

RESEARCH-BY-DESIGN JOURNAL

GRADUATION REPORT

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Graduation Plan

Master of Science Architecture, Urbanism & Building Sciences

Graduation Plan: All tracks

Submit your Graduation Plan to the Board of Examiners (Examencommissie-BK@tudelft.nl), Mentors and Delegate of the Board of Examiners one week before P2 at the latest.

The graduation plan consists of at least the following data/segments:

Personal information	
Name	Daria Ivanova
Student number	5686717

Studio		
Name / Theme	Public Building	
Main mentor	Ir. Henk Bultstra	Architecture
Second mentor	Ir. Ger Warries	Bulding Technology
Third mentor	Ir. Sien van Dam	Theory and Delineation mentor
Argumentation of choice of the studio	I am interested in the topic of the architecture of educational buildings and concerned with the question: how can an architect organise a space where innovative ideas can be born? I believe that the project of a public hub of the future in the Hague will be a comprehensive final study of the Master's programme, in which I will be able to define myself as an architect.	

Graduation project	
Title of the graduation project	Homo Ludens: The playground as a metaphor for learning
Goal	
Location:	The Hague, Netherlands
The posed problem,	The coexistence of the mental and physical activities in the vertical campus of the future
research questions and	How can mental and physical activities coexist in the vertical campus of the future? What outdoor and indoor public spaces with amenities for sports and other physical activities can be included on this campus?
design assignment in which this result	The Vertical Campus – a hybrid high-rise building combining educational and office functions as well as outdoor and indoor spaces for physical activity and play

Process
Method description
<p>The research consists of the following components:</p> <p>Firstly, the analysis of the historical role of sports as part of education and their architectural impact. Secondly, sociological research on the interests of stakeholders in the Central Station area of The Hague. Thirdly, the studio uses a specific method known as Research-by-Design. Research-by-Design focuses on design work as a special form of research. It considers theory and praxis, analysis, and imagination as inseparable and as a medium to help conceive and develop architectural ideation. Research is not only about preparation, description, and explanation but also more importantly about projection and speculation. Research is therefore a form of design and design is a form of research.</p> <p>By combining these methods, it will be possible to define the potential functionality of contemporary architecture and to propose a program for a Vertical Campus in The Hague that considers social needs and cultural context. The research entails experiments and is not linear, but iterative.</p> <p><u>I. Analysis of the program</u></p> <ol style="list-style-type: none"> 1. Literature review about the classical Greek gymnasium typology. Analysis of functions and their combination. 2. An excursion to Eindhoven and a literature review about university campuses in the Netherlands. They allow for a comparison of the Technical University of Delft and the Technical University of Eindhoven. Thus, it is possible to identify the specific features of the sports facilities of universities in the Netherlands and to determine to what extent Dutch campuses are open and ready to integrate public functions. 3. Literature review about contemporary hybrid buildings, including texts on hybrid high-rise buildings and those with a predominantly educational and sports function. This phase aims to understand how different functions can be combined in hybrid buildings. 4. Interviews with the practicing architects. They will provide a deeper understanding of the architectural design process and identify possible problems or limitations. <p><u>II. Sociological research on the interests of stakeholders in the Central Station area of The Hague</u></p> <ol style="list-style-type: none"> 1. A visit to The Hague and the project area. The objective is to analyze the existing sports facilities and their interrelationships in the Central Station area. 2. Mapping of the connections and connectivity between sports facilities in the area, using a variety of data including information from the municipality of The Hague, social media, tourist booklets, and public transport timetables. The goal of this stage is to form the architects' preliminary opinion on the functional potential of the site. 3. A survey of some stakeholders. The purpose of the study is to collect personal sports habits and preferences of residents and visitors of the city. Moreover, to gather opinions on the existing sports facilities and perspectives on the functional development of the area.

Literature and general practical references
<p>Literature:</p> <p><u>On theoretical framework</u></p> <p>Gehl, Jan. 2013. Cities for People. Island Press.</p> <p>Lynch, K. 1960. The image of the city. https://ci.nii.ac.jp/ncid/BA01382449</p> <p>Spencer, H. 1892. Social Statics: Abridged and Revised; Together with The Man Versus the State.</p> <p>Steinbach, H., & Vladlen, E. 2004. Psychology of living space (for psychologists, architects, and designers) [Психология жизненного пространства (для психологов, архитекторов и дизайнеров)].</p> <p>The Editors of Encyclopaedia Britannica. 2023. "Symbiosis Definition, Types, & Facts." Encyclopedia Britannica. September 12, 2023. https://www.britannica.com/science/symbiosis</p> <p>Zheltnina, A. 2011. "Here like a museum": the shopping centre as a public space [«Здесь как музей»: торговый центр как общественное пространство]: Laboratorium, 3(2).</p> <p><u>On historical framework</u></p> <p>Engel, Henk, and Esther Gramsbergen. 2017. "Over Holland 18/19." Ov 11.</p> <p>Taylor, Miles, and Jill Pellew. 2020. Utopian Universities: A Global History of the New Campuses of the 1960s. Bloomsbury Publishing.</p> <p>Van Gameren, Dick. 2013. "College versus Campus." DASH 10.</p> <p>Van Leeuwen, Thomas a. P. 1986. The Skyward Trend of Thought: Five Essays on the Metaphysics of the American Skyscraper.</p> <p><u>On the campus-city relationship</u></p> <p>Hoeger, Kerstin, Kees Christiaanse, and Edzo Bindels. 2007. Campus and the City: Urban Design for the Knowledge Society. Gta Verlag EBooks. http://ci.nii.ac.jp/ncid/BB03082829</p> <p>"Interuniversity Campus [Межвузовский Кампус]: A Research on the Potential for Creating Inter-University Campuses in Russia, Conducted by VEB.RF and KB Strelka with the Support of the Ministry of Science and Higher Education." 2021. Campus.Strelka-Kb.Com. 2021. Accessed October 22, 2023. https://campus.strelka-kb.com/5/</p> <p>Kuleshova, Galina. 2021. "University and City. An Essay on the Evolution of the University Institution's Relationship with the Urban Environment. Part 1. International Experience [Университет и Город. Очерк Эволюции Связи Университетской Институтции с Городской Средой. Часть 1. Мировой Опыт]." Academia. Architecture and Construction, no. 4 (December): 70–79.</p> <p><u>On hybridity and multifunctionality</u></p> <p>Den Heijer, Alexandra. 2021. "Campus of the Future: Managing a Matter of Solid, Liquid and Gas." Delft University of Technology.</p>

Metz, Tracy. 1985. "New York at Street Level. What Skyscrapers Return to the City [New York Gelijkvloers. Wat Wolkenkrabbers Aan de Stad Teruggeven]." Wonen TABK, 1985.

Per, Aurora Fernández, Javier Mozas, and Javier Arpa. 2011. This Is Hybrid: An Analysis of Mixed-Use Buildings. a+t architecture publishers.

Slessor, Caroline. 2003. "The Joy of Mix." The Architectural Review 1279 (September): 46–47.

Per, Aurora Fernández, and Javier Mozas. 2020. 50 Hybrid Buildings. Catalogue on the Art of Mixing Uses. a+t architecture publishers.

Vay, Thaïsa. 2016. "The Urban University 's Hybrid Campus." Journal of Landscape Architecture 11 (1): 42–55. <https://doi.org/10.1080/18626033.2016.1144673>

Practical References:

Spaces for physical and mental activity

- Great Palaestra, Pompeii, Greece, VII-VI century BC
- The Bath-Gymnasium complex at Sardis, Sardis, Turkey, late II- early III century AD
- Downtown Athletic Club, Starett and van Vleck, New York City (US) 1929-1931
- Auburn University Recreation & Wellness Center at Auburn University, 360 Architecture, Auburn, US, 2013
- White Collar Factory, Allford Hall Monaghan Morris, London, UK, 2017
- Game Streetmekka Aalborg, Jaja architects, Aalborg, Denmark, 2016-2018
- CopenHill, Bijarke Ingels Group, Copenhagen, Denmark, 2019
- Sports facilities in WeWork coworking spaces all around the world

Vertical Campuses

- Cathedral of Learning, architect Charles Z. Klauder and the Chancellor of the University of Pittsburgh, John G. Bowman, Pittsburgh, USA, 1926-1937
- Main building of Moscow State University, architect Lev Rudnev, Moscow, Russia, 1949-1953
- Idea Vertical Campus, OMA, Tokyo, Japan, 2004
- Roy and Diana Vagelos Education Center, Diller Scofidio + Renfro, New York, USA, 2016

Reflection
<p>1. What is the relation between your graduation (project) topic, the studio topic (if applicable), your master track (A,U,BT,LA,MBE), and your master programme (MSc AUBS)?</p> <p>The Public Building studio investigates the future of public buildings and their role in the built environment, by developing new spatial formulas, programmatic articulations, and building components. The work of the Public Building studio involves reinventing past structures and questioning existing typologies through research and design as well as research by design. The Graduation Studio aims to produce future-proof designs that are sustainable and investigates the possibilities of design thinking in a world where the definition of what an architect is and does, ceaselessly shifts. Public architecture should respond to and accommodate today's needs while anticipating the future. The concept of a public campus offers a useful approach to the venues of higher education in the future.</p>
<p>2. What is the relevance of your graduation work in the larger social, professional, and scientific framework?</p> <p>Nowadays, a high-quality educational infrastructure is not only an integral component for the development of universities but also a critical center of urban public life. Today urban campuses can form entire neighborhoods and be integrated into the city by including cafes, coworking spaces, cultural centers, parks, and sports complexes, considering the needs of residents and guests of the city. A high-quality educational infrastructure is not only an integral component for the development of universities but also a critical center of urban public life. University and city are living organisms and symbionts. Like any living organism, they are characterized by the complexity of the organization, by the specialization and close interrelationship of their parts, and by the opportunity for evolutionary development.</p> <p>Games and physical activity can be one of the key elements for campus-city symbiosis. Even in Ancient Greece, there was a cult of physical culture as an integral part of the complex education. The Greek gymnasium was a building used for athletic activities, study, and philosophical discussion (Cartwright, 2023). Gymnasiums were large architectural complexes that included areas for training and discussion (stoas), athletic wrestling (palaistra), running tracks (paradromis), pools, and fountains. Many centuries later, as cities began to grow upward, physical activity also made its way into high-rise buildings and mixed with other functions. One of the first standard bearers of hybrid high-rise buildings is the Downtown Athletic Club. Metropolitan hybrid culture is engendered there, disseminating buildings that are seemingly serene and sculptural on the exterior yet on the interior are bustling in a constant state of flux of programmes.</p> <p>Contemporary researchers are convinced that spaces for physical activity and play on a university campus can not only be presented as separate sports centers but can also be directly integrated into academic buildings (Gavrilik, 2022). Changing activities, movement, and play techniques help to acquire information at any age.</p>

PROJECT ABSTRACT

Nowadays, urban campuses can form entire neighborhoods and be integrated into the city by including cafes, coworking spaces, cultural centers, parks, and sports complexes, taking into account the needs of local residents and guests of the city. A high-quality educational infrastructure is not only an integral component for the development of universities but also a critical center of urban public life. University and city are living organisms and symbionts. Like any living organism, they are characterized by the complexity of the organization, by the specialization and close interrelationship of their parts, and by the opportunity for evolutionary development.

Games and physical activity can be one of the key elements for campus-city symbiosis. Contemporary researchers are convinced that spaces for physical activity and play on a university campus can not only be presented as separate sports centers but can also be directly integrated into academic buildings. Changing activities, movement, and play techniques help to acquire information at any age.

The research will confirm or refute the hypothesis that the Hague Central Station forms a multinational community with diverse cultures,

and sports can become a starting point for a dialogue between them. Public spaces with the amenities for games and contests as a place for this dialogue will integrate the campus into a dense urban environment, make possible the symbiosis of the city and the university, and give rise to innovative ideas. The research will be the basis for the architectural project of the Vertical Campus, including educational, office, sports, wellness, and recreational programs. The hybrid complex project will include both new construction and reorganization of the existing building of the Universiteit Leiden.

How can mental and physical activities coexist in the vertical campus of the future? What outdoor and indoor public spaces with amenities for sports and other physical activities can be included on this campus?

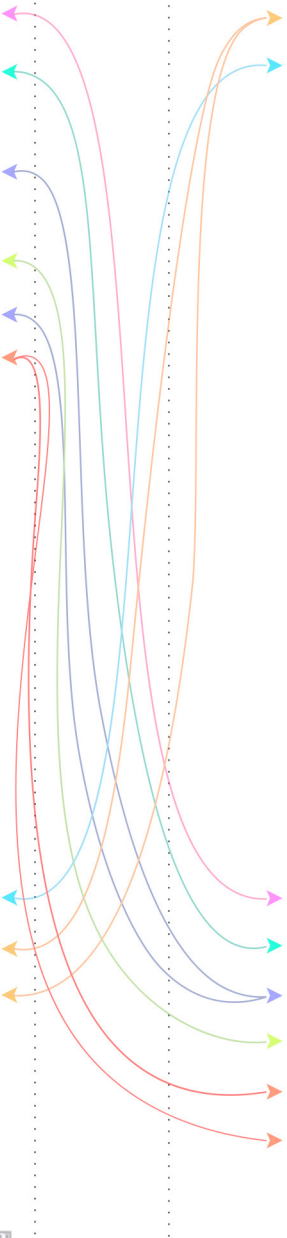
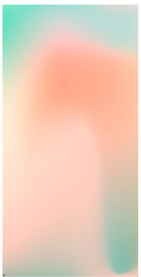
THE UNIVERSITY

- +
- WORKPLACES
- DIVERSE ACADEMIC INFRASTRUCTURE INCLUDING OPEN AND CLOSED PUBLIC SPACES
- INVOLVING STUDENTS, PROFESSORS, AND RESEARCHERS FROM OTHER CITIES AND COUNTRIES
- SUPPORT OF LOCAL BUSINESSES
- EDUCATION FOR THE LOCAL COMMUNITY
- FREEDOM OF EXPERIMENTS

THE CITY

- +
- DIVERSE COMMUNITY
- A VARIETY OF ACTIVITIES
- TRANSPORT ACCESSIBILITY

-
- ISOLATION
- CLOSED ACCADEMIC COMMUNITY
- UNEMPLOYMENT
- LACK OF GREEN SPACES
- PHYSICAL DANGER, DEPRIVED AREAS
- INTENSE ECONOMIC COMPETITION
- LACK OF THE DISTINCTIVE IDENTITY
- LACK OF THE COMMERCIAL AND TOURIST POTENTIAL

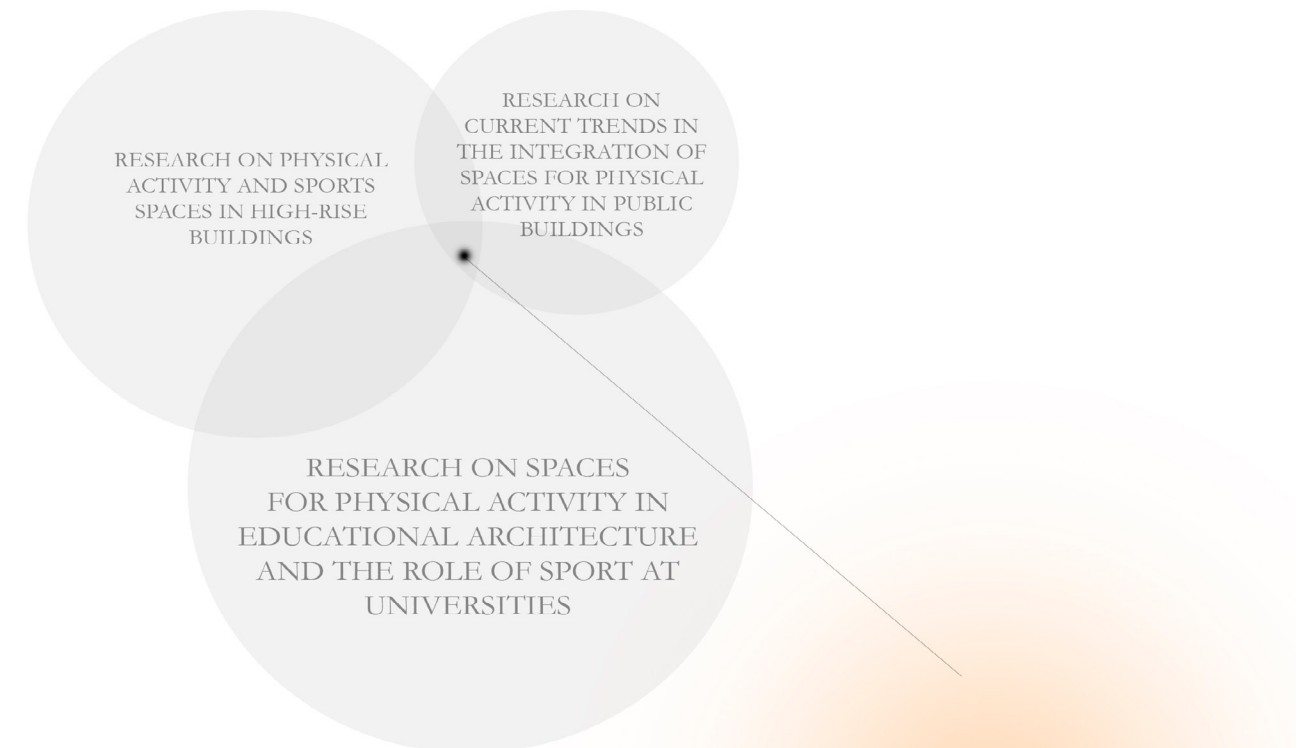




The image created by Midjourney neural network
prompt/ the Vertical Gymnasium of the Future, University campus

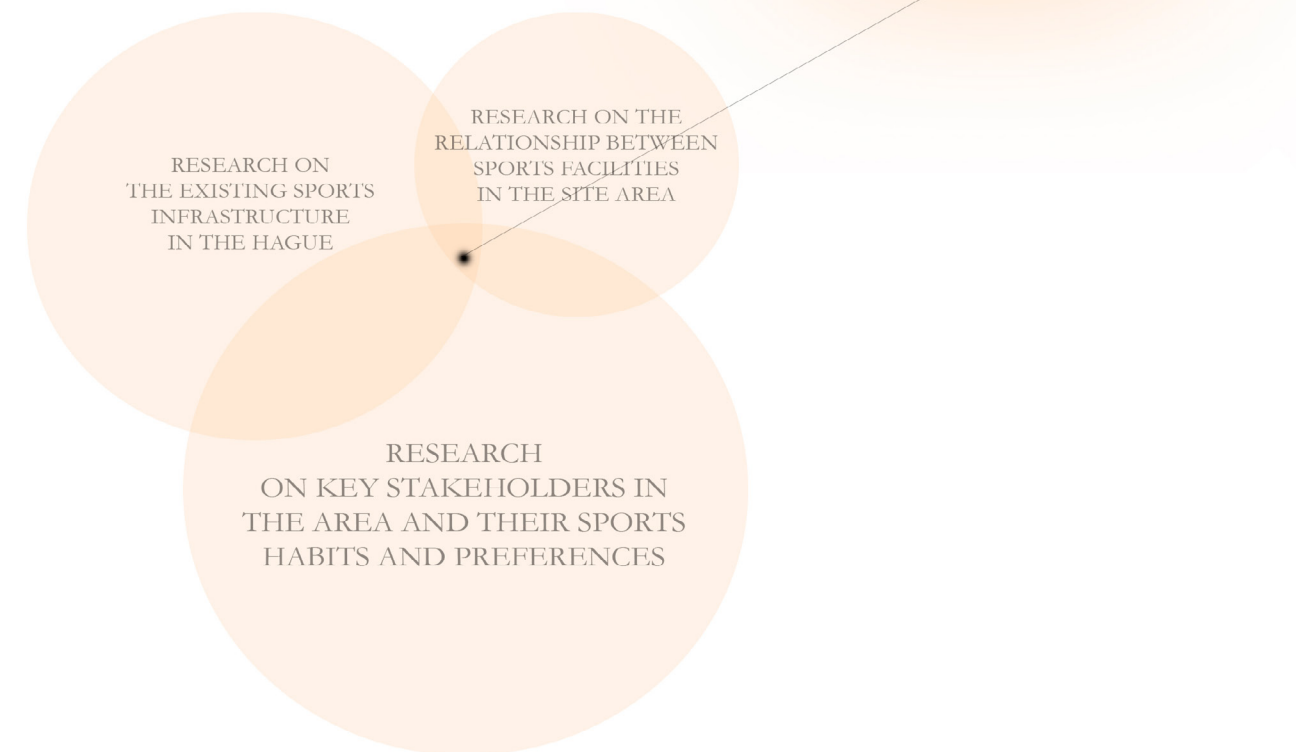
I

RESEARCH ON THE INTERNATIONAL ARCHITECTURAL EXPERIENCE

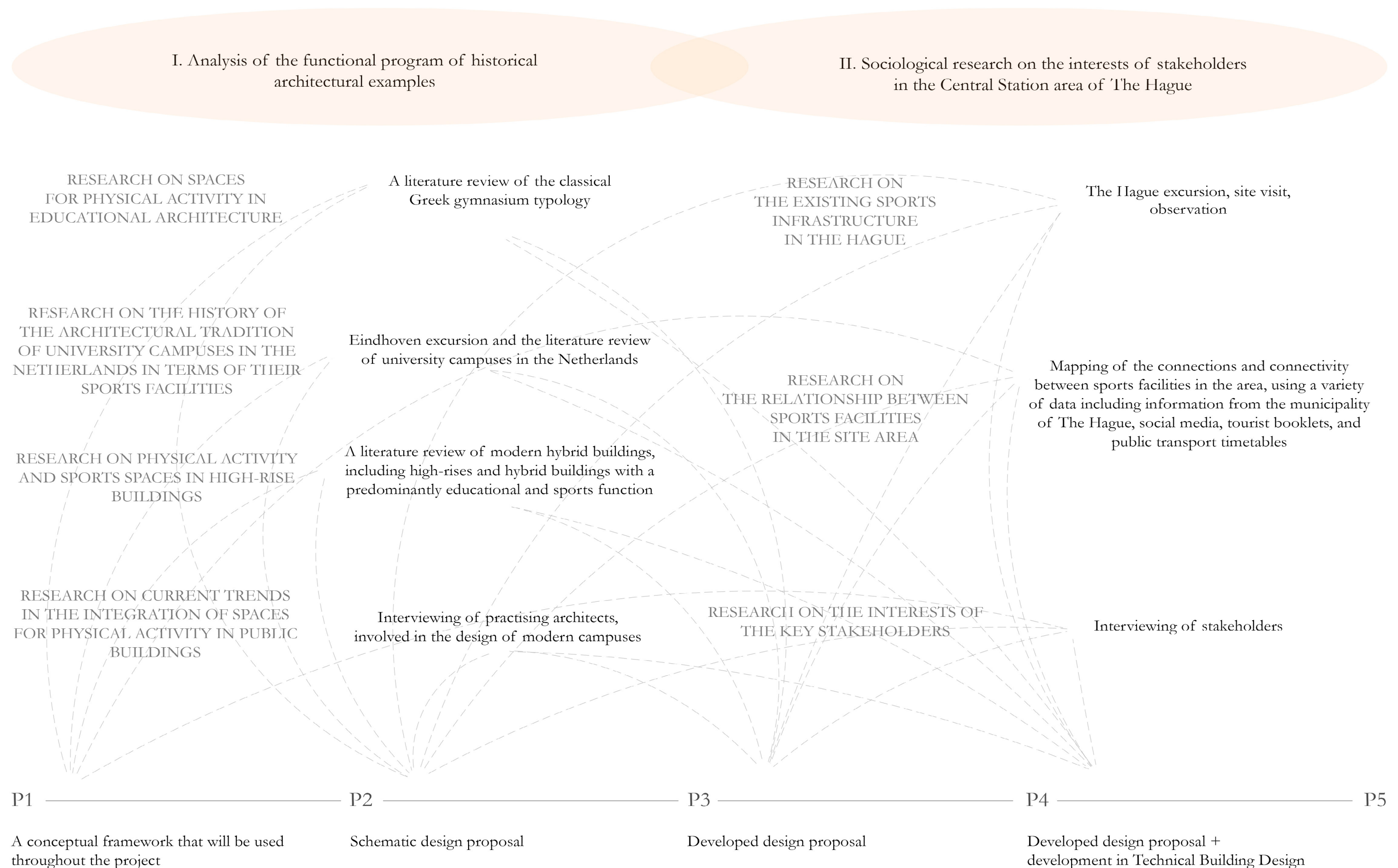


II

RESEARCH ON THE SOCIAL DEMAND IN THE HAGUE CENTRAL STATION AREA

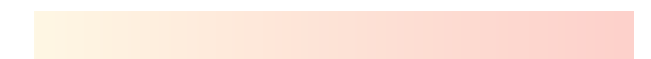


HOW CAN PHYSICAL AND MENTAL ACTIVITY COEXIST IN THE FORM OF THE VERTICAL CAMPUS?





P1 CONCEPTUAL FRAMEWORK



Group work
Urban capacity plan for the Fly-over
Infrastructure zone
The Horizontal Brief, continuous
public space layers, thematic urban
analysis, case studies

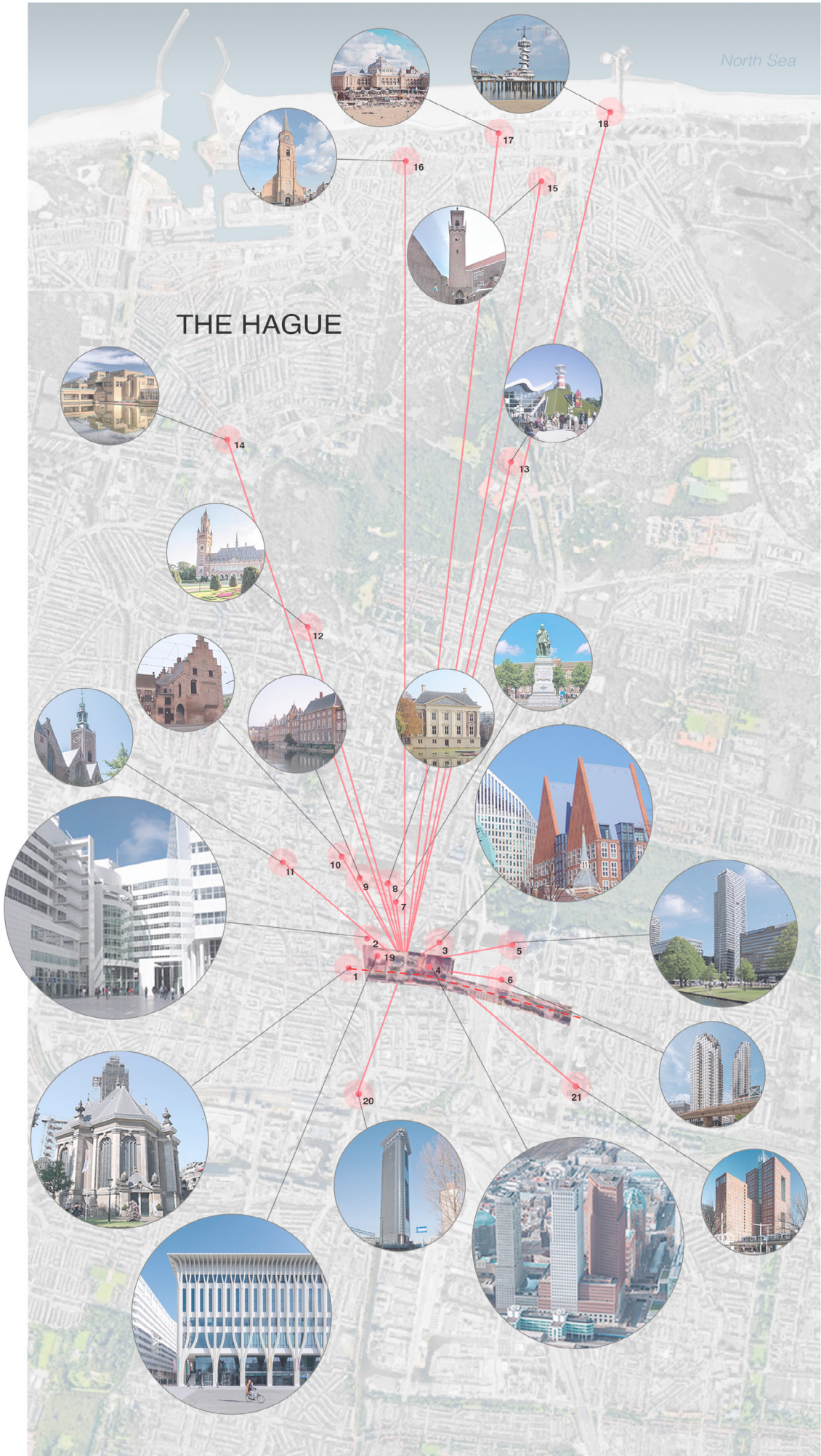
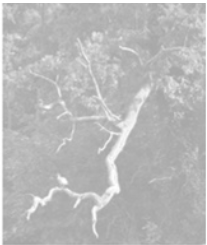
THE HAGUE EXCURSION
SITE AREA III: FLY-OVER INFRASTRUCTURE

The research area is located in the centre of the transport hub.

The Central Station area is full of buildings of ministries and other government offices, and today the building requirements for these stakeholders are changing and they have a great potential to be more integrated into the city. In the future the area of the Hague Central Station will be a territory where the boundaries between leisure, life, and work are blurred. In the context of the constant densification of cities in the Netherlands, the lack of opportunities for horizontal growth and, at the same time, the annual increase in the number of university students, the Hague needs an educational center to expand universities of different cities beyond their main historical campuses.



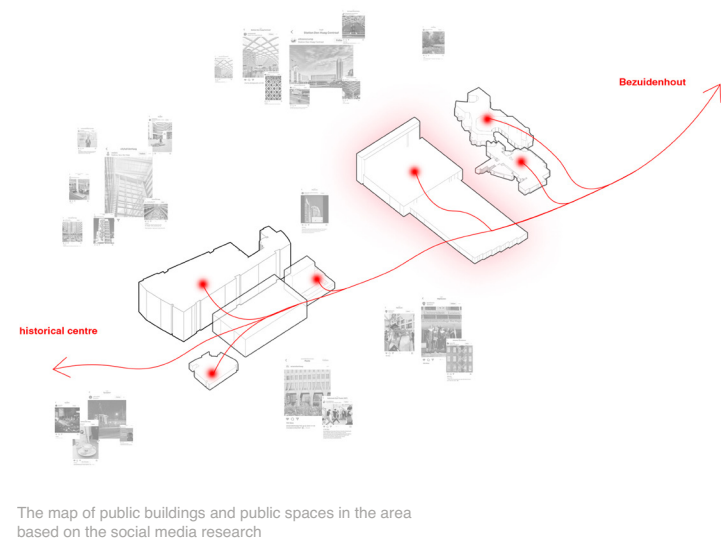
The map of accessibility of the site
The area is accessible from small to large; by foot (dark grey), by public transport (light grey), by bike (stripe) and by car (large crosshatch)



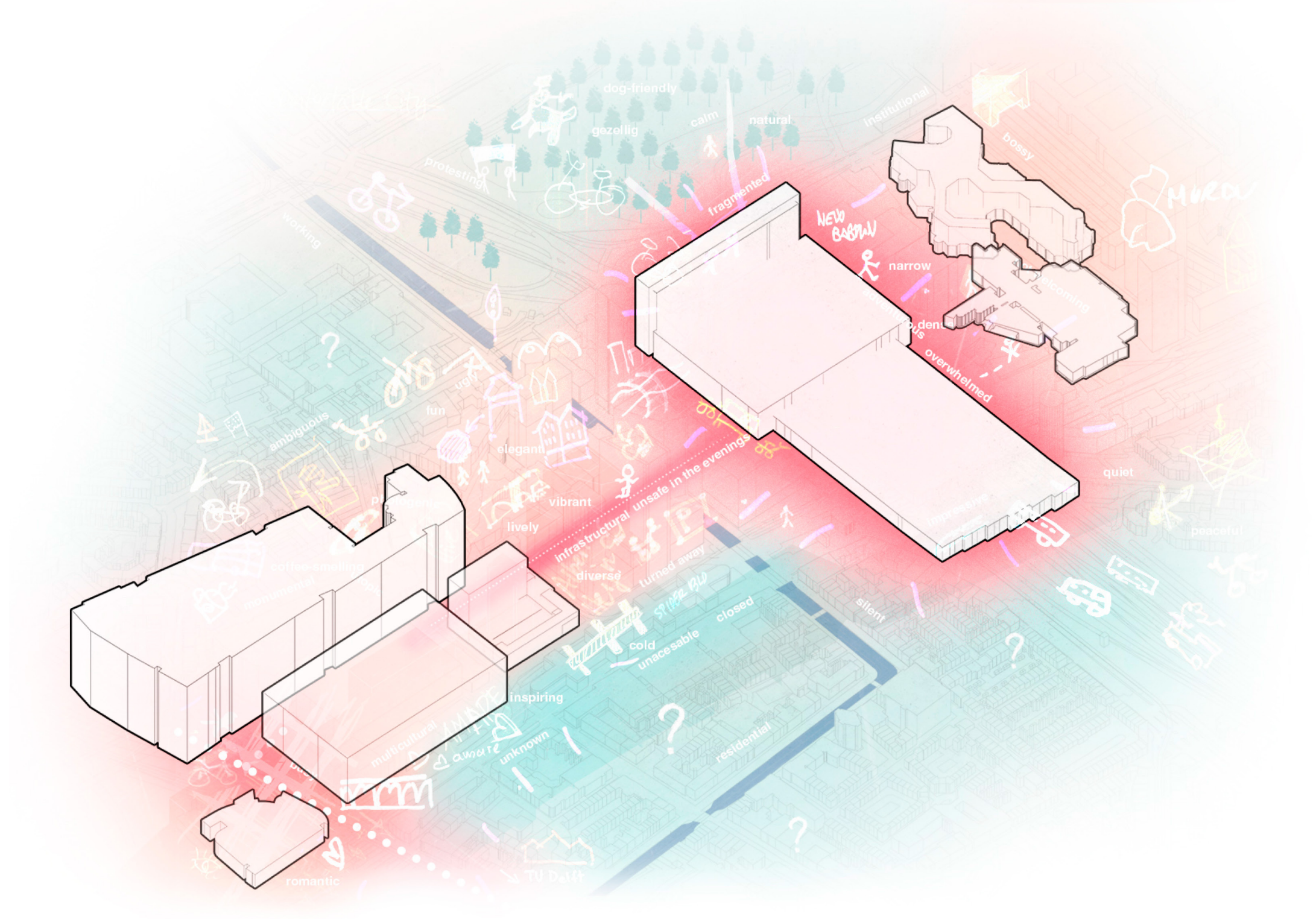
PSYCHOGEOGRAPHICAL RESEARCH

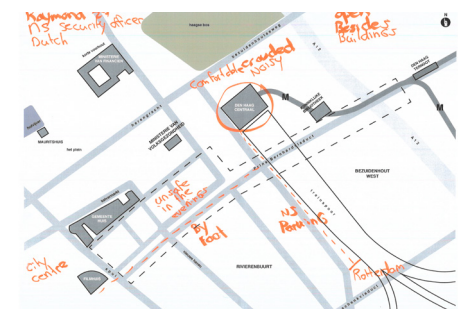
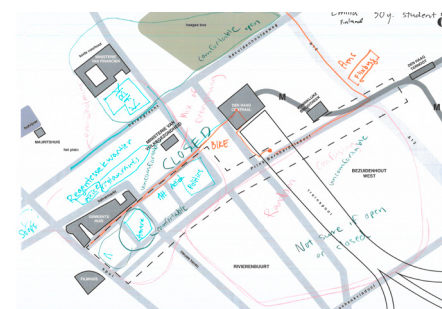
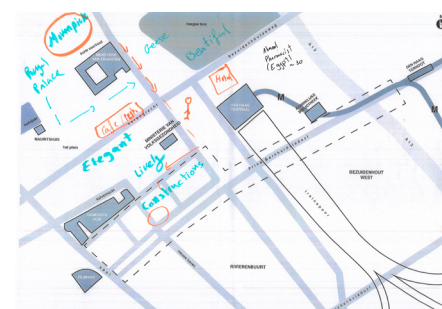
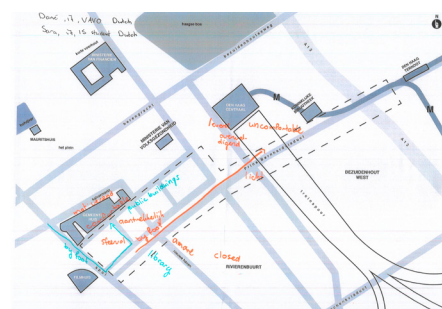
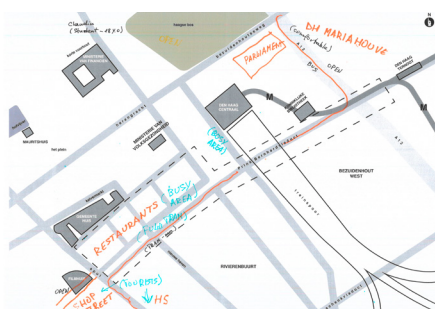
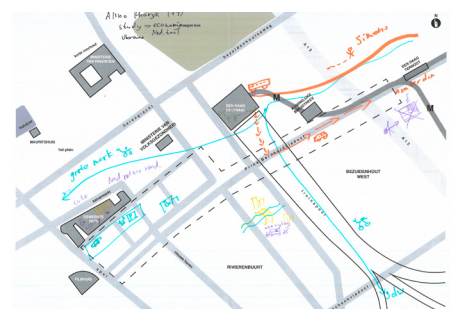
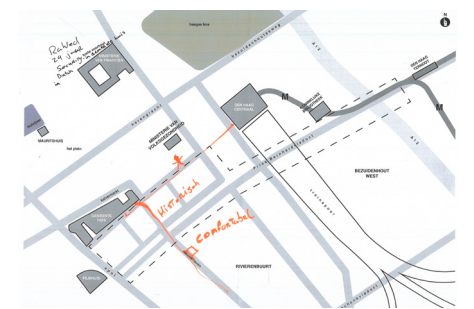
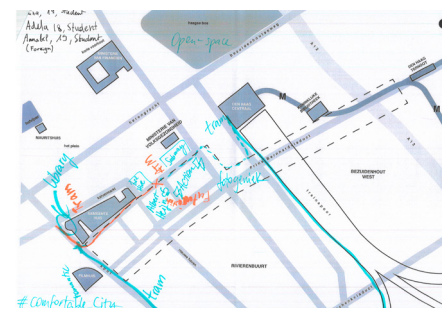
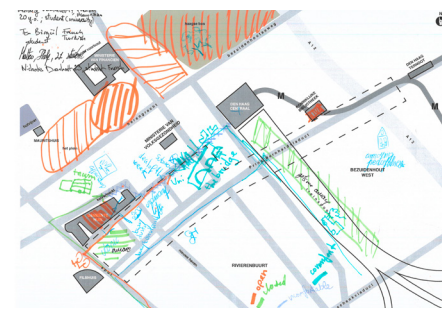
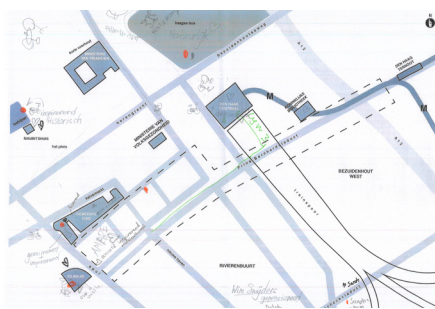
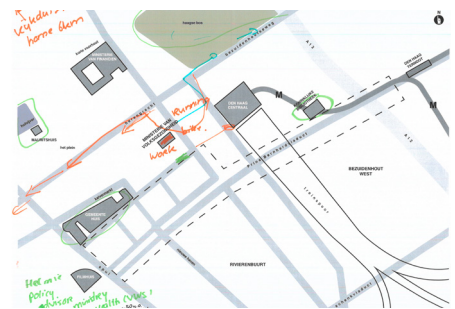
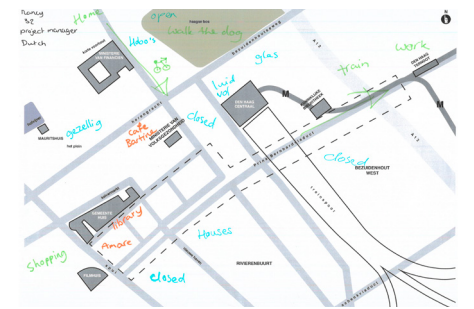
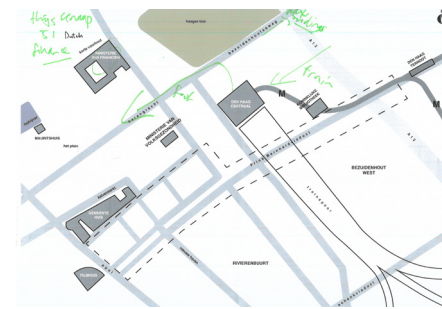
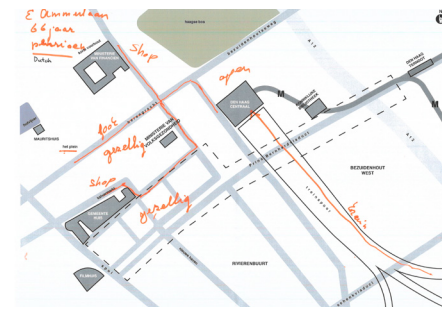
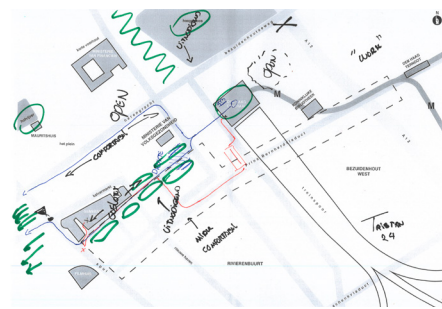
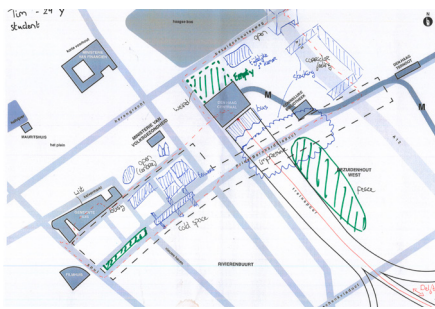
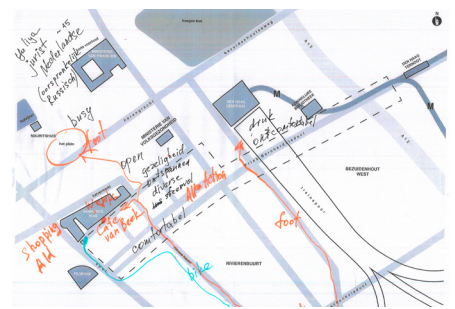
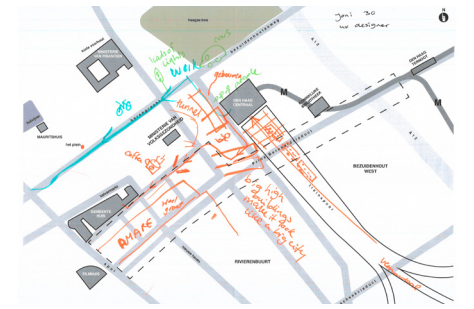
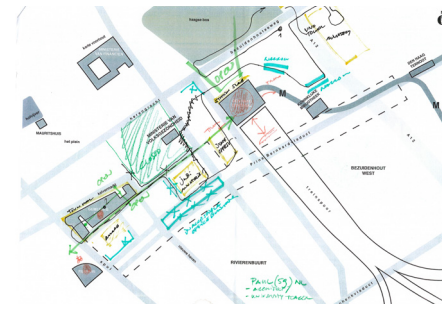
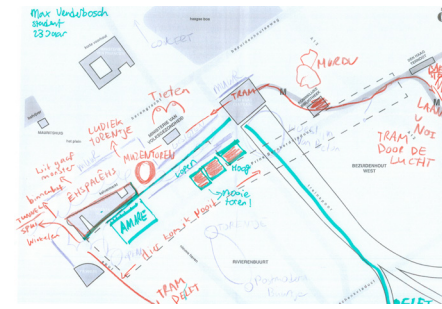
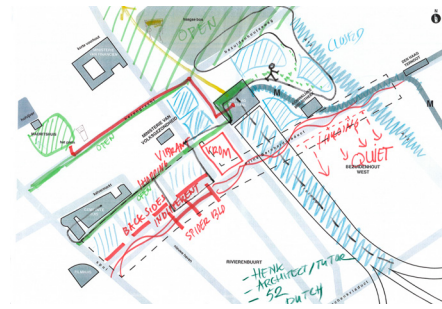
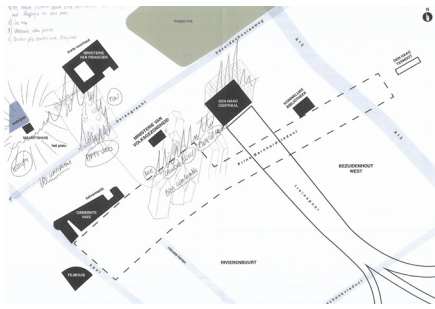
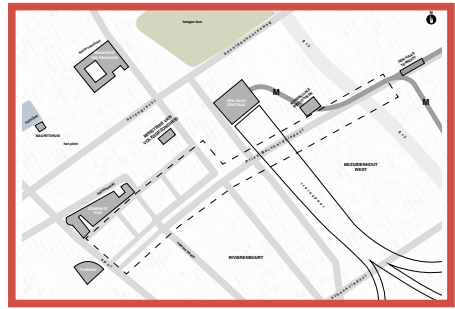
For a map to be more informative than Google Maps, it has to be based on the way people see the space.

