

# Urban Refuge.

DESIGN FOR DECREASING URBAN STRESS IN A  
DENSE ENVIRONMENT.



Jenny Jönsson  
Chalmers School of Architecture  
Architecture and Civil Engineering  
Examiner: Cristiana Caira  
Supervisor: Lin Tan

## Thanks to:

Lin  
Christine  
Family and friends  
Fellow students

Urban Oasis  
Jenny Jönsson  
2020  
Chalmers School of Architecture  
Architecture and Civil Engineering  
Examiner: Cristiana Caira  
Supervisor: Lin Tan  
Architecture and Urban Design  
Healthcare Studio



**CHALMERS**  
UNIVERSITY OF TECHNOLOGY

## Urban Refuge.

### DESIGN FOR DECREASING URBAN STRESS IN A DENSE ENVIRONMENT.

In today's society where we are always on the move or in the middle of an activity and spend more and more time in urban environments with its noise, high density and cognitive and visual stimuli are environments for recovery important. Stress and mental illness have increased and is a topical issue today. Among these are Urban stress, the stress we feel because of the urban environment, where we are in close quarters with lots of people to whom we compare ourselves but don't feel a sense of community with. People need places where they can feel connected to each other and get a relive from the city buzz. Which leads to the question:

*How can we design public buildings that helps to decrease urban stress?*

This thesis explores the relationship between the build environment and mental well-being. There are lots of studies that show the positive effects nature has on our wellbeing and how being in nature has a calming effect on us. Through literature research with a focus on mental well-being, public places and Biophilic design translated into atmospheres inspired by nature this thesis investigates how we can design with wellbeing in focus. The knowledge foundation created by research emanates in an Evi-

dence-based design proposal.

The research is interpreted into design concepts that are implemented in a design proposal for a visitor centre as a refuge. It's located on an extended quay in-between the old town and a new development in Varberg on the west coast of Sweden.

The design process combines literature investigations with mainly sketching, model making, site analysis and material tests focusing on the benefits for stress relive.. Key feature of the design is working with spaces for different types of being, a strong connection to the location, layers from most public to more private and design features that has a positive impact on mental well-being.

#### KEY WORDS:

Architecture, Atmospheres, Well-being, Urban stress, Community, Biophilic design, Evidence Based Design



## Student background.

**BACHELOR**  
Chalmers University of technology, Architecture

**MASTERS**  
MPARC Architecture and urban design

Sustainable development and the design professions

Future visions for healthcare, housing and work 3:  
Healthcare architecture

Future visions for healthcare, housing and work 2:  
Housing inventions

Architectural competitions

Managing design projects

Future visions for healthcare, housing and work 1:  
Residential healthcare - housing for seniors

**INTERNSHIP**  
Sweco Architects Göteborg 2017-2018

**WORK**  
Sweco Architects Göteborg 2018-2020  
(Healthcare studio)

### THESIS IDEA

The idea for the project has evolved from my volunteering with children and youth in 4H. I have seen how mental illness and stress increase among younger people but also how the environments we spend time in affects how we feel. A moment in nature can do wonder for our well-being. But what is it in nature that does it? And how do we capture and translate those qualities into the built environment?

The choice to focus on my hometown Varberg was given since the city is undergoing several major development projects in the increasingly urban environment.

## Table of Content.

Title page	1	04.	ATMOSPHERES	38-47	
Abstract	3		Nature of space	39	
Student background	5		From research to design	41	
Thesis idea	5		Natures Spaces	43	
Table of content	6		Atmospheric concepts	45	
Reading instructions	7		Building concept	47	
01.	BACKGROUND	8-15	05.	MATERIALITY	48-55
	Nature of stress	9		Natural materials	49
	Problem statement	11		Wood -Shou Sugi Ban	51
	Purpose and aim	12		Material concept	52
	Research question	12		Structural concept	53
	Methodology and Delimitations	13		Detail	55
	Biophilic design	15	06.	DESIGN PROPOSAL	56-71
02.	PUBLIC BUILDING	16-21		Siteplan	57
	Public places	17		Outdoors	59
	Places for being	19		Floorplan entrance level	61
	Program	21		Floorplan level 2&3	63
				Outer cube	65
03.	CONTEXT	22-37		Middle cube	67
	Nature in the space -Water	23		Inner cube	69
	Varberg	25		Facade	71
	Varberg as a “kurort”	27	07.	REFLECTION	72-75
	A string of wellness	29		Discussion	73
	Hoken	31		Conclusion	75
	Flows and Views	32	08.	PROCESS	76-77
	Natural elements	33			
	Prerequisites	34			
	Approach	37			
				References	78
				List of figures	79

## Reading instructions.

The booklet is divided into eight parts. Throughout the chapters, the content unfolds from the theoretical basis to a concrete architectural design proposal for a specific site.

### 01. BACKGROUND

The first chapter gives an entry point into the thesis. Here, the main discourse, the thesis framework and methodology are introduced as well as an introduction to public places and Biophilic design based on the book *14 Patterns of Biophilic Design* by Browning, Ryan, Clancy (2014).

### 02. PUBLIC BUILDING

The second chapter is based on theories on public places, libraries and third places. It introduces the function and program of the building.

### 03. CONTEXT

The third chapter is based on the pattern category, Nature in the space within Biophilic design. It introduces the site and the town, its history and future as well as relevant flows and conditions.

### 04. ATMOSPHERES

The fourth chapter has a starting point in the second category Nature of the space and how atmospheres

can effect us. The findings are translated into specific approaches for the architectural design. The atmospheric and space concepts and form is developed.

### 05. MATERIALITY

In the fifth chapter, the materiality, wood treatment and detailing developed based on the third and last category of patterns within Biophilic design, Natural Analogues.

### 06. DESIGN PROPOSAL

The sixth chapter Design Proposal converts the findings from the previous chapters into a concrete proposal for a visitor centre. Architectural drawings and renderings communicate the spatial solutions.

### 07. REFLECTION

The seventh chapter Reflection summarizes the thesis and opens a discussion on how the work can contribute to the discourse of architecture in connection to decreasing urban stress.

### 08. PROCESS

In the last chapter show a glimpse of how the form evolved to the proposed design.

# 01. Background.



*“Mental health matters, but the world has a long way to go to achieve it.”  
-Dr Margaret Chan Director-General WHO (2013) p. 7.*

## The nature of stress.

### WELLBEING

The World Health Organization (WHO) defines health as “...a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.” (WHO 2001). Mental health is then defined as “...a state of well-being in which the individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community.” (WHO 2001).

### STRESS

Stress is a normal reaction that occurs when we feel that the demands placed on us significantly exceed our ability. Everybody gets stressed, it happens in situations that require us to mobilize power and energy. When faced with a challenge stress can make us focus and perform better, ergo it can be a positive thing and is a necessary function. However, prolonged exposure to stress, without adequate recovery, can damage our body and increase the risk of illness. Cardiovascular diseases and depression are examples of conditions associated with long-term stress. (Folkhälsomyndigheten 2019.)

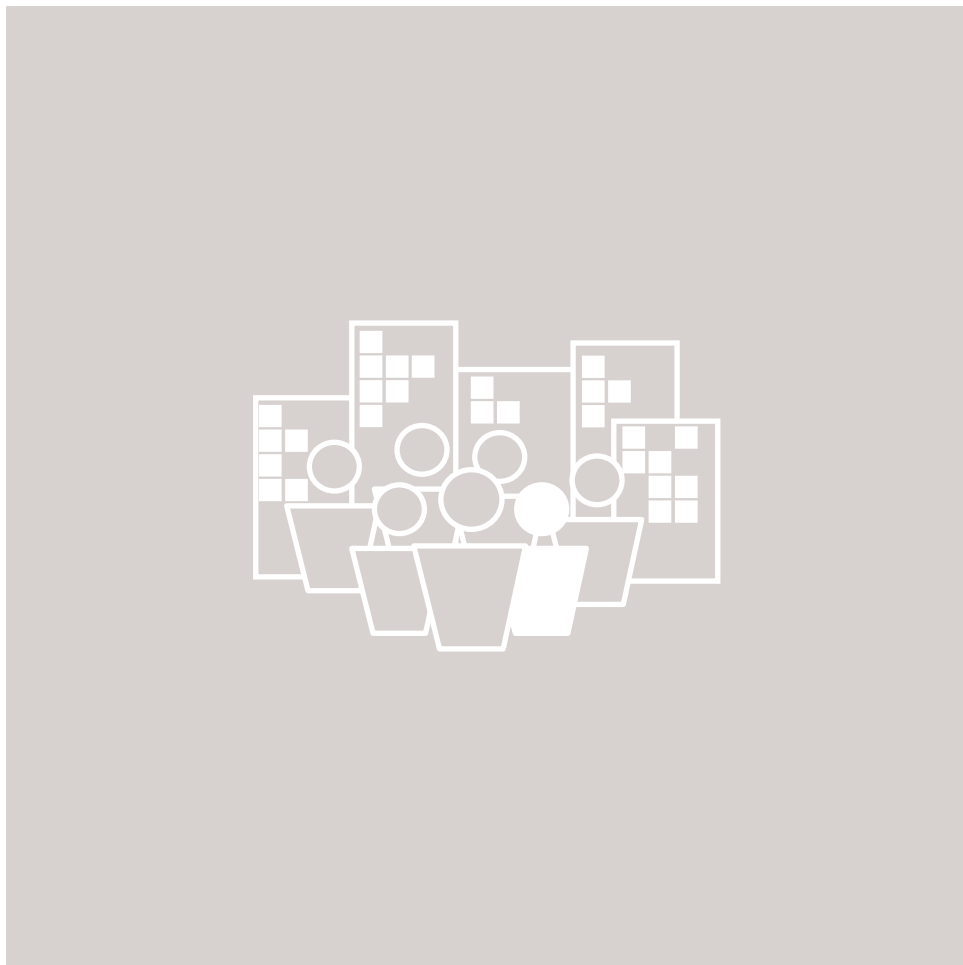
The sympathetic nervous system, which is part of our autonomic nervous system that controls breathing,

blood pressure and heart rate, is alerted when our brain interprets a situation as threatening. Various stress hormones are released into the bloodstream with the job to ensure that our heart rate and blood pressure are raised and that there is enough energy for our muscles and brain to endure our fight-fly reaction. We become less sensitive to pain and the blood flow is redirected so that the muscles and brain get more blood while functions not needed for the fight on life and death get less energy.

Long term stress leads to changes in the brain. The connections between nerve cells, the cerebral cortex and the amygdala is affected by chronic stress. These parts effect our short-term memory, fatigue, our ability to concentrate, organize, plan and prepare us for fight or fly. (Hjärnfonden 2017)

In everyday life we experience several different stressful situations. Such situations can be when we react to physical threats, stress over big questions and major issues e.g. climate change and work situation, stress to manage our daily puzzle or simpler things like catching the bus. To the above the social stress must be added e.g. fitting in, finding community and the issue of loneliness.





## Problem statement.

In a society where we are always online, on the move or in the middle of an activity, are environments for recovery and recreation important. Today over 50 percent of the world's population lives in cities with it's visual, aural and cognitive stimuli of advertisement, traffic and high density environments. Its projected that this figure will increase to 70 percent by 2050. (UN, 2018)

Already a challenge today and constantly increasing where we will live in urban environments where we are in close quarters with lots of people to whom we compare ourselves and unconsciously compete with. People that we are close to but often lack the sense of community with.

Urbanization is a major challenge in connection with mental well-being. Except from personality traits, genes, coping strategies and upbringing are how we react to stress depending on environmental factors like where we live and spend our time. In addition to genes, upbringing, personality traits and coping strategies, has as well the physical environment where we live and spend our time an impact on how we react to stress. There is a 39 percent higher risk of depression and a 21 percent higher risk of anxiety disorders if you live in cities rather than in rural areas. In Dr. Mazda Adli's TEDxBerlin talk he points out what he calls urban stress, which he defines as a city specific social stress due to the social density in combination with social isolation.

The amygdala, a part of our brain, is negatively affected by living in urban environments. The amygdala effects our ability to process emotional stress, cope with negative emotions and environmental threats and it works better the more rural we live.

There is a need for minimizing density and at the same time provide places with opportunities for social connections to reduce social isolation and loneliness and thereby decrease urban stress. (TED, 2013)

We need to take breaks from the urban context, the noise of the streets and the density. We feel better spending time in nature than in urban environments, we recover faster and perform better. The urban environment has a negative effect on our ability to handle stress, both from a preventing and recovering perspective. (SVT, 2019) So how can we translate nature's positive effects into the urban environment?

If only for a short time, people need a reprieve from the urban environment. (Channon, B, 2018) With the shift towards an even more urban world, the need for design and architecture to reconnect people to the healing experiences of nature increases and providing room for social connections becomes even more important.

## Purpose and aim.

### PURPOSE

The purpose of this thesis is to investigate how architecture and design can promote stress relieve in a public place and increase the feeling of community between visitors. The focus will be on how spatial planning and chosen design strategies inspired by Nature can be used to create restoring atmospheres for community places in an urban context.

### AIM

The thesis aims to contribute to the current discourse on how architecture and design can be used to help lower urban stress. The aim is to design a visitor centre with a focus on stress relive. A place where visitors can find a haven in the urban environment, a sanctuary free from social requirements and expectations. Giving visitors the right to breathe and the opportunity to connect to each other.

## Research question.

*How can we design public buildings  
in a Scandinavian context that  
helps to decrease urban stress?*

*“We shape our buildings and thereafter they shape us.”  
-Winston Churchill.*

## Methodology and Delimitations.

This thesis follows a work process of three steps; Foundations - Design Concepts - Design Proposal. The process leads from literature and reference findings to concepts and architectural design in four categories, Public building, Context, Atmospheres and Materiality. The study combines literature investigations with reference projects, site analysis, sketching and model making in an iterative process.

### FOUNDATIONS

Explore references to create a knowledge base that will enable an evidence-based design. Take inspiration from existing projects that addresses issues related to this thesis with focus on Public spaces, Urban stress and/or Biophilic design.

-Can we by taking inspiration from atmospheres in nature create architecture with a positive impact on our mental well-being?  
-What type of spaces have a positive impact on us, materials, atmospheres, forms, programs?

### DESIGN CONCEPTS

Translating the findings into concepts and design-strategies to clarify the knowledge and push the process forward to in the end get a clear design proposal. By incorporating the research into the design in a structured way get an understanding of the design.

### DESIGN PROPOSAL

The design process will mainly be done through sketches and sketch models.

This thesis is limited within the categories of foundations and background, users, context and design.

### FOUNDATIONS AND BACKGROUND

I have chosen to limit the focus within mental well-being to stress and more specifically Urban stress. The project will focus on everyday stress relive in connection to public buildings and not on therapy or healthcare facilities. Solutions is limited to be based on the theories of public places and Biophilic design.

### USERS

The users is the public masses, visitors and citizens in urban environments. The thesis will focus on users experiencing the everyday stress of living in an urban society.

### CONTEXT

The study is based on knowledge and the local conditions and history of Varberg, Sweden and therefore applies to the cultural framework of the Nordic countries.

The project follows the spirit of the municipality's plans for the site but freely adheres to the details of the plan regarding the building form and dimensions.

### DESIGN

The level of detailing in the design has a focus on the experience of the architecture rather than technical solutions and details.



*“A space with a good Visual Connection with Nature feels whole, it grabs one’s attention and can be stimulating or calming. It can convey a sense of time, weather and other living things.”*  
 -Browning, W.D., Ryan, C.O., Clancy, J.O. (2014) p.24

# Biophilic Design.

**EVIDENCE BASED DESIGN**  
 The built environment influences how we think and feel and it is therefore important to use existing knowledge on how spaces affect us when designing. (Williams Goldhagen, S. 2017)

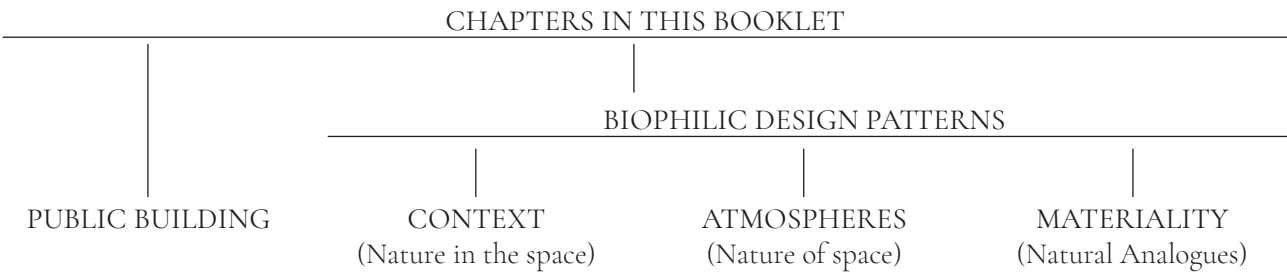
Within healthcare architecture there is a research field called Evidence Based Design. It is about using evidence developed from various disciplines and integrate it into the design to consciously use architecture to improve the resulting buildings effects on us. One part of Evidence Based Design is about using the building design to reduce stress. Positive distractions and nature refer to a category of environmental characteristics or circumstances that affect emotional well-being, mental well-being, pain levels, concentration and stress levels. (Ulrich, 2012)

**BIOPHILIC DESIGN**  
 The evolution has through centuries adapted human beings to a life in nature. The concept Biophilic Design is an approach to architecture that seeks to strengthen the connection between human beings and nature, through direct and indirect contact with nature and the nature of space. (Kellert, S. Heerwagen, J. Mador, M. 2008)

It is widely researched that nature has a positive effect on us. Studies has shown that Biophilic Design can help improve mental well-being though reduced stress and by providing opportunities for mental restoration within the build environment. Mental restoration improves our cognitive functions such as our mental agility, our ability to think and learn and our creativity. Biophilic Design can provide opportunities for emotional restoration that lower instances of fatigue, anxiety and overall mood disturbances. (Browning, Ryan, Clancy, 2014)

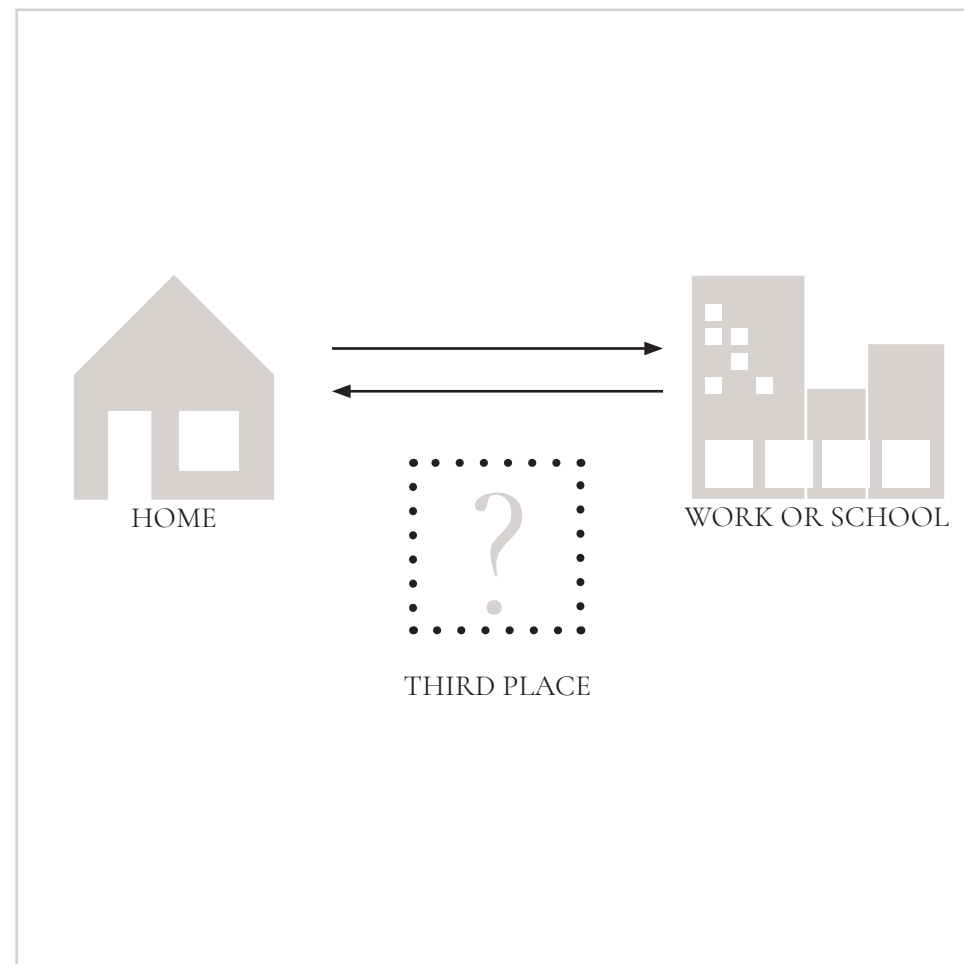
It is possible to organize Biophilic Design into three categories – Nature in the Space, that addresses the direct and physical presence of nature, including living organisms, water and natural elements such as breezes and sounds. Natural Analogues addresses the indirect evocations of nature. Processed or altered materials such as wooden planks, patterns and sequences found in nature and is manifested in the build environment. The third, Nature of space is about the spatial configurations and atmospheres in nature, the authors of 14 Patterns of Biophilic Design divided these into Prospect, Refuge, Mystery and Risk/Peril. (Browning, W.D., Ryan, C.O., Clancy, J.O.,2014)

The chapters 03. Context, 04. Atmospheres and 05. Materiality are based on these categories.





