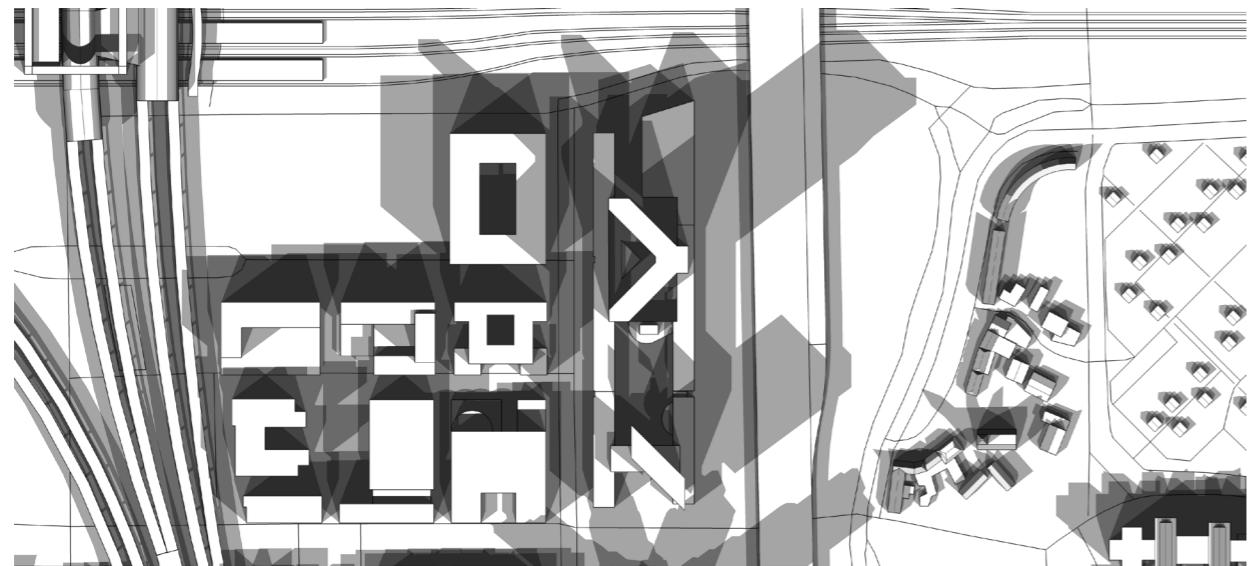


Atrium

- Space for socializing & social coherence between residents

- Glass for maximum openness off the space





21 MARCH

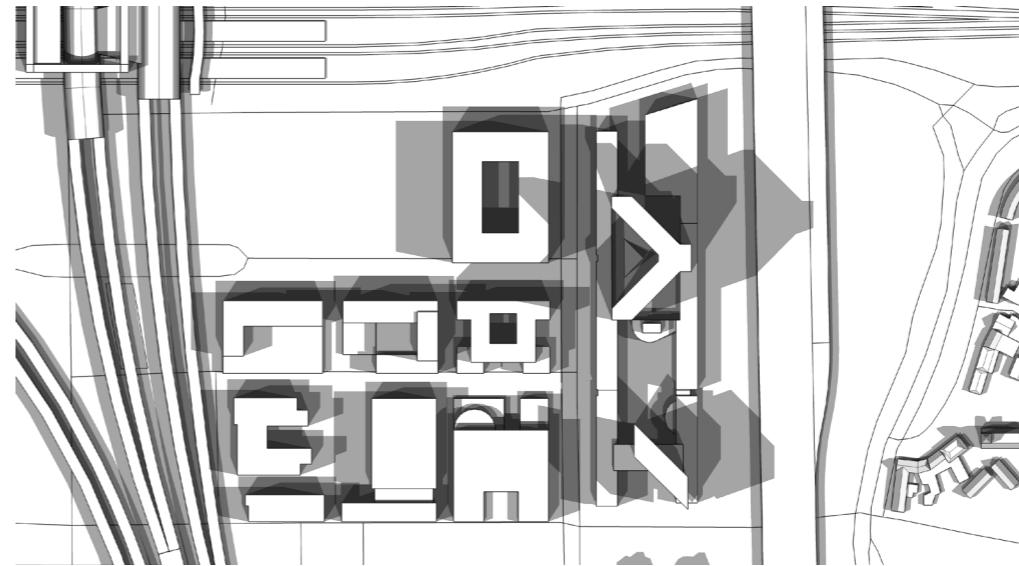
NO	ZO	ZW	NW
3h	8h	3h	5h



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



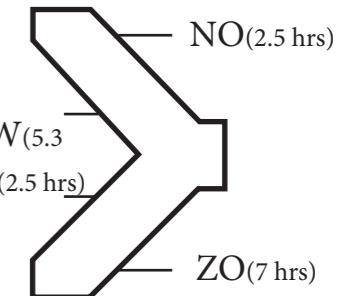
