Naturum Tjurpannan

Ocean plastic exhibition center and storm shelter

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Master Thesis

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Department of Architecture and Civil Engineering
Master's programme of Architecture and Urban Design

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Direction: Building and Tectonics

Abstract

Tjurpannan Nature Reserve holds a distinctive beauty thanks to its special bedrock with a characteristic pink tone, shaped in a sculptural softness through the ice age thousands of years ago. In this landscape one can find historical examples of great talent for fitting the buildings into its surroundings. This is also an outstanding place to observe the unique spectacle of the storm, but when the storm settles the great threat of ocean plastic is revealed in this beautiful landscape.

The idea behind this master's thesis is to challenge the notion of conventional building methods and explore how the philosophy of a light footprint could be expressed through new designs in this iconic landscape.

Focus will be put on exploring the question: *How will a light footprint shape the buildings and their overall appearance within its surrounding landscape of Tjurpannan?*

In order to answer that question, the methods "research for design" and "research by design" have been used through an iterative design process.

The result is showcased in the final design of an ocean plastic exhibition center and a storm lookout, where careful consideration is taken to the conditions of each site. Several influences are interwoven such as topography, the character of the landscape and a special emphasis on how the new buildings touch the ground. Architectural drawings, illustrations and physical models are used to showcase the final designs in a wide range of scales to approach the built reality.

In conclusion, we believe this Master's thesis can contribute to the discourse on the importance of place and show how architecture can act as a translator to let the context be part of the project. Along with how the philosophy of a light footprint can ensure the landscape is protected for future generations as well as be a significant part of the overall design.

Keywords:

/Landscape / Environmental awareness /Adaptation / Footprint / Appearance /

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Thesis framework

Purpose

The purpose of this master thesis is to challenge the notion of conventional building methods and explore how architecture with the concept of light footprint could be experienced in the harsh but fragile landscape of Tjurpannan. Focus will be put into the investigation of how the construction method of stilts could be incorporated in the design.

Aim

The aim of this master's thesis is to use architecture as a translator of the chosen site to emphasize present potentials. This will be presented through a design proposal of a exhibition center together with a storm shelter gently placed in the landscape.

The intention is to create a clear relationship between the two buildings while still relating to the vernacular context. Materials that will stand the test of time and age with dignity should be used to adapt the buildings to the local conditions.

There will be special emphasis put on the development of architectural drawings, illustrations and models that together will display the project in a wide range of scales in order to approach the built reality.

Thesis Question

How will a light footprint shape the buildings and their overall appearance within its surrounding landscape of Tjurpannan?

Delimitations

In order to research this question with no other limitations than the conditions of the site we do not consider regulations regarding the shoreline protection since this is a speculative project.

Method

This process was mainly carried out through the methods "research for design" and "research by design" in order to answer the question through the design itself.

At an initial phase of the project, research for design was carried out through site visits and literature studies relevant to the context of bohuslän. Further on the two methods have been used in parallel throughout the project. In order to get a deeper understanding of the sites we used photogrametry as a tool to generate a digital model of the landscape.

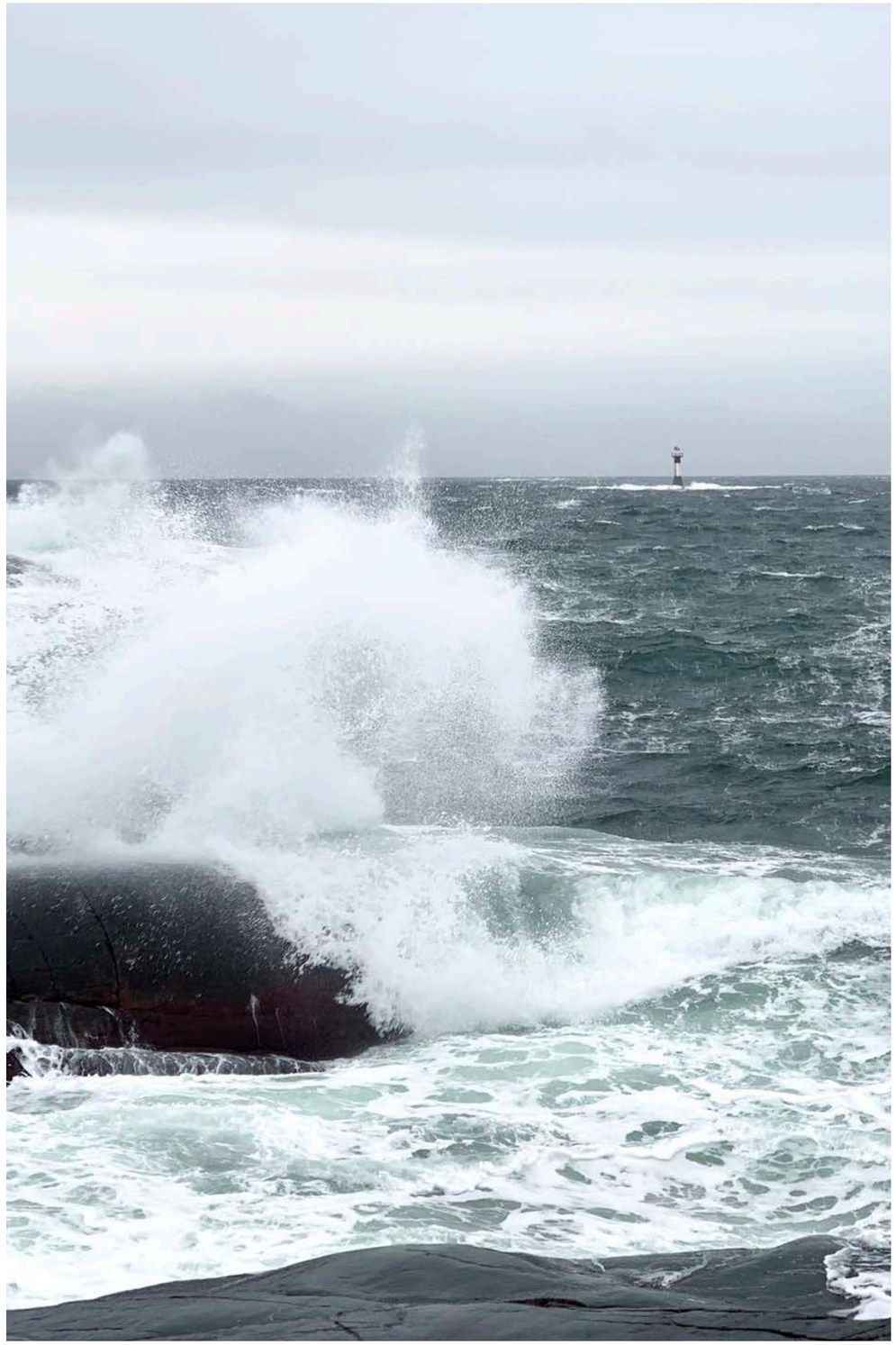
References of vernacular and contemporary architecture in relation to light footprint have been used to investigate different approaches regarding building gently in the landscape.

Site visits have been done several times throughout all seasons to understand the character of the place and all it offers. Visits have also taken place repeatedly during the design process to evaluate the design in relation to the site and to look for hidden and uncovered potentials.

Research by design was carried out through iterative drawings, visualizations and physical models to reach the final proposal.

Reading instructions

This master's thesis is structured through four parts; Introduction, background, design proposal and discussion. The introduction presents the thesis framework as well as the discourse. Background presents the context, reference projects, introduction and analysis of the site as well as the chosen program. The main chapter presents our speculative design proposal where the tools and knowledge presented in chapter one and two have been used in order to reach the final design. The conclusion reflects up on this master's thesis in relation to the discourse and question as well as the design proposal and process.



Discourse

The concept of place and its importance

The construction industry today is mainly characterized by standardized methods and the philosophy of one fits all. This is something that emerged from the international style and has been questioned by various architects throughout the years. As a result of this it seems like we lost the talent of adapting the buildings to their surroundings while learning how to conquer nature and let nature adapt to the standardized buildings. Modification of our surroundings are now happening in a non reversible way that can never be recreated. If this is then to be put in relation to the very short life span of both human beings and buildings in comparison to mother earth it seems like our footprint exceeds what's reasonable.

Looking at historical buildings we believe the building methods were more adapted to local conditions. Something that is also said by the Austrian American architect Bernad Rudolfsky. In his book 'Architecture without architects' published in 1964 together with his well known exhibition at the MoMA he states "there is much to learn from architecture before it became an experts art. The untutored builders in space and time demonstrate an admirable talent for fitting their buildings into the natural surroundings. Instead of trying to conquer nature, as we do, they welcome the vagaries of climate and the challenge of topography." (Rudolfsky, 1964)

What Bernad Rudolfsky mentions is very much present in the vernacular architecture of Sweden, not least in the coastal areas of Bohuslän. Today what is seen as the iconic landmarks of Bohuslän was historically seen as a convenience for the fisherman and part of their survival in a barren and rough landscape. Built with a humble attitude towards their surrounding where local materials have been carefully adapted to the landscape leaving little or no traces in the ground. (Lind & Leandersson, 2002)

Due to the Norwegian architect Christian Norberg-Schultz architecture can work as a translator of a specific site and emphasize qualities to uncover the potential present in a site.

One can imply the importance of place within nordic building traditions and how it worked as a starting point being integral to man's sense of form. This however subsequently fell into oblivion, perhaps as a result of the increasingly international character of architecture. In the last decades reactions against the international architecture grew stronger and as early as 1954 Siegfried Giedion called for new regionalism.

Norberg-Schultz also criticizes international architecture and the way it deals with abstract functionality that can be applied in a generic way rather than with tangible meaning that is specific to a place. This does not mean he believes in copying the old but instead respects the "genius loci" by determining the identity of the place and to interpret it in ever new ways. (Norberg-Schultz, 1996)

When looking at what is built today, the importance of place seems rather small, and the vast majority of today's buildings use modern technology to adapt the site to what the building requires. The Swedish concept of Naturum on the other hand can be seen as a good example showcasing what was achieved when the client developed design criteria regarding the relation between the landscape and their buildings before any design work started.

We believe it is of great importance to highlight the possibilities of adapting buildings to the topography present and showcase how this could be expressed as architectural qualities. It may encourage more people to question the one fit's all solution and enhance building methods that are carefully adapted to its surroundings.

"Touch the earth lightly" is an expression that comes from the aboriginals but became known in the world of architecture by the Australian architect Glenn Murcutt. For him it is about the physical footprint on earth as well as the production of materials and the possibilities of reuse and recycling. (Fromonot, 2008) The expression "touch the earth lightly" are words of wisdom that seem more relevant today than ever. Approaching architecture with this philosophy could mean that land is only to be borrowed for a certain amount of time and could be given back with minimal traces for future generations. Like footprints on a beach that occurred a hundred years ago got washed away by the waves same as the footprints from today. Not all footprints are temporary though and therefore we need to consider our moves.

We would like to contribute to this discussion through a design proposal that demonstrates how the philosophy of "touch the earth lightly" could be part of the design strategies and thereby contribute to the overall appearance in the landscape.

Background

Context: Bohuslän

Ocean plastic

Naturum

Reference projct

Introduction to the site

Site visits

Context: Bohuslän

Introduction

The area of Bohuslän holds a distinctive beauty thanks to its special bedrock with a characteristic pink tone, shaped in a sculptural softness through the ice age thousands of years ago. Located on the border to Norway stretching 160 km south to the city of Gothenburg. With more than 3000 islands, the archipelago of Bohuslän is well visited by tourists not only from Sweden but world wide. (NE)

This relatively small geographical area is constantly reminding you of the presence of nature and the weather is very much part of your experience.

