

# VÄGLÖST LAND

A mountain station in a roadless land



## VÄGLÖST LAND ROADLESS LAND

Isabella Endre & Charlotta Gatenbeck  
Chalmers University of Technology  
Department of architecture and Civil Engineering  
Master's Program of Architecture and Urban  
Design (MPARC)  
Graduation and Publication year: 2023

Supervisor: Filip Rem  
Examiner: Björn Gross



## ABSTRACT

The Swedish mountains of Jämtland have a strong historical value as a recreational area for outdoor life. The mountains offer a unique biological diversity, nature and cultural values that attract an increased number of people to the area for outdoor life and to spend their time off in a sustainable way. This is today also important as a source of business and employment in the area. An increased number of accommodation options are a prerequisite to enhance the accessibility to the area. At the same time, exploitation must be carried out in a cautious way to fully respect and consider the unique environment with sensitive nature and local traditions.

This thesis investigates the concept and design of a mountain station as a development of an existing cabin. Focus is on maintaining and developing the essence of the local cultural values while respecting the conditions of the site.

The cabins "Gåsenstugorna", by the foot of the mountain "Gåsen", is situated in a barren and secluded high mountain landscape and is one of Sweden's highest located mountain cabins. It works as a hub between the three popular mountain stations of "Jämtlandstriangeln" in the west

and mountain cabins in the nature reserve of Vålådalen. A development and expansion of "Gåsenstugorna" enables more people to experience the mountain environment, while at the same time it relieves the currently overloaded mountain stations and trails in the area.

In order to understand how traditional techniques can be translated into a modern reinterpretation, traditional and contemporary references have been studied to form a framework for design. The identity and conditions of the place have been formulated to deepen the understanding of the site. As a result, a design proposal for the development of a mountain station in Jämtland has been formed. The results incorporate cultural values of the area and showcases how building traditions can be translated into contemporary and contextual architecture. The project has raised questions about which local traditions of architecture can contribute to present design concepts and how place identity can be further developed and strengthened by architecture, which are discussed in the study.

Keyword:

Mountain station | Building traditions | Log  
timber construction | Context

## ABOUT US

### Isabella Endre

Bachelor in architecture 2017  
Chalmers University of Technology -2020

Internship 2021  
Tham och Videgård Architects -2022

Master's Program, 2020  
Architecture and Urban Design -2023

Studio fall term 2020  
Matter Space Structure 1

Studio spring term 2022  
Housing inventions

Studio fall term 2022  
Residential Healthcare

Studio spring term 2023  
Master's thesis:  
Building Tectonics

### Charlotta Gatenbeck

Bachelor in architecture 2017  
Chalmers University of Technology -2020

Master's Program, 2021  
Architecture and Urban Design -2023

Studio fall term 2021  
Residential Healthcare

Studio spring term 2022  
Housing inventions

Studio fall term 2022  
Matter Space Structure 1

Studio spring term 2023  
Master's thesis:  
Building Tectonics

## CONTENT

<b>Introduction</b>	9	<b>Design proposal</b>	47
Discourse	10	Situation and placement	50
Aim and purpose	11	Landscape	50
Research question	11	Landscape section	51
Method	11	Site plan	52
Reading instructions	11	Building design	54
Delimitations	13	Main building	54
Terminology	13	Construction and details	70
		Structure	76
<b>Background</b>	15	Annex	78
Context   History	16	Staff building	82
Building traditions	18		
Timber construction	20	<b>Conclusion</b>	87
References	24	Discussion and reflection	88
Zumthor. P. Haus Luzi	24		
Caminada. G. Walpen House	26	<b>List of sources</b>	90
Gåsen	30		
Paths and activities	34		
Site analysis	36		
Weather and seasons	38		
Snowdrift	40		
Design strategies	42		
Space program	44		



# INTRODUCTION

## DISCOURSE

### Aim and purpose

The aim of this thesis is to investigate the relationship between design and context, with regard to existing cultures, weather conditions and sensitive nature. Focus has been on studying local building traditions and the use of timber construction and how to reformulate its tectonics and spatial qualities into contemporary design. The design will also incorporate architectural climate adaption to create a resilient building that is adapted to extreme weather conditions.

The research will be conducted through the design of a Fjällstation (Mountain station) as a development of the existing Gåsenstugorna (Gåsen mountain cabin) in the mountains of the southern Jämtlandsfjällen. This in order to respond to the increased activity of outdoor life in the Swedish "Fjäll" (mountains), and its following demand for shelter and tourist beds.

### Research question

*How can a contemporary building in Jämtland strengthen the relationship between design and context, with regards to local traditions, the extreme weather and sensitive nature?*

### Method

The process for this thesis is divided into two main parts where the first is focused on investigating the background and character of the place. A study of local vernacular architecture and contemporary references is carried out to provide knowledge of materials, techniques and form that can be translated and implemented into our design. Furthermore, snow and wind are studied in relation to context and building volume at an early stage in order to understand the site's conditions and the subsequent requirements placed on our design proposal.

The second, and the greater part of the project, consists of design work where the research is explored through architectural design of a mountain station. Architectural drawings, illustrations and physical models are produced to display the project in a range of scales to get close to built reality.

### Reading instructions

The thesis is divided into four main parts - *introduction, background, design proposal* and a concluding chapter with discussion. The introduction presents the general background and the scope of the project, whereas description and analyzes of the context, the climate, building traditions and design strategies are gathered within *background*. The main part is included in *design proposal* and presents the final design. The concluding chapter reflects upon the thesis in relation to the aim, the result and the process.

## DISCOURSE

### Delimitations

The project takes place in a high mountain area in Jämtland, which has a rich but threatened biodiversity, and consists of a cultural landscape with native people (Samis) that have lived and worked on the site doing reindeer herding for a long time.

As a result, planning on such land involves an extensive political process to take into account geopolitical and cultural aspects. The project is based on the prerequisite that suggested development would be approved. However, the project is carried out aiming to be as realistic as possible through promoting sustainable development by promptly considering the existing natural- and cultural values.

Furthermore, the location in roadless land is in a regulatory area where the county administrative board has forbidden motor vehicles for the public. Its purpose is to reduce wear and tear and protect the environment for reindeer husbandry and animal- and outdoor life. To access the site, you must therefore be able to walk or ski 15 kilometres in difficult terrain. This means that people with certain functional variations cannot get to the mountain station that we are planning. In consultation with an

accessibility consultant, we assume that this project is an exception to the accessibility requirements that are usually placed on a building and the project proposal does not need to be fully accessible. We comply with all BBR (Boverket's building regulations) requirements otherwise.

To conclude, if the project were to be realized there is a need for an in-depth investigation of self-sufficiency to investigate how these solutions would work in practice. These factors have been taken into account in the project, but to a limited extent.

### Terminology

#### *Fjäll*

Fjäll describes the mountains and flat landscapes, whose highest point reaches above the tree line (Lundqvist, 1948).

#### *Fjällstuga (Mountain cabin)*

Fjällstuga is a building in roadless country that can be reached by hiking or skiing and which is intended to function as shelter and accommodation for people in the mountains. Fjällstuga is based on self-catering and is usually only supplied with the basic needs (STF, n.d-a).

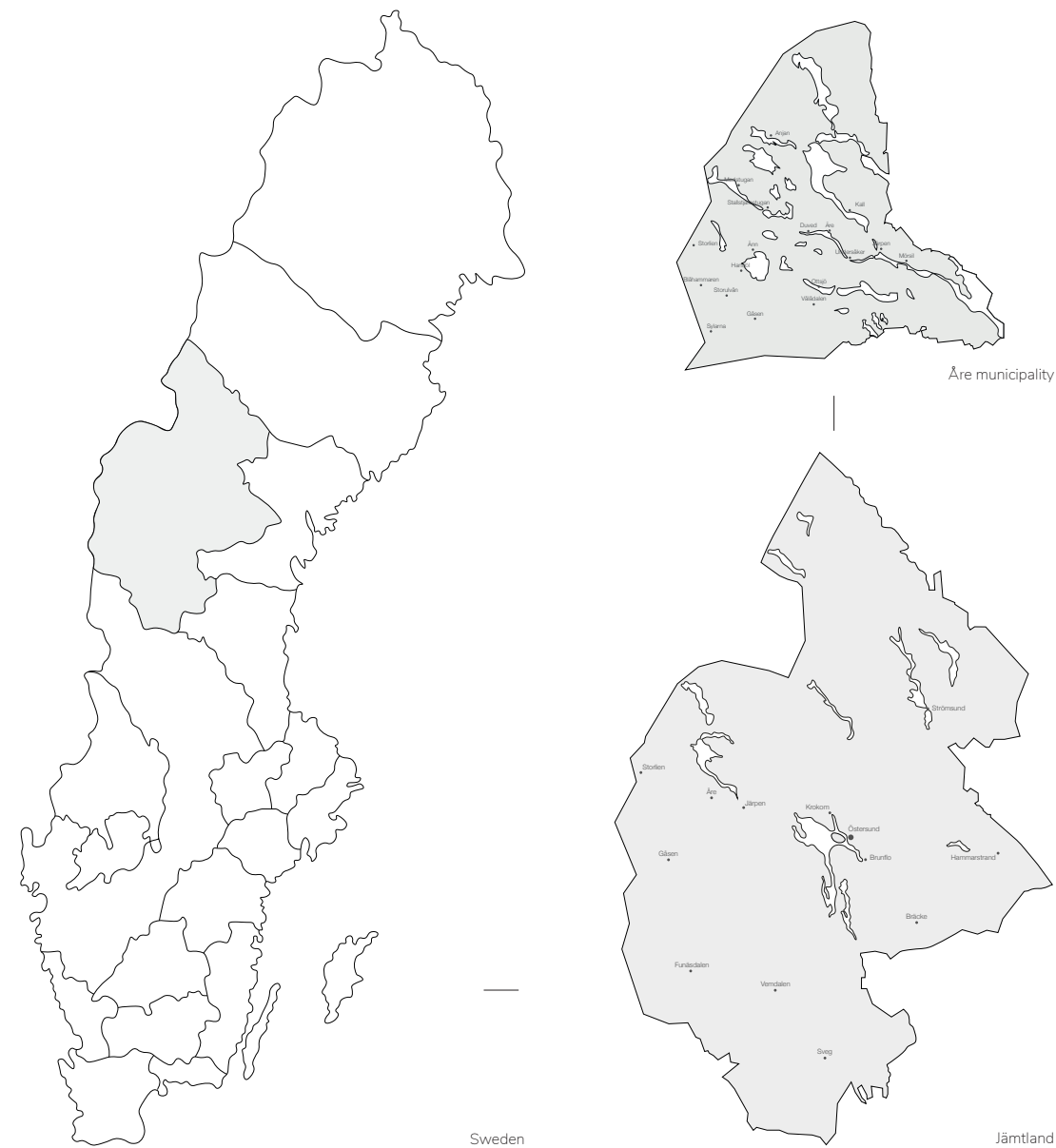
#### *Fjällstation (Mountain station)*

Fjällstation is an extension of the Fjällstuga and a mix between hotel and hostel. Mountain stations are provided with water and electricity, as well as facilities such as a restaurant, a shop and guided tours (STF, n.d-a).

#### *STF, Svenska Turistföreningen (Swedish Tourist Association)*

STF is a non-profit membership association that aims to promote nature and cultural tourism in Sweden by maintaining trails and providing accommodations in the mountains (STF, n.d-a).

# BACKGROUND



## CONTEXT | HISTORY

According to Eliasson et al (2015) the Swedish mountain area is a landscape where people have lived and worked for thousands of years. Ever since the inland ice melted, ten thousand years ago, people have used the Swedish mountains for various purposes. The first immigrants in Jämtlandsfjällen were hunter-gathers that came from the west and lived out of hunting, fishing and gathering plants close to waterways. This way of living was fairly constant for thousands of years although climate variations changed animal and plant life.

Among these first immigrants, early ancestors of the Sami have been found. It is known that the Sami have conducted reindeer husbandry since the 11th century. Reindeer nomadism was most widespread between the 17th and the 19th century and was gradually replaced by today's large-scale reindeer husbandry with a focus on meat instead of milk production. Reindeer herding is still carried out throughout the Swedish mountain range and is characterized by thousands of years of reindeer herding (Eliasson et al, 2015).

The population in Jämtland increased from the 17th to the 19th century. Livestock farming was the foundation

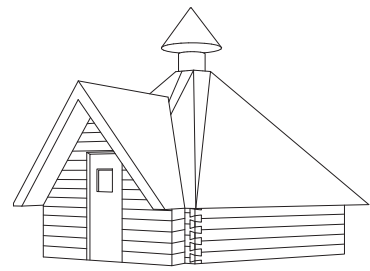
of the economy and "fäbodvallar" (shacks) were built on valleys and meadows around the mountain areas. Just like the Sami, the mountain farmers supplemented their economy with hunting and fishing.

During the Great power period in the 17th and 18th centuries, the need for metals increased, and the mountains became an interesting area for mining. In the County of Jämtland, iron and copper was mined at Åreskutan and at Ljusnedal in Härjedalen (Eliasson et al, 2015).

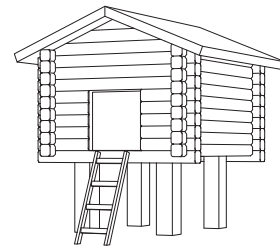
During this time, as Sweden became urbanized and people began to move into the cities to work in the industries, the Nordic landscape was rediscovered with a new romantic look. Previously the untamed nature had been considered frightening and valued primarily from a utility point of view. But this approach changed. The mountains and the outdoor life became a symbol for health. Hotels, hunting lodges, health resorts and sanatoriums opened up in the Swedish mountain world. The altitude and air conditions were thought to have medical benefits. (Eliasson et al, 2015)

Improved communication and the arrival of the railway was the

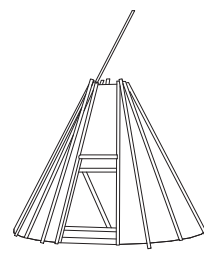
most important prerequisite for the expansion of mountain tourism. Today the interest for outdoor activities in the area is increasing and the desire to discover and enjoy the Swedish mountain world is bigger than ever (Naturvårdsverket, 2022).



