Architecture of the skeleton

Research & Design booklet

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Vacant Heritage: AR3AH105

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Reflection

The graduation project departed with the introduction of a significant and rising problem in the Netherlands, whose core is found in the Dutch police organization. Due to the 2013 reformation, operational changes took place, by harnessing the benefits of the digital era. Although this made the police more efficient and effective, the consequence of such changes, resulted in 700.000m2 of the Dutch police real estate becoming vacant in the foreseeable future, with 30% of them, being heritage buildings. On top of that, new buildings covering 200.000 m2 will be constructed. Through a more centralized organization, which operates with larger teams in fewer places, the police will become more efficient, functionally, and financially, saving annually 76 million euros (Weessies, 2017).

Although new construction must take place to accommodate the needs of the police, 1/3 of the existing police stations require redevelopment. Despite the fact that the initial consequence of the organizational change appeared to be a purely real estate issue, since heritage buildings are involved, suddenly, the issue has a cultural, architectural, and sustainability impact. To that end, the HA graduation studio challenges us to respond to this emerging problem, through a research-based design proposal, for one of the ten selected case studies. Particular emphasis is given to the sustainability contribution of the vacant heritage police stations.

The Hague

Among the ten case studies of heritage buildings, the one that I have chosen is the Hague's Police station; a large-scale building, consisting of a monumental part built in the 50s and an extension, completed in the 70s, featuring a distinct architectural representation of the police, in a prominent location in the Hague. Additionally, fascinating was the fact that the building complex portrays the strict regime of the police, through clean lines, rectilinear geometry and neutral colours, characteristic of the Traditionalist School. Noteworthy was the use of materiality and specifically Schokbeton, along with the load-bearing, prefabricated façade which is found in the 70s extension (Monumentenzorg, 2018). As a result, the complex features a distinguishable character, which reflects the police values and its relationship with the Dutch society. Given the special architectural character of the Hague's case study, and its meaning for the social context, it becomes a challenge to find a suitable program for this specific building, that also accommodates the future needs of the Hague. This has been a fundamental question, and subject that I aim to answer via the design process.

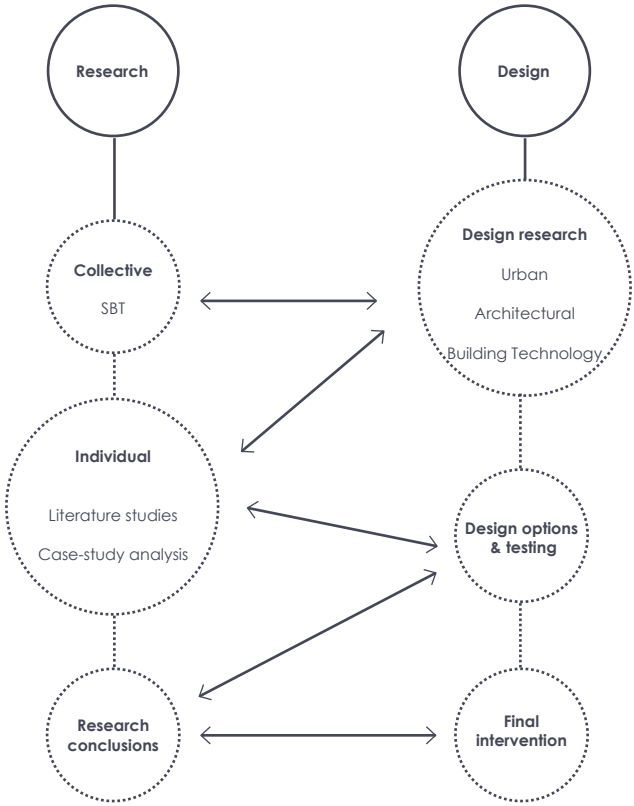
Design assignment & problem

The police station at its current state, is no longer suitable for the organization, therefore, becoming obsolete. My initial approach was to decode the problem that led to its vacancy. One financial and two architectural reasons accounted for the police relocation in the Hague. As a major and costly renovation was necessary in the existing building, it was impossible for this to take place, while the building being occupied (Omroep West, 2018). On top of that, the technical and functional degradation, that was reported by the users, had to be further analyzed, so that solutions could be found.

On the one hand, it is straightforward that the sustainability status does not meet the current requirements. Therefore, the inquiry that occurred is what strategies are appropriate in order to improve the thermal performance of the building, with respect to its values. This could be answered by carefully analyzing the existing building, its structural mechanism and construction technique. Input from the individual research, through case studies that deal with thermal performance improvements, has been of great benefit in the design process.

On the other hand, the functional degradation that has been reported by the building's users, required further exploration. In the first place, this was achieved through the SBT and individual research, where it was highlighted that the biggest disadvantages of the building had to do with the circulation system and the daylight

conditions; by experiencing the space during the site visits in person, the spatial dysfunction became apparent. Realistic solutions would only start to be found, by studying the existing structure, when certain opportunities and limitations were unveiled, that could influence the building's functionality. Additionally, the level of accessibility and permeability in the urban-block scale level, was not suitable for a public function. Hence, starting points were formulated by analysing the drawbacks of the existing condition.



Research and design

The graduation project's approach was not that of a mere transformation project, but that of a research-based design. Hence, the reason of conducting both the individual and collective research, is to assist and contemplate the design process, resulting in a research-based design. Although the link of the two domains was not clear from the beginning, the SBT research demonstrated several topics related to space, that helped me choose my individual research theme.

Organizing the research, required an approach to be taken. Important is to mention, that prior to any design decisions, research had to be conducted, so that a holistic and thorough understanding of the existing could be obtained. That way, a substantiated and logical approach could be taken, based on research findings, towards the transformation of the monuments. Starting with the SBT research, the individual research topic was formulated and studied in parallel with the design development. Certain preliminary conclusions were derived from the research that led to design decisions, that were regarded as appropriate for the Hague's case study.

Through my research, the goal was to address the potential of structure in a wider context, and find an approach and strategy, that can be applied to spatially and structurally similar projects. This could contribute to the project's transferability and relevance in the sector of transformations in the architecture discipline. This is particularly relevant, given the increasing vacancy rates of old buildings, the scarcity and importance of materials and the environmental footprint that every architectural decision is associated with. Also, the architectural approach, followed neither a bespoke, nor a generic design, as the goal was to showcase an applicable and realistic solution for other case studies.

Concerning my individual research, I examined the structural and architectural role in the adaptability of former 20th century Dutch Police station. [The choice of the selected theme is justified with the realization that structure constitutes an essential element of an existing building, whose potential needs to be thoroughly identified in order to transform it for future uses. The contribution of structure to the spatial organization, qualities, and form of existing buildings, has been researched during the final graduation year.] (Research plan). Stemming from the SBT research, my individual research topic, as an extended structural typology research, questions the following:

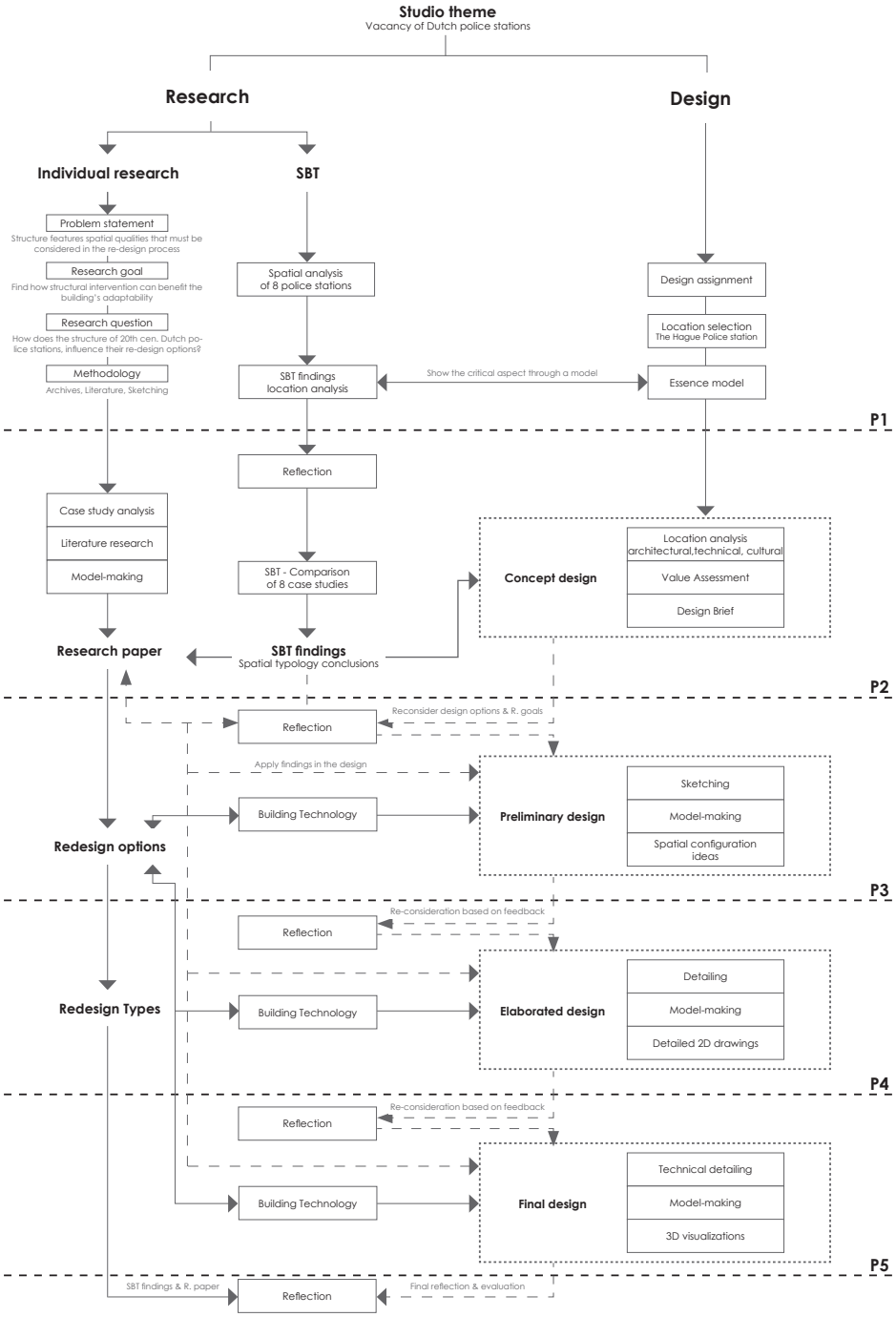
"To what extent does the load-bearing structure in 20thcentury Dutch police stations, influence their re-design options, in comparison to other office buildings of that era, in the Netherlands?"

[To answer this research question, the structural characteristics and the modern strategies of dealing with such structures, constituted the main focus area of the research. With the commencement of this research, the starting points of the design ideas were being gradually formulated, for my graduation project.] (Research plan).

Together with the research question, a more specific design question was posed, that could strengthen the connection between the two fields of research and design. Therefore, the design question that I aimed to respond to, was the following:

''How can the role of load-bearing structure, improve the spatial qualities and adaptability in the Hague's police station?''

What made this design question particularly fascinating and relevant to the broader discipline of architecture, is the focus on solutions regarding prefabricated and standardized load-bearing elements that are present in the Hague's police station.



Summary of Research results & design application

To conduct this research, the methodology used, included: literature studies, case study comparison, sketching and sectional studies through diagrams.

The book 'Structure as Architecture' by Charleson (2005) laid the foundations, upon which the research was built. By studying this book, it became clear how influential structural elements can be in an architectonic space. That way, I aimed to bridge the gap between structure and architecture and showcase through my design that structure can have a principal architectural role during the design phase. Moreover, based on additional literature studies (Voordt et al., 2007), the research took into account five main aspects that influence structure, space and adaptability; these were afterwards analysed in diagrams, for the case-study comparison. The examined aspects include the following: Structural grid, Bay width, Depth & daylight, Circulation and the position of the cores. To examine even deeper the spatial possibilities through structural interventions, the book 'Manual of Section' (Tsumraki et al., 2016) was studied, while I produced a series of hand-sketches.

Out of this examination, the ultimate aim that would link research and design, was the formulation of design guidelines for the transformation of the Hague's police station. The research pointed out the importance of the structural layout and system, as well as the role of materiality, which relates to the structural capacity and the construction technique. Through the examination of the grid, the potential of space division was shown which depends on the structural density/ per m2, the bay width and the structural layout. More specifically, in the monumental part of the Hague's station the structural density of the old building is 3,6 times greater than that of the extension, which clearly reveals certain limitations of the monument. Based on the research findings, the more effective solution for the monument, would be to minimize the space division, and create large longitudinal open spaces. A more costly solution to increase the flexibility of the space, is through the demolition of the top floors and the addition of a lightweight structure, with larger spans, but the financial impact should be taken into account. At all events, the features of the existing layout and structure, should be considered, which in this case of the monumental part, are suitable for housing and office spaces.

The possibilities of spatial configurations within an existing layout, strongly depend on the bay width. The greater the bay width, the greater the possibilities of spatial division, though this directly affects the depth and therefore the daylight levels of the space. Therefore, to increase the sunlight in a deep space, several options were configured. Initially, by removing the internal partitions and keeping them into a minimum, this can significantly increase the sunlight. A more financial-demanding solution is to alter the façade and add transparency through glazing; the cost-factor lies in the fact that the façade accounts for approximately the 1/3 of the total building cost. Therefore, when the area of the envelope is large, other solutions can be more suitable. On the other hand, removing floor plates in a stacked section, created double height space, therefore increased light levels, but it is associated with loss of floor area, which is important for building with small footprint. Also, additional supports were needed to counteract additional loads and lateral forces. As a major identified issue with the Hague's extension, was the daylight condition, it was decided, after analysing the structural system, that the creation of voids, could provide the greatest outcome for the spatial enrichment.

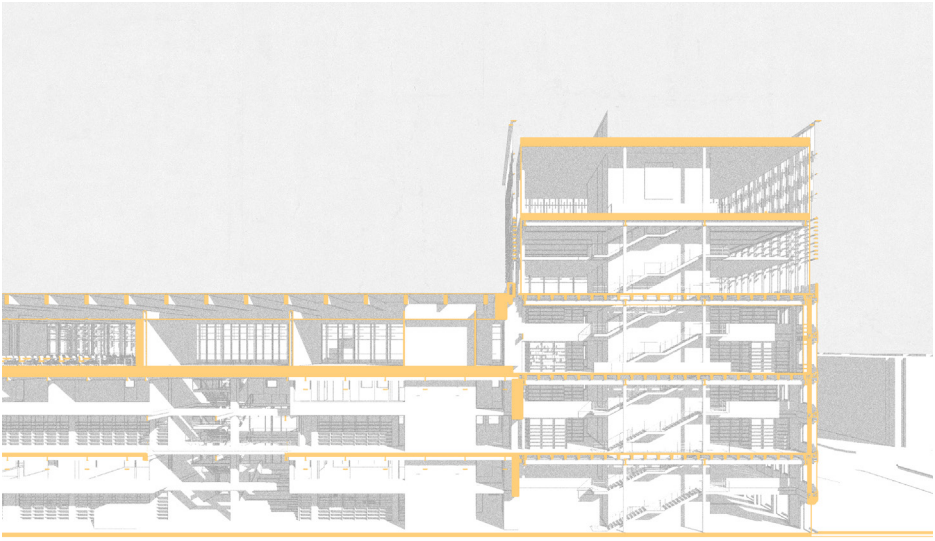
Circulation plays a major role as well in the spatial organization, which is directly linked to the structure and three solutions have been worked out during the research. In a common case when the circulation system is 'blind', by replacing the space dividers with transparent ones, this increases the visual connections and spatial relations within a building. In addition, the circulation zone can take place in an open plan arrangement, without significantly reducing the floor area; a clear zoning of the functions is required to make this option effective. Lastly, particularly effective in existing building is to add value to the circulation paths, by converting them into buffer zones, positioned in-between

the facade and the enclosed space. This option could have both thermal and architectural benefits, as this solution does not require intervention in the original façade, though some floor area needs to be sacrificed. In the case of the Hague, a combination of the three options was employed.

Lastly, the re-positioning of the cores is rather significant, not only for spatial connections, but also because of their importance in the structural integrity in a building. The relocation of them, is a costly intervention, (Remøy, 2010), and structurally challenging, though their position may influence the spatial possibilities, as well as compatibility with different programmatic uses. Thus, a solution for existing cores, is utilizing them by transforming them into shafts for either services or stack ventilation shafts. In any case, fire-safety regulations should be considered when intervening with the existing circulation cores.

[All things considered, certain design guidelines were formulated; improvement of spatial conditions through the addition of voids, is an effective strategy that enhances visual relations too. Introducing new circulation systems and maintaining large open-plan spaces is another effective approach. On the other hand, more cost-demanding approaches, including facade alternations and core-relocation (Remøy, 2010), constitute re-design options too. Overall, once the structural potential of the former police stations is identified, clear directions is given towards their re-design opportunities.] (SBT,Part 3)

Most importantly for a heritage project, the sum of the re-design options had to be examined in parallel with the value assessment (Kuipers et al. 2017); an important tool which simplified the dilemmas that occurred, and enabled design choices to be made. By evaluating the building in different scale levels, such as urban block, spatial organization and façade-materiality, I was able to identify the areas for improvement of the existing and formulate my design starting points.



Sectional perspective

Dilemmas

During both the research and the design, certain dilemmas emerged, that questioned the methodology and the design solutions found in the research. Since the transformation project aims to improve an existing condition, a central question that was posed, is how the re-design of the police station, could overcome its construction and environmental cost and if that is measurable. In this case, the answer provided by the design, was the increase of the longevity of the existing through spatial efficiency. A monetary estimation could provide additional input regarding the feasibility of the project.

As for the design process, a significant dilemma is whether the value assessment, which served as a fundamental design method, could be actually used in reality. Given the decisions that need to be taken in the fast-paced construction industry, where time is highly valuable, the value assessment requires on its own a considerable amount of time to be conducted, prior to decisions making in the design. So, in order to be effective in real-life scenarios, it needs to be both precise and concise. By repeating this method, an architect can shorten this period and deliver a proposal without additional delays, making this method applicable in practice.

Scientific & societal relevance.

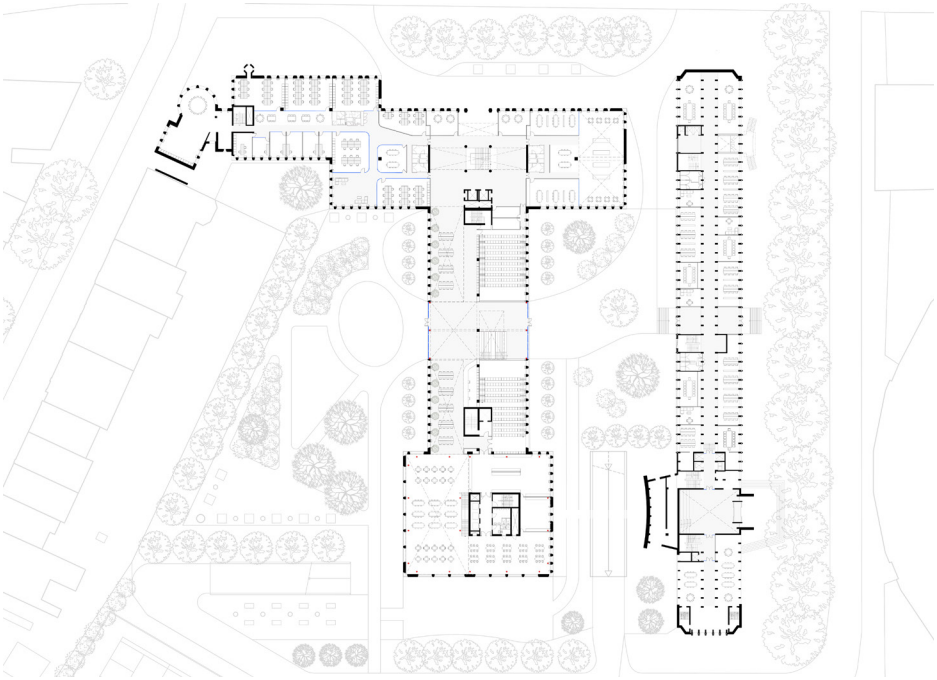
The process of the graduation studio, through a research-based redesign, leads to an overall project, whose relevance extends beyond the architecture discipline. Initially, the methodology and approach used, is directly linked with the three directions offered by the chair of Heritage & Architecture, which include: Heritage & Design, Heritage & Building Technology and Heritage & Values. For the heritage professional field, the graduation project demonstrates a systematic approach based on a research framework, and therefore, the rationale that is developed during the design process follows a certain architectural logic. The same approach, is applicable in the field of the professional field, given the rising number of vacant heritage office buildings that are in thereat of obsolescence. Developing a reliable framework upon which, existing heritage can be redesigned, constitutes a reasonable methodology that can be used across the built environment.

The graduation project highlights the urgency of the Sustainable Development Goals, which is also underlined by the TU Delft faculty of architecture, and especially that of energy. Redesigning existing heritage buildings can respond to the SDG by creating sustainable cities and communities, and providing renewable and affordable energy, through resilient and innovative infrastructure. With the number of existing vacant buildings in mind, it becomes apparent that their contribution to sustainability can be significant, therefore the graduation project has an increased societal relevance.

The project also aims to point out the variety of possibilities of prefabricated architecture, which is certainly becoming more dominant in the future. Not regarding standardization as an inferior design choice, but as an opportunity to be used innovatively, has been a design guideline throughout the entire process. To that end, applicable in future projects is -from a wider perspective-, the systematic approach of a research-based design, by taking into account

the importance of values, and from a more specific standpoint, the re-design possibilities of existing buildings, featuring prefabricated load-bearing facades and structures.

Finally, the collective research conducted through the Spatial Building Typology, will take a tangible form, through the second volume of the SBT series. Prioritizing the spatial attributes above the former function of an existing building, does provide a different approach that can result in more innovative solutions for heritage architecture, therefore addressing the scientific relevance of this research line.



Ground floor plan

Conclusion

All in all, the graduation project has been based in a non-linear design process, which required a constant reflection on the research findings and design solution, by questioning the interrelation between them. Despite the array of various and unexpected problems that emerged during the design, the mentors and the research findings, provided the steppingstones to overcome the numerous challenges, and finalized an elaborated architectural transformation. Critical points during the entire process, have been the formal and informal presentations, from which valuable feedback was derived, setting the design process on the right track. That way the presentation formulated a pause in the design process, which assisted in finalizing certain decisions, reflecting on them, and proceeding. In addition, the relation of the research with the design, as well as its architectural and societal relevance have differentiated this project from a mere transformation, and design solutions have been configured that can be applicable in a wide range of projects. Also, the research topic revealed domains, that can be further explored in other projects, that make use of prefabricated structural components, and different solutions could be found. Finally, by constantly questioning the design decisions, has strengthened the critical argumentation of the design and heritage approach, and has proved to be the right path, according to which reasonable and realistic solutions can be found to alarming architectural and societal challenges.

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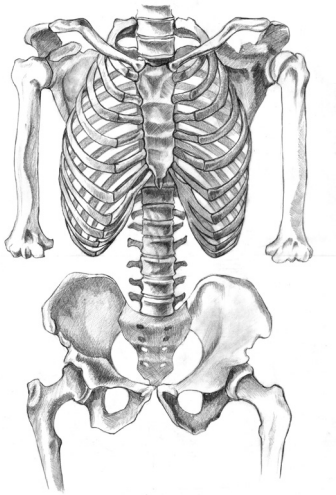
*Who is an **'architect'**?*

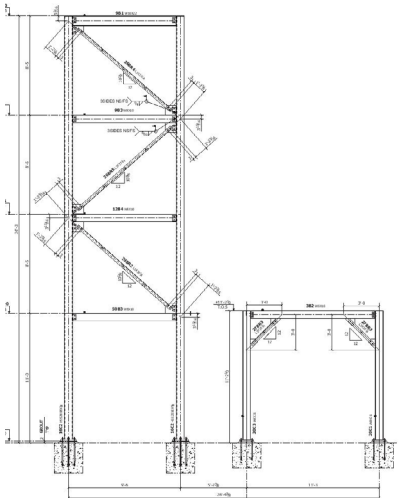
***arkhitéktōn** (Greek): from αρχι- (**arkhi**-, "chief") **+** τέκτων (**téktōn**, "mason, builder")*

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

Individual Research topic



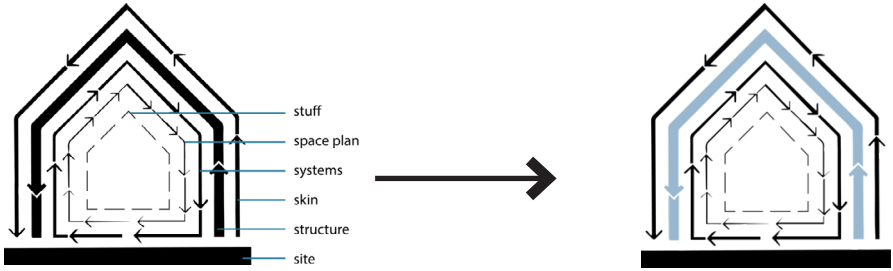
Human skeleton



Building skeleton

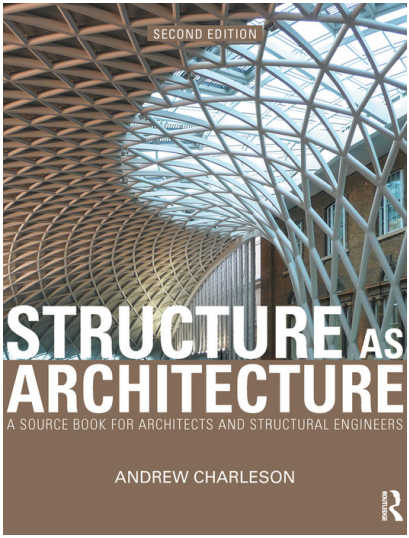
Skeleton, (Greek: *skeletos*): *''A rigid supportive or protective structure or framework of an organism'' (Merriam-Webster.com)*

Structure

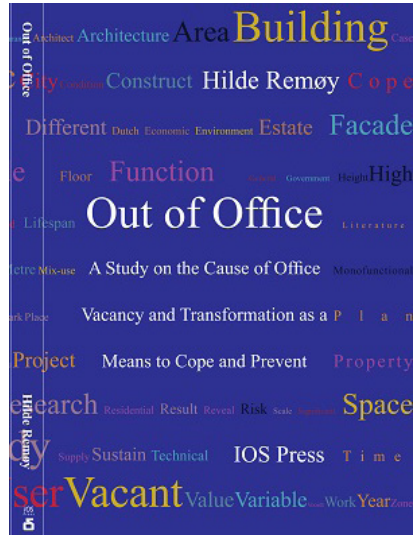


Structure = **?**
Architecture = **?**
Structure = Architecture **?**

Literature studies



Charleson (2005)



Remoy (2010)

Van der Voordt (2007)

Van Meel (2000)

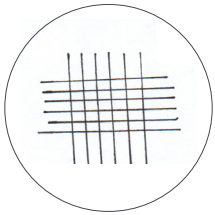
Research question

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

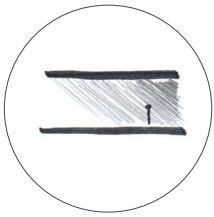
Structural types

Modern strategies

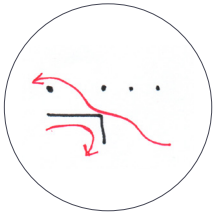
Case studies - Examined aspects



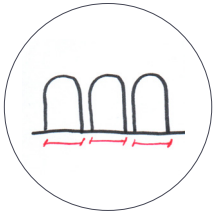
Grid



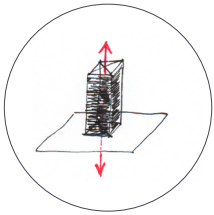
Daylight & depth



Routing



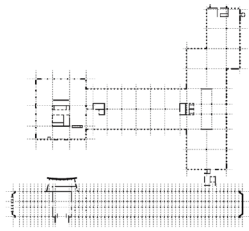
Bay width



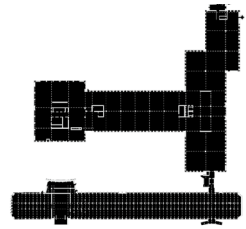
Circulation cores

The Hague

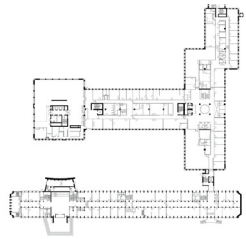
Grid



Free-space



Non load-bearing partitions



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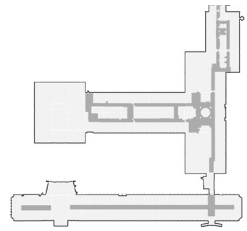
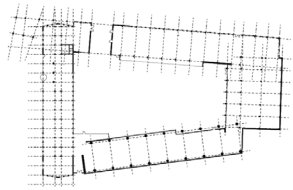
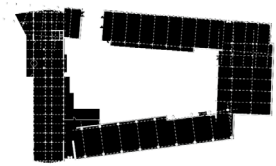
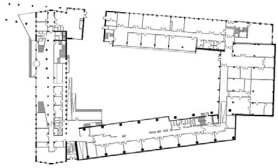


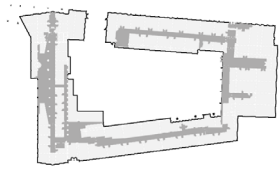
Cores

Groningen

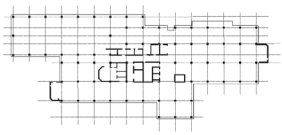








Eindhoven



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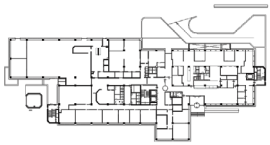
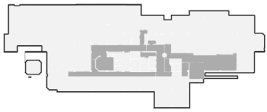
Free-space



Non load-bearing partitions



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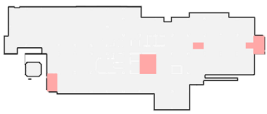
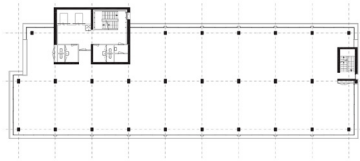
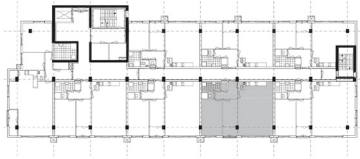
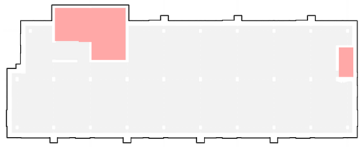


Cores

Stadhouder, Alphen aan den Rijn

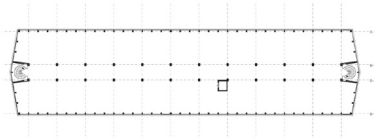






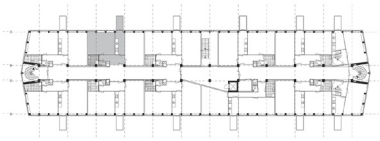
Westplantsoen, Delft

Grid

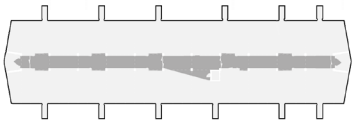


Free-space

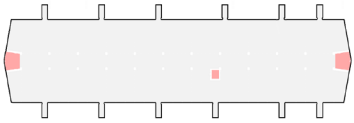
Non load-bearing partitions



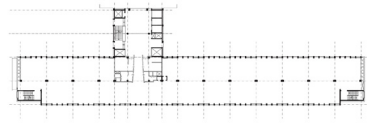
Routing

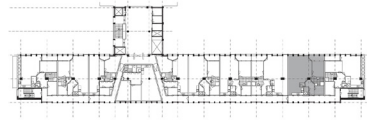


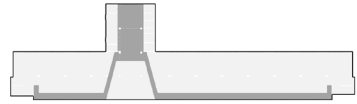
Cores

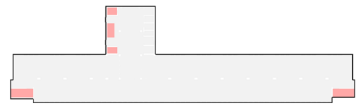


Enka, Arnhem

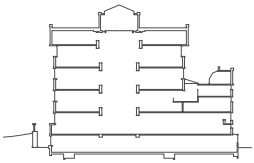


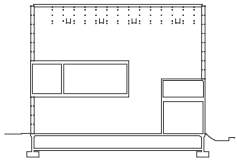


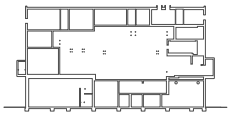




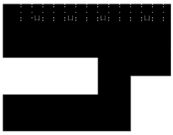
Larking Building **Art Centre, La Coruna** **De Effenaar, NL**







