UP CLOSE

SUB-ARCTIC TOURISM ACCOMMODATION

AGNES DANNEHOLM & ANNA SKOGHAGEN

Chalmers School of Architecture
Department of Architecture and Civil Engineering
Examiner: Björn Gross
Tutor: Mikael Ekegren

Figure 1. Landscape of the site. Author's own copyright.

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Direction within Building and its tectonics
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ABSTRACT

The design programme of Härjedalen is very strict and refers mainly to the mountain farmers' culture, aiming to keep a strong identity of the area. The Saami culture is not included in this document, making it hard to get building permission for designs relating to Saami building traditions.

The aim of this thesis is to challenge the design programme, proving that a contemporary building, flirting with cultural and natural values from the site can enable new possibilities in broadening target groups and loosening the somewhat restricted view on traditional building which is common in Härjedalen.

Taking a stand against the design programme does not necessarily have to fracture the identity of the county. On the contrary it could result in an interesting discussion about how to approach history, culture and traditions in the built environment.

Many people think of the bare mountain as an untouched place lacking culture, but these sites are full of hidden cultural traces not discovered at first appearance. The ground is also highly valuable and important for reindeer farming.

This thesis investigates the possibility to design contemporary tourism accommodation that maintains the essence of cultural values on site, while respecting the delicate nature on the bare mountain and considering the harsh weather conditions on the site. It is intended for the municipality in Härjedalen, providing them an interesting example on how to build accommodation buildings in a new way along trekking paths on the mountains.

Two weeks were spent in Funäsfjällen, to integrate with local people, visit the site of the project and to get a sense of the areas around it. The meetings helped increase knowledge about the building traditions in the area and the affectional values. Building projects that have been built in the area, both historically and more recently, were visited to see a spectrum of different structures, from lightweight to more heavy. Different reference projects have given inspiration on how to create a self-supporting facility, construction, space and program et cetera.

The result of this thesis is showcasing an alternative to the traditional way of designing public mountain huts in Sweden, that includes cultural values of the area, combining it with the needs of a broadened target group for outdoor tourism. This is implemented in a tourism facility providing accommodation, self service spaces and a sauna - a stop on a day tour, longer stay visits, and also provides shelter in emergency situations. A lightweight construction enables whole piece placement by helicopter, shortening the construction period on site.

ACKNOWLEDGEMENTS

THANK YOU

Family, friends, PAUS-gruppen, colleagues in Building design, Mikael Ekegren, Björn Gross, Marcus Rosenborg, Stefan Knutsson, Bo Lundmark, Ola Hanneryd, all helpful people in Härjedalen, Anders Robertsson, Kalle Arnell, Kerstin Valkeapää, Edvin Rensberg, Malin Lidberg, Theo Tsesmatzoglou

TABLE OF CONTENT

BACKGROUND

STUDENT BACKGROUND

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Internship:
Wall to Wall Stockholm

PURPOSE / EXPLORATION

The aim of this thesis is to challenge the design programme, proving that a contemporary building, that appreciates cultural and natural values of the site, can enable new possibilities in broadening target groups and loosening the somewhat restricted view on traditional building which is common in Härjedalen. Hopefully, this thesis will result in an interesting discussion about how to approach history, culture and traditions, in this case of the built environment in Härjedalen.

MAIN QUESTIONS AND OBJECTIVES

Exploring the relation between nature and culture in Swedish sub-arctic mountain area by designing contemporary architecture to broaden the target group for outdoor tourism. By doing this, the aim is also to start a discussion whether the design programme in Härjedalen should open up for more contemporary construction and include cultures from the area other than the mountain farmer's culture.

BACKGROUND

The municipality of Härjedalen has developed a design programme which is followed quite strictly in Funäsfjällen. It is very narrow and refers mainly to the mountain farmers' culture, aiming to keep a strong identity of the area. The document is very strict regarding proportions, window placement, roof angling etc. Even though the Saami culture is highly present in the area of the project, the building traditions are not taken into account in the design programme, making it hard to get building permission for designs relating to Saami building traditions.

In general, Sweden's mountain villages have a very traditional style with a character relating to the mountain farmer's culture. Looking at mountain facilites or hut constructions in Norway and Iceland, for example, they have a much more permissive approach in terms of contemporary design, which in some site conditions is more suitable than traditional building techniques.

The aim of this thesis is to challenge the design programme, proving that a contemporary building, that appreciates cultural and natural values of the site, can enable new possibilities in broadening target groups and loosening the somewhat restricted view on traditional building which is common in Härjedalen and in Sweden in general.

The site of this master thesis project is on the bare mountain around 1000m above sea level in Funäsfjällen, Sweden, in between a number of villages that are situated in the valley surrounding the mountain. The site is quite remote as there are no roads on the mountain, and it can only be reached by foot, on skis or by snowmobile. Today there are three buildings on the site, and a suspension footbridge over a stream connecting them. South of the stream there is an emergency cabin with emergency phone, which can only be used in emergency situations, and a building with toilets and storage. On the north side of the stream there is a hunting cabin built by a wholesaler in the 1930's, today owned by the state property agency. The hunting cabin is in bad condition and not open for the public. Today there is no accommodation available on the mountain between these villages.

METHOD

Initially, the area of the project was visited. Through meetings, reading books and reports and spending time in the area, knowledge about cultural values, the surrounding areas of the project site etc. was gained. In the design process, spatial qualities of Saami buildings were investigated and analyzed by interviews, looking at images and reading books. These qualities were then interpreted in the design through sketches both in two dimensional sketches and sketch models (digital and physical).

THEORY

Three built projects in the area of Funäsfjällen have been studied regarding their relation with the design programme. These are Aula Capella by 3dO Arkitekter, Restaurang Tusen by Murman Arkitekter, and Fjällbyn by Murman Arkitekter. Additionally, three other projects - Alpine Shelter Skuta by AKT II, Hardvard GSD Students and OFIS Architects; Monte Rosa Hut by Bearth & Deplazes Architekten; and Restaurant Björk by Murman Arkitekter - have been studied regarding construction, self-sufficiency, materiality and relation to nature.
In contact with the Swedish tourist association, STF, knowledge about stand-alone facilities, hiking life and tourist necessities have been discussed.

DELIMITATIONS

This thesis presents a proposal for tourist accommodation, where cultural values and spatial qualities can be discussed. It does not:
...Include a participatory design process. This is something that could, and should, be included if the project was to be realized.
...Deeply investigate solutions for self-sufficiency and evaluate how these solutions would work in practise. However, these factors are considered and included in the design proposal.
...Deeply investigate modular placement. The buildings are, however, designed with a light structure that could be divided into smaller modules, in order to make possible modular placement by helicopter.

READING INSTRUCTIONS

This report starts off presenting research information about the site, the nature of the surrounding areas and its built environment, history of the Saami people, the situation in Härjedalen, climatic conditions etc. This part justifies the thesis and provides the reader with knowledge needed to appreciate and understand the investigations and design proposal. After the research comes the part which explains the design investigation, including programme, layout development, material research, desired spatial qualities etc. The last part of the report shows the design proposal, including drawings and visualisations of the buildings, model photos and ideas for self-sufficiency.

RESEARCH

Figure 2. Road on Flatruet.
Author's own copyright.

THE SITE

LOCATION

Figure 3. Map of Sweden.
Author's own copyright.

Figure 4. Map of Funäsfjällen according to data from Lantmäteriet.
Author's own copyright.

HISTORY OF THE SITE

The first tourists of Funäsfjällen were the so called “air guests”, people with lung diseases who came to the mountains for the clean air. Later also people from the wealthy upper and middle classes came to the area to enjoy the fresh air, to get rest and meet other people. In the late 19th century the mountains became the target of the so called wholesale trade tourism, which meant that wealthy Englishmen and Scottish came to hunt and fish in the area. It was then expanded to include Swedish businessmen and wholesalers. Many of them would build hunting cabins or lodges in the midst of the mountains. The cabin at Långbrottet is one of those, and was built in the early 20th century by wholesaler Ando Wikström. A few years earlier, the Swedish Tourist Association Ando Wikström also allowed the Swedish Tourist Association (STF) to use two of the rooms in his lodge as guest rooms. (Ljungdahl, 2013)

Closest cities:
Hudiksvall 300km
Trondheim 180km
Östersund 220km
Rörås 80km

Figure 5. View over Funäsdalen. (Robertsson, 2012). Reprinted with permission.

SITE PLAN

Scale 1:2000

Figure 6. Map over site with current buildings according to data from Lantmäteriet. Author's own copyright.

SAAMI VILLAGE CLOSE TO SITE

Type of grounds around Långbrottet and nearby areas:

- ☐ Fixed surfaces
- ☐ FR- National interest in outdoor activities
- ☐ MB 4:2 Tourism and outdoor activities
- ☐ Reindeer herding area
- ☐ Saami villages
- ☐ Country comfort
- ☐ All-year-round grounds for reindeer herding

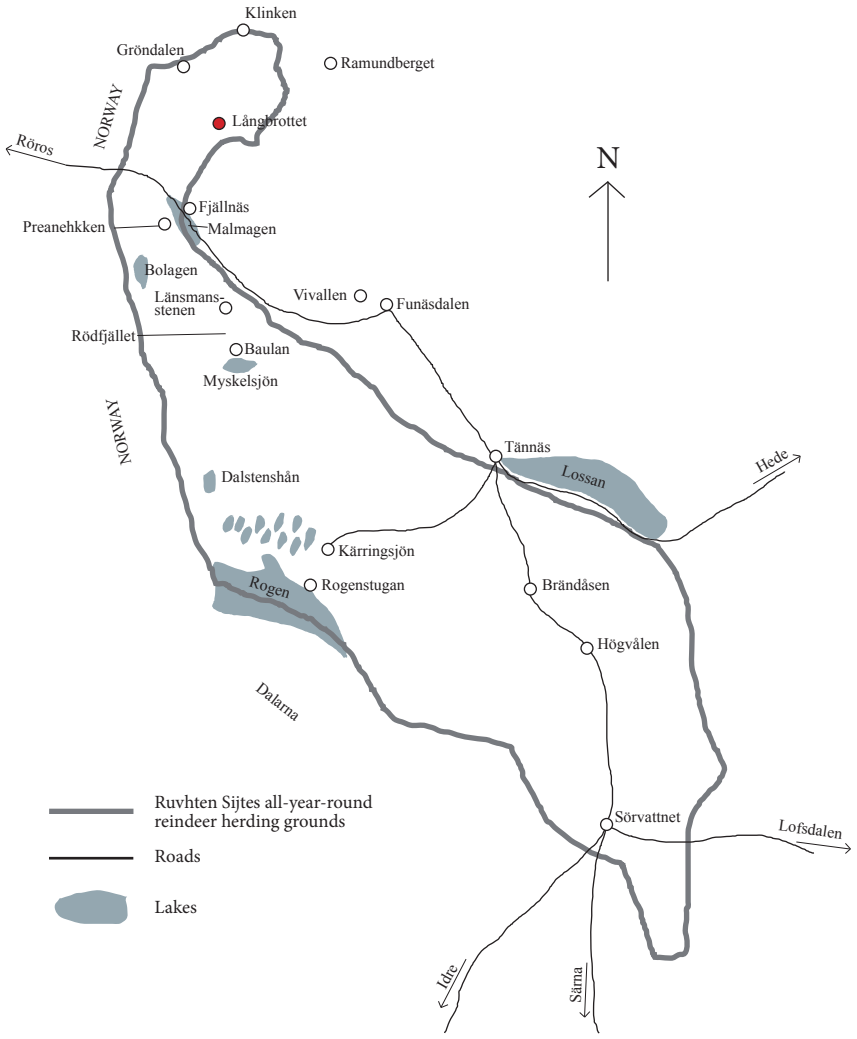


Figure 7. Map of Saami villages according to Ruvhten Sijte, 2013. Author's own copyright.

PATHS ON THE MOUNTAIN

Paths up on the mountain between the villages Ramundberget, Bruksvallarna, Funäsdalen, Tänndalen, Hamra and Fjällnäs.

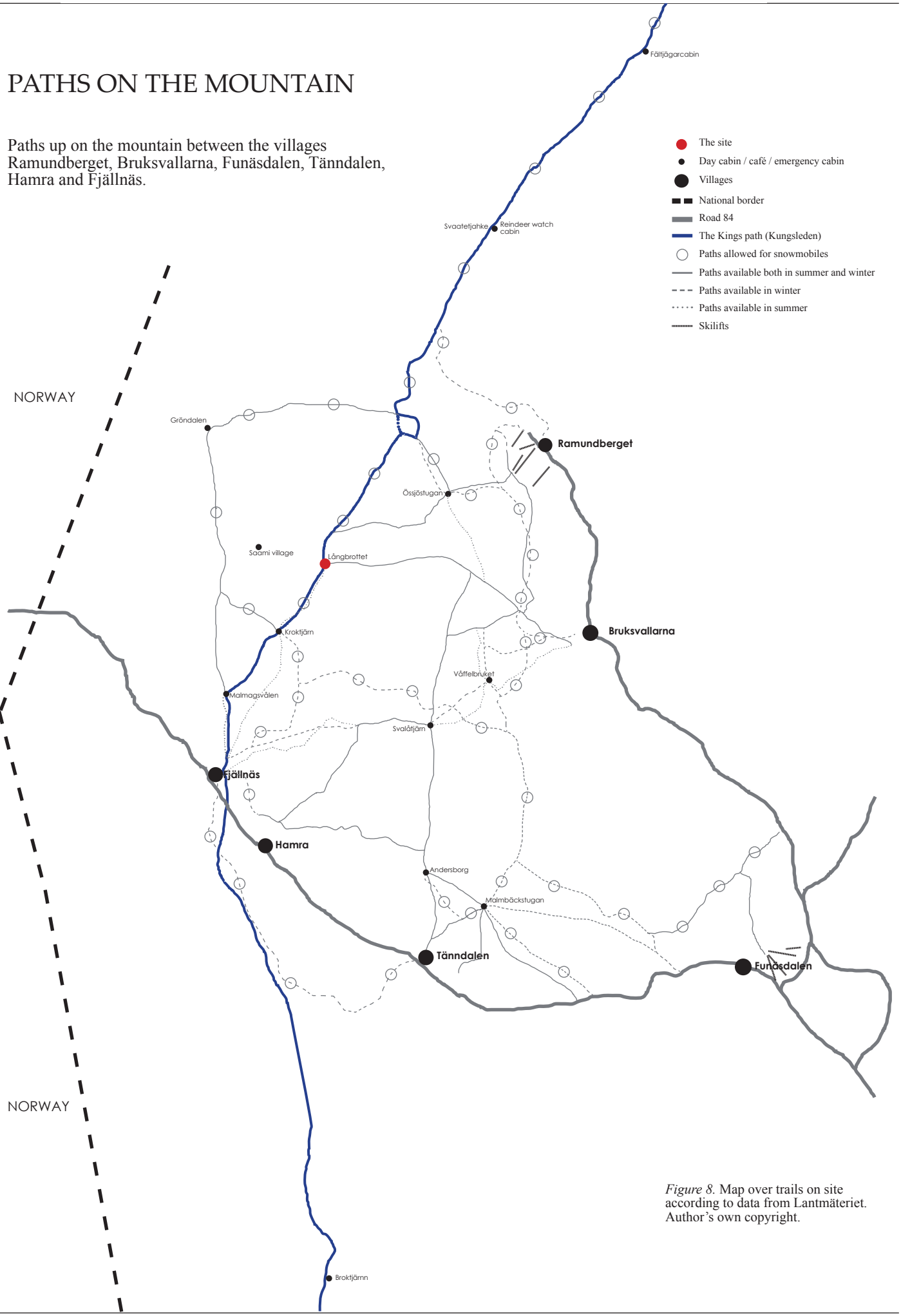


Figure 8. Map over trails on site according to data from Lantmäteriet. Author's own copyright.

ACTIVATE PATHS ON THE MOUNTAIN

Today, the paths via Långbrottet between the villages is not as activated as via Svalåtjärn. Svalåtjärn offers a rest cabin and that is why most people choose that path instead of via Långbrottet. (The emergency shelter at Långbrottet can only be used in emergency situations.) Allthough, the path through Långbrottet offer a more special sense of freedom and wilderness, making this trip unique. (Arnell, personal communication, February 2018)

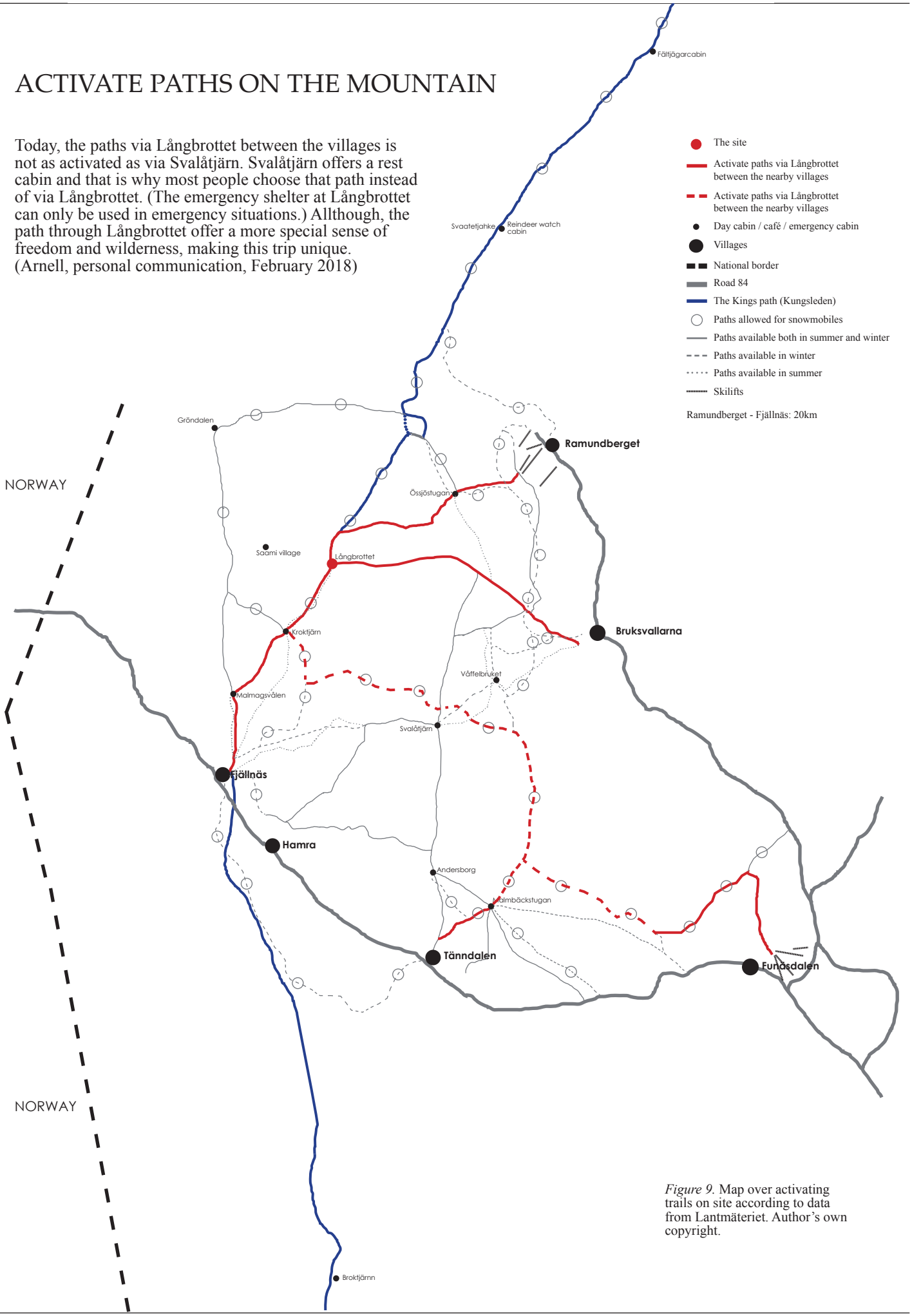


Figure 9. Map over activating trails on site according to data from Lantmäteriet. Author's own copyright.

CURRENT BUILDINGS ON SITE

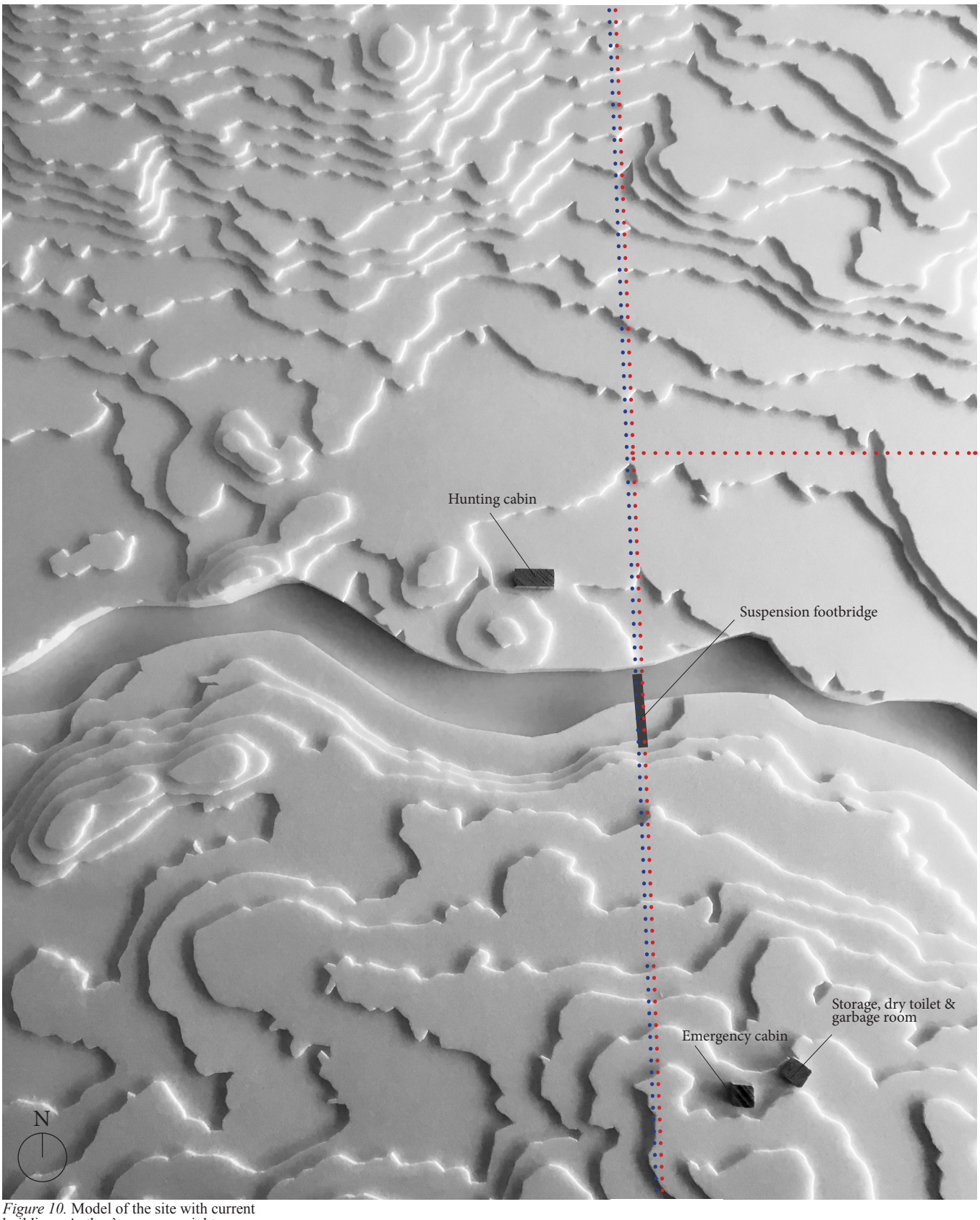


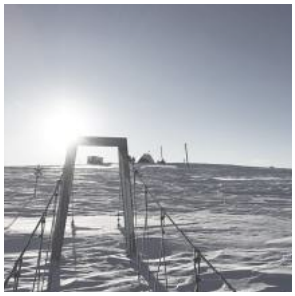
Figure 10. Model of the site with current buildings. Author's own copyright.

