

Reconnect to Nature



Designing learning environments that strengthen
children's connection to nature

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Abstract

This thesis emphasizes the importance of nature's presences in our lives. An increasingly urbanized world with reduced access to green spaces, a rise in electronic media, a change in social norms and a reduced perception of the role of the natural world for human survival have all lead to a disconnection between human and nature. The disconnection has been proposed as a root cause of the global environmental crisis and research findings across a wide range of sectors show the benefits of contact with nature and its impact on human health and well-being. Against this background the purpose of this master's thesis is to investigate how humans can be reconnected to nature through architecture.

A good relationship to nature is strongest when developed in early ages and a connection to nature during childhood is essential for physical and mental development. In this thesis, strategies for reconnecting children with nature are explored and a preschool located in an urban context is used as a basis for the investigation.

We spend approximately 90% of our time indoors so a satisfying relation between people and the natural world in the built environment is crucial for human's connection to nature. Architects are using biophilic design as a method to improve human health and to create an experience of nature in the built environment. In this thesis biophilic design is explored and interpreted into design strategies with the aim to create learning environments that strengthen children's connection to nature. The use of the strategies also aims to improve children's development and well-being and strengthen pro-environmental behaviours.

The design strategies are translated into physical form in a design proposal; a transformation of the preschool Levgrensvägen 3 in Gothenburg, Sweden, which showcase an architecture that incorporates nature and nature experiences in the design. The outcome is a speculative transformation of the building and its outdoor spaces in the light of biophilic design, which can contribute to a raised discussion on the importance of a connection between human and nature and the awareness on the benefits and limitations of using biophilic design.

Keywords: Human-nature connection, Biophilic design, learning environments, preschool



CHALMERS
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2022

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Acknowledgement

Thanks to

Supervisors and examiner
for guiding me through the process, for all your inputs and for
contributing with your expertise

The pedagogues at Levgrensvägen 3 preschool
for a good collaboration

My reference group, Emma and Leonardo,
for our inspiring and helpful meetings

Fellow students
for all helpful comments and good conversations

Tove
for all your valuable inputs and ideas
Maja & Matilda
for being the friendly faces on the other side of the table
answering all my questions and discussing my struggles
To all three of you for all the laughter's and for being my fan club
– forever grateful

Family and friends
for always believing in me and cheering on me

Student background



"Architecture is a tool to improve life"
Anna Heringer

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Master

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Studios and courses

- Sustainable development and the design profession
- Planning and design for sustainable development in a local context
- Managing design projects
- Reality Studio
- History, theory and method 7
- From concept to existing building
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- Social-ecological urbanism

Internship

Kanozi Arkitekter, Gothenburg 2018-2019

Work

Kanozi Arkitekter, Gothenburg 2019-2020

Thesis motivation

The idea for the master thesis has evolved from my personal appreciation and love for nature. I have been curious as to why I so often find myself longing for the outside world and what it is that uncontrollably makes me smile when I hear a bird's song break the silence of the early spring morning, when the first snow falls in winter or when the sun filters through a foliage. An encounter with nature leaves a certain feeling in your body and mind; relaxation, inspiration, awe or joy to mention some, so a moment in nature can do wonders for your well-being. And I ask myself; Can we create environments that evoke these feelings indoor as well? How do we capture and translate those qualities in nature into the built environment? And by it create buildings that enhance our well-being? This interest in the relation between architecture, humans and nature framed the thesis.

I do believe that if a connection to nature is created at an early age you will create a lifelong relationship that will foster sustainable behaviours and care for our, only, planet. And that architecture is an important tool in shaping the environments that can support the creation of this important relationship. And I hope that this thesis project can bring awareness to the importance of nature and its presence in urban areas, in the built environment and in our lives.

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Reading instructions

This booklet is divided into seven chapters, where the content unfolds from the theoretical basis to an architectural design proposal.

1. Introduction

The first chapter gives an entry point into the thesis. Here the problem statement is explained together with the aim, purpose, method, and delimitations. It also presents the research question and where it derives from.

2. Framework

The second chapter provides the theory which the design proposal is based upon. Used references are introduced and the connections between human and nature is explained. The notions of nature, biophilia, biophilic design and preschools are defined.

3. Reference projects

The third chapter presents selected reference projects in relation to learning environments, biophilic design and connecting to nature which have inspired the design proposal.

4. Context & Site

The fourth chapter introduces the existing preschool at Levgrensvägen 3. General information about the preschool, site and building analysis is presented together with selected parts from conversations with pedagogues. The chapter is concluded with identified problems and qualities of the site and building.

5. Concept

The fifth chapter provides the design strategies which are based upon the theory and context. It presents the conceptual ideas on how to transform learning environments with the use of biophilic design principles with the intention to strengthen the connection between children and nature. It presents the exploration on biophilic design conducted during the thesis.

6. Design proposal

The sixth chapter presents the final design proposal which translates the findings from previous chapters into a transformation proposal of the Levgrensvägen 3 preschool. Drawings, illustrations and text communicates the proposal.

7. Discussion

The seventh chapter concludes the master thesis with a discussion and conclusion.

If nothing else is stated images and figures are made by author

*“For most of history, man has had to fight nature to survive; in this century he is beginning to realize that, in order to survive, he must protect it.”
Jacques-Yves Cousteau*

INTRODUCTION

Chapter one

Gives an entry point into the thesis. Here the problem statement is explained together with the aim, purpose, method, and delimitations. It also presents the research question and where it derives from.

Problem statement

The title of this thesis, "Reconnect to nature" implies that there would be a disconnection going on. Lately, calls for humanity to do just that, reconnect to nature, have grown louder (Ives et al., 2018). But why has a disconnection between human and nature occurred?

According to Ives et. al (2018) literature on causes of disconnection from nature differs depending on whether immediate or more fundamental causes are contemplated, but the disconnection is often seen as a consequence of a broader societal change where multiple factors are underpinning the creation of a physical as well as a mental disconnection from nature.

In having a connection to nature, encounters with greenery are crucial. Today more than 50 percent of the world's population live in cities and this number is estimated to rise to approximately 70 percent by 2050 (UN, 2018). With urbanization and growing cities, the access to green spaces are decreasing and opportunities for people to experience nature becomes limited (Colding et al., 2020).

In the increasingly urbanised world that we live in people have reduced access to green spaces. Due to changes in social norms and perceptions as well as technological and environmental changes created from our modern society the time spent in these green spaces also decreases (Snell et al., 2020). For instance, the rise in electronic media increases our screen time which is often at the cost of physical activity or time spent outdoors. And less time spent outdoors means more time spent indoors and today people spend approximately 90 percent of their time in the indoor built environment (Kellert & Calabrese, 2015). According to Kellert & Calabrese this becomes especially problematic as the built environment of today is failing in having a satisfactory presence of nature which they argue derives from an approach to modern building design that overlooks the important benefits of a nature experience in the built environment. This has resulted in an increasing disconnection between humans and nature in the built environment indicated through unsatisfactory experiences of natural materials, views, light, ventilation and vegetation and in general beneficial contact with the natural world.

According to Ives et. al (2018) more speculative causes for disconnection are the fundamental ones as they, despite their intuitive appeal,

often have little concrete evidence. One such cause is the contemporary level of consumption and materialism as part of a larger, underlying philosophical shift in society that is argued by some scholars to be causing a disconnection. Another proposed cause for a separation of human from nature with stronger evidence is a cognitive disconnection that people have between their actions and what impact these have on their biophysical reality. The complexity of the global resource system has placed most people physical far away from the source of their daily used resources and mental far away in the understanding of how our actions affects this system and in extension the impact it has on the environment and health of our planet.

A separation between human and nature is evident and as this disconnection has been proposed as a root cause of the global environmental crisis (Ives et al., 2018) the calls for humanity to reconnect to nature needs to be answered.

90%
*of our time is spent
indoors*

Focus children

As our behaviours towards, knowledge about and valuation of nature largely depends on our contact with the natural world it becomes important to create a connection to nature. Especially in relation to that the disconnection between human and nature has been proposed as a root cause of the global environmental crisis, just because of this correlation between our connection with nature, our values and beliefs and our behaviours towards nature. To develop an affection and responsibility for nature that leads to pro-environmental behaviours it is important to create a relationship with nature and several studies indicates that if a good contact with nature is established during childhood the chance of a lifelong relationship is high as it predicts a continuous contact with nature through adulthood (Snell et al., 2020). This highlights the importance of creating a connection to nature in early ages and therefore strategies for reconnecting children with nature are explored in this thesis. As a lack of connection to nature also has been linked to increased physical and emotional illness for children there is a need to pay attention to the spaces that children use (Pedersen Zari & Woodward, 2018). Besides the home environment the spaces mostly used by children in Sweden are the ones they encounter in their education and in this thesis the preschool environment will be in focus as this is the time when the foundation of our personality is formed.

*"We shape our buildings, and
afterwards our buildings shape us"*

(Winston Churchill)

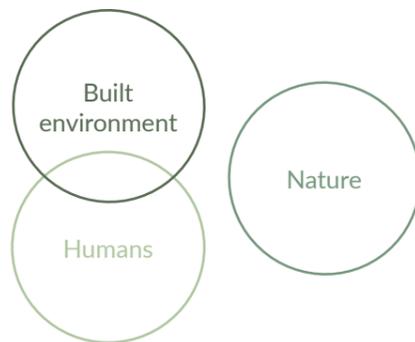


Purpose

The purpose of this master's thesis is to address the ongoing disconnection between human and nature by investigating how architecture can be used as a tool to reconnect us to the natural world.

The intention is to bring awareness on the benefits and limitations of using biophilic design as little guidance for implementation of biophilic design exists today. As access to green spaces are diminishing in urban areas it is important to highlighting the value of nature's presence for human health and well-being and the hope is to contribute to this discussion within the context of children.

By proposing spaces that enable experiences of nature the intention is to change the relation between the built environment, humans and nature; particularly bringing humans closer to nature with architecture as a bridging tool.

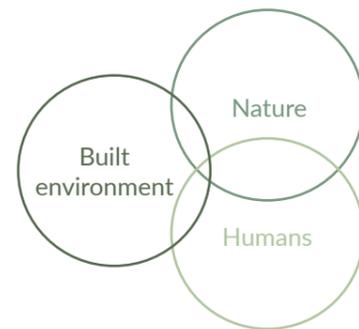


Conceptual image of the relationship today

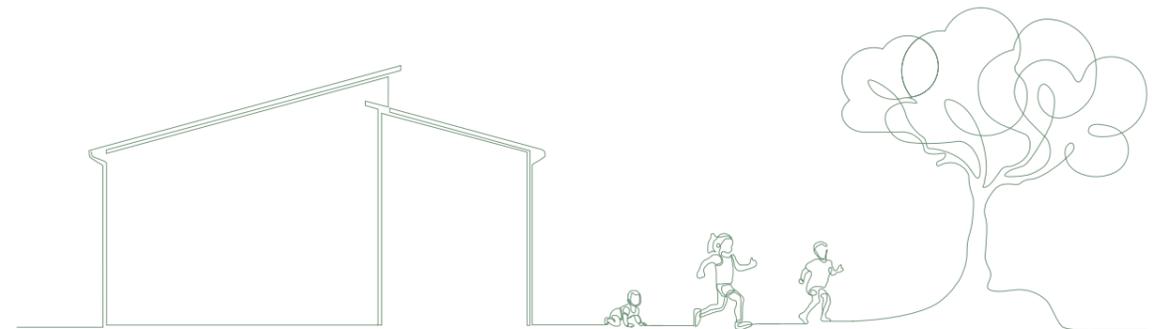
Aim

The master thesis aims to use biophilic design to create learning environments that strengthen children's connection to nature, which are exemplified through a transformation of a preschool in an urban area in central Gothenburg, Sweden.

The project also aims to improve children's development and well-being and strengthening pro-environmental behaviours. By that the transformed preschool can be a space where children can escape urban environments and enjoy the benefits of, learn about and get inspired by nature.



Conceptual image of the relationship this thesis aims to create



Research question

How can biophilic design principles be used in the redesign of a preschool to strengthen children's connection to nature?

Method

To realize an architectural proposal for this thesis, the method of research by design is applied. By exploring through design, sketching, modelling and reflecting, different solutions are tested to find the experiences, views and environments which best corresponds to the aim of the project.

The thesis can be seen as three parallel running phases, which are Research, Design and Reflection (Figure 1). The research consists of literature studies, visits at the preschool, conversations with pedagogues and site and building analysis. The research findings are then interpreted into a design concept where strategies for reconnecting to nature through architecture in the context of learning environments are developed. During design, sketching, modelling, and testing together with a biophilic design exploration was used to develop the design proposal. During the project continuous reflections over the work: literature findings, the process and methods and the design are made. These phases run parallel in an iterative process where they continuously affect and contribute to each other.

The literature research focused on why there is a disconnection between human and nature, why we need to have a connection to nature and how architecture and biophilic design can be used to reconnect us to nature.

An important part of the process has been the visits (n=2) at the preschool and the conversations, in person and through email, with the preschool pedagogues at Levgrensvägen 3. This provided a deeper understanding of the environments of a preschool and the needs of children. I learnt about the problems that the pedagogues' experiences with the preschool environments today and what wishes they have if they could dream freely. We discussed nature reconnection and what view on nature and outdoor activities the preschool has today. But also, to what extent they use nature as a physical part of the indoor environments and how they interact with and use nature in lessons, play and creative activities. The conversations and emails were conducted in Swedish. A translation of the information was done, and the pedagogues were given the chance to read and comment the translations. To read the emails in full see appendix.

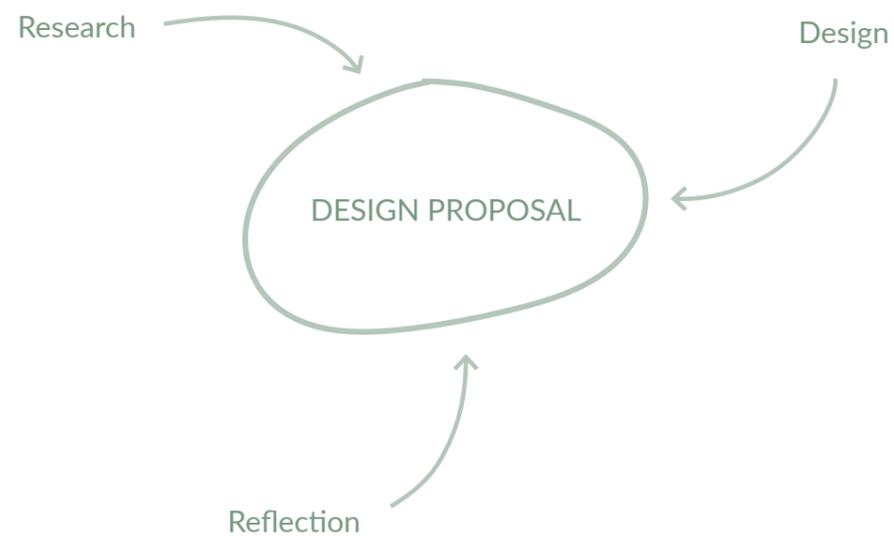


Figure 1. Conceptual figure of the thesis process

Delimitations

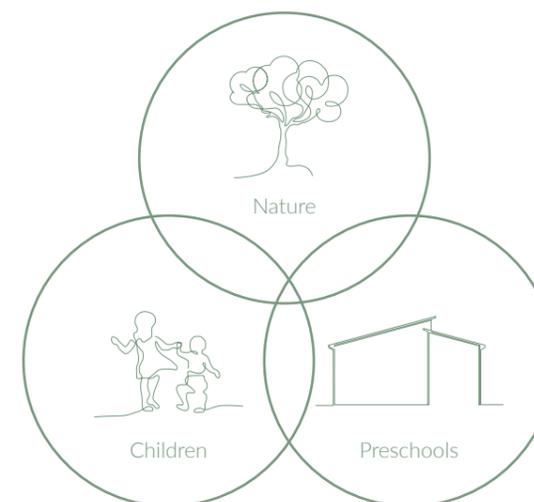
To complete the project within its timeframe, certain delimitations had to be set. As the thesis aims to reconnect humans and nature the architectural transformation focuses on creating environments, in the context of a preschool, which can enable this reconnection. Identified problems with and wishes from the preschool today will be considered but figure in the background as the goal is not to make an optimal redesign of the preschool environments in all aspects.

As childhood is a crucial time in a person's life in creating a strong and lifelong relation to nature the project focuses on children. To enhance the chances of giving children the opportunity to create a good relationship to nature the project focuses on an environment where children spend a lot of time in their early ages, the preschool. In preschools in Sweden, where the thesis project is located, the children are between 1 and 6 years old.

To be able to have an explorative approach to design economic factors will not restrict the process.

In terms of the level of detail in the design, the project focuses on experiences and materiality rather than technical solutions. Building codes and regulations will not be in focus in the design.

Regarding sustainable development this thesis has a focus on the social perimeter of sustainability, psychological and behavioural aspects are at the centre, rather than a more environmental or technical approach calculating and reducing emissions and energy use.



*"Fresh air is as good for the mind as for the body.
Nature always seems trying to talk to us as if she
had some great secret to tell. And so she has."*

John Lubbock

FRAMEWORK

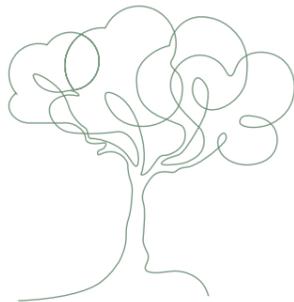
Chapter two

Povides the theory which the design proposal is based upon. Used references are introduces and the connections between human and nature is explained. The notions of nature, biophilia, biophilic design and preschools are defined.