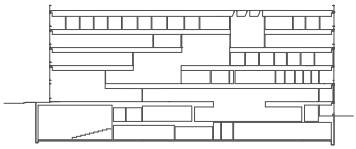
Section



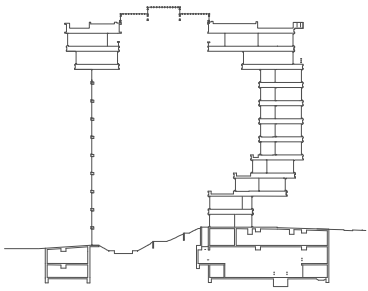
Void

Enclosed space

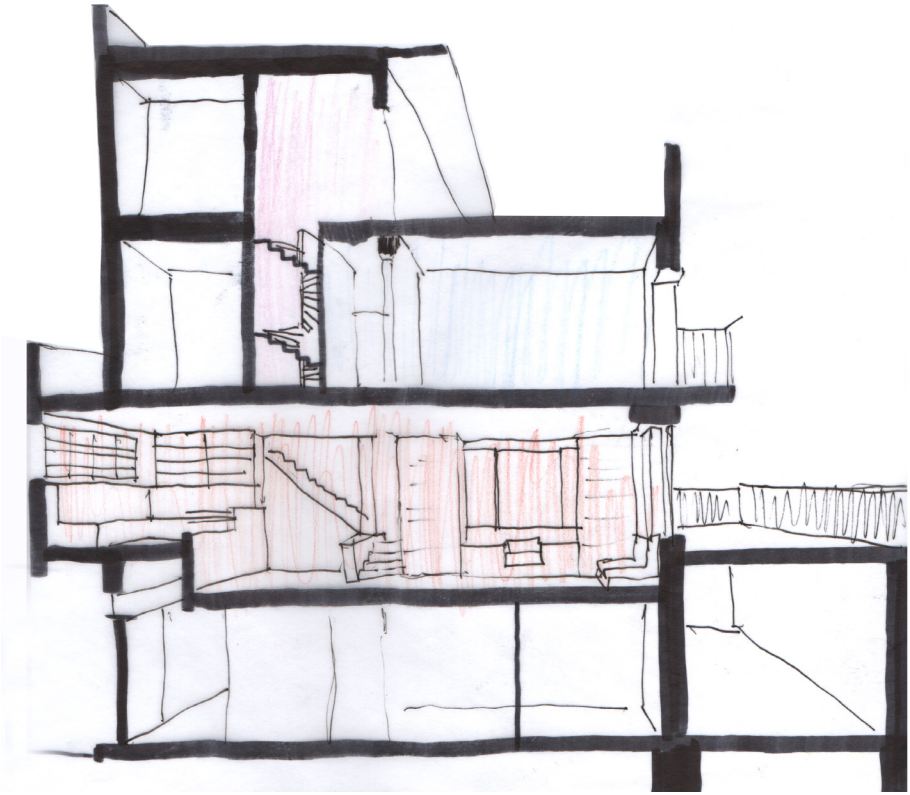
Bernard College

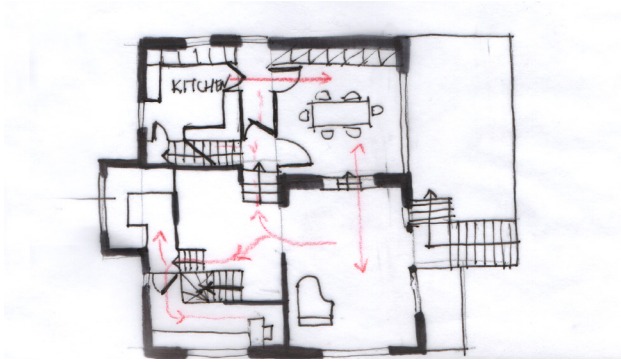


Ford Headquarters

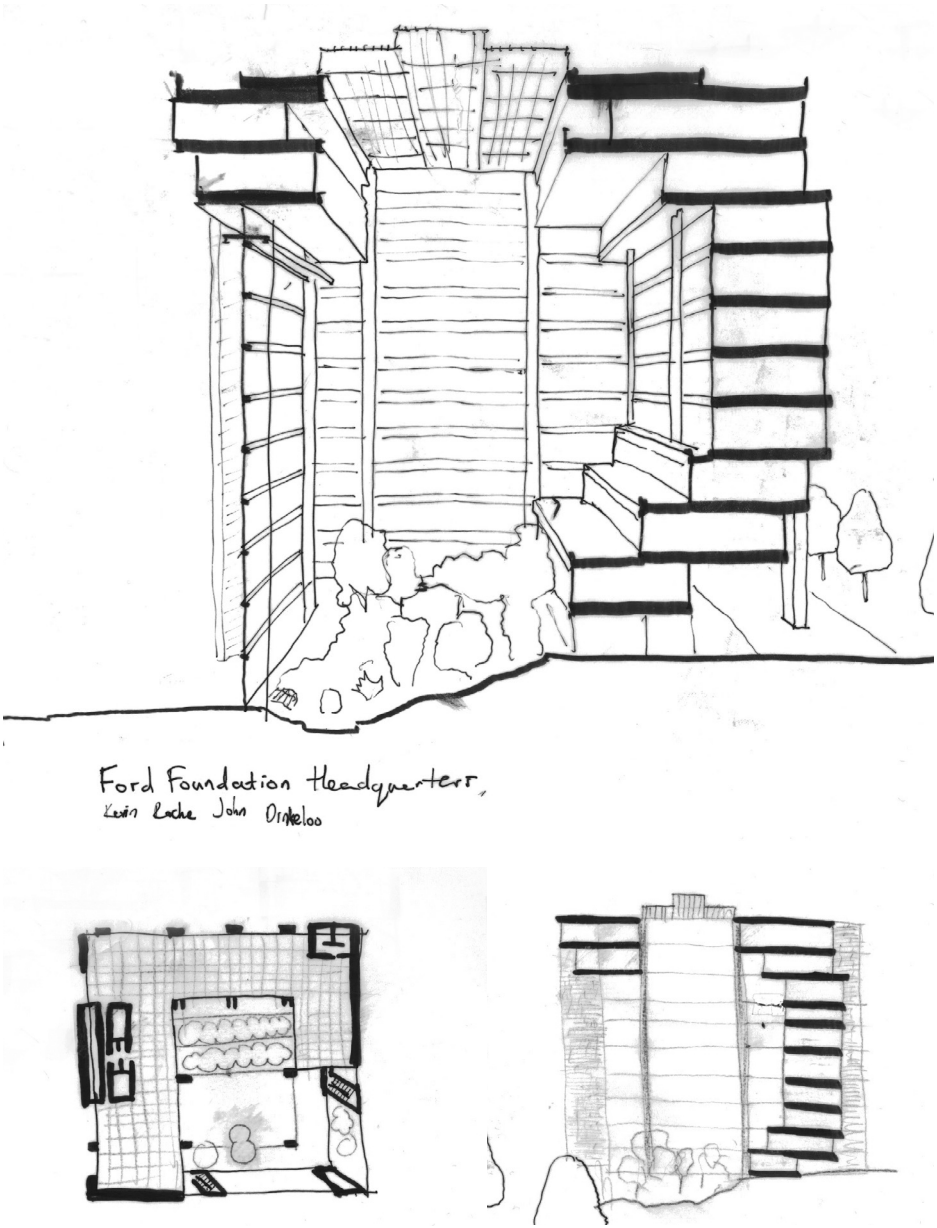


Sectional sketches

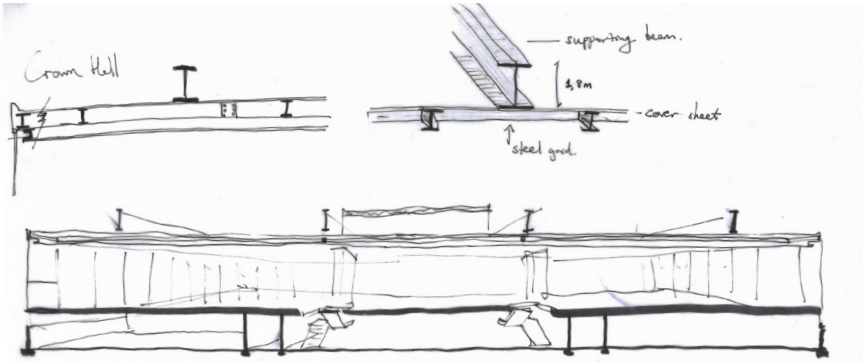




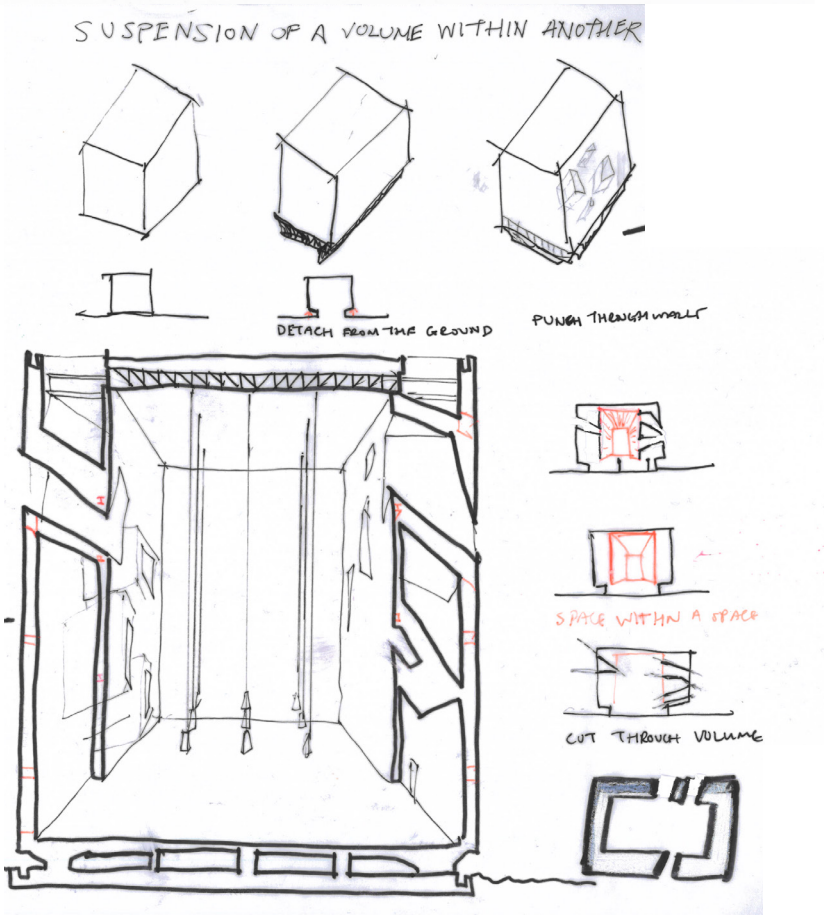
Villa Moller, Adolf Loos



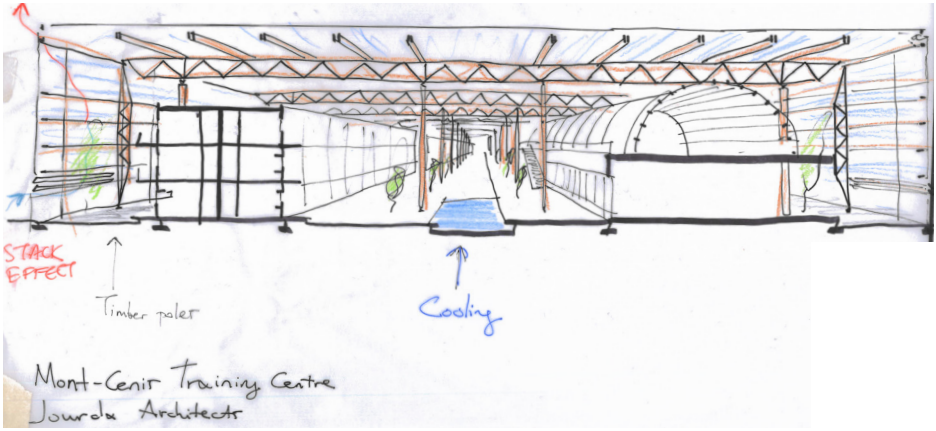
Ford Foundation Headquarters, Kevin Roche



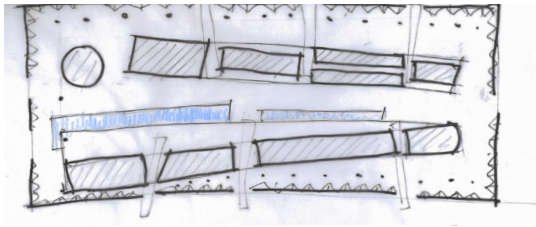
S.R. Crown Hall, Mies van der Rohe

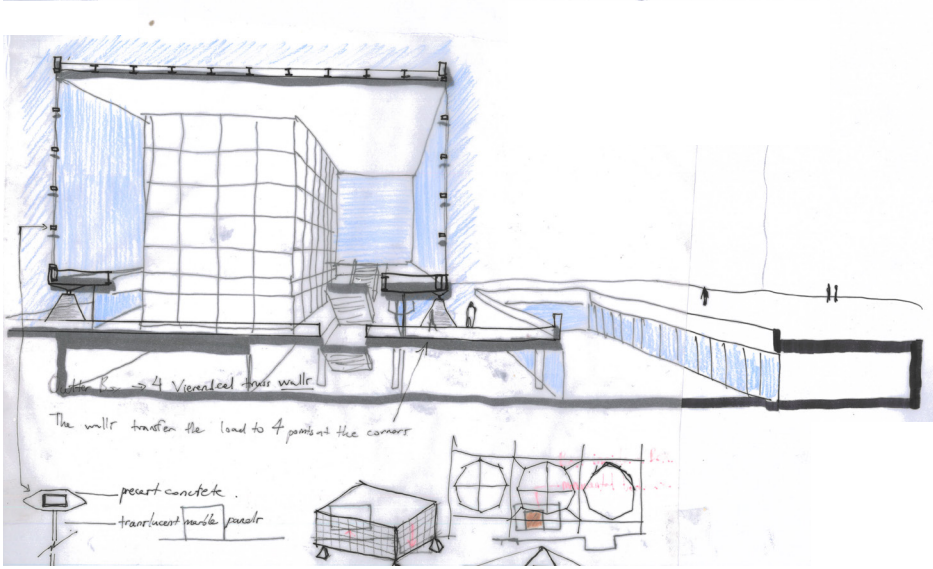


San Paolo Parish Complex, Studio Fuksas

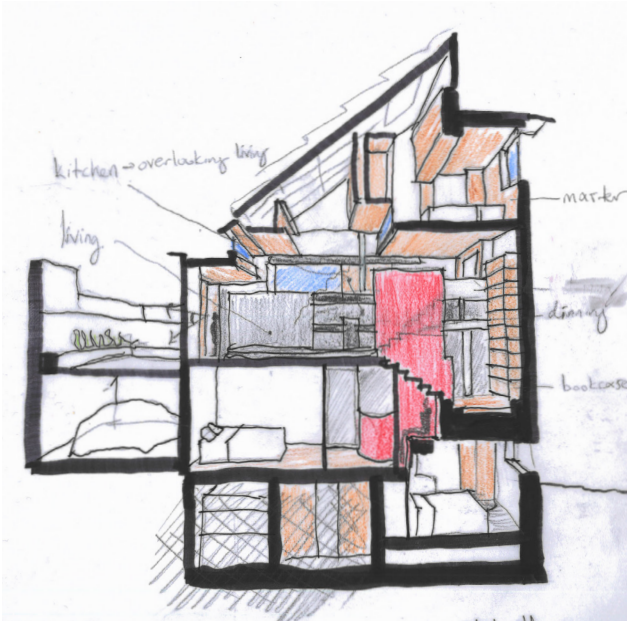


Mont-Cenis Training Centre, Jourda Architectes

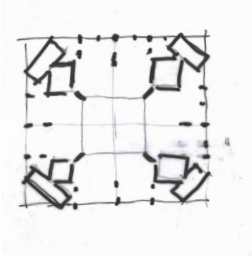


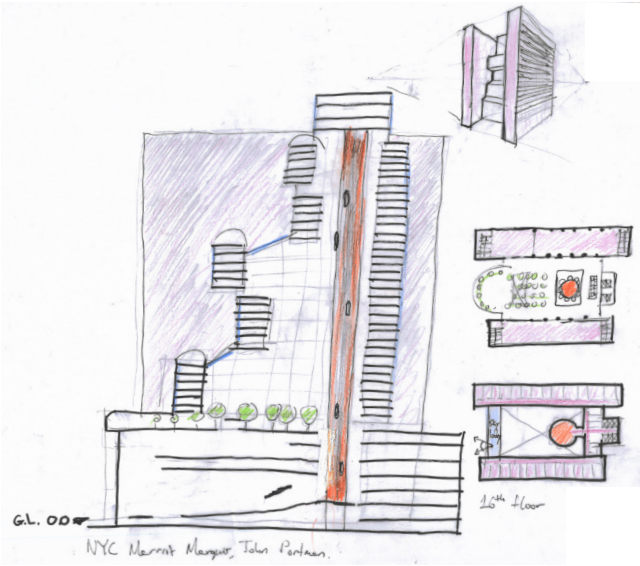


Beinecke Rare Book and Manuscript Library, Gordon Bunshaft

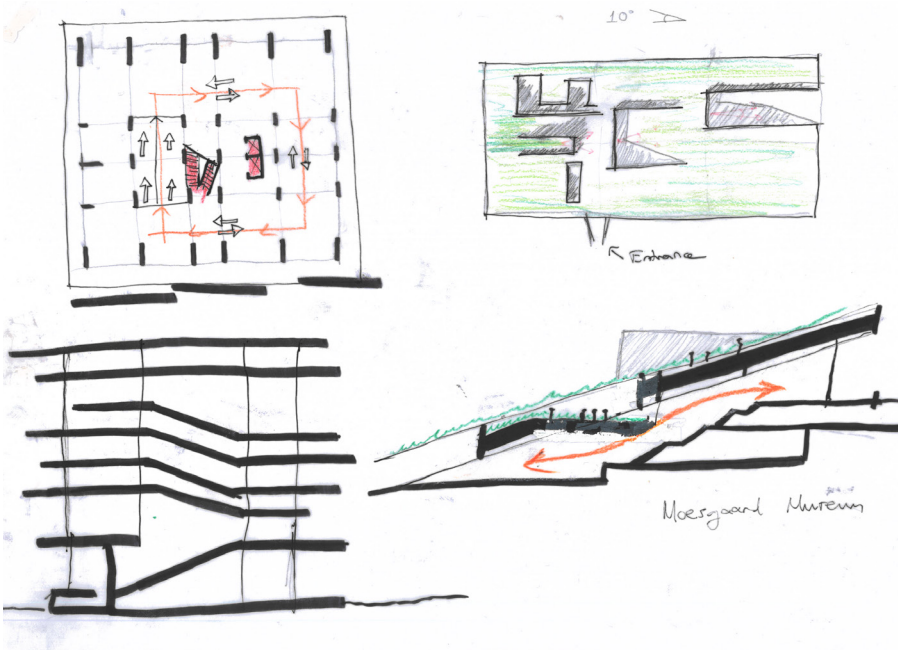


Murphy House, Richard Murphy Architects



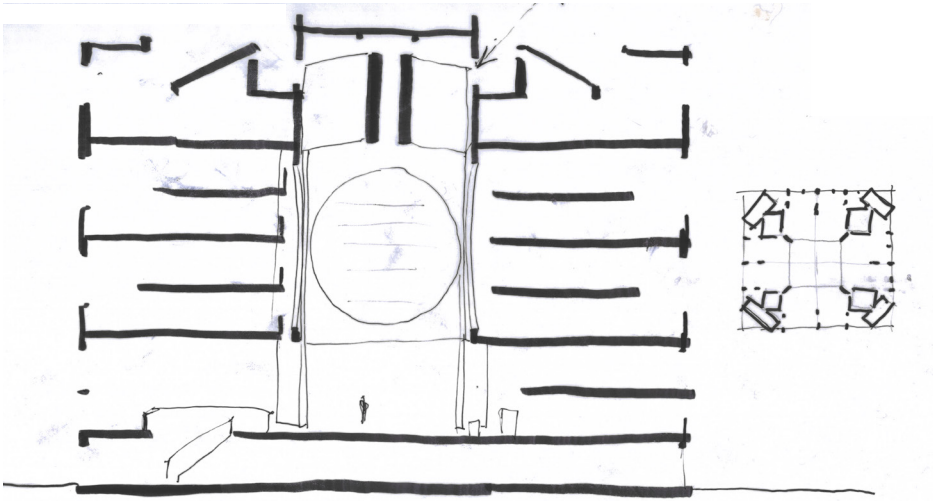


Murphy House, Richard Murphy Architects

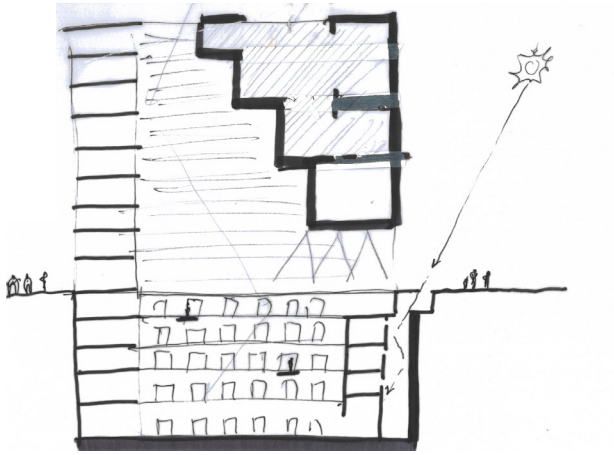


1111 Lincoln Road, Herzog & de Meuron

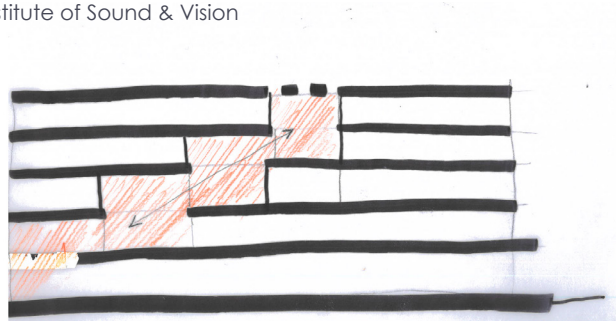
Moesgaard Museum, Henning Larsen



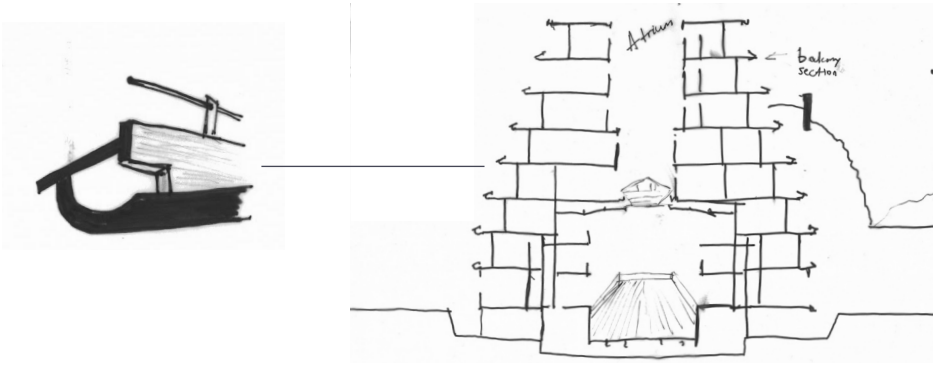
Exeter Library, Louis Kahn



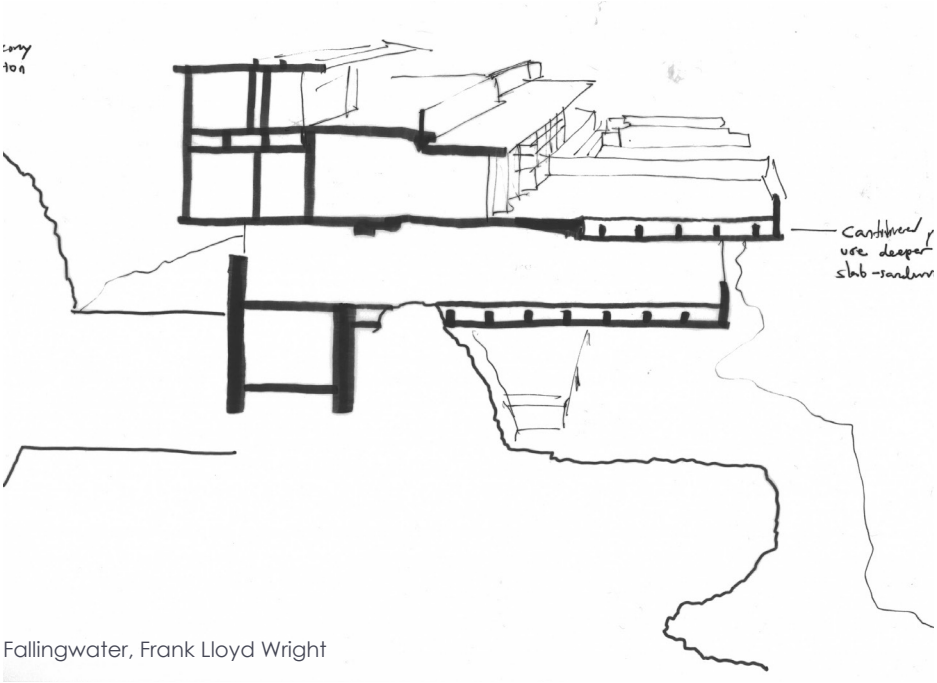
Netherlands Institute of Sound & Vision



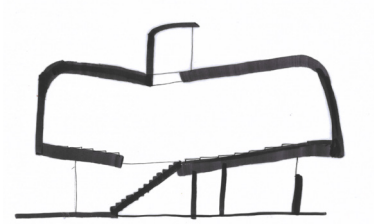
Netherlands Institute of Sound & Vision



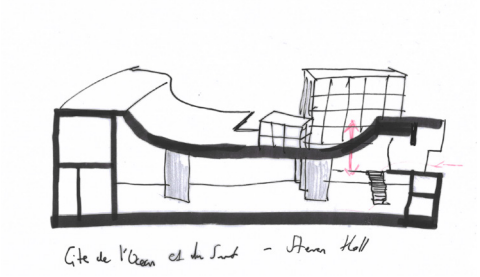
13 Rue des Amiraux, Henri Sauvage



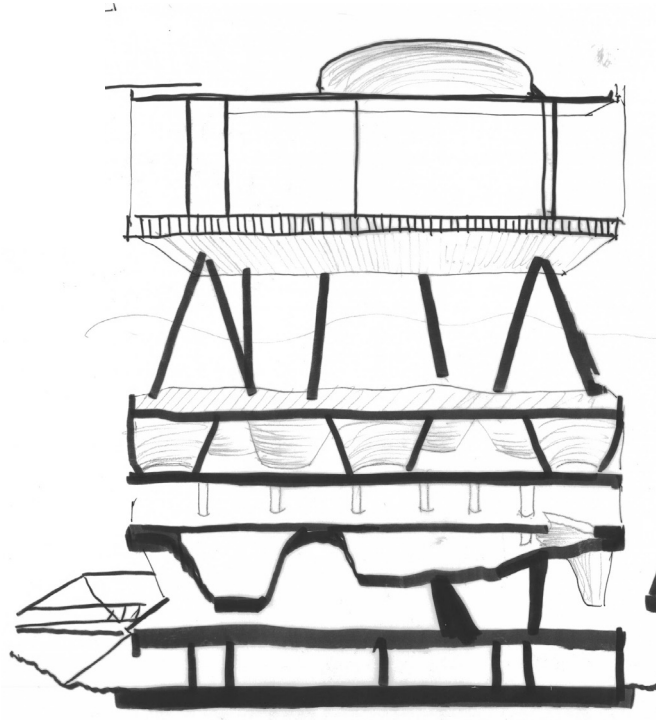
Fallingwater, Frank Lloyd Wright



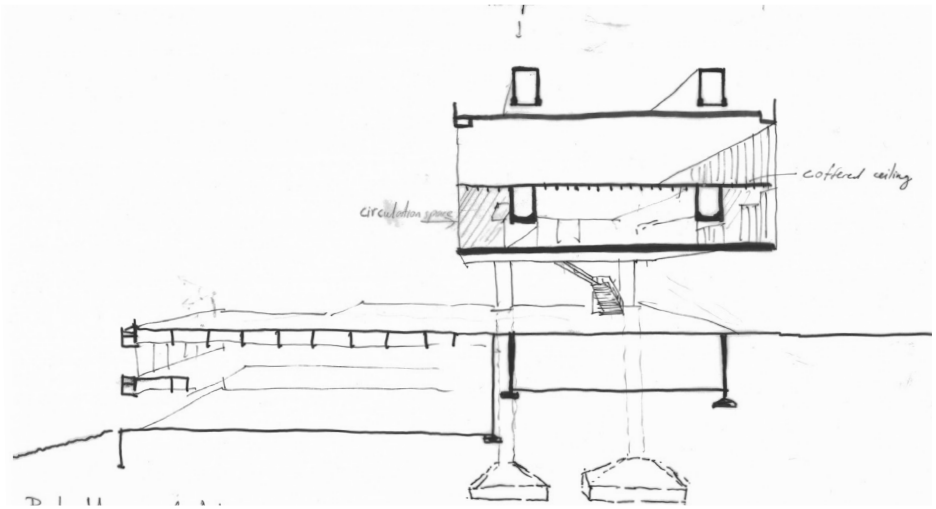
Exeter Library, Louis Kahn



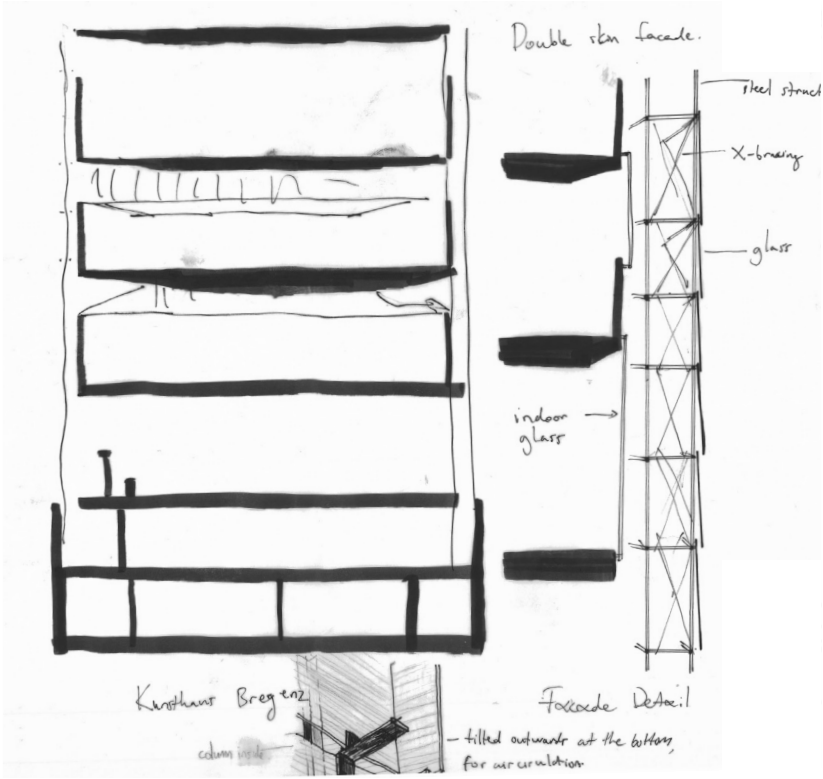
Cite de l' ocean, Steven Holl



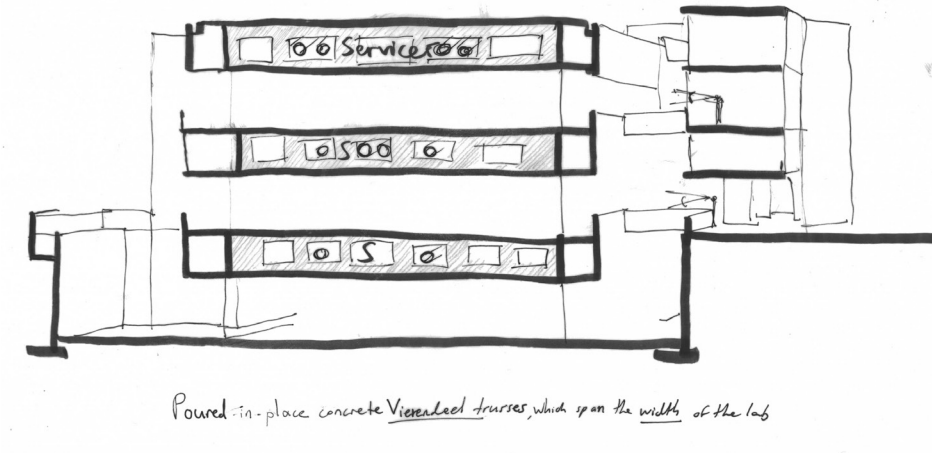
Expo 2000 Netherlands Pavilion, MVRDV



Sao Paolo Museum of Art, Lina Bo Bardi

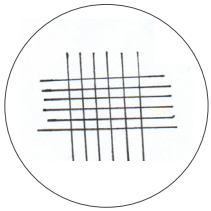


Kunsthaus Bregenz, Zumthor

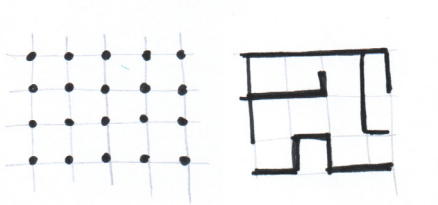


Salk Institute, Louis Kahn

Design guidlines

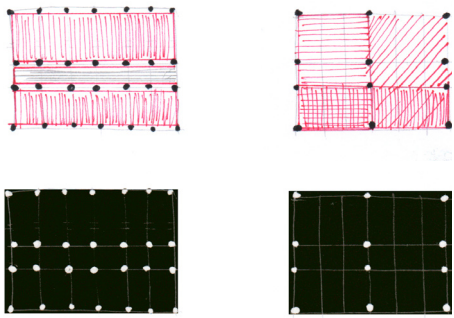


Grid

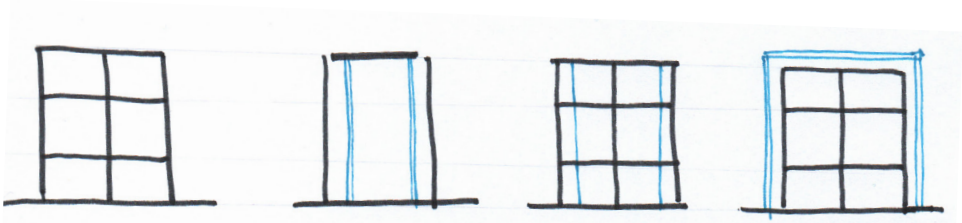


Columns / Load bearing walls

Materiality, structural capacity & technique



Space division, distancing & structure/ m^2

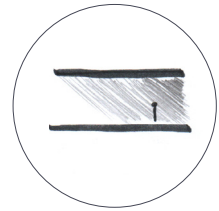


Original structure

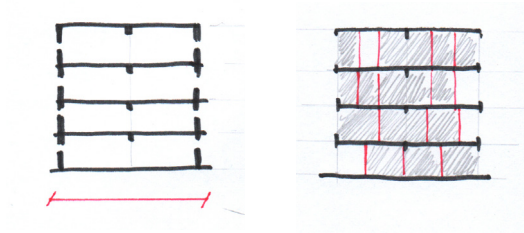
a) Keep shell, remove internal structure

b) Internal glazing for thermal improvement

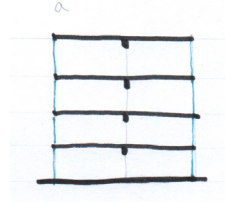
c)External insulation via external glazing



