

Esmee Heemskerk (5079543)

Research & Design: Studying and being well

90% of our lives are indoors

Rice (2019); Marsh et al. (2019); Lamberti et al. (2021)

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Rice (2019); Marsh et al. (2019); Lamberti et al. (2021)



30% of university buildings is below standard

Heijer et al. (2016)

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Heijer et al. (2016)



Headaches, fatigue, and concentrations problems

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Rice (2019); Marsh et al. (2019); Lamberti et al. (2021)



30% of university buildings is below standard

Heijer et al. (2016)



Headaches, fatigue, and concentrations problems

=

Environmental stress

Awada et al. (2023)

Environmental stress

Awada et al. (2023)

Environmental stress

Awada et al. (2023)

+

Personal stressors (e.g. academia, housing, financial)

Regehr et al. (2013); Robotham (2008); Aalbers (2023)

Environmental stress

Awada et al. (2023)

+

Personal stressors (e.g. academia, housing, financial)

Regehr et al. (2013); Robotham (2008); Aalbers (2023)

=

Negative impact on academic performance

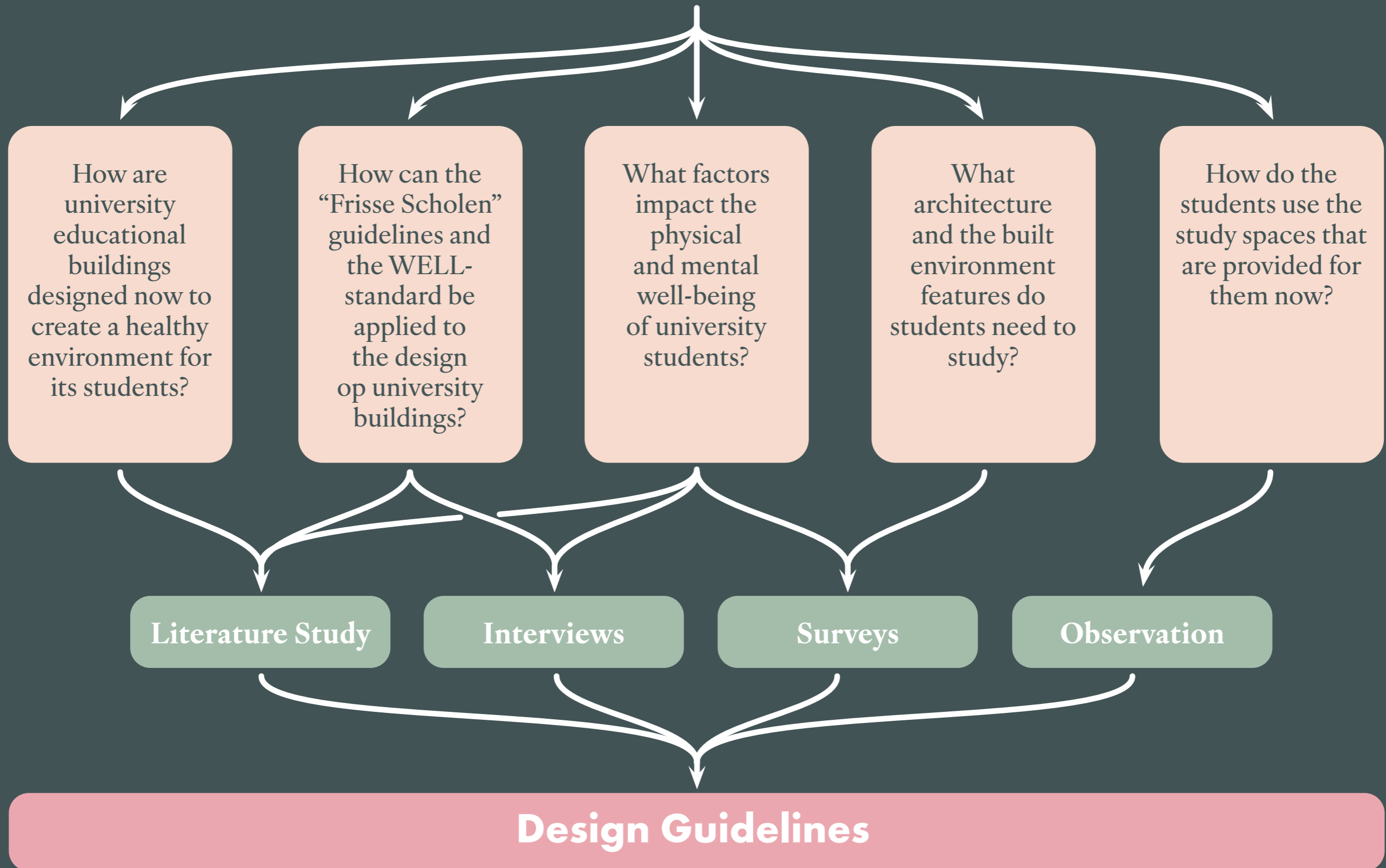
Zhong et al. (2022); Lau et al. (2014); Awada et al. (2023)

How can the architectural and built environment design of a **university educational building improve the physical and mental well-being of its students?**

“(...) a typology built to house both formal education and informal study across the institution – large-scale structures comprising an individualised mix of lecture theatres, classrooms, and casual learning spaces that, crucially, are not affiliated with any single faculty or department but used by the whole university community.”

Coulson et al. (2023, p. 33)

How can the architectural and built environment design of a university educational building improve the physical and mental well-being of its students?