21 JUNE

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

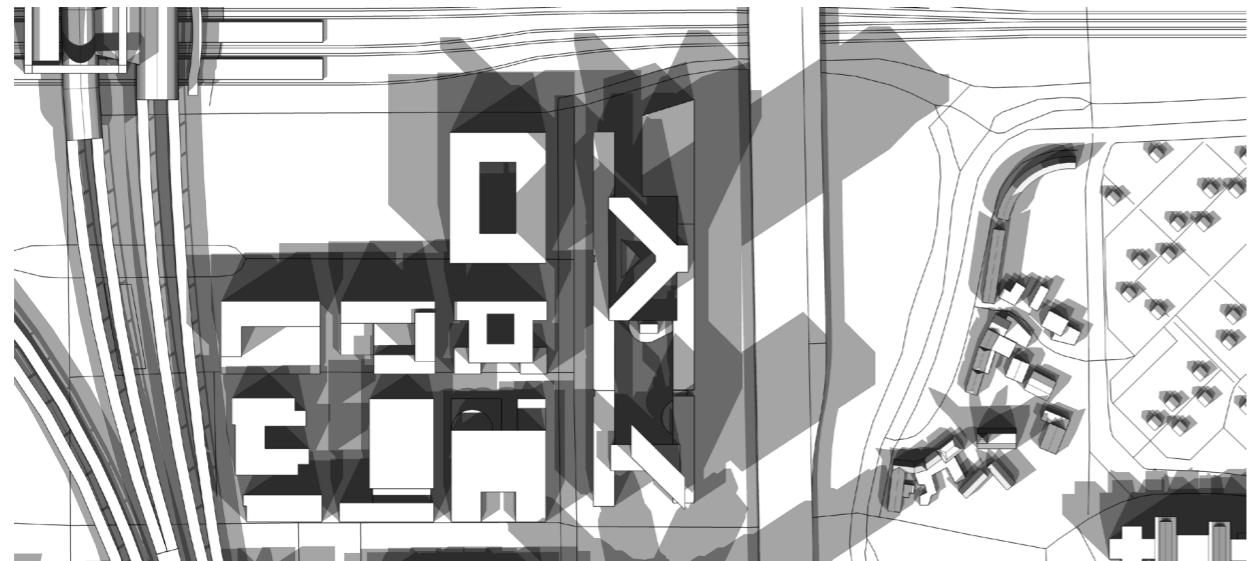
Most exposed façades to sunlight radiation are: the north facade. The Kingsfordweg and inner courtyards are free of shadow during the midday.

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.



