

Architecture of the skeleton

Converting the Hague's former police station into a public mixed-use development



Michail Mexis

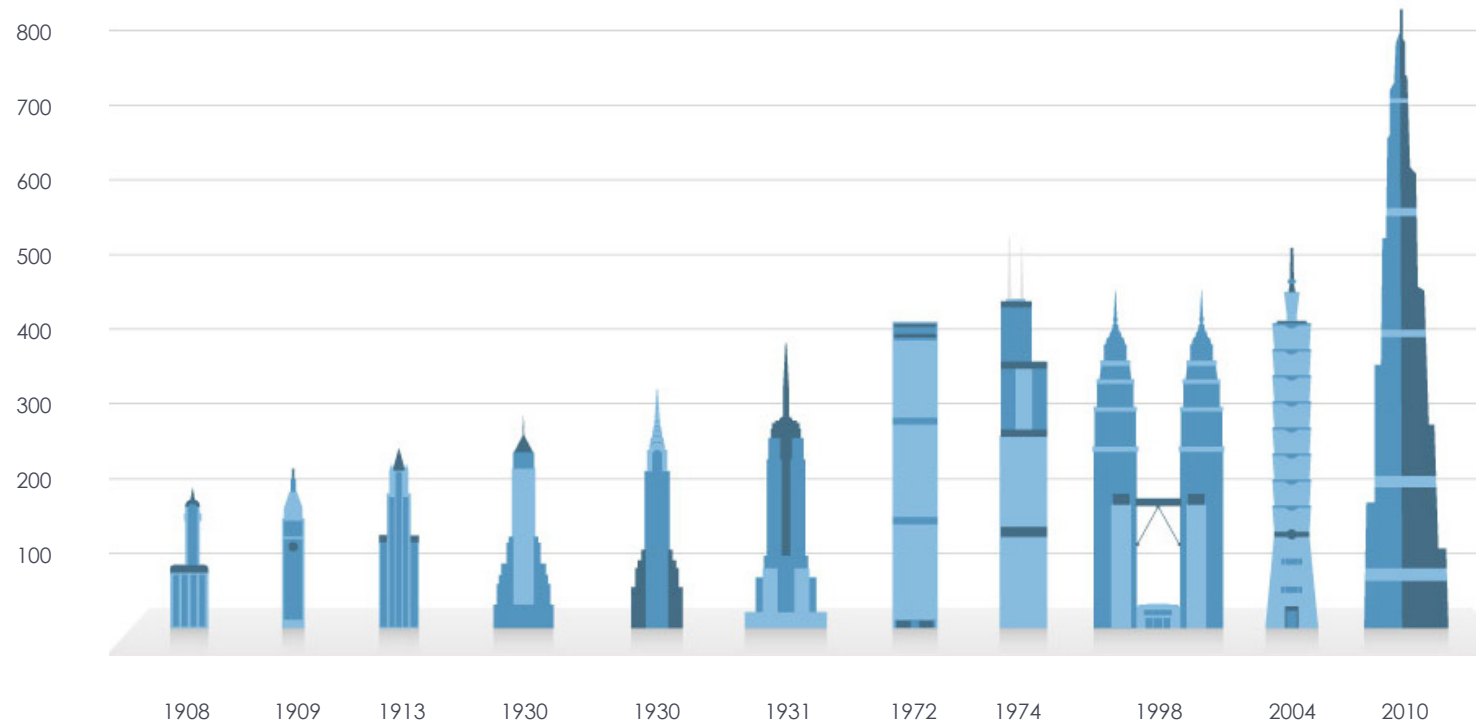
Student number: 5035384

Vacant Heritage: AR3AH105

P5 Presentation

Date: 20.06.2022

20th century evolution



Police heritage



Hague, Police HQ



Den Haag - Police station



1959



1978

The future of the police



1959-2024



2024 onwards

The future of the building



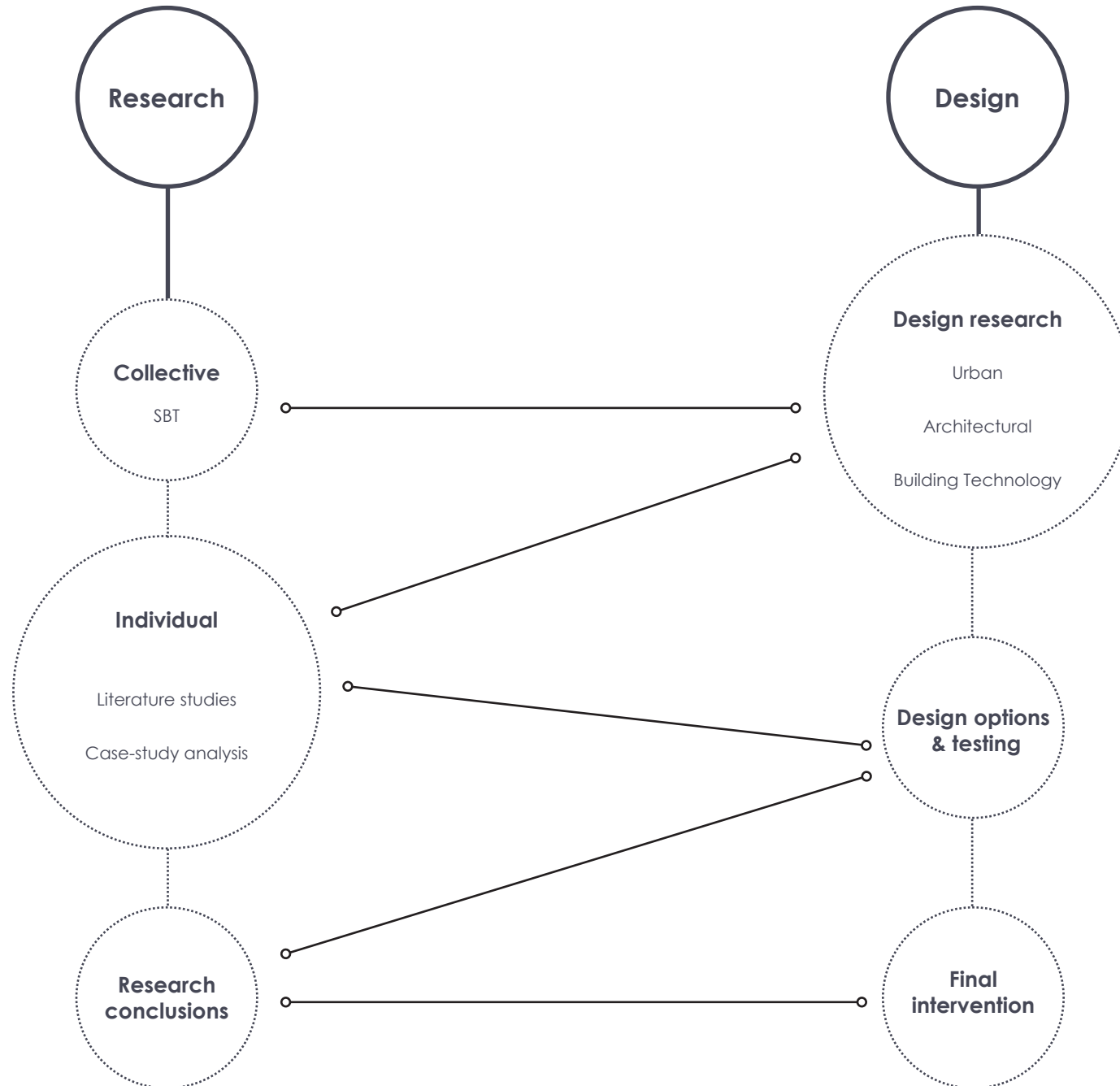
1959-2024



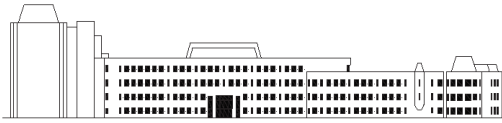
2024 onwards

Research

Research & Design



Spatial Building Typology



The Hague



Eindhoven



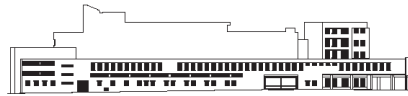
Middelburg



Warnsveld



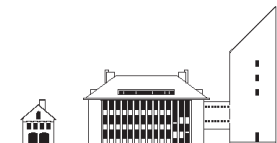
Haarlem



Groningen



Rotterdam witte de With



Rotterdam Haven

Who is an **'architect'**?

arkhitéktōn (Greek): from αρχι- (**arkhi-**, "chief") + τέκτων (**téktōn**, "mason, builder")

Definition: "Person skilled in the art of building, one who plans and designs buildings and supervises their construction," (etymonline.com)

To what extent does the load-bearing **structure** in **20th-century Dutch** police stations, influence their **re-design options**?

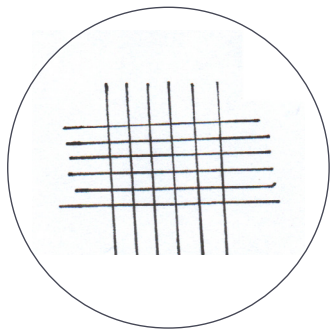


Structural types

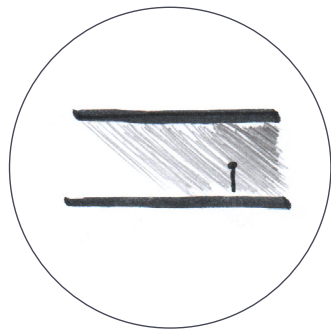


Modern strategies

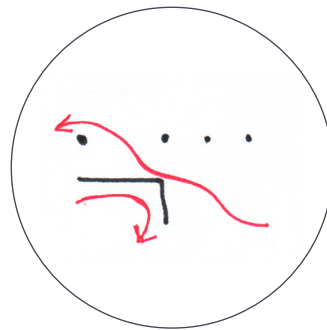
Case studies - Examined aspects



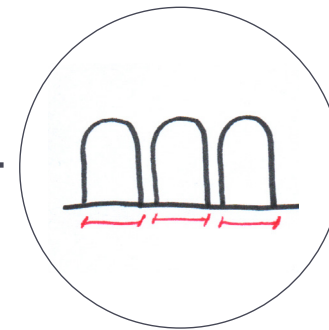
Grid



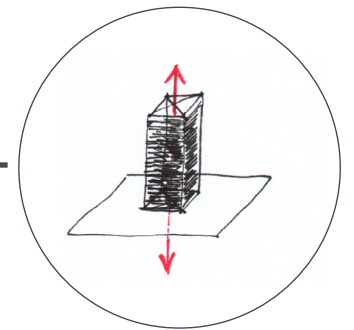
Daylight & depth



Routing



Bay width



Circulation cores

The Hague

Groningen

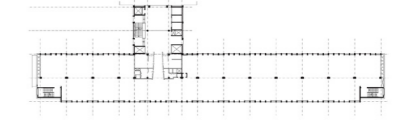
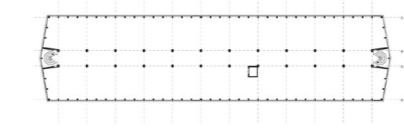
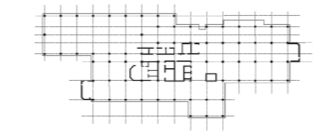
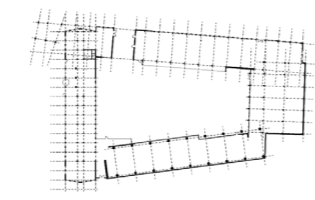
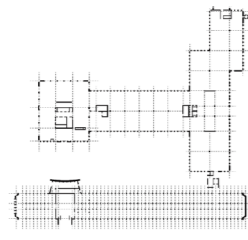
Eindhoven

Stadhouder, Alphen aan den Rijn

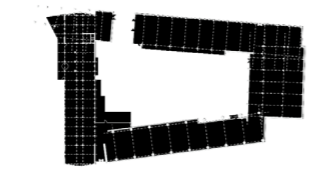
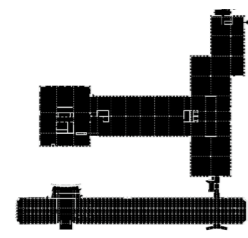
Westplantsoen, Delft

Enka, Arnhem

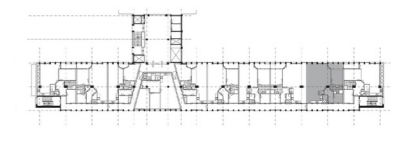
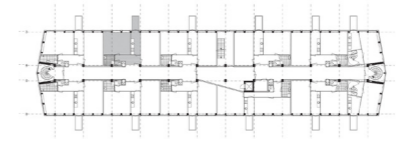
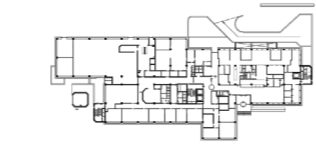
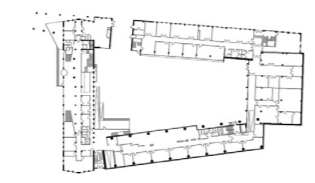
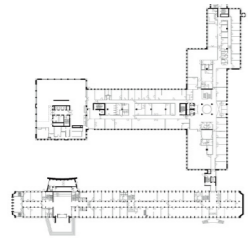
Grid



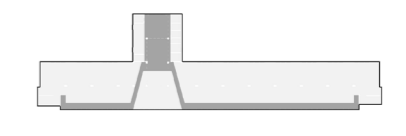
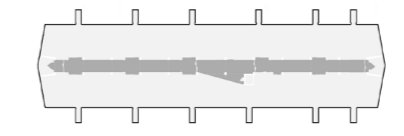
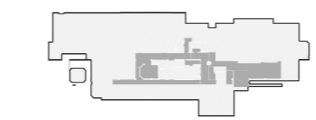
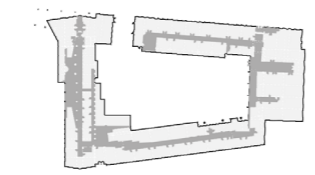
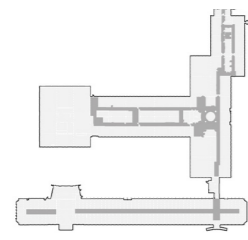
Free-space



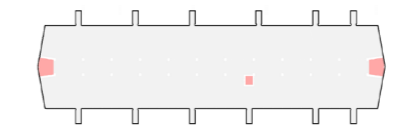
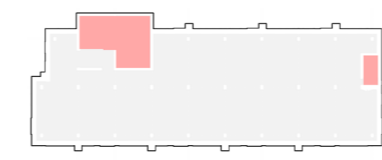
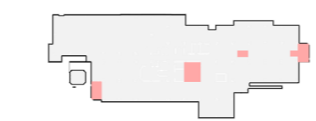
Non load-bearing partitions



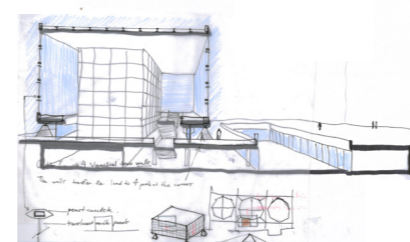
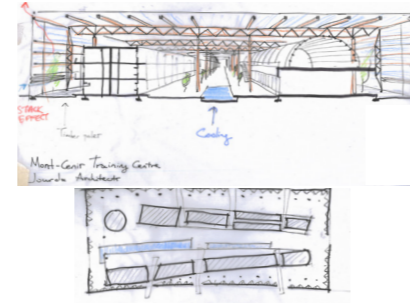
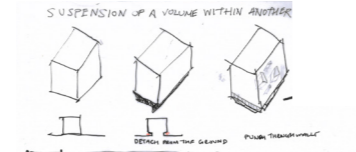
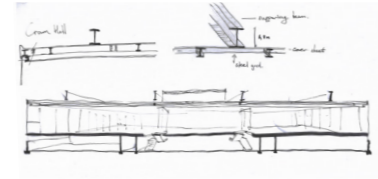
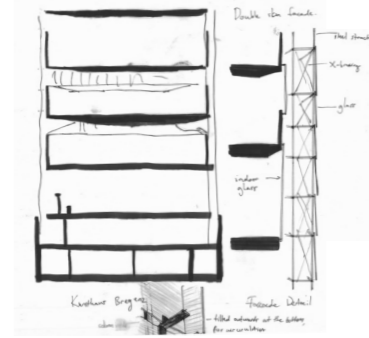
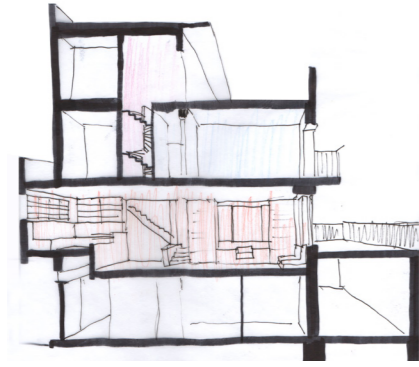
Routing



Cores



Sectional studies



Larking Building

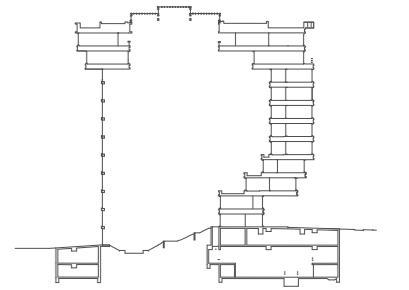
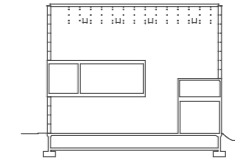
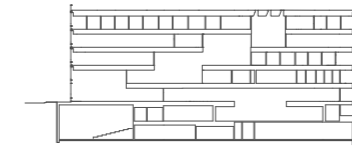
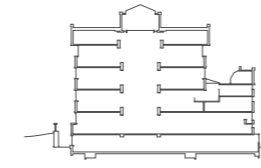
De Effenaar, NL

Bernard College

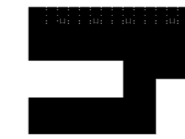
Art Centre, La Coruna

Ford Headquarters

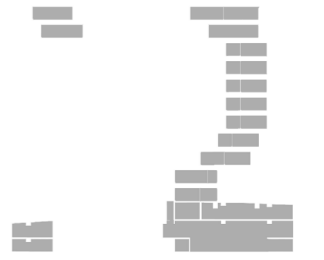
Section



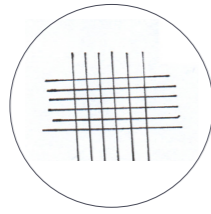
Void



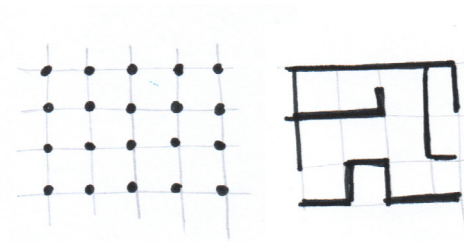
Enclosed space



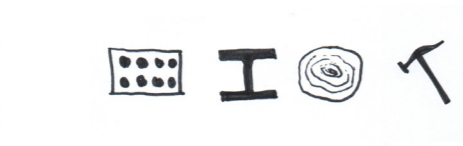
Research & design



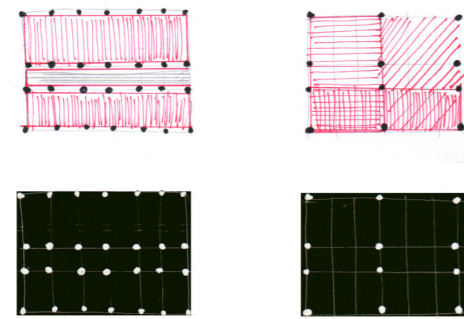
Grid



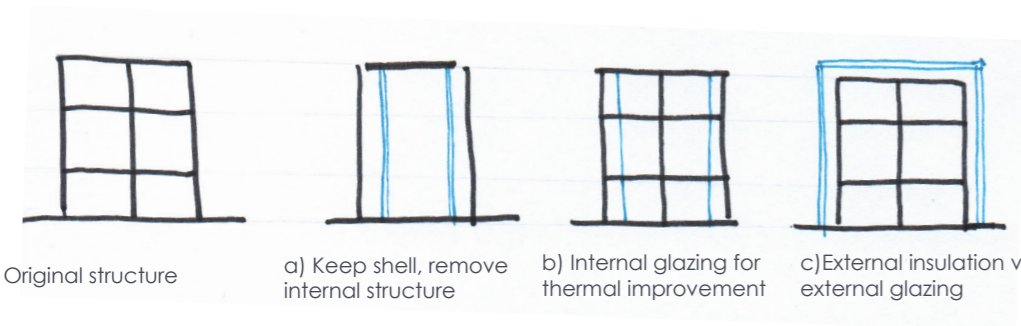
Columns / Load bearing walls



Materiality, structural capacity & technique



Space division, distancing & structure/ m²

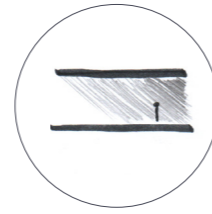


Original structure

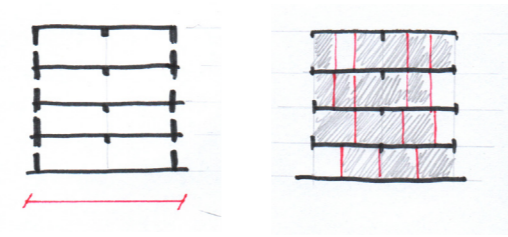
a) Keep shell, remove internal structure

b) Internal glazing for thermal improvement

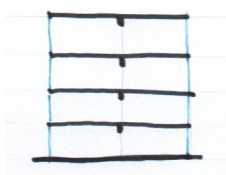
c) External insulation via external glazing



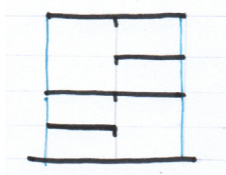
Depth & daylight



a) Remove internal partitions to increase daylight



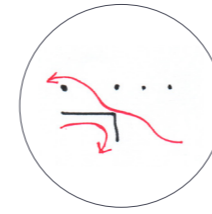
b) Facade intervention (-) cost & value - conflict



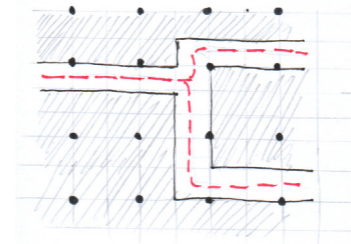
b) Add voids (loss of floor area)



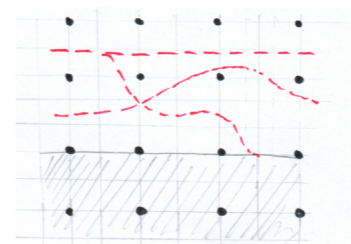
b) Completely new structure, column-free space



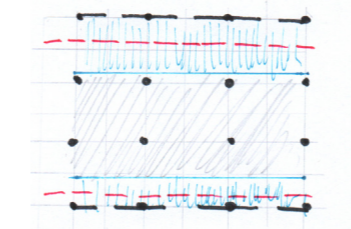
Circulation



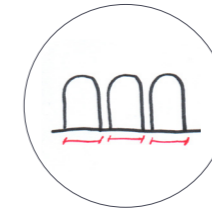
a) Closed/ blind system



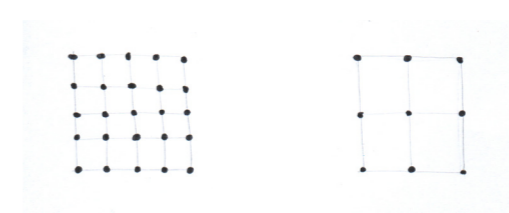
b) Combination of open plan & closed spaces via zoning



c) Circulation as buffer zone & axial organization of movement



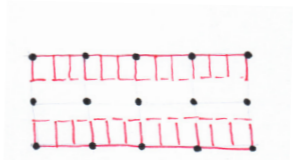
Bay width



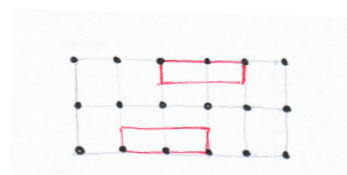
Structural density & space division



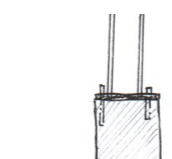
a) Demolish top level & add ultra-lightweight structure



b) Minimize space division



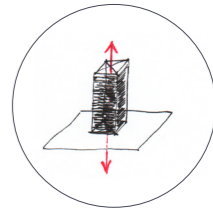
c) Cores as free standing objects in the space



