

A Village House

Designed by the Inspiration of the Season's Cycle

Master thesis spring 2016
Klara Resare

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by Klara Resare



The Section of Architecture
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Professor:
Morten Lund

Tutors:
Jonas Carlsson
Kengo Skorick

abstract

A village house is a community center inspired from commuting and the rural landscape in Sweden's northern inland. With the intention of making the villagers feel at home in a commun building by shaping it from their everyday life.

Inspiration from vernacular architecture combined with new technologies, in a small community.

table of content



Looking over the valley of Indalsälven from Vättaberget.

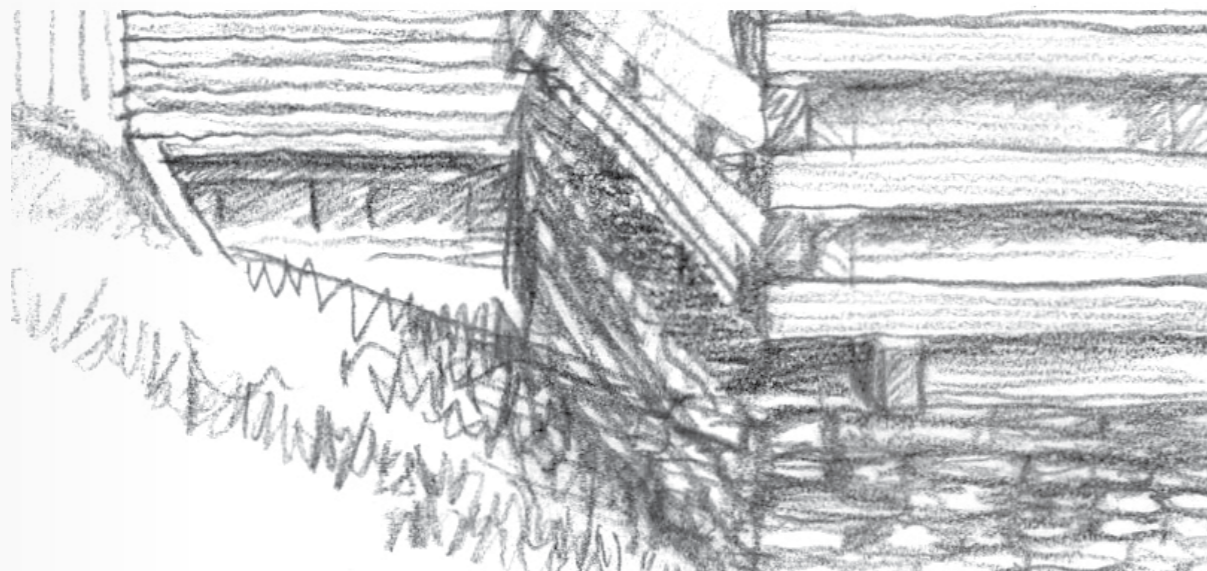
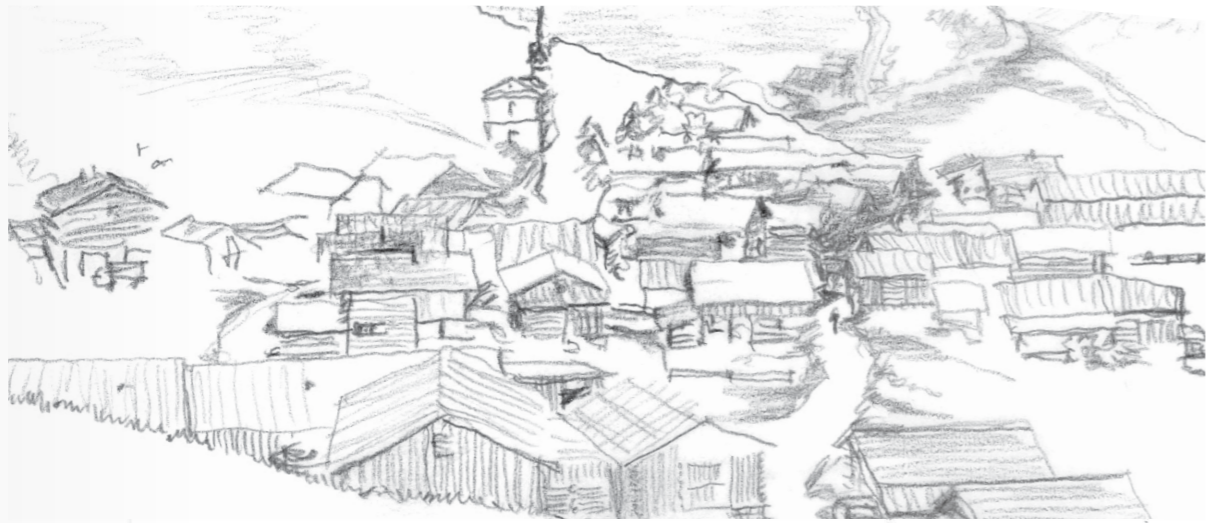
1.	preface	6
1.1	introduction	7
1.2	background	9
2.	program and site	10
2.1	interviews	11
2.2	creating a program	13
2.3	position in the village	19
3.	shaping a building	20
3.1	theory	21
3.2	simulations	21
3.3	physical tests	28
4.	materialisation	36
4.1	history	37
4.2	new technology	38
5.	representation	40
5.1	the assembly	41
6.	bibliography	62
6.1	Literature	62
6.2	Web sources	63

1.0 - preface

1.1 Introduction

My idea is to work with an architecture serving as a public building, with the inspiration from “the must to commute” to live in the area. A place where you will pass through back and forward to work, a place where you could choose to take a class, or just stay a bit to discuss.

My inspiration for this project came after living a couple of years in Switzerland. I was fascinated of how architecture developed in Switzerland’s small villages. Many well published, well worked through, material generous buildings, most of all I was triggered by the fact that the architecture often was made with local handcraft. They rebuilt a cottage from the trees standing on the place. Used old building techniques that people in the village mastered in a new body shape, or a classic body that people didn’t question with new techniques. Mixed with a vernacular spirit and new technology. And I started to play with the thought on how a project like that could be realized in my home village Liden. How would an architecture that’s inspired and shaped by Sweden’s north inland look like?



Examples of existing architecture in Liden from different eras of economic industrial support



Examples of existing architecture in Liden from different eras of economic industrial support

1.2 Background

There is a complexity of a new construction in Liden as village, partly in the acceptance of the village people for something new, but also of economical support from the municipality and government. To get acceptance, ensure a long-term use and find a possibility to finance a project on this place. The project need to give something more than one function as a larger argument to what it could be. By constructing with a spirit to strengthen the identity of the village, not only within the program of the building but also by the actual materialization, could this building integrate in another manner with the population. It would also be easier to motivate a project that will strengthen the village for the municipality.

By integrate known materials or working methods that symbolize the village could this become a building that tells a story from the village.



2.0 - program and site

2.1 Interviews

I decided to go and spend a week in the village Liden, making some interviews to get a clearer idea of what they found local and special about this place. I did 6 proper interviews and talked along the road with handful of people passing. The people I interviewed have all been in active in different organizations or engaged in the development of the village. My main questions where:

Who are you and where do you come from?

When and why did you move to Liden?

What do you feel is symbolic for this village?

Do you have a story or action that you think ?
reflects Liden?

Describe Liden with one to three words

It was really interesting to hear the different stories from people and I got surprised that it was so many that came from the outside.

For example, one couple arrived to the village through work opportunities in the 70s, originally were they from Umea. Others like the owners of the gas station from south of Sweden arrived 2010 and another couple from Goteborg, that bought and renovated an old farm house. Though it is clear that the most common reason for people to be living in the village is through their family roots.

The conclusions were that everybody mentioned the great value to live close to nature. Where they expressed it as a freedom and liberty, an ability to just walk straight out in the free and at the same time feel a close to others, you are never left alone. This was also the main reason why they couldn't see a reason to live elsewhere.

When I then asked the people if they had a special place in the nature, they all mentioned the valley and the view over the river. But almost everybody had their own special place, on different peaks close. A place where they took their children, a place they took a picnic with a friend or partner, or a place to just sit with your own philosophies.

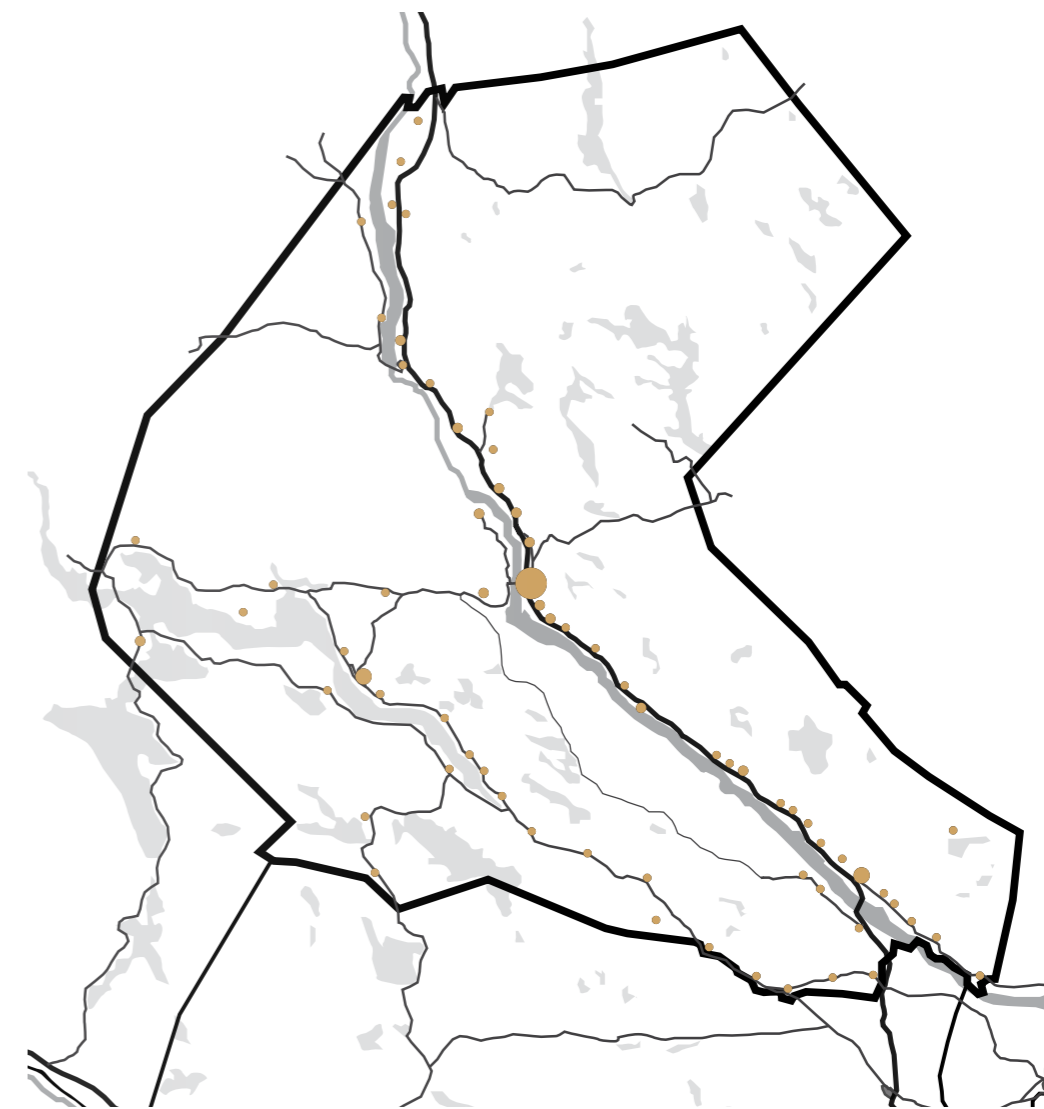
Photos from interviews and interviewed villagers



Map of Liden's activities

2.2 Creating a program

Liden is a small village with the population of ca. 260 inhabitants, but it is also a region center in the municipality of Sundsvall, serving for ca 1500 inhabitants in surrounding villages. Facilities as school in the ages 4-15, elderly care, health center, physiotherapist, library bus once a month, are provided from the municipality. Private and cooperative establishments as, bank, grocery market, gas station with reparation service, offices for different forest owners, hairdresser, small handcraft shops.



Map of the villages surrounding Liden. Liden being an important centerpoint



Tourist information of Liden



Popular meeting spots today.

Type of spaces

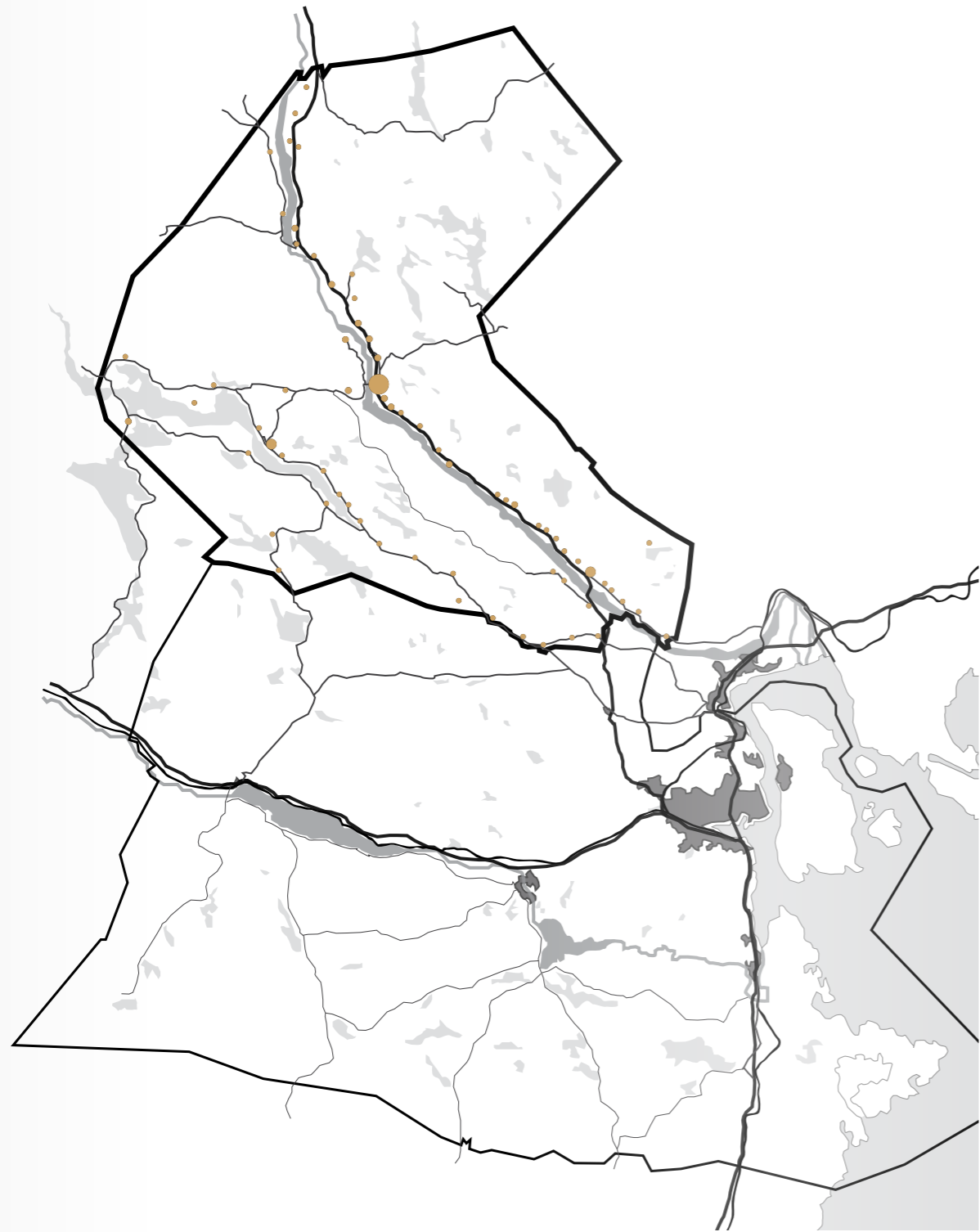
As explained earlier the village serves for multiple villages as a region center with school and health care etc. What has been partly missing and been a wish from the villagers has been a main social building, for possibility to meet up with bigger and smaller gatherings. Also, a place where information for visitors as well as for the villagers could be put up clearly.