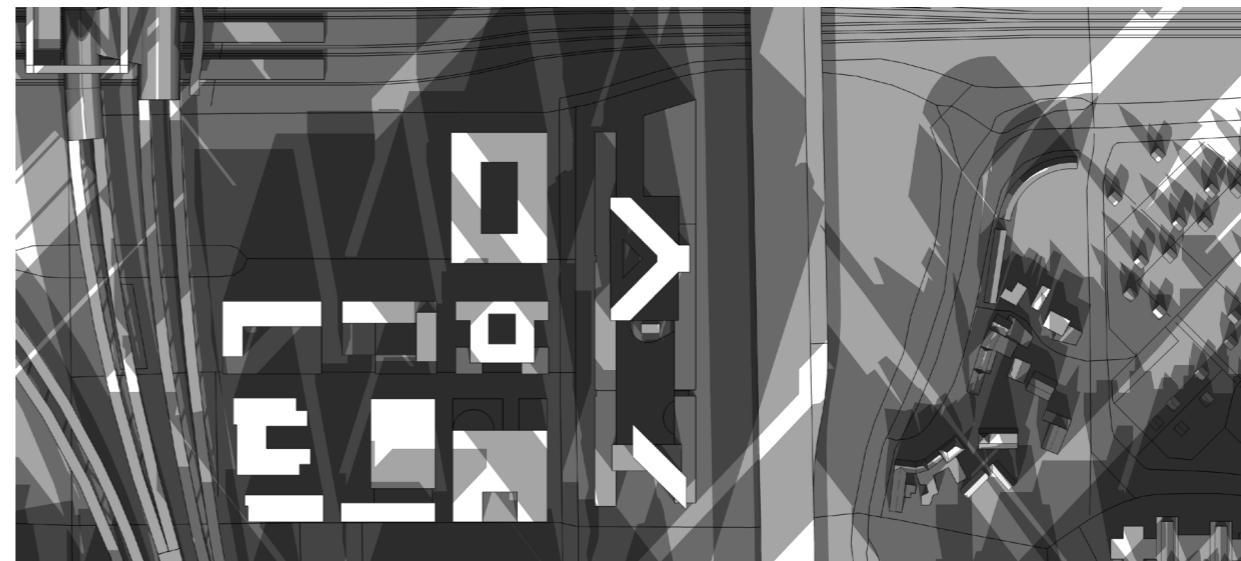
21 SEPTEMBER

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

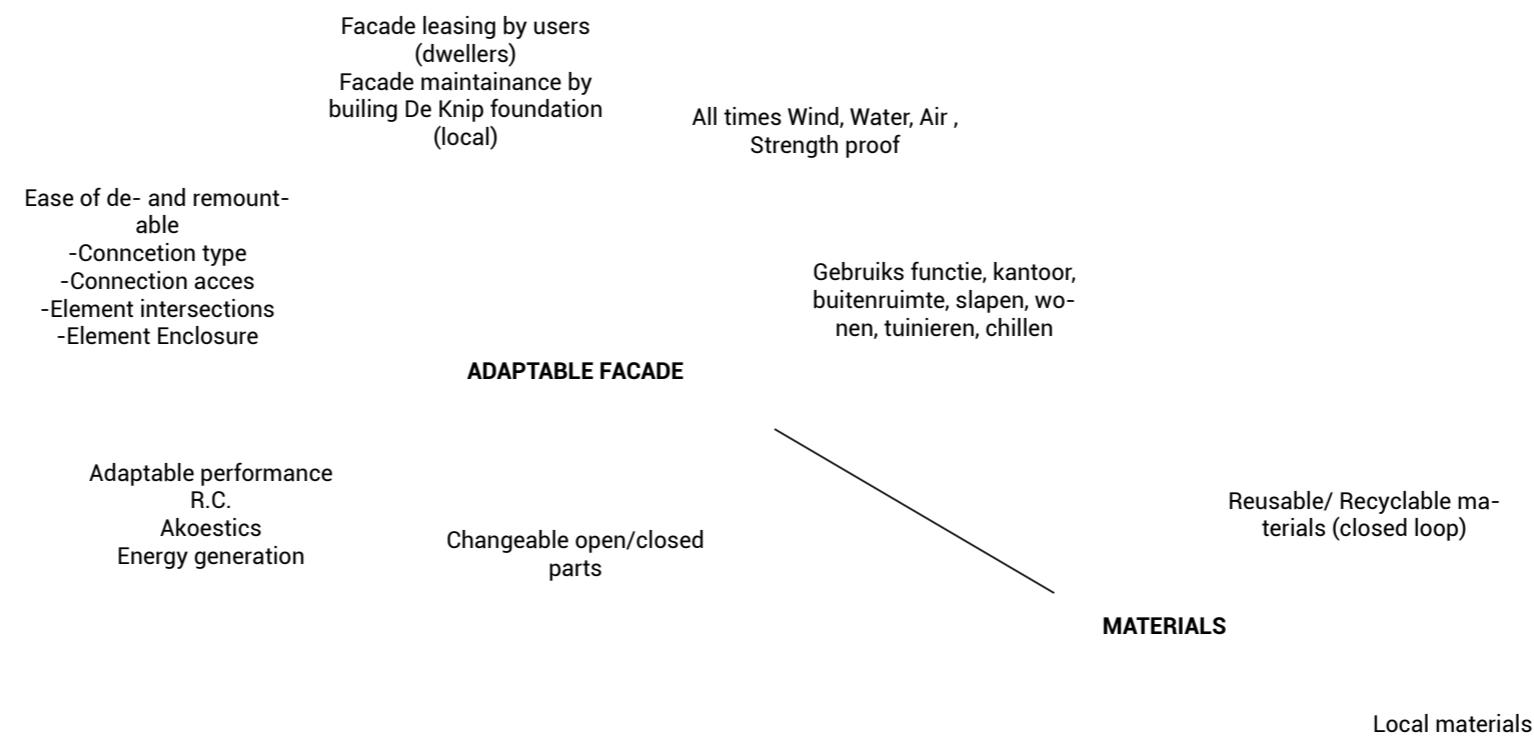
NO	ZO	ZW	NW
0h	6h	0h	3h

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



PRO'S

- Performance updatable
- Focus op lange levensduur (hoge kwaliteit)
- Locally replacement/repairs/maintenance
- Creeert lokaal werk (economische voordelen)
- geen conflict tussen meedere belangen partijen (verschillende componenten en beheerders)

HOW IT FITS IN THE CONCEPT

- Quality, economic benefits, customer benefits, environmental benefits, energy benefits

