

dwellbeing

Residential Architecture for Mental Health



Amanda Alsterlund | 2025 | Examiner: Anna Braide | Supervisor: Hanna Morichetto
Chalmers School of Architecture | Department of Architecture and Civil Engineering



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Dwellbeing - Residential Architecture for Mental Health
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Author: Amanda Alsterlund
Examiner: Anna Braide
Supervisor: Hanna Morichetto
Chalmers School of Architecture
Department of Architecture and Civil Engineering
Master Program of Architecture and Urban Design, MSc.

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abstract

In this stressful world, one might look to architecture for answers on better mental health. Research shows that we spend about 90% of our time indoors and almost 19 hours a day in our homes. The new building regulations from Boverket are a big threat to the residential qualities we have taken for granted. Along with the strained Swedish healthcare system and the fact that an increased amount of people are suffering from mental illness - this constituted the thesis' background. The aim was to explore how architects can enhance building qualities related to residential architecture for the sake of people's mental health, emphasizing on stress-regulation. The research questions were 1) What architectural concepts can be identified in residential architecture that promote good mental health through stress regulation, based on relevant theories? 2) How can these concepts be sustainably applied in a housing project on the site of Tuvesvik? 2B) In order to illustrate generalizability, how can the same concepts be used in a housing project in Högsbo - an urban site? The theories used were interdisciplinary; the residential aspect of enriched environments, the importance of the outdoors, the perceived sensory

dimensions along with support of other relevant research in residential qualities. Methods used were; a literature overview highlighting important research, an extensive case study, and research through design. Two design projects were carried out - a main one in a rural context (Tuvesvik) and another one in an urban context (Högsbo). Results generated six design concepts for residential architecture for mental health; directional diversity, transitions, zones of social and private, context sensitivity, individuality, and control and safety. Two research-informed design proposals were conducted to embody previous mentioned design concepts. On Tuvesvik, this resulted in eight semi-detached houses and in Högsbo this meant terraced housing (16 dwellings in each). The thesis showed how design concepts for mental health in residential architecture can be used also in future projects, due to their general and applicable nature. The overall implications are relevant not only because they address the societal problems with mental illness - but also because it amplifies residential qualities in the light of recent threats. However, the findings must be further supported to be fully generalizable.

Keywords: residential qualities; mental health; enriched environments; swedish archipelago; rural; urban.



preface

Introduction

The work with this thesis is a result of a deep interest in humans and the fascination for the places we call home.

Based on present and future societal problems we face, such as the increasing level of mental illness, the overgrowth of our cities, deteriorating building regulations and the gradual but constant alienation from nature - this offers an alternative version of our future.

A **future** where the needs of the resident, the human living in the dwellings, are understood and met.

A **future** where the home reflects both dignity and safety, individuality and community, flexibility and robustness.

A **future** where residential architecture supports its residents by offering a sanctuary and a stimulating environment for growth.

A **future** where the places we call home are connected to wellbeing, through research-informed design and evidence-based knowledge.

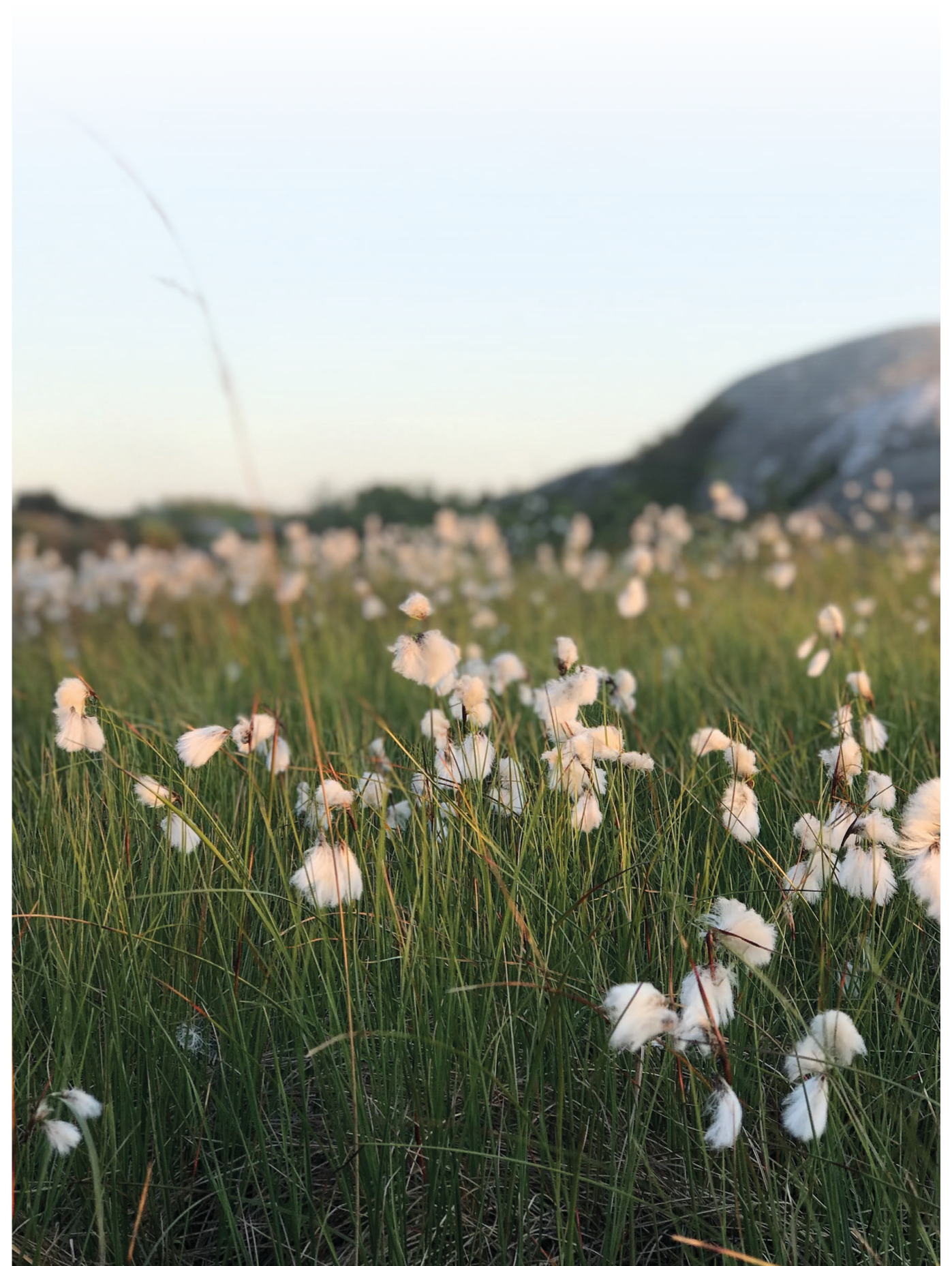
This thesis does not claim to have the answers on how to reach this utopia. Instead, it adds to the debate and highlights a growing field of research on the topic of enhanced residential qualities - in times where the people of society need it the most.

Through interdisciplinary theories, an extensive case study, suggested design concepts for mental health and the embodiment of those in both an urban and a rural context - this thesis explores how architecture can support good mental health among its residents. I sincerely believe that the implications of this work can be of use for both architects, developers, builders or for anyone involved with future places we call home.

Acknowledgements

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All the best,





student information

Chalmers University of Technology
Architecture and Urban Design, MSc 120ECT
2023 Aug - 2025 Jun

*Studios: Housing Inventions 1, Architectural Competitions,
Residential Healthcare: Housing for Seniors*

University of Strathclyde, Glasgow
Erasmus Exchange
2024 Sept - 2024 Dec

*Courses: Design Studio 5A, Social and Health Psychology,
Cultural Studies 2.*

Chalmers University of Technology
Architect Program, BSc 180ECT
2020 Aug - 2023 Jun

Örebro University
Psychologist Program, 30ECT
2019 Jan - 2019 Jun

University of Gothenburg
Psychology Basic Course, 30ECT
2018 Aug - 2019 Jan



For contact or questions
regarding the thesis or
anything else:
+46705689074
amanda.alsterlund@gmail.com

background

Introduction

At home is where people spend the majority of their time. A UK study shows that we on average spend 18 hours and 43 minutes within the walls of our home - which is more than at any other place (Sagar, 2023). The research field in architecture and health is a growing field. Evidence-based design (EBD) continues to expand and how the home affects our wellbeing is also on the rise, as seen in research from both Chalmers University and Sweden's Agricultural University. How architecture affects our brain, "neuroarchitecture", is a new interdisciplinary branch relevant to this topic (Morichetto et al. 2025).

Theories like EBD, used extensively in healthcare architecture, offer a solid foundation on the topic health and well-being among architects. Healthcare facilities are ideally and typically used by patients for a shorter period of time - the goal is almost always to be able to go back home. This thesis argues that we can enhance the residential qualities we are aware of with the design concepts related to mental health and well-being. This will create research-informed designs that benefits everybody.

In Sweden, mental health is declining. Worrying, stress and insomnia are the

most common mental health disorders, especially in young adults and women (Folkhälsomyndigheten, 2022). What if we could prevent certain mental-health problems through the architecture of our homes? Could residential architecture promote and maintain mental health and well-being?

The issue is even more pressing, after the existing building regulations controlling residential architecture are threatened by the implication of new ones (Olsson, 2024).

Because simultaneously to the growing discovery of how buildings affect our health, an intense debate regarding Boverket's new building regulations are in the works. Starting July 1st this year (2025) the authority will remove regulations about sunlight (allowing apartments to only face north), all restrictions of floor height, the well-implemented system of daylight factor (the new will allow bedrooms in the dark) and among many other things (Granath, 2025 April 24).

These are all residential qualities we have taken for granted and which are more or less important for people's health. Research evidence is needed when arguing for what effects residential architecture has and could have on people's well-being.

It also comes down to public health and money - the society spends billions on mental health problems each year. The report by the Swedish Social Insurance Agency (Försäkringskassan, 2023) declares mental illness is the most expensive sickness for

society. Over 42 percent of all sick leave from work is due to stress-related illnesses such as depression - resulting in more than 16 billion crowns being paid in sickness benefits annually (Försäkringskassan, 2023); (Österberg, 2023).

The amount of people on sick leave due to stress has on top of this also increased rapidly, with about 25% from 2019 to 2024, resulting in about 43 500 people currently unable to work (Rovira & Österberg, 2024). The causes behind these issues are complex and most often related to one's workplace, but being able to rest and recover in one's home is absolutely crucial for mental health - hence the aim of this thesis.

Relevance for Sustainable Development

Sustainability is a key motivating factor behind this thesis. As described in the UN:s Sustainable Development Goals (SDG:s), goal number three, "Good health and wellbeing", ten; "Reduced inequalities" and eleven "Sustainable cities and communities" cities do affect our wellbeing and we can pave the way for a sustainable future (UN, 2012).

When building something new, sustainability should be one of the first things to consider. Especially since the building sector in Sweden is responsible for over 22% of all greenhouse emissions (Boverket, 2025). So first one must ask the question if a new building really is necessary. There is a growing number of buildings that are transformed from offices to dwellings for instance - and more creative ways of transformation and minimising demolition are on the rise. If there is a need for a building or that an area is supposed to be exploited - life cycle analyses (LCA:s), energy efficiency and choice of materials need to be considered. One example of ecological sustainability within this process is using materials from 'renewable' resources such as timber and/or locally sourced materials. Acknowledging the biodiversity through respect for the flora and fauna on site is

another ecological-sustainability aspect. Throughout this thesis focus will lie on creative solutions that combine the three parts of sustainability as well as improve health. An example is the possibility to grow crops or vegetables in connection to one's dwelling - something that fulfills all three aspects of sustainability. Green roofs or making use of sunlight and heat in greenhouse-like environments are others.

Furthermore, if the design concepts in this thesis actually do bring people more wellbeing and better mental health, it could in extension result in benefits for the society as a whole. That is if people need to be on sick leave from work for shorter periods of time or become more resilient towards stress due to resilience gained in the home. These hypotheses are to be seen as an indirect consequence of the present thesis and at this stage impossible to prove - but a motive nonetheless.

Student Background

Before I pursued architecture, I studied psychology. How we interact with ourselves, the people around us and how the sum of it all affects us is to me very fascinating. We all have a relationship with ourselves as well as with others. The study of psychology also correlated surprisingly well with architecture. Architecture primarily serves people, which is why a deeper understanding of the human psyche is important for solid and empathetic designs. Specifically applicable to this thesis is health and environmental psychology, the latter involving the relationship between people and their surroundings.

My interest grew further after I had recovered from a stressful time in 2019 and I started asking myself questions like; why did I experience that loud and over-stimulating environment as stressful? Why did I prefer the room facing the garden instead of the road even if it is smaller? How did science explain why I felt more at ease in the brighter room with big green plants in my mom's house?

And why did I suddenly become addicted to the presence of the ocean to think more clearly? These were all questions that I started to reflect over during my recovery which then became a key motivator for me to study architecture. How could I help design healing environments?

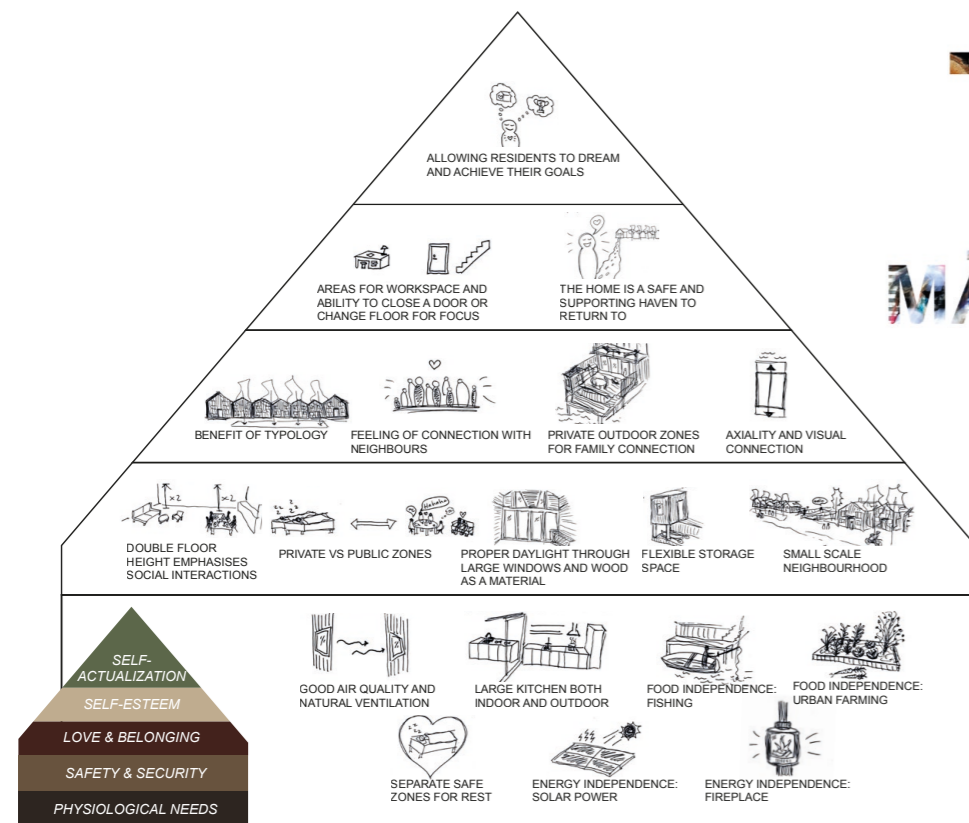
This interest has continued to grow throughout my studies at Chalmers School of Architecture. In the master's studio Housing Inventions 1 with course leader Kaj Granath, I studied the well-known Hierarchy of Needs by Maslow (1931) and translated this into residential qualities in terraced housing by the water, in a free and explorative manner.

In the bachelor's course "Arkitektur: Teori och Text" with theme leader Monica Billger, I chose to investigate the psychological and physical aspects of health in relation to wood and timber in buildings - resulting in the essay "Trä och Människan" (translates "Timber and Humans"). Useful knowledge since then

is that wood do affect our health in a positive way but sometimes it can also become overstimulating.

The choice of site is also close to my heart. Gullholmen, which is the closest society from Tuvesvik, is where I have spent all of my summers and many weekends of my life. It has been a constant in my life and the island holds some of my most cherished memories, as it also contrasts well to the hectic city-life in Gothenburg. The connection I have to the places around Gullholmen, such as Tuvesvik is personal and I have considered the potential downside of this when choosing Tuvesvik as a site. It could have complicated the design process if I would not have continuously asked myself "is this choice done as an architect or as an islander of Gullholmen?" to remain objective.

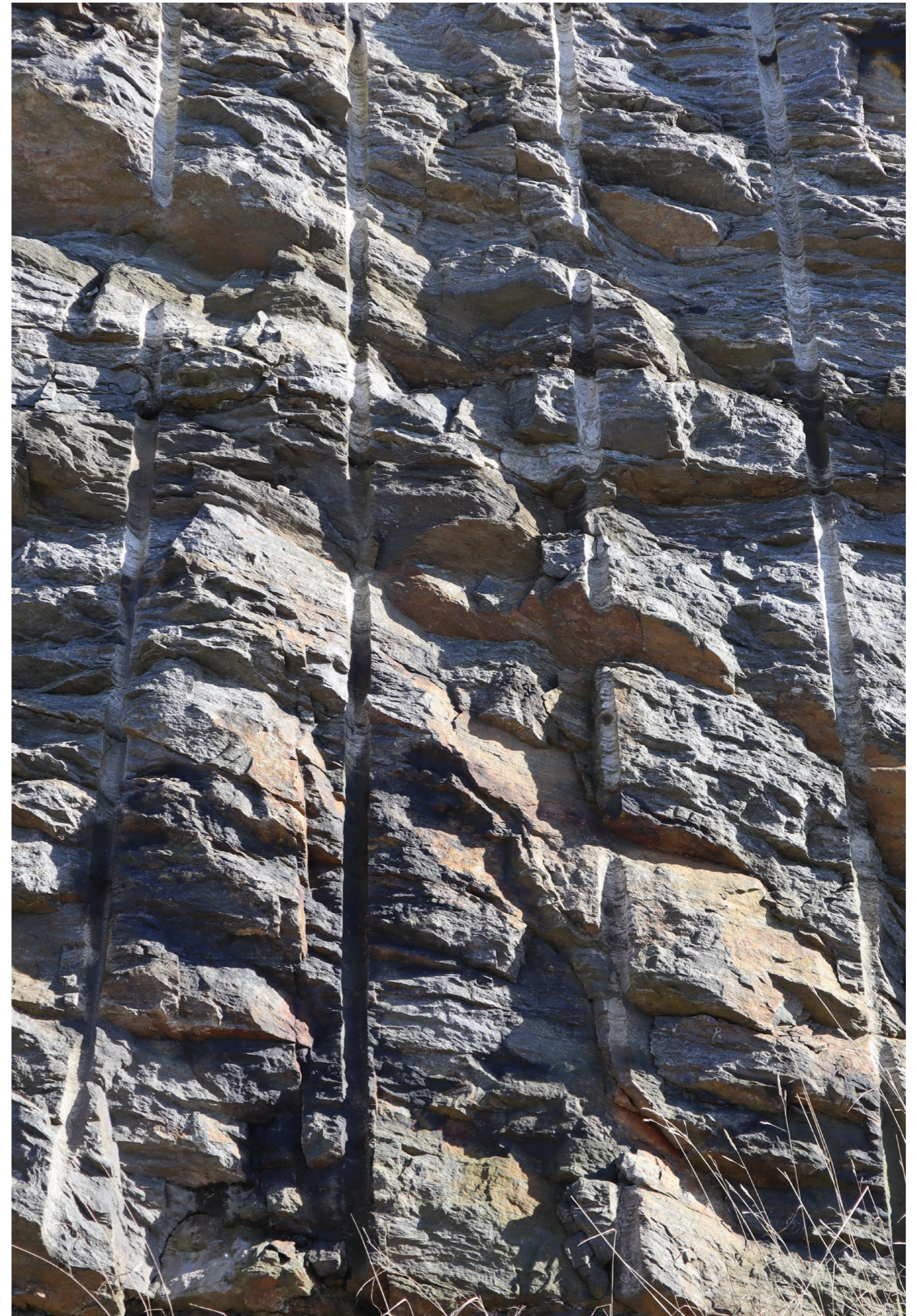
However, the knowledge I carry about the site and its surroundings is at the same time an advantage for me during the design work.



TRÄ OCH MÄNNISKAN

Illustration from the course "Arkitektur: Teori och Text", 2023.

Diagram from the studio "Housing Inventions 1", 2023. Based on Maslow's Hierarchy of Needs (1943).



aim and research questions

The Aim

The general aim of the thesis is to explore how architects can enhance building qualities related to residential architecture for the sake of people's mental health and well-being, while emphasising on stress reduction (through instoration and restoration).

This overall aim is then broken down into three categories or specific aims, each related to one research question. This is graphically explained in the diagram on the second next spread.

The Research Questions

Primarily, this thesis strive to explore some theoretical concepts and aspects important for mental health in residential architecture.

- 1) What architectural concepts can be identified in residential architecture that promote good mental health through stress regulation, based on relevant theories?

The second is the embodiment and application of these aspects through a design project in Bohuslän.

- 2) How can these concepts be sustainably applied in a housing project on the site of Tuvesvik?

The third aim is to go back to research question one and apply the findings to an urban context:

- 2B) In order to illustrate generalizability, how can the same concepts be used in a housing project in Högsbo - an urban site?

Dictionary

Restoration = factors that can be seen as recovering (e.g. physiological stress recovery and restoration of attention) (Markevych et al. 2017).

Instoration = factors that help the build capacity (e.g. stimulating and complex environments that strengthens the brain) (Markevych et al. 2017).

Mitigation = factors that can be measured and if controlled they can reduce harm (e.g. managing air pollution, heat and noise levels) (Markevych et al. 2017).

Salutogenic = a focus on what brings health in contrast to the pathogenic approach which focuses on what brings sickness (Antonovsky, 1979).

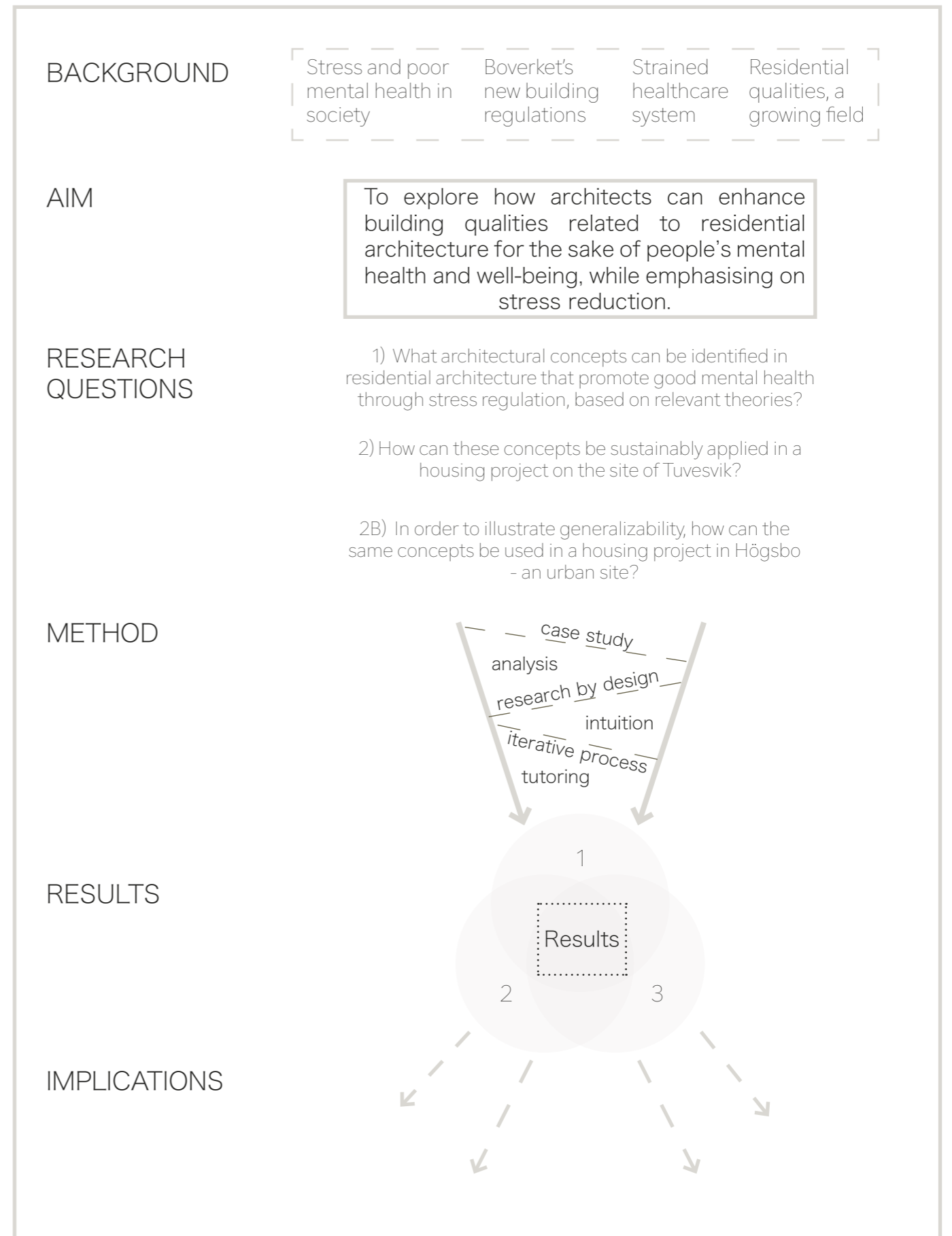


Diagram illustrating the structure and process of the thesis.

method and approach

The work is conducted through below stated methods and approaches. Throughout the process, an iterative approach has been guiding the thesis rather than a chronological methodology, apart from the structured work with the case study. Intuitive knowledge as an architect is also of importance especially in the design process, as certain decisions "feels right" based on accumulated knowledge and should be acknowledged as a valid approach in this context.