To offer a meeting area for smaller organizations, and open up for meetings less organized, as hanging out after school, or continuing a discussion after work before going home.

Looking at the statistics and the population over Liden. It is clear that most working people have a need to commute to get to their work. Therefore it is an importance that the space offers an easy way to park and stop by on the way back and forward to their work.

	Quantity	
Population in the village Liden :	252	
Population in the region Liden :	2947	
Which the village service for.		Percentage of the region population
Working (16 years old-) :	1450	49%
School and preschool (0-15 years old-)	218	7%
		Percentage of the working population
Working (16 years old-) :	1450	
Working in the area :	700	48%
Commuting to the area:	208	14%
Commuting from the area:	958	66%

source: <http://www.sundsvall.se/Kommun-och-politik/Kommunfakta/Befolkning/Omrpdesfakta/>



Municipal map of Sundsvall with region divisions

Size reference

To get an idea of how many square meters a community gathering building could have. I looked into some different newly constructed community centers and their size depending on the amount of people they served to.

Finding it quite broad and saw a rather a connection through activity then square meter per resident.

Concluding that my space should be able to fit an amount of 200 for a full village gathering. But mainly have in thought That the space should be flexible and possible to divide for multiple meetings and smaller gatherings at the same time.



Diagram | main village road

2.3 position in the village

Looking at the village and how people are passing through, there is one main village road, that you will enter on when entering the village independent if you'll arrive from North or South. Real soon the decision was to put the building connecting it to this road. Secondly was to try to find a position where most people also pass through in their everyday activities. Comping up with the chosen site.

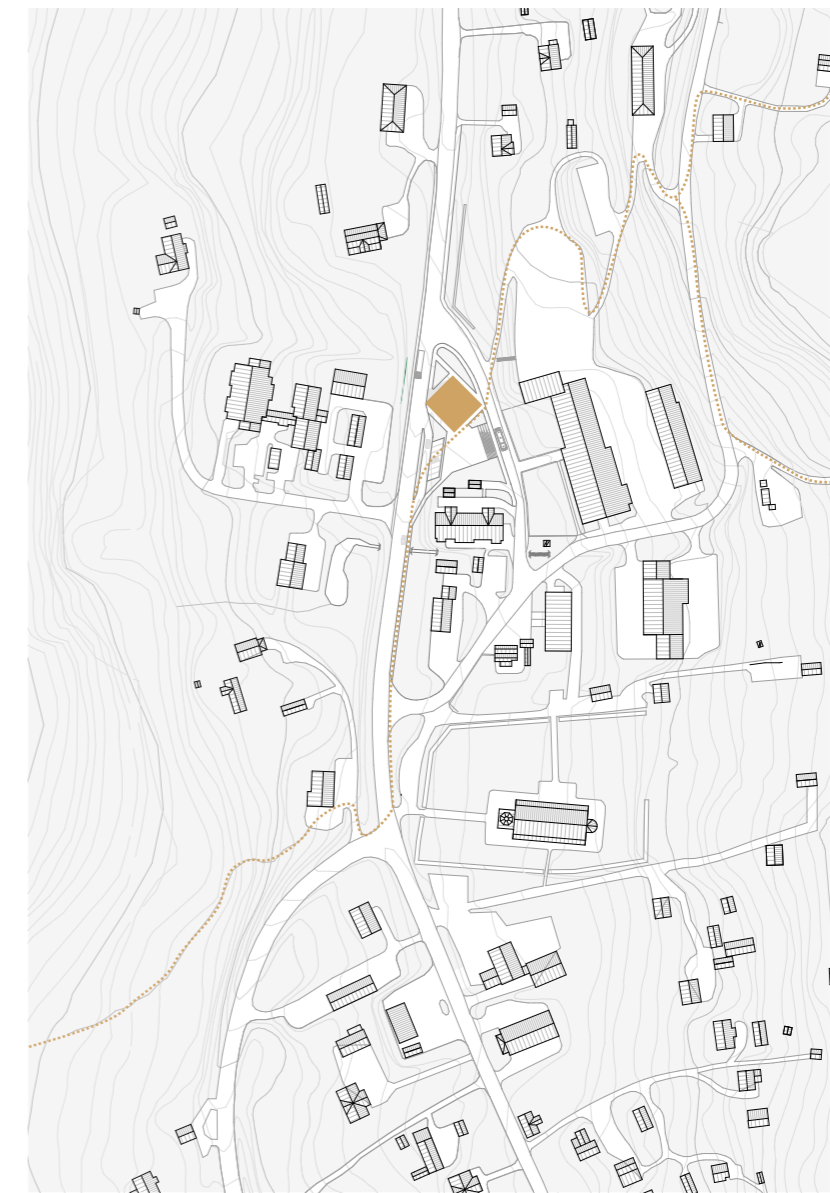
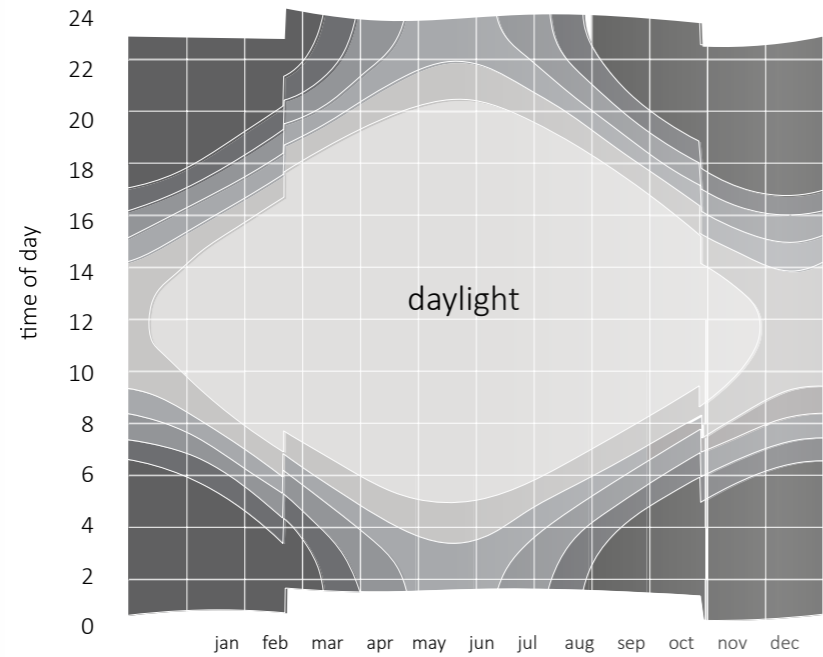
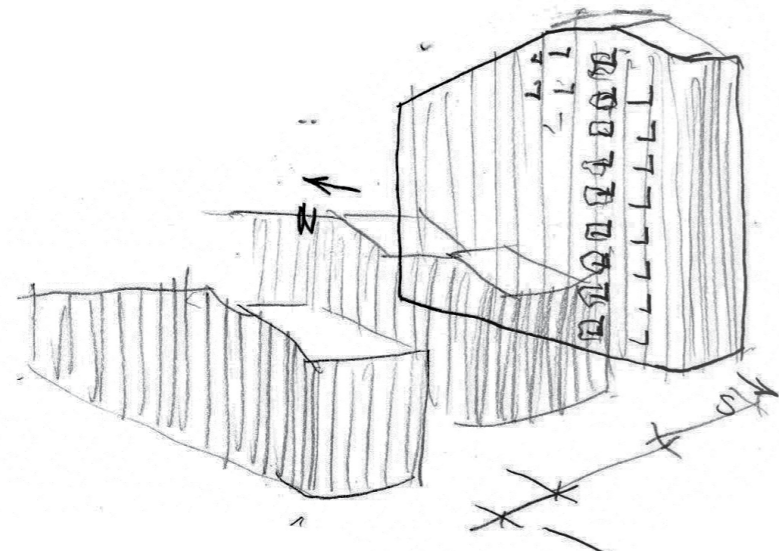


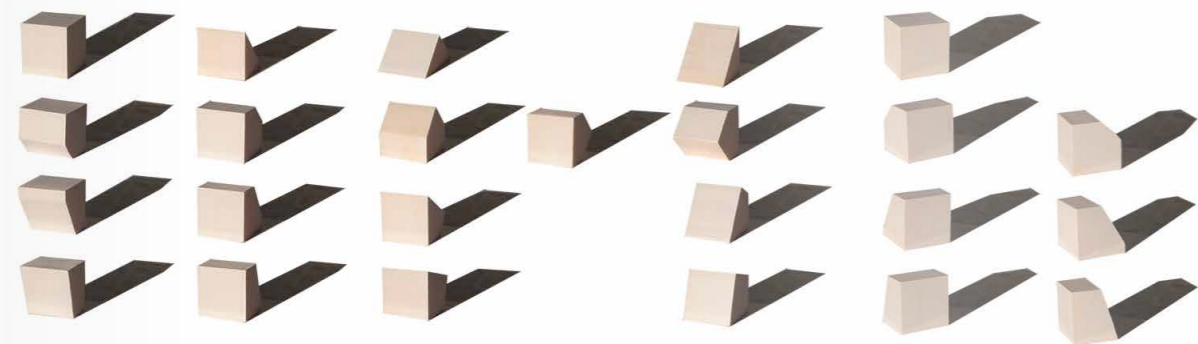
Diagram | hike and snowmobiles routes



sunlight chart



Sketch over Ralph Erskins project Ortdrivaren in Kiruna Sweden



Assemble of a first model study from Erskines theory trying to make out a shadow difference

3.0 - Shaping a building

3.1 theory

The building strategy for this project comes from two main points:

1. The program and the wishes to integrate the use of the program all year round.
2. Second, a sense of the village and its history in a new public building.

To be able to make the building accessible the parameters of the climate has to be analyzed and taken into account. Looking closer the graphs of how sunlight, precipitation, humidity, wind, temperature, passes through the site in the village. Making it possible to see what are the impacts to take into account.

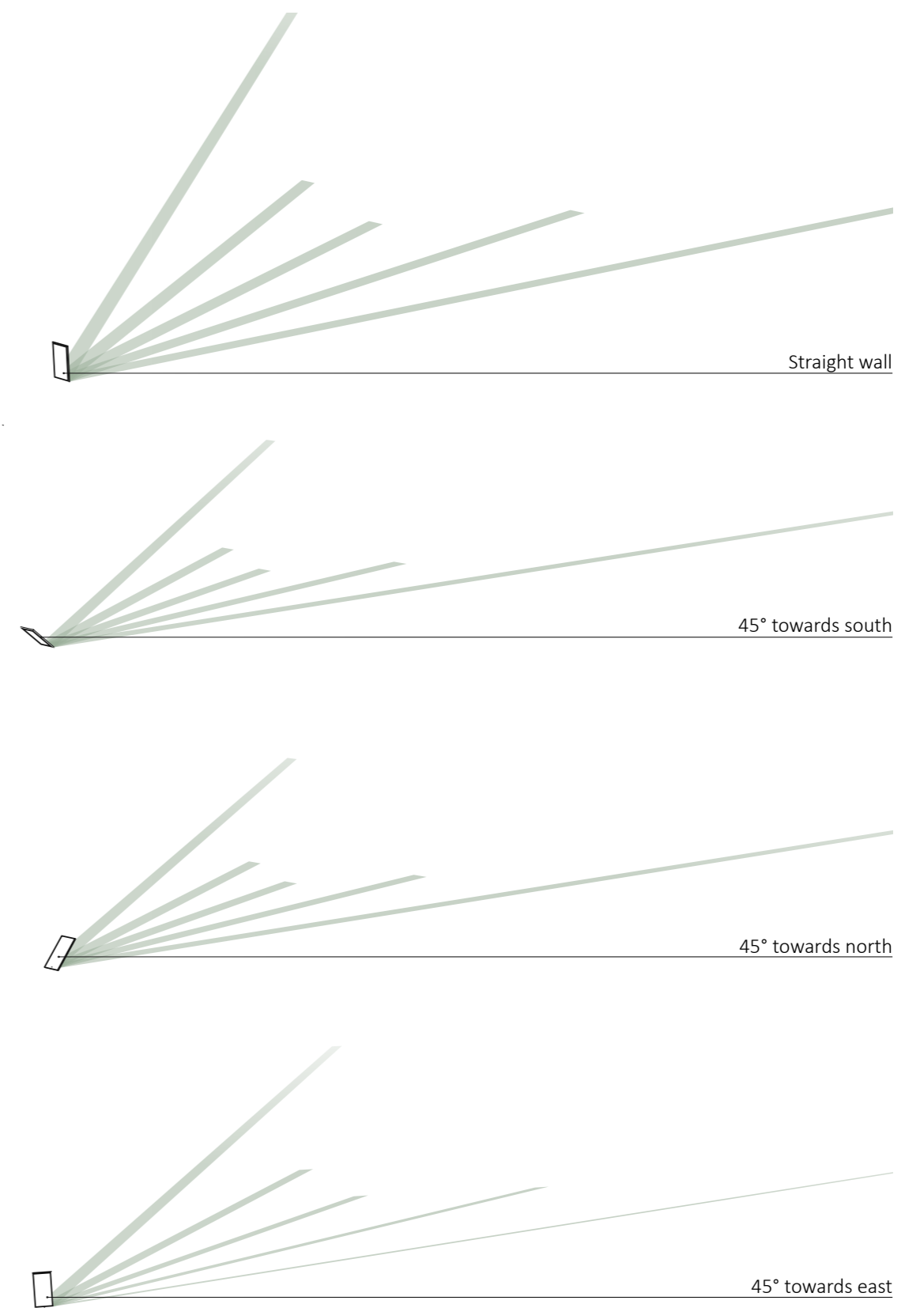
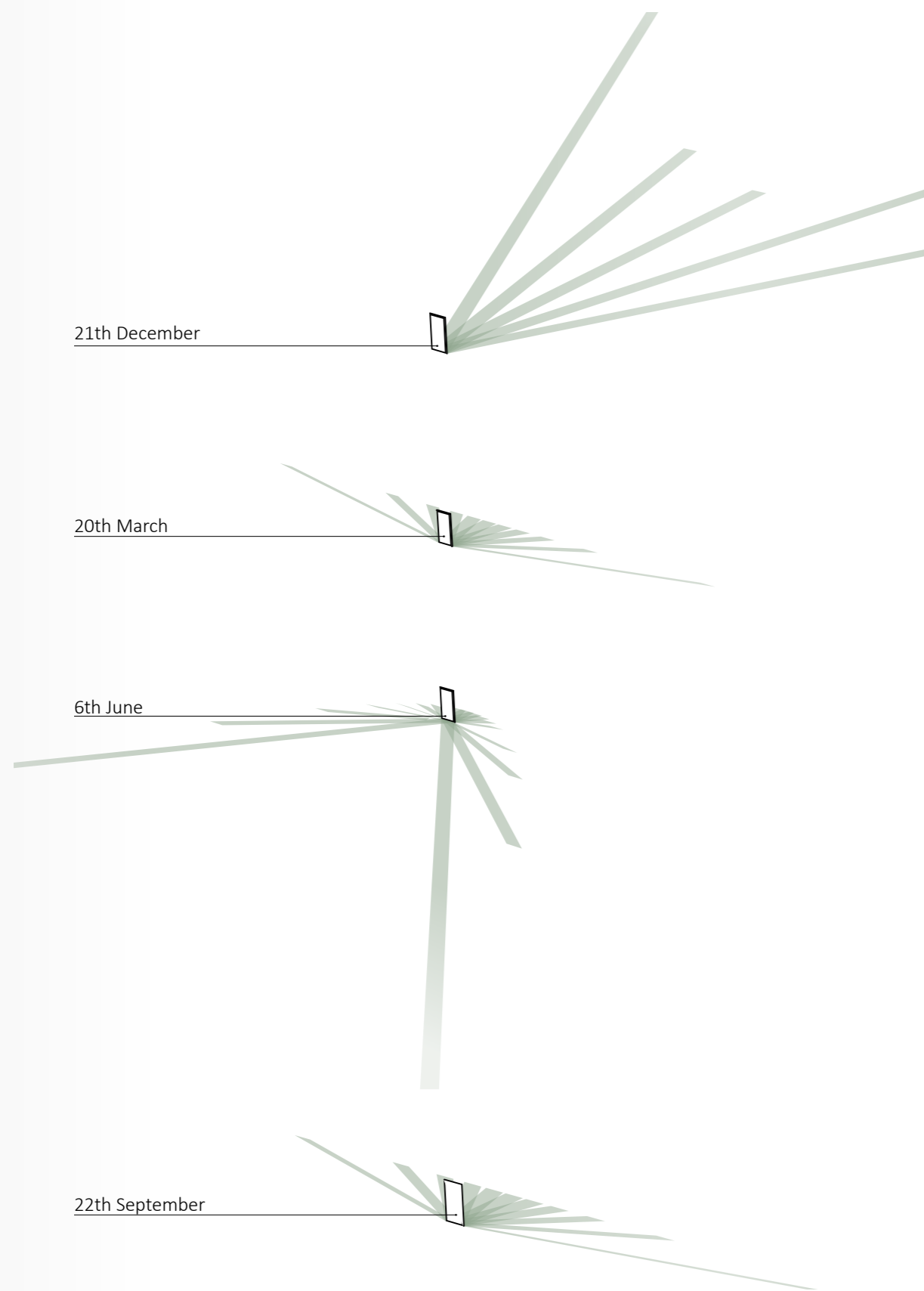
During winter time shadows are long in the village, creating even more non-untouched places. These tests are to get an understanding for how the shadows move during the seasons and how they could be shorter, less squaramide's, when constructing a new building.

