Nature Interpretation Center The Great Alvar

Master Thesis In Architecture By Christopher Polteg 2015

AAHM01: Degree Project in Architecture

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Lunds universitet
Lunds Tekniska Högskola

NATURE INTERPRETATION CENTER THE GREAT ALVAR

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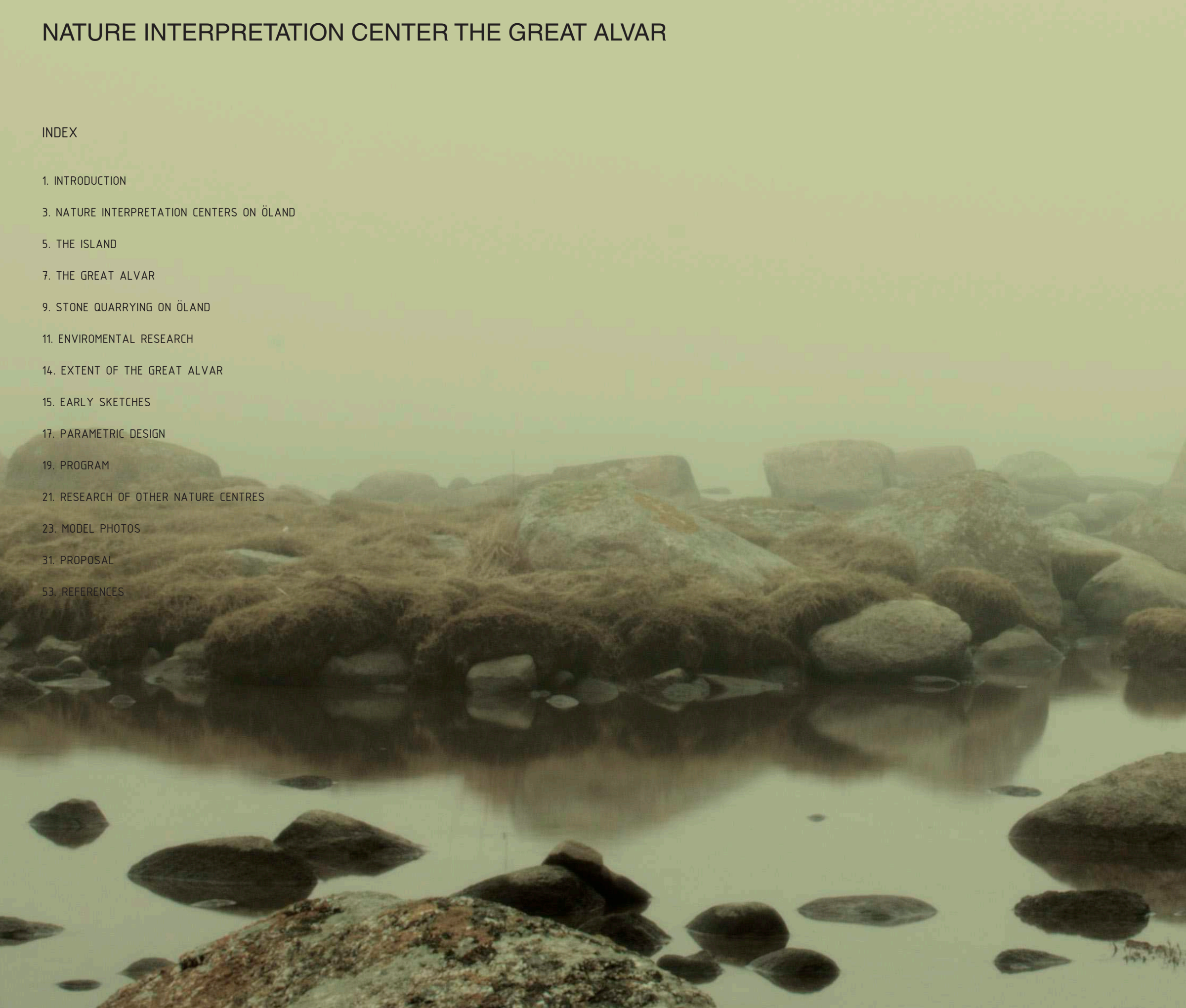


Nature Interpretation Center

A nature interpretation center is all about enhancing public knowledge and understanding of nature and environment.

The placement of such a center is in connection with either a place of much beauty or of scientific interest which often happens to be a nature reserve. Visitors should leave enriched in knowledge and impressions and with a will to explore the nature for themselves.

The architecture of a nature visitors center should help to strengthen these goals and be adapted to the nature and the context of the place. These are my ideas of what a nature interpretation center is supposed to be.

I have focused my project on the experience of the place by pinpointing specific characters in the environment of the Öland landscape.

Nature Interpretation Centers on Öland

Öland has two nature interpretation centers one in the north and one in the south. The north is located in an area called Trollskogen (which literally means forest of the trolls) and focuses around the environment and the cultural heritage of the most northern part of Öland.

The southern nature interpretation center is located in Ottenby and deals mostly with birds and the migration of these around the globe but it also deals with the cultural heritage and the landscape of southern part of öland and how the agriculture has been playing an important role for the population of birds which breeds in the area. There is also a ornithological research center next to the nature interpretation center.

The Island of Öland

Located in the Baltic sea just of the eastern coast of southern sweden Öland has a special climate in comparison with mainland of Sweden. Due to Ölands location in the baltic sea it has a more even temperature during the year as a result of the temperature buffering effect of the sea. This gives Öland milder winters and a delayed spring in comparison with the mainland of Sweden. (Natur och kultur på Öland 2001 p. 29). Öland is often called the Island of sun and wind which is quite striking as it is one of the places in Sweden that has the most hours of sun annually and has a high exposure of winds.

Dry Climate

The eastern part of sweden has a lower rainfall than the western part due to the moist air giving rise to rain often strikes Sweden from the west and thus leaving the eastern part in a rain shadow. Due to Öland being a narrow and flat Island it often lacks a sufficient cooling factor on the moist air arriving from the east to give rainfall locally. Instead it is not unusual that this air passes over the island and give rise to rainfall first after reaching the mainland.(Natur och kultur på Öland 2001 p. 30).

Heavy winds

Being a flat and narrow island located in the sea it is very exposed to winds blowing in from the open baltic sea in the east. Which in the winter can lead to severe snowstorms, rendering the island inaccessible at certain areas. (Natur och kultur på Öland 2001 p. 32).

The Great Alvar

With an area of 260 km² the Great Alvar covers a vast part of the entire island and almost the whole of the southern part of Öland.

In the year 2000 this area was listed as a part of the Agricultural Landscape of southern Öland. The interplay between the agricultural use of the land and the special environment was the reason for this. The Great Alvar is special in its character due to its harshness and stressed environment with severe drought in the summer and flooding in the spring. Put together with the fact of its geographical location it poses a very special environment which supports an ecosystem that is rare and has a variety of different plants and animals that thrives in this particular environment. (Länsstyrelsen Kalmar län 2015).

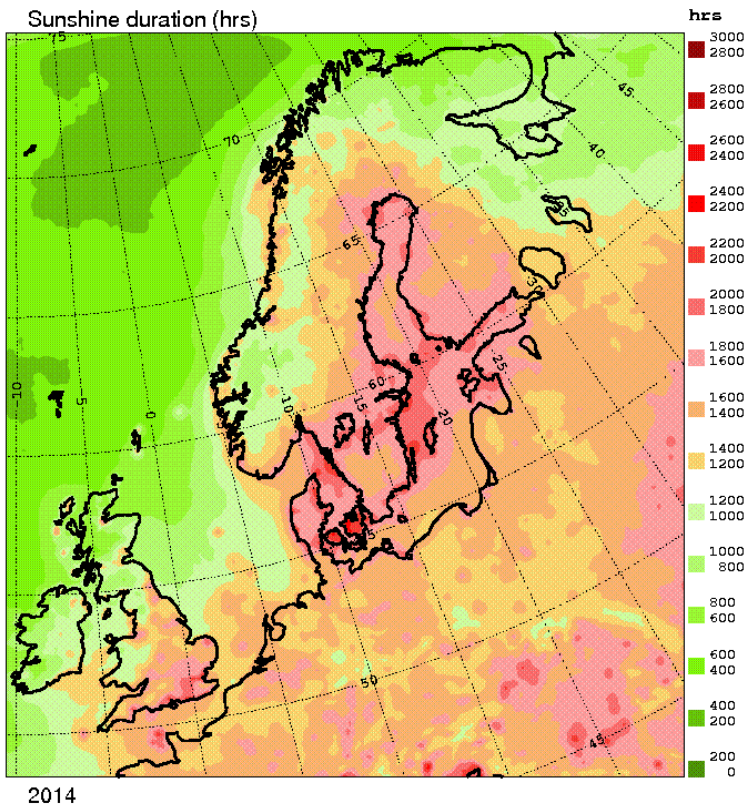
The Geology and Ecology

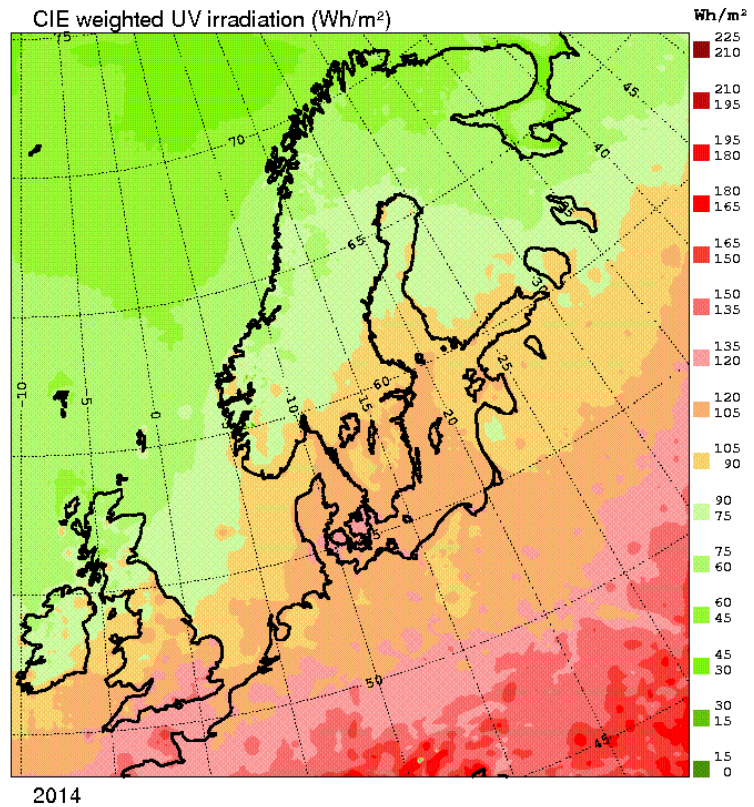
The limestone bedrock that constitutes the whole of the island is in this area covered only in a thin layer of soil which makes it difficult for species that otherwise is common in sweden to grow. Instead the ground is covered with different species of lichen, herbs and wildflowers. Some of which are endemic to Öland as the Artemisia oelandica, which is a type of wormwood (Naturhistoriska riksmuseet 1998).

