

Maria Oxelman
Master Thesis 2022

Supervisor: John Helmfridsson
Examiner: Nils Björling

Architecture and Planning
Beyond Sustainability

Chalmers School of Architecture
Department of Architecture and Civil Engineering

A photograph of a rural landscape. In the foreground, a brown chicken stands in a field of tall, dry grass. A small pond reflects the sky and the surrounding landscape. In the middle ground, there is a building with a steep, thatched roof. In the background, a large, rocky hill rises against a clear blue sky.

New Nordic Architecture

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New Nordic Kitchen Manifesto*

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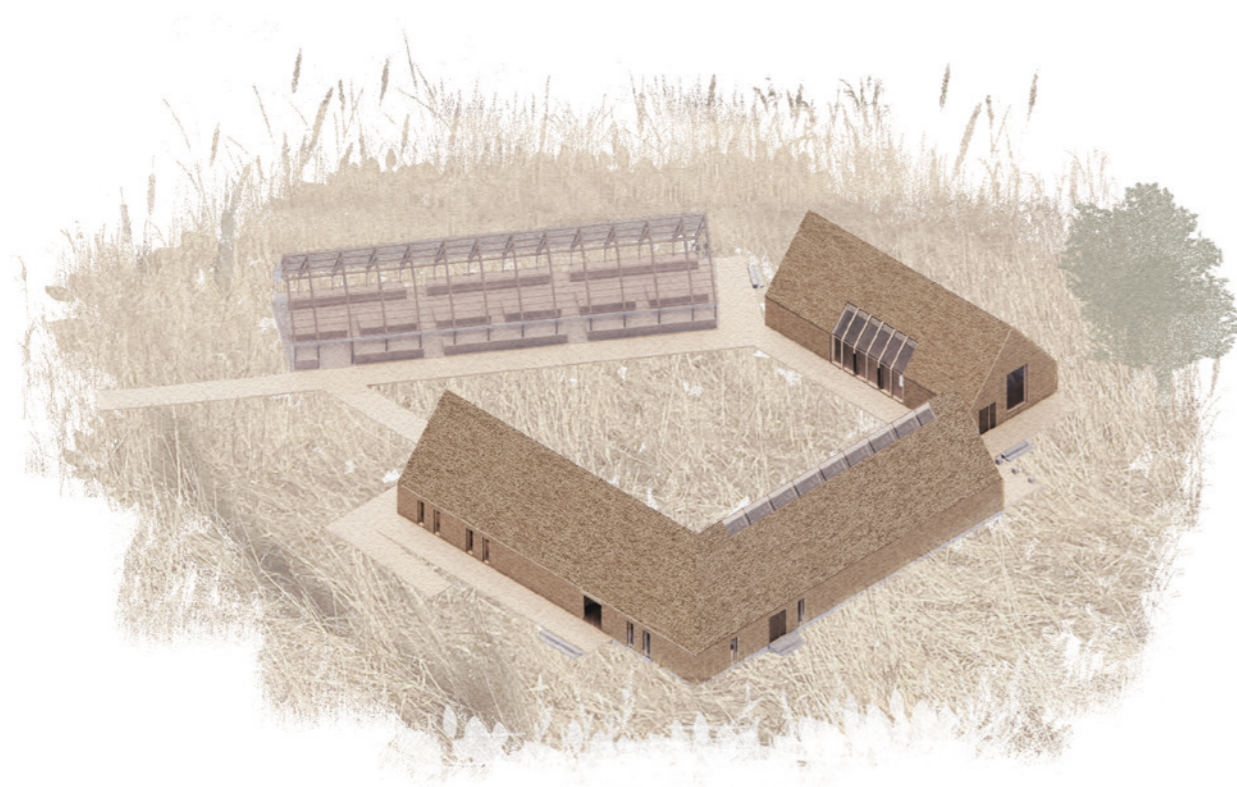


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*Sustaining Food, Nature, and Architecture Based on Local Resources and the
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Abstract



There are many connections between architecture and food - they are creative practices highly connected to history, trends, culture, and constants in our lives. Today, our globalized world has made us disconnected to the natural processes in both fields, as products are highly processed through several steps before it is reached its final destination.

The New Nordic Kitchen is a movement within food that promotes use of food and traditions from the Nordic region in an environmentally sound and healthy way. A manifesto was formulated in 2004 to guide chefs in their work. In this thesis, the manifesto is translated to architecture and used as the concept.

Consequently, the thesis engages in theories in architecture: Regenerative design, wellbeing and comfort, and primitivism. Furthermore, the thesis discusses the standardized construction industry in opposition to handcraft and local production. Vernacular Nordic architecture is an important reference, and natural, local materials are used.

The site of the thesis is Gerlesborg in Bohuslän, Sweden. Because of the connection to food, the program of the project is a restaurant where all food can be gathered in the immediate surroundings,

just like the materials of the building. Many artists live in Gerlesborg, and therefore, an additional building for exhibitions and to gather in is placed on the site.

On the grass field where the buildings stand, three buildings completely clad in straw rise. The fourth is a greenhouse, prolonging the vegetable season for the restaurant. Views towards a mountain and the sea are important to the building complex, and people are invited to experience them with the building.

The manifesto showed to be easily applicable to regenerative architecture. It is a clear strategy, and one can interpret and put different amount of importance to different points. If to be built in reality, a close collaboration with craftsmen would be important, as the project works outside of regular building regulations.

Keywords

New Nordic Kitchen, regenerative design, local materials, vernacular architecture.

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Student Background



Maria Oxelman

- 2020-2022 Master Program in Architecture and Planning Beyond Sustainability, Chalmers University of Technology, Gothenburg, Sweden
- 2020 Master Studio Social Inclusion
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- 2019-2020 Internship at Dall & Lindhardt A/S, Elsinore, Denmark
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1. Introduction

Problem Statement

Architecture, Food, & Culture

There are many connections between architecture and food - they are creative practices highly connected to history, trends, culture, and constants in our lives. Today, our globalized world has made us disconnected to the natural processes in both fields, as products are often highly processed through several steps before it is reached its final destination. Globalization ofcourse makes cultures and products more accessible to us. Our societies are more multicultural and diverse due to global human flows, but cultures also risk becoming more homogenous over the globe. The global flows also have big impacts on climate change with its implied transport.

The New Nordic Kitchen is a movement within food that promotes use of food and traditions from the Nordic region in an environmentally sound and healthy way. A manifesto was formulated in 2004 to guide chefs in their work. In this thesis, the manifesto is translated to architecture and used as the concept.

Prefabrication

Having food from all over the world accessible at all times has impact on our relationship to food and cooking. The global industrial development implies prefabrication. We eat prefabricated food that has been processed and sold in several steps before consumption, and most of us cannot name where our food is from, or what our food consists of (Steel, 2020). One exception is in current trends of self-sufficiency, and another in the expensive high-end diners, where the New Nordic Kitchen is pioneering. Similarly in Architecture, we build with less natural and context-based materials, and use standardized prefabricated,

modular elements. The fields of food and architecture clearly reflects our current state of civilization and culture, that is fast economic growth in the global era.

Value & Lifespan

In this time, we overproduce many products, and this "high productivity" is often described as positive. But it means we overuse resources, and many products are intentionally designed weak to get a shortened life, so that the consumer relatively soon must replace it instead of repairing (Berge, 2009). It means we can follow trends carefully, but also makes us less affectionate to the objects we surround us with. Like with food, when we don't know the craftsman of an object, it loses its soul and value, and is consumed quickly and without thought.

Impact on Climate Change

Food and architecture are large contributors to greenhouse gas emissions, where food is at 34 % (UN, 2021) and the building industry at 38 % (UNEP, 2020). In 2050, all carbon emissions should be at net-zero to limit global warming to 1.5 degrees Celsius (IEA, 2021), and therefore these fields hold great responsibility and possibilities to create difference for a regenerative future. Both can bring people closer to each other and what they eat. They can enhance local representation and contribute to social and ecological regeneration in the urban context.

Hes and du Plessis argues in *Designing for Hope* that the way we face the climate crisis and tipping points within to come in short time is like "rearranging the deckchairs on the Titanic" – a more radical approach is needed (2015, p. 11). By 2030-2070, if emissions continue to grow like they do today, large regions of the world are highly

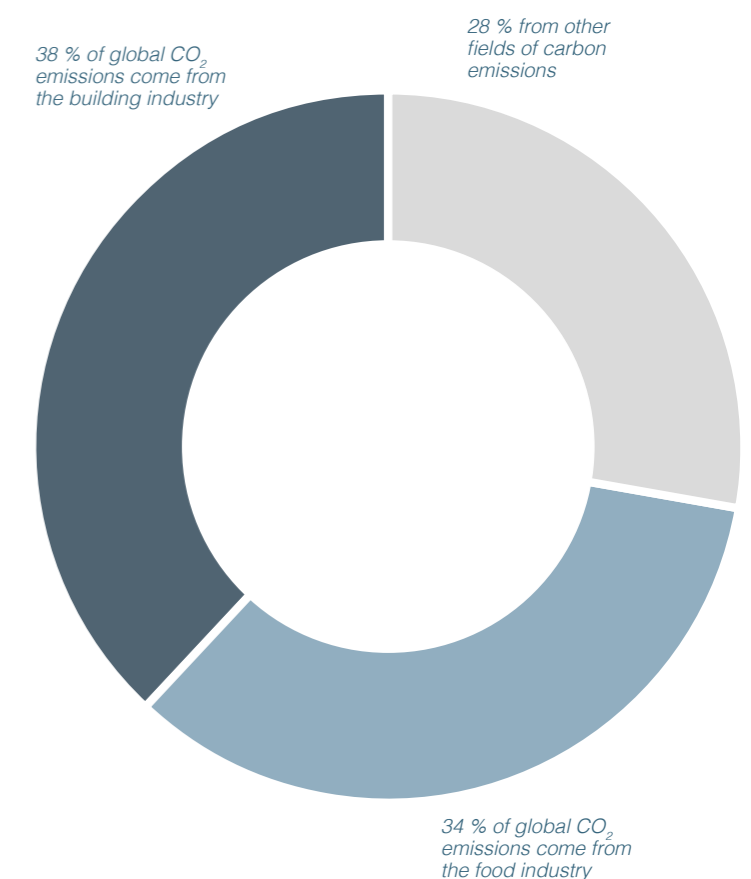
probable to exceed 2 degrees Celsius warming and rise to 3-4 degrees, having disastrous effects on all life on Earth and with that development, the economy, global security, and food security (WWF, 2020, p.13). In fact, we already see these devastating events in biodiversity loss between 1970 and 2016 by 68 % (ibid, p. 6) and more frequent extreme weather (ibid, p. 104).

New buildings are rarely expected by standards to stand longer than 50 years, and far too many existing buildings are maintained poorly. Lately in Sweden, movements against poor maintenance of our built cultural heritage have risen with associations like Fasad and Renoveringsraseriet. In today's climate crisis, the only solution is that all buildings, new and old, should be maintained to last a lot longer than today's standards, and those few newly built buildings should be built with carefully picked sustainable materials.

In spite of this, this project focuses on newly built architecture using biodegradable materials.

Relevance

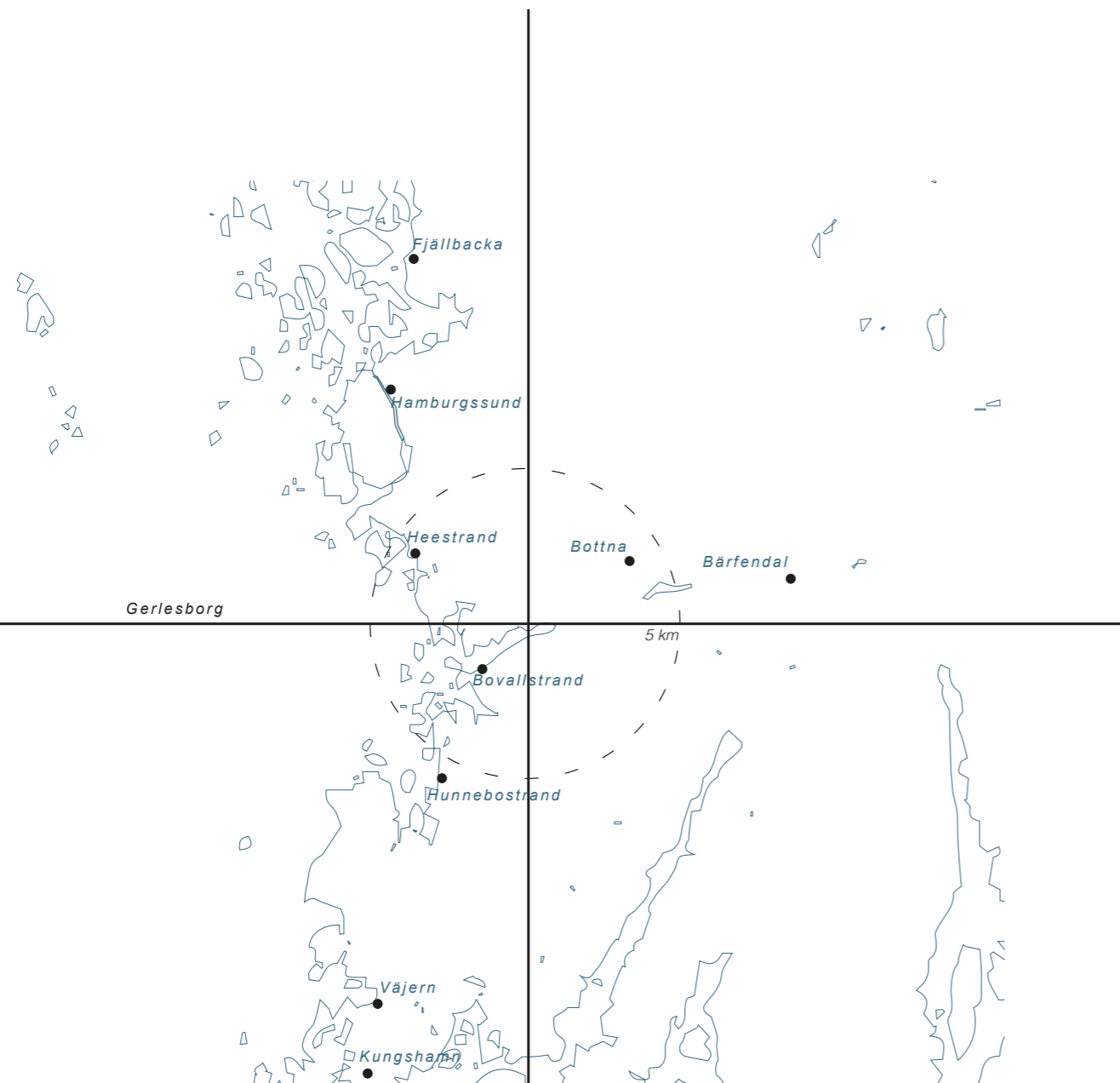
Given these problems of our current time, this thesis works in empowering the culture and identity for the local context, both in food and architecture, as well as the social and economic bonds in the area. It promotes handcraft that gives objects soul and hopefully added value that makes people want to prolong its lifespan. Combined with using local, natural materials that are kind to the ecosystems of both the site and the agricultural land of extraction, the thesis aims to make a lower impact on climate than the conventional way of life. The point of departure is in food.