Key references

References used in this thesis concerns, in one way or the other, the topic of human-nature connections. To introduce and understand the connection between human and nature the thesis refers to literature by sustainability scientist Christopher Ives, social psychology researcher Jody Davis, psychologist Tristan Snell and researcher and author Stephen Kellert. Here, the definition of biophilia and research on strategies to achieve a strong human nature connection is found. Translating this background into architecture and the built environment is done through comprehensive literature on biophilic design. This includes books and reports written by Stephen Kellert, environmental consultant organization Terrapin Bright Green and sustainable city researcher Timothy Beatly. Mentioned references creates a general understanding of how architecture, designed with biophilic design principles, can create nature connecting environments. This is then anchored in the context of children and preschools through literature, among others, by researcher Maibritt Pedersen Zari and architectural researcher Ghaziani Rokhshid concerning biophilic design and learning environments. Another important reference in the context of preschools and establishing a connection between child and nature is the pedagogue working at Levgrensvägen 3 preschool.

This collection of references creates an understanding of the relationship between human, nature and architecture. Which is, through the perspective of children, brought forward by this thesis as it explores and proposes a preschool that synthesizes learning environments and biophilic design.



Nature

There are many different views on what the word nature means and what it actually constitutes of. It has no obvious definition and Ducarme, F. & Couvert, D. (2020) argues that nature “fits the definition of an abstract concept, hence a mental construction rather than a concrete notion, which is situated both historically and geographically, and needs definition in context” (s. 1). Through history the notion of nature has aggregated an abundance of meanings and sometimes conflicting ones. Individuals’ associations with nature varies which creates a dissonance in a mutual understanding of what one means when referring to nature. Hence, to understand this thesis it is important to define what is referred to as nature in this context.

To simplify, you can say there are two “opposite” ends in the understanding of what nature refers to. In one end you have the view of nature “as a living organism unaffected by anthropogenic impacts on the environment” (Browning et al., 2014, p. 8). A rather narrow perspective and a phenomenon that doesn’t really exist anymore as almost everything on our planet have been impacted by humans in some way, either direct by human hand or indirect as an effect of human activities. A view like this exclude human made greenery like parks and gardens which constitutes much of the flora and fauna we encounter in our cities. In contrast to this, in the other end, one can argue that “everything, including all that humans design and make, is natural and part of nature because they are each extensions of our phenotype” (Browning et al., 2014, p. 8). This would include everything from human made plantations and paved roads to plastic objects and concrete buildings.

Nature in the context of this thesis is rather something of a middle ground of these two connotations. In the light of biophilic design I will apply the same definition of nature as Terrapin Bright Green uses in the report 14 Patterns of Biophilic Design: “as living organisms and non-living components of an ecosystem”, including flora and fauna, the unaltered materials the planet is made of, weather phenomena and everything from the sun and the moon to human made parks and gardens.

Human-Nature connection

When a disconnection between human and nature becomes evident one may ask why we should reconnect to nature. What are the consequences of the disconnection and why do we need a strong human-nature connection?

Research show that contact with nature has a great impact on our quality of life and general well-being (Beatly, 2016). Being in contact with nature have both mental and physical benefits and studies show that exposure to nature helps reduce stress, boost our cognitive functioning and lower blood pressure (Kellert & Calabrese, 2015). In 1984, Roger Ulrich published his study of patient’s recovery from gallbladder surgery which showed that patient looking out on trees recovered faster and needed less pain killers than patients looking out on a brick wall. With this study he was the first one to demonstrate the positive effect of nature on hospital patients. Since then, other studies have come to similar conclusions, such as environmental scientist Gretchen Daily that made a study that showed that nature can work similarly to antidepressant drugs. Or Japanese researchers that have done studies on “forest bathing” where they have observed the positive impacts, improved immune system and reduced stress, on our health that a walk in the forest have (SVT, 2019).

Further research on human-nature connections suggests that exposure to nature have positive impact on our personality; emotions, behaviours and thinking (Snell et al., 2020). Contact with nature leads to better social skills, increases our creativity and make us more caring and compassionate. As much of our personality, values and behaviours are shaped in our childhood it is not difficult to understand that one consequence of having a connection to nature is the positive benefits on children’s development and maturation (Ives et al., 2018). Building a strong connection to nature in childhood therefore becomes even more important, adding on to the health benefits.

It becomes evident that reconnecting to nature can be seen as a treatment, on an individual scale, to improve people’s mental and physical health and wellbeing. Ives et al. (2018) discusses how reconnecting human and nature also can function as a treatment on a society-scale in matter of treating the global environmental crisis. They argue that a strong human-nature connection has the potential to contribute in a societal change towards sustainability. It is our core values and beliefs that governs our actions and

behaviours and with a change in our worldview, to one that advocates a unity between human and nature, there is also a change in our actions and behaviours, that currently are contributing to the environmental crisis. Literature indicates that there are links between feeling connected to nature and sustainable behaviours as establishing a personal bond with nature teach us to value, protect and care for nature which in turn fosters pro-environmental behaviours (Pedersen Zari & Woodward, 2018). As childhood is the time when lifelong deep-rooted attitudes are established it becomes extra important to create a connection to nature already in a young age (Ives et al., 2017).

“The person-environment relationship is bidirectional: just as human behaviour affects the well-being of the environment, changes in the environment affect human well-being” (Davis et al., 2011, p. 257). This bidirectional relationship brings to light the importance of the planet’s health for human survival and that we ourselves are the ones in charge of the environments well-being. A strong human-nature connection leads to health benefits, it improves our quality of life and cognitive development. Further, it also fosters pro-environmental beliefs and behaviours resulting in that there is no reason for not reconnecting to nature.

Biophilia

To understand why nature perform such immense impact on our health and well-being one must turn to the concept of biophilia. During almost the entire existence of our species, humans have lived on the terms of nature where our survival depended on quick responses to environmental forces and knowledge of flora, fauna and ecological cues. Our body, mind and senses all developed in adaptive response to this natural world and over time "adaptations to nature became biologically encoded, resulting in a diverse set of inclinations to affiliate with natural processes and patterns" (Kellert, 2018, p. 2).

This innate connection to nature, the tendency to experience and interact with the natural world has is called 'Biophilia'. The term was first used by the psychologist Erich Fromm in the 1960s. Biologist Edward O. Wilson then popularized the term when he developed and introduced the Biophilia Hypothesis in his book Biophilia (1984). The hypothesis has then been further developed as parts of theories on evolutionary psychology by Stephen R. Kellert and Edward O. Wilson in the book The Biophilia Hypothesis (1993). Even though developed in circumstances far from today's modern society our inherent tendency to connect with nature continues to be significant for human physical and mental health and well-being (Kellert, 2018).

Biophilia

"The inherent inclination to affiliate with nature"

(Stephen R. Kellert, 2018, p. 15)

Connecting to nature

There is a diversity of concepts of reconnecting to nature available, spanning from perspectives of health and well-being, global sustainability to social ecological systems and environmental psychology. This has led to a large but fragmented amount of literature on the subject (Ives et al., 2017). To facilitate more coherent research on the human-nature connection Ives et al. (2018) presents five different types of nature connections, which clarifies how people can be reconnected to nature. The connections are material, experiential, cognitive, emotional, and philosophical connections, which can be seen to span from external to internal connections to nature (Figure 2).

To deeper understand these five connections to nature Ives et al. (2018) are adapting the concept of leverage points. Leverage points are parameters in a system that, when adjusted, can influence and change behaviour of the whole system. The five connections are organized from shallow to deep leverage points in relation to their potential to bring change in the system; how well they can strengthen the connection between human and nature. A change in a shallow leverage point, in this case the material connection, is not likely to make any major change for the system (connecting humans with nature). While deep leverage points, even with small adjustments, can have great impacts. Deep leverage points are the cognitive, emotional, and philosophical connections, which offers the best potential, when addressed, to create a strong human-nature connection (Ives et al., 2018). Changing the cognitive (knowledge and attitudes), emotional (empathy and feelings of attachment) and philosophical (world view) connections to nature is a challenge and even more so in relation to adulthood. Therefore, striving to establish these connections to nature at a young age are important. The five nature connections are however not working in isolation but influence each other, meaning that activities connecting human and nature can affect both shallow and deep leverage points. For example, it was found that children engaging in outdoor activities, experiential connection, developed good environmental attitudes, cognitive connection, lasting until adulthood (Ives et al., 2018). Against this, one can argue that experiencing and connecting to nature have the potential to establish pro-environmental beliefs and a world view fostering sustainable behaviours, thus seen as a treatment for the global environmental crisis. When striving to create experiences of nature in the built environment, biophilic design can be a helpful tool.

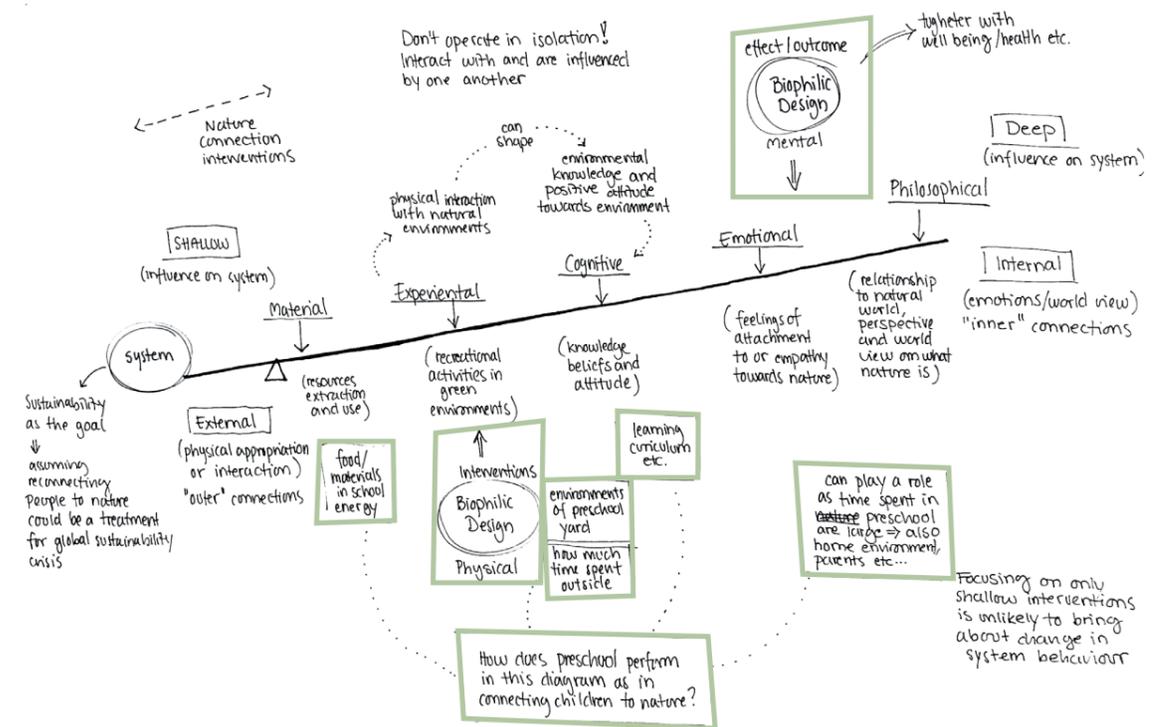


Figure 2. Illustrates the five categories of nature connections and their relation to the concept of leverage points. The illustration is based on Figure 2 in the article Reconnecting with nature for sustainability (Ives et al., 2018). I have added the green marked parts in the diagram.

Biophilic design

Biophilic design is the practice that translates the concept of biophilia into the design of the built environment. Thus, the practice derives from the understanding of human biology and our innate tendency to affiliate with the natural world. The core of biophilic design is to address the disconnection between human and nature arisen thorough the built environment. When applying biophilic design, the aim is to create environments where the physical, mental and behavioural benefits of being in contact with nature are obtained (Kellert, 2018).

Both Kellert (2018) and Browning et al. (2014) state that their respective frameworks should not be seen as a formula telling the architects what to do, but they should inform and guide in what is important, how one can incorporate nature into the building design and how people benefit from and react to a connection with nature. They also highlight that what aspects, attributes/patterns, to implement in a design varies depending on the type of project and its circumstances. Biophilic design is to be used as a whole to be successful; attributes/patterns should not be used individually or incoherent, but in a way where they complement and strengthen each other.

According to Browning et al. biophilic design is "design that reconnects us with nature" (2014, p. 4) and when applied successfully includes benefits such as decrease in anxiety and stress, improved health and general well-being, enhanced concentration and improved creativity and social interaction. Making biophilic design a good tool for a nature-including design approach that aims to reconnect children with nature.

Two existing biophilic design frameworks were in this thesis studied to understand the practice of biophilic design and how nature can be incorporated into the built environment. Further reading on biophilic design and its implementation in this thesis in chapter 5 - Concept, p. 43-51.

STEPHEN KELLERT'S 25 ATTRIBUTES OF BIOPHILIC DESIGN

"Specific design strategies can greatly assist the practice of biophilic design... The identification of particular strategies for the practice of biophilic design does not tell the architect, designer, and developer what to do, but rather what is important, and how one might effectively incorporate nature into the built environment." (Kellert, 2018) His practice of biophilic design includes 3 elements, the ways people experience nature, and 25 associated attributes, which are the specific strategies.

Direct experiences of nature

1. Light
2. Air
3. Water
4. Plants
5. Animals
6. Landscapes
7. Weather
8. Views
9. Fire

Indirect experiences of nature

10. Images
11. Materials
12. Texture
13. Colour
14. Shapes & forms
15. Information richness
16. Change, age and the patina of time
17. Natural geometries
18. Simulated natural light & air
19. Biomimicry

Experiences of space and place

20. Prospect & refuge
21. Organized complexity
22. Mobility
23. Transitional Spaces
24. Place
25. Integrating parts to create wholes

TERRAPIN BRIGHT GREEN'S 14 PATTERNS OF BIOPHILIC DESIGN

"The patterns have been developed through extensive interdisciplinary research and are supported by empirical evidence... The 14 patterns have a wide range of applications for both interior and exterior environments, and are meant to be flexible and adaptive, allowing for project-appropriate implementation." (Browning et al., 2014, p. 4) Definitions of the 14 patterns are Terrapin Bright Greens own, retrieved from the report *14 Patterns of Biophilic Design* (Browning et al., 2014)

1. Visual Connection with Nature

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

2. Non-Visual Connection to Nature

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

3. Non-Rhythmic Sensory Stimuli

Stochastic and ephemeral connections with nature that may be analysed statistically but may not be predicted precisely.

4. Thermal & Airflow Variability

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

5. Presence of Water

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

6. Dynamic & Diffuse Light

Leveraging varying intensities of light and shadow that change over time to create conditions that occur in nature.

7. Connection with Natural Systems

Awareness of natural processes, especially seasonal and temporal changes characteristic of a healthy ecosystem.

Biophilic design

"Biophilic design is the practice of connecting people and nature within our built environments and communities"

(International Living Future Institute)

8. Biomorphic Forms & Patterns

Symbolic references to contoured, patterned, textured or numerical arrangements that persist in nature.

9. Material Connection with Nature

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

10. Complexity & Order

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

11. Prospect

An unimpeded view over a distance for surveillance and planning.

12. Refuge

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

13. Mystery

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

14. Risk/Peril

An identifiable threat coupled with a reliable safeguard.

Children

Childhood is considered the time when experiencing nature is most essential to human physical and mental maturation (Kellert, 2006) and one widely published consequence of having a connection to nature is the learning and development benefits for children. Empirical studies shows that spending time in nature, having a direct and/or indirect contact with nature and interacting with nature through simple activities increases children's health and well-being (Ghaziani et al., 2021). According to Ives et al. (2018) early life outdoor activities (which would be experiential connections with nature relating to Figure 2 on page 13) is related to environmental beliefs (cognitive connections) in adulthood. Following that Pedersen Zari & Woodward (2018) argues that biophilic design i.e., creating a connection to nature, focused on the development and psychological well-being of children can add to social sustainability agendas by fostering pro-environmental behaviours amongst children.



Preschools

The preschool in Sweden is a function with childcare and education for children, aged 1-6 years, before the actual schooling begins. The purpose with the preschool is to lay the foundation for the learning that will continue for the rest of life. How the preschool is operating is regulated by the Swedish Education Act and the curriculum. The Education Act regulates the rights and obligations of children and their guardians while the curriculum defines the values of the preschool, the responsibility that the principal and pedagogues have and the different goals they should work towards. In preschool the children are given the opportunity to develop and learn through playing, creating and exploring both on their own, with other children and with adults. It is the municipalities that are responsible for ensuring that there are preschools and that all children are offered a place at a preschool. There is both municipal preschools and independent preschools, but it is the municipality that approves the independent preschools, and they must follow the curriculum (Skolverket, 2021). In addition to the curriculum each preschool has the opportunity to formulate their own pedagogy which is the basis for how the pedagogues work with the children. Different preschools have different pedagogical orientations which exists because there are different theories about and views on child development. This means that there is a variation in preschools available in Sweden where there are different pedagogical orientations in focus. This in turn affect what subjects and areas the preschool is focusing on in their activities. Montessori, Reggio Emilia and "I Ur och Skur" (Swedish forest preschool) are some examples of orientations a preschool can have. There are also municipal preschools with no specific focus on a pedagogical orientation (School Parrot, 2019). This thesis is not focusing on any specific pedagogy but the preschool used as a basis in the project has a Reggio Emilia focus and more information on this is found in chapter 4, p. 38.

In Sweden, 94 percent of children aged 3-5 are attending preschool (SCB, 2019) and the preschool therefore becomes an important environment for children's development and maturation. As children spend a lot of their time in preschool environments the preschool premises have the opportunity, through its design, to contribute to the creation of a connection between children and nature.

Summary - What do i bring to the design

To sum up the research on how to create a connection to nature the knowledge acquired was compiled and interpreted into a reconnection strategy. A strategy consisting of three parts; Interact with nature, Experience of nature (divided in direct and indirect experiences) and learning in and about nature. These are together creating a strong opportunity for a children-nature connection to be established.

INTERACT WITH NATURE

An important aspect of creating a strong connection to nature is interacting with natural environments and elements. Interaction with nature through various activities fosters feelings of affection and responsibility for nature which lays the foundation for a strong bond to nature. Interacting with nature can mean several things. It can be playing with natural elements, such as water or sand or creative creation with natural materials. It can also be the activities of gardening or growing plants or care for animals. For children to be able to interact with nature in the preschool environments, spaces where interactions can take place is required.