## 02. Public building.



*“...offer what no other contemporary building type provides: vibrant, informal, attractive, non-commercial community places where people of any age, class, gender, race, religion, or ethnicity can gather...”*  
-SARAH WILLIAMS GOLDHAGEN (2013)

## Public places.

### PUBLIC PLACE

Greenhalgh, Landry, & Worpole describes the term “public place” as open and covered places such as parks, streets, squares and libraries. Places open to all, which you have the right to use without expectation of purchase and in many cases you feel that you have co-ownership of. In today’s society where museums and other once free venues often has an entrance fee, streets are taken over by cars and pedestrian streets are filled by shopping and restaurants expecting you to purchase, there is a lack of neutral spaces. Places with opportunities to; just be, stroll, stand and talk or just sit and watch the time pass by. (Dahlkild N, 2011)

### THIRD PLACES

People need places where they can interact with others like or unlike them, whom they can feel connected to just by belonging to the same neighborhood or city.

It is possible to divide our daily life into three types of places: the first is domestic, our home, the second is gainful or productive, the school or workplace and the third is inclusively sociable places or Third places as defined by the urban sociologist Ray Oldenburg in his book *The Great Good Place*. (Oldenburg, 1989)

The French term *rendez-vous* suites well for this as it refers to a public meeting place or a context where friends gather away from the confines of home and work.

### PUBLIC BUILDING

There is a need for Third place buildings and the concept of libraries is a good example of that. Providing the possibility to just take a break, sit down and read when you need it and for your own benefits you just have to enter. It also offers an informal meeting place, a non-commercial community space, where individuals regardless of age, gender, class, provenance and religion can participate in cultural and social activities and have a place for reflection, retreat and concentration. It is a place that promotes social equality, providing opportunities for discussions and counteract the isolation of individuals in the modern society. With or without books, there is a need for the function of third places indoors. (Mattern S, 2014)

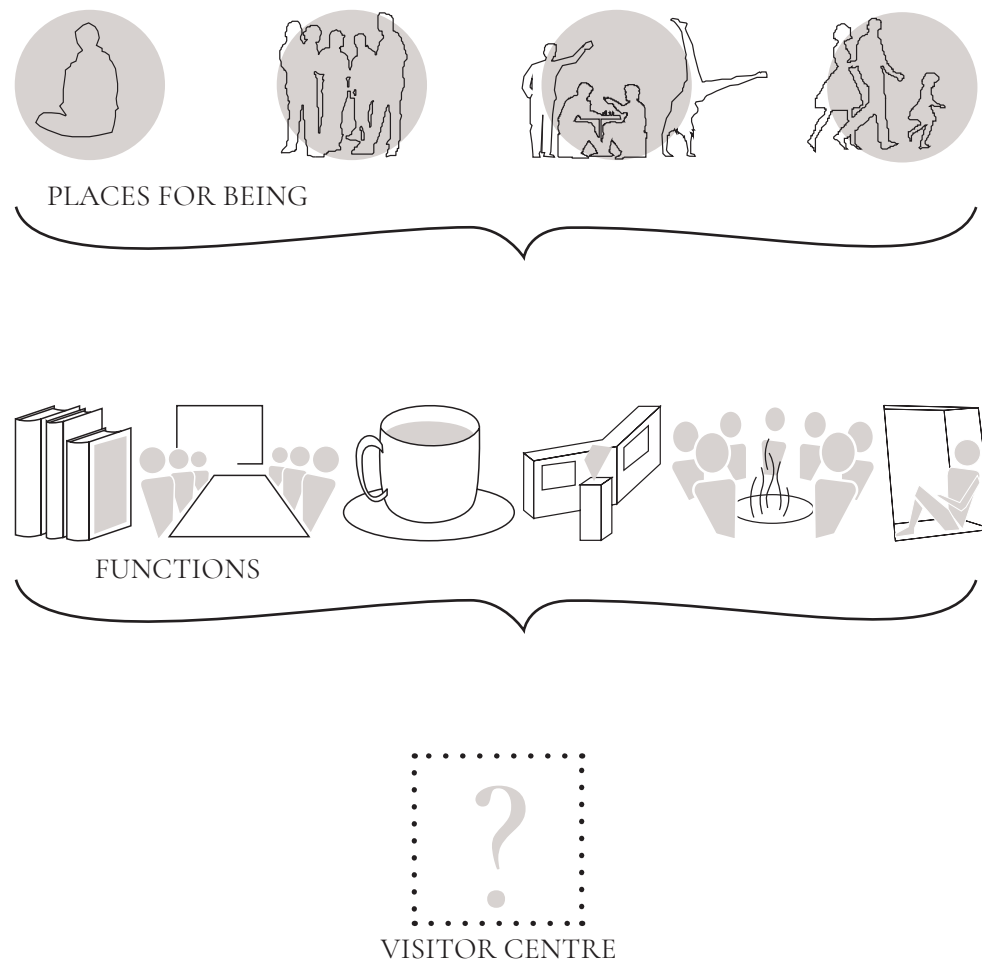
In the Scandinavian context, the climate increases the need of indoor public places. Parks and other outdoor places are not as attractive on windy and rainy days leading to a lack of places to be in the local context.

### RENDEZVOUS

noun [ C ]

a place where a particular group of people often go or meet, by arrangement or habit.

(Cambridge dictionary 2020)



## Places for being.

### THEORIES BEHIND A LIBRARY

As early as in the 15th century the French librarian and thinker George Naudé wrote advice on designing and maintaining libraries. One of the things he pointed out was that a library should be placed far away from hubbub and distractions by moving it some distance from the street and if possible with wide prospect view over nature and provide good natural light. Even within the building it should be placed away from kitchens and communication to offer a place for contemplation, retreat and reflection.

Within the library users should except from reading the books they looked for also be able to stumble on to something unexpected where the architecture and design support the notion to explore. It should also offer active meeting places for social activities. All this supporting both individuals and communities as they counteract the isolation of the urban society. (Dahlkild, N. 2011)

The functions, program and atmospheres are based on the basic needs of different spaces for being.

### PLACE FOR BEING ALONE

Places for contemplation, to breathe, think, read, study and gather strength.



### PLACE FOR BEING TOGETHER

Room for talking and feel connected to the persons next to you.



### PLACE FOR ACTIVITY

For lectures, workshops, group work and group activities.

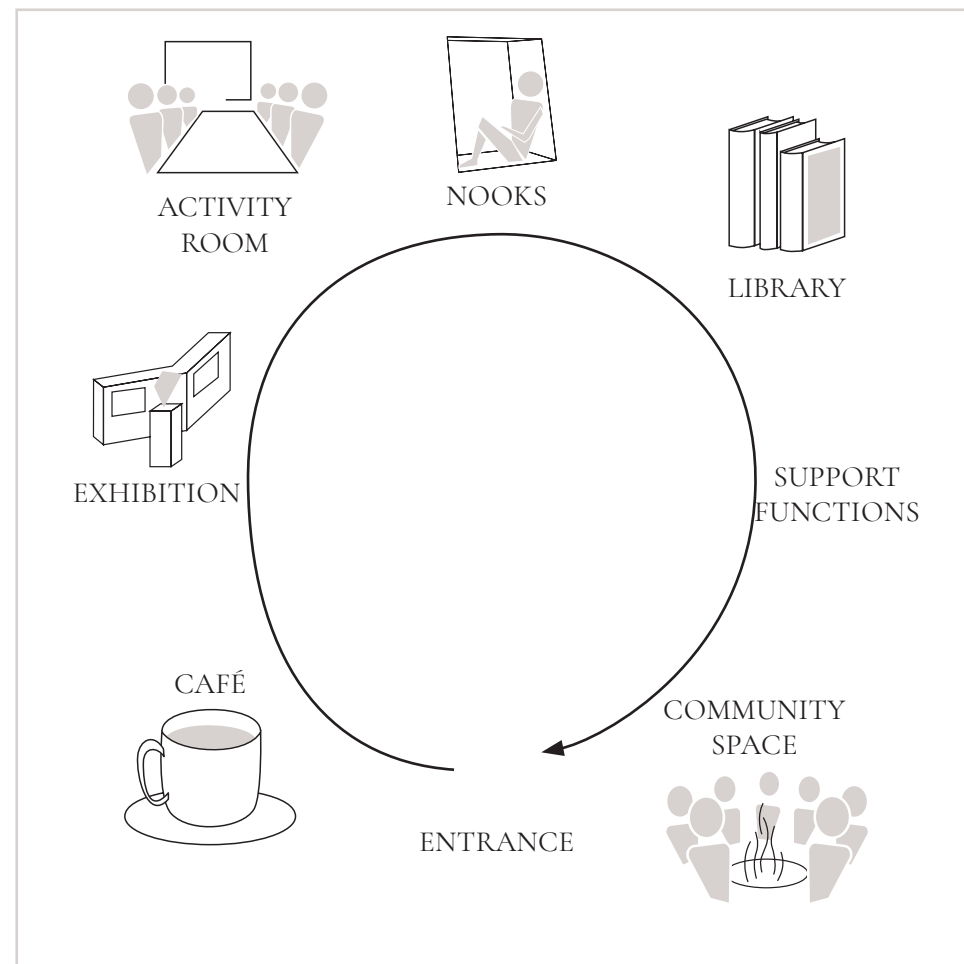


### PLACE FOR MOVEMENT

For walking, taking in scenery, exploring exhibitions and connecting spaces and atmospheres.



## Program.



### FUNCTION

The function of this project is a visitor centre, a meeting place, but also a haven in the city where visitors can gather away from home and work to just be.

### PROGRAM

The program can be divided into two parts, for visitors and behind the scenes. Focus for the staff areas is to be as efficient as possible. The visitor's spaces on the other hand will focus on the experience.

The community space is where the community can gather, to sit together and do nothing else than feeling connected to each other just by being in the same space, like sitting around a campfire sheltered from the urban environment.

The nooks are places to be alone or with a selected few, refuges where you can read a book or relax. It is places for contemplation and concentration.

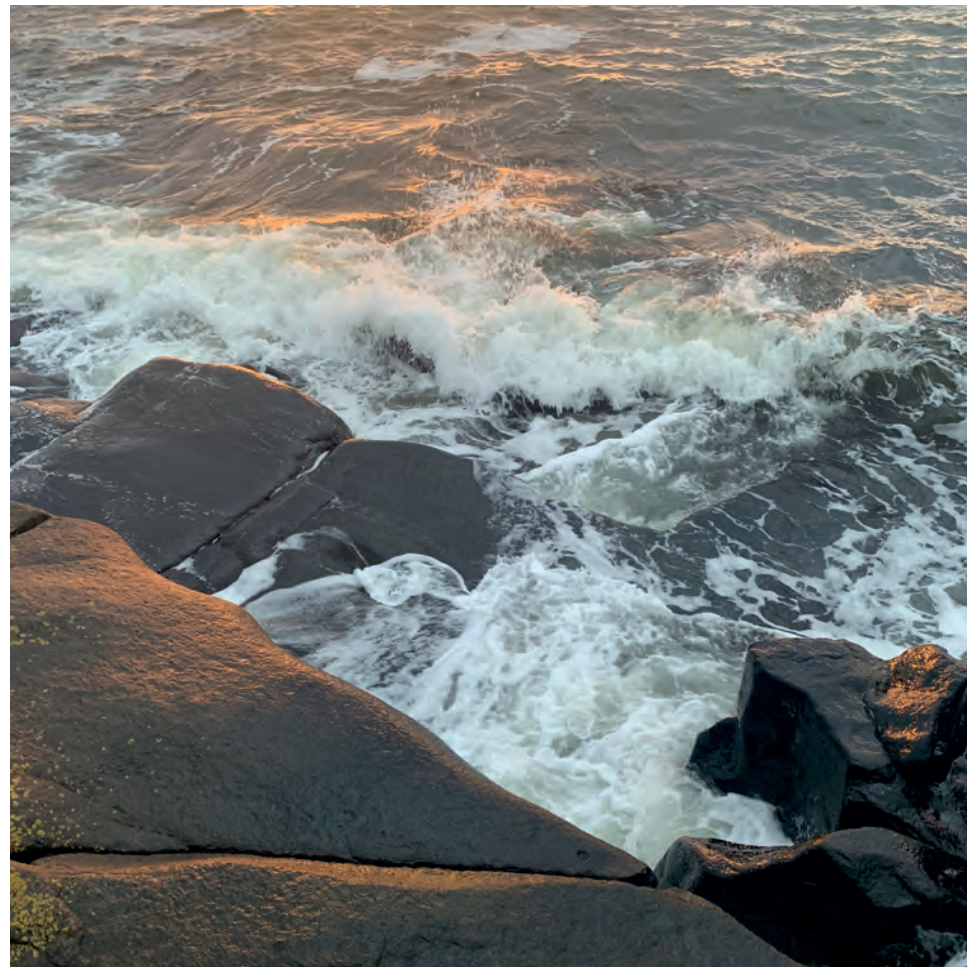
The activity rooms are spaces for lectures, meetings or workshops. Rooms and places where groups can gather around an activity to conquer social isolation and through that urban stress. These are opened up towards the outdoors to invite the community.

Exhibition is a function that gives an opportunity to stroll around and gain knowledge by exploring and experiencing different atmospheres.

Library is the ultimate public building, where everyone is always welcome. Since the town has a bigger library already a branch is a good complement with more focus on the atmospheres to read in. To combine it with other functions gives the public an opportunity to easily access these.

Café gives visitors access to food or coffee, that is important in third places to create the feeling of being a regular and of having the right to the place. To invite visitors to bring their own food is another way, so everyone can sit inside and eat their food together even if all of them can't afford eating out.

## 03. Context.



*“When I sit here by the sea and listen to the sound of waves, I feel free from all obligations and people of this world.”*  
Henry Thoreau

## Nature in the space -Water.

Nature in the Space is a pattern within Biophilic design that addresses the direct and physical presence of nature, including living organisms, water and natural elements such as breezes and sounds. In this projects this pattern has been important when choosing the site in the town of Varberg and as a foundation background when looking at the context and it's benefits.

Among the health benefits of Nature in the space and the presence of water are stress relieve, increased feelings of tranquility, lowered blood pressure and heart rate, reduced attentional fatigue, improved attitude and overall happiness. Activities conducted in spaces with nature scenes improves both our self-esteem and mood in contrast to the same activities with views of urban environments. But it is proven that nature scenes without the presence of water and urban scenes with water elements has equal benefits. (Browning, W.D., Ryan, C.O., Clancy, J.O.,2014) Water has therefore an positive effect on us independently on the surrounding environment. Enabling views towards the water has therefore been of the essence in the choice of location.

Seeing cloud-, bird and wave movements or hearing water babbling, birds chirping or the wind is called

Non-Rhythmic Sensory stimuli. These non-rhythmic movements subconsciously take up some periphery focus which actually helps us focus and have a calming effect. (Browning, W.D., Ryan, C.O., Clancy, J.O.,2014)

The closeness to water has historically been linked to buildings that promote well-being. Not least if you look at the Swedish city of Varberg's history as a spa resort. So, designing a visitor centre and public building by the water feels natural.







## Varberg.

- New Development. (Not built yet)
  - Existing buildings.
  - The project site, Hoken.
- 1. Main square of Varberg
  - 2. Coastal bath
  - 3. Open-air swimming pool
  - 4. The fortress
  - 5. Sea bath
  - 6. Söcietetsparken
  - 7. Open-air bath house
  - 8. Campus area
  - 9. The new development
  - 10. Färdhamnen, new industrial port
  - 11. Getterön
  - 12. City library and cultural centre
- A Existing Connection to city centre
  - B Existing Ocean walk
  - C The diagonal (New development)
  - B The quay walk (New development)

Varberg is a medium-sized Swedish town with 35 000 inhabitants 2018. (Statistiska centralbyrån 2020). The attractive location in commuting distance to Gothenburg and Halmstad and still being a smaller town right by the ocean means that the desire to move there is great that the city is growing steadily.

The fortress in Varberg begun being built as a castle at the end of the 13th century and today's city grid was planned during the 17th century. Since the beginning the city's development has been characterized by the life around the fortress and the naturally protected harbour.

Today Varberg municipality's vision is to be the creative centre of the west coast with the following addition:  
*"We will simplify people's everyday lives and inspire them to achieve their dreams."*

The fortress together with the proximity to the ocean and a waterfront walk connecting the city centre with beaches, wellness buildings and baths is characteristic for the town.  
 (Varbergs kommun, 2019)



## Varberg as a “Kurort”.

Since the 19th century, Varberg has been profiled as a spa resort, in Swedish “Kurort”. The word is a combination of the Swedish word “kur” meaning health or care, (originally from the Latin word cura) and “ort” meaning place, and the concept is defined as a place for treatment of illnesses, for recreation and relaxation. Here well-being has been in focus for two centuries.

