THE GYM FOR EVERYONE:
A public space for physical
and mental wellbeing

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CONTENTS

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ABSTRACT

I have always been curious about the effects architecture and the built environment have on us. The special atmospheres and the ability to arouse a sense of safety and calmness, but also the negative feelings certain spaces can evoke. Which architectural elements contribute to the way we perceive a space and more importantly, does the built environment not only affect our emotions but also our mental health and wellbeing?

In the last couple of years there has been a strong incline of people dealing with mental health problems, stress and burnouts. As much as every fifth person has claimed to have struggled with their mental health only during the last year.[1] Additionally it is proven that mental health promotion as well as mental disorder prevention have a great effect on the overall decrease of mental health related struggles[2] and needs to be implemented in our everyday life.
It is obvious that mental health plays a great role in our quality of life and happiness, but the topic still encounters stigma and discrimination.

The aim of this thesis is to investigate the connection between mental health and the built environment. With which tools can we design buildings that have a positive effect on our mental health? What is the overall responsibility of the architect, holding the power to create the spaces that inevitably surround and influence us everyday?

By introducing a new typology gym, this project offers a space that encourages the users and the passing people to become more active, while being surrounded by an architecture that has a positive effect on their mental health. Additionally spaces for education, reflection and relaxation contribute to prevent the risk of mental disease. To achieve this, the project considers several different layers, in order to create a multisensory experience as well as to provide a variance of different situations, spatially and emotionally. Accessibility and inclusivity is one of the key components of the proposal, which is achieved by considering individual needs rather than a one-fits-all approach. By designing a public space for physical and mental wellbeing, a new typology is created that can also be implemented in other future urban developments.

1 Introduction

My motivation and starting points

I have always been interested in the specific atmospheres and forces that a space can have. Certain spaces evoke certain feelings in me, positive or negative. Some of them, I am sure, have been designed to do so, others probably not. There are buildings that make me feel calm, at ease and safe, while other spaces feel dangerous and arouse anxiety. Not only does the built environment have an effect on me, but there seems to be a fluctuating relationship. Depending on how I feel, I seek out or avoid some spaces. If I for example am in a good mood, and relaxed, I like to walk through the crowded streets of the city center. I enjoy the vibrant colors and the sound of the other people around me. It makes me feel alive and as a part of it. On another day, when I am stressed and anxious, the same street might increase my anxiety, make me annoyed and decrease my mood even further. I can then try to avoid that space or accept its influence on me, but I can usually not change the space itself. Which features are decisive to evoke positive or negative emotions? And what is our responsibility as an architect, when we assume that the built environment affects how we feel?

In my years as an architecture student I have learned about atmospheres, about light and shade, about views and sequences, about form and materiality. But in my experience the process of creating a certain atmosphere mainly comes down to intuition. How would I personally feel being in the space I am designing, how would someone else feel? In order to do so I rely on memories of spaces I have experienced or images I have seen, but mainly I am guessing.
If the effect the architectural environment has on us is so strong, and carries such a power to influence our emotions, then how can intuition be enough?
It almost seems arrogant to assume that my intuition would be good enough to carry such a responsibility.
Aren't there any factual references we could implement in our design process? Any scientific proof that some design elements are good for us while others might do harm?
These are the main questions I want to investigate in my thesis. They form the starting point of my work and aim to justify my design choices.

Guiding questions

The first part of my investigation is dedicated to finding out whether the built environment does have a measurable effect on us humans. By measurable I mean if this effect can be scientifically proven, since the fact that we are affected by our environment in one way or another seems obvious.

I then intend to compile a selection of tools that can help us as designers to create spaces that positively instead of negatively influence our well being.

At the end of my investigation I will address the question of the responsibility that we carry as architects when we are designing the spaces around us. Spaces that we all inevitably are confronted with on a daily basis.
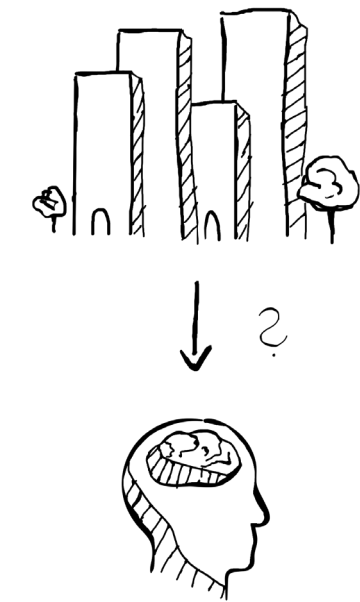
1 How does the built environment affect our mental health?

2 How can we design an environment that has a positive influence on our mental health?

3 Which responsibility do we as architects carry?

?

Overview: the role of mental health in our life

In the last couple of years there has been a strong incline of people dealing with mental health problems, stress and burnouts. Current research shows an increase of depressive episodes in adolescents (12-17) by 52% and an 63% increase in the age group of 18-25 year olds. The experience of psychological distress is stated to have grown even more with a 71% increase.[3] Even though other sources question whether this growth is actually evident, or if it rather is a reflection of a changed behavior towards mental health recognition and diagnosis[4], the numbers of people affected by mental health struggles are undeniably high.
According to Jean M. Twenge et al.[5] as much as one in six people will battle a major depressive disorder at some point during their lifetime.
The World Health Organization (WHO) even categorizes depression as one of the leading causes of disability.
Additionally people who struggle with severe mental health conditions are prone to die 20 years prematurely, caused by preventable physical conditions.[6]
On top of carrying the burden of the condition itself victims also encounter severe discrimination and stigmatization in their everyday life.[7]

Common causes for mental health problems can be genetic or specific personal characteristics on one side, but also social, cultural, political or environmental influences on the other. These environmental triggers include living standards, working conditions and community support[8], as well as the built environment itself.[9]
Stress can also contribute to the development of several mental and physical illnesses[10] and should therefore not be considered negligible.
Scientific research proves that stress has an impact on our autonomic and neuroendocrine response and is linked to several deathly diseases, including HIV/AIDS, diabetes mellitus and strokes.[11]

To tackle the burden mental health issues carry, an increased investment is required.[12]
In addition to providing access to healthcare and treatments it is important to also focus on the destigmatization of the topic by increasing awareness in the general population, as well as focusing on preventive measures.

Among U.S. Adults in 2020

1 in 5 experienced a mental illness

1 in 20
experienced a serious mental illness

1 in 15
experienced both a substance use disorder and a mental illness

12 + million
had serious thoughts of suicide

fig. 1: Occurrence of mental health issues in U.S. adults in 2020

2 Mental Health and the Built Environment

Why mental health promotion matters

As the previously described statistics show, mental health problems are ubiquitous and play a great factor in our happiness and quality of life.
An additional burden to the conditions itself is the stigma around the topic. Even though discussions about mental health seem to be increasingly accepted by society, admitting to be struggling with mental health still encounters rejection, especially in older generations. Researchers additionally suspect that mental health stigma (MHS) prevents a majority of the affected people from seeking help and treatment, leading not only to social exclusion and isolation but also increased mortality rates and an overall increased economical burden.[13]

Furthermore, studies have shown that early prevention (MDP) and mental health promotion (MHP) are an effective method to decrease the occurrence of mental health problems. Not only will this have a positive effect on individual wellbeing and happiness, but it appears that preventive methods can also significantly decrease the economic burden on society in general as well as the individual economy, since untreated mental health problems in childhood can have a strong influence on employment and salaries as an adult.[14]
I therefore see the need to continuously open up for a dialogue about mental health in every aspect of society and believe that we can all contribute by enhancing the understanding for each other, as well as the general understanding of mental disorders.
Of course prevention and treatment should be medically evaluated, and therefore stay mainly in the responsibility of the healthcare system, but I believe that the execution can be carried out also in other areas of society and expertise and should be constantly considered in every aspect of life, including the design of a new space.

raise AWARENESS
promotion (MHP)
information

decrease MENTAL HEALTH STIGMA
preventive measures
acceptance of treatments

overall DECREASE of mental health related struggles

How the built environment affects our mental health

Research over the last couple of decades has mainly focussed on how certain characteristics of the built environment influence our physical health, while studies about the effects on our mental health seem scarce.[15] A highly studied subject is for example the effect of indoor air pollution on our physical well being, which most likely influences our mental health as well, but specific research in this regard is very limited.[16] Not only has this lack of information made it harder for me to outline and specify the relevant architectural elements but it also shows the importance of the further investigation of this matter.
In order to gain a broader overview of the topic I have extended my research into the field of environmental psychology, social studies and neuroscience, intending to collect information that can be applied and implemented onto architecture.
Even though I am not capable of introducing an interdisciplinary approach in my thesis project, I strongly believe that an interdisciplinary cooperation between architects, neurological and social scientists and engineers is needed in order to further study this subject. Currently collaborations like that are rare and insufficient.[17]

Unfortunately concepts that see a relation between the physical world and mental health are still partly rejected.[18] Despite the fact that research is rare, evidence can be found that directly links the brain morphology with the exposure to external influences, highlighting a difference between the brain morphology and reactivity patterns of a city dweller versus those of a person living in a more rural area.[19] What is concerning about this, is that the brain morphology of city dwellers are closely linked to several different psychiatric illnesses like depression, schizophrenia and psychosis. The prevalence of mental disorders amongst people living in an urban context is also confirmed in other studies.[20] The correlation between the physical world and mental health can be explained by studying the neurological processes evoked by our perception. It is evident that the same nerve chemicals and cell processes that create the mood or imbalance of mood are also involved in the perception of the environment.[21] This is further proven by looking at the brain morphology of an early deaf or blind person, which is developed differently than the morphology

of a person that can hear or see, showing that neurological impacts and perception are undeniably connected.[22]

An additional problem is the lack of understanding among planners on how the built environment affects us.[23]
J. Golembiewski, who is studying the connection between neuroscience and the effects of the built environment, drastically describes "the world of design [...] like a highway, where each and every driver is asleep at the wheel."[24] He claims that designers are mostly unaware of the effect that their design has on the brain and therefore the mental well being.[25]
Up until today it seems rare that a building is intentionally designed with the aim of improving mental health.[26] This can be explained with the lack of research and the resulting lack of education in the field of architecture.

Not only does the built environment affect our well being, but it can become even more harmful to people with an existing mental health condition. Usually humans have developed coping mechanisms which help to avert uncontrolled reactions to environmental stimuli, but in cases of severe mental disorders the brain is lacking the ability to suppress these cues, which can lead to stronger reactions to the surroundings. These reactions can be expressed in inhibited actions like stereotypy and tics.[27] If the environmental stimuli is positive this excess of neutral excitation can be for example expressed through laughter and is considered healthy.
In general it is proven that spaces that are experienced as crowded, noisy or dangerous can trigger stress, anxiety, depression and violent behavior.[28] Even though the severity varies between individuals[29], the stress-related activation of the amygdalae is stronger in city dwellers.[30] Additionally researchers consider the circumstances of modern life to drain our abilities to pay attention, leading to mental fatigue which can be expressed through withdrawal, impulsiveness, inattention and irritability.[31]However, instead of solely harming us, the built environment can also protect and enhance our mental health. In order to do so planners need to consider certain aspects.[32]
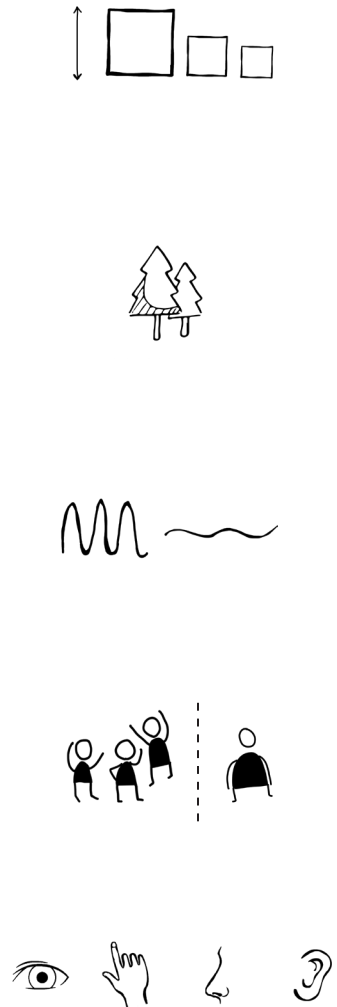
fig. 2: Elements that influence mental health

It is important that a space is perceived as non aversive and undangerous, by offering a positive narrative that suggests safety and easy wayfinding. A space should also protect vulnerable people from overexposure to undesired environmental stimuli, like noise or people. It should also be considered that not everyone is the same and therefore a variety of triggers and preferences can appear which need to be catered for.[33] Furthermore the environment should be controllable by the user to avoid helplessness, which can lead to severe distress.[34] Also other architectural elements such as light, material, floor plan layout and scale play an important role.
There are several other aspects that should be implemented, which will, in order to offer a greater overview, be listed in the attached graphic (see p.16). Additionally the aspects that I have worked with further, will be explained in more detail later on and in connection to the design.

A Toolbox

environmental characteristics with:

<div>

direct effects *

*noise / sound
air quality
light
temperature
smell*
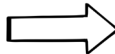
indirect effects *

*lack of control
spaces to maintain social network
incomprehensible wayfinding
lack of privacy vs isolation
overexposure*

</div>

**design strategies that help to
avert these effects:**

- *sensitive lightplanning: consider levels of illuminance; wavelength*
- *multisensory approach: consider sound, smell, haptic and asthetic*
- *creating a soundscape*
- *different levels of arousal; changing sensory stimuli*
- *positive narrative that suggests safety*
- *providing unprogrammed + adaptable spaces*
- *considering individuality*
- *offering oppurtunities for engagement*
- *supporting social interactions with possibility to regulate exposure to crowding*
- *design to gently hold attention of user through nature views, water features*
- *offering a variety of scales: from solitude to public spaces*
- *allowing for controllability to avert helplessness*
- *encouraging physical activity*
- *good wayfinding with possibility to observe: make user feel self-assured and competent*
- *offering spaces for genuine restoration*
- *protection from overexposure*

The division of mental health effectors into the category of direct and indirect has been introduced by *G. Evans* in *The built environment and Mental Health*. He explains that mental health can be directly affected by environmental characteristics like light and sound, but that it can also be indirectly influenced by affecting psychosocial processes, which then compromise mental health . For example dense buildings, without any space for social interaction would lead to the decline of social contacts and the lack of a social network which will then negatively affect the mental health.[35]
In order to organize the effectors that I have found in my research, I adapted and extended this methode. Additionally I have compiled a range of possible design strategies that can help to improve mental health through architecture.

* environment directly influences our wellbeing and mental health

* environment contributes to a change in psychosocial processes which lead to mental health consequences

Negative examples

The images below show different examples of designs that do not enhance mental health, but rather deteriorate it. Figure 3 shows a common example of a waiting room. The lack of windows results in a lack of natural light as well as a lack of orientation. The room is also not providing any sort of art or plants in order to make up for it. It has been proven that art, nature views, sound and smell have a positive effect on the stress and anxiety levels of the patient, which are usually higher when waiting for a doctor's appointment.[36]

Figure 4 shows the view out of a high-rise apartment building that I considered renting. Looking out of the window the view is limited to the opposing building, not even the sky is visible. Because there have been a large amount of pigeons nesting inside the balconies a net was installed. Even though the net might have been necessary, it made me feel locked in and even further separated from any sort of natural elements. My overall impression of the space was depressing and isolated, whilst not allowing for privacy. Even though the building was situated at a great location, I decided not to move in.

The last image shows the view out of my previous apartment in Lund. The desk that is set up in front of the window of this picture has later been moved towards the wall since the view protection on the windows was so bright that I couldn't see anything. The apartment is on the ground floor, with a pathway and the trash cans directly located in front of it. Even though the image does not show it, I always ended up closing my blinds, since people were constantly looking in or passing by. Not only did that take away all of the daylight in the initially bright apartment but it also made me feel locked in and uncomfortable. Either it was dark and almost windowless or I felt exposed and observed. All of these images show architectural features and designs that negatively influence our or in this case my mental health. These effects could have been avoided or at least diminished, if the planner had considered mental health and user wellbeing a priority.

fig. 3: A windowless waiting room

fig. 4: The view out of a high-rise high density apartment building

fig. 5: The view out of my old apartment

3 Design Proposal: Introduction

Why I am not designing a healthcare facility

"Mental health is only for the crazy" - No it is not!

