Complexity & order

Interpreting patterns in the transformation of the former Munch museum

Master thesis

Tine Kierulf
University of Liechtenstein

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Student: Tine Kierulf

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Supervisors: Dr. Lindsay Howe | Dipl.-Ing. Dr. techn. Carmen Rist-Stadelmann

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Abstract:

What are the main elements of this thesis?

This thesis project is an attempt at transforming an existing building through the use of biophilic design patterns. Biophilia is defined as human kinds innate connection with nature, and the hypothesis is that using patterns of biophilia within design we can create spaces that humans will enjoy inhabiting due to their positive associations with nature.

To carry out the design task, an existing building was chosen as the case. The building is the former Munch museum in Oslo, which is now abandoned. The site has a central location, and the two closest neighbours are the botanical garden in the west, and Tøyen park with a public bath in the east. Working with biophilic design patterns and their connection with nature, it made sense to propose the site and building as an extension of the botanical garden and its events. This is a realistic proposal as the topic has already been discussed politically. The main stance of the case is to focus on biodiversity and create an extension of the botanical garden that focuses on local endangered and endemic plant species.

With this context the design question became: Can the former Munch museum be transformed into a public meeting space that revitalizes the borough of Tøyen, designed with the use of biophilic design patterns?

The work continued with interpreting and translating the biophilic patterns into architectural tools. Models were used in the process to experiment with light and shadow. The Final proposal breathes life back into the building through material gestures of natural materials and complex structures, curves and atmospheres. The site is also remade to connect the surrounding area and give the local residents a revitalized, sustainable neighborhood.

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Introduction:

What is the project about?

Environmental psychology has become a popular discussion and research topic over the past decade. Although it is a relatively new topic, discoveries are made fast. One of the more developed theories is biophilic design. It relies on the belief that humans are naturally drawn to nature, and therefore drawn to design that our brains can process as imitating or referencing nature or natural processes. When thinking about biological answers to design, it becomes tempting to ask the question: is there some form of universal truth about what kind of environments we as humans enjoy? There is no easy answer to that question, and it will not be attempted to find any universal truth in this thesis. However, this thesis is an experiment that slightly touches the topic. If one uses biophilic design patterns when designing, does that mean the outcome will have a positive effect on us biologically and lead to what can be described as "good design"?

To create some limitations and give the philosophical question a realistic starting point, an abandoned building was chosen as the case for this thesis. The building lies in Oslo, Norway, in a borough called Tøyen. The building, the former Munch museum, used to be one of the main points of attraction and now that it is abandoned the discussion is how to revitalize Tøyen as the vibrant part of the city it once was. With this context, the design question becomes:

Can the former Munch museum be transformed into a public meeting space that revitalizes the borough of Tøyen, designed with the use of biophilic design patterns?

The methods used for this thesis was developed in the preliminary study "Recognizing and identifying patterns". The topics of environmental psychology and biophilic design were researched, and boiled down to 14 patterns discovered throughout the study. These patterns have been used as design tools throughout this thesis project.
When working with an existing building it is important to analyse the context of its surroundings. Site analysis, and cultural considerations were important. Extensive site analysis was an important factor when deciding functions and layout of the building.

Models were used to work with atmosphere. Light and shadow is a very important ingredient in biophilic design, and became a vital part of the project. The book starts off with important research, and an introduction to the patterns. It then introduces the site with a following analysis. After the site the building is introduced with its relevant backstory. Following there will be a short walkthrough of methods used to execute this master thesis, and the final chapter consists of the design proposal. Following the proposal a short conclusion with final thoughts can be found.

The design question

Developing the design question:

What factors were considered when developing a clear design question?

The thesis project started out with a curiosity to whether or not one could use psychology when designing, as a sort of fool-proof guide. As the preliminary progressed and research was done it became quite clear that the topic of environmental design is both new, complicated and disputed amongst both architects and psychologists. Some theorise that we as humans could radically change the built environment for the better if psychological responses were considered as a fundamental part of every design project, with the main intention of influencing the human mind in a positive way. Others strongly disagree with this, mainly because upbringing, culture, past experiences and even individual taste makes it impossible to create a one-fits-all design guide. Further there exists plenty of both buildings, art projects and even furniture designed to influence the mind in many other ways than purely positive. This can be in a way that makes us think (political, philosophical etc), leaves us in awe or feeling small (religious buildings and political monuments) (Glenn, 2003), plays with our conception of reality (art, with James Turell's work as a good example) or even uncomfortable (art regarding for example climate change or other serious issues).

As the project progressed it became clear that to try and find something strictly positive was not desired. With both sides of the discussion in mind, the conclusion was that design is not just good/bad or positive/negative. Reaching this realization lead to a change of heart, and the goal became to create something that will be perceived as interesting, rather than purely positive.

A theory that encompasses this complexity quite well is biophilic design. It includes both positive and negative emotional triggers, and the goal is to create interesting environments with visual information humans enjoy processing. The main premiss of biophilic design is biophilia: humankind's innate biological connection with nature (Browning, Ryan, & Clancy, 2014). Most people can relate to the freeing feeling a hike in the mountains can provide. Or how a beautiful view of fields can make a house so much more desirable to live in. Scientifically biophilic design principles applied to buildings has been proven to reduce stress, improve cognitive function and creativity, improve our well-being and even expedite healing (Browning, Ryan, & Clancy, 2014). A deep dive-into biophilic design was done during the preliminary study, and the 14 design patterns of biophilic design were discovered. A sustainability consulting firm Terrapin Bright Green describes them quite well in an article posted on their website (Browning, Ryan, & Clancy, 2014). Finally the goal of the thesis project was defined: to design a building using the patterns of biophilic design as building blocks through the project. The challenge being interpreting and translating these patterns into physical spaces and materials.

With the design question clearly formulated, it was time to get into the architecture.

Introducing the patterns:

What are biophilic design patterns?

A theory that encompasses this complexity quite well is biophilic design. It includes both positive and negative emotional triggers, and the goal is to create interesting environments with visual information humans enjoy processing. The main premiss of biophilic design is biophilia: humankind's innate biological connection with nature (Browning, Ryan, & Clancy, 2014). Most people can relate to the freeing feeling a hike in the mountains can provide. Or how a beautiful view of fields can make a house so much more desirable to live in. Scientifically biophilic design principles applied to buildings has been proven to reduce stress, improve cognitive function and creativity, improve our well-being and even expedite healing (Browning, Ryan, & Clancy, 2014). A deep dive-into biophilic design was done during the preliminary study, and the 14 design patterns of biophilic design were discovered. A sustainability consulting firm Terrapin Bright Green describes them quite well in an article posted on their website (Browning, Ryan, & Clancy, 2014). Finally the goal of the thesis project was defined: to design a building using the patterns of biophilic design as building blocks through the project. The challenge being interpreting and translating these patterns into physical spaces and materials.

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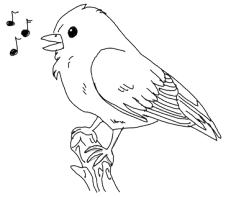
P01

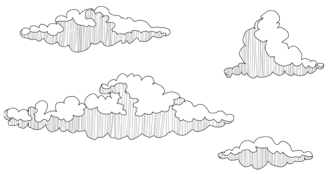
Visual connection with nature.
A view to elements of nature, living systems and natural processes.

P02



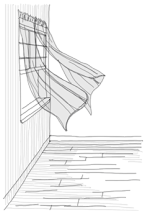
Non visual connection with nature.
Auditory, haptic, olfactory, or gustatory stimuli that engender a deliberate and positive reference to nature, living systems or natural processes.

P03



Non-rythmic sensory stimuli.
Stochastic and ephemeral connections with nature that may be analysed statistically but may not be predicted precisely.

P04

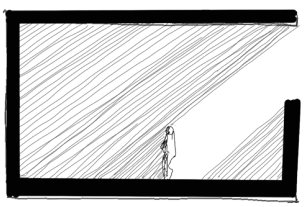


Thermal & airflow variability.
Subtle changes in temperature, relative humidity, airflow across the skin, and surface temperatures that mimic natural environments.

P05

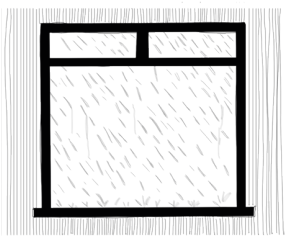
Presence of water.
A condition that enhances the experience of a place through seeing, hearing or touching water.

P06



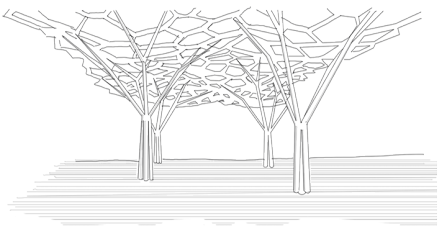
Dynamic & diffuse light.
Leverages varying intensities of light and shadow that change over time to create conditions that occur in nature.

P07



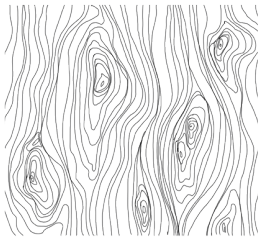
Connection with natural systems.
Awareness of natural processes, especially seasonal and temporal changes characteristic of s healthy ecosystem.

P08



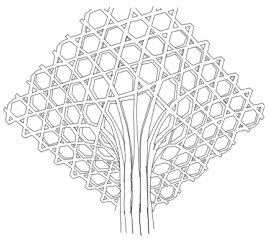
Biomorphic forms & patterns.
Symbolic references to contoured, patterned, textured or numerical arrangements that persist in nature.