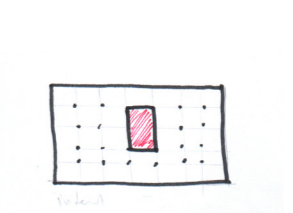
(-) Construction challenges



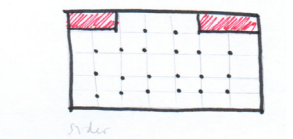
(-) Financial impact



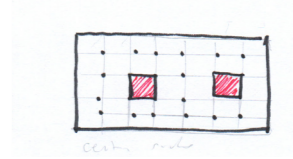
Re-location of cores



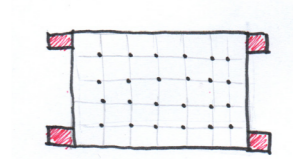
a) Single & centrally positioned core



b) Double cores placed sideways

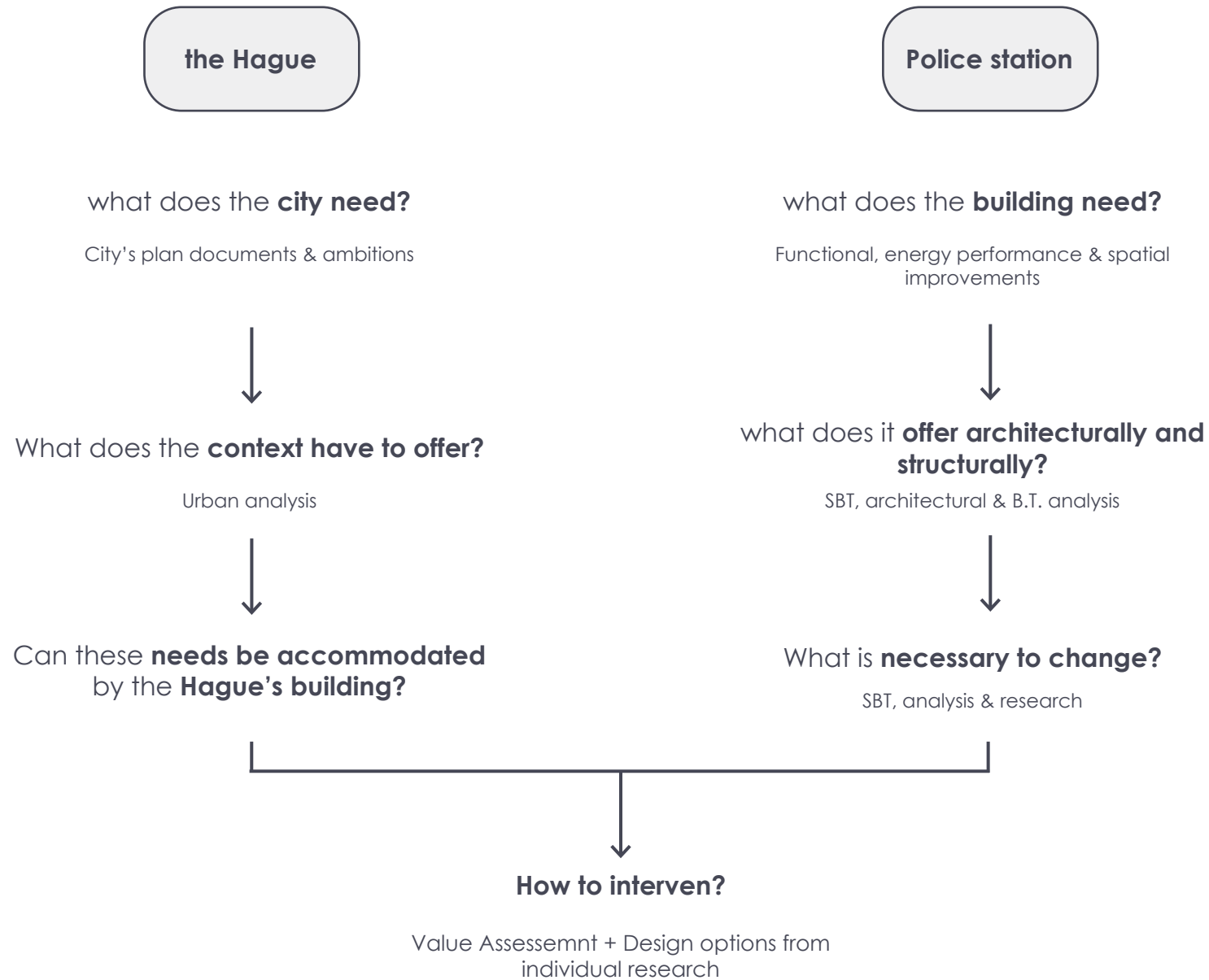


c) Cores as free standing objects in the space



b) Cores placed externally for maximum flexibility (high-tech architecture principles)

Strategic approach & Starting points



Urban analysis

Location



Location



Urban tissue



1. Portugese & Israelite cemetery



2. The Zone - Offices



3. Peace Palace



4. Main entrance



5. Alexanderplein



6. Burgemeester de monchplein

Strategic plans for the future



Plan development framework, Burgermeester Patijnlaan 35



Urban plan for International Zone



Opportunities for the 'new' Hague

Ontwikkelingen

2018	Nieuwe stad	2040
46.000	INWONERS	90.000
26.000	HUISHOUDENS	50.000
1,9 mln.	M ² KANTOORRUIMTE	2,4 mln.
2018	Nieuwe economie	2040
90.000	BANEN	125.000
200.000	FORENSBEWEGINGEN	400.000
DIVERSIFICATIE ECONOMIE UITBREIDING KENNISSTAD MODERNISERING ECONOMISCH DNA		

Urban framework

City

Region

People

Facts



Student friendly



International zones - Safety

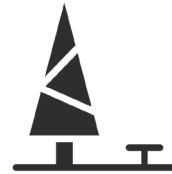


Different backgrounds

Needs



Expand educational facilities



Improve public space



Informal meeting

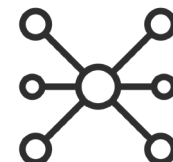
Goals



Establish a university



Add social value



Innovative knowledge clusters

Program

Program organization

IT University, Co-working, Housing & Library



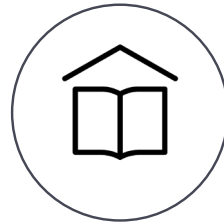
University

12.100m²



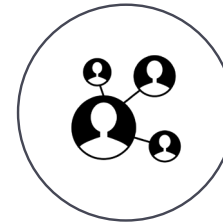
Office space

6.000m²



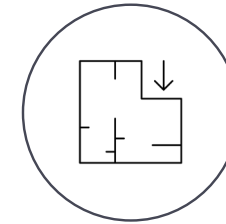
Library

2.500m²



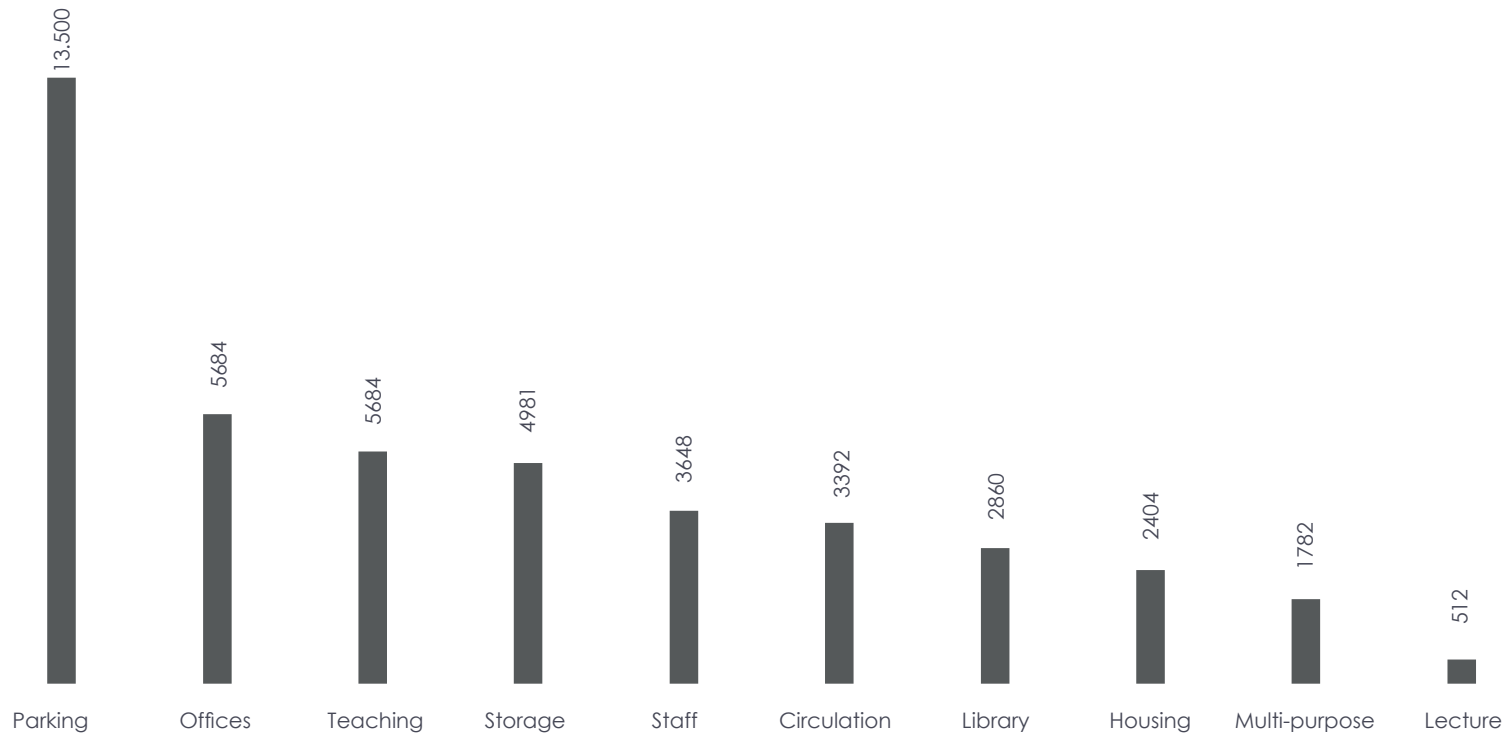
Social activities

7.470m²

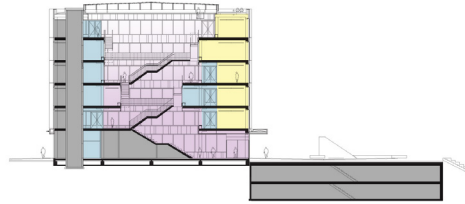
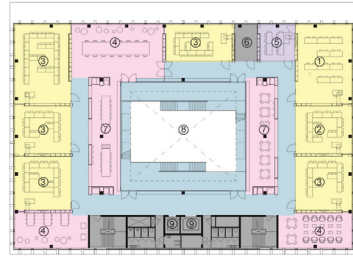


Studios

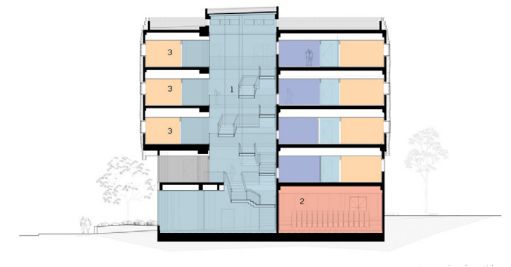
50+20m²



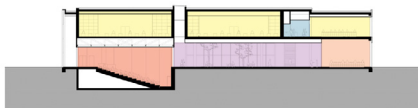
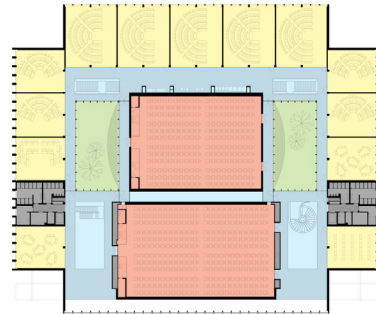
Precedent analysis



Erasmus University Rotterdam, Paul de Ruiter



Check Point Building, Computer Science



CUBE, KAAO Architects

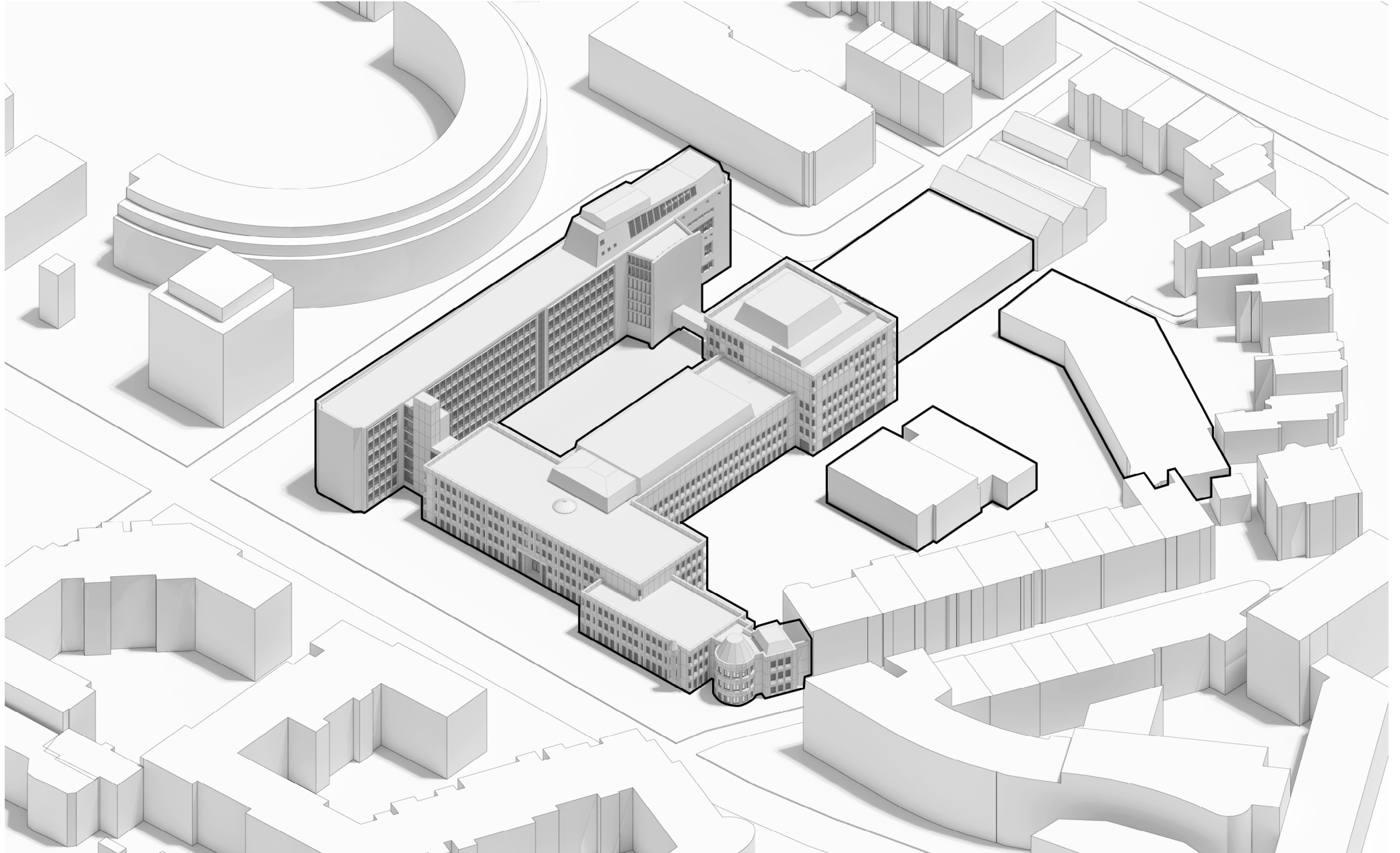


iPabo University, Mecanoo

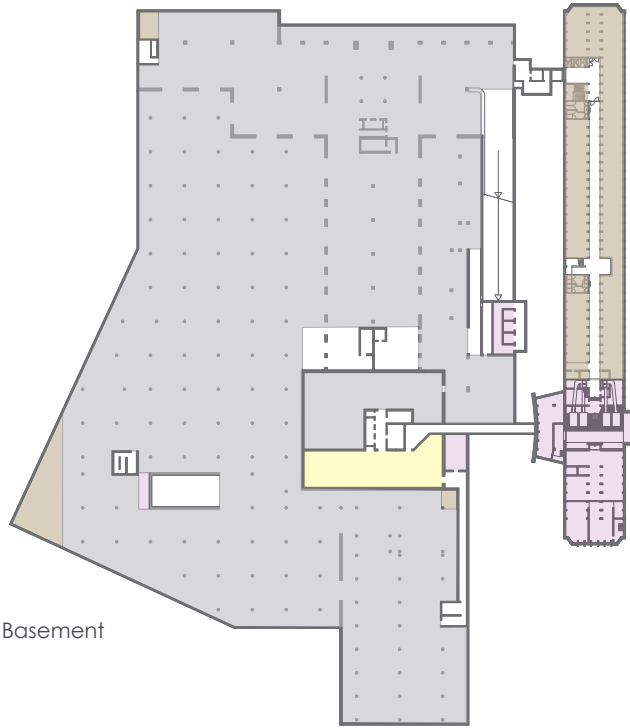
- | | |
|-----------------|------------|
| Education | Study area |
| Offices | Open space |
| Circulation | Meeting |
| Public activity | Lecture |
| | Storage |

Composition analysis

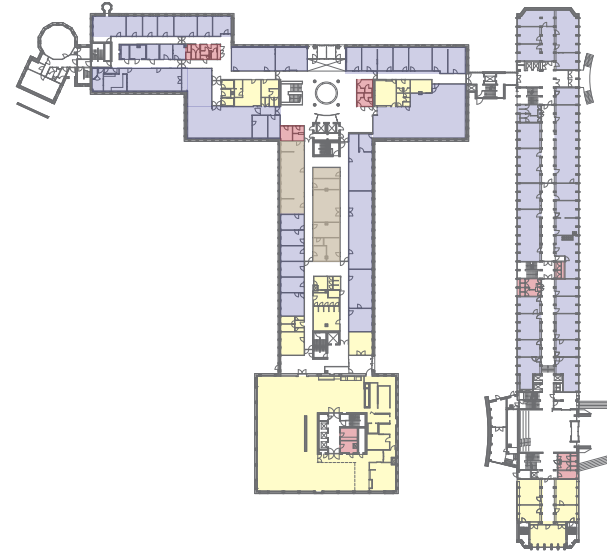
Axonomic view



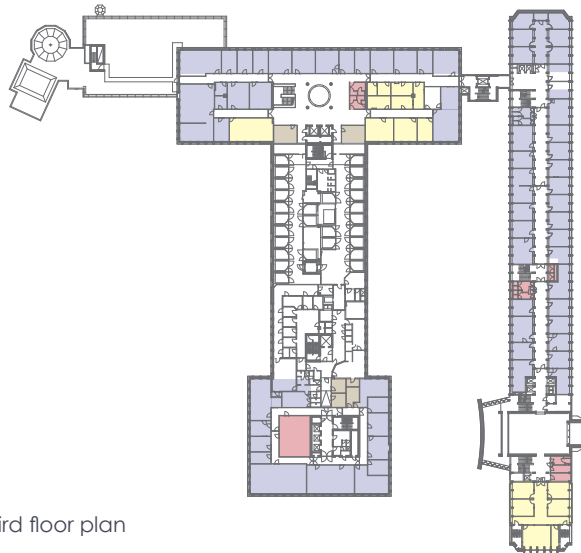
Existing floor plans



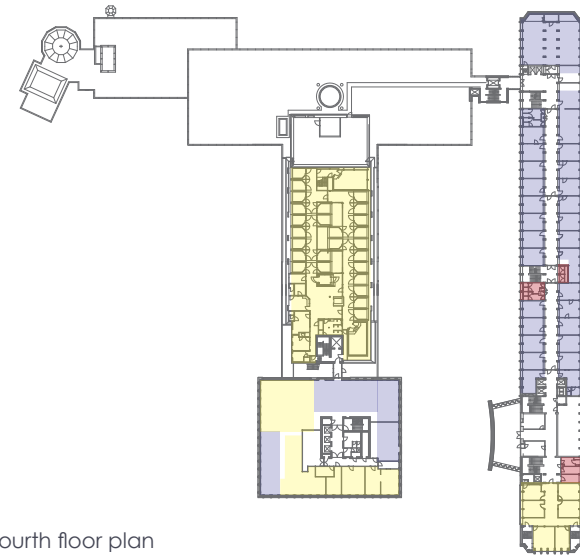
Basement



Ground floor plan



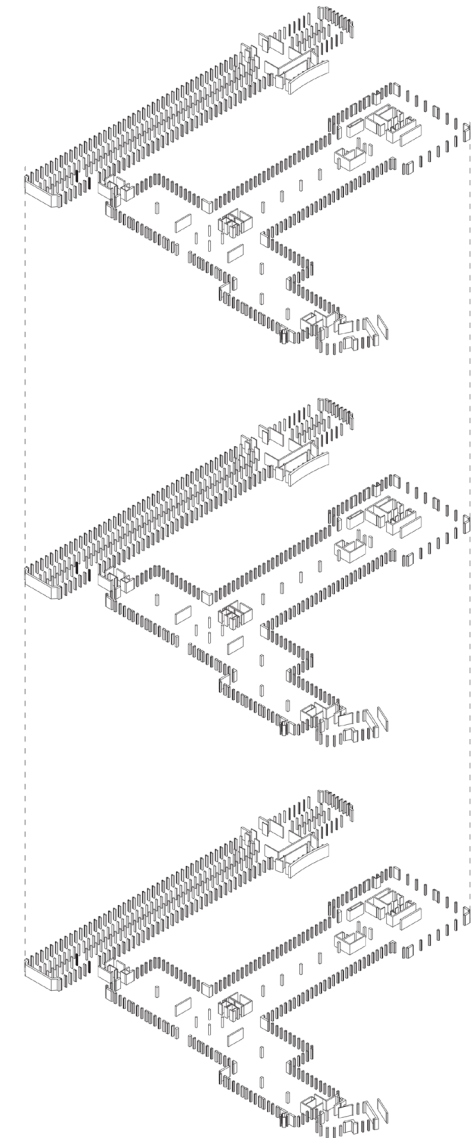
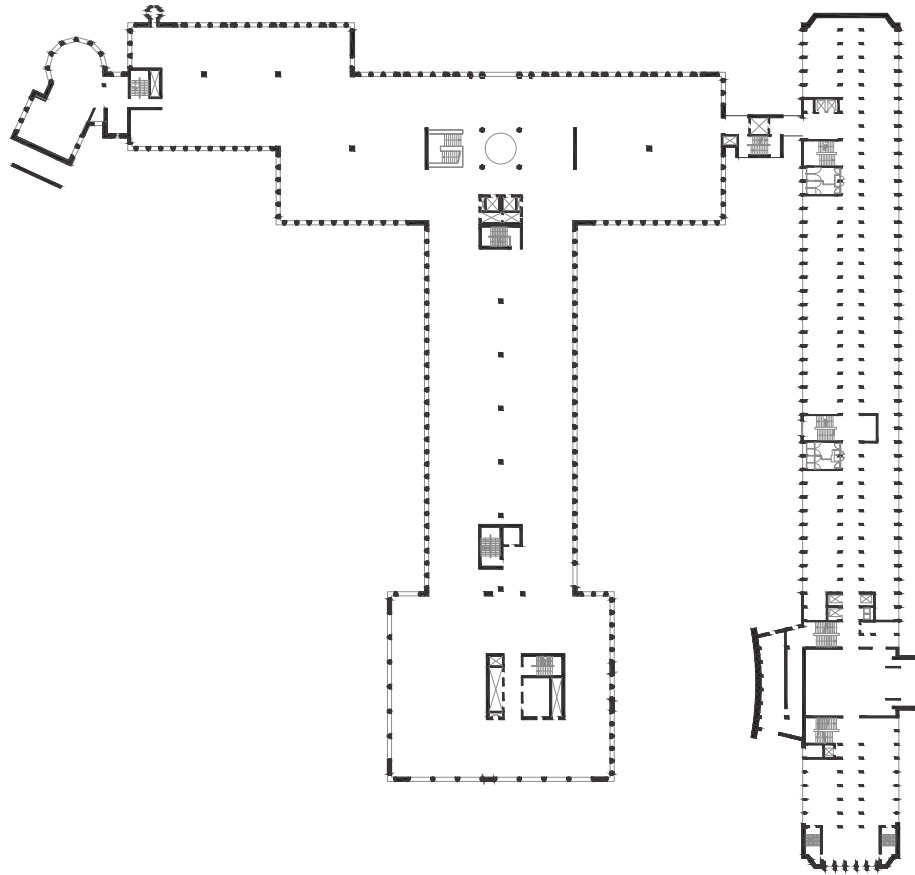
Third floor plan