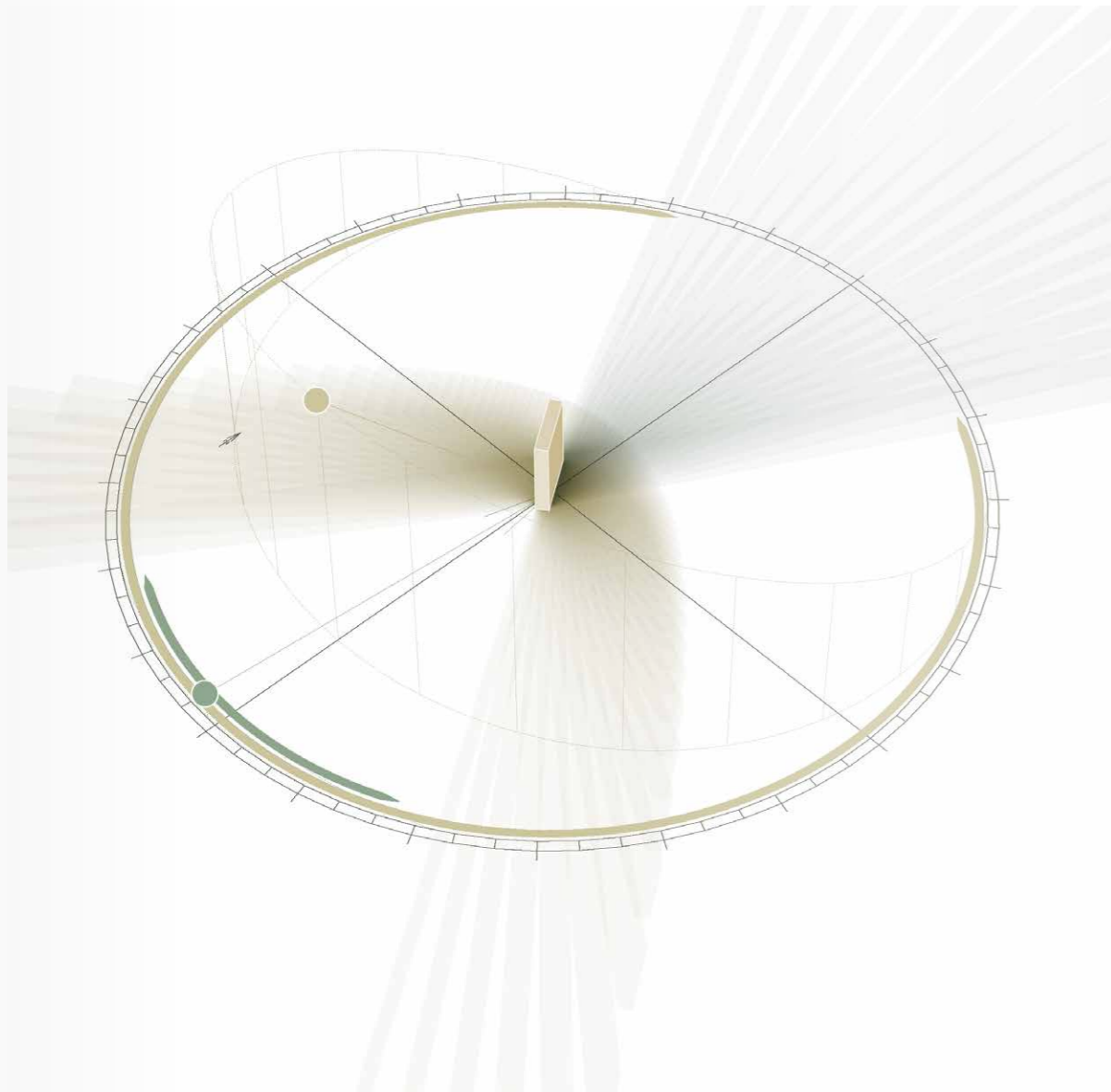
Further on looking in to other architects working with the climate I took into account Erskins theories of shaping building in harsh nordic climate.

Sketch over Ralph Erskines housing project in Kiruna, Ortdrivaren Where he worked with inclination of roofs to manage shorter shadows during to minimize the shadowed areas from the

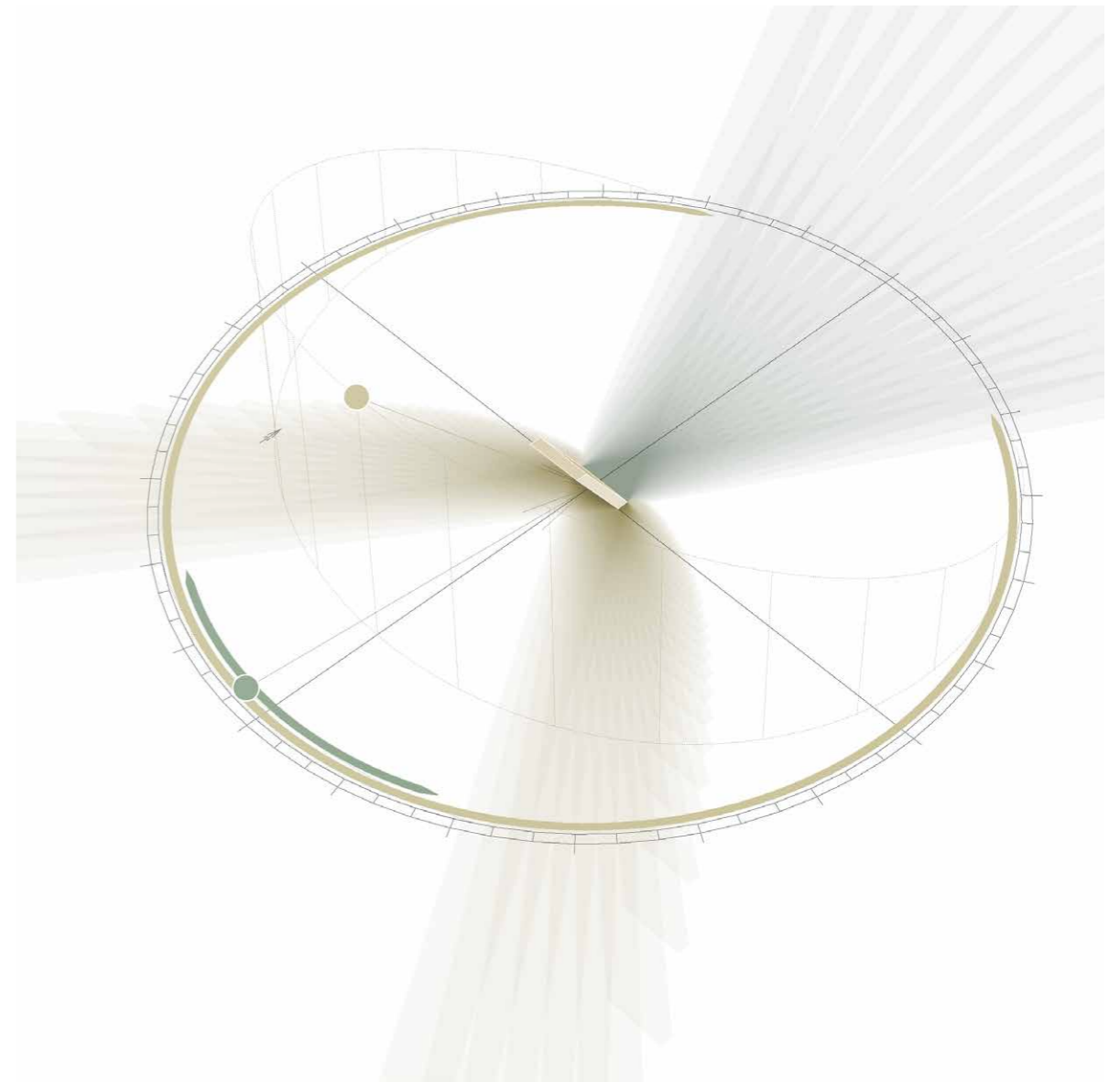
3.2 simulations

I wanted to tests these theories with the coordinates of my site in Liden. With help of software's taking in sun positions and looking at sun movements I could easily see the changes of shadows and scale of sun radiation at a shape chosen.



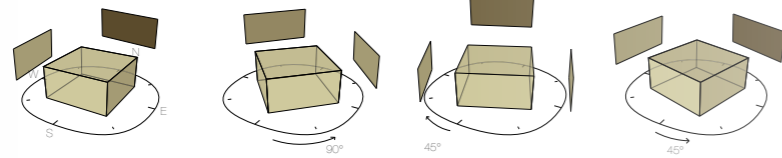


Shadow map | south-east wall

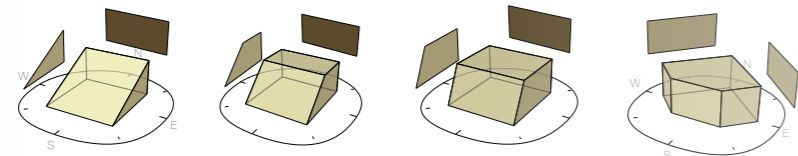


Shadow map | southward inclined wall

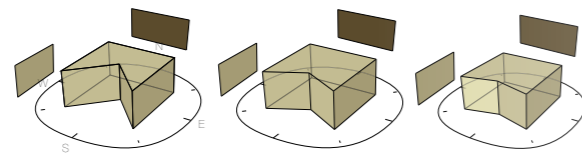
Tool outcome: The orientation and the angle of a wall have an important impact on the shadow within and surrounding a building. Inclining a wall towards the sun reduces the importance of the shadow it casts.



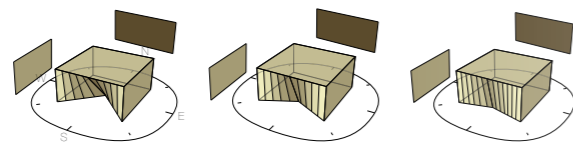
The first row is simple just looking at the difference through the orientation



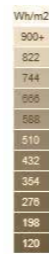
The second the differs from having the south wall inclined against the sky.



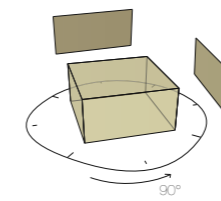
The third, the reflections between two walls in the south position



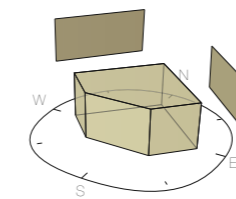
The fourth is a variation by the third, keeping the roofline against the sky straight



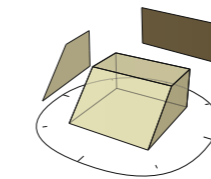
Tool outcome



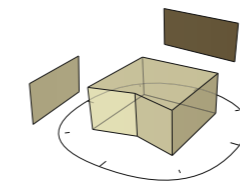
By orienting the volume with facades against Southwest, Southeast, Northeast, Northwest, will all the facades get sunradiation yearly.



By rounding or cutting the edge against South will more surface get heated.



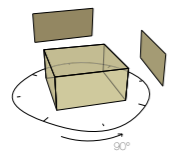
By leaning the wall against the sky in south will the heat get even better.



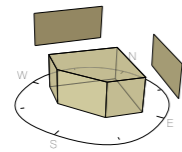
By turning the walls of south slightly against each other will even more heat appear against one of the walls.

3.3 physical tests

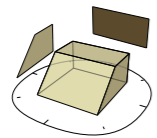
Taking note of my findings in present tests and simulations I continued in physical model to discover how the building would interact with the site adapting my previous tool outcome



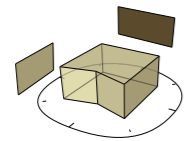
By orienting the volume with facades against Southwest, Southeast, Northeast, Northwest, will all the facades get sunradiation yearly.