P09



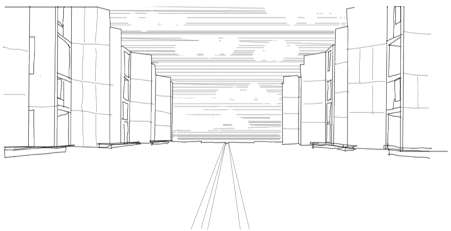
Material connection with nature.
Materials and elements from nature that, through minimal processing, reflect the local ecology or geology and create a distinct sense of place.

P10



Complexity & order.
Rich sensory information that adheres to a spatial hierarchy similar to those encountered in nature.

P11



Prospect.
An unimpeded view over a distance, for surveillance and planning.

P12

Refuge.
A place for withdrawal from environmental conditions or the main flow of activity, in which the individual is protected from behind and overhead.

P13

Mystery.
The promise of more information, achieved through partially obscured views or other sensory devices that entice the individual to travel deeper into the environment.

P14

Risk/Peril.
An identifiable threat coupled with a reliable safeguard.

Figure 1: Biophilic design patterns

The Site

Choosing the right site:

What factors were considered when deciding on a site for the project?

When choosing the site for the project, a lot of factors needed to be considered. First of all: making a new building or upcycling an old one? In the end, the deciding factor was sustainability. With the design question revolving around biophilia and the connection with nature, it made sense to choose a site that would embody a sustainable factor of preserving nature and biodiversity. Building an entirely new building seemed like an invasion of nature itself and did not make sense for this project.

The choice fell on the former Munch museum in Oslo. The construction and finalisation of a new Munch museum in 2021 left the former museum abandoned. The site lies site in a central location, in the borough of Tøyen. The borough has been a hot topic of discussion for the past decade as a part of the city in need of improvement. There were big plans of building an extension to the botanical garden on the site, but the project was terminated in 2022 due to budget cuts in the state budget. Upon evaluating the project, one could argue it was a step in the wrong direction. First of all it was very expensive, but second and most importantly; it was not a sustainable proposal. The building was very big, there was no focus on sustainable materials or local biodiversity. The plan included major glass domes with tropical climates.

With the climate changes we are facing, it is more important than ever to take care of our environment, and a step in that direction is to educate people on their local natural environments. Oslo is the biggest city in Norway, and therefore also the biggest interruption of natural habitats. On the south-west coast there are numerous critically endangered species that are disappearing because of city development.

With a vision of preserving local biodiversity, and taking into account the fact that the site neighbors the botanical garden, it does make sense to let the existing building become an extension of the botanical garden with a focus on educating and becoming a meeting place for the local residents.

Figure 2: Botanical greenhouse planned on the site, project was terminated in 2022

Figure 3: Schwarzplan showing the site in context of Oslo city


Site, in Tøyen
Diameter: 1200 m
Oslo city
Diameter: 8700 m
2 000 m

Site analysis:

How are the conditions on site?

As previously mentioned the site is very central in oslo city. It is easy to reach by all kinds of public transport within a readius of 750 meters. The area in general is dominated by residential buildings. The park and botanical garden are two very important public arenas, as well as being the local green space for the area. The site of this thesis lies sandwiched in between, separating the two green lungs.

Other important publi functions in the immediate surroundings are two kindergardens, a school, a church, and the museum of natural histoty which lies inside of the botanical garden.

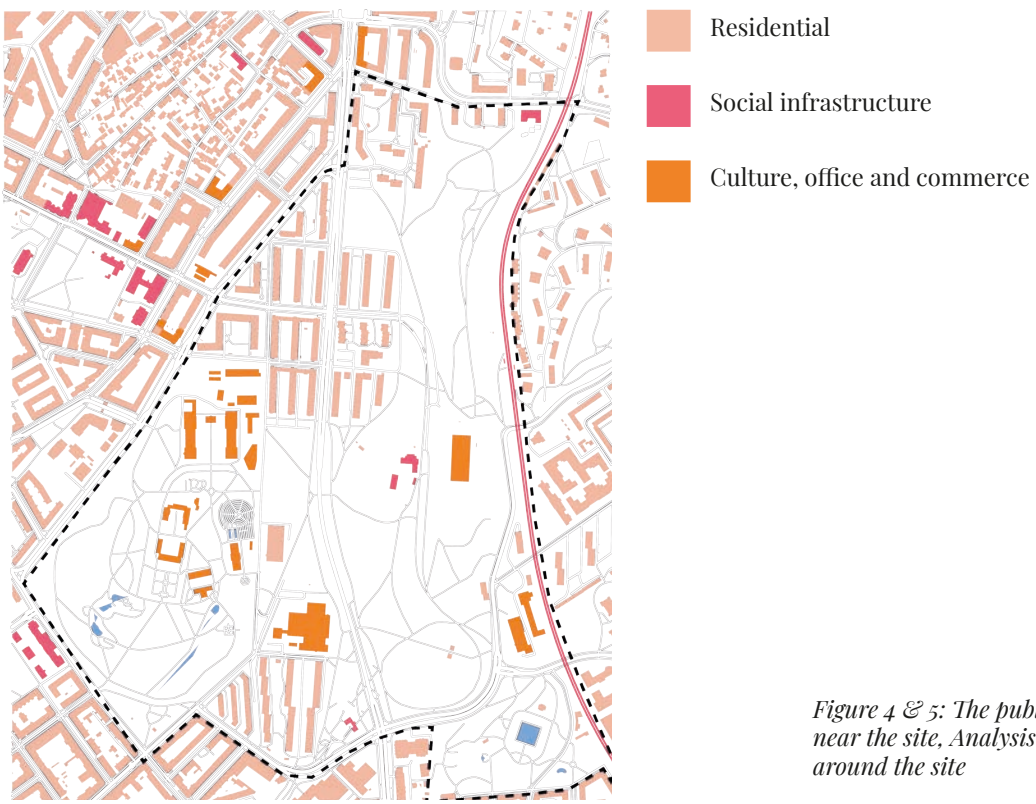


Figure 4 & 5: The public transport options near the site, Analysis of the functions around the site

There are trafficated roads on each side of the site creating barriers between the green lungs. An analysis of the yearly amount of traffic passing through the area shows that it would be possible to close the road between the site and the botanical garden without putting too much strain on the surrounding area.

The road between Tøyen park and the site on the other hand is highly trafficed as it is one of three main ring-roads around Oslo. It prevents the green areas from being connected and poses a danger for children in the schools and kindergarden. The situation regarding this road has been a topic of discussion politically as well, trying to identify different solutions for the area.

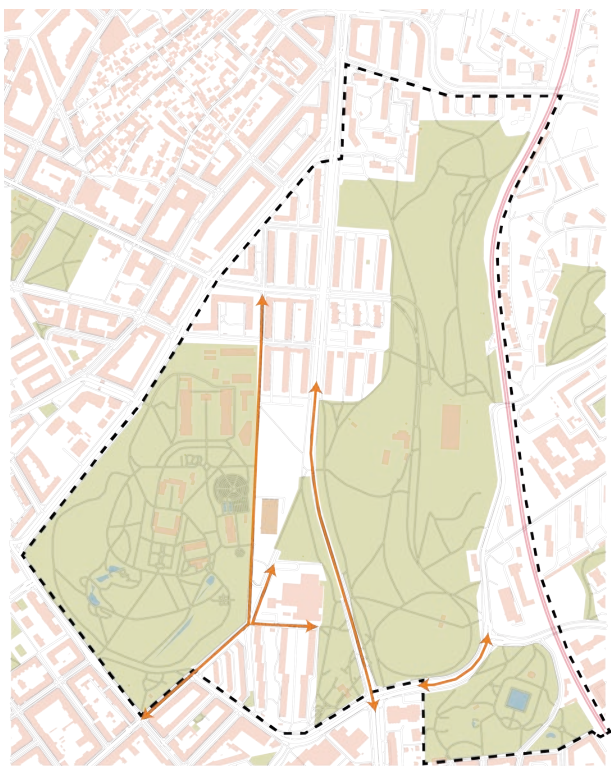


Figure 6 & 7: The green space on the site, Illustration of barriers between the green lungs on the site

By making a few changes to the site, it becomes possible to connect the green lungs through the site, and create a big central green area providing safe passage to schools and kindergardens as well as a recreational area for the local residents. The road between the site and the botanical garden is completley removed, making the site an exstension of the garden.

The site is covered in green area, expanding both north and south to the residential areas, giving residents easy access to green spaces in ther immediate surroundings. The road between tøyen park and the site is put under the ground into a tunnel, to create a safe passage above.

The city of Oslo is currently running a big project trying to put as much road under ground as possible, making room for public space, so the solution with the tunnel would make sense in the current political picture as well.

Figure 8: Proposal for changes to be made on site

The botanical garden:

What functions does the garden have?

Upon deciding the building should be an extension of the botanical garden, it made sense to do a deep-dive into the different functions and events it has to offer. The Botanical garden in Oslo shares its site with the natural history museum, a climate house for education on climate change, as well as a few historical preserved buildings. This makes the area very educational and a great resource for the local residents. The botanical garden itself has an array of different gardens and buildings. To mention a few: viking garden (plants used in the viking-age and their purposes), the victorian palm house, herb garden. It recently added a small flower bed for showcasing critically endangered plants.

The garden itself is a popular attraction in Oslo, and have many visitors. There are several organizations using the garden as well. They include the "friends of the botanical garden community" who are a group of people voluntarily growing plants together, they also arrange several events each year where they sell plants, and invite people to a nice day in the garden. There are also a hobby-farmer community that grow vegetables and fruits, their events include farmers markets throughout the year selling seasonal produce. There is a lot of local initiative, but the space is limited. This project could give the initiatives a space to hold their events, and reinforce the local sense of community.

Biodiversity:

How is the current situation on biodiversity?

In Norway, there are many species growing at their absolute limit as the cold climate and challenging weather conditions makes it hard to survive. As a result of this Norway has a lot of rare and endemic genetic variations. The genetic variations might even be restricted to a small specific area like one single forest. Preserving the biodiversity has therefore become a difficult and increasingly important task (Fjellstad, 2022).