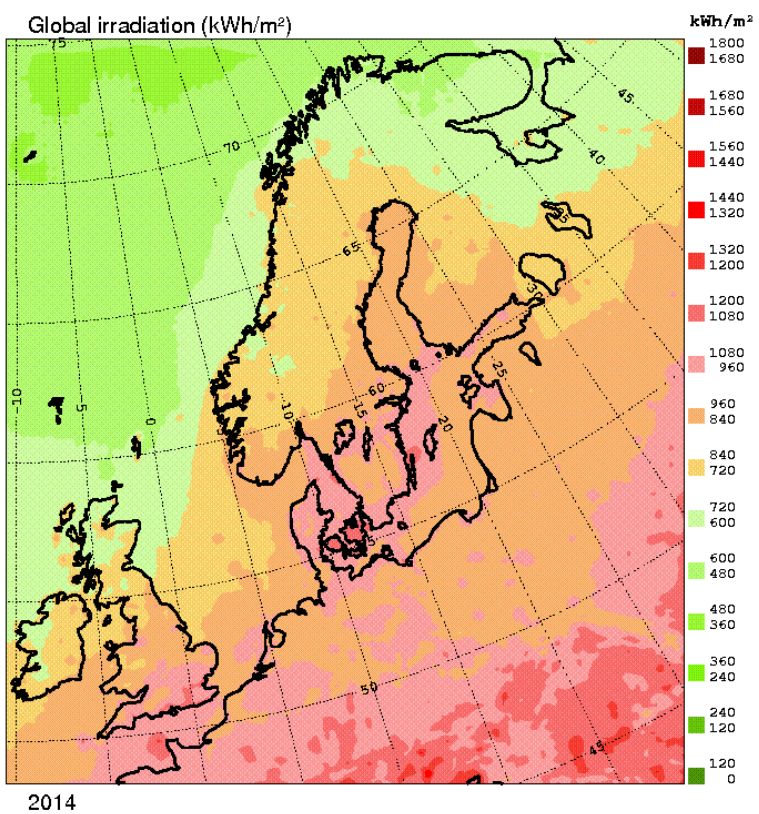
Stone quarrying on Öland

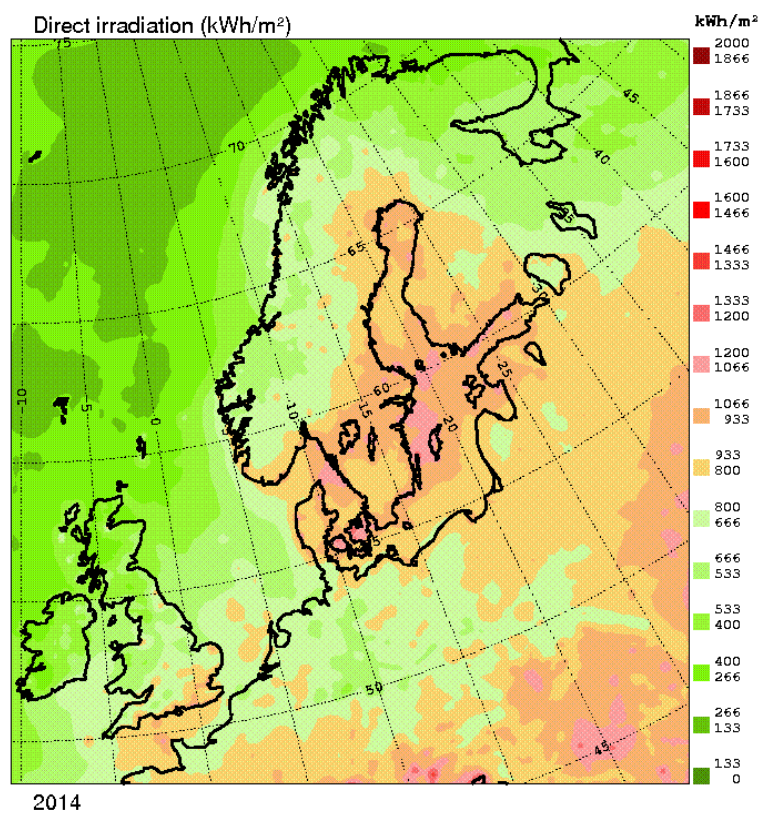
The limestone of Öland has been an important resource for trade since the medieval days. It was described as the most sought after resource of Öland as early as 1544. The quarrying industry expanded in the 19th century with the village of Sandviken as the center. On the west coast of the northern part of the island lays many remnants of this past quarrying.

As well as limestone for buildings there was a need for limestone to be calcined in lime kilns to be used as limewash and plaster in house construction. As this industry grew in the 17th and 18th century the shortage of wood became a large problem. Due to this excessive use of firewood the forests of Öland diminished fast during this this period. (Natur och kultur på Öland 2001 p. 134)









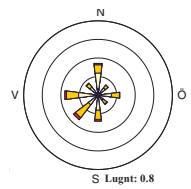
Sunlight and radiation

Diagrams showing irradiation levels across the region. Showing how Öland is under a great sunload on an annual basis. During the summer months the direct sunlight on Öland is the heighest in Sweden.

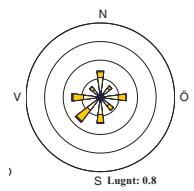
STRÅNG data used here are from the Swedish Meteorological and Hydrological Institute (SMHI), and were produced with support from the Swedish Radiation Protection Authority and the Swedish Environmental Agency.

Wind conditions 1961–2004

Wind roses assembled from the weatherstation Hoburg on the island of Gotland. This shows that winds from the west and south are dominant through the year.



February



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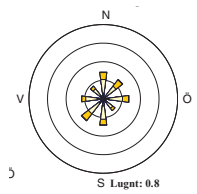
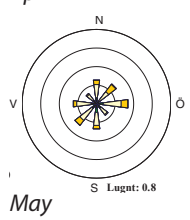
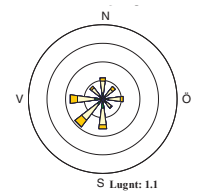


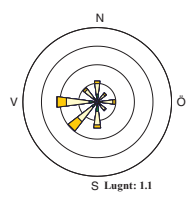
April



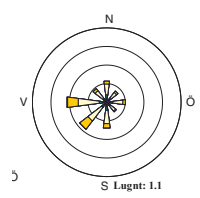
May



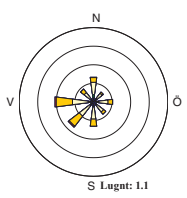
June



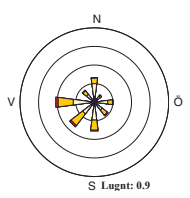
July



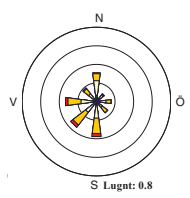
August



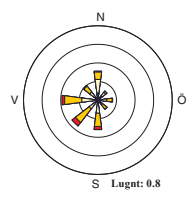
September



October

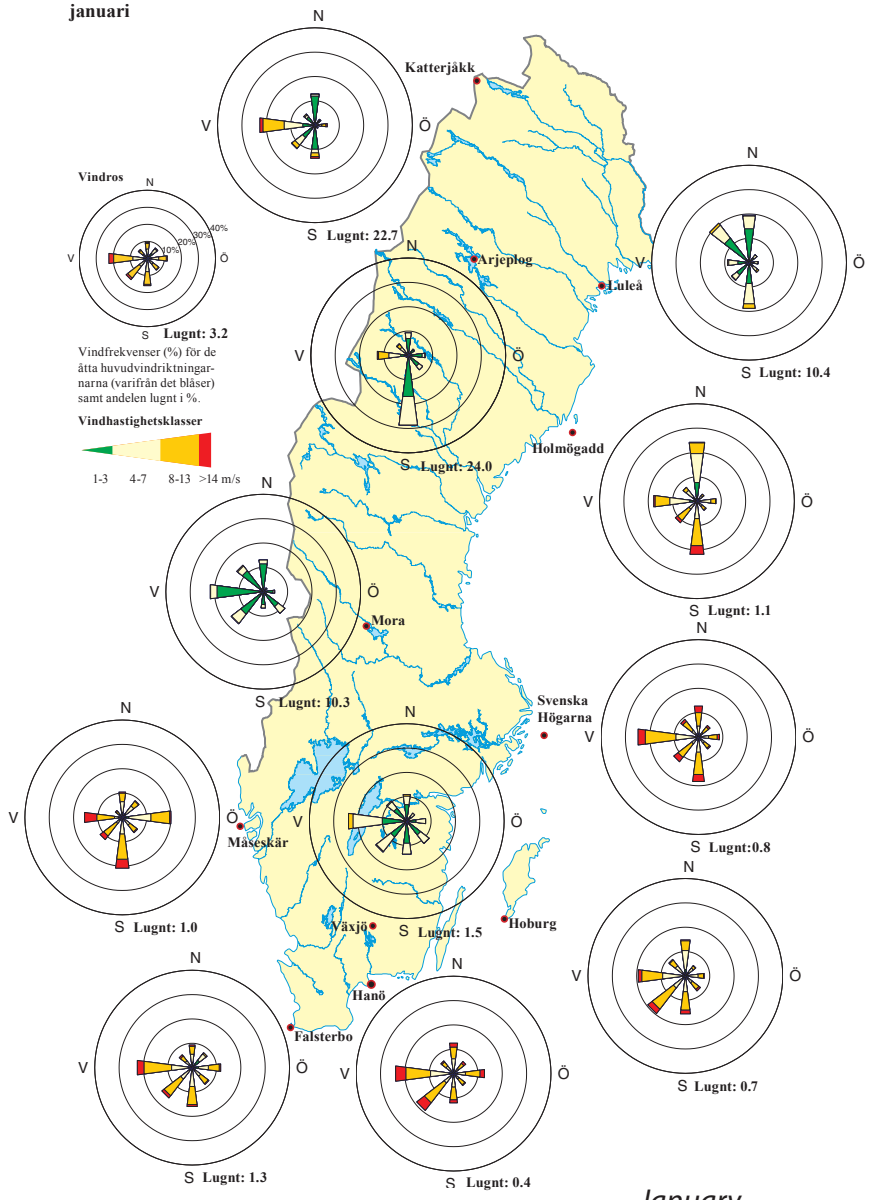


November



December

Vindrosor januari



January

SMHI
Vindstatistikrapport -06

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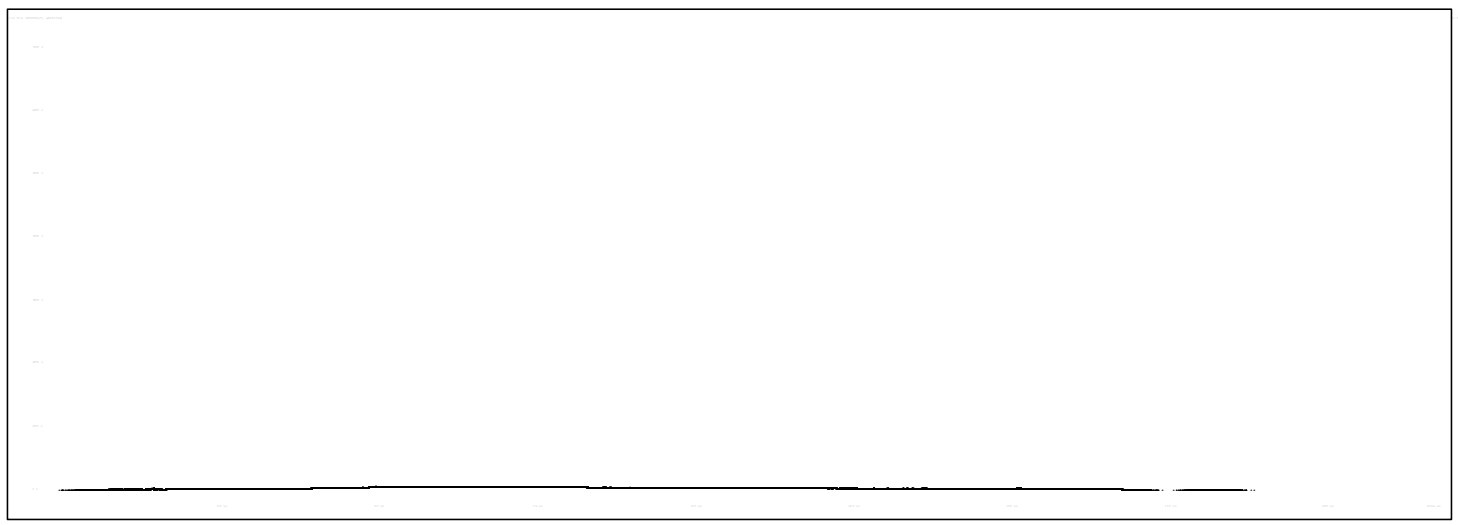
SITE INVESTIGATION

Site Criterias

When searching for a suitable site I first put up some criterias which the diffrent sites should be weighted after.