During the beginning of 19th century, tourism arose around drinking well-water and swimming in the ocean on the west coast. A natural source with mineral-rich water was around this time discovered outside Varberg. Going to the spa and “dricka brunn” (freely translated to drinking well) had become fashionable at this time and attracted many visitors, a well house was therefore built in the city centre to compete with other locations on the West coast. The well house was a community centre with entertainment and socializing, in addition to water drinking.

In the second half of the 19th century Varberg got steamboat lines and rail lines making it much easier for the resort visitors to get to Varberg, that developed to a well-known spa resort. During this time both cold and hot bath houses were built in the harbour area. The society park (Societetsparken) with

the society house was built to be a place where the upper class could socialize, drink the mineral water and take walks under the trees between baths as a part of the therapy. The social community together with the healing powers of the mineral water, the salt baths and the place were said to be good for health.

In the beginning of the 20th century the belief about the healing aspect of the salty air and the closeness to the ocean led to the establishment of a coastal sanatorium for children with tuberculosis in the outskirts of Varberg. When the antibiotic and the vaccine came the need changed, and the sanatorium was transformed into a care and spa facility. The spa tradition has continued and has further developed with several new spa facilities.

(Lennartsson B-M, 2013)

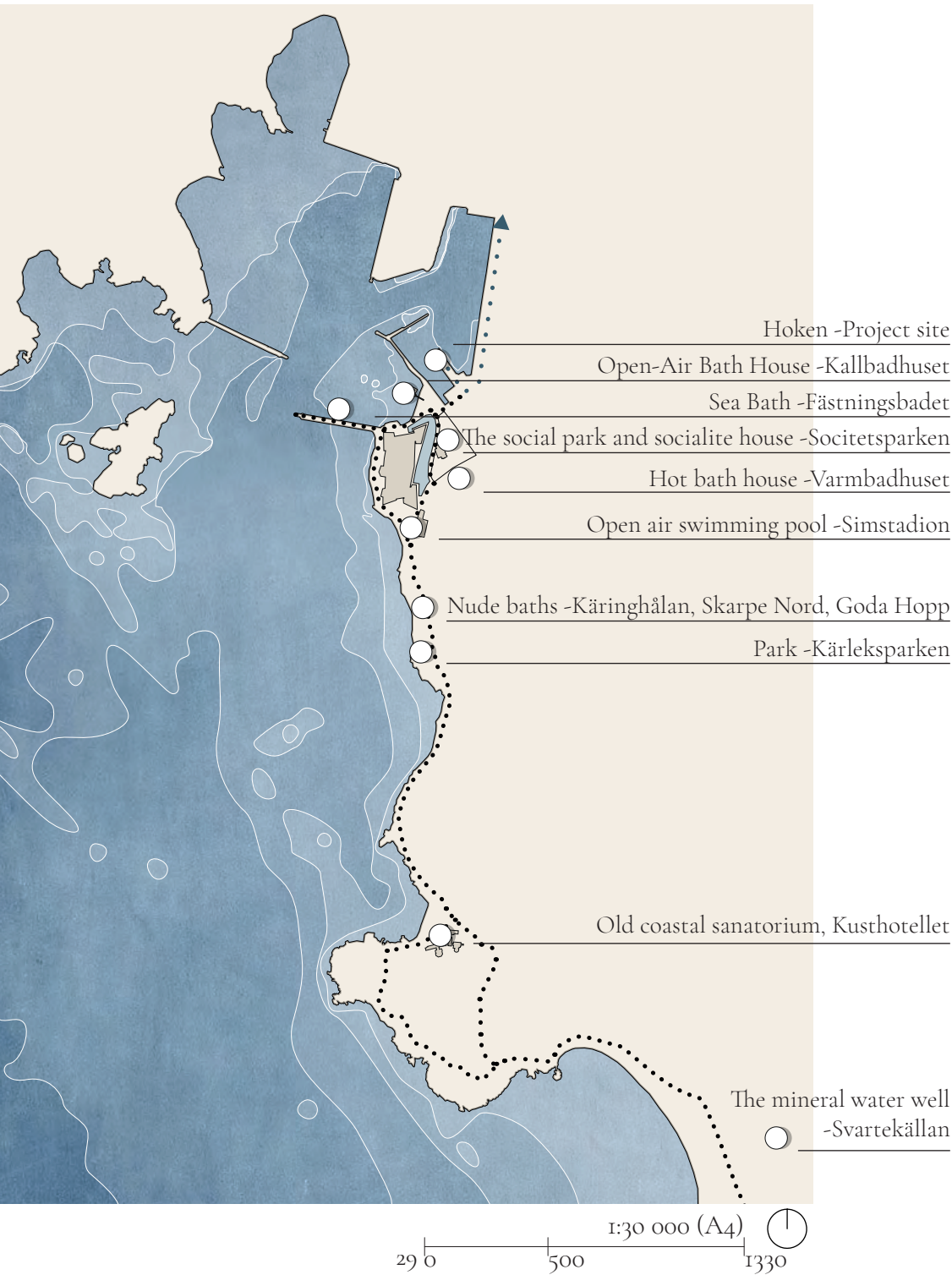
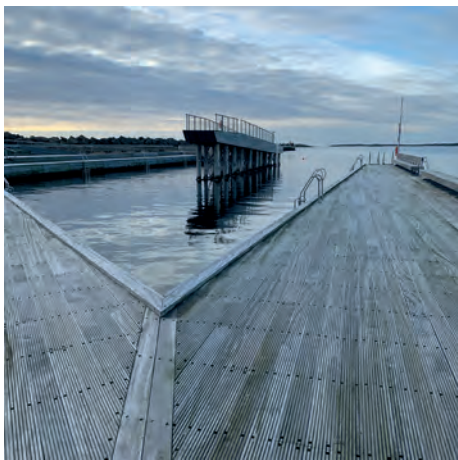
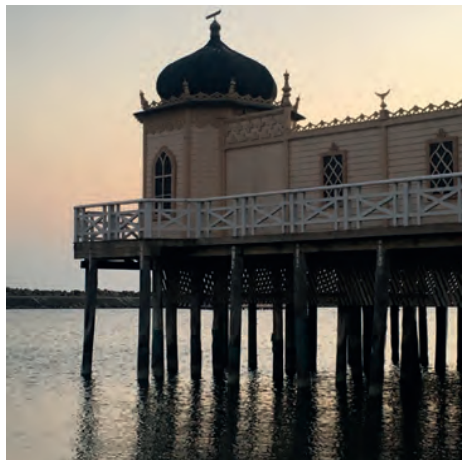
During the last 2 centuries the town has been a place where inhabitants and visitors has enjoyed the coastal nature, fresh air, healthy water and baths as well as the wellness effects of social connections. In today’s society with the densifying environments and urban stress we should learn from the past and create places that focus on wellness and encourage socialization and stress relive.

*“Healing is a matter of time, but it is sometimes also a matter of opportunity.”*

*Hippocrates*



A string of wellness locations  
along the ocean walk



HAVEN  
noun [ C ]  
haven noun [C] (SAFE PLACE)  
1. a safe or peaceful place  
haven noun [C] (SMALL PORT)  
2. an area of water next to the coast where ships and boats can shelter, or a small port.

(Cambridge dictionary 2020)



View from the site looking back at the city

57°06'36.4"N 12°14'33.3"E  
57.110118, 12.242569

Site.

VÄSTERPORT  
Varberg has historically had a strong connection to the ocean. The development and infrastructure of the past have unfortunately created barriers between the city centre and the water. Today the biggest barriers are being taken care of, the train tracks will be moved underground (this will be done by 2026) and the industrial harbor are being moved away from the city center to Farehamnen (done by 2022). This opens up space for the development of a new living area by the waterfront, Västerport, making way for the growing city and reconnecting Varberg and Kattegat. (Varbergs kommun, 2019)

The plan for Västerport is divided into 3 phases, beginning in the south and grows north as more land becomes available from the other projects. The first phase with construction starting 2020-2021 includes 6 new building blocks with an average height of 5 floors with public ground floors, apartments and a new hotel. It will also embrace the existing campus area, multistory car park, hotel and the quay. (Varbergs kommun, 2019)

Along the line of coastal buildings and places with a health focus, this quay, on the border between the old town and the new development, is suitable for this project. The quay is called “Hoken” due to its hook-like shape.

HOKEN  
The scenic site is a few steps out onto the quay within the harbour/haven, protected from the open water by the outer breakwater, where you can look back on the city's bustle and problems with perspective and distance.

The quay has since the 1960s been the place where the Denmark-ferry departed until January 2020 when it moved in favour of the development of Västerport. (Varbergs kommun, 2019)

Hoken is a part of the first phase in the development of Västerport. The new plan for the area states that the quay is intended to be a pedestrian public place with a public building. The design and content should help to create an attractive destination and be a new focal point for the community and tourists visiting the town. (Varbergs kommun, 2019)

West of the quay is a guest harbour for smaller boats and it is planned for temporary docking for larger boats along the quay. (Varbergs kommun, 2019)



## Views and flows.



### VIEWS

From the site there are view lines towards surrounding well known buildings and area, as well as the sunset and ocean. Enabling outlooks will be important, but also to create spaces shielded from the surroundings.

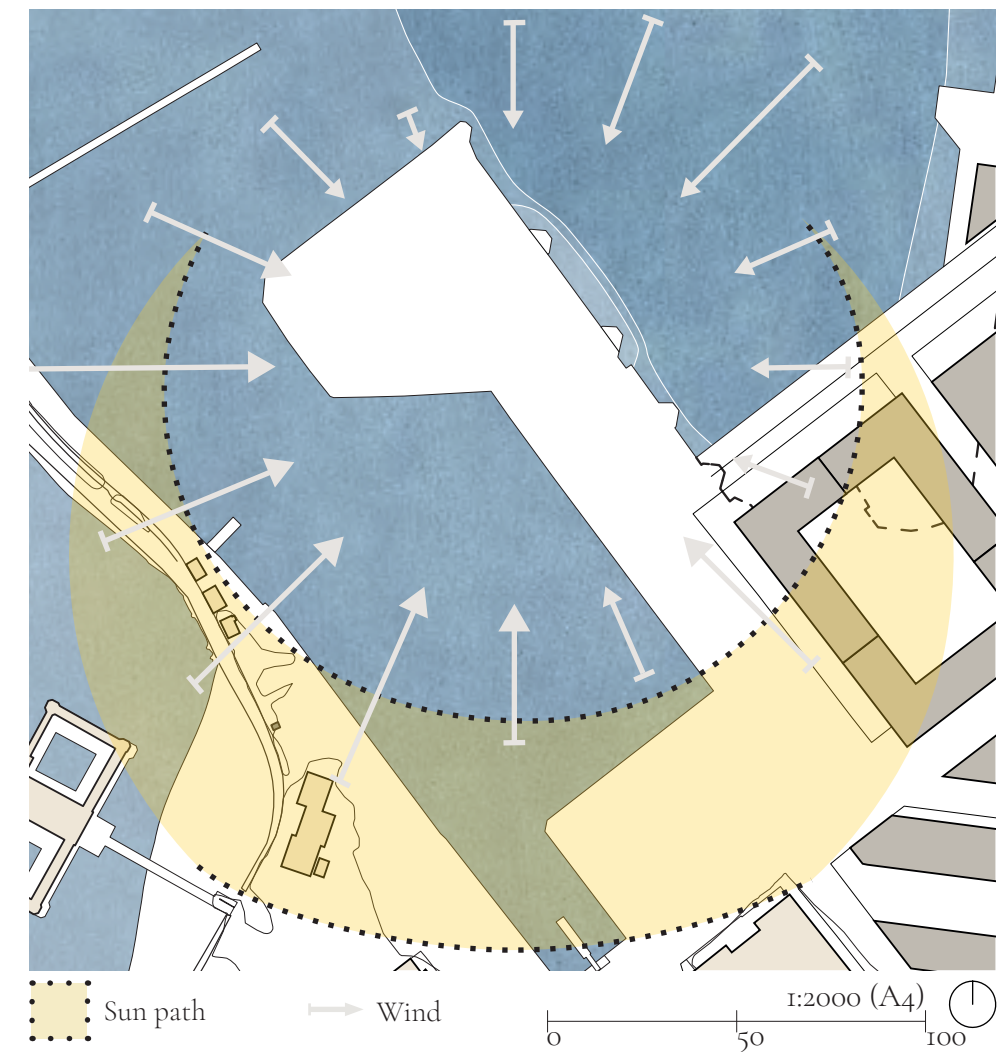
- ➡ A. Open-air bath house -Kallbadhuset
- ➡ B. The fortress
- ➡ C. The inner harbour
- ➡ D. Industrial harbour
- ➡ E. Västerport (future development)
- ➡ F. City centre

### FLOWS

The site is in connection to popular pedestrian walks, entering the project will begin with a journey out on the extended quay.

- ➡ 1. Sjöallén -The main walkway between the ocean and the city center.
- ➡ 2. Strandpromenaden (the ocean walk) ends at the base of the quay.
- ➡ 3. The quay walk (Kajstråket) -Planned extension of the ocean walk.
- ➡ 4. The Diagonal, planned main pedestrian road in Västerport.

## Natural elements.



### SUN

Sunlight and the sunset are important elements on the site. During the year's darkest day, the 21 December, sunrise is at 08.48 and sunset 15.29. 2020s lightest day, 19 June the sunrise is at 04.14 and sunset at 22.09.

### WIND

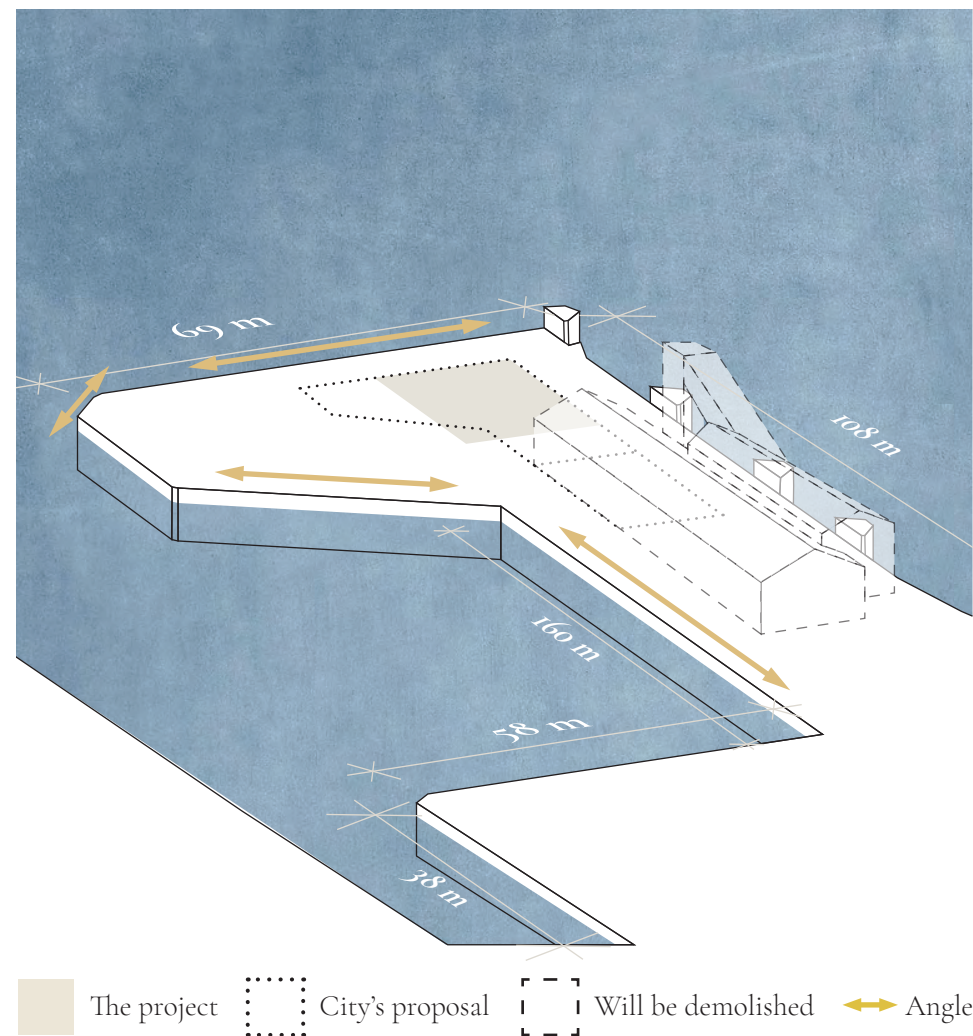
The main wind direction along the coast is west and southwest. Despite the location of the quay inside the outer breakwater, the wind is a constantly present element on the site.

### WATER

Surrounded by water this location brings fantastic opportunities to experience the closeness of the sea. Due to the expected consequences of climate change the plan is to raise the area from +1.9 m to +2.3 m with the building's finished floor height on +3.0 m above sea level. Waves is on the other hand not a big problem due to the location. (Varbergs kommun, 2019) Water has a proven calming effect on humans (Channon B. 2018) and the location being surrounded by it is therefore a good place for stress relieve.



## Prerequisites.



### EXISTING BUILDING

The building on the site today is the old ferry terminal which will be demolished as a result of that the ferry no longer depart from the site and that the water levels is expected to raise.

### THE CITY'S PROPOSAL

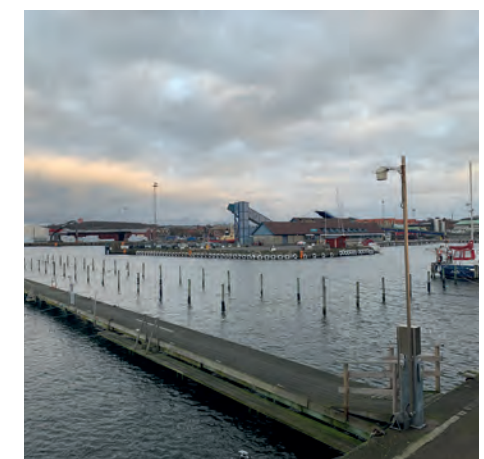
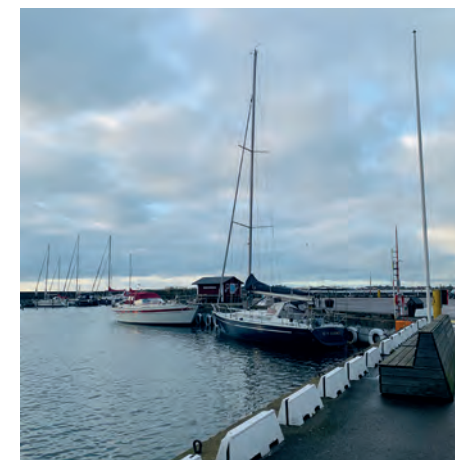
According to the proposed regulations, a building with public functions must be located on the site, however which specified function is still being investigated. The city wants an iconic building that represents the new area. The footprint for the building has not gained legal

power yet, but this master's thesis deviates from the shape of the footprint but not the height restrictions of 12 m above new ground level.