CURRENT BUILDINGS ON SITE

Figure 11. The site with current buildings, according to data from Lantmäteriet. Author's own copyright.

1. Hunting Cabin

Figure 12. Hunting cabin. Author's own copyright.



2. Suspension Bridge

Figure 13. Suspension Bridge. Author's own copyright.

3. Storage

Figure 14. Storage. Author's own copyright.

4. Emergency Cabin

Figure 15. Emergency Cabin. Author's own copyright.

HUNTING CABIN

On the north side of the stream there is the hunting cabin built by a wholesaler in the 1930's, today owned by the state property agency. However, even though much of the material is in a pretty good state, the building itself is in a very bad condition since nobody has been maintaining it or used it in many years. (Ljungdahl, 2013)

The aim is to deconstruct the hunting cabin and reuse the material from it. As much of the wooden panel as possible from the building will be utilized.

The shiffer stones from the current fireplace and the foundation of the hunting cabin will also be reused and utilized.

Figure 16-20. Photos of Hunting cabin. Author's own copyright.

Figure 16.

Figure 17.

Figure 18.

Figure 19.

Figure 20.

SUSPENSION BRIDGE, EMERGENCY CABIN, STORAGE

South of the stream there is an emergency cabin with emergency phone, and a building with toilets and storage. There is also a suspension footbridge over the stream which is in good condition.

Figure 21-29. Photos of current buildings on site. Author's own copyright.

Suspension bridge *Figure 21.*

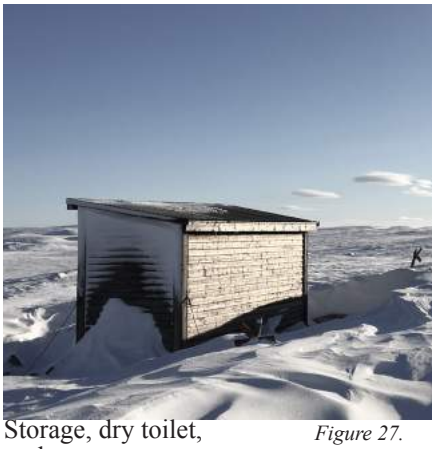
Figure 22.

Figure 23.

Emergency cabin *Figure 24.*

Figure 25.

Figure 26.



Storage, dry toilet, garbage room *Figure 27.*

Figure 28.

Figure 29.

THE DESIGN PROGRAMME AND CULTURE OF HÄRJEDALEN

THE DESIGN PROGRAMME

In 1993, a design programme for Härjedalen was developed by the municipality with the aim to create an environment that gets it characteristics from the building traditions of Härjedalen and embraces the genuine, barren and simple building style developed by the mountain and forest farmer. It is claimed that this style harmonizes well with the landscape and creates a profile appreciated by both visitors and inhabitants. This design programme has become an important part of the community planning and branding of Härjedalen. (Härjedalens kommun, 2006)

As stated in "Härjedalens genuina kulturarv", the focus on the building culture of the farmers has meant that other stories of the cultural heritage of Härjedalen have not been told at the same extent. It is in particular the Saami culture and history which has been treated in a stereotypical way for many years, and many aspects of their culture and history have also been ignored. The document has been created to lead to an increased dialogue about questions revolving view of history and cultural identity, since this has a political tension in the area. (Loock, 2011)

Figure 30. Drawing of house in Härjedalen. (Boberg, 1924). Public domain.

Figure 31. Funäsdalen mountain museum, designed according to guidelines of the design programme. (Vågen, 2012). CC BY-SA 3.0.

RAMUNDBERGETS FJÄLLBY

The mountain village in Ramundberget, designed by architect Hans Murman for the medical company Praktiker services and its employees, has been an important reference for the design program, especially around the time when it was published. The traditional farm structure has been inspirational for Murman in this design. It is a well appreciated project in the area, with its combination of peat roof and bold detail coloring. (Loock, 2011).

Figure 32. Ramundbergets Fjällby by Murman Architects. (Ehrs, 1990). Reprinted with permission.

Figure 33. Ramundbergets Fjällby by Murman Architects. (Ehrs, 1990). Reprinted with permission.

RESTAURANT TUSEN

The restaurant “Tusen” in Ramundberget, designed by Murman Architecs and opened in 2009 has very clear connections with the aesthetics of traditional Saami building, but with these aesthetic connections Murman architects had a hard time to get a building permission since the Saami building traditions is not included in the design programme. Therefore the reasons behind the shape had to be toned down and instead Murman architects referred the shape and it’s materials to the surrounding nature. (Loock, 2011).

Figure 34. Restaurang Tusen by Murman Architects.
Author’s own copyright.

AULA CAPELLA

It seems that the design programme can, in some cases, be interpreted in a broader sense. Aula Capella was built in 2008 and designed by 3dO Arkitekter next to Fjällnäs mountain hotel, and has very little resemblance with the idealized building styles of the design programme. (Loock, 2011)

Figure 35. Aula Capella by 3dO Architects.
Author's own copyright.

SAAMI CULTURE

HISTORY

The Saami people are the indigenous people of Sapmi, an area that stretches over Sweden, Norway, Finland and the Kola peninsula in Russia. (Samiskt informationscentrum, 2018) The Saami culture is highly present in the area of our project, especially in the tourism industry. however, the building traditions are not taken into account in the design programme, making it hard to get building permission for designs relating to Saami building traditions. The Saami culture is aslo known for having been treated unfairly and stereotyped over the years, both in Härjedalen and in Sweden in general (Loock, 2011). The Swedish mountain landscape is sometimes seen as the only wilderness area left in Sweden. However, the land has been used for a long time, and has been shaped by reindeer herding by the Saami during hundreds of years. The land may look untouched, but subtle traces can be found. (Ljungdahl, 2013)

The traditional occupations of the Saami people are reindeer herding, hunting, fishing, farming and handicraft, but today they have jobs in all different occupations, both within and outside Sapmi. However, the cultural heritage is still very important to most Saami people, and many are engaged in the fight for their right to their land and culture. (Ljungdahl, 2013)

In Sweden there are 51 Saami villages, where the members of the villages have the right to practise reindeer herding. Close to Långbrottet, the Saami village Ruvhten Sijte is located, and around midsummer, calf labeling takes place in the area around Långbrottet. (Rensberg, personal communication, February 2018)

Figure 36. Reindeers. (Robertsson, 2012). Reprinted with permission.

BUILDING TYPOLOGY

The Saami peat cot have always had a central role in the Saami life. It explains their way of living and the cohesion within the family/ families. The Saami peat hut was from the beginning the most common residence, both during spring, summer and autumn in the mountains. (Karbelius, 1994). Narrow birch stems were leaned against a structure of arched poles. The structure was covered with birch bark, and on top of it the peat was laid out. Since the structure is light it can be deconstructed without leaving any obvious traces. This type of construction only exists within the Saami culture. In winter time, it was common that the Saami people stayed with the mountain farmers, and when they followed the reindeers they lived in tents. Reindeer herding Saamis were forbidden to live in ordinary houses up until the 1950's. (Hanneryd, personal communication, January 2018).

Figure 37. Newly built Sami peat hut, northern style, in Ammarnäs, Sweden. (Photo by Gudrun Norstedt, 2012). CC-BY.

Figure 38. Construction of a Sami cot, Laponia. (Allard, 1958). Public domain.

Figure 41. Traditional Sami storage hut in Sorsele municipality, photo by Gudrun Norstedt. (Norstedt, 2012). CC BY-SA 3.0.

Figure 39. Sami cot in Vuollerim 6000 Nature and Culture area, Vuollerim. (Oberger, 2012). CC BY-SA 3.0.

Figure 40. Construction of a Sami cot in the summer settlement Arasluokta, Padjelanta National Park. (Manske, 1982). Public domain.

THE FIRE PLACE "ARRAN" IN CENTRE

The peat cot provided intimacy where everybody could see one another and everyone in the family was within reach. (Lundmark, personal communication, February 2018). The fireplace, Arran, was in the middle of the peat cot and provided light, heat and cooking possibilities. (Karbelius, 1994). Around the fireplace the family would gather to share both joy and sorrow. If you lifted your eyes, you could see the stars through the smoke opening of the peat cot and meet the mountain sky. (Lundmark, personal communication, February 2018).

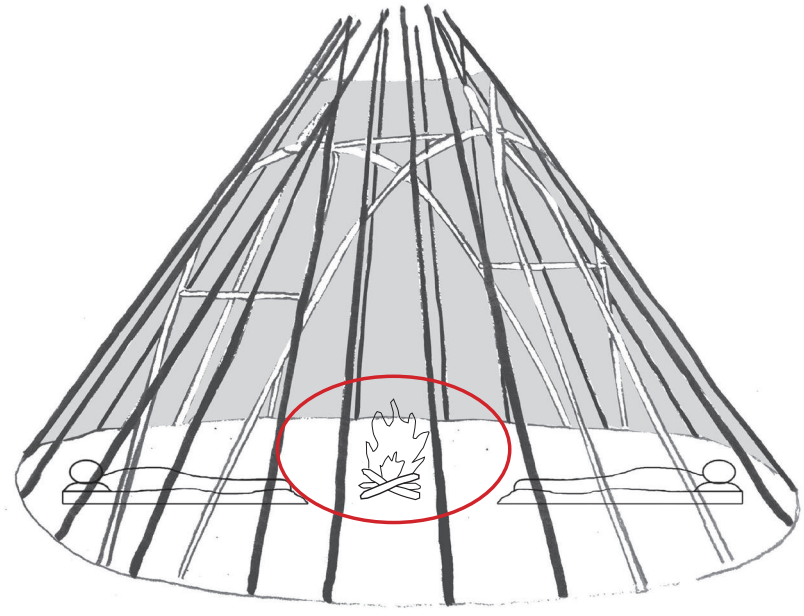


Figure 42. Sketch peat cot, fireplace is always central. Author's own copyright.

PROJECTS INSPIRED BY SAAMI CULTURE

Figure 43. Naturum Laponia by Wingårdhs, photo by Carl-Johan Utsi. (Utsi, 2016). Reprinted with permission.

Figure 44. Proposal for Naturum Laponia by Tham & Videgård Arkitekter. (Tham & Videgård, 2009). Reprinted with permission.

Figure 45. Restaurant Tusen by Murman Architects. (Murman, 2016). Reprinted with permission.

NATURE & WEATHER CONDITIONS

THE SAMI'S EIGHT SEASONS

For the Sami, the climate and seasons are of great significance and, according to ancient Sami culture, the year is divided into eight seasons. (Lundmark, personal communication, February 2018).
The ambition is to offer the guests of the new facility varied experiences and activities during all of these eight different seasons. During the most harch conditions, the facility will also function as an emergency shelter when needed.

Figure 46. Pre spring (march-april)

Figure 47. Spring (april-may)

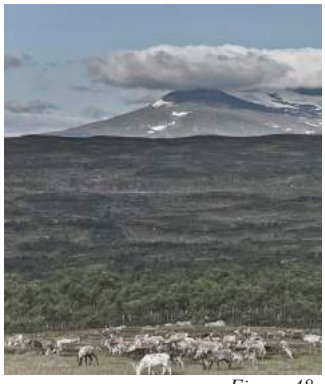


Figure 48. Pre summer (june)

Figure 49. Summer (june– july)

Figure 50. Pre fall (august)

Figure 51. Fall (september-october)

Figure 52. Pre winter (november-december)

Figure 53. Winter (december-march)

Figure 46-53. Seasons of Funäsfjällen. (Robertsson, 2012, 2010, 2010, 2011, 2012, 2012, 2012, 2012). Reprinted with permission.

ACTIVITIES

During these eight different seasons alot of different activities are offered on the mountain, the ambition is to provide the guests with a spectrum of varied experiences according to what season they choose to visit the new facility.
Examples of activities offered on the mountain:

Snowmobile tours *Figure 54.*

Cross-country skiing *Figure 55.*

Hiking *Figure 56.*

Hiking *Figure 57.*

Cross-country skiing *Figure 58.*

Hiking, pre spring *Figure 59.*

Hunting *Figure 60.*

Mountainbike *Figure 61.*

Fishing *Figure 62.*

Freeride *Figure 63.*

Horseback riding *Figure 64.*

Bird watching *Figure 65.*

Figure 54-62. Activities in Funäsfjällen. Author's own copyright.

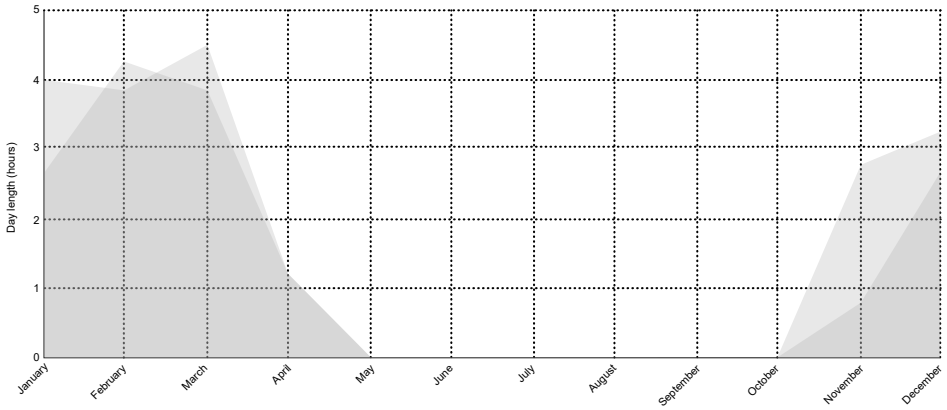
Figure 63. Freeride. (Robertsson, 2012). Reprinted with permission.

Figure 64. Horse riding. (Tellström, 2011). Adapted with permission.

Figure 65. Bird watching. (Claussen, 2013). Public domain.

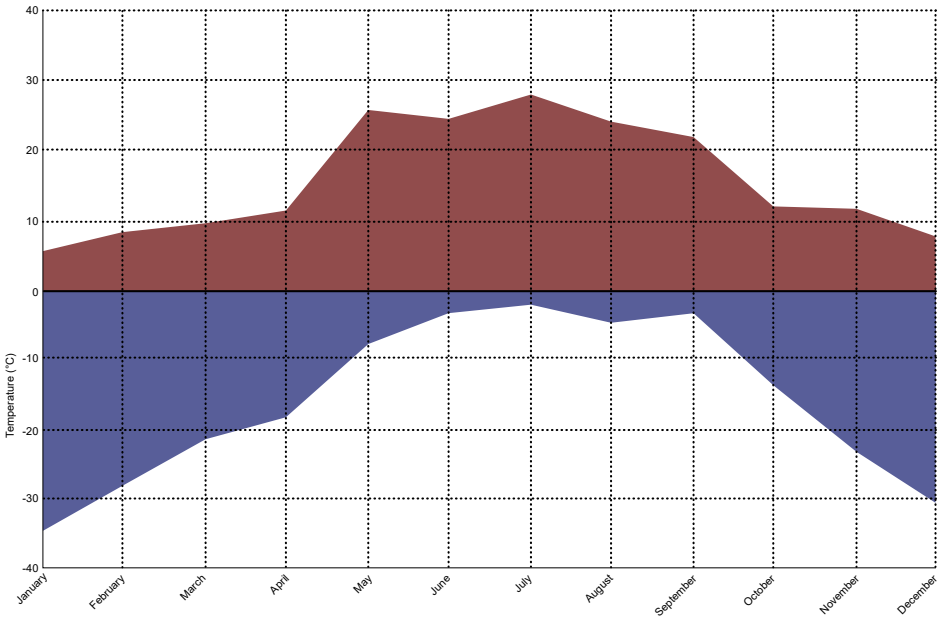
TEMPERATURE & SNOW CONDITIONS

There is probably some deviation in these site condition data, because there are no data instruments on the exact site, why data has been retrieved from the most representative places nearby.



SNOW DEPTH (Funäsdalen) Compilation of 2015, 2016, 2017

Figure 66. Graph of snow depth according to data from SMHI. Author's own copyright.

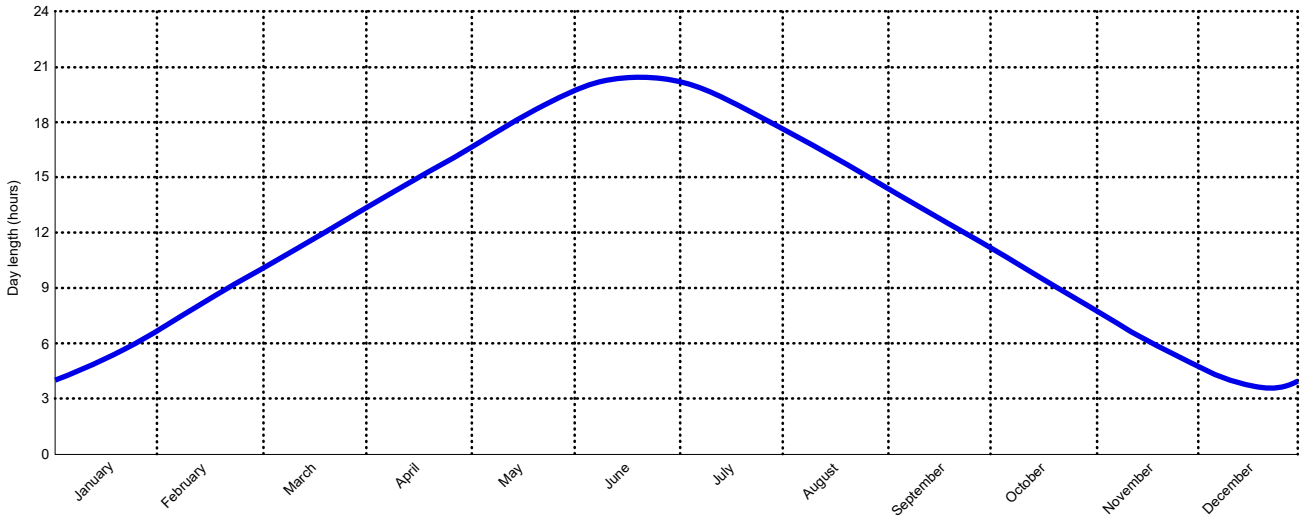


TEMPERATURE (Funäsdalen) Compilation of 2015, 2016, 2017

Figure 67. Graph of temperature according to data from SMHI. Author's own copyright.

SUN HOURS

There is probably some deviation in these site condition data, because there are no data instruments on the exact site, why data has been retrieved from the most representative places nearby.