History

Historically, man has been largely dependent on the sea for his survival while today it's more about the local culture than the survival itself. The past is very much present today through what could be called the 'iconic landmarks of Bohuslän.' The fisherman's shed faces the sea and could be seen as an outpost of the coastal landscape while telling a story of their time. This was once a place for preparing and storing the fishing gear and the catch. To some extent still used for the same purpose but without the same importance of everyday life on site. (Lind & Leandersson, 2002)

The earliest shed's were built with the Swedish building culture of log timber while the roofs consisted of the local materials of seaweed and reed. The wood was untreated and weathered into a silver grey tone over time. This is something that today can be experienced as being very humble to it's surrounding landscape. As the fishing industry generated more money, fishing gear developed and so did the shed's with their new building method of timber frames. Larger sheds were needed and width and height started to vary. Local materials were used to a great extent and the sheds were cladded with wooden paneling which was treated mainly with tar and the roofs were cladded with clay tiles. This is how we imagine the typical fisherman's shed today, although this is not always the case. In modern times, we began to abandon the local materials in favor of industrialized durable materials that came with a promise of low maintenance. On closer observation, you can see that fiber cement boards and sheet metal have to some extent replaced the wooden panel and clay tiles. One can think the shed's are all looking much alike painted in their characteristic red color but when observing then one can see they hold a great variety and still being experienced as similar. (Lind & Leandersson, 2002)

Picture showing the difference of appearance between red and brown sheds in relation to the landscape.

Adapted

From site visits in the area the old fisherman's shed is a great source of inspiration in how to approach the landscape with a wide variety of foundations. It comes with the advantage of no need to blast away rock, pour large amounts of concrete, or use heavy machinery on site. Therefore placing buildings on stilts seems to be used for its convenience and functionality in regional architecture around Bohuslän. After decades of rough climate by the sea one can admire how they seem to survive on top of some stacked stones. At times when they were built sustainability was probably not the most important aspect, still the local materials and knowledge seems to have done no damage to the landscape. One can think, if they were to be removed could the next generation even find traces of these iconic landmarks?

Appearance

While most of the shed's found today are painted in red with its white detailing there are still shed's to be found showing variety in color and thereby relating to the landscape differently. While the red color is very much working nicely with the pinkish rock face they are also to be seen as landmarks contrasting its surroundings being visible in a far distance. Silver grey weathered wood or wood treated with brown tar are instead becoming part of its surrounding, being hard to discover from a distance. Thereby there are examples found showcasing different ways of approaching this distinctive landscape.

Reflection

This approach could be used to show respect for nature and the fragile landscape even in contemporary architecture. It could be a way of communicating respect for nature and a philosophy of building with care for the surroundings. It will also give a special character, architectural qualities and overall appearance when sympathy is given to the surroundings.

Ocean plastic

Bohuslän

The coast of Bohuslän is today threatened by a large amount of plastic waste. It is one of Europe's worst littered areas and wherever you look you can be sure to find plastic objects and pieces. The combination of wind, ocean currents and the landscape's conditions are optimal for the plastic waste to find its way onto cliffs and beaches and wedge itself between the stones. (Håll Sverige rent, n.d.) Visiting the area throughout the season especially after stormy weather it's hard to not be emotionally affected.

Background

Ocean plastic is a global problem that knows no national boundaries. Scientists believe that there are more than 150 million tons of plastic in our oceans and every year 5-13 million tons of plastic are added. And it is growing fast, in sixty years plastic production in the world has increased like an avalanche, and it is now seen in our oceans, where gigantic amounts accumulate.

Plastic is by far the most common litter found in the ocean. Plastic is perhaps also one of the most linear types of material we have today. It is usually made from fossil raw materials that can last for 200 years, but which we use for just a short period of time.

The biodiversity of the oceans are threatened and the plastic waste is causing deaths of animals mistaking plastic for food. This could also become a threat for humans when we are eating the fish full of micro plastic. (Håll Sverige rent, n.d.)

Architecture as a solution

As architects, it lies in our nature to ask ourselves if architecture could be used to meet challenges of tomorrow. With the global problem of ocean plastic very much present in this location we believe that architecture could communicate to the visitors about plastic as a material and what harm it is to nature.

Small actions can still make a big difference in stopping the global problem of ocean plastic and our personal choices can make a difference (Håll Sverige rent, n.d.).

We believe architecture could become one piece in sharing knowledge which results in changing behavior to its visitors.

Naturum

Naturum

Sweden's nature visitor centers, famous as Naturum, were invented to use architecture as a communicator and entrance into nature. Throughout the country you will find them in close connection to national parks and nature reserves of special character. They are accessible and open to anyone and therefore function as educators about nature, environmental awareness and cultural history that shaped the specific area over time. They are founded by the Environmental Protection Agency's to enhance public knowledge and understanding of nature and the environment. They should always strive to be a combination of architecture, exhibitions and the natural surroundings. (Ågren, 2013)

What we can learn from Naturum

The Swedish concept Naturum is a general reference of great value to us. We completely agree that good architecture is important as a communicator when it comes to getting a deeper understanding of nature and our surroundings. We emphasize the idea that through buildings placed carefully in beautiful areas of special character such as national parks and nature reserves, we can inform about the challenges and opportunities connected to our natural environment. This is something that Sweden's Naturum actively works with and through good quality architecture the architectural experience that Naturum provides the visitor with is a strong spatial experience closely linked to the conditions and nature on site. We also believe that this could help us to not only see nature as a raw material deposit but a context that we as humans are very much part of.

Reference projects

Store mosse naturum

Project by White architects

Store Mosse Naturum has been used as a reference of great importance when designing the building that functions as an exhibition center. What we have mainly found interesting to relate to is how the lay-out of the floorplan lets the building contribute to a natural movement through the rooms. The building therefore becomes like an extended sequence and part of the walk. The functions that don't require direct daylight are placed in the core of the building, where the other rooms and functions are located along the facade where you as a visitor move through the building and then come back out like a loop.

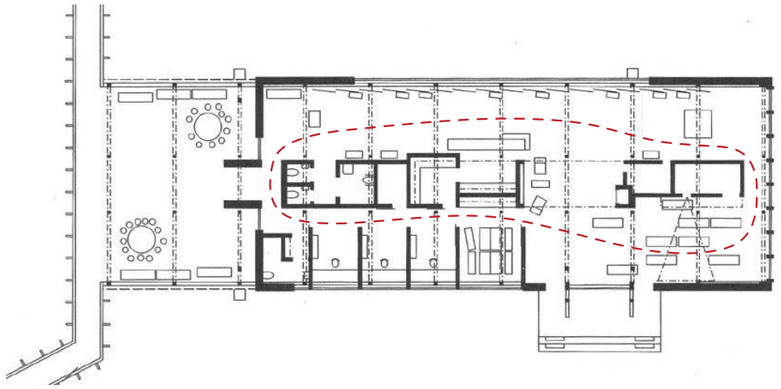


Figure 01. White Architects (n.d.) Store Mosse floor plan

Touch earth lightly

Projects by Glenn Murcutt

The Australian architect Glenn Murcutt has designed several projects and we looked at some of them for references on how to handle horizontal building volumes and manage to make them sit naturally in the landscape of their specific locations. By using a series of plinths on a set distance the buildings appear to have a light footprint. These are projects of high quality architecture but where he also borrows material and elements from the building's vernacular context which together with a clear silhouette contributes to the building's overall feeling and appearance.These project are situated in a different climatic zone and therefore comes with solutions that we can't take advantage of. Still the way different projects work with visible or non visible structure became the starting point in our own investigation.

Figure 02. Blunck, R,. & Murcutt, G. (n.d.) Marika Alderton house

Plywood house

Project by Herzog & de Meuron

The plywood house by Herzog & de Meuron could be seen as a reference of how to handle a reasonably large building volume but still achieve a feeling of something lightweight that sits on top of the ground, but at the same time brings a clarity of being a permanent structure in the situation where it is built. But the most relevant reference from this project is how the facade is designed in a way that divides horizontal sections with a vertical offset. This gives the low-angled roof a floating feeling and contributes to the building's lightweight overall appearance and a characteristic silhouette. Something that becomes very clear in both the section drawing and the photograph of the gable facade.

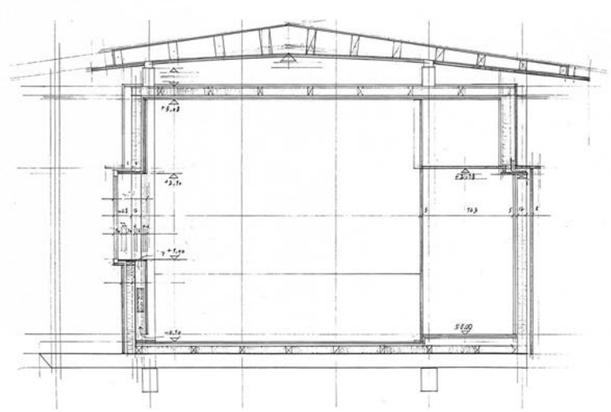


Figure 03. Herzog, J,. & de Meuron, P. (1988). Plywood house

Figure 04. Herzog, J,. & de Meuron, P. (1988). Plywood house

Figure 05. Herzog, J,. & de Meuron, P. (1988). Plywood house

Introduction to the site

Tjurpannan Nature Reserve

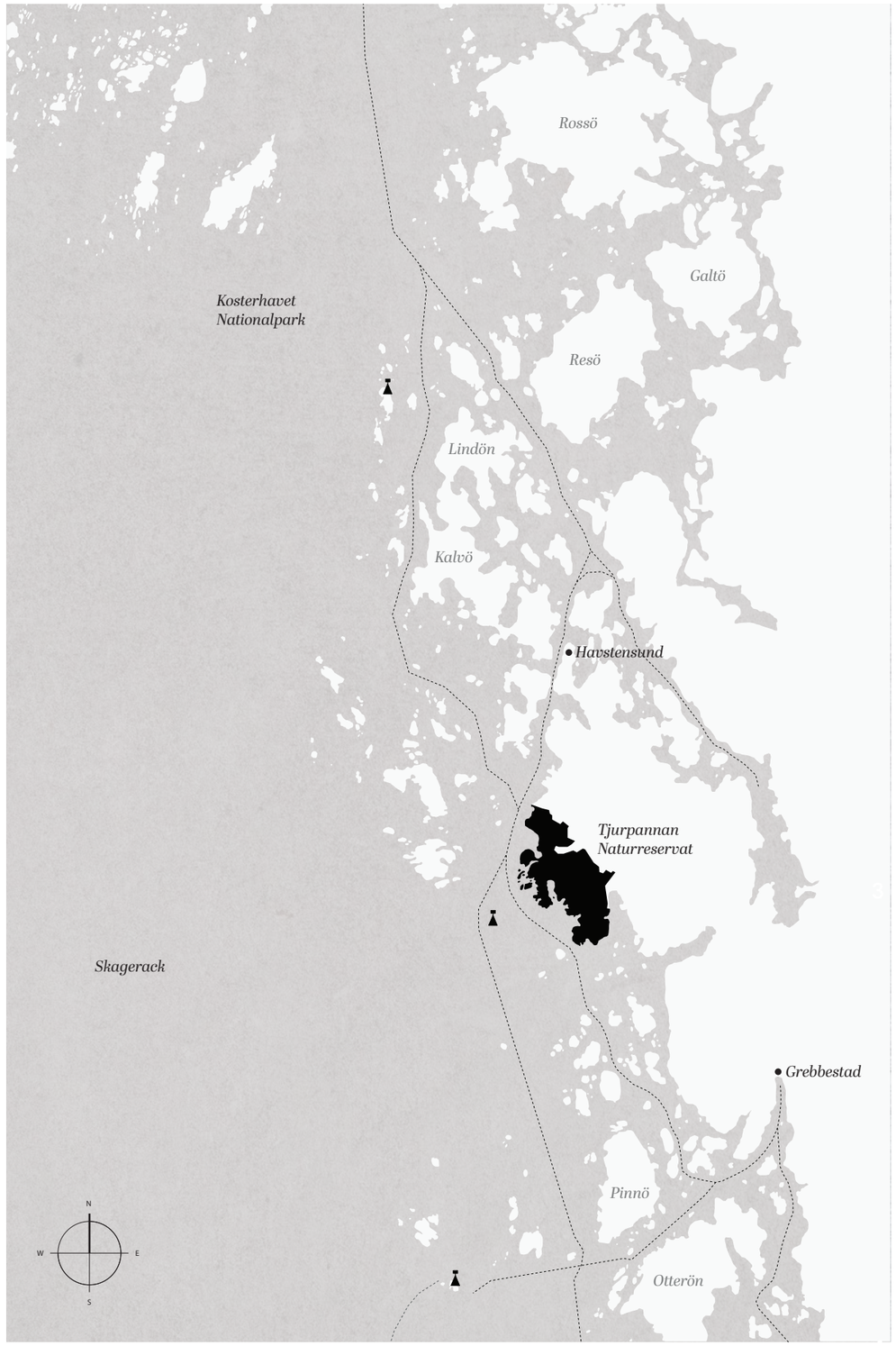
In the northern part of Bohuslän between the coastal towns Grebbestad and Havstenssund you'll find Tjurpannan nature reserve founded 1968. The easiest way to get here is by car. You arrive at the carpark and choose one of the trails or combine a few of them depending on what part of the nature reserve you wish to experience.