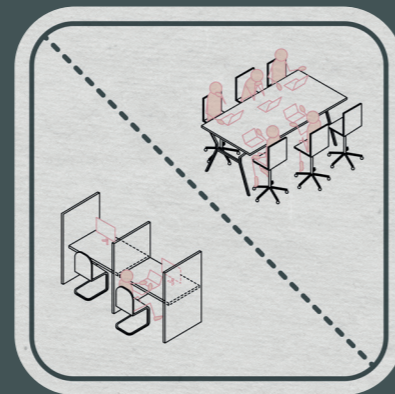


Guidelines

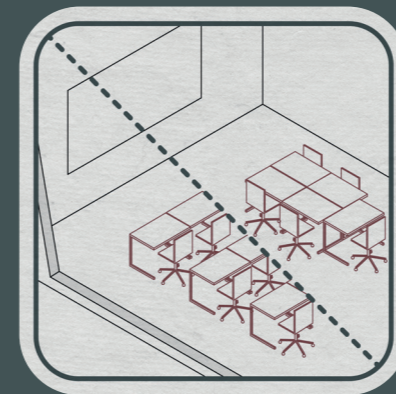
Architecture & the Built Environment



Classrooms



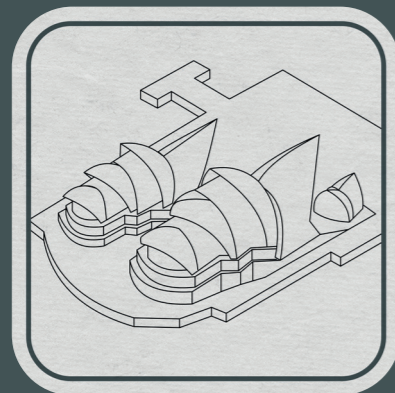
Study Spaces



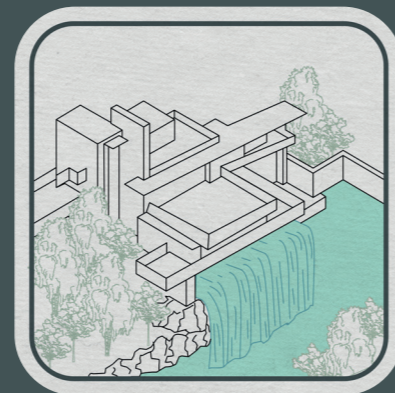
Flexibility



Nature Incorporation



Nature Inspiration



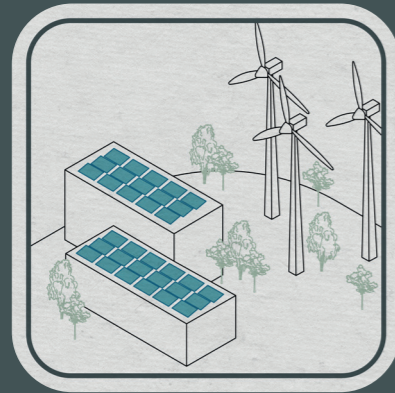
Nature Interaction



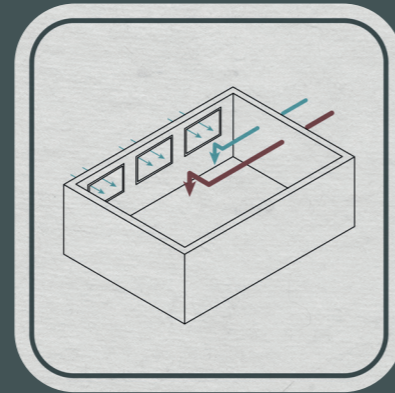
Architecture

Guidelines

Indoor Environment



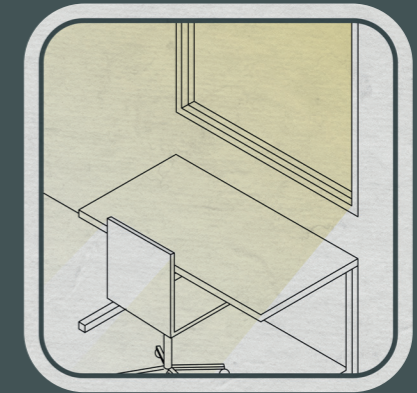
Energy



Air Quality



Temperature



Daylight



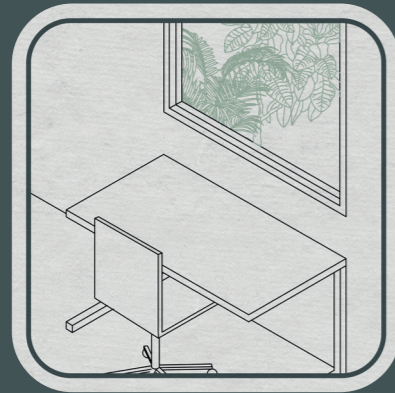
Sunscreen



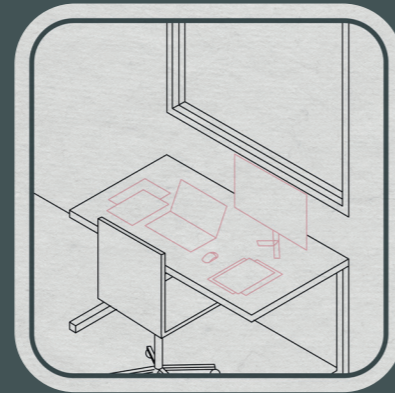
Noise

Guidelines

Indoor Design



Views of Nature



Space



Personal Control



Personal Control



Movement

The Design: Voxel

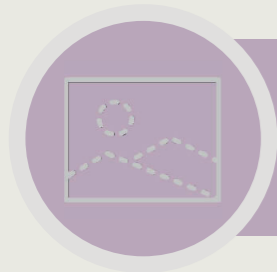
Location vision



TU Delft Campus

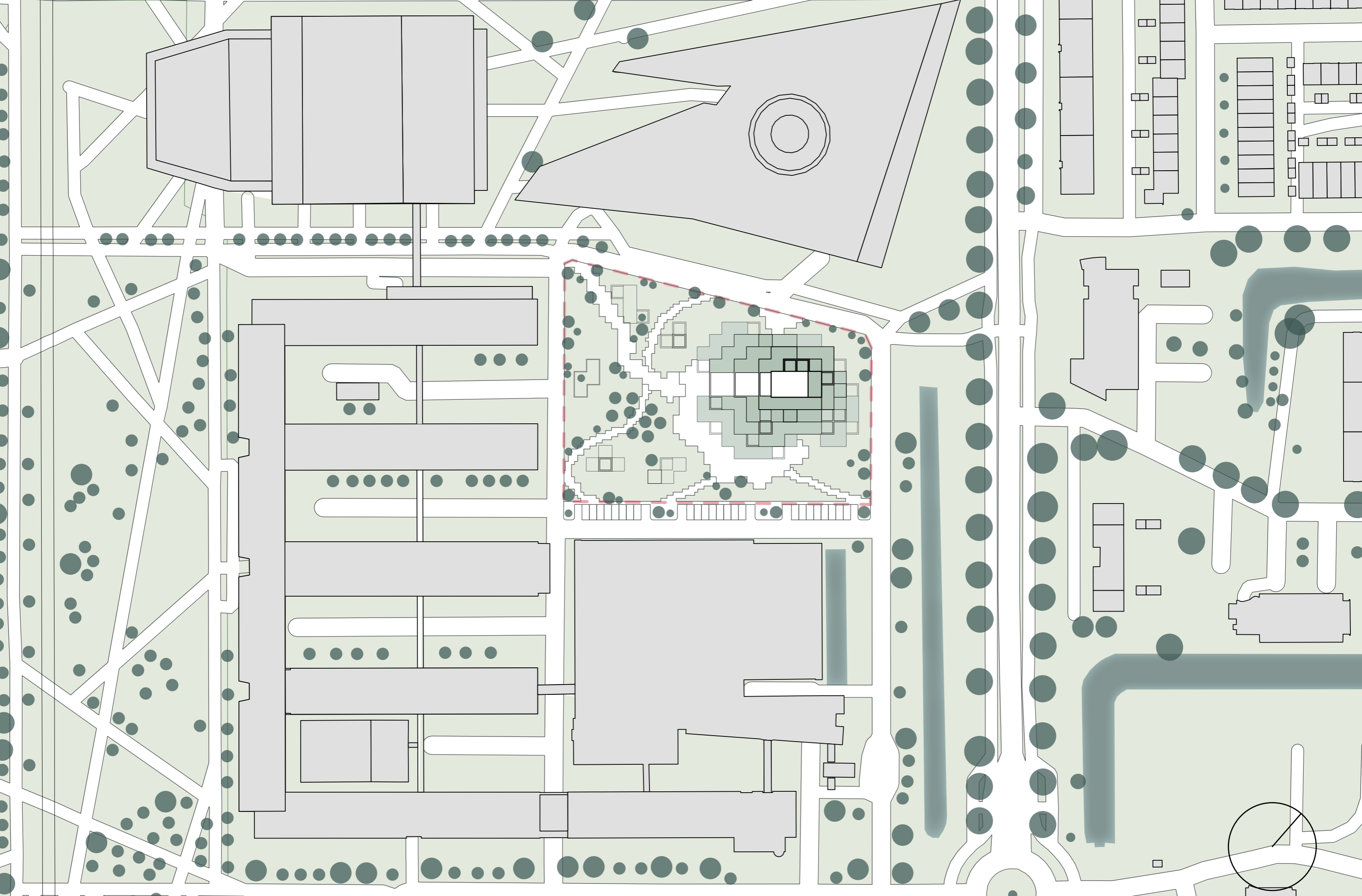


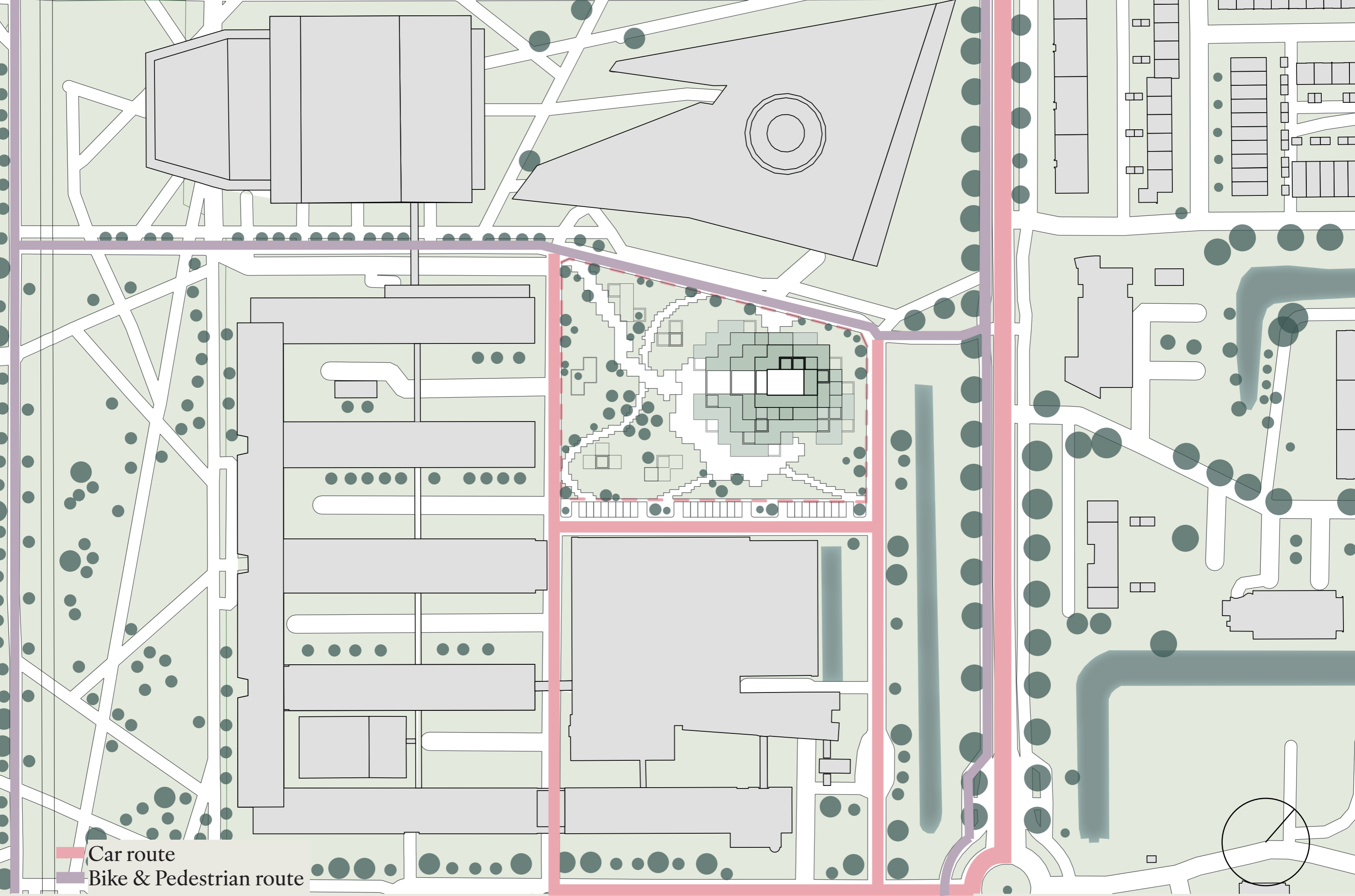
Central location



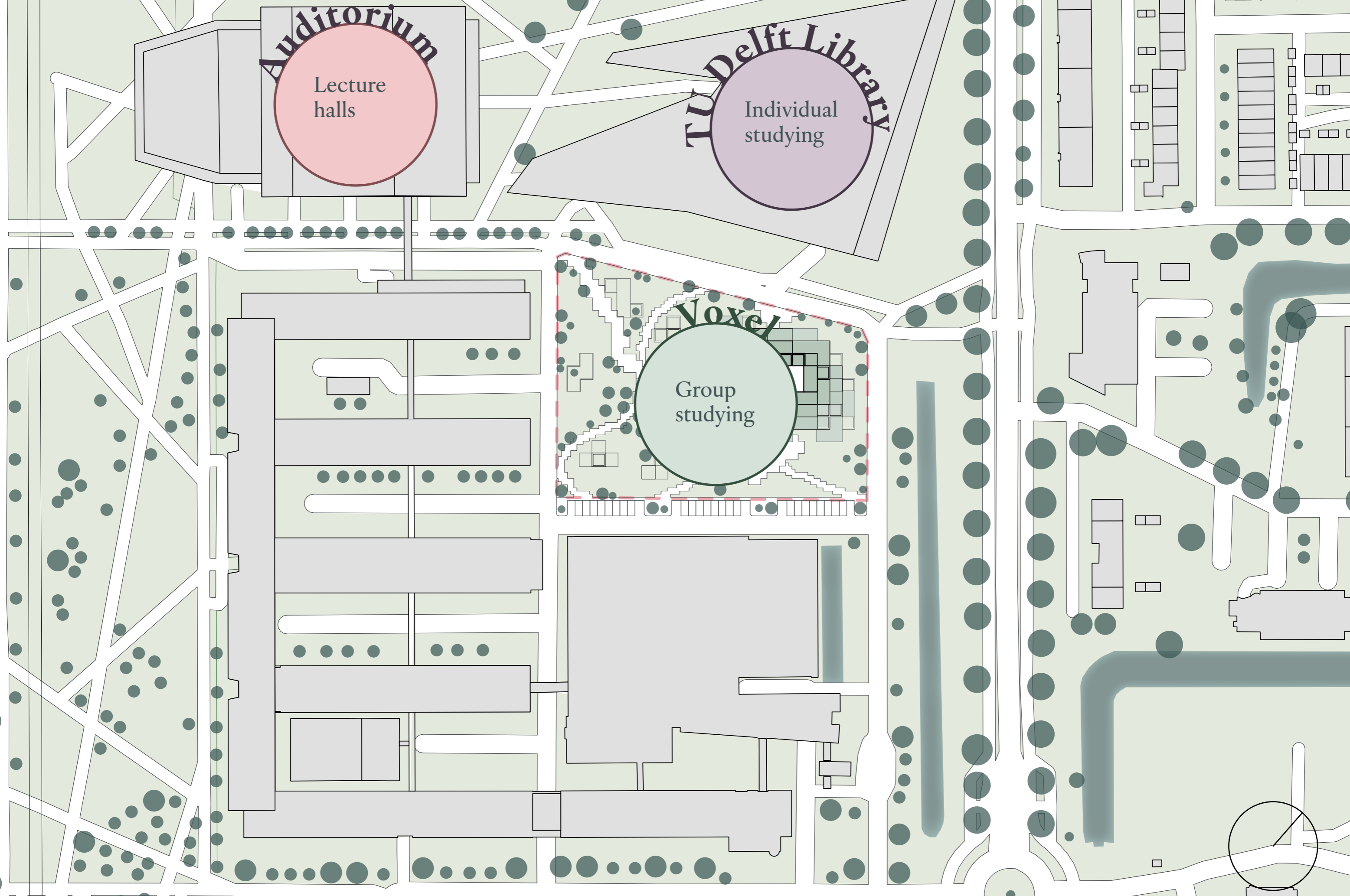
Empty plot







Car route
Bike & Pedestrian route



Library



Auditorium



Voxel

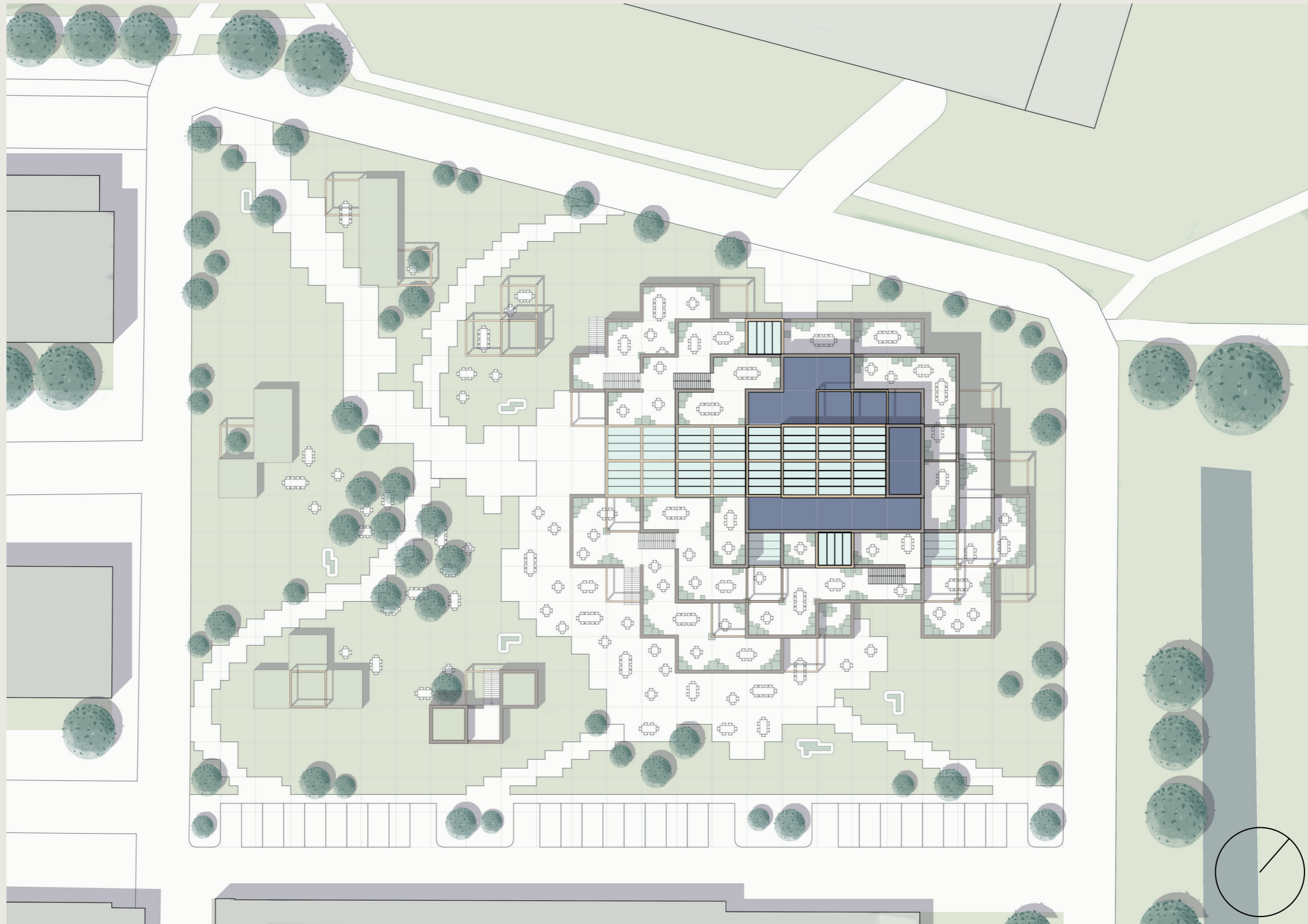
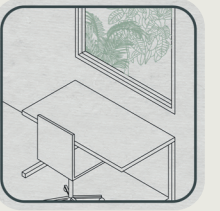


Modernism

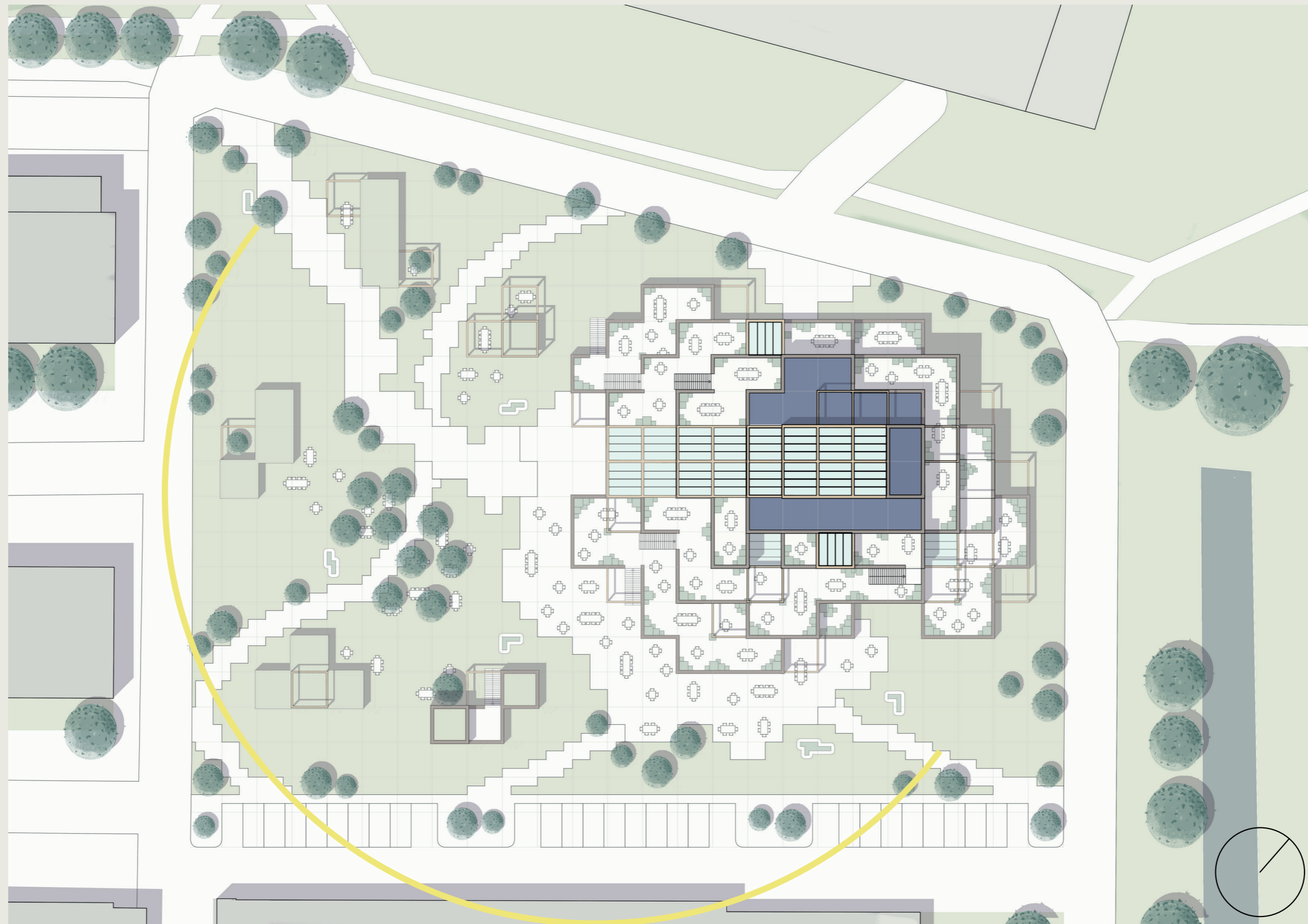
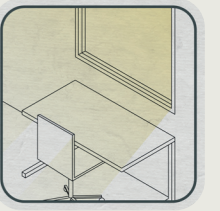
Brutalism

Biophilic Design

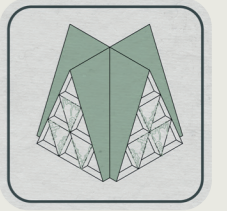
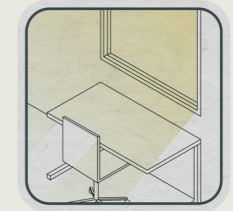
The landscape design

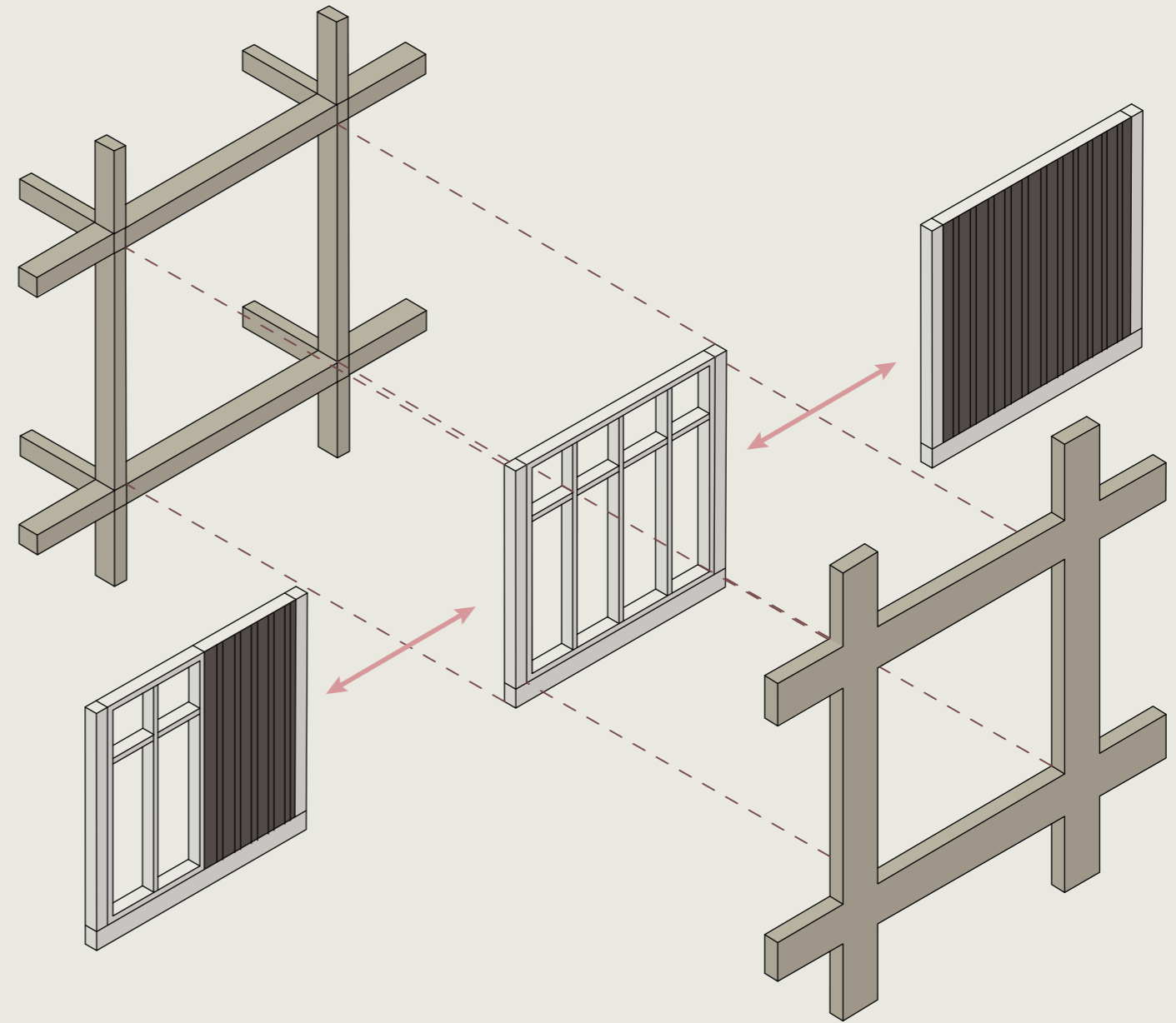
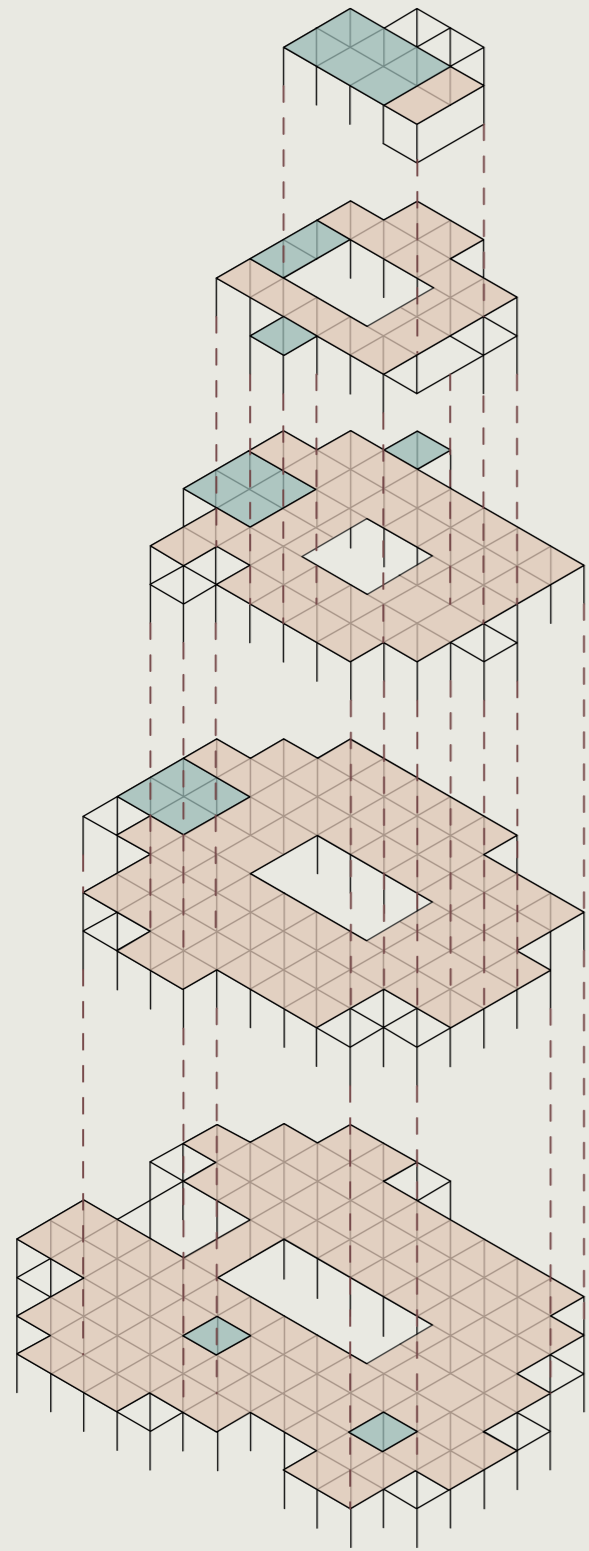