9 out of ten endangered species in Norway, has area change listed as the main threat to their survival (WWF, u.d.). This happens either through:

- Deforestation
- Conversion of nature areas into agricultural purposes
- Construction of roads, docks, powerplants, houses and holiday homes

With construction being one of the three main reasons behind loss of biodiversity, our responsibility as architects become apparent. Through reading and research on biodiversity it was decided to hand-pick trees to use on the site and make sure to focus on the local, endemic and endangered. There are quite a few species of trees on the south-east coast of Norway that cannot be found anywhere else in the country (NIBIO, 2017). By using them in the design it can help preserve them, make a positive impact on local biodiversity and educate the locals about their environment.

The building

The history of the Munch museum:

What inspired the design of the building, and why was it shut down?

When dealing with an existing building, it was necessary to research the history of the building and figure out the deciding factors behind the architectural language. The building is the former Munch museum in Oslo. It was built for the purpose of housing and displaying Edvard Munch's art after his death. About the project, the architects have said it was a difficult task to build a museum for a single artist. Most museums show an array of different works and artists, this building was intended to show a single painters development throughout the years. This had a big impact on the architecture. The building was meant to be an architectural frame of the paintings. To achieve this the architects analysed them, what kind of emotion do they convey?

Their answer was silence, the paintings require a kind of lonely silence that emphasize the anxious and fragile emotions the paintings inhabit. The building was designed as a simple skeleton, designed to be experienced as a dry silence that makes the paintings come alive (Norberg-Schulz, 1962). In the transformation of the building it became important to introduce more warmth and playfulness. The building comes off as very strict as of now, the goal was to make a welcoming, interesting building that invites its users inside. One could even say that the building was based on a strict rule of order, and now that the paintings were long gone it was lacking its complexity.

The museum was built in 1962 and has had a colorful history during the 60 years it was operative. Already a few years after its opening it had to be expanded and redone, different adaptations were made on three different occasions due to lack of space and functionality. In 2004 its security was put to the test when the two arguably most famous paintings were stolen in broad daylight. The museum was robbed at gunpoint right in front of innocent visitors. Again the museum was closed for renovation and when it finally reopened it had fitted airport-like security. Unfortunately the robbery just became the last straw in a haystack of problems the building had caused during its lifetime, and we are back in 2008 when it was decided to move the museum permanently.

Figure 9: Historic picture of the Munch museum in 1962

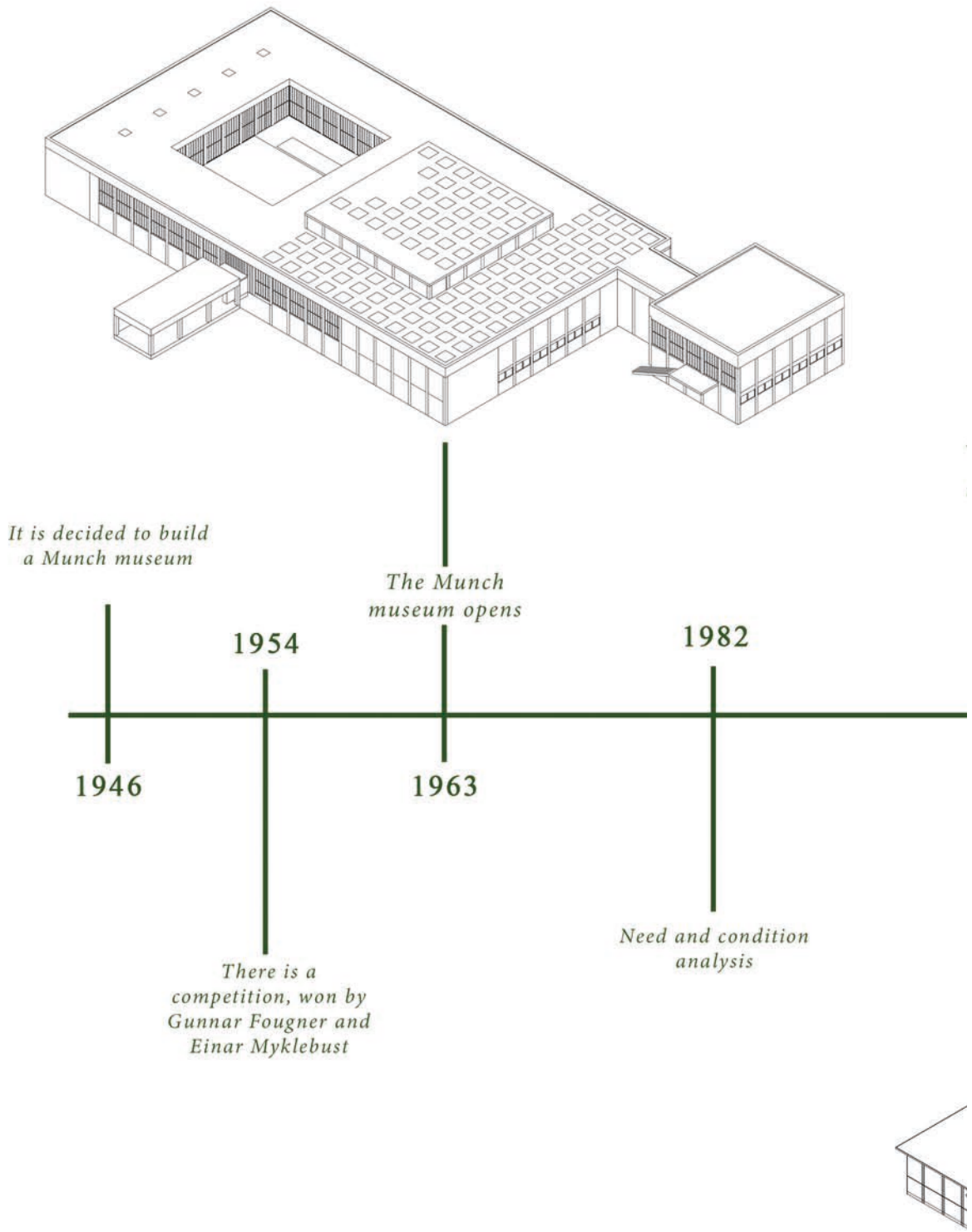


Figure 10: Timeline from the preliminary study, showing the evolution of the building

It is decided to build a new museum in Bjørvika

Rehabilitation and expansion of the magazine-building

1994

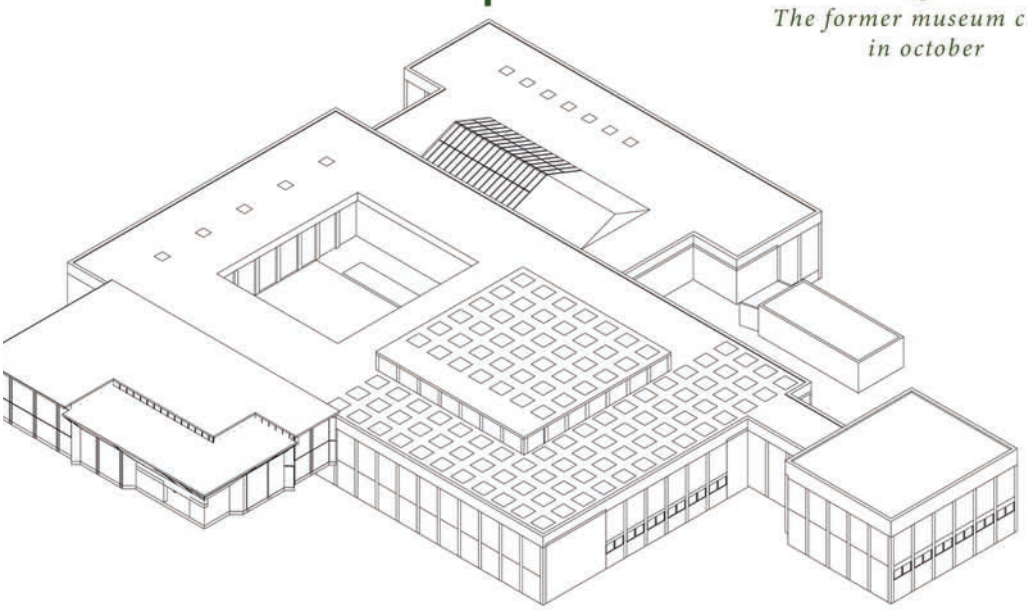
2021

1992

Extention: the pavillion

2008

The former museum closes in october



Interpreting patterns:

How will the patterns translate in the transformation of an exising building?

When faced with the task of interpreting the patterns for the transformation of the existing building, a strategy needed to be developed. It started with drawing all the patterns as different moments, events and spaces. This helped translate them into a specific atmosphere that could be used when designing. With the baseline for the design lying in biophilia a translation of the patterns moved towards an intuitive approach. All humans have the ability to interpret spatial information, and draw the parallels to nature in our built environment. The challenge was to get in touch with this innate biological connection.

The journey began with re-programming the mind to start noticing the daily environment, and what type of spatial configurations were subconsciously processed as nature-like. A small polaroid camera became a travelling companion for a couple of weeks, trying to take pictures of mundane everyday situations with a biophilic quality. It had an effect on a personal level where the general perception of environments became much more tuned to all the small references that can be found, both intentionally designed, but also the small happy accidents.

Furthermore the patterns all have precise descriptions, but they are mainly referring to abstract concepts in need of translation for use in architecture. When starting the design it became important to just let go of the over analysation of space and try to trust intuition. The main ingredients became natural materials, play with shadow and light, immersing oneself into the space and getting a hold of the emotional experience.

Figure 11: Polaroids of daily life biophilic spatial configurations

The proposal

The design proposal:

What was the outcome of the thesis project?