A drawing of the map from memory is a projection of the mental model of the territory that can be analysed. Before starting the work on the map, we gathered dozens of such drawings from different groups of people. The result is a collective image, where the shapes are simplified, zones and common patterns can be easily identified, and the size of the most critical objects is deliberately enlarged.



The psychogeographic research resulted in a catalogue of public buildings with open access, which are planned to be connected by a new pedestrian route. The Vertical Campus will become one of the destinations on this route.

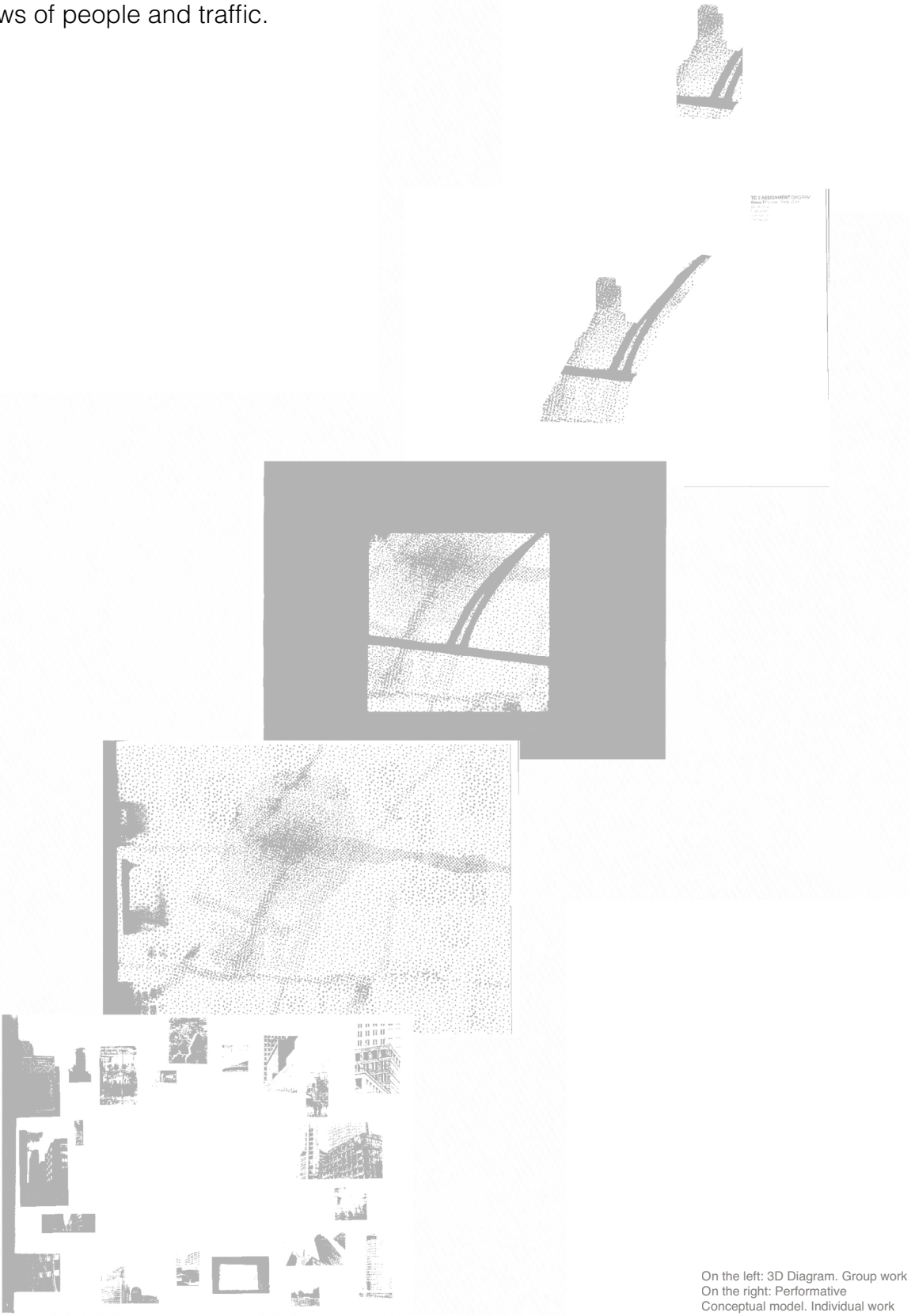
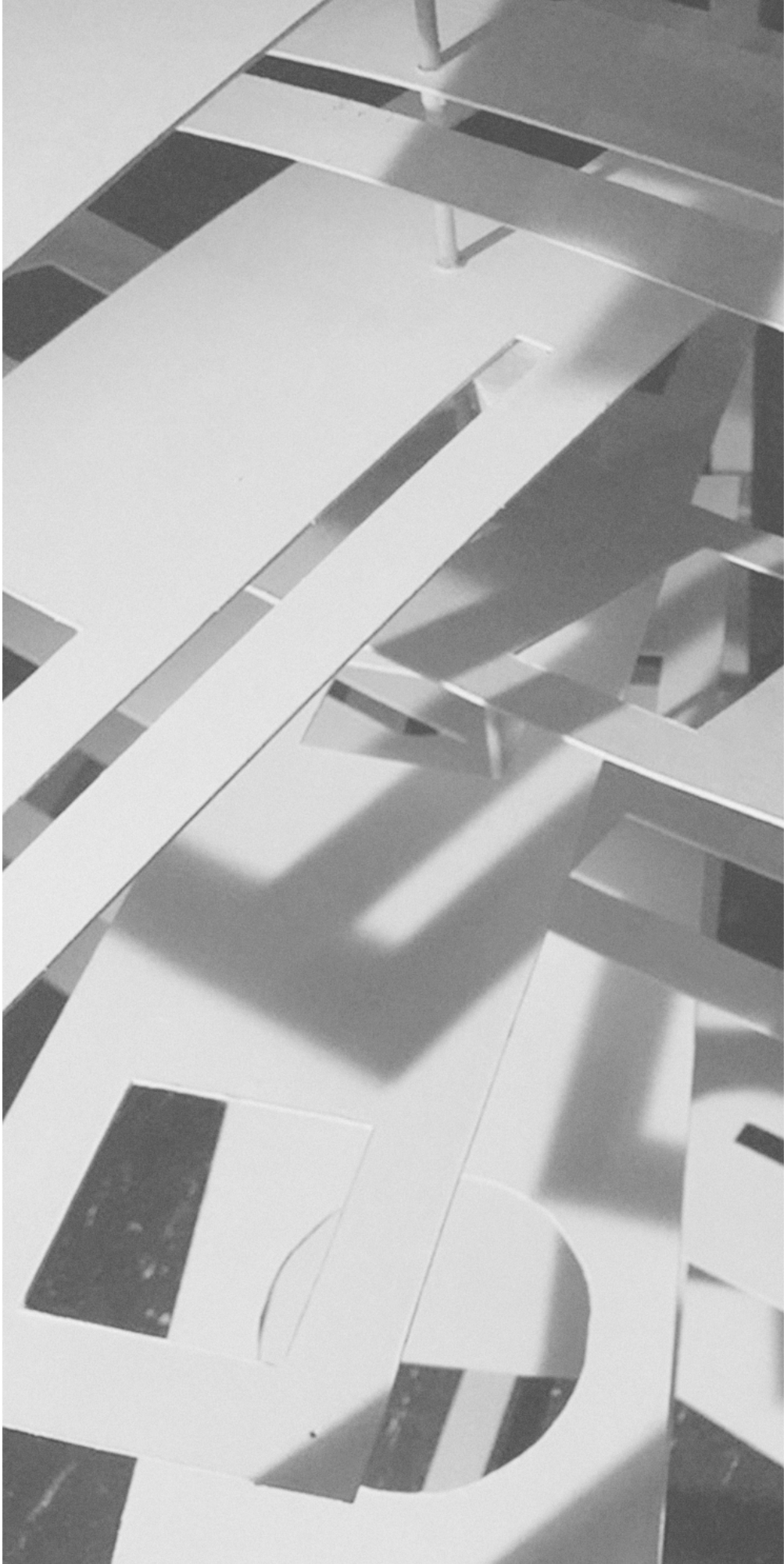
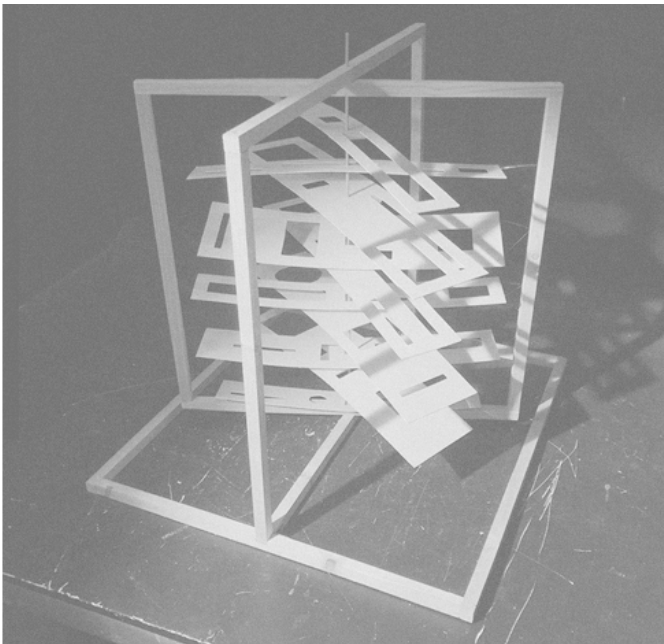
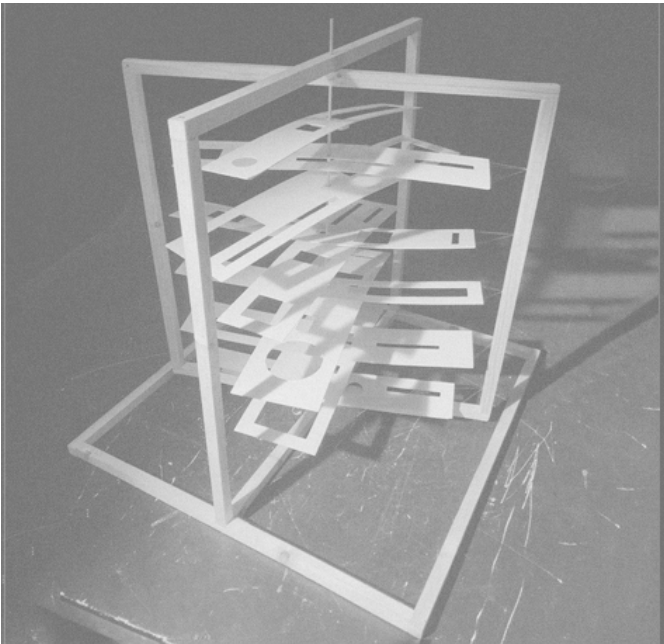
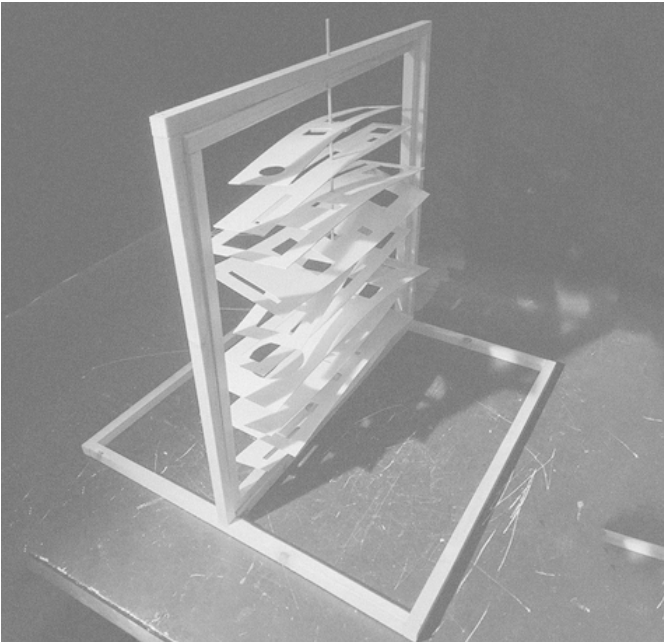




5 seniors
6 working class people
5 students from The Hague
8 architects

THEORY AND DELINEATION

The first Theory and Delineation assignments (3D diagram-booklet and performative conceptual model) were related to reflections on the design site. Its characteristic features are high density, multiple layers and intertwined flows of people and traffic.

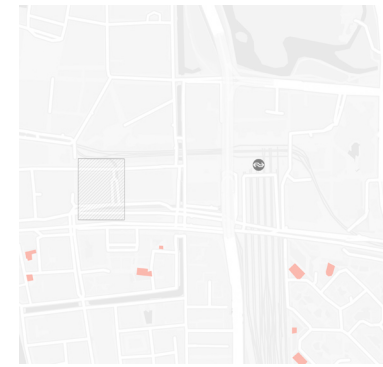


On the left: 3D Diagram. Group work
On the right: Performative
Conceptual model. Individual work

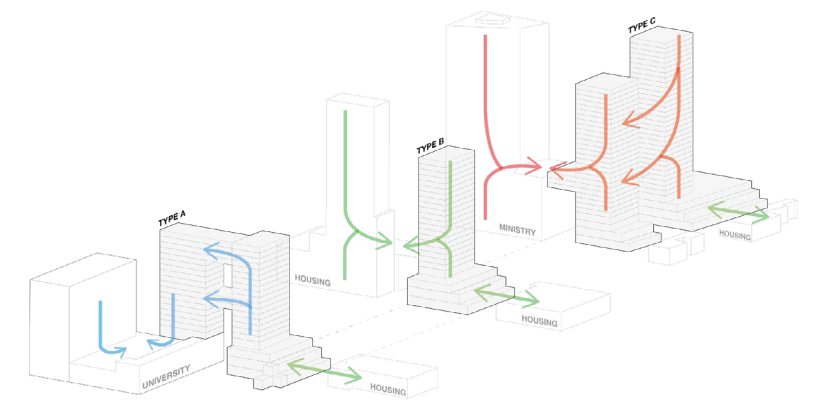
CAPACITY PLAN

The area around The Hague Central Station and the Fly-over infrastructure in particular is characterised by distinct boundaries between separate parts of the city: busy and deserted, with low-rise residential buildings and high-rise ministry buildings, with active pedestrian and car flows. These are not only physical boundaries, but also social and mental ones.

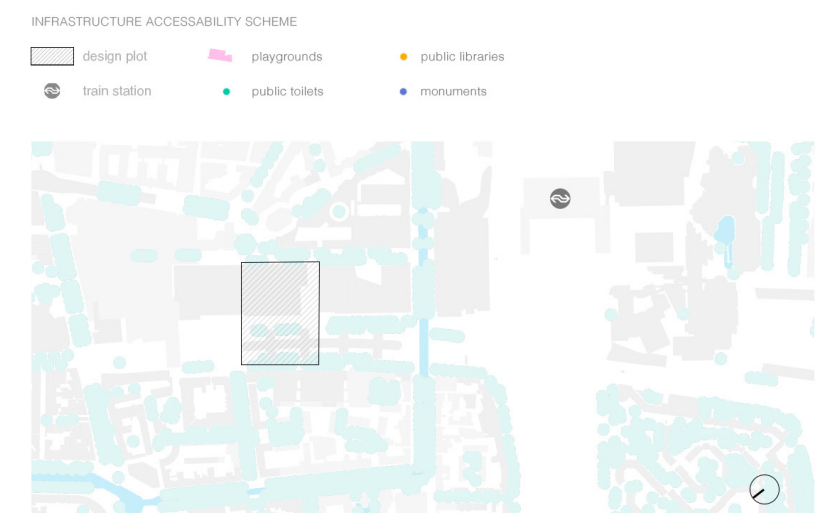
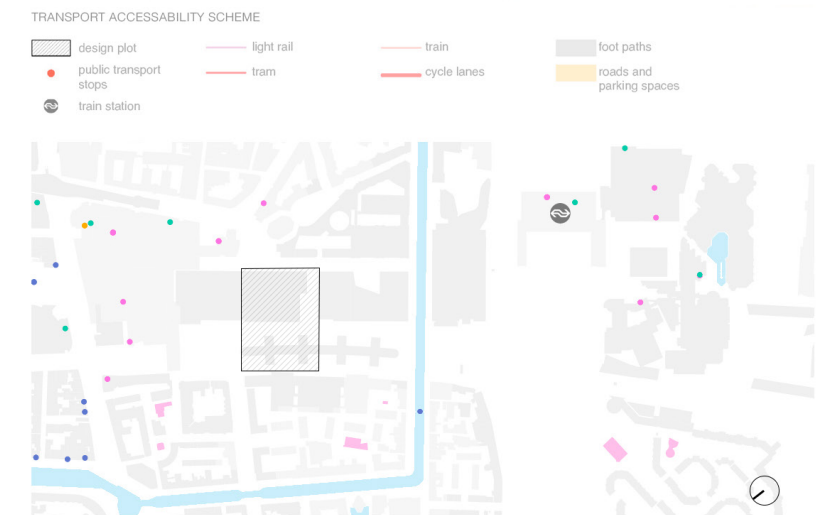
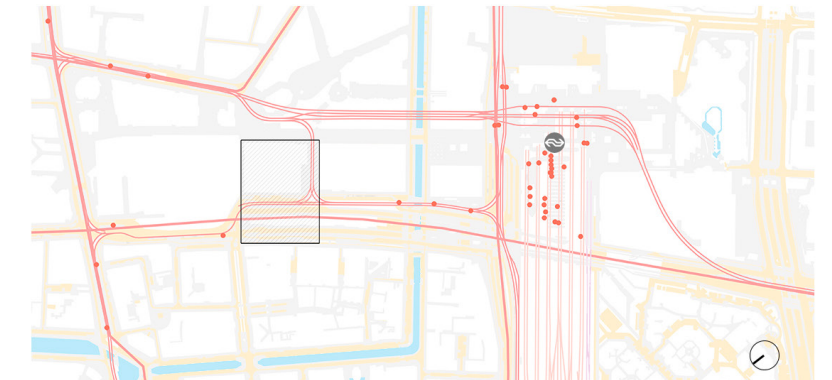
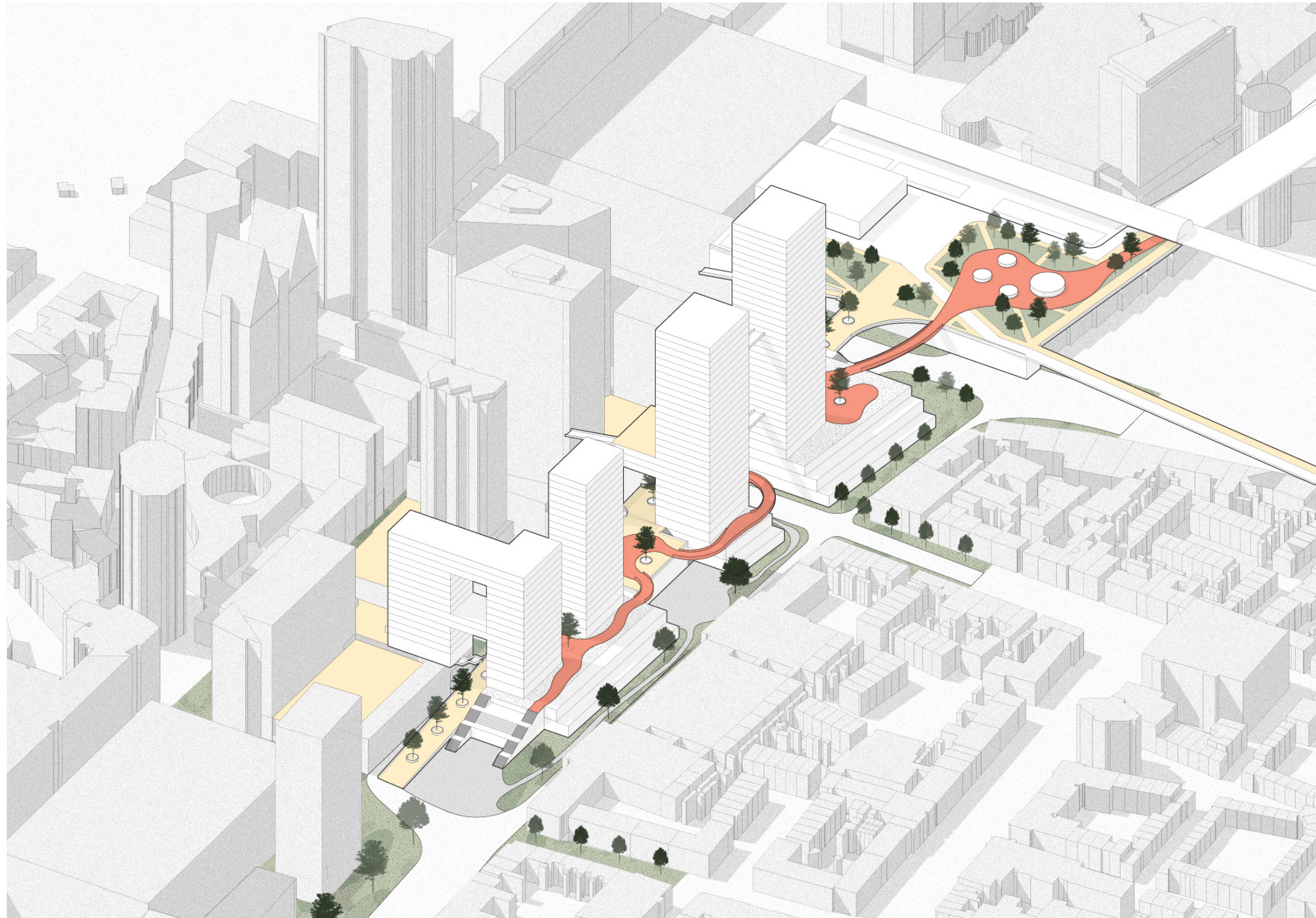
The proposal of the group was a pedestrian route connecting parts of the city and public buildings with open access and the integration of the Vertical Campus complex into this route.

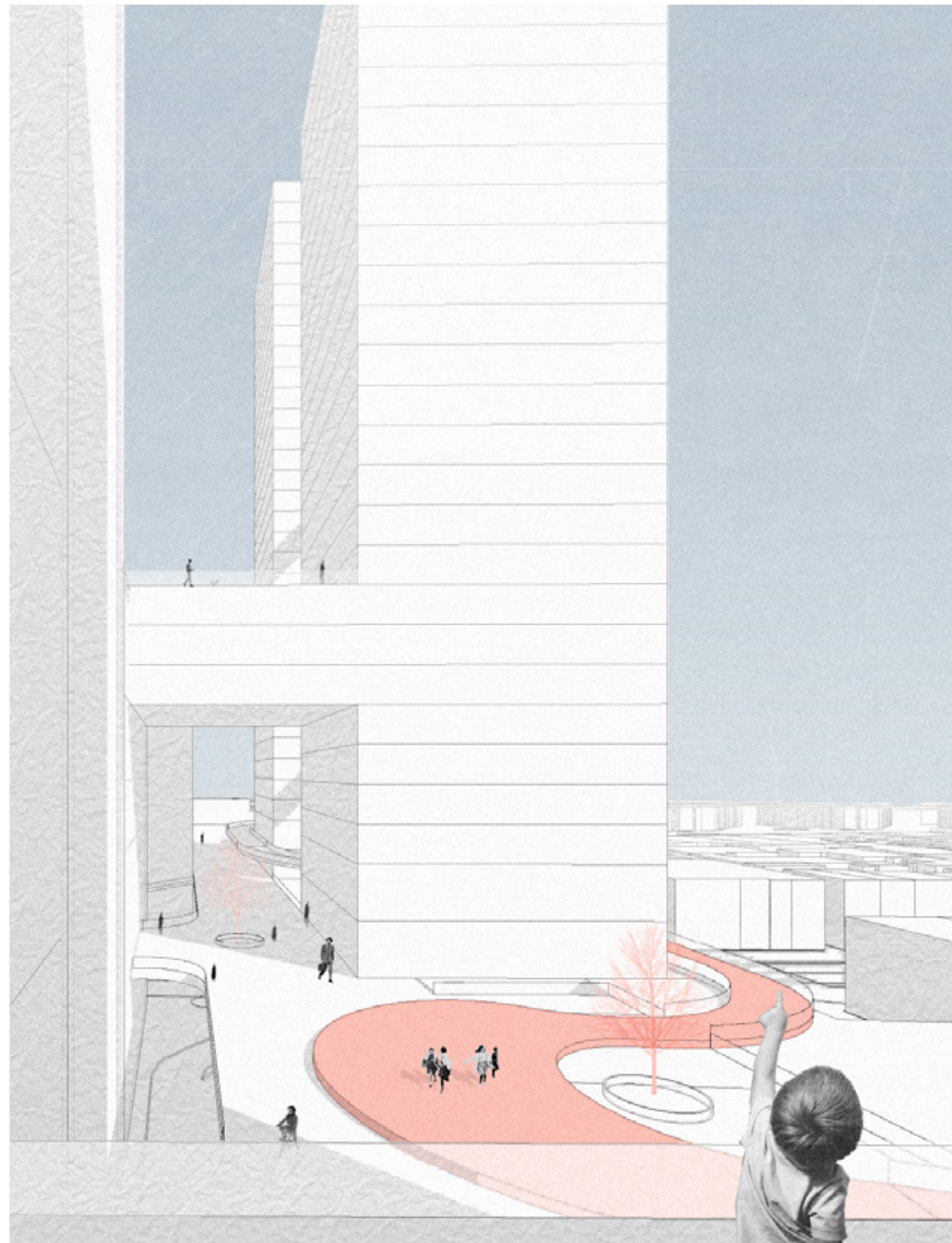


Play and sportgrounds in the design area, the Hague

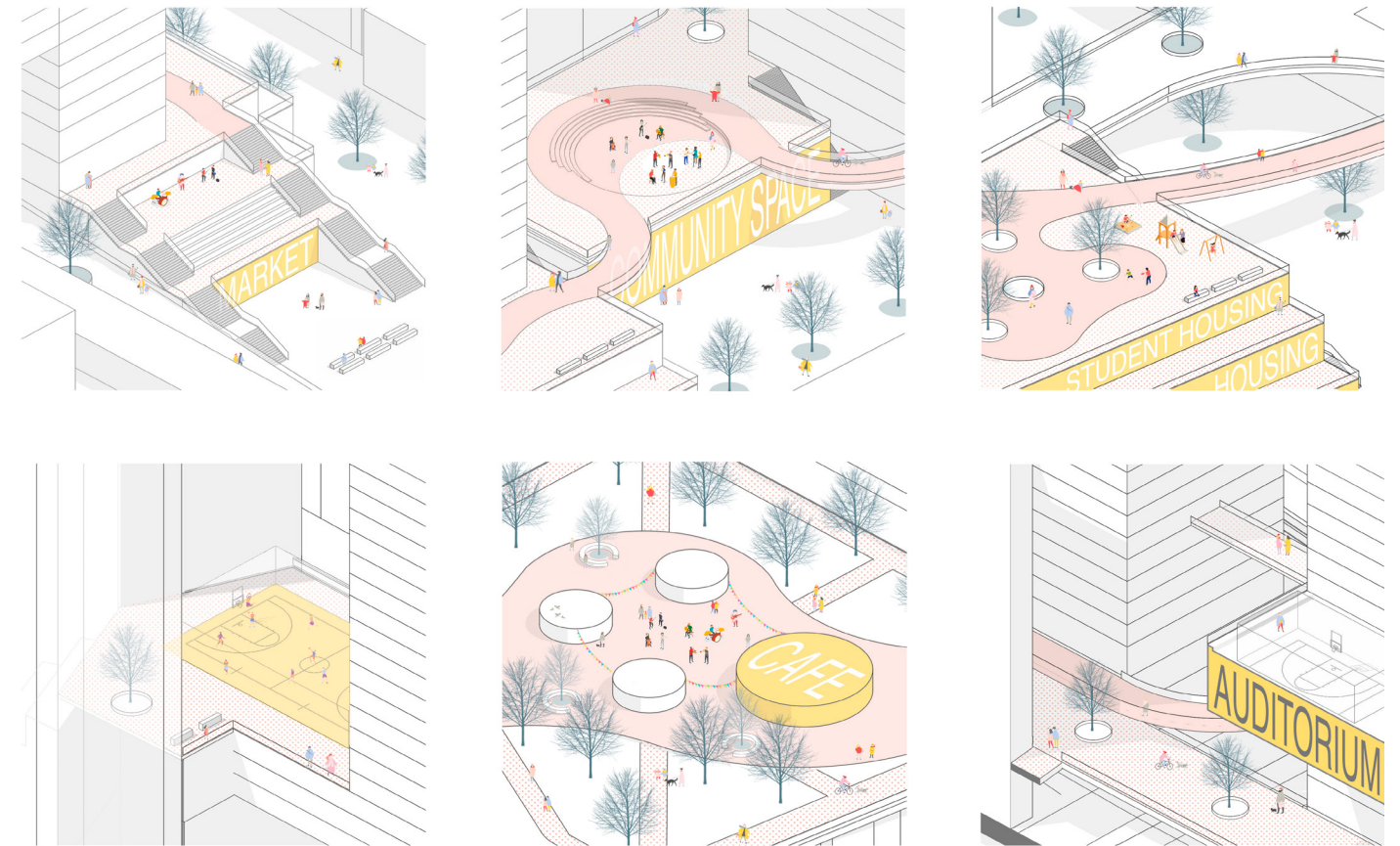


Conceptual diagram

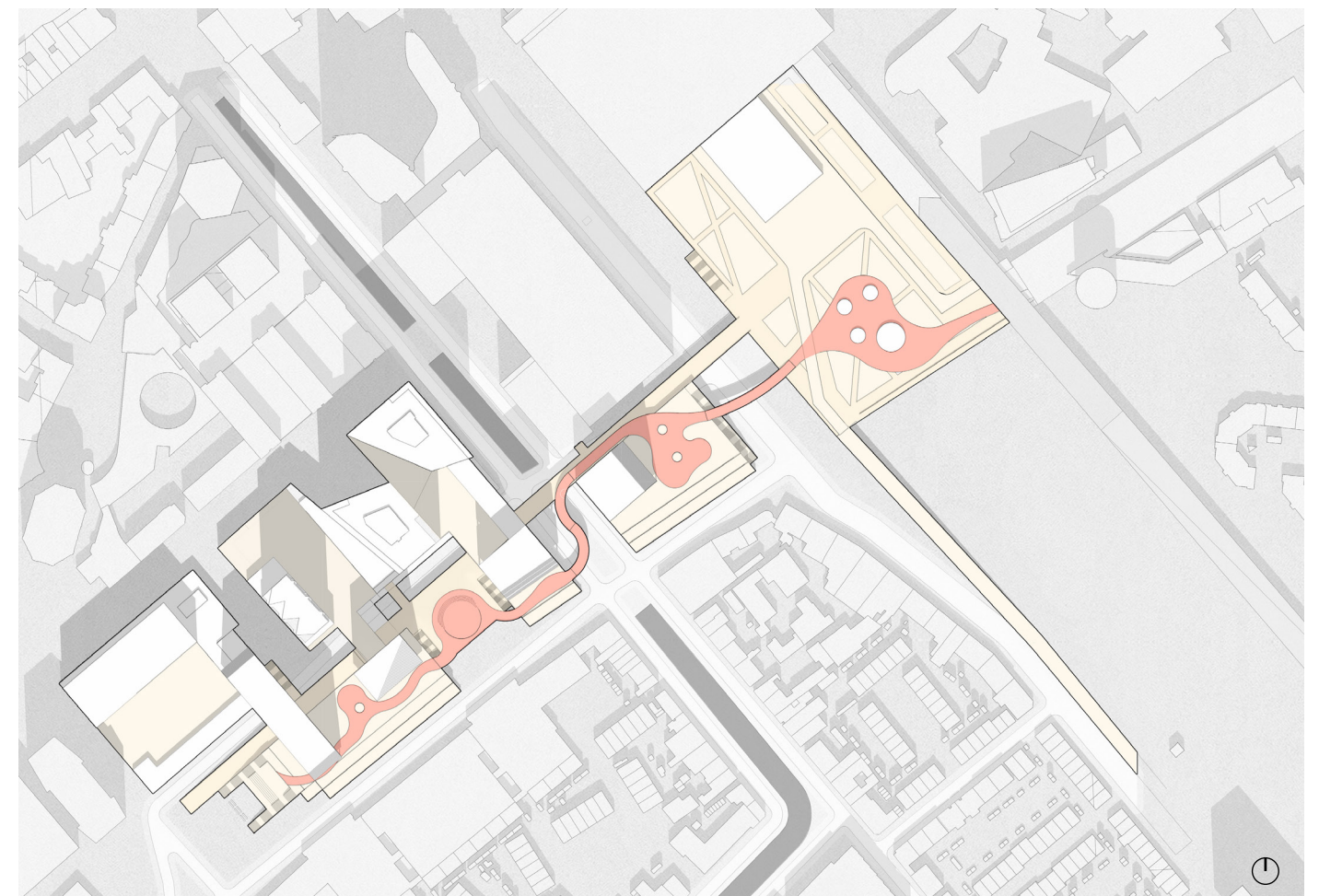




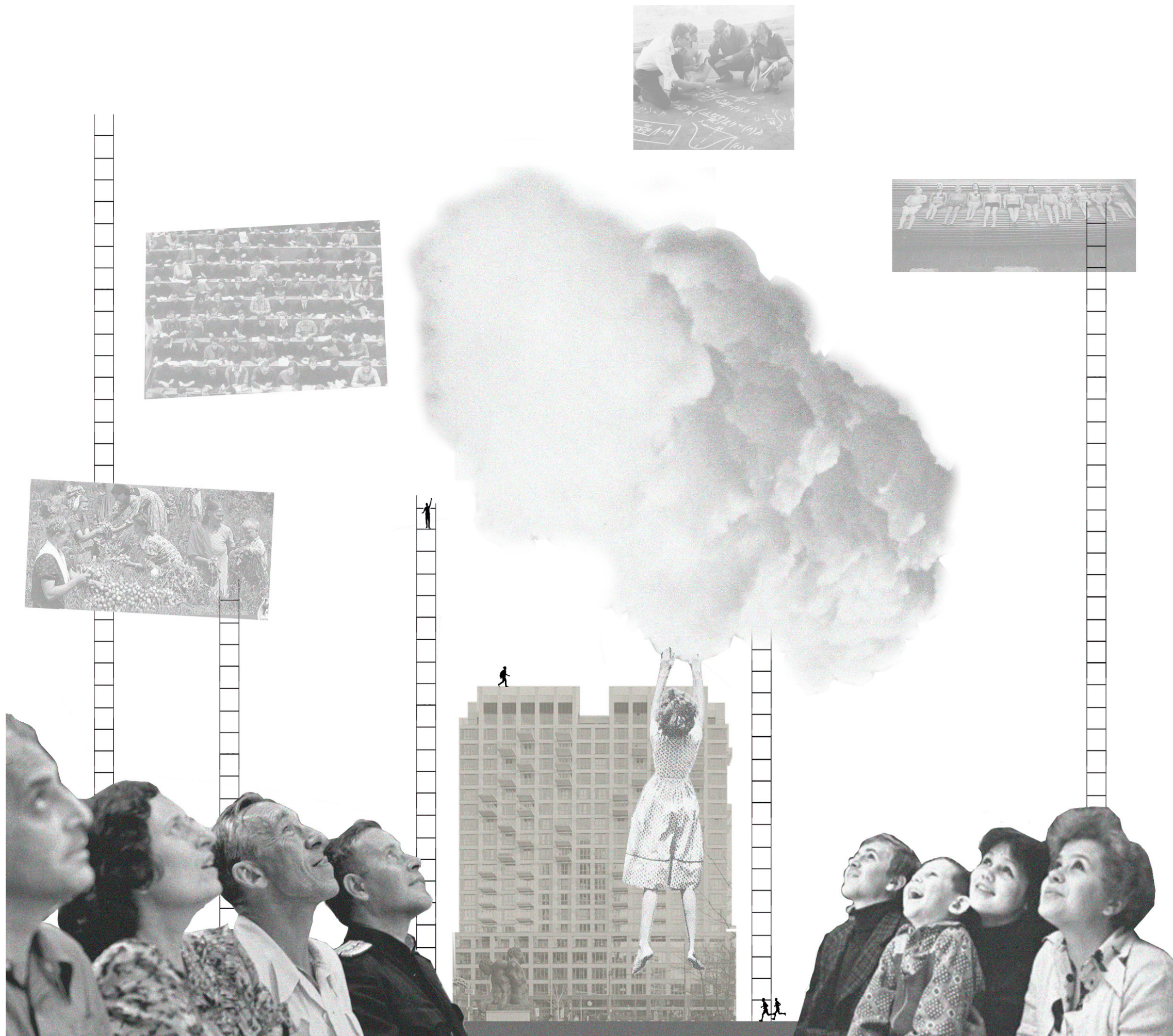
View on the new Vertical Campus complex



Outdoor public spaces included in the route



General plan



P2 INTEGRATED CONCEPTUAL DESIGN

Individual work
Design framework. Scenarios
Multiplicity, hybridity, resilience, and
sustainability concepts

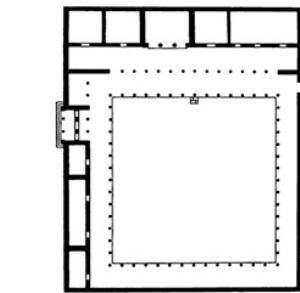
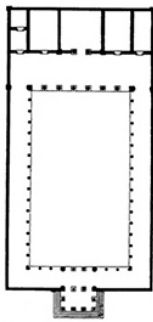
HISTORICAL REVIEW

In Ancient Greece, there was a cult of physical culture as an integral part of the complex education. The Greek gymnasium was a building used for athletic activities, study, and philosophical discussion. Gymnasiums were large architectural complexes that included areas for training and discussion (stoas), athletic wrestling (palaestra), running tracks (paradromis), pools, and fountains.