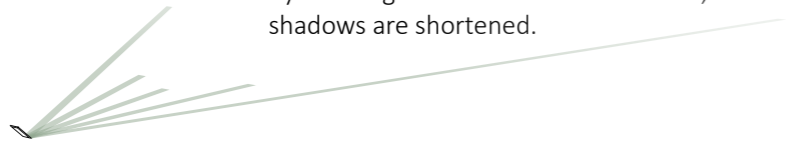
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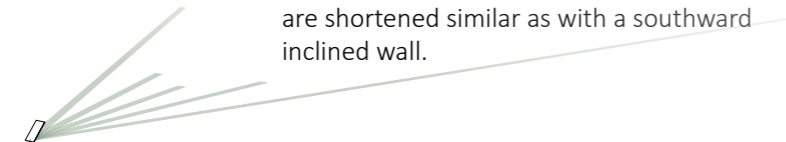
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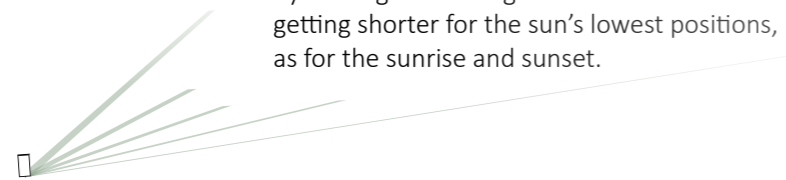
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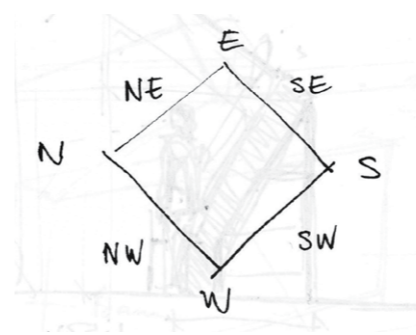
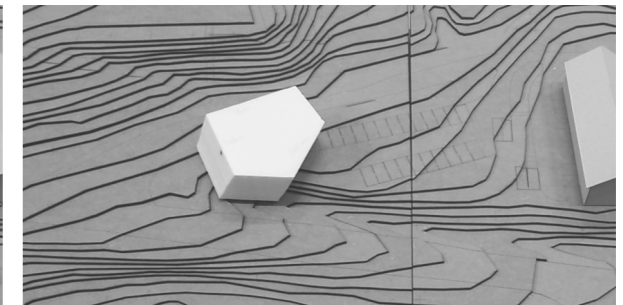
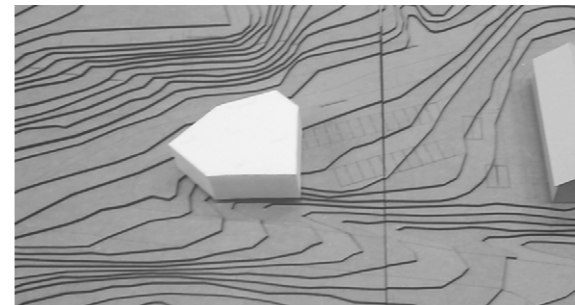
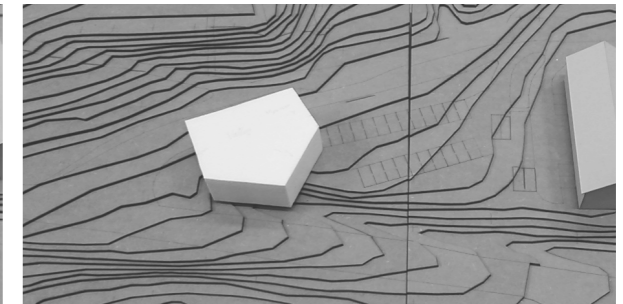
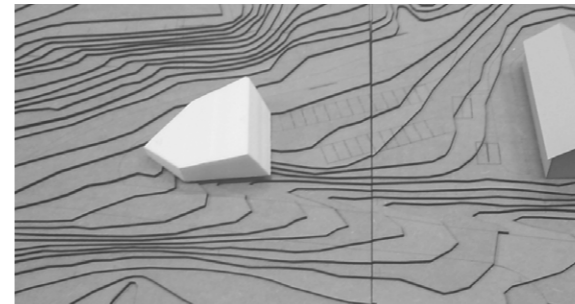
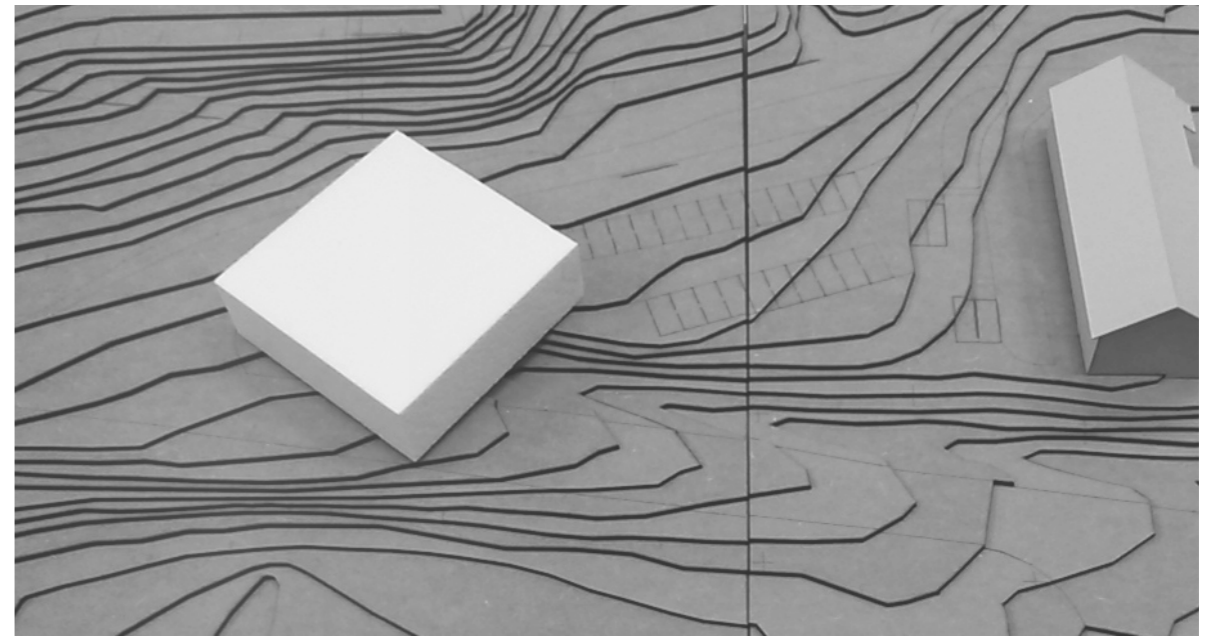
By inclining the wall towards the south, the shadows are shortened.

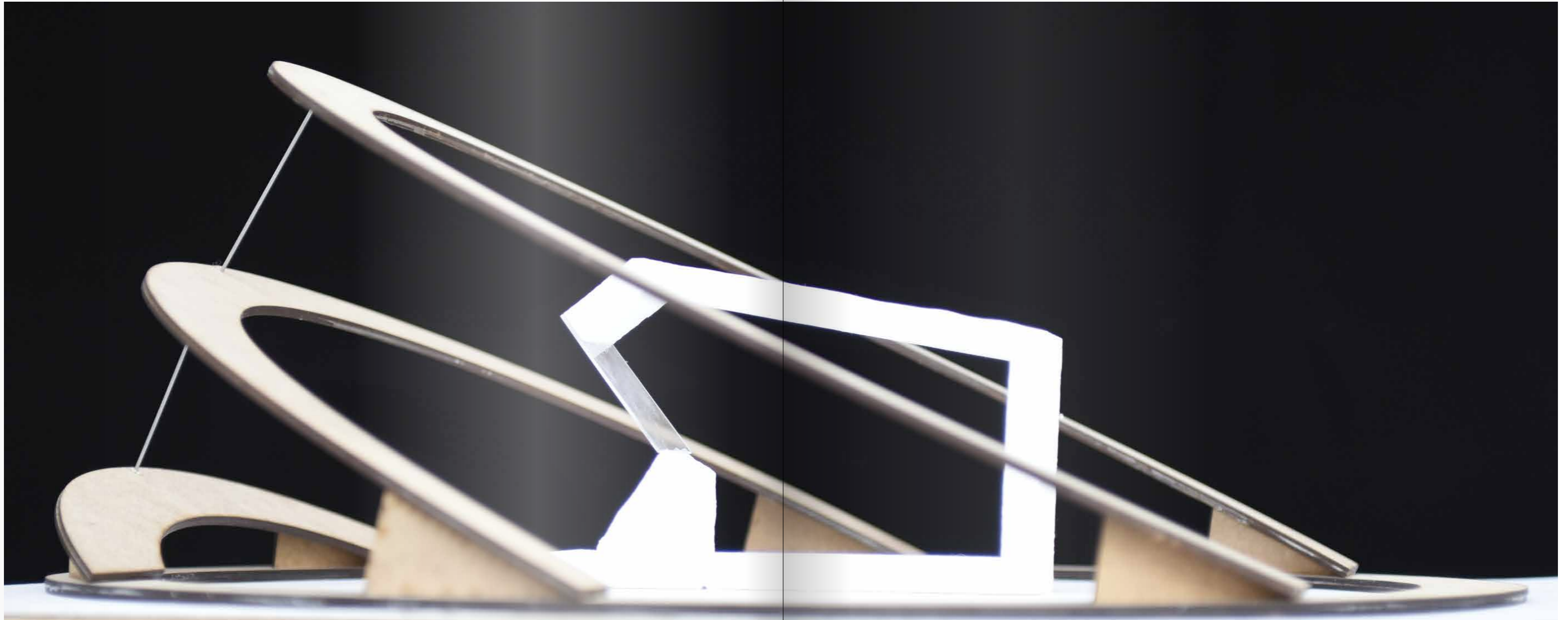


By inclining the wall northward the shadows are shortened similar as with a southward inclined wall.

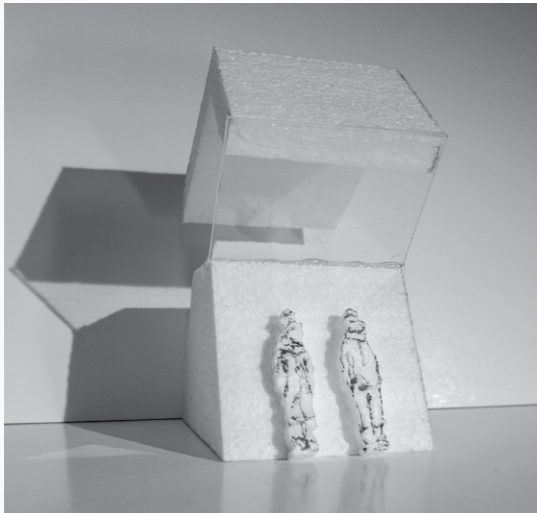


By turning the wall against East the shadows are getting shorter for the sun's lowest positions, as for the sunrise and sunset.

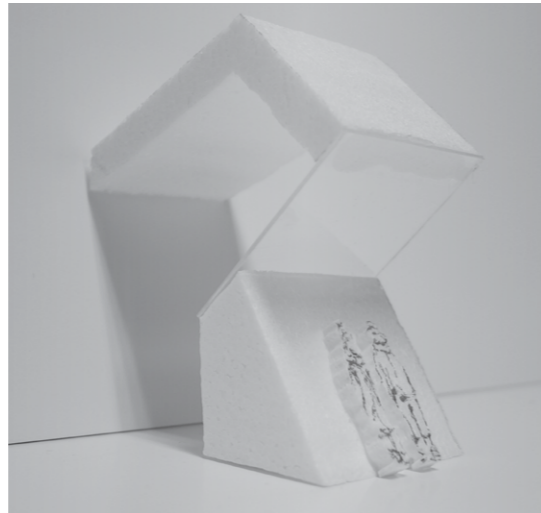




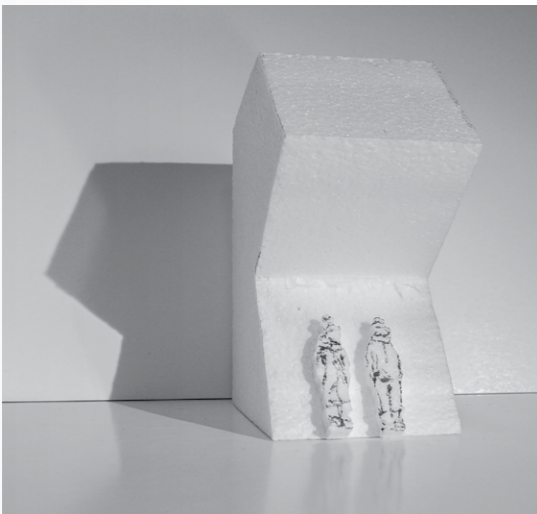
Model of the sunmovement yearly in Liden-used as guide when countinuing exploring each facade of the building and the light impact



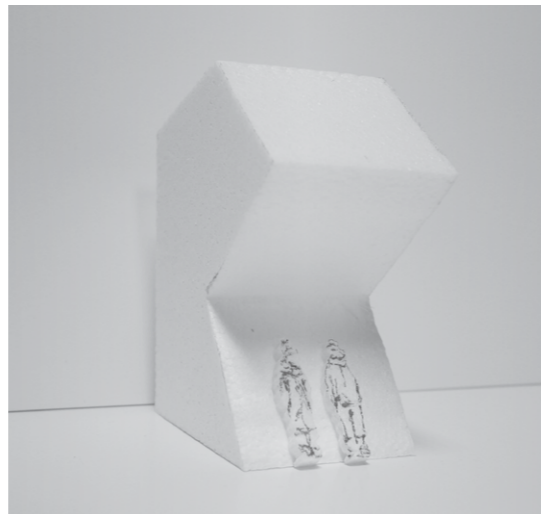
Var 1 | The southwest wall at 12 22 of december



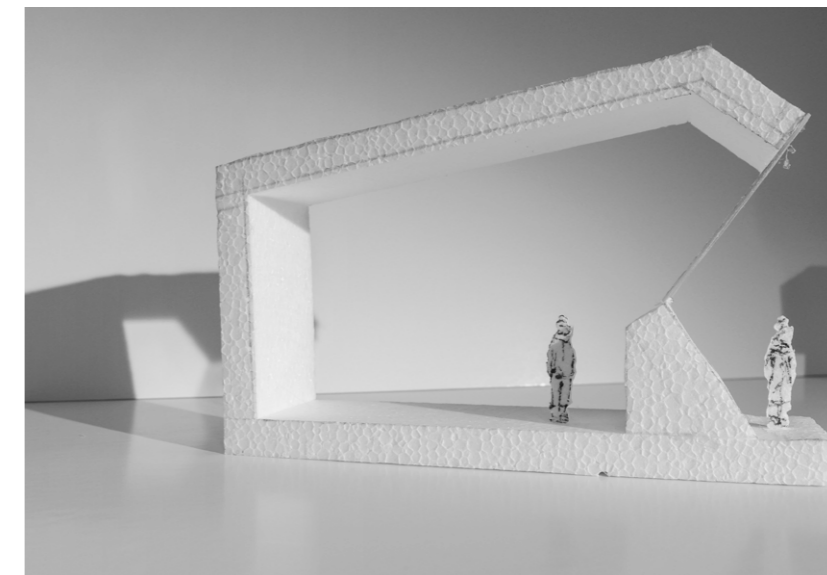
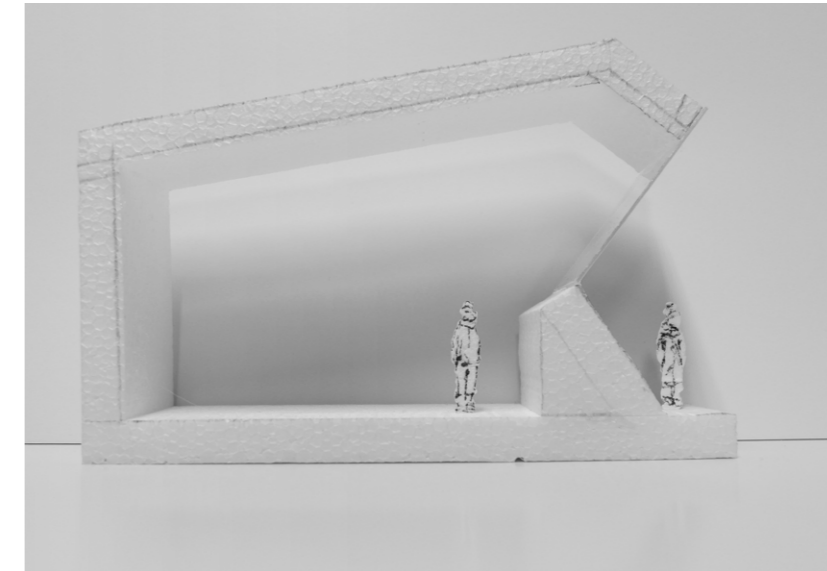
Var 1 | The southwest wall at 12 6th of june