- Literature Overview

To gain a deeper understanding of the existing interdisciplinary research field, discourses and to explore the relationship between (mental) health, stress, the built environment and research related to residential qualities and architecture.

Motivation: A review is required in order to select relevant theories to guide this thesis and be aware of founding research leading up to those.

- Case study

Through the lens of the three main theories, four reference projects of high quality will be analysed and studied carefully, each with their own related subcategories. Study visits will be made to all reference projects. The question "how does this project relate to this category from this theory?" is asked repeatedly throughout this process and that data is compiled for the formulation of the design concepts.

Motivation: The importance of testing and evaluating the theories on existing housing projects to gain knowledge of how high quality architecture can embody abstract theories, but also how the methods "design through research" and "research through design" interact and influence each other.

- Design Concepts

Based on the theory and results from the conducted case study, concluding design concepts are formulated which are found to be related to mental health and wellbeing in the context of residential architecture. These will respond to the primary research question and are a compilation of the chosen theories, the reference projects and the results of the case study.

Motivation: This step is crucial for the translation of theory to strategy and is the core of this thesis. It shows how interdisciplinary research can generate a compiled framework of concepts and is also

an addition to the research field.

- Research Through Design (and Design Through Research)

The last methodology is the design phase, which involves the graphical embodiment of the previously mentioned design concepts. Research through design (RtD) includes the designing as a research method involving a iterative process, tangible outcomes (the design) and reflections. For the main site of the thesis, Tuvesvik, these are adapted according to the context and conditions that rule there. For the secondary site, Högsbo, the design concepts are adapted to the conditions in that location. The two sites represent the rural and urban context for residential architecture and together the drawings and illustrations exemplify the thesis both graphically and architecturally.

Motivation: The thesis is written under the Department of Architecture and Civil Engineering at Chalmers and therefore it is necessary to not only conduct a theoretical master's thesis. Because the work process also involves several reference projects, it is rewarding to me myself create the residential architecture this thesis argues for - as a good practice and something concrete for my professional portfolio.

delimitations

Following delimitations will guide the work of this thesis:

Scale

As a result of time, capacity, and balance of work - this thesis has purposely targeted plots that would benefit from small-scale buildings. This was considered when choosing projects for the case study and was later embodied through semi-detached housing in Tuvesvik and terraced housing in Högsbo. From a developers perspective, both plots could have been exploited more - which perhaps would have been more realistic. But in regards to above stated reasons, the amount of dwellings were purposely kept low. The thesis can however also be seen as a reaction to a society where buildings keep getting higher and courtyards keep getting smaller - mostly due to economic reasons. As a soon to be-architect, this is concerning - especially because mental health is so very connected to a more human scaled-design, in my opinion. So, the choice of working with small-scale housing is deliberate due to both the extent of the work but also as a result of a problematic view on dwellings. I argue that the building sector in Sweden should strive to protect residential qualities and the soft values they stand for in order to promote mental health for our citizens - small-scale housing could be one approach.

Site(s)

The choice of site was primarily Tuvesvik, due to a personal connection to the area. However, the thesis can be proved stronger if also an urban context were considered. Instead of changing the site, because the rural context as a good environment for mental health still stands - a site in Högsbo Industrial area was added. The two sites complement each other and shine light on different perspectives of residential architecture. This has been done through the questions like: How can the design concepts be utilized and embodied to this specific context? For instance, when no nature can be seen from a dwelling like in Högsbo - perhaps the vertical connection to the sky is equally important? A goal of the thesis is to generate design strategies that can be generalized, and the two sites amplify this argument. Furthermore, it would be interesting to apply the design concepts to an apartment house and see what that will result in - perhaps a question for the future.

Theory

Choosing and delimiting a gigantic field of research for the purpose of this thesis has been difficult. The choice of three main theories and support from some studies in residential qualities in architecture was a result of wanting a variety of research. There are multiple others that could have been used, and throughout the process of this thesis - several books and studies have

been read. The choice resulted in three main sources; "Bostadens arkitektur och berikad livsmiljö" (Morichetto, 2019); "From Experiences of the Outdoors to the Design of Healthcare Environments" (Bengtsson, 2015) and "From Experiences of the Outdoors to the Design of Healthcare Environments" (Stoltz, 2019) with additional support by mostly Braide's dissertation "Dwelling In Time" (2019).

Mental Health and Stress

Mental health is the chosen subject, not physical health even though they are intertwined. However, including both aspects would be too extensive for this thesis. The thesis will target one of the most common

mental-health struggles in Sweden today - stress (Folkhälsomyndigheten, 2024). However, the dwellings that are designed are not meant to be seen as a social housing project - even though the design concepts may correlate with research in healthcare architecture and evidence-based design. Instead, their purpose is regular housing for healthy people with enhanced residential qualities based on the chosen theories. The dwellings will not claim to cure mental illness through architecture, nor will it claim to be able to prevent mental-health problems from occurring - the hypothesis is that the presented design will bring restorative and instorative effects for the residents, all according to research.



theory

Mental Health

The most common, yet simplified, definition of being healthy is the assumption that "Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity." (World Health Organisation, 1948). This thesis emphasises on the resident's mental health, which is an essential element of health and goes further than just the absence of mental illness (WHO, 2022). As WHO further states it;

Mental health is a state of mental well-being that enables people to cope with the stresses of life, realize their abilities, learn well and work well, and contribute to their community. It is an integral component of health and well-being that underpins our individual and collective abilities to make decisions, build relationships and shape the world we live in. Mental health is a basic human right. And it is crucial to personal, community and socio-economic development. (WHO, 2022)

The purpose of this thesis is to investigate how architects can promote mental health through residential architecture.

This thesis is based on the salutogenic

approach as opposed to the pathogenic. Pathogenic is a word that derives from pathogenesis, which is the study of how disease and illness influence health (Cambridge, n.d.). In contrast to this traditional approach, salutogenesis was first introduced by Antonovsky (1979) and in contrast to a pathogenesis, it focuses on determinants of health and well-being. He stated that health should be considered as a continuum where which we constantly move, preferably towards healthy, not as a dichotomy such as healthy or sick (Antonovsky, 1979). This is also the foundation of health psychology, where research within this field targets health behaviours to determine how healthy an individual is, as opposed to clinical psychology (Ogden, 2004).

The global rise of mental health problems is a motivation behind this thesis, but due to the limitations of this study, the main focus is to target the most common mental-health problem in Sweden today, resulting in about 42% of all sick leave from work - stress and exhaustion disorder (Folkhälsomyndigheten, 2022). Despite working salutogenic, it is important to explain what happens to a person when they experience stress to fully be able to address the architectural solutions

Stress

The definitions of stress vary, but a modern way of defining it refers to stress as a stressor deriving from external environmental causes (Ogden, 2004). A more nuanced explanation is; "the concept of stress is something that involves biochemical, physiological, behavioral and psychological changes."

(Ogden, 2004 s. 234). Stress is not only something negative but also normal and crucial for our everyday function. This is why it is usually categorised as either dangerous to health (distress) or something positive (eustress) (Ogden, 2004). Eustress can be compared to the previously mentioned salutogenic approach by Antonovsky (1979), where stress can be seen as something potentially beneficial.

Lazarus and Launier (1978) provided the most widely used definition, where they argue that stress is a transaction between a person and the environment and one's ability to fit into a certain situation, a so-called "person environment fit". Through two succeeding appraisals, the individual evaluates if the event is 1) a potential stressor and 2) if they have enough resources to cope, resulting in either high or low stress levels (Lazarus & Launier, 1978).

Stress results in a physical reaction in the body, where two parallel mechanisms kick in; the activation of the sympathetic nervous system and the hypothalamic-pituitary-adrenocortical (HPA) activation (Ogden, 2004).

Sympathetic nervous system activation: The sympathetic nervous system is a part of the central nervous system in the human body and can simply be described as the fight or flight response, as opposed to the rest and digest response (Ogden, 2004). The latter refers to the second component of the central nervous system, also known as the parasympathetic nervous system, which will be discussed later. When an event is appraised as a stressor, the sympathetic nervous system reacts instantly. Adrenalin (epinephrine) and noradrenalin (norepinephrine) is produced which brings a variety of physical changes. Ogden exemplifies; "(...) factors such as blood pressure, heart rate, sweating and pupil dilation and is experienced as a feeling of arousal." (Ogden, 2004 s. 241). The released hormones (adrenalin and noradrenalin) also affect a range of other body parts and can influence the immune system (Ogden, 2004).

Hypothalamic-pituitary-adrenocortical (HPA) activation: Parallel to the previously mentioned process, stress instantly affects the HPA systems, resulting in the release of cortisol and other corticosteroids (Ogden, 2004). This affects the inflammation in the body as well as changes in how the carbohydrate supply is managed, which are more low-key physical changes and important when discussing long term effects of stress (Ogden, 2004). Ogden (2004) further writes that levels of brain opioids also increase throughout this process, which is harmful to the immune system.

Chronic Stress

After a stressful event has passed, the body recovers and when the parasympathetic nervous system takes over, the activity of the HPA system simultaneously decreases (Ogden, 2004). This is how things are supposed to go at least. However, while our bodies exist in the 21st century, our brains are still wired to a life 10 000 years ago on the savanna. Constant experience of stressors, as seen in today's highly technological world, is equal to a prolonged production of adrenalin, noradrenalin and cortisol (Ogden, 2004). This is related to many health problems. Some examples are cardiovascular diseases, digestion problems, immunosuppression (poor immune function), damage to neurons in the area of the hippocampus in the brain as well as anxiety and insomnia (Ogden, 2004).

After a time of chronic stress and lack of restoration, some people will experience complete exhaustion, leading to an inability to work and function like normal. Exhaustion disorder is the equivalent of the Swedish term "utmattningssyndrom", which is similar to "clinical burnout" but is related to stressors in both the work environment and life in general, such as relationship problems and high demands in the home environment (Västra Götalandsregionen, 2024); (Öster, 2023). Recovery from exhaustion disorder involves both physical rest and uninterrupted good sleep, but also "active" recovery is important, such as exercise, hobbies and social interactions with friends and/or family

(Öster, 2023). These things can be facilitated through our built environment and therefore fall under the category of what architects can control with their design.

Looking wider, chronic stress can also be a result of social factors such as poverty, unemployment, isolation and housing (Ogden, 2004). The housing crisis seen in many countries, Sweden included, is a result of politics, economics and other decisions by society's stakeholders. Currently, 148 of 290 Swedish municipalities report a housing shortage and about 70% of Sweden's population live in one of those regions (Boverket, 2024). This housing crisis is more complex than just a lack of housing and it is obvious that architects are not solely responsible for all the stress related to this societal problem. Nevertheless, some of the responsibility is ours. Designing high quality residential architecture is our most important job. It is where people spend most of their time and the playing field for their lives and where they retaliate to recover from stress. So, what factors related to architecture can influence the health of the people spending time in them? And how can we argue for the reassurance and protection of residential qualities?

The Impact of Nature

The research on the connection between nature and health is multifaceted. Much derives from the concept "biophilia" referring to the innate love and need for nature and natural life (Wilson, 1984), which later has branched out into the study of biophilic design (Sjövall, 2020). Whether it relates to an innate love for it, research shows that nature has positive effects on our health and quality of life, Sjövall (2020) states. The parasympathetic nervous system, also known as the "rest and digest" response, gets activated when a person is being exposed to natural elements - even just visually (Sjövall, 2020). As previously described, this means a lower heart frequency and a decrease in the stress-hormones cortisol and adrenaline and noradrenaline. As Sternberg (2009)

states, being in nature has a healing effect as it lowers inflammation in the body while releasing hormones connected to joy and contentment. There is also evidence for placebo, the belief that something is working, when it comes to a strong conviction of what is healing or health-promoting - which can be utilized in many ways (Sternberg, 2009). "Forest medicine" is a new interdisciplinary field of research, which involves the study of "natural-killer cells", simplified as cells that strengthen our immune system, (Sjövall, 2020). This new evidence supports the ancient Japanese tradition of forest baths or "Shinrin-yoku", where forests for a long time have been seen as healing and stress reducing.

Related to architecture, Ulrich (1984) et al. were the first to prove the connection of nature as healing in a health-care setting. He showed that patients admitted to hospitals due to both physical and psychological disorders, would get discharged faster and require less painkillers if their room was facing nature rather than a brick wall (Ulrich, 1984) e.g. The project of restorative workplaces (Bengtsson et al. 2023) is one of many on-going projects channeling nature as an effectful restorative element in architecture.

What about the ocean? Many studies have been conducted with so-called green elements, whereas water is considered a blue element. The interest in the potential health-benefits of spending time by the ocean is a growing field, seeing as humans traditionally have always lived in connection to water. Being around water has several stress-reducing benefits - both the sound of running water and the reflection of daylight have positive effects on our health and people who often visit freshwater sources, such as lakes and rivers, report higher mental health and sense of wellbeing (McDougall et al. 2022). Research also shows that people who live in coastal areas report better health in general and the exposure (through inhalation) of certain biochemicals or molecules, present in sea mist, reduce inflammation in the body (Depledge, 2019).



Main Theories

The Four Zones of Contact with the Outdoors

One of Anna Bengtsson's many relevant theories on the topic of health promoting and evidence-based design, the model "Four zones of contact with the outdoors" (2015) is a very applicable and communicative tool for evaluating a dwelling's gradual contact with nature and the outdoors and how the transition between the indoors and outdoors follows. The delimitations of this thesis only allowed me to extract this model from Bengtsson's research, to apply to the case study and illustrate how different rooms are more or less in contact with the outdoors. The 2015 model (presented in the Appendix - Diagrams) was originally made for health-care settings, but can easily be translated to residential architecture as the need for daylight and contact with the outdoors are just as important in the home environment. Perhaps even more so, as most people spend their majority of time within their dwelling.

The models different zones are by Bengtsson (2015) described as following, with comments:

0. Spaces with no windows to the outdoors. This is normally bathrooms, closets, hallways in a dwelling.
1. Contact with the outdoors from indoors, through windows. Traditionally bedrooms, kitchen, living room. It should be seen as a high residential quality to have more than one window, especially in different directions in rooms and in rooms typically without windows. Baywindows and windows over corners takes this to the next level and relates with Morichetto's research about views and atmosphere (2019).
2. Transition zones between the interior and exterior; balconies, terraces and patios e.g. This gives the architect a lot of freedom in regards to designing, and sometimes too little consideration can be seen. The transition zones are crucial and how they are planned (direction, size, configuration) matters a lot for the usage and for the resident. How balconies for instance affect

the daylight conditions in the room of the floor beneath is also worth mentioning, as it can be a direct consequence of too large balconies e.g.

3. The immediate surroundings of the building, preferably a garden or park. The ocean, or views and contact with this is considered a natural element just as good as a garden, park or forest, as previously mentioned.
4. The wider neighbourhood and what nature encounters it offers. This is hard, especially in an urban context, where nature can be distant and especially untouched nature. How the dwelling can reflect some natural elements might be helpful.

In the context of a dwelling, arguments to provide each and every room with daylight when possible is a strong contradiction to Boverket's new building directions starting in July this year (2025), where bedrooms can be designed without a window - something that has been against the law before. Bengtsson's model can be used to measure and compare different designs and how well they are considering the daylight needs - which is being done in the work with case study, in the next section of this thesis.

Residential Architecture and the Enriched Environment

The concept of enriched environment (EE) is a model used to study how stimulating environments, as opposed to deprived or standard, affects the brain structures and mental health through both restorative and instorative elements (Morichetto & Nilsson, 2020). In order for an environment to be seen as enriched, it needs to satisfy both physical, cognitive and social needs and aspects, which is done through multisensory stimulation that can't be static over time (Morichetto et. al 2025). In her dissertation on this topic, Morichetto (2019) presents three main findings on how one's home has the potential to be an enriched environment with multisensory stimulation; 1) Spatial extension (subgroups: diverging and converging views, variation and events, horizontal and vertical extension, interface)

, 2) Movement (variation, rhythm, passage) and 3) Materials and detailing (abstract touch and association). The categories are a result of several different research methods such as in-depth interviews, case study, mapping review and several different architectural analyses. As shown in the diagram in the Appendix (under Diagrams), the categories are also connected to more general feelings which are related to the well-being of the resident (Morichetto, 2019). These are spaciousness, protection (shelter), stimulation, control, freedom, care, restoration, inspiration and genuineness.

Furthermore, the different categories from Morichetto's (2019) results are described below.

1. Spatial Extension

The first category addresses the importance of views, both diverging and converging for a feeling of spaciousness and a stimulating atmosphere. Multiple and varied views through the dwelling, as well as views towards the outside that can be seen from different angles create a dynamic feeling of extension and overview. Along with horizontal and vertical elements and views in the dwelling, this feeling of extension can be further emphasized. Good examples can be achieved by different strategies and how varied and contrasting the views and events are will determine the complexity and stimulation of the brain. How well the interface, the transition between the indoor and outdoor, is handled and relates to both the interior spaces and the exterior context, is crucial for feelings of safety and control in the dwelling. It is also related to residents' satisfaction, especially if the interface has different characters - for instance providing a feeling of belonging or a feeling of shelter.

2. Movement

Moreover, this category emphasizes movement and circulation through the dwelling and how it is designed and considered. Varied movements have multiple benefits - both as stimulators due to the complexity and practical when using the dwelling. Being able to take different routes

inside allows for flexibility and possibility for simultaneous activities. The rhythm in the movement, moving through a pattern of different sized rooms for instance, strengthens the complexity. Furthermore, the passages and the options they provide in a dwelling - many connections to the rooms, are for instance considered desirable - but more importantly the connection to the outdoors. Multiple openings strengthen the connection and tend to motivate residents to go outside while being stimulating. This relates well to Bengtsson's (2015) model which values the amount of rooms with windows. In the context of Boverket's new building regulations - one does wonder what consequences a bedroom without windows may have on the resident - especially if said person is bedridden.

3. Materials and detailing

The third category in Morichetto's (2019) dissertation involves how materials, both their detailing and joining, is related to residents' experience of the home. Abstract touch refers to when two materials meet, the touching of those stimulates the brain in the same way as when we ourselves are being touched. But also the physical exposure to different materials and shapes within the dwelling affects us through association and stimulation, which also can be individual. How for instance, wood and other natural materials can influence our health through multisensory impressions - wood contains patterns of so-called fractals that are beneficial, for example. Morichetto also emphasizes the "feeling of care" in relation to materials (2019, p. 229).

Morichetto's dissertation is a good example on how research in residential qualities can be combined with studies in neuroscience, health and mental health in an interdisciplinary manner. For example the concepts of vistas, circular movement, room organisation ("axialitet, rundgång, rumsorganisation" - Nylander, 2011 e.g.) and knowledge and experience by renowned practicing architects with research in both evidence-based design and neuroarchitecture. It is also a large inspiration

for the work with this thesis - for example how Morichetto intertwines and discusses relevant research and gives practical examples on how to conduct a case study by analysing reference projects - an approach similar to the one in this thesis.

Perceived Sensory Dimensions

Jonathan Stoltz (2019) provides a nuanced idea of the duality of human needs (stimulating and restorative) with the further developed "perceived sensory dimensions", based on the original dimensions by Grahn and Stigsdotter (2010). The perceived sensory dimensions are categorised as either stimulating: diverse, social, cultural, open or restorative: sheltered, natural, serene, cohesive (Stoltz, 2019). It is considered that the model can be of use to be as a tool for landscape planners or urban planners, and may therefore need some adaptation to be translatable to the scale of one dwelling. However, I argue that the model could be used as a guiding tool for designing floor plans and spaces within and around the dwelling as well, especially since the need for both stimulation and rest are taken into account - two general human needs that exist whether one is in a small-scale context or a larger one. The dimensions are categorised as opposing (see Appendix - Diagrams), restorative vs stimulating, like following:

1. Sheltered versus Open
2. Natural versus Cultural
3. Serene versus Social
4. Cohesive versus Diverse.

The dimensions Stoltz (2019) argues for are explained and discussed below, with the original labels by Grahn and Stigsdotter (2010) in parentheses.

1. Natural (Nature): The natural aspect refers to an innate admiration for nature and its strength and wildness, Stoltz argues for "seemingly self-sown plants and naturally shaped features" (2019 s. 37). This is a very applicable tool for both architects and urban planners to consider in the design work of the outdoors, perhaps more so than the inside of a dwelling. But based on the knowledge

of how just watching nature affects us, views towards untouched natural environments should have very positive side effects.

2. Cultural (Culture): The cultural dimension is opposed to the natural one, a fascination for the human-created environment - the cultural or historic context of our surroundings (Stoltz, 2019). This is quite wide yet very relevant, considering how many people live in urban "man-made" contexts, interacting with the unnatural everyday. Stoltz (2019) (and Grahn & Stigsdotter, 2010) does acknowledge the value of this aspect in this dimension and I think this also speaks to the feeling of connection and community, feeling like you are a part of a context or society and not left all alone in the middle of nature - which can be daunting.

3. Open (Prospect): The open aspect is exemplified by Stoltz as "overviews, sceneries, prospects, vistas and stays" (2019 s. 37) and involves spaces to dwell in where there is room for activities such as playing or being physically active. This also relates to Morichetto's category "Spatial extension" (2019), with diverging and converging views as well as horizontal extension, proving the concept is somewhat interdisciplinary and relevant to different contexts.

4. Social (Social): The social dimension refers to qualities related to people's social needs, and places where they can interact like places that serve food or drinks. This is, according to me, a very popular and easy way to meet the social requirements when designing and planning new areas, as it has been almost trendy to create places to meet during my architectural education. But how they are designed are crucial in order to work as social nodes of neighbourhood e.g. And do they always involve spending money or could some be free to visit?

5. Cohesive (Space): The feeling of entering a new world, which is cohesive yet spacious and follows a clear concept. This feeling of atmosphere relates also to Morichetto's research (2019).

6. Diverse (Rich in species): The diverse dimension is seen as opposite to the cohesive and includes a variety and diversity of elements, both related to nature (species) and spatial design (organisation and

substance).

7. Sheltered (Refuge): A feeling of protection, being safe and the environment as a safe haven. This is very translatable to housing and the basic need for shelter within four walls and a roof. How these sheltering aspects are considered in the environment varies and should vary depending on context, in some places the need for safety is larger - perhaps next to a busy road.

8. Serene (Serene): An experience of peace and quiet, calm and serenity rules. No noise disturbances and no people. A possibility to withdraw and be alone. Within residential architecture this is traditionally the bedroom or even bathroom, but what if there could be a bigger diversity of spaces where one could experience this serenity - perhaps outdoors?

Residential Qualities

It is difficult to summarize the whole study of residential qualities in just a paragraph, without being unjust to the field. Due to the delimitations of this thesis, emphasis will lie on the parts not already included in Morichetto's (2019) dissertation in terms of residential qualities. These are things that I believe are equally important for mental health within a dwelling. When homes are designed, we strive to create the best possible solution for the resident. But seeing how people value different things and are different in terms of personality, for instance when it comes to social versus private spaces, some consideration of how a home

can be adapted to different individuals and households is needed. Braide (2019; 2023) argues for generality and flexibility in an apartment, among other things. A general room can have different purposes if it is designed with the right conditions - size and shape (Braide, 2019; 2023). Regarding size, it is hard to determine but all from 11,2 sqm, 12,5 sqm up to 16,3 sqm is suggested (Braide, 2023). She further states that a squared room has better conditions for usage and furnishability, which can be a challenge in reality both this and reasonable shape can be hard to achieve due to regulations and economy. A flexible design of a dwelling allows adaptations through the moving of interior walls or furnishings (Braide, 2019). This residential quality allows people to live in their dwelling for longer which brings a sense of continuity and safety in the neighbourhood (Braide, 2023). One could also argue that this flexibility involves other things, such as turning a roof terrace into an extra room, covering an opening in the floor slab to create more square metres or renting out parts of a dwelling.

Furthermore, the final important condition for the design of dwellings for mental health in this thesis is accessibility. It is not only a matter of social sustainability, but it makes a home more flexible and caring for people with different needs. A dwelling where one could park the car close by or have a proper bedroom on the ground floor is a matter of inclusion and equality.

case study

Introduction

The initial part of the results will address the primary research question; "What architectural concepts can be identified in residential architecture that promote good mental health through stress management, based on relevant theories?"

Four projects of high quality were chosen and analysed through the lens of the chosen theories by Morichetto (2019), Bengtsson (2015) and Stoltz (2019), along with some of the work on residential qualities by Braide (2019;2023).

Criteria

The projects have been awarded or nominated to Bostadspriset. This award was initially handled by Sveriges Arkitekter and from 2023 handled by CBA (Centrum för Bostadens Arkitektur), Chalmers University of Technology.

They all are small scale projects, in order to serve also as references and good examples for the design work on the two chosen sites (Tuvesvik and Sisjön industrial area). All projects could be visited with reasonable distance from the author's base in Gothenburg. Bonus: Because of a house sale in Äppelträdgården, one of the dwellings

in that project was visited and explored interiorly, which of course would have been desirable for all projects.

Floorplans and proper materials had to be accessible to fully understand the projects.

Projects

- *Äppelträdgården* in Gothenburg by White Arkitekter (2011). 126 sqm and 4 (5) rooms and a kitchen. Two floors. Architect is the developer.
- *Brf Valö Fyr* in Gothenburg by HSB and Landström Arkitekter (2010). 123 sqm and 4,5 rooms and a kitchen. Two floors. In this project, there were three different types of dwellings but the other two were eliminated because they were either too small or not accessible.
- *Källsprångsvägen* in Viskafors by Brunnberg & Forshed (2021). 80 sqm and 3 rooms and a kitchen. One floor. Tenement agreement with Viskaforshem.
- *Twelve Houses* in Malmö by Förstberg Ling (2022). 160 sqm and 6-7 rooms and a kitchen. Three floors. Architects are the developer.