This characteristic barren landscape is highly enjoyable in all seasons. Since there is no protective outer archipelago, it is one of the most weather exposed sections of mainland on the coast of Bohuslän. The fairway passes close by, and has always been one of the most feared passages for sailors.

Here the winds can howl and waves throw themselves high over rocks and shards and the many underwater quarries lead to an exciting spectacle that attracts visitors during strong winds. To visit Tjurpannan during a stormy day is indeed an unforgettable experience.

Here nature is threatened by a large amount of plastic waste washed up by the ocean. Due to currents and wind this is one of Europe's worst littered areas. While getting closer to the ocean you can be sure to find plastic waste both large items and small fractions.

There are not many traces from human activity except visitors here but there are some. In the sheltered bay you'll find a few fisherman's shed still in use. Historical dry stone walls extends through the landscape as a reminder of the past. As nature conservation measures, grazing animals are used during the summer months.



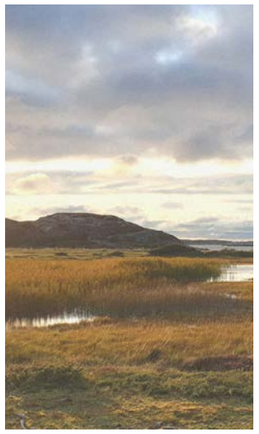

Gullbringa
Valberget
+30m
Tjurvikbukten
Tjurviktjärn
Stora Huvudet
+11m
1.
Storemyr
Graftöberget
+14m
+35m
2.
Smugholmen
+11m
+19m
Krabbemyr
Saltvik
Släta backarna
+12m
1. Identified location for ocean plastic exhibition center
2. Identified location for storm shelter
N
W
E
S

Landscape typology

This barren landscape is characterized by the harsh climate, heavily exposed by the weather. Wind-swept trees are climbing alongside the cliffs to find shelter. As far as you can see there are pink colored granite rocks. Like huge sculptures rising from the sea shaped by the ice age and the ever sweeping waves. While walking in the high sections the view stretches far and it's almost hard to understand the size of it, while within the bays and the lower sections one can feel very small in comparison with the landscape. The western part is dominated by steep rocky beaches interrupted by pebble fields that quickly turn into deep sea and occasionally shallow sandy beaches.

Storemyr and Krabbemyrarna are nutrient-poor almost overgrown wetlands within the area that hold the habitat for certain plants while Tjurvikstjärn with its shallow gravel and sand bottom are home to other species.

Cliffs



Wetlands

Beaches

Building typology

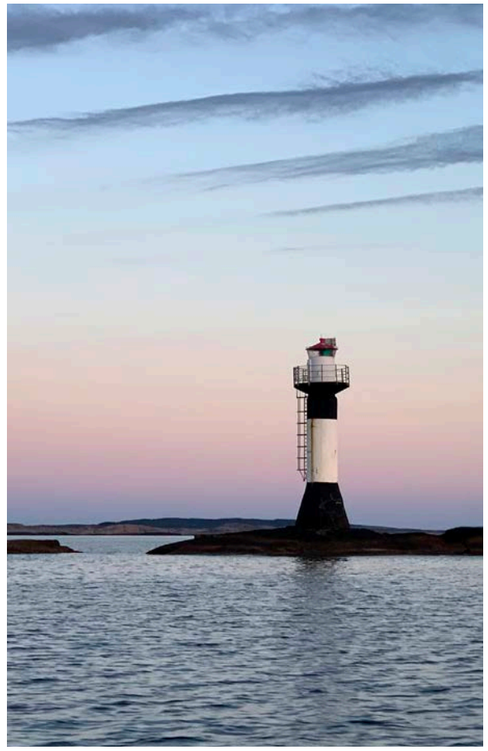
Within the nature reserve one can only find the building typology of the fisherman's shed. As a result of time they all hold great variety in both conditions, materials used and the level of maintenance. Some more traditionally looking with vertical wood boards treated with falu rödfärg. Others consist of unique solutions with different materials on all sides as a result of replacement in the heat of the moment. The replacement comes with no architectural features at all but instead with no maintenance for the fishermen while the more traditionally looking holds detailing from the local craftsmanship of it's time. What is striking in certain light is how well the red colored facade works with the pinkish colors of the foundation and surrounding landscape. What they all have in common is how the construction sits on foundations of stones or stilts of local stone or concrete. All the buildings are fitted into their surroundings without any harm to the ground. Whether they are anchored to the ground or not is hard to tell from just observation.

Tradtional components

The great variety

Foundation

Site visits



Choosen sites

Ocean plastic exhibtion

This site is located a couple of minutes walk from the car park, a gravel road leads up to the grazing land where the trail begins. The landscape is mainly characterized by grassland, wetland and cobblestone fields. Oak trees shaped by the wind follow alongside the trail. Here you have a great view over the horizontal open landscape but at this location the ocean is not visible.

Areal view of the chosen site and it's surrounding landscape.

Storm shelter

This site consists of a bare rock surface only, you leave the trail and walk towards the smooth cliffs. It's close to the ocean, but high enough to stand both high and low tide. The view is stunning, offering both storms and sunsets with the lighthouse on the horizon. This is a place well exposed to wind and on stormy days you can experience the waves rolling in and splashes over the rocks.

Areal view of the chosen site and it's surrounding landscape.

Program

Spatial program

This project consists of two buildings placed in different locations within the nature reserve. Their locations have been carefully selected through multiple study visits. Both buildings are fitted to their certain situations and topography with the concept of a light footprint.

Naturum Tjurpannan

This building sits on stilts that consist of both indoor and sheltered outdoor space for exhibitions and seasonal workshops. Toilets will be reached from the sheltered outdoor space as well as an ocean plastic disposal and space for staff and landscape cultivators. Located right next to the carpark, this building works as an entrance to the nature reserve.

Storm Shelter

Gently placed on stilts next to the edge between the sturdy cliffs and the stormy sea, this small building of unheated spaces allows visitors to take part of the wonderful spectacles taking place in stormy days. Sheltered outdoor space could be used for protection along with multiple views over the landscape.

Entrance

Parking / Access point
Information / Directions

System of trails / Walking bridges

Naturum

[Outdoor]
Veranda
Plastic waste disposal

[Indoor]
Entrance space
Information desk
Indoor exhibition
Digital exhibition room

Toilets
Staff room

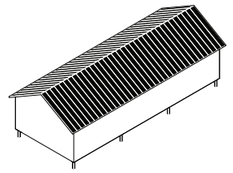
Storm Shelter

[Semi-Outdoor]
Plastic waste disposal
Entrance space exposed to wind

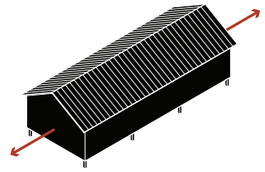
Wind sheltered room

[Indoor]
Lookout over ocean

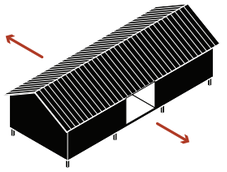
Design Concept



Light footprint



Horizontal in landscape



Sightline through building

Design proposal

Naturum

Storm Shelter

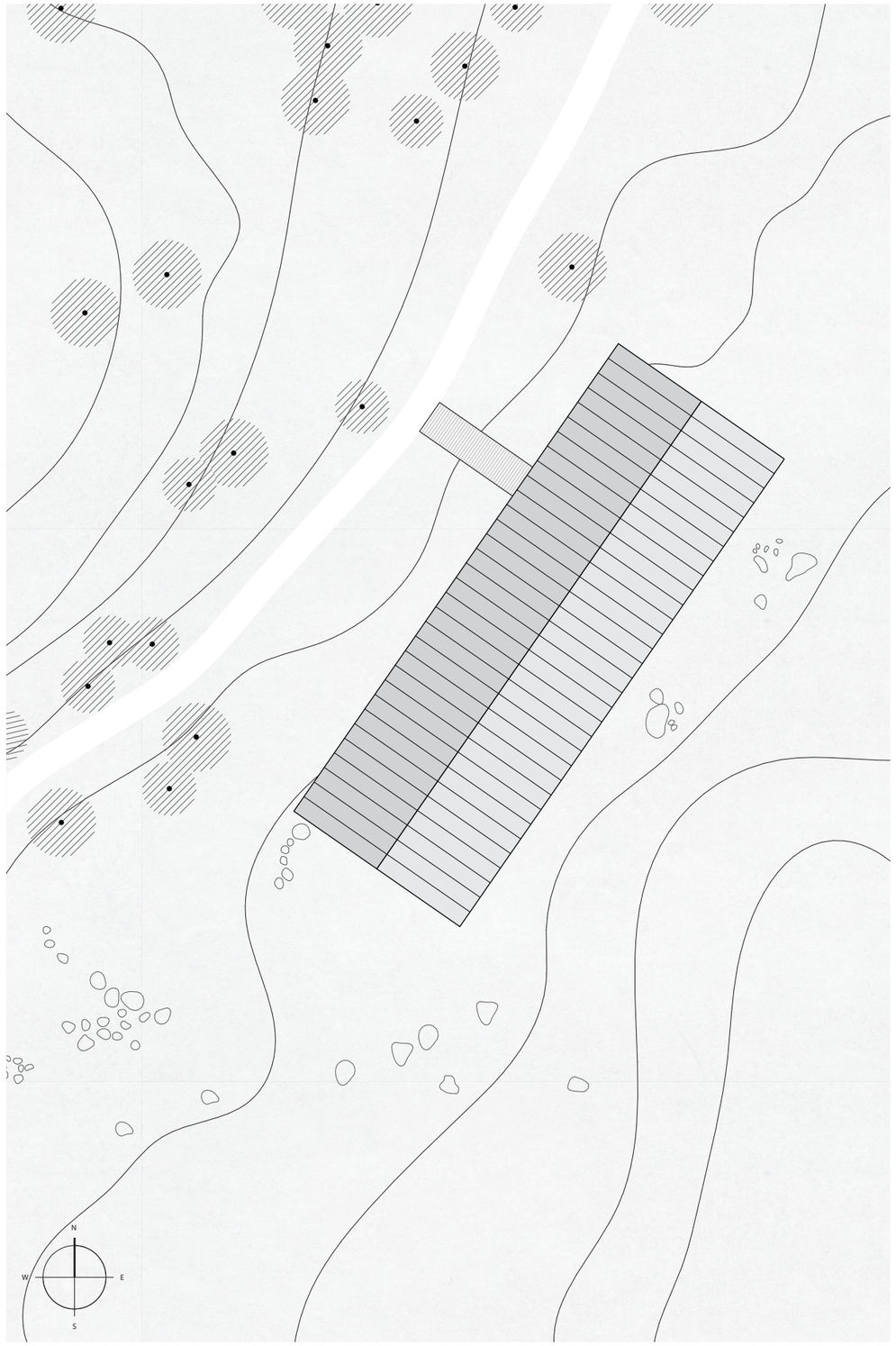
Situation & Placement

The chosen site of the visitor center is located just a few minutes walk from the carpark. The building will be visible from arrival, creating a direction of movement. This location was chosen not only to create an entry point to the nature reserve but also to ensure easy access for all visitors and influence the choice of route allowing the most fantastic views throughout the landscape. Not long ago this place was poorly maintained and quite overgrown while today it is maintained by grazing animals throughout the summer months. Besides the grass found at site there are a few windswept oaks that tells you about the proximity to the sea, a wetland and a field of cobblestone. The sea is still not visible, but the pink colored rocks are creating a lovely backdrop.