Fourth floor plan

- Special function
- Office
- Toilets
- Storage

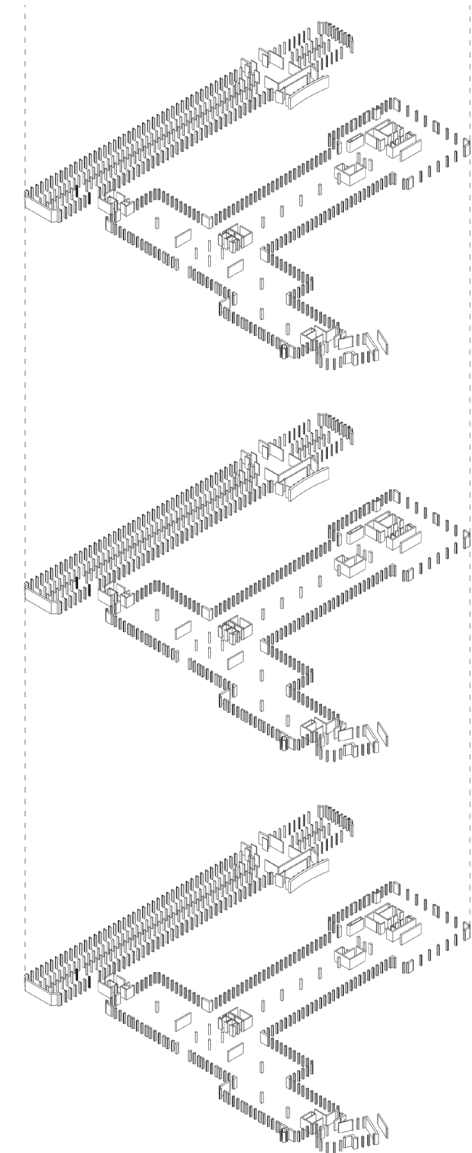
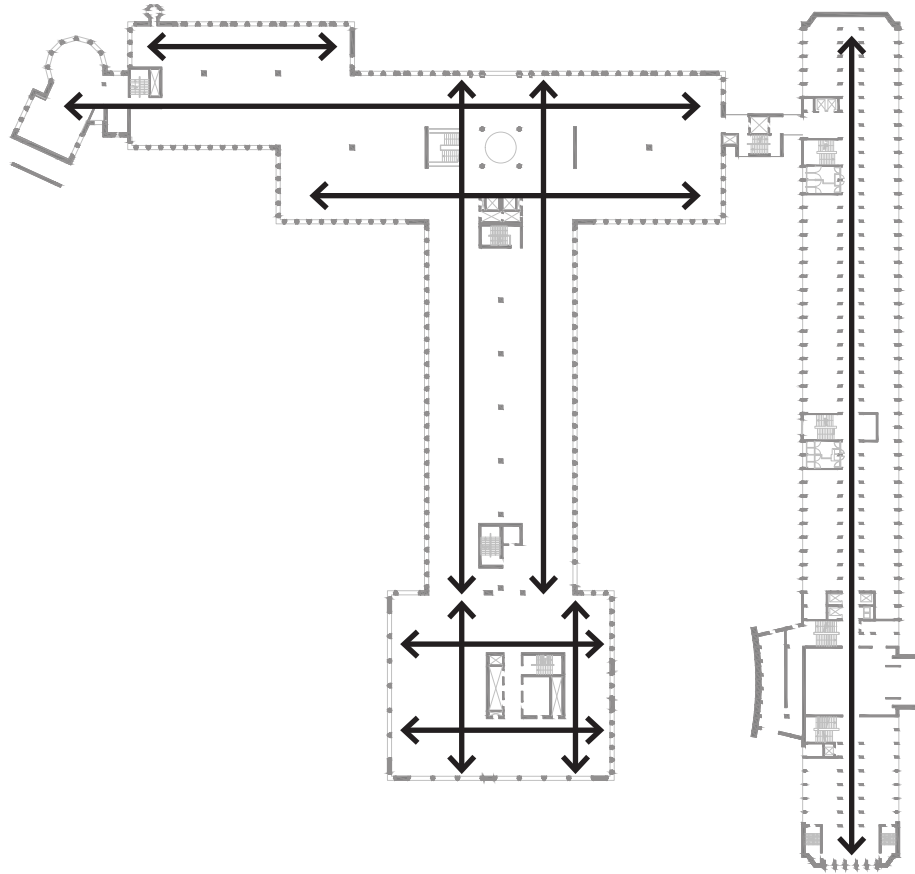
Load bearing structure



0M 10M



Load bearing structure



0M 10M



Space



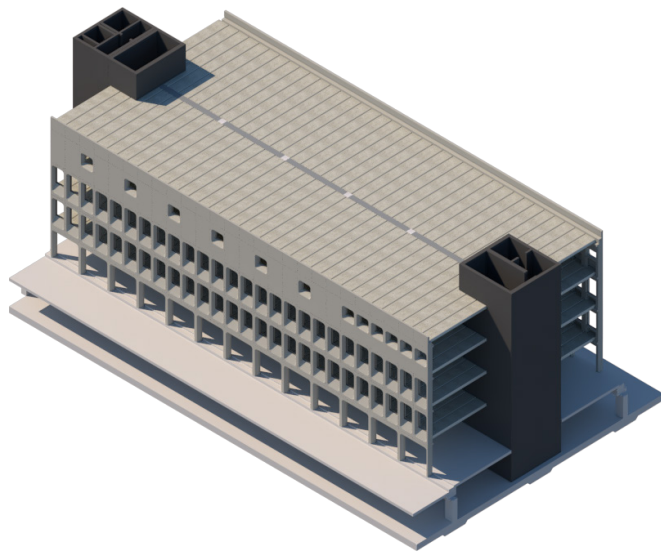
Main Hall



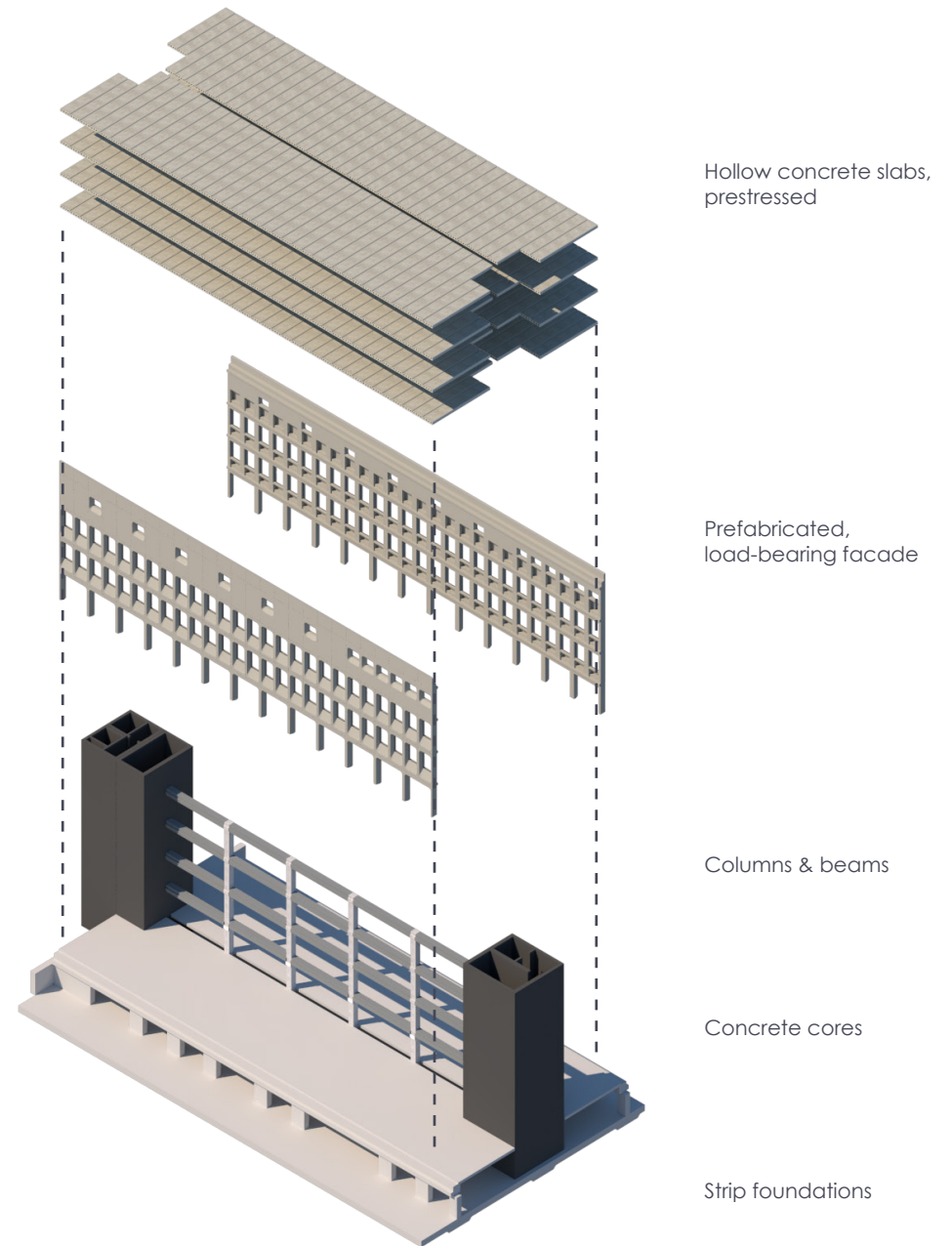
Circulation corridors



Extension - Structural mechanism



Main structural system



Hollow concrete slabs, prestressed

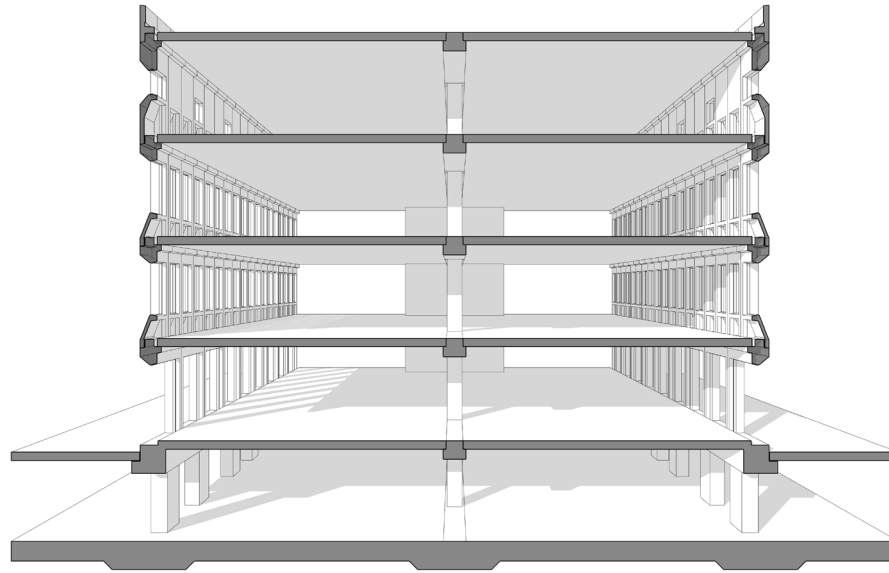
Prefabricated, load-bearing facade

Columns & beams

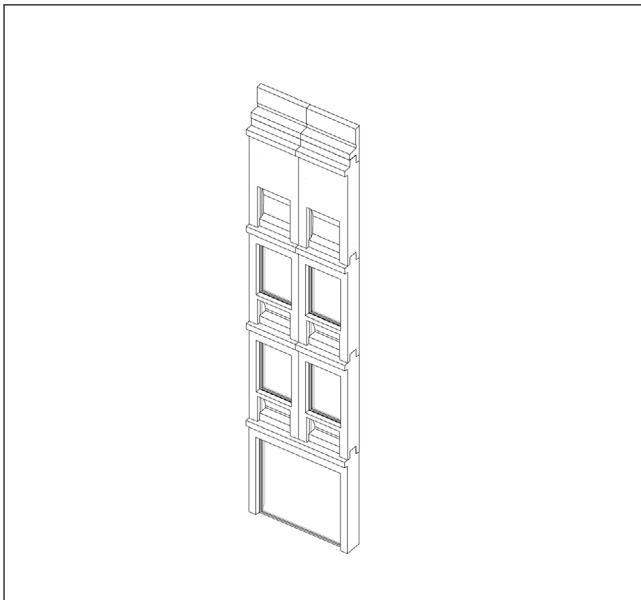
Concrete cores

Strip foundations

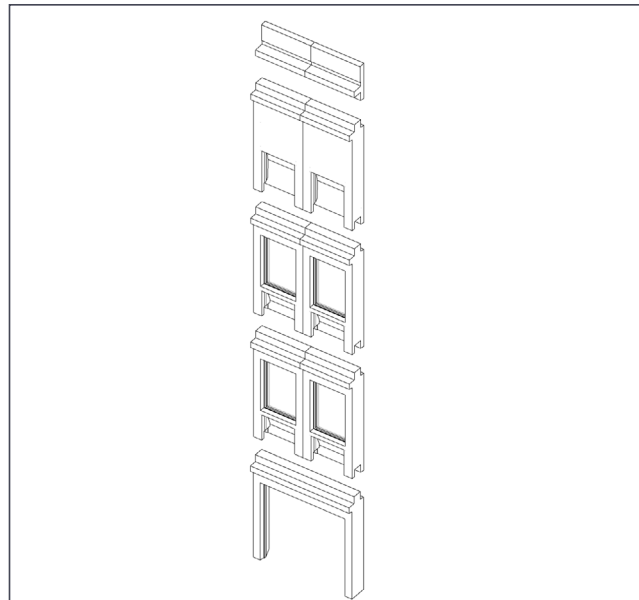
Section



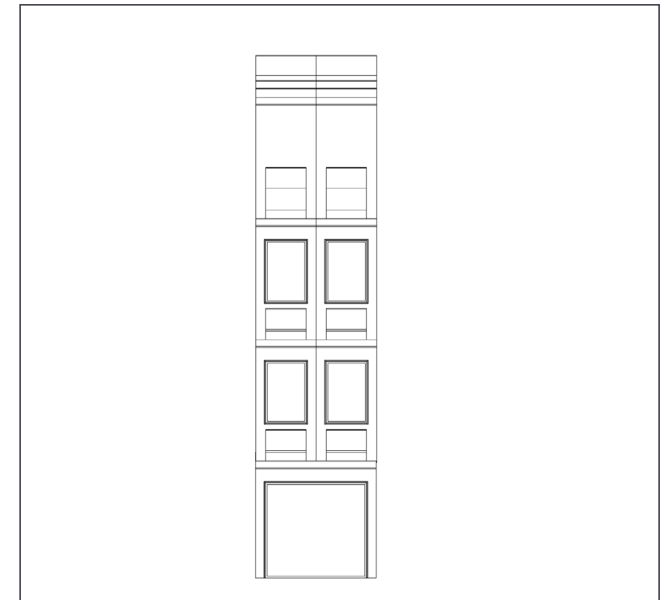
Sectional perspective



Interlocking panels



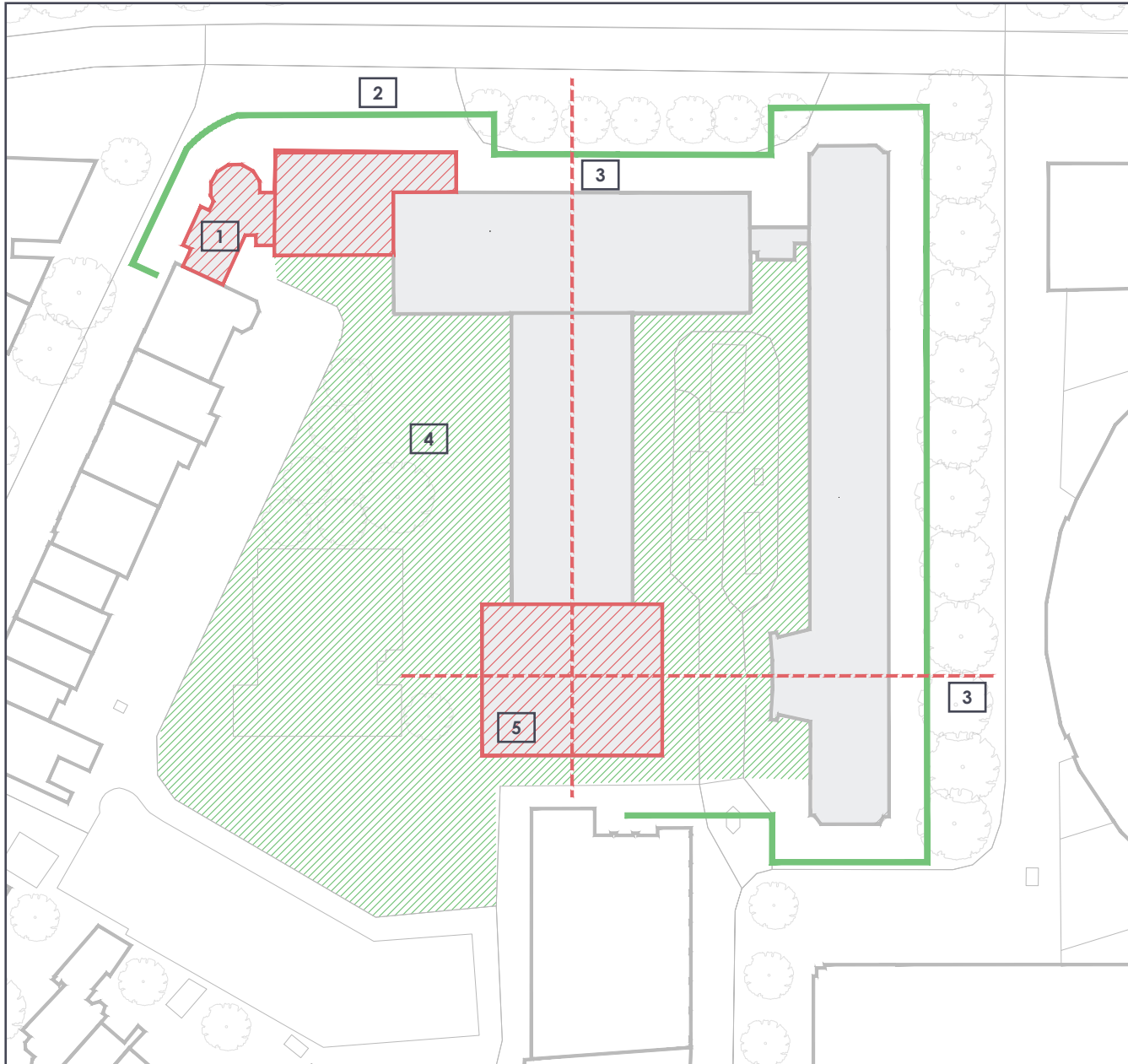
Exploded view



Interior elevation

Value assessment

Value Assessment - Ensemble

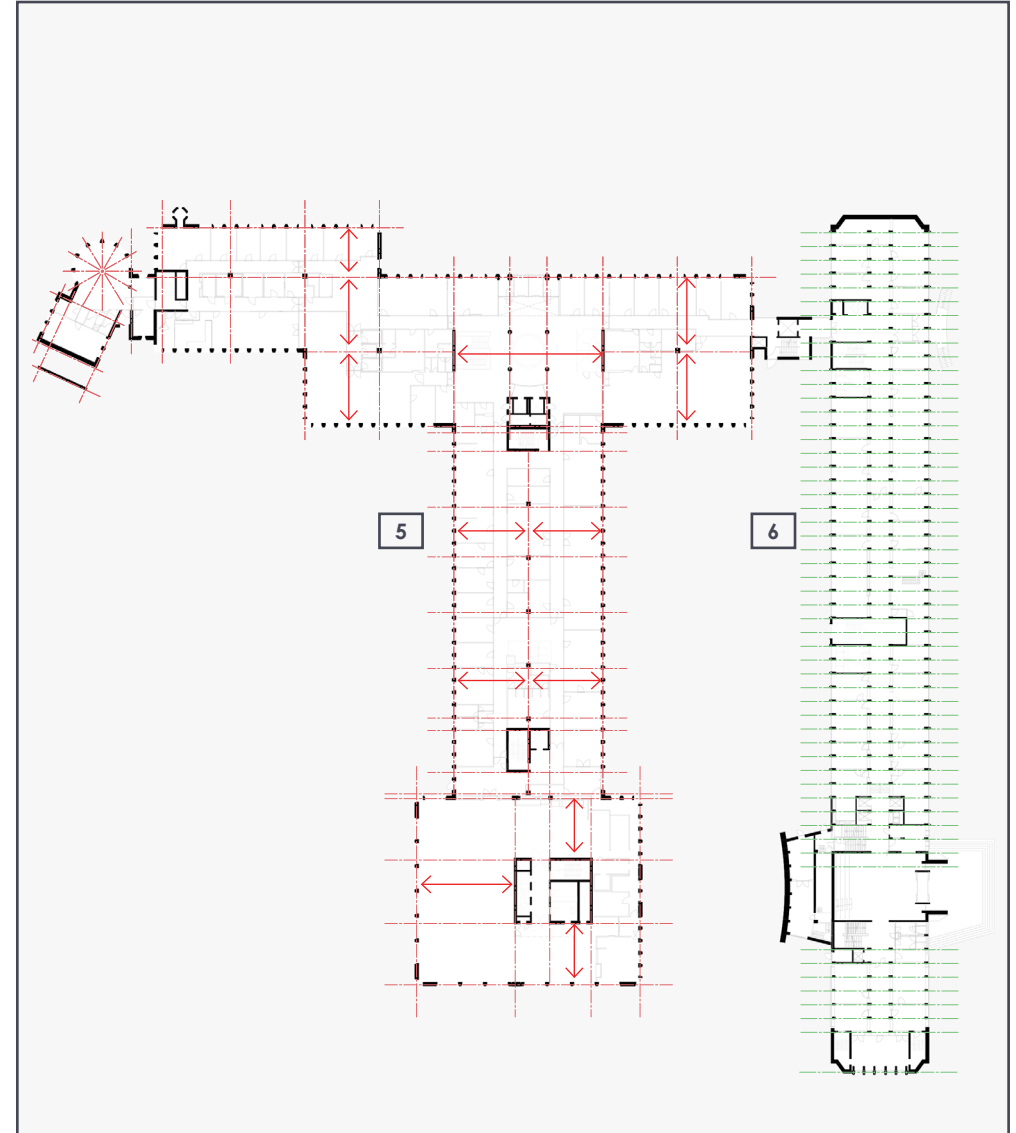
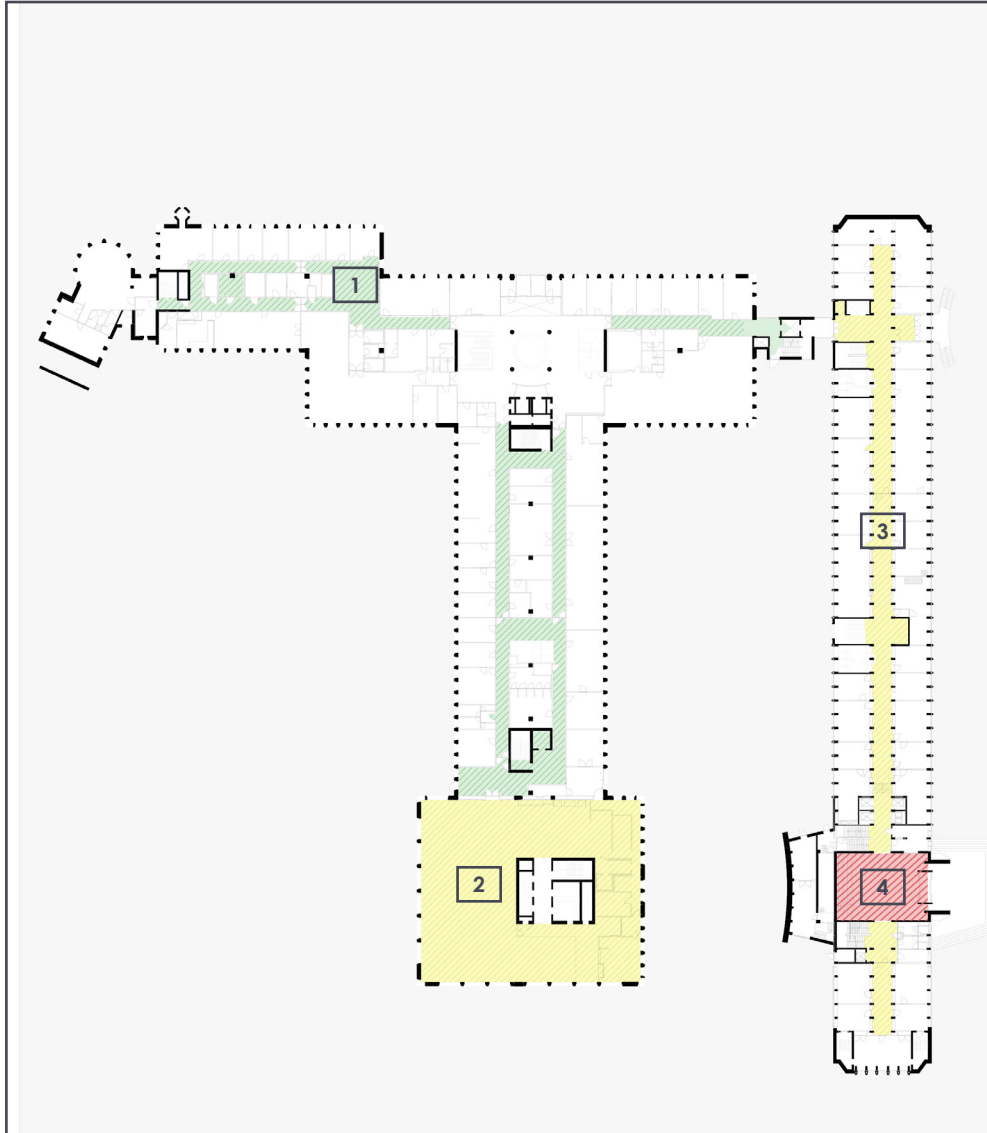


Ensemble values

1. Connection to surroundings
2. Permeability
3. Axes - symmetry - entrances
4. Outdoor area
5. Form

High	■
Medium	■
Low	■

Value Assessment - Spatial organization



Spatial values

- 1. Circulation system - blind
- 2. Column-free space
- 3. Linear corridor
- 4. Main hall - historical & cultural value