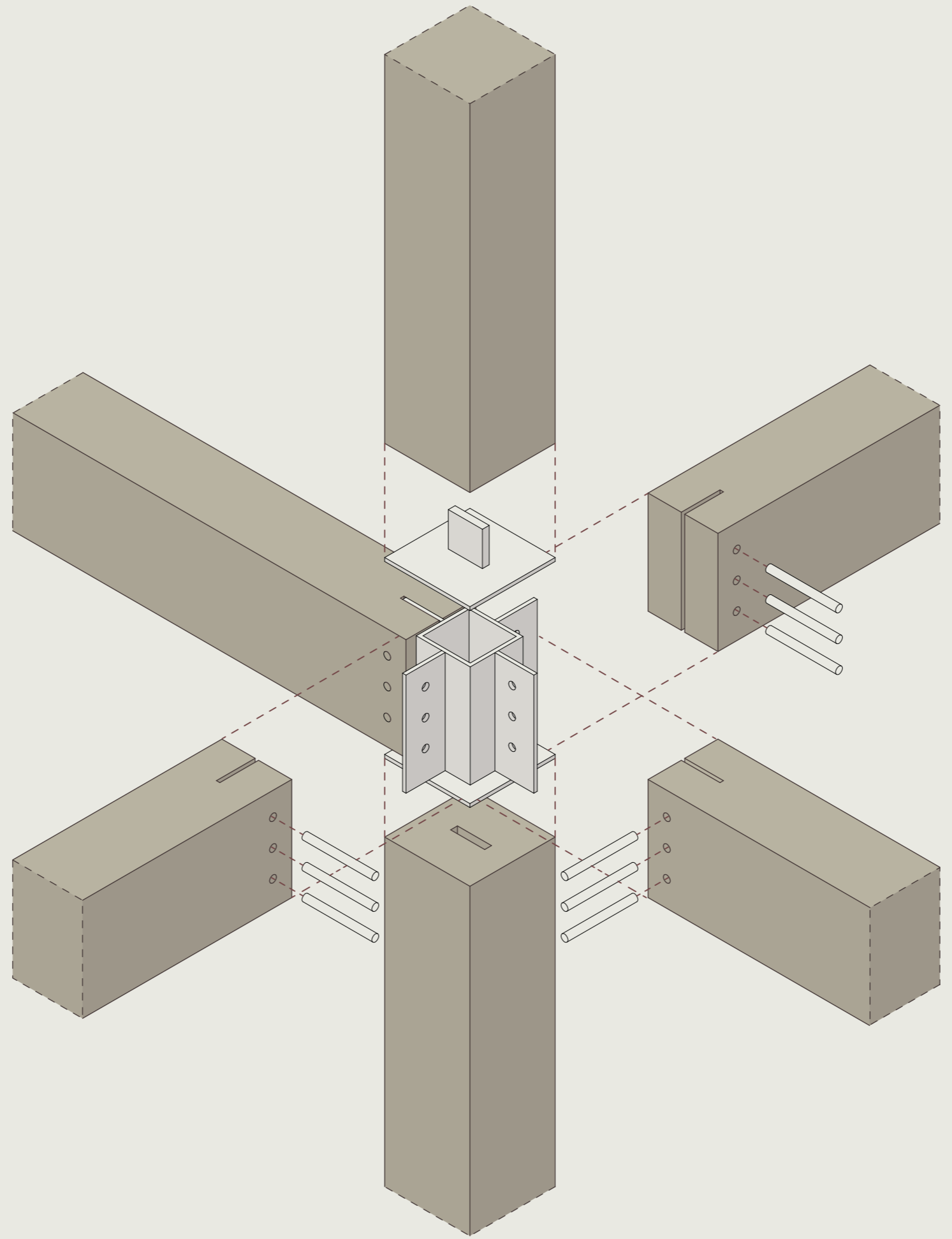
The landscape design



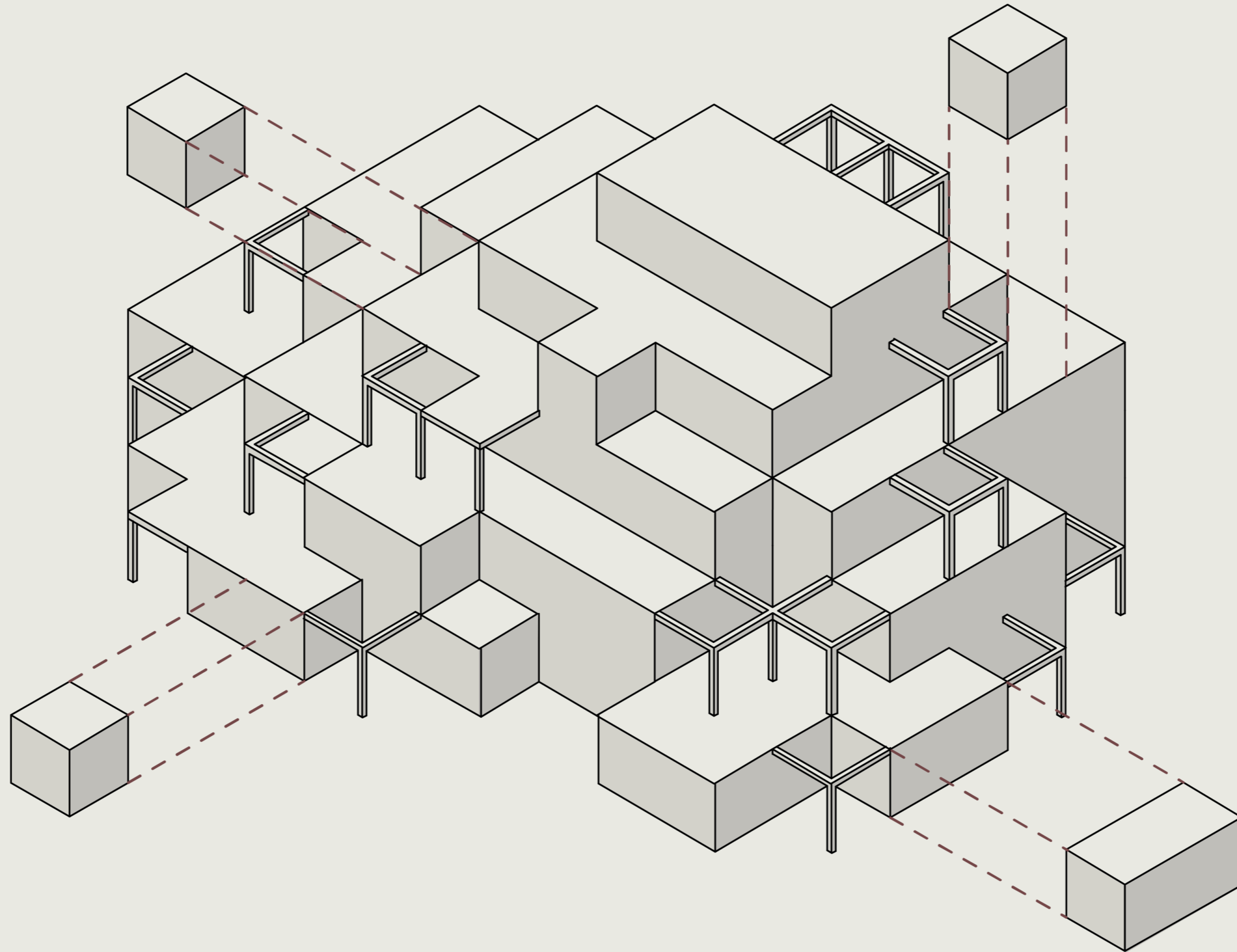
The outdoor seating

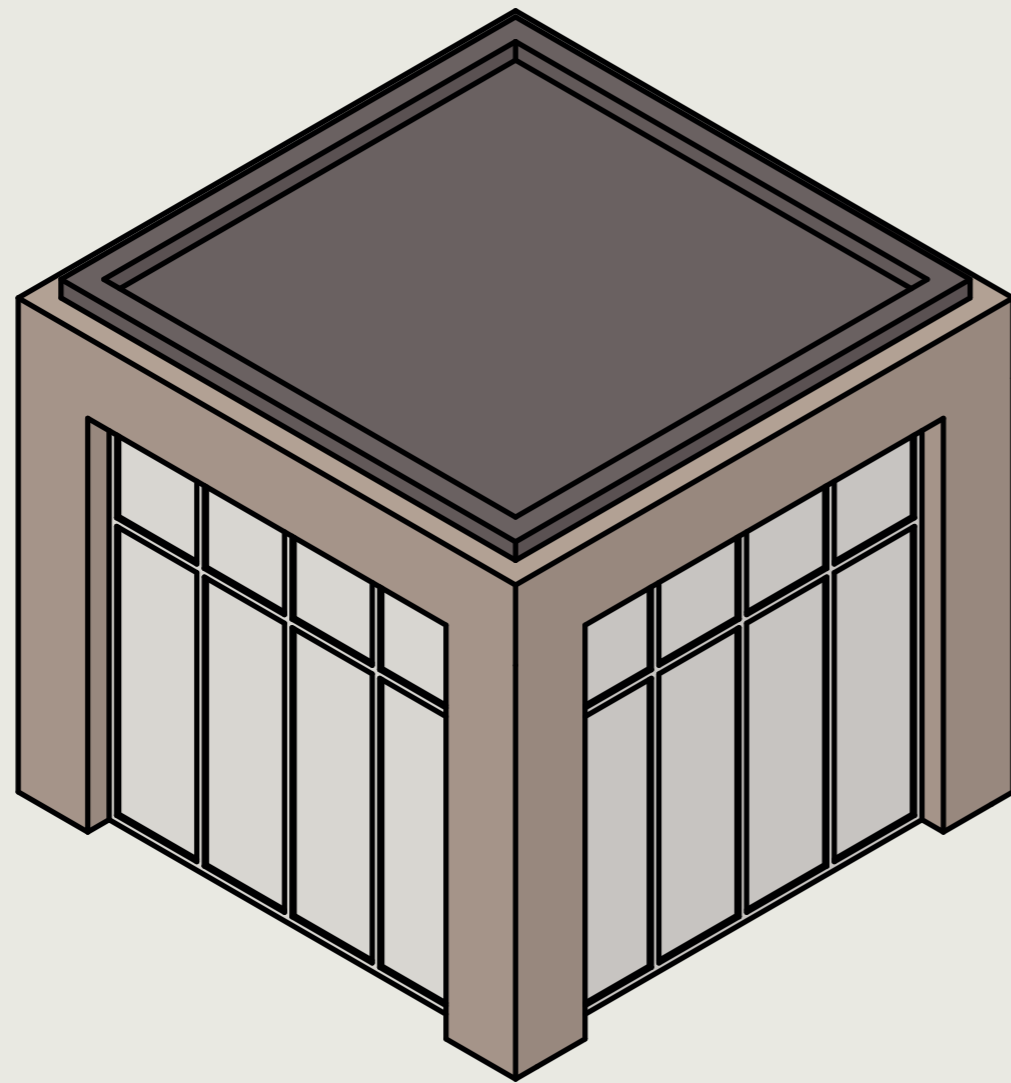


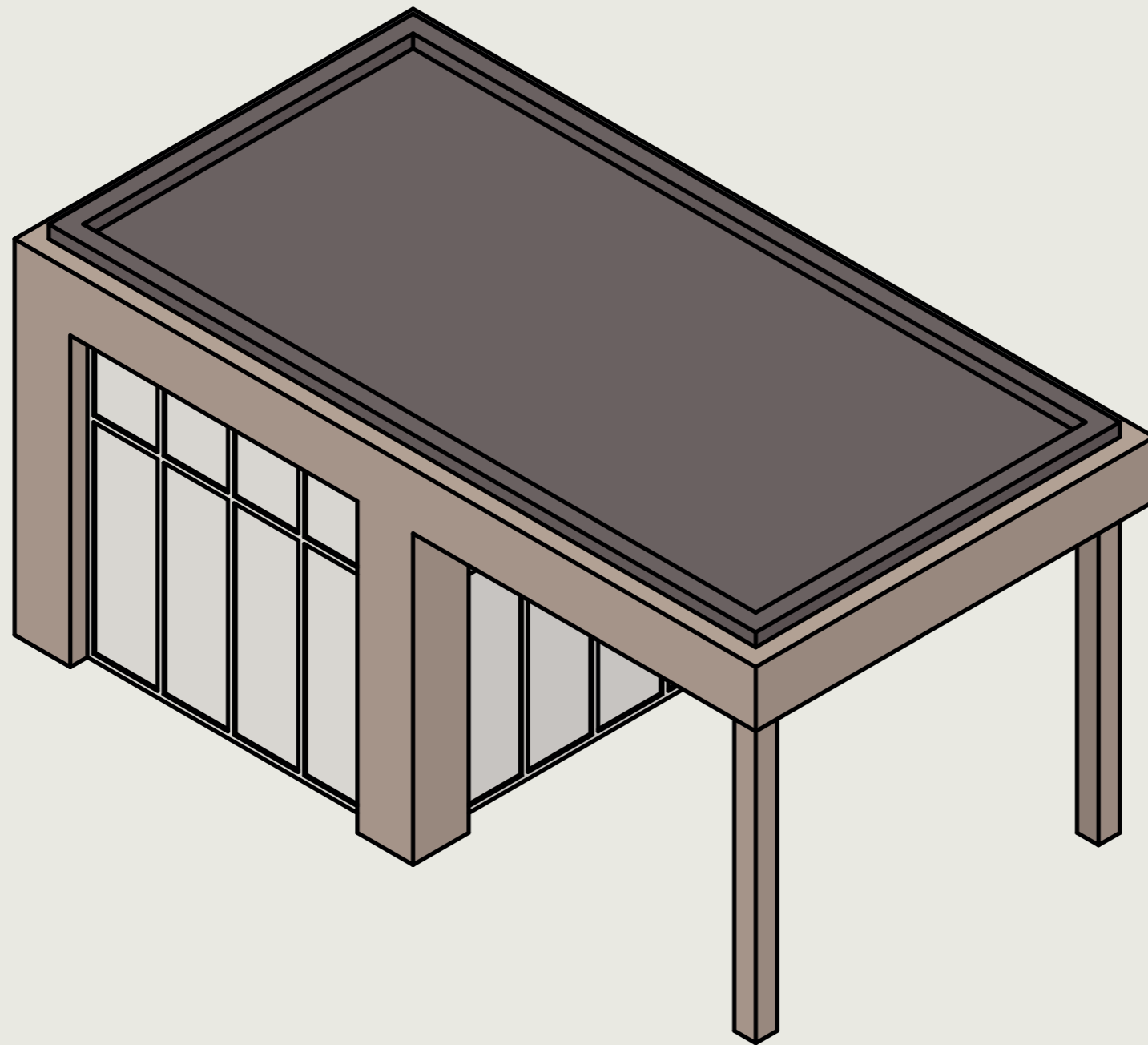


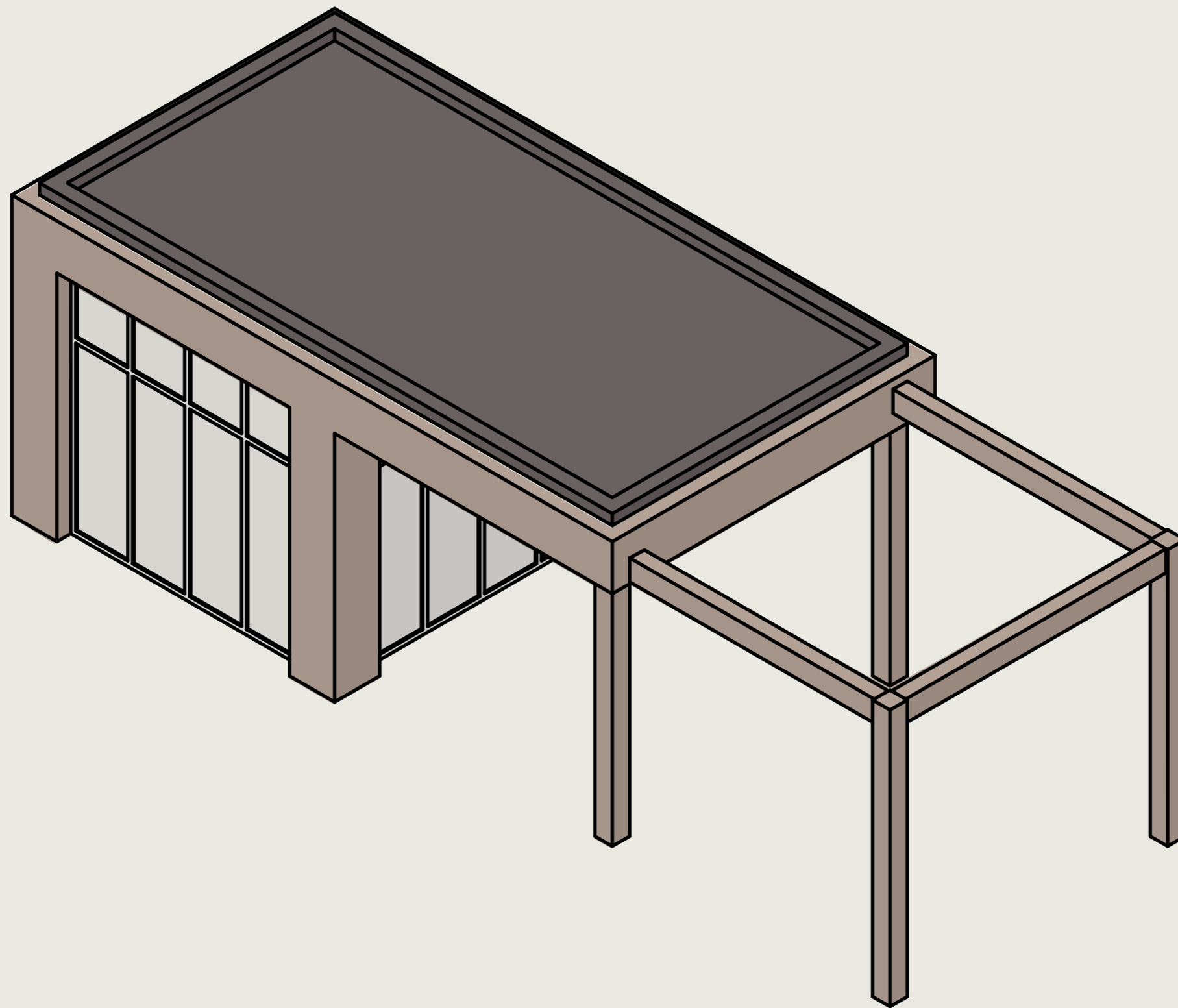


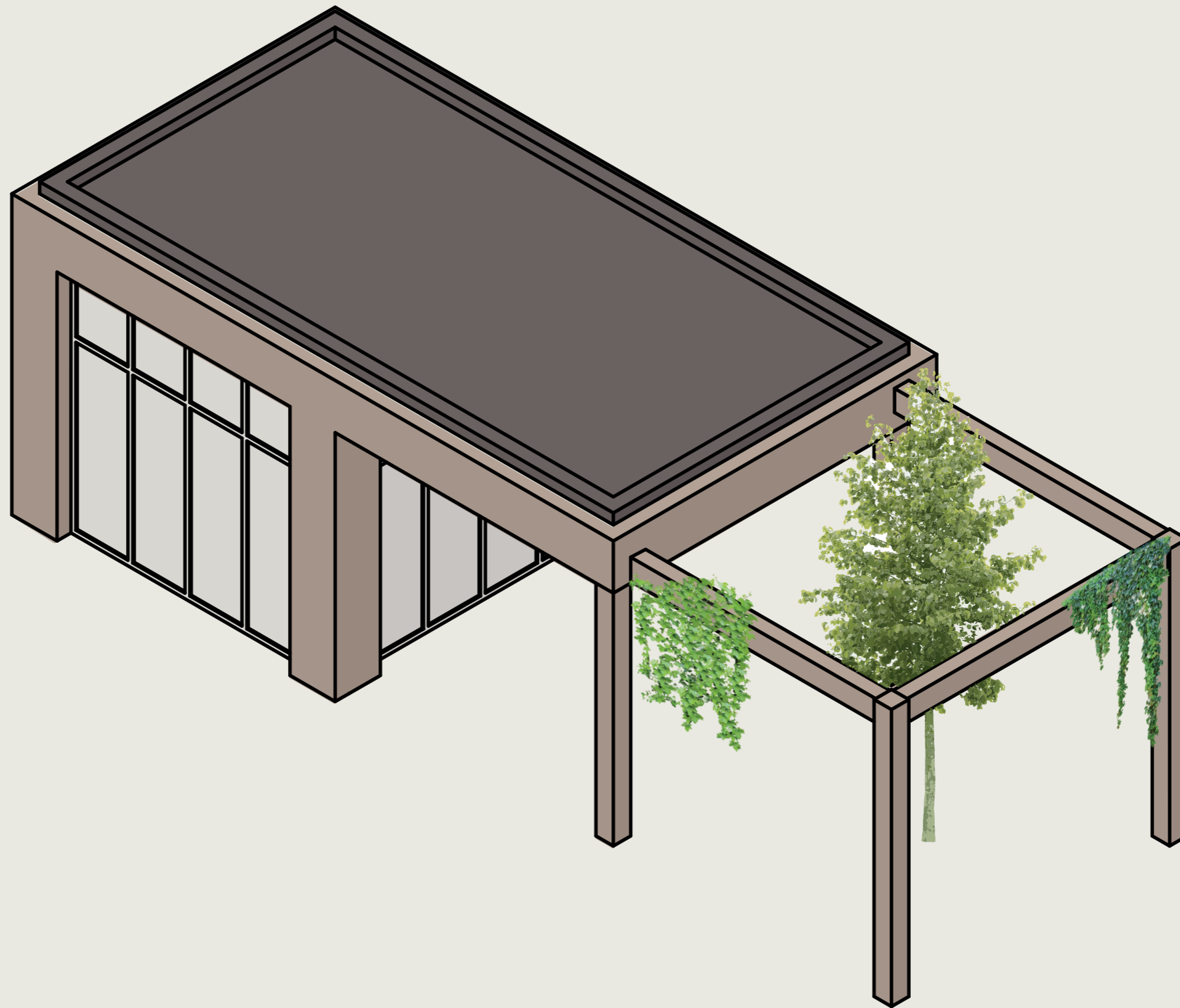
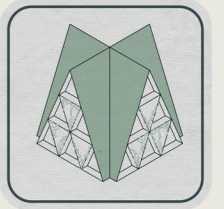
Adaptability

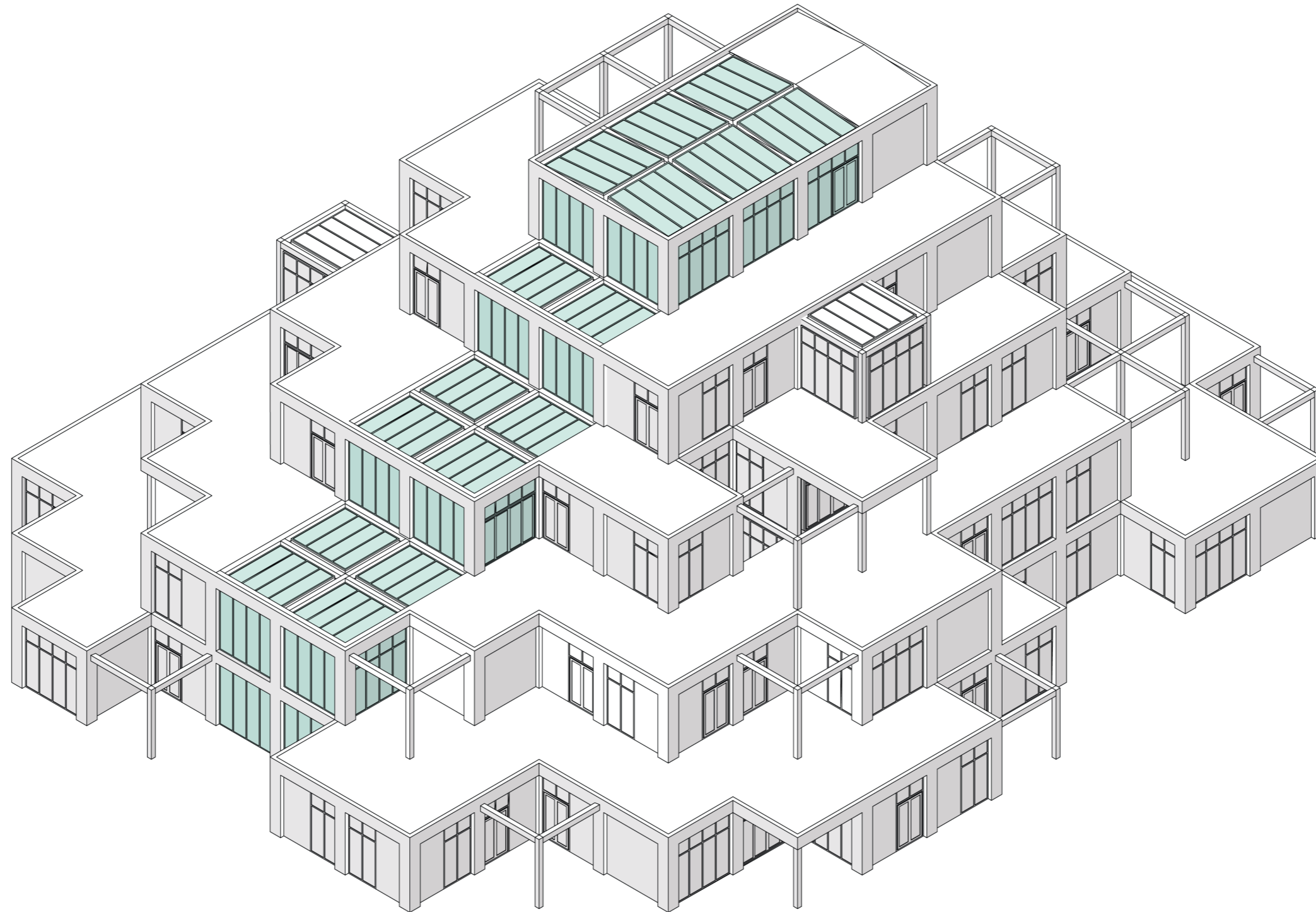


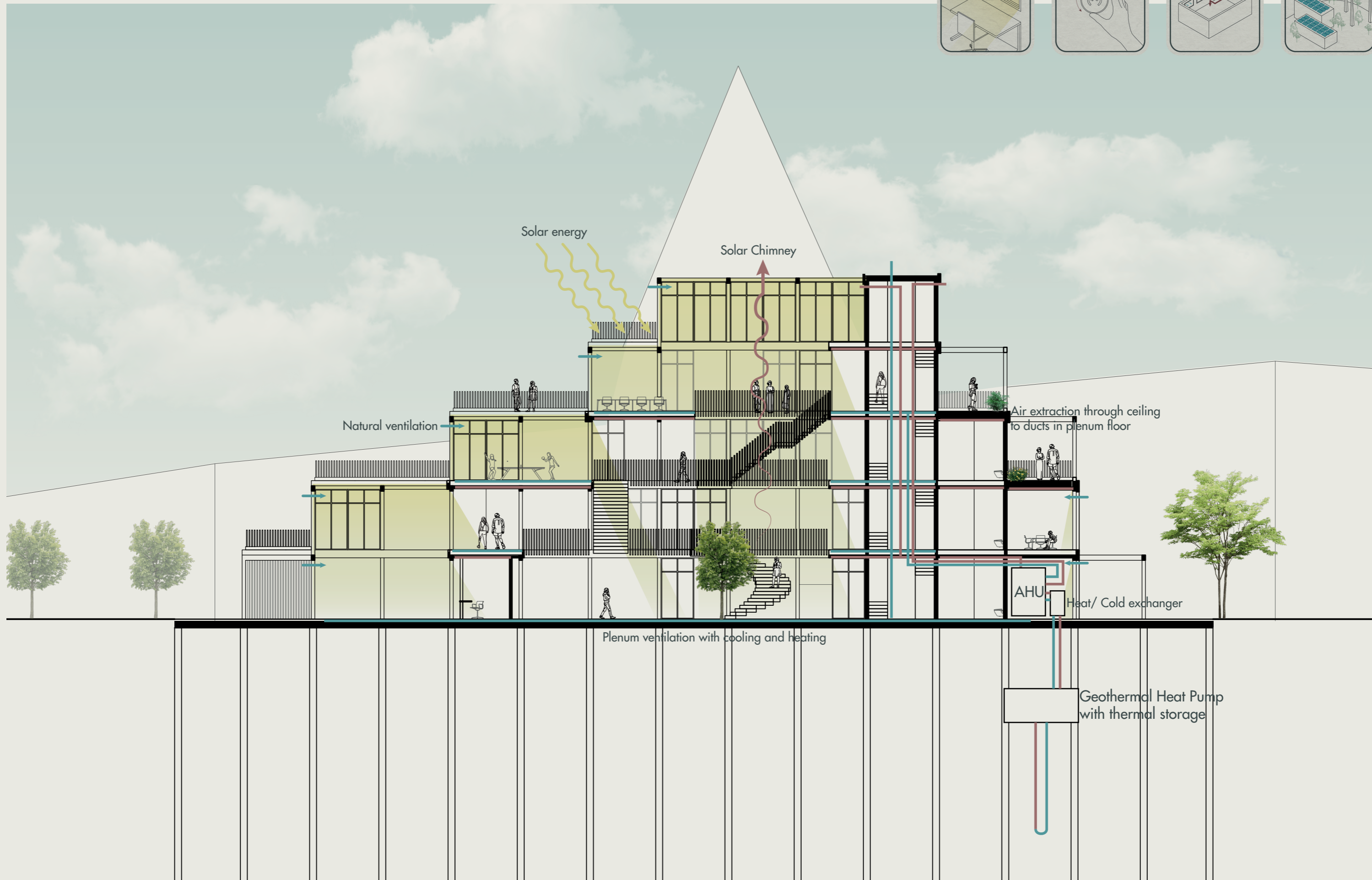