The placement of the building is the outcome of multiple things such as the direction of movement. By placing the building alongside the trail following the landscape this rather long and horizontal building becomes more part of the landscape while also avoiding the height difference to make the stilts too tall. The formation of the landscape has been taken into consideration to allow the height of the interior floor to meet the height of the trail – binding it together through a boardwalk.

One can thereby easily choose to enter the building or just pass by. The entrance of the building is articulated through a division in the building where a sheltered veranda is used as an extension of the entrance. This space is open straight through the building, allowing the visitors to get closer to the wetland. Here you can choose to enter the ocean plastic exhibition, recycle plastic collected in the nature reserve, use the toilets or just hide from rough weather when having a picnic.

Landscape section
Scale 1:400



Siteplan
Scale 1:400

Spatial program

The building is divided into different parts one can say in order to make the building more valuable at site. We chose to separate functions in order to work in parallel as well as individual. For example to allow visitors to use the veranda, recycle collected plastic and to use the toilet when the exhibition is closed, same as for the conservationists to use the staff room while looking after the nature reserve.

Floorplan & Functions

When you visit the building, the visit begins on the veranda, which is meant to function as an extension to the entrance. This is a weather-protected outdoor tempered space, intended to work together with the exhibition as well as individually since it's open at all times. One can imagine this could work as a starting point for gathered walks in the nature reserve as well as to be used for outdoor lectures or eating lunch sheltered from the weather.

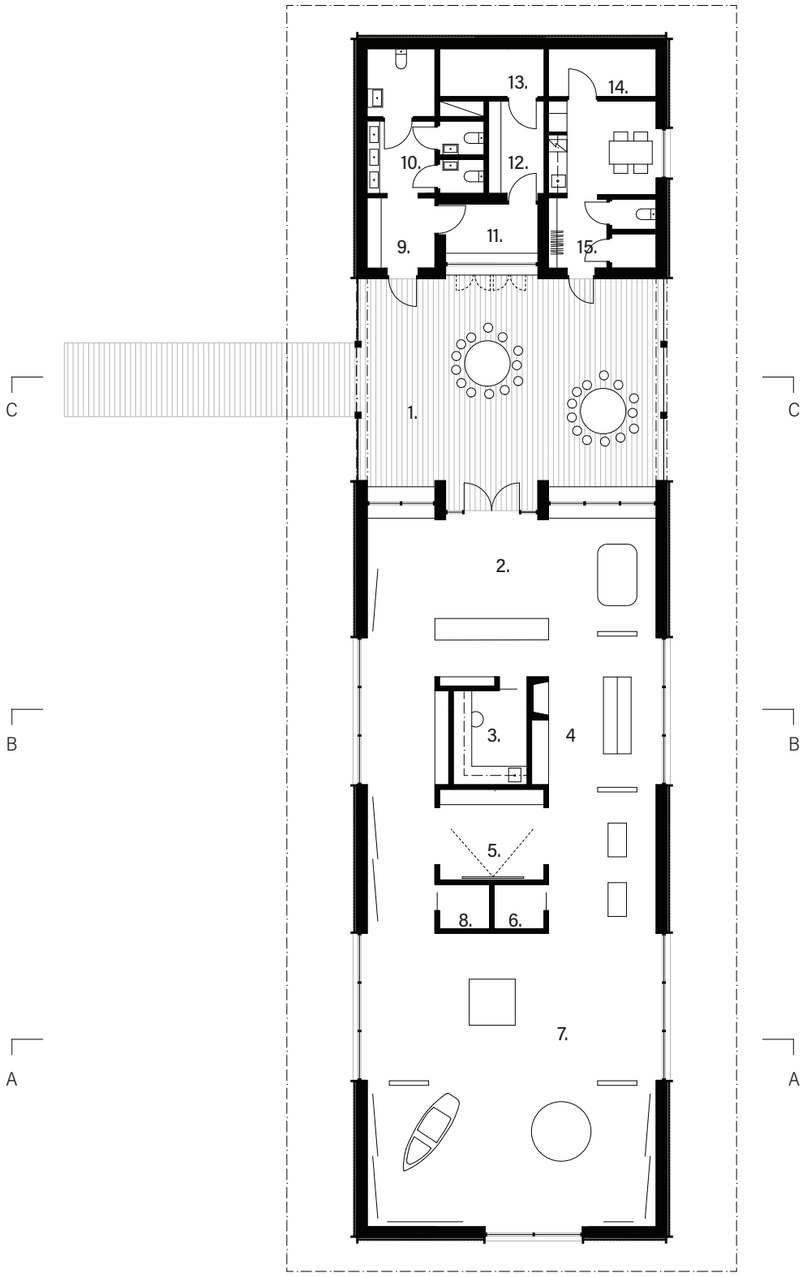
At the veranda one can find the ocean plastic recycling box. This is part of encouraging visitors to be part in cleaning up plastic being washed up along the shore lines. It is designed to showcase what's being collected during the year, perhaps telling the visitors the amount of days needed to fill it up. Behind there's a disposal room for the staff to rearrange for further recycling.

The main idea behind the exhibition space is to organize the permanent functions in a core to create a movement through the building to make the visit a part of the walk. In the core one can find a video room, back office and storage for foldable chairs to arrange lectures or gatherings. The core is decentralized in order to achieve areas of different size and character for displaying items and posters.

Sightlines are created to take part of the surrounding environment and to see through the building being part of the movement.

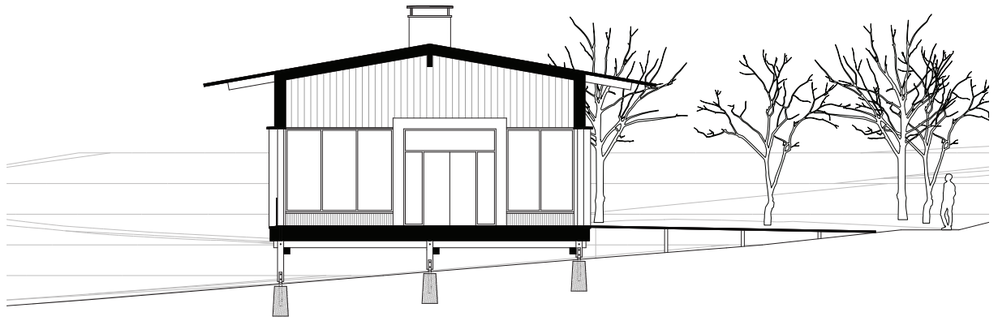
With its generous ceiling height one can use the space to work with installations of ocean plastic hanging above being part of the experience without taking up floor space.

The interior is related to the outdoors, divided at the height of the windows. The interior walls are cladded with wood panels that give a warm and soft tone to the room without taking too much focus off the exhibition.

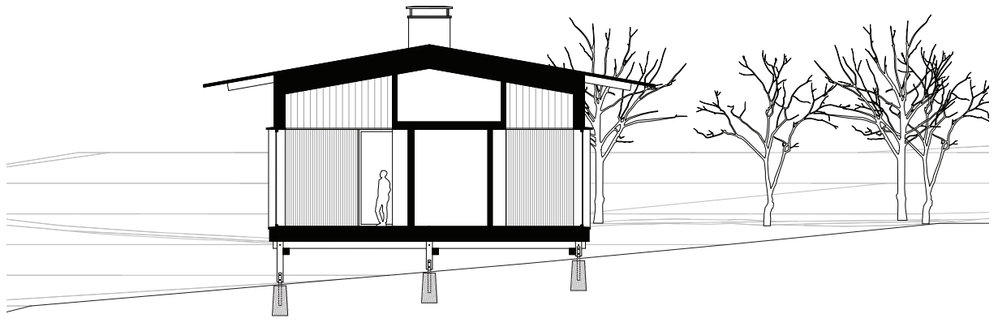


Floorplan
Scale 1:200

1. Veranda
2. Reception
3. Back office
4. Lounge
5. Media room
6. Storage
7. Exhibition
8. Storage
9. Beach cleaning kit
10. Toilets
11. Ocean plastic disposal
12. Storage
13. Utility room
14. Staff rooom
15. Storage

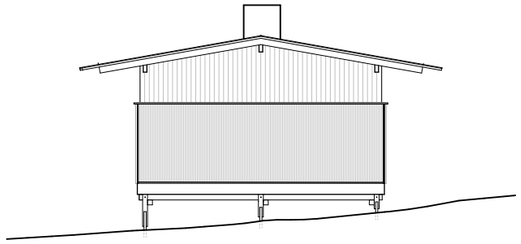


Section C-C
Scale 1:200

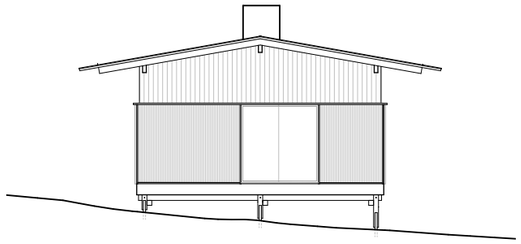


Section B-B
Scale 1:200

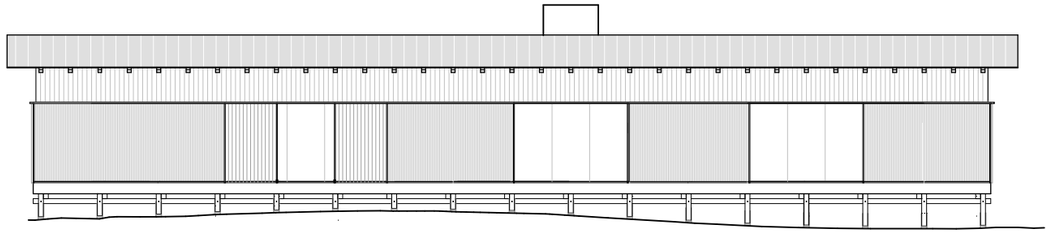
Interior view exhibition space



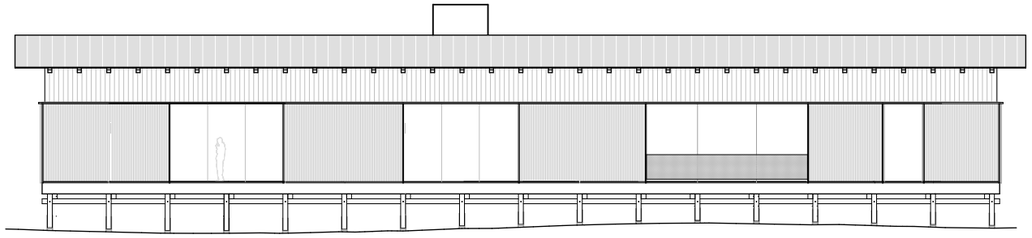
Elevation towards north east
Scale 1:250