As I have described before there lies a great potential in mental health promotion as well as mental disease prevention, but also a great danger in the still prevailing stigma concerning mental illness. Even though the stigma seems to be currently decreasing, due to increased education and exposure on social media, researchers only see a slight softening of the negative attributes related to mentally disordered people since the last half decade.[37] The perception of mentally ill people as "dirty, unintelligent, insincere and worthless"[38] and the related thereto behavior and discrimination against the affected, might lead to delayed or even averted help seeking behaviour[39], which can increase the illness and lead to a more drastic outcome.[40] But even if the affected person does seek treatment, the belief that they are being stigmatized due to the label of being mentally disordered still causes an alteration in behavior, social isolation and can trigger anxiety.[41] It is therefore of great importance to decrease mental health stigma.

How can we tackle stigma?
An important aspect in the attempt to reduce stigma is to educate and expose people to the matter. It is also important to break the habit of referring to mentally ill people as "them". In order to do so people must recognize that at least every sixth of us will suffer from a mental illness during our lifetime[42], which not only makes ourselves vulnerable but it makes it almost inevitable to be at least confronted with an affected person in our close circle.[43]

Even though the study of stigma reduction in the context of architecture is of great importance, it does not form the main focal point of my thesis project, but plays a great role in the decision making process of what kind of architecture I want to design.

So why am I not designing a healthcare facility?
It is important for me to offer a space that everyone will be able to benefit from. As previously explained, the step of seeking treatment, even though undeniably crucial, might be a burden some people can

not overcome. I believe it is therefore extremely important to raise awareness and decrease stigma, but also to offer accessibility and room for education. A space that is free from stigma but will still be beneficial and preventative for everyone, since mental health is not only for "the crazy" after all.
Furthermore I believe it is important to raise the sensibility in architects and planners to consider mental health in our designs, not only specifically dedicated to healthcare architecture, but also in everyday environments.
Most importantly my research focused on the architectural elements that have an effect on our mental health, even though most research has been conducted in connection to healthcare design, I see a great potential in implementing these strategies onto everyday spaces in order to help prevention in the field of architecture.
Additionally it is estimated that we spent around 90% [44] of our time indoors, so I believe it is inevitable that we as architects reflect on how these spaces affect us and do not just focus that research on specific buildings dedicated to treating the already sick.
In summary, instead of designing a space for treatment as a healthcare facility would be, I want to investigate the design of a space that benefits every one of us, and does not only address affected people but promotes mental health for all kinds of user groups.
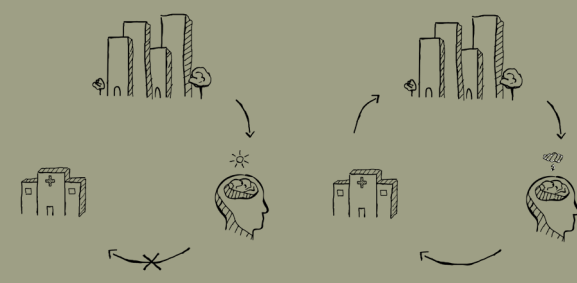

fig. 6: Treatment vs Prevention

A new typology gym: intention and goals

Of course there are already places dedicated to the stressed out and the exhausted of the fast-paced and hectic life of the modern world. Spas, Bathhouses and Retreats are specially designed to give people a break from their everyday environment that causes these effects. Unfortunately these places are mainly accessible for medium to high-income households, since a spa visit is expensive. The socially disadvantaged that are already affected the most by their surrounding environment, due to higher noise exposure, lack of greenspaces and lack of social gathering spaces[45], do mostly not have the privilege to visit these institutions. Furthermore, the positive effect of these facilities is sometimes reduced to the activities offered, the location and the aspect of leaving the stress behind for a certain amount of time, but not necessarily to the architectural concept behind it.
I want to therefore introduce a space that is accessible to everyone, in close proximity to residential areas and that can be implemented into everyday life. A place that helps to prevent mental health struggles instead of enhancing them.
Within office architecture there has been a shift towards a more user and well being friendly layout, but these concepts do not necessarily consider the individual needs, but rather apply a generalized one-for-all solution. Additionally these concepts are mainly implemented with the goal to generate more profit, because better mental health results in fewer sick days of the workers.[46] Even though this will still result in an overall better mental health, which is the ultimate goal, I find it unfortunate that the motivator needs to be money.
I have therefore decided to work with a space that is not motivated by generating a profit, but which is truly just dedicated to helping people better their mental health.

A new typology gym
This project introduces a "new typology gym", a space that connects mental and physical health, by offering opportunities for activity as well as respite. The location of the project as part of a park landscape addresses not only typical gym users but also the visitors of the

from GYM to .... ?

park. By implementing a concept that has its main focus on mental health improvement rather than the alteration of physical appearance, also people that want to visit a gym but have felt an insurmountable threshold before will find their place here. An important aspect of the project is the consideration of individual needs instead of applying a generalized solution.
Usually gyms, which are mostly functional spaces, not only offer equipment to be physically active but also enhance negative and compulsive behavior, which will in the long term result in worse mental health. Instead of only offering equipment, the "new typology gym" also offers spaces for education and reflection, in order to prevent this effect.

In conclusion, the overall goal is to offer a space that benefits physical and mental health, is accessible to the public and can be implemented to everyday life, instead of being a retreat that can only be used by a small group of people and for a limited amount of time.

4 Physical / Mental Health and Exercising

Benefits of physical activity

The link between physical activity and physical health is widely researched and also commonly known. Still more than 60% globally[47] and 33% of adults in Sweden[48] insufficiently participate in physical activities. Even more concerning is that in the group of young adolescents and kids more than 80% do not fulfill the daily exercise requirements.
Strategies that promote and enable physical activity are therefore urgently needed and are increasingly becoming a part of urban planning.

Not only can sufficient physical activity reduce the risk of coronary heart disease, ischemic stroke, diabetes, colon and breast cancer, but it also positively affects mental health.[49] Almost 2 million deaths yearly could be avoided by increasing activity levels and fulfilling the daily requirements.
It is proven that people who exercise regularly are less likely to suffer from depression, anxiety disorders and panic attacks.[50] Enhancing activity can therefore be used as a protective measure to decrease the risk of mental diseases.[51] Not only is physical activity used as

an effective treatment for people that have already fallen ill, to help overcome anxiety and depression without additional medication, but it also reduces the likeliness of a relapse compared to patients that are being treated with sertraline.[52] In patients with schizophrenia physical activity as a part of the rehabilitation can prevent long-term hospitalization. Even though the symptoms can not be decreased by exercise, taking part in workout groups enhances social participation, which encourages the maintenance of social skills and support, which then contributes to an enhanced mental health.[53]
In a study carried out amongst Chinese college students, a linear correlation between physical activity and mental health is established. The higher the amount of physical activity, the better the mental health of the participants.[54]

For planners it is therefore important to consider features that enhance the physical activity levels of the users. This could be achieved by including play opportunities for children or for example highlighting the stairs as an architectural feature instead of the elevators or escalators.
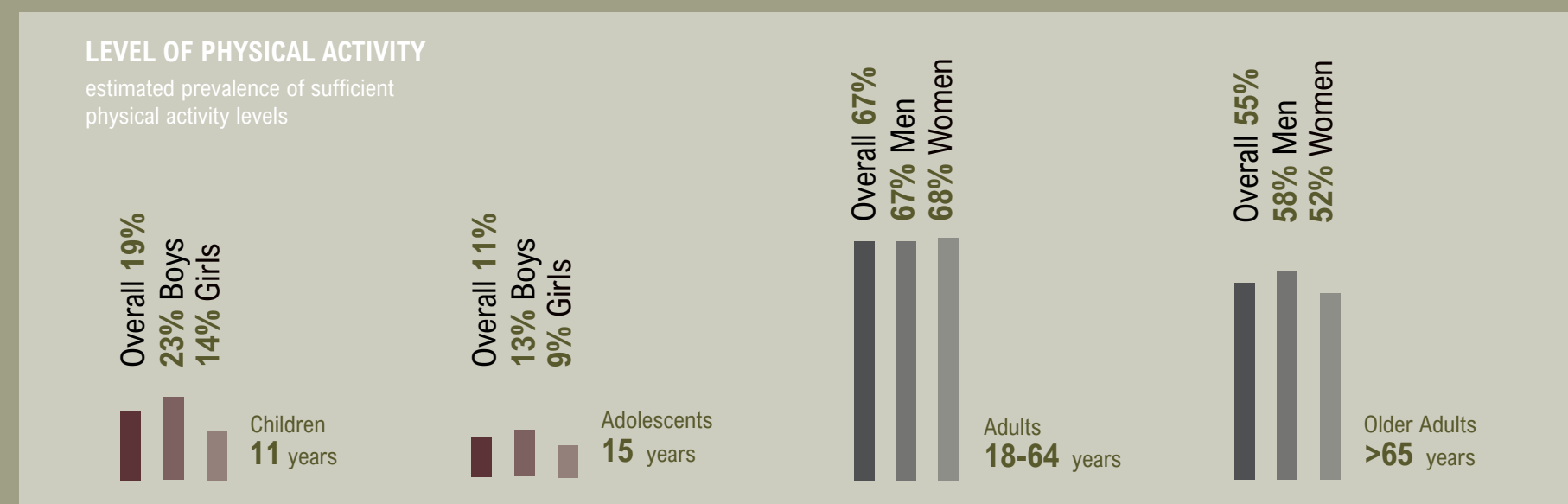
LEVEL OF PHYSICAL ACTIVITY
estimated prevalence of sufficient
physical activity levels

Overall 19%
23% Boys
14% Girls
Children
11 years

Overall 11%
13% Boys
9% Girls
Adolescents
15 years

Overall 67%
67% Men
68% Women
Adults
18-64 years

Overall 55%
58% Men
52% Women
Older Adults
>65 years

fig. 7: Level of sufficient physical activity in sweden

Anxiety and disordered behavior in the gym

As previously elaborated, exercise can play a great role in enhancing physical and mental health. Not only does it help to prevent several different illnesses and increase the overall wellbeing but it can also be used as a treatment for depression and anxiety disorders.
Unfortunately gym environments do not always contribute to these positive effects but are likely to even decrease mental health in the long run.[55]

Due to the high pressure on society to fulfill an unreachable beauty standard, exercise levels have strongly increased in the in the last couple of years.[56] Even though most people do statistically still move far to little,[57] the group of people that does exercise regularly is prone to developing eating disorders and compulsive behaviors. Men that regularly exercise at the gym show 3 times higher scores in the Eating Disorder Examination Questionnaire (EDE-Q) than the general population.[58] The occurrence of eating disorders in female gym users is equally high[59], even though men are overall proven to be more content with their bodies than women. Among female teenagers up to 60% aim to lose weight, even though their weight is within the optimal range.[60]
In a study among female gym instructors (which act as role models for participants) conducted in Sweden, 35% of the participants stated to have previous experience with eating disorders, while 11% claim to be still struggling with an active disorder. Due to the stigmatization and shame around the topic the actual numbers are likely to be much higher.[61] The high occurrence of eating disorders are proven to be linked to "sociocultural values of thinness"[62] in our

society. Being thin is still greatly associated with beauty, success and power, and is therefore strived after.
Unfortunately compulsive behavior is even further fueled in the gym environment, as it is accepted and even encouraged. Working out the most and becoming the strongest or thinnest seems to be the ultimate goal while the health aspect of physical activity is increasingly neglected.
Another study concerning "gender-typical" norms in the gym states that men are mostly affected by evaluation concerns related to comparison with other users, while women are mostly concerned about being judged about their physical appearance and competence.[63]
A coping mechanism to avoid these evaluation concerns is to either entirely avoid scenarios that evoke that feeling, which can lead to avoiding physical activity in general or to try to change the factors that appear to have the power to influence how other people might evaluate you, which can then lead to eating disorders.
A further problem of the typical gym environment is the prevailing masculine dominance of the space, which can discourage female users from participating. The previously mentioned study highlights specific "gender-coding" of certain exercises. The bench press is perceived as a masculine exercise, while the stairmaster is perceived as feminine. Due to these prevailing norms, women also tend to avoid more (perceived as) "masculine" exercise and vice versa, which then more strongly encourages the norm.[64] The enhanced "gender-coding" of the space further fuels evaluation concerns in women, with an outcome of increased avoidance of the space which then leads to further perceived male dominance.

criteria of
BULIMIA NERVOSA
include:

* self-evaluation influenced by bodily appearance and weight
* recurrent inappropriate compensatory behavior to prevent weight gain: self-induced vomiting, misuse of laxatives, diuretics, fasting, or **excessive compulsive exercise** [65]

definition of
EVALUATION CONCERNS

* peoples interest in what others think about them
* experienced more strongly in females
* further enhanced by public participation in behavior that is perceived as "counter-normative"
* feelings of being **judged, observed, evaluated**[66]

Problems of common gym environments: my experiences

fig. 8: Crowded cardio area

fig. 9: Male dominated free-weight area

I personally really enjoy working out, but I do not necessarily like gyms. There are some gyms that I feel comfortable in, but at most gyms it feels like a battle every time to get myself to go. Why is that? In my experience gyms are mostly just one big room, sometimes maybe two, that offer workout equipment, tightly arranged, with little to no possibilities to retreat. Additionally the atmosphere in my opinion feels rather competitive. Who is the strongest or has the best figure? Some gyms further encourage this mentality by advertising specific shred programs or working with fitness models. If you do not look like them, what are you even doing here? The next page shows a couple of examples from one of the biggest gym chains in Germany. Not only does the gym advertise with extremely lean fitness models, but they also encourage users to join weight-loss challenges and portrait it as desirable to workout every day, even though one might not be in the mood for it. The slogan of the chain "simply look good" perfectly summarizes the motto behind the brand. Looking good is all that counts. On their instagram account another post reads "Train so hard that you don't need photoshop.", which implies that if you don't workout hard enough and go to the gym every day and lose all that weight, your true self is not acceptable and needs to be improved with photoshop. Not only does this trigger compulsive behavior and potential eating disorders, but it also highlights their focus on improving appearance, rather than helping people to become fit, happy and healthy. I have myself struggled with disordered eating behavior and still do sometimes and have experienced a compulsive need to workout. Missing a workout would leave me feeling anxious and afraid of gaining weight and I would in that case restrict my diet even further. These patterns are hard to overcome and being exposed to an atmosphere like that is certainly triggering. Of course the fitness industry has a huge lobby and playing on people's insecurities generates more money. You feel fat because you do not look like one of the fitness models on the wall? Not to worry, join our weight-loss program for an additional 10€ or buy this Fittea that will suppress your hunger. Happy and content people just don't pay as much.

In my personal environment it is rare that a person has an actually healthy attitude towards working out. Either people workout excessively or they do not workout at all. Talking to people that do not workout or go to the gym, they usually explain to me that they don't like the gym because they do not know how it works or feel too weak, or because they experience the atmosphere to be dominated by posers and bodybuilders. I personally also have problems getting myself to go to the gym when I don't feel good in my skin. I know a workout would make me feel better, but being exposed to all those people in the gym that are stronger or leaner or more competent than me... no thank you. It is ironic that especially when we should workout, because we have been moving insufficiently or are feeling down, the gym becomes this intimidating space that seems impossible to enter. I need a gym that I can also go to when I do not already feel great, when I feel uncomfortable and sad, or when I just want to be left alone.

