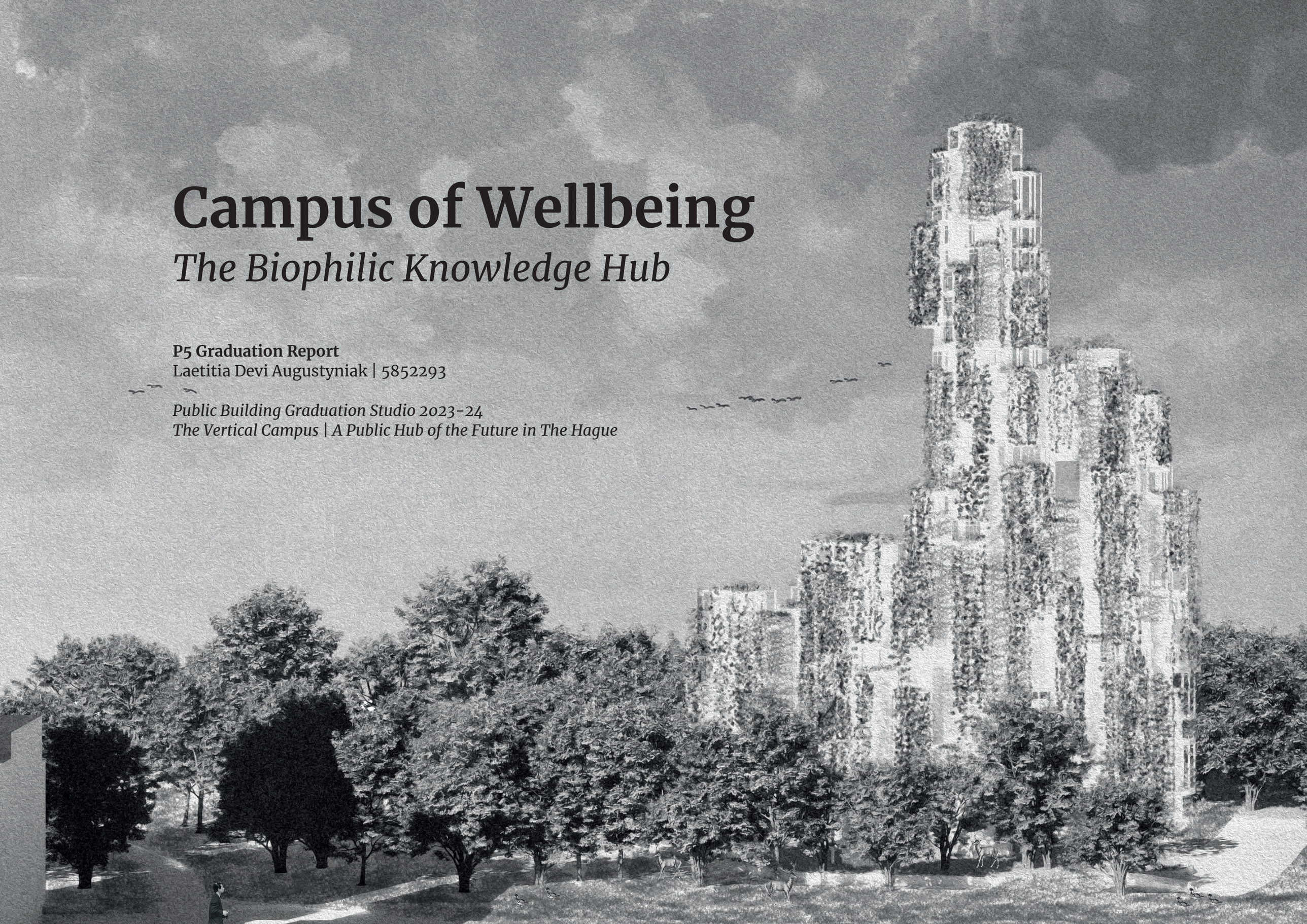
Campus of Wellbeing

The Biophilic Knowledge Hub

P5 Graduation Report
Laetitia Devi Augustyniak | 5852293

Public Building Graduation Studio 2023-24
The Vertical Campus | A Public Hub of the Future in The Hague



- Colophon -

Graduation Report | Master Thesis
20/06/2024

Title:	Campus of Wellbeing: The Biophilic Knowledge Hub
Studio:	Public Building Graduation Studio 2023-24 | The Vertical Campus: A Public Hub of the Future in The Hague
	Delft University of Technology Faculty of Architecture and the Built Environment
Author:	Laetitia Devi Augustyniak | 5852293
First Mentor:	dr. Stefano Corbo (Project Design)
Second Mentor:	ir. Florian Eckardt (Technical Building Design)
Third Mentor:	dr. Sang Lee (Theory and Delineation)
Professor:	Nathalie de Vries

A. GRADUATION PLAN

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	Laetitia Devi Augustyniak
Student number	5852293

Studio		
Name / Theme	Public Building Graduation Studio 2023-24 / The Vertical Campus: A public hub of the future in the Hague	
Main mentor	dr. Stefano Corbo	Project Design (Architecture)
Second mentor	ir. Florian Eckardt	Technical Building Design (Architectural Technology)
Third mentor	dr. Sang Lee	Theory and Delineation (Architecture)
Argumentation of choice of the studio	The Public Building Studio intrigued me because of its proposal to challenge the classical horizontal campus into a vertical structure and to design a mixed-used, public hub for lifelong learning. Public buildings are the architectural interfaces of a city because they are providing spatial opportunities for people of distinct backgrounds, communities, and cultures to gather, exchange or access communal services such as education or societal organization. Through its appearance and spatial structure, it can display current values and systems of the society it's based in and represent past and future visions. How these future visions for public buildings can look like, is investigated in this graduation studio through concepts such as hybridization and multiplicity to respond to an urban diverse society. Thus, I was fascinated by the challenge to design a Vertical Campus and Public Hub in The Hague that brings various stakeholders, users, and cultures together, and how this complexity then can be translated into space and architecture.	

GRADUATION PLAN

Graduation project	
Title of the graduation project	The healthy and happy Vertical Campus: How a biophilic university promotes mental health, well-being, and cognitive performance.
Goal	
Location:	Koekamp, The Hague, Netherlands
The posed problem,	The assignment of this graduation project is to design a Vertical Campus in The Hague. That leads to the question of what common issues students in higher education are dealing with and how these insights can conclude architectural ambitions on how a Campus in the 21st century should look like. Entering higher education after school, while exciting, can also be accompanied by uncertainty or anxiety, when unknown challenges occur. These aspects can affect the well-being and mental health of students, which also correlates to and can negatively impact the academic success of students (Eisenberg et al. 2009). The World Health Organization defines mental health as "a state of mental well-being that enables people to cope with the stresses of life, realize their abilities, learn well and work well, and contribute to their community" and "is more than the absence of mental disorders" (WHO 2022), which can be simplified as "symptoms of positive feelings and positive functioning in life" (Keyes 2002). The topic of mental health in higher education already attracts attention by offering consultations. In the United States for example, the first mental health service for students was established 1910 at Princeton University (Kraft 2011). Likewise, the Delft University of Technology offers mental health services, and the student association 'Stylos' from the Faculty of Architecture and the Built Environment, organized a week of "Well-being days" in December 2023 to raise awareness on the significance of good physical and mental health. However, studies about the mental health status of students have been conducted in various countries such as the Netherlands and the United States. They display the need to deal with this topic even more and especially to prevent mental health issues also before they appear or deteriorate. During Covid, the Dutch National Institute for Public Health and the Environment commissioned a nationwide study to investigate the mental well-being of students in higher education. To detect the level, they used common psychological methods such as the "Cantril ladder", which measures "life satisfaction", and the "Mental Health Continuum" (MHC-SF 2.1), which conducts the "positive mental health". About 28.000 students participated in this study, whereby the results of the survey displayed that 51% expressed mental health issues that ranged from anxiety, performance pressure, insomnia (sleeplessness) or a feeling of loneliness. (RIVM 2022) But not just students in Europe experience mental health issues. The "Healthy Minds Study" conducted the mental well-being of students in North America between 2013 and 2021. During the studied period, numbers were constantly rising, so that in the year 2020-2021, 60% of the students stated to suffer from one or more mental health issues, as for example anxiety or depression (Lipson et. al 2022). These high numbers of students with mental health issues also increased during the covid-pandemic (Li et al. 2021). Therefore, this graduation project aims to implement architectural and spatial solutions based on the concept of biophilic design that support and promote mental well-being, increase cognitive performance, and can prevent mental health issues. Nevertheless, architecture alone can't solve these problems and it needs to be accompanied by general mental health services and policies. Biophilic design consists of the term biophilia. It can be derived from the ancient Greek "bios" and "philia", which means "life" and "love" or "love for life". It was defined by the biologist Edward O. Wilson "as the innate tendency to focus on life and lifelike processes" (Wilson 1984, p.1) and "refers to the inherent affinity people have for the natural world" (Kellert 2018, p.vii) because humans evolved in nature about 200.000 years ago, while the species just started to build and live in cities since 6.000 years (Kellert 2018, p.3). This concept includes design principles of "direct" and "indirect experience(s) of nature" such as using greenery, natural lighting, or materials (Kellert 2018). Implementing these elements can benefit people's mental health and cognitive performance. Various studies in that concern have been conducted (Zhong et al. 2022). One of these studies has been done by a group of scientists from the University of Michigan, testing how people's cognitive performance would change after walking through an urban or natural context. Their results displayed a greater positive impact of the natural environment on the participants' attention restoration. (Berman et al. 2008)

GRADUATION PLAN

	Finally, the concept of biophilic design can be summarized with the question: "How does the built environment affect the natural environment, and how will nature affect human experience and aspiration?" (Kellert et al. 2008, p.vii).
research questions and	Since the studio assignment is to design a "Vertical Campus", I divided my research into two main questions: the notion of a campus and vertical extension. Both components come with different requirements that influence design decisions. Starting with the theoretical component of the "Campus": The studio assignment already proposes the aspect of multiplicity, hybridity, and a mixed-used concept, which will open the opportunity for various collaborations between higher education, practice, and the public. This will be part of the overall concept of promoting mental health and well-being in my design of the Vertical Campus. Thus, based on my problem statement, it began with the question *"How can architecture promote mental well-being?".* This first question led me to the concept of biophilic design because I found several studies that displayed the benefits of nature on mental health. This was broken down into one primary and four secondary research questions: 1. How can nature and biological components be architecturally implemented into a campus building? 1.1. What is biophilic design? 1.2. What architectural green spaces already exist? 1.3. How can green space be a spatial design tool? 1.4. What other activities are also benefiting (mental) health and can be combined with green space? Implementing natural elements into a campus is by itself not a new concept. The horizontally aligned, historical Oxford Campus also implemented green space in form of courtyards on the ground level, or parks in-between buildings and the city fabric. Building vertical helps to densify cities, while having a low footprint. On the other hand, there are climatic issues such as the heat-island effect in dense cities. This led me to my second main research field: 2. How can biophilic design principles and green space be implemented into a vertical structure?

	2.1. How can horizontal green space merge with a vertical building? 2.2. How does the city benefit from a biophilic campus? 2.3. How does the city climate improve through the building? 2.4. How can the site conditions support the use of as much natural daylight and ventilation as possible to design a more passive building system? These two thematic blocks can be combined into one overall research question: *"How can green spaces be integrated in a vertical campus to benefit students and the urban fabric of The Hague?".*
design assignment in which this result.	My design objective and assignment are to design a Vertical Campus in The Hague that promotes mental health, well-being and benefits the cognitive performance of students. To achieve that, principles of the concept of biophilic design are used, focusing on the benefit of green spaces and natural daylight. Furthermore, these biophilic design principles will benefit the city fabric by enhancing climate resilience. The Public Building studio splitted the area around the Central Station of The Hague into three zones for the Graduation projects. My building site is the zone of the "green border". This area consists of the interface between the urban fabric (from the Central Station to 'New Babylon', further to the residential areas in north-east direction) and the horizontal green spaces (of 'Koekamp' and the 'Haagse Bos'). The description "green border" is derived from its visual appearance of being divided by a strict green edge that makes them seem to be different areas of the city that don't belong together. The exact plot of my project is located in front of the Central Station of the Hague, in the beginning of 'Koekamp'. I propose to move the animal park, which is currently located there, to a part of the 'Haagse Bos'. The 'Koekamp' has great potential to add more value to the city center of The Hague, an entry point through its station close to Downtown. City fabric and green space don't need to be divided with a "green border". I'm not questioning the need for open and horizontal green spaces; however, I'm questioning the strict edge between them. That's why my objective is also to design a building that merges park and campus, by not just being a Vertical Campus, but also a kind of Vertical Park.

GRADUATION PLAN

	Because in this approach lies unused potential in intertwining architecture and nature. Combining their characteristics into one building can activate new kinds of hybrid buildings that are a transition between city fabric and green space, blending in with and belonging to both environments. It fuses the advantages of densification and open green space. Eventually, humans need architecture and nature to thrive. Thus, by merging both, this hybrid typology aims to enhance the well-being and cognitive performance of its users, and the city's climate and ecosystem.

Process

Method description

To approach my research, first of all I follow the general method of the Public Building Graduation Studio of Research-by-Design. This method unites research and design by not dividing both aspects into different phases, but they are executed at the same time and constantly influence each other. Thereby, an integration of research and design can evolve because research isn't just done through analysis, before starting the actual design process. They are interwoven, which is achieved through using for both aspects the same tools such as drawings.

Besides that, I chose the method of literature research to support my design statement. I divided the literature research into three parts:

1) The current state of mental health and well-being of students to investigate if this is an issue that could be improved.
2) The theory and concept of biophilic design in general.
3) Looking into studies that investigated the impact of nature, green space and biophilic design on the mental well-being and cognitive performance generally, but particularly of students.

For the first part, I investigated research papers that assessed the state of mental well-being of students in different countries such as The Netherlands or the United States. These showed that the state of mental health in higher education is an issue. Especially, during the covid pandemic, various countries conducted studies to consider the impact of social isolation or lockdowns on students. Furthermore, I investigated how mental health is defined by sources such as the World Health Organization, and how it is measured in psychology.

Besides this theoretical foundation, I researched the concept of Biophilic Design in general, but especially in architecture. Here, I was looking shortly into the history of the concept and mainly into the main design principles such as natural lighting, and nature-inclusiveness. Additionally, I was looking into books about biophilic architecture to investigate how other architects and designers were implementing these biophilic design principles.

To link the first both aspects and to have a foundation for design decisions, I was researching various studies that investigated how mental health, well-being and cognitive performance can be improved through environmental factors such as plants, trees, and green space, or activities such as walking or socializing.

This was always accompanied by the studio method of Research-by-Design by testing what components can be implemented in the design of the Vertical Campus that would support the students' and in general users' well-being.

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GRADUATION PLAN

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Reflection

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)?

Architecture is a profession that consists of various disciplines such as technology, art, natural sciences, engineering, philosophy, and sociology. It operates on different scales, in terms of size and user numbers, and concerns every human, particularly those who live in dense cities. Most of our lifetime, we spend inside buildings. Moreover, architecture requires a lot of material and financial resources. An architect always designs for others. Hence, architects have great responsibility for how resources are spent, especially when designing a public building. They are space for a diverse user group, coming from different backgrounds. This requires openness, inclusivity, and needs to offer space that benefits its distinct users and the society where this public building is located.

The public building graduation studio topic to design "The Vertical Campus: A public hub of the future in the Hague", already consists of the aspect of mix-use and programmatic hybridity. It aims to connect and be inclusive to various user groups by proposing a campus that not just includes higher education, but also offices and public program. Based on this, my research is adding to the studio assignment by investigating how space can be designed with biophilic design principles, so that it promotes mental well-being of its users inside and the urban fabric outside.

2. What is the relevance of your graduation work in the larger social, professional and scientific framework.

As I explained above in my problem statement, many students in the Netherlands experience mental health issues, which prevents them of reaching their actual academic potential. Furthermore, individual health is a foundation for a functioning society. That is why this topic is relevant. The literature research has shown that these issues can be also tackled through architecture. My graduation project will add to this discourse on a social level.

Furthermore, it's contributing to the architectural profession by exploring design possibilities on how urban fabric and green space could be merged. On the other hand, it adds to the question on how a Vertical Campus can be nature-inclusive by benefiting its users and environment without decreasing the quality and amount of horizontal green spaces.

Time Planning

P2 – P3:
After the feedback of P2, I will revise the work that I have done so far. That means to review and sharpen the conceptual design, its spatial structure, program distribution and circulation system. Thus, it will develop from *Concept Design* to *Preliminary Design*, which means going deeper into detail and particularly into the Technical Building Design (TBD). While refining the design, I will work further on the façade, building structure, materiality, sustainability concept, and optimizing floor plans and sections in scale 1:200. Furthermore, this will be accompanied by fragment drawings in 1:50 and a planning of the significant construction details. Finally, this will lead to the P3 presentation, and an elaborated "Research-by-Design Journal", which will be part of the Graduation report later.

P3 – P4:
This phase will lead to the *Final Design* at P4. After the P3 presentation, I will submit a reflection about the *Preliminary Design* phase. Moreover, I will implement the comments that I received on my P3 presentation to revise the current design. While reworking it, I will specifically design and draw construction details to explain the structure of the building. Additionally, I will examine the coherence of the design from urban scale to architectural details. At the end of this phase, I will have finished my Graduation Report.

P4 – P5:
In the beginning of the last phase, I will again revise the project with the feedback I got for my P4 presentation. Afterwards, it's mainly about creating the final drawings, materials and models that will explain and clarify the final design of the building. Furthermore, I will examine the coherence of the decisions that have been made during the process. This will lead to the *Final Presentation and Graduation*.

B. DESIGN BRIEF

GENERAL BUILDING PROGRAM (INCLUDING GREEN SPACE CATALOGUE)

ENTRANCE	400 m2
Reception and Information	
Elevator Lobby	
Security Center	
Gates to shielded areas	
Cloakroom	
Amenities	
Lounge	

COMMERCIAL SPACES	1000 m2
(individual units divided in 100m2 including amenities)	
Commerce unit 1 (incl. amenities)	100 m2
Commerce unit 2 (incl. amenities)	100 m2
Commerce unit 3 (incl. amenities)	100 m2
Commerce unit 4 (incl. amenities)	100 m2
Commerce unit 5 (incl. amenities)	100 m2
Commerce unit 6 (incl. amenities)	100 m2
Commerce unit 7 (incl. amenities)	100 m2
Commerce unit 8 (incl. amenities)	100 m2
Commerce unit 9 (incl. amenities)	100 m2
Commerce unit 10 (incl. amenities)	100 m2

CAFÉ AND LOUNGE	500 m2
Sun - energetic	
cloudy focused	
areas to meet informal	
areas to study	

PLAY AND LEARN	2000 m2
supervised and safe play areas for the youngest	
daycare center	
(elementary) learning for about 200 students and 15 staff	

LEARN AND DISCOVER; STUDIO SPACES	1000 m2
open spaces	
closed, private studio spaces	
for about 20 groups of students (16-20 people)	

LIBRARY AND MEDIA CENTER (range of different spaces)	2000 m2
analogue materials (books, magazines)	
digital spaces	
art spaces	
storage of books	
photocoping and printing	
exhibition space	

WORKSHOPS (access to ground floor)	400 m2
wood	
steel	
general modeling	

CENTRE FOR ADVANCED VIRTUALITY (a lot of smaller spaces)	500 m2
VR Lab	
Maker's Lab	
Meeting rooms	

LEARN AND DEVELOPMENT; RESEARCH SPACES	2000 m2
secure, private working spaces	
for 100 students	
for 100 staff	
for 200 part-time students	

TEACHING, LEARNING AND DEVELOPMENT SPACES	1000 m2
small private, quiet rooms	
for groups of 20 students	

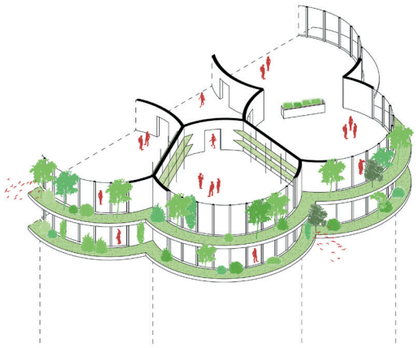
(LECTURE) THEATERS	1000 m2
one large (400+ people; dividable in 2)	
medium theater (120-150 people)	
medium theater (120-150 people)	
small theater (50-60 people)	
small theater (50-60 people)	
foyer	
breakout spaces	

Exhibition space	500 m2
close to public amenities	
close to commercial space	

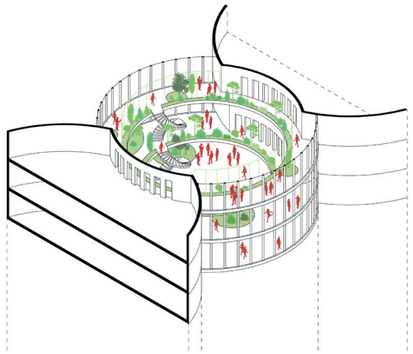
Sports	500 m2

Office space	10.000 m2
start-ups	

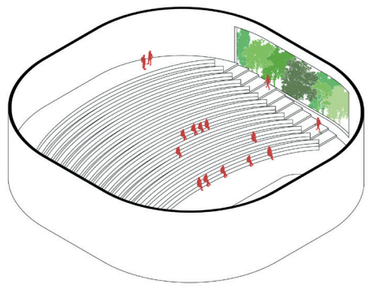
GENERAL BUILDING PROGRAM (INCLUDING GREEN SPACE CATALOGUE)



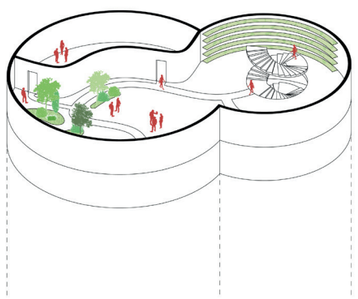
1. Zen - Learning Garden



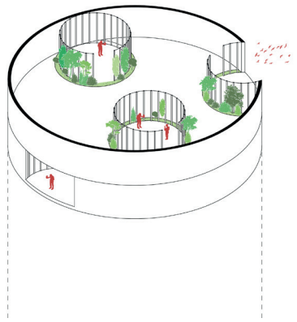
2. Jungle Workspace



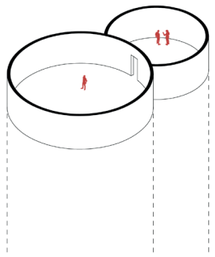
3. Lecture - Amphittheatre



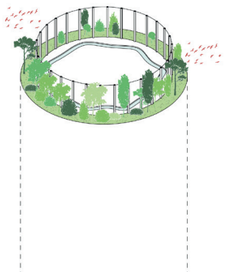
4. Co-Working Park



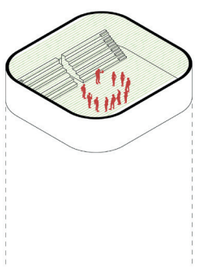
5. Book Glades



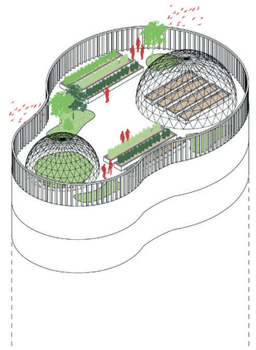
6. Virtual Nature Reality - Lab



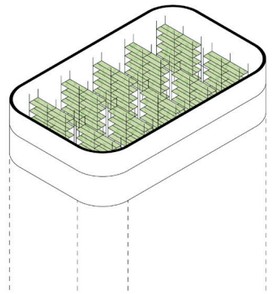
7. Mindfulness Forest (Yoga, Meditation)



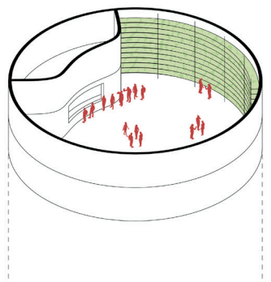
8. Wild Space



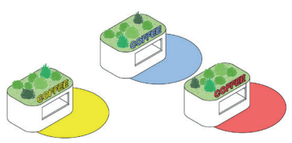
9. Rooftop Gardening



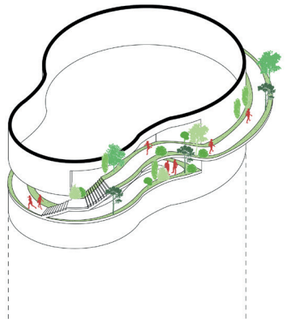
10. Vertical Farming - Lab



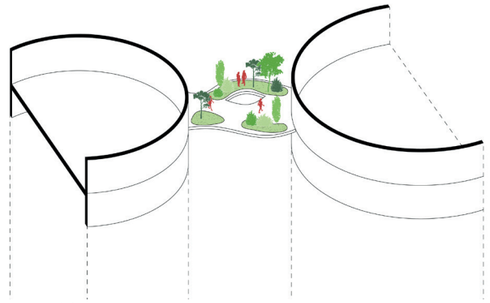
11. Herbs - Cantine



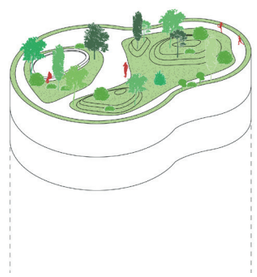
12. Cafés (Identities: sun-energetic, cloudy-focused, flower-mixed)



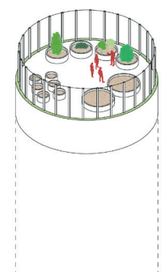
13. Vertical Pathway



14. Green Bridge



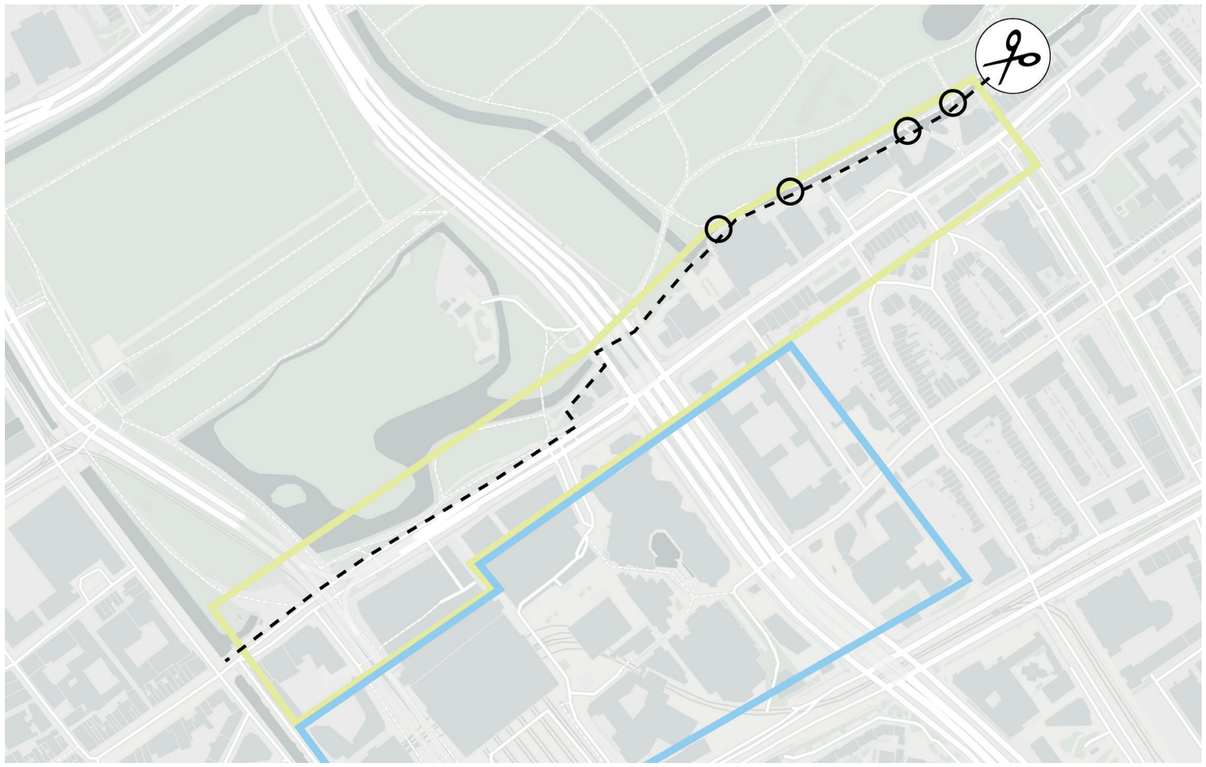
15. Forest Playground



16. Learning Garden (Pre-school)

C.1 RESEARCH-BY-DESIGN PHASES (TD)

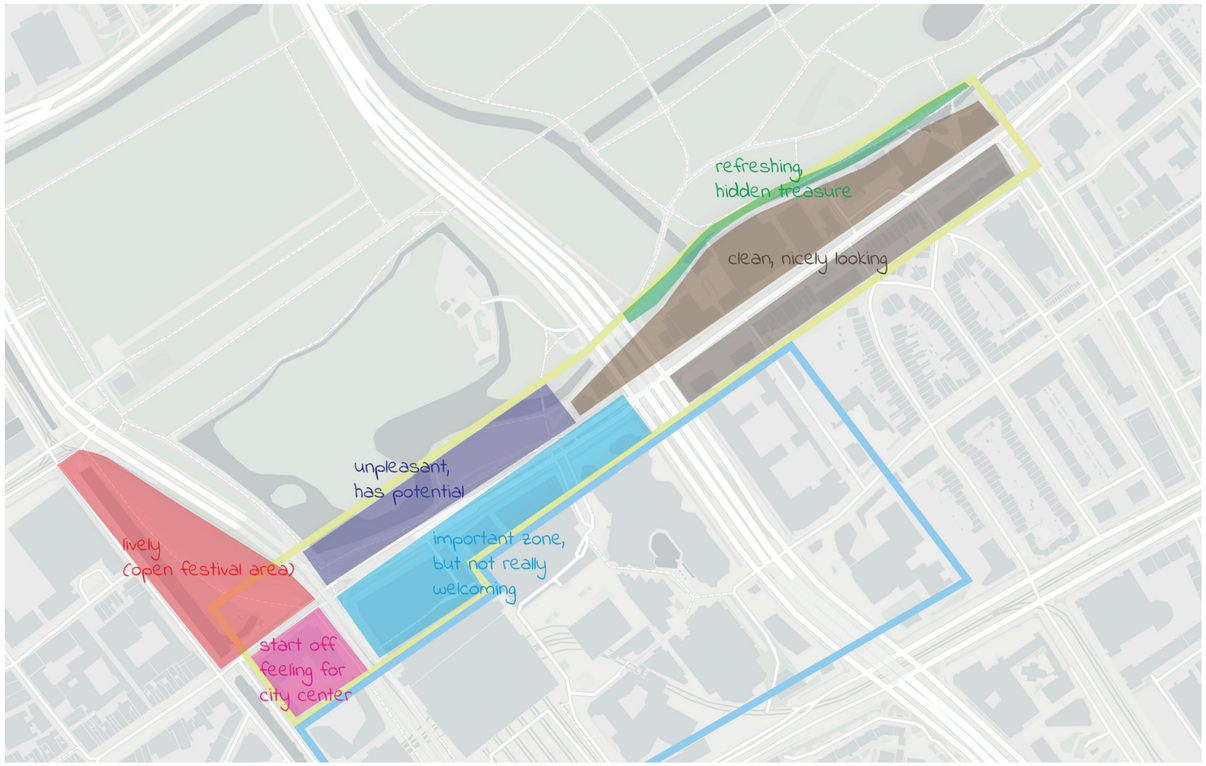
PSYCHO-GEOGRAPHICAL MAP



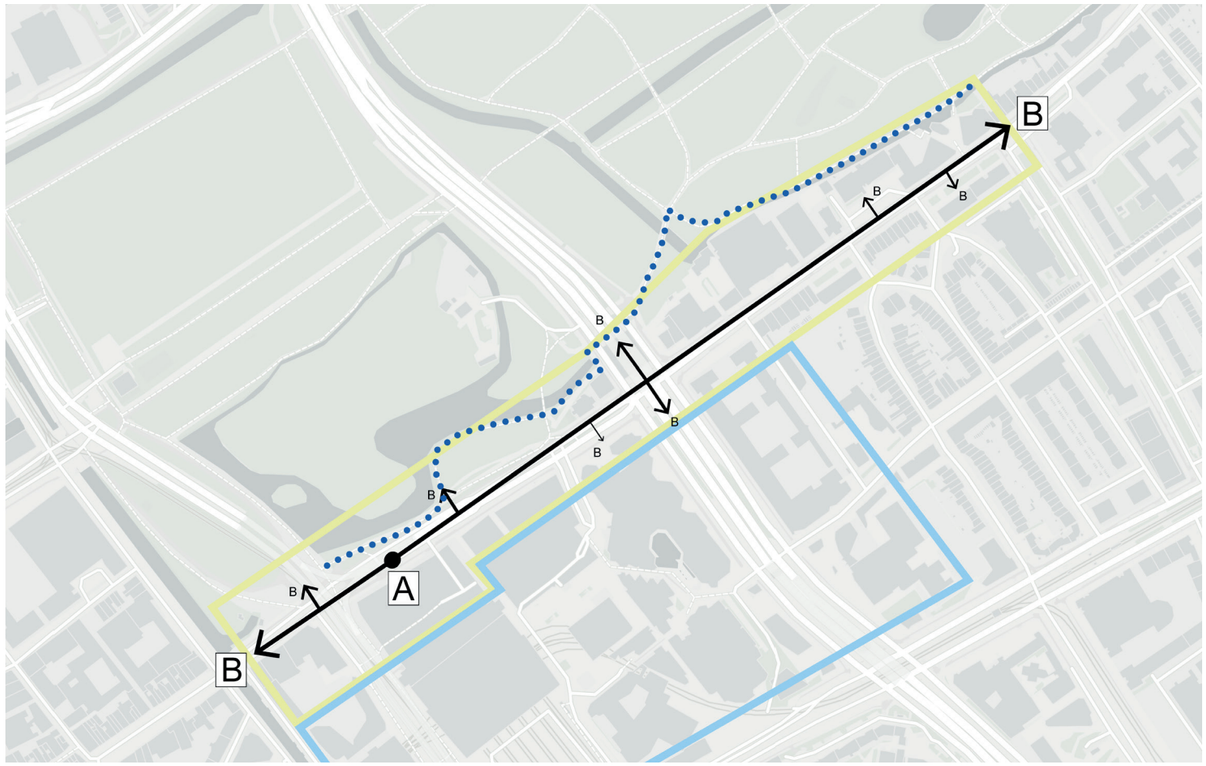
Scissor and Glue



Special visual moments



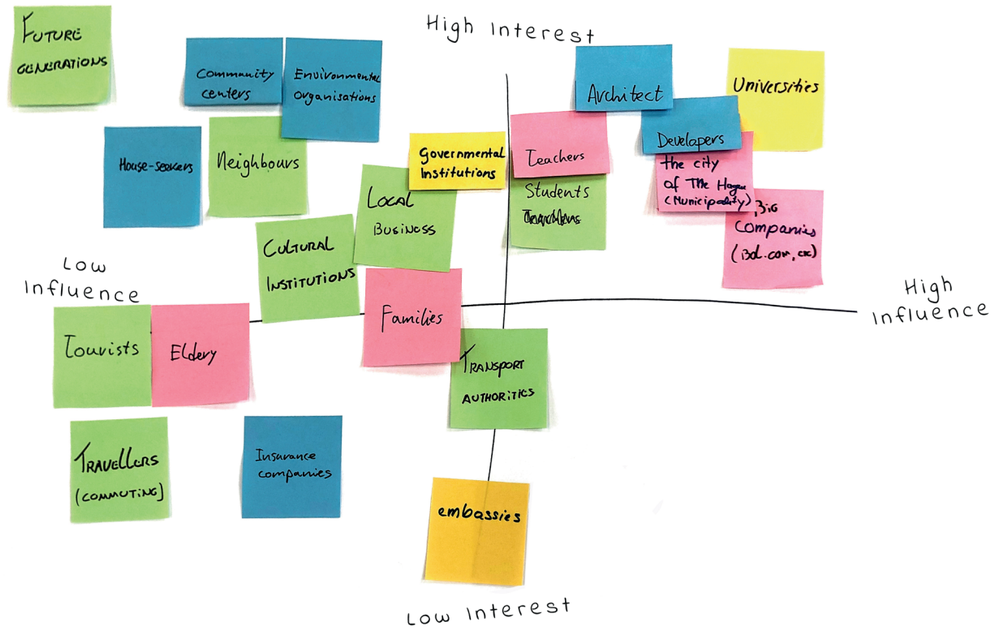
Atmospheres



A to B – “The journey is the reward“

DESIGN THINKING WORKSHOP

Design Thinking I Stakeholder Map



Stakeholder Map

Design Thinking I Personas



THE WORKER

Age: 39

Gender: Female

Occupation: Legal assistant

Characteristics / Behaviors: She lives in Zoetermeer but is familiar with the city of The Hague for some time because she was born in the area. Even in her spare time she can sometimes be found in the city to go to go shopping in the city centre or go out. For her job she visits The Hague two to three times a week. She travels to Central Station and from there walks to her job which is in the New Babylon building. During her breaks she sometimes go to a nearby supermarket or a healthy to-go restaurant. When she has the time for it, she likes to grab a cup of coffee or fresh tea on her way in or out of the office.

