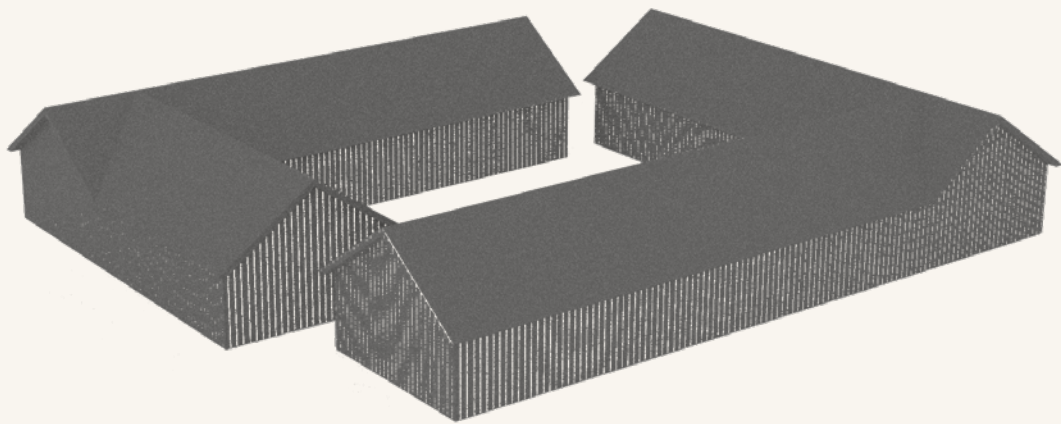


ENCLOSED

/ the barn and the yard



Eira Andersson

Examiner / Björn Gross | Supervisor / Mikael Ekegren

Building Tectonics

Department of Architecture and Civil Engineering

Chalmers University of Technology

2021



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Abstract

Looking back in history on the countryside, the barn with its simple and humble shape has always inspired me. It shows itself in various assemblies and sizes, the exterior has an anonymous expression with harmonious proportions while the interior is often captivating with a bare structure, and a pitched roof, which completes the room.

The four-length farm was the southern Swedish traditional building type on the countryside during the 1700s and 1800s. During the turn of the century when the mechanisation of agriculture began to gain momentum, one of the barn lengths was often removed and the enclosed barn is rare to find today. (Kungsbacka, 1989)

The simplicity and beauty of the barn and its construction is something that has made an imprint on me. I have a lot of memories from barns and I have created an idea about what the barn looks like out of these memories. How do I interpret both the interior and exterior design of the barn and the yard, what kind of spatial experiences will appear.

The outcome of this master's thesis will be a dwelling, interpreted from the traditional four length enclosed farm. Swedish rural landscape and architecture is very dear to me, therefore it is important to connect to tradition and context. Enclosed is an investigative project where tradition is interpreted into contemporary architecture, material and detail will be in focus. The methods used for this master's thesis are: 1. Research on design and 2. Research by design.

Keywords : tradition, barn, interpretation, nature, vernacular, rural, heritage

Student Background

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I / Introduction

Thesis Question

How can the traditional four-length barn with its enclosed yard be translated into a modern home?

Purpose and Aim:

The purpose of this master's thesis is to investigate how a modern home could be designed while it's interpreted by the traditional Swedish southern 4-length barn and its enclosed yard. The outcome is a villa located on the coastline countryside south of Gothenburg. The project aims to locate certain architectural pieces in the traditional barn and its enclosed yard and later use these pieces while making my own design. Furthermore I want this master's thesis to give me a greater knowledge in understanding the building and its details.

Method:

Two methods will be used during this master's thesis, 1. Research on design and 2. Research by design.

1. Studying literature, old vernacular buildings located close to the site and references.

2. Models and drawings will be investigated using the material gathered in earlier research and studies, and interpreted into my own design as a modern home.

Delimitations:

This is an investigative project where contemporary architecture and tradition meet. The focus of this master's thesis, is on the interpretation of the traditional 4-length barn and its enclosed courtyard, and how this could be translated into a modern home. The master's thesis will result only in one design proposal.



Photo of a south Swedish enclosed farm (near the site)

Figure 1: Asserlund 2:1, Fjärås
(Adler, 1982-84)

"A walk in the past"

"The old cultural landscape is our main heritage and requires careful treatment. In the past characterised by intensive animal husbandry - fences, gates, pastures and pruned trees gave a completely different picture of the landscape than today. We must ensure that new houses are located in the same thoughtful way as the old and as far as possible revive and protect the landscape patterns and horticulture". (Andersson, 1999, my translation)

Old buildings carry unique opportunities and properties, an imprint from society which provides knowledge from the past. It provides a living contact between past and present - *"A house, a village or a working environment that you can enter"*. Through well worked details, harmonious proportions and careful placement in context older buildings convey beauty of a rare kind. (Andersson, 1999)

Furthermore, in society, buildings play a part for the collective identity. In Warsaw, after the second World war, the city was rebuilt after its destruction, as a kind of national proclamation. Around the same time in Stockholm, large areas in the city centre was demolished, to later realise that parts of the city's identity was deprived. Around 1930 when functionalism had its breakthrough a negative view of old buildings grew stronger both in the city and on the countryside, they were seen as *"irrational relics from a technically inferior time, a chapter that was both environmentally and economically negative and would cost large sums to get rid of"*. Nowadays, rural architecture is seen in a different way. (Andersson, 1999)

II / Background

Architectural heritage

The modernisation and industrialisation of rural areas have developed at a rapid pace since the second world war, constantly changing the picture of the countryside. Nevertheless, from the middle ages until the post war period, a lot of vernacular architecture is still with us. It is a valuable part of our cultural heritage and therefore important to care for and preserve. (Andersson, 1999).

"The Swedish house emerges when the builder uses what nature provides and allows buildings and nature to interact". (Andersson, 1999, my translation)

The usage of the best possible materials and skills, has resulted in well preserved buildings, using old proven techniques and building materials from nature close by. It is not easy to maintain buildings from the past, it requires knowledge and understanding, that not everyone possesses. When it succeeds, it has a positive impact on the human. (Andersson, 1999).

The constant change of the rural landscape, my observations, is that many times, there is a lack of connection between the past and the present in today's architecture. Building a house is no longer an art of construction and material becoming one. It has in some way become a machinery, where tradition, cultural context and identity is lost.

Tectonics is commonly used as a geological term and refers to the controlling structures and processes in the earth's crust. The term is also used in architectural contexts and can then be defined as "*«the science or art of construction, both in relation to use and artistic design.» Hence, the concept refers to that of uniting aesthetics and technique, conceiving construction as a spatial art form.*". (Frier Hvejsel, 2015)

Looking at architectural heritage, I wanted the tectonic approach of this master's thesis to have a strong connection to the historical context while at the same time be an aesthetic element in the architectural form.

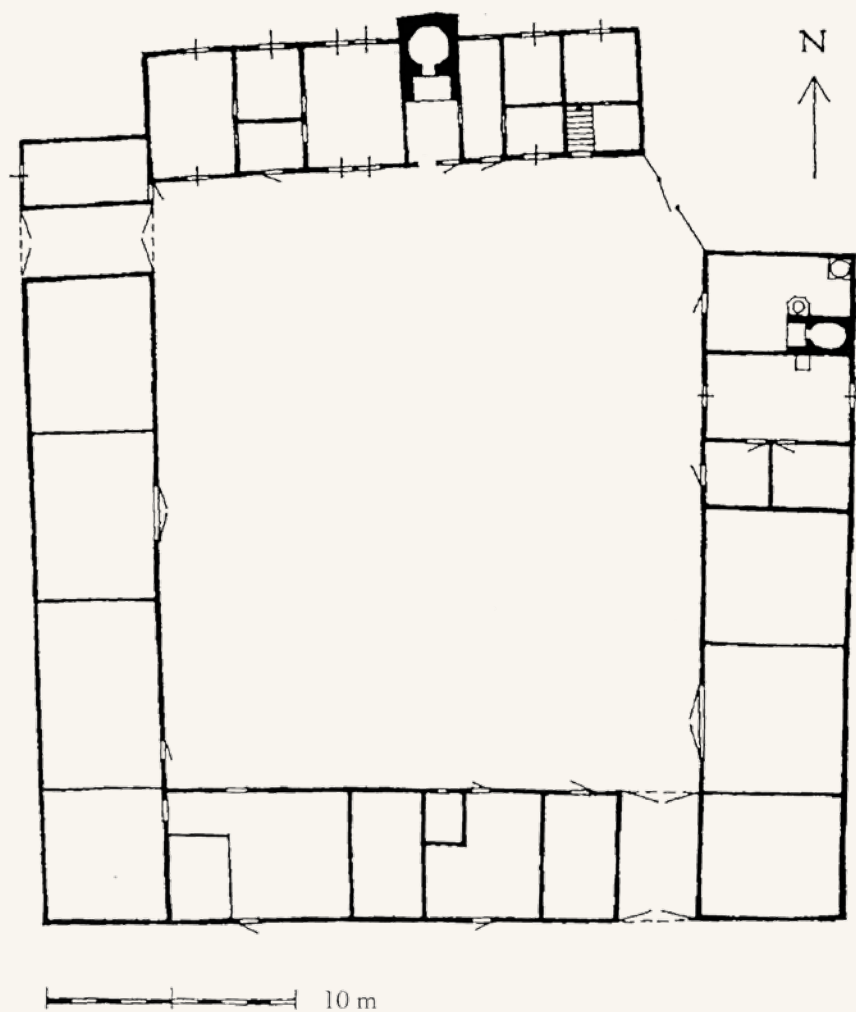


Figure 2: Sydsvensk gård, Skåne
(Källström, 1993-95)

Swedish vernacular architecture

Looking at Swedish vernacular architecture one can find that it differs in form and size, depending on where you are in the country. There is the south Swedish farm, "Götisk" farm, the west Swedish farm, the central Swedish farm och the northern Swedish farm. These five different types of farms can further be arranged into two different groups, the border goes between the old Danish landscapes and the rest of the country. In the northern parts, dwelling, barns and byres are kept separately. While in the southern parts, Halland, Skåne and southern Bohuslän the four length enclosed farm was the most common type of farm. Here, the courtyard was not divided between dwelling, barn and byre, the different functions were well integrated under the same roof. (Andersson, 1999).



Figure 3: Manbyggnad, Småland
(Källström, 1993-95)



Figure 4: Agtak av Gotländsk typ
(Jonsson, n.d.)

Characterising features

Base: The barn sits traditionally on a base made of stone. Byre and stable were often standing on a stone wall attached with mortar while other parts were standing on a stonewall put together without using mortar. The base comes in different heights and formations, this is a typical characteristic of the barn. (Hansen, 2007). Walking around, old barns, byres and dwellings, this feature becomes very clear and obvious. Looking at nature, you can clearly see the connection between building and nature, and you understand the connection that they had in the past.

Facade: The dominant material that was used to cover the facades of the different buildings was wood. But other materials were being used, such as stone and clay. Depending what the landscape had to offer, the materials were chosen. In areas where wood was scarce, stone or clay were used. (Blomberg, 2002).

Roof: The roof has been clad in many different materials. Local materials were being used, you took what nature had to offer. The different materials that have been used, seaweed, straw, peat, slate and bricks are a few examples. The angle of the roof and the type of material being used depends on each other. For example, peat gave a flat roof while straw gave a steep roof. (Andersson, 1999). The gable of the roof really makes an impression looking at the Swedish landscape. Remembering old barns and byres, one can understand that the gable is no coincident, which I think makes vernacular architecture even more unique.