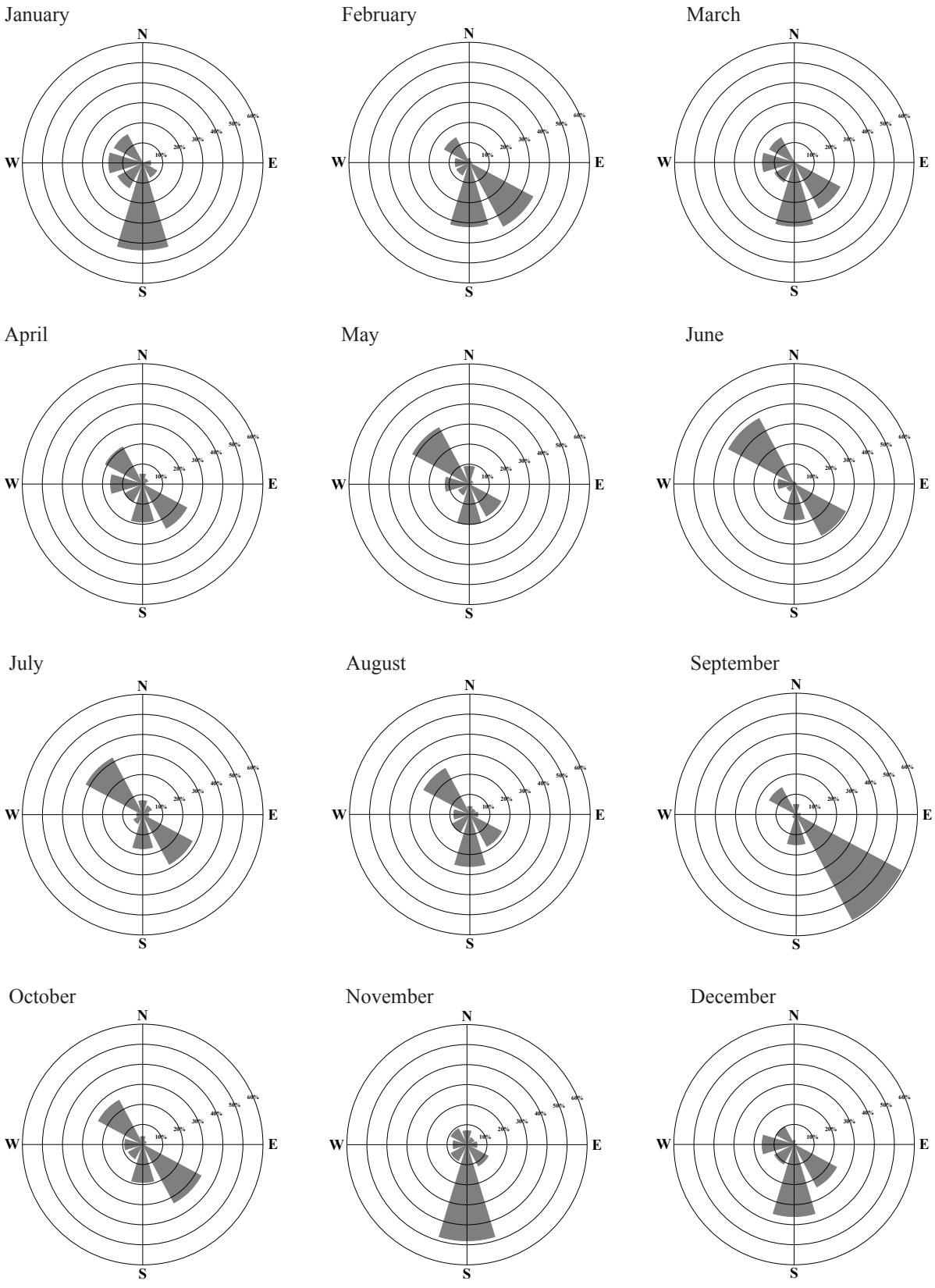


DAY LENGTH (Southern part of Norrland)

Due to the short days in the mountains wintertime, self-sufficiency via solar panels only is not an option.

Figure 68. Graph of day length according to data from SMHI. Author's own copyright.

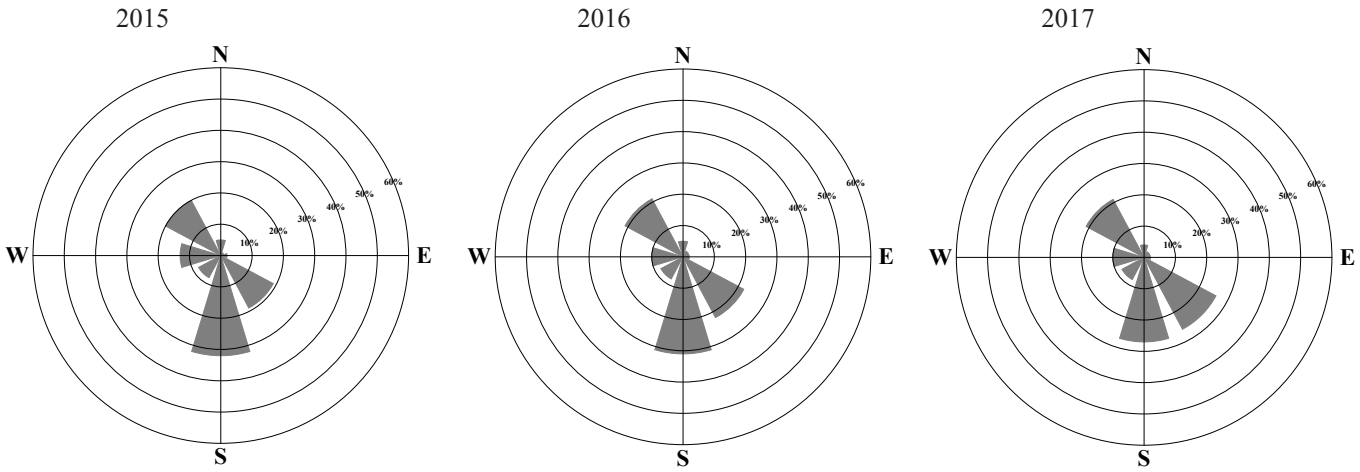
WIND CONDITIONS BY MONTH 2017 (Blåhammaren A)



Wind measurements compiled from the wind station at Blåhammaren which is, according to SMHI, the most accurate wind station in comparisation to the site of Långbrottet. We take it into account that this may be a source of error and that the winds might behave slightly differently at Långbrottet, but overall they are probably quite accurate.

Figure 69. Wind roses according to data from SMHI. Author's own copyright.

WIND CONDITIONS OVER THE YEAR



Wind measurements compiled from the wind station at Blåhammaren which is, according to SMHI, the most accurate wind station in comparisation to the site of Långbrottet. We take it into account that this may be a source of error and that the winds might behave slightly differently at Långbrottet, but overall they are probably quite accurate.

Figure 70. Wind roses according to data from SMHI. Author's own copyright.

TARGET GROUP ANALYSIS & BUILDING TYPOLOGIES

TARGET GROUP ANALYSIS

The aim is to target and capture these groups of tourists:

-Hikers:
Highly active people,
enjoys the struggle to reach their goal.
Nature is the main focus, no major requirements for accommodation.

-Campers:
Nature is the main target, no major requirements for accommodation, primitive and peace & quiet are qualities aimed for.

-Sport tourists:
Looking for activities in nature, where the sport is in focus. Enjoys standard to more comfortable accommodation.

-Experience visitors:
Looking for exciting destinations outside of the norm. Accommodation as well as the experience is important.

Figure 71. Target Group Analasys. Author's own copyright.

BUILDING TYPOLOGY

Figure 72.

Figure 73.

Figure 74.

Figure 75.

Figure 76.

Figure 77.

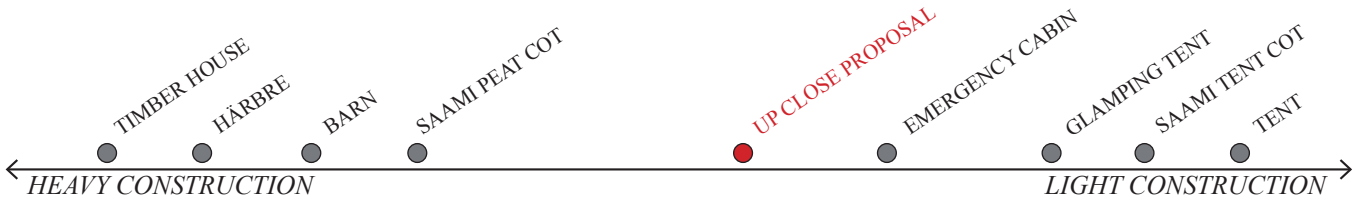


Figure 72. Ramundbergets Fjällby by Murman architects. (Ehrs, 1990). Reprinted with permission.

Figure 73. Härbre in Bruksvallarna. Author's own copyright.

Figure 74. Barn in Bruksvallarna. Author's own copyright.

Figure 75. Newly built Sami peat hut, northern style, in Ammarnäs, Sweden. (Photo by Gudrun Norstedt, 2012). CC-BY.

Figure 76. Saami cot, on Funäsdalsberget. Author's own copyright.

Figure 77. Emergency cabin on site. Author's own copyright.

REFERENCE PROJECTS

REFERENCE PROJECTS

We have also looked into more contemporary building typologies in the mountain areas, which is Alpine Shelter skuta which is a student project in Slovenia, where the building was placed by helicopter, and it is a very compact and light building. Restaurant Björk has been a reference regarding construction, and Monte Rosa hut due to systems for self-sufficiency, material-wise and the relation to the nature.

Figure 78. Alpine Shelter Skuta. (Čokl, 2015). Reprinted with permission.

Figure 79. Restaurant Björk by Murman Architects. (E-son Lindman, 2016). Reprinted with permission.

Figure 80. New Monte Rosa Hut 2. (Unknown, 2010). CC BY-SA 3.0.

DESIGN INVESTIGATION

Figure 81. Surrounding from site.
Author's own copyright.

FEATURES & CONNECTIONS

SPACE DIVISION

Programme:

-Accommodation
-Common area
-Self catered kitchen
-Sauna
-Wet room; showers, wc, changing room
-Dry room
-Storages

Figure 82. Sketch space division. Author's own copyright.

SPACE DIVISION

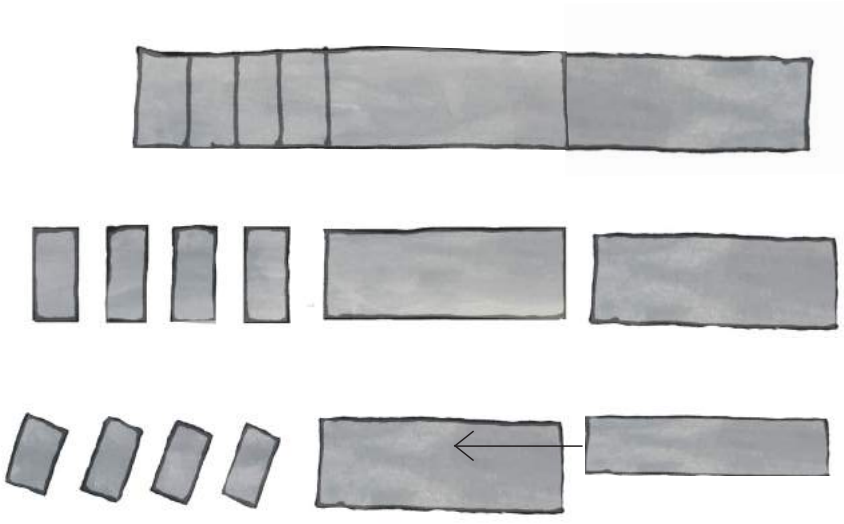


Figure 83. Sketch space division.
Author's own copyright.

SPACE DIVISION

Small buildings includes:
- -Accommodation, 4 people/hut
- -Private & seperated space

Main building includes:
- -Common areas
- -Self catered kitchen
- -Sauna
- -Wet room; showers, wc, changing room
- -2 Dormitories, 16 people
- -Dry room
- -Storage

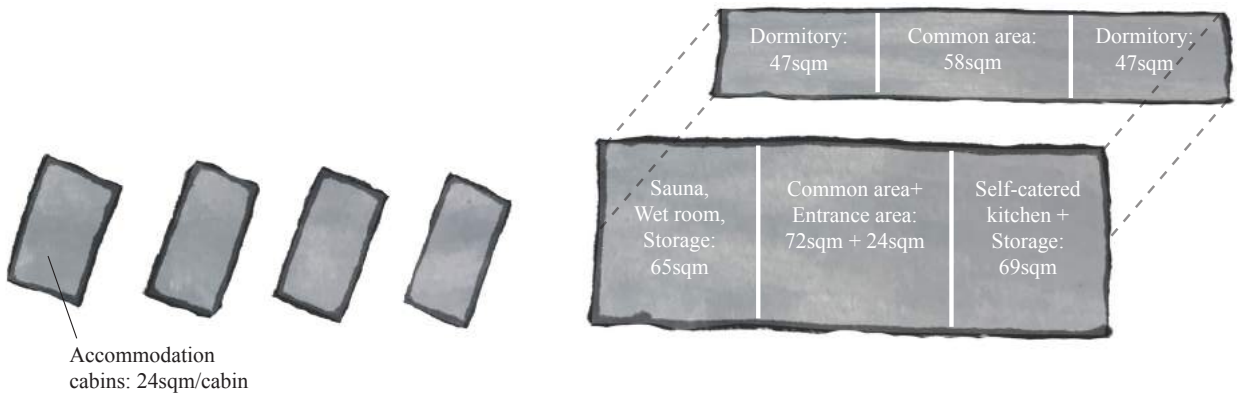


Figure 84. Sketch space division. Author's own copyright.

SPACE DIVISION

It is important that the fireplace has a central loaction in the most used areas- the kitchen and the common area. The wet room need to be close to the sauna and the entrance. The entrance will be located with easy access both to the common area and the wet room.

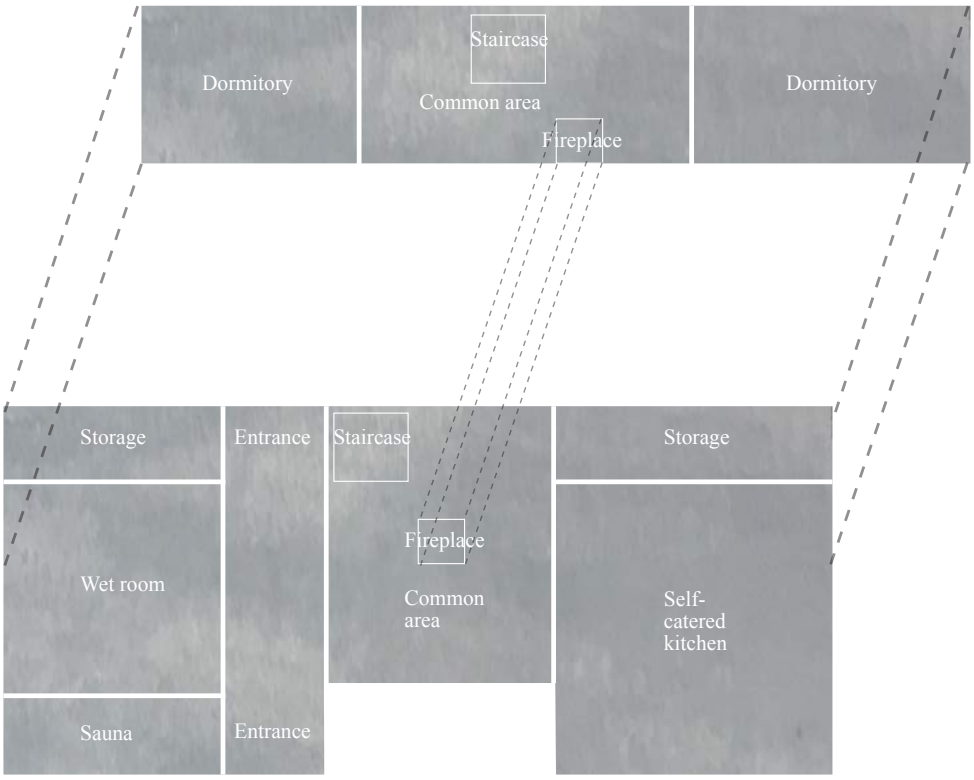


Figure 85. Sketch space division. Author's own copyright.

THE SHAPE

THE SHAPE

The design investigation started with the triangular shape of the classic peat cot typology. An investigation have been made on how to approach this shape and interpret it to create a new contemporary design. A spart was added to the structure, which resulted in a very classic way of dealing with entrance situations. Then a part was removed from the structure, although this proposal lost the quality of a protected entrance and snow would probably fall down and block the entrance. Then the final proposal where a part was removed from the structure which resulted in an interesting and protective entrance situation and a shape where you still can see resemblance and traces from the classic peat cot typology.

Figure 86. Newly built Sami peat hut, northern style, in Ammarnäs, Sweden. (Photo by Gudrun Norstedt, 2012). CC-BY.

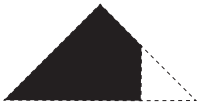
NO IMPACT

Shape of a classic Saami peat cot

ADDING

More material usage

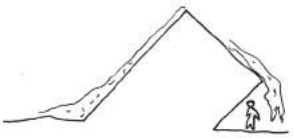
REMOVING



No entrance protection.

Snow will fall down and block the openings.

Entrance protection achieved.



Covered entrances prevent snow from falling down and blocking the openings.

Figure 87. Sketches entrance situations / impact on shape. Author's own copyright.

ENTRANCES

The entrances to the small huts as well as to the main building are covered with protective roofs and walls. They give shelter from harsh winds and also help keep snow away from covering the entrances, making sure they can always be accessed by visitors.

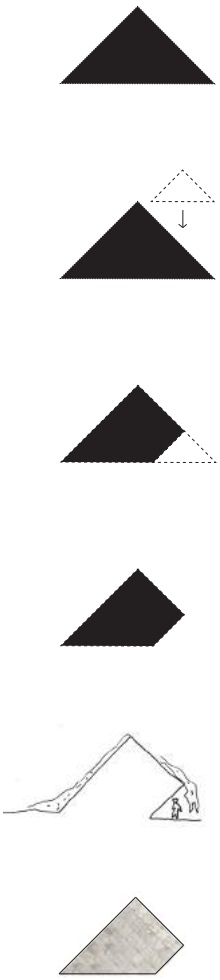


Figure 88. Sketch impact on the shape. Author's own copyright.

Figure 89. Sketch covered entrance. Author's own copyright.

ANGLES & OUTLOOKS

OUTLOOK INSPIRATION

Aiming for an easy access view and outlook towards the sky from where you are sleeping. Go to bed and wake up to a view where you can catch the northern lights, the stars and the mountain sky in general, is a quality strived for.

Inspired by the saami culture, where it is described how the horizon and the sky feels close and where you met the stars and the mountain sky through the smoke opening of the peat cot. The spatial quality of the peat cot with its smoke opening has been interpreted in the dormitory areas.

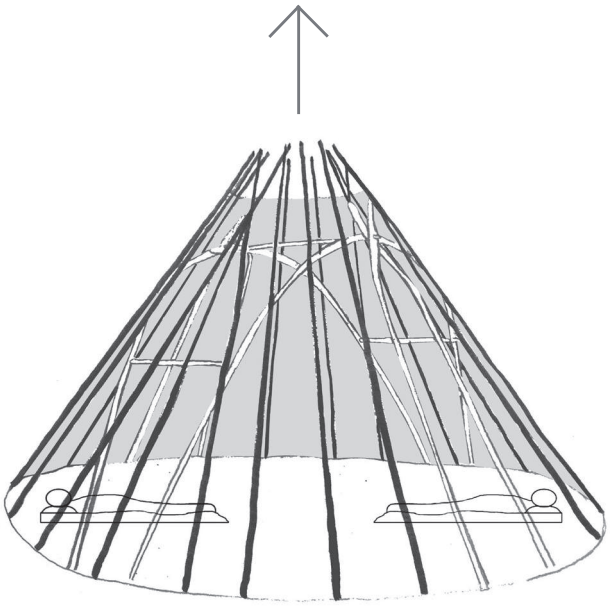


Figure 90. Sketch. Author's own copyright.

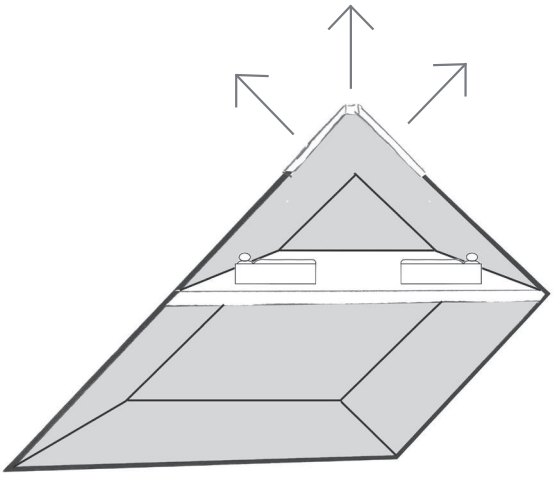


Figure 91. Sketch. Author's own copyright.

Figure 92. View through the ceiling windows from inside of the mountain museum in Funäsdalen. Author's own copyright.

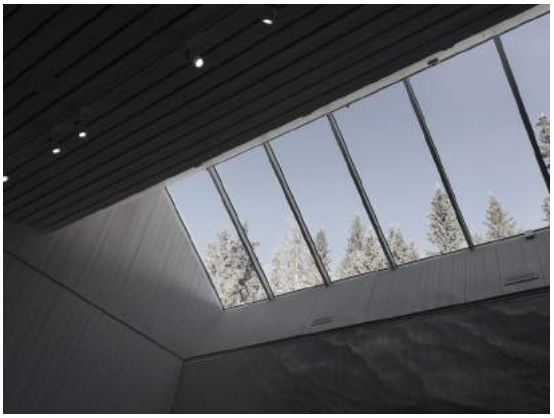


Figure 93. View through the ceiling windows from inside of the mountain museum in Funäsdalen. Author's own copyright.

SKETCHES OUTLOOK ANGLES

Sketches were made to achieve the optimum angle, both in terms of roof and visibility from where you are sleeping. According to self observed studies and sketches the conclusion is that an angle of 45 degrees is good both in terms of roof and visibility through windows with the view aimed for and for solar panels.

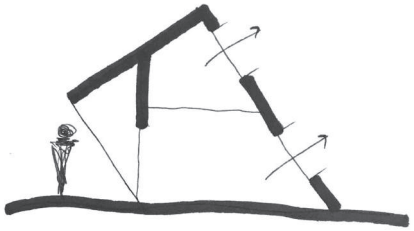


Figure 94. Sketch. Author's own copyright.

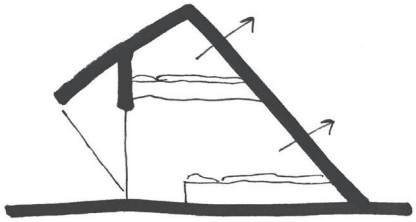


Figure 95. Sketch. Author's own copyright.

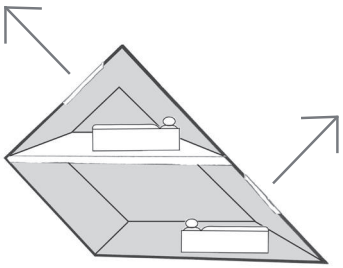


Figure 96. Sketch. Author's own copyright.

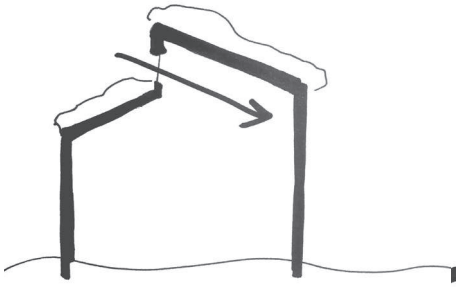


Figure 97. Sketch. Author's own copyright

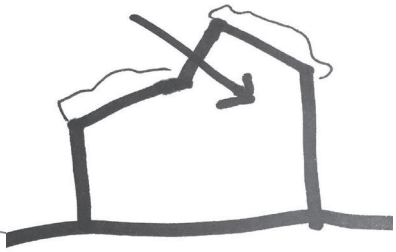


Figure 98. Sketch. Author's own copyright.