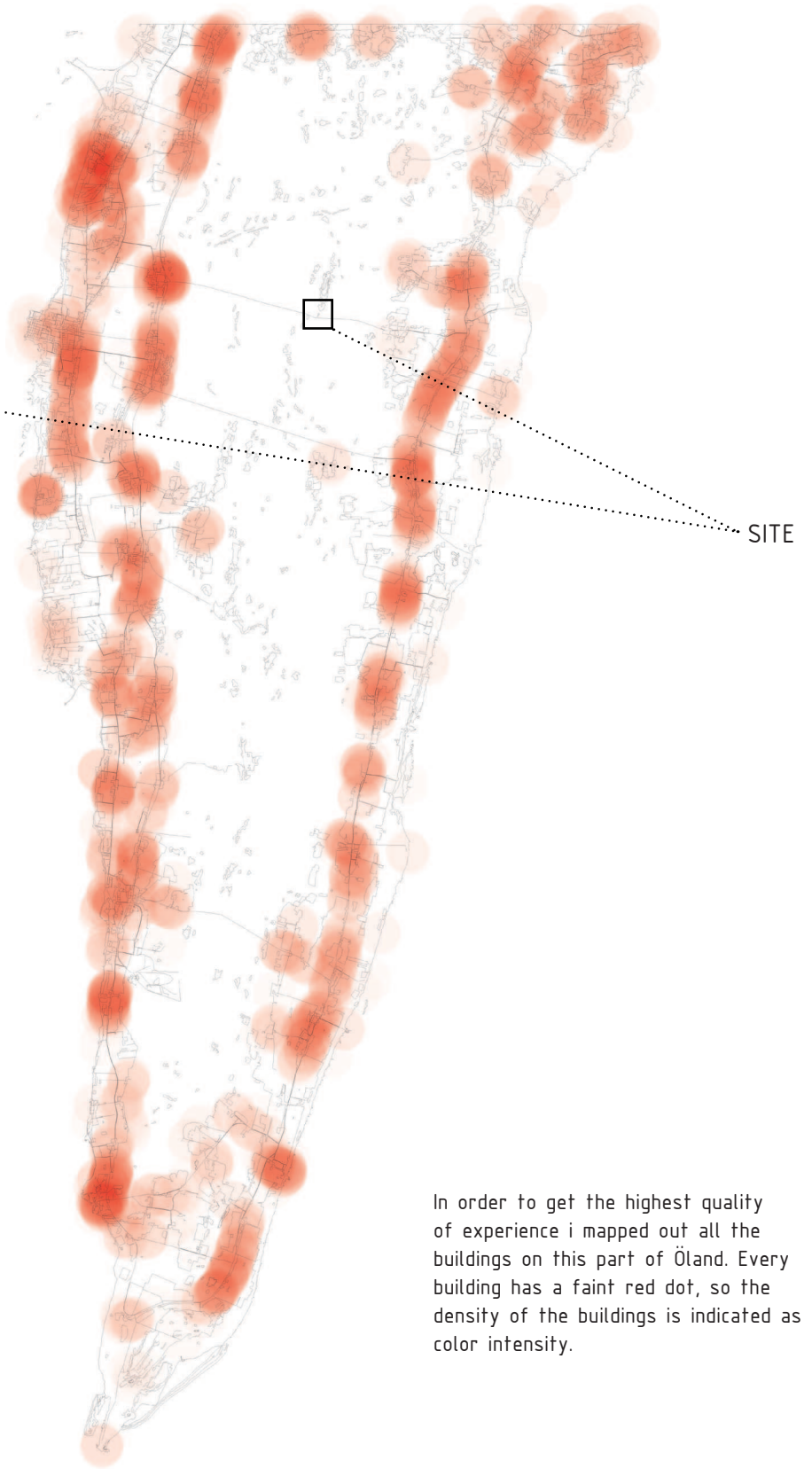
- Quality of experience
- Accessabilty
- Competition with other attractions



This section across Öland indicates the height profile of the landscape.

The extent of Stora Alvaret is indicated as a hatch on the map. The site i finally chose is placed in the middle of the largest part of Stora alvaret.

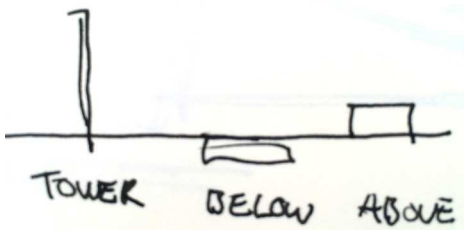
THE EXTENT OF STORA ALVARET

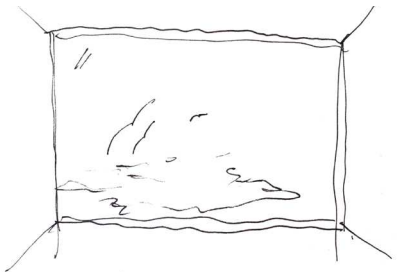


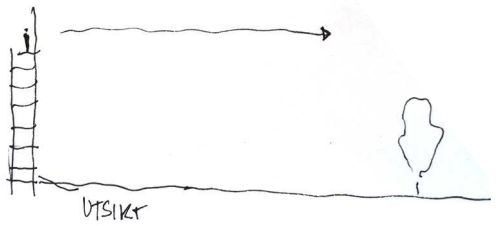
In order to get the highest quality of experience i mapped out all the buildings on this part of Öland. Every building has a faint red dot, so the density of the buildings is indicated as color intensity.

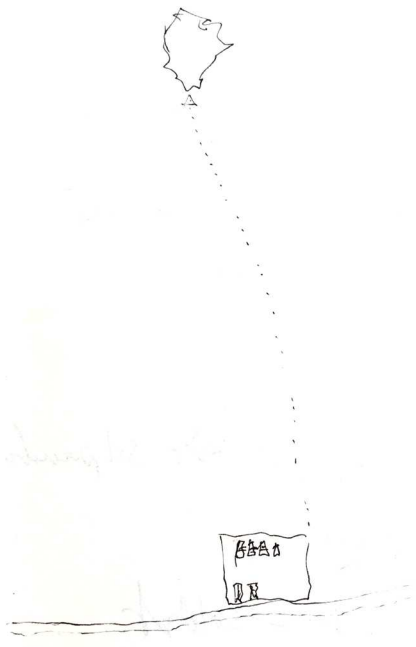
DIAGRAM OF BUILDINGS

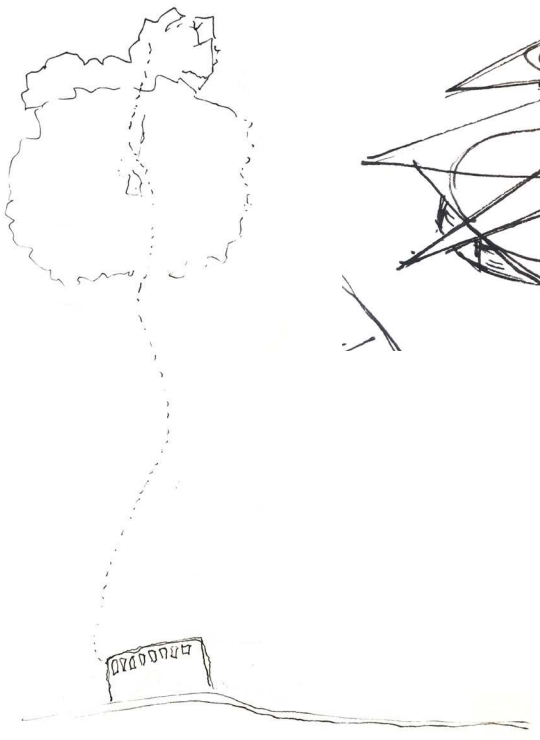
EARLY SKETCHES

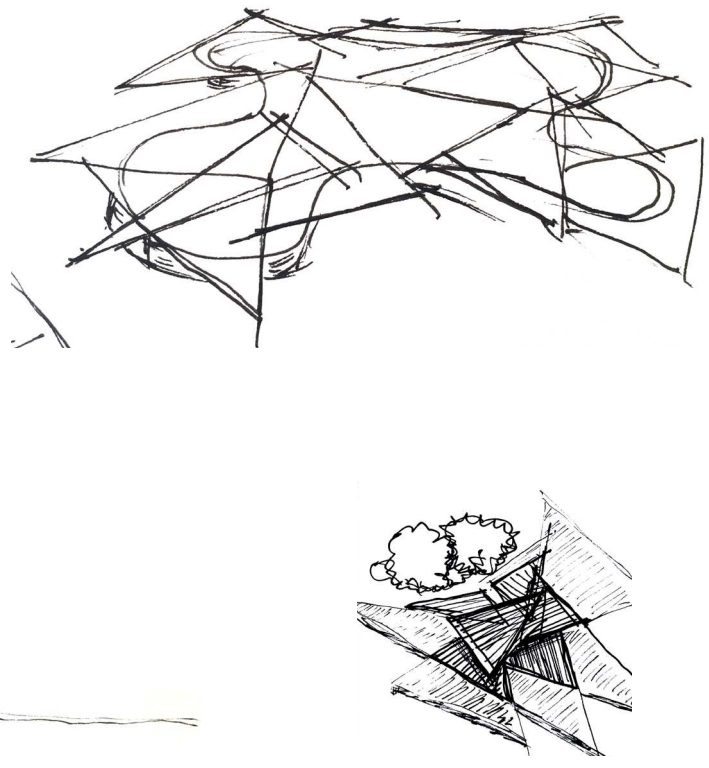


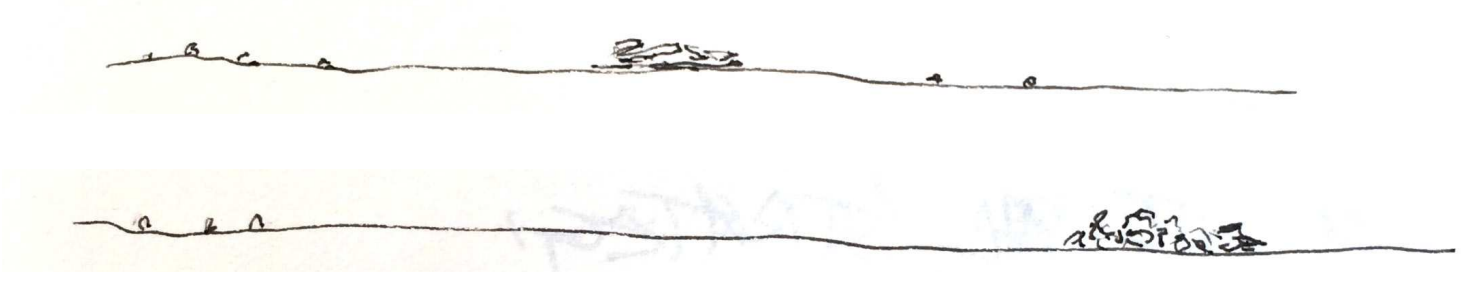


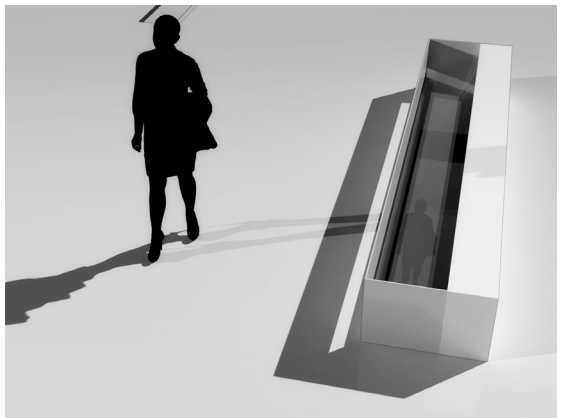
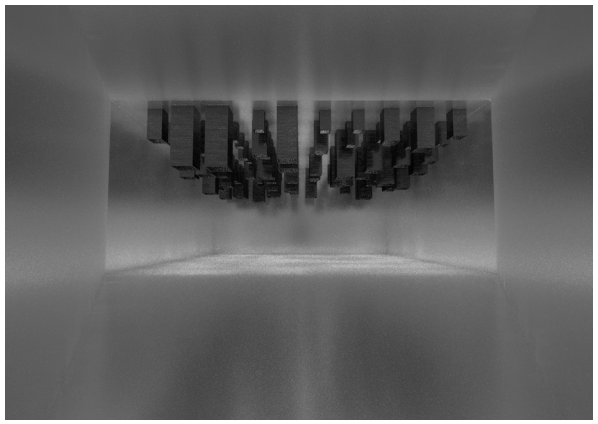
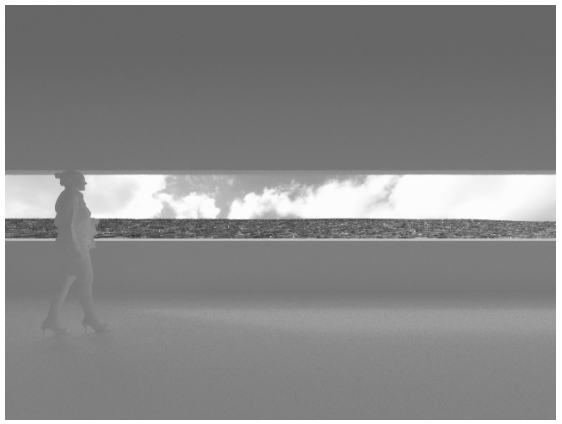
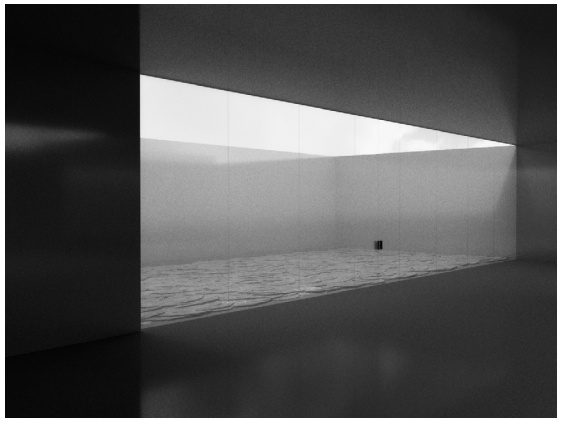
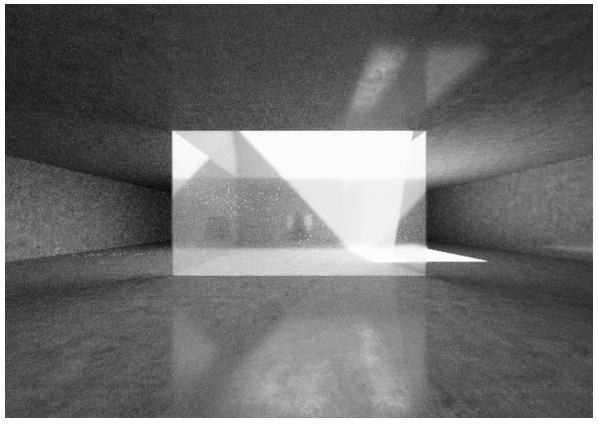
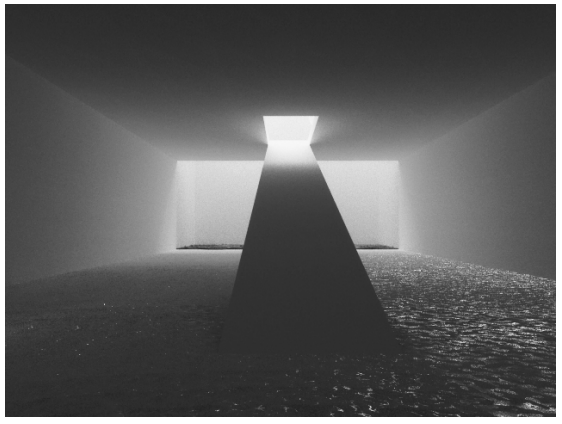