### HAVEN

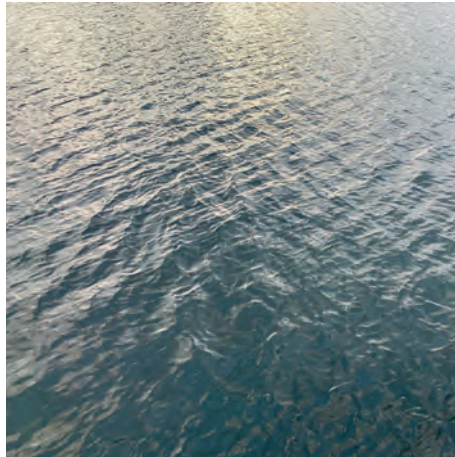
The location inside a marina means a character of life and movement on the surrounding water and it is not relevant to allow visitors to access the water. Today and in the future there are spots for anchorage along the entire quay.

## Architecture.





## Materials.



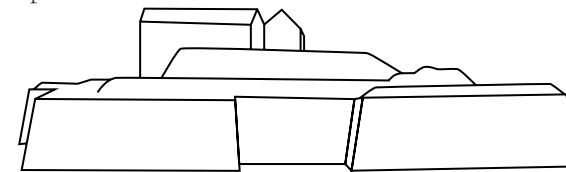
## Approach.

### ARCHITECTURAL ADDITION

The architecture in the area with historical buildings from different eras mixed with newer additions are varied in style, material and colour and show characteristic features of their time. Therefore, and because of the location as a sole structure on the extended quay, the building can be a solitaire one that complements the iconic buildings by the ocean.

### TILTED WALLS

The tilted walls of the fortress and outdoor elements in the area (also these inspired by the fortress) could inspire.



### MARINA

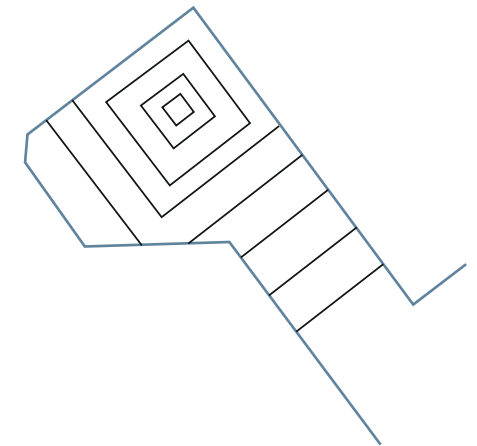
The surrounding water creates a barrier to the city buzz as visitors walk out on the quay. As the activities in the industrial harbour and along the waterfront sometimes can be rather busy it is an argument for creating alternative spaces in the building shielding visitors from all visual stimuli, layer by layer.

### PATTERN

The site has clear angles which are interesting to pick up and relate to in the design of the new building.

### JOURNEY OUT ON THE QUAY

The journey into the building begins with the walk out on the quay as you step by step gets further away from the city's stress. Visitors pass through layers along the walk towards the centre of the building. This sequence becomes part of the design.



### QUAYSCAPE

Due to that the quay is being elevated there is a possibility to use the one meter elevation to create levels on the quay.



# 04. Atmospheres.



“..to introduce a sense of freedom of movement, a milieu for strolling, a mood that has less to do with directing people than seducing them.”  
- Peter Zumthor (2006) p. 41

## Nature of space.

The atmospheres in nature and how they affect our well-being is in *14 patterns of Biophilic design* described by 4 conditions, Refuge, Prospect, Mystery and Risk/Peril.

### PROSPECT

Prospect conditions are open and freeing. It is the ability to have a good overview of one's surroundings and the space you are in, as well as to see from one space to another. Prospect is longer sightlines with distant focal lengths, that gives a greater sense of comfort and space awareness. Good prospect reduces one's stress responses and gives a sense of control and safety. It can also reduce irritation and fatigue. (Browning, W.D., Ryan, C.O., Clancy, J.O., 2014)

### REFUGE

Refuge is a place to breathe out in and to withdraw to. It is a place to find shelter from weather, wind, predators as well as activity. It's a place to be alone or with a selected few. A place with refuge conditions is important for recovery and restoration experiences. It reduces stress through lowered blood pressure and heart rate. Being there reduces the feeling of vulnerability and increases the sense of safety while improving one's concentration. (Browning, W.D., Ryan, C.O., Clancy, J.O., 2014)

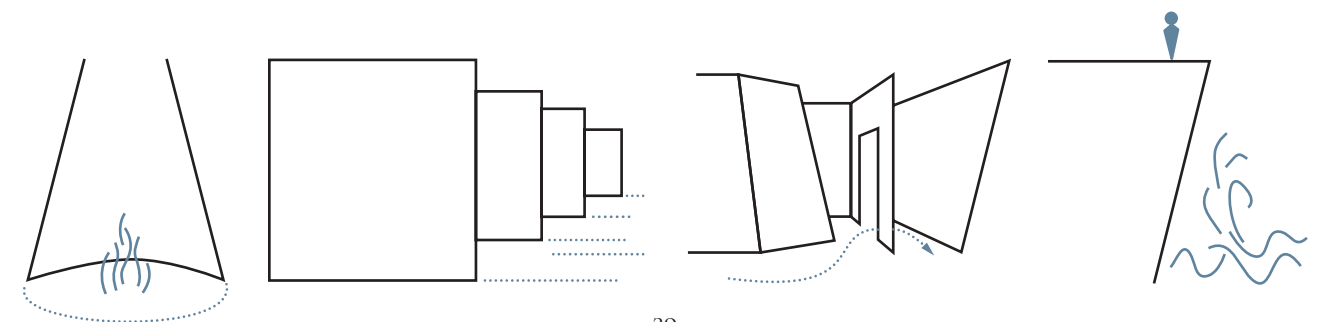
Sitting in a tree with your back against the trunk overlooking your surroundings is one of nature's prospect-refuge settings.

### MYSTERY

Mystery characterizes a place where you are encouraged to through movement explore and seduced to move forward to see what's around the next corner. The goal by using mystery is to encourage exploration in a way that reduces stress and supports cognitive restoration. The benefits include stronger pleasure responses, improved preference of space, increased curiosity and interest and a greater likelihood of encountering other conditions of Biophilic Design. (Browning, W.D., Ryan, C.O., Clancy, J.O., 2014)

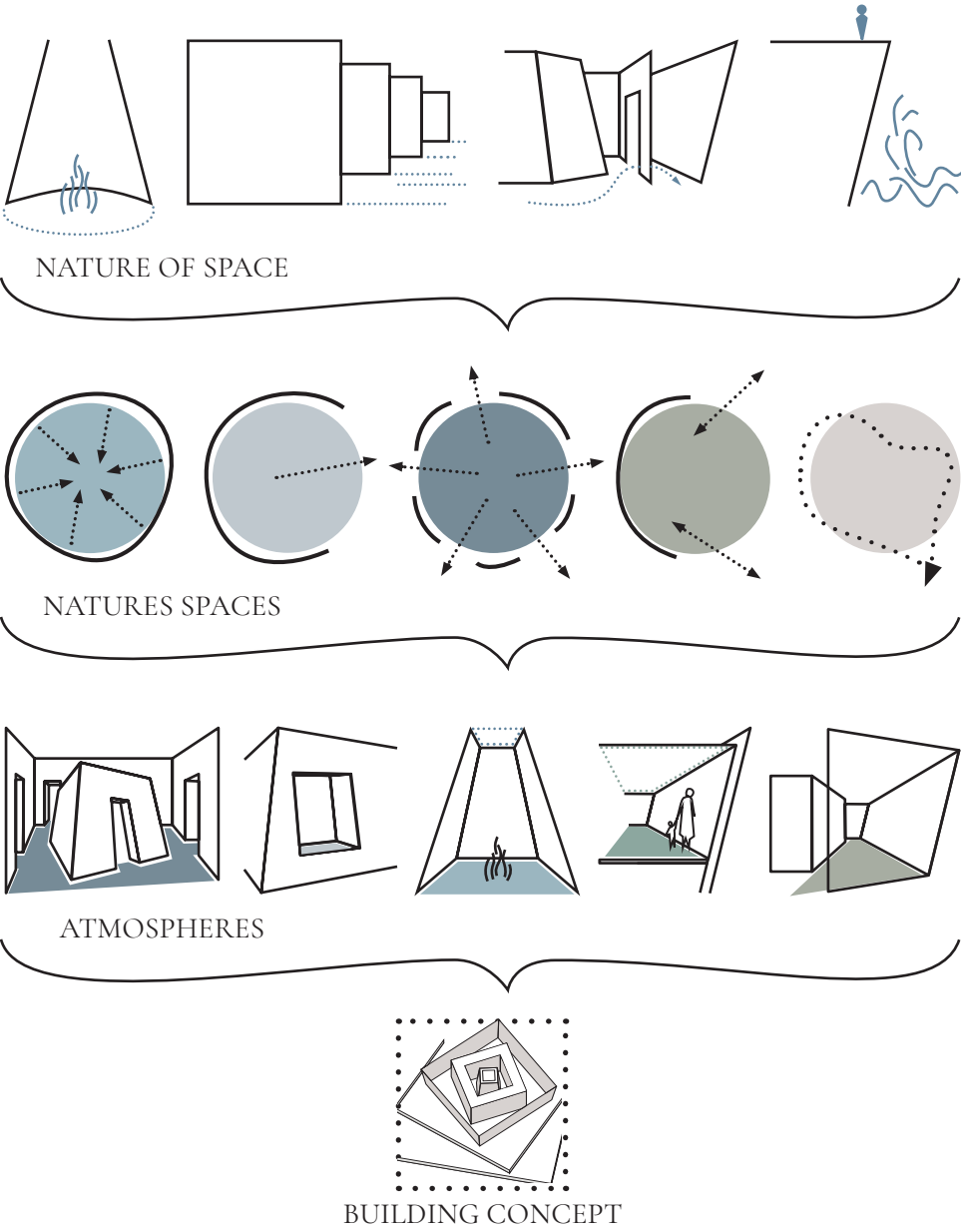
### RISK/PERIL

A space with a good Risk/Peril condition feels exhilarating and is triggered by a near and present danger. This danger, however, is inert and unable to cause harm due to a trusted element of safety. The element of safety protects you from harm while still permitting the experience of risk. A cantilevered walkway over a sheer cliff is an extreme case; whereas, rock hopping over a water presents the risk of getting one's feet wet. Having an awareness of a controllable risk can support positive experiences that result in strong dopamine or pleasure responses. In adults, short doses of dopamine support motivation, memory, problem solving and fight-escape responses. (Browning, W.D., Ryan, C.O., Clancy, J.O., 2014)



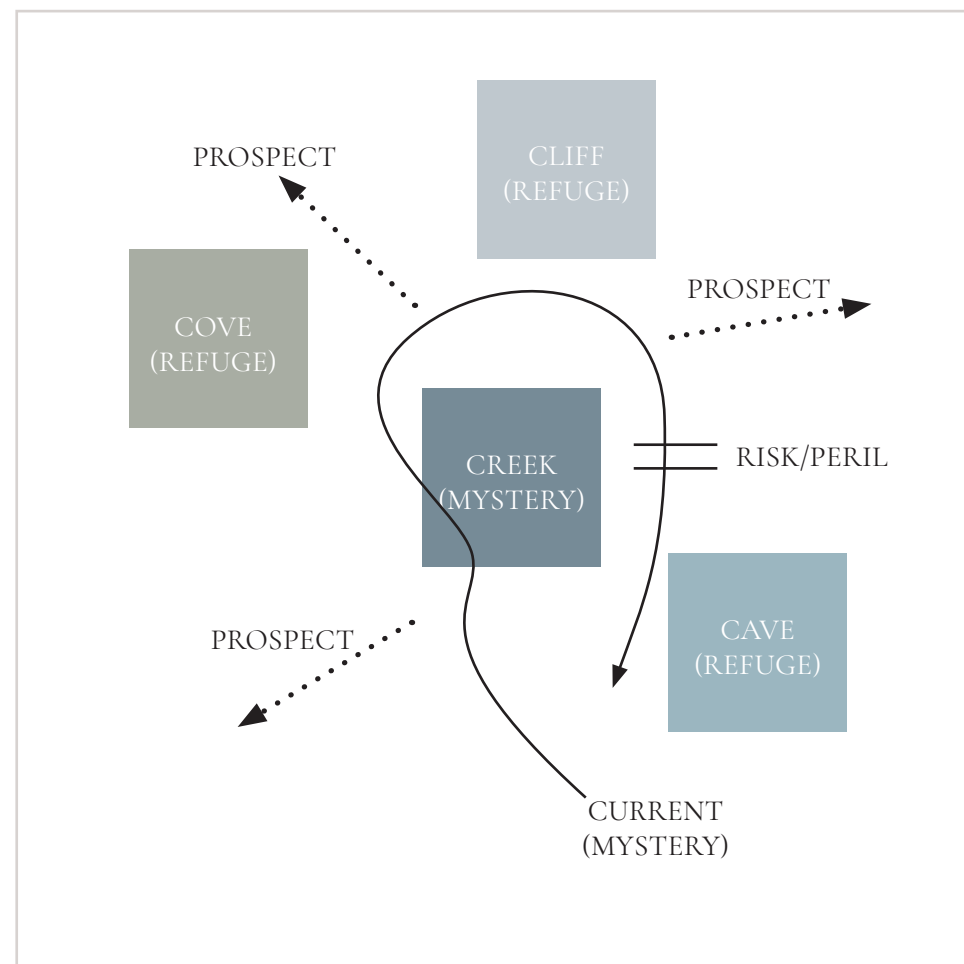


From research to design.



The building and atmospheric concepts in this project takes off in the theory of the four situations in Nature of the Space. Refuge, Prospect, Mystery and Risk/Peril are in connection with the places for different types of being, program and site analysis translated into spatial concepts based on coastal spaces in nature. The combination of these and the program has lead to atmospheric concepts and a building concept for a Visitor centre on Hoken in Varberg.

## Natures spaces.



*“Let the current guide your way”*

The building is structured with areas for different types of being, inspired by the diversity of nature. A current flow through the project connecting coves with caves, cliffs and creeks. A movement connecting places for activities with places for being together and places for being alone. Enabling visitors to experience different atmospheric qualities based on the diversity of nature.

### CREEK

Atmospheres that opens up in different directions, where you can chose different paths and get prospect views, seducing you to move ahead.

### CLIFFS

Nooks where you can find refuge similar to hiding out in between cliffs, still offering some prospect to overlook your surroundings.

### CAVE

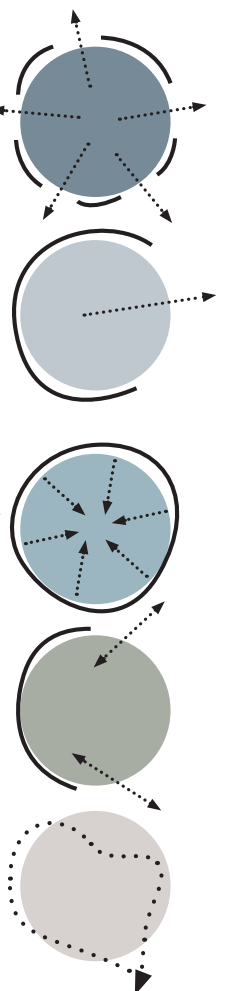
Enclosed refuge where you are protected from the surrounding environment, sheltered from the urban life for contemplation and focus inwards.

### COVE

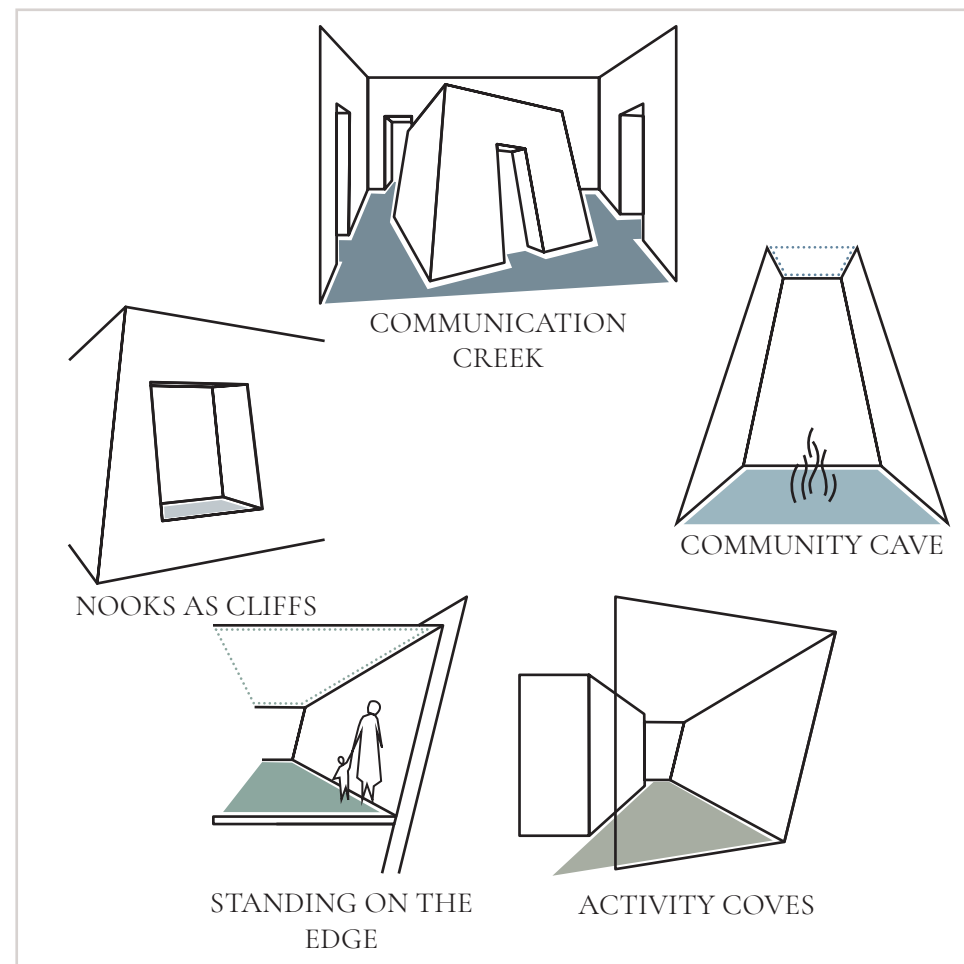
Spaces opening up to and inviting the surroundings, but still giving some shelter and protection from behind.

### CURRENT

The mystery path connecting functions and knowledge and inspire you to stroll and experience different atmospheres.



## Atmospheric concepts



### COMMUNICATION CREEK

The movement through the building goes through a central communication where prospect views seduce you to move through the layers of the building. In the book *Atmospheres* the author and architect Peter Zumthor (2006) writes "...to introduce a sense of freedom of movement, a milieu for strolling, a mood that has less to do with directing people than seducing them." This space is about exploring and movement.