Aim

The aim of this thesis is to find an equivalent of the New Nordic Kitchen Manifesto in architecture. It implies a change of the building industry to be more local, social, and resilient, focusing on crafts and value. This is showcased in a restaurant inspired by vernacular building typologies as a social meeting place on the west coast of Sweden, in Gerlesborg.

The project focuses on small-scale regenerative farming, creating synergies, and social meetings.



Thesis Question

How can an architectural translation of the New Nordic Kitchen Manifesto impact the building industry, using food systems in a rural context?



Site model 1:500, detail



Site model 1:500, detail

Delimitations & Glossary

Delimitations

This project is:

- A translation of the New Nordic Kitchen manifesto onto architecture,
- Based in a Nordic context, tested in a Swedish context and site specific,
- About local resources and produce, focusing on clay, wood, and straw,
- About vernacular architecture, mainly the longhouse and low-tech systems,
- About value and worth of food and architecture, and our cultures,
- A design proposal of a restaurant or community kitchen and center,

This project is not:

- A commercial restaurant,
- A transformation project, though it would be a more realistic approach,
- Elaborating on high-tech systems like HVAC and sewage required in a restaurant,
- Focused on social sustainability in the method,
- About building regulations or laws,
- Discussing life cycle analysis in detail of the building or materials.

Glossary

Rurban - refers to either geographical location or spatial condition, or both, being set aside from mainstream urban planning, a rural area where agriculture is no longer the main economic activity, or in urban peripheral areas fragmented in several structures.

Vernacular - a style of architecture designed based on local needs and materials, reflecting local traditions.

Regenerative design - process oriented whole system design, having the effect of making something develop or grow strong again.

Agroecology - using ecological principles in agricultural systems and practices.

Permaculture - the development of agricultural ecosystems intended to be sustainable and self-sufficient.

Terroir - the complete natural environment, including factors such as the soil, topography, and climate, in which a particular wine is produced that is giving the grape its distinctive character.

Method & Process

This thesis has used a research by design method, where the process consists of three main parts: Theory, site analysis, and design iterations.

Research by Design

The design has emerged through iterations of tests based on the findings in the site analysis and design concept, where climatological constraints has been taken into consideration by using sketches, architectural drawings, and physical models. The designs are done as developments between theory and practice, building up as my understanding broadens.

Theory

The design concept is based on theory from literature, site visits/analysis, research in the field and reference projects. The outcome is visualized in images, illustrations, texts, diagrams, and photos.

Site Analysis

The site analysis contains spatial, historical, and human attributes of the area, and supports the research. As this thesis will aim to fulfill a local identity of a place, the context's characteristics is very important to it. This is investigated through a spatial analysis and research of site specific materials, and population analysis in the area.

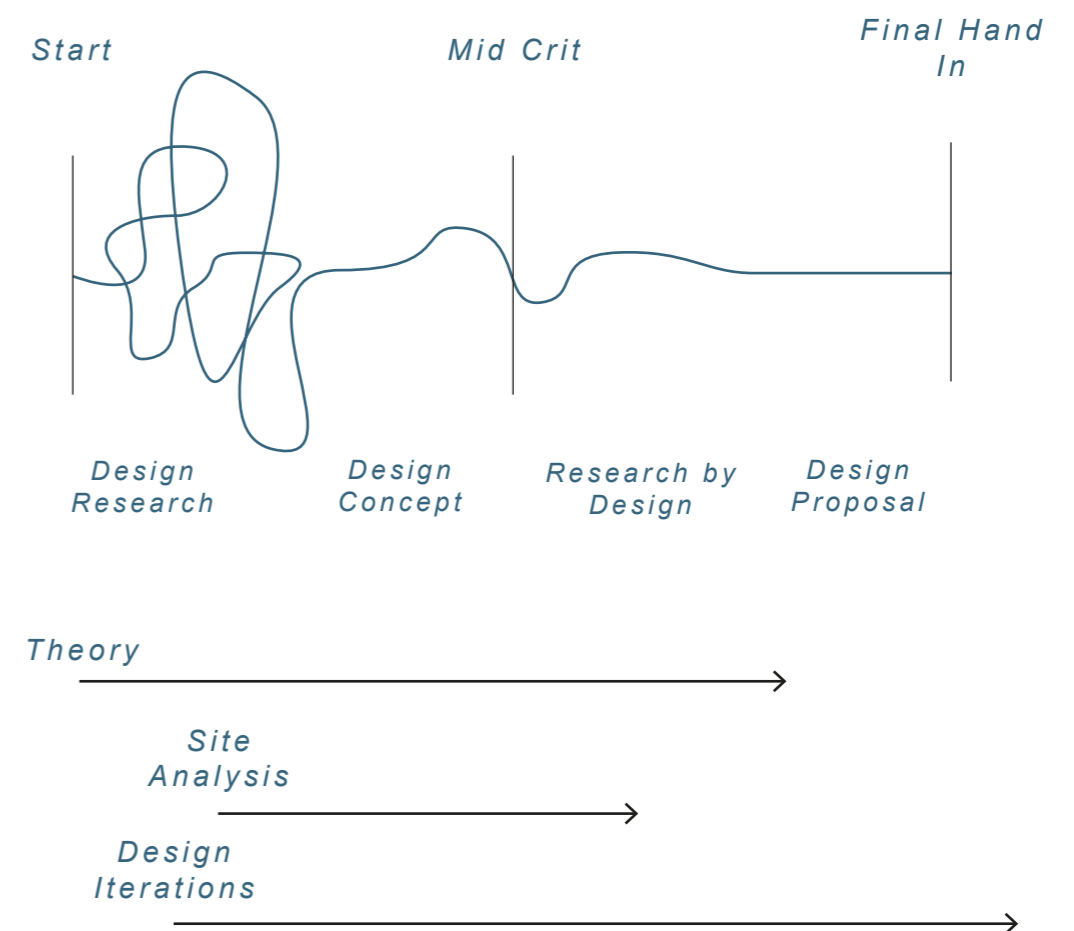
Design Concept

Based on theory and design iterations, I developed a design concept to continue the architectural implementation on. Translating the New Nordic Kitchen manifesto to architecture is the main tool in making the concept.

Digital & Physical Tools

The explorations are done with both digital and physical tools - the latter to further test my digital explorations.

Timeline





2. Design Strategy

Site location in the Nordic region

The Food System

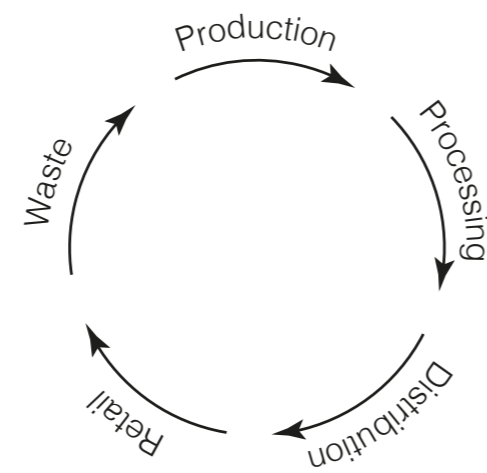
The food systems of today are global and so vast that many of us don't know where our food comes from. We have year-around access to exotic and off-season fruits and vegetables, we eat a lot of processed foods, all sold and purified in several steps before it ends up on our plates. Then, 1/4 of our foods is wasted (WHO, 2020, p. 62). Food has huge impacts on our health, with high numbers of food related diseases being rated as endemic diseases, and the planet, with 34 % of greenhouse gas emissions coming from the food industry (UN, 2021).

Current conventional food systems are evidently unsustainable in many ways. On top of that, they will not be able to meet demands of growing populations and affluence expansion, primarily because of more than half of the world's agricultural lands are already degraded (Gremmen, 2022).

In *Regenerative Agriculture As a Biomimetic Technology*, Gremmen explained that efforts already done in trying to meet global food demands has led to biodiversity loss, destruction of natural habitat, soil degradation and depletion of natural resources (2022). He then presents two scenarios as solutions: One being "super charged" scientific and technology-driven agriculture research (like GMO and digital technologies instead of mechanical), and the other being a radical switch to nature-based systems, such as agroecology or permaculture (2022). This connects to a recent Swedish study on climate impact from conventional and ecological agriculture that found that seen to the land use, ecological agriculture gives positive

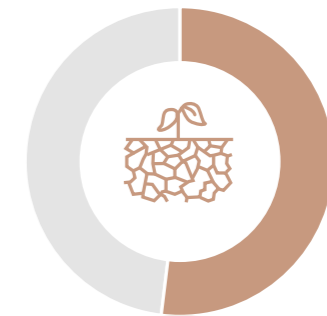
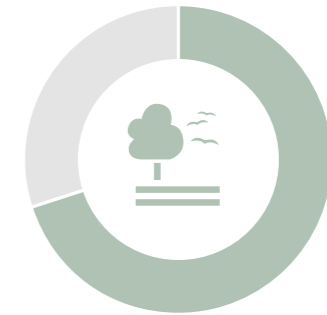
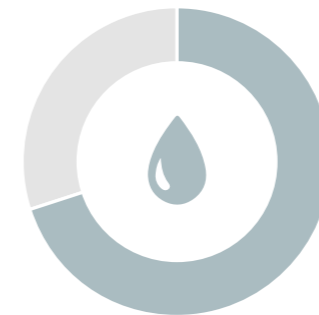
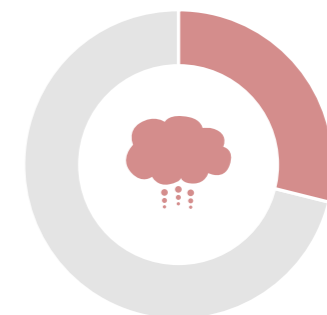
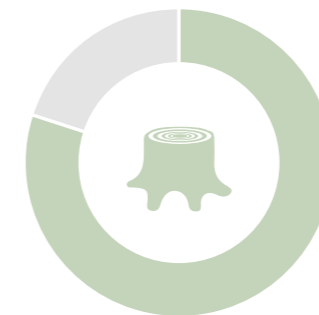
biodiversity, less nutrient leakage, and less CO₂ emissions, but seen to the production volume, ecological agriculture only gives positive effects on biodiversity, meaning none of the systems are empirically right for a climate positive future (Andersson et al, 2021).

There is an analogy to the construction industry here. We overuse and appropriate on nature to excavate materials, destroying ecosystems by polluting and drawing too much nutrition from it. I want to look deeper into the analogies, but first, I will describe the history of the Nordic cuisine.



Steps in food production to waste.

Agriculture is responsible for...



Data from WHO (2020, p. 61)

History of Nordic Food Culture

In the Nordic region, we have never eaten according to the season, but conserved fresh vegetables and root vegetables from an annual surplus in May-September and added meat and fish during the rest of the year (Nilsson, 2017, p. 27). Conserved vegetables have a lot of tastes in themselves, why few spices were used (ibid, p. 29). According to Tellström (ibid, p. 28), the key to the farmed food culture of the Nordic history is not primarily the choice of edible plants and animals, but about building technology in creating dry and stable depots and houses to store the conserves over the year. Industrialization with refrigerators and long way transportations made fresh vegetables, new spices, and cuisines accessible throughout the year (ibid, p.29).

In the first half of the 20th century, Swedish restaurant culture was neglected globally because of poor market conditions and restrictive laws on alcohol consumption (Jönsson, 2013, p. 54). But in the late 70's and 80's, restaurants inspired by the French cuisine were on the uprise, and in 1984, Swedish restaurants started receiving Guide Michelin based on the French Nouvelle Cuisine, where "a natural way of life" is highly valued (ibid, p.55-57). It also valued locality, and in the Nordic context, that eventually led to the fall of the supremacy of the French cuisine (ibid, p.59).

The New Nordic Kitchen

In 2004, the Danish chef Claus Meyer was the driving force in formulating a manifesto as guidelines for the New Nordic Cuisine (Jönsson, 2013, p. 61). It consists of 10 aims that aren't very far from previous aims of the Nouvelle Cuisine but differs in the emphasis on the Nordic qualities of raw products and good taste (Ibid, p.62-63). The cuisine was initiated as an alternative to the French image of the "good taste" in the region, setting up a terroir to redefine the Nordic cuisine and identity (Leer, 2016).

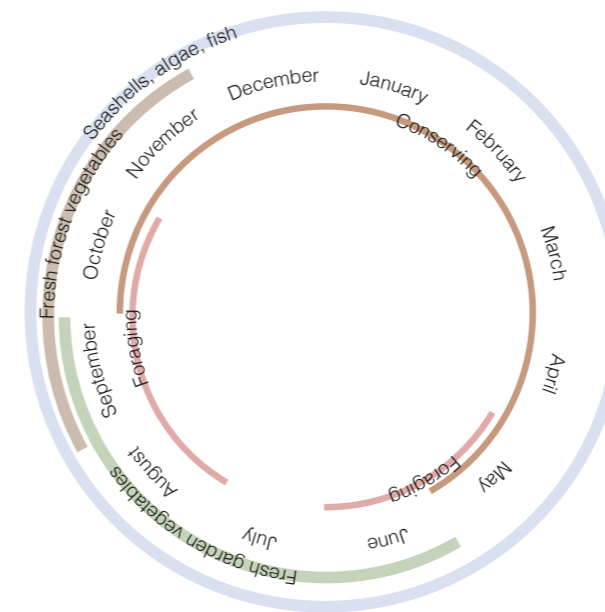
The movement is a part of a construction of national identity in current globalism that brings people in geographical disconnection closer to each other through an imagined community (Neuman, 2017; Skaarup, 2013, p. 52). The cuisine has spread all over the western world because of local produce's freshness when harvested at the perfect ripeness with short transportation and therefore, less pollution (Skaarup, 2013, p. 52).

Quality in food is in the Nordic region about technique, health, animal welfare, nutrition, and hygiene (Bergflødt et al, 2012). This is also visible in the New Nordic Kitchen Manifesto, as the aims declare to "promote animal welfare" and "combine the demand for good taste with modern knowledge of health". Quality also lies in the food produce. The emphasis on local produce has meant that urban restaurants support rural development in the region (Jönsson, 2013, p. 65).