South Swedish enclosed farm newly painted with falu red color and tar

Eira Andersson, 2021

Characterising features

Faluröd: Traveling through the Swedish countryside, there is one element that is hard to miss. The falu red color, "faluröd", has been produced since the 1590s. In the beginning, the facades, was probably painted mostly for aesthetic reasons, but during the 1700s, the colors preservative properties became important. To save forest and making the building materials last longer, during 1740s the discussion, how to preserve the wooden facades was ongoing. Tar had been the most common way to preserve materials, but it used a lot of fuel to produce, and by that was not appropriate. (Andersson, 1999).

Saltwater, brine and lye together with iron vitriol was used to produce the "Faluröd" color. 1820-1880, the color made its real breakthrough. In the beginning the color was used mainly for the dwelling, but later on the barn and byre was also painted with it. (Andersson, 1999). I think this is one of the more eye catching characteristics, one can experience on the Swedish countryside today.

Characterising features

Structure / Old technics: Vernacular building techniques vary in regional and local features, using building materials from nature that was easy to come by. Wood was the most important material, but other materials such as stone and clay have been used.

Connection between nature and building are strong. Three main building techniques are used in the country, depending on nature's resources. The knot timbering technique was used in north of Sweden, Svealand and the south

Swedish highlands, areas that had plentiful of coniferous forest, parcel technique were used in Götaland, Öland and Gotland where deciduous and mix forest was growing and half-timber technique



Figure 5: Detalj av skiftesverkslänga från Öland
(Källström, 1993-95)

Characterising features

was used in Skåne where forest was scarce. In some areas, a mix of building techniques have been used, in Halland, Småland, north of Skåne and on north of Öland. Using for example knot timbering technique on the dwelling and parcel technique on the barn and byre. It could even be a mix of techniques in one building. (Andersson, 1999).

Knot timber technique: This technique involves stacking logs on top of each other, where the end of the log has a carved hook, in this way a knot is formed in each corner of the wall. Moss is added to the furrow for sealing and insulation. To stabilise the wall, the logs are connected with dowels, these vertical rods go through all the logs. The type of wood used for knot timber was pine. (Andersson, 1999).

Parcel technique: Have a load-bearing structure with standing pillars, between sills and beams, this, together with cross beams form a framework. The walls between the pillars are planks laid in horizontal shifts, the ends of which are recessed into the grooves of the pillars. The structure is stiffened with diagonal planks (snedstavor). (Andersson, 1999).

Half-timbered technique: This technique has a load-bearing structure of oak. The structure consists of a lattice of wood, pillars, beams, top and bottom plate, stiffened with diagonal planks. the compartments are filled with clay-lined wickerwork or masonry. The framework is later filled with clay-lined wickerwork or masonry. (Andersson, 1999).



Figure 6: Baron House
(E:son Lindman, 2005)

Reference Studies

Baron House, John Pawson Architects

Baron House is located in Skåne in southern Sweden. This is a great example of contemporary architecture interpreted into the traditional south Swedish enclosed farm. One interesting feature in this project is the footprint of the new design, it is the same as the farm that once stood there. The old stone courtyard still exists and creates a beautiful bridge between the new and the old, the past is not forgotten.



Figure 7: Baron House
(E:son Lindman / Weber, 2003)



Figure 8: House for mother
(Linderoth, 2017)

House for mother, Förstberg Ling Architects

House for mother is located in Linköping, Sweden. The building has a strong structure out of wooden beams and trusses. The construction is specially interesting because of its tectonic ability showing what technically defines the house, this allows an open and airy space which makes it possible to experience the gable roof from the inside, this is also common in old barns and byres. The design is simple and rational and gives the user both intimate and spacious rooms.



Figure 9: House for mother
(Linderöth, 2017)



Figure 10: Student Village
(Berndtson, 2017)

Student village is located in Aarhus, Denmark. This project is an addition and transformation project to a 17th century old farm. It is beautifully composed and the new addition together with the old farm creates small streets and private enclosed yards, like an old rural village. Proportions, materiality and design meets harmoniously between the new and the old but are also in contrast to each other which makes it clear what once was the old farm building.



The old traditional half-timbered farm

Figure 11: Sgarden-7
(Lenschow & Pihlman, 2017)

III / Site



Figure 12: Situation
Google Earth, 2021

Background

The site is located in Fjärås, Halland, on the coastline countryside, approximately thirty minutes from the city of Gothenburg, Sweden. Fjärås, is an old agricultural society where people have lived and farmed for centuries.

Historically, the most common type of main building in this area was "framkammarstugan". These building were mostly build in one level with one room in the middle, chambers on one end and kitchen and vestibule on the opposite. The traditional farm in Halland during 1700s-1800s consisted of four connected building lengths, where framkammarstugan as the main building was connected to the barn and byre, the four-length farm creating an enclosed yard. Traditionally the main building was build using knot timber technique and the barns and byres were constructed using parcels technique. (Kungsbacka Kommun, 1989)



Figure 13: Aerial photo site, 1960
(Lantmäteriet, 2021)

Context

The site that I have chosen is today uninhabited, but as you can see in the 1960 aerial photo from Lantmäteriet, there has been a building situated on the site. Not far from the site is Tjolöholm Castle. It was designed by architect Lars Israel Wahlman and was completed in 1904. The castle is built in red and light grey granite in English Tudor style. Associated with the castle is a village for those who worked at the castle, these buildings are a great example of romantic nationalism.

The plot is surrounded by nature. Southwest is overlooking large fields continuing in coastal meadows, oceans and ends with islands. In a southeastern direction deciduous forest grows and in a northeastern and northwestern position arable land and countryside stretches out.

Not far from the plot you are able to find old barns and four length farms that are partly preserved and tradition shines through.

Every place has a story to tell, as do the built environment. I think there is a beauty in understanding the past and learn from it. I want building tradition from this geographical area, implemented in modern building to be a guiding factor when it comes to design and structure during this master's thesis.

Siteplan

Scale 1:10000





Views on surrounding nature and buildings



Environmental photos

Eira Andersson, 2021



Environmental photos

Eira Andersson, 2021

Views on / from site



se



sw

Environmental photos

Eira Andersson, 2021



nw



ne

Environmental photos

Eira Andersson, 2021

Siteplan

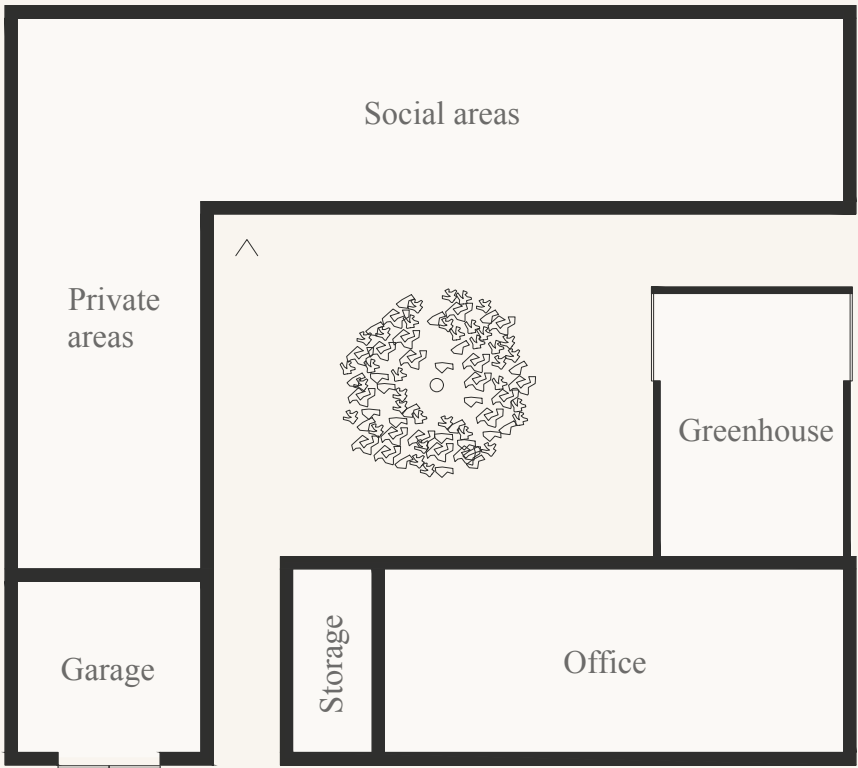
Scale 1:4000





IV / Proposal

View over courtyard



Project description

For whom, the project address a family constellation of four, that has the need for a home office, dreaming of the Swedish countryside, but not to be too disconnected from urban life. Wanting the modern life of today and with nature around the corner. The house must be able to function for the user for a lifetime. The opportunity to perform work from home in an environment separated from the dwelling is a requirement, this space should also be able to be used for other purposes. Friends and family who visit must have clear space in the building.

Result, a contemporary four-length enclosed building typology interpreted by rural traditions, situated on the Swedish coastal countryside. The architecture reflects the familiar farm type that can be found in the rural landscape of Halland. The project consists out of two L-shaped buildings, which together creates the enclosed yard. The two buildings is clearly divided with different functions, where one features a dwelling for everyday use and the other an office with a small guest loft and an integrated greenhouse. The two buildings have a total area of 345 sqm, *dwelling: 190 sqm, office: 67 sqm, greenhouse: 52 sqm, carport: 31 sqm and storage: 15 sqm.*

To enter the dwelling or the office, one have to go through a passage between the buildings, leading into the courtyard. The main entrance lies straight ahead as you walk through the passage, while the office entrance lies in the opposite corner of the yard. Standing on the courtyard one can experience the variety of landscape through the different sight-lines between and through the buildings. The different seasons of the year become noticeable by the cherry tree centered on the courtyard.

View

From entrance towards the kitchen



While inside the main building, the south western landscape opens up in front of you. Further into the building one will find that private and social functions are kept separated. The bedrooms are facing the south east forest landscape and are located along a corridor with a view of the courtyard. Moving into the social areas, you walk along the south western facade, passing large sliding window doors which makes the connection to the outside a strong element. The living room have a strong connection to the courtyard and the south western landscape, while the kitchen connects to the south- and north-western landscape.