Theories

The projects were analysed through the main theories They were broken down into several sub-categories, all listed below.

"Residential architecture and enriched

environments" (Morichetto, 2019)

- Diverging and converging views
- Interface
- Variations and events
- Horizontal and vertical extension
- Movement
- Materials and detailing

"The four zones of contact with the outdoors" (Bengtsson, 2015):

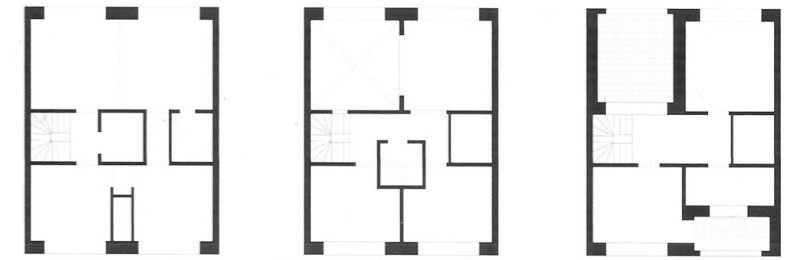
0. Rooms with no connection to the outdoors.
1. Room with windows that connects to the outdoors.
2. Transition zones in connection to the dwelling, balcony/terrace/wintergardens e.g.
3. Outdoor spaces in connection to the dwelling, like gardens or courtyards.
4. Outdoor space in the neighbourhood and surrounding area outside the plot or block.

"Perceived sensory dimensions" (Stoltz, 2019): These dimensions are categorized as either restorative or stimulating, with the restorative ones mentioned first and the more stimulating ones on the opposite side of "versus".

1. Sheltered versus Open
2. Natural versus Cultural
3. Serene versus Social
4. Cohesive versus Diverse.

A selection of relevant research of residential qualities

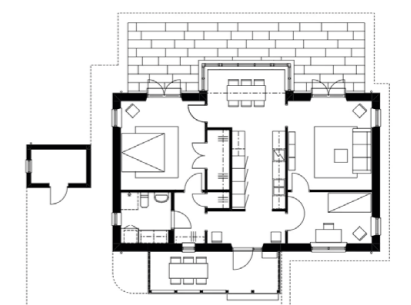
- Generality (Braide, 2019; 2023)
- Flexibility (Braide, 2019; 2023)
- Accessibility - focus lies on the access to a bedroom on the first floor as well as access to parking space in connection to the dwelling.
- Room shape (furnishability and usage) (Braide, 2019; 2023 e.g)



Twelve Houses by Förstberg Ling (2022). (Arkitektur, nr 5 2023).



Brf Valö Fyr by Landström Arkitekter and HSB (2010). (Arkitektur, nr 6 2010).



Källsprångsvägen by Brunnberg & Forshed (2021). (Arkitektur, nr 8 2021).



Äppelträdgården by White Arkitekter (2011). (Arkitektur, nr 2 2012).

Äppelträdgården by White Arkitekter (2011)



Valö Fyr by Landström Arkitekter (2010)



Källsprångsvägen by Brunnberg & Forshed (2021)



Twelve Houses by Förstberg Ling (2022)



Photos by Robin Hayes (Brunnberg & Forshed, 2021).

Design Concepts for Mental Health

After conducting the case study, several common denominators and concepts became could be identified as patterns.

For example, all four projects had considered the concept of axiality, with long sightlines through the dwellings. Some offers the quality of circulating (Källsprångsvägen, Valö Fyr and Twelve Houses). All projects worked with horizontal and vertical extension in some ways and together they state as examples of how transitions can be made - good and bad. Some of them, Källsprångsvägen and Brf Valö Fyr seems to have high context sensitivity as they are very well adapted to their surroundings. Twelve Houses and Källsprångsvägen do like most private, despite the large/many windows. All four projects offers the possibility to park a car in contact with the dwelling but only Källsprångsvägen have proper bedrooms on first floor (however in Äppelträdgården it can easily be added as it had been done in the house I visited when it was for sale.)

The houses can be ranked according to what flexibility they offer (from most to least): Twelve Houses, Äppelträdgården, Källsprångsvägen, Valö Fyr. Same with generality: Twelve Houses, Källsprångsvägen, Äppelträdgården, Brf Valö Fyr.

The qualities found in the projects were identified, summarized and categorized with help from the chosen theories (and sub-categories) previously presented.

This process resulted in following design concepts for mental health: direction diversity, transitions, zones of social and private, context sensitivity, individuality and control and safety. They together offer both restorative and instorative elements. The presented design concepts are a summary of the chosen theories (Bengtsson (2015), Morichetto (2019) and Stoltz (2019) along with Braide (2019; 2023)) when they are applied to the reference projects in the case study.

The concepts are to be understood without chronological order and is meant as a tool for designing dwellings for mental health based on research.

- direction diversity
- transitions
- zones of social and private
- context sensitivity
- individuality
- control & safety

Direction Diversity

- Of views. Are there long vistas and axiality through the dwelling?
- Of movement. Is it possible to circulate?
- Of space. Are there elements of vertical and horizontal extension?

Transitions

- How can the resident interact and transition into the outdoors and nature?
- In what ways the outside is present and accessed through transitions like atriums, baywindows, balconies or terraces.
- How transitions protect the residents and especially the private zones from unwanted visibility from the outside.

Zones of Social and Private

- How the transitions are handled between social and private spaces within the dwelling.
- How well the are zones divided and mixed.
- The possibility to retract to a sheltered space, both indoor and outdoor.

Context Sensitivity

- How well are the dwelling and design is adapted to the location, context and direction.
- Balance of enclosure and transparency e.g towards neighbours or what room is facing what direction.

Individuality

- How well the dwelling can be adapted to the resident in terms of flexibility, division or extension.
- Versatile rooms large enough for different purposes, e.g. bedrooms -> livingrooms.
- How the rooms can be used in terms of furnishing, involves placement of openings.

Control & Safety

- To what degree the resident can feel incharge over the dwelling while also regulate the degree of privacy and publicness.
- The clarity of division between one's own, somebody elses and shared space.
- The home as the safest place.

During the work of this thesis, the release of the report "Neuroarkitektur & Bostadsgårdar" by main author Morichetto, Liljewall together with Leif Blomkvist Forskningsstiftelse, Sverigehuset and Akademiska Hus was released (2025, April 23). The process and work with present thesis has several similarities with that report, as it is based on partly the same theories by the same researchers. The results present here, are not to be seen as a conflicting but more as a complement and my own interpretation of the theories and their applicability as a student of architecture. Also, the report by Liljewall et.al (2025) states seven design keys for residential courtyards for the health of the residents in contrast to the perspective of a dwelling, like in this thesis. However, the report were a great reference for this thesis' urban application where a courtyard was designed in relation to terraced housing. In the application to Tuvesvik, no proper courtyard exists.

tuvesvik

The Site

The site of Tuvesvik is located 50 minutes from Uddevalla, the main city of Bohuslän county. Ellös is the largest town in the area and can be reached within eight minutes by car, 10 minutes by boat and 20 minutes with a bike from the site. Gullholmen is the closest community, with visual connection and can be accessed through a ferry within five minutes. A proper walking- and bicycle road was added along the road leading up to Tuvesvik about ten years ago. On site, a bus terminal with two bus lines, are located. The ferry terminal also offers access to Kåringön within 35 minutes. All of the surrounding islands and small communities can be reached easily by boat.

The landscape consists mainly of rocks and low growing vegetation such as mountain oak, heather and blackberry bushes.

West of Härmanö is just open water.

History

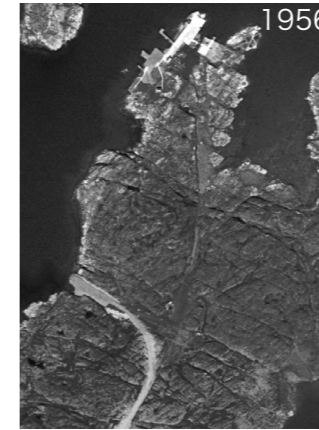
Tuvesvik is known as the ferry terminal and a car park area for the residents of Gullholmen, an island with history from the 13th century and one of the oldest fishing societies in Sweden. The cultural history of Tuvesvik, or Krokön, was a steel factory which has left a industrial heritage area north of the bay.

During the 20th century, the site grew - mostly in terms of parking spaces, as the location's purpose mostly served the islanders of Gullholmen, which had become a famous holiday destination for workers.

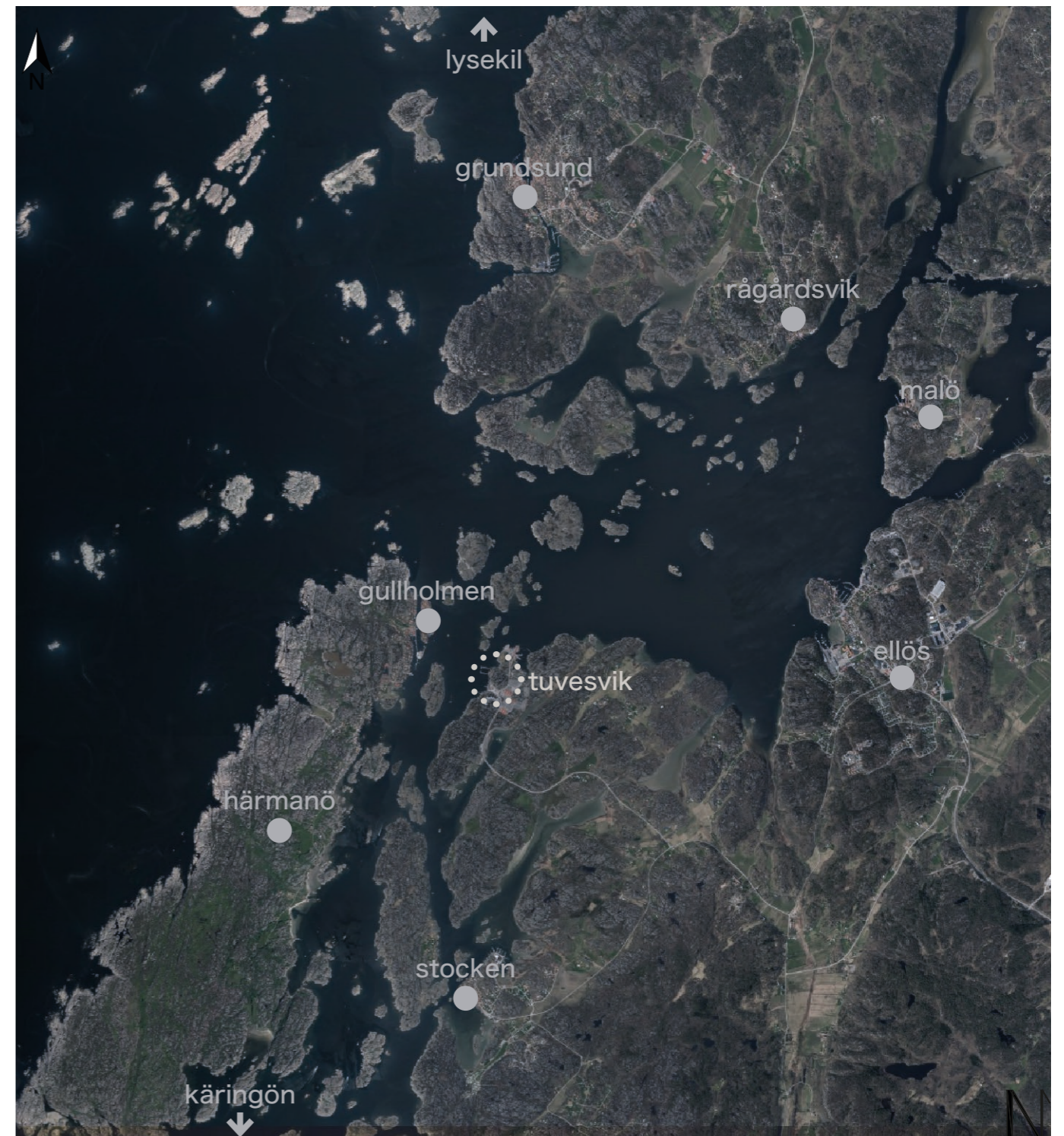
By 2013, the area was updated with new parking lots and a new ferry terminal by Kanozi Architects (Bohuslänningen, 2013). This was a part of a project where Tuvesvik would be the new point of departure for the residents of Kåringön, an island south of Härmanö. The seashed-inspired terraced houses by the water northeast of the site was built 1987 and are mostly used as summer residences. The newest addition on the site is the multifamily-house complex from 2019 by White Architects, housing residents all year around. In connection to the site lies a new small harbour with boat sheds built in 2024 on initiative of some residents on Gullholmen. The site also contains a sewage treatment plant, with pipes over to Gullholmen. According to new directions from Orust municipality, Ellös will house the sewage treatment for all islands in the area and work with this are planned to start this autumn (Orust kommun, 2025). The abandonment of the power plant complex creates a great condition for a proper entry to the site in the housing proposal of this thesis.

Plans

North of the ferry terminal and allowed in the detailed development plan from 2006, a large hotel complex is planned (Orust kommun,



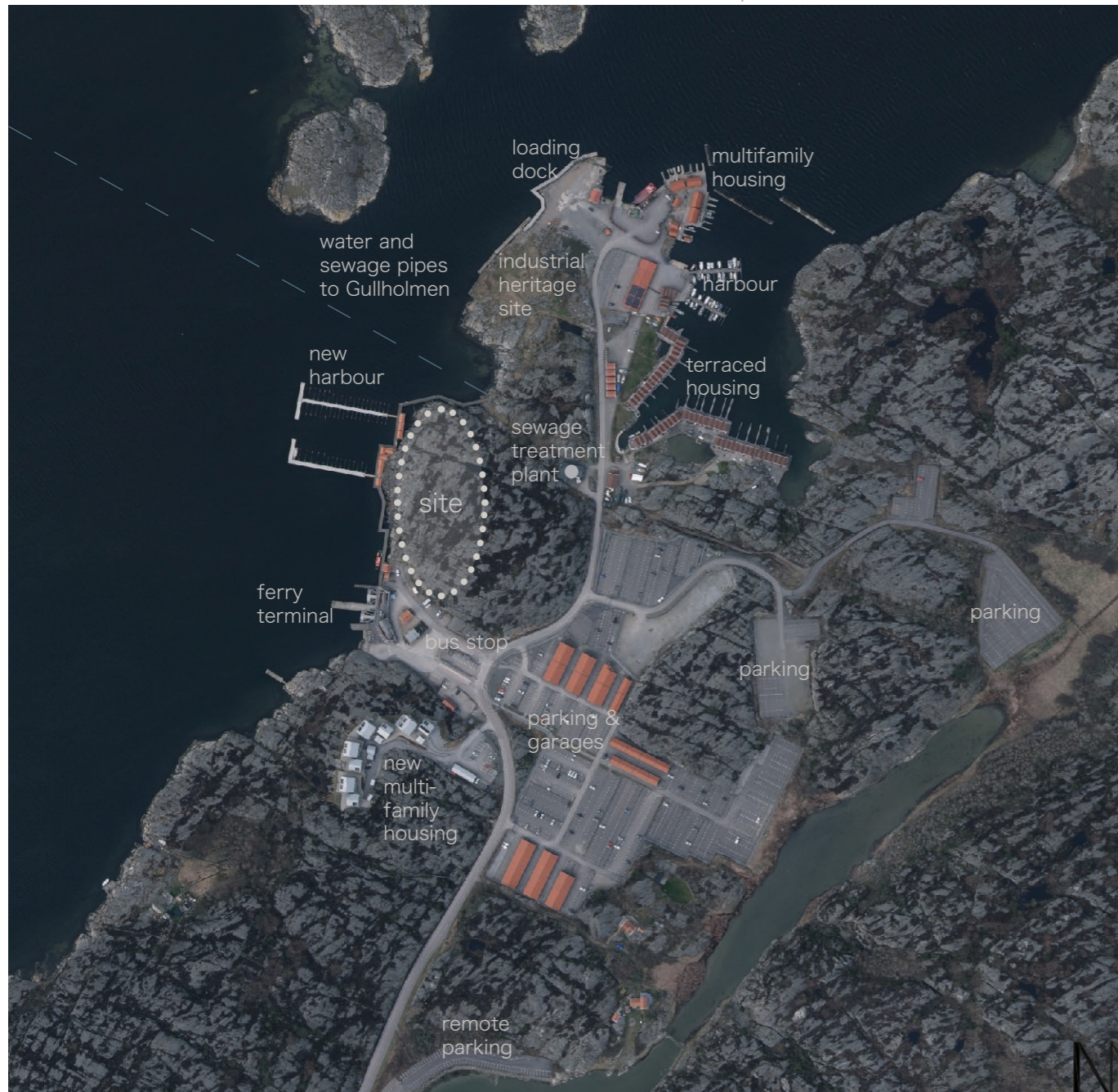
Historical aerial photos over Tuvesvik and map of surrounding coastal area, 1:50 000. (Lantmäteriet, 2024).





Tuvesvik seen from Härmanö, with Gullholmen to the left.

Aerial photo over Tuvesvik 1:5000. (Lantmäteriet, 2024).



2025). This is a hot topic among the islanders of Gullholmen who claim that the structure is way to massive for the area.

Because of the sensitive cultural and historical heritage of the archipelago, all building permits are run through the agency of Bohuslän Museum. See extraction from the guidelines for new buildings:

– Adapt the building’s volume, shape, and placement to the surrounding environment and the volume and form of the neighboring older buildings.

– Design the building with an architectural expression that does not dominate the landscape.” (Bohusläns Museum, 2025)

In light of this, the planned hotel does not seem to reach these guidelines and therefore a smaller structure would be more suitable out of respect for the area. Orust municipality writes that they want to strengthen the identity of Tuvesvik (Orust kommun, 2025),



Visual image of planned hotel complex on Tuvesvik, by Inobi Architects from 2024 (Orust Kommun, 2025).

but there are multiple ways to do so.

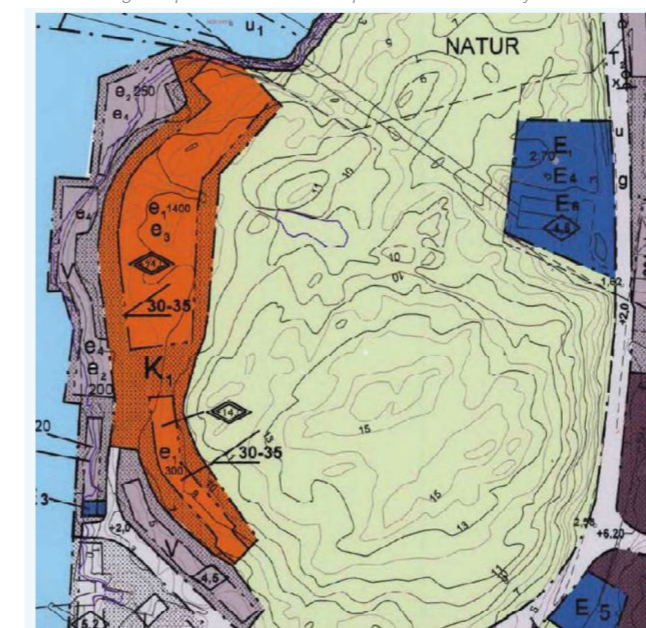
I argue that embracing the residential aspect of the site would be ideal, considering the already existing houses in the area and the appeal of the location as a beautiful place to dwell in.

Having identified the movement of the sewage treatment plant as a potentially good entry and parking space for the site in February (see appendix), I was pleased to see that Orust Municipality announced the possible change of the detailed development plan in April (Orust kommun, 2025), possibly based on the same deduction as mine.

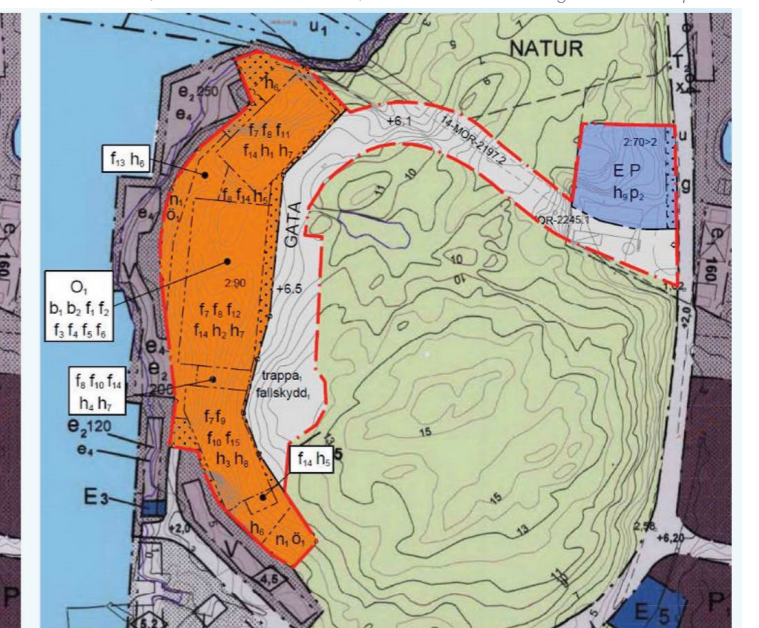
However - in the soon to be presented alternative for the site and based on the aim of this thesis, the new proposal would avoid the hotel's massive intrusion of the landscape. It also strives to respect the sensitivity of the site's nature in a more empathetic and sustainable way by more small scale volumes.



Sewage treatment plant.



Detaljplan från 2006



Planändringsförslag

From the detailed development plan from 2006, with the suggested alterations from a public meeting in april 2025 (Orust kommun, 2025).

View over site, bridge, ferry terminal and housing by White Architects (2021).



View of new boat houses and Gullholmen.



The site seen from the ferry terminal.



View over site from the water.

The terraced housing from 1987.

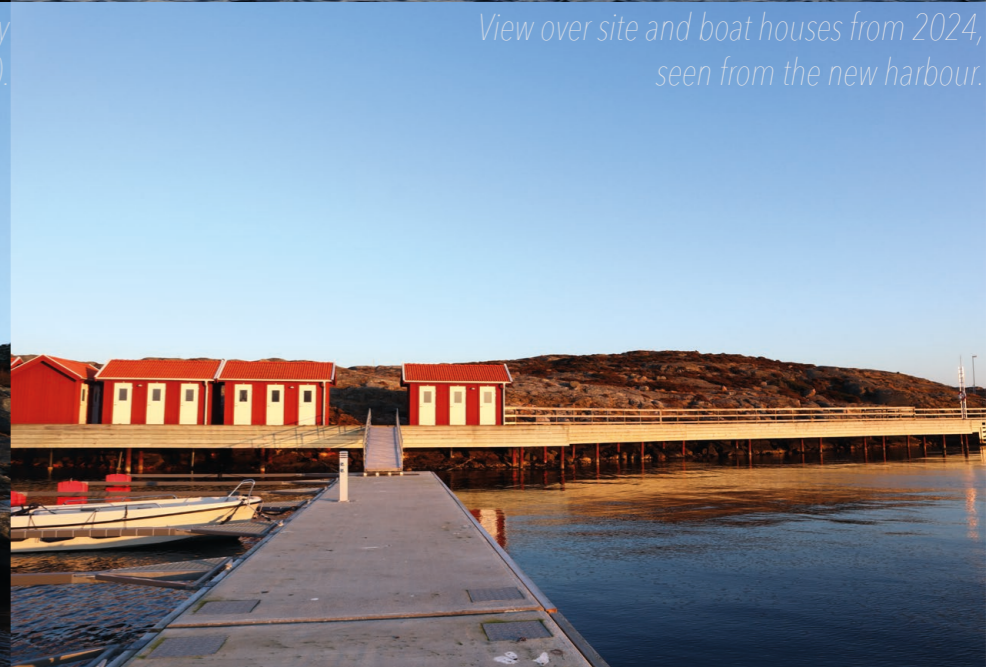
View of Gullholmen.



The ferry terminal seen from a bridge in the south.

Multi-family housing by White Architects (2019).

View over site and boat houses from 2024, seen from the new harbour.



Sunlight Study

The purpose was to explore the changes of the sun for a deeper understanding of the site. Observe the sun's angle and how it changed in just one month.