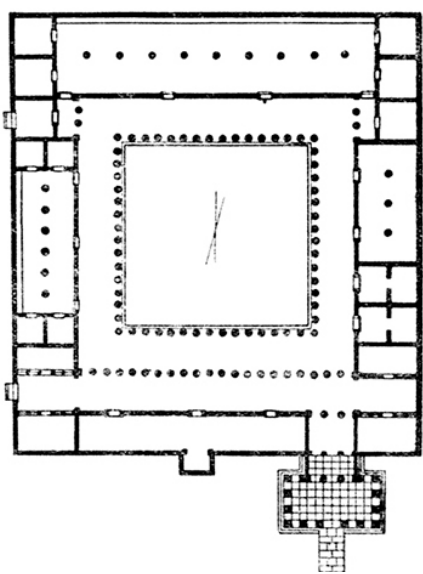
Many centuries later, as cities began to grow upward, physical activity also made its way into high-rise buildings and mixed with other functions. One of the first standard bearers of hybrid high-rise buildings is the Downtown Athletic Club. Metropolitan hybrid culture is engendered there, disseminating buildings

that are seemingly serene and sculptural on the exterior yet on the interior are bustling in a constant state of flux of programmes.

Contemporary researchers are convinced that spaces for physical activity and play on a university campus can not only be presented as separate sports centers but can also be directly integrated into academic building. Changing activities, movement, and play techniques help to acquire information at any age.

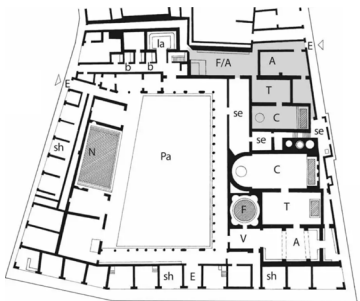


Gymnasium in Priene
Source: https://archvuz.ru/2019_1/3/

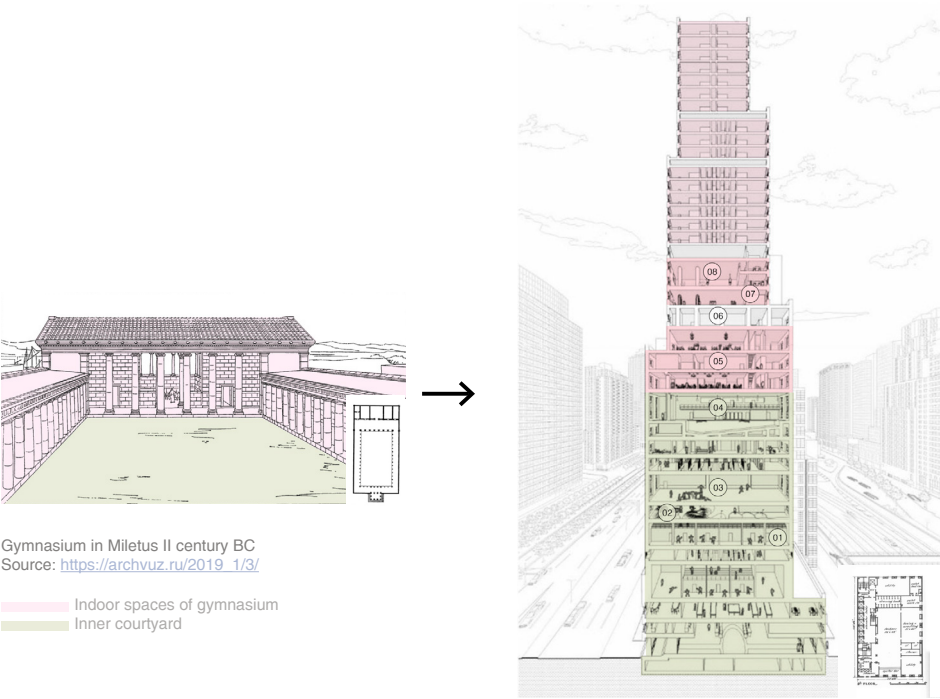


Gymnasium in Epidauros 380-330 B
Source: https://archvuz.ru/2019_1/3/

Gymnasium in Miletus II century BC
Source: https://archvuz.ru/2019_1/3/



Great Palaestra, Pompeii, Greece, VII-VI century BC
Source: <https://coollib.net/b/373268/image>



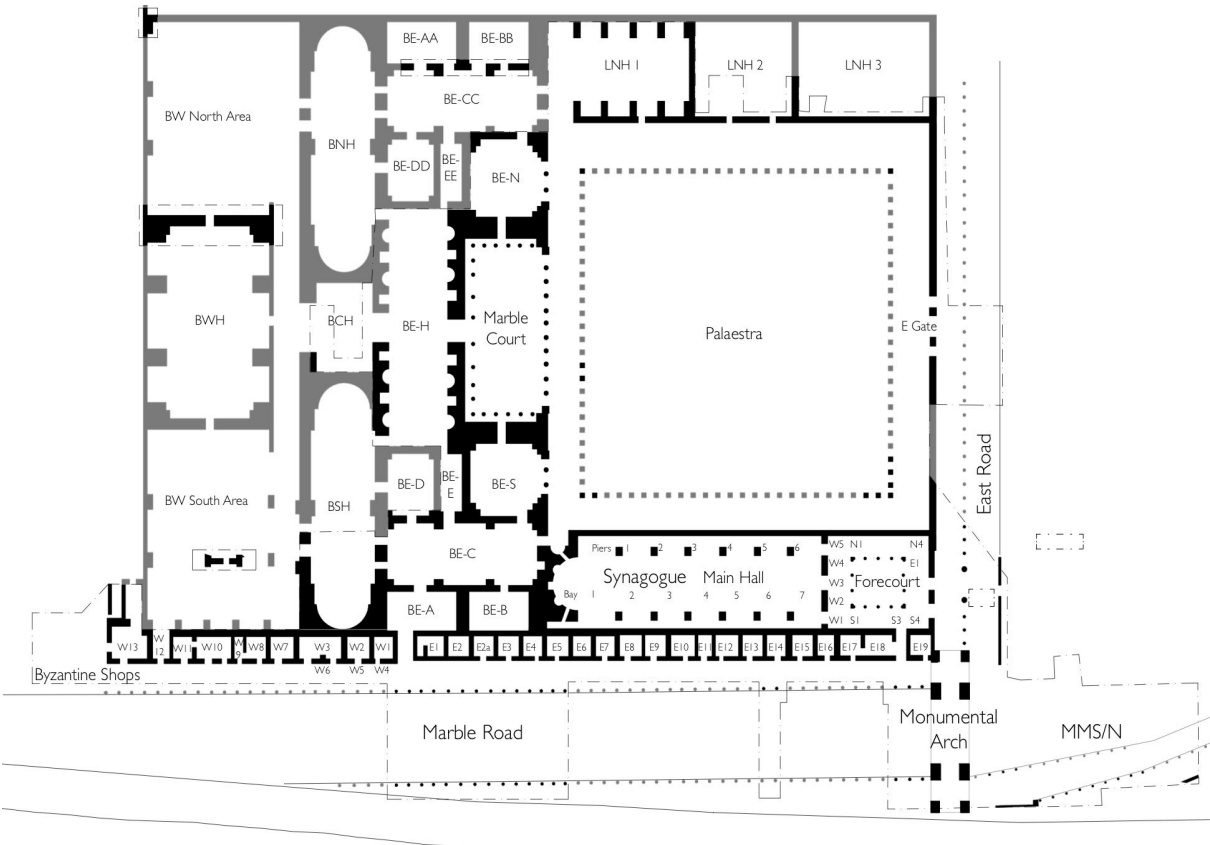
Gymnasium in Miletus II century BC
Source: https://archvuz.ru/2019_1/3/

Indoor spaces of gymnasium
Inner courtyard

Downtown Athletic Club Building, 1929-1931, Starett and van Vleck, New York, US
Section. 01- squash courts, 02- golf, 03- gymnasium, 04- swimming pool, 05- restaurants, 06- roof garden, 07- lounge, 08- private restaurants
Source: 50 Hybrid buildings. Catalogue on the Art of Mixing Uses, 2020

Hotel
Retail
Sports

?



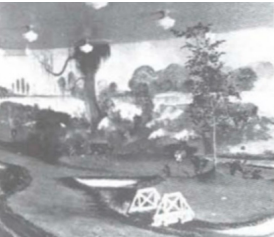
The Bath-Gymnasium complex at Sardis, late II- early III century AD, Sardis, Turkey
Source: [https://commons.wikimedia.org/wiki/File:The_Bath-Gymnasium_complex_at_Sardis_...late_2nd_-_early_3rd_century_AD_Sardis_Turkey_\(16391012853\).jpg](https://commons.wikimedia.org/wiki/File:The_Bath-Gymnasium_complex_at_Sardis_...late_2nd_-_early_3rd_century_AD_Sardis_Turkey_(16391012853).jpg)

Downtown Athlitic Club

Starett and van Vleck
New York City (US) 1929-1931. Built

Site data
Plot area: 1 020 m²
Gross floor area: 25 220 m²
(23 411 m²)

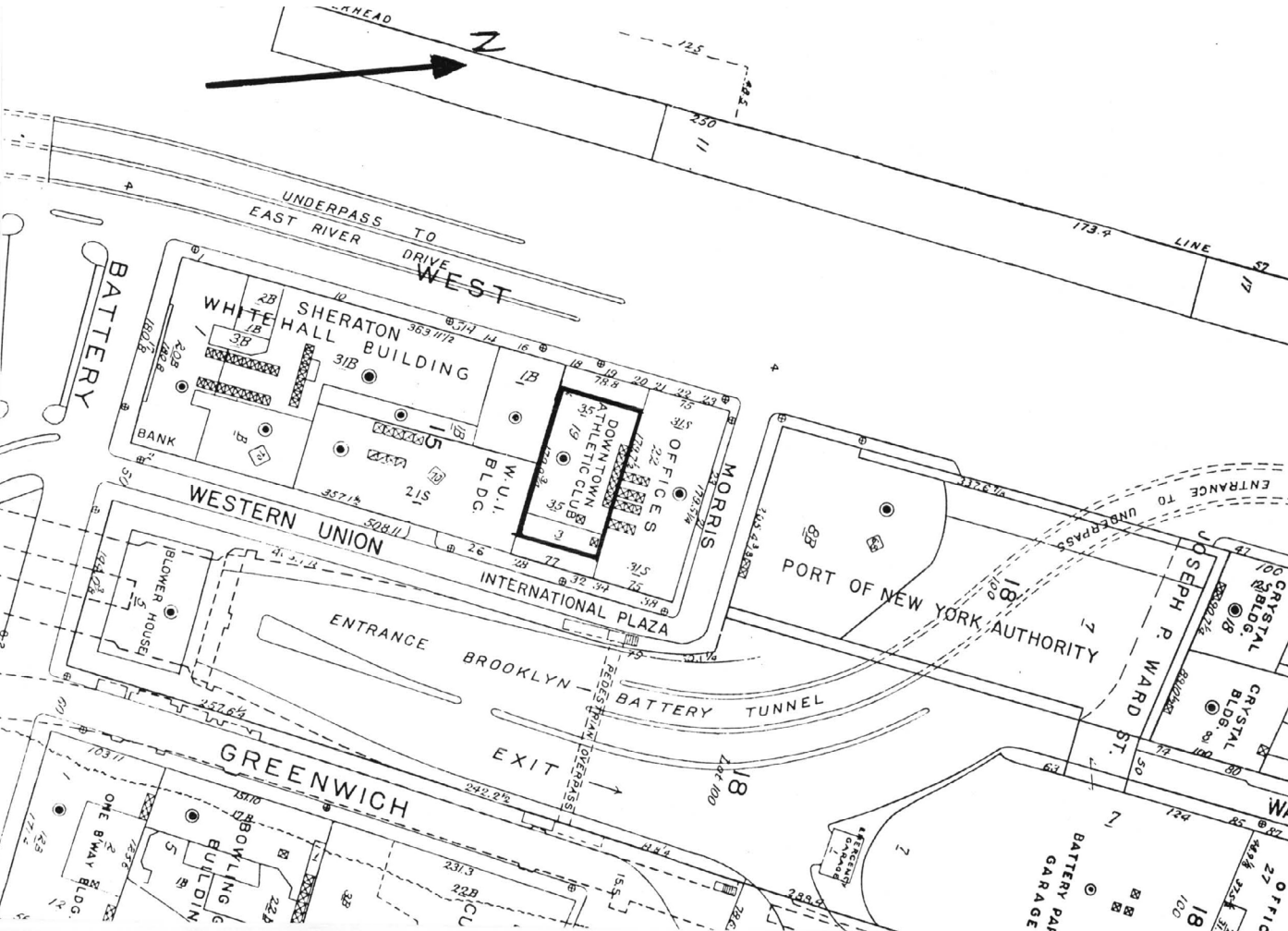
Density indicators
Floor area ratio: 22.95
Covered area: 100%



12th floor - swimming pool at night and 7th floor - interior golf course
Source: <http://transit-city.blogspot.com/2018/05/quand-le-sport-avait-une-ambition.html>



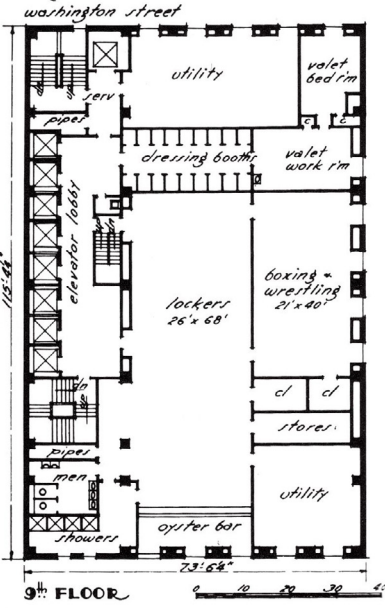
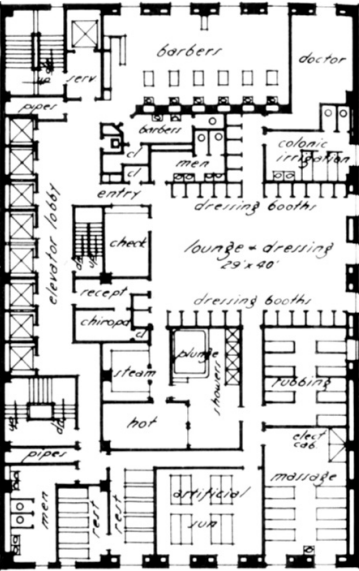
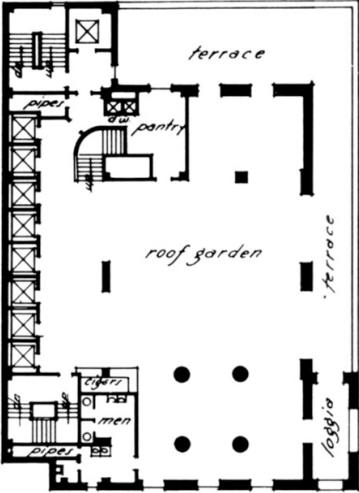
Section. 01- squash courts, 02- golf, 03- gymnasium, 04- swimming pool, 05- restaurants, 06- roof garden, 07- lounge, 08- private restaurants
Source: 50 Hybrid buildings. Catalogue on the Art of Mixing Uses, 2020

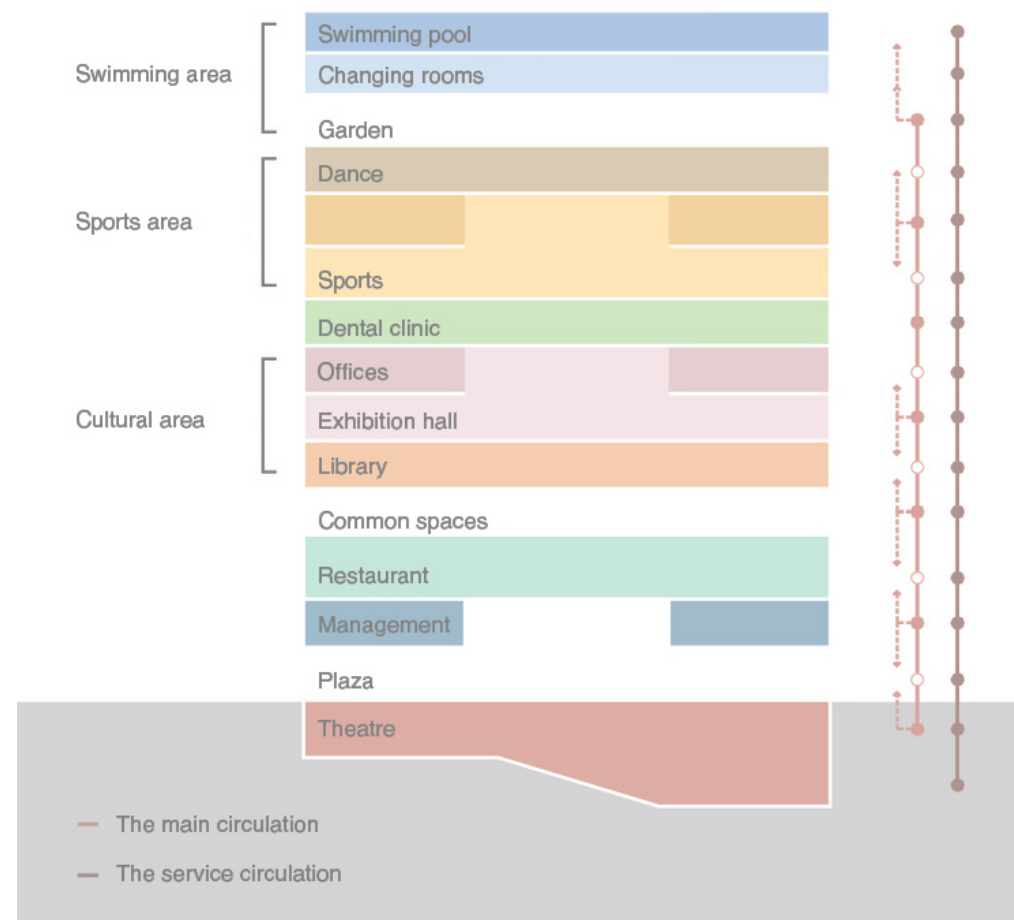


Downtown Athletic Club Building. 19 West Street (aka 18-20 West Street and 28-32 Washington Street), Manhattan. Source: Sanborn Manhattan Landbook, 1999-2000, Plate 2



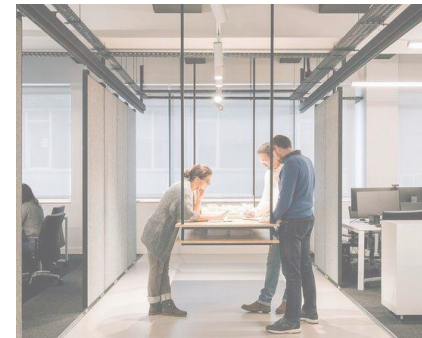
Washington Street facade and plans (9th, 10th and 17th floor)
Source: <https://mavink.com/explore/Downtown-Athletic-Club-Rem-Koolhaas>





Sesc 24 de Maio / Paulo Mendes da Rocha + MMBB Arquitetos, 2017
Source: <https://www.archdaily.com/893553/sesc-24-de-maio-paulo-mendes-da-rocha-plus-mmbb-arquitetos>

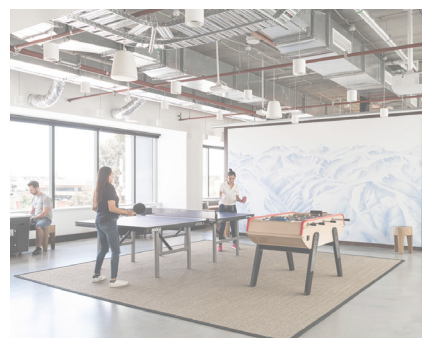
S



Facilities for physical activity in WeWork coworking spaces all around the world
Source: <https://www.wework.com/en-GB/locations>



Facilities for physical activity in WeWork coworking spaces all around the world
Source: <https://www.wework.com/en-GB/locations>



Facilities for physical activity in WeWork coworking spaces all around the world
Source: <https://www.wework.com/en-GB/locations>

M



Auburn University Recreation & Wellness Center at Auburn University, 360 Architecture, Auburn, US, 2013
Source: <https://stock.feinknopf.com/gallery/Auburn-University-Recreation-Wellness-Center/G0000QjhlBslJV8/3/>



White Collar Factory, Allford Hall Monaghan Morris, London, UK, 2017
Source: <https://www.ahmm.co.uk/projects/office/white-collar-factory/>

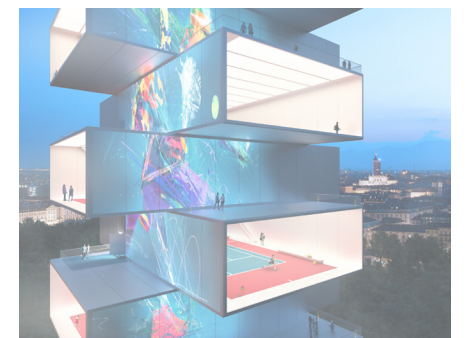


CopenHill, Bijlark Ingels Group, Copenhagen, Denmark, 2019
Source: <https://big.dk/>

L



Empire Tower, Meganom, 2013 (competition).
Source: <https://meganom.team/ru/project/imperia-tower/>



Playscraper, 2020, CRA-Carlo Ratti Associati with Italo Rota (concept).
Source: <https://carloratti.com/project/21816/>



Sports and Cultural complex, Malley, Switzerland, 2021 (competition)
Source: <http://mikoustudio.com/projects/sports-and-cultural-complex-in-malley/>

THEORY AND DELINEATION

The photomontage, analogue collages and zine relate to the topic of the research - the relationship between physical and mental activity.

- 1. Play is free, is in fact freedom.
- 2. Play is not «ordinary» or «real» life.
- 3. Play is distinct from «ordinary» life both as to locality and duration.
- 4. Play creates order, is order. Play demands order absolute and supreme.
- 5. Play is connected with no material interest, and no profit can be gained from it.

Johan Huizinga

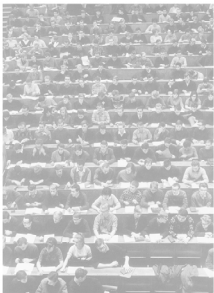
Photomontages



COMPETITIVENESS AND GROWTH POTENTIAL



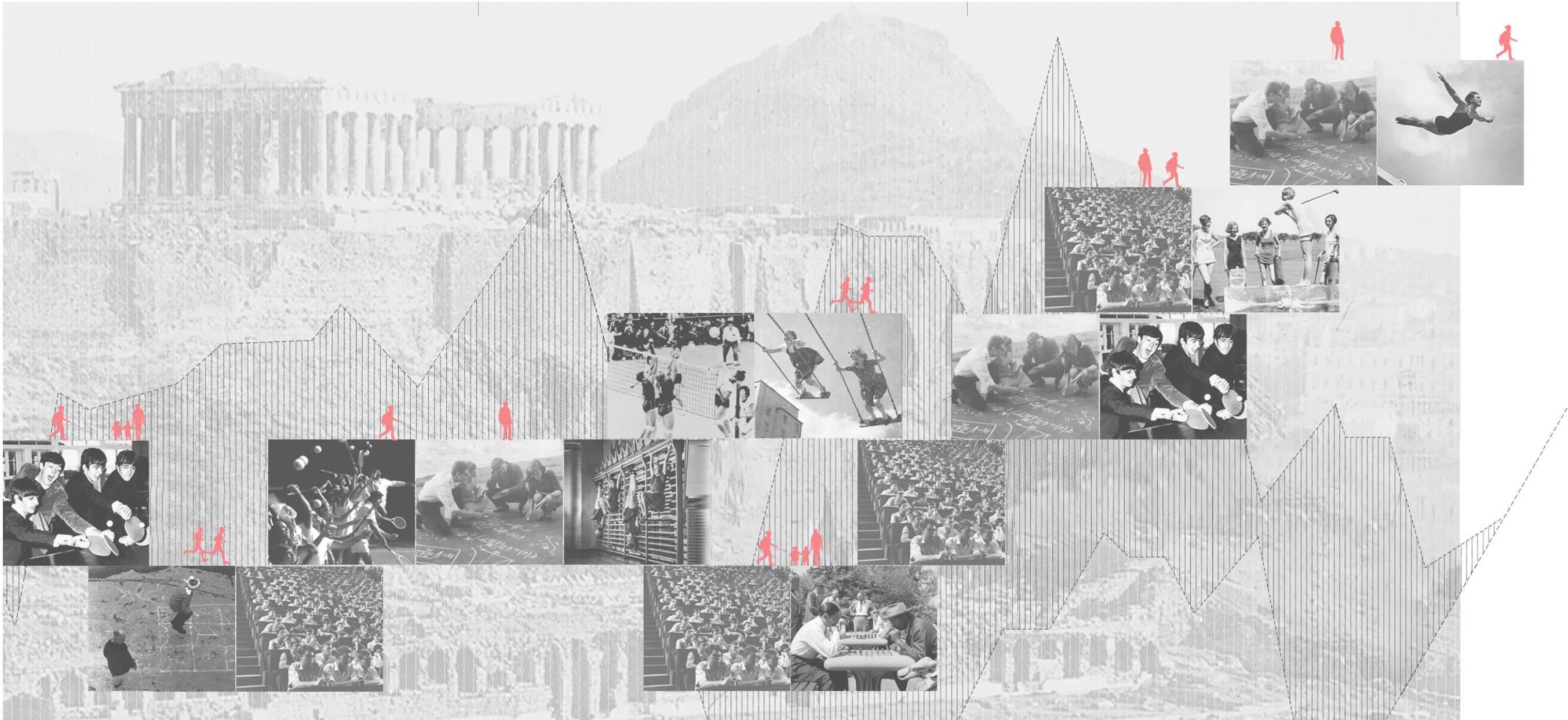
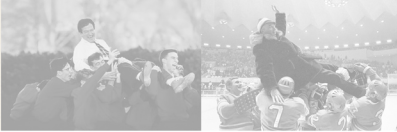
LEADERSHIP AND EXCITEMENT



PUBLICNESS AND SPECTACULARITY



STATICS AND DYNAMICS



A part of zine



2.5 D collage



Analogue collage



Analogue collage

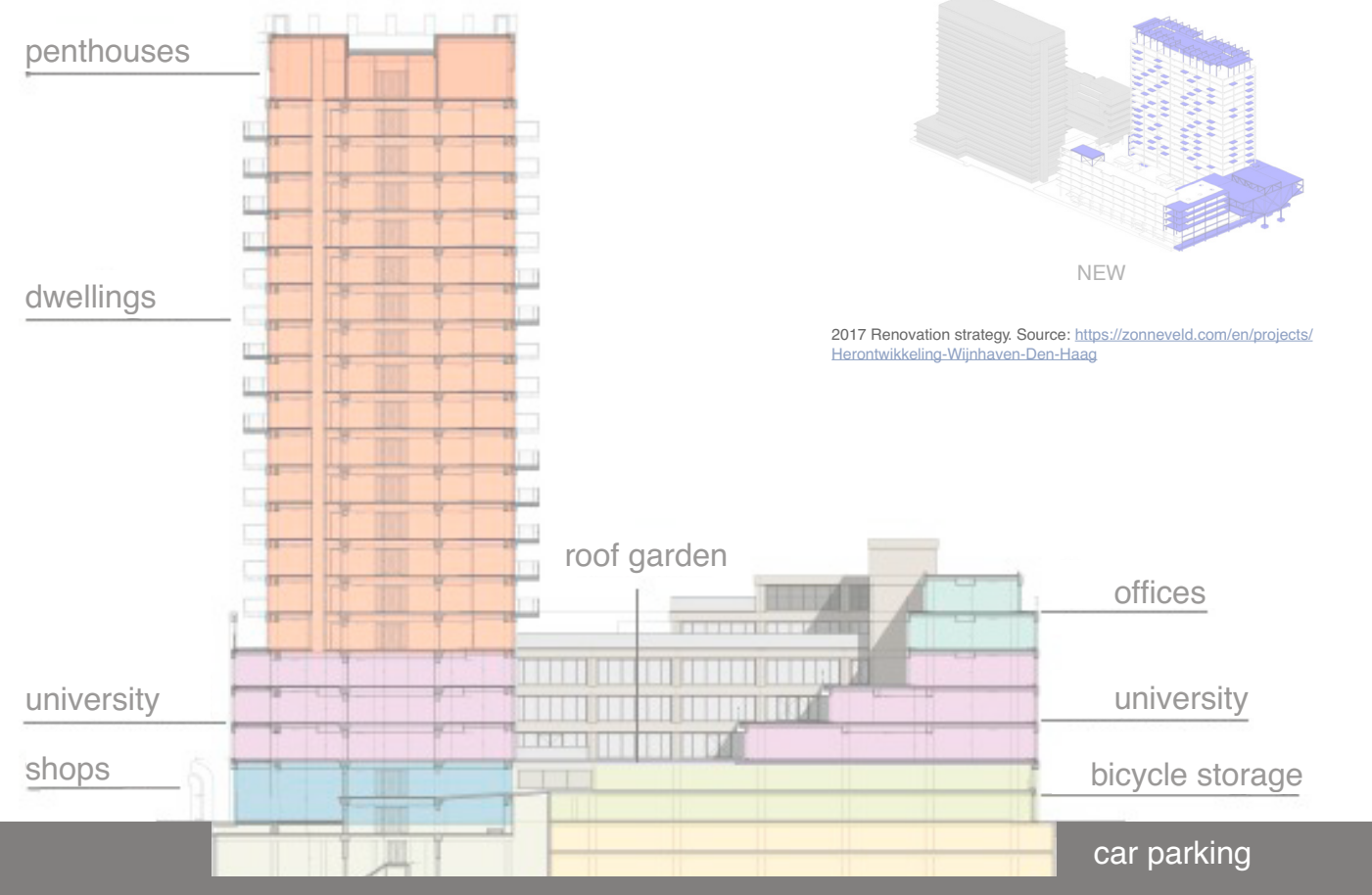
LEIDEN UNIVERSITY BUILDING, WIJNHAVEN

Original design and construction:
Architecten bureau lucas & niemeijer,
1972-1978

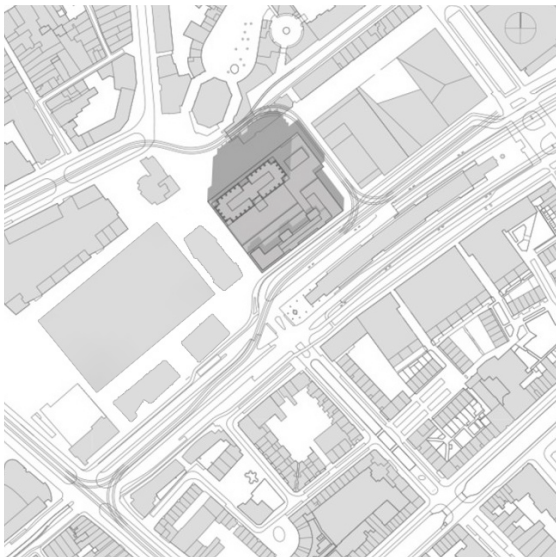
Renovation project (architecture):
Geurts and Schulze, 2014-2017

Renovation project (interiors):
Studio Leon Thier, 2017

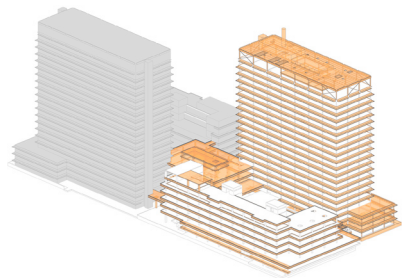
The building originally was a part of the Ministry of the Interior and Kingdom Relations complex and then one of the largest office transformations in the Netherlands took place here. The existed complex was divided into two building blocks. One of them was transformed into the multifunctional centre.



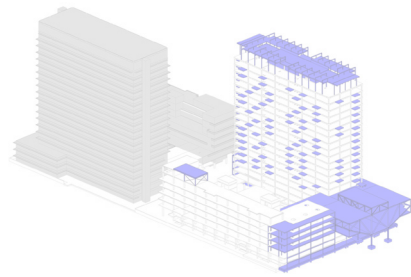
Functional Section. Source: <https://architizer.com/idea/2069353/>



Site plan. Source: <https://www.geurst-schulze.nl/herbestemming/wijnhavenkwartier-den-haag/>



DEMOLITION



NEW

2017 Renovation strategy. Source: <https://zonneveld.com/en/projects/Herontwikkeling-Wijnhaven-Den-Haag>



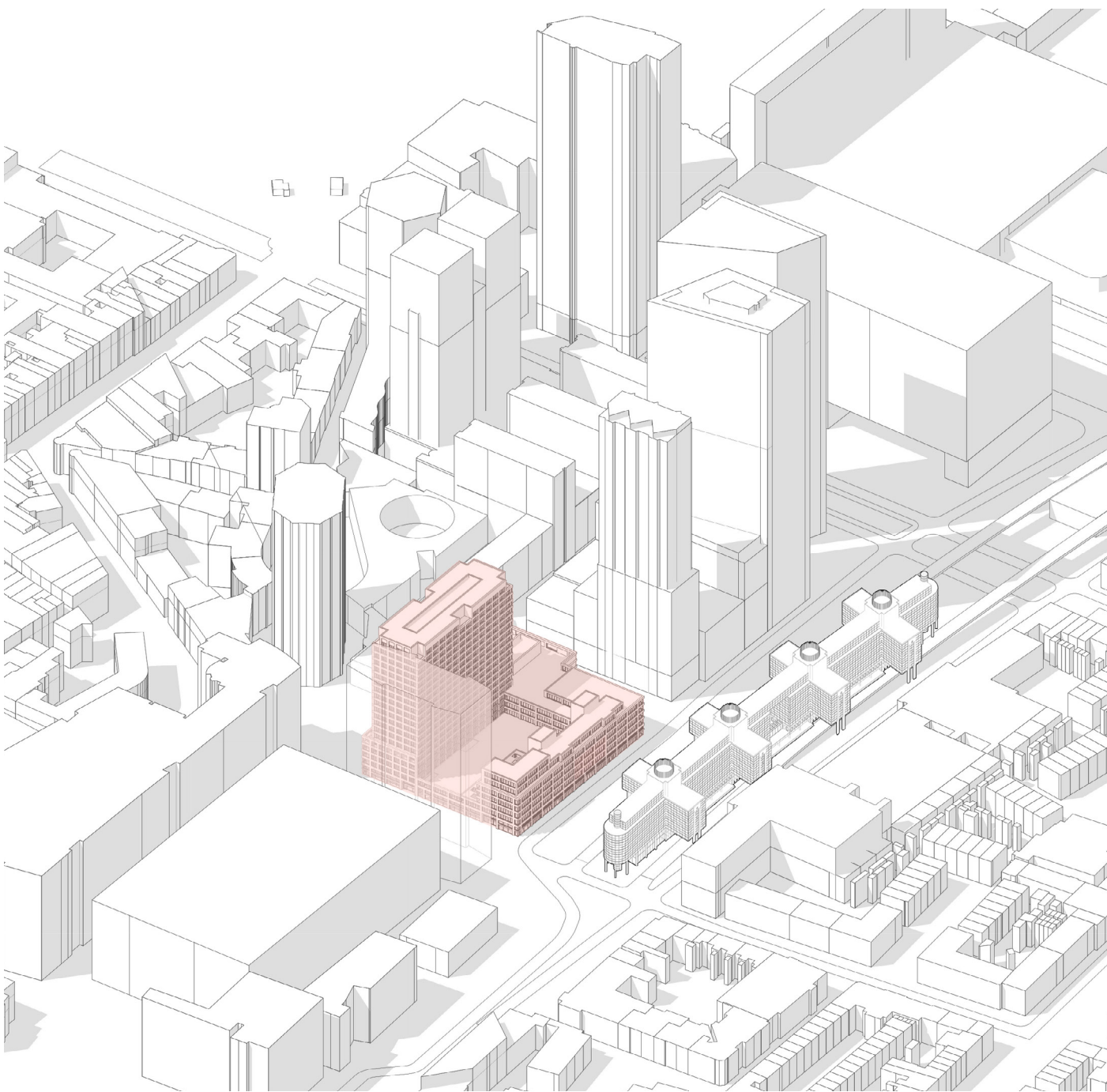
View from the Turfmarkt street. Source: <https://www.geurst-schulze.nl/herbestemming/wijnhavenkwartier-den-haag/>



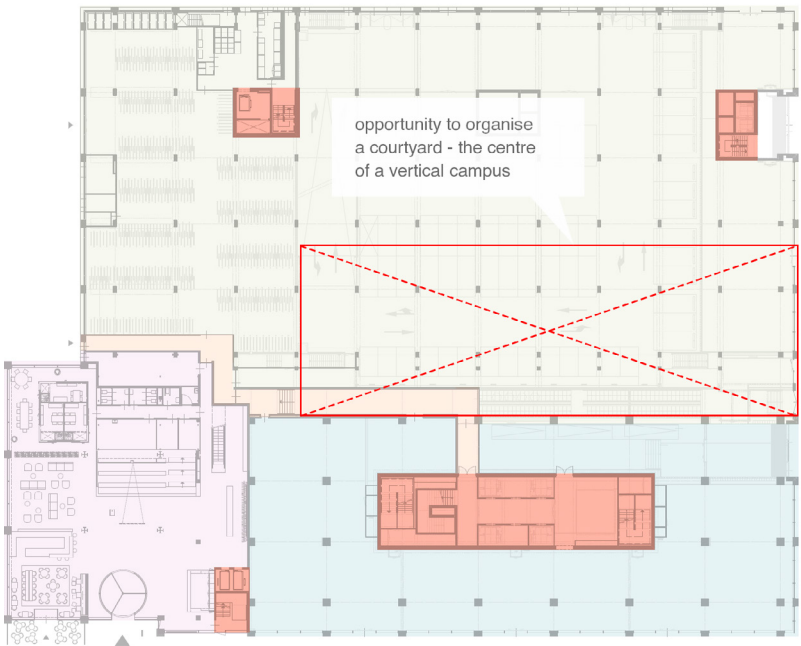
Surrounding buildings. Terminal Zuid. Source: <https://www.geurst-schulze.nl/herbestemming/wijnhavenkwartier-den-haag/>

DESIGN FRAMEWORK

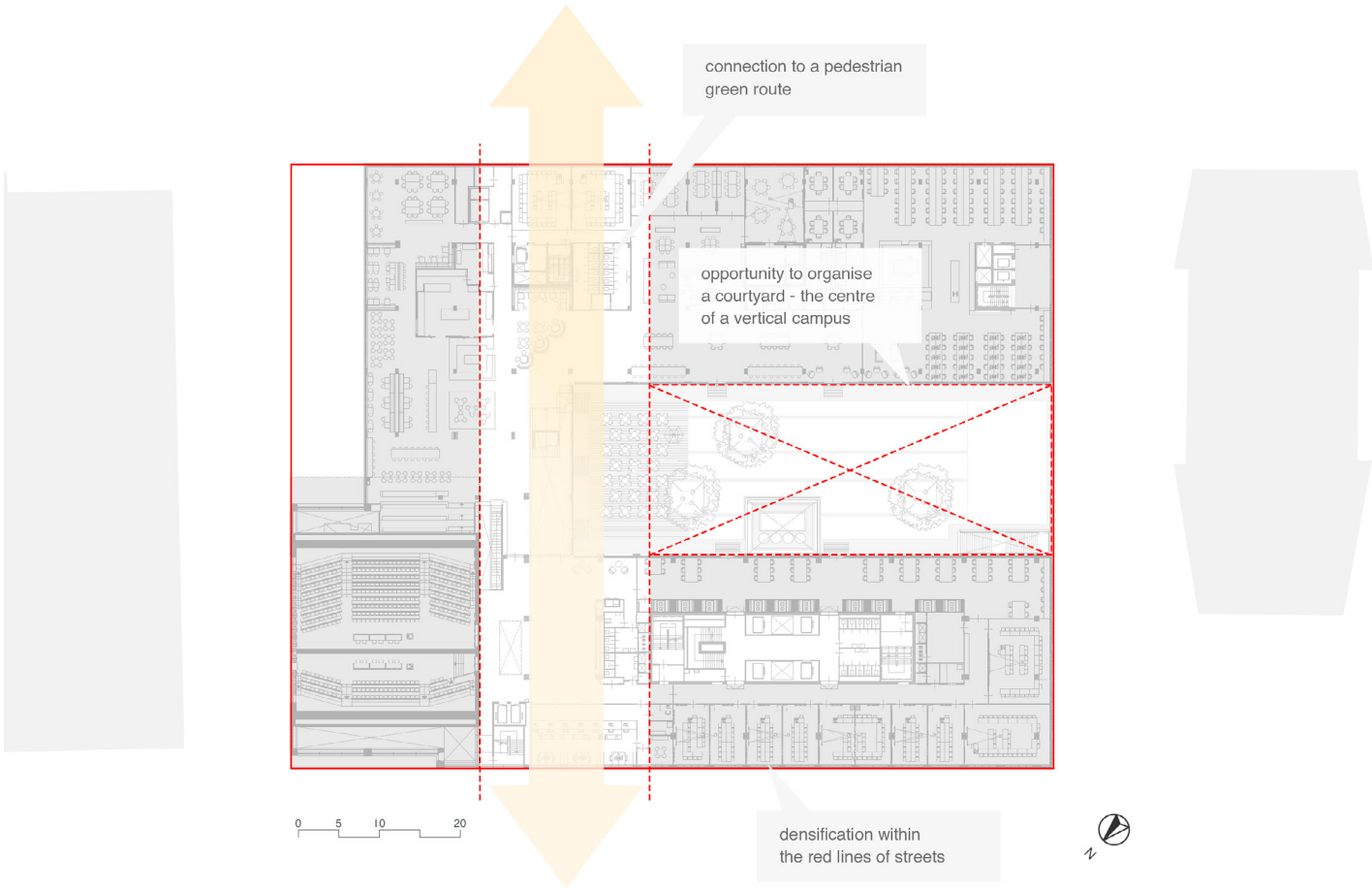
Currently, the lower part of the building is occupied by the university, which has both study spaces of various sizes and large lecture theatres. There are offices on the upper floors of the plinth. The high-rise part is residential. A characteristic feature of the building is the raised courtyard, which has the potential to be connected to a new pedestrian route and become the centre of a Vertical Campus.