Toxic advertisement at the most famous german gym chain

fig. 10 **"4 WEEK WEIGHT-LOSS PACKAGE"**

fig. 11 "Give a like to all the girls and boys that **always** make it to the gym. No matter if they want to or not."

fig. 12 **"McFIT simply look good"**

fig. 13 "Train so hard that you **won't need Photoshop**"

5 Design Method
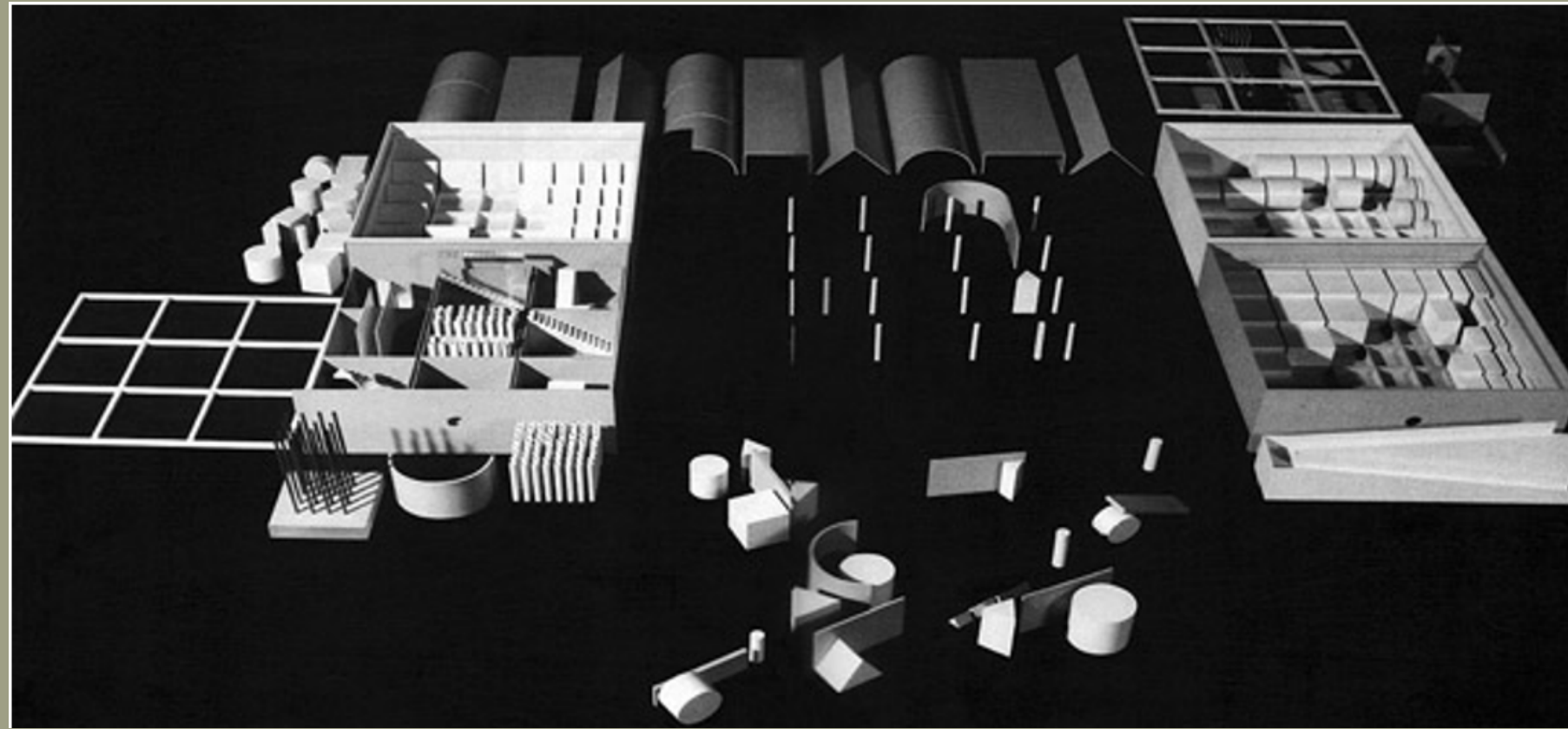
The 9-square problem

The 9-square problem is a design exercise developed among others by *John Hejduk* at the University of Texas in the 1950s.[67] The exercise has been designed for newly admitted students, in order for them to get acquainted with architectural elements like the "Grid, frame, post, beam, panel, center, periphery, field, edge, line, plane, volume, extension, compression, tension, shear, etc."[68] The arrangement of the elements on a 9-square grid focuses on spatial figures, circulation and composition, rather than on the relation between program and form.[69]

Hejduk describes that the intention of the exercise is for students to understand the relationship between two dimensional drawings, axonometric presentation and the three dimensional form[70], while the framing of the exercise ensures an abstract architectural language.[71] The task consists of a 9-square grid, a predefined kit of parts and a set of rules, that allows for various executions and outcomes. Since the development of the exercise in the 1950s, there have been numerous interpretations. Especially in the 1970s-1990s the 9-square problem has been a common introductory studio task[72], but its relevance is tangible up until today.
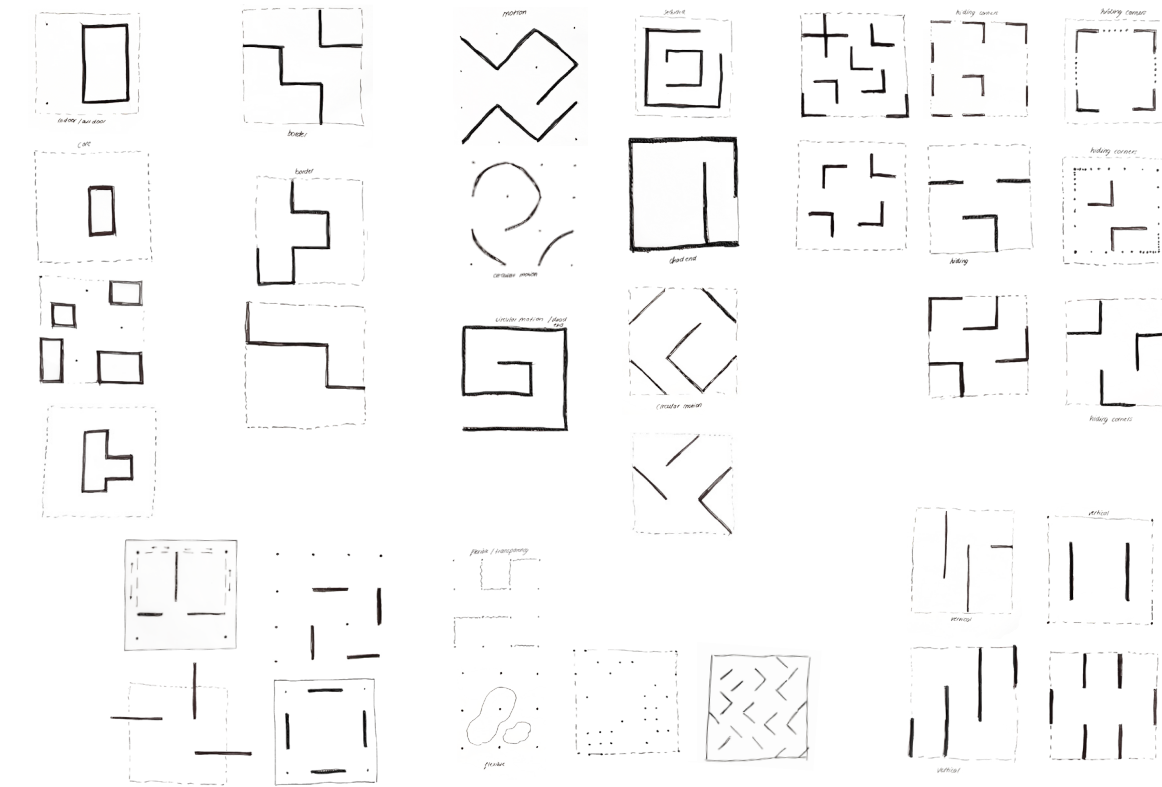

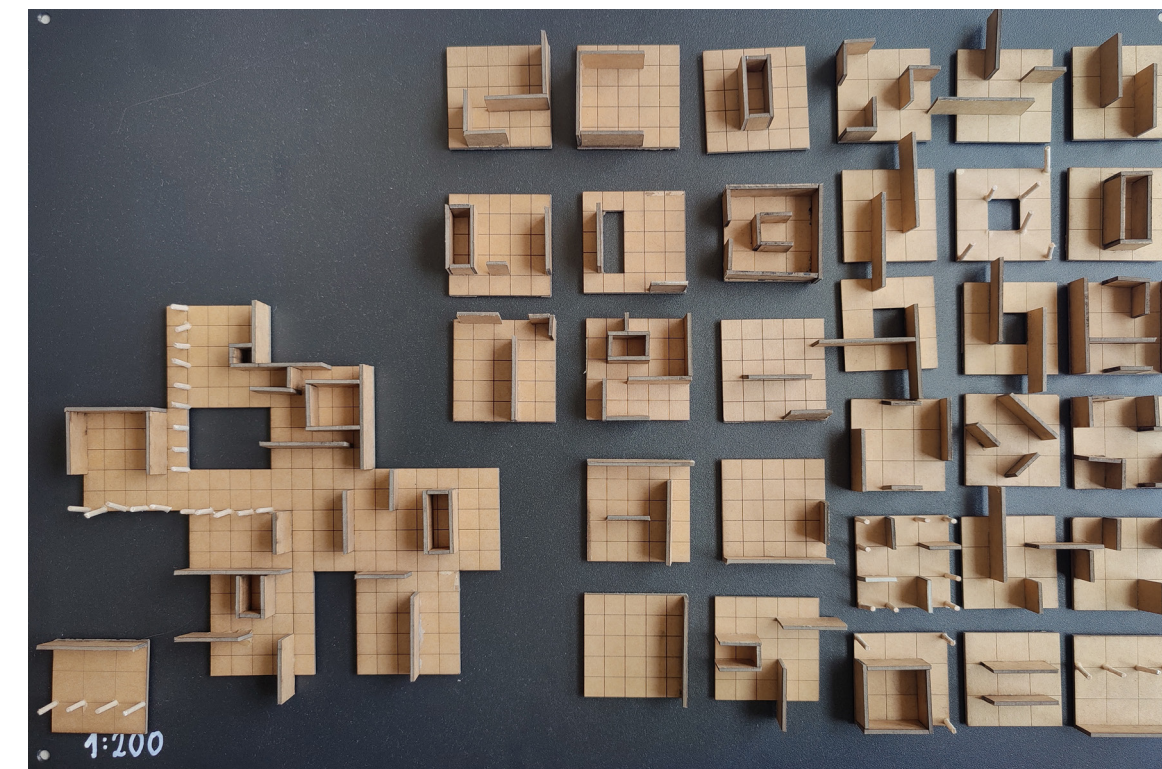fig. 15: Configuration of architectural elements

fig. 16: Magnet board with models of the configurations

Introduced to the 9-Square problem by my supervisor, I started my design process by creating several two dimensional drawings of possible spaces, which I afterwards translated into small three dimensional models. Since the scale is much smaller, and the designs are much less detailed, than the original 9-square task intended, the goal was not to learn the relation between architectural elements per se but to rather build up a catalog of potential spatial situations that would help me in my ensuing design process. Without assigning a specific program or function to the models, I started to assemble different combinations of spaces that would lead me to interesting spatial configurations. Even though there was no specific function, I started thinking about the qualities I wanted my proposal to fulfill and identified typologies that could help me later on.

After firstly assembling the models to different compositions, I started to draw the configurations that I found had the most potential. While drawing I thought about the different qualities the spaces have and what kind of role they could play for my specific concept. An important aspect that I included from the beginning was the outdoor pathway that connects the different spaces with each other. I also considered the openness and closeness of the spaces and the orientation, either towards the pathway or away from it. What was also important for me was to include barriers that help to distance the volumes from each other. By more loosely connecting the models, courtyards and framed in-between spaces developed.

After deciding in which direction I wanted to go, I continued my process, by adding potential roofs and a second floor. Here I played with overhangs and setbacks, as well as covered and uncovered spaces.

Since it was a priority for me to create certain atmospheres, rather than filling a room with a function, I focussed on how these configurations could make me feel. What kind of qualities would they have? An enclosed space could make the user feel trapped, while a very open space could be very exposing. Specifically set walls, could help to guide people and corners could give a chance for retreat. Having developed configurations that I found appropriate, I then began to design more site-specific. By translating the sketches into the right scale and context I realized that the 9-square grid does not further make sense, so I adapted the grid to a 5x5 grid á 2m and arranged the elements accordingly. From here on my design process continuously developed and evolved.
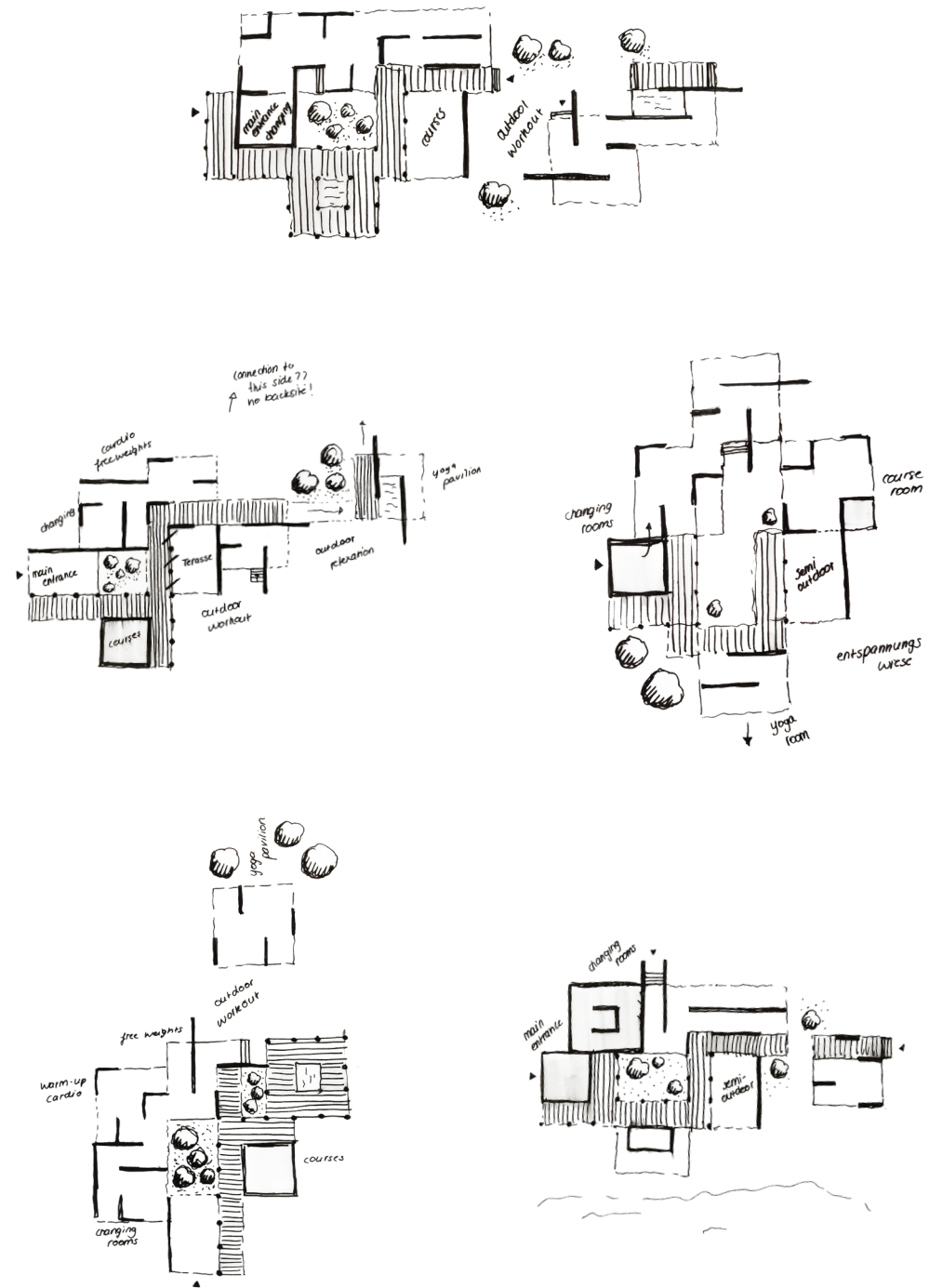