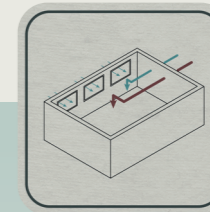
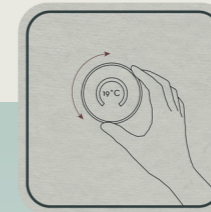
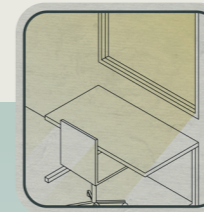


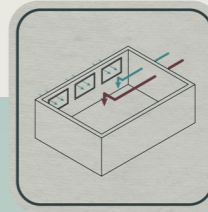
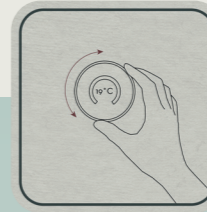
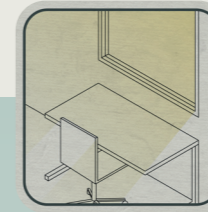


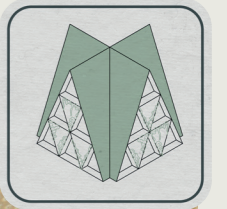
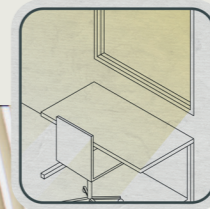


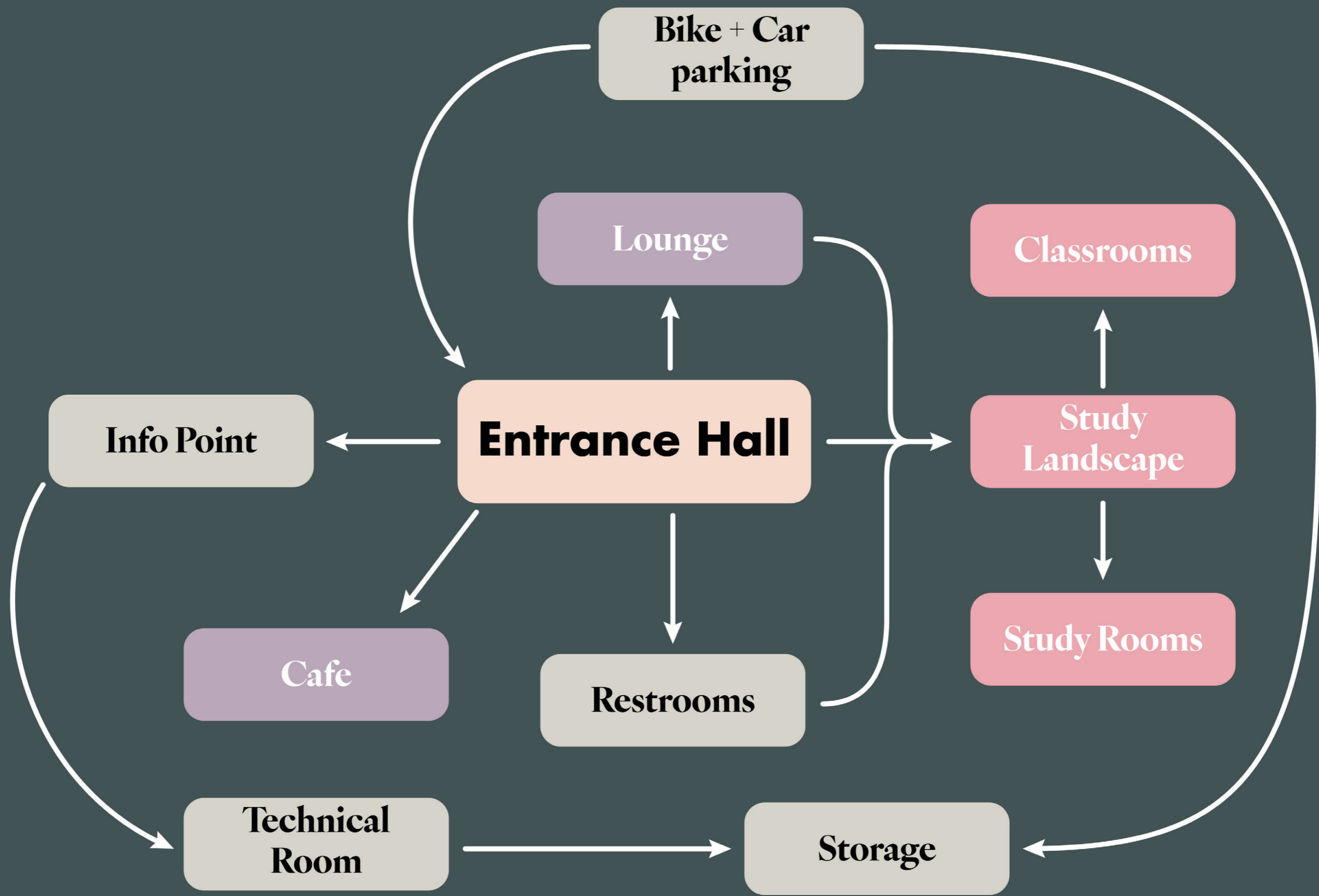
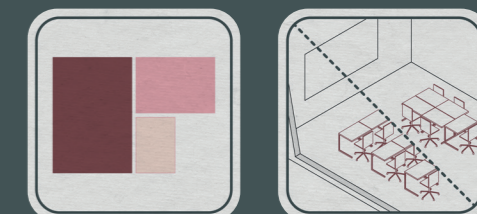