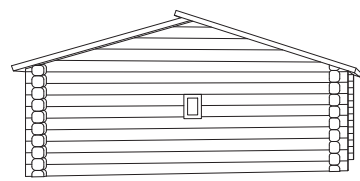
Southern Sami Timber "Kåta"



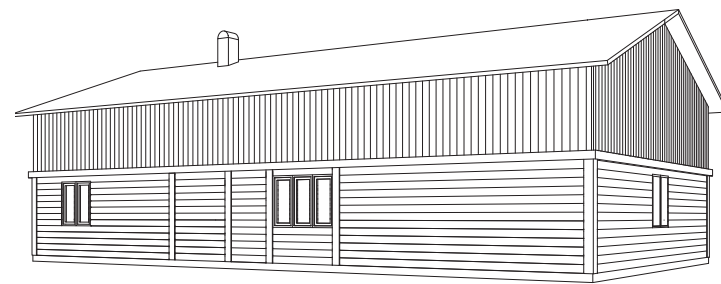
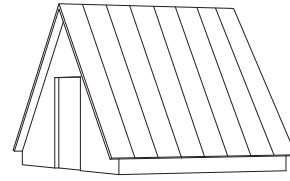
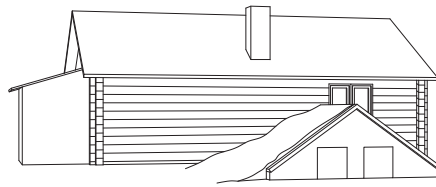
Southern Sami Buvrie



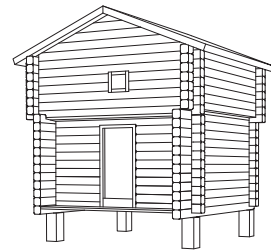
South Sami Peat Hut



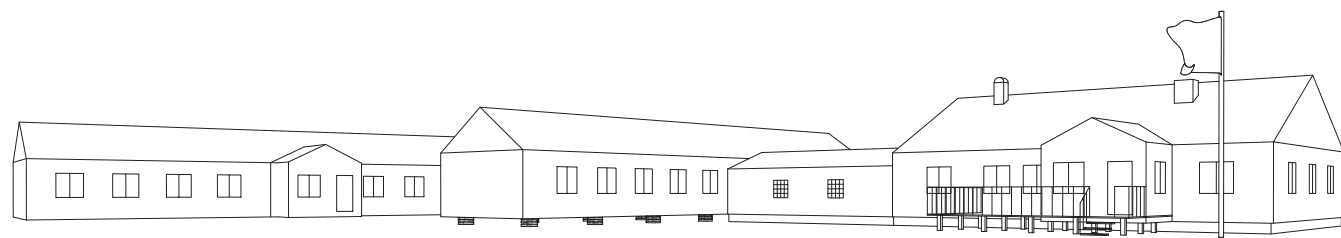
Mountain Farm, Fäbod



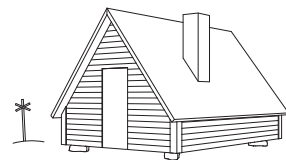
Barn



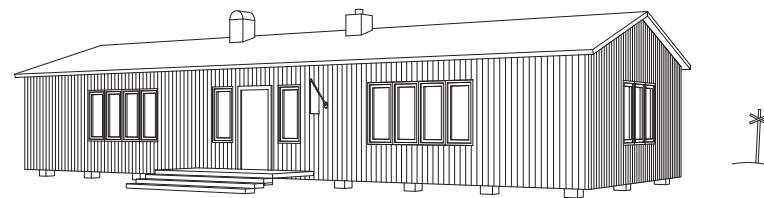
Härbre



STF Sylarna Mountain Station



Shelter Cabin



Tourist Cabin

## BUILDING TRADITIONS

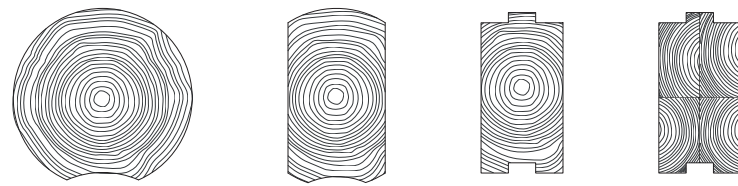
Local building traditions have been studied to connect to the local context and make use of local materials and techniques. By studying these architectural systems and the substance of their construction the tectonic and spatial qualities can be reformulated into contemporary design that meet the requirement of today's needs.

The building traditions differ significantly, which comes from the different cultures that have interacted over time in the area.

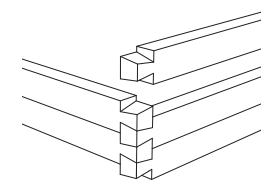
Building traditions have developed based on the conditions of the area and access to materials. As a result, what the various typologies have in common is the use of wood that determines the structure of the building (Werne, 1993).

Representations of traditional building typologies in Jämtland.

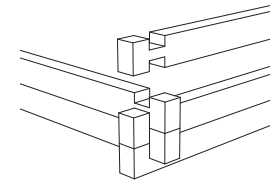




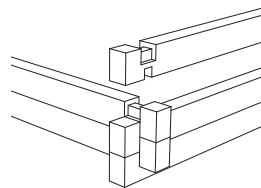
Representation of different profile expressions on log timber given by planing, sawing and lamelling



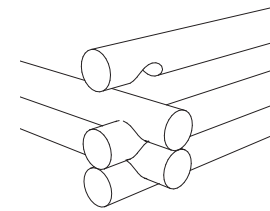
Dovetail joint  
Slätknut: Laxknut



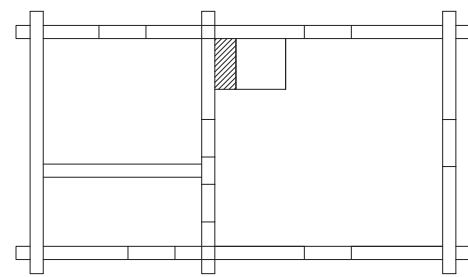
Corner joint  
Utknut: Enkel dubbelhaksknut



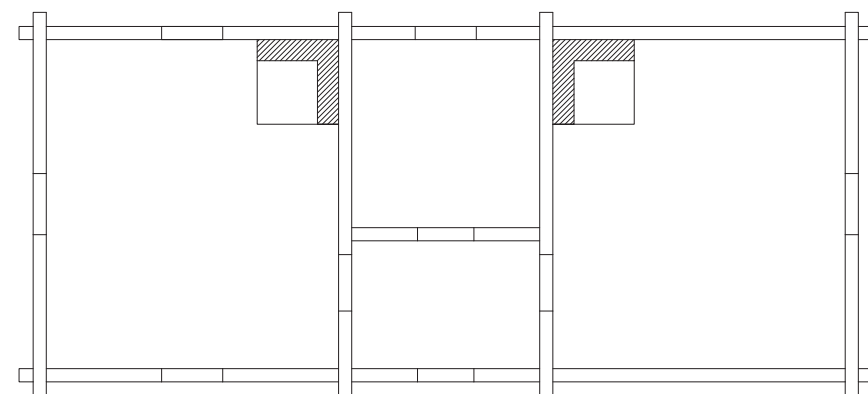
Corner joint  
Utknut: Dubbelhaksknut



Corner joint  
Utknut: Överhaksknut



Floor plan and structure of a traditional "enkelstuga"



Floor plan and structure of a traditional "parstuga"

## TIMBER CONSTRUCTION

Log timber constructions have been used in Sweden for at least a thousand years. Its prevalence and tradition are described by Finn Werne (1993), author of the book *Böndernas bygge*, who writes that timber houses have historically been the most common building method in Sweden and that its widespread use is largely due to the availability of the material and the simplicity of the technology.

### Material

Traditionally timber buildings are closely linked to the landscape and its local conditions since the material was derived from near forest areas. The broad variation of forest in Sweden has resulted in building techniques with regional differences, but the same principles of log hewing apply to all. Most log houses in Sweden are timbered from pine wood. Pine is usually straight-grown and relatively resistant to rot and is therefore a good material for timbering. Spruce is also used, but mainly in projects where durability is less important as the wood can easily twist and has a greater risk of rotting (Andersson, 2016).

### Structure

The timbering technique is based

on horizontally stacked wooden components where the walls are joined together and locked at the corners through carved notches. The construction, that to a large extent is based on these repetitive elements of wood, allows for disassembly and reassembly and the possibility to pre-produce the material and assemble it on site. Knots are used to lock the walls, and in between, holes are drilled vertically through the wall to attach a dowel that stabilizes the vertical alignment and prevents the wall from being deformed (Ivarson, 2014).

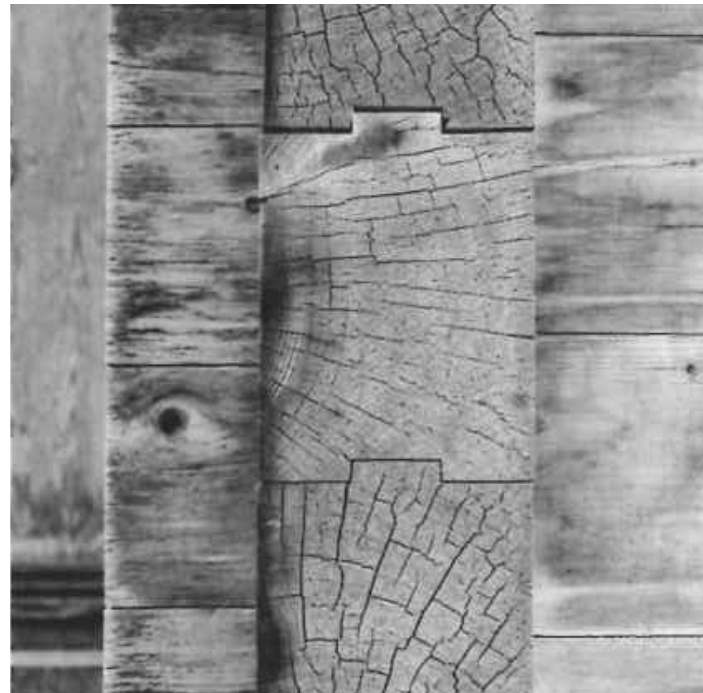
The massive timber walls together with the knots provide a stable construction that is load-bearing without the need for vertical stabilizing elements. This means that log houses are often assembled in rectangular units to maintain the load-bearing capacity, which provides special conditions for the floor plan. Because of this, and the dimensions of traditional timber log, the buildings have often been constructed long and narrow. A traditional timber single cabin, "enkelstuga" has dimensions of six by ten meters with rectangular distributions inside. The double cabin, "parstuga", increases in length, which gives knots in the corners but also along the facade, that comes from

the length of the log. Both traditional floor plans have a structural simplicity where function, construction and aesthetics come from the properties of the material.

### Knots

In the meeting of timber walls, various forms of knots are used to lock the construction. The expression of the knots and the log profile have changed over time but have in common that they expose the heartwood, which is the most resistant part of the wood, and that they allow assembly without mechanical fasteners (Ivarson, 2014).

Some of the most common knots are the dovetail joint and finger joint ("slätknutar"), which have good tensile strength by connecting them at the ends with interlaced "fingers" that give a smooth expression in the corner. The corner joint, "utknut", is also a common joint in log houses and means that the walls are overlapped at the corners and the logs are allowed to protrude a bit to create an aesthetic expression and an even stronger construction (Ivarson, 2014).



### Development

Technology and materials for log timber construction have continued to develop to meet today's demands for thermal insulation, load-bearing function, reduced settlement and renewed aesthetic expression. As mentioned above, the traditional building technique has been limited by the length of the log but also by its thermal insulation ability, which does not correspond to today's requirements. To meet these needs, laminated timber has been developed as an alternative, which broadly means that several lamellas of wood are glued together into a log. In relation to its weight, the construction becomes stronger and stiffer as its length consists of several assembled parts of core wood. Core wood in itself is the strongest part of the wood, and is therefore assembled into a unit that gives a better load-bearing capacity that can handle longer spans. Likewise, the material becomes slower for thermal transmittance, more resistant to settlement, and more fire-resistant. As a result, timber construction is given new conditions where modern dimensions and bolder design language can lead the development of timber buildings (Kontio, 2023).

Top: Photograph of modern timber log corner joint by Cecilia, F.M., Levene, R. (2021).





## PETER ZUMTHOR

The architect Peter Zumthor shows through his work that craftsmanship and construction are the core of architecture. His simple but clear treatment of materials, details and form conveys solidity, local connection, and presence.

In the mountains above Vals in Leis, at an altitude of 1500 meters, Peter Zumthor built three timber log houses. By using new design principles, Zumthor has incorporated modern elements into a traditional and local architectural style. The architecture becomes a tribute to traditions and the local culture, while adding a contemporary expression to the area.

Zumthor (2005) reflects on this project in the book *Thinking Architecture* where he places great emphasis on the tactile qualities that the solid timber log provides and how the material is constantly present.

The traditional use of timber has been reformulated into a new expression by using narrower dimensions of timber. Furthermore, the timber is used in a new way that can be read as straight and structured boards while retaining the logic and details from timber technology.

To achieve better thermal insulation, Zumthor works with massive double construction timber walls with insulation between. This new way of working with log timber has been an important reference for construction and how to reformulate the tradition of timber to today's requirements (Wood in culture association, 2007).

The thesis ambition, to connect existing character to the site and reformulate vernacular architecture into contemporary buildings, interacts with this project, which is therefore used as a reference throughout the project's process. In the architectural projects in Leis, Zumthor has placed the windows and doors in the wall in such a way that they are read as holes in the wall. He has also extended the timber corner knots longer than standard to allow them to frame a motif of the facade and to function as bay windows, balconies and seating areas. These idioms have been further formulated in our design proposal.

Haus Luzi by architect Peter Zumthor. Photograph and plan by Wood in Culture Association (2007).





## GION A. CAMINADA

Gion A Caminada is a Swiss architect and professor of architecture at ETH Zurich, who is well known for his work that is developed out of its context and gives it new life. He founded his office in the late 70s as he returned to his hometown Vrin, in Switzerland. Since then most of his realized work has been focused on his native region and the village of Vrin and its surroundings (Amy Frearson, 2014).

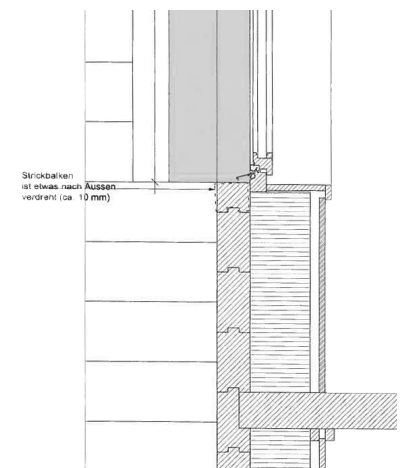
Caminada is known for his focus on tradition, culture and material. He is interested in local building traditions and how old building constructions can be translated into modern architecture. His aim is to combine traditional construction with modern detailing by using traditional local materials such as wood and stone (Amy Frearson, 2014) .