EXPERIENCE OF NATURE

Equally important for creating a connection to nature is to enable spaces where the children can experience and explore nature themselves. An experience of nature can be both direct and indirect. A direct experience of nature here refers to being physically outside in a natural environment, giving a multisensory experience of nature. As both sight, touch, smell, hearing and at times even taste is activated. This direct contact with nature can be achieved in various environments spanning from the urban greenery in a city park to the wilderness of the forest. An indirect experience of nature instead refers to a contact with nature created indoors. Either by creating a contact to the outside world through the building envelope, such as a visual experience of nature, or by bringing nature and natural elements indoors. Having a visual experience of nature, while being inside a building, places demand on the surrounding environment and its level of greenery. For both the direct and indirect experiences the level of access to nature becomes an important parameter.

LEARNING IN AND ABOUT NATURE

One important part in creating a connection to nature is that of acquiring knowledge about nature. The knowledge of flora, fauna, natural processes and phenomena's as well as an understanding of how one's actions affect the environment fosters a sense of connectedness with nature. Children's enthusiasm and interest for nature seems to increase when they in person can explore and interact with the natural features they are learning about. This relates to the learning through experience benefit that an outdoor classroom can offer. And highlights the importance of creating spaces outdoors where you in person can experience features and elements of nature. Creating spaces for learning and play outdoors, in a nature setting, also increase the time that is spent outside, which in turn increases the children's physical and mental health.

STRATEGY FOR RECONNECTION

Interact with nature

Experience of nature

Learning in and about nature

*"There's a whole world out there, right outside
your window. You'd be a fool to miss it."
Charlotte Eriksson*

REFERENCE PROJECTS

Chapter three

Presents selected reference projects in relation to learning environments, biophilic design and connecting to nature which have inspired the design proposal.

Reference Projects

Finding reference projects that state that they use biophilic design as a strategy in their school or preschool projects was a challenge. But that does not mean that there are no projects where a strong connection to nature is achieved in the building design. One project, project 2, was found where the architects, Oliver Heath design, on their website state that they as designers work with a biophilic design approach in all their projects.

1. Paul Chevallier School by Tectoniques

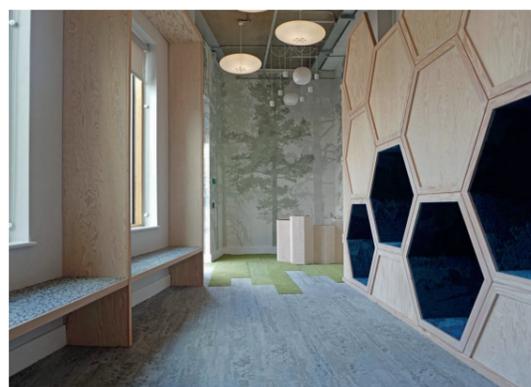
The building comprises both a preschool and an elementary school and is situated in Lyon, France. Nature was one of the main themes for the architects when designing and one of the most prominent features of the project is the relationship it creates between nature and architecture. The school is situated next to a wooded parkland and the hilly roof landscape are covered with plants and wildflowers. These greens roofs become an extra façade of the building as they are accessible, through walkways, and visible both from inside and outside. Being inside, large windows frame the nature and looking out children feels surrounded by it as nature is present in every outlook. Floor to ceiling windows also increase the natural light. Wood has a significant presence in the project as it is almost only constructed from wood and the wood is left exposed on the inside surfaces giving the inside environment a certain texture and feeling. ()



Araud & Tectoniques, n.d

2. The Garden School by Oliver Heath Design

A school for children with special educational needs located in Hackney, UK. Oliver Heath Design did a makeover of a storage space and used biophilic design to create a recovery space for the children that became overwhelmed by the noises in the outside playground. The biophilic design approach used are natural analogues and they work with tactile and visual references to nature. Natural textures, colours and images are used to mimic nature. Window seats makes it possible to watch the happenings on the playground, but also creates smaller personal spaces with an abundance of natural light to perform activities, like reading a book. The hexagonal seating provides space for withdrawal.



Oliver Heath Design, n.d

Reference project 1-3 were selected upon their urban location and their prosperity in establishing a connection between children and nature in various ways and where several biophilic design principles could be identified. Reference project 4 was selected as an inspiration in fragmenting a spacious room into several smaller spaces and creating recreational spaces reminiscent of outdoor play in an indoor environment.



Benschneider, 2011

3. Bertschi School by KMD Architects

The school is located in Seattle, Washington and the added science wing serve as a science teaching space for kindergarten through fifth-grade students. The wing includes a classroom, an attached greenhouse and a smaller garden area. These spaces display how biophilic design can be used to connect children with nature and natural processes, but also to engage them in interacting with and learning about nature. The greenhouse creates a semi-tropical ecosystem where the children, even on a cloudy day, can feel the warmth of captured solar energy and humidity from the plants. In here there is a green wall that not only looks and feel nice, but it also cleans and oxygenate the air as well as treat the greywater from the building creating learning opportunities for children about the systems and cycles of processes in nature. In the ethnobotanical garden the children can get acquainted with different plants, care for them, harvest and use in learning or creative work. The project nicely integrates water into the design by creating an "indoor river" where rainwater runs while making its way from the roofs of the school to the garden outside of the science wing when its raining.

4. St. Johann primary school by ZMIK

A redesign of the main corridors, of St. Johann school in Basel, Schweiz, into multifunctional spaces for learning and recreation. The architects created a new type of spatial structure for new forms of teaching. These playful learning spaces are flexible and provides various work surfaces for both individual and group activities. Recreational elements such as bouncy steppingstones, slides, balancing beams, cubbyholes and lookouts are placed across different levels linked by steps and sloping surfaces that all create a miniature landscape where children can explore, play and interact with others. The landscapes provides different views out from the windows and over the corridor and small caves and perches are inviting retreats for rest.



WEISSWERT, n.d

*"We don't inherit the earth from our ancestors,
we borrow it from our children."
Native American proverb*

CONTEXT & SITE

Chapter four

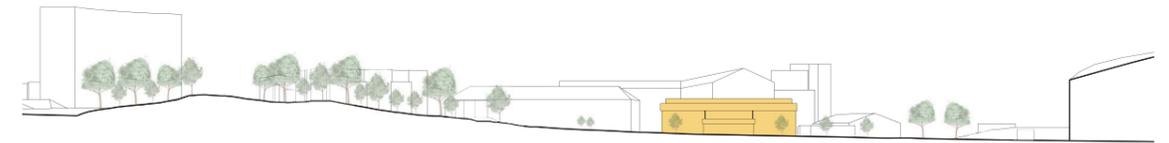
Introduces the existing preschool at Levgrönsvägen 3. General information about the preschool, site and building analysis is presented together with selected parts from conversations with pedagogues. The chapter is concluded with identified problems and qualities of the site and building.

Finding a preschool

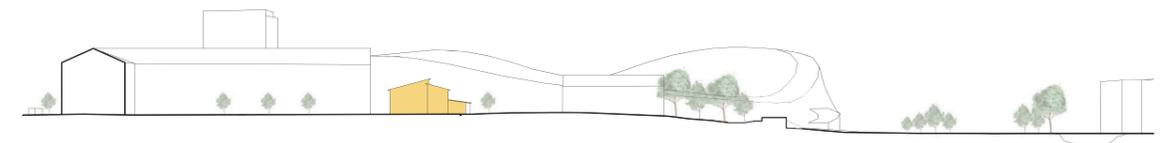
As the thesis investigates the reconnection between children and nature, a context where the disconnection is extensive, and nature is not a matter of course is selected as the setting for the project. An existing preschool in a dense urban environment was identified and used as a basis for the investigation. The urban location was the main criteria for finding a preschool, but the choice was also based on the following criteria:

- Located in Gothenburg to be able to easily make visits.
- The preschool is located in its own building.
- Good drawing material exist to facilitate the work.
- The building should not be in the light of cultural heritage to avoid a collision between transformation and conservation as the focus of this thesis is not conservation architecture.

The chosen preschool is called Levgrönsvägen 3 and is located at Heden in central Gothenburg, Sweden (Figure 3). The premises is situated in the middle of Evenemangsstråket ("The event track"), which consists of the hotels, arenas, sport halls, museums and amusement park found in the area that extends from Korsvägen, along Skånegatan and past Ullevi (Figure 4). West of the preschool, you find the Katrinelund High School and to the north you have the Ullevi arena. South of the premises there is a hilly recreational green area, Burgårdsparken. Directly to the east the property of Stora Katrinelund is located and further away the area of Gårda is visible, a rather dense residential and office area with a lot of ongoing development where now several high-rise buildings are visible. Levgrönsvägen 3 is a municipal preschool built in 2009.



Landscape section A-A, 1:2000 (A4)



Landscape section B-B, 1:2000 (A4)



Figure 3. Gothenburg, 1:40000 (A4). Aerial photo underlay ©Lantmäteriet (2022)

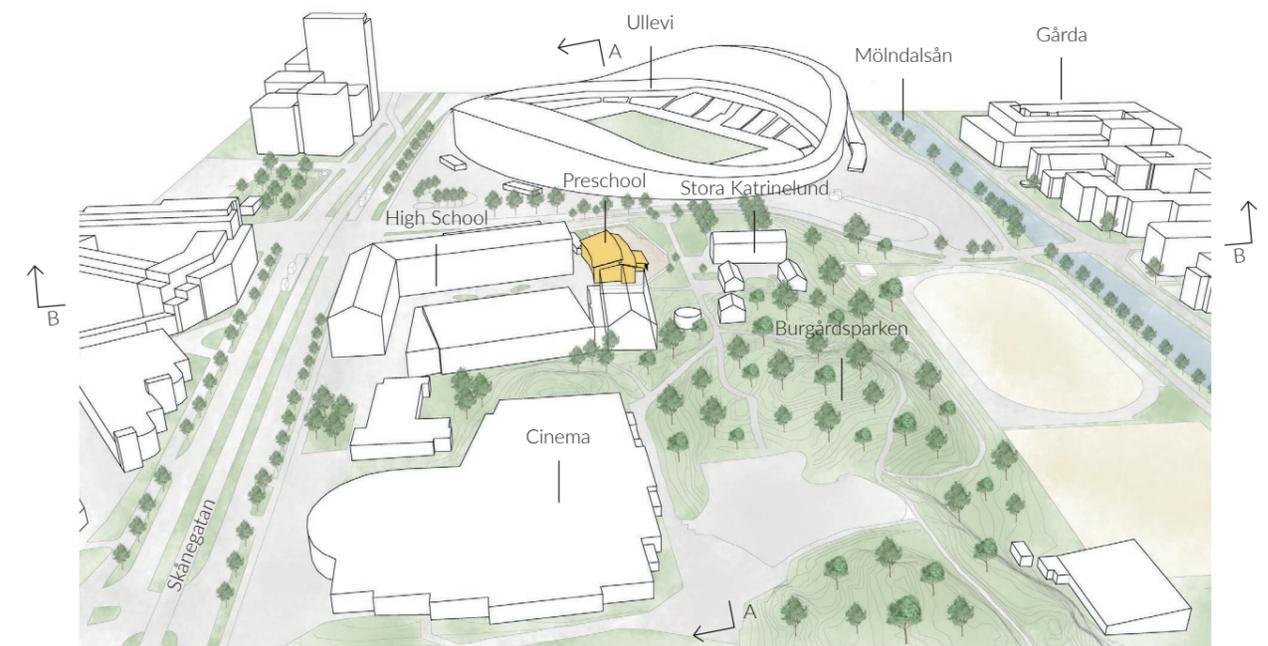
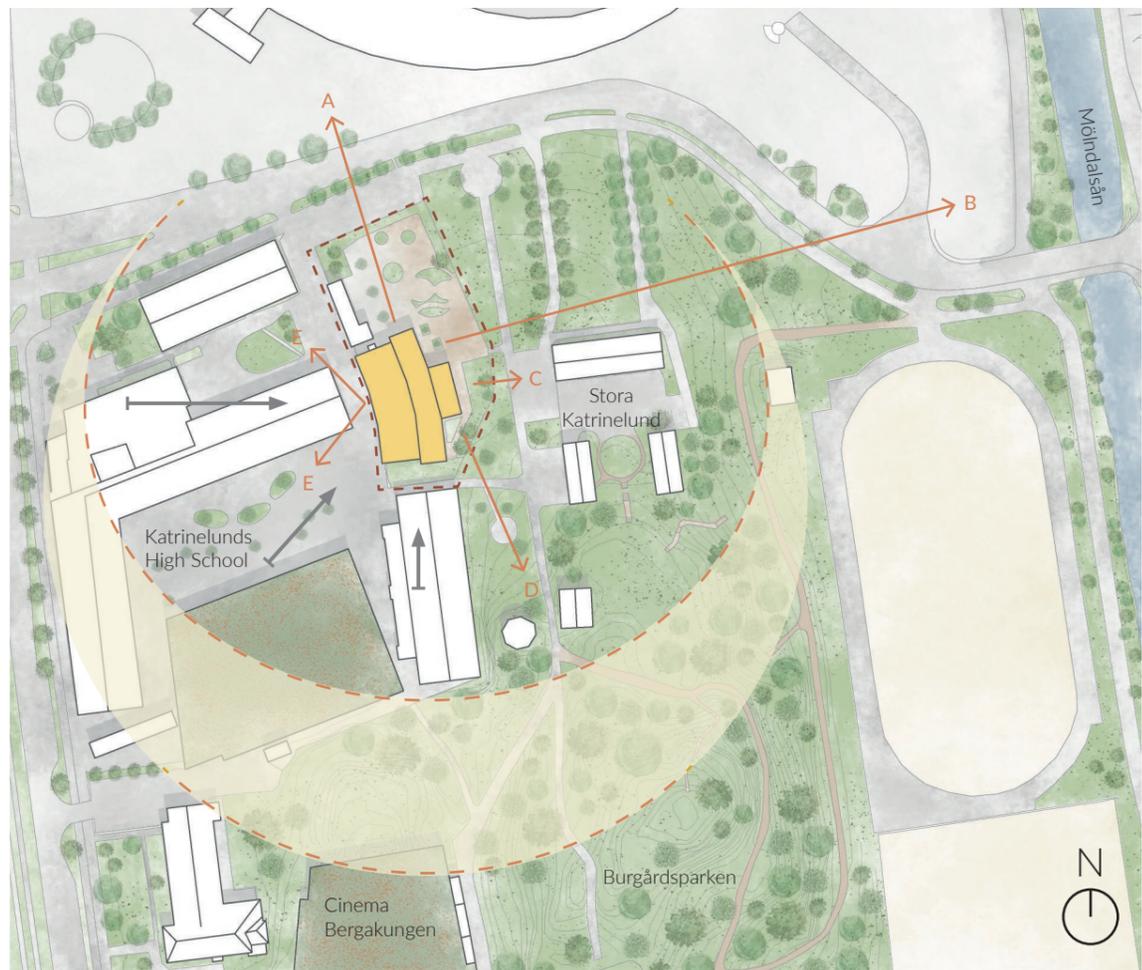


Figure 4. Location of preschool Levgrönsvägen 3 and its surrounding environment

Site analysis



- Preschool building
- Property boundaries
- Preschool yard
- Sun path
- Wind

VIEWS

From the preschool windows and yard there are views of all directions. Some more pleasant than others in relation to having a visual connection with nature. There are both views with a short and long line of sight. Enabling outlooks on greenery are important for creating a visual connection with nature.

- A. Ullevi
- B. Gårda, new high-rise buildings
- C. Stora Katrinelund
- D. Burgårdsparken
- E. Katrinelund High School

LAND USE

The land to the east of the preschool is today an open grassy landscape with some bushes and trees which belongs to the municipality and Stora Katrinelund. The parts directly in front of the preschool belongs to the municipality which provides the opportunity to extend the size of the preschool yard.