Criticism & Opportunity

The New Nordic Kitchen has been criticized to be an elitist food culture, a culture by the elite chefs that made it, for themselves, journalists, and their rich clientele (Leer, 2016). Andreassen argues that the concept can be interpreted as a, maybe unintentional, mean of promoting Nordic whiteness as supreme (2014). The concept of the manifesto is mostly used in high end restaurants, but actually, it deals with values that are sustainable, local and healthy. The kitchen concept is guiding in a sustainable food system, where "other impulses from abroad" are welcome to shape tastes.

One of the founders of the manifesto, Claus Meyer, says that the manifesto now holds values of the new normal – that it is a good guide and revolutionizing at the time of its declaration, but now is a part of everyday values in cooking (Thurfjell, n.d.). Comparing to the problems of agriculture and climate change stated above, it can still do more, and be revolutionizing within architecture as well. The manifesto is used in this thesis as guidance in designing sustainable and affordable architecture that strengthens the culture of a Nordic place, and will be developed further later in the booklet.



Seasonal wheel based on Fäviken food strategy (Nilsson, 2012).



Image of New Nordic Kitchen dish, example from Fäviken (Nilsson, 2017)

Translating the New Nordic Kitchen Manifesto

The New Nordic Kitchen Manifesto (2004) aims:

1. To express the purity, freshness, simplicity, and ethics we wish to associate to our region.
2. To reflect the changes of the seasons in the meal we make.
3. To base our cooking on ingredients and produce whose characteristics are particularly in our climates, landscapes, and waters.
4. To combine the demand for good taste with modern knowledge of health and well-being.
5. To promote Nordic products and the variety of Nordic producers - and to spread the word about their underlying cultures.
6. To promote animal welfare and a sound production process in our seas, on our farmland and in the wild.
7. To develop potentially new applications of traditional Nordic food products.
8. To combine the best in Nordic cookery and culinary traditions with impulses from abroad.
9. To combine local self-sufficiency with regional sharing of high-quality products.
10. To join forces with consumer representatives, other cooking craftsmen, agriculture, fishing, food, retail and wholesales industries, researchers, teachers, politicians, and authorities on this project for the benefit and advantage of everyone in the Nordic countries.

The New Nordic Architecture Manifesto aims:

1. To express the purity, honesty, simplicity, and ethics we wish to associate to our region.
2. To reflect the changes of the seasons in the architecture we design.
3. To base our designs on materials and produce whose characteristics are particularly in our climates, landscapes, and cultures.
4. To combine the demand for comfort with modern knowledge of health and well-being.
5. To promote Nordic architecture and the variety of Nordic design - and to spread the word about their underlying cultures.
6. To promote the natural environment and a sound production process in order to preserve resources in our Earth.
7. To develop potentially new applications of traditional Nordic architecture and design.
8. To combine the best in Nordic design methods and traditions with impulses from abroad.
9. To combine local self-sufficiency with regional sharing of high-quality design.
10. To join forces with clients, other architects, professionals in the field, material producers, house retailers, researchers, teachers, politicians, and authorities on this project for the benefit and advantage of everyone in the Nordic countries and the world.

The manifesto of the New Nordic Kitchen is easily applicable to architecture, and the translation the key design strategy of this thesis. The translation is partly based on Miki Morita's translation in her thesis from KADK in 2015.

3. Theory



Farm building insulated with eelgrass from Bangsbo, Læsø

Regenerative Design

Regenerative design is closely connected to point 6 about the natural environment and Earth's resources in the New Nordic Architecture manifesto. It is to repair, recreate or revitalize a system's energy sources in a refinery process, such as air, soil, or water, or any other medium (Attia, 2018, p. 19). It rejects the human-nature dualism, and argues that humans belong in eco-systems, as well as eco-systems belong in society (Östlund, 2017, p. 72). It is not only about designing eco-efficiently, but also techno-efficiently while considering current measures not being sufficient, meaning we need a new regenerative paradigm where we design from cradle to cradle instead of greenwashing small shifts (Braungart, McDonough, 2002, p. 67). Cradle-to-cradle design means no waste should be produced, and instead considered as nutrition for the next loop (ibid, p. 92-93). Regenerative agriculture is to focus on soil fertility instead of the conventional within agriculture, plant growth. This project uses regenerative design in both architecture and agriculture.

Three principles to design climate neutral buildings according to Berge (2009, p. 35) are to: Choose low impact materials and constructions, reduce all operational energy, in particular that based on fossil fuels, and maximize storage of carbon. Using local and unprocessed materials, the first and last criteria are already almost fulfilled by themselves, which is done in this thesis.

Regenerative Architecture

Attia (2018, p. 24) suggests regenerative design elements according to the desired building typology that should improve air and water quality, increasing biodiversity, use healthy materials, enable cultural and social diversity, enable functionality, mobility and generate energy. A regenerative building produces more energy than it consumes (ibid, p. 28).

In the building industry, it is crucial to apply regenerative thinking early in the design stage (Attia, 2018, p. 20). The main challenge is to ensure that the project as a whole will have such a positive impact that it will reproduce and recreate all its components during the building's lifespan, including what was produced in order to build it (ibid, p. 20). According to Attia (2018, p. 26-31), three main principles guide regenerative design in architecture: Selection of a Construction System, Defining of Design Elements and Their Performance, and Choice of Regenerative Materials.

Climate Responsive Design

In the rise of modernism, Le Corbusier famously stated that "a building is a machine for living", meaning that the building houses functions suited for life and supports the modern person like a machine, not necessarily with highly refined materials or high-tech equipment. Now, almost a century later, buildings are less adapted to their local conditions causing a need to be equipped with high-tech machines. But the aim of a well-functioning building, and point 2 of the New Nordic Architecture manifesto about change of seasons, is to be responsive to local climate conditions, both indoors and outdoors, supported with machines when necessary.

Wellbeing & Comfort

According to Norsk Treteknisk Institutt (2016, p.10), we spend 90 % of our time indoors, and this of course impacts on our health, wellbeing, and comfort, although in the building industry, we seem to lack knowledge of its importance. Furthermore, the report suggests natural building materials that are associated with nature because they potentially have positive psychological impacts on people (ibid, p. 43). The most natural materials are unprocessed without additives (ibid). This

is important to the project as health and soundness towards ecosystems are central to the design strategy and point 4 and 6 in the manifesto about comfort and health, and the natural environment and Earth's resources, respectively.

Wellbeing and comfort is dependent on many factors, such as lighting conditions, air, humidity, acoustics, material choice, smell, ease of adjustment and combinations of materials, expectations, traditions, physical space, and purpose of the building (Norsk treteknisk institutt, 2016, p. 45; Block, Bokalders, 2010, p. 112).

Primitivism

Primitivism can be described as a rejection of everything but nature. It relates to the design strategy because the manifesto in general supports local and traditional means of thinking. In primitive societies, one is less dependent on a large group of people, and more self-sustained. John Zerzan argues that conventional means of thinking and living yields for an increasingly dissatisfied and disconnected society, and that the primitive man, before enslavement by constitutions like kings, priests, and bosses, were much more focused on "a life of leisure, intimacy with nature, sensual wisdom, sexual equality, and health" (Tucker & Zerzan, 2005, p. 220-221). We do need a network of people with different skills to rely on to support each other, but the way we live today is too complex and decoupled from nature. This thesis works with primitivism with material use and techniques, and supports for a sustainable and primitive kind of agriculture and foraging.

Three Principles for Climate Neutral Design:

1. Choose low impact materials and constructions,
2. Reduce all operational energy, in particular that based on fossil fuels,
3. Maximize storage of carbon.

(Berge, 2009, p. 35)

The Construction Industry

Similar to the food industry, the Nordic construction industries today are highly efficient and based on highly processed and industrially manufactured materials, such as concrete, steel, glass, mineral wool and gypsum. In the US, almost 50 % of materials used in 1900 were based on renewable resources, a number that drastically sank to less than 8 % in 1990 (Golden, 2018, p. 1). The whole building industry globally contributes to 38 % of all CO₂ emissions (UNEP, 2020). In addition, buildings are highly pollutive, with surfaces emitting volatile organic compounds (VOC) that affect our health negatively (Berge, 2009, p.29 & 31; Nriagu, 1992, p. 336-383).

Buildings are today standardized and prefabricated in global supply chain logistics and economies instead of being designed to suit the culture and climate of the area (Golden, 2018, p. 1). Point 3 in the manifesto is about using local materials to our climate and cultures. The natural and local material wood is highly industrialized to be more homogeneous in order to further standardize the material, leading to less ecological diversity. This process has made it possible to provide a higher building standard to the broader public without extreme costs put on manual labor. Another effect is a visual catalogue expression, meaning they could be placed anywhere in the world. In this project, handcraft and the collaboration between the craftsman and architect according to point 5, 7 and 10 about Nordic culture and style, new applications of the traditional, and collaboration with other professionals, respectively, in the manifesto.

Craft vs. Industrialization

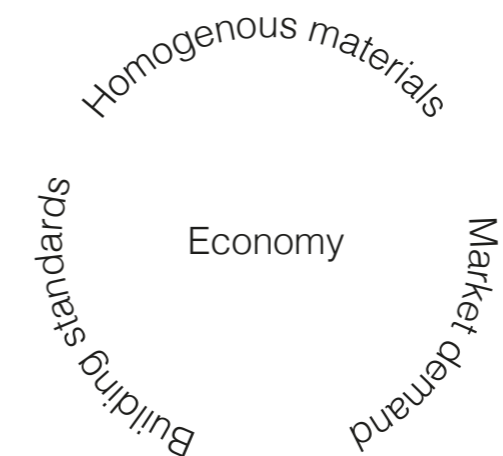
Food and design meet in craft, where both the craftsman and chef need to practice the same procedure over and over to master their field, and more importantly – know how to save an unexpected error. Especially errors are feared in both architecture and cooking (Martin-McAuliffe, 2016, p. 148). Craft can tend to be equated with skill, but is much more in requiring patience, time and “an uncompromising dedication to one’s materials” that together shape the craftsman’s intuition for judgement (ibid, 2016, p. 143). Digitalization and higher productivity in the architectural process has decoupled the architect from the material, threatening the architect’s ability to create spaces suitable to the human eye, touch and scale (Pallasmaa, 2005). Here, the architect needs to collaborate with the craftsman in order to achieve a satisfying result.

Handcraft is associated to detail-richness and low-tech building techniques. These have been eliminated by industrialization and mass fabrication to the bare minimum, and even though some vernacular building materials like earth and bamboo are used widely in some parts of the world, they are labeled as an inferior alternative to concrete (Golden, 2018, p. 2).

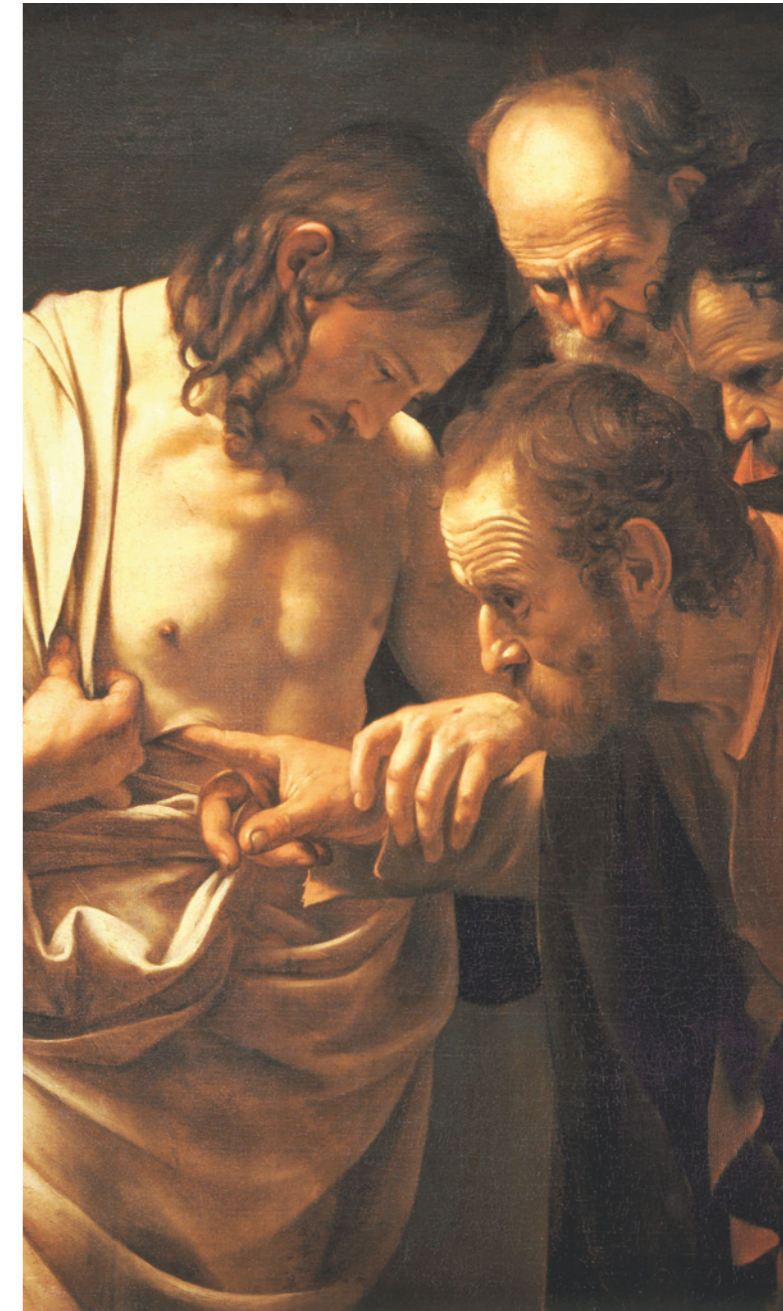
But craft also represents an affectional value that makes us want to tend to our possessions and use them throughout their lifetime and beyond. In architectural cradle to cradle design, value of objects is considered important in upcycling and upgrading of products into new functions or applications (Attia, 2018, p. 21). For me, this is a question not only about sustainability for the generations to come, but also about surrounding ourselves with things that we love. In that respect, time can lose its inferior value to things that take longer time to produce and therefore clearly express the handcraft and its soul, both in food and architecture, is something we value higher to experience.

Local Production

Production can be divided in three categories: manufactured by the general user, manufactured by a craftsman, or manufactured through a production line (Berge, 2009, p.49). The two first are almost necessarily local and hold a spirit within the product shared with the hand of the producer. To the user, this is a quality that can lead to a better and more personal product. The latter mean of production is associated to efficiency and economical growth. But as Bjørn Berge (2009, p.51-52) argues, an ecological building industry is close to both the worker and consumer, responding to the local needs and resources. This refers to point 3 about materials, climate and culture, 6 about the natural environment and Earth’s resources, and 10 about collaboration with other professionals in the manifesto.