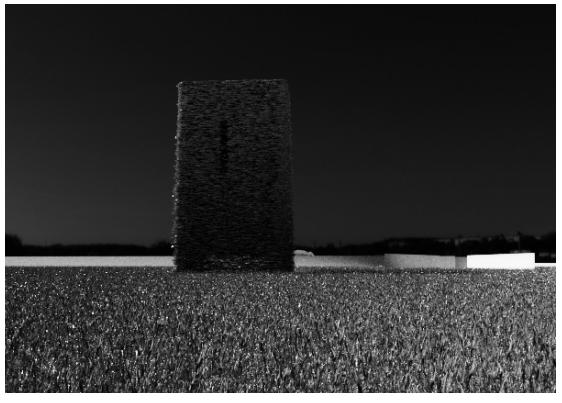


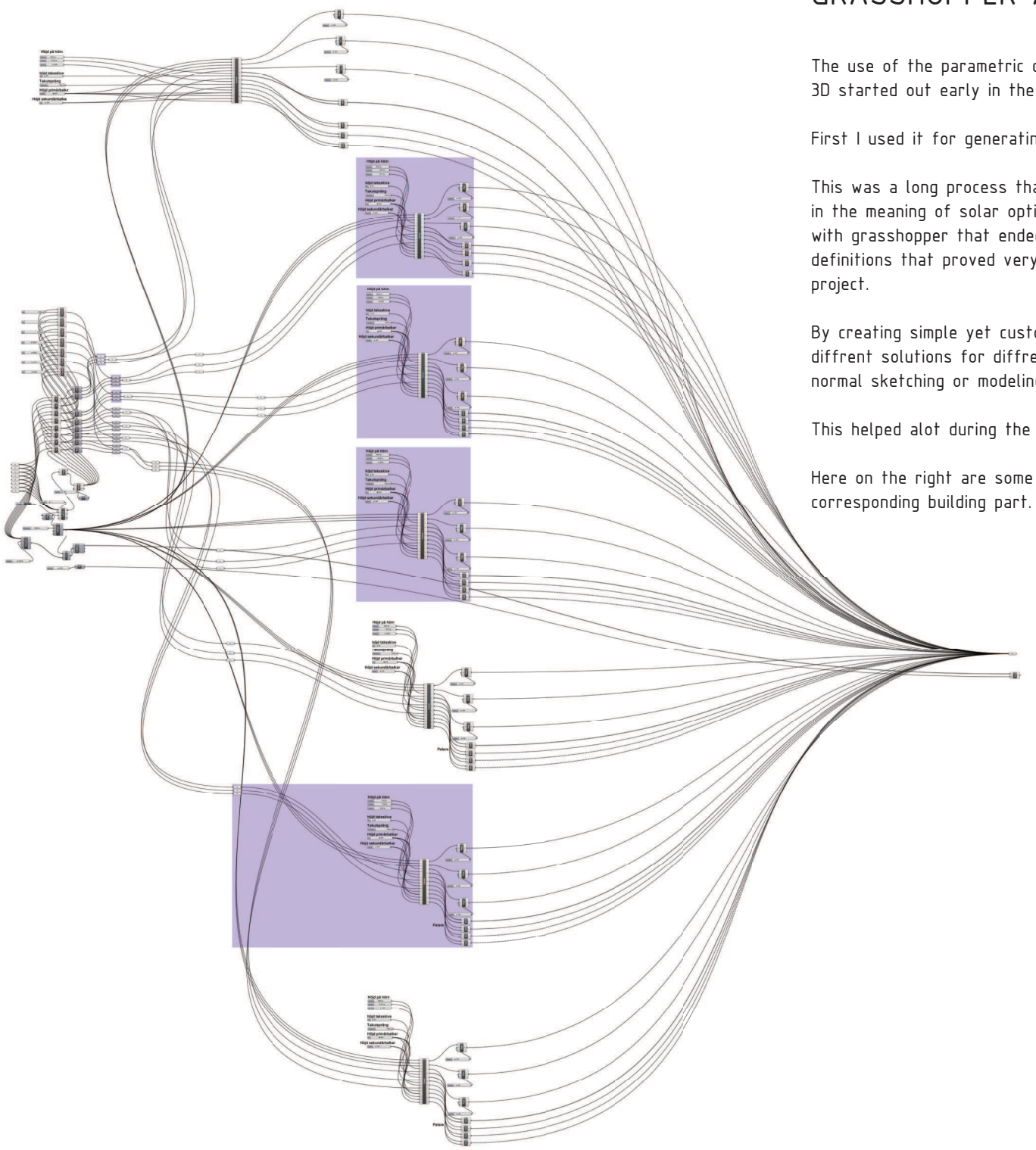



Modulating light and volume

Early conceptual sketches and lightstudies. Focusing on enhancing the the interpretation of the landscape





Early thesis grasshopper script

GRASSHOPPER AS A DESIGNTOOL

The use of the parametric design plugin grasshopper for Rhinoceros 3D started out early in the project.

First I used it for generating solar studies and as a formfinding tool.

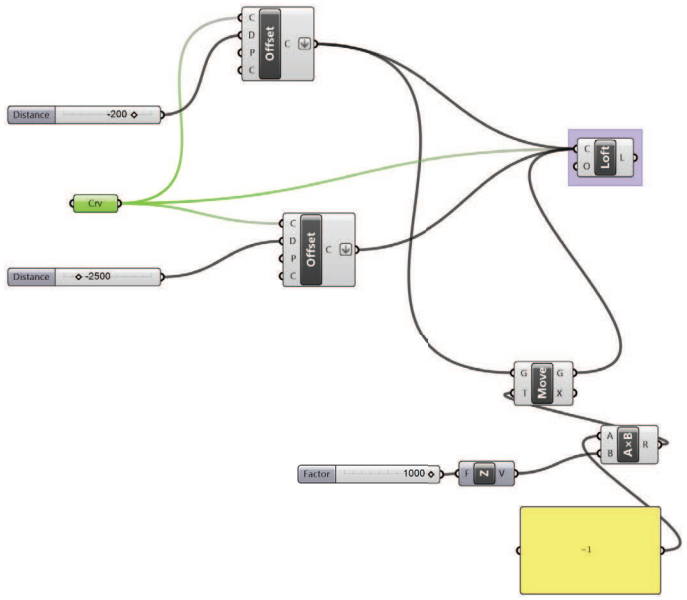
This was a long process that gave alot back to the design, but not in the meaning of solar optimization. But rather as a training time with grasshopper that ended up with various simple grasshopper definitions that proved very helpful in the overall design of the project.

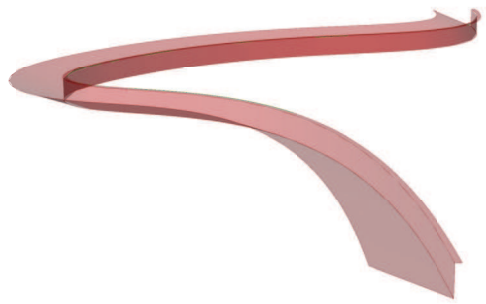
By creating simple yet customizable small scripts i could tryout many diffrent solutions for diffrent parts of the design much quicker than normal sketching or modeling would allow.

This helped alot during the intense designphase of the project.

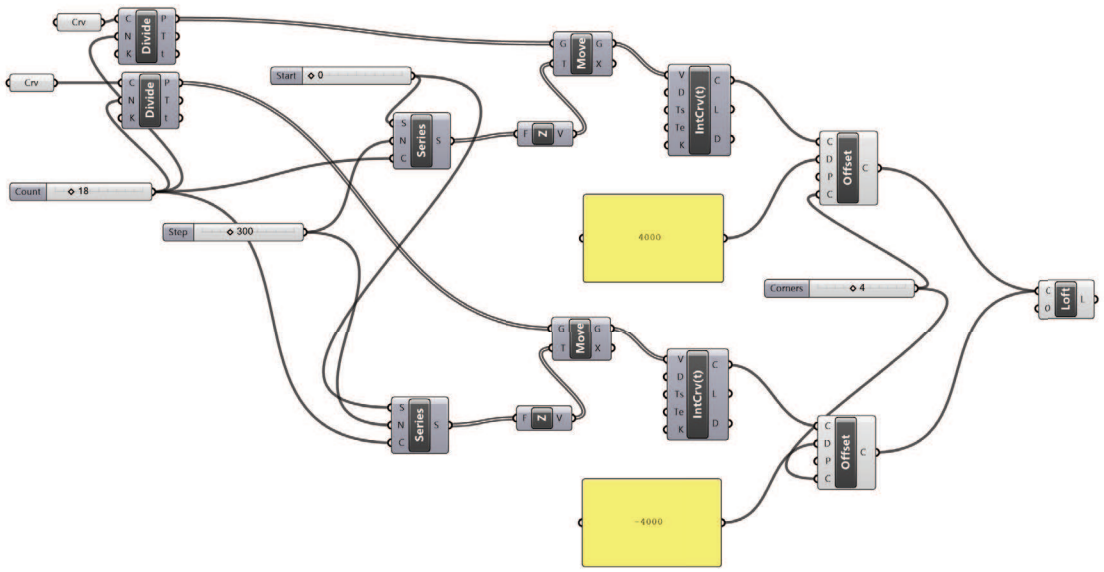
Here on the right are some of the scripts used and with corresponding building part.

Definition for the trenches

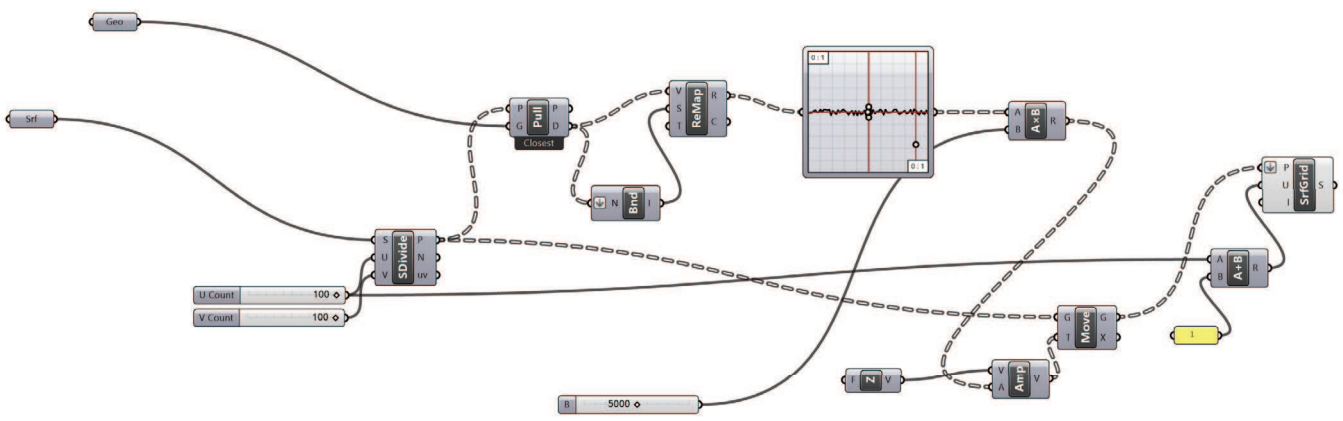


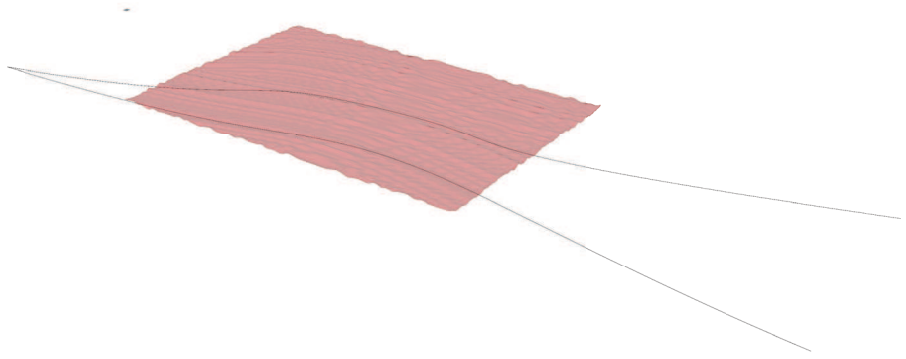


Definition for the walkway ramps



Definition for the ceiling in the main building





The program for the competition InNatur4

MINIMUM AREAS

SPACE	AREA m²
Access Area	55
Exhibition Area	420
Multimedia Classrooms	120
Cafeteria	170
Administrative Offices	50
General Toilets	35
Bedrooms	110
Bathrooms and changing rooms	40
General Warehouse	50
Facilities Room	20
Total	**1050**