A - View towards Ullevi



B - View towards Gårda



C - View towards Stora Katrinelund



C - View towards Stora Katrinelund



D - View towards Burgårdsparken



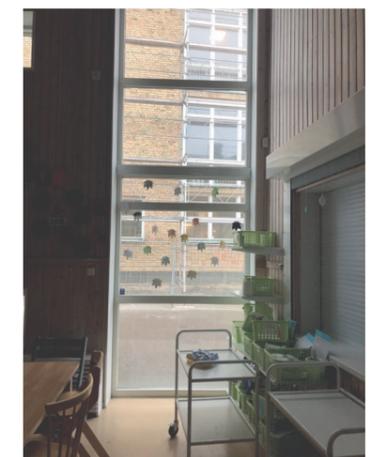
C - View towards Stora Katrinelund



E - View towards Katrinelund High School

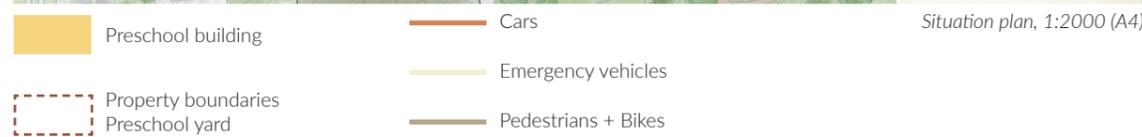
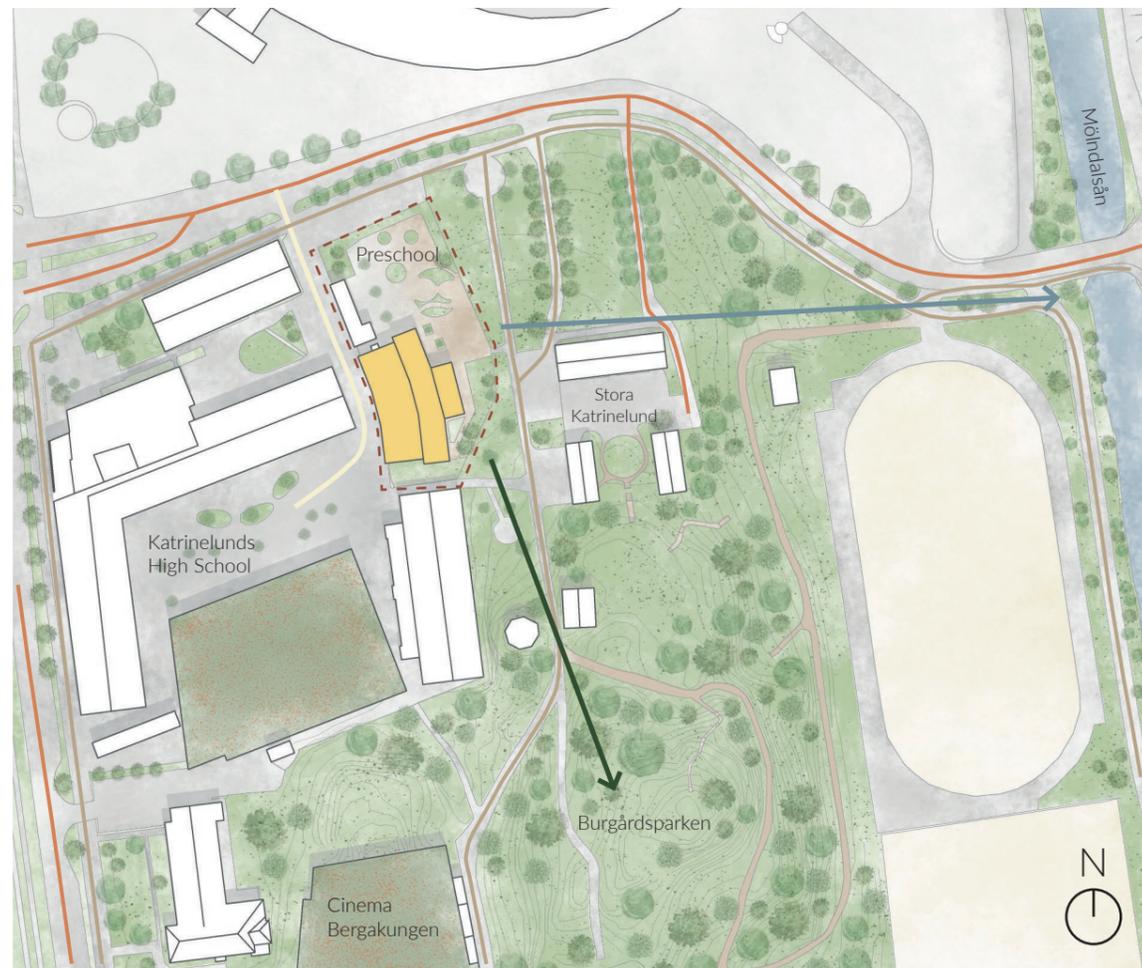


E - View towards Katrinelund High School



E - View towards Katrinelund High School

Site analysis



SURROUNDING NATURE

There are both blue and green structures (Mölndalsån and Burgårdsparken respectively) in close proximity of the preschool. Today the preschool occasionally goes on excursions to the hilly greenery of Burgårdsparken in smaller groups. Both the river and the park have the potential to be more integrated in the preschool activities and the land is accessible as it belongs to the municipality. The surrounding nature is a quality that should be used in creating a stronger connection between the preschool and nature.

→ Connection to Burgårdsparken

→ Connection to Mölndalsån

FUNCTIONS OF SELECTED BUILDINGS

Stora Katrinelund is today used for educational activities. Studium, which conducts vocational training and adult education in gardening, share the premises with an agricultural gymnasium with focus on animals. There are often activities happening on the premises in relation to gardening and planting and there are rabbits, guinea pigs and chickens in the yard belonging to the gymnasium. A symbiosis between the preschool and the educational function on Stora Katrinelund could be made.

Preschool Levgrensvägen 3

Levgrensvägen 3 is a municipal preschool with a Reggio Emilia focus. The preschool has 104 children who are divided into five departments, or as they call it Hemvister, (Figure 5). Approximately 17 pedagogues work here, and the preschool has their own chef.

The visits at the preschool and conversations in person and through email with pedagogues gave an understanding of the outdoor and indoor environments, both qualities and problems, and how the preschool is operating; what activities they have in a day, the pedagogics they use and how they use the spaces they have at their disposal.

A normal day at the preschool could look like this: They start the day with breakfast in the piazza before going outside for lessons and/or play in the yard. They stay outside until lunchtime when they go inside and eat lunch. After lunch it is rest time, the smaller children sleep and the older ones are having a calm learning session, which could be watching educational children's program. After the rest there are time for more active learning sessions or play before eating an afternoon snack. Then they are playing and having lessons, inside or outside, until the parents pick them up. The amount of time the children spend outside depends on the weather conditions and varies between the ages. The younger children spend approximately 2 hours outside each day and the older children between 3 and 6 hours.

The pedagogue was asked if the days looked different between the younger and older children, and she answered:

“The young children’s activities focus more on creating a basic sense of security and the older children get to approach the school’s thoughts on acquiring knowledge in lessons. But important for everyone is that without a sense of security there is no good learning”

(Personal communication, 15 February 2022)



Facade facing north



Facade facing east



Facade facing west

Building analysis

The preschool is located in a two-story building where parts of the plan layout originate from the Reggio Emilia philosophy. The rooms revolve around a Piazza that is the centre or hearth of the building and preschool (Figure 5). The Piazza is a room with partial double ceiling height, it works as a gathering place in the morning and afternoon and the children also eat in this space. At times it is also used by a Hemvist to have a group activity. Each Hemvist have their own spaces with rooms for rest, play and lessons. In each Hemvist there is also access to an Atelier (creative workshop).

The pedagogue was asked if the indoor spaces were sufficient for the number of children, and she expressed that the space is enough if they organize themselves and the activities. She added that they experience that the Hemvist are small so they appreciate the common areas of the balcony and piazza that they also can use (Personal communication, 4 Mars 2022).

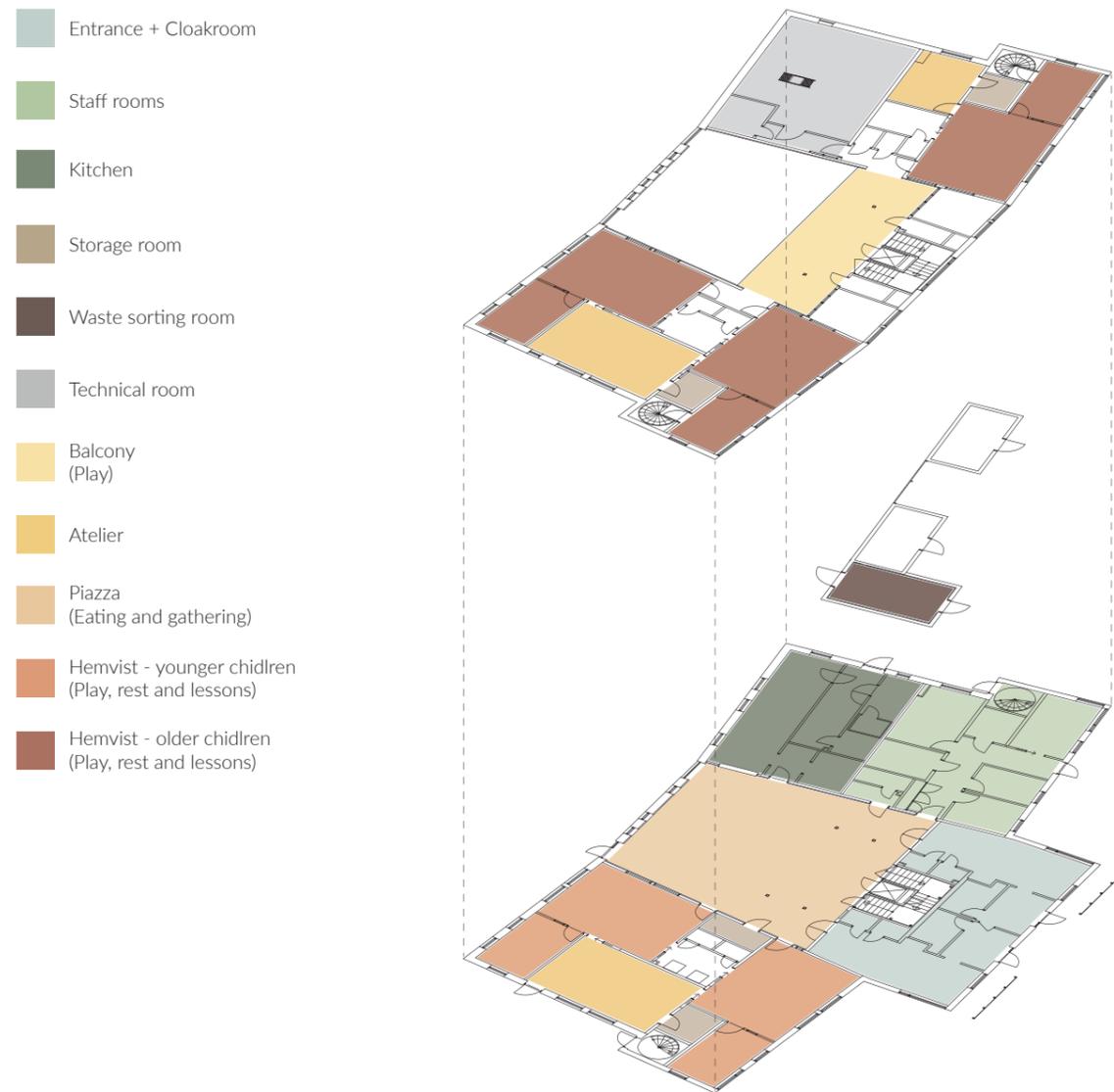
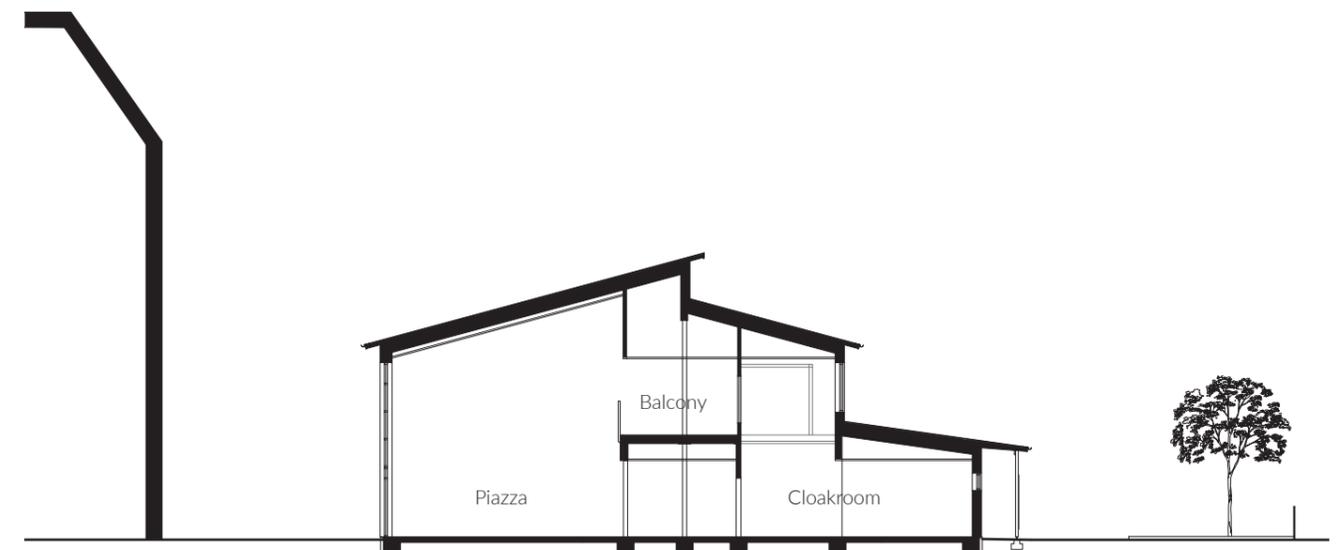


Figure 5, plans showing the different functions



Facade facing north, 1:250 (Lohk Arkitekter)



Section C-C, 1:250 (Lohk Arkitekter)



- - - Property boundaries
 - - - Preschool yard, available outdoor space
 ▲ Entrance yard ▲ Entrance building

Figure 6, Plan over preschool and yard, 1:600 (A4)

In Sweden there are guidance on how much “free space” (Friyta) there should be per child for play and outdoor activities. In 2014, Boverket together with Tankesmedjan Movium was commissioned by the government to develop a guide for planning, design, care and management of children’s and young people’s outdoor environment with special focus on preschool- and schoolyards. The assessment of a sufficiently large Friyta should take into account both the Friyta per child and the total size of the Friyta (Boverket, 2015). Several municipalities have from proven practice and current research developed their own guidelines with measurements for Friyta. These guidelines are

not binding but can work as a support. According to Boverket (2015), a reasonable measure of the Friyta could be 40 sqm per child in a preschool and research shows that the total size of it should be no less than 3000 sqm (regardless of the number of children in the school).

The size of the Friyta at Levgrensvägen 3 preschool is approximately 23000 sqm, which gives a Friyta per child that is 22 sqm (Figure 6). These numbers are insufficient regarding both space per child and in total size in comparison to the guidelines from Boverket.



Facade facing east, 1:250 (Lohk Arkitektur)

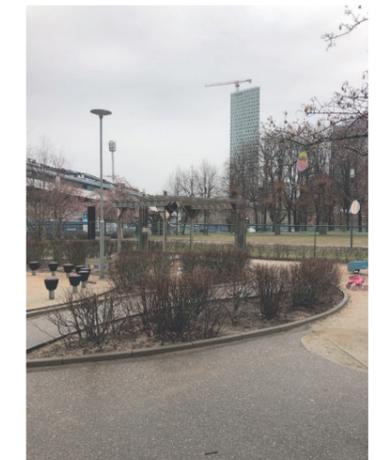
PRESCHOOL YARD ENVIRONMENTS



1. View of preschool yard



2. View of preschool yard



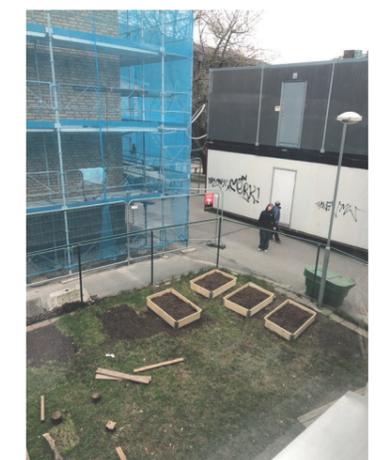
3. View of preschool yard



4. View of preschool yard



5. View of preschool yard



6. View of preschool yard



INDOOR ENVIRONMENTS - GROUND FLOOR



1. Image of atelier



2. Image of department - play room



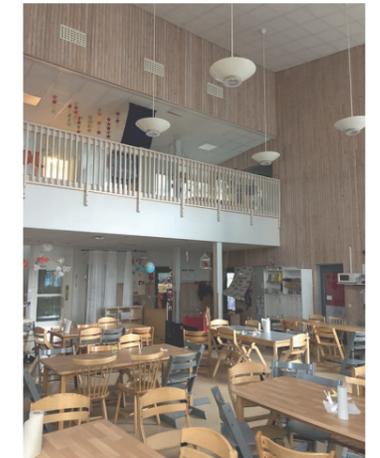
2. Image of stair



4. Image of piazza



5. Image of atelier



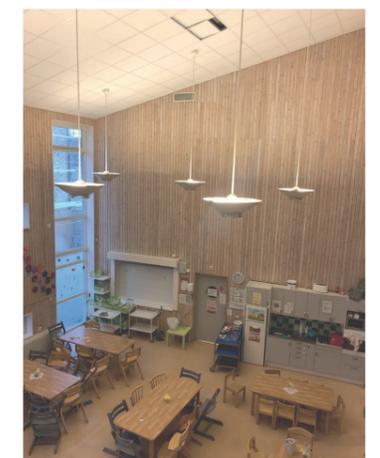
6. Image of piazza and balcony



7. Image of cloakroom



8. Image of piazza



9. Image of piazza



INDOOR ENVIRONMENTS - UPPER FLOOR



10. Image of atelier



11. Image of balcony



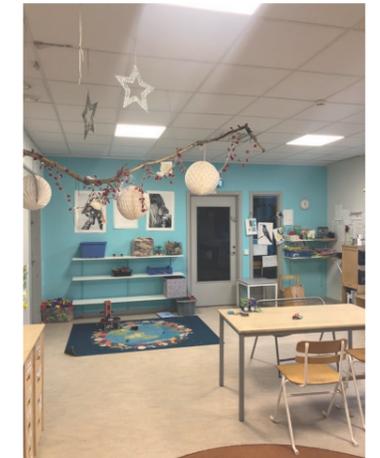
12. Image of balcony



13. Image of reading room



14. Image of department - play room



15. Image of department - play room



16. Image of balcony



17. Image of atelier



18. Image of department - rest room

REGGIO EMILIA

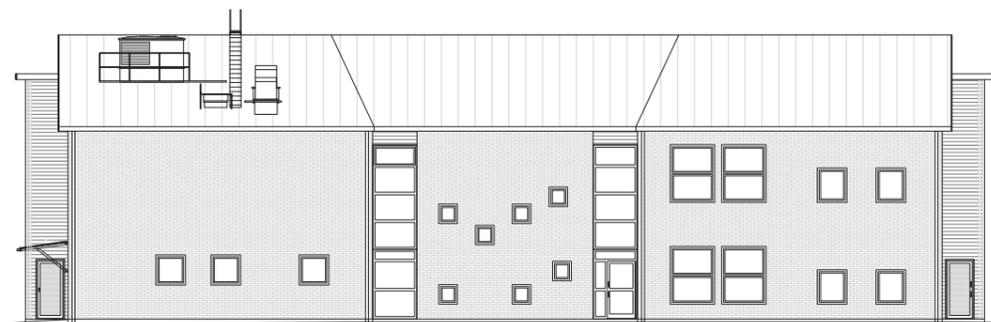
Reggio Emilia is a philosophy more than a pedagogy; it is a view of children and humans rather than a pedagogical focus. The children are seen as competent and important citizens well worth listening to. The philosophy is not offering any pedagogical tools that you can copy or borrow, but it is about deeper values about children and their development. Children must have opportunities to use their 100 languages, which are all the different ways in which a child can express themselves, for example with pictures, dance and mathematics. Reggio Emilia draws attention to the pedagogical significance of the environments and materials in a preschool and calls this the third pedagogy (where the first one is the cooperating children and the second the adult). Therefore, the Piazzas were created to promote meetings between children and Ateliers to cherish the aesthetic creativity; to make room for more of the 100 languages (Reggio Emilia Institutet, 2022).