- 5. Structural grid & span (11 X 8 m)
- 6. Span - dense grid (5 X 2 m)

High	
Medium	
Low	

Value Assessment - Monument facade



Entrance

Use value : Access to the building
Currently underused



Art value : Artworks
Monumental scale



Masonry walls

Use value : Structural support
(-) Insufficient insulation



Art value : Traditionalism
scale, rythm,
natural color
sober character



Window element - Serpentino stone

Use value : Thermal bridge



Art value : Natural material
Sober character



Pefabricated panels

Use value : Strukturwal support



Art value : Detailing
Panel-connections
Schokbeton
Proportion, rhythm



Windows

Use value : Provision of daylight

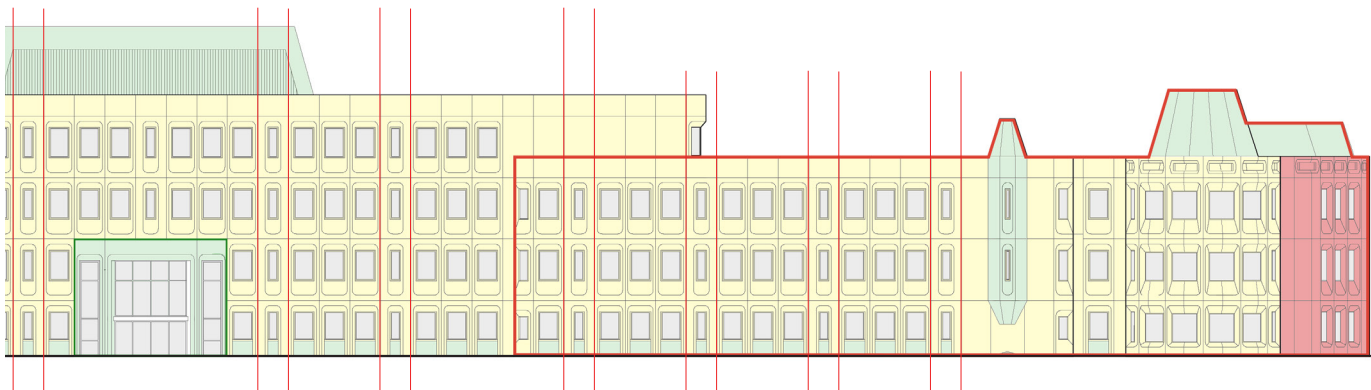


Art value : Proportion & scale



Entrance statue

Art value : Entrance elaboration
Added at a later stage



Entrance

Use value : Main entrance
Not particularly visible



Concrete prefabricated wall elements

Use value : Structural support
(-) No insulation



Art value : Construction technique
Natural material
Articulation through daylight



Left volume

Art value : Seamless connection
to the surrounding buildings through scale



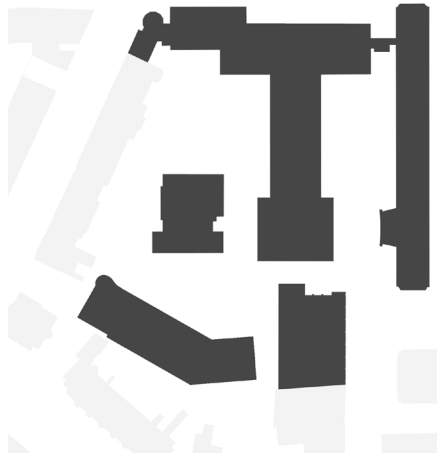
Roof elements

Use value : Water protection & concealing HVAC systems

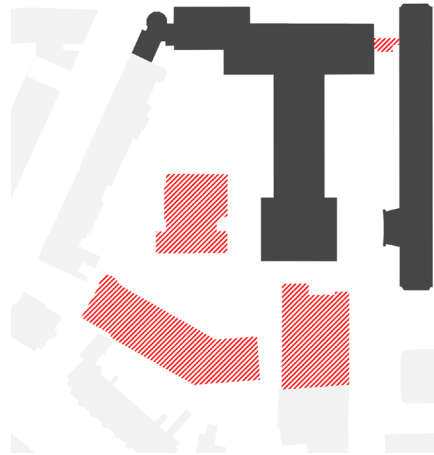


Concept

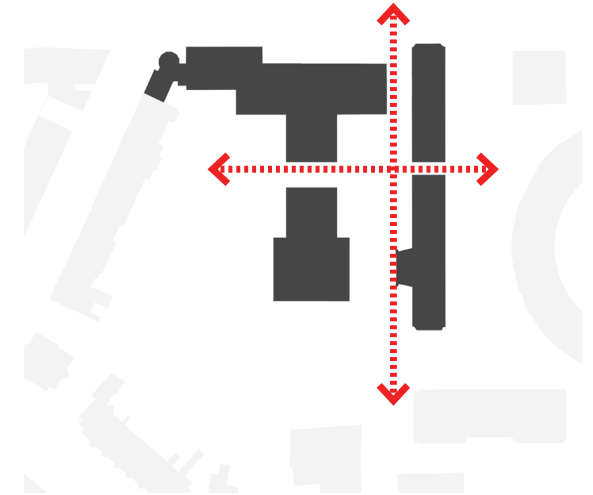
Plan transformation



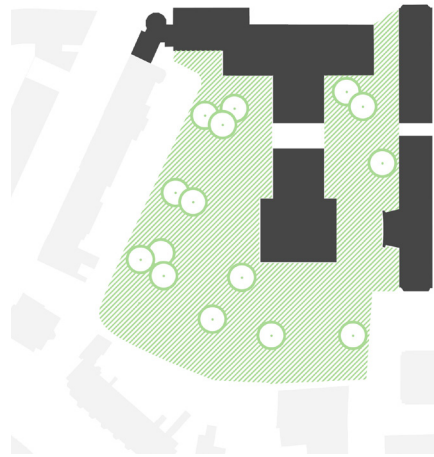
1. Existing condition



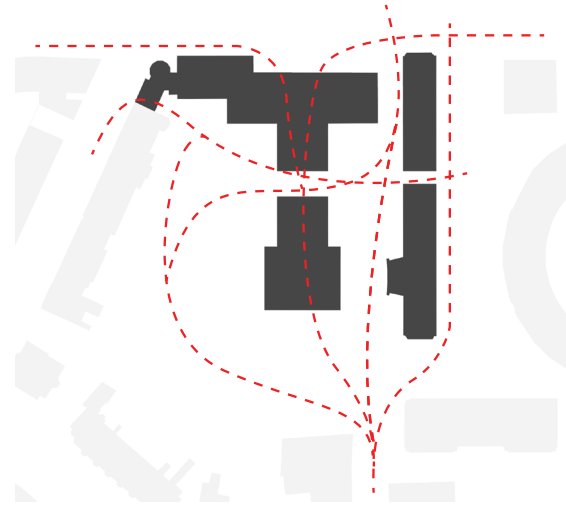
2. Demolition of surrounding buildings



3. Site connection



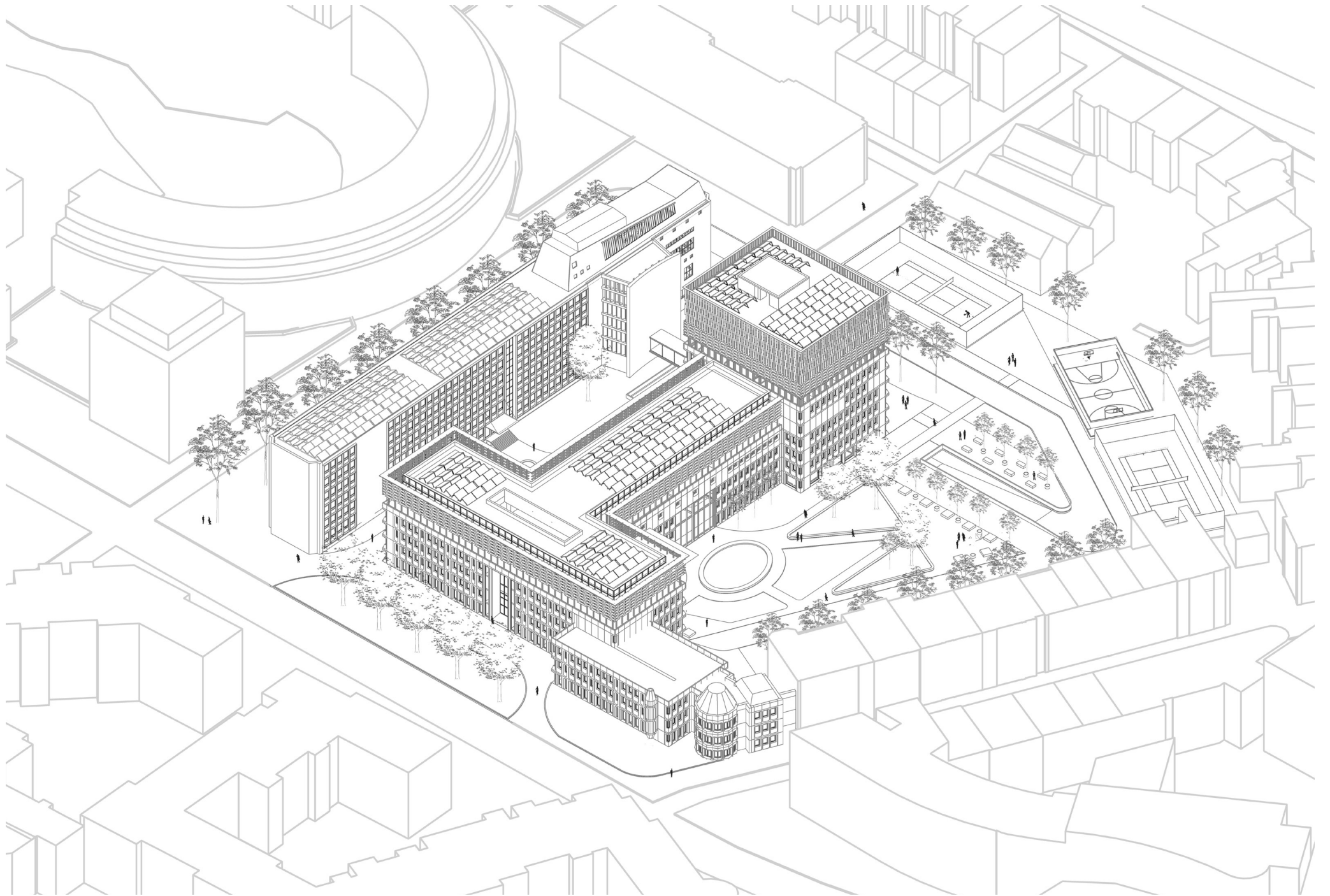
4. Landscape - activities



5. Permeable building

Intervention strategy





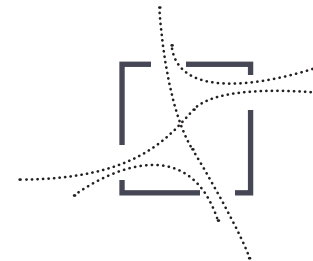
Open space variety



Private

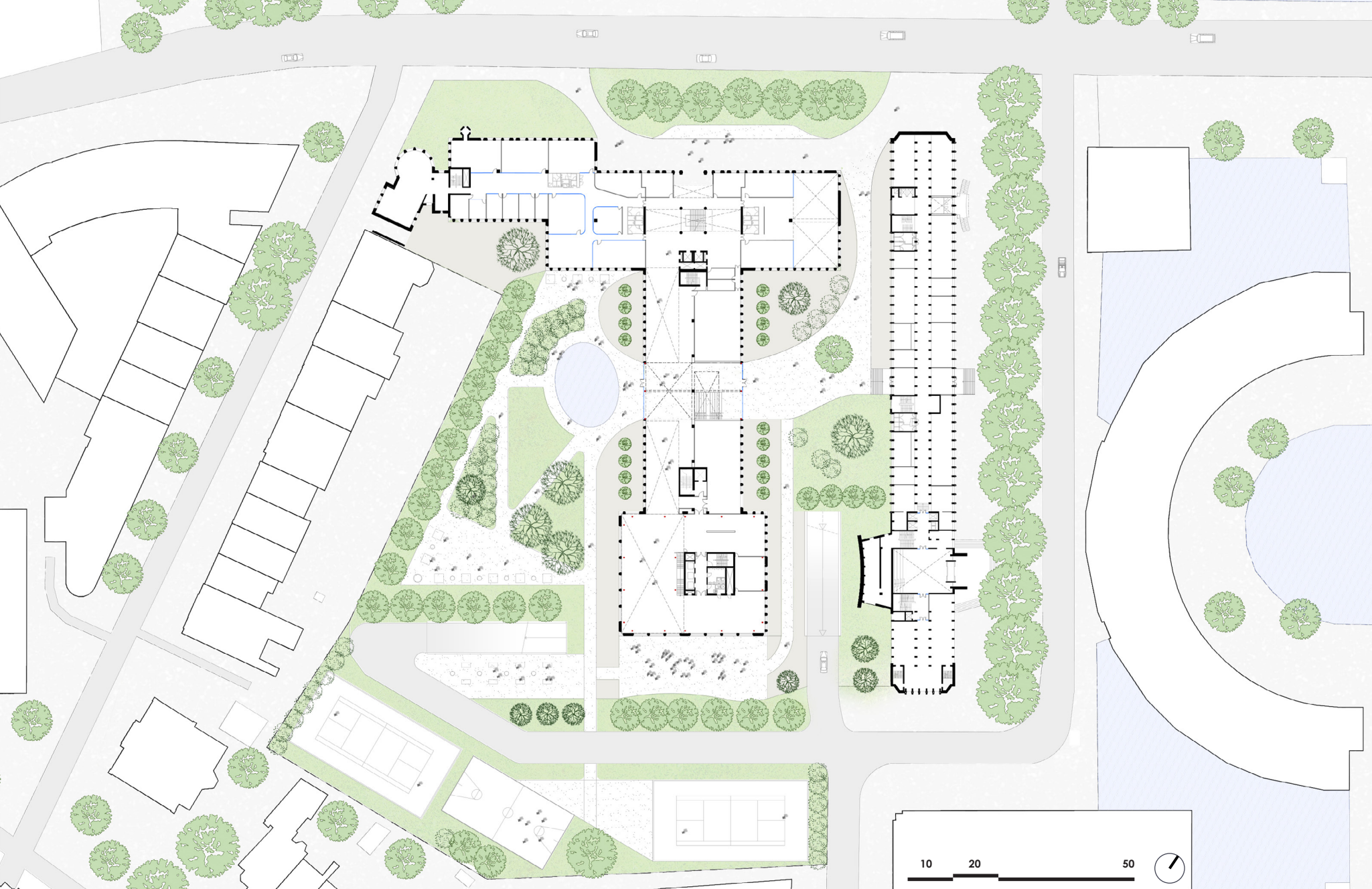


Semi-private

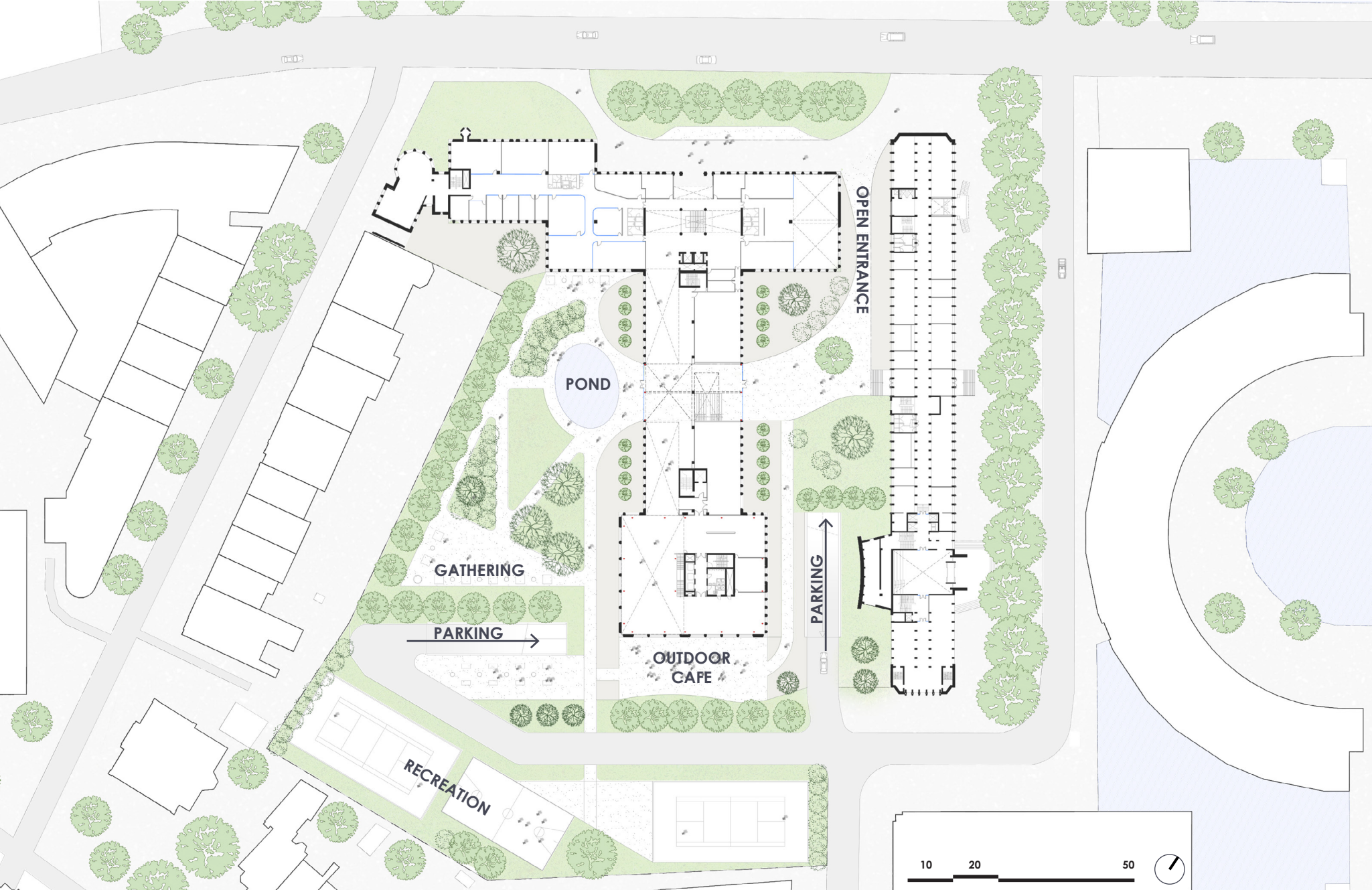


Public

Site plan



Site plan

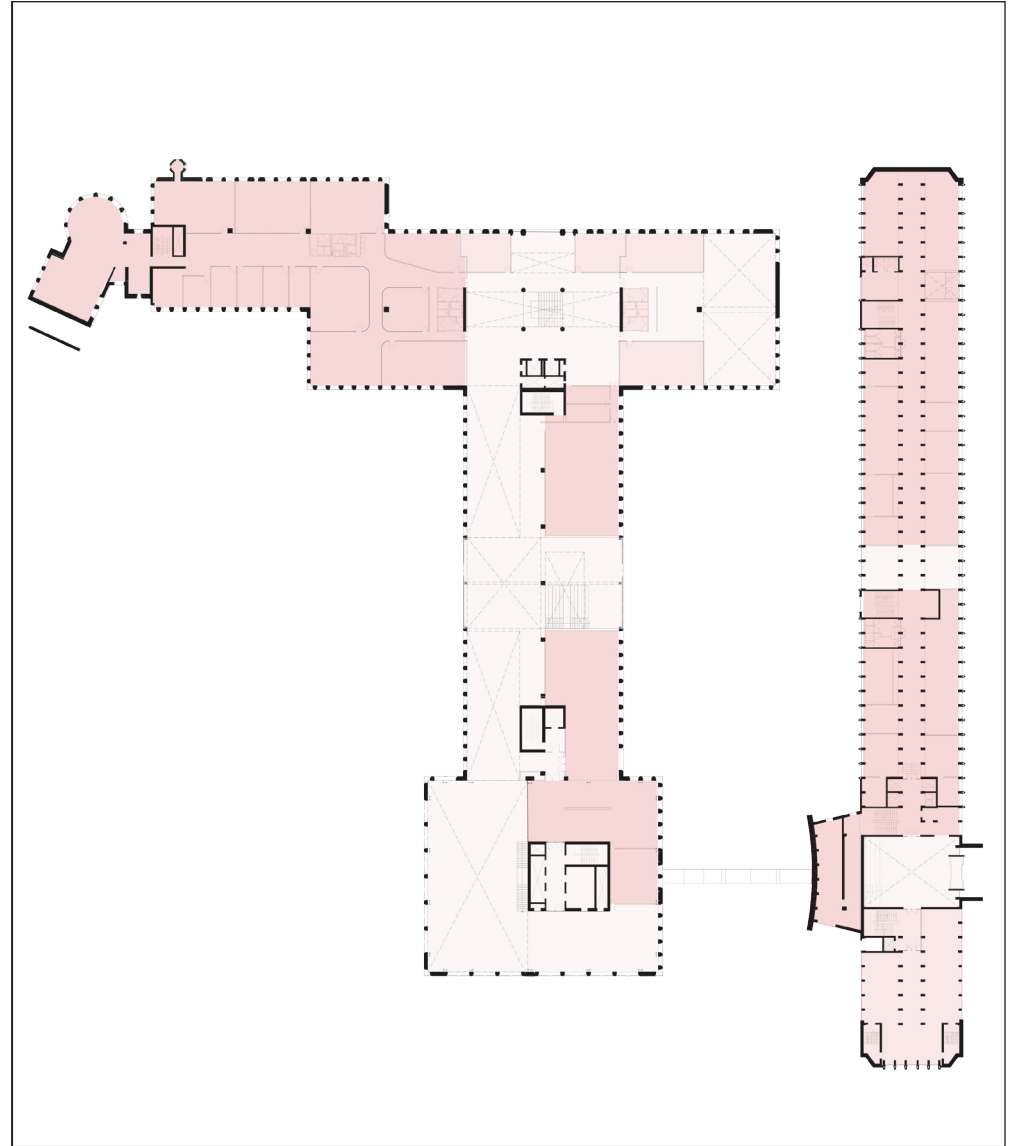
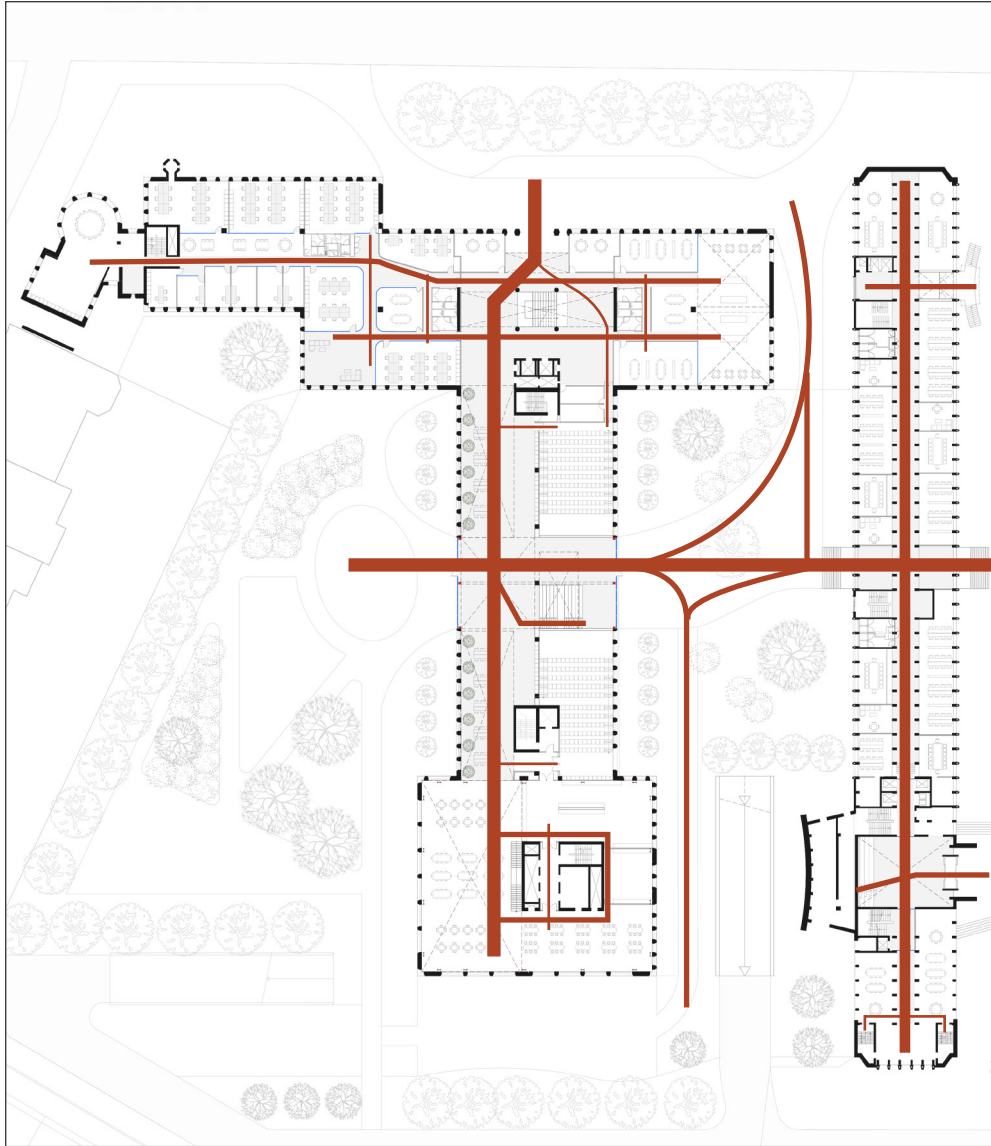