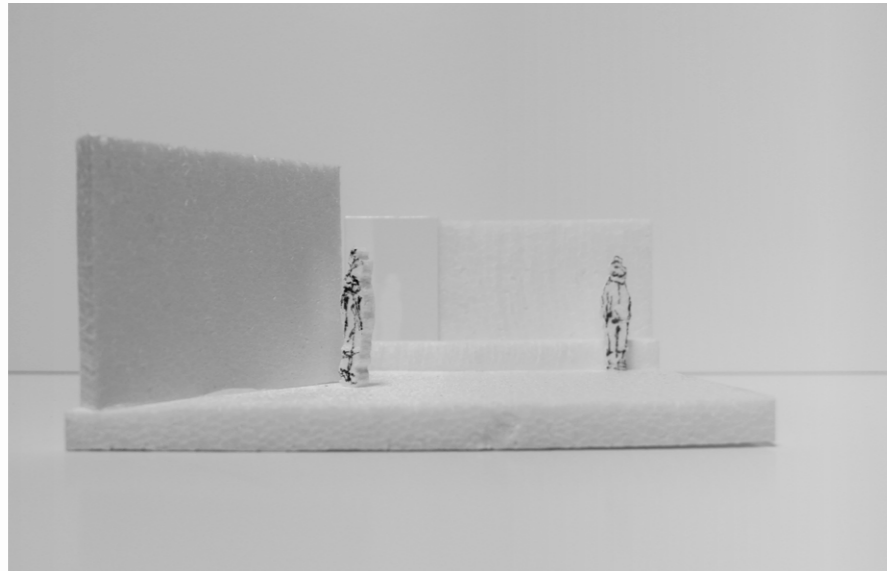
Var 1 | The southwest wall at 12 22 of december



Var 1 | The southwest wall at 12 6th of june

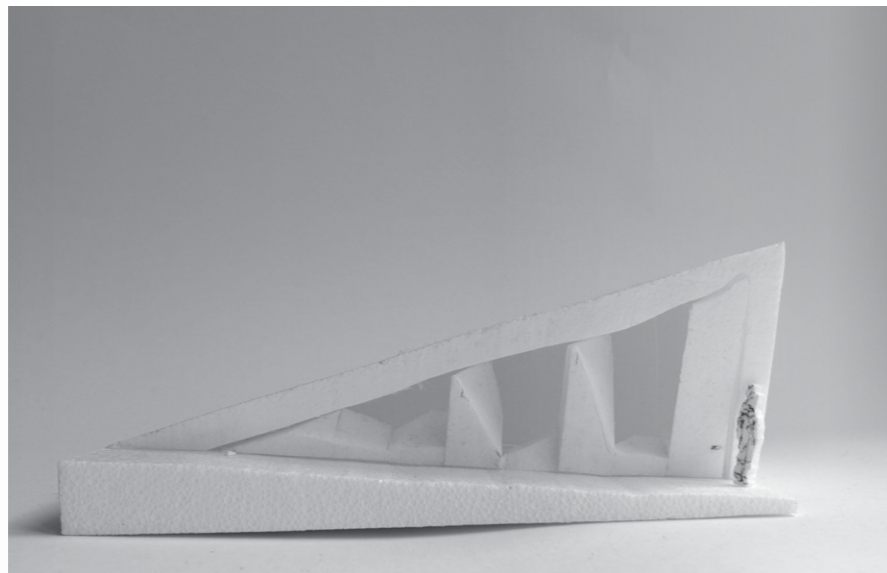


As next step I continued to look further into each facade and its meeting with the sun during the hours most visited by people.



The southeast wall at 12 6th of June

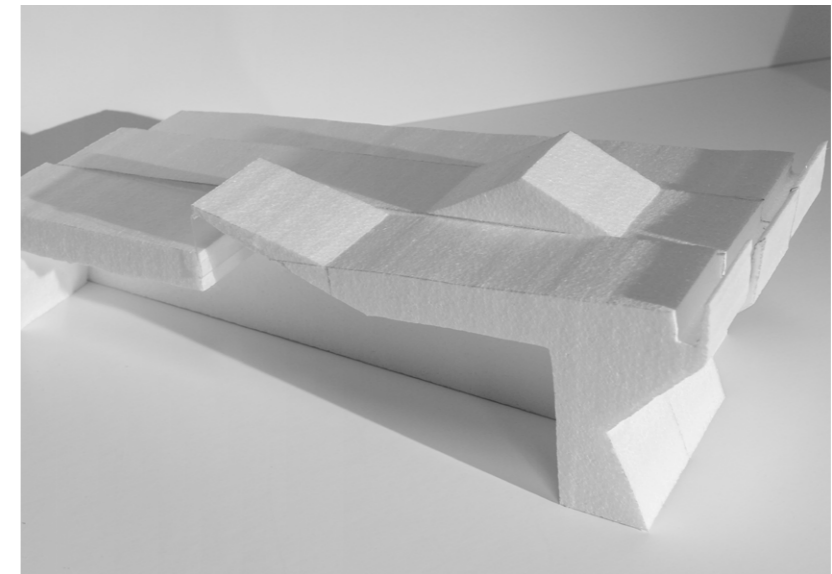
One wall naturally lightened up guiding in to the building, one in shprotecting shadow



The north east wall at 22 6th of june

Decomposing the wall trying to get as much natural light possible into the building.

As next step I continued to look further into each facade and its meeting with the sun during the hours most visited by people.



The northeast wall at 12 22 of december

Looking how to create a seating in the sun for the colder days. Also creating a roof-window getting the cold northern light into the building



The lodgepole pine forest north of the village Liden.

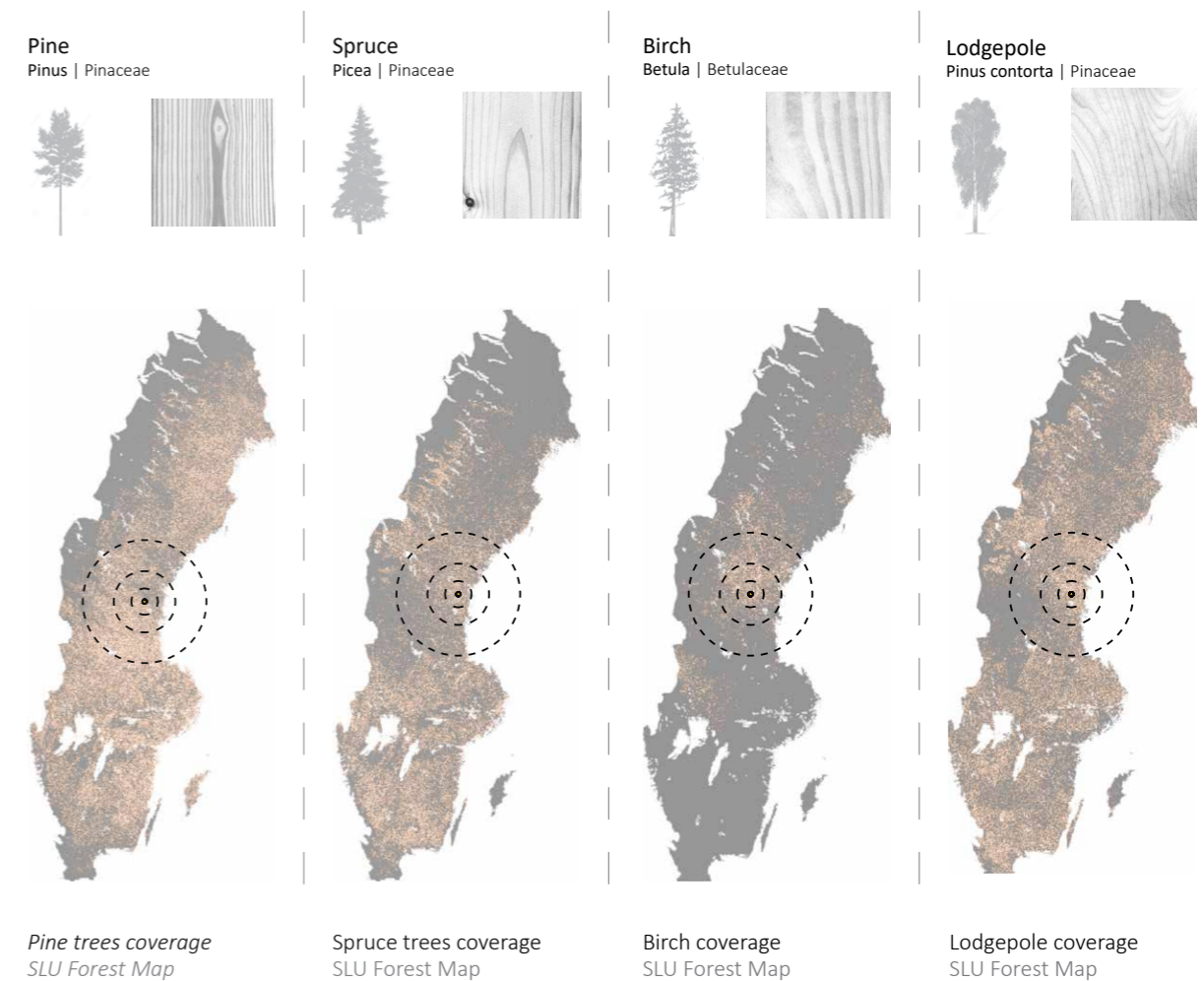
4.0 - Materialisation

4.1 History

The continental ice shaped the valley of Liden and the river Indalsalven, giving a poor soil and little land to agricult, instead have the richness of the region been in the woods and with the river as transport system all the way to one of Europes biggest pulp industries.

Thanks to the river could wood be transported directly to the big sawmills and pulp industries by the east coast, to afterward get shipped away all over Europe.

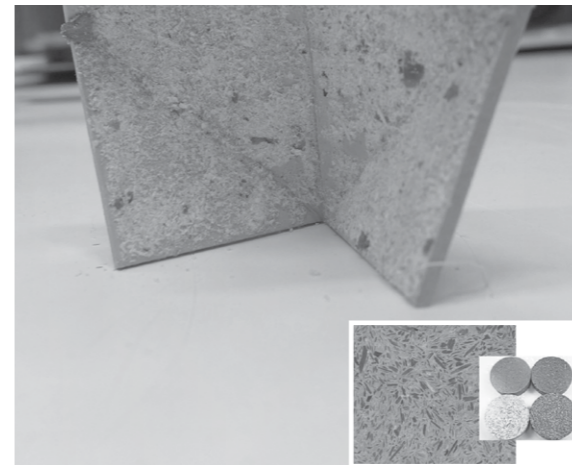
Many of the villages owned forest as capital that stayed in the family, and still do.



4.2. new technology

The goal of the material choses for this thesis project is to challenge the use wood, to show a new face of it. By using parts of the wood otherwise sorted away in the industry.

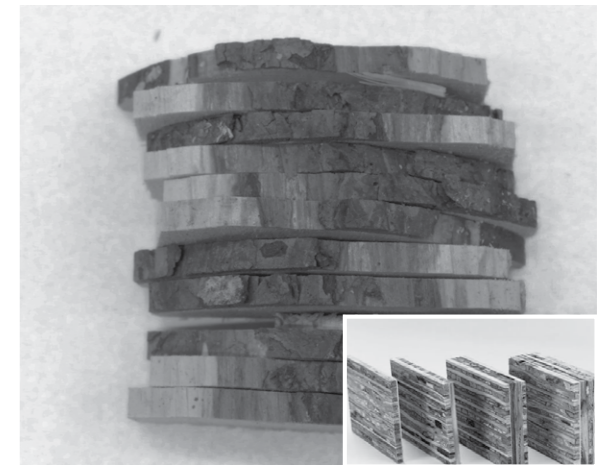
The private forest owners have the last couple of years lost crop to the bark beetles, that eats the wood and makes it loose its bearing properties. At a university in Canada they have done research to reuse these attacked woods in concrete, as a wood fiber concrete.



Cement-bonded wood fiber | waste wood

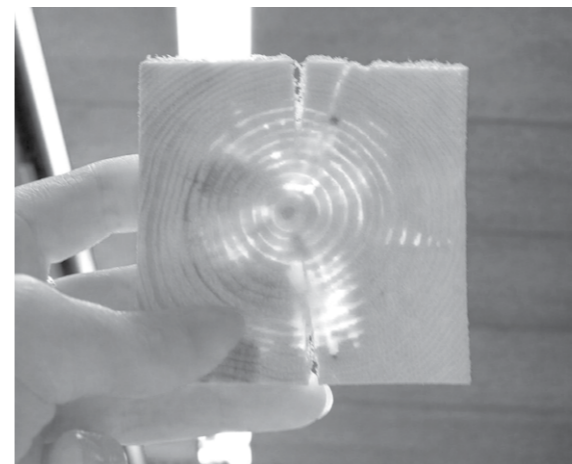
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Eco-paneling | kirai board

There is a lot of wood panels and knowledge of cross timber construction in the village. With this wood panels shown down here, it would still be a mass of wood. Though the expression would be something completely new, that still doesn't exist in the village.



Wood tar | resinous tar

When the pine and spruce grow slowly in the north side hills with little sun, which is the case of lot of the woods around Liden, is often the core of the trees looking like this. Wood affected with a lot of tar is often sorted out in the industry.

Historically these parts of the wood were used in window frames as they are more resistant for rain and wind.



Wood fibers | durisol

There is quite some sawdust and wood flakes in the sawmills as rest product. This have multiple using areas already today as alternative use in heating in form of pellets, for example. But it is also soft and has a certain flex as flooring material, where used in playgrounds for example.