Levgrensvägen 3 is profiled as a preschool with Reggio Emilia focus and when asked about what this meant for the preschool the pedagogue explained that the Reggio Emilia focus is mostly visible in the adaptation to the Reggio Emilia thinking in the design of the premises. The Piazza and the Ateliers stem from the philosophy and

the preschool are using them as wisely as they can. When it comes to pedagogics and mindset about how to run a preschool there are other thoughts that profile them (Personal communication, 1 Mars 2022).

To conclude, there is a gap between the layout of the preschool and what philosophy/pedagogy that is used. The preschool was built 13 years ago as a Reggio Emilia preschool and during these years the way in which pedagogy is conducted and what philosophy around which the work circulates have changed and developed but the building and its spaces have not. The preschool activities and pedagogy are today not strongly connected to the Reggio Emilia philosophy and therefore the layout of the premises doesn't need to be either. What is important is the general quality of the preschool environments and that they support the activities and the pedagogy the preschool is using.

Therefore, the design in this project will not take into account the Reggio Emilia philosophy, nor will it focus on designing spaces in relation to pedagogics as the aim of this thesis is to strengthen children's connection to nature and thus focusing on designing spaces that support this reconnection.



Facade facing west, 1:250 (Lohk Arkitekter)

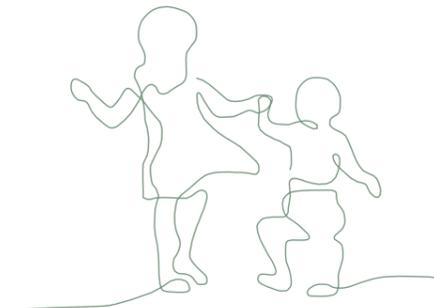
PEDAGOGY

When asked about what the cornerstones in their work at the preschool is, the pedagogue answered:

"At our preschool, the absolute cornerstone is play, which we work with both as a means and an end. All children must be given the opportunity and ability to participate in the play based on their conditions."

(Personal communication, 15 February 2022)

The preschool is mainly using a traditional mixed pedagogy, which means they are using the "goodies" from several different pedagogical schools. What profiles them is the play, as in play there are endless opportunities for development in all areas of the curriculum. Learning has a central role in everything they do, and they aim to find ways of having a learning thought in all activities, but also routine situations as for example putting on outerwear.



RELATIONSHIP TO NATURE

When discussing what connection the pedagogues experience that the children have to nature today she answered:

"There is a genuine interest among us pedagogues to convey a good relationship with nature in our children. However, we see that it involves an extensive learning and enlightenment work for our children today. We meet children who ruthlessly kill, trample and tear apart the relatively meager flora and fauna we have here."

(Personal communication, 4 Mars 2022)

In the preschool today they are working with creating a relationship between children and nature in some different ways. They try to create, in the children, a care for nature by talking about and teaching them about nature. For example, they learn the children about that plastic and other waste materials harms animals and the nature if it is thrown in it. They also talk about the seasons and how nature changes according to these and what different nature environments look like by creating for example a beach or forest environment in a plastic tray with materials they picked outside. The preschool is running a small pallet collar cultivation which is part of the yearly project called "from seed to pizza" where they are collecting seeds from vegetables they are eating, such as tomatoes and peppers, that they then sow and lets the children help to water and care for. They are then selling some of the plants to use the money for a celebratory pizza, finishing the project (Personal communication, 4 Mars 2022).

In relation to having a physical connection to nature, the pedagogue tells me that there is a difference in the children's interest and enthusiasm for nature when they are inside talking about nature, showing pictures and looking at movies, compared to when they are able to be outside in nature exploring it in person. When they are in park or green area they see the children experiencing the freedom of being in nature interacting with it, something they can't do inside. The pedagogues experience that the children are playing in a more harmonious way outside and that they are comfortable being in nature as long as it is a familiar environment. (Personal communication, 10 February 2022).

Identified patterns:

- 1. Visual connection with nature (Windows, outdoor space, some plants inside)
- 6. Dynamic & diffuse light (Windows in piazza, windows against all directions)
- 7. Connection with natural systems (Outdoor spaces, yard and hill (Burgårdsparken), garden land)
- 9. Material connection with nature (Wood panels Piazza, wall colour "in one room", wood furniture, facade: wood)
- 11. Prospect (Views windows, transparent materials – views between rooms, balcony)
- 14. Risk/peril (Piazza-Balcony)

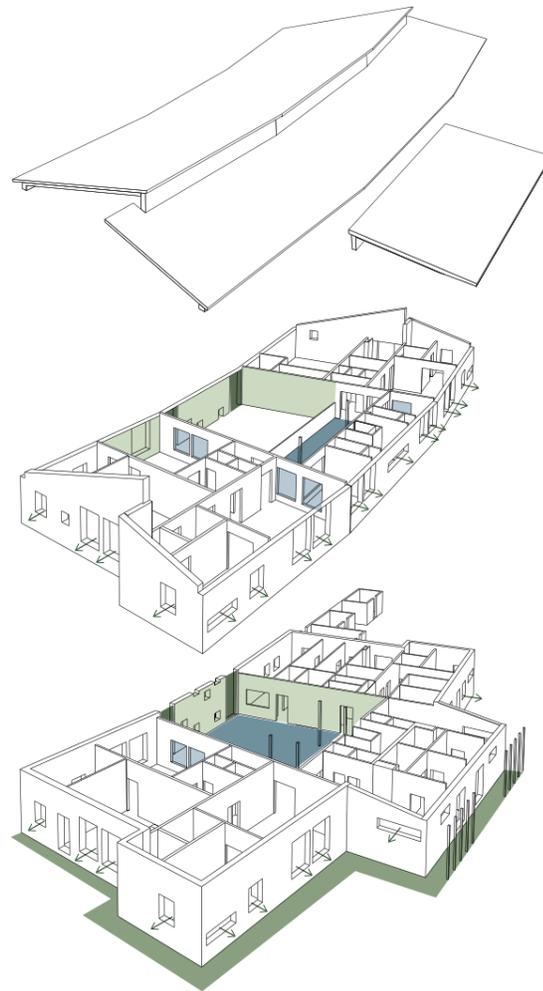


Figure 7.
Showing identified biophilic design patterns in the preschool

BIOPHILIC DESIGN

In analysing the preschool building and its outdoor environments there are some biophilic design principles present. However, these are occurring in a disconnected way only creating traces of a biophilic design environment leaving a lot to be desired in a design supporting children's connection to nature. The preschool was analysed in relation to Terrapin Bright Green's 14 Patterns of biophilic design, where Figure 7 shows the patterns identified and what aspects of the building and its outdoor environments that relates to them.

Discussing biophilic design with the pedagogue there were some principles that she wished were more present in the preschool environments. In general, she thought it would be good with more

greenery inside, especially potted plants and flowers but she was also enthusiastic about the idea of bigger green walls or acoustic moss panels. Another element that she talked about was water and the possibility for the children to interact and play with it in a space indoors. In relation to having the children activate and understand all their senses she experiences that materials and elements from nature is rewarding when used and she expressed a wish for having more textures and surface materials inspired by nature. But also nature sounds and the possibility to make the ateliers into spaces where they could create with materials picked from nature and not focus as much on drawing and painting as they do today. (Personal communication, 10 February 2022).

Learnings

Problems and possibilities with the preschool indoor and outdoor environments concluded from analysis, visits, and conversations with pedagogue.

Problems:

- Poor quality of indoor environment (cold and hard floors, cold in the air, low humidity)
- Too much volume that is not used; proportions of spaces
- Entrance situation is cramped
- Uninspiring environments
- Messy indoor environments
- Acoustic problems in Piazza and the short amount of time the room is used in relation to its size
- Not enough shadow in the yard and mostly hard surfaces
- Not enough Friyta ("free space") per child
- Views from windows

Qualities:

- Nearby green areas
- Mölndalsån
- Stora Katrinelunds Landeri
- Existing traces of biophilic design

There are possibilities to create synergies between addressing problems identified with the preschool and using biophilic design to connect children and nature. That a biophilic design intervention can both strengthen the nature connection and address a spatial problem.

There is a potential in the pedagogue's personal enthusiasm for nature and environmental sustainability. They are interested in the concept of creating a stronger connection between children and nature in the built environment. This creates potential for interventions that requires care and involvement from the pedagogues.

*"Just living is not enough. One must have
sunshine, freedom, and a little flower."
Hans Christian Andersen*

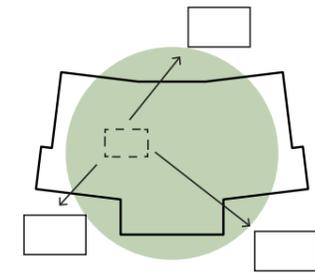
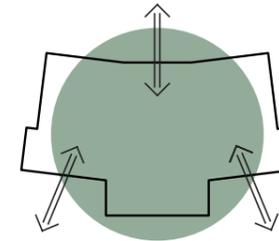
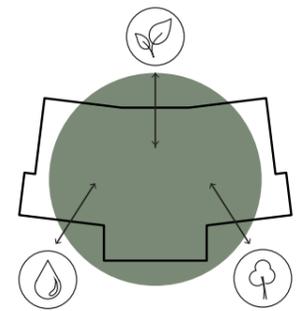
CONCEPT

Chapter five

Provides the design strategies which are based upon the theory and context. It presents the conceptual ideas on how to transform learning environments with the use of biophilic design principles with the intention to strengthen the connection between children and nature. It presents the exploration on biophilic design conducted during the thesis.

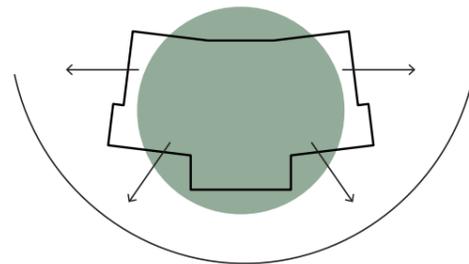
Design strategies

Information collected from visits at the preschool, building and site analysis and conversations with pedagogues together with explorations on biophilic design have developed the reconnection strategy (presented in chapter 2, page 17), (Figure 8) into a biophilic design framework for this project. (More information about this process on page 48). This framework consists of five parts which are referred to as design strategies. These design strategies is the conceptual idea on how to transform a preschool into a learning environment that strengthen children's connection to nature.



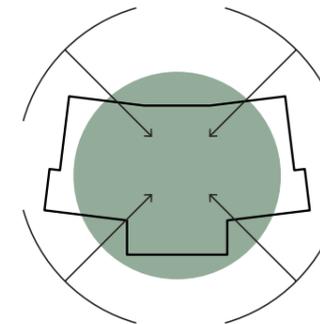
1. Space for nature interacting activities

Creating various spaces, both outdoors and indoors where the children can engage in activities where they interact with nature. A remake of the preschool yard to a space with more possibilities to engage with natural features, such as water, trees and plants but also opportunities to play and create with nature object such as sticks, stones, sand and leaves. Establishing a gardening area with a greenhouse, berry bushes and a garden land. Adding a pond, bird feeders, insect hotels and plants and flowers to enable an encounter with animals.



3. Connect inside and outside

Transform the building envelope from being a separator of the inside and outside to instead be a spatial transition between the two. Blurring the line between inside and outside by creating spaces where you are perceived to be both indoors and outdoors. Enabling visual connections to outside through changes in window sizes. With this comes the aspect of transforming the environment that one looks out at, to more nature-dense views. Increase access to the outdoors with more doors and openable glass sections and make it possible to go outside directly from the upper floor.



5. Create spaces for outdoor learning

Seeing the whole preschool yard as a learning space where opportunities for the children to develop and acquire knowledge through playing, exploring and creating should be created. Creating outdoor classrooms with tables, seating possibilities and storage facilities that protects from weather located in the preschool yard. But also, located at the identified "yard-extensions" in Burgårdsparken and at Mölndalsån to facilitate the use of these as learning spaces and increase the number of visits.

2. Connect to existing outdoor spaces

Identify and take advantage of outdoor areas outside the property borders, but in close approximation to the preschool, that offers an encounter with nature. The hilly greenery at Burgårdsparken and the stream Mölndalsån can act as such spaces that the children can visit together with pedagogues and thereby work as extensions of the preschool yard.

4. Bring beneficial experiences of nature into the design

Creating an indoor environment that affects our health in the same positive way that an experience of nature does. Bringing natural features such as vegetation and water inside. Using natural materials, colours and textures on surface layers and furniture. Creating good daylight conditions and spaces where nature-sounds and scents are present through the use of audio and diffusers. Enable the characteristics of playing in nature; climbing, running, balancing, hiding and jumping, by creating an indoor playground reminiscent of a playground in nature.

Figure 8.
The Strategy for reconnection, which represents the knowledge acquired during research on how to create a connection to nature.

Design tool

To help develop and understand the project a design tool was used which consists of a scale that span from gentle to radical. Possible design interventions were mapped (Figure 9) to understand their consequence for the preschool and level of radicality in relation to 1. creating a physical contact with nature, 2. pedagogics and 3. changes in preschool building design. The interventions at the gentle end of the line would be easier to implement than the ones in the radical end which are more challenging and require more effort. This process raised reflections on how far it made sense to go in the transformation of the preschool and helped frame the project. The tool was helpful in the development of the

design strategies, in creating design strategies for a preschool in an urban setting to become a preschool that enable opportunities for a connection between children and nature to be established.

In the far ends of the lines (Figure 9) the thesis becomes something else than intended, too gentle is not enough to bring a beneficial experience of nature or making a difference in the reconnecting aspect. Too radical is proposing to actually tear down the building or move it to another location, which change the direction of the project to not address the problem of that we in the city have become disconnected from nature.

The ultimate way of connecting children to nature in a preschool environment would be to change it into a forest preschool. A forest preschool is a type of preschool held almost exclusively outdoors, typically in the forest and can be described as a preschool without ceiling or walls (Friluftsförbundet) (Friluftsförbundet, 2022) Proposing this as the solution in this project is of course one answer on how to reconnect children with nature, but that is not a reasonable solution for all the preschools located in an urban environment. What this thesis is focusing on is exploring biophilic design to find ways in which we can reconnect children to nature in the built environment and therefore moving the preschool to the forest is not the solution. The project proposes to bring nature to preschool rather than preschool to nature. To also note is

that the urban environment that Levgrensvägen 3 preschool is located in, is one of several types of urban environments that exist. If the preschool instead were located in for example New York City, that much more dense urban setting would be something else to relate. Where changing the environment surrounding the preschool, adding greenery, would not be possible and there are no or little greenery nearby to benefit from the solution is in the gentle end of the line, bringing plants inside. The context and site of this project is positioned in between these extremes and thereby have the opportunity to relate to interventions found in the middle of the line, creating an understanding of what a biophilic preschool could look like in an urban setting similar to Gothenburg, Sweden.

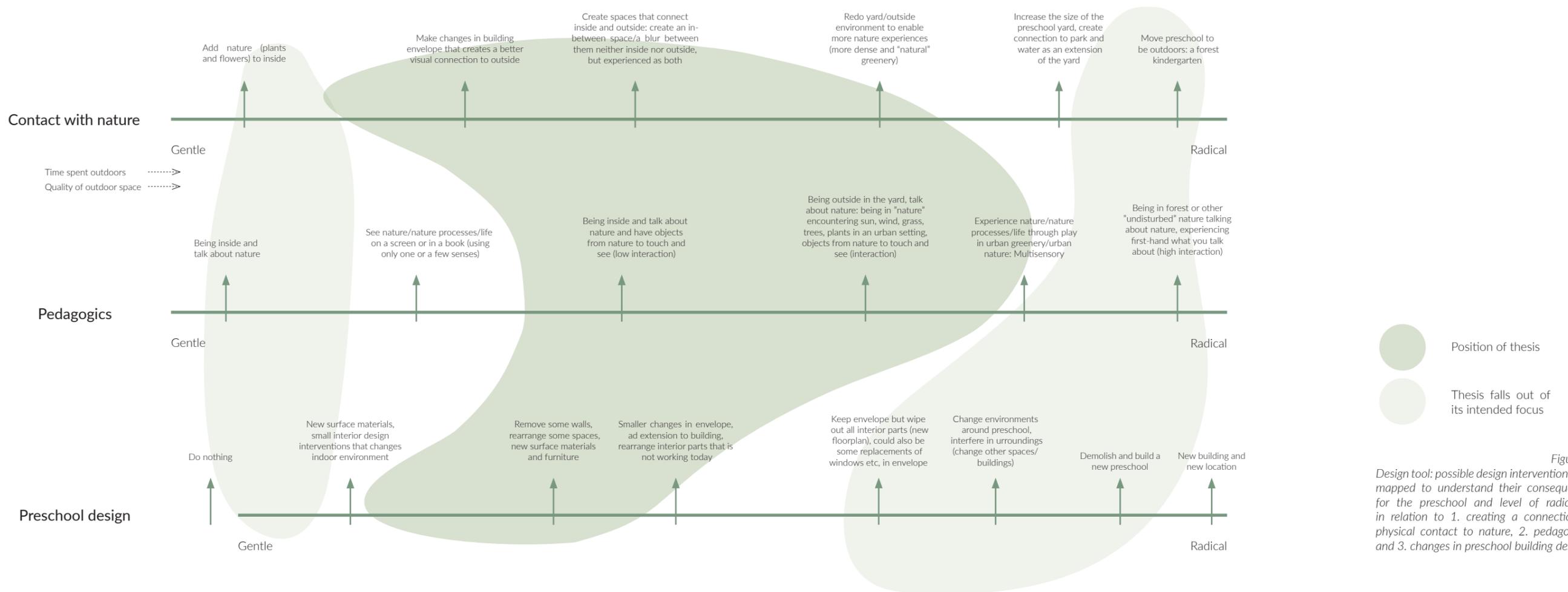


Figure 9
 Design tool: possible design interventions are mapped to understand their consequence for the preschool and level of radicality in relation to 1. creating a connection a physical contact to nature, 2. pedagogics, and 3. changes in preschool building design

Biophilic design exploration

An exploration on biophilic design were made in this thesis. Literature was reviewed and existing biophilic design frameworks were studied to understand the concept and practice of biophilic design. Existing frameworks studied was Terrapin Bright Greens 14 *Patterns of Biophilic Design* (2014) and the *Experiences and Attributes of Biophilic Design* established by Stephen R. Kellert, in this thesis read about in his book *Nature by Design* (2016). Besides literature review reference projects have been studied, (see selected in chapter 3 – Reference projects) projects that have been analysed by others in relation to biophilic design and projects that are successful in its creation of creating a connection to nature, to be inspired and develop the understanding of how biophilic design principles can take shape in architecture and how a connection to nature can be established in the built environment. During reading, studies and analyses sketches have been made to explore what biophilic design could mean in relation to this thesis, the Levgrönsvägen 3 preschool and how to transform it with biophilic design to an environment that connects children and nature (Figure 11 and 12).