Spatial organization

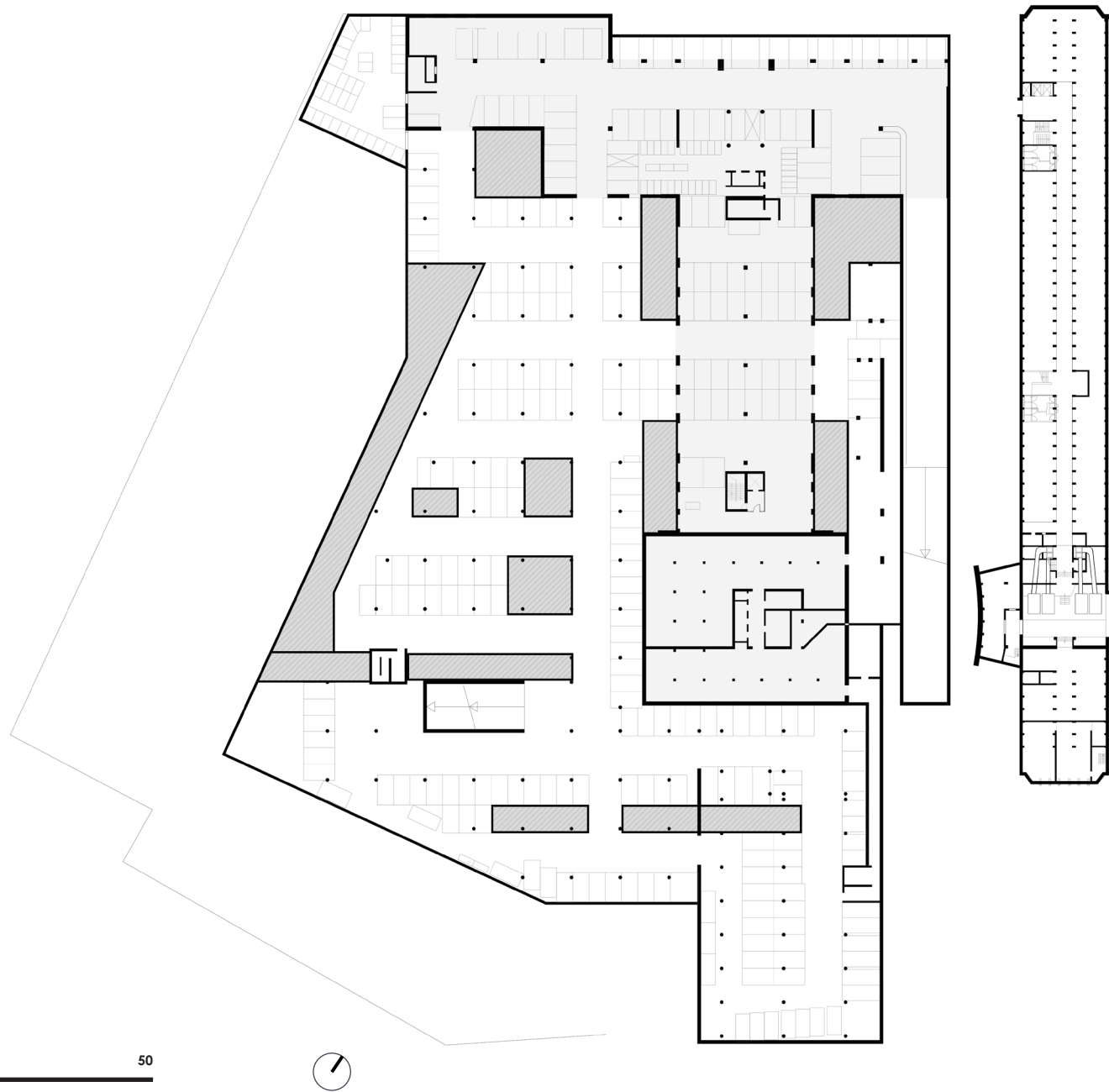


Circulation

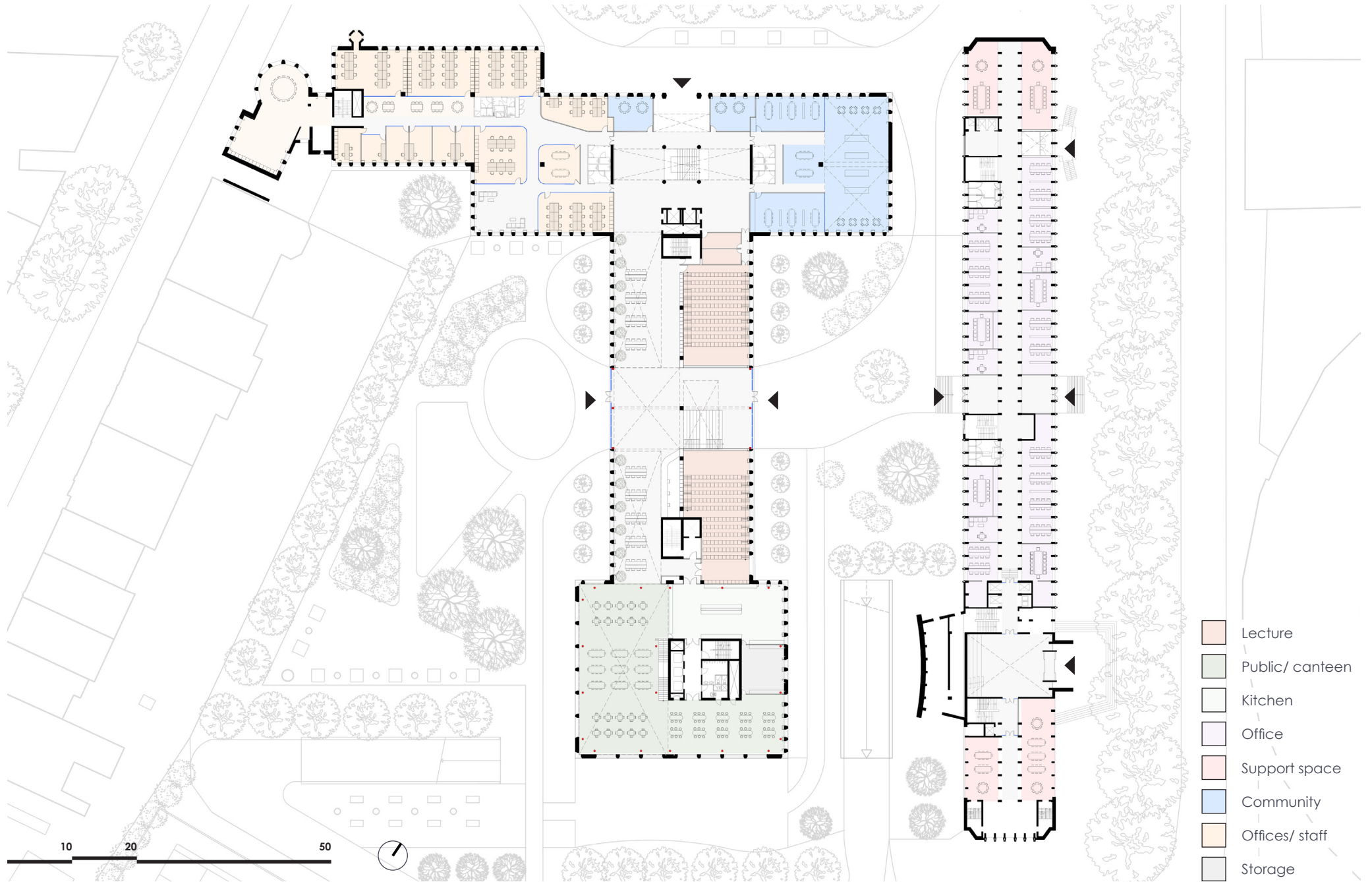


- Private
- Semi-private
- Public

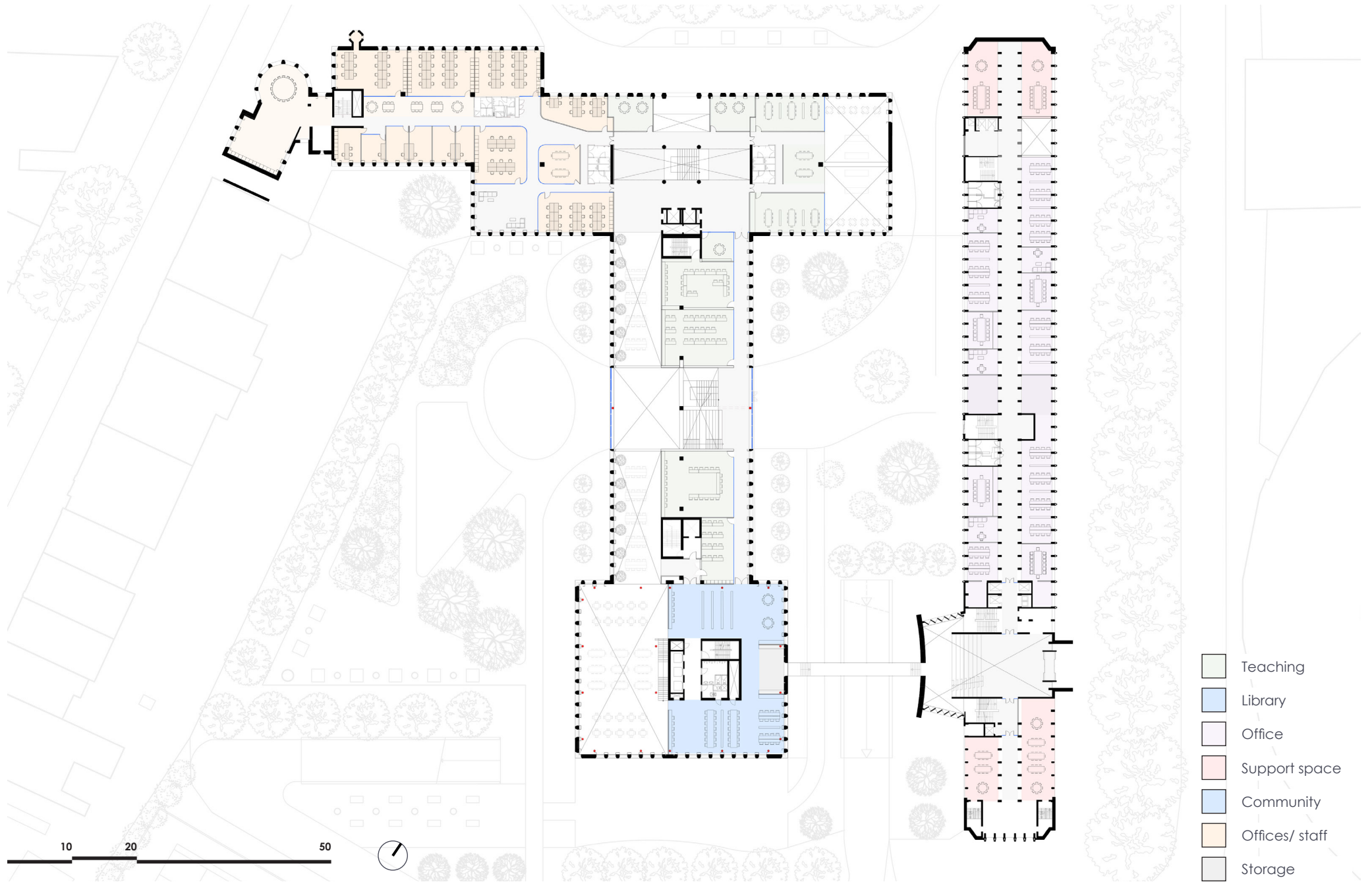
Basement plan



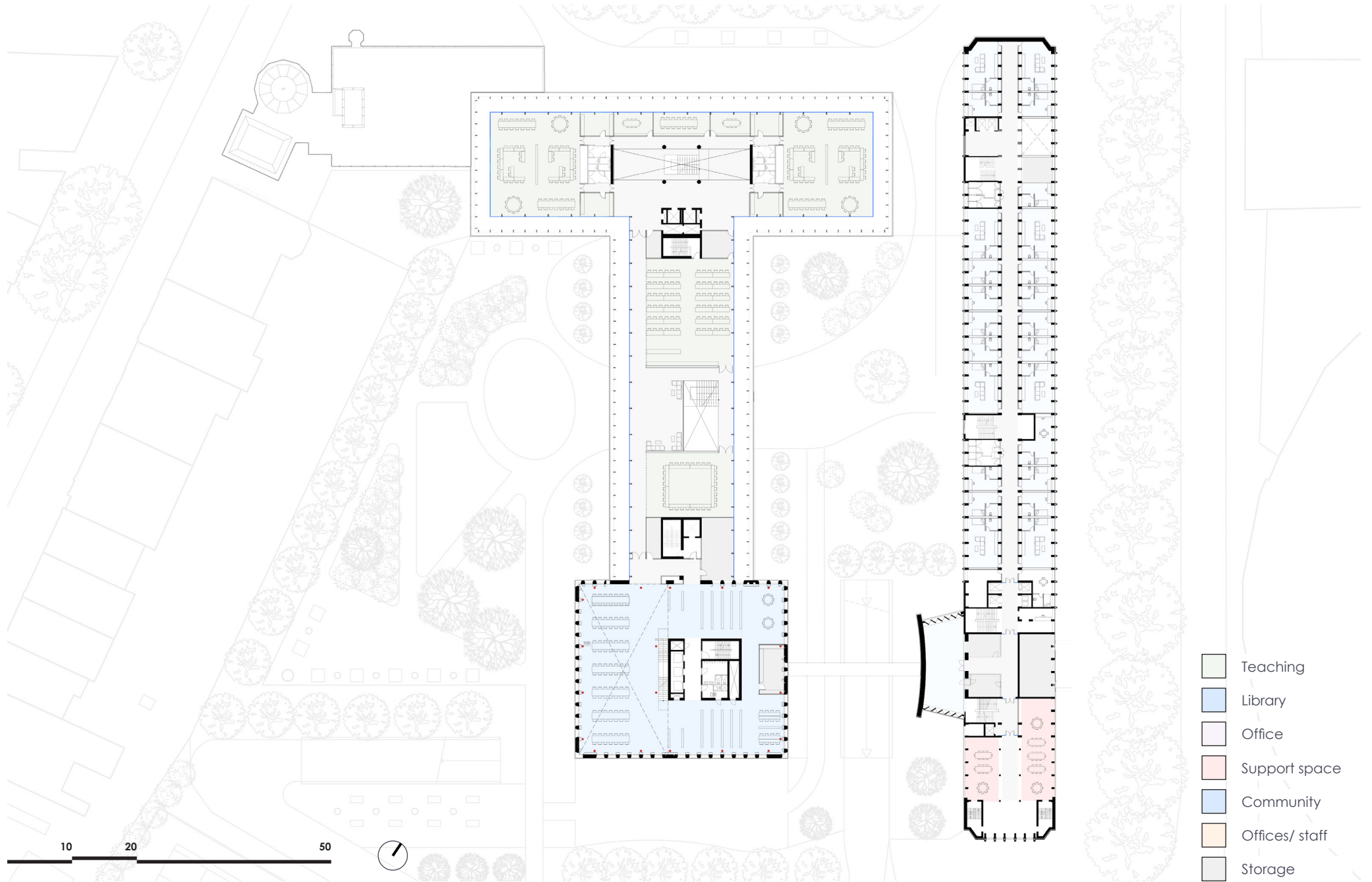
Ground floor plan



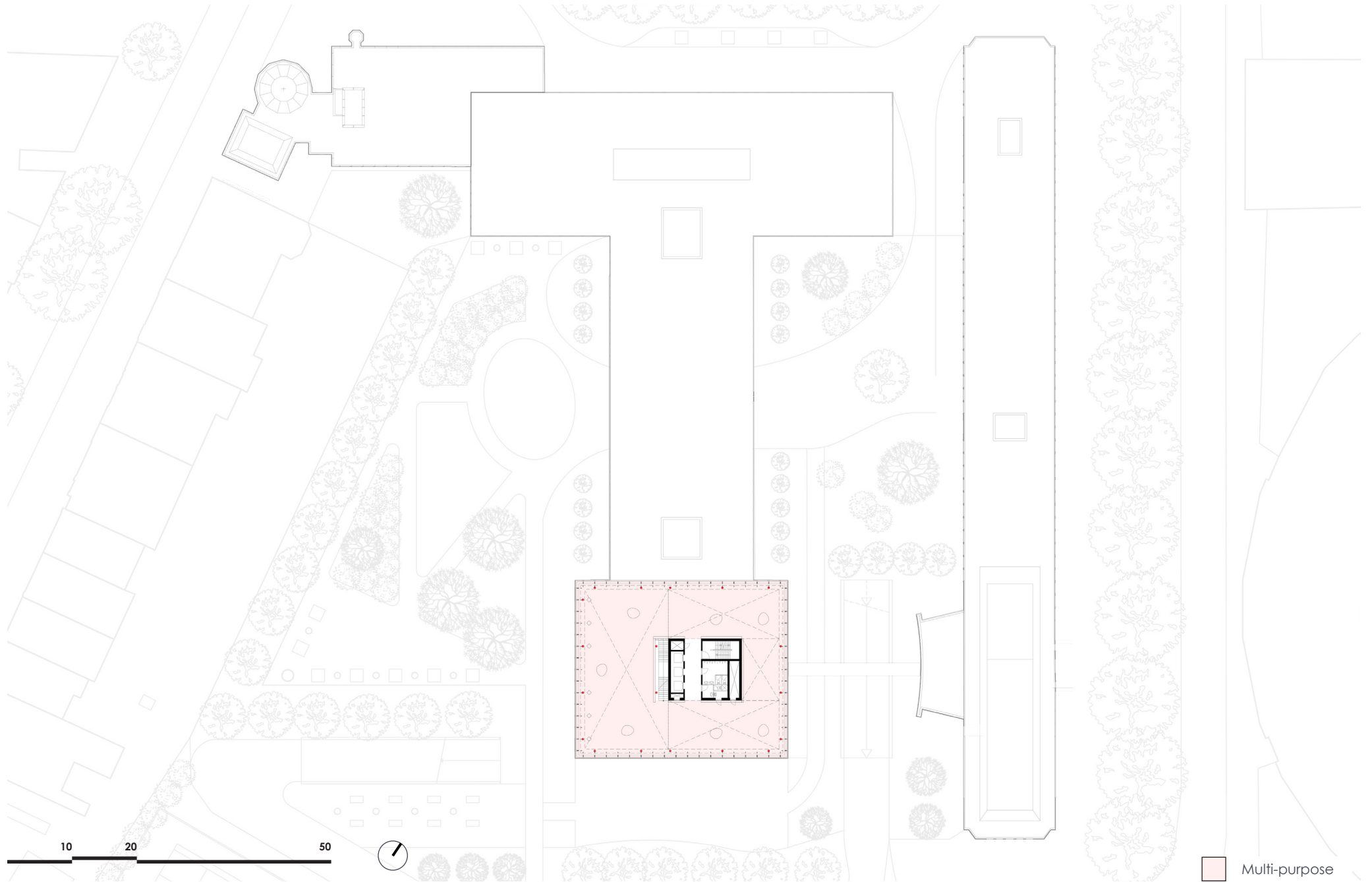
1st floor plan



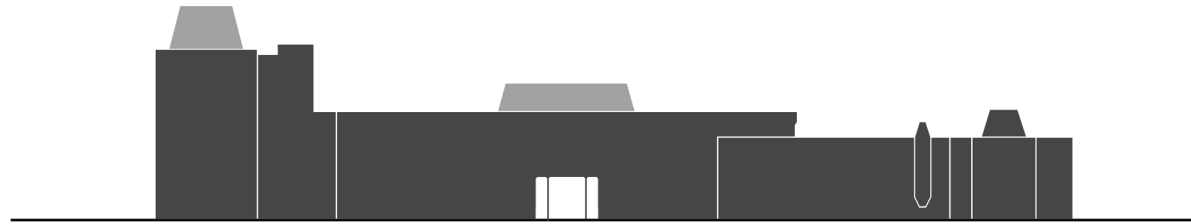
4th floor plan



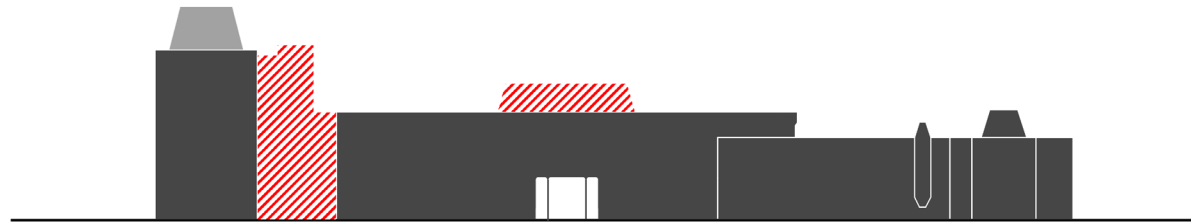
7th floor plan



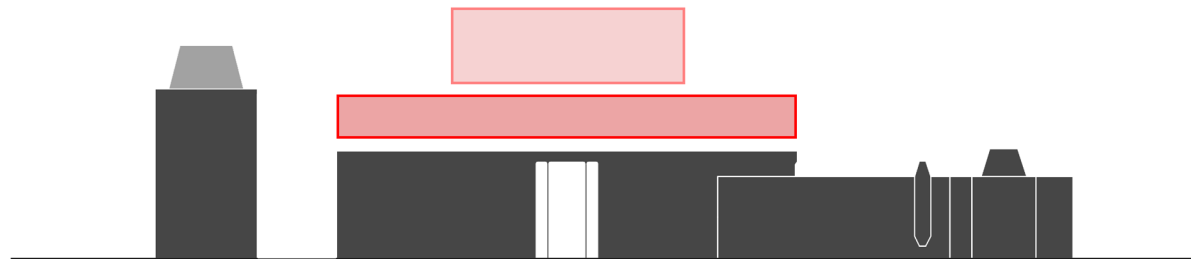
Elevation transformation



1. Existing condition



2. Demolition



3. Lightweight volume





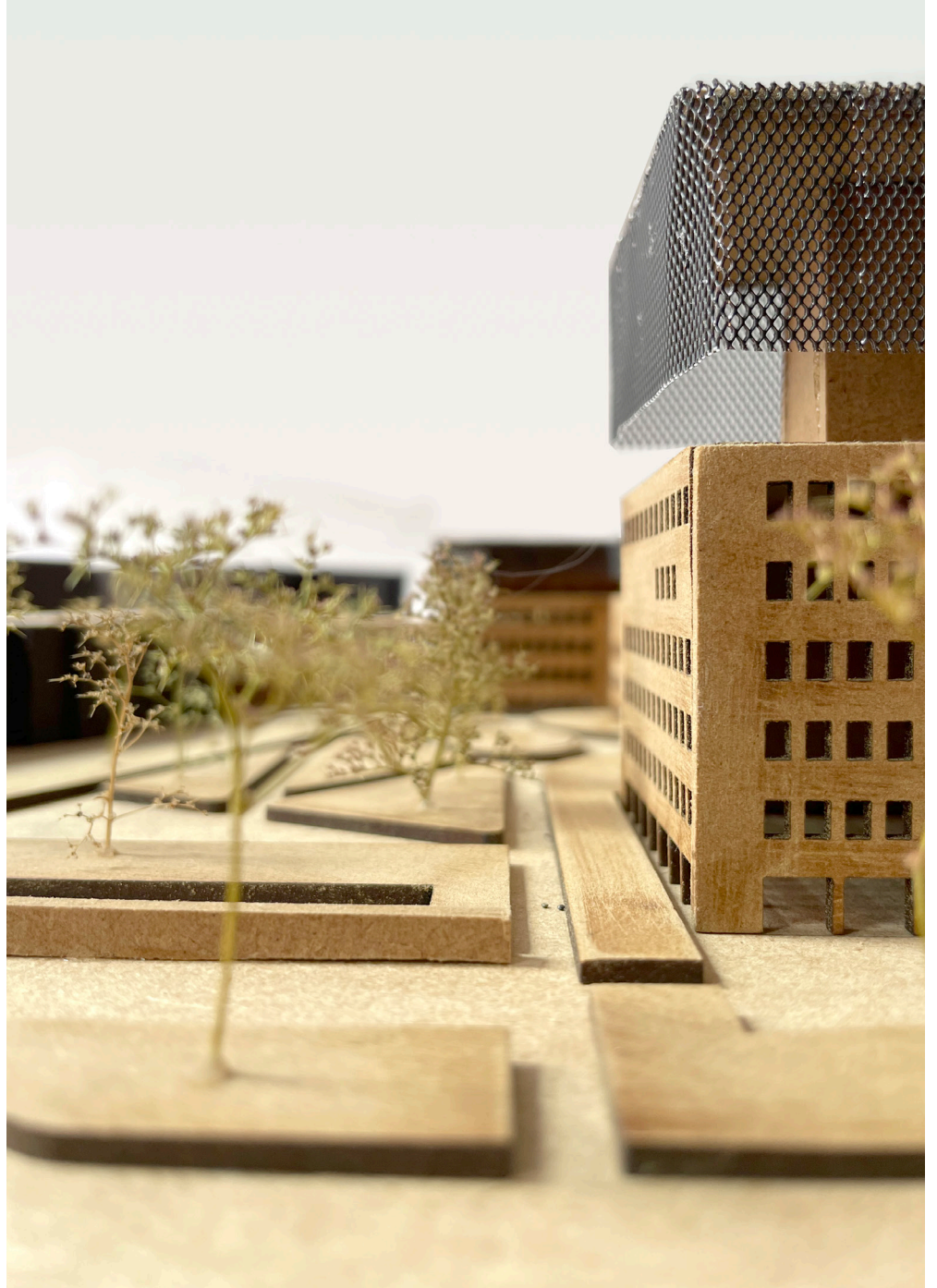






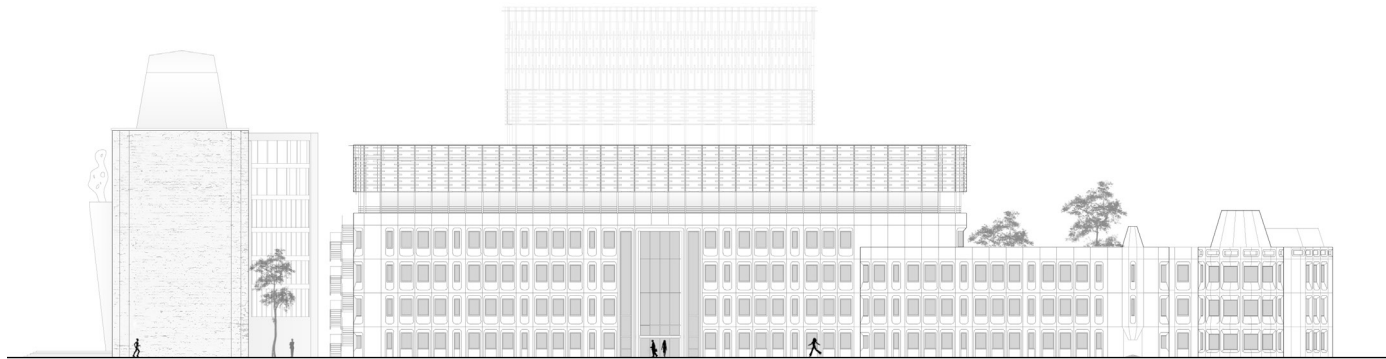




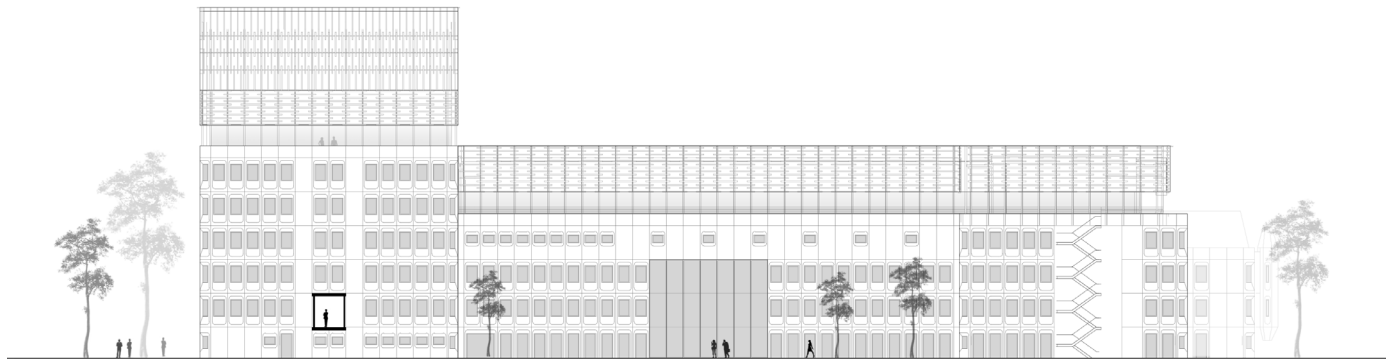




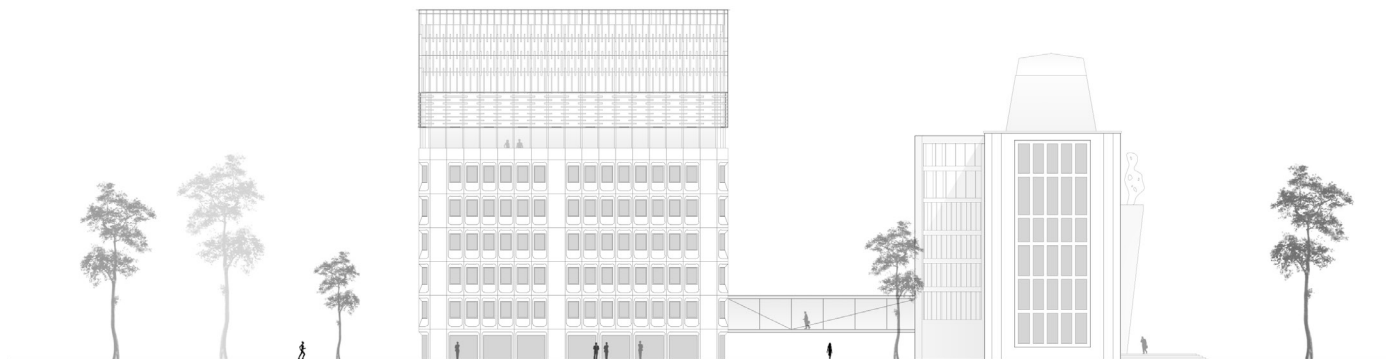
Elevations



North-West elevation

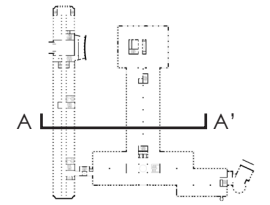


North-East elevation