The proposal is consist of two main parts:
The first one being the biophilic design patterns and integrating them into both the building and the site. The goal was to create an interesting space that humans enjoy. The result uses light and shadow, difference in height, material gestures and intricate complex structures to create the desired atmosphere. As the building was a white skeleton when the design process started it became important to introduce warm natural materials, as well as soft textures and curved structures to create an overall warmer and more welcoming atmosphere in the building. The strict square grid- system of the façade has been broken up by curved windows and a curved glass roof to give it a more playful look.

The major material gesture comes in shape of a wooden pathway, going all the way from the north side of the south, down the park, through the building and exits on the south end towards the subway station. The pathway curves playfully around in the park, making an interesting walk. It has different hight levels, sometimes allowing to walk among the treetops and over the water, but it also comes back down to create a path through the fruit garden. Through the building the pathway has a canopy-like structure creating playful shadows reminiscent of forests. There are three pavilions in different areas of the park, all speaking the same architectural language as the canopy inside, reinforcing the gesture and connecting inside to outside.

The other main part of the design is the botanical garden. Three big plant halls have been created to make space for local plants, and research on biodiversity. Some parts of the buildings basement are still in use as storage for the current Munch museum, as well as storage space for the national museum of historical science. This created some limitations to the use of the basement, but by removing the floors in several rooms a connection to the lower level was made without compromising the storage spaces. The building includes spaces for educating on biodiversity, as well as a market hall both for exhibitions and farmers markets or other events frequently arranged by the different societies in connection to the botanical garden. The project as a whole breathes new life into the area, making Tøyen once again an attractive spot in the city, both for the locals and for tourists.

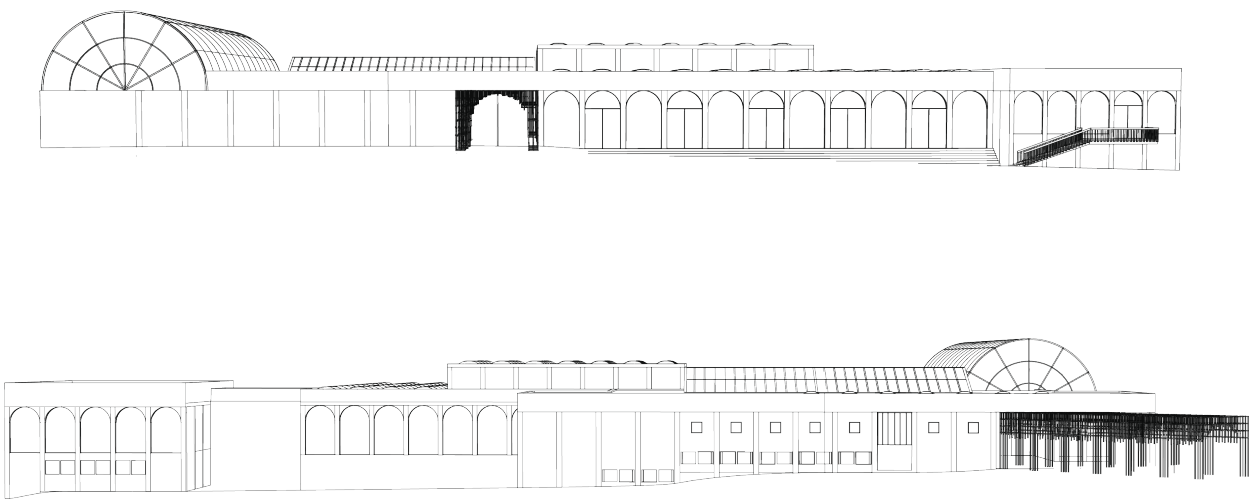
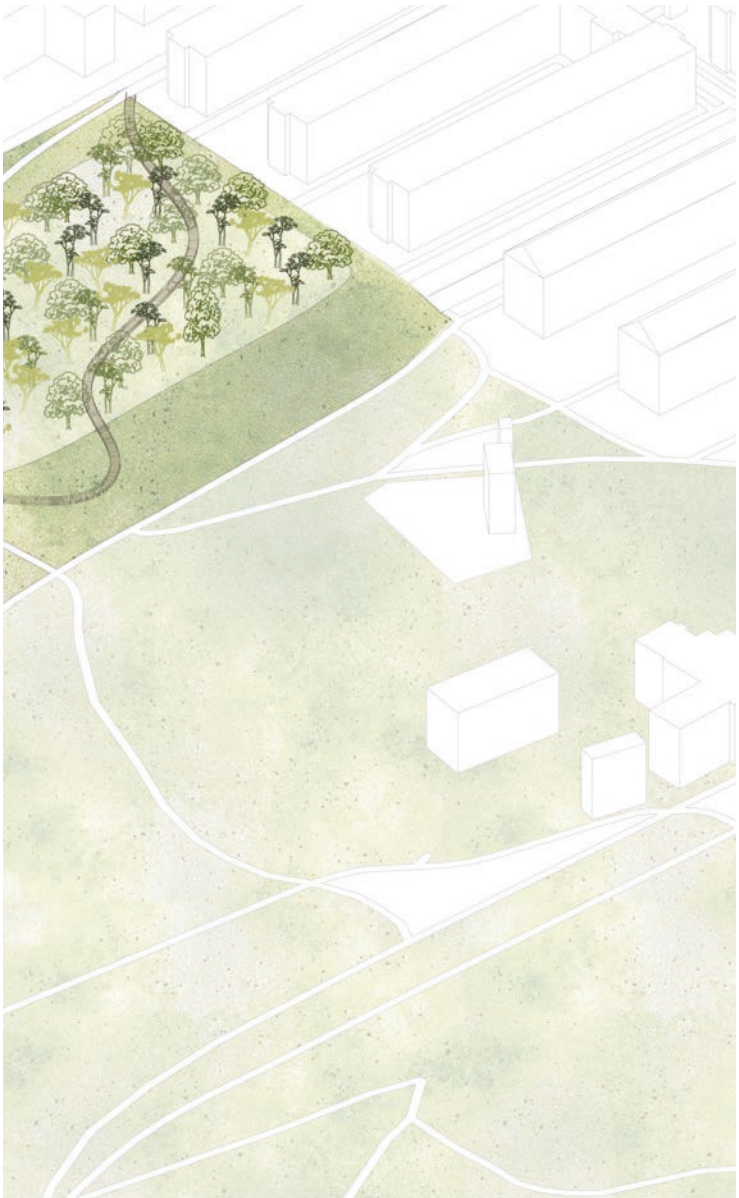


Figure 12 & 13: North and South elevations of the building proposal

The park which should not only promote but also sustain biodiversity, serves as a connecting point for the green lungs in the area. Protected by fences, many types of endangered trees and plants are able to grow and blossom on site. By enabling easy access to birds and bees the natural environment should be further strengthened. This enables visitors to not only get educated on the matters of biodiversity but also experience it first-hand. The small lake, which is placed centrally, adds to the pattern language by giving a presence of water and playful risk/peril situations. It can be used to cool down during the summer, and for ice skating by the residents during the wintertime.

Small paths throughout the park are connecting the park with the surrounding botanical garden, the Tøyen park and the residential area as well as giving an easier access to the nearby train station. These paths should serve as a more efficient way for the residents to get from one point to another. Additionally, the main wooden pathway, enable visitors to take their time while going on a walk through the park and enjoy the scenery and wildlife on site. The wooden pathways connect the pavilions, which are situated in three different locations throughout the park. The first one, which is positioned next to the lake enables visitors to rest by the water. The second and third pavilions especially allow the experience of the biodiversity at the park. While the second wooden pavilion is



close to the forest and serves as a viewpoint of the endangered plants, the third pavilion is a viewpoint to the fruit garden. Wild cherry and wild apple can be found in the fruit garden, providing a connection to the historical landscape of Norway. The fruit garden can serve as an extension of nearby farming areas cultivated by the local community "friends of botanical garden". This way they can use the area to plant and grow their produce and contribute to a healthy eco-system.

In times in which construction of the built environment is one of the biggest threats to biodiversity, the park should serve as a place of preservation in the heart of the city.

Figure 14: Site plan illustrating the proposal

Plant palette:

What kind of trees were chosen for the site, and why?

The trees chosen for the site are all naturally occurring in the ecosystem of the east coast. Starting of with wild cherries and apples, they are both important trees in the national historical landscape. Particularly the apple trees in Hardanger is famous throughout the country for their beautiful pink blossoms, contrasted by the deep blue of the fjords in spring.

The two taller trees, are in Norwegian called “Ask” and “Alm”, they have been prominent in the landscape ever since the viking age. In Norse mythology, the two first people to ever walk the earth were called Ask and Embla, according to the legends the god Odin took a branch from the Ask tree and created them. “Alm” has been used as medicine for centuries and is thought to have healing powers as well as being able to predict the weather. Both these wooden giants are now critically endangered due to illnesses, it is important to put the spotlight to these historical trees and facilitate for research to save them.

The last two trees are in the rose family, commonly called rowan. They have a specific genetic variation that can only be found in Norway, so it is an endemic species to the south part of the country.

They have decorative potential as they blossom with red berries and hints of red in the leaves. The berries are an important source of nutrition for birds, and the flowers for bees.

The gardens of the site will also be open for wild flowers and grass naturally found on the site, and will develop over time as seeds are carried by the wind and birds. The only maintenance to be done is to make sure no invasive plant species take over and become a problem for the eco-system.