Existing building of the Leiden University. Winjhaven, 1980s
Source: <https://architizer.com/idea/2069353/>



Existing building of the Leiden University. Winjhaven. Ground floor.
University
Bicycle storage
Housing
Commercial spaces

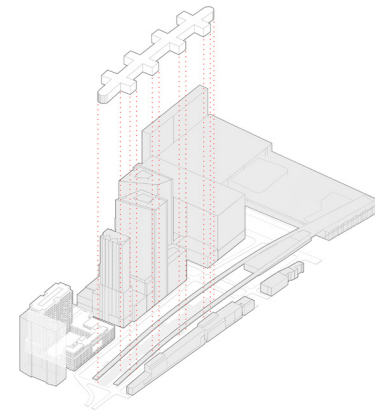


Existing building of the Leiden University. Winjhaven. 2nd floor.

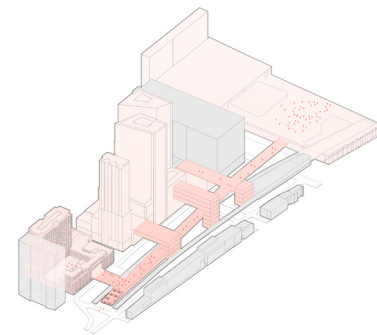
Potential of the university building

The design proposal includes the demolition of the building at Schedeldoekshaven 101 and the construction of a pedestrian bridge in its place with a passage to the university courtyard. Taking into account the position of this bridge as well as the structural characteristics of the existing building, the possible positions of the new cores have been determined.

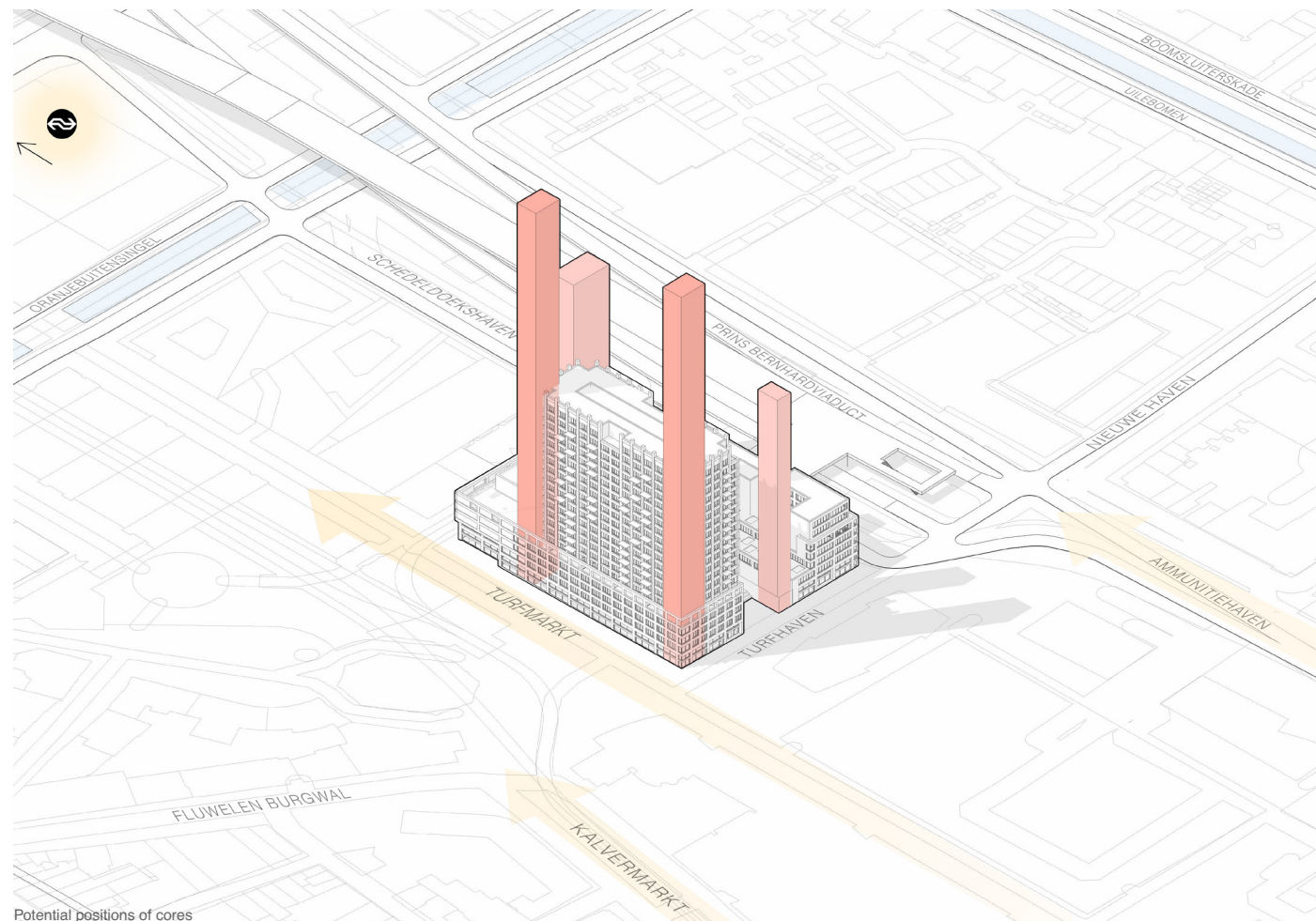
The different options for raising the low or (and) high part of the complex were then considered. The advantages and disadvantages of each scenario in terms of the structure and programme are compared. A model with growth on the high part of the building and the addition of two new cores to the external façade has been chosen for more elaborate development.



01 DEMOLITION



02 TRANSFORMATION

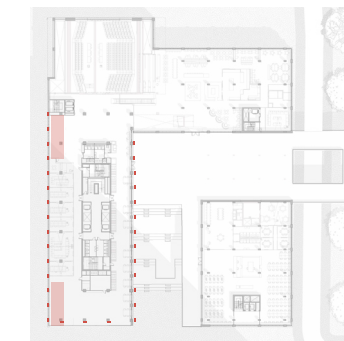
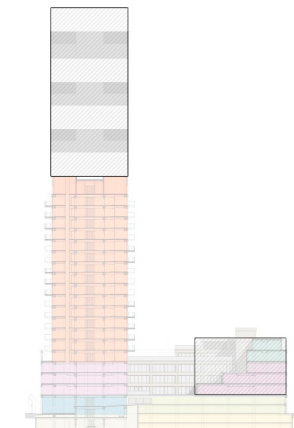


Potential positions of cores



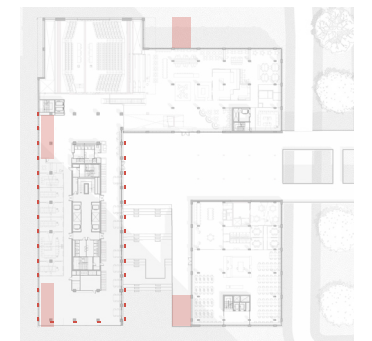
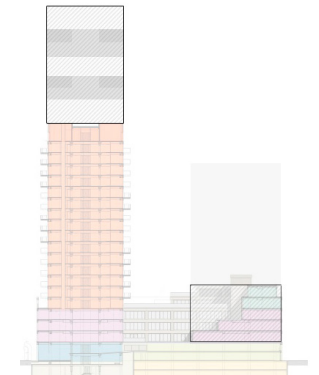
FILLING THE TERRACED PLINTH

- + Minimal structural disruption of the residential part of the building
- Blocking the view from the windows of residents
- Height not commensurate with the surroundings
- Close distance to the neighbouring towers



NEW EXTERIOR CORES

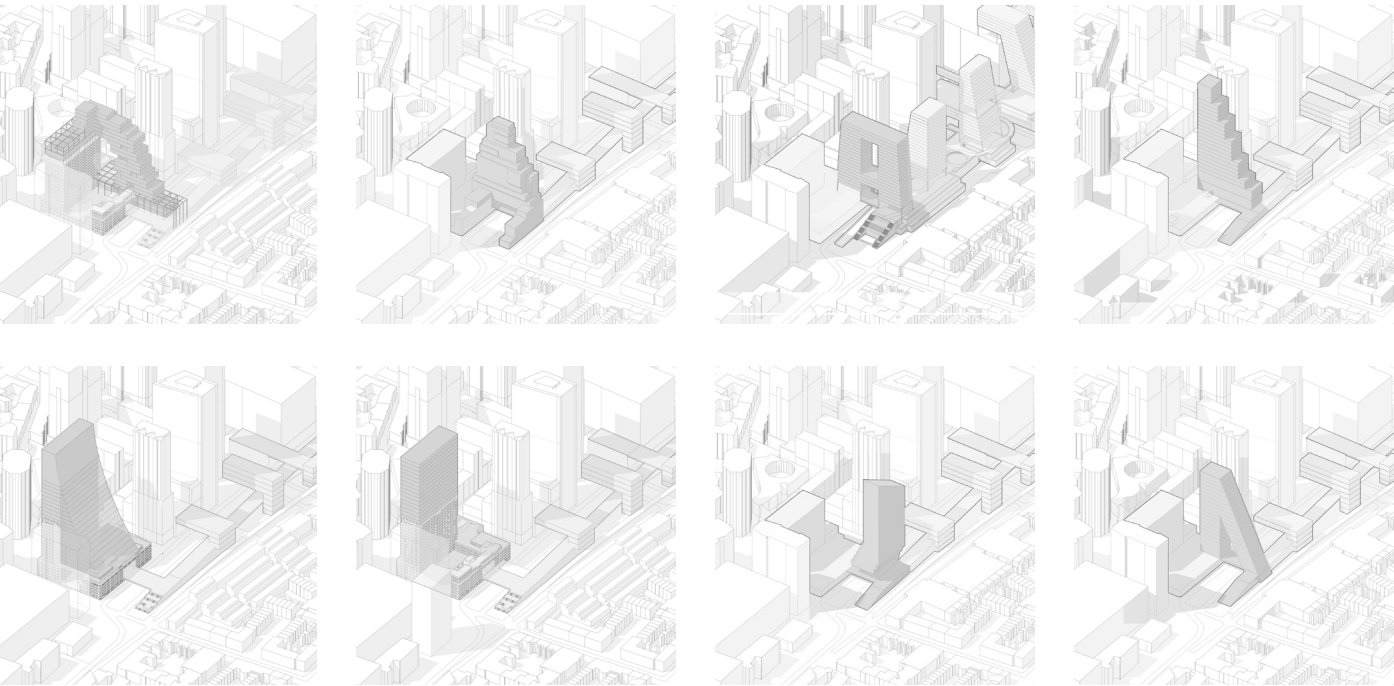
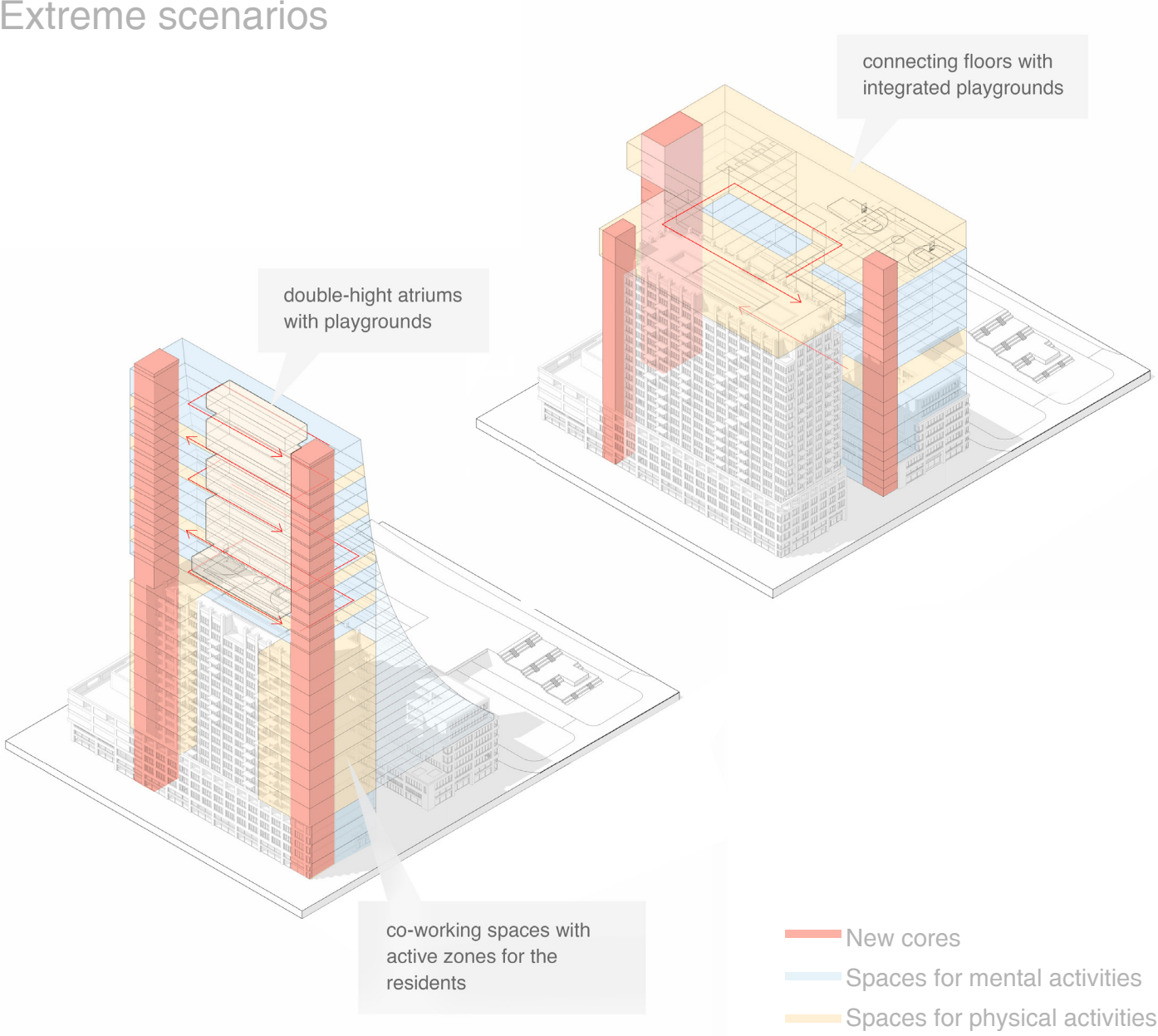
- + Intervention of the new coworking spaces into the student housing
- + Reaching a height commensurate with the surroundings
- Structural challenges



COMBINATION

- + Distribution of the programme around the courtyard
- + Active circulation
- Wasting resources on the construction of 4 cores

Extreme scenarios



Structure and programme

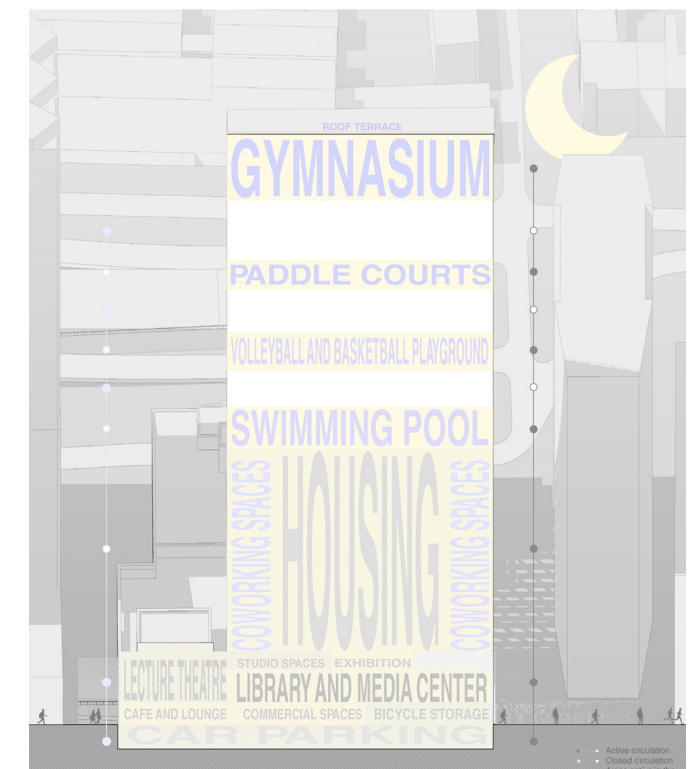
Contemporary examples of construction of a high-rise building based on an existing building were examined. The final choice of the position of the cores will be determined taking into account the structural capacity of the existing building after P2.

At the courtyard level, the existing programme of the university building will be used. In the upper part spaces for physical and mental activity will be mixed. Playgrounds will be located both on separate floors and integrated into the learning spaces. In addition, some spaces can be used in different ways during the daytime and in the evening (for example, a basketball playground becomes a dance hall).

The growth of the high part will require the transformation of the side parts of the building, where new co-working spaces with play areas for students can be introduced.



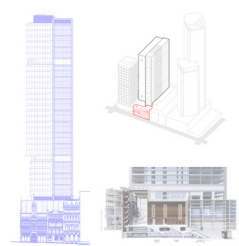
- Active circulation
- More active areas
- Quieter areas



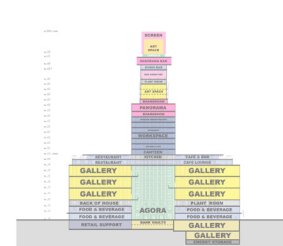
- Active circulation
- Closed circulation
- Areas active in the late evenings



7 St. Thomas, Hariri Pontarini Architects, 2017
Source: <https://hariripontarini.com/projects/7-st-thomas/>



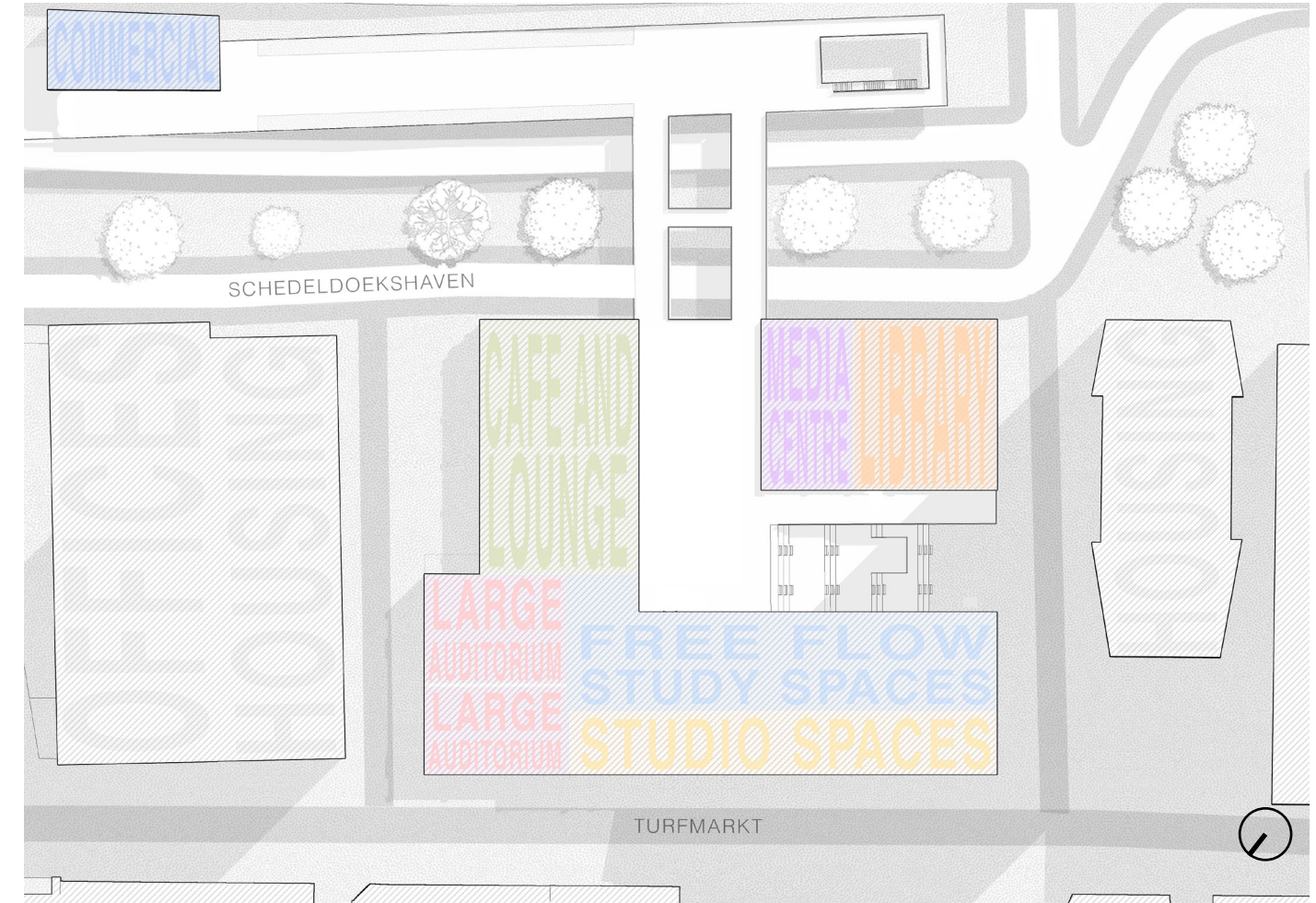
Olderfleet, Grimshaw, 2020
Source: <https://grimshaw.global/projects/workplace/olderfleet/>



Boerentoren, Herzog and de Meuron, 2021
Source: <https://www.herzogdemeuron.com/projects/575-boerentoren/>



Atlassian Central, BVN Architects, 2021
Source: <https://www.bvn.com.au/project/atlassian-central>





Children



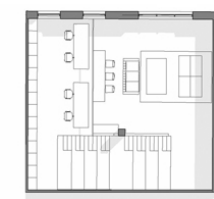
Adults



Senior people



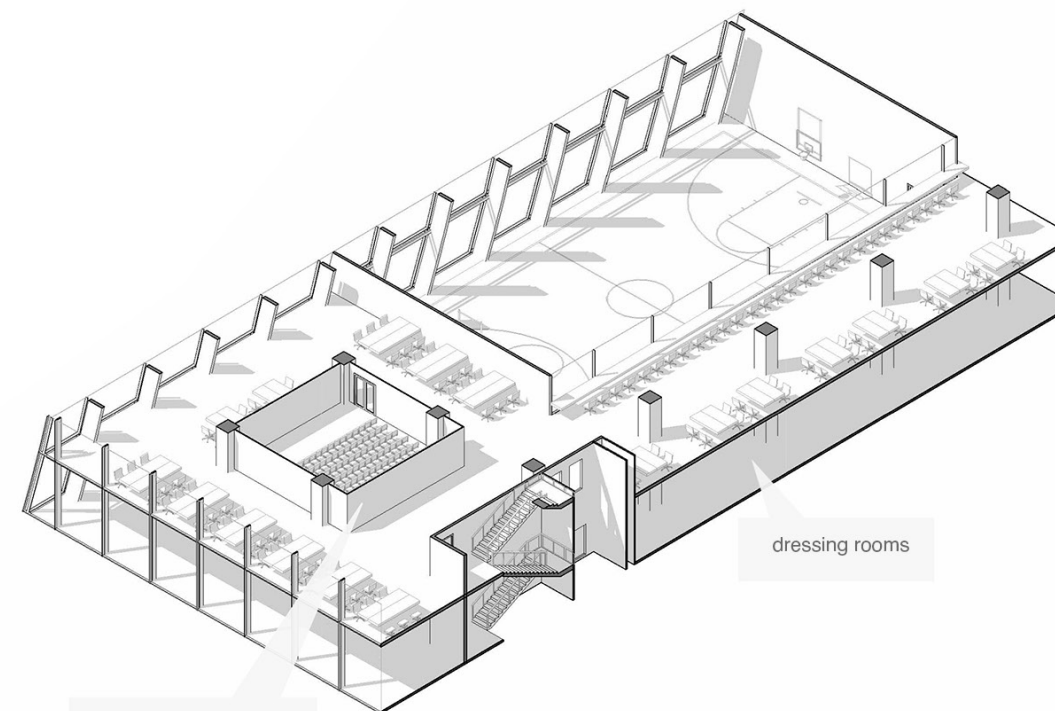
PADDLE COURTS



LIVING ROOMS (TABLE TENNIS AND TABLE SOCCER)



coworking space with
table tennis zone

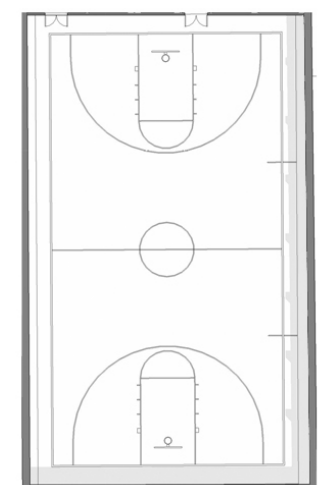


media room with
mobile partition walls

dressing rooms



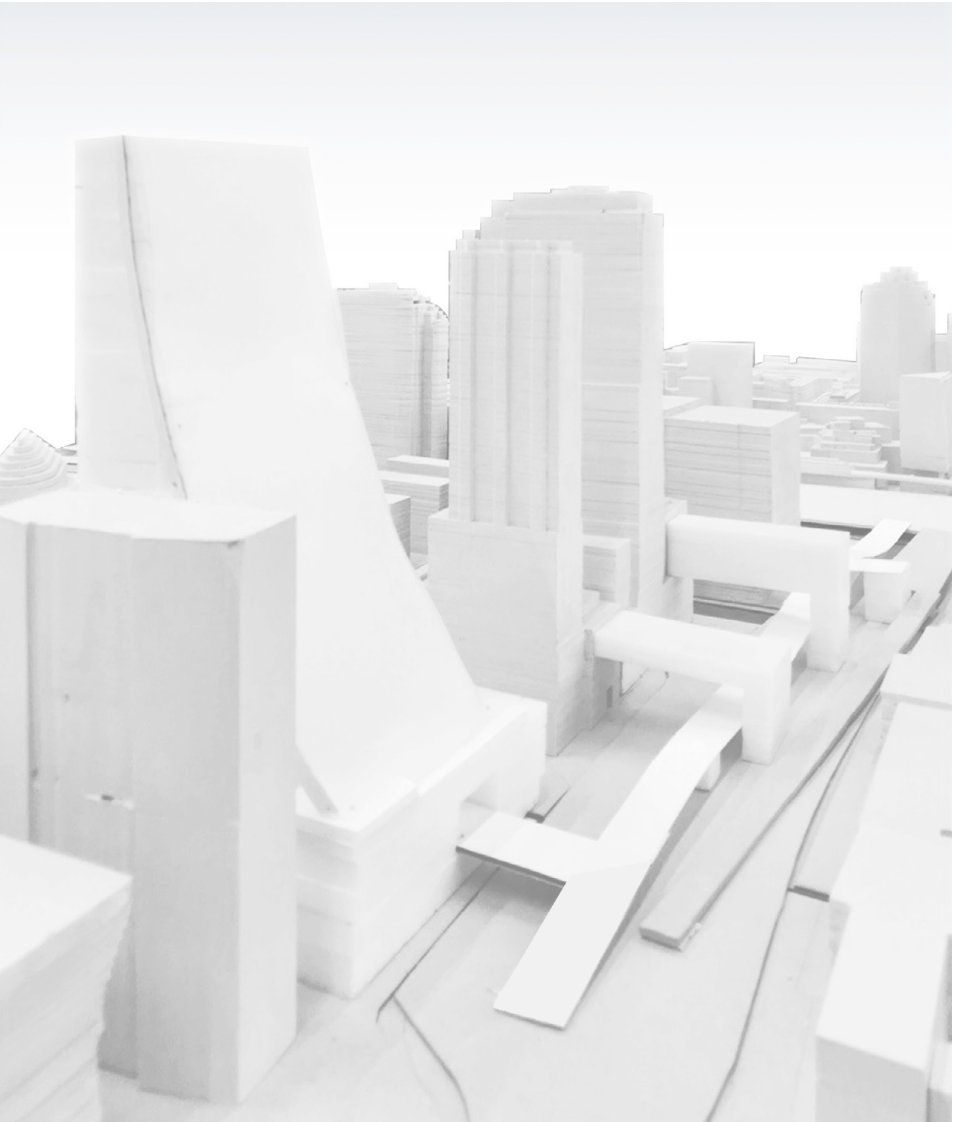
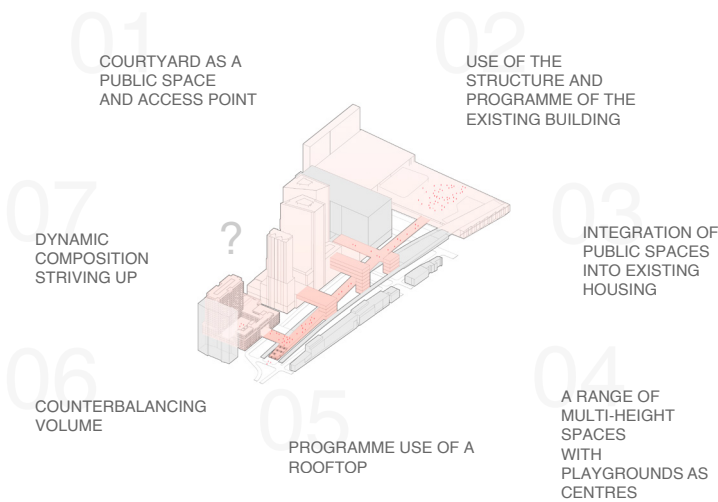
SWIMMING POOL



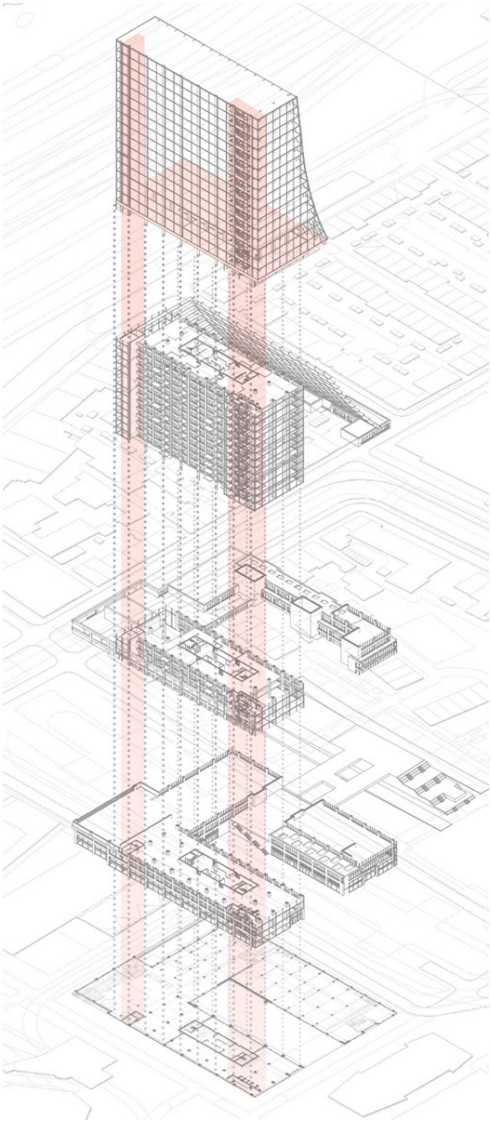
TEAM SPORTS PLAYGROUND

P2 INTEGRATED DESIGN PROPOSAL

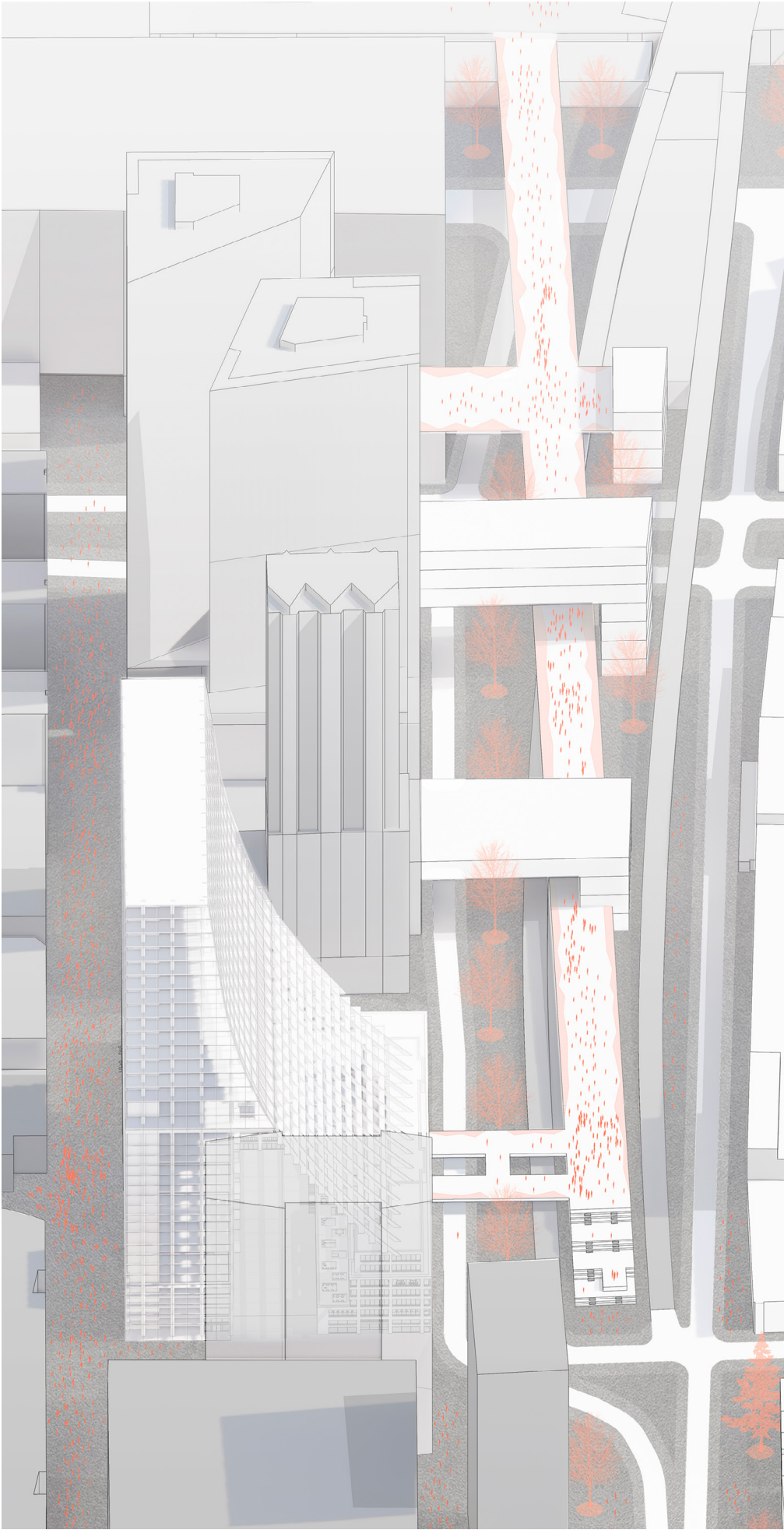
The project site is located in a dense urban environment which presents both opportunities and constraints. Several scenarios for the densification have been considered and the main design principles were defined. In the case of the growth on the high part of the complex, it is planned to complete two new outdoor cores and erect new load-bearing structures around the existing building.



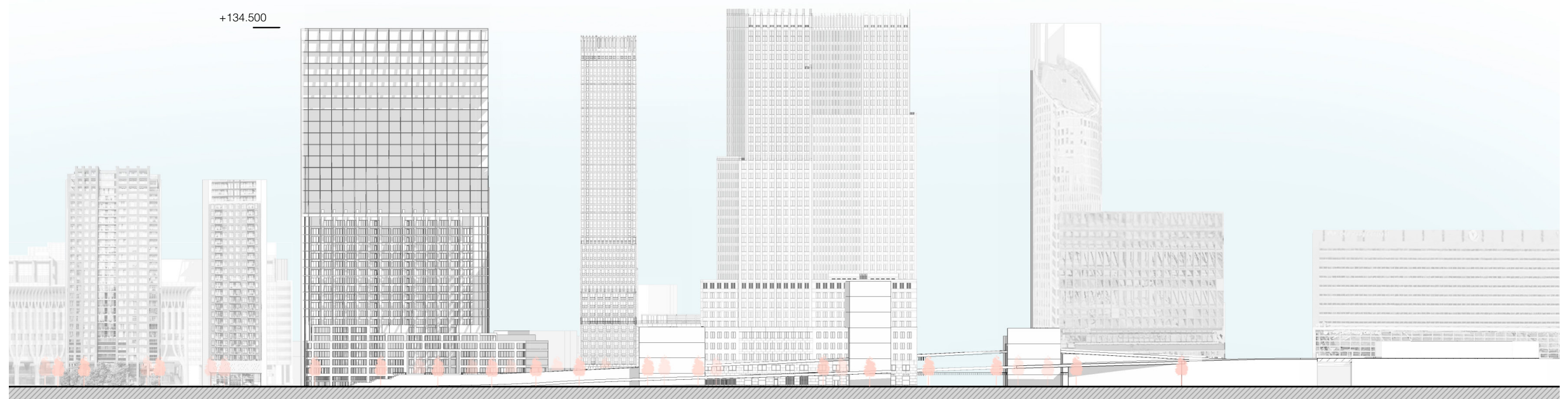
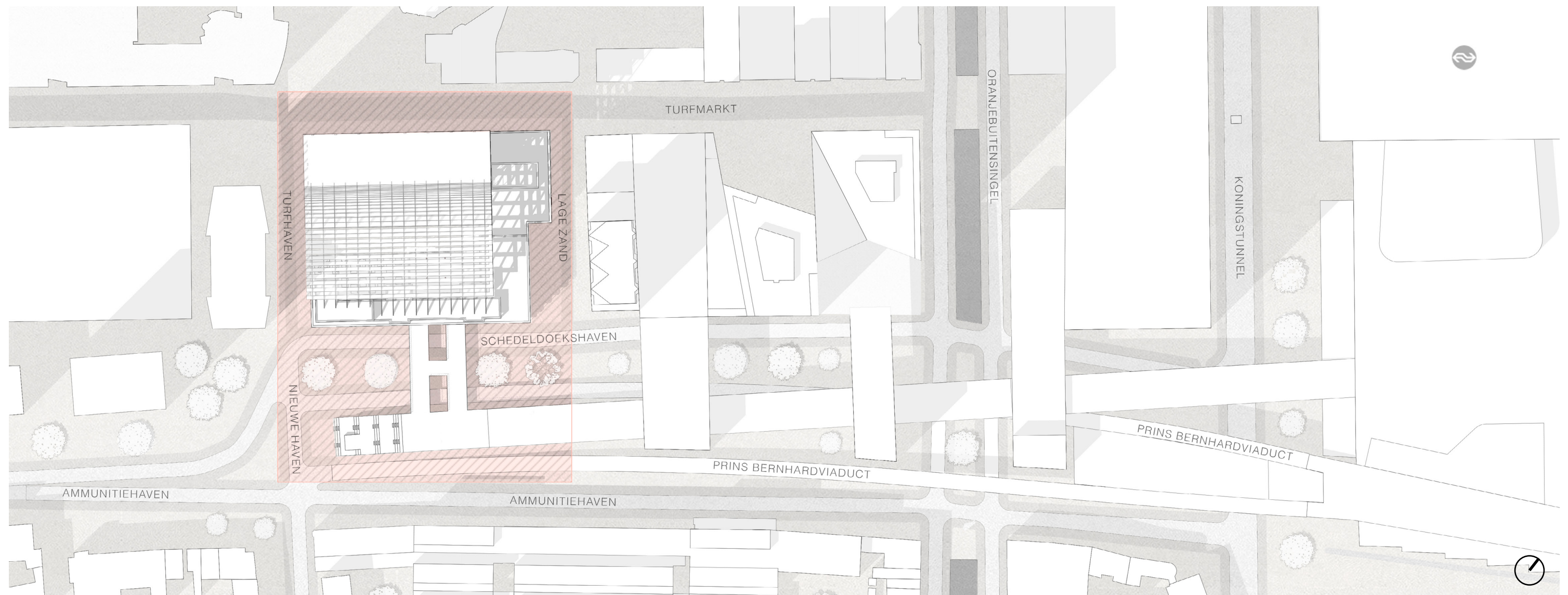
Photos of the physical model 1:500