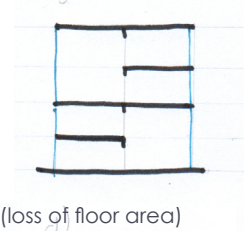
Depth & daylight



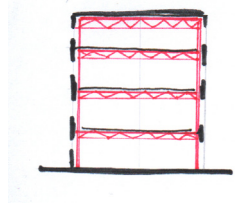
a) Removel interal partitions to increase daylight



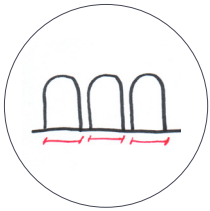
b) Facade intervention (-) cost & value - conflict



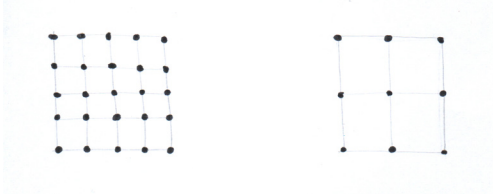
b) Add voids (loss of floor area)



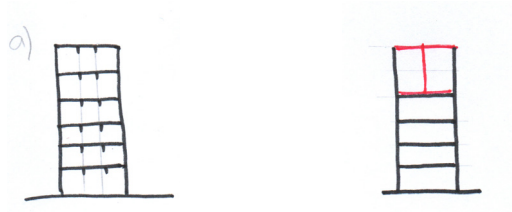
b) Completely new structure, column-free space



Bay width

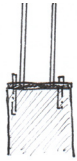


Structural density & space division



a)Demolish top level & add ultra- lightweight structure

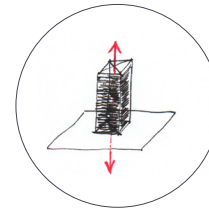
b) Minimize space division



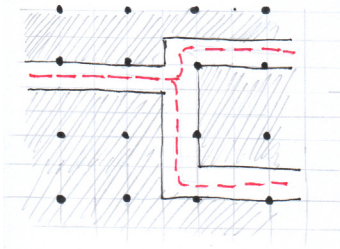
(-) Construction challenges

(-) Financial impact

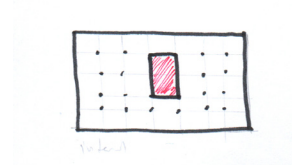
Circulation



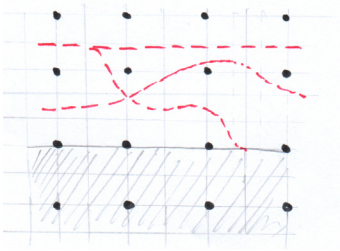
Re-location of cores



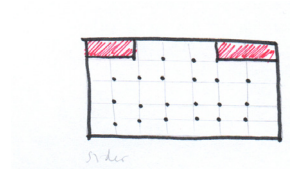
a) Closed/ blind system



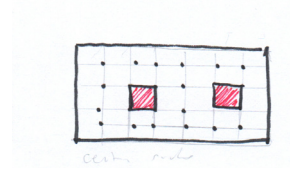
a) Single & centrally positioned core



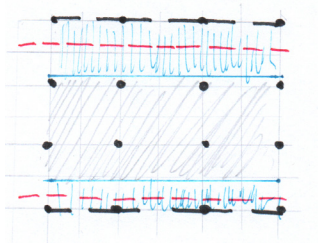
b) Combination of open plan
& closed spaces via zoning



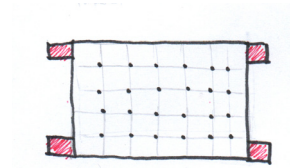
b) Double cores placed sideways



c) Cores as free standing objects in the space



c)Ciruclation as buffer zone &
axial organization of movement



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

Research conclusions

- Limited options in 'structurally' traditional office buildings.
- Limited sectional opportunities (stack section)
- Layout suitable for housing

Design guidlines

- Open up space - voids/ atria
- Enhance visual connections
- New circulation system
- Minimum space division
- Core relocation (-$)
- Open up facade (-$)

The research

The individual research builds directly upon the SBT, as an extended structural typology research, which sets structure in a wider context, aiming to find appropriate strategies that can be applicable to spatially identical projects. Thus, the research poses the following question: To what extent does the load-bearing structure in 20th-century Dutch police stations, influence their re-design options? The examined fields that are researched, are the structural characteristics of these buildings and the exploration of modern strategies employed by architects in similar projects. Setting the theoretical framework that the research is based on, was the starting point, which was followed by case study analysis, where examined aspects of the literature were researched further. To that end, the focus shifted from a broader to a narrower scale regarding structure, space and adaptability.

Testing

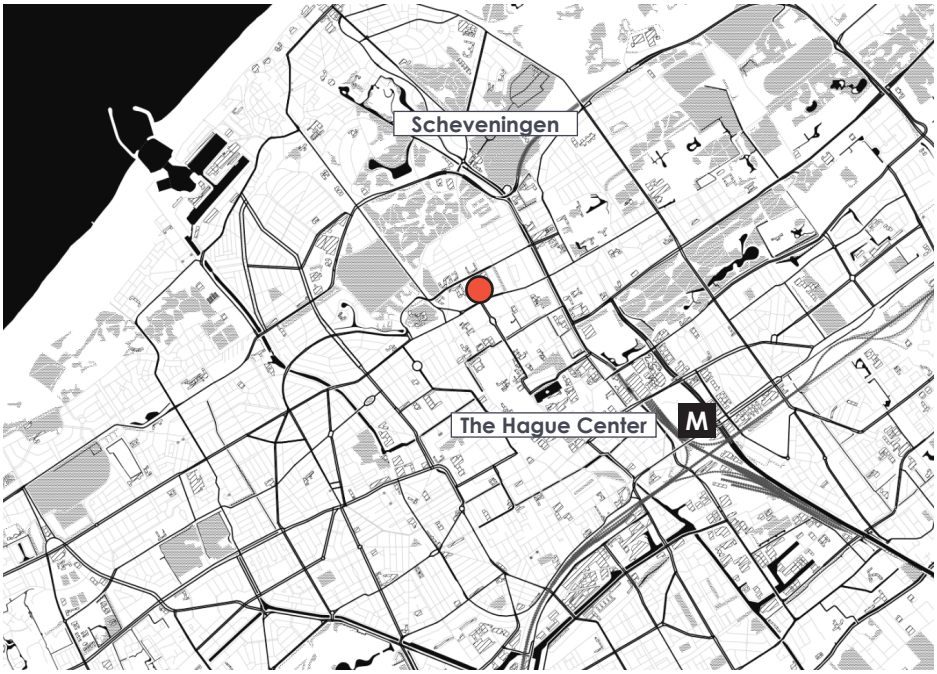
The research showcased that the transformation potential of structure, highly influences the architectural form, exterior, daylight and the spatial flexibility, as explained by Charleson (2005). On top of that, the research uses former Dutch offices as case-studies, found in Van der Voordt's (2007) book, and examines five physical characteristics: structural grid, bay-width, depth & daylight, circulation, and core-location. This resulted in a production of a series of diagrams and reduction drawings of the examined aspects. Certain observations could be made afterwards, such as the spatial implications of a central colonnade in comparison to a double colonnade corridor. Configuring circulation alternatives, daylight improvements and core-relocation, contributed with a substantial output in the individual research and design assignment. The sectional variation that relates to the existing structure and its transformative dimension, was further explored by reduction drawings, using examples of Lewis et al. (2016) book. The conclusion derived was that deep buildings, arranged in a stack section, need a central space that is often in the form of an atrium, which enables for spatial enrichment and visual connections.

Conclusions

Throughout the various stages of the literature and case-study research, certain conclusions were derived, that gave direction towards re-design options. With the police stations, being spatially similar to office buildings, it is concluded that this typology is rather limited in terms of re-design options, due to high cost and the construction methods employed (Remøy, 2010). Additionally, a stack section, when combined with a dense structure, has equally limited opportunities. On the other hand, the structural capacity and structural layout is often suitable for residential projects. All things considered, certain design guidelines are formulated; improvement of spatial conditions through the addition of voids, could be an effective strategy that enhances visual elations too. Introducing new circulation systems and maintaining large open-plan spaces could be another effective approach. On the other hand, more cost-demanding approaches, including facade alternations and core-relocation (Remøy, 2010), constitute re-design options too. Overall, once the structural potential of the former police stations is identified, clear directions can be given towards their re-design opportunities.

Urban analysis

Location



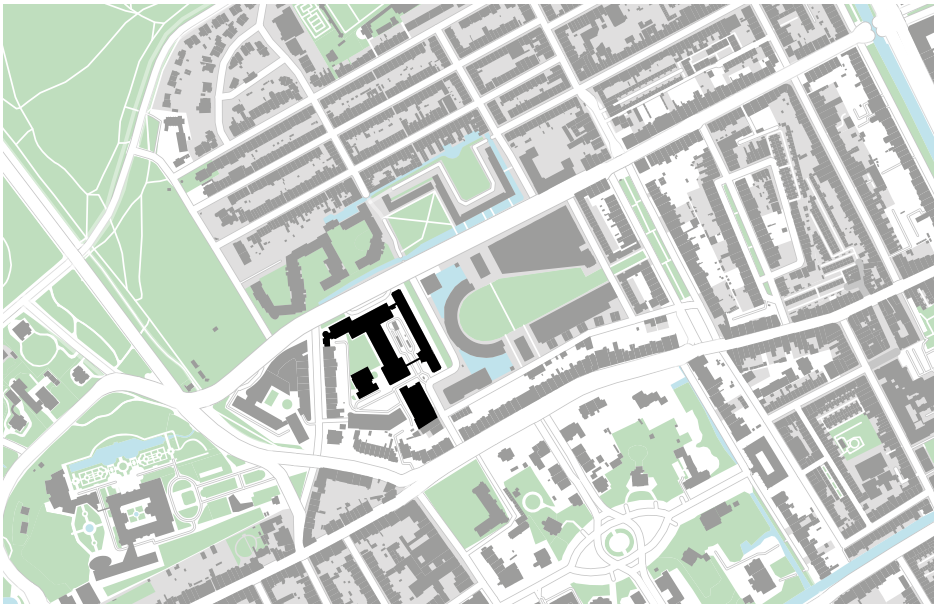
Urban maps

Urban tissue

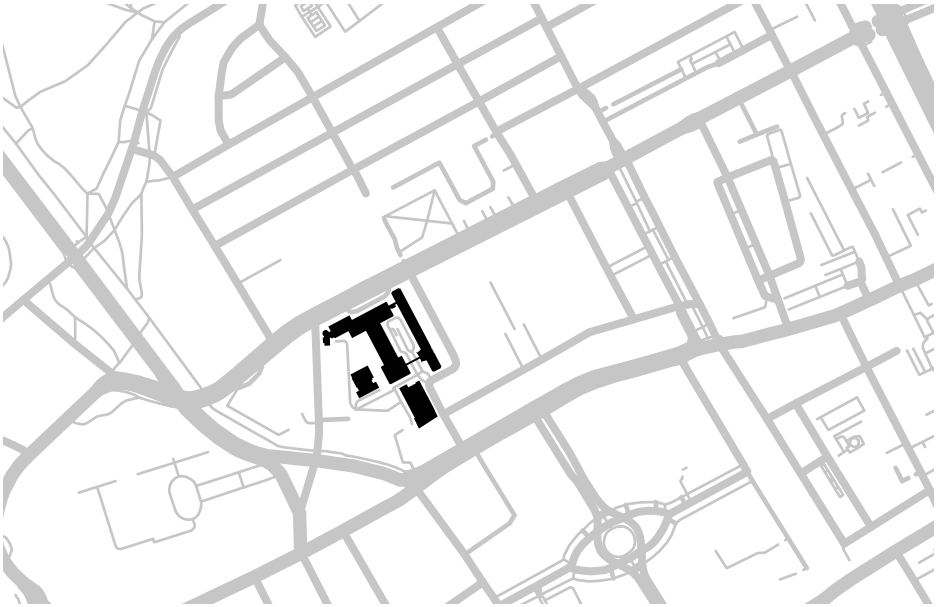
Public spaces, greenery & water

Urban maps

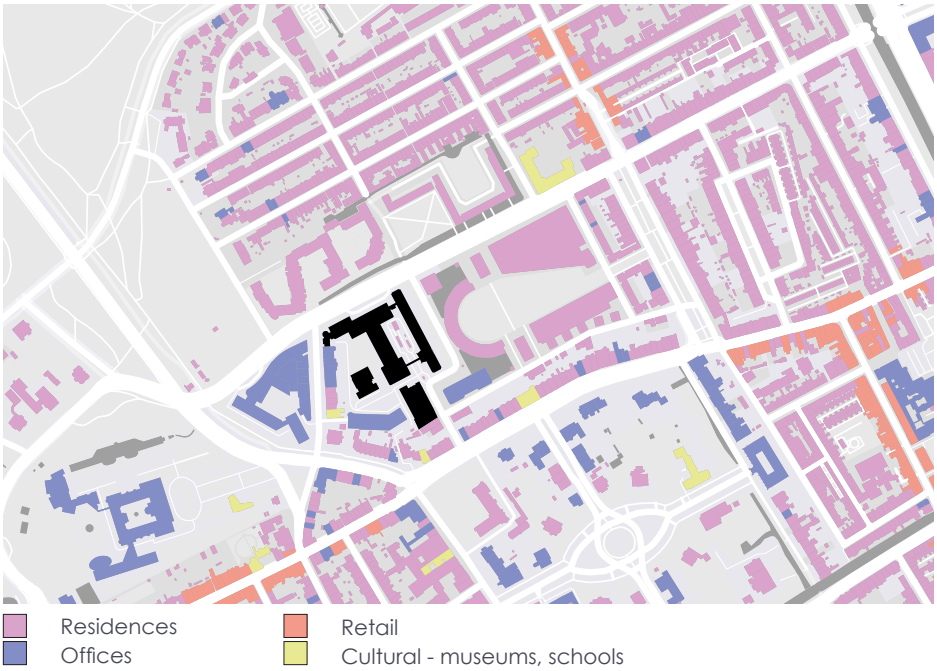
Urban tissue



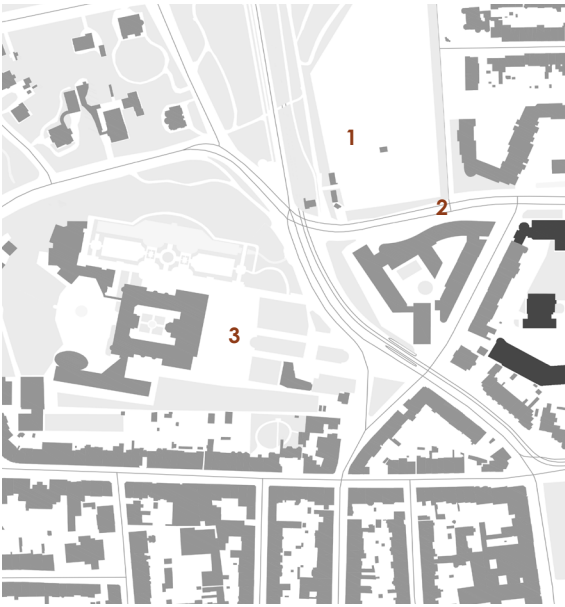
Greenery & water



Infrastructure



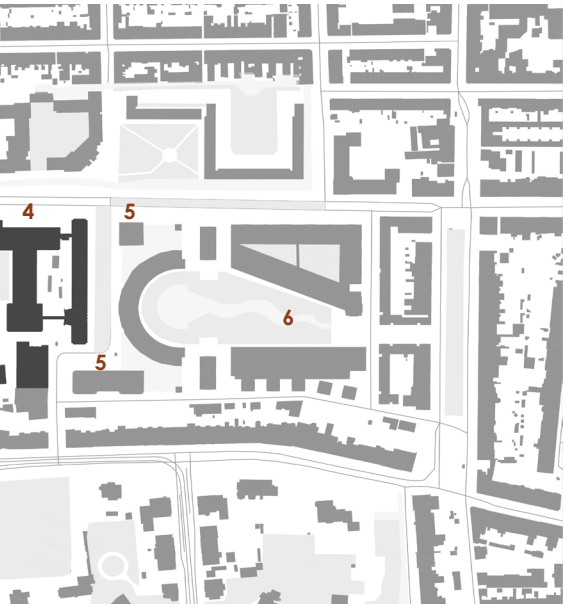
Location



1. Portugese & Israelite cemetery

2. The Zone - Offices

3. Peace Palace



Urban tissue

4. Main entrance

5. Alexanderplein

6. Burgemeester de monchyplein

Open space variety

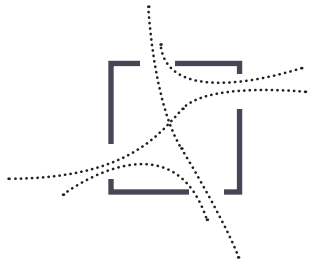
Peace palace & cemetery

Housing block courtyard

Accessible spaces

Private

Semi-private



Public

Strategic plans for the future

Plan development framework, Burgermeester Patijnlaan 35

Urban plan for International Zone

Opportunities for the 'new' Hague

Program

Urban framework

City

Facts

Student friendly

Needs

Expand education facilities

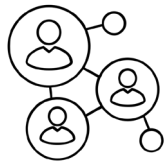
Goals

Establish a university

Region

International zones - Safety

Improve public space

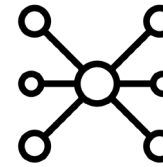


Add social value

People

Different backgrounds

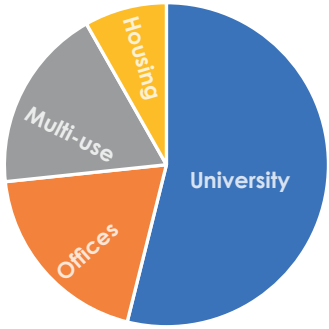
Informal meeting

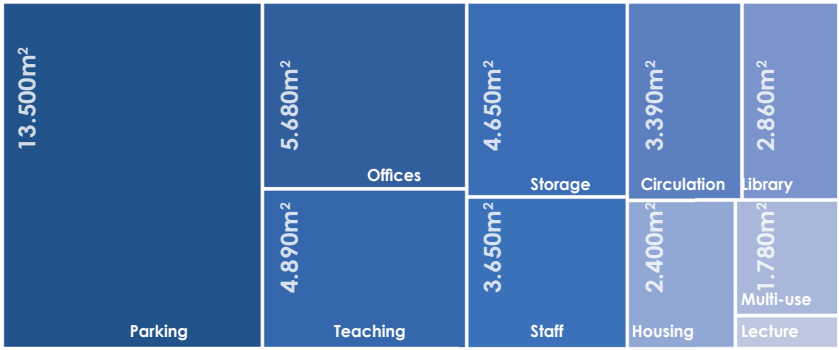


Innovative knowledge clusters

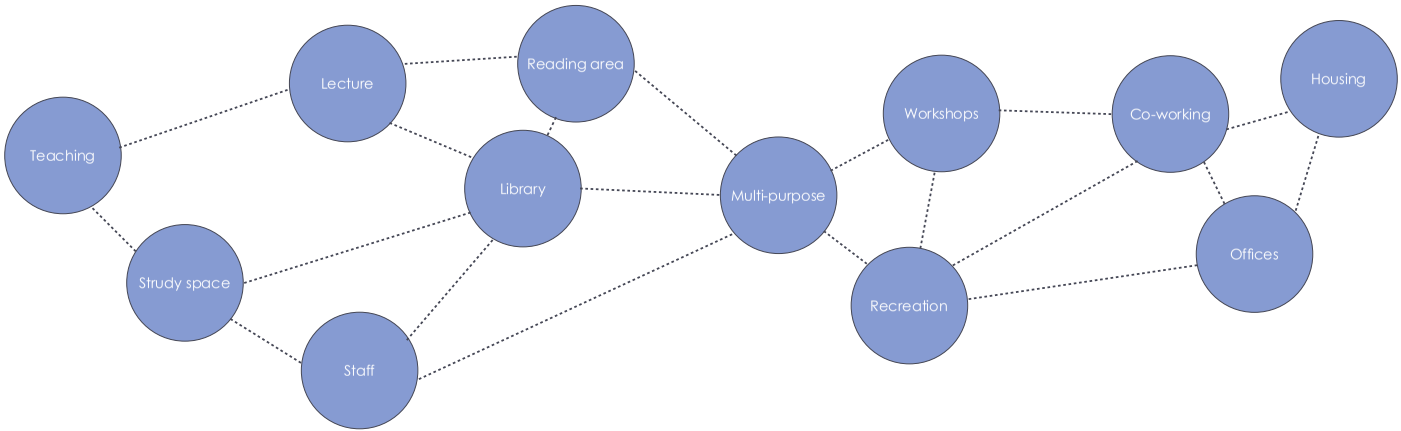
Program organization

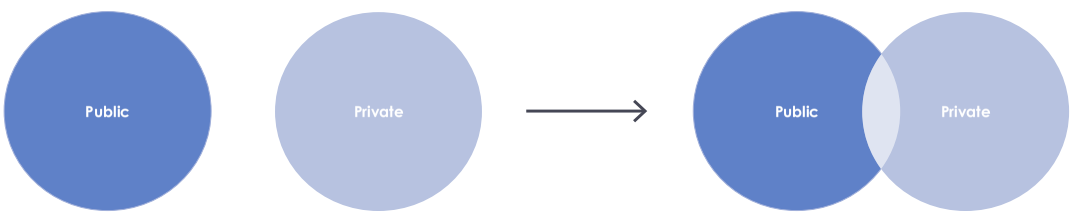
IT University, Co-working, Housing & Library



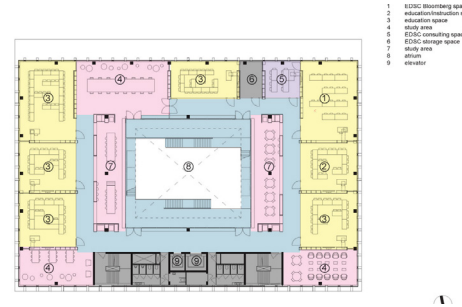


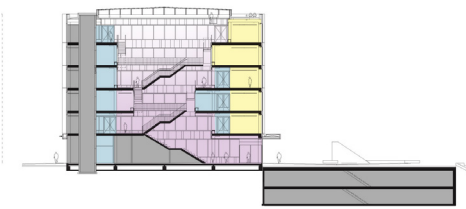
Spatial connections



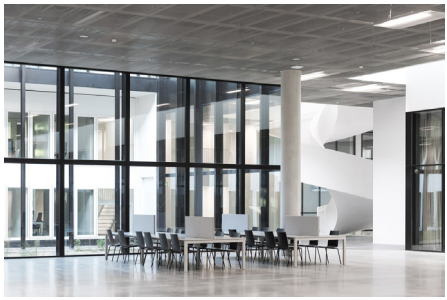


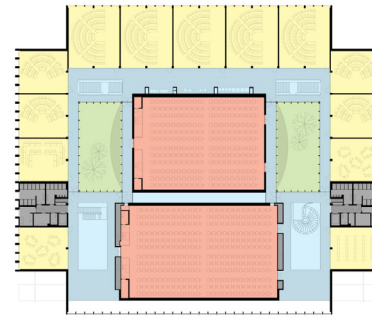
Precedent analysis



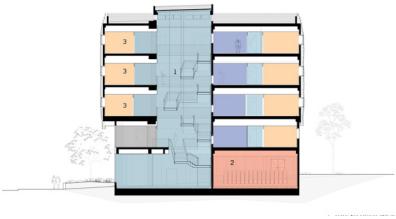


Erasmus University Rotterdam, Paul de Ruiter





CUBE, KAAN Architects



Check Point Building, Computer Science

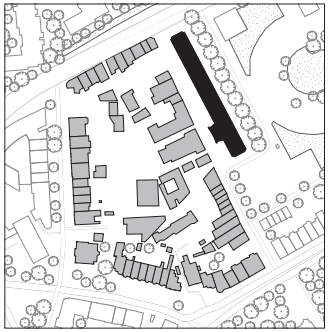
Education
Offices
Circulation
Public activity
Study area
Open space
Meeting
Lecture
Storage