Gains:

- She has quite some convenience around her with the different stores and to-goes that are near the Central Station.

Pains:

- An option to enjoy the nice weather outside is only possible on the roof terrace of the office or in the park, which is not ideal and a bit too far maybe from the office.



THE LOCAL RESIDENT

Age: 46

Gender: Male

Occupation: Architect / Teacher

Characteristics / Behaviors: Has lived in quite some big cities in the Netherlands but has eventually settled on The Hague. Works as an architect in Rotterdam and teaches architecture abroad. Likes The Hague for it's location within the Netherlands, its connection to public transport and because of the size of the city. At least once a week he can be found on Central Station from where he either travels to Rotterdam or towards Rotterdam / The Hague airport to travel Brno to teach there.

Gains:

- Can travel quite easily wherever he has to go to from a central location within the Netherlands.
- All the pleasantness of a big city he can find within the city.

Pains:

- Getting in and out of the city by car can be hard sometimes given that the city is quite dense.
- Living in an apartment means that finding public green space sometimes can be hard.



THE EXPAT

Age: 32

Gender: Male

Occupation: Developer

Characteristics / Behaviors: He works 3 days at office and 2 days at home per week. Colleges in his office mostly only go to office once a week. He goes grocery shopping every 3 days in a walking distance from his place. He spends 2 to 4 hours at restaurants or pubs twice a week with friends in the evening. On the weekend he goes to climbing gym near the Passage and likes to walk abound the neighborhood with girlfriends.

He learns new things online mostly. He uses library only for printing.

Gains:

- He feels comfortable to have the flexibility to choose where to work.
- He likes the diversity of the Hague which can provide him almost all services he wants.

Pains:

- He does not have chance to meet new people. He would like to have some good places to play billiards or darts with friends.
- He found it difficult to drink cheaply with friends since it is not allowed to drink in the public space such as park and his place is not large enough to accommodate friends.

Design Thinking I Personas



THE PHD CANDIDATE

Age: 29

Gender: Male

Occupation: PhD Candidate

Characteristics / Behaviors: He's not originally from here, but he's been studying in The Hague for quite a while now and even found a place to live in the city. He's all settled down in the Regentessekwartier neighborhood, just a 20-minute bike ride away from the central station. He's living among the locals and has gotten the hang of the city's lifestyle. With his PhD research keeping him busy, he practically lives on campus and often opts for faculty dinners. Lately, he's been feeling the need to socialize more with peers because most of his study friends have already graduated, and he's mostly surrounded by older colleagues.

Gains:

- There are pleasant green areas near the station for lunchtime relaxation.
- Lives in proximity to work, minimizing commute time.

Pains:

- Limited dining choices near the station area; heading toward the city center is necessary to find restaurants, which aligns with the route home, potentially leading to a preference for eating at home.
- He primarily resides in the bustling station area, where casual interactions are limited due to the constant stream of travelers.



THE PROFESSOR

Age: 43

Gender: Female

Occupation: Professor

Characteristics / Behaviors: A foreign professor who desired to teach in the Netherlands has made Leiden her home for an extended period. She teaches at both Leiden and The Hague faculties, requiring frequent travel. While her leisure time often takes her elsewhere, during office hours, you'll often find her in the vicinity of the station area. She highly appreciates breaks from her work and enjoys conversing with students and colleagues between classes. Staying confined to the same building throughout the day can be quite draining for her.

Gains:

- Traveling between University of Leiden and Delft faculties is straightforward using public transportation.
- The station and its surroundings create a lively city hub where she can interact with a diverse range of people

Pains:

- Opting for public transport would be much more convenient and time-efficient compared to using a car, as it minimizes restrictions on her life and enhances flexibility.
- She might face cultural disconnect with both Leiden and The Hague residents, needing to adapt to two cities at once. The work-focused environment near the station could hinder social connections in The Hague.



THE LONGTIME RESIDENT

Age: 63

Gender: Male

Occupation: Buisiness owner

Characteristics / Behaviors: Has lived his whole life in The Hague and has watched its ups and downs. He does not interact with the station area that often but as a longtime resident still has a urge to let his voice be heared when it comes to anything that is happening in the city,e does not mind the tall buildings and actually enjoys seeing the city flourish which he compares to american cities. On the other hand he is very protective over the heritage of the city especially when it comes to things that outsiders would never consider to be heritage or a part of the cities culture. "The Hague is The Hague and it has to stay that way.

Gains:

- Increased pride for your hometown can contributes to a more close community and social environment.
- The area appeals more to the local residents.

Pains:

- Keep heritage of The Hague intact for local residents while still renewing the city at the same time.
- Living in an apartment means that finding public green space sometimes can be hard.

Design Thinking I Personas



STUDENT (Nr. 1)

Age: 23

Gender: Female

Occupation: Student, 1st year Master

Characteristics / Behaviors: She studies International Studies at Leiden University in The Hague and lives also in the city. Usually, she goes four to five times a week to the university for lectures and regular studying.

However, when she wants to meet her friends, she will go somewhere else outside the university campus, maybe even outside the city to Rotterdam or Amsterdam. For other leisure activities such as sports, she is satisfied with the option Leiden University is providing for everyone.

Gains:

- She likes the university buildings because it overalls offers her everything that she needs while studying.
- She likes the diversity of the Hague which can provide him almost all services he wants.

Pains:

- Sometimes, it hard to find quiet spaces to study, especially during lunch time.
- Generally limited study spaces.
- Comparing the cultural offer of the city The Hague regarding different events or locations, she prefers to go to Rotterdam or Amsterdam due to more options.



STUDENT (Nr. 2)

Age: 19

Gender: Male

Occupation: Student, 1st year Bachelor

Characteristics / Behaviors: He is a student in Urban studies at Leiden University and lives in Rotterdam, why he needs to commute daily to The Hague. He's not moving to city because of the expenisve rents. He likes the "traditional" Campus layout in The Hague, which is intertwined with the city because it enables the students to use city facilities such as diverse food and coffee places. Additionally, he thinks The Hague provides enough options to meet your friends after classes and in the evening, but there are all outside of the university buildings.

Gains:

- Due to the Campus building layout, the university is intertwined with the city, which gives opportunity to use various facilities outside of the campus buildings.

Pains:

- Expensive rents.



THE TRAVELER

Age: 28

Gender: Female

Occupation: UX designer

Characteristics / Behaviors: She lives in Pijnacker. She comes to the Hague around twice a month. One purpose to come the Hague is to do shopping in the Passage commercial area. She usually spend 3 to 5 hours with friends visiting clothes shop and coffee house. The other reason to be in the Hague is to transfer to the Amsterdam airport. She usually goes to coffee house or food takeaway within the waiting time which is usually within 30 minutes.

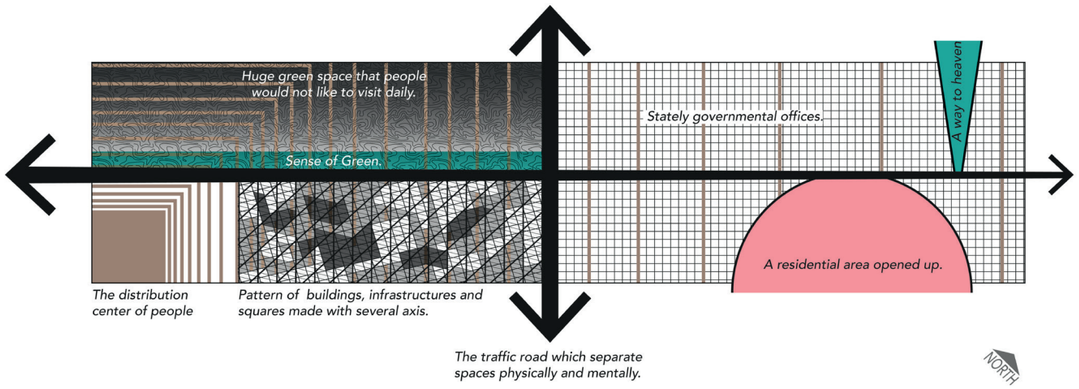
Gains:

- She feels convenient and pleasant on her experiences to transfer in the Hague center and the Passage commercial area is also easily reachable.

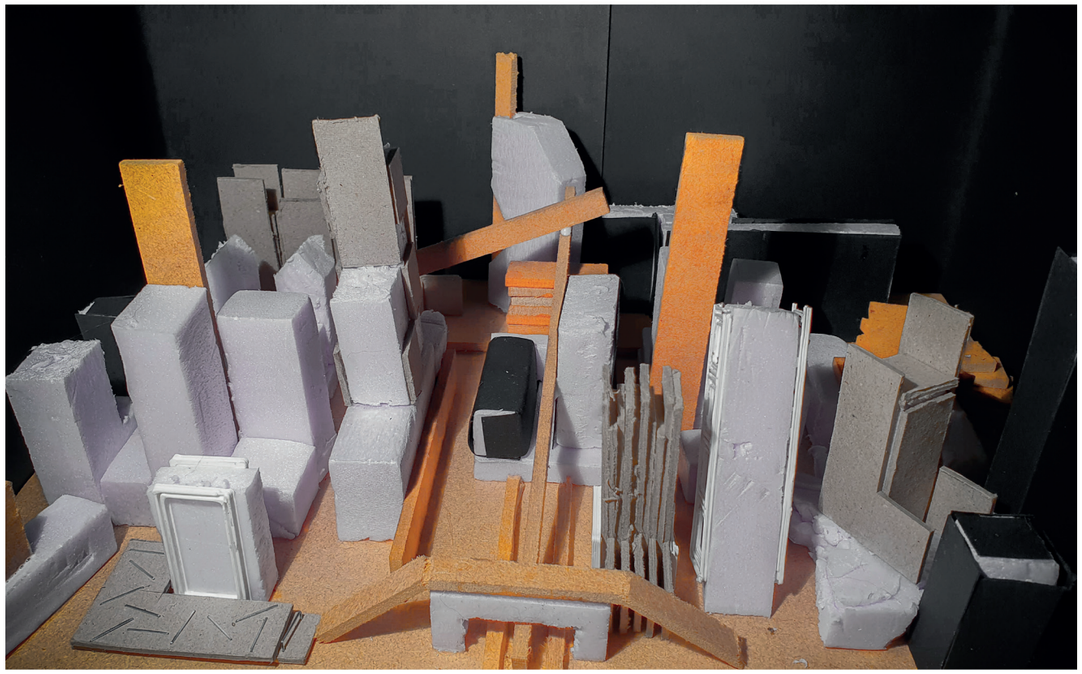
Pains:

- She mentioned the main entrance of the station was confusing when the first time she was there.

DIAGRAMS



1. Spatial relations



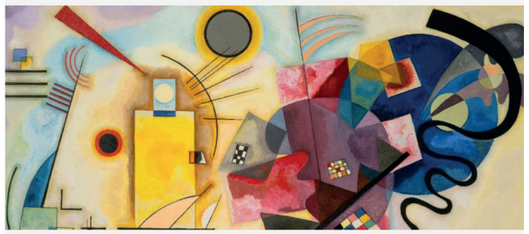
2. 3D model “Densification“

Henri Matisse - The Snail (1953)



(© 2014 Tate© Succession Henri Matisse/DACS 2013 - https://www.thelancet.com/journals/lancet/article/PIIS0140-6736%2814%2960903-X/fulltext)

Wassily Kandinsky - Yellow-Red-Blue (1925)



(© Wassily Kandinsky, Google Arts & Culture - https://www.tagesspiegel.de/kultur/wassily-kandinskys-playliste-5098453.html)

Kazimir Malevich - Suprematist Composition (1916)



(© Stedelijk Museum - https://www.kunstkopie.de/a/kasimir_sewerinowitsch_malewitsch/suprematistischekomposition-3.html)

Pablo Picasso - Bottle of Vieux Marc, Glass, Guitar and Newspaper (1913)



(© Succession Picasso/DACS 2023 - https://www.tate.org.uk/art/art-terms/c/cubism)

3.1 Inspiration

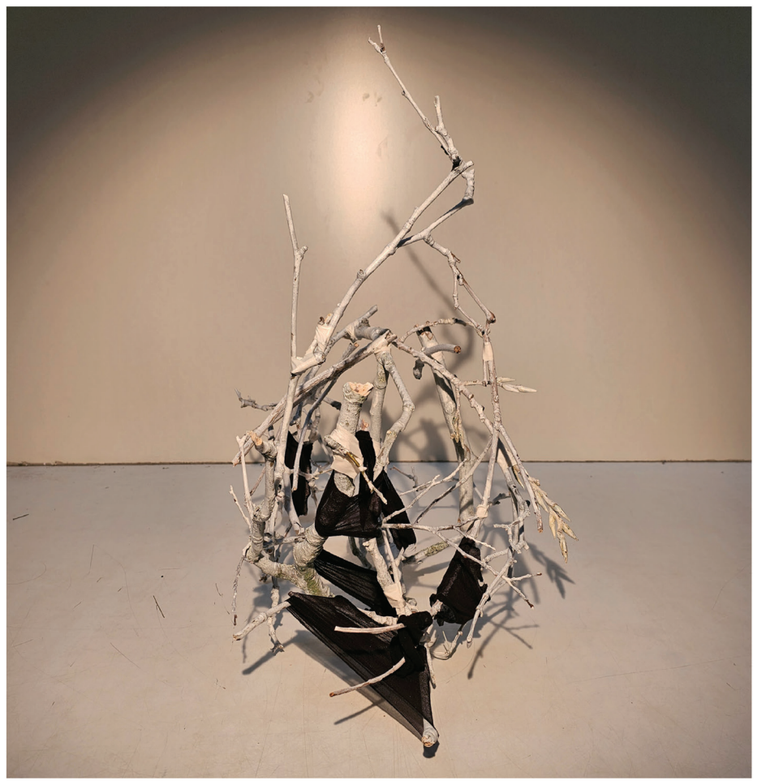


Explanation: *Colored forms - buildings; Growing lines - natural elements)*

3.2 “Growing densification“

PERFORMATIVE CONCEPTUAL MODEL - “Natural Tectonics“





COLLAGE & MONTAGE



Balance of biosphere and technosphere



Technological opportunities

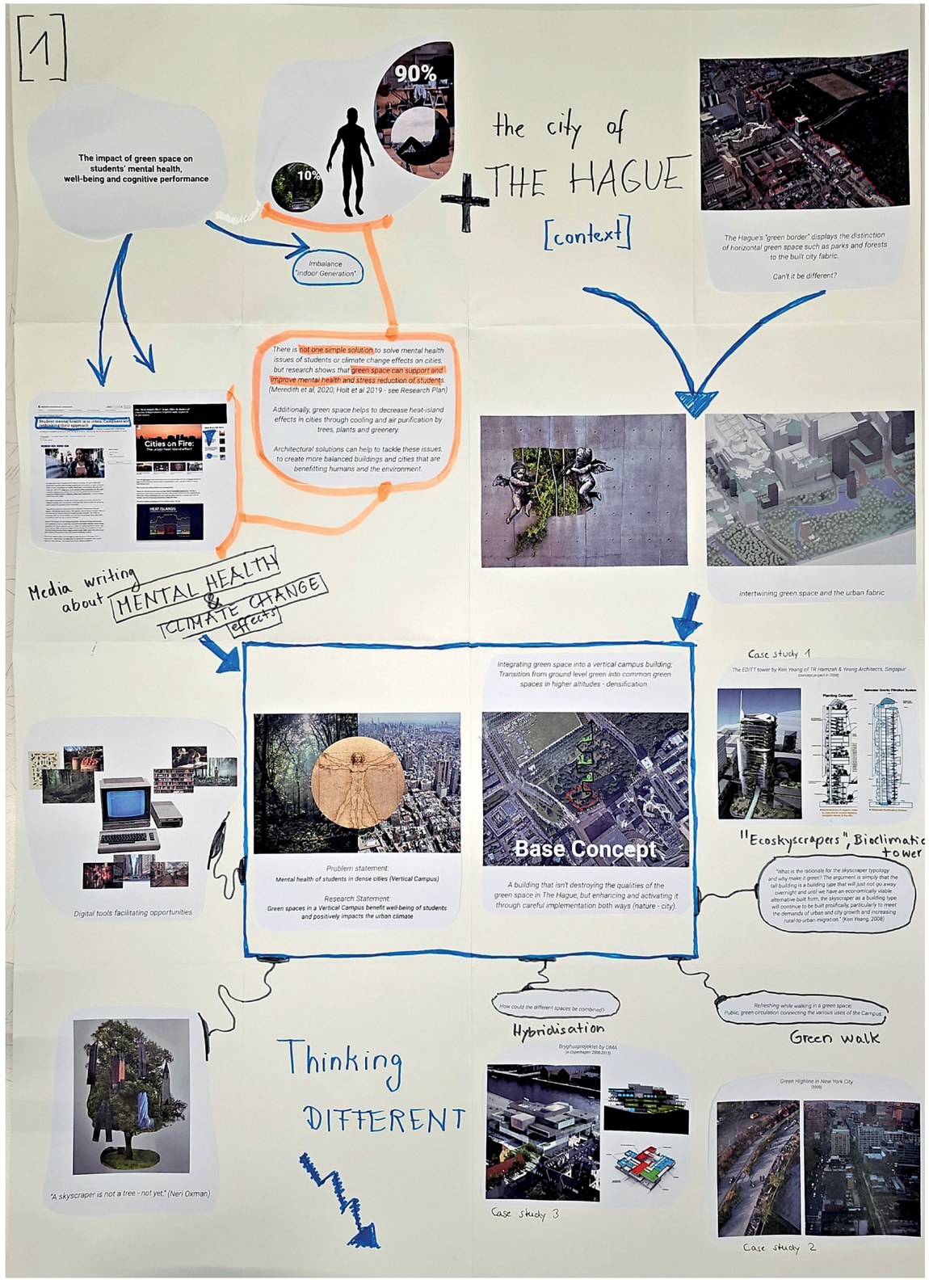


“How would architecture look when it would grow?“ (inspired by Neri Oxman)



“Liberating“ nature

COLLAGE & MONTAGE - ZINE



SUSTAINABILITY DIAGRAM

DURABILITY (object)

- *flexible spaces (allow various interior scenarios)*
- *biological components (green space) have a positive impact on users, what increases their well-being = valuable beyond a specific generation*
- *greenery creates pleasable indoor environments; improvement of the air quality for example*

SUSTAINABILITY (process)

- *adding green space might be more expensive when building, but it has a positive longterm impact on the residents and city*
- *using rainwater (case studying Ken Yeang's 'Bioclimatic Towers' and 'Ecoskyscrapers')*
- *using renewable energy*

CONSERVATION (use)

- *focusing on 'low-tech' building technology, which means to use as less as 'high-tech' such as artificial ventilation*
- *natural ventilation, natural daylight, natural shading*
- *ecosystem as an inspiration (circularity; the waste of one is the usable for someone / something else)*

OPTIMIZATION (production)

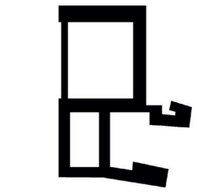
- *using computational tools such as Grasshopper to optimize the direction of the building*
- *optimizing the structure (note: a rectangular beam for example isn't the most efficient form when looking at the force curve)*
- *using digital fabrication tools (such as 3D printing or CNC milling)*

C.2 RESEARCH-BY-DESIGN PHASES (PD)

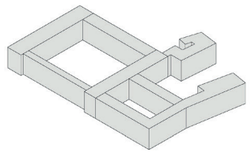
OXFORD ASSIGNMENT (EXCERPT)

FORM and TYPOLOGICAL ARTICULATION

All Souls College



(Source: self-produced)





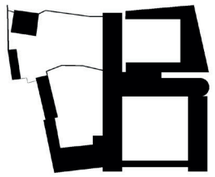
(Source: Google Earth)

Architect(s):
Nicholas Hawksmoor

Topology:
Courtyards, Blocks, Symmetrical

Form:
Cubic, Gable Roof

Queen's College



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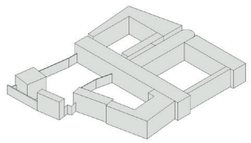




(Source: Google Earth)

Architect(s):
Christopher Wren, Nicholas Hawksmoor

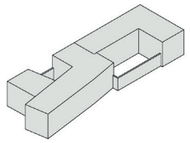
Topology:
Courtyards, Blocks, Symmetrical

Form:
Cubic, Gable Roof

Exeter College Cohen Quad



(Source: self-produced)





(Source: Google Earth)

Architect(s):
Alison Brooks Architects

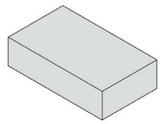
Topology:
Courtyards, Cutted Block

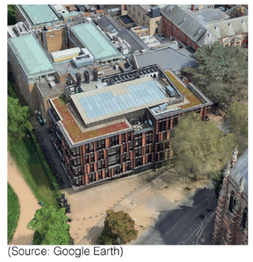
Form:
Cubic, Rounded Roof

Beecroft Building



(Source: self-produced)





(Source: Google Earth)

Architect(s):
Hawkins / Brown

Topology:
Closed Block, Symmetrical

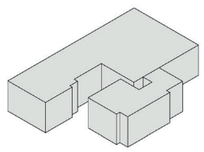
Form:
Cubic, Flat Roof

FORM and TYPOLOGICAL ARTICULATION

Oxford University - Library Group



(Source: self-produced)





(Source: Google Earth)

Architect(s):
Sir Leslie Martin
Sir Colin St John Wilson

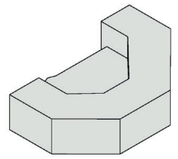
Topology:
Plates, Asymmetrical

Form:
Cubic, Flat Roof

Florey Building



(Source: self-produced)





(Source: Google Earth)

Architect(s):
Sir James Stirling

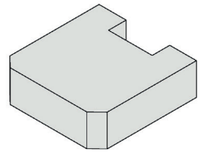
Topology:
"Roof Courtyard", Freeform, Asymmetrical

Form:
U-Shape, Flat Roof

Garden Building



(Source: self-produced)





(Source: Google Earth)

Architect(s):
Alison Smithson, Peter Smithson

Topology:
Closed Block, Symmetrical

Form:
Cutted Edges, Flat Roof

P1 - CONCLUSION



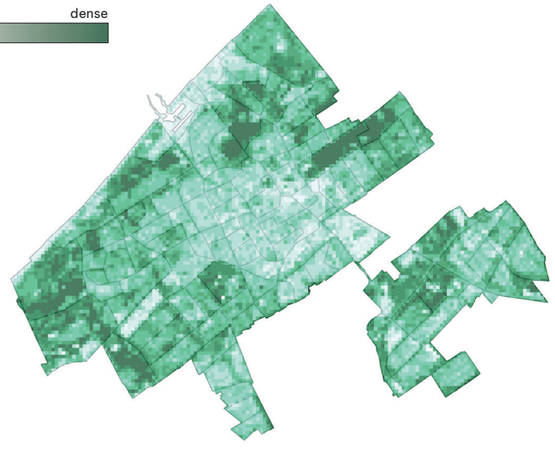
Birds eye view on the “green border“



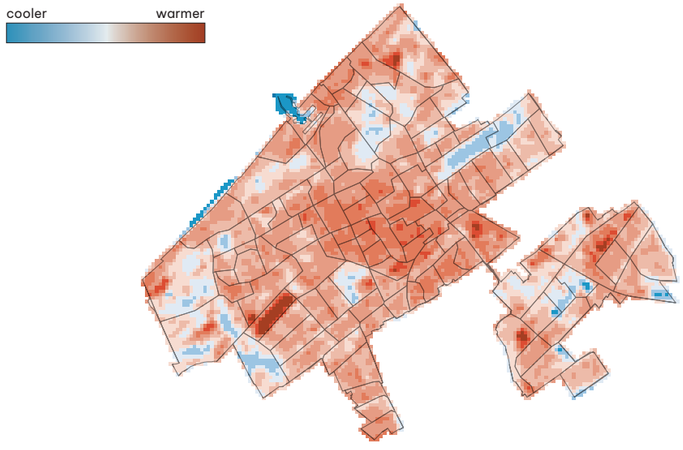
Strengths and opportunities (SWOT - analysis)



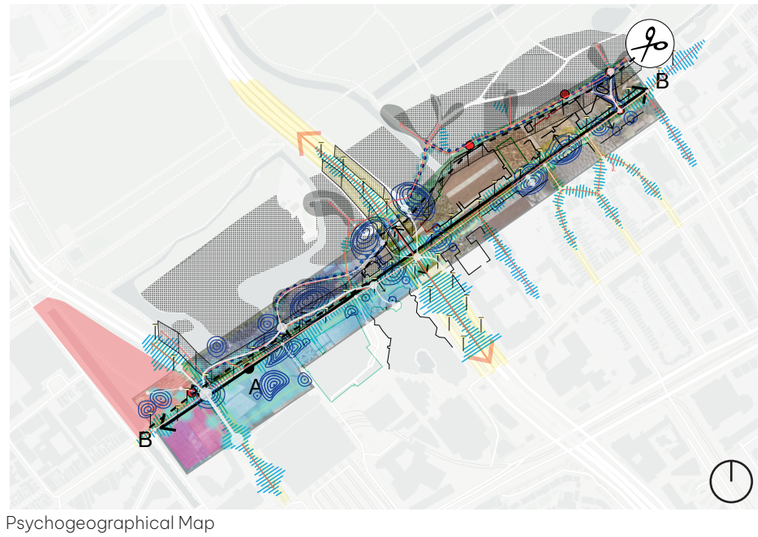
Weaknesses and Threaths (SWOT - analysis)



Amount of green space in The Hague (with ArcGis, data by F. van der Hoven & A. Wandl, 2017)



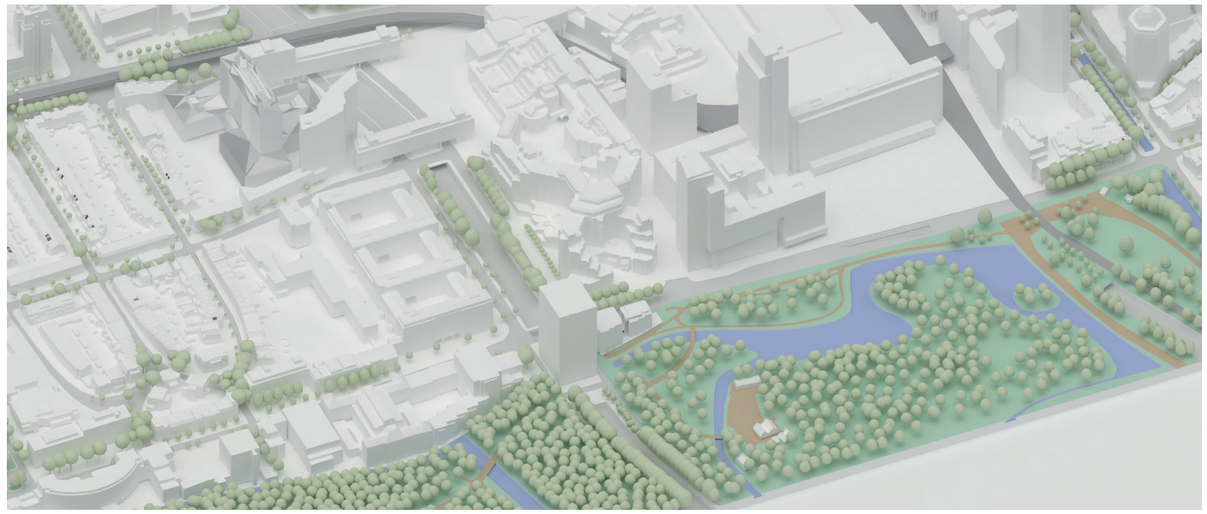
Surface temperatures in The Hague (with ArcGis, data by F. van der Hoven & A. Wandl, 2017)