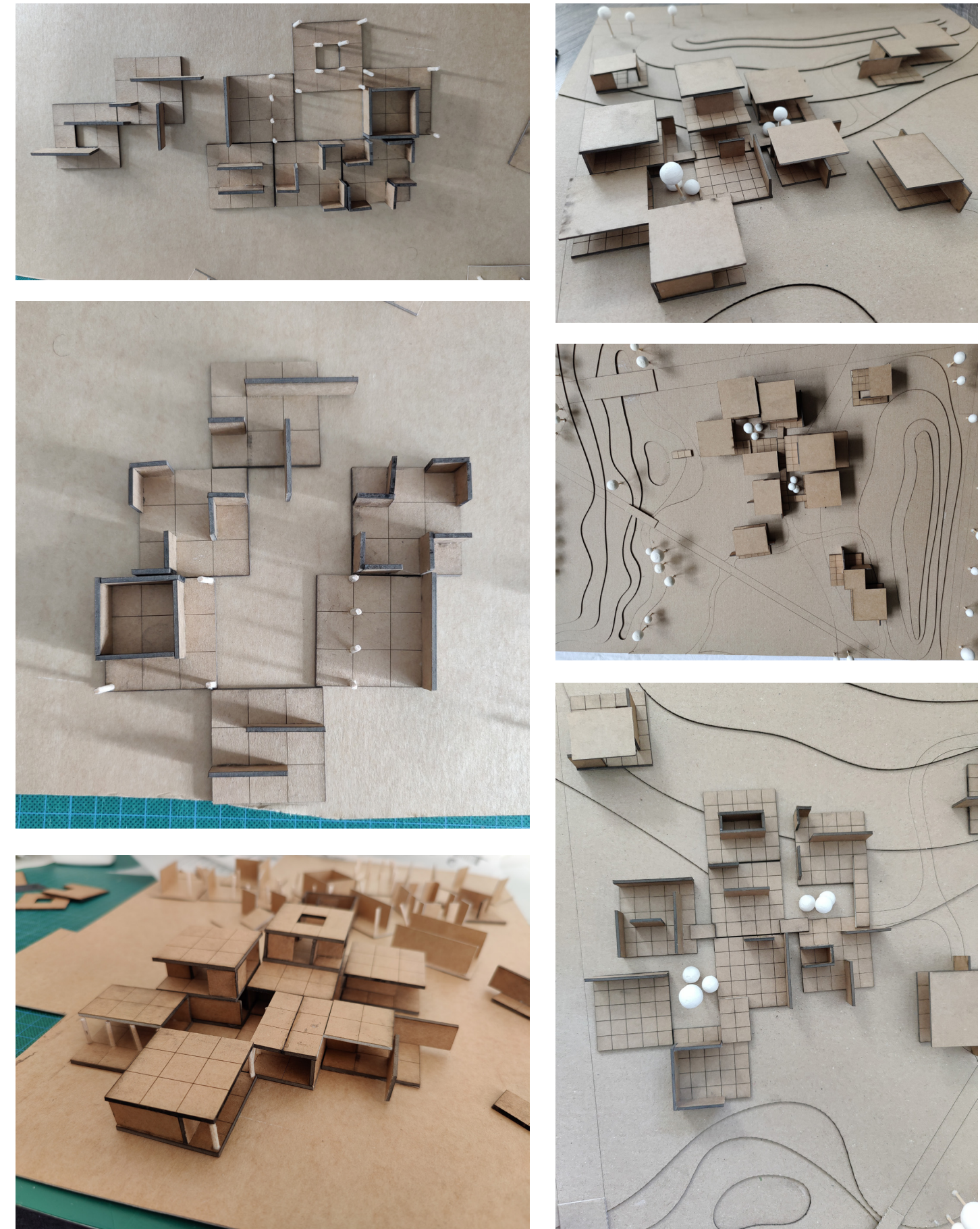*fig. 17: Results of the combination of the configuration models*

fig. 18: Combination of models

6   The Site: Hyllie

Current development strategy for Southern Hyllie

Hyllie is a newly developed city district in southern Malmö. The vision for the area is to create a mixed, dense, attractive and green urban landscape, by prioritizing recreational green spaces, mixed functions and offering various meeting spaces. Due to its proximity to the Öresunds bridge and Copenhagen, it does not only play an important role locally but also reaches global importance. By aiming to become Öresund region's most climate smart area, Hyllie is a pioneering project that has gained international attention. Next to environmental sustainability, social sustainability is a key factor in the development plan. The district is designed to encourage movement and social interactions in order to increase public health and social inclusivity. In addition to becoming Malmös second city center, Hyllie also physically connects the segregated areas of Vintrie, Svågertorp and Lindeborg and complements the surrounding districts with trade, service and cultural functions.[73]

I have chosen Hyllie as my site because it is a newly developed area with focus on social sustainability and movement. With the aim of becoming Malmös second city center I see a chance of adding another important brick that I believe can be seen as a pilot project for future developments to further help social sustainability and overall public health. The location also addresses the surrounding districts that are partially socially disadvantaged and can therefore become an important meeting and anchor point for people of all social statuses. Due to Hyllies international role the project does not only gain local but also global attention, which further helps to raise mental health awareness. Another beneficial aspect is the high occurrence of green spaces, that makes it easier to include vegetation and nature views to the space. Lastly I chose this site because most of the planned development does not yet exist. This helps to introduce the project right from the beginning of the construction, rather than being perceived as a potential parasite later on.

fig. 19: Site in southern direction

fig. 20: Site in northern direction

fig. 21: The northern part of the park

realized development (may 2022)

planned development

planned green space

realized development (may 2022)

fig. 22: Development plan for southern hyllie

The Hyllievångsparken

fig. 23: Visualization of the heart of the park by Nyréns Arkitektkontor/Plot Studio

fig. 24: Park-proposal by Wingårdhs

In 2018 *Nyréns arkitektkontor, Plot Studio, Ekologigruppen, Marcus Abrahamsson arkitektur and Linders plantskola* have won the international competition to design Hyllie's district park.[74] Their proposal "Framtidens park är aldrig färdig" ("the park of the future is never finished") focusses on offering high biological values[75] and encourage user participation.[76] The concept of the everchanging park describes the natural processes of constant change, and the possibility for the visitors to shape their surroundings. Developed in three stages, the park is allowed to grow organically over time. Currently only the northern part of the park exists, but the intended finalization is planned for 2029. The planners describe the goal of their proposal is to bring people together by offering inclusive places, to arouse creativity and encourage participation. The park is intended to mix the urban with the rural and the natural with the commercial. A stormwater path to handle rainwater meanders through the park, connecting different spaces with each other. A hiking trail runs through the lush and wild landscape, offering outdoor gym equipment for children and adults. In the northern part Malmös largest greenhouse, that functions as a district garden, is planned.[77]

My proposal integrates into the proposed park structure by acting as an addition and progression of the outdoor gym loop. Intertwining with the hiking trails, the design offers indoor and outdoor workout spaces, as well as covered terraces and a kiosk and further strengthens the concept of user participation and inclusivity. Due to its modularity (see chapter 7, Timeline) the structure can organically grow with the park landscape and adapt to the user's needs. Next to encouraging physical activity, the complex also offers spaces for education and learning and invites the user to understand the importance of an active and healthy lifestyle, which additionally allows visitors to take in the park on another level.
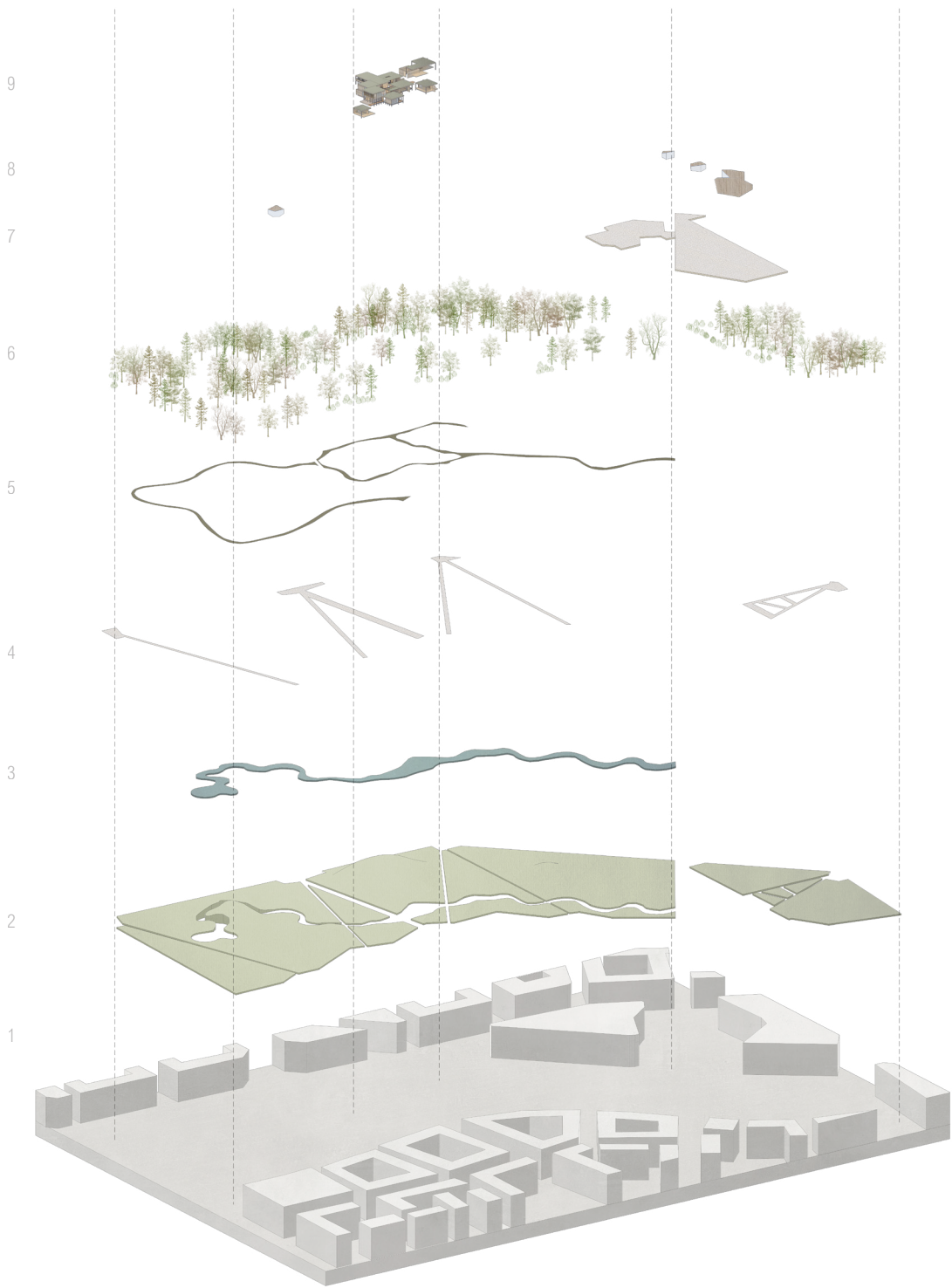

fig. 25: Masterplan by Nyréns Arkitektkontor/Plot Studio

7   The Proposal in Detail

fig. 26: Masterplan

Adding an additional layer:
The gym for everyone

9	THE GYM
8	INITIALLY PLANNED BUILDINGS
7	SEALED SURFACE
6	VEGETATION
5	WALKING TRAIL
4	SHORT CUTS
3	THE RIVER
2	GREEN AREAS
1	SOURROUNDINGS

To increase the acceptance and appreciation of the buildings I am assuming that my proposal is part of the initial park design. The concept of the evergrowing park introduced by the architects includes several different layers, for example a network of pathways, vegetation, floor materials, and built volumes. My concept simply adds another layer to the park, which can also grow over time (see chapter 7, timeline and maintenance) and intertwines naturally with the other layers.

By introducing several smaller buildings instead of a large volume, the fragmentation of the park is maintained and additional opportunities to engage with the landscape are offered.

The park-visitor and the gym-user

What is the relationship between the gym-user and the park-visitor?

On the first sight these two user groups might seem to not have too much in common. It might even appear that the park-visitor could be disturbed by the gym-user and the building in the park. To avert this effect it was important to me to not create a parasite that takes away from the park but to instead offer an additional benefit for the visitors. The proposed building is not solely a gym, but rather a public space for activity, retreat, relaxation and exploration. These functions do not only address the typical gym-goer but also the park-visitor.

Even though both user groups might visit the place with different intentions, in the end both groups can benefit from the park and the building equally. Maybe the park-visitor intended to go for a walk and enjoy nature, but due to a change in weather he finds shelter underneath one of the outdoor pavilions. Here he can sit or lay down and still enjoy his surroundings, while otherwise he might have just gone home. It is also here where he first becomes aware of the possibilities the buildings offer, his curiosity is awakened and during his next park visit he will try out one of the outdoor gyms. The gym user on the other hand might at first visit the complex to make use of the gym equipment, but because he took the quickest route through the park to reach the building, he realizes how good this walk through nature feels. Even though the next day is usually his rest day, he still comes back to take a stroll through the park and buy a smoothie at the kiosk.

By catering for different needs and situations, the park-user might in the end become the gym-goer and vice versa. This way both groups can benefit from each other and the pavilions.
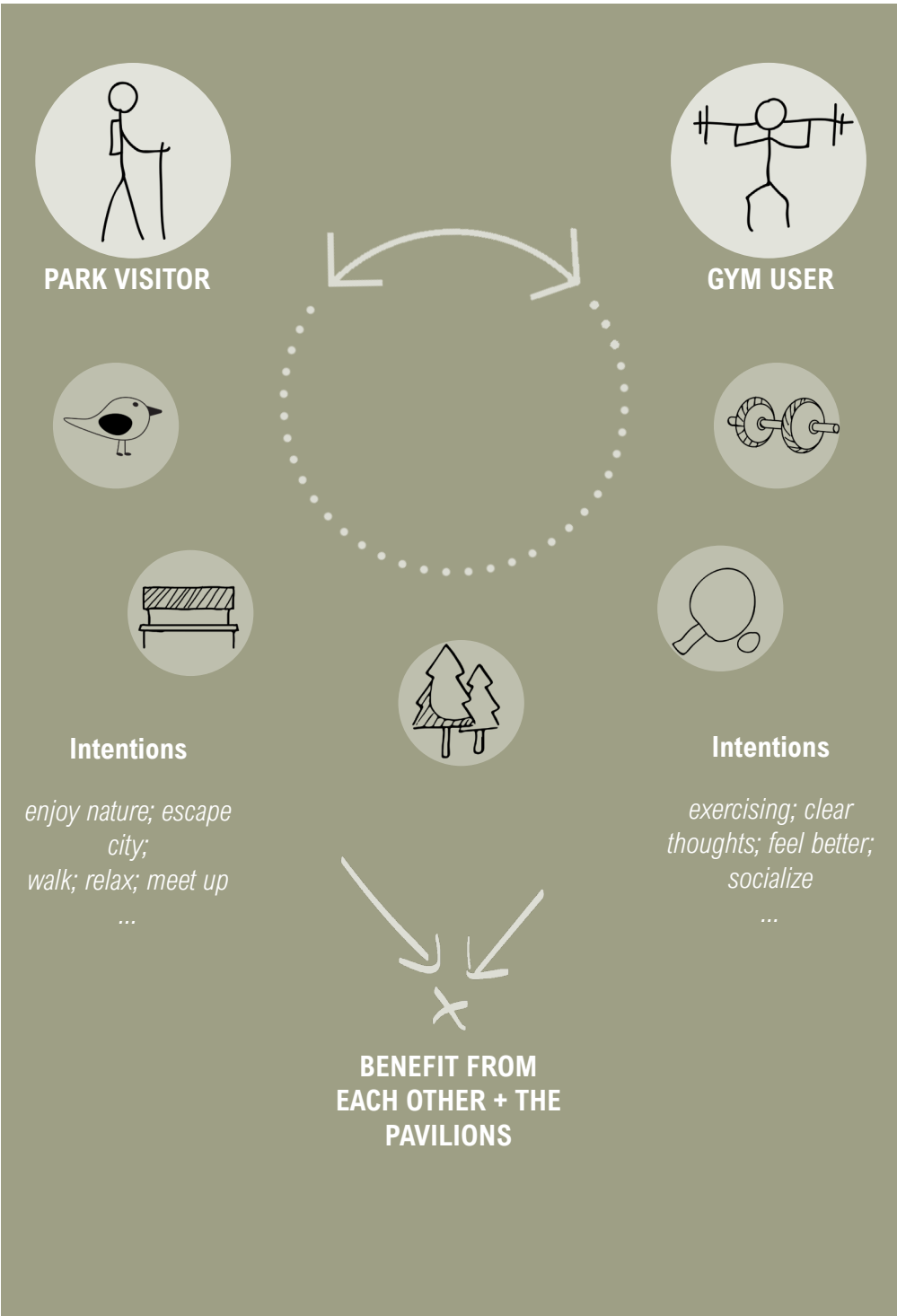

fig. 27: The relationship between park visitor and gym user
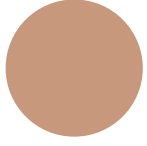
Concept and Program

One of the main goals of the project is to offer a space where everyone feels welcome and included. To achieve that it is important to consider that everyone has different needs and wishes, and a generalized solution is not suitable for all. Of course it is not possible to design a space that will perfectly reflect the wishes of every individual, but an approach in that direction is to offer a variance of different spaces, in scale, function and execution. Giving people the option to choose and adapt their surroundings, gives a feeling of greater perceived control, which averts helplessness that results in stress and avoidance.[78] The possibility to choose the amount of people or sound one wants to be exposed to, as well as the scale of the space or the level of participation, helps additionally for people to find their place in the complex.