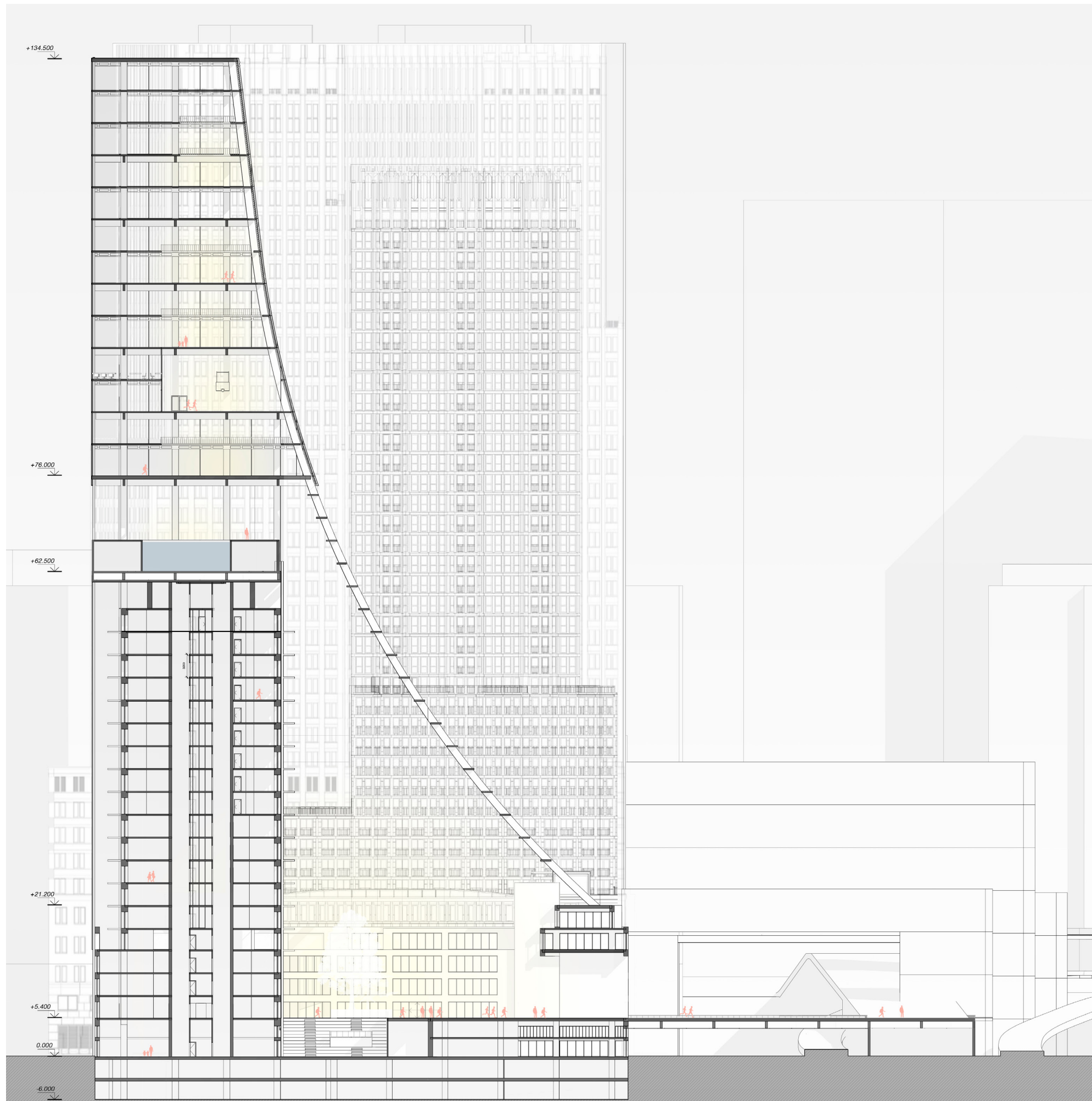


Structural diagram

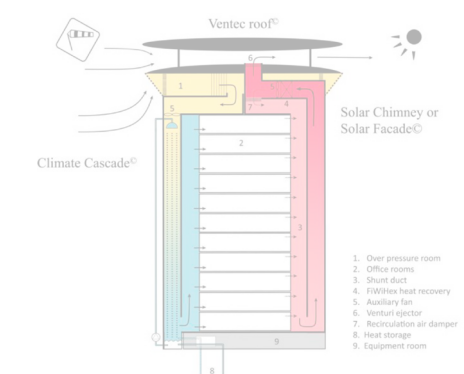


Axonometric view





NATURAL VENTILATION SYSTEM

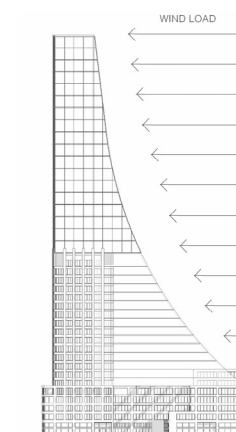


ENERGY GENERATION



BIPV panels

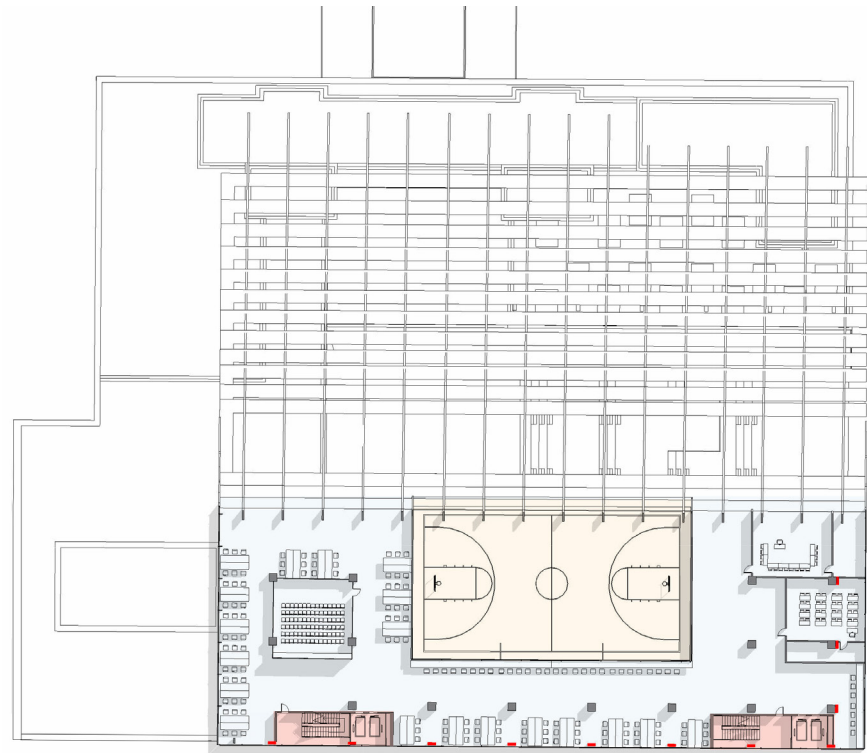
RESISTANCE TO WIND AND RAIN PROTECTION



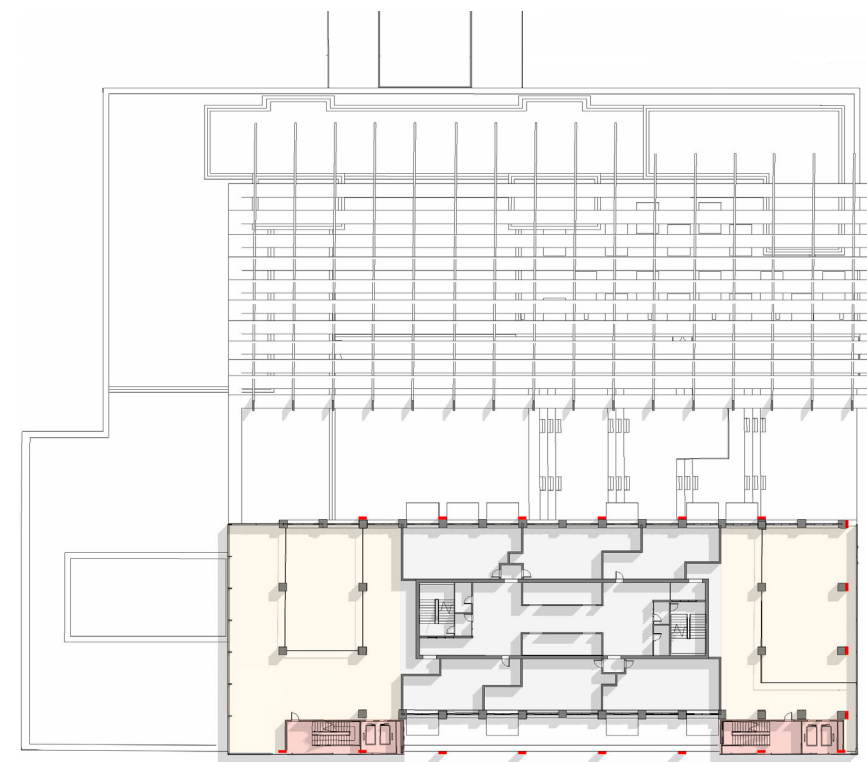
MEDIA FACADE POSSIBILITY



The National Art Centre, Kisho Kurokawa Architect and Associates, 2007
Source: <https://divisare.com/projects/17030-The-National-Art-Center-Tokyo>



EDUCATION + PHYSICAL ACTIVITY



HOUSING + COWORKING LIVING ROOMS

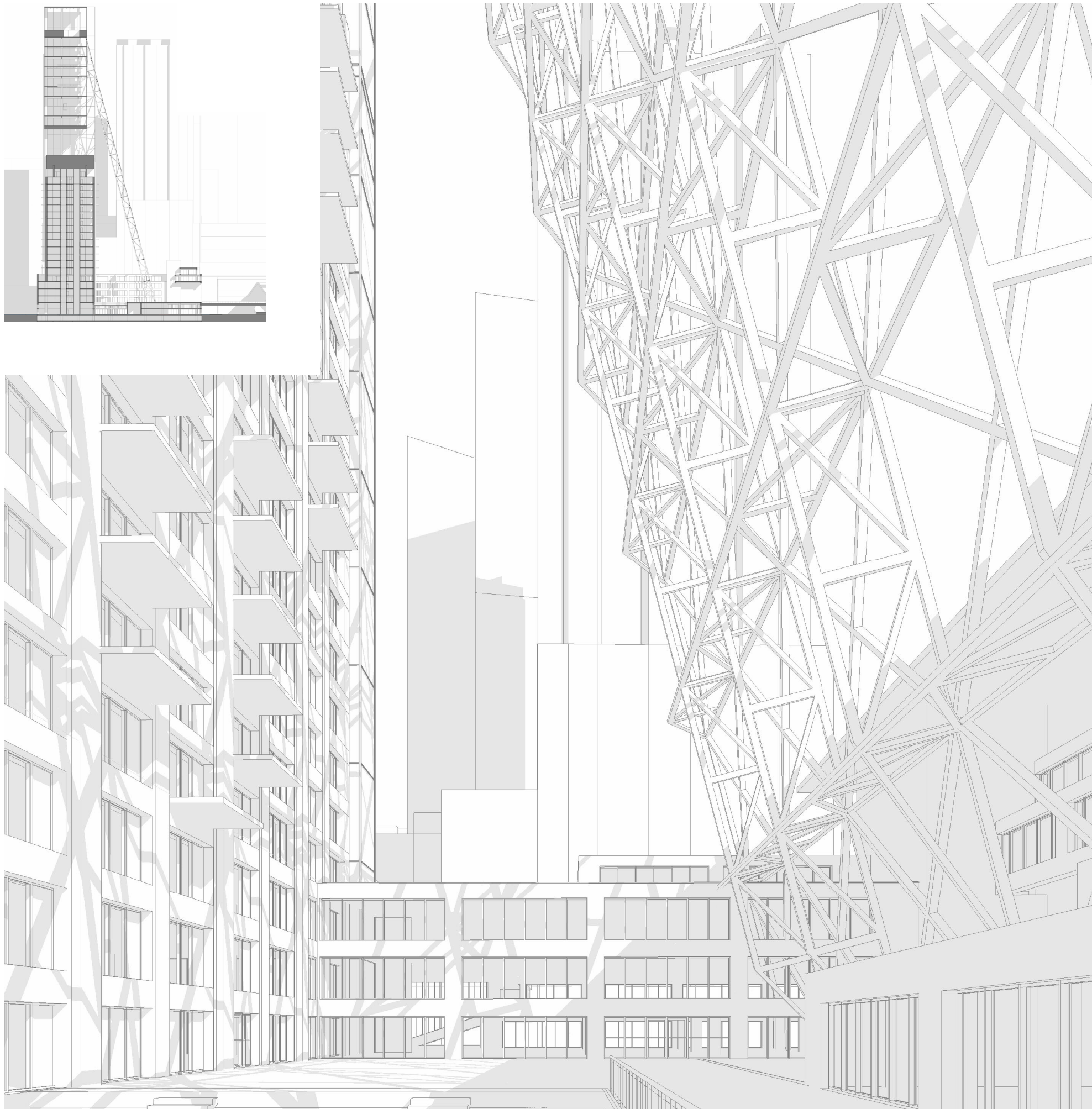


- Studying space
- Sports hall and living rooms
- Housing
- Cores



P3 FROM CONCEPT TO PRELIMINARY DESIGN

Individual work
 Programme and circulation scheme
 Structural principles and facade concept
 Climate design

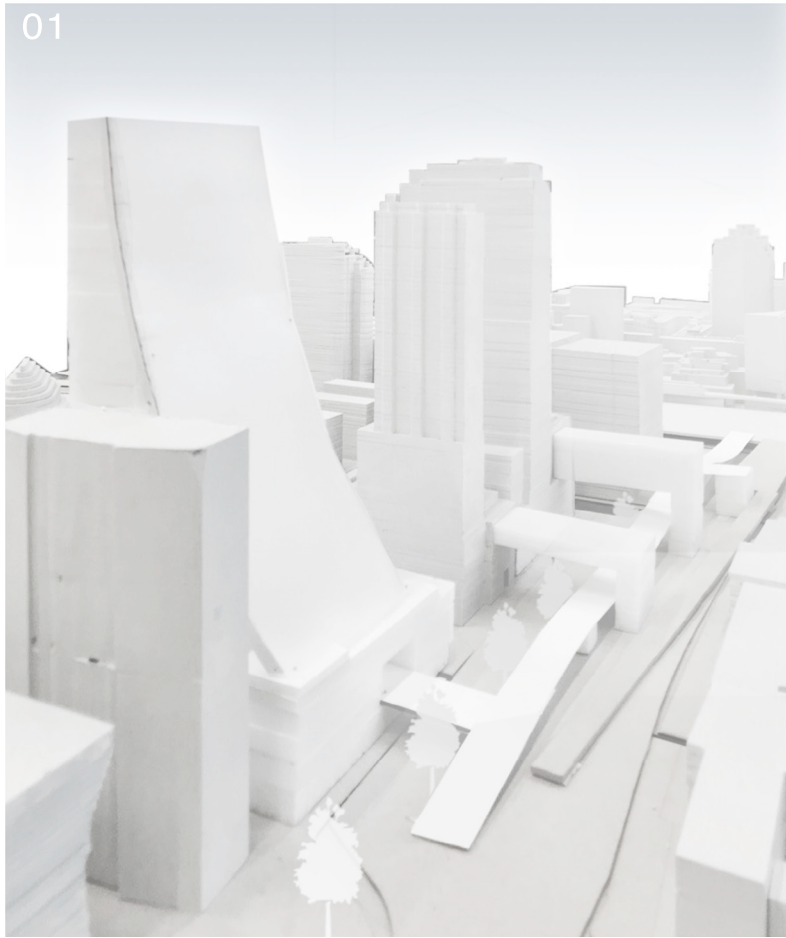


Sony Center, Helmut Jahn, 1996
Source: https://ru.wikipedia.org/wiki/Sony_Center

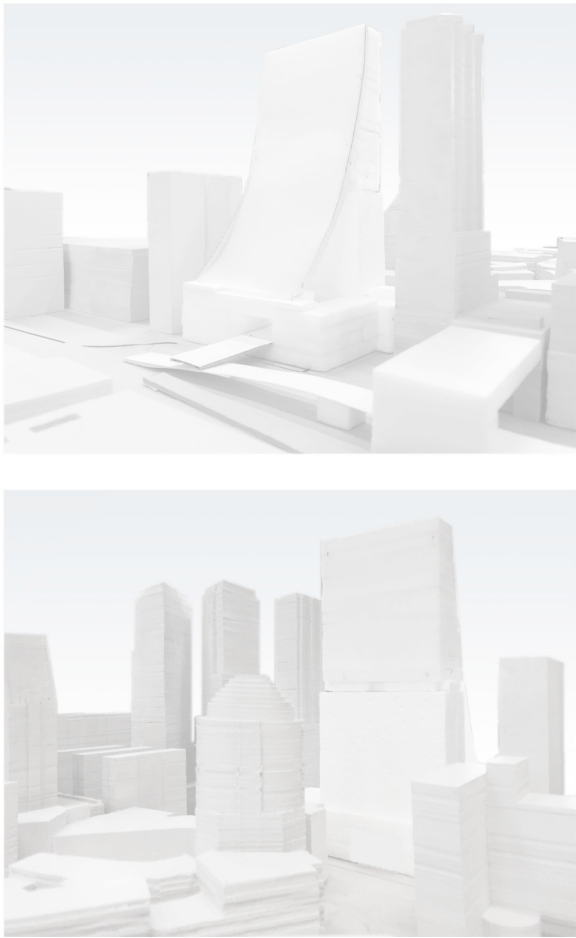


The National Art Centre, Kisho Kurokawa Architect and Associates, 2007
Source: <https://divisare.com/projects/17030-The-National-Art-Center-Tokyo>

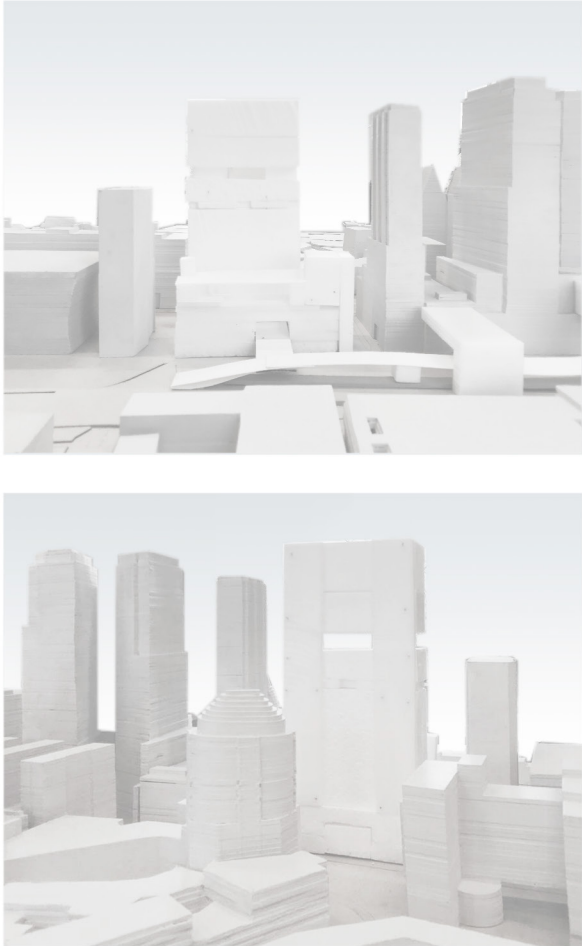
After the P2 presentation, the design concept of the open public space in the courtyard and entrance area was reconsidered. Examples of semi-open public spaces were analysed: coverage structures, scenarios of use, additional functions, etc. The function and relevance of the additional construct remained controversial. It was decided to return to other previously developed urban models without courtyard coverage.



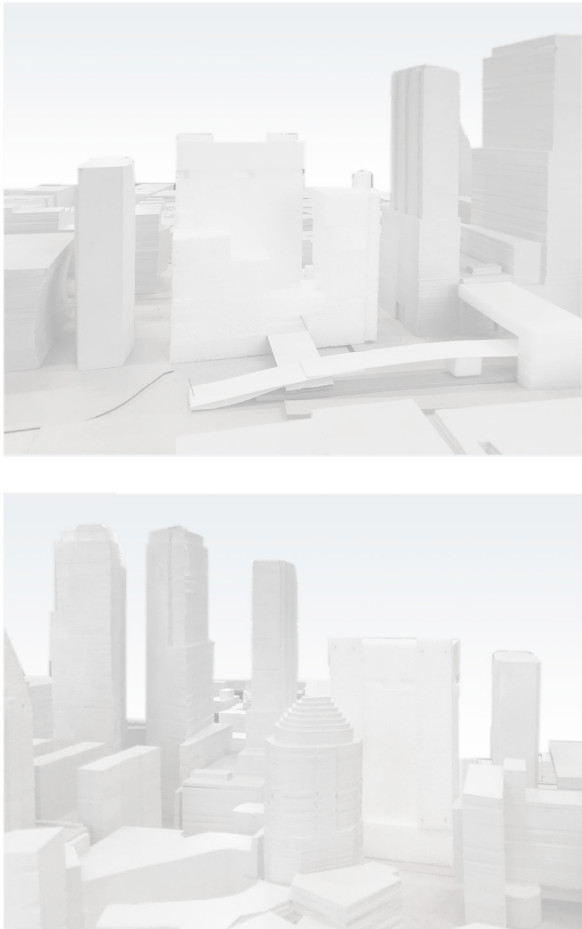
Photos of the physical model 1:500. Scenario 1. Tower extension with the covered courtyard



Photos of the physical model 1:500. Scenario 2. Tower extension and distribution of the program around the courtyard

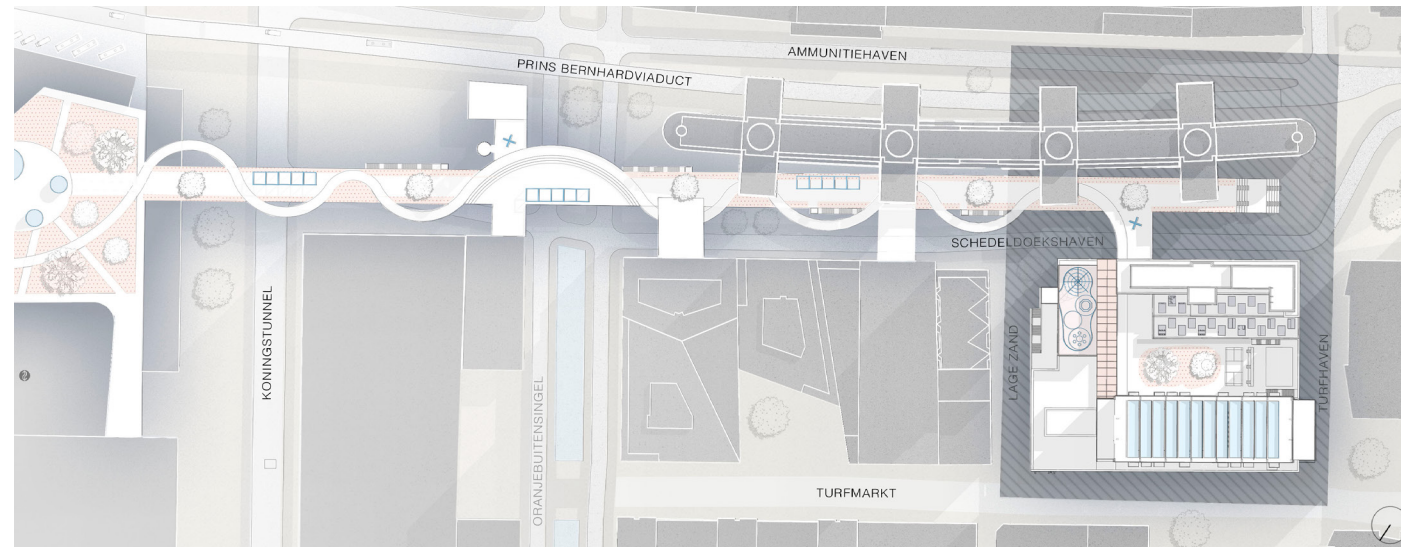
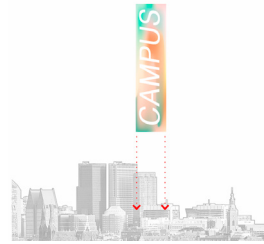


Photos of the physical model 1:500. Scenario 3. Maximum distribution of the programme around the yard



URBAN CONTEXT

In the context of dense urban development, the project proposes an extension of the university building with public functions.



Site plan

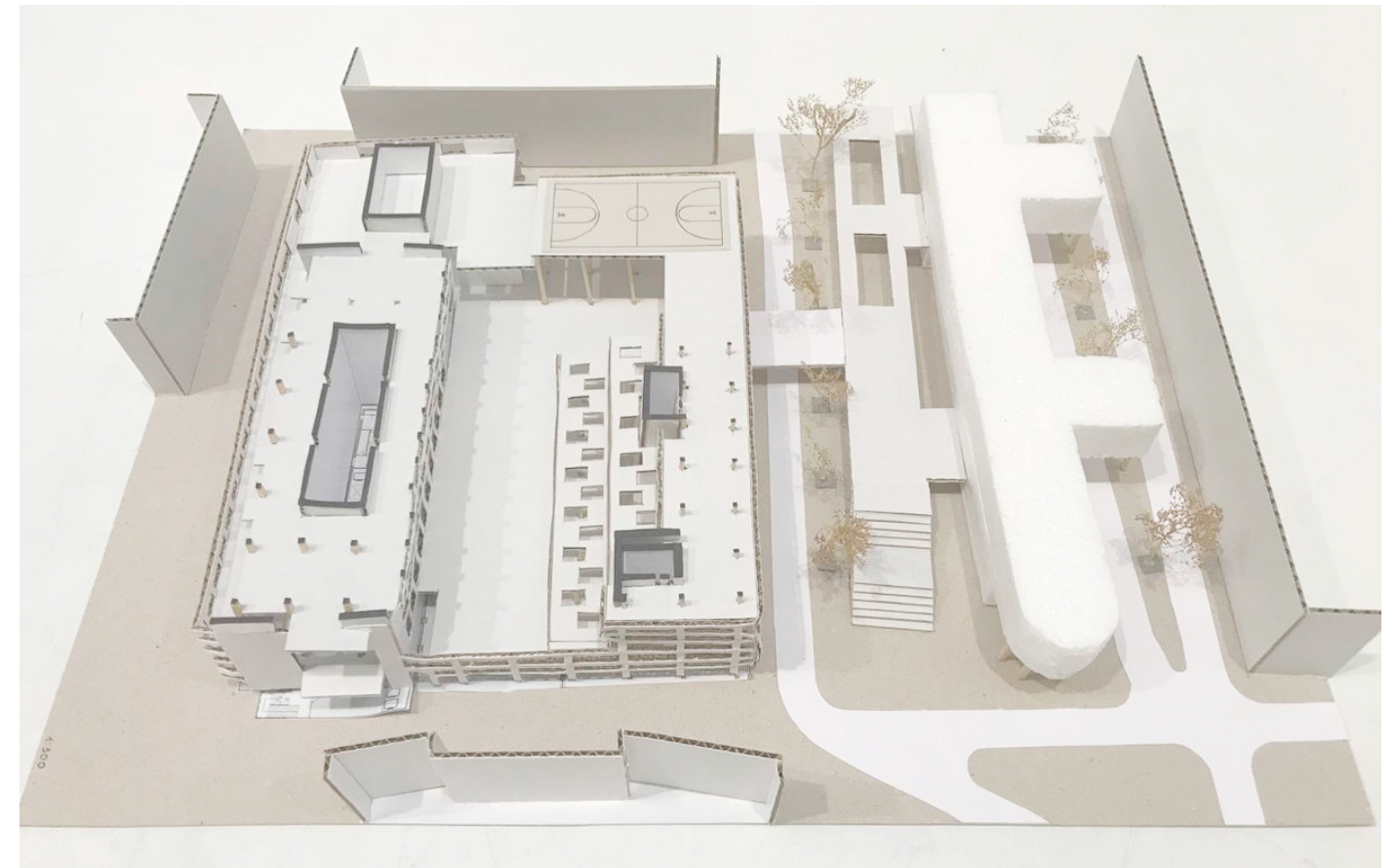
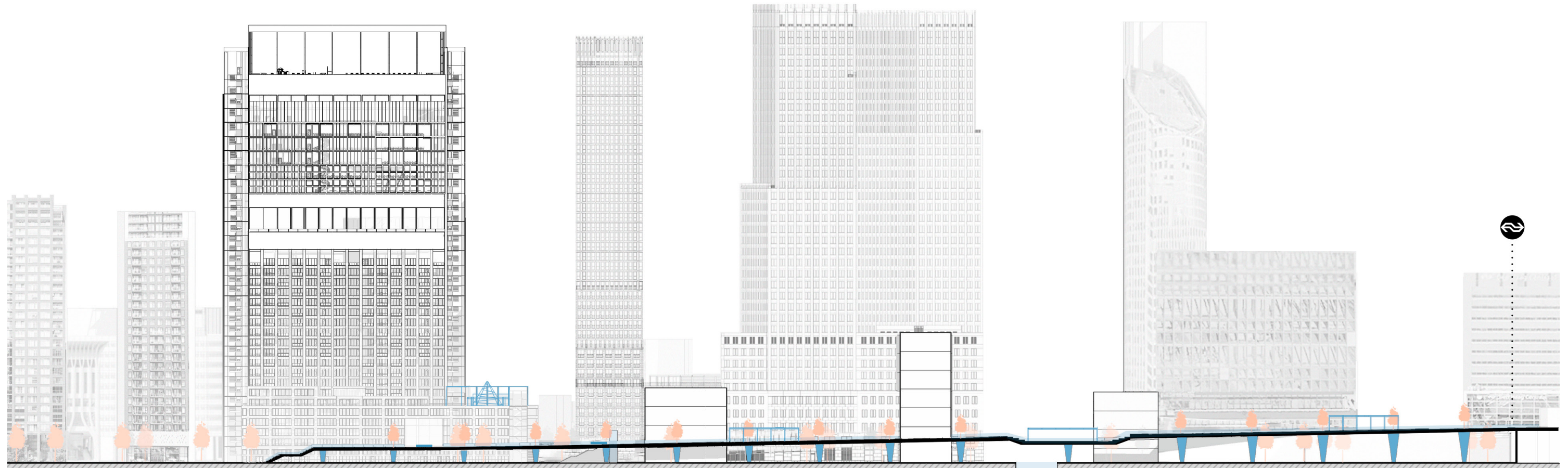
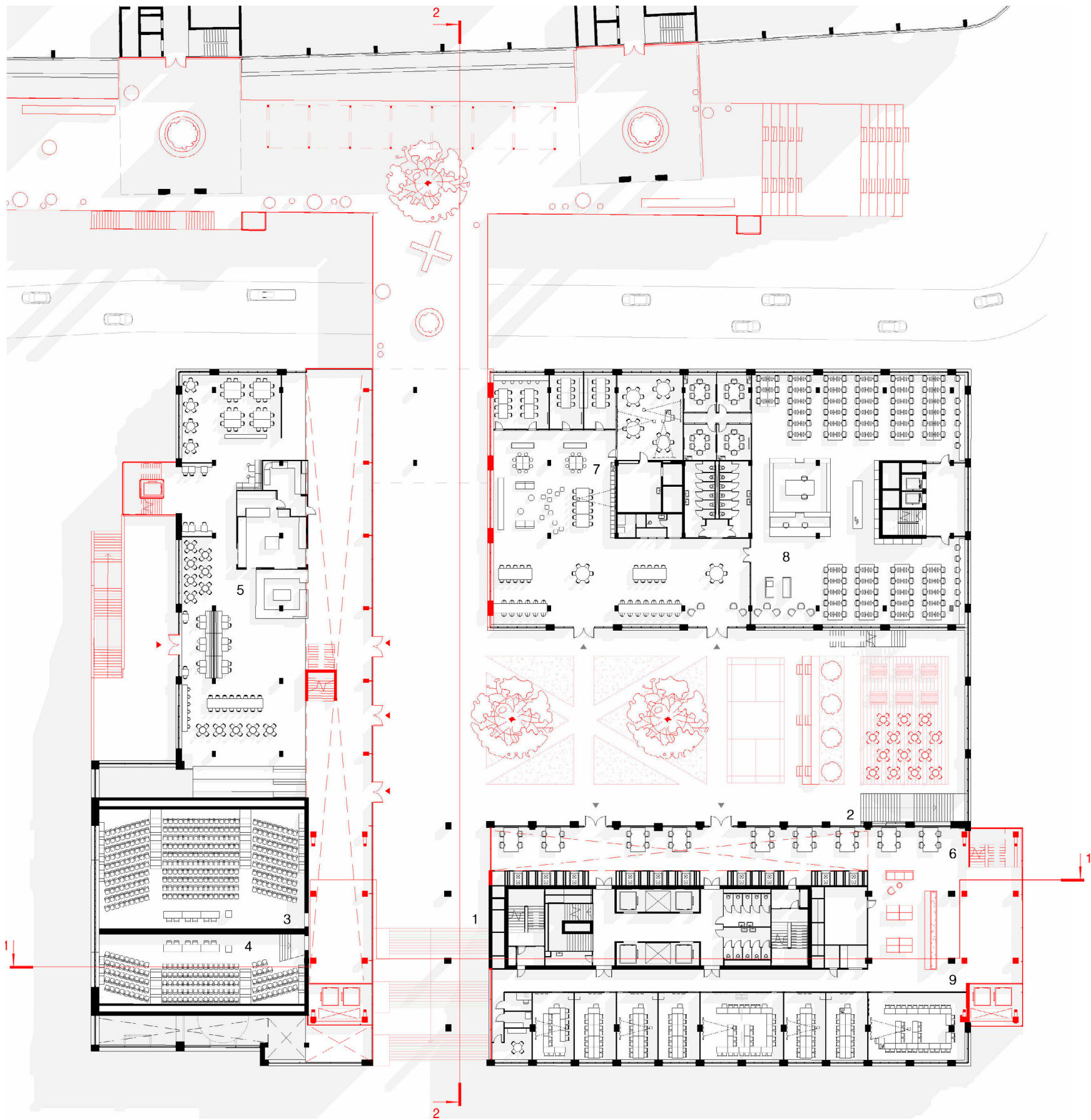


Photo of the physical model 1:300



Ammutiehaven street urban section

ENTRANCE

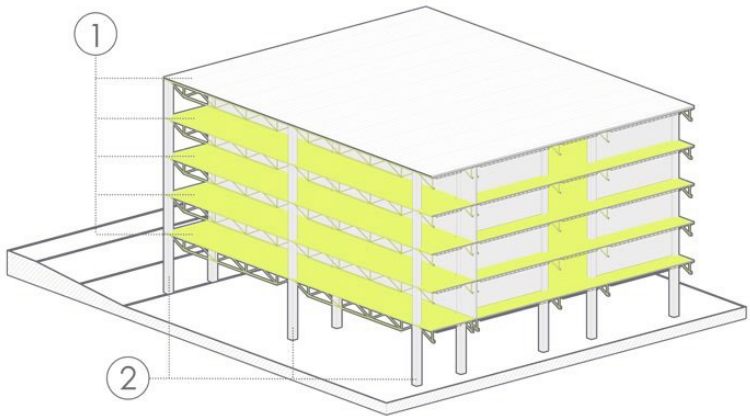


FLOOR AT +5.400

- | | | |
|---------------------------------------|---------------------------|---|
| 1. NEW PASSAGE AND ENTRANCE HALL | 4. GRAND AUDITORY (308 P) | 7. INSPIRATION LAB |
| 2. COURTYARD WITH THE BADMINTON COURT | 5. RESTAURANT | 8. LIBRARY AND MEDIA CENTRE |
| 3. GRAND AUDITORY (543 P) | 6. FREE FLOW STUDY AREA | 9. CLASSROOMS ZONE WITH NEW PLAYGROUNDS |

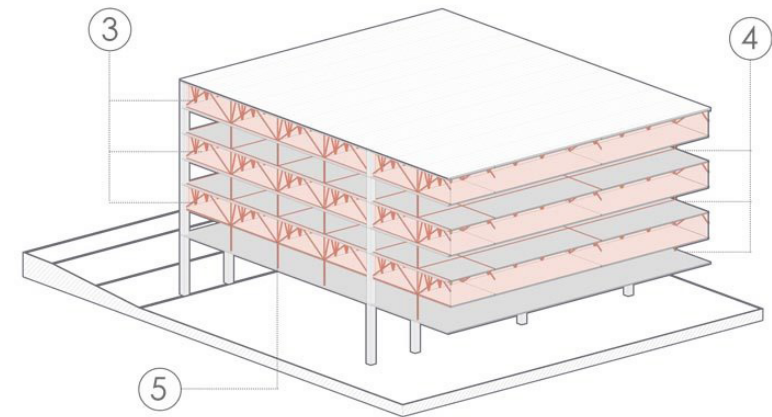


STRUCTURAL SCHEMES OF THE BRIDGE-BUILDINGS



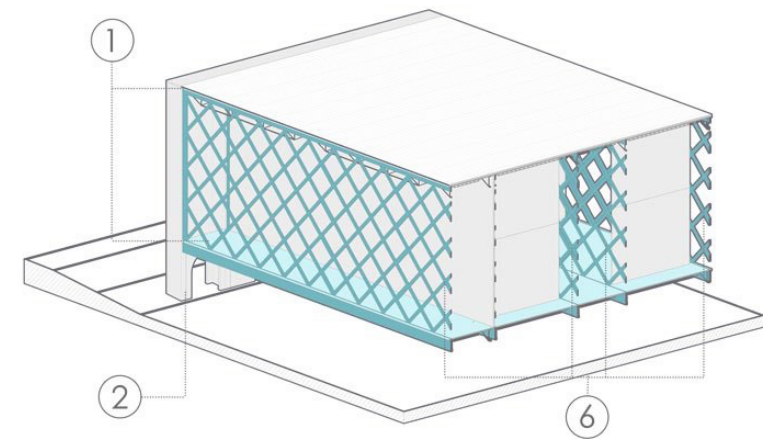
STRUCTURAL SCHEME OF A LOW-SPAN BRIDGE BUILDING

- 1 - steel reinforced concrete slab
- 2 - vertical pillars



STRUCTURAL SCHEME OF A MEDIUM-SPAN BRIDGE BUILDING

- 3 - "load-bearing floor"
- 4 - floor with free span slab
- 5 - suspension



STRUCTURAL SCHEME OF A LONG-SPAN BRIDGE BUILDING

- 1 - steel reinforced concrete slab
- 2 - vertical support
- 6 - multi-storey truss



Bruggebouwen Grotiusplaats. Source: <https://commons.wikimedia.org/wiki/>



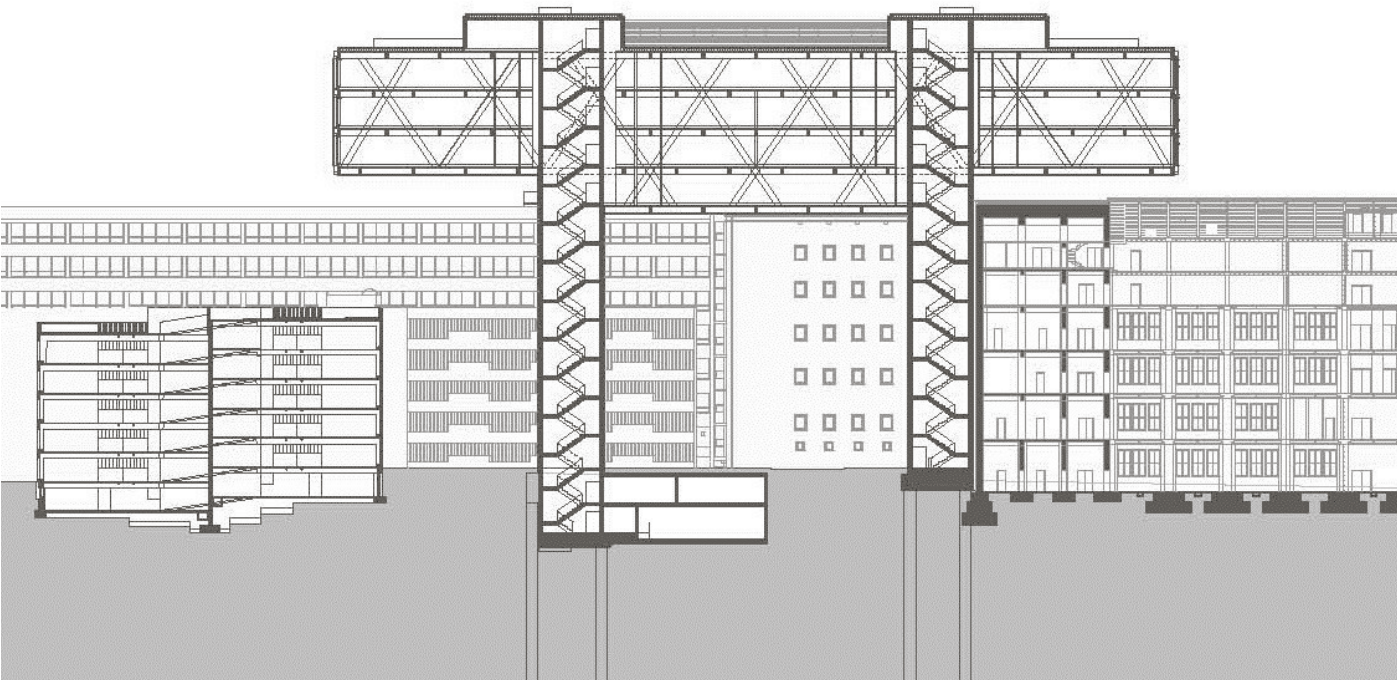
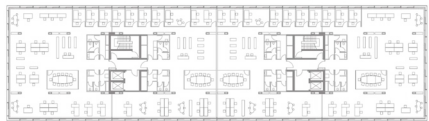
Malietoren, the Hague, Benthem Crowell Architects, 1991-1996. Source: <https://www.benthemcrowell.com/projects/malietoren>



The Bosch Parkhaus building above the motorway in Stuttgart. (Spans range from 85 to 105 metres). Source: https://www.btc-echo.de/wp-content/uploads/2023/02/shutterstock_1814136131-scaled.jpg



Pontsteiger Residential Building, Arons en Gelauff architecten, 2019 Source: <https://www.archdaily.com/956406/pontsteiger-residential-building-aron-en-gelauff-architecten/601c2c59f91c81915a0006b8-pontsteiger-residential-building-aron-en-gelauff-architecten-image>



Medienbrücke München, Steidle Architekten, 2011 Source: <https://www.steidle-architekten.de/projekte?pid=10&cHash=44a6d3559baf6c9935d0994530093040>

From the article "Volume-planning systems of bridge buildings" (Skiba, Zabalueva, 2020)
Source: <https://cyberleninka.ru/article/n/obemno-planirovochnye-sistemy-zdaniy-mostov/viewer>

Hong Kong Shanghai Banking Corporation Headquarters

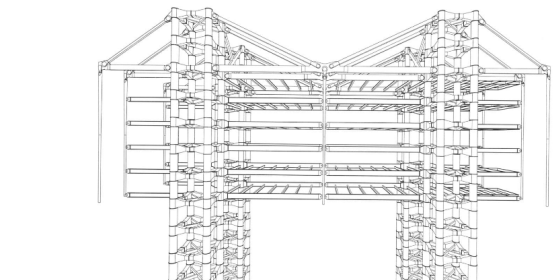
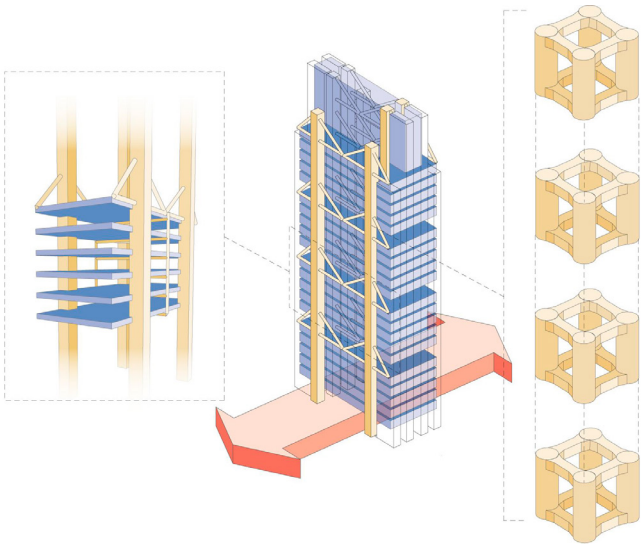
Suspended structure

Norman Foster
Hong Kong, 1985. Built

The suspension system allows for a virtually column-free ground floor+ open floor plan throughout as well as the 40m central atrium space. A modular system for the eight load-bearing «masts» allowed for faster construction and possible dismantling.