Morning
February 11
10.00



Midday
February 8
12.00



Afternoon
February 10
15.00



Late Afternoon
February 10
16.30



Morning
March 16
10.00



Midday
March 15
12.00



Afternoon
March 15
15.00



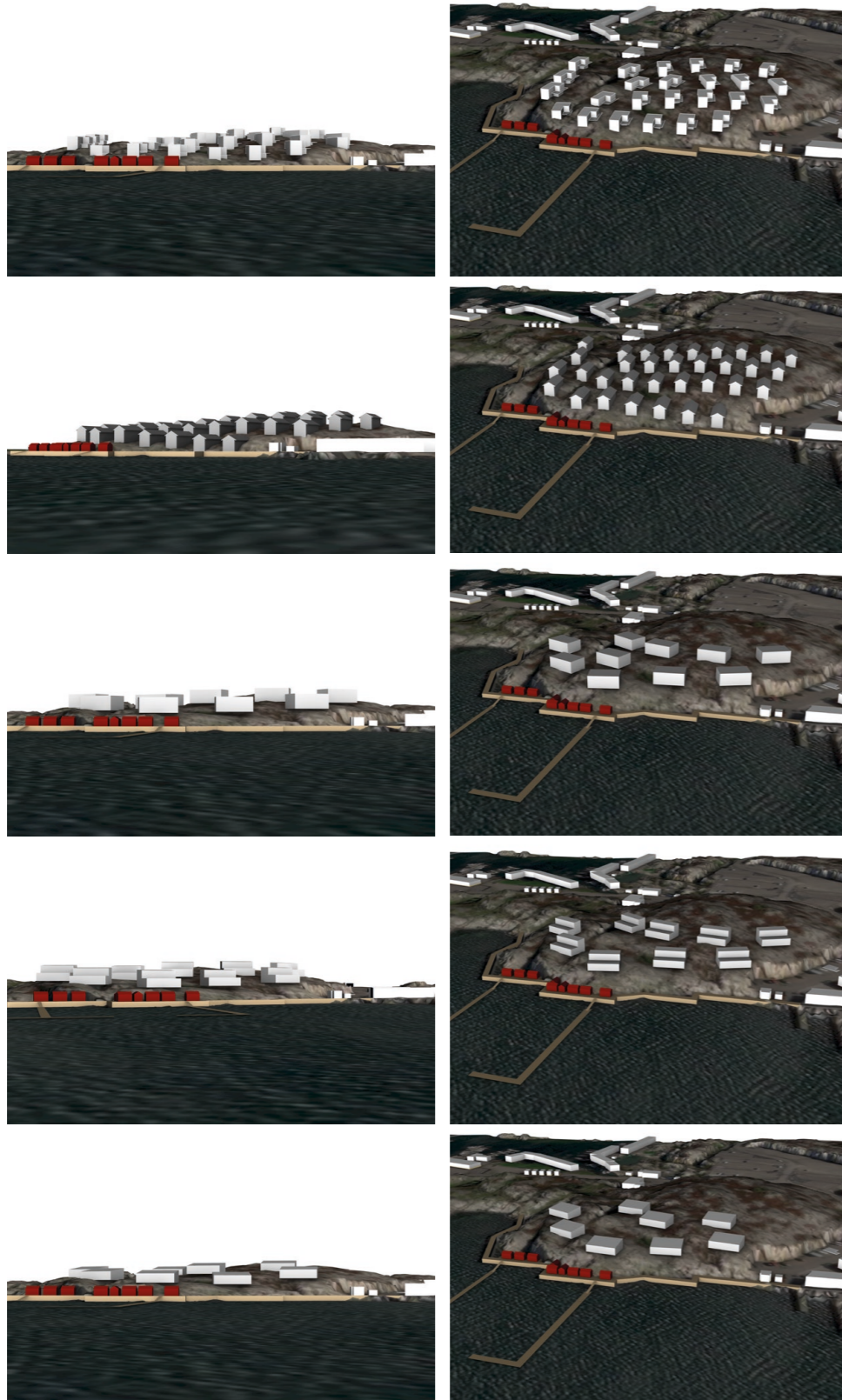
Late Afternoon
March 15
16.30

Volume Study

A selection of images from the conducted volume study. The importance of respecting the mountain and the area was the foundational aim.

The procedure was to explore how different volumes would fit on the site - single-family

houses or two-family houses (semi-detached housing). A volume lower in the front and higher in the back was selected due to the landscape and the impression from the water. A two-family dwelling with maximum 1,5-2 floors and a low amount of buildings are shown to be most suitable for the context.



Design Strategies

- | | |
|-------------------------------|-----------------------|
| • direction diversity | • context sensitivity |
| • transitions | • individuality |
| • zones of social and private | • control & safety |

The purpose of pursuing a design project is to embody the abstract design concepts (that were a result of the theory and case study) in a concrete context. In this part it is done in the site of Tuvesvik. Each category of the concepts is considered and the translation is described below.

Direction Diversity

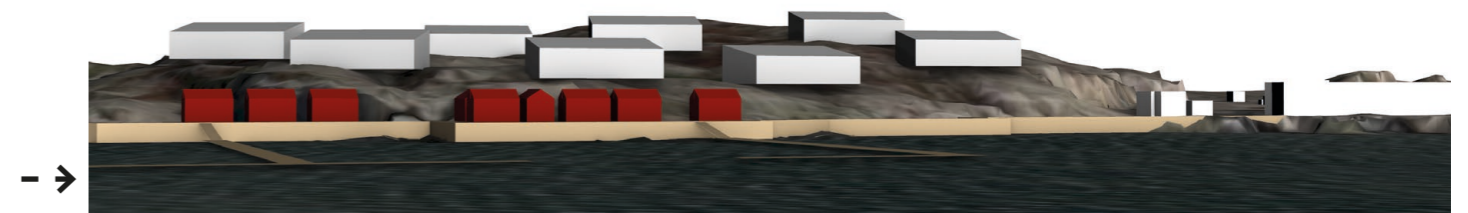
- Axles and views follow the design on both floors. An exterior corridor frames the view and gives direct access to the backside balcony while adding vertical light.
- Possibility to circulate in several ways on first floor - both indoor and outdoor.
- An opening in the floor slab creates diversity of space and the sloping roof gives complexity. Windows in different height stimulates and shifts the gaze upwards.
- Windows over corners elongate the rooms and a window in the ceiling gives skylight.

Transitions

- Outdoor spaces with different characteristics (outside with glazed roof, outside with regular roof, completely outside, outside of the building's volume) gives variety.
- Through large openings with sliding doors the interior spaces can melt into the exterior.
- Overhang creates distance from entrance.
- Each dwelling have undisrupted ocean view and all rooms have a minimum of one window.

Zones of Social and Private

- Bedroom on ground floor faces away from



the street and have daylight from three directions.

- Social zones are connected and kitchen can be reached directly from entrance.
- Social first floor with one bedroom which can be reached from the outside and private second floor with 1-3 bedrooms.

Context Sensitivity

- Emphasis was on the landscape and how the buildings would melt into it, resulting in a volume with a sloping roof towards the sea.
- The street-side and seas-side were handled differently, where the street-side was more private (entrance and kitchen) and the sea-side were more social (with exception from the bedroom, which can be turned into a dining place e.g.). Windows thereafter.
- The long side was also handled with care for curious glances from neighbours, with smaller windows towards the back and larger towards the front.
- Because of the windy context, a glazed corridor creates a perfect microclimate regardless of the weather.

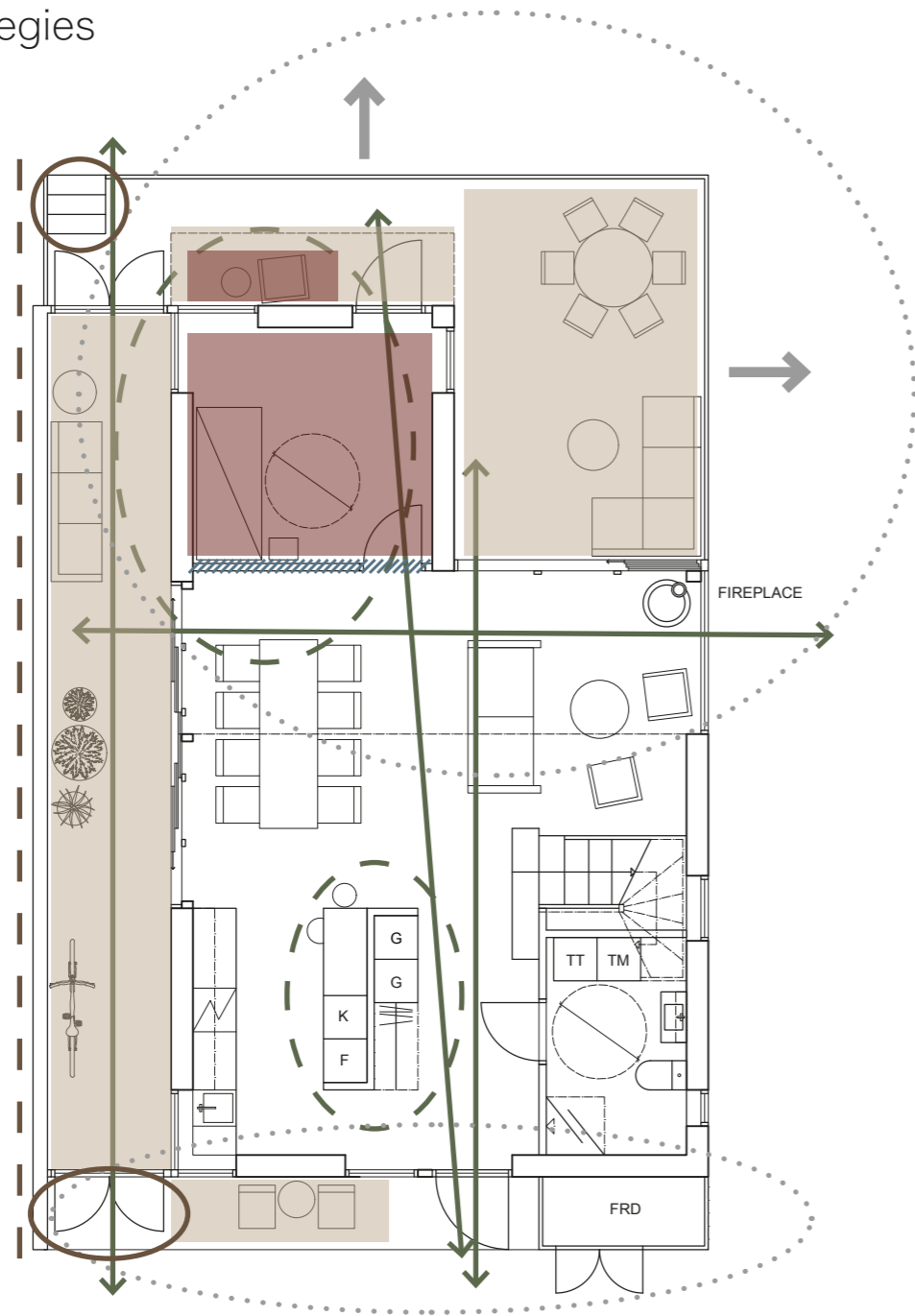
Individuality

- As illustrated in the "Household Study", the dwellings can house multiple variations of families and households.
- The changes can be done fairly easy and allow for healthy aging in the dwelling.
- Rooms are mostly squared and large, which allows for diverse use.
- Doors and openings are placed for optimal furnishing.
- To withdraw and study or spend time alone in bedrooms with minimum of two windows is possible. Room for a desk in each bedroom.

Control & Safety

- The glazed corridor can be locked and the balcony does not have to have small stair to the mountains which gives total control over trespassers. A clear line between dwellings exists.

Design Strategies



Direction Diversity

- Views
- Movement
- Space

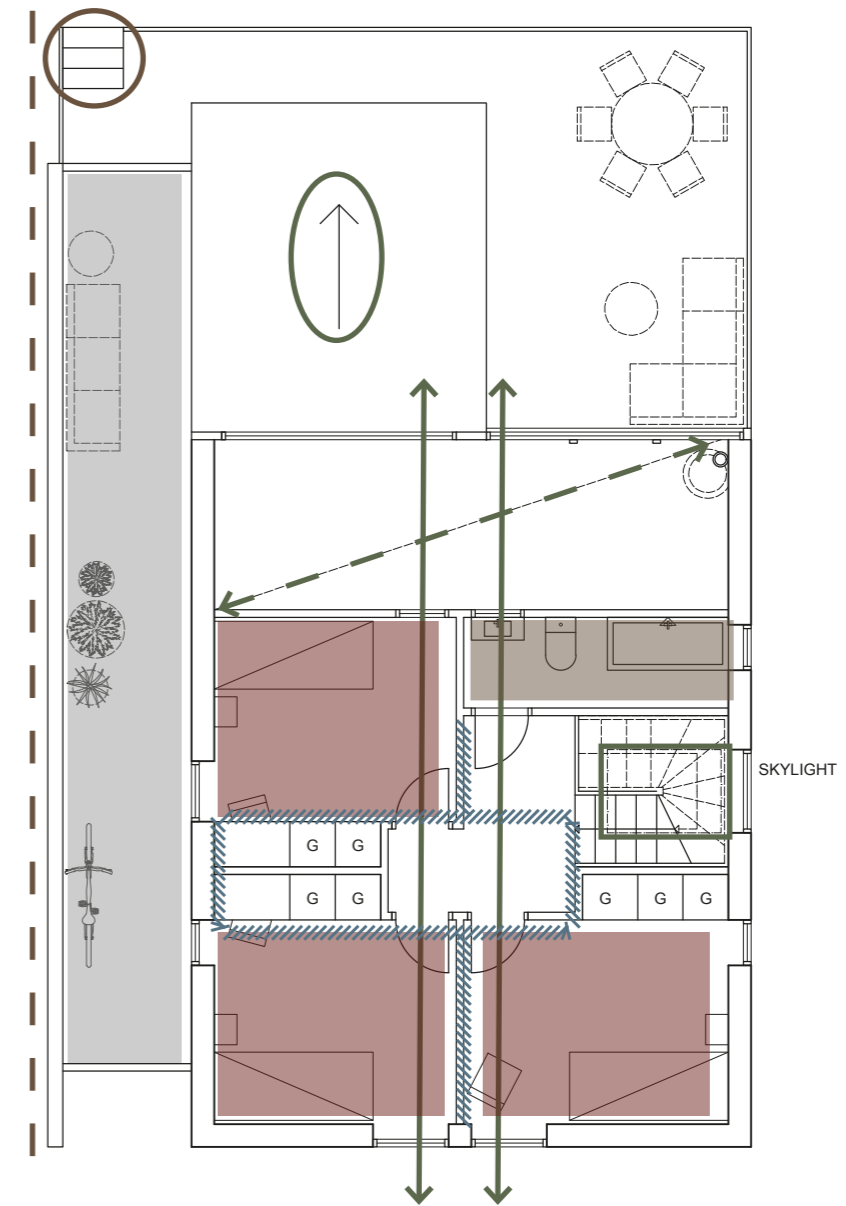
Transitions

- Outdoor spaces.
- Openings (size & direction).
- Overhang.
- Contact with outdoors.

Zones of Social and Private

- First floor versus second.
- Sheltered spaces.

Design Strategies



Context Sensitivity

- Nature and landscape.
- Street-side versus sea-side

Individuality

- Adaptable to resident's need and wishes.
- Furnishability and room shape.

Control & Safety

- Clear boundary between neighbours.
- Possibility to interact with neighbours easily.

Site Plan

The units are placed so that every dwelling has a direct visual connection to the water. The placement and number is similar to the housing by White (2019) south of the ferry terminal. Parking is done where the old sewage power plant was, which minimizes the intrusion in the mountain. Slim roads with accessible parkings can be found in

connection to the dwellings. The dwellings are built of massive wood and are fitted into the mountain on the side facing the road - on the other side they stand on poles.

A staircase connects the roads with the ferry terminal, but otherwise the residential area is reached from the back. Garbage disposals are located in small boat house-styled houses next to the car park.

Scale 1:1000.

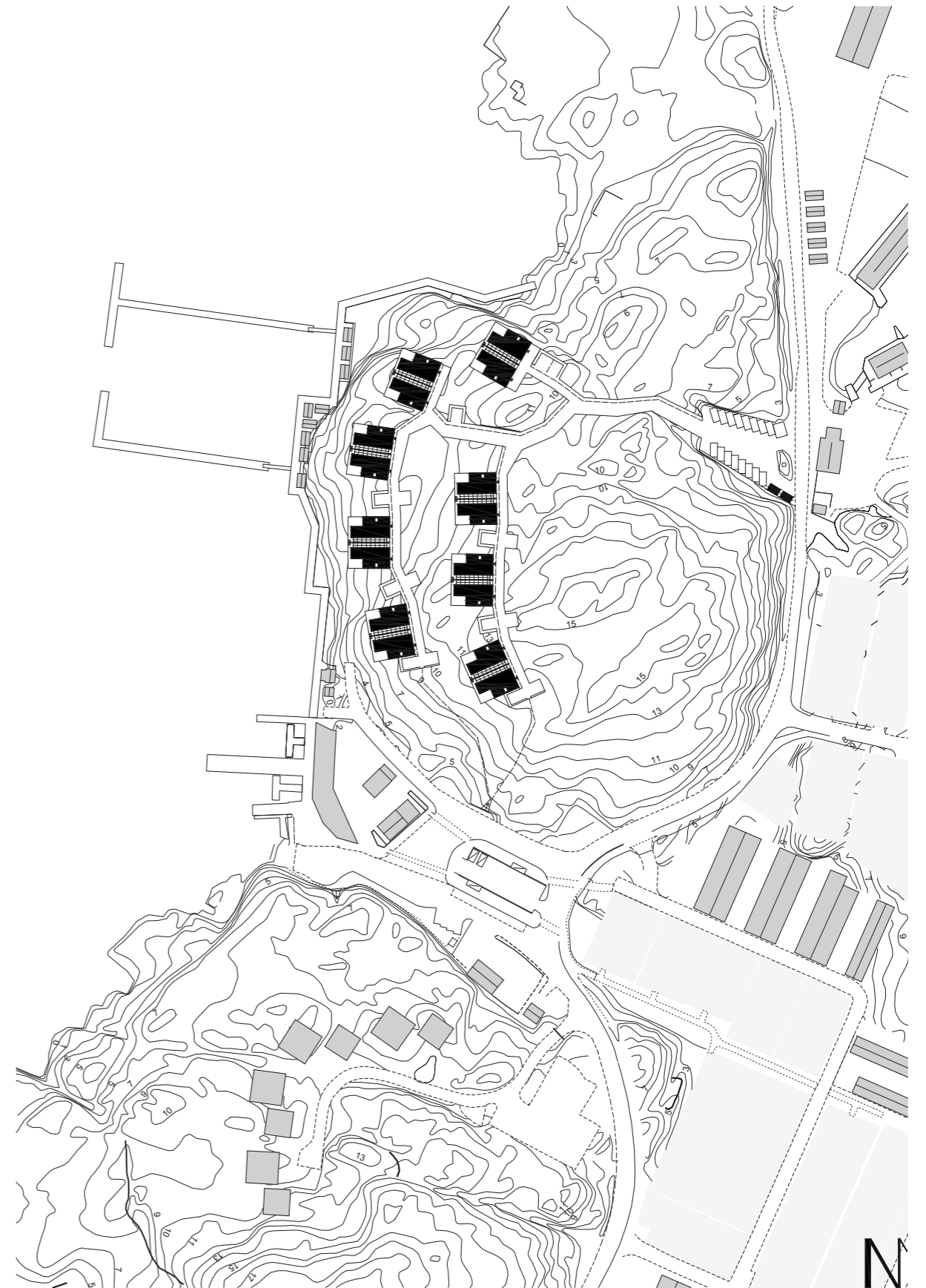
0 10 20 30 40 50 m



Site Plan

Scale 1:2000

0 20 40 60 80 100 m

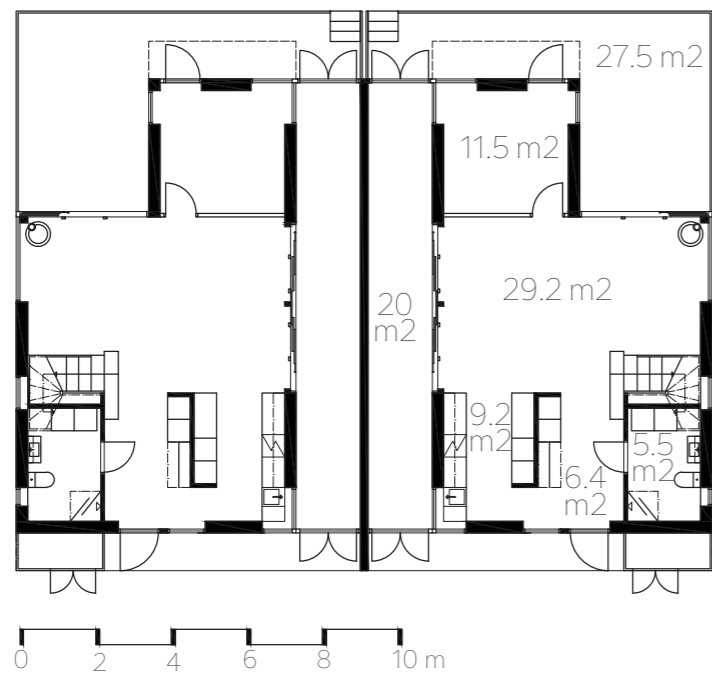
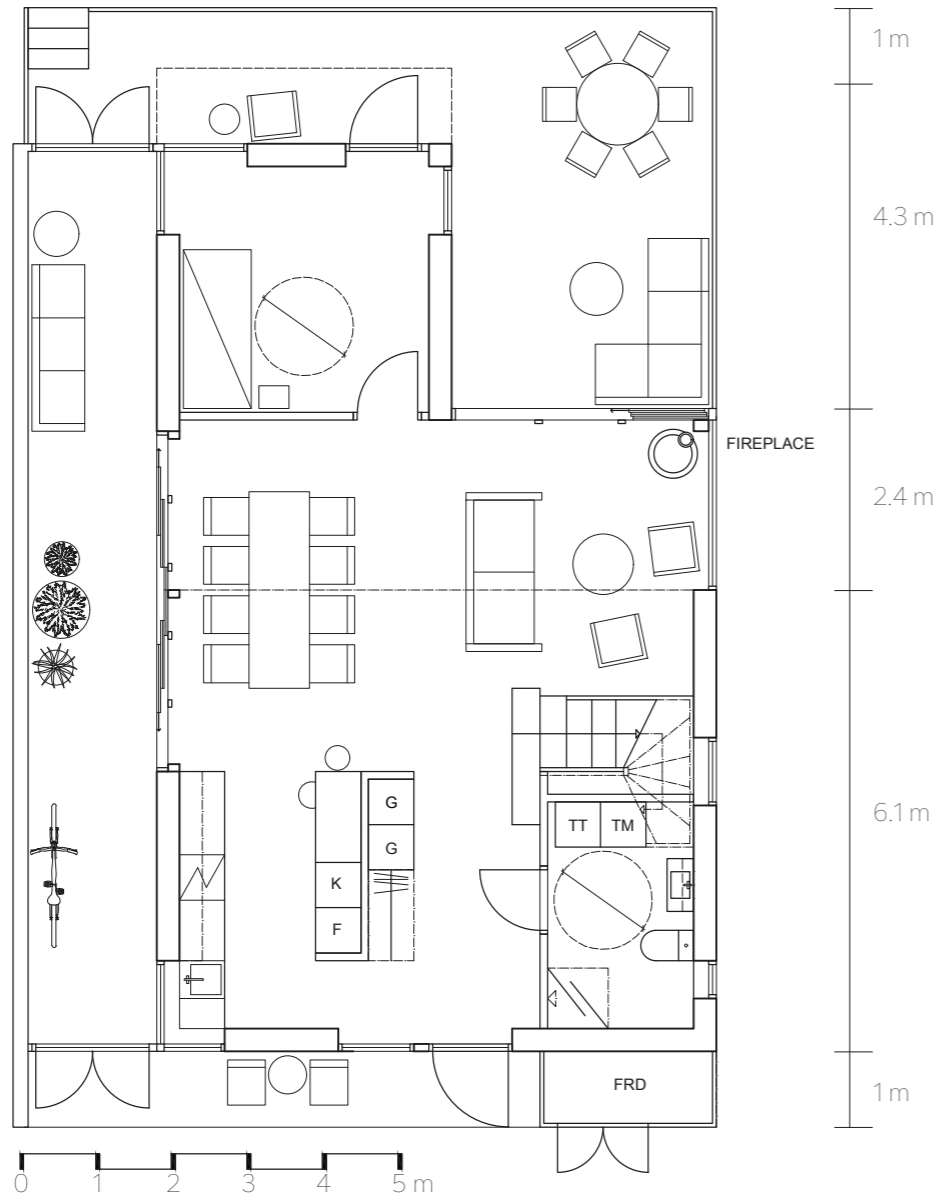


Floor Plan

5 ROK (2-5 bedrooms).
Total BOA: 114.5 sqm.

First floor.
BOA: 68 sqm.