Driving forces of the building industry



The Incredulity of Saint Thomas by Caravaggio, emphasising the human urge to confirm visual impression with touch, the attraction of handcraft

Case Studies: Vernacular Buildings



Longhouse From the Bronze Age, Bohuslän

The longhouse is a geographically widespread building typology, and in the Nordic region it has been dated back to 3900 BCE (Edblom, 2004, p.95). It is characterized as a proportionally narrow building with one single room and was built independently in various cultures all over the world.

This longhouse is reconstructed at Vitlycke museum, Sweden, from the bronze age. It is a one-room building with a fireplace in the center, flanked by benches for seating and sleeping. On the short ends were niches for storage, and at the top of the façade a wind's eye opening for ventilation and smoke to exit. It is extremely site specific in material use, with oak construction, clay walls and straw roof, just like the diet was based on the wild feed from the forest and ocean, and a fenced in garden.

In this thesis, the longhouse is a driving design concept as community building, and in the hyperlocal, biodegradable building materials used.



Farm From Bangsbo, Læsø

Læsø is a Danish island located in Kattegat surrounded with a lot of eelgrass in the oceans. These farm buildings from the 18th century is moved from Læsø, and most eye-catchingly built with an eelgrass roof. At the time, no trees grew on the island due to a sand flight (Stoklund, 1962, p.7). The roof is one meter thick and has a long life-time – especially in its designated location, where salty winds from the ocean kills invading organisms otherwise growing on the organic roof.

The building resembles a longhouse in many ways but is more modern with ceiling trusses that allowed to open larger spans in the room, losing the two- or three-shipped layout. Construction-wise a timber frame filled with wattle and daub of algae. The timber in this building was from shipwrecks (Ibid, p.12).

This building is inspirational to the thesis as it works in similar climate to the site of the thesis, and the vernacular but, compared to the longhouse, modernized building techniques.

Case Study: Straw Clad Building



Image: Arch Daily

Naturum Tåkern, Glänås, Väderstad

Naturum Tåkern is a visitors center for bird watching at lake Tåkern, built in 2012. It is a wooden construction clad in reeds from a local farm, but in fact, the insulation in the wooden construction combined with a backing board under the reed is superfluous. Reed is insulating and works as a diffuser of humidity in itself. The roof is significant to the building, as it is taking up large parts of the facades and has a high, varying inclination.

The ridge window allows for natural light throughout the building. To me, it is a translation of the wind-eye opening of a traditional longhouse.

The overall aesthetics of Naturum Tåkern is a reference to this project, as the load bearing structure is in wood, all exterior walls are clad in reed, and a skylight is placed along the ridge of the building.

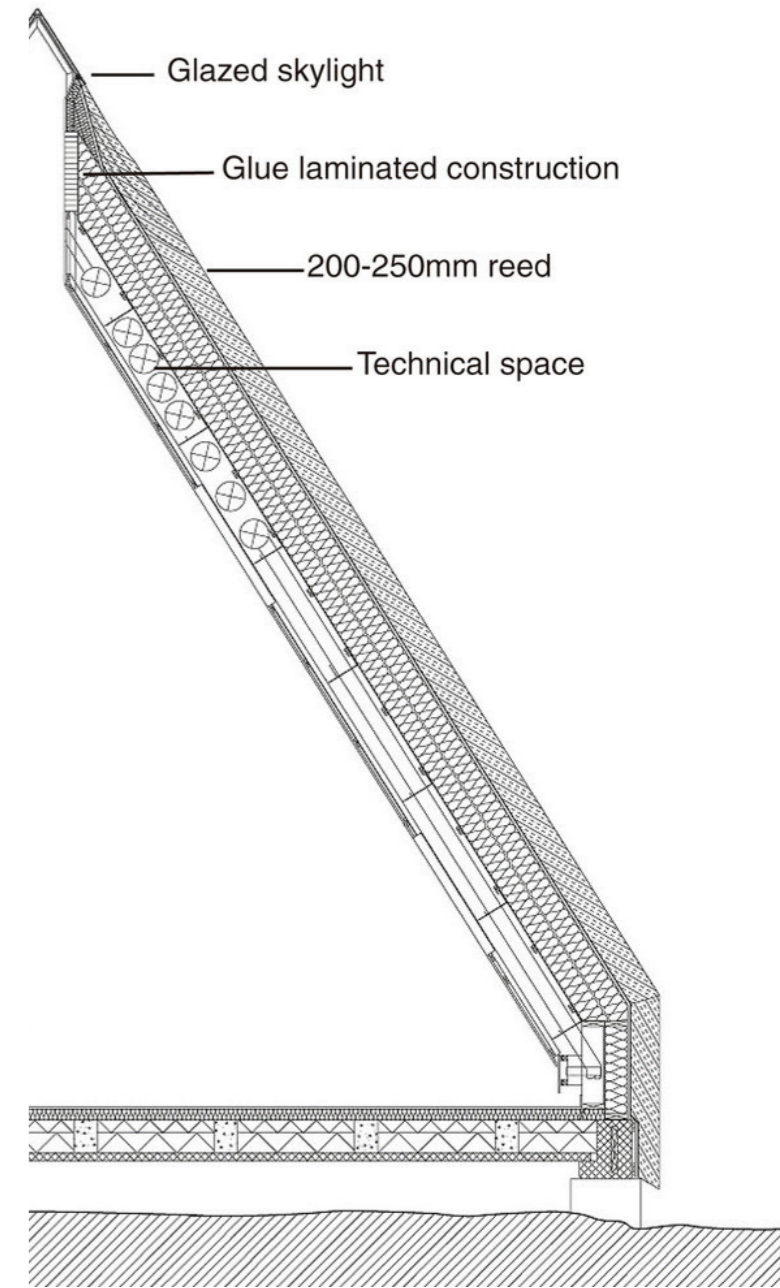


Image: Arch Daily

Case Studies: Social Constructions



Image: Arch Daily

Svartlamon, Trondheim

The cluster of buildings called Svartlamon in Trondheim, Norway, is a historical workers' quarter that in 2001 became a test bed for ecological urban planning. Most buildings are conserved since the switch of the 19th to 20th century, and most of them are managed in a flat hierarchy by the residents themselves. The row-houses, are some of few newly built, self-built by the residents.

Significant to Svartlamon is the social community, where residents share work between them. They operate different functions together, like a "free-shop" - where everything is free, and money doesn't exist - a kindergarten, a pub, a grocery store, and more. Residential laymen chip in with their time, and when needed, professionals are lent in to achieve the required product.

The community and social systems of Svartlamon are inspirational to the concept of my imagined community in this thesis, and a way to understand how the building of this thesis could work.



Garveriet, Floda

Garveriet is a restaurant based on sustainable local production and social clusters. It houses in an old tannery building (garveri in Swedish) in Floda, Sweden, and is a collaborative hub connecting sustainable fish farming, a beer brewery, an apple cider brewery on fallen, unwanted fruits, and more. It is a place to eat, meet, and learn in a sustainable food environment. They have a studio kitchen for courses in food, and anyone can rent the building for a closed event, or attend a public event hosted by Garveriet.

At a study visit, I learnt that the restaurant has some logistical obstacles that is fruitful for my design layout of a restaurant. For example, the kitchen and storage are located on opposite ends at Garveriet.

Inspiring for this thesis is the community of several sustainable producers surrounding food, as well as the use of the building for the social community. The thesis also strives to be a sustainable, social hub surrounding regenerative food.



Image: Lofotr Museum

Longhouse Lofotr Viking Museum, Lofoten

This longhouse is a reconstruction of a viking building from the Vendel Period in Lofoten, Norway. It is approximately 80 meters long and 9 meters tall, making it a typical longhouse of the time. The buildings were now more like large feast halls than only homes as in the Bronze age, and much clearer show a hierarchy in the society. The building was used to invite for feast and celebrating the foreman of the group.

The building has a ridge window opening above the hall, that is placed centrally in the hall. In the three-aisled building, the two outermost aisles were presumably used for seating, while the central one is for cooking.

The typology of a large hall where people from one or several communities gather around food is a strong reference to this project. The same goes for the general floor plan concept.



Image: Lofotr Museum

Wild Materials

Historically, materials have always been extracted from the local context of a building and can be divided into geological materials; earth and stone, and plant materials; straw and grasses, wood, and bamboo (Golden, 2018, p. 1, 7-53). Insulation materials have been reeds, peat and sheep wool.

Straw

Straw and reed are natural materials that has clad roofs at least since the early bronze age, on traditional longhouses all over the world. In a discussion with Adam Ooms, thatcher at Svenska Stråaktäckarföreningen, he explained that their lifetime spans up to 50 years but are worn out faster if the roof inclination is lower than 45 degrees. The same goes for parts of roofs that are covered from the sun and therefore dry out slowly, like a north-oriented side or in the shadow from a tree, he continued. Freshwater reeds have better durability than saltwater reeds, he continued, and the thickness of a roof is 250-270 mm.

Wood

Sweden has large areas of coniferous forest and forest agriculture, but during the past 50 years 50 % of Swedish forests have been cut down, and only 10 % of the forest is over 140 years old (Karlsson, 2021, p. 17). The modern Swedish forest industry is mainly clear-felled areas of relatively young and tall wood, like fir, that are later planted with new trees of the same species to face the same fate.

However, wood as a material is a more positive material against the climate than others. It binds and stores CO₂ from the air and transfers it to the soil during growth, and this carbon is later what is known as embodied carbon stored in construction materials (Berge, p.34, 2009). Both wood

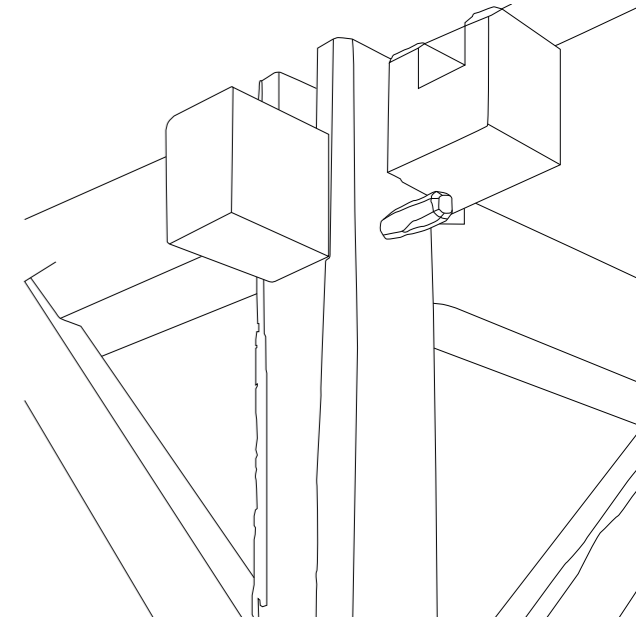
and concrete are good carbon-binders. Forestation industries can even have positive impacts on biodiversity and carbon storage, in opposite to the conventional forestation of today. Instead of cutting down an entire field of trees, individual trees that are ready for harvest are picked, leaving small free spaces where natural rejuvenation is allowed (Karlsson, 2021, p.45).

In moist indoor areas, exposed organic materials should be avoided because they decay faster and become hosts for hazardous mycotoxins that can impact health negatively (Berge, 2009, p. 43). This is also why timber constructions has high requirements on vapor barriers.

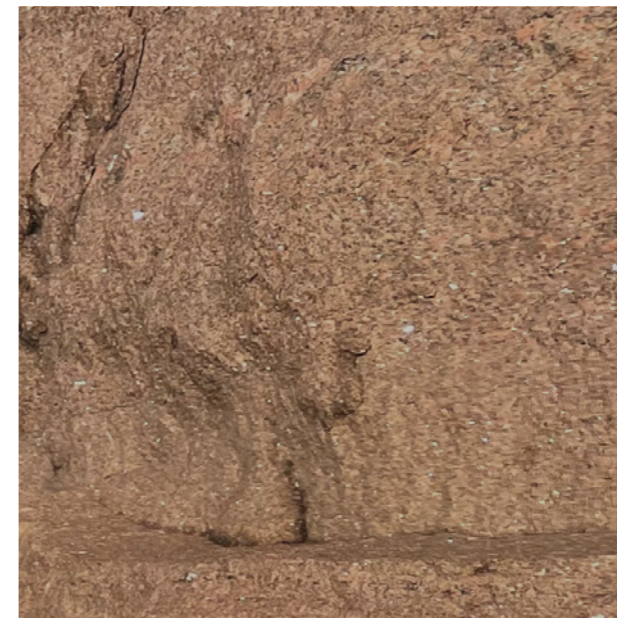
During the thesis, I took a study trip to visit Ulrik Hjort Lassen during a one-week timber frame workshop he held. There, I saw the construction manners in detail, and understood how I as an architect can draw in that manner in this thesis. The way of construction does not require any metal joints, and is traditional to the southern Nordic region.



Thatched reed roof



Timber frame without metal joints



Granite



Waxed clay and clay wall surfaces



Discarded windows at a renovation
Image: SSAM



Mussel shell drainage in foundation
Image: Bondegaard Rydbjerg

Clay

When aiming to build on local resources, clay is a good material because it can be found immediately on almost any site. Using clay on indoor surfaces gives a good air quality – it has good thermal properties that equalize temperature and works as a humidity regulator (Berge, 2009, p. 266). The mean outdoor temperature is the indoor temperature, without any additional heating. Clay indoor surfaces can reduce ventilation requirements to one third, as done in Vorarlberg Museum (Valenzuela, 2021). It is a heavy construction material and has good acoustic properties.

In the Nordic region, straw bale construction clad with clay is a good wall construction alternative to clay walls. It gives good insulation properties in combination with direct sunlight heating on the clay, supported with a heating system. The typical load-bearing construction in a straw-bale construction is timber frame.

Mussel Shell Drainage

Mussel shells as a building material is quite rare, but can be used in walls, roof and foundation. It has good insulation and drainage properties, and can also work as partly load bearing, and since it is a waste material from the food industry it is fairly cheap (Nielsen, 2006). The U-value of mussel shells is 0,4 W/m²K (ibid). No other insulation or drainage is required in a foundation at a depth of 500-750 mm (ibid). In this project, mussel shells are used in the foundation.