The existing frameworks are used as a reference to understand how a connection to nature through architecture can be created. While exploring these frameworks it was found that they are complex and can't and shouldn't be used as a checklist where the patterns/attributes are boxes to tick off in the design. The patterns/attributes don't all make sense or have high priority in relation to creating learning environments. And in relation to this thesis and the aspect of reconnecting children to nature only picking some of these principles straight off were not sufficient enough, but it required a reformulation that could meet the requirements identified to create a child-nature connection. Therefore, a new biophilic design framework was formulated for this project. The existing frameworks was used in the exploration process of creating the understanding of biophilic design and what it should be, in this thesis, meaning; what principles of biophilic design are most important in relation to learning environments in creating a strong children-nature connection at Levgrönsvägen 3 preschool? The outcome of the biophilic design exploration is the new biophilic design framework, used in this project, and the process of creating it is seen in Figure 10. This new framework consists of 5 parts which are referred to as design strategies, presented at page 44-45.

14 Patterns of Biophilic design:

Nature in the space

- 1. Visual connection with nature
- 2. Non-visual connection to nature
- 3. Non-Rhythmic sensory stimuli
- 4. Thermal & airflow variability
- 5. Presence of water
- 6. Dynamic & diffuse light
- 7. Connection with natural systems

Natural analogues

8. Biomorphic forms & patterns

9. Material connection with nature

10. Complexity & order

Nature of the space

11. Prospect

12. Refuge

13. Mystery

14. Risk/peril

Patterns of existing biophilic design framework, 14 *Patterns of Biophilic design* by Terrapin Bright Green (2014), principles found most important for a preschool are highlighted and incorporated in the design strategies that creates the biophilic design framework for this project. The patterns have been identified based on all the information acquired during research: literature on human-nature connections, site and building analysis, conversations with pedagogues and biophilic design research. I.e., the potential in them to create experiences of nature that builds a good children-nature connection.

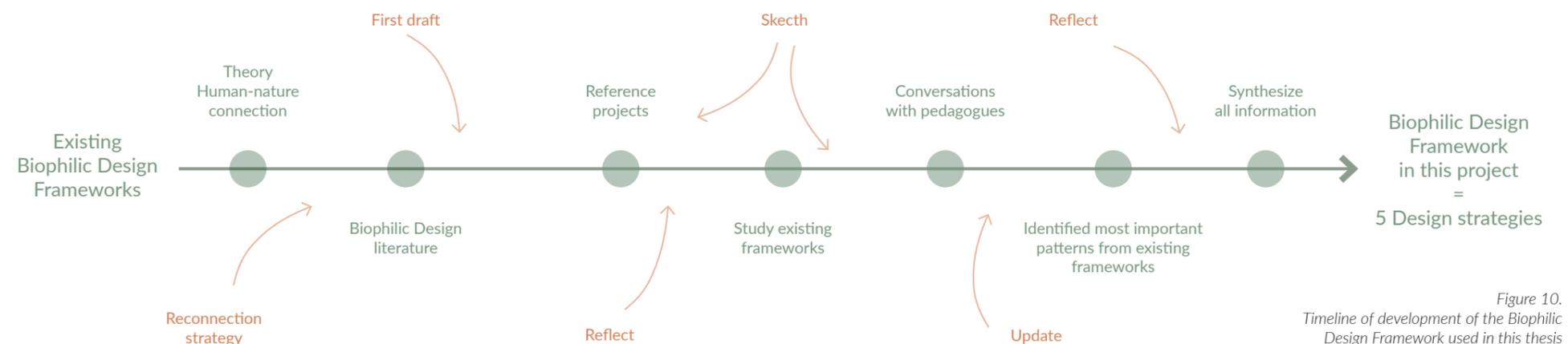


Figure 10. Timeline of development of the Biophilic Design Framework used in this thesis

REFLECTION ON BIOPHILIC DESIGN

In light of the fact that it was hard to find reference projects and architects claiming they use biophilic design as a strategy in their work, biophilic design seems like an unfamiliar notion and rarely used concept and one can wonder why. This doesn't mean there are no buildings successfully connecting humans and nature or that biophilic principles are not "used" in architecture, as one can argue that many of the principles of biophilic design are equivalent to "good architecture" practiced since forever. Such as daylight conditions, views to the outside, good indoor climate, conscious material choices and incorporation of plants. So why then the concept of biophilic design, what makes it important to gather these design aspects under one concept and notion?

Browning et al. writes that:

The consistency of natural themes in historic structures and places suggests that biophilic design is not a new phenomenon; rather, as a field of applied science, it is the codification of history, human intuition and neural sciences showing that connections with nature are vital to maintaining a healthful and vibrant existence as an urban species. (2014, p. 6).

Suggesting that we subconsciously always designed according to biophilic design principles,

without having any notion our concept to follow, as our instinct tells us that this is architecture that creates environments we feel healthy and happy being in. The importance of having a concrete strategy or concept to follow can be understood through Kellert's consideration on the relationship between biophilic design and sustainability (low-environmental-impact-design):

Low-environmental-impact design is intended to minimize and avoid the adverse effects of the built environment on natural systems and human health that results from such practices as excess resource and energy use, pollution, climate emissions, loss of biodiversity, and more. Biophilic design embodies the opposite side of the same coin – how human health and well-being can be enriched through beneficial contact with natural systems and processes. (2016, p. ix).

For this thesis the value of biophilic design as a concept and design framework becomes the understanding that biophilic design is about the awareness of nature; mainly raising awareness about the increase in human health and well-being when we are in contact with nature. But also, awareness of that encounters with nature is diminishing in cities and awareness that a strong connection with nature fosters pro-environmental behaviours.

BIOPHILIC DESIGN SKETCHING

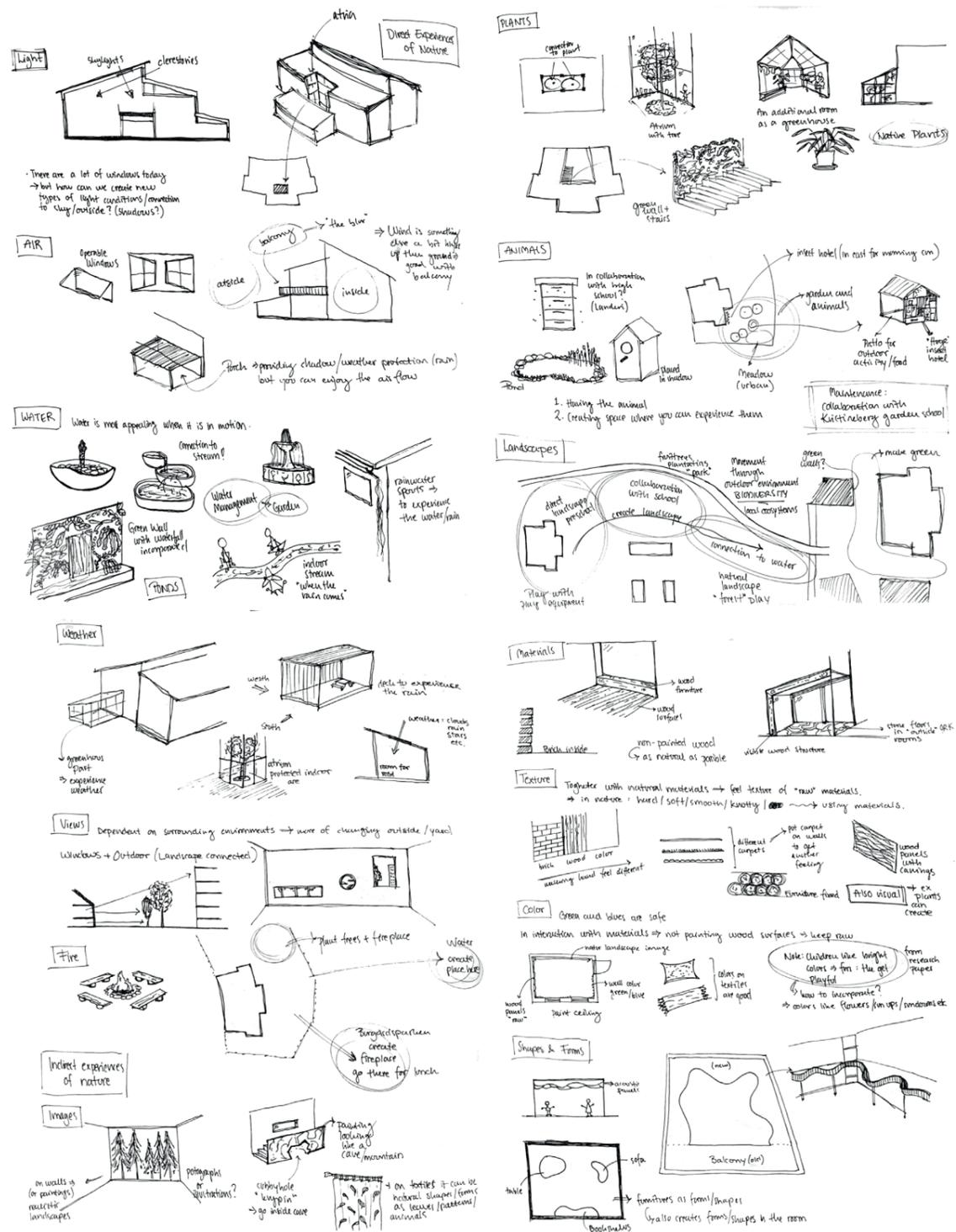


Figure 11

Sketches done while reading about Stephen Kellerst biophilic framework, his 25 experiences and attributes of biophilic design. Sketches are done in relation to Levgrönsvägen 3 preschool and show ideas on how the attributes could be implemented.

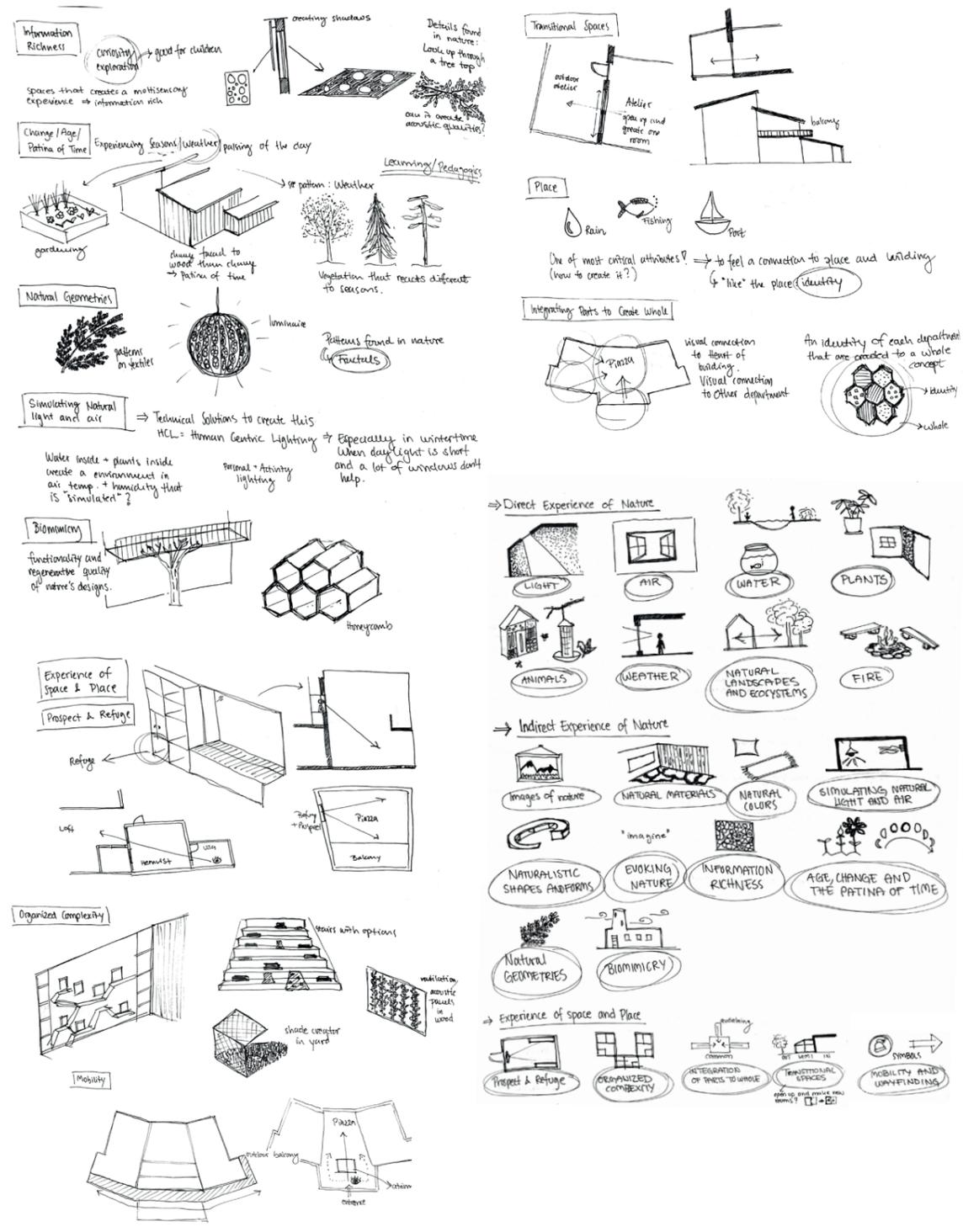


Figure 12

Sketches done while reading about Stephen Kellerst biophilic framework, his 25 experiences and attributes of biophilic design. Sketches are done in relation to Levgrönsvägen 3 preschool and show ideas on how the attributes could be implemented.

*"Study nature, love nature, stay close to nature.
It will never fail you."
Frank Lloyd Wright*

DESIGN PROPOSAL

Chapter six

Presents the final design proposal which translates the findings from previous chapters into a transformation proposal of the Levgrönsvägen 3 preschool. Drawings, illustrations and text communicates the proposal.