South-West elevation

Short section





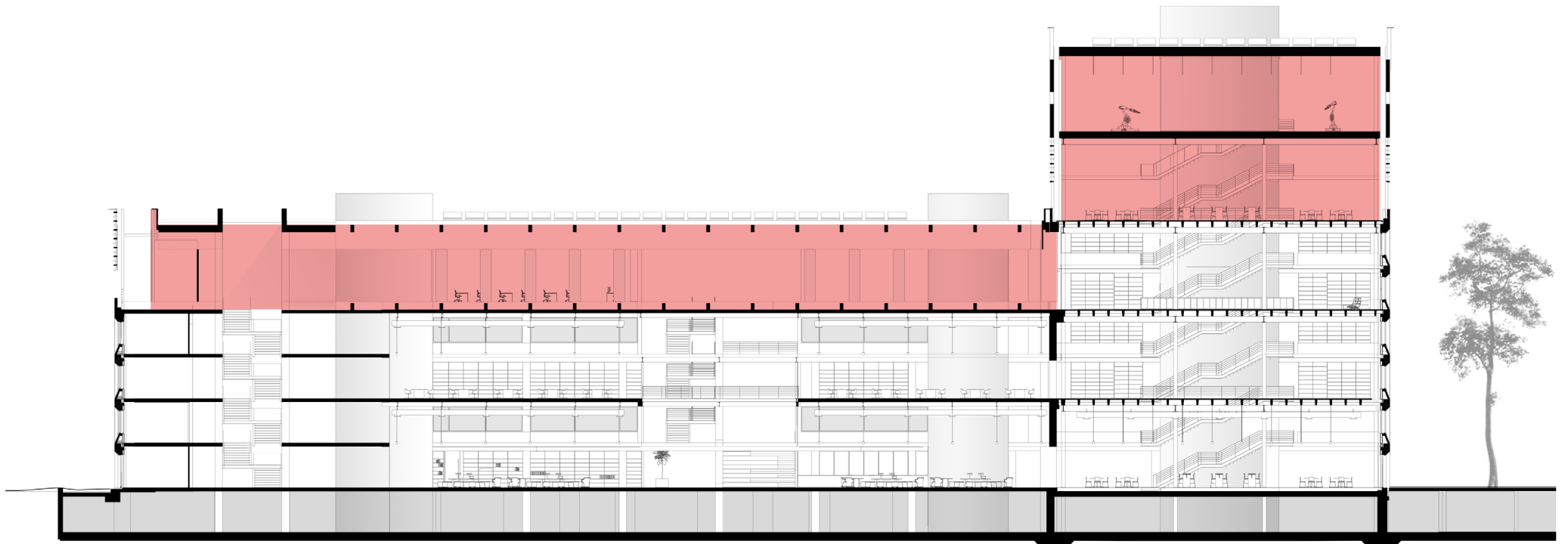
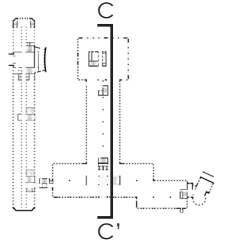
Monument - office space



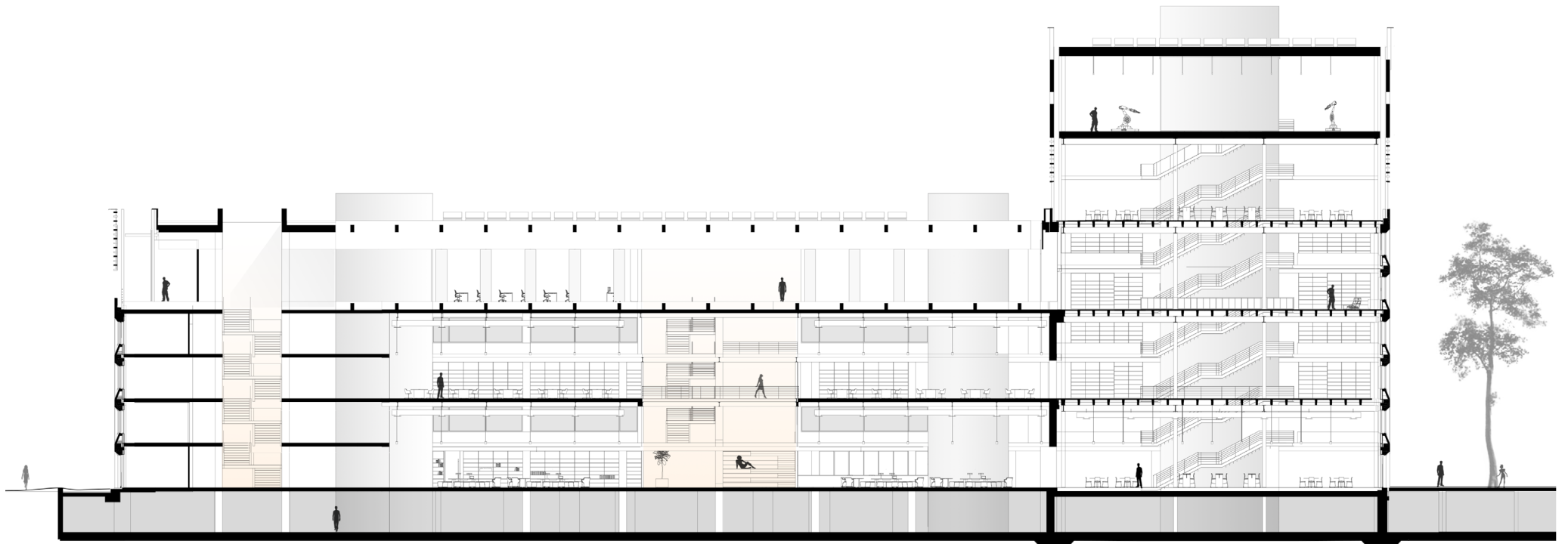
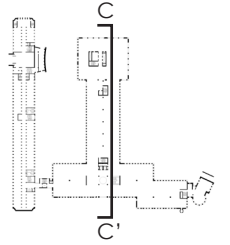
Extension - circulation zone



Longitudinal section

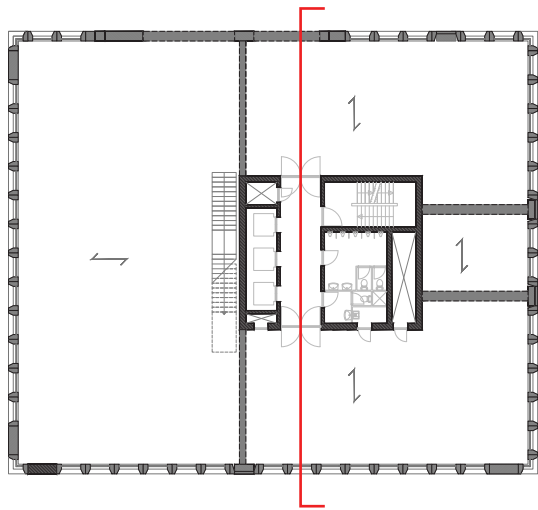


Longitudinal section

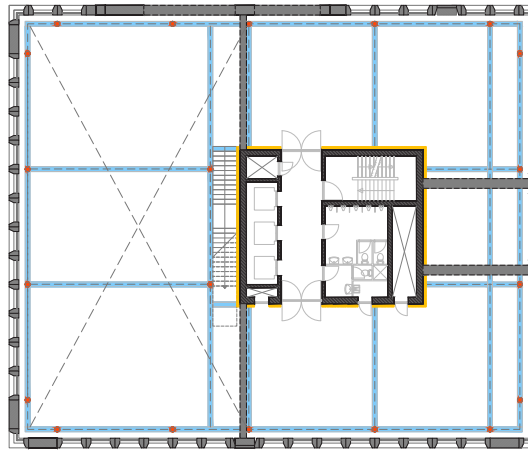




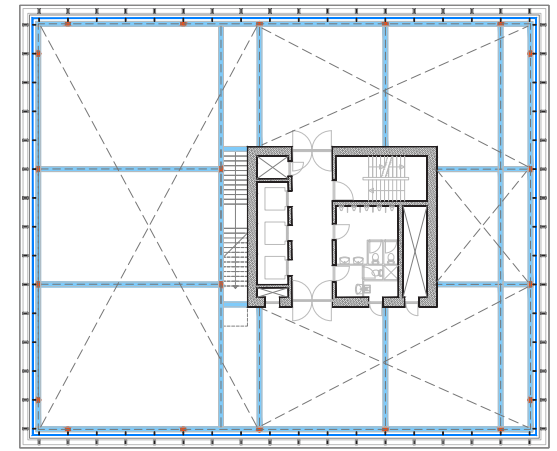
Tower: structural interventions



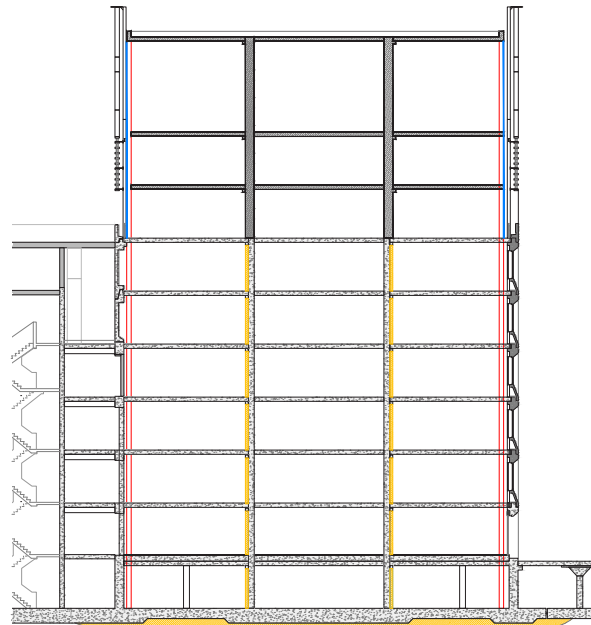
Existing condition



Added structure

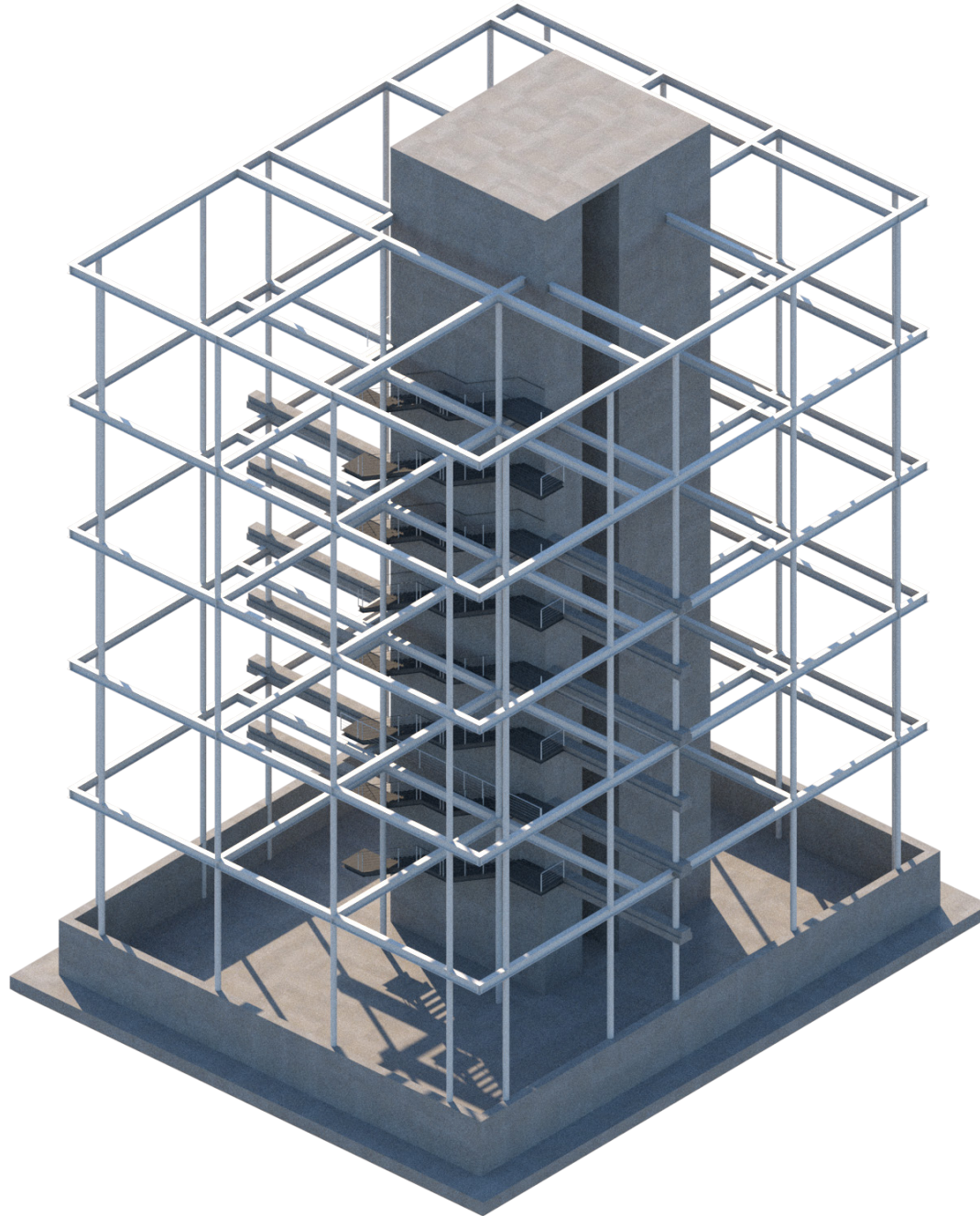


Facade structure attached to main structure



- Existing beams
- Added beams
- Added columns
- Reinforced concrete

Added structure



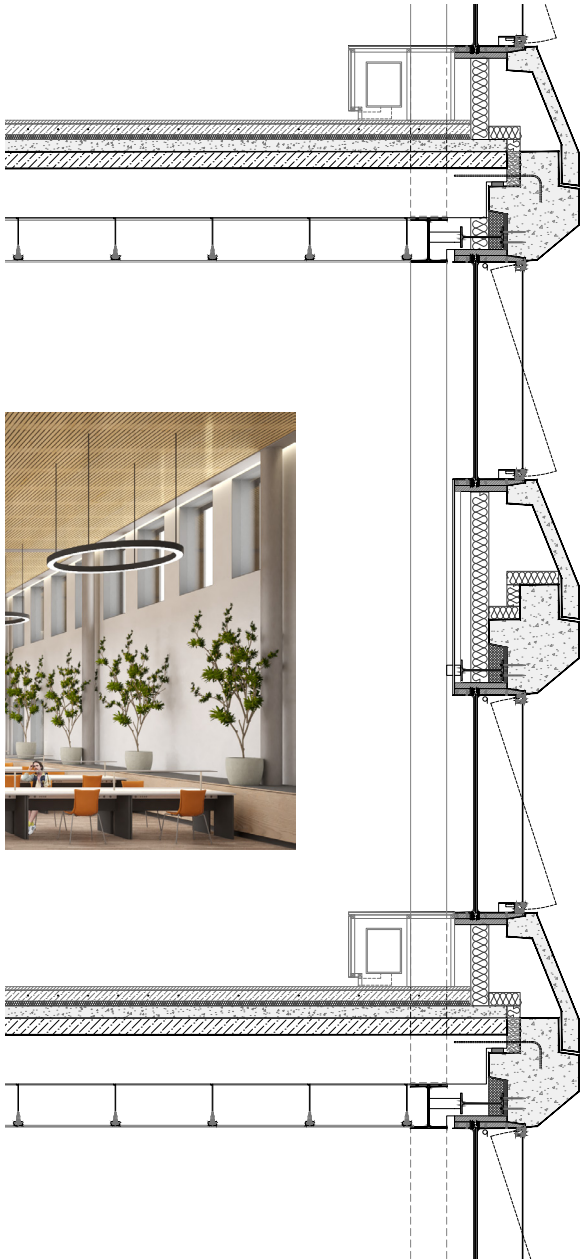


5

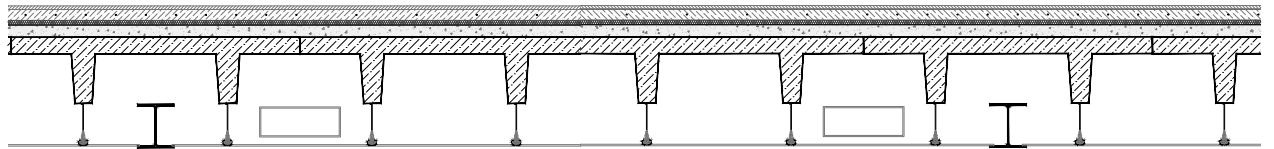
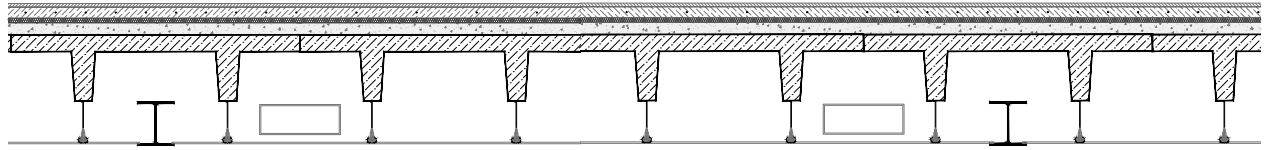
4