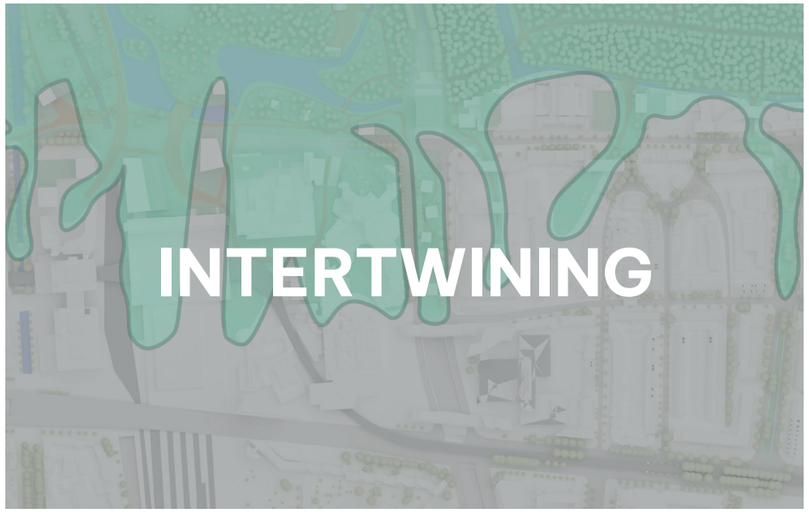


Psychogeographical Map

P1 - CONCLUSION

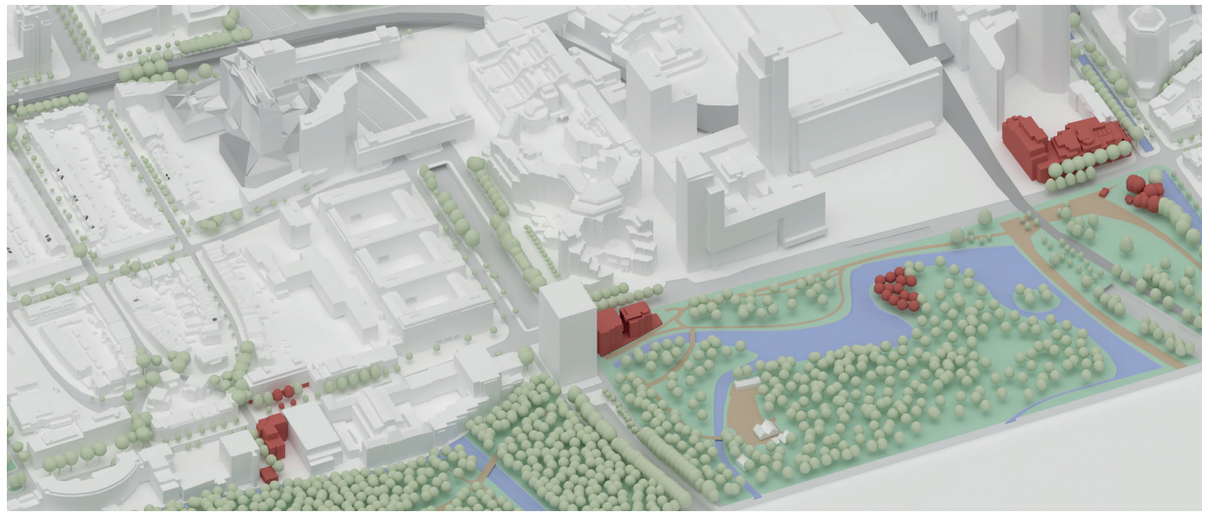
1. CURRENT SITUATION

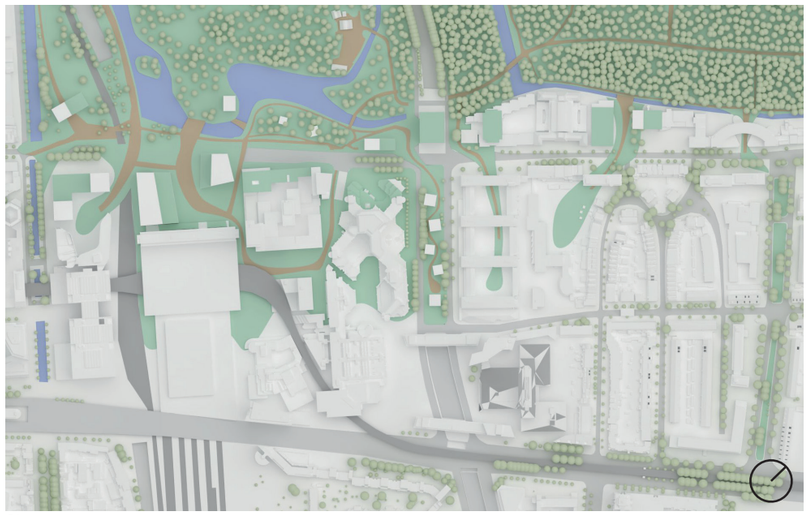




Concept

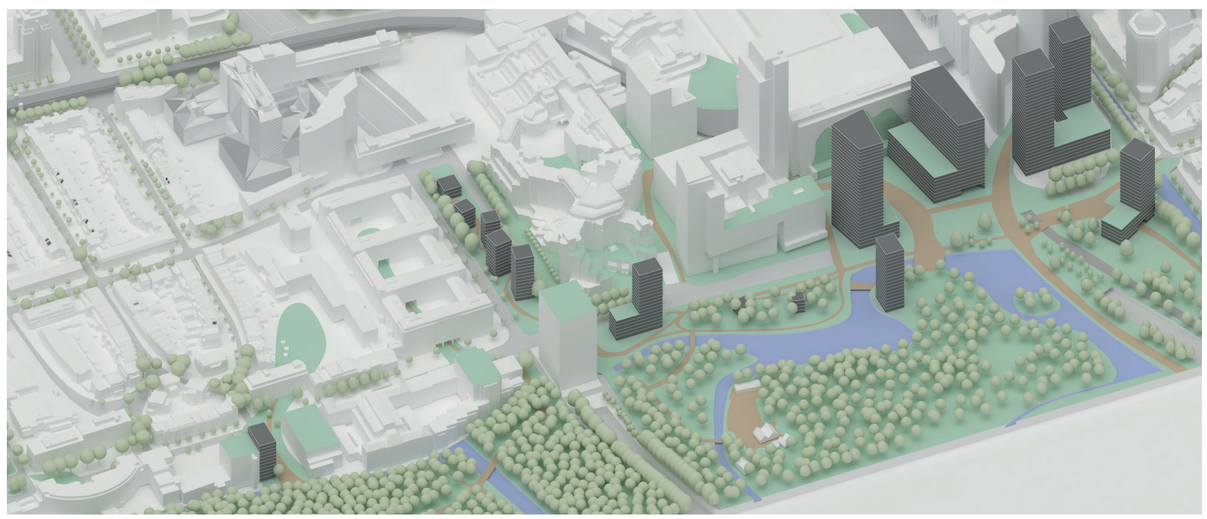
2. DEMOLOTION





Site plan

3. VISION



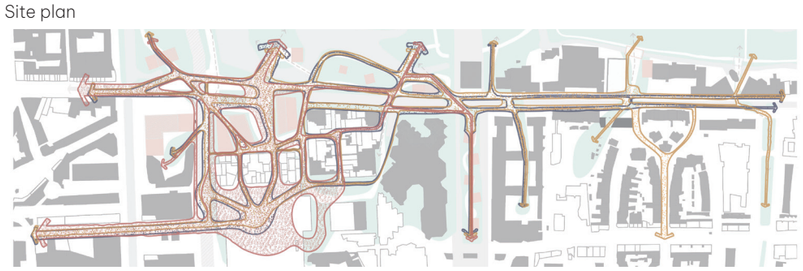


Diagram - New movement patterns

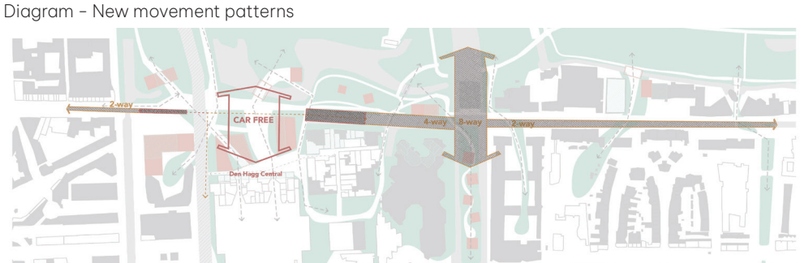


Diagram - Car-free zone

D. INTEGRATED DESIGN PROPOSAL

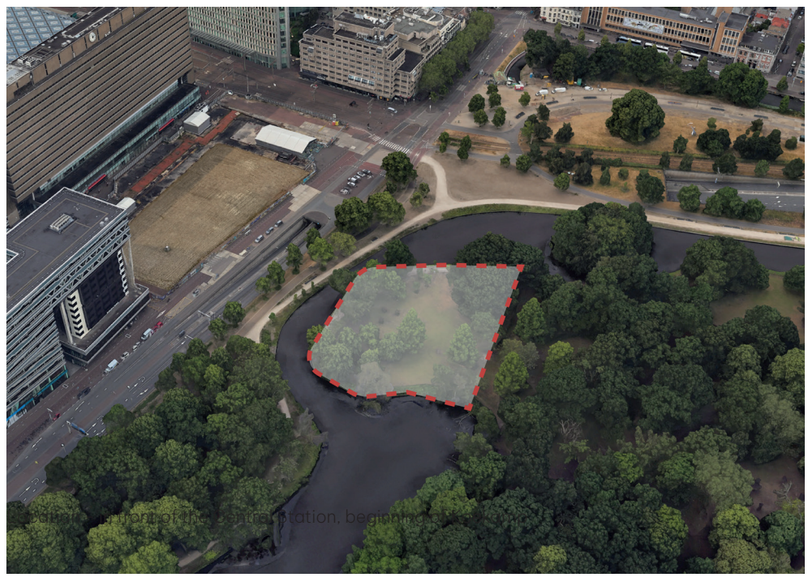
WHERE: KOEKAMP

ENTRY POINT TO THE HAGUE

POTENTIAL FOR CITY CENTRE

GREEN HYBRID BUILDING

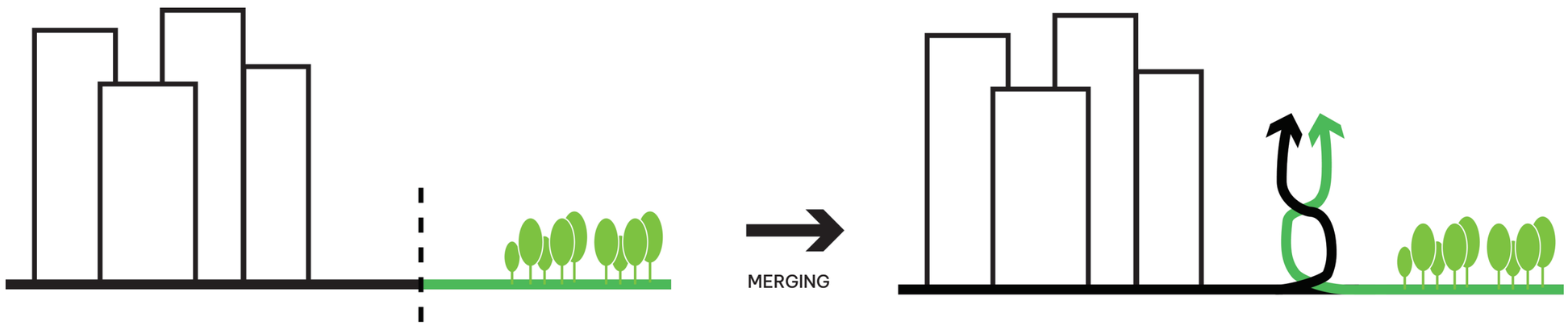
MERGING PARK AND CITY



DECREASE OF HORIZONTAL GREEN SPACE

SLIPPERY-SLOPE ARGUMENT, WHEN BUILDING ON THE EDGE OF THE PARK

INCREASE OF GENERAL WELL-BEING



WHAT: BIOPHILIC CAMPUS

MENTAL HEALTH

COGNITIVE PERFORMANCE

NATURE-INCLUSIVE

CLIMATE RESILIENT



WHY: INCREASE OF MENTAL WELL-BEING AND CITY CLIMATE

BENEFITS FOR HUMANS:

- increases mental well-being
- higher cognitive performance
- attention restoration
- enhances creativity
- better academic performance
- positive mood
- stress reduction
- improves emotional control
- lower blood pressure
- motivates to exercise

BIOPHILIA

- *“love for life“*
- *“(...) refers to the inherent affinity people have for the natural world” (Kellert 2018)*

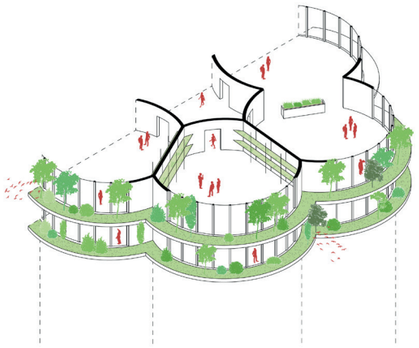
DESIGN PRINCIPLES:

- designing with nature
- nature-inclusive
- natural daylight
- (eco)system-thinking

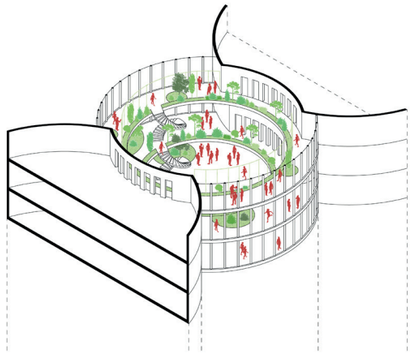
BENEFITS FOR THE CITY:

- mitigates the heat-island effect
- better air quality
- cooling
- enhances water managment
- decrease of energy consumption
- increases biodiversity

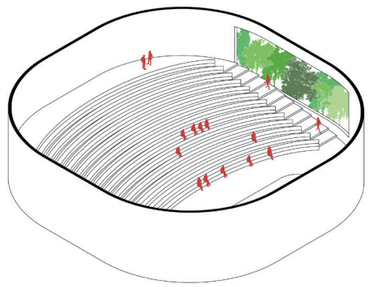
HOW: GREEN SPACE CATALOGUE



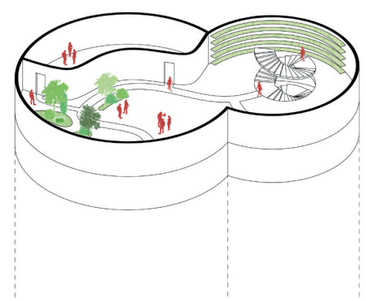
1. Zen - Learning Garden



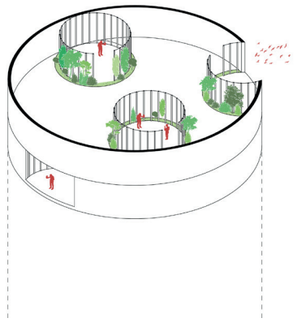
2. Jungle Workspace



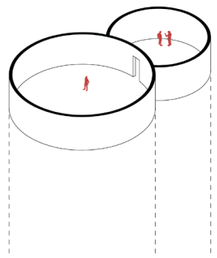
3. Lecture - Amphittheatre



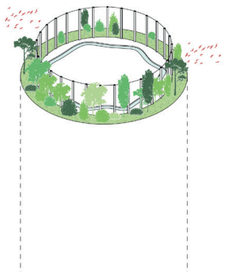
4. Co-Working Park



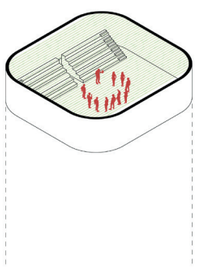
5. Book Glades



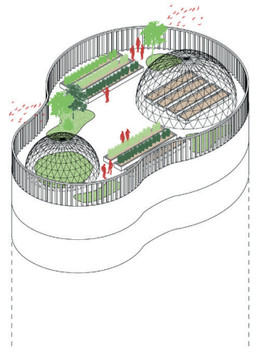
6. Virtual Nature Reality - Lab



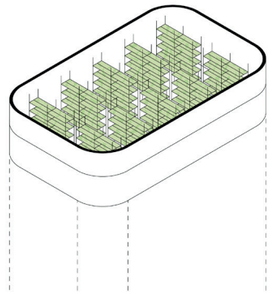
7. Mindfulness Forest (Yoga, Meditation)



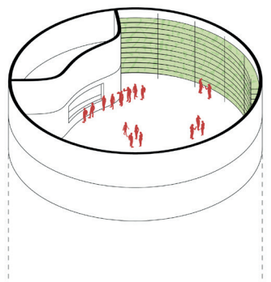
8. Wild Space



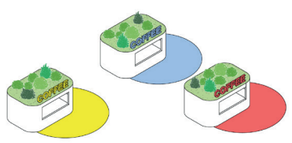
9. Rooftop Gardening



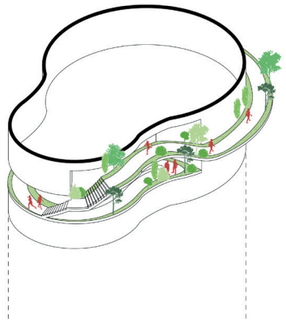
10. Vertical Farming - Lab



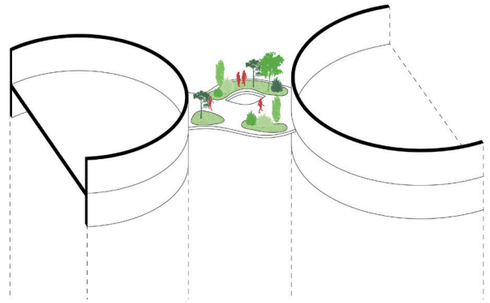
11. Herbs - Cantine



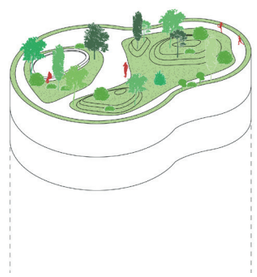
12. Cafés (Identities: sun-energetic, cloudy-focused, flower-mixed)



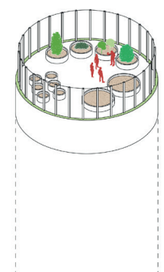
13. Vertical Pathway



14. Green Bridge

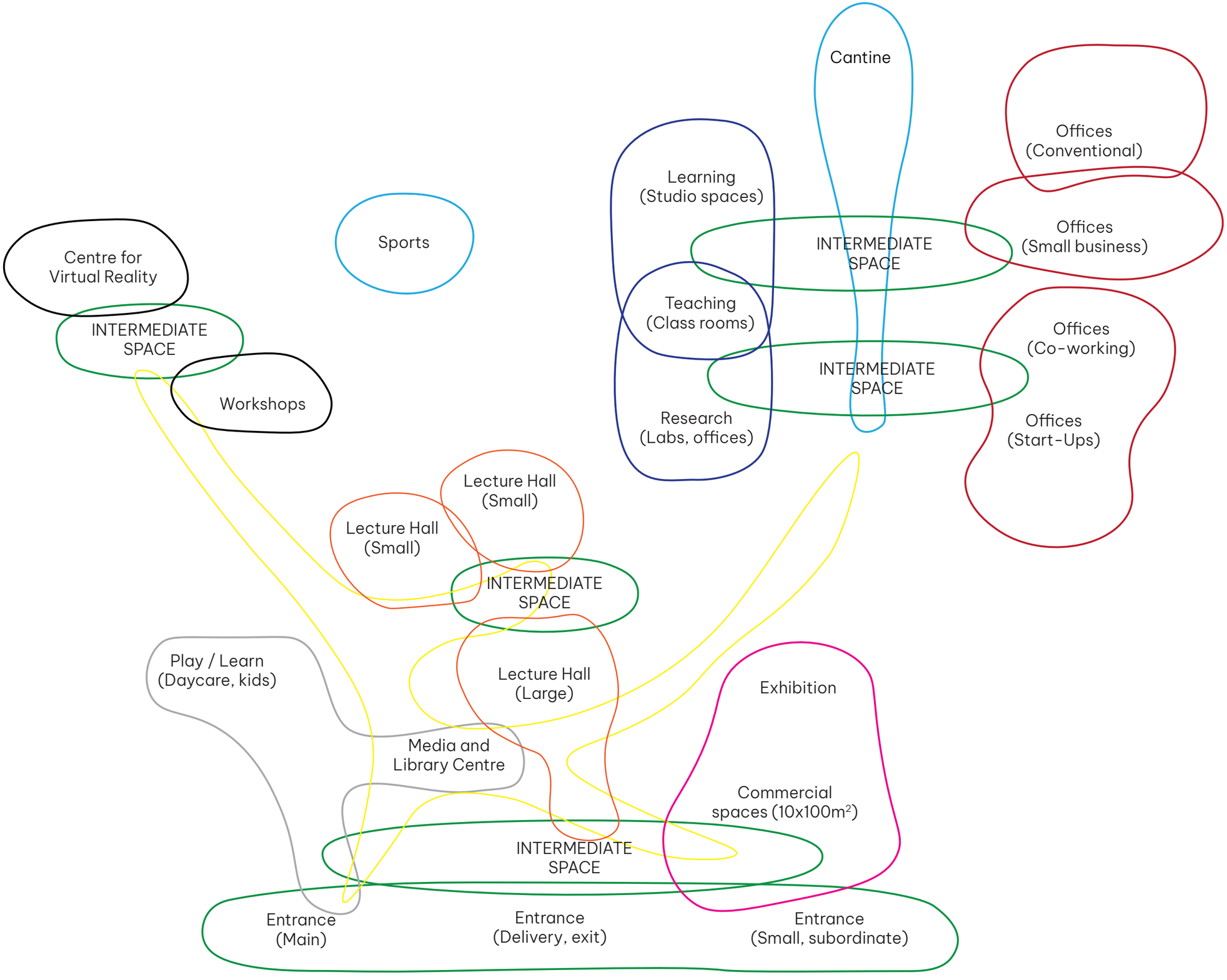


15. Forest Playground

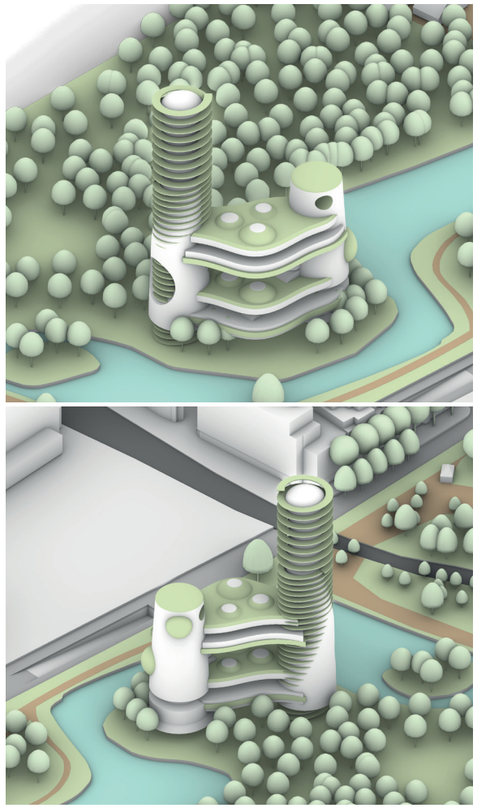


16. Learning Garden (Pre-school)

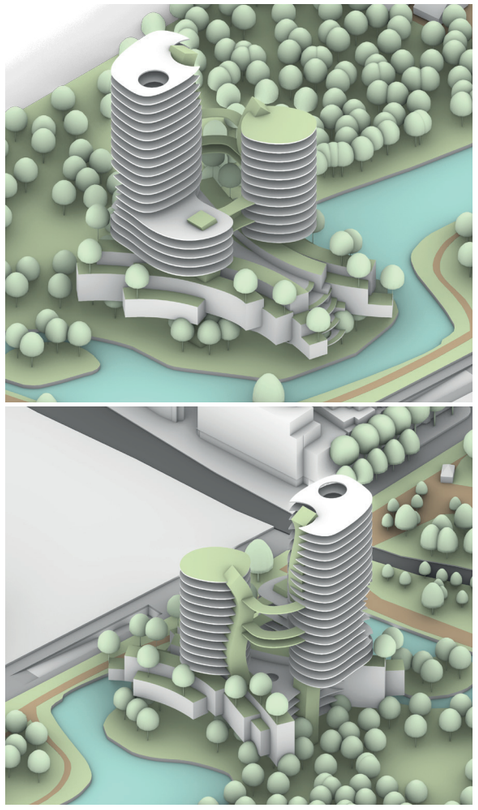
P2 - P3


Centre for
Virtual Reality
INTERMEDIATE
SPACE
Workshops
Sports
Learning
(Studio spaces)
Teaching
(Class rooms)
Research
(Labs, offices)
Cantine
INTERMEDIATE
SPACE
INTERMEDIATE
SPACE
Offices
(Conventional)
Offices
(Small business)
Offices
(Co-working)
Offices
(Start-Ups)
Lecture Hall
(Small)
Lecture Hall
(Small)
INTERMEDIATE
SPACE
Play / Learn
(Daycare, kids)
Lecture Hall
(Large)
Media and
Library Centre
Exhibition
Commercial
spaces (10x100m²)
INTERMEDIATE
SPACE
Entrance
(Main)
Entrance
(Delivery, exit)
Entrance
(Small, subordinate)