Instead of dictating a specific program, the project rather offers spaces with different levels of adaptability. Some spaces are more obvious in the function they fulfill while others are completely unprogrammed and can be appropriated by the needs of the user. This decreases the expectation of what role one should fulfill when visiting the gym and lowers the threshold for people who would otherwise not feel accepted in a gym environment.

Another important aspect to increase mental health is to offer opportunities for engagement and social interaction.[79] The design encourages participation in several different locations, while always allowing one to keep a distance to observe, making it easy for the user to take part or stay away as preferred.
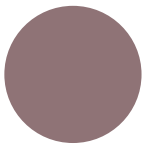
The main entrance point is oriented towards the main cyclist and pedestrian walkway. Here people can come in, get information about the gym and how it works or just buy a snack for a picnic in the park. Without having to enter the building, visitors can also walk the boardwalk through the complex and explore what the place has to offer. It is open for everyone.

From the main entrance one can access the second floor. Here spaces for individual study, group meetings or workshops can be found. The goal is to offer visitors a calm space to study that they might not have in their own home. The bigger scale room can be used for workshops or lectures about mental health or even as a workout room.

Along the walking trail and the boardwalk, outdoor gym equipment can be found. Here people can break out from their walk and get motivated to explore the complex further or workout in a more casual atmosphere. A climbing wall in the middle of the complex allows kids to be active in a playful way. Even the smallest ones can try to balance on one of the wooden beams.

The natural areas around the building offer several different activities. Park visitors who just want to run by or take a walk are not disturbed by the complex, but several different gestures invite people to participate. The landscape around is diverse and allows for relaxation, observation, sunbathing, gatherings or open play.
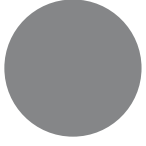
There are several different rooms that offer typical gym equipment. No matter if it is preferred to workout alone or in a bigger group, here anyone can find a space that best fits their needs. Open group classes are offered in the eastern part, inviting bypassers to join in. On the second floor, users can get an overview of the complex or stretch out on the balcony.

Additionally, unprogrammed indoor and outdoor spaces can be found. Here visitors are offered a quiet spot to retreat, find shelter, do yoga or appropriate the space to their needs. If someone does not feel comfortable in the common gym environment here might be the perfect place for them. Even if you just need a calm space to read a book you are welcome to come in.

Typology and Topography

In its original sense a pavilion can be defined as a single-bodied building, that is usually temporary and lightly constructed. Pavilions are generally understood to be placed in a garden or park, with a flexible program.[80] A clear definition of the typology seems nonetheless uncertain, as the notion of what a pavilion can be is fluctuating over time.

Looking at the Nordic Pavilion in Venice, it is obvious that the construction is neither light-weight, nor temporary, since the building with its large concrete elements was constructed more than 60 years ago.[81] Still it is undeniably a pavilion.

Gonca Tuncbilek states that the architect can redefine and set up his own rules, concerning what the definition of a pavilion is and its definition therefore changes according to the interpretation of the architect.[82]

I personally interpret the pavilion as a building in a green space, that is submissive to its surroundings. For me a pavilion is also a rather singular structure, that can stand alone or form a larger composition if combined with a second pavilion, while it should still fulfill its submissive role. In this sense I will refer to my building as a composition of various pavilions, while someone else might not interpret it as that.

Since my proposal is located in a park, it was important for me to design a structure that is submissive to its surroundings. The goal is not to overshadow the vegetation, but to rather offer spaces within it, spaces that further enhance the experience of the surrounding nature. Besides two of the volumes, all pavilions are only one storey, and rather compact in their execution. If two volumes are merged together, their original singularity is still readable, enhancing the pavilion character. Only the buildings that include the main entrance and the large workout space, are combined with an additional second storey. In the case of the workoutspace, the height difference to the other pavilions is kept small, by submerging the volume. This way the building height gradually decreases from the south. The building that is located along the main pedestrian / cyclist path, is also extended with a second storey. This creates a high point that clearly indicates the main entrance of the complex, which makes it more accessible. Even though the topography is declining towards the east, the pavilions that are connected by the main path are on the same level. This leads to a gradual elevation of the pavilions, as visible in Section B-B, making the structure appear more lightweight towards the waterbody.

Section A-A shows the merging of volumes towards the core, while other pavilions are physically separated and stand for themselves. Still the modularity of the original volumes stays clearly recognizable.
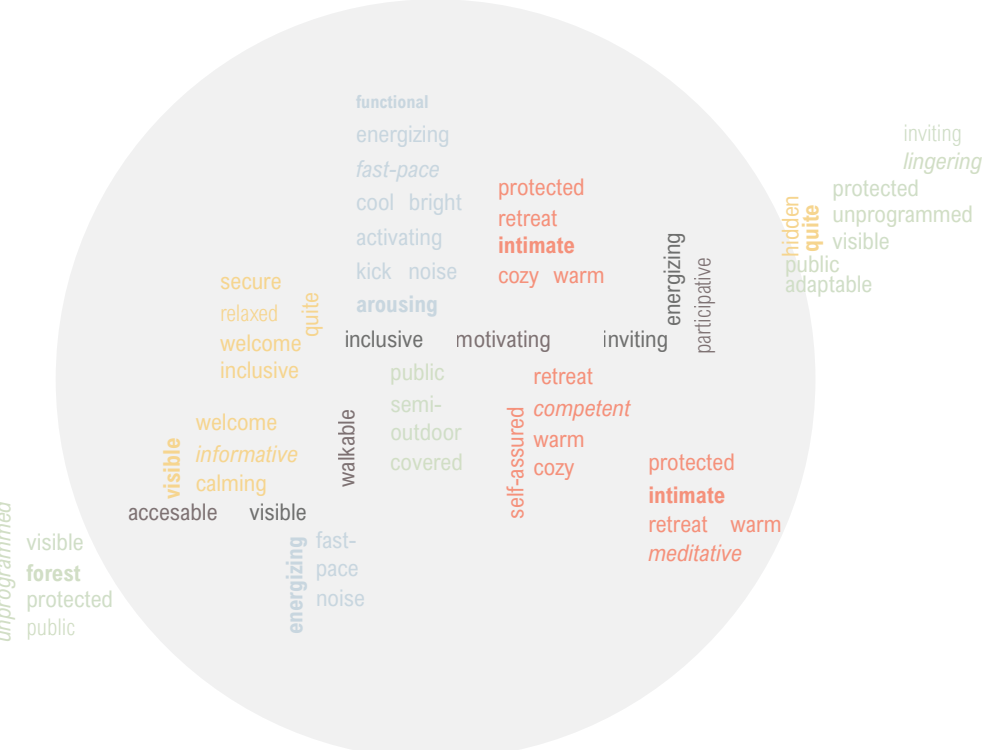

*fig. 28: Section A-A*

fig. 29: Section B-B

fig. 30: Section C-C

The Pavilions: a multisensory approach

Instead of dictating specific functions, my design approach was to rather create spaces that evoke certain emotions. Some spaces should feel welcoming and open, while other spaces can arouse excitement and have an activating effect. In contrast other spaces have a calming and cozy atmosphere instead. In this way the user can find a space that positively enhances their mood, or changes their wellbeing to the better. If a person for example feels anxious about visiting the gym, a fast paced, bright and loud room will further trigger their anxiety. In this case the person will benefit more from a room that has a calming effect. For another person that is already in a positive and active mindset, a highly stimulating environment will further arouse excitement and motivation. In this way everyone can find a space that will have a positive effect on their individual mental wellbeing. Since the mood can fluctuate constantly, a person that might enjoy a calm space on one day, the next day a more activating space might fit their mood better. This lowers the threshold of visiting the complex also on days where one does not wanna be surrounded by a typical gym environment, but still wants to be physically active.

In order to achieve these specific atmospheres it was important to me to not solely rely on my intuition but focus on an evidence based design process. As mentioned before, certain aspects of the built environment can have an effect on our mental health and I have previously introduced several design strategies that help to avert these effects (p.14). On the coming pages I will elaborate more in detail the elements that have played a decisive role in my design process.
A very important aspect was to consider not only the visual aesthetic of my proposal, but also include all other senses, since smell, sound, and haptic have a strong influence on mental health as well.
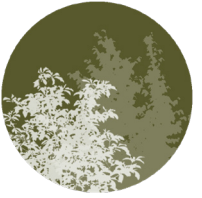
NATURE

In a society where 50% of the global population lives in cities[83] and individuals spend up to 90% of their time indoors[84], it is especially important to offer possibilities that help us reconnect with our natural environment.
In contrast to the urban environment, which largely negatively influences mental health[85], natural environments bring a lot of benefits to our overall wellbeing. It is proven that exposure to natural elements improves the mood, lowers stress and anxiety levels, improves cognitive performance and productivity and has a positive effect on the heart rate.[86] These effects can already be evoked by visual exposure to nature but are further enhanced by a multisensory experience.[87] In designs that additionally consider auditory and olfactory elements, most effects are higher than in solely visual concepts. Especially auditory concepts additionally positively influence the working memory[88], while designs that consider the sense of smell leave the visitors with a more memorable impression of the place.[89] But, it is important to acknowledge that too much stimuli might lead to distractions.[90]
In order to generate exposure to natural elements, planners can for example implement indoor plants, nature views and water features into their design. In locations that do not offer direct exposure to natural elements, another possibility is to simulate movements found in nature, through e.g. mimicking the shadow of a tree or the reflection of water covered skylights.[91]

BARRIERS + CONTROLLABILITY

The negative effects of being exposed to unwanted noise, smell and people have been previously explained, but the larger problem lies in the uncontrollability of these environmental factors. As long as people have the possibility to evade these situations, negative effects can be averted. Being exposed to uncontrollable stimuli can lead to helplessness and distress, which negatively influences mental health.[92] Even though it is not always possible, especially in public spaces, to allow every individual to control the environment, a solution is to offer the possibility to choose the amount of preferred exposure, by offering a variety of different spaces. In order to create these spaces certain barriers are needed. These barriers help to guide visitors and make it obvious which spaces that can be accessed and which spaces that should be avoided. (see p. 47)
Another important aspect is to additionally lower unwanted barriers and thresholds that might be insurmountable for certain people. This includes for example the fear of not belonging, which can lead to a general avoidance of a place. In order to lower these barriers it is important to create a welcoming space for several different user groups instead of applying a one-fits-all approach, as well as allowing people to gradually get acquainted with the space. This additionally ties back to controllability by allowing people to evade a specific situation if they feel uncomfortable but offering them another space that might better fit their needs. On top of that architectural elements like openable windows and curtains help to make people feel more in control.

SMELL

As well as noise, scent as an ambient condition can have a strong impact on the exposed. Even if the occurrence is imperceptible, mental health and wellbeing can still be compromised.
Pleasantly perceived smells, like lavender or peppermint, are proven to enhance the mood and positively influence cognition and behavior.[93] A study carried out in the waiting room of a doctors office shows that installing a scent diffuser has a positive effect on the patients anxiety levels and helps to calm them down.[94]
In general pleasantly perceived scents positively influence the mood and help decrease anxiety, while unpleasantly perceived smells have the opposite effect. The use of different smells to alter people's behavior has primarily been studied in the context of consumer behavior[95], but the findings can also be implemented in non-commercial projects. By inviting wanted smells into the environment and eliminating unwanted smell, mental health can further be improved. Vegetation like lavender and peppermint can be placed strategically to achieve the desired effects of a space, while ventilation systems help to avoid unpleasant odors. Additionally planners can consider the scent that the construction materials radiate. For example specific types of wood, like pine and cedar, can have a long lasting scent, while other materials are neutral.
Since the smell is the most memorable factor of a space[96], creating a specific smellscape can also help to create a positive place attachment.
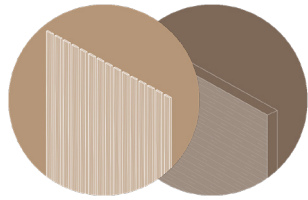
MATERIALITY

Specific research that connects the effect of materials to mental health are (to my knowledge) currently non-existent. A study that observed the emotional response to certain textures when being touched found out a correlation between the soft- or roughness of the texture with evoked emotions. In this study participants found soft and gentle materials more pleasant to touch, while rough textures were perceived mostly unpleasant. Surprisingly soft surfaces were also related to sadness. The author speculated that these responses are likely linked to objects that are associated with the texture. For example, the touch of marble might evoke sadness, due to its association with monuments.[97]
Even though this study is very interesting, I do not think that it can be directly translated to architecture. For example in the study the touch of furry materials mainly evoked happiness[98], but applying that to a gym design would firstly not make any sense functionally, but I also believe the perception of fur in this context would be more negative, potentially filled with disgust. What I do find interesting about it though is the power of association and conditioning with certain materials and textures.
Several other studies agree that places and things that are visually perceived as attractive make us happy.[99] When looking

at a scene that we consider beautiful, an opiate-rich pathway in the brain is activated, which gives us a morphine high.[100] Visual aesthetics should therefore not be neglected.
A possibility of integrating materiality in mental health beneficial design is to consider the associations and expectations that can be evoked through conscious design decisions.
Expectation plays a fundamental role in the placebo effect. It is proven that the expectation alone that a product or place can heal you causes a release of nerve chemicals in the brain as effectively as a drug.[101] The expectation of entering a healing place can trigger the reward cascade,[102] which means by designing a space that could universally be associated with healing an actual healing effect may occur.
In this case more specifically this means by designing a place that aesthetically resembles commonly known typologies for healing (spa or retreat), the expectation of visitors that this place will be beneficial for their health and wellbeing can already trigger a healing effect.

SOUNDSCAPE

Being exposed to unpleasant sounds can quickly become a stressor, especially when the originator is uncontrollable. Even background noise with moderate levels of loudness can have a long lasting effect on the overall health.[103] Urban noise from traffic, infrastructure and residential density can increase the risk of heart diseases and strokes, as well as trigger depression, anxiety and chronic stress.[104] Even if the exposed person is not consciously aware of the background noise, health damage still occurs.[105] It is therefore especially important to protect the affected from unwanted noise and create a pleasant soundscape instead.
Design strategies to influence the urban soundscape can include the appropriate localization of functions and noise screening, the creation of biotopes for songbirds, the inclusion of water features and vegetation and the consideration of materials and sound art.[106] Particularly suitable to mask unwanted sounds is the implementation of vegetation like bamboo and aspen which have a strong rustling effect. Additionally, diverse vegetation that provide shelter and food, as well as accessible water features, attract songbirds and other animals.[107] Not only does this positively affect mental health through the auditory aspect, but also through the visual and olfactory perception. Another aspect to consider

is the use of specific walking materials. Wooden pathways are perceived especially positively, while gravel paths help to warn from other approaching people.[108]
Next to creating a natural soundscape it can also be helpful to include music and soundart. Music, that is slow-paced and soothing, can prevent high blood pressure and release stress, while fast-paced music has a more arousing effect.[109] According to Apter's reversal theory very low arousal can be perceived as either pleasant and relaxing or unpleasant and boring, while high arousal can be perceived as exiting or anxiety enhancing.[110] This means depending on the mood the listener is in, either level of arousal can have a positive or negative effect and it is therefore important to offer several different spaces with various levels of arousal, so that the user can chose the space with a positive effect in their specific situation.

LIGHT

Another important aspect to consider is appropriate and sensitive light planning. *The World Health Organization* (WHO) states that inadequate access to daylight can increase the risk for depression by 60%.[111] Light also has a direct effect on our circadian rhythms, hormone release and body temperature. Workers that do not have access to daylight during working hours, sleep on average 43 minutes less per night and show overall lower scores in the quality of life, compared to their light exposed colleagues.[112] The disruption of the circadian rhythm by light deprivation, is directly linked to sleep disorders, obesity, diabetes, depression, bipolar disorder and seasonal affective disorder (SAD).[113] Light exposure also has a direct effect on the immune system and it is proven that women who work in night shifts have a 30-80% higher chance of getting breast cancer.[114]

In his book *Happy by Design, Ben Channon* describes natural daylight as a fundamental human need that can significantly impact happiness and mental wellbeing.[115]

Not only can an appropriate exposure to daylight shorten the length of the hospital stay in patients with depression and bipolar disorder, but full-spectrum lighting can also effectively treat several mood disorders.[116] It is therefore important to include appropriate daylight access in the design process, while still considering possible negative effects like compromised privacy, and heat gain.