PROGRAM

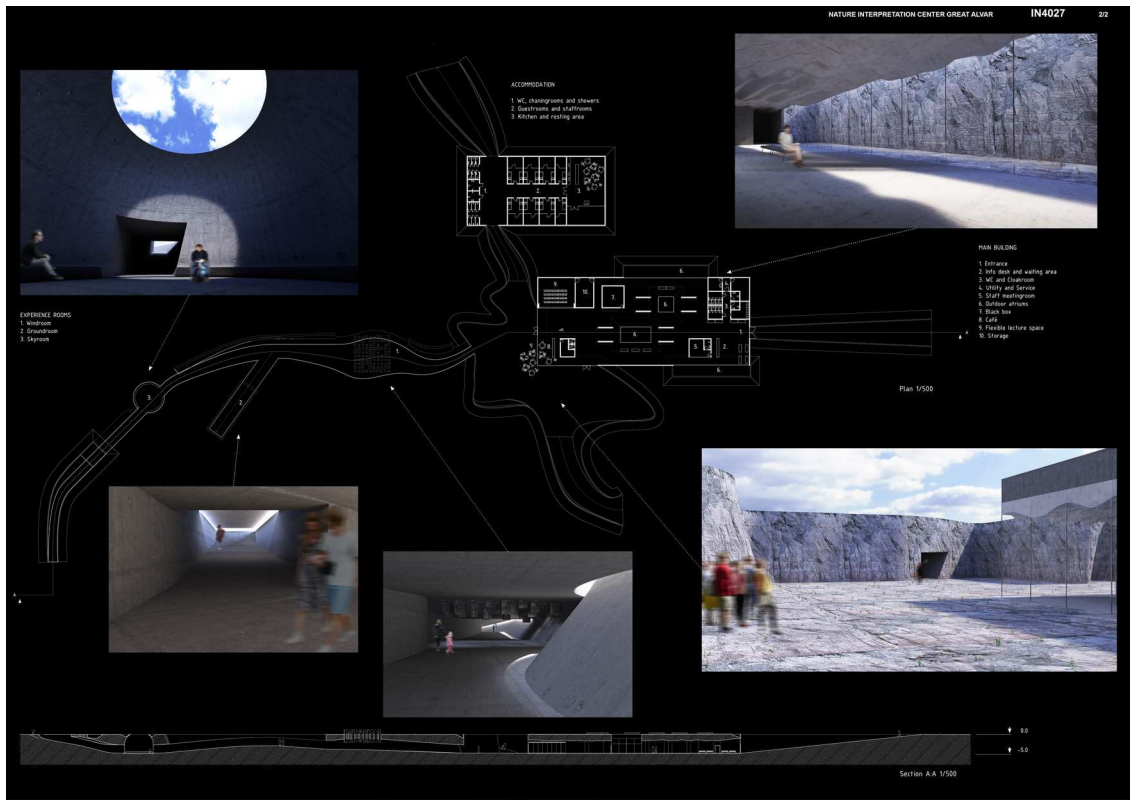
I found a competition for the design of a nature interpretation center. Which had an interesting view of what the function of a nature interpretation centre should be.

The competition was still open for registration and the deadline for submitting ones proposal was places very well in time just weeks before i planned to present my thesis.

I thought this was a great idea to take on an extra deadline to get the design done well in time before the presentation.

The competition program that was stated as a minimum for certain areas and what type of functions that should be included became my point of departure for the program of my design.

One part of the program was very interesting and that was the bedrooms. The idea of the nature interpretation center being more than just a place to visit during a shorter time.



Submitted competition posters

NATURE CENTERS ON ÖLAND

RESEARCH OF OTHER NATURE CENTERS

Looking at other swedish nature centers to understand what concepts that is used to adopt to the context and raise the understanding of the nature through architecture.

I recognise the building strategy as being lightweight, lifted from the ground and thus gentle towards the nature. As an object gracefully places in an pristine enviroment. This concept is sympathical and effective by giving a minimal impact on the nature which is to be preserved.

But it also has its flaws as it can be obstructive to the sense of nature and the wild. It can be direct intrusive in the natural enviroment and have a negative impact on the experience of the nature. Is this damage worth the fact that the building itself is easily removable and nature is left with a minimal building footprint?

I want to argue for a thought of the nature center as a permanent structure that becomes a part of the nature, adopting to the specifics of the place and maintains the character of the nature and adopts to the conditions and specifics of the nature it aims to serve and strenghten.

ÖLANDS TWO NATURE CENTERS

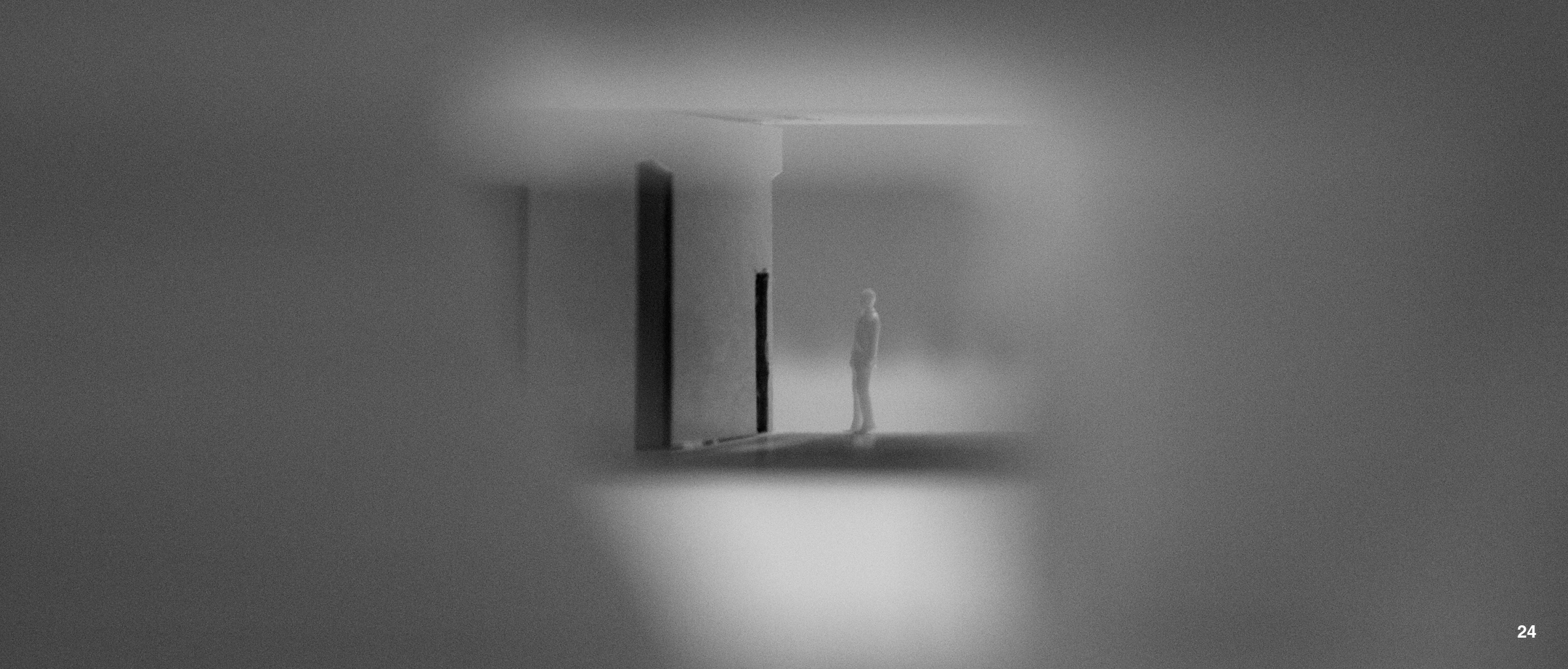
Öland has two nature centers located at the northern part and the southern part of the island.