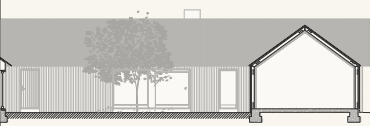
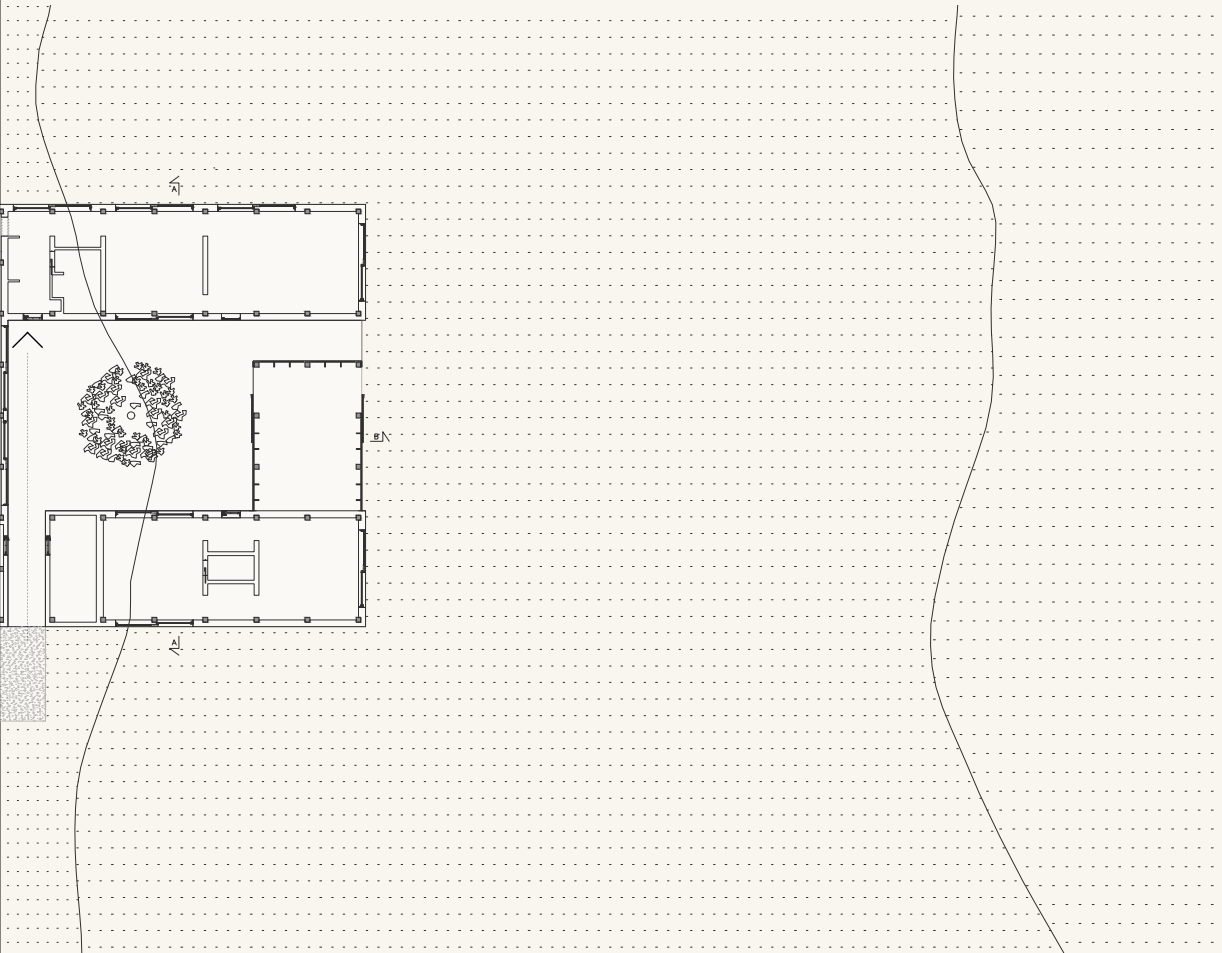
The construction of the building consists out of glue lam pillars creating a framework that carries the rest of the structure, this element is the core of the project, and almost always present from the interior. The glue lam framework is resting on a base made out of concrete, which has been casted with a formwork of timber and thus relates to the wooden exterior facade. The exterior facade highlights tradition in its expression, painted with falu red color. The interior has a light wooden materiality on walls and integrated furnitures, and the floor is made out of concrete that has been polished on the surface. Wood and concrete unites the interior and the exterior materials and are the characteristic materials throughout the project.

The structure of the building allows an open and airy interior inspired by the barn and byre, with its pitched roof and present construction while at the same time being a part of the magnificent landscape. The design is simple and rational, striving for harmony, and gives the user both intimate and spacious spatial experiences.

Site plan / Site section B-B

Scale 1:400





View

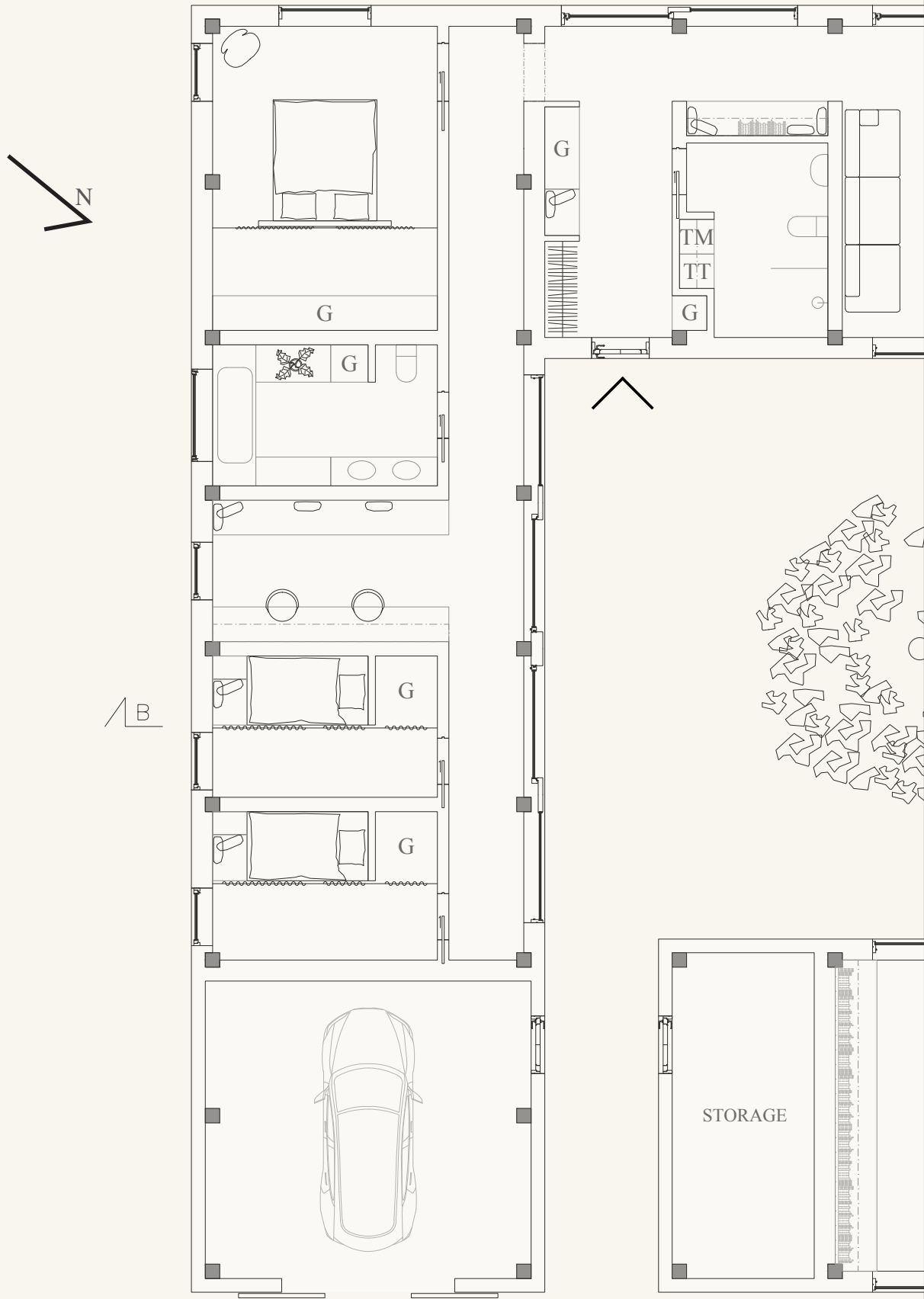
View over courtyard

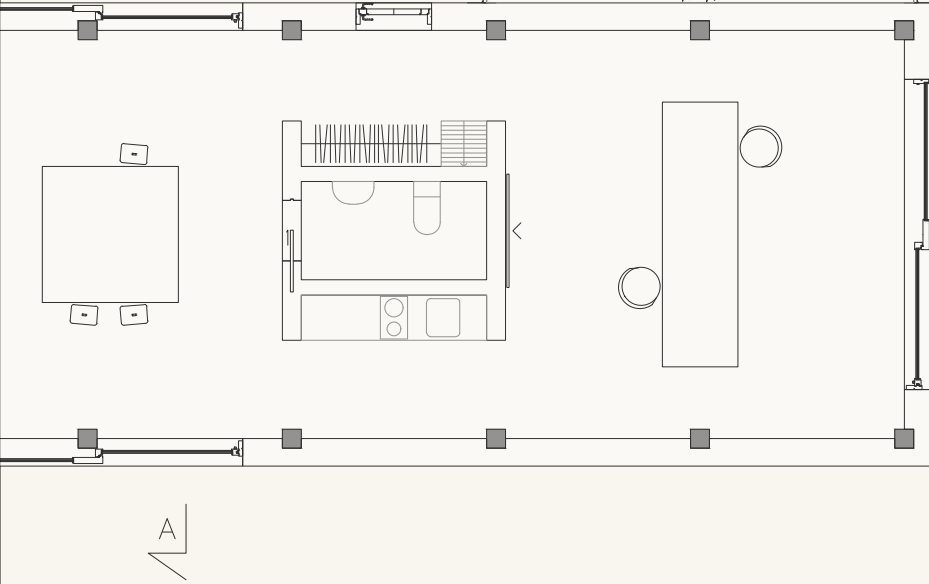
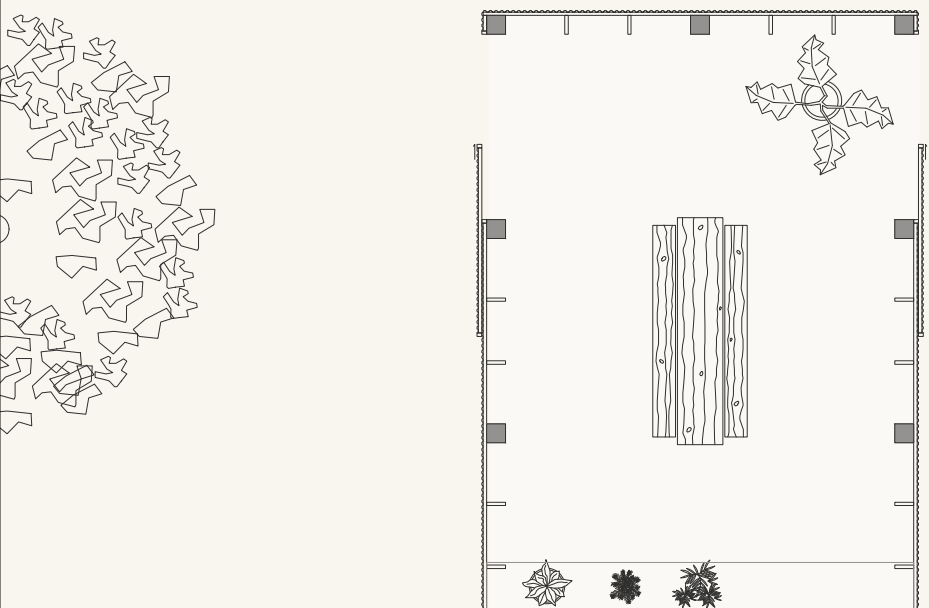
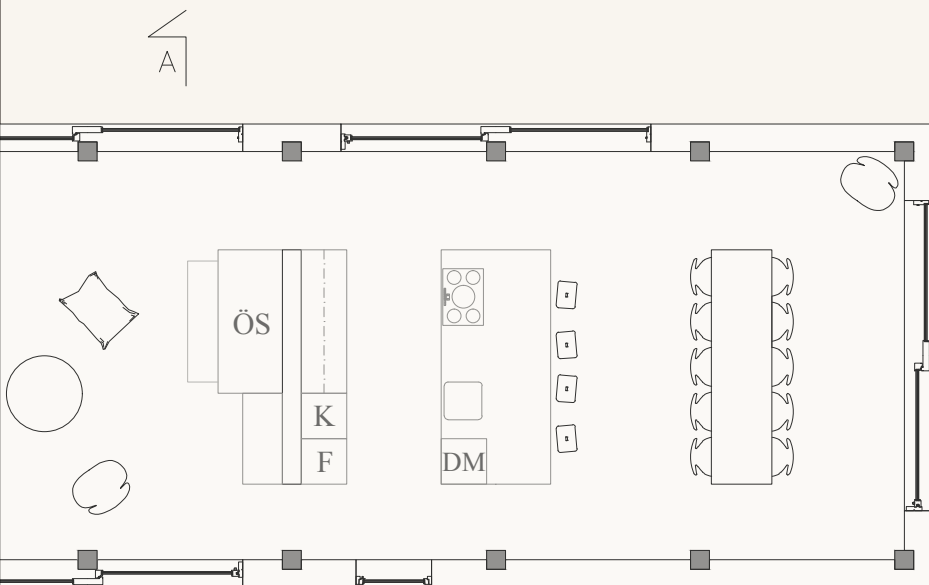