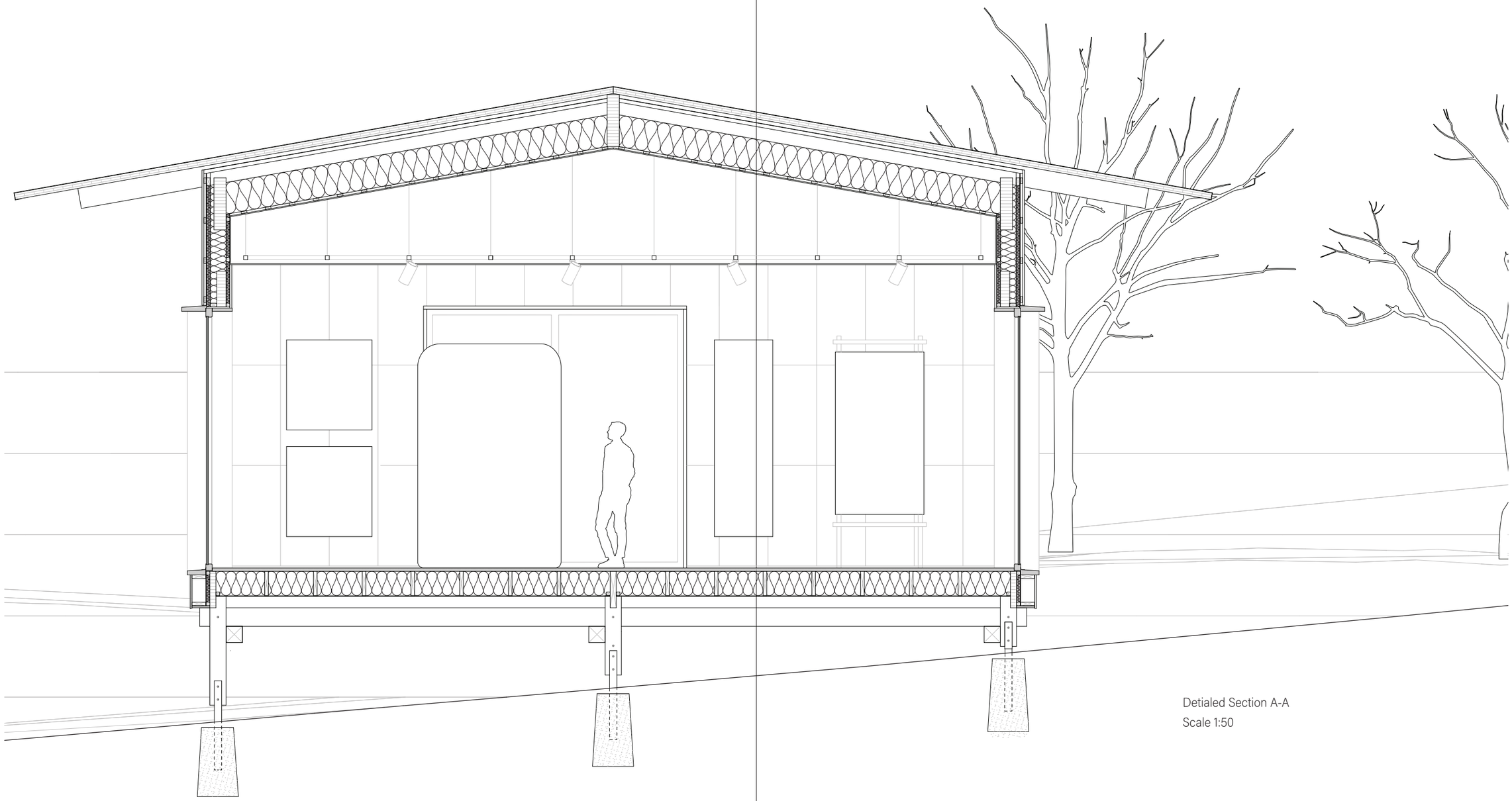
Elevation towards south west
Scale 1:250



Elevation towards north west
Scale 1:250



Elevation towards south east
Scale 1:250



Detialed Section A-A
Scale 1:50

Appearance

The landscape of the place is vast and horizontal, almost difficult to understand the scale. In order to make the building part of the landscape and not stand out too much, we have reinforced the horizontal aspect of the design.

Light footprint & construction

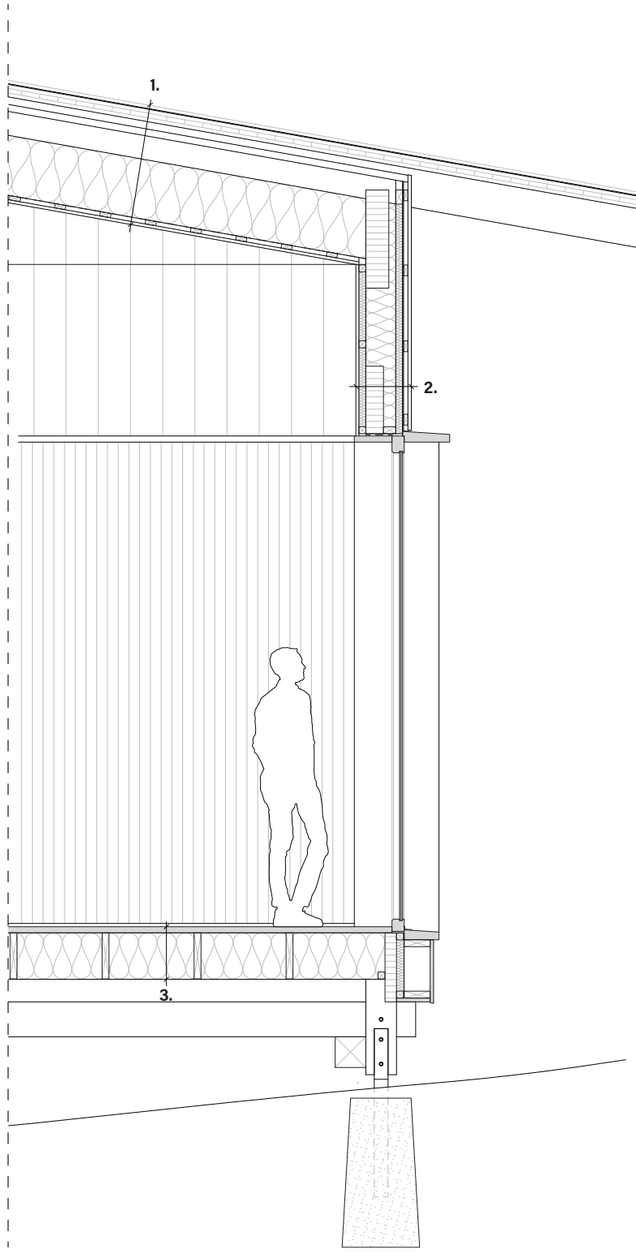
This building stands in the grassland with multiple stilts and underground concrete foundations working as the load bearing structure. Glulam beams are holding up the low angled roof where clt slabs function as stabilization and managing the light feel of the overhang. The roof is covered in aluminum sheets.

Light footprint & construction

To enhance the verticality created by the large roof and the placement in the landscape the facade is divided with horizontal beams. To add small but simple details to the building there are different widths of the facade planks above and below the division. In the lower section there's an added layer of a raster creating interest to a rather large building. The raster also adds a layer in depth to experience the upper part to be pushed into the facade creating a characteristic detail in the corner. This is also visible in the gabel making the building their own characters within the landscape. The aim has been to make the building look designed, but still relate to the vernacular context. Thereby the cladding shows a simplicity in a sense.

Detail model of stilts meeting the ground.
Scale 1:10

Elevation
Scale 1:40



Detailed Section
Scale 1:40

1. Roof construction

Aluminum sheet metal	1mm
Waterproof membrane	0.5 mm
Clt roof slab	80 mm
Air gap	45mm
Timber roof truss	650mm
Cellulose fiber	385mm
Vapour barrier	0.2mm
Timber profile	28 mm
Interior panel	20mm

Total 764 mm

2. Wall construction

Vertical timber facade	22 mm
Horisontal timber profile	28mm
Air gap	8mm
Insulation	45mm
Insulation	80mm
Glulam beam	115mm
Vapour barrier	0.2mm
Insulation	45mm
Vertical interior panel	20mm

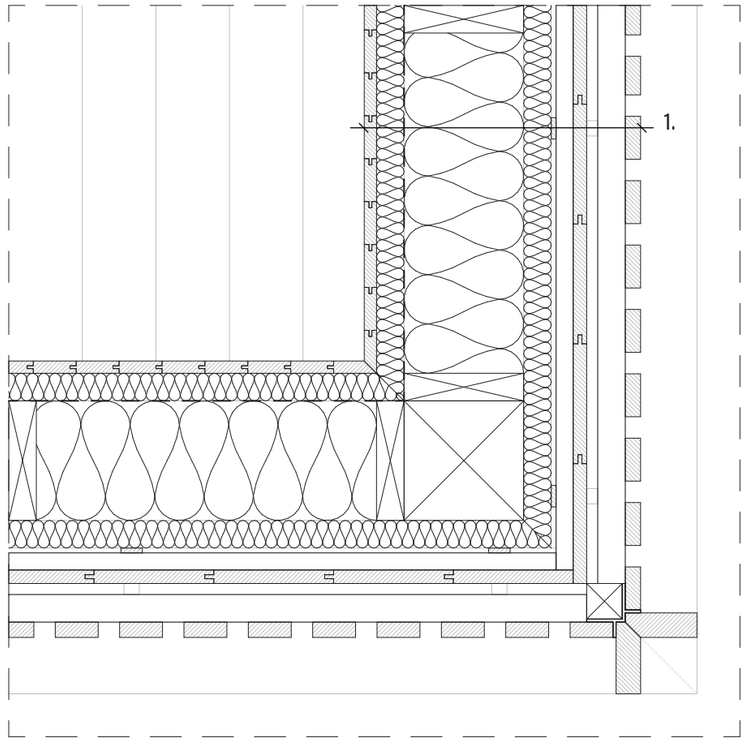
Total 363 mm

2. Floor construction

Fibre cement board	6mm
Glulam beam	300mm
Insulation	300mm
Interior floor board 40mm	