Like Zumthor, Caminada connects to the local context by exploring and translating traditional building techniques into contemporary architecture. His work is therefore used as a reference throughout the project's process.

The Project "Haus Walpen" shows how traditional timber construction can be translated into a modern reinterpretation by modifying the

detailing, for example using narrower dimensions of timber to get a more sleek expression. The log timber method is used to determine the structure and the materiality of the building and affects it's character. The project has been used as reference for its use of material with log timber walls that are visible at all times, inside and out.

Walpen House by architect Gion A. Caminada. Photograph and detail by Cecilia, F.M., Levene, R. (2021).









## GÅSEN

Gåsen mountain cabins are situated by the foot of the mountain "Gåsen", in the secluded high mountain landscape of Jämtland. They are located at an altitude of 1,100 meters and are thus one of Sweden's highest mountain cabins (Svenska Turistföreningen, n.d.-b). Because of its exposed and secluded position it has a strong value for the infrastructure and as a contribution to the possibility to experience the environment.

The existing building is owned and maintained by the Swedish Tourist Association [Svenska turistföreningen] and includes a guest building with self-catering, a cabin host building, a smaller cabin with a shop and an emergency shelter that is dog friendly. The quality of the buildings would need to be evaluated more in-depth, but as a first process it has been assessed to have varying conditions. Their exposure to the climate leads to faster aging and an increased need for care. The annex has been evaluated to be in poor condition with probable moisture damage and can rarely be used as its heating does not work.

The other buildings are older and with their solid materials have acquired a nice patina and are judged to be in good condition for continued use.





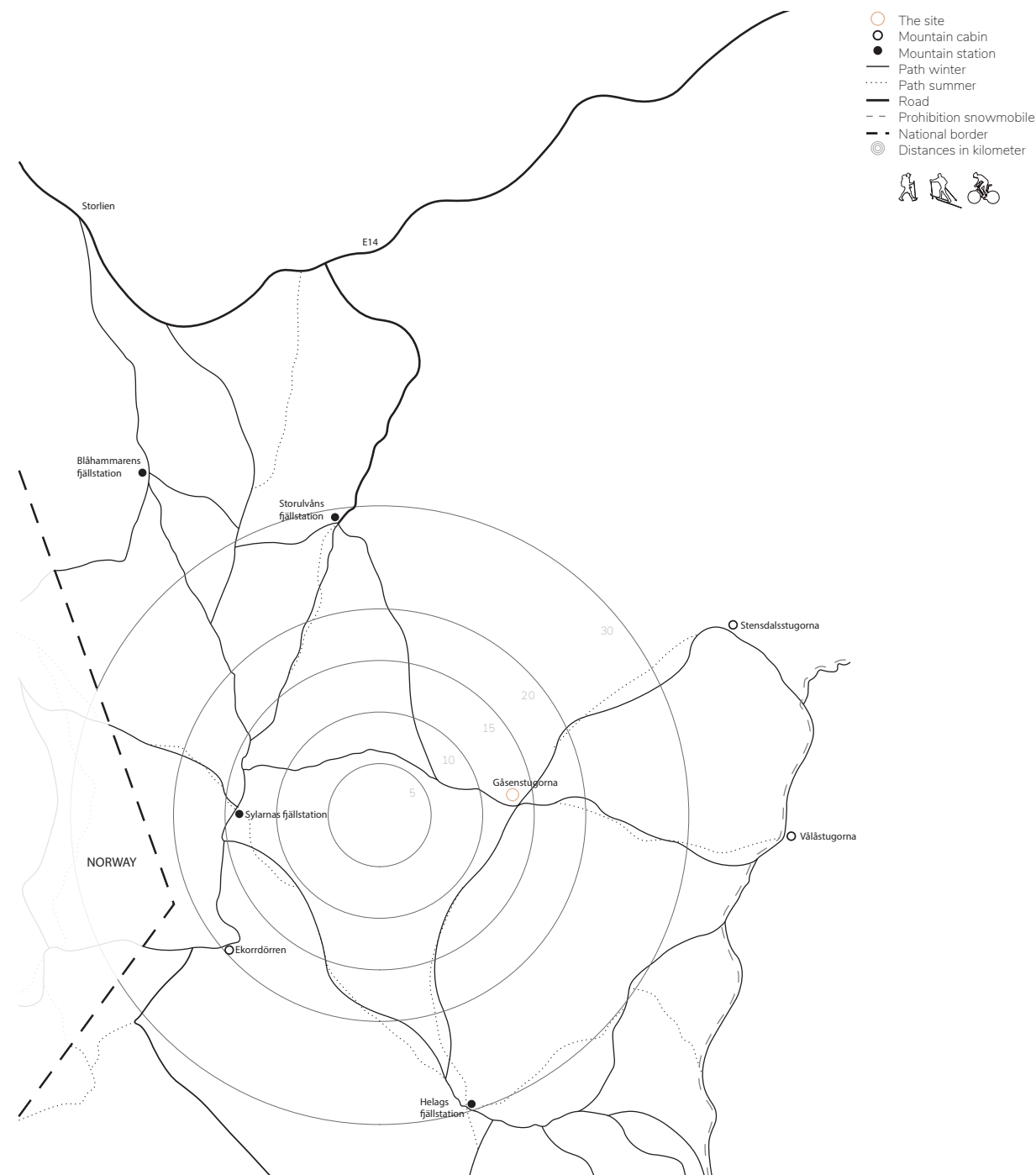
Photo of Gåsenstugorna



Photos from Gåsenstugorna, Jämtland. Top and bottom right: Eklund, 2022. Bottom left: Fredrik Schenholm, 2022.







## PATHS AND ACTIVITIES

Jämtland has a long tradition of travel. Pilgrims, farmers, scientists, health visitors and tourists have been on the move in the mountain landscape throughout history. Health tourism, which in the Swedish sense is called “Luftgäst”, came from the desire to get clean air and beautiful nature as a form of therapy (Loock, 2010). Today’s increasing mountain tourism seeks the high mountain landscapes for the same reason and to vacation in a more sustainable way (Svenska Turistföreningen [svenskatouristforeningen.se], 2018).

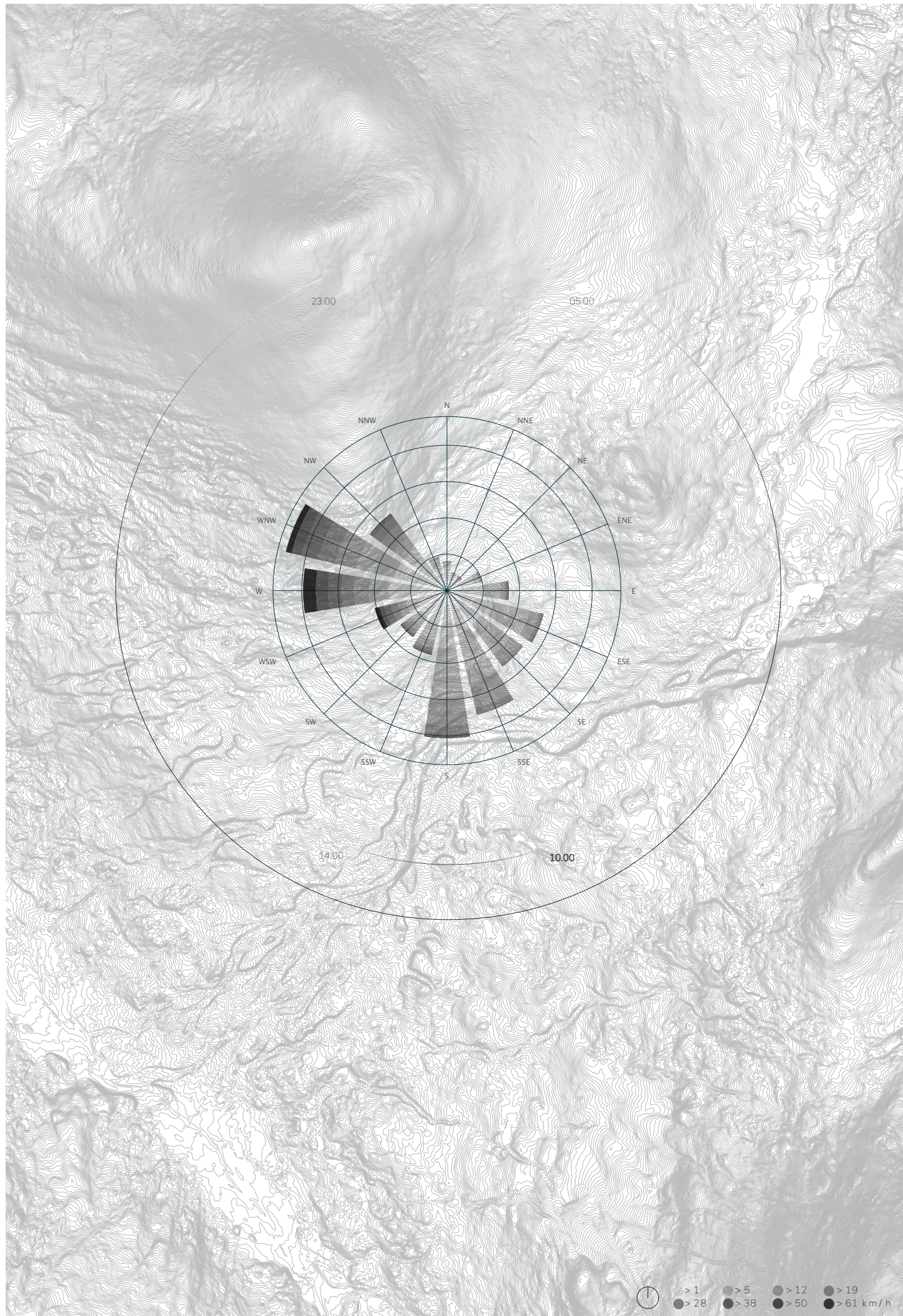
Trails have helped form human mobility patterns and have been crucial in making nature accessible and maintaining tourism as a business (Godtman Kling et al., 2017). In Jämtland there are several trails that are connected with long distances between start and finish point. The different types of accommodations therefore have an important function as protection and place of rest between long journeys.

Gåsen mountain cabins work as a hub between four main trails and can with its secluded position only be reached by hiking, skiing or mountain biking. In order to protect natural values and reindeer husbandry, a large part of

the surrounding area is prohibited for snowmobiles for the public. Other variants of off-road driving are regulated so that it is permitted for deliveries to a limited extent and with a seasonal limitation (Naturvårdsverket, 2022).

Map of paths in the area





## SITE ANALYSIS

The mountain landscape of Jämtland is to a large extent affected by immense wind speeds because of the high altitude and the lack of vegetation. In the valley of the landscape even stronger winds can occur which highly impacts Gåsen mountain cabins due to its location (smhi, 2021).

The wind rose presented shows data from Sylarna which is the closest weather station, situated 16 kilometers from Gåsenstugorna. The mountain station in Sylarna has a relatively weather-protected location, while Gåsen mountain cabins are positioned in the open mountain landscape with lack of protective elements. As a result, it can therefore be assumed that the winds may be even stronger for the project location than the statistics from the diagram.

The most common wind directions during winter are from south and southeast, and as a result the movement of the snowdrift is mainly towards west and northwest. The summer winds are generally stronger than the winter winds and come from northwest (meteoblue, n.d.).

Wind rose, Sylarna. Data from meteoblue (n.d.).

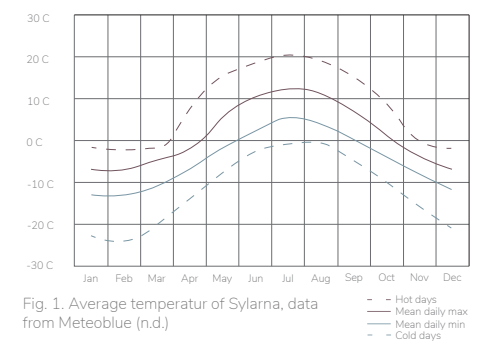


Fig. 1. Average temperature of Sylarna, data from Meteoblue (n.d.).

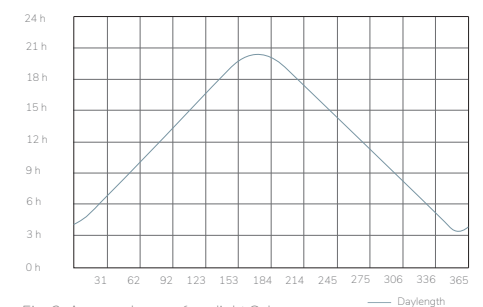


Fig. 2. Average hours of sunlight Sylarna, data from SMHI (2011).

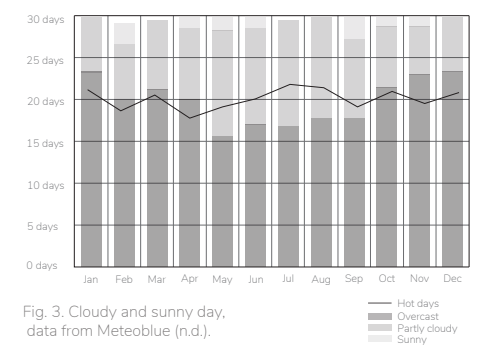


Fig. 3. Cloudy and sunny day, data from Meteoblue (n.d.).