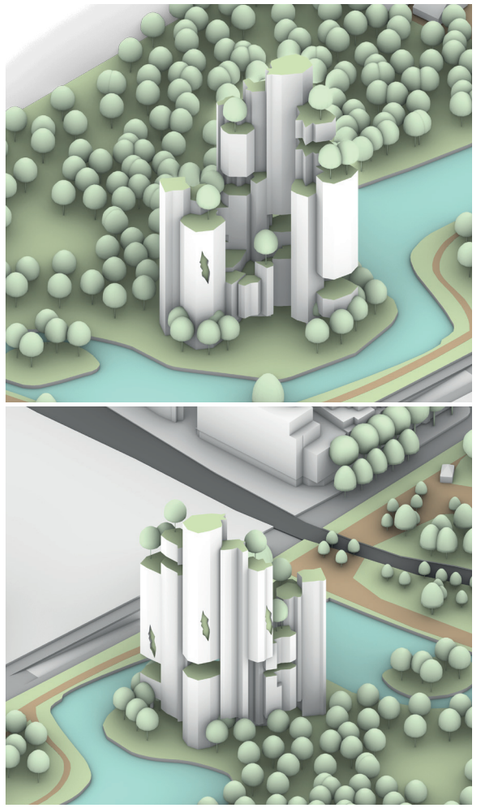
Massing 1: Spirals



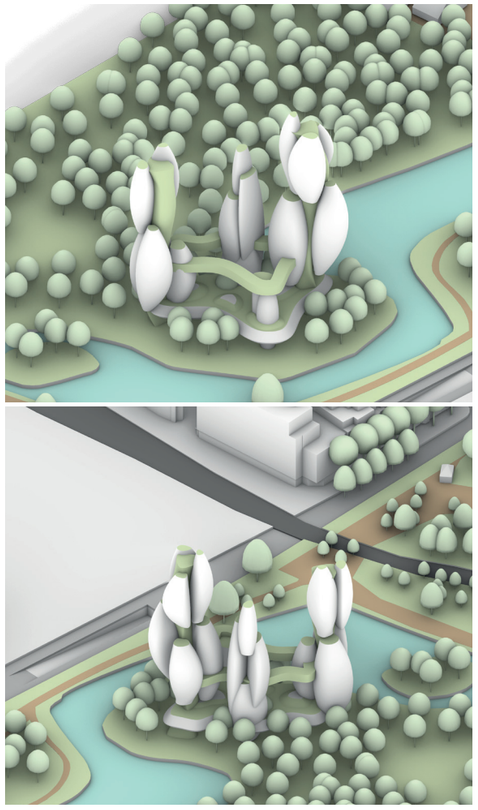
Massing 2: Lines



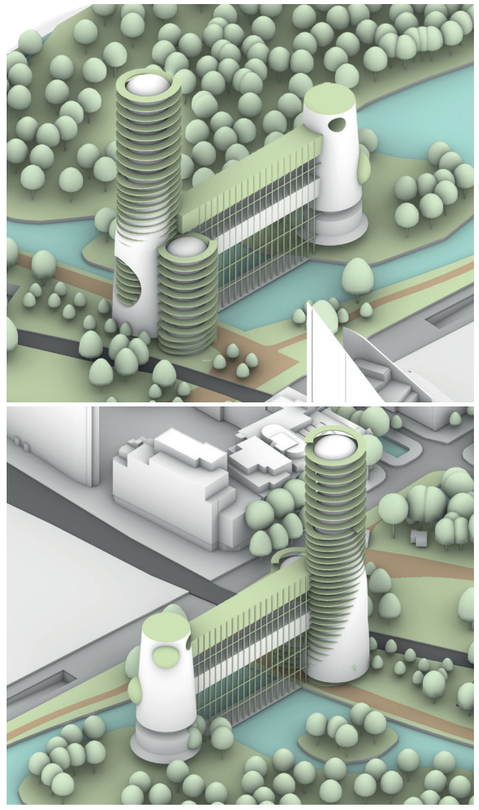
Massing 3: Cliffs

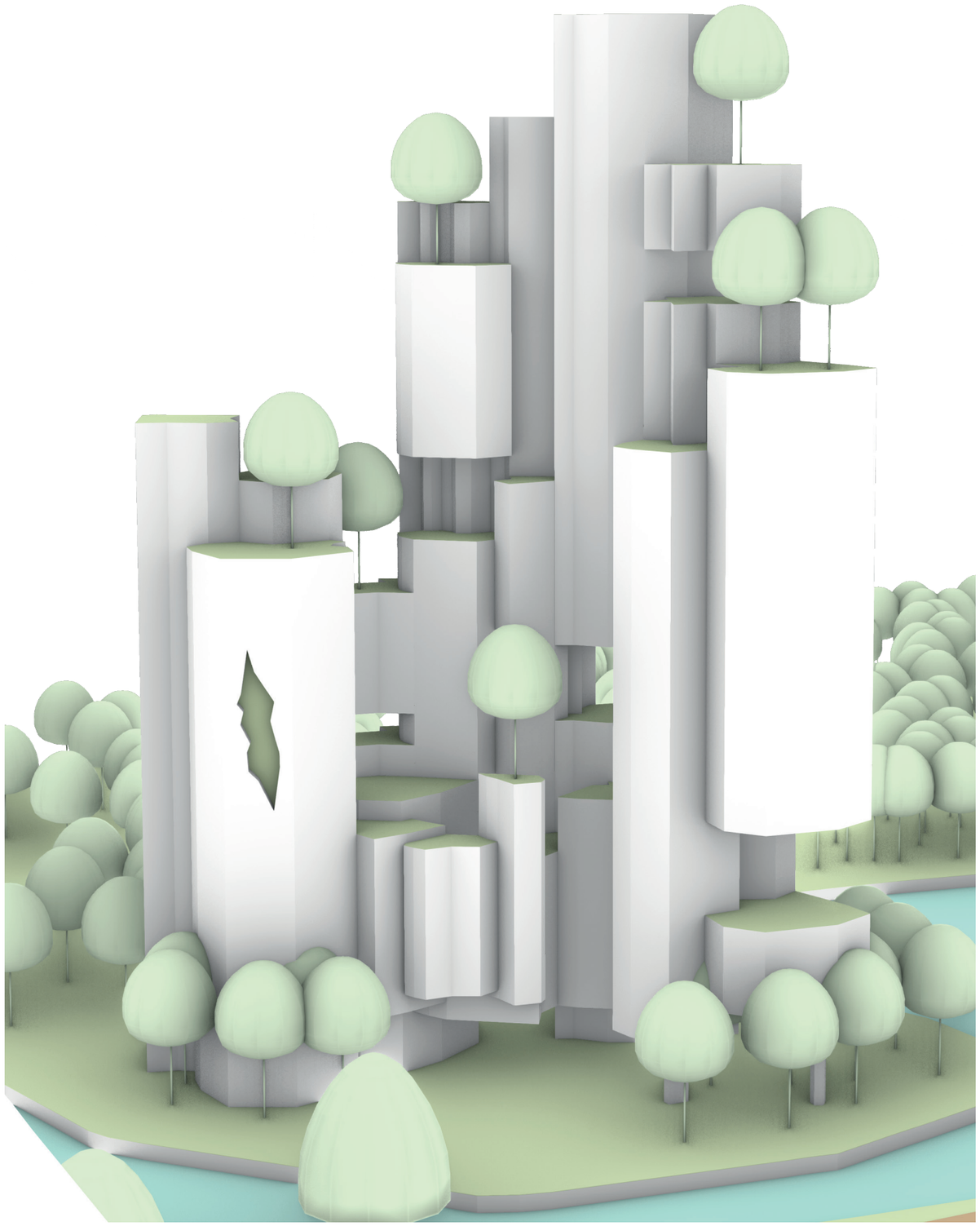


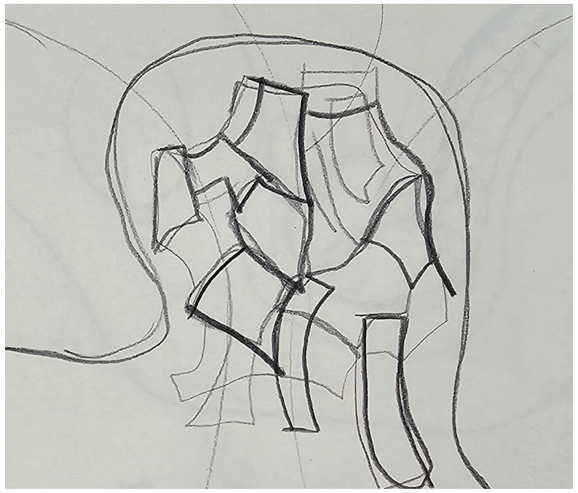
Massing 4: Cells



Massing 5: Nature Bridge









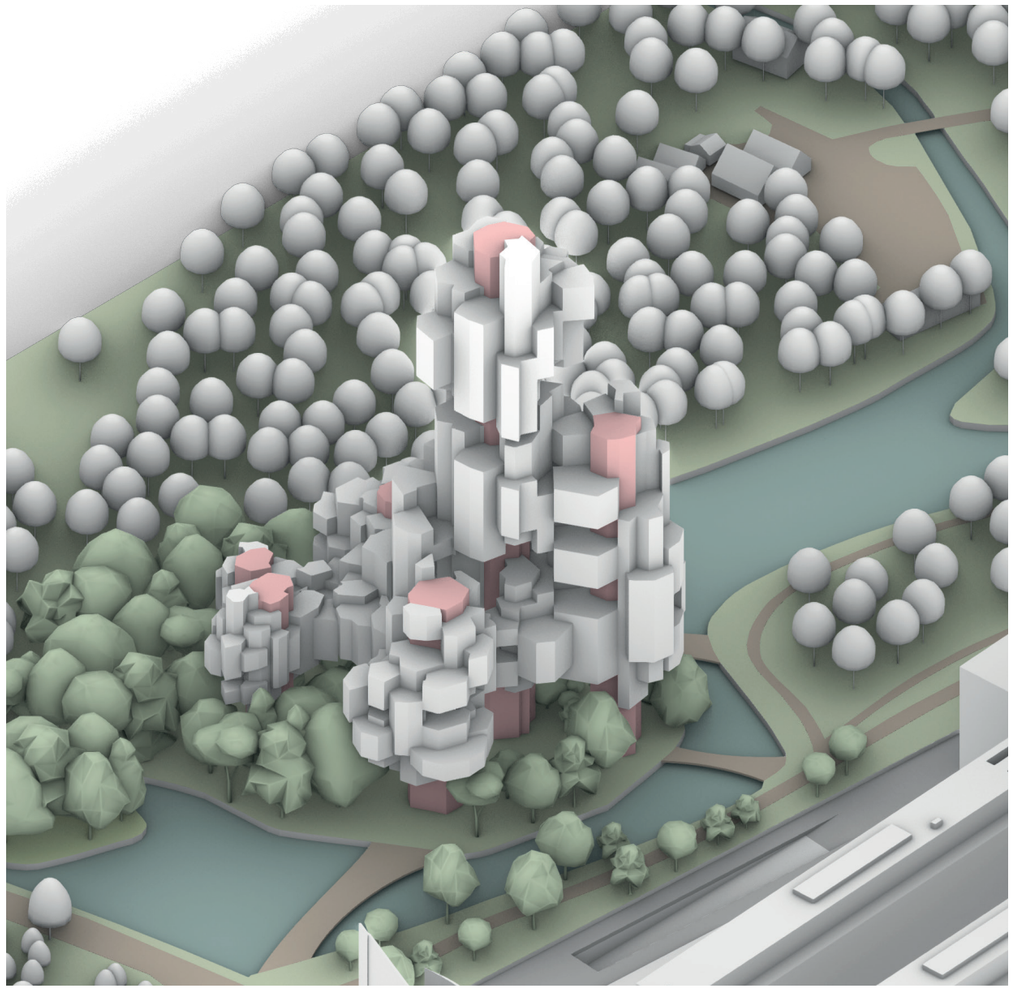










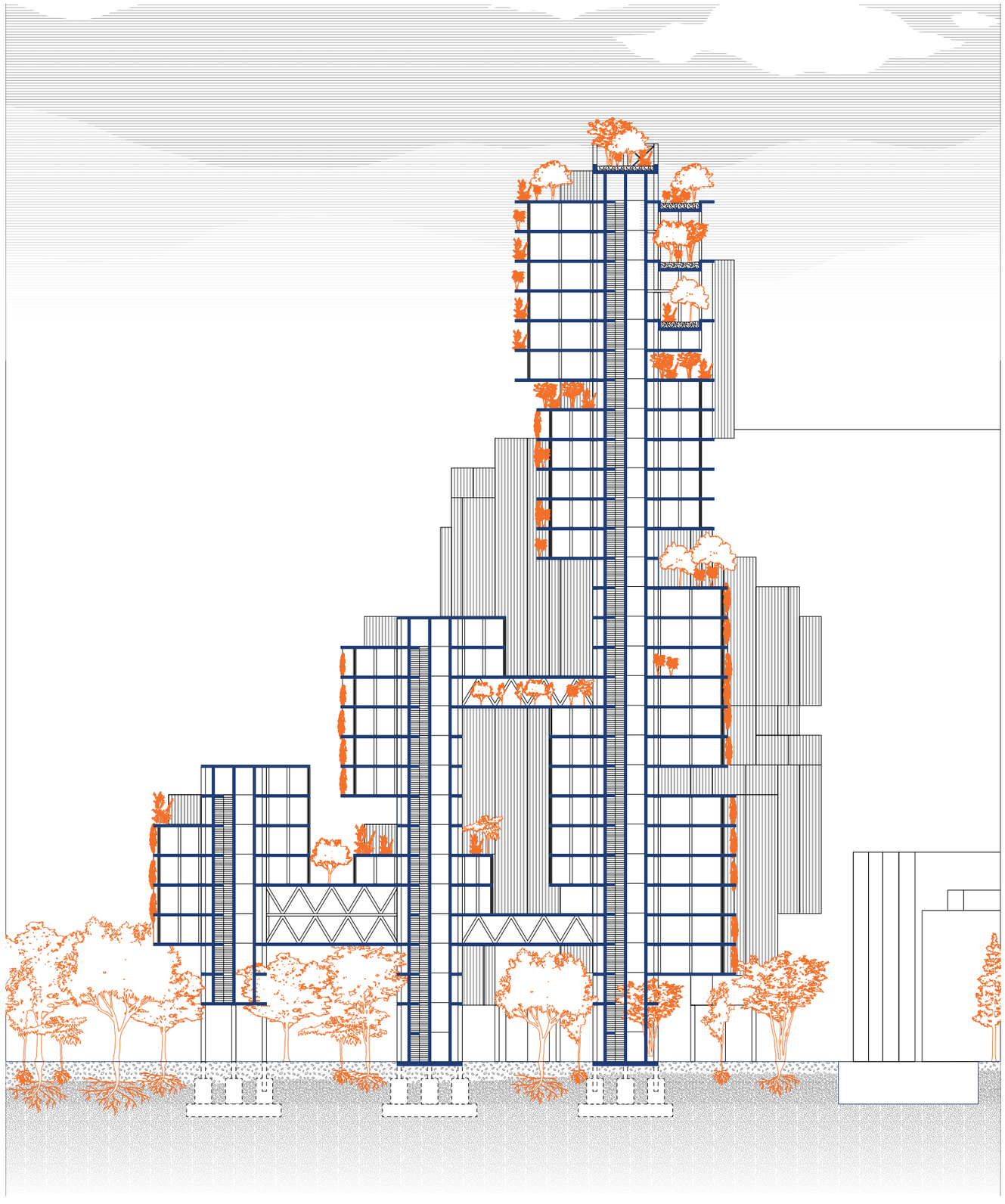


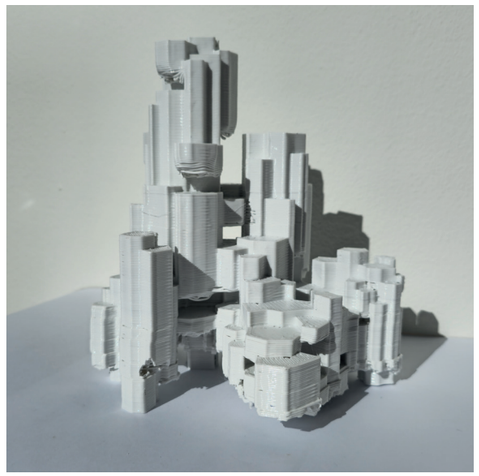
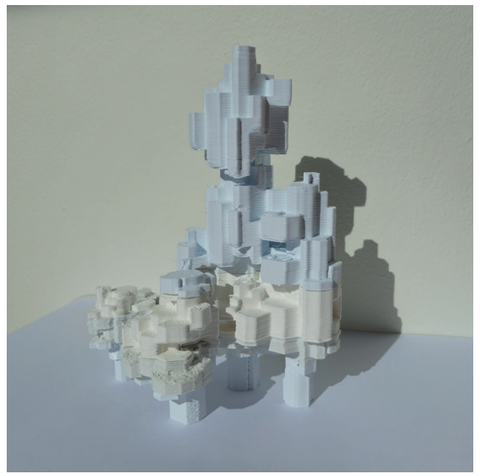
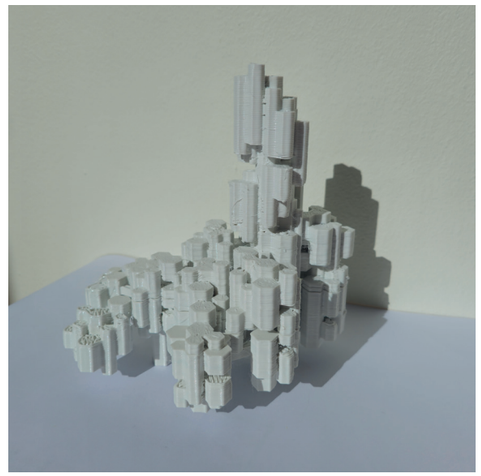
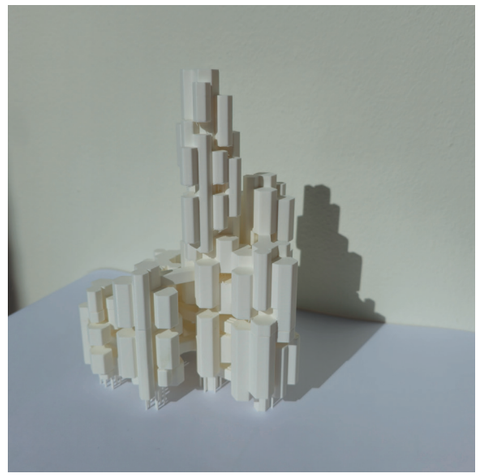
ANALYSIS:

- Fragments are irregular
- Question of how cores shall be the primary structure
- Some fragments are not connected to the cores
- A lot of small, individual components

GOALS:

- Simplification
- Creating order,
- but keeping a level of dynamism and flexibility
- Low impact on ground floor



P3 - P4

Biophilic Design Framework by Zhong et al. (2021)

1. Nature Incorporation

Water; Air; Daylight; Plants; Animals;
Landscape; Weather; Time and seasonal changes

2. Nature Inspiration

Forms and shapes; Patterns and geometries;
Mechanisms; Images;
Materials, texture and colour

3. Nature Interaction

Prospect and refuge; Complexity and order;
Enticement (peril and mystery);
Connection to place;
Connection of spaces

Benefits on:

1. General Wellbeing

2. Cognitive Performance

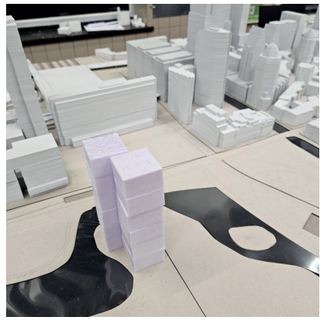
3. Creativity

4. Academic Performance / Productivity

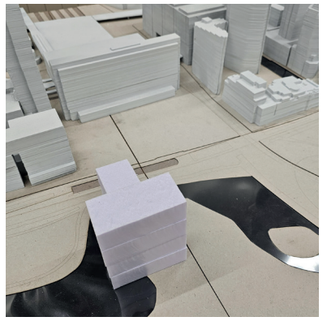
5. Stress reduction

6. Physical Health

- MASSING STUDIES / RESEARCH BY DESIGN -



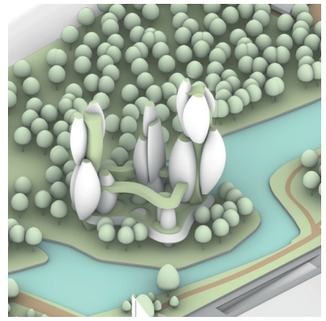
Q2_Week 3 - **Blocks**



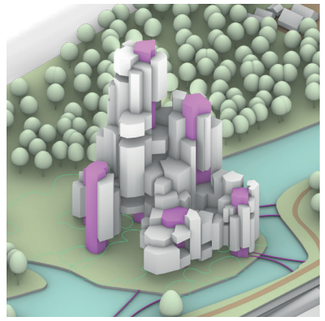
Q2_Week 3



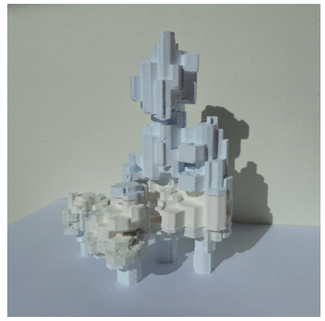
Q2_P2 Massing



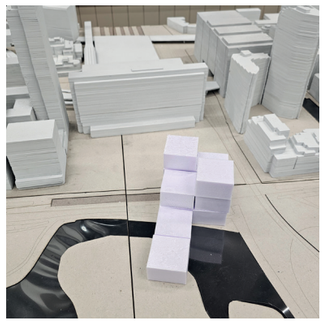
Q3_Week 2



Q3_Week 3 -**Irregularity**



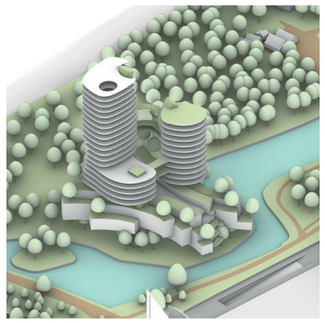
Q3_Week 4



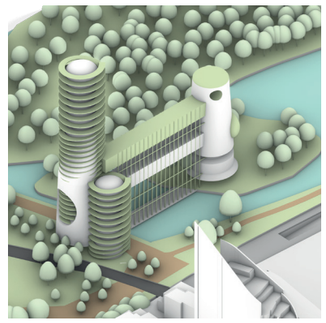
Q2_Week 3



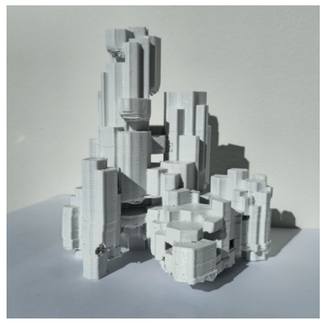
Q2_Week 3 - **Bridge**



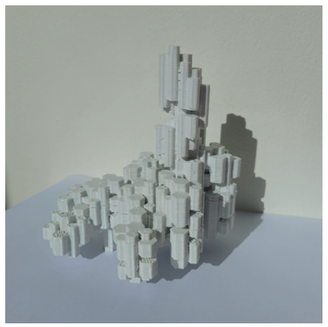
Q3_Week 2



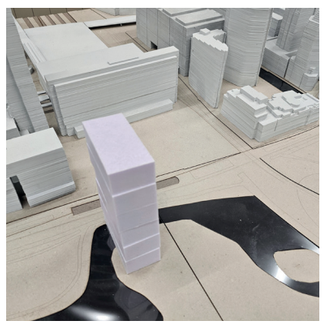
Q3_Week 2



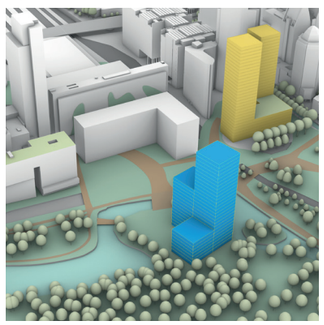
Q3_Week 3



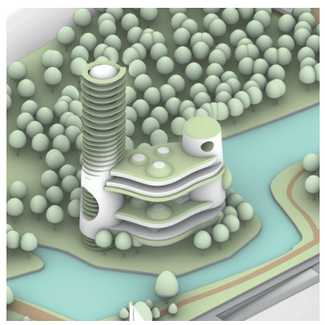
Q3_Week 5 - **Regularity**



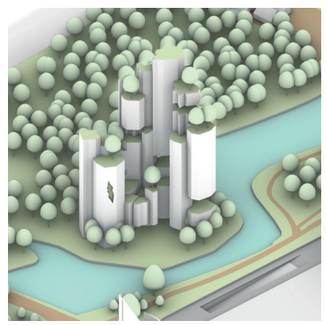
Q2_Week 3 - Tower



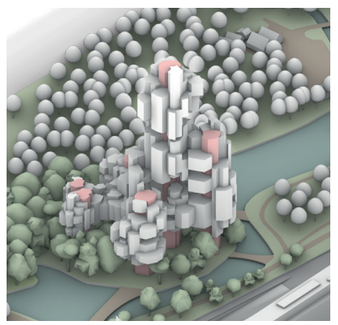
Q2_Week 4 - **Levels**



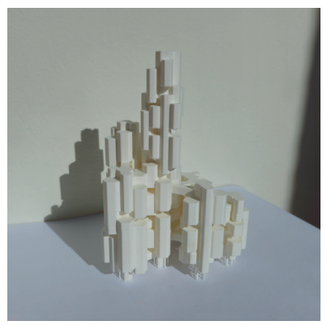
Q3_Week 2



Q3_Week 2 - **Fragmentation**

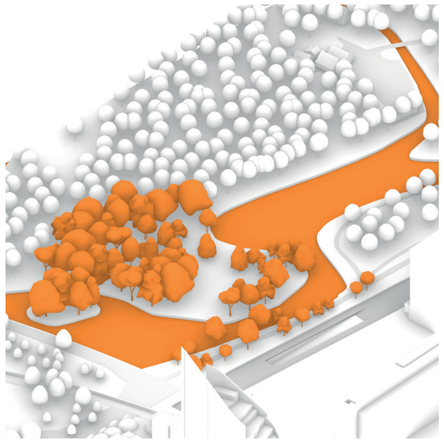


Q3_Week 4

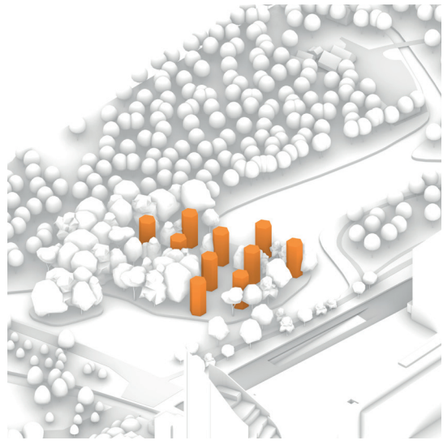


Q3_P3 Final Massing

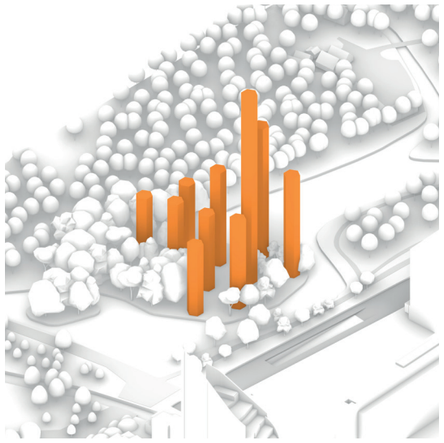
- MASSING DEVELOPMENT -



1. Existing situation / Environmental constraints



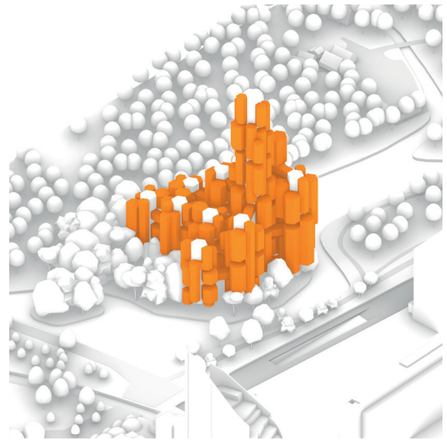
2. Placing cores



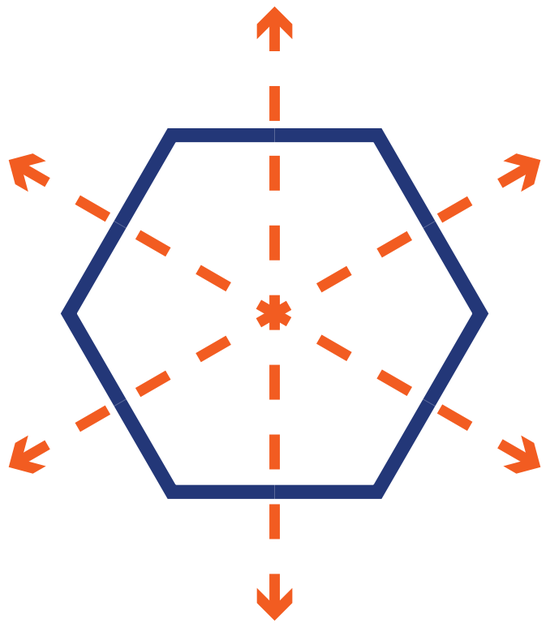
3. Height according urban strategy and sunlight



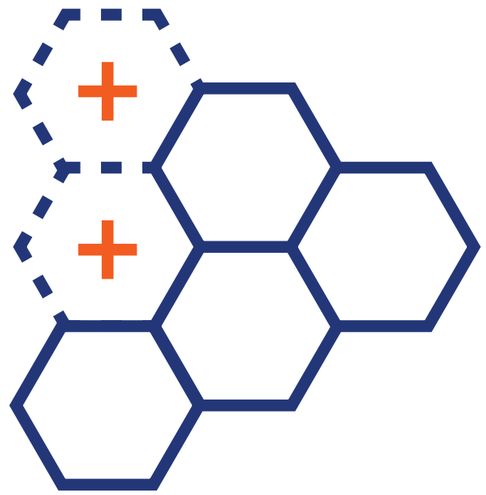
4. Adding Building Program



5. Creating Permeability



Flexibility

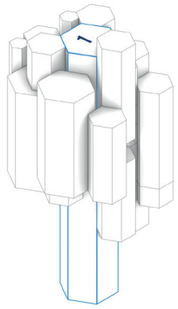


Space Efficiency

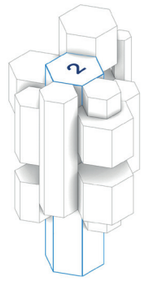
- SITE PLAN -



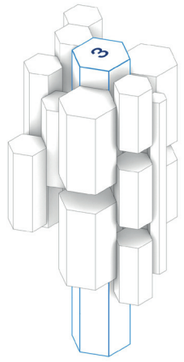
- BUILDING PROGRAM / CLUSTERS -



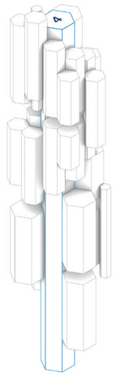
1. Public
- Entrance, Cantine, Lounge, Café)



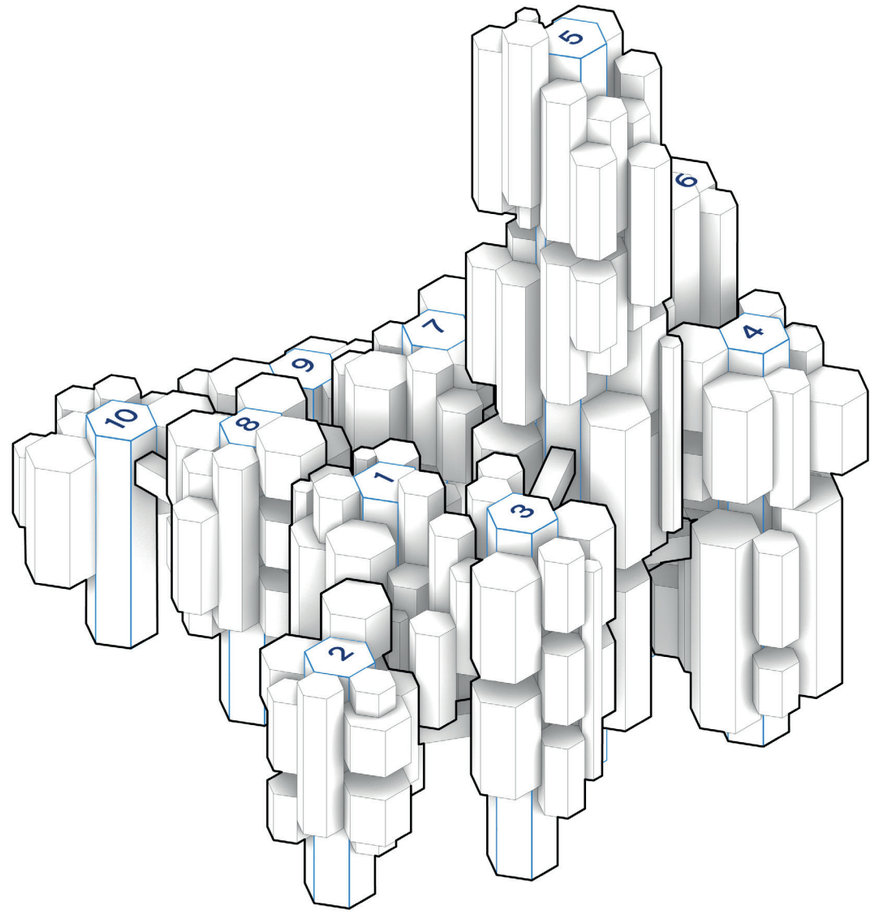
2. Public
- Infopoint, Meeting Spaces

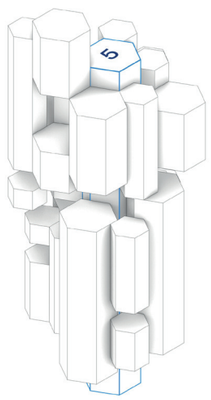


3. Public / University
- Exhibition, Virtual Reality

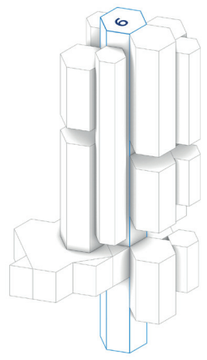


4. University
- Learning Spaces, Classrooms Research, CoWorking, Lecture hall

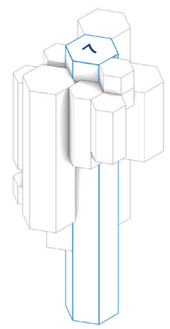




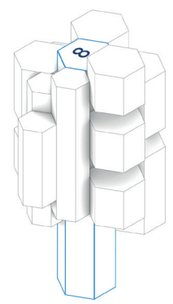
5. Research
- Research spaces, CoWorking, Workshops



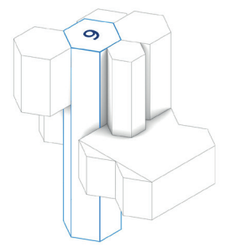
6. Office
- Traditional offices, CoWorking, Lecture hall



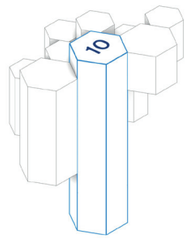
7. Office
- Traditional offices, CoWorking