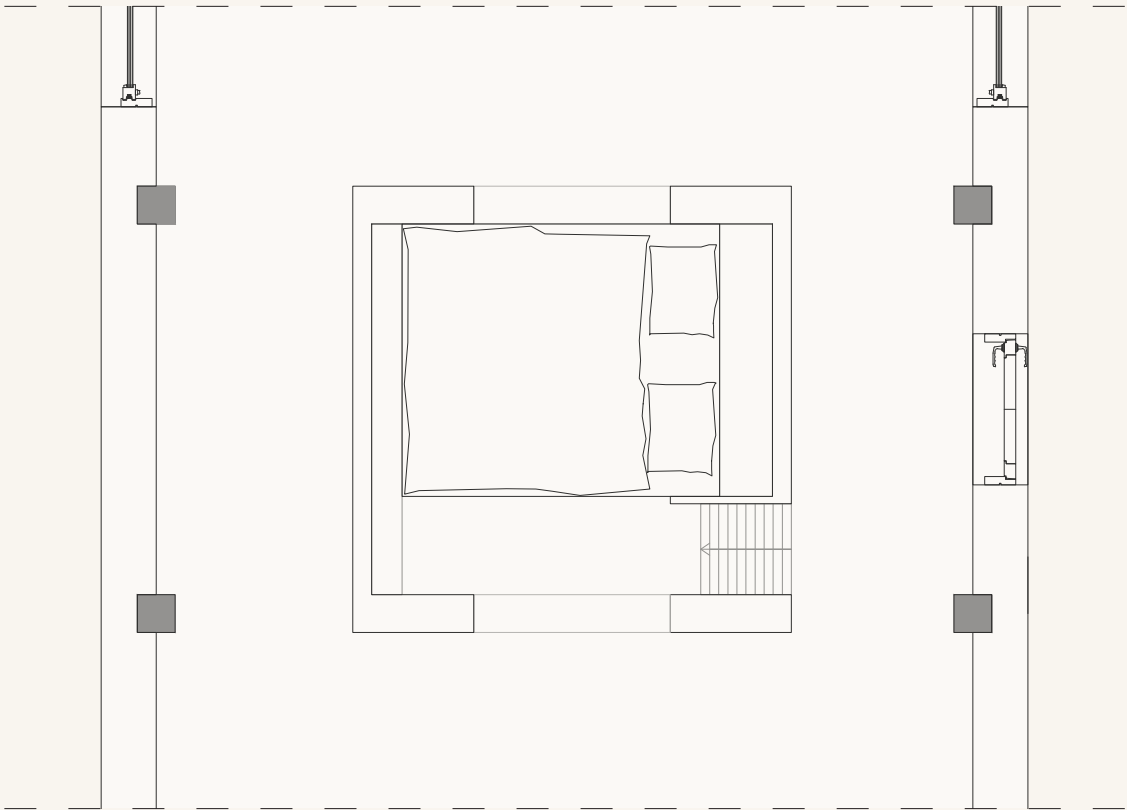
Plan

Scale 1:100



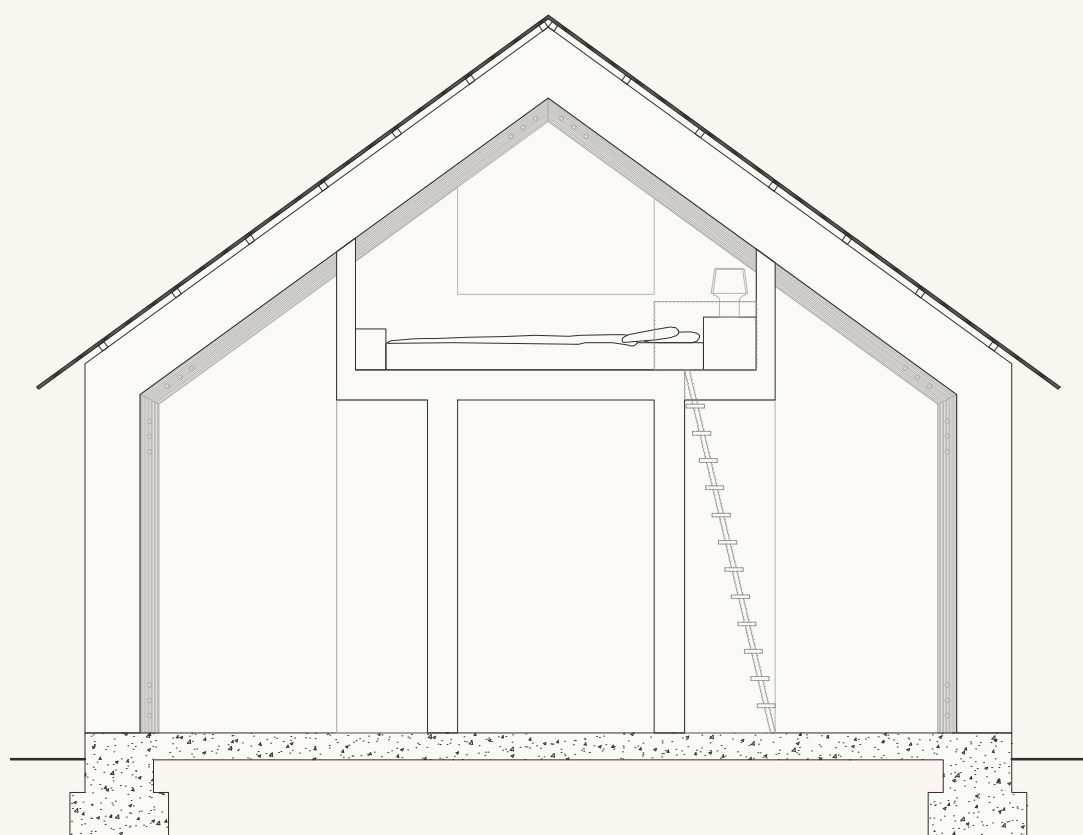


Loft, plan
Scale 1:50



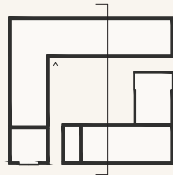
Loft, section

Scale 1:50



Section A-A

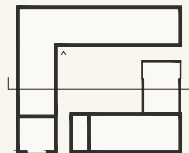
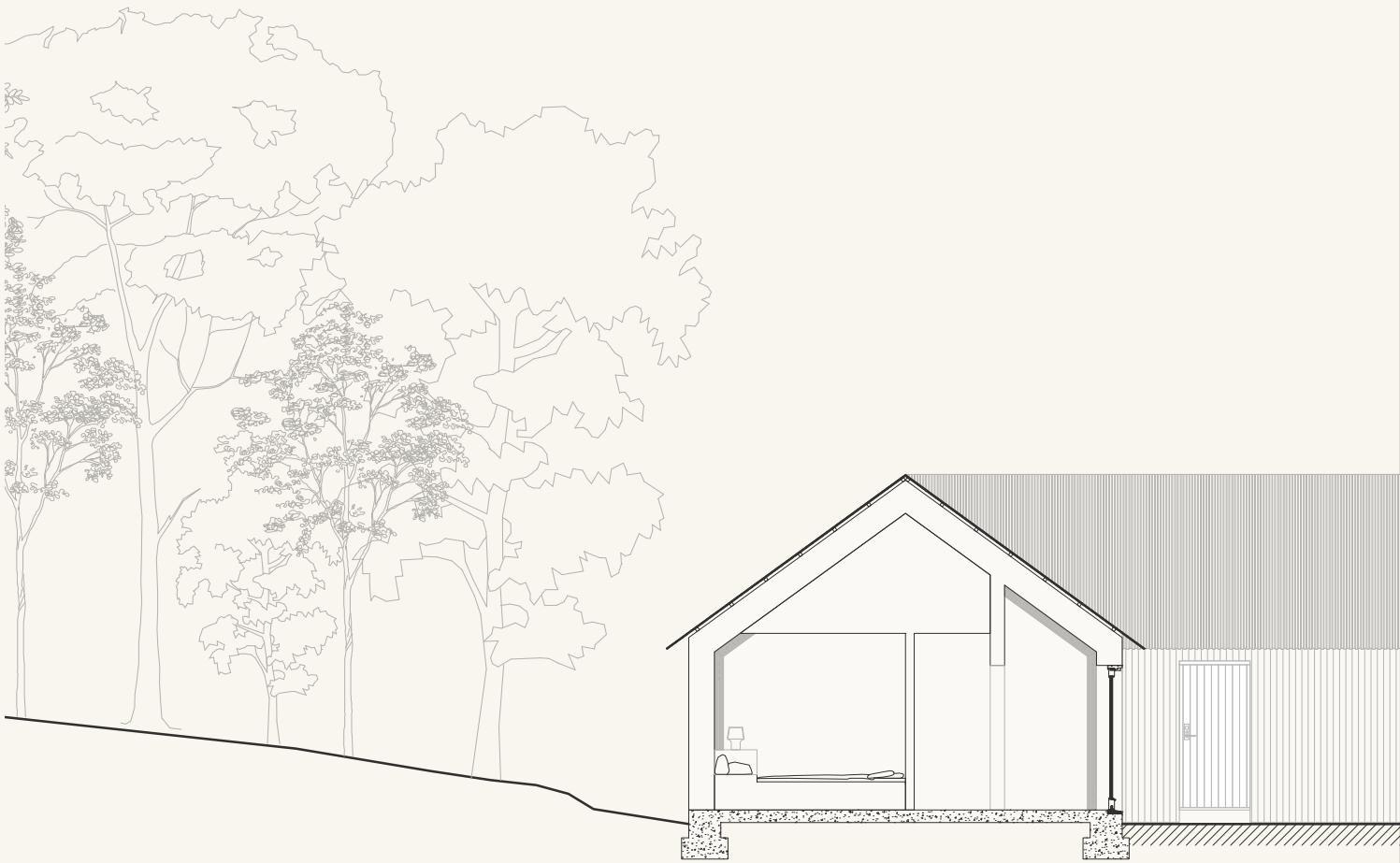
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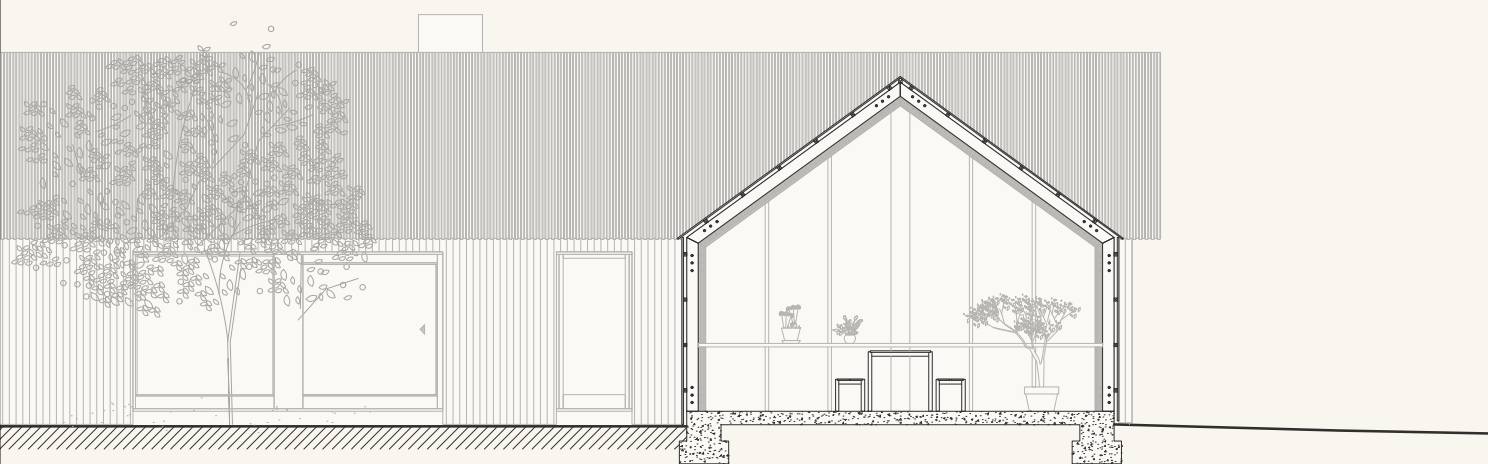