iPabo University, Mecanoo

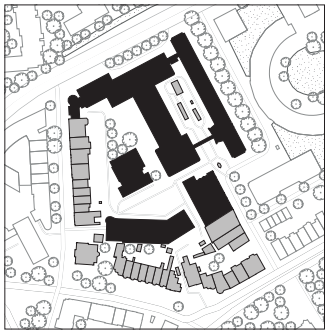
Composition analysis

Urban block development

1945

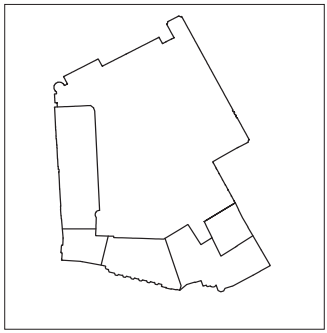


1952-1959

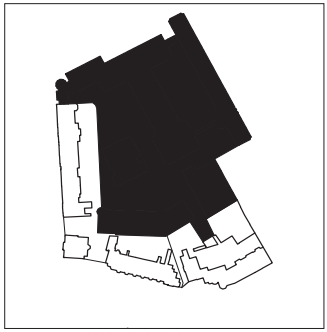


1981

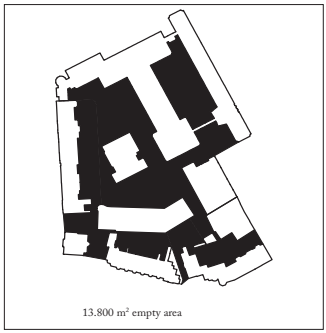
Property distribution



6 Parcels

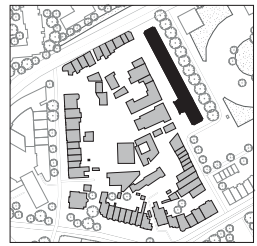


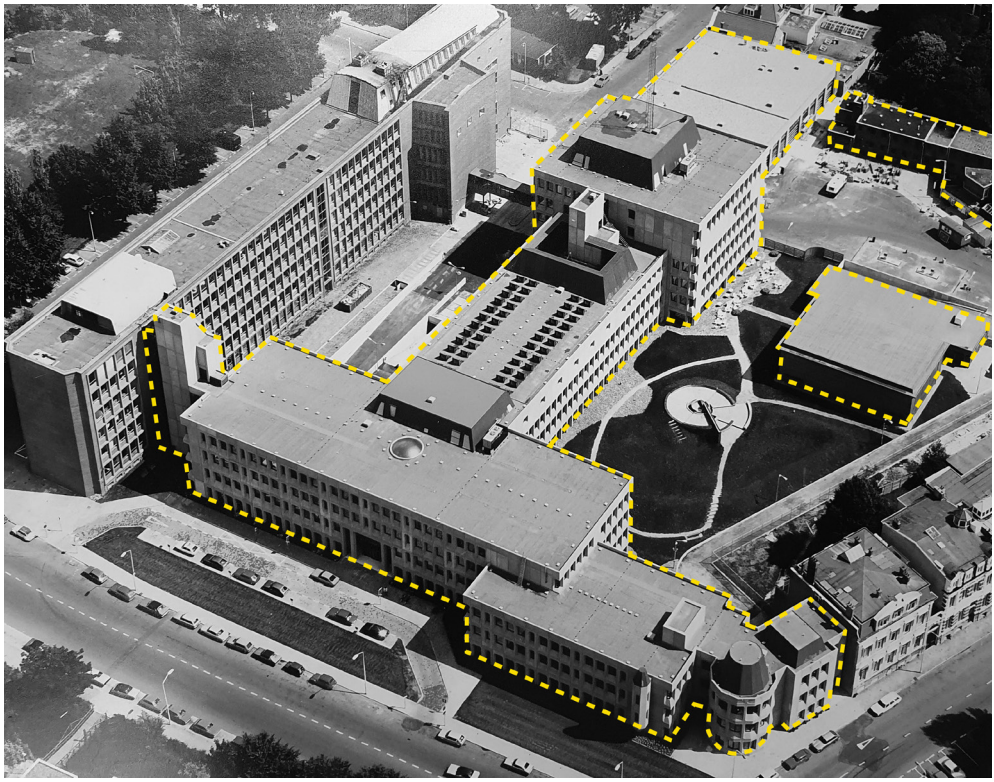
Police real estate

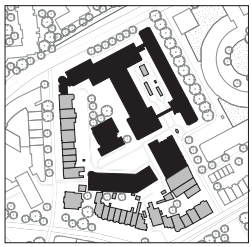


Empty area

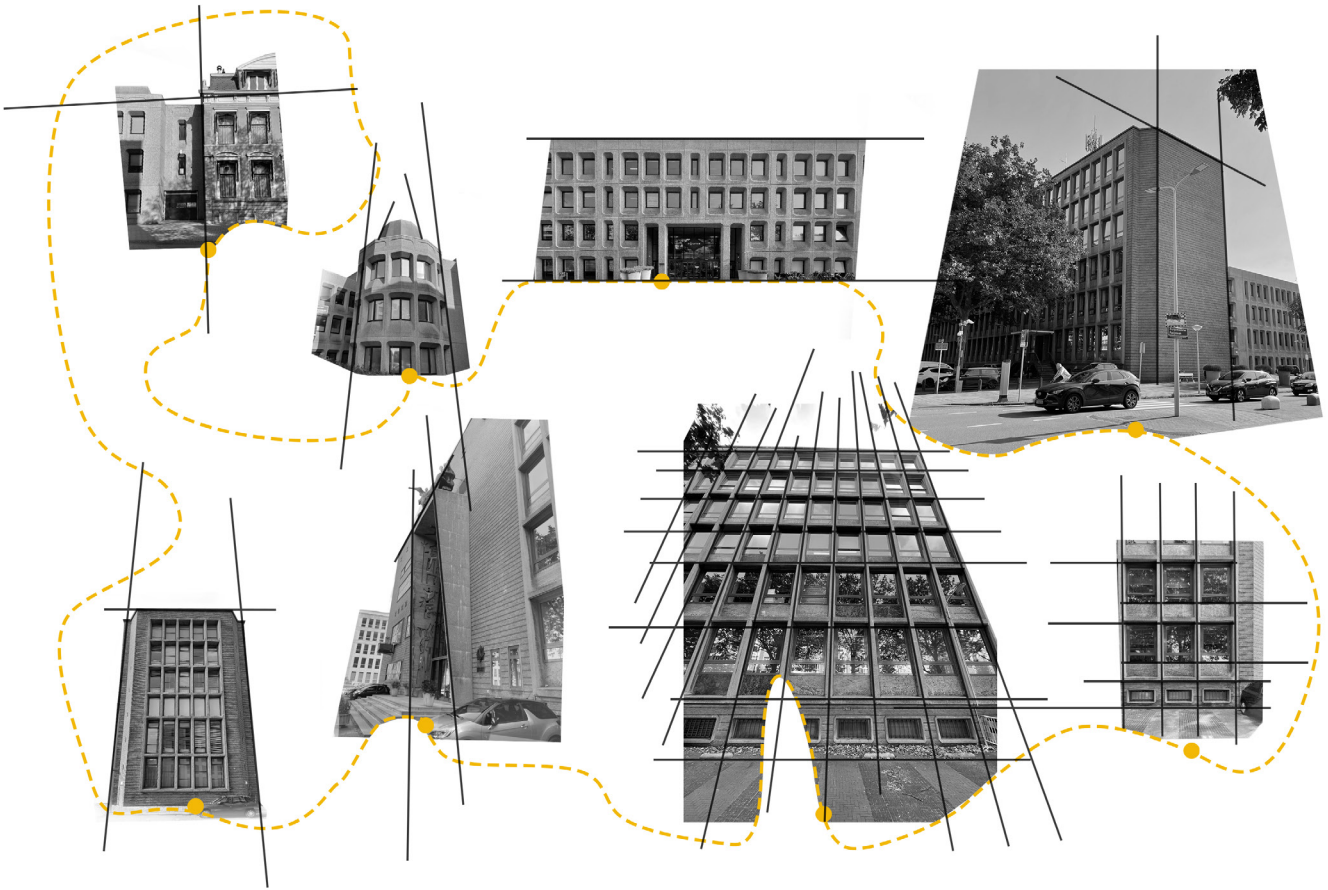
1952, 1981



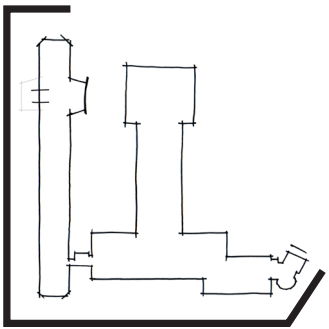


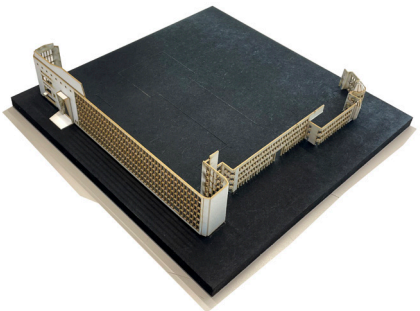


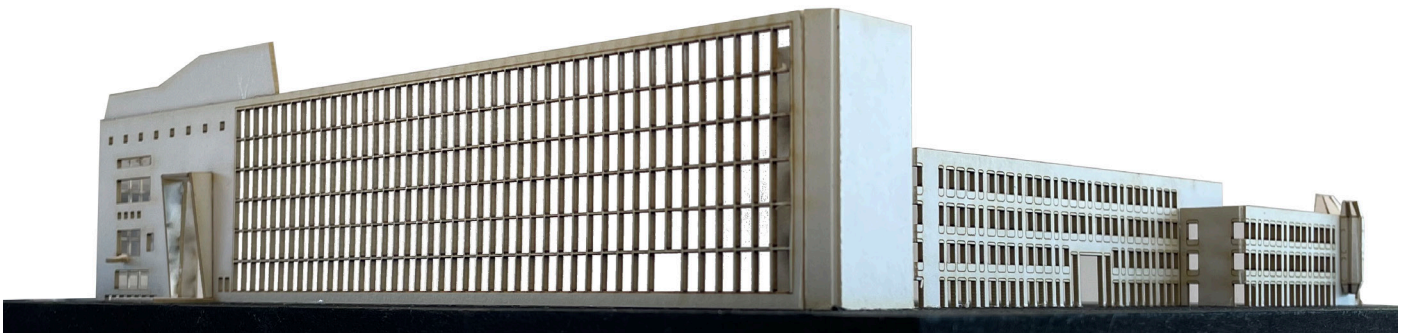
Collage



Essence model 1:500

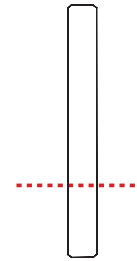




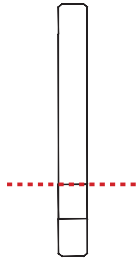


Composition development - monument

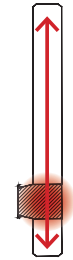
1. Long building



2. Split

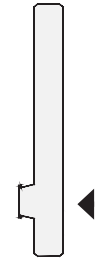


3. Divide



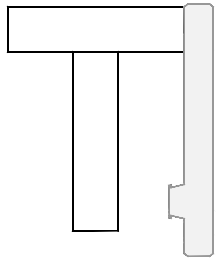
4. Main hall

5. Three (3) volumes

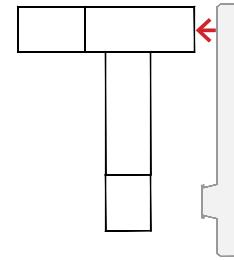


6. Final composition

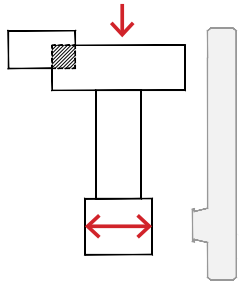
Composition development - extension



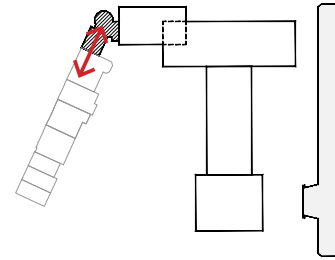
1. T-Shape



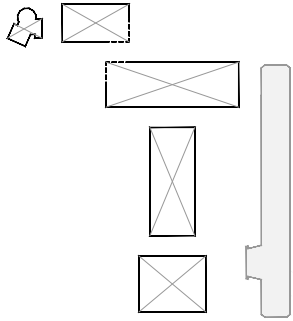
2. Split



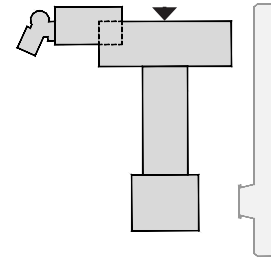
3. Push & differentiate



4. Connect with surroundings

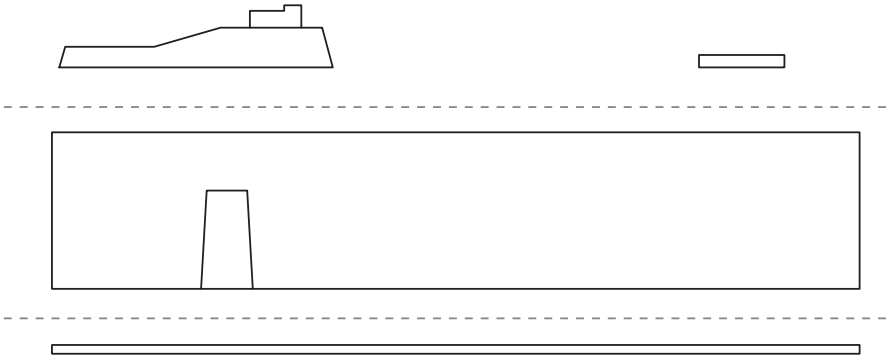


5. Five (5) volumes

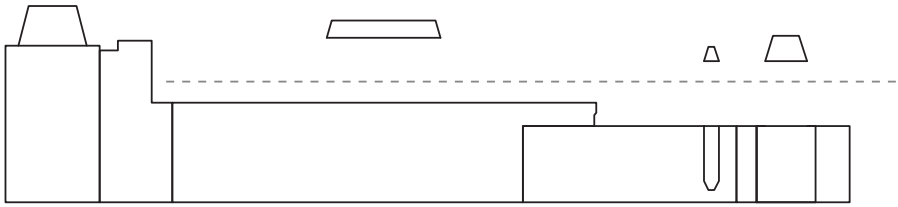


6. Final composition

Facade composition



Tripartite composition

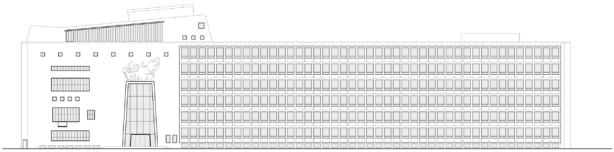


North facade composition

10 50

Capital

Shaft

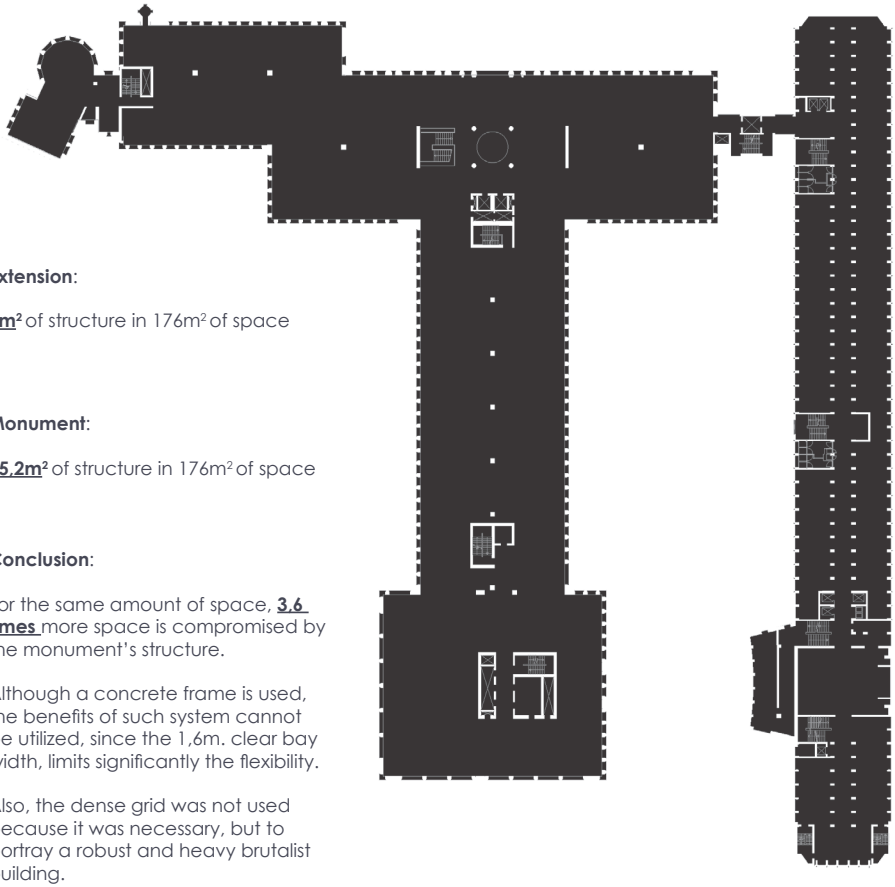


Base

Capital

Shaft

Structural density



Extension:

7m² of structure in 176m² of space

Monument:

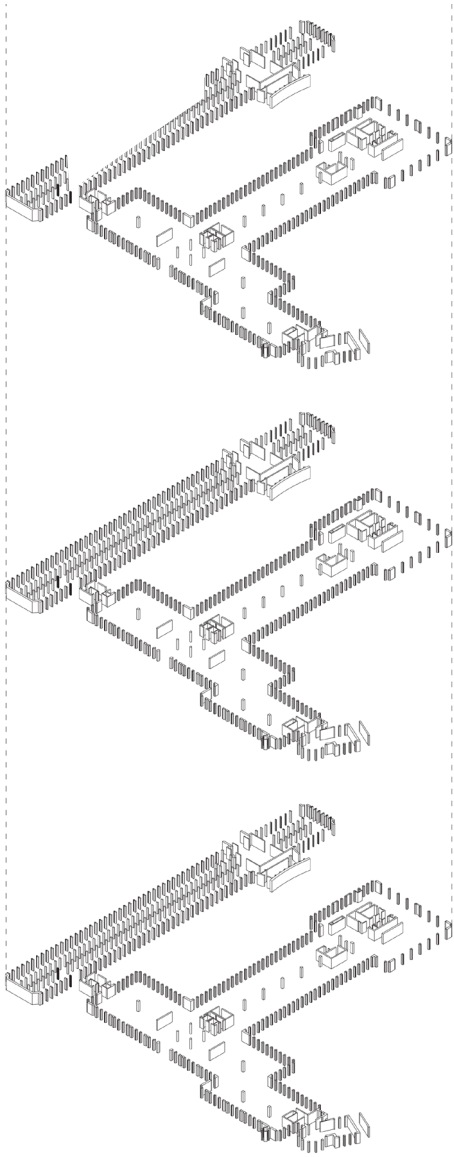
25,2m² of structure in 176m² of space

Conclusion:

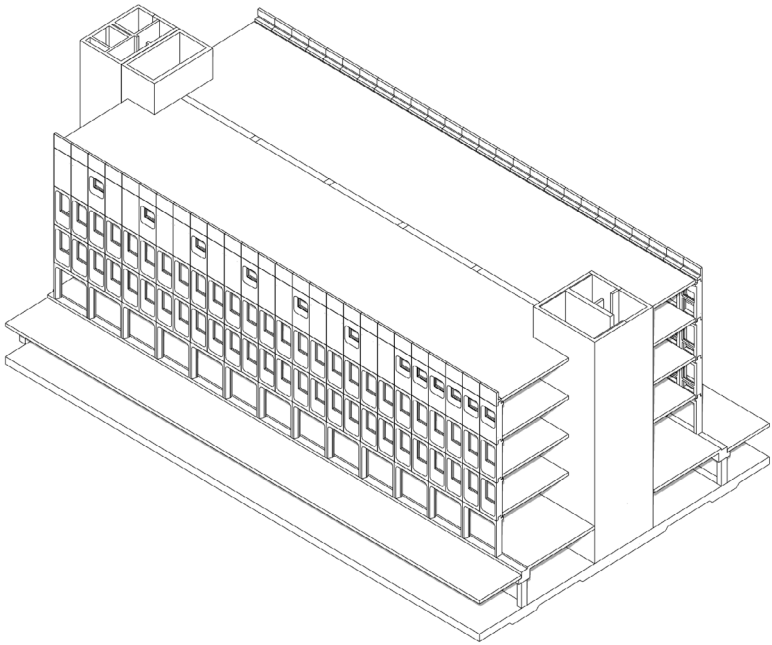
For the same amount of space, **3,6 times** more space is compromised by the monument's structure.

Although a concrete frame is used, the benefits of such system cannot be utilized, since the 1,6m. clear bay width, limits significantly the flexibility.

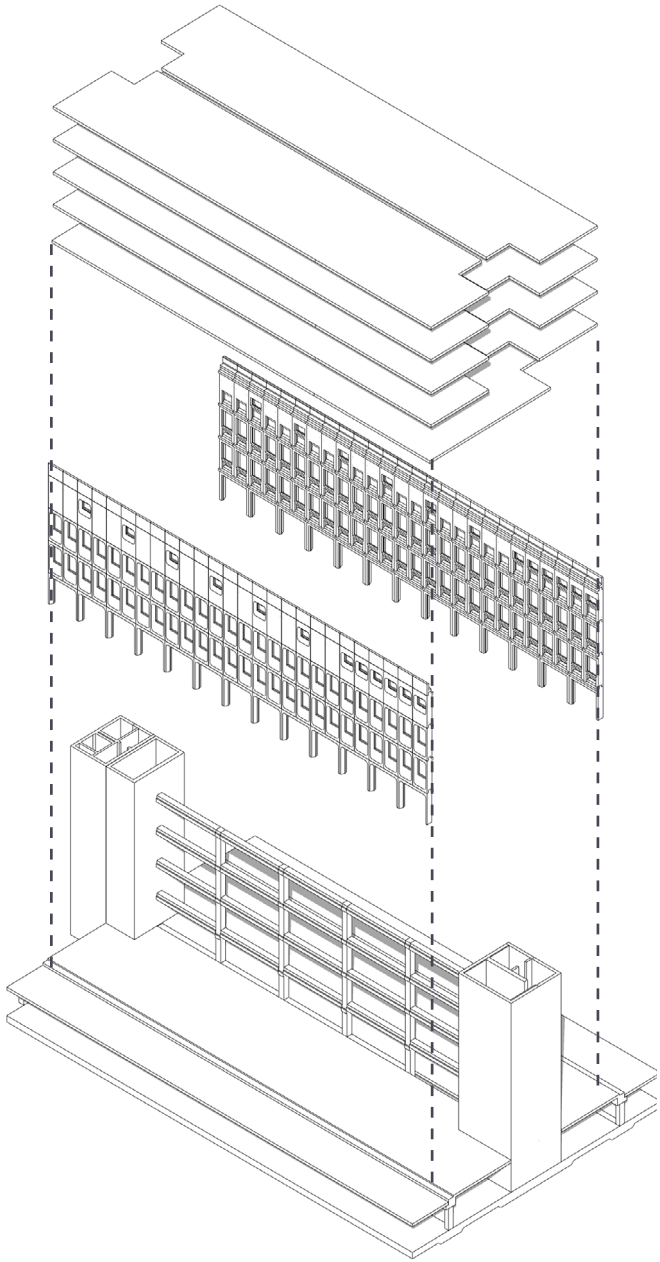
Also, the dense grid was not used because it was necessary, but to portray a robust and heavy brutalist building.



Extension - structure

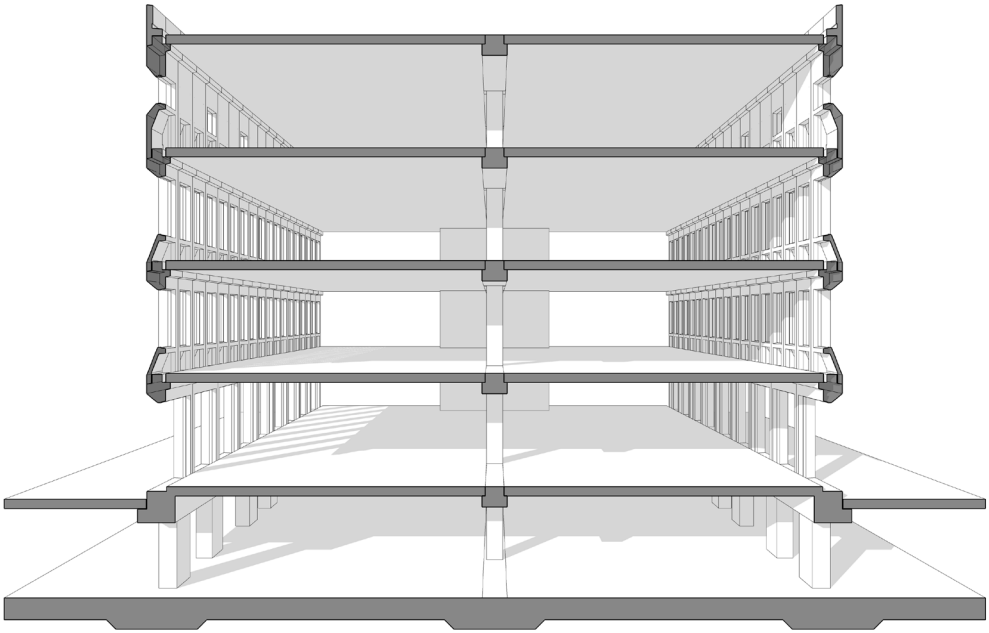


Main structural system

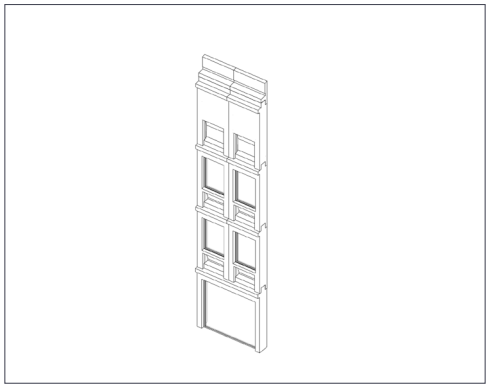


Exploded axonometric view

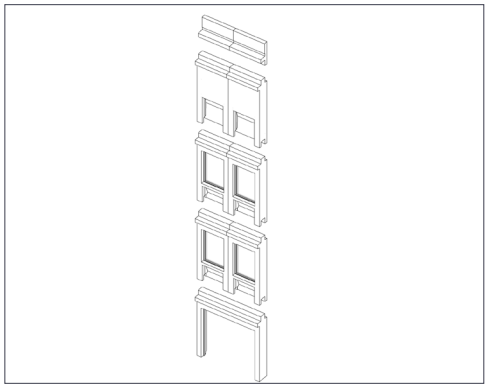
Section



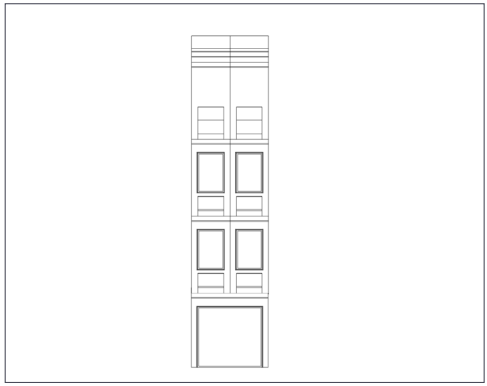
Sectional perspective



Interlocking panels



Exploded view



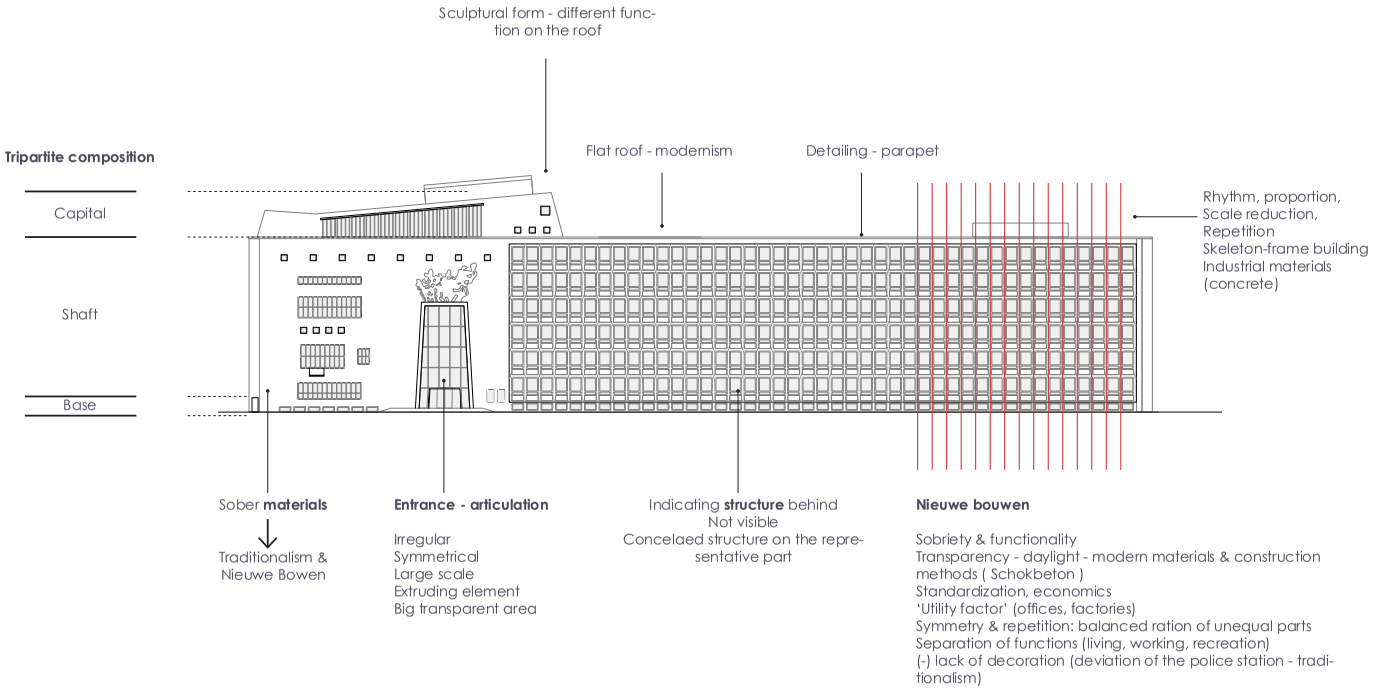
Interior elevation

Value assessment

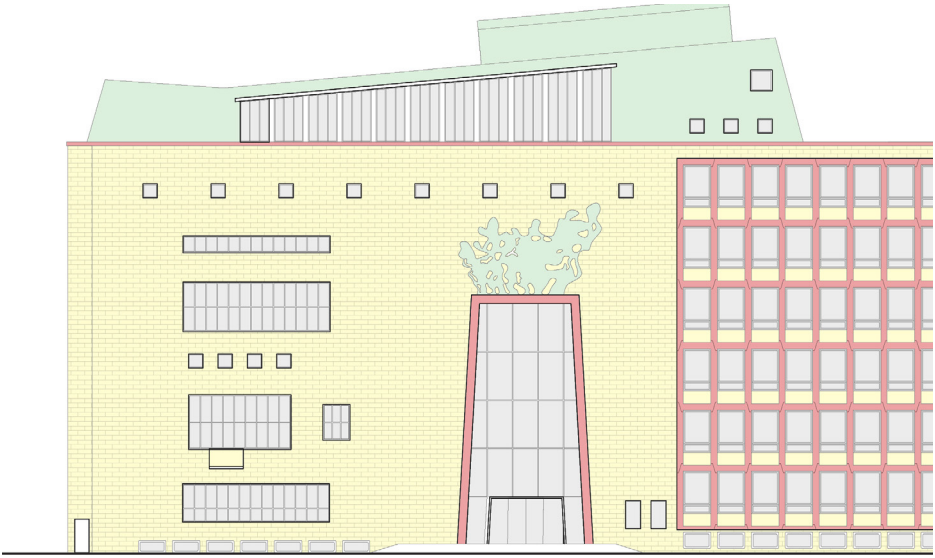
Value Assessment Matrix

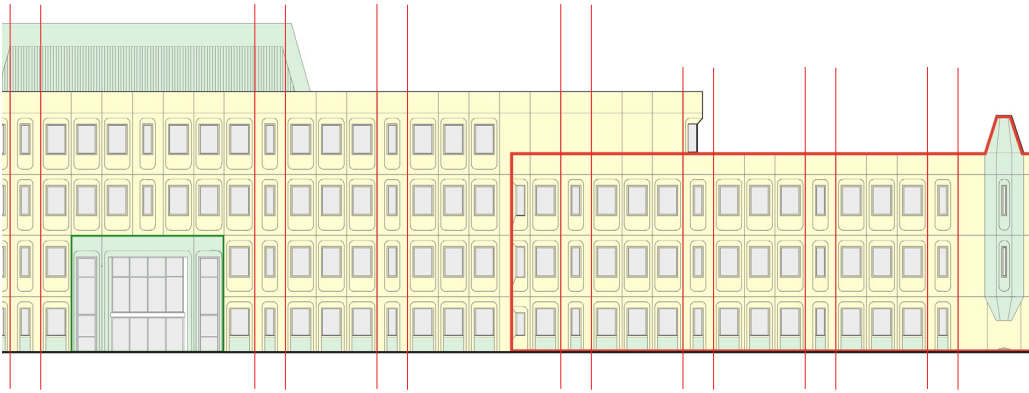
	Age value	Historical value	Commemorative value	Use value	New-ness value	Architecture value	Economic value
Surroundings / Setting		"international city of peace and justice"					
Site			Free standing building	Peace of palace nearby Empty lot - solar gains Embassies - urban block		Positioning: Opposite the non-existing town hall	Part of the International zone route
Skin (exterior)	Exterior well preserved, Rough textures - low maintenance	Reconstruction period - intact building	Nieuw Bouwen, modernism, & traditionalism (materiality)	Distinction between working area & represenetative part		Austere character Tripartite compostion Clean lines, cool colors Prefabricated facade Proportions - Scale Tactile materials Entrance canopy	
Structure	Structural elements well maintained			Concrete structural frame	New materials, construction systems & methods		
Space Plan		Nieuwe Bowen - Sobriety & Functionality building physics, standardization, organization, coordination, economics		Nieuwe Bouwen - separation fo functions Tradit. office layout Hall-used for gather.	Utility factor' (offices, factories)	Open plan design - 'Plan libre' Long, continuous spaces Light, spatiousness Unity - cohesion	Rentable spaces within the building.
Surface (interior)	Intrerior is well preserved (original state)	Artworks - public buildings - reconstruction period	Reliefs - symbolic			Hall walls - exposed conrete	
Services				Aged mechanical systems.			
Stuff	Furniture of the main hall		Sculpture on top of the main entrance				
Spirit of place			Police - autority, civic protection, safety			Character of the building - sober,proportions, rhythm	Income generation from a recognizable buildng

High
Medium
Low



Value Assessment - Monument facade





Entrance

Use value : Access to the building
Currently underused

Art value : Artworks
Monumental scale

Masonry walls

Use valvue : Structural support
(-) Insufficient insulation

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

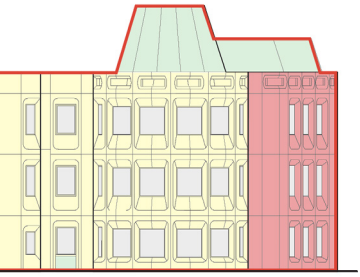
Window element - Serpentino stone

Use value : Thermal bridge

Art value : Natural material
Sober character

Entrance

Use value : Main entrance
Not particularly visible



Pefabricated panels

Use value : Structurwal 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

Concrete prefabricated wall elements

Use valvue : Structural support
(-) No insulation

Art value : Construction technique
Natural material
Articulation through daylight