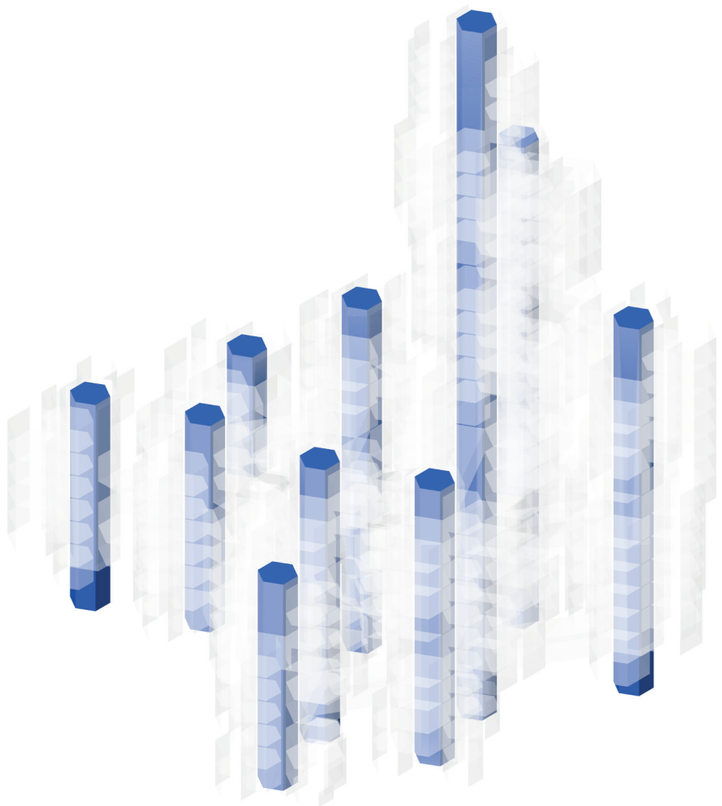
8. Media / Library



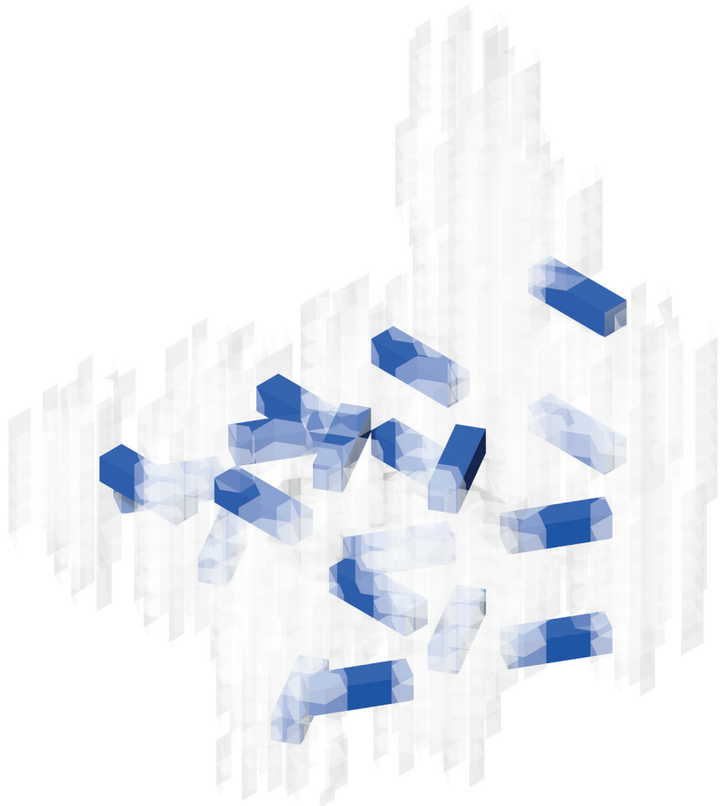
9. Activities
- Sports, Arts



10. Wellbeing
- Consultation, Yoga, Mental Health

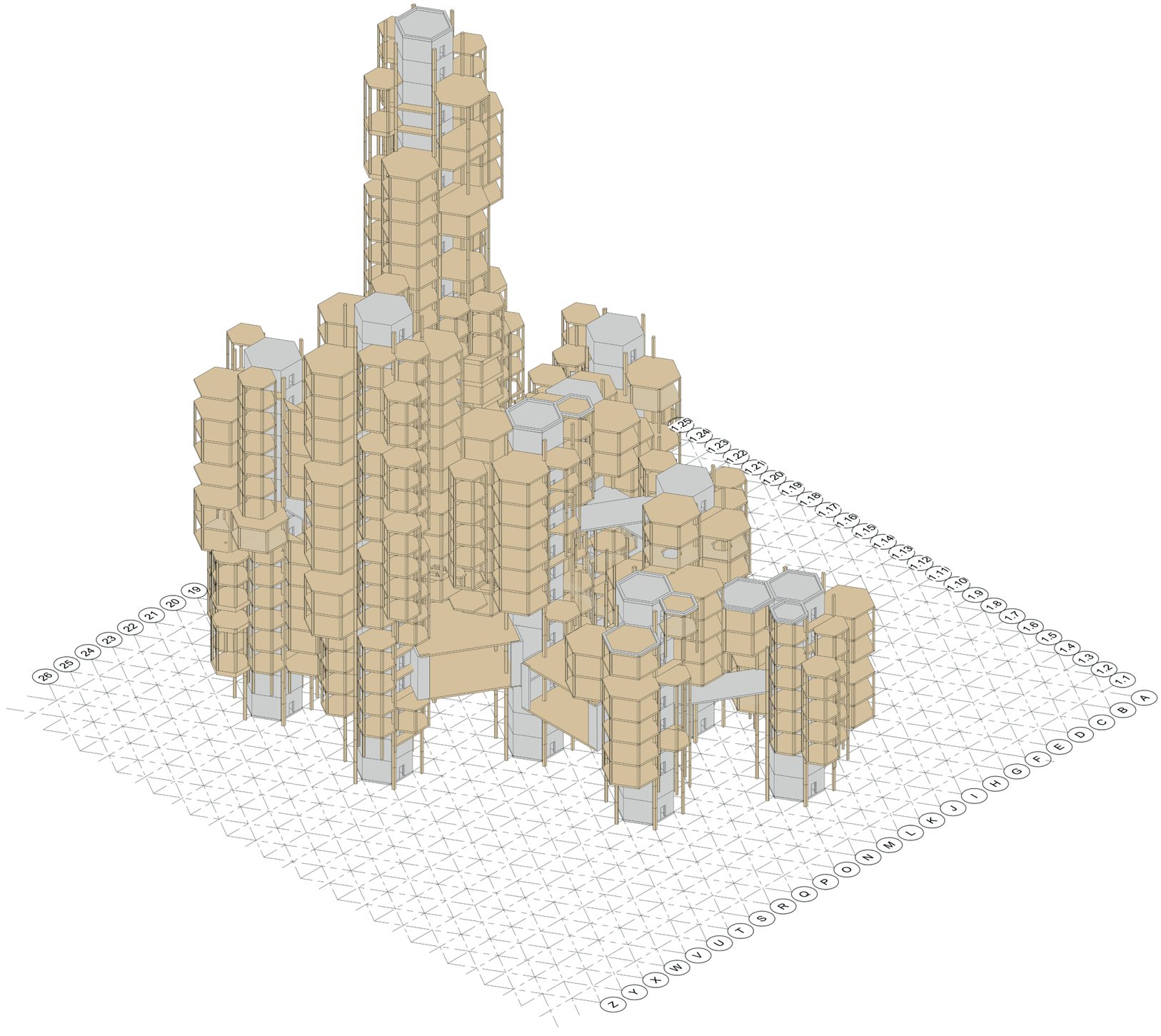


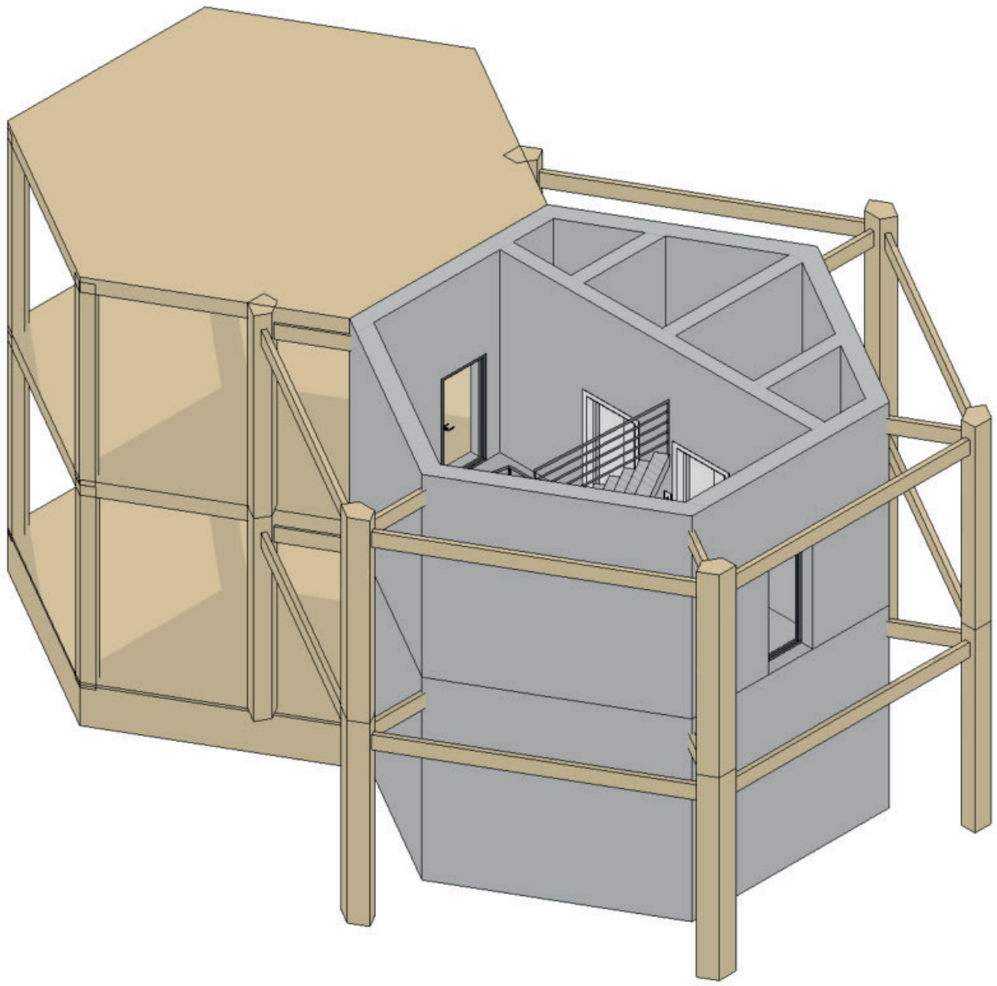
Vertical Circulation

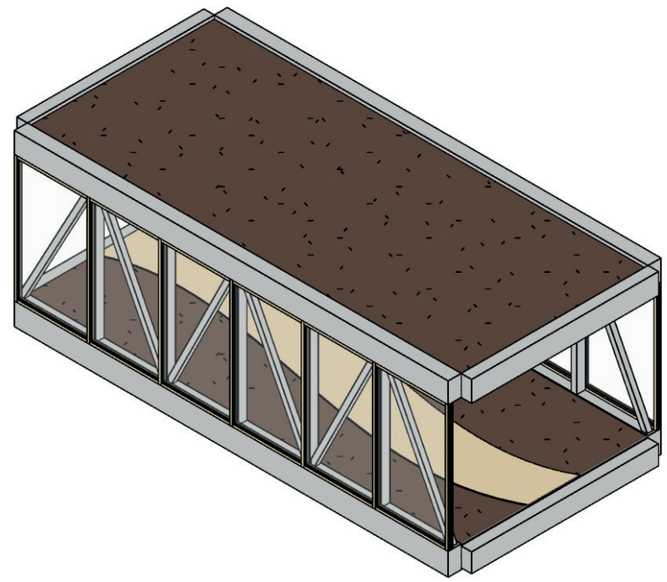


Horizontal Circulation

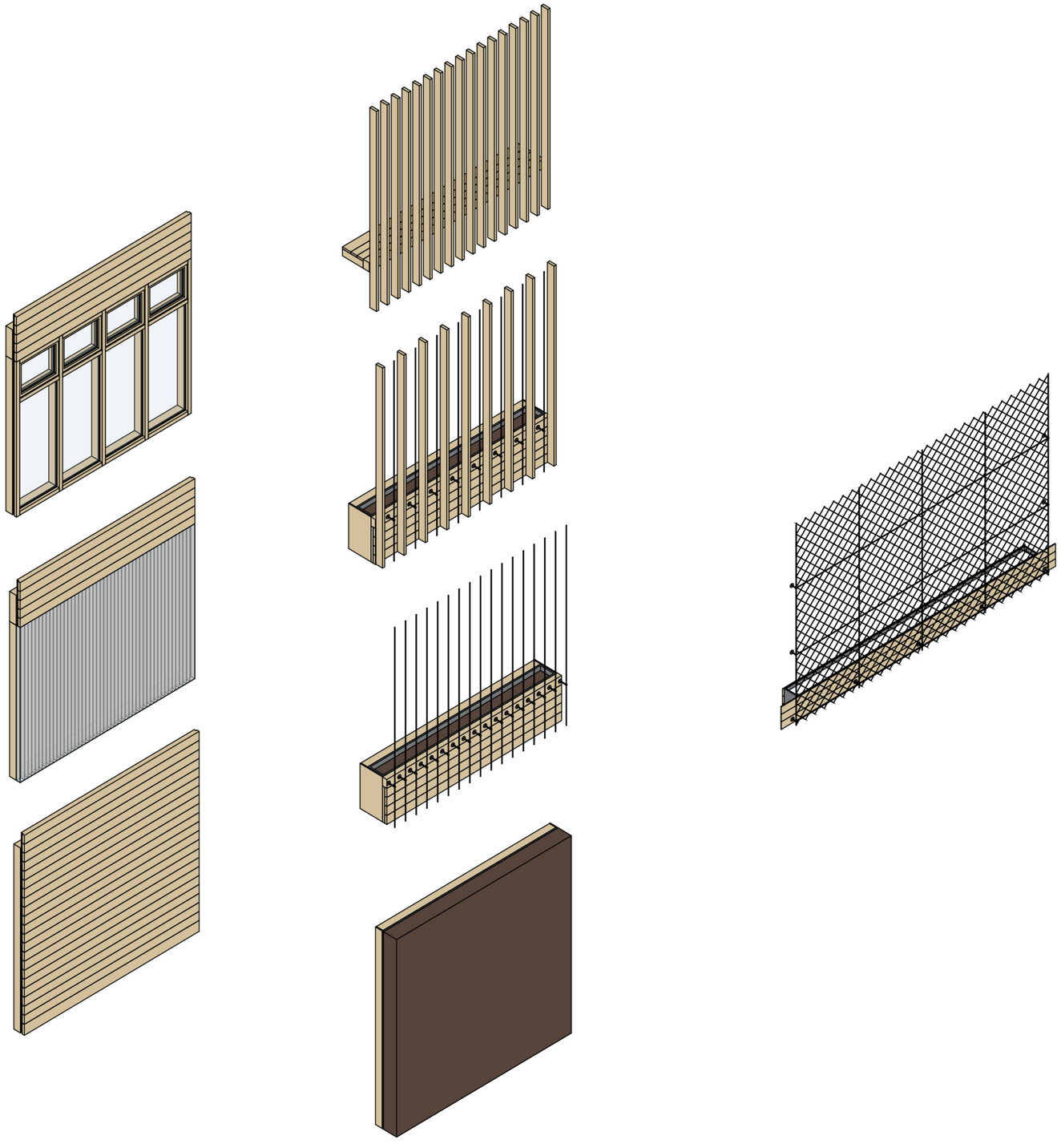
- OVERALL STRUCTURE -



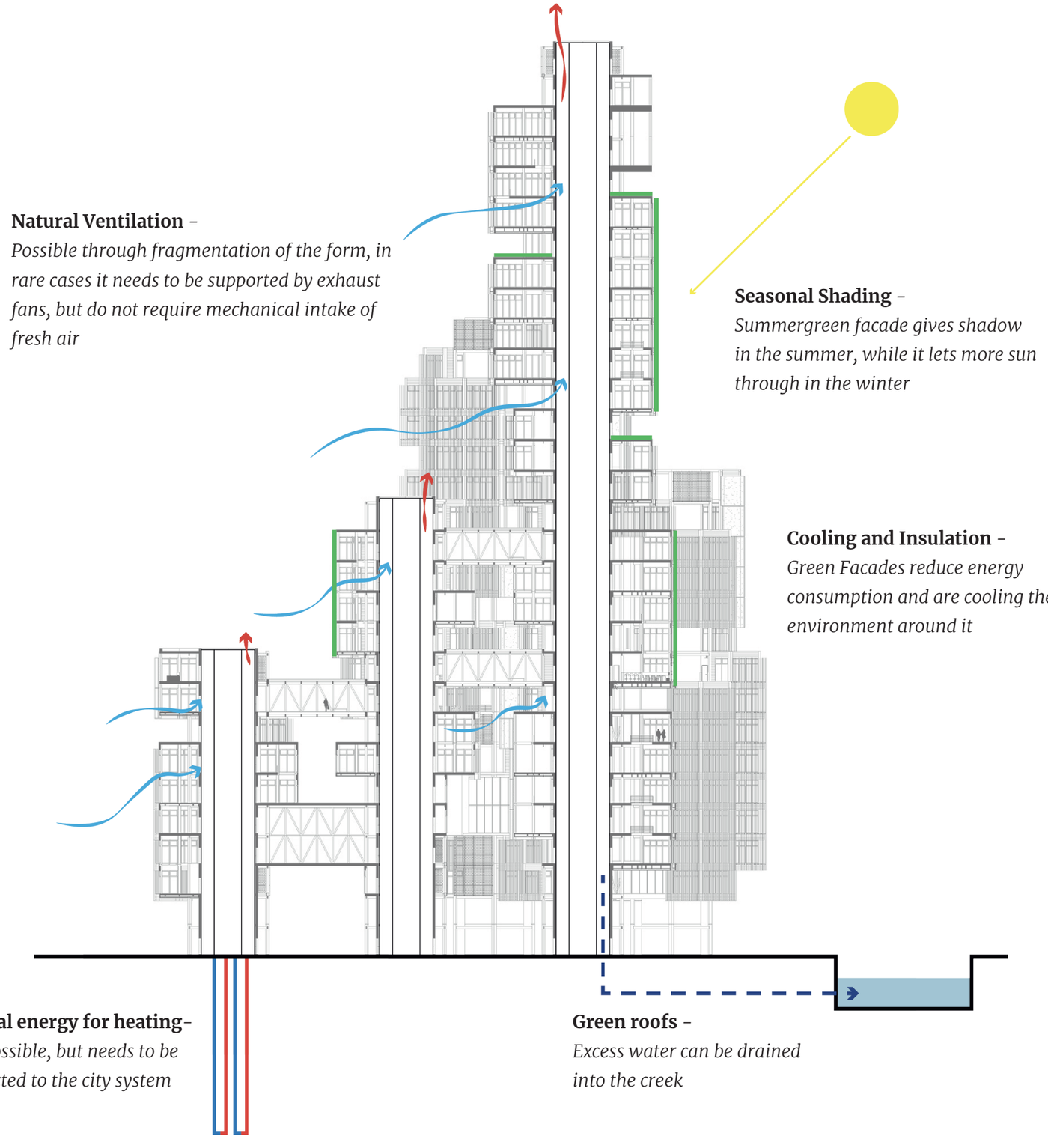




- FACADE ELEMENTS -



- PASSIVE CLIMATE CONCEPT -



Natural Ventilation -
Possible through fragmentation of the form, in rare cases it needs to be supported by exhaust fans, but do not require mechanical intake of fresh air

Seasonal Shading -
Summergreen facade gives shadow in the summer, while it lets more sun through in the winter

Cooling and Insulation -
Green Facades reduce energy consumption and are cooling the urban environment around it

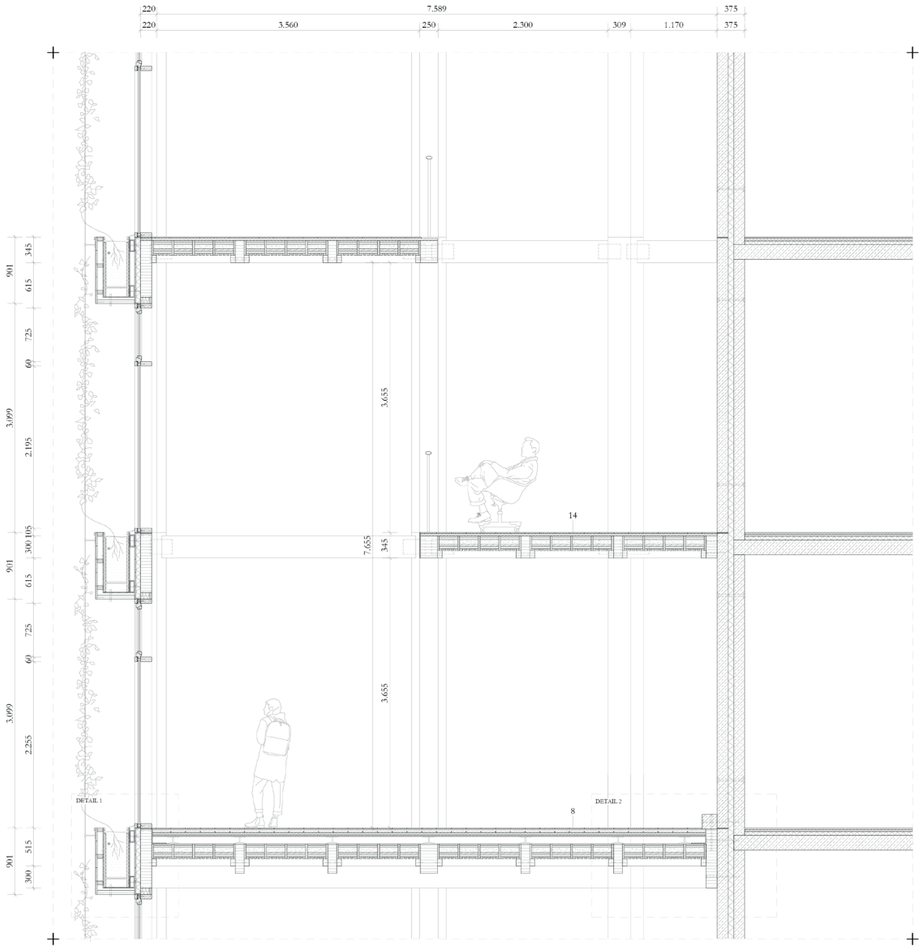
Geothermal energy for heating-
Partially possible, but needs to be also connected to the city system

Green roofs -
Excess water can be drained into the creek

- FRAGMENT AND DETAILS -



ELEVATION / 1:20



FACADE CROSS SECTION / 1:20

LEGEND

1 Summergreen Ivy vegetation
- species south side (sun): Ampelopsis aconitifolia
- species north side (shadow): Clematis lanuginosa

2 Green Facade:
- substrate
- 5 mm fleece
- 100 mm gravel
- 10 mm sheet steel trough (planter box)

3 Ø 20/5 mm steel pipe

4 Ø 25 mm irrigation hose

5 Steel rope clamps / 4 mm steel rope

6 60/230 mm Timber facade with triple glazing

7 800/150 mm Glued-laminated timber (GLT) beam

8 Loadbearing floor:
- 15 mm parquet
- 50 mm heating screed
- 30 mm impact soundproofing
- 18 mm formwork element
- 102 mm installation space

9 Lignatur - Geometry surface elements (LFE):
- 65 mm thermal insulation filling
- room acoustics (sound absorption)

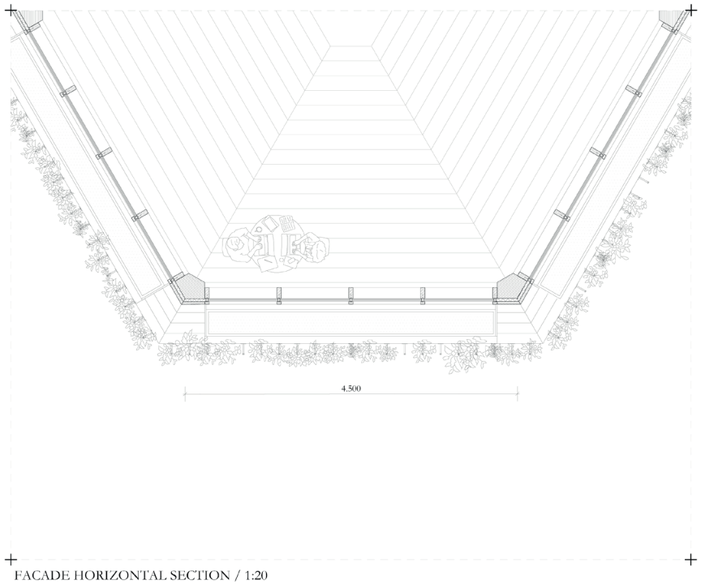
10 375 mm Core wall (sandwich construction):
- 150 mm prefabricated reinforced concrete elements (2x)
- 75 mm thermal insulation (hempwool)
- bolt connection

11 300 mm Core floor:
- 20 mm screed
- Polyethylene (PE) foils
- 30 mm impact soundproofing
- 50 mm thermal insulation
- 200 mm reinforced concrete

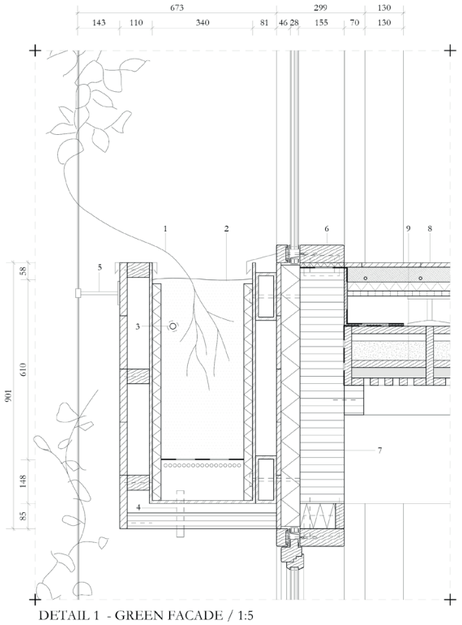
12 200/200 mm reinforced concrete element (needed for cantilevering)

13 350/350 mm Glued-laminated timber (GLT) column (supports the cantelevering beams)

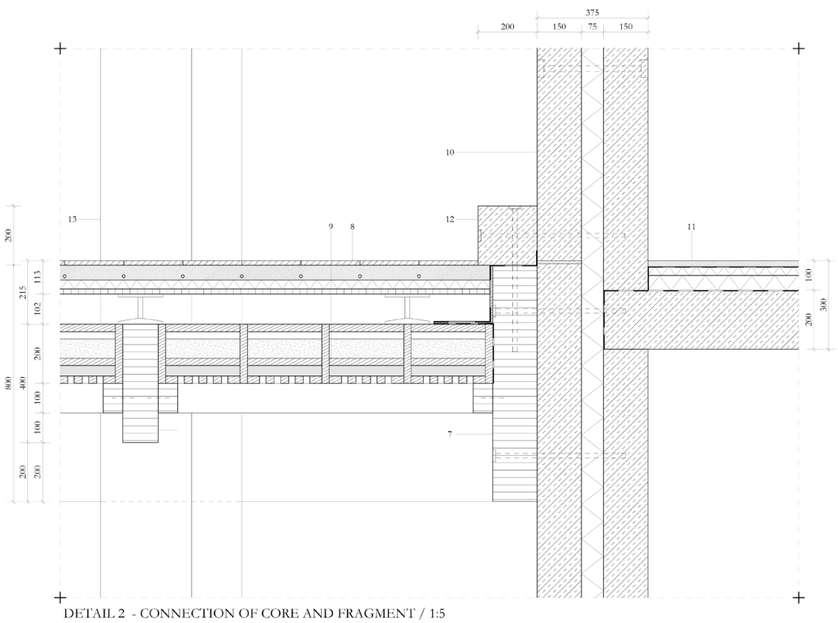
14 In-between flexible floors



FACADE HORIZONTAL SECTION / 1:20



DETAIL 1 - GREEN FACADE / 1:5

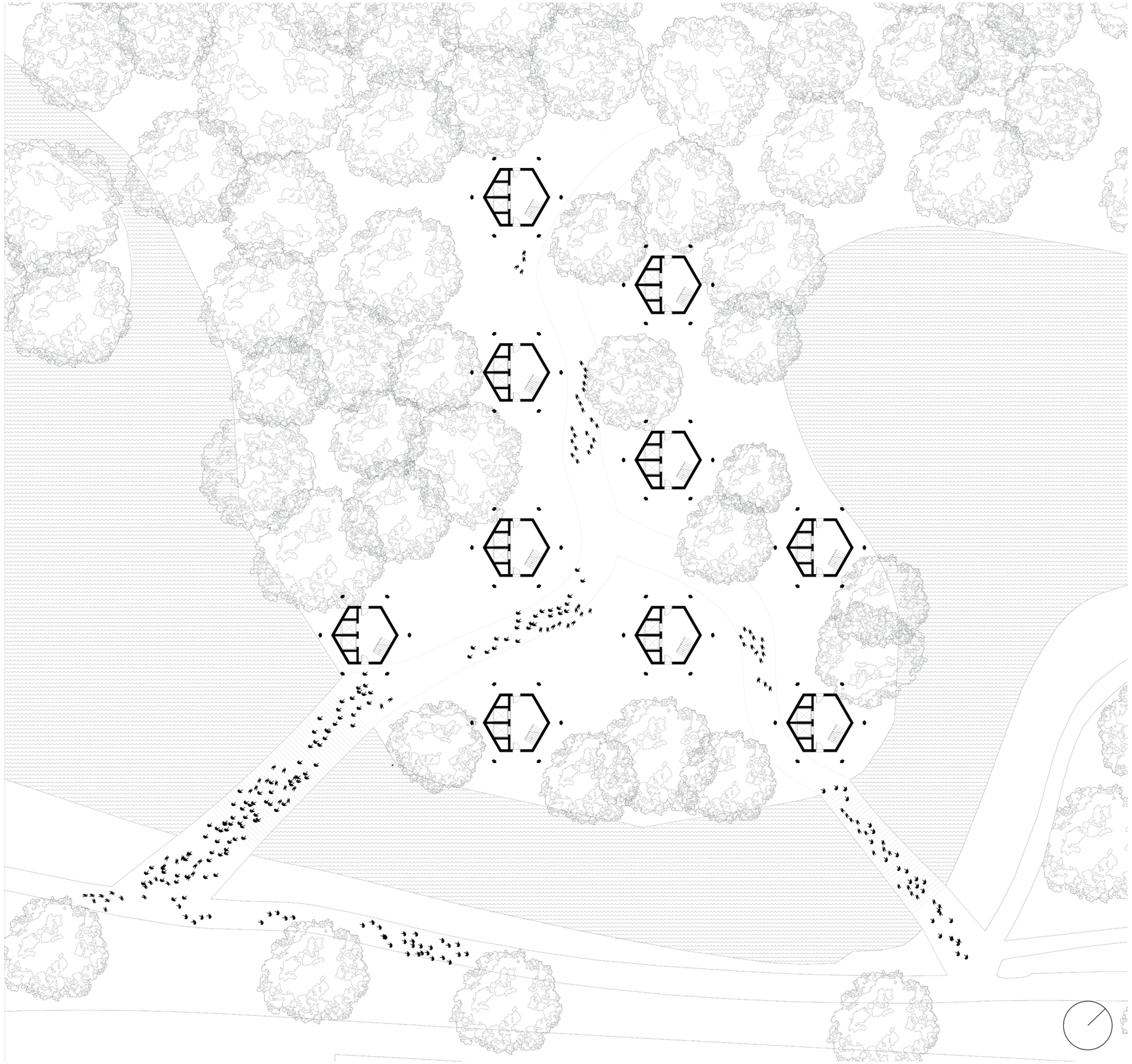


DETAIL 2 - CONNECTION OF CORE AND FRAGMENT / 1:5

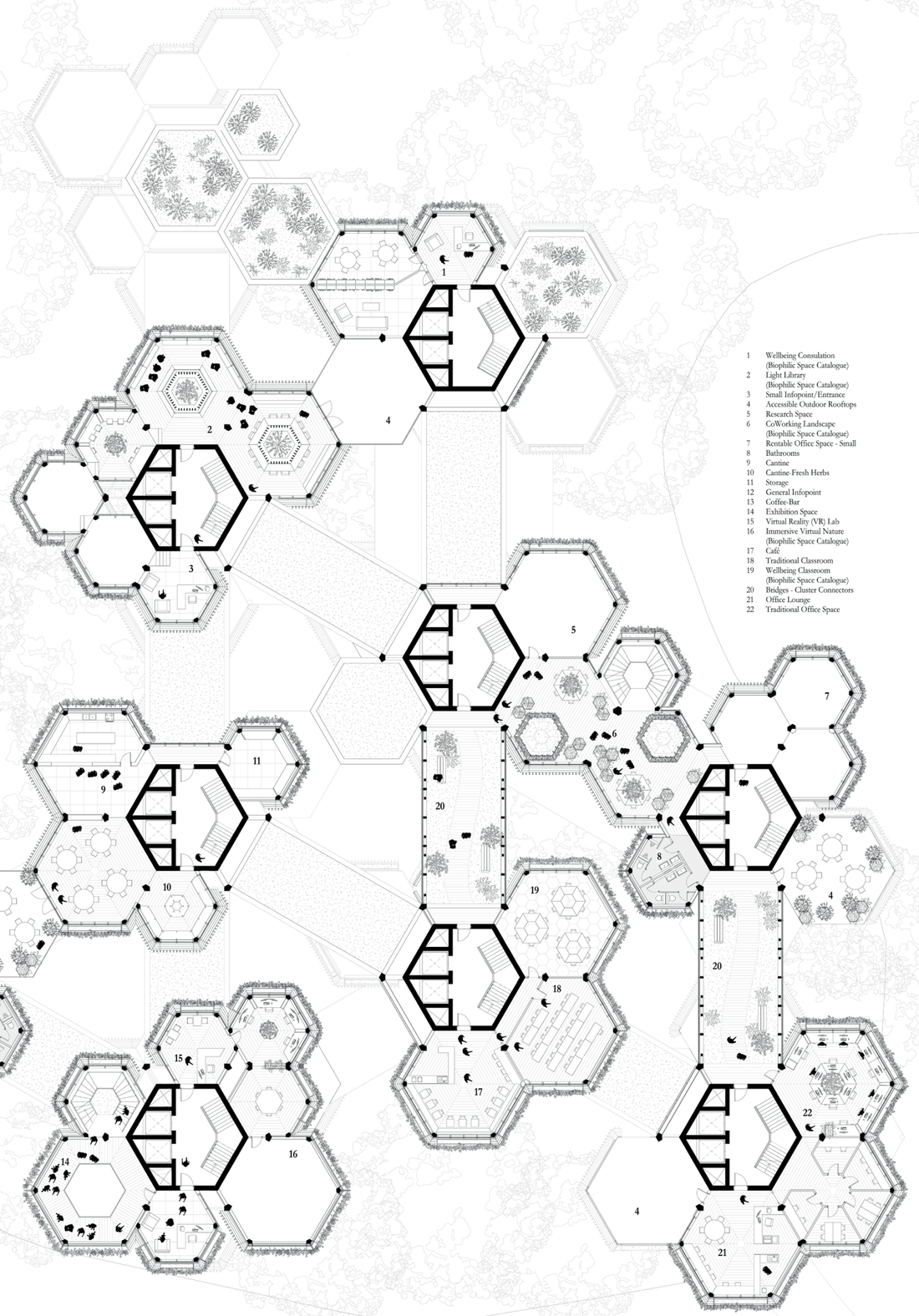
– EXTERIOR VIEW FROM KOEKAMP –



- GROUND FLOOR PLAN -



- TYPICAL FLOOR PLAN / 9th LEVEL -



1 Wellbeing Consulation (Biophilic Space Catalogue)
2 Light Library (Biophilic Space Catalogue)
3 Small Infopoint/Entrance
4 Accessible Outdoor Rooftops
5 Research Space
6 CoWorking Landscape (Biophilic Space Catalogue)
7 Rentable Office Space - Small
8 Bathrooms
9 Cantine
10 Cantine-Fresh Herbs
11 Storage
12 General Infopoint
13 Coffee-Bar
14 Exhibition Space
15 Virtual Reality (VR) Lab
16 Immersive Virtual Nature (Biophilic Space Catalogue)
17 Café
18 Traditional Classroom
19 Wellbeing Classroom (Biophilic Space Catalogue)
20 Bridges - Cluster Connectors
21 Office Lounge
22 Traditional Office Space

- Clustering the program, while creating
hybrid spaces where the public,
university and industry can meet,
exchange and collaborate

- Green Hybrid Typology,
Merging Architecture and Nature
in the verticality

- Activating the Park and making it
publicly accessible

- Implementing Biophilic Design Principles
into the given building brief
for a Vertical Campus