Section B-B

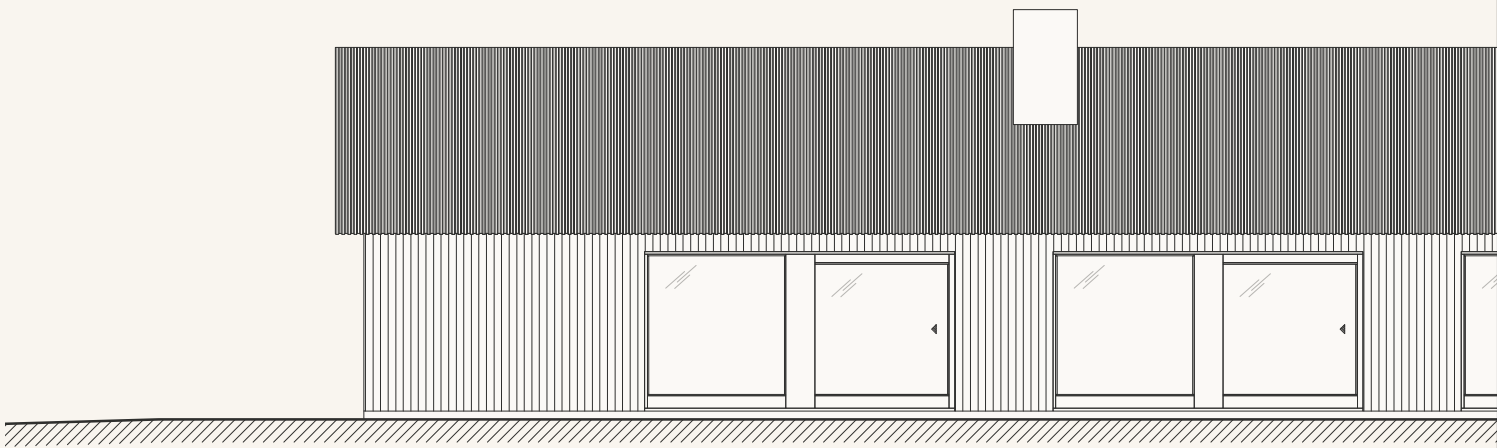
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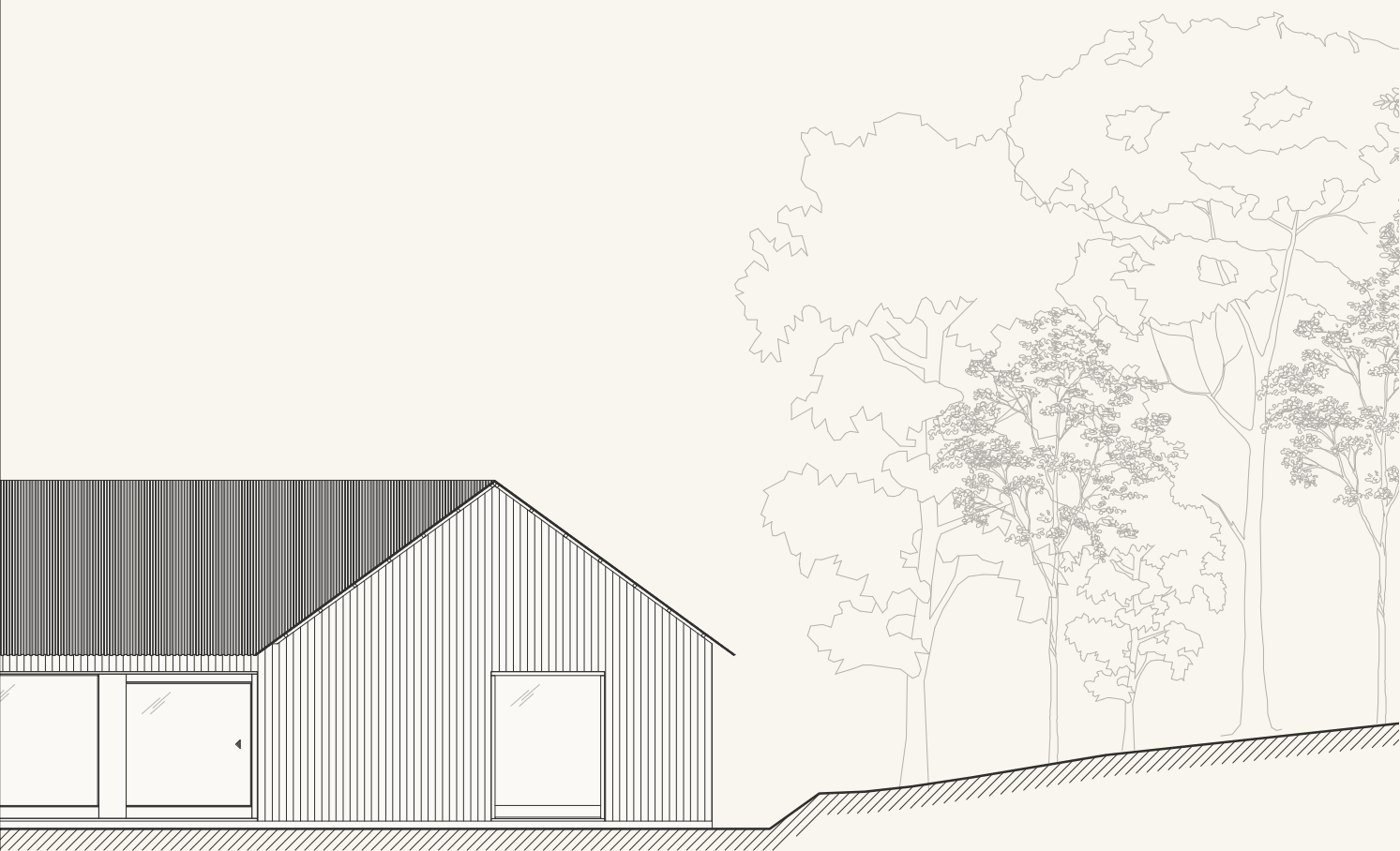