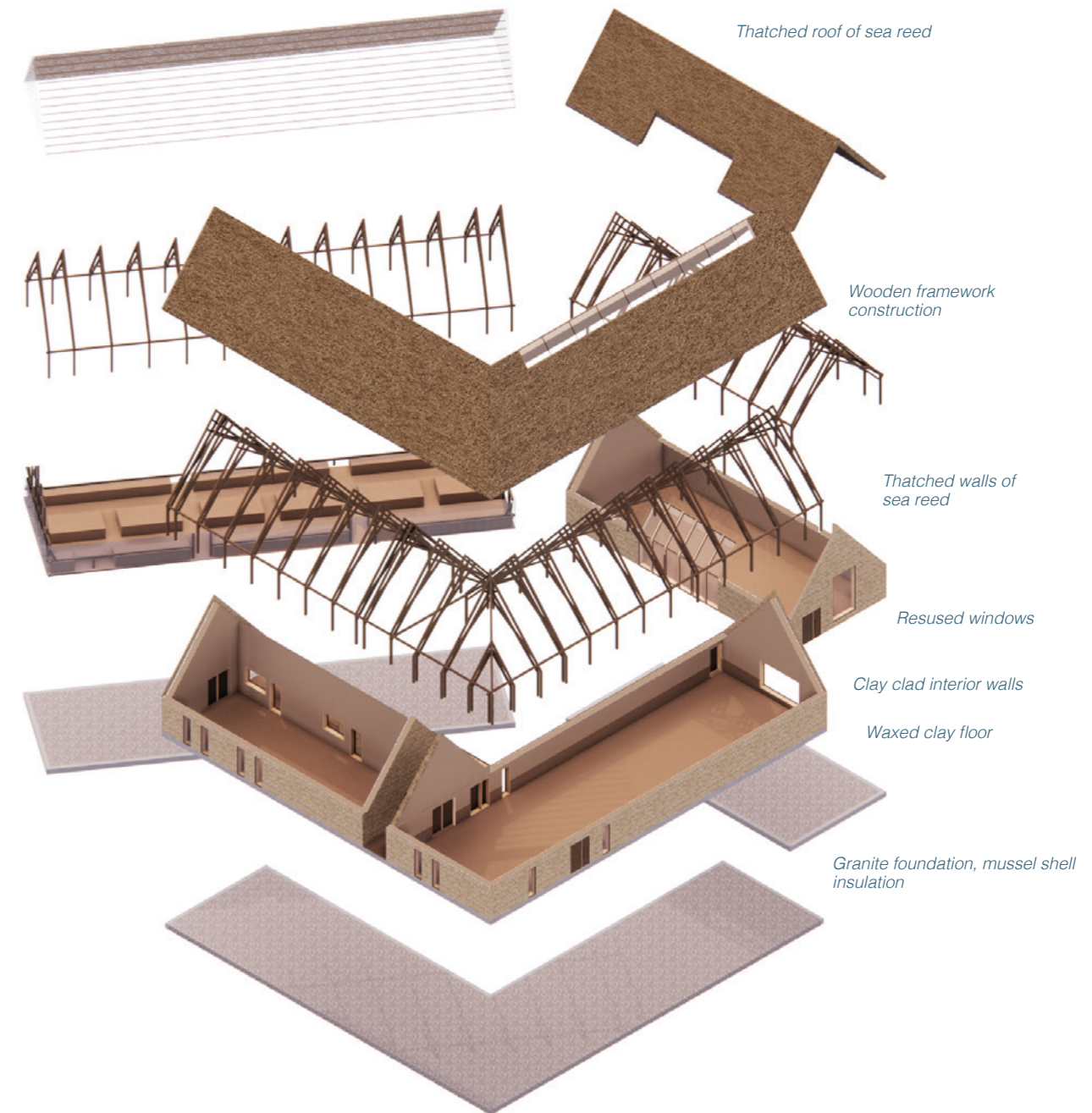
Reusing Windows

In modern times, many follow the trend of renovating. This means that sometimes completely durable building components are thrown away. In the ongoing climate crisis, all buildings should be considered as a material bank to support for a circular economy. In this project, windows are said to be reused, but not specifically collected. The Upcycle Studios are row houses based on mainly reused materials in Copenhagen by Lendager Group, the architects claim the project to save 45 % CO₂ compared to a similar project with only newmade materials (Lissalde, 2022). A constraint to consider is that existing building components have set sizes and material properties, and that the design will change according to available materials.

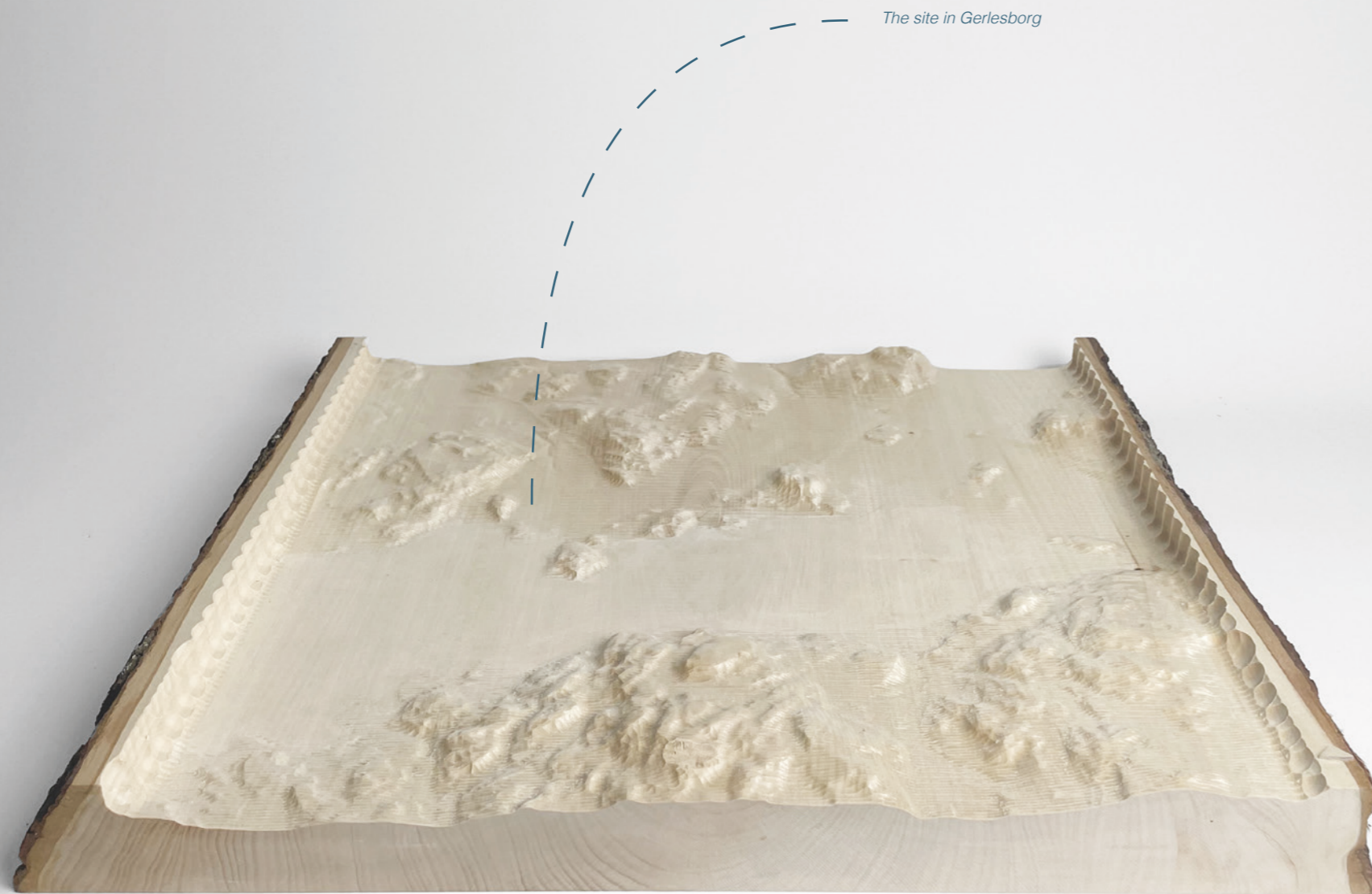
This thesis will not investigate what specific windows to be used, so drawings will show general looks of window openings. In a real implementation, the windows will have a more random look. For insulating properties, reused 1- or 2-glass windows will be transformed to 3-glass windows.

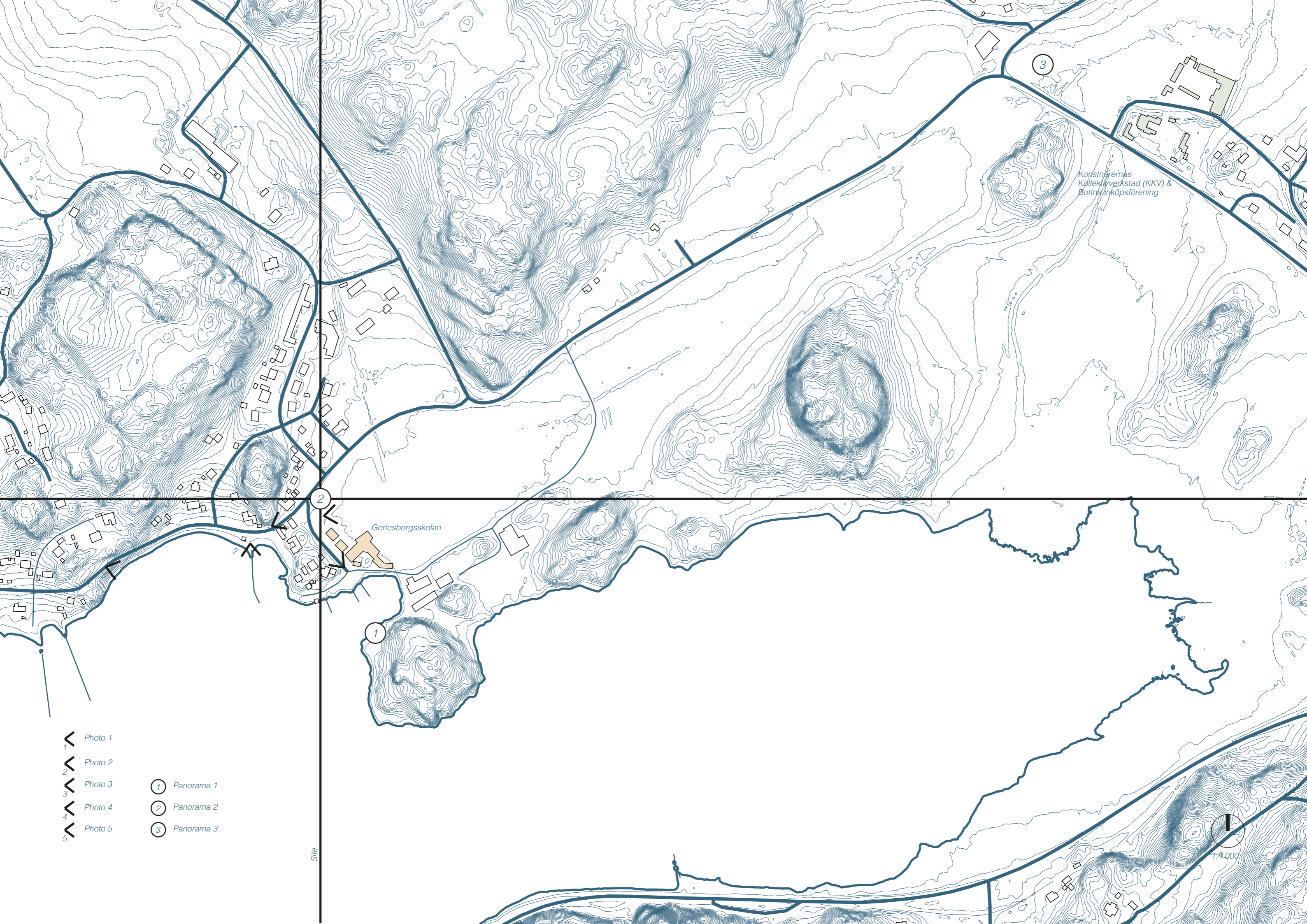
Primitive Materials

Using wild materials connects to primitivism. It is to move closer to nature and to understand the natural material properties. This will not only refer to the manifesto by being a usage of local and environmentally sound materials, but also help the visitor read the building and its honesty in tectonics.











4. Context





Korpnärens
Kollektivverkstad (KKV) &
Bottna Inköpsförening

Gerlesborgsskolan

-  Photo 1
 -  Photo 2
 -  Photo 3
 -  Photo 4
 -  Photo 5
-  Panorama 1
 -  Panorama 2
 -  Panorama 3

Site

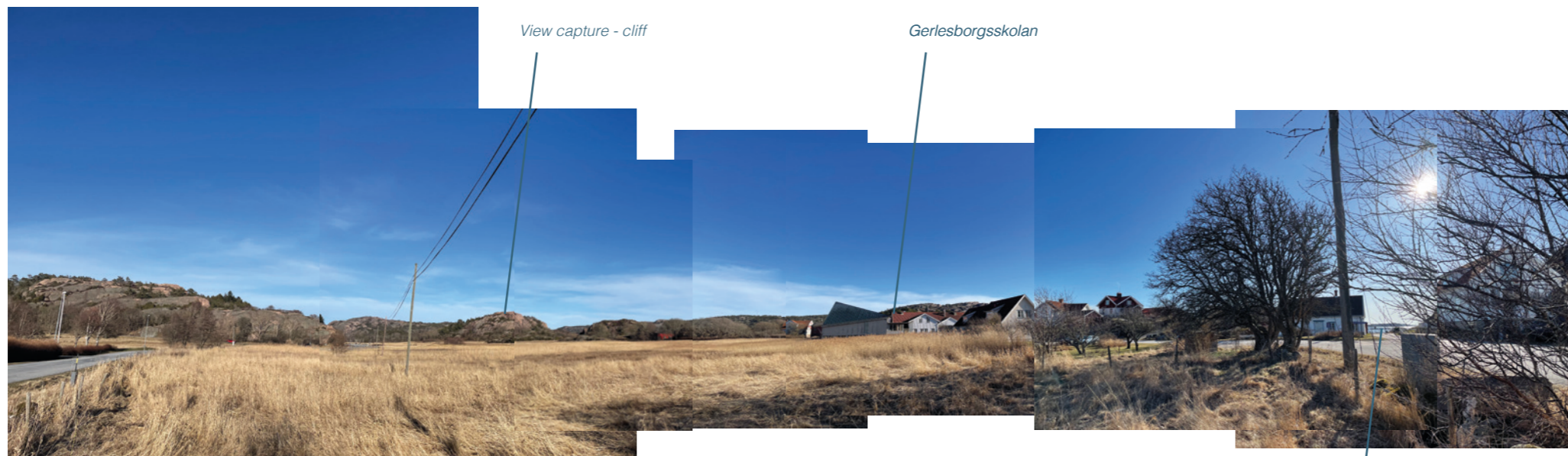
1:4,000

Gerlesborg - Identity



Panorama 1

Gerlesborgsskolan



Panorama 2

View capture - cliff

Gerlesborgsskolan

View capture - sea

Gerlesborg is a small coastal community in Bottnafjorden in mid Bohuslän. It is most known for its art school, Gerlesborgsskolan, and Konstnärernas Kollektivverkstad, that attracts people from all over Sweden (Knapp, 2008, p.250).