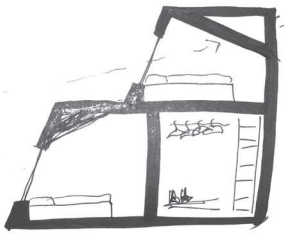


Figure 99. Sketch. Author's own copyright.

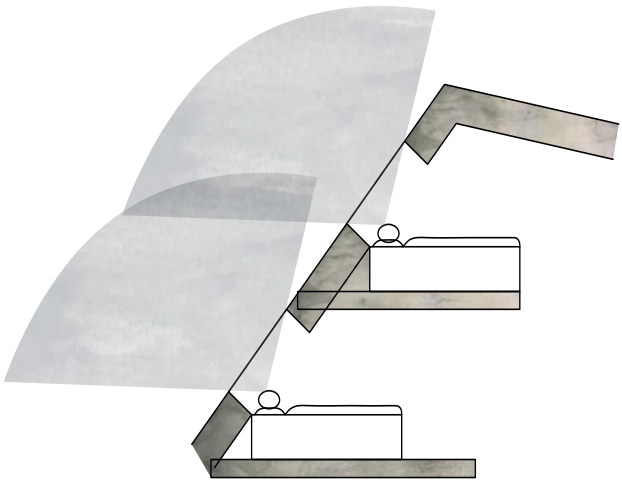


Figure 100. Sketch. Author's own copyright.

Figure 101. Sketch. Author's own copyright.

OUTLOOK QUALITIES

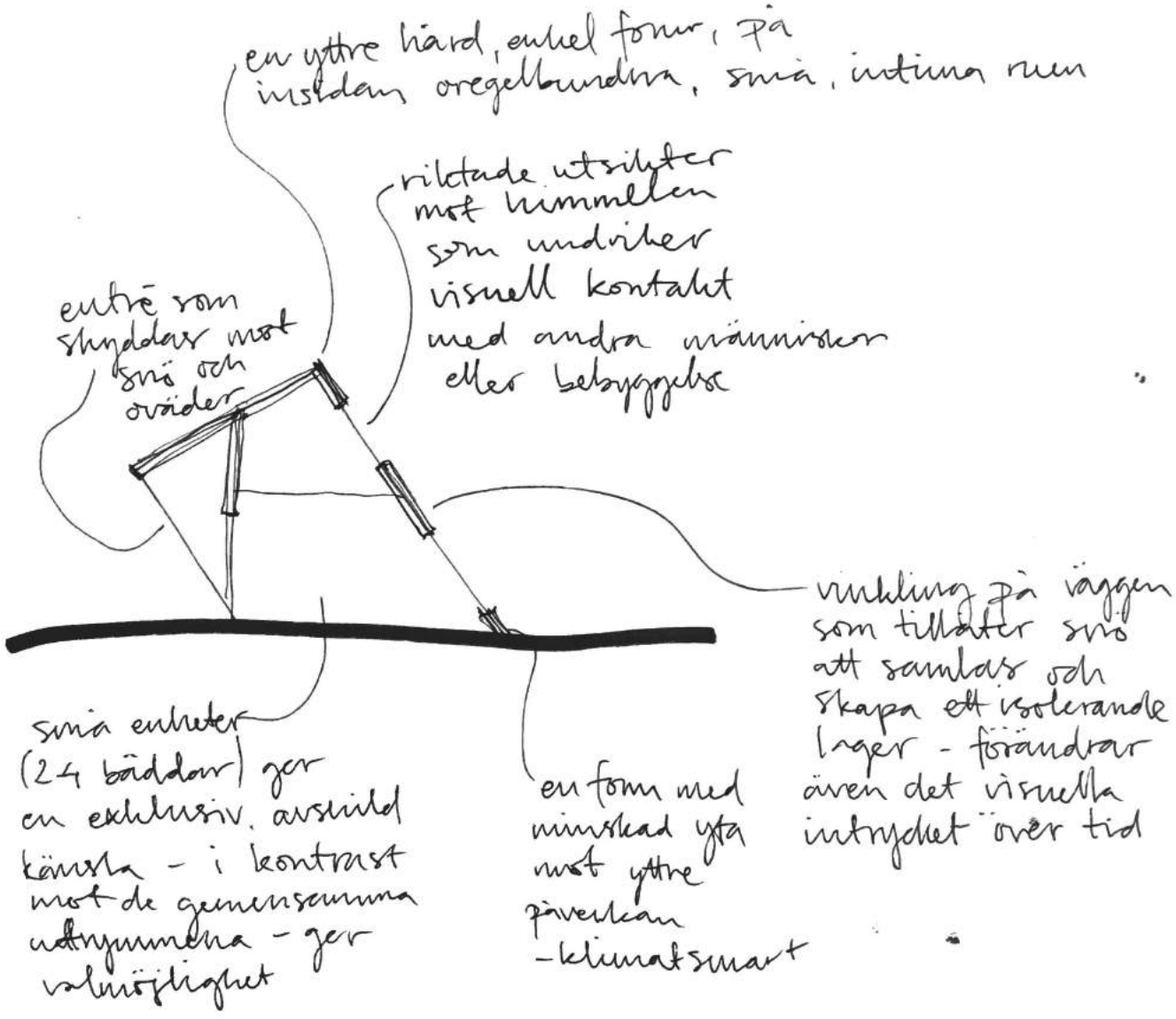


Figure 102. Sketch. Author's own copyright.

NATURAL LIGHT

The small huts are placed with a distance from the main building, to create a sense of privacy and exclusivity. Two different locations were investigated. The initial desire was to put the huts on the other side of the stream from the main building, to make use of the existing bridge. They would then have views towards the north overlooking the hill and turned away from the other building as well as the paths. However, as the daylight is very valuable in this climate, especially during winter time, another option was tried out. The views of the huts are then turned towards south west to get the maximum amount of daylight into the huts, while still turning away from the main building and the paths. By placing them on the north side of the stream, they will overlook the water, which gives an extra quality to them. The second option was chosen, due to the importance of the thermal comfort of the huts.

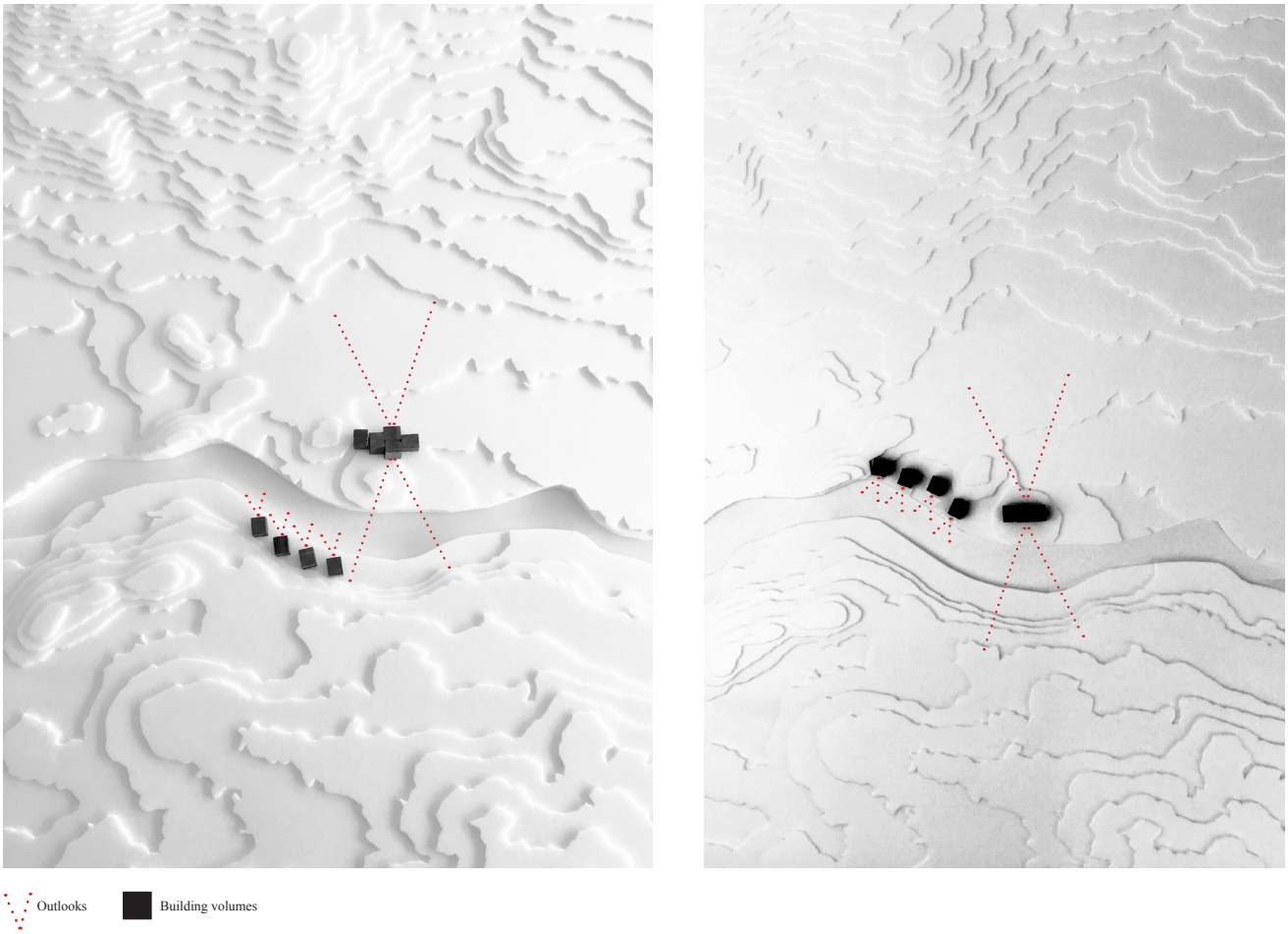


Figure 103. Sketch model of building placement. Author's own copyright.

MATERIAL USE

MATERIAL USE

Galvanized steel plates. Maintenance-free and can withstand the extreme weather conditions that the site's location implies. The surface and pattern provide an effect with a shimmering expression.
When the weather is harch and reaches below zero, the humidity gets crystallized on the surface of the steel plates, creating a feeling of a cold exterior.
The cold exterior is combined with warm elements of wood panel in the "cut outs" of the facade.

NEW MATERIALS

Exterior: Galvanized steel plates

Exterior: Wood panel

Interior: Cross laminated birch timber panel

RE-USING MATERIALS ON SITE

The aim is to deconstruct the hunting cabin and reuse as much of the material as possible as interior panelling in the sauna. The shiffer stones from the current fireplace and the foundation of the hunting cabin will be reused in the new fireplace.

The suspension bridge will be preserved just as it is and remains on site.The emergency cabin and the storage will be moved to another site where an emergency cabin and a storage is needed. A good suggestion on where to move it is Broktjärn, where the current emergency cabin is in bad condition and should be replaced. (Arnell, personal communication, February 2018)

REUSING MATERIALS

Figure 104. Current foundation. Author's own copyright.

Figure 105. Current fireplace. Author's own copyright.

Figure 107. Current panelling. Author's own copyright.

Figure 106. Reusing shiffer in the new fireplace. Author's own copyright.

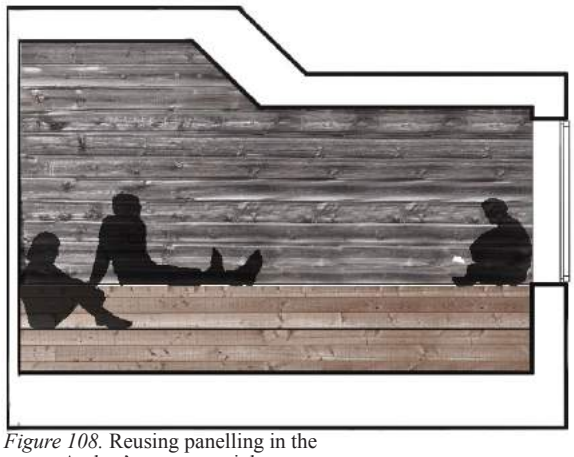


Figure 108. Reusing panelling in the sauna. Author's own copyright.

Reusing the panneling on the walls in the sauna combined with new wood panels on the benches

STEEL PLATE PATTERN

The pattern of the galvanized steel plates is inspired and inerpreted by commonly used patterns in the Saami culture, seen in both handcrafting and peat roof placement.

Figure 109. Peat roof placement.

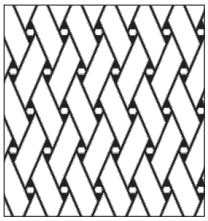


Figure 110. Southern Sami braid design, traditional braid design. (Almqvist, 2010). CC BY-SA 3.0.

Figure 111. Handcrafted bag. Author's own copyright.

Figure 112. Wood Shingles. Author's own copyright.

Figure 113. Pattern sketch. Author's own copyright.

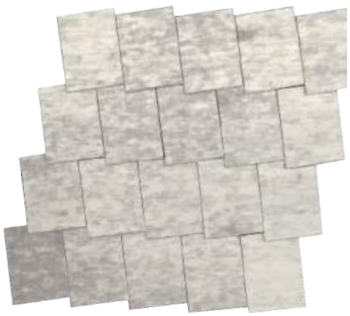


Figure 114. Pattern applied on the material. Author's own copyright.

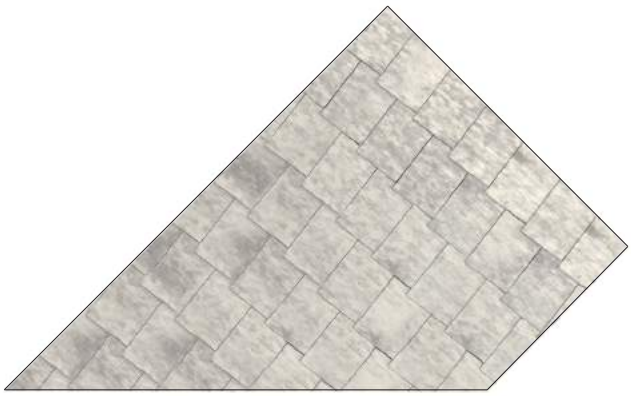
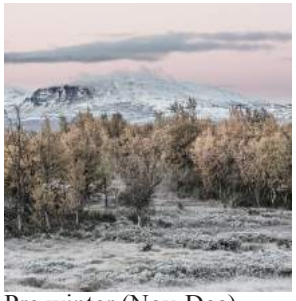


Figure 115. Pattern follows angle. Author's own copyright.

The pattern follows the angle of the facade to enhance the tilted expression and the visual effect of the building being pressed down in the ground.

THE SAMI'S EIGHT SEASONS

For the Saami, the climate and seasons are of great significance and, according to ancient Saami culture, the year is divided into eight seasons. (Lundmark, personal communication, February 2018).
The different lighting during the seasons will be reflected on the galvanized steel facade, providing a diverse facade expression according to the time of the day and year, enhancing the beauty of the particular ligthing of the season.


Pre winter (Nov-Dec)


Pre spring (Dec-March)


Pre spring (March-April)


Spring (April-May)


Pre summer (June)


Summer (June– July)


Pre fall (Aug)


Fall (Sept-Oct)

Figure 116. Seasons of Funäsfjällen.
(Robertsson, 2010-2012). Reprinted with permission.

Figure 117. Sketch of lighting on facade.
Author's own copyright.

AFFECTIONAL VALUE

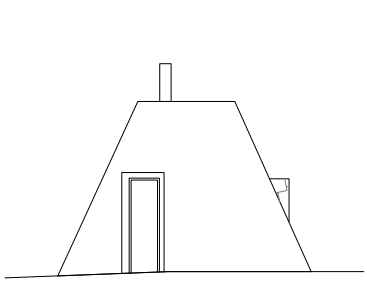
PEAT

The peat roof has a very high affectional value in the area, in both sami and farmers culture, and is highly appreciated by both visitors and inhabitants. Therefore this material has been considered in this project and has been analyzed to be used at different extents.
The conclusion, however, was that using this material was perceived as a pastish - an attempt to imitate something that was not. It did not become authentic, why this material in the end was excluded completely. Instead, the focus has been on the spatial qualities and approaches to nature with the creation of a light construction that takes little claim on the ground, similar to the cultural tradition of the Saami peat cot. The galvanized steel plate facade represents the light construction with its lightweight material.

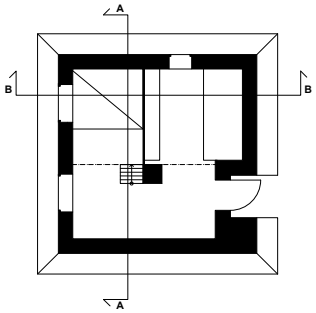
ALL IN PEAT

Figure 118. Sketch, new facility all covered with peat.
Author's own copyright.

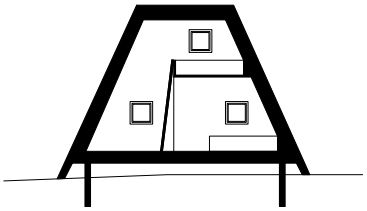
SMALL HUTS



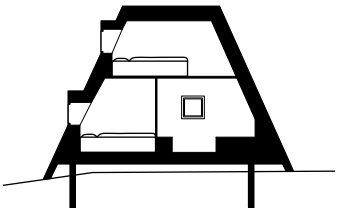
NORTH FACADE



FLOOR PLAN



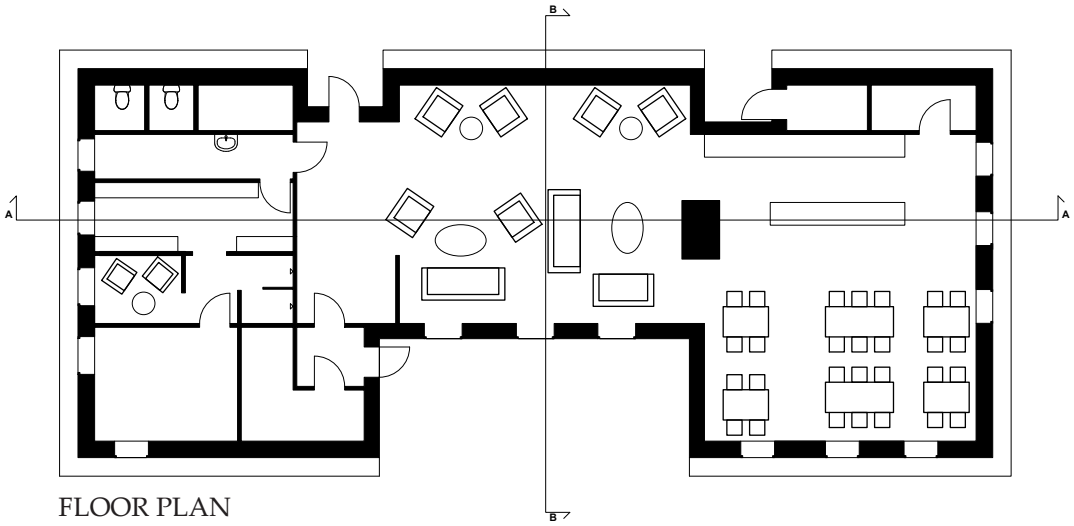
SECTION A-A



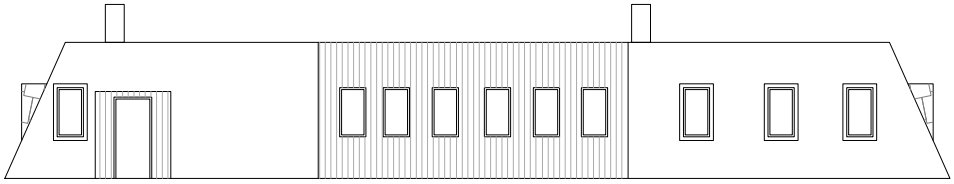
SECTION B-B

ALL IN PEAT

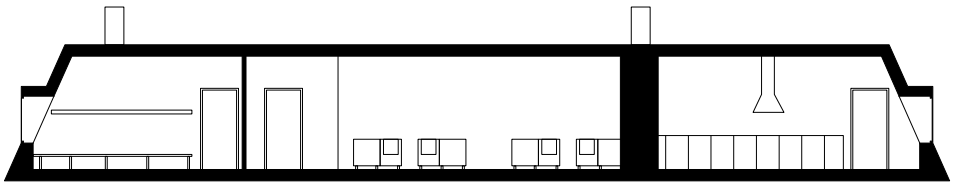
MAIN BUILDING



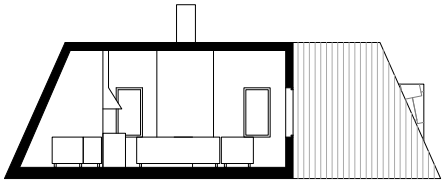
FLOOR PLAN



SOUTH FACADE



SECTION A-A



SECTION B-B

ONE FACADE IN PEAT

Figure 119. Sketch, new facility partly covered with peat.
Author's own copyright.

Figure 120. Sketch, new facility partly covered with peat.
Author's own copyright.