Site plan - Concept

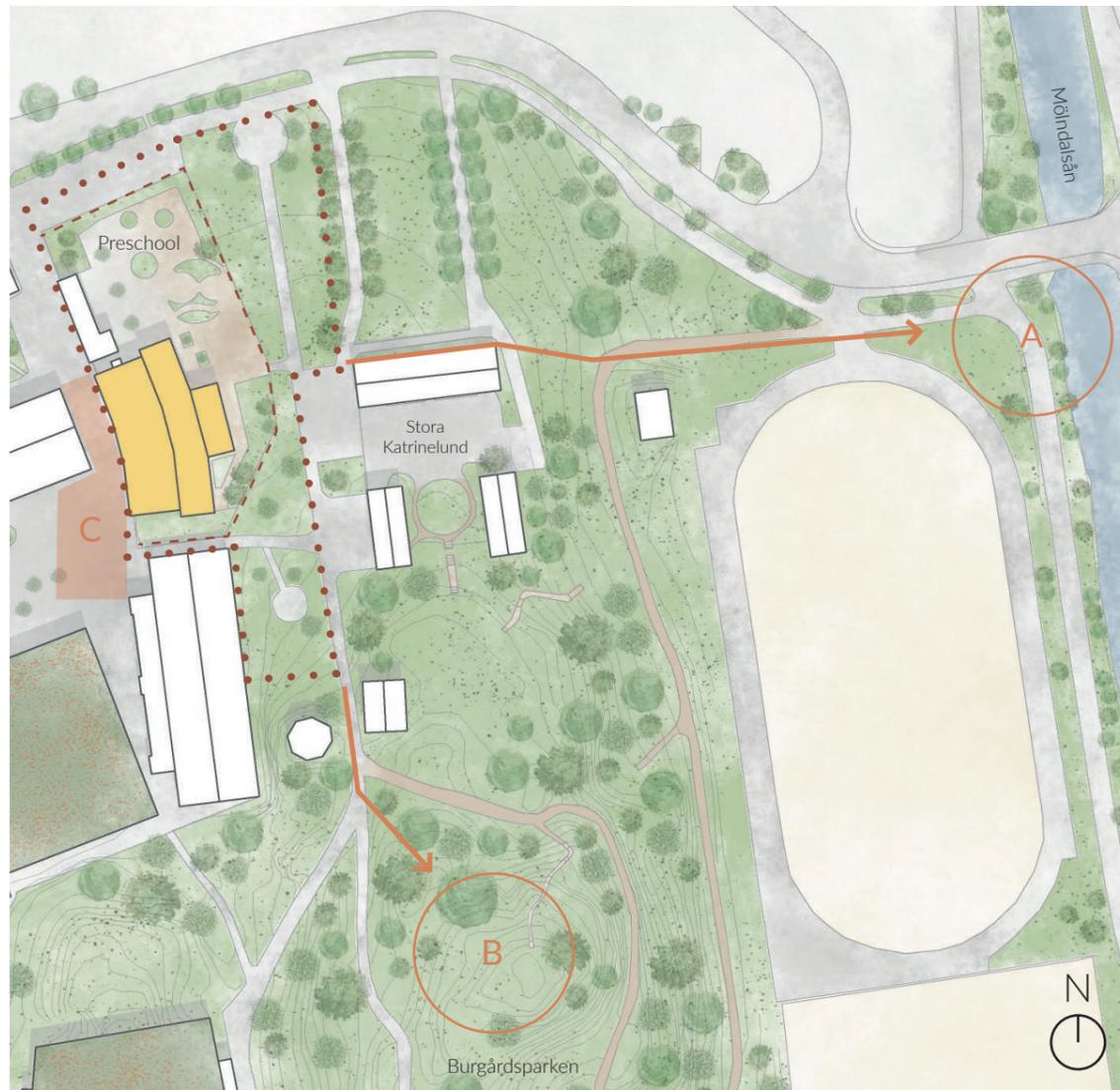
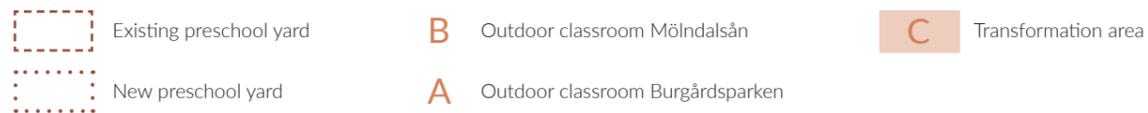
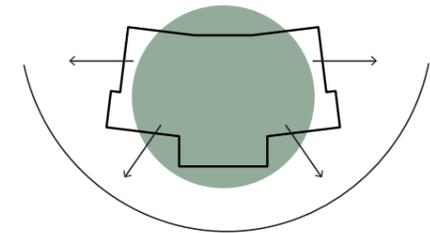


Figure 13. Existing site plan showing actions done in the project. 1:1500 (A4)

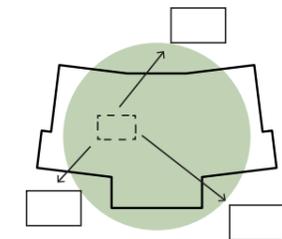


OUTDOOR CLASSROOMS

Starting with the environment outside of the preschool premises relating to design strategy 2. *Connect to existing outdoor spaces*, there are opportunities to establish connections between the preschool and the nature surrounding it (Figure 13). Identified areas that could work as “extensions of the preschool yard” are the green hill at Burgårdsparken and the stream Mölndalsån. At these locations outdoor classrooms are implemented to enable encounters with natural environments not found on the preschool premises. The outdoor classrooms relate to design strategy 5. *Create spaces for outdoor learning* and can consist of a wooden roofed structure which provides shade and protection against rain. Tables, benches and storage possibilities makes it possible to have more structured activities here. “Extending” the preschool outdoor environments to include these classrooms at the hill in Burgårdsparken and at Mölndalsån increases the variations of nature encounters for the children. At location A, Burgårdsparken, the children can run up and down the hill, see and learn about different plants and tree species and engage in more free way of playing in and exploring nature. At location B, Mölndalsån, the children get to encounter water along with the plants and animals found at such environments. These outdoor classrooms facilitate learning activities for the children and for excursions to the sites to be made more often. As these locations are public areas the small structures can also attract other people to stay for a while and experience the nature.



2. Connect to existing outdoor spaces



5. Create spaces for outdoor learning

AREA WEST OF PRESCHOOL

The “backside” of the preschool faces the High School and with buildings close by and the ground mostly covered with asphalt, the views are neither pleasant nor green. Therefore, transforming this area with greenery becomes a part of increasing the visual connection with nature from inside the building (Figure 13). To transform this asphalted area into a green space the High School facade facing the preschool becomes a green wall. The asphalt is replaced with grass and two rows of stone paving to enable the arrival of emergency vehicles. An urban meadow and bushes along the preschool facade are added to enhance the nature view from windows facing west.

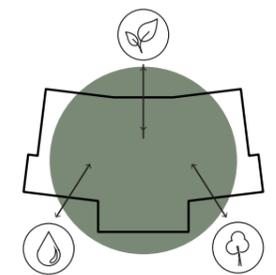
PRESCHOOL YARD

As the existing preschool yard is not meeting the guidelines from Boverket (2015) regarding the Friyta (amount of “free space”) an important action is to increase the size of the outdoor space available. The preschool yard is therefore extended towards north and east to occupy land that is today owned by the municipality (Figure 13).

Preschool yard



The preschool yard is extended to increase the outdoor space available inside the property borders and transformed to a space where the children more easily can engage in activities where they interact with nature which relates to design strategy 1. *Space for nature interacting activities* (Figure 14). More possibilities to engage with natural features, such as water, trees and plants are created but also opportunities to play and create with nature objects such as sticks, stones, sand and leaves. A fenced garden area with a small greenhouse, pallet collars, berry bunches and fruit trees, is added so the children can engage in gardening activities and learn about where vegetables and fruits come from (Figure 22). From the kitchen and eating area inside there is direct access to the garden area. Adding a pond, bird feeders, insect hotels and plants and flowers enable encounters with and knowledge about animals. The preschool yard should be seen as one big learning space where opportunities for the children to develop and acquire knowledge through playing, exploring and creating should be enabled. By adding outdoor classrooms in the preschool yard, in the same way that is done outside of the property borders; through a small structure with tables, seating possibilities and storage facilities, activities usually taking place inside can move out which increases the time that is spent outside. This in turn also increases the children's physical and mental health. The amount of greenery and trees in the yard is increased to create a more nature filled environment, but also to provide more shadow and create a more pleasant and nature dense view from inside the building.



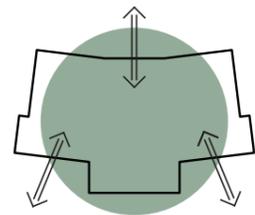
1. Space for nature interacting activities

Figure 14. Plan over the new preschool yard. 1:450 (A4)

Building extensions

Relating to design strategy 3. *Connect inside and outside*, additions to the building and transformations in the building envelope is done. The additions (Figure 15, 16 and 17) focus on creating spaces where you feel like you are both indoors and outdoors and thereby blurs the line between inside and outside. The visual connection with the outside is improved by increased window sizes and the access to outside is increased with added operable glass sections and more doors on both ground and upper floor.

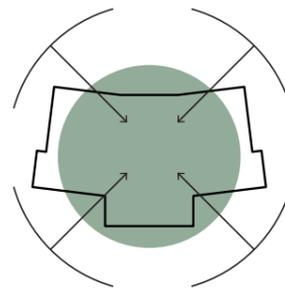
With creating visual connection and access to nature also comes the aspect of what environment you are actually looking out on and how nature dense these outlooks are. This relates to earlier mentioned interventions: the number of trees in the yard is increased, the side of the building towards the high school is transformed with greenery on the ground and the High school facade facing the preschool is made a green facade. Also, the big greenhouse that is added to the south facade of the preschool creates a green outlook from the indoor environment.



3. Connect inside and outside

Indoor environment

Relating to design strategy 4. *Bring beneficial experiences of nature into the design* the indoor spaces aim to create environments that affects our health in the same positive way that an experience of nature does. In the big greenhouse the children can experience natural features such as vegetation and water while still being indoors. The indoor spaces in the departments, ateliers and common areas are changed with the help of natural materials, colours and textures on surface layers and furniture (Figure 19). Using audio and diffusers to mimic natural sounds and smells are also added to create a multisensory experience of nature in the indoor environment. The piazza room is transformed from an eating and gathering area to an indoor playground where characteristic of playing in nature: such as climbing, balancing and hiding are enabled through play equipment and creates a reminiscent feeling of being outside playing.



4. Bring beneficial experiences of nature into the design

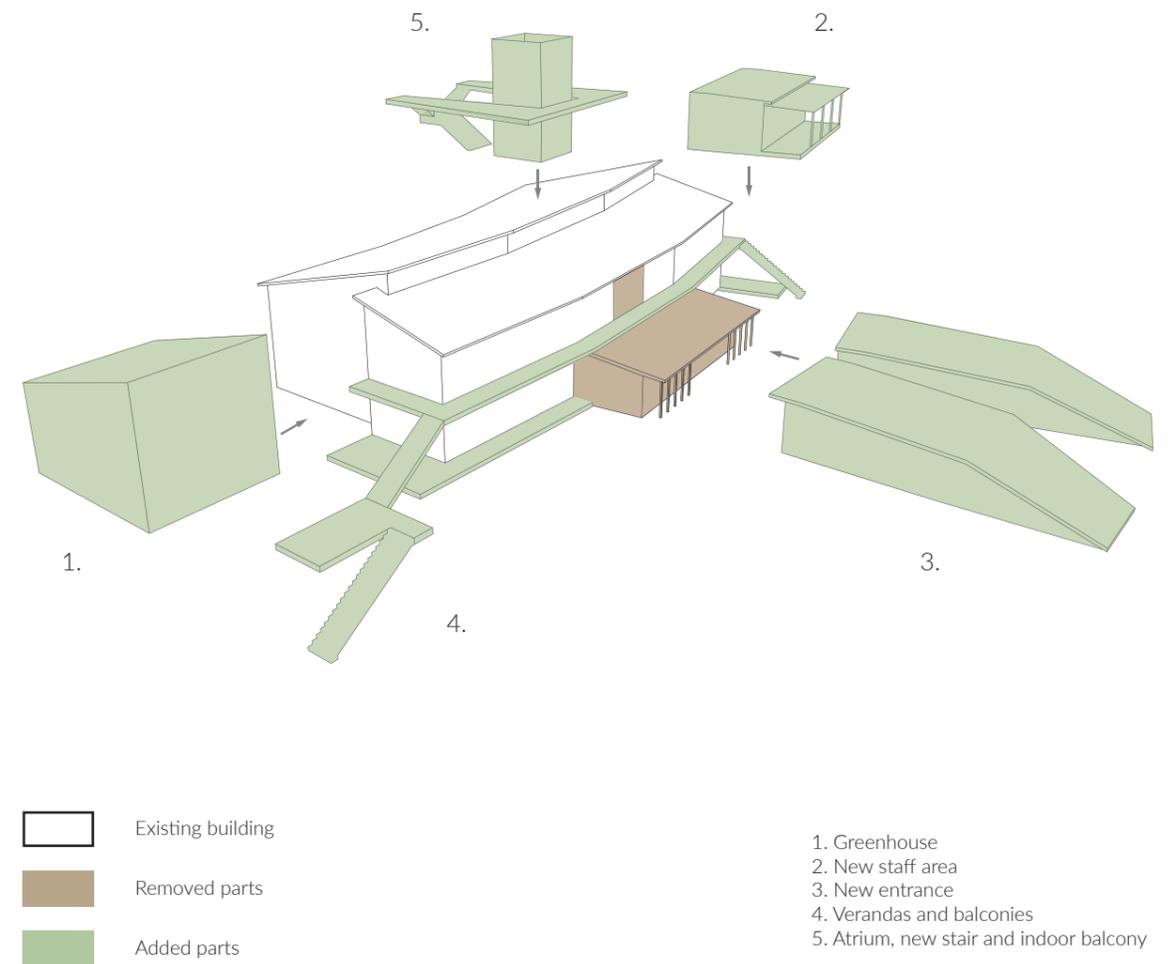


Figure 15. Showing the extensions done to the existing building

Transformed spaces



Figure 16. Additions and changes in the preschool. Ground floor. 1:400 (A4)



Figure 17. Additions and changes in the preschool. Upper floor. 1:400 (A4)

Greenhouse

This is an indoor room filled with nature where the children can experience natural features such as vegetation and water while still being indoors. (Figure 20)

New staff area

This addition makes it possible to use the space of the existing staff area to create a separate eating room with views towards the garden. A kitchen is added in the eating area to enable the staff to cook and bake with the children in educational purposes.

Eating area

The new staff area makes it possible to use the space of the existing staff area to create a separate eating room with views towards the garden. A kitchen is added in the eating area to enable the staff to cook and bake with the children in educational purposes.

Piazza room

As the eating area is moved from the piazza room it enables a new function to be introduced in the piazza and it is transformed to an indoor playground where characteristic of playing in nature: such as climbing, balancing and hiding are enabled through play equipment and creates a reminiscent feeling of being outside playing.

Atrium, new stair and balcony

An atrium is placed inside the big piazza room to enable better daylight condition and increase the presence of greenery. The old stair is removed and a new stair with an incorporated slide is added. The balcony is also extended to make use of the volume in the big double high piazza room and increase the floor area available. (Figure 18 & 21)

Room for interacting with water

A storage room is transformed into a room where the children can play and interact with water.

New entrance

The existing entrance part is replaced and the new one is designed as two ramps with green roofs where one of them is accessible and has a walkway leading up to the balcony on the second floor. The new entrance situation creates an embracing space which is a bit separated from the rest of the yard where drop-off and pick-up of the children can take place in a calm way.

Reading room

As the old stair is removed a new room can be introduced in its place. The cramped and dark reading room located in a small storage room in the existing preschool is moved here. In this new reading room you almost feel like you are outside as you have the atrium in one direction and a big window on the opposite side looking out on the greenery in the entrance situation.

Verandas

Verandas are added on the ground floor to increase access to the outside and to create a transition from indoors to outdoors.

Balconies

Balconies are added to enable access to the outside from the upper floor and to create an additional outside room to the upper floor creating a transition from indoors to outdoors. The balconies have stairs leading down to ground level.

New common areas

Where there before where double ceiling height in the cloakroom there is now to common smaller playrooms with big windows from floor to ceiling to let light and a visual connection to greenery into the room.

Floorplan - Ground floor

Scale 1:250 (A4)



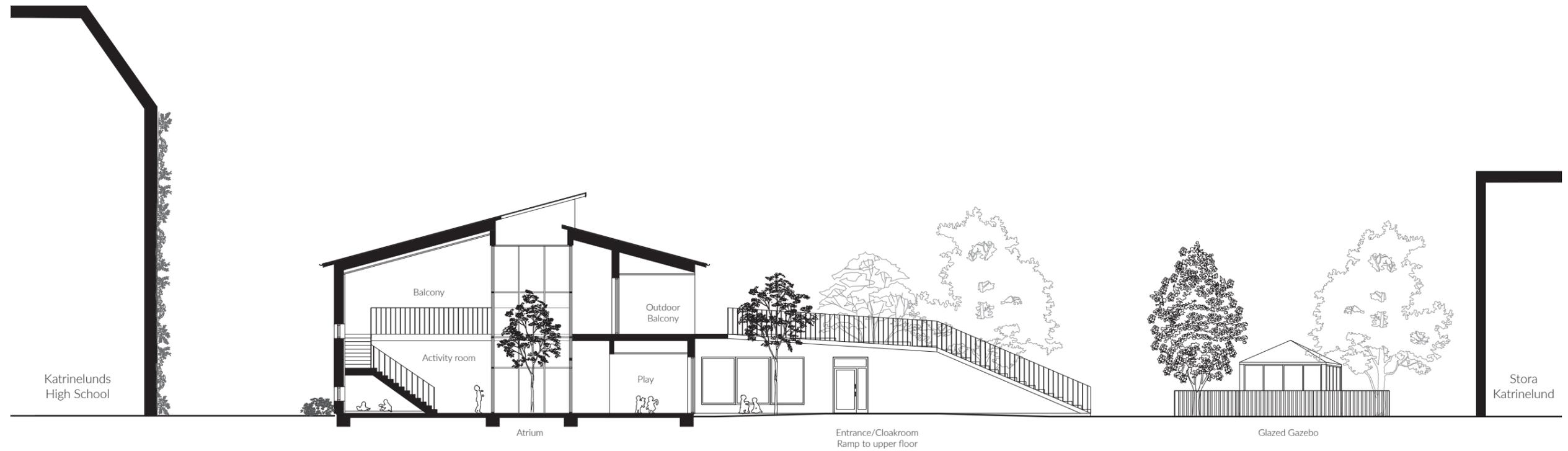
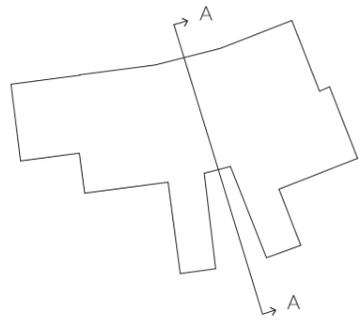
Floor plan - Upper floor

Scale 1:250 (A4)



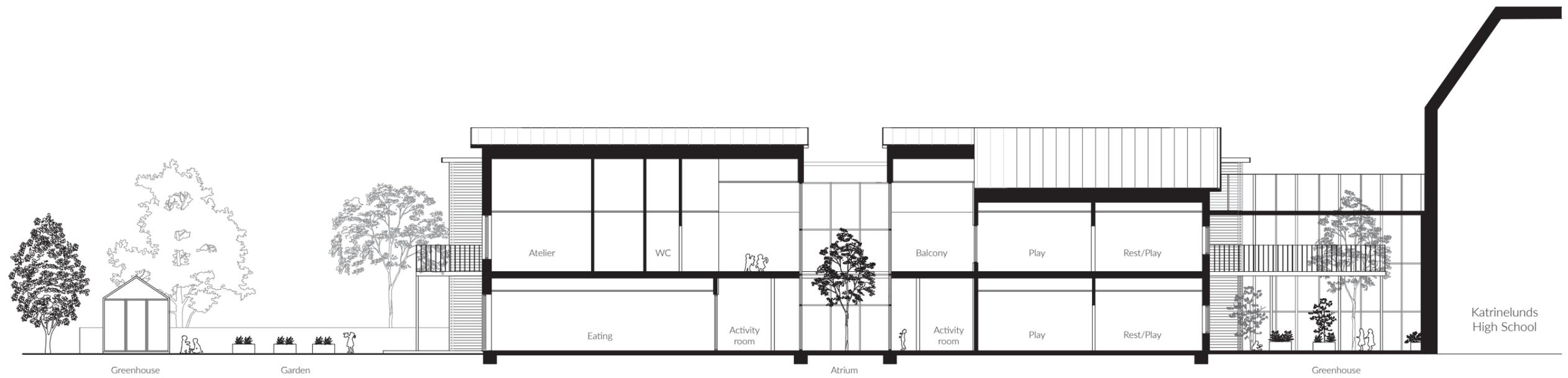
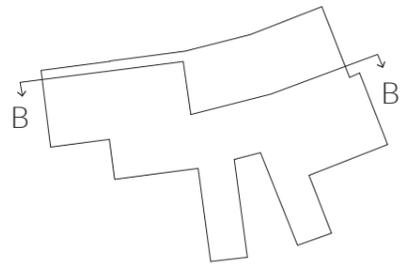
Section A-A

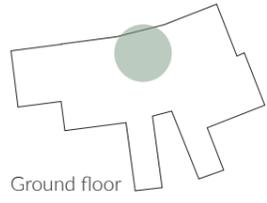
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Section B-B

Scale 1:150 (A4)





Ground floor

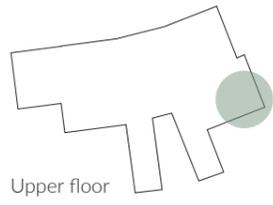
Perspective piazza - before



Perspective piazza - after



Figure 18. Perspective of the new stair, extended balcony and atrium in the piazza room.