Facade - sw

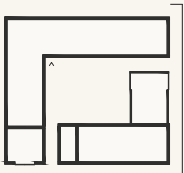
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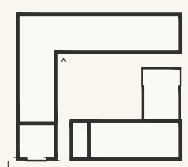
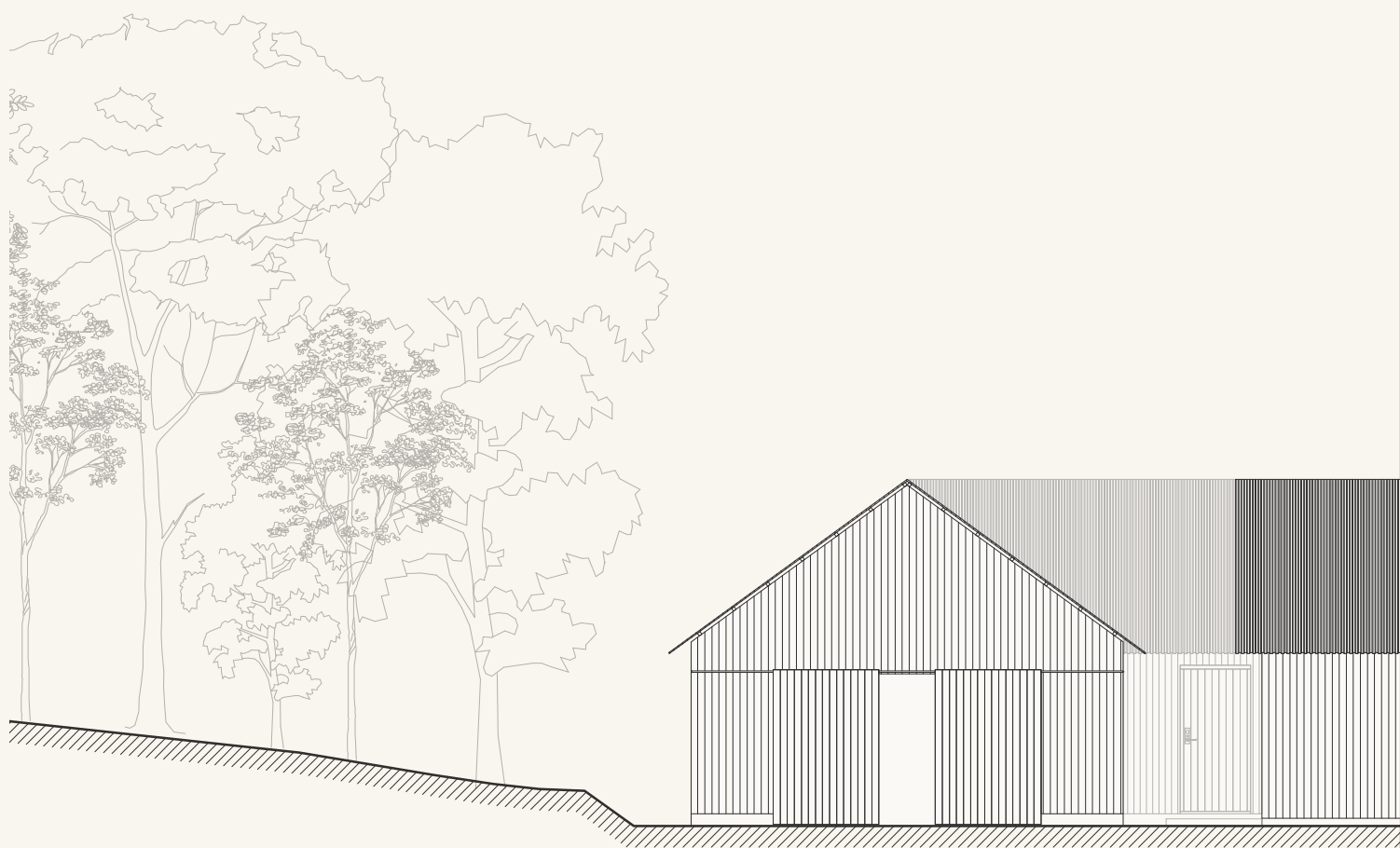
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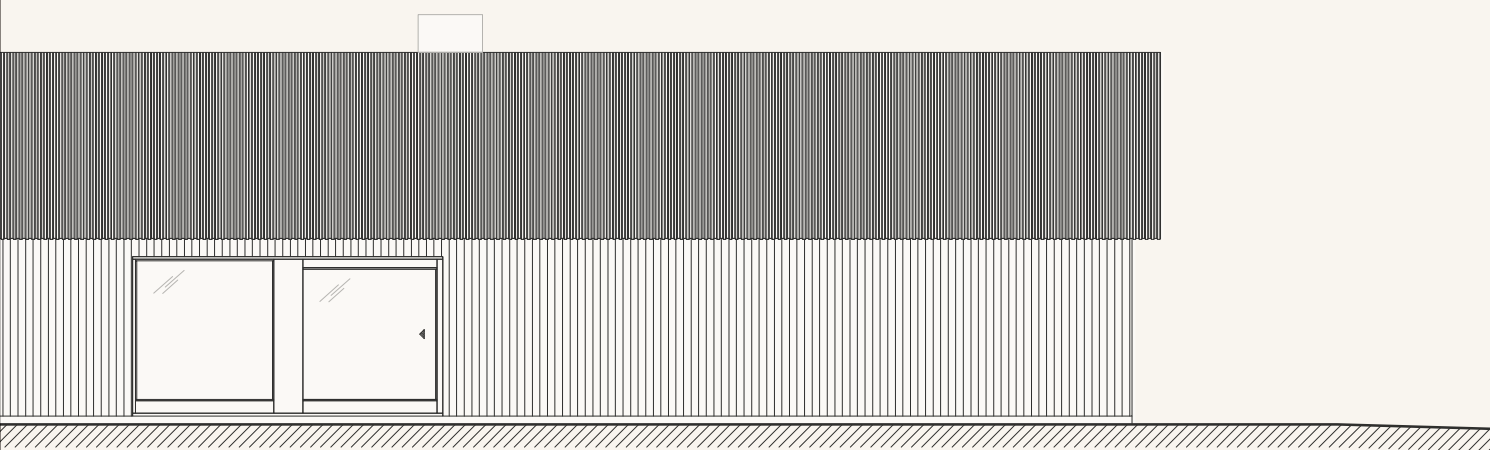




Facade - ne

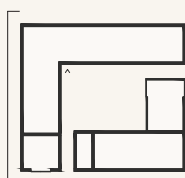
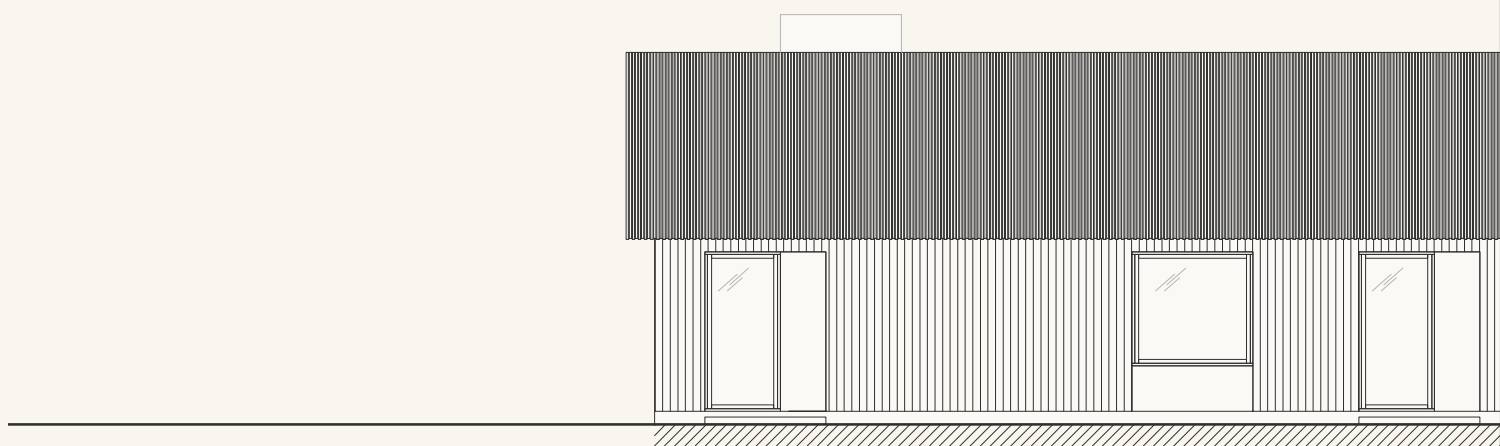
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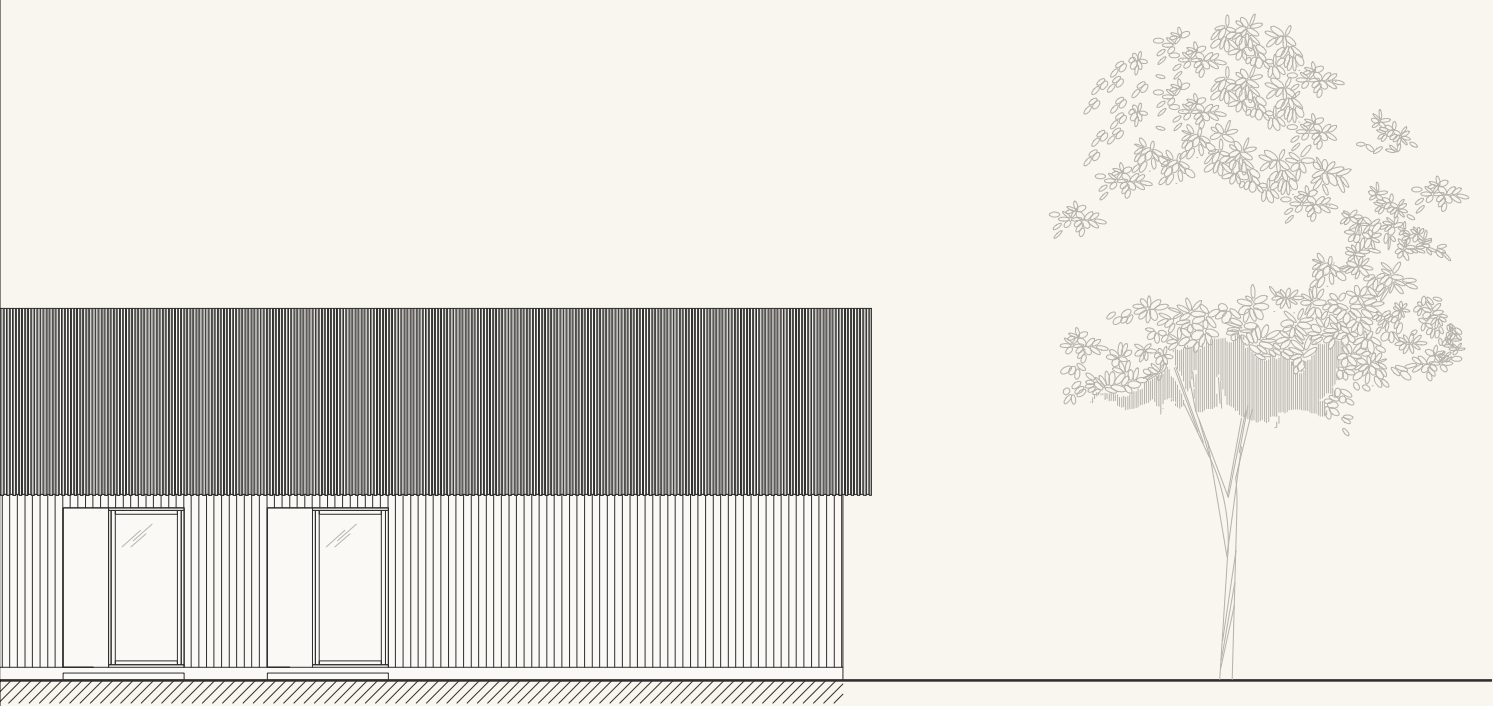