Left volume

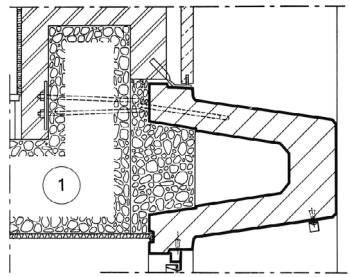
Art value : Seamless connection to the surrounding buildings through scale

Roof elements

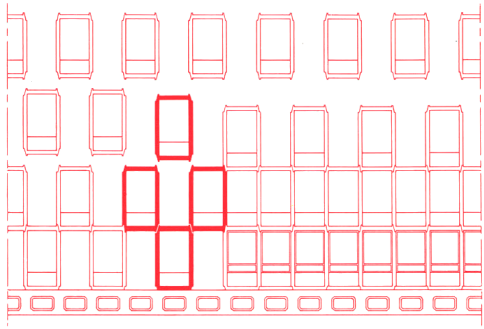
Use value : Water protection & concealing HVAC systems

Facade construction

Essence model 1:25



Detail



Panel mechanism

Exterior elements - Monument

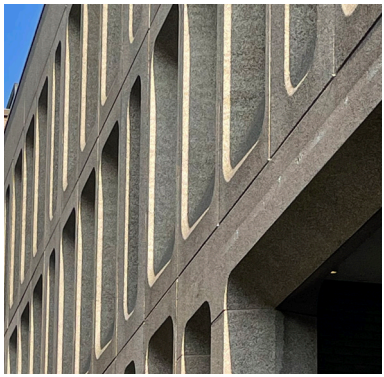
Artworks - relief (symbolic)

Proportions

Materiality - stretch-emphasis

Exterior elements - Extension

Connection to surroundings



Daylight of facade niches

Open corner

Design principles & spatial qualities- monument

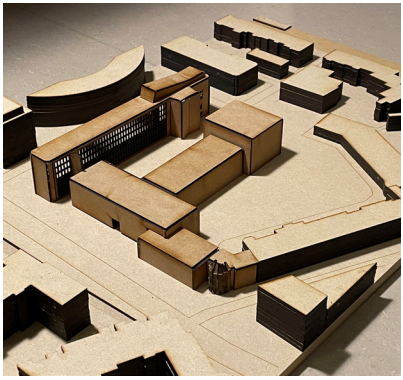
Spatial diversity - hall as a meeting space. Structure as a cave - empty space

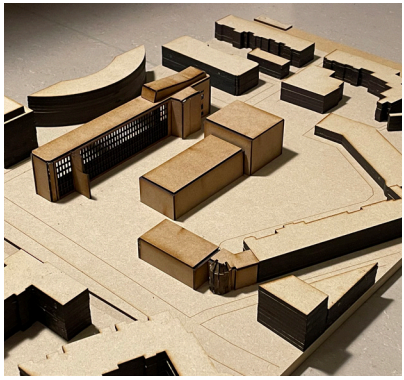
5th level - maximizing flexibility. Exception to the structure below

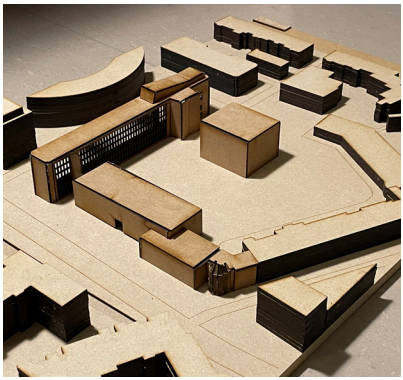
Exposed structure & rhythme in space

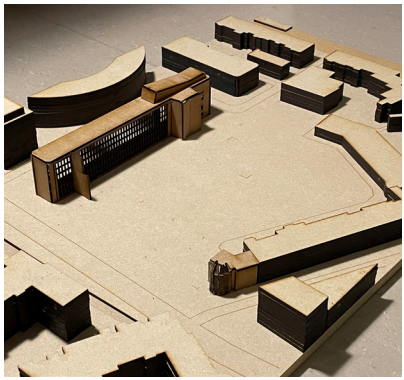
Concept

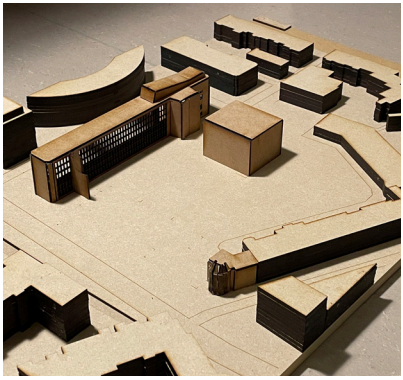
Model Testing - Volume composition

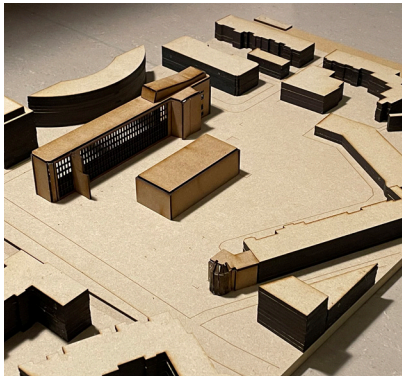




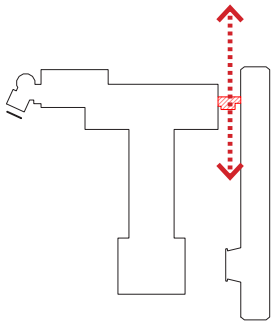




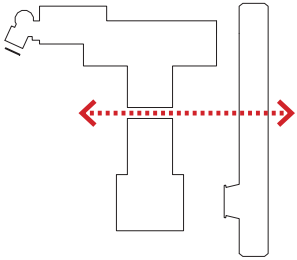




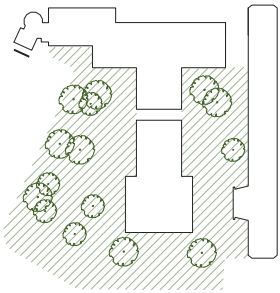
Concept diagrams



1. Permeability

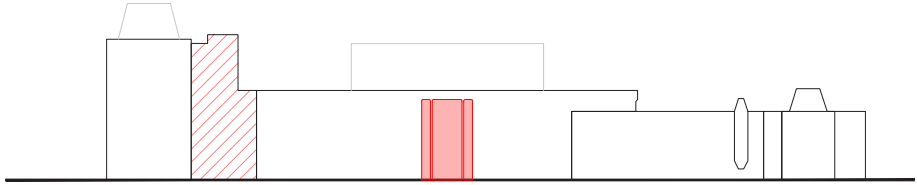


2. Site connection

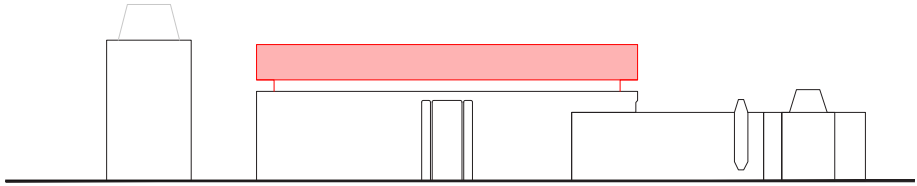


3. Landscape - activities

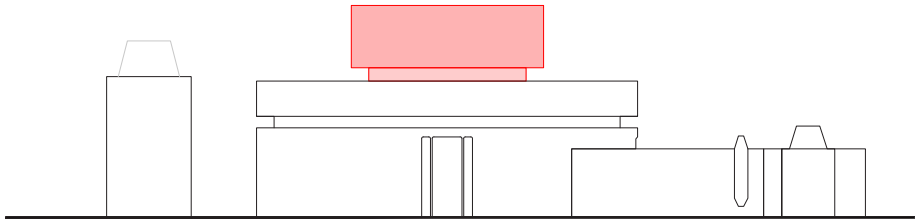
Concept diagrams



1. Pronounced entrance



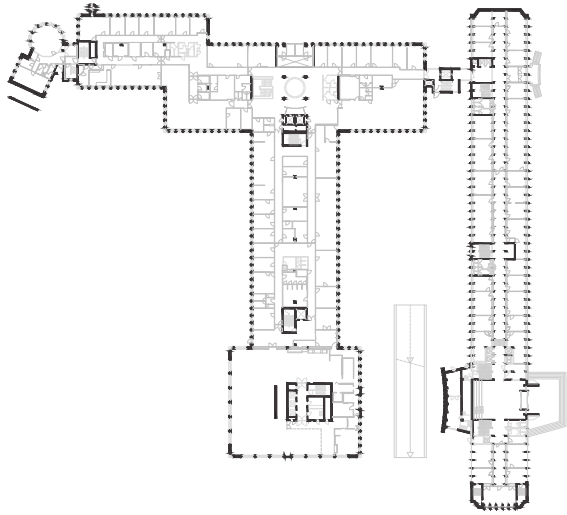
2. Lightweight volume



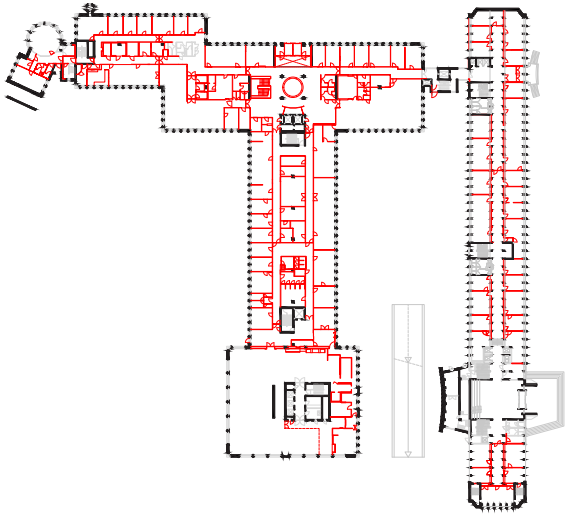
3. Landmark - skyline

Transformation framework

Demolition - Phase 1

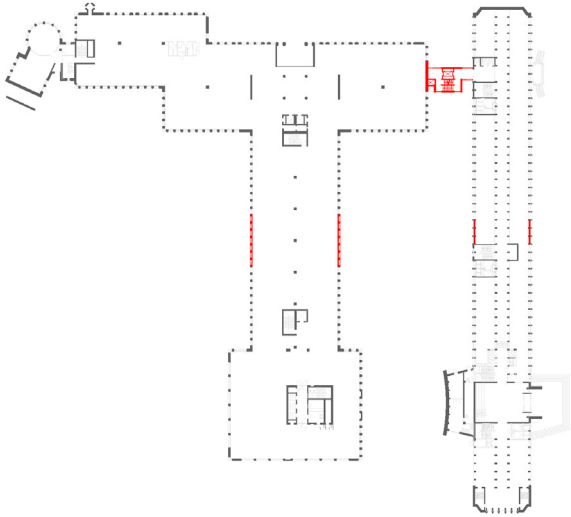


Current condition

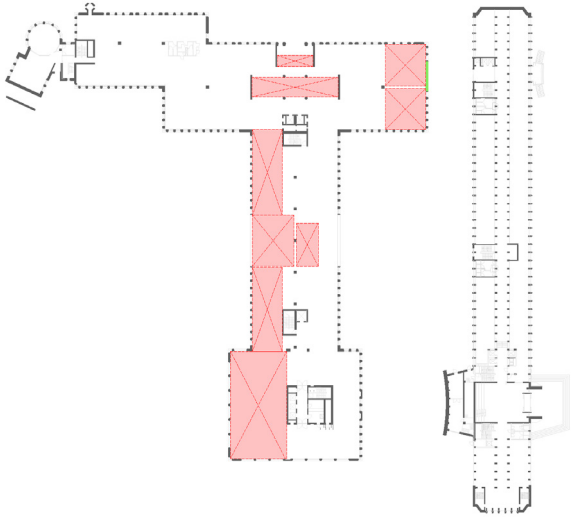


Demolition of internal partitions

Demolition - Phases 2



Demolition of load-bearing elements

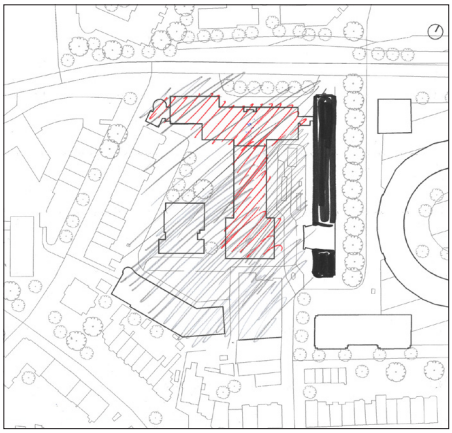


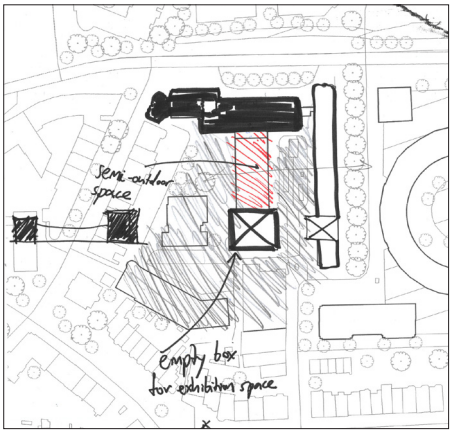
0M 10M

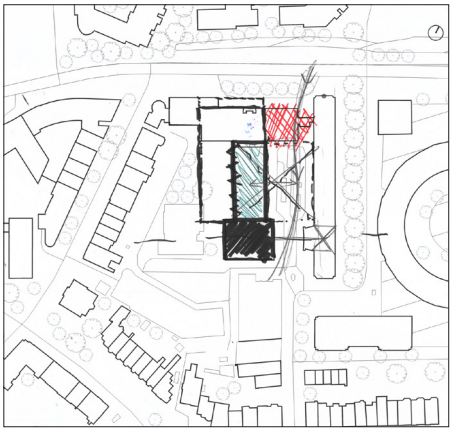
Demolition of floor slabs

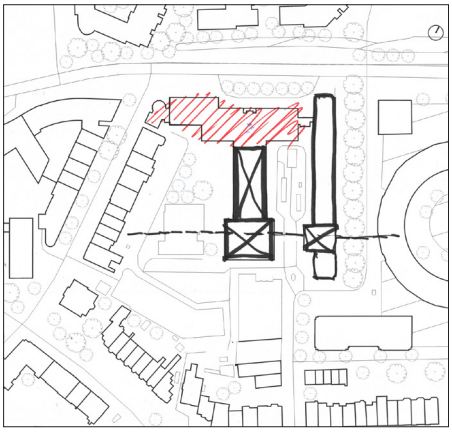
Design development

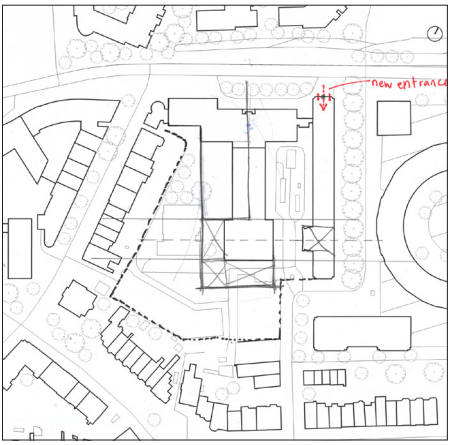
Site plan sketches

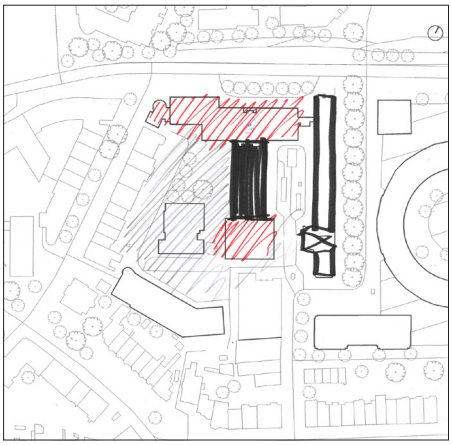


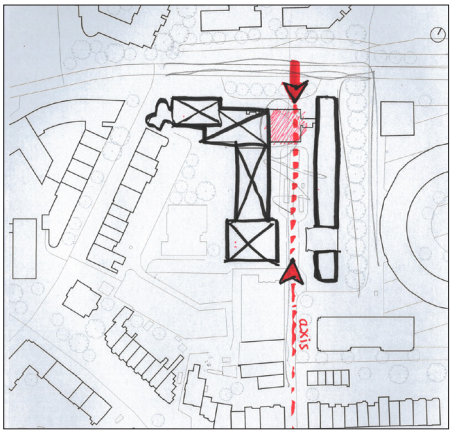


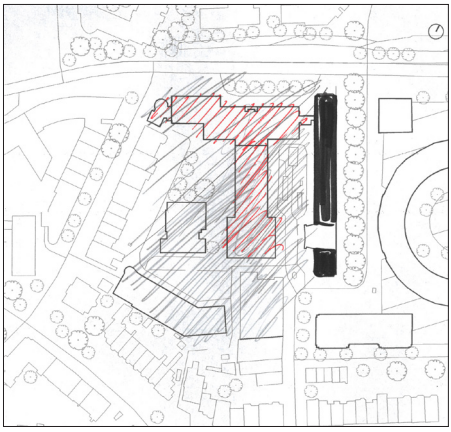


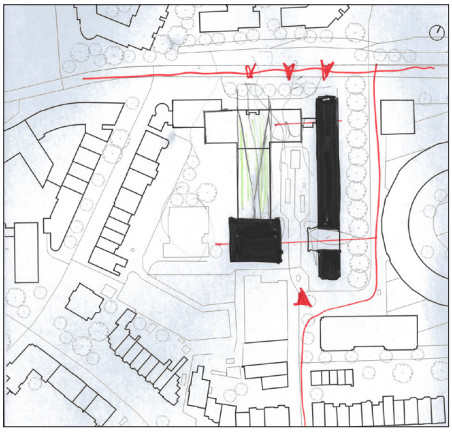


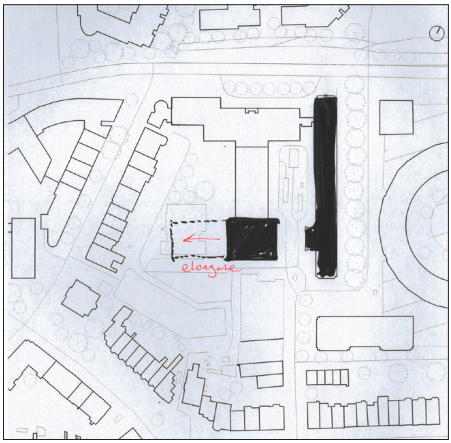


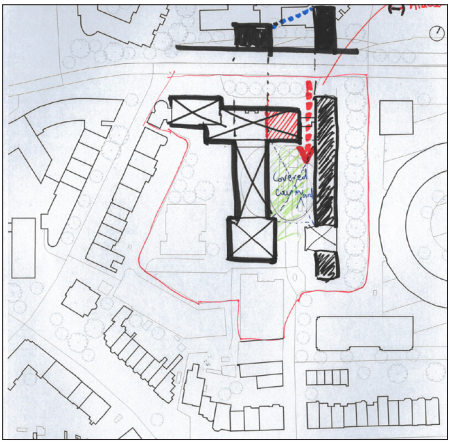




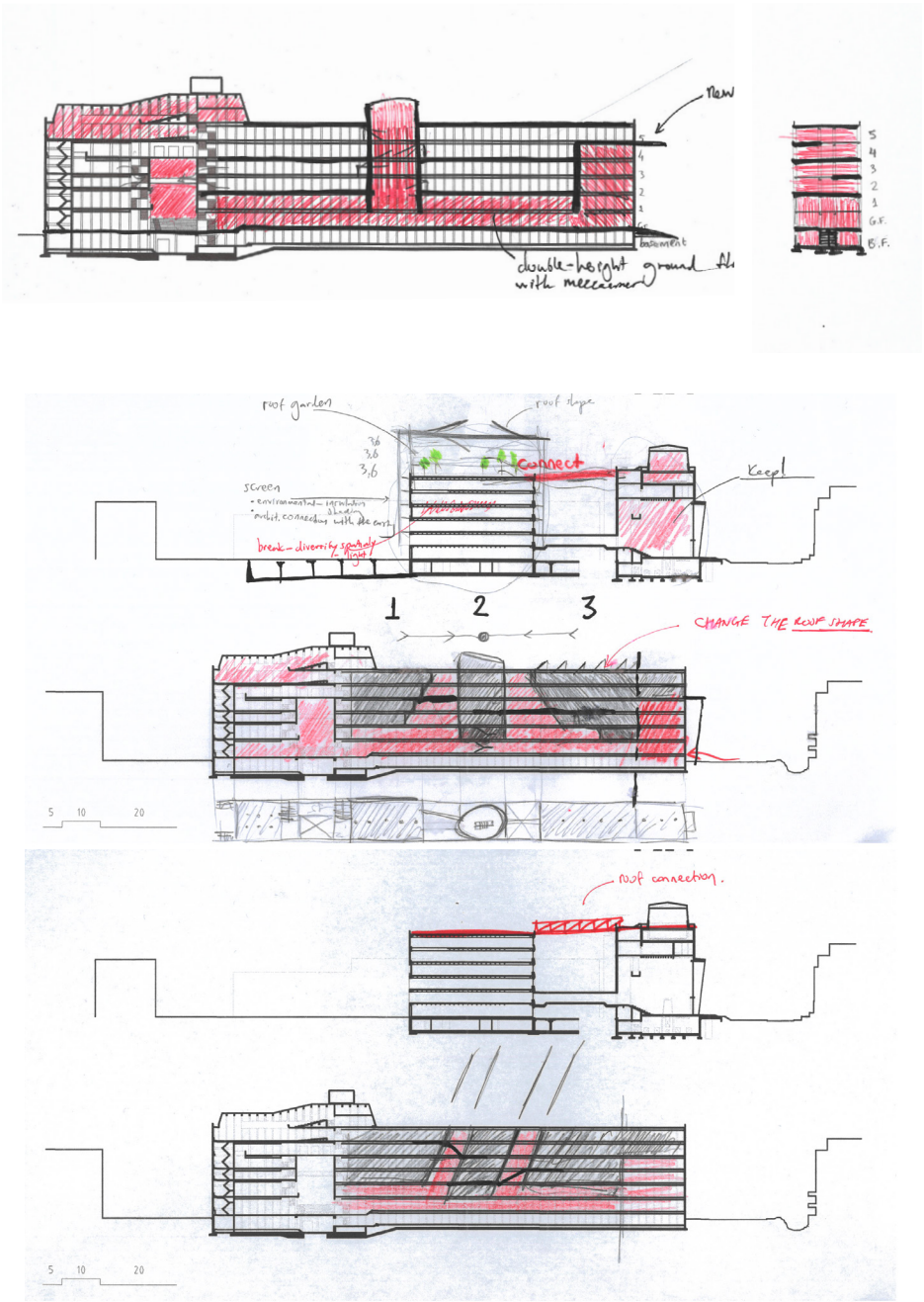


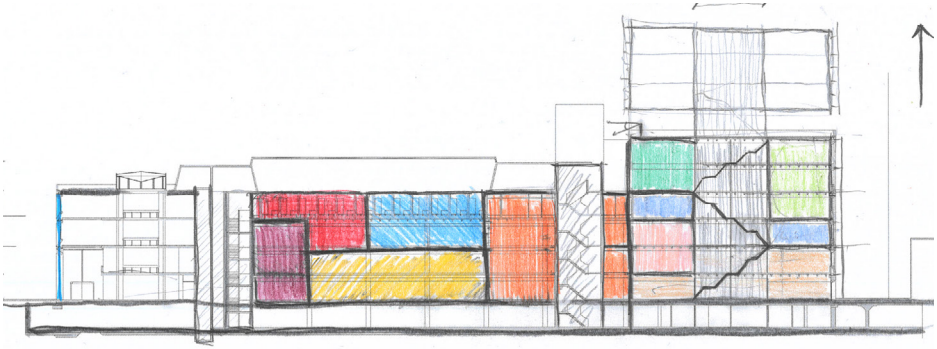


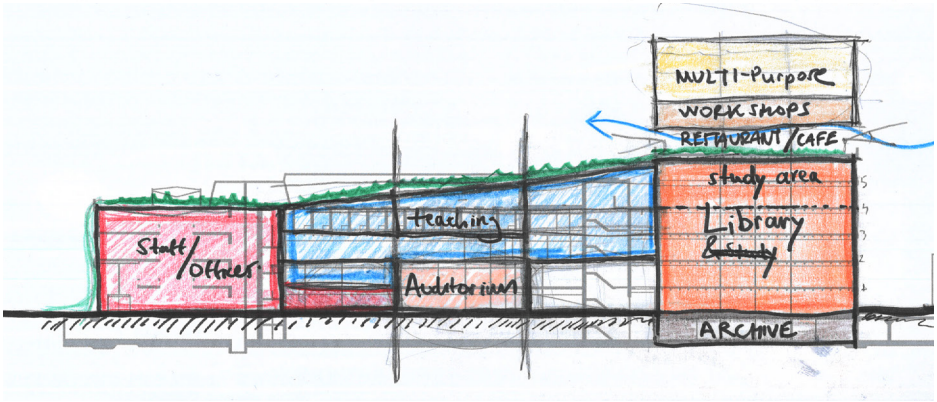


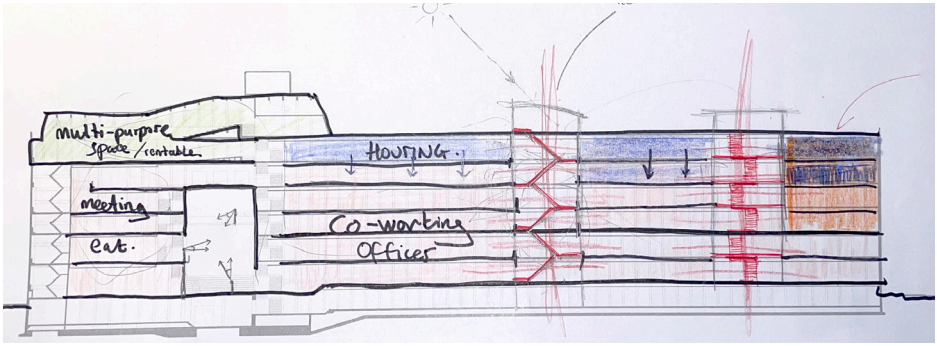


Sketches-testing









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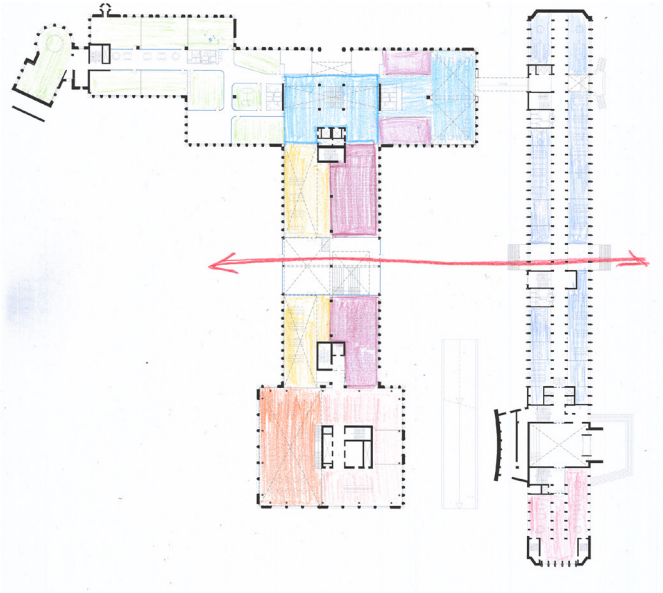
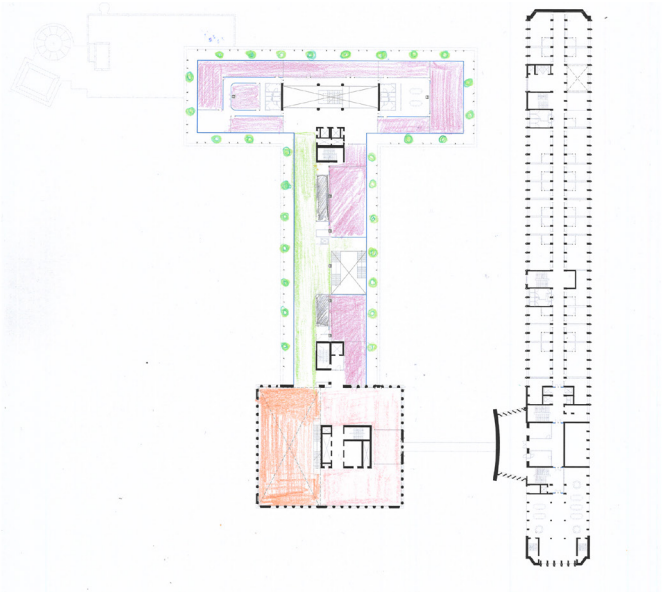
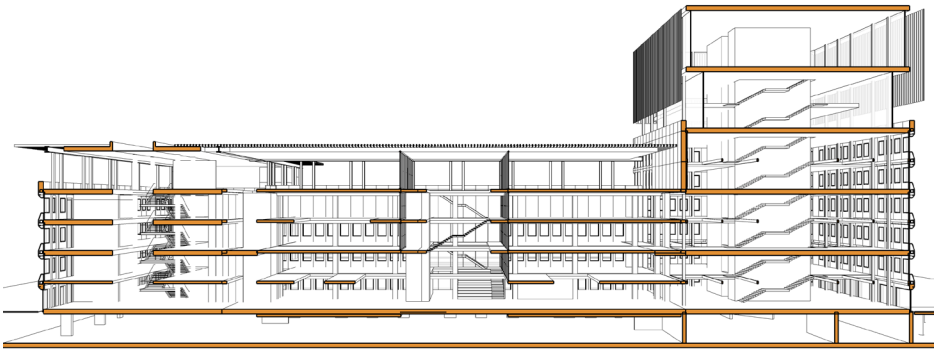
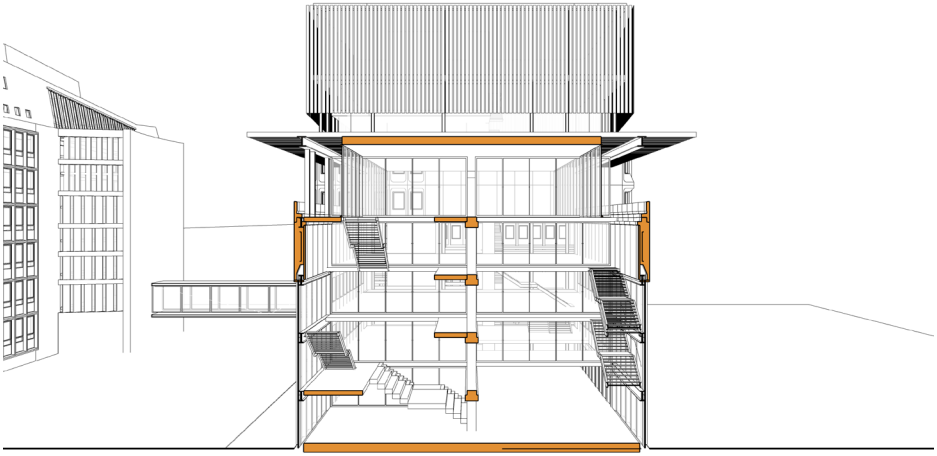
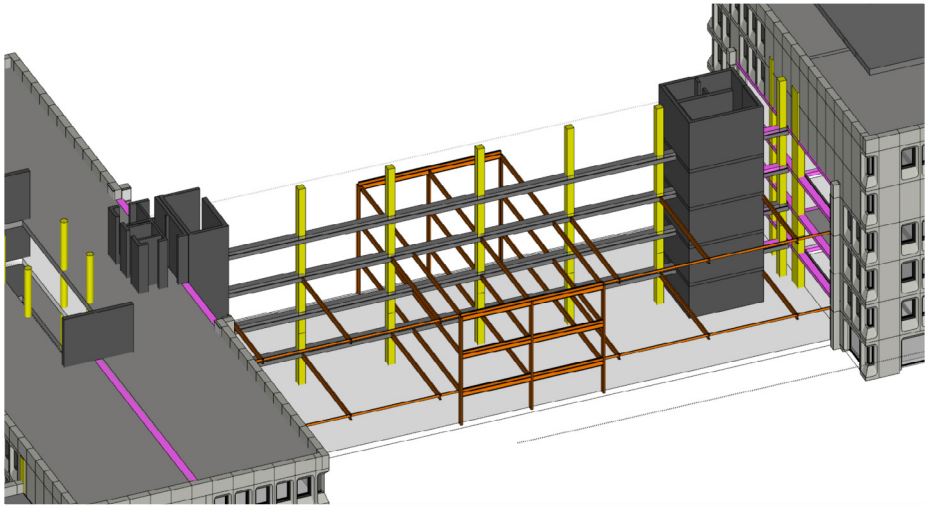