5.0 - Representation

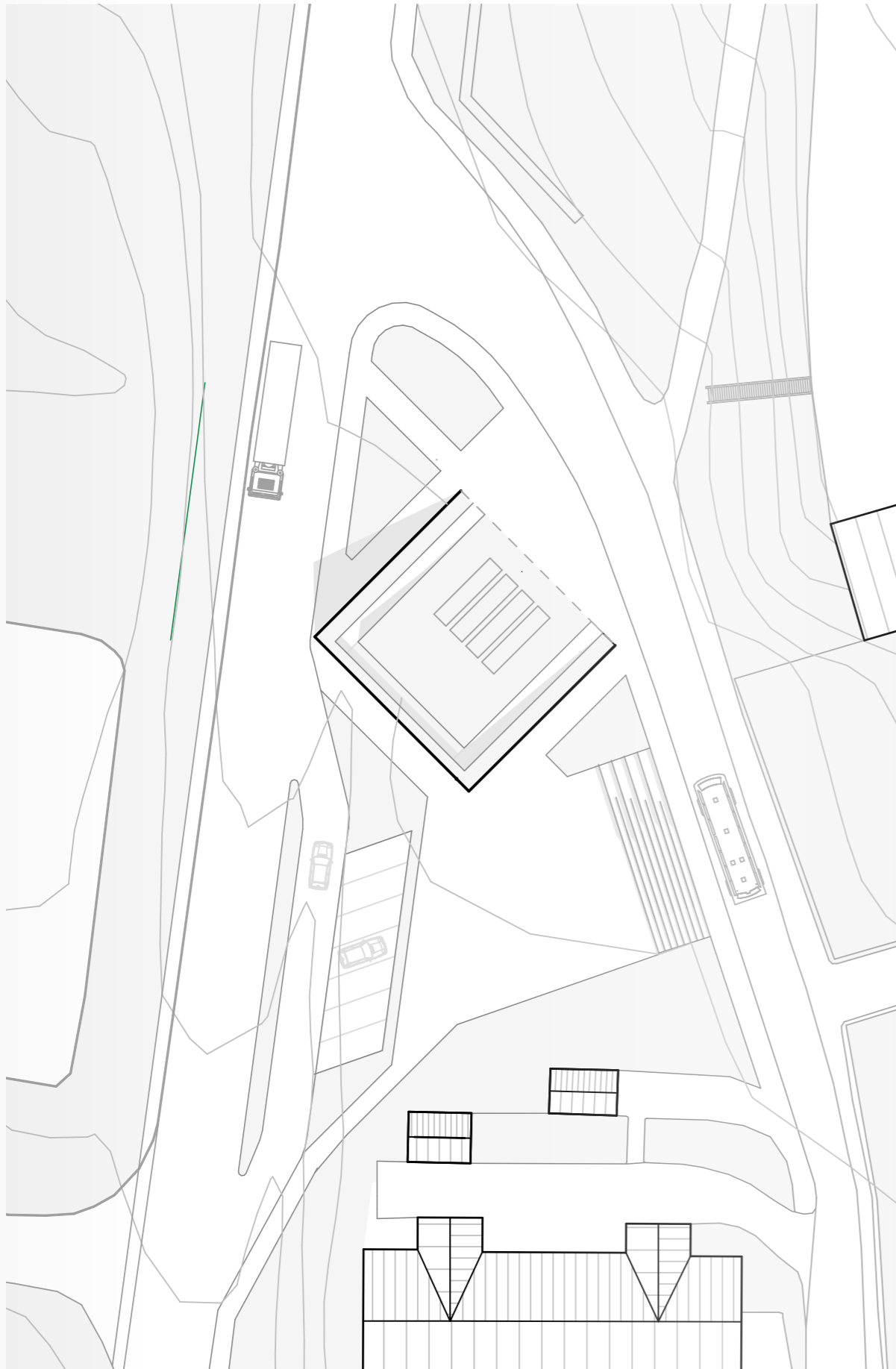
5.1 The assembly

Putting together my research and tests I looked at a building whose shape I never could have predicted.

The buildings position in the village was an outcome of possible construction sites and connecting existing infrastructure. For it to be a natural pass through.

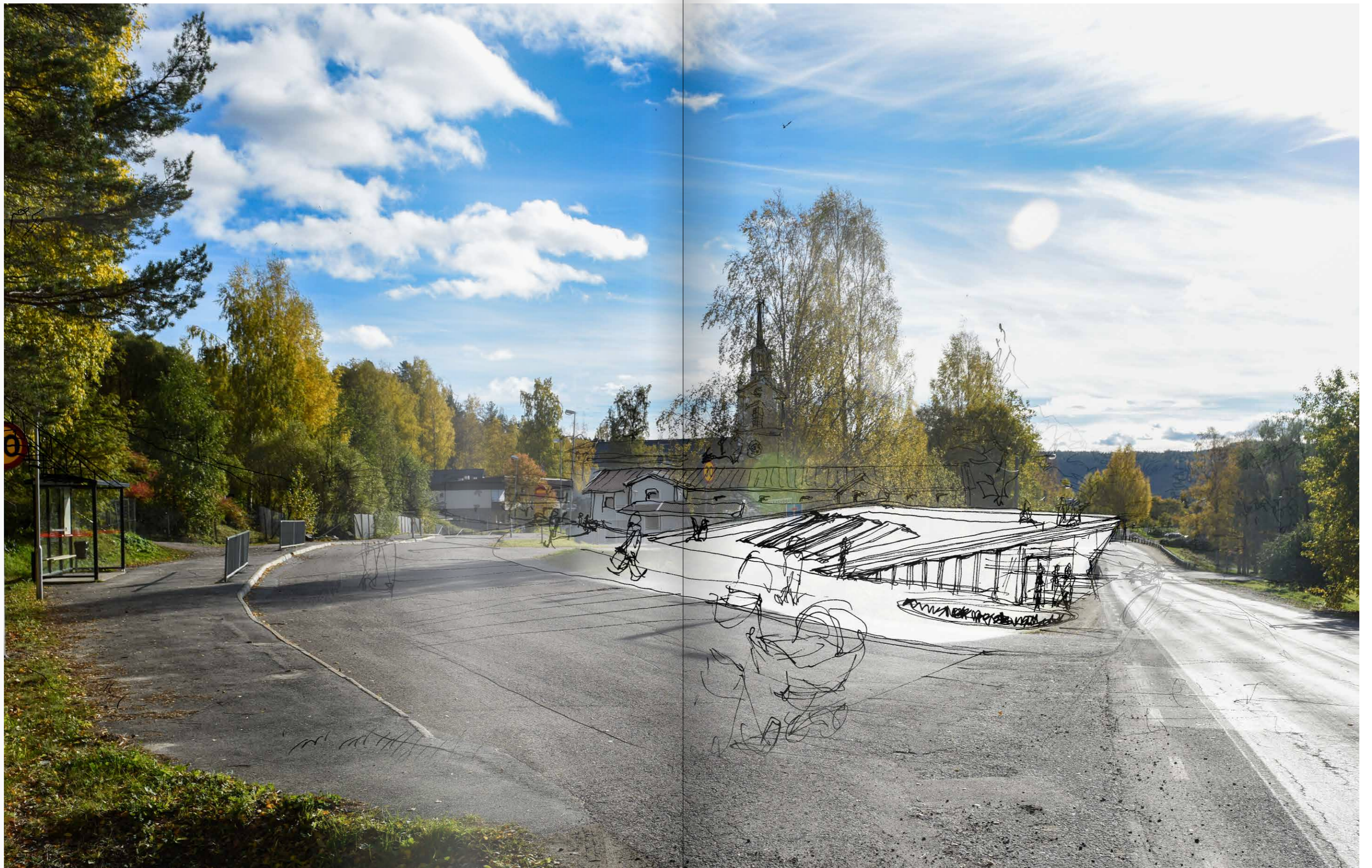
The designed volume and shape of the spaces is an outcome of seasonal studies. Creating comfortable places to meet up inside and outside.

The materialization of the building is the connection to the important history of the village.

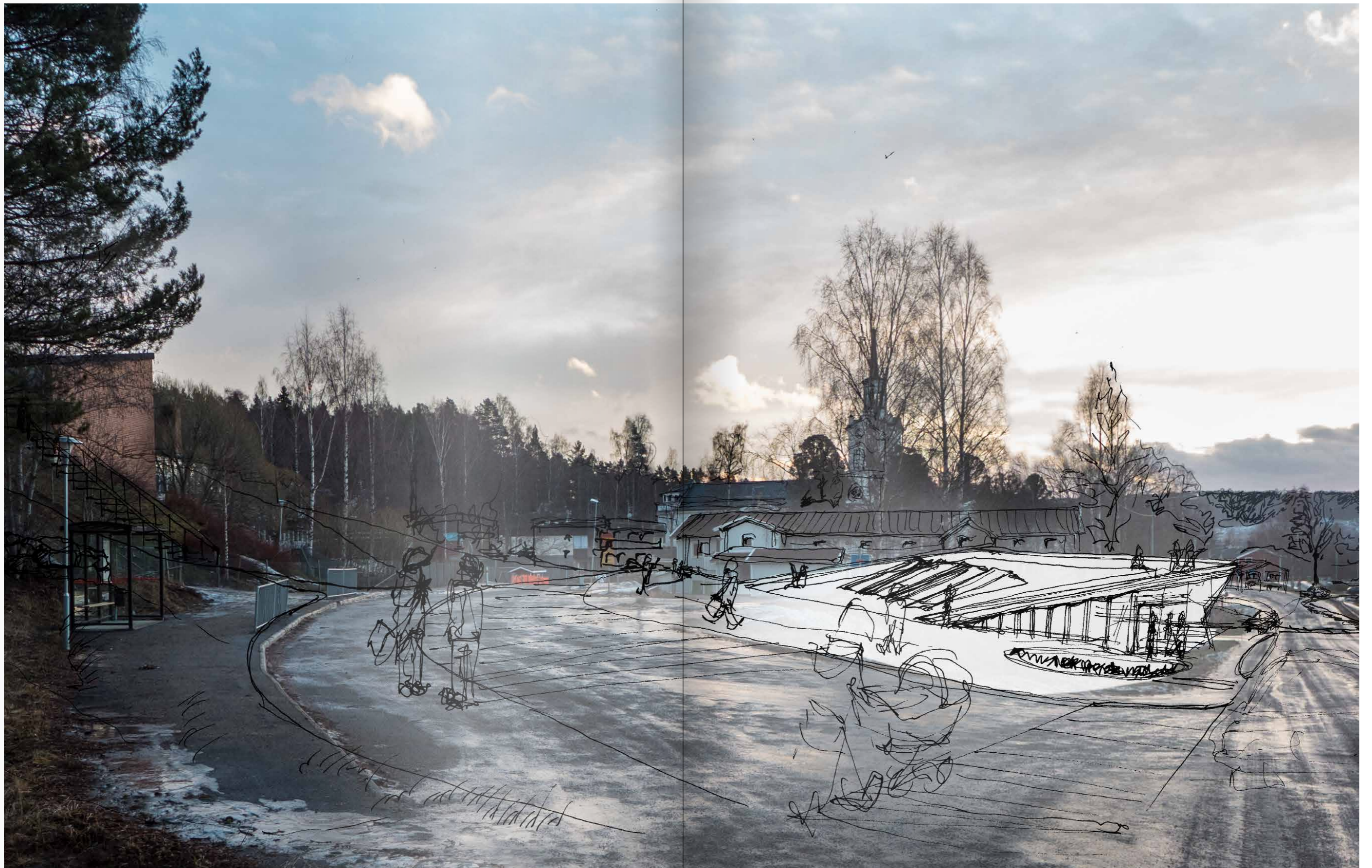




Collage from photo taken:
15 July at 14.00



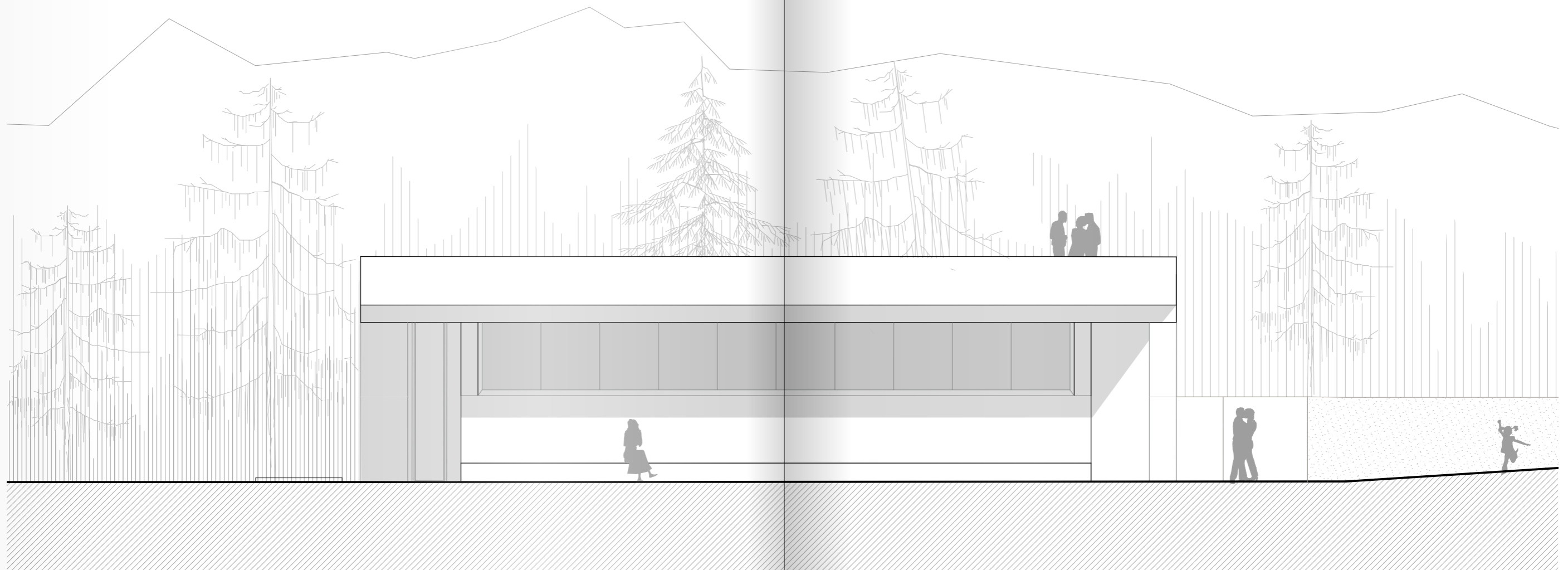
Collage from photo taken:
5 October at 14.00



Collage from photo taken:
28 December at 14.00



Collage from photo taken:
20 March at 14.00

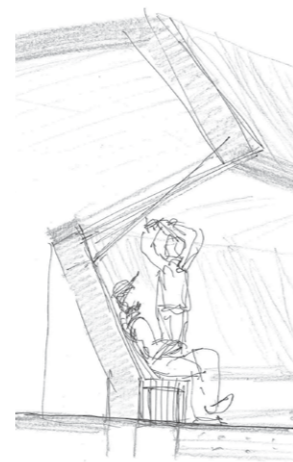


South-West Elevation | 1 : 100

The southwest wall is one off the two walls getting the highest radiation yearly, through the calculations. Looking closer at the site this is actually the wall that will get most sun hours over the year as the village is situated on a hill towards west.

Its orientation is also towards the main entrance in the village, coming from Sundsvall and the National road. So, this owe to be the best watch out direction and the place where you just want to be able to sit down and absorb the heat from the wall.

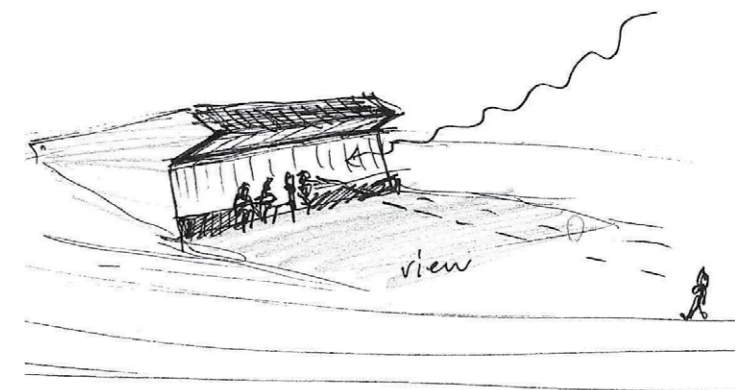
The angles of the wall are to make the wall taking care of as much radiation as possible.