ONE FACADE IN PEAT

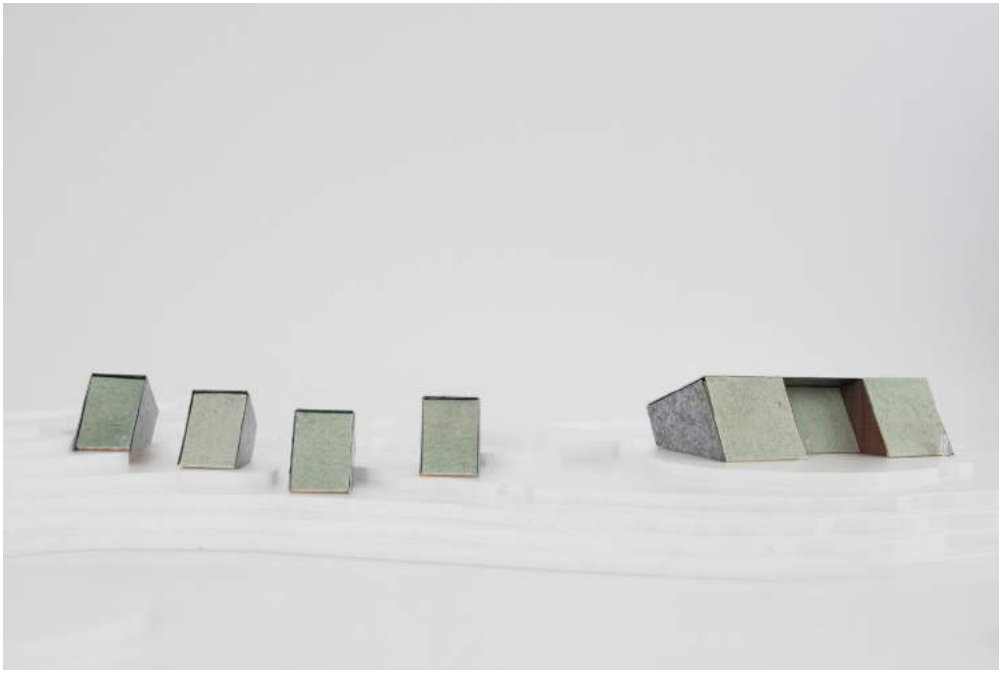


Figure 121. Sketch model of facility partly covered in peat.
Author's own copyright.

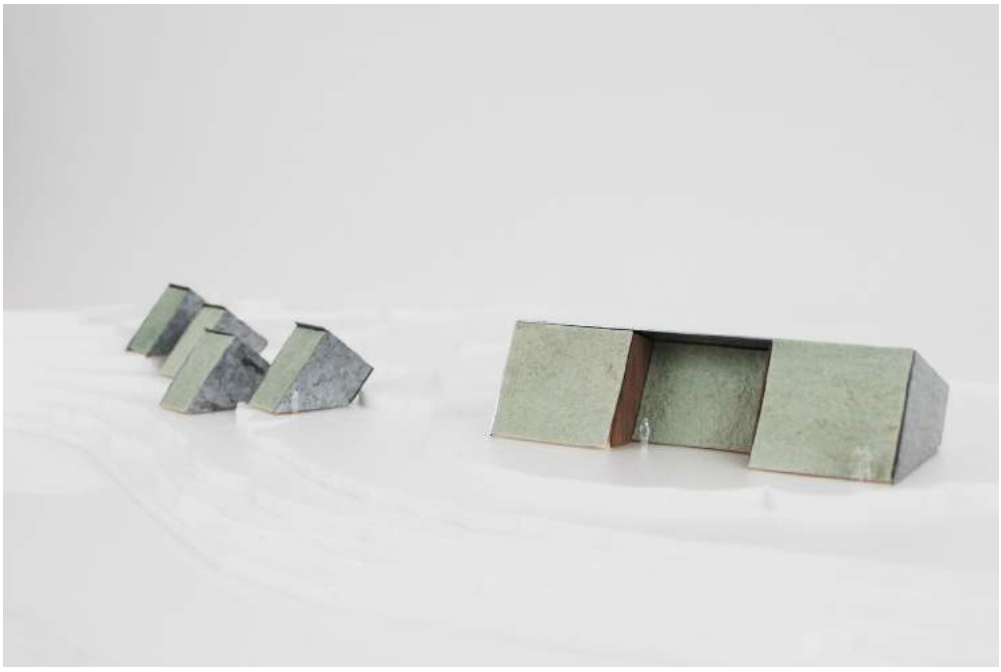


Figure 122. Sketch model of facility partly covered in peat.
Author's own copyright.

PEAT EXCLUDED

The conclusion was that using peat as a facade material was perceived as a pastish - an attempt to imitate something that was not. It did not become authentic, why this material in the end was excluded completely. Instead, the focus has been on the spatial qualities and approaches to nature with the creation of a light construction that takes little claim on the ground, similar to the cultural tradition of the Saami peat cot. The galvanized steel plate facade represents the light construction with its lightweight material.

Figure 123. Sketch, new facility without peat.
Author's own copyright.

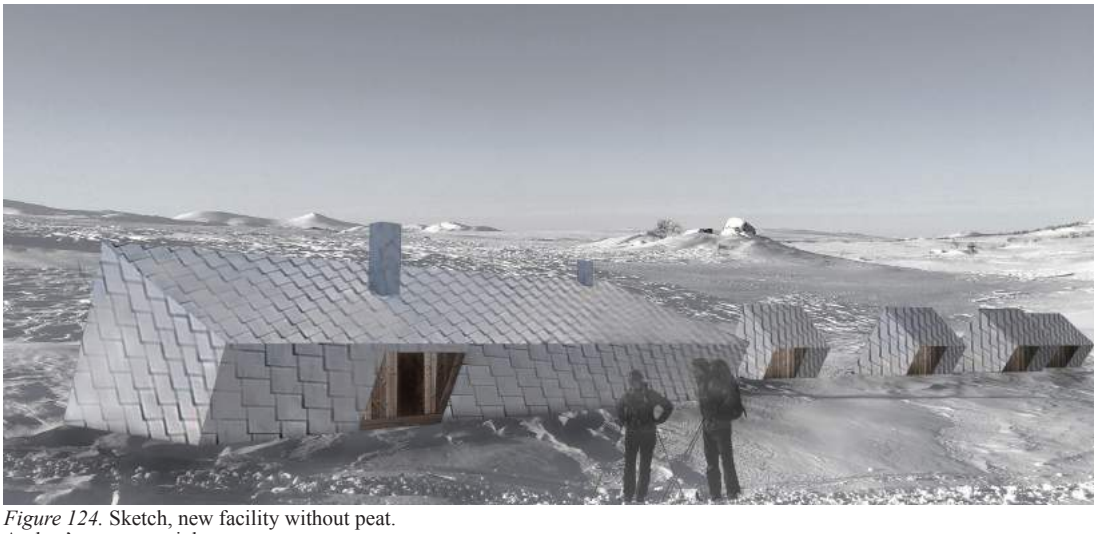


Figure 124. Sketch, new facility without peat.
Author's own copyright.

PEAT EXCLUDED

Figure 125. Sketch model of facility without peat.
Author's own copyright.

Figure 126. Sketch model of facility without peat.
Author's own copyright.

CONSTRUCTION PROCESS

CONSTRUCTION MEETS GROUND

The aim is to take as little claim as possible on the ground, at the same time the building needs to be stable and be able to withstand harch weather conditions during a long period of time. It was therefore decided that the building would be on plinths, which can easily be cut off if the building would no longer be in use or had to me moved to another site.

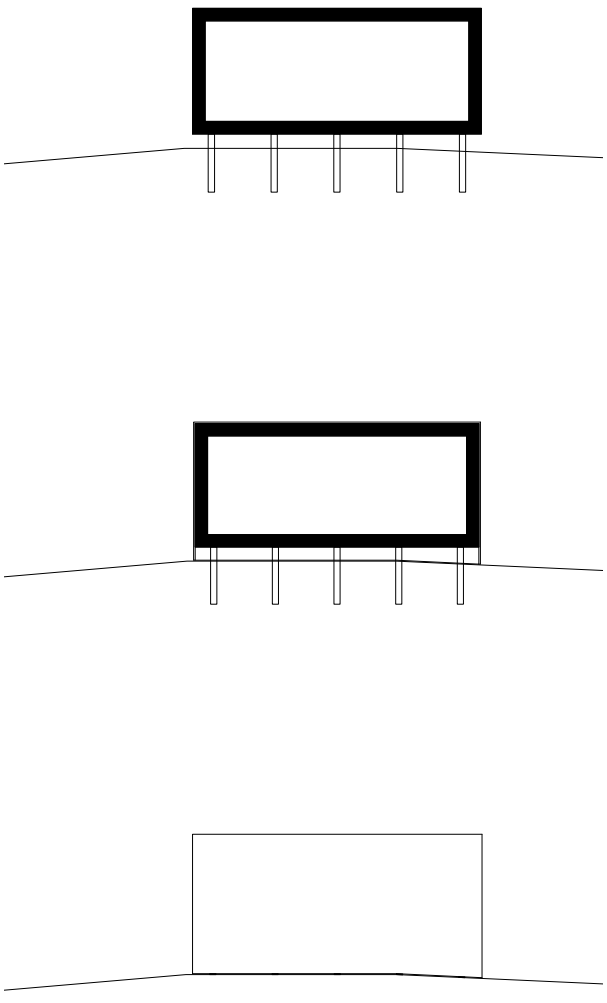


Figure 127. Sketch, building meets ground.
Author's own copyright.

VISUAL VS NON VISUAL CONSTRUCTION

The cultural constructions on site with visible construction in the interior, with the classic beams in the ceiling has been interpreted and conceived with clean surfaces achieved by using cross laminated birch timber.
Cross laminated birch timber, which function as the load bearing construction, will remain untreated on interior walls and ceiling to create a warm and intimate interior space, contrasting to the cold and harch steel facade.

Figure 128. Construction of a Sami cot, Laponia. (Allard, 1958). Public domain.

Figure 129. Classic construction in mountain farmer´s culture. Author's own copyright.

Figure 130. Sketch of cross laminated birch timber. Author's own copyright.

THE PROPOSAL

Figure 131. New facility from north.
Author's own copyright.

DESIGN PROPOSAL

Figure 132. New facility from north.
Author's own copyright.

Figure 133. Site plan.
Author's own copyright.

N

SCALE 1:2000


N
SCALE 1:400
0
5
10
15
20
40m

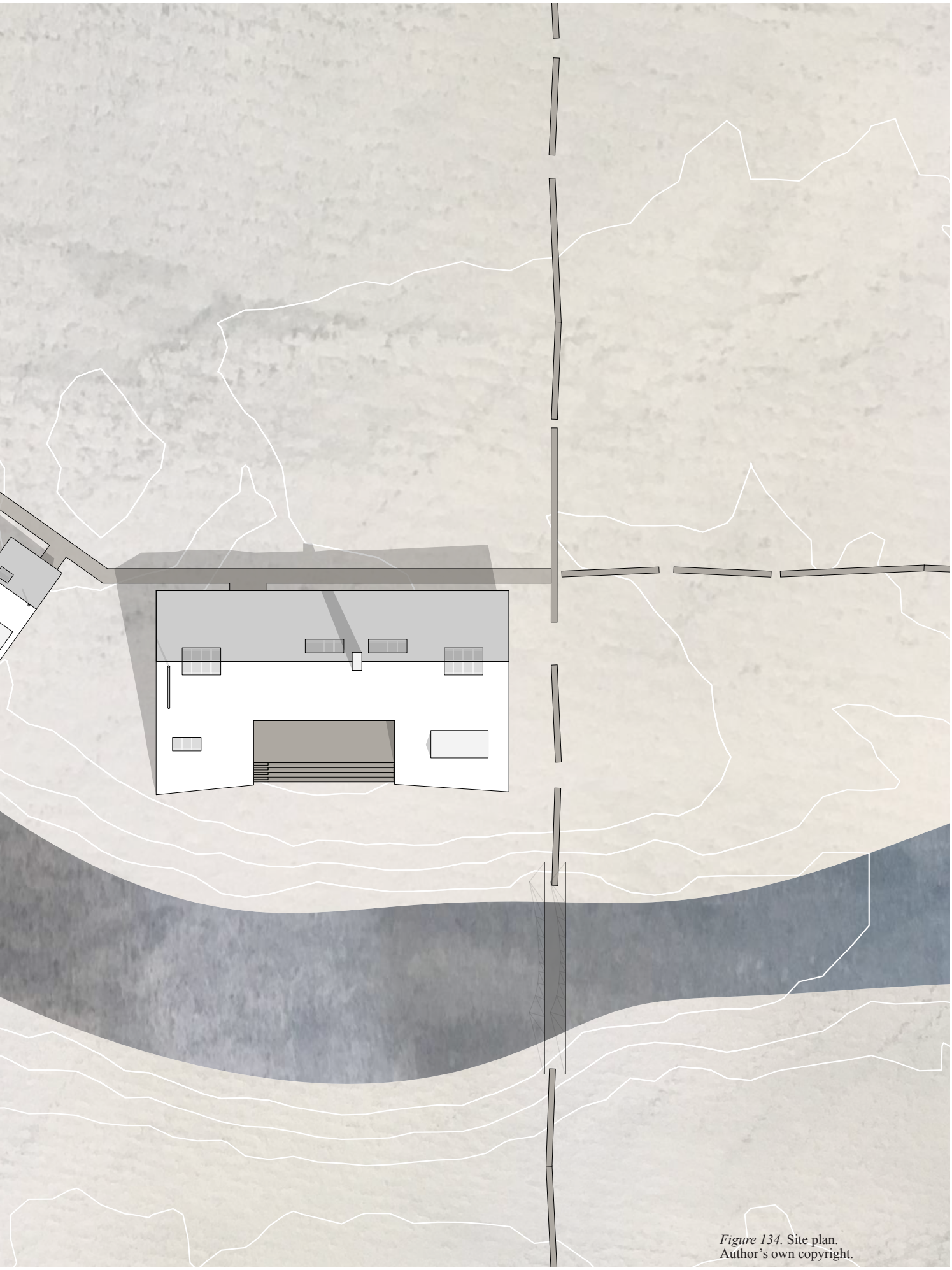
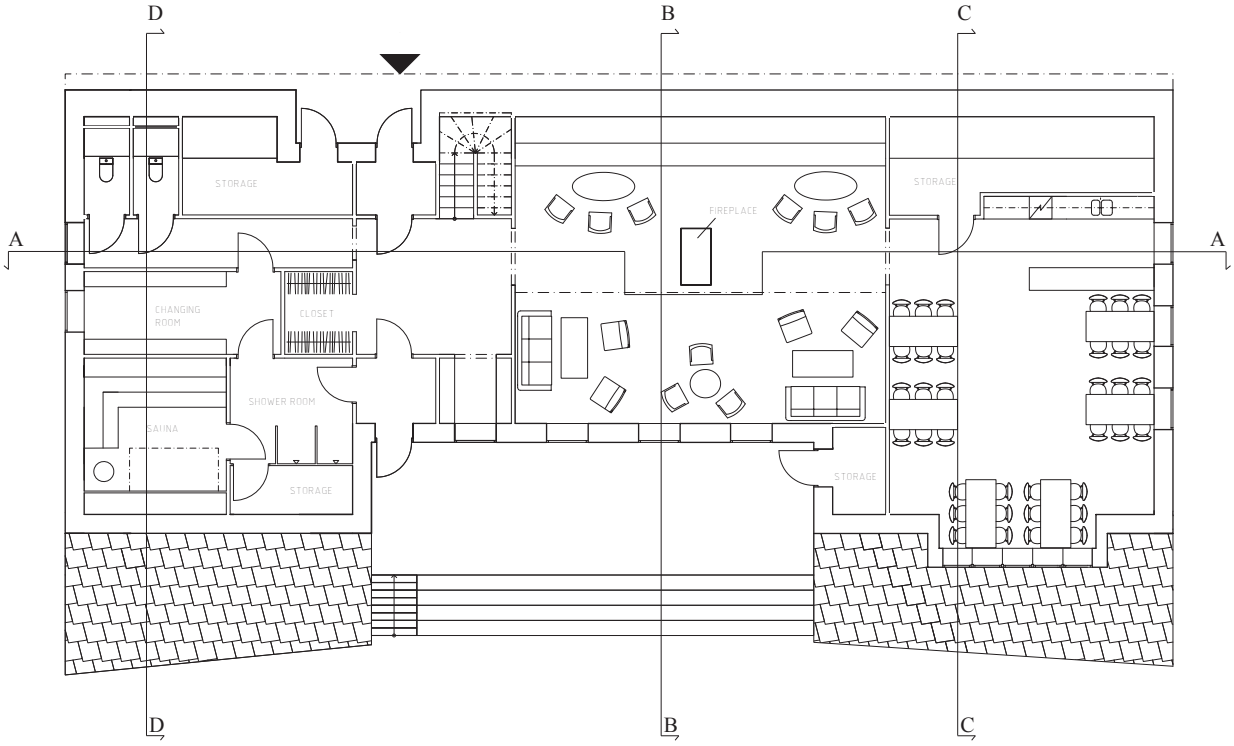
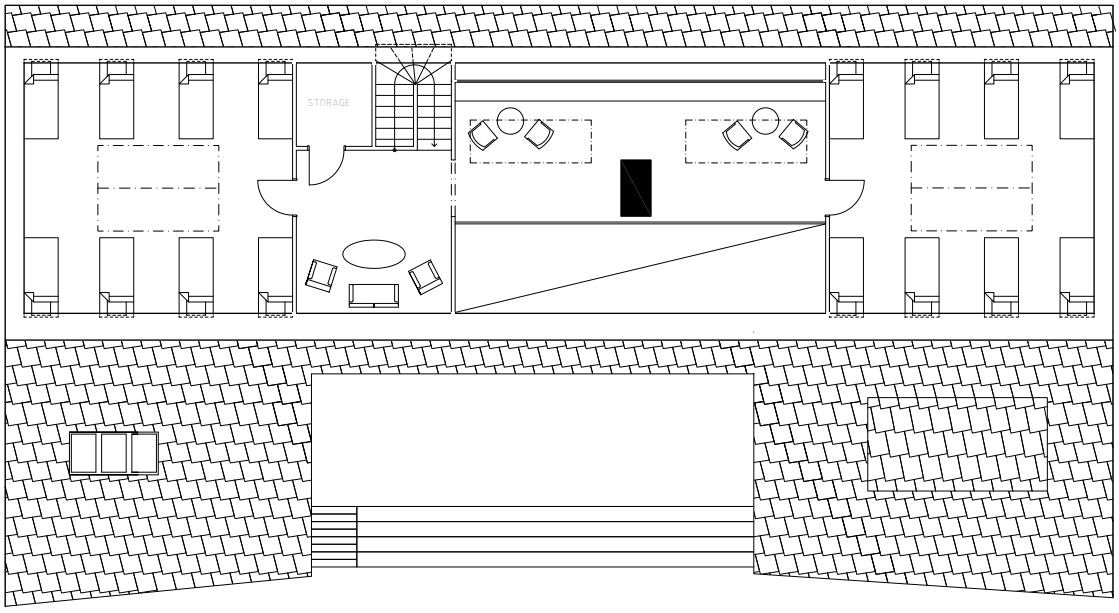


Figure 134. Site plan.
Author's own copyright.