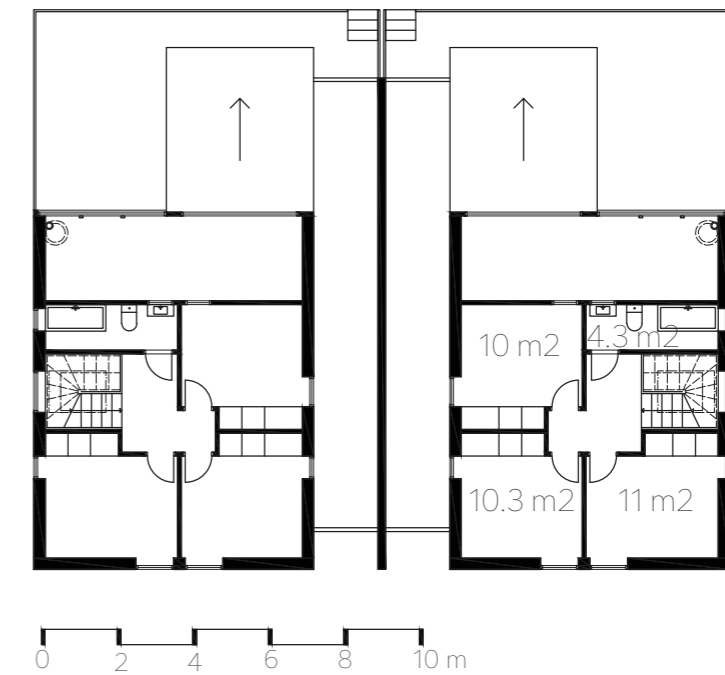
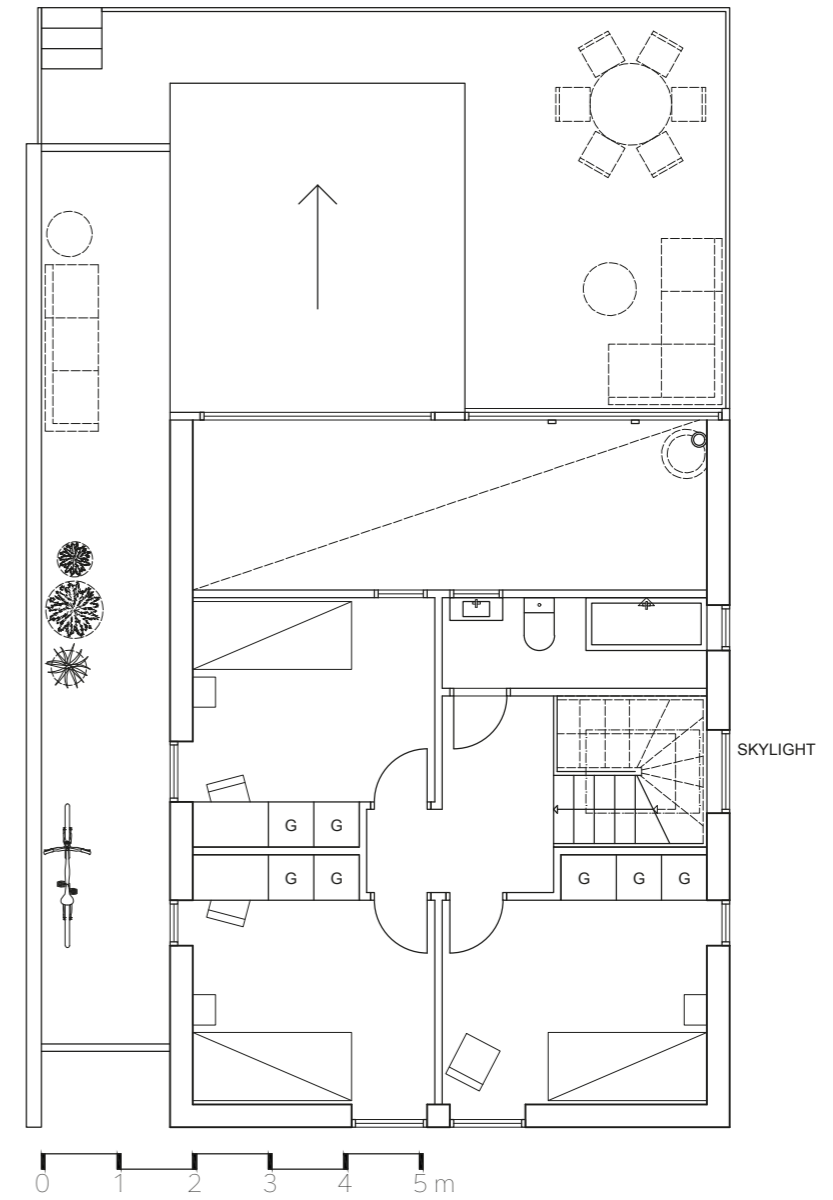
Scale 1:100 / 1:200



Floor Plan

Second floor.
BOA: 46.5 sqm.

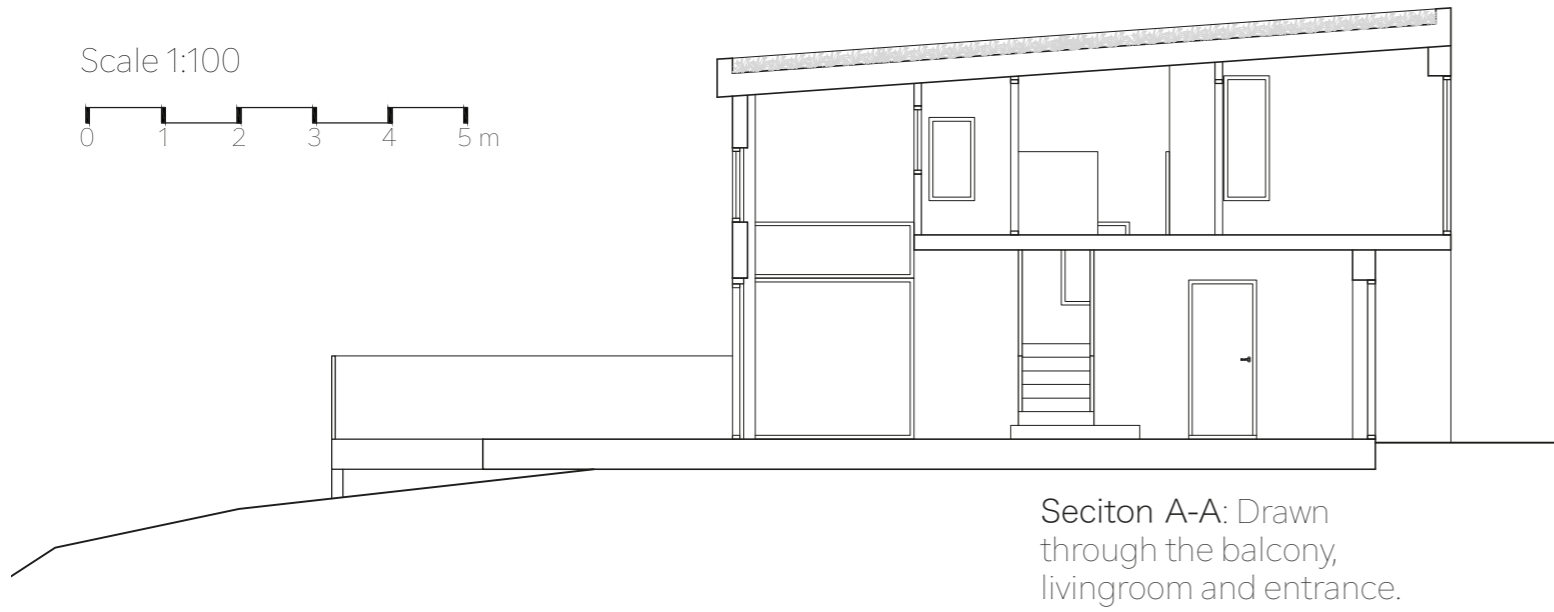
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Sections

To melt into the landscape, the roofs are sloping and covered with greenery - perhaps heather from the surrounding nature?

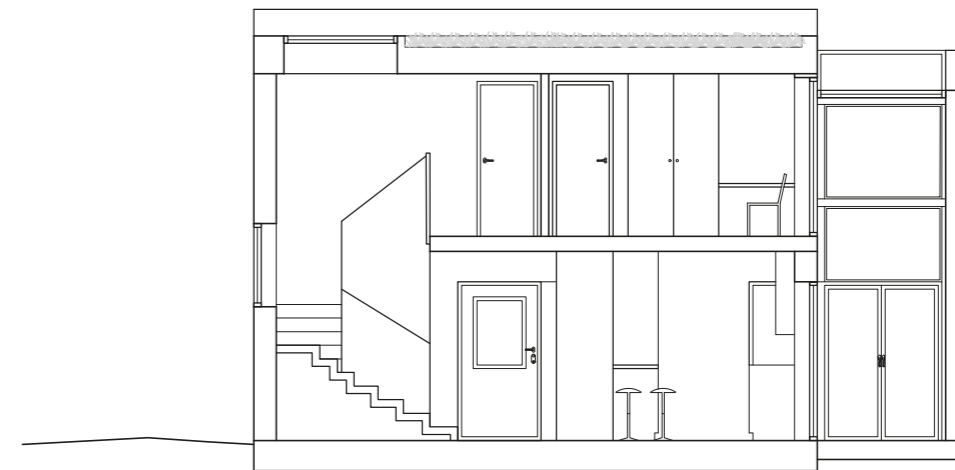
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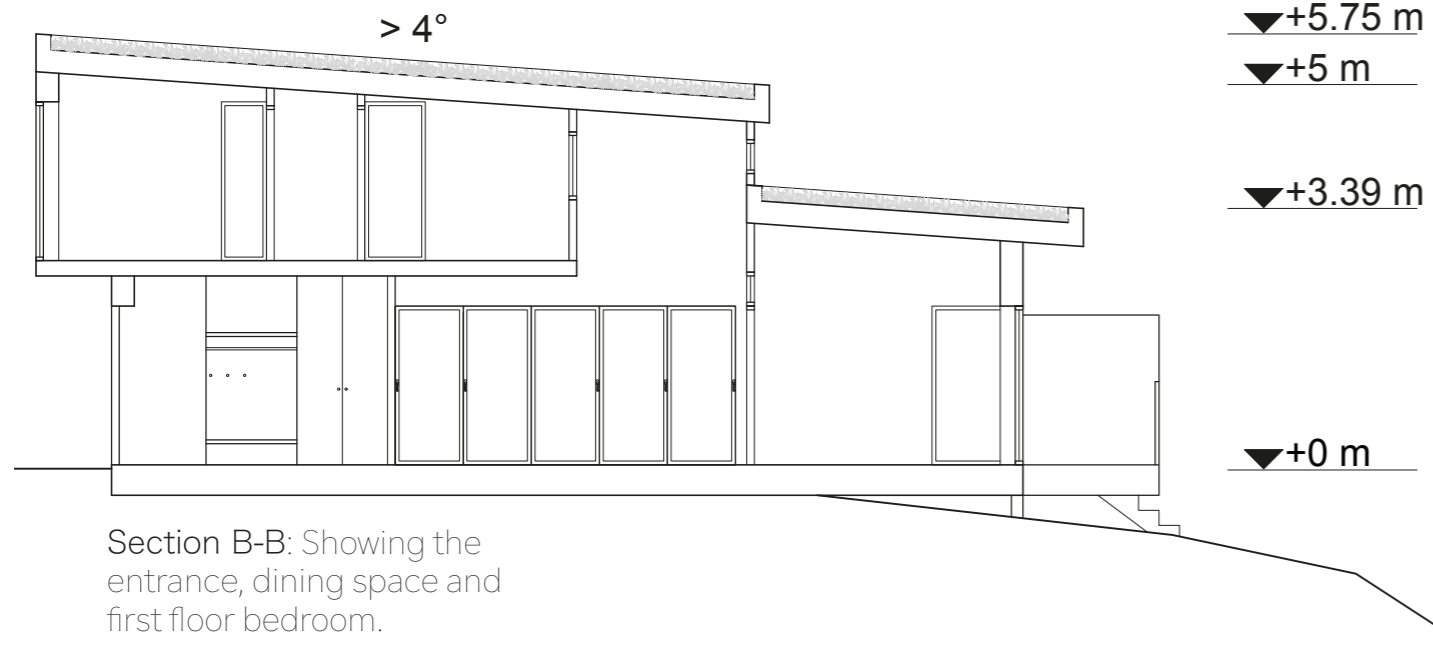
Section A-A: Drawn through the balcony, living room and entrance.

Sections

Scale 1:100



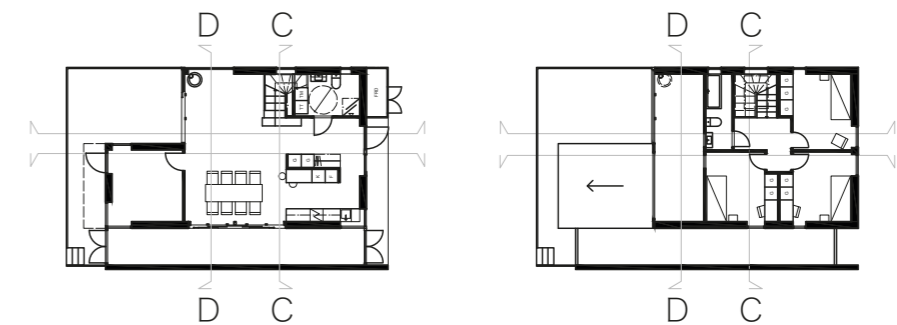
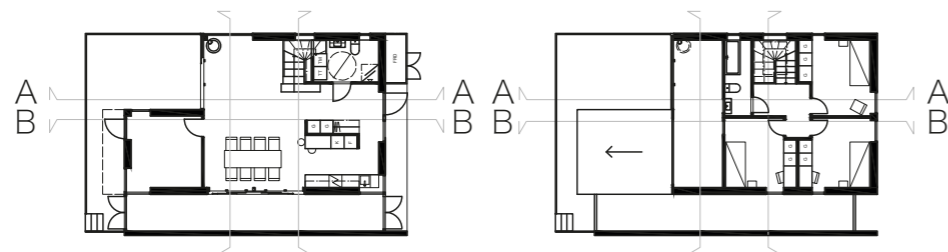
C-C: Going through the illuminated stairs, kitchen and exterior corridor.



Section B-B: Showing the entrance, dining space and first floor bedroom.



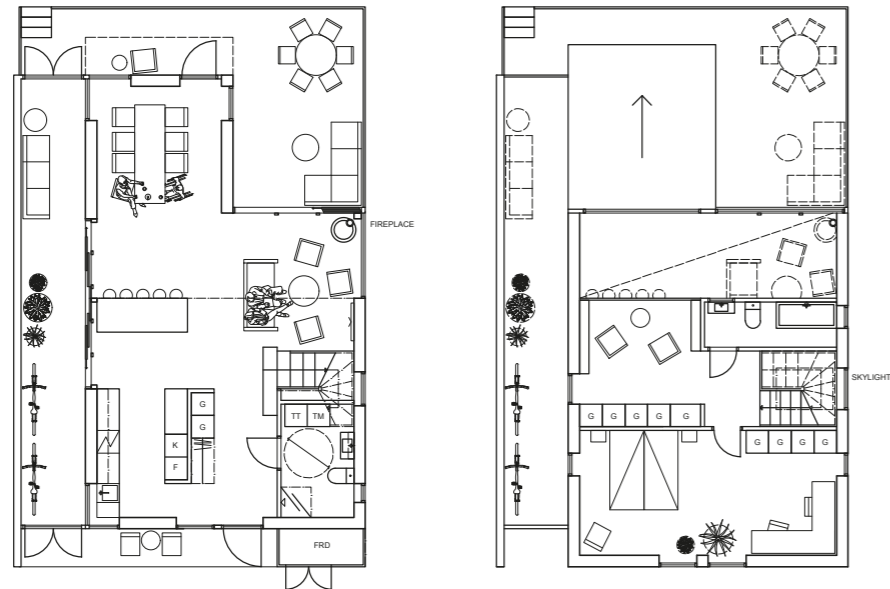
D-D: Drawn through the exterior corridor, dining place and living room.



Different Households

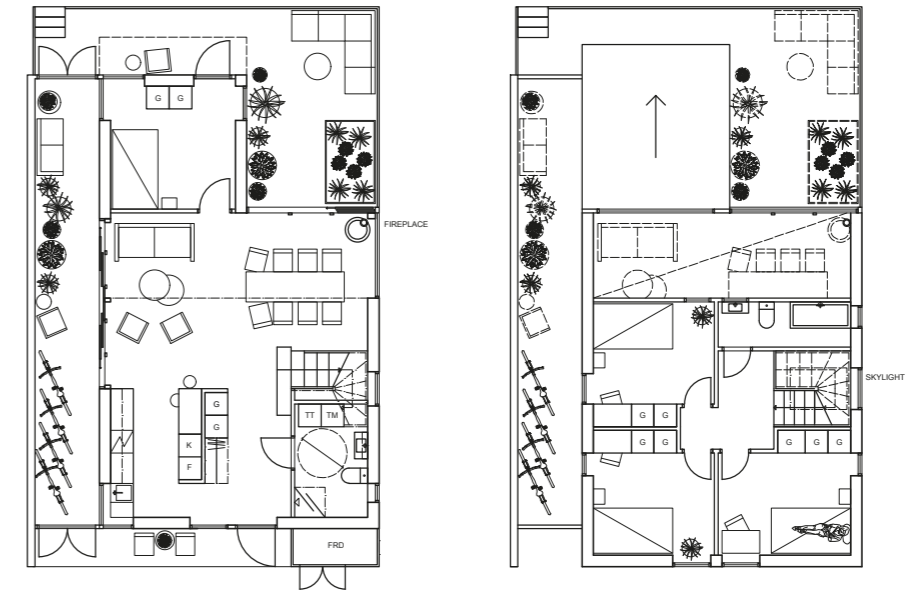
The dwelling can be adapted to suit different people, families and households. Not only a traditional constallation is encouraged. Here, three alternatives are presented but more variations are possible.

Scale 1:200



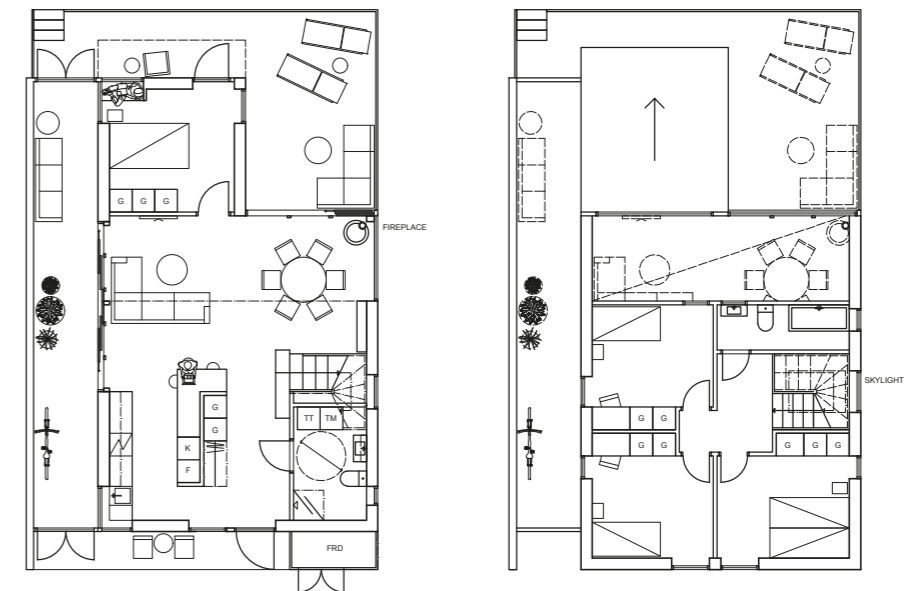
1. A couple without children who likes to socialize.

This dwelling is a home to a couple who likes inviting friends over and prefer to keep their bedroom on second floor. Two bedrooms are combined through the easy demounting and remounting of the walls. The third bedroom is turned into a library with connection to the ground floor. On first floor, the bedrooms makes the perfect dining space - which creates space for a kitchen island.



2. Four friends who live together and like to grow food.

This dwelling is adapted to suit the needs of four friends who lives together. The walls do not have to change to fit a 120 cm-bed. The group decided to place the sofa to the left and the dining place to the right to fit their big TV. On their spare time they like to grow their own food and plant flowers - which can be done easily in th eglazed corridor or on the balcony.



3. A single parent with two children and a young summer worker.

In this dwelling, a single parent lives together with their two small children. They share the second floor. On first floor, they rent out a room to a young worker who is employed at the restaurant at Gullholmen and need a place to stay during the summer half of the year. The direct access to the bedroom leaves the family undisturbed and the tenant has their own separate outdoor space. Besides, both bathrooms have showers so parallell lives are possible.

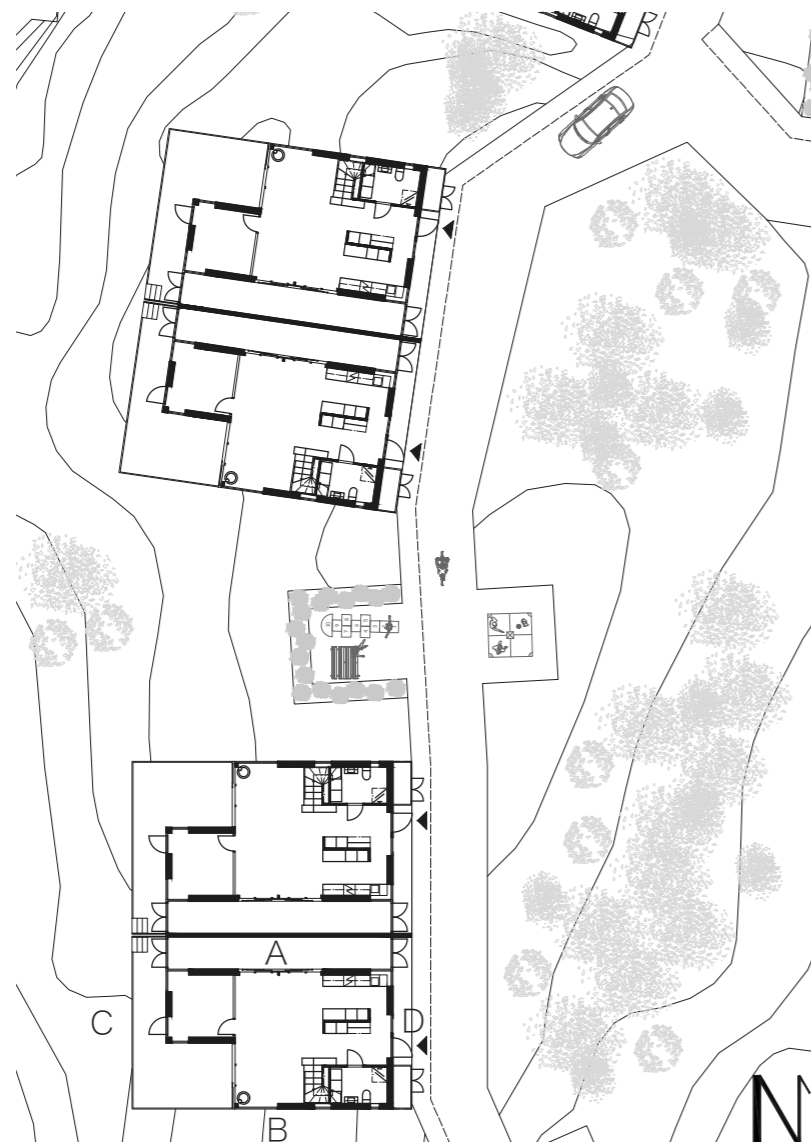
Combined Functions

The residents can drive up to their house without issues but parking is done when entering the area. However, accessible parking is possible well within the 25-metre rule. They are surrounded with plants of heather and is mirrored across the road for additional space.

When the parkings are not in use, it is a perfect place for children to play, workouts to be done or barbecues to be had - all while enjoying the beautiful view. This combined use is beneficial for minimizing the intrusion in the landscape and keeps the other cars out of vision from the sea.

Scale 1:400

0 4 8 12 16 20 m



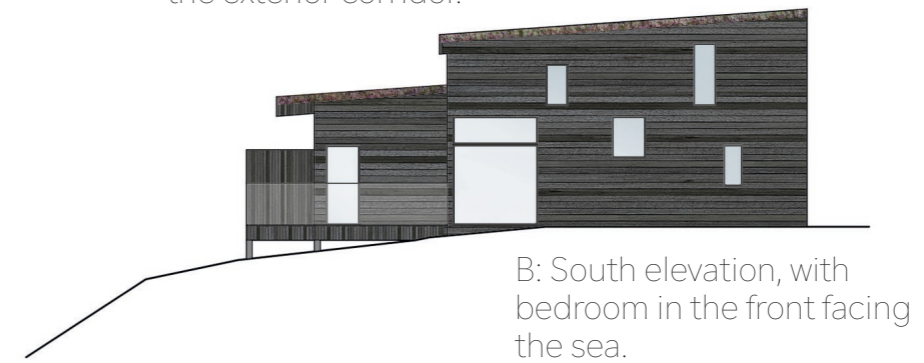
Elevations

Scale 1:200

0 2 4 6 8 10 m



A: North elevation, cutting through the glazed roof of the exterior corridor.



B: South elevation, with bedroom in the front facing the sea.



C: West elevation, meeting the sea with a clear horizontal profile.



D: East elevation, more vertical in its character to catch all the morning light. First floor is more private.