Figure 15: Tree palette visualizing and explaining the different types of trees chosen for the site

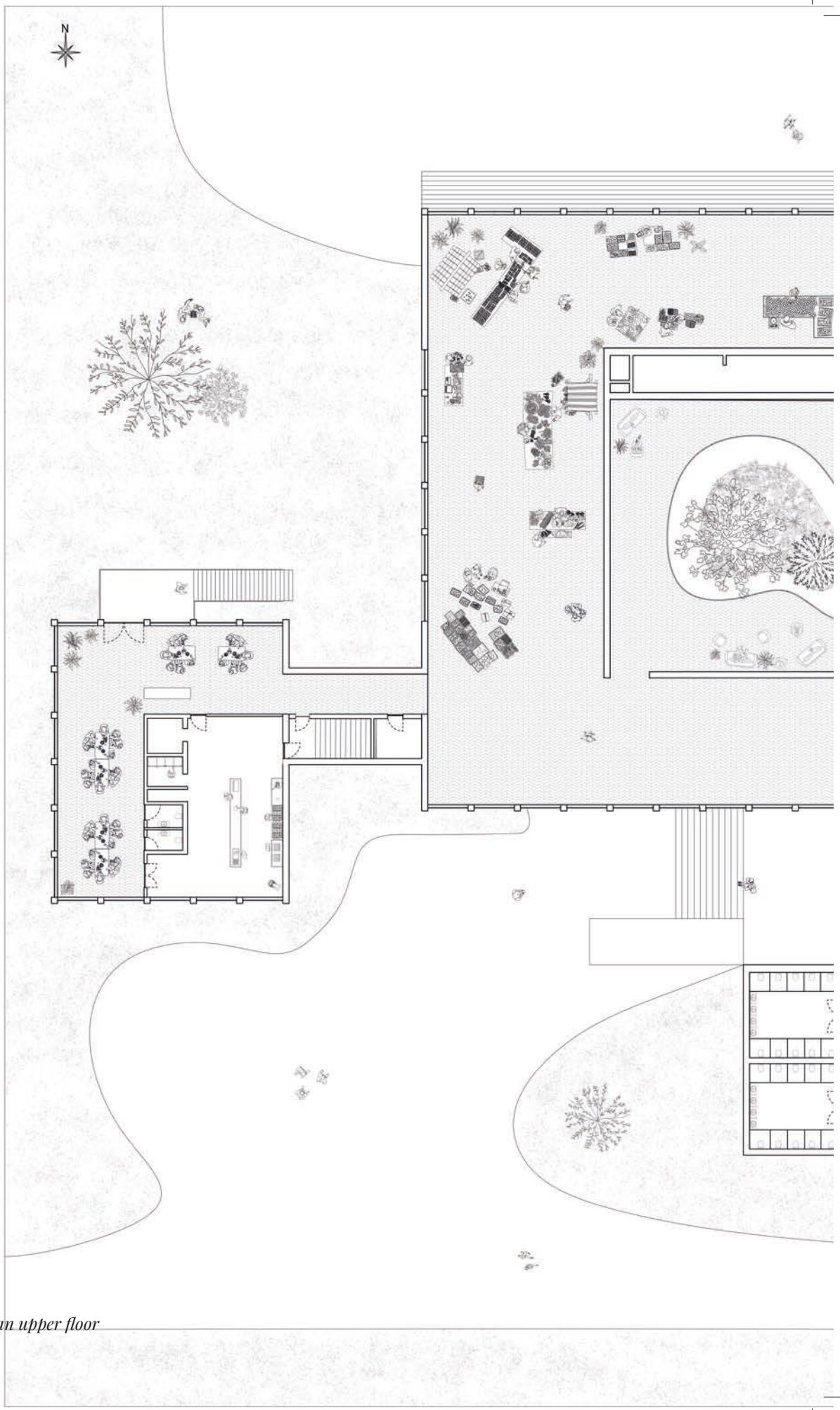
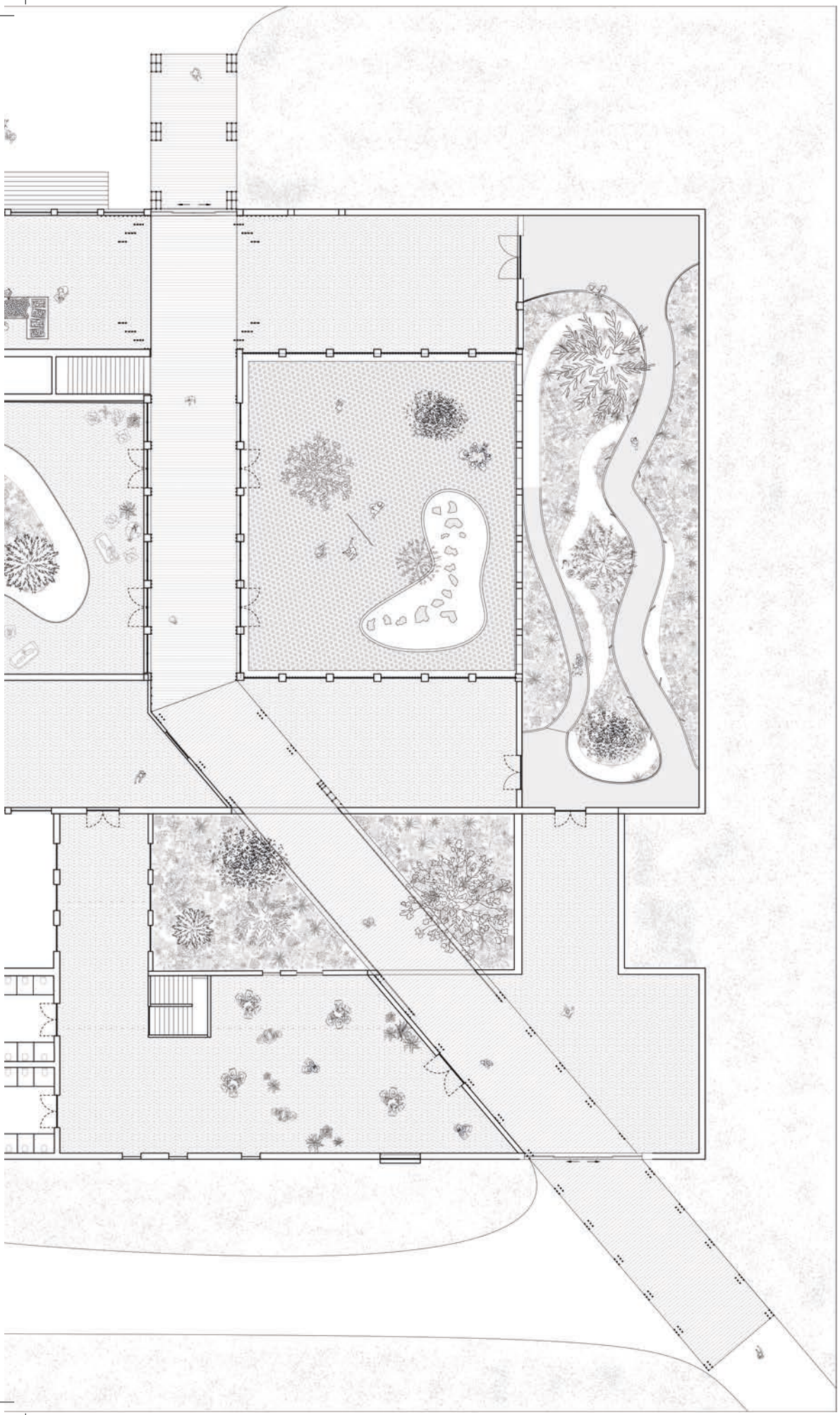