BONUS SLIDES

HARVEST COMPONENTS

Natural stone column cladding

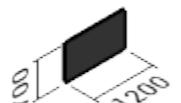
- Main material: Nero Impala Granite Polished
- Weight of element:



D3.05 Natural stone cladding 30mm

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

6109pts.

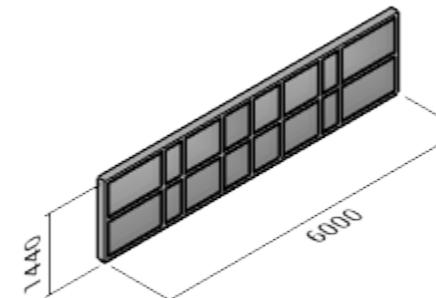
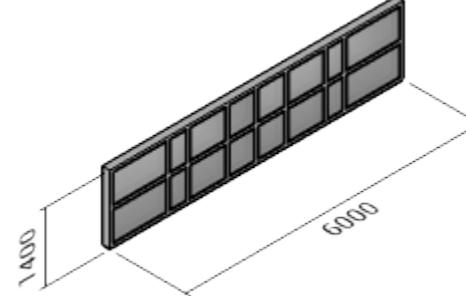


Fixed dubbel glazed window-

- Main material:
- Weight of element:

137pts.

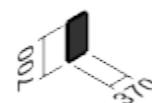
Low rise & High rise



Natural stone column cladding 30mm

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

912pts.