### COMMUNITY CAVE

The community room is based on the feeling of gathering around a campfire and the atmosphere of a cave, protected and separated from the surrounding life. Through a skylight the weather and stars are visible to give a sense of the outdoors but still shelter you from the city, traffic and activity going on outside.

### STANDING ON THE EDGE

To move along the facade is a risk/peril moment, like walking on the edge of a cliff. Tilted double glassed facades give the opportunity to look down on the outside environment. This gives that exhilarating feeling of high heights and prospect views of the ocean and urban life, still protected from the rain

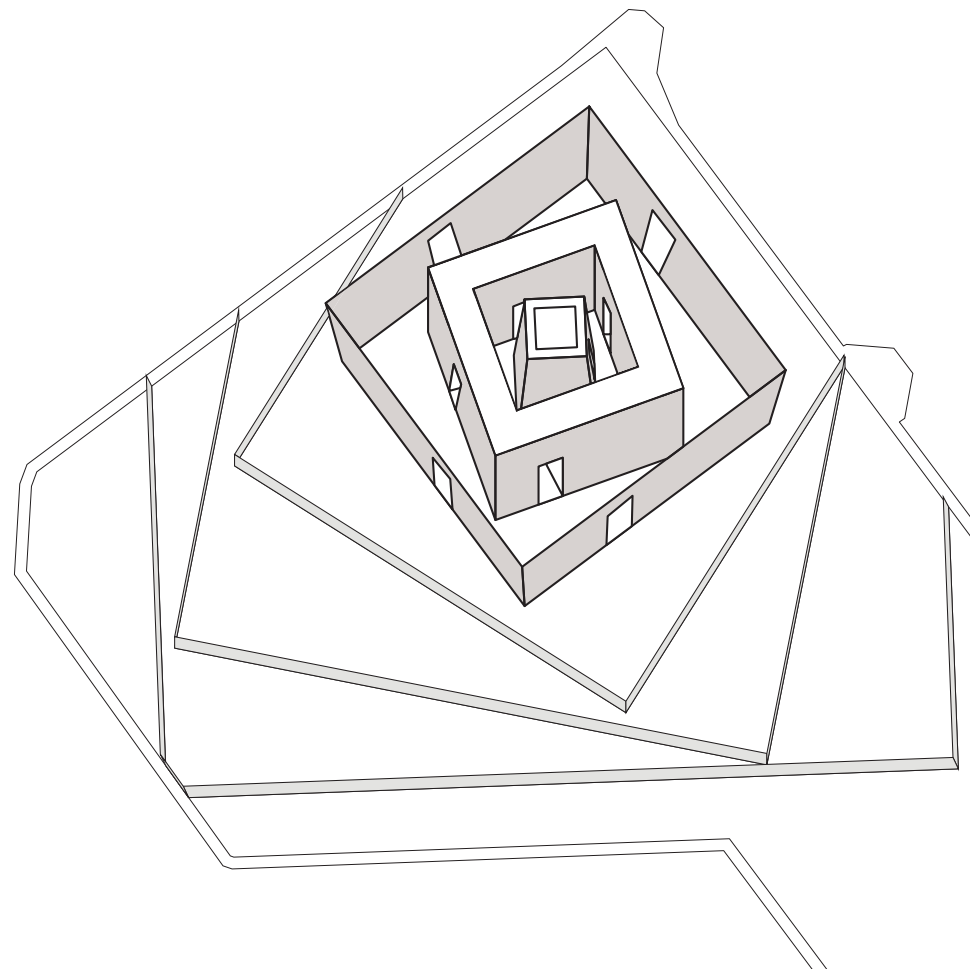
hitting the glass and noises from the outdoors.

### ACTIVITY COVES

Glass walls opening up the spaces to the community outside inviting them to participate in the activities going on. The atmospheres showcase the activities to seduce visitors to enter the building whilst still offering a protecting structure behind.

### NOOKS AS CLIFFS

Smaller nooks in the walls give refuge to breathe out in while still seeing what's going in the surroundings. Creating the combination of refuge and prospect on different levels, some with long prospects and some more intimate. Larger nooks are created to enable groups to be together.



## Building concept.

### VOLUME MYSTERY

A box within a box, within a box. Like the Russian dolls does the building revile more and more, layer by layer. As moving towards and into the building one peel away the city buzz step by step.

Though the outer glass layer you see the inner facade that in turn hide what's behind. Peter Zumthor writes that; "The Facades says: I am, I can, I want.. ..The facade also says: but I am not going to show you everything." (Zumthor P. 2006 p.47) This quote gives a hint of the mystique of the layers seducing visitors to move through to explore what's hidden.

### THE TWIST

The buildings form has been anchored on the site by picking up the sites borders by gradually turning the building elements emphasizing the angles of the quay.

### TILTED WALLS

Inspired by the fortress sloping walls is the facade tilted outwards, opening up the building and creating an more interesting shape that connects with the context. It also enable some sense of risk while walking along the facade. The inner box is on the other hand tilted inwards creating a more intimate space.



# 05. Materiality.



## Natural materials.

### NATURAL ANALOGUES

Natural Analogues addresses direct and indirect evocations of nature. Materials, organic and non-living objects, colors, shapes and patterns found in nature and manifested in the built environment. As well as Mimicry of nature and natural materials that have been processed or altered like wood planks. These providing an indirect connection to nature. The advantages in consideration to mental health is among other decreased diastolic blood pressure, increased comfort and positive effects on stress responses. (Browning, W.D., Ryan, C.O., Clancy, J.O., 2014)

### WOOD

We spend 90 percent of our lives inside today, consequently the indoor environments means a great deal for our well-being. Wood is a renewable and living material that can affect both the physical indoor environment like temperature, humidity and acoustics as well as how we experience the spaces.

Wood has the ability to give positive relaxation. The wooden structure has a pattern that is so complex that we can spend time just studying it, still so smooth that we don't get tired by it. It gives us an opportunity to disconnect from our pain or even for a while forget that we are stressed. The warm colour of wood also often gives us a positive feeling says Anders Q. Nyrud, professor at the Faculty of Environmental Sciences and Natural Resource Management at the Norwegian University of Life Sciences (NMBU). (Moelven. 2020).

The tactility of wood can help us focus and be present in the moment which has proven to be beneficial for our mental well-being (Channon B. 2018)

In local context, Varberg has for many years been the country's leading export port when it comes to wood. As Sweden is the third largest exporter of wood products in the world, it says a lot about what volumes that pass by the site daily. (Varbergs kommun 2019)

### STONE

The municipality has an ambition to reuse the stone from the existing quay built with local granite in the design of the public outdoor environments. (Varbergs kommun 2019) The bedrock in the surroundings consists of red granite and the rare rock charnokite (Varberg's granite) which is grey-green in colour.

### LOCAL MATERIALS

Except from the environmental advantages of using local material there are arguments for it connected to our need of belonging to a context. Using indigenous materials that connect to the local conditions and surrounding strengthens the positive relation to place. With the sites visual connection to the monolithic stone structure of the fortress and the reuse of the granite from the harbour it also strengthening the connection to the areas culture and enhancing our collective memory. A strong connection to a place makes us feel connected not only to the site but also to each other by belonging to the same place and community. (Kellert, S. Heerwagen, J. Mador, M. 2008)





## Wood -Shou sugi ban.

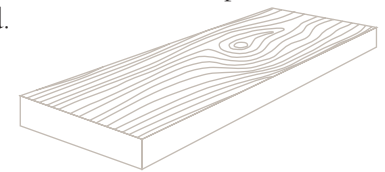
Yakisugi or Shou sugi ban is a old Japanese wall cladding traditionally made from cypress planks and intensely burned as a preservative heat treatment. The heat treatment improves siding longevity by minimizing rot and infestation, hardening the planks and making them more dimensionally stable. The soot layer increases the temperature needed for combustion therefore improving the fire retardancy.

The technique and process  
Yakisugi is traditionally made by bounding three planks of Sugi Cypress wood together to form a long triangle tunnel, and then starting a fire within to char the wood.

Although Cypress has historically been the type of wood used, development has progressed. Today, cedar wood is commonly used, but pine and spruce wood are also frequently used in the manufacture of the burnt wood planks. In the last decades the material treatment has been more widespread and the process has developed and modernized. Yakisugi is a product, not a burning technique and since then the technique of burning is not as important as the way it impacts the wood.

Cooper, K. (2017)

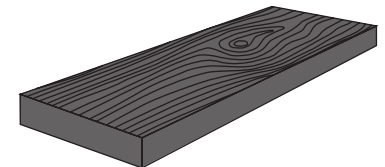
The process starts off with carefully selecting the timber and dimensions. The planks are then air or sun dried.



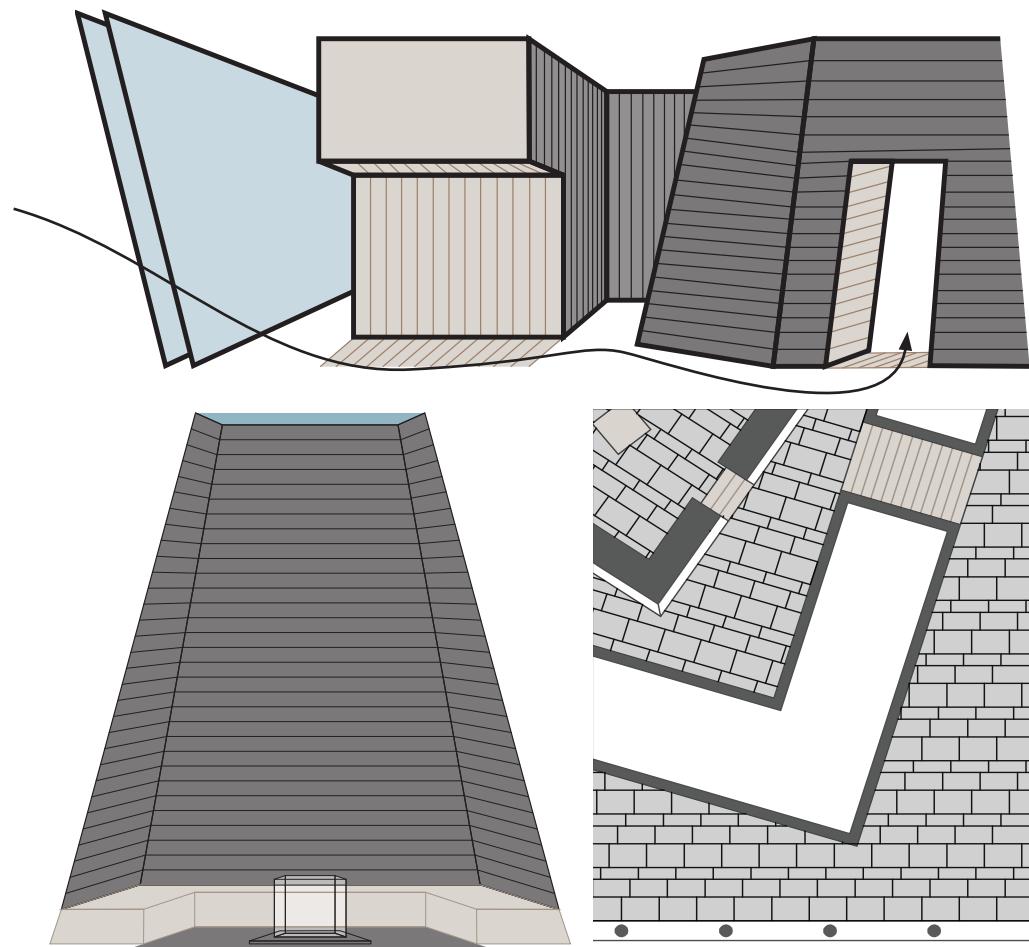
Step two is to char the top 5 mm of each board. The heat treatment should be intense and the wood is then quenched at the right moment. All surfaces are charred to a crocodile pattern called Suyaki. The boards are then dusted of dried again.



The wood can then be kept like Suyaki (original charred), or brushed with different brushes to achieve the other traditional products Gendai (gently brushed) or Pika-Pika (brushed with a steel brush). The boards can be left like this or one can finish with a natural wood sealant or oil.



## Material concept.



### BURNT WOOD

As visitors move in through the layers of the building the spaces will become darker. The outer box has a double glass facade towards the outside letting light in to its spaces.

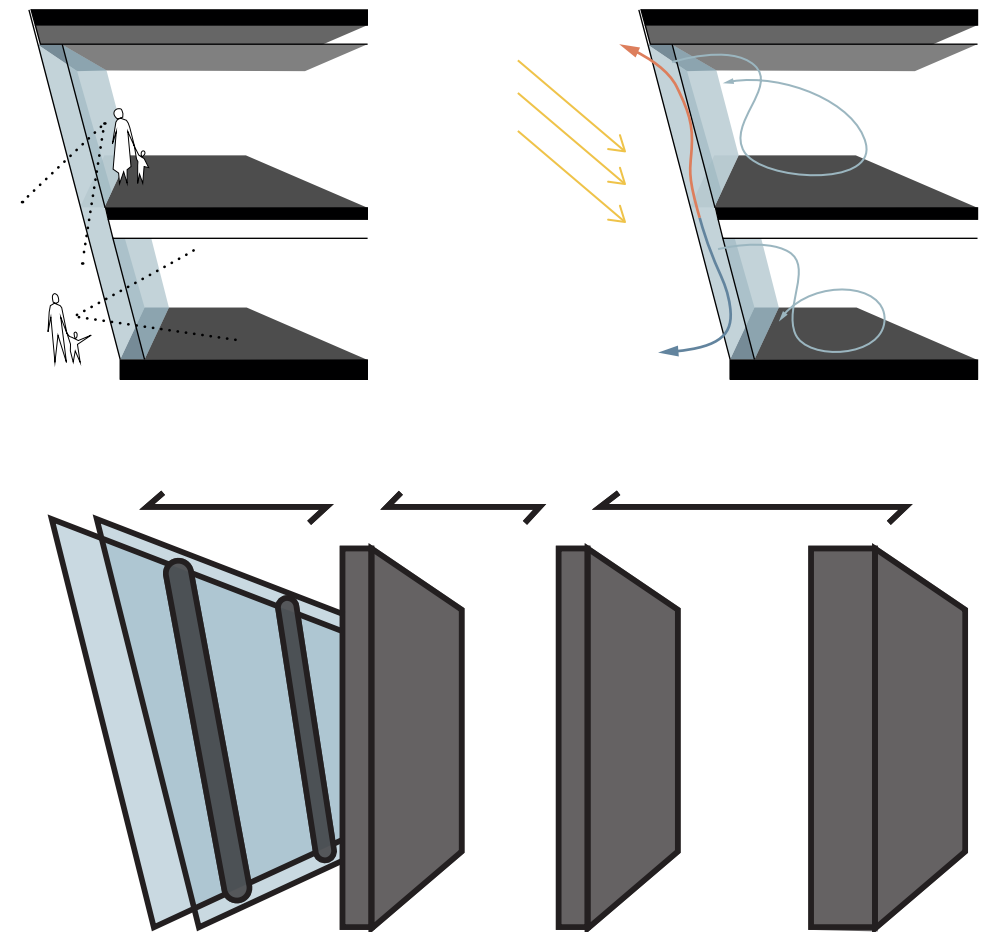
The walls of the inner boxes is burnt, the first one in Gendai style where the structure of the wood still remains. The panels are vertical to raise the feeling of height in the spaces. The inner tilted box has horizontal paneling to lower the feeling and make it more intimate.

Inside the inner box, in the core of the building the panels are charred in Suyaki style, matching the function of the room where people gather around a campfire. All passages between boxes and nooks are in natural wood to enlighten them and create a warm feeling.

### GRANITE

The granite slabs follows the boxes both inside and outside to enhance the rotation as visitors pass through the layers.

## Structural concept.



### DOUBLE GLASS FACADE

A tilted double glass facade has the atmospheric advantage of enhancing the Risk/Peril condition of standing on the edge, being able to see down through the glass elements.

It also has a climatic propose, due to that glass facades heat up like greenhouses when the sun shines for most of the year and therefore have to be cooled. A somewhat natural ventilation can be accomplished, helping to keep a good temperature on the inside when the sun shines on the large glass parts.

A more low-tech ventilation system can be used inspired by the nature example of termites.

### CONSTRUCTION

The load-bearing system consist of pillars between the glass elements in the facade and solid walls along the boxes within the building.

## Detail.



0 0,5 1  
1:20 (A4)

The drawing shows more in detail the wood cladding around and in nooks. The combination of natural wood together with Gendai burned wood is used to highlight the refuge spaces within the darker areas. The natural wood is used to create a sense of comfort and warmth where visitors have places for relaxation, focus and contemplation.

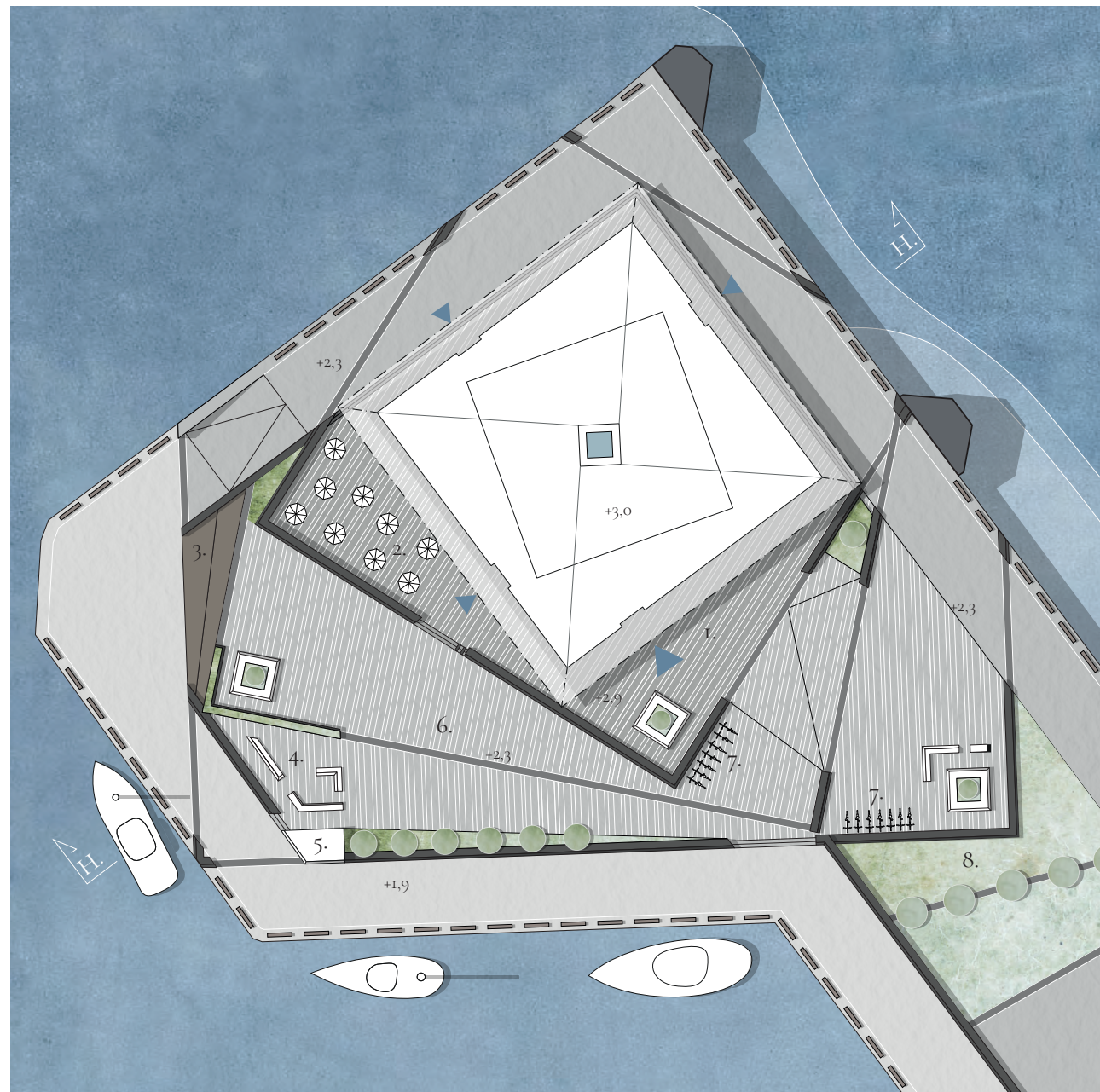
Features like spotlights in the ceiling to provide good reading light or a dimmed down cozy setting accompanied with outlets for charging devices are placed in the nooks to meet the need of the users.