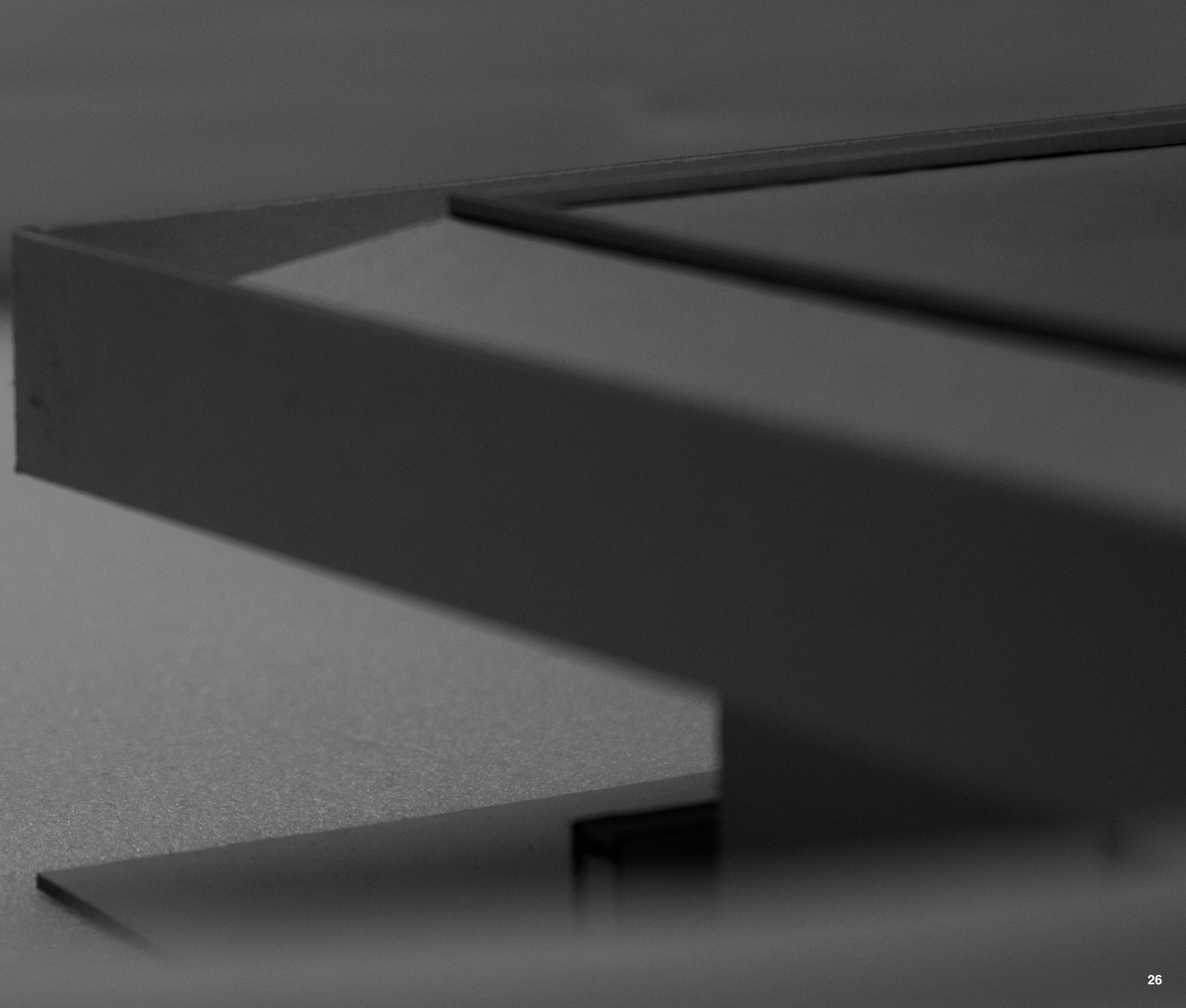
TROLLSKOGEN

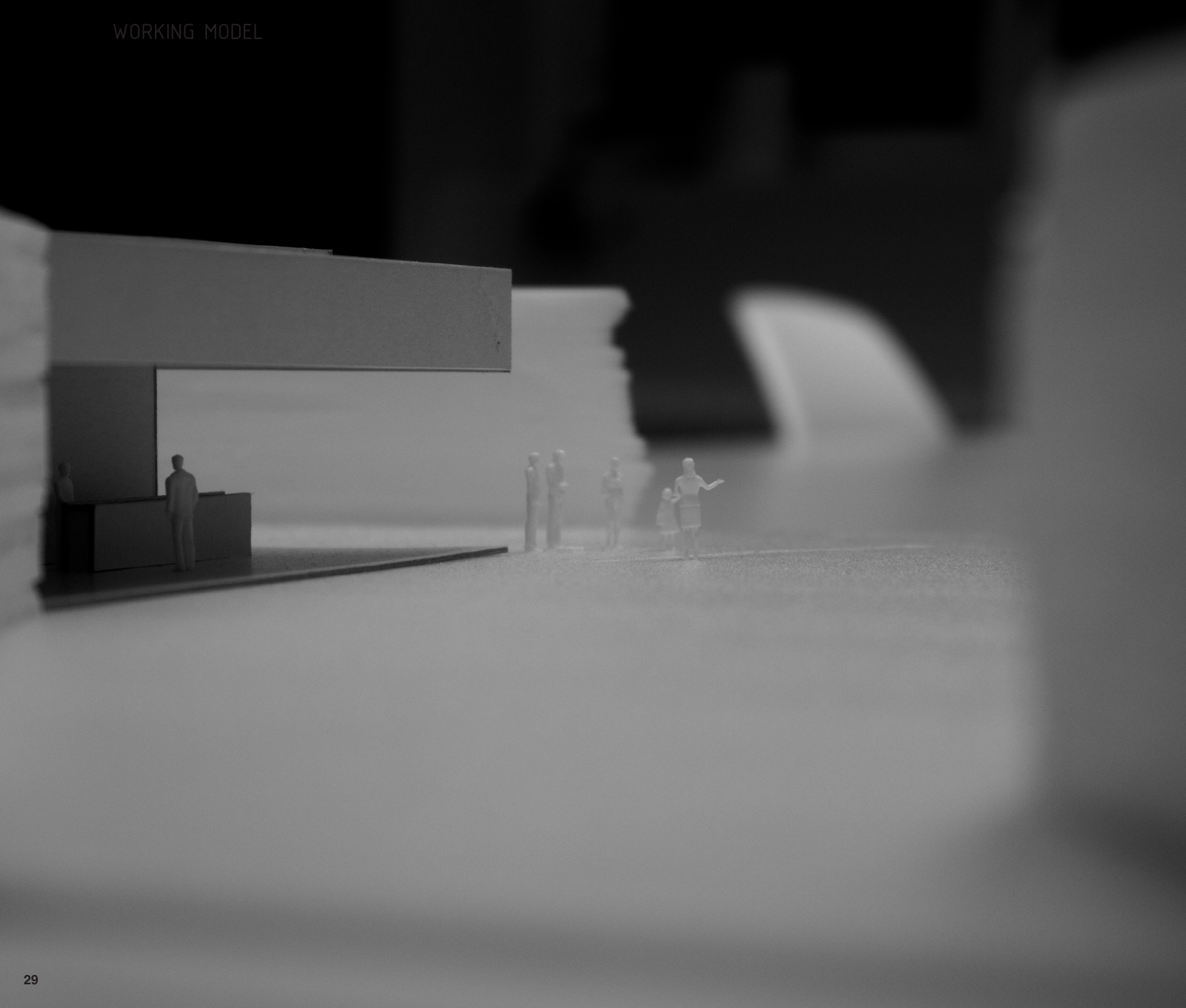
A nature center set in an old wind torn forest, houses exhibitions concerning the culture of Öland and the nature of the north of öland.

OTTENBY

Located at the southern point of the island in a landscape that is flat, windy and is an important breeding site for diffrent birds. The exhibition focuses on the birds and their migration.







PROPOSAL

A nature interpretation center on the Great Alvar

Öland has a thriving tourism industry, in the year 2013 12 461 218 guest nights was registered on Öland (RESURS för Resor och Turism i Norden AB 2014).

The two nature interpretation centers on Öland is located far from each other and far from the main arrival point to the island, the bridge that connects Öland with the mainland of Sweden. A drive from the bridge to Ottenby takes approx. one hour and is sixty kilometers long. To the south and Trollskogen is about one and a half hours and is about one hundred kilometers long.

The location i have chosen for the placement of this nature interpretation center for the Great Alvar is about 20 minutes and about twentyfive kilometers from the bridge which makes it more accessible.

The site is located close to one of the smaller lakes of the Great Alvar, Möckelmossen, a location which already has a smaller parking lot and an rest area.

Möckelmossen is a frequently visited location on Öland especially during September and October when thousands of migrating common cranes are resting at the lake (Natur och kultur på Öland 2001 p. 372).

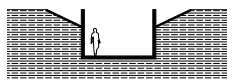
My proposed nature interpretation center is focused on the environment of the Great Alvar and will act as a great point of departure into the landscape. From the site one can hike to numerous interesting locations on the Great Alvar.


N
Möckelmossen
Existing Parking
Path to center
Stenåsavägen

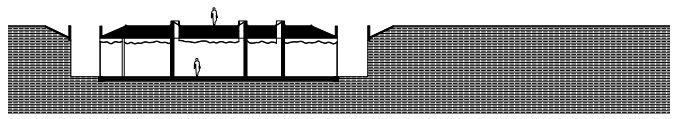
Building programme

The project consists of two buildings one which is the main building that houses an exhibition space, lecture halls and a small cafe. Giving the opportunity to host various events such as courses or lectures.

The other building houses an accommodation space for 24 people in dormitory type rooms with bunkbeds, four people per room. A social room with kitchen, seating, a fire stove for the colder months of the year and two individual bedrooms for staff.



Section B:B 1/500



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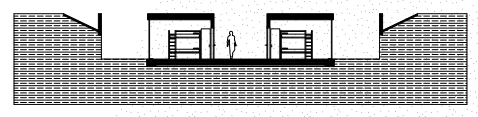

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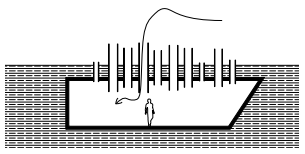

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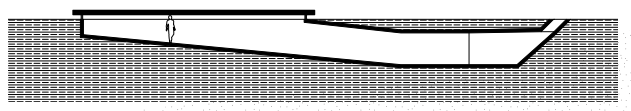

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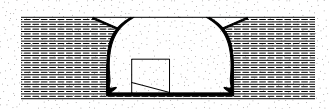
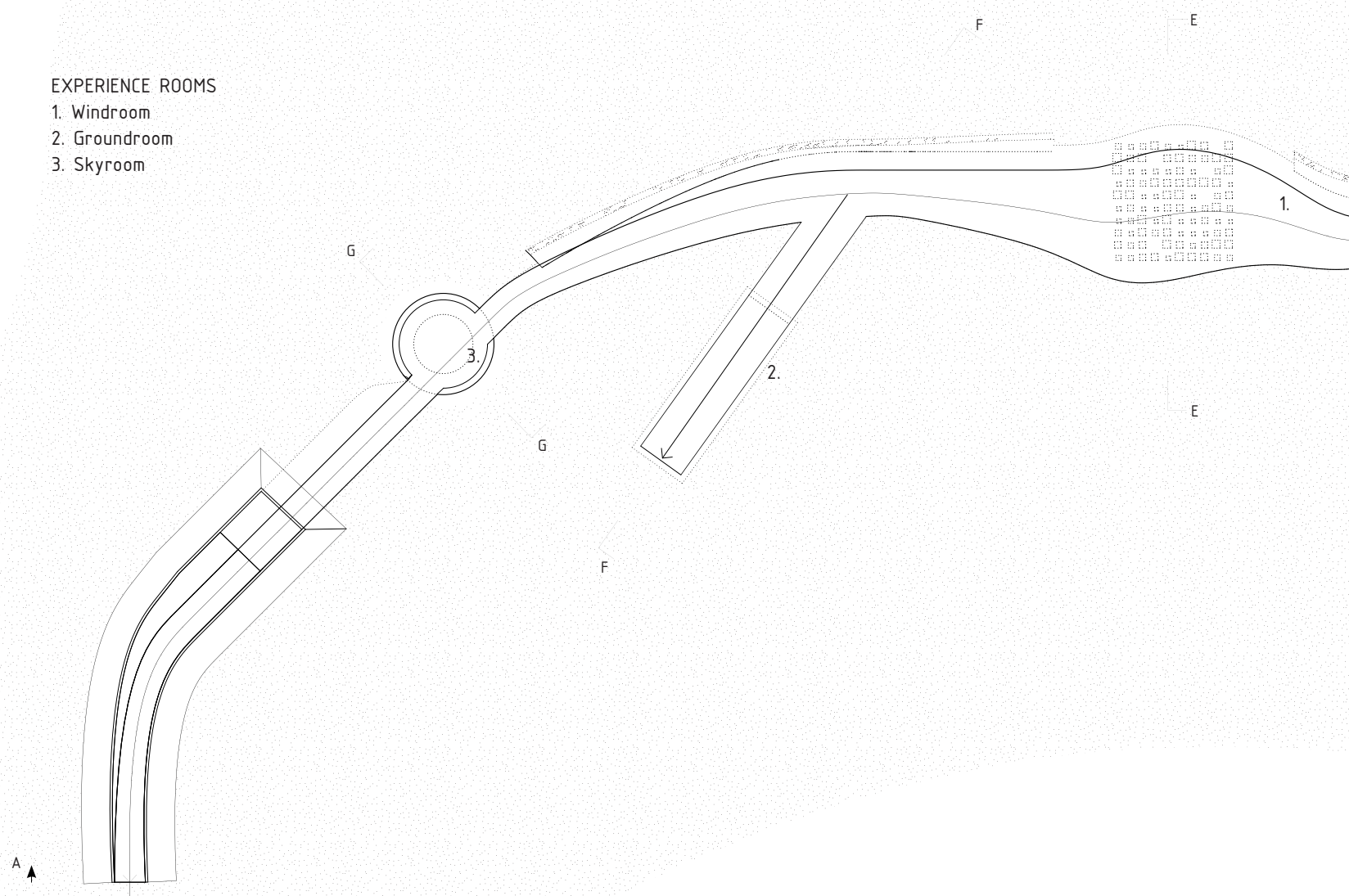