Figure 16: Floorplan upper floor



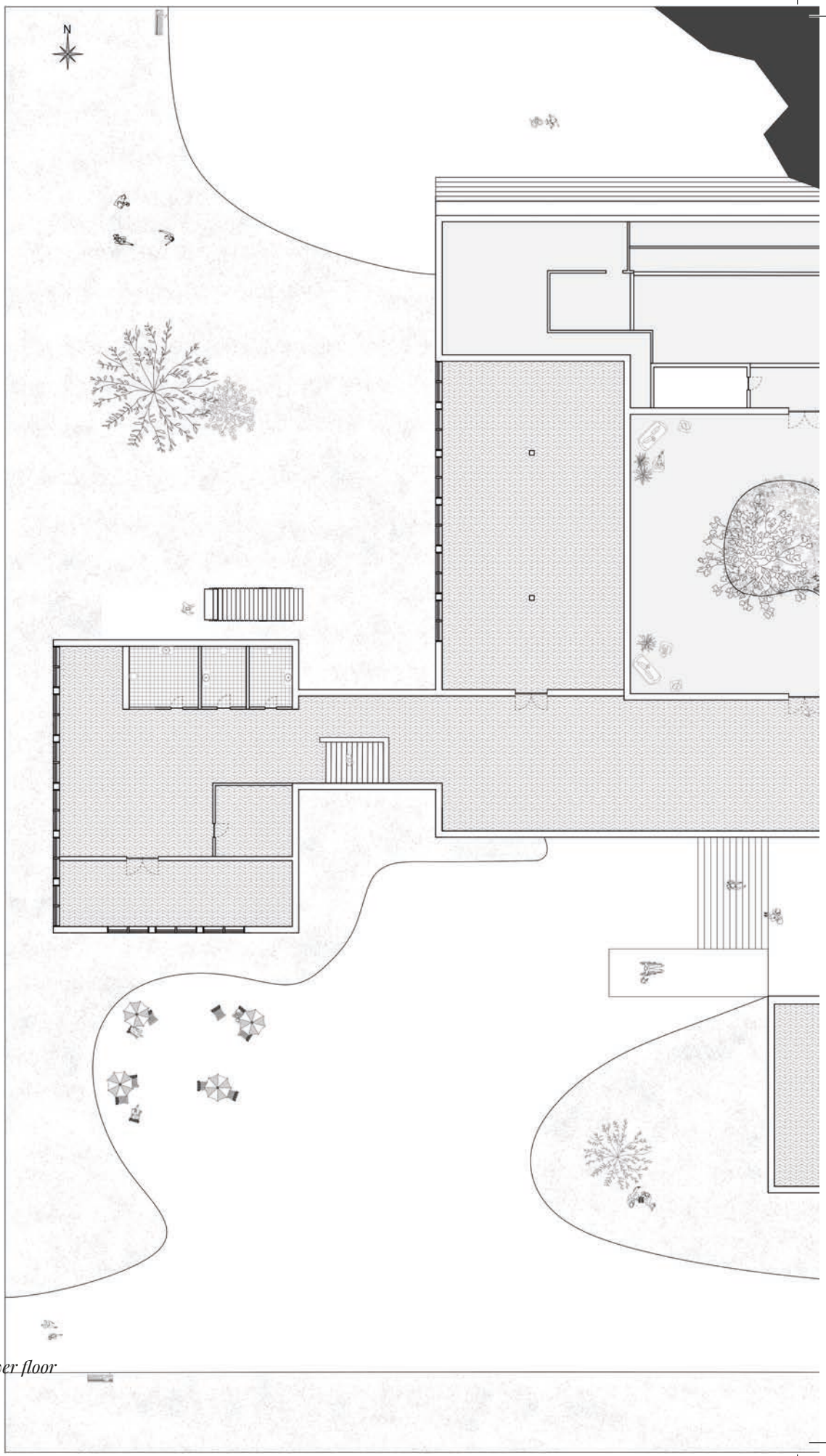
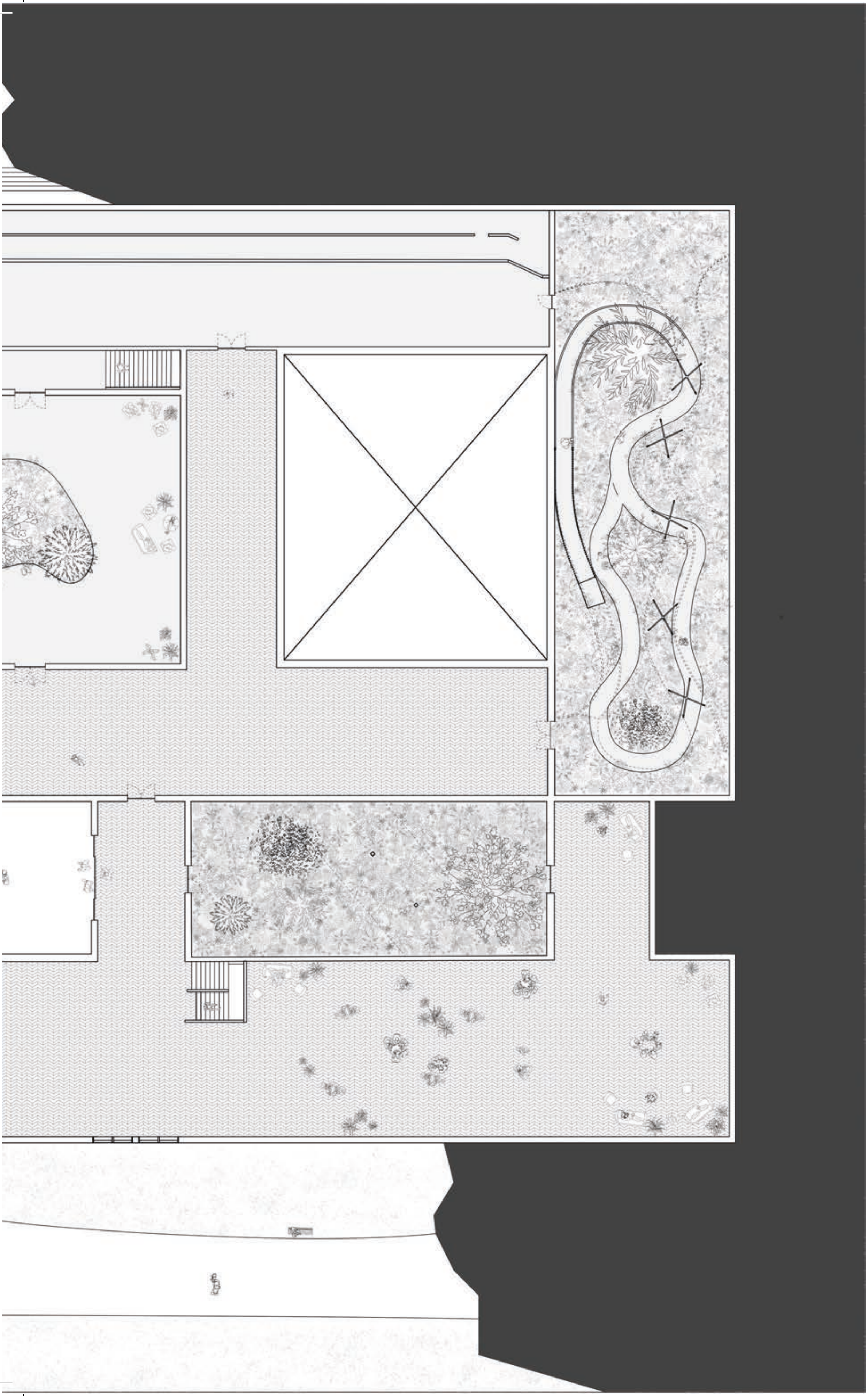


Figure 17: Floorplan lower floor



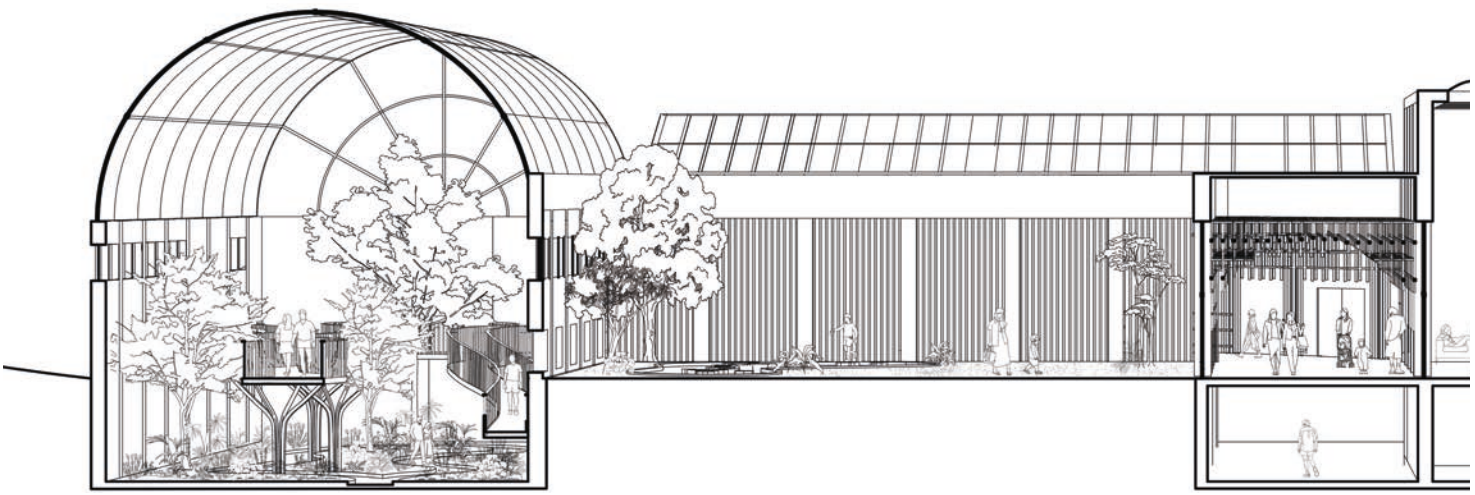
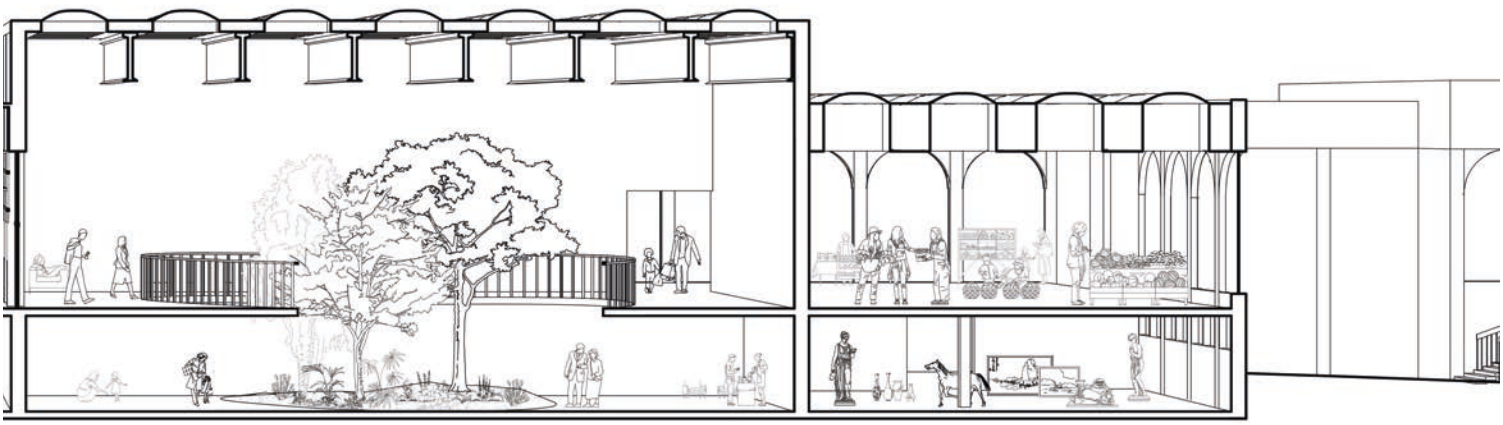


Figure 18: Section east-west, illustrating the proposal

The main functions of the building are the three botanical gardens. The botanical hall with its classic curved glass roof being the biggest of the three. It has a wooden curved bridge on the upper level that connects the north and south side of the room. The bridge curves around the treetops, referencing the patterns of mystery as it draws the attention towards what can be found around the next bend. The bridge is made of wood, giving a material connection to nature as well. The visual connection is apparent in the trees and plants growing inside the garden, and by looking up at the sky and the clouds drifting by the pattern of non-rhythmic sensory stimuli can be found.