The tactility and pattern of the wood in the surrounding spaces are highlighted by using indirect light from above on the burned walls. The flooring is granite of the same type as outside connecting the spaces.



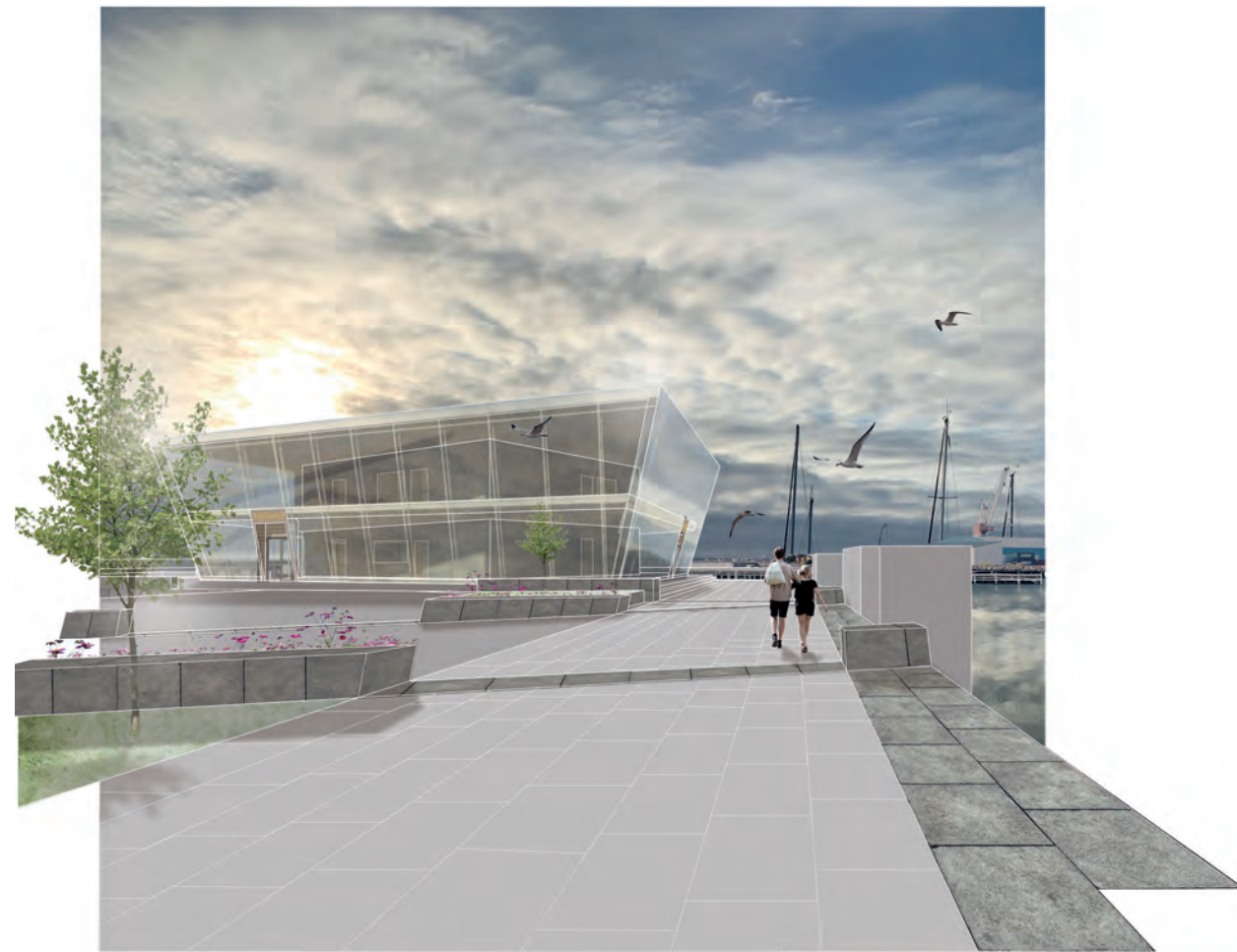
# o6. Design proposal.

## Siteplan.

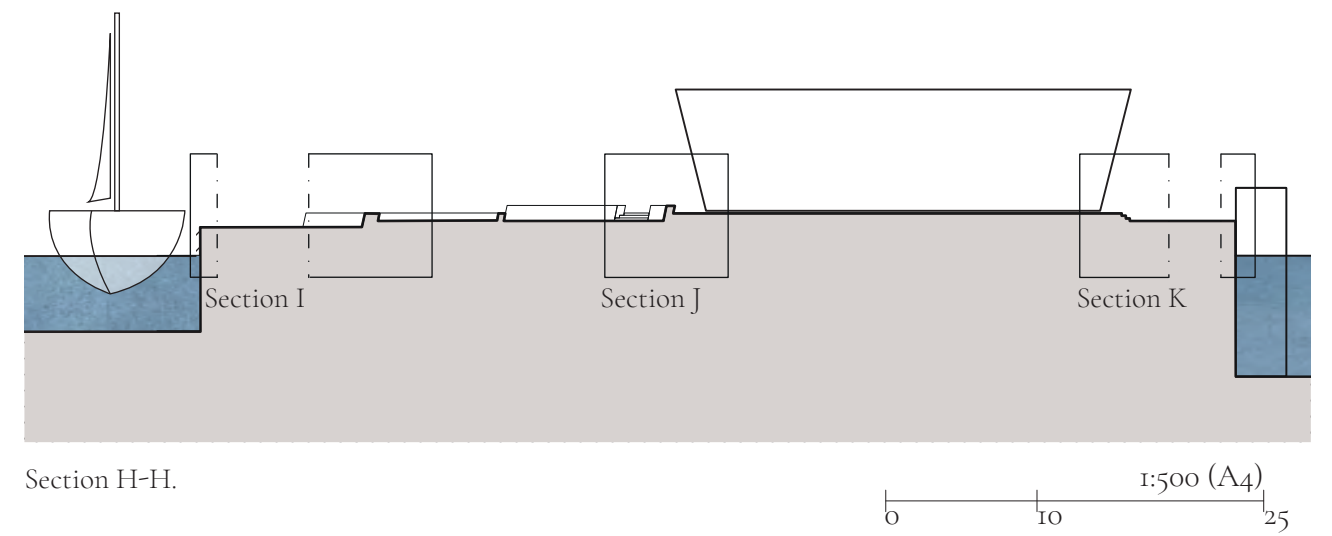
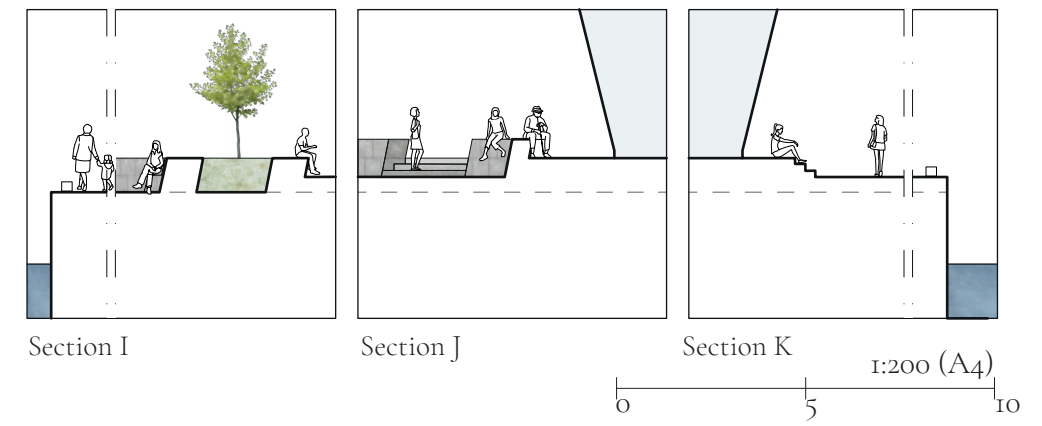


1. ENTRANCE SQUARE
2. CAFÉ OUTDOOR SEATING AREA
3. SUNNY STAIRS
4. SEATING AREA
5. UTILITY BUILDING
6. ACTIVITY SPACE
7. BIKE PARKING
8. PARK

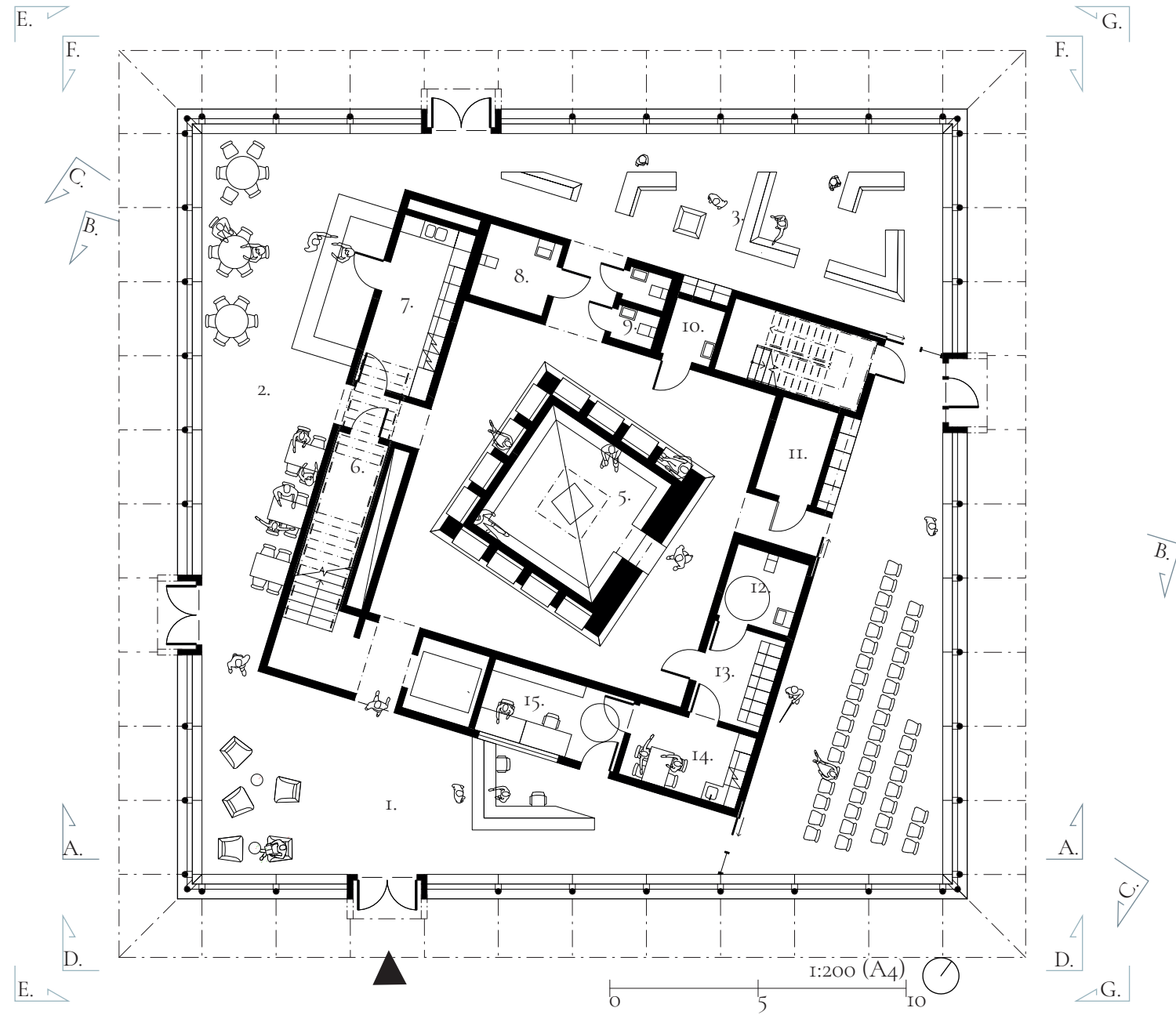
Total area of the building 1465 sqm divided on two main floors and a smaller technique floor with a total hight of 9,6 meters.