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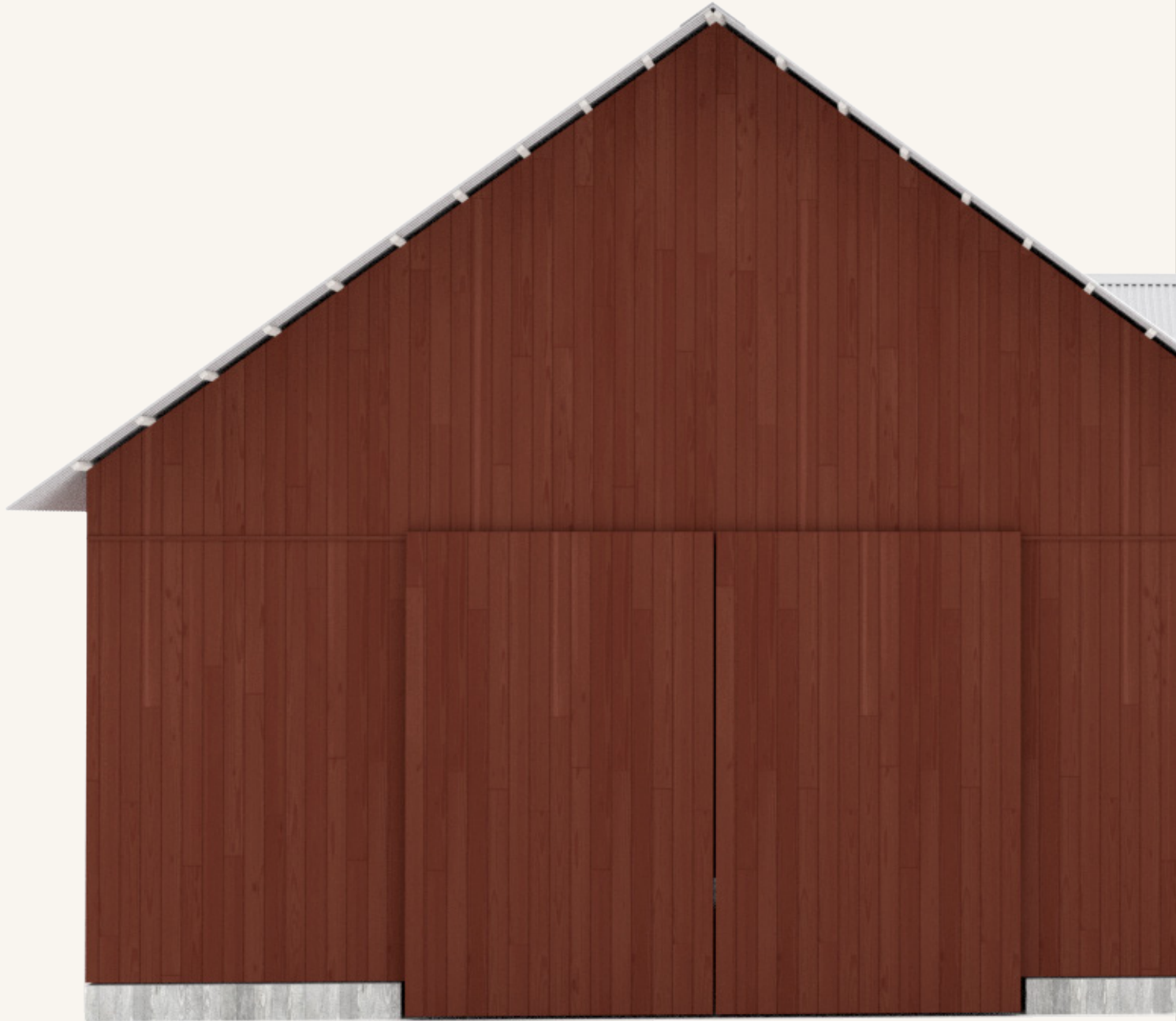
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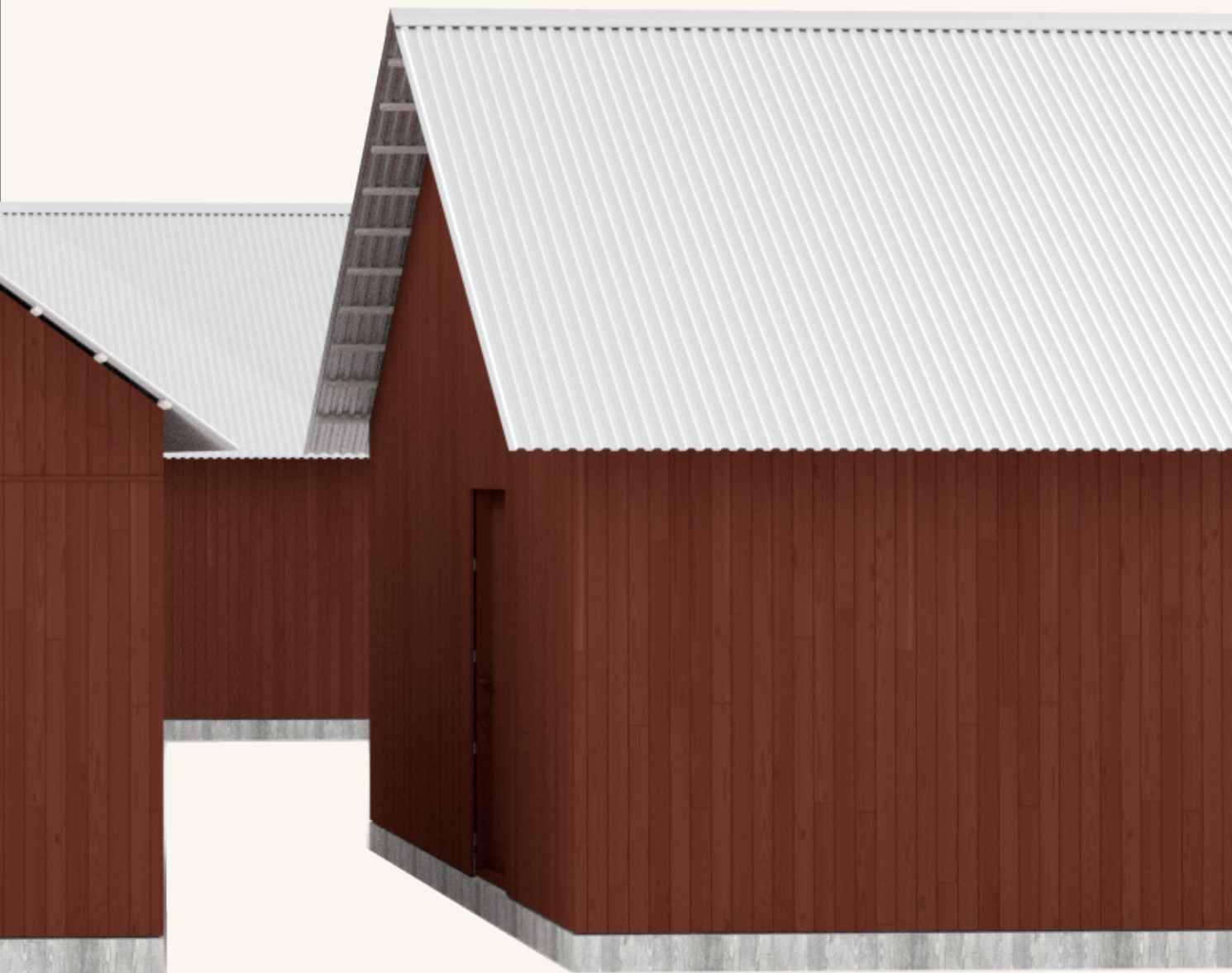




View

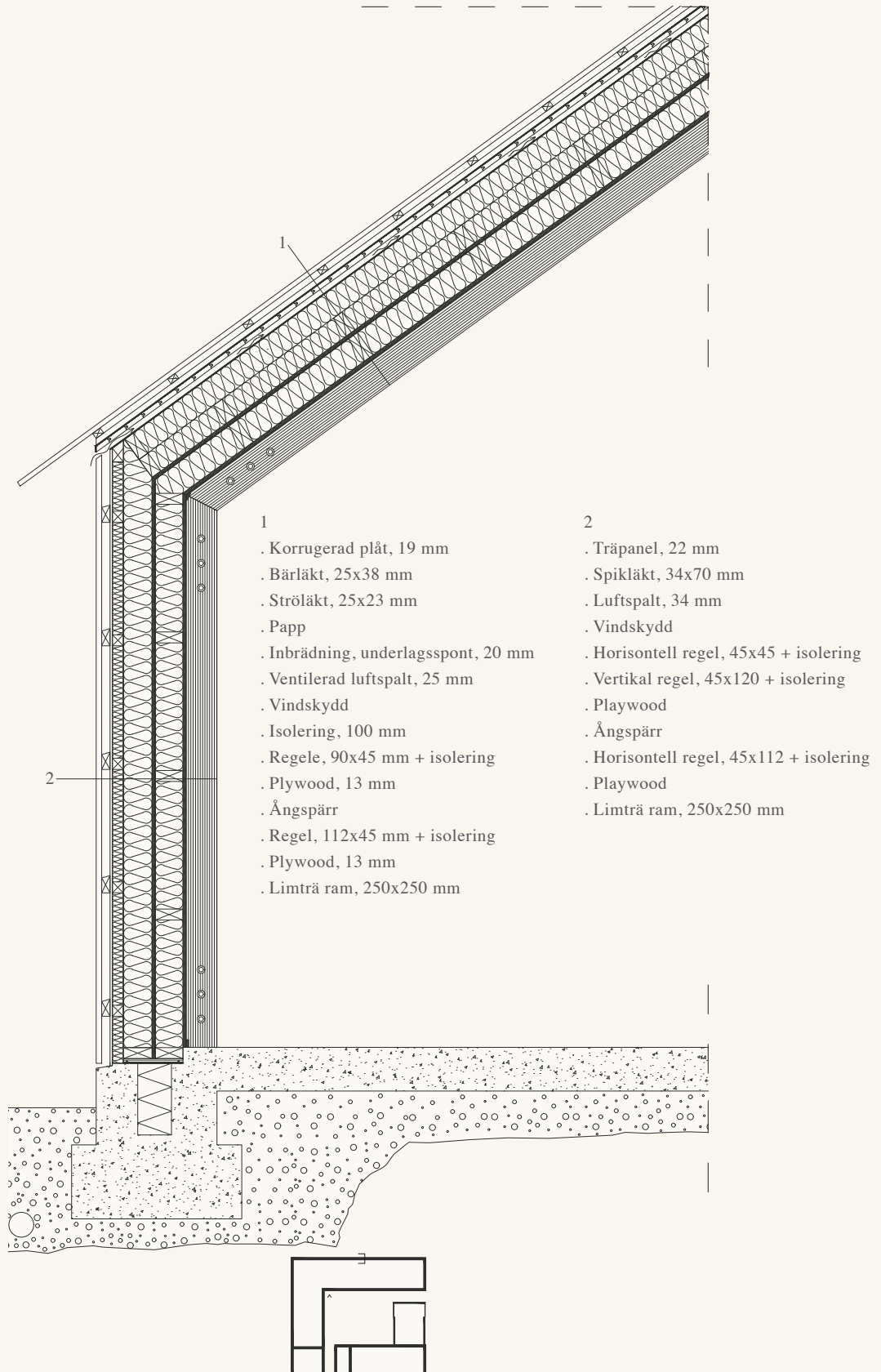
carport portal and passage to enter the courtyard



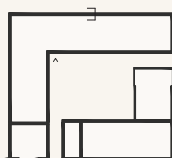
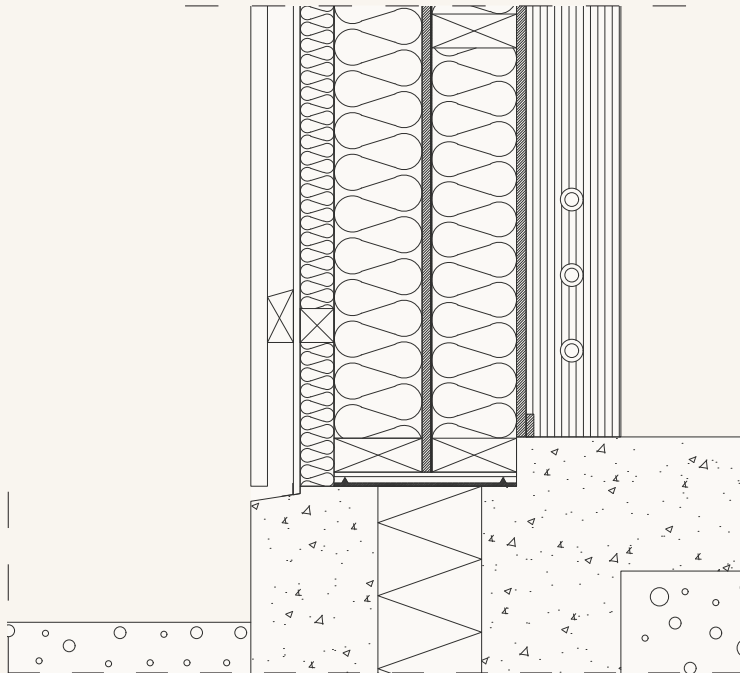
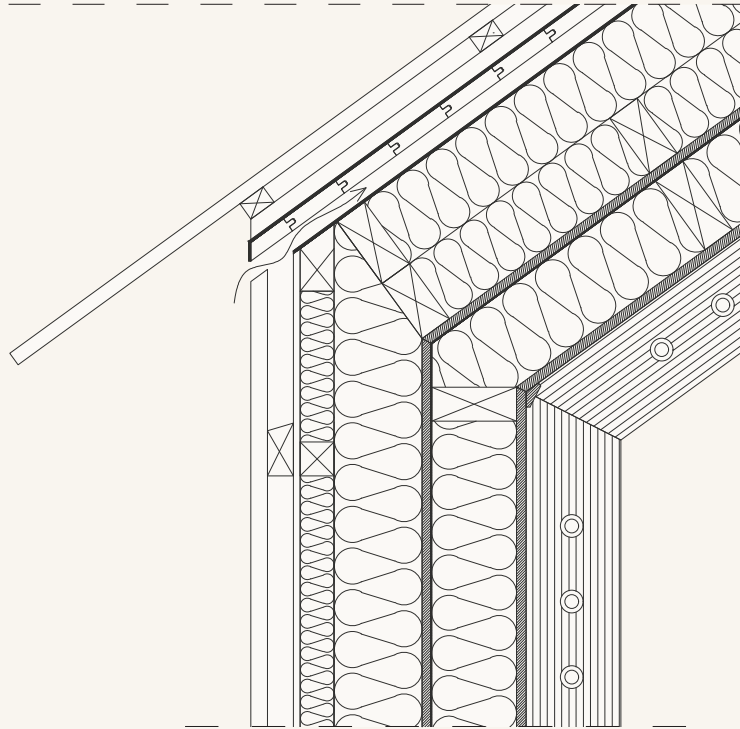