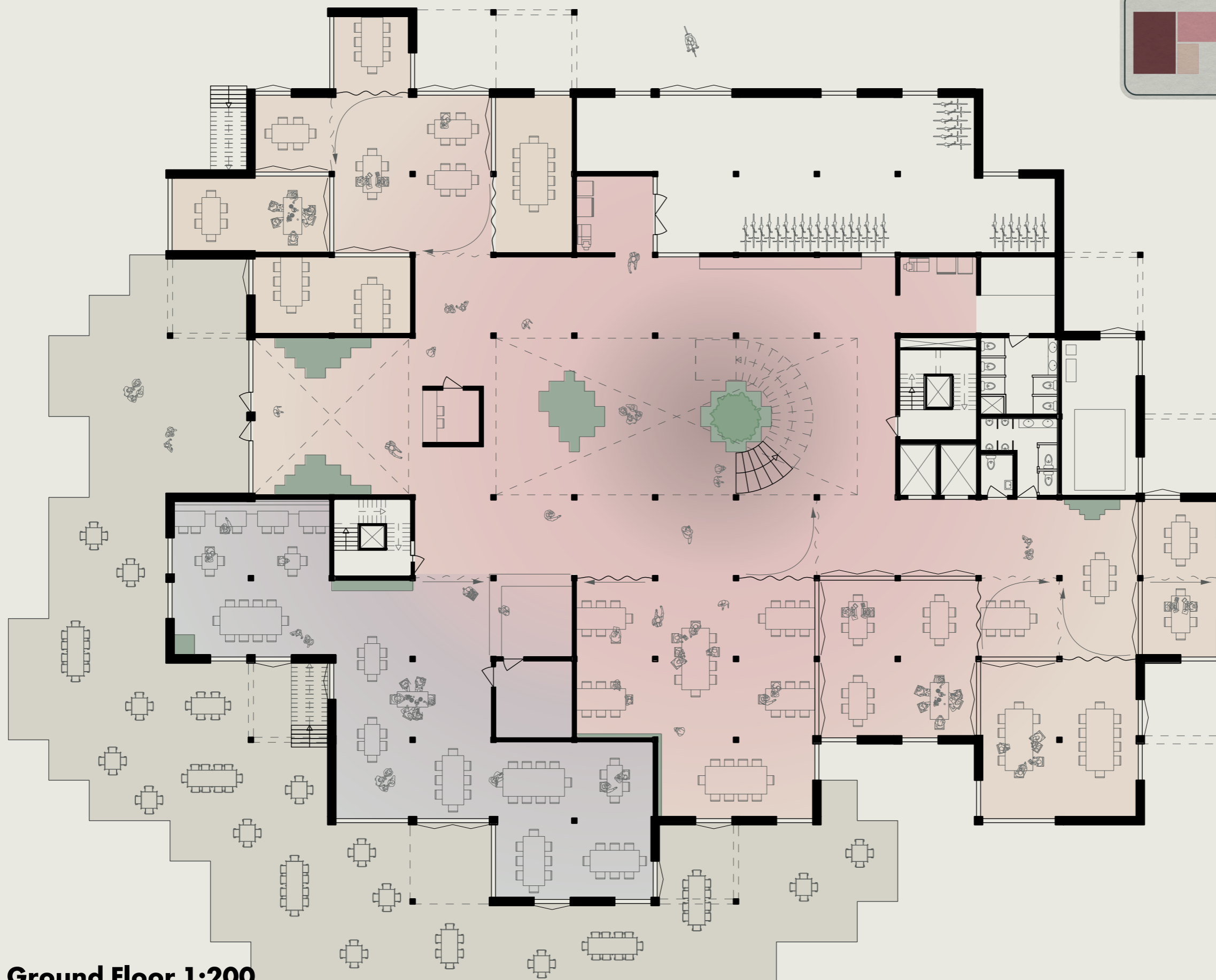
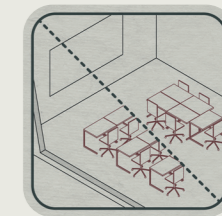
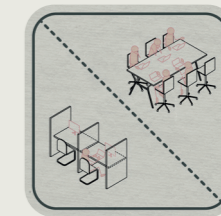
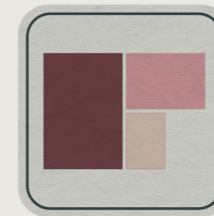










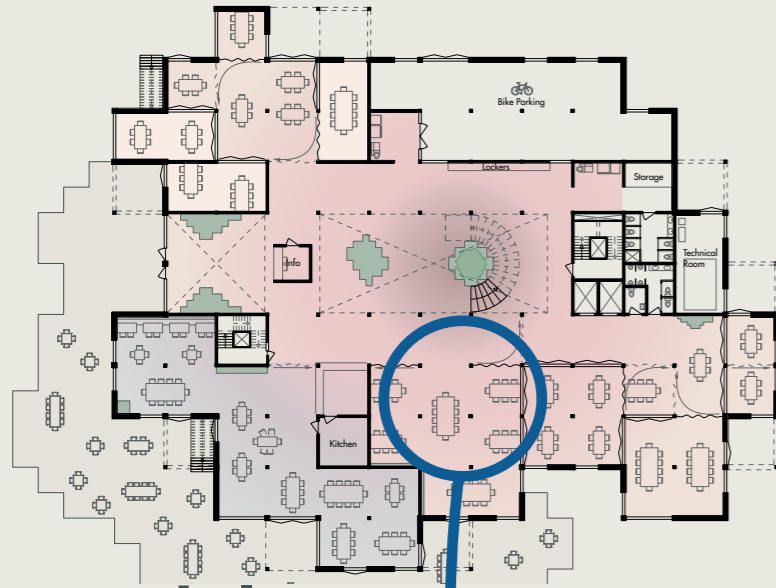


- Study Space
- Canteen
- Plants
- Outside Space



Ground Floor 1:200

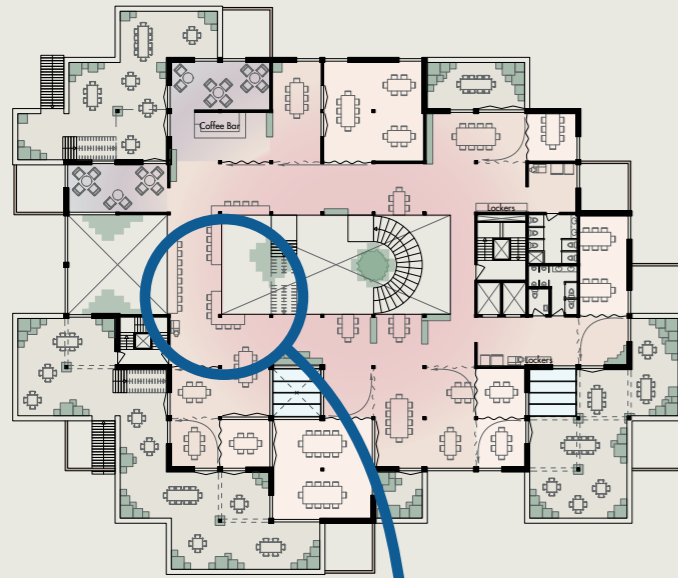
Study Landscape - Group



Ground Floor



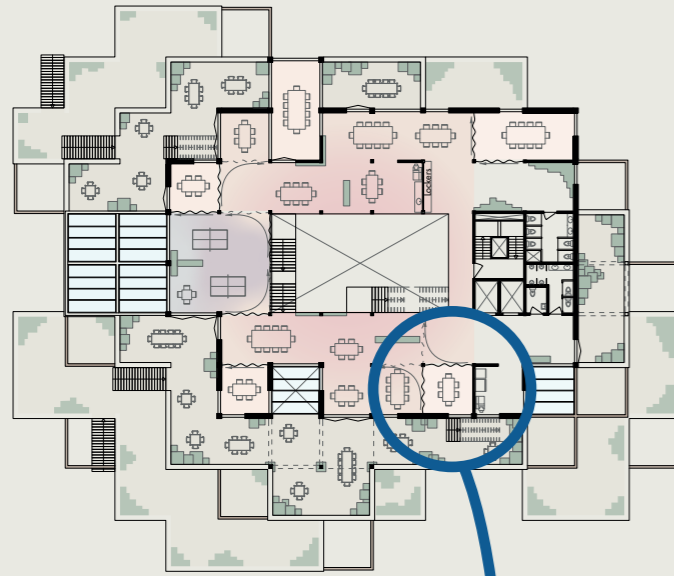
Study Landscape - Individual



First Floor

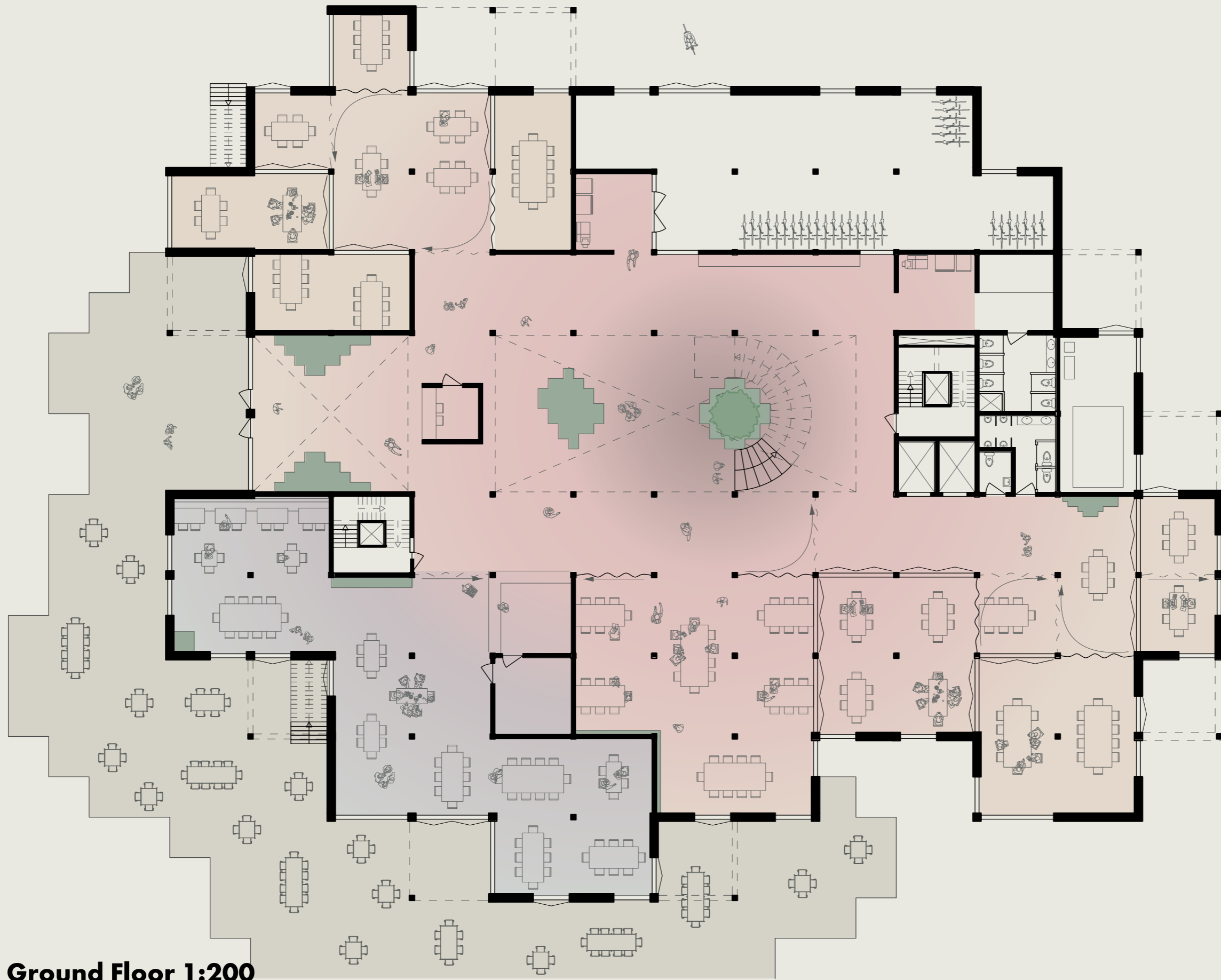
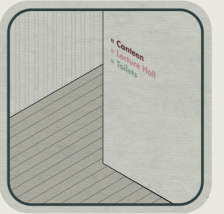