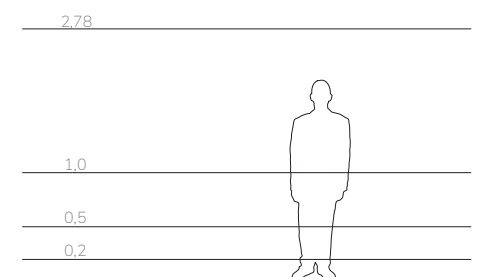
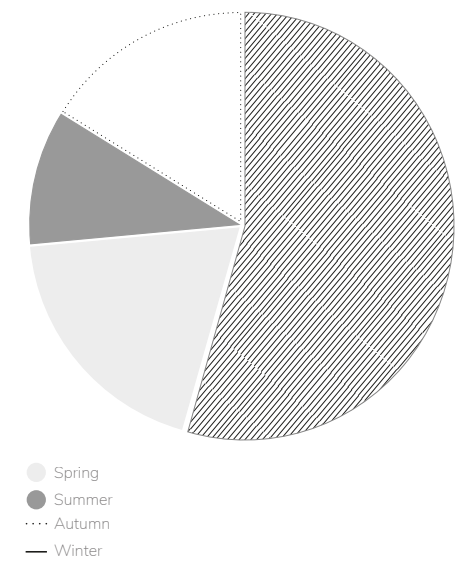


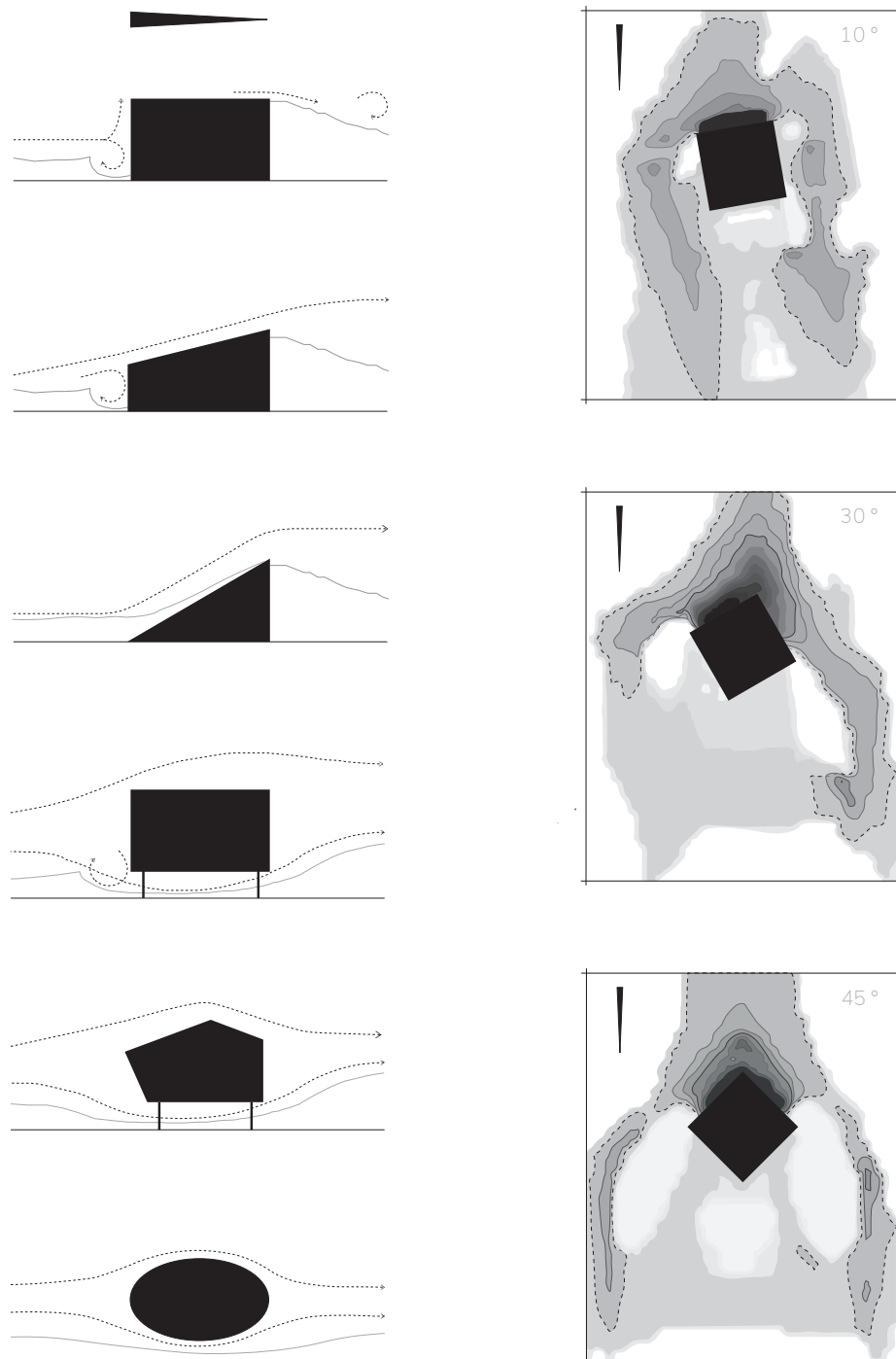
## WEATHER AND SEASONS

Jämtland's climate is largely influenced by its geographical location with proximity to the Atlantic and with a narrow outlet to Norway from Jämtland, that does not consist of particularly high mountains (smhi, 2021). This is most evident during the winter months where low pressure from the west is intense and as a result the precipitation is high close to the national border. The average annual amount of precipitation is over 1100 mm and the greatest snow depth of the area has been measured to 2,78 meter (smhi, 2009). The large amount of snow together with strong winds cause snowdrifts which can result in that the buildings on the high mountains become covered by snow, and thus inaccessible and lose their function as landmarks and protection. Existing buildings by Gåsen today face this problem where entrances, and sometimes entire facades, become completely covered in snow.

The seasons in Jämtland are also influenced by its northwestern location where meteorological winter is long with an average beginning in October and ending in April. As a result, the other seasons, and foremost the summer, become shorter (smhi, n.d.)

Photograph of Gåsen mountain cabins (Eklund, 2022). Processing of statistics from the seasonal maps by SMHI (n.d).





## SNOWDRIFT

It is necessary to understand the fundamental features of the climatic conditions of the site in order to predict how architecture will influence and be influenced by the environment. To create climatically suitable design, climatic factors of wind and snow are studied (Børve, 1989).

Unlike nature that is constantly changing, architecture is a static addition in the landscape that affects its environment and the diverse climatic factors. A vertical addition in the natural landscape changes the direction of the wind which in its turn affects the snowdrift that can create unwanted situations. The shape and the direction of the building is therefore crucial to evaluate in order to create a climatically adapted design (Børve, 1989).

From the diagrams on the left, it can be deduced that an uplifted and low building in combination with an angle towards the wind creates a smooth wind movement around the building and naturally snow-cleared areas are created in the wind direction.

Left: General wind and snowdrift simulation based on different building volumes. Right: Snowdrift and snow accumulation around an object based on different incidence angle of wind.

## TRANSLATING THEORY INTO DESIGN

In order to interpret theory into a design proposal, a collection of design strategies has been formulated as a basis for design. Each design strategy has been evaluated and practiced in the sketch process to result in a design proposal that takes climate, culture and local conditions into account.

### Building traditions

The study of local vernacular architecture and contemporary references have been translated into our design.

Given the properties and limitations of timber log construction we have formulated new rules for the construction and idiom of our project. The log timber determines the structure of the building and the details are formulated into contemporary design to create a new expression.

### Climate

The study of the conditions of the area have been formulated into design strategies to adapt to the harsh climate. Low building volumes, lifted structures and angled volumes towards the wind are strategies to cope with the challenges.

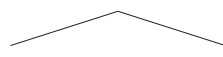
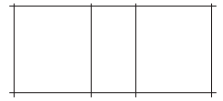
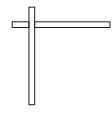
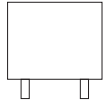

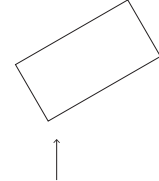
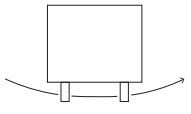
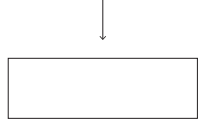
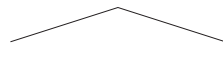


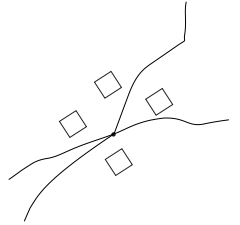
### Location

In order to create a site-specific design, we have related to the surrounding landscape and existing buildings. This is done by relating to materiality, form and position.

### Design strategies

Through our design we investigate how traditional buildings methods can be used and developed in order to adapt to the specific conditions of the context.

## DESIGN STRATEGIES

BUILDING TRADITIONS	 Gabled roofs	 Timber construction	 Detailing: timber knots	 Raised foundation
CLIMATE	 Low pitched roof to facilitate wind movement over the building	 Building volumes angled towards the wind to provide natural snow removal	 Lifted building volumes that allows wind movement underneath to remove snow	 Low ceiling height to generate efficient heating and reduce wind resistance
SITE	 Gabled roofs that refers to the existing buildings	 A low and long building that interacts with the expanses in the landscape	 Framed views	 Gathering around the junction



## FUNCTIONS AND SPACE

	BLÅHAMMAREN STF Mountain Station	SYLARNA STF Mountain Station	TUNGESTOLEN DNT Mountain Station	HELAGS STF Mountain Station	EXT. GÅSEN STF Mountain Cabin	NEW GÅSEN Mountain Station	
CONTEXT RELATION	accessibility	foot ski mountain bike	foot ski mountain bike	foot ski mountain bike snowmobile	foot ski mountain bike	foot ski mountain bike	
	seasonal use	23 feb - 23 apr 15 june - 1 oct	16 feb - 23 apr 15 june - 1 oct	june - october	23 feb - 23 apr 15 june - 1 oct	24 feb - 23 apr 22 june - 17 sept	mid feb - end apr mid june - beg oct
APPEARANCE	building volumes	4 1 main building 2 annexes 1 staff	3 1 main building 1 annex 1 staff	9 1 main building 3 annexes 5 cabins	7 1 service building 6 annexes	3 2 guest 1 staff	3 new 1 main building 1 replaced annex 1 staff 1 new plan layout
	QUANTITY	total beds staff restaurant seats	64 10 75	120 10 60	40 44	78 8 50	52 2 90
FUNCTIONS	restaurant	X	X	X	X		X
	self cooking	X	X		X	X	X
	private cabins			X			
	tent area	X	X		X		X
	fireplace	X	X	X	X	X	X
	shop	X	X		X	X	X
	drying room	X	X		X	X	X
water toilet	X	X	X	X		X	
AREA	total area	1050	2135	400	1280	385	1200

The biggest need on site today is more bedrooms due to the increased number of visitors and the fact that the annex is out of use. As a result, functions such as expanded areas for shop, restaurant and functions for staff are needed.

The main building is added to accommodate more guests, restaurant and additional functions. This building

accounts for the largest part of the transformation from mountain cabin to mountain station.

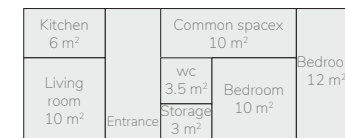
The existing annex is replaced by a new building that houses the same functions and is built on the same plinth foundation. A separate building for staff will also be added to the site to provide them with private areas and space for relaxation.

Existing building for shop and staff is transformed internally to one part long-term storage of food and other articles, and to the other part technical functions such as compost machine, recycling and a generator as a backup function.

All new buildings need a durable, long-term and as maintenance-free construction as possible.

## Background

## PROGRAM



Main building	m²	Annex	m²	Staff building	m²
Reception	6,0	Drying room	8,0	Living room	10
Bar	7,0	Living room	18	Kitchen	6,0
Lounge	33	Kitchen	18	Common spaces	10
Restaurant	80	Bedroom	10	Bedroom	10
Kitchen	66	Bedroom unit	110	Bedroom site manager	12
Dish room		Privy	20	Storage	3,0
Storage Kitchen				Toilet	3,5
Storage					
Garbage room	8,0	Guest house		Storage building	
Technical room	5,0	Existing			
Cleaning room	4,0			General storage	40
Laundry room	6,0			Technical room	48
Shop	9,0			Compost machine	
Showers	15			Hydraulic waste press machine	
Toilets	12			Diesel generator	
Coatroom	7,0				
Drying room	7,0				
Bedroom	14				
Bedroom unit	136				
Storage bar	5,0				
Staff functions	6,0				

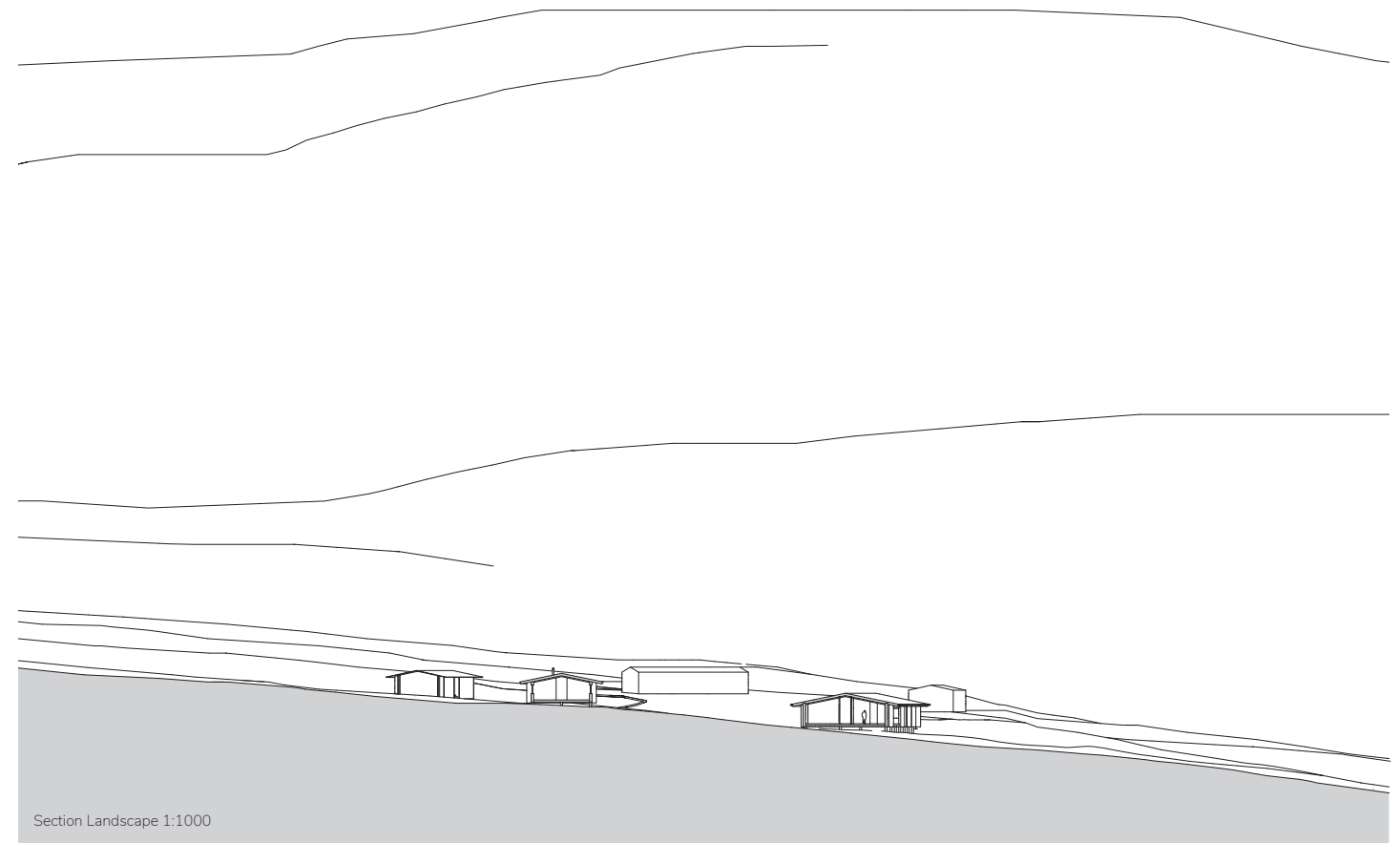
# DESIGN PROPOSAL





Gåsen mountain station

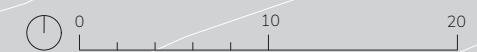






Site plan 1:400

- 01. Main building
- 02. Annex
- 03. Staff building
- 04. Storage | Garbage disposal
- 05. Guest house, dog friendly
- 06. Privy