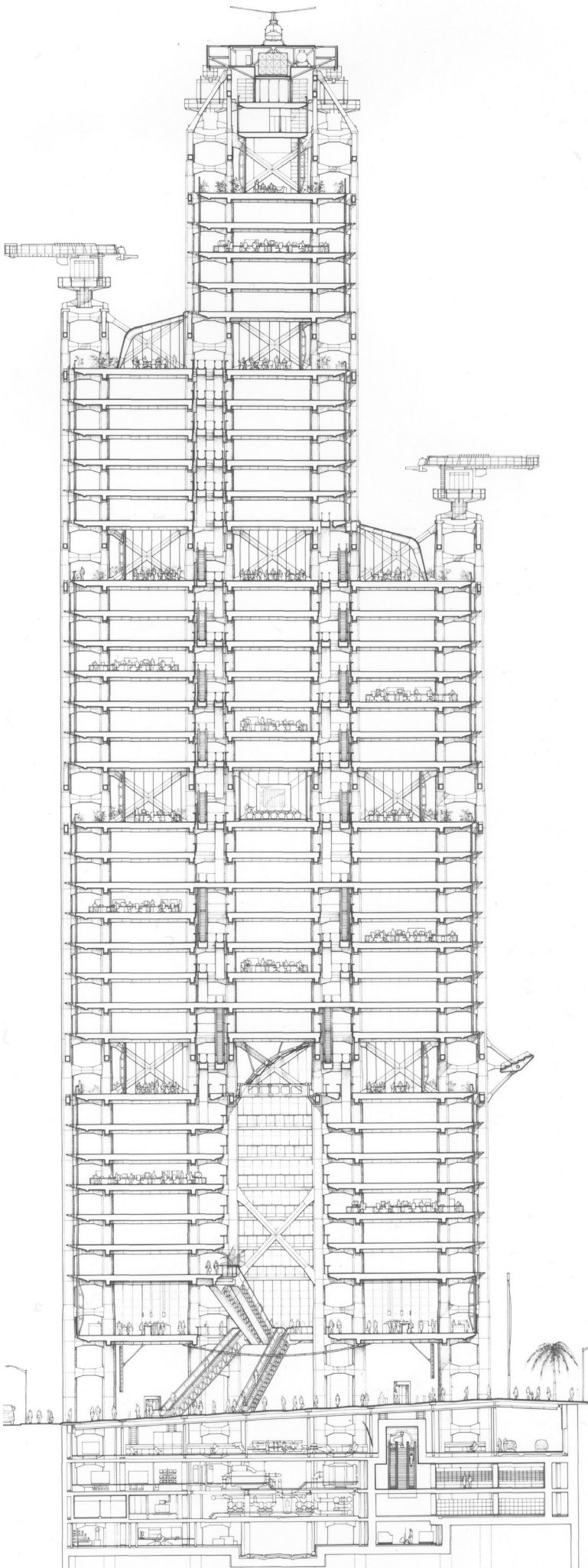
Interiors
Source: https://www.dezeen.com/2020/02/10/hsbc-norman-foster-video-interview/?il_source=base&il_medium=bottom_block_1



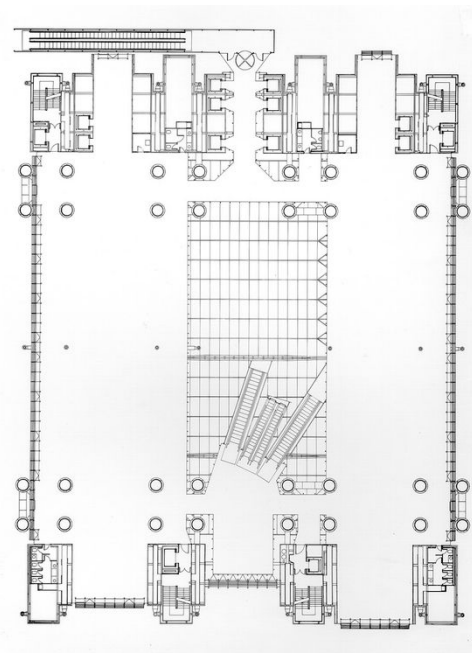
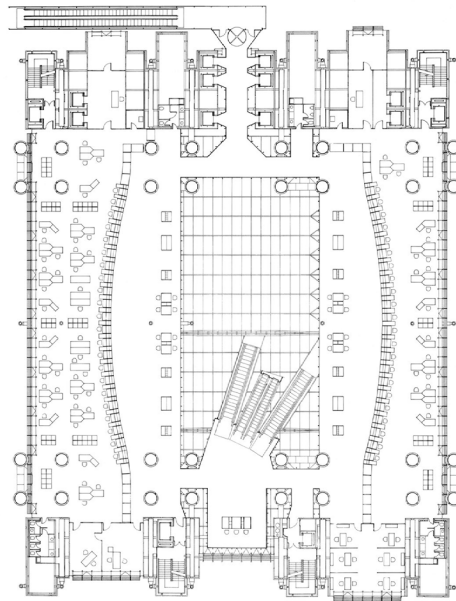
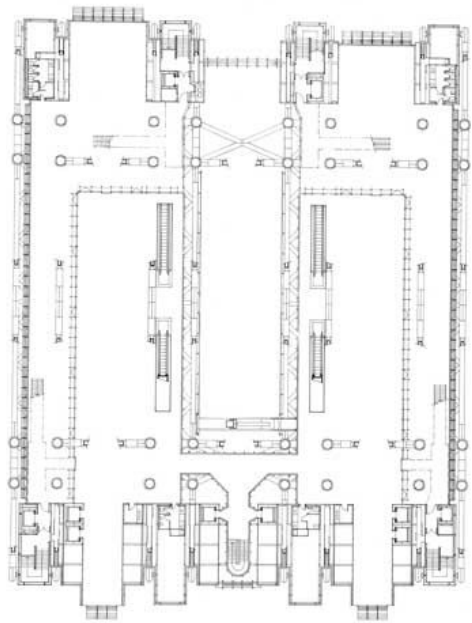
Structure
Source: https://www.dezeen.com/2020/02/10/hsbc-norman-foster-video-interview/?il_source=base&il_medium=bottom_block_1



Exterior view. Source: https://www.dezeen.com/2020/02/10/hsbc-norman-foster-video-interview/?il_source=base&il_medium=bottom_block_1

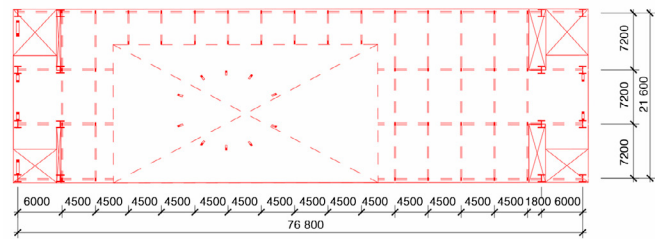


Section and plans
Source: <https://content.fosterandpartners.com/api/media/getCroppedImage?imagePath=/media/>

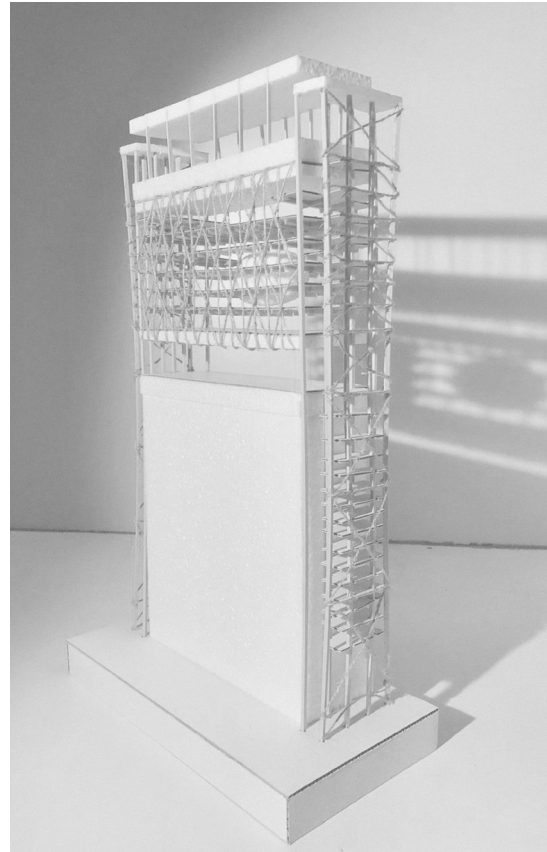


STRUCTURE

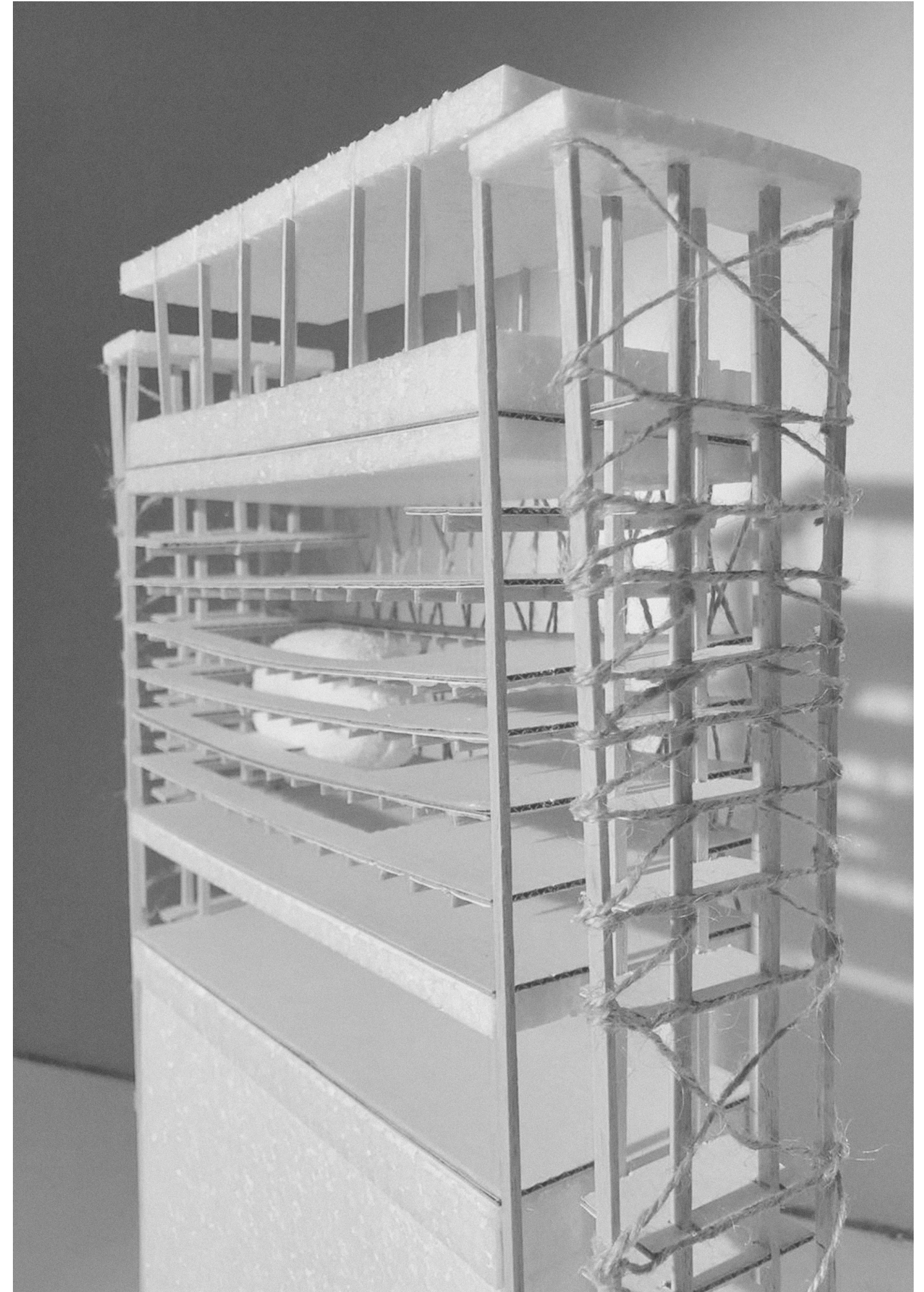
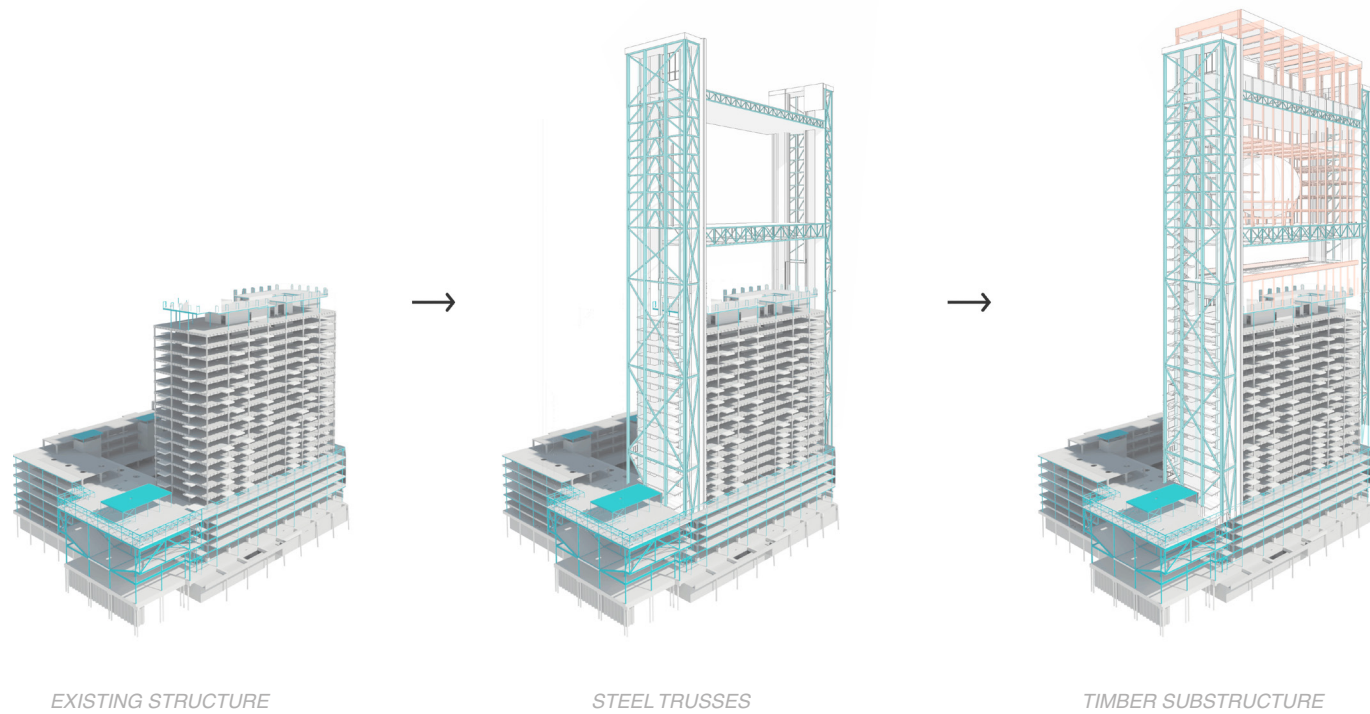
The load-bearing structure of the building consists of a main steel system and timber sub-systems. The main vertical steel pillars with spatial connections are located in cores on the sides of the existing tower. The load-bearing technical floors with trusses in two directions lean on them. Between these load-bearing floors there are wooden subsystems (columns and beams) that can be transformed over time.



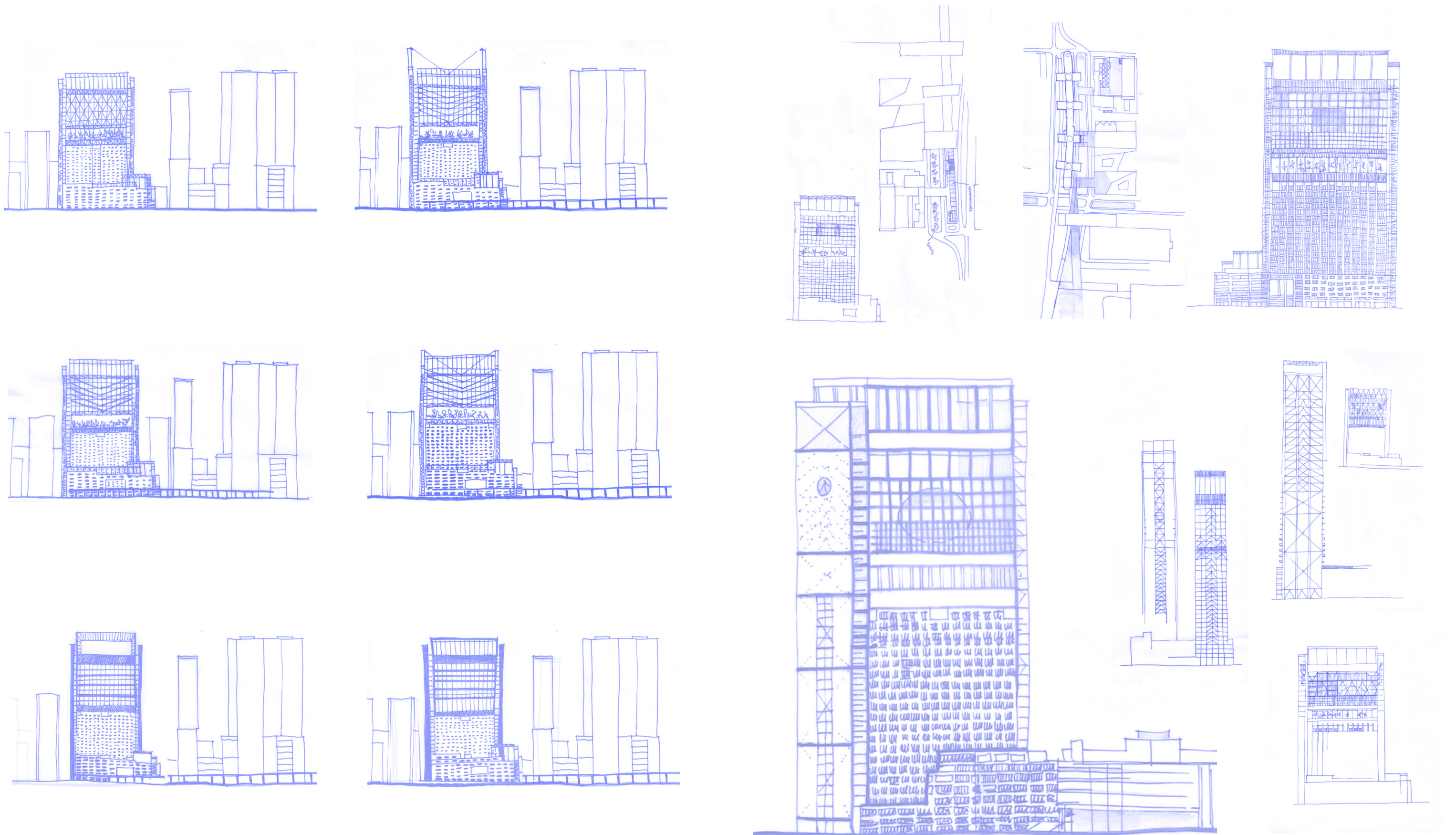
Structural plan



Physical working structural model 1:300

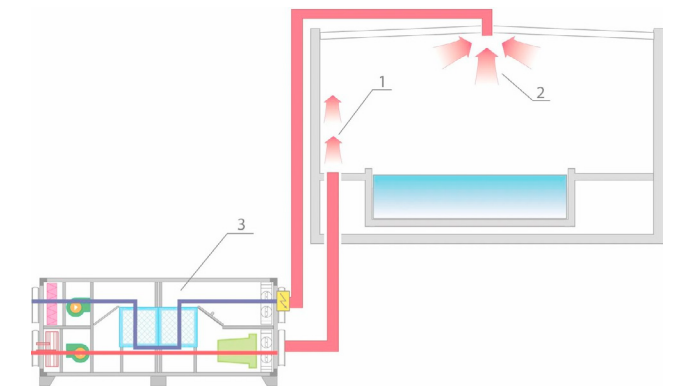


FAÇADE SKETCHES

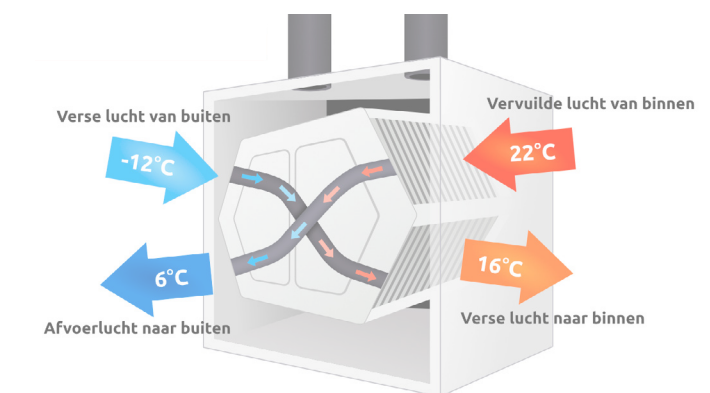




In terms of climate, the upper extension of the university building is independent from the existing part. The air supply is provided from the level of the sky garden, and each block has its own ventilation, using the technical load-bearing floors for machinery. The distance between the old and new parts of the tower is used for technical ducts, where a balanced ventilation system is integrated. Moreover, the building generates energy, using the PVT panels on the roof.

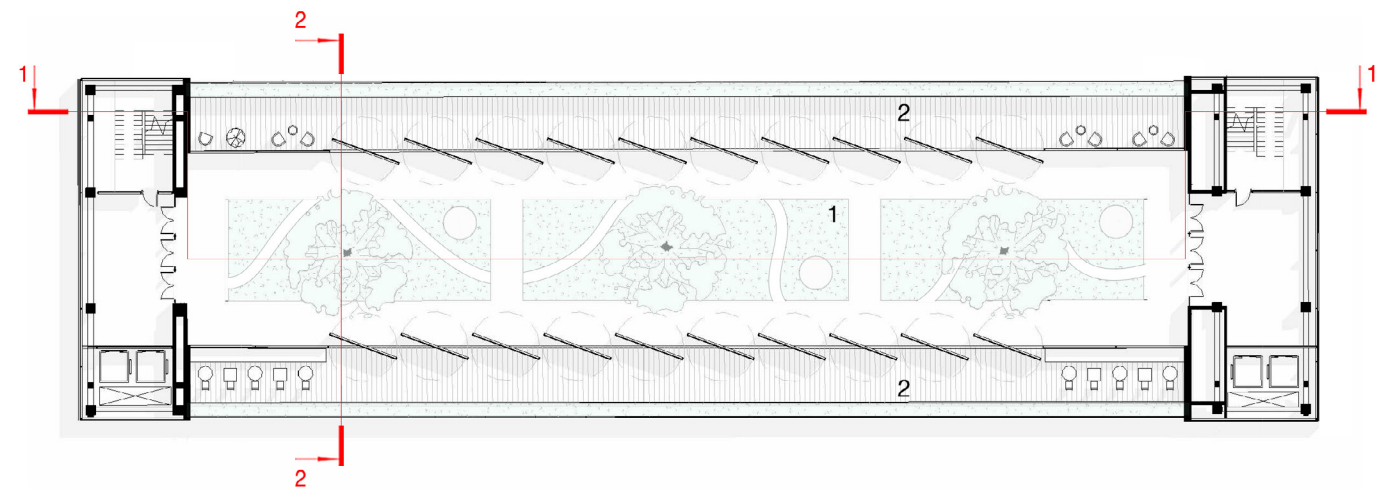


Principle scheme of the swimming pool ventilation: 1 - air supply, 2 - air exhaust, 3 - mechanical climate control system

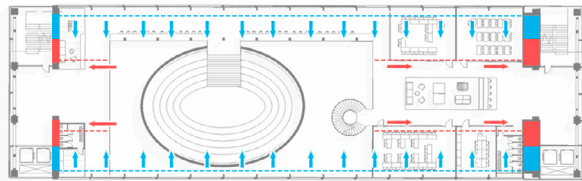


Principle scheme of the swimming pool ventilation: 1 - air supply, 2 - air exhaust, 3 - mechanical climate control system

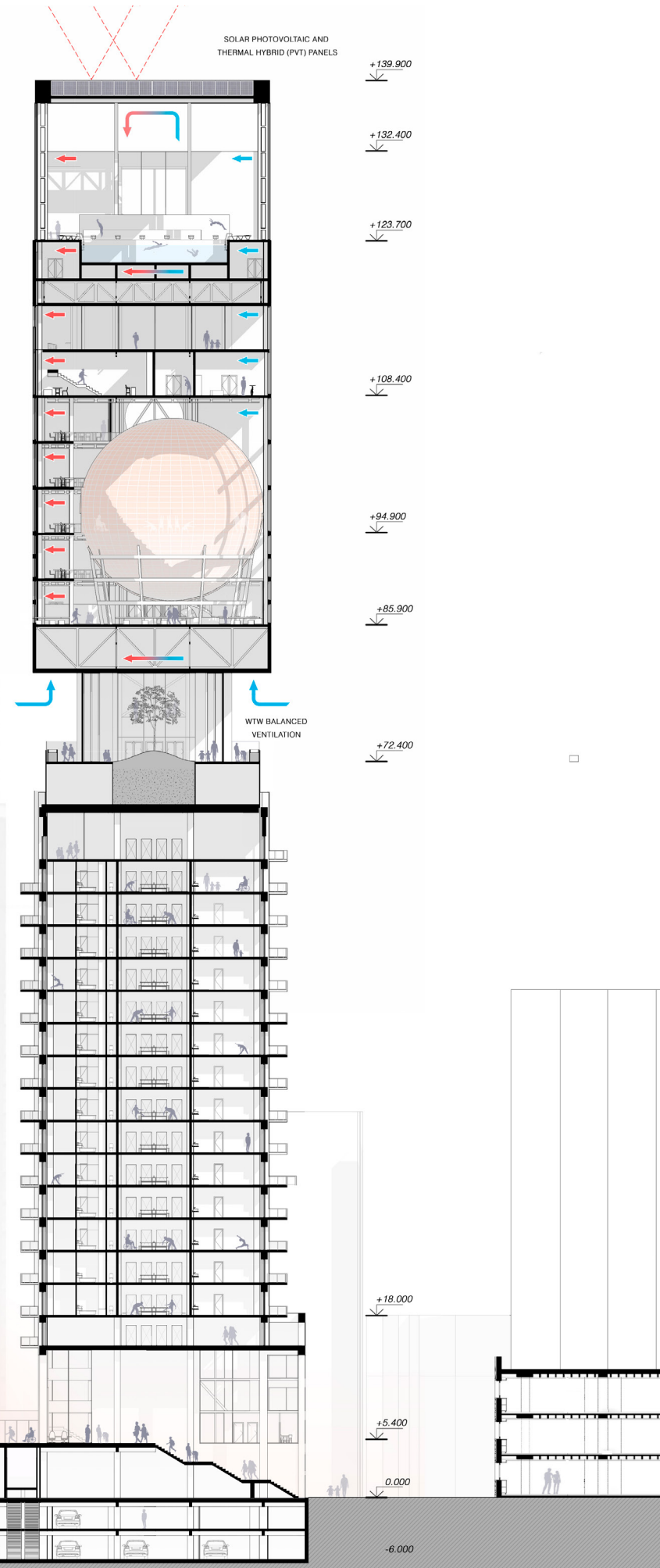
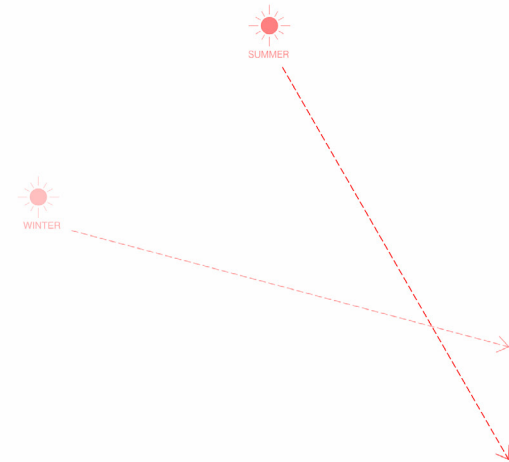
CLIMATE DESIGN

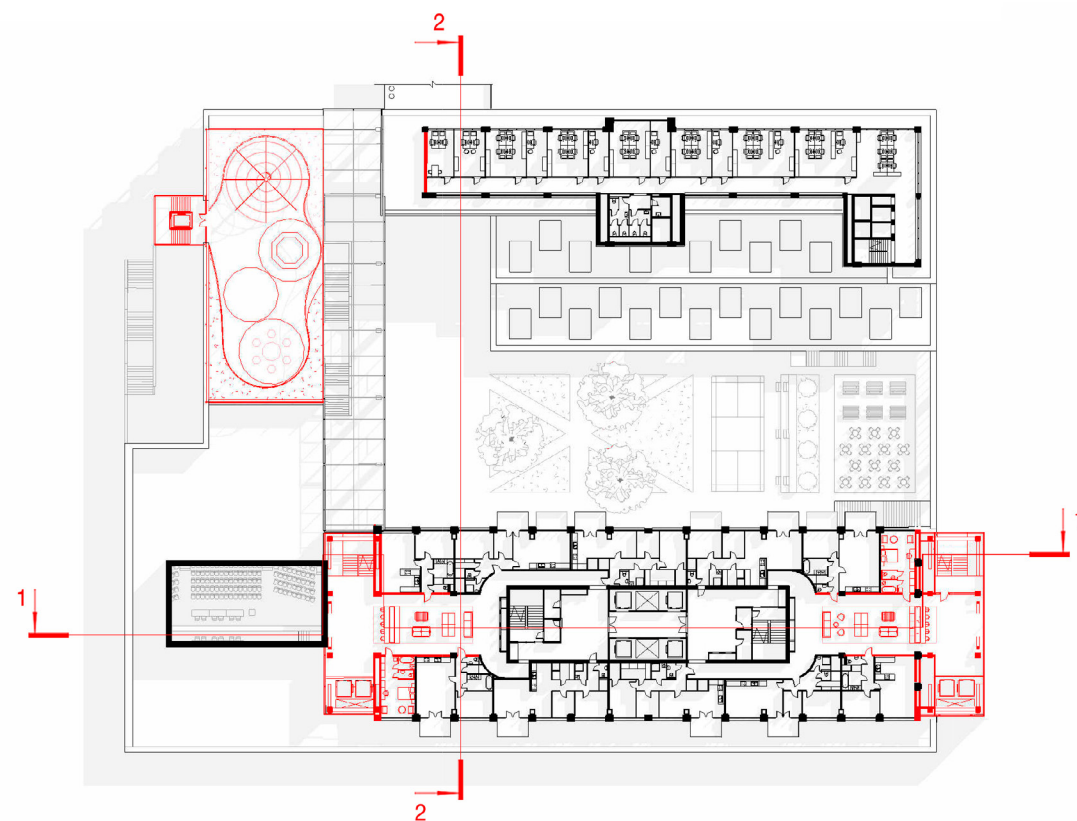


FLOOR AT +85.900
1. SKY GARDEN
2. GREEN BALCONIES



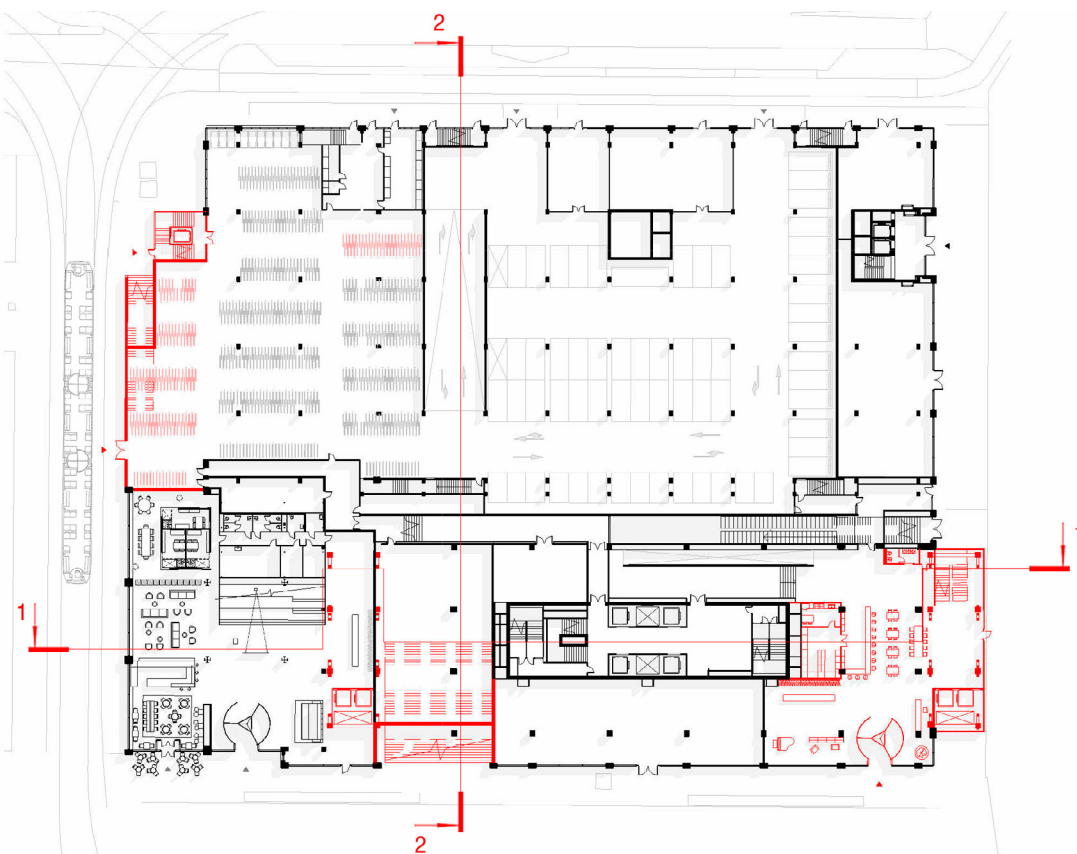
VENTILATION SCHEME
— SUPPLY
— EXHAUST





FLOOR AT +18.000

- 1. NEW STUDENT FLATS
- 2. NEW STUDENT PLAYGROUNDS
- 3. ROOF PLAYGROUND
- 4. EXISTING FLATS
- 5. WORKSPACES AND SECONDARY FUNCTIONS

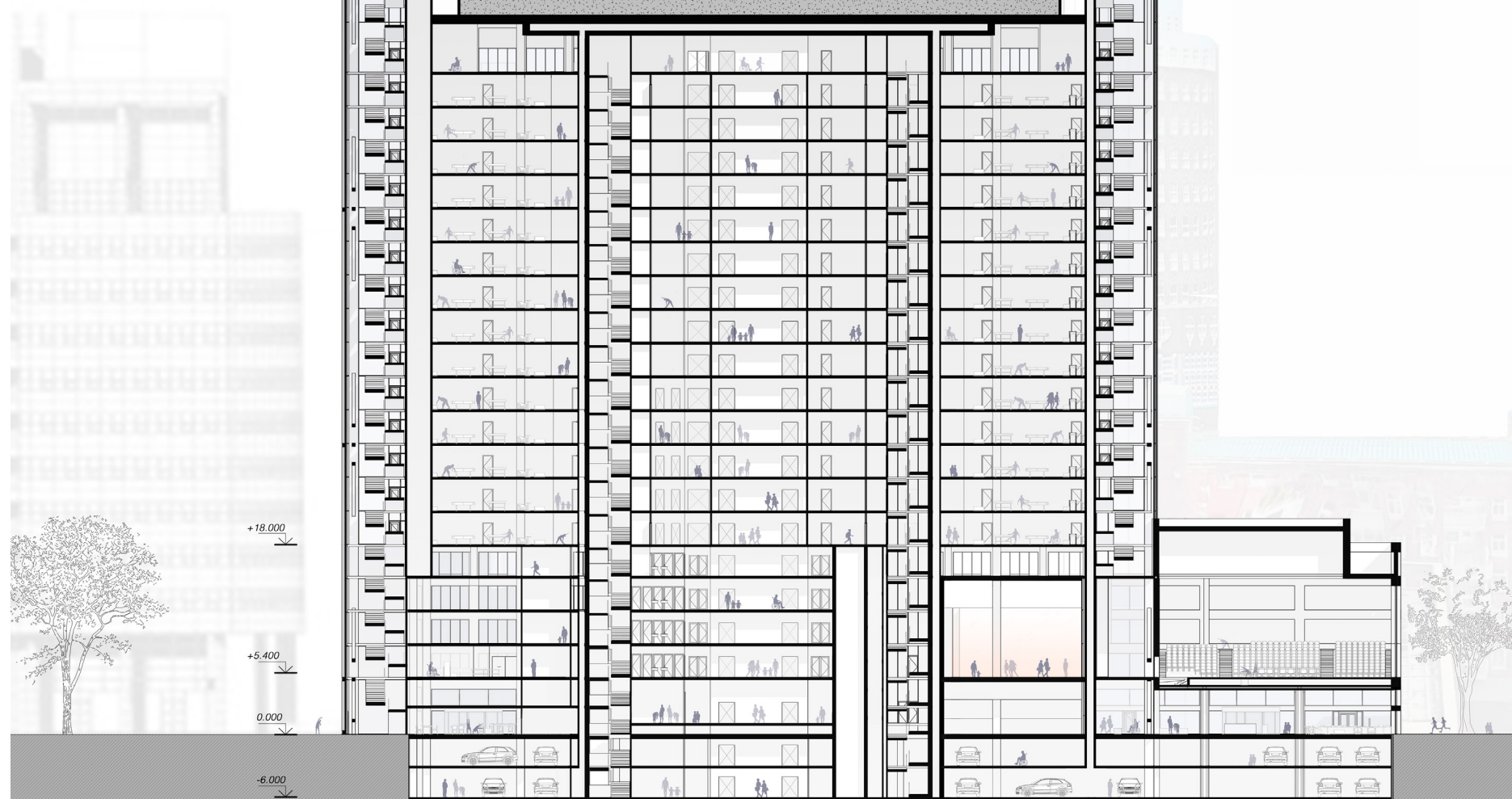


GROUND FLOOR 0.000

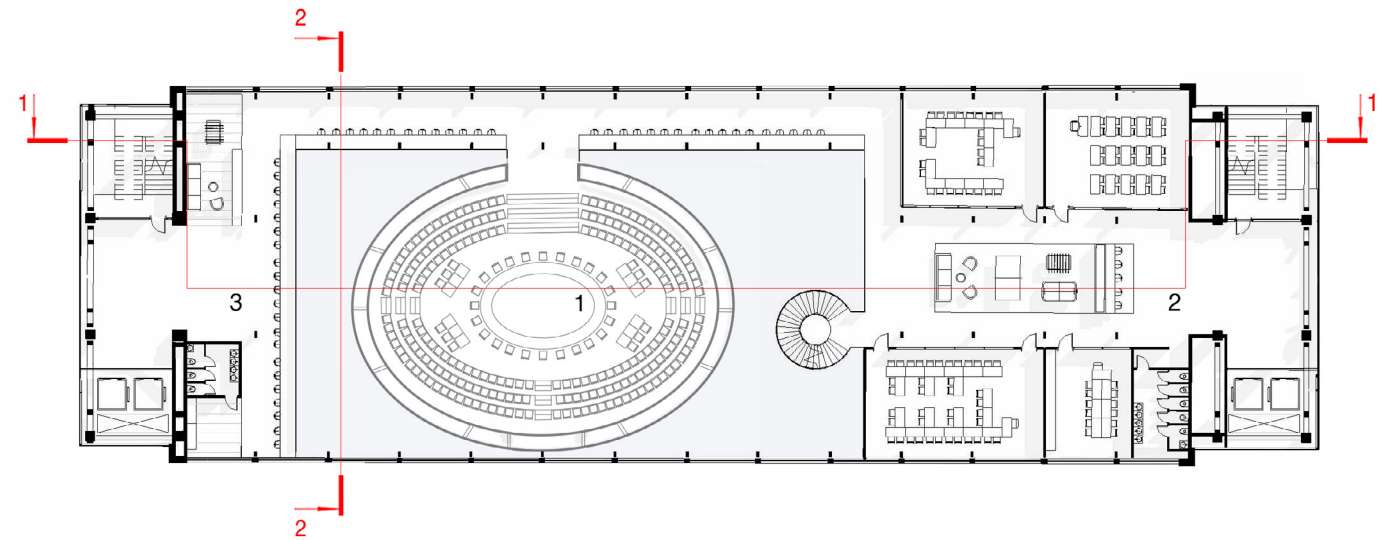
- 1. NEW PASSAGE TO THE OPEN-ACCESS PUBLIC ROUTE
- 2. NEW ENTRANCE HALL
- 3. EXISTING ENTRANCE HALL AND RECEPTION