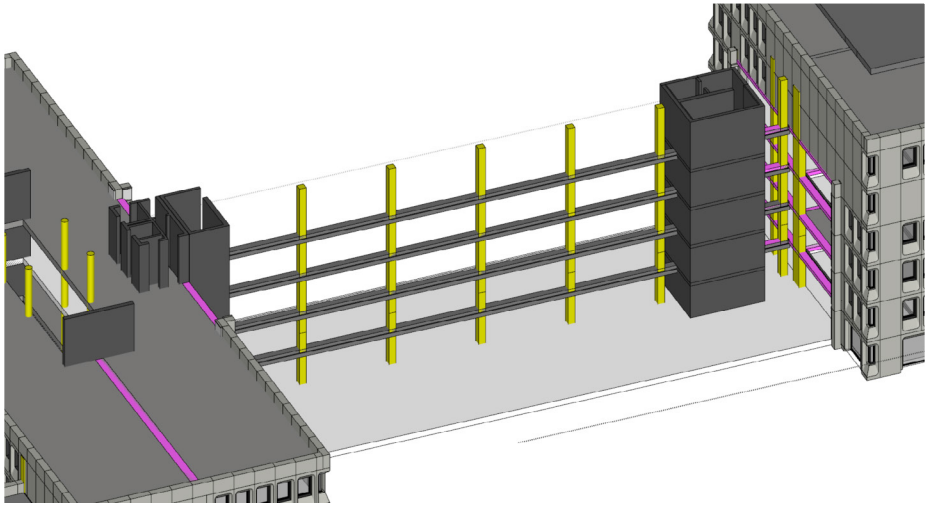


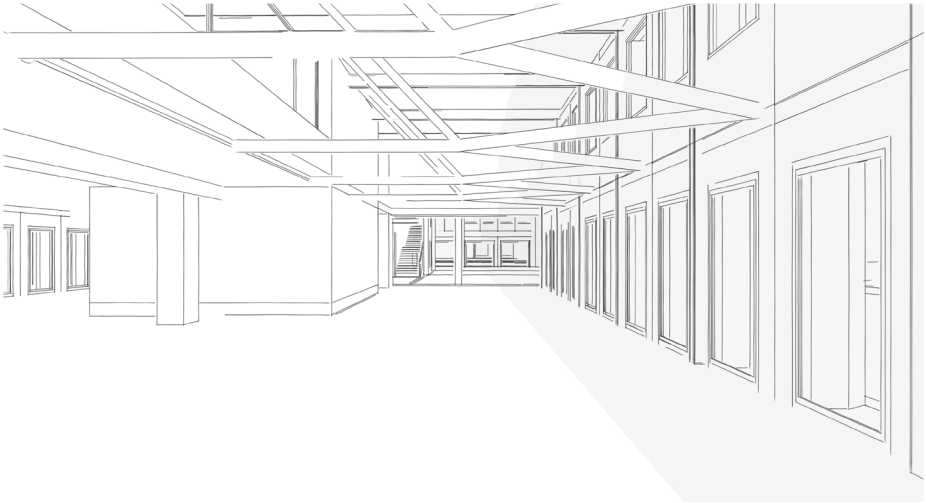




3D modeling-testing





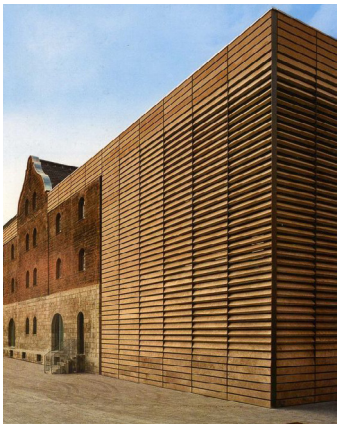


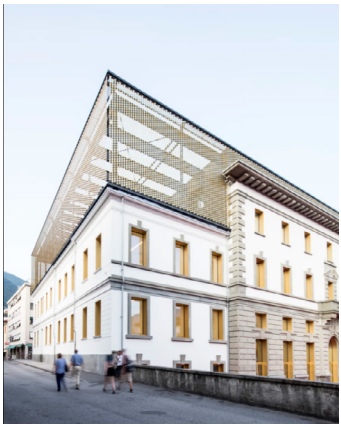
3D modeling-testing

Michail Mexis ©

Precedents

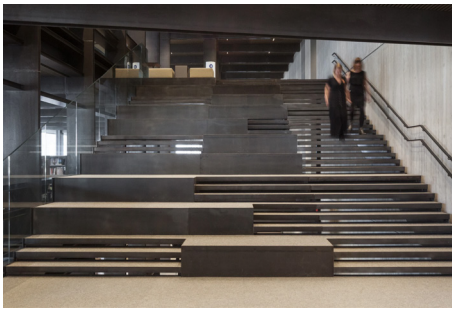
Dialogue

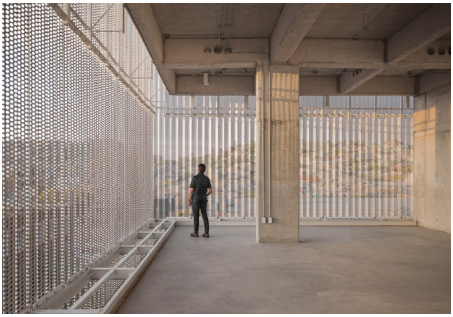


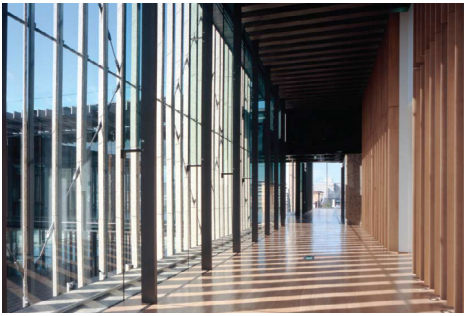


Michail Mexis ©

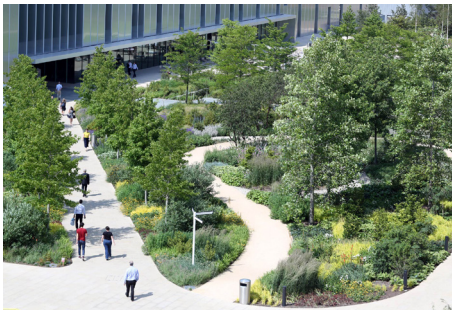
Interior





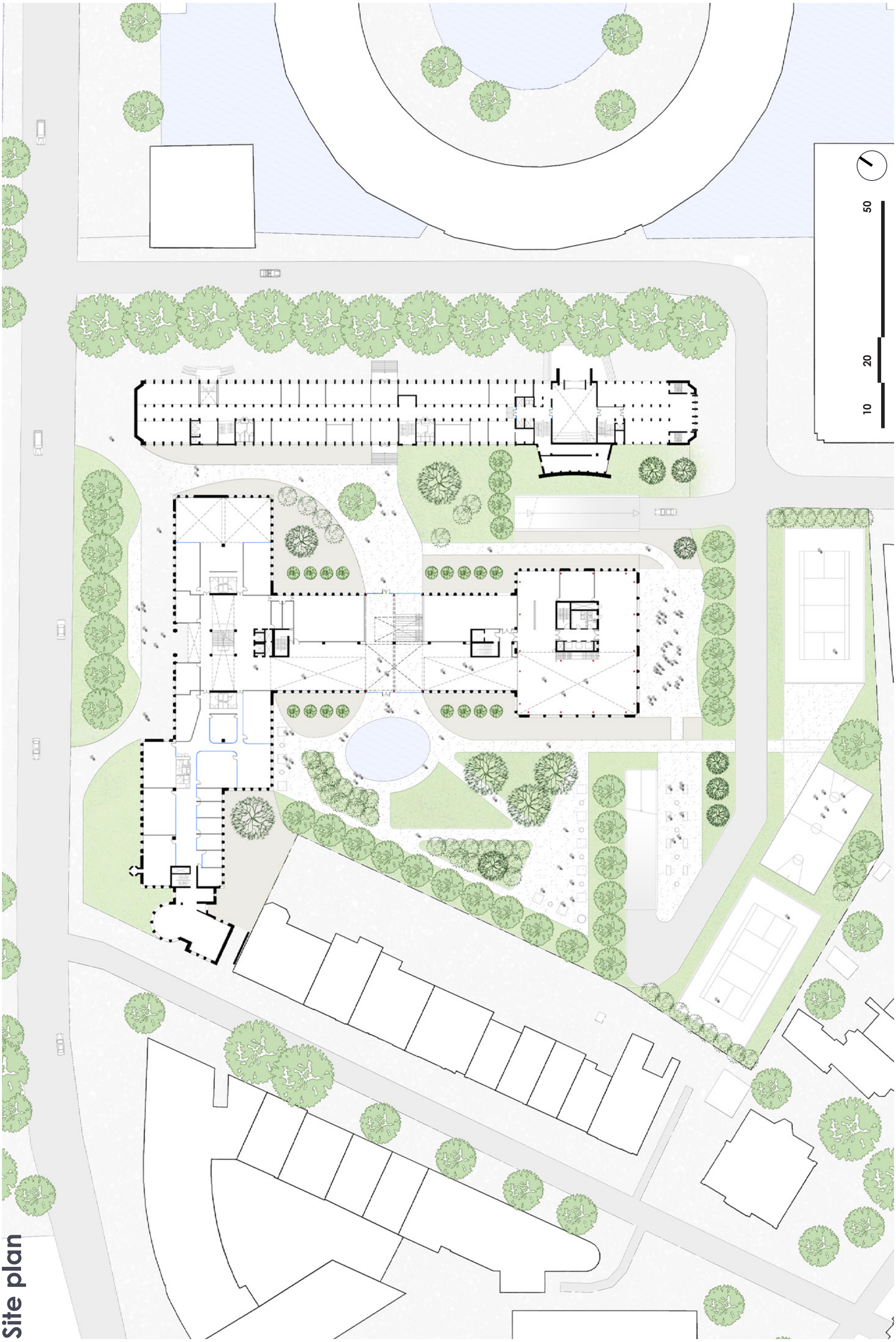


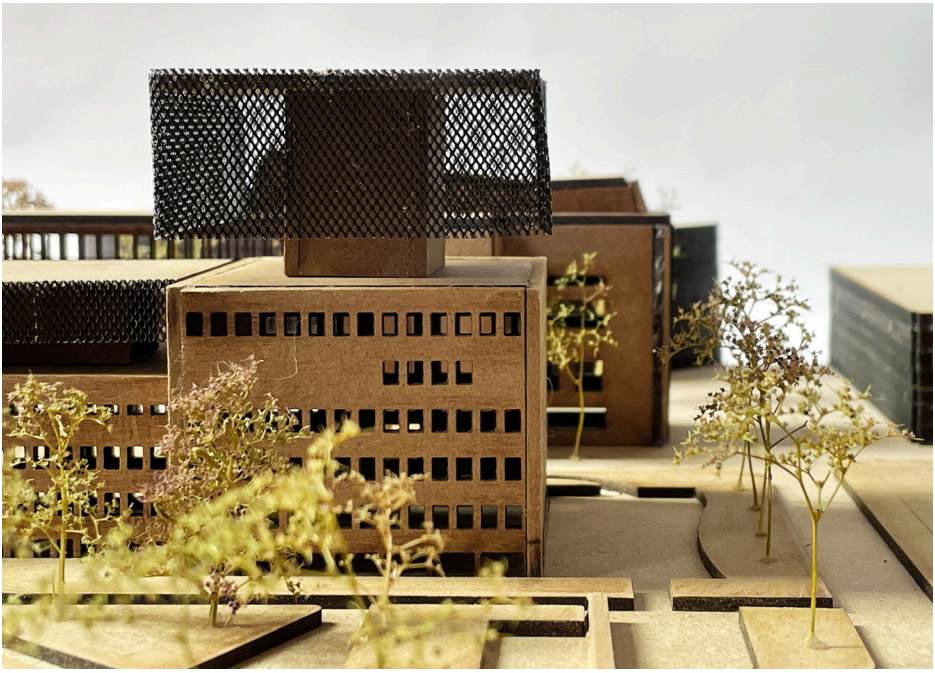
Landscape features



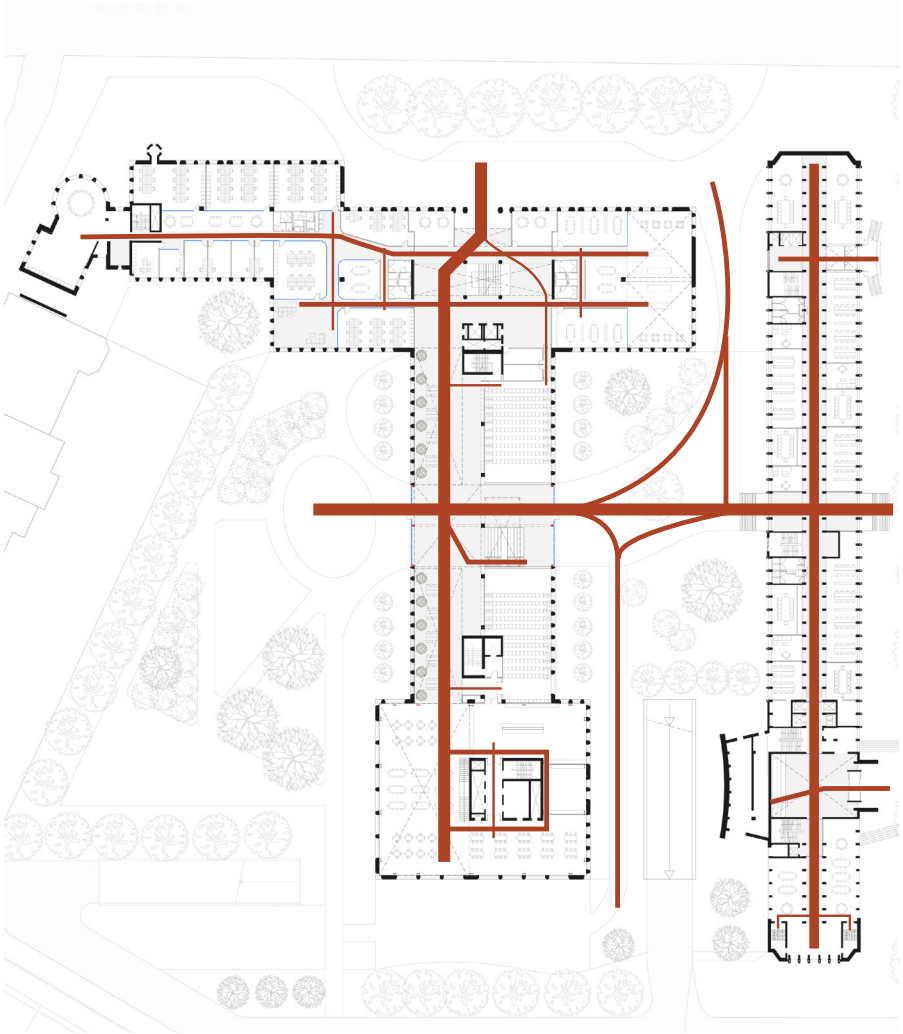
Intervention strategy

Site plan





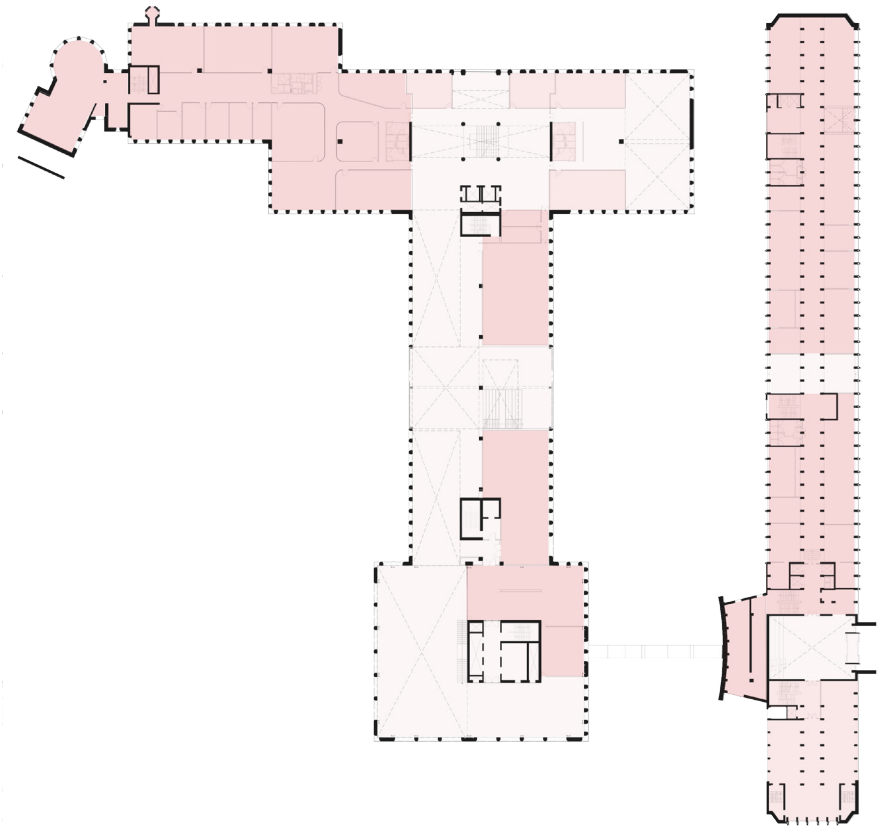
Spatial organization



Circulation

10 20 50

Zoning devision

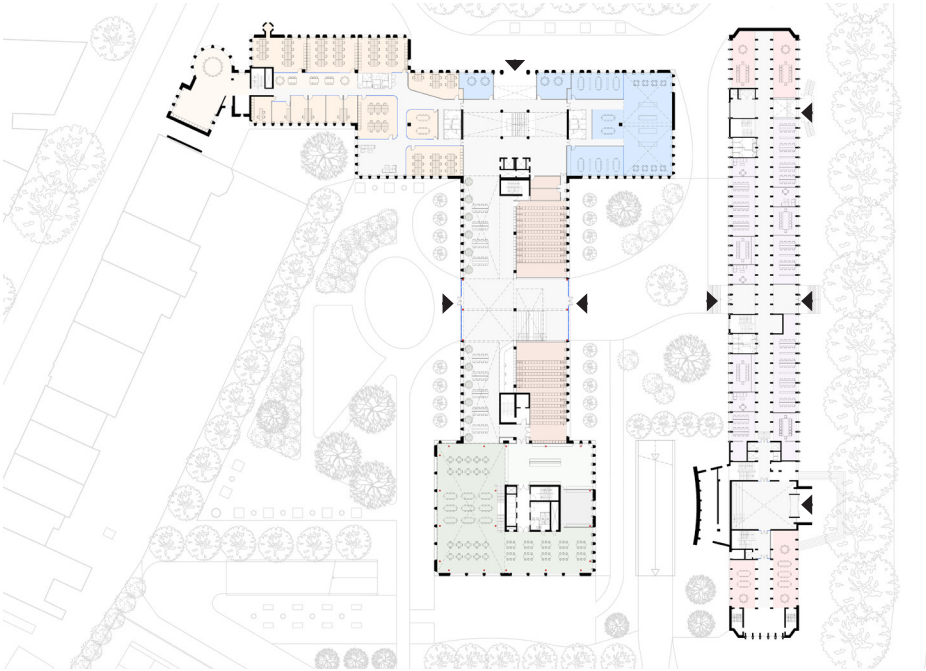


Private

Semi-private

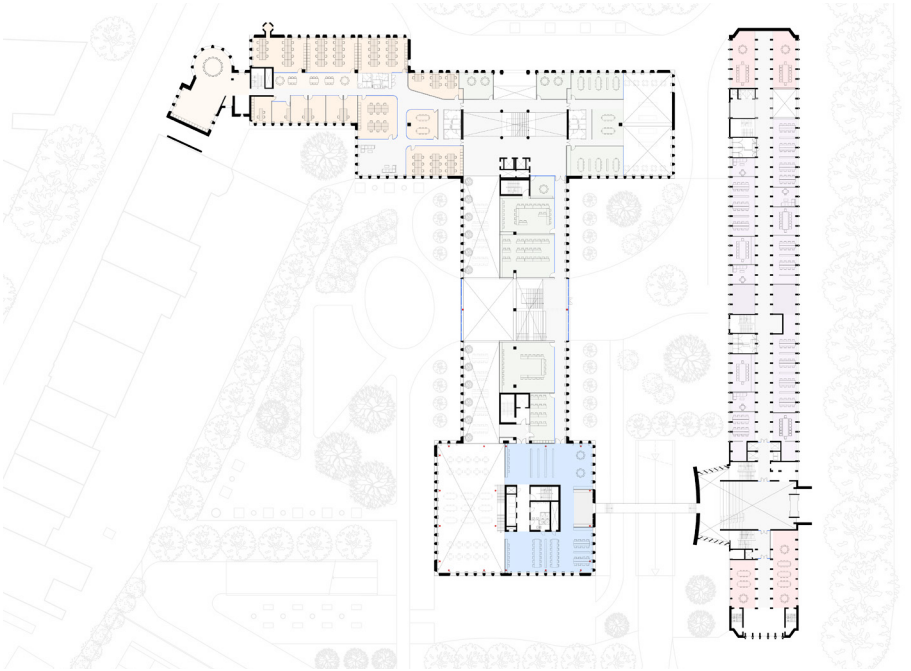
Public

Ground floor plan



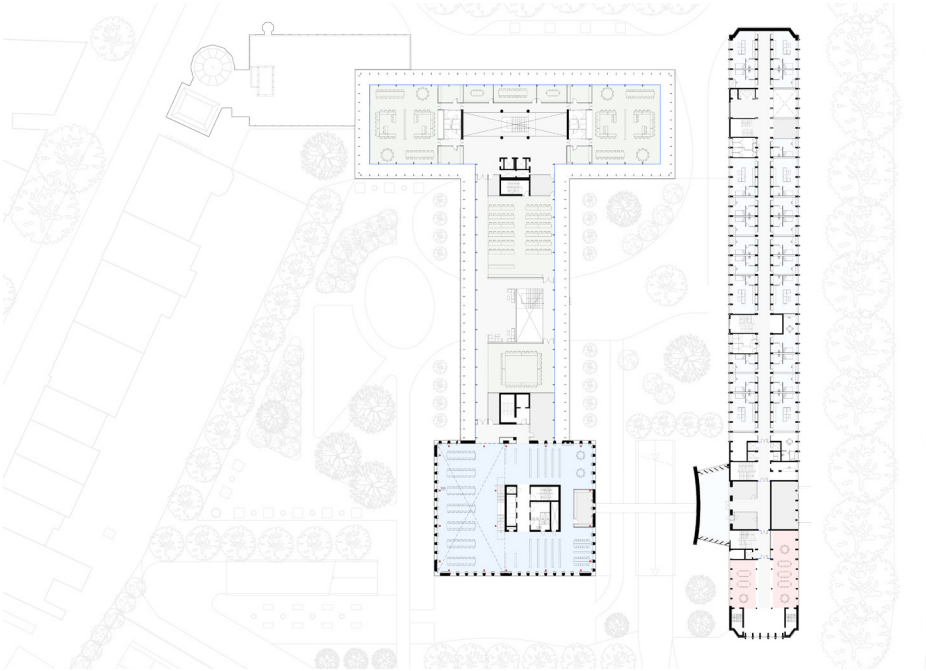
10 20 50

1st floor plan



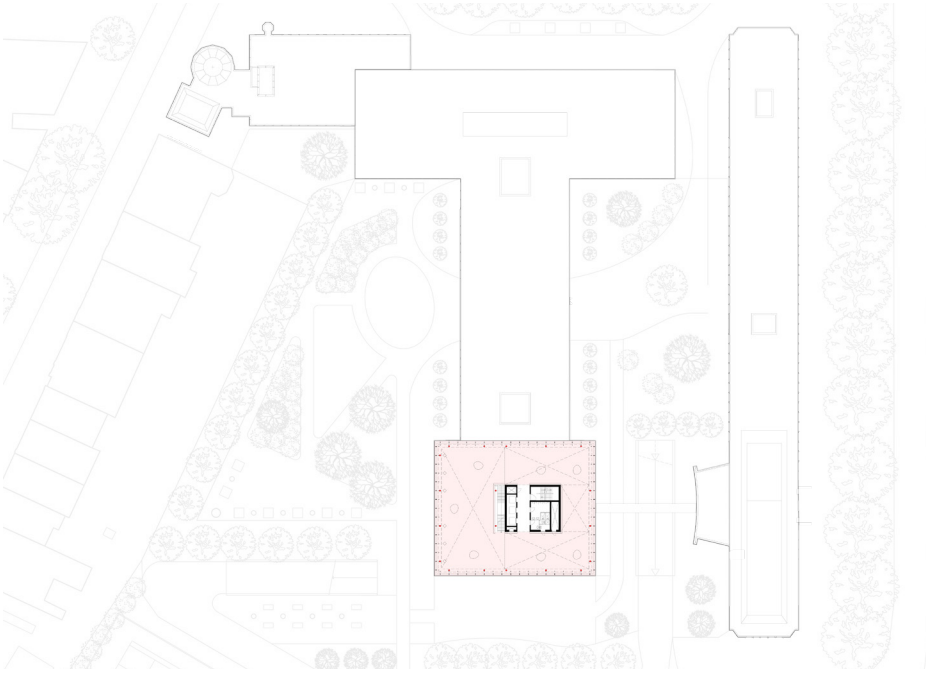
Teaching
Library
Office
Support space
Lecture
Community
Public/ canteen
Offices/ staff
Kitchen
Storage

4th floor plan



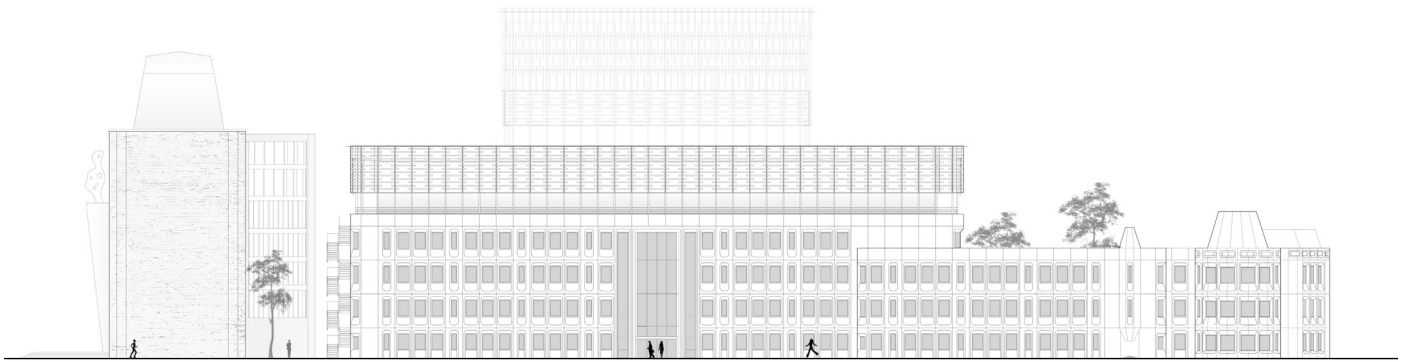
10 20 50

7th floor plan

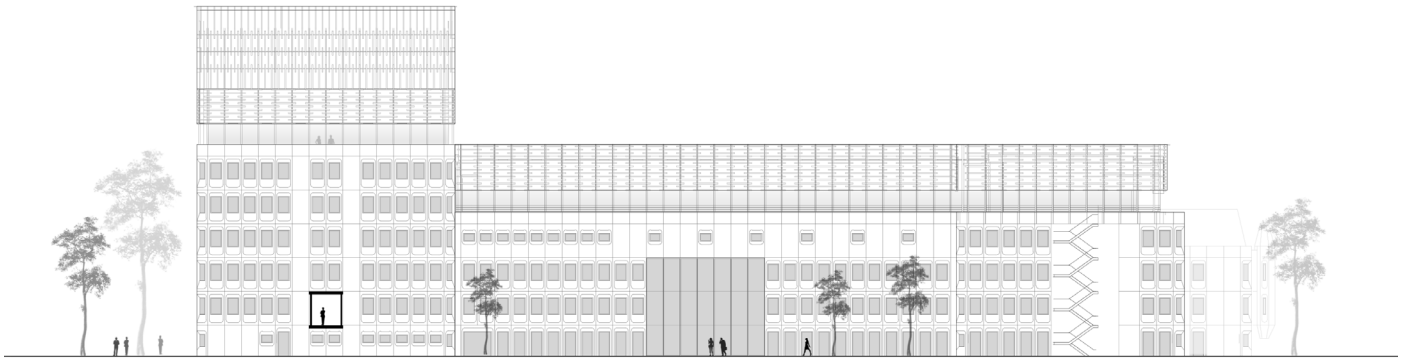


Teaching
Library
Office
Support space
Community
Offices/ staff
Storage
Multi-purpose