Library
Reading area

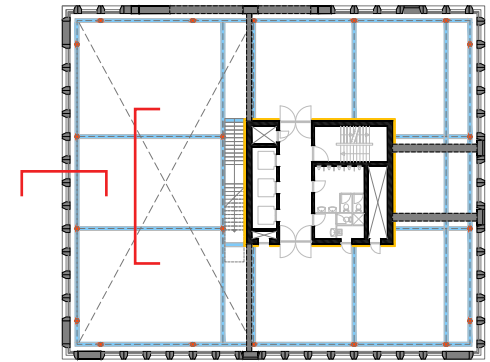
Tower: facade 1:25



Cross section

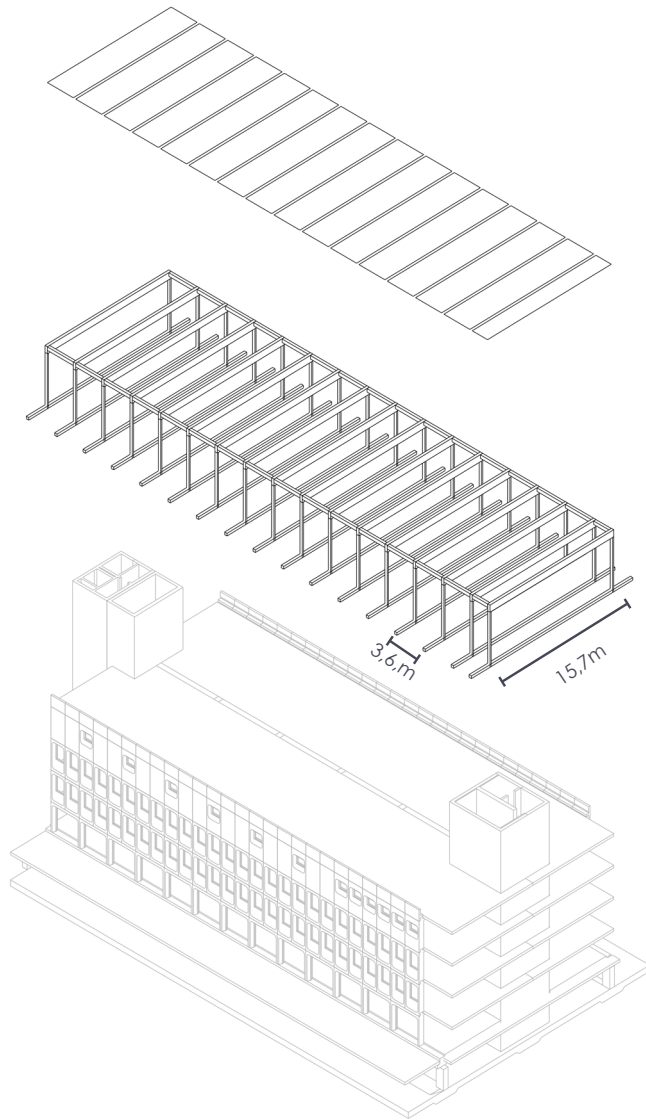


Long section



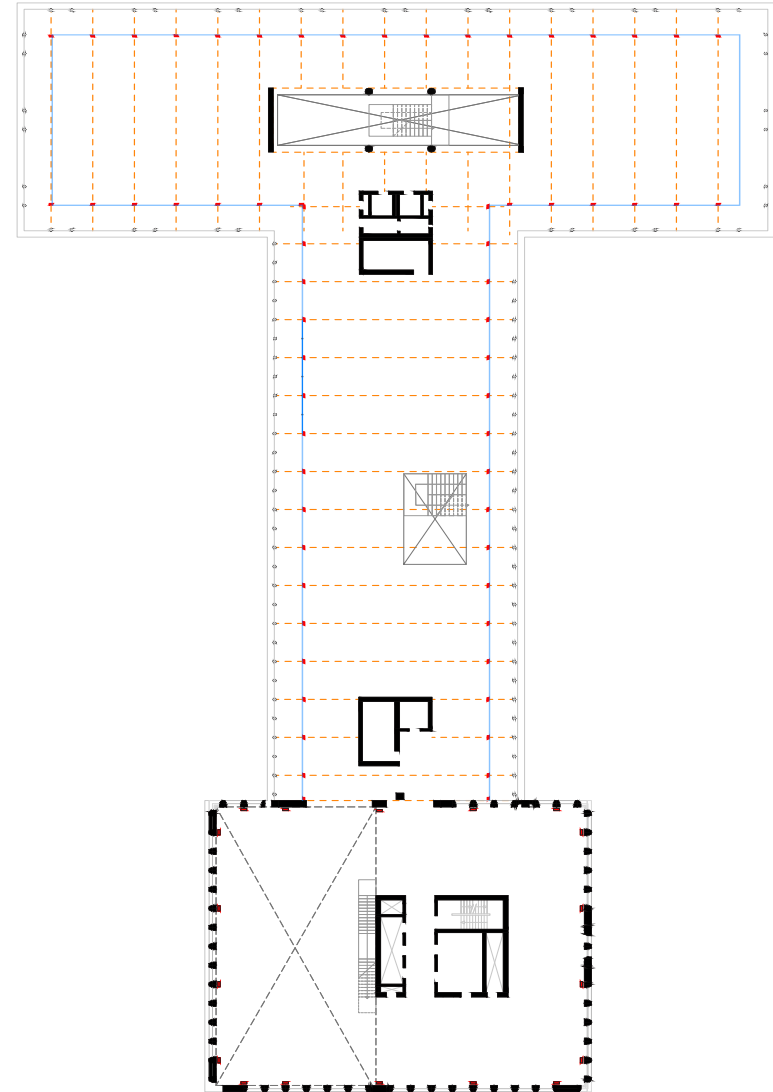


Added structure on top of existing roof

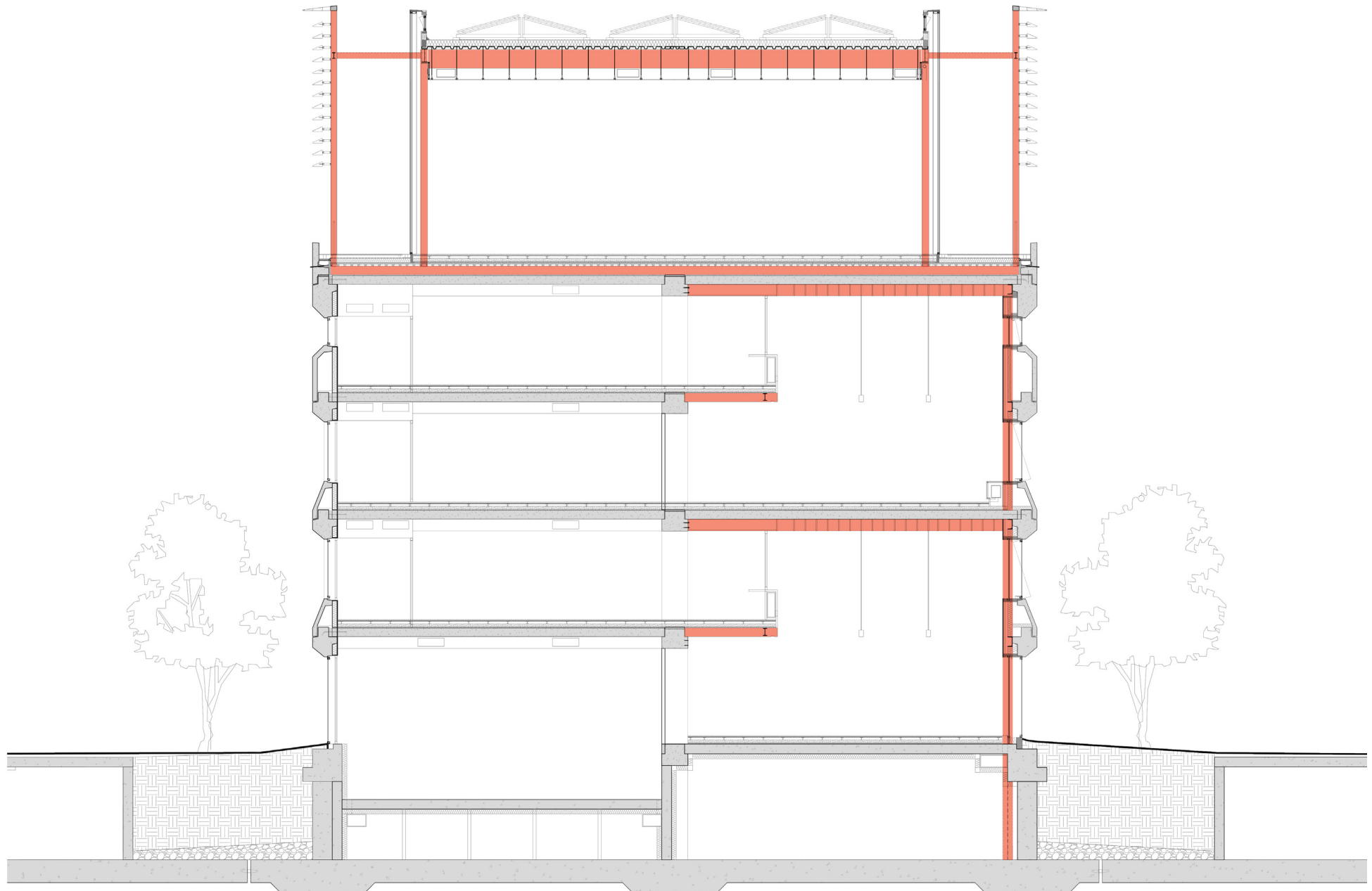


Structural frame - lightweight

15.7 X 3,6m grid

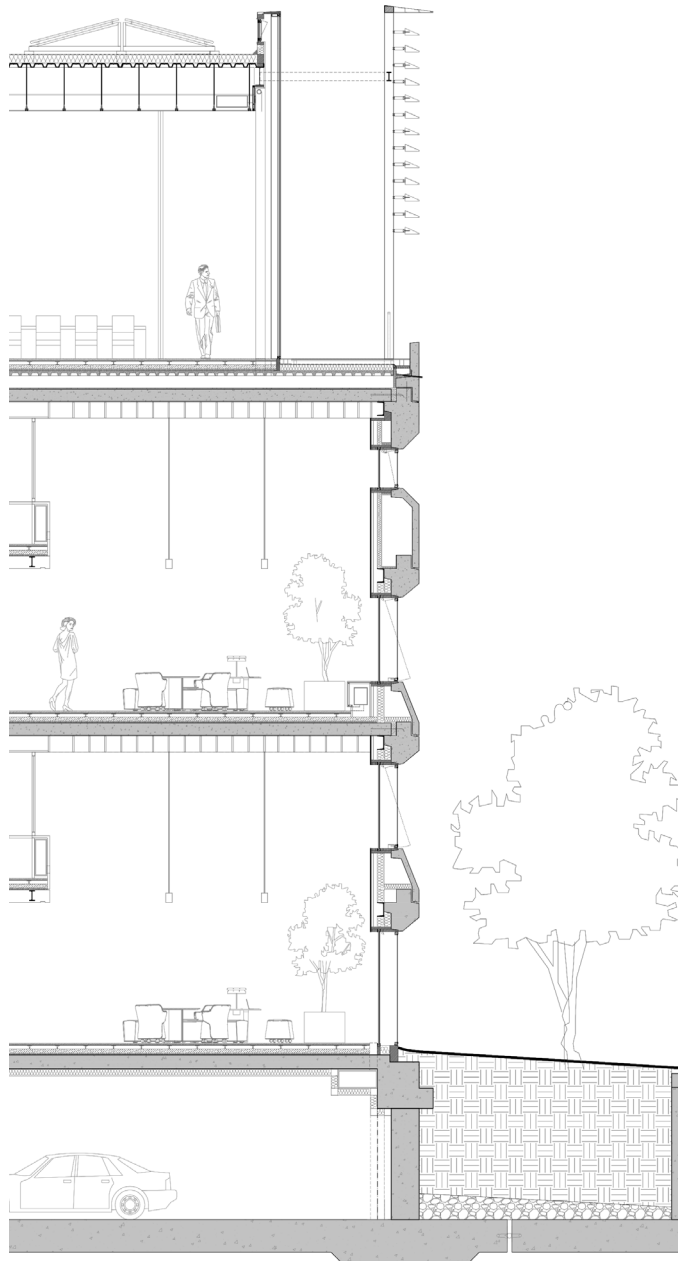


Cross section - added structure

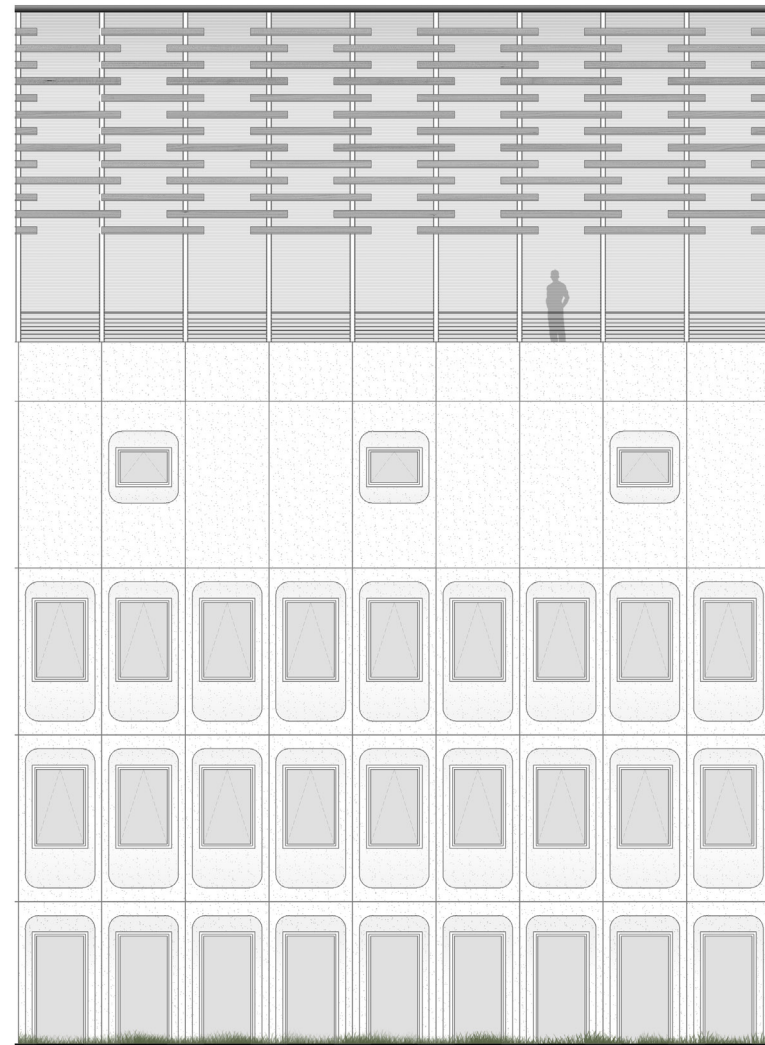




Part section & elevation

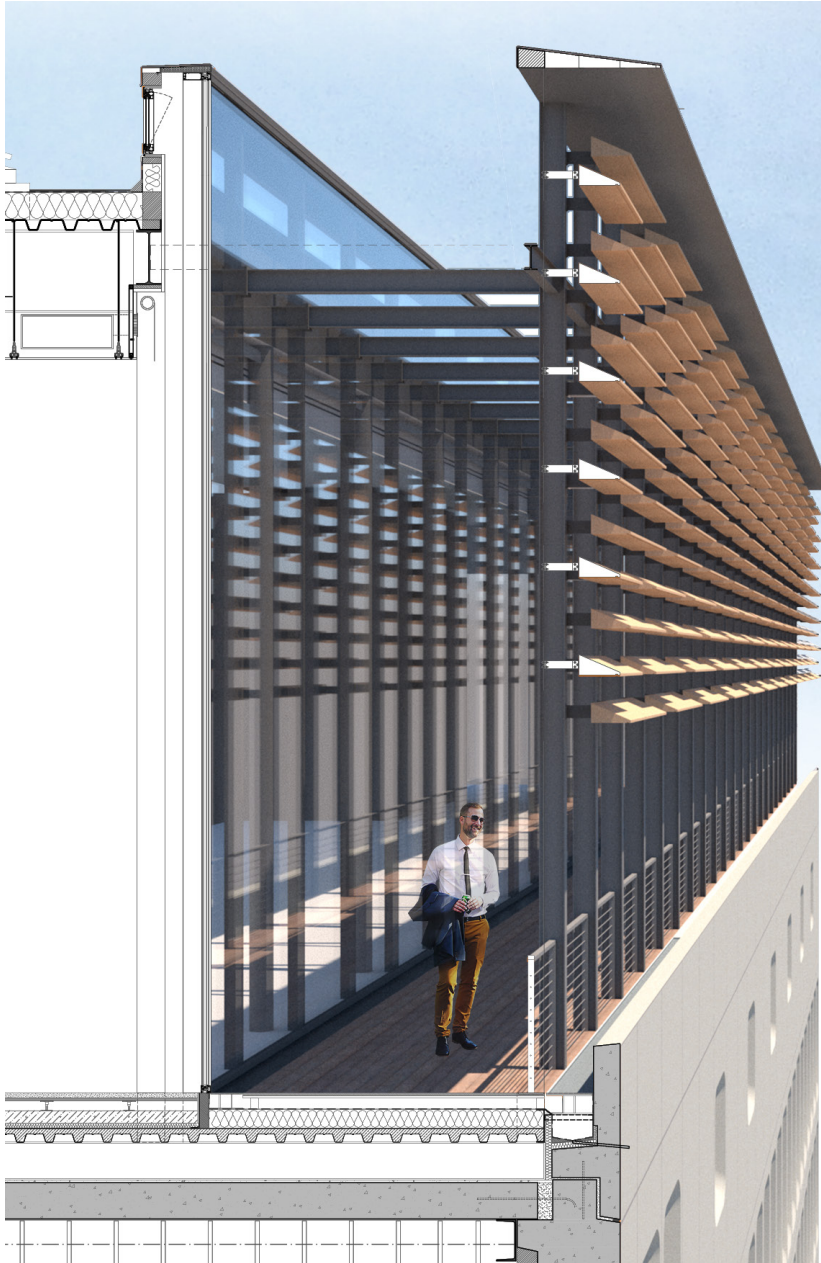


Part section

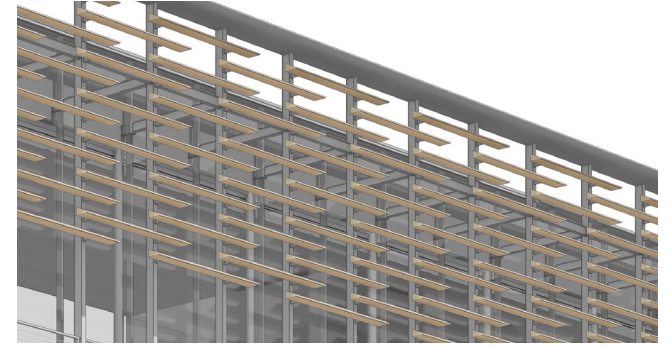


Part elevation

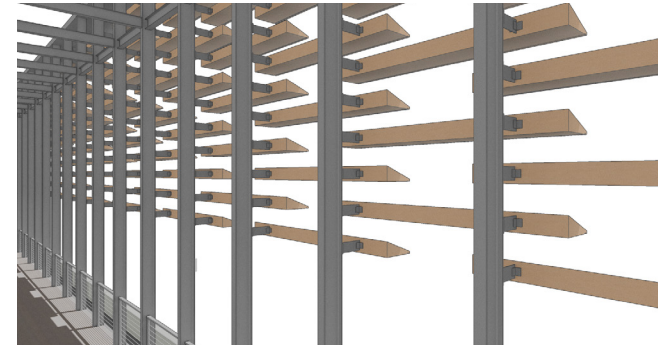
Extension's facade



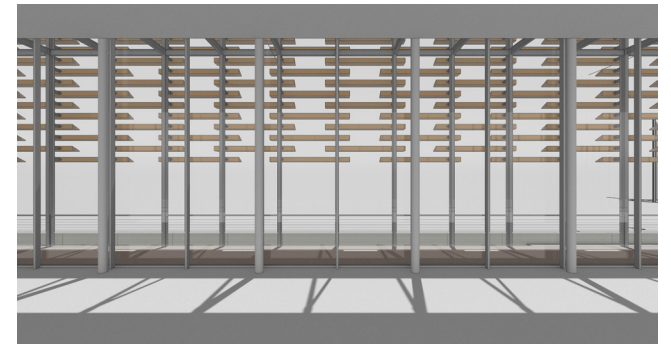
Sectional perspective



Parapet detailing

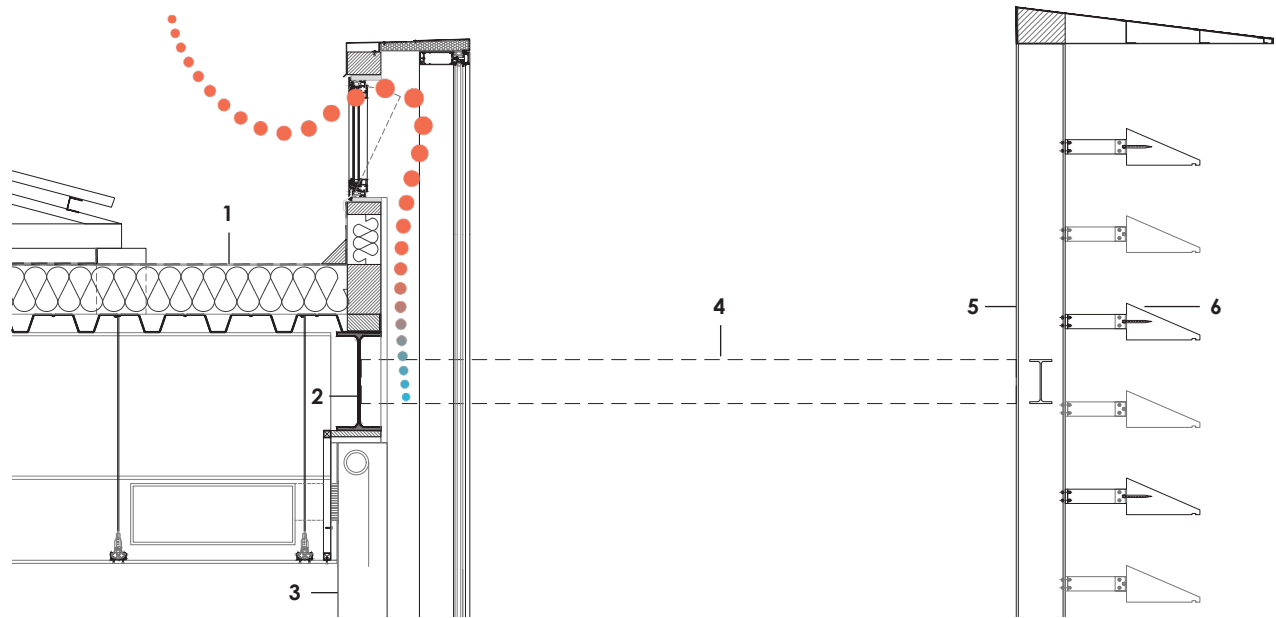


Connections

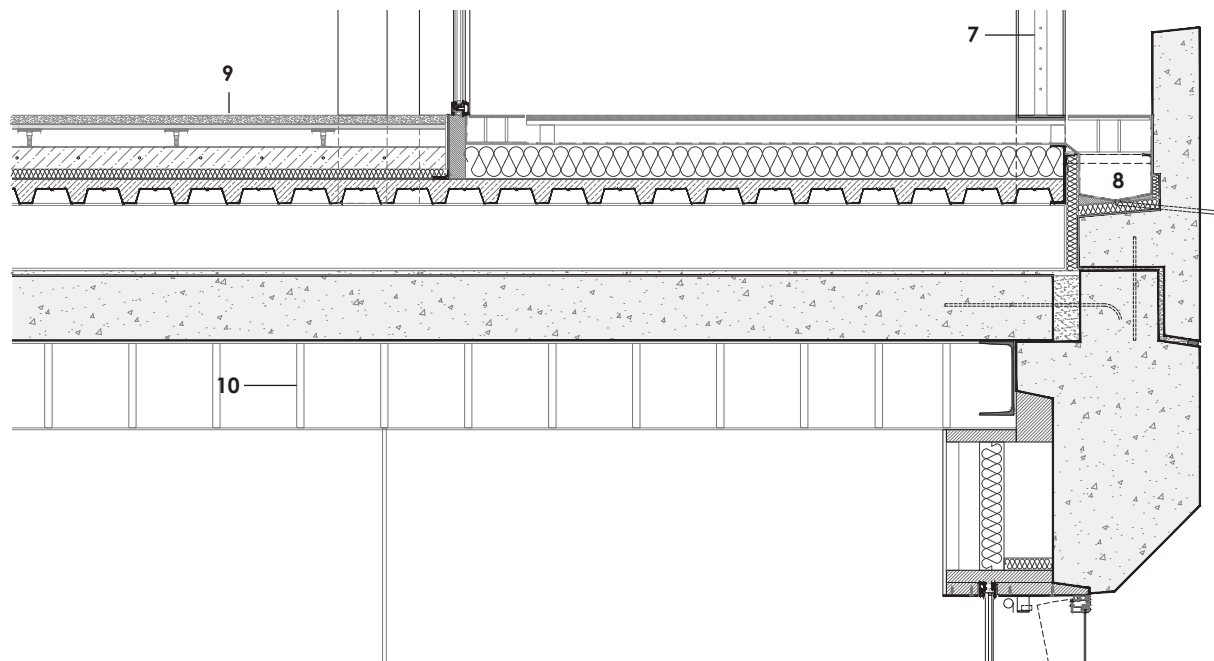


Interior view

Detail 1:10



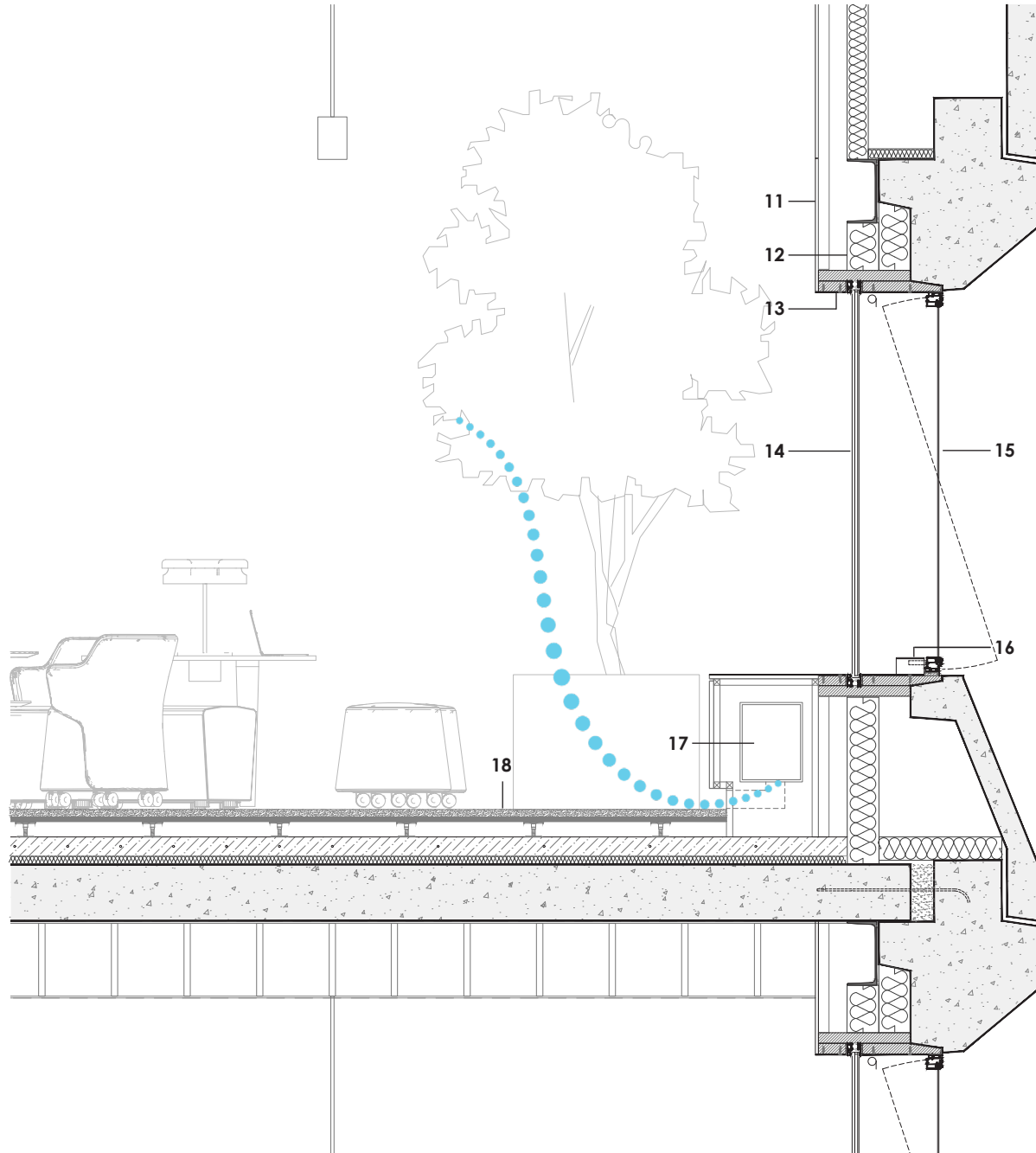
1. Roof insulation 200mm
2. I-beam 400x180mm
3. Steel circular column - 200mm
4. Steel beam, connected to main structure 180x90mm
5. Steel column - louvre support 100X200mm
6. Timber louvre 300X150X2600mm
7. Balustrade 1000mm
8. Gutter