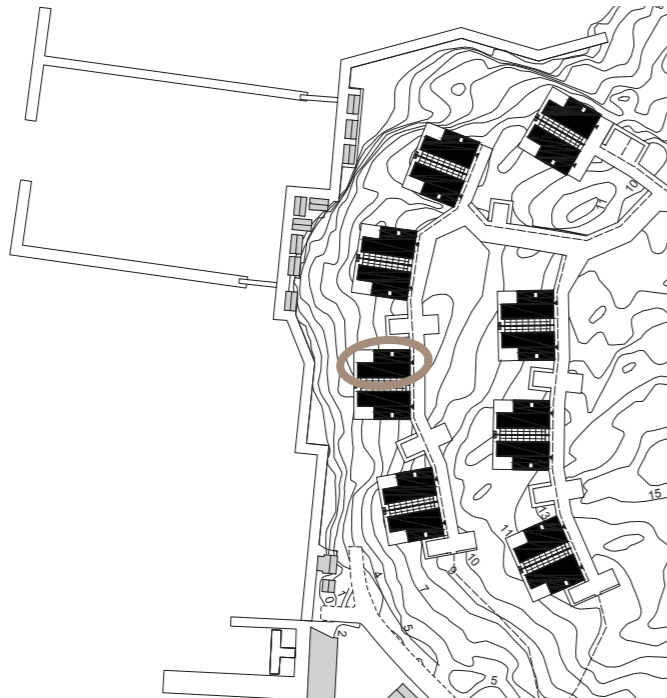
Exterior Perspectives



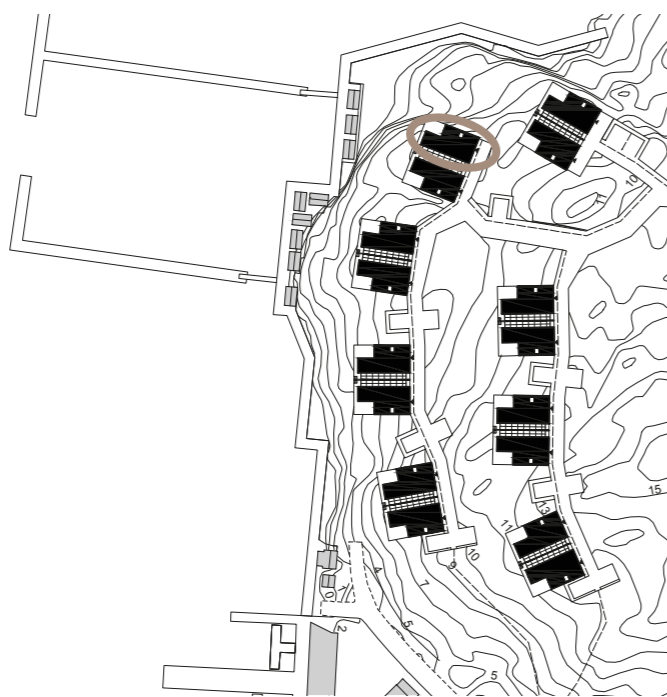
Interior Perspectives



Dwellings in Perspectives

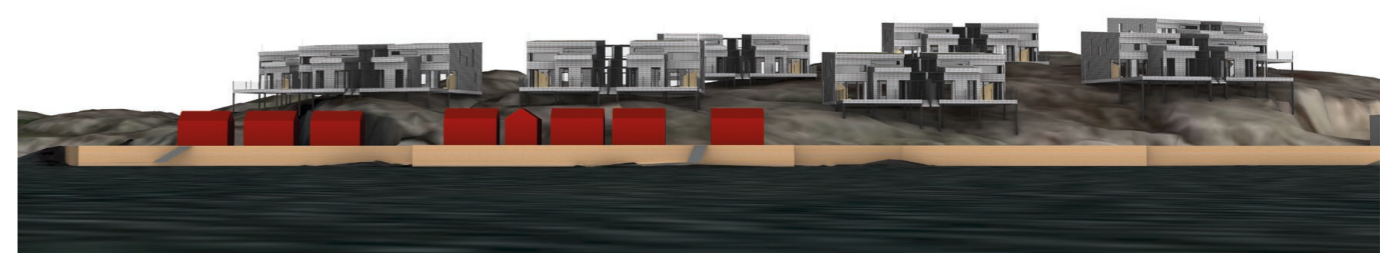
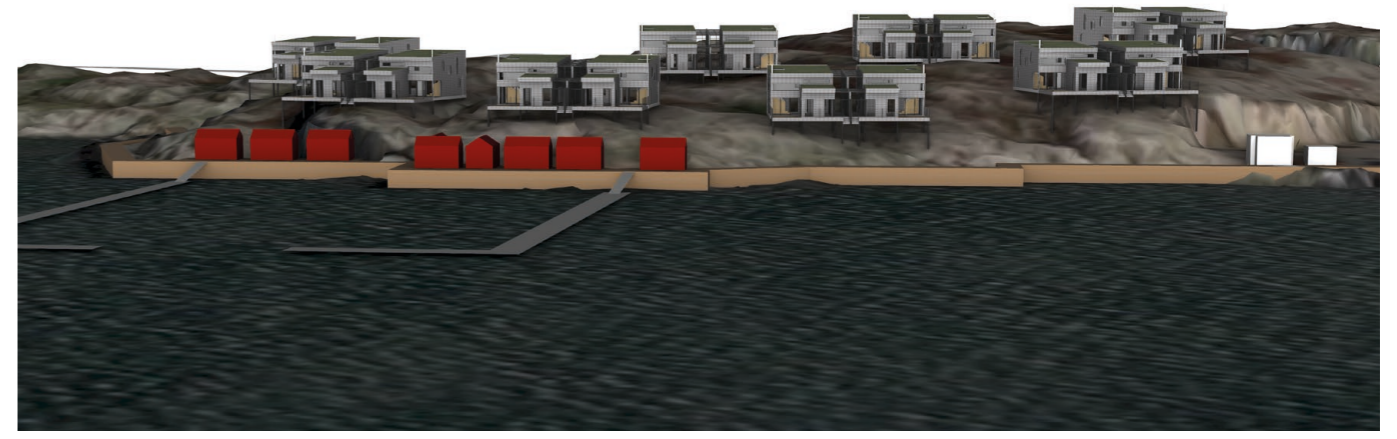


View from the exterior corridor.



View from the social spaces and the living room.

Volumes in the Landscape



högsbo

The Site

Högsbo industrial area is located in the area of Sisjön in the southwestern parts of Gothenburg. To the left (as seen on the map) lies the iconic factory of Pågen, spreading its scent of newly baked goods in the area. The site was chosen because of the on-going project of Södra Änggården - a large varied residential area with the main selling argument of being close to the nature of Änggårdsbergen (Göteborgs stad, 2025). 7000 dwellings are being planned, and the pictures of the future vision is dominated by high volumes. However, the site today feels far from natural. Based in a industrial area, the majority of buildings have a commercial character but several have closed. Apart from Pågen factory, there are mainly small-scale buildings in the area today. After visiting, the new English school is finished but otherwise the project is very much under construction.

The site of choice is a squared plot around 60 x 60 metres. Platzer is the developer for the site in real life, and they are planning a creative center, dwellings and car parks on site Södra Änggården (2025). Being located in the western part of the planned neighbourhood a smaller gesture would also do, like an entrance to the area.



Conditions

Compared to Tuvesvik, this site does not offer the same qualitative views. The nature area of Änggårdsbergen feels distant and the impression is quite gray, which can be seen on the aerial photo. However, it is not a far to Flatås residential area just across the motor way, and the football field just across the small street offers recreative opportunities. The direction of the site is quite well-directed and the squared shape provides good opportunities.

As previously mentioned, the report "Neuroarkitektur & Bostadsgårdar" by Liljewall et al. 2025 (main author: Morichetto) was released in the midst of this thesis. Their seven keys for a healthy courtyard inspired the layout of this proposal. However, due to limitations of time - more consideration would have been needed to explore the courtyard's qualities more in detail. However, this part of the thesis is secondary to the main site of Tuvesvik - as stated in Delimitations.

Aerial photo of site, 1:5000 (Lantmäteriet, 2024).



Design Strategies

- direction diversity
- context sensitivity
- transitions
- individuality
- zones of social and private
- control & safety

This second interpretation contains the embodiment of the design concepts in the industrial site of Högsbo. Down below, the translations and representations of the specific strategies are described.

Direction Diversity

- Axles and vistas are implemented, in some situations diagonal to prohibit unwanted transparency. This adds complexity.
- A squared opening over the living room combined with windows over corners adds space. A skylight lifts the gaze vertically.
- A possibility to circulate indoor - outdoor on both floor 1 and 3 exists and adds dynamics.
- An exterior corridor which can be glazed for weather protection gives access to garden instantly.
- Possibility to see from kitchen to entrance through carport-space (atrium-like space).

Transitions

- Through outdoor spaces in three directions; a patio with garden, a roof terrace and a balcony partially under roof along with an exterior corridor which can be glazed and an atrium in front of the entrance the possibility to be in the interface of indoor-outdoor is diverse.
- Large windows where many rooms have more than one window.
- Skylight over the staircase and interior windows.
- Many possibilities to be outside both in company or by oneself.

Zones of Social and Private

- A social floor on entrance floor with dining space separated from livingroom which allows for a diverse use of that squared room.
- Bedroom possible on first floor with own

access to patio.

- Floor 2 more private in character but with connection to livingroom through opening. Floor 2 with balcony reached from possible bedroom.
- Floor 3 opens up again with bigger hallway and rooms that can be of varied use. Rooftop terrace generous enough for social gatherings.
- Balcony on second floor gives distance from bedroom to road.

Context Sensitivity

- Emphasis on creating a sheltered courtyard due to a busy road and environment outside.
- The exterior corridor can be closed and locked or opened depending on choice.
- Cardependent area. Dwelling contains a carpark (accessibility-sized) or just a large atrium with bicycle racks.
- Three floors give distance from street and verticality (skylight e.g.) draws attention to the sky.

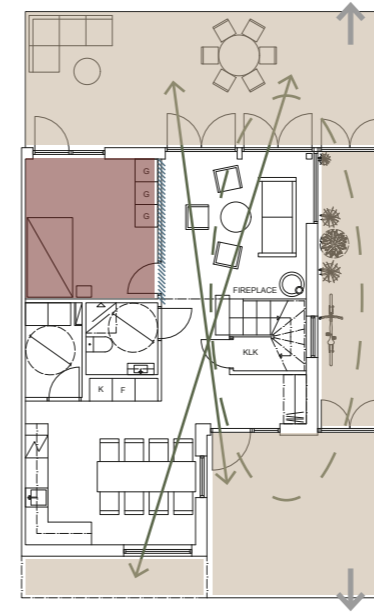
Individuality

- A large flexibility and generality exists - rooms on three floors can be adapted and changed in multiple ways. Floor opening can be covered for an extra room. Rooftop terrace can be built in. Balcony and the outdoor corridor as well as atrium can be covered, glazed or built in.
- On floor 2 and 3, the space next to the staircase can be turned into a home office, a closet or an additional bathroom.
- Rooms are large with big windows. Purposes are not fixed.

Control & Safety

- Balcony gives distance and protection from kitchen while distancing room from road.
- The courtyard can be reached only from some places, outdoor corridor can be locked.
- Clear boundaries between dwellings but an encouragement to meet in the middle of the shared garden space.
- Larger openings towards garden, rather than the street.
- A busy area = bedroom of first floor faces the garden.

Design Strategies

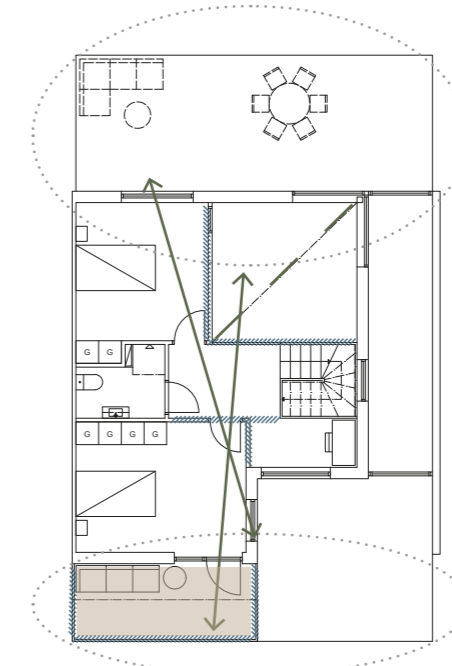


Direction Diversity

- Views
- Movement
- Space

Transitions

- Outdoor spaces.
- Openings.
- Overhang.

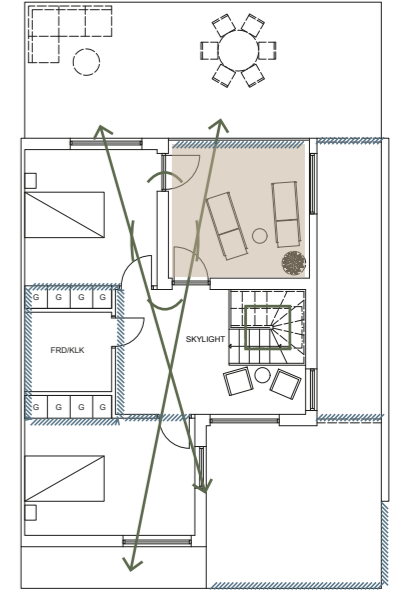


Zones of Social and Private

- Bedroom.
- Entrance, second floor, third floor.
- Changeable disposition

Context Sensitivity

- Street side - garden side.
- Three floors & verticality.



Individuality

- Large flexibility and adaptability.
- Examples.

Control & Safety

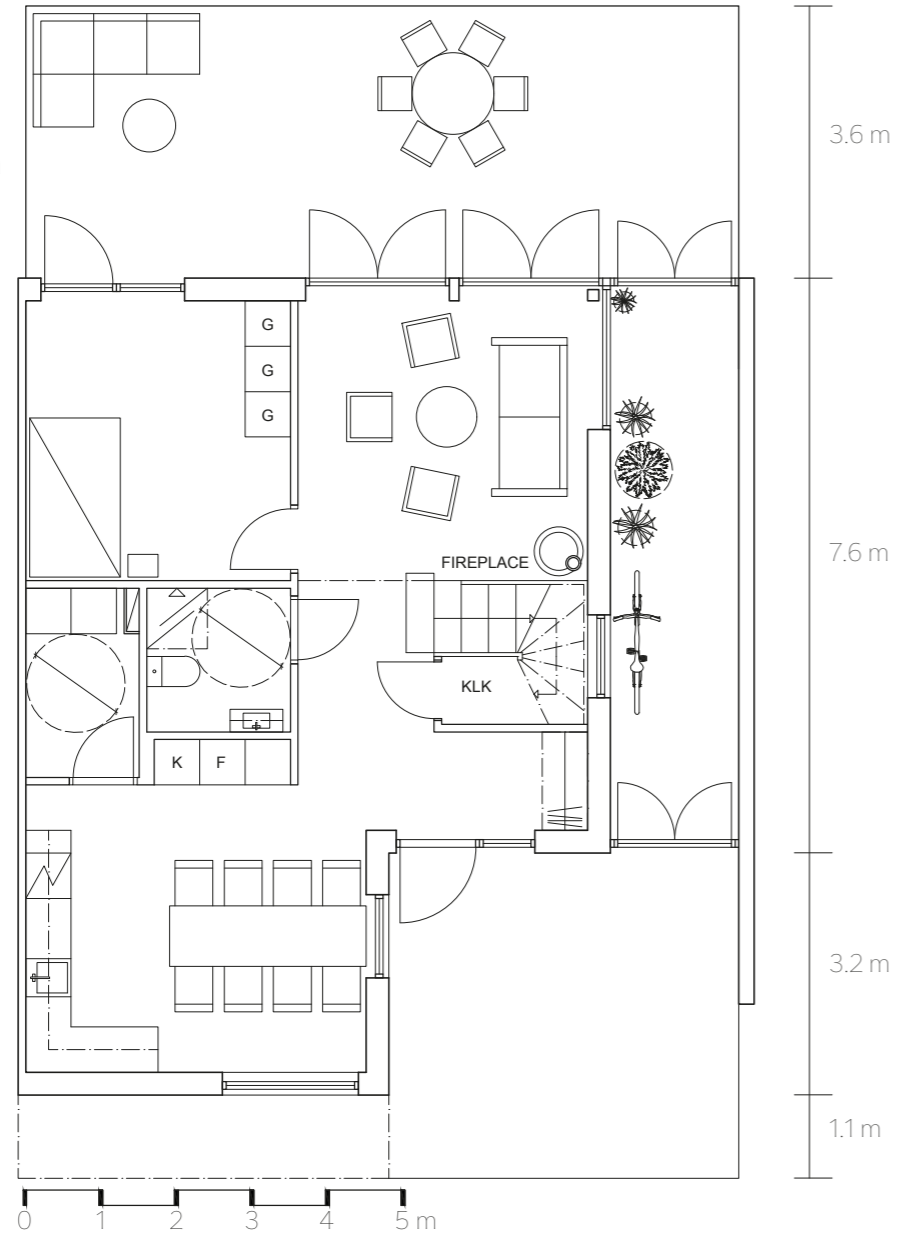
- Boundaries.
- Courtyard
- Balcony.
- Window size.

Floor Plan

Total BOA:
168.1 sqm

First floor:
BOA: 68.2 sqm

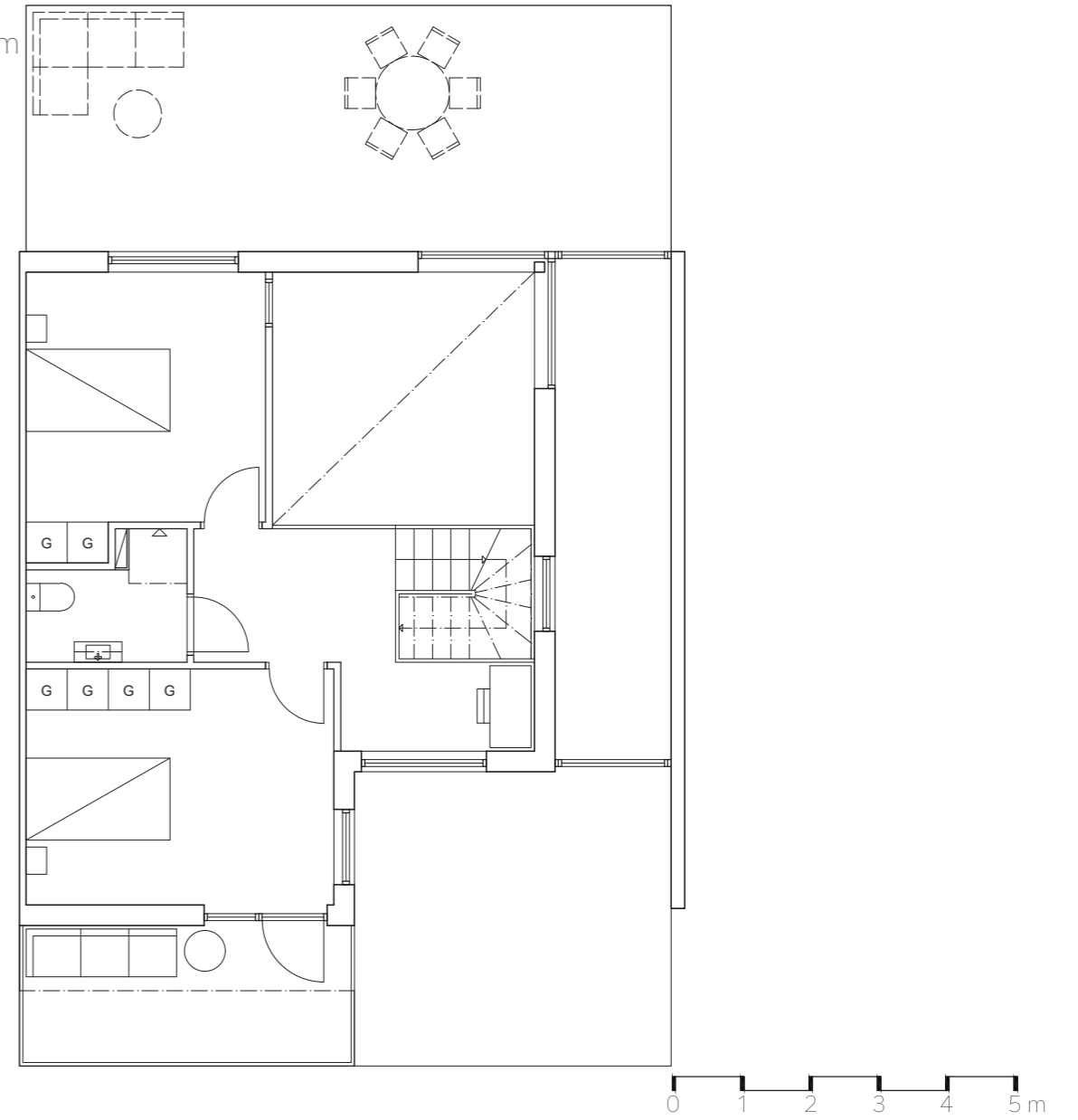
Scale 1:100
/ 1:200



Floor Plan

Second floor:
BOA: 47.8 sqm

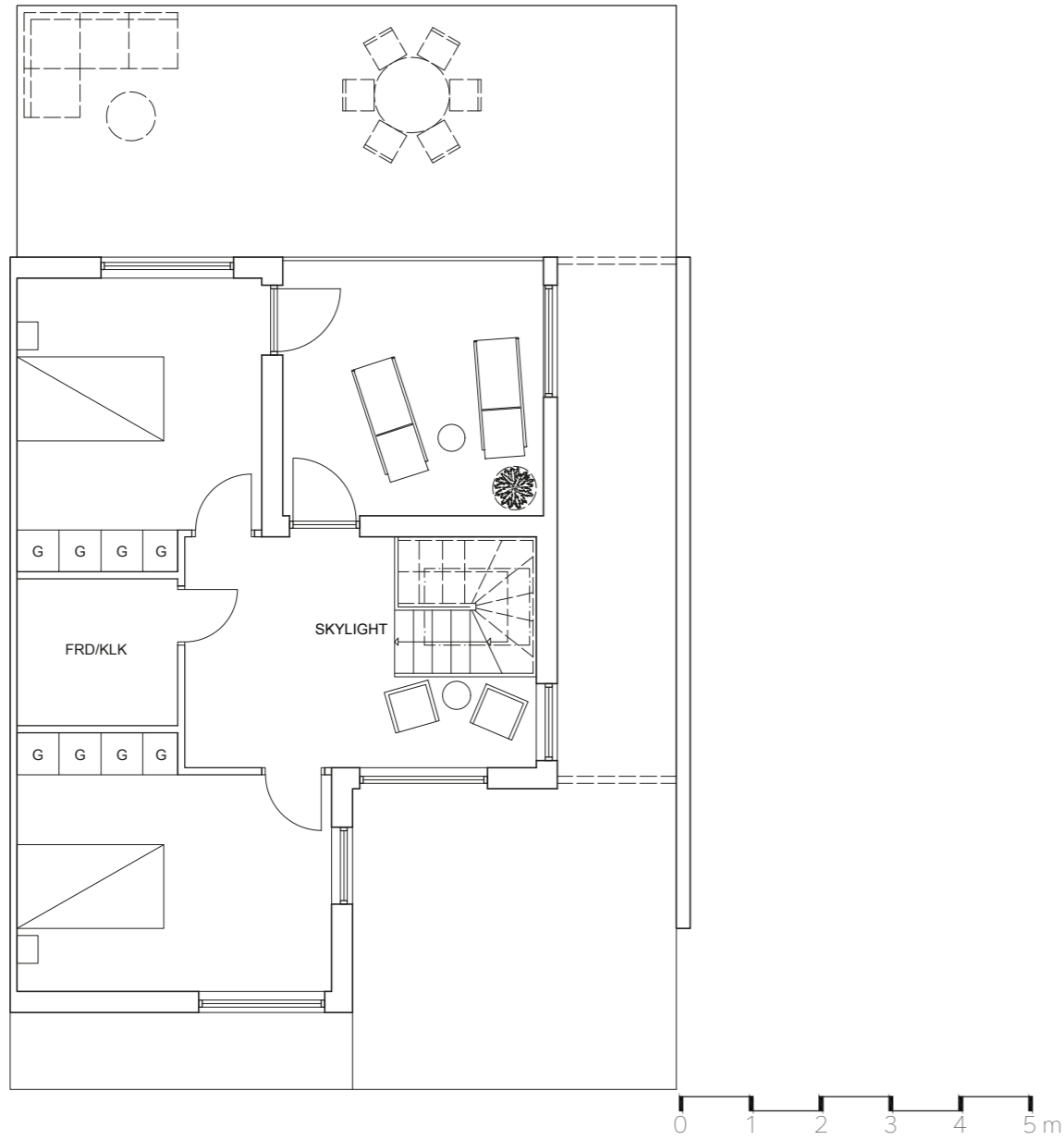
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/ 1:200



Floor Plan

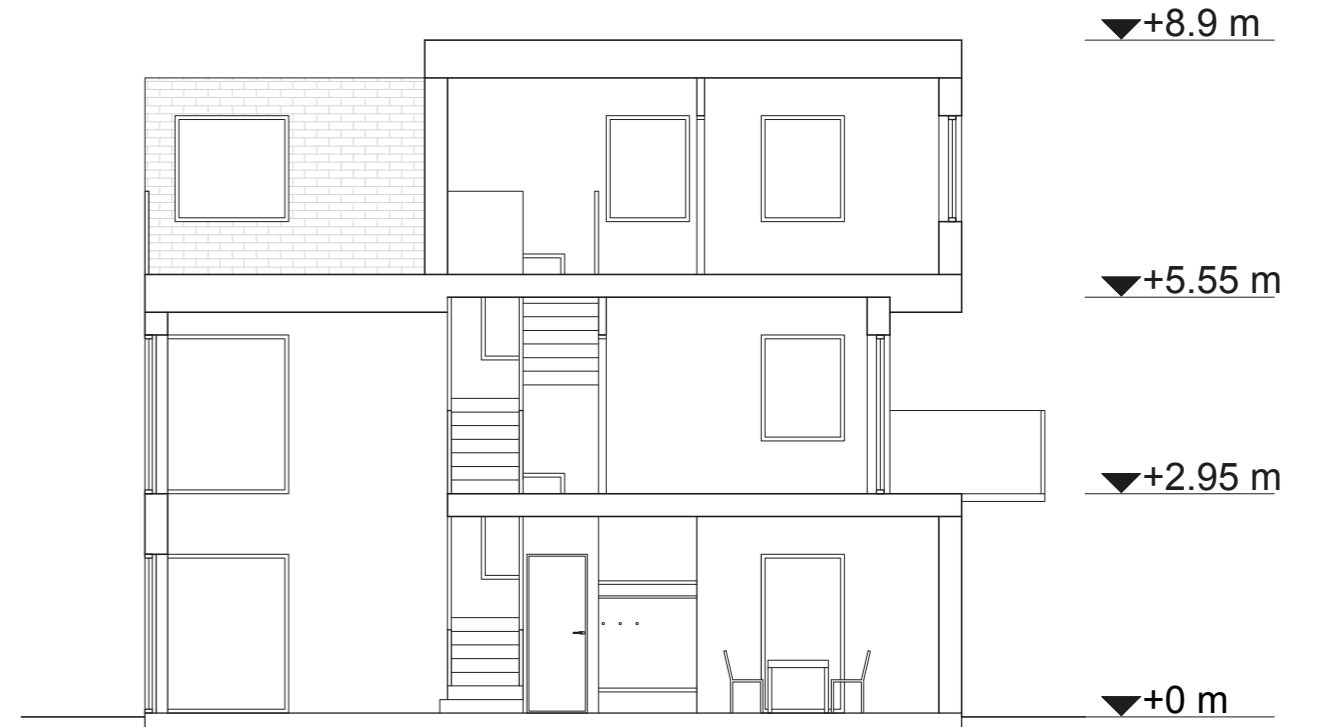
Third floor.
BOA: 52.1 sqm

Scale 1:100
/1:200

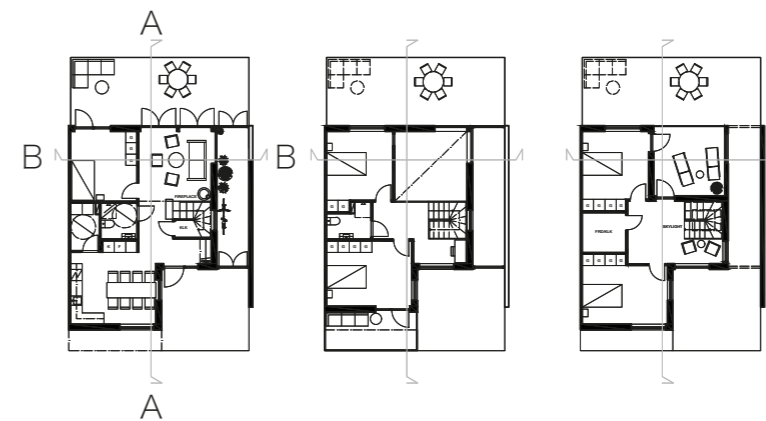


Sections

Scale 1:100

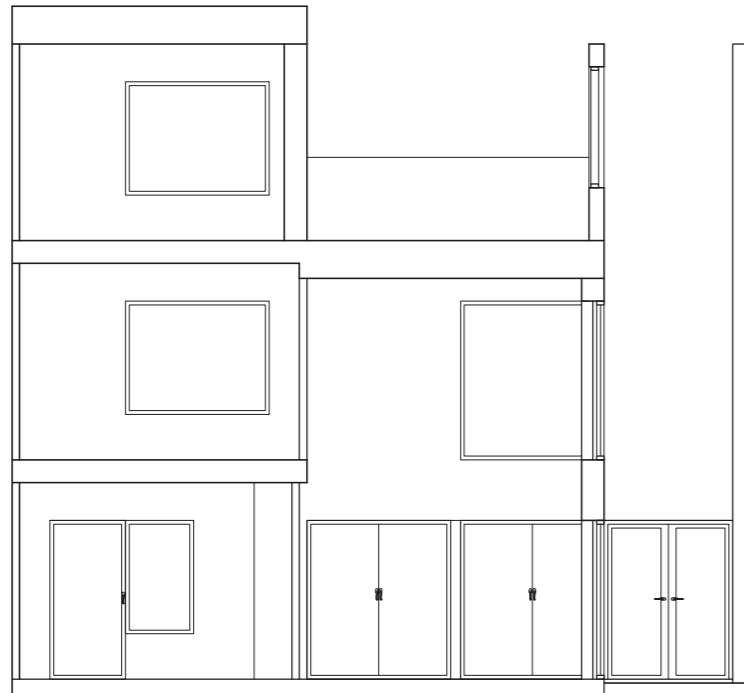


Section A-A: Drawn through the living room with double-floor height, showing the stairs, hallways and dining place. A proper window on the roof terrace facilitates the glazing of the exterior corridor. That space can then be used as a greenhouse.