## Outdoors.

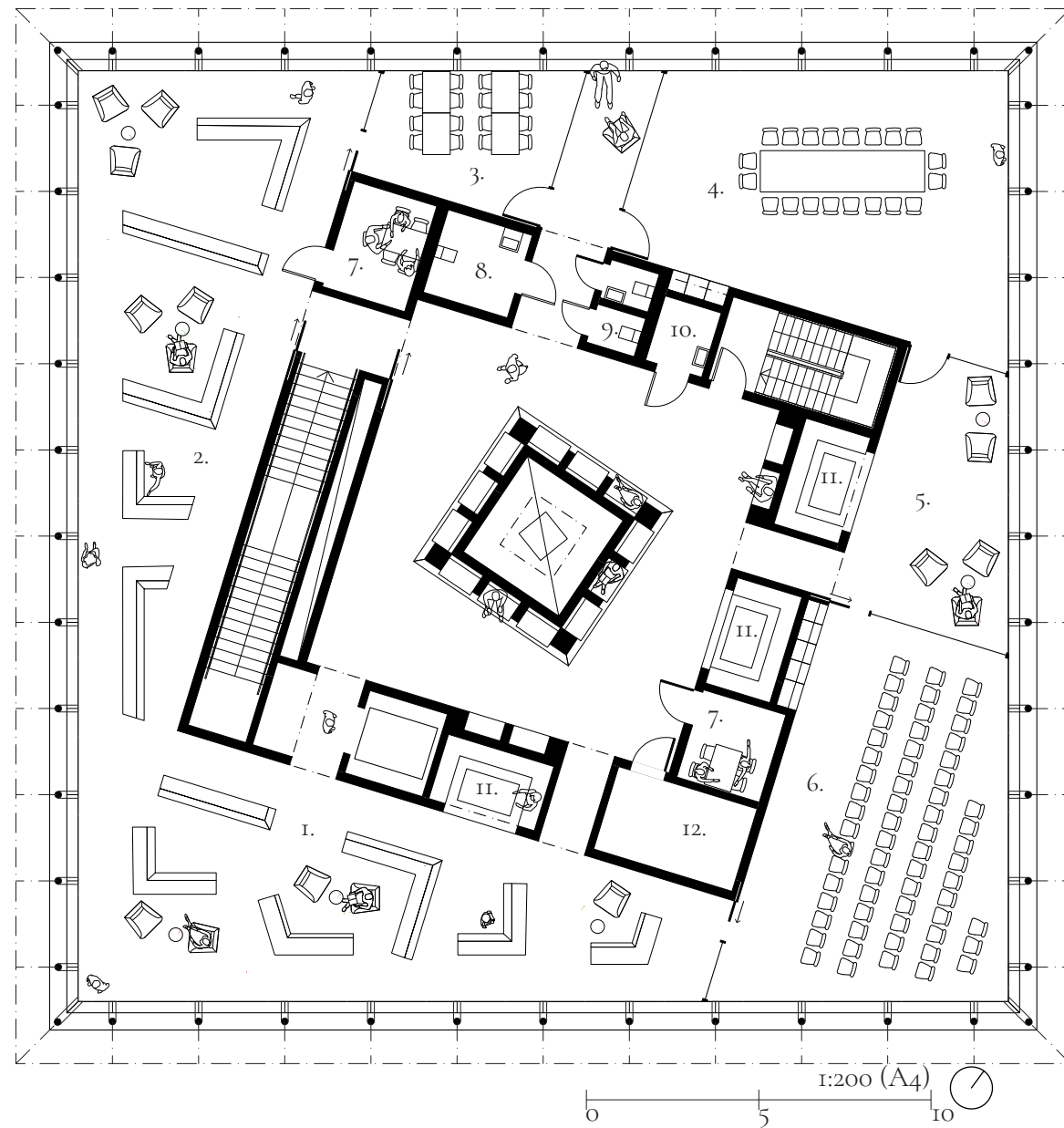


## Floor plan entrance level.



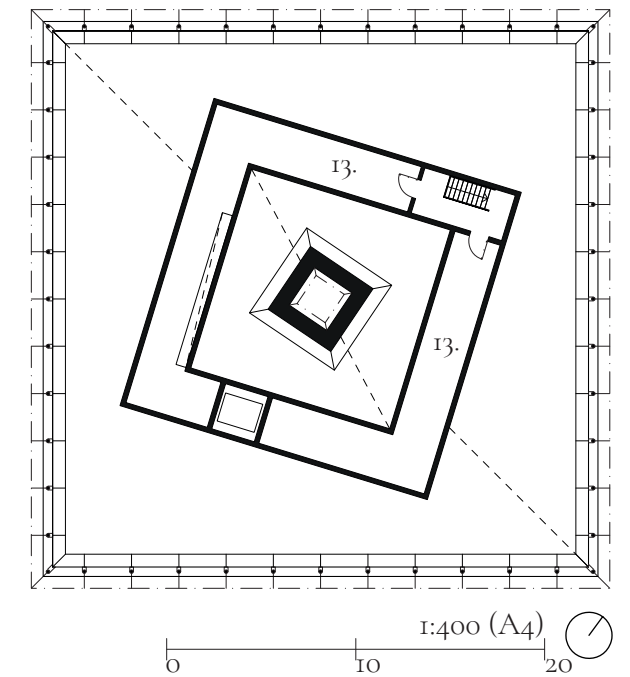


## Floor plans level 2 & 3.

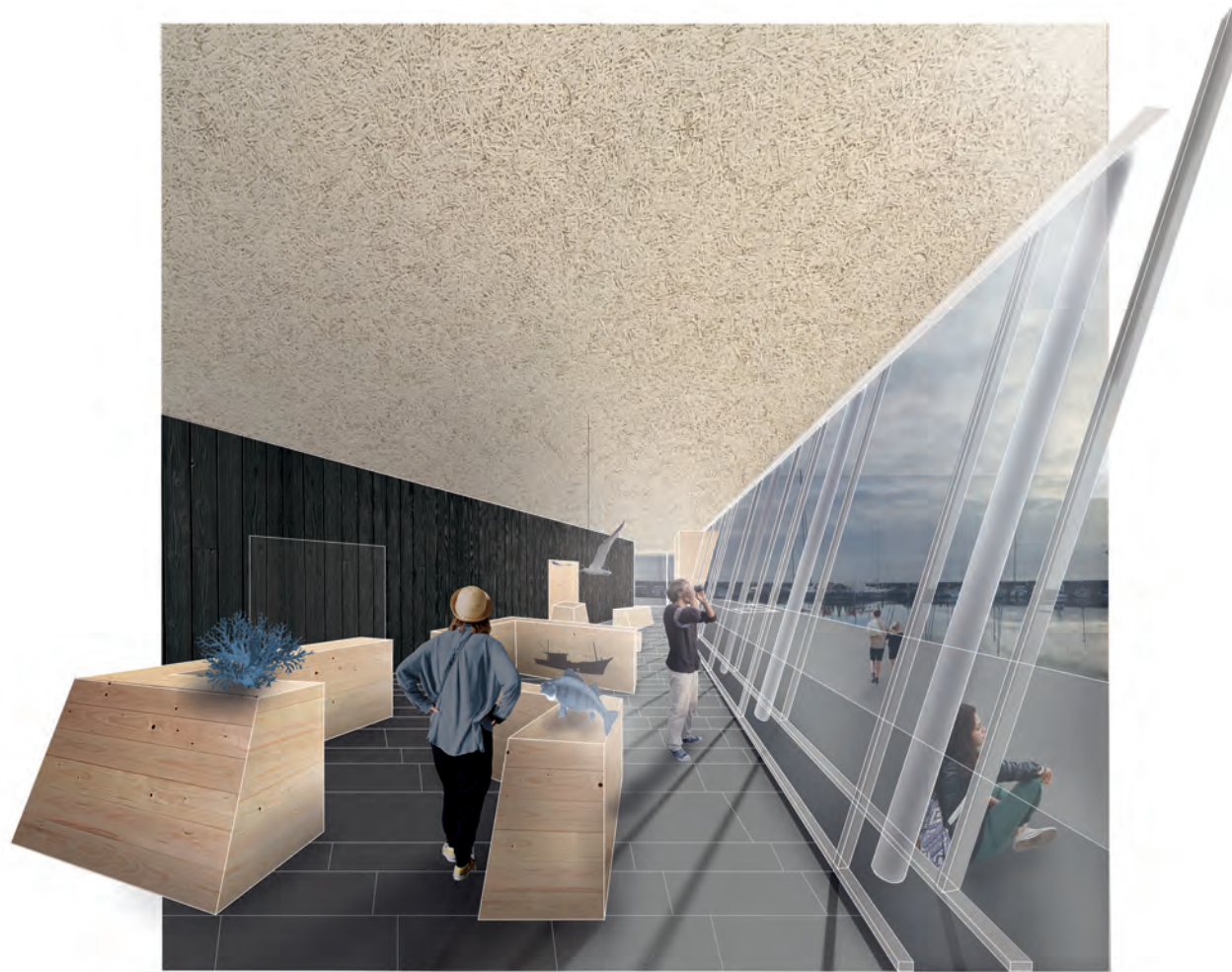


- 1. LIBRARY
- 2. LIBRARY
- 3. SMALL ACTIVITY ROOM
- 4. MEDIUM ACTIVITY ROOM
- 5. LOUNGE CONFERENCE ROOM
- 6. BIG ACTIVITY ROOM
- 7. GROUP ROOM
- 8. RWC
- 9. WC
- 10. UTILITY ROOM
- 11. GROUP NICHE
- 12. STORAGE
- 13. TECHNIQUE

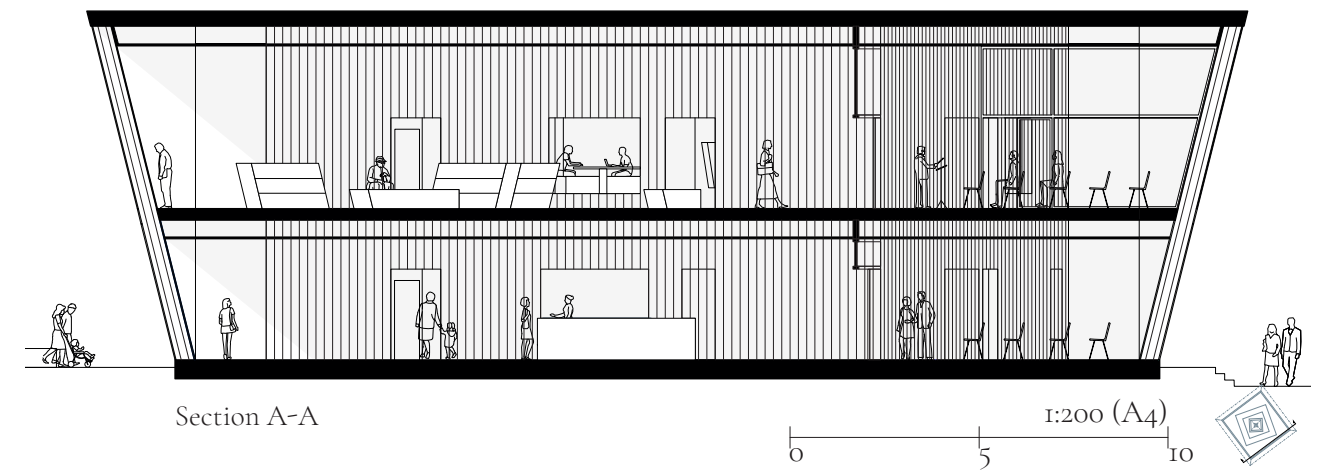
The third floor is limited to the enclosed space within the middle box for technical spaces.



Outer cube.

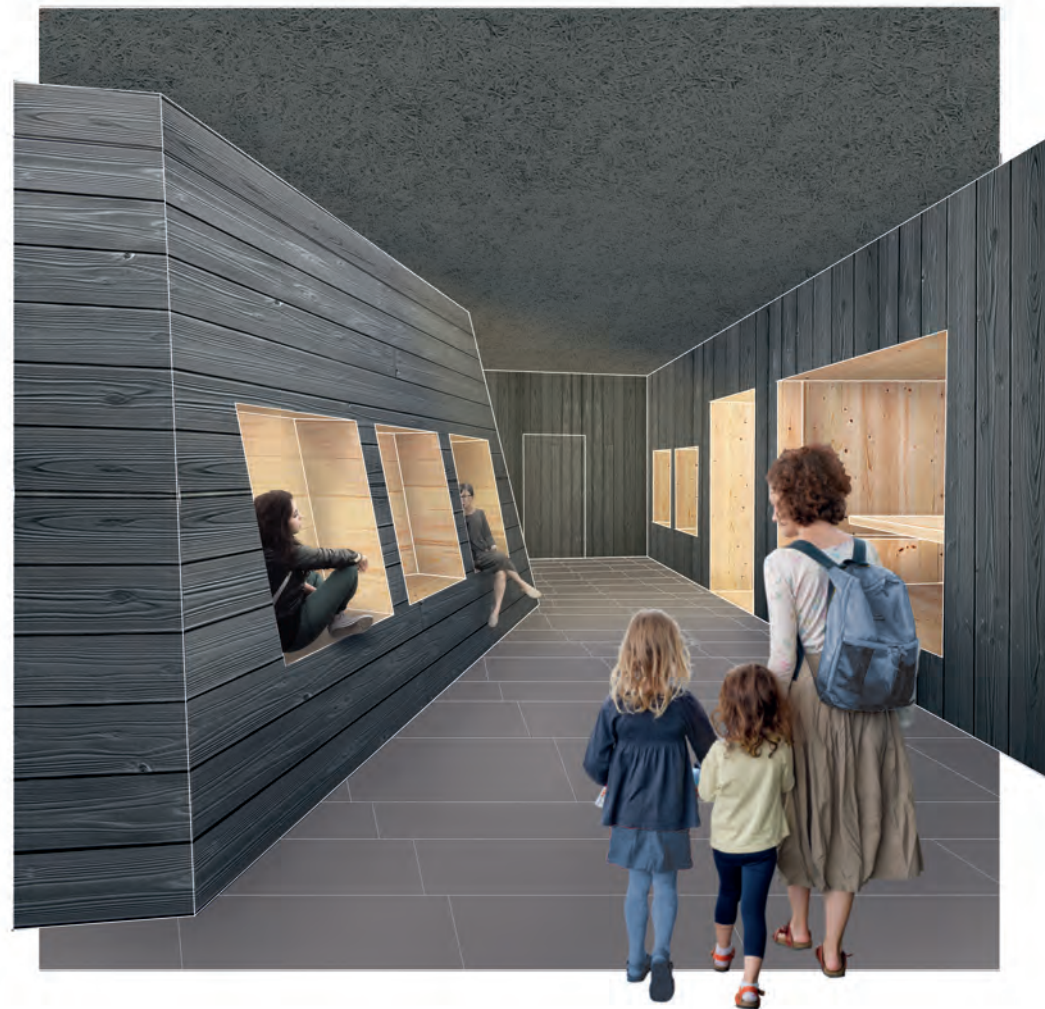


View of activity cove, exhibition .

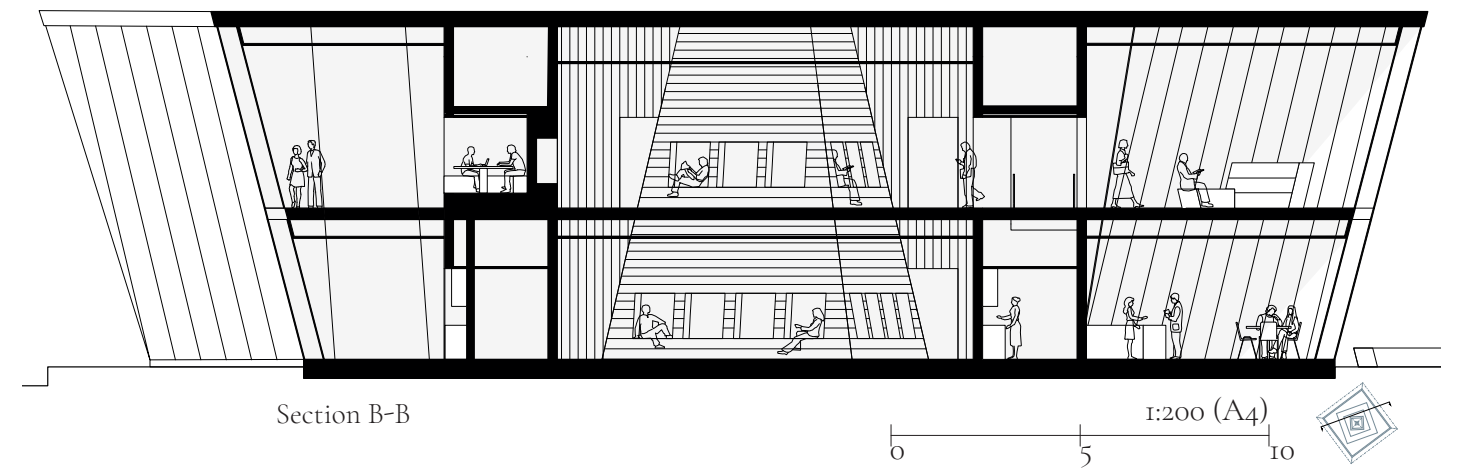


Section A-A

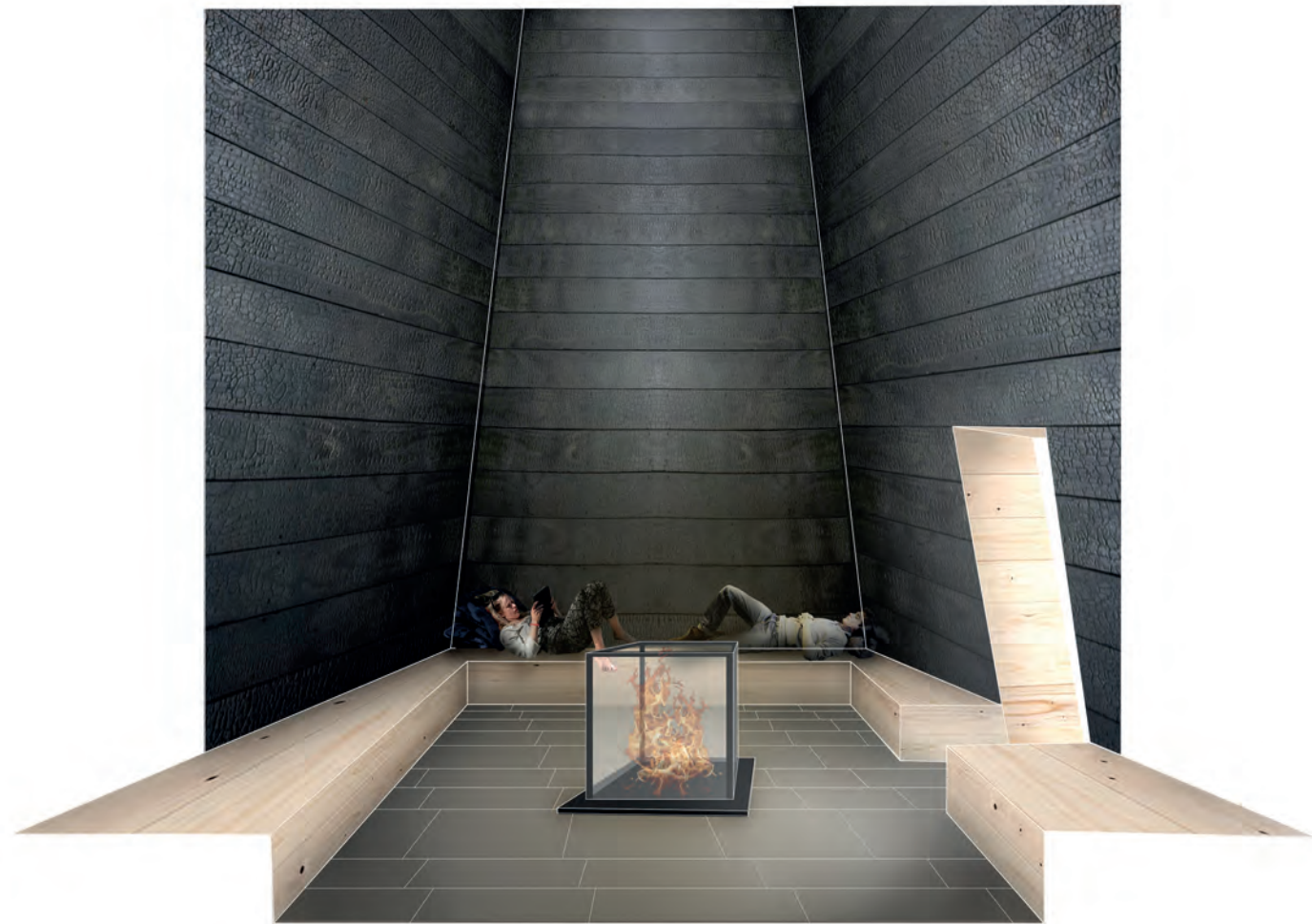
Middle cube.



View of communication creek and nooks.

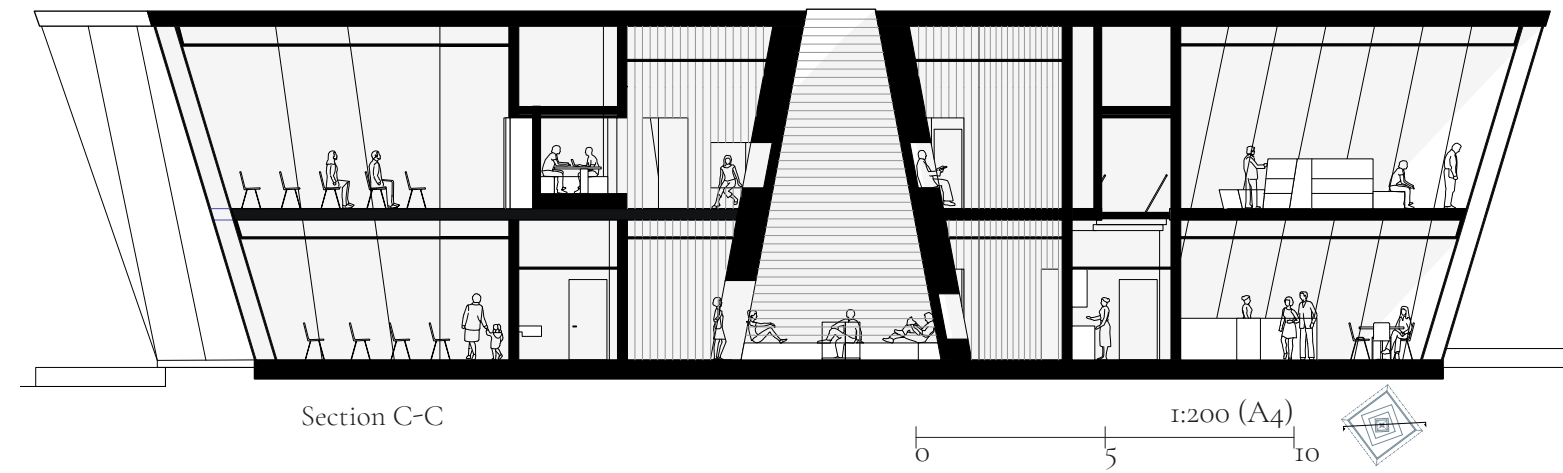






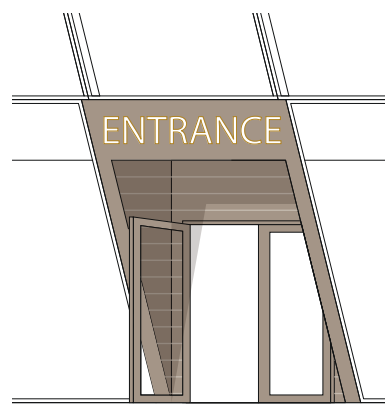
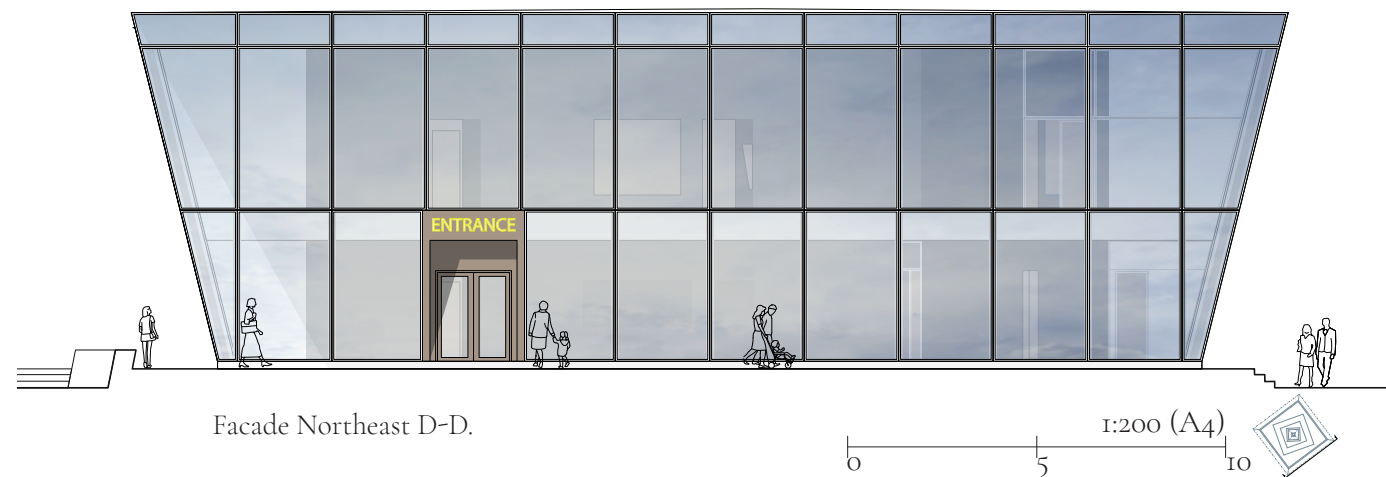
View of community cave.