MAIN BUILDING



FLOOR PLAN 1

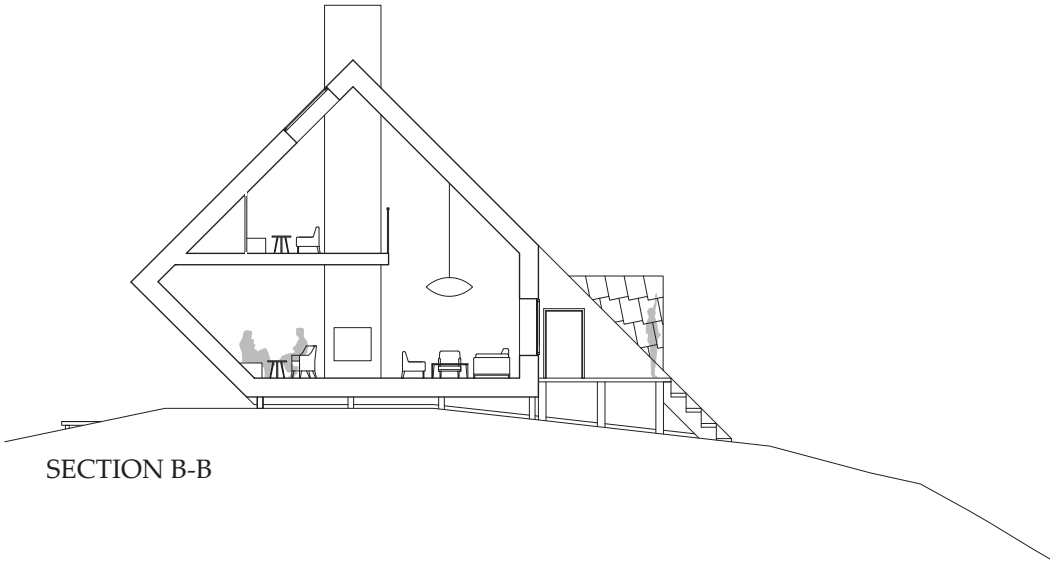


FLOOR PLAN 2

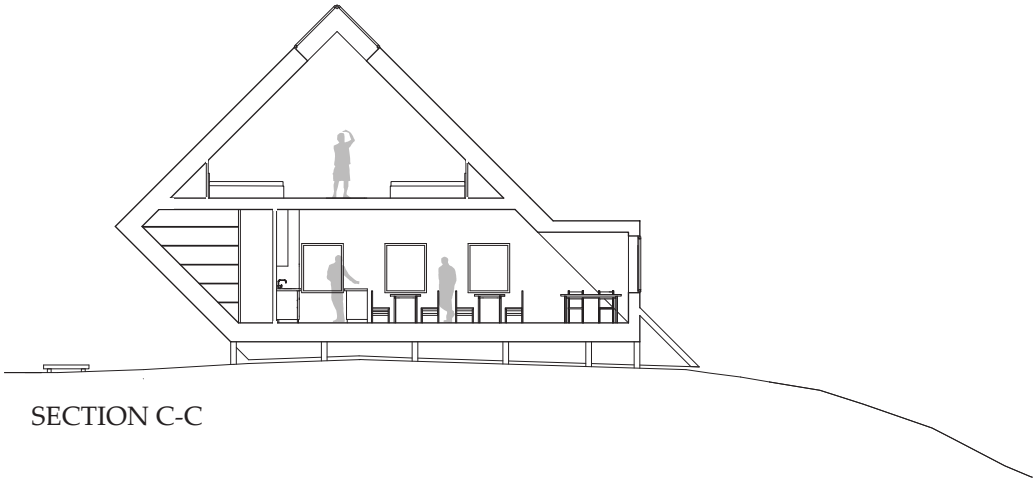
N

SCALE 1:200

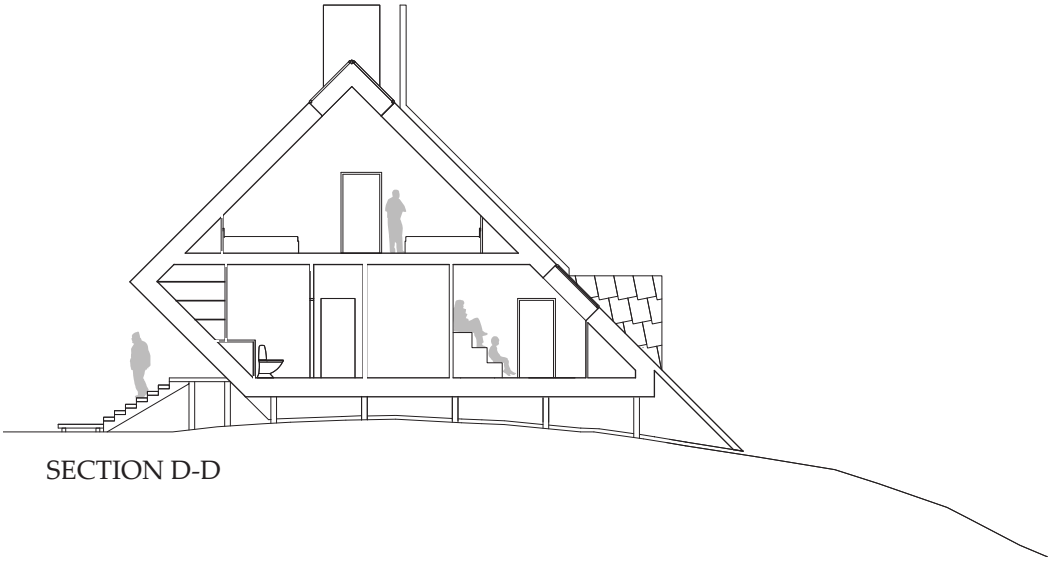
MAIN BUILDING



SECTION B-B



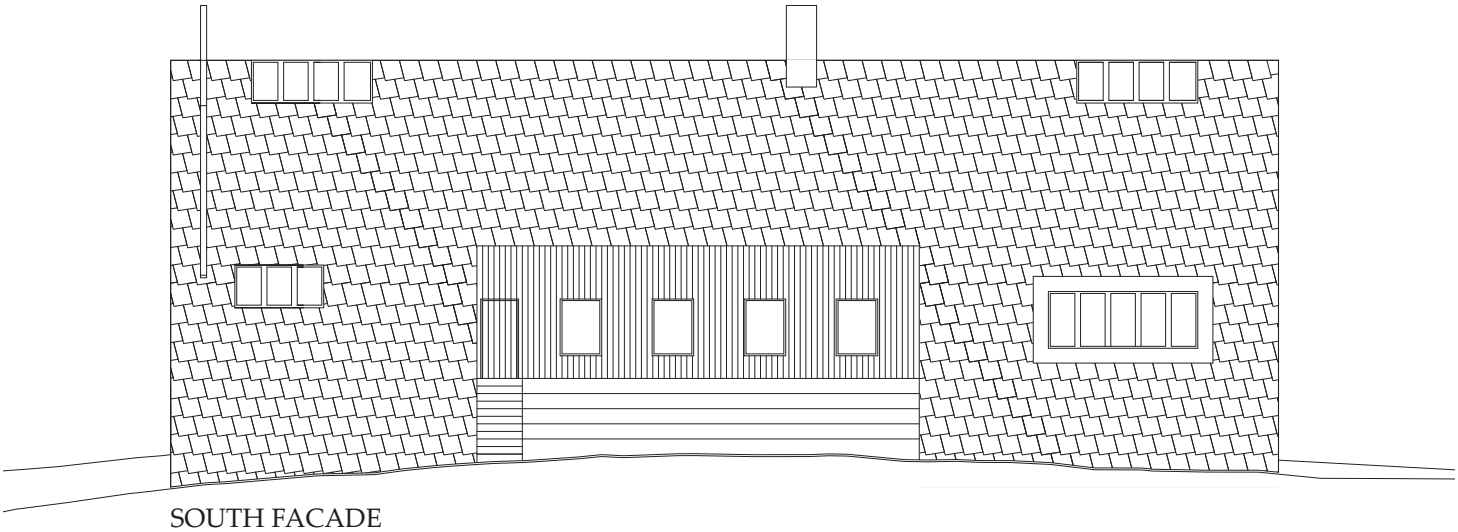
SECTION C-C



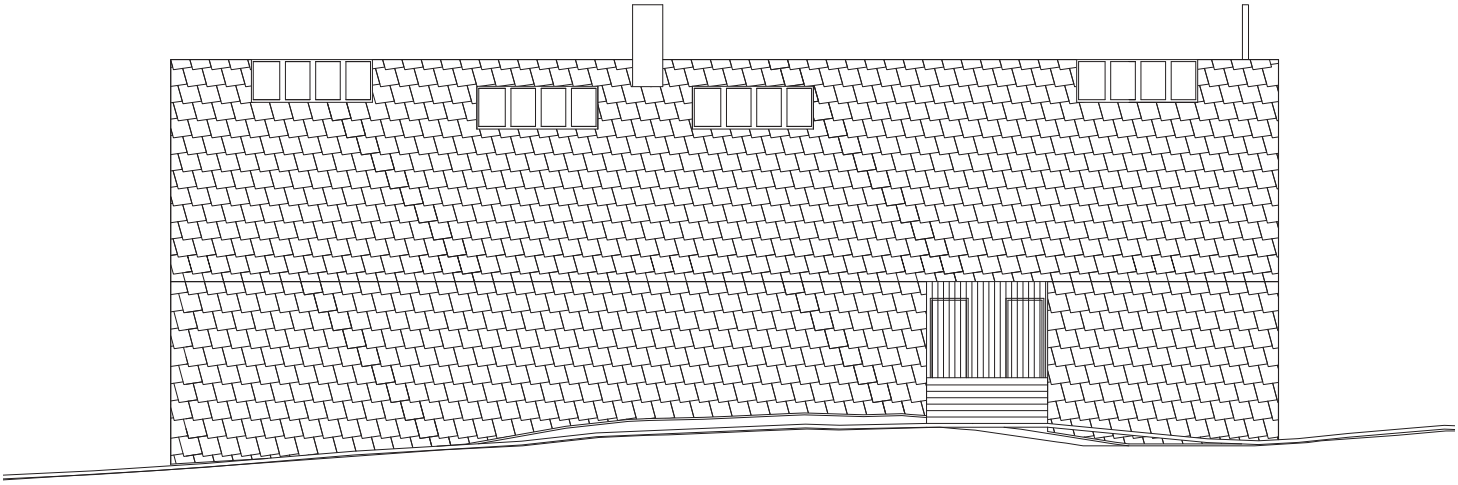
SECTION D-D

SCALE 1:200

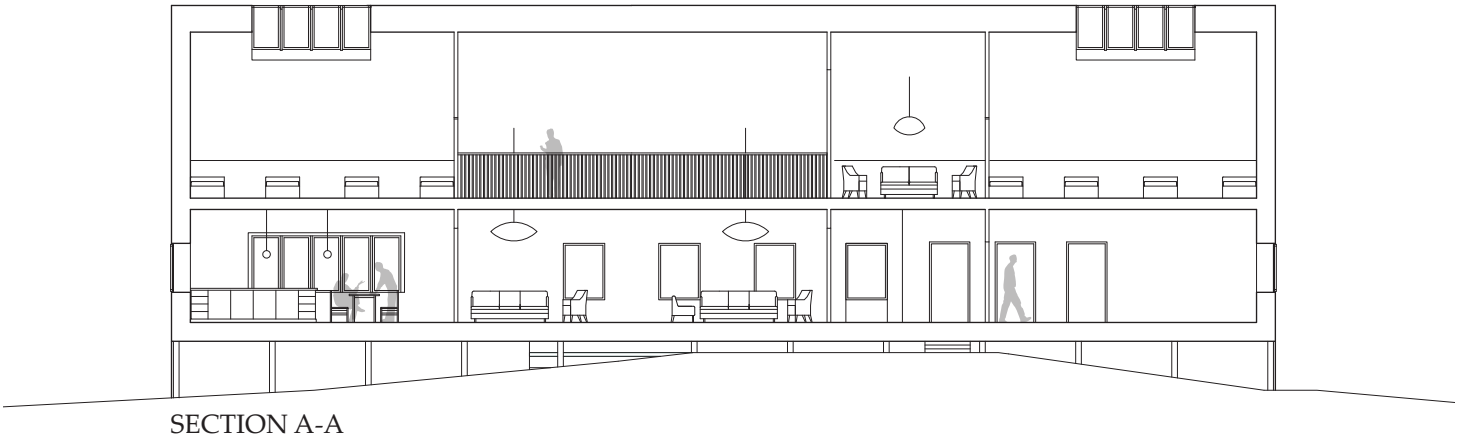
MAIN BUILDING



SOUTH FACADE



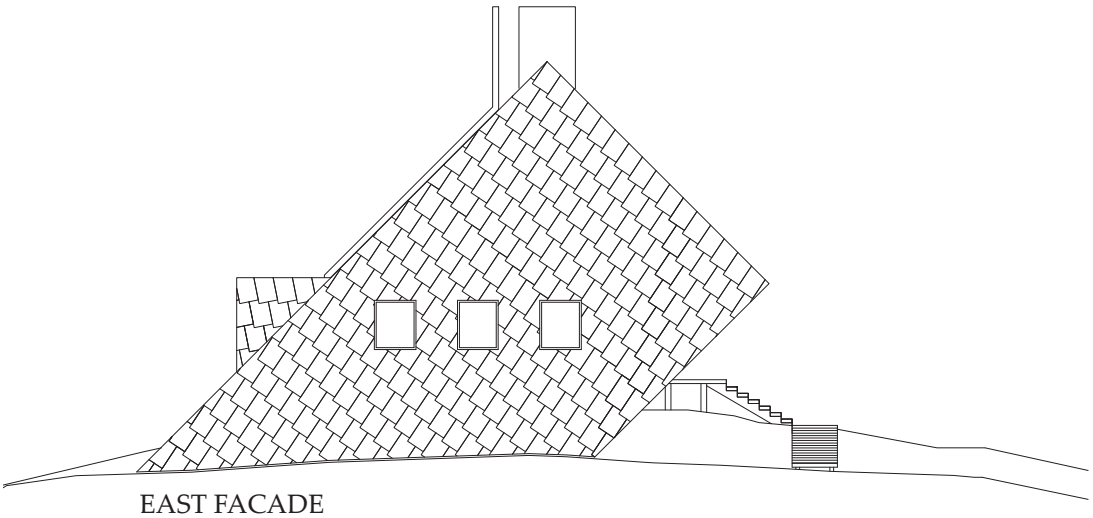
NORTH FACADE



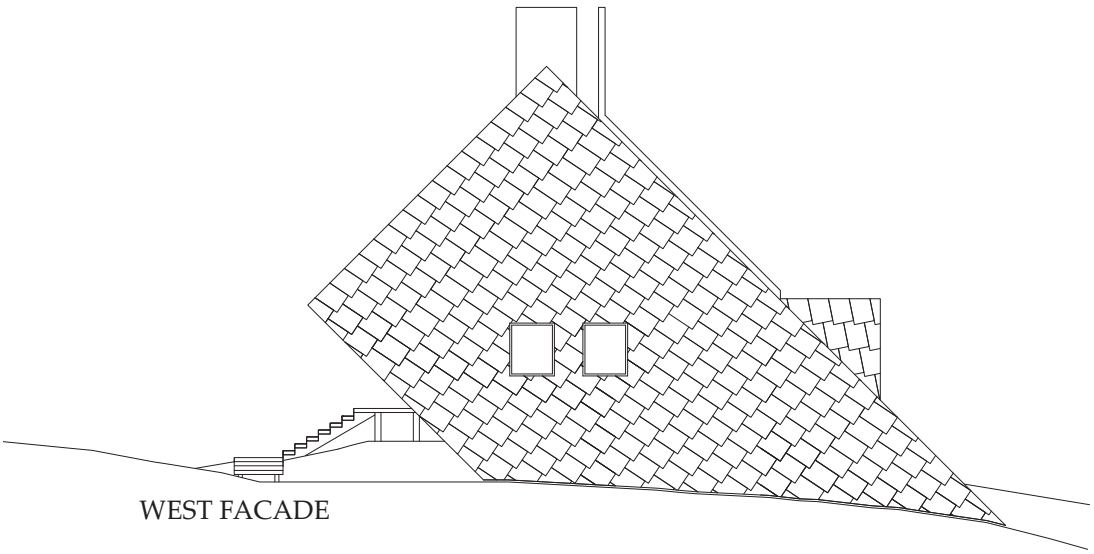
SECTION A-A

SCALE 1:200

MAIN BUILDING



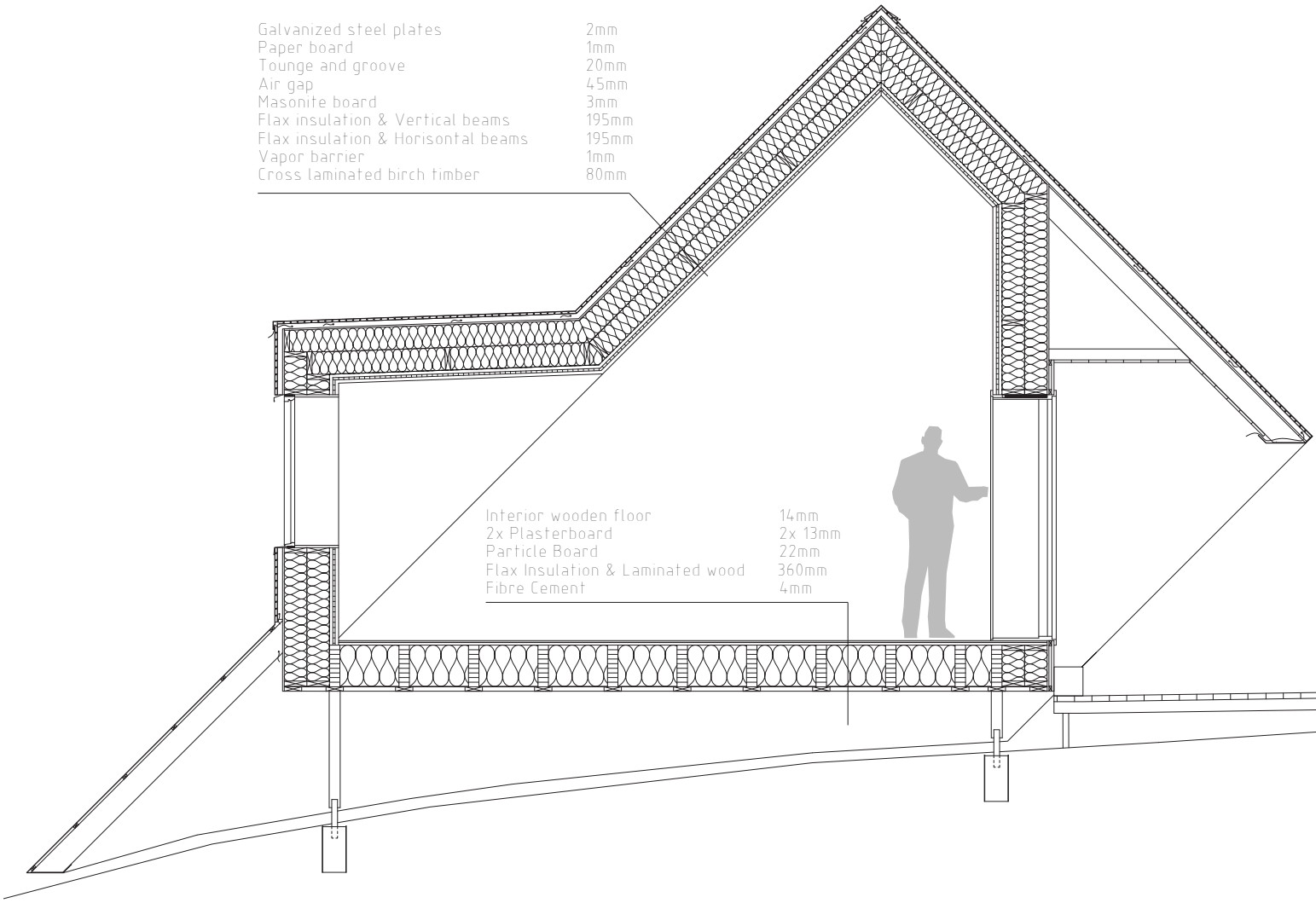
EAST FACADE



WEST FACADE

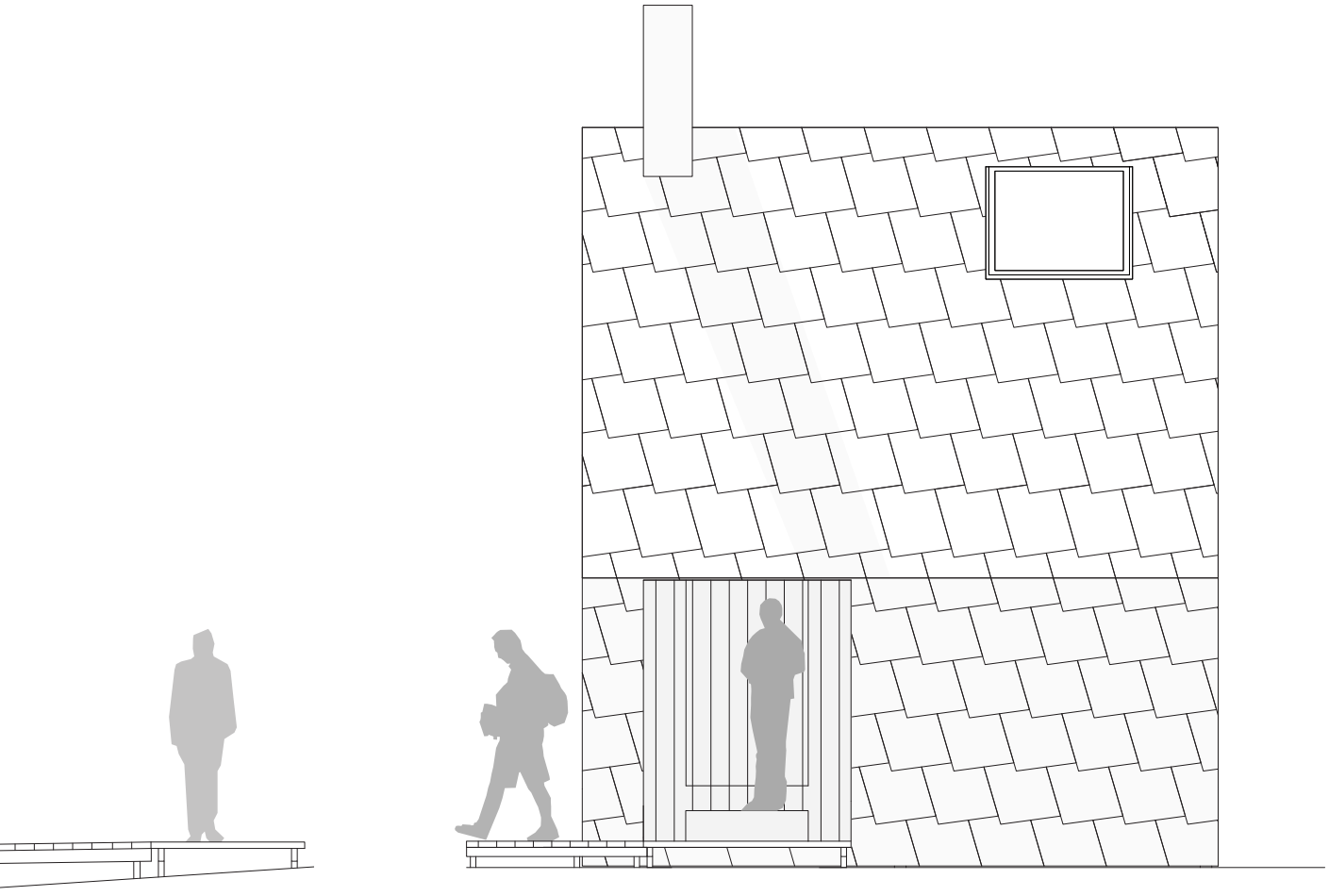
SCALE 1:200

SMALL HUTS



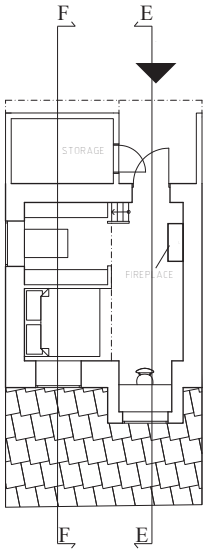
DETAIL SECTION

SMALL HUTS

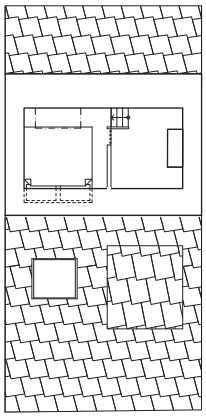


NORTH FACADE

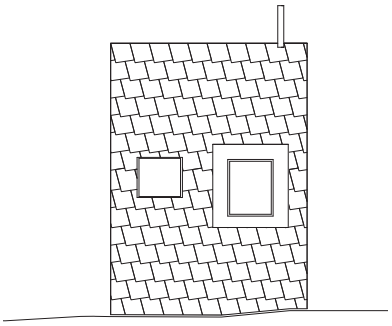
SMALL HUTS



FLOOR PLAN 1



FLOOR PLAN 2

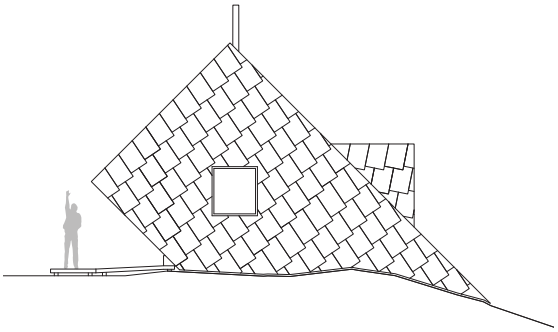


SOUTH FACADE

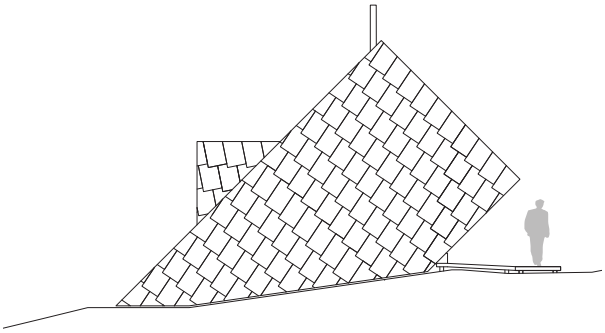
N

SCALE 1:200

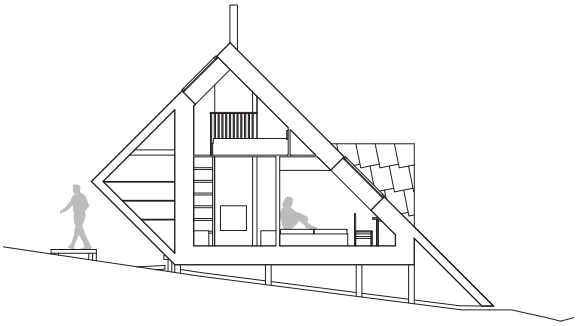
SMALL HUTS



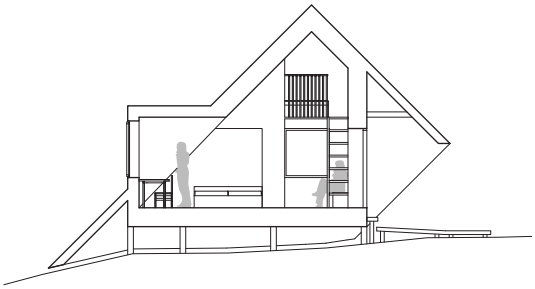
WEST FACADE



EAST FACADE



SECTION E-E



SECTION F-F

SCALE 1:200

Figure 135. New facility from south.
Author's own copyright.