+139.900
+132.400
+123.700
+108.400
+94.900
+85.900
+72.400



STUDY SPACES

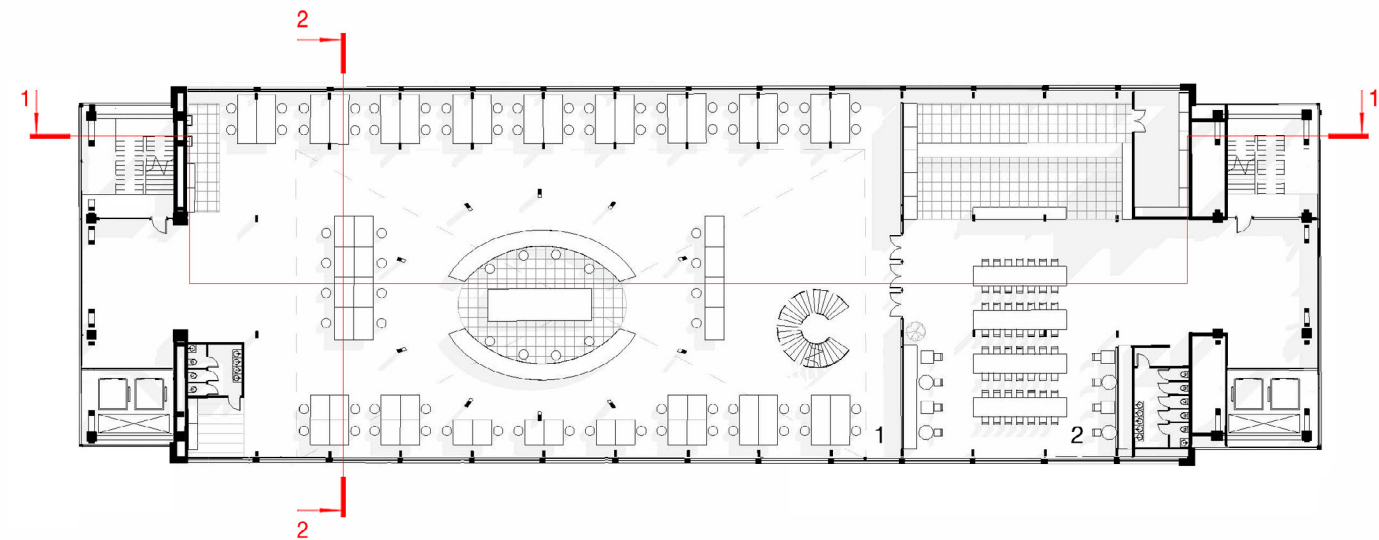


FLOOR AT +94.900

1. CENTRE FOR ADVANCED VIRTUALITY

2. TEACHING, LEARNING & DEVELOPMENT SPACES WITH PLAYGROUNDS

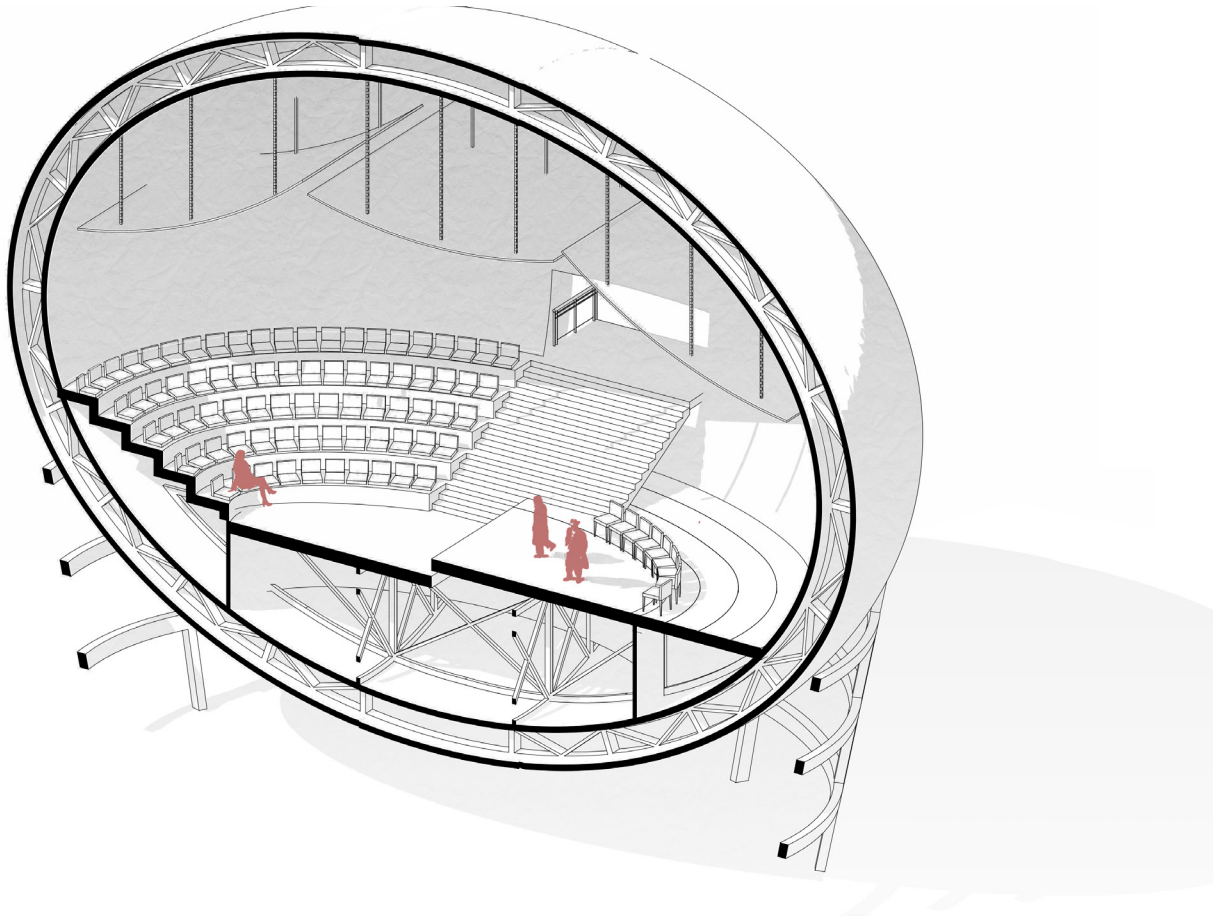
3. FREE FLOW STUDY AREA



FLOOR AT +85.900

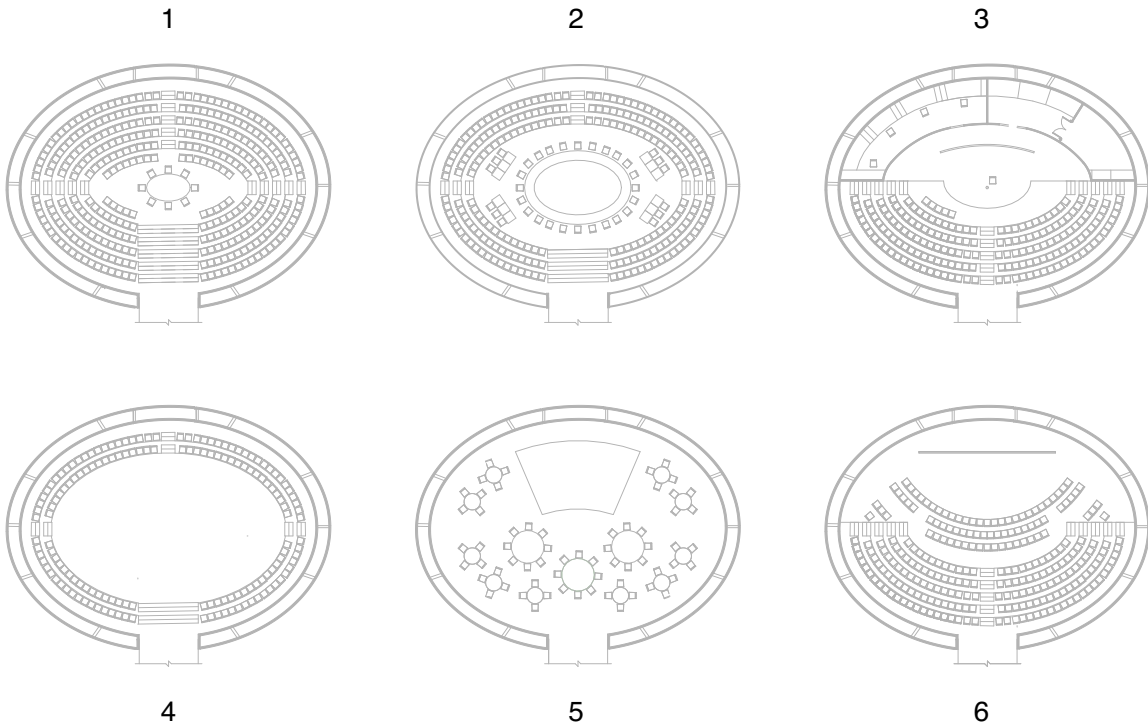
1. WORKSHOP AREA

2. CANTEEN

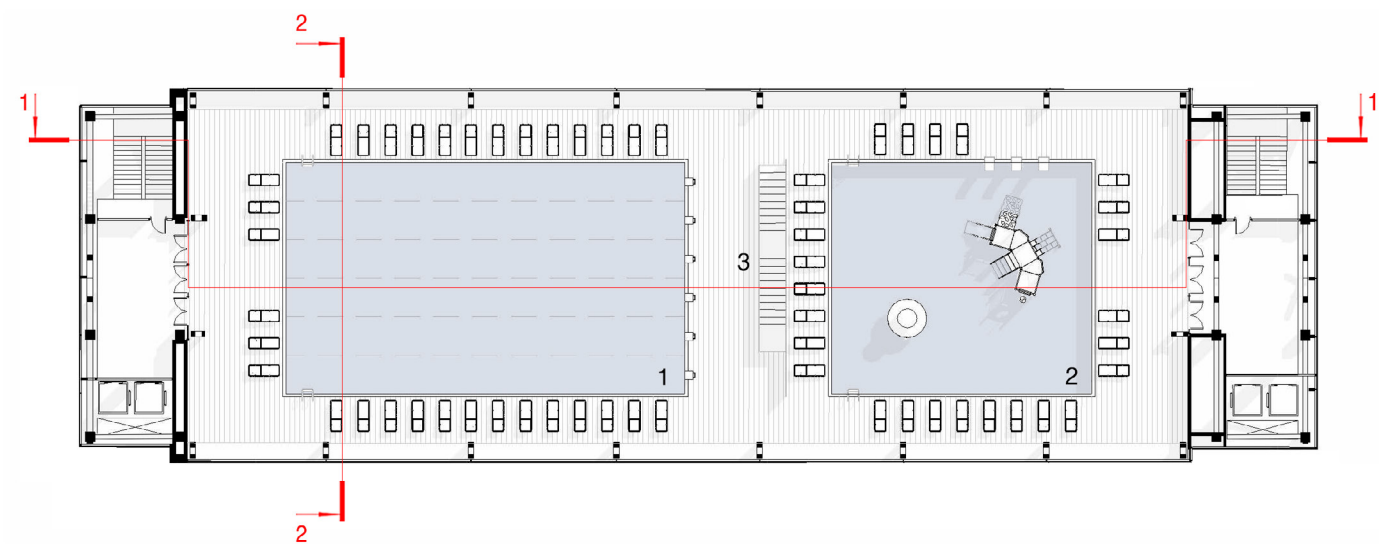


BASIC TRANSFORMATION SCENARIOS

- | | |
|------------|------------------------------|
| 1. FORUM | 4. DANCE FLOOR OR EXHIBITION |
| 2. SUMMIT | 5. BANQUET |
| 3. CONCERT | 6. CINEMA |

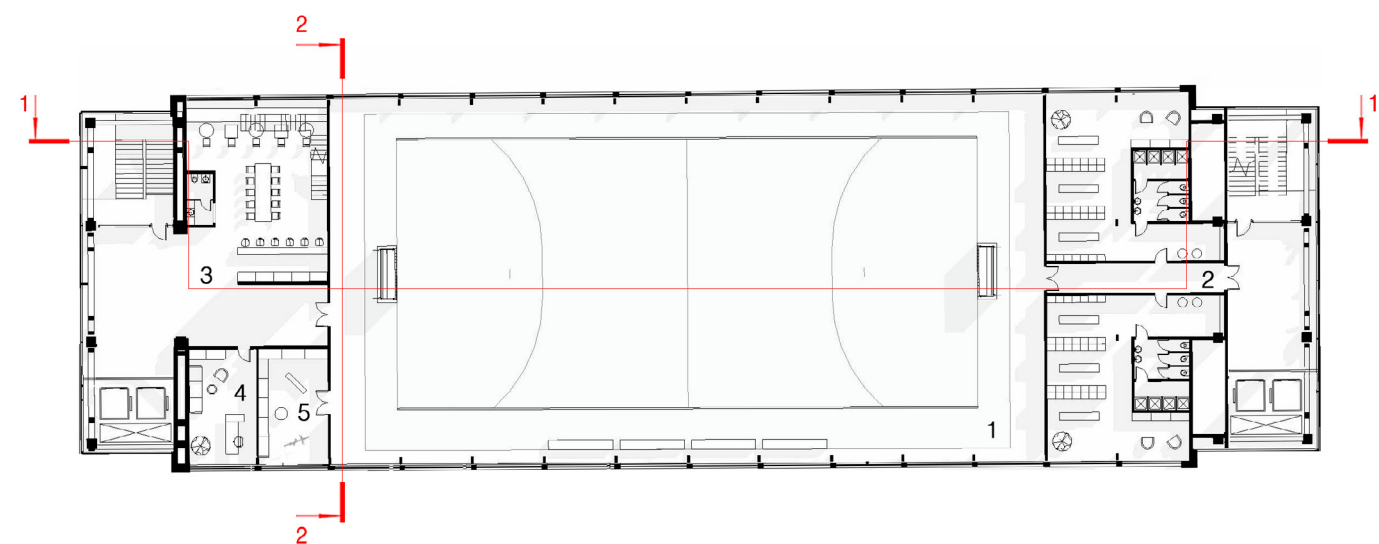


SPORTS SPACES



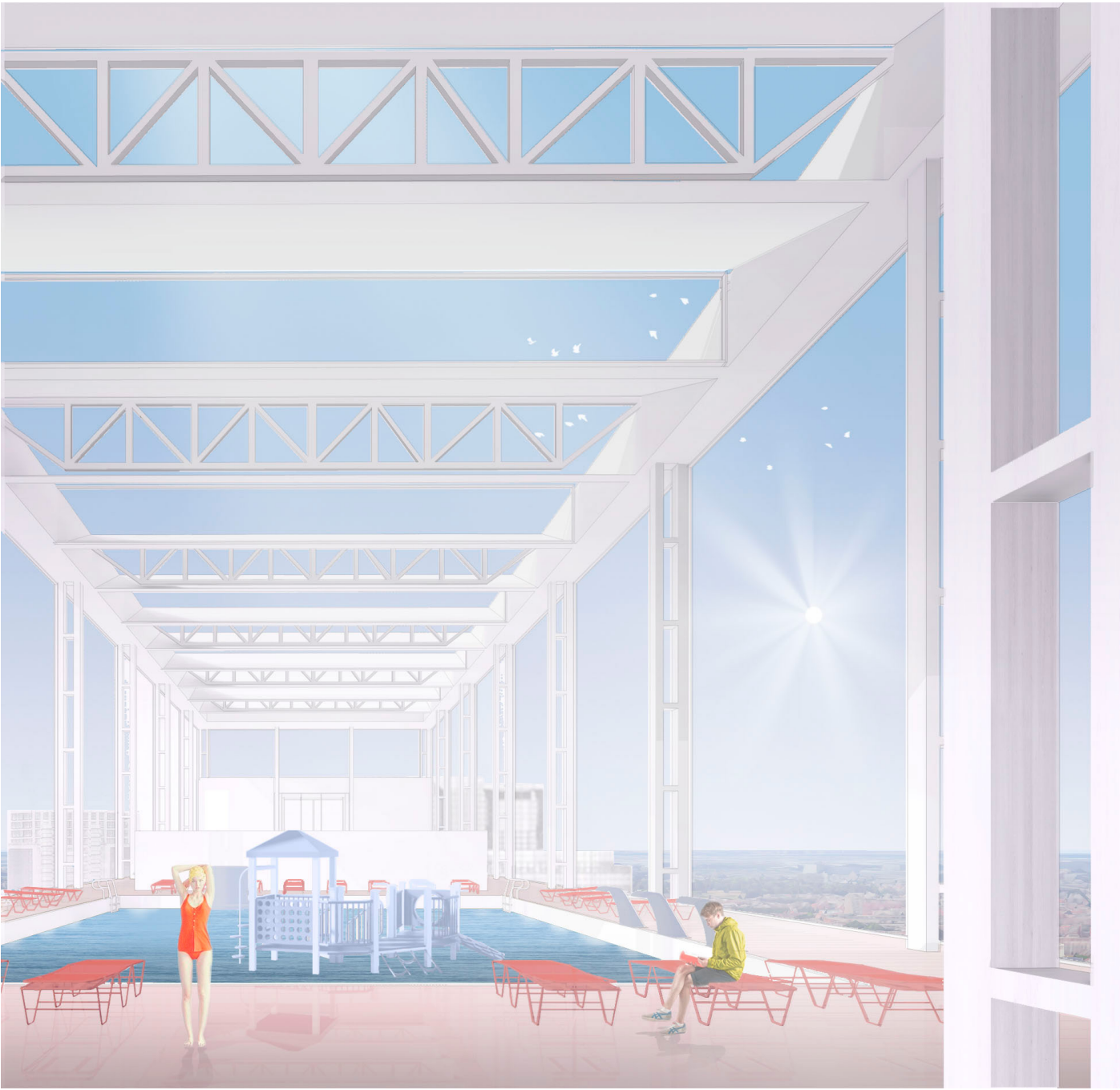
FLOOR AT +123.700

- 1. 25-METER SPORT SWIMMING POOL
- 2. SWIMMING POOL FOR CHILDREN
- 3. STAIRS TO THE DRESSING ROOMS



FLOOR AT +108.400

- 1. UNIVERSAL GYMNASIUM
- 2. DRESSING ROOMS
- 3. CAFETERIA
- 4. COACH'S OFFICE
- 5. STOREROOM





P4 FROM PRELIMINARY TO INTEGRATED DESIGN

Individual work
Materialization
Developement in Technical Building
Design

FAÇADE CONCEPT

Currently the Leiden University building is clad in beige coloured curtain walled metal panels with a single module of 2.25 metres.

Keeping in mind the idea of the new educational cloud soaking over the monumental building, the idea of multilayeredness and translucency were crucial in the façade design. The façade of the new part tends to use the same module but contrasting materials. For both the educational and sports part, lightweight and light-transmitting materials are important for the comfort of the educational process.



Physical working model of the facade fragment

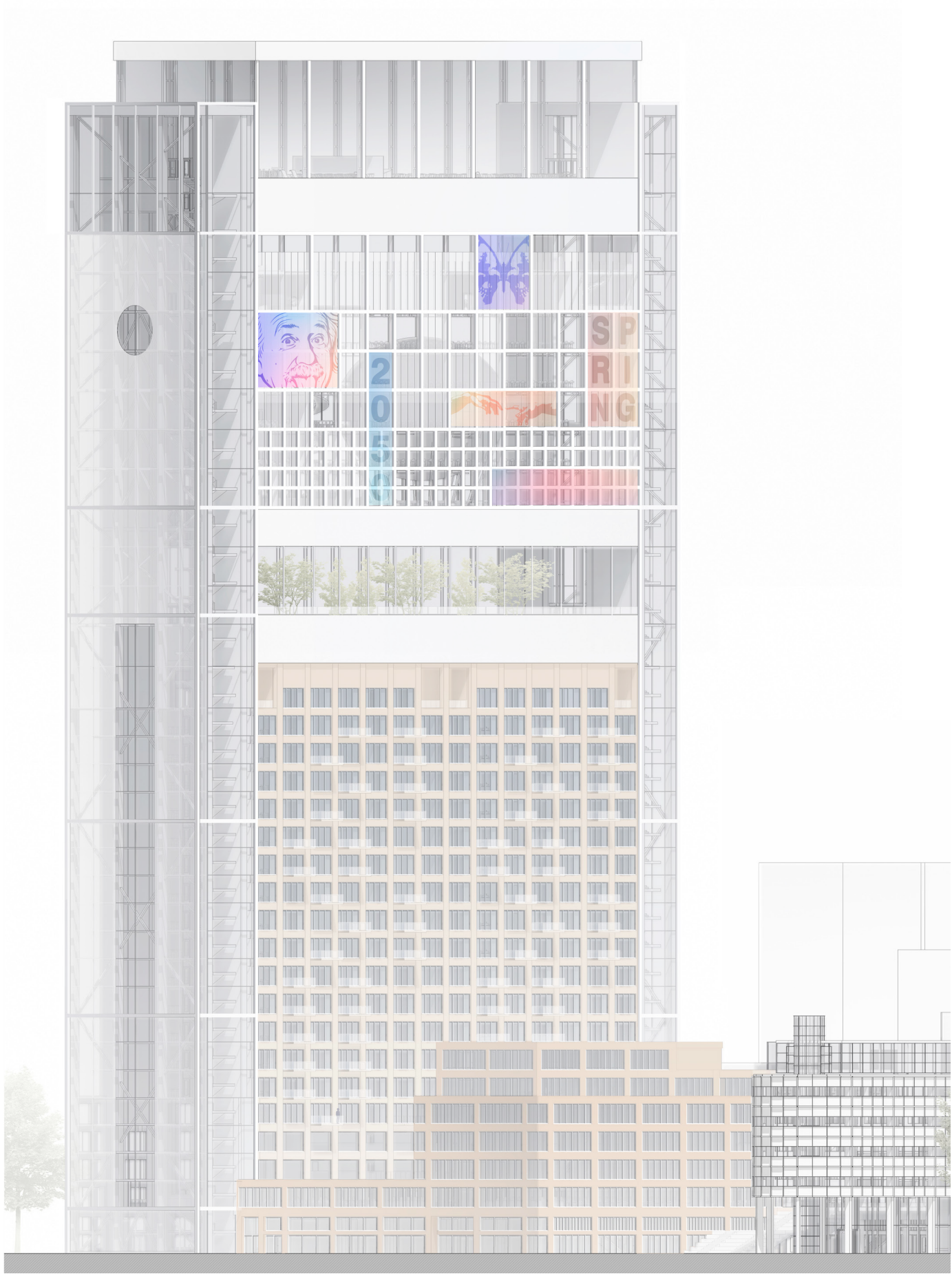


Renovated façade. Source: <https://zonneveld.com/en/projects/Herontwikkeling-Wijnhaven-Den-Haag>



Physical working model of the facade fragment

U-GLASS FOR THE NEW INTERVENTION ?



The wooden grid on the façade of the central zone uses a single module, enlarging towards the top - the sports zone. In some areas (classrooms, sports ground and dressing rooms) the grid is filled with translucent panels.

Different options for translucent façade materials were considered, including glass U-panels. The choice was later made in favour of a more energy-efficient material.

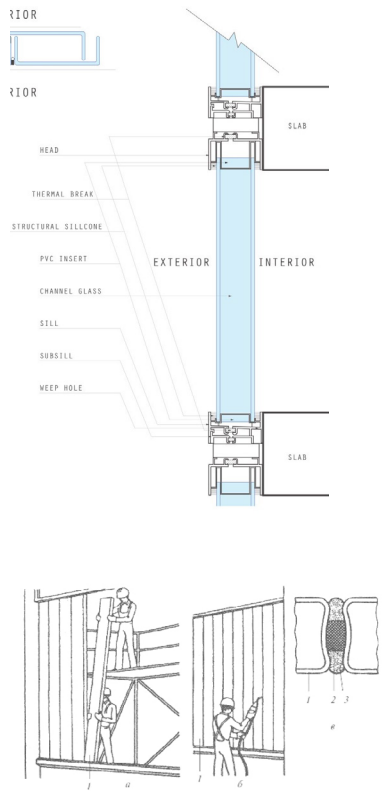
At the same stage of design, the idea of creating a façade with dynamic properties that reflected the atmosphere of the campus emerged.

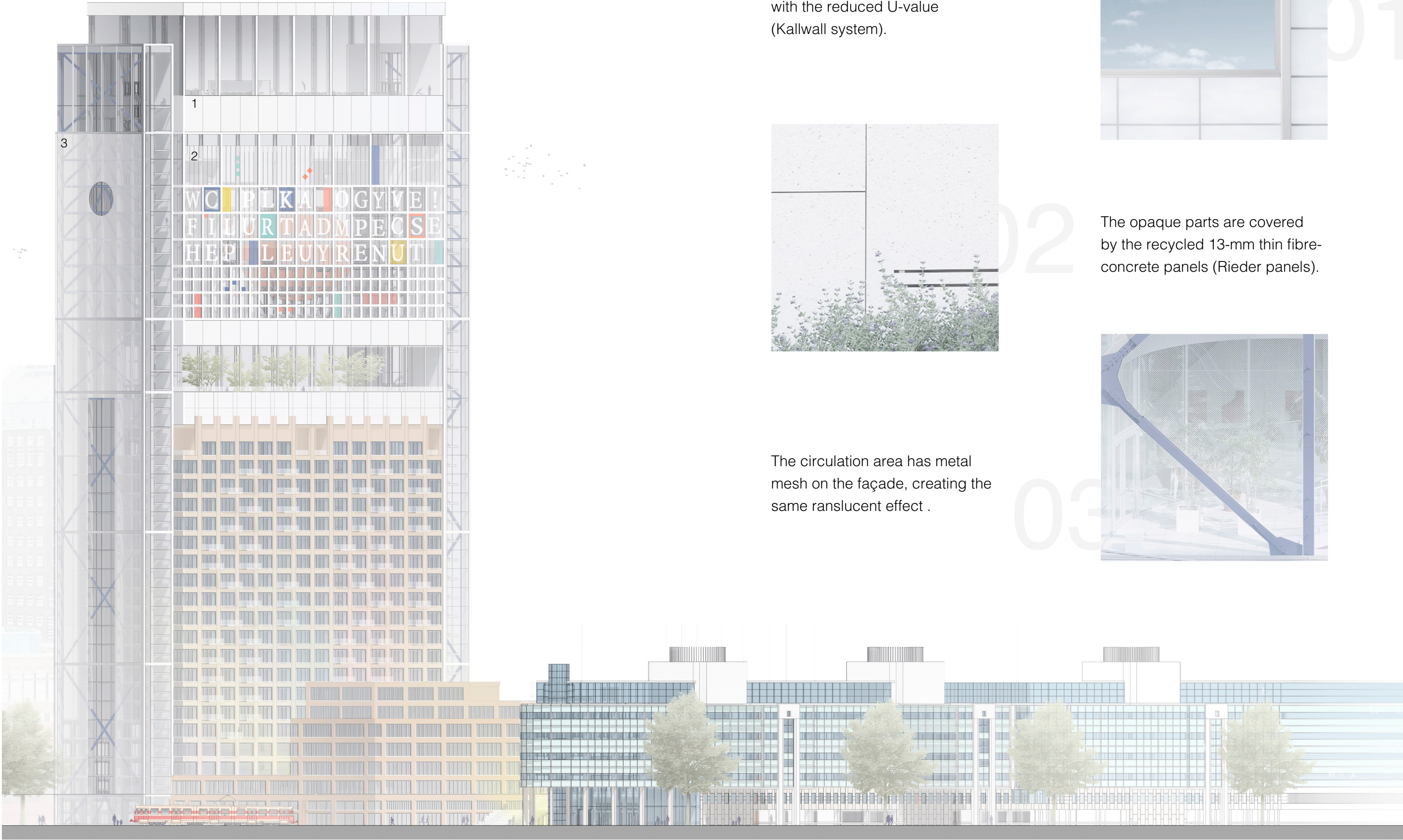


STUDY SPACES



SPORTS SPACES





In general, there are three main principles of the façade. The main body uses translucent and transparent composite panels with the reduced U-value (Kallwall system).

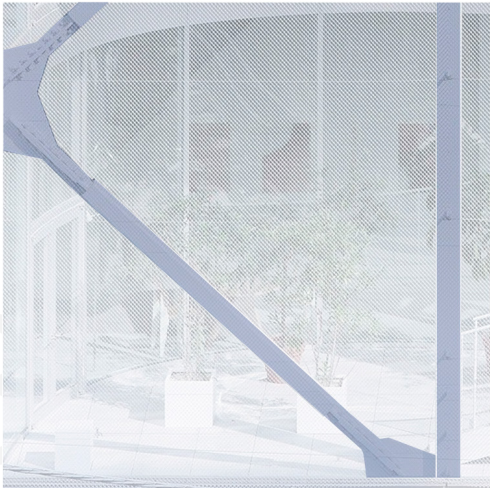


01



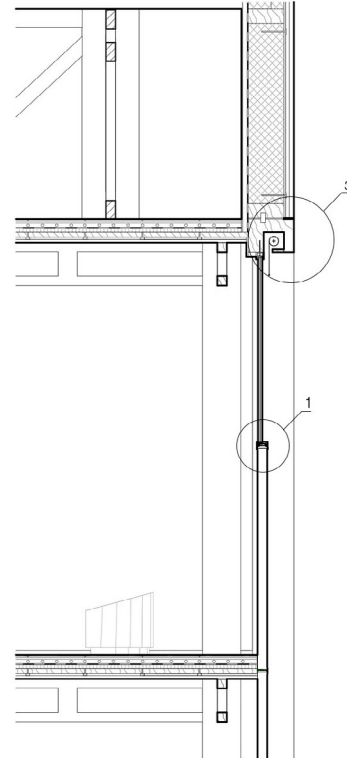
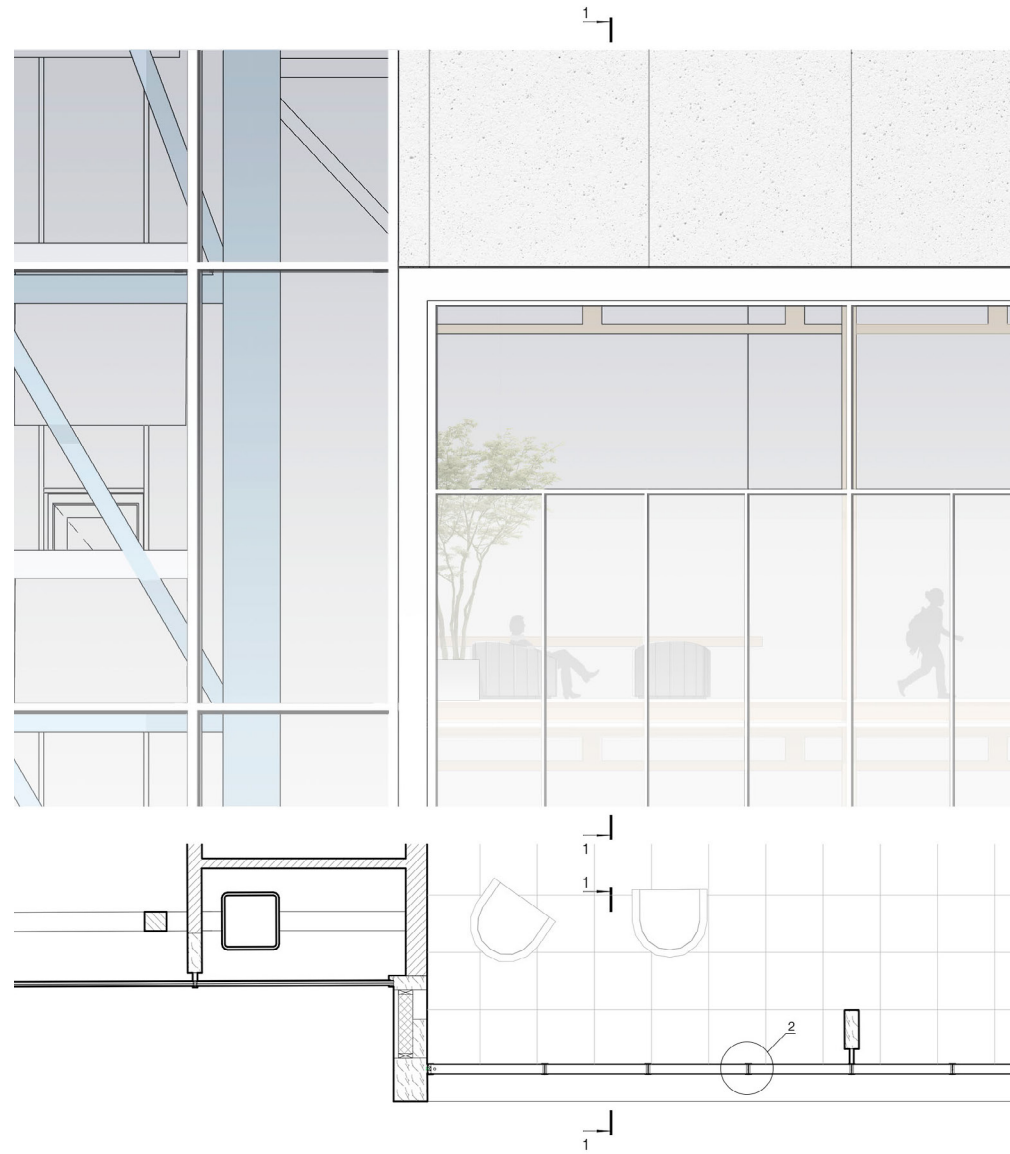
02

The opaque parts are covered by the recycled 13-mm thin fibre-concrete panels (Rieder panels).

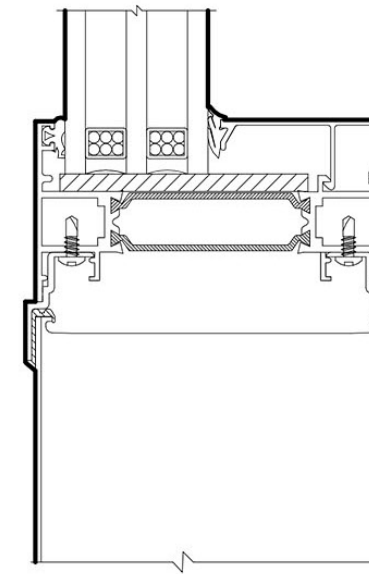


03

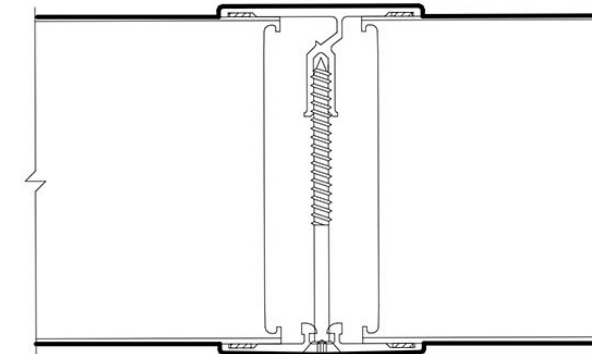
The circulation area has metal mesh on the façade, creating the same translucent effect .



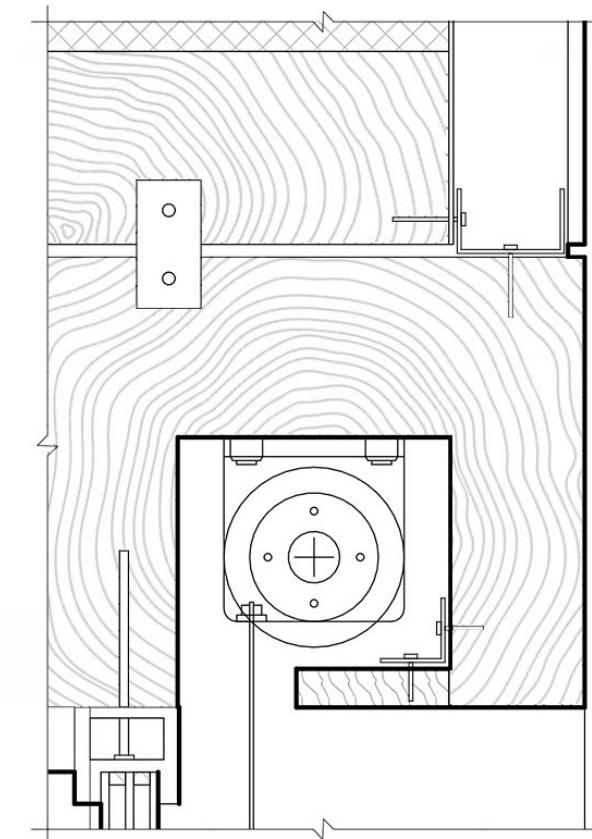
1



2



3



Floor construction

- Ceramic tiles 60x60 mm
- Tile adhesive
- Fermacell boards,
- Screed with underfloor heating 80 mm
- Separating layer (1 mm foil)
- Insulation, 40 mm
- Counter-floor (diagonal boarding with butt joints), 20 mm
- Timber joists 50 mm
- Battens, 24 mm
- Clapboard, 15 mm

Translucent sandwich 100 mm panels (Kalwall)

- Kalwall Weatherable Surface (KWS), self-cleaning protective coating
- Exterior color-stable Fiberglass Reinforced Polymer (FRP) face sheets
- Translucent Insulation, aerogel
- Interior shatterproof FRP face sheets
- Aluminium composite Grid Core

Exterior FRP and Interior FRP are white

U factor= 0.55 W/m²K

Visible Light Transmission (VLT) % = 23%

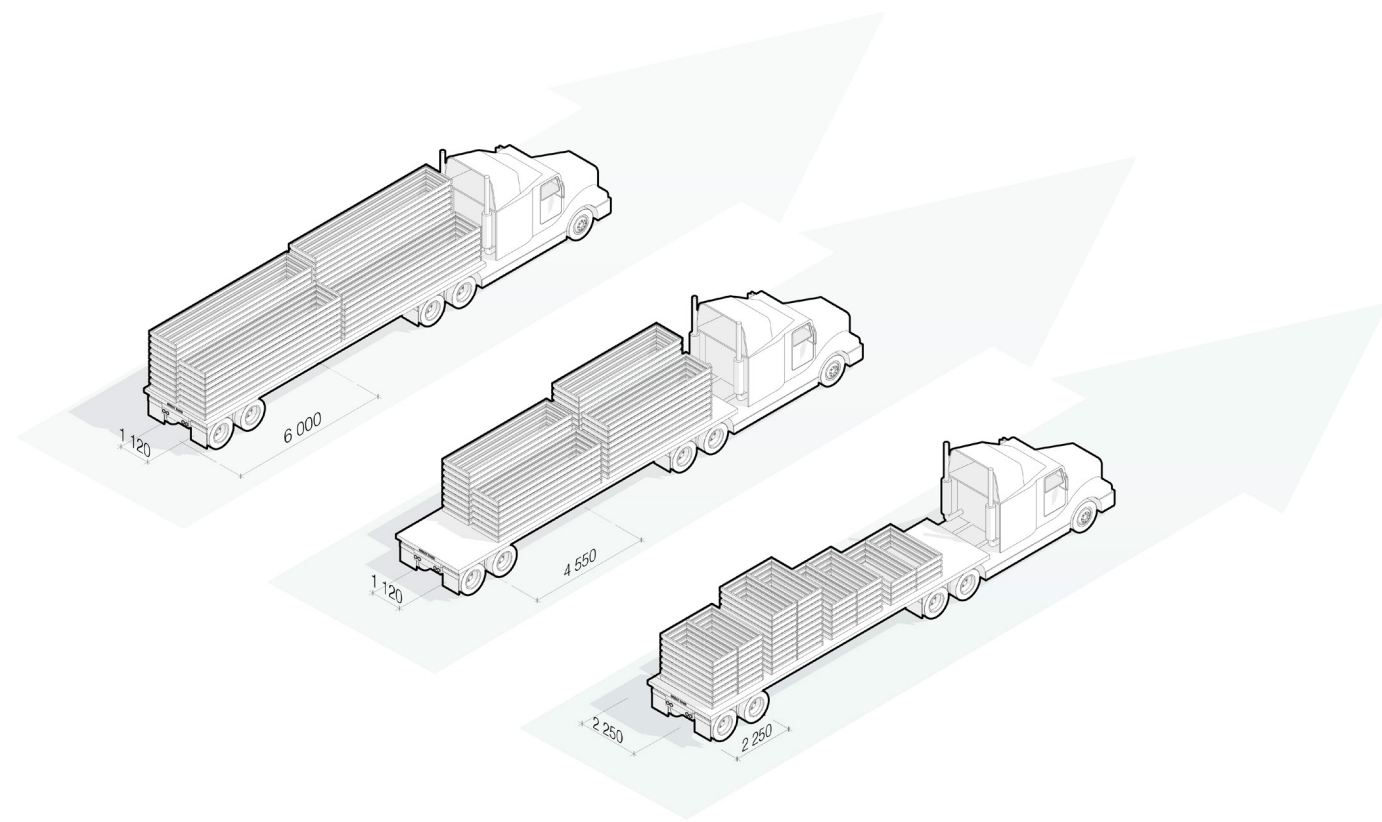
Solar Heat Gain Coefficient @ 0o = 0.38

Wall construction

Platform frame construction

- Rieder recycled glassfibre reinforced concrete panels, 13 mm
- Ventilated cavity and fastening, 75 mm
- Softboard (airtight membrane), 18 mm
- Thermal insulation, frame, 300 mm
- Vapour check
- Plain angled connections
- Battens (space for services), 50 mm
- Wood-cement particleboard

FAÇADE INSTALLATION



The façade tends to be modular, so it can be easily assembled. Large panel units are assembled and glazed at the factory. They are then delivered to the construction site in phases - panels for one floor at a time so as not to occupy a lot of space on the site. Once delivered to the site, these large units can be installed rapidly to save both time and money. This approach also allows the building to be enclosed in a fraction of the time compared to conventional curtain wall systems allowing interior work to commence much earlier.