Final Design



Promoting Wellbeing



Cognitive Performance

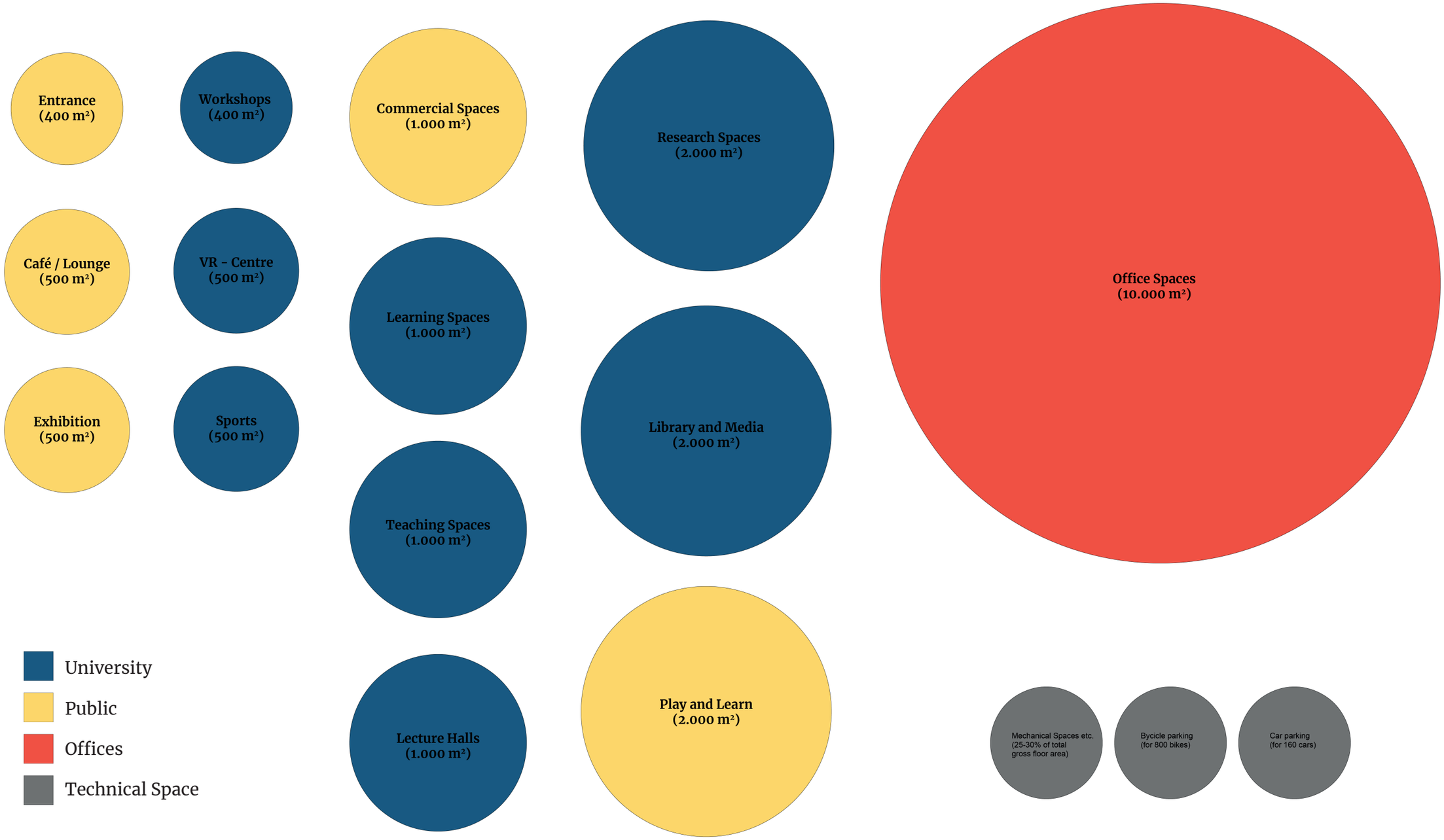


Green Hybrid | Merging City and Nature

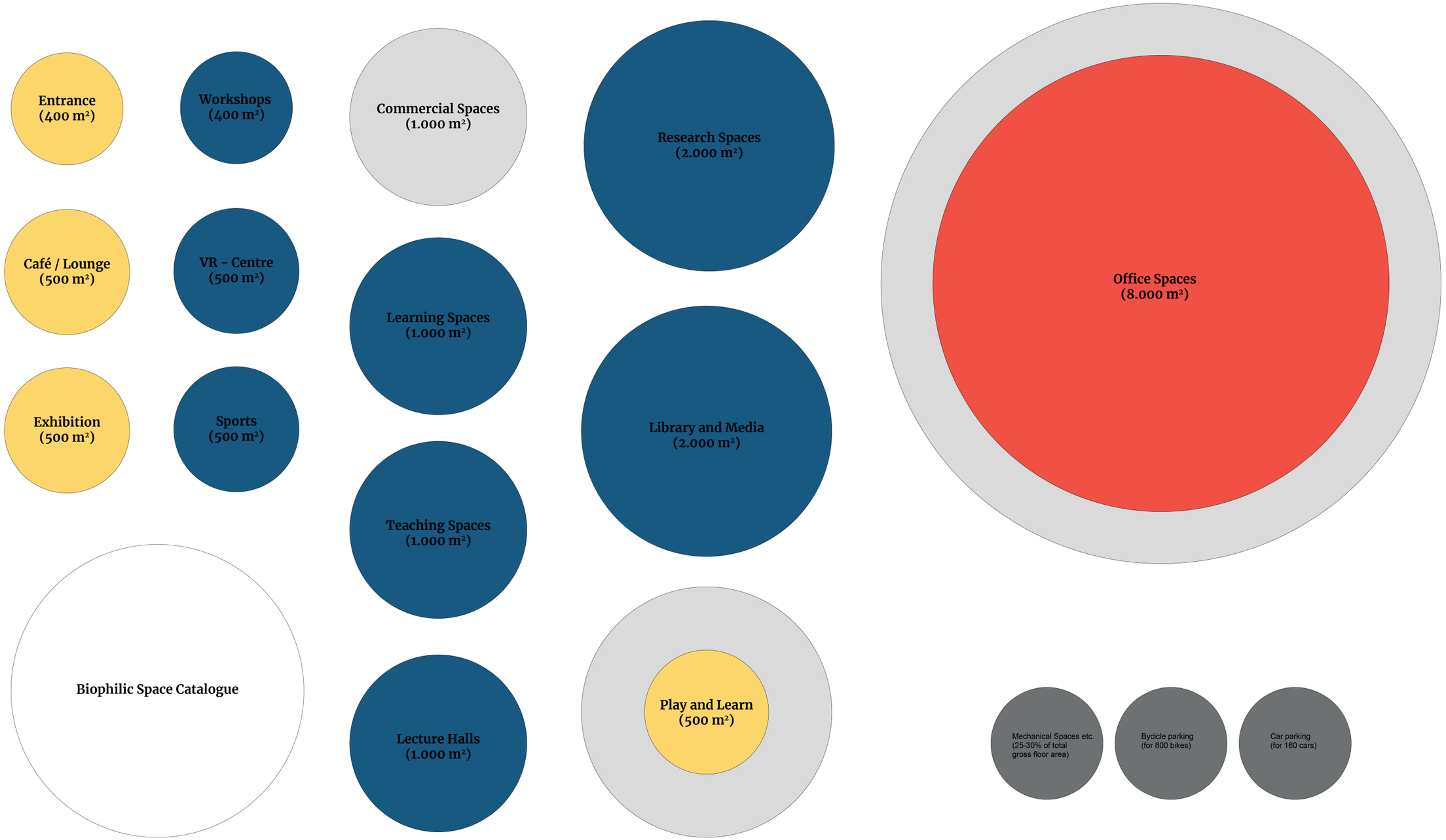


Climate Resilience

- Original Building Program -

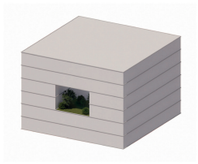


- Adapted Building Program -

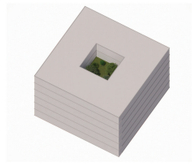


- Development of Biophilic Space Catalogue -

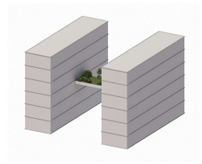
Catalogue - Collection of the 12 Green spaces



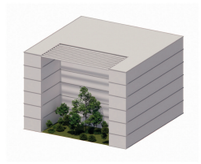
1. Loggia



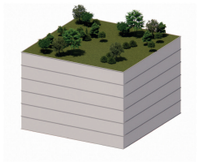
2. Patio



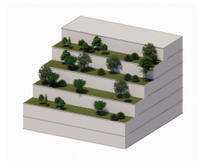
3. Bridge



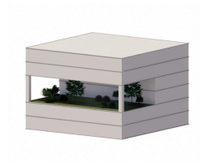
4. Atrium



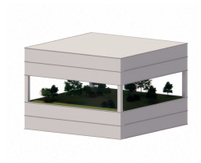
5. Rooftop



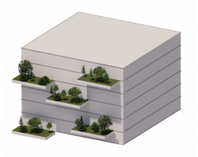
6. Terrace



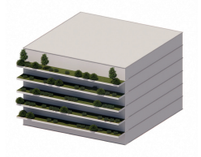
7. Half-Open Level



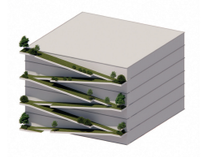
8. Open Level



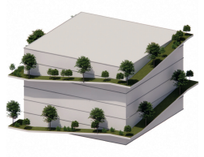
8. Balcony



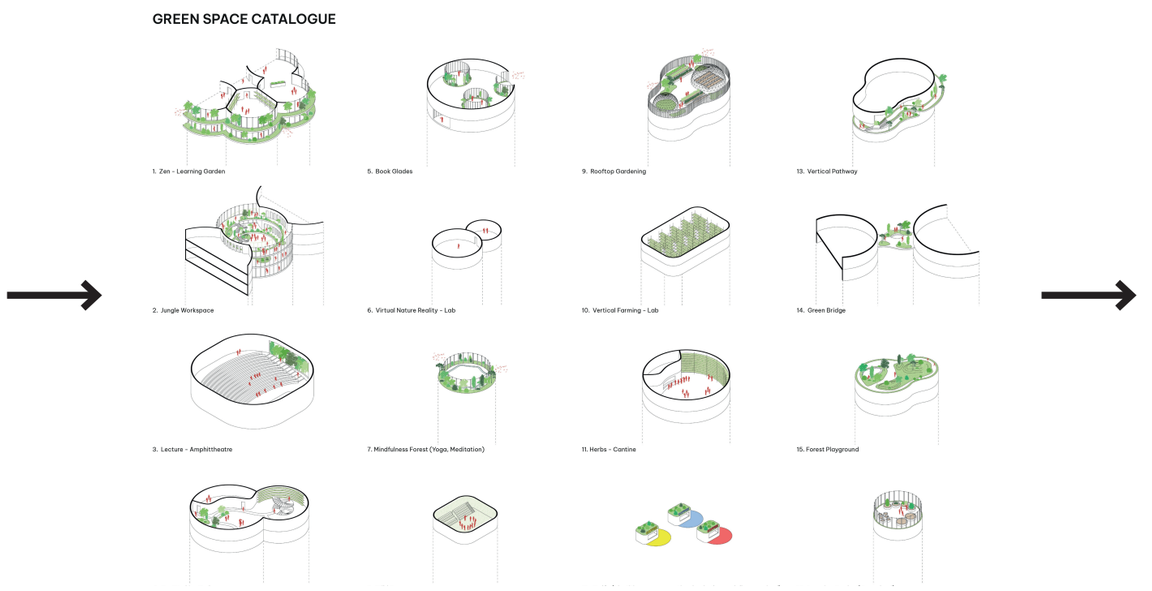
10. Colonnade / Arcade

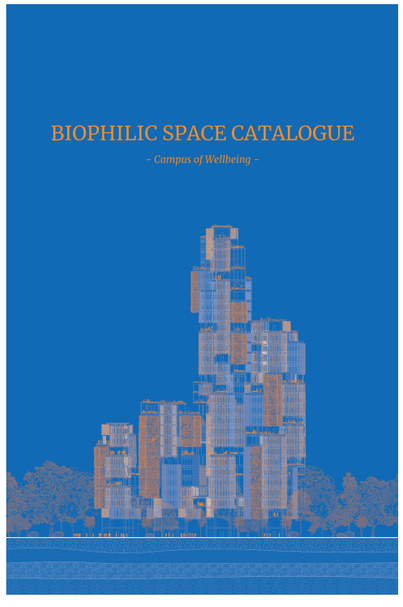


11. Outdoor Circulation (one side)



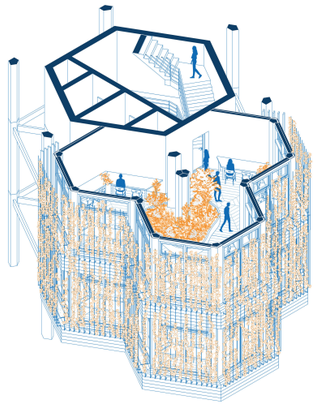
12. Outdoor Circulation (around)



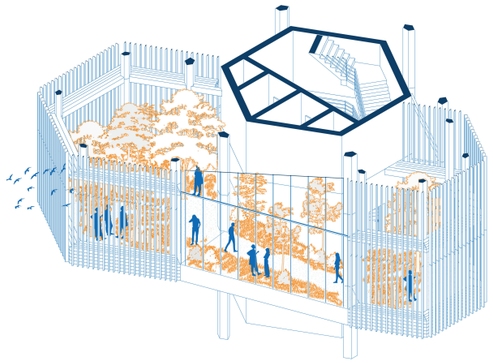


- Biophilic Space Catalogue | Overview -

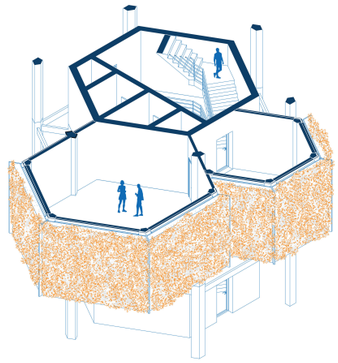
1. Learning Garden



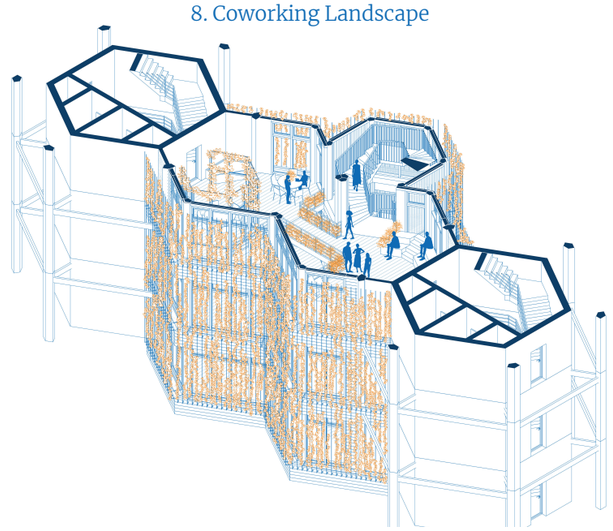
2. Study Forest



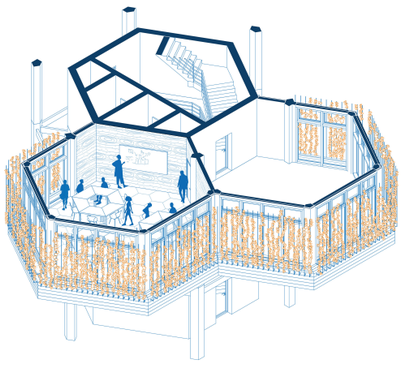
7. Immersive Nature (Virtual Reality)



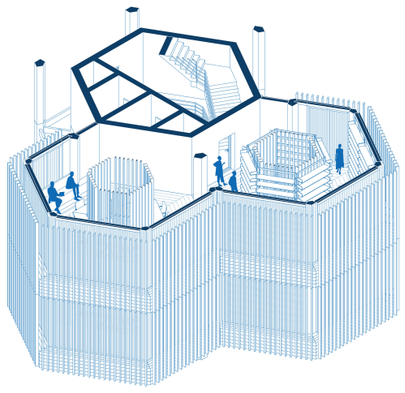
8. Coworking Landscape



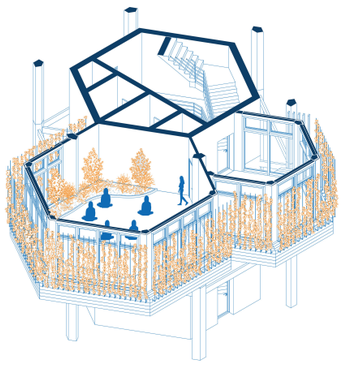
3. Biomimicry Classroom



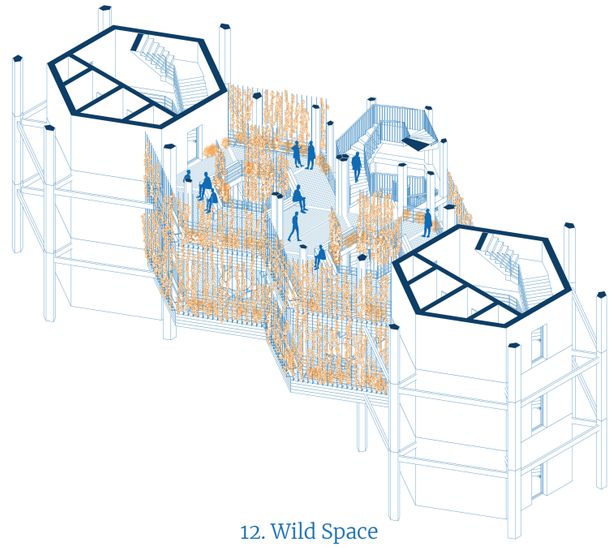
4. Light Library



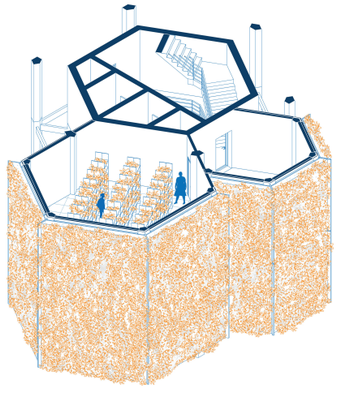
9. Mindfulness Garden -



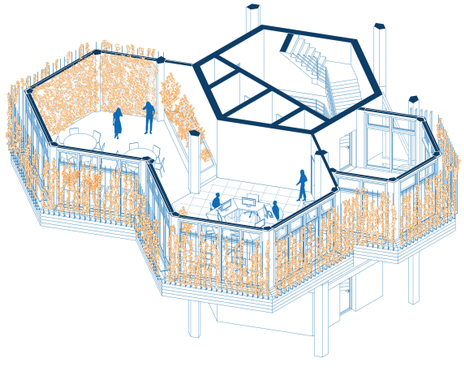
10. Vertical Park



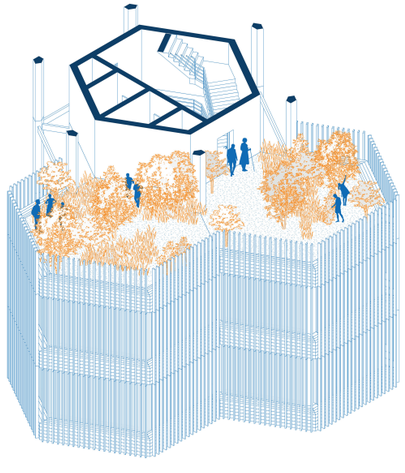
5. Vertical Farming -



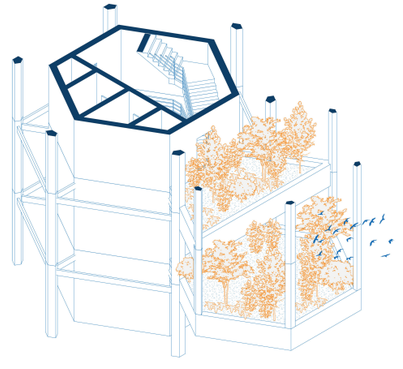
6. Biophilic Test Laboratory



11. Forest Playground



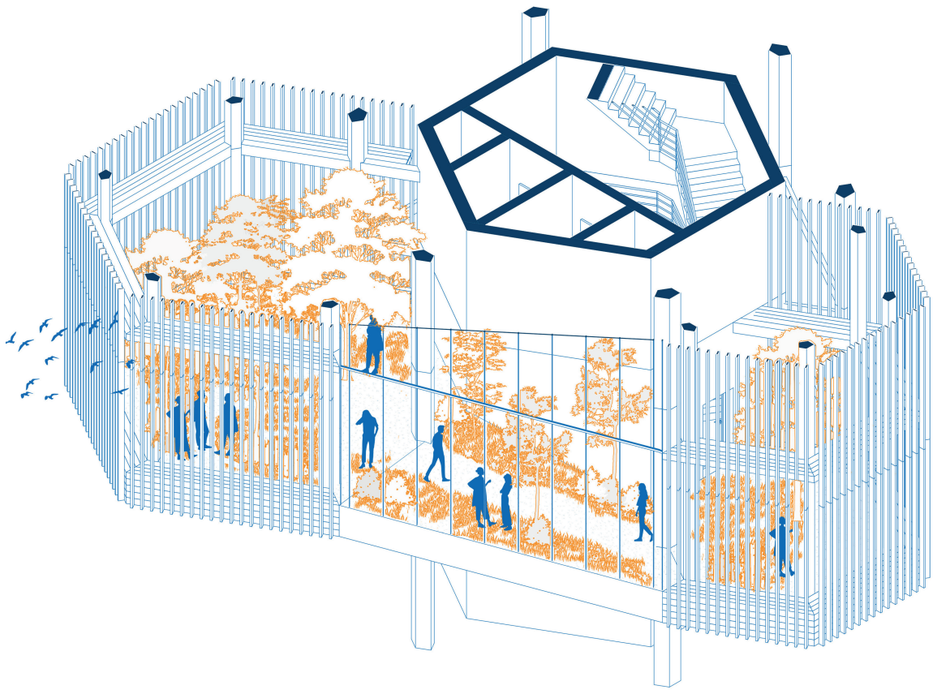
12. Wild Space



1. Biophilic Design Patterns

2. Benefits of Biophilic Design

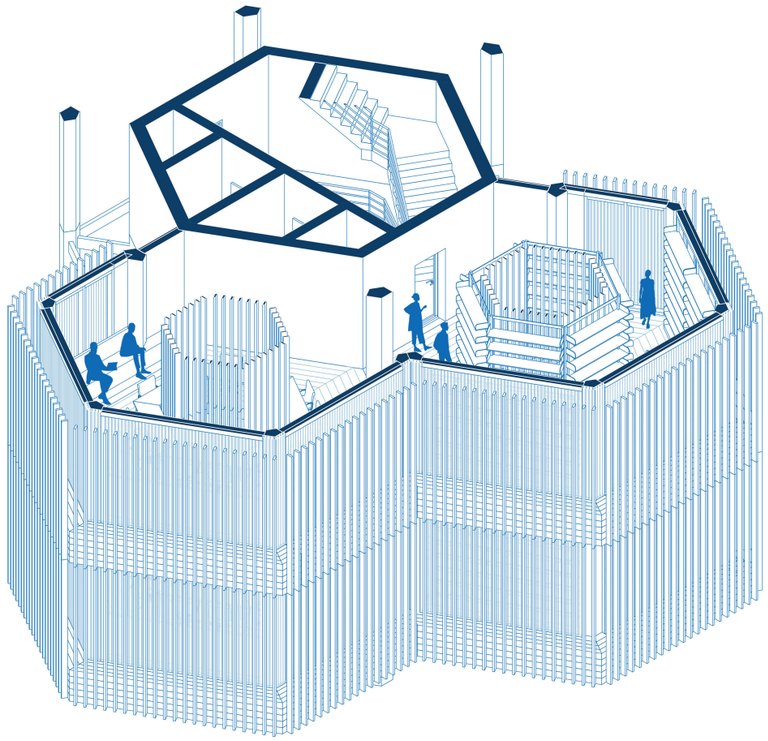
3. Space Characteristics



Name:	Study Forest
User Group:	Students
Function:	Self-study, Taking Breaks
Benefit(s):	Wellbeing, Creativity
Biophilic Design Patterns:	1. Incorporation: *Plants, Weather*

Space Characteristics:

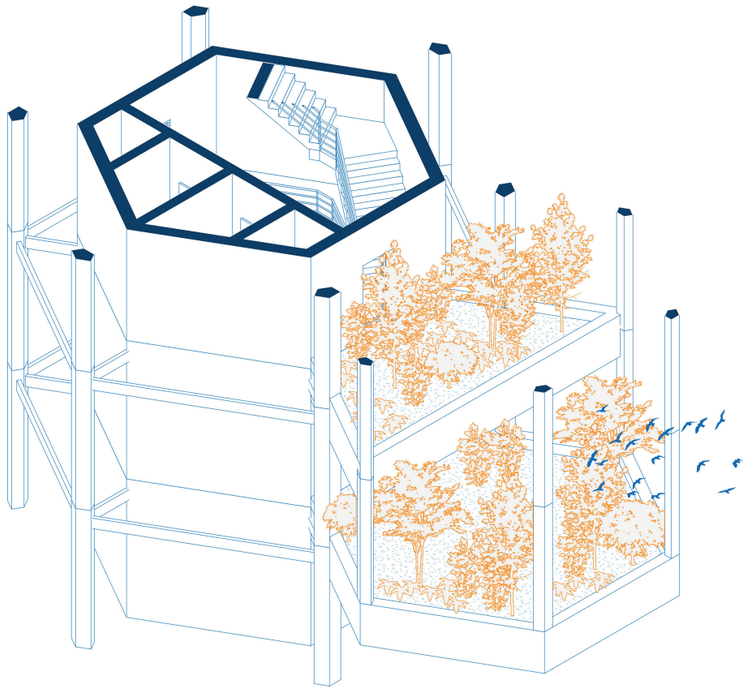
- Atmosphere:	Mixed - calm / busy
- Lighting:	South
- In-/Outdoor:	Outdoor
- Organization:	Mixed - order / wild
- Plant size:	Grasses, flowers, shrubs, small trees
- Materiality:	Soil (incl. grasses) or clay - natural flooring
- Facade:	Open



Name:	Light Library
User Group:	University, Office
Function:	Learning, Self-study
Benefit(s):	Cognitive Performance
Biophilic Design Patterns:	1. Incorporation: *Daylight (various)*

Space Characteristics:

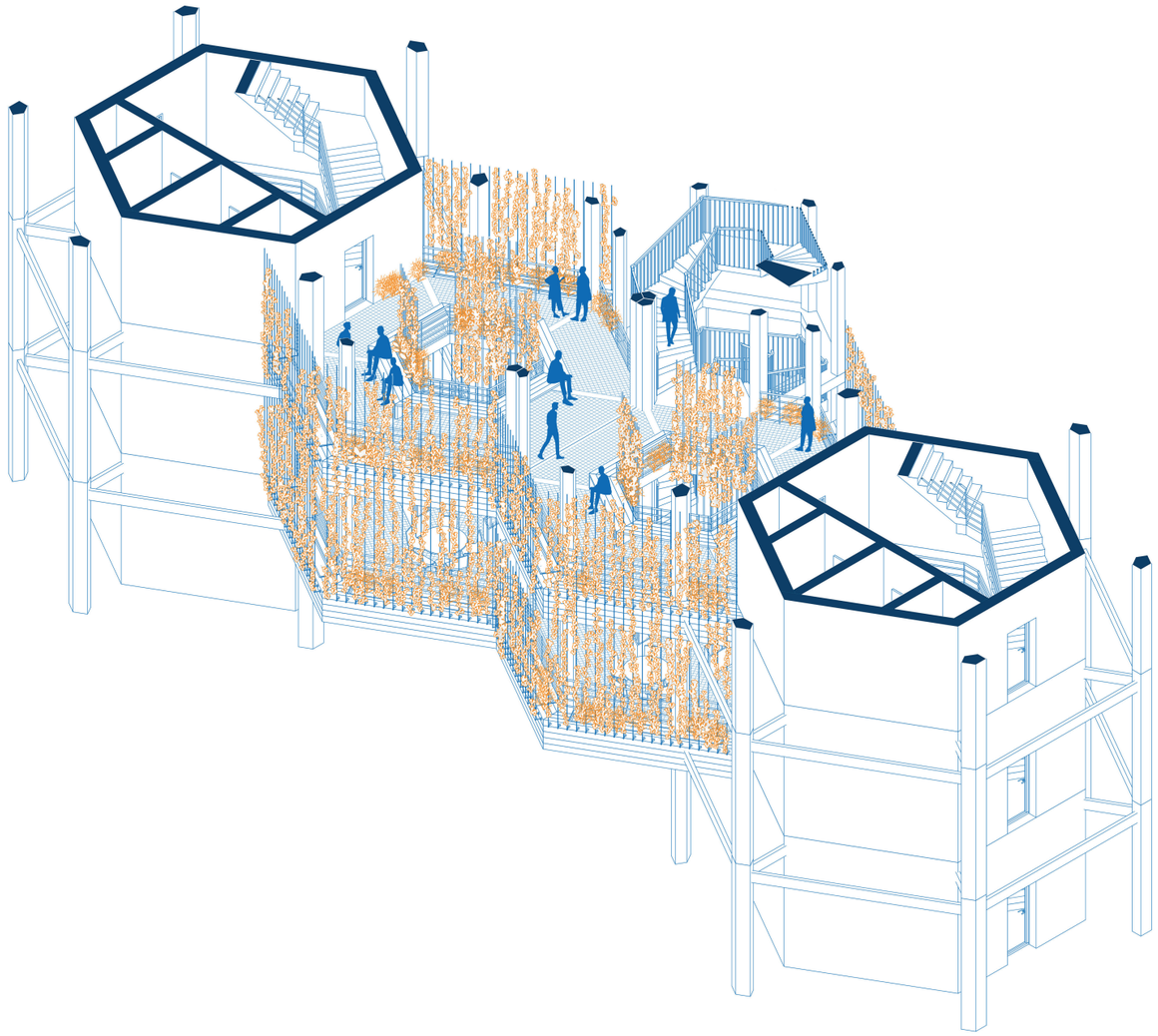
- Atmosphere:	Focused
- Lighting:	West / East
- In-/Outdoor:	Indoor
- Organization:	Order
- Plant size:	-
- Materiality:	Polycarbonat walls, skylights, timber flooring
- Facade:	Translucent



Name:	Wild Space
User Group:	Vegetation / Animals
Function:	Space for non-human organisms
Benefit(s):	Environmental Awareness
Biophilic Design Patterns:	1. Incorporation: *Plants, Animals*

Space Characteristics:

- Atmosphere:	Calm
- Lighting:	South
- In-/Outdoor:	Outdoor
- Organization:	Wild
- Plant size:	Grasses, flowers, shrubs, small trees
- Materiality:	-
- Facade:	Open



Name:	Vertical Park
User Group:	Public
Function:	Meeting, Exchange
Benefit(s):	Wellbeing
Biophilic Design Patterns:	3. Interaction: *Connection to Place*

Space Characteristics:

- Atmosphere:	Busy, Energetic
- Lighting:	South
- In-/Outdoor:	Outdoor
- Organization:	Order
- Plant size:	Climbing plants
- Materiality:	Mesh steel flooring, Permeable
- Facade:	Open

Sun Movement

Urban Movement

Clash of Form and Typology
(Artifical and Natural Lines)

Sensitive Environment
(Living Organisms, Trees, Plants,)

Low Building Footprint

Mixed-Used Building Program
(Clusters that are overlapping)

Merging city and park

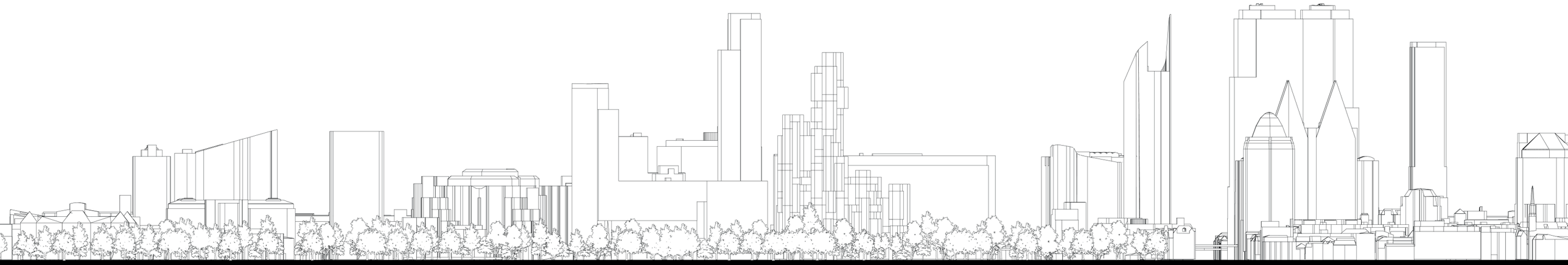
- Site Plan -



- Urban Elevation | View to Koekamp -



- Urban Elevation | View to the Central Station -





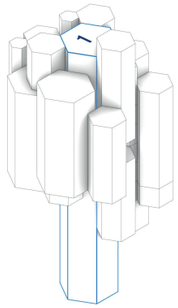
Public

Offices

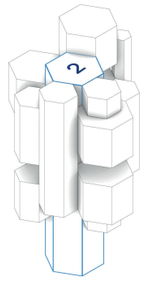
University

University / Office

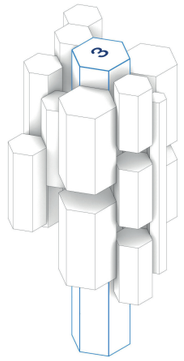
- Building Program | Clusters -



1. Public
- Entrance, Cantine, Lounge, Café)



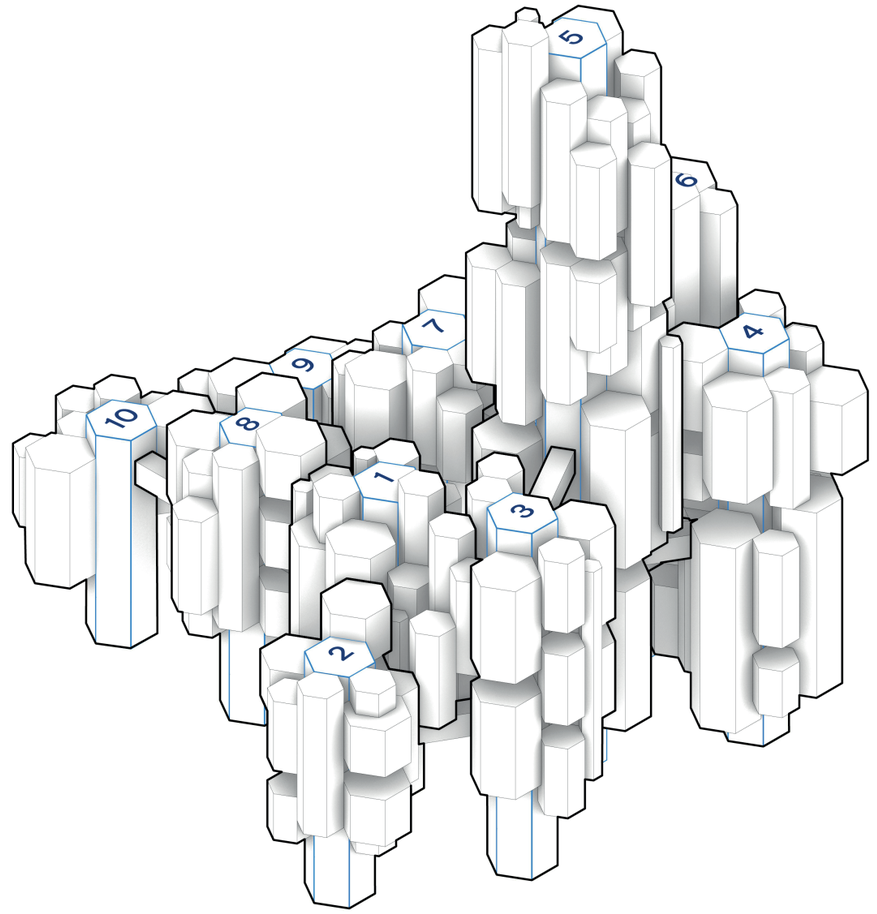
2. Public
- Infopoint, Meeting Spaces

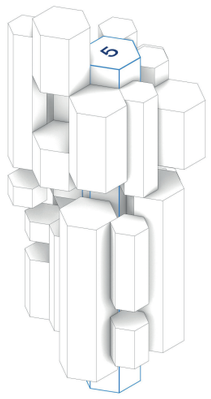


3. Public / University
- Exhibition, Virtual Reality

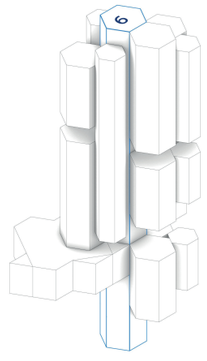


4. University
- Learning Spaces, Classrooms Research, CoWorking, Lecture hall

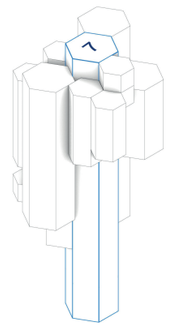




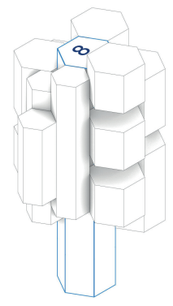
5. Research
- Research spaces, CoWorking, Workshops