Artificial light can additionally contribute to a successful design. Different wavelengths of light can trigger different emotional responses. For example, warm whites (2700-3000K) are usually perceived as warm, calming and relaxing, while bright whites (3500-4100K) are perceived as energetic and cool.[117] Depending on the perceived heat, different emotional reactions can be triggered. Bright light, can intensify people's initial emotional reaction, which can be both positive or negative.[118]

Overall it is important to consider sufficient access to daylight, the wavelength and luminance of the light as well as the intended reaction.

From big to small: design strategies

Every design decision that has been made along the way evolved around the goal to enhance mental health. It is of great importance to consider that every choice has a consequence, either in user behavior or in the emotional response that it evokes. I believe it is therefore crucial to carefully and sensibly evaluate each decision and question the resulting outcomes. I am not claiming that I have seen through all the possible consequences, nor do I believe it is even possible to do so, since every person is different and it is impossible to acquaint yourself with everyone, but I think certain patterns of user groups can be identified and prevented or catered for.

As described in chapter five *Design Method*, my initial approach in finding a shape is based on the 9-square grid. Even though that approach might at first seem more random than what I described is needed to achieve a healing architecture, it has helped me greatly to find a sensitive and considerate shape. Already by generating these compositions of different shapes I tried to identify the characteristics that I was looking for, and even discovered new configurations that would help my aim. Having found a "base configuration", I then applied the design strategies that I consider important to create an environment that positively affects our mental health.

The following diagrams show the implementation of these strategies, as well as a description of the purpose behind it.
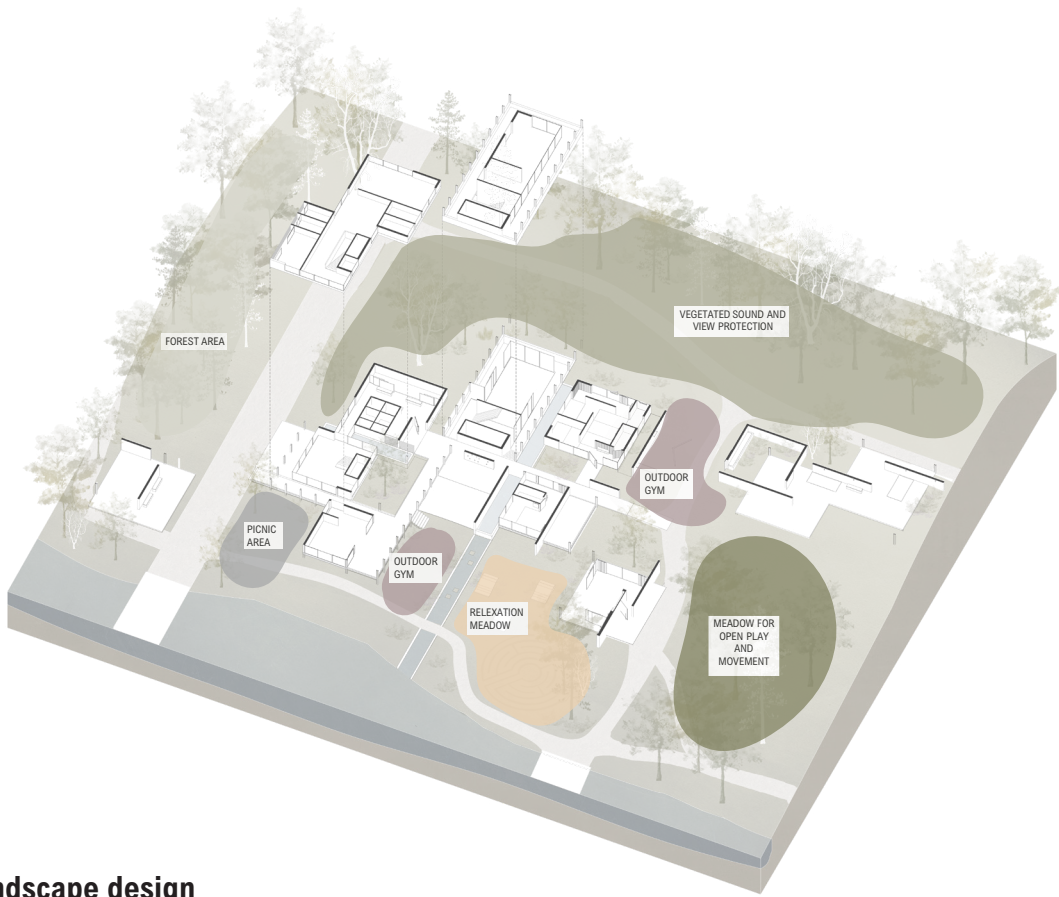
Landscape design

The surrounding landscape is divided into different zones that fulfill diverse tasks. To the west, the site forms the border to the hyllie boulevard, one of the main streets in the district. The western border is also strongly exposed to the prevailing wind coming from the south-west. In order to shade the pavilions from the noise of the street as well as the strong winds, a vegetated mound is introduced. To mark the transitioning from the more programmed parts of the park to the more natural forest landscape in the south the southern border shows increased vegetation and a natural layout. In contrast, the northern part of the park offers more open meadows that allow for free play and movement.
The two outdoor gym areas intend to offer the park visitors an easy access point to the complex. By including typical outdoor gym equipment that can usually be found in parks and is known to be open to the public, the threshold of entering is lowered. The easy access to the equipment also further

activates the bypassing people and might motivate some of the people to workout that did not intend to do so in the first place. The space additionally offers gym users a possibility to move their training outside if the weather allows for it.
Next to the main entrance in the south, a picnic area allows the park visitors or the gym users to sit down and enjoy a smoothie or snack that can be purchased at the kiosk. The area offers another easy contact point to the complex, that does not ask for a commitment of any sort.
In contrast to the outdoor gym area the relaxation meadow in the east invites visitors to relax and recharge. Here the goal is not to activate movement but rather to offer a space for genuine respite.
Being accessible from the pathway and the complex, both gym users and park visitors are equally invited to unwind. This area offers sun loungers and a labyrinth, which is proven to destress and calm down.[119]

Barriers / Creating distance

- 🟡 *wall*
- 🔴 *set back*
- 🟢 *courtyard*
- ⚫ *water feature*
- 🟠 *bridge*
- *vegetation*

In order to create distance and view protection, certain architectural elements have been used. To shield from the looks of people passing by, walls are an obvious choice. But to not create win*do*wless spaces, the walls are set up with a distance. Daylight or a view to the vegetation are uncompromised, while allowing for full protection. Bridges help to distance the entrance of the pavilions from the pathway, while making space for courtyards that further shield from unwanted looks and instead offer a view towards greenery. In addition to having a stimulating effect, the water features create an inaccessible barrier that guides where visitors are supposed to walk or not. It also divides the different zones visually and spatially from each other, and can only be crossed where intended. With a similar effect, vegetation also creates barriers that indicate an inaccessible area. Other than the water they also work vertically, creating a wall-like characteristic.

Inviting gestures

Since the gym is an additional offer to the park visitors, the visitors should not feel forced but rather invited to participate. Instead of occupying the whole pathway with the boardwalk only a small part reaches over, inviting the bypassing people to enter. As described in the zoning of the landscape, the surrounding areas also aim to motivate participation without having to overcome a great threshold. The complex integrates into the park without forcing itself on the visitors, but allowing them to pass by, observe or take part.

Circulation

The pavilions are connected by a boardwalk that is open to everyone. It does not only offer access to the different spaces but can also be used as part of the walking trail network throughout the park. Instead of designing a closed structure that can only be accessed internally, the boardwalk helps to open up the gym to the park visitors and enables different levels of participation. If the user does not want to enter the closed spaces it is still possible to make use of the terraces and outdoor gyms or to just walk through without feeling out of place. This encourages to explore the complex and get acquainted with it before committing to entering. By lowering the threshold for interested users and suggesting a safe narrative it gets easier to become an active participant.

Covered vs uncovered spaces

● *uncovered*
● *covered*

In addition to offering indoor and outdoor spaces a variance of covered and uncovered spaces can be found. In that way a terrace can be used for sunbathing during a sunny day or for shelter during rain and snow. This again increases the variance of spaces to choose from depending on individual preferences or changing environmental factors.

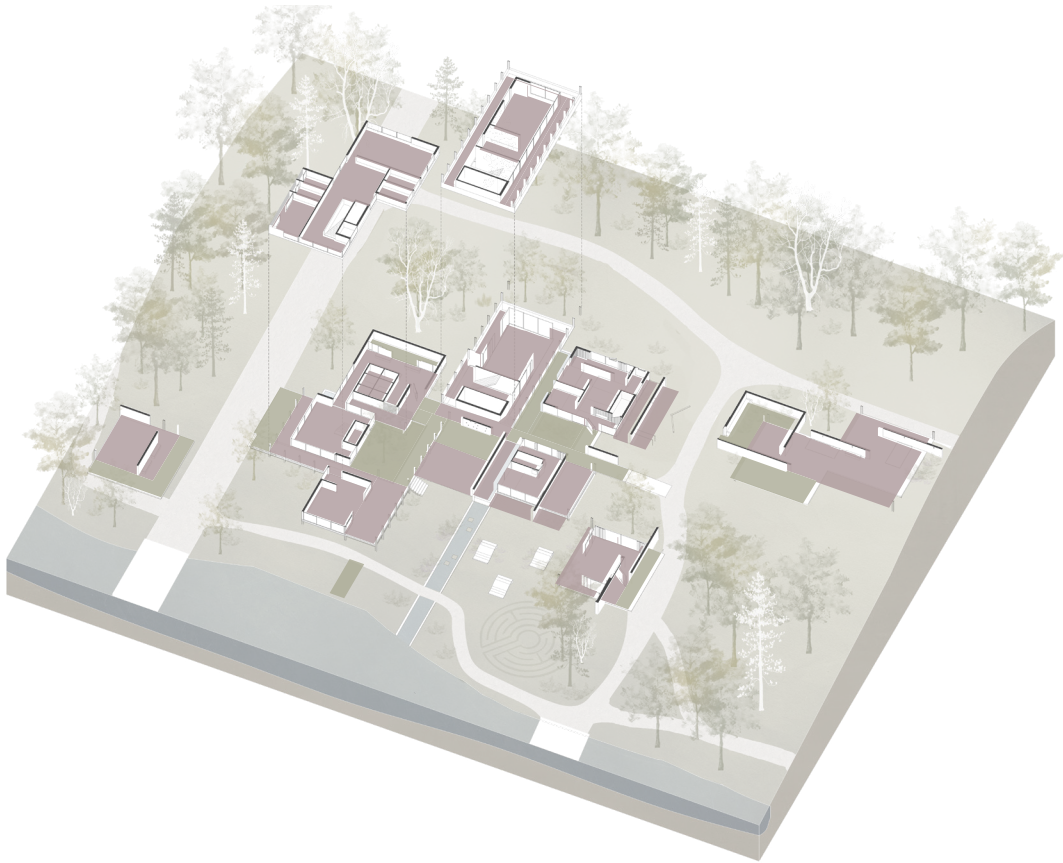**Indoor vs outdoor spaces**

● *indoor*
● *outdoor*

The building offers several indoor and outdoor spaces. As mentioned above the open boardwalk meanders through the pavilions and connects the different spaces with each other, allowing the visitors to enter at different levels of participation. Including outdoor spaces additionally enhances this effect. It is easier to enter a space that doesn't have closed borders and the threshold is lowered. Providing indoor as well as outdoor spaces also helps to integrate the structure into the park and makes it more permeable. It offers the users a variance of different spaces with different characteristics. The structure therefore stays usable during all weather conditions.

Visual references

The complex is permeable from all directions allowing bypassing people to have a glimpse inside. Not only does this help to integrate the building into the park but it also helps to lower the threshold of entering. By making the circulation more foreseeable, a greater safety is suggested, while simultaneously enhancing the curiosity of the bypassing people. Making the building more permeable additionally helps to decrease room depth and increase access to daylight and natural features and therefore increases the positive effect on the users mental health.

Variance in soundscape

 medium arousal   outdoor space
 low arousal   high arousal

The soundscape of the rooms is designed depending on the intended characteristic. Some spaces are more protected from noise and a more relaxing soundscape is introduced. For this, elements like specific plants, water features and enhanced biodiversity are used to mask the unwanted noise with more pleasantly perceived sounds. These spaces might attract people who intend to calm down and unwind. Other spaces are more open and more typical fast pace gym music is played to arouse excitement and motivation. To offer the possibility for people to find their preferred surroundings it is important to offer a variety of different options in different combinations.

Orientation and direction

Direction giving elements like walls and the boardwalk help the visitors to orient themselves in the structure. Along the walking trail the wall slabs indicate the direction of the pedestrian flow while inviting the bypassing people inside the pavilions. The orientation of the rooms further helps to understand their purpose. Some rooms are extroverted and speak directly to the park visitor. Other rooms are more introverted and allow for privacy and solitude. By orienting the rooms in different directions, the eastern side becomes more open and accessible, while the western side towards the street appears more closed. This encourages participation on the one side while still allowing to just pass by with a distance on the other side, without creating a backside.

Entrance zones

All indoor workout spaces have an entrance zone. Here the visitors can change their shoes, lock in their belongings or fill up their water bottle. Architecturally these zones help to distance the workout spaces further from the boardwalk, which protects the users from views of the bypassing people, while maintaining the closeness of the volumes and the pathway and therefore keeping the threshold of entering low. It also helps the users to get an overview over the room which builds up their competence and comfort.

Changes in floormaterial

 wood   pu concrete
 brick   wood boardwalk
 rubber mat

In addition to the changes in wall material, the changes in floor materials indicate the transition from one space to another. They also facilitate the wayfinding by making it easily understandable which makes the users feel self-assured. The different floor materials do not dictate a function, but they might be preferred for one or another activity. For example wooden floors may be perceived as warmer and therefore inviting for stretching or meditation, while concrete floors can be perceived as more rough and cold and could be preferred for weightlifting. Again the user is invited to find a space that fits their needs, which might also vary from time to time.
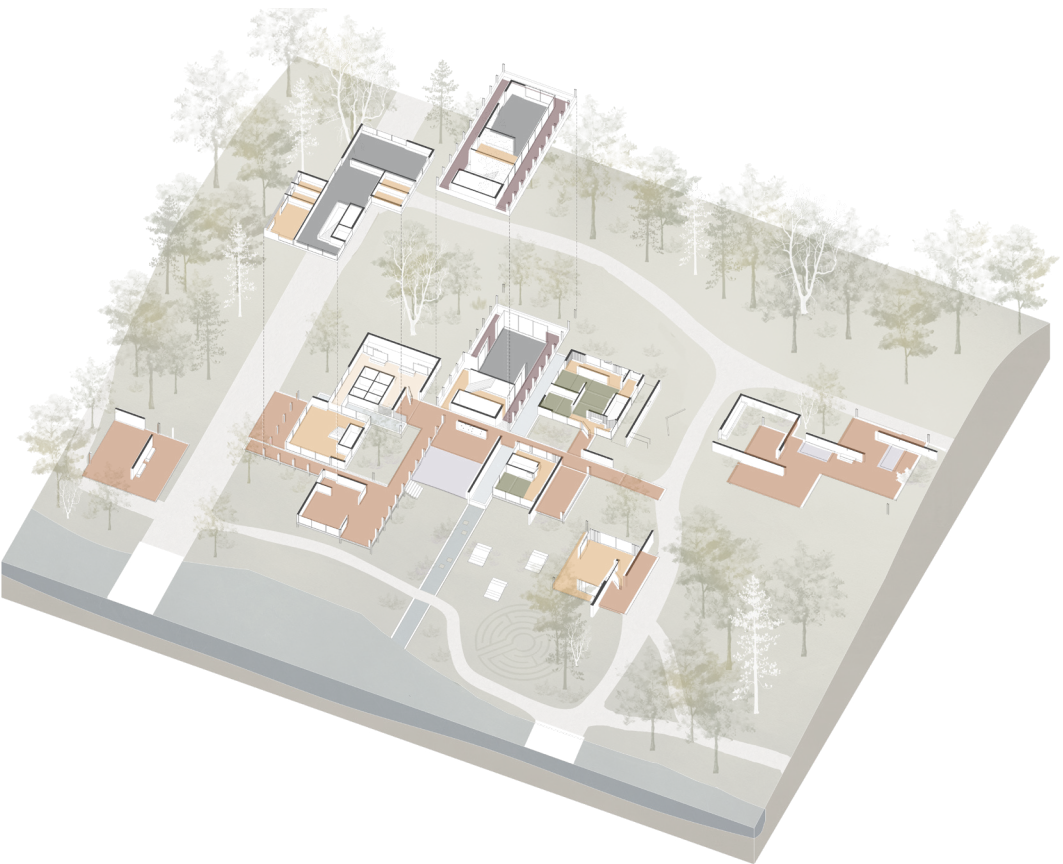
Programmed vs unprogrammed spaces

- *unprogrammed*
- *programmed*

To further encourage participation while catering to the individual needs of the users, the complex offers a mix of programmed and unprogrammed spaces. This allows for a more diverse range of activities than a typical gym, by allowing the user to practice whatever movement they prefer in a space that does not specify the intended use. Including unprogrammed spaces lifts the pressure of fulfilling an expected role and encourages creativity and individuality instead. The spaces that indicate a more specific program on the other hand cater to the needs of a user group that wants to participate in more typical gym activities, offering the needed equipment and the required environment.