Study Room



Second Floor

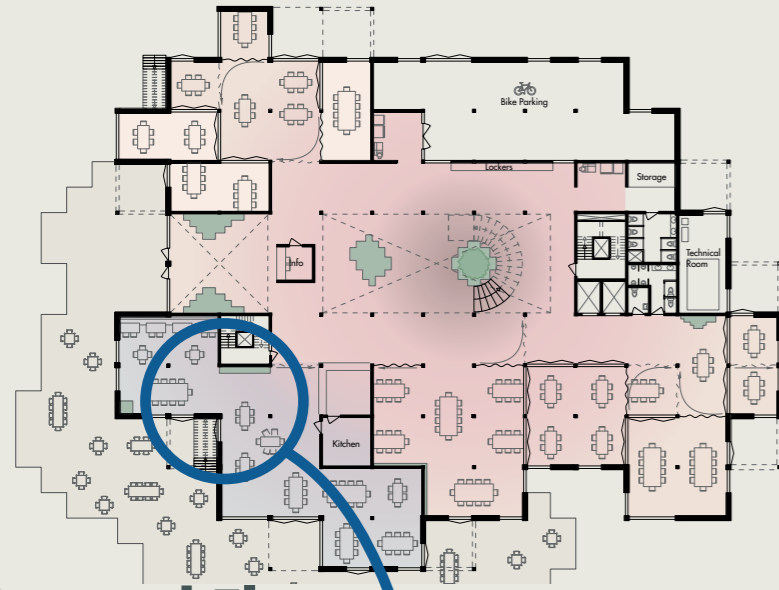




- Study Space
- Canteen
- Plants
- Outside Space

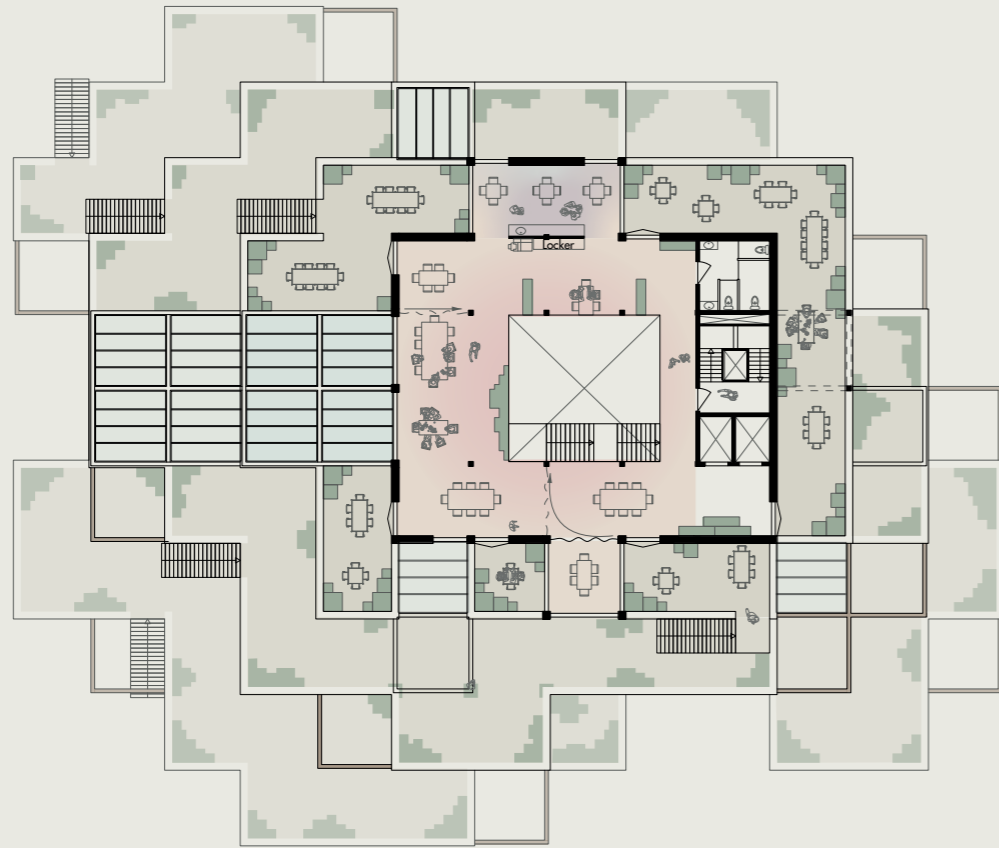
 **Ground Floor 1:200**

Canteen

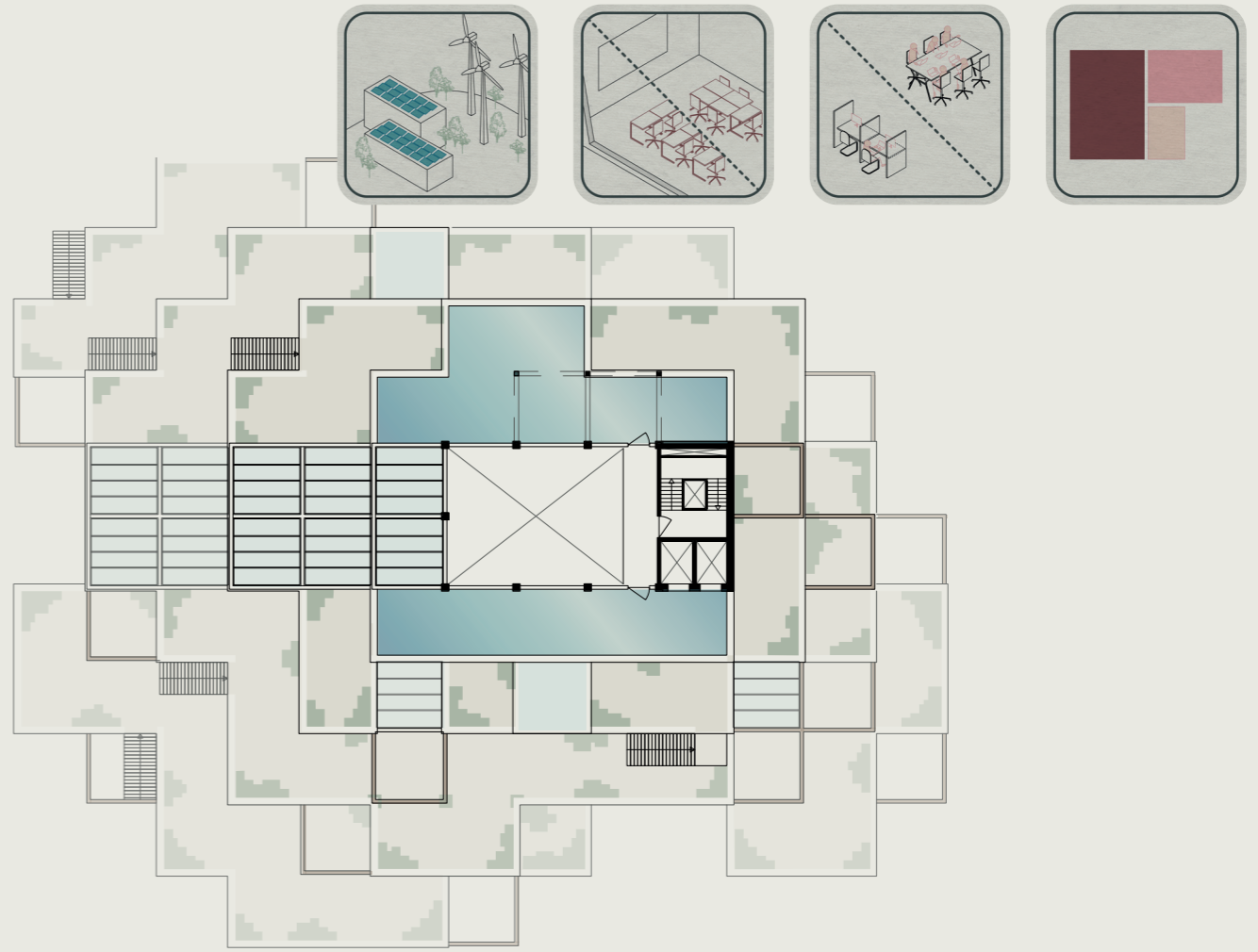


Ground Floor

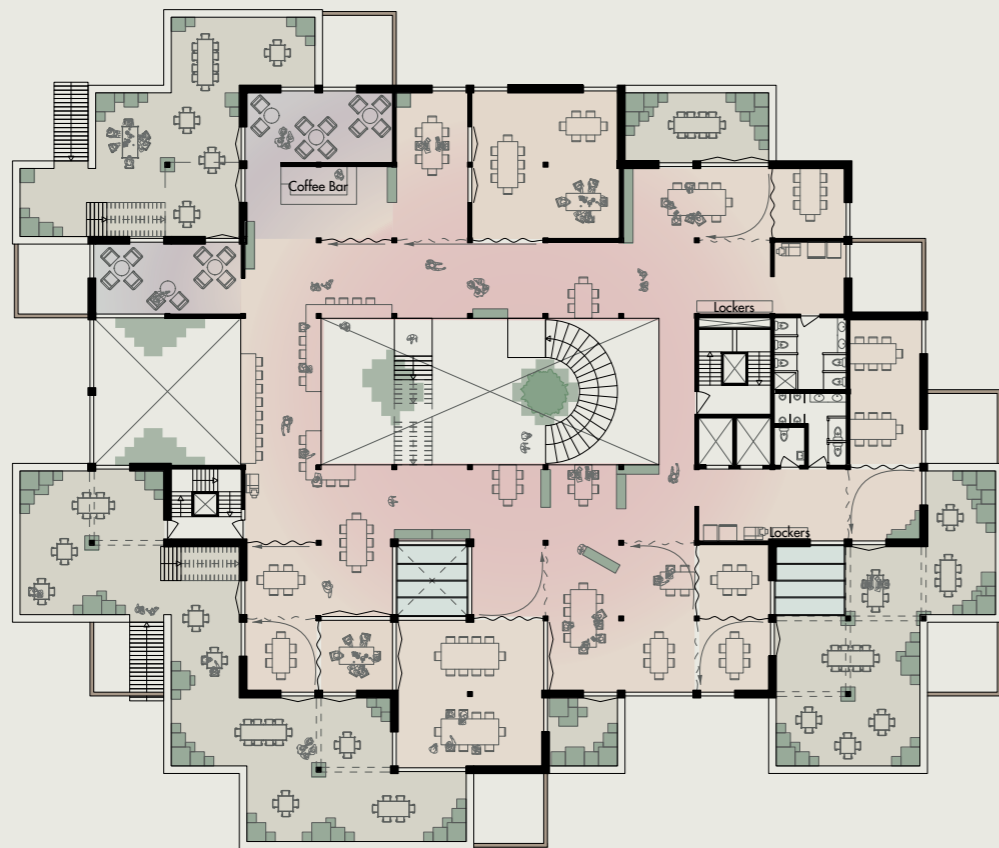




Third Floor 1:200

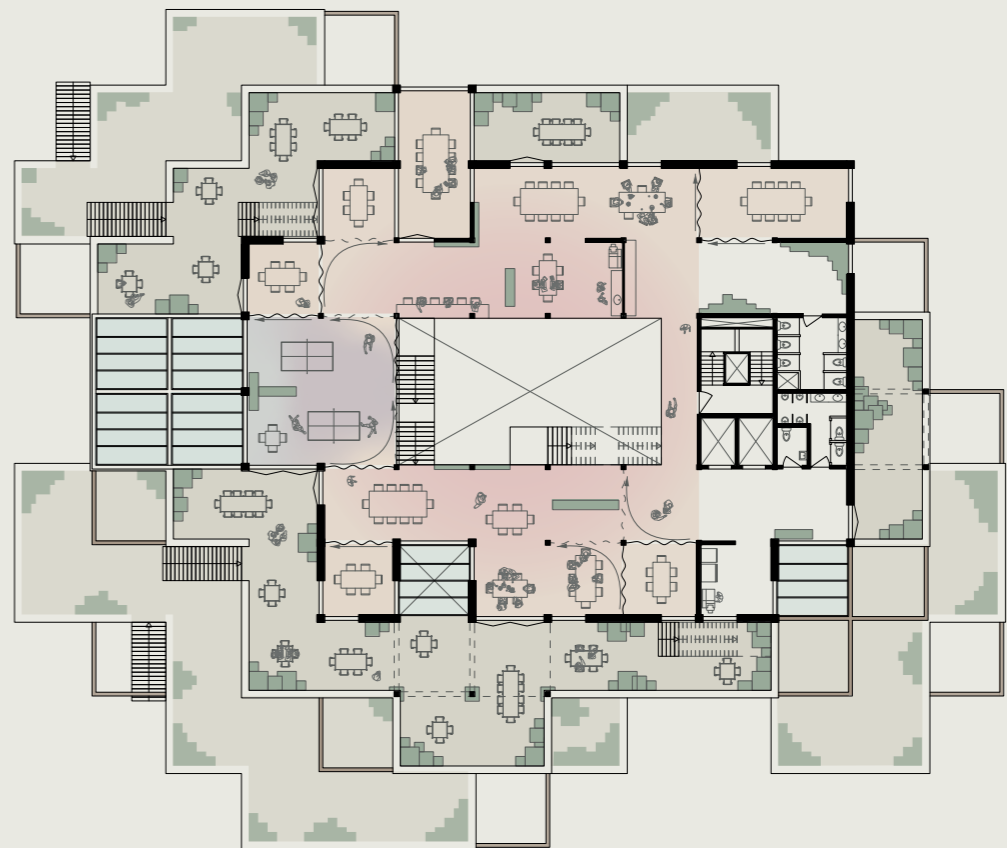
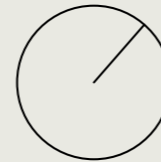


Fourth Floor 1:200



First Floor 1:200

- Study Space
- Coffee Corner
- Plants
- Outside Space

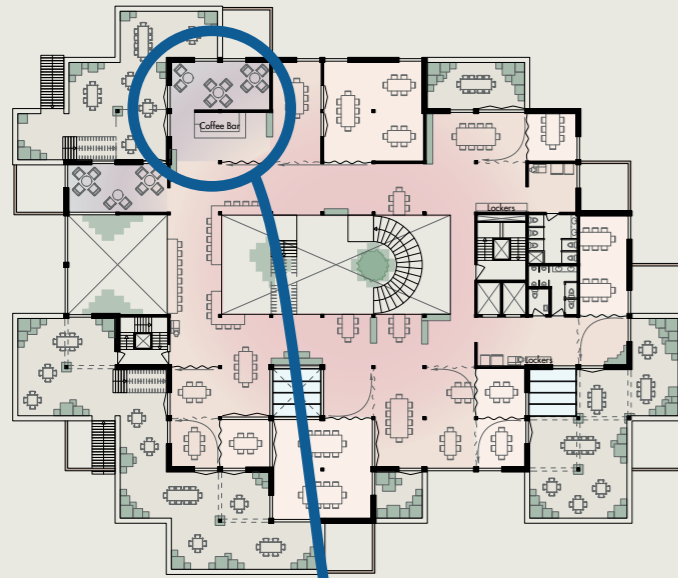


Second Floor 1:200

- Study Space
- Coffee Lounge
- Plants
- Outside Space

- Study Space
- Table Tennis
- Plants
- Outside Space

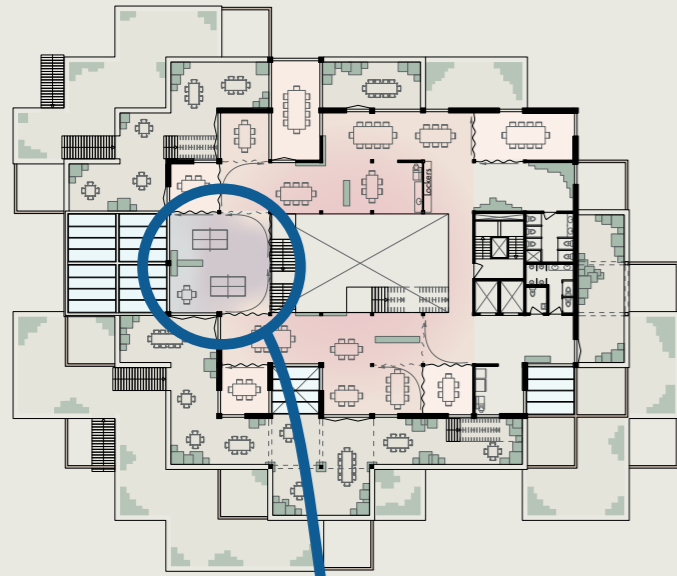
Coffee Lounge



First Floor



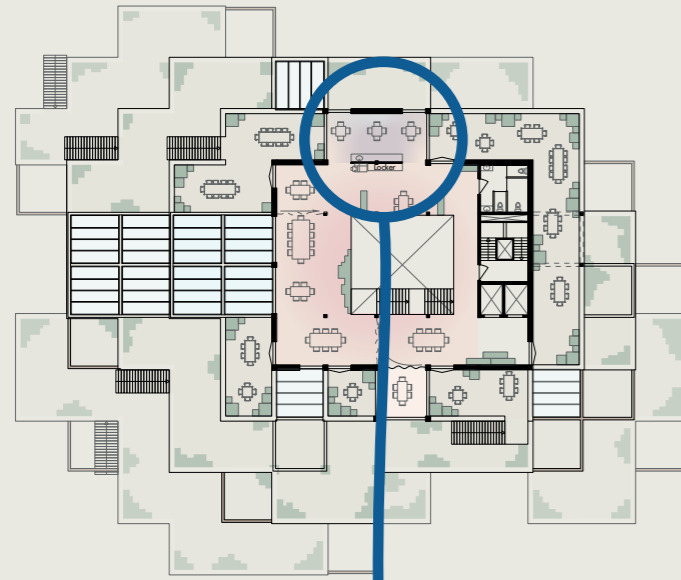
Active Relaxing



Second Floor



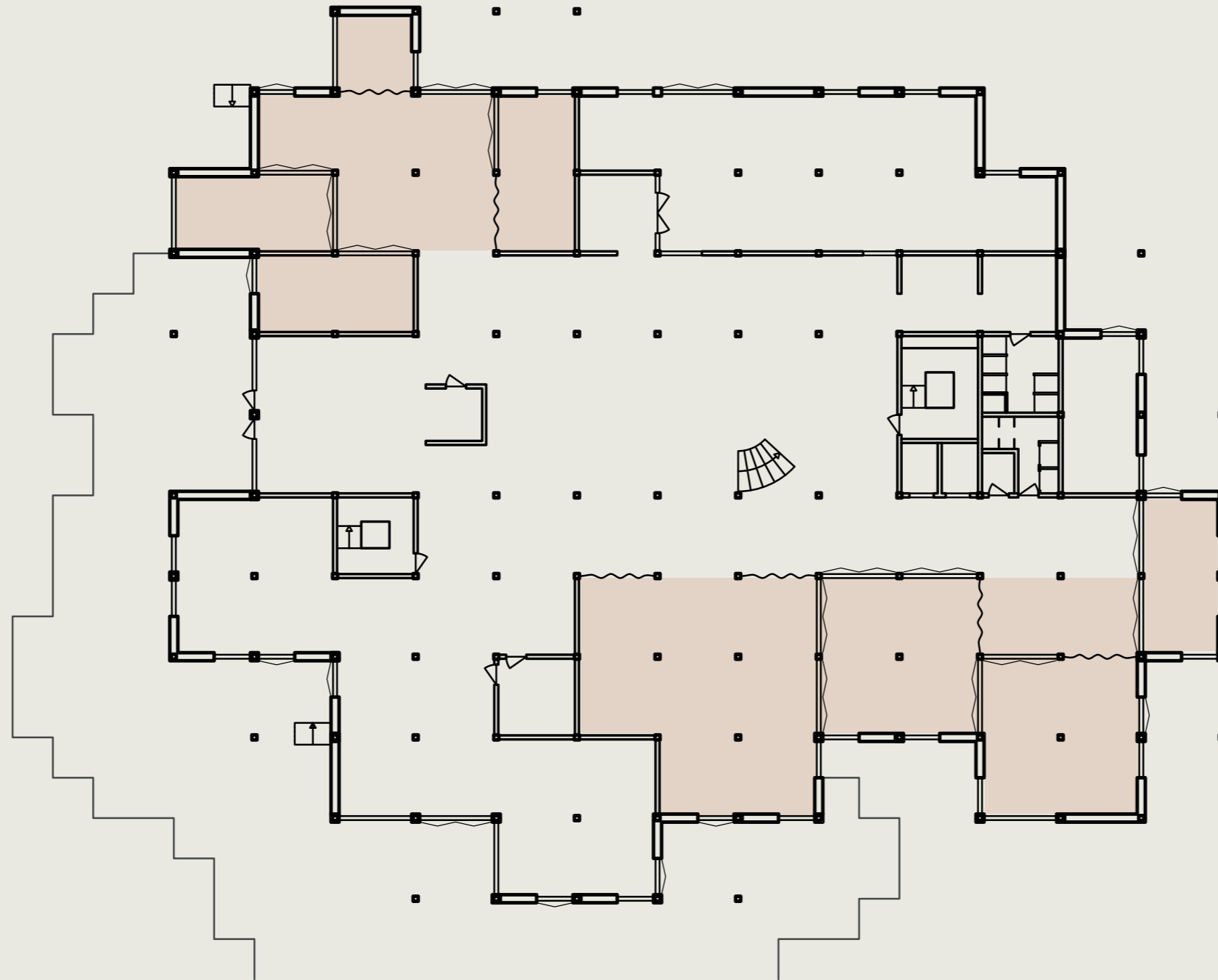
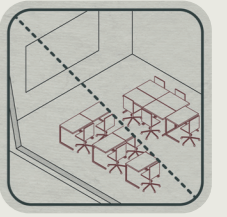
Small Lounge



Third Floor

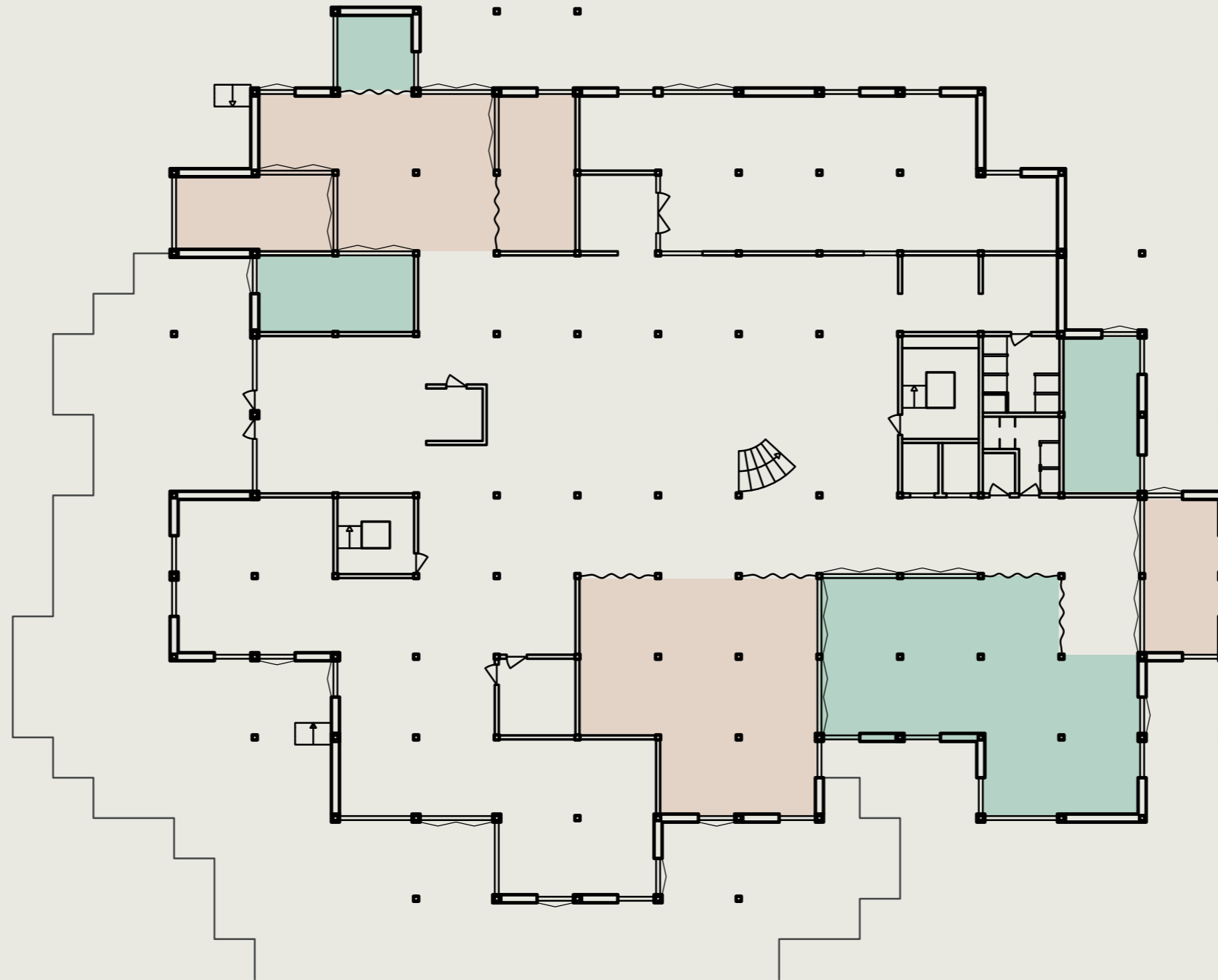
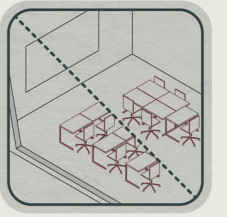
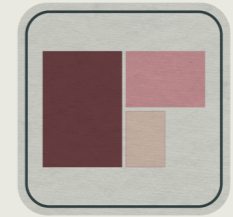