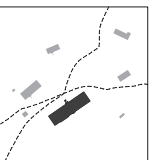
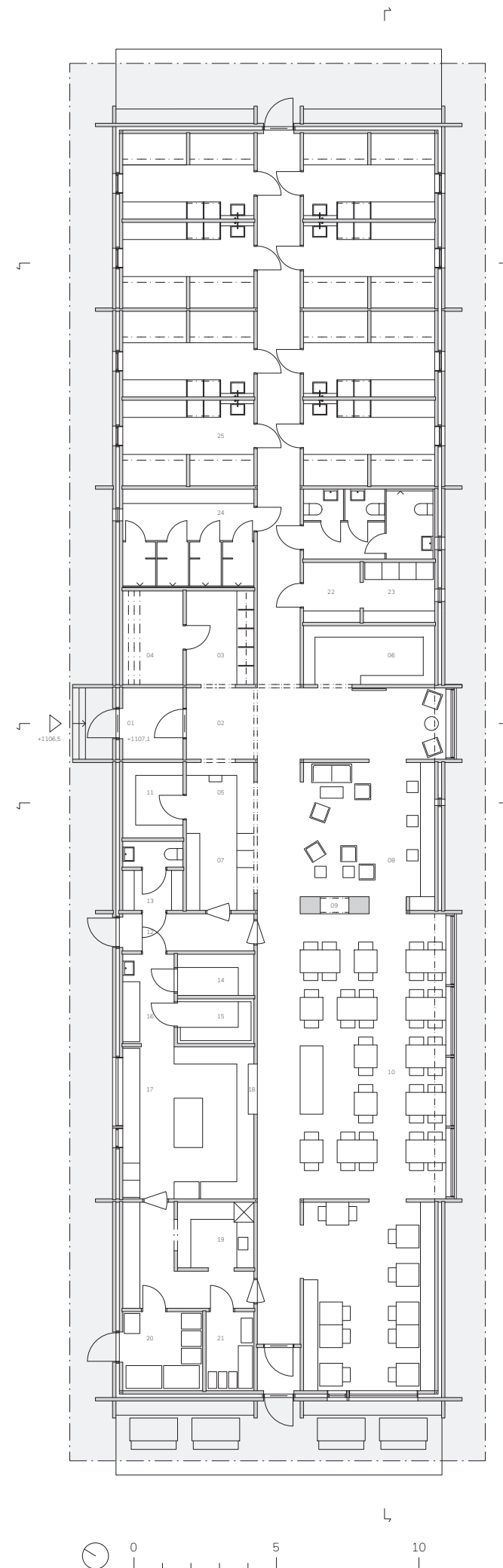


Outdoor shower 20 m



Plan 1:200

- 01. Vestibule
- 02. Entrance room
- 03. Coatroom
- 04. Drying room
- 05. Reception
- 06. Shop
- 07. Bar
- 08. Lounge
- 09. Fireplace
- 10. Restaurant
- 11. Storage
- 12. Staff Entrance
- 13. Staff cloakroom
- 14. Pantry
- 15. Fridge
- 16. Scullery
- 17. Restaurant kitchen
- 18. Serving hatch
- 19. Dish room
- 20. Garbage room
- 21. Technical room
- 22. Cleaning room
- 23. Laundry room
- 24. Shower room
- 25. Bedroom of four guests





## MAIN BUILDING

The main building is an elongated volume that follows the horizontality of the landscape, and is placed at the meeting of the paths, with an unobstructed view of the open landscape.

The sequences of the facade, formed by extended timber knots, provide a variation in the encounter of the building and form frames for seating areas, bay windows and sheltered entrance situations. The main entrance is marked in the facade with oversized corner knots that provide a snow-free zone and a clear entrance. The door has a small window opening to give a view through the building and to be able to locate oneself better.

Once inside the building, past the vestibule, a direct view of the landscape outside and a glimpse of the warmth of the lounge is given. Here, the tactility of the wood and the beauty of the knots, which make up the entire construction, are also present and as an extension of the facade. To the right, through an opening, you are welcomed by a receptionist and can then go to the coatroom and drying room, or as a guest in the annex, receive your key to then get to that building without having to go far into the main building.

Near to the reception, to be easily accessible to all buildings, there is a shop where supplies can be purchased. In the lounge, the focus is directed to the fire and a warm and intimate feeling is given. The bar, which is an extension of the reception to reduce staffing needs and area, is reached with direct contact to the lounge to create a natural connection between guest and staff.

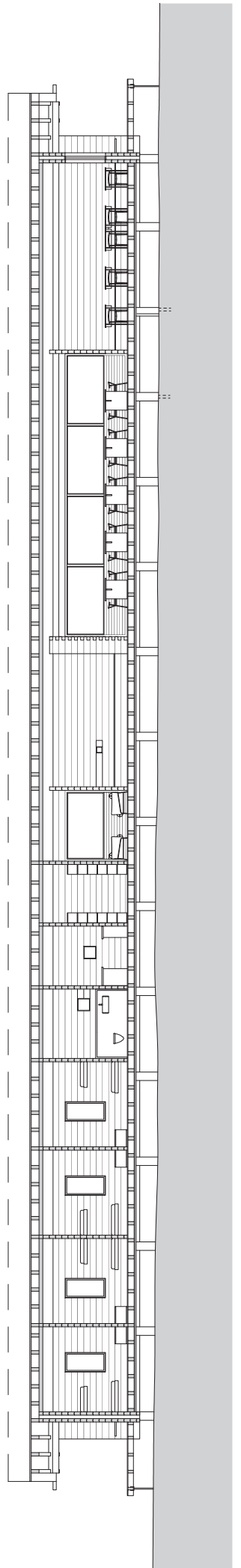
The restaurant, which is an extended sequence of the lounge, contrasts with the lounge's inward focus and opens to the outside with generous horizontal views over the mountain peaks. With views over the trails and the largest stations within the Jämtland triangle, guests can exchange conversations here about today's and tomorrow's adventures. An opening in the longitudinal timber wall provides an insight into the kitchen and a place to collect your hot food. Side dishes are served in front of a bar.

The building is extended by an outdoor space, which functions as a meeting place and extension of the building's social areas. Here you can sit down on the stretched benches along the facade and be protected from the wind with the help of the extended knots. In case of harsh weather conditions

and large accumulations of snow, the entrance via the outdoor area can function as an alternative entrance to the building.

The bedrooms are placed at the other end of the building to create tranquility but also so that guests can arrive and directly get to their room without having to pass through social areas where previous guests have landed and found rest. Each bedroom is planned for four guests but with deeper lower beds to be able to function flexibly for couples or families. In the room, emphasis is put on the tactile experience of solid wood where the material is present throughout. The beds are attached between the timber walls and on the other side is a functional wall with first a sink, then shelves for simple and temporary storage that ends in a bench with light and views through the window.

As a complement to the guests, there are shower rooms and toilets that are in the middle of the building to be accessible from all functions and guests.







Entrance room

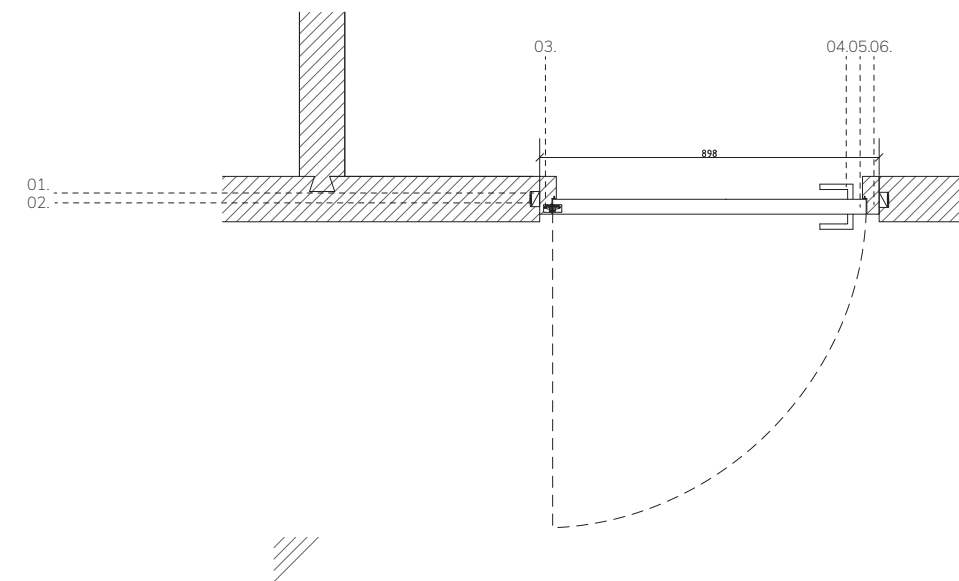


Bedroom





Detail interior door 1:20



- 01. Dowel to prevent settlements around the door
- 02. Sealing strip for increased comfort
- 03. Concealed hinge to give a seamless expression
- 04. Forged door handle for a solid expression with a connection to tradition
- 05. Door leaf in solid oak
- 06. Door frame in oak without door lining that is mounted further into the wall

“There is a special feel to living in a room of solid joined beams, a room that is not simply clad in wood but made of wood through and through”  
 Peter Zumthor, Wood in Culture Association (2007).





Framed view

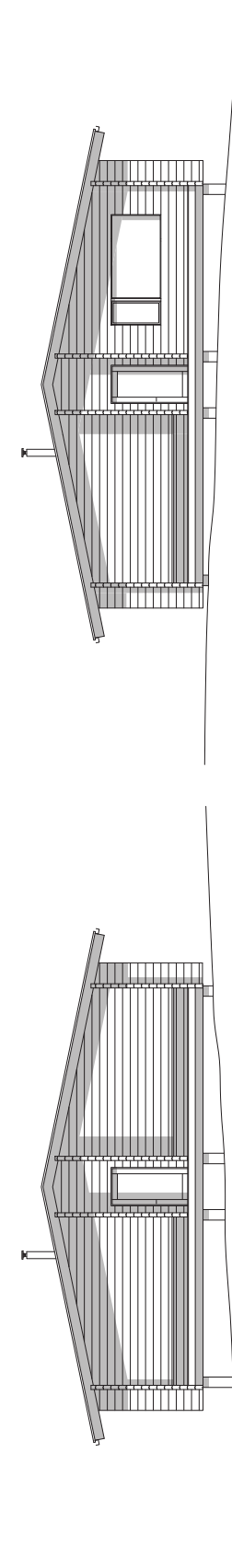
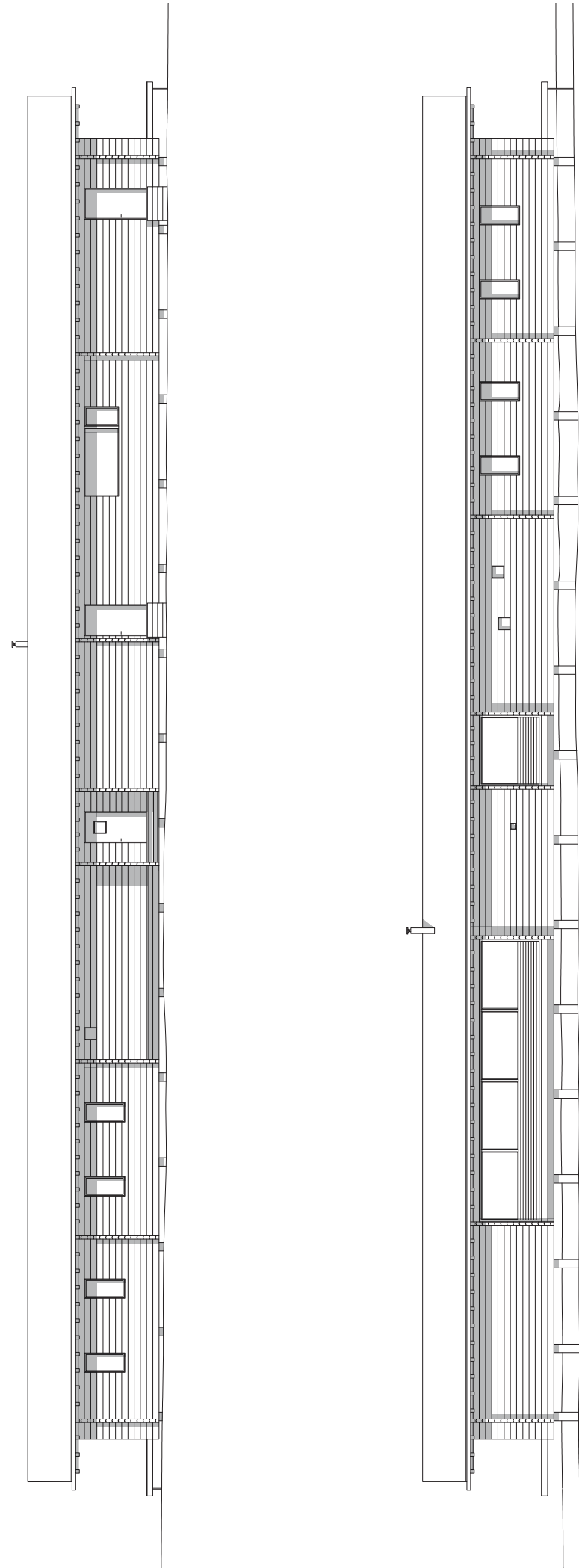