Total 346 mm

Detail model of corner and exterior.
Scale 1:10

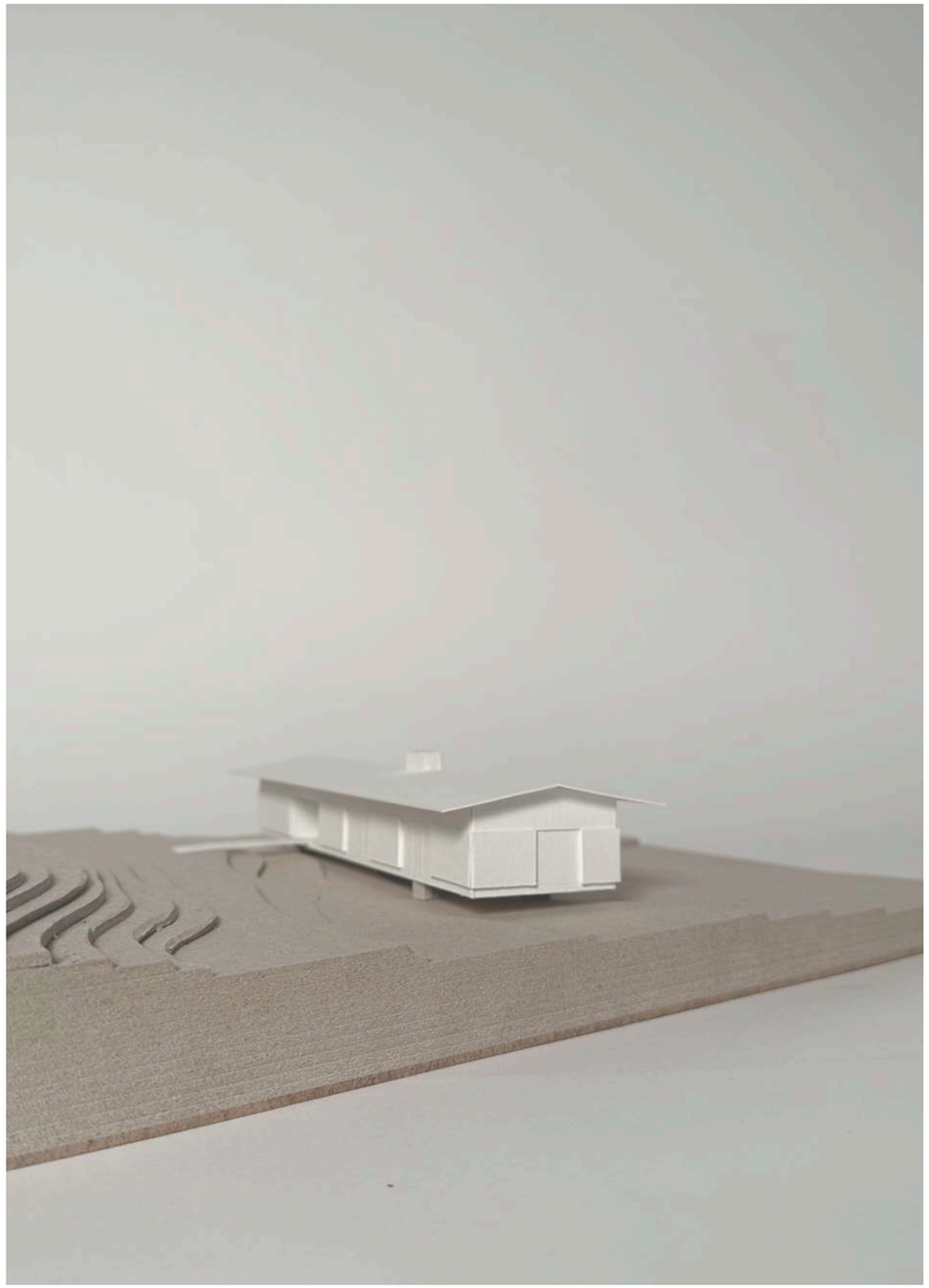


Corner detail
Scale 1:10

1. Wall construction

Vertical timber raster	25mm
Horisontal timber profile	45mm
Air gap spacer	18mm
Vertical timber facade	22mm
Horisontal timber profile	28mm
Air gap	8mm
Wind barrier	0.2mm
Insulation	45mm
Insulation	195mm
Vapour barrier	0.2mm
Insulation	45mm
Vertical interior panel	20mm

Building model.
Scale 1:100



Landscape model.
Scale 1:200

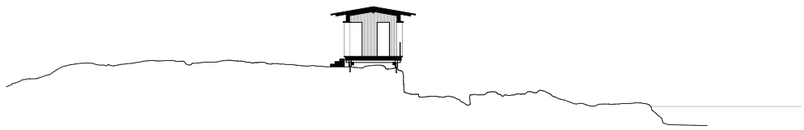
Landscape model.
Scale 1:200

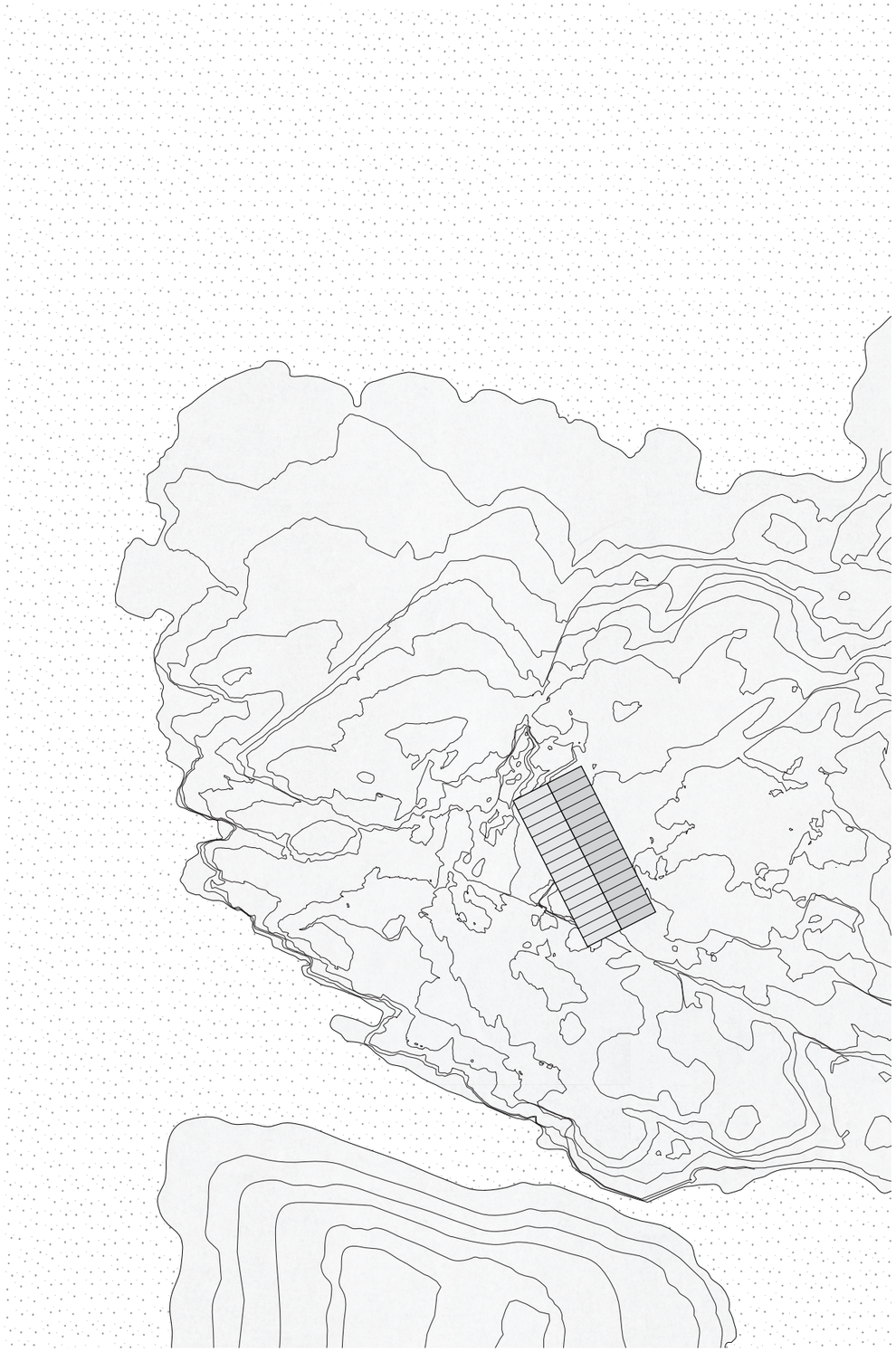
Situation & Placement

The chosen site of the storm shelter is located just by the ocean further out the red trail. It does not sit in direct connection to the trail, something that enhances the feeling of being a destination and not something you just pass by. Due to the hilly landscape on site the building will be visible from a distance and appear rather small in comparison to the wide sweeping landscape. This means the building will not limit the magnificent views from the trail but still hold great views whilst inside the shelter. The location has been carefully chosen based on where the storm is experienced as most dramatic and beautiful.

There is no marked path between the trail and the shelter but the formation of nature creates a natural movement leading the visitors to the entrance where the lighthouse is framed in the horizon. The relation to the ocean will appear differently during high or low tide. This means the shelter sits just right where it should during storms where water will create a spectacle both in the far back of the ocean but also just in front of the shelter by waves hitting the rocks. On a sunny day with low tide the distance to the sea can appear to be longer than what could be needed, but since the building sits high just on the edge of the cliffs the views are perfect any day enjoying the ocean.

Depending on the direction of the walk, one meets the building in different ways. When you choose the left loop the shelter stretches out along the landscape right on the borderland between the cliff and the ocean, while when choosing the right loop, you will meet the gable and a view that contributes to the building being perceived as small in relation to the surrounding landscape and the high rocks in the background. When approaching the building it will appear as if it stands on a rather flat surface and you won't see how it's slightly stretching out with one of the feets. This is mainly experienced from inside and whilst looking at the building facing the gable.