Section G:G 1/500

EXPERIENCE ROOMS
1. Windroom
2. Groundroom
3. Skyroom

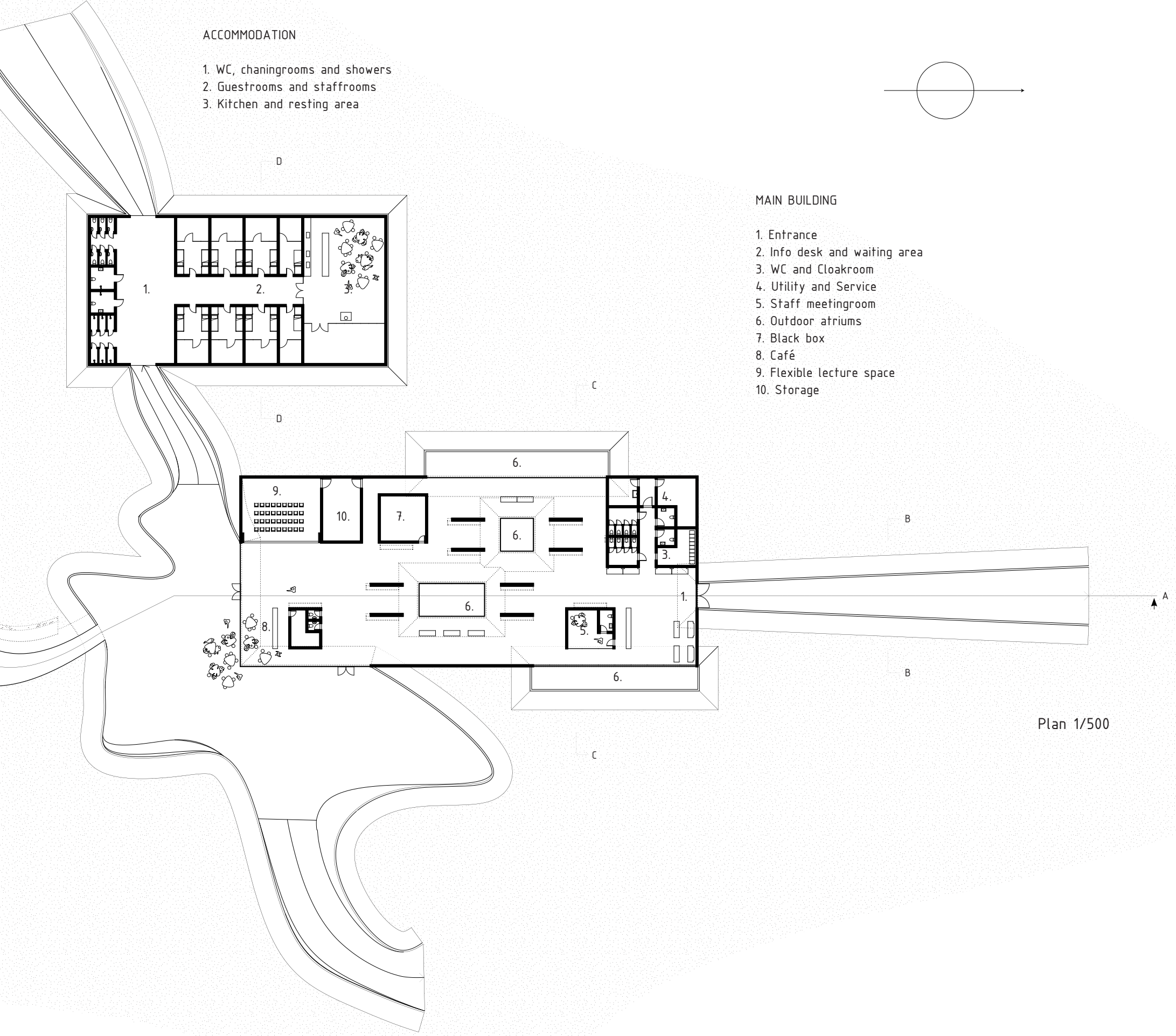


ACCOMMODATION

1. WC, chaningrooms and showers
2. Guestrooms and staffrooms
3. Kitchen and resting area

MAIN BUILDING

1. Entrance
2. Info desk and waiting area
3. WC and Cloakroom
4. Utility and Service
5. Staff meetingroom
6. Outdoor atriums
7. Black box
8. Café
9. Flexible lecture space
10. Storage



Plan 1/500

Project design concepts

Keeping the horizon

The Great Alvar is characterized by its vast and flat character, its strong sunlight during summer, the strong wind and the barren environment.

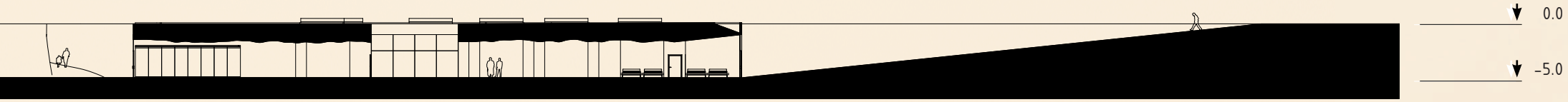
First the concept of the building is to not interfere with the flat character but instead pay a homage to this special character by lowering it down into the limestone bedrock keeping the horizon clear and undisturbed.

Experience of the place

The proposition is conceptually centered around an idea of sequence, where the visitor moves through a walk with different experiences that aims to add up to a deeper understanding of Stora Alvaret.

Entrance

Arrival at the site is by a walk from the parking towards the center which is only suggested in the landscape as concrete edges and smaller glimmering metal objects that appears to be placed on the ground. Coming closer one reaches a long concrete walk which gradually becomes more narrow until one reaches the entrance to the building five meters below ground.

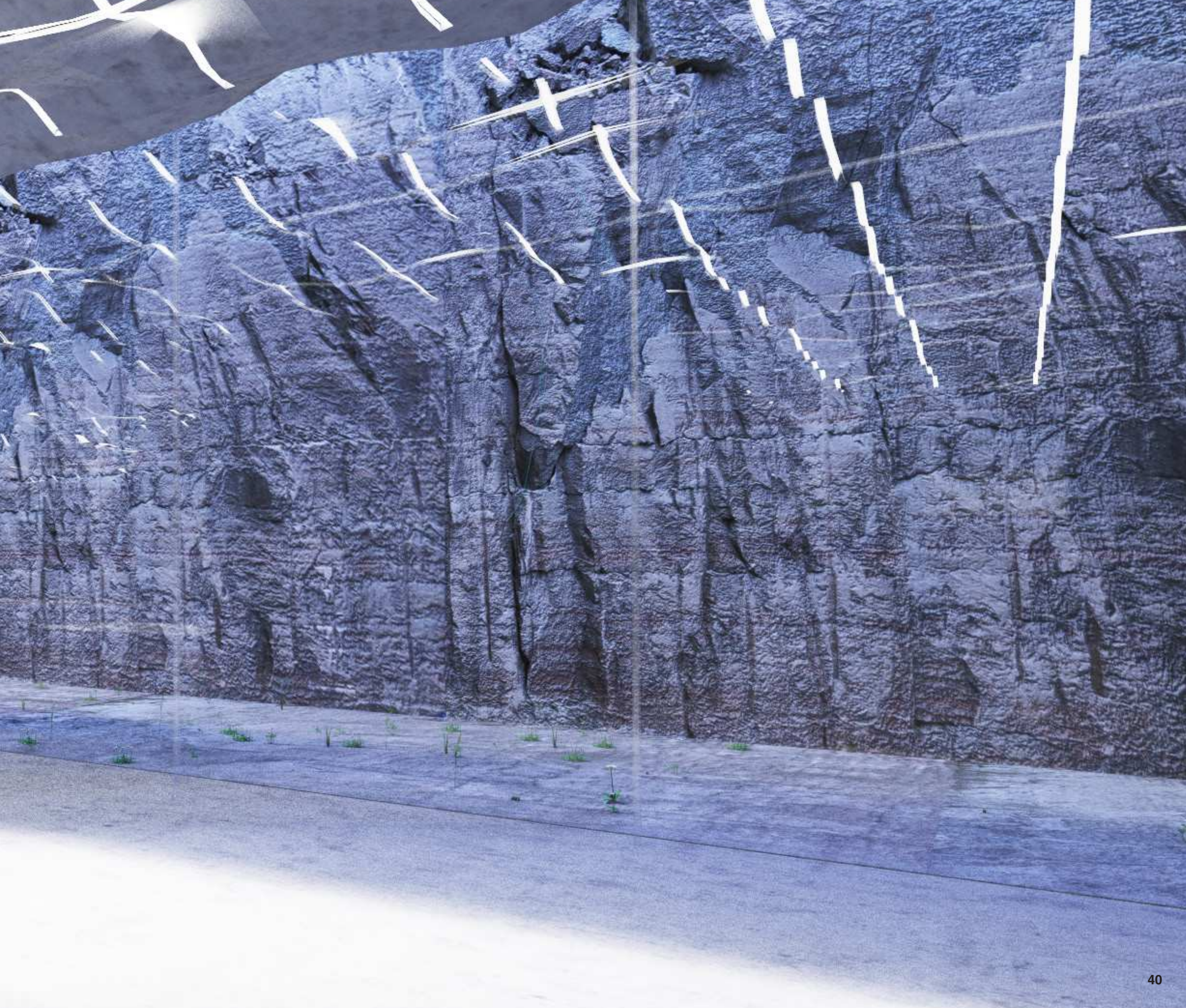


Section A:A 1/500

Exhibition

The exhibition space is is lit with natural light from two outdoor atriums cutting through the roof and two atriums on opposing sides dedicated to showing the bedrock. One showing the rough character of the limestone and the other a polished stonewall showing the natural layers of the limestone.

The space is directed as an continuation of the walk directing the view outwards the open courtyard.

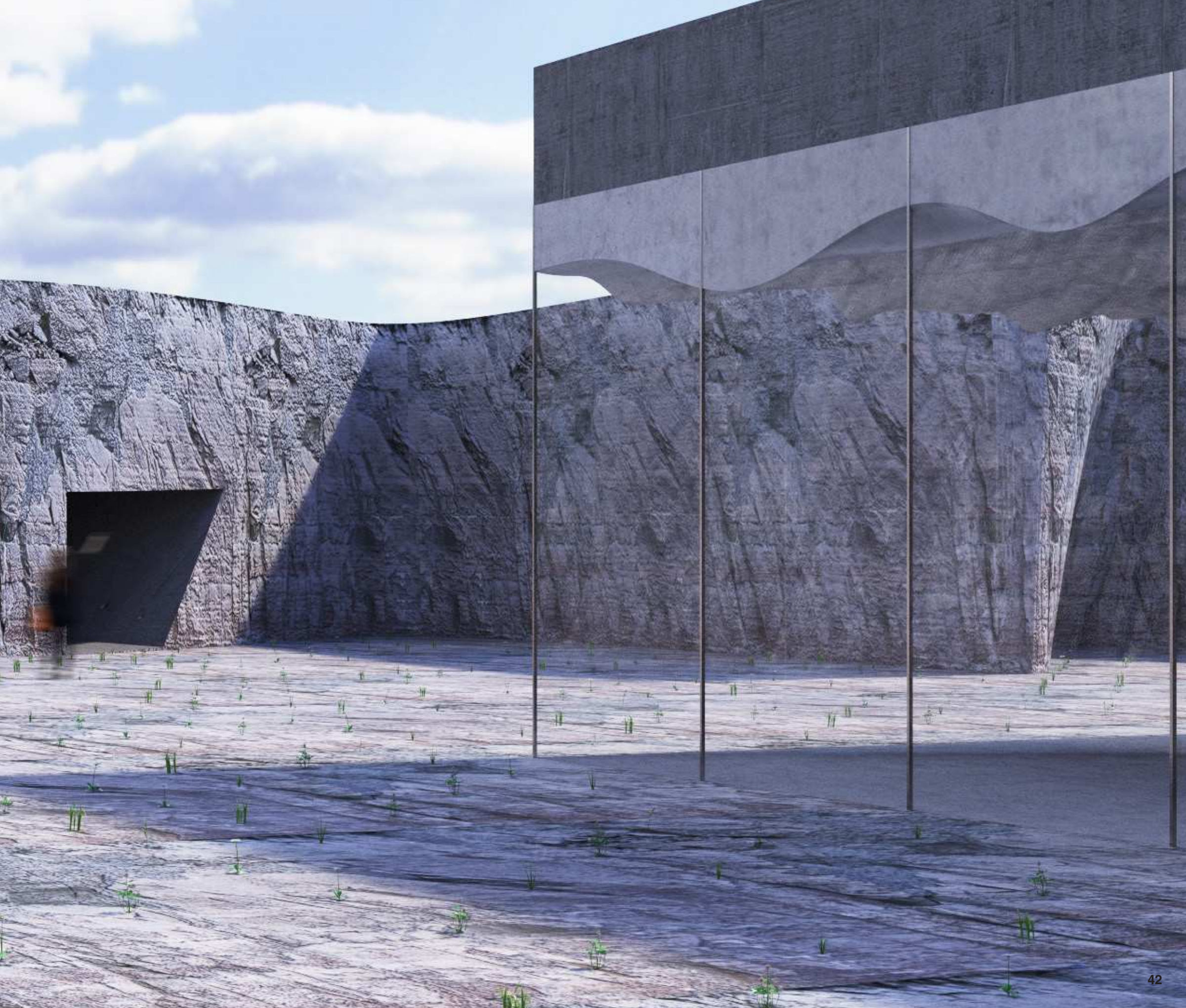


Geology

After passing through the exhibition space one exits the building and enters the courtyard that is excavated from the stone and celebrates the long tradition of quarrying on Öland. It also gives shelter from wind.

Underground walk

From the courtyard one enters a underground path which gives the visitor three different experiences that aims to strengthen the impression of the character of the the Great Alvar.



Wind

First room of this walk is the wind room with various sized steel openings that allows the wind to resonance in different frequencies and lets the visitor experience the whistling noise of the wind.