Lounge



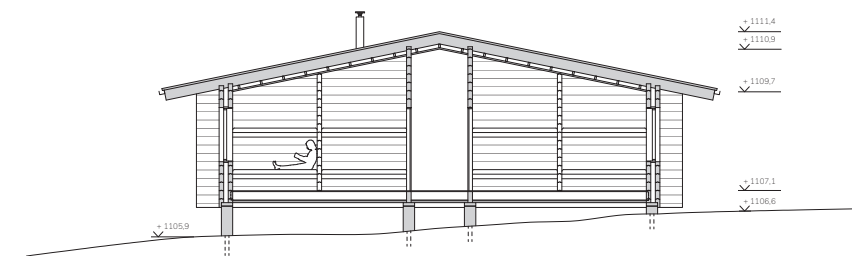
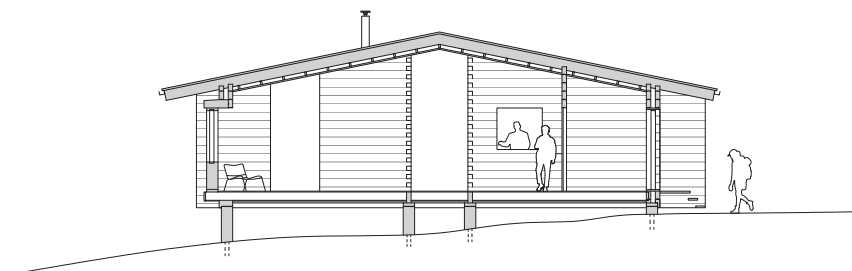
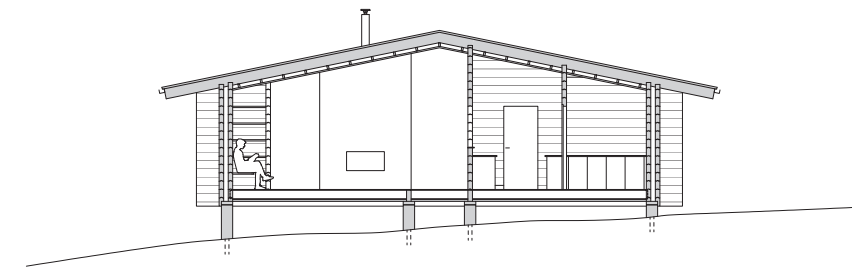








Facade gable



+1111.4  
+1103.9  
+1109.7  
+1107.1  
+1106.6

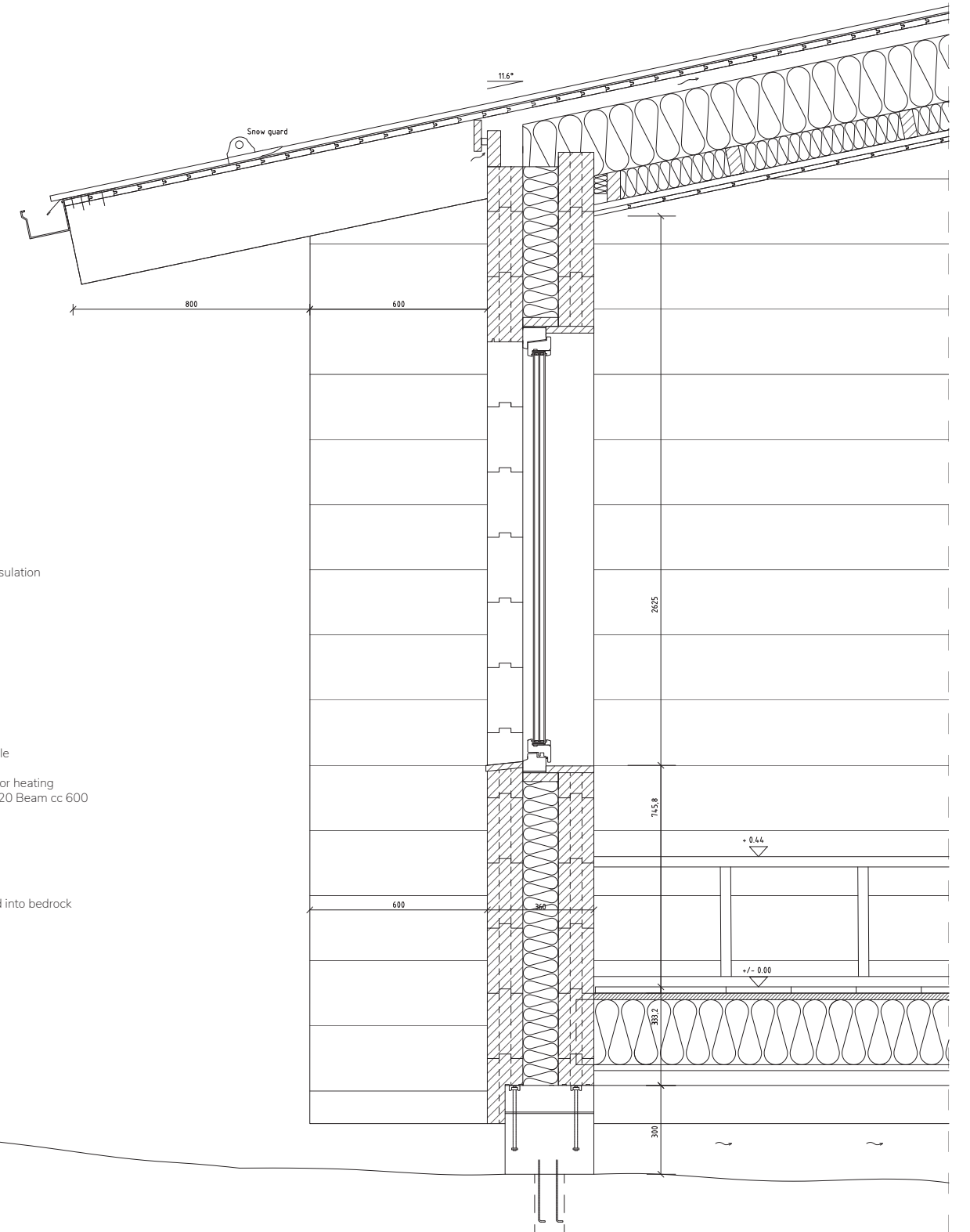
Sections 1:200







Facade elevation



Technical section bedroom 1:20

Roof  
 Corrugated roofing sheet  
 Underlayment  
 20 Tongued and grooved board  
 120x270 Beam cc 600 | 220 Insulation  
 22x95 Rule | 95 Insulation  
 15x120 Woodpanel, Maple

Wall  
 120 x 220 Laminated log, Pine  
 120 Cellulose Insulation  
 120 x 220 Laminated Log, Pine

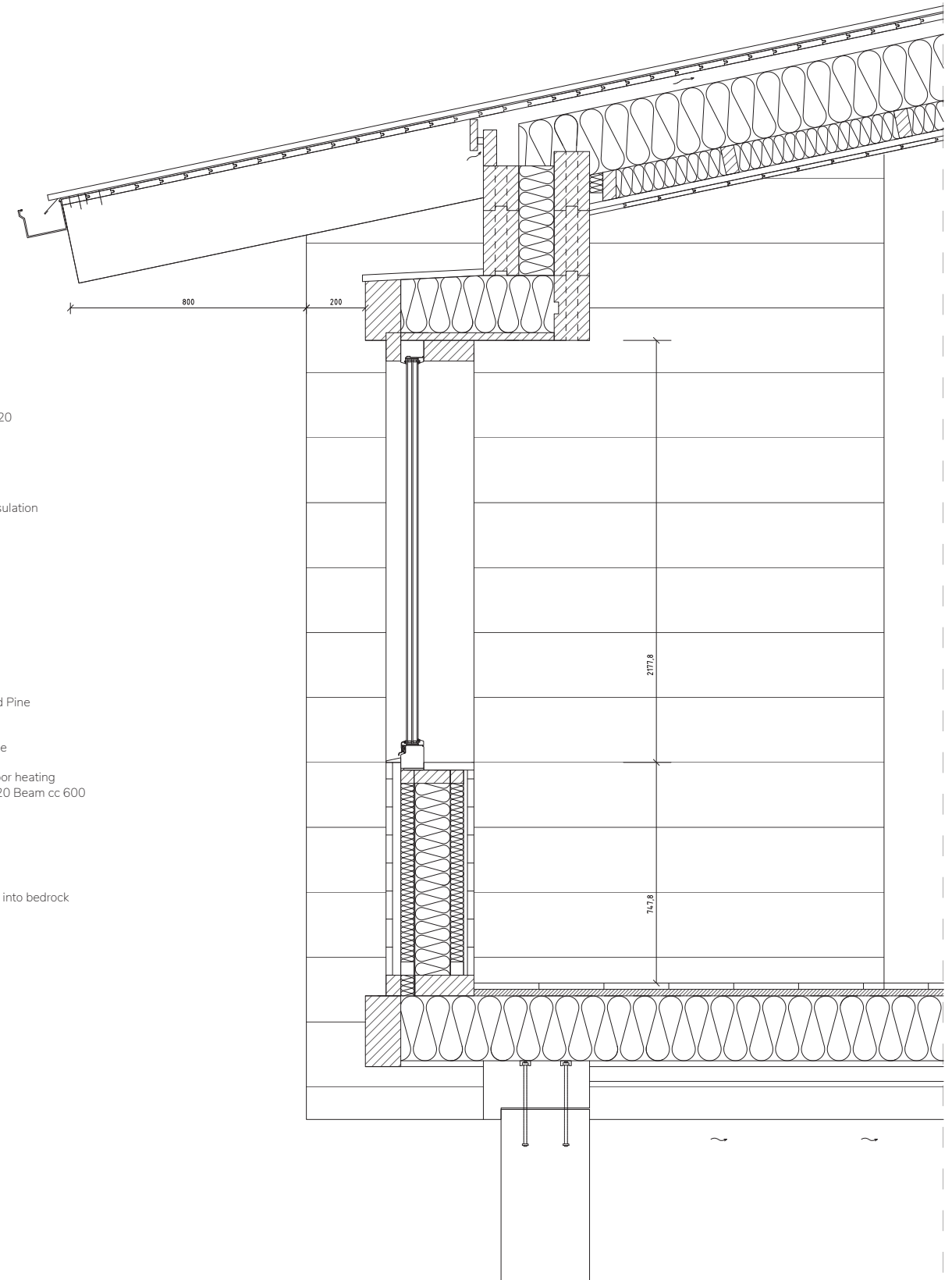
Floor  
 22 x 120 Solid Wood Floor, Maple  
 0,2 Vapour barrier  
 22 OSB with integrated under floor heating  
 220 Cellulose Insulation | 45 x 220 Beam cc 600  
 20 Minerit  
 50 Insulation board

Ground  
 Open plinth ground  
 300 x 300 Plinth cc 3000, drilled into bedrock





Facade elevation bay window



Technical section bay window 1:20

Roof  
 Corrugated roofing sheet  
 Underlayment  
 20 Tongued and grooved board  
 120x270 Beam cc 600 I 220 Insulation  
 22x95 Rule I 95 Insulation  
 15x120 Wood panel, Maple

Wall  
 22 x 95 Panel, Core wood Pine  
 28 x 45 Rule  
 45 x 45 Rule I 45 Insulation  
 4 Wind protecting board  
 120 x 45 Rule I 120 Insulation  
 45 x 45 Rule I 45 Insulation  
 13 Board  
 22 x 95 Interior panel, Core wood Pine

Floor  
 22 x 120 Solid Wood Floor, Maple  
 0,2 Vapour barrier  
 22 OSB with integrated under floor heating  
 220 Cellulose Insulation I 45 x 220 Beam cc 600  
 20 Minerit  
 50 Insulation board

Ground  
 Open plinth ground  
 300 x 300 Plinth cc 3000, drilled into bedrock

01. Laminated log timber 120 x 220 for longer spans, durability and to eliminate settlement in the house

02. A simple and wide milling of 40 x 15 for a stable construction and a modern expression that gives the walls the appearance of panels rather than separate elements