Flexibility



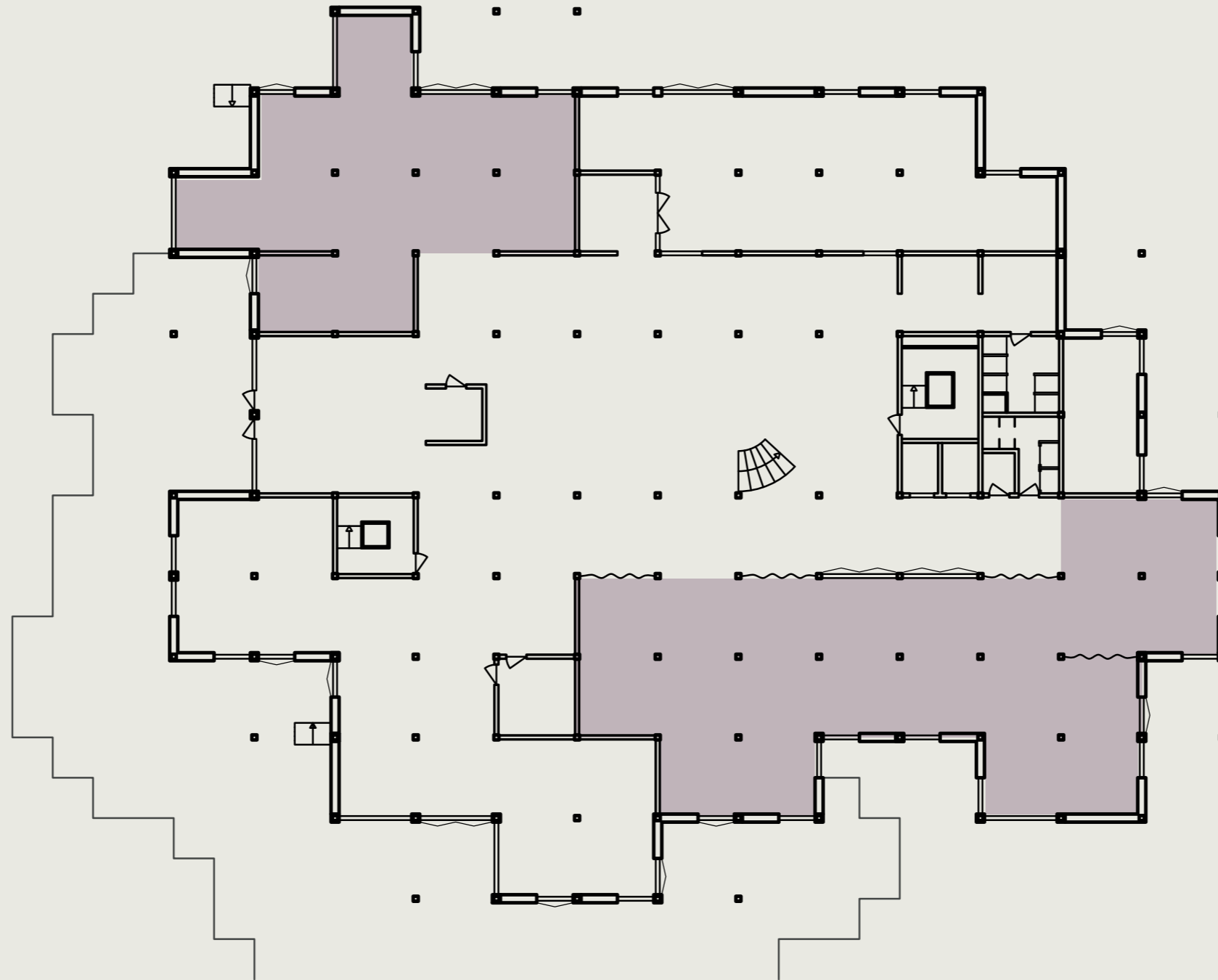
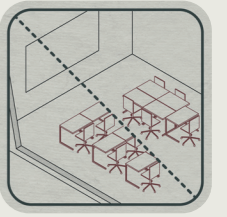
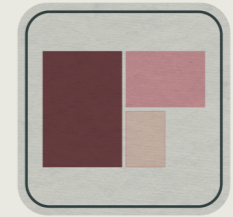
Ground Floor - Studying

Flexibility



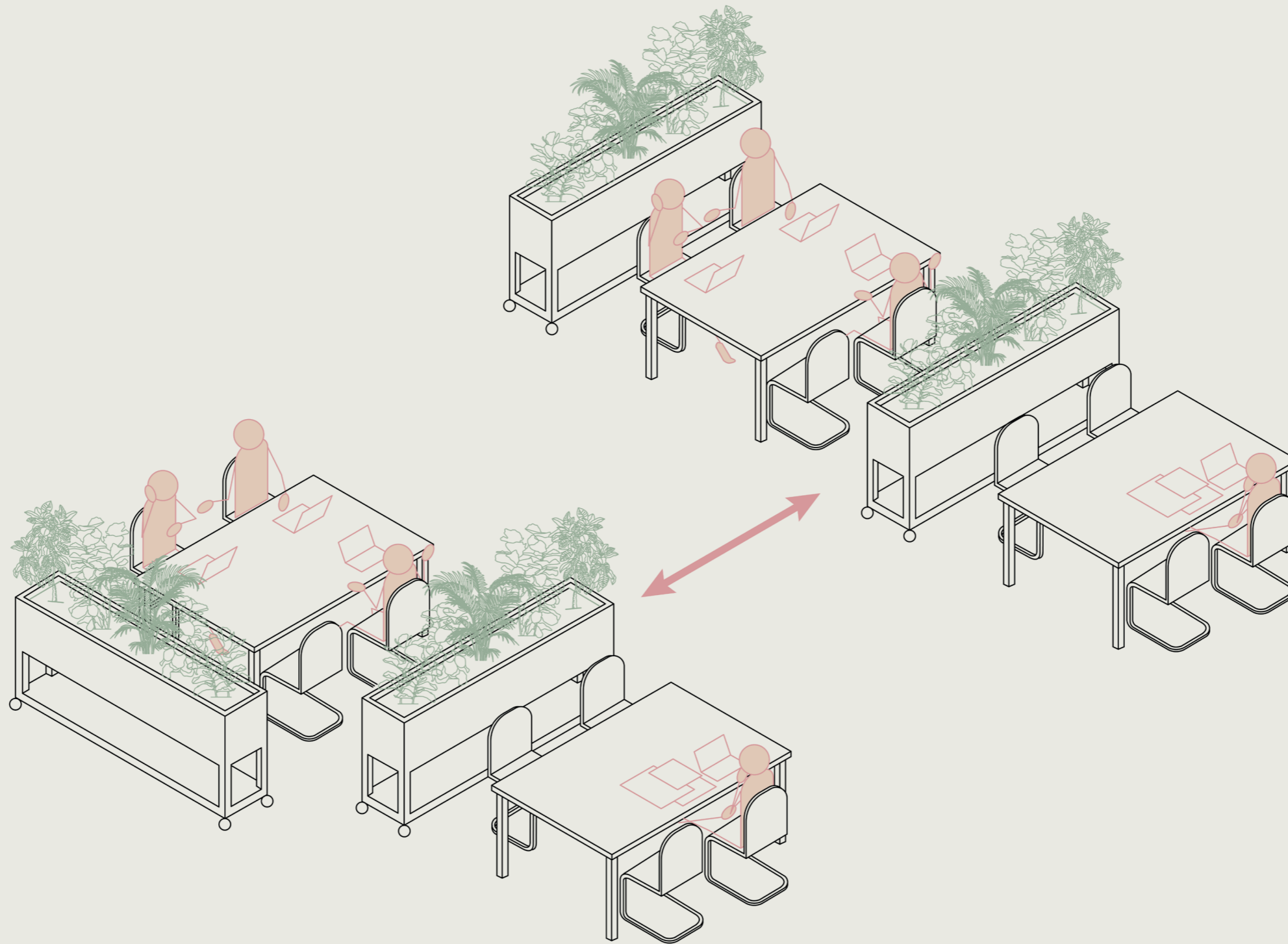
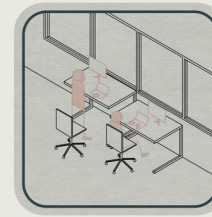
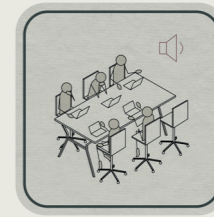
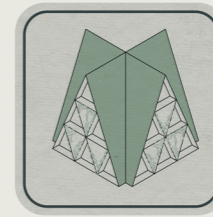
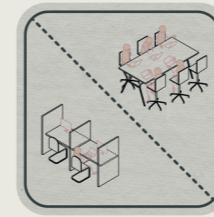
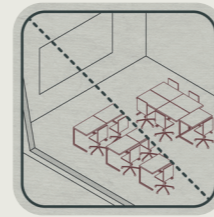
Ground Floor - Studying & Office Rental

Flexibility

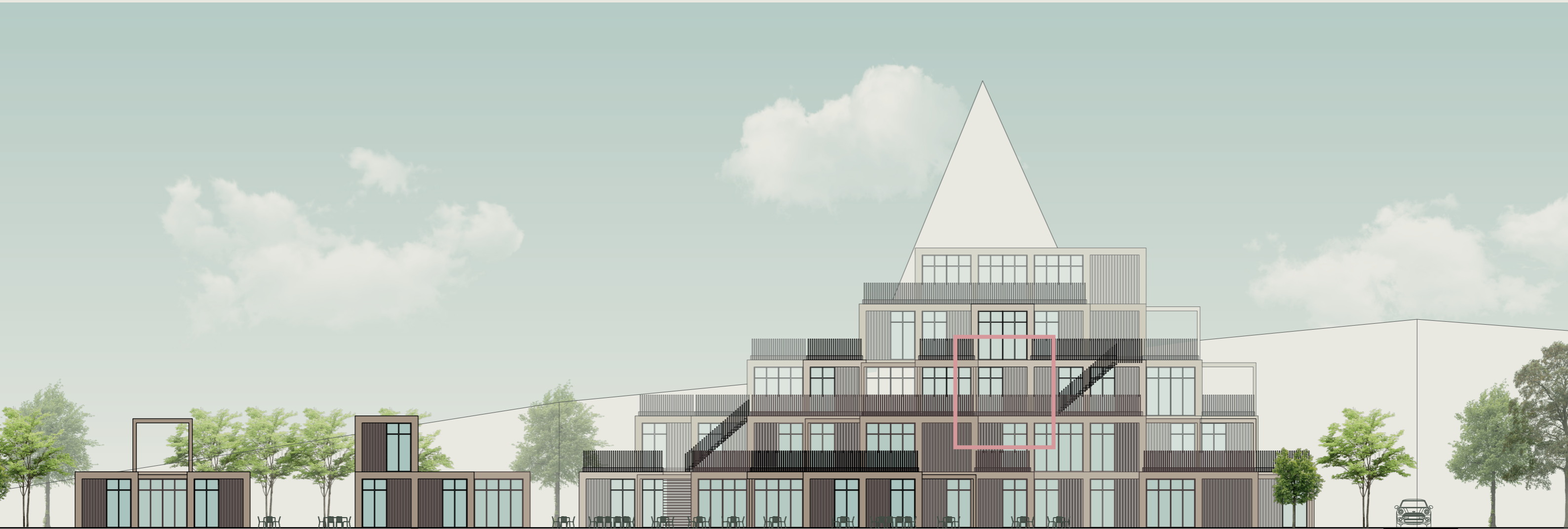


Ground Floor - Event

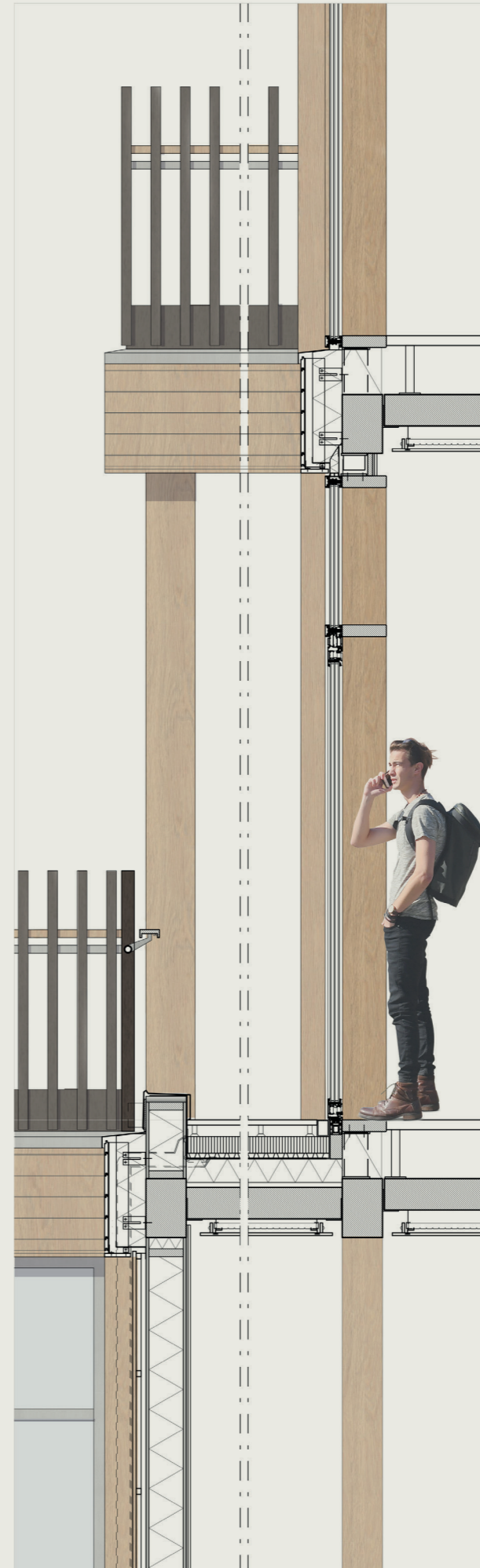
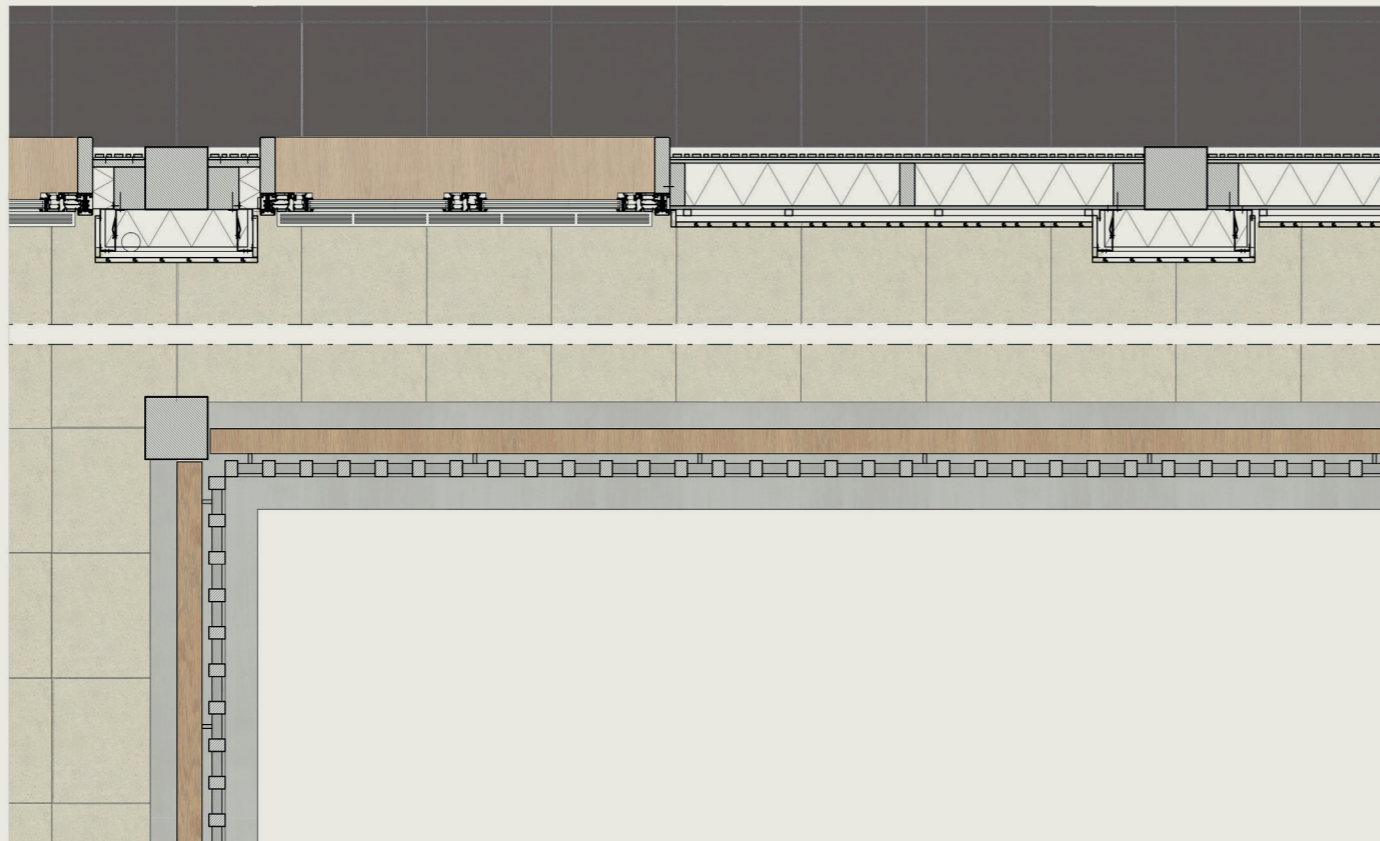
Flexibility