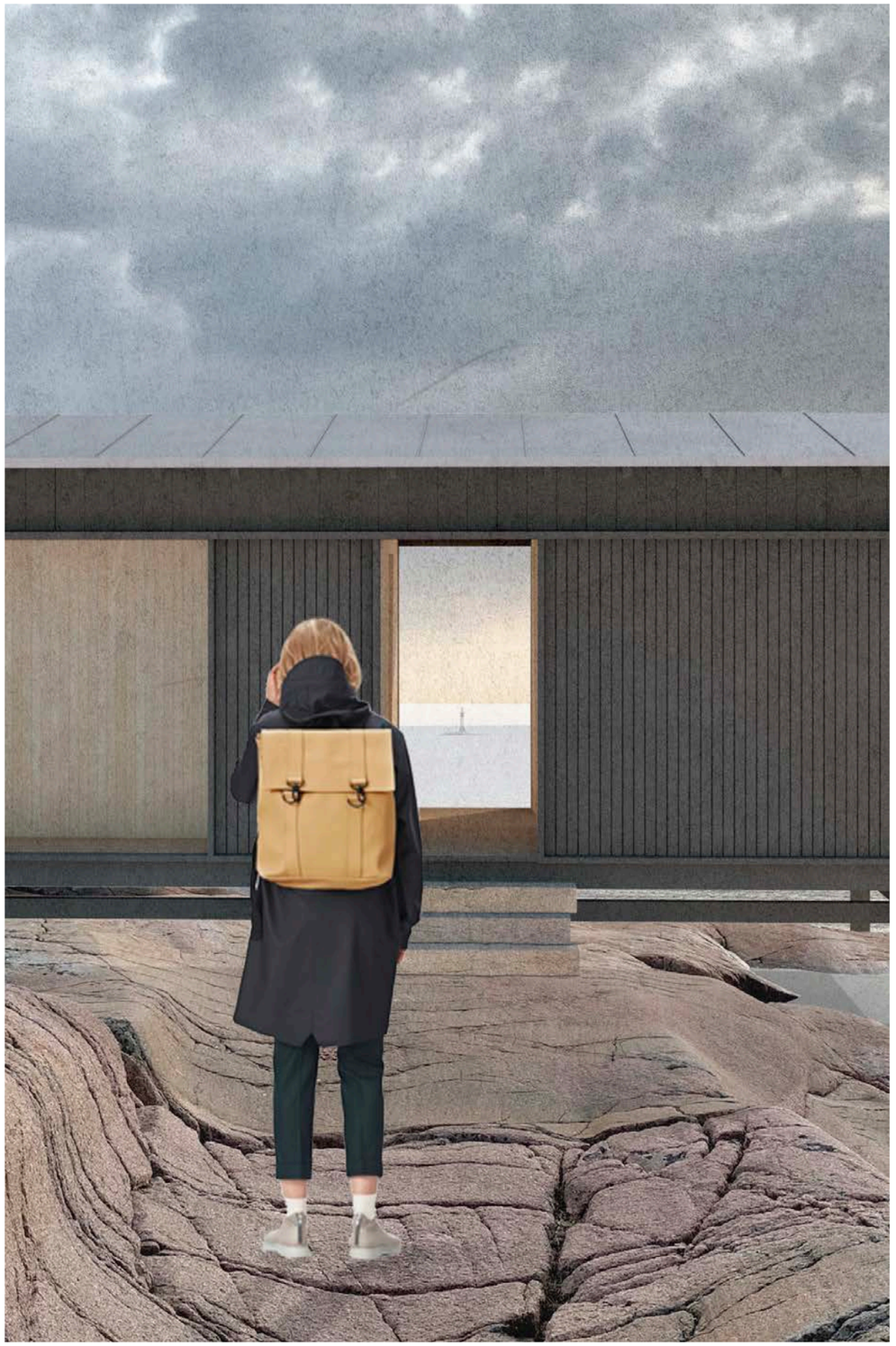




Height curves 0,5m

Siteplan 1:400

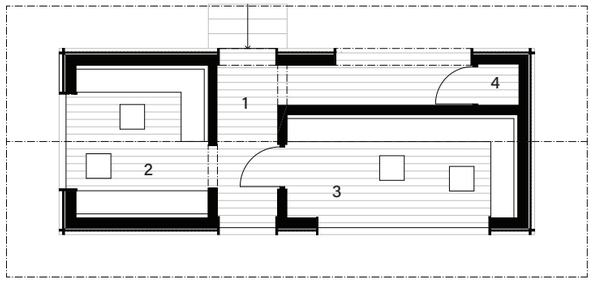
Exterior perspeective



Exterior Perspective

Building design

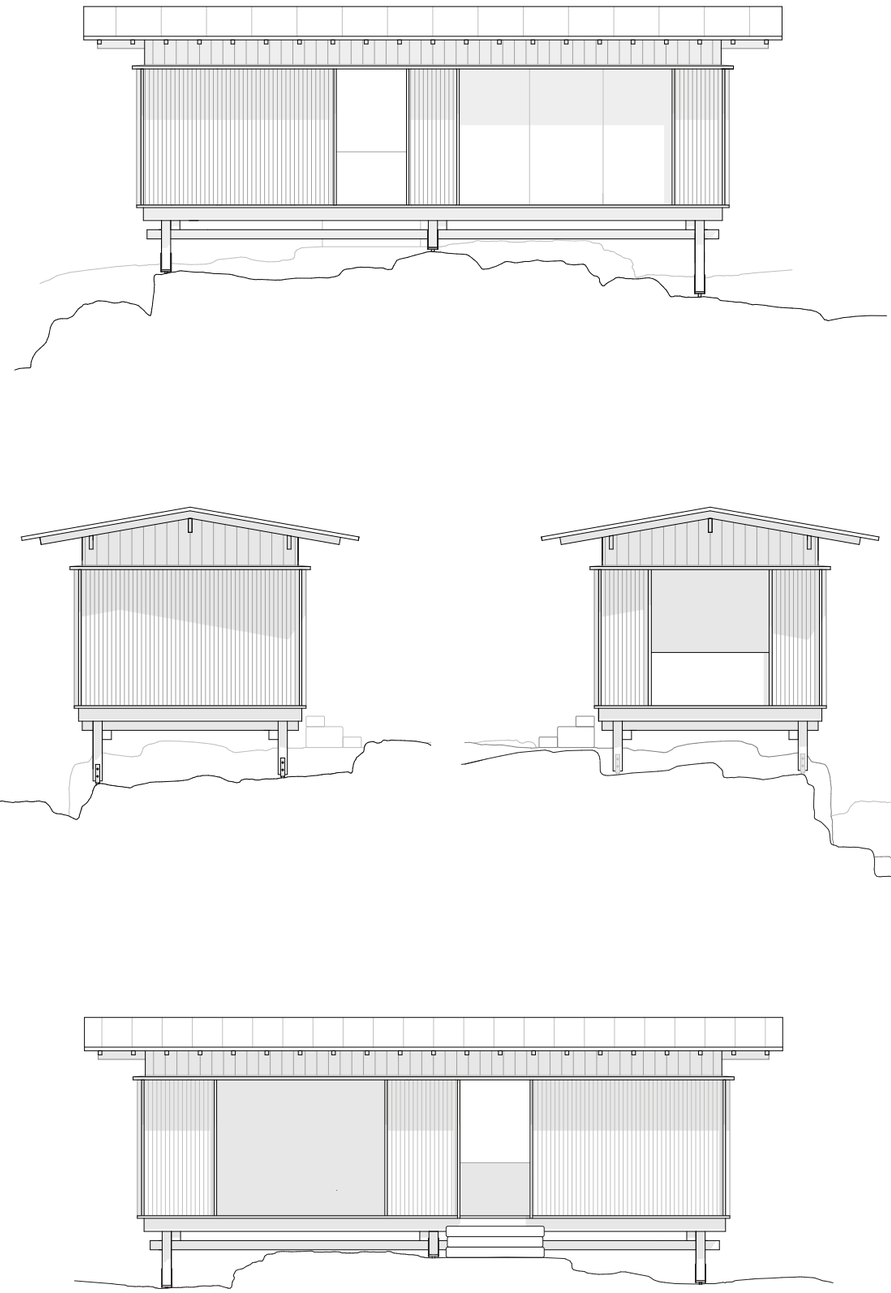
The layout of the storm shelter is organized around the middle room that works as the entrance to the building. Here you are sheltered by the roof of the building but still exposed to the wind. To the right there is a space sheltered from the wind where multiple visitors can sit down and have a view over both the ocean and the landscape. To the left is the storm lookout room that is completely sheltered from the wind with both windows and a door. Here you get a panoramic view over the ocean with the lighthouse in the horizon. On the entry side of the building is a space for disposal of plastic waste findings and a space sheltered from the wind where you look back into the rocky landscape.