03. Cellulose insulation for air tightness, good heat capacity and natural convection

04. Under floor heating for invisible interior heating

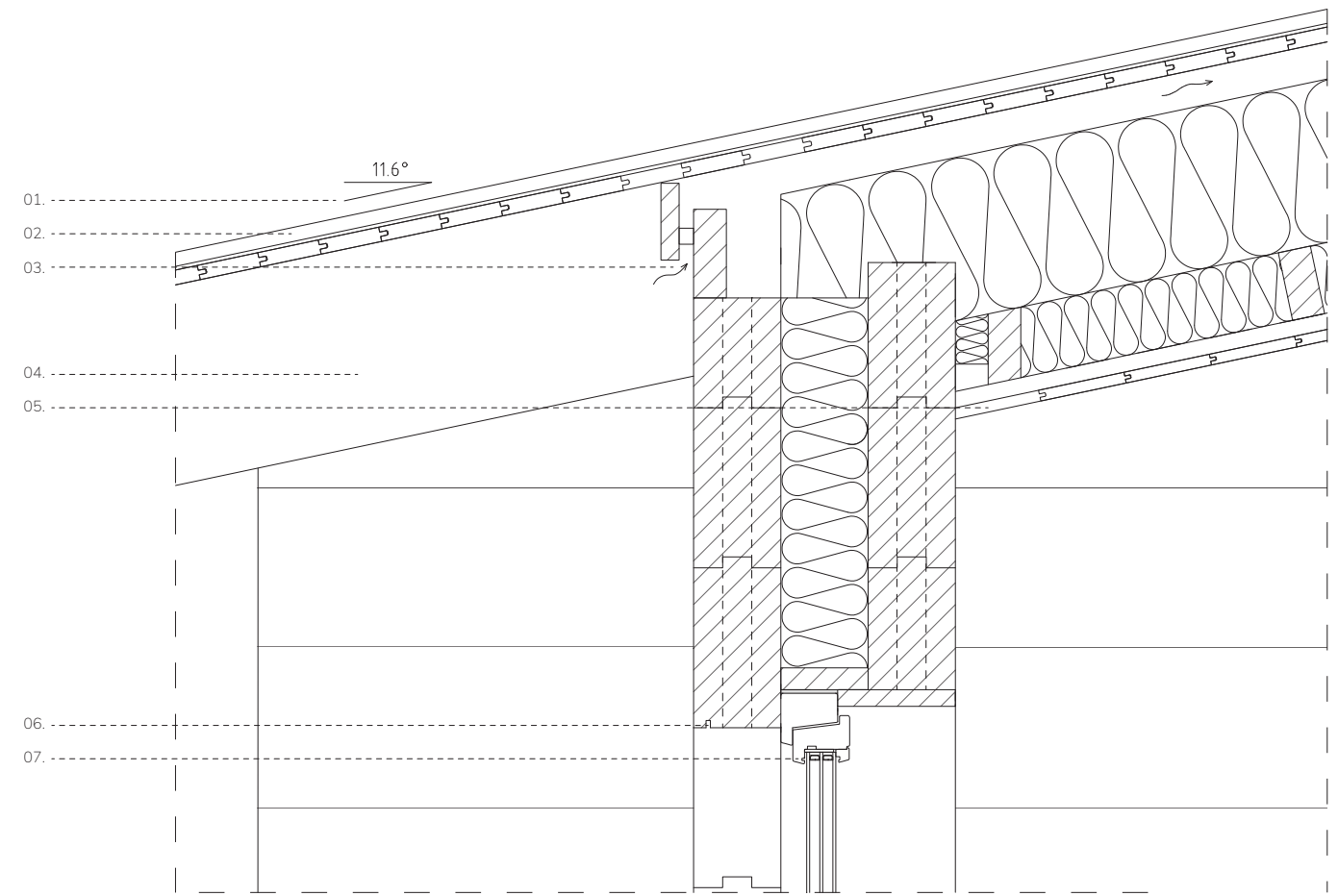
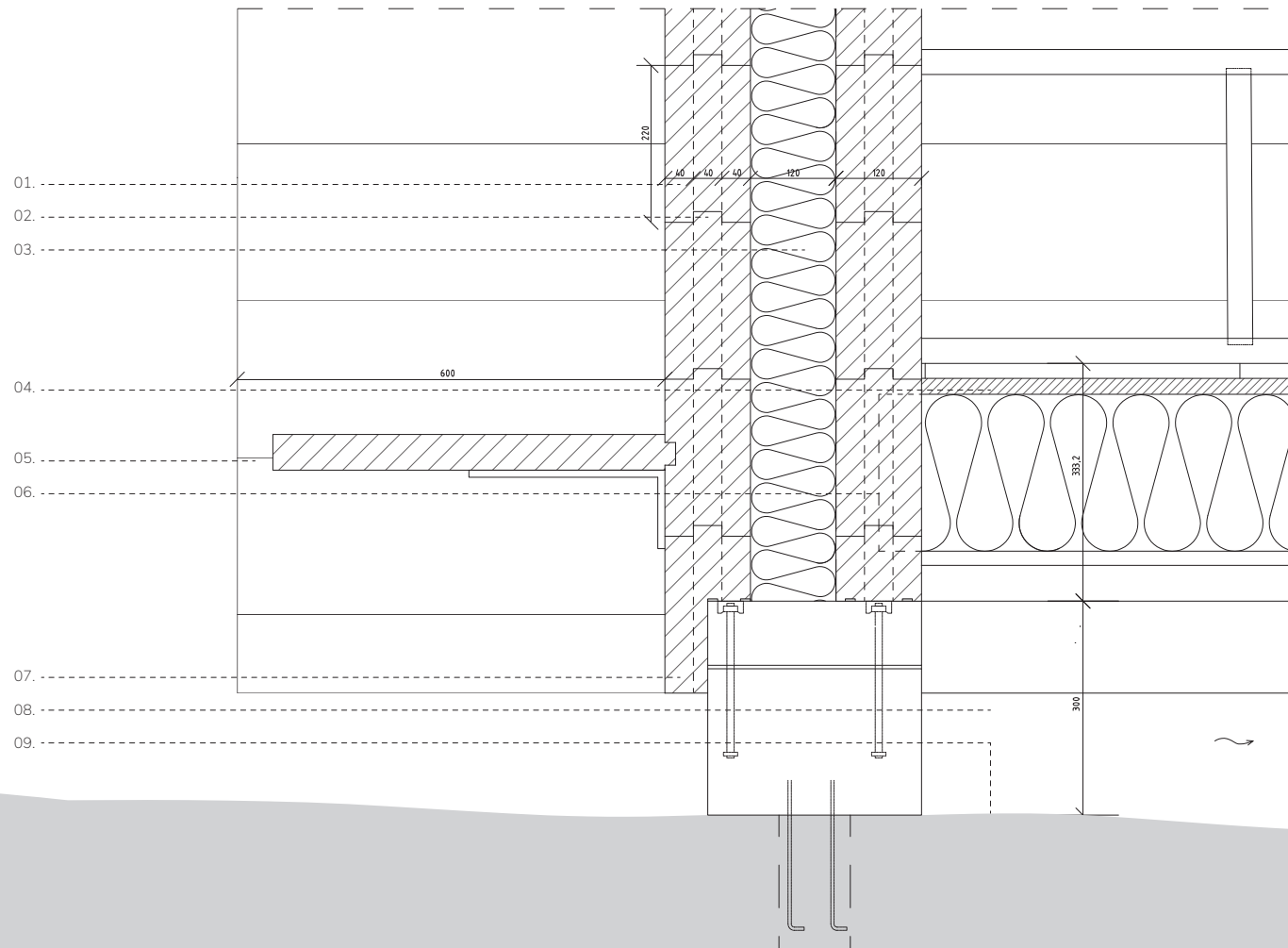
05. Extended dimension on corner joint for facade expression and to create sequences of places in lee along the facade as well as for temporary storage of skis

06. Seamless joint of beams attachment to the wall

07. Milled log that hides part of plinth

08. Open plinth ground to enable natural snow removal by wind and to minimize the impact on the ground surface

09. Gravel for drainage



Detail Roof 1:10

01. Roof with 11,6 degree slope to enable smooth wind movement over the building and aesthetically agree with existing buildings on the mountain

02. Corrugated sheet roof for a lightweight and durable construction that can withstand adverse weather conditions and eliminate water accumulation, with low maintenance and clear visibility from distance

03. Air gap with cover piece in pine at the front

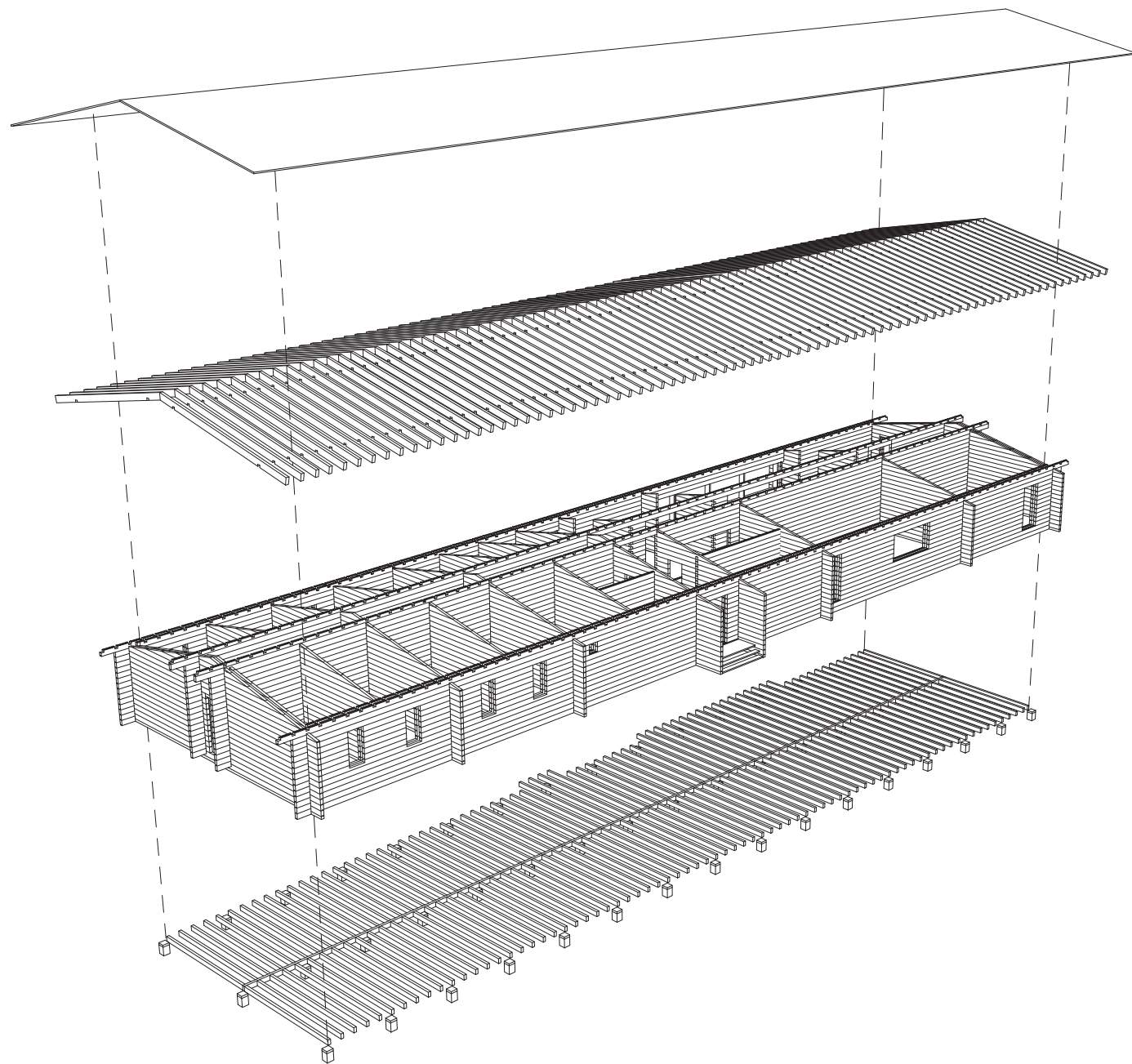
04. Roof beams to support roof overhang and with visual visibility to aesthetically connect with local building traditions

05. Panel 15 x 120 in maple in direction with the length of the building to create a harmony with the walls

06. Milled groove in log to prevent moisture migration further in

07. Window frames in oak with timber in facade exceeding 46 mm to create the expression of narrow window frames and holes in the wall





## STRUCTURE

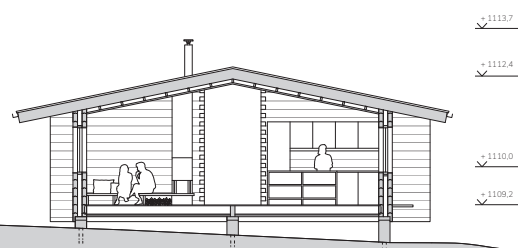
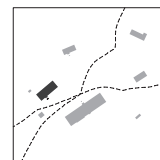
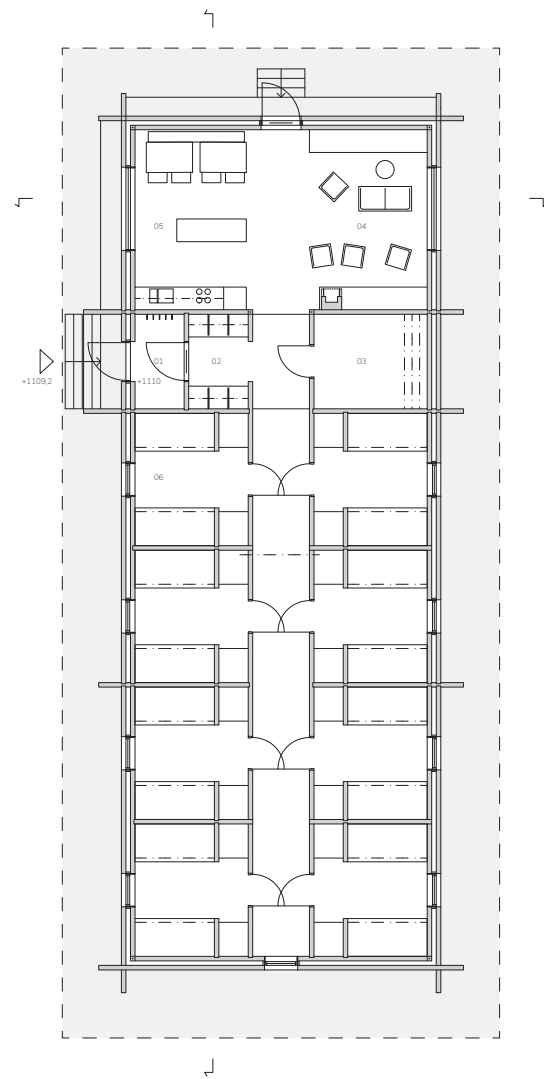
The timbering technique is based on horizontally stacked wooden components where the walls are joined together and locked at the corners through carved notches. The massive timber walls together with the knots provide a stable construction that is load-bearing without the need for vertical stabilizing elements. The structure can be derived from the traditional cabin, "enkelstugan" and "parstugan". To meet today's needs, laminated timber has been developed as an alternative, which broadly means that several lamellas of wood are glued together into a log. In relation to its weight, the construction becomes stronger and stiffer as its length consists of several assembled parts of core wood that gives a better load-bearing capacity and can handle longer spans. Likewise, the material becomes slower for thermal transmittance, more resistant to settlement, and more fire-resistant (Kontio, 2023). As a result, timber construction is given new conditions where modern dimensions and bolder design language can lead the development of timber buildings.

Timber construction determines the structure of the buildings but new rules and details have been constructed to find the interrelation between

nature and culture. The structurally fundamental but also expressive knots become an important element for managing the climatic conditions at the site. In that manner, our design proposal can be distinguished from the traditional typologies in its way of adapting to the conditions of the site but its basic elements are drawn from the tradition.

Plan 1:200

- 01. Vestibule
- 02. Entrance room
- 03. Drying room
- 04. Living room
- 05. Self catering kitchen
- 06. Bedroom of four guests



## ANNEX

The Annex is placed on the same position as the existing building today, in close relation to proposed main building and further up in the landscape to enable views of the landscape.

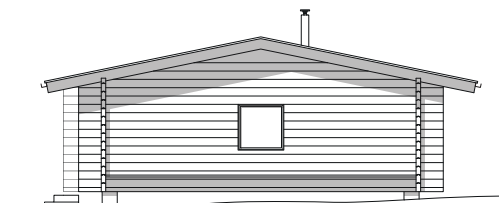
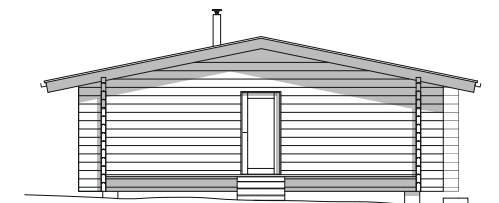
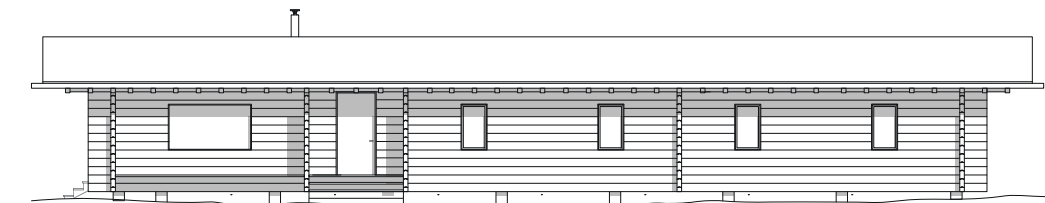
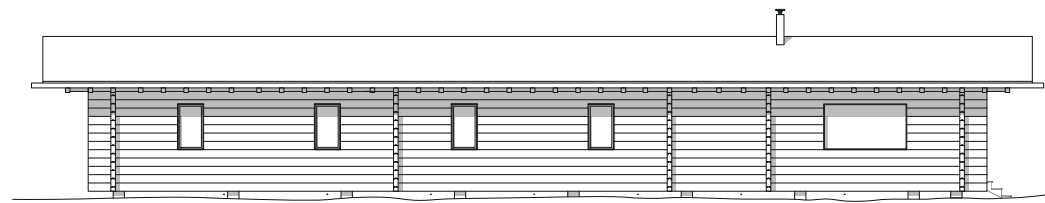
Similar to main building, the annex builds upon the concept of timber structure with extended corner joints that functions for different purposes.