Ground

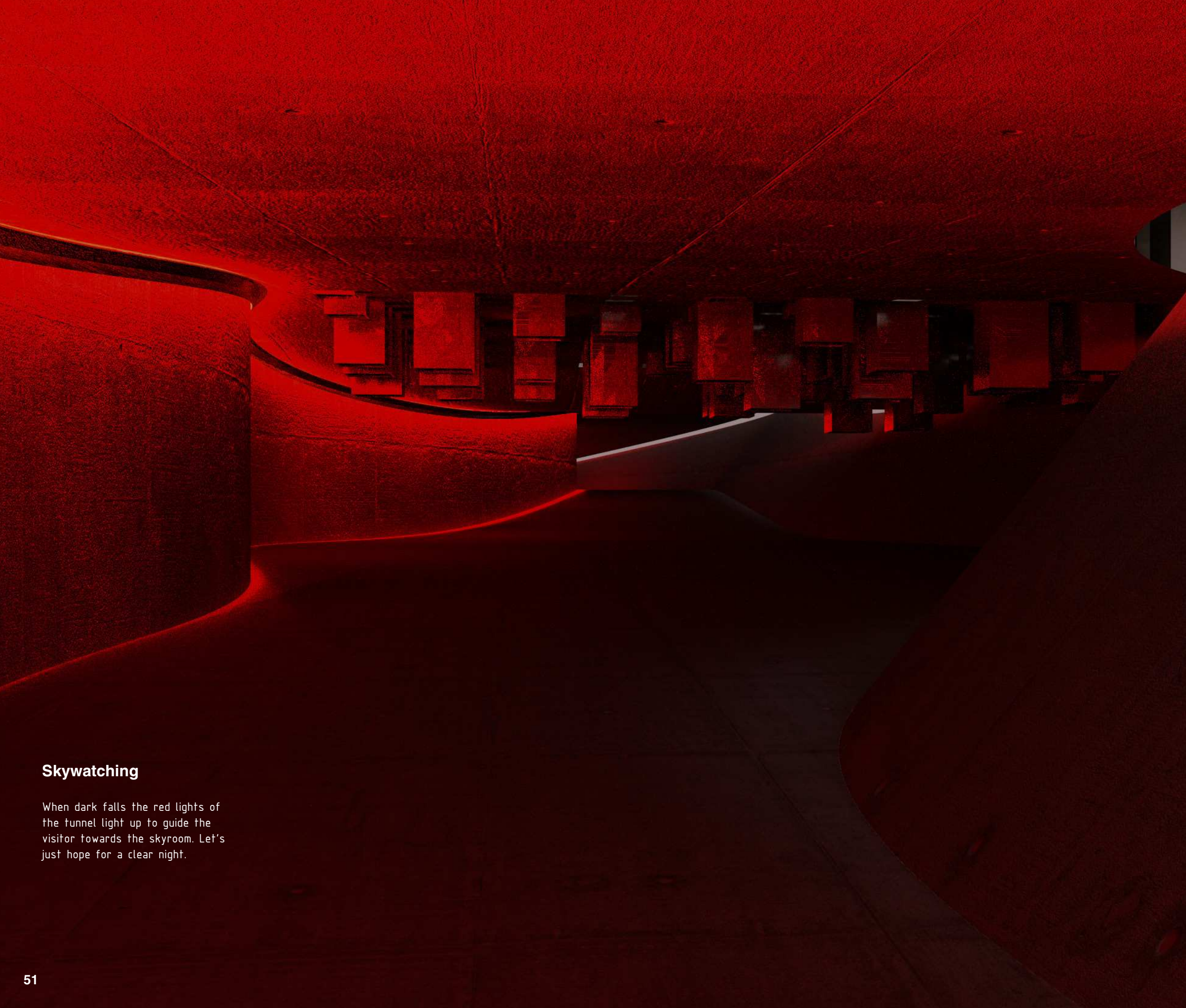
The groundroom is meant to enhance the focus on the ground that is the main characteristic of the Great Alvar.

Sky

Last of the underground walk a large circular room opens up towards the sky. A room for contemplation and rest.

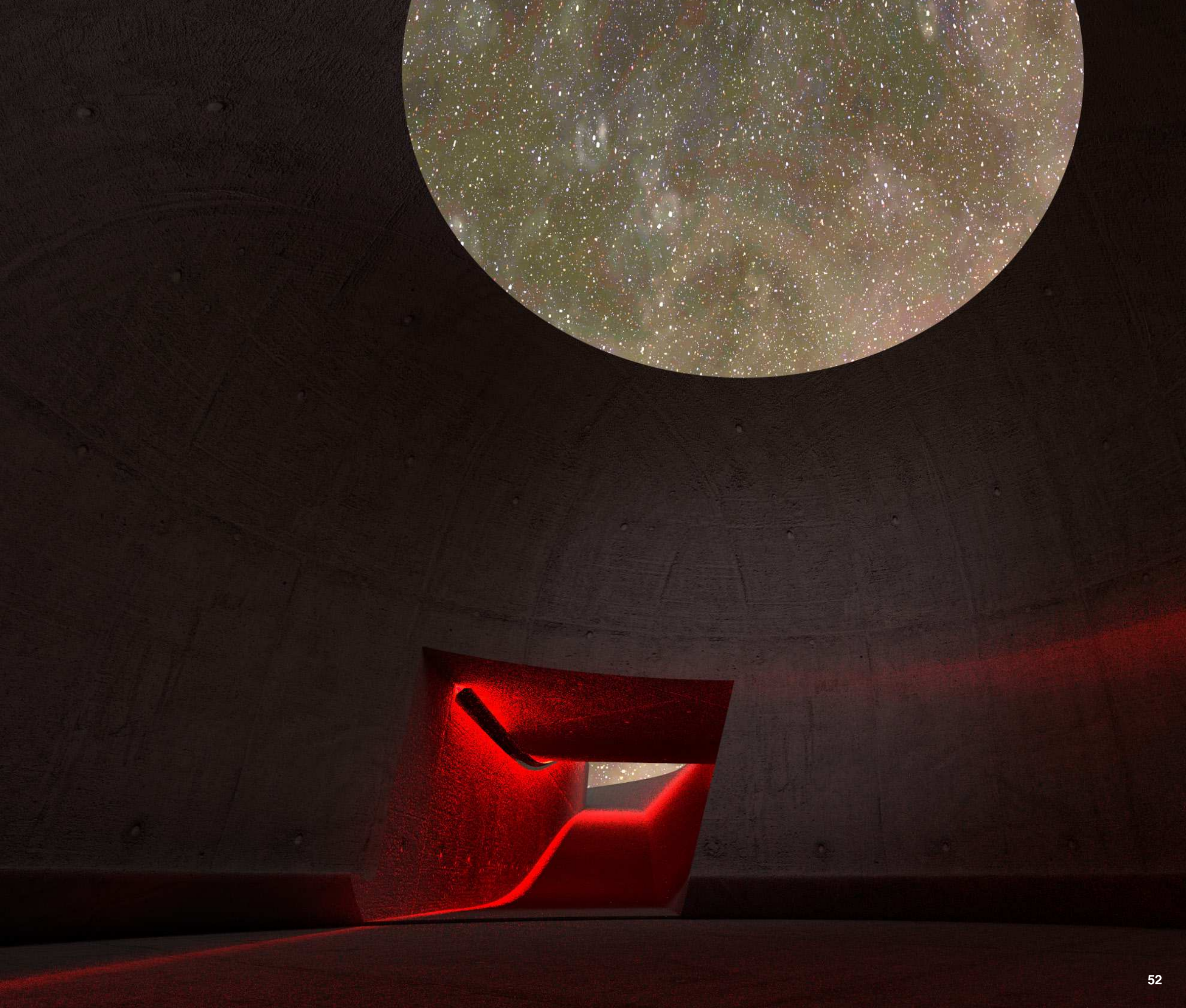
Nature

Exiting into nature with the experience of the preceding walk the visitor is meant to be strengthen in the ability to reflect over the environment and what constitutes the rise of this unique landscape.



Skywatching

When dark falls the red lights of the tunnel light up to guide the visitor towards the skyroom. Let's just hope for a clear night.



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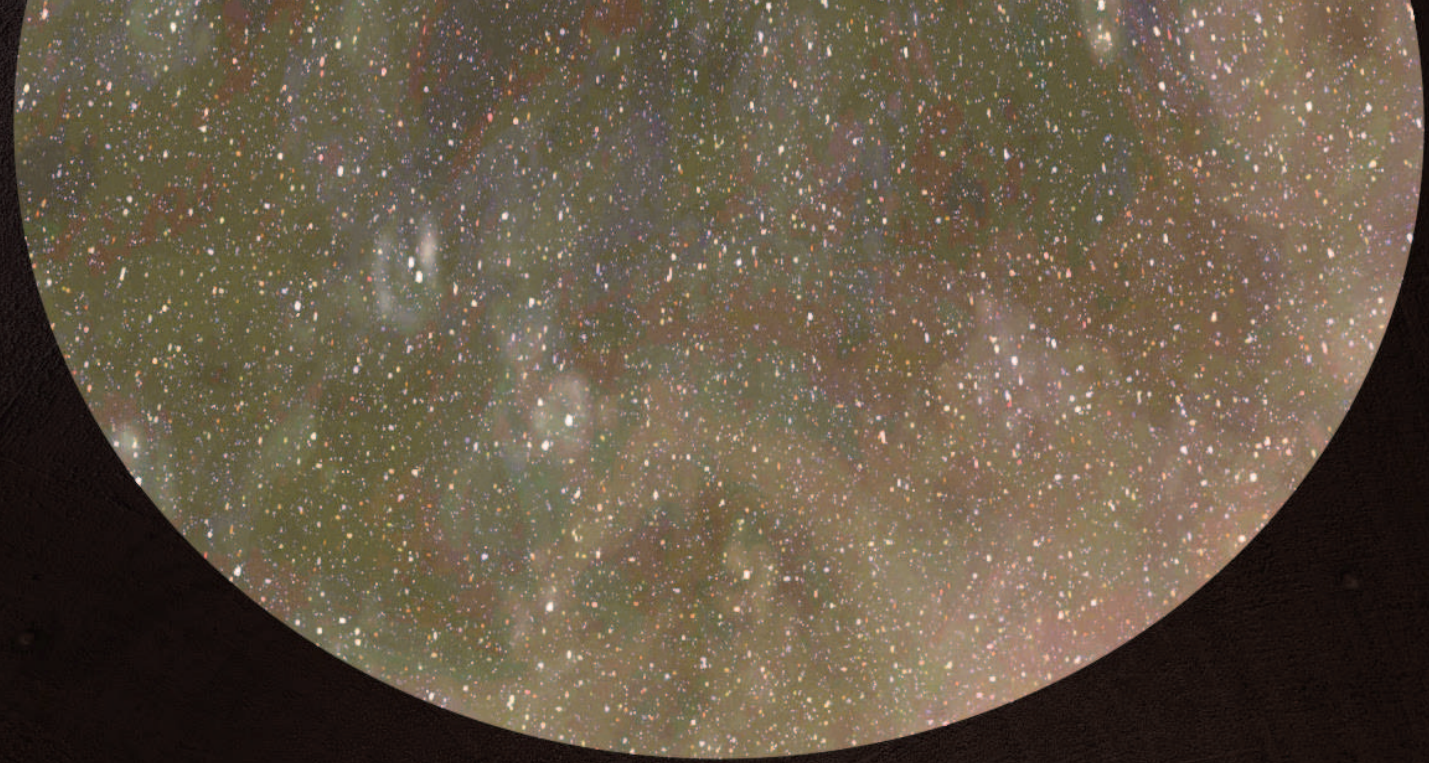

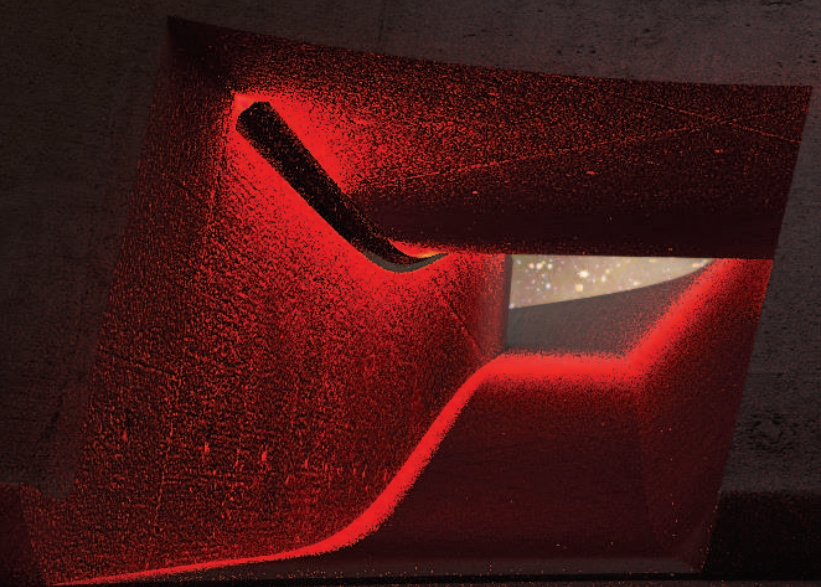

This book is a summary of the work with my degree project in architecture and a description of the process during the length of the project.

The main program is the design of a nature visitors center in a nature-reserve. The design process is influenced by parametric design as a tool to solve specific design goals, and study of light and experience of volume.

The goal and main object of this project is to research and study the connection of architecture and nature and how the architecture can invoke and increase understanding of the natural landscape.

With focus on giving the visitors an experience and understanding of the specifics of the natural landscape of this very location, the Great Alvar on Öland an Island located on the east coast of Sweden in the Baltic sea.

With a brief introduction to the specifics of the landscape of Öland the journey of the design process begins and is finally concluded with drawings and illustrations with comments regarding the design decisions.