1. Entrance
2. Fika room
3. Storm lookout
4. Ocen plastic disposal

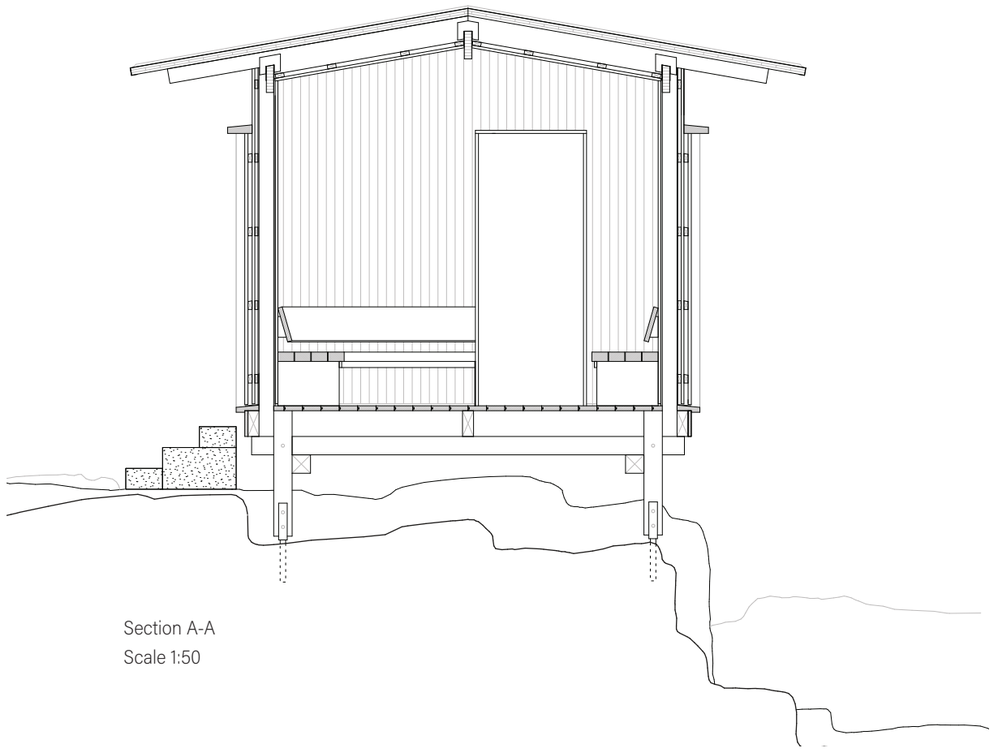
Floorplan

Scale 1:100

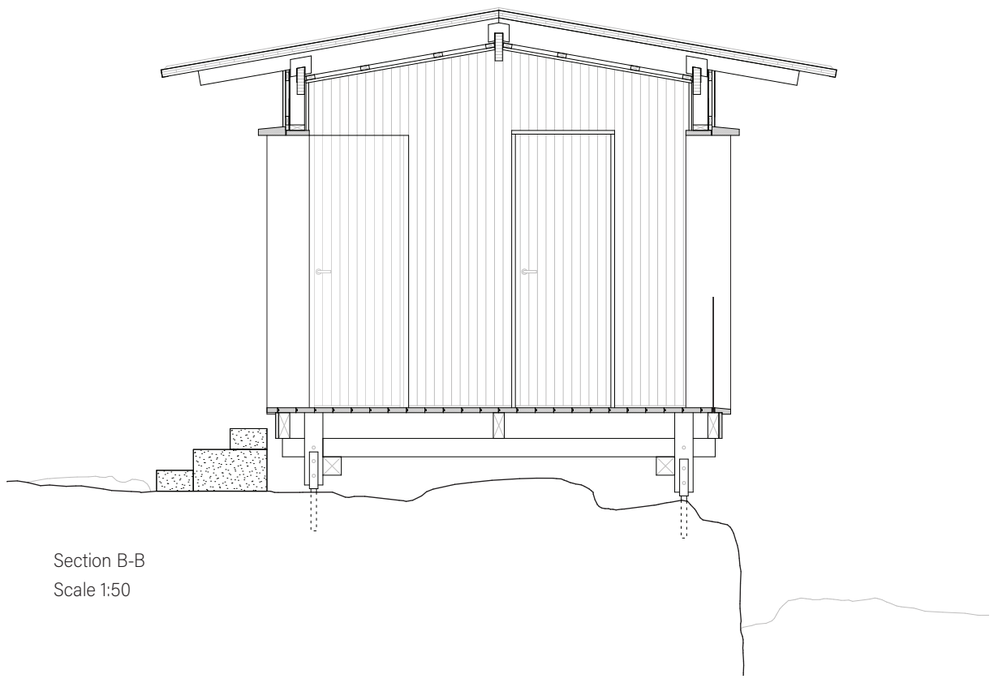


Facade drawings

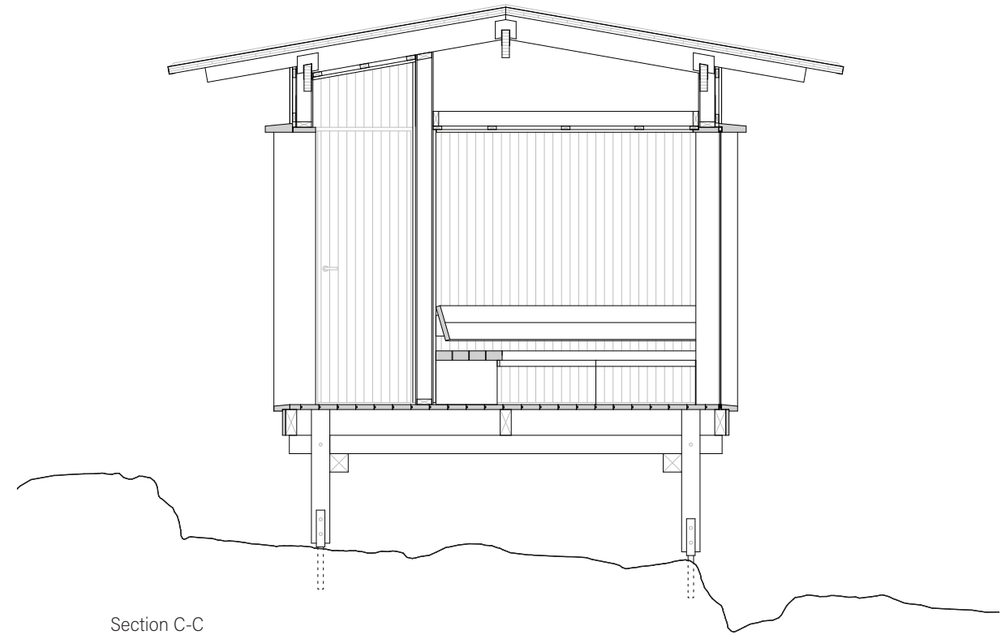
Scale 1:100



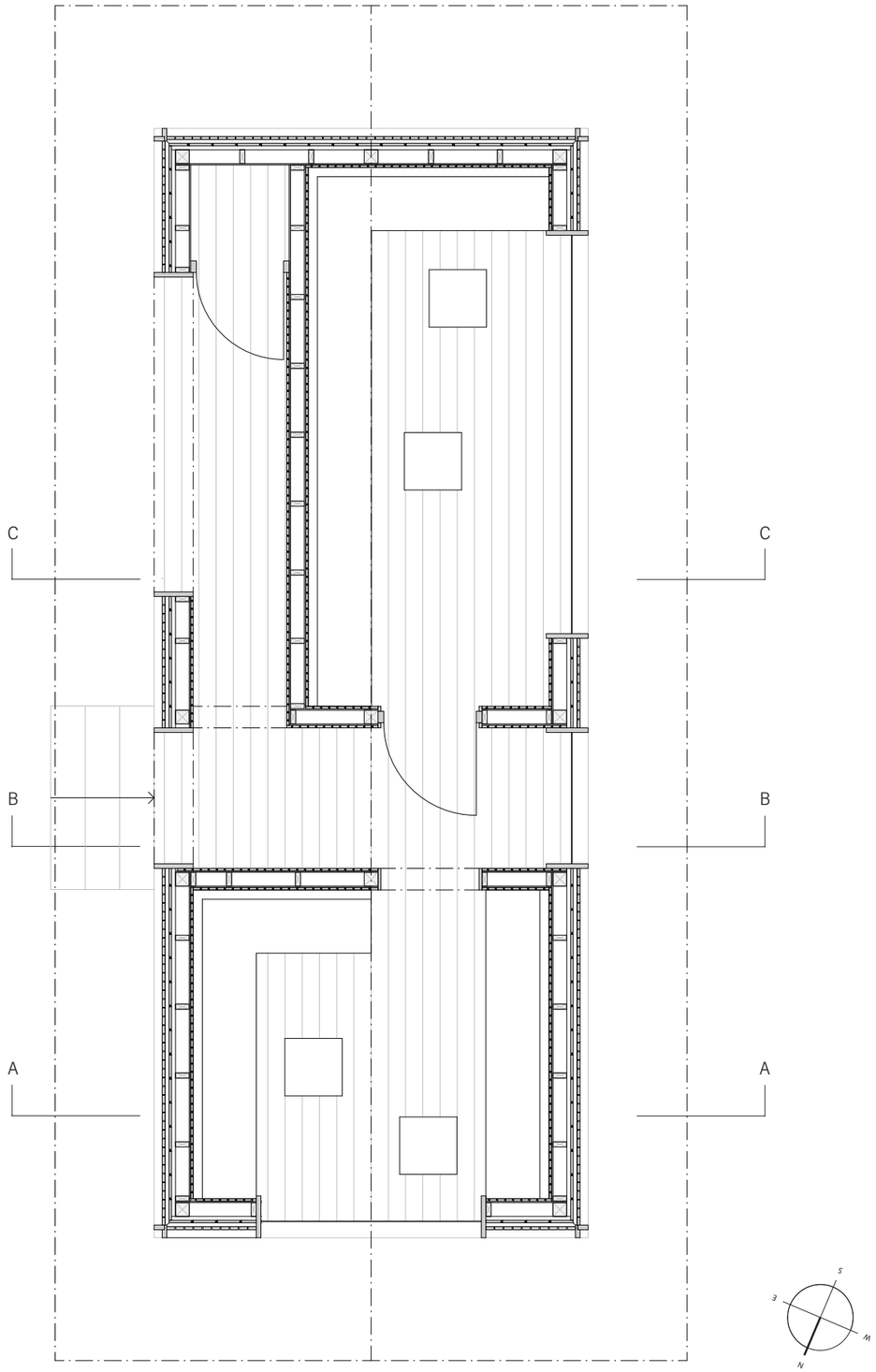
Section A-A
Scale 1:50



Section B-B
Scale 1:50



Section C-C
Scale 1:50



Floorplan
Scale 1:50

Landscape model.
Scale 1:200

Landscape model.
Scale 1:100

Apperance

Light footprint

Since this building stands on bare rock it's been of importance to not use too many anchor points leaving scars for the future. With six anchor points connected to the rock going straight up through the wall connecting to the truss, stability is created to stand rough weather.

Construction

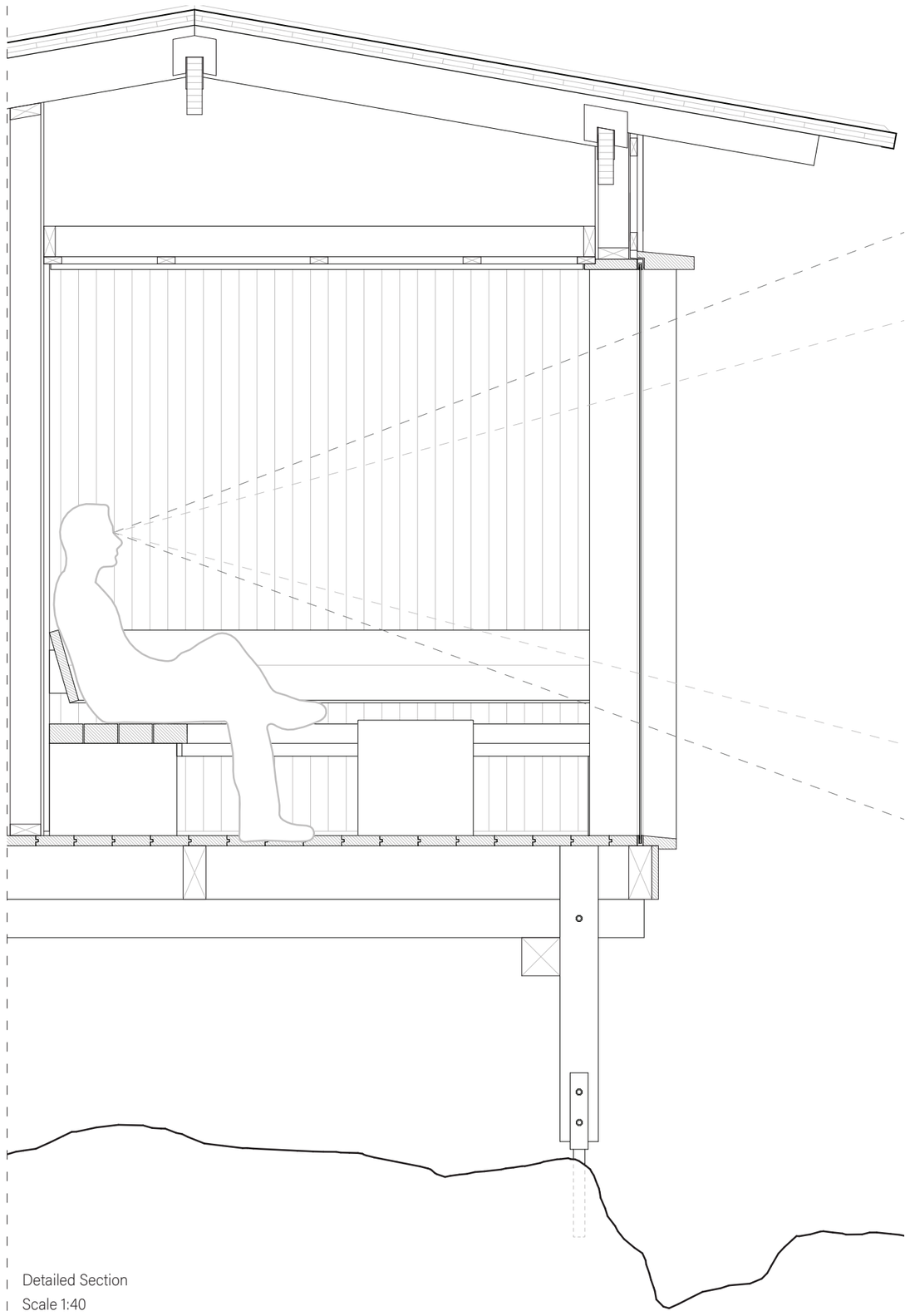
Most of the building is constructed with lightweight timber making it possible to assemble on site. The roof consists of clt slabs to stabilize the building and manage wind together with the large overhang. Since this building mainly acts as a storm shelter, it does not have any insulation or wind protecting layers but are built purely with wood except from the roof which is covered in aluminum sheets.

Materials & Details

To enhance the verticality created by the large roof and the placement in the landscape the facade is divided with horizontal beams. To add small but simple details to the building there are different width of the facade planks above and below the division. They are also shifted vertically to make the upper part feel pressed into the facade even though it's the other way around.

Building in landscape.
Scale 1:50

Elevation
Scale 1:40



Detailed Section
Scale 1:40

Discussion

Reflection

Bibliography

Reflection

In order to answer the thesis question we have investigated the building methods of stilts as part of the overall design and how the philosophy of light footprint could be used in relation to a chosen context. To relate to the discourse "concept of place and its importance" we tried to use architecture as a translator of this site allowing the context to shape the overall idea behind this specific project where the buildings are added to both highlight the unique spectacle of the storm but also sharing information about the the problem of ocean plastic being visible after the storm.

It has been both challenging and interesting to work with a light footprint as a concept.Through the process multiple versions have been iterated to compare different structures, construction and shapes. In relation to light footprint we have realized the importance of allowing the stilts to be part of the design process and not be something added in the end.

Throughout the project we realized how local knowledge can both shape the project to become even more site specific and get a deeper connection to the site such as where buildings should be placed to enhance the direction of movement or where to experience the best view of storms. At the same time it's been challenging to design something that is good enough for this place and not being too hard on ourselves as the site is of great importance to us both.

In order to let the buildings be part of the landscape instead of being landmarks we came to the conclusion to enhance the horizontality of the landscape. Working with the lightness achieved by placing the construction and stilts further into the wall and dividing the building facade we could achieve a horizontal and light appearance especially with the shape of the roof using reference projects as a guideline.

We have appreciated the chance to investigate how to use the concept of light footprint and what expressions it could achieve. We think it's of great importance for us as architects to learn to use the advantages and handle the weaknesses of stilts when designing architecture that allows nature to stay the way it is.

Our design proposal does meet a lot of our expectations regarding placement and function, and the design process took us somewhere we could never imagine before.

In conclusion, we hope that this master thesis could contribute to the discourse of importance of place and how the philosophy of light footprint could both ensure to protect our landscape while at the same time be a significant part of the design.

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Aureliano Ramella. (2019, January 1). Belonging - Glenn Murcutt [Video].
YouTube. https://www.youtube.com/watch?v=QYEbgU7xZHA

Images

All images are privet unless stated.

Figure 1. White Architects (n.d.) Store Mosse floor plan [Drawing]. Retrieved 15 april 2023, from Sveriges naturum

Figure 2. Blunck, R,. & Murcutt, G. (n.d.) Marika Alderton house [Photograph]. Retrieved 15 april 2023, from https://atlasofplaces.com/architecture/marika-alderton-house/

Figure 3. Herzog, J,. & de Meuron, P. (1988). Plywood house [Drawing]. Retrieved 15 april 2023, from https://www.herzogdemeuron.com/projects/027-plywood-house/

Figure 4. Herzog, J,. & de Meuron, P. (1988). Plywood house [Photograph]. Retrieved 15 april 2023, from https://www.herzogdemeuron.com/projects/027-plywood-house/

Figure 5. Herzog, J,. & de Meuron, P. (1988). Plywood house [Photograph]. Retrieved 15 april 2023, from https://www.herzogdemeuron.com/projects/027-plywood-house/