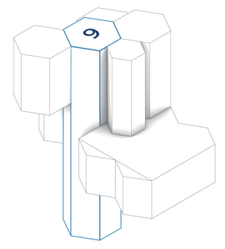
6. Office
- Traditional offices, CoWorking, Lecture hall



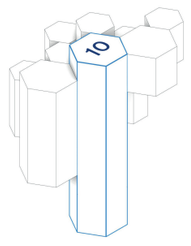
7. Office
- Traditional offices, CoWorking



8. Media / Library



9. Activities
- Sports, Arts

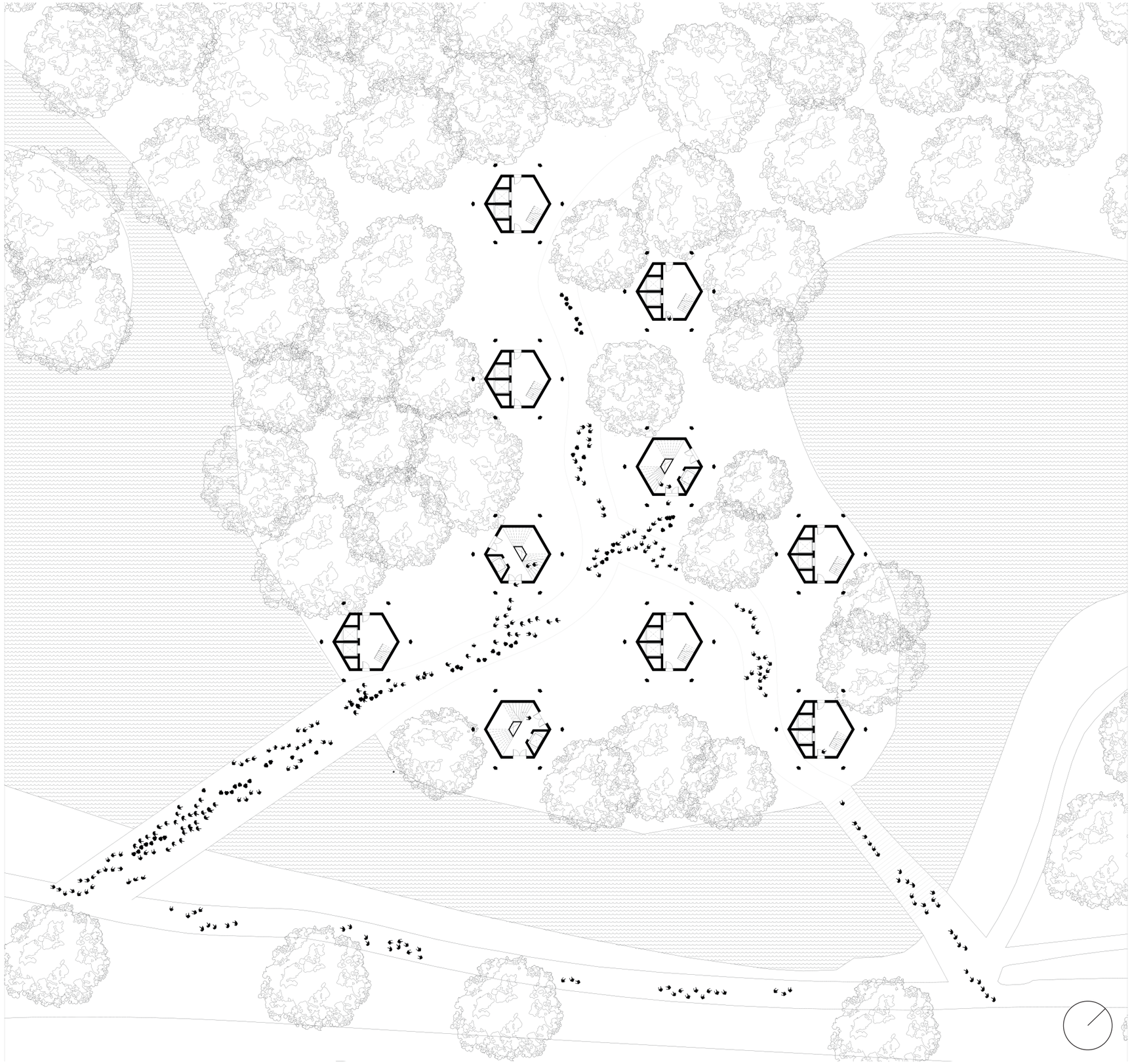


10. Wellbeing
- Consultation, Yoga, Mental Health

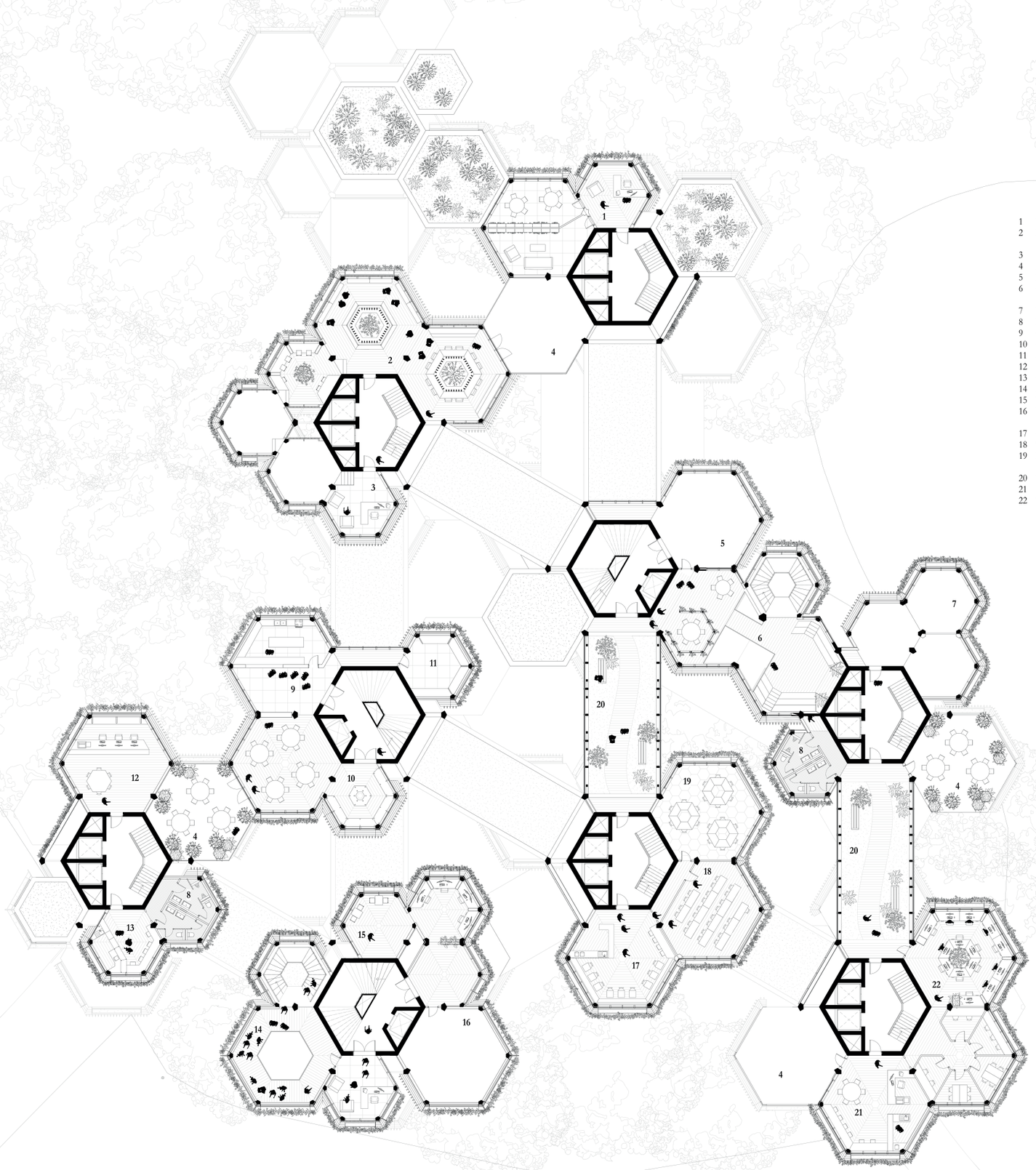
- Exterior View -



- Ground Floor Plan -



- Typical Floor Plan / 9th Level -

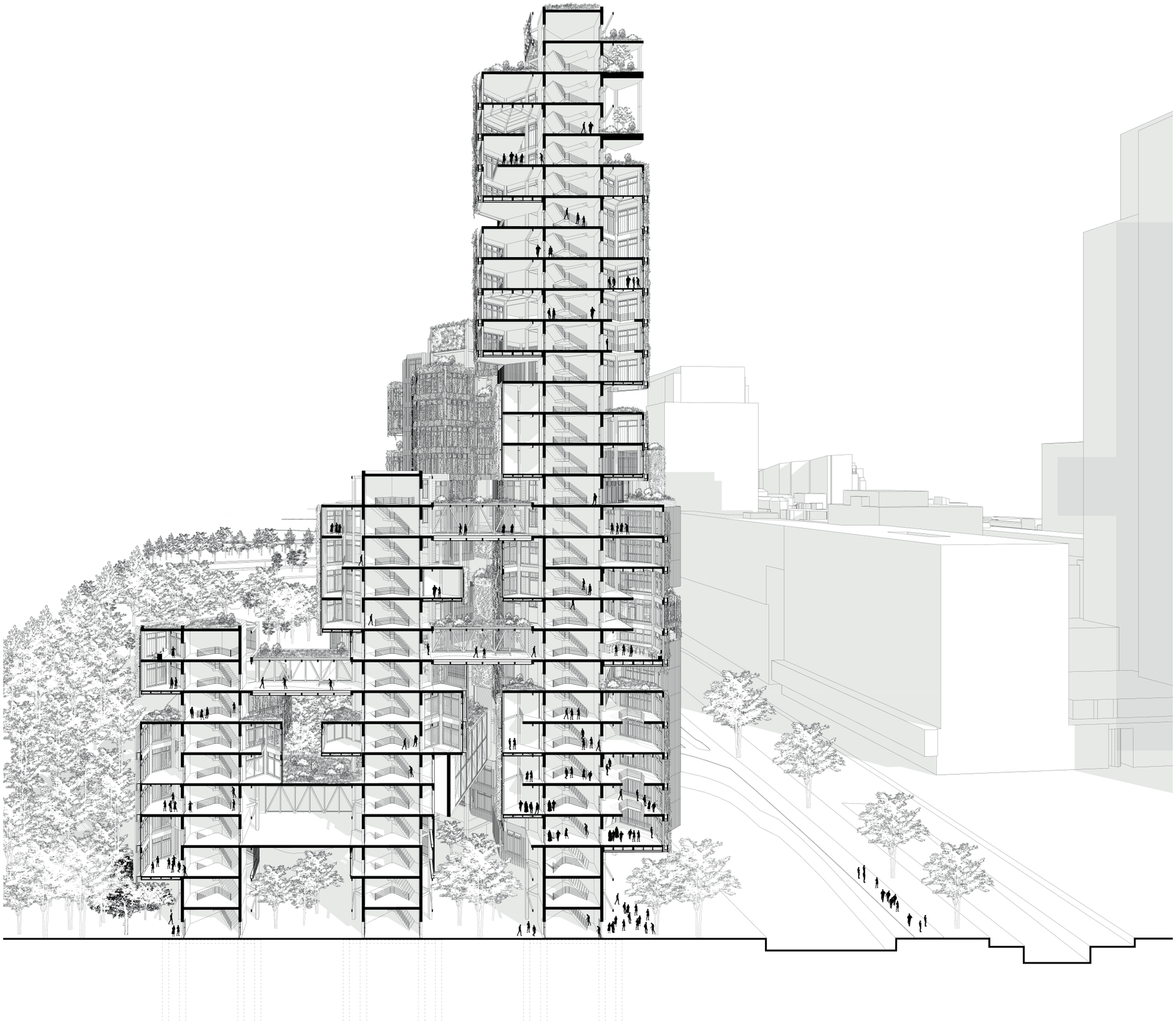


1 Wellbeing Consulation
2 Light Library
(Biophilic Space Catalogue)
3 Small Infopoint/Entrance
4 Accessible Outdoor Rooftops
5 Research Space
6 CoWorking Landscape
(Biophilic Space Catalogue)
7 Rentable Office Space - Small
8 Bathrooms
9 Cantine
10 Cantine-Fresh Herbs
11 Storage
12 General Infopoint
13 Coffee-Bar
14 Exhibition Space
15 Virtual Reality (VR) Lab
16 Immersive Virtual Nature
(Biophilic Space Catalogue)
17 Café
18 Traditional Classroom
19 Biomimicry Classroom
(Biophilic Space Catalogue)
20 Bridges - Cluster Connectors
21 Office Lounge
22 Traditional Office Space

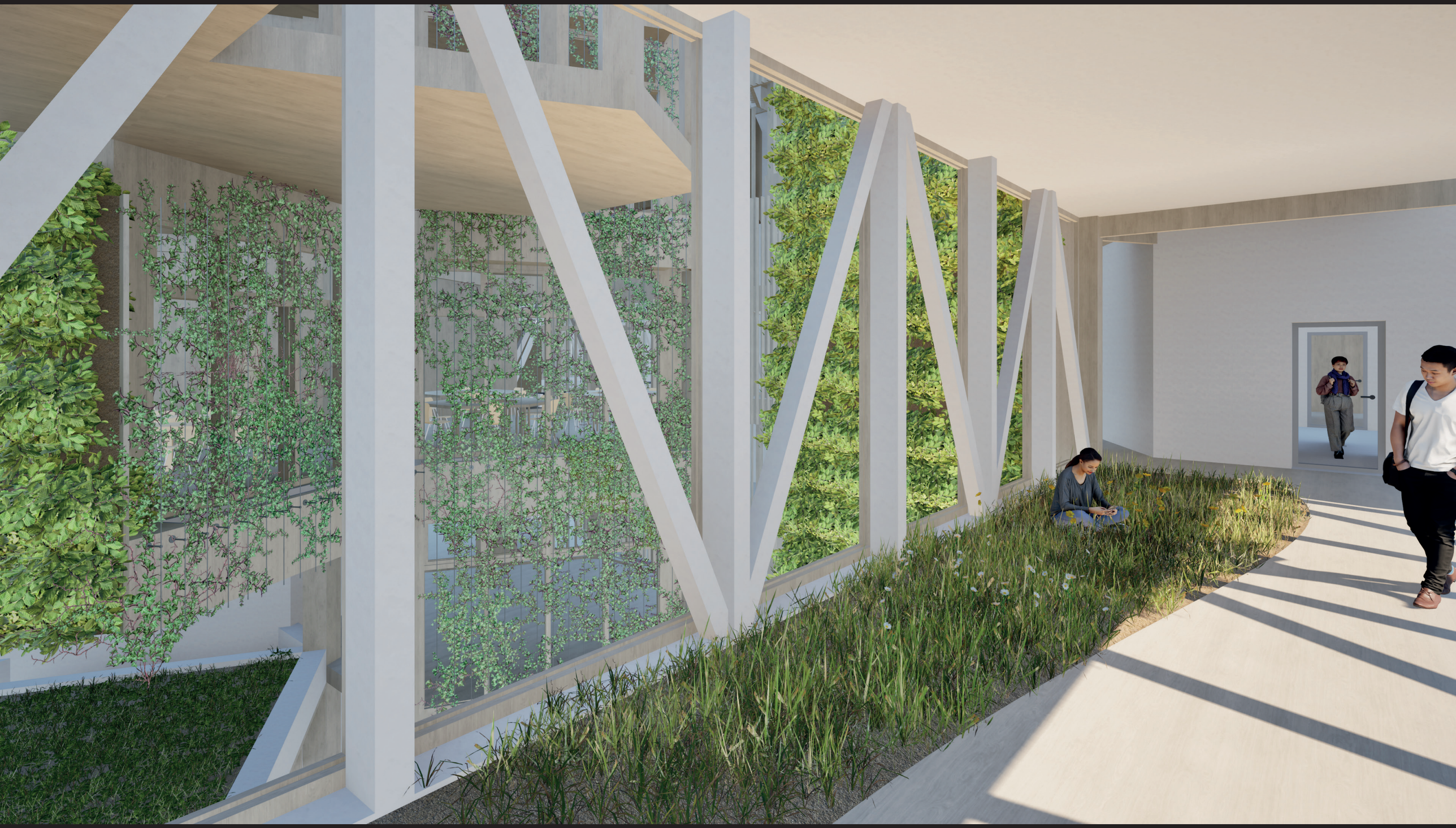
- Café and Meeting Space -



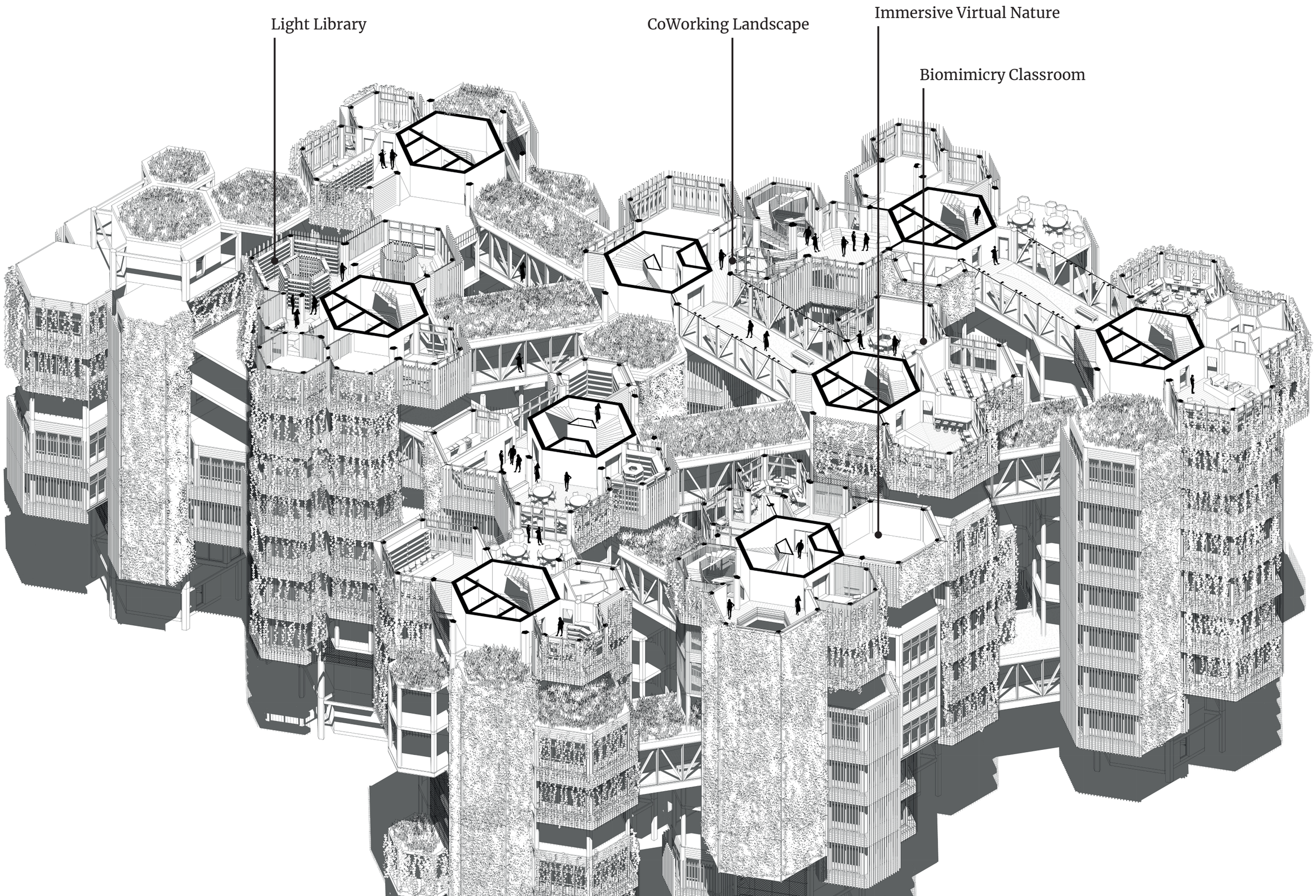
- Perspective Section -



- Interior Bridge -



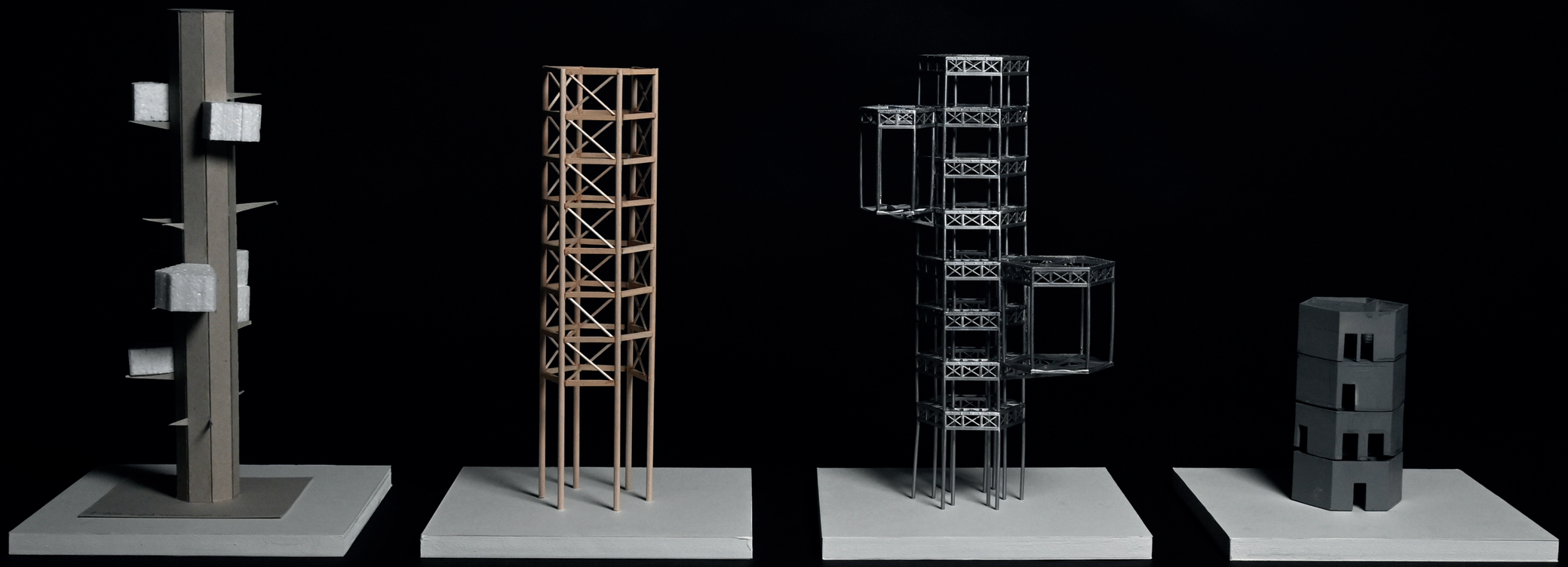
- Implementation of Green Space Catalogue / 9th Level -



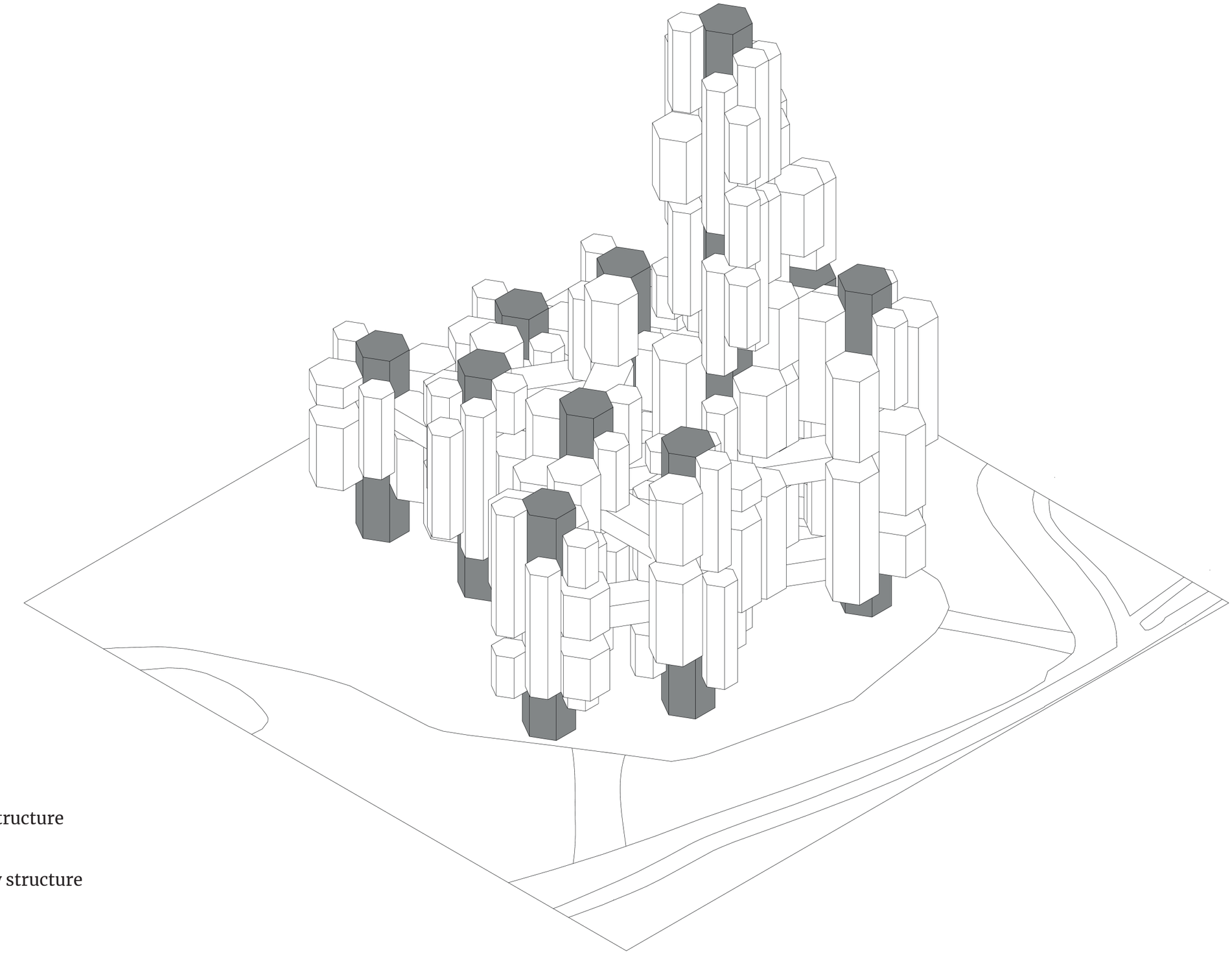
- Light Library -



- Structural Development -

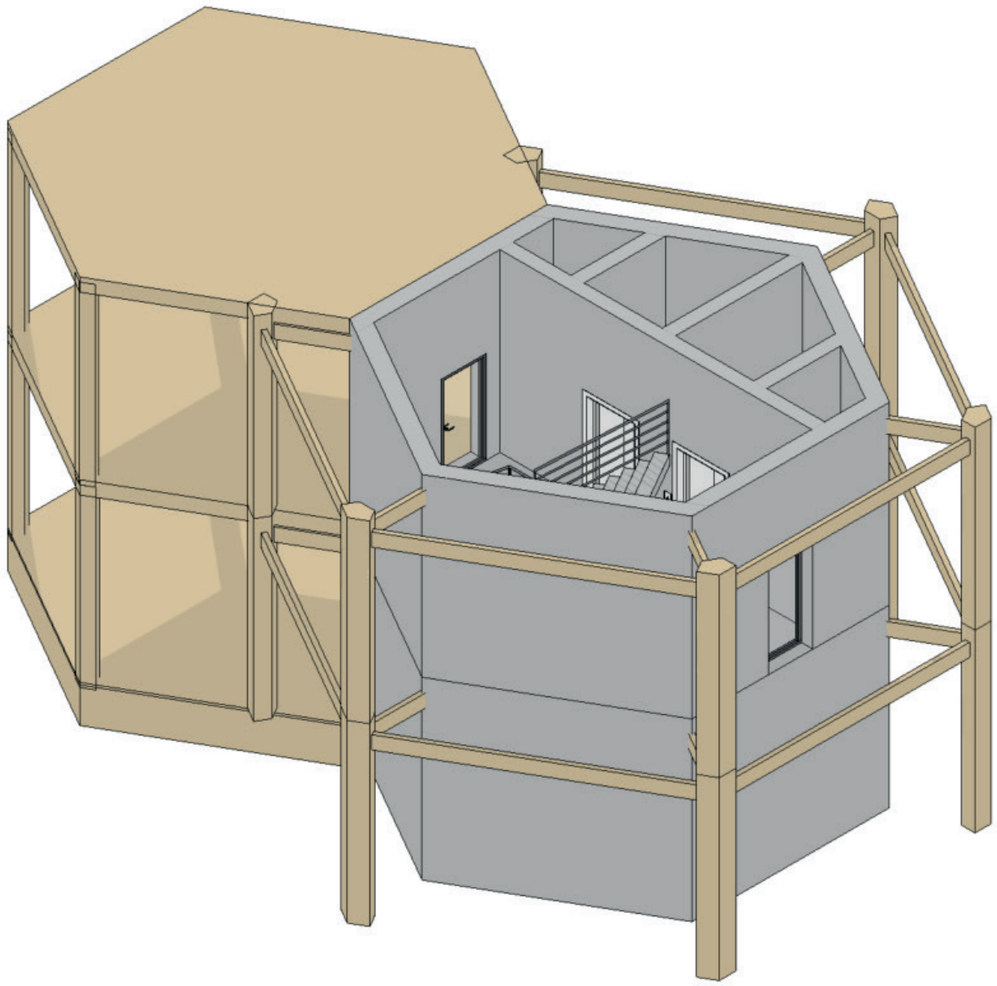


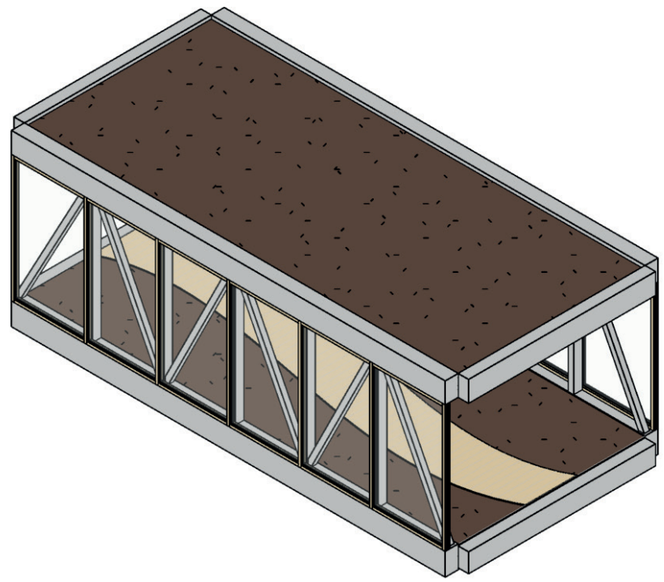
- Structural Hierarchy -



Primary structure

Secondary structure





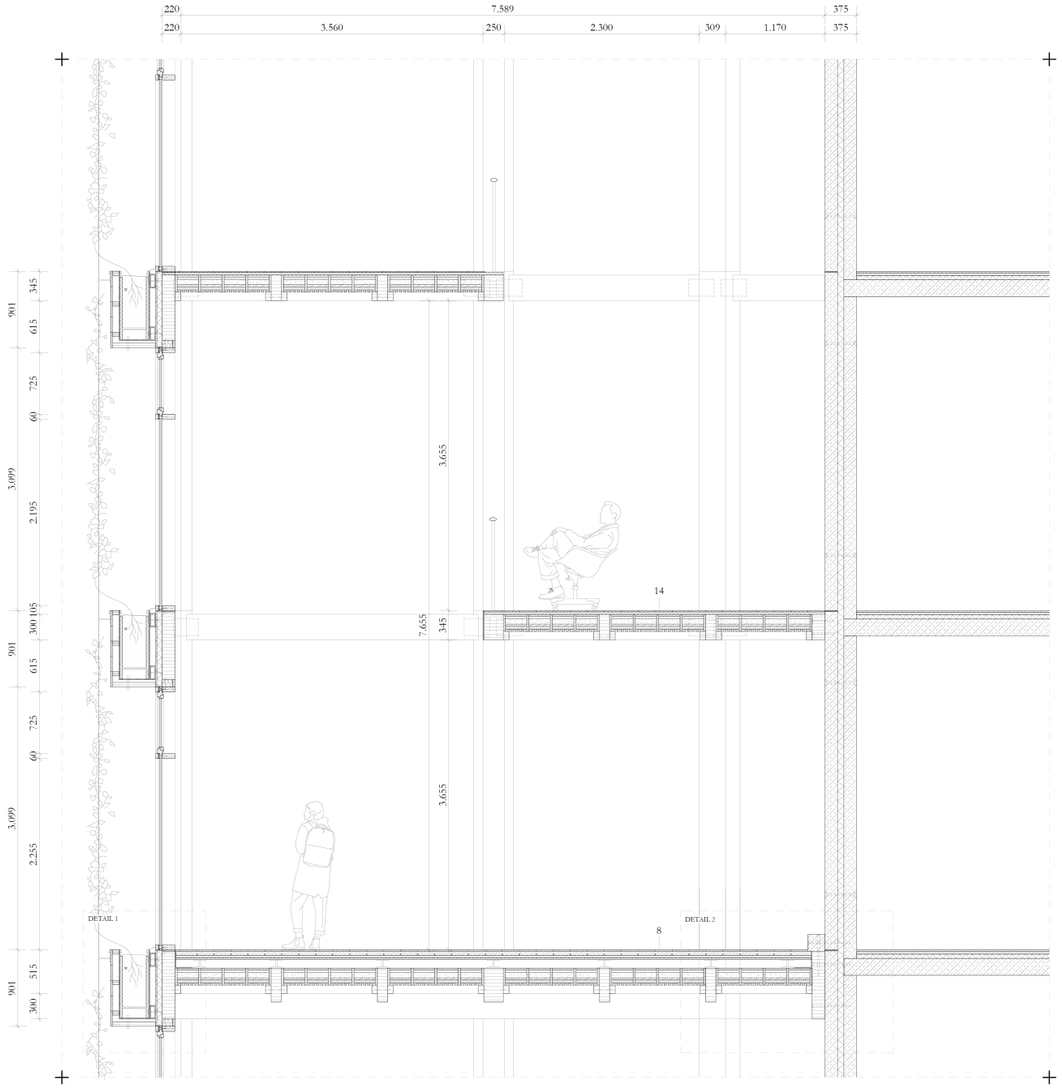
- Overall Structure -



- Facade Fragment 1:20 -



ELEVATION / 1:20



FACADE CROSS SECTION / 1:20

LEGEND

1 Summergreen Ivy vegetation
- species south side (sun): Ampelopsis aconitifolia
- species north side (shadow): Clematis lanuginosa