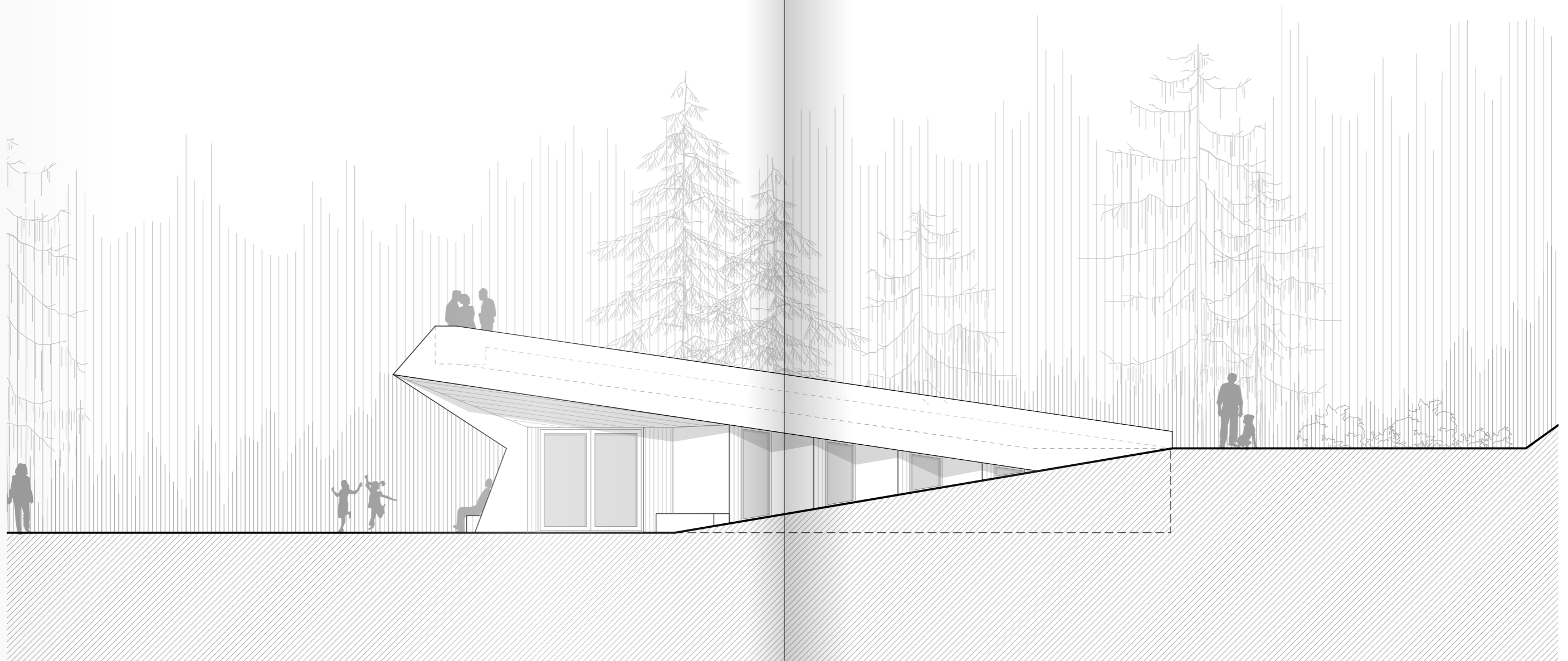
South West Wall | inclined wall



South West Wall | Sunheated bench



South West Wall | view on the main road

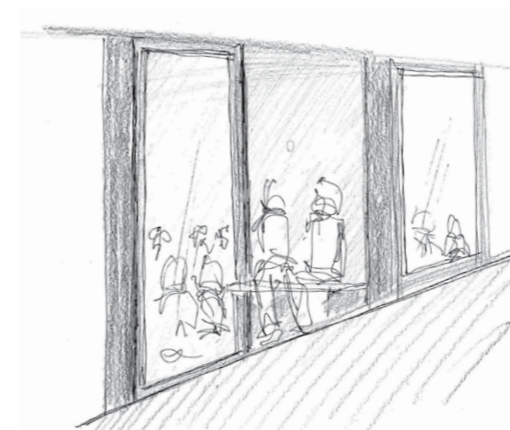


South-East Elevation | 1 : 100

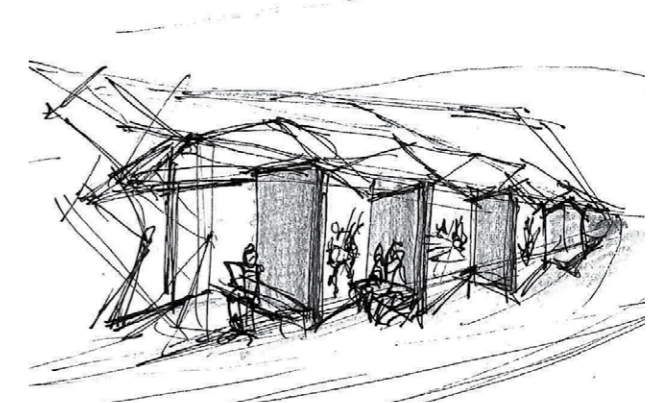
The South East wall, is the second warmest wall, with main sun in the morning.

It is also the wall oriented towards the village old square and the main workplaces in the village, as the school and the health care center. There for this wall has been shaped for one of the main entrances to the building.

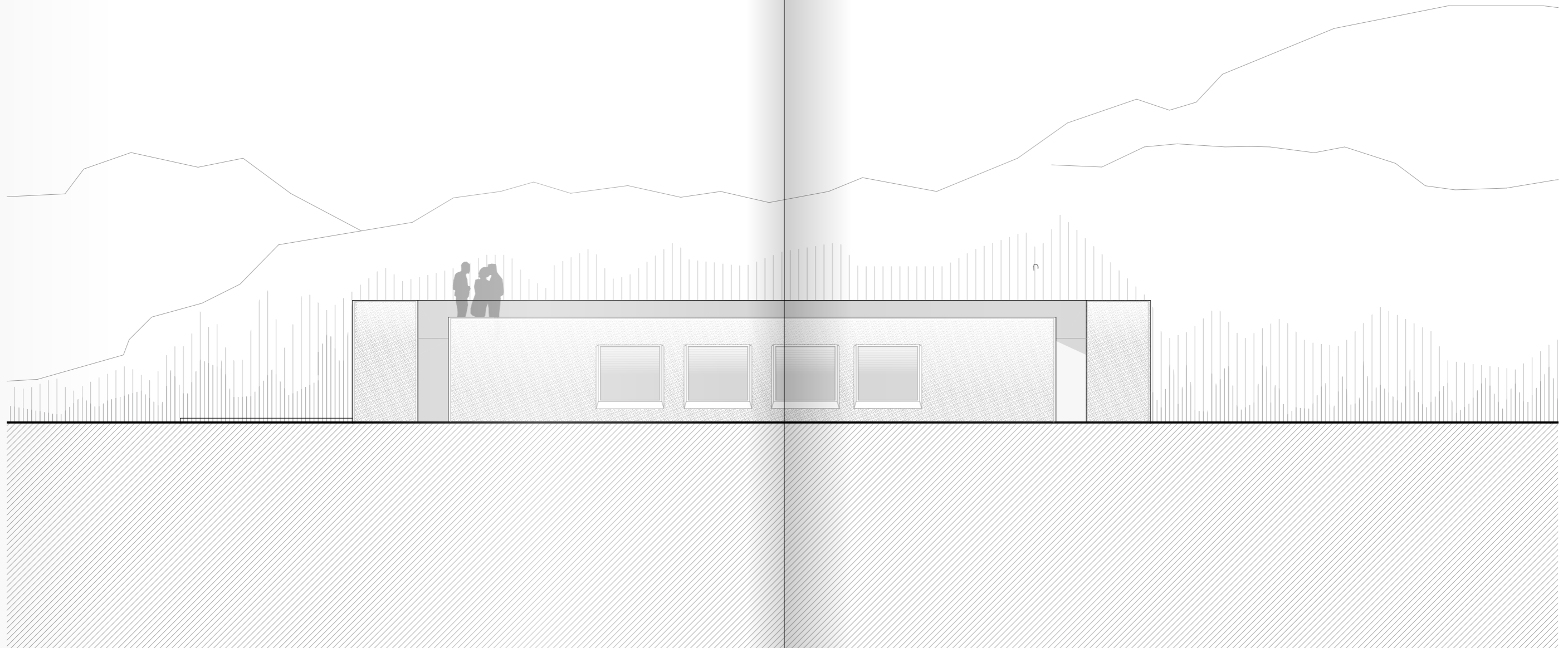
The facade itself also take care of the eastside slope, and has opening shaped towards east for the morning light and during the day a colder light into the building. While at the same time creating small seating areas against south, that will be light up during the school hours.



South East Wall | imbedded benches



South East Wall | oscillating facade

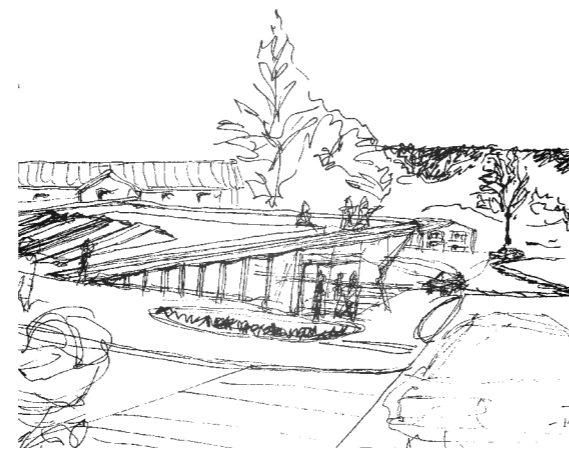


North-East Elevation | 1 : 100

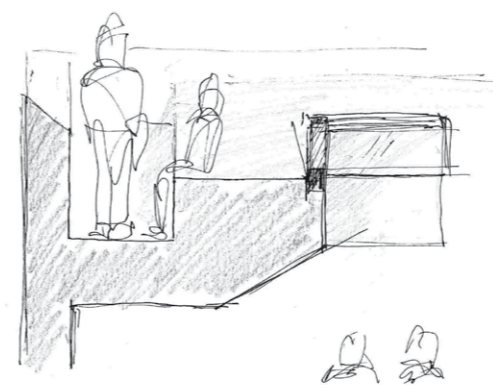
The North East wall is the coldest of walls and has as main task to cast as little shadow as possible. Therefore this wall has ended up as the roof, connecting the ground with the building.

As the coldest wall it also has as task to get in as much light as possible, that isn't sun heated. Therefore the biggest windows are set here. They're having a slight slope to get the snow to run off during snow times and still trying to hold as low profile as possible for not creating new shadowed cold spots for the site.

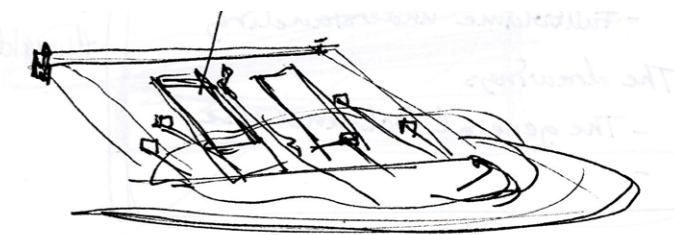
This place also has the best view over the mountains and the valley, working as a relaxing viewpoint in the village.



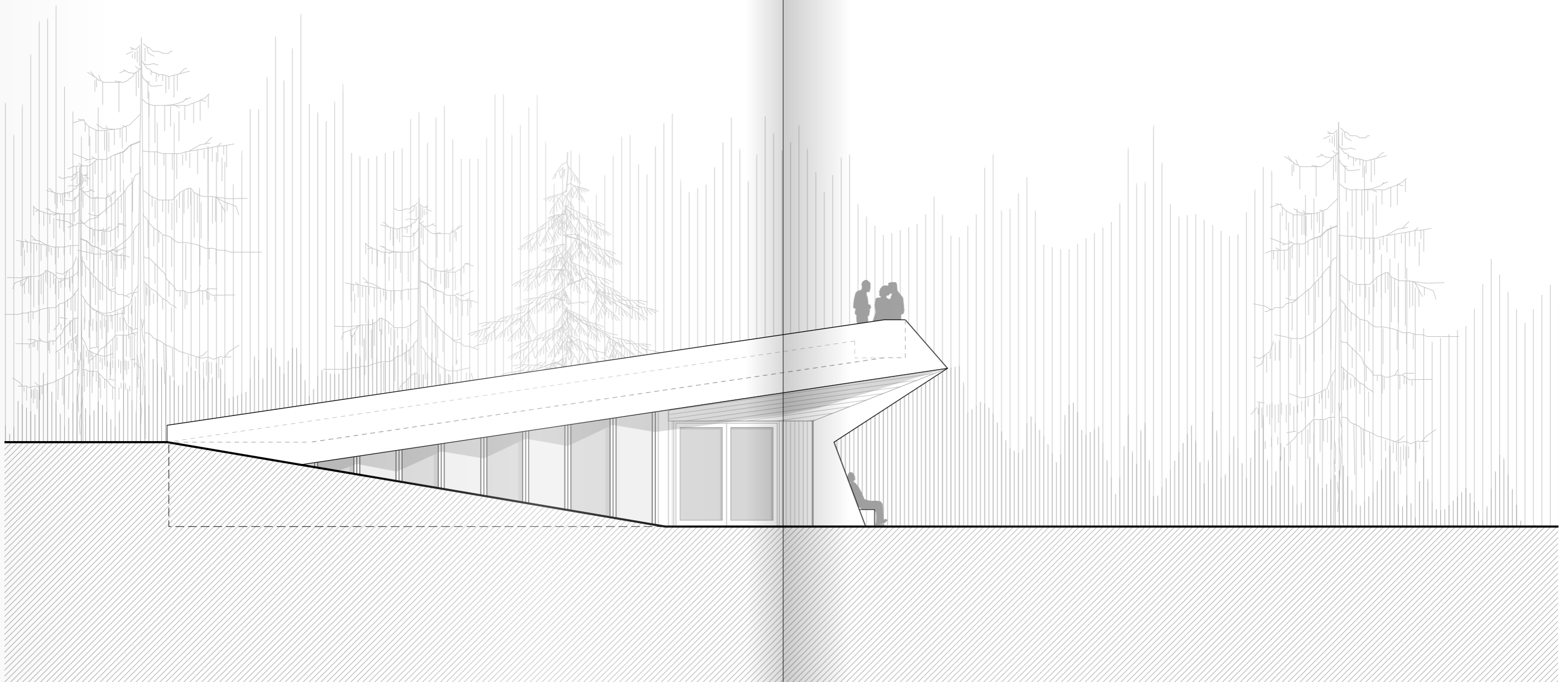
North East Wall | View of the valley



North East Wall | Roof platform

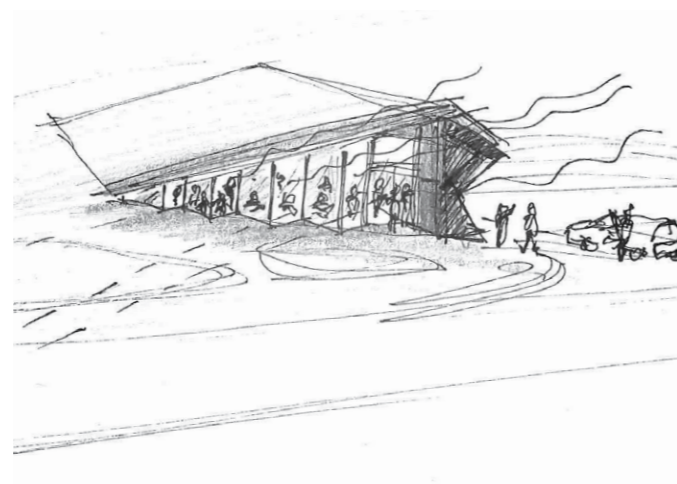


North East Wall | skylight

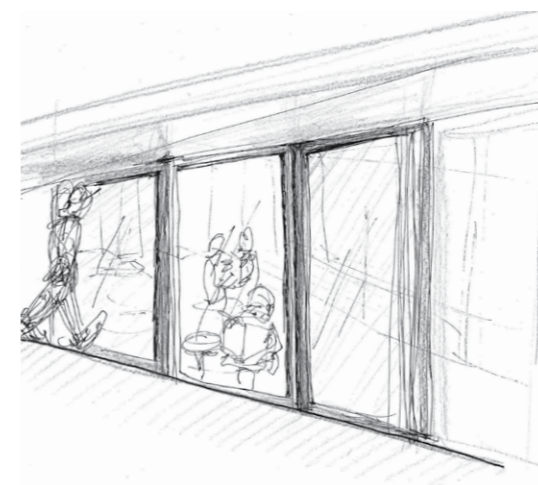


The North west wall is oriented towards the north entrance in the village. This entrance serves for villages situated more up North and one of the bigger wildlife areas for hunting and fishing. Therefore this wall has window openings framing and gives and overlook of the road from inside the building.