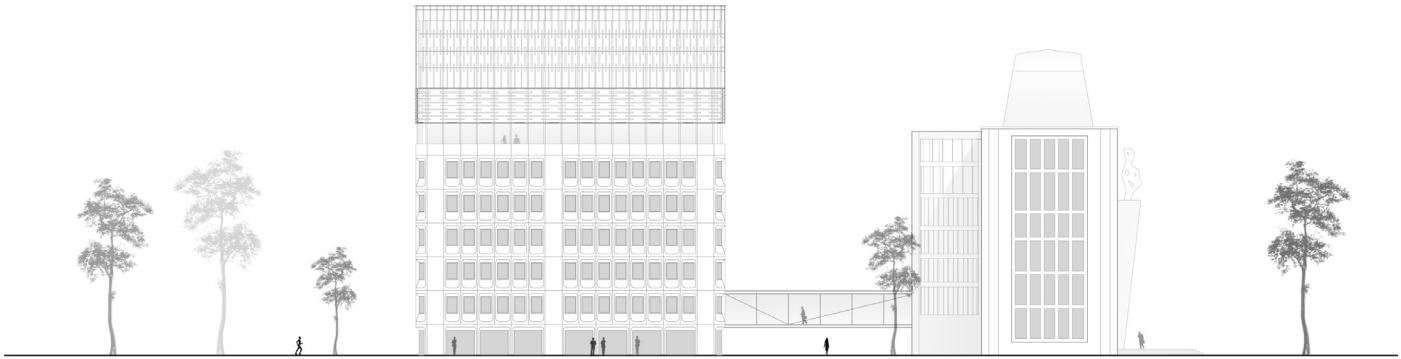
Elevations



North-West elevation

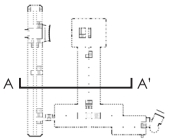


North-East elevation



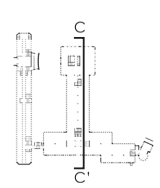
South-West elevation

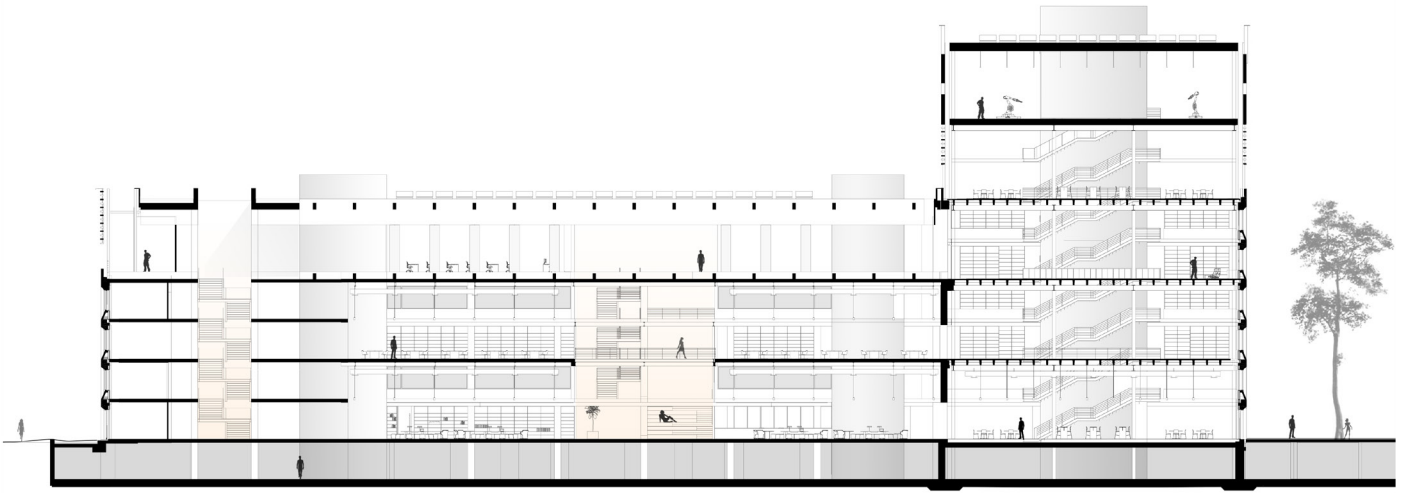
Short section




info

Longitudinal section

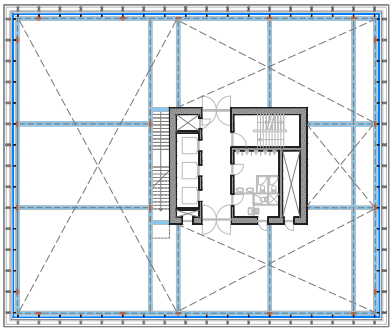




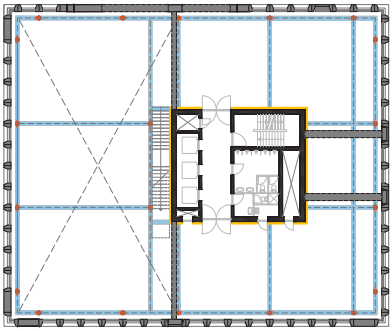
10 20 50


info

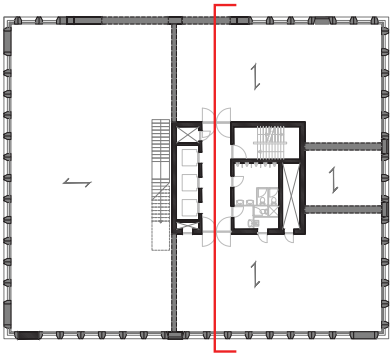
Tower: structural interventions



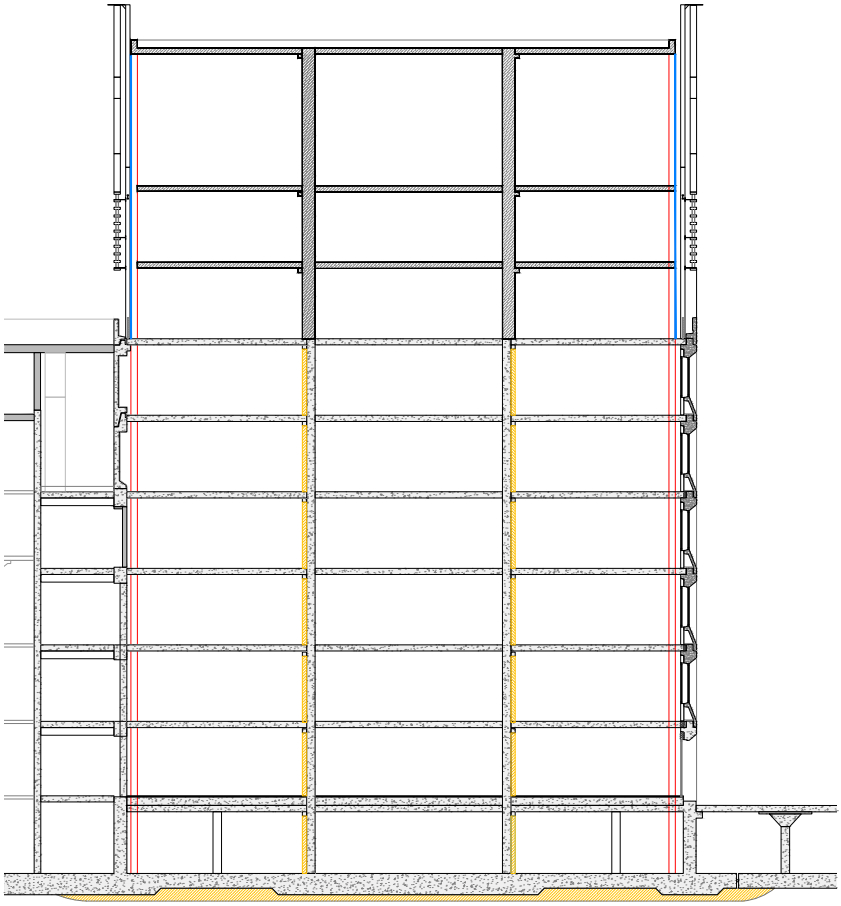
7th floor - structure layout



4th level - Added structure



Existing condition



Existing beams

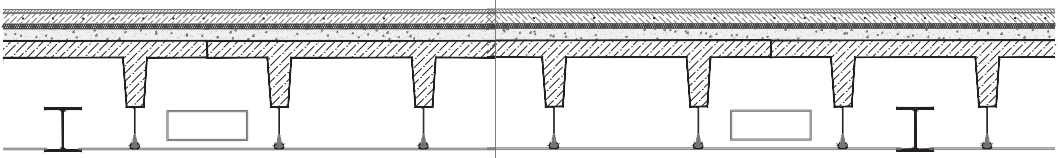
Added columns

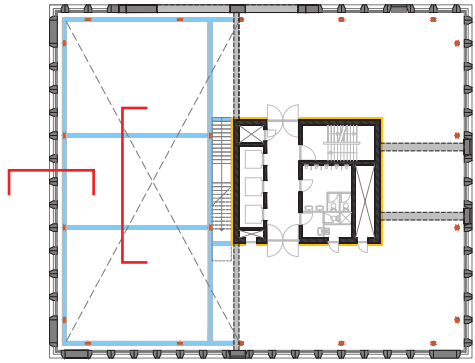
Added beams

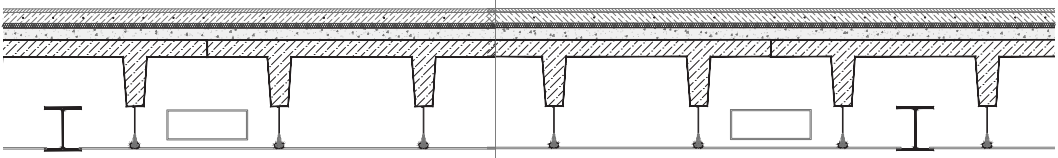
Reinforced concrete

Tower: facade 1:25

Cross section

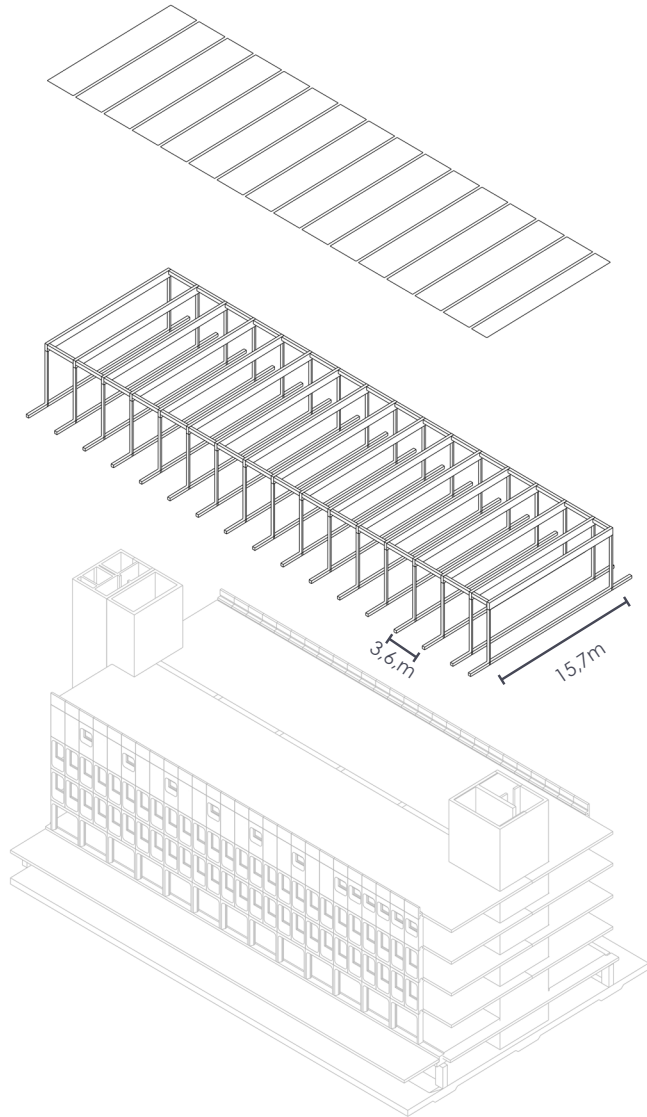






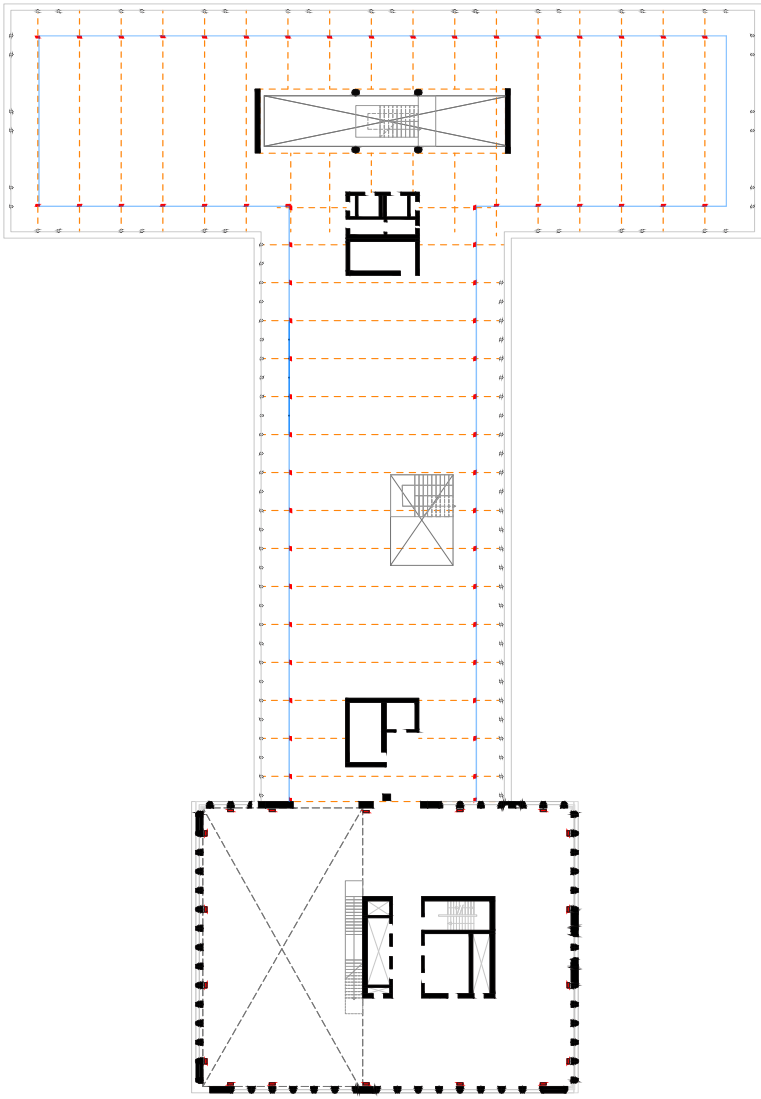
Long section

Added structure on top of existing roof

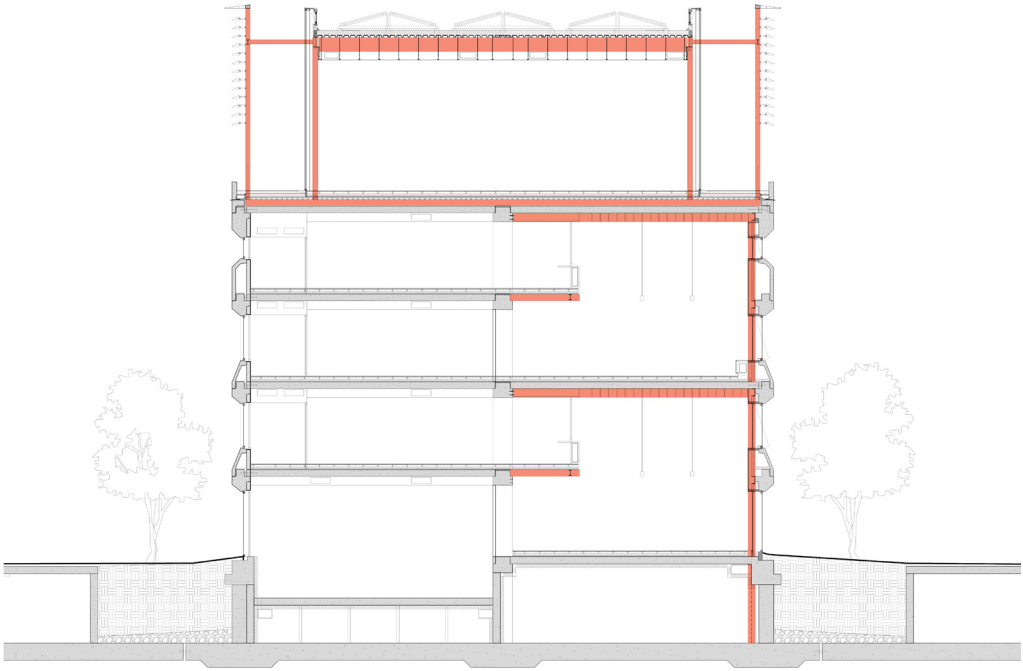


Structural frame - lightweight

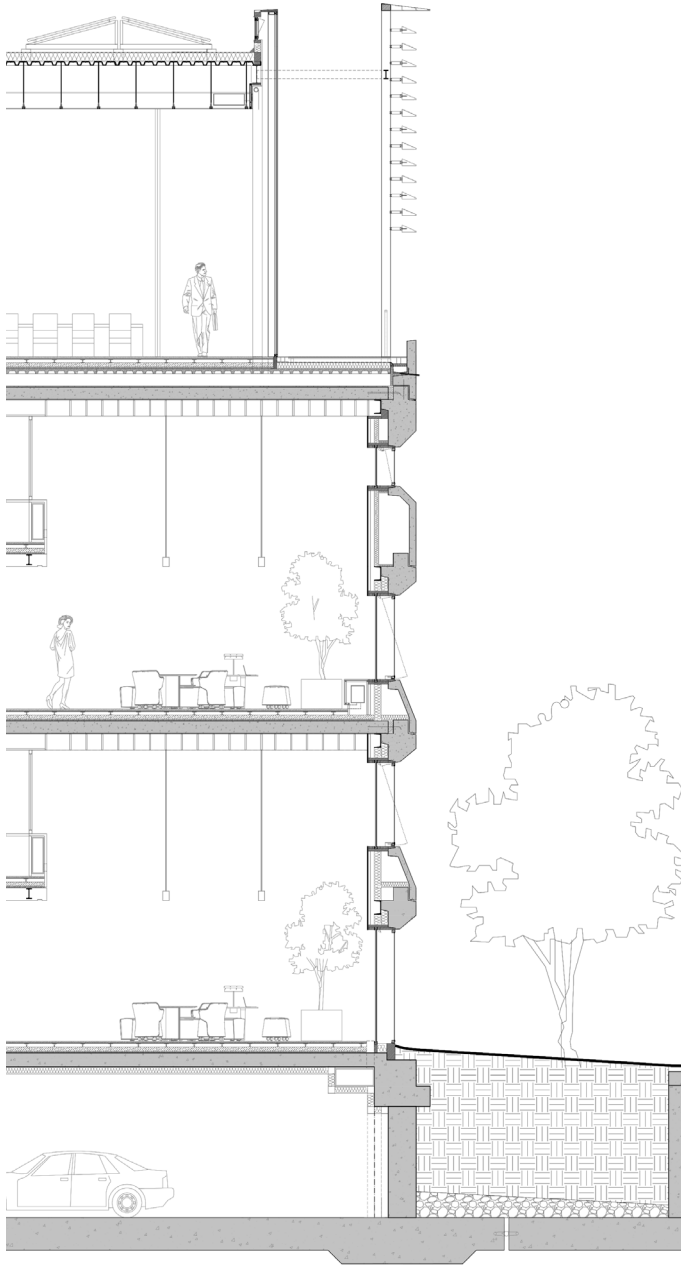
15.7 X 3,6m grid



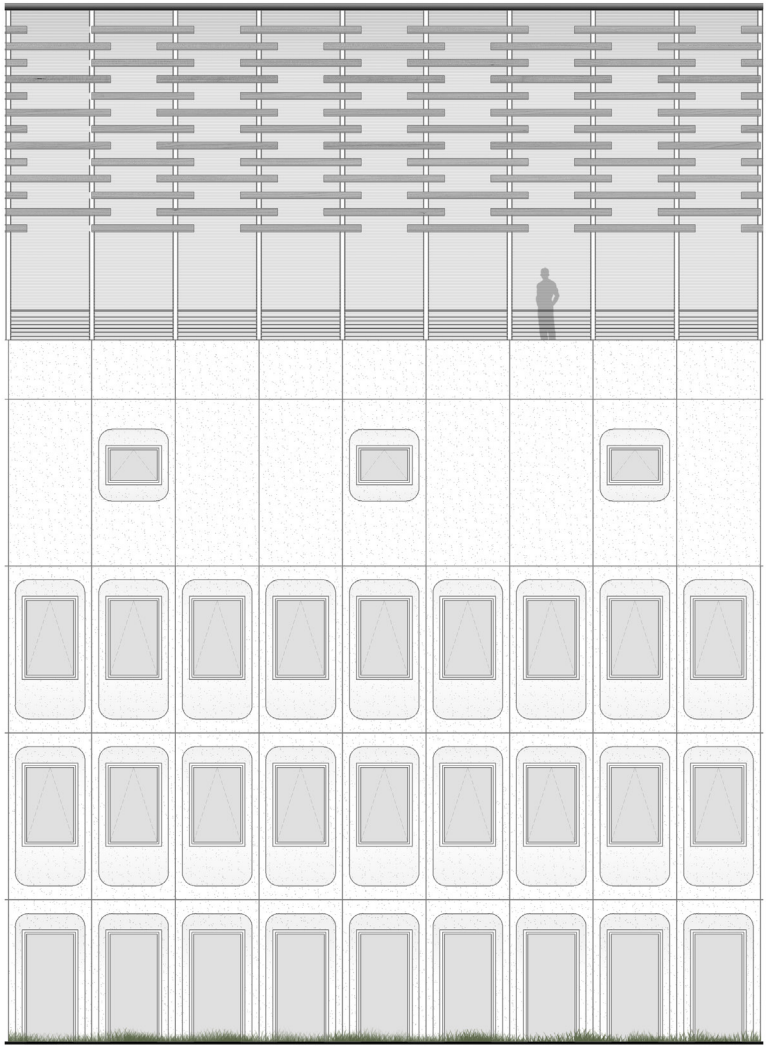
Cross section - added structure



Part section & elevation

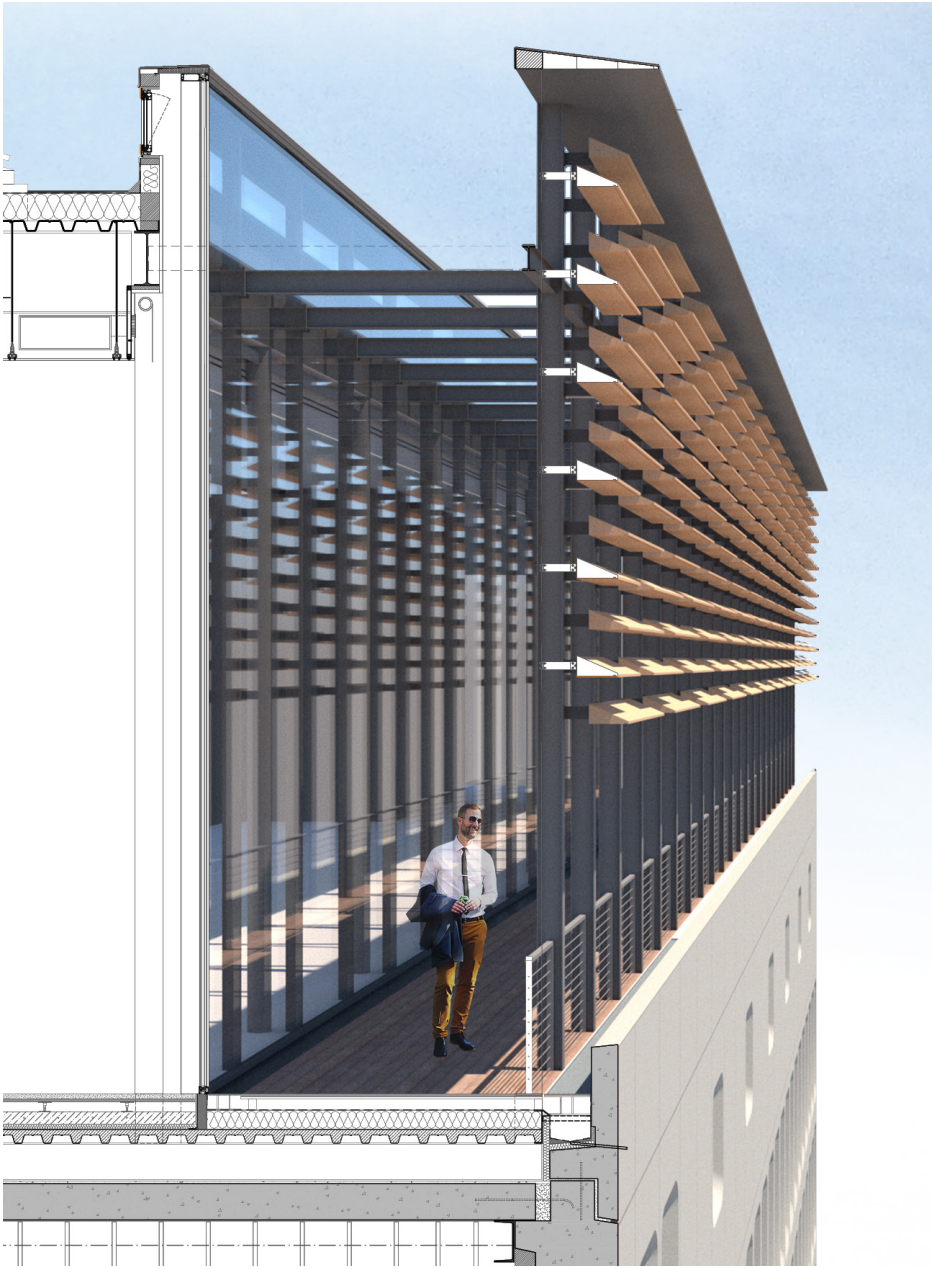


Part section

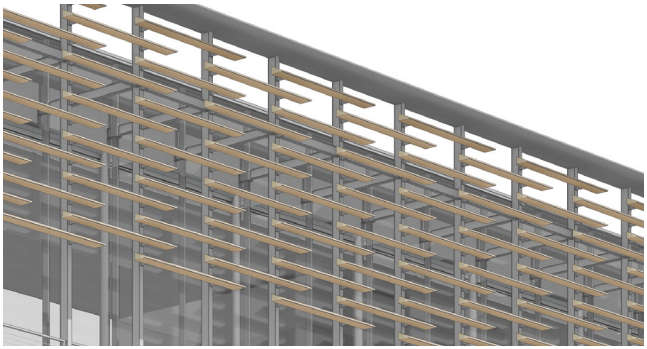


Part elevation

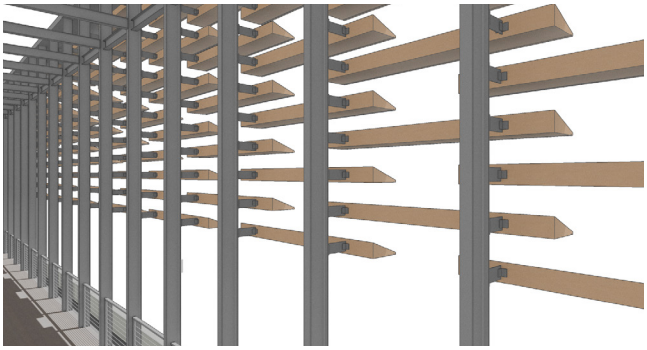
Extension's facade



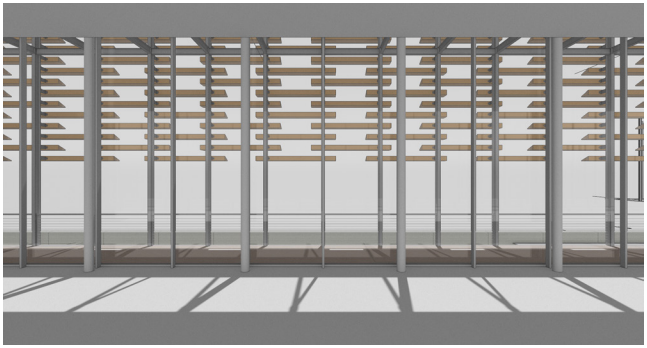
Sectional perspective



Parapet detailing



Connections

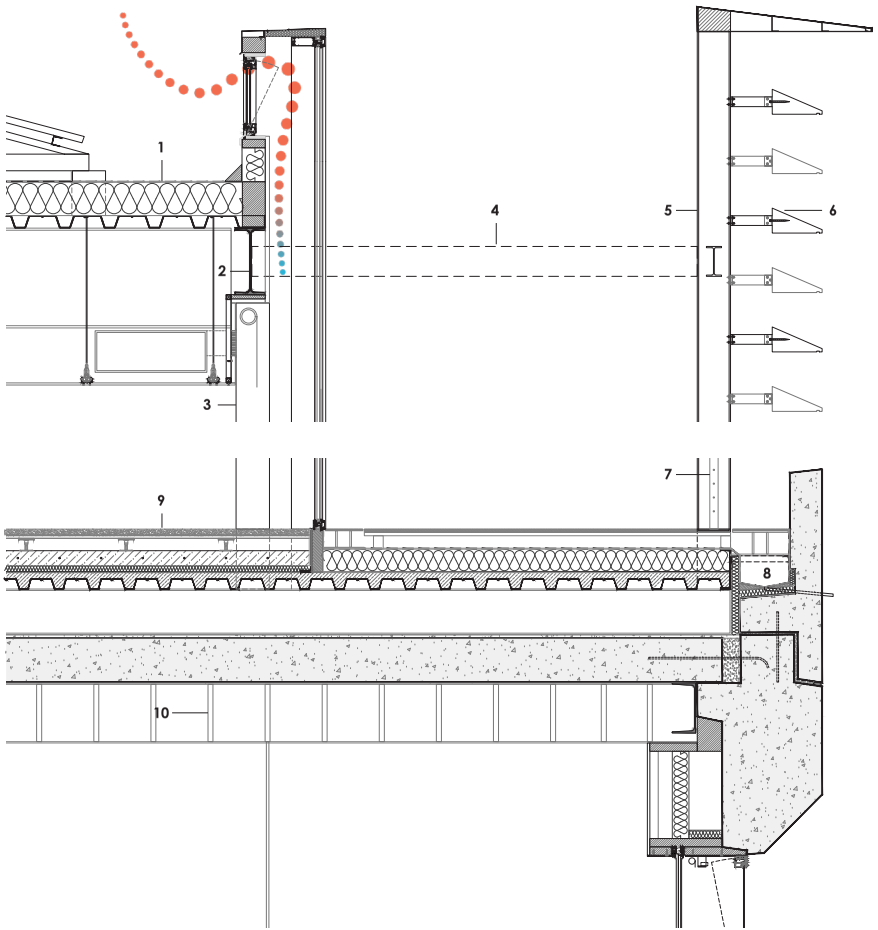


Interior view

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
   Existing concrete pre-stressed hollow core slab 265mm
   I-beam for lateral load 360mm
10. Integrated timber elements for acoustics

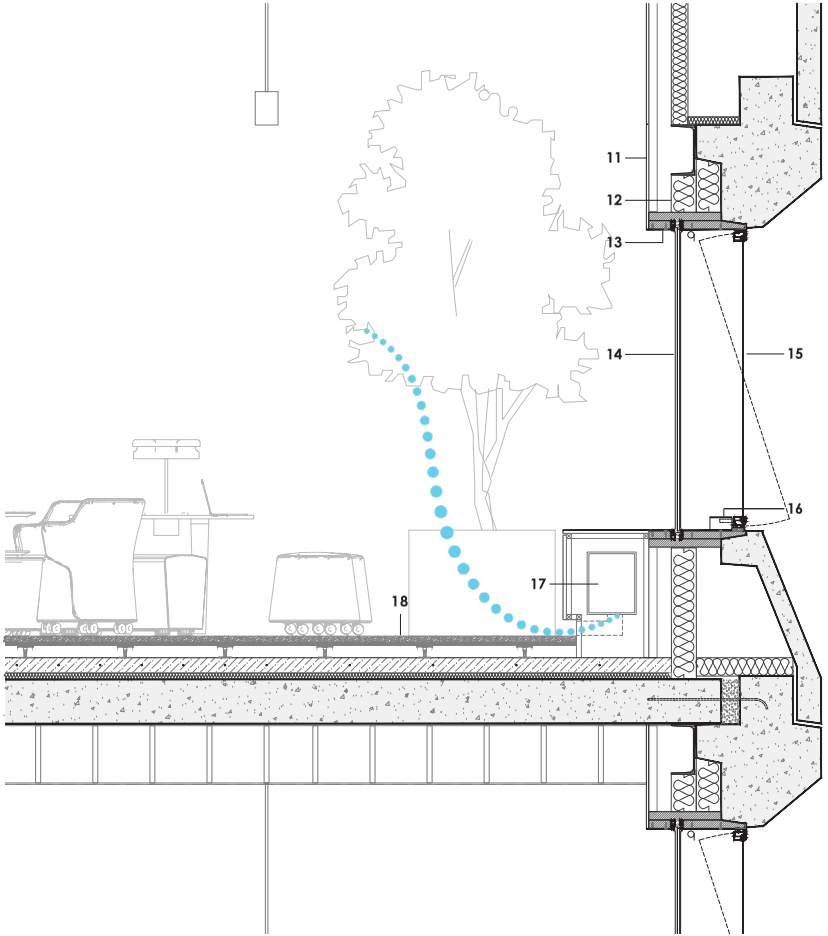


11. Plasterboard 15mm
    Timber supporting frame 50x50mm
    Cavity 85mm
    C-section 300x150mm
    Polystyrene sheet
    Existing precast concrete facade

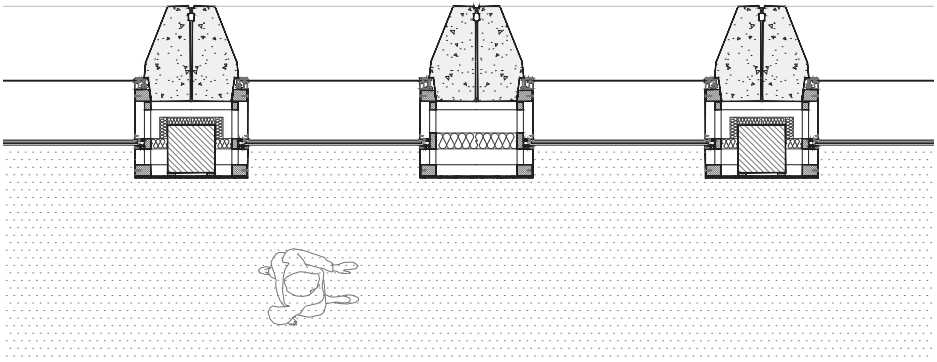
12. Thermal insulation 150mm (x2)