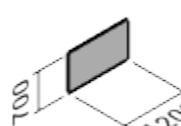


2mm Alum. Cassette cladding

- Main material:
- Weight of element:

2734pts.

High rise



Insulation 80mm

- Main material:
- Weight of element:

26109m2.

Low rise & High rise

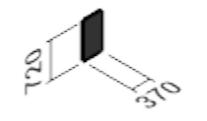
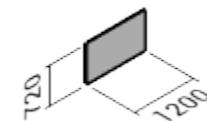


D25.03 Fixed dubbel glazed window-

- Main material:
- Weight of element:

320pts.

High rise



D25.05 2mm Alum. Cassette cladding

- Main material:
- Weight of element:

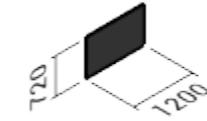
11662pts.

High rise

Natural stone column cladding 30mm

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

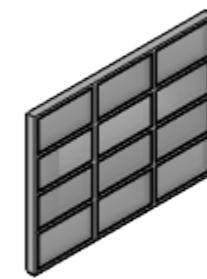
3720pts.



D33.03 Natural stone column cladding

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

1824pts.



Additional Dubbel glazed windowframe

- Main material:
- Weight of element:

8668m1 Alu

Low rise & High rise

2441m2 Glass

BONUS SLIDES

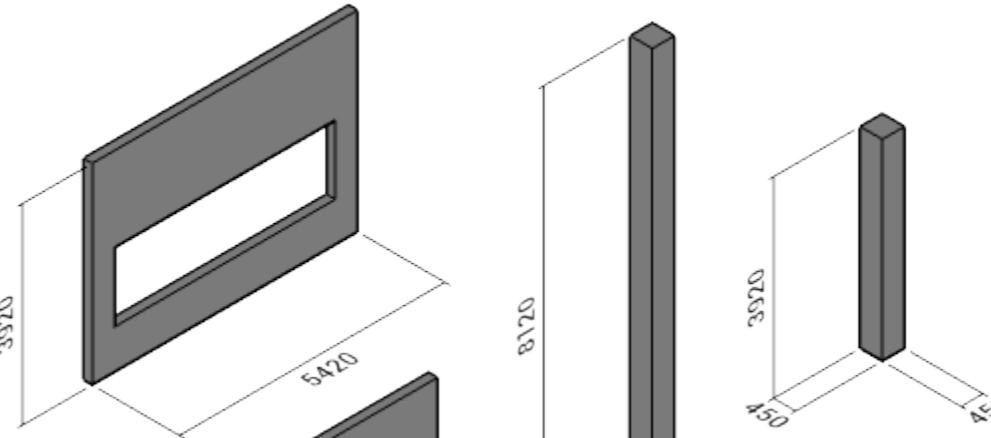
HARVEST COMPONENTS

D3.01b Prefab facade element

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

Low rise

17pts.