Secondly this wall has the privilege of the evening sun, especially in the summer, when the sun touches this wall until after 22 at night. which make this the perfect spot for late dining and feasting still having the sun coming in to the building.



South East Wall | Emerging panorama

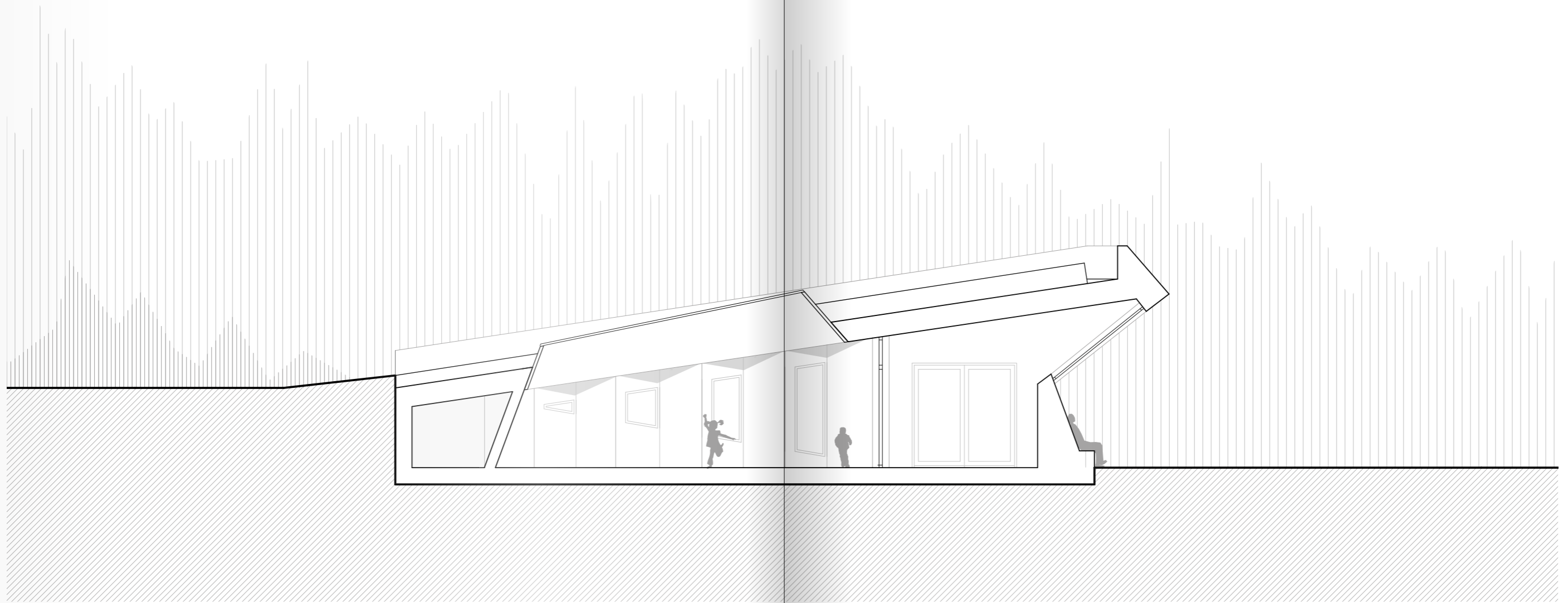


North West Wall | oscillating facade



North West Wall | Height variation

North-West Elevation | 1 : 100



Section | 1 : 100

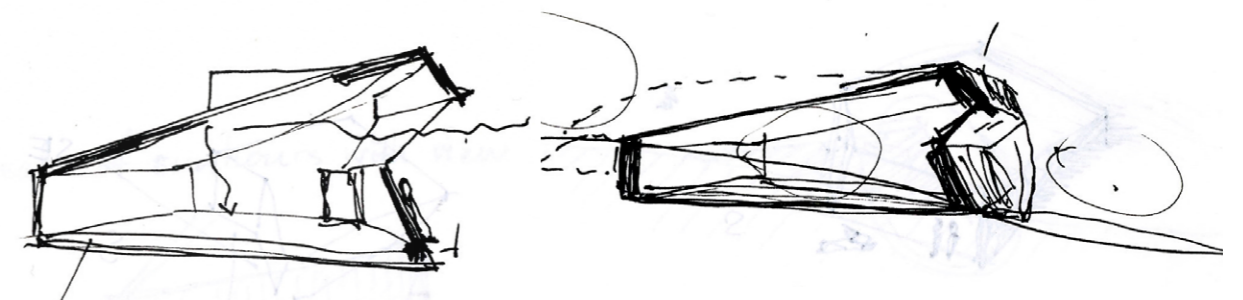
Cutting through the building you can see the different sequences of spaces. from the open exposed to the protected wall into the protected inside.

The big roof windows are serving as a connection to the outside. With the roof entrance main direction from the school, inviting the school kids to interact without having to engage in activity on the inside.

The window in the south wall is a window of light reflecting the inside light out to the road during dark hours. And taking in the striking low sun during the late summer hours.

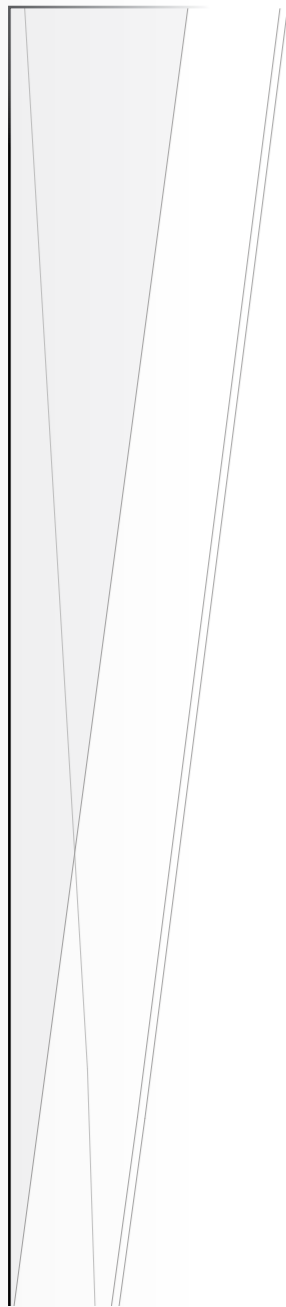


Section | Connecting in and out



Section | reflection

Section | spaces sequence

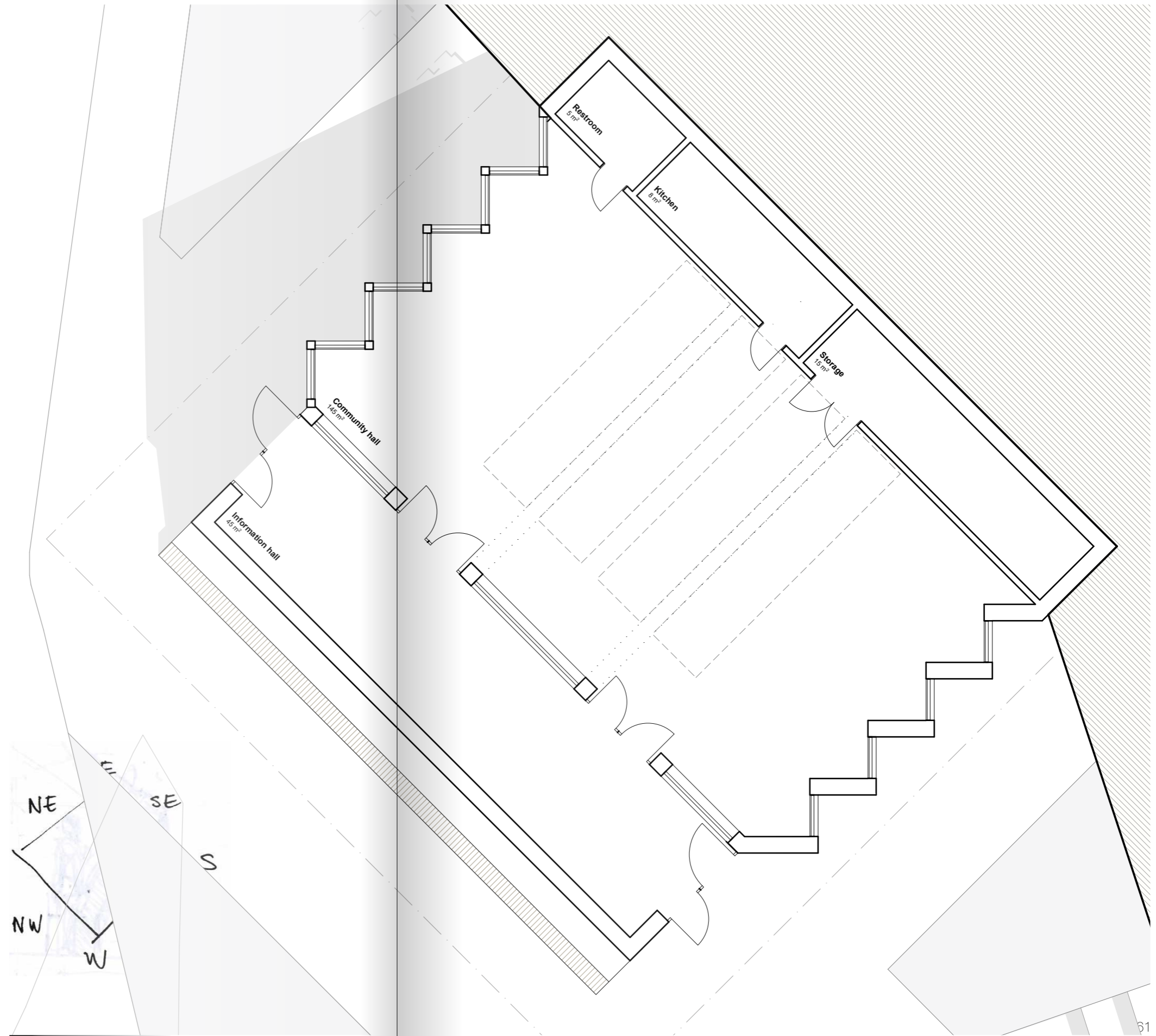


Inside the plan is divided in three main sequences of spaces:

The entrance and information hall. A place to stay for short notice of time waiting for the bus someone to pick you up or just passing through on your way home to take part of any new common information.

The big and main hall for with possibility of division for bigger or smaller meetings.

The isolation socle with storage space and facilities on the northeast side.



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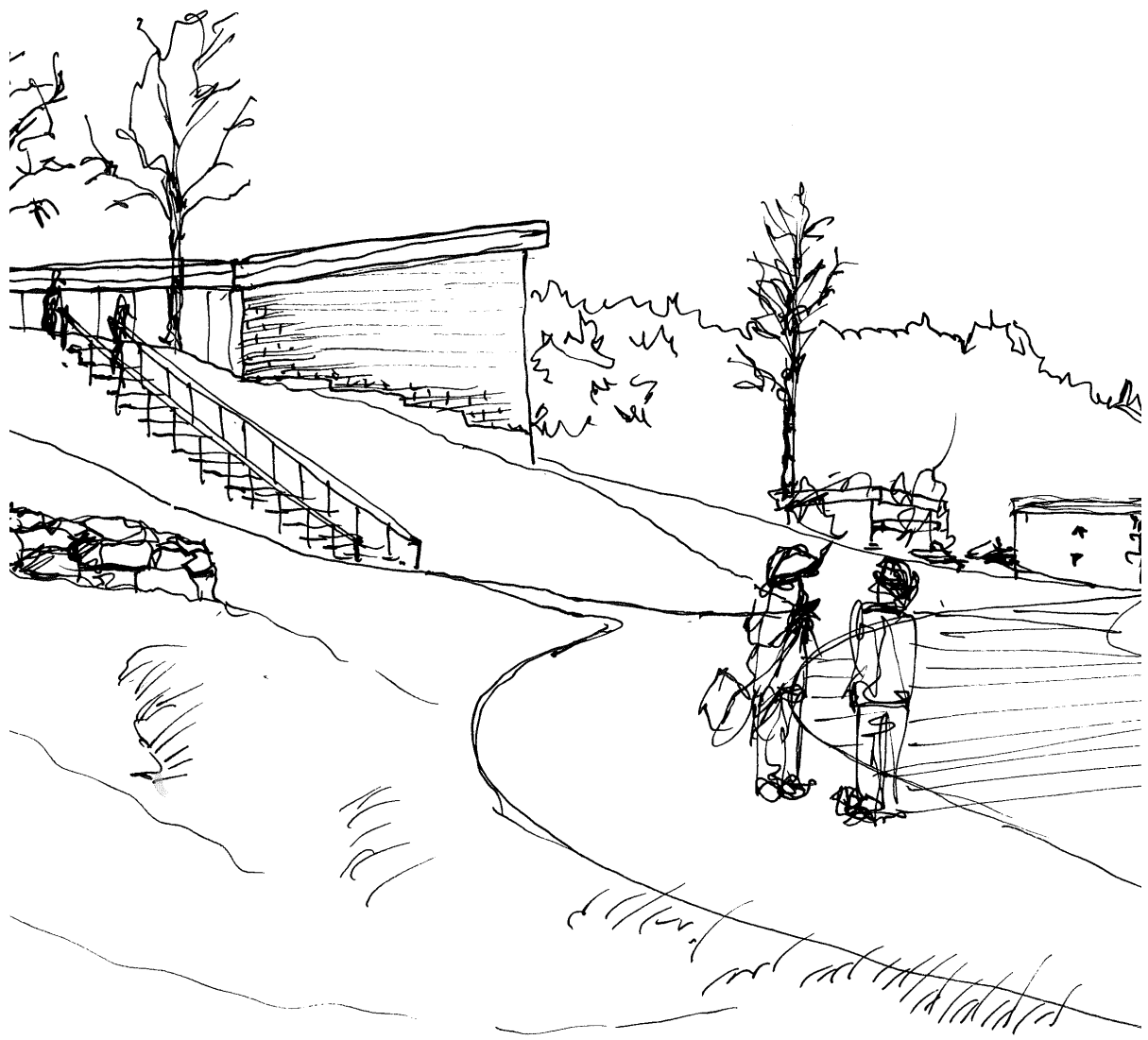
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