Figure 136. New facility, the terrace.
Author's own copyright.

Figure 137. Interior new facility, the common area 1st floor.
Author's own copyright.

Figure 138. Interior new facility, the common area 2nd floor.
Author's own copyright.

Figure 139. Interior new facility, kitchen area.
Author's own copyright.

Figure 140. Interior new facility, dormitory area.
Author's own copyright.

CONSTRUCTION AXONOMETRY

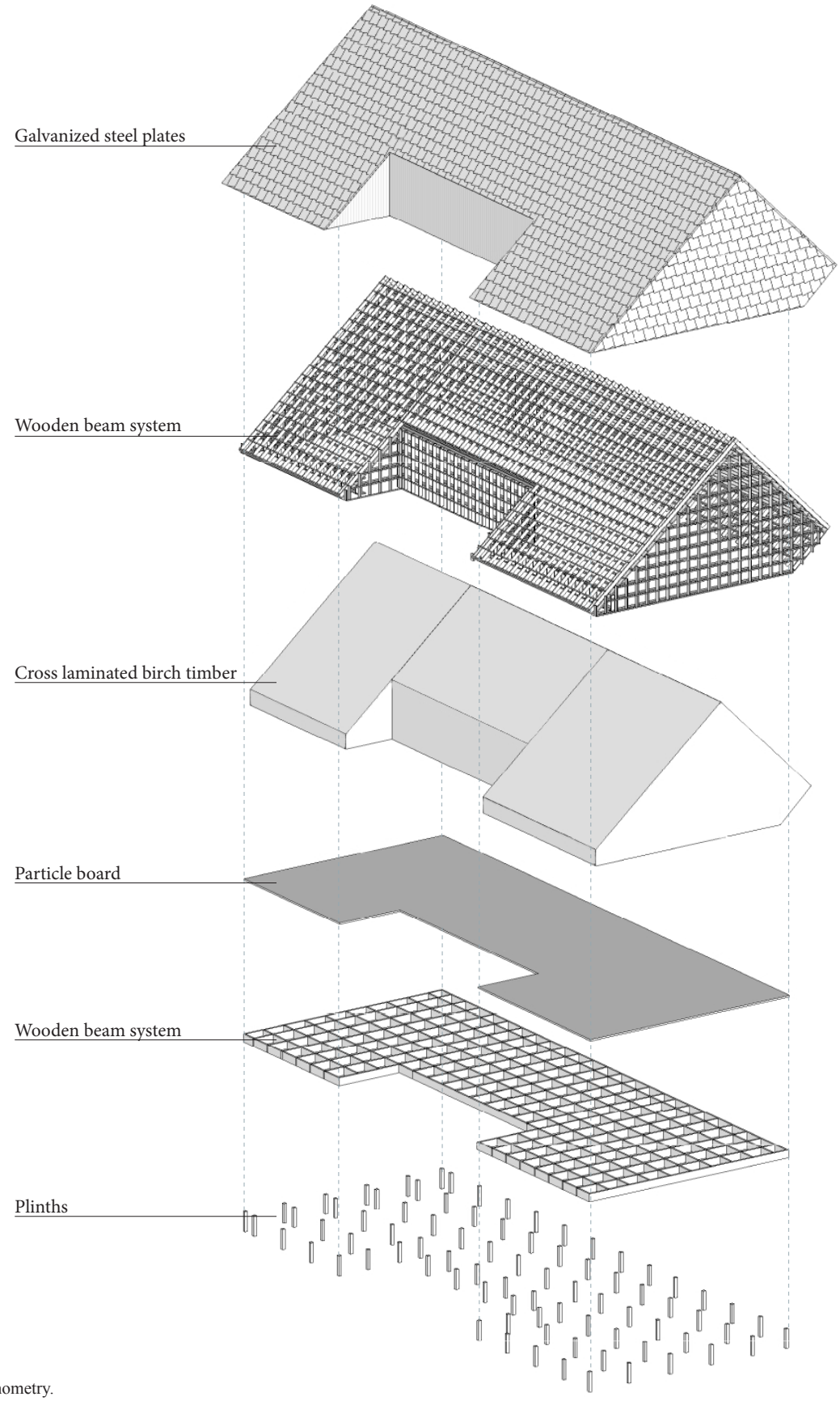


Figure 141. Sketch, construction axonometry.
Author's own copyright.

MATERIAL TRANSPORTATION

A lightweight wood construction enables the buildings to be placed in modules on site. The transportation will be by helicopter, since there are now roads on the mountain, and snow cats cannot take sufficient load. Placing the buildings in modules reduces the construction process on site. This is of importance both to minimize disturbance of the reindeer herding that happens on the site, but also due to the climatic conditions, as the ground is covered by snow half of the year. Additionally, by reusing material from the existing buildings on the site, the amount of material that needs to be transported is reduced.

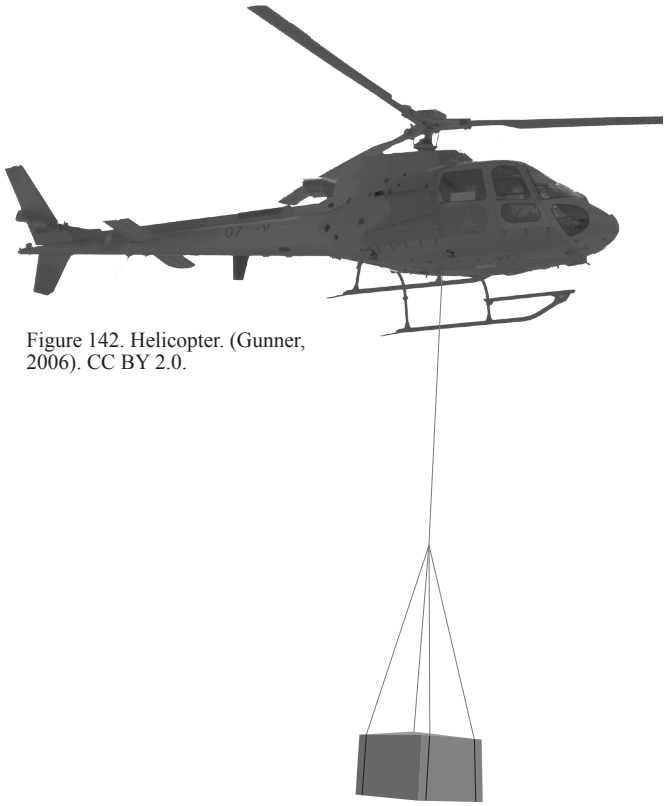
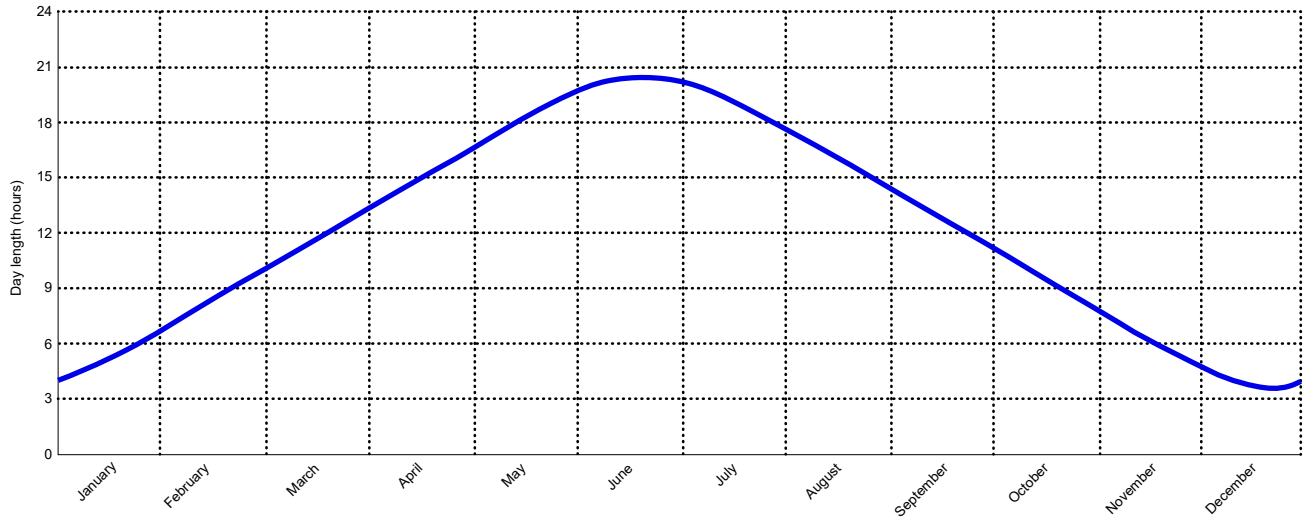


Figure 142. Helicopter. (Gunner, 2006). CC BY 2.0.

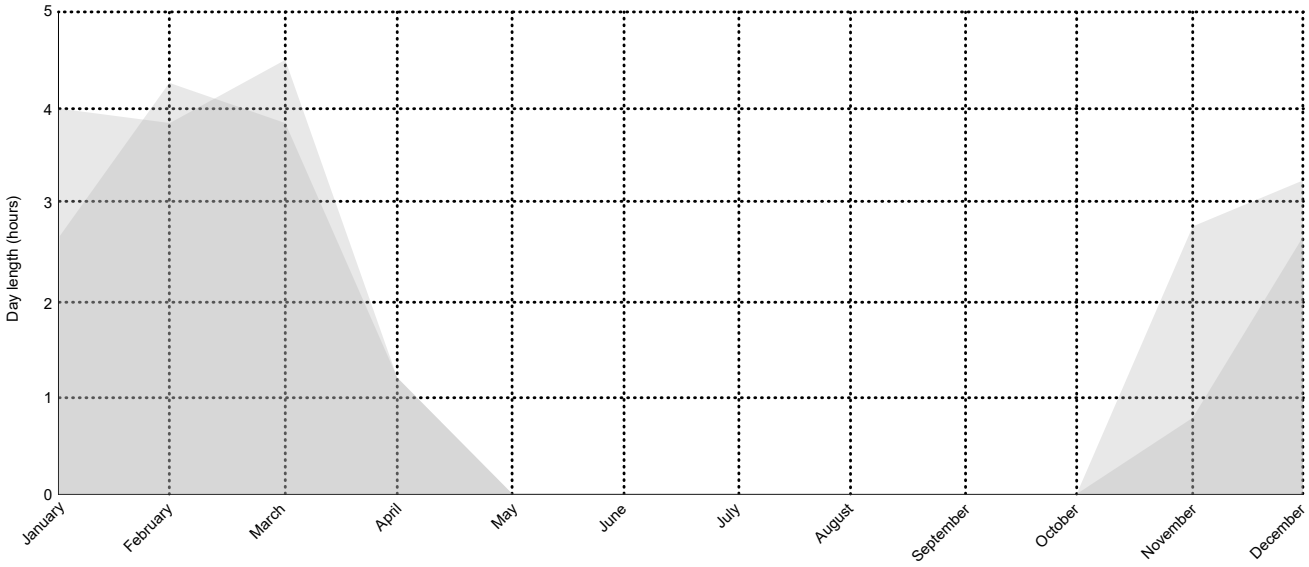
SELF-SUFFICIENCY



DAY LENGTH (Southern part of Norrland)

Due to the short days in the mountains wintertime, self-sufficiency via solar panels only is not an option.

Figure 143. Graph of day lenght according to data from SMHI. Author's own copyright.



SNOW DEPTH (Funäsdalen)

There is probably some deviation in the snow depth data, because there are no data instruments on the exact site, why data has been retrieved from the most representative place nearby, which is Funäsdalen in this case.

Figure 144. Graph of snow depth according to data from SMHI. Author's own copyright.

TECHNIQUE BUILDING

There is not only one solution when it comes to self-sufficiency on the mountain - it requires a combination of solutions and control systems. In this case a ‘battery solar diesel system’ is the best solution, where the diesel system supplements the solar panels when they do not generate enough energy, especially during the short winter days. Batteries store energy so that energy can be used during the hours when the sun does not shine. (Rönning, personal communication, May 2018).

The water in the bedrock is of good quality, and therefore a deep hole with a water pump powered by the solar system is the easiest solution. The water pump takes power for a short period of time, it is for example harder to power a fan - which takes power all the time. (Rönning, personal communication, May 2018).

A machinery building is needed for the energy and water systems, including battery system, diesel system, control system, a sterling motor driven by pellets and a water well. Around 20 sqm is estimated to be necessary for this. (Rönning, personal communication, May 2018).

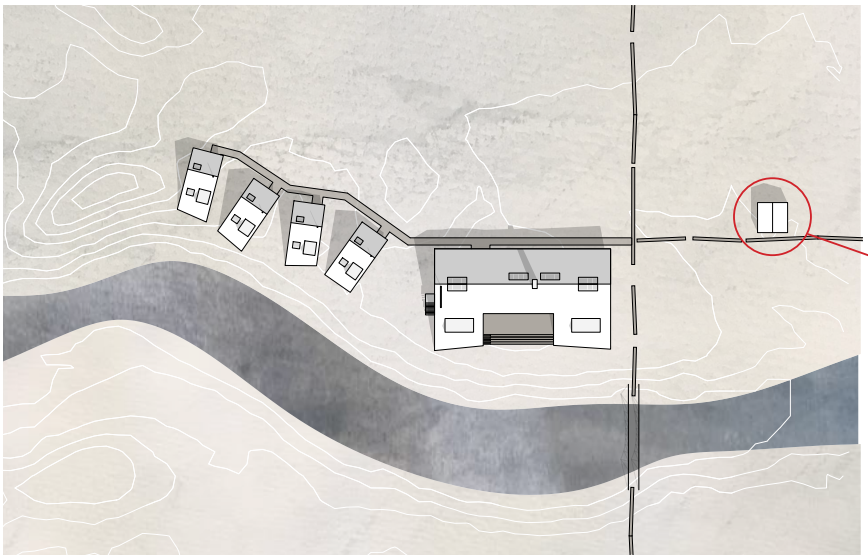


Figure 145. Sketch, technique building on site.
Author’s own copyright.

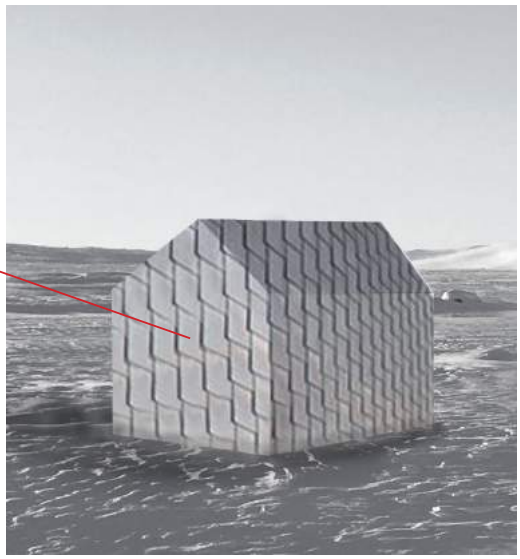


Figure 146. Sketch, technique building.
Author’s own copyright.

SOLAR PANELS

The solar panels can be attached on the sloping south facade of the main building. Because of the steep angle, the snow will fall off, so that they will be exposed to the sun as much as possible over the year.
(Rönning, personal communication, May 2018).

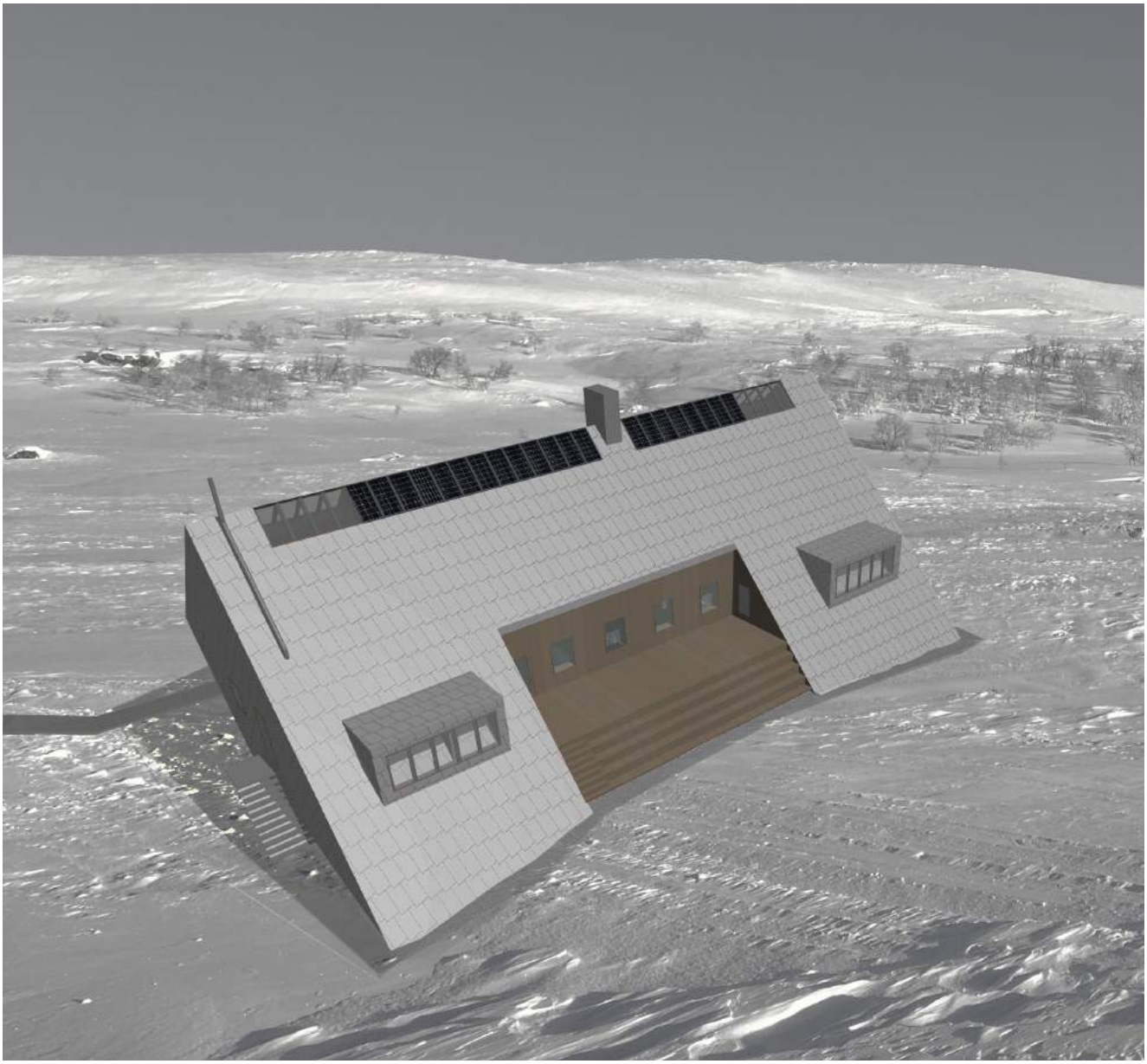


Figure 147. Solar panels on new facility.
Author's own copyright.

VENTILATION

The building is self-ventilated. Cold air enters through window portholes, and when heated travels up through chimnies and kitchen fan. The use of natural materials in the walls also helps create thermal interior comfort.

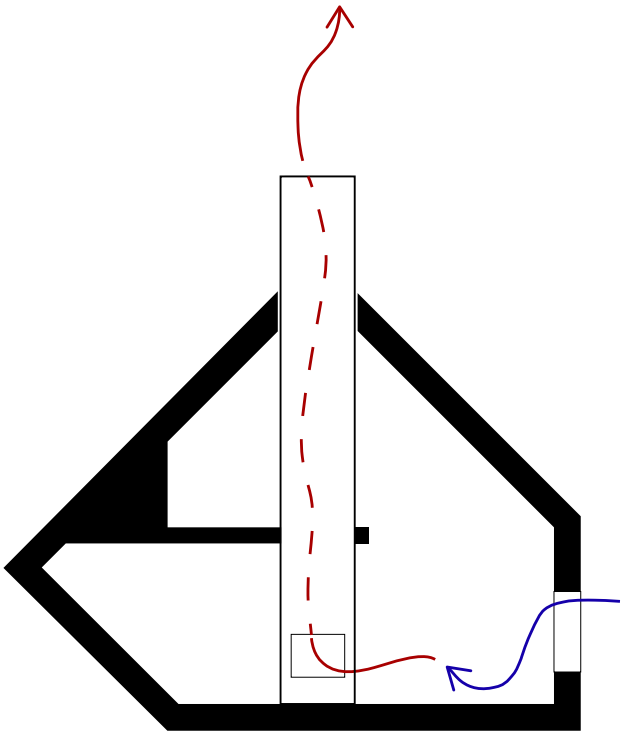


Figure 148. Sketch, self-ventilation. Author's own copyright.