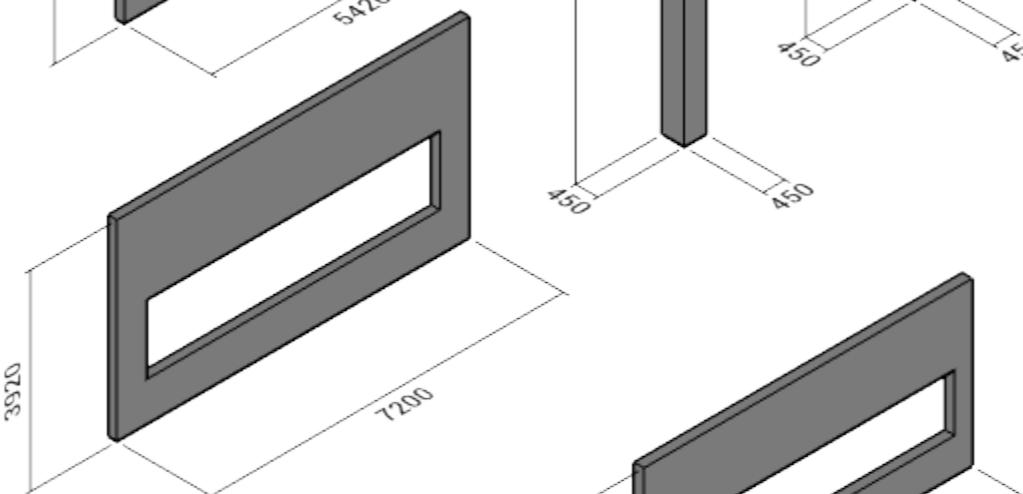


D3.01 Prefab facade element

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

Low rise

149pts.



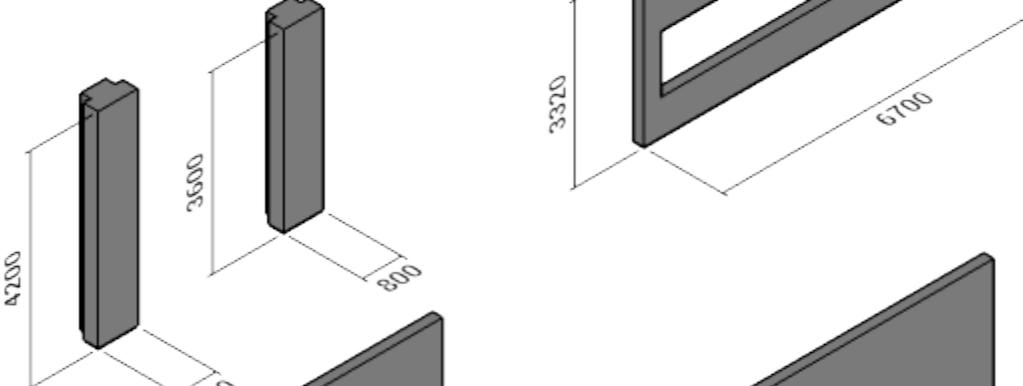
D33.01 &

Prefab concrete column

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

High rise

96pts.



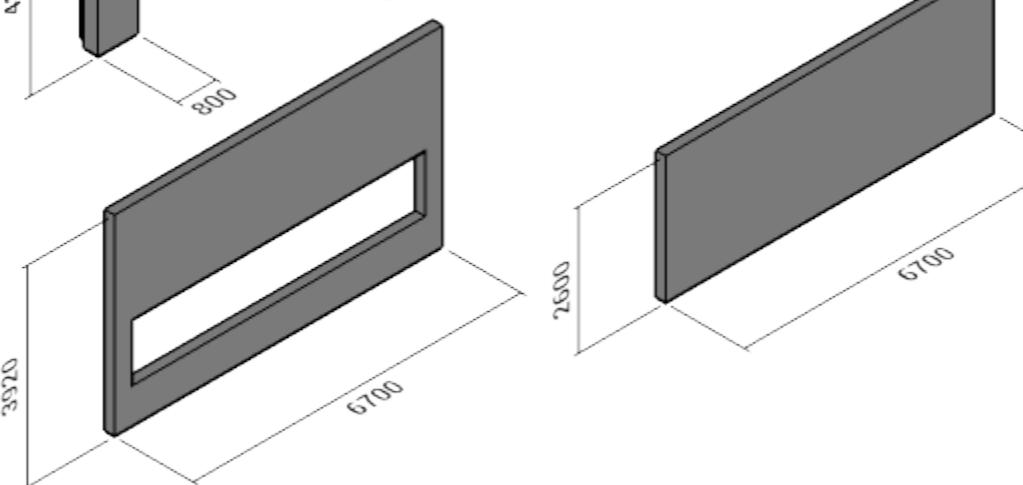
364pts.

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