Scale variance

- *large scale*
- *small scale*
- *medium scale*

Additionally to the variance in soundscape, there is also a variance in the scaling of the rooms. Depending on the intended exposure to other people, views, and sound, users can choose between larger spaces that allow and encourage social interaction to medium spaces that can be used in a smaller group and spaces for solitude and retreat. This helps to make people feel in control and averts helplessness. In combination with the other design strategies a great variance of different atmospheres and possibilities is created.

Fusion

Approaching the building from the west, a covered entrance area invites the visitors to access the structure. Here they can either enter the first pavilion, which hosts a kiosk, a reception and educational spaces on the second level, or continue their way on the covered boardwalk. The location of the main entry point along the highly frequented Almviksvägen is strategically chosen to form an address and make the building accessible for a larger number of people, as well as to orient the more calm spaces towards the north.

Walking through the structure, the visitors will pass several different pavilions with varying atmospheres. They are invited to participate, observe or simply pass by, and use the boardwalk as an extension to the hiking trail network. Depending on their intentions they might join a workout class, listen to a lecture or play with their kids in the outdoor gym area. All these spaces can be accessed either from the central boardwalk or are located along the hiking trails. If the visitor is approaching from the trail, several other access points to the structure are offered. Due to its high permeability and accessibility, the public character becomes apparent. Everyone is equally invited to participate and explore, become active or rewind.
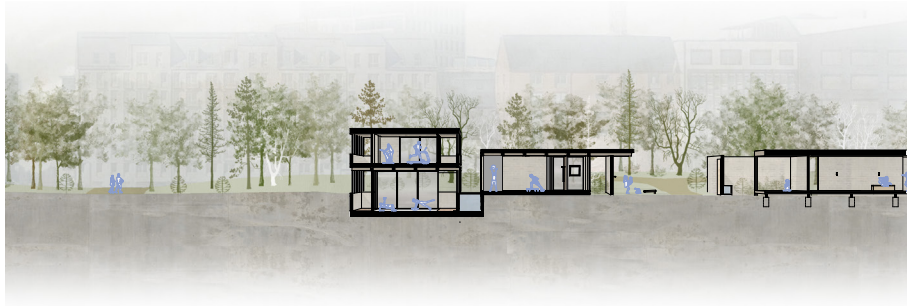
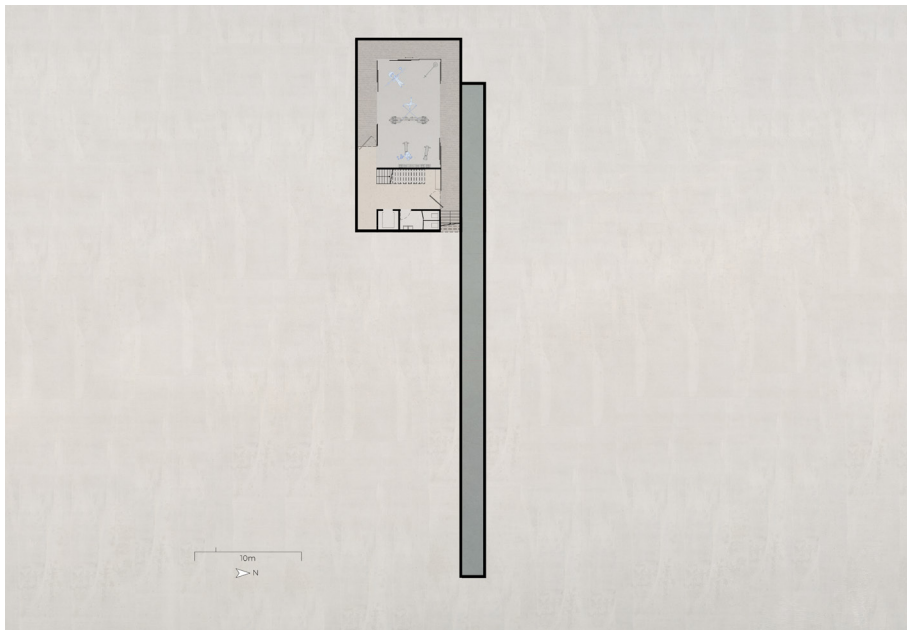fig. 31: +1. Floor

fig. 32: Section D-D
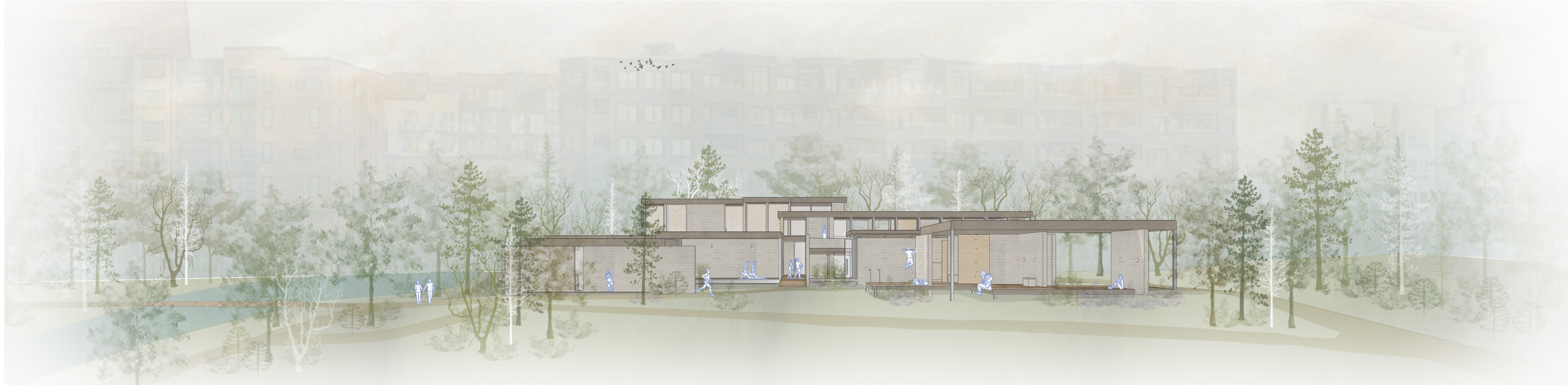
fig. 33: -1. Floor

fig. 34: Ground floor

fig. 35: Elevation north

fig. 36: Elevation east

Example:
small workout space

Pavilion 6 is divided into small scale workout spaces that are separated by wall segments. This allows visitors to workout in a more protected setting, where they can visually retreat from other people. Because the spaces are not self-contained, visitors are not protected from the noise created by others, hence they do not feel isolated. The pavilion is distanced from the boardwalk and accessible over a bridge. This helps to further shelter users from bypassing people, while offering nature views instead. The water feature acts as a separator from the neighboring pavilion, and additionally induces a stress reducing effect. An exterior wall towards the hiking trail shields the visitors for unwanted exposure and doubles as an element for the outdoor gym. In this way bypassing people get invited to participate, while people inside stay undisturbed. Openable windows and curtains allow users to control their exposure towards external influences. In combination with offering spaces for retreat versus spaces for interaction, the user gains a greater perceived controllability over their environment. In certain areas the concrete walls are covered by pine-wood slats. By changing haptic qualities of the material, in combination with a shift in floor material, the atmosphere of the room is altered, offering the user another possibility to choose their preferred environment. Two skylights in the core of the pavilion improve the daylight access, making the room feel more airy and light. In case of overheating, the windows can be shaded by external elements.
The concrete ceiling is complemented by indirect light sources. Not only does this aesthetically highlight the structure, but it can also be perceived as more flattering, since hard shadows are avoided. This can help insecure visitors to feel more comfortable, especially those that are affected by evaluation concerns and might otherwise avoid the space.

Example:
large workout space
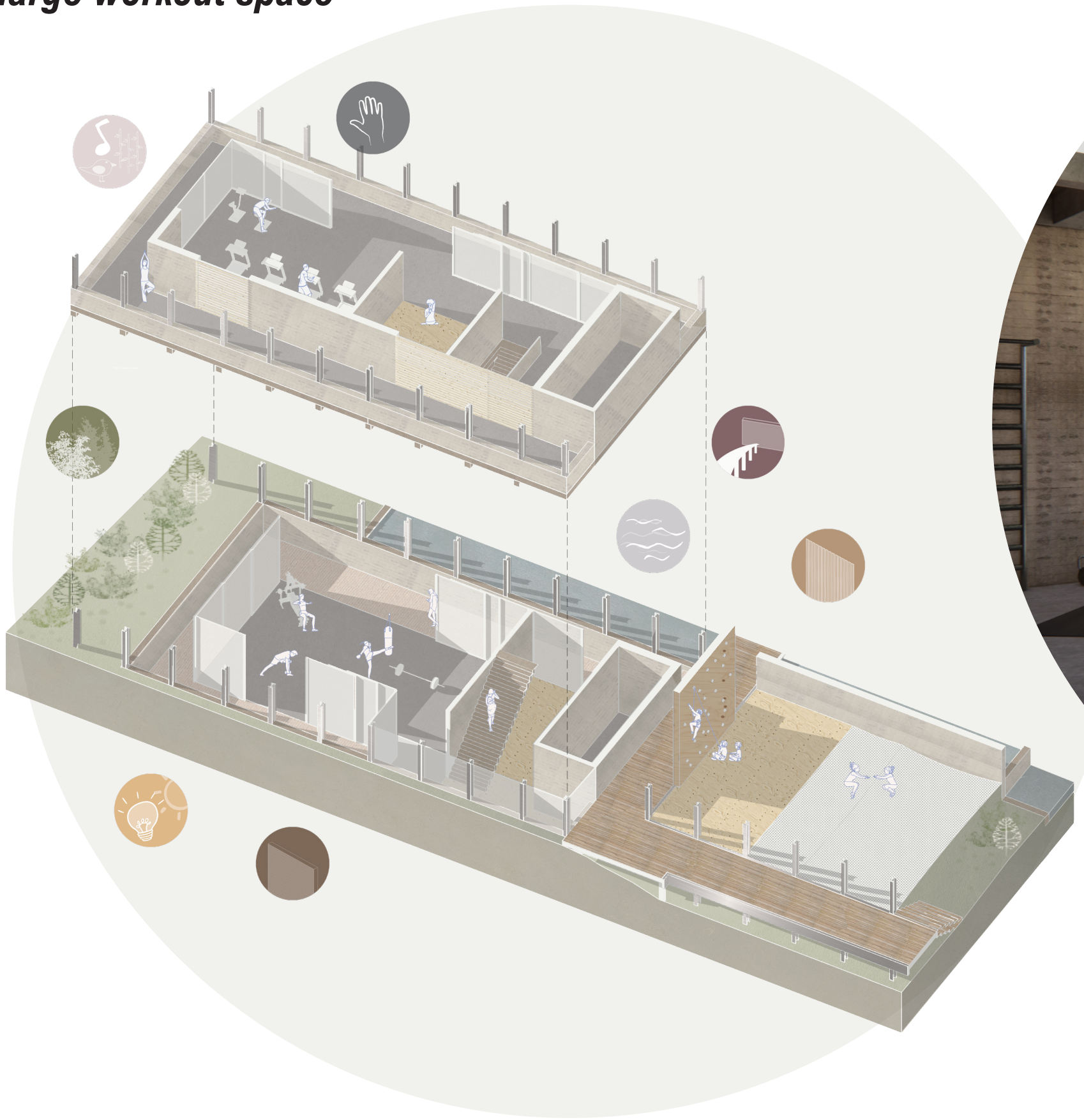
The large-scale workout space is located in the western part of the complex and can be accessed from the main boardwalk. To protect the space from overheating, while offering uncompromised nature views, the volume is submerged and the facade is set back. The window elements are slidable, making it possible to transform the place from an indoor to a semi-outdoor space, when desired. The water feature, that separates from the neighboring pavilion, is on the level of the soil, which makes it touchable when walking down the stairs from the boardwalk. It additionally affects the microclimate of the space and induces a cooling effect. The atmosphere of the space is cool, bright, fast-paced and activating. Due to its larger scale, the space does not offer places to retreat but rather encourages interaction. Fast-paced music arouses excitement and energy in those that feel comfortable in the space. The bright ceiling lights, commonly referred to as "anabolic light" enhances the contrast between exposed and unexposed areas. While some may experience it as exposing and unflattering, other users might feel empowered by the highlighted muscle definition. Additionally bright white lights are usually perceived as cool and energetic, further contributing to the atmosphere of the space. When walking up the internal stairs, the visitor reaches the second floor of the pavilion. Here the facade is also set back, to protect from the sun. While the north and north-west facade is openable by sliding elements, the facade towards the south and south-west is mostly closed or additionally shaded by external shading elements. In addition to helping the microclimate of the space, the movable elements also contribute to the perceived controllability.

Towards the west, vegetation helps to shade from unwanted exposure, as well as direct sunlight, and acts as a barrier for bypassing people. On the other side of the boardwalk a 1.5 storey high climbing wall connects the outdoor gym area with the pavilion. Here kids are invited to play, climb or jump, while adults can relocate their workout outdoors or simply enjoy the river view. A mix of materials indicates the room borders and offers various properties for different activities. The trampoline net and wooden floor in the outdoor gym area invite people to sit or lay down, while the pu-concrete in parts of the inside space stay cool and could be preferred for weight lifting or cardio.

Example:
unprogrammed space

Pavilion 9 is located separately from the main boardwalk. It is directly accessible from the hiking trail or the relaxation meadow and invites park visitors and gym users equally. The space is unprogrammed and allows for free movement or calm reflection. An in-built closet with equipment can be opened with a QR code. Here users can find useful equipment like yoga mats or rubber bands, but also books and lanterns. The wooden floor, as well as the wood-slats covered walls, create a warm atmosphere that is appealing for sitting or laying down, while the massive vegetated concrete roof keeps the place cool during the warm summer months. The massivness of the slab radiates a protective and sheltering character, which makes the pavilion a perfect space to rewind and relax. Openable window elements transform the building from an inside space to a semi-outdoor space, with terrace-like characteristics. Additionally visitors have the possibility to open or close fabric curtains to protect themselves from unwanted exposure. To avoid glaring effects when lying down, the light sources are installed at the walls instead of the ceiling. Additionally visitors can make use of the lanterns during the evening hours. Due to its warm color, the light has a calming and relaxing effect, further enhancing the meditative atmosphere of the space. Along the south facade a row of bamboo trees is planted. Not only does this offer visual protection from other people, but it also creates an attractive soundscape. The bamboo plants have a rustling effect that masks unwanted noise while also producing a soft and light sound-. Inside the building, there is no additional music, which makes the place a low arousal area. In order to further enhance the calming effect of the space, lavender plants are arranged around the building. Since the entrance to the space is located on the back, windchimes placed above the door alarm the user from incoming people. The pavilion offers uncompromised nature views to three sides. Here visitors can look at the river, listen to the songs of the birds or enjoy the shadow play of the surrounding trees.

Accessibility and nighttime use

One of my main goals is to offer a space for anyone to participate. Since spaces that are usually designed to enhance wellbeing and health, like spas and retreats, are generally expensive to visit and therefore exclude a large part of the population, it was important to me to propose a concept that all parts of society can benefit from. Therefore the pavilions are publically accessible and free of charge. Since some of the spaces offer equipment, a potential problem is vandalism and theft. To avoid exploitations, certain spaces are locked and can be opened with a QR code. To get such a code, one needs to register with their credentials either online or at the information in the main entrance. This allows the buildings to be freely accessible, but not anonymously accessible.