The shadow room provides a darker atmosphere, as a contrast to the bright spaces in the rest of the building. Trees of the European yew family (also called the tree of resurrection) are growing here as, they are a very slow growing tree-type that thrive in the shadow (Fjellstad, Barlind , 2021). Dynamic and diffuse light is a prominent pattern in the room, as the rays of sunlight move across the floor throughout the day.

The last botanical room is a more protected area, it is possible to walk above it among the trees on a bridge as part of the wooden pathway. It is not intended to walking among the plants. In that way the ground can be kept clean and suitable for research. The gardeners and arborists at the botanical garden can use the space to do experiments and research on endangered plants and how to strengthen the biodiversity in the area.
The southernmost room of the building is a two story educational space, it is intended to be used in cooperation with the climate house, to educate on how biodiversity is also threatened by climate change. It is also important to educate on the current state of biodiversity in Norway and the different types of threats endangered plants are facing.



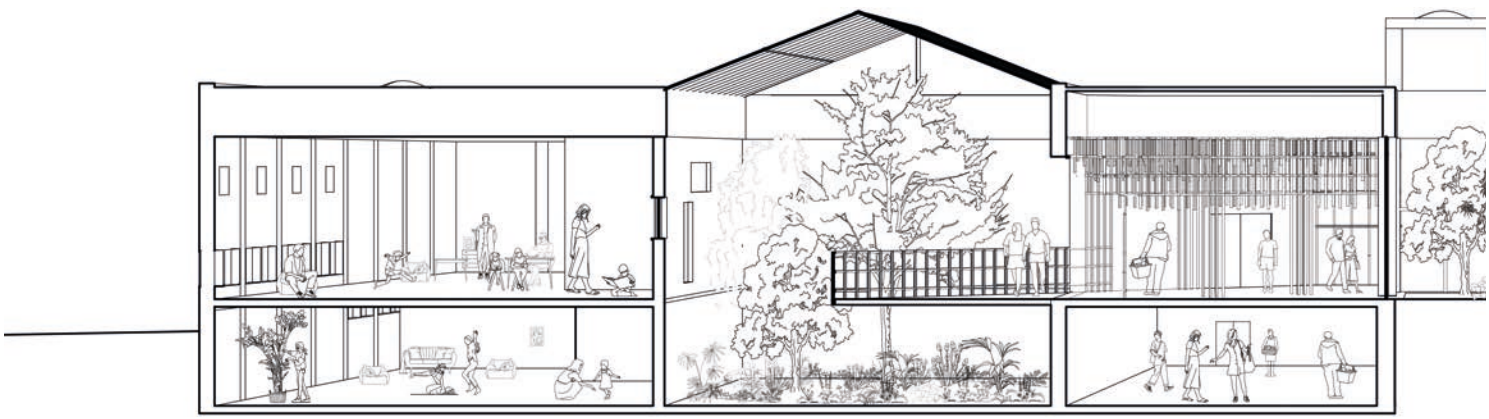


Figure 19: Section south-north illustrating the proposal

The southernmost room of the building is a two story educational space, it is intended to be used in cooperation with the climate house, to educate on how biodiversity is also threatened by climate change. It is also important to educate on the current state of biodiversity in Norway and the different types of threats endangered plants are facing.

The restaurant provides a space for visitors and locals to meet up and relax, and the restaurant has direct access to fresh herbs and produce from the botanical gardens.

The wooden pathway that cuts through the building ads the complexity and interest the building was missing. It provides a fast and fun way to walk to and from the subway every-day on the way to work. It connects the park to the rest of the city, and ensures a vibrant atmosphere full of people walking by.

The market place provides a space for farmers markets, exhibitions in collaboration with the museums and event space for the local residents. The building has been shown to have the capacity to house all the different functions needed in the area, and provides a sustainable solution to the expansion of the botanical garden.

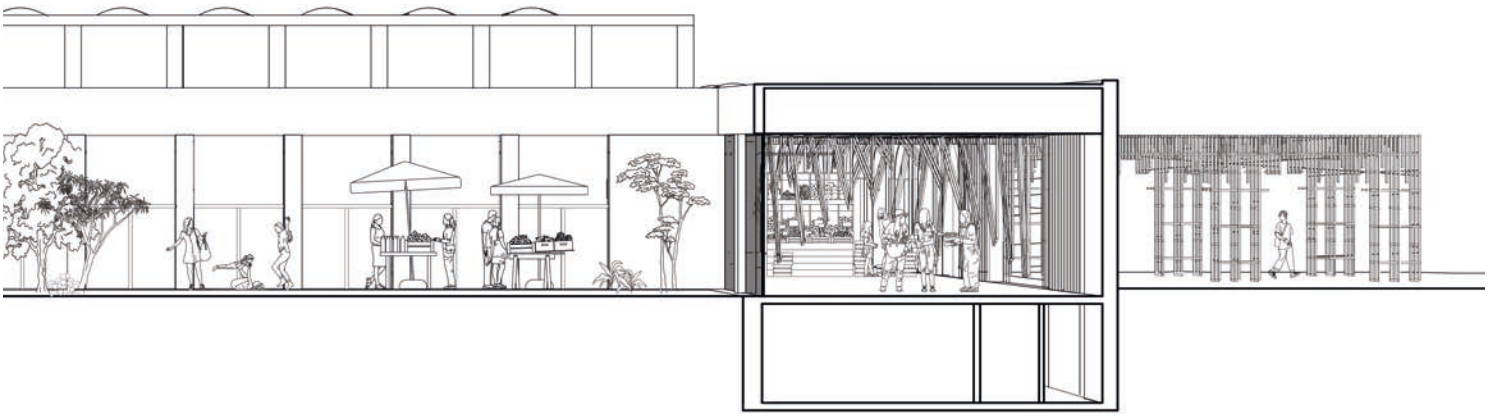
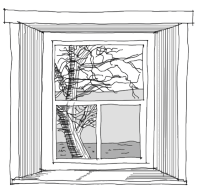


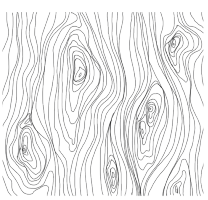
Figure 20: Visual of the proposal for the building, the botanical hall. Accompanied by the pattern design tools.

P01



Visual connection with nature.
A view to elements of nature, living systems and natural processes.

P09



Material connection with nature.
Materials and elements from nature that, through minimal processing, reflect the local ecology or geology and create a distinct sense of place.

P13

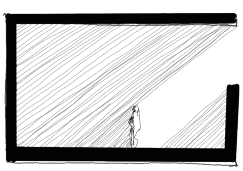
Mystery.
The promise of more information, achieved through partially obscured views or other sensory devices that entice the individual to travel deeper into the environment.

Figure 21: Visual of the proposal for the building, the shadow room. Accompanied by the pattern design tools.

P01

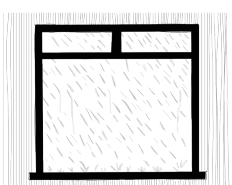
Visual connection with nature.
A view to elements of nature, living systems and natural processes.

P06



Dynamic & diffuse light.
Leverages varying intensities of light and shadow that change over time to create conditions that occur in nature.

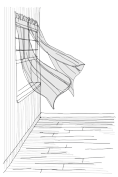
P07



Connection with natural systems.
Awareness of natural processes, especially seasonal and temporal changes characteristic of s healthy ecosystem.

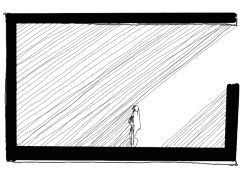
Figure 22: Visual for the proposal of the building, the market hall. Accompanied by the pattern design tools.

P04



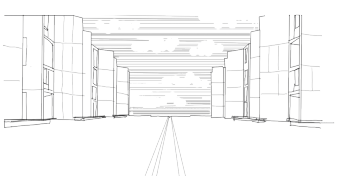
Thermal & airflow variability.
Subtle changes in temperature, relative humidity, airflow across the skin, and surface temperatures that mimic natural environments.

P06



Dynamic & diffuse light.
Leverages varying intensities of light and shadow that change over time to create conditions that occur in nature.

P11



Prospect.
An unimpeded view over a distance, for surveillance and planning.