Nearby the community lies an eco-village, Skärkäll, and Bottnavikens Inköpsförening that distributes local and mainly ecological food to its members. Café Olivia houses near KKV and works as a meeting space around food for people from the area. During summer, the area is popular to tourists, and becomes denser.

The population of the area are interested in art and collaborative living in different ways. There isn't any restaurant or community building for any of them to meet and attract more people to this rural context, and an exhibition hall in extension to this would mark out a center in the area clearer.



Photo 1



Photo 2



Photo 3



Photo 4



Photo 5

Local Materials



Panorama 2

Arable land



Selected edible species from the area

Both food and building materials origin from the same biotope where the building stands accordig to the translation of the New Nordic Kitchen Manifesto to architecture. The local biotopes that provide materials in this thesis lie within 5 km from the site. They are natural but can be refined in a craftsman's manner, but not industrially.

On the panorama image of a plot between an art gallery and KKV, a few possible building materials are identified: trees like birch, oak, fir and pine, clay and silt with a depth of 10-20 m (SGU, 2022), granite and reed. Mussel shells are also available due to the nearness of the sea.



Entrance space

Space enough to support the restaurant, bigger exploitation

Green space

Considered placement, small and cramped

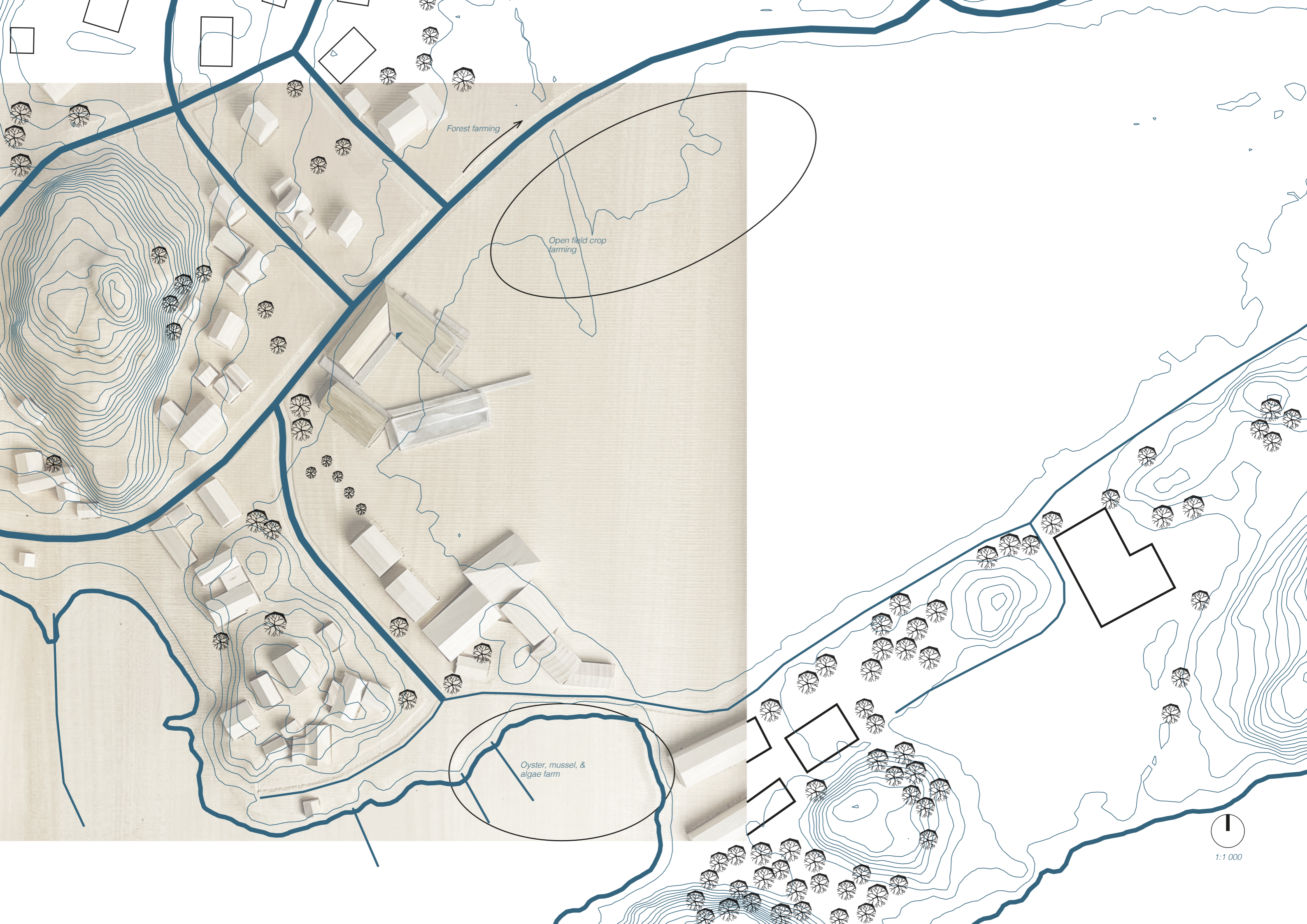


1:1 000

5. Design



Facade of main entrance to the exhibition and gathering hall



Forest farming

Open field crop farming

Oyster, mussel, & algae farm

1:1 000



Site model 1:500

Placement

The building is located on a large field on the left-hand side when entering Gerlesborg from the east. It is consisting of four bodies, two of which - the restaurant and preparation/storage building - are connected by the roof structure. The building to the South-West is an exhibition hall and gathering space decoupled from the restaurant, and the Southern building is a greenhouse building extends the garden season.

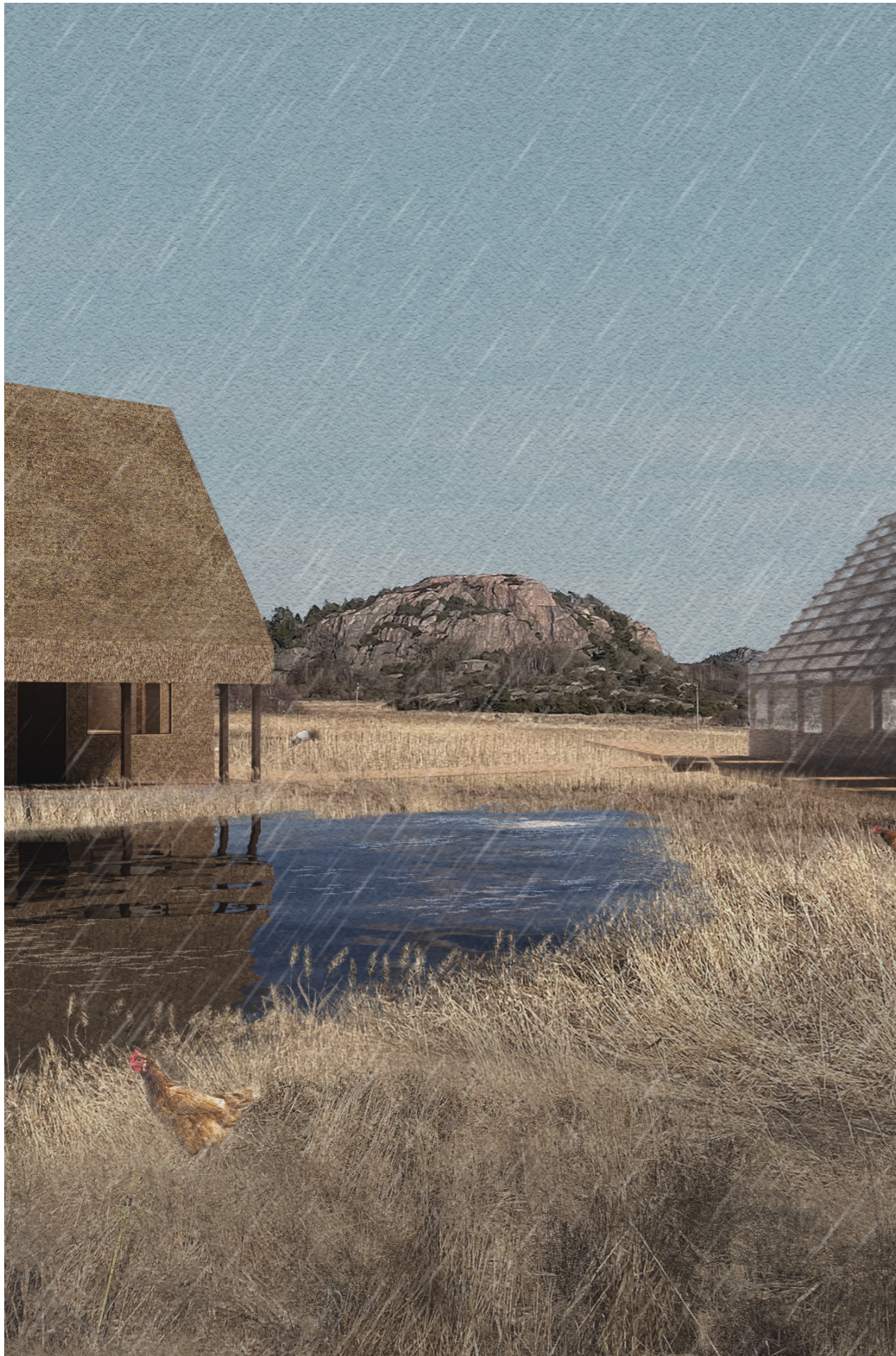
All buildings are connected with a wooden deck that extends out in the field towards the East. The buildings center a grey water pond in the courtyard.

The orientation and placement allow for views of the sea towards the South-West from the restaurant, and a mountain from the courtyard towards the East-North-East.

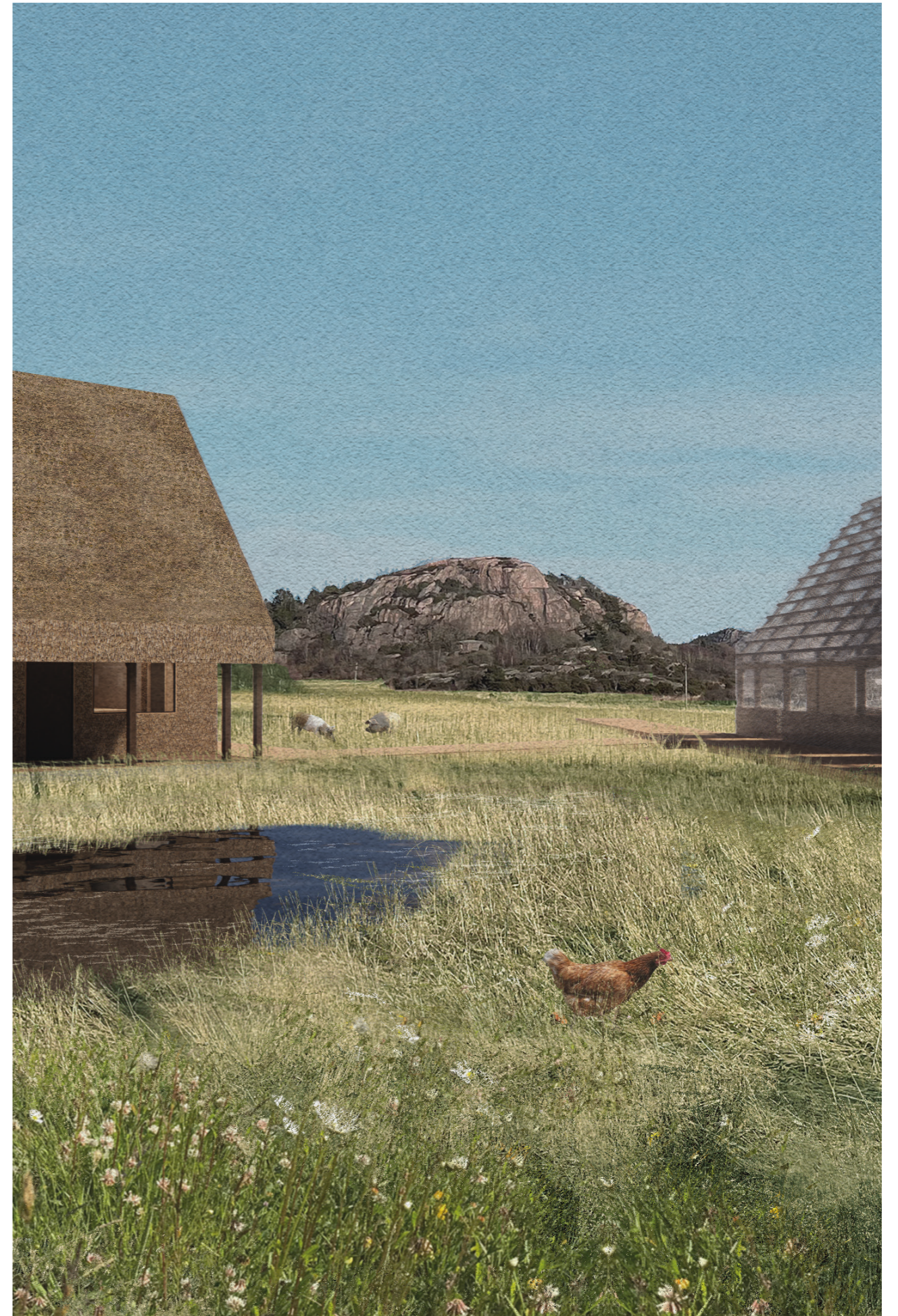
The solid buildings on the site all have thatched roofs and exterior walls. The material decays faster if shadowed for long times, and therefore the placement with few surrounding trees and orientation in the solar landscape is beneficial to the material.

The Social Construction

The restaurant is not only a place where you eat, but, similar to a local pub, a place to have your dinner several times a week and meet the people from the area. Similarly, the buildings are meant to be built by the community themselves, taking support from experts in each field like carpenters and architects. This draws inspiration from the case study of Svartlamon, and will have an impact on the finishing look of the architecture. This is an attempt at further strengthening the identity of the area, and attract people.