CO-OPERATION SAAMI VILLAGE

SAMI VILLAGE CLOSE TO SITE

Långbrottet is the site for the Saami village Ruhvten Sijtes reindeer calf labeling, which takes place during two weeks in June or July. The building themselves are not an issue during the short period of time the reindeers are calf labelled here, it is human beeings. (Rensberg, Valkiapää, personal communication, February 2018)
In conversation with Edvid Rensberg, chairman of the board for the sami village Ruvhten Sijte and Kerstin Valkeapää, project manager of many sami projects in the area, a suggestion was discussed to make a co-operation with the Saami village during this valuable and sensitive period of time.

If this project was to be realized, only smaller groups would be able to rent parts of the facility during these weeks, and be part of the calf labeling, as a unique experience as well as a way to increase the knowledge about sami culture.

Figure 149. Reindeers. (Robertsson, 2014). Reprinted with permission.

MODEL PHOTOS

Figure 150. Photo of model in scale 1:500.
Author's own copyright.

Figure 151. Photo of model in scale 1:500.
Author's own copyright.

Figure 152. Photo of model in scale 1:500.
Author's own copyright.

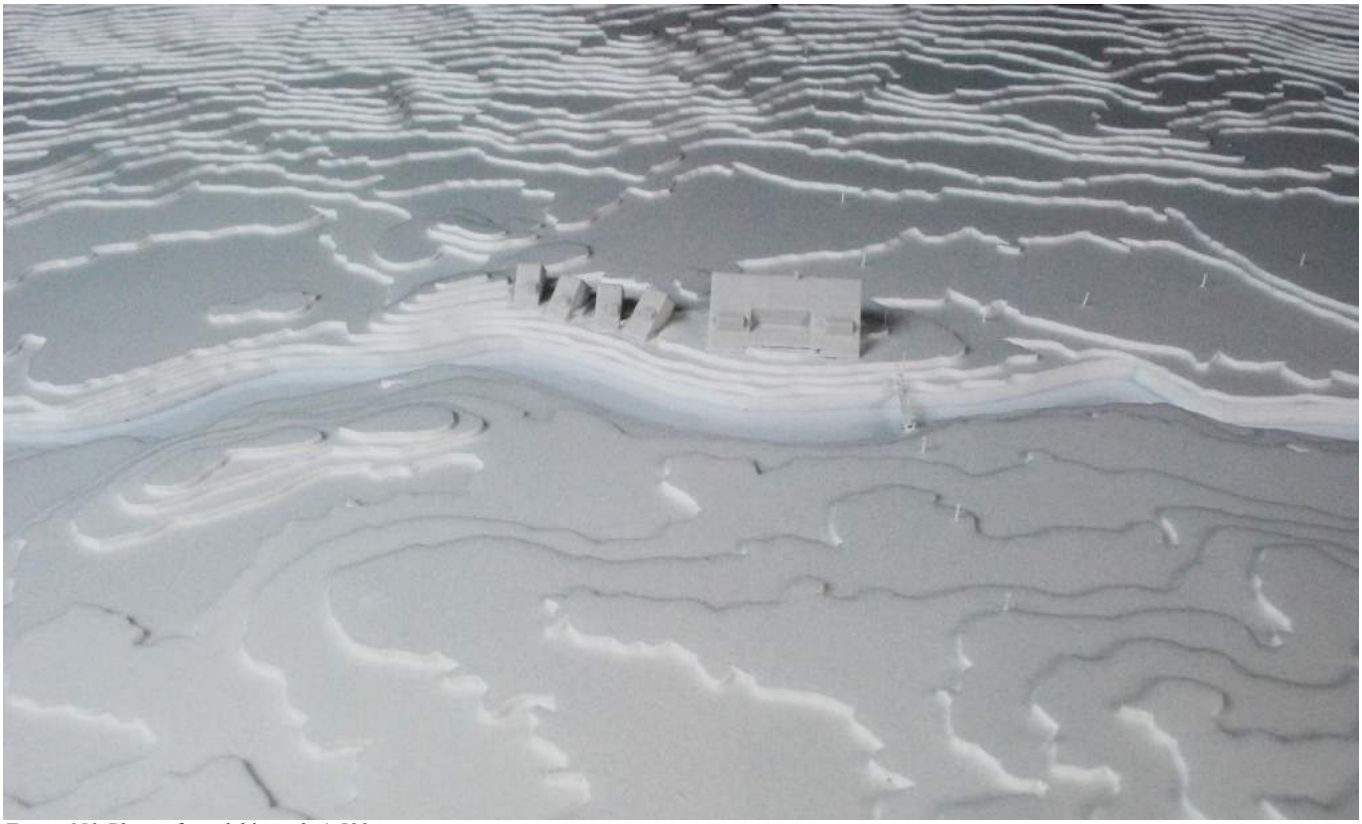


Figure 153. Photo of model in scale 1:500.
Author's own copyright.

Figure 154. Photo of model in scale 1:200.
Author's own copyright.

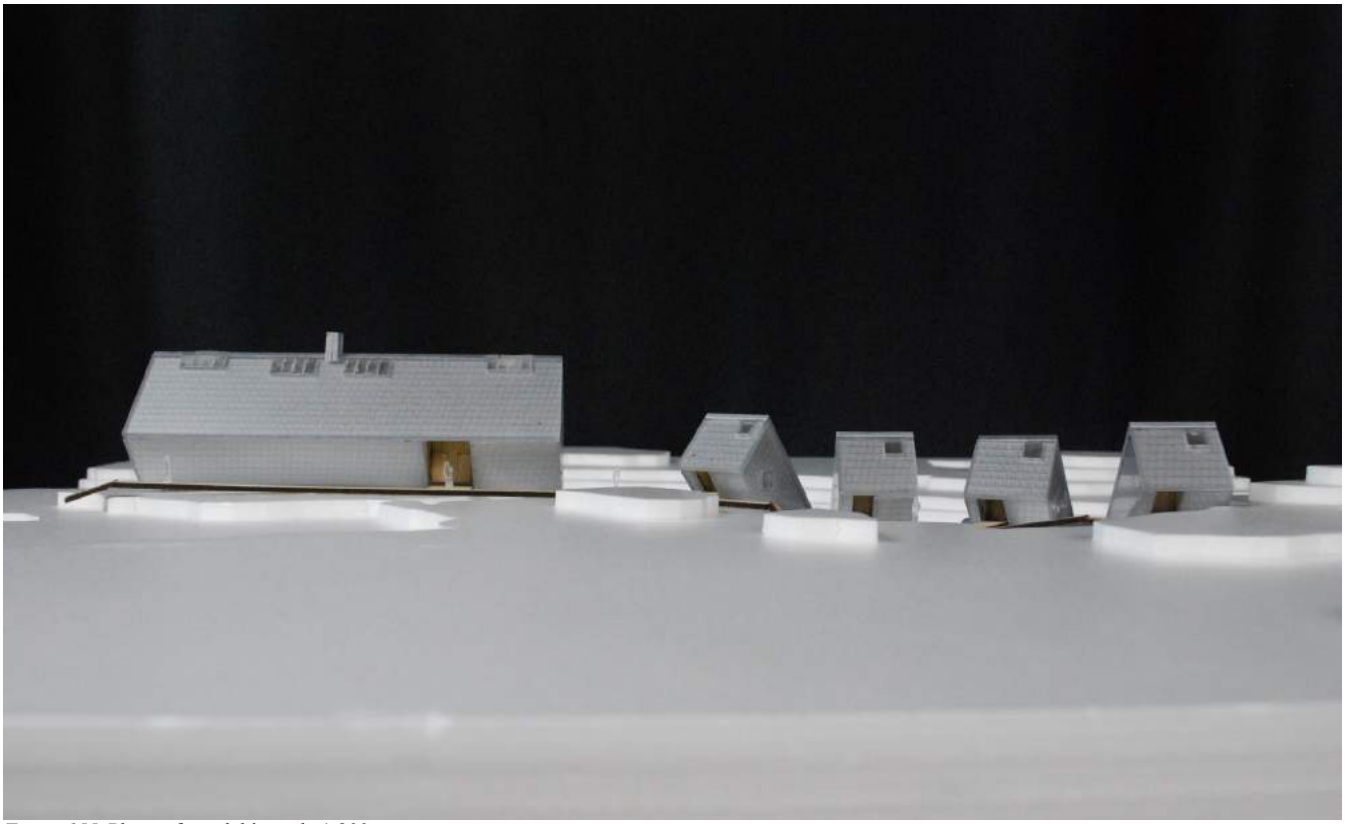


Figure 155. Photo of model in scale 1:200.
Author's own copyright.

Figure 156. Photo of model in scale 1:200.
Author's own copyright.

Figure 157. Photo of model in scale 1:200.
Author's own copyright.

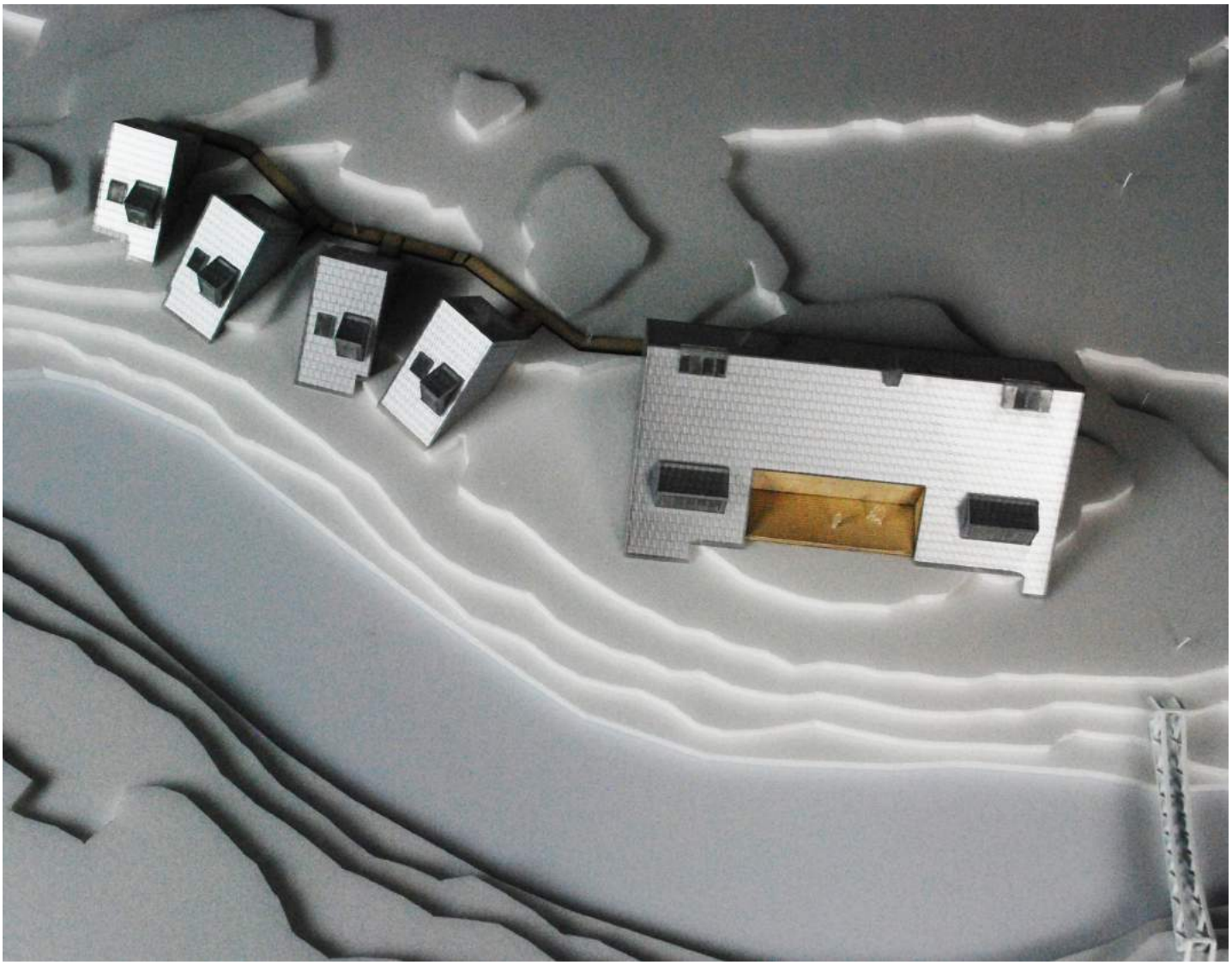


Figure 158. Photo of model in scale 1:200.
Author's own copyright.

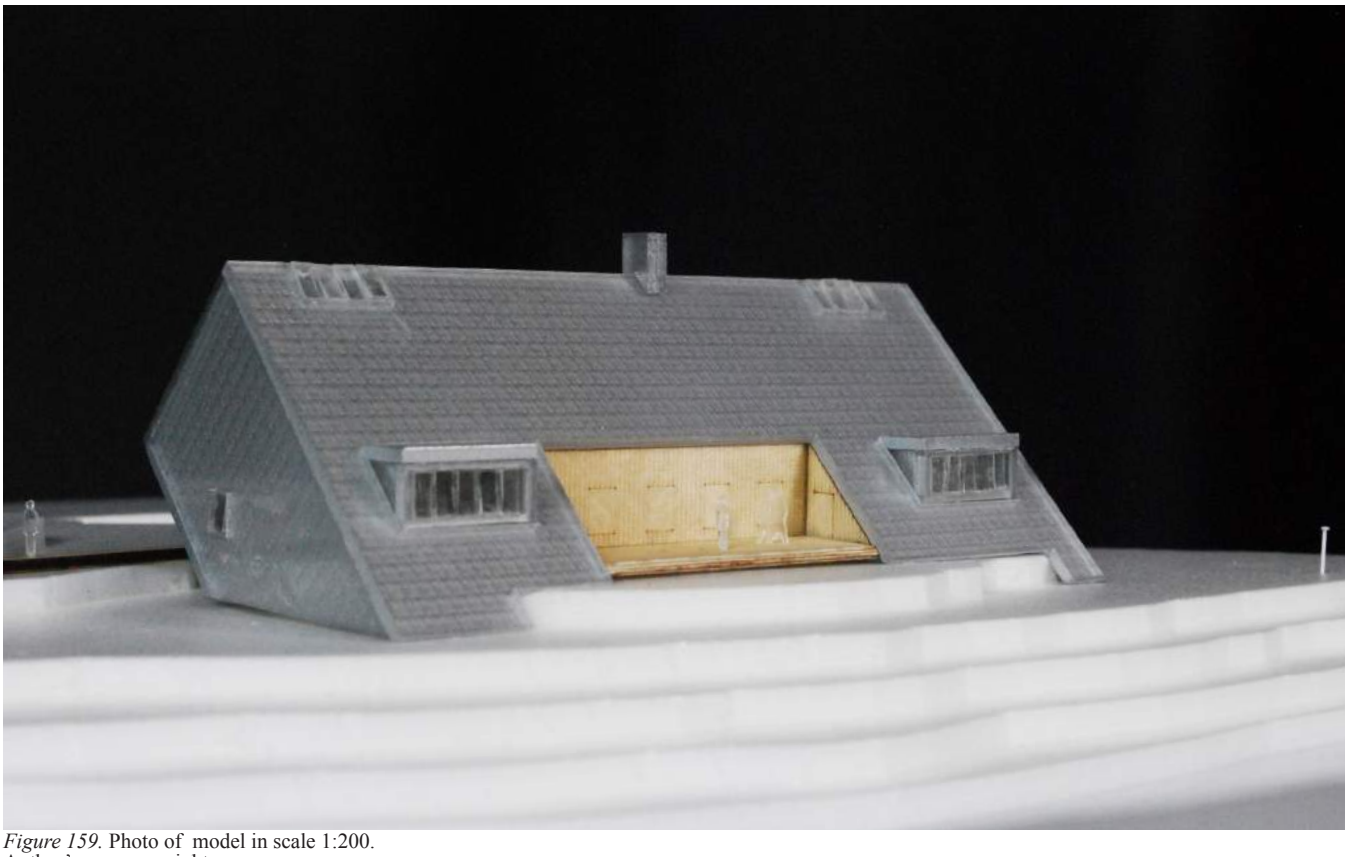


Figure 159. Photo of model in scale 1:200.
Author's own copyright.

Figure 160. Photo of model in scale 1:200.
Author's own copyright.

Figure 161. Photo of model in scale 1:50.
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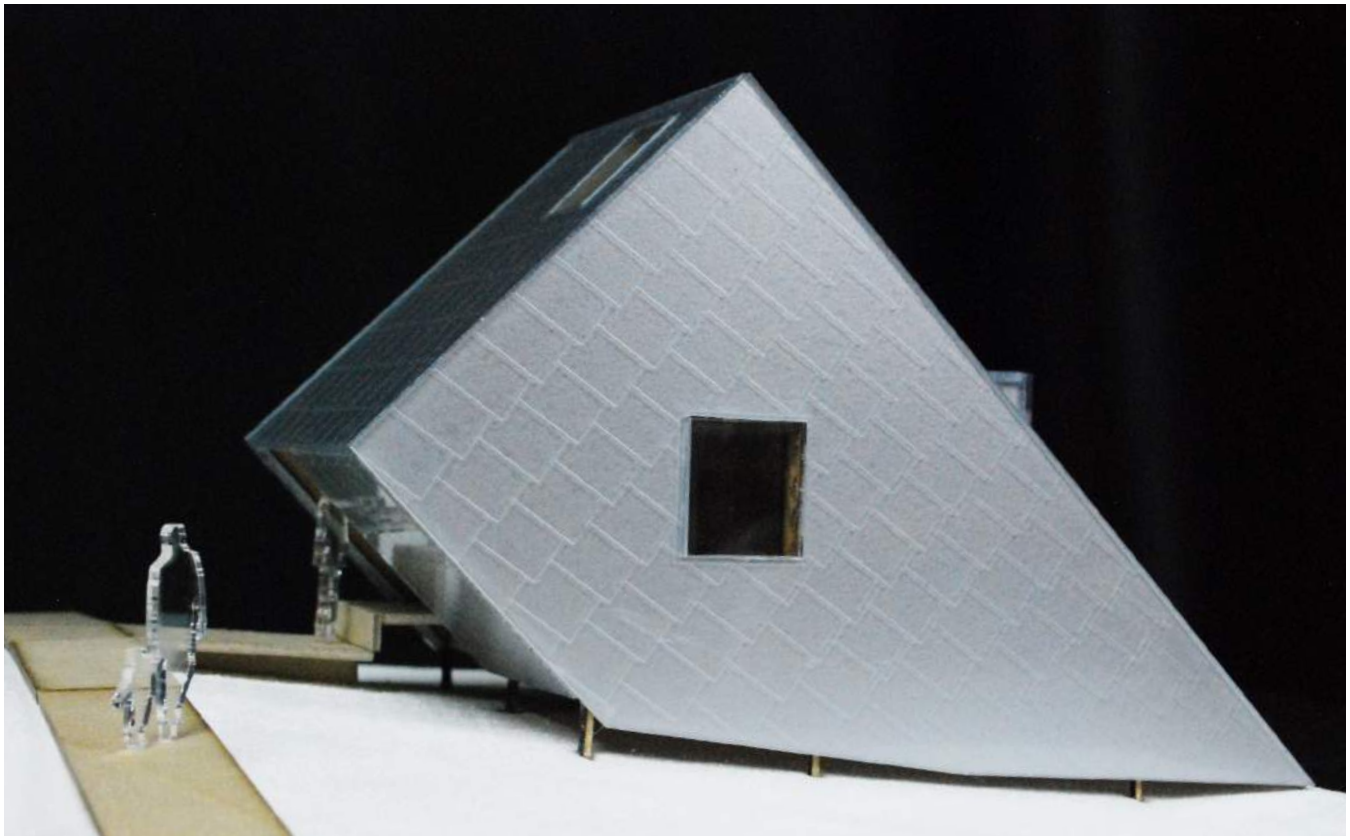

Figure 162. Photo of model in scale 1:50.
Author's own copyright.

Figure 163. Photo of model in scale 1:50.
Author's own copyright.

Figure 164. Photo of model in scale 1:50.
Author's own copyright.

Figure 165. Photo of model in scale 1:50.
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DISCUSSION

Figure 166. Ramundberget. (Robertsson, 2012). Reprinted with permission.

DISCUSSION

This thesis has resulted in a design proposal for tourist accommodation up on the bare mountain, with an interpretation of cultural values in the area of Funäsdalen in the northern part of Sweden. On the bare mountains of Funäsfjällen there is a high presence of history of the Saami culture why it has been taken into bigger account than the mountains farmer's culture, which is more present in the valleys below the tree line.

When learning about the situation in Funäsfjällen, where the Saami culture is ignored in the building and planning sector (and especially in the design program of Härjedalen), it became important to address this in the thesis. Cultural values and spatial qualities have therefore been evaluated and interpreted in this design proposal, in order to bring attention to the situation. This resulted in a design which appreciates values and qualities from the Saami culture, as well as introducing a more contemporary design to show that there are alternative ways on how to build and design suitable constructions up on these harsh, exposed and vulnerable environments.

The design proposal has brought up many interesting discussions regarding how architects can, and should, approach history, culture and nature in contemporary architecture. There is no clear answer to this question and the subject is very subjective. However, as the aim was to bring the subject to discussion through a design that highlights the Saami culture, as well as a more contemporary way of building, the desired result was accomplished.

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Figure 167. Landscape on the mountains of Funäsfjällen. (Robertsson, 2012). Reprinted with permission.

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UP CLOSE

SUB-ARCTIC TOURISM ACCOMMODATION

Chalmers School of Architecture
Department of Architecture and Civil Engineering
Direction within Building and its Tectonics
Agnes Danneholm, MPDSD
Anna Skoghagen, MPARC
Examiner: Björn Gross
Tutor: Mikael Ekegren

Figure 168. Landscape of the site. Author's own copyright.