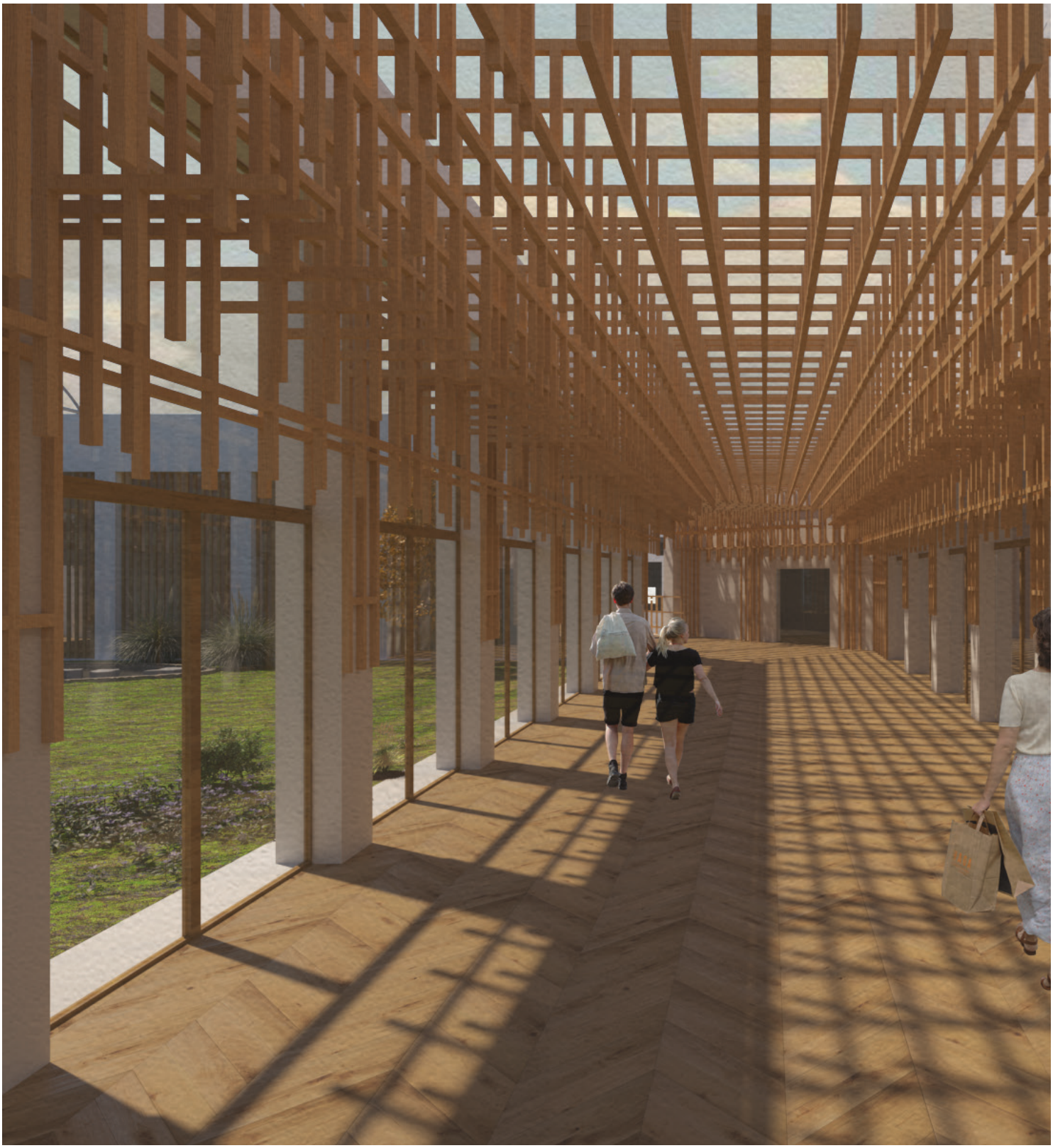
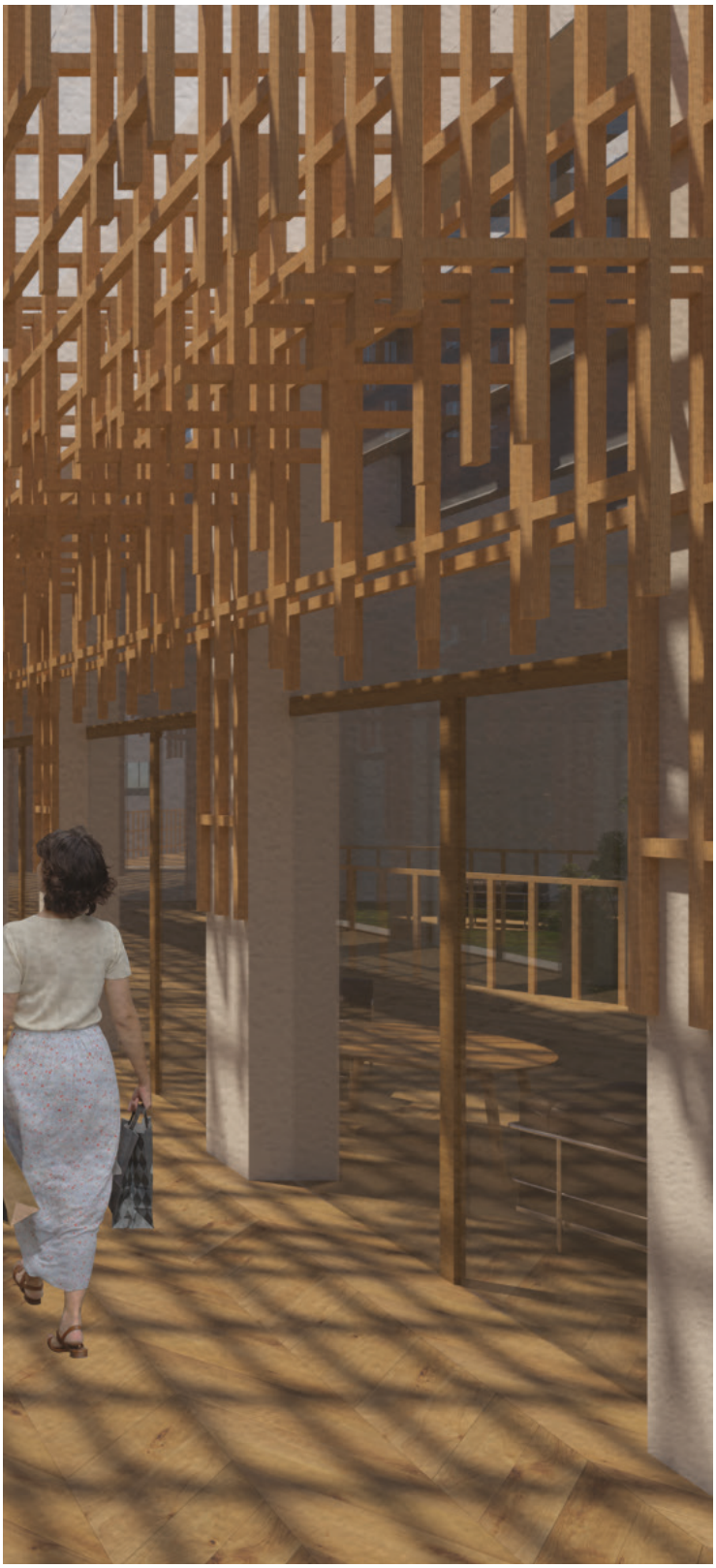
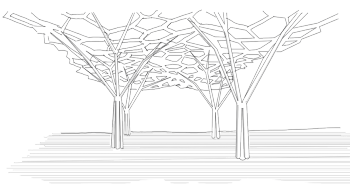


Figure 23: Visual of the wooden pathway leading through the building. Accompanied by the pattern design tools.

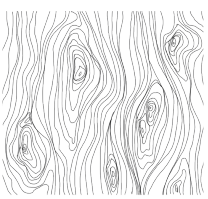


P08



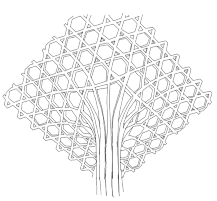
Biomorphic forms & patterns.
Symbolic references to contoured, patterned, textured or numerical arrangements that persist in nature.

P09



Material connection with nature.
Materials and elements from nature that, through minimal processing, reflect the local ecology or geology and create a distinct sense of place.

P10



Complexity & order.
Rich sensory information that adheres to a spatial hierarchy similar to those encountered in nature.

To conclude

Conclusion:

What is the take-away fron this project?

Through the use of biophilic design patterns the building and surrounding site has been successfully transformed. A new architectural language has been introduced to the site and building, adding a pleasant and interesting atmosphere that contrasts that of the existing skeleton of the building.

Working with plans from 1950's has been a challenge, it was difficult to grasp specific construction details. Unfortunately the museum is still under strict security measures as it has some art still in storage in the basement, this meant that updated plans are not available to the public. With updated plans the project could have gone further into the construction details and static systems of the building, rendering it even more feasible.

An unforeseen limitation was the fact that the building was temporarily used as a vaccination centre during and after the pandemic. This made it impossible to visit the building and take a look inside, as only people with their vaccination appointments were allowed inside.
Despite limitations, the project moved along, and the decision was made to make assumptions or educated guesses in order to ensure progress. The results were interesting and promising for further work with biophilic design patterns. It is also a possibility to submit the project as a proposal to the city of Oslo as it is still very much undecided what is going to happen to the building.

The biggest take-away from this project is the change of perception a deep-dive into biophilic design has made. Design references to nature is all around us in our daily life, and upon noticing them they definitely seem to have a promising effect on human psychology. This field of study is something that will develop exponentially over the next few years, at it will be exiting to see what that does for our built environments.

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Annex:

Model pictures of the following models:

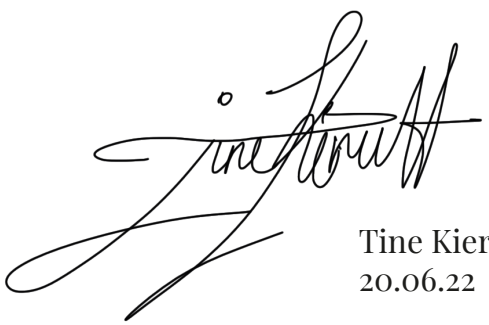
Site model, scale 1:500. Main materials: cartboard and dried flowers.

Section model, scale 1:50. Main materials: Cartboard and dried flowers.

Construction detail, scale 1:1. Main material: wood.

Affidavit:

I hereby declare under penalty of perjury that the present paper has been pre- pared independently by myself and without unpermitted aid. Anything that has been taken verbatim or paraphrased from other writings has been identified as such. This paper has hitherto been neither submitted to an examining body in the same or similar form, nor published. I herewith confirm that my digitally submitted thesis book is identical to this printed version.



Tine Kierulf, Vaduz, Liechtenstein
20.06.22