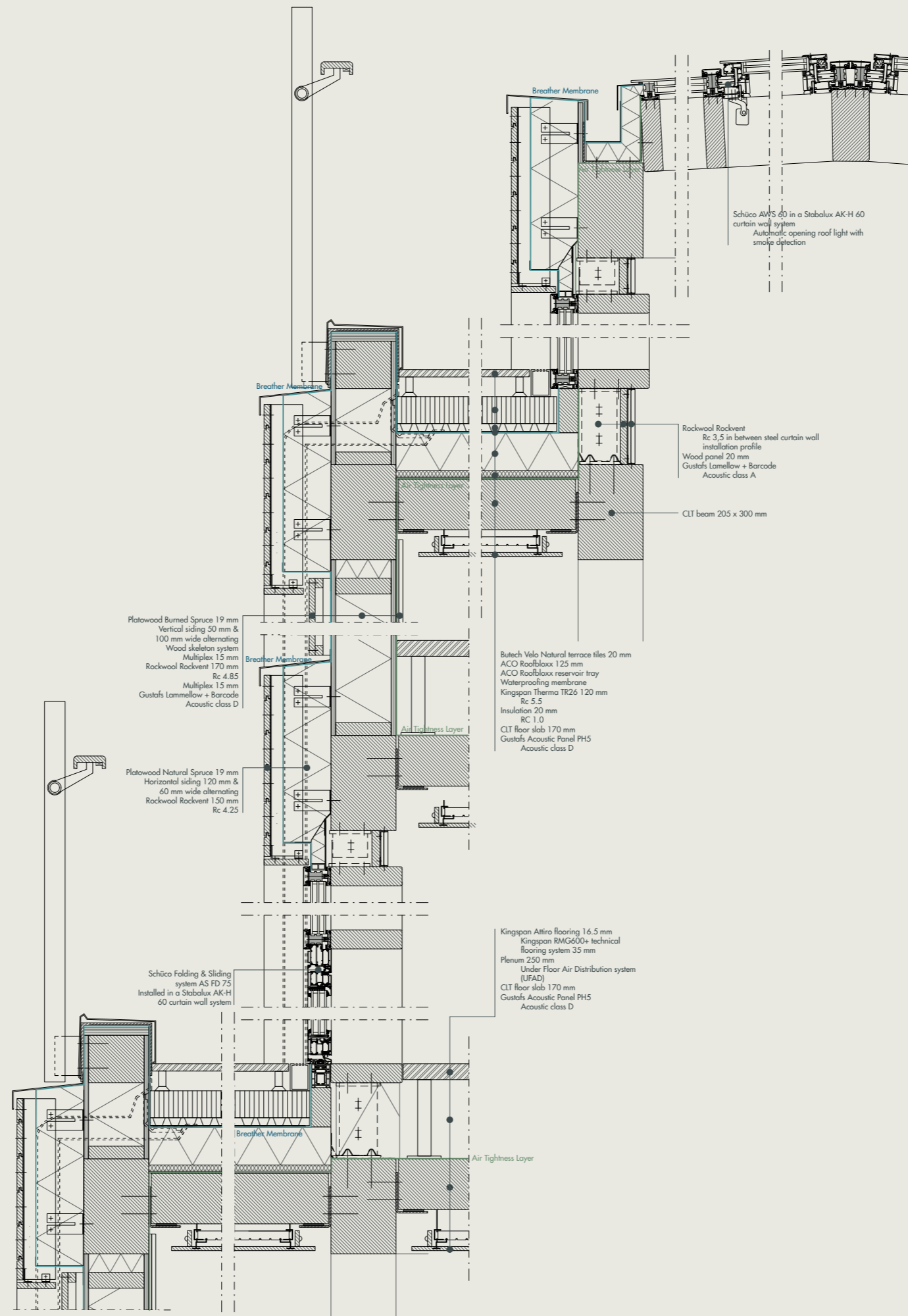


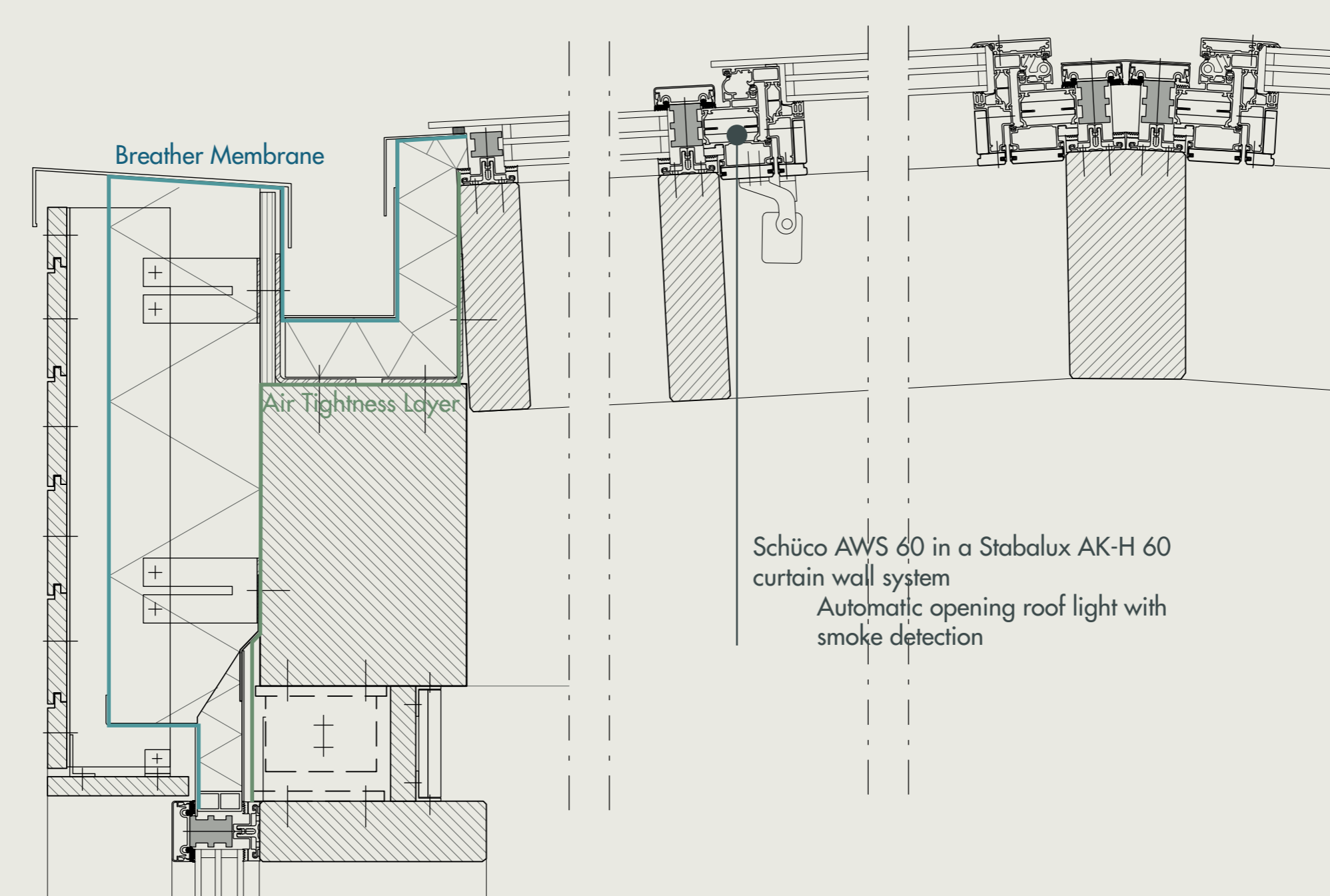
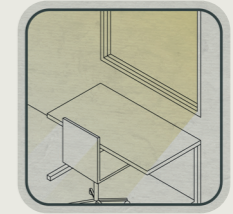
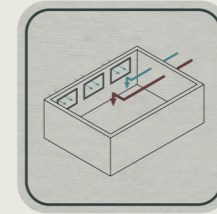


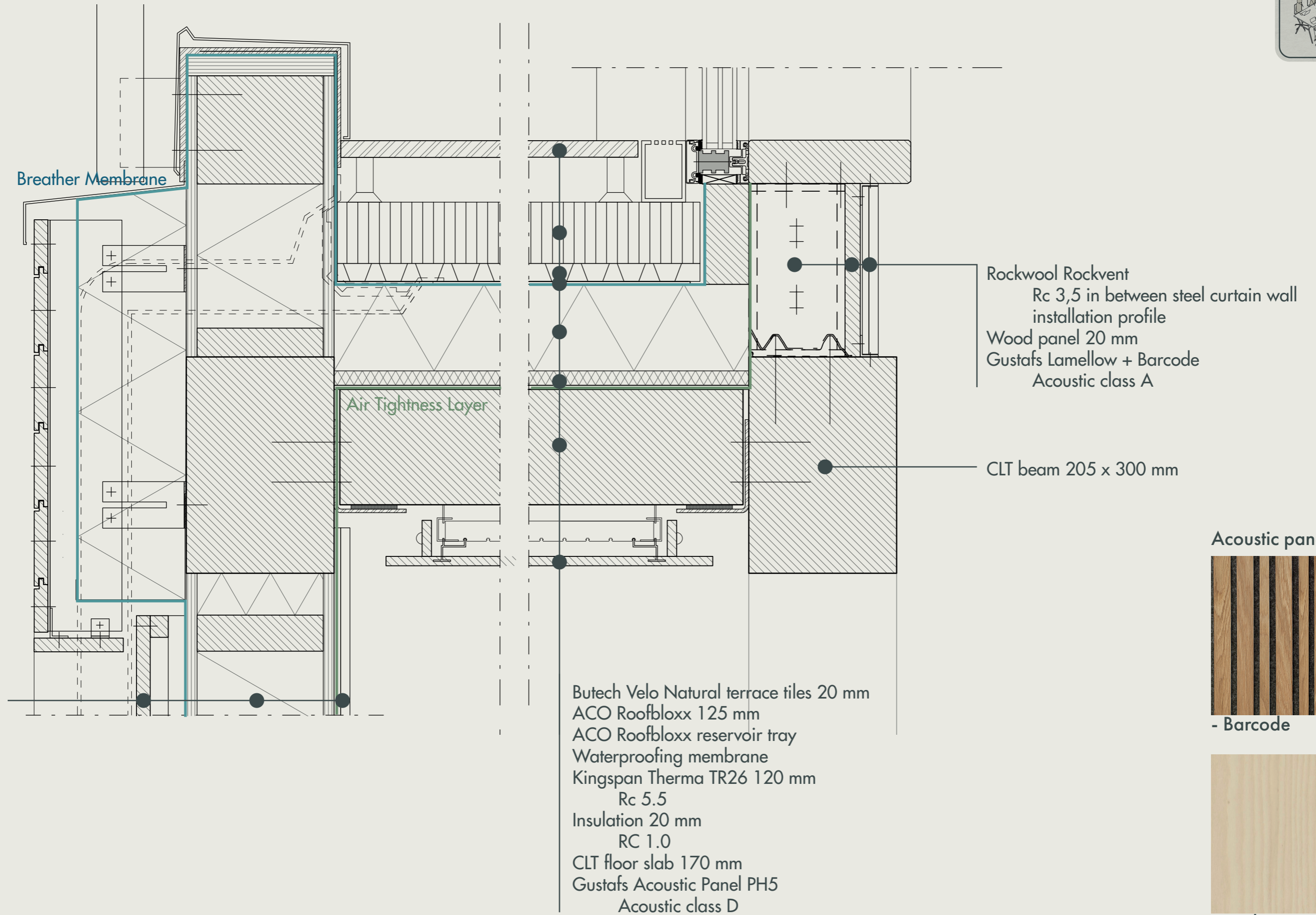












Butech Velo Natural terrace tiles 20 mm
 ACO Roofbloxx 125 mm
 ACO Roofbloxx reservoir tray
 Waterproofing membrane
 Kingspan Therma TR26 120 mm
 Rc 5.5
 Insulation 20 mm
 RC 1.0
 CLT floor slab 170 mm
 Gustafs Acoustic Panel PH5
 Acoustic class D

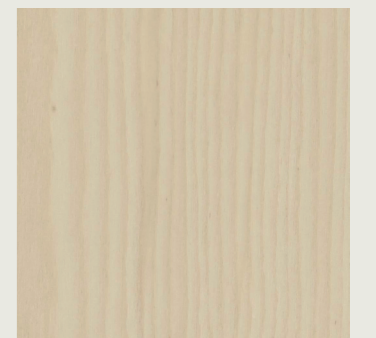
Rockwool Rockvent
 Rc 3,5 in between steel curtain wall
 installation profile
 Wood panel 20 mm
 Gustafs Lamellow + Barcode
 Acoustic class A

 CLT beam 205 x 300 mm

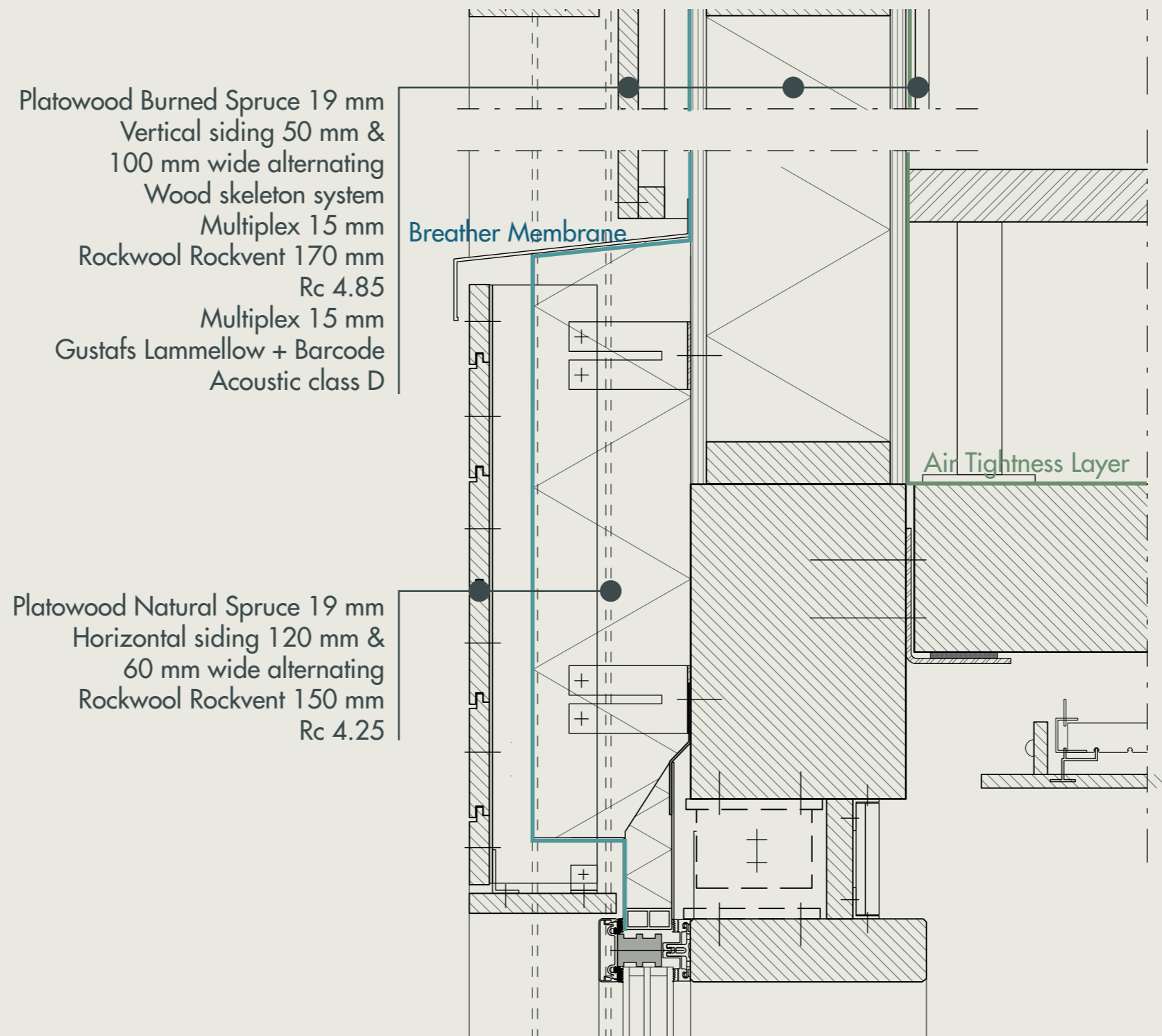
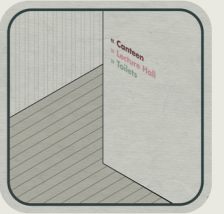
Acoustic panelling:



- Barcode



- Birch



Platowood Burned Spruce 19 mm
Vertical siding 50 mm &
100 mm wide alternating
Wood skeleton system
Multiplex 15 mm
Rockwool Rockvent 170 mm
Rc 4.85
Multiplex 15 mm
Gustafs Lammellow + Barcode
Acoustic class D

Platowood Natural Spruce 19 mm
Horizontal siding 120 mm &
60 mm wide alternating
Rockwool Rockvent 150 mm
Rc 4.25

Breather Membrane

Air Tightness Layer

Facade cladding:



- Natural spruce



- Burned spruce

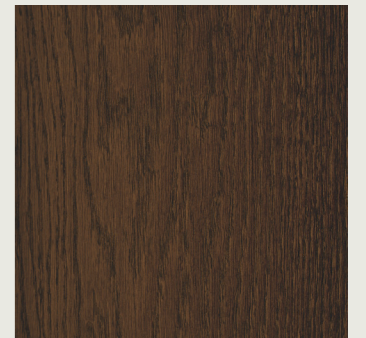
Schüco Folding & Sliding system AS FD 75
Installed in a Stabalux AK-H
60 curtain wall system

Kingspan Attiro flooring 16.5 mm
Kingspan RMG600+ technical
flooring system 35 mm
Plenum 250 mm
Under Floor Air Distribution system
(UFAD)
CLT floor slab 170 mm
Gustafs Acoustic Panel PH5
Acoustic class D

Breather Membrane

Air Tightness Layer

Flooring:



- Oak veneer



- Porcelain tile