The risk of vandalism may be further decreased by also inviting groups/individuals more prone to demolishing behavior to participate, instead of excluding them. By creating a sense of ownership and responsibility, the chances of destruction are expected to be much lower, since it is seen as their space too.

As illustrated in fig. 37, most spaces are also accessible during the night time. This includes the pavilions that are accessed with a QR code, as well as the outdoor spaces. By allowing the users to also engage with the building during the night, the risk for vandalism is further reduced, since there is always people watching. The outdoor pavilions can in the evening or night be used for e.g. getting together with friends or having a picnic. In this way the park also stays accessible at night and invites people to linger. By illuminating the structure an additional light source during the night is established. This helps to make the park more safe and adds to the illumination concept of the original park proposal.
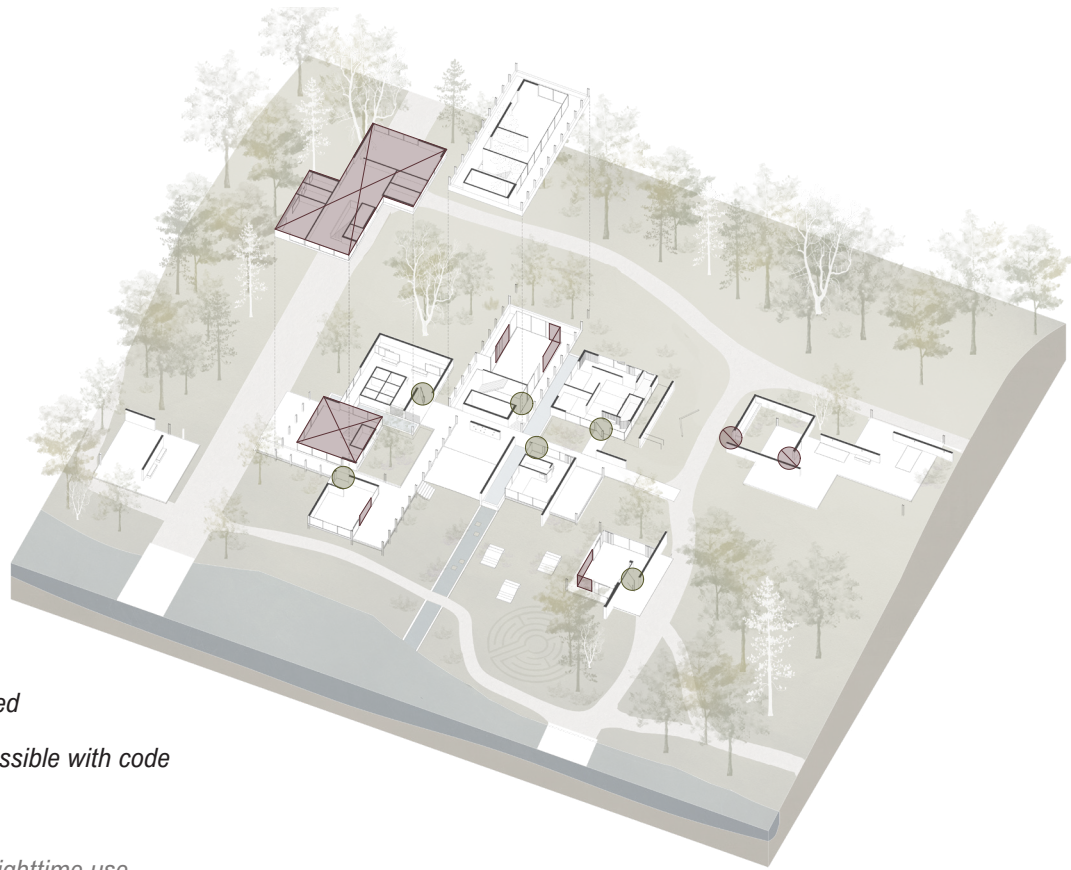

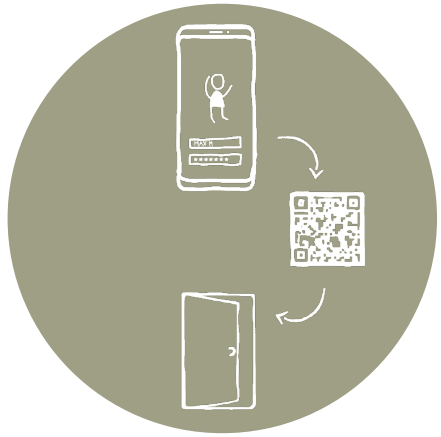
● *closed*
● *accessible with code*

fig. 37: Nighttime use

fig. 38: Accessibility concept

Weathering

Weathering describes the progressive destruction of buildings by natural influences over time.[120] Appropriate maintenance can help to slow down or reduce this process, but partial destruction of building materials is mostly inevitable.[121]

The book *On Weathering: The Life of Buildings in Time by Mohsen Mostafavi and David Leatherbarrow* describes the potentials of weathering as a process that does not only subtract but can also add value to buildings. The authors see a potential in the sedimentation and the marks that weathering leaves and encourage planners to understand the building process as never ending, fueled by the layer that weathering adds long after the final brick has been laid. Finalizing the construction of the structure should not be seen as the conclusive finish, but as a beginning of the everchanging weathering process.[122]

The location of this project in a park landscape inevitably invites vegetation-growth and weathering to influence the appearance of the structure over time. Especially the rainy and windy weather in Hyllie further accelerates this process. But as described by *Mostafavi and Leatherbarrow,* weathering can enhance and add to the aura of the space.[123] Since one of the main aspects of the project is to offer access to nature and natural views, a thriving vegetation further enhances this concept. Spaces that get partly taken over by nature (e.g. see p.69) radiate a mystical and calm atmosphere, and the weathering process is therefore intended and encouraged.

Exposed concrete walls will over time get covered by moss, adding another haptic quality and enhanced microclimate to the space. Wooden elements will change color, depending on their level of exposure, and an interesting play of colors will develop. Due to the lower budget for the project, it is important to choose materials that are low-maintenance and age gracefully, as well as cost-effective and durable. Pinewood is a local material that is easily fabricable and offers versatile possibilities for construction elements and furniture design. Freshly cut wood has a light brown, sometimes reddish color, that will over time become gray with a potential red undertone.[124]
Cast-in-place concrete offers the possibility to create various surface textures. In this case the concrete is cast in a horizontal wooden framework, leaving a texturized and direction giving surface. Over time the concrete elements might show water-marks, discolorations and get covered by moss, which in my opinion further enhances its visual quality, as well as the microclimate and atmosphere of the space. Since the use of concrete is a strong burden on our environment and natural resources, the concrete used in this project is made with recycled concrete aggregates (RCA). The use of RCA is not only more environmentally friendly but also economically attractive and durable[125], which makes it appropriate for a lower budget project

fig. 39: Moss-covered concrete wall

fig. 40: Seasoned timber (pine)

0-5 years

finalized construction
no patina yet
intended placement of plants which can
grow over time
low maintenance required

> 5 years

vegetation is taking over
weathering of the materials
moss-covered concrete
seasoned timber
generates mystic atmosphere
enhanced appearance of the structure

Timeline and maintenance

The building is intended to be run by Malmö municipality as a public activity center. As mentioned in chapter 4 *Physical / Mental Health and exercising* it is important to encourage citizens to be more active, since the majority of people in Sweden as well as globally, engages in physical activity insufficiently. Mental and physical illness put a high burden on the economy and it is therefore profitable to establish preventative measures.
Since the building is owned by the municipality the construction and maintenance budget can be expected to be fairly low. It is therefore important to consider the cost-efficiency, durability and maintenance cost of the building materials.

By proposing several independent pavilions that are connected by a central pathway, it is possible to construct the complex in different time stages. This further helps to stay within a potential budget, by offering the possibility to extend the structure depending on available funds.

For example in the first stage only the main entrance building, the educational spaces, the changing room and a large and medium sized workout space, as well as the covered outdoor gym space with the

climbing wall and one terrace are constructed. This allows for the core of the center, with the main functions to be developed and open for the public, without compromising its functionality.

In a potential second stage, a space that could be used for course training, small scale workout spaces and a second outdoor gym area could be added, offering a bigger variety of spaces to choose from and a larger capacity for visitors.

Later on the covered outdoor spaces and an unprogrammed space could be offered. Additionally the water feature can be extended to further define the landscaping.
This stage shows the building in the stage that I have designed it, but due to its modularity future stages could be imagined as well. For example singular pavilions in other places of the park could enhance the variety of spaces and the level of intended participation.

By allowing for different construction stages it can also firstly be observed how well the concept is being accepted and used by the public. The needed capacity can then be adapted accordingly.

Stage 1   *Stage 2*   *Stage 3*
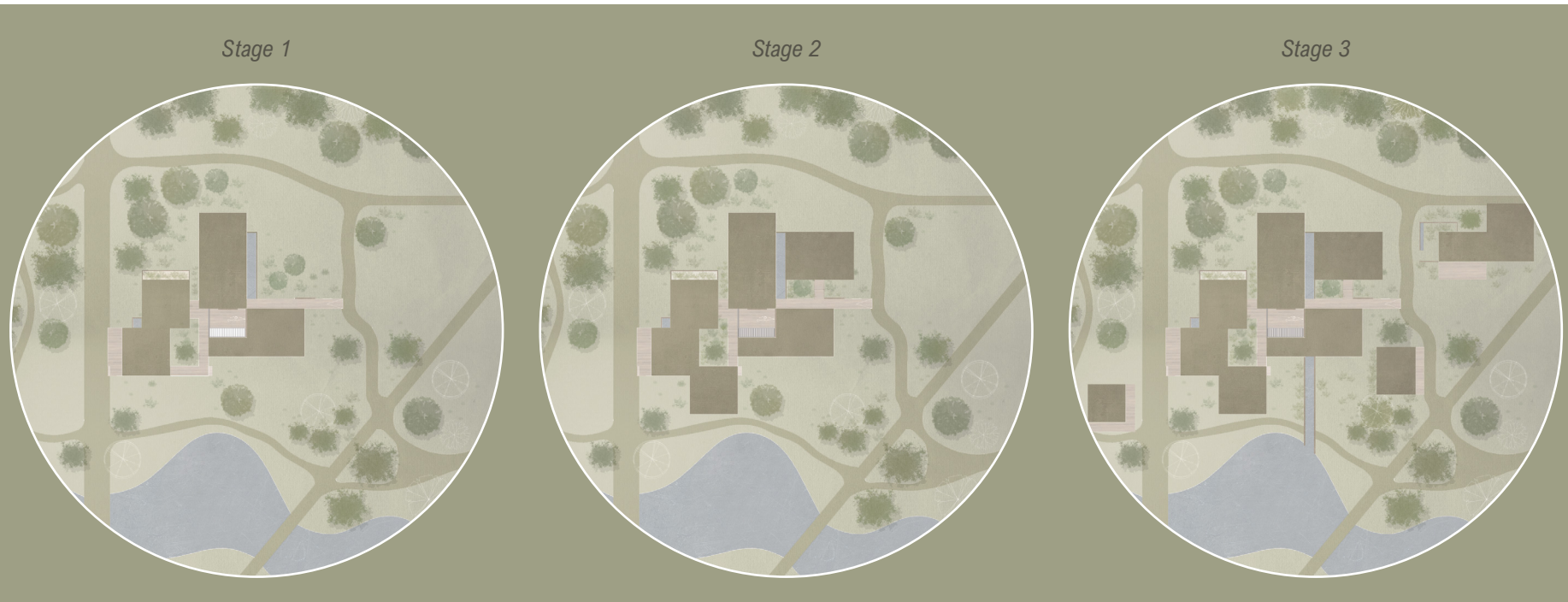
8 Reflection

Summary

The goal of this thesis project was to create a space that positively influences mental health by exploring an evidence based design process.
The proposed project, a public gym, combines mental and physical wellbeing, by encouraging movement and participation in an environment that benefits mental health. Additionally spaces for education, reflection and relaxation contribute to prevent the risk of mental disease. Instead of relying on treatment, the project focuses on enhancing mental health before an illness occurs. By designing a public space for physical and mental wellbeing, a new typology is created that can also be implemented in other future urban developments. Accessibility and inclusivity is one of the key components of the proposal, which is achieved by considering individual needs rather than a one-fits-all approach.
The first part of the project was dedicated to researching how the built environment affects mental health and what architectural strategies and elements either enhance or decrease it. Afterwards the gained knowledge has been applied to the design process, placing mental health at the center of every design decision. By making informed choices rather than relying solely on intuition, a more reliable result can be achieved.

The role of the architect

What responsibility does the architect have, since the built environment is proven to affect mental health?[126] In my opinion the architect must be held responsible for what effect their designs have on the mental health of the population, since everyone is inevitably and constantly surrounded by architecture and designed environments. Society can not escape the visions of the architect. We are completely powerless at their mercy. How can it be fair that a singular person that has such a huge influence on other peoples health and happiness, has no education and potentially not even an awareness of the outcomes of their design?
During my research I have thought about the relationship between intuition and evidence a lot. Most decisions I made based on research, would have been similar if I had solely relied on my intuition. But some of the elements I would not even have considered, just because I was not aware of their impact on our wellbeing. As an architect I usually base my design decisions on past experiences and images that I have in my mind. I try to replicate atmospheres that have left an impression on me, consider my own expectations, as well as try to imagine the expectations of other potential users. And since we are all human beings, it is understandable that research for the most part agrees with the way we design buildings, it would have been shocking otherwise. At least this is the case, when user-experience is prioritized in design decisions. There might be designs that do not correspond with the research at all. This could be the case where an architect prioritizes for example visual aesthetics over everything else. A design decision that would be more beneficial for the mental health of the inhabitants, might not fit with the expectations of the architect and his design vision. In such a case, when the awareness of the actual extent of the effect is missing, the ego of the architect, combined with his cluelessness becomes a problem. Even though intuition can bring us a long way, and might even lead us to making all the right decisions, it could potentially also not do that. I believe it is therefore beneficial in every case to consider evidence based design, but at the same time also accept the fact that we can all make mistakes.

Limitations and Problems

Instead of proposing a project in a park landscape which offers the great opportunity of working with a natural environment, but is otherwise rather scarce in an urban context, it could have also been interesting to explore how the strategies I propose could be implemented in a less privileged location. How could for example a low-income area be redesigned to enhance the mental wellbeing of its inhabitants? By designing a public space for mental and physical health I am proposing a new typology that can be implemented in future developments, but of course another approach could have been to reimagine existing structures instead.
A further approach for my project could also have been to design spaces that are fundamentally different from each other. Maybe a space for relaxation could have entirely different materials than a space for activation, with the outcome of a very mixed architecture instead.
Either way I am not claiming that the way I worked with the subject is the only correct one, but I rather hope to start a conversation about mental health in general, as well as the relevance of mental health in relation to architecture. I believe that the aspect of how our designs affect mental health can be considered in every architectural project, making it a broad subject to discover.
I further believe that architecture offers a great potential to raise mental health awareness. Implementing mental health in everyday designs, instead of only healthcare architecture, does not only reduce the stigmatization of the subject, but also enhances mental disease prevention.

Hopes and wishes for the future

As previously elaborated, the unawareness of the architect concerning the effect of their design decisions on mental health might become a problem. It is therefore important to create awareness for the topic, and implement an evidence based design process. The architect in its original role is never trained to measure psychological indicators[127] or to understand the neurological processes evoked by their design. I believe it is therefore of the essence to induce an interdisciplinary debate with other fields of research. Of course it can not be expected that every single project is designed in combination with an interdisciplinary team, but the correlation between architecture and mental health should be further studied. I additionally believe it is important that the education of the architect includes evidence based design strategies, as it sensitizes to not solely rely on intuition. Of course here it needs to be discussed how intuition and education are related, but I do not have an answer to that question at this moment.
What I believe is most important at this point is to raise the awareness that the built environment does in fact affect mental health. This is also the goal of my thesis. Of course I can not prove that all design decisions I have made in fact positively influence mental health, and that this is the way it needs to be done, simply because I can not measure the psychological influence my buildings would have. But by working with a rather evidence based approach, my own awareness has certainly increased, and I hope that it might also have inspired someone else to evaluate the effects that their design decisions might have on the mental health of the users in the future.

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All other figures are created by the author.

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