13. Steel sheet 2mm
14. Double glazed window 32mm
15. Existing single-pivot aluminium window
16. Electric window opener
17. Fresh air inlet 300x400mm

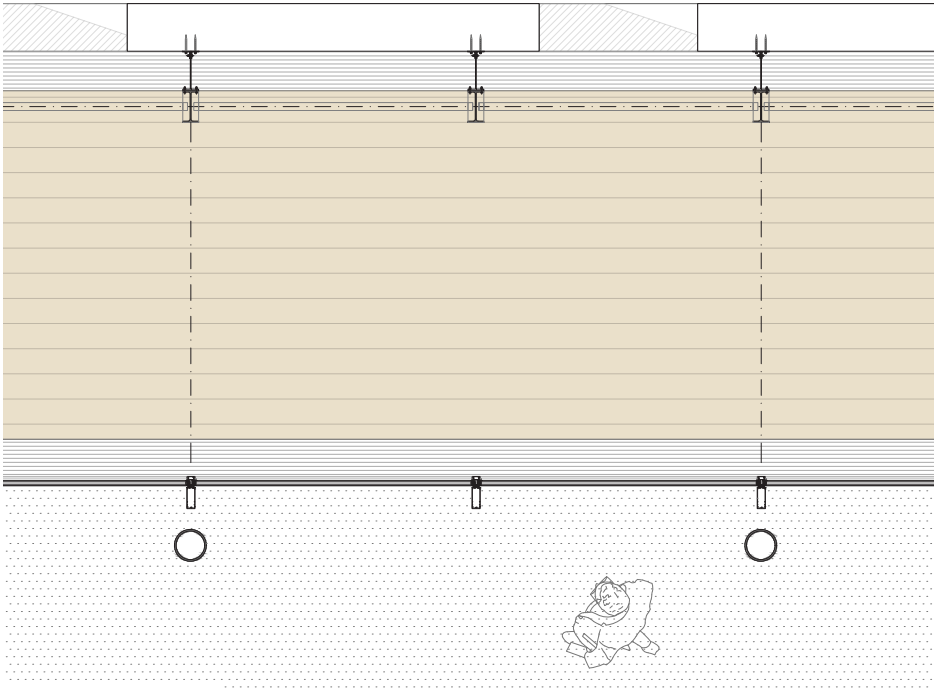
18. Raised floor 130mm
    Underfloor heating 90mm
    Sound insulation 40mm
    Concrete on ribbed metal sheeting 100mm
    Steel beam 265mm
    Concrete finish
    Existing concrete pre-stressed hollow core slab 265mm



Horizontal section 1:20

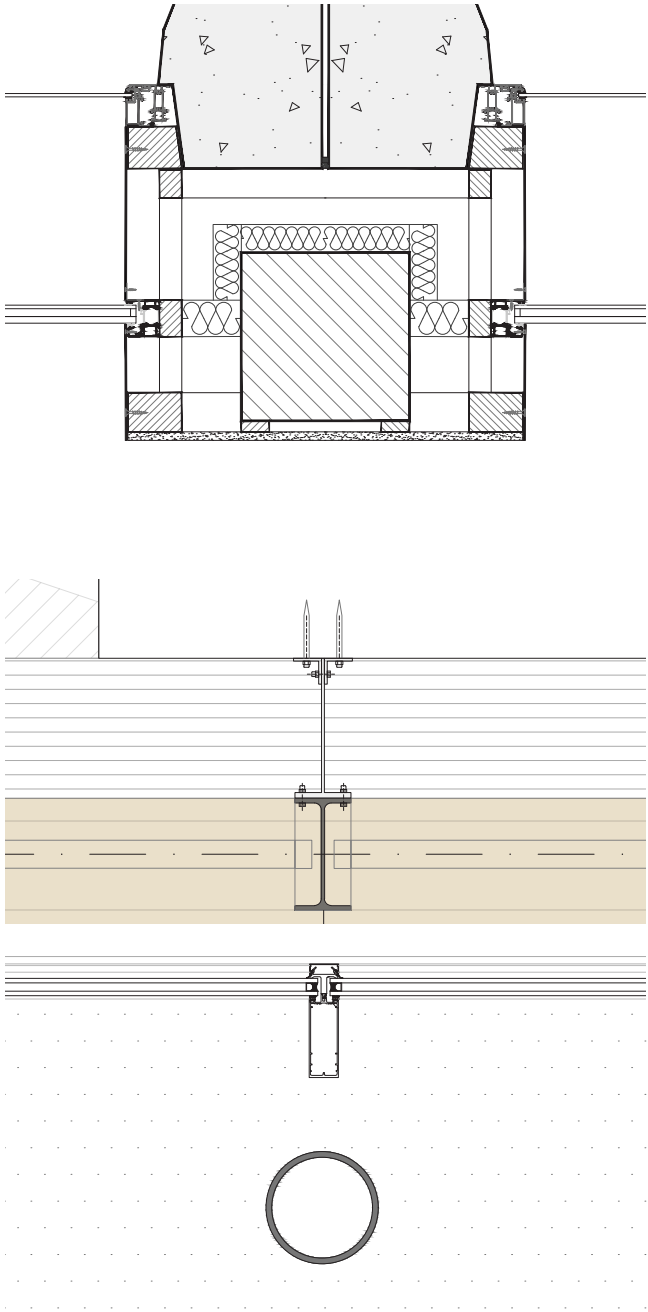


Ground floor

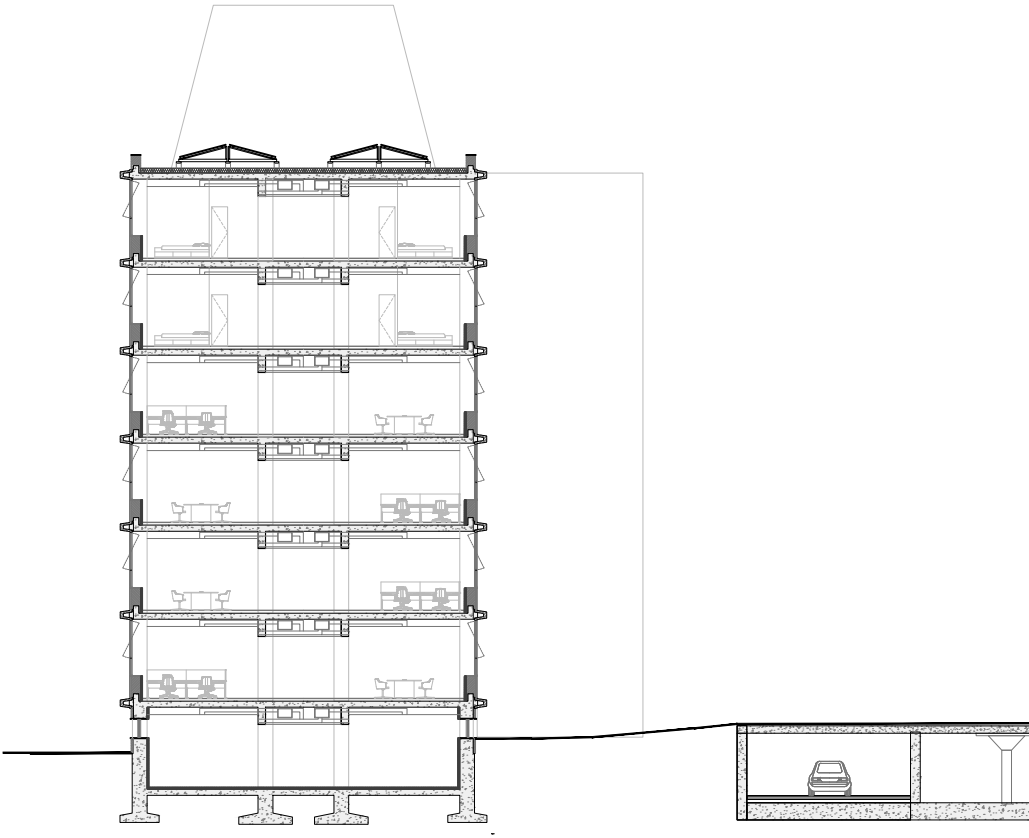


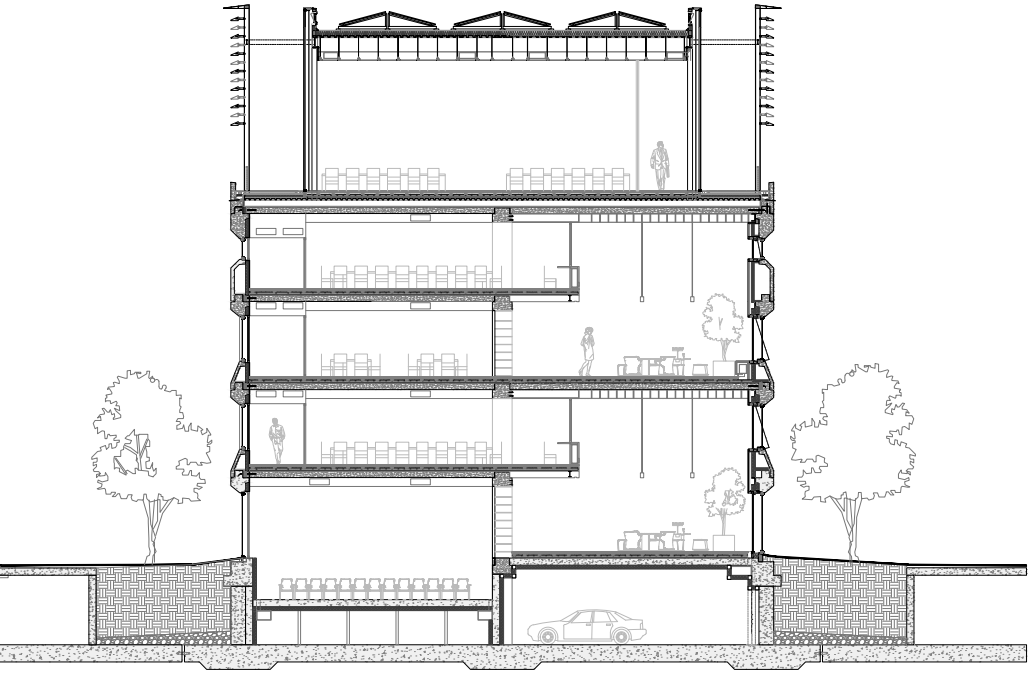
Fourth level

Detail 1:10

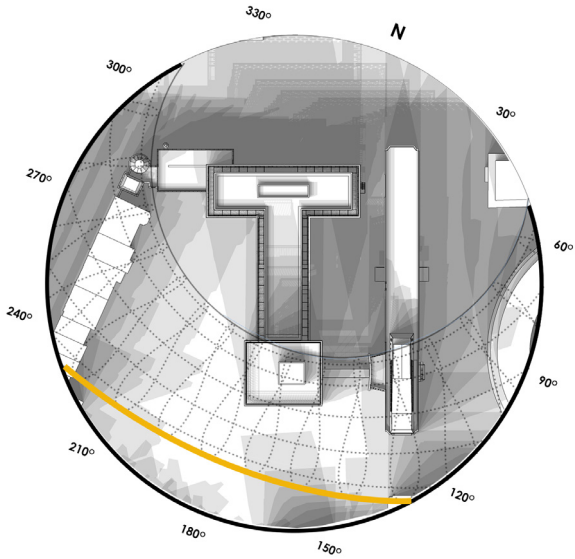


Section 1.200



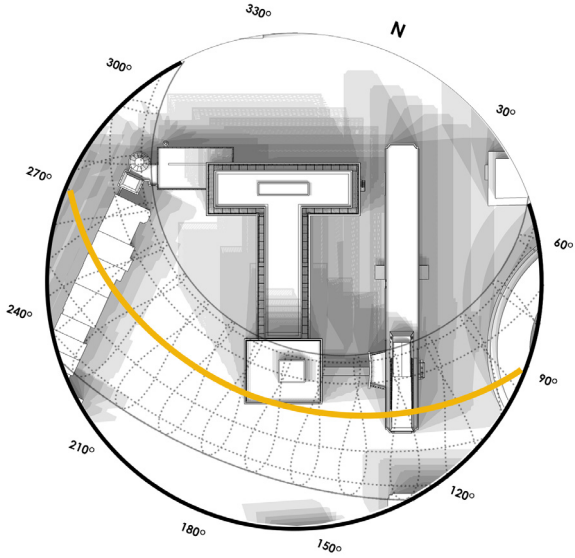


Solar diagrams



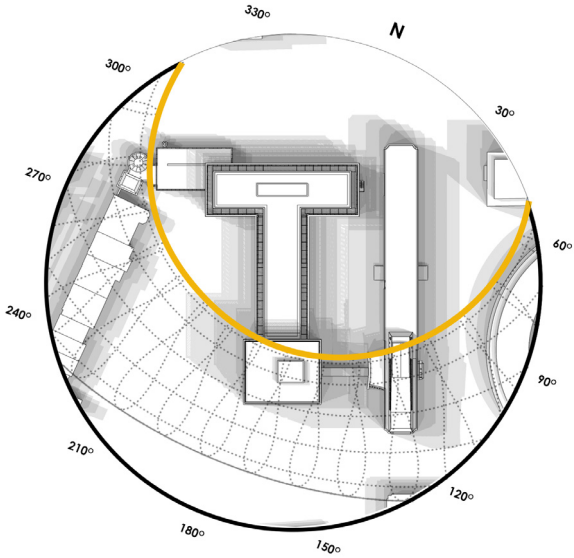
21 December

Winter Solstice



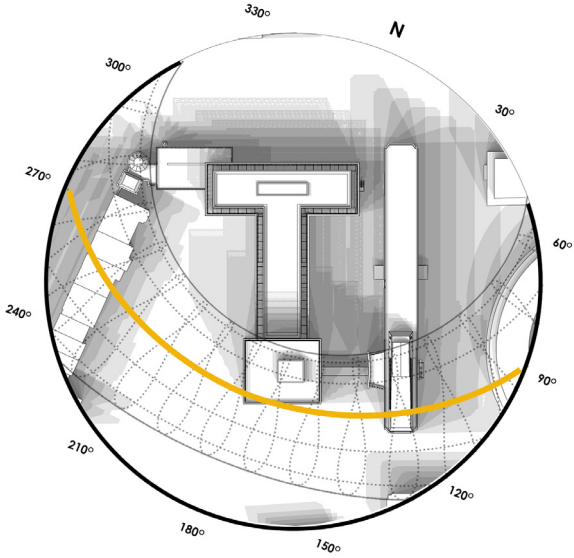
21 March

Spring Equinox



21 June

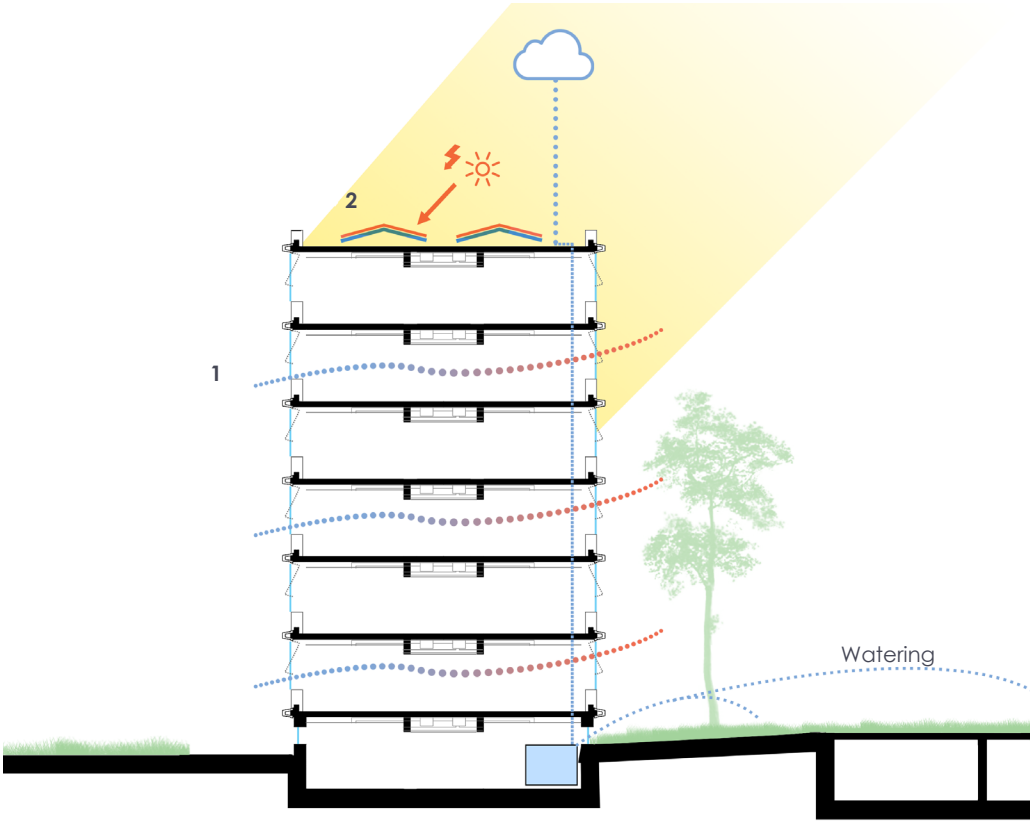
Summer Solstice



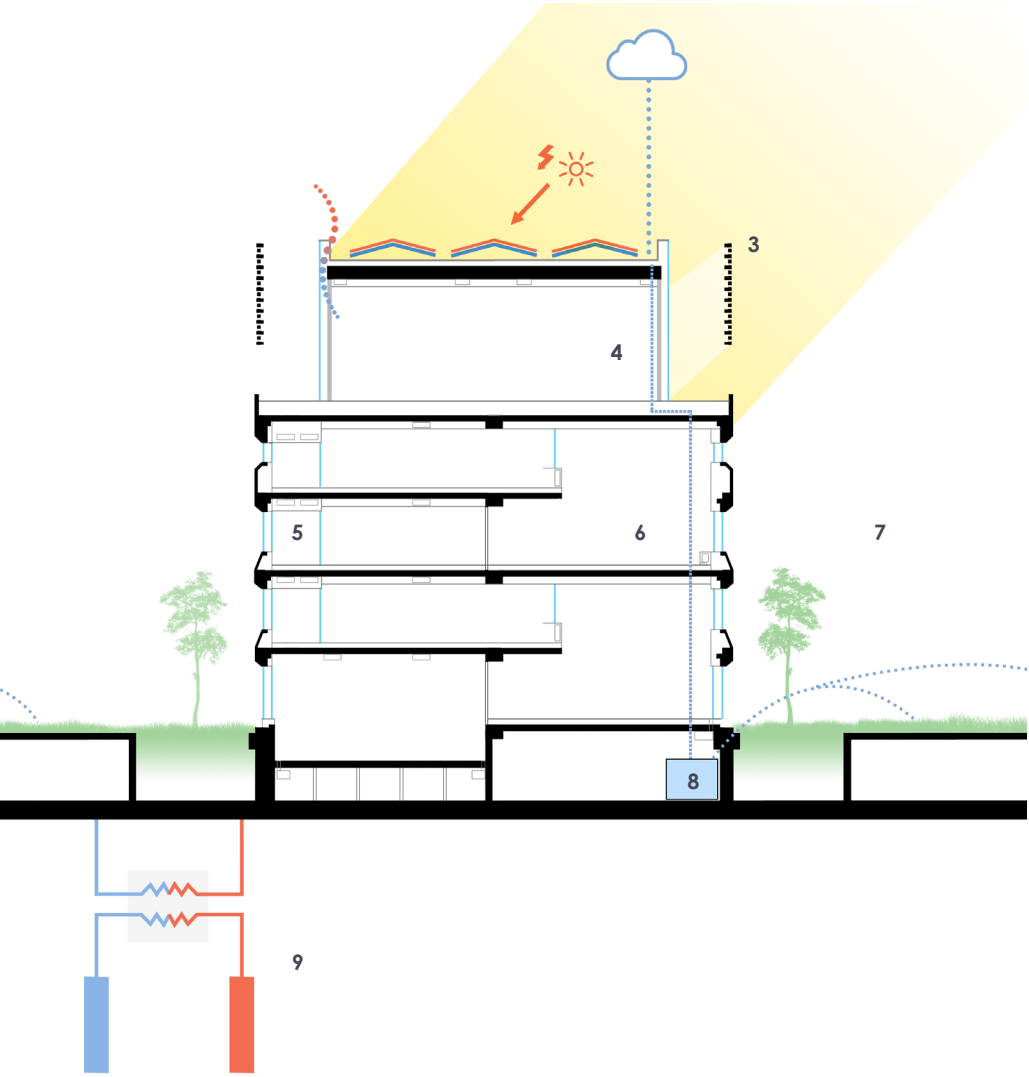
21 September

Autumn Equinox

Energy concept



1.	Cross-ventilation	4.	Materiality - prefabrication
2.	PV panels	5	Buffer zone
3.	Climate facade - solar shading	6	Natural daylight

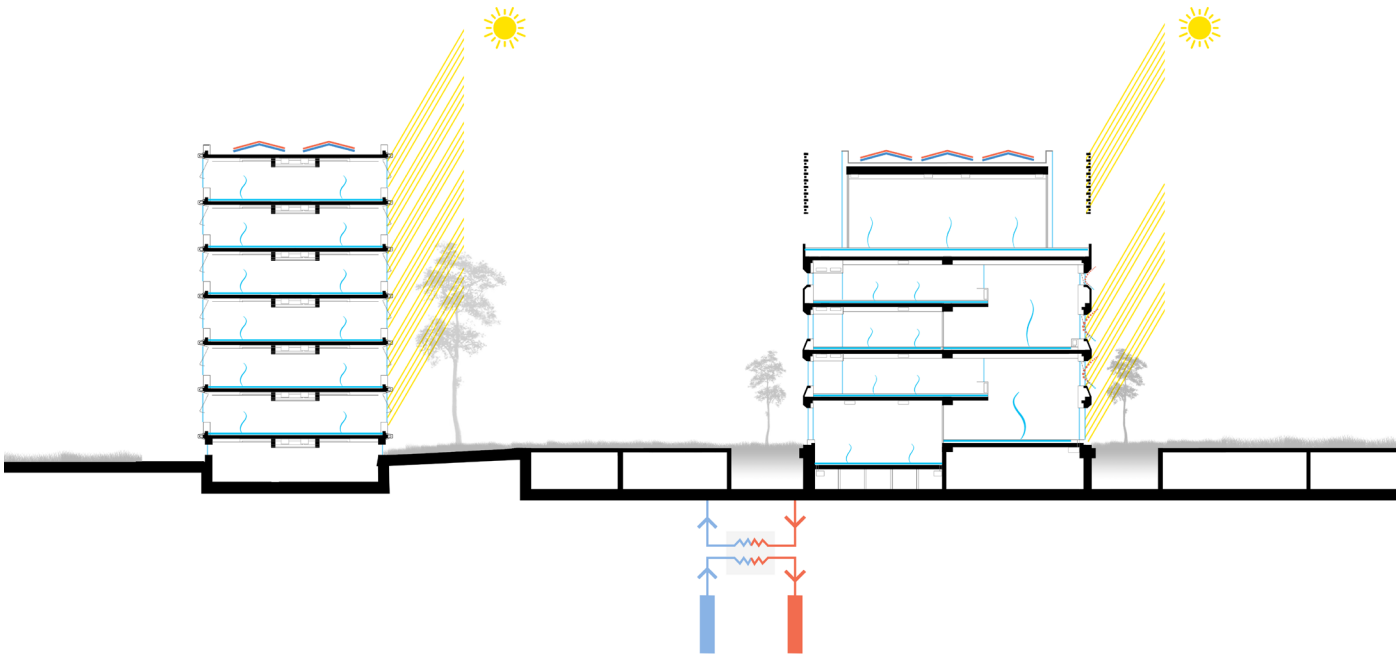


7. Micro climate & wind protection

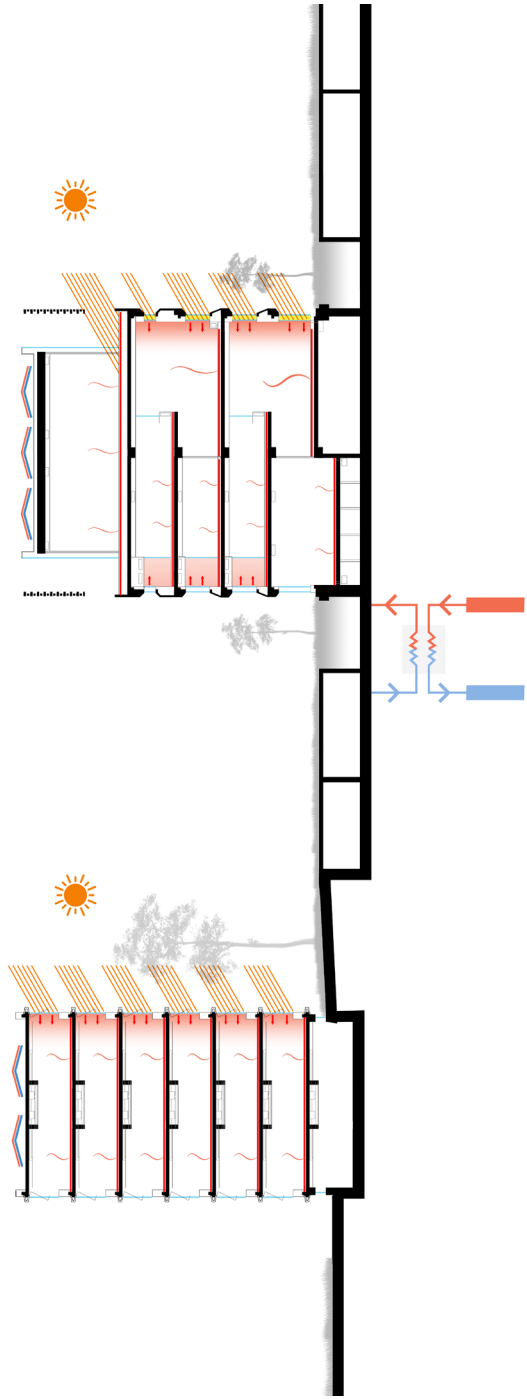
8. Grey water tank

9. Aquifer Thermal Energy storage

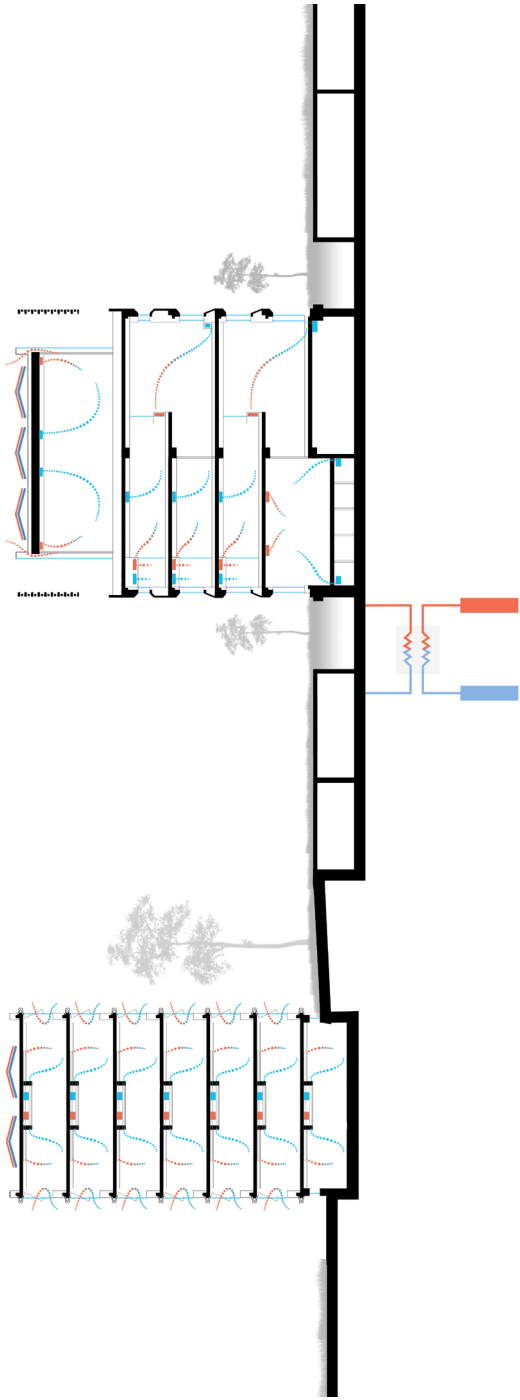
Heating & cooling



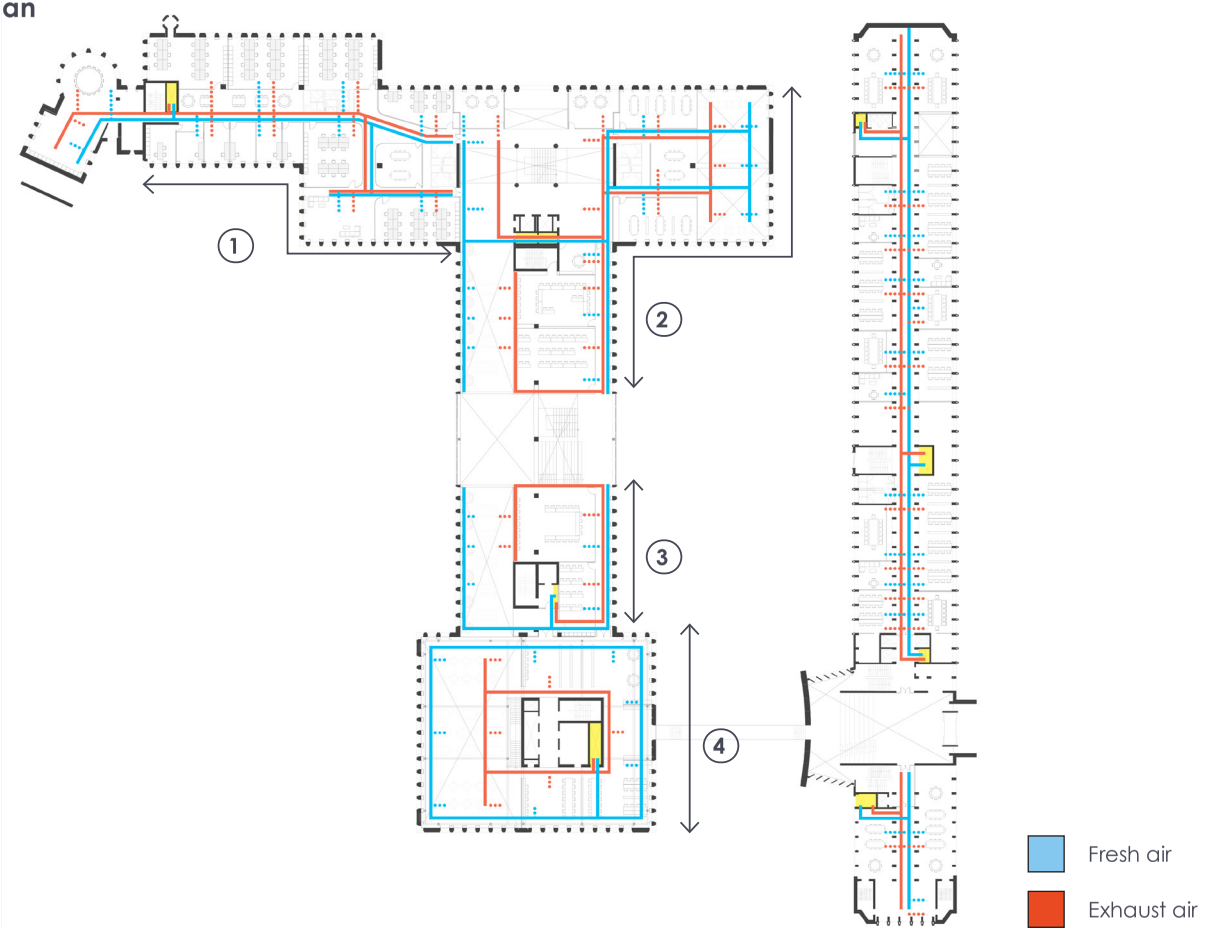
Summer day - Cooling



Winter day - Heating



Ventilation plan



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