Upper floor

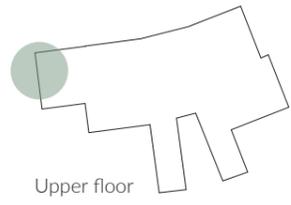
Perspective room for play and rest - before



Perspective room for play and rest - after



Figure 19. Perspective of room for play and rest.



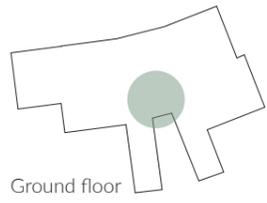
Perspective view to south - before



Perspective view to south - after



Figure 20. Perspective of the big greenhouse added to the south side of the existing preschool.



Ground floor

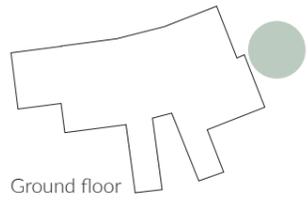
Perspective piazza/balcony - before



Perspective piazza/balcony - after



Figure 21. Perspective of atrium and balcony. In the back the new reading room is visible.



Perspective yard and north facade - before



Perspective yard and north facade - after



Figure 22. Perspective of the north facade and the garden area in front of it.

*"I felt my lungs inflate with the onrush of scenery
– air, mountains, trees, people. I thought,
This is what it is to be happy."
Sylvia Plath*

DISCUSSION

Chapter seven

Concludes the master thesis with a discussion and conclusion.

Discussion

The aim of this thesis was to create an architecture that reconnects children to nature. The project synthesises findings from literature studies, analyses, conversations and explorations into a physical architectural proposal. The theory built upon comes from several perspectives: research on the human-nature connection, reference projects, biophilic design and personal perceptions. The thesis has investigated how biophilic design can be used in learning environments to strengthen children's connection to nature. The investigation was translated into design strategies which were then turned into physical form in a design proposal. The design proposal resulted in a transformation of the Levgrensvägen 3 preschool that, through its new environments, increase the opportunities for the children to create a strong and lifelong connection with nature.

Existing biophilic design frameworks largely impacted the development of the design strategies and thereby also the design proposal in terms of materiality, spatiality and experiences. The conversations with the pedagogue at Levgrensvägen 3 also had a large impact on the project. This brought forward an important perspective in the understanding of the children-nature connection as she gave her point of view (as pedagogue in daily contact with children and their preschool environment) of the importance for children to be in contact with nature.

With more time several aspects could have been further developed in the project. One could be the opportunity to implement a collaboration with the educational unit at Stora Katrinelund. This would lead to enhanced encounters with domesticated animals during preschool time as they at Stora Katrinelund owns and take care of rabbits, guinea pigs and chickens. A more technical approach to learning about nature and sustainability could also have been developed. This could include having technical systems for energy supply, such as solar panels, or a grey water management system incorporated with the green wall (similar to what was done at the Bertschi School science wing by KMD Architects). Which would give the children enhanced knowledge of the understanding of the connectedness between human and nature.

It has been challenging to create successful experiences of nature in the aspect of being inside a building. Understood is that surrounding a building with nature, or locating a building in a dense green area, is one thing but creating

a cohesive connection with nature from the indoor perspective, integrating nature into the design, is another. Biophilic design principles offer guidance and support in creating environments that connects humans with nature but there are no easy or truly correct way in which one should design such spaces. The application and outcome differ and greatly depend on the location of the intended project. As the surrounding environment and its level of existing greenery or unused space, with potential to be turned green, becomes highly relevant in what types of connections to and experiences of nature, but also what principles of biophilic design that can be created. In this thesis, the location of Levgrensvägen 3 offered opportunities to add more outdoor space to the preschool and make these spaces more densely green. Which had a big impact on the final result.

*How can biophilic design principles
be used in the redesign of a
preschool to strengthen
children's connection to nature?*

Conclusion

The thesis does not answer to what degree a connection between children and nature is created in the final design proposal or exactly how this design will affect the child-nature connection. But what it does, is that it proposes environments where the children can interact with, experience and learn about nature. Thereby, giving a spatial support which increases the chances that they create a relationship with and connection to nature, thus the purpose of this thesis was fulfilled.

In the process of realizing this thesis my own personal relation to nature have been developed. Acquiring knowledge on the full range of benefits that a contact with nature provides, in relation to health and well-being but also to values and beliefs, have deepened the understanding of the importance of nature's presence in our built environment. Even though a strong love for nature already existed prior to this thesis a new appreciation for the natural world and an awareness of the environments that surround me have been created.

The design focus was on exploring and applying biophilic design in the context of children and preschool environments with the intention to strengthen children's connection to nature. With the use of biophilic design principles Levgrensvägen 3 is transformed into a preschool with learning environments that offer various experiences of and encounters with nature.

The thesis focused on understanding the role that architecture can have in the reconnection of humans to nature. The result is a synthesis between theory on human-nature connections, biophilic design and learning environments. Showing that architects by designing spaces, which integrates nature experiences, have the opportunity to increase human health and well-being and reconnect people to the natural world.

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*"My wish is to stay always like this, living
quietly in a corner of nature."
Claude Monet*



CHALMERS
UNIVERSITY OF TECHNOLOGY

Reconnect to nature
Cornelia Ahlstedt
2022

Chalmers School of Architecture
Department of Architecture and Civil Engineering
Architecture and Planning Beyond Sustainability

Examiner: Liane Thuvander
Supervisors: Walter Unterrainer & Janneke van der Leer

APPENDIX

Contains the full email conversation with pedagogues
at Levgrensvägen 3.

Reconnect to nature

by Cornelia Ahlstedt

Chalmers School of Architecture
Department of Architecture and Civil Engineering

Examiner: Liane Thuvander
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Questions and answers

- Q: How many children are enrolled in the preschool?
A: The preschool shall have 104 children when the placements are made for the year.
- Q: How big are the groups of children?
A: The children are divided into five departments. 2 departments for younger children located downstairs with an average of 18 children each, and 3 departments for older children with 22, 23 and 23 children each on average upstairs.
- Q: How many pedagogues work at the preschool?
A: We should be three full-time pedagogues per department, and then we have two more pedagogues employed, of which one is a special pedagogue.
- Q: What activities do you have in a day? What does a typical day look like?
A: We spin the days around fixed activities. Breakfast, going outside, outdoor lessons, going inside, lunch, quiet learning time with the help of UR's program (children's educational program) or something similar, indoor lesson, snack, lesson and going home. We use a lot of learning thinking in routine situations such as dressing and when we take ourselves from the inside out or from the top down. There is a learning thought in everything we do.
- Q: Does a typical day look different for the younger and older children?
A: The young children's activities focus more on creating a basic security and the older children get to approach the school's thoughts on acquiring knowledge in lessons. but important for everyone is that without security there is no good learning.
- Q: What are the cornerstones of the preschools work and activities?
A: At our preschool, the absolute cornerstone is play, which we work with both as a means and an end - all children must be given the opportunity and ability to participate in play based on their conditions.
- Q: Do you make excursions? If so, what are the excursion destinations and how often do you usually make excursions?
A: We are happy to make excursions when we have enough. We like to go for walks on our nearby hill and little green lung at Burgårdsparken. We also like to go to a playground nearby that has a lot of greenery and water games interspersed with many good play equipment. We do not have a scheduled excursion day at the moment because we have chosen to stay close to our se due to the pandemic, both in terms of infection control but also due to high staff absenteeism. We have constantly topped up our groups with children from other groups to cover staff demand. We only go when it feels safe to move outside the yard and we must know the children we have with us and they cannot be too many per adult.
- Q: What type of pedagogy do you use at the preschool?
A: We mainly use a traditional mixed pedagogy. That is, we take the "goodies" from several pedagogical schools. The premises are designed according to the Reggio Emilia philosophy (Reggio Emilia is not a pedagogy but a philosophy) and has a square / heart / piazza what one now chooses to call it as the center of the house. Each department also has an atelier / studio / creative workshop. Both of these things stem from the Reggio Emilia philosophy, and we try to use them as wisely as possible. What is profiled pedagogically with us is the play. Our special pedagogy has developed a play concept that we are all encouraged to work from. The play must have a clear goal in line with our governing documents and it must also have at least one adult present. within the framework of playing, the children should control the play process and play freely. As there are children who have not yet learned to play, the adult must support and encourage the joint play for all these children as well.

- Q: What does it mean that you have a Reggio Emilia focus on your preschool?
A: The Reggio Emilia philosophy is probably mostly the adaptation to the Reggio thinking in the premises.
- Q: How does the Reggio Emilia focus affect the pedagogy, learning and the learning environments in the preschool?
A: See above.
- Q: What does the curriculum look like? (What are the most important parts?) How is the relationship between the curriculum and the Reggio Emilia orientation, does it affect the curriculum in any way?
A: We work with the curriculum as a living document in our planning. We also have a common cake piece model so that we do not miss any area. The rose on the cake is the play and the rest of the year is divided into three parts. A. Children's participation and influence. Language. Equal treatment plan B. Care and development. Mathematics. Technique. C. Norms and values. Nature. Equality. Social and emotional development. The pieces of cake naturally go into each other and are touched throughout the year, but we have the cake division to focus a little more on different areas during the year.
- Q: What are your goals with your work, the learning and pedagogy?
A: Our goal is for all children to be given the opportunity to participate in play. Playing contains endless opportunities for development in all areas of the curriculum. We also aim for sustainable teaching. Environmentally, socially, and emotionally. We break down these huge goals into evaluable goals in our planning. Such a goal can e.g., be that all the children in rounds are allowed to participate in a structured free play group on a regular basis or that we talk about and actually help each other, e.g. If a child has difficulty reaching his hat and another child is taller, the taller child is encouraged to help the shorter one. We formulate, revise and implement the goals in large and small.
- Q: How do the learning environments you use today work? Are they sufficient for the learning you are doing or are they missing something?
A: The learning environments we have today are not optimally built for preschool activities. Materials and design leave a lot to be desired.
- Q: Do the children learn about our senses, do you "practice" the senses? If so, what methods, techniques, activities do you use then?
A: Sensory exercises are included in the traditional pedagogy with e.g. the "taste-game". The child gets to guess what it is tasting their eyes closed. Another one is the "listening-game" when they get to guess what it is the sounds they are hearing comes from. But today when we have access to so much more knowledge about how our senses are affected by colors e.g. I think we could develop and do much more with the "background" of our day. Textures, sounds, colors, etc.
- Q: How does the Piazza room work, what is its function?
A: The piazza serves as a gathering space in the morning, dining room and gathering in the evening. Sometimes it is used by some department for group activity.
- Q: Do children of different ages play and learn together or are the groups of children of different ages kept apart?
A: We meet outdoors, but it's just a bit of playing together. Overall, the groups are quite separated. Cross-grouping is mostly for the purpose of avoiding taking supply pedagogues as the children are temporarily moved to another department. We try to have activities out in the yard where a pedagogue takes the children who want to participate in a particular activity, regardless of which department the child belongs to.

- Q: How do you experience the indoor environment? Air quality, air temperature, floor temperature, daylight, acoustics, etc.
- A: The indoor environment is something we often talk about. Many people experience allergic symptoms indoors such as watery eyes and nose, dry mucous membranes and cough. The skin becomes crisp dry. The floors are hard and cold. The rooms are cold in winter and hot in summer. We get a lot of daylight and large parts of the preschool feel very spacious, partly cathedral-like. As the large rooms are made to accommodate many and at times it gets quite loud there. The departments are small and then it is good that we have the common areas to be able to use as well.
- Q: Are the indoor spaces sufficient for the number of children attending the preschool?
- A: Yes, we have space if we organize ourselves and our activities.
- Q: What is your general impression of the indoor environments? Do you like the premises?
- A: We have worked in places with other thinking that worked better. We experience it as advantageous with single-storey buildings with an exit and halls without stairs, e.g. We also think it is better with many small rooms than with a couple of giant ones. To put it poetically, the children's souls get lost when the rooms they use have cubic meters upon cubic meters raised to ten by just air. Even if it is bright and spacious. The children often want to crawl in and nestle in small corners and windings and it is not possible here.
- Q: Are you missing something in the indoor environment? (Examples could be: a specific type of surface for some activity or other type of storage)
- A: Maybe a corridor for sock football or to be able to run really fast in or have as an exhibition hall with a lot of wall space etc. We lack our own hall for just our department where we can let undressing and dressing take time. Maybe a real wet room used just for water play. We also lack a kitchen to bake with the kids and prepare snacks and such.
- Q: Are the outdoor areas sufficient for the number of children attending the preschool?
- A: Outdoors we always want more, although we are pretty good here anyway.
- Q: What is your general impression of the outdoor environments? Do you like the outdoor environments you have?
- A: Yes, it's pretty ok.
- Q: Are you missing something in the outdoor environment?
- A: If we could wish, it could have been a little hillier, more shade and a greater opportunity to divide the activities. For example, a fence between the bike path and the sandbox so the toddlers had an area where they could be left alone. A fenced ball field and a fenced orchard. We also lack a permanent water play outside and a real outdoor kitchen would have been fantastic.
- Q: Are there any requests for changes with the indoor and / or outdoor environment or any plan for future changes?
- A: We have been promised some trees and we are investigating the possibilities of getting help to start up new pallet collar cultivation with the help from the Park och nature division at the municipality. Indoors, wild plans sometimes flare up to build additional departments into the desolate voids under the roof, but it probably won't happen. The budget does not allow the plans and dreams to be too extensive.
- Q: Do you feel that the children are comfortable being out in nature when, for example, you are on an excursion or visiting the park / hill next to the preschool?
- A: Yes, here in the local area, they are familiar with the natural areas and mostly enjoy being on "pasture".

- Q: What do the pedagogues know about the children's relationship to nature: how do they experience the children's actions when they are in nature / in relation to nature, for example are there differences in the children's behaviors when they play indoors vs. outdoors?
- A: There is a genuine interest among us educators to convey a good relationship with nature in our children. However, we see that it involves a fairly extensive learning / enlightenment work for our children today. We meet children who ruthlessly kill, trample and tear apart the relatively meager flora and fauna we have here. We still think that the children play with each other in a much more harmonious way outdoors. The indoor games also become less mobile and less bushy for spatial reasons.
- Q: How do you relate to nature at the preschool today? Are e.g., science incorporated in the curriculum? And is nature an important part of the preschool's activities?
- A: Yes, it is part of the sustainability goals / sustainability work. It is an important part but I think it can vary quite a lot depending on the educators' attitude to nature.
- Q: How do you work today to create a relationship between children and nature? What pedagogy and methods do you use? (e.g., the children can take care of and be responsible for a plant)
- A: In our staff group, we are nature junkies. We are quite passionate about nature, animals, sustainability, cultivation and outdoor stays. Now we just started a project that has become a tradition that we call "From seed to pizza". We take seeds from the vegetables we eat, such as peppers or tomato, and collect them. We sow them and let the children be part of the whole process and water and take care of them. Then we sell the seeds and use the money for a finishing pizza. We also talk a lot about what is not good for nature. For example, about how the plastic harms birds and other animals and how we can help and protect them by picking up the plastic from the yard and putting it in the right place in the recycling. It would have been nice to have an easily accessible recycling station for the children outdoors so they could become self-propelled with waste sorting.
- Q: What are the challenges, in relation to your indoor and outdoor environments and the pedagogy you use, in creating a relationship between the children and nature?
- A: It is for example difficult to protect our small trees from being destroyed from climbing and hanging. Strong trees and lots of greenery are needed.
- Q: Do you visit the forest, parks or nature areas? How often on an approximately?
- A: We do not visit other areas very often. We go to the hill behind the house and the nearest park from time to time. It must feel safe if we leave the preschool premises, we cannot take any risks.
- Q: What is the preschool's approach to conducting preschool activities outdoors?
- A: As long as we do planned and well-thought-out activities, it's ok to be outdoors. Not all staff think it's good to be out for too long, so it probably depends a bit on the interest in the staff groups.
- Q: Approximately how much time of the day do you spend outdoors? Does the time differ between the older and younger children?
- A: The time outdoors is different between younger and older children. On average, the younger children spend about 2 hours outdoors and the older ones between 3 and 6 hours, depending on which department they belong to and whether it is very cold, hot or wet.
- Q: Do you use the outdoor environments as a learning environment in any special way?
- A: We have a balance course that we build daily that is a specific outdoor learning environment and then we build a water play that also only occurs outside. Otherwise, it is the indoor learning activities that is picked out. We take the Lego out with us or the crayons or books.



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