Wall / Roof

Scale 1:25



Scale 1:10



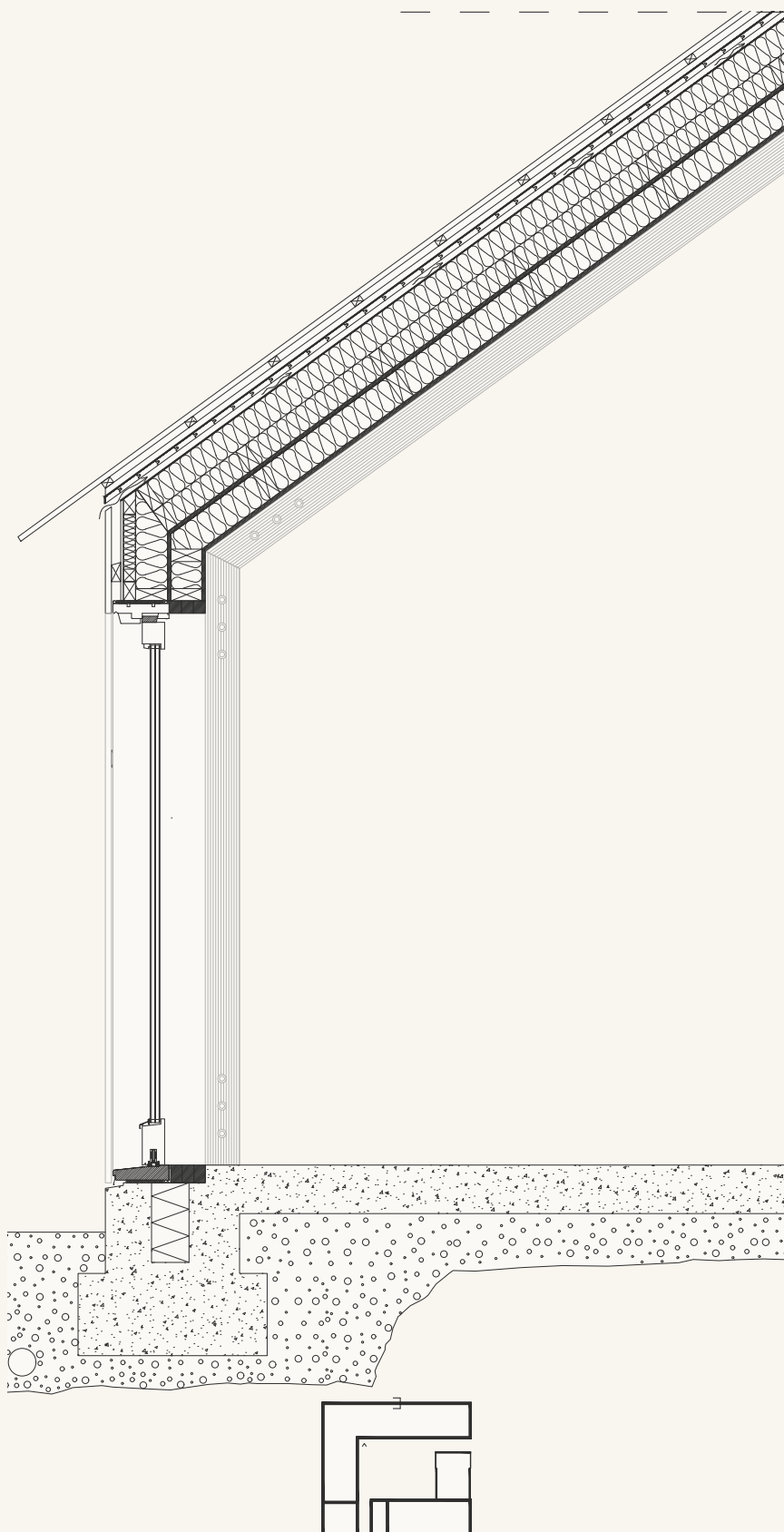
Elevation - exterior

Scale 1:25



Window / Roof

Scale 1:25



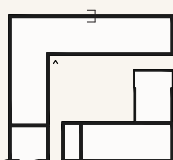
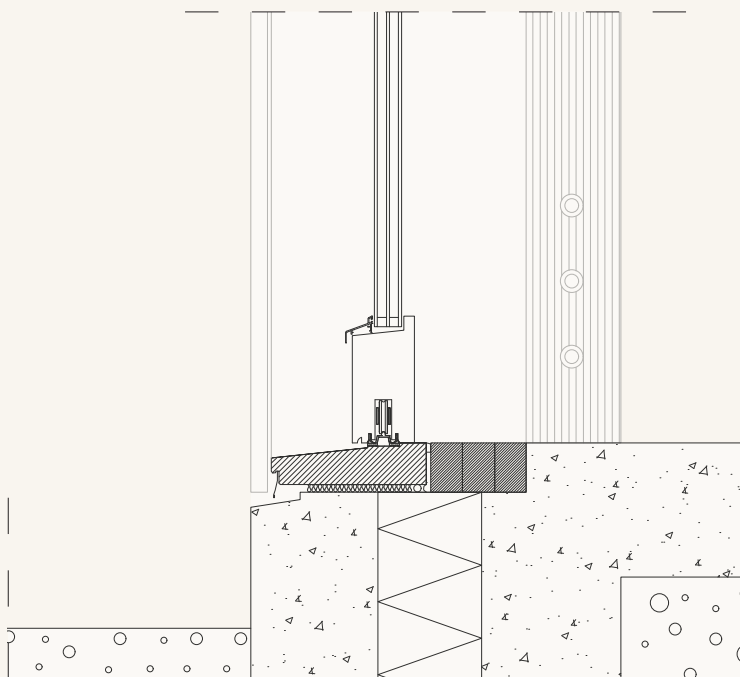
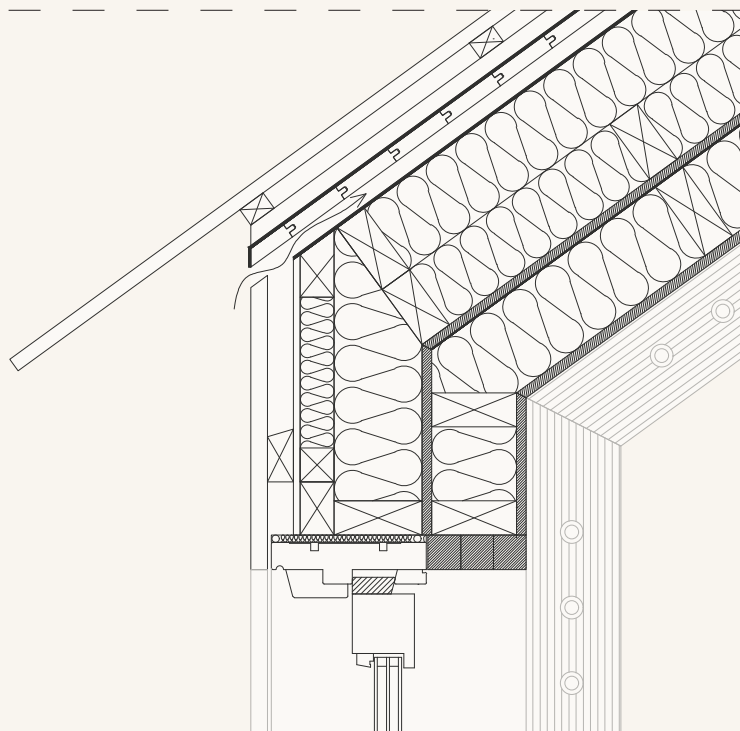
Elevation - interior

Scale 1:25



Window / Roof

Scale 1:10



View

From master bedroom towards the forest



V / Epilogue

Discussion

How can the traditional four-length barn with its enclosed yard be translated into a modern home?

Looking at the thesis question, it is being answered by the proposed project, where contemporary architecture emerges from Swedish rural tradition.

Sometimes it feels as if the rural landscape have been forgotten, there are no clear rules that determine how you are allowed to build, such as in a detailed plan for an urban context. I think that we have to consider everyday architecture as important elements in history, we can not put all architectural efforts into public buildings and urban areas. I also understand that there are difficulties in the countryside, you own your land and why should someone decide what should be built. But I think that there could be a good idea to have some kind of guidelines, of what to be build, maybe because I'm afraid of what the rural landscape will look like in the future, when today, chalk-white catalog houses pop up here and there.

I think that the proposal reminisces to traditional Swedish architecture, in this case the traditional four-length farm. The proposal suits the landscape harmoniously, you can see that the design results in a new type of building but that it relates to tradition and culture.

Looking at the proposal in comparison with tradition, one can see that the ingenious handcraft that once was, is now lost. That is not the only thing that is lost, when interpret traditional architecture into contemporary. The connection to nature, that in the past, was extremely strong is now lost. That is the result of interpretation in this case, from tradition to contemporaneity, and it was not the task to recreate the past but rather to be inspired by it, in an attempt to retain the humble picture of the countryside. But one can discuss if this would be the right way to go.

The traditional building is a reflection of the location and its surrounding nature, where every choice in the construction of the building was significant, choice of material, roof angle, surface treatment, etc. The outcome of the proposed project is more a contemporary visualisation of vernacular architecture, but still using robust materials such as concrete and wood. As vernacular architecture has sustained, I think that the outcome provides a sustainable architecture, that will last over time.

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Figure 12: Google earth. (2021 01 22). *Situation overview*. [Map]. <https://earth.google.com/web/@57.50352409,12.08190581,39.62000937a,108566.65819645d,35y,359.04480579h,0t,0r>.

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