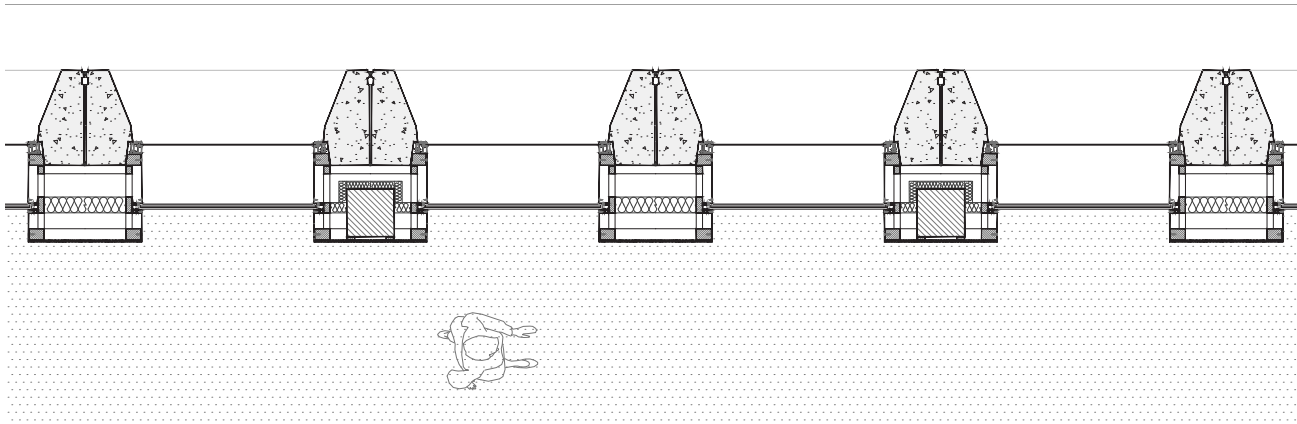
9. Raised floor 130mm
Underfloor heating 90mm
Sound insulation 40mm
Concrete on ribbed metal sheeting 100mm
Steel beam 265mm
Concrete finish
10. Existing concrete pre-stressed hollow core slab 265mm
I-beam for lateral load 360mm

Detail 1:10

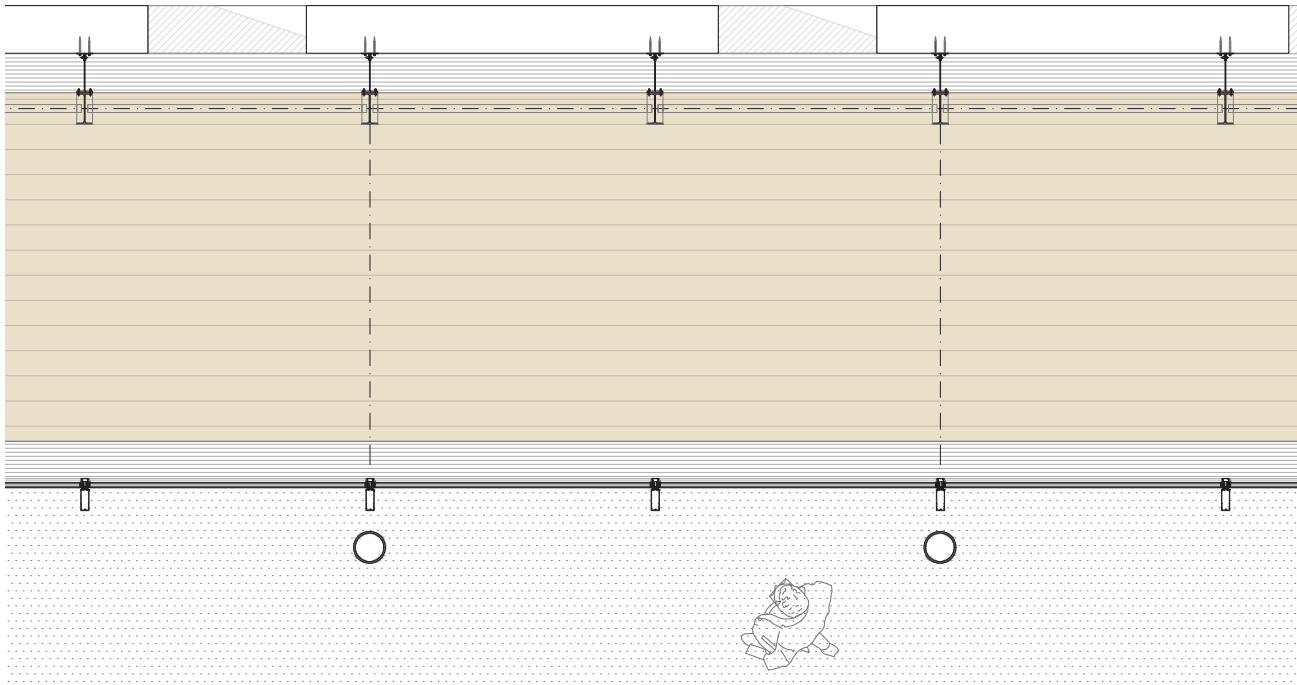
- 11. Plasterboard 15mm
Timber supporting frame 50x50mm
Cavity 85mm
C-section 300x150mm
Polystyrene sheet
Existing precast concrete facade
- 12. Thermal insulation 150mm (x2)
- 13. Steel sheet 2mm
- 14. Double glazed window 32mm
- 15. Existing single-pivot aluminium window
- 16. Electric window opener
- 17. Fresh air inlet 300x400mm
- 18. Raised floor 130mm
Underfloor heating 90mm
Sound insulation 40mm
Concrete on ribbed metal sheeting 100mm
Steel beam 265mm
Concrete finish
Existing concrete pre-stressed hollow core slab 265mm



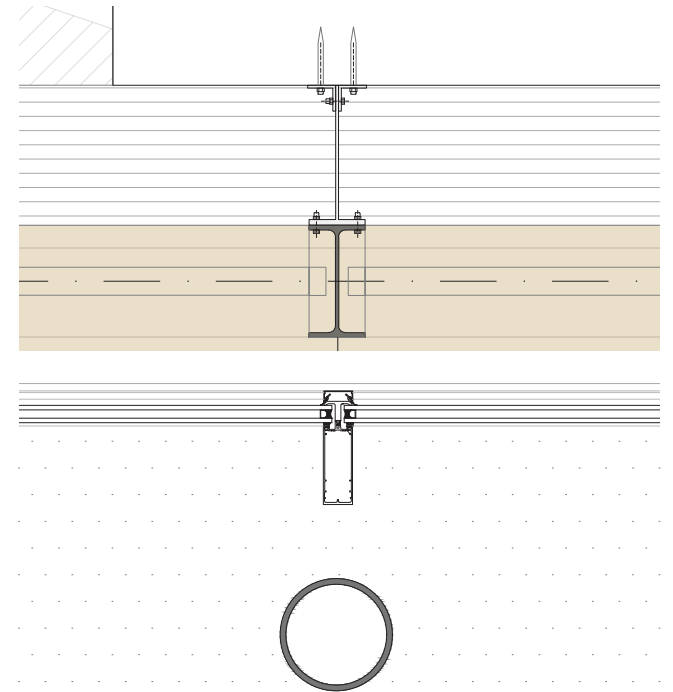
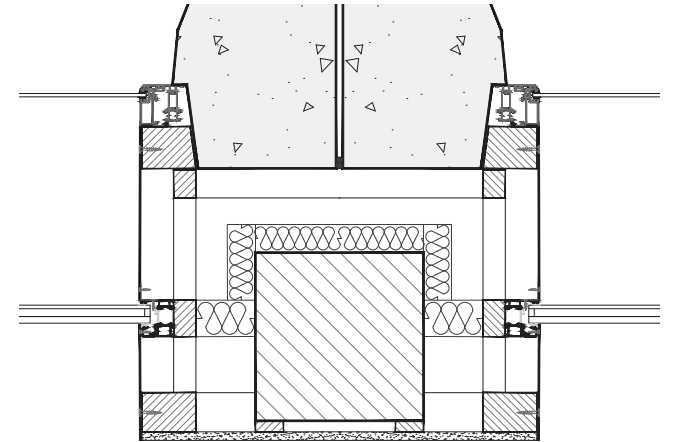
Horizontal section 1:20



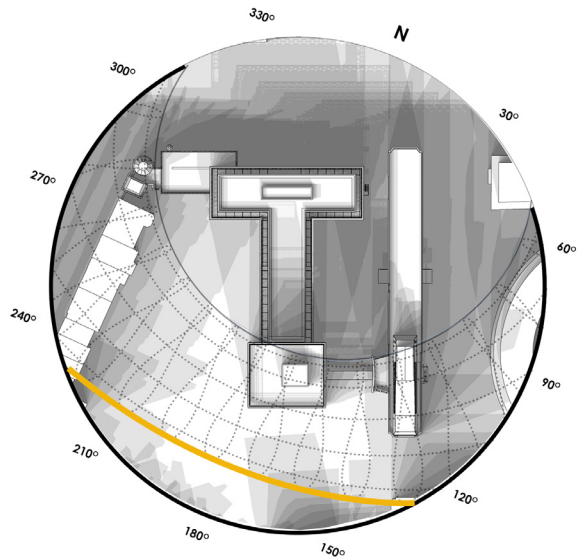
Ground floor



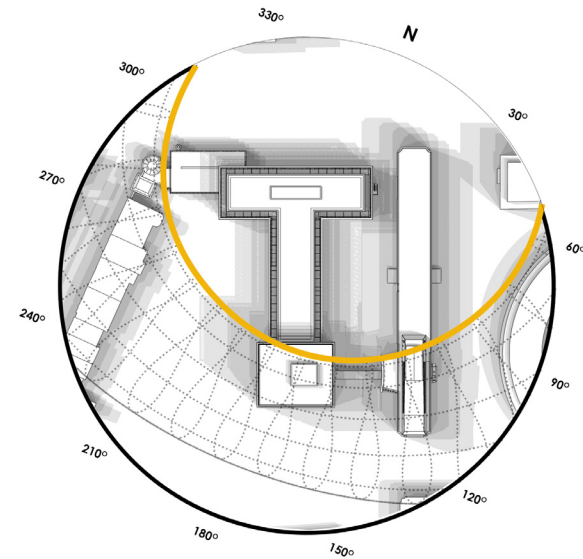
Fourth level



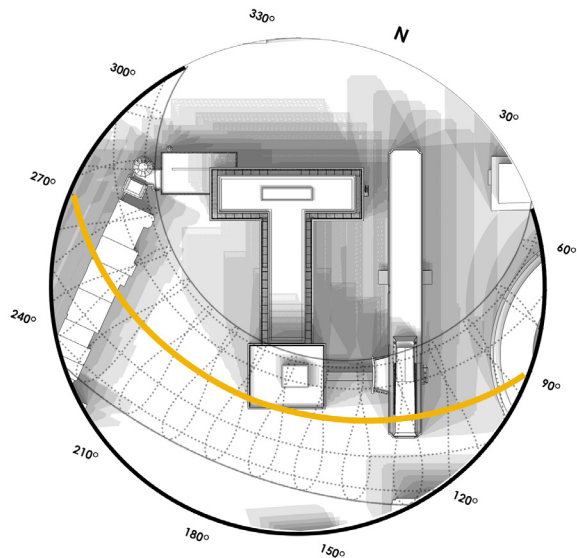
Solar diagrams



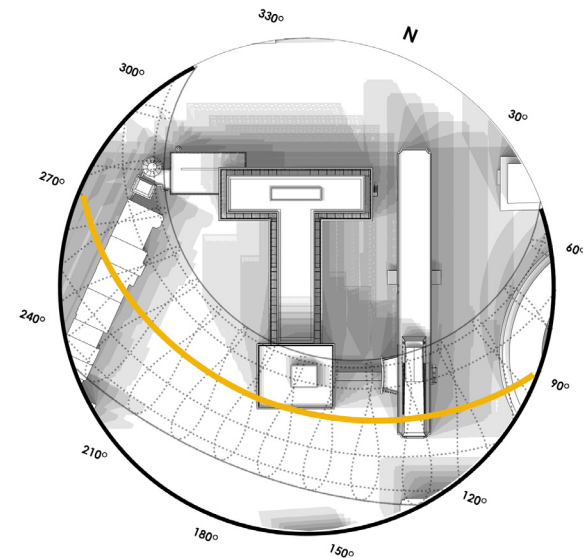
21 December
Winter Solstice



21 June
Summer Solstice

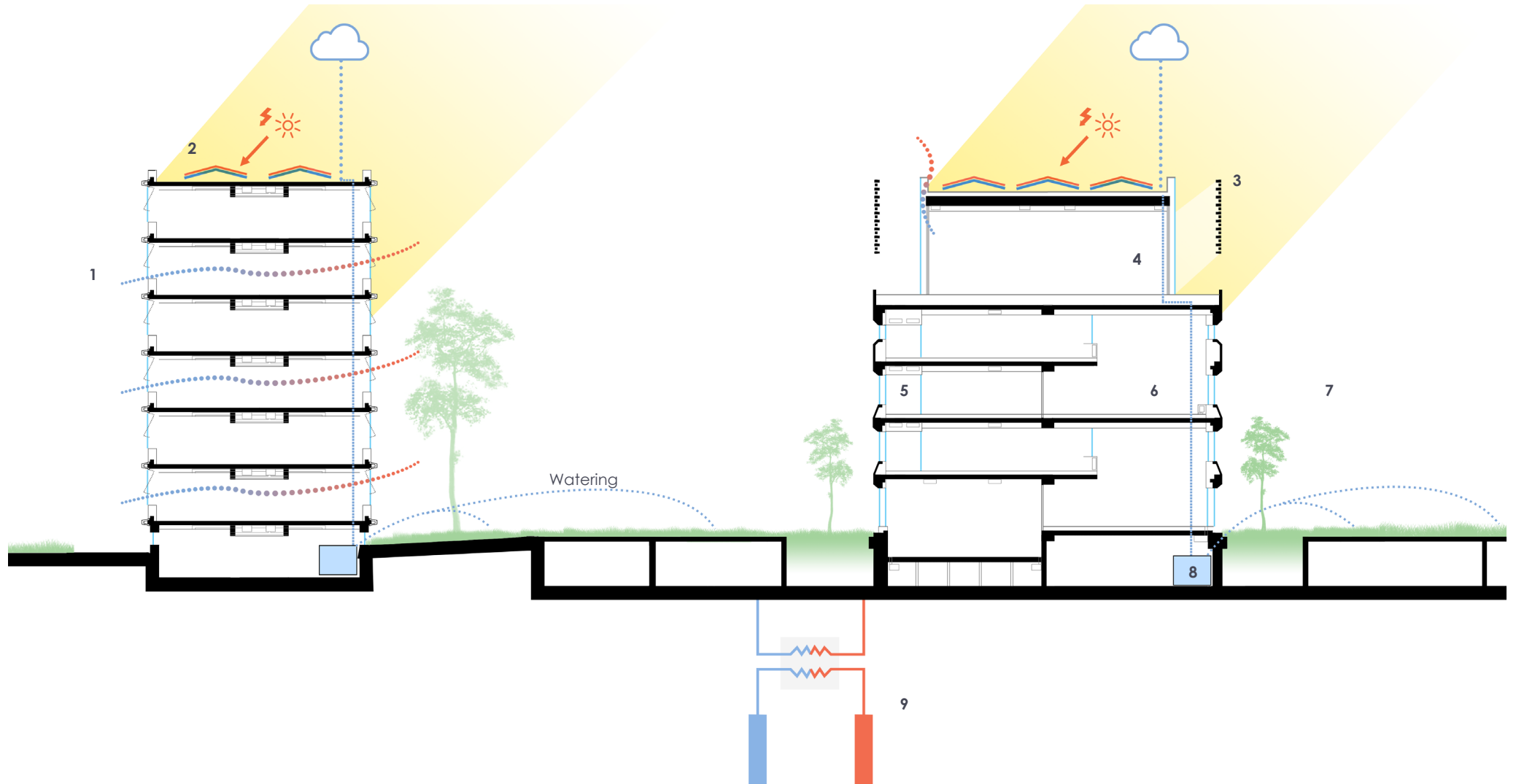


21 March
Spring Equinox



21 September
Autumn Equinox

Energy concept



1. Cross-ventilation

2. PV panels

3. Climate facade - solar shading

4. Materiality - prefabricated & demountable

5. Buffer zone

6. Natural daylight

7. Micro climate & wind protection

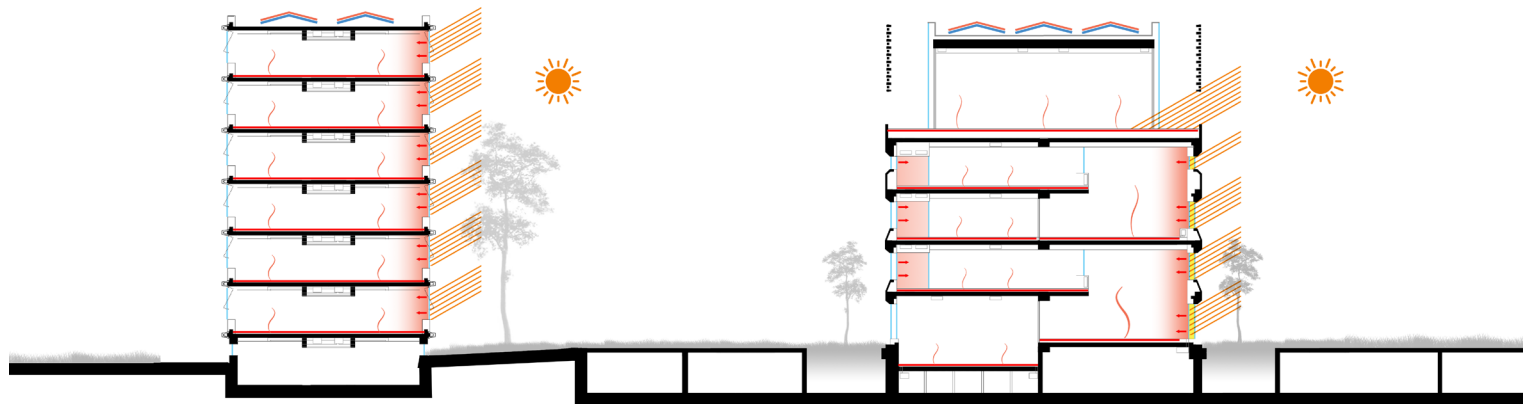
8. Grey water tank

9. Aquifer Thermal Energy storage

Heating & cooling



Summer day - Cooling

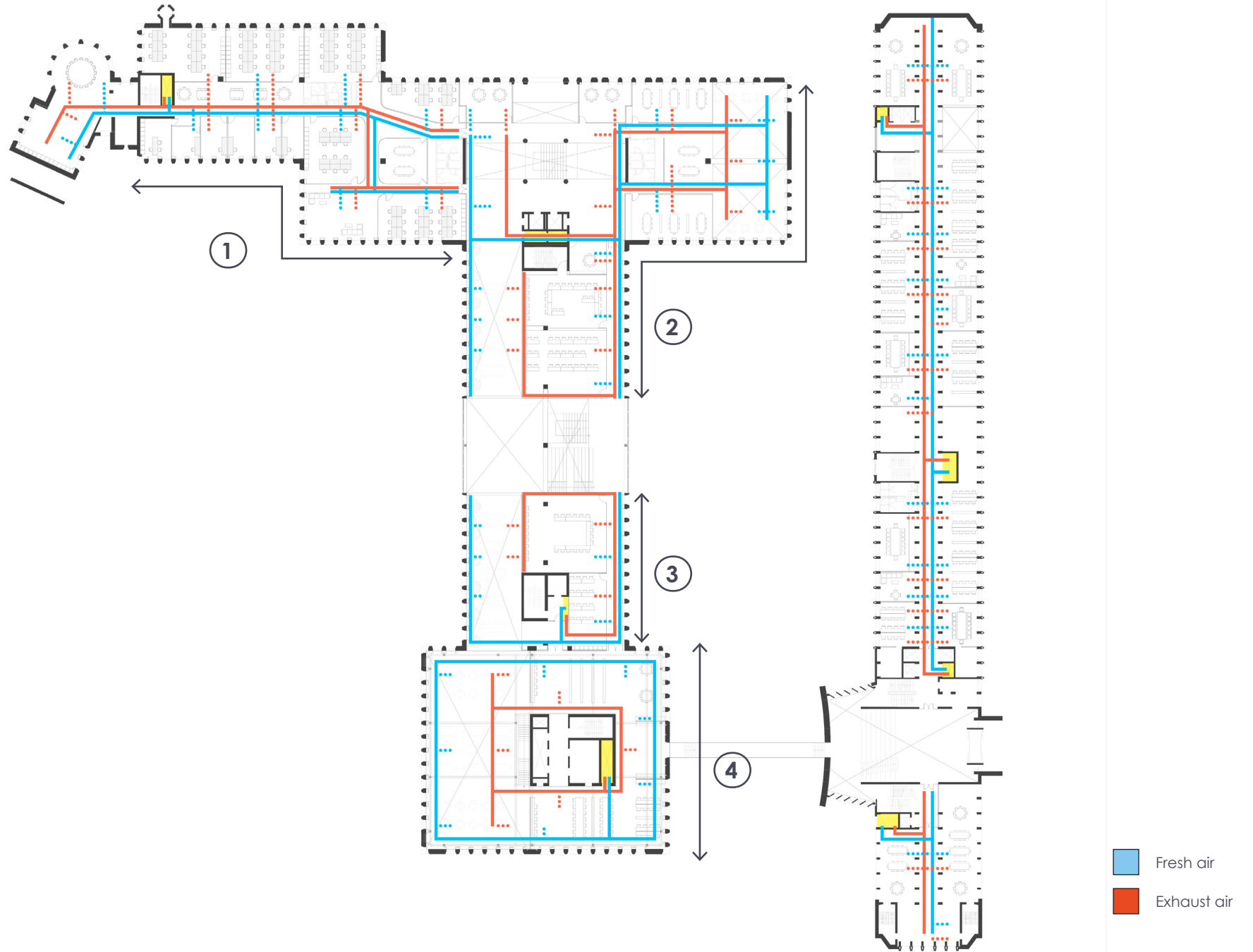


Winter day - Heating

Ventilation



Ventilation plan



Conclusion





To what extent does the load-bearing **structure** in **20th-century Dutch** police stations, influence their **re-design** options?









Thank you !