View of the courtyard and framed mountain during winter time



View of the courtyard and framed mountain during summer time

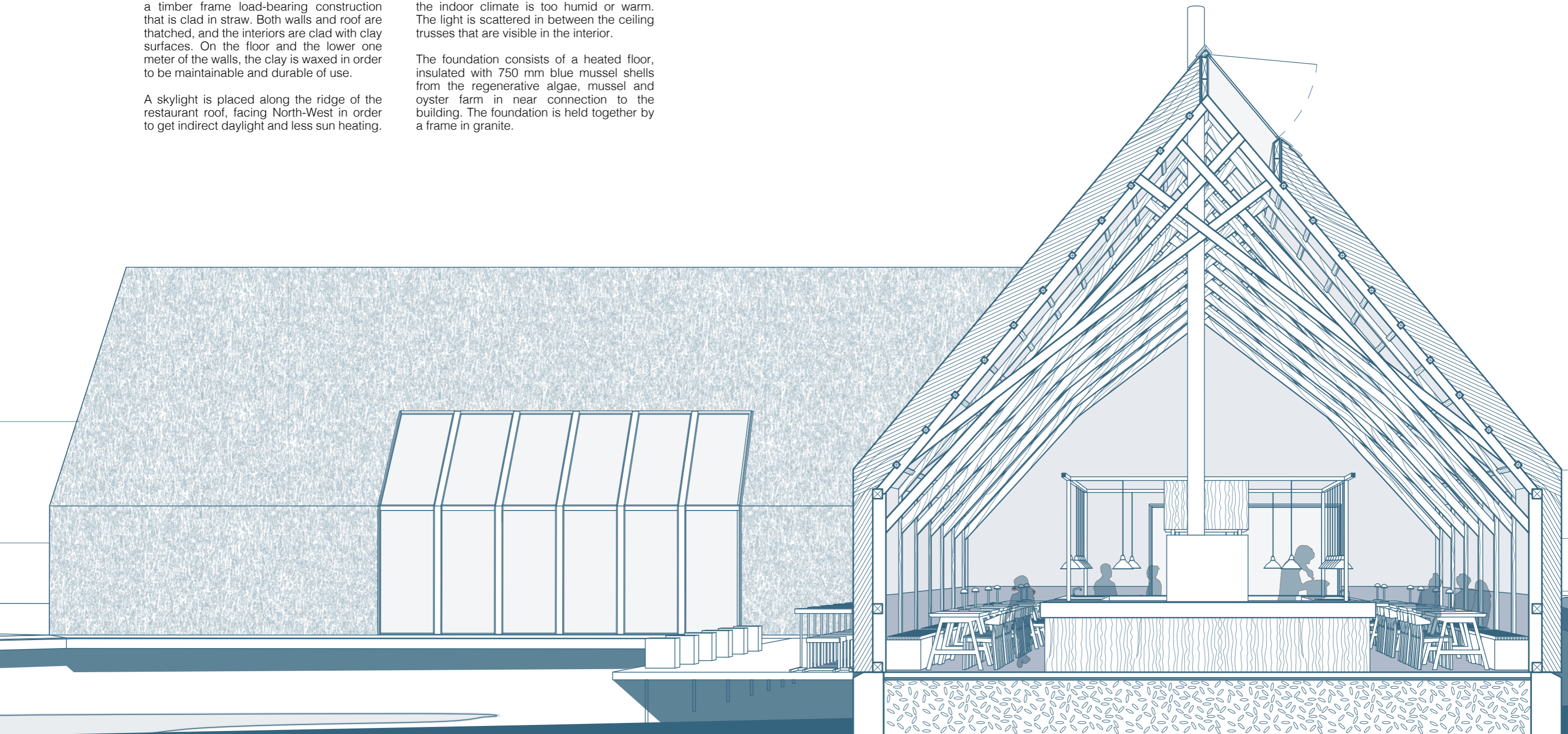
Section

The buildings are generally made up of a timber frame load-bearing construction that is clad in straw. Both walls and roof are thatched, and the interiors are clad with clay surfaces. On the floor and the lower one meter of the walls, the clay is waxed in order to be maintainable and durable of use.

A skylight is placed along the ridge of the restaurant roof, facing North-West in order to get indirect daylight and less sun heating.

The skylights can open automatically when the indoor climate is too humid or warm. The light is scattered in between the ceiling trusses that are visible in the interior.

The foundation consists of a heated floor, insulated with 750 mm blue mussel shells from the regenerative algae, mussel and oyster farm in near connection to the building. The foundation is held together by a frame in granite.



Floor Plan

There are many entrances to the building, but the main entrance is located in the North-East. You arrive and park your vehicle, pass under the roof between the storage building and restaurant building. There, you meet the, meadow-like courtyard.

The building allows the visitor to walk around and see the rituals of local food production, passing the greenhouse, the washing room and long-term food storage. The wooden deck stretches out towards the view of the mountain for a decoupled experience of nature, in the grass field.

During warm days, the restaurant can be stretched out to the courtyard where seats can be arranged on the wooden deck around the wild grass field and grey water pond. Movable granite boxes stand on the edge of the wooden deck, where one can take a seat on the edge.





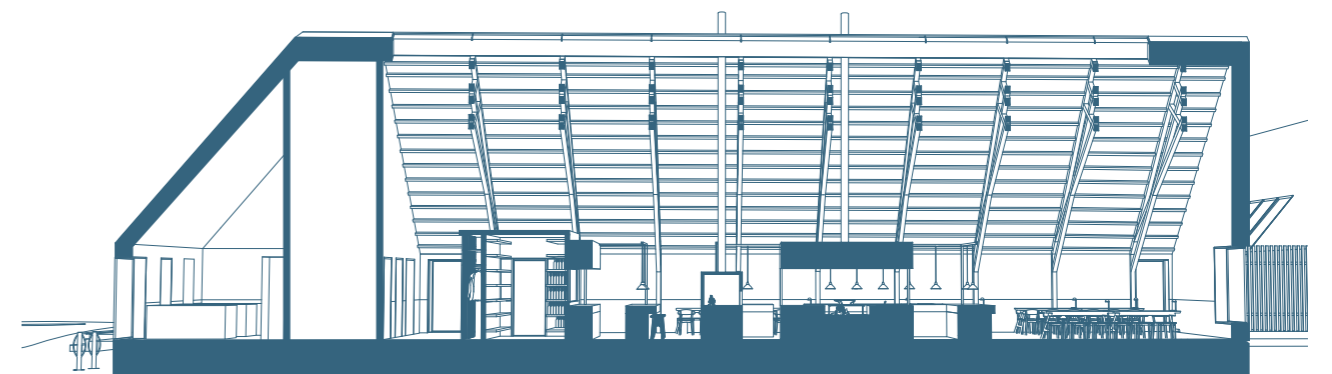
Interior perspective of the restaurant and service kitchen

The Restaurant

The restaurant holds seats for 96 people, including bar seats. They are centered around the service kitchen where the cooking is only powered with fire on logs and gas as a reference to the longhouse. There is an oven, an open fireplace and a gas stove centered in the kitchen. The idea is for people to be able to see and engage with the chefs cooking. After a discussion with a chef, the connection is not too prominent, as that would disturb the chef in the stressful work.

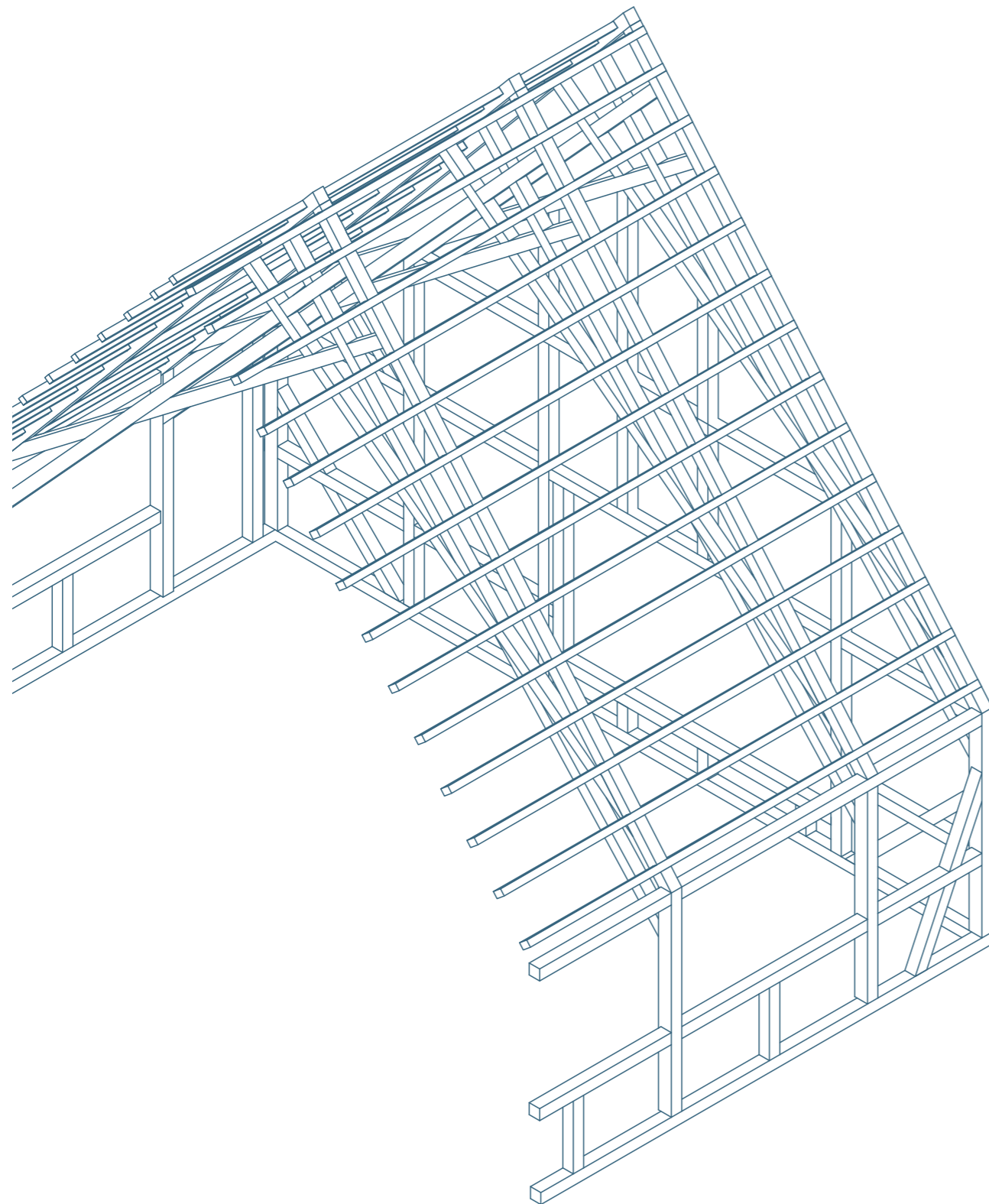


Interior perspective from the restaurant entrance



*B - B
1:200*

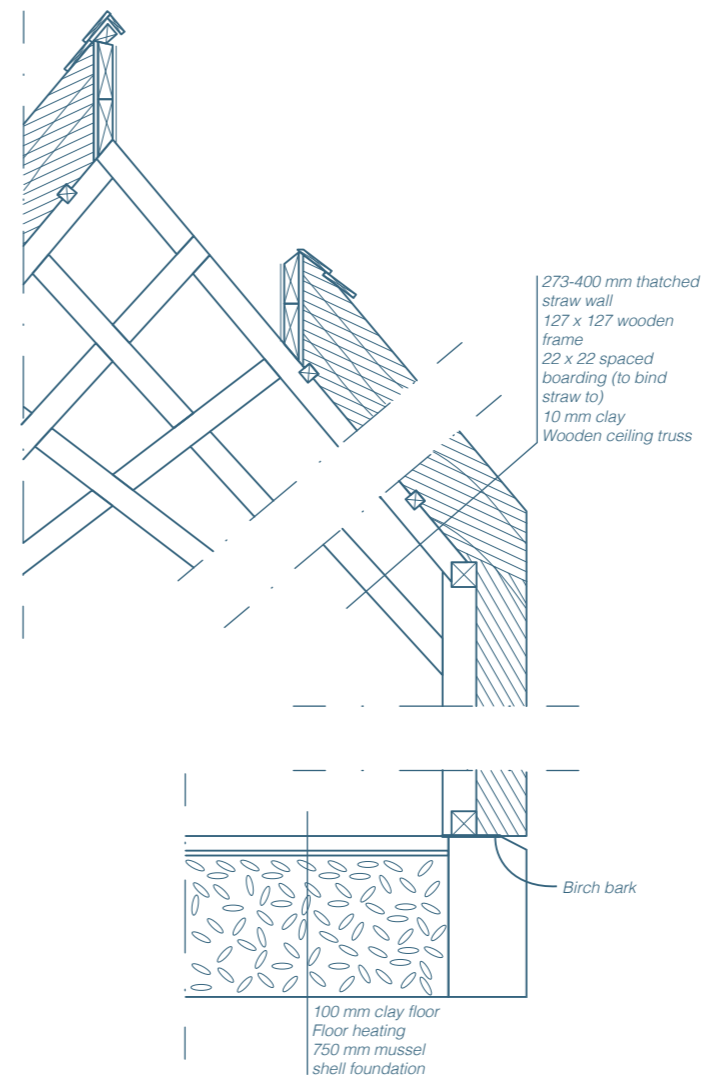
Construction



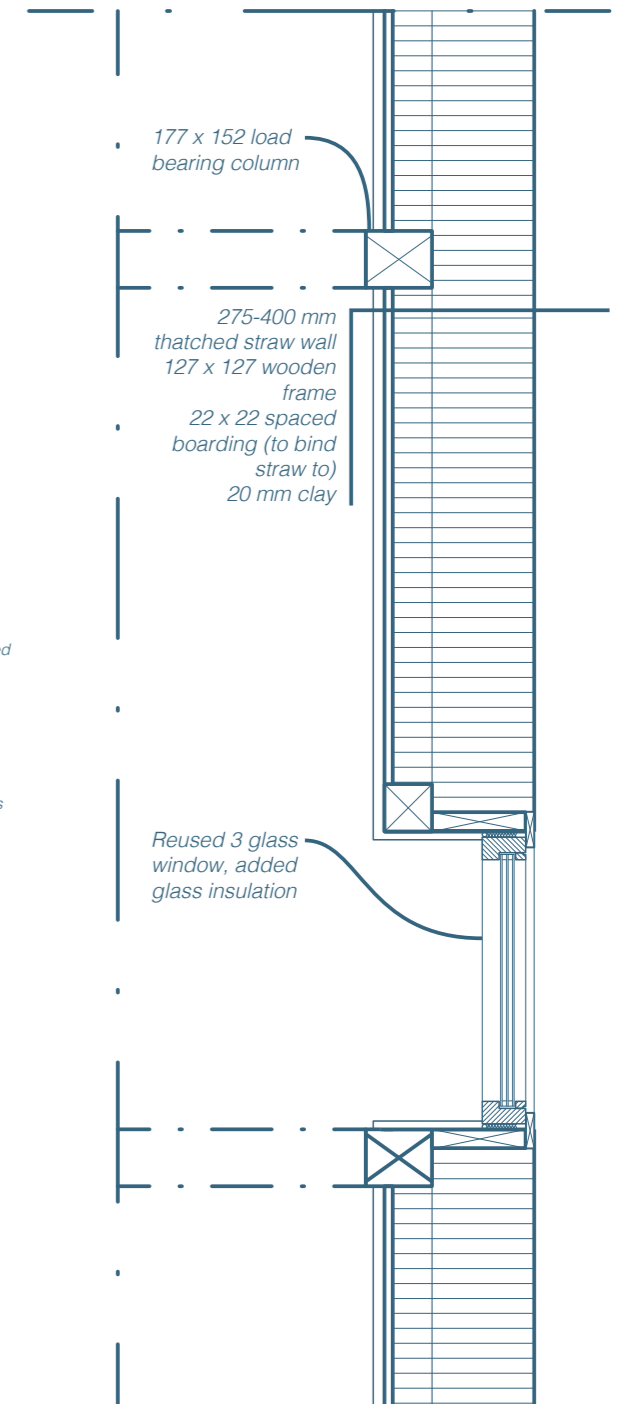
General wooden construction, isometric view of eastern part of the restaurant
1:100

The construction is, as already mentioned, a wooden load-bearing timber frame. The technique is traditional and requires no joints. Instead, wooden dowels are inserted in holes where wood overlaps.