Inner cube.



Section C-C

0 5 10 1:200 (A4)



#### ENTRANCES

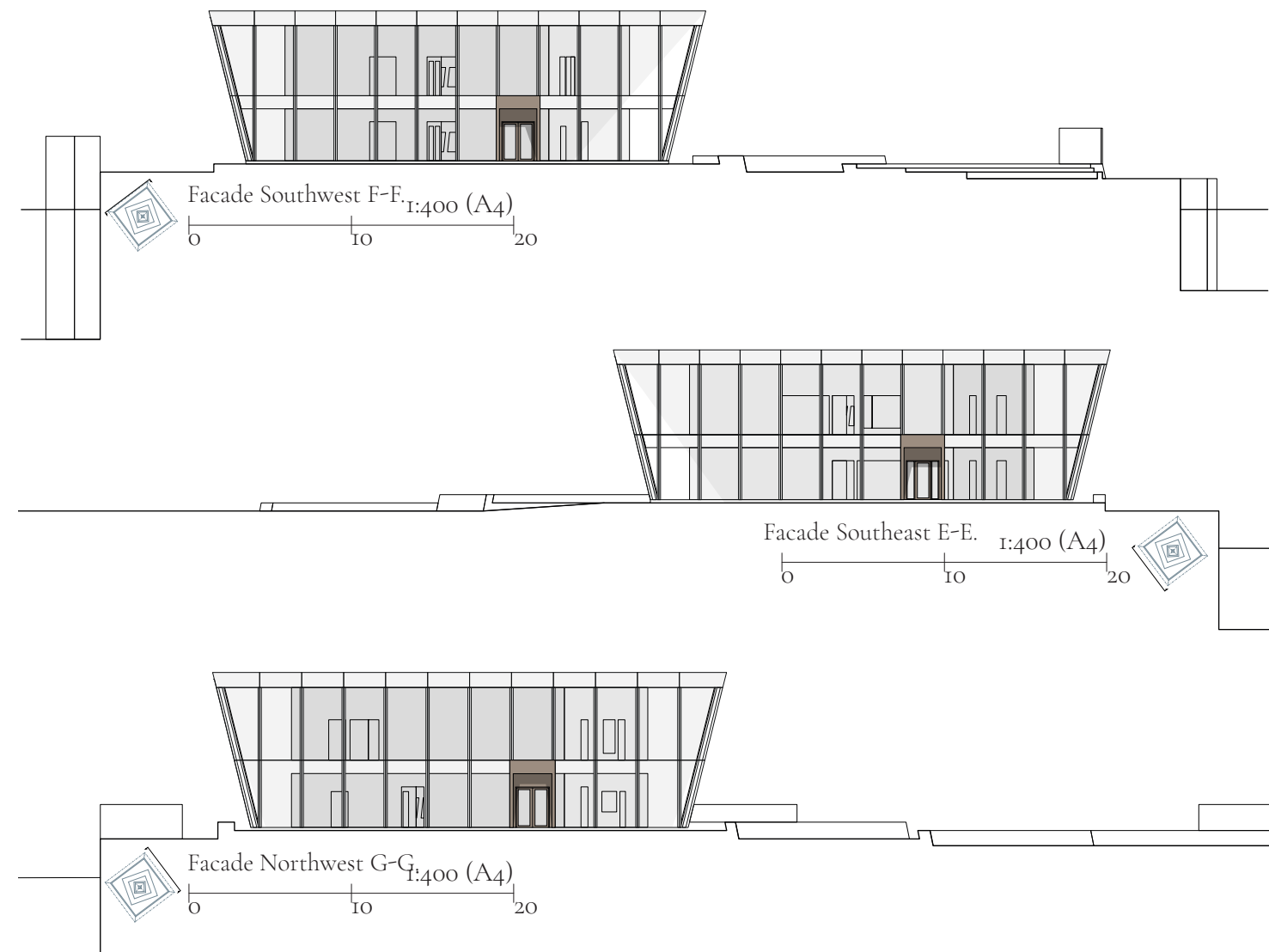
The entrances are pushed into the structure creating entrance nooks in the tilted walls. Warm wood is used to highlight the entrances on the otherwise plain facades.

#### LAYERS

You will see the inner black wooden facade through the transparent outer facade as well as get a glimpse of the passages into the inner spaces. The quote under by the renowned architect Peter Zumthor describes the intended feeling of the facade.

*“The Facades says: I am, I can, I want.. ..The facade also says: but I am not going to show you everything.”*  
*-Peter Zumthor (2006) p.47*

## Facade.



## 07. Reflection.

*How can we design public buildings in a Scandinavian context that helps to decrease urban stress?*

After finishing this thesis the answer I have found to the question of how we can use architecture to help decrease urban stress is that there are many different ways for design to be used. As argued in this thesis, Biophilic Design is one way to use architecture to design our physical environments to have a more positive impact on us by taking inspiration from nature scenes and systems. However this thesis doesn't take into account other solutions and theories. This limitation in the methodology and fact finding may have excluded some alternative solutions.

I have found four categories in the design process where architecture can have a positive impact on mental well-being. Working with these categories in a structured way to design with well-being in focus is one approach to conquer urban stress. Program, Location, Atmospheres and Materiality can all be planned with consideration to how they make us feel.

For example by considering; Programs that are democratic with functions where visitors can be without the expectation to pay or purchase; Locations with prospect outlooks towards natural environments or water elements and placement a few steps away from the streets; Atmospheres based on the diversity in nature and Materiality with detailing and choices of materials that captures our attention and has health benefits e.g. wood.

From a program point of view, there is one important aspect that I have deliberately left out of my process. When designing public places it is important to include the public to get their views and opinions

## Discussion.

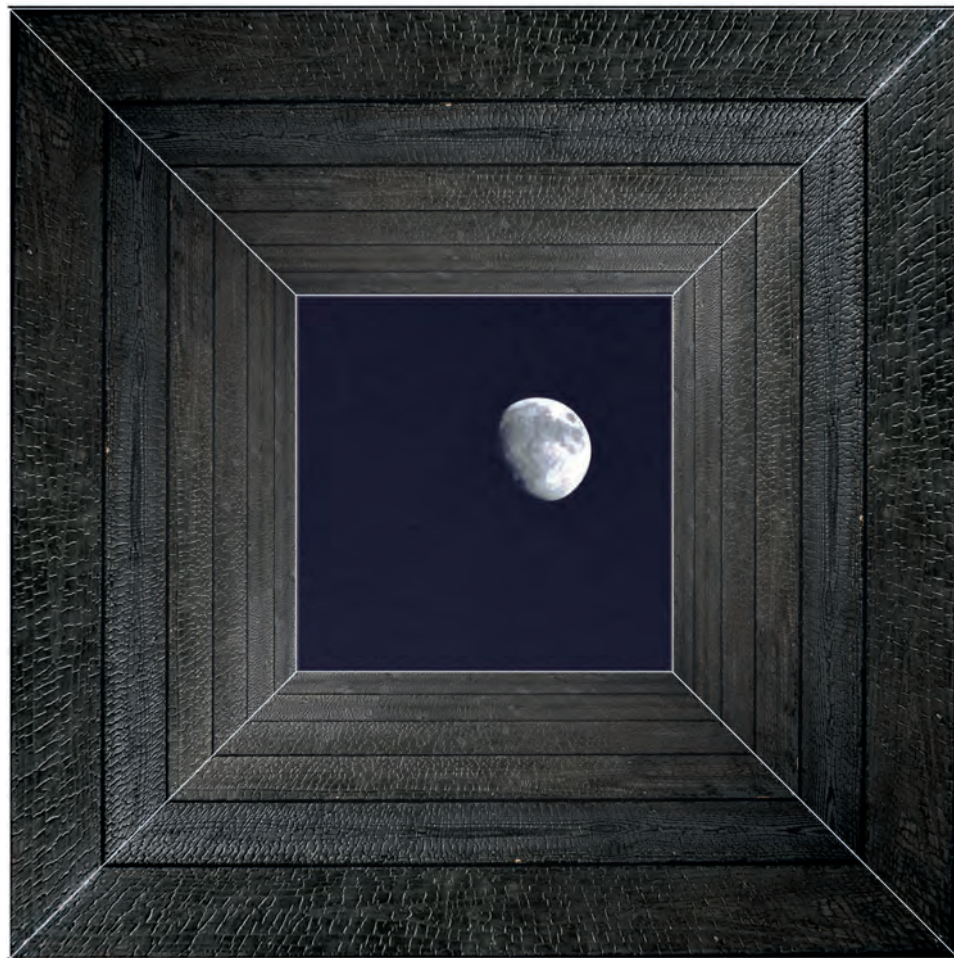
on their future place. Looking back, this would have been a benefit when developing the program. The method of dialogue does not contradict with the main focuses of this thesis but would rather have added a layer of legitimacy to the design. If I should continue to design further or had begun the process again then this would have been included.

Regarding the location and context of the proposed project, the choice of site fell naturally this time. But if located in an even more urban context such as in the middle of the city buzz, then the project would have faced other challenges and the layering might have been more enclosed. Without the outlooks given on this site it would have been an interesting approach to bring water elements into the design instead.

The assembled design is based on lots of individually good solutions and evidences, however, the effect of putting them together as a full concept has not been proven in practice. One could argue that the evidence used for the individual parts is evidence enough. To better understand the results and see the effects future studies could be done in scale 1:1 with mock-ups to test the effects of spaces and atmospheres.

Finally when it comes to materiality, this project could be taken further from the included materials e.g. Shou sugi ban, other types of wood/wood treatments and local granite. Here as well the inclusion of the public would be good with the purpose to understand their relation to and perception of materials.





View towards the ceiling and sky in the community room.

*Thank you.*

## Conclusion.

To conclude and answer the question; How can we design public buildings in a Scandinavian context that helps to decrease urban stress? Based on literature studies, site analysis and an intuitive design process this thesis aimed to investigate how architecture inspired by Biophilic design can help us de-stress from the urban society.

The problem of Urban stress will probably increase due to that more and more of the worlds populations is projected to live in dense environments. The answer could be democratic non-commercial public spaces that provides spaces for informal meetings with others like, and unlike us, and where we can be alone among others without being lonely. Thereby counteract social isolation whilst creating a refuge from the urban density. One could argue that there is a shortage of this types of spaces indoors today.

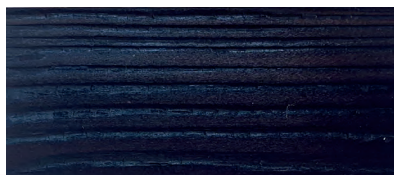
One thing that became apparent during this thesis is that there are several ways to design for de-stressing. This research clearly illustrates that there are possibilities through architecture to impact the stress levels of the end users. What the thesis doesn't answer is to what degree the design actually will affect people's mental well-being as this thesis doesn't result in a physical building.

I want to end this thesis with a note that connects back to one of quotes by Winston Churchill; "*We shape our buildings and thereafter they shape us.*". By conscious choices we as architects should take into account the existing knowledge within the area of design for well-being. Using that knowledge in our designs to support us future users to feel well and strengthened to tackle the everyday life.



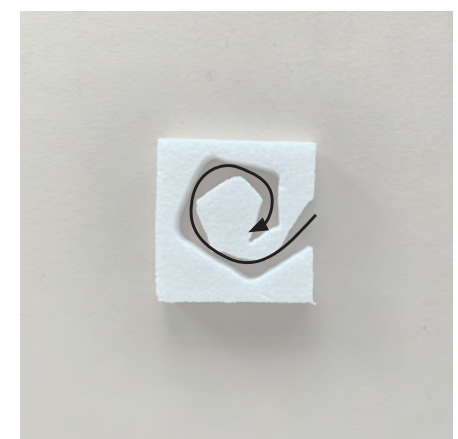
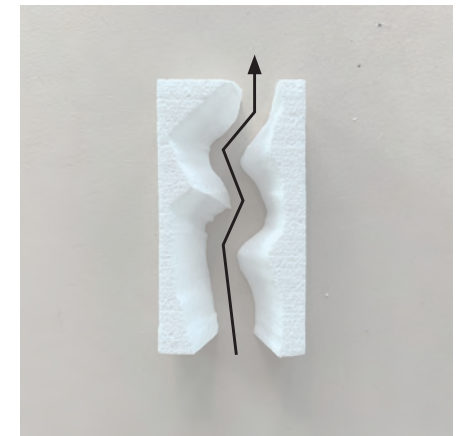
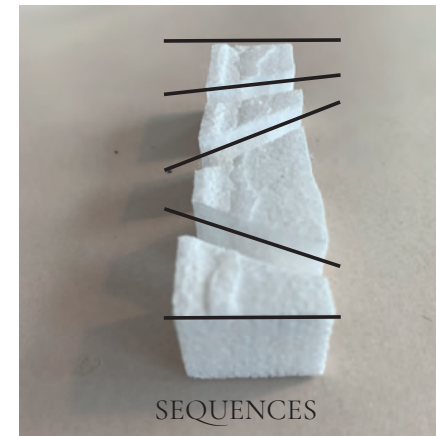
# o8. Process.

## MATERIAL TESTS



## MODELS

### MOVEMENT



## References.

### PUBLICATIONS

Ben Channon. (2018) Happy by design -A guide to architecture and mental wellbeing. London: Riba publishing

Browning, W.D., Ryan, C.O., Clancy, J.O. (2014). 14 Patterns of Biophilic Design. New York: Terrapin Bright Green, LLC.

Dahlkild, N. (2011). The Emergence and Challenge of the Modern Library Building: Ideal Types, Model Libraries, and Guidelines, from the Enlightenment to the Experience Economy. I Black, A. Dahlkild, N. (Red.), Library trends, Vol. 60, No. 1, (ss. 11-42). Illinois: University of Illinois

Chan M. (2013) Mental health action plan 2013-2020. Geneva: World Health Organization. p 7.

Kellert, S. Heerwagen, J. Mador, M. (2008). Biophilic design: the theory, science, and practice of bringing buildings to life / edited by Stephen R. Kellert, Judith Heerwagen, Martin Mador. New Jersey: John Wiley & Sons, Inc.

Lennartsson B-M. (2013) Söcietetsparken: Kulturhistoriskt värde och bevarande. Sverige: Kulturmiljö Halland

Mattern S. (2014) Library as Infrastructure. Places journal Hämtad från URL <https://placesjournal.org/article/library-as-infrastructure/>

Oldenburg, R. (1989) The great good place. New York: Marlowe & Company

Statistiska centralbyrån. (2020) Varbergs kommun-fakta 2019. Hämtad från [www.scb.se/Mfo810](http://www.scb.se/Mfo810).

Ulrich, R. (2012). Evidensbas för vårdens arkitektur 1.0 : forskning som stöd för utformning av den fysiska vårdmiljön. Göteborg: Centrum för vårdens arkitektur.

UN. (2018) 68% of the world population projected to live in urban areas by 2050, says UN. Hämtad från <https://www.un.org/development/desa/en/news/population/2018-revision-of-world-urbanization-prospects.html>

Varbergs kommun (2019). Plan- och genomförandebeskrivning: Detaljplan för Västerport etapp 1, Granskningshandling, 2019-12-12 (2018/1428). Varberg: Planenheten, Stadsbyggnadskontoret.

WHO (2001). Basic documents. 43rd Edition. Geneva: World Health Organization

WHO (2001a). Strengthening mental health promotion. Geneva: World Health Organization (Fact sheet, No. 220).

Williams Goldhagen, S. (2013). The Revolution at Your Community Library. New York: The new republic Hämtad från <https://newrepublic.com/article/112443/revolution-your-community-library>

Zumthor, P. (2006). Atmospheres: Architectural environments, surrounding objects. Basel: Birkhäuser.

### WEB PAGE

Cooper, K. (2017) Use This Incredible Technique to Waterproof Wood Furniture: Shou sugi ban is the art of preserving and finishing wood using fire. Hämtad från <https://www.architecturaldigest.com/story/shou-sugi-ban-black-waterproof-wood-furniture>

Folkhälsomyndigheten. (2019) Stress. Hämtad från <https://www.folkhalsomyndigheten.se/folkhalsorapportering-statistik/tolkad-rapportering/folkhalsans-utveckling/halsa/psykisk-ohalsa/stress/>

Hjärnfonden. (2017). Vad är stress och vad händer i kroppen när vi stressar? Hämtad från <https://www.hjarnfonden.se/2017/12/vad-ar-stress-och-vad-hander-i-kroppen-nar-vi-stressar/>

Moelven. (2020). Trä kan göra dig frisk snabbare. Hämtad från <https://www.moelven.com/se/aktuellt-och-nyheter/nyhetsarkiv/2020/tra-kan-gora-dig-frisk-snabbare/>

### MULTIMEDIA

SVT. (2019). Vetenskapens värld: Frisk av Naturen [TV-program]. Sverige: Sveriges Television.

TED. (2013, December 9). Stress in the city: Mazda Adli at TEDxBerlin [Video file]. Hämtad från <https://www.youtube.com/watch?v=chmRjQP8-eo>

Williams Goldhagen, S. (2017, June 15). Welcome to Your World: How the Built Environment Shapes Our Lives [Video file]. Retrieved from <https://www.youtube.com>

### FIGURES

All diagram, photos and other figures are my own.

Cut out people in renderings: Skalgubbar (2020) retrieved from <https://skalgunbar.se/>