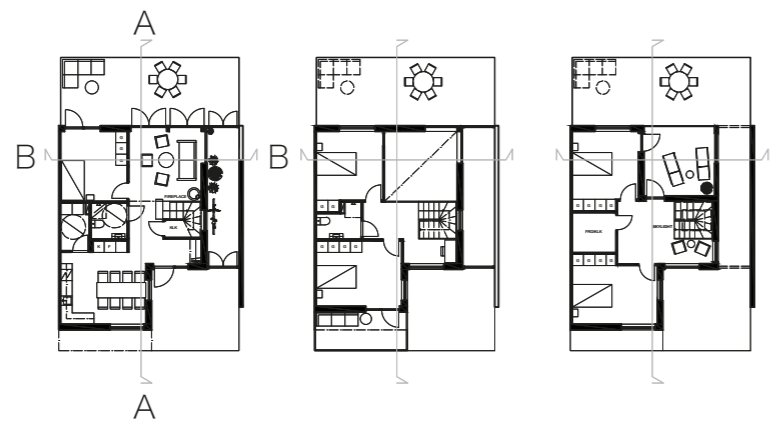


Sections

Scale 1:100

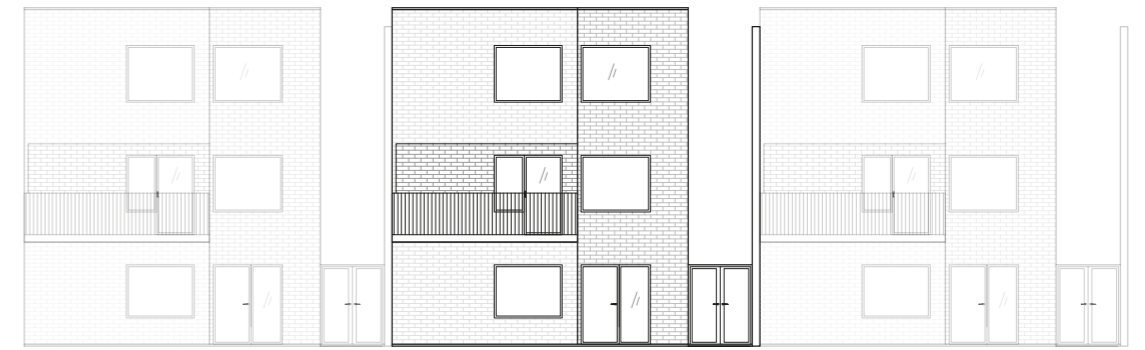


Section B-B: Illustrating the bedroom with own access to the patio, the livingroom and the external corridor. Doors are there for safety and wind protection but can easily be removed.

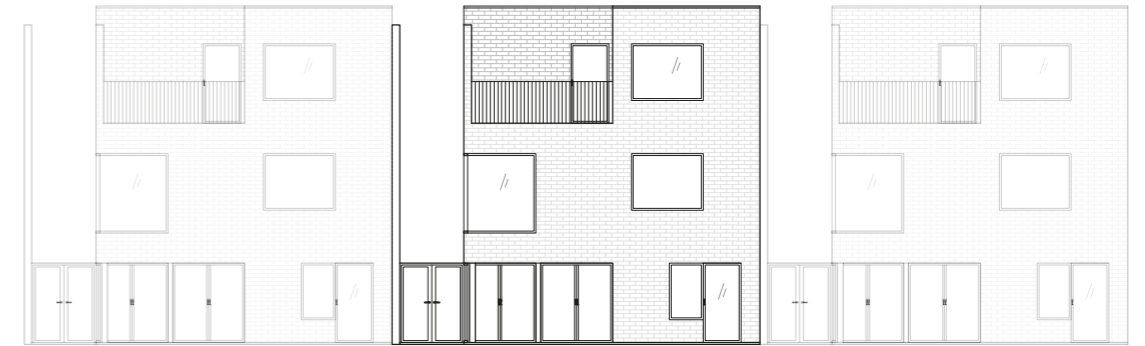


Elevations

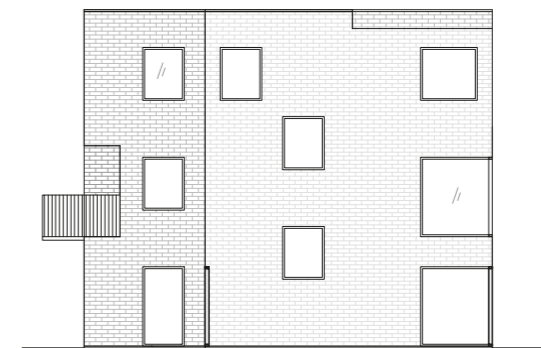
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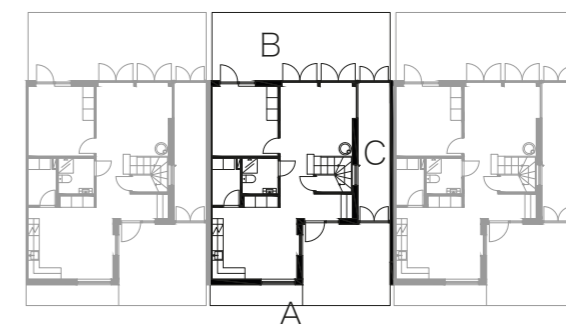
A: Elevation facing the street.



B: Elevation facing the garden.

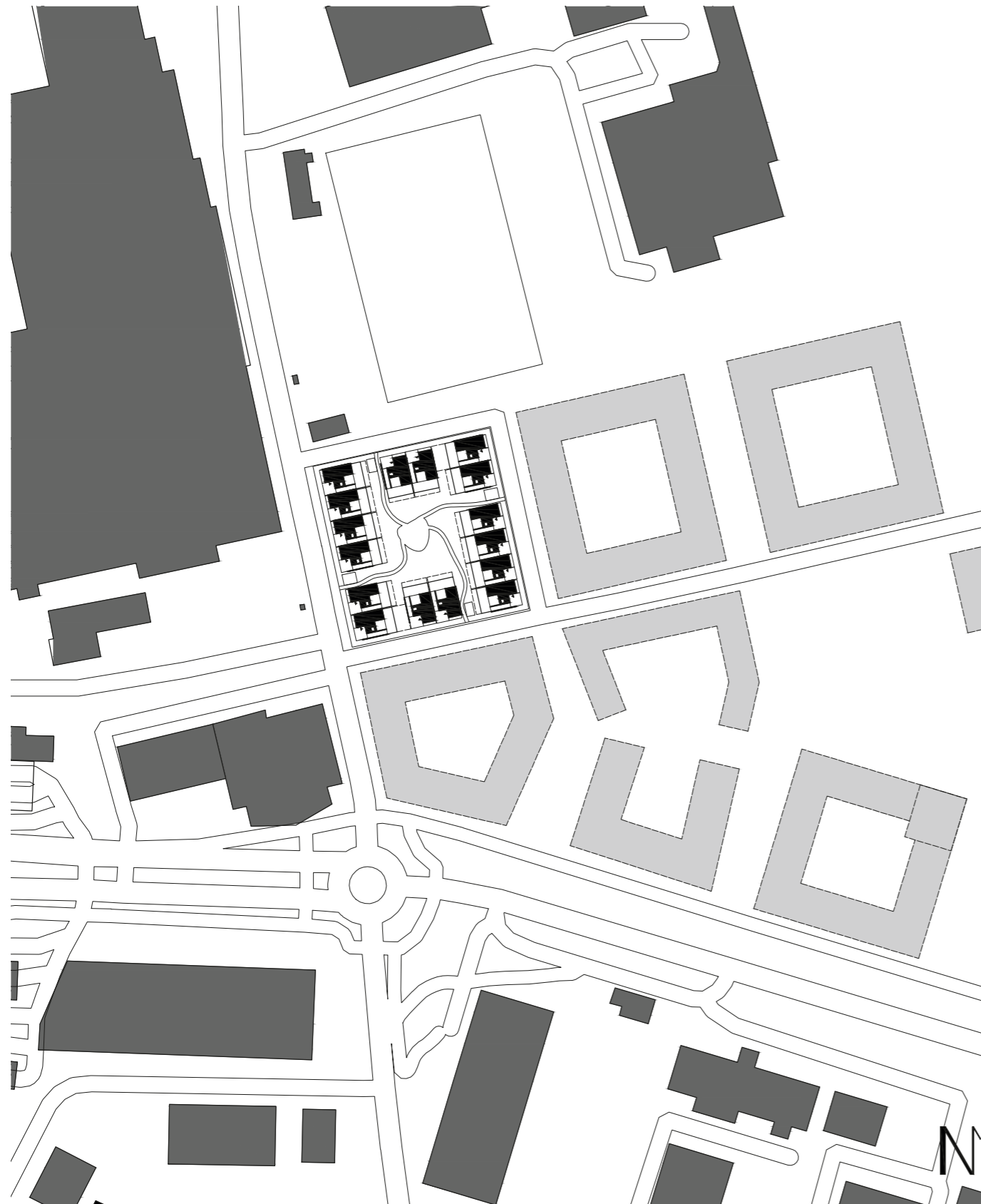


B: Elevation facing the atrium and exterior corridor.



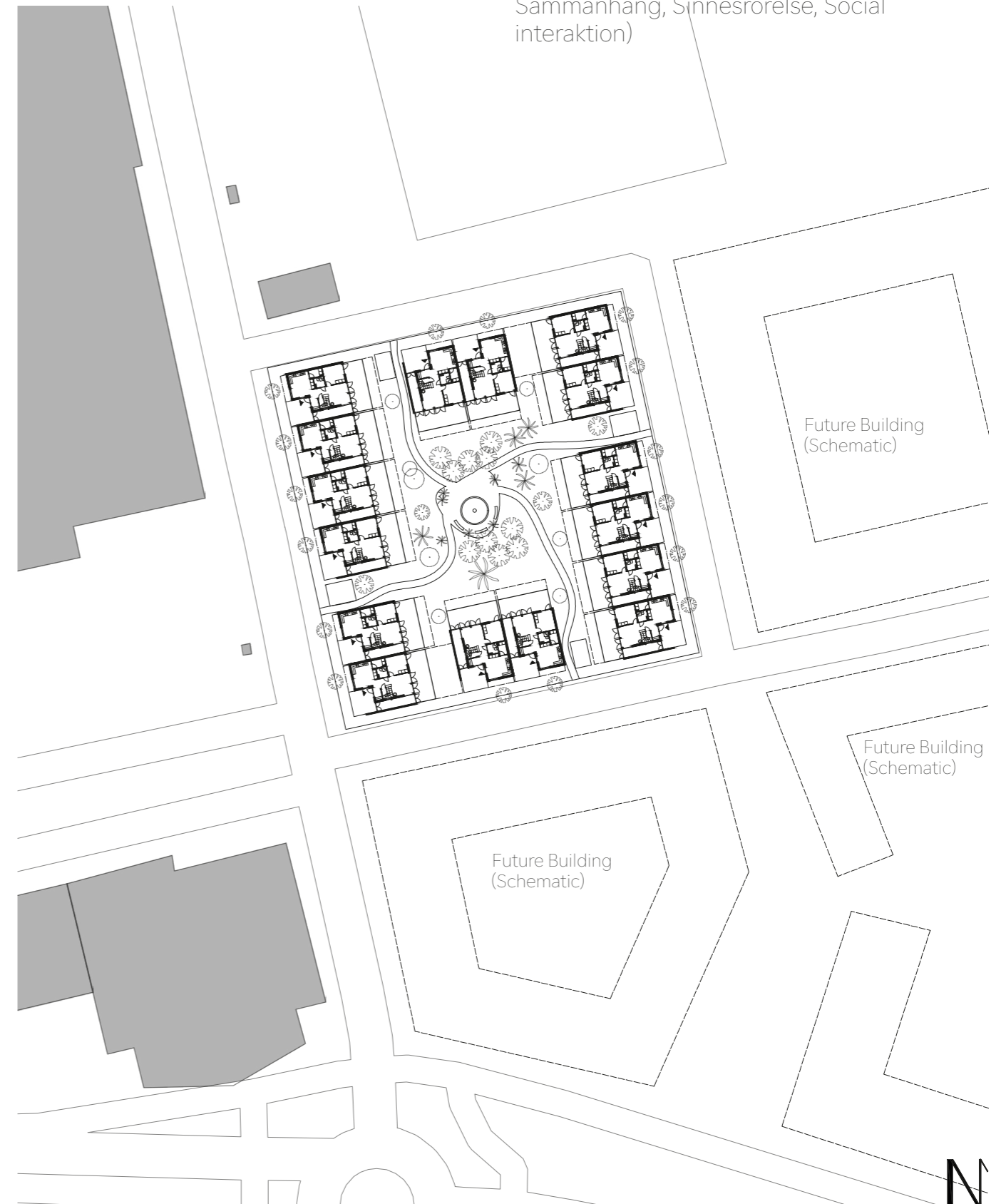
Site Plan

Scale 1:2000



Site Plan

Scale 1:1000



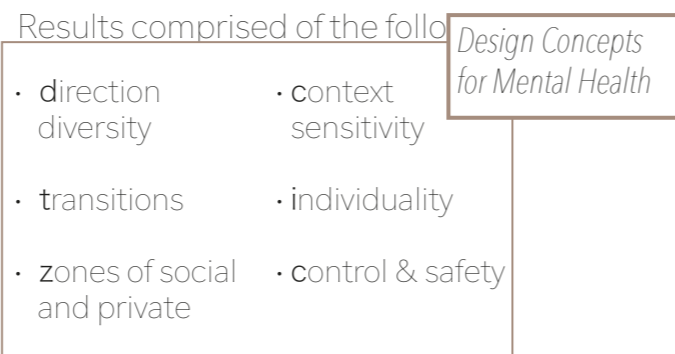
Inspiration for the schematic layout of the courtyard derives from Liljewall et al. (2025) which present seven concepts for a healthy courtyard: 1. Enclosure, 2. Interface, 3. Complexity, 4. Cultivation, 5. Context, 6. Emotional Response, 7. Social Interaction (Own translation A.A.; Omslutenhet, Gränssnitt, Komplexitet, Kultivering, Sammanhang, Sinnesrörelse, Social interaktion)

discussion

Conclusion

The present thesis aimed to explore the theories and strategies behind architecture for mental health and more specifically stress reduction through the concepts of instoration and restoration. Given the delimitations and the site of Tuvesvik, and the addition of the urban site in Högsbo, the results illustrate how architecture can be connected to health in humans through practical design concepts.

Through the lens of the chosen theories by Morichetto (2019), Bengtsson (2015) and Stoltz (2019), along with the on-going studies on residential qualities by Braide (2019; 2023) - four housing projects of high quality were chosen to be analysed. These were 1) Äppelträdgården, 2) Brf Valö Fyr, 3) Källsprångsvägen and 4) Twelve Houses. They were selected due to them winning or being nominated to the housing award Bostadspriset by CBA and because of their small-scale and relevance to my sites. The projects were analysed as in a case study which were conducted thoroughly in order to answer the primary research question: "What architectural concepts can be identified in residential architecture that promote good mental health through stress regulation, based on relevant theories?".



An extraction from the description of the concepts:
" *Direction Diversity*
- *Of views. Are there long vistas and axiality through the dwelling?*
- *Of movement. Is it possible to circulate?*
- *Of space. Are there elements of vertical and horizontal extension?*"

These concepts are to be seen as a summary of both research and that theory in the context of high-qualitative housing projects. The concepts are a result of my own conclusions, any misinterpretations of the theories should be seen as my fault. Nonetheless, this initial part of the result addressed the first research question in a clear and applicable way.

The second research question referred to the illustration and embodiment of the results from the case study and read as follows "How can these concepts be sustainably applied in a housing project on the site of Tuvesvik?". The approach to answer this question involved traditional architectural work such as a site analysis, photographs, a volume study,

drawings and illustrations. To illustrate the flexibility and change of the floorplan over time, diagrams showcasing the dwelling's possible adaptations and alterations were made. This was important due to the life-long perspective of a dwelling, where different household constellations should be able to live, change and thrive over time.

In order to further generalise the findings of the thesis and be able to show generalizability an urban context was also chosen. This was crucial because of Tuvesvik's rural location. An urban setting would illustrate the thesis in another setting where most people live - the city. This design work is to be seen as a smaller part of the results and is therefore referred to as research question 2B: "In order to illustrate generalizability, how can the same concepts be used in a housing project in Högsbo - an urban site?" The site chosen was Högsbo industrial area in Gothenburg, an area under current transformation under the name "Södra Änggården". This site had a minimum of peaceful views and limited contact with nature, which made the adaptation different. But through carefulness of specifically the social-private concept and through the diversity of movement and directions - the results showed a terraced housing based on the design concepts. With creativity and out of the box-thinking, the context is not the obstacle for mental health.

Furthermore, it is of importance to state that the intention for the result regarding the design concepts for mental health were to serve as a guide for future housing projects, without providing strict rules to follow for

the architect. These are therefore more general and can be translated into specific design strategies for the sites. For example, some strategies that were used for the sites of Tuvesvik and Högsbo are related - the exterior corridor, the vertical space above the living room and the big focus on daylight and window placement and sizes as well as circular movement and axiality. These are a result of the study of the reference projects, the case study and how the theories also support these design strategies. Why these are present in the design is not a coincidence, but a choice that research supports. It has not been my intention to generate a "fit for all-framework" for residential architecture but instead showcasing what broader themes are related to mental health and stress management in the dwelling, based on research. It is clear that some themes also overlap and refer to similar things. Sometimes 1+1 equals 3 and sometimes -1 when it comes to experiencing architecture, which is why no general solutions can be presented. What is best for one dwelling and its residents in one site might not fit the next - but the choices can still be based on research with the intention of designing architecture that promotes mental health - in this case through instoration and restoration. The balance and consideration is the core of an architect's intuition and not to be overridden or simplified by a checklist or a strict framework. In the site of Tuvesvik, the concepts were adapted into site-specific design strategies relevant for the context, history and landscape - a strategy familiar by all architects. There are some contradictions in so-called general design solutions, which is

why a careful site analysis and understanding of each site's possibilities and limitations are very important. People are also different and prefer different things, so what might be a perfect solution for mental health for one might not be that for someone else. This is why the design concepts of 'individuality' and 'control & safety' are so important. A dwelling can not fit everybody unless there are elements of choice, control and flexibility integrated into the design. I think, for instance, a bedroom on the first floor in dwellings with more than one floor is an excellent example of this. This design choice offers a possibility to sleep comfortably on the first floor while still having the choice of turning it into something else (a dining space like in Tuvesvik, e.g.). Accessibility is therefore the bottom line, but the choice of how to utilize the space is up to the resident. Certain values and empathy for the needs of the resident allows the architect to generate design proposals that are more inclusive and at the same time flexible, which contributes to a dwelling that more people can enjoy and live healthy lives in.

The two different design proposals are different responses to the same design concepts - one in a rural context and one in an urban context. In Tuvesvik, the nature and the sea are given for 'free' and the task there was to integrate it into the design of the dwelling. This is important due to the positive health benefits from the sea and nature, which was discussed earlier in the thesis. The result is an extroverted and social floor plan composition with large windows to capture and frame the view. The exterior corridor offers many opportunities on this site - for instance accessing the balcony on the seaside without entering the building envelope and also providing a sight line (axiality) from the street side. This creates curiosity and excitement about what the other side has to offer. The exterior corridor is more than just a corridor - it can also extend the social spaces within the dwelling and provide an opportunity to almost be outdoors but under a glazed roof. This is a unique design strategy that combines several of the design concepts for mental

health. It refers to 'direction diversity' - because it accommodates both diversity in views, movement and space. Also, it handles the design concept 'transitions' because the space offers multiple opportunities to transition from indoor to outdoor and fades out the barrier between indoors and outdoors. 'Zones of social and private' - the exterior corridor can be a space to withdraw (illustrated with the sofa in the floor plan) or as a way to extend the social zone of the living room and dining space. As already stated, this glazed space is an adaptation to the context and climate of Tuvesvik and therefore also a response to 'context sensitivity'. And since the exterior corridor can be utilized in many ways and be controlled by the residents (storage, social space, restorative space, gardening, communication) it also accommodates 'individuality' and 'control & safety' - the last two design concepts.

In Högsbo, the design can be seen as more introverted. The first floor consists of more divided spaces, since the kitchen and living room are placed in separate rooms. This was a conscious choice, since the urban context is more challenging and no naturally beautiful views are present in the same extension as in Tuvesvik. Placing the kitchen facing the street side makes it possible to have a living room with double floor height facing the garden - all while protected from unwanted transparency from people walking by. Diagonal sight lines and axiality connect the spaces on all floors. However, if the residents choose not to utilize the bedroom on the first floor - the dining space can be moved to the same side as the living room allowing the entire first floor to become 'social'. The choice of adding an atrium and pushing the climate envelope further back, was a 'context sensitivity' decision. It offers a space, which in connection with the exterior corridor which is present here too - can be utilized in even more ways than in Tuvesvik. Here, the residents can park their car, bikes or allow children to play. However, more consideration about the size and proportions of this space would have benefitted the design. I do think the site in the Högsbo industrial area has many interesting opportunities to further

develop and I would have loved to explore this site even more. Also, the way the dwelling interacts with the surroundings are an important next step in this discussion - which I did not have an opportunity to explore. But it is all relative and a give and take - what is present outside the dwelling and how does this affect the residents? Bengtsson's research takes this into consideration which is why I chose to include her theories in this thesis. Even though I analysed the four case study-projects according to her model ('Four Zones of Contact with the Outdoors', 2015) I did not include it as much in my own design proposals as I would have wanted. Instead I focused more on the interior and how that relates to the outdoors and less about how the outdoors relates to the indoors. I do, on the other side, argue that this part is where the need for interdisciplinary research is the biggest - how landscape architects and architects designing dwellings can really collaborate and find solutions. For example, since nature and daylight are so important for mental health - how can the relationship and transition (or the "interface" as Morichetto (2025) states) between indoor and outdoor be optimized and included into the design? Also, the need for interdisciplinary research on the topic of designing dwellings is huge - psychologists, physiologists, interior designers and technical experts ("mitigation" - noise and ventilation regulations) should and could all be consulted if we really want to elevate the residential qualities to fit the needs of the residents.

I do feel like the design in both sites did not reach as far as I would have wanted. In retrospect, there are many more things I would have liked to explore and work with more and perhaps that is the main problem with my thesis - the delimitations could have been more present. The topic is so interesting and fascinating that working with two different sites was a bit too much for the time and capacity this semester offered. More consideration of the details and really diving into each section of the dwelling as well as exploring the design element of the exterior corridor more, would have been better when looking back. I spent a lot of

time on the case study and generating the design elements in order to really contribute with something new for the research field - which limited my time to work and develop the design. However, that phase of the thesis work was really important but perhaps I was a bit too optimistic about how much I would have time for during this semester. In a perfect world, I would be able to continue this theoretical analysis of design concepts for mental health during a PHD dissertation, which is something I strive for. The process of using theories and applying them to real residential projects for understanding how theories can be translated into concrete examples seems like a very important step in future research to fully utilize the knowledge in the design process. I do think being able to really argue for certain design choices and back it up with research (research-informed design or evidence-based design) is a strong weapon to consider in times where architectural qualities need to be defended.