Annex builds upon the same floor layout as the main building, where the entrance is centrally placed and divides the social and the private functions from each other. This type of accommodation is of a more simple character, and provides self-catering and privy.

The bedroom is more compact in its layout and is planned for four to six guests.





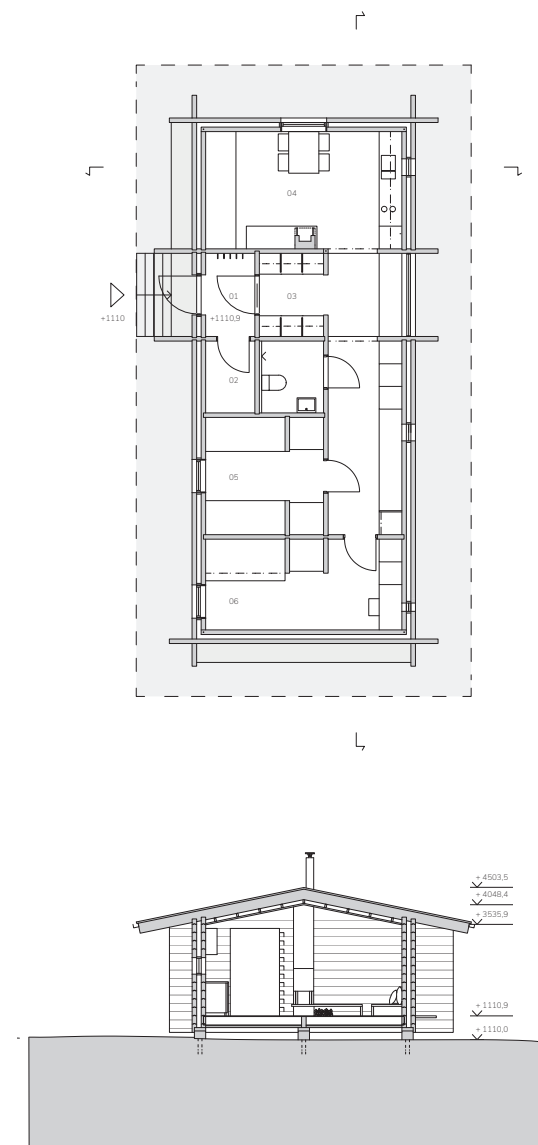


## STAFF BUILDING

With the development of the mountain station that can accommodate more guest, the need for an increased number of staff is required.

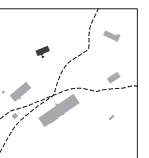
The staff building is located higher up in the landscape to achieve a distance to other guest buildings, and create a private feeling. Staff at Gåsenstugorna works seasonal, up to four months at a time, and privacy is therefore needed.

The expression of the building is consistent with the other buildings in both plan layout and exterior design. Site manager, which stays for longer periods, has been given its own bedroom with space for sleep, work and rest. The other staff share bedroom. Sequences of functions are placed between the joints along the long facade of the building. Its flexibility enables places for different activities such as cooking, place for reading and working,.



Plan 1:200

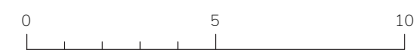
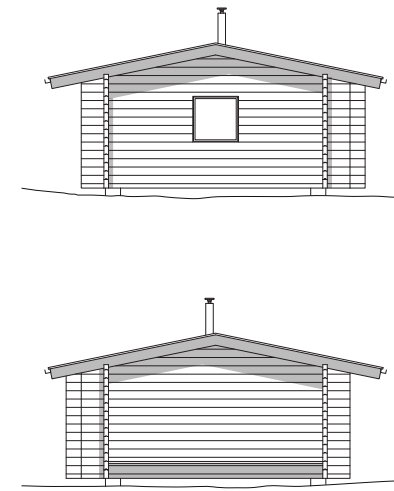
- 01. Vestibule
- 02. Storage | Technical room
- 03. Entrance room
- 04. Living room | Kitchen
- 05. Bedroom
- 06. Bedroom site manager







Scale 1:200



## CONCLUSION



## ON UNIFYING DESIGN AND CONTEXT

This thesis' aims to investigate the relationship between design and context in regard to local traditions in the Swedish mountain area. This is conducted through the design of a mountain station as a development of the existing Gåsenstugorna in the mountains of the southern Jämtlandsfjällen. The study has resulted in a design proposal that incorporates cultural values of the area and showcases how building traditions can be translated into contemporary and contextual architecture. A central question of issue throughout the project has been to understand how traditional techniques can be translated into a modern reinterpretation without reproducing what already exists.

The aspect of architecture where local traditions and contemporary architecture interact and create a sense of local character and distinctiveness in the historic environment, creating a local heritage, have been present during the process. We pose the questions to ourselves, what can the local traditions of architecture contribute to present design? What is the core of those structures and how can they be interpreted into contemporary architecture to meet the requirements

of today? It is a fragile line between creating an inferior copy of the traditional and being far too bold and uncontextualized in its expression. Identity is lasting, but it is not static so how can identity continue to develop? Finding the interaction between the architectural eras and letting the architecture become a tribute to the identity of the place, while at the same time responding to the present, has been re-evaluated and reconstructed many times. The discussion will continue and be re-evaluated over time and has for us been temporarily shaped by our method where design has shaped the outcome.

By developing frameworks within building traditions and the conditions of the site, strategies have been formulated that guided the process to choices to unify form, structure and space. Timber construction determines the structure of the buildings but new rules and details have been constructed to find the interrelation between nature and culture. The structurally fundamental but also expressive knots become an important element for managing the climatic conditions at the site. In that manner, our design proposal can be distinguished from the traditional typologies in its way of adapting to

the conditions of the site but its basic elements are drawn from the tradition. In the end, vernacular architecture is about doing the right thing for the place and to respond to the natural features, so by answering to the places needs and conditions we can link back to the tradition.

Going back to built contemporary references that deal with a context with strong identity and old buildings, and the duality of present and change, has been a way to get answers to questions we couldn't formulate ourselves. Selected references have shown how modern works that coexist with traditional ones can strengthen each other's character. When using the references we have tried to not take them literally but to understand them to the core and reinterpret them. The aim of the design proposal has been that references blend together and cannot be directly readable from the new.

The supporting structure is to a large extent static, due to mechanical principles, and therefore the detailing becomes more significant to distinguish the old from the new. The details constitute the project's own identity, which is required to avoid creating something that already exists.

A contemporary building in Jämtland can strengthen the relationship between design and context through mainly answering to what is demanded by the place, and so will architecture with resonance to local traditions emerge. Architecture that connects to tradition doesn't emerge from autonomy which relates only to itself, but from the character of the time and place.

## LIST OF SOURCES

### Figures

Meteoblue [meteoblue.com]. (n.d.). Simulated historical climate & weather data for Sylarna [figures]. Retrieved Mars 14, 2023, from [https://www.meteoblue.com/en/weather/historyclimate/climatemodelled/sylarna\\_sweden\\_3134981](https://www.meteoblue.com/en/weather/historyclimate/climatemodelled/sylarna_sweden_3134981)

SMHI [smhi.se]. (2011). Dagslängdens förändring under året [figure]. Retrieved Mars 14, 2023, from <https://www.smhi.se/kunskapsbanken/meteorologi/solens-upp-och-nedgang/dagslangdens-forandring-under-aret-1.7185>

All other figures not listed are produced and owned by the authors.

### Images

Eklund, B. (2022). 01\_Jämtland\_Eklund [photograph]. bjerneklund.com. <https://www.bjerneklund.com/vldalenbcskiing>. Copyright 2023 by Björn Eklund. Reprinted with permission.

Eklund, B. (2022). 03\_Jämtland\_Eklund [photograph]. bjerneklund.com. <https://www.bjerneklund.com/vldalenbcskiing>. Copyright 2023 by Björn Eklund. Reprinted with permission.

Eklund, B. (2022). 06\_Jämtland\_Eklund [photograph]. bjerneklund.com. <https://www.bjerneklund.com/vldalenbcskiing>. Copyright 2023 by Björn Eklund. Reprinted with permission.

Eklund, B. (2022). 15\_Jämtland\_Eklund [photograph]. bjerneklund.com. <https://www.bjerneklund.com/vldalenbcskiing>. Copyright 2023 by Björn Eklund. Reprinted with permission.

Schenholm, F. (2022). IMG\_20220409\_095158.jpg [photograph]. Copyright 2023 by Björn Eklund. Reprinted with permission.

All other photos not listed are produced and owned by the authors.

### Reports

Eliasson, I. Knez, I. Ljungdahl, E. Hanneryd, O. Karlsson, E. (2015). Fjäll som kultur?. Länsstyrelsen. chrome-extension://efaidnbnmnipcajpcgclefindmkaj/<https://www.storslagnafjall.se/globalassets/konferens--och-projektsajter/storslagnafjall/fjall-som-kultur-webbpdf>

Godtman Kling, K., Fredman, P., & Wall-Reinius, S. (2017). Trails for tourism and outdoor recreation: A systematic literature review. *Tourism*, 64(4). [https://www.researchgate.net/publication/322802901\\_Trails\\_for\\_tourism\\_and\\_outdoor\\_recreation\\_A\\_systematic\\_literature\\_review](https://www.researchgate.net/publication/322802901_Trails_for_tourism_and_outdoor_recreation_A_systematic_literature_review)

Ivarson, M. (2014). Träbyggnadssystem utifrån äldre träbyggnadstekniker. [Master Thesis, CTH]. Docplayer. <https://docplayer.se/10416990-Trabyggnadssystem-utifran-aldre-trabyggnadstekniker-forslag-pa-fortillverkade-byggsatser.html>

Loock, J. 2010. *Turismens miljöer: historia, anläggningar och företeelser i Jämtlands län* (Report No. 2010:1). Länsstyrelsen Jämtlands län. <https://docplayer.se/2955252-Turismens-miljoer-historia-anlaggningar-och-foreteelser-i-jamtlands-lan.html>

Naturvårdsverket. (2022). Storslagen Fjällmiljö (Report No. 7073). Naturvårdsverket. <https://www.naturvardsverket.se/om-oss/publikationer/7000/978-91-620-7073-1/>

SMHI. (2021). *Klimatanalys för fjällområdet i Jämtlands län*. SMHI. <https://docplayer.se/222096910-Rapport-nr-klimatanalys-for-fjallområdet-i-jamtlands-lan.html>

### Journals

Cecilia, F.M., Levene, R. (2021). Gion A. Caminada. *El croquis Editorial*, 210/211, 5, 44-63.

Liu, M. et. al. (2018). Experiments on natural snow distribution around simplified building models based on open air snow-wind combined experimental facility. *Journal of Wind Engineering and Industrial Aerodynamics*, 173(1), 1-13. <https://doi.org/10.1016/j.jweia.2017.12.010>

### Literature

Andersson, G. (2016). *Timmerbyggnader: tematiska undersökningar av traditionella timringsmetoder*. Mariestad: Hantverkslaboratoriet, Göteborgs universitet.

Børve, A.B. (1989). *Hus og husgrupper i klimautsatte, kalde strøk: utforming og virkemåte = The design and function of single buildings and building clusters in harsh, cold climates*. Diss. Oslo Arkitektøgskolen : 1987. Oslo.

Glaumann, M. & Westerberg, U. (1988). *Vind*. Solna: Svensk byggtjänst.

Lundqvist, G. (1948). *De svenska fjällens natur. (Andra reviderade och utökade upplagan)*. Stockholm: Svenska Turistföreningens Förlag.

Timothy, D.J. & Boyd, S.W. (2015). *Tourism and trails: cultural, ecological and management issues*. Bristol, UK: Channel View Publications.

Zumthor, P. (2005). *Thinking architecture*. (3. exp. ed.) Basel: Birkhäuser.

Werne, F. (1993). *Böndernas bygge: traditionellt byggnadsskick på landsbygden i Sverige*. Höganäs: Wiken.

Wood in Culture Association. (2007). *Zumthor: Spirit of Nature Wood Architecture Award 2006 (2nd ed.)*. Wood in Culture Association

### Webpages

Frearson, A. (2014, April 16). New exhibition showcases the work of Swiss architect Gion A Caminada. *Dezeen*. Retrieved November 8, 2021, from <https://www.dezeen.com/2014/04/16/gion-a-caminada/>

*Kontio. (2023). Kontio Healthy Living. Kontio.com. https://www.kontio.com/en/healthy-house/*

SMHI [smhi.se]. (2009, November 1). *Jämtlands klimat*. <https://www.smhi.se/kunskapsbanken/klimat/klimatet-i-sveriges-landskap/jamtlands-klimat-1.4996>

SMHI [smhi.se]. (n.d.). *Årstidskarta*. Retrieved Mars 12, 2023, from <https://www.smhi.se/vader/observationer/arstidskarta/>

STF. Svenska Turistföreningen [svenskatouristforeningen.se]. (n.d-a). *Fjällstation eller Fjällstuga*. Svenska Turistföreningen. <https://www.svenskatouristforeningen.se/boende/fjall/fjallstation-eller-fjallstuga/>

SF, Svenska Turistföreningen [svenskatouristforeningen.se]. (n.d). *STF Gåsen Fjällstuga*. Retrieved Mars 14, 2023, from <https://www.svenskatouristforeningen.se/boende/stf-gasen-fjallstuga/>

Svenska Turistföreningen [svenskatouristforeningen.se]. (2018). *STF - Årsberättelse med hållbarhetsrapport 2018: En hållbar svemester*. Svenska Turistföreningen. Retrieved March 12, 2023, from <https://www.svenskatouristforeningen.se/app/uploads/2019/03/stf-ar-2018.pdf>



## THANK YOU

Supervisor Filip Rem

Åre Municipality

Mari at Kontio

Metria Östersund

Björn Ekund | Fotograf Björn Eklund

Fredrik Schenholm | Schenholm photo

STF | Swedish Tourist Association

VÄGLÖST LAND