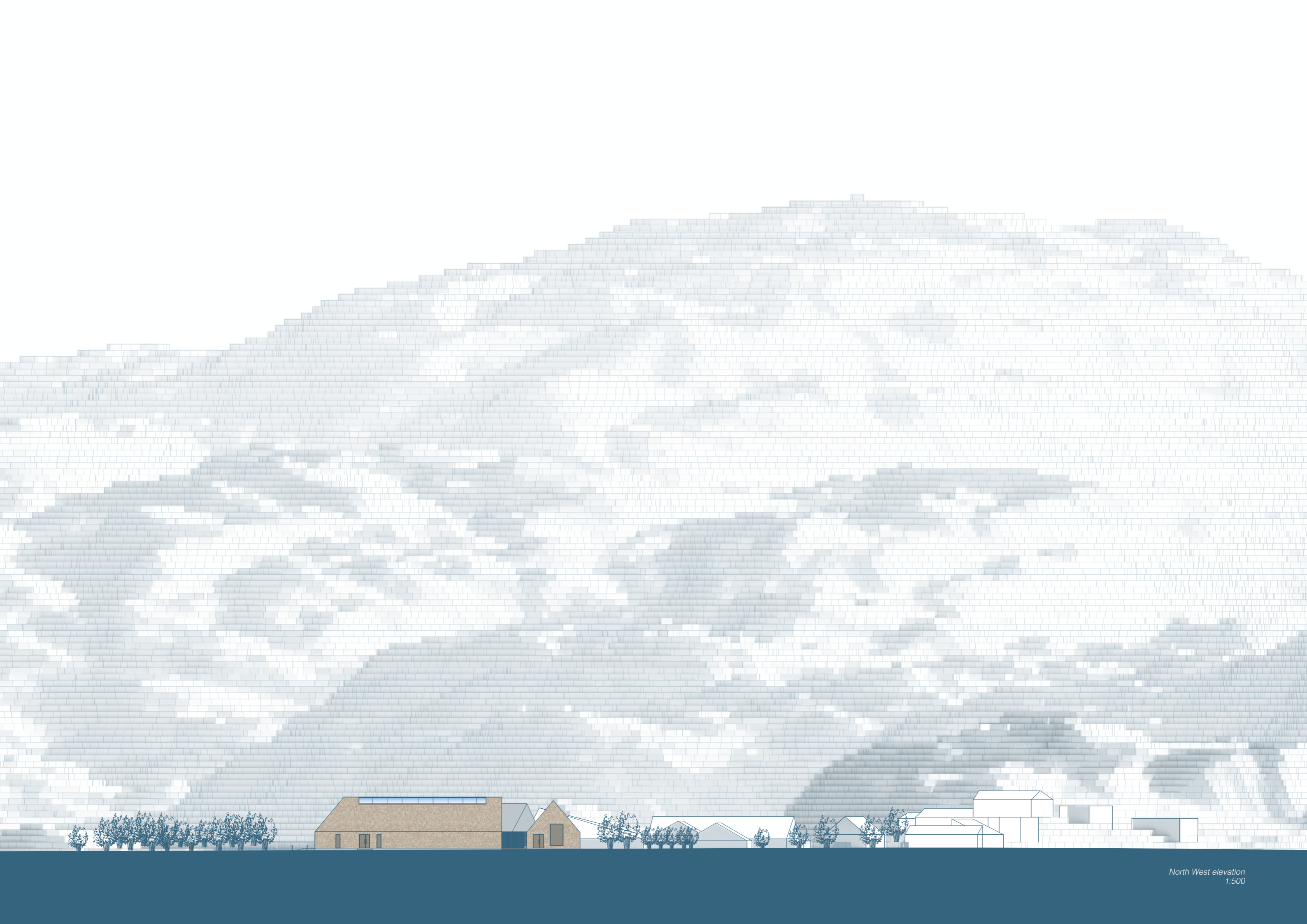
The roof trusses of this building are inspired from a medieval Norwegian church, where a similar scissor lock was used. These scissor locks take up tensile forces and free space in height to accentuate the height of the buildings. This also allows for more light.



Detail section
1:40



Planar section, wall detail
1:20



6. Conclusion & Discussion



Main entrance from the courtyard

Conclusion of Translation

The New Nordic Architecture Manifesto aims:

1. To express clear building tectonics, honesty, simplicity, and ethics we wish to associate to our region.
2. To reflect the changes of the seasons in the architecture we design by designing for an experience of the climate over the year.
3. To base our designs on materials and produce whose characteristics are particularly in our climates, landscapes, and cultures. Examples of these are wood, straw, clay, mussels and stone.
4. To combine the demand for comfort with modern knowledge of health and well-being, that doesn't harm people in use of it.
5. To promote Nordic architecture and the variety of Nordic design - and to spread the word about their underlying cultures by looking to Nordic vernacular building techniques and manners.
6. To promote the natural environment, and their ecosystems, and a sound production process in order to preserve resources and ecosystems in our Earth.
7. To develop potentially new applications of traditional Nordic architecture and design in a modern and social sustainable structure.
8. To combine the best in Nordic design methods and traditions with impulses from abroad by allowing for new inventions in the design, and using already existing materials and components.
9. To combine local self-sufficiency with regional sharing of high-quality design in materials, energy use and water use.
10. To join forces with clients, other architects, craftsmen, constructors, material producers, house retailers, researchers, teachers, politicians, and authorities on this project for the benefit and advantage of everyone in the Nordic countries and the world.

As a conclusion, the New Nordic Architecture Manifesto is updated and clarified according to the findings of the thesis.

Conclusion

Conclusion

How can an architectural translation of the New Nordic Kitchen Manifesto impact the building industry, using food systems in a rural context?

Working with the translation of the New Nordic Kitchen Manifesto has been a conceptual design strategy. The manifesto turned out to be applicable to architecture, as both food and architecture are fields within creativity.

The manifesto states to take references from traditional local culture, and a strict reference that was used in the design process is the vernacular Longhouse, defining the boundary of each building volume. Although important to this project, it should not necessarily be that building typology in other designs using this manifesto. As the manifesto showed to support for sustainable and regenerative design in the social, economical, and ecological fields, it is suitable to be used further in the paradigm shift within architecture. Therefore, it is also important to apply the manifesto to the specific context in which the design stands. With that mindset, the manifesto is less of a white supremacist guideline.

Local materials and less processed refineries are required by the New Nordic Architecture manifesto, which is shown in the design. This thesis is a test of the food concept in architecture, and an introduction for the building industry to become more radically sustainable with clear boundaries. The manifesto proved for me to be a design strategy beyond sustainability.

I think the project manages to have an impact both on the desired building industry, and the food industry to become regenerative. By working on the sustainable aspects of architecture on a restaurant with a sustainable food concept as the guide, both fields are impacted towards the better.

Hopefully, also people's relationship to food can change with a realization of this project.

At the specific site of Gerlesborg, it is natural to expand the restaurant as a meeting center to also being a place to enjoy views of the dramatic landscape, and to curate the art produced at Konstnärernas Kollektivverkstad and Gerlesborgsskolan. With a collaborative community that builds the building together with experts in the fields, the outcome of the design would be artsy and showing the identity of the context.

Natural materials have an identity to themselves that is hard to predict. The materials will change over time, and therefore, the modern and sharp-cut design of the thesis is a bit contradicting. As the case studies shows, the materials in themselves expose a wilderness far from today's building standards. Especially with community building techniques, the aesthetics of the built building might differ from the design proposal. It is in combination with this and execution of details even more important for the architect to keep a close collaboration with the carpenters and builders, and allow for the identity of the local and hand made to shine through.

In this thesis, I have used digital tools to design and to manufacture physical models, and the handcraft lies in the execution of the design. One can argue that the physical models are one of a kind, and therefore have the handcraft soul to them. They were created by a computer combined with the human hand when leaving the bark on the sides. The thesis shows that either digital tools or handcraft is superior, but should be used in aim of creating value suitable to the cause.

The design strategy for this project showed to be closely connected to the theory of primitivism. The project is about coming closer to nature, people, and materials in shorter spans than the long production chains of today.

Discussion & Reflection

All points in the manifesto are important, but those I found to be most important in this thesis are 2, 3, 4, 6, 7 and 10. They lead the design decisions, and are prominent throughout the design.

Point 1 in the manifesto is interpreted to show the building tectonics relevant to the selected construction material and climate shell. The design does this, exposing the load-bearing structure.

The design takes the seasons into account according to point 2. The building provides experiences in the outdoor climate, the local nature, and views of it, and how nature changes over the year. In addition, the food served at the restaurant follow the seasons for foraging and growing food.

Point 3 about using local materials is the most prominent in the design, as the materials have brought limits and possibilities according to their properties. This is important since many of the materials used are less common in today's new buildings.

Comfort and well-being, point 4, are promoted by the use of materials in the building, as they are less pollutive than popular materials like concrete. It is also considered in the design as floor plan flows provides an interest to explore views and the building, and to be comfortable in the experience of food. One example of this is the automatically opened skylights that open when indoor humidity or temperature is too high. The amount of window openings is also considered with comfort and well-being in consideration. Views and daylight are captured carefully with them.

As the project is situated in the Nordic context and has Nordic references, it promotes Nordic architecture and culture according to point 5, but that is not a central driver to the project in itself, only a biefect.

Using regenerative design as a design strategy and materials low-pollutant materials supports the natural environment and local ecosystems as in point 6.

The project develops new applications of traditional Nordic architecture by having clear vernacular references, as in point 7.

Point 8 is very similar to point 7 but invites impulses from abroad. This is not intentionally done, but since the project is designed in with a modern look, it is still considered to some extent.

As one of the delimitations were to refrain from high-tech systems in the design, point 9 is not thoroughly considered in the design. It should be emphasized further because otherwise, as already mentioned, the design might strip the local landscape on all natural living species. It is however prominent in the concept, where regenerative design conceptually is about just that.

Point 10 is very important in a development of this project, see the discussion. The thesis has mainly focused on collaboration with other professionals in required fields in theory, though discussions with professionals like chefs, architects, roof thatchers, and carpenters in framework building technology has been carried out.

Discussion

As already stated, this project relies a lot on the craftsman and qualities of craft. Value, detail, precision, and variation is hard for the architect alone to predict, and when working with low-tech and local materials, the object in itself automatically takes a greater part in the design. In this thesis, it leads to working outside of the general construction standard which means that all design decisions need to be supported by a study, and preferably also a praxis of work via a craftsman.

In the start of the project, I viewed it to be unbuildable at the site and in this socio-economical system, where our food culture is indeed bounded to profit. Instead, I thought the project was speculative and set in a future utopian reality. But during the process, I came to realize that this absolutely can be built, and if it was to be built, it would be pioneering in the development towards a holistically sustainable society.

The use of local materials has a backside to it - the local landscape would shift dramatically with the use of only local materials. To this project only, a lot of trees and reed would have to be cut down in the nearby area, leaving the reed fields and forests to be cut down. One can ask in itself if that is really strengthening of the identity of the area, and consider that that is what the industry already does in northern Sweden today. The materials should be excavated over time to allow the fields to regrow over time, but in reality, the building and concept might have such huge impacts on the local area that one should not restrain to only local materials. This is also where a collaboration with other nearby places comes in, because what happens when a building is to be built, and no nature is left to the inhabitants of the area?

As the New Nordic Kitchen Manifesto has become an obvious everyday use in at least the high-end food industry, it has to spread to all layers of food consumption in order to actually make change happen. The same goes for architecture, and I found recently that the general discussion is becoming much more aware and active, but we still need to move faster forward.

Reflection

This thesis is a test of the translation from the concept of New Nordic Kitchen manifesto, and therefore conceptual in its development. I found that interesting to work with, as all design decisions are based on the manifesto. That makes the project outcome quite conceptual, and I realize that if the project was to be built, some decisions would be reconsidered to work better as a commercial building. For example, I think the restaurant would benefit commercially if the restaurant was more open towards the courtyard. The wall would be more transparent and possible to open up. This would also call for more structured and many seats in the courtyard.

Like the storage building, the restaurant building would have gained usability with an arcade along the courtyard. With that, the roof structure would be widened and the hierarchy of the four buildings with the most important - the restaurant - would have been clearer. Furthermore, the project would affect the landscape that should be shown in the design design. A earth storage should be in near connection to the building, and a ceramic workshop could be added to make cutlery and plates of the waste produced in the restaurant.

The building has a clean cut look to it, and can be associated with prefabricated materials, which they are not. To me, that was difficult to draw and design as I have learnt to draw in modern ways with modern techniques during my education.

The site of the project was changed several times through the process. It was not a big problem to the design as it was driven strongly by the concept and could stand almost anywhere in the Nordic context, but it meant I had to put a lot of time in restarting and reconsidering new sites in the search for one I was content with. I changed my mind because I wanted to find a "utopian" context where all parts of the context could support with materials, food, and engaged people to the project, according to the concept.



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