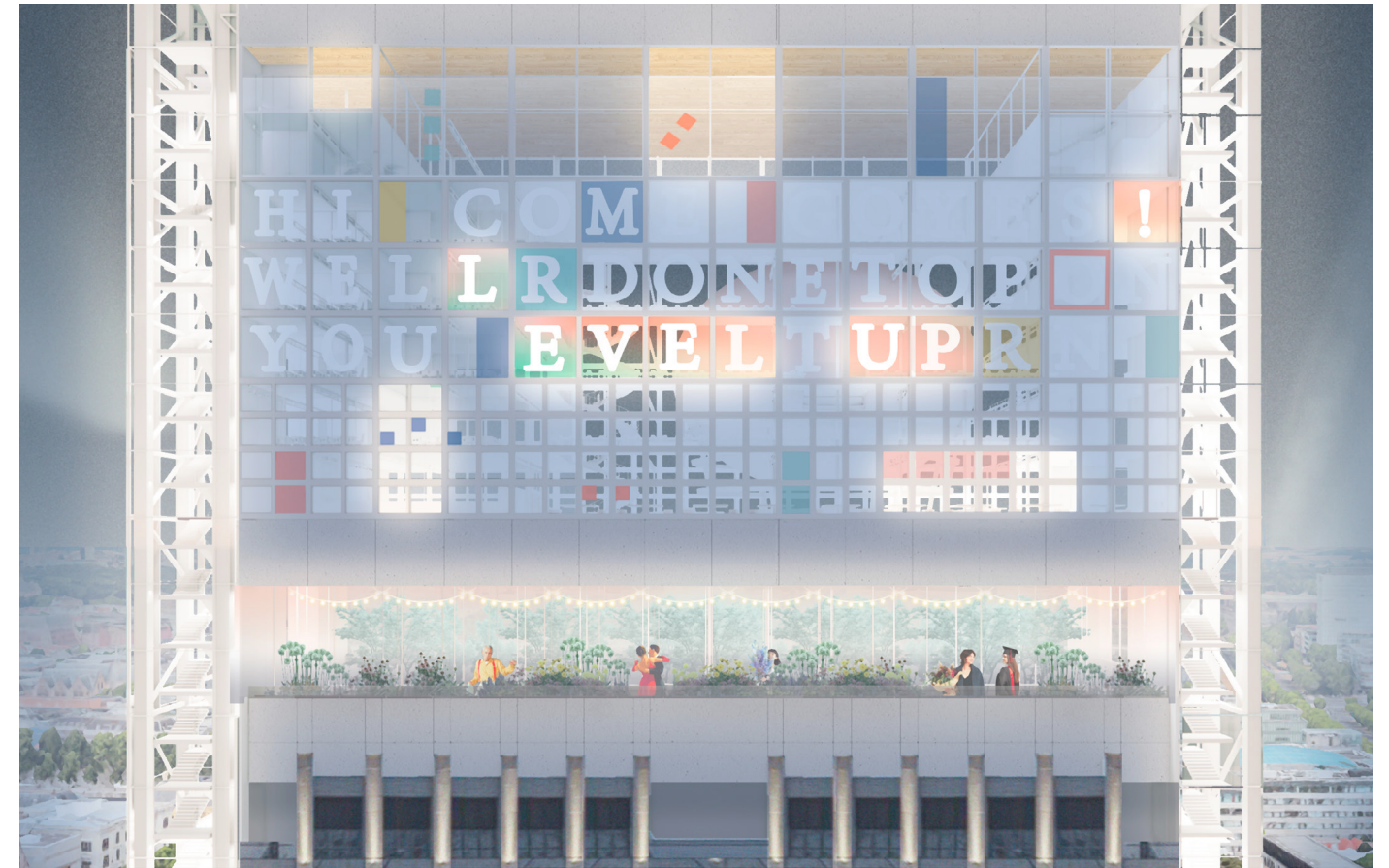
Kalwall facade system. 1. Kalwall Weatherable Coating (KWS) 2. The Bond Line 3. Exterior Fiber-Reinforced Polymer (FRP) face sheet 4. Translucent Insulation (TI) Lumira aerogel. 5. Interior Fiber-Reinforced Polymer (FRP) face sheet 6. Structural Grid Core composed of a series of interlocking aluminum and thermally broken I-beams. Source: https://www.kalwall.com/resources/?resource_type=cad-details



Kalwall facade system. Installation process
Source: https://www.kalwall.com/resources/?resource_type=cad-details

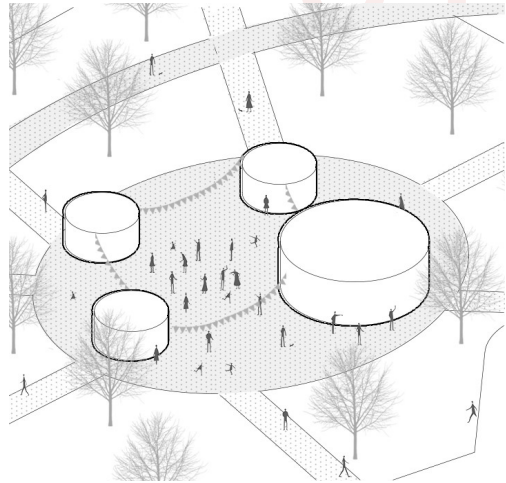


FAÇADE TRANSFORMATION

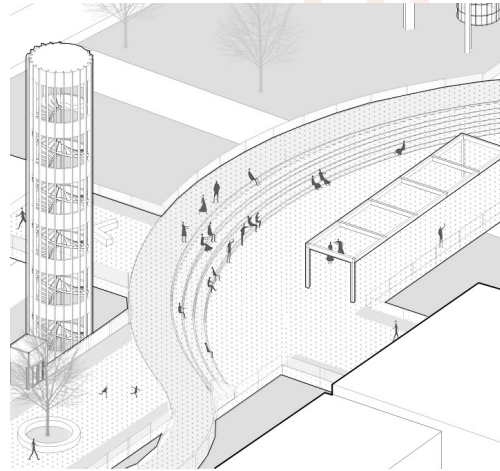


DESIGN OF THE GREEN PEDESTRIAN ROUTE

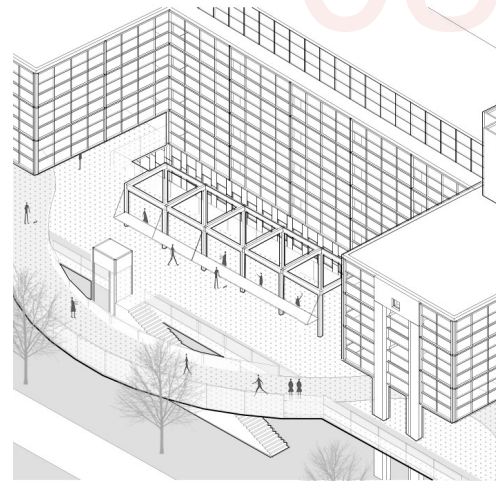
01



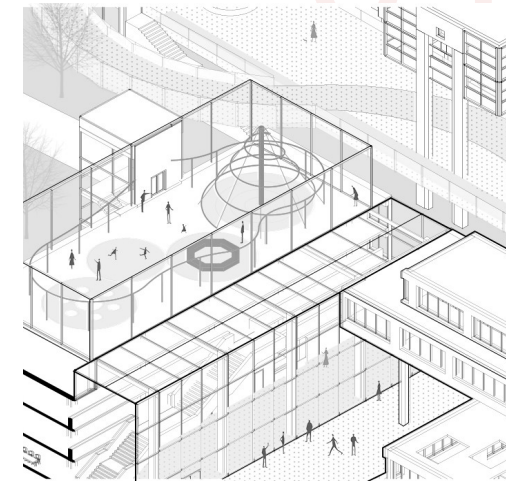
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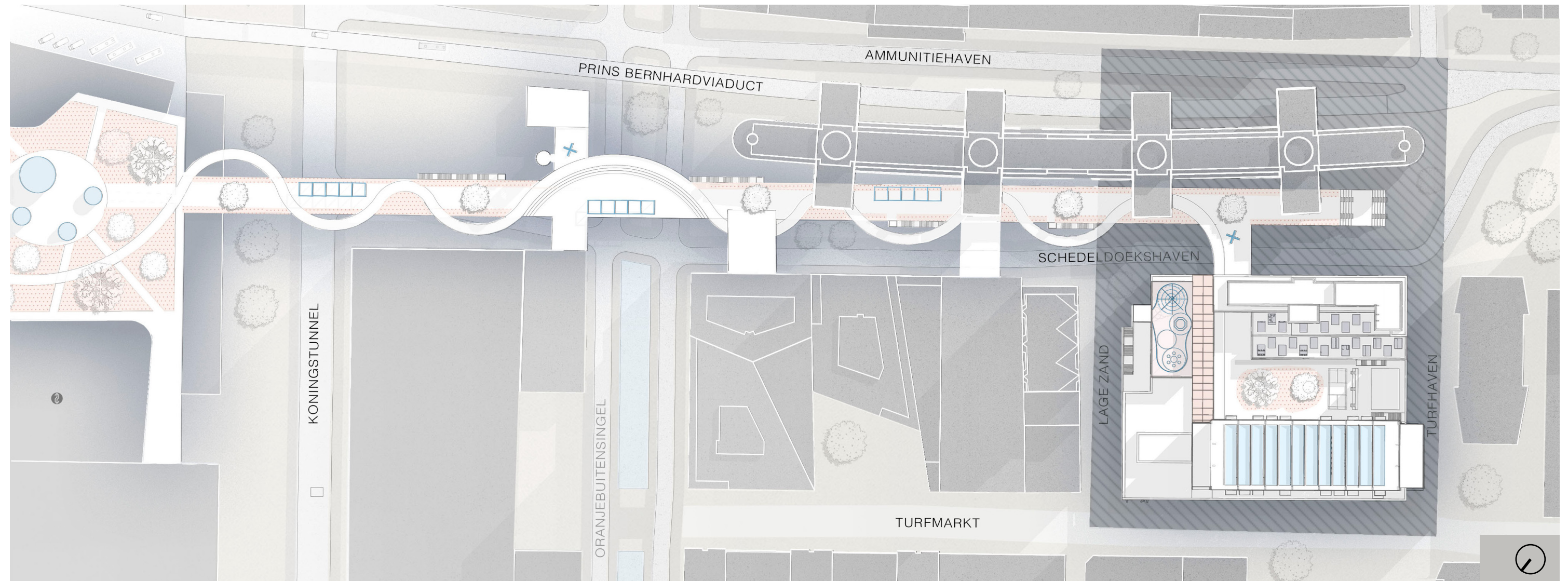
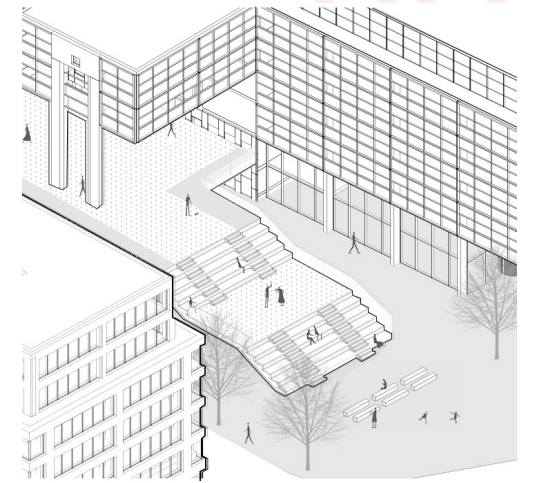
03



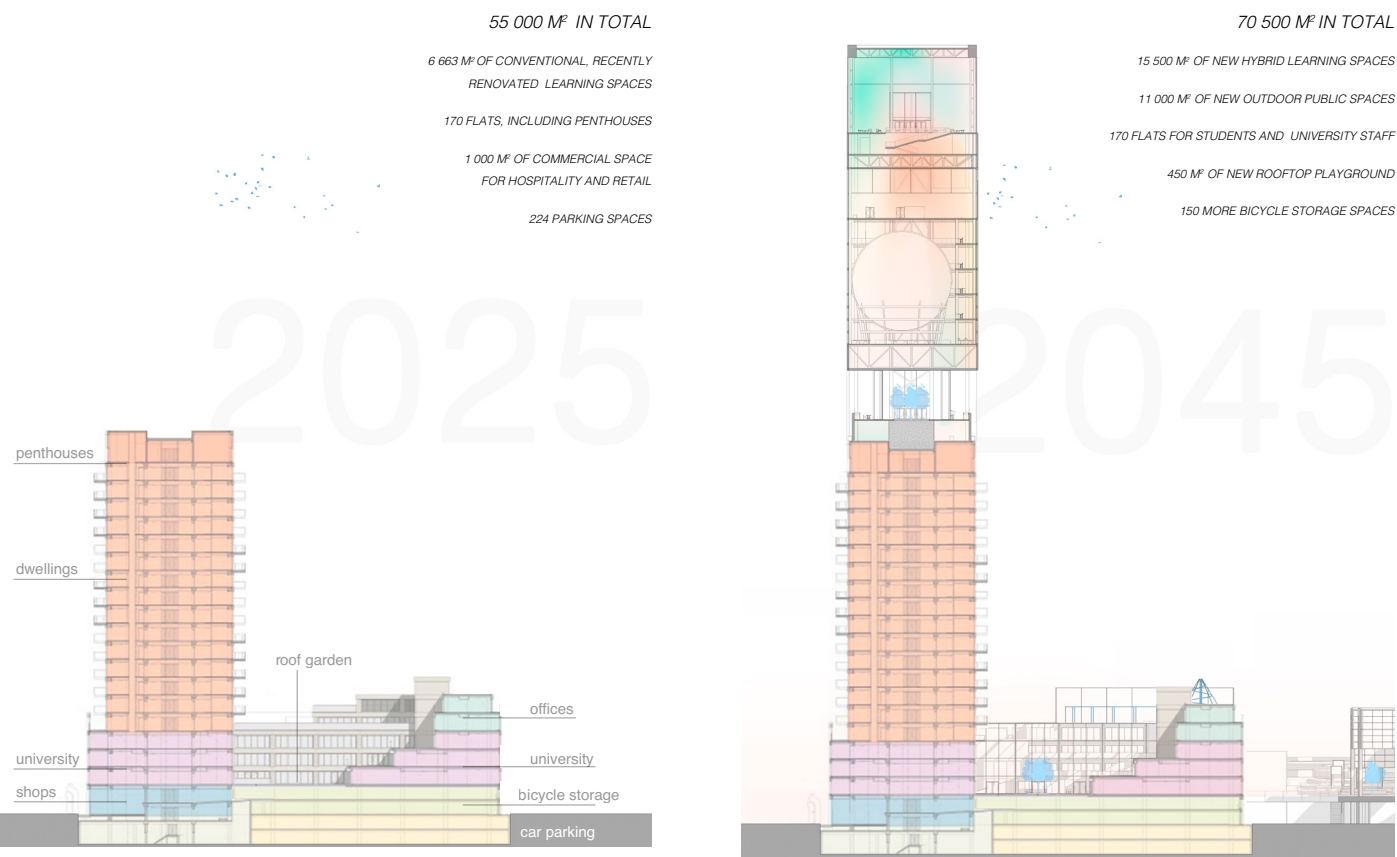
04



05



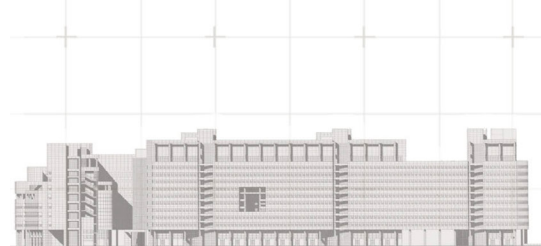
DENSIFICATION PRINCIPLES IN A LARGER SCALE





P5 FINAL DRAWINGS AND FINAL REFLECTION

Graduation project results
Conclusions



The Hague City Hall, Richard Meier, 1995



Leiden University, Lucas & Niemeijer, 1972-1978



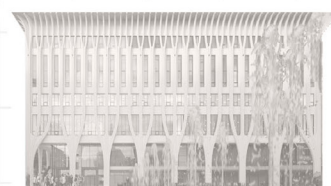
Royal Library of the Netherlands, Arie Hagoort, B.M. van der Meer, A.J. Trotz, 1982



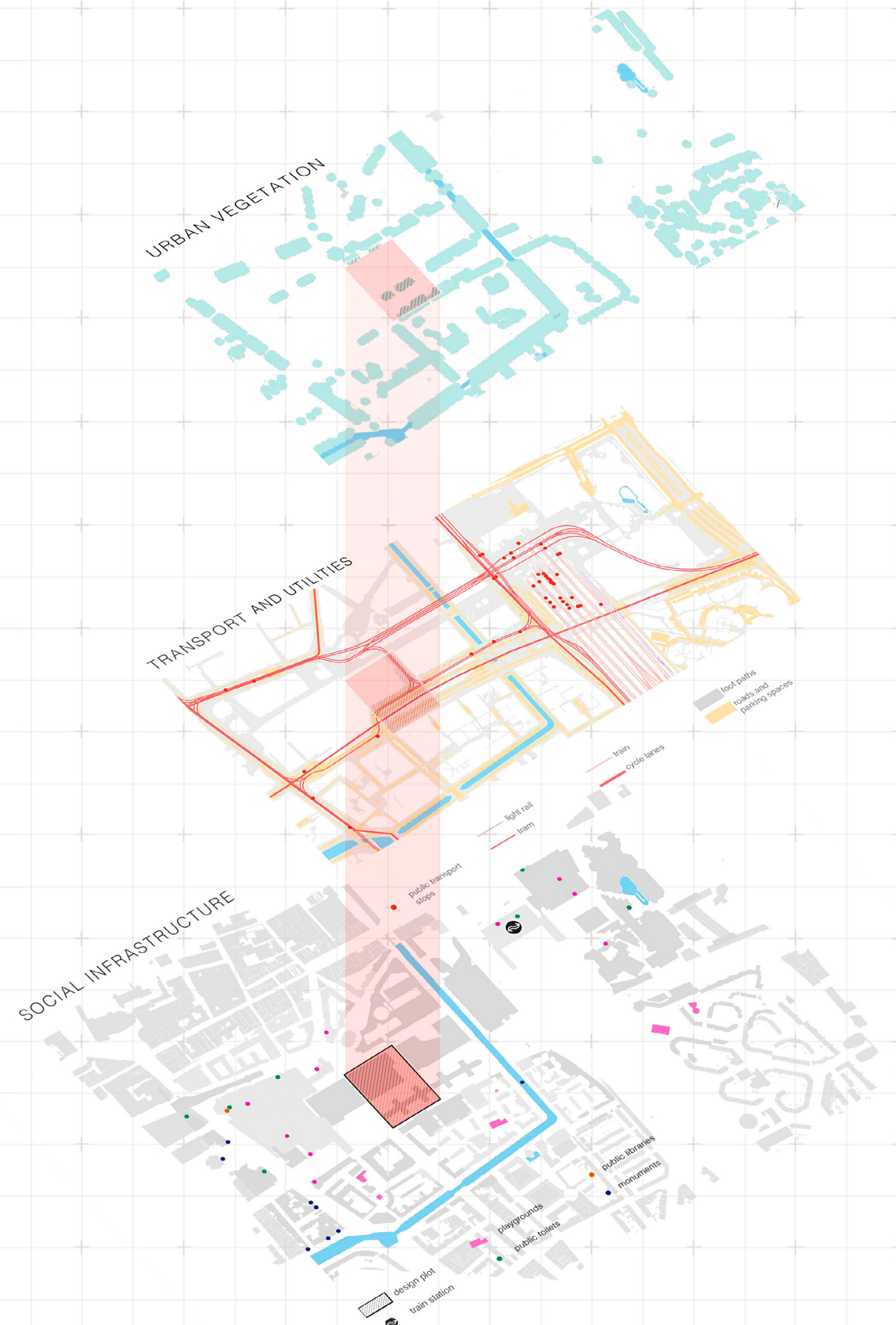
The Hague Central Station, Benthem Crouwel Architects, 2016



Filmhuis Den Haag, Herman Hertzberger, 1991



Amare Home of the Performance Arts, NOAHH, 2021

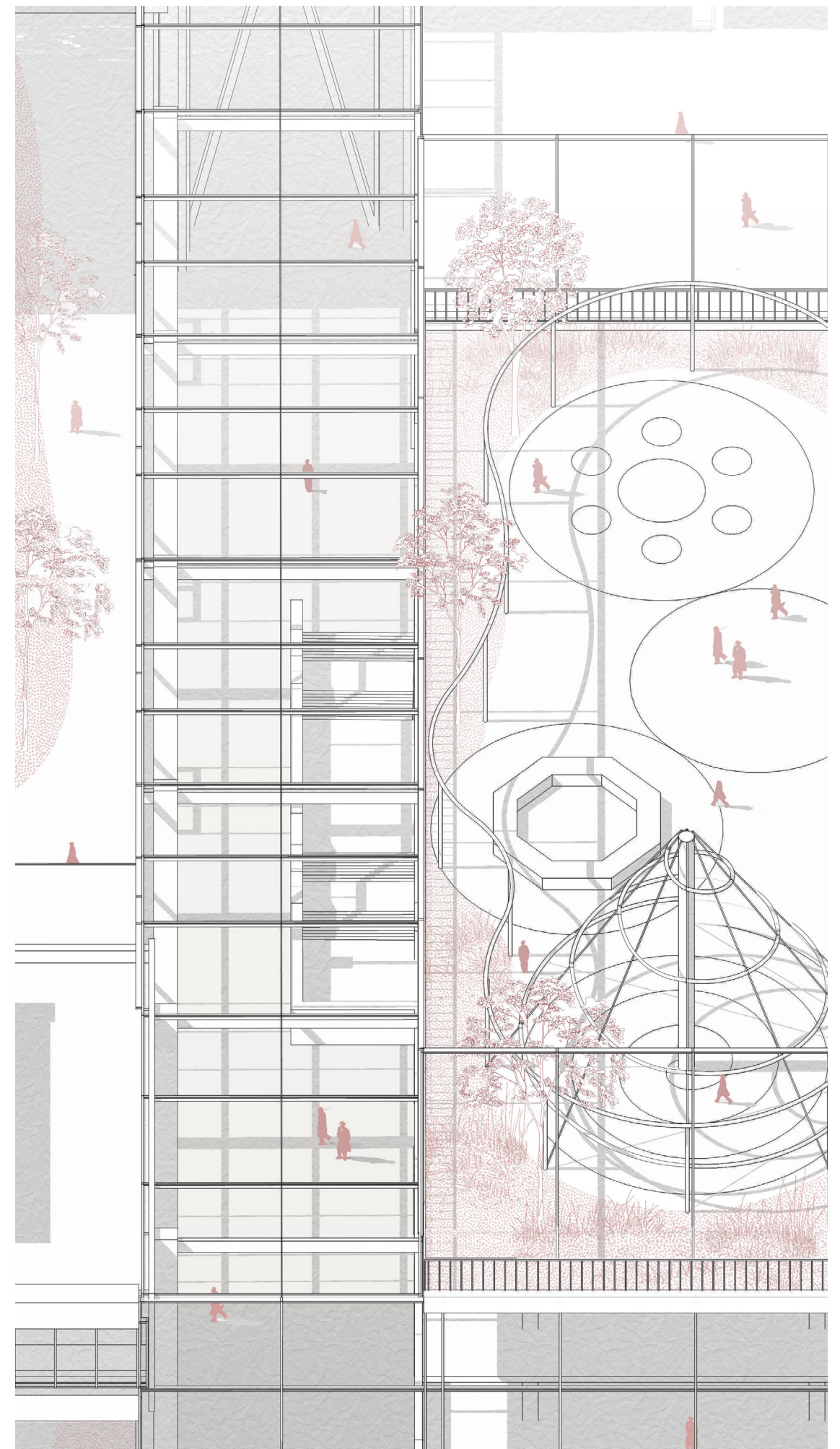


ARCHITECTURAL AND BIOLOGICAL DENSIFICATION

If we infuse cities with natural diversity, complexity, and most of all, opportunities to feel, touch and work with nature, we can win the biophilic challenge. Quite simply, biological density must be the prerequisite for architectural density.

Charles Montgomery

Red maple



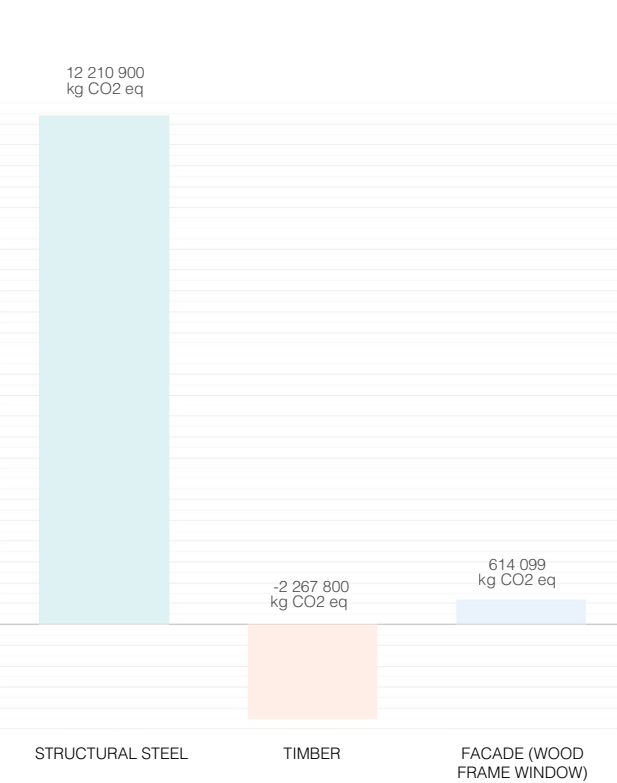
SUSTAINABILITY STRATEGY

BUILDING MATERIALS PYRAMIDE



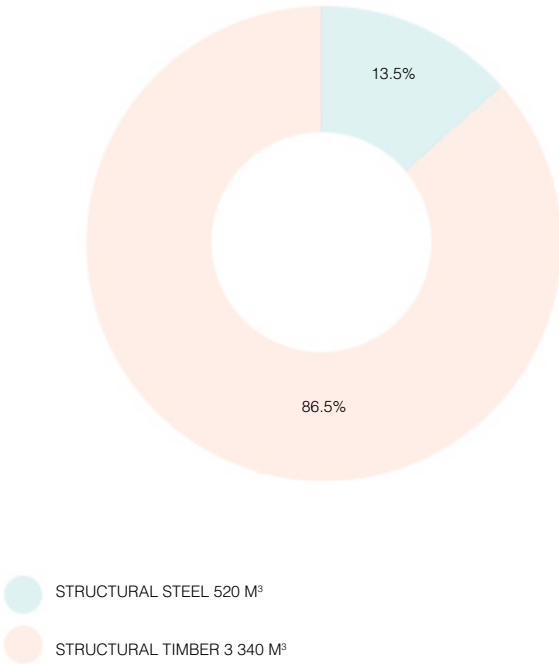
Building Materials Pyramide organized by Carbon footprint
Royal Danish Academy Centre for Industrialised Architecture (CINARK), 2019
Source: <https://www.materialepyramiden.dk/>

EMBODIED CARBON

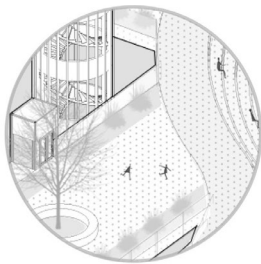


IN TOTAL: 10,557,199.5 kg CO2 eq

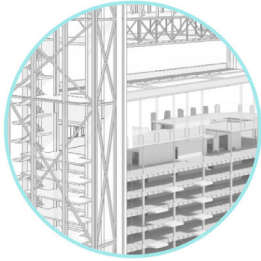
MATERIAL VOLUME



DENSIFICATION OF THE CITY
INTEGRATING BIODIVERSITY



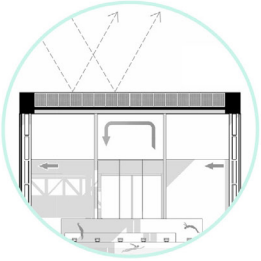
TRANSFORMATION OF
THE EXISTING STRUCTURE +
FLEXIBLE NEW STRUCTURE



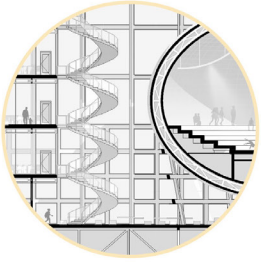
ENERGY EFFICIENT
RECYCLED FACADE
MATERIALS THAT MINIMIZE
THE CARBON FOOTPRINT



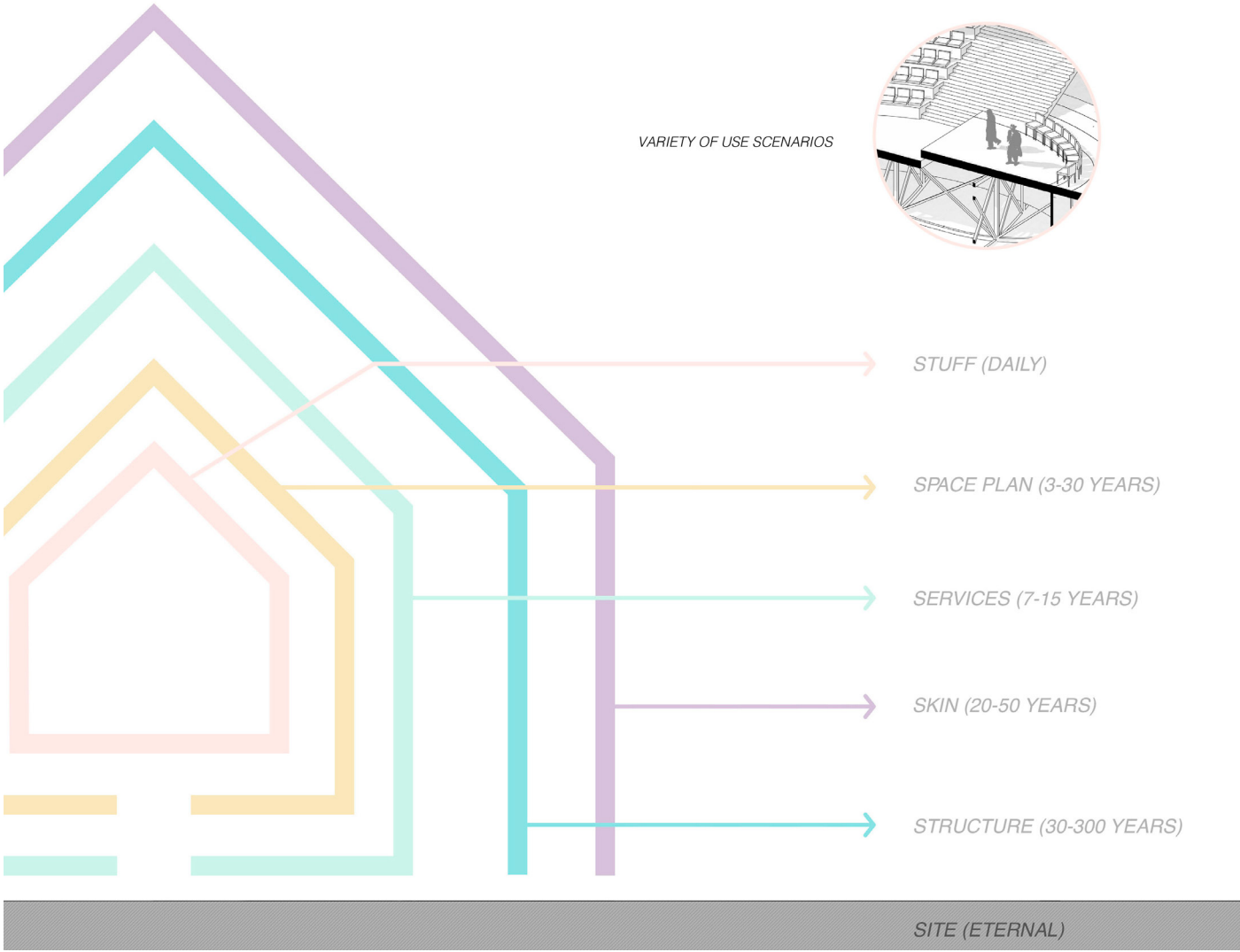
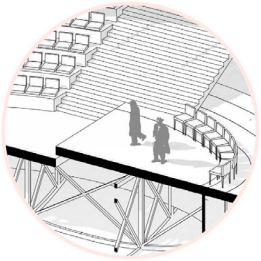
ENERGY PRODUCTION AND
HEALTHY INDOOR CLIMATE



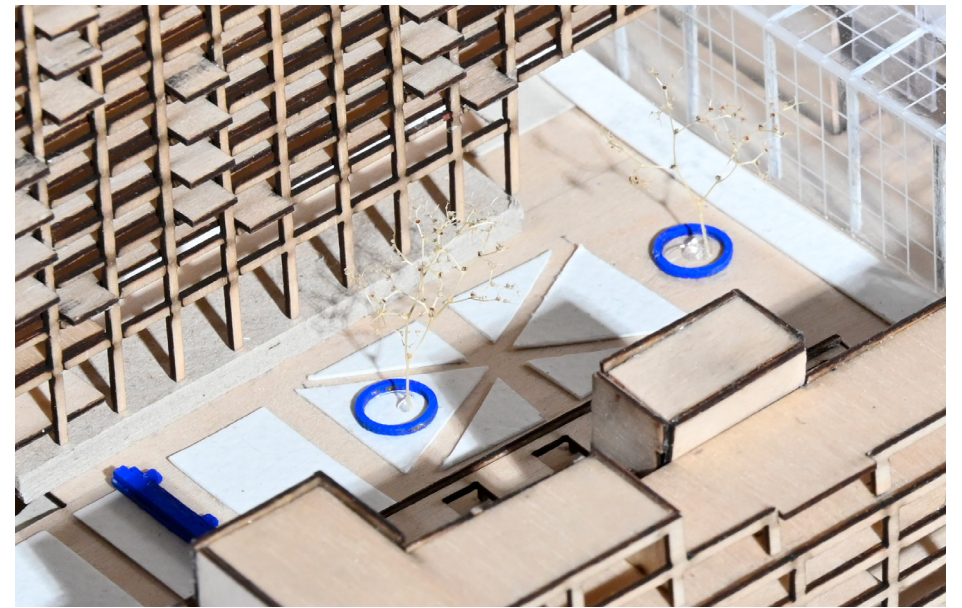
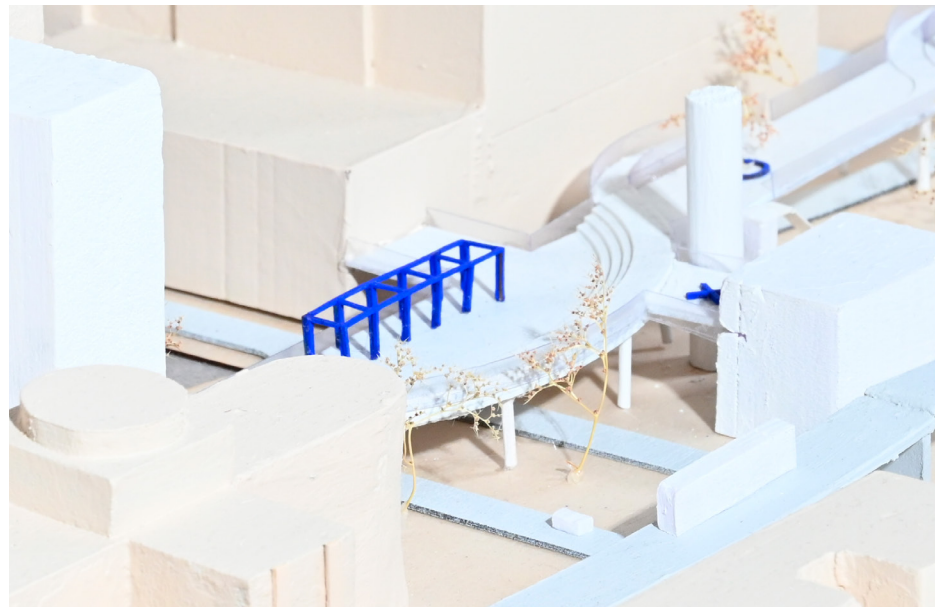
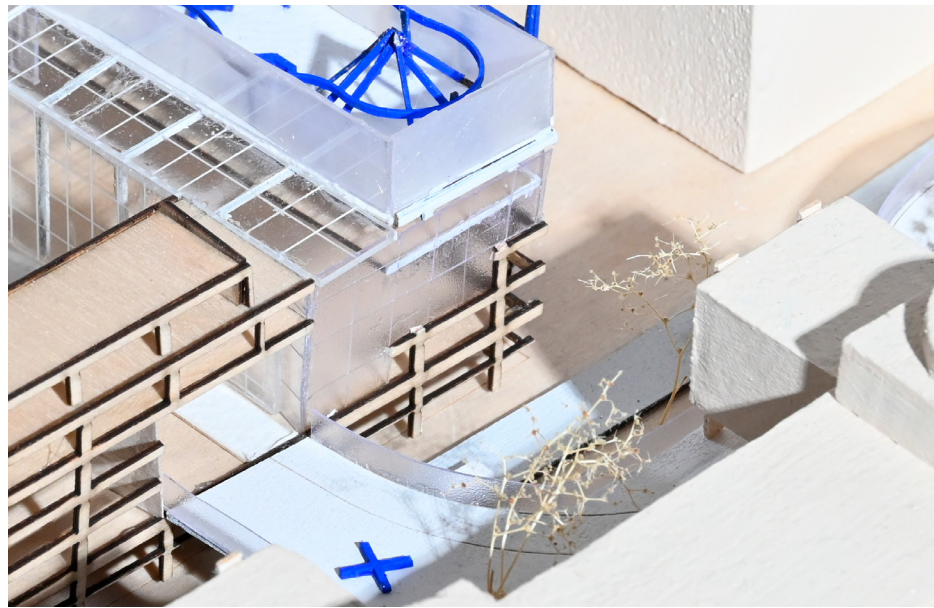
TRANSFORMABILITY AND
DIVERSITY OF SPACES

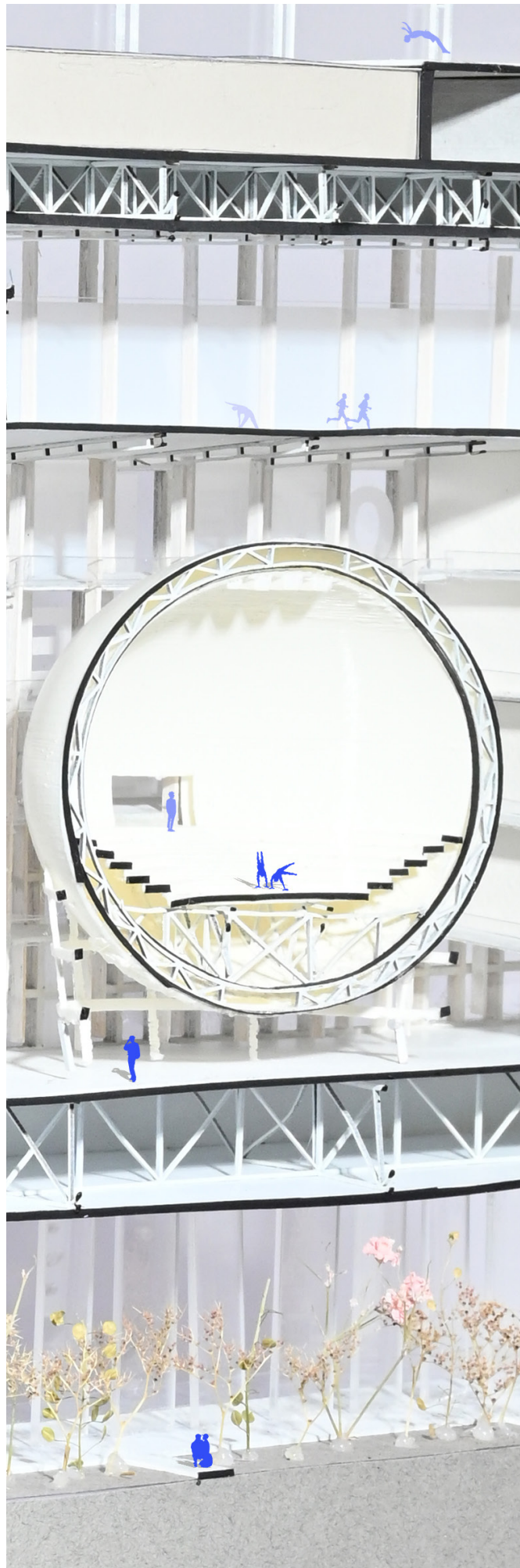


VARIETY OF USE SCENARIOS









FINAL REFLECTION

Through research and design, I have explored the role of play and physical activity in the future educational environment. Play has the potential to become a crucial component of education, promoting both mental and physical development. The graduation project examined how these factors would influence the spatial qualities of campuses.

According to Johan Huizinga's «Homo ludens» (1938), play is «free action» in a special «play space» that implies a strict internal order. Access to play is often unrestricted and easy due to its non-formal nature and minimal risk. It is not typically motivated by material interests or profit. When entering the game, all participants become equal and follow the same rules. The uncertainty of the outcome and the tension keep people engaged. All these characteristics of play can be applied in education and help students from different social and age groups acquire knowledge and skills while remaining engaged in the learning process. For this purpose, educational spaces should have playful qualities such as interactivity, dynamism, and rigid frameworks (“rules of the game”) for flexible development and future use. In addition, the spaces should be suitable for use by a diverse range of public groups and should include a significant number of outdoor spaces, keeping the game entry open.

These rules were tested during the design of the Vertical Campus in The Hague at different scales. The tower serves as the entrance to a pedestrian greenway that

leads from the city center to Central Station. The green walkway itself is full of the playful elements. There is a transformable stage for urban events and festivals, as well as temporary pavilions for shopping and leisure activities, and outdoor work and learning areas. The expanded Leiden University building serves as an «experimental starting point» of the route. It provides new hybrid spaces, renovated entrance areas, and rooftops that complement programme of the existing building.

Johan Huizinga's definition of play also applies to sports games, in which, in addition to democracy and excitement, physical training and body development are significant. Sports games teach teamwork and leadership skills. They develop self-control, responsibility, and quick thinking. That is why, besides classrooms for group and individual work, concentrated study, and lively discussions, the vertical campus includes a multi-purpose sports field and a swimming pool on the top floor. The building provides opportunities for both mental and physical development for citizens and visitors of the Hague.

The structural scheme of the Vertical Campus with the main steel system and timber subsystem allows future transformations. There are “rules of the game” that can be used for the further development. In the atrium of the study area, there is a multimedia hall that can be transformed with more than six use scenarios and can be adapted for innovative activities that may arise. Dynamic facade with minimal environmental impact and

energy consumption keeps the campus lively. Translucent facade panels with letter patterns change their meaning under different lighting conditions. The campus aims to meet today's demands and be resilient to future challenges.

The campus of the future is a free and safe zone. It is a playground where mental and physical development coexist. It is a space that is different from «real life» and where innovative ideas can be tested. These ideas will have practical applications in the future and will serve progress.