2 Green Facade:
- substrate
- 5 mm fleece
- 100 mm gravel
- 10 mm sheet steel trough (planter box)

3 Ø 20/5 mm steel pipe

4 Ø 25 mm irrigation hose

5 Steel rope clamps / 4 mm steel rope

6 60/230 mm Timber facade with triple glazing

7 800/150 mm Glued-laminated timber (GLT) beam

8 Loadbearing floor:
- 15 mm parquet
- 50 mm heating screed
- 30 mm impact soundproofing
- 18 mm formwork element
- 102 mm installation space

9 Lignatur - Geometry surface elements (LFE):
- 65 mm thermal insulation filling
- room acoustics (sound absorption)

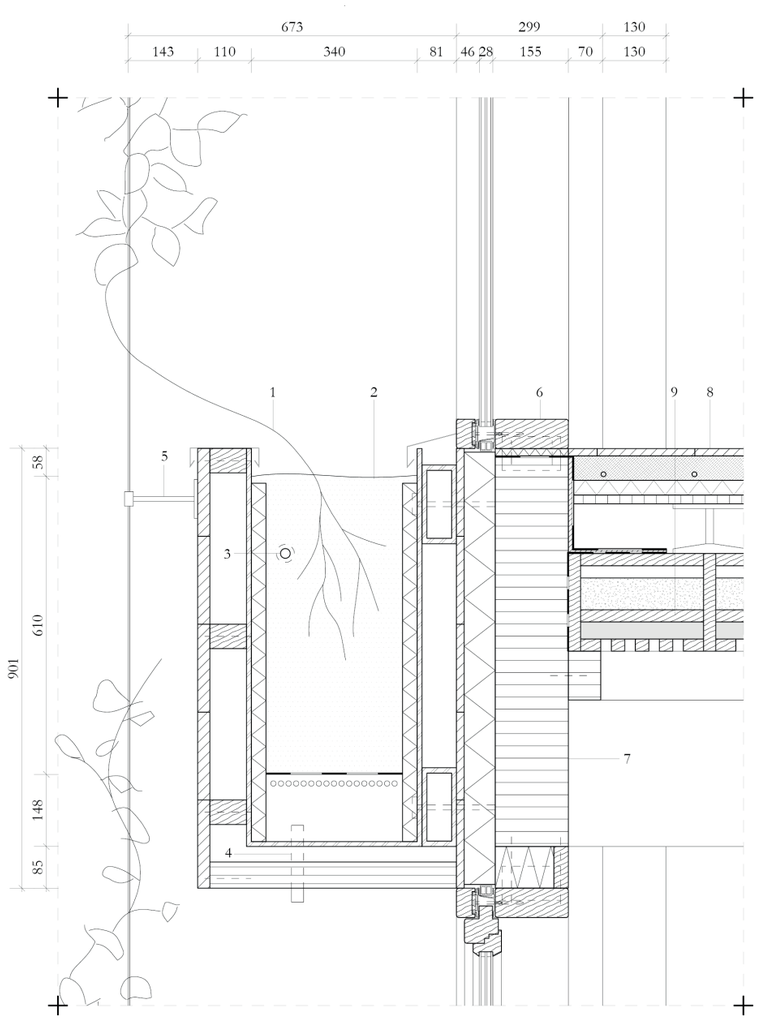
10 375 mm Core wall (sandwich construction):
- 150 mm prefabricated reinforced concrete elements (2x)
- 75 mm thermal insulation (hempwool)
- bolt connection

11 300 mm Core floor:
- 20 mm screed
- Polyethylene (PE) foils
- 30 mm impact soundproofing
- 50 mm thermal insulation
- 200 mm reinforced concrete

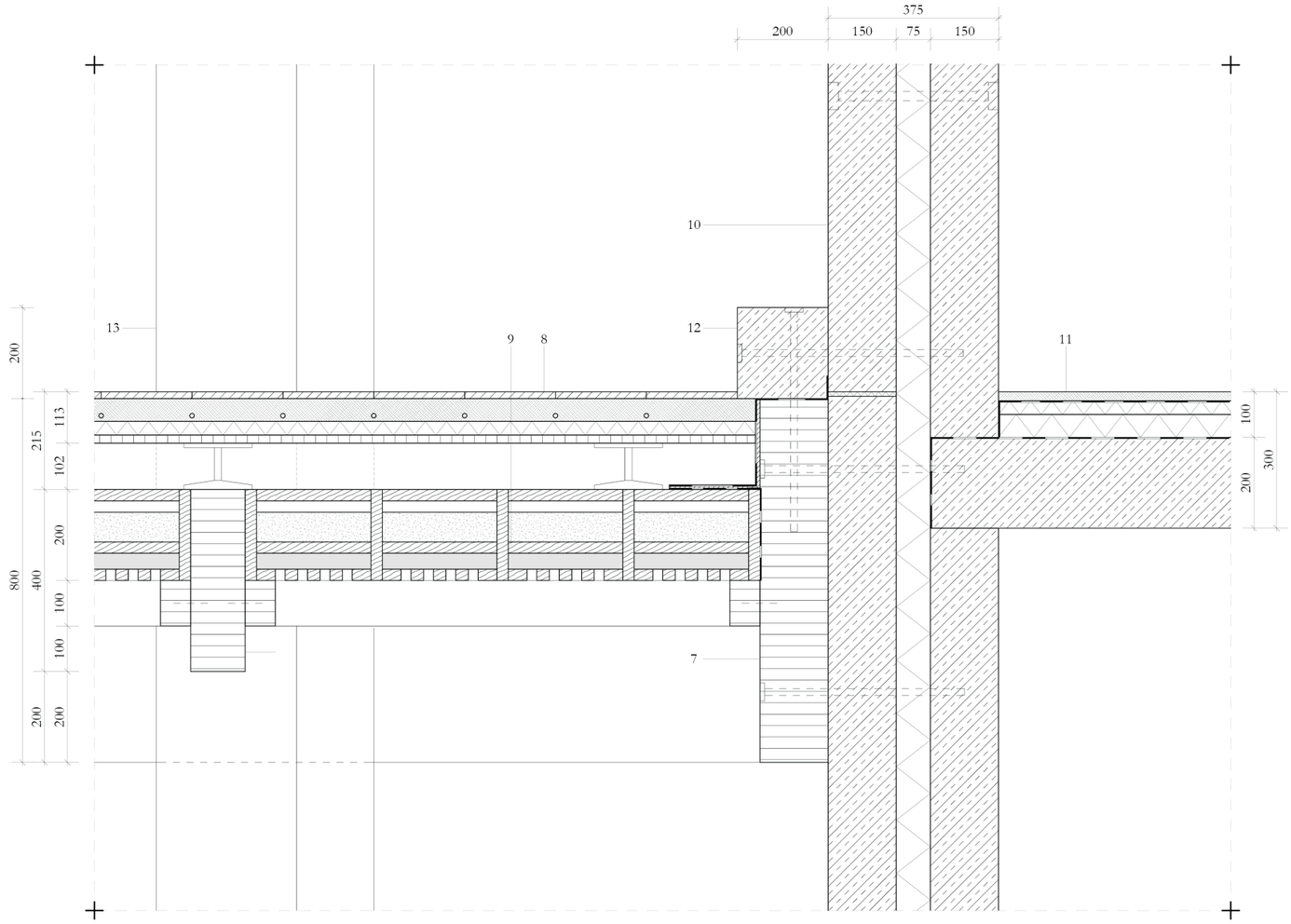
12 200/200 mm reinforced concrete element
(needed for cantilevering)

13 350/350 mm Glued-laminated timber (GLT) column
(supports the cantelevering beams)

14 In-between flexible floors

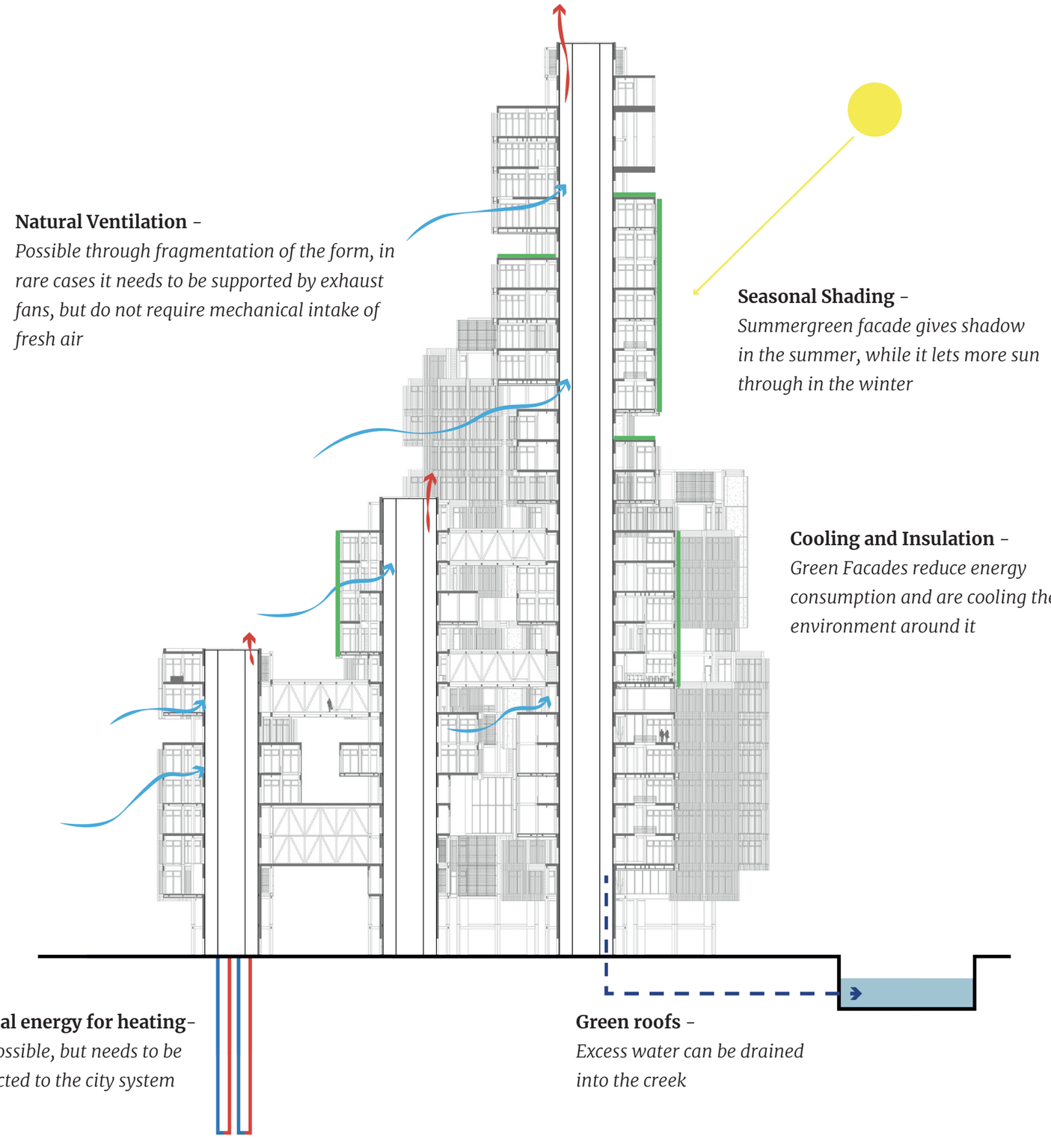


DETAIL 1 - GREEN FACADE / 1:5



DETAIL 2 - CONNECTION OF CORE AND FRAGMENT / 1:5

- Passive Climate Concept -



Natural Ventilation -
Possible through fragmentation of the form, in rare cases it needs to be supported by exhaust fans, but do not require mechanical intake of fresh air

Seasonal Shading -
Summergreen facade gives shadow in the summer, while it lets more sun through in the winter

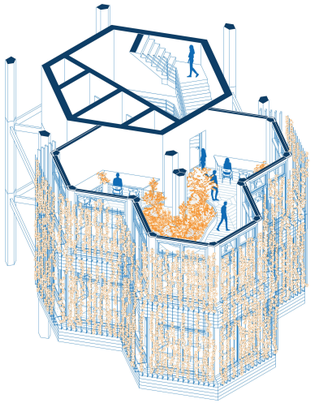
Cooling and Insulation -
Green Facades reduce energy consumption and are cooling the urban environment around it

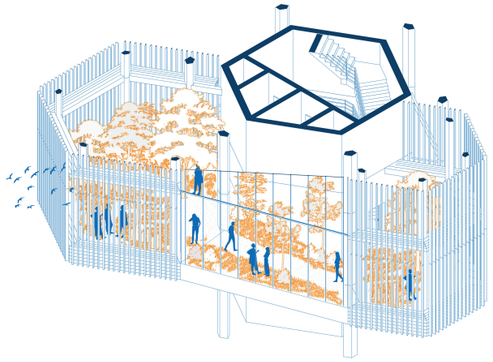
Geothermal energy for heating-
Partially possible, but needs to be also connected to the city system

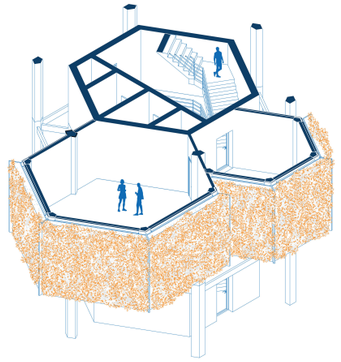
Green roofs -
Excess water can be drained into the creek

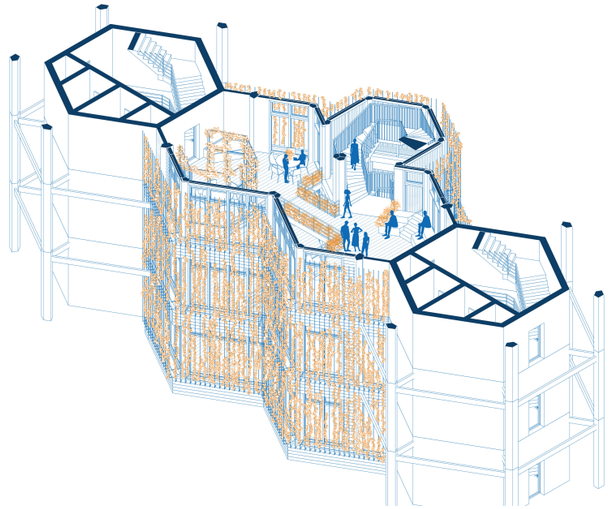
- South / East Elevation -

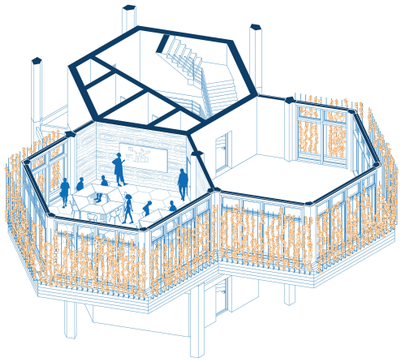


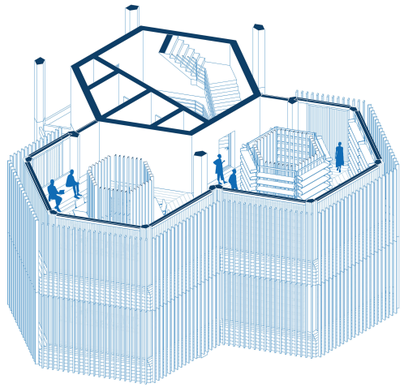


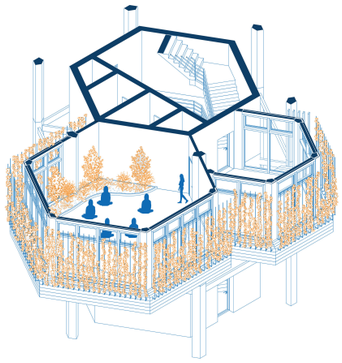


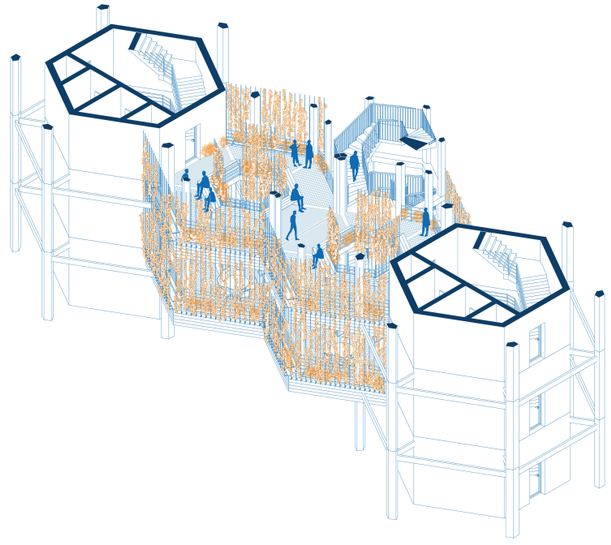


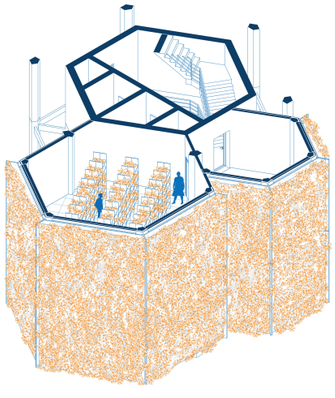


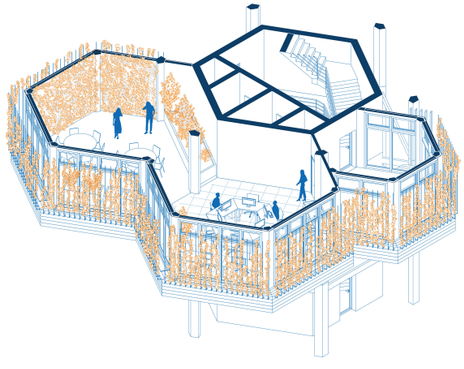


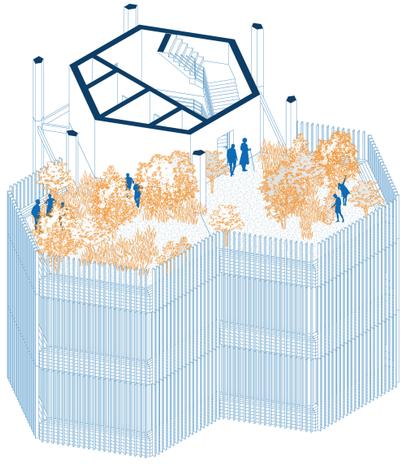


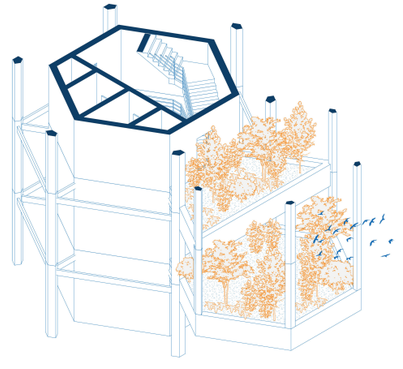












Final Reflection

P4 Reflection

Student: Laetitia Devi Augustyniak (5852293)
Theme: Public Building Graduation Studio 2023-24 /
The Vertical Campus: A public hub of the future in the Hague
Title: Campus of Wellbeing: The Biophilic Knowledge Hub

1st Mentor: dr. Stefano Corbo
2nd Mentor: ir. Florian Eckardt
3rd Mentor: dr. Sang Lee
Delegate: ir. Christian van Ees

1. *What is the relation between your graduation project topic, your master track (A, U, BT, LA, MBE), and your master programme (MSc AUBS)?*

Architecture is an interdisciplinary profession consisting of art, technology, philosophy, natural sciences, engineering, and sociology. It operates on various scales, in terms of size and user numbers, and concerns every human, particularly those who live in dense cities. In contemporary societies, people spend most of their lifetime inside buildings. Moreover, architecture requires a lot of common goods such as materials and financial resources, and also, an architect always designs for others. Hence, they have great responsibility for how these finite resources are spent, especially when designing a public building. They need to be spaces that serve a diverse user group, coming from different backgrounds. This requires openness, inclusivity, and the need to offer space that benefits this variety of users and the society where this public building is located.

The Public Building Graduation Studio topic to design 'The Vertical Campus: A public hub of the future in the Hague' already consists of the aspect of mix-use and programmatic hybridity. It aims to connect and be inclusive to different user groups by proposing a campus that not just includes higher education, but also offices and public program. Based on this, my research is adding to the studio assignment by investigating how space can be designed with biophilic design principles to support the wellbeing of its users inside, and the urban fabric outside on an architectural level. Additionally, by choosing a building site on the edge of the park in the Hague (the 'Koekamp' in front of the Hague's central station), with my graduation project, I wanted to challenge to not just design a building, but a green hybrid, a typology that merges architecture and nature to blur their boundaries and dissolve this urban 'Green Border'.

2. *How did your research influence your design/recommendations and how did the design/recommendations influence your research?*

The research for my design was divided into two aspects: Literature research and the method 'Research by Design', the general approach of the Public Building Graduation Studio.

In the beginning of the design process, the literature research gave me the needed theoretical framework and foundation to assess the relevance of my initial ideas and settle them into a broader academic and societal context. I've found a variety of research on the three components that my topic consists of:

1. The current state of mental health of students in higher education especially during and after the COVID-19 pandemic,
2. Studies that investigated how nature can promote human's wellbeing, and
3. How the implementation of biophilic design in general can benefit the urban fabric in regards of biodiversity or heat stress.

Thus, the literature research laid the foundation for my overall design goal to focus on wellbeing in correlation to biophilic design, when approaching the assignment of the Vertical Campus.

Simultaneously, I was following the studio's method of 'Research by Design'. Since this method unites research and design, and doesn't divide it into two successive steps, it enabled the possibility of integrating these both aspects because research and design were constantly influencing each other.

For example, during the process I was researching the aspect of how a typology would need to be physically expressed when building on a site like the 'Koekamp' park in the Hague. It had different requirements and constraints because of its location in a natural environment but still being in direct contact with the urban fabric of the city center.

Thus, when I began to approach the first conceptual massing ideas, I recognized that a linear method of starting with a site analysis and then going into the design process wouldn't work with this project. I noticed that my design options in the beginning weren't reacting to the site conditions and didn't fit. They were too compact and looked like conventional buildings that were imposed on a natural environment. It showed me that I needed to shift my research focus in that part on how to become more permeable with the design, and that I would need to design a project that goes beyond a building, a hybrid typology that merges nature and architecture. These insights then influenced my design approach in the following massing studies, which eventually led to the final design.

Even though my overall focus on wellbeing and biophilic design always stayed as my guiding principles, research and design were constantly and mutually influencing each other when creating this project.

3. *How do you assess the value of your way of working (your approach, your used methods, used methodology)?*

The chosen methodology of combining literature research and 'Research by Design' created the possibility to tackle the complexity of the general studio assignment of a Vertical Campus in the Hague and my research on how biophilic design could promote mental health and wellbeing in a vertical structure on various layers. The literature research gave the theoretical foundation and the method of 'Research by Design' enabled the possibility to investigate how these ideas could be translated into actual space and architecture. Finally, this methodology allowed me to achieve a result that aligned with my overall project goals.

When approaching the structural configuration of the project, I started by setting guidelines that were aligned with my overall design objectives. These were developed from the building program, theoretical research and chosen building site, and consistently evaluated and adapted during the

movement of users, sun path, the environmental constraints of the site such as the vegetation, topography and location of the creek, and its location of being in direct contact with the urban fabric in the center of the Hague. These considerations resulted in guidelines such as taking the position of the existing trees into account, having a low building-footprint, to design a building which would react to the various axes the building site offers compared to a rectangular street layout and especially the goal to merge city and nature.

Furthermore, I was developing a systematic approach on the architectural level based on the requirements of the mixed-used building program consisting of public, university, and offices, linked to my research on biophilic design in correlation with wellbeing. This led to the design of a 'Biophilic Space Catalogue' that reinterprets the given design brief and proposes specific spaces that aim to enhance the wellbeing of the students and users based on biophilic design principles. Furthermore, taking the diversity of the building program into account influenced the design of programmatic clusters which are then partially overlapping and connected to create hybrid spaces. These give opportunities for different user groups such as the public and university to exchange and meet.

In general, this approach of defining certain objectives or guidelines during the process, from urban, architectural to technical scale, has contributed to systematize decisions and create an understandable framework.

4. *How do you assess the academic and societal value, scope, and implication of your graduation project, including ethical aspects?*

As I stated in my Graduation Plan, many students in the Netherlands experience mental health issues, which prevents them of reaching their actual academic potential (RIVM 2022). Furthermore, individual health is a foundation for a functioning society. Besides that, due to the reason that the urban populations are globally growing, and the United Nations' prediction is that by 2050 about 68% will live in cities (United Nations 2018), there is the question on how urban densification can be done and planned not just horizontally, but in particular vertical. One of the challenges hereby is on how this can be achieved without decreasing the quality of life in cities, health of humans and in general ecosystems, animals, and vegetation in correlation to climate change.

Thus, with my graduation project 'Campus of Wellbeing: A Biophilic Knowledge Hub', I'm contributing to two overarching themes: (Mental) Wellbeing in higher education and urban densification in the vertical dimension. Thus, it's adding to the question of how a Vertical Campus can be nature-inclusive by benefiting its users and environment without decreasing the quality and amount of horizontal green spaces. It's also contributing to the architectural profession by proposing spatial solutions on how urban fabric and green spaces could be merged in verticality. Additionally, this project shows another possibility on how the public can be directly included into a (Vertical) Campus.

5. *How do you assess the value of the transferability of your project results?*

While the actual physical articulation of my design of the 'Campus of Wellbeing' can't be from The Hague, there are overarching ideas, concepts, and a way of thinking that can be extracted from my graduation project which could be transferred and adapted to other projects.

In terms of 'way of thinking', one of the transferable results I gained was how I can approach a project differently. The idea is to perceive challenges and the choice of constraints as a driver for not immediately obvious architectural solutions. In this case, it started for me with recognizing the social tension, when proposing ideas of building in the park and the strong response to protect the public green areas. This topic became a focal point in my group's P1 presentation and the questions we received regarding our urban proposal to merge city and park. Even though I did and do understand the perspective and worries regarding that topic, it led me to question why it seems to be common ground and a widely agreed opinion, and by challenging that, how we can get to unexpected results.

Besides that, I can transfer the general knowledge that I've gained through the research on architectural references, the theory of the concept of biophilic design and its correlation to wellbeing, and the variety of design options on an architectural, structural, and technical level.

6. *Debate around biophilic design, the use of greenery in architecture and 'Green Washing'*

One of the aspects that my tutors challenged me to reconsider constantly during the different phases of the project was to critically question the concept and articulation of biophilic design and the relationship between architecture and nature. It shifted my attention to the possible issues of using greenery in architecture, when it's just used as a marketing strategy to let a building look more appealing by adding plants and trees, hence 'Green Washing'. Because due to the raising awareness of climate change and the effects on cities such as heat stress and a high number of sealed surfaces which can cause water management issues, biophilic design and adding greenery became a kind of trend in architecture.

The discussions with my tutors and these considerations led me to focus and delve deeper into reading various research papers of studies that are aiming to scientifically prove that certain biophilic design principles can enhance for example wellbeing, academic performance or even creativity. However, some research papers were also stating that even though there seems to be evidence that nature and biophilic design can improve wellbeing, there is still the need for more research and studies on that topic (Zhong et al. 2022).

7. *General conclusion*

The Graduation Project was a process to reconsider what I have learned during all of my architectural education. It was an opportunity to recognize certain design dogmas, concepts, values, and patterns that I had established during the recent years of my studies. They were valuable knowledge during the process of learning and take an important place in the architectural knowledge that I have right now. However, when I was starting with the graduation project, I realized during the process a drive and wish to challenge myself to develop ideas that I couldn't think of and imagine in the beginning and to go beyond my current capabilities because I was aware that there are always more possibilities.

Finally, I can see in the result that I was able to go beyond what I could've imagined at the start of my graduation project. In this context, I'm grateful for my tutors because it was only through their support, discussions, input, feedback, and questions that constantly challenged me to look further into the various design aspects and topics, so that I was able to develop this graduation project.

8. *References*

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