Even though I did not reach as far as I would have wanted, my intent is that the results of this thesis can add to the discourse of the already established evidence of residential qualities and health. It might push the discussion forward among architects and others involved in this interdisciplinary field of research. How to then measure and evaluate if a dwelling said to promote mental health through stress regulation really does so, is another question and hopefully we will find out eventually. There are of course many aspects of health and wellbeing and the environment of the home is only one part. More studies, interdisciplinary ones, have to be made to fully measure and evaluate the effects of theories such as the ones discussed in the present thesis. The research on architecture's impact on people's health is still young but is growing rapidly and I am eager to see what the future holds. Hopefully I will get the chance to contribute further to this very exciting field of research.

Perhaps 'Dwellbeing' is just the beginning.

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appendix

AI Appendix

Artificially intelligence, more specifically Chat GPT has been used only as a supportive tool throughout the process writing with this thesis. All text is written by the myself, the author (Amanda Alsterlund), but Open AI's Chat GPT has helped with correct translations of certain words when my knowledge was insufficient.

All work is my own and no autogenerated text nor graphical content is being used. The use of Chat GPT as a translator device is due to the competence of this service compared to traditional dictionaries or even Google Translate. It can give examples of how a word is used and can provide more or less formal synonyms when needed. See examples of the type of prompts that have been used below:

1. Prompt: "i sin helhet översättning engelska"

Response from Chat GPT (2025):

Uttrycket "i sin helhet" kan översättas till engelska som:
"in its entirety"
"as a whole"
"in full"

Vilken översättning som passar bäst beror på

sammanhanget. Här är några exempel:

Texten lästes upp i sin helhet.
→ The text was read in its entirety.

Projektet måste bedömas i sin helhet.
→ The project must be evaluated as a whole.
Rapporten publicerades i sin helhet på webben.
→ The report was published in full on the website.

2. Prompt: "percieved eller perceived?"

Response from Chat GPT (2025):

Den korrekta stavningen är: perceived (med e efter c).
"Percieved" är en vanlig felskrivning.
Exempel:
He perceived a change in her attitude.
(Han uppfattade en förändring i hennes attityd.)

3. Prompt "utdrag på engelska"

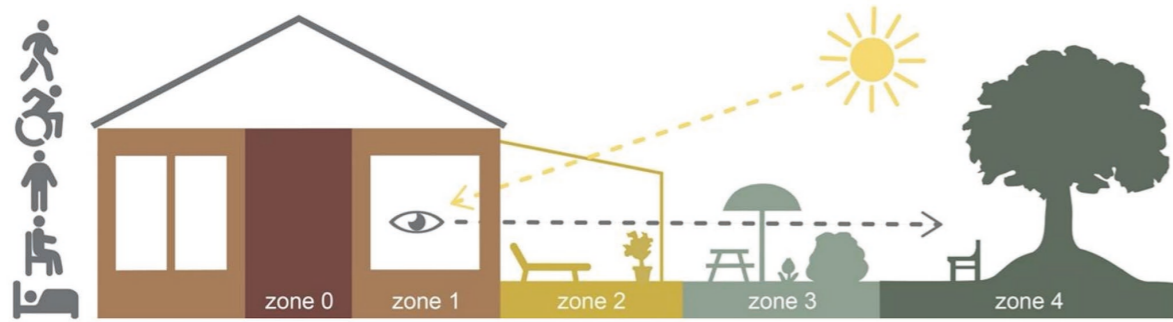
Response from Chat GPT (2025):

Ordet "utdrag" kan översättas till engelska som:
"excerpt" – när det handlar om ett utdrag ur en text eller bok.
"extract" – används också ofta i liknande sammanhang, ibland mer formellt.
"statement" – när det handlar om ett ekonomiskt utdrag, som ett kontoutdrag.
"summary" – om det är ett sammanfattande utdrag.

Diagrams

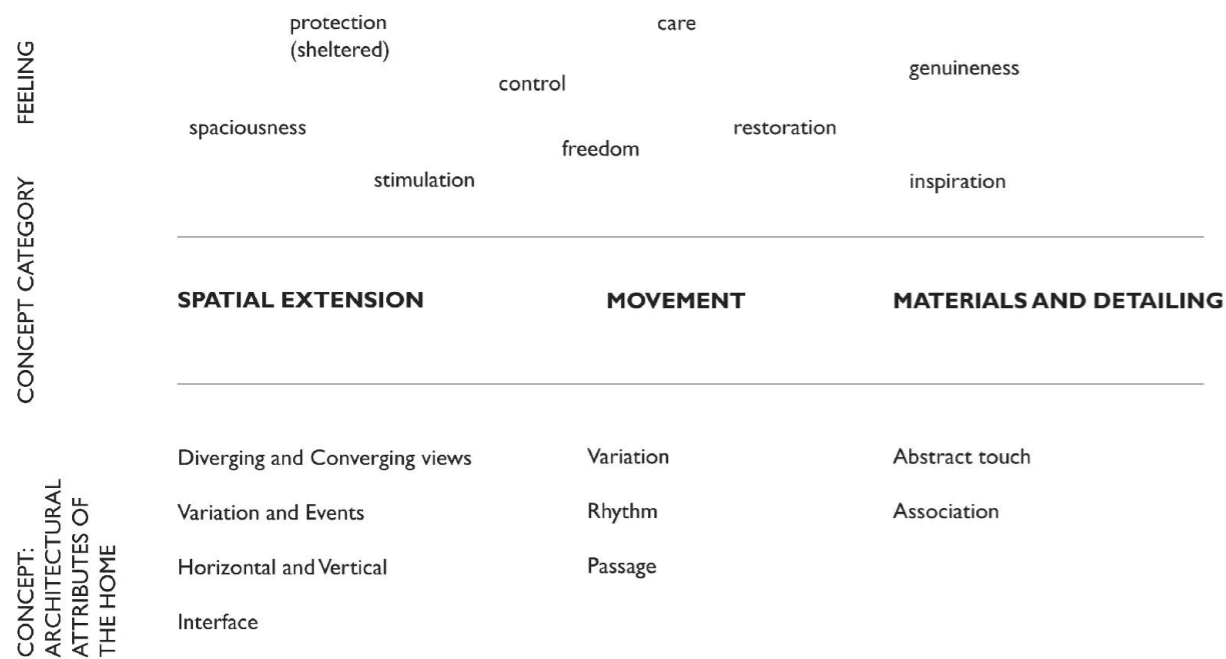
The Four Zones of Contact with the Outdoors (Bengtsson, 2015).

"Zone model regarding different body positions. [...] Illustration by: A. Bengtsson" (Liljegren et al., 2024 s. 3)



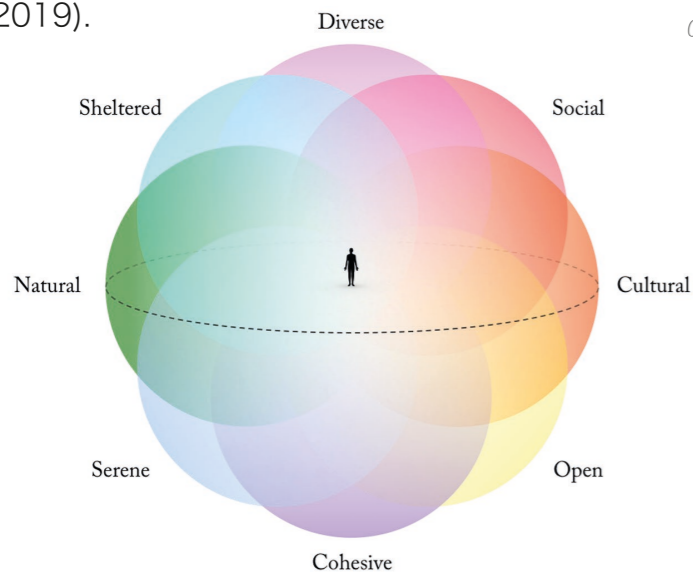
Residential Architecture and Enriched Environments (Morichetto, 2019).

Diagram of the concepts for an enriched environment in residential architecture. (Morichetto, 2019 s. 220)



The Perceived Sensory Dimensions (Stoltz, 2019).

"A model with suggested relations between the eight PSD qualities." (Stoltz, 2019 s. 39)



Full Data of Case Study

Summary in English of all the projects and all the categories in which they were analysed.

DIVERGING & CONVERGING VIEWS

Äppelträdgården

- + Atrium (carport) allows views into own house through outdoor space
- + Windows in multiple directions
- + Terrace above atrium adds views
- Too many c. and d. views can remove privacy!

Valö Fyr

- + Nature views (cliffs and ocean)
- + Bay window crucial for both converging and diverging views
- + Windows around corners
- + Social zones emphasized by more converging and diverging views

Källsprångsvägen

- + Nature views (forest and natural pond/wetland)
- + Bay window in social zone gives c. views.
- + Axiality ending with windows adds to views, also variety in movement.
- + Outdoor space surrounding bay window facing nature with multiple doors adds to both c. and d. views.
- + Porch adds to views in three directions.

Twelve Houses

- + Axiality and circular movement around a core adds to variety of views.
- + Opening between floors adds to views.
- + Interior window over opening in adds to views.
- + Small terrace with two openings adds to c. views.

INTERFACE

Äppelträdgården

- + Atrium enhances interface
- + Elevated terrace gives more privacy.
- + Concept of community shows through the social/transparent approach in floorplan.

- Bigger private zone in front of house needed, or at least private backyard.

- Too large window(s)?

Valö Fyr

- + Carport and storage in front of house enhances interface by entrance.
- + Windows around corners give spaceousness.
- + Unique window placement for optimal view
- +/- Many windows, every room has minimum 1.
- Feeling of too much transparency? Intimidating.

Källsprångsvägen

- + Both open and private depending on street side or nature side. Double doors.
- + Feeling of control, choice and protection.
- + Baywindow-styled room for dinner table facing nature.
- + ^Divides backyard terrace into both social and private.
- + Porch, gives control and a gradual transition from street to hallway to kitchen.

Twelve Houses

- + Very enclosed elevated outdoor spaces, only full recessed balconies/terraces. But optimal for this location?
- + Very large symmetrical windows. Too symmetrical?
- Also on groundfloor next to busy road?
- + Balcony in front of bathroom protects privacy.
- + Large overview/control from inside the house.
- Lost opportunities with doors opening up towards terraces.
- Little protection/transition of outdoor spaces in front of house.

VARIATION AND EVENTS

Äppelträdgården

- Predictable floor plan with high transparency. Privacy protectors.
- Entrance reveals entire floor, also gives control.
- Low contrast between rooms, clear contrast

between social and private floors.
+ Long passage creates variation and clear rhythm between kitchen and living room.
+ Same rhythm shown on second floor, but no social space except terrace, feels misplaced because very exposed?

- Unbalanced large windows.

Valö Fyr

+ Varied and a bit unpredictable floor plan despite small.
+ Staircase hidden from entrance, adds to variety.
+ High contrast in rooms sizes first floor, second floor lower contrast.
+ Common room important upstairs, could be used as extra bedroom.
+ Baywindows and windows around corner adds to space and variation of events.
+ Many views and individually placed windows.

Källsprångsvägen

+ Defined rooms, some unpredictability.
+ High contrast in room shapes and usage.
+ Variety of outdoor space and different zones in backyard terrace.
+ Variety of views ending in windows through defined axiality.
+ Varied views through bay window-room and protected porch, 180° .
+ Varied circular movement throughout house.

Twelve Houses

- Low variety, floorplan and façade design are predictable.
+ High contrast between small and large.
+ Many views and much light.
- + No variation in window placement.
- No bay windows or angled windows that gives variety.
+ Opportunity for variety and flexibility, e.g. terrace.
- Outdoor terrace on floor 3 views limited and lost opportunities with possible doors towards terrace. Also lost opportunity in circularity.

HORIZONTAL AND VERTICAL

EXTENSION

Äppelträdgården

+ Large diversity and variety of horizontal and vertical extensions.
+ Floor height higher in living room.
+ Terrace creates unexpected event vertically and horizontally.
+ Carport increases daylight and horizontal extension.
+ Window placement stimulates.
- Even more extension is possible for example by another door or window to terrace from bedroom.
- Too much transparency for the site?

Valö Fyr

+ Mostly horizontal extension. Overhanging baywindow on second floor lets you outside the walls of the dwelling.
+ Windows around corners.
+ Sightlines all through residence ending in windows.
- No opening between floors.
+ Vertical extension through extra floor height.
+ Ceiling on second floor reaches ridge, creates spaciousness.
+ Less windows second floor adds to privacy and furnishability.

Källsprångsvägen

+ Bay window-room with high horizontality, 180° views, and as a result of axiality from hallway through kitchen.
+ Large glazed double doors from both livingroom and bedroom towards backyard.
+ Vertical extension through openness and angled ceiling.
- Lost opportunity with no skylights despite single floor.
- Small windows.

Twelve Houses

+ Verticality through double floor height over livingroom, also enhances social zones.
+ Axiality and window placement gives horizontality.
+ Light over staircase invites verticality.
+ Internal window towards opening in floor,

gives horizontal and vertical extension.
- Lost opportunity to get outside the façade line to get 180° views.
+ Window placement higher than door line increases verticality.

MOVEMENT (VARIATION, RYTHM, PASSAGE)

Äppelträdgården

Variation
- No circular or varied movement. Lots of communication space.
- Similar movement pattern both floors.
Rhythm
+ Consistent rhythm. Large small large. Bedroom hallway bedroom.
Passage
- Only one door/passage towards each outdoor space, no roof or protective transitional device.

Valö Fyr

Variation
+ Circular and varied movement on first floor, both internally and externally. Good with kitchen entrance. One core.
Rhythm
+ Consistent rhythm. Small, bigger, biggest. Similar rhythm both floors. Roomsize (importance?) increases towards water.
+ Smooth transitioning between.
Passage
+ Plot offers movement but why no additional entry to terrace?

Källsprångsvägen

Variation
+ Varied movement in circles, many changes of directions possible. Two cores.
- Lower predictability and orientation.
Rhythm
+ Less clear rhythm but clear variation and systematics and hierarchy. Complexity with terrace included in circular movement.
Passage
+ Minimum 2 doors per room.
+ Freedom and safety with rooms facing outdoors from bedroom.

+ Axles ending in windows.

Twelve Houses

Variation
+ Varied movement in circles. One core. Predictable yet complex.
Rhythm
+ Similar rhythm all floors. Central core, large small large. Circular movement decreases with each floor^.
Passage
+ Open on first floor and transition between indoor outdoor small, however additional door or window onto terrace would have helped and made movement more complex.

MATERIALS AND DETAILING

Äppelträdgården

+ Timber construction.
- The exterior and interior does not reveal this, expect in the monolithic parts. Exterior consists of fiber cement boards. White walls inside.
+ Consideration of details and material meetings, red and brown façade gives warmth.
+ Windows in different sizes and heights breathes carefulness.
- A bit generic and unpersonal with white walls.

Valö Fyr

+ Timber construction and wooden panels inside and out. Grey painted.
+ Massive wood allows for varied window placement which gives character and is adapted to views and sea direction.
+ Roof in red bricks tiles and ground floor in concrete, gives robustness. Beautiful material meetings.
- Wooden floors, too much wood?
+ Glass roof over doors, humble.
- Why are they all painted gray?

Källsprångsvägen

+ Wooden façade beautifully detailed, especially good when meeting with the gray metal roof.
+ Timber construction, white paint/laced creates openness and bright rooms, contrast

well with gray cold floor.
+ Not too much with all the wood.

Twelve Houses

+ Timber construction with brick cladding, and bricks around the core interiorly. Feels solid yet raw and honest.
- Too much wood can be overwhelming which may happen when it ages and shifts in colour.
+ A cohesive exterior and interior. Warm wood meets cold concrete on ground floor. Interesting and robust.

FOUR ZONES OF CONTACT WITH THE OUTDOORS

Äppelträdgården

0. Four rooms + staircase.
1. Windows in every room that requires it by law, master bedroom and social zones have 2+ windows.
2. +Terrace floor 2 & backyard outdoor space.
-Why no transition outside the kitchen? Next house so close.
3. - Minimal plot, only 1,5m outside building and terrace.
+ Internal carport
4. Community garden. Tall buildings, infrastructure, Frölunda Mall. Ruddalen.

Valö Fyr

0. One room completely dark.
1. Windows in almost every space in the house. Social zones and master bedroom 2+. But kitchen only a small one..? Bay windows and windows around corners!
2. + Carport (roof), storage (could be wintergarden?), balcony in the back.
3. Yard around house, but small!
4. Nature area; forest and rocks and the ocean. Secondary; human built environment; residential buildings, harbour.

Källsprångsvägen

0. Two spaces in the dark but also kitchen? Only indirect light.
1. All other rooms 2 + windows apart from bathroom.
2. Entry porch and protected baywindowed dinnerplace. Large backyard terrace.
3. Small yard around house.

4. Natural vegetation, then deep forest and neighbouring residential area.

Twelve Houses

0. Five spaces + staircase in the dark. But indirect light from hall.
1. When windows, very much daylight and contact with outdoors.
2. Terraces in both directions, very enclosed however. But one large facing away from street.
3. Very little common outdoor space and limited back yard. Miniature-styled transition from busy street to exterior walls.
4. Industrial area, other residential blocks, allotment park and gym, school and shop.

THE PERCEIVED SENSORY DIMENSIONS

Äppelträdgården

Sheltered vs Open
+ All bedrooms on floor 2 = sheltered.
Possibility for one bedroom facing backyard.
- Massive windows in general for a dense area and especially the window behind car park.
- Kitchen very exposed towards street, no privacy zone in front.
- Terrace on floor 2, feels exposed on all sides.
+- Very open and transparent, perhaps better for another context.
+ Daylight from multiple directions, also gives long vistas and control.

Natural vs Cultural

+ Views over apple garden, but otherwise limited despite close to forest area.
+ Apple garden involves unprogrammed space for the whole community.
- Small private garden.
- Car is unnatural yet it "comes into the house".
+ A very cultural project with focus on community and human built environment.
- Perhaps the nature of the dwelling is more suitable for a less busy area? Floor 1 feels way too exposed for a safe and quiet home. Many of the windows are covered in both directions.

Serene vs Social

+ Second floor quiet and private. Same with wc.

- Not very serene, perhaps better in summer.
+ A lot of movement in and around area.
+ Located in busy Frölunda, full of busy roads, schools, malls and businesses.
+ A social dwelling with higher floor height over living room. Large livingroom.
- Kitchen separated from livingroom, why?
+ Small private gardens, large shared garden.

Cohesive vs Diverse

+ A cohesive dwelling in terms of concept.
+ Dwelling in combination with neighbourhood feels like a world of its own. Individuality hard?
- As a visitor inside the house there are no non-exposed places.
+ Not diverse in movement but in outdoorspaces and rooms. Kitchen separated.
+ Diversity of floors, one social one private.

Valö Fyr

Sheltered vs Open
+- Some parts of floor 1 feels sheltered, wc and kitchen. Social spaces more exposed due to the slim volume. Windows over corners.
+ Balcony is sheltered in some dwellings., location on site decides is sheltered/open.
+ Open due to many windows, slim volume and many vistas and ways to move in, out and around. Baywindow on second floor opens up.

Natural vs Cultural

+ In natural context by the sea, a forest and on top of a rocky mountain.
+ Some sense of wild untouched nature.
+ House volumes placed naturally on site.
- Garden limited but offers some gardening.
+ Cultural connection to vernacular architecture of Bohuslän, fishing cottages.
+ Views over neighbouring houses and/or human built harbour and road and water traffic.
+ Fireplace that adds to both natural and cultural feel.

Serene vs Social

+ Feels serene because of present nature.
+ Quiet and restorative. Safe with many dwellings placed together.
+ No bypassers unless visitors or residents.
+ Social floorplans with integrity.

+ Social livingroom on second floor offers a place to interact more privately.
+ Close to Nya Varvet centre with schools, shops and restaurants and easily accessible with all forms of vehicles.

Cohesive vs Diverse

+ Gives off a cohesive impression but is diverse in the ways you can move, interact, look in multiple directions.
+ Follows a clear concept of social floor (1) and private floor (2) with some exceptions.
+ Diverse in room shapes, but follows a traditional family type-layout, with master bedroom and two smaller bedrooms.
- No accessible bedroom on first floor. That floor is not suitable for a sheltered sleep.

Källsprångsvägen

Sheltered vs Open
+ Sheltered both by location and porch.
+ Walls feel solid and robust.
+ Small windows gives protection.
- Entrance doors to bedroom.
- Kitchen most social but most sheltered, however good communication zone.
+ Open towards nature/back yard.
+ Porch opens up interaction with street.
+ Many windows in many directions.

Natural vs Cultural

+ Multiple windows in each room.
+ Context is wild forest and wetland. Weed and free growing nature around houses.
+ Built of timber, natural materials and plastic free paint.
+ Façade resembling tree stems.
+ Three dwellings "interacting" with neighbouring houses, too close?
- Isolated, completely surrounded by forest.
+ Still close to the society of Viskafors.

Serene vs Social

+ Very serene context. Peaceful.
+ Calm, nobody else using street.
+ Free from noise and disturbances.
+ Quiet, restorative. But nature gives complexity.
- Small bedroom too exposed?
- Too quiet and no movement through.
- Isolated.
+ Preschool and healthcare center close.

+ Bus stop not far, same with city centre.

Cohesive vs Diverse

- + Timber and wooden surfaces give cohesion.
- But painted.
- +/- Floorplan organized but scattered, social and private zones mixed.
- Why different roofs on some of the houses?
- + Diverse and varied plan, movement, views, outdoor spaces. Biodiversity.
- Master bedroom and livingroom too similar.

Twelve Houses

Sheltered vs Open

- + Sheltered core, staircase and toilet on third floor sheltered by small terrace. Front double doors shelter room inside. Large terrace very sheltered by framing brick walls.
- + Only recessed balconies. Very sheltered feeling with brick and timber.
- + Small but protected backyard.
- Large windows facing the street or close neighbouring house.
- + Open floor plan, large windows create openness and give control.
- + Long vistas and transparency.

Natural vs Cultural

- +/- Large windows. However views over mostly built area but some over allotment park.
- Introverted outdoor spaces. Limited contact.
- Small yards.
- + Urban industrial neighbourhood.
- + Common road right outside, schools etc.
- + A lot of city life.

Serene vs Social

- + Solid structure creates calm environment interiorly and in the backyards.
- + Small but well organized gardens, peaceful.
- + Small path gives serenity, a cat sleeping.
- +/- Surprisingly quiet for an area with many busy functions. Not a busy road by the time of my visit.
- + Potential to be busy and full of life; schools, allotment park, senior housing, pre-school, playground, offices, cafés and restaurants.
- + Central

Cohesive vs Diverse

- + Very cohesive project in all aspects.
- + Does feel like a world of its own. Calming.

- Too cohesive? Why no windows in dwellings with one free side? Too much timber interiorly?

+ Within all the cohesiveness, diversity occurs. Contrasting materials, heights, movement and variety in outdoor spaces.

RESIDENTIAL QUALITIES (GENERALITY, FLEXIBILITY, ACCESSIBILITY, ROOM SHAPE)

Äppelträdgården

Generality: Hierarchy in room sizes, clear master bedroom that serves traditional family constallations best. Every room with a clear purpose, no general space unless you use the space in the car port as something else., perhaps a wintergarden or extension.

Flexibility: Additional room, bedroom or office kan easily be added in livingroom. Other alterations more complicated and expensive. In theory possible to turn carport and/or terrace into indoor space.

Accessibility: Possible for bedroom on first floor. Car can be parked right outside the door. Proper outdoor space on first floor.

Room shape: Well-shaped rooms for furnishing, but a lot of communication space with limited furnishability.

Valö Fyr

Generality: Hierarchy in room sizes, clear master bedroom and two smaller ones that however can be turned into another large one. Opens up for different living constallations. Also possible to use livingroom on floor 2 as anything, including another bedroom.

Flexibility: Possible to use storage as something else, perhaps a home office? Possible to enlarge bedroom as previously mentioned.

Accessibility: Not possible for a proper bedroom on first floor. Car can however be parked in connection to dwelling. The only outdoor space is on first floor = accessible.

Room shape: Okay furnishability, well squared master bedroom. Communication space is shared and a part of circular movement = ok.

Källsprångsvägen

Generality: Every room with a clear purpose, but with small alterations can the livingroom and master bedroom be swapped as they are about the same size.

Flexibility: As mentioned above, and because of the circular movement and two doors and windows - the master bedroom can be divided into two smaller ones if needed. Porch can be turned into heated space. But a tenement agreement, so unlikely.

Accessibility: Single floor dwelling, double doors and full accessibility., except on porch. Parking space next to house.

Room shape: Mostly squared rooms with good hidden storage (master bedroom), except small bedroom which also lacks storage.

Twelve Houses

Generality: Appears to have more generality than it actually does, especially on first floor. Too little social space here? "Garage" space is however. Further on, given the three floors and similar sized rooms (general rooms) multiple residential constallations possible, collective housing e.g.

Flexibility: Possible to create another room on top of livingroom, but seems unlikely. large rooftop terrace can be glazed or turned into heated space with some alterations. Possible to take down wall between rooms on floor 2.

Accessibility: Three floor dwelling, residents need to be in good physical condition. Without window in "garage", no proper bedroom is possible on first floor. However, doors can ge changed to windows, but is then facing the street.

Room shape: In general very well-shaped rooms, squared with high furnishability.

Physical Model

In timber, using CNC-process. Scale: 1:400.



Physical Model



Physical Exhibition: Dwellbeing

On the light yard in Chalmers SB1 from
2025-06-02 to 2025-06-12.

Presentation time: 2025-06-04 09.00-09.30.





CHALMERS
UNIVERSITY OF TECHNOLOGY

Amanda Alsterlund | 2025 | Examiner: Anna Braide | Supervisor: Hanna Morichetto
Chalmers School of Architecture | Department of